ESSEX COUNTY
OFFICE OF THE MANAGER

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Daniel L. Palmer
County Manager

Linda M. Wolf
Purchasing Agent

TO: All Bidders

FROM: Linda Wolf, CPA, Purchasing Agent

DATE: May 20, 2014

SUBJECT: Addendum #1 CEMETERY ROAD BRIDGE

This Addendum, issued to bid document holders of record, indicates changes to the bid documents for the *CEMETERY ROAD BRIDGE* Bid Opening June 6, 2014.

Please see attached Geotechnical Study dated November 21, 2013, prepared by Dente Engineering.

END OF ADDENDUM # 1

DENTE ENGINEERING

ALBANY AREA
594 Broadway
Watervliet, NY 12189
Voice 518-266-0310
Fax 518-266-9238

BUFFALO AREA
PO Box 482
Orchard Park, NY 14127
Voice 716-649-9474
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November 21, 2013

Mr. Anthony LaVigne
Superintendent
Essex County DPW
8053 Route 9
Elizabethtown, NY 12932

Re: Geotechnical Study
Cemetery Road Bridge over Norton Brook
Town of Keene, New York
Project Number No. FDE-13-208

Gentlemen;

In accord with your authorization, we have completed a subsurface investigation and prepared this geotechnical evaluation report for the planned replacement of the existing Cemetery Road Bridge over Norton Brook in the town of Keene, New York.

This report presents the results of the subsurface investigation completed at the site on November 8, 2013, a summary of the conditions disclosed and our recommendations for the design and construction of the geotechnical aspects of the project.

Subsurface Conditions

The Subsurface Investigation completed at the site consisted of two (2) exploratory test borings, one at each end of the existing bridge. The borings were performed where accessible and without utility conflicts in the general vicinity of the locations shown on the attached Subsurface Investigation Plan. The bores were advanced using a rotary drill rig mounted on a trailer, and overburden soils were sampled in general accord with the procedures of ASTM D-1586. Subsurface Logs were prepared and are attached to this report, together with sheets that explain the terms used in their preparation. It should be understood that boring logs present a description of the conditions encountered on the date, specific locations investigated, and the depths sampled. Conditions at locations and depths other than those investigated may differ. It should also be understood that conditions can change with time.

The Subsurface Logs should be reviewed for the specific conditions encountered at each investigated location. The borings were advanced from the roadway grades at the site and, as such, penetrated Soil Fill, which is believed to have been placed to establish the grades for the approach roads to the existing bridge crossing.

The fill soils were composed of a mixture of Sand and Gravel with lesser amounts of silt, cobbles and possibly boulders and wood. These fills were moist grading to wet and judged to be of a loose to compact relative density. The fills extended to estimated depths of between about 5 and 10 feet. Underlying the fill soils are similarly graded fine to coarse textured sand and gravel with lesser amounts of silt, cobbles and wood. These soils were of a generally firm to loose relative density and extended to depths of between about 20 and 25 feet where they were underlain with silt containing lesser amounts of finer textured sands which extended through the depths explored about 52 feet.

Groundwater was measured within the test borings advanced at the site as stated on the logs. In our opinion, these measurements are representative of the true saturated ground level at the time of the study. Groundwater should be expected to coincide with the stream level at the site throughout the seasons.

Geotechnical Recommendations

We understand the bridge is to be supported upon abutments comprised of concrete filled sheet pile cofferdam structures. In our opinion, the bridge may be supported upon this system or spread foundations within sheet piles installed for scour protection. It should be understood that in either case, all fills and any organics contained within or beneath these fill soils must be removed from beneath the foundation.

Based on the available subsurface information Seismic Site Class D should be used. The soils, during the design seismic event, should not liquify.

Steel sheet piles may be used to form a cofferdam or an abutment wall, both designed as a cantilever or tied back system. It may be necessary to remove obstructions in some locations as the fills may contain boulders, wood and/or debris.

Excavation within the sheet piled cofferdam must extend through and remove all fills and any organics contained within or beneath these fill soils from within the cofferdam prior to concrete placement within the cofferdam. Concrete placement may be considered through a tremmie placement within the flooded cofferdam sheets, again provided all fills and organics are removed from within the sheet piled cofferdam.

Excavation to establish bearing for spread foundations, if they are selected, should again proceed through the fill and any buried organic soils or at least one (1) foot beneath these grades, whichever is deeper. Structural fill required to establish the design bearing grade should extend beyond the edge of the foundations a distance at least equal to half the depth of the structural fill placed beneath the foundations. The bearing grade excavation should be backfilled with crusher-run stone similar in gradation and quality to a NYSDOT Section 304 Type 2 Material. The material should be placed in a single lift and be compacted to at least 95 percent of its maximum dry density established through the procedures of ASTM D-1557, the Modified Proctor Test. If the grades are established at or within a foot of the stream/groundwater levels, we recommend the foundation grade be prepared by placing a layer of synthetic fabric such as Mirafi 500X upon the approved bearing grade, followed by at least 12 inches of a 50/50 blend of NYSDOT number 1 and 2 sized aggregate to create a working surface that can also be dewatered with ordinary sumps and pumps set within it.

Dependent upon stream levels during construction, the excavations planned may penetrate saturated soils and groundwater, which will coincide with the stream levels in the immediate

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Excavation to establish bearing for spread foundations, if they are selected, should again proceed through the fill and any buried organic soils or at least one (1) foot beneath these grades, whichever is deeper. Structural fill required to establish the design bearing grade should extend beyond the edge of the foundations a distance at least equal to half the depth of the structural fill placed beneath the foundations. The bearing grade excavation should be backfilled with crusher-run stone similar in gradation and quality to a NYSDOT Section 304 Type 2 Material. The material should be placed in a single lift and be compacted to at least 95 percent of its maximum dry density established through the procedures of ASTM D-1557, the Modified Proctor Test. If the grades are established at or within a foot of the stream/groundwater levels, we recommend the foundation grade be prepared by placing a layer of synthetic fabric such as Mirafi 500X upon the approved bearing grade, followed by at least 12 inches of a 50/50 blend of NYSDOT number 1 and 2 sized aggregate to create a working surface that can also be dewatered with ordinary sumps and pumps set within it.

Dependent upon stream levels during construction, the excavations planned may penetrate saturated soils and groundwater, which will coincide with the stream levels in the immediate

project area. Common sump and pump techniques from within cofferdam sheets and behind sheetpile walls should be capable of limited depression and control of the water table at this site. The dewatering system must be designed and operated to assure that the system does not fail and allow groundwater to rise, possibly creating "quick" conditions at the bearing grades within the cofferdam or buoyant forces upon partially completed structures.

Sheet pile cantilever walls or enclosed cofferdams should be designed to achieve stability for varying water elevations that might occur during the construction process. The Contractor's dewatering plan, as well as any construction sheeting and shoring, should be designed by a Licensed Professional Engineer. The design should meet the requirements of 29 CFR Part 1926 Occupational Safety and Health Standards - Excavations for Type C Soils.

The structural fill used to backfill the abutment walls above the water table should consist of NYSDOT Section 304 Type 4 Processed Sand and Gravel material. The fill should be placed in loose layers no more than one (1) foot thick and each be compacted to not less than 95 percent of the material's maximum dry density determined through the procedures of ASTM D-1557, the Modified Proctor Compaction test.

The following parameters are recommended for use in the design of the bridge foundations, abutments, and wing walls;

Fill Parameters

1.	Overburden Unit Weight (Total)	=	125 lbs/Cu. Ft.
2.	Friction Angle of Soil	=	30 Degrees
3.	Coefficient of Active Earth pressure	=	0.33
4.	Coefficient of At-Rest Earth pressure	=	0.5
5.	Coefficient of Passive Earth pressure	=	3.0 (FS = 1.0)

Sand/Gravel/Silt Overburden Parameters

1.	Allowable Net Bearing Pressure Total	=	4,000 PSF
2.	Overburden Unit Weight (Total)	=	135 lbs/Cu. Ft.
3.	Friction Angle of Soil	=	32 Degrees
4.	Coefficient of Active Earth pressure	=	0.31
5.	Coefficient of At-Rest Earth pressure	=	0.47
6.	Coefficient of Passive Earth pressure	=	3.25 (FS = 1.0)

Abutment and sheet pile abutment walls should be designed to restrain lateral earth pressures calculated for the At-Rest Condition. Wingwalls and temporary cofferdams may be designed to resist Active Lateral Earth Pressures.

Settlement of the bridge's concrete filled sheet piled abutments or conventional spread foundations should occur in a semi-elastic manner as loads are actually applied and cease with each incremental loading of the foundations. We believe that the foundations will settle in total and differentially less than about one (1) inch, provided our recommendations concerning bearing grade preparation are followed. It should be understood that actual settlements will be dependent in great part upon the care exercised during bearing grade preparation.

Summary

This report was prepared for specific application to the project site and the construction planned. It was prepared on the basis of a limited number of investigation locations at the site. Subsurface conditions at other than the investigated locations may be different. We should be allowed the opportunity to review appropriate plans and specifications prior to their release for bidding. The Geotechnical Engineer should be retained to observe and test earthwork and bearing grades during construction. This report was prepared using methods and practices common to Geotechnical Engineering in the area at the time, no other warranties expressed or implied are made.

A sheet entitled "Important Information about your Geotechnical Engineering Report" prepared by the Association of Engineering Firms Practicing in the Geosciences is attached to this report. This sheet should never be separated from this report and be carefully reviewed as it sets the only context within which this report should be used.

We appreciate the opportunity to be of service. Should questions arise or if we may be of any other service, please contact us at your convenience.

Yours truly,
Dente Engineering, P.C.

Fred A. Dente, P.E.
President

Enclosures;

Important Information About Your

Geotechnical Engineering Report

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes

The following information is provided to help you manage your risks.

Geotechnical Services Are Performed for Specific Purposes, Persons, and Projects

Geotechnical engineers structure their services to meet the specific needs of their clients. A geotechnical engineering study conducted for a civil engineer may not fulfill the needs of a construction contractor or even another civil engineer. Because each geotechnical engineering study is unique, each geotechnical engineering report is unique, prepared *solely* for the client. No one except you should rely on your geotechnical engineering report without first conferring with the geotechnical engineer who prepared it. *And no one - not even you* - should apply the report for any purpose or project except the one originally contemplated.

Read the Full Report

Serious problems have occurred because those relying on a geotechnical engineering report did not read it all. Do not rely on an executive summary. Do not read selected elements only.

A Geotechnical Engineering Report Is Based on A Unique Set of Project-Specific Factors

Geotechnical engineers consider a number of unique, project-specific factors when establishing the scope of a study. Typical factors include: the client's goals, objectives, and risk management preferences; the general nature of the structure involved, its size, and configuration; the location of the structure on the site; and other planned or existing site improvements, such as access roads, parking lots, and underground utilities. Unless the geotechnical engineer who conducted the study specifically indicates otherwise, do not rely on a geotechnical engineering report that was:

- not prepared for you,
- not prepared for your project,
- not prepared for the specific site explored, or
- completed before important project changes were made.

Typical changes that can erode the reliability of an existing geotechnical engineering report include those that affect:

- the function of the proposed structure, as when it's changed from a parking garage to an office building, or from alight industrial plant to a refrigerated warehouse,
- elevation, configuration, location, orientation, or weight of the proposed structure,
- composition of the design team, or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project changes - even minor ones - and request an assessment of their impact. *Geotechnical engineers cannot accept responsibility or liability for problems that occur because their reports do not consider developments of which they were not informed.*

Subsurface Conditions Can Change

A geotechnical engineering report is based on conditions that existed at the time the study was performed. *Do not rely on a geotechnical engineering report* whose adequacy may have been affected by: the passage of time; by man-made events, such as construction on or adjacent to the site; or by natural events, such as floods, earthquakes, or groundwater fluctuations. *Always* contact the geotechnical engineer before applying the report to determine if it is still reliable. A minor amount of additional testing or analysis could prevent major problems.

Most Geotechnical Findings Are Professional Opinions

Site exploration identifies subsurface conditions only at those points where subsurface tests are conducted or samples are taken. Geotechnical engineers review field and laboratory data and then apply their professional judgment to render an opinion about subsurface conditions throughout the site. Actual subsurface conditions may differ-sometimes significantly from those indicated in your report. Retaining the geotechnical engineer who developed your report to provide construction observation is the most effective method of managing the risks associated with unanticipated conditions.

A Report's Recommendations Are *Not* Final

Do not overrely on the construction recommendations included in your report. *Those recommendations are not final*, because geotechnical engineers develop them principally from judgment and opinion. Geotechnical engineers can finalize their recommendations only by observing actual

subsurface conditions revealed during construction. The geotechnical engineer who developed your report cannot assume responsibility or liability for the report's recommendations if that engineer does not perform construction observation.

A Geotechnical Engineering Report Is Subject to Misinterpretation

Other design team members' misinterpretation of geotechnical engineering reports has resulted in costly problems. Lower that risk by having your geotechnical engineer confer with appropriate members of the design team after submitting the report. Also retain your geotechnical engineer to review pertinent elements of the design team's plans and specifications. Contractors can also misinterpret a geotechnical engineering report. Reduce that risk by having your geotechnical engineer participate in prebid and preconstruction conferences, and by providing construction observation.

Do Not Redraw the Engineer's Logs

Geotechnical engineers prepare final boring and testing logs based upon their interpretation of field logs and laboratory data. To prevent errors or omissions, the logs included in a geotechnical engineering report should *never* be redrawn for inclusion in architectural or other design drawings. Only photographic or electronic reproduction is acceptable, *but recognize that separating logs from the report can elevate risk.*

Give Contractors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can make contractors liable for unanticipated subsurface conditions by limiting what they provide for bid preparation. To help prevent costly problems, give contractors the complete geotechnical engineering report, *but* preface it with a clearly written letter of transmittal. In that letter, advise contractors that the report was not prepared for purposes of bid development and that the report's accuracy is limited; encourage them to confer with the geotechnical engineer who prepared the report (a modest fee may be required) and/or to conduct additional study to obtain the specific types of information they need or prefer. A prebid conference can also be valuable. *Be sure contractors have sufficient time* to perform additional study. Only then might you be in a position to give contractors the best information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions.

Read Responsibility Provisions Closely

Some clients, design professionals, and contractors do not recognize that geotechnical engineering is far less exact than other engineering disciplines. This lack of understanding has created unrealistic expectations that have led to disappointments, claims, and disputes. To help reduce the risk of such outcomes, geotechnical engineers commonly include a variety of explanatory provisions in their reports. Sometimes labeled "limitations" many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely.* Ask questions. Your geotechnical engineer should respond fully and frankly.

Geoenvironmental Concerns Are Not Covered

The equipment, techniques, and personnel used to perform a *geoenvironmental* study differ significantly from those used to perform a *geotechnical* study. For that reason, a geotechnical engineering report does not usually relate any geoenvironmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated environmental problems have led to numerous project failures.* If you have not yet obtained your own geoenvironmental information, ask your geotechnical consultant for risk management guidance. *Do not rely on an environmental report prepared for someone else.*

Obtain Professional Assistance To Deal with Mold

Diverse strategies can be applied during building design, construction, operation, and maintenance to prevent significant amounts of mold from growing on indoor surfaces. To be effective, all such strategies should be devised for the express purpose of mold prevention, integrated into a comprehensive plan, and executed with diligent oversight by a professional mold prevention consultant. Because just a small amount of water or moisture can lead to the development of severe mold infestations, a number of mold prevention strategies focus on keeping building surfaces dry. While groundwater, water infiltration, and similar issues may have been addressed as part of the geotechnical engineering study whose findings are conveyed in-this report, the geotechnical engineer in charge of this project is not a mold prevention consultant; ***none of the services performed in connection with the geotechnical engineer's study were designed or conducted for the purpose of mold prevention. Proper implementation of the recommendations conveyed in this report will not of itself be sufficient to prevent mold from growing in or on the structure involved.***

Rely on Your ASFE-Member Geotechnical Engineer For Additional Assistance

Membership in ASFE/The Best People on Earth exposes geotechnical engineers to a wide array of risk management techniques that can be of genuine benefit for everyone involved with a construction project. Confer with your ASFE-member geotechnical engineer for more information.

ASFE
The Best People on Earth

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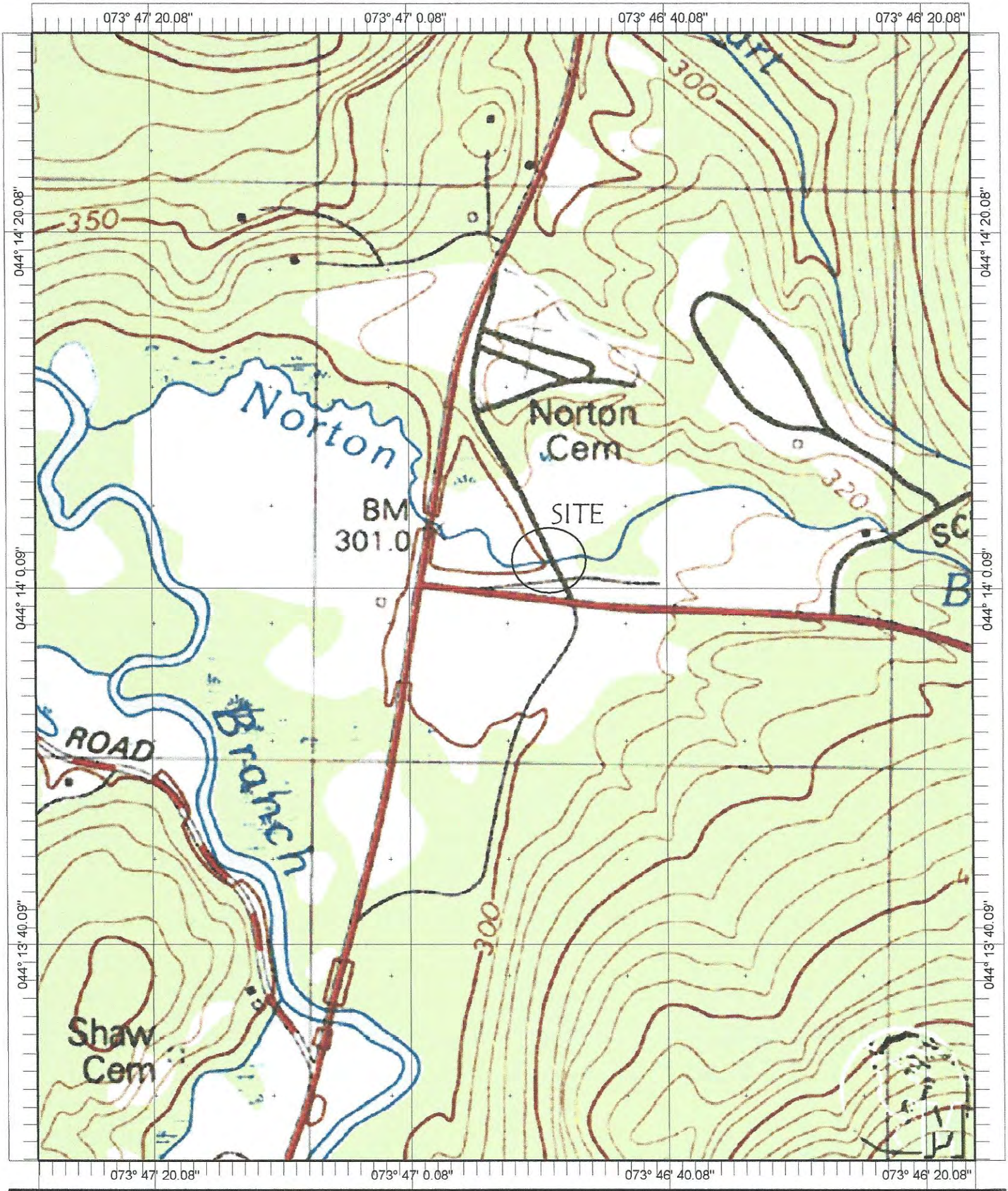
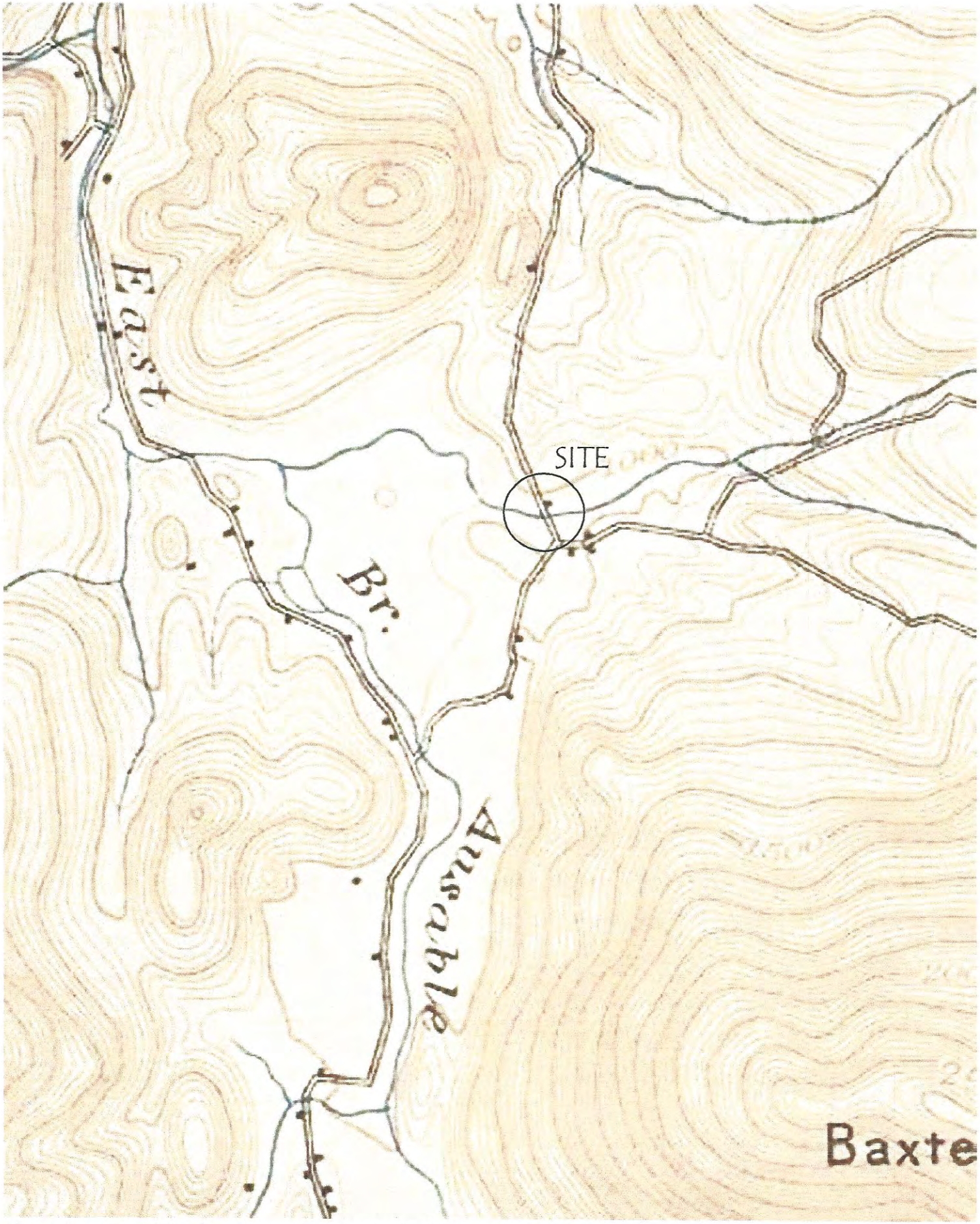


Name: KEENE VALLEY
Date: 11/21/113
Scale: 1 inch equals 666 feet

Location: 044° 13' 59.6" N 073° 46' 52.8" W
Caption: CEMETERY ROAD
KEENE, NEW YORK
FDE-13-208



Cemetery Road Bridge, Keene, New York 1895, FDE-13-208


N
Norton Brook
Cemetery Road
B-1
2.0'
4.0'
2.0'
B-2
6.0'
Flow
To Route 9N

INTERPRETATION OF SUBSURFACE LOGS

The Subsurface Logs present observations and the results of tests performed in the field by the Driller, Technicians, Geologists and Geotechnical Engineers as noted. Soil/Rock Classifications are made visually, unless otherwise noted, on a portion of the materials recovered through the sampling process and may not necessarily be representative of the materials between sampling intervals or locations.

The following defines some of the terms utilized in the preparation of the Subsurface Logs.

SOIL CLASSIFICATIONS

Soil Classifications are visual descriptions on the basis of the Unified Soil Classification ASTM D-2487 and USBR, 1973 with additional comments by weight of constituents by BUHRMASTER. The soil density or consistency is based on the penetration resistance determined by ASTM METHOD D1586. Soil Moisture of the recovered materials is described as DRY, MOIST, WET or SATURATED.

SIZE DESCRIPTION		RELATIVE DENSITY/CONSISTENCY (basis ASTM D1586)			
SOIL TYPE	PARTICLE SIZE	GRANULAR SOIL		COHESIVE SOIL	
BOULDER	> 12	DENSITY	BLOWS/FT.	CONSISTENCY	BLOWS/FT.
COBBLE	3" - 12"	LOOSE	< 10	VERY SOFT	< 3
GRAVEL-COARSE	3" - 3/4"	FIRM	11 - 30	SOFT	4 - 5
GRAVEL - FINE	3/4" - #4	COMPACT	31 - 50	MEDIUM	6 - 15
SAND - COARSE	#4 - #10	VERY COMPACT	50 +	STIFF	16 - 25
SAND - MEDIUM	#10 - #40			HARD	25 +
SAND - FINE	#40 - #200				
SILT/NONPLASTIC	< #200				
CLAY/PLASTIC	< #200				

SOIL STRUCTURE		RELATIVE PROPORTION OF SOIL TYPES	
STRUCTURE	DESCRIPTION	DESCRIPTION	% OF SAMPLE BY WEIGHT
LAYER	6" THICK OR GREATER	AND	35 - 50
SEAM	6" THICK OR LESS	SOME	20 - 35
PARTING	LESS THAN 1/4" THICK	LITTLE	10 - 20
VARVED	UNIFORM HORIZONTAL PARTINGS OR SEAMS	TRACE	LESS THAN 10

Note that the classification of soils or soil like materials is subject to the limitations imposed by the size of the sampler, the size of the sample and its degree of disturbance and moisture.

ROCK CLASSIFICATIONS

Rock Classifications are visual descriptions on the basis of the Driller's, Technician's, Geologist's or Geotechnical Engineer's observations of the coring activity and the recovered samples applying the following classifications.

CLASSIFICATION TERM	DESCRIPTION
VERY HARD	NOT SCRATCHED BY KNIFE
HARD	SCRATCHED WITH DIFFICULTY
MEDIUM HARD	SCRATCHED EASILY
SOFT	SCRATCHED WITH FINGERNAIL
VERY WEATHERED	DISINTEGRATED WITH NUMEROUS SOIL SEAM
WEATHERED	SLIGHT DISINTEGRATION, STAINING, NO SEAMS
SOUND	NO EVIDENCE OF ABOVE
MASSIVE	ROCK LAYER GREATER THAN 36" THICK
THICK BEDDED	ROCK LAYER 12" - 36"
BEDDED	ROCK LAYER 4" - 12"
THIN BEDDED	ROCK LAYER 1" - 4"
LAMINATED	ROCK LAYER LESS THAN 1"
FRACTURES	NATURAL BREAKS AT SOME ANGLE TO BEDS

Core sample recovery is expressed as percent recovered of total sampled. The ROCK QUALITY DESIGNATION (RQD) is the total length of core sample pieces exceeding 4" length divided by the total core sample length for N size cored.

GENERAL

- Soil and Rock classifications are made visually on samples recovered. The presence of Gravel, Cobbles and Boulders will influence sample recovery classification density/consistency determination.
- Groundwater, if encountered, was measured and its depth recorded at the time and under the conditions as noted.
- Topsoil or pavements, if present, were measured and recorded at the time and under the conditions as noted.
- Stratification Lines are approximate boundaries between soil types. These transitions may be gradual or distinct and are approximated.

DENTE ENGINEERING, P.C.	SUBSURFACE LOG **B-1.1**

PROJECT: CEMETERY ROAD BRIDGE	**DATE**	START: 11/8/13	FINISH: 11/8/13
LOCATION: Town of Keene, New York	**METHODS:** 3-1/4" I.D. Hollow Stem Augers		
CLIENT: Essex County DPW	with ASTM D1586 Sampling Methods		
JOB NUMBER: FDE-13-208	**SURFACE ELEVATION:**		
DRILL TYPE: CME 45C Trailer Mounted Rig	**CLASSIFICATION:** E. Gravelle, PE		

SAMPLE		BLOWS ON SAMPLER					CLASSIFICATION / OBSERVATIONS
DEPTH	#	6"	12"	18"	24"	N	
							± 1.5" Asphalt and ± 3" Granular Base
	1	-	6				**FILL:** Grayish Brown F-C SAND and
				5	1	6	GRAVEL, trace silt, Moist
	2	4	35				Dark Brown F-M SAND, trace silt with
				6	4	41	seams Fine Sand Little Silt, Moist
5'	3	15	39				Gray GRAVEL, Some F-C Sand, trace
				25	50/.3'	64	silt, Wet
							(MOIST TO WET, LOOSE TO V. COMPACT)
10'	4	6	7				Decayed WOOD to Brown F-C SAND and
				11	13	18	GRAVEL, trace silt, Saturated
15'	5	6	8				grades Brown SILT with thin seams Gray
				7	7	15	Fine SAND
20'	6	2	8				Similar with seam Brown F-M SAND at
				16	14	24	21' depth
25'	7	4	3				grades Brown SILT
				4	6	7	**(SATURATED, FIRM TO LOOSE)**

DENTE ENGINEERING, P.C.	SUBSURFACE LOG **B-1.2**

PROJECT: CEMETERY ROAD BRIDGE	**DATE**	START: 11/8/13	FINISH: 11/8/13

LOCATION: Town of Keene, New York	**METHODS:** 3-1/4" I.D. Hollow Stem Augers
CLIENT: Essex County DPW	with ASTM D1586 Sampling Methods
JOB NUMBER: FDE-13-208	**SURFACE ELEVATION:**
DRILL TYPE: CME 45C Trailer Mounted Rig	**CLASSIFICATION:** E. Gravelle, PE

SAMPLE		BLOWS ON SAMPLER					CLASSIFICATION / OBSERVATIONS
DEPTH	#	6"	12"	18"	24"	N	
	8	6	4				Tan SILT, trace fine sand
				4	7	8	
35'	9	3	2				grades Light Gray
				2	2	4	
40'	10	2	3				grades Some Very Fine Sand
				4	4	7	
							(SATURATED, LOOSE)
45'	11	1	2				Gray F-M SAND, trace silt
				2	8	4	**(SATURATED, LOOSE)**
50'	12	10	24				Grayish Brown SILT
				21	24	45	**(SATURATED, COMPACT)**
							Boring Ended at 52.0'
55'							Groundwater in augers at 5.7' below grade after sample #3 was obtained.

DENTE ENGINEERING, P.C.	SUBSURFACE LOG **B-2.1**

PROJECT: CEMETERY ROAD BRIDGE	**DATE**	START: 11/8/13	FINISH: 11/8/13
LOCATION: Town of Keene, New York	**METHODS:** 3-1/4" I.D. Hollow Stem Augers		
CLIENT: Essex County DPW	with ASTM D1586 Sampling Methods		
JOB NUMBER: FDE-13-208	**SURFACE ELEVATION:**		
DRILL TYPE: CME 45C Trailer Mounted Rig	**CLASSIFICATION:** E. Gravelle, PE		

SAMPLE		BLOWS ON SAMPLER					CLASSIFICATION / OBSERVATIONS
DEPTH	#	6"	12"	18"	24"	N	
							± 3" Asphalt, ± 2" Sand, ±4" Asphalt
	1	1	2				**FILL:** Lt. Brown Fine SAND, trace silt, Moist
				1	1	3	
	2	2	2				Grades Brown F-M SAND, trace silt, Wet
5'				1	2	3	**(MOIST TO WET, LOOSE)**
	3	3	7				Brown GRAVEL and F-C SAND, trace silt
				15	20	22	and organic matter, Saturated
10'	4	7	10				grades Some F-C Sand
				15	15	25	
15'	5	7	4				grades Grayish Brown F-C SAND and
				5	4	9	GRAVEL, trace silt
							(SATURATED, FIRM TO LOOSE)
20'	6	5	7				Tan Varved SILT with seam Brown Fine to
				15	12	22	Medium SAND, Saturated
25'	7	2	4				grades Grayish Brown SILT, trace fine sand
				2	3	6	

DENTE ENGINEERING, P.C.	SUBSURFACE LOG **B-2.2**

PROJECT: CEMETERY ROAD BRIDGE	**DATE**	START: 11/8/13	FINISH: 11/8/13
LOCATION: Town of Keene, New York	**METHODS:** 3-1/4" I.D. Hollow Stem Augers		
CLIENT: Essex County DPW	with ASTM D1586 Sampling Methods		
JOB NUMBER: FDE-13-208	**SURFACE ELEVATION:**		
DRILL TYPE: CME 45C Trailer Mounted Rig	**CLASSIFICATION:** E. Gravelle, PE		

SAMPLE		BLOWS ON SAMPLER					CLASSIFICATION / OBSERVATIONS
DEPTH	#	6"	12"	18"	24"	N	
	8	3	5				Light Grayish Brown SILT, Little Very Fine Sand, Saturated
				6	5	11	
35'	9	3	3				Similar
				2	2	5	
40'	10	2	3				Similar
				2	3	5	
							(SATURATED, FIRM TO LOOSE)
45'							Boring Ended at 45.0'
							Groundwater in augers at 5.3' below grade after sample #3 was obtained.
50'							Boring ended at 45.0' with sand in augers.
55'