ADDENDUM NO. 1

2017 - Hulls Falls Road Embankment Stabilization

Essex County, NY

January 17, 2017

TO ALL HOLDERS OF BIDDING DOCUMENTS:

This Addendum, issued to bid document holders of record, indicates clarifications to the bid documents for the *2017 - Hulls Falls Road Embankment Stabilization* project. All clarifications described herein shall be incorporated into the Contractor's bid proposal. This Addendum is part of the Contract Documents. Adjustments required by each item shall be understood to apply to all document references affected by the clarifications described.

1. **General:** A Pre-Bid meeting was held for the project at the sites on January 13, 2017 at 10:00 AM. Minutes from the meeting are enclosed and are a part of this Addendum and the Contract Documents.

2. **General:** A copy of the Geotechnical Report for the project is attached to this Addendum for reference only. This report is provided for informational purposes and shall not be considered to be part of the contract documents. If distributed to others by the bidder or contractor, they must be delivered in their entirety only.

   It is the bidder's responsibility to determine if the information contained in these geotechnical reports is adequate for bidding purposes. The bidders may make their own investigations, tests and analyses for use in bid preparation if additional information is required. Contractors will not be relieved of any of their obligations for performance of the work for the project, nor shall they be entitled to any additional compensation on the premise of differing subsurface conditions or soils types which may be encountered.

   Individual subsurface boring logs were prepared based upon the visual classifications and laboratory testing. The individual subsurface logs and keys explaining the terms used in their preparation are presented in the geotechnical reports and should be reviewed for a description of the conditions encountered at the specific test boring locations. It should be understood that conditions are only known at the specific depths and locations sampled. Conditions at other depths and locations may differ. Determinations of earthwork quantities for bidding must not rely solely on the soil strata thicknesses measured at the discrete test boring locations completed for this investigation. The bidder should perform their own explorations as needed to obtain representative thicknesses of soil layers and strata as required to prepare their bids for the work.

3. **General:** There are no DBE/WBE/MBE goals for this project.

4. **General:** It is the contractor's responsibility locate a disposal site/sites for demolition waste materials and to verify that all disposal sites have the appropriate regulatory agency permits for disposal of the construction waste or excess soil materials.

END OF ADDENDUM NO. 1
(attachments)

Pre-Bid Meeting Minutes

SCHODER RIVERS ASSOCIATES
Consulting Engineers, P.C.

Evergreen Professional Park
453 Dixon Road, Suite 7, Bldg. 3
Queensbury, NY 12804
Tel. (518) 761-0417
Fax (518) 761-0513

PRE-BID MEETING MINUTES

Report Date: January 17, 2017

Project: Hulls Falls Road Embankment Stabilization

Attending:
Matthew Huntington, PE - Schoder Rivers Assoc.
Gary Rancour - Essex Co. DPW
Gary Olcott - Adirondak Concrete
Chris Huchro - John W. Sheehan & Sons.
Wayne Van Vackenburgh - WM. Schultz
Matt Schmitt - Bette & Cring
Darin Cooper - Rifenberg Construction
John Ostrander - Winn Construction
Jeff Dziarcak - Winn Construction
Donald Beaton - Luck Bros. Construction
Peter Reale - Reale Construction Co.
Jon Sprague - Reale Construction Co.
Eric Deyopugh - Filler Excavating
Sanford Eruysal - Prime Highway Contractors
(Copy of attendance sheet is attached for information)

Distribution: Via posting on the Essex County Website as a part of Addendum No. 1 for access by all holders of bidding documents.

A scheduled pre-bid meeting was held for the above referenced project on January 13, 2017 at 10:00AM at the project site. The following items were discussed:

1. Huntington provided a general summary of the overall scope of work for the project.

2. The County will provide and install roadway closure and detour signage. Closure barricades and lights shall be furnished and installed by the contractor in accordance with the contract documents.

3. Utility company coordination shall be by the County.

4. Removal of trees indicated as to be removed on the Drawings shall be by the Contractor.

5. Rancour reviewed the pre-blast survey requirements for rock excavation and stated the awarded contract will include an additional $50,000 allowance for the repair/replacement of the potable water well on the property owned by Edward and Barbara M. Hale should any damage occur to the well as result of blasting operations.

The meeting adjourned at 10:30 AM.

Respectfully submitted:

Matthew Huntington, PE
Sr. Project Engineer

PREBID MEETING ATTENDANCE SHEET

Project: Hulls Falls Road Embankment Stabilization   Date: 1/13/17   Job No. 15-880.12

NAME	COMPANY	PHONE	EMAIL
Gary OLcott	ADK Concrete	518-572 8806	golcottjR @gmail.com
Chris Huchro	Sheehan	518 963-4303	sheehansons @ willex.com
WAYNE VAN VALKENBURGH	WM. SCHULTZ	518-365-8613	WVANVALKENBURGH@ WMSCHULTZ.com
Donald Beaton	Lock Bros, Inc	361-4321	dfbeaton@ lockbros.com
JEFF DZIARCAK	Winn Construction	221-1116	jdziarcak@winnconst.com
John Ostrander	Winn Const.	365-6296	jostrander@winnconst.com
Matt Schmitt	Botto + Crowe	518-213-1010	mschmitt@bottocrowe.com
Sanford Eruysal	Prime Highway contractors	518 459-4076	s.eruysal@ primehighway.com
Peter Reale	Reale Const Co	585-6782	realep @realeconstruction.com
[illegible]	"	"	"
Eric Deyo-Hugh	Fuller Excavating	518 834 4617	eric@fullerexcavating.com
DARIN COOPER	RIFENBURG CONST.	518 545 8477	DCOOPER@RIFENBURG.com

Geotechnical Report

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
Fax 716-648-3521

July 21, 2016

Mr. Jim Dougan
Essex County DPW
8053 Route 9
Elizabethtown, NY 12932

Re: Hulls Falls Road Stabilization
Keene, New York
File No. FDE-12-135R

Gentlemen:

Per your request, Dente Engineering conducted an investigation of the subsurface conditions along that portion of Hulls Falls Road which suffered a slope failure in the fall of 2011 during and after the flooding caused by Tropical Storm Irene.

In general, our scope of services for the study included;

- A reconnaissance of the site and the completion of eight (8) test borings along the alignment of the roadway,
- Completing moisture content and particle size analyses on several of the overburden samples retrieved,
- The evaluation of the subsurface information collected and the preparation of this report, which presents preliminary recommendations for the design and construction of the geotechnical aspects of the project's planned retaining walls and associated rock cuts.

It should be understood that this letter report is preliminary. As the design of this project progresses and plans, grades and retaining wall type and loading criteria become finalized, we should be afforded an opportunity to review and evaluate the design and alter or offer supplemental recommendations to those presented in this preliminary report.

It should also be understood that this report was prepared on the basis of the information supplied to us and the results of a limited number of explorations performed for the field investigation. The borings were advanced at specific locations and the overburden soils and bedrock sampled through limited and specific depths. Conditions are only known at the locations and through the depths investigated. Conditions at other locations and depths may be different and these differences may impact upon the conclusions reached and the recommendations offered. For this reason, among others, we should be retained to perform review of the design as it progresses and any construction actually performed.

This report was prepared on the basis of generally accepted Geotechnical Engineering Practices. No other warranty or assertion, either expressed or implied, is made. A sheet entitled "Important Information about your Geotechnical Engineering Report" prepared by the Association of Engineering Firms Practicing in the Geosciences is attached. The sheet should never be separated from the report and should be carefully reviewed as it sets the only context within which this report should be used.

The Contractors bidding the work must review and understand our report. The report should be made available for information on factual data only and must not be interpreted as a warranty of subsurface conditions, whether interpreted from written text, subsurface logs or other data. Should the data contained in the report not be adequate for the Contractor's purposes, the Contractors may make their own investigations, tests and analyses for use in bid preparation.

Site and Project Description

The portion of Hulls Falls Road which is the subject of this study lies about ½ mile south of its intersection with NYS Route 73 in the town of Keene. The general area is sparsely populated and consists of wooded mountainous terrain with steep slopes within the Ausable River Gorge along the north side of Hulls Falls Road. The site is depicted on the attached portions of the current and historic 1898 USGS Topographic Map of the Lake Placid Quadrangle.

The roadway follows the south shore of the Ausable and in the study area appears to have been constructed by cutting into the steeply sloped gorge and placing the excavated rock and soil as fill. The cut above the road is exposed rock with soil and vegetation standing at what appears to be a slope of about 4V on 1H where rock and between 1.5V to 2V on 1H where soils. The fill apparently placed downslope of the road is retained by grouted rocks in areas and at other locations vegetation, both brush and trees.

As we understand it, during and after the flooding caused by Tropical Storm Irene, the slope below the road was eroded in areas and with the vegetation and some rock removed, the slope failed and the shoulder and some portion of the north travel lane

was lost. The road is passable now only by its southern lane and erosion of the slope continues following rainfall and runoff events.
Photographs of the roadway and slope areas are attached.

Subsurface Conditions

As a basis for this study, eight (8) test borings were completed at the approximate locations depicted on the attached Subsurface Investigation Plan. The investigated locations were approximately located in the field through tape measurements relative to existing site features and their associated ground surface elevations were interpolated from survey mapping provided to us and thus should be considered approximate.

The test borings were advanced using two rotary drill rigs that employed flush joint casing or hollow stem augers to drill and case the holes through the overburden. Overburden soils were sampled and their relative density was determined through the procedures of ASTM D-1586. Bedrock was core sampled at all locations in general accordance with ASTM D-2113.

Subsurface logs were prepared for the borings by a Geotechnician and are attached to this report, together with a sheet explaining the terms used in their preparation. The subsurface logs should be reviewed for the specific conditions encountered at the investigated locations.

It should be understood that conditions are only known at the depths and locations sampled. Conditions at other depths and locations may be different, especially where rock has been excavated and fill has been placed to create the site grades. Continuity in stratification often does not exist across sites. It should also be understood that groundwater measurements report conditions at the time, date and following the methods employed to investigate the site. These measurements may or may not reflect saturated zones which exist at the site seasonally, seasonal fluctuations in levels or the effects of adjacent land use.

In summary, the overburden conditions at the locations and within the depths investigated may be grouped into a single overburden strata above bedrock and beneath the roadway for discussion.

Fill & Outwash Soils mantle the site. The differentiation of these soil types between fill and native was not able to be performed because of the similarity of their composition. These fill and native soils were composed of brown, moist to wet, sand and gravel with cobbles and boulders which were judged to be of a loose to compact relative density on the basis of the standard penetration resistance of the split spoon sampler.

Bedrock was encountered beneath the overburden at all of the borings performed.

Bedrock outcrops were also noted in cuts above the roadway and in scarps, falls and cliffs beneath the roadway. In general, the bedrock surface appears to follow the surface topography and slope steeply down to the river. Rock cores recovered from the site were classified as gneiss. The rock was hard to very hard and weathered grading to less weathered with increasing depth beneath the rock surface. The rock in some areas was very fractured and broken, possibly as a result of previous blasting operations. The core recovery generally ranged between 92 and 100% with one core at location B-8 being 60%. The Rock Quality Designation's (RQD's) were measured between 7 and 40% with the lower measurements recorded along the western half of the study area.

It should be noted that the rock surface elevation that may be interpreted from the plan and subsurface logs is approximate, as the elevations noted on the logs are based on approximated exploration locations and surface elevations interpolated from survey maps provided to us.

Groundwater measurements were attempted upon the completion of each of the borings advanced for this study. Both core water and groundwater did not accumulate within the borings in the time allotted following their completion. It should be noted that wet and saturated soils were encountered at various depths and locations, which may be representative of perched water levels.

Based on this study, perched waters should be expected to be encountered within the overburden, at the bedrock surface and within fractured and weathered bedrock. Further, depending on the time of year, relatively significant quantities of water may seep from excavated soil and rock faces over time.

Discussion & Preliminary Recommendations

As we understand it, the County has retained Schoder Rivers Associates (SRA) of Queensbury to evaluate alternative means of stabilizing the roadway and restoring the roadway in the failed area. The alternatives developed by SRA as presented on their schematic sections dated August 22, 2012 entail the installation of a retaining wall along the river side of the road, lowering the roadway somewhat and enlarging the uphill shoulder and flattening the adjacent slope somewhat. The type of retaining wall has not been determined but may include a cast in place concrete or a segmental masonry type.

In general we believe the stabilization concept being evaluated by SRA is prudent. We recommend all new retaining walls planned at this site should extend to and bear upon bedrock. The selection as to which type of wall can be made on the basis of economics and aesthetics.

Retaining Walls

For seismic design purposes, Seismic Site Class "B" is applicable to the design of the retaining walls when founded upon bedrock at this project.

Excavating for the retaining wall foundations should be made with temporary side slopes for the site excavations no steeper than 1 vertical on 1.5 horizontal as required by OSHA regulations for a Type C soil. The excavations should be observed by a competent person to confirm acceptability of the temporary slopes.

All excavations should be completed so as not to undermine roads, utilities, slopes and/or foundations of adjacent structures. In general, excavations should not encroach within a zone of influence defined by a line extending out and down from the existing structures at an inclination of 1 vertical on 1.5 horizontal. Excavations that encroach within this zone should be sheeted, shored, and braced to support the soil and adjacent structure loads, or the structure should be underpinned to establish bearing at a deeper level.

In addition to implementing the above guidelines provided for temporary excavation of side slopes, the contractor should be requested to provide an excavation plan for review to confirm that slope stability concerns are not created.

The retaining wall foundation should bear directly on bedrock that is clean and near level. The foundation for the retaining wall may be designed using a Factored Bearing Resistance 20,000 PSF and a Nominal Bearing Resistance of 60,000 PSF. A Coefficient of Sliding Friction equal to 0.35 may be used. Assuming standard care is used in preparing the foundation bearing grades, we estimate that total foundation settlements should be negligible.

If a segmental type wall is considered, the reinforced zone behind the blocks should be carefully planned so as not to create a soil wedge above a sloping rock surface. In this regard we recommend that the excavated rock surface beneath the reinforced zone be no steeper than 1V on 8H and both perimeter and foundation level drains be provided.

Perimeter and foundation drains are recommended to intercept and divert surface infiltration which could otherwise become trapped in the retaining wall backfill above the bedrock. The drains may consist of a nominal four-inch diameter, slotted, corrugated HDPE pipe embedded at the base of a minimum 12-inch wide column of clean crushed stone (ASTM C33 Blend 57). The stone should be isolated from the wall backfill with a filter fabric (Mirafi 140N or equivalent).

The retaining walls should be designed to resist lateral earth pressures together with any applicable surcharge loads. Active earth pressures may be assumed for walls that are free to deflect as the backfill is placed and surcharge loads applied.

The following design parameters are provided to assist in determining the lateral wall loads for ordinary structural fill composed of NYSDOT Section 304 Type 3 or 4 materials when compacted to 95% of their maximum dry density determined through the Standard Proctor Test Method ASTM D-698.

Fill Parameters
- Overburden Unit Weight (Total) = 130 lbs/Cu. Ft.
- Friction Angle of Soil = 30 Degrees
- Coefficient of Active Earth pressure = 0.33
- Coefficient of At-Rest Earth pressure = 0.5
- Coefficient of Passive Earth pressure = 3.0
- Coefficient of Sliding Friction = 0.40
- Resistance Factor for Passive Resistance = 0.50
- Resistance Factor for Shear Resistance = 0.80

It may be beneficial to reduce the lateral loads on the walls by using clean crushed aggregate as backfill. This material would simplify the backfilling, provide a porous backfill medium and lessen the lateral loadings. If the stone is selected it should be an ASTM C33 Blend 57 material. The design parameters tabulated below may be used.

Crushed Stone as Fill Parameters
- Stone Unit Weight (Total) = 100 lbs/Cu. Ft.
- Friction Angle of Soil = 42 Degrees
- Coefficient of Active Earth pressure = 0.33
- Coefficient of At-Rest Earth pressure = 0.20
- Coefficient of Passive Earth pressure = 5.0
- Coefficient of Sliding Friction = 0.58
- Resistance Factor for Passive Resistance = 0.50
- Resistance Factor for Shear Resistance = 0.80

Excavated Slope

In general, the bedrock slopes downward to the river in the project area and its surface is expected to be erratic in elevation and its quality.

In general, rock cuts at this site with inclinations of about 4V on 1H or flatter should be globally stable. However, the rock surface will weather regardless of its final inclination and result in loose rock fragments and possibly larger blocks toppling to the toe. The selection of the rock face inclination along the study area will also be complicated by the sloping and variable overburden depth above the planned rock cut areas.

The toe of slope must be separated from the roadway shoulder by a rock fall collection ditch, as discussed subsequently. A rock fall collection ditch should be constructed along the toe of the rock slopes following the guidelines presented in the current FHWA Design Chart for the specific rock slope height and inclinations planned.

At the location of the rock/overburden interface, we recommend the overburden be stripped back about 5 feet from the rock face. A swale should be constructed along the crest of the rock slope to collect runoff and direct it away from the face. This will help to slow the weathering process.

The overburden excavations should be sloped at no steeper than 1V on 2H. Retaining walls may be employed to steepen the overburden slopes and thus limit the slope flattening required above the rock cut areas and the consequent loss of vegetation.

Considering the bedrock type, weathering and hardness observed in the test borings, it is our opinion that controlled blasting techniques will be required for the majority of the rock removals and enable the mostly timely and cost effective means and methods for the removal of large volumes of rock. Rock hammers, rippers and large excavators may prove economical for the shallow rock removal over local areas and where the rock is more severely weathered, however, progress will likely be slow.

The excavated rock face should be constructed at a uniform slope face. Accordingly, controlled blasting techniques, such as pre splitting, line drilling and cushion blasting will be required. Blasting should be performed by licensed contractors in a method that limits the peak particle velocity, as measured at the closest adjacent existing off-site structures and at the property lines, to a peak particle velocity of less than 1.5 inches per second. It should be noted that these are general guidelines to prevent damage to structures and greatly exceeds the limits at which humans will notice vibration (0.02 inches per second).

The excavated rock faces should be cleaned of all loose rock and soil and their condition thoroughly examined by the Engineer for the presence of unfavorable bed and joint orientations, which could produce unstable rock masses. These conditions will only become evident after the rock is excavated and, should they be found, they should be remediated at that time. For this reason, allowances must be made in the design documents and construction budget to account for potentially adverse joint and fracture orientations, which may require bolting, netting or that the slopes to be flattened in some areas.

The excavated gneiss may be used as rock fill provided that the soil and gravel sized materials do not exceed 30% of the total sample. The rock fill should be placed in layers no thicker than 1.5 feet and be compacted with a large self propelled vibratory sheepsfoot roller weighing about 40,000 pounds to break down the material, followed by self propelled vibratory drum compactors. The rock fill may be graded as steep as 1V on 2H.

Where the soil and gravel sized materials predominate, embankments composed of the excavated rock may be constructed when placed in lifts that are no more than 12-inches thick and be compacted to at least 95% of the Maximum Standard Proctor Density determined in accord with ASTM D-698 procedures using the equipment recommended above. The material must contain no pieces greater than about six-inches in size. These embankment slopes should be graded no steeper than 1V on 2.5H and they should be protected from erosion.

Closure

This report was prepared for specific application to the site and slope and roadway reconstruction as outlined in it. We should be retained to review plans and specifications applicable to our report to assure our recommendations have been interpreted and implemented as intended. This report was prepared using Geotechnical Engineering methods and practices generally in use in the area and at the time of its preparation. No other warranty, expressed or implied, is made.

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

Attachments:

Important Information about This

Geotechnical-Engineering Report

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

While you cannot eliminate all such risks, you can manage them. The following information is provided to help.

The Geoprofessional Business Association (GBA) has prepared this advisory to help you – assumedly a client representative – interpret and apply this geotechnical-engineering report as effectively as possible. In that way, clients can benefit from a lowered exposure to the subsurface problems that, for decades, have been a principal cause of construction delays, cost overruns, claims, and disputes. If you have questions or want more information about any of the issues discussed below, contact your GBA-member geotechnical engineer. Active involvement in the Geoprofessional Business Association exposes geotechnical engineers to a wide array of risk-confrontation techniques that can be of genuine benefit for everyone involved with a construction project.

Geotechnical-Engineering 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 given civil engineer will not likely meet the needs of a civil-works constructor or even a different civil engineer. Because each geotechnical-engineering study is unique, each geotechnical-engineering report is unique, prepared *solely* for the client. *Those who rely on a geotechnical-engineering report prepared for a different client can be seriously misled.* No one except authorized client representatives should rely on this geotechnical-engineering report without first conferring with the geotechnical engineer who prepared it. *And no one – not even you – should apply this report for any purpose or project except the one originally contemplated.*

Read this Report in Full

Costly problems have occurred because those relying on a geotechnical-engineering report did not read it *in its entirety*. Do not rely on an executive summary. Do not read selected elements only. *Read this report in full.*

You Need to Inform Your Geotechnical Engineer about Change

Your geotechnical engineer considered unique, project-specific factors when designing the study behind this report and developing the confirmation-dependent recommendations the report conveys. A few typical factors include:

- the client's goals, objectives, budget, schedule, and risk-management preferences;
- the general nature of the structure involved, its size, configuration, and performance criteria;
- the structure's location and orientation on the site; and
- other planned or existing site improvements, such as retaining walls, access roads, parking lots, and underground utilities.

Typical changes that could erode the reliability of this report include those that affect:

- the site's size or shape;
- the function of the proposed structure, as when it's changed from a parking garage to an office building, or from a light-industrial plant to a refrigerated warehouse;
- the elevation, configuration, location, orientation, or weight of the proposed structure;
- the 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. *The geotechnical engineer who prepared this report cannot accept responsibility or liability for problems that arise because the geotechnical engineer was not informed about developments the engineer otherwise would have considered.*

This Report May Not Be Reliable

Do not rely on this report if your geotechnical engineer prepared it:

- for a different client;
- for a different project;
- for a different site (that may or may not include all or a portion of the original site); or
- before important events occurred at the site or adjacent to it; e.g., man-made events like construction or environmental remediation, or natural events like floods, droughts, earthquakes, or groundwater fluctuations.

Note, too, that it could be unwise to rely on a geotechnical-engineering report whose reliability may have been affected by the passage of time, because of factors like changed subsurface conditions; new or modified codes, standards, or regulations; or new techniques or tools. *If your geotechnical engineer has not indicated an "apply-by" date on the report, ask what it should be*, and, in general, *if you are the least bit uncertain* about the continued reliability of this report, contact your geotechnical engineer before applying it. A minor amount of additional testing or analysis – if any is required at all – could prevent major problems.

Most of the "Findings" Related in This Report Are Professional Opinions

Before construction begins, geotechnical engineers explore a site's subsurface through various sampling and testing procedures. *Geotechnical engineers can observe actual subsurface conditions only at those specific locations where sampling and testing were performed.* The data derived from that sampling and testing were reviewed by your geotechnical engineer, who then applied professional judgment to form opinions about subsurface conditions throughout the site. Actual sitewide-subsurface conditions may differ – maybe significantly – from those indicated in this report. Confront that risk by retaining your geotechnical engineer to serve on the design team from project start to project finish, so the individual can provide informed guidance quickly, whenever needed.

This Report's Recommendations Are Confirmation-Dependent

The recommendations included in this report – including any options or alternatives – are confirmation-dependent. In other words, *they are not final*, because the geotechnical engineer who developed them relied heavily on judgment and opinion to do so. Your geotechnical engineer can finalize the recommendations *only after observing actual subsurface conditions* revealed during construction. If through observation your geotechnical engineer confirms that the conditions assumed to exist actually do exist, the recommendations can be relied upon, assuming no other changes have occurred. *The geotechnical engineer who prepared this report cannot assume responsibility or liability for confirmation-dependent recommendations if you fail to retain that engineer to perform construction observation.*

This Report Could Be Misinterpreted

Other design professionals' misinterpretation of geotechnical-engineering reports has resulted in costly problems. Confront that risk by having your geotechnical engineer serve as a full-time member of the design team, to:

- confer with other design-team members,
- help develop specifications,
- review pertinent elements of other design professionals' plans and specifications, and
- be on hand quickly whenever geotechnical-engineering guidance is needed.

You should also confront the risk of constructors misinterpreting this report. Do so by retaining your geotechnical engineer to participate in prebid and preconstruction conferences and to perform construction observation.

Give Constructors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can shift unanticipated-subsurface-conditions liability to constructors by limiting the information they provide for bid preparation. To help prevent the costly, contentious problems this practice has caused, include the complete geotechnical-engineering report, along with any attachments or appendices, with your contract documents, *but be certain to note conspicuously that you've included the material for informational purposes only.* To avoid misunderstanding, you may also want to note that "informational purposes" means constructors have no right to rely on the interpretations, opinions, conclusions, or recommendations in the report, but they may rely on the factual data relative to the specific times, locations, and depths/elevations referenced. Be certain that constructors know they may learn about specific project requirements, including options selected from the report, *only* from the design drawings and specifications. Remind constructors that they may perform their own studies if they want to, and *be sure to allow enough time* to permit them to do so. Only then might you be in a position to give constructors the information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions. Conducting prebid and preconstruction conferences can also be valuable in this respect.

Read Responsibility Provisions Closely

Some client representatives, design professionals, and constructors do not realize that geotechnical engineering is far less exact than other engineering disciplines. That lack of understanding has nurtured unrealistic expectations that have resulted in disappointments, delays, cost overruns, claims, and disputes. To confront that risk, geotechnical engineers commonly include 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

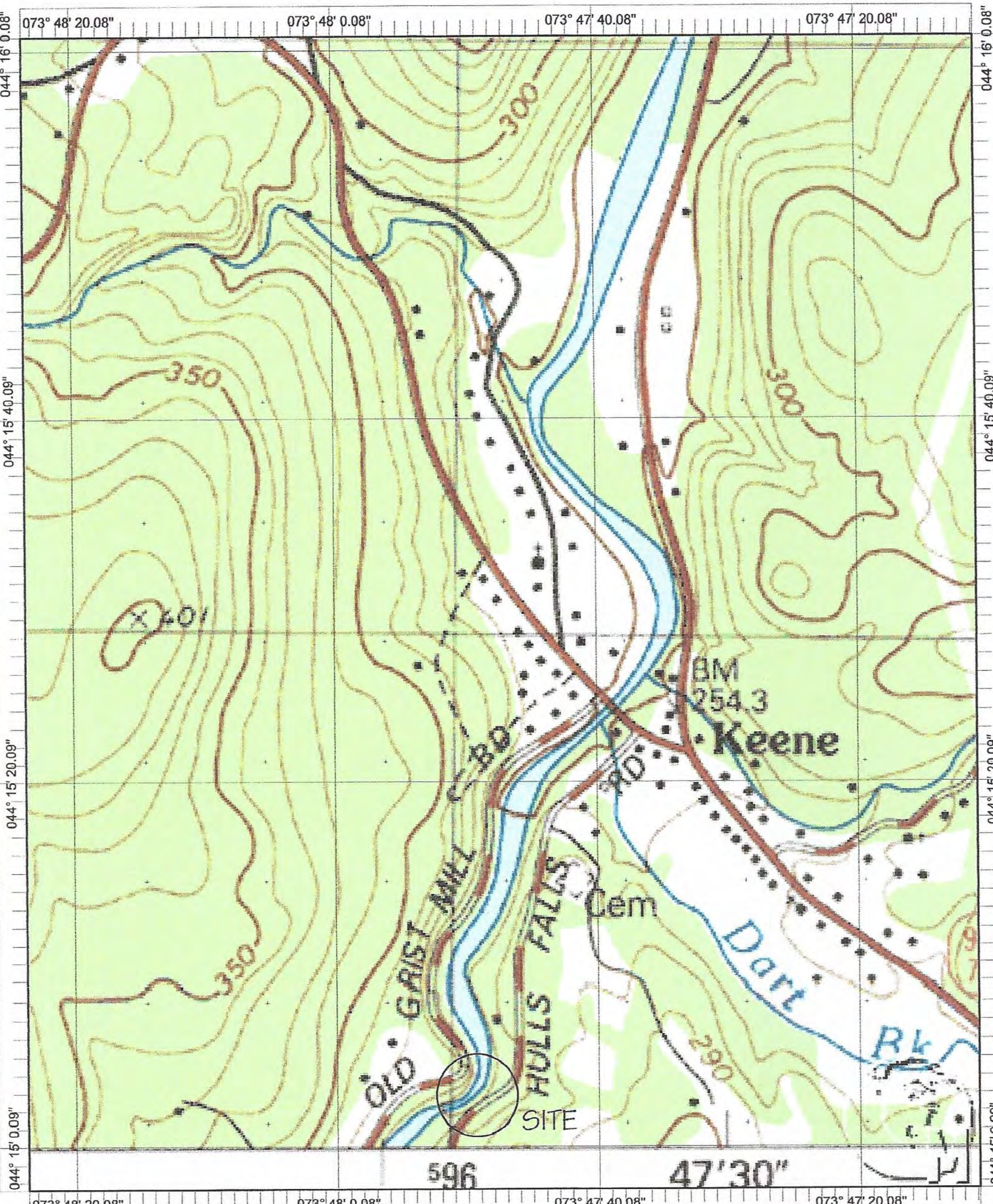
The personnel, equipment, and techniques used to perform an environmental study – e.g., a "phase-one" or "phase-two" environmental site assessment – differ significantly from those used to perform a geotechnical-engineering study. For that reason, a geotechnical-engineering report does not usually relate any environmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated subsurface environmental problems have led to project failures.* If you have not yet obtained your own environmental information, ask your geotechnical consultant for risk-management guidance. As a general rule, *do not rely on an environmental report prepared for a different client, site, or project, or that is more than six months old.*

Obtain Professional Assistance to Deal with Moisture Infiltration and Mold

While your geotechnical engineer may have addressed groundwater, water infiltration, or similar issues in this report, none of the engineer's services were designed, conducted, or intended to prevent uncontrolled migration of moisture – including water vapor – from the soil through building slabs and walls and into the building interior, where it can cause mold growth and material-performance deficiencies. Accordingly, ***proper implementation of the geotechnical engineer's recommendations will not of itself be sufficient to prevent moisture infiltration.*** Confront the risk of moisture infiltration by including building-envelope or mold specialists on the design team. ***Geotechnical engineers are not building-envelope or mold specialists.***

GEOPROFESSIONAL
BUSINESS
ASSOCIATION

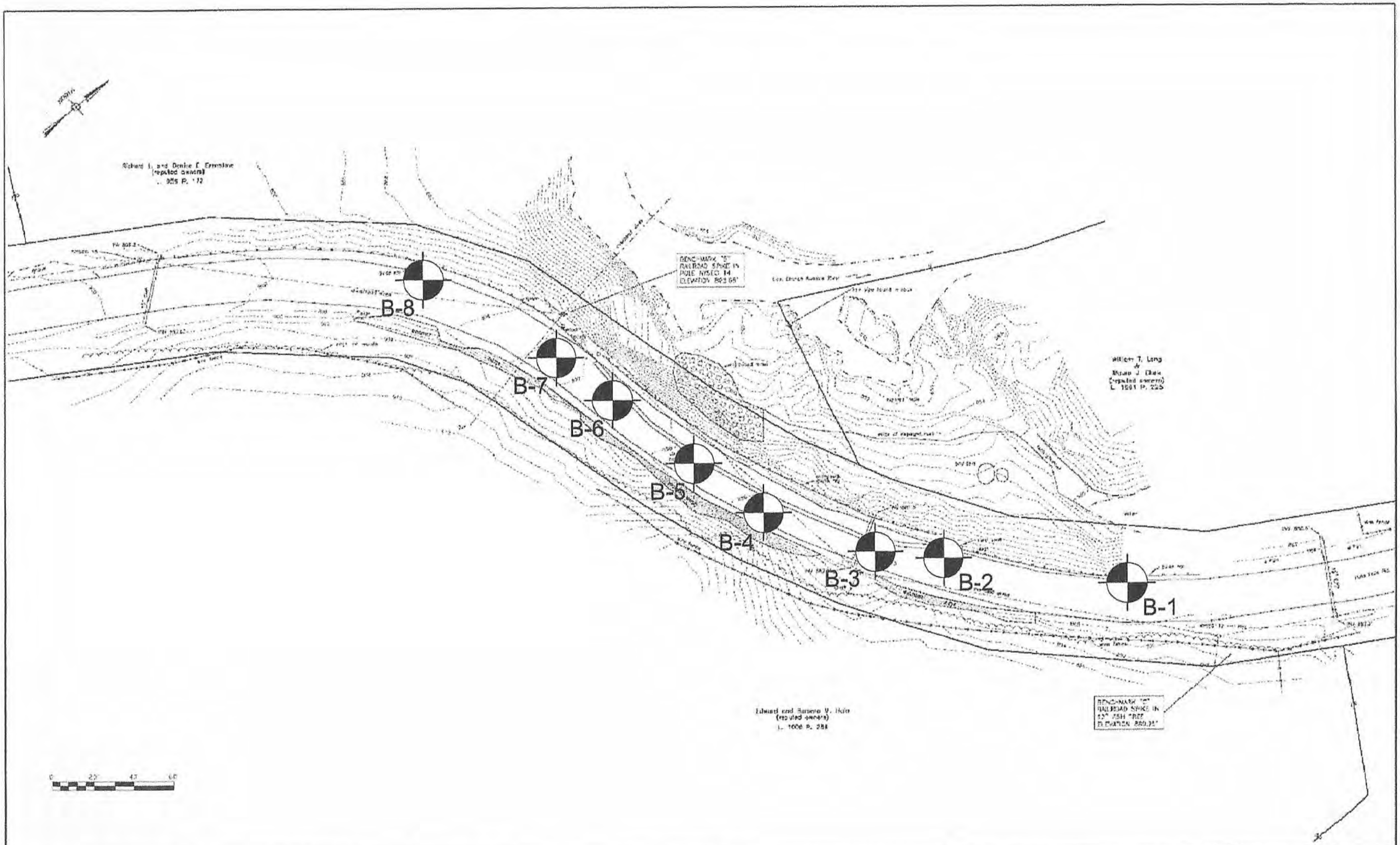
Telephone: 301/565-2733
e-mail: info@geoprofessional.org www.geoprofessional.org



Name: LAKE PLACID
Date: 8/3/112
Scale: 1 inch equals 666 feet

Location: 044° 15' 29.2" N 073° 47' 47.4" W
Caption: HULLS FALLS ROAD
KEENE, NEW YORK
FDE-12-135

Hulls Falls Road Stabilization, Keene, New York 1898, FDE-12-135



HULLS FALLS ROAD STABILIZATION
KEENE, NEW YORK
SUBSURFACE INVESTIGATION PLAN
DRAWN BY: N/A
SCALE: N/A
DATE: AUGUST 6, 2012

LEGEND

APPROXIMATE SOIL BORING LOCATION

DENTE ENGINEERING

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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	
		DENSITY	BLOWS/FT.	CONSISTENCY	BLOWS/FT.
BOULDER	> 12	LOOSE	< 10	VERY SOFT	< 3
COBBLE	3" - 12"	FIRM	11 - 30	SOFT	4 - 5
GRAVEL-COARSE	3" - 3/4"	COMPACT	31 - 50	MEDIUM	6 - 15
GRAVEL - FINE	3/4" - #4	VERY COMPACT	50 +	STIFF	16 - 25
SAND - COARSE	#4 - #10			HARD	25 +
SAND - MEDIUM	#10 - #40				
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

PROJECT: Hulls Falls Road Stabilization	**DATE**	START: 7/30/12	FINISH: 7/30/12

LOCATION: Keene, New York	**METHODS:** 3 1/4" Hollow Stem Augers with
CLIENT: Essex County DPW	ASTM D1586 Drilling Methods
JOB NUMBER: FDE-12-135	**SURFACE ELEVATION:** +/- 885.0'
DRILL TYPE: CME 45C	**CLASSIFICATION:** O.Burns

SAMPLE		BLOWS ON SAMPLER					CLASSIFICATION / OBSERVATIONS
DEPTH	#	6"	12"	18"	24"	N	Asphalt/Base
	1	2	1				Brown F-C SAND and GRAVEL, trace silt
				2	15	3	(WET)
	2	36	50/.4			50+	cobble noted
5'	3	50/.4				50+	
							(WET, LOOSE TO VERY COMPACT)
10'							White/Brown, Hard, Weathered GNEISS
		Core Run #1 9.0'-14.0' REC=94% RQD=28%					
15'							End of boring 14.0' depth.
20'							
25'							
30'							

DENTE ENGINEERING, P.C.	SUBSURFACE LOG B-2

PROJECT: Hulls Falls Road Stabilization	**DATE**	START: 7/30/12	FINISH: 7/30/12

LOCATION: Keene, New York	**METHODS:** 3 1/4" Hollow Stem Augers with
CLIENT: Essex County DPW	ASTM D1586 Drilling Methods
JOB NUMBER: FDE-12-135	**SURFACE ELEVATION:** +/- 885.0'
DRILL TYPE: CME 45C	**CLASSIFICATION:** O.Burns

SAMPLE		BLOWS ON SAMPLER					CLASSIFICATION / OBSERVATIONS
DEPTH	#	6"	12"	18"	24"	N	Asphalt/Base
	1	6	19				Brown F-C SAND and GRAVEL, trace silt
				50/.4		69+	**(MOIST, VERY COMPACT)**
5'		Core Run #1 3.0'-8.0' REC=98% RQD=33%					White/Brown, Hard, GNEISS with Occasional High Angle and Horizontal Fractures
10'							End of boring 8.0' depth.
15'							
20'							
25'							
30'							

DENTE ENGINEERING, P.C.	SUBSURFACE LOG B-3

PROJECT: Hulls Falls Road Stabilization	**DATE**	START: 7/31/12	FINISH: 7/31/12

LOCATION: Keene, New York	**METHODS:** 3 1/4" Hollow Stem Augers with
CLIENT: Essex County DPW	ASTM D1586 Drilling Methods
JOB NUMBER: FDE-12-135	**SURFACE ELEVATION:** +/- 885.0'
DRILL TYPE: CME 45C	**CLASSIFICATION:** O.Burns

SAMPLE		BLOWS ON SAMPLER					CLASSIFICATION / OBSERVATIONS
DEPTH	#	6"	12"	18"	24"	N	Asphalt/Base
	1	4	7				Dark Brown to Brown F-C SAND and
				10	13	17	GRAVEL, Little Silt (MOIST)
	2	9	5				
				7	50/.4	12	
5'							**(MOIST, FIRM)**
		Core Run #1 6.0'-11.0' REC=100% RQD=44%					White/Brown, Hard, GNEISS with Significant Fracturing and Little Weathering
10'							
							End of boring 11.0' depth.
15'							
20'							
25'							
30'							

DENTE ENGINEERING, P.C.

SUBSURFACE LOG B-4

PROJECT: Hulls Falls Road Stabilization	**DATE**	START: 7/31/12	FINISH: 7/31/12

LOCATION: Keene, New York	**METHODS:** 3 1/4" Hollow Stem Augers with
CLIENT: Essex County DPW	ASTM D1586 Drilling Methods
JOB NUMBER: FDE-12-135	**SURFACE ELEVATION:** +/- 885.5'
DRILL TYPE: CME 45C	**CLASSIFICATION:** O.Burns

SAMPLE		BLOWS ON SAMPLER					CLASSIFICATION / OBSERVATIONS
DEPTH	#	6"	12"	18"	24"	N	Asphalt/Base
							Brown F-C SAND and GRAVEL, Little Silt
	1	5	11				
				11	50/.4	22	
							(MOIST, FIRM)
							- - - - - - - - - - - - - - - - - - - -
5'							Gray, Very Hard to Brown/Gray, Weathered and Fractured GNEISS
		Core Run #1 4.5'-9.5' REC=92% RQD=38%					
10'							
							End of boring 9.5' depth.
15'							
20'							
25'							
30'							

DENTE ENGINEERING, P.C.	SUBSURFACE LOG B-5

PROJECT: Hulls Falls Road Stabilization	**DATE**	START: 7/31/12	FINISH: 7/31/12

LOCATION: Keene, New York	**METHODS:** 3 1/4" Hollow Stem Augers with
CLIENT: Essex County DPW	ASTM D1586 Drilling Methods
JOB NUMBER: FDE-12-135	**SURFACE ELEVATION:** +/- 887.0'
DRILL TYPE: CME 45C	**CLASSIFICATION:** O.Burns

SAMPLE		BLOWS ON SAMPLER					CLASSIFICATION / OBSERVATIONS
DEPTH	#	6"	12"	18"	24"	N	Asphalt/Base
	1	8	9				Brown F-C SAND and GRAVEL, trace silt
				15	17	24	(MOIST)
	2	16	12				Grades Little Silt
				50/.4		62	**(MOIST, FIRM TO VERY COMPACT)**
5'							
							White/Brown, Very Hard, Weathered GNEISS with Vertical and Horizontal Fractures
		Core Run #1 5.5'-10.5' REC=96% RQD=7%					
10'							
							End of boring 10.5' depth.
15'							
20'							
25'							
30'							

DENTE ENGINEERING, P.C.	SUBSURFACE LOG B-6

PROJECT: Hulls Falls Road Stabilization	**DATE**	START: 8/1/12	FINISH: 8/1/12

LOCATION: Keene, New York	**METHODS:** 3 1/4" Hollow Stem Augers with
CLIENT: Essex County DPW	ASTM D1586 Drilling Methods
JOB NUMBER: FDE-12-135	**SURFACE ELEVATION:** +/- 890.5'
DRILL TYPE: CME 45C	**CLASSIFICATION:** O.Burns

SAMPLE		BLOWS ON SAMPLER					CLASSIFICATION / OBSERVATIONS
DEPTH	#	6"	12"	18"	24"	N	Asphalt/Base
	1	6	11				Brown F-C SAND and GRAVEL, trace silt
				19	30	30	(MOSIT)
	2	50/.4				50+	
							(MOIST, FIRM TO VERY COMPACT)
5'							
							White/Brown to Gray/Brown, Hard, Fractured and Weathered GNEISS
		Core Run #1 5.0'-10.0' REC=94% RQD=7%					
10'							
							End of boring 10.0' depth.
15'							
20'							
25'							
30'							

DENTE ENGINEERING, P.C.	SUBSURFACE LOG B-7

PROJECT: Hulls Falls Road Stabilization	**DATE**	START: 8/1/12	FINISH: 8/1/12

LOCATION: Keene, New York	**METHODS:** 3 1/4" Hollow Stem Augers with
CLIENT: Essex County DPW	ASTM D1586 Drilling Methods
JOB NUMBER: FDE-12-135	**SURFACE ELEVATION:** +/- 893.0'
DRILL TYPE: CME 55	**CLASSIFICATION:** O.Burns

SAMPLE		BLOWS ON SAMPLER					CLASSIFICATION / OBSERVATIONS
DEPTH	#	6"	12"	18"	24"	N	+/- 4" Asphalt, +/- 10" Base
	1	10	55				Brown F-C SAND and GRAVEL, trace silt
				75	63	130	**(MOIST, VERY COMPACT)**
							Brown/Gray GRAVEL, Some F-C Sand, trace silt
5'	2		21				
				50/.1		50+	**(WET, VERY COMPACT)**
							Brown/Gray, Hard, Weathered GNEISS with Significant Fracturing
		Core Run #1 6.0'-11.0' REC=94% RQD=40%					
10'							
							End of boring 11.0' depth.
15'							
20'							
25'							
30'							

DENTE ENGINEERING, P.C.	SUBSURFACE LOG B-8

PROJECT: Hulls Falls Road Stabilization	**DATE**	START: 7/31/12	FINISH: 7/31/12

LOCATION: Keene, New York	**METHODS:** 3 1/4" Hollow Stem Augers with
CLIENT: Essex County DPW	ASTM D1586 Drilling Methods
JOB NUMBER: FDE-12-135	**SURFACE ELEVATION:** +/- 897.0'
DRILL TYPE: CME 55	**CLASSIFICATION:** O.Burns

SAMPLE		BLOWS ON SAMPLER					CLASSIFICATION / OBSERVATIONS
DEPTH	#	6"	12"	18"	24"	N	+/- 4" Asphalt, +/- 10" Base
	1	1	4				Brown F-C SAND, Some Gravel, Little Silt
				4	6	8	Grades to Brown F-M SAND, Some Brown/
	2	6	3				Gray Mottled Silt, trace coarse sand, Grades
				3	4	6	Little Silt, trace gravel
5'	3	5	50/.2			50+	**(MOIST, LOOSE TO VERY COMPACT)**
							Boulder noted
							Brown/Gray, Hard, Weathered GNEISS with
		Core Run #1 5.7'-10.7'					Significant Fracturing
		REC=60% RQD=15%					
10'							
							End of boring 10.7' depth.
15'							
20'							
25'							
30'							

Hulls Falls Road Stabilization

Keene, NY

Moisture Content Results - ASTM D2216

Boring No.	B-2	B-4	B-5	B-7	B-8	
Sample No.	695/S1	696/S1	697/S2	698/S2	699/S2	
Sample Depth	1'-3'	1'-3'	3'-5'	4.5'-5.1'	3'-5'	
Tare Weight	72.29	72.01	221.41	227.37	298.24	
W_S + Tare	425.53	410.37	521.64	520.79	520.79	
W_D + Tare	407.11	384.99	500.38	499.53	500.09	
W_{WATER}	18.42	25.38	21.26	21.26	20.70	
$W_{DRY\ SOIL}$	334.82	312.98	278.97	272.16	201.85	
% Moisture (W_W / W_D)	5.5	8.1	7.6	7.8	10.3	

Boring No.						
Sample No.						
Sample Depth						
Tare Weight						
W_S + Tare						
W_D + Tare						
W_{WATER}						
$W_{DRY\ SOIL}$						
% Moisture (W_W / W_D)						

Boring No.						
Sample No.						
Sample Depth						
Tare Weight						
W_S + Tare						
W_D + Tare						
W_{WATER}						
$W_{DRY\ SOIL}$						
% Moisture (W_W / W_D)						

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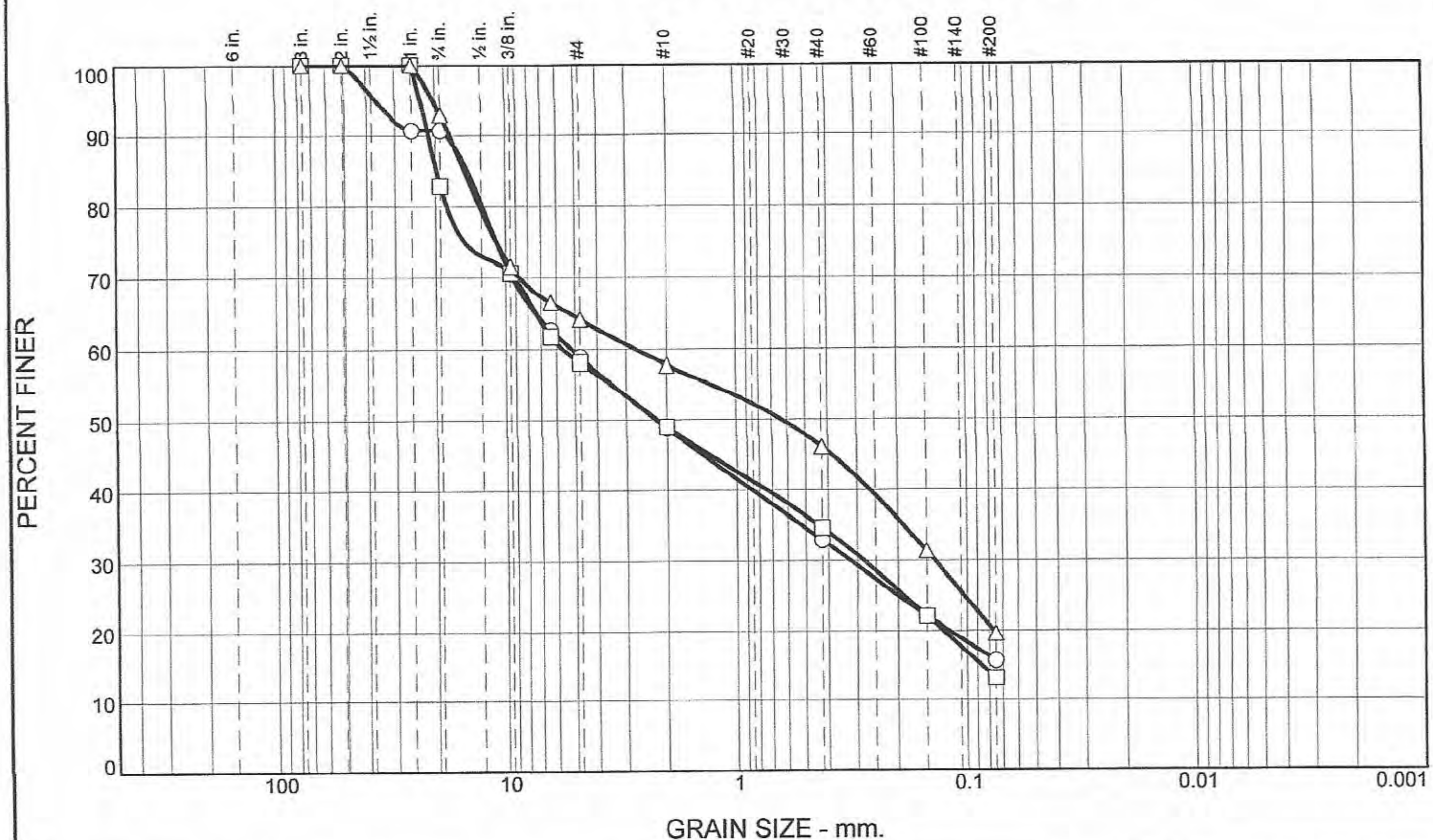
Client: Essex Co. DPW
File No. FDE-12-135
Date: August 3, 2012

Particle Size Distribution Report



	+3"	% GRAVEL	% SAND	% SILT	% CLAY	USCS	AASHTO	PL	LL
○	0.0	41.1	43.2	15.7		SM	A-1-b	NP	NP
□	0.0	41.8	45.0	13.2		SM	A-1-b	NP	NP
△	0.0	35.9	44.5	19.6		SM	A-1-b	NP	NP

SIEVE inches size	PERCENT FINER ○	□	△
3	100.0	100.0	100.0
2	100.0	100.0	100.0
1	90.7	100.0	100.0
.75	90.7	82.8	92.9
.375	70.5	70.6	71.5
.25	62.7	61.7	66.5
	GRAIN SIZE		
D_{60}	5.1780	5.6633	2.7520
D_{30}	0.3212	0.2813	0.1382
D_{10}			
	COEFFICIENTS		
C_c			
C_u			

SIEVE number size	PERCENT FINER ○	□	△
#4	58.9	58.2	64.1
#10	48.8	49.0	57.8
#40	32.9	34.7	46.1
#100	22.1	22.1	31.4
#200	15.7	13.2	19.6

Material Description

○ GRAVEL and coarse to fine SAND, little Silt

□ GRAVEL and coarse to fine SAND, little Silt

△ coarse to fine SAND and GRAVEL, little Silt

REMARKS:

○ Per ASTM D422 Washed

□ Per ASTM D422 Washed

△ Per ASTM D422 Washed

○ Source of Sample: Borings Depth: 1'-3' Sample Number: 695: B-2/S1
□ Source of Sample: Borings Depth: 1'-3' Sample Number: 696: B-4/S1
△ Source of Sample: Borings Depth: 3'-5' Sample Number: 697: B-5/S2

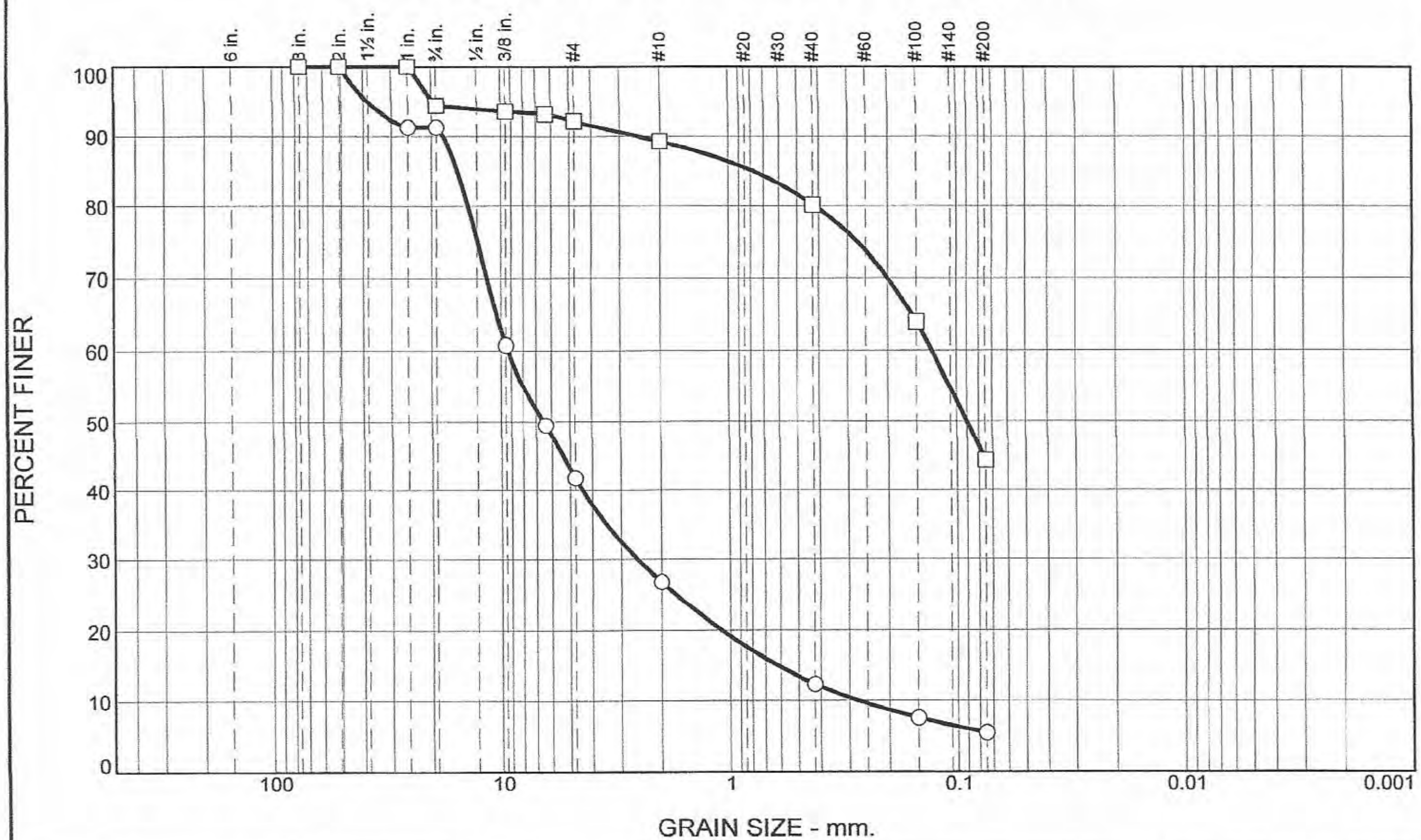
EVERGREEN TESTING, INC.
Watervliet, NY

Client: Essex Co DPW
Project: Hulls Falls Road Stabilization
Keene, NY
Project No.: FDE-12-135

Figure 695-697

Tested By: CC **Checked By:** OB

Particle Size Distribution Report



	+3"	% GRAVEL	% SAND	% SILT	% CLAY	USCS	AASHTO	PL	LL
○	0.0	58.2	36.3	5.5		GW-GM	A-1-a	NP	NP
□	0.0	7.8	47.8	44.4		SM	A-4(0)	NP	NP

SIEVE inches size	PERCENT FINER ○	□	
3	100.0	100.0	
2	100.0	100.0	
1	91.4	100.0	
.75	91.4	94.5	
.375	60.7	93.6	
.25	49.4	93.3	
	GRAIN SIZE		
D_{60}	9.3511	0.1287	
D_{30}	2.5615		
D_{10}	0.2745		
	COEFFICIENTS		
C_c	2.56		
C_u	34.07		

SIEVE number size	PERCENT FINER ○	□	
#4	41.8	92.2	
#10	26.7	89.3	
#40	12.4	80.2	
#100	7.6	63.8	
#200	5.5	44.4	

Material Description

○ GRAVEL and coarse to fine SAND, trace Silt

□ coarse to fine SAND and SILT, trace Gravel

REMARKS:

○ Per ASTM D422 Washed

□ Per ASTM D422 Washed

○ Source of Sample: Borings Depth: 4.5'-5.1' Sample Number: 698: B-7/S2

□ Source of Sample: Borings Depth: 3'-5' Sample Number: 699: B-8/S2

EVERGREEN TESTING, INC.
Watervliet, NY

Client: Essex Co DPW

Project: Hulls Falls Road Stabilization
Keene, NY

Project No.: FDE-12-135 Figure 698-699

Tested By: CC **Checked By:** OB