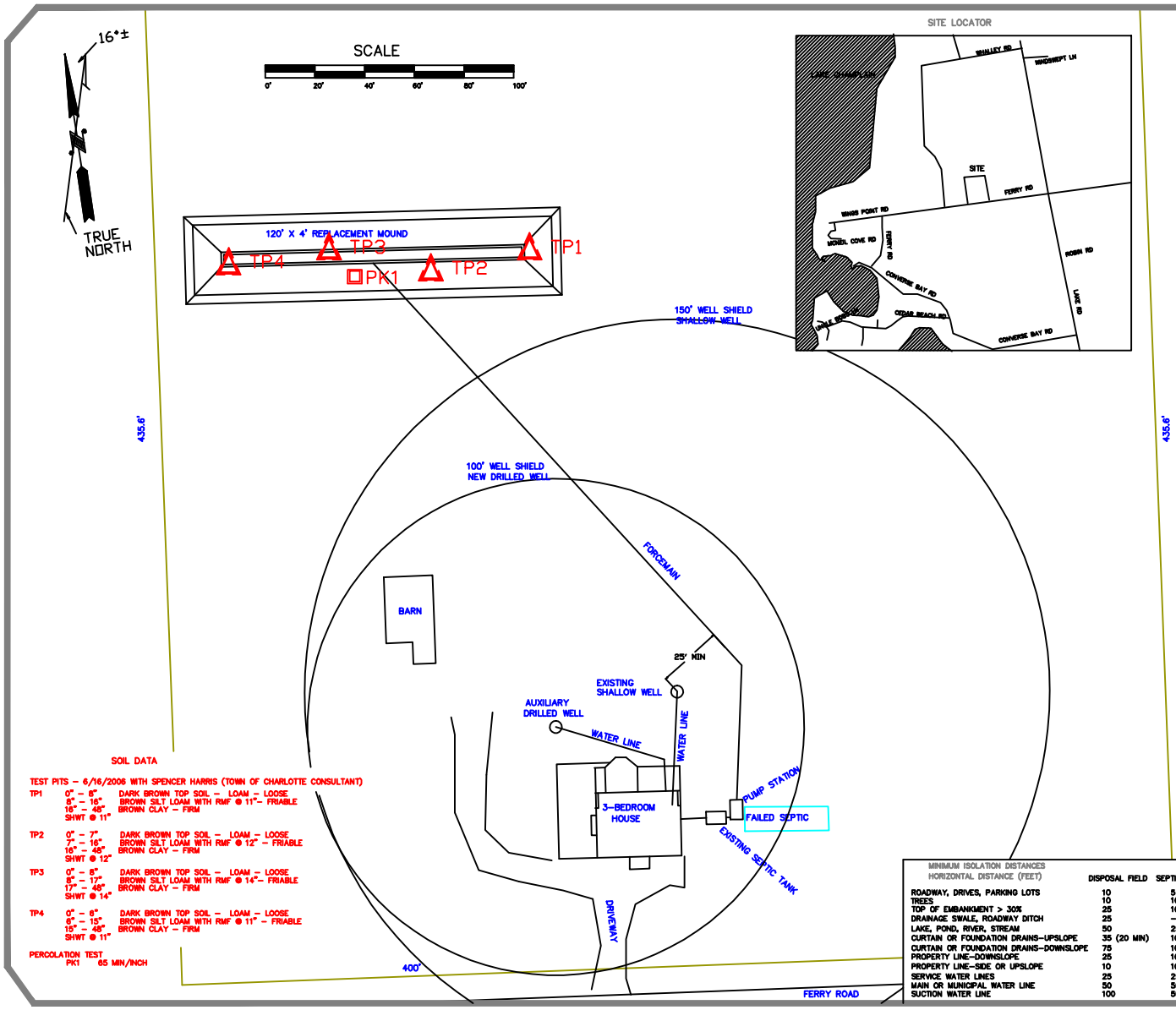


SOIL DATA

TEST PITS – 6/16/2006 WITH SPENCER HARRIS (TOWN OF CHARLOTTE CONSULTANT)

TP1	0" – 8" 8" – 16" 16" – 48" SHWT @ 11"	DARK BROWN TOP SOIL – LOAM – LOOSE BROWN SILT LOAM WITH RMF @ 11"– FRIABLE BROWN CLAY – FIRM
TP2	0" – 7" 7" – 16" 16" – 48" SHWT @ 12"	DARK BROWN TOP SOIL – LOAM – LOOSE BROWN SILT LOAM WITH RMF @ 12" – FRIABLE BROWN CLAY – FIRM
TP3	0" – 8" 8" – 17" 17" – 48" SHWT @ 14"	DARK BROWN TOP SOIL – LOAM – LOOSE BROWN SILT LOAM WITH RMF @ 14"– FRIABLE BROWN CLAY – FIRM
TP4	0" – 8" 8" – 15" 15" – 48" SHWT @ 11"	DARK BROWN TOP SOIL – LOAM – LOOSE BROWN SILT LOAM WITH RMF @ 11" – FRIABLE BROWN CLAY – FIRM

PERCOLATION TEST
PK1 65 MIN/INCH

SCALE
0' 80' 160' 240' 320' 400'

N/F EDWARD H. FINKBEINER

400'

PROPERTY OF BARBARA S. GRAF
4 ACRES

SKATING RINK

N/F MEGAN P. PRICE

REPLACEMENT SYSTEM

150' WELL SHIELD

100' WELL SHIELD

BARN

AUXILIARY DRILLED WELL

EXISTING SHALLOW WELL

3-BEDROOM HOUSE

FAILED SEPTIC

N/F EDWARD H. FINKBEINER

435.6'

435.6'

400'

FERRY ROAD

N/F LEWIS HUGH JR.

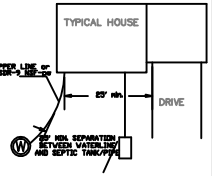
N/F SAMUEL & PRISCILLA SPEAR REVOCABLE TRUST

AUXILIARY DRILLED WELL

NOT TO SCALE

WATER SUPPLY RULE 11.2.0

AVERAGE DAY DEMAND	420 GAL/DAY
MAXIMUM DAY DEMAND	0.58 GAL/MIN
INSTANTANEOUS PEAK DEMAND	5.0 GAL/MIN
SOURCE CAPACITY	N/A ---(11.2.4.3)
STORAGE	N/A---(11.8.2.1)
PUMP CAPACITY	5 GAL/MIN
OPERATING PRESSURE RANGE	30–50 PSI OR 40–60 PSI
FLOOD PLAIN	NONE



I HEREBY CERTIFY THAT THE DESIGN–RELATED INFORMATION SUBMITTED WITH THIS APPLICATION IS TRUE AND CORRECT, AND THAT, IN THE EXERCISE OF MY REASONABLE PROFESSIONAL JUDGMENT, THE DESIGN INCLUDED IN THIS APPLICATION FOR A PERMIT COMPLIES WITH THE VERMONT WASTEWATER SYSTEM AND POTABLE WATER SUPPLY RULES AND THE VERMONT WATER SUPPLY RULES EXCEPT AS NOTED

MICHAEL AVERILL DATE

THIS IS A "BEST FIX" DESIGN
WELL SHIELD ASSUMED TO BE 150' PER DISCUSSION WITH SPENCER HARRIS
LINEAR LOAD RATE FACTOR INCREASED FROM .7 TO 8.3 PER DISCUSSION WITH SPENCER HARRIS

THIS IS NOT A SURVEY – NOT FOR CONVEYANCE

MINIMUM ISOLATION DISTANCES
HORIZONTAL DISTANCE (FEET)

	DISPOSAL FIELD	SEPTIC TANK
ROADWAY, DRIVES, PARKING LOTS	10	5
TREES	10	10
TOP OF EMBANKMENT > 30%	25	10
DRAINAGE SWALE, ROADWAY DITCH	25	--
LAKE, POND, RIVER, STREAM	50	25
CURTAIN OR FOUNDATION DRAINS–UPSLOPE	35 (20 MIN)	10
CURTAIN OR FOUNDATION DRAINS–DOWNSLOPE	75	10
PROPERTY LINE–DOWNSLOPE	25	10
PROPERTY LINE–SIDE OR UPSLOPE	10	10
SERVICE WATER LINES	25	25
MAIN OR MUNICIPAL WATER LINE	50	50
SUCTION WATER LINE	100	50

DESIGNED AND DRAFTED BY M. AVERILL
SITE TECHNICIAN NUMBER 463
CHECKED BY: M. AVERILL
DATE JUNE 20, 2008
SCALE: AS NOTED
JOB NO.: AE–265–08

GRAF REPLACEMENT SYSTEM SITE PLAN

BARBARA GRAF
1016 FERRY ROAD
CHARLOTTE, VT 05445
TOWN OF CHARLOTTE, VERMONT

AVERILL ENGINEERING, LLC
67 Willis Pine Road
Fairfax, Vermont 05454
802–785–3325

CONTACT ENGINEER TO FIELD VERIFY ALL LOCATIONS PRIOR TO CONSTRUCTION

REVISIONS 7/7/08
Add auxiliary well

SHEET 1 OF 2

DESIGN CALCULATIONS REPLACEMENT SYSTEM

NATURAL GROUND SLOPE = 0.05
DEPTH TO SEASONAL HIGH WATER = 11" (TP-1 & TP-4)
MINUS 6" (UNSATURATED SOIL NEEDED) = 5" USE .42' (h) THEREFORE 2.5' SAND REQUIRED
DESIGN FLOW = (3 BEDROOMS X 140 GAL./BEDROOM) = 420 GAL/DAY
LINEAR LOAD RATE = (h)(f) = .42 X 0.7 = .29 GPD/LF
SYSTEM LENGTH = 420 GPD/ .29 GPD/LF = 1448 LF (IMPRACTICAL & COSTLY)

VARIANCE REQUESTED PER DISCUSSION WITH SPENCER HARRIS - USE LINEAR LOAD RATE FACTOR = 8.3
LINEAR LOAD RATE = (h)(f) = .42 X 8.3 = 3.5 GPD/LF

SYSTEM LENGTH = 420 GPD/ 3.5 GPD/LF = 120 LF
LOADING RATE = 1.0 GAL./DAY/SQ. FT.
REQUIRED AREA = 420/1.0 = 420 SQ.FT.
SYSTEM WIDTH = 420 SQ.FT./120 FT = 3.5 FT USE 4 FT
USE SEEPAGE BED 120' X 4' = 480 SQ.FT.
PERCOLATION RATE = 65 MINUTES/INCH

FLOW RATE MINIMUM = 2.51 GPM (TO MAINTAIN 1.0 PSI MIN. DISTRIBUTION PRESSURE) 36 ORIFICES
12.4 X DIAMETER OF THE ORIFICE SQUARED X SQ. ROOT H PRESSURE AT THE LAST ORIFICE X # ORIFICES
12.4 X 3/16" SQUARED X SQ. ROOT 2.51' X 36 = GPM
12.4 X .03515 X 1.5843 X 36 = 24.9 GPM DESIGN FOR 25 GPM

HEAD LOSS FOR PRIMARY MOUND

DISTRIBUTION PRESSURE = 2.51 X 1.3 = 3'
FORCED MAIN FRICTION = 270' PIPE X .011 = 3'
MISCELLANEOUS LOSSES (ASSUMED) = 2.0'
ELEVATION HEAD = 7'
TOTAL HEAD LOSS = 15'

PUMP REQUIRED = CHAMPION PUMP MODEL CPE4A-12 EFFLUENT PUMP OR EQUAL
TO PROVIDE 15' TOTAL HEAD AT 25 GALLONS PER MINUTE

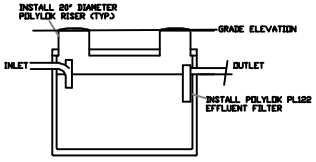
DOSE VOLUME MINIMUM = 5 X DISTRIBUTION PIPING CAPACITY
IN 1 1/2" SCHED 40 PVC THE CAPACITY = 0.1235 GAL./LF.
MINIMUM DOSE VOLUME = 5 X 0.1235GAL./LF. X 118FT. = 74 GALLONS

USE 4.5" DOSE IN SPECIFIED PUMP STATION, PROVIDING 111 GALLONS PER DOSE
USE 6" ALARM SETTING ALLOWING 21.2" OF STORAGE OR 424 GAL.
(MORE THAN 1 DAY (420 GAL.))

TANK DETAIL

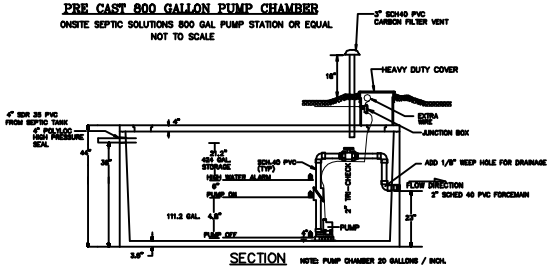
NOT TO SCALE

EXISTING 1000 GALLON STANDARD SEPTIC TANK



PRE CAST 800 GALLON PUMP CHAMBER

ONSITE SEPTIC SOLUTIONS 800 GAL PUMP STATION OR EQUAL
NOT TO SCALE

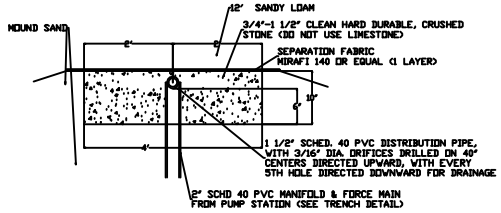


PUMP CHAMBER NOTES:

THE PUMP SHOULD BE ABLE TO OPERATE EFFICIENTLY AT 25 GPM AGAINST 7.5 FT. TDH USE A SUPER SINGLE OR OFF FLOAT SWITCH, AND A SEPARATE ALARM FLOAT. THE ALARM SHALL BE LOCATED OUTSIDE THE HOUSE.

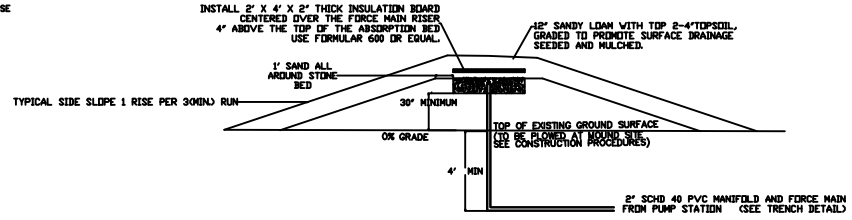
PRIMARY DISPOSAL FIELD, TRENCH DETAIL

NOT TO SCALE



PRIMARY MOUND TYPE DISPOSAL FIELD, SIDE VIEW

NOT TO SCALE



CONSTRUCTION PROCEDURES FOR MOUND-TYPE DISPOSAL FIELD

BEFORE STARTING CONSTRUCTION THE CONTRACTOR SHALL NOTIFY DIG-SAFE (888) 344-7233, AND SCHEDULE THE SYSTEM STAKING AND PRECONSTRUCTION MEETING WITH THE DESIGN ENGINEER. THE CONTRACTOR SHALL PROVIDE THE ENGINEER WITH A RECENT SIEVE ANALYSIS OF THE PROPOSED MOUND SAND, DEMONSTRATING THE CONFORMANCE OF THE PROPOSED SAND WITH THE REQUIRED SPECIFICATIONS.

TO PREVENT COMPACTION, CONSTRUCTION EQUIPMENT SHALL NOT BE MOVED ACROSS THE PLOWED SURFACE OR THE EFFLUENT DISPERSAL AREA. HOWEVER, AFTER PLACEMENT OF A MINIMUM OF 6 INCHES OF SAND FILL OVER THE PLOWED AREA, CONSTRUCTION EQUIPMENT MAY BE DRIVEN OVER THE PROTECTED SURFACE TO EXPEDITE CONSTRUCTION. CONSTRUCTION AND/OR PLOWING SHALL NOT BE INITIATED WHEN THE SOIL MOISTURE CONTENT IS HIGH. IF A SAMPLE OF SOIL OBTAINED FROM ABOUT 9 INCHES BELOW THE SURFACE CAN BE EASILY ROLLED INTO A WIRE, THE SOIL MOISTURE CONTENT IS TOO HIGH FOR CONSTRUCTION PURPOSES.

AFTER THE PRECONSTRUCTION MEETING, ABOVE-GROUND VEGETATION SHALL BE CLOSELY CUT AND REMOVED FROM THE SURFACE THROUGHOUT THE AREA TO BE UTILIZED FOR THE PLACEMENT OF THE FILL MATERIAL. PRIOR TO PLOWING, THE DOSING PUMP DISCHARGE LINE (FORCE MAIN) FROM THE PUMP STATION OR SIPHON CHAMBER TO THE POINT OF CONNECTION WITH THE DISTRIBUTION PIPING HEADER SHALL BE INSTALLED. THE AREA SHALL THEN BE PLOWED TO A DEPTH OF 7 TO 8 INCHES, PARALLEL TO THE LAND CONTOUR WITH THE PLOW THROWING THE SOIL UP-SLOPE TO PROVIDE A PROPER INTERFACE BETWEEN THE FILL AND NATURAL SOILS. TREE STUMPS SHOULD BE CUT FLUSH WITH THE SURFACE OF THE GROUND AND ROOTS SHOULD NOT BE PULLED. ONCE PLOWING OF THE MOUND AREA IS COMPLETED, THE AREA SHOULD BE FENCED TO PREVENT VEHICLES AND EQUIPMENT FROM ENTERING, UNLESS THE FILL MATERIAL IS GOING TO BE PLACED WITHIN 24 HOURS. IF THE SITE CANNOT BE PLOWED, A BACKHOE BUCKET WITH CHISEL TEETH MAY BE USED TO TILL THE SITE.

THE AREA SURROUNDING THE MOUND SHALL BE GRADED TO PROVIDE DIVERSION OF SURFACE RUN-OFF WATERS.

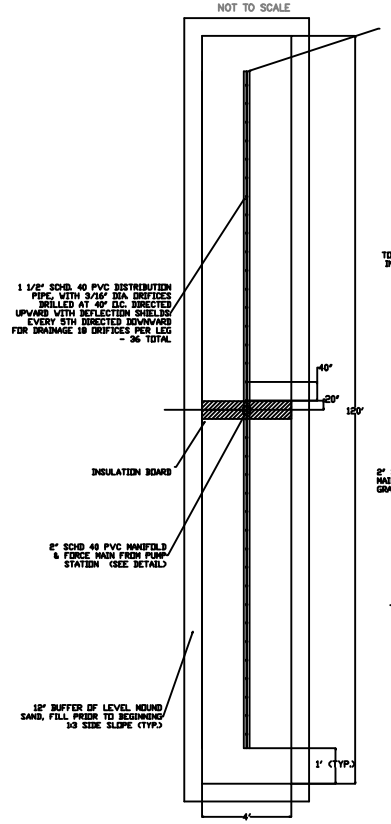
CONSTRUCTION SHOULD BE INITIATED IMMEDIATELY AFTER PREPARATION OF THE SOIL INTERFACE BY PLACING ALL OF THE SAND FILL NEEDED FOR THE MOUND TO A MINIMUM DEPTH OF 21 INCHES ABOVE THE PLOWED SURFACE (OR MORE, AS SPECIFIED ON DETAILS). THIS DEPTH WILL PERMIT EXCAVATION OF TRENCHES OR BED TO ACCOMMODATE THE 6 INCHES OF CRUSHED STONE NECESSARY FOR THE DISTRIBUTION PIPING. AFTER HAND LEVELING OF THE ABSORPTION AREA, THE STONE SHALL BE PLACED, HAND LEVELED, AND PIPING INSTALLED.

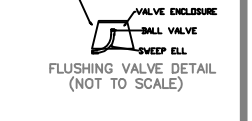
THE SEPTIC TANK, PUMP STATION, SIPHON CHAMBER, SEWER PIPING, AND/OR ANY OTHER APPURTENANCES SHALL BE INSTALLED. THE PIPING SHOULD BE FLUSHED OUT AFTER ORIFICES ARE DRILLED TO REMOVE ANY DRILL SCRAP LEFT IN PIPE. THE DESIGN ENGINEER SHALL BE CONTACTED TO OBSERVE THE COMPLETED SYSTEM AND TO OBSERVE THE TESTING OF THE SYSTEM BY THE CONTRACTOR.

UPON COMPLETION OF THE SATISFACTORY INSPECTION AND TESTING OF THE SYSTEM, PLACE CRUSHED STONE AND THE FILTER FABRIC OVER THE TRENCH/BED, AND COVER THE MOUND WITH SANDY LOAM AND TOPSOIL. GRADE THE MOUND AND DIVERSION SWALE TO PROMOTE SURFACE WATER RUNOFF. ALL DISTURBED AREAS SHALL BE SEEDED WITH CONSERVATION MIX BETWEEN APRIL 15 AND OCTOBER 15, AND MULCHED. ON SITES COMPLETED AFTER OCTOBER 15, SEED WITH ANNUAL RYE AND MULCH; RESEED WITH CONSERVATION MIX IN THE SPRING.

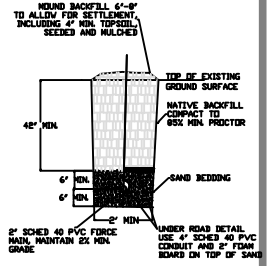
PRIMARY DISPOSAL FIELD, TOP VIEW

NOT TO SCALE

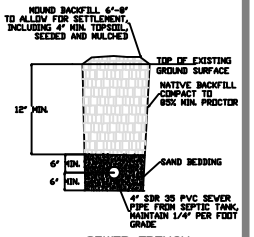




FLUSHING VALVE DETAIL
(NOT TO SCALE)



FORCE MAIN TRENCH
(NOT TO SCALE)



SEWER TRENCH
(NOT TO SCALE)

WARNING & DISCLAIMER OF LIABILITY

THIS SEPTIC DESIGN HAS BEEN PERFORMED IN COMPLIANCE WITH ALL STATE DESIGN REQUIREMENTS, EXCEPT AS NOTED. A PRUDENT DESIGN, HOWEVER, DOES NOT NECESSARILY IMPLY THAT THE SYSTEM WILL BE FREE FROM MALFUNCTION. THE REQUIRED SOIL PERCOLATION AND SOIL SURVEY MAY NOT REVEAL ALL THE SOIL CHARACTERISTICS AFFECTING OPERATIONS. FURTHER, UNUSUAL PRECIPITATIONS, DISPOSAL OF SOME HOUSEHOLD CHEMICALS, DRIVING OVER SYSTEM COMPONENTS AND FAILURE TO PUMP OUT SEPTIC TANKS OFTEN ENOUGH ARE BEYOND THE CONTROL AND RESPONSIBILITY OF THE DESIGNER. THEREFORE, IN NO EVENT, WILL THIS DESIGN CREATE LIABILITY FOR THE DESIGNER OR COMPANY.

APPROVED MOUND SAND SHALL CONFORM WITH ANY ONE OF THE FOLLOWING THREE SIEVE ANALYSES.

A) SIEVE NO.	OPENING (mm)	%PASSING BY WT.
3/8	9.500	95 - 100
40	0.420	75 - 25
60	0.240	0 - 30
100	0.149	0 - 10
200	0.074	0 - 5

B) SIEVE NO.	OPENING (mm)	%PASSING BY WT.
4	4.750	95 - 100
8	2.360	80 - 100
16	1.180	50 - 85
30	0.590	25 - 60
50	0.297	10 - 30
100	0.149	2 - 10

C) SIEVE NO.	OPENING (mm)	%PASSING BY WT.
3/8	9.500	95 - 100
40	0.420	30 - 80
200	0.074	0 - 10

DESIGNED AND DRAFTED BY M. AVERILL
SITE TECHNICIAN NUMBER 463
CHECKED BY: M. AVERILL
DATE JUNE 20, 2008
SCALE: AS NOTED
JOB NO.: AE-265-08

GRAF REPLACEMENT SYSTEM DETAIL SHEET

BARBARA GRAF
1010 FERRY ROAD
CHARLOTTE, VT 05445
TOWN OF CHARLOTTE, VERMONT

AVERILL ENGINEERING, LLC
67 Mills Pine Road
Fairfax, Vermont 05454
802-785-3325

CONTACT ENGINEER TO FIELD VERIFY ALL LOCATIONS PRIOR TO CONSTRUCTION

REVISIONS

SHEET 2 OF 2