

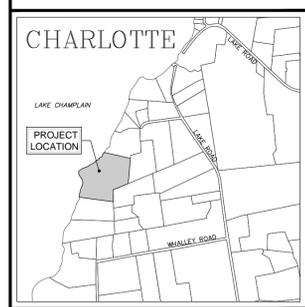
SITE ENGINEER:

 CIVIL ENGINEERING ASSOCIATES, INC.
 10 MANSFIELD VIEW LANE, SOUTH BURLINGTON, VT 05403
 802-864-2323 FAX: 802-864-2271 web: www.cca-vt.com
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DRAWN
 MAB
 CHECKED
 JLM
 APPROVED
 JLM

OWNER:
THOMAS & MICHELLE TILLER
 362 HOLMES ROAD
 CHARLOTTE VERMONT

PROJECT:
THOMAS & MICHELLE TILLER
 362 HOLMES ROAD
 CHARLOTTE VERMONT



LOCATION MAP
 1" = 2000'

DATE	CHECKED	REVISION
11/17/14	JLM	ADDITIONAL TOPO FOR W.W. AND BARN

OVERALL SITE PLAN

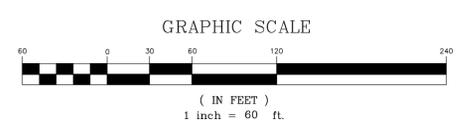
DATE
 FEB., 2015
 SCALE
 1" = 60'
 PROJ. NO.
 13229
 DRAWING NUMBER
C1.0

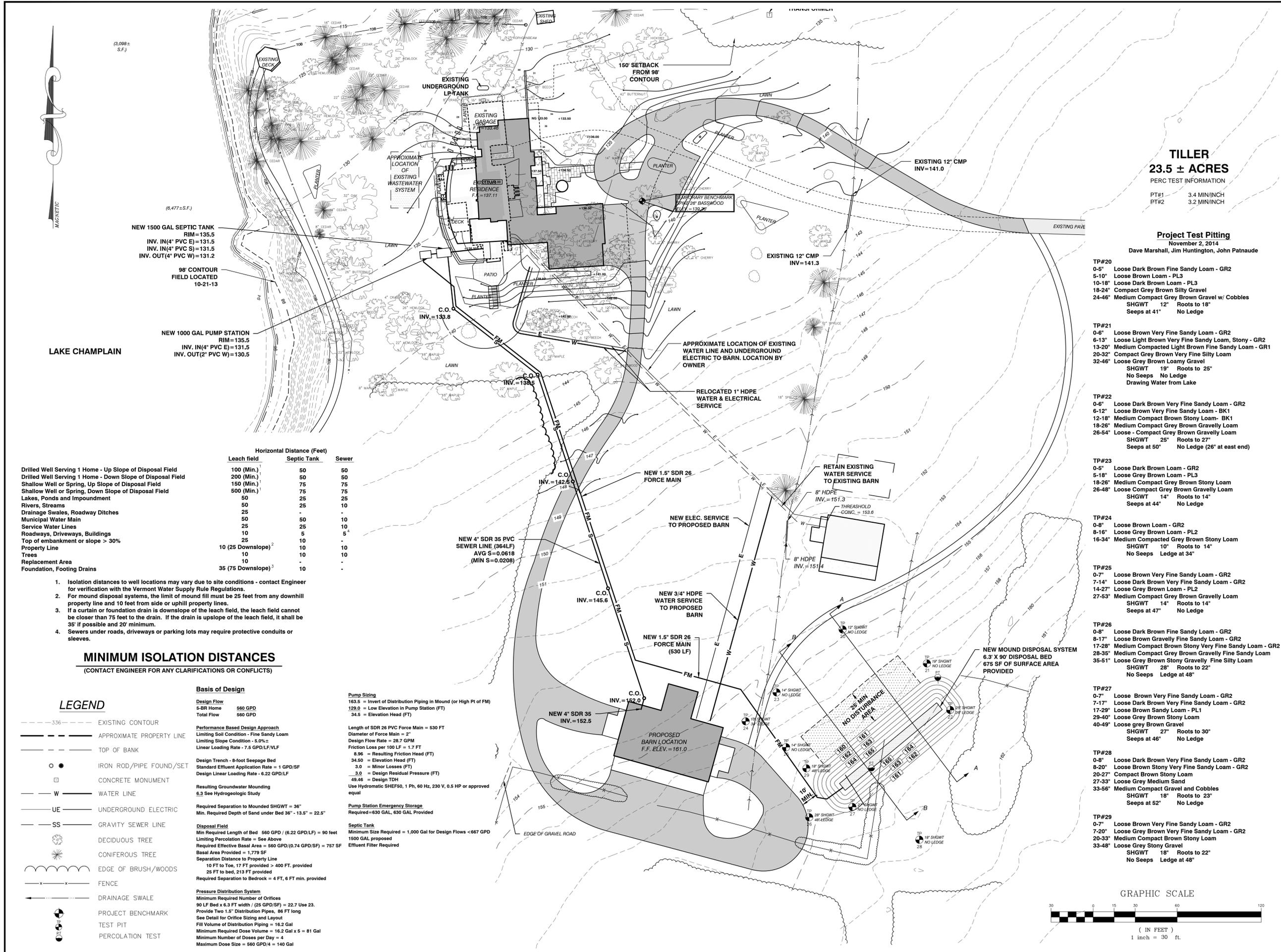
LEGEND

- 3.36 --- EXISTING CONTOUR
- --- APPROXIMATE PROPERTY LINE
- --- TOP OF BANK
- ● IRON ROD/PIPE FOUND/SET
- CONCRETE MONUMENT
- W — WATER LINE
- UE — UNDERGROUND ELECTRIC
- SS — GRAVITY SEWER LINE
- ○ ○ ○ ○ DECIDUOUS TREE
- ★ CONIFEROUS TREE
- ~ ~ ~ ~ ~ EDGE OF BRUSH/WOODS
- x — FENCE
- — — DRAINAGE SWALE
- ⊕ PROJECT BENCHMARK
- ○ ○ ○ ○ TEST PIT
- ○ ○ ○ ○ PERCOLATION TEST

GENERAL NOTES

1. Utilities shown do not purport to constitute or represent all utilities located upon or adjacent to the surveyed premises. Existing utility locations are approximate only. The Contractor shall field verify all utility conflicts. All discrepancies shall be reported to the Engineer. The Contractor shall contact Dig Safe (888-344-7233) prior to any construction.
2. All existing utilities not incorporated into the final design shall be removed or abandoned as indicated on the plans or directed by the Engineer.
3. The Contractor shall maintain as-built plans (with ties) for all underground utilities. Those plans shall be submitted to the Owner at the completion of the project.
4. The Contractor shall repair/restore all disturbed areas (on or off the site) as a direct or indirect result of the construction.
5. All grassed areas shall be maintained until full vegetation is established.
6. Maintain all trees outside of construction limits.
7. The Contractor shall be responsible for all work necessary for complete and operable facilities and utilities.
8. The Contractor shall submit shop drawings for all items and materials incorporated into the site work. Work shall not begin on any item until shop drawing approval is granted.
9. In addition to the requirements set in these plans and specifications, the Contractor shall complete the work in accordance with all permit conditions and any local Public Works Standards.
10. The tolerance for finish grades for all pavement, walkways and lawn areas shall be 0.1 feet.
11. Any dewatering necessary for the completion of the sitework shall be considered as part of the contract and shall be the Contractor's responsibility.
12. The Contractor shall install the electrical, cable and telephone services in accordance with the utility companies requirements.
13. Existing pavement and tree stumps to be removed shall be disposed of at an approved off-site location. All pavement cuts shall be made with a pavement saw.
14. If there are any conflicts or inconsistencies with the plans or specifications, the Contractor shall contact the Engineer for verification before work continues on the item in question.
15. This plan is not a boundary survey and is not intended to be used as one.
16. Project benchmark is Lake Champlain established from the United States Geological Survey Gauging Station 04294500 located in Burlington, Vermont. (Datum NGVD 29).
17. Property line information is based on a plan entitled "Pamela L. & Willett S. Foster IV - Westwind Farms Subdivision". Recorded June 18, 1979, Volume 3, Page 40. Monumentation recovered was consistent with the recorded documents.
18. This property lies in the Shoreland District per town of Charlotte Land Use Regulations Dated November 2, 2010.





(3,098 ± S.F.)

(8,477 ± S.F.)

NEW 1500 GAL SEPTIC TANK
RIM=135.5
INV. IN(4" PVC E)=131.5
INV. IN(4" PVC S)=131.5
INV. OUT(4" PVC W)=131.2

NEW 1000 GAL PUMP STATION
RIM=135.5
INV. IN(4" PVC E)=131.5
INV. OUT(2" PVC W)=130.5

LAKE CHAMPLAIN

Horizontal Distance (Feet)	Leach field	Septic Tank	Sewer
100 (Min.)	50	50	50
200 (Min.)	50	50	50
150 (Min.)	75	75	75
500 (Min.)	75	75	75
Lakes, Ponds and Impoundment	50	25	25
Rivers, Streams	50	25	10
Drainage Swales, Roadway Ditches	25	-	-
Municipal Water Main	50	50	10
Service Water Lines	25	25	10
Roadways, Driveways, Buildings	25	5	5
Top of embankment or slope > 30%	25	10	10
Property Line	10	10	10
Trees	10	10	10
Replacement Area	10	-	-
Foundation, Footing Drains	35 (75 Downslope) ³	10	-

- Isolation distances to well locations may vary due to site conditions - contact Engineer for verification with the Vermont Water Supply Rule Regulations.
- For mound disposal systems, the limit of mound fill must be 25 feet from any downhill property line and 10 feet from side or uphill property lines.
- If a curtain or foundation drain is downslope of the leach field, the leach field cannot be closer than 75 feet to the drain. If the drain is upslope of the leach field, it shall be 35' if possible and 20' minimum.
- Sewers under roads, driveways or parking lots may require protective conduits or sleeves.

MINIMUM ISOLATION DISTANCES
(CONTACT ENGINEER FOR ANY CLARIFICATIONS OR CONFLICTS)

LEGEND

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- ~ EDGE OF BRUSH/WOODS
- FENCE
- DRAINAGE SWALE
- ● PROJECT BENCHMARK
- ● TEST PIT
- ● PERCOLATION TEST

Basis of Design

Design Flow
5-BR Home 560 GPD
Total Flow 560 GPD

Performance Based Design Approach
Limiting Soil Condition - Fine Sandy Loam
Limiting Slope Condition - 5.0%±
Linear Loading Rate - 7.5 GPD/LF/VLF

Design Trench - 8-foot Seepage Bed
Standard Effluent Application Rate = 1 GPD/SF
Design Linear Loading Rate - 6.22 GPD/LF

Resulting Groundwater Mounding
5.3 See Hydrogeologic Study

Required Separation to Mounded SHGWT = 36"
Min. Required Depth of Sand under Bed 36" - 13.5" = 22.5"

Disposal Field
Min Required Length of Bed 560 GPD / (6.22 GPD/LF) = 90 feet
Limiting Percolation Rate = See Above
Required Effective Basal Area = 560 GPD / (0.74 GPD/SF) = 757 SF
Basal Area Provided = 1,779 SF
Separation Distance to Property Line
10 FT to Toe, 17 FT provided > 400 FT, provided
25 FT to bed, 213 FT provided

Pressure Distribution System
Minimum Required Number of Orifices
90 LF Bed x 6.3 FT width (25 GPD/SF) = 22.7 Use 23.
Provide Two 1.5" Distribution Pipes, 36 FT long
See Detail for Orifice Sizing and Layout
Fill Volume of Distribution Piping = 16.2 Gal
Minimum Required Dose Volume = 16.2 Gal x 5 = 81 Gal
Minimum Number of Doses per Day = 4
Maximum Dose Size = 560 GPD / 4 = 140 Gal

Pump Sizing
163.5 = Invert of Distribution Piping in Mound (or High Pt of FM)
129.0 = Low Elevation in Pump Station (FT)
34.5 = Elevation Head (FT)

Length of SDR 26 PVC Force Main = 530 FT
Diameter of Force Main = 2"
Design Flow Rate = 28.7 GPM
Friction Loss per 100 LF = 1.7 FT
8.96 = Resulting Friction Head (FT)
34.50 = Elevation Head (FT)
3.0 = Minor Losses (FT)
3.0 = Design Residual Pressure (FT)
49.46 = Design TDH
Use Hydromatic SHEP50, 1 Ph, 60 Hz, 230 V, 0.5 HP or approved equal

Pump Station Emergency Storage
Required = 630 GAL, 630 GAL Provided

Septic Tank
Minimum Size Required = 1,000 Gal for Design Flows < 667 GPD
1500 GAL proposed
Effluent Filter Required

TILLER
23.5 ± ACRES
PERC TEST INFORMATION

PT#1 3.4 MIN/INCH
PT#2 3.2 MIN/INCH

Project Test Pitting
November 2, 2014
Dave Marshall, Jim Huntington, John Patnaude

- TP#20**
0-5" Loose Dark Brown Fine Sandy Loam - GR2
5-10" Loose Brown Loam - PL3
10-18" Loose Dark Brown Loam - PL3
18-24" Compact Grey Brown Silty Gravel
24-46" Medium Compact Grey Brown Gravel w/ Cobbles
SHGWT 12" Roots to 18"
Seeps at 41" No Ledge
- TP#21**
0-6" Loose Brown Very Fine Sandy Loam - GR2
6-13" Loose Light Brown Very Fine Sandy Loam, Stony - GR2
13-20" Medium Compacted Light Brown Fine Sandy Loam - GR1
20-32" Compact Grey Brown Very Fine Silty Loam
32-46" Loose Grey Brown Loamy Gravel
SHGWT 19" Roots to 25"
No Seeps No Ledge
Drawing Water from Lake
- TP#22**
0-6" Loose Dark Brown Very Fine Sandy Loam - GR2
6-12" Loose Brown Very Fine Sandy Loam - BK1
12-18" Medium Compact Brown Stony Loam - BK1
18-26" Medium Compact Grey Brown Gravelly Loam
26-54" Loose - Compact Grey Brown Gravelly Loam
SHGWT 25" Roots to 27"
Seeps at 50" No Ledge (26" at east end)
- TP#23**
0-5" Loose Dark Brown Loam - GR2
5-18" Loose Grey Brown Loam - PL3
18-26" Medium Compact Grey Brown Stony Loam
26-48" Loose Compact Grey Brown Gravelly Loam
SHGWT 14" Roots to 14"
Seeps at 44" No Ledge
- TP#24**
0-8" Loose Brown Loam - GR2
8-16" Loose Grey Brown Loam - PL2
16-34" Medium Compact Grey Brown Stony Loam
SHGWT 10" Roots to 14"
No Seeps Ledge at 34"
- TP#25**
0-7" Loose Brown Very Fine Sandy Loam - GR2
7-14" Loose Dark Brown Very Fine Sandy Loam - GR2
14-27" Loose Grey Brown Loam - PL2
27-53" Medium Compact Grey Brown Gravelly Loam
SHGWT 14" Roots to 14"
Seeps at 47" No Ledge
- TP#26**
0-8" Loose Dark Brown Fine Sandy Loam - GR2
8-17" Loose Brown Gravelly Fine Sandy Loam - GR2
17-28" Medium Compact Brown Stony Very Fine Sandy Loam - GR2
28-35" Medium Compact Grey Brown Gravelly Fine Sandy Loam
35-51" Loose Grey Brown Stony Gravelly Fine Silty Loam
SHGWT 28" Roots to 22"
No Seeps Ledge at 48"
- TP#27**
0-7" Loose Brown Very Fine Sandy Loam - GR2
7-17" Loose Dark Brown Very Fine Sandy Loam - GR2
17-29" Loose Brown Sandy Loam - PL1
29-40" Loose Grey Brown Stony Loam
40-49" Loose grey Brown Gravel
SHGWT 27" Roots to 30"
Seeps at 46" No Ledge
- TP#28**
0-8" Loose Dark Brown Very Fine Sandy Loam - GR2
8-20" Loose Brown Stony Very Fine Sandy Loam - GR2
20-27" Compact Brown Stony Loam
27-33" Loose Grey Medium Sand
33-56" Medium Compact Gravel and Cobbles
SHGWT 18" Roots to 23"
Seeps at 52" No Ledge
- TP#29**
0-7" Loose Brown Very Fine Sandy Loam - GR2
7-20" Loose Grey Brown Very Fine Sandy Loam - GR2
20-33" Medium Compact Brown Stony Loam
33-48" Loose Grey Stony Gravel
SHGWT 18" Roots to 22"
No Seeps Ledge at 48"

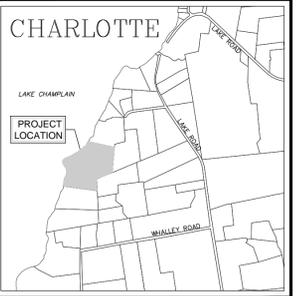
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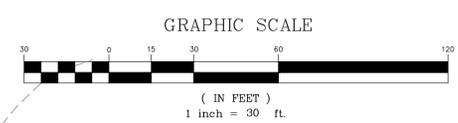


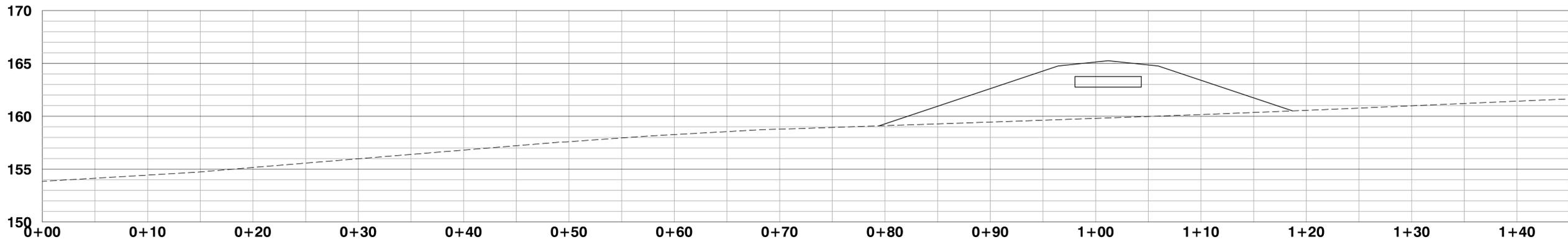
LOCATION MAP
1" = 2000'

DATE	CHECKED	REVISION
11/17/14	JLM	ADDITIONAL TOPO FOR W.W. AND BARN

WASTEWATER DISPOSAL SYSTEM SITE PLAN

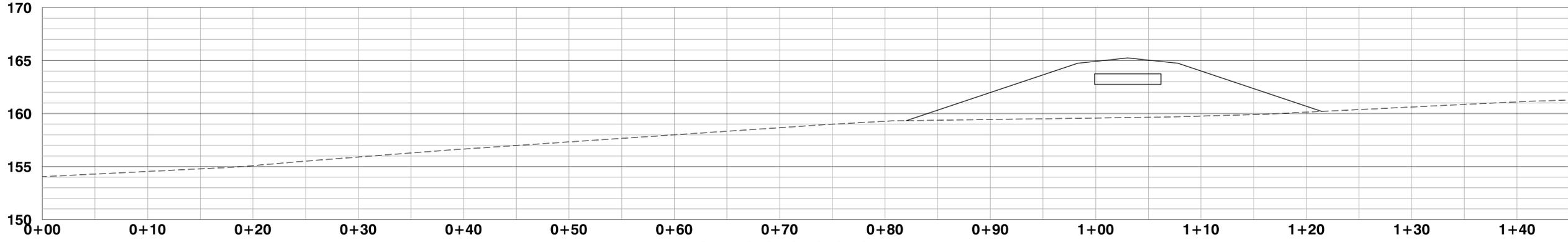
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SCALE
1" = 30'
PROJ. NO.
13229.01
DRAWING NUMBER
C1.1





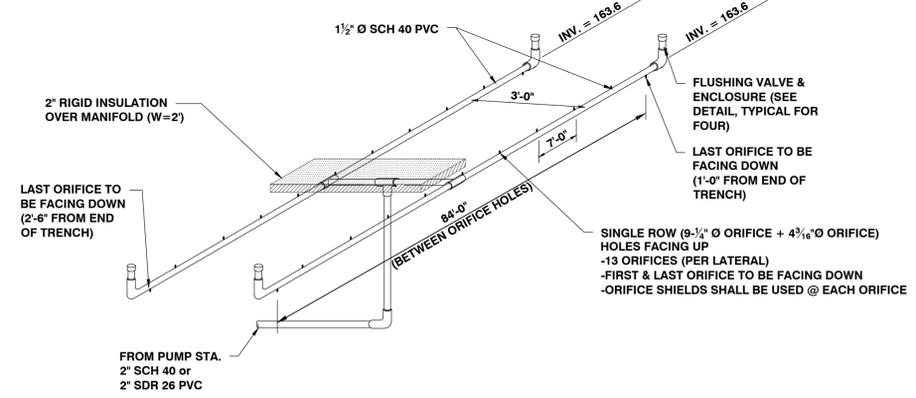
MOUND SECTION AA

HORZ: 1" = 5'
VERT: 1" = 5'

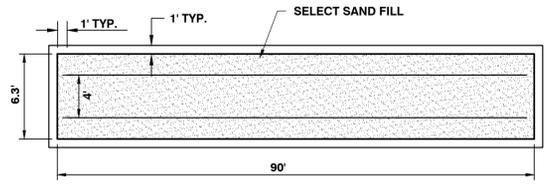


MOUND SECTION AA

HORZ: 1" = 5'
VERT: 1" = 5'



TRENCH PIPING DETAIL
N.T.S.



TYPICAL TRENCH PLAN
N.T.S.

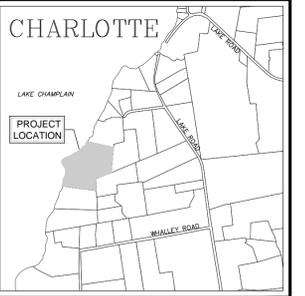
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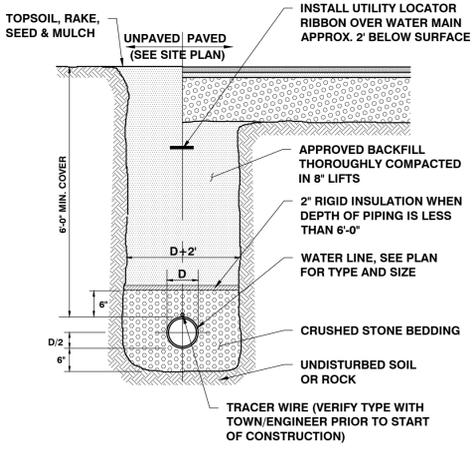
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DSM
APPROVED
DSM

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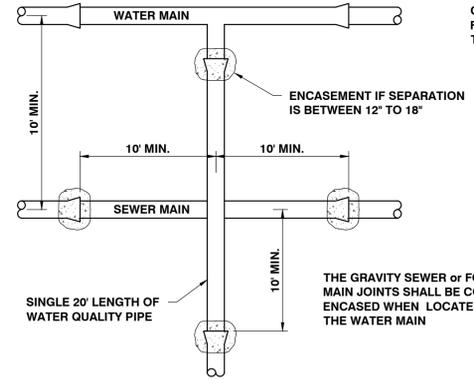


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1" = 2000'

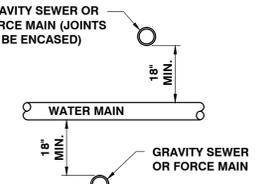


TYPICAL WATER TRENCH DETAIL
N.T.S.

- NOTES:
1. COMPACTION OF BACKFILL AND BEDDING SHALL BE A MINIMUM OF 90% (95% UNDER ROADWAY SURFACES) OF MAXIMUM DRY DENSITY DETERMINED IN THE STANDARD PROCTOR TEST (ASTM D698).
 2. BEDDING MATERIAL SHALL NOT BE PLACED ON FROZEN SUBGRADE.
 3. APPROVED BACKFILL SHALL NOT CONTAIN ANY STONES MORE THAN 1 1/2" IN LARGEST DIMENSION (6" IN ROADWAYS, 1 1/2" MAXIMUM DIAMETER WITHIN 24" OF THE OUTSIDE OF THE PIPE), OR CONTAIN ANY FROZEN, WET, OR ORGANIC MATERIAL.
 4. TRENCHES SHALL BE COMPLETELY DEWATERED PRIOR TO PLACING OF PIPE BEDDING MATERIAL AND KEPT DEWATERED DURING INSTALLATION OF PIPE AND BACKFILL.
 5. IN TRENCHES WITH UNSTABLE MATERIALS, TRENCH BOTTOM SHALL FIRST BE STABILIZED BY PLACEMENT OF FILTER FABRIC THEN CRUSHED STONE (3/4" MAXIMUM).
 6. THE SIDES OF TRENCHES 4' OR MORE IN DEPTH ENTERED BY PERSONNEL SHALL BE SHEETED OR SLOPED TO THE ANGLE OF REPOSE AS DEFINED BY O.S.H.A. STANDARDS.
 7. BEDDING MATERIAL SHALL CONSIST OF CRUSHED STONE WITH A MAXIMUM SIZE OF 3/4". SUBMIT A SAMPLE TO THE ENGINEER FOR APPROVAL.
 8. CONTRACTOR TO INSTALL TRACER WIRE ALONG ALL SECTIONS OF NEW WATER LINE. TERMINATE TRACER WIRE AT ALL VALVE BOXES AND HYDRANTS. COORDINATE INSTALLATION WITH TOWN AND ENGINEER.



PLAN VIEW



PROFILE VIEW

REFERENCE:
VT. WATER SUPPLY RULE
CHAPTER 21 SECTION 8.6

WATER/SEWER CROSSING
N.T.S.

DATE	CHECKED	REVISION

SEWER DETAILS

DATE
FEB., 2015
SCALE
AS SHOWN
PROJ. NO.
13229.01

DRAWING NUMBER
C2.1