

TEST PIT LOG

DATE: 11/11/15
METHOD: EXCAVATOR (P&P SEPTIC SERVICE)
PRESENT: J. WILLIS, L.D., T. PANCUCCI

TP-1
0'-5": 10YR 3/2 (DARK GRAYISH-BROWN) LOAM, LOOSE, MANY ROOTS.
5'-25": 10YR 4/4 (DARK YELLOWISH-BROWN) VERY FINE SANDY LOAM, LOOSE TO VERY FRABLE, COMMON ROOTS.
28'-48": 10YR 5/4 (YELLOWISH-BROWN) VERY FINE SANDY LOAM, FIRM, REDOX FEATURES (FANT DEPLETIONS AND CONCENTRATIONS).
ESTIMATED SEASONAL HIGH WATER TABLE (ESHWT) 28"
BEDROCK: NONE TO DEPTH

TP-2
0'-5": 10YR 3/2 (DARK GRAYISH-BROWN) LOAM, LOOSE, MANY ROOTS.
5'-25": 10YR 4/4 (DARK YELLOWISH-BROWN) VERY FINE SANDY LOAM, LOOSE, MANY ROOTS.
23'-31": 7.5YR 4/6 (STRONG BROWN) VERY FINE SANDY LOAM, LOOSE, COMMON ROOTS.
28'-44": 10YR 5/4 (YELLOWISH-BROWN) VERY FINE SANDY LOAM, FIRM, REDOX FEATURES (FANT DEPLETIONS AND CONCENTRATIONS).
ESHWT: 31"
BEDROCK: NONE TO DEPTH

TP-3
0'-5": 10YR 3/2 (DARK GRAYISH-BROWN) LOAM, VERY FRABLE, MANY ROOTS.
5'-17": 10YR 4/4 (DARK YELLOWISH-BROWN) VERY FINE SANDY LOAM, FRABLE, COMMON ROOTS.
17'-38": 10YR 5/4 (YELLOWISH-BROWN) VERY FINE SANDY LOAM, FIRM, REDOX FEATURES (FANT DEPLETIONS AND CONCENTRATIONS).
ESHWT: 17"
BEDROCK: NONE TO DEPTH

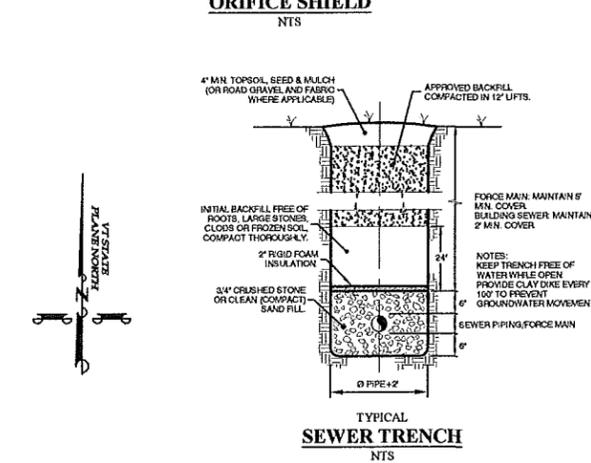
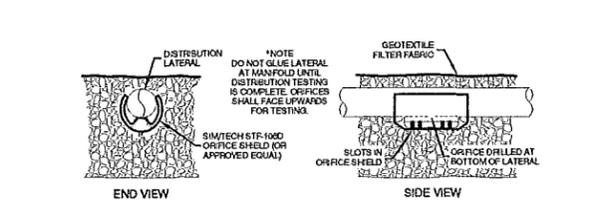
TP-4
0'-5": 10YR 3/2 (DARK GRAYISH-BROWN) LOAM, VERY FRABLE, MANY ROOTS.
5'-21": 10YR 4/4 (DARK YELLOWISH-BROWN) VERY FINE SANDY LOAM, FRABLE, COMMON ROOTS.
21'-34": 10YR 5/4 (YELLOWISH-BROWN) VERY FINE SANDY LOAM, FIRM, REDOX FEATURES (FANT DEPLETIONS AND CONCENTRATIONS).
ESHWT: 21"
BEDROCK: NONE TO DEPTH

TP-5 (SUSPECTED FILL)
0'-3": 10YR 3/2 (DARK GRAYISH-BROWN) LOAM, VERY FRABLE, MANY ROOTS.
3'-8": 10YR 4/4 (DARK YELLOWISH-BROWN) VERY FINE SANDY LOAM, FRABLE, COMMON ROOTS.
8'-48": 10YR 5/4 (YELLOWISH-BROWN) VERY FINE SANDY LOAM, FIRM, REDOX FEATURES (FANT DEPLETIONS AND CONCENTRATIONS).
ESHWT: 8"
BEDROCK: NONE TO DEPTH

PERCOLATION TEST RESULTS
CONDUCTED 11/16/15

NUMBER	DEPTH	DRIVE	RUNS	RATE (EXTRAPOLATED)
P1	18"	1"	7	8.3 RPM*

*DESIGN RATE



BOUNDARY NOTE
THIS IS NOT A BOUNDARY SURVEY. APPROXIMATE BOUNDARIES ARE DERIVED FROM GROUND, DESCRIPTION, TAX MAP AND LIMITED EVIDENCE FOUND IN THE FIELD. CONTACT A LICENSED LAND SURVEYOR AS NECESSARY TO CONFIRM BOUNDARIES.

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 30' DOWNGRADIENT OF THE ELEVATED SAND MOUND IS THE EFFLUENT DISPOSAL 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.

WASTEWATER SYSTEM BASIS OF DESIGN
PROPOSED MOUND SYSTEM TO SERVE EXISTING 4 BR SINGLE FAMILY HOME.
DESIGN FLOWS: (3 BR) 140 GPD/BR + (1 BR) 70 GPD/BR = 490 GPD
APPLICATION RATE: (0.8)(3+1+0.3) = 0.79 GDSF (USE 1.0 MAX. RATE)
490 GPD ÷ 1.0 GDSF = 490 SF REQUIRED ABSORPTION AREA.
CONSTRUCT A 62.0' x 10.0' ABSORPTION BED = 496 SF AREA.
BASAL AREA: 490 GPD/0.74 GDSF = 662.2 SF = 62.0' x 10.7' W.

PRESCRIPTIVE DESKTOP MOUNDING ANALYSIS
LINEAR LOADING RATE (LLR) FACTOR:
• SLOPE IN DISPOSAL AREA = 21.0-28%
• VERY FINE SANDY LOAM 015.1-20% = 28.2
• USING 4" (0.33) EFFLUENT PLUME, THE MOUNDED WATER TABLE WOULD BE 13" BELOW THE SURFACE (BASED ON 17" TO ESHWT).
• LINEAR LOADING RATE (LLR) = (0.33)(28.2) = 8.8 GPD/LF
• 490 GPD ÷ 8.8 GPD/LF = 55.9 LF REQUIRED SYSTEM LENGTH (62' PROPOSED).
23" SAND DEPTH BELOW ABSORPTION BED IS PROPOSED TO MAINTAIN 36" SEPARATION TO MOUNDED WATER TABLE (23" + 13" = 36").

HEAD LOSS CALCULATIONS
REQUIRED GPM:
(24) 5/16" ORIFICES = 1.82 GPM/ORIF. @ 2.5' = 43.7 GPM
1/4" WEEP HOLE = 2.0 GPM = 2.0 GPM
TOTAL DISCHARGE RATE = 45.7 GPM
FRICTION LOSS:
BASED UPON 300 FT EQUIVALENT LENGTH OF 2" FM = ± 14.1 FT
ELEVATION LOSS = 426.7 (LATERAL) - 2396 (P-OFF) = 30.7
NETWORK LOSS = 1.31 x 2.5' = ± 3.3
TOTAL LOSS = ± 48.1 FT

DESIGN NOTE
TO THE EXTENT REASONABLY POSSIBLE, THIS DESIGN WAS PREPARED IN ACCORDANCE WITH CHAPTER 1, WASTEWATER SYSTEM AND POTABLE WATER SUPPLY RULES, EFFECTIVE 9/28/07.
REQUESTED (NECESSARY) VARIANCES INCLUDE: DISPOSAL SYSTEM IS PROPOSED LESS THAN LESS THAN 25' TO A BOUNDARY AND DRAINAGE DITCH. MOUND SIDE SLOPES ARE PROPOSED USING 2.5:1 VS 3:1 GRADE. SUBSURFACE TANKS ARE PROPOSED LESS THAN 50' FROM A DRILLED WELL.
USE OF LOW FLOW PLUMBING FIXTURES AND DEVICES IS RECOMMENDED. PLUMBING FIXTURES SHOULD BE OPERATING PROPERLY.

MOULD CONSTRUCTION SPECIFICATIONS

- 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.
- 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.
- 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.
- 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.
- 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).
- THE MOUND PERIMETER SHALL BE GRADED TO ENSURE DIRECTION OF SURFACE WATER RUN-OFF (DIRECTION DOWN OR DIAGONAL AS SHOWN).
- ONCE PLOWING IS COMPLETE, CONTACT THE DESIGNER FOR AN INSPECTION OF THE SITE PRIOR TO PLACEMENT OF MANIFOLD.
- UNLAP THE APPROVED SAND FILL ALONG 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.
- 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.
- FORM THE TRENCH/BED BY MOVING ALONG ITS LENGTH. BOTTOM OF TRENCH/BED MUST BE LEVEL. HAND WORK WILL BE NECESSARY.
- UNLAP THE STONE IN THE TRENCH/BED BY MOVING UP THE SIDE SLOPE. LEVEL THE STONE TO REQUIRED ELEVATION.
- CHANNEL STONE FOR LATERALS. LAY PIPE LEVEL WITH ORIFICES POINTING UPWARDS (WITHOUT ORIFICE SHIELDS INSTALLED UNTIL PRESSURE TESTING IS COMPLETE).
- 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.
- FILL REMAINING 2" OF STONE OVER LATERALS AFTER TEST IS COMPLETE.
- COVER ENTIRE TRENCH/BED WITH "MIRAFI 140-M" GEO-TEXTILE FILTER FABRIC (OR EQUAL).
- 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.
- LANDSCAPE THE MOUND BY PLANTING GRASSES ON THE SURFACE. SHRUBS PLACED AT THE FOOT AND UP THE SLOPE ON THE SIDES AND END 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

- 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.
- 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, 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.
- AT LEAST ONCE A YEAR, DODGING TANKS AND DISTRIBUTION BOXES SHOULD BE OPENED AND SETTLED SOLIDS REMOVED AS NECESSARY AND THE DODGING TANK OR DISTRIBUTION BOX CHECKED FOR LEAKINESS.
- PLUMBING AND ELECTRICAL COMPONENTS ASSOCIATED WITH PUMP STATIONS OR ADVANCED TREATMENT UNITS MUST BE CHECKED REGULARLY FOR OPERATION AND LEAKS.
- 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 SEPTIC AND SUBSEQUENTLY CONTAMINATE THE SOIL OR CROSS AT THE SITE OF ULTIMATE DISPOSAL.
- 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.
- THE EFFLUENT FILTER IN THE SEPTIC TANK OUTLET BAFFLE SHOULD BE CLEANED (HOSED-OFF) EVERY 3-8 MONTHS OR MORE FREQUENTLY DEPENDING ON USAGE. THE EFFLUENT FILTER MUST BE CLEARED IF SEWAGE BEGINS TO DRAIN SLOWLY FROM THE HOUSE. THE SEPTIC TANK MAY REQUIRE PUMPING IF THE FILTER BECOMES PLUGGED.
- 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 DEETANTS, CHEMICALS AND USE OF A GARAGE 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-DOSING SYSTEMS ARE RECOMMENDED VERSUS TIME-DOSING. CONNECTION TO A WASTEWATER DISPOSAL SYSTEM SHOULD BE AVOIDED IF POSSIBLE.
- THE OWNER ASSUMES FULL RESPONSIBILITY FOR THE CONTINUED PROPER USE AND MAINTENANCE OF THE SYSTEM.

LEGEND

- TEST PIT (DEPTH TO ESHWT)
- PERCOLATION TEST
- CONTROL POINT (SPRING IN GROUND)
- UTILITY POLE
- DRILLED WELL
- IRON ROD/REBAR
- EXISTING CONTOURS
- APPROX. BOUNDARY
- DRAINAGE DITCH
- TREE LINE
- WIRE FENCE
- WOOD FENCE
- FM - FORCE MAIN
- W - WATER LINE
- OE - OH ELECTRIC

DESIGN NOTE
TO THE EXTENT REASONABLY POSSIBLE, THIS DESIGN WAS PREPARED IN ACCORDANCE WITH CHAPTER 1, WASTEWATER SYSTEM AND POTABLE WATER SUPPLY RULES, EFFECTIVE 9/28/07.
REQUESTED (NECESSARY) VARIANCES INCLUDE: DISPOSAL SYSTEM IS PROPOSED LESS THAN LESS THAN 25' TO A BOUNDARY AND DRAINAGE DITCH. MOUND SIDE SLOPES ARE PROPOSED USING 2.5:1 VS 3:1 GRADE. SUBSURFACE TANKS ARE PROPOSED LESS THAN 50' FROM A DRILLED WELL.
USE OF LOW FLOW PLUMBING FIXTURES AND DEVICES IS RECOMMENDED. PLUMBING FIXTURES SHOULD BE OPERATING PROPERLY.

SITE PLAN & DETAILS
WASTEWATER SYSTEM DESIGN

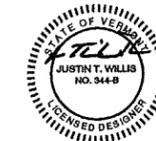
PAMELA G. GRAHAM
995 PRINDLE ROAD
CHARLOTTE - VERMONT

DATE: 11/23/15
PROJECT: 15-047
DRAWING: 15047-1

SCALE: NOTED
SHEET: S1

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

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



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 BE VERIFIED PRIOR TO ORDERING OR DELIVERY OF TANK(S).

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

*INSTALL COUNTER-BUOYANCY KITS ON EACH TANK PER MANUFACTURER'S INSTRUCTIONS (I.E. STAINLESS STEEL CABLES TO CONCRETE DEAD-MEN).

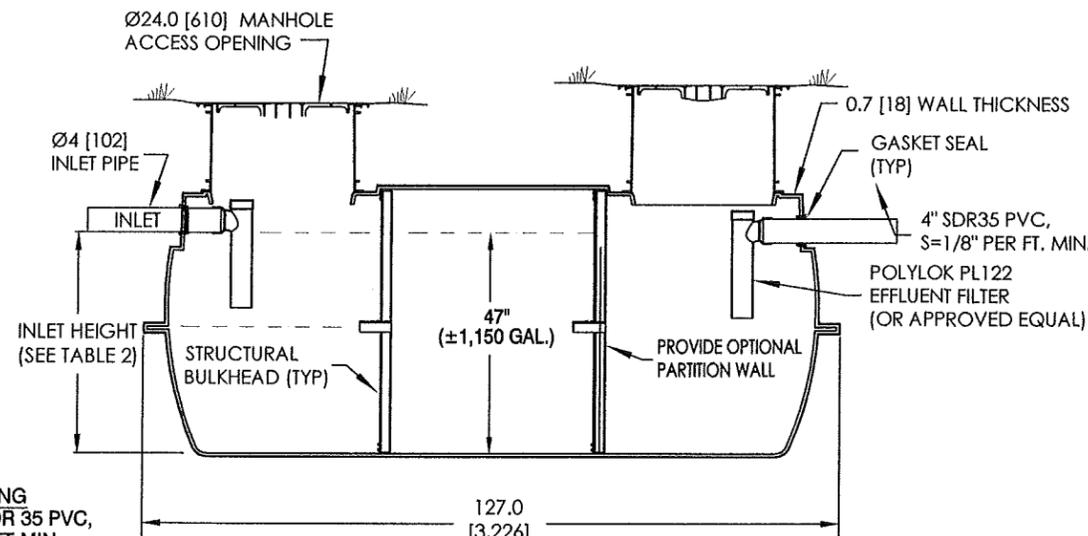
MIN. 4 DOSES PER DAY = 122.5 GAL./DOSE.
SET FLOAT TO DISCHARGE ±150
GALS./DOSE = ±5 DOSES/DAY (INCLUDING
±40 GALS. WEEP-BACK).

SELECT EFFLUENT PUMP CAPABLE OF
DISCHARGING 50 GPM @50' TDH (MIN.).
USE GOULDS MODEL 3885 WE10H OR
APPROVED EQUAL.

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

PROVIDE RISERS TO GRADE OVER ALL ACCESS
COVERS. INSTALL AND SEAL PER
MANUFACTURER'S GUIDELINES.
INSTALL COUNTER-BUOYANCY KIT (DEAD-MEN
WITH TIE-DOWNS) ON BOTH TANKS.

INSTALL 3" SCH. 40 PVC VENT PIPE WITH
CARBON FILTER (OR POLYLOK VENTED
COVER). EXTEND 18" MIN. ABOVE GRADE.
VENT MAY BE CONNECTED AT TANK
SIDE INLET (GROMMET REQUIRED)



INLET PIPING
4" SCH. 40 OR SDR 35 PVC,
S = 1/4" PER FT MIN.

OUTLET PIPING
4" SDR 35 PVC,
S = 1/8" PER FT MIN

WIDTH = 62.2
HEIGHT = 54.7

SECTION

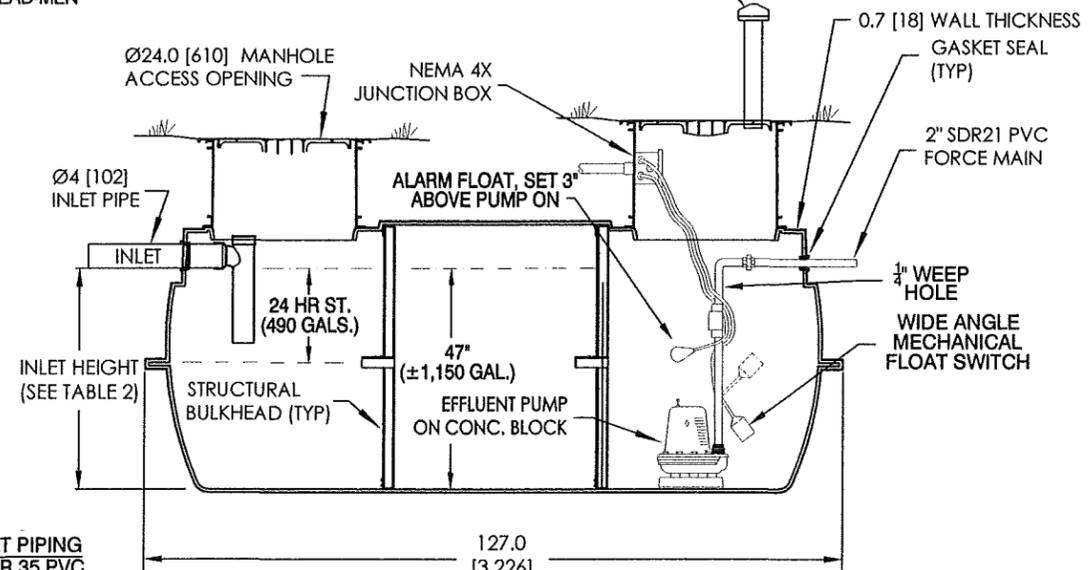
1,000 GAL.

SEPTIC TANK

INFILTRATOR #IM-1060

NTS

TANK INSTALLATION SHALL BE
COMPLETED PER MANUFACTURER'S
GUIDELINES.



INLET PIPING
4" SDR 35 PVC,
S = 1/8" PER FT MIN.

OUTLET PIPING
2" SDR 21 PVC

WIDTH = 62.2
HEIGHT = 54.7

SECTION

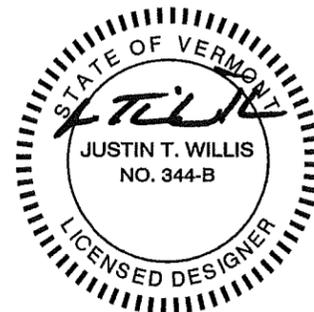
1,000 GAL.

PUMP STATION

INFILTRATOR #IM-1060

NTS

TANK INSTALLATION SHALL BE
COMPLETED PER MANUFACTURER'S
GUIDELINES.



NO.	DATE	REVISION	BY
WILLIS DESIGN ASSOC., INC. P.O. BOX 1001, JERICO, VERMONT 05465 (802) 858-9228			

**DETAILS
WASTEWATER SYSTEM DESIGN**

**PAMELA G.
GRAHAM**
995 PRINDLE ROAD
CHARLOTTE - VERMONT

DRAWN: JTW	SCALE: NOTED
DESIGN: JTW	
DATE: 11/23/15	SHEET: D1
PROJECT: 15-047	
DRAWING: 15047-1	