KVPartners
CONSULTING ENGINEERS

MEMORANDUM

To: **C. Terenzini, Moultonborough**
S. Kinmond, Moultonborough

From: **R. Korber, KVPartners**

Date: **November 12, 2010**

Re: **Public Safety Building-Parking Lot Evaluation**

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1. Background:

KVPartners conducted an evaluation on the distressed pavement in the parking lot and access drives at the Moultonborough Public Safety Building. In summary, the evaluation included:

1. Obtain and review available data and information.

2. Perform field reconnaissance of the project area to assess existing conditions.

3. Assist the Town in retaining qualified firms to complete subsurface investigations and field survey and provide field observation by a qualified engineer for the duration of drilling operations for subsurface investigations.

4. Based on available information, complete a condition assessment of the parking lot and attempt to ascertain the cause of distress in the pavement and base structure. Make recommendations for improvements to the parking lot including treatment strategies for rehabilitation or replacement.

5. Prepare a conceptual level estimate of probable construction cost for the preferred treatment strategy.

6. Document findings and assessments and coordinate with Town staff.

2. Findings:

KVPartners completed site visits to the parking lot to observe existing conditions. In summary, pavement failures include:

1. Rutting in front of all vehicle bays.

2. Frost heaves in the access drives on the east and west sides of the building. Town staff indicates that fire apparatus cannot access the rear of the building in the winter months due to the size of the frost heaves.

3. Frost heaves along the edge of building. Town staff indicates that access doors cannot be opened in the winter months due to the frost heaves.

4. Longitudinal and transverse cracking of pavement in the vehicle parking area.

5. Subsistence of pavement structure around catch basins limiting the functionality of the catch basins to collect and transport stormwater runoff from the pavement.

KVPartners teamed with Ward Geotechnical Consulting PPLC (geotechnical engineering), New Hampshire Boring Company (drilling contractor) and Geotechnical Services Inc. (analytical services) for the subsurface investigations. The subsurface investigations included the completion of 15 test borings, sieve analyses of 12 samples of base and subgrade soils below the pavement, and installation of one groundwater observation well. The test borings were drilled to a maximum depth of 11 feet. Groundwater levels were measured in the observation well. Refer to Appendix A (boring location plan, boring logs and particle size distribution reports) for results of the subsurface investigation program. The results of the subsurface investigations are summarized as follows:

1. The soil underlying the pavement (base material) is predominantly sand with gravel and is only about 6 to 12 inches in thickness at most of the boring locations.

2. The base material is typically underlain by silty soils that are frost susceptible.

3. The pavement varies in thickness from approximately 1.5 to 6 inches. The pavement thickness is predominately 2 to 3 inches.

4. The rutting exhibited in the pavement surface is probably due to the thin pavement and base materials.

5. The frost heaving in the pavement is due to the formation of ice lenses in the silty, frost susceptible subgrade soils that underlie the base materials. The frost heaving is exacerbated by the thin pavement and base soils, which expose more of the frost susceptible subgrade to freezing temperatures. In some areas, the frost action may be causing boulders to rise to the surface and disrupt the pavement.

6. Pavement cracking was observed in the areas of pipe trenches, probably caused by inadequate compaction of trench backfill.

7. Some organic soils were detected in borings B1 and B2. The organic soils were probably trapped beneath the fill placed for the parking lot. Note that the trapped organics could cause long-term settlements but, as the pavement in this area is not especially poor (compared with other areas of the parking lot), it would probably not be cost-effective to excavate and remove the organics.

8. Groundwater was observed at 2.8 feet below existing grade. It is expected that high groundwater in this area is contributing to the pavement distress.

3. Recommendations:

Based on the available information, it is recommended that the parking lot and access drives be reconstructed to return these areas to full functionality. Full-depth reconstruction should include:

1. Excavate and remove existing pavement and base materials.
2. Excavate and remove existing unsuitable materials detected during excavating operations.
3. Install underdrain along the edge of the parking lot adjacent to the boulder retaining wall on the west side of the building. The underdrain should outlet to nearby catch basins if there is sufficient grade and/or the wetland west of the building.
4. Install soil reinforcement fabric at subgrade in areas susceptible to heavier vehicle loads such as in front of the vehicle bays.
5. Place and compact 12 inches of bank run gravel.
6. Place and compact 6 inches of crushed gravel.
7. Place and compact 3 inches of binder course pavement.
8. Place and compact 1.5 inches of wearing course pavement. Final pavement grade shall match existing.
9. Install bituminous curb around the perimeter of the parking lot.
10. Adjust catch basin castings to the new pavement grade.

Table 1 presents estimates of probable project costs for Option #1. The estimates include major items of construction, are based on recent bid pricing for similar types of work, are conceptual level estimates and are subject to final design development.

Table 1
Option #1: Full-Depth Reconstruction

Construction:	$290,000
Engineering:	$45,000
Total Cost:	$335,000
Contingency (~10%):	$35,000
Recommended Budget:	**$370,000**

KVPartners evaluated a lower cost alternative to the full-depth reconstruction of the parking lot and access drives as noted above. Refer to Figure 1 for select treatment strategies at various locations in the parking lot and access drives. This alternative includes the following work items:

1. Reconstruct Section #2 as recommended above.
2. Reclaim existing pavement in-place to a minimum 8-inch depth in Sections #1, #3 and #4. Remove reclaim material.
3. Excavate and remove existing unsuitable materials detected during excavating operations.
4. Install soil reinforcement fabric at subgrade in areas susceptible to heavier vehicle loads such as in front of the vehicle bays.
5. Place and compact reclaim material.
6. Place and compact 3 inches of binder course pavement.
7. Place and compact 1.5 inches of wearing course pavement. Final pavement grade shall match existing.
8. Install bituminous curb around the perimeter of the parking lot.
9. Adjust catch basin castings to the new pavement grade.
10. Consider installing a 3 foot concrete apron at the entrance to the building vehicle bay and access doors. The area below the apron should be excavated as required to prevent heaving of apron.

Please note that this alternative will not provide the same useful life as full-depth reconstruction and should only be considered if budgetary constraints do not allow you to proceed with Option #1. Table 2 presents estimates of probable project costs for Option #2. The estimates include major items of construction, are based on recent bid pricing for similar types of work, are conceptual level estimates and are subject to final design development.

Table 2
Option #2: Full-Depth Reconstruction/Reclaim

Construction:	$195,000
Engineering:	$45,000
Total Cost:	$240,000
Contingency (~10%):	$25,000
Recommended Budget:	**$265,000**

FIGURE 1
PARKING LOT SECTIONS

PUBLIC SAFETY BUILDING
MOULTONBOROUGH NH

SECTION #1

SECTION #2

SECTION #3

SECTION #4

PROPOSED LIFE-SAFETY BUILDING
FL. EL. 599.83

FL. EL. 599.5
APPARATUS FLOOR

PARKING 27 CARS
9' OC @ 15' FROM CURB

10 CARS OVERFLOW 9' OC. on inside rdwy.

PROPOSED SEPTIC SYSTEM (BY OTHERS)

TOWN HALL

RAMP/STEP WALK TO TOWN HALL (4)-10'RISERS @ 12" & 3-10' LANDINGS w/ 1" OFFSET

PARTIAL STONE WALL REMOVAL

RIP-RAP SLOPE (SEE DETAIL)

PAINT LINES CROSSWALK

BROOM FINISH CONC. APRON

3' WIDE CONC. APRON

FL. EL. 599.5 CONT. FLOOR

EROSION CONTROL & WORK LIMIT LINE

POST LIGHT

MECH. PAD 6'x6'

PAINT LINES 4" x 15' (TYP.)

CONC. APRON (BROOM FIN.)

BOLLARD LIGHT

FLAGPOLE LIGHT INFO. 2 PER POLE

SEE L107 FOR DETAIL

SIGN

FILL BEHIND WALL

WALL

MEMORIAL PARK

2' CURB OPENING

BLDG. FACE

U. POLE

WEST ROAD grade

ROAD EDGE

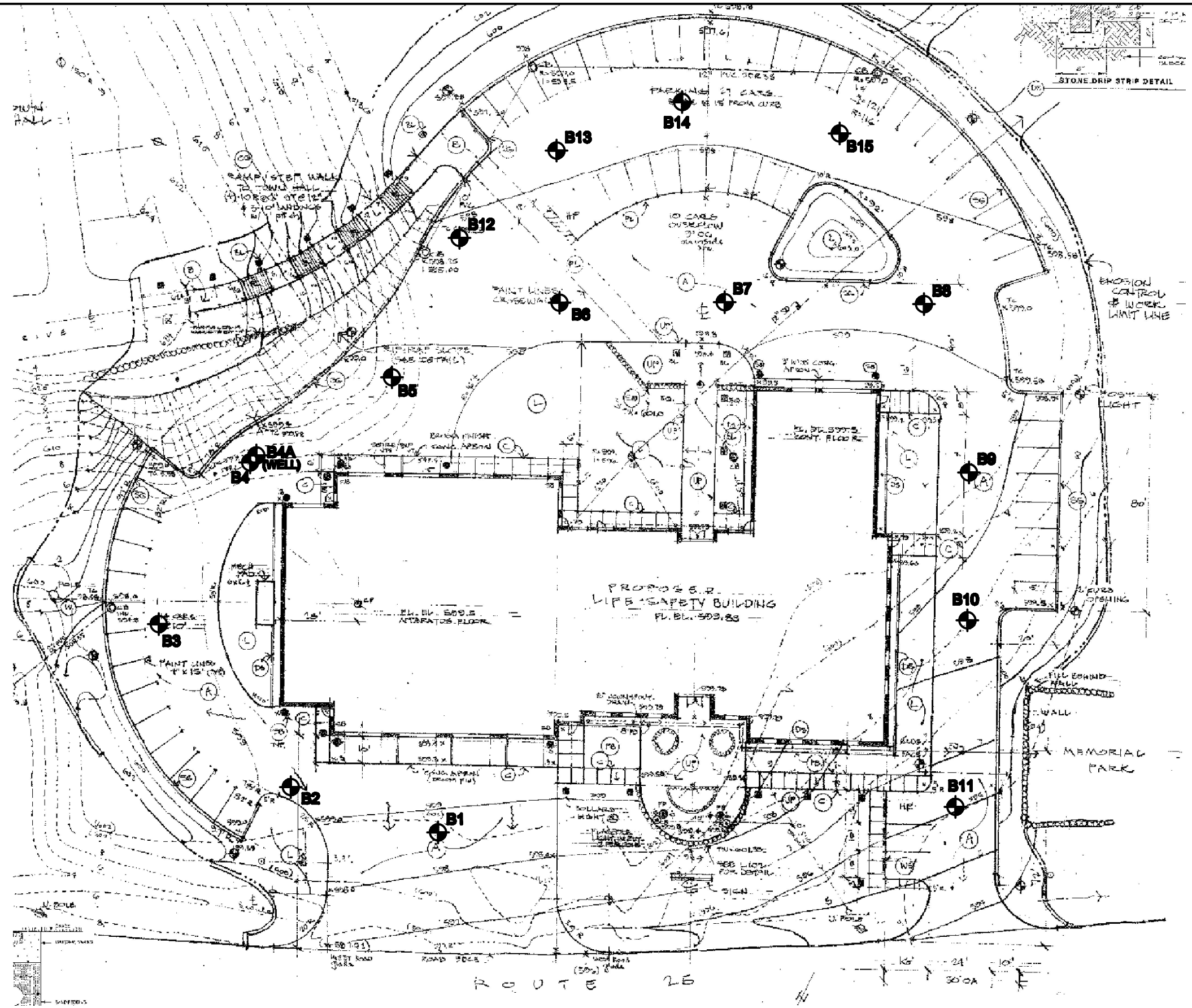
ROUTE 25

16' 24' 10'
50'OA

KVPartners

APPENDIX A

Boring Location Plan
Boring Logs
Particle Size Distribution Reports



LEGEND

B1 **Boring Location**

0 20′ 40′ 80′

Approx Scale: 1′ = 40′

Notes:

1. Site Development Plan, prepared by HKT Architects, dated 1/15/2002, was provided by the Town of Moultonborough for our use in preparing this Boring Location Plan. The Site Development Plan was scanned in PDF format and imported into the AutoCAD drawing file. The resulting scale is approximate.
2. The borings were drilled by New Hampshire Boring, Inc. and observed by Ward Geotechnical Consulting, PLLC on September 28 through 30, 2010.
3. Boring locations are based on approximate measurements from corners of the existing building.

KV Partners, LLC Gilford, New Hampshire	PUBLIC SAFETY FACILITY PARKING LOT MOULTONBOROUGH, NEW HAMPSHIRE	BORING LOCATION PLAN
Ward Geotechnical Consulting, PLLC	WGC Project 10140	October 2010

Ward Geotechnical Consulting, PLLC

Project:	Public Safety Facility Parking Lot		Boring Log
Location:	Moultonborough, New Hampshire		**B1**
Client:	KV Partners, PLLC		
Project No.:	10140		
Contractor:	New Hampshire Boring, Inc.	Groundwater Depth: Not Measured	Date:
Logged By:	Craig Ward		Page 1 of 1
Drilling Dates:	9/29/2010	GS Elevation:	Boring Location: see Boring Location Plan
Drill Rig:	Mobile B-59 Truck	Datum:	

DEPTH FT.	SAMPLE TYPE & NO.	BLOWS per 6 IN.	PEN. IN.	REC. IN.	REMARKS	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS	
0					Hollow-stem augers		4.5" Asphalt Pavement	
1	S1	48-62 19-20	24	18	3" split-spoon used for S1.		S1: upper 7": **Sand with Gravel (SW)** - fine to coarse sand, 40%-50% subangular gravel to 2", brown. lower 11": **Silty Sand (SM)** - fine to medium sand, 15%-25% nonplastic fines, occasional subrounded gravel to 1/2", occasional roots/twigs, ~1" black organic soil at mid-spoon, olive-brown.	**Fill**
2								**~2.5'**
3	S2	25-20 50/3"	15	12			S2: **Sand with Silt (SP-SM)** - fine to medium sand, 5%-15% nonplastic fines, occasional subrounded gravel to 1/2", light brown-olive.	**Sand with Silt**
4								**~4'**
5							S3: **Silty Sand with Gravel (SM)** - fine to medium (some coarse) sand, 10-20% nonplastic fines, 15%-25% subangular gravel to 3/4" (some weathered), heterogeneous structure, light brown-olive.	**Glacial Till**
6	S3	20-39 53-55	24	18				
7							Bottom of Boring at 7'	
8								
9								

Notes:

Abbreviations:

PEN - Penetration length of sampler or core barrel
REC - Recovery length of sample
S - Split Spoon Sample
C - Rock Core Sample
U - Undisturbed Tube Sample

Ward Geotechnical Consulting, PLLC

Project:	Public Safety Facility Parking Lot	Boring Log
Location:	Moultonborough, New Hampshire	**B2**
Client:	KV Partners, PLLC	
Project No.:	10140	

Contractor:	New Hampshire Boring, Inc.	Groundwater Depth: Not Measured	Date:	Page 1 of 1
Logged By:	Craig Ward			
Drilling Dates:	9/29/2010	GS Elevation:	Boring Location: see Boring Location Plan	
Drill Rig:	Mobile B-59 Truck	Datum:		

DEPTH FT.	SAMPLE TYPE & NO.	BLOWS per 6 IN.	PEN. IN.	REC. IN.	REMARKS	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS	
0					Hollow-stem augers		5" Asphalt Pavement	
1	S1	13-16 34-19	24	15	3" split-spoon used for S1.		S1: **Sand with Silt & Gravel (SP-SM)** - fine to medium (some coarse) sand, 5%-15% nonplastic fines, 20%-30% subangular gravel, brown and light brown. Most of gravel in middle 6" of spoon.	**Fill**
2								
3	S2	9-3 5-6	24	0			S2: **No Recovery** - Auger cuttings from this depth interval consist of dark brown silty sand with wood fibers.	
4								**~4.5**
5								
6	S3	12-15 17-25	24	22			S3: **Silty Sand (SM)** - fine and fine to medium sand, 20%-30% nonplastic fines, occasional subangular gravel to 3/8", stratified structure, wet, light brown and gray with rust staining. Approx 3" band in middle of spoon contains 40%-50% medium plastic fines.	**Silty Sand**
7							Bottom of Boring at 7'	
8								
9								

Notes:

Abbreviations:

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REC - Recovery length of sample
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Ward Geotechnical Consulting, PLLC

Project:	Public Safety Facility Parking Lot	Boring Log
Location:	Moultonborough, New Hampshire	**B3**
Client:	KV Partners, PLLC	
Project No.:	10140	

Contractor:	New Hampshire Boring, Inc.	Groundwater Depth: Not Measured	Date:	Page 1 of 1
Logged By:	Craig Ward			
Drilling Dates:	9/29/2010	GS Elevation:	Boring Location: see Boring Location Plan	
Drill Rig:	Mobile B-59 Truck	Datum:		

DEPTH FT.	SAMPLE TYPE & NO.	BLOWS per 6 IN.	PEN. IN.	REC. IN.	REMARKS	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS	
0.3	S1	23-20 17-20	24	19	Hollow-stem augers 3" split-spoon used for S1.		3.25" Asphalt Pavement S1: upper 6": **Sand with Gravel (SW)** - fine to coarse sand, 25%-35% subangular and subrounded gravel to 1", brown. middle 10": **Silty Sand with Gravel (SM)** - fine to medium (some coarse) sand, 10%-20% nonplastic fines, 15%-25% subangular gravel to 3/4", occasional roots and twigs, olive-brown.	**Fill** **~2'**
2.3	S2	19-21 22-37	24	18			lower 3": **Sand with Silt (SP-SM)** - fine to medium sand, 5%-15% nonplastic fines, light brown. S2: **Sand (SP) and Silty Sand (SM)** - fine, fine to medium, and fine to coarse sand, stratified structure, most with <5% fines, upper 1" with 15%-25% nonplastic fines, light brown. S3: upper 7": **Silty Sand (SM)** - fine to medium sand, 10%-20% nonplastic fines, vaguely stratified, occasional roots, light brown. Possible fill.	**Sand and Silty Sand** **~5.8'**
4.3	S3	22-37 65-58	24	19			lower 12": **Silty Sand with Gravel (SM)** - fine to medium (some coarse) sand, 15%-25% nonplstic fines, 20%-30% subangular gravel to 1" (some weathered), mottled olive-brown and brown.	**Glacial Till**
7							Bottom of Boring at 7'	

Notes:

Abbreviations:

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REC - Recovery length of sample
S - Split Spoon Sample
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U - Undisturbed Tube Sample

Ward Geotechnical Consulting, PLLC

Project:	Public Safety Facility Parking Lot	Boring Log
Location:	Moultonborough, New Hampshire	**B4**
Client:	KV Partners, PLLC	
Project No.:	10140	

Contractor:	New Hampshire Boring, Inc.	Groundwater Depth: Not Measured	Date:	Page 1 of 1
Logged By:	Craig Ward			
Drilling Dates:	9/28/2010	GS Elevation:	Boring Location: see Boring Location Plan	
Drill Rig:	Mobile B-59 Truck	Datum:		

DEPTH FT.	SAMPLE TYPE & NO.	BLOWS per 6 IN.	PEN. IN.	REC. IN.	REMARKS	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS	
0.5					4" Casing		2" Asphalt Pavement	Fill
1	S1	22-100/4"	10	8			S1: upper 6": **Sand with Gravel (SW)** - fine to coarse sand, 20%-30% subangular gravel to 1", brown.	~1'
1.3							lower 2": **Silty Sand (SM)** - fine to medium sand, 20%-30% nonplastic fines, gray.	Silty Sand (Till?)
1.5	S2	50/6"	6	0	SPT refusal on boulder. Drilled ahead to 3'. Drove casing to refusal at 2.5'.		S2: **No Recovery** - probably pushed boulder with spoon.	
2 2.0								
3					Hole collapsed and couldn't sample. Drive shoe on casing crimped. Tried diamond spin casing - wore out diamond shoe. Abandoned hole. Moved ~3.5' east to drill B4A.		Bottom of Broing at 3'	
4								
5								
6								
7								
8								
9								

Notes:

Abbreviations:

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REC - Recovery length of sample
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C - Rock Core Sample
U - Undisturbed Tube Sample

Ward Geotechnical Consulting, PLLC

Project:	Public Safety Facility Parking Lot	Boring Log
Location:	Moultonborough, New Hampshire	**B4A**
Client:	KV Partners, PLLC	
Project No.:	10140	

Contractor:	New Hampshire Boring, Inc.	Groundwater Depth: 2.8 feet below ground surface	Date: 10/30/10
Logged By:	Craig Ward		Page 1 of 1
Drilling Dates:	9/28/2010	GS Elevation:	Boring Location: see Boring Location Plan
Drill Rig:	Mobile B-59 Truck	Datum:	

DEPTH FT.	SAMPLE TYPE & NO.	BLOWS per 6 IN.	PEN. IN.	REC. IN.	REMARKS	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS	
0					4" Casing		1.5" Asphalt Pavement	Fill ~1'
1								
1.3								
2	S1	17-26 27-26	24	17			S1: **Silty Sand with Gravel (SM)** - fine to medium (some coarse) sand, 15%-25% nonplastic fines, 20%-30% subangular gravel to 1" (some weathered), light brown.	
3					Casing refusal on boulder at 3.5'. Drilled through.			
3.3								
4	S2	47-46 57-50/4"	22	20			S2: **Silty Sand with Gravel (SM)** - similar to S1.	Glacial Till
5								
5.1	S3	49-55/4"	10	9			S3: **Silty Sand with Gravel (SM)** - fine to medium (some coarse) sand, 15%-25% nonplastic fines, 25%-35% subangular gravel to 1" (some weathered), light brown.	
6					Casing refusal on boulder at 6.3'. Drilled through.			
6.0								
10								
10.0	S4	71/6"	6	5			S4: **Silty Sand with Gravel (SM)** - similar to S1.	
10.5								
11							Bottom of Boring at 11'	
12							Installed well to 10.4' below ground surface: - 2" PVC: 5' screen & 5' riser - Sand filter from 2.75' to 11'. - Bentonite seal from 0.8' to 2.75'. - Road box at surface.	

Notes:

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C - Rock Core Sample
U - Undisturbed Tube Sample

Ward Geotechnical
Consulting, PLLC

Project:	Public Safety Facility Parking Lot	Boring Log
Location:	Moultonborough, New Hampshire	**B5**
Client:	KV Partners, PLLC	
Project No.:	10140	

Contractor:	New Hampshire Boring, Inc.	Groundwater Depth: Not Measured	Date:	Page 1 of 1
Logged By:	Craig Ward			
Drilling Dates:	9/28/2010	GS Elevation:	Boring Location: see Boring Location Plan	
Drill Rig:	Mobile B-59 Truck	Datum:		

DEPTH FT.	SAMPLE TYPE & NO.	BLOWS per 6 IN.	PEN. IN.	REC. IN.	REMARKS	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS	
0.4					Hollow-stem augers		3" Asphalt Pavement	Fill
1	S1	16-13 11-12	24	20	3" split-spoon used for S1.		S1: upper 6": **Sand with Gravel (SW)** - fine to coarse sand, 40%-50% subangular gravel to 1.5", light brown. lower 14": **Silty Sand (SM)** - fine to medium (some coarse) sand, 20%-30% nonplastic fines, occasional fine gravel, light brown.	~1' Silty Sand
2								~2.4'
2.4								
3	S2	19-51 60	18	16			S2: **Silty Sand with Gravel (SM)** - fine to medium (some coarse) sand, 15%-25% nonplastic fines, 20%-30% subangular gravel to 3/4", light brown.	Glacial Till
3.9								
4								
5	S3	60/6"	6	6			S3: **Silty Sand with Gravel (SM)** - similar to S2.	
5.5							Bottom of Boring at 5.5'	
6								
7								
8								
9								

Notes:

Abbreviations:

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REC - Recovery length of sample
S - Split Spoon Sample
C - Rock Core Sample
U - Undisturbed Tube Sample

Ward Geotechnical Consulting, PLLC

Project:	Public Safety Facility Parking Lot	Boring Log
Location:	Moultonborough, New Hampshire	**B6**
Client:	KV Partners, PLLC	
Project No.:	10140	

Contractor:	New Hampshire Boring, Inc.	Groundwater Depth: Not Measured	Date:	Page 1 of 1
Logged By:	Craig Ward			
Drilling Dates:	9/28/2010	GS Elevation:	Boring Location: see Boring Location Plan	
Drill Rig:	Mobile B-59 Truck	Datum:		

DEPTH FT.	SAMPLE TYPE & NO.	BLOWS per 6 IN.	PEN. IN.	REC. IN.	REMARKS	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS	
0.3					Hollow-stem augers		2" Asphalt Pavement	
1	S1	34-27 33-43	24	17	3" split-spoon used for S1.		S1: upper 10": **Sand with Gravel (SW)** - fine to coarse sand, 30%-40% subangular gravel to 1.5", brown.	**Fill** **~1.2'**
2							lower 7": **Silty Sand (SM)** - fine to medium (some coarse) sand, 10%-20% nonplastic fines, vaguely stratified with fine sand lenses, occasional subangular gravel to 1/2", light brown.	**Silty Sand** **~2.3'**
2.3	S2	38-60 50/4"	16	14			S2" **Silty Sand with Gravel (SM)** - fine to medium (some coarse) sand, 10%-20% nonplastic fines, 15%-25% subangular gravel to 3/4", heterogeneous structure, light brown.	**Glacial Till**
3.6								
4								
5								
6	S3	22-28 40-50/4"	22	19			S3: **Silty Sand with Gravel (SM)** - fine to medium (some coarse) sand, 5%-20% nonplastic fines, 15%-30% subangular and subrounded gravel to 3/4", heterogeneous structure, light brown.	
6.8							Bottom of Boring at 6.8'	
7								
8								
9								

Notes:

Abbreviations:

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REC - Recovery length of sample
S - Split Spoon Sample
C - Rock Core Sample
U - Undisturbed Tube Sample

Ward Geotechnical Consulting, PLLC

Project:	Public Safety Facility Parking Lot	Boring Log	
Location:	Moultonborough, New Hampshire	**B7**	
Client:	KV Partners, PLLC		
Project No.:	10140		

Contractor:	New Hampshire Boring, Inc.	Groundwater Depth: Not Measured	Date:
Logged By:	Craig Ward		Page 1 of 1
Drilling Dates:	9/28/2010	GS Elevation:	Boring Location: see Boring Location Plan
Drill Rig:	Mobile B-59 Truck	Datum:	

DEPTH FT.	SAMPLE TYPE & NO.	BLOWS per 6 IN.	PEN. IN.	REC. IN.	REMARKS	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS	
0.3					Hollow-stem augers		3" Asphalt Pavement	
1	S1	26-32 100/3"	15	12	3" split-spoon used for S1.		S1: **Sand with Gravel (SW)** - fine to coarse sand, 30%-40% subangular gravel to 1", brown.	
1.5								
2	S2	11-20 16-16	24	10			S2: **Sand (SW)** - fine to coarse sand, brown.	**Fill (Possible Utility Trench)**
3								
4								
5								
6	S3	11-3 4-7	24	14			S3: **Sand (SW)** - fine to coarse sand, brown. Piece of styrofoam in sample.	
7							S1: upper 6": **Sand (SW)** - fine to coarse sand, brown.	**~7.5'**
8	S4	11-18 54-66	24	18			middle 12": **Silty Sand (SM)** - fine sand, 15%-30% nonplastic fines, brown. lower 6": **Sand (SP)** - fine to medium sand, brown.	**Sand & Silty Sand**
9							Bottom of Boring at 9'	

Notes:

Abbreviations:

PEN - Penetration length of sampler or core barrel
REC - Recovery length of sample
S - Split Spoon Sample
C - Rock Core Sample
U - Undisturbed Tube Sample

Ward Geotechnical Consulting, PLLC

Project:	Public Safety Facility Parking Lot	Boring Log
Location:	Moultonborough, New Hampshire	**B8**
Client:	KV Partners, PLLC	
Project No.:	10140	

Contractor:	New Hampshire Boring, Inc.	Groundwater Depth: Not Measured	Date:	Page 1 of 1
Logged By:	Craig Ward			
Drilling Dates:	9/29/2010	GS Elevation:	Boring Location: see Boring Location Plan	
Drill Rig:	Mobile B-59 Truck	Datum:		

DEPTH FT.	SAMPLE TYPE & NO.	BLOWS per 6 IN.	PEN. IN.	REC. IN.	REMARKS	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS	
0.3					Hollow-stem augers		3" Asphalt Pavement	Fill
1	S1	23-39 23-28	24	18	3" split-spoon used for S1.		upper 8": **Sand with Gravel (SW)** - fine to coarse sand, 35%-45% subangular gravel to 1.5", brown.	~1'
2							lower 10": **Silty Sand (SM)** - fine (some medium) sand, 40%-50% nonplastic fines, occasional rounded gravel to 3/4", vaguely stratified, light tan.	Sand & Silty Sand
2.3								
3	S2	19-26 34-44	24	18			S2: **Sand (SP)** - fine to medium (some coarse) sand, 5%-10% nonplastic fines, occasional subrounded gravel to 3/4", tan.	
4								
4.3								
5	S3	36-58 50/3"	15	14			S3: **Silty Sand (SM)** - fine (some medium) sand, 15%-25% nonplastic fines, occasional subangular gravel to 1/2", vaguely stratified, tan-light brown. 3" weathered granitic cobble in tip of spoon.	
6								
6.3							Bottom of Boring at 6.3'	
7								
8								
9								

Notes:

Abbreviations:

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REC - Recovery length of sample
S - Split Spoon Sample
C - Rock Core Sample
U - Undisturbed Tube Sample

Ward Geotechnical Consulting, PLLC

Project:	Public Safety Facility Parking Lot	Boring Log
Location:	Moultonborough, New Hampshire	**B9**
Client:	KV Partners, PLLC	
Project No.:	10140	

Contractor:	New Hampshire Boring, Inc.	Groundwater Depth: Not Measured	Date:	Page 1 of 1
Logged By:	Craig Ward			
Drilling Dates:	9/30/2010	GS Elevation:	Boring Location: see Boring Location Plan	
Drill Rig:	Mobile B-59 Truck	Datum:		

DEPTH FT.	SAMPLE TYPE & NO.	BLOWS per 6 IN.	PEN. IN.	REC. IN.	REMARKS	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS	
0.3					Hollow-stem augers		3" Asphalt Pavement	Fill
1	S1	44-82 44-51	24	20	3" split-spoon used for S1.		S1: upper 10": **Sand with Gravel (SW)** - fine to coarse sand, 35%-45% subangular gravel to1", brown.	~1.1'
2							lower 10": **Sand with Silt (SP-SM)** - fine to medium sand, 5%-15% nonplastic fines, occasional subangular gravel to 1", vaguely stratified, light brown-tan.	Sand with Silt
2.3								
3	S2	28-40 42-38	24	17			S2: **Sand with Silt (SP-SM)** - fine & fine to medium sand, 5%-15% nonplastic fines, occasional subangular gravel to 3/4", vaguely stratified, light tan.	
4								
4.3								
5								
6	S3	15-21 28-32	24	18			S3: **Sand with Silt (SP-SM)** - similar to S2.	
7							Bottom of Boring at 7'	
8								
9								

Notes:

Abbreviations:

PEN - Penetration length of sampler or core barrel
REC - Recovery length of sample
S - Split Spoon Sample
C - Rock Core Sample
U - Undisturbed Tube Sample

Ward Geotechnical Consulting, PLLC

Project:	Public Safety Facility Parking Lot	Boring Log
Location:	Moultonborough, New Hampshire	**B10**
Client:	KV Partners, PLLC	
Project No.:	10140	

Contractor:	New Hampshire Boring, Inc.	Groundwater Depth: Not Measured	Date:	Page 1 of 1
Logged By:	Craig Ward			
Drilling Dates:	9/30/2010	GS Elevation:	Boring Location: see Boring Location Plan	
Drill Rig:	Mobile B-59 Truck	Datum:		

DEPTH FT.	SAMPLE TYPE & NO.	BLOWS per 6 IN.	PEN. IN.	REC. IN.	REMARKS	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS	
0.4	S1	69-54 19-22	24	18	Hollow-stem augers 3" split-spoon used for S1.		3" Asphalt Pavement S1: upper 5": **Sand with Gravel (SW)** - fine to coarse sand, 25%-35% subangular gravel to 2", brown. middle 5": **Silty Sand with Gravel (SM)** -fine to medium sand, 15%-25% nonplastic fines, 15%-25% subangular gravel to 3/4", olive-brown and gray. Piece of bark. lower 8": **Silty Sand (SM)** - fine to medium sand, 10%-20% nonplastic fines, occasional rounded gravel to 3/4", twigs/roots throughout, orange-brown.	**Fill** **~2.5'**
2.4	S2	18-12 17-48	24	16			S2: **Silty Sand (SM)** - fine and fine to medium sand, 10%-20% nonplastic fines, occasional fine gravel, vaguely stratified, light tan.	**Silty Sand**
4.4	S3	16-19 22-24	24	18			S3: **Silty Sand (SM)** - similar to S2.	
7							Btoom of Boring at 7'	

Notes:

Abbreviations:

PEN - Penetration length of sampler or core barrel
REC - Recovery length of sample
S - Split Spoon Sample
C - Rock Core Sample
U - Undisturbed Tube Sample

Ward Geotechnical Consulting, PLLC

Project:	Public Safety Facility Parking Lot	Boring Log
Location:	Moultonborough, New Hampshire	**B11**
Client:	KV Partners, PLLC	
Project No.:	10140	

Contractor:	New Hampshire Boring, Inc.	Groundwater Depth: Not Measured	Date:	Page 1 of 1
Logged By:	Craig Ward			
Drilling Dates:	9/30/2010	GS Elevation:	Boring Location: see Boring Location Plan	
Drill Rig:	Mobile B-59 Truck	Datum:		

DEPTH FT.	SAMPLE TYPE & NO.	BLOWS per 6 IN.	PEN. IN.	REC. IN.	REMARKS	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS	
0.5					Hollow-stem augers		3" Asphalt Pavement	
1	S1	47-21 26-16	24	17	3" split-spoon used for S1.		S1: upper 7": **Sand with Gravel (SW)** - fine to coarse sand, 35%-45% subangular gravel to 2", brown. lower 10": **Silty Sand with Gravel (SM)** - fine to medium (some coarse) sand, 15%-25% nonplastic fines, 15%-25% subangular gravel to 1.5", occasional roots and twigs, olive-brown.	Fill
2								
2.5								~2.5'
3	S2	12-12 15-18	24	18			S2: **Sand with Silt (SP-SM)** - fine & fine to medium sand, 5%-25% nonplastic fines, occasional subrounded gravel to 1", vaguely stratified, light brown and tan.	
4								
4.5								
5								
6	S3	14-17 23-30	24	18			S3: **Sand with Silt (SP-SM)** - similar to S2.	
7							Bottom of Boring at 7'	
8								
9								

Notes:

Abbreviations:

PEN - Penetration length of sampler or core barrel
REC - Recovery length of sample
S - Split Spoon Sample
C - Rock Core Sample
U - Undisturbed Tube Sample

Ward Geotechnical Consulting, PLLC

Project:	Public Safety Facility Parking Lot		Boring Log
Location:	Moultonborough, New Hampshire		**B12**
Client:	KV Partners, PLLC		
Project No.:	10140		
Contractor:	New Hampshire Boring, Inc.	Groundwater Depth: Not Measured	Date:
Logged By:	Craig Ward		Page 1 of 1
Drilling Dates:	9/28/2010	GS Elevation:	Boring Location: see Boring Location Plan
Drill Rig:	Mobile B-59 Truck	Datum:	

DEPTH FT.	SAMPLE TYPE & NO.	BLOWS per 6 IN.	PEN. IN.	REC. IN.	REMARKS	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS	
0.5	S1	19-20 24-24	24	23	Hollow-stem augers 3" split-spoon used for S1.		6" Asphalt Pavement S1: upper 6": **Sand with Gravel (SW)** - fine to coarse sand, 30%-40% subangular gravel to 1.5", brown. middle 6": **Silty Sand (SM)** - fine (some medium) sand, 10%-20% nonplastic fines, light tan. middle 2": **Silty Sand (SM)** - fine to medium sand, 15%-25% nonplastic organic fines, dark brown. Possible old topsoil layer. lower 9": **Silty Sand with Gravel (SM)** - fine to medium (some coarse) sand, 10%-25% nonplastic fines, 15%-25% gravel, 6" weathered cobble, olive brown.	**Fill** **~2.5'**
2.5	S2	14-21 26-42	24	19			S2: upper 13": **Silty Sand (SM)** - fine & fine to medium sand, 10%-25% nonplastic fines, occasional silt lenses (1/32" to 1/4"), stratified structure, light brown-tan. lower 6": **Sand (SP)** - fine to medium sand, light brown.	**Sand & Silty Sand** **~5'**
4.5	S3	19-58 100/4"	16	16			S3: **Silty Sand with Gravel (SM)** - fine to medium (some coarse) sand, 15%-25% nonplastic fines, 20%-30% subangular gravel (some weathered) to 1", heterogeneous structure, olive brown.	**Glacial Till**
6.3							Bottom of Boring at 6.3'	

Notes:

Abbreviations:

PEN - Penetration length of sampler or core barrel
REC - Recovery length of sample
S - Split Spoon Sample
C - Rock Core Sample
U - Undisturbed Tube Sample

Ward Geotechnical Consulting, PLLC

Project:	Public Safety Facility Parking Lot		Boring Log
Location:	Moultonborough, New Hampshire		**B13**
Client:	KV Partners, PLLC		
Project No.:	10140		
Contractor:	New Hampshire Boring, Inc.	Groundwater Depth: Not Measured	Date:
Logged By:	Craig Ward		Page 1 of 1
Drilling Dates:	9/28/2010	GS Elevation:	Boring Location: see Boring Location Plan
Drill Rig:	Mobile B-59 Truck	Datum:	

DEPTH FT.	SAMPLE TYPE & NO.	BLOWS per 6 IN.	PEN. IN.	REC. IN.	REMARKS	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS	
0.3					Hollow-stem augers		3" Asphalt Pavement	
1	S1	31-28 36-50/2"	20	16	3" split-spoon used for S1.		S1: upper 9": **Sand with Gravel (SW)** - fine to coarse sand, 25%-35% subangular gravel to 1.5", brown. lower 7": **Silty Sand with Gravel (SM)** - fine to medium (some coarse) sand, 15%-25% nonplastic fines, 20%-30% subangular gravel to 1.5", occasional pieces of bark and twigs, olive-gray & brown.	**Fill**
2					SPT refusal at 2'. Augered through boulders to 5'.			**~2'**
3								**Boulders (possible fill) - Soil matrix not sampled**
4								
5								
5.3	S2	50/3"	3	0	SPT refusal at 5.3'. Augered to refusal at 6.1'.		S2: **No Recovery** - probably pushed boulder with spoon.	
6							Bottom of Boring at 6.1'	
7								
8								
9								

Notes:

Abbreviations:

PEN - Penetration length of sampler or core barrel
REC - Recovery length of sample
S - Split Spoon Sample
C - Rock Core Sample
U - Undisturbed Tube Sample

Ward Geotechnical Consulting, PLLC

Project:	Public Safety Facility Parking Lot		Boring Log
Location:	Moultonborough, New Hampshire		**B14**
Client:	KV Partners, PLLC		
Project No.:	10140		
Contractor:	New Hampshire Boring, Inc.	Groundwater Depth: Not Measured	Date:
Logged By:	Craig Ward		Page 1 of 1
Drilling Dates:	9/29/2010	GS Elevation:	Boring Location: see Boring Location Plan
Drill Rig:	Mobile B-59 Truck	Datum:	

DEPTH FT.	SAMPLE TYPE & NO.	BLOWS per 6 IN.	PEN. IN.	REC. IN.	REMARKS	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS	
0.3					Hollow-stem augers		2.5" Asphalt Pavement	
1	S1	34-64 100/5"	17	16	3" split-spoon used for S1.		S1: upper 7": **Sand with Gravel (SW)** - fine to coarse sand, 25%-35% subangular gravel to 1.5", brown. middle 6": **Silty Sand with Gravel (SM)** - fine to medium (some coarse) sand, 15%-25% nonplastic fines, 10%-20% subanguular gravel to 1.5"; light brown-olive. lower 3": **Sand with Gravel (SW)** - fine to coarse sand, 15%-25% subangular gravel to 1", light brown.	**Fill**
1.7					SPT refusal on boulder at 1.7'. Augered to 3'.			**~2'**
2								
3.1								
3	S2	100/3"	3	2	SPT refusal on boulder at 3.3'. Augered to 4.5'.		S2: **Silty Sand with Gravel (SM)** - fine (some medium & coarse) sand, 10%-20% nonplastic fines, 10%-20% subangular gravel to 3/8", light brown.	**Glacial Till**
3.3								
4								
4.5								
5	S3	45-55/5"	11	10			S3: **Silty Sand with Gravel (SM)** - fine (some medium & coarse) sand, 10%-20% nonplastic fines, 10%-20% subangular gravel to 3/4", light brown.	
5.4					SPT refusal on boulder at 5.4'. Augered to refusal at 6.3'.			
6								
							Bottom of Bornig at 6.3'	
7								
8								
9								

Notes:

Abbreviations:

PEN - Penetration length of sampler or core barrel
REC - Recovery length of sample
S - Split Spoon Sample
C - Rock Core Sample
U - Undisturbed Tube Sample

Ward Geotechnical Consulting, PLLC

Project:	Public Safety Facility Parking Lot	Boring Log
Location:	Moultonborough, New Hampshire	**B15**
Client:	KV Partners, PLLC	
Project No.:	10140	

Contractor:	New Hampshire Boring, Inc.	Groundwater Depth: Not Measured	Date:	Page 1 of 1
Logged By:	Craig Ward			
Drilling Dates:	9/29/2010	GS Elevation:	Boring Location: see Boring Location Plan	
Drill Rig:	Mobile B-59 Truck	Datum:		

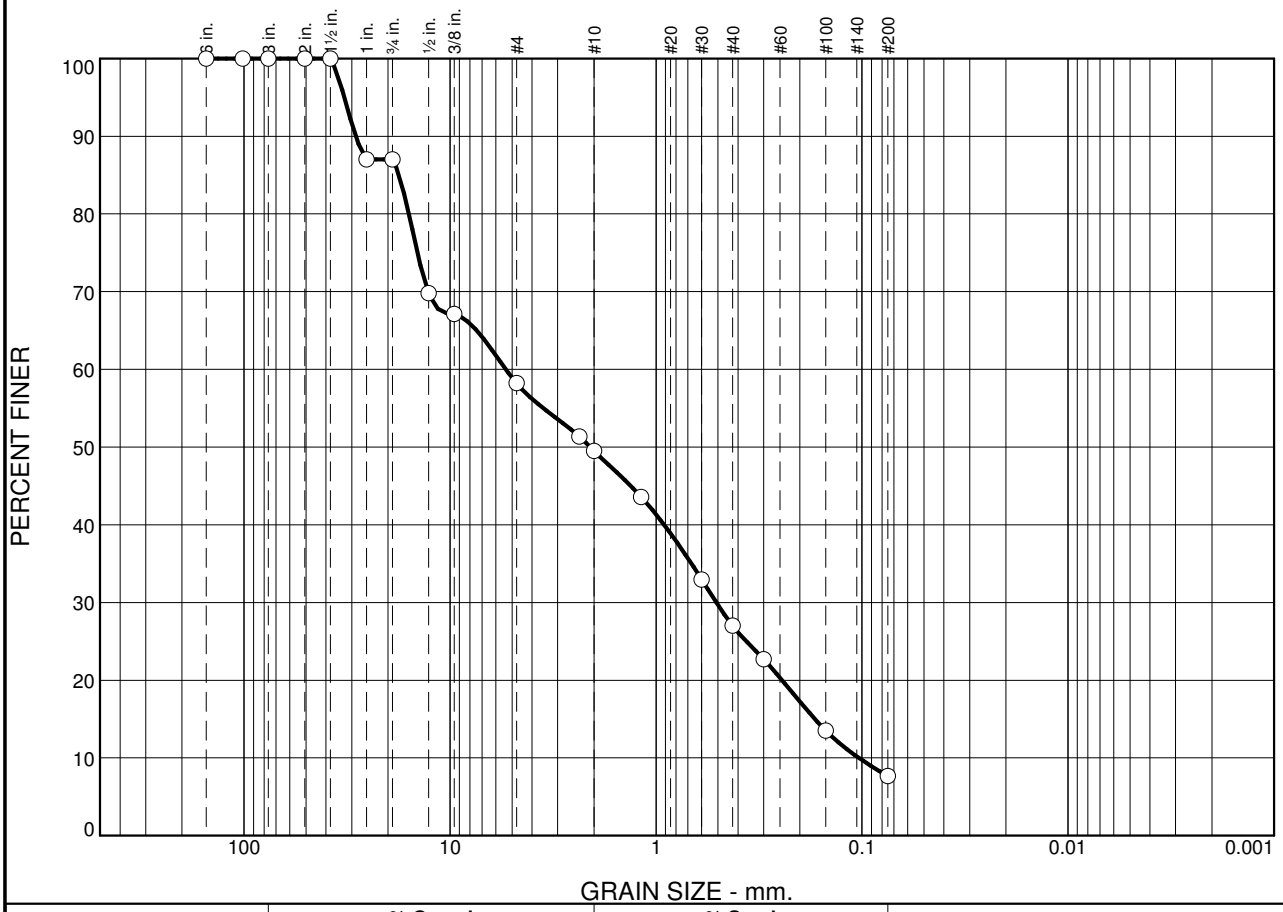
DEPTH FT.	SAMPLE TYPE & NO.	BLOWS per 6 IN.	PEN. IN.	REC. IN.	REMARKS	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS	
0.3					Hollow-stem augers		3" Asphalt Pavement	
1	S1	31-18 26-50/4"	22	20	3" split-spoon used for S1.		S1: upper 6": **Sand with Gravel (SW)** - fine to coarse sand, 35%-45% subangular gravel, brown. middle 6":**Sand with Gravel (SP)**- fine to medium (some coarse) sand, 20%-30% subangular gravel to 1.5", tan. lower 8": **Silty Sand (SM)** - fine (some medium) sand, 15%-25% nonplastic fines, occasional subangular gravel to 1.5", heterogeneous structure, tan-light brown.	**Fill**
2 2.1					Augered thru boulder at 2.1'.			**~2.5'**
3								
4	S2	11-13 34-58	24	21			S2: **Silty Sand (SM)** - fine (some medium) sand, 15%-25% nonplastic fines, vaguely stratified, light brown.	**Silty Sand**
5								
6	S3	56-61 93	18	11			S3: upper 9": **Silty Sand (SM)** - similar to S2.	**~6'**
6.5							lower 2": **Silty Sand with Gravel (SM)** - fine to medium (some coarse) sand, 15%-25% nonplastic fines, 15%-25% gravel, heterogeneous structure, light brown-olive.	**Glacial Till**
7							Bottom of Boring at 6.5'	
8								
9								

Notes:

Abbreviations:

PEN - Penetration length of sampler or core barrel
REC - Recovery length of sample
S - Split Spoon Sample
C - Rock Core Sample
U - Undisturbed Tube Sample

Particle Size Distribution Report



% +3"	% Gravel			% Sand			% Fines
	Coarse	Medium	Fine	Coarse	Medium	Fine	
0.0	13.0	19.9	17.6	16.5	12.7	12.6	7.7

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
6"	100.0		
4"	100.0		
3"	100.0		
2"	100.0		
1.5"	100.0		
1"	87.0		
.75"	87.0		
.5"	69.8		
.375"	67.1		
#4	58.2		
#8	51.4		
#10	49.5		
#16	43.6		
#30	33.0		
#40	27.0		
#50	22.7		
#100	13.5		
#200	7.7		

* (no specification provided)

Material Description

coarse to fine GRAVEL and, coarse to fine Sand, trace Silt

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 17.6907 D_{60}= 5.3556 D_{50}= 2.0863
D_{30}= 0.5093 D_{15}= 0.1694 D_{10}= 0.1034
C_u= 51.78 C_c= 0.47

Classification

USCS= AASHTO=

Remarks

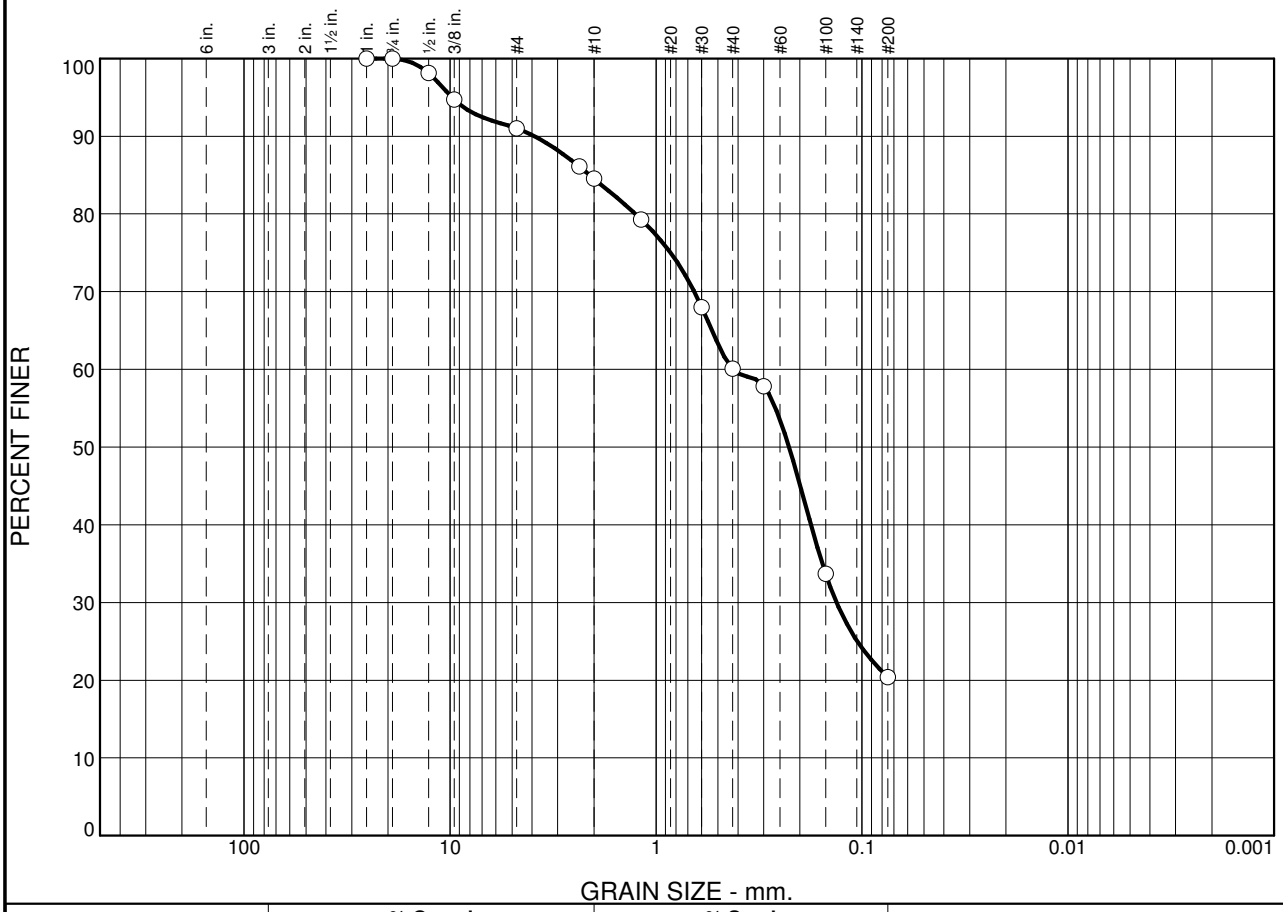
Sample No.: L629-10 **Source of Sample:** Boring 1 **Date:** 10/16/10
Location: S-1A **Elev./Depth:**

GEOTECHNICAL SERVICES, INC.

Goffstown, New Hampshire

Client: KV Partners LLC
Project: Public Safety Parking Lot
Moultonborough, NH
Project No: 210293 **Plate**

Particle Size Distribution Report



% +3"	% Gravel			% Sand			% Fines
	Coarse	Medium	Fine	Coarse	Medium	Fine	
0.0	0.0	5.3	10.2	16.5	14.5	33.1	20.4

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1"	100.0		
3/4"	100.0		
1/2"	98.1		
3/8"	94.7		
#4	91.0		
#8	86.1		
#10	84.5		
#16	79.3		
#30	68.0		
#40	60.1		
#50	57.8		
#100	33.7		
#200	20.4		

* (no specification provided)

Material Description

coarse to fine SAND, some Silt, little med to fine Gravel

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 2.0997 D_{60}= 0.4217 D_{50}= 0.2262
D_{30}= 0.1328 D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= AASHTO=

Remarks

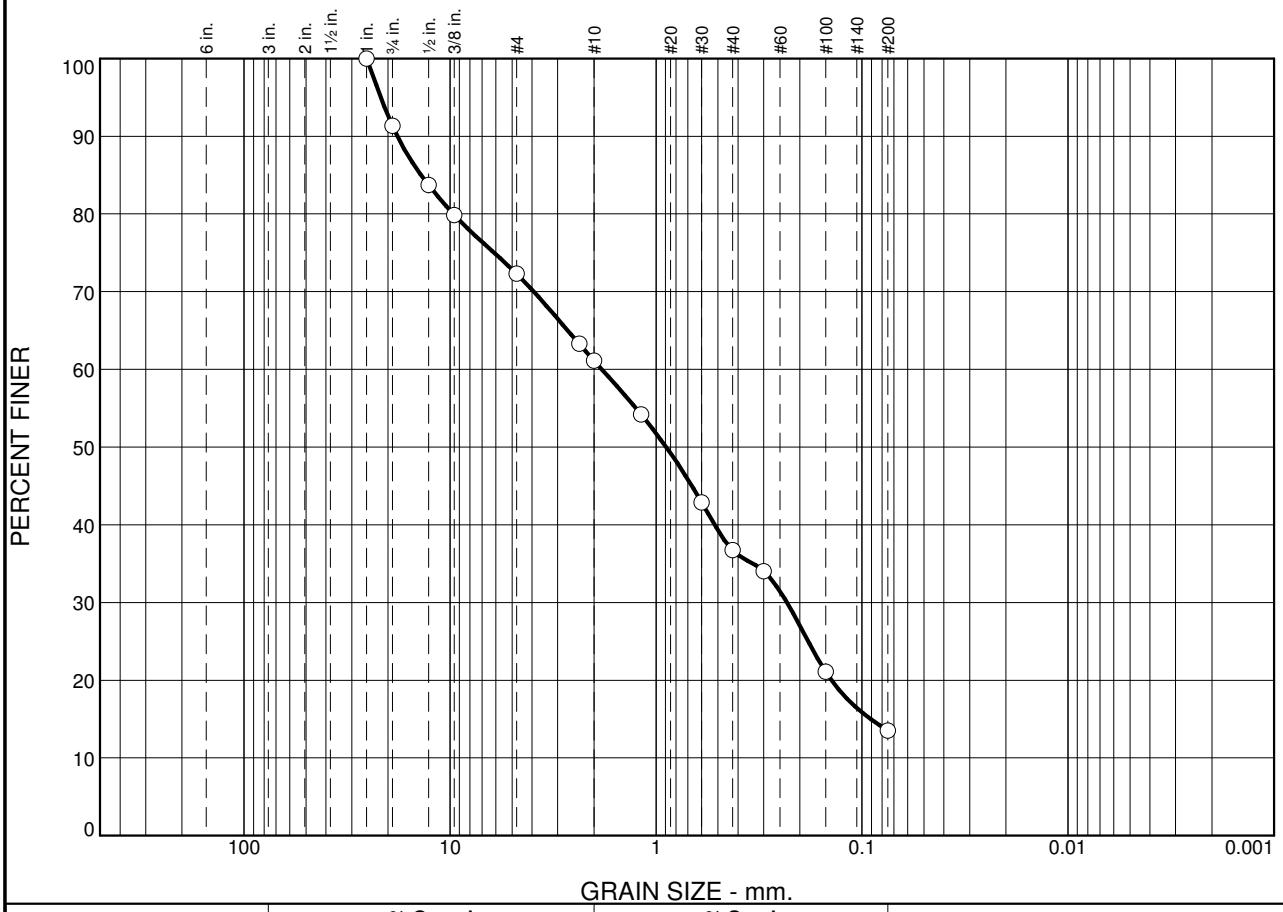
Sample No.: L-630-10 **Source of Sample:** Boring 1 **Date:** 10/16/10
Location: S-1B **Elev./Depth:**

GEOTECHNICAL SERVICES, INC.

Goffstown, New Hampshire

Client: KV Partners LLC
Project: Public Safety Parking Lot
Moultonborough, NH
Project No: 210293 **Plate**

Particle Size Distribution Report



% +3"	% Gravel			% Sand			% Fines
	Coarse	Medium	Fine	Coarse	Medium	Fine	
0.0	0.0	20.2	18.7	18.2	11.5	17.9	13.5

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1"	100.0		
3/4"	91.4		
1/2"	83.7		
3/8"	79.8		
#4	72.3		
#8	63.3		
#10	61.1		
#16	54.2		
#30	42.9		
#40	36.7		
#50	34.0		
#100	21.1		
#200	13.5		

* (no specification provided)

Material Description

coarse to fine Sand, little Silt, and med to fine Gravel

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 13.8162 D_{60}= 1.8346 D_{50}= 0.8927
D_{30}= 0.2315 D_{15}= 0.0906 D_{10}=
C_u= C_c=

Classification

USCS= AASHTO=

Remarks

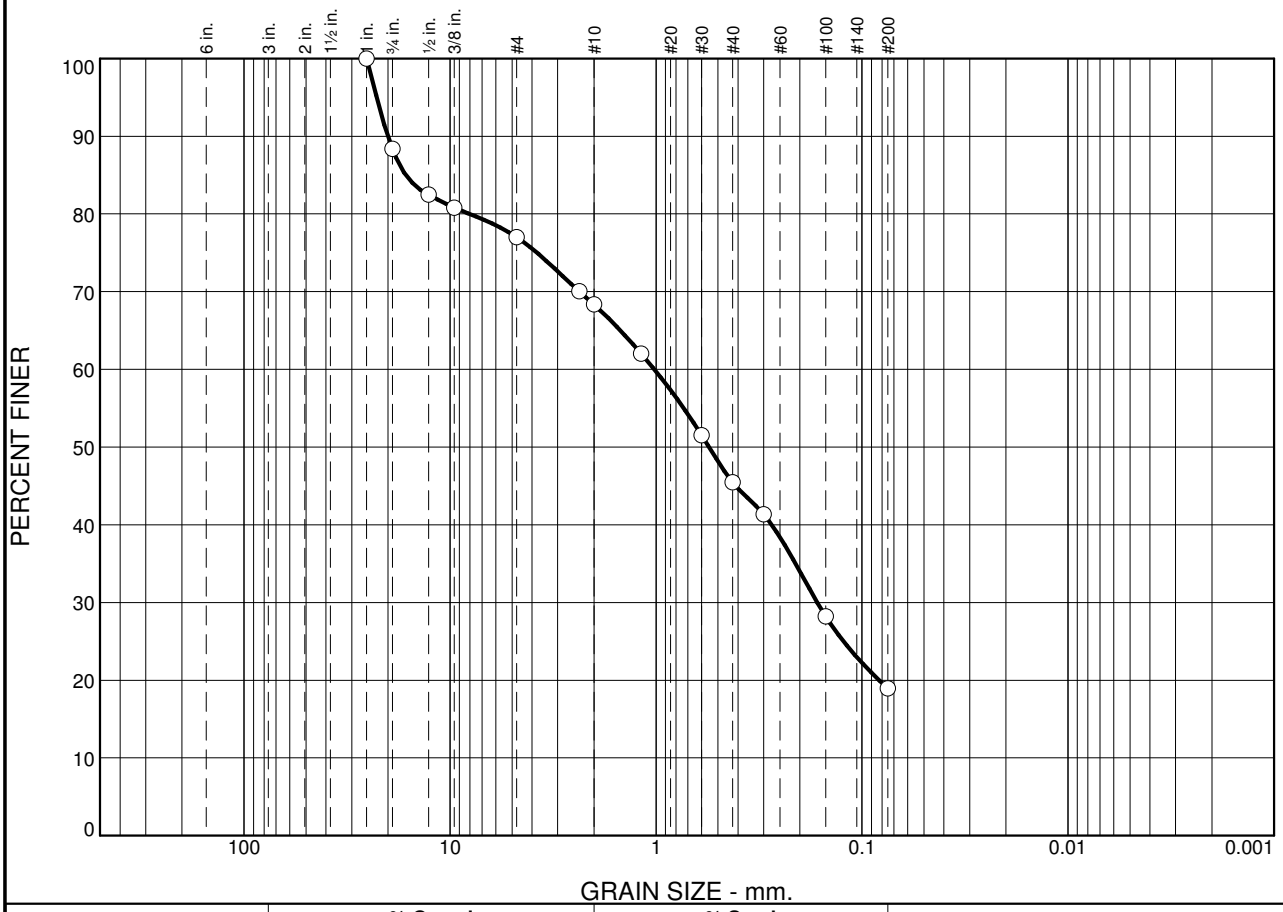
Sample No.: L-631-10 **Source of Sample:** Boring 4 **Date:** 10/18/10
Location: S-1A **Elev./Depth:**

GEOTECHNICAL SERVICES, INC.

Goffstown, New Hampshire

Client: KV Partners LLC
Project: Public Safety Parking Lot
Moultonborough, NH
Project No: 210293 **Plate**

Particle Size Distribution Report



% +3"	% Gravel			% Sand			% Fines
	Coarse	Medium	Fine	Coarse	Medium	Fine	
0.0	0.0	19.2	12.5	16.8	13.1	19.5	18.9

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1"	100.0		
3/4"	88.4		
1/2"	82.5		
3/8"	80.8		
#4	77.0		
#8	70.0		
#10	68.3		
#16	62.0		
#30	51.5		
#40	45.5		
#50	41.3		
#100	28.2		
#200	18.9		

* (no specification provided)

Material Description

coarse to fine Sand, little Silt, some med to fine Gravel

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 16.4085 D_{60}= 1.0194 D_{50}= 0.5531
D_{30}= 0.1648 D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= AASHTO=

Remarks

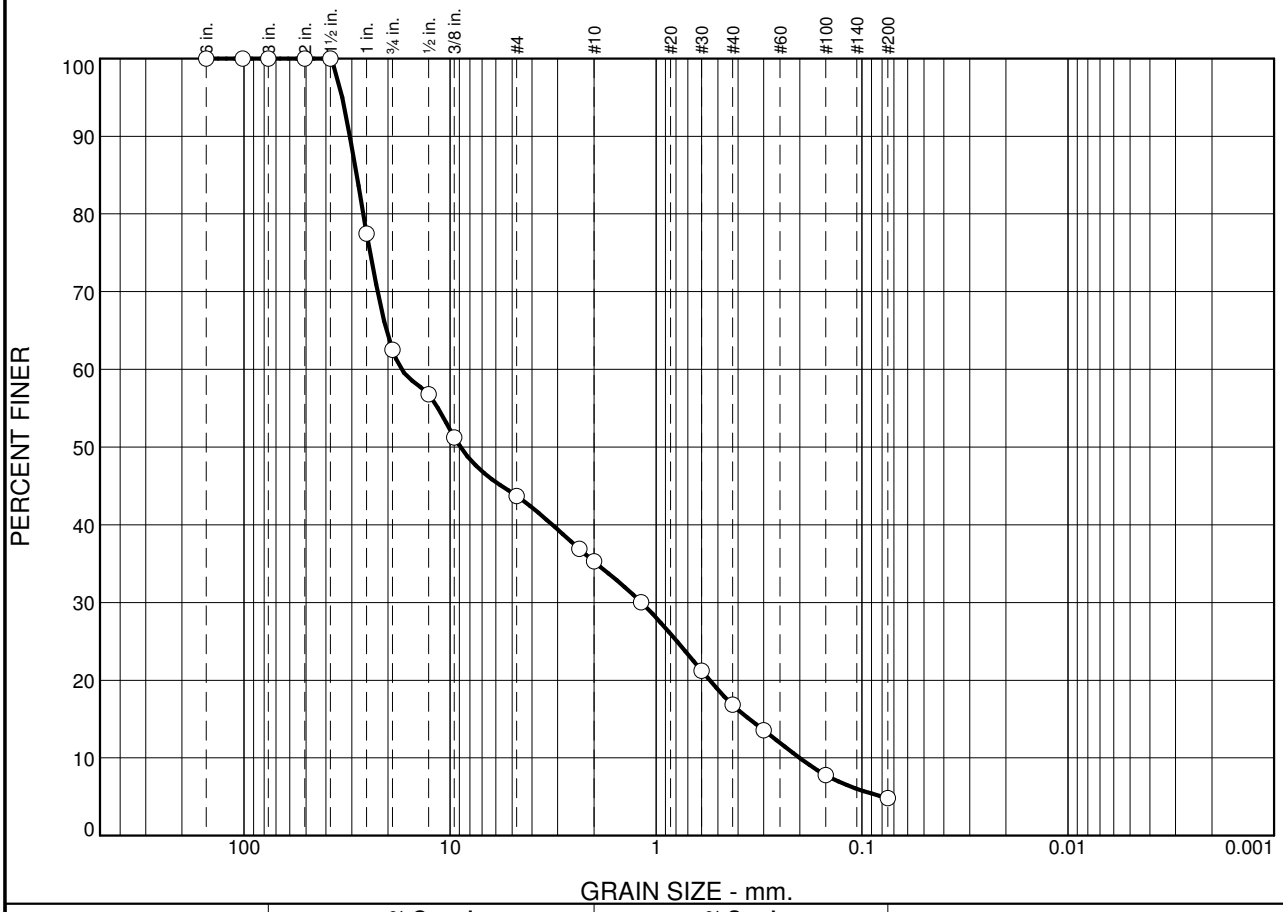
Sample No.: L-632-10 **Source of Sample:** Boring 4A **Date:** 10/18/10
Location: S-1 **Elev./Depth:**

GEOTECHNICAL SERVICES, INC.

Goffstown, New Hampshire

Client: KV Partners LLC
Project: Public Safety Parking Lot
Moultonborough, NH
Project No: 210293 **Plate**

Particle Size Distribution Report



% +3"	% Gravel			% Sand			% Fines
	Coarse	Medium	Fine	Coarse	Medium	Fine	
0.0	22.5	26.3	15.9	14.1	9.3	7.1	4.8

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
6"	100.0		
4"	100.0		
3"	100.0		
2"	100.0		
1.5"	100.0		
1"	77.5		
.75"	62.5		
.5"	56.8		
.375"	51.2		
#4	43.7		
#8	36.9		
#10	35.3		
#16	30.0		
#30	21.2		
#40	16.8		
#50	13.6		
#100	7.8		
#200	4.8		

* (no specification provided)

Material Description

coarse to fine GRAVEL and, coarse to fine Sand, trace Silt

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 28.3928 D_{60}= 17.1873 D_{50}= 8.8951
D_{30}= 1.1765 D_{15}= 0.3529 D_{10}= 0.2011
C_u= 85.47 C_c= 0.40

Classification

USCS= GP AASHTO=

Remarks

Sample No.: L-633-10 **Source of Sample:** Boring 5 **Date:** 10/18/10
Location: S-1A **Elev./Depth:**

GEOTECHNICAL SERVICES, INC.

Goffstown, New Hampshire

Client: KV Partners LLC
Project: Public Safety Parking Lot
Moultonborough, NH
Project No: 210293 **Plate**

Particle Size Distribution Report

% +3"	% Gravel			% Sand			% Fines
	Coarse	Medium	Fine	Coarse	Medium	Fine	
0.0	0.0	1.4	9.3	18.0	21.0	24.2	26.1

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1"	100.0		
3/4"	100.0		
1/2"	100.0		
3/8"	98.6		
#4	95.2		
#8	90.7		
#10	89.3		
#16	83.5		
#30	71.3		
#40	63.1		
#50	54.9		
#100	37.7		
#200	26.1		

* (no specification provided)

Material Description

coarse to fine SAND, some Silt, little med to fine Gravel

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 1.3289 D_{60}= 0.3725 D_{50}= 0.2472
D_{30}= 0.0978 D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= AASHTO=

Remarks

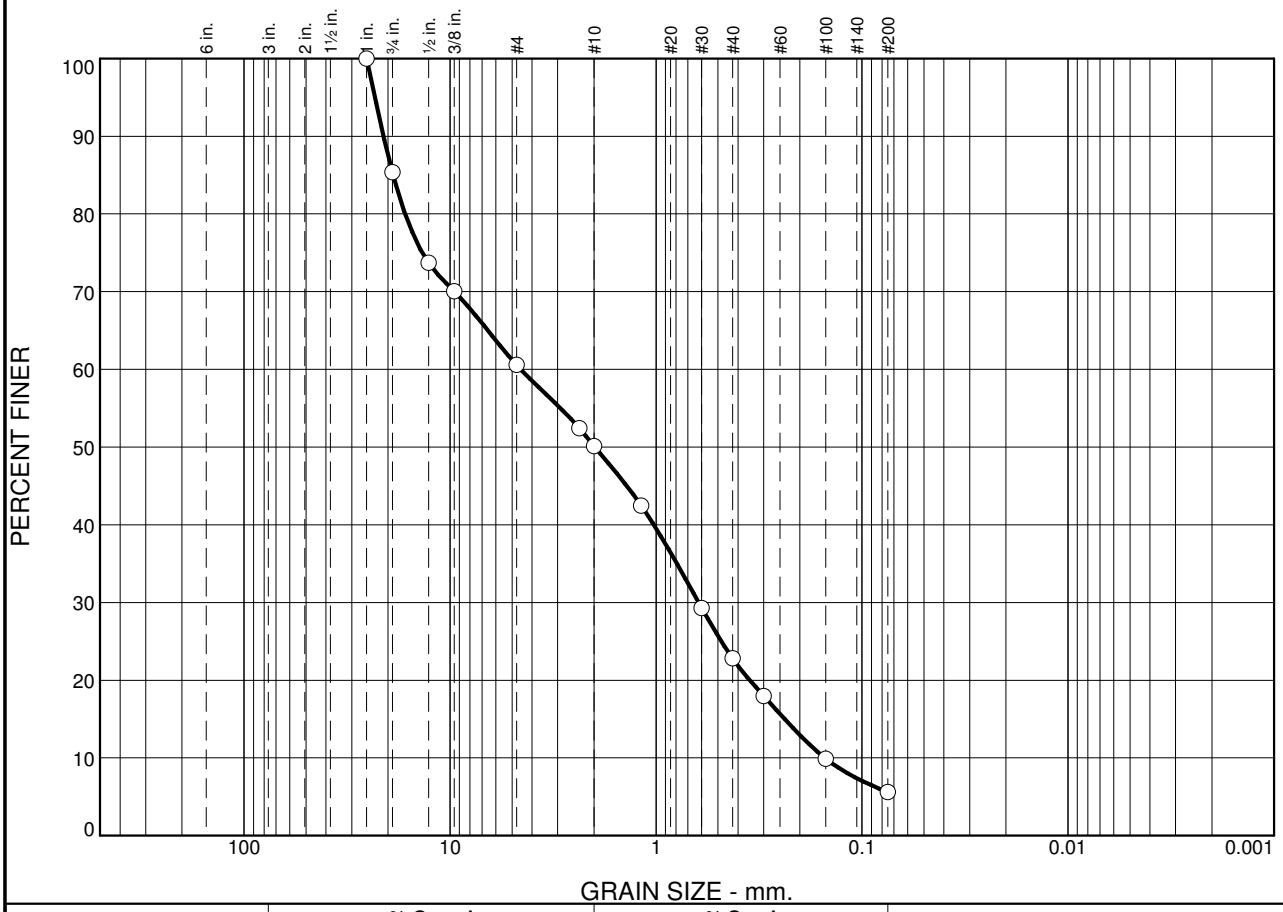
Sample No.: L-634-10 **Source of Sample:** Boring 5 **Date:** 10/18/10
Location: S-1B **Elev./Depth:**

GEOTECHNICAL SERVICES, INC.

Goffstown, New Hampshire

Client: KV Partners LLC
Project: Public Safety Parking Lot
Moultonborough, NH
Project No: 210293 **Plate**

Particle Size Distribution Report



% +3"	% Gravel			% Sand			% Fines
	Coarse	Medium	Fine	Coarse	Medium	Fine	
0.0	0.0	30.0	19.9	20.8	13.7	10.0	5.6

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1"	100.0		
3/4"	85.4		
1/2"	73.7		
3/8"	70.0		
#4	60.6		
#8	52.4		
#10	50.1		
#16	42.5		
#30	29.3		
#40	22.8		
#50	18.0		
#100	9.9		
#200	5.6		

* (no specification provided)

Material Description

coarse to fine Sand, trace Silt, and med to fine Gravel

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 18.8896 D_{60}= 4.5388 D_{50}= 1.9805
D_{30}= 0.6208 D_{15}= 0.2375 D_{10}= 0.1515
C_u= 29.95 C_c= 0.56

Classification

USCS= AASHTO=

Remarks

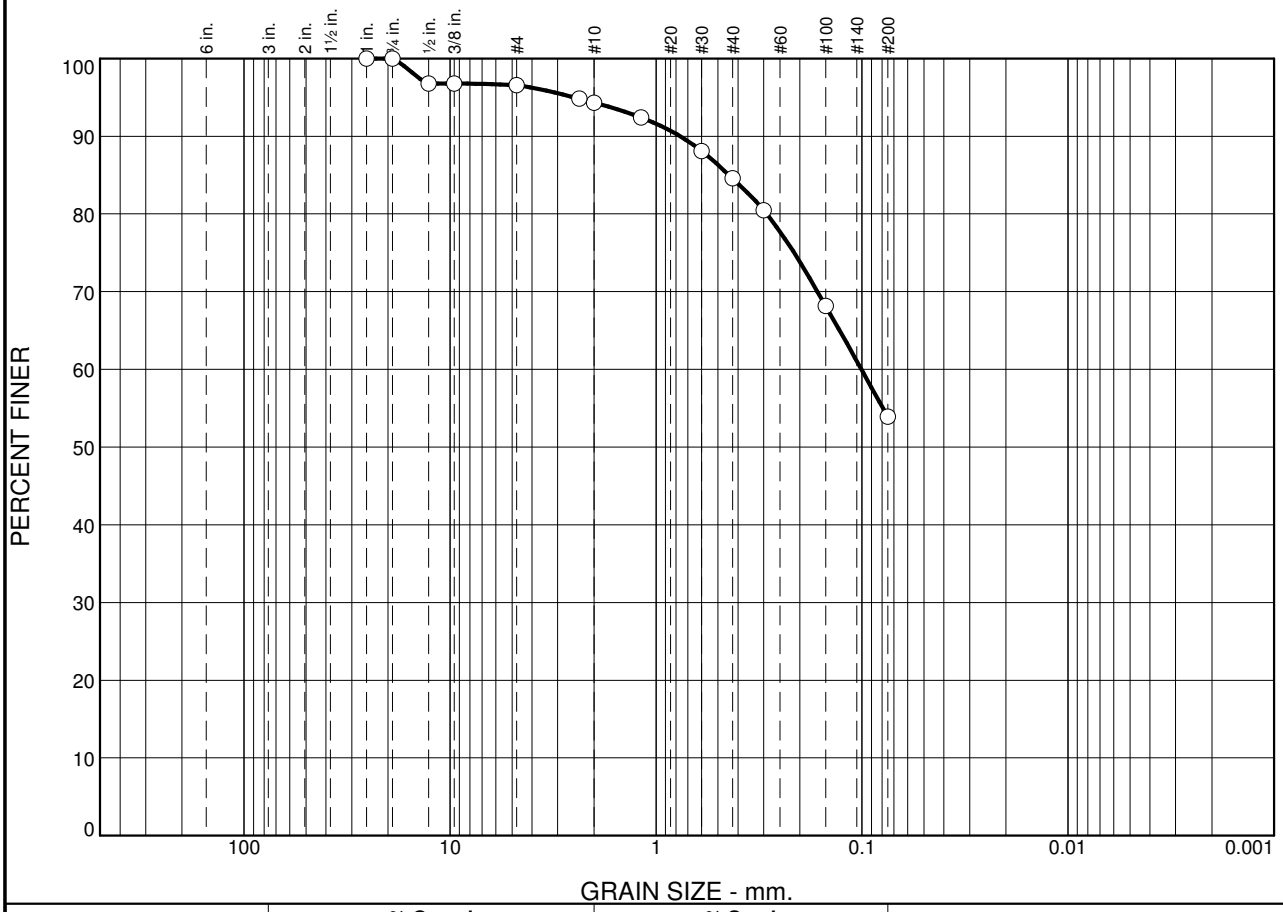
Sample No.: L-635-10 **Source of Sample:** Boring 8 **Date:** 10/18/10
Location: S-1A **Elev./Depth:**

GEOTECHNICAL SERVICES, INC.

Goffstown, New Hampshire

Client: KV Partners LLC
Project: Public Safety Parking Lot
Moultonborough, NH
Project No: 210293 **Plate**

Particle Size Distribution Report



% +3"	% Gravel			% Sand			% Fines
	Coarse	Medium	Fine	Coarse	Medium	Fine	
0.0	0.0	3.2	2.5	6.2	10.4	23.8	53.9

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1"	100.0		
3/4"	100.0		
1/2"	96.8		
3/8"	96.8		
#4	96.6		
#8	94.8		
#10	94.3		
#16	92.4		
#30	88.1		
#40	84.6		
#50	80.5		
#100	68.2		
#200	53.9		

* (no specification provided)

Material Description

SILT and, coarse to fine Sand, trace med to fine Gravel
SILT and, coarse to fine Sand, trace med to fine Gravel

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 0.4422 D_{60}= 0.1006 D_{50}=
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= AASHTO=

Remarks

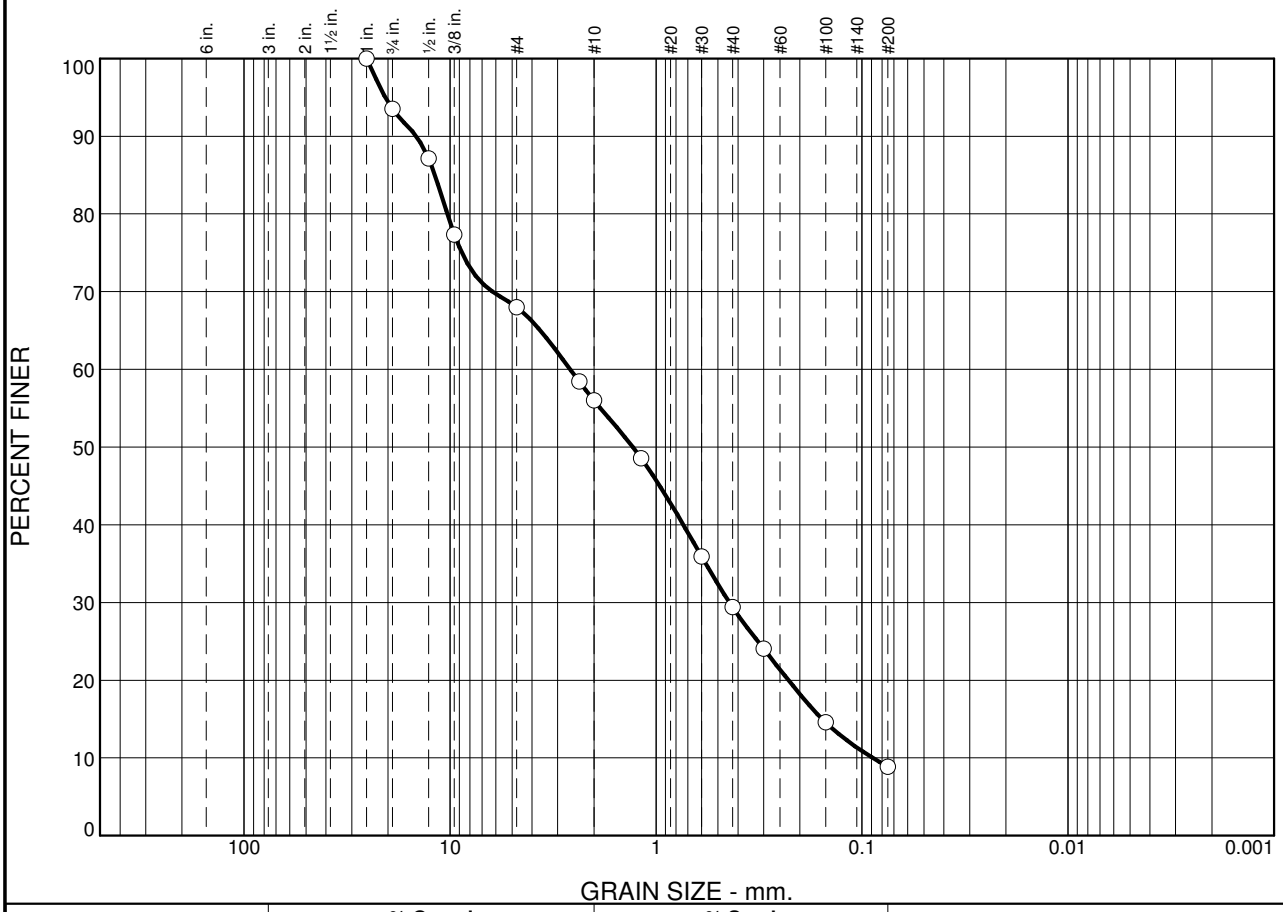
Sample No.: L-636-10 **Source of Sample:** Boring 8 **Date:** 10/18/10
Location: S-1B **Elev./Depth:**

GEOTECHNICAL SERVICES, INC.

Goffstown, New Hampshire

Client: KV Partners LLC
Project: Public Safety Parking Lot
Moultonborough, NH
Project No: 210293 **Plate**

Particle Size Distribution Report



% +3"	% Gravel			% Sand			% Fines
	Coarse	Medium	Fine	Coarse	Medium	Fine	
0.0	0.0	22.7	21.3	20.1	14.5	12.5	8.9

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1"	100.0		
3/4"	93.5		
1/2"	87.2		
3/8"	77.3		
#4	68.0		
#8	58.4		
#10	56.0		
#16	48.6		
#30	35.9		
#40	29.4		
#50	24.0		
#100	14.6		
#200	8.9		

* (no specification provided)

Material Description

coarse to fine Sand, trace Silt, and med to fine Gravel

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 11.8393 D_{60}= 2.6135 D_{50}= 1.2972
D_{30}= 0.4403 D_{15}= 0.1558 D_{10}= 0.0885
C_u= 29.54 C_c= 0.84

Classification

USCS= AASHTO=

Remarks

Sample No.: L-637-10 **Source of Sample:** Boring 11 **Date:** 10/18/10
Location: S-1A **Elev./Depth:**

GEOTECHNICAL SERVICES, INC.

Goffstown, New Hampshire

Client: KV Partners LLC
Project: Public Safety Parking Lot
Moultonborough, NH
Project No: 210293 **Plate**

Particle Size Distribution Report

% +3"	% Gravel			% Sand			% Fines
	Coarse	Medium	Fine	Coarse	Medium	Fine	
0.0	15.0	4.6	6.3	15.4	19.6	22.7	16.4

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
6"	100.0		
4"	100.0		
3"	100.0		
2"	100.0		
1.5"	100.0		
1"	85.0		
.75"	85.0		
.5"	82.3		
.375"	80.4		
#4	78.5		
#8	75.2		
#10	74.1		
#16	69.7		
#30	58.7		
#40	50.9		
#50	43.5		
#100	26.5		
#200	16.4		

* (no specification provided)

Material Description

coarse to fine SAND, some coarse to fine Gravel, little Silt

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 19.0460 D_{60}= 0.6386 D_{50}= 0.4074
D_{30}= 0.1753 D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= AASHTO=

Remarks

Sample No.: L-638-10 **Source of Sample:** Boring 11 **Date:** 10/18/10
Location: S-1B **Elev./Depth:**

GEOTECHNICAL SERVICES, INC.

Goffstown, New Hampshire

Client: KV Partners LLC
Project: Public Safety Parking Lot
Moultonborough, NH
Project No: 210293 **Plate**

Particle Size Distribution Report

% +3"	% Gravel			% Sand			% Fines
	Coarse	Medium	Fine	Coarse	Medium	Fine	
0.0	0.0	11.2	30.4	23.6	15.2	12.2	7.4

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1"	100.0		
3/4"	100.0		
1/2"	93.4		
3/8"	88.8		
#4	74.9		
#8	61.9		
#10	58.4		
#16	48.8		
#30	34.8		
#40	28.3		
#50	22.4		
#100	13.1		
#200	7.4		

* (no specification provided)

Material Description

coarse to fine SAND, and med to fine Gravel, trace Silt

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 7.7526 D_{60}= 2.1612 D_{50}= 1.2592
D_{30}= 0.4675 D_{15}= 0.1768 D_{10}= 0.1064
C_u= 20.32 C_c= 0.95

Classification

USCS= AASHTO=

Remarks

Sample No.: L-639-10 **Source of Sample:** Boring 14 **Date:** 10/18/10
Location: S-1A **Elev./Depth:**

GEOTECHNICAL SERVICES, INC.

Goffstown, New Hampshire

Client: KV Partners LLC
Project: Public Safety Parking Lot
Moultonborough, NH
Project No: 210293 **Plate**

Particle Size Distribution Report

% +3"	% Gravel			% Sand			% Fines
	Coarse	Medium	Fine	Coarse	Medium	Fine	
0.0	0.0	4.8	14.5	19.1	15.7	23.2	22.7

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1"	100.0		
3/4"	100.0		
1/2"	95.7		
3/8"	95.2		
#4	89.8		
#8	82.7		
#10	80.7		
#16	74.1		
#30	61.6		
#40	53.8		
#50	49.5		
#100	32.6		
#200	22.7		

* (no specification provided)

Material Description

coarse to fine SAND, some Silt, little med to fine Gravel

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 2.9197 D_{60}= 0.5623 D_{50}= 0.3103
D_{30}= 0.1323 D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= AASHTO=

Remarks

Sample No.: L-640-10 **Source of Sample:** Boring 14 **Date:** 10/18/10
Location: S-1B **Elev./Depth:**

GEOTECHNICAL SERVICES, INC.

Goffstown, New Hampshire

Client: KV Partners LLC
Project: Public Safety Parking Lot
Moultonborough, NH
Project No: 210293 **Plate**