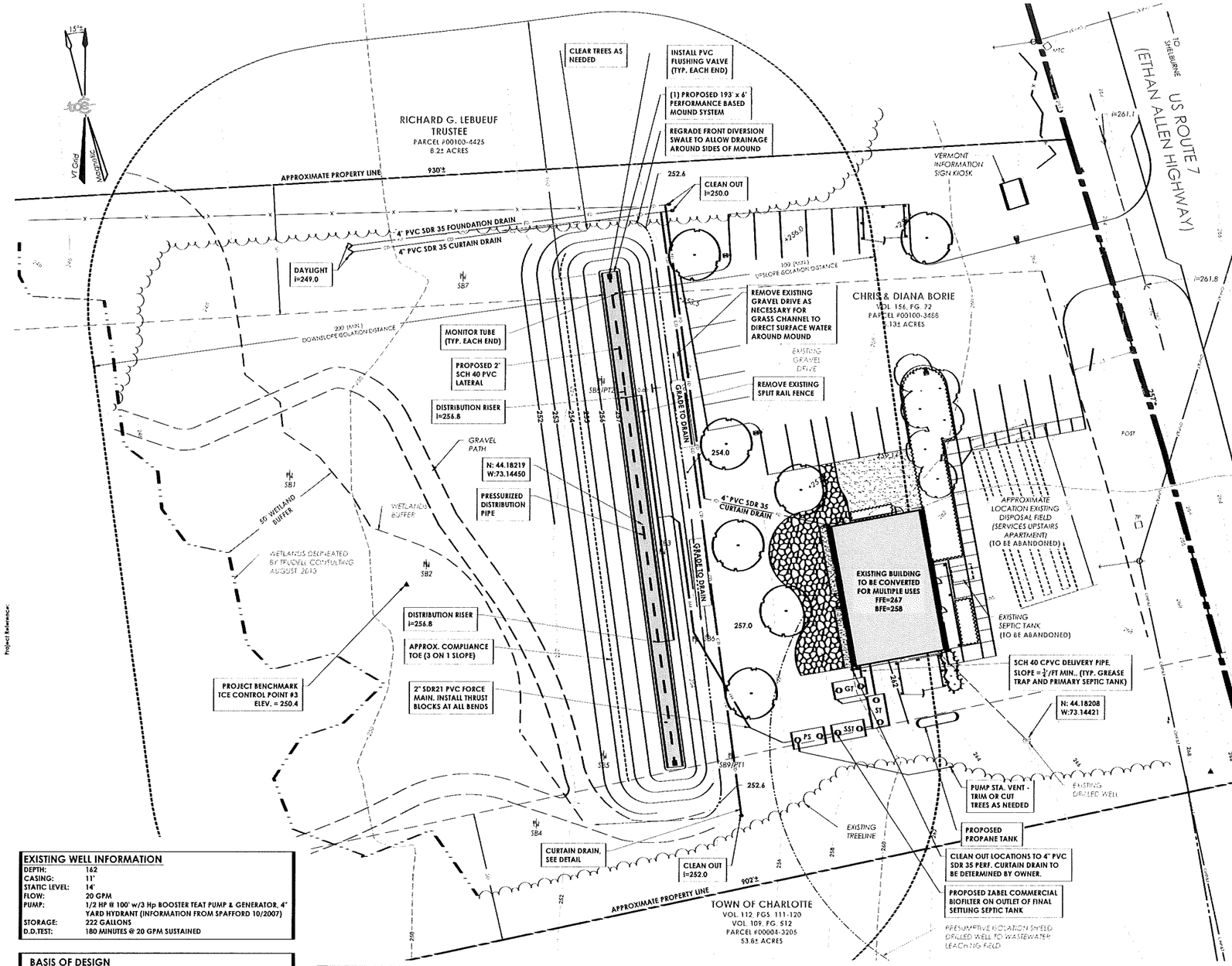

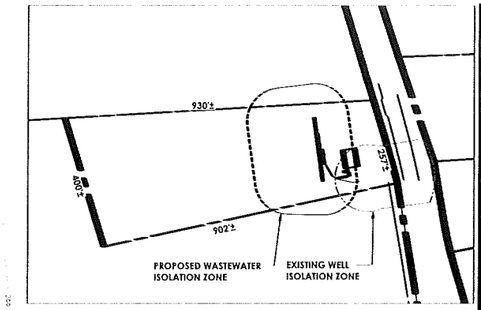

ISOLATION ZONE MAP
SCALE: 1" = 200'

SOIL TEST PIT INFORMATION:

SOIL PROFILES WERE CONDUCTED ON 08/18/13 BY ANDRE LAMBERT, LICENSED DESIGNER #406 AND STEPHEN REVELL, CPG. WITNESSED BY SPENCER HARRIS FOR TOWN OF CHARLOTTE

SB-1 0/10" MEDIUM BROWN FINE SANDY LOAM, PERMEABLE, CRUMBLY, ROOTS
10/50" DARK TAN & BROWN CLAY LOAM, FIRM W/ DISTINCT MOTTLES AND REDOX FEATURES, SHWT = 10"

SB-2 0/9" SAME AS SB 1
9/50" SAME AS SB 1, WITH STICKY, BLOCKY & PLATY COMPOSITION, SHWT = 9'

SB-3 0/11" SAME AS SB 1, W/ ALTERNATE LOAMY LENSES
11/50" SAME AS SB 1, SHWT = 11"

SB-4 0/9" SAME AS SB 1
9/50" SAME AS SB 1, SHWT = 9"

SB-5 0/11" LOOSE SANDY LOAM W/ STONES
11/50" SAME CLAY AS SB 1, SHWT = 11"

SB- 6 0/9" SAME CRUMBLY FINE SANDY LOAM AS SB 1
9/50" SAME CLAY AS SB1, DENSE W/ ROOTS, SHWT = 9"

SB -7 0/10" SAME AS SB 6
10/50" SAME CLAY AS SB 1, SHWT = 10"

SB-8 0/10" SAME LOOSE SANDY LOAM AS SB 1
10/50" SAME CLAY LOAM AS SB 1, SHWT 10"

SB-9 0/11" SAME LOOSE SANDY LOAM AS SB 1
11/50" SAME CLAY LOAM AS SB 1, SHWT = 11"

* SOIL PROFILER NOTE: SOIL BORING HAND DUG TO 15", THEN BORED TO A DEPTH OF 50" TO PROVE DEPTH TO LEDGE. NO LEDGE ENCOUNTERED IN ANY OF THE SAMPLE HOLES TO A DEPTH OF AT LEAST 50".

* NOTE: SOIL TEXTURE RESULTS CONFIRMED BY HYDRO-ANALYSIS FROM KNIGHT CONSULTING ENGINEERS (SEE SIEVE ANALYSIS ATTACHMENT IN WASTEWATER APPLICATION TO TOWN OF CHARLOTTE)

PERCOLATION TESTS:

PT#1 @ SB#9 = 45 MIN./INCH
PT#2 @ SB#8 = 52 MIN/INCH

LEGEND

	EXISTING	PROPOSED
PAVED DRIVE OR ROAD		
GRAVEL DRIVE OR ROAD		
TOPOGRAPHIC CONTOURS		124
SEWER FORCEMAIN	FM	FM
WATER MAINS	W	W
WATER MAINS AND SERVICES		CD
OVERHEAD POWER	OHP	OHP
UNDERGROUND POWER	UP	UP
OVERHEAD TELEPHONE	OHT	OHT
UNDERGROUND TELEPHONE	UT	UT
OVERHEAD POWER & TELEPHONE	OHP&T	OHP&T
PROPERTY LINE		
RIGHT-OF-WAY LINE		
EASEMENTS		
BUILDING SETBACKS		
EDGE OF WOODS		
WATER SUPPLY WELL		
UTILITY POLE		
TELEPHONE PEDESTAL	TP	
ELECTRICAL CABINET	MTC	
TCE CONTROL POINT STEEL REBAR		
PERCOLATION TEST		
SOIL TEST PIT		
BENCHMARK		

EXISTING WELL INFORMATION

DEPTH:	162
CASING:	11'
STATIC LEVEL:	14'
FLOW:	20 GPM
PUMP:	1/2 HP @ 100' w/3 Hp BOOSTER TEAT PUMP & GENERATOR, 4" YARD HYDRANT (INFORMATION FROM SPAFFORD 10/2007)
STORAGE:	222 GALLONS
D.D.TEST:	180 MINUTES @ 20 GPM SUSTAINED

BASIS OF DESIGN

NOTE: THE HYDROLOGICAL STUDY PERFORMED BY STEPHEN REVELL, CPG SUPERCEDES THE DESKTOP MOUNDING ANALYSIS FOR CALCULATING THE LINEAR LOADING RATE. THE HYDROLOGICAL STUDY STATES THE LLR AT 1.0 GPD/LF.

1. SEWAGE FLOWS: A MAXIMUM OF 1,000 GPD
2. LOADING RATE: 1.0 GPD / SQUARE FOOT
3. REQUIRED DISPOSAL FIELD AREA: 1,000 GPD / 1.0 GPD/SF = 1,000 SF
4. DISPOSAL AREA PROVIDED: A MOUND SYSTEM WITH ONE TRENCH THAT IS 6.0 FT. WIDE AND 193 FT. LONG = 1,158 SQ. FT. TO MEET SQUARE FOOTAGE AND LENGTH REQUIREMENTS
5. BASAL AREA PROVIDED = 32'x193' = 6,176 SQUARE FEET

REQUIRED ORIFICE SPACING FOR 1 - 193 FT. LONG BY 6 FT. WIDE TRENCH:
1 HOLE / 25 SF OF SEEPAGE AREA IS REQUIRED
1,000 SF / 25 SF = 46 ORIFICES REQUIRED
USE 46 HOLES 1/4" DIAMETER PER TRENCH
MINIMUM FLOW RATE: 46 ORIFICES x 1.10 GPM / ORIFICE = 51 GPM

THIS DISPOSAL SYSTEM DESIGN INCORPORATES THE "PERFORMANCE BASED APPROACH", WHERE A DETAILED AND SITE SPECIFIC ANALYSIS DEMONSTRATES THAT THE SYSTEM WILL FUNCTION DURING ALL PORTIONS OF THE YEAR WHILE MAINTAINING AT LEAST 6 INCHES OF NATURALLY OCCURRING UNSATURATED SOILS ABOVE THE CALCULATED LEVEL OF THE EFFLUENT PLUME.

ADDITION TO DESIGN BRIEF

PERFORMANCE BASED SYSTEM, WITH LOW FLOW FIXTURES WITHIN THE BUILDING, RESULTING IN A 10% REDUCTION DESIGN FLOWS.
RESTAURANT - TWO MEALS PER DAY: 30 SEATS X 30 GPD/SEAT X 0.9 = 810 GPD
RETAIL: 1309 SF X 5 GPD/100 SF X 0.9 = 59 GPD
OFFICE: 9 EMPLOYEES = 9 X 15 GPD/PERSON X 0.9 = 122 GPD
TOTAL = 991 GPD.

BASIS OF DESIGN FOR WATER SUPPLY - TRANSIENT NON COMMUNITY

DESIGN FLOW = 991 GPD
MAXIMUM DAY DEMAND IS CALCULATED BY DIVIDING THE AVERAGE DAY DEMAND BY NOT MORE THAN 720 (12 HR DELIVERY) MINUTES. 991 GPD/720 = 1.38 GPM.
THE INSTANTANEOUS PEAK DEMAND (IPD) IS BASED ON THE NUMBER OF FIXTURE UNITS. THUS, ASSUMING 32 FIXTURE UNITS FOR THE BUILDING THE RESULTANT I.P.D. = 42 GPM.

ELEVATION KEY:

BASEMENT FINISHED FLOOR ELEVATION BFE	= 258±
BUILDING INV. OUT GREASE LINE	= 256.00'
BUILDING INV. OUT SEWER LINE	= 255.85'
2,000 GAL. GREASE TRAP (GT) IN	= 255.90'
2,000 GAL. GREASE TRAP OUT	= 255.65'
2,000 GAL. SEPTIC TANK (ST) INV. IN	= 255.55'
2,000 GAL. SEPTIC TANK INV. OUT	= 255.30'
2,000 GAL. SETTLING SEPTIC TANK (SST) INV. IN	= 255.25'
2,000 GAL. SETTLING SEPTIC TANK INV. OUT	= 255.00'
2,000 GAL. PUMP STATION (PS) INV. IN	= 254.95'
2" FORCE MAIN OUT OF PUMP STATION	= 252.0'
DISCHARGE ELEVATION	= 256.8'
TOP RISER	= 257.0'

1. OWNER:
   GEMINI PROPERTIES
   3488 ETHAN ALLEN HIGHWAY
   (U.S. ROUTE 7)
   CHARLOTTE, VT.
2. TOTAL PARCEL AREA: 5.13 ± ACRES
3. ZONING: VILLAGE COMMERCIAL

SETBACKS: FRONT -25 FT FROM R/W
REAR - 50 FT
SIDE - 50 FT
MAX HT. - 35'
MIN. FRONTAGE - 200'

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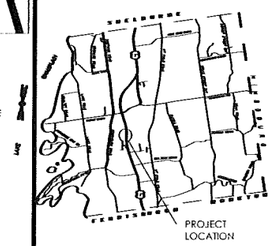
Revisions

No.	Description	Date	By



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3. Owner and Architect, are responsible for final design and location of buildings shown, including an area measured a minimum five (5) feet around any building and coordinating final utility connections shown on these plans.

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STATE OF VERMONT
FRED MALOY
No. 8719
LICENSED
PROFESSIONAL ENGINEER

Project Title

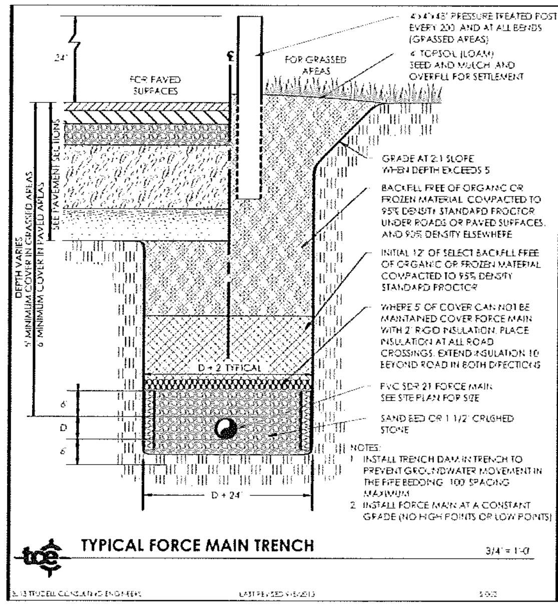
Gemini Properties
The Crossing
3488 Ethan Allen Highway
Charlotte, VT

Sheet Title

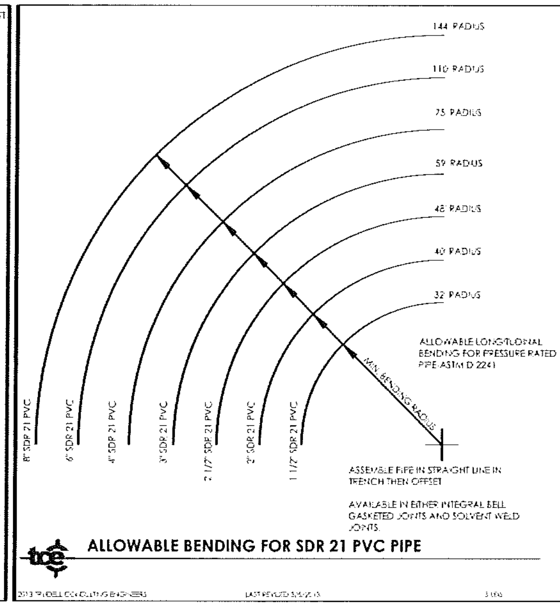
Wastewater Site Plan

Date:	11/01/2017
Scale:	1 = 20
Project Number:	13-067
Drawn By:	NPC
Project Engineer:	FM
Approved By:	FM
Field Book:	

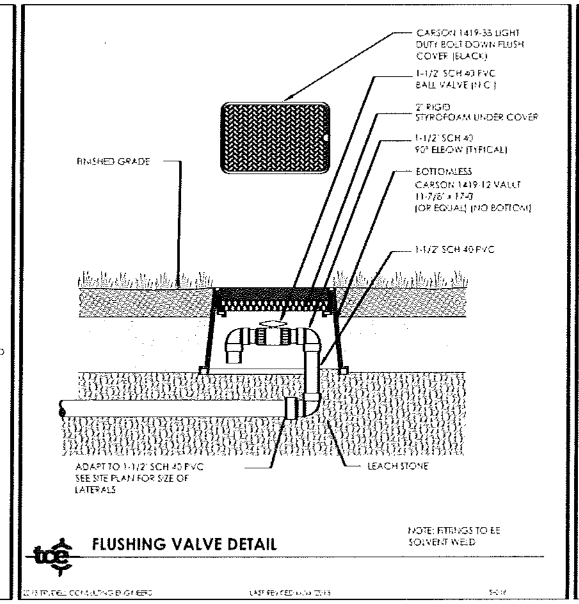
C3-01



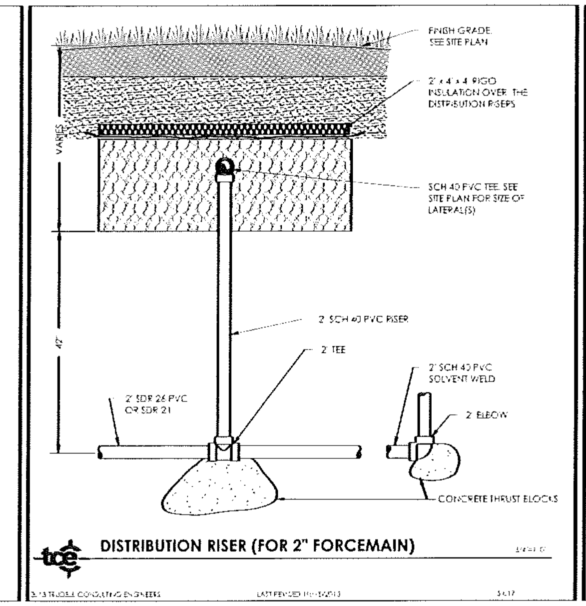
TYPICAL FORCE MAIN TRENCH



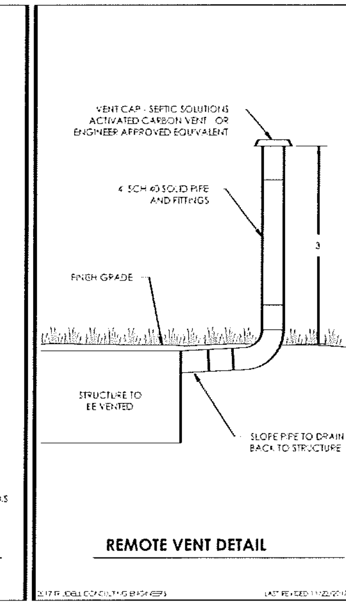
ALLOWABLE BENDING FOR SDR 21 PVC PIPE



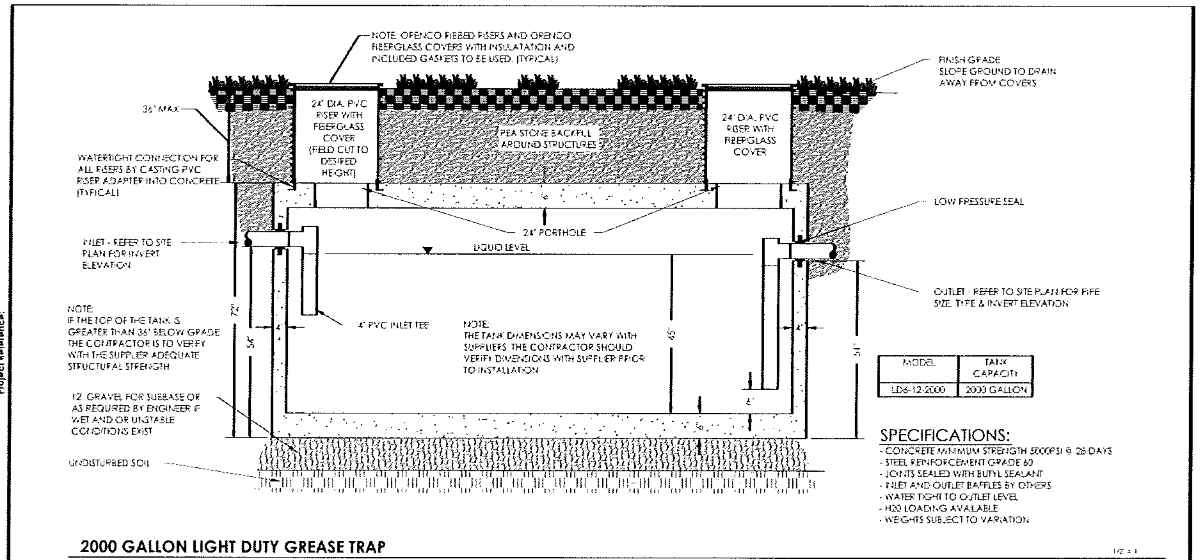
FLUSHING VALVE DETAIL



DISTRIBUTION RISER (FOR 2" FORCEMAIN)



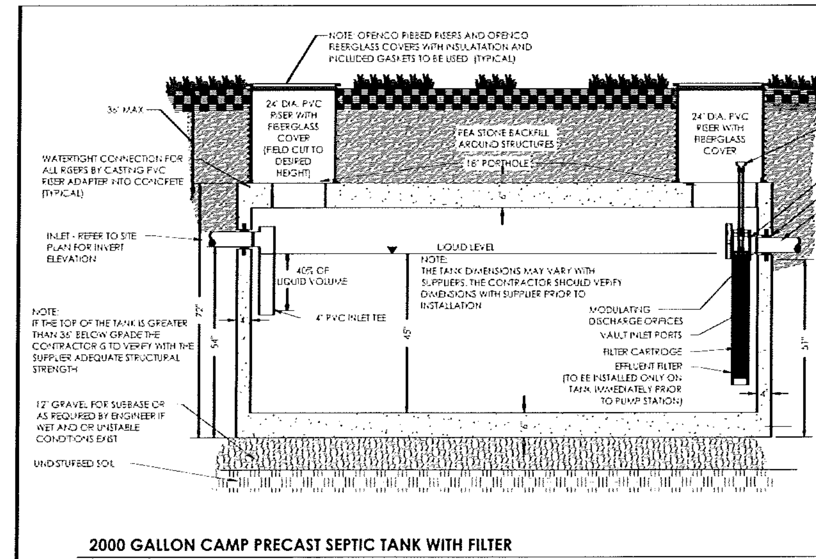
REMOTE VENT DETAIL



MODEL	TANK CAPACITY
LD6-12-2000	2000 GALLON

SPECIFICATIONS:
- CONCRETE MINIMUM STRENGTH 5000PSI @ 28 DAYS
- STEEL REINFORCEMENT GRADE 60
- JOINTS SEALED WITH BUTYL SEALANT
- INLET AND OUTLET BAFFLES BY OTHERS
- WATER TIGHT TO OUTLET LEVEL
- H20 LOADING AVAILABLE
- WEIGHTS SUBJECT TO VARIATION

2000 GALLON LIGHT DUTY GREASE TRAP (LD6-12)

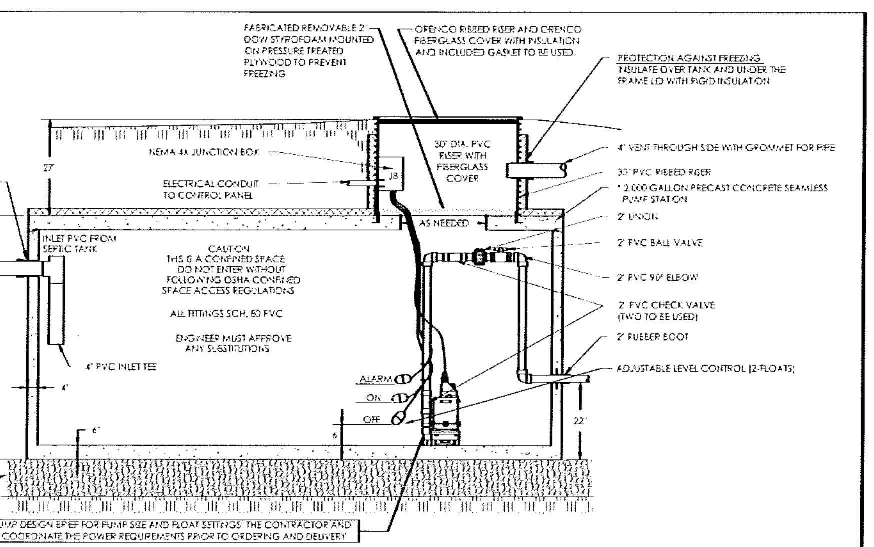


DESIGN NOTES
1. 5000 PSI CONCRETE, 28 DAY STRENGTH
2. STEEL REINFORCEMENT - 6x6x10 GAUGE WIRE MESH
3. 4" THICK TOP, BOTTOM, & WALLS
4. POLYLOK LOW PRESSURE SEALS. USE OF MULTIPLE COMPARTMENT TANKS. USE NEXT LARGEST SEPTIC TANK OR CONTACT ENGINEER REGARDING
5. JOINTS SEALED WITH BUTYL SEALANT AT FACTORY
6. MONOLITHIC CONSTRUCTION
7. TANK NOT DESIGNED FOR TRAFFIC
8. GARBAGE GRINDERS ARE NOT RECOMMENDED IF A GRINDER IS USED.

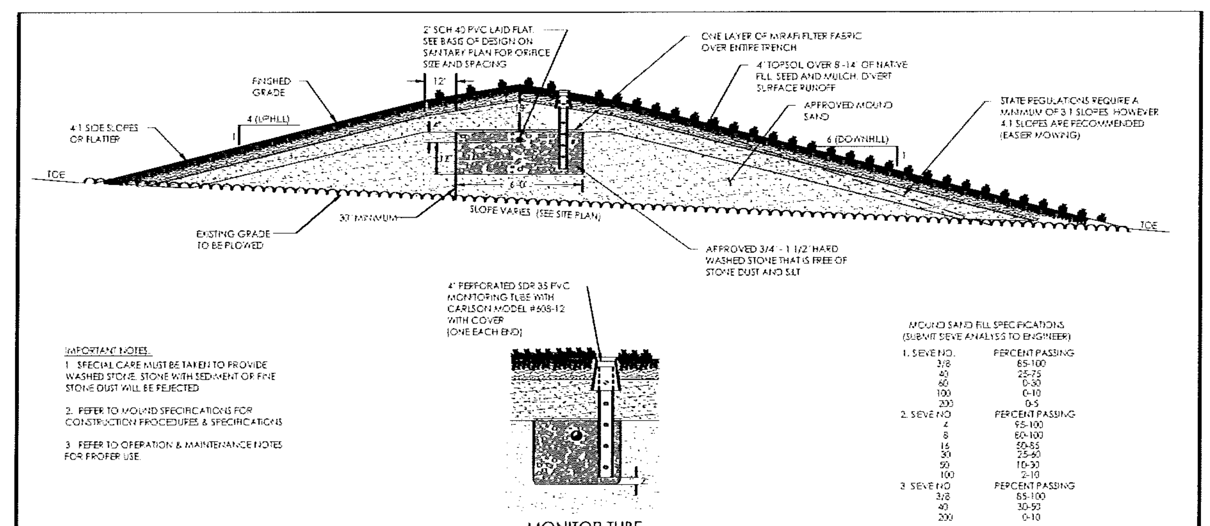
1) THE STATE OF VERMONT REQUIRES AN EFFLUENT FILTER FOR ALL NEW SEPTIC TANK INSTALLATIONS
2) THE FILTER IS DESIGNED TO PROTECT AND INCREASE THE LIFE OF THE DISPOSAL FIELD
3) EFFLUENT FILTER MUST BE CLEANED PERIODICALLY.
4) AN OPTIONAL ALARM IS AVAILABLE THAT WILL ALERT THE HOMEOWNER IN THE EVENT THAT THE FILTER IS PLUGGED - CONTRACTOR SHALL CONSULT WITH THE OWNER ABOUT USING AN ALARM, SUCH AS THE ZABEL SMART FILTER OR APPROVED EQUIVALENT
5) WARNING: WITH SUCH FINE FILTRATION A SCHEDULED MAINTENANCE PROGRAM MUST BE FOLLOWED
6) WARNING: DO NOT PUMP SEPTIC TANK DURING SPRING HIGH GROUNDWATER TABLE CONDITIONS

2000 GALLON CAMP PRECAST SEPTIC TANK WITH FILTER (LD6-12)

NOTES:
A) DRILL 3/16" "WEEP HOLE" IN ELBOW (DISCUSS WITH ENGINEER) CONTRACTOR/OWNER SHOULD TAKE NECESSARY PRECAUTIONS TO PREVENT THE FORCE MAIN AND STATION FROM FREEZE-UPS.
B) THE TOP OF THIS SEAMLESS TANK SHALL BE NO DEEPER THAN 3 FEET BELOW FINISH GRADE. IF THE TANK IS DEEPER THAN 3 FEET THE CONTRACTOR SHOULD COORDINATE WITH RESPECTIVE SUPPLIERS TO SELECT A SIMILAR TANK THAT CAN BE BURIED DEEPER.



2000 GALLON PUMP STATION
* COORDINATE TANK DIMENSIONS WITH MANUFACTURER



IMPORTANT NOTES:
1. SPECIAL CARE MUST BE TAKEN TO PROVIDE WASHED STONE. STONE WITH SEDIMENT OR FINE STONE DUST WILL BE REJECTED
2. REFER TO MOUND SPECIFICATIONS FOR CONSTRUCTION PROCEDURES & SPECIFICATIONS
3. REFER TO OPERATION & MAINTENANCE NOTES FOR PROPER USE.

MOUND SAND FILL SPECIFICATIONS (SUBMIT SIEVE ANALYSIS TO ENGINEER)

SIEVE NO.	PERCENT PASSING
1.	
3/8	85-100
40	25-75
60	0-30
100	0-10
200	0-5
2.	
4	95-100
8	80-100
16	50-85
30	25-60
50	10-30
100	2-10
3.	
3/8	85-100
40	30-50
200	0-10

ONE TRENCH MOUND SYSTEM (MINIMUM 30" REQUIRED MOUND SAND BELOW STONE TRENCH)

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STATE OF VERMONT ... LICENSED PROFESSIONAL ENGINEER

Project Title

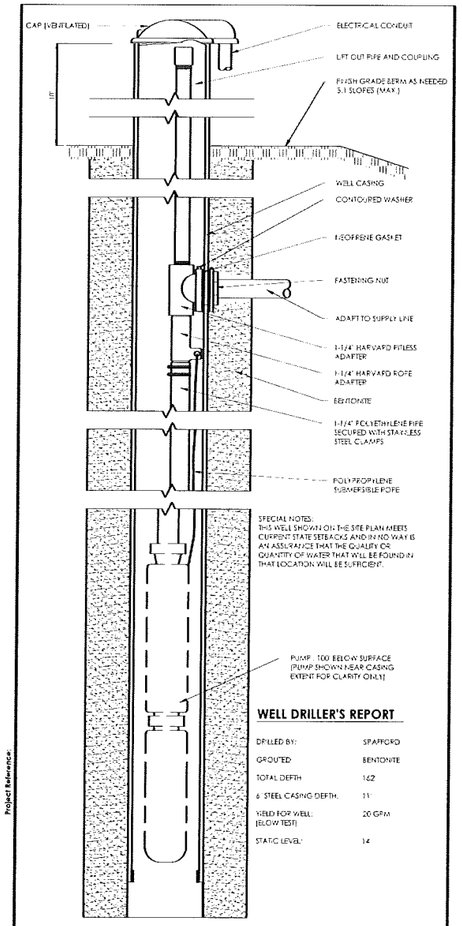
Gemini Properties
The Crossing
3488 Ethan Allen Highway
Charlotte, VT

Sheet Title

Sanitary Details

Date:	11/01/2017
Scale:	AS SHOWN
Project Number:	13-067
Drawn By:	NPC
Project Engineer:	PM
Approved By:	PM
Field Book:	

C8-01

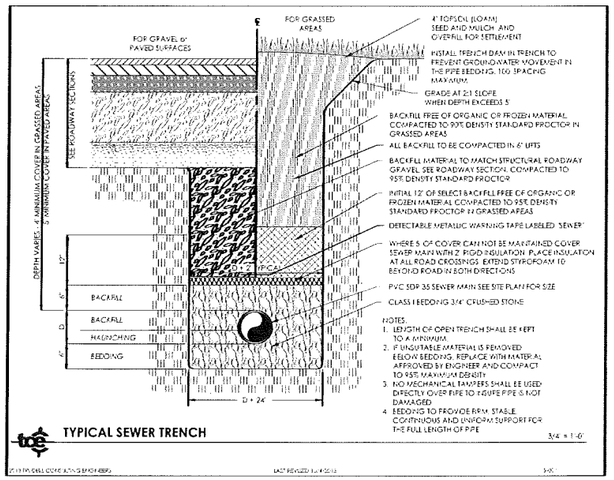


SPECIAL NOTES:
THIS WELL SHOWN ON THE SITE PLAN MEETS CURRENT STATE SETBACKS AND IN NO WAY IS AN ASSURANCE THAT THE QUALITY OR QUANTITY OF WATER THAT WILL BE FOUND IN THAT LOCATION WILL BE SUFFICIENT.

WELL DRILLER'S REPORT

DRILLED BY:	SPAFFORD
GROUTED	BENTONITE
TOTAL DEPTH	162'
6" STEEL CASING DEPTH.	11'
YIELD FOR WELL. (FLOW TEST)	20 GPM
STATIC LEVEL:	14'

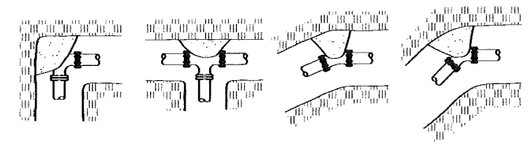
EXISTING WELL DETAIL



NOTES:
1. LENGTH OF OPEN TRENCH SHALL BE KEPT TO A MINIMUM.
2. IF UNSUITABLE MATERIAL IS REMOVED BELOW BEDDING, REPLACE WITH MATERIAL APPROVED BY ENGINEER AND COMPACT TO 95% MAXIMUM DENSITY.
3. NO MECHANICAL TAMPERS SHALL BE USED DIRECTLY OVER PIPE TO ENSURE PIPE IS NOT DAMAGED.
4. BEDDING TO PROVIDE FIRM, STABLE, CONTINUOUS AND UNIFORM SUPPORT FOR THE FULL LENGTH OF PIPE.

TYPICAL SEWER TRENCH

USE CLASS D (2500 PSI) CONCRETE FOR THRUST BLOCKS. PLACE 4 MIL POLYETHYLENE BETWEEN FITTING AND THRUST BLOCK. PLACE THRUST BLOCK AGAINST UNDISTURBED TRENCH WALL. CONCRETE BEARING AREA ON FITTING TO BE A MINIMUM OF 1/2 SQUARE FOOT. THRUST BLOCKS BASED ON 50 PSI TEST PRESSURE. IF CHANGE IN ELEVATION BETWEEN ANY 2 FOHTS IN THE LINE IS GREATER THAN 110' THRUST BLOCKS WILL HAVE TO BE ENLARGED.

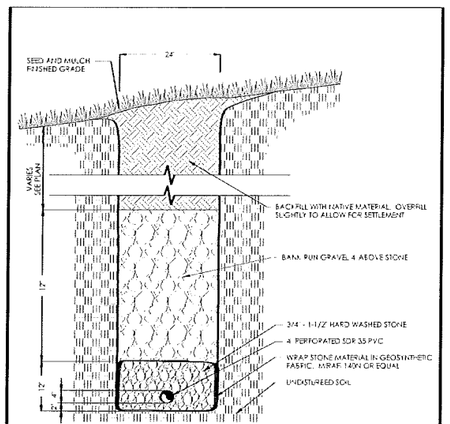


MINIMUM BEARING AREA IN SQUARE FEET ON UNDISTURBED TRENCH WALL

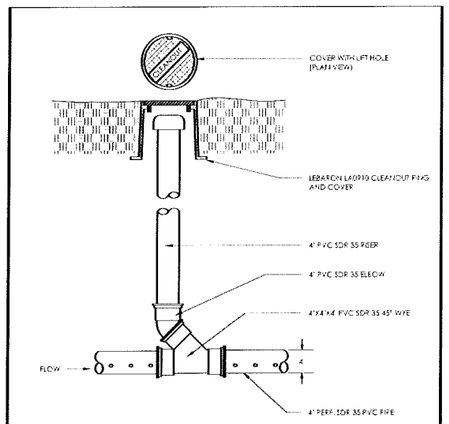
SOIL TYPE	SAFE BEARING LOAD LBS/FT. 2	2"				2 1/2"				3"				4"				6"			
		TEE	90°	45°	22.5°	TEE	90°	45°	22.5°	TEE	90°	45°	22.5°	TEE	90°	45°	22.5°	TEE	90°	45°	22.5°
CLAY	1000	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.8	0.9	0.7	0.5	1.6	2.0	1.5	0.8
SAND	2000	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.9	1.0	0.8	0.5
GRAVEL	3000	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
FILL	4000	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
SHALE	10000	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5

NOTE: ENGINEER TO OBSERVE ALL THRUST BLOCKS PRIOR TO BACKFILL

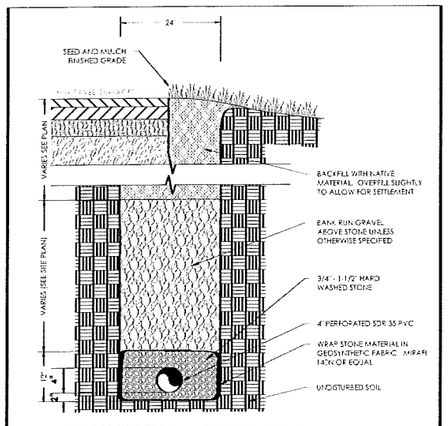
FORCE MAIN THRUST BLOCK SPECIFICATIONS



TYPICAL CURTAIN DRAIN CROSS SECTION



TYPICAL CURTAIN DRAIN CLEANOUT



TYPICAL UNDERDRAIN CROSS SECTION

CONTRACTOR'S CERTIFICATION REQUIRED

PRIOR TO THE DESIGN ENGINEER CERTIFYING THAT THE INSTALLATION HAS BEEN INSTALLED IN ACCORDANCE WITH THE PERMITTED DESIGN, THE CONTRACTOR SHALL PROVIDE A CERTIFICATION THAT THE WATER SYSTEM WAS INSTALLED AND TESTED IN ACCORDANCE WITH THE APPROVED DESIGN PLANS. STATE PERMITS REQUIRE THERE SHALL BE NO DEVIATIONS FROM THE APPROVED PLANS WITHOUT PRIOR APPROVALS. THE DESIGN ENGINEER SHALL BE NOTIFIED AND ALLOWED TO OBSERVE THE CRITICAL PHASES OF CONSTRUCTION INCLUDING ANY REQUIRED TESTS. LIKEWISE, THE DESIGN ENGINEER SHALL BE NOTIFIED OF ANY DEVIATIONS FROM THE APPROVED PLANS. SINCE THE DESIGN ENGINEER DOES NOT CUSTOMARILY OBSERVE ALL PHASES OF THE WORK OR ALL TESTING, HE MAY RELY ON THE CONTRACTOR'S CERTIFICATION AS THE BASIS FOR FINAL CERTIFICATION. THE CONTRACTOR SHALL THEREFORE SIGN AND RETURN A COPY OF THE FOLLOWING CERTIFICATION UPON COMPLETION OF THE WORK:

"I HEREBY CERTIFY THAT I HAVE INSTALLED, PROPERLY TESTED, AND SUCCESSFULLY PASSED THOSE TESTS AND THE WATER SYSTEM(S) ARE BUILT IN ACCORDANCE WITH THE APPROVED DESIGN PLANS AND APPLICABLE PERMIT CONDITIONS."

CONTRACTOR NAME: _____

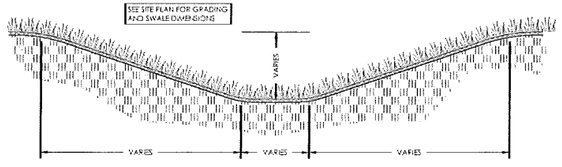
AUTHORIZED AGENTS NAME: _____

SIGNATURE: _____ DATE: _____

NOTE ANY DEVIATIONS FROM APPROVED PLANS HERE.

_____

CONTRACTOR'S CERTIFICATION FOR POTABLE WATER SYSTEMS



CONSTRUCTION SPECIFICATIONS:
1. SIDE SLOPES FOR SWALES SHALL NOT EXCEED 3:1. IN AREAS WHERE SIDE SLOPES WILL EXCEED 3:1, APPLY EROSION CONTROL BLANKETS TO STABILIZE GROUND.
2. SEED & MULCH ALL AREAS OF GRASSED SWALES. PERFORM ALL SEEDING PRIOR TO APPLYING EROSION CONTROL BLANKETS.

DIVERSION & DELIVERY SWALE

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Revisions

No.	Description	Date	By

TAX ID:

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2. By use of these drawings for construction of the Project, the Owner represents that they have reviewed, approved, and accepted the drawings, obtained all necessary permits, and have met with all applicable parties/disciplines, including but not limited to, the Engineer and the Architect, to insure these plans are properly coordinated including, but not limited to, contract documents, specifications, owner/contractor agreements, building and mechanical plans, private and public utilities and other pertinent permits for construction.

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STATE OF VERMONT
PAUL SCHULTZ
No. 5719
LICENSED PROFESSIONAL ENGINEER

Project Title

Gemini Properties
The Crossing
3488 Ethan Allen Highway
Charlotte, VT

Sheet Title

Site Details and Notes

Date:	11/01/2017
Scale:	AS SHOWN
Project Number:	13-067
Drawn By:	NPC
Project Engineer:	PJM
Approved By:	PJM
Field Book:	

C8-02

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 SITE WITH THE PROPER ORIENTATION OF THE MOUND ACCORDING TO THE APPROVED PLAN.
2. ABOVEGROUND VEGETATION SHALL BE CLOSELY CUT AND REMOVED FROM THE GROUND SURFACE THROUGHOUT THE AREA TO BE UTILIZED FOR THE PLACEMENT OF THE FILL MATERIAL. PRIOR TO PLOWING, THE DOSING PUMP DISCHARGE LINE FROM THE PUMP CHAMBER TO THE POINT OF CONNECTION WITH THE DISTRIBUTION PIPING HEADER SHALL BE INSTALLED. CONTACT THE DESIGN ENGINEER TO OBSERVE TESTING OF THE SEWER FORCEMAIN.
3. THE AREA SHALL THEN BE PLOWED TO A DEPTH OF 7 TO 8 INCHES PARALLEL TO THE LAND CONTOUR PLOWING THE SOIL UP SLOPE TO PROVIDE A PROPER INTERFACE BETWEEN THE FILL AND THE NATURAL SOILS. ONCE PLOWING OF THE ENTIRE MOUND AREA IS COMPLETED, THE AREA SHALL BE FENCED TO PREVENT VEHICLES AND EQUIPMENT FROM ENTERING THE PLOWED AREA.
4. THE AREA SURROUNDING THE MOUND SHALL BE GRADED TO PROVIDE DIVERSION OF SURFACE RUN-OFF WATERS.
5. ONCE THE PLOWING IS COMPLETED, THE CONTRACTOR SHALL CONTACT THE DESIGN ENGINEER FOR AN INSPECTION OF THE SITE PRIOR TO THE PLACEMENT OF SAND FILL.
6. PLACE THE APPROVED SAND FILL AROUND THE EDGE OF THE PLOWED AREA KEEPING THE WHEELS OF THE DUMP TRUCK FROM PLOWED AREA. WHEEL TRACKS IN THE AREA WILL LEAD TO COMPACTION. THE EFFLUENT WILL FLOW WITHIN THE RUTS AND SEEP FROM THE MOUND.
7. USING A CRAWLER TRACTOR WITH A BLADE, MOVE THE SAND AROUND INTO PLACE. KEEP AT LEAST 6 INCHES OF SAND UNDER THE TRACKS TO MINIMIZE COMPACTION OF THE PLOWED SURFACE. SHAPE THE SIDES TO THE REQUIRED SLOPES AS SHOWN ON THE SITE PLAN.
8. WITH THE BLADE OF THE CRAWLER, FORM THE BED (OR TRENCH) BY MOVING ALONG ITS LENGTH. MAKE SURE THE BOTTOM OF THE BED (OR TRENCH) IS LEVEL. SOME HAND SHOVEL LEVELING WILL BE REQUIRED.
9. PRIOR TO THE PLACEMENT OF STONE IN THE BED (OR TRENCH) THE STONE SHALL BE WASHED FREE OF ALL STONE DUST OF SEDIMENT. THE CONTRACTOR WILL BE RESPONSIBLE FOR THE WASHING OF THE STONE. WASHING SHALL BE DONE BY TILTING THE BODY OF THE DUMP TRUCK AND WITH A FIRE HOSE, HOSING THE STONE UNTIL THE WATER EXITING THE TRUCK IS CLEAR. CONTACT THE DESIGN ENGINEER FOR INSPECTION OF THE WASHED STONE PRIOR TO PLACEMENT.
10. UPON ACCEPTANCE, USE A BUCKET ON THE CRAWLER TO PLACE THE STONE IN THE BED (OR EACH TRENCH) BY TRAVELING UP THE SIDE SLOPE. LEVEL THE STONES OFF TO THE DESIRED ELEVATION.
11. THE PRESSURE DISTRIBUTION PIPE SHALL BE PLACED IN CRUSHED STONE WITH THE ORIFICES UPWARD. THE HOLES SHALL BE COVERED WITH AN ORIFICE SHIELD. ONE ORIFICE MAY BE FACED DOWNWARD TO ALLOW DRAINAGE OF THE PIPING AND TO HELP PREVENT FREEZING. THE MATERIAL USED TO COVER THE TOP OF THE STONE SHALL BE ONE LAYER OF FILTER FABRIC AND ONE LAYER OF INSULATION.
12. CONTACT THE DESIGN ENGINEER PRIOR TO BACKFILLING FOR INSPECTION OF THE DISTRIBUTION PIPING.
13. FINISH BY PLACING 2 INCHES OF STONE OVER THE DISTRIBUTION PIPE.
14. PLACE ONE LAYER OF FILTER FABRIC OVER STONES. THE ENTIRE MOUND SHALL BE COVERED WITH A MINIMUM OF 12 INCHES OF TOPSOIL (18 INCHES AT THE CREST) SHAPING THE MOUND SURFACE AS SHOWN ON THE PLAN.
15. LANDSCAPE THE MOUND BY PLANTING GRASSES ON THE SURFACE. A MIXTURE OF 90 PERCENT BIRDSFOOT TREFOIL AND 10 PERCENT TIMOTHY MAY BE DESIRABLE IF THE MOUND WILL NOT BE MANICURED. IF MANICURING IS DESIRED, A COMBINATION OF 60 PERCENT BLUEGRASS, 30 PERCENT CREEPING RED FESCUE AND 10 PERCENT ANNUAL RYE GRASS MAY BE THE DESIRED VEGETATIVE COVER. SHRUBS PLACED ALONG THE SIDE SLOPES AND TOE ARE RECOMMENDED. DO NOT PLACE SHRUBS OR TREES DIRECTLY ON TOP OF THE MOUND AS ROOTS WILL INTERFERE WITH THE DISTRIBUTION SYSTEM.
16. UPON COMPLETION OF THE CONSTRUCTION, CONTACT THE DESIGN ENGINEER. IF THE MOUND CONSTRUCTION IS SATISFACTORY, THE DESIGN ENGINEER WILL PROVIDE WRITTEN CERTIFICATION THAT THE CONSTRUCTION WAS DONE IN ACCORDANCE WITH THE APPROVED PLANS.

PRESSURIZED MOUND CONSTRUCTION SPECIFICATIONS

PRESSURE TEST

UPON COMPLETION OF CONSTRUCTION OF A FORCE MAIN, THE LINE SHALL BE PRESSURE AND LEAKAGE TESTED IN ACCORDANCE WITH THE FOLLOWING PROCEDURE.

AFTER THE PIPE HAS BEEN LAID, ALL NEWLY LAID PIPE OR ANY VALVED SECTION THEREOF SHALL BE SUBJECTED TO A HYDROSTATIC PRESSURE OF AT LEAST 1.5 X THE HIGHEST WORKING PRESSURE IN THE SECTION.

1. TEST PRESSURE RESTRICTIONS. TEST PRESSURES SHALL:
   A. NOT BE LESS THAN 50 PSI AT THE HIGHEST POINT ALONG THE TEST SECTION.
   B. NOT EXCEED PIPE OR THRUST RESTRAINT DESIGN PRESSURES.
   C. BE OF AT LEAST 2 (TWO) HOUR DURATION.
   D. NOT VARY BY MORE THAN ± 5 PSI.
   E. NOT EXCEED TWICE THE RATED PRESSURE OF THE VALVES WHEN THE PRESSURE BOUNDARY OF THE TEST SECTION INCLUDES CLOSED GATE VALVES.
2. PRESSURIZATION.
   A. EACH VALVED SECTION OF PIPE SHALL BE FILLED WITH WATER SLOWLY AND THE SPECIFIED TEST PRESSURE, BASED ON THE ELEVATION OF THE LOWEST POINT IN THE LINE OR SECTION UNDER TEST AND CORRECTED TO THE ELEVATION OF THE TEST GAUGE, SHALL BE APPLIED BY MEANS OF A PUMP CONNECTED TO THE PIPE.
   B. AIR REMOVAL. BEFORE APPLYING THE SPECIFIED TEST PRESSURE, AIR SHALL BE EXPELLED COMPLETELY FROM THE PIPE VALVES.
   C. EXAMINATION. ALL EXPOSED PIPE, FITTINGS, VALVES, AND JOINTS SHALL BE EXAMINED CAREFULLY DURING THE TEST. ANY DAMAGED OR DEFECTIVE PIPE, FITTINGS, OR VALVES THAT ARE DISCOVERED FOLLOWING THE PRESSURE TEST SHALL BE REPAIRED OR REPLACED WITH SOUND MATERIAL AND THE TEST SHALL BE REPEATED AT NO EXPENSE TO OWNER.

LEAKAGE TEST

A LEAKAGE TEST SHALL BE CONDUCTED CONCURRENTLY WITH THE PRESSURE TESTS.

1. LEAKAGE SHALL BE DEFINED AS THE QUANTITY OF WATER THAT MUST BE SUPPLIED INTO THE NEWLY LAID PIPE, OR ANY VALVED SECTION THEREOF, TO MAINTAIN PRESSURE WITHIN 5 PSI OF THE SPECIFIED TEST PRESSURE AFTER THE AIR IN THE PIPELINE HAS BEEN EXPELLED AND THE PIPE HAS BEEN FILLED WITH WATER.
2. ALLOWABLE LEAKAGE. NO PIPE INSTALLATION WILL BE ACCEPTED IF THE LEAKAGE IS GREATER THAN THAT DETERMINED BY THE FOLLOWING FORMULA:

$$L = \frac{ND\sqrt{P}}{7400}$$

WHERE:
L IS THE ALLOWABLE LEAKAGE, IN GALLONS PER HOUR
N IS THE NUMBER OF JOINTS IN THE LENGTH OF PIPELINE TESTED.
D IS THE NOMINAL DIAMETER OF THE PIPE, IN INCHES; AND
P IS THE AVERAGE TEST PRESSURE DURING THE LEAKAGE TEST, IN POUNDS PER SQUARE INCH GAGE.

NOTE: IN THE EVENT THAT THE FORCE MAIN IS RELATIVELY SHORT (100 FEET OR LESS) THE PROJECT ENGINEER CAN UTILIZE DISCRETION IN TEST REQUIREMENTS.

TESTING FORCE MAINS

(ENVIRONMENTAL PROTECTION RULES CH1, EFFECTIVE 9/29/07 SECTION 1-A-05(g))

1. THIS SITE DOES NOT MEET THE MINIMUM REQUIREMENTS FOR A CONVENTIONAL SANITARY DISPOSAL SYSTEM. THE DESIGN OF A MOUND TYPE DISPOSAL SYSTEM WILL BRING THE SITE INTO CONFORMANCE WITH THE MINIMUM REQUIREMENTS.
2. THE ENGINEER HAS DETERMINED A LOCATION FOR SANITARY DISPOSAL ON THE PROPERTY BASED ON SITE INVESTIGATION AND SOIL TESTS. THE REQUIRED DISPOSAL AREA AND SYSTEM DESIGN WERE DETERMINED BY CODE REQUIREMENTS AND SUBMITTED TO APPROVING AUTHORITIES. UPON APPROVAL, THE OWNER ASSUMES RESPONSIBILITY FOR PROPER CONSTRUCTION AND CONTINUED OPERATION OF THE SYSTEM.
3. THE OWNER IS RESPONSIBLE FOR OPERATING THE DISPOSAL SYSTEM IN A MANNER WHICH WILL PROTECT THE PUBLIC HEALTH AND PREVENT POLLUTION.
4. NEW DISPOSAL SYSTEMS REQUIRE ADJUSTMENTS OR MODIFICATIONS DURING START UP, AND DURING THE LIFE OF THE SYSTEM. THESE ADJUSTMENTS INCLUDE LEVELING THE SEPTIC TANK, PUMP STATION OR SIPHON, DUE TO SETTLEMENT OR FROST ACTION. FILL MAY BE ADDED TO REPAIR EROSION OR LEVEL SETTLED AREAS.
5. ON SITE SANITARY DISPOSAL SYSTEMS REQUIRE REGULAR INSPECTION AND MAINTENANCE. THE SEPTIC TANK, EFFLUENT FILTER AND PUMP STATION OR SIPHON CHAMBER, IF APPLICABLE, SHOULD BE INSPECTED ANNUALLY AND PUMPED OUT AND CLEANED EVERY 3 YEARS. THE PLUMBING AND ELECTRICAL SYSTEMS, IF APPLICABLE, SHOULD BE CHECKED FOR PROPER OPERATION AND LEAKS.
6. THE LIFE OF THE DISPOSAL SYSTEM CAN BE AFFECTED BY A VARIETY OF OPERATIONAL AND ENVIRONMENTAL FACTORS. THE PRESENCE OF EXCESS GROUNDWATER, RAINWATER, INTRODUCTION OF MATERIAL OTHER THAN HUMAN WASTES (INCLUDING BUT NOT LIMITED TO, BACKWASH FROM WATER SOFTENERS, POOLS, SPA'S AND/OR SIMILAR EQUIPMENT), OR EXCESSIVE SEWAGE FLOWS WILL ADVERSELY AFFECT OPERATION OF ANY DISPOSAL SYSTEM. SOIL SETTLEMENT, FREEZING OF COMPONENTS, AND CLOGGING DUE TO ORGANIC SOLIDS ACCUMULATION WILL REQUIRE REPAIRS.
7. THE OWNER IS RESPONSIBLE FOR COMPLIANCE WITH STATE AND LOCAL OPERATION AND MAINTENANCE REQUIREMENTS. THE ENGINEER AND CONTRACTOR ASSUMES NO RESPONSIBILITY FOR THE IMPROPER USE AND/OR MAINTENANCE OF THE SYSTEM.
8. WARNING: WITH SUCH FINE FILTRATION (SEPTIC TANK EFFLUENT FILTER) A SCHEDULED MAINTENANCE PROGRAM MUST BE FOLLOWED.
9. THE OWNER IS RESPONSIBLE FOR ALL STATE AND LOCAL PERMITS AND REQUIRED CONDITIONS OF SAID PERMITS. THIS INCLUDES BUT IS NOT LIMITED TO ANNUAL INSPECTIONS AND REPORTING. THE OWNER IS ALSO RESPONSIBLE FOR RECORDING PERMITS IN THE TOWN LAND RECORDS OFFICE. IF CONSTRUCTION DOESN'T OCCUR IN THE TIME FRAMES ESTABLISHED BY SAID PERMITS THEN THE OWNER IS RESPONSIBLE FOR REVISING DESIGN PLANS AS NEEDED AND RE-PERMITTING. IF CHANGES IN THE REGULATIONS OCCUR ONCE THE PERMITS HAVE EXPIRED, TRUDELL CONSULTING ENGINEERS DOES NOT OFFER ANY GUARANTEES THAT THE PERMIT WILL BE REISSUED. CHANGING REQUIREMENT MAY PREVENT COMPLIANCE AND CAUSE CERTAIN PROPERTIES TO BE UNDEVELOPABLE.
10. IF THE SYSTEM IS DESIGNED USING THE PERFORMANCE BASED DESIGN ACCORDING TO PREVIOUS STATE PERMITS THE SYSTEM SHALL BE INSPECTED EACH SPRING FOR THREE CONSECUTIVE YEARS BY A LICENSED ENGINEER TO DEMONSTRATE THAT THE SYSTEM IS WORKING AS DESIGNED.

MOUND DISPOSAL FIELD - OPERATION AND MAINTENANCE

CONTRACTOR'S CERTIFICATION REQUIRED

PRIOR TO THE DESIGN ENGINEER CERTIFYING THAT THE INSTALLATION HAS BEEN INSTALLED IN ACCORDANCE WITH THE PERMITTED DESIGN, THE CONTRACTOR SHALL PROVIDE A CERTIFICATION THAT THE WASTEWATER SYSTEM WAS INSTALLED AND TESTED IN ACCORDANCE WITH THE APPROVED DESIGN PLANS. STATE PERMITS REQUIRE THERE SHALL BE NO DEVIATIONS FROM THE APPROVED PLANS WITHOUT PRIOR APPROVALS. THE DESIGN ENGINEER SHALL BE NOTIFIED AND ALLOWED TO OBSERVE THE CRITICAL PHASES OF CONSTRUCTION INCLUDING ANY REQUIRED TESTS. LIKEWISE, THE DESIGN ENGINEER SHALL BE NOTIFIED OF ANY DEVIATIONS FROM THE APPROVED PLANS. SINCE THE DESIGN ENGINEER DOES NOT CUSTOMARILY OBSERVE ALL PHASES OF THE WORK OR ALL TESTING, HE MAY RELY ON THE CONTRACTOR'S CERTIFICATION AS THE BASIS FOR FINAL CERTIFICATION. THE CONTRACTOR SHALL THEREFORE SIGN AND RETURN A COPY OF THE FOLLOWING CERTIFICATION UPON COMPLETION OF THE WORK.

"I HEREBY CERTIFY THAT I HAVE INSTALLED, PROPERLY TESTED, AND SUCCESSFULLY PASSED THOSE TESTS, AND THE WASTEWATER DISPOSAL AND COLLECTION SYSTEM(S) ARE BUILT IN ACCORDANCE WITH THE APPROVED DESIGN PLANS AND APPLICABLE PERMIT CONDITIONS."

CONTRACTOR NAME ______________________

AUTHORIZED AGENTS NAME ______________________

SIGNATURE ______________________ DATE ______________

NOTE ANY DEVIATIONS FROM APPROVED PLANS HERE:

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____

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____

____

CONTRACTOR CERTIFICATION FOR WASTEWATER SYSTEM

IMPORTANT NOTE

CHECK WITH STATE OR ENGINEER TO VERIFY SETBACK DISTANCES. SETBACK DISTANCES CAN VARY FROM WHAT IS SHOWN HEREON BASED ON THE SIZE AND SCOPE OF THE PROJECT OR NEWLY PUBLISHED RULES FROM OTHER STATE AGENCIES.

ITEM	HORIZONTAL DISTANCE (FEET) * DISPOSAL FIELD	SEPTIC TANK	SEWER
DRILLED WELL	b	50	50
GRAVEL PACK WELL, SHALLOW WELL OR SPRING	b	75	75
LAKES, PONDS, IMPOUNDMENTS	50	25	25
RIVERS AND STREAMS	50	25	10
DRAINAGE SWALES, ROADWAY DITCHES	25	–	–
MAIN OR MUNICIPAL WATER LINES	50	50	d
ATMOSPHERIC WATER STORAGE TANKS	50	50	50
SERVICE WATER LINES	25	25	d
ROADWAYS, DRIVEWAYS, PARKING LOTS	10	5	c
TOP OF EMBANKMENT OR SLOPE GRATER THAN 30%	25	10	–
PROPERTY LINE (a)	25 [2]	10	10
TREES	10	10	10
OTHER DISPOSAL FIELD OR REPLACEMENT SYSTEM	10 [3]	–	–
FOUNDATION DRAINS, FOOTING DRAINS, CURTAIN DRAINS	35 [4]	10	–
PUBLIC WATER SUPPLY (e)	f	f	f
SUCTION WATER LINE	100	50	50

* THESE DISTANCES MAY BE REDUCED WHEN EVIDENT THAT THE DISTANCE IS UNNECESSARY TO PROTECT AN ITEM OR INCREASED IF NECESSARY TO PROVIDE ADEQUATE PROTECTION.
* INDIRECT DISCHARGE REQUIREMENTS SUPERSEDE THIS IF DIFFERENT.
* WATER SUPPLY RULES SUPERSEDE THIS IF DIFFERENT.

GENERAL CRITERIA REGARDING ISOLATION DISTANCES

a. ISOLATION DISTANCES APPLY REGARDLESS OF PROPERTY LINE LOCATION AND OWNERSHIP.
b. SEPARATION BETWEEN POTABLE WATER SUPPLIES AND LEACHFIELDS SHALL BE DETERMINED BY THE METHODS IN THE VERMONT WATER SUPPLY RULE, APPENDIX A, PART 11, SECTION 11.4
c. SEWERS UNDER ROADS, DRIVEWAYS, OR PARKING LOTS MAY REQUIRE PROTECTIVE CONDUITS OR SLEEVES.
d. SEPARATION OF PRESSURE WATER LINES CONSIDERED AS "SERVICE CONNECTIONS" AND SEWER LINES SHALL ADHERE TO THE VERMONT PLUMBING RULES. SEPARATION OF PRESSURE WATER LINES (CONSIDERED TO BE PART OF A PUBLIC WATER SYSTEM AS DEFINED BY THE VERMONT WATER SUPPLY RULE) AND SEWER LINES SHALL ADHERE TO THE REQUIREMENTS OF THE VERMONT WATER SUPPLY RULE.
e. THIS REFERS TO PUBLIC COMMUNITY WATER SYSTEMS, AS DEFINED IN THE VERMONT WATER SUPPLY RULE.
f. CONTACT THE DEPARTMENT OF ENVIRONMENTAL CONSERVATION'S WATER SUPPLY DIVISION, 103 SOUTH MAIN STREET, WATERBURY, VERMONT.

SPECIFIC CRITERIA FOR ISOLATION DISTANCES

2. FOR MOUND WASTEWATER DISPOSAL SYSTEMS, THE LIMIT OF FILL MUST BE 25 FEET FROM ANY DOWNHILL PROPERTY LINE AND 10 FEET FROM ALL PROPERTY LINES ON THE SIDE OR UPHILL.
3. NO DISPOSAL FIELD OR REPLACEMENT AREA SHALL BE CLOSER THAN 10 FEET TO ONE ANOTHER EXCEPT AS ALLOWED FOR TRENCH SYSTEMS IN SECTION 1-907(M)
4. IF A CURTAIN OR FOUNDATION DRAIN IS DOWNSLOPE OF THE DISPOSAL FIELD, THE DISPOSAL FIELD CANNOT BE CLOSER THAN 75 FEET TO THE DRAIN. IF THE CURTAIN OR FOUNDATION DRAIN IS UPSLOPE OF THE DISPOSAL FIELD, IT SHALL BE 35' IF POSSIBLE, AND A MINIMUM OF 20 FEET TO THE DISPOSAL FIELD. THE ISOLATION DISTANCES FOR MOUND SYSTEMS SHALL BE FROM THE EDGE OF THE MINIMUM BASAL AREA OR THE EDGE OF THE ABSORPTION TRENCH OR BED WHICHEVER IS CLOSER. THIS DISTANCE MAY BE REDUCED IF THE CONSULTANT PROVIDES ADEQUATE DATA AND ANALYSIS TO SHOW THAT EFFLUENT FROM THIS SOIL BASED SYSTEM WILL NOT ENTER THE DRAIN OR INCREASED IF EFFLUENT WILL ENTER THE DRAIN.

ISOLATION DISTANCES

ENVIRONMENTAL PROTECTION RULES, CHAPTER 21, EFFECTIVE 9/29/07 SECTION 1-907

Project Reference:

WATER PRESSURE TEST

UPON COMPLETION OF INSTALLATION ALL TANKAGE SHALL BE TESTED WITH CLEAN WATER TO DEMONSTRATE THAT THE STRUCTURES ARE WATERTIGHT. THE TESTING SHALL BE CONDUCTED BEFORE THE TANKAGE AND STRUCTURES ARE BACKFILLED. THE TEST SHALL BE CONDUCTED BY COMPLETELY FILLING THE TANKAGE TO THE TOP OF THE STRUCTURES AND PROVIDING A HYDROSTATIC HEAD OF AT LEAST TWO FEET ABOVE THE SURROUNDING GROUNDWATER LEVEL AT THE TIME OF TESTING. THE TEST SHALL BE AT LEAST 24 HOURS WITH NO LEAKAGE RESULTING. IF ANY LEAKAGE OCCURS DURING THE TEST PERIOD THE TANKS SHALL BE REPAIRED AND RETESTED (PER ASTM C1227-9.2.2 STANDARDS).

VACUUM TEST

UPON COMPLETION OF INSTALLATION ALL TANKAGE SHALL BE TESTED TO DEMONSTRATE THAT THE STRUCTURES ARE WATERTIGHT. THE TESTING SHALL BE CONDUCTED BEFORE THE TANKAGE AND STRUCTURES ARE BACKFILLED. THE TEST SHALL BE CONDUCTED BY SEALING THE EMPTY TANK AND APPLYING A VACUUM TO 2 INCHES (50MM) OF MERCURY. THE TANK IS APPROVED IF 90% OF THE VACUUM IS HELD FOR A MINIMUM OF 2 MINUTES (PER ASTM C1227-9.2.1 STANDARDS).

TANK LEAKAGE TESTING

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STATE OF VERMONT ... No. 8719 ... LICENSED PROFESSIONAL ENGINEER

Project Title

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The Crossing
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Charlotte, VT

Sheet Title

Sanitary and Water Notes

Date:	11/01/2017
Scale:	AS SHOWN
Project Number:	13-067
Drawn By:	NPC
Project Engineer:	FM
Approved By:	FM
Field Book:	

C8-03