Waterbury Municipal Complex Summary Geotech Report (06/30/2014)

A. General:

1. Eight (8) soil borings were taken at the locations depicted on the Boring Location Plan.

2. The subsurface soil conditions are generally comprised of 2 to 13.5 feet of very loose-to-medium dense brown silty sand with trace-to-some gravel (Fill - Moist to damp) over 0 to 12.5 feet of medium dense-to-very dense oxidized fine-to-coarse sand & mf gravel (Dry to wet) over 0 to 35 feet of loose-to-medium dense gray non-plastic silt (Damp to wet) over weathered rock (Oxidized mica schist).

3. Loose fill soils were encountered in most of the soil borings at the site. Below is a summary of the loose soils ($N_{60} \leq 10$):

Boring	G.W.T.	Bot. Loose	Top Silt	Till or Ledge
SB-1	406.5'	412.0'	409.5'	N/A
SB-2	410.0'	417.0'	410.0'	N/A
SB-3	409.5'	420.0'	406.5'	371.5'
SB-4	410.0'	418.0'	410.0'	N/A
SB-5	409.0'	N/A	409.0'	402.5'
SB-6	408.5'	418.0'	408.5'	401.0'
SB-7	409.0'	417.5'	404.0'	379.5'
SB-8	N/A	419.0'	N/A	407.0'

4. Though it may be possible to design for a low bearing pressure of 1250 to 1500 PSF, the resulting differential settlements would likely be unacceptable due to the variability in the density of the existing fill soils. Our firm recommends removing the existing soils down to elevation 418.5', compacting the exposed subgrade soil to at least 95% of the Standard Proctor dry density value, then reusing the excavated material in properly placed 8" maximum lifts compacted to at least 95% of the Standard Proctor dry density value. Replacement and re-compaction of the existing soils may be restricted in depth immediately adjacent to the existing Library. Soil bearing values in these areas should be reduced to 1250 PSF for strip footings and 1500 PSF for square footings.

B. **2012 IBC Seismic (New Municipal Offices):**
Site Class "D" (Average $SPT_{100} >$ 15)
Ss=0.277 (Fa=1.578)
S1=0.094 (Fv=2.400)
Sds=0.292
Sd1=0.151

Seismic Design Category "C" for Risk Categories 1, 2 & 3. Seismic Design Category "B" for Risk Categories 1, 2 & 3 if the provisions for Alternate 1613.3.5.1 can be met.

Because the site is not located directly over an active fault, the risk of surface rupture during a seismic event is relatively low. Using the SPT values contained in the boring logs, estimated & tested silt contents from the boring samples, and a (2% in 50-year) design 6.03 Magnitude earthquake (0.14g peak ground acceleration) obtained from the U.S.G.S. Probable Seismic Hazard Deaggregation, our firm calculated that the on-site soils should not be liquefiable based upon a minimum Factor-of-Safety of 1.06 below the groundwater elevation. Seismic settlements were calculated to be less than 0.97".

C. **2012 IBC Seismic (New Library):**
Site Class "D" (Average $SPT_{100} >$ 25.83)
Ss=0.277 (Fa=1.578)
S1=0.094 (Fv=2.400)
Sds=0.292
Sd1=0.151

Seismic Design Category "C" for Risk Categories 1, 2 & 3. Seismic Design Category "B" for Risk Categories 1, 2 & 3 if the provisions for Alternate 1613.3.5.1 can be met.

Because the site is not located directly over an active fault, the risk of surface rupture during a seismic event is relatively low. Using the SPT values contained in the boring logs, estimated & tested silt contents from the boring samples, and a (2% in 50-year) design 6.03 Magnitude earthquake (0.14g peak ground acceleration) obtained from the U.S.G.S. Probable Seismic Hazard De-aggregation, our firm calculated that the on-site soils should not be liquefiable based upon a minimum Factor-of-Safety of 1.55 below the groundwater elevation. Seismic settlements were calculated to be 0.12".

D. **Design Bearing Pressures:**

Based upon the SPT data, visual classification of the soils and following the recommendations listed under Section A.4 (soil replacement), these soils should have sufficient strength to support conventional strip and spread footings with the following Allowable Net Foundation Loading:

Allowable Net Foundation Loading (1) (2) (3)

Shallow Interior Footings (FFE = 431' +/-, BOF = 428' to 429')

Footing width:	Strip Ftg.	Sq. Ftg.
B = 2.0'	2750 PSF	2650 PSF
B = 3.0'	3050 PSF	2950 PSF
B = 4.0'	3250 PSF	3250 PSF
B = 5.0'	3000 PSF	3500 PSF
B = 6.0'	2850 PSF	3700 PSF
B = 7.0'	2750 PSF	3850 PSF
B = 8.0'	2650 PSF	3700 PSF
B =10.0'	2550 PSF	3500 PSF
B =12.0'	2500 PSF	3450 PSF
B =15.0'	2400 PSF	3350 PSF
B =20.0'	2350 PSF	3250 PSF

Deep Perimeter & Interior Footings (FFE = 431' +/-, BOF = 425' +/-)

Footing width:	Strip Ftg.	Sq. Ftg.
B = 2.0'	4000 PSF	4000 PSF
B = 3.0'	3900 PSF	4000 PSF
B = 4.0'	3500 PSF	4000 PSF
B = 5.0'	3250 PSF	4000 PSF
B = 6.0'	3050 PSF	4000 PSF
B = 7.0'	2950 PSF	4000 PSF
B = 8.0'	2850 PSF	3950 PSF
B =10.0'	2750 PSF	3800 PSF
B =12.0'	2700 PSF	3700 PSF
B =15.0'	2600 PSF	3600 PSF
B =20.0'	2500 PSF	3500 PSF

Notes:

1. Footing & subgrade conditions should be inspected prior to placement of the footing. Inspections should be performed by a qualified geotechnical engineer licensed in the State of Vermont.

2. **Strip and square footings**: At these design loads and footing depths, the bearing strength factor-of-safety should be a minimum of 3.0 and the projected differential and total settlements should be less than 0.5" and 1.0", respectively.

3. **Allowable Net Foundation Loading** includes the above-grade loads plus the displaced weight of the foundations (use approximately 20 to 50 PCF for the density difference between the concrete and the soil).

E. Based upon the anticipated footing depths, construction de-watering should not be required. Care should be taken during construction to divert surface water away from open excavations as damp or saturated soils may destabilize excavation sidewalls or make proper compaction difficult.

F. The local frost depth is approximately 5.5 feet; unheated foundations and utilities should be designed accordingly or properly insulated.

G. Structural fill for footing and slab subgrade should be compacted in 8" maximum lifts to at least 95% of the Standard Proctor dry density value. After excavation for the footings, the disturbed subgrade soils should be compacted to at least 95% of the Standard Proctor dry density value. If the soils at footing elevation appear to be too damp or saturated such that compaction cannot be achieved, consult the Project Geotechnical Engineer.

H. Neither concrete rubble nor other construction debris should be used as structural fill or backfill.

I. Structural fill should be placed and compacted in layers of 8-inch maximum thickness (12" maximum loose). Field density tests should be accomplished on each lift to verify that adequate compaction is achieved. A reasonable guideline would be to perform at least 1 test per 2500 SF per lift for bulk filling; additional tests may be conducted on each lift at isolated excavation locations.

J. If construction is to take place during periods of freezing temperatures, the existing materials must be protected against freezing heave until they can be properly insulated or backfilled.

K. The existing surface soils are marginally frost-active. Isolated exterior foundations should be installed at least as deep as the local frost depth or properly insulated (see note "F"). Where minimizing frost heaving is critical, such as entry slabs or pads supporting equipment connected to buried piping or building piping, exterior structural slabs-on-grade should be constructed on 60" of clean crushed stone wrapped in filter fabric (Mirafi 500X) or on 30" of clean crushed stone wrapped in filter fabric (Mirafi 500X) on top of 3" of rigid insulation (extend the insulation out 3 feet beyond the edges of the slab).

L. Utilities susceptible to damage from frost should be installed at least 5.5 to 6 feet below grade or properly insulated to limit typical frost penetration to above the top of the utility.

M. Excavation and trenching in excess of 4 feet should be kept to a maximum slope of 1.5 Horizontal to 1 Vertical (OSHA Class C). Where slopes are adjacent to critical structures, permanent (unsaturated) slopes should be 2.5 Horizontal to 1 Vertical or flatter.

N. Allowable resisting/bearing pressures may be increased 33% for wind and seismic loading.

O. The design internal friction angle for granular fill placed behind retaining walls should be assumed to be 30 degrees. The design coefficient of friction (ultimate, not factored) should be 0.57 for concrete cast directly on the re-compacted sandy soils or structural fill (0.38 for precast concrete). Design soil unit weights should be in the range of 100 to 120 PCF for the native sandy soils (unsaturated). At 30 degrees, the following design lateral earth coefficients should be assumed:

Active (Ka): 0.333
At-rest (Ko): 0.500
Passive (Kp): 3.000

If design for permanent traffic or temporary construction traffic is applicable, our firm recommends a lateral surcharge pressure of 0.333q (100 PSF) for active earth conditions and a lateral surcharge pressure of 0.500q (150 PSF) for at-rest earth conditions. These values are based upon a 300 PSF effective surcharge. Retaining walls free to rotate at the top may be designed using active earth pressures; retaining walls restrained at the top should be designed using at-rest earth pressures. Perimeter drains should be properly designed to eliminate hydrostatic pressures on retaining structures where possible.

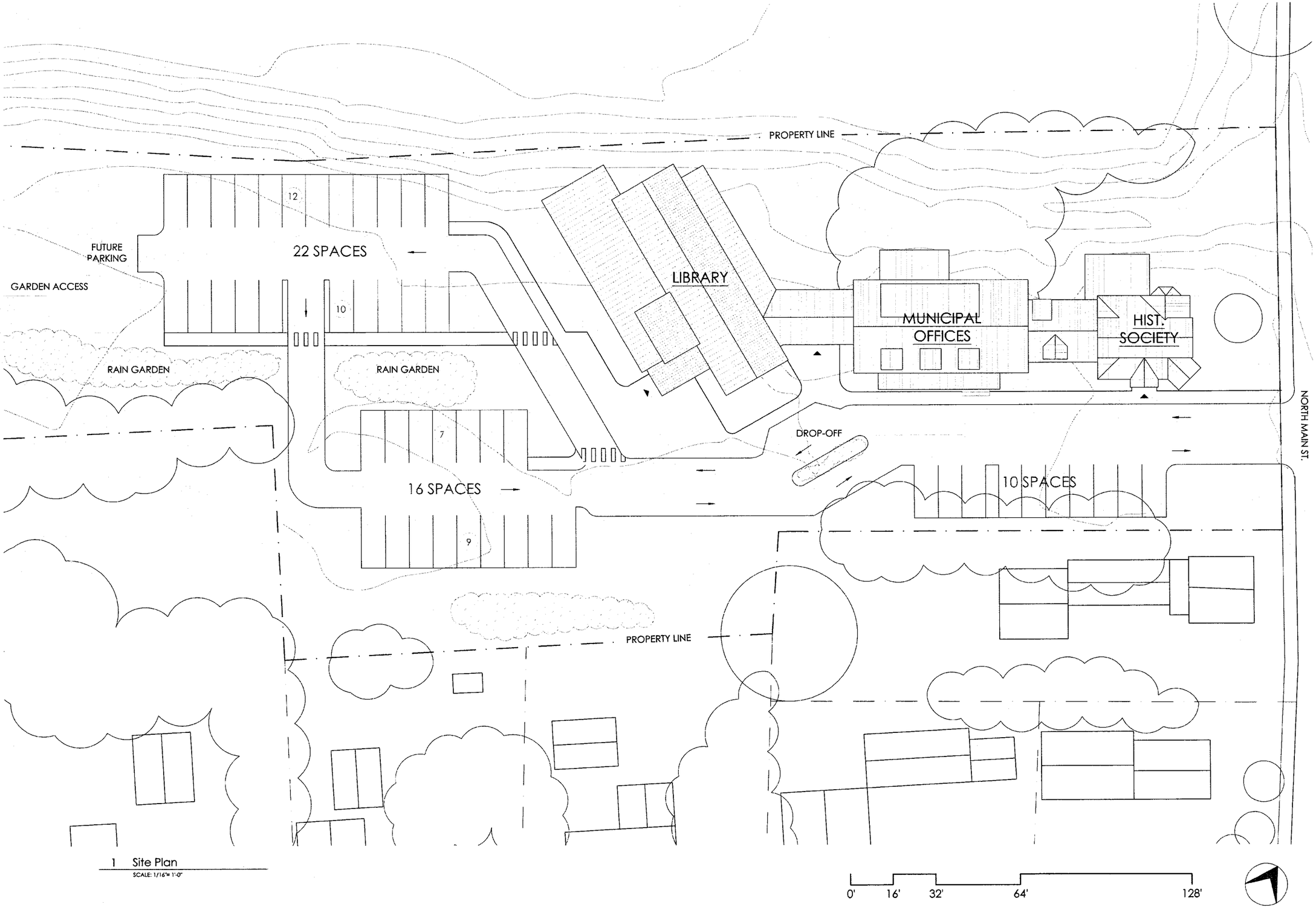
P. For permanent foundation walls designed to retain soil, the design passive pressure resistance should not exceed the at-rest lateral earth pressures for soils that will remain in-place during and after backfilling of these foundation walls. This requirement is to insure that excessive displacements are not experienced in an attempt to develop the passive resistance. The appropriate Factors-of-Safety (Resistance Forces/Driving Forces) shall be a minimum of 1.5 for sliding and 2.0 for overturning. For temporary sheeting/bracing systems where lateral displacement will not have significant adverse effects, the design passive pressure resistance should not exceed 50% to 67% of the full passive pressure value for soils that will remain during the entire use of these sheeting/bracing systems. At these values the Factors-of Safety (Resistance Forces/Driving Forces) should be in the range of approximately 1.5 to 2.0.

STATE OF VERMONT
ERIC H. GODDARD
No. 6035
REGISTERED
PROFESSIONAL ENGINEER

Submitted by,

Eric Goddard

Eric Goddard, P.E.
Senior Vice President



1 Site Plan
SCALE: 1/16"= 1'-0"

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ARCHITECTURE, PC

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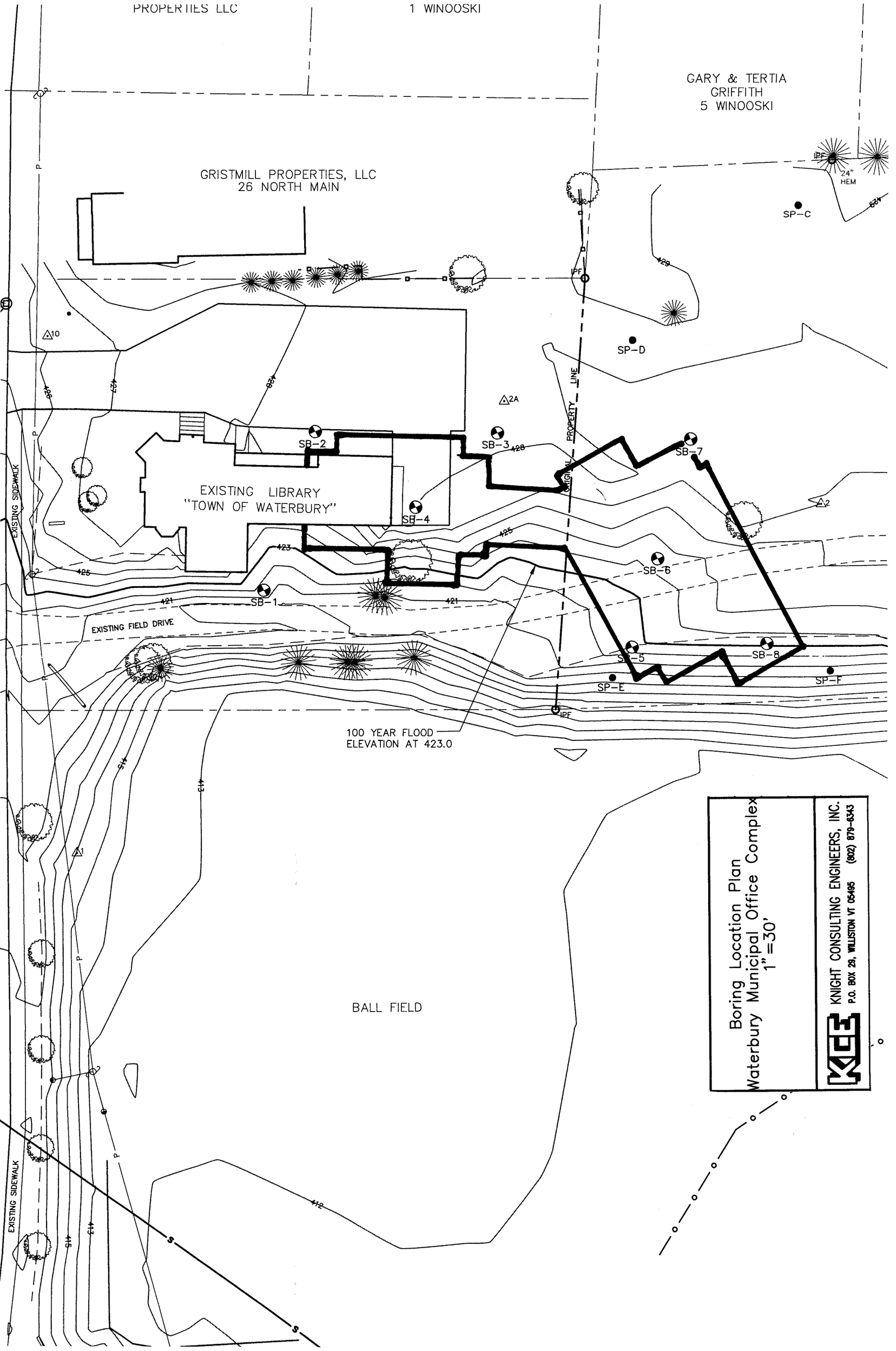
DATE ISSUED:
Januar 21, 2013
Drawn: WG, SO, JM
Checked: A. Murray / A. Nelson
REVISIONS:

WATERBURY MUNICIPAL COMPLEX

Town of Waterbury
Vermont

SCHEME B
SITE PLAN


PROPERTIES LLC
1 WINOOSKI
GARY & TERTIA
GRIFFITH
5 WINOOSKI
GRISTMILL PROPERTIES, LLC
26 NORTH MAIN
EXISTING LIBRARY
"TOWN OF WATERBURY"
EXISTING SIDEWALK
EXISTING FIELD DRIVE
ORIGINAL PROPERTY LINE
SB-1
SB-2
SB-3
SB-4
SB-5
SB-6
SB-7
SB-8
SP-C
SP-D
SP-E
SP-F
IPF
24" HEM
100 YEAR FLOOD
ELEVATION AT 423.0
BALL FIELD
Boring Location Plan
Waterbury Municipal Office Complex
1"=30'
KCE
KNIGHT CONSULTING ENGINEERS, INC.
P.O. BOX 29, WILLISTON VT 05495 (802) 879-6343

T & K Drilling Inc.
189 Fitzwilliam Road
Troy, NH 03465
(603) 358-5588

Boring: SB-1 **Project:** Waterbury Municipal Complex **Project #** 14195

Project Address: 28 North Main Street **City:** Waterbury **State:** VT **Zip:** 05676

Date Start: 06/02/2014 **Date End:** 06/02/2014 **Location:** Offset 14' North (Elev 420.0' +/-)

Casing: Hollow Augers	**Sampler:**	**Auger:** 4-1/4" ID	**Sampler:**
Type:	Split Spoon	Size:	1-3/8 in. I.D.
Hammer:	140 lbs.	Fall:	30 in.

GROUNDWATER OBSERVATION

Date: 06/02/14	**Depth:** 13.5' est.	**Casing:**	**Stabilization Period** Instantaneous

DP	S/#	DEPTH	PEN	REC	BLOWS/6"	S/C	SAMPLE DESCRIPTION
-	S-1	0'-2'	24"	18"	1-3-2-3	Damp	Loose brown SILT, some mf SAND, tr f gravel (ML)
-							
-	S-2	2'-4'	24"	16"	3-4-4-4	Damp	Loose brown mf SAND & SILT, tr f gravel (SM-ML)
-							
5'0"	S-3	4'-6'	24"	15"	2-2-2-4	Damp	Loose brown SILT & mf SAND, tr mf gravel -
-						6'	possible cinders (SM-ML)
-	S-4	6'-8'	24"	4"	5-3-2-3	D/W	Loose brown mf GRAVEL & cmf SAND, some SILT
-							(GM)
-	S-5	8'-10'	24"	3"	6-5-3-3	D/W	Loose brown mf GRAVEL & cmf SAND, some SILT
10'0"						10.5'	(GM-SM)
-	S-6	10'-12'	24"	12"	16-4-3-4	Damp	Loose brown SILT, some f SAND, tr f gravel
-							
-						13.5'	
-							
15'0"	S-7	15'-17'	24"	13"	9-4-5-5	Wet	Loose gray non-plastic SILT (ML)
-							
-							
-							
-							
20'0"	S-8	20'-22'	24"	15"	2-4-4-4	Wet	Loose gray non-plastic SILT (ML, w=26.5%)
-							
-							
-							
-							
25'0"	S-9	25'-27'	24"	17"	WH-WH-2-3	Wet	Loose gray SILT, some vf SAND (ML, w=25.9%)
-							
-							
-						27'	End of Boring
-							
30'0"							
-							

Drillers. Kevin Singleton **Helper:** Sean McGarry **Inspector:** Eric Goddard

Remarks:

S/#: Sample **PEN:** Penetration **REC:** Recovery **S/C:** Strata Change

T & K Drilling Inc.
189 Fitzwilliam Road
Troy, NH 03465
(603) 358-5588

Boring: SB-2 **Project:** Waterbury Municipal Complex **Project #** 14195

Project Address: 28 North Main Street **City:** Waterbury **State:** VT **Zip:** 05676

Date Start: 06/02/2014 **Date End:** 06/02/2014 **Location:** No Offset (Elev 428.5' +/-)

Hollow Augers:	**Sampler:**	**Auger:** 4-1/4" ID	**Sampler:**
Type:	Split Spoon	Size:	1-3/8 in. I.D.
Hammer:	140 lbs.	Fall:	30 in.

GROUNDWATER OBSERVATION

Date: 06/02/14	**Depth:** 18.5' est.	**Casing:**	**Stabilization Period** Instantaneous

DP	S/#	DEPTH	PEN	REC	BLOWS/6"	S/C	SAMPLE DESCRIPTION
-	S-1	0'-2'	24"	14"	4-4-3-4	Moist	Loose brown/black f SAND & SILT, tr f gravel & organics – probable fill.
-	S-2	2'-4'	24"	7"	4-3-3-4	Moist	Loose brown f SAND & SILT, tr f gravel – probable fill.
5'0"	S-3	4'-6'	24"	20"	3-2-3-3	M/D	Loose brown f SAND & SILT – probable fill.
-	S-4	6'-8'	24"	20"	3-2-1-3	M/D 8'	Very loose-to-loose brown f SAND & SILT – probable fill.
- 10'0"	S-5	8'-10'	24"	18"	3-2-3-4	Moist	Loose brown mf SAND, little silt – probable fill.
-	S-6	10'-12'	24"	22"	2-2-3-10	Damp	V. loose-to-loose brn mf SAND, little silt, tr f gravel - Probable fill.
15'0"	S-7	15'-17'	24"	14"	15-20-23-29	11.5' Dry/M 18.5'	Very dense brn cmf SAND & mf GRAVEL, tr silt.
20'0"	S-8	20'-22'	24"	15"	3-4-7-8	Wet	Loose-to-medium dense olive brown non-plastic SILT.
25'0"	S-9	25'-27'	24"	16"	2-2-4-5	Wet	Loose gray non-plastic SILT (ML, w=25.8%).
30'0"						27'	End of Boring

Drillers. Kevin Singleton **Helper:** Sean McGarry **Inspector:** Eric Goddard

Remarks:

S/#: Sample **PEN:** Penetration **REC:** Recovery **S/C:** Strata Change

T & K Drilling Inc.
189 Fitzwilliam Road
Troy, NH 03465
(603) 358-5588

Boring: SB-3 (Page 1) **Project:** Waterbury Municipal Complex **Project #** 14195

Project Address: 28 North Main Street **City:** Waterbury **State:** VT **Zip:** 05676

Date Start: 06/03/2014 **Date End:** 06/03/2014 **Location:** No Offset (Elev 428.0' +/-)

Hollow Augers:	**Sampler:**	**Auger:** 4-1/4" ID	**Sampler:**
Type:	Split Spoon	Size:	1-3/8 in. I.D.
Hammer:	140 lbs.	Fall:	30 in.

GROUNDWATER OBSERVATION

Date: 06/04/14	**Depth:** 18.4'	**Casing:**	**Stabilization Period** 24 hours

DP	S/#	DEPTH	PEN	REC	BLOWS/6"	S/C	SAMPLE DESCRIPTION
-	S-1	0'-2'	24"	10"	2-3-4-5	Moist	Loose brown/black f SAND & SILT, tr roots & organics – probable fill.
-	S-2	2'-4'	24"	0"	3-3-2-2	-	No recovery (pushed stone) – probable fill (loose).
5'0"	S-3	4'-6'	24"	8"	17-9-17-12	Dry	Dense green/gray/brown/orange cmf SAND & mf GRAVEL (oxidized weathered rock) – probable fill.
-	S-4	6'-8'	24"	1"	6-3-2-2	Moist	Loose brown cmf SAND, little f gravel & silt, tr organics - probable fill.
-	S-5	8'-10'	24"	11"	5-8-13-13	Moist	Med. den. brn mf SAND, little f gravel & silt – fill into
10'0"						Dry	green/gray/brown/orange cmf SAND & mf GRAVEL.
-	S-6	10'-12'	24"	12"	12-12-11-12	Dry	Medium dense green/gray/brown/orange cmf SAND & mf GRAVEL, tr silt.
15'0"	S-7	15'-17'	24"	6"	11-15-16-30	Moist	Medium dense-to-dense brown/black cmf SAND & mf GRAVEL, tr silt (stone in tip).
20'0"	S-8	20'-22'	24"	12"	12-14-11-7	Wet 21.5'	Medium dense green/gray/brown/orange cmf SAND & mf GRAVEL, tr silt.
							Medium dense olive brown SILT, some f SAND.
25'0"	S-9	25'-27'	24"	18"	3-5-4-4	Wet	Loose olive gray-to-gray non-plastic SILT (ML, W=32.6%).
30'0"	S-10	30'-32'	24"	16"	3-6-5-5	Wet	Loose gray f SAND & SILT.

Drillers. Kevin Singleton **Helper:** Sean McGarry **Inspector:** Eric Goddard

Remarks:

S/#: Sample **PEN:** Penetration **REC:** Recovery **S/C:** Strata Change

T & K Drilling Inc.
189 Fitzwilliam Road
Troy, NH 03465
(603) 358-5588

Boring: SB-3 (Page 2) **Project:** Waterbury Municipal Complex **Project #** 14195

Project Address: 28 North Main Street **City:** Waterbury **State:** VT **Zip:** 05676

Date Start: 06/03/2014 **Date End:** 06/03/2014 **Location:** No Offset (Elev 428.0' +/-)

Hollow Augers:	**Sampler:**	**Auger:** 4-1/4" ID	**Sampler:**
Type:	Split Spoon	Size:	1-3/8 in. I.D.
Hammer:	140 lbs.	Fall:	30 in.

G R O U N D W A T E R O B S E R V A T I O N

Date:	**Depth:**	**Casing:**	**Stabilization Period**
06/04/14	18.4' est.		24 hours

DP	S/#	DEPTH	PEN	REC	BLOWS/6"	S/C	SAMPLE DESCRIPTION
35'0"	S-11	35'-37'	24"	19"	5-5-7-14	Wet	Loose-to-medium dense gray f SAND & SILT.
40'0"	S-12	40'-42'	24"	21"	4-5-5-6	Wet	Loose gray SILT & f SAND.
45'0"	S-13	45'-47'	24"	16"	0-5-5-7	Wet	Loose gray SILT, some f SAND.
50'0"	S-14	50'-52'	24"	14"	0-5-7-9	Wet	Loose gray SILT, some f SAND.
55'0"	S-15	55'-57'	24"	10"	0-12-16-20	Wet 56.5'	Medium dense gray glacial outwash (SAND, GRAVEL & SILT, tr clay) into
							Dense glacial till
60'0"						57.6'	End of Boring (Auger refusal).

Drillers. Kevin Singleton **Helper:** Sean McGarry **Inspector:** Eric Goddard

Remarks:

S/#: Sample **PEN:** Penetration **REC:** Recovery **S/C:** Strata Change

T & K Drilling Inc.
189 Fitzwilliam Road
Troy, NH 03465
(603) 358-5588

Boring: SB-4 **Project:** Waterbury Municipal Complex **Project #** 14195

Project Address: 28 North Main Street **City:** Waterbury **State:** VT **Zip:** 05676

Date Start: 06/03/2014 **Date End:** 06/03/2014 **Location:** Offset 12' East (Elev 428.0' +/-)

Hollow Augers:	**Sampler:**	**Auger:** 4-1/4" ID	**Sampler:**
Type:	Split Spoon	Size:	1-3/8 in. I.D.
Hammer:	140 lbs.	Fall:	30 in.

G R O U N D W A T E R O B S E R V A T I O N

Date: 06/03/14	**Depth:** 18' est.	**Casing:**	**Stabilization Period** Instantaneous

DP	S/#	DEPTH	PEN	REC	BLOWS/6"	S/C	SAMPLE DESCRIPTION
-	S-1	0'-2'	24"	11"	6-7-11-20	Moist	Medium dense gray f SAND & SILT, tr f gravel into crushed rock – probable fill.
-	S-2	2'-4'	24"	14"	27-5-6-8	M/D	Brown/gray crushed rock into medium dense brown f SAND & SILT – probable fill.
5'0"	S-3	4'-6'	24"	18"	3-3-3-5	Damp	Loose brown f SAND & SILT with mf sand lenses – probable fill.
-	S-4	6'-8'	24"	18"	4-2-3-4	Moist	Loose brown mf SAND, tr silt – probable fill.
10'0"	S-5	8'-10'	24"	18"	4-3-3-4	M/D	Loose brown mf SAND, little silt with lenses of f sand & silt – probable fill.
-	S-6	10'-12'	24"	16"	5-6-14-17	Damp	Loose brn f SAND, little silt – probable fill into
15'0"	S-7	15'-17'	24"	13"	12-28-33-35	Dry Dry 18'	Dense orange/brn/gray cmf SAND & mf GRAVEL. Dense-to-very dense green/gray/orange/brown Cmf SAND & mf GRAVEL, tr silt.
20'0"	S-8	20'-22'	24"	17"	4-9-7-6	Wet Wet	Loose-to-medium dense brown f SAND, some SILT.
25'0"	S-9	25'-27'	24"	16"	4-6-8-6	21.5' Wet	Loose-to-med. den. olive brn SILT, some f SAND, tr organics. Loose-to-med. den. olive gray SILT, some f SAND.
30'0"						27'	End of Boring

Drillers. Kevin Singleton **Helper:** Sean McGarry **Inspector:** Eric Goddard

Remarks:

S/#: Sample **PEN:** Penetration **REC:** Recovery **S/C:** Strata Change

T & K Drilling Inc.
189 Fitzwilliam Road
Troy, NH 03465
(603) 358-5588

Boring: SB-5 **Project:** Waterbury Municipal Complex **Project #** 14195

Project Address: 28 North Main Street **City:** Waterbury **State:** VT **Zip:** 05676

Date Start: 06/02/2014 **Date End:** 06/02/2014 **Location:** No Offset (Elev 422.5' +/-)

Hollow Augers:	**Sampler:**	**Auger:** 4-1/4" ID	**Sampler:**
Type:	Split Spoon	Size:	1-3/8 in. I.D.
Hammer:	140 lbs.	Fall:	30 in.

GROUNDWATER OBSERVATION

Date: 06/02/14	**Depth:** 13.5' est.	**Casing:**	**Stabilization Period** Instantaneous

DP	S/#	DEPTH	PEN	REC	BLOWS/6"	S/C	SAMPLE DESCRIPTION
- -	S-1	0'-2'	24"	5"	3-5-5-5	Moist	Loose-to-medium dense brown/black mf SAND, little f gravel, tr organics – probable fill.
- -	S-2	2'-4'	24"	6"	7-8-7-9	Moist	Med. dense brown/black cmf SAND & mf GRAVEL, little silt.
5'0" -	S-3	4'-6'	24"	16"	7-8-9-13	Dry	Medium dense brown cmf SAND & mf GRAVEL, tr silt.
- -	S-4	6'-8'	24"	18"	13-12-13-20	Dry	Medium dense brown cmf SAND & mf GRAVEL, tr silt.
- 10'0"	S-5	8'-10'	24"	18"	12-13-20-19	Dry	Dense brown cmf SAND & mf GRAVEL, tr silt.
- - -	S-6	10'-12'	24"	18"	12-15-22-27	Dry 13.5'	Dense brown/orange/black cmf SAND & mf GRAVEL, tr silt.
- 15'0" - - - -	S-7	15'-17'	24"	18"	5-7-7-7	Wet 20'	Loose-to-medium dense brown f SAND & SILT.
20'0"	S-8	20'-22'	4"	4"	42/4"	Damp	Very dense green/gray weathered rock.
- - - - 25'0" - - - - 30'0" -						20.3'	End of Boring (Auger refusal).

Drillers. Kevin Singleton **Helper:** Sean McGarry **Inspector:** Eric Goddard

Remarks:

S/#: Sample **PEN:** Penetration **REC:** Recovery **S/C:** Strata Change

T & K Drilling Inc.
189 Fitzwilliam Road
Troy, NH 03465
(603) 358-5588

Boring: SB-6 **Project:** Waterbury Municipal Complex **Project #** 14195

Project Address: 28 North Main Street **City:** Waterbury **State:** VT **Zip:** 05676

Date Start: 06/02/2014 **Date End:** 06/03/2014 **Location:** No Offset (Elev 424.5' +/-)

Hollow Augers:	**Sampler:**	**Auger:** 4-1/4" ID	**Sampler:**
Type:	Split Spoon	Size:	1-3/8 in. I.D.
Hammer:	140 lbs.	Fall:	30 in.

GROUNDWATER OBSERVATION

Date: 06/03/14	**Depth:** 16' est.	**Casing:**	**Stabilization Period** Instantaneous

DP	S/#	DEPTH	PEN	REC	BLOWS/6"	S/C	SAMPLE DESCRIPTION
-	S-1	0'-2'	24"	20"	2-2-3-3	Damp	Loose brown f SAND & SILT, tr organics – probable fill.
-	S-2	2'-4'	24"	20"	3-2-2-2	Damp	Loose brown f SAND & SILT – probable fill.
5'0"	S-3	4'-6'	24"	18"	3-2-2-4	Damp 6.5'	Loose brown f SAND, little silt (SM) – probable fill.
-	S-4	6'-8'	24"	18"	5-11-9-9	Dry	Medium dense brown cmf SAND & mf GRAVEL, tr silt.
10'0"	S-5	8'-10'	24"	17"	12-15-15-16	Dry	Dense brown cmf SAND & mf GRAVEL, tr silt.
-	S-6	10'-12'	24"	18"	9-18-18-24	Dry	Dense brn/orange/black cmf SAND & mf GRAVEL, tr silt.
15'0"	S-7	15'-17'	24"	8"	18-13-21-21	Dry	Den. brn/orange/blk cmf SAND & mf GRAVEL, tr silt
-						Damp	Dense brown/gray f SAND & SILT, some rock fragments.
20'0"	S-8	20'-22'	24"	15"	11-13-11-20	Wet	Medium dense brown/gray f SAND & SILT.
							Auger refusal.
25'0"						23.7'	End of Boring
30'0"							

Drillers. Kevin Singleton **Helper:** Sean McGarry **Inspector:** Eric Goddard

Remarks:

S/#: Sample **PEN:** Penetration **REC:** Recovery **S/C:** Strata Change

T & K Drilling Inc.
189 Fitzwilliam Road
Troy, NH 03465
(603) 358-5588

Boring: SB-7 (Page 1) **Project:** Waterbury Municipal Complex **Project #** 14195

Project Address: 28 North Main Street **City:** Waterbury **State:** VT **Zip:** 05676

Date Start: 06/03/2014 **Date End:** 06/03/2014 **Location:** No Offset (Elev 427.5' +/-)

Hollow Augers:	**Sampler:**	**Auger:** 4-1/4" ID	**Sampler:**
Type:	Split Spoon	Size:	1-3/8 in. I.D.
Hammer:	140 lbs.	Fall:	30 in.

GROUNDWATER OBSERVATION

Date:	**Depth:**	**Casing:**	**Stabilization Period**
06/03/14	18.5' est.		Instantaneous

DP	S/#	DEPTH	PEN	REC	BLOWS/6"	S/C	SAMPLE DESCRIPTION
-	S-1	0'-2'	24"	18"	3-3-3-3	Damp	Loose brown SILT, some f SAND – probable fill.
-							
-	S-2	2'-4'	24"	18"	3-3-2-3	Damp	Loose brown f SAND & SILT – probable fill.
-							
5'0"	S-3	4'-6'	24"	17"	2-3-2-2	Damp	Loose brown f SAND & SILT with 6" lens of f sand -
-						6'	probable fill.
-	S-4	6'-8'	24"	18"	2-3-2-4	Damp	Loose brown f SAND, little f silt – probable fill.
-							
-	S-5	8'-10'	24"	17"	3-3-2-2	Moist	Loose brown mf SAND, tr silt into
10'0"						Moist	Very loose brown f SAND, little silt – probable fill.
-	S-6	10'-12'	24"	13"	4-5-6-8	Damp	Loose brown f SAND, little silt – probable fill.
-						11'	Medium dense brown/orange cmf SAND & mf
-							GRAVEL, tr silt.
-							
15'0"	S-7	15'-17'	24"	16"	15-25-40-43	Dry	Very dense brown/orange cmf SAND & mf
-							GRAVEL, tr silt.
-							
-						18.5'	
-							
20'0"	S-8	20'-22'	24"	4"	12-15-7-17	Wet	Medium dense brown/orange cmf SAND & mf
-							GRAVEL, tr silt.
-							
-						23.5'	
-							
25'0"	S-9	25'-27'	24"	16"	8-7-9-8	Wet	Medium dense gray f SAND & SILT.
-							
-							
-							
-							
30'0"	S-10	30'-32'	24"	12"	0-3-5-5	Wet	Loose olive gray f SAND & SILT.
-							

Drillers. Kevin Singleton **Helper:** Sean McGarry **Inspector:** Eric Goddard

Remarks:

S/#: Sample **PEN:** Penetration **REC:** Recovery **S/C:** Strata Change

T & K Drilling Inc.
189 Fitzwilliam Road
Troy, NH 03465
(603) 358-5588

Boring: SB-7 (Page 2) **Project:** Waterbury Municipal Complex **Project #** 14195

Project Address: 28 North Main Street **City:** Waterbury **State:** VT **Zip:** 05676

Date Start: 06/03/2014 **Date End:** 06/03/2014 **Location:** No Offset (Elev 427.5' +/-)

Hollow Augers:	**Sampler:**	**Auger:** 4-1/4" ID	**Sampler:**
Type:	Split Spoon	Size:	1-3/8 in. I.D.
Hammer:	140 lbs.	Fall:	30 in.

GROUNDWATER OBSERVATION

Date: 06/03/14	**Depth:** 18.5' est.	**Casing:**	**Stabilization Period** Instantaneous

DP	S/#	DEPTH	PEN	REC	BLOWS/6"	S/C	SAMPLE DESCRIPTION
35'0"	S-11	35'-37'	24"	17"	4-5-5-7	Wet	Loose gray SILT, some f SAND.
40'0"	S-12	40'-42'	24"	11"	13-14-5-8	Wet	Medium dense gray SILT, little f SAND.
45'0"	S-13	45'-47'	24"	20"	0-2-4-6	Wet	Loose gray SILT, little f SAND.
						48'	
50'0"	S-14	50'-52'	3"	7"	50/3"	Damp	Very dense green/gray glacial till.
						50.3'	End of Boring (weathered rock).
55'0"							
60'0"							

Drillers. Kevin Singleton **Helper:** Sean McGarry **Inspector:** Eric Goddard

Remarks:

S/#: Sample **PEN:** Penetration **REC:** Recovery **S/C:** Strata Change

T & K Drilling Inc.
189 Fitzwilliam Road
Troy, NH 03465
(603) 358-5588

Boring: SB-8 **Project:** Waterbury Municipal Complex **Project #** 14195

Project Address: 28 North Main Street **City:** Waterbury **State:** VT **Zip:** 05676

Date Start: 06/02/2014 **Date End:** 06/02/2014 **Location:** No Offset (Elev 423.0' +/-)

Hollow Augers:	**Sampler:**	**Auger:** 4-1/4" ID	**Sampler:**
Type:	Split Spoon	Size:	1-3/8 in. I.D.
Hammer:	140 lbs.	Fall:	30 in.

G R O U N D W A T E R O B S E R V A T I O N

Date: 06/02/14	**Depth:** N/A	**Casing:**	**Stabilization Period** Instantaneous

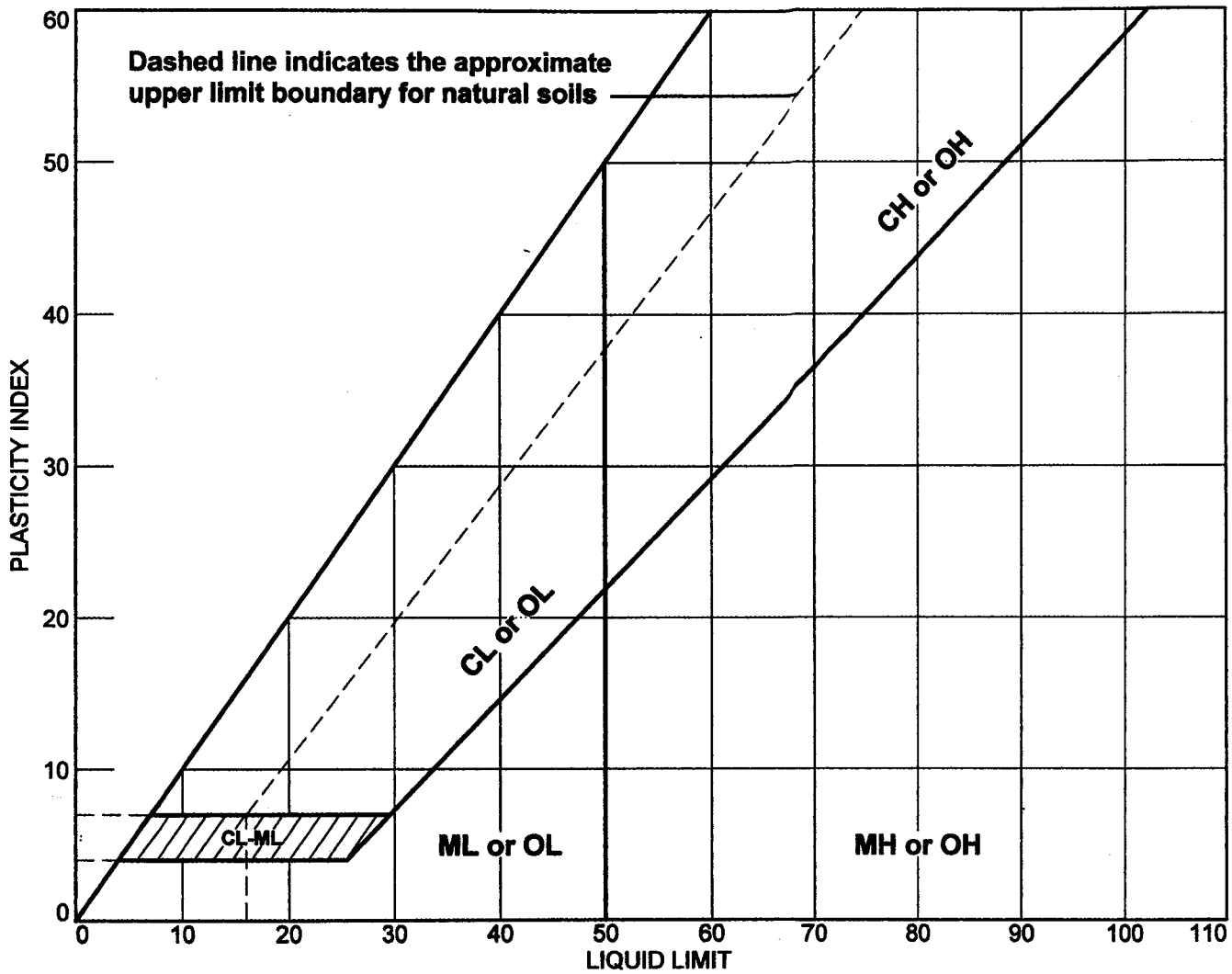
DP	S/#	DEPTH	PEN	REC	BLOWS/6"	S/C	SAMPLE DESCRIPTION
-	S-1	0'-2'	24"	14"	1-1-1-2	Moist	V. loose brown mf SAND, little silt, tr f gravel (SM) – probable fill.
-	S-2	2'-4'	24"	16"	2-2-1-2	M/D	Very loose-to-loose brown mf SAND, little silt (SP-SM) – probable fill.
5'0"	S-3	4'-6'	24"	18"	3-5-5-8	M/Dry	Loose brown mf SAND, little silt – probable fill.
-						5.5'	Med. dense brown cmf SAND, tr f GRAVEL & silt
-	S-4	6'-8'	24"	15"	6-4-6-16	Dry	Med. dense brown cmf SAND, tr f GRAVEL & silt
-	S-5	8'-10'	24"	20"	12-20-20-27	Dry	Dense brown cmf SAND, little f GRAVEL, tr silt into
10'0"							Den. brn/orange cmf SAND & mf GRAVEL, tr silt.
-	S-6	10'-12'	24"	16"	18-21-25-25	Dry	Den. brn/orange cmf SAND & mf GRAVEL, tr silt.
15'0"	S-7	15'-17'	16"	12"	16-25-50/4"	Dry	Den. green/gray/orange/brn weathered rock, tr silt.
-						16'	
20'0"						16.3'	End of Boring.
25'0"							
30'0"							

Drillers. Kevin Singleton **Helper:** Sean McGarry **Inspector:** Eric Goddard

Remarks:

S/#: Sample **PEN:** Penetration **REC:** Recovery **S/C:** Strata Change

LIQUID AND PLASTIC LIMITS TEST REPORT



SOIL DATA								
SYMBOL	SOURCE	SAMPLE NO.	DEPTH	NATURAL WATER CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	USCS
●	Soil Borings	SB-1	(20-22'Depth)	26.5	NP	NV	NP	ML
■	Soil Borings	SB-2	(25-27'Depth)	25.8	NP	NV	NP	ML
▲	Soil Borings	SB-3	(25-27'Depth)	32.6	NP	NV	NP	ML

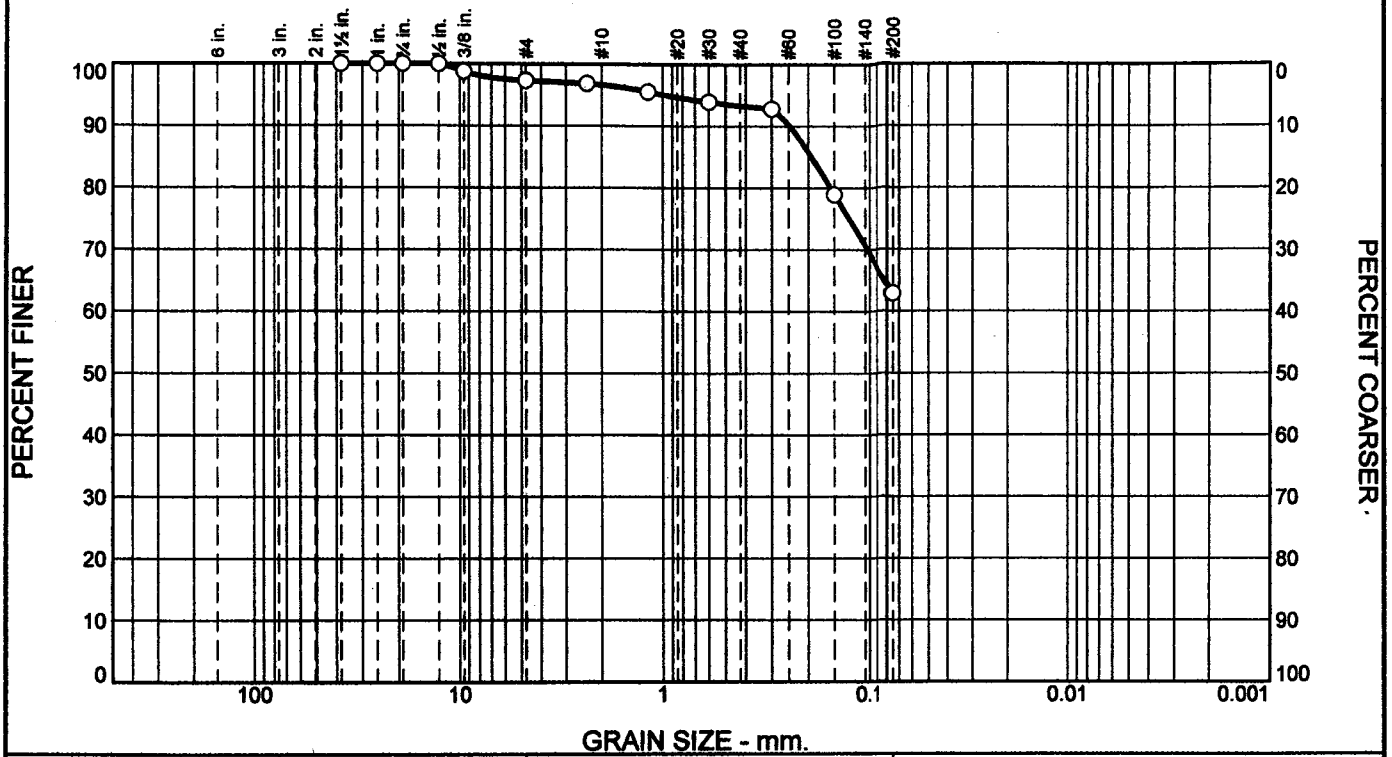
Results reflect soil gradation only and not other specification requirements.

Knight Consulting Engineers, Inc.
Williston, Vermont

Client: KAS, Inc
Project: Waterbury Municipal Complex - Geotech
Project No.: 14195
Figure 1 of 1

Tested By: P. Rixford **Checked By:** P. Rixford

Grain Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	0	3	0	4	30	63	

TEST RESULTS

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
1-1/2"	100		
1"	100		
3/4"	100		
1/2"	100		
3/8"	99		
#4	97		
#8	97		
#16	96		
#30	94		
#50	93		
#100	79		
#200	63		

* (no specification provided)

Material Description

SB-1 (0-2')

silt, some of sand, tr of gravel

Atterberg Limits (ASTM D 4318)

PL= LL= PI=

Classification

USCS (D 2487)= ML AASHTO (M 145)=

Coefficients

D_{90}= 0.2459 D_{85}= 0.1931 D_{60}=
D_{50}= D_{30}= D_{15}=
D_{10}= C_u= C_c=

Remarks

Sampled and delivered by KCE on 6-6-14.
F.M.=0.46

Date Received: 6-6-14 **Date Tested:** 6-10-14
Tested By: K. Parrow
Checked By: P. Rixford
Title: Testing and Lab Coordinator

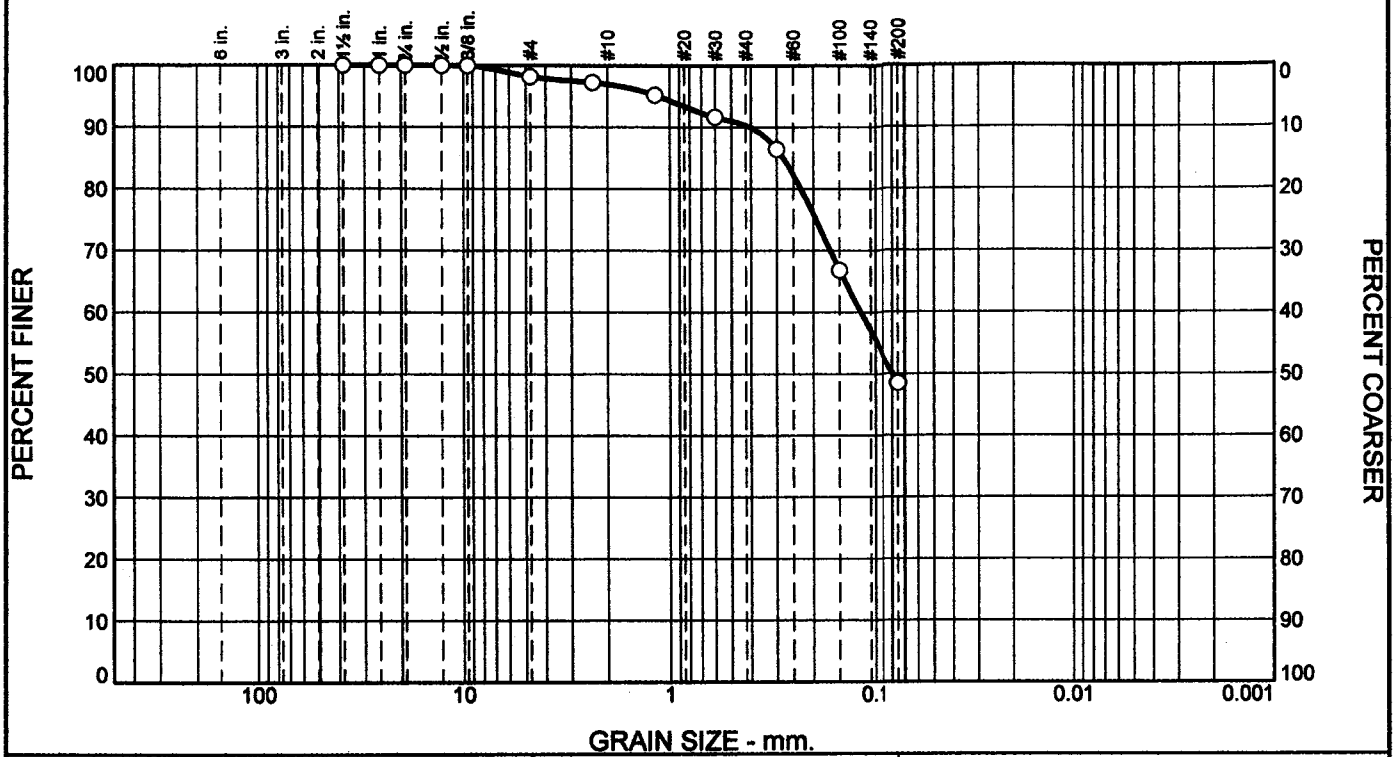
Source of Sample: Soil Borings **Date Sampled:** 6-6-14
Sample Number: 1

Knight Consulting Engineers, Inc.
Williston, Vermont

Client: KAS, Inc
Project: Waterbury Municipal Complex - Geotech
Project No: 14195 **Figure** 1 of 9

Results reflect soil gradation only and not other specification requirements.

Grain Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	0	2	1	7	42	48	

TEST RESULTS

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
1-1/2"	100		
1"	100		
3/4"	100		
1/2"	100		
3/8"	100		
#4	98		
#8	97		
#16	95		
#30	92		
#50	86		
#100	67		
#200	48		

* (no specification provided)

Material Description

SB-1 (2-4')
Mf Sand & Silt, tr f Gravel

Atterberg Limits (ASTM D 4318)

PL= LL= PI=

Classification

USCS (D 2487)= SM AASHTO (M 145)=

Coefficients

D_{90}= 0.4038 D_{85}= 0.2791 D_{60}= 0.1182
D_{50}= 0.0798 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Remarks

Sampled and delivered by KCE on 6-6-14.
F.M.=0.64

Date Received: 6-6-14 **Date Tested:** 6-10-14
Tested By: K. Parrow
Checked By: P. Rixford
Title: Testing and Lab Coordinator

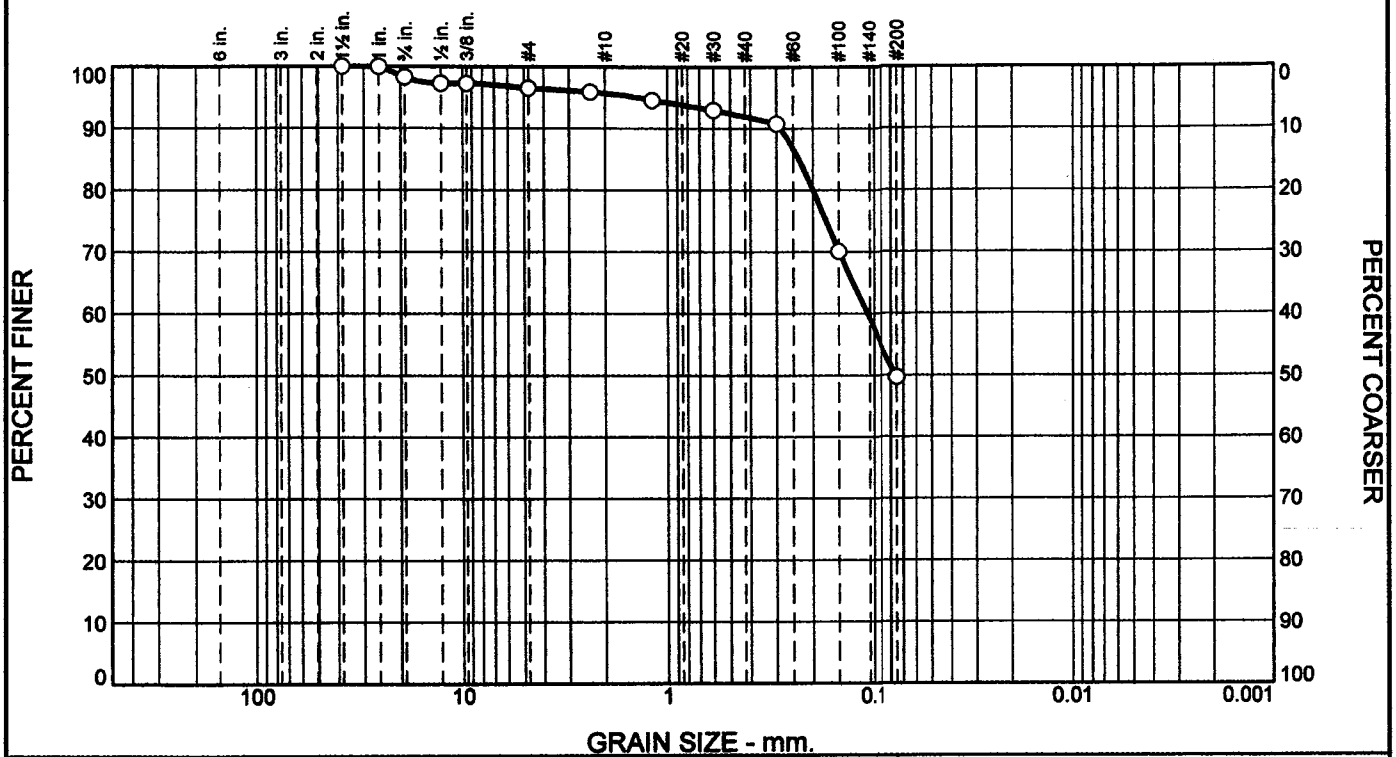
Source of Sample: Soil Borings **Date Sampled:** 6-6-14
Sample Number: 2

Knight Consulting Engineers, Inc.
Williston, Vermont

Client: KAS, Inc
Project: Waterbury Municipal Complex - Geotech
Project No: 14195 **Figure** 2 of 9

Results reflect soil gradation only and not other specification requirements.

Grain Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	2	1	1	4	42	50	

TEST RESULTS

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
1-1/2"	100		
1"	100		
3/4"	98		
1/2"	97		
3/8"	97		
#4	97		
#8	96		
#16	95		
#30	93		
#50	91		
#100	70		
#200	50		

* (no specification provided)

Material Description

SB-1 (4-6')
Silt & mf Sand, tr mf Gravel

Atterberg Limits (ASTM D 4318)

PL= LL= PI=

Classification

USCS (D 2487)= SM-ML AASHTO (M 145)=

Coefficients

D_{90}= 0.2870 D_{85}= 0.2345 D_{60}= 0.1085
D_{50}= 0.0759 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Remarks

Sampled and delivered by KCE on 6-6-14.
F.M.=0.64

Date Received: 6-6-14 **Date Tested:** 6-10-14
Tested By: K. Parrow
Checked By: P. Rixford
Title: Testing and Lab Coordinator

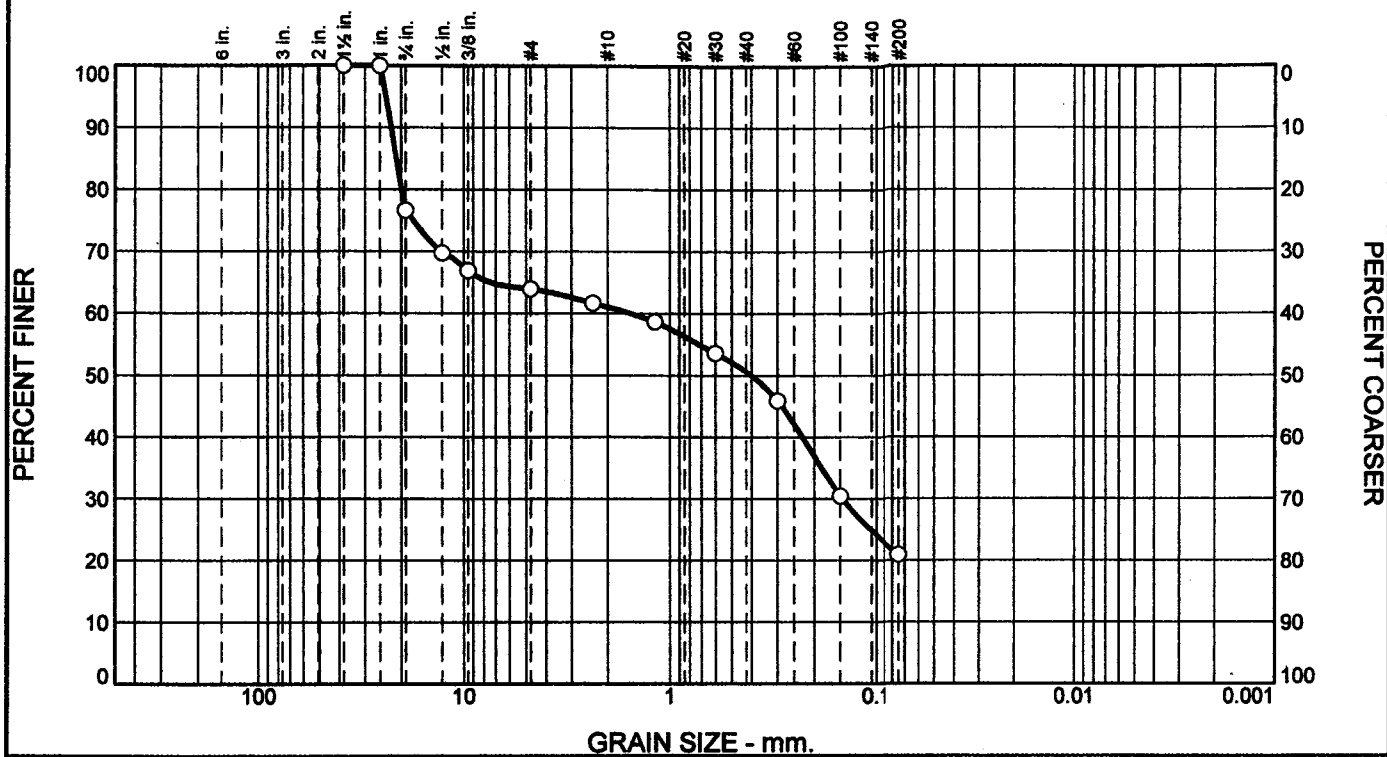
Source of Sample: Soil Borings **Date Sampled:** 6-6-14
Sample Number: 3

Results reflect soil gradation only and not other specification requirements.

Knight Consulting Engineers, Inc.
Williston, Vermont

Client: KAS, Inc
Project: Waterbury Municipal Complex - Geotech
Project No: 14195 **Figure** 3 of 9

Grain Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	23	13	3	10	30	21	

TEST RESULTS

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
1-1/2"	100		
1"	100		
3/4"	77		
1/2"	70		
3/8"	67		
#4	64		
#8	62		
#16	59		
#30	54		
#50	46		
#100	30		
#200	21		

* (no specification provided)

Material Description

SB-1 (6-8')
Mf Gravel & Cmf Sand, some Silt

Atterberg Limits (ASTM D 4318)

PL= LL= PI=

Classification

USCS (D 2487)= GM AASHTO (M 145)=

Coefficients

D_{90}= 22.3552 D_{85}= 21.1561 D_{60}= 1.5367
D_{50}= 0.4004 D_{30}= 0.1467 D_{15}=
D_{10}= C_u= C_c=

Remarks

Sampled and delivered by KCE on 6-6-14.
F.M.=3.42

Date Received: 6-6-14 **Date Tested:** 6-10-14
Tested By: K. Parrow
Checked By: P. Rixford
Title: Testing and Lab Coordinator

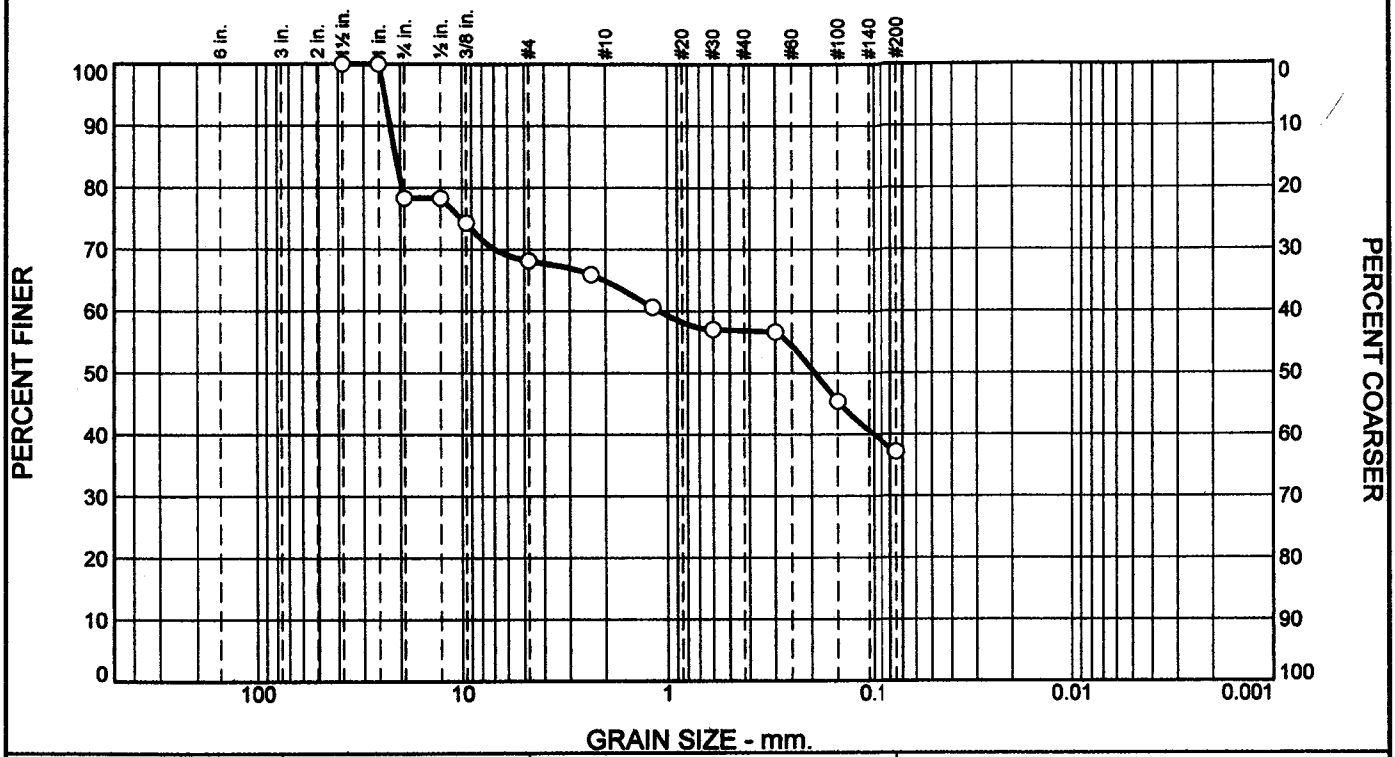
Source of Sample: Soil Borings **Date Sampled:** 6-6-14
Sample Number: 4

Knight Consulting Engineers, Inc.
Williston, Vermont

Client: KAS, Inc
Project: Waterbury Municipal Complex - Geotech
Project No: 14195 **Figure** 4 of 9

Results reflect soil gradation only and not other specification requirements.

Grain Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	22	10	3	8	20	37	

TEST RESULTS

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
1-1/2"	100		
1"	100		
3/4"	78		
1/2"	78		
3/8"	74		
#4	68		
#8	66		
#16	61		
#30	57		
#50	57		
#100	45		
#200	37		

* (no specification provided)

Material Description

SB-1 (8-10')
MF Gravel & cmf Sand & Silt

Atterberg Limits (ASTM D 4318)

PL= LL= PI=

Classification

USCS (D 2487)= GM-SM AASHTO (M 145)=

Coefficients

D_{90}= 22.2798 D_{85}= 21.0048 D_{60}= 1.0932
D_{50}= 0.1936 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Remarks

Sampled and delivered by KCE on 6-6-14.
F.M.=2.94

Date Received: 6-6-14 **Date Tested:** 6-10-14
Tested By: K. Parrow
Checked By: P. Rixford
Title: Testing and Lab Coordinator

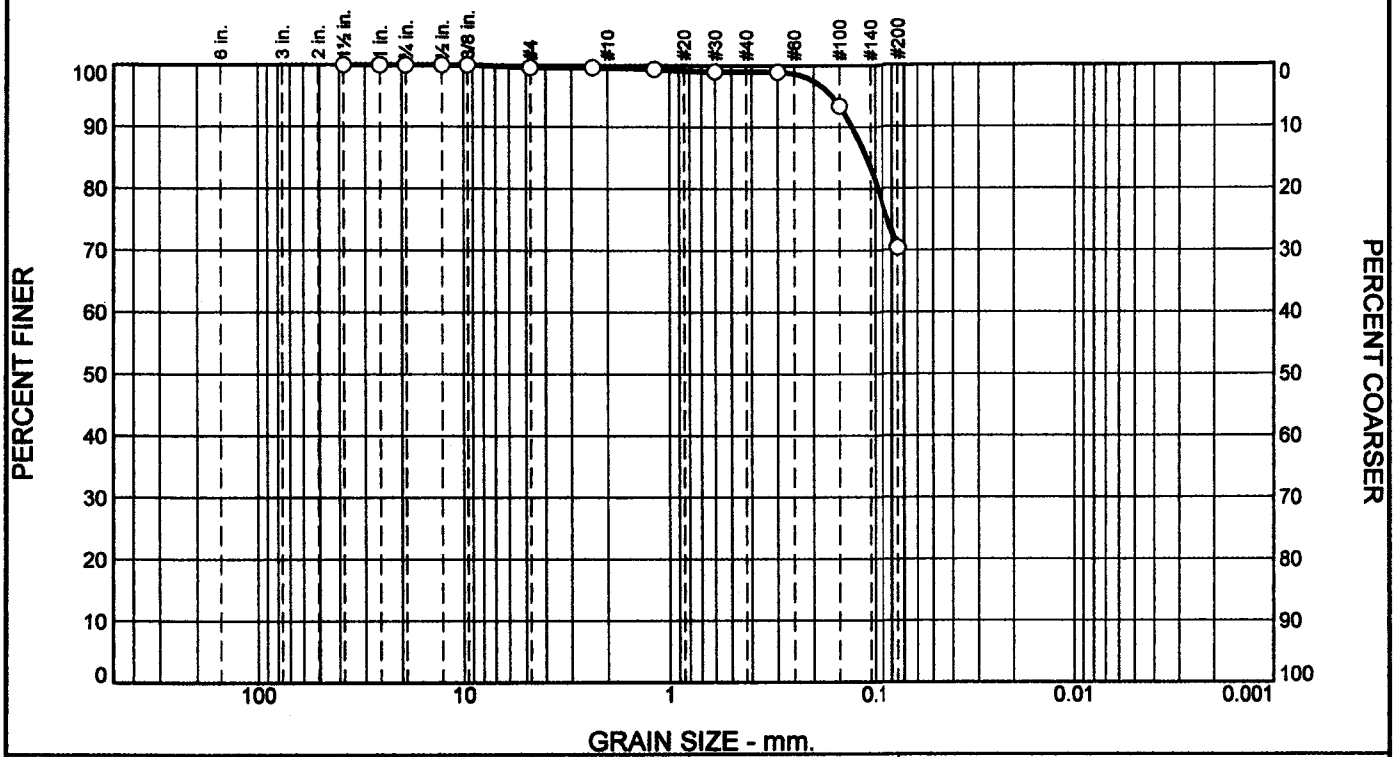
Source of Sample: Soil Borings **Date Sampled:** 6-6-14
Sample Number: 5

Results reflect soil gradation only and not other specification requirements.

Knight Consulting Engineers, Inc.
Williston, Vermont

Client: KAS, Inc
Project: Waterbury Municipal Complex - Geotech
Project No: 14195 **Figure** 5 of 9

Grain Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	0	0	0	1	29	70	

TEST RESULTS

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
1-1/2"	100		
1"	100		
3/4"	100		
1/2"	100		
3/8"	100		
#4	100		
#8	100		
#16	99		
#30	99		
#50	99		
#100	93		
#200	70		

* (no specification provided)

Material Description

SB-1 (25-27')

Silt, some vf Sand

Atterberg Limits (ASTM D 4318)

PL= LL= PI=

Classification

USCS (D 2487)= ML AASHTO (M 145)=

Coefficients

D_{90}= 0.1304 D_{85}= 0.1108 D_{60}=
D_{50}= D_{30}= D_{15}=
D_{10}= C_u= C_c=

Remarks

Sampled and delivered by KCE on 6-6-14.
As received moisture content: 25.9%
F.M.=0.10

Date Received: 6-6-14 **Date Tested:** 6-10-14

Tested By: K. Parrow

Checked By: P. Rixford

Title: Testing and Lab Coordinator

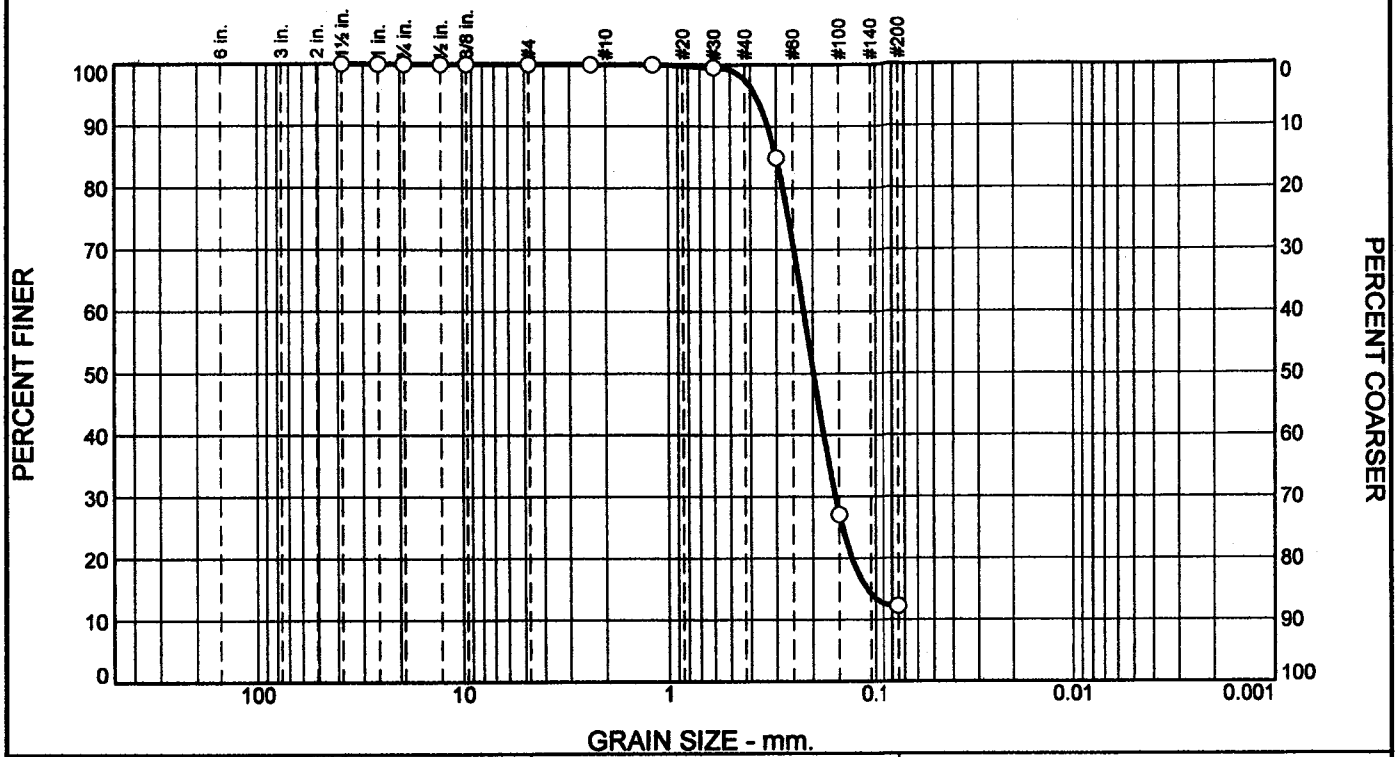
Source of Sample: Soil Borings **Date Sampled:** 6-6-14
Sample Number: 6

Knight Consulting Engineers, Inc.
Williston, Vermont

Client: KAS, Inc
Project: Waterbury Municipal Complex - Geotech
Project No: 14195 **Figure** 6 of 9

Results reflect soil gradation only and not other specification requirements.

Grain Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	0	0	0	2	86	12	

TEST RESULTS

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
1-1/2"	100		
1"	100		
3/4"	100		
1/2"	100		
3/8"	100		
#4	100		
#8	100		
#16	100		
#30	100		
#50	85		
#100	27		
#200	12		

* (no specification provided)

Material Description

SB-6 (4-6')

Fine Sand, little Silt

Atterberg Limits (ASTM D 4318)

PL= LL= PI=

Classification

USCS (D 2487)= SM AASHTO (M 145)=

Coefficients

D_{90}= 0.3293 D_{85}= 0.3004 D_{60}= 0.2213
D_{50}= 0.1989 D_{30}= 0.1568 D_{15}= 0.1104
D_{10}= C_u= C_c=

Remarks

Sampled and delivered by KCE on 6-6-14.
F.M.=0.88

Date Received: 6-6-14 **Date Tested:** 6-10-14
Tested By: K. Parrow
Checked By: P. Rixford
Title: Testing and Lab Coordinator

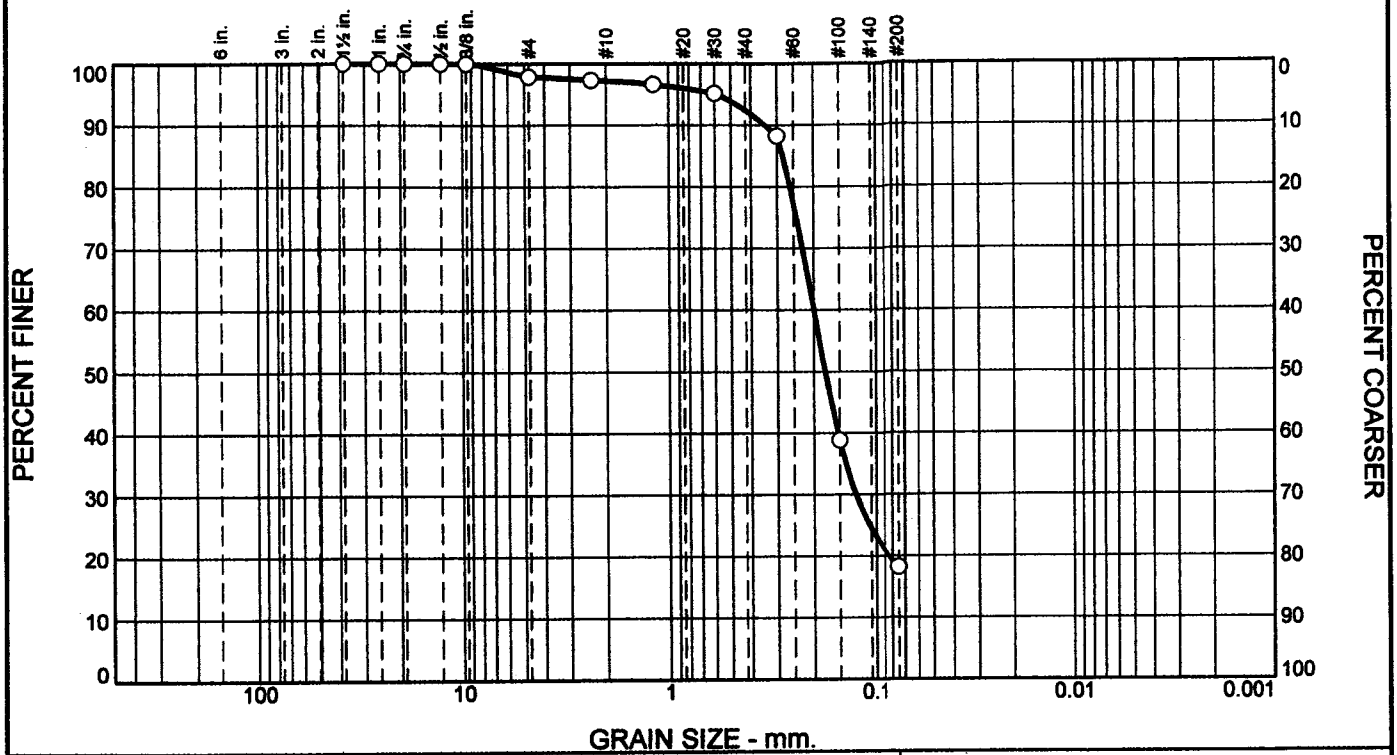
Source of Sample: Soil Borings **Date Sampled:** 6-6-14
Sample Number: 7

Knight Consulting Engineers, Inc.
Williston, Vermont

Client: KAS, Inc
Project: Waterbury Municipal Complex - Geotech
Project No: 14195 **Figure** 7 of 9

Results reflect soil gradation only and not other specification requirements.

Grain Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	0	2	1	5	74	18	

TEST RESULTS

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
1-1/2"	100		
1"	100		
3/4"	100		
1/2"	100		
3/8"	100		
#4	98		
#8	97		
#16	97		
#30	95		
#50	88		
#100	39		
#200	18		

* (no specification provided)

Material Description

SB-8 (0-2')
MF Sand, little Silt, tr F Gravel

Atterberg Limits (ASTM D 4318)

PL= LL= PI=

Classification

USCS (D 2487)= SM AASHTO (M 145)=

Coefficients

D_{90}= 0.3426 D_{85}= 0.2818 D_{60}= 0.2000
D_{50}= 0.1762 D_{30}= 0.1256 D_{15}=
D_{10}= C_u= C_c=

Remarks

Sampled and delivered by KCE on 6-6-14.
F.M.=0.86

Date Received: 6-6-14 **Date Tested:** 6-10-14
Tested By: K. Parrow
Checked By: P. Rixford
Title: Testing and Lab Coordinator

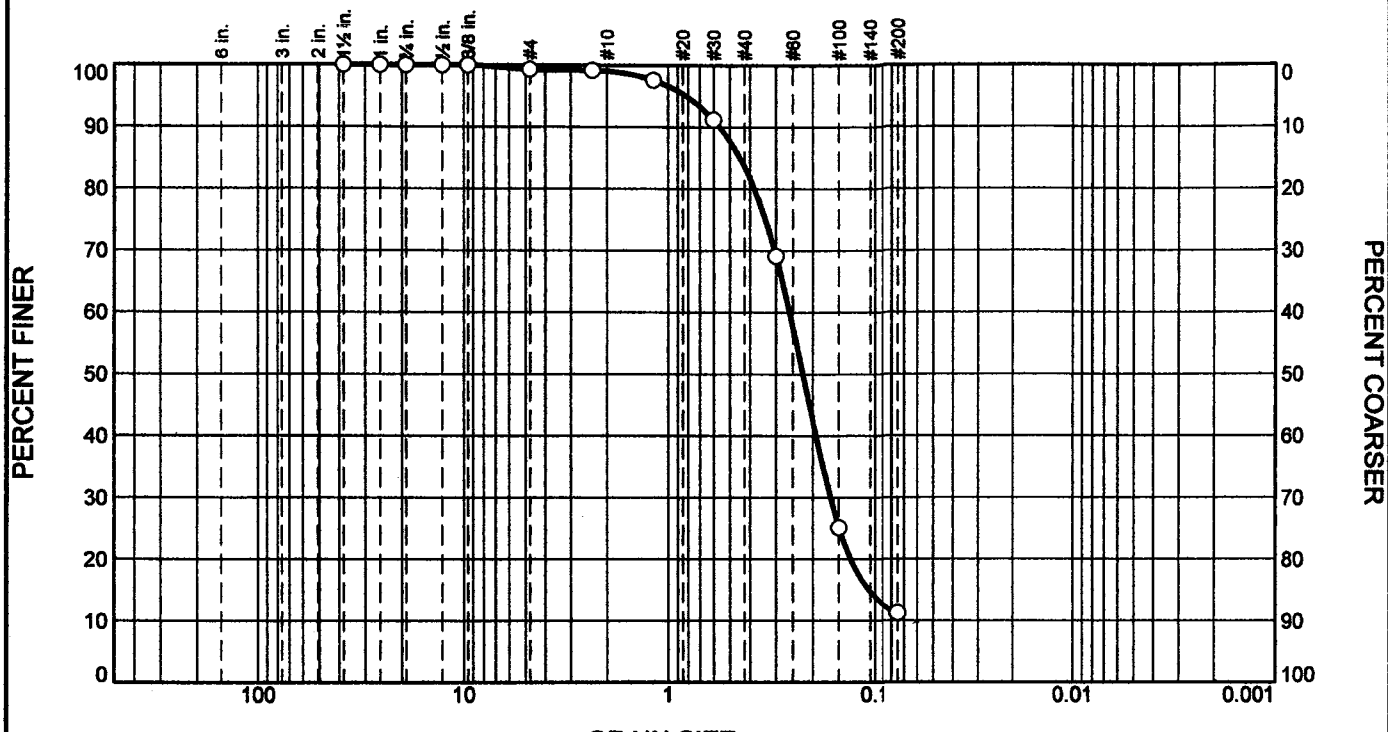
Source of Sample: Soil Borings **Date Sampled:** 6-6-14
Sample Number: 8

Knight Consulting Engineers, Inc.
Williston, Vermont

Client: KAS, Inc
Project: Waterbury Municipal Complex - Geotech
Project No: 14195 **Figure** 8 of 9

Results reflect soil gradation only and not other specification requirements.

Grain Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	0	1	0	15	73	11	

TEST RESULTS

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
1-1/2"	100		
1"	100		
3/4"	100		
1/2"	100		
3/8"	100		
#4	99		
#8	99		
#16	98		
#30	91		
#50	69		
#100	25		
#200	11		

* (no specification provided)

Material Description

SB-8 (2-4')

MF Sand, little Silt

Atterberg Limits (ASTM D 4318)

PL= LL= PI=

Classification

USCS (D 2487)= SP-SM AASHTO (M 145)=

Coefficients

D_{90}= 0.5590 D_{85}= 0.4453 D_{60}= 0.2586
D_{50}= 0.2234 D_{30}= 0.1647 D_{15}= 0.1080
D_{10}= .06± C_u= 4.3 C_c= 1.75

Remarks

Sampled and delivered by KCE on 6-6-14.
F.M.=1.18

Date Received: 6-6-14 **Date Tested:** 6-10-14
Tested By: K. Parrow
Checked By: P. Rixford
Title: Testing and Lab Coordinator

Source of Sample: Soil Borings **Date Sampled:** 6-6-14
Sample Number: 9

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Williston, Vermont

Client: KAS, Inc
Project: Waterbury Municipal Complex - Geotech
Project No: 14195 **Figure** 9 of 9

Results reflect soil gradation only and not other specification requirements.