GEOTECHNICAL EVALUATION
CONGERS ELEMENTARY SCHOOL
NEW CITY, NEW YORK

Dente File No. FDE-14-108

Prepared For:
Mr. Robert Lafayette, RA
CS Arch
19 Front Street
Newburgh, NY 12550

June 26, 2014

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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APPENDICES

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GEOTECHNICAL EVALUATION
CONGERS ELEMENTARY SCHOOL
NEW CITY, NEW YORK
FDE-14-108

I. INTRODUCTION

This report presents the results of a geotechnical evaluation completed by Dente Engineering, P.C. for the renovations and additions to the Congers Elementary School in New City, New York. The evaluation was completed in general accord with our proposal No. PFDE-14-88 and authorized by CS Arch of Newburgh, New York.

In general, the geotechnical evaluation consisted of the completion of a total of two (2) test borings about the exterior of the existing school and two (2) core and probes beneath the interior floor slab of classrooms in the southern wing, and the preparation of this report which summarizes the results of the site explorations and presents recommendations to assist in planning for the geotechnical related aspects of the project.

This report and the recommendations contained within it were developed for specific application to the site and construction planned, as we currently understand it. Corrections in our understanding, changes in the structure locations, their grades, loads, etc. should be brought to our attention so that we may evaluate their effect upon the recommendations offered in this report.

It should be understood that this report was prepared, in part, on the basis of a limited number of test borings performed for the field exploration. The borings were advanced at discrete locations and the overburden soils sampled at 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.

A sheet entitled *"Important Information about your Geotechnical Engineering Report"* prepared by the Association of Engineering Firms Practicing in the Geosciences is presented following the title page of 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.

This report was prepared for informational purposes only and should not be considered part of the contract documents. It should be made available to interested parties in its entirety only. Should the data contained in this report not be adequate for the contractor's purposes, the contractor may make their own investigations, tests and analyses for use in bid preparation.

The recommendations offered in this report concerning the control of surface and subsurface waters, moisture or vapor membranes address only conventional Geotechnical Engineering aspects and are not to be construed as recommendations for controlling or providing an environment that would prohibit or control infestations of the structure or its surroundings with mold or other biological agents.

II. SITE AND PROJECT DESCRIPTION

The project will entail the construction of building additions at the Congers Elementary School located on Lake Road between Kings Highway and Grant Avenue South in Clarkstown (New City), Rockland County, New York. Site grades slope down from northeast to southwest some 10 or so feet across the property as depicted on the USGS maps attached as Appendix A and the Site Plans provided to us.

The existing school building was constructed in 1927 with the southern wing added in 1956. The one (1) and two (2) story masonry clad structure has a basement beneath a portion of the original building and all are reportedly supported upon spread foundations. A cursory review of the building indicates it is relatively free of distress usually associated with ground subsidence or foundation settlements, except in the southern most slab area of the southern wing constructed in 1956.

We understand a new entrance and reconstruction of several walls are planned at the front and rear of the school and rehabilitation of the slabs in the southern wing.

III. SUBSURFACE CONDITIONS

The subsurface conditions at the site were investigated through the completion of two (2) test borings about the exterior of the existing school and two (2) cores and probes beneath the interior floor slab of classrooms in the southern wing . The approximate boring and core locations are shown on the Subsurface Investigation Plan in Appendix B.

The borings were completed using a standard rotary drill rig equipped with hollow stem augers. As the augers were advanced, the overburden soils were sampled and their relative density determined using split-spoon sampling techniques in general accord with ASTM D1586 procedures. Representative portions of the recovered soil samples were transported to our office for visual classification by a Geotechnical Specialist. Individual Subsurface Logs that were prepared based upon the visual classifications are presented in Appendix C together with a key that explains the terms used in their preparation. The cores were advanced through the slab with an electric core machine and the probes advanced by driving a sampler by hand.

The individual subsurface logs 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 depths and locations sampled. Conditions at other depths and locations may be different.

The borings B-3 and B-4 which were located outside of the building each penetrated asphalt pavement and stone base followed by about a 2 to 5 feet thick layer of loose fill composed of cinders, sand and silt with trace to some gravel with building rubble and asphalt noted. Below this loose surficial layer was a relatively firm grading with depth to very compact glacial till. The till consisted of sand and silt with some gravel.

Borings B-1 and B-2 located within classrooms 1 and 2 of the south wing penetrated concrete slab on grade between 5.5 and 6.5 inches thick. The slabs bear directly on fill soils similar in composition and density to that encountered at the exterior boring locations.

Groundwater was present in the augers at completion of the drilling at the exterior locations and the recovered soil samples were moist grading to wet at depths about 15 feet beneath the grades.

IV. GEOTECHNICAL RECOMMENDATIONS

A. GENERAL

Based upon our evaluation of the test boring results it appears that the existing building foundations are likely seated on firm to compact glacial till. It is expected that all new building foundations for any new interior and exterior additions will also be seated on the surface of the glacial till.

It is not expected that groundwater will be encountered during either the renovation of the classrooms or the new construction currently planned. However, it should be understood that perched waters may exist within the fills and that the site soils are fine grained and will become soft and unstable if allowed to saturate. For these reasons any water which collects within excavations should be promptly removed through common sump and pump techniques as it collects.

The floor slabs within classrooms 1 and 2 are believed to have settled as the poorly compacted fills beneath them consolidated over time. In as much as this addition was constructed in 1956, these soils have likely completed their consolidation and as such the floors may either be topped and leveled or replaced as may be desired.

B. SEISMIC DESIGN CONSIDERATIONS

For seismic design purposes, we have evaluated the site conditions in accord with Sections 1613 of the New York State Building Code. On this basis we have determined that Seismic Site Class D (Stiff Soil Profile) can be assumed for the project site. The glacial till soils at these sites are not susceptible to liquefaction due to earthquake motions.

C. SITE EXCAVATIONS, UNDERPINNING & EXCAVATION BRACING

Temporary side slopes for unbraced site excavations should be made no steeper than one vertical on one horizontal as required by OSHA regulations for a Type B soil. The excavations should be observed by a competent individual to confirm the soil types and the sloping adjusted as needed to conform to the OSHA regulations.

It is possible that zones of trapped or perched groundwater may be found in the site excavations or wherever undrained foundations and their backfills are in close proximity. If groundwater is encountered in the site and foundation excavations, it should be promptly removed together with any softened/wet bearing grade soils.

All excavations should be completed so as not to undermine existing foundations. In general, excavations should not encroach within a zone of influence defined by a line extending out and down from the existing foundation at an inclination of one vertical on one and one-half (1½) 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.

Standard pit underpinning should be feasible for depths up to about 3 or 4 feet below the existing bearing elevations. For design purposes, the total unit weight and angle of internal friction for the glacial till may be assumed equal to 138 pounds per cubic foot and 38 degrees, respectively. A coefficient of at-rest lateral earth pressure equal to 0.40 may also be assumed in determining lateral earth and foundation or other surcharge pressures acting on any underpinning walls.

D. SITE PREPARATION FOR EXTERIOR ADDITIONS

The proposed building pad should be stripped of topsoil, asphalt, and concrete. The exposed surfaces should be proof-rolled through the completion of at least two (2) passes, each in perpendicular directions, using a steel drum roller with a static weight of at least ten tons. The roller should operate in its static mode, unless directed otherwise by the Geotechnical Engineer observing the work, and travel at a speed not exceeding three feet per second (two miles per hour). Soft areas which are identified by the proof-rolling should be investigated to ascertain the cause and, where determined to be necessary, undercut and replaced with Structural Fill.

E. FILL AND COMPACTION REQUIREMENTS

Imported Structural Fill should be used as fill and backfill within the proposed and existing building pad areas and beneath any floor slabs, adjoining pavements or sidewalks. The Structural Fill should meet the requirements stipulated for Type 2 or 4 material in Section 304 of the NYSDOT Standard Specifications, with the exception that recycled concrete, asphalt, bricks, glass and pyritic shale rock should not be allowed as components of the fill.

The Structural Fill should be placed in uniform loose layers no more than about one (1) foot thick where heavy vibratory compaction equipment is used. Smaller lifts should be used where hand operated equipment is required for compaction. Each lift should be compacted to not less than 95 percent of the maximum dry density for the soil established by the Modified Proctor Compaction Test, ASTM D1557.

On-site soils/fill comprised of silty sand and gravel may be considered for reuse as General Fill in landscape areas outside the building pad provided they do not contain unsuitable foreign matter and/or organic matter. The General Fill should be placed in maximum 12-inch thick loose lifts, with each lift compacted to at least 90 percent of the Modified Proctor Compaction Test, ASTM D698, maximum dry density.

F. FOUNDATIONS

It is expected that new building addition foundations will be seated on undisturbed glacial till. The bearing grades should be observed by a Geotechnical Engineer who should direct the removal of existing fills or otherwise unsuitable materials should they be present. The bearing surfaces should be thoroughly compacted using a mechanical tamper or similar methods to densify the soil loosened by the excavation equipment. All final bearing grades should be firm, stable and free of loose soil, mud, water and frost.

The new foundations may be proportioned for a maximum net allowable bearing pressure equal to 5,000 pounds per square foot (psf). They should have a minimum width of two (2) feet even if this results in a bearing pressure which is less than the maximum allowable. Exterior foundations should be seated at least four (4) feet below final adjoining grades for frost protection. Interior foundations may bear at a nominal two (2) feet depth below the floor slab if allowed by local building codes.

For planning purposes, it should be assumed that the existing foundations may be loaded to a maximum net allowable bearing pressure of 5,000 psf provided that the foundations have adequate structural capacity for these loads and the expected settlements induced by the new loadings are within tolerable limits. Information regarding the size and existing and proposed loads for the existing foundations should be provided to Dente Engineering for a final determination of the allowable bearing pressures and estimated settlements.

Assuming standard care is used in preparing the new foundation bearing grades, we estimate that total foundation settlements should be less than one-half inch. Existing foundations should experience settlements proportional to their increased loading, and the settlements should also be less than one-half inch. The settlements should occur quickly as construction is completed and each load increment is applied. Assuming dead loads are roughly one-half the total load, about one-half of the estimated settlement should occur as construction is completed and the dead loads are applied. The remaining estimated settlement should occur as live loads are applied.

A perimeter foundation drain should be installed for the exterior building addition to prevent water from becoming trapped in the backfill soils. The drain may consist of a nominal four-inch diameter perforated PVC or slotted, corrugated HDPE pipe embedded at the base of a minimum twelve-inch wide column of clean crushed stone (ASTM C33 Blend 57). The stone should be wrapped in a filter fabric (Mirafi 140N or equivalent).

G. FLOOR SLABS

If the settled floor slabs are to be replaced rather than topped, the existing slabs should be removed and the subgrades excavated to allow the placement of six (6) inches of crushed stone. The subgrade should be proof compacted using a walk behind self propelled roller with any soft or unstable areas identified through the proof compacting undercut to stable soils.

New building floor slabs in the renovated classroom areas and any new building additions, should be constructed over a nominal six-inch thick base composed of crushed stone (ASTM C33 Blend 57). A vapor retarder (Stego Wrap 15 mil Class A or equivalent) should be placed above the stone base. The slabs may be designed in accord with the recommended procedures of the American Concrete Institute or Portland Cement Association using a Modulus of Subgrade Reaction equal to 150 pounds per cubic inch (pci) at the top of the stone base layer.

It should be understood that frost heave may occur beneath sidewalks or pavements, and the heave may be differential, particularly where sidewalks and pavements meet building doorways and curbs. If these conditions exist and the potential for heaving is to be minimized, a 16-inch thick base of crushed stone should be placed beneath the walks and underdrains should be placed to drain the stone bed in order to limit heave to generally tolerable magnitudes for most winters.

H. RETAINING WALLS

Building walls that retain earth should be designed to resist lateral earth pressures together with any applicable surcharge loads. The following design parameters are provided for the undisturbed glacial till and for compacted Structural Fill to assist in determining the lateral wall loads. The listed design parameters include no factor of safety.

Design Parameter	Structural Fill	Glacial Till
Soils Angle of Internal Friction	30 degrees	38 degrees
Coefficient of At-Rest Earth Pressure	0.50	0.40
Coefficient of Passive Earth Pressure	3.00	4.20
Total Unit Weight of Soil	120 pcf	138 pcf
Coefficient of Sliding Friction	0.45	0.45

I. CONSTRUCTION MONITORING

The Geotechnical Engineer should be retained to monitor earthwork and bearing grade preparations for foundations and floor slabs. It should be understood that the actual subsurface conditions that exist across these sites will only be known when the sites are excavated. The presence of the Geotechnical Engineer during the earthwork and foundation construction phases will allow validation of the subsurface conditions assumed to exist for this study and the design recommended in this report.

V. CLOSURE

This report was prepared for specific application to the project site and construction planned based on a limited number of explorations made at discrete locations. Dente Engineering should be retained during construction to validate that the actual site conditions are similar to those assumed for development of the recommendations contained in this report. Dente Engineering should also review plans and specifications related to foundations and earthwork prior to their release for bidding to confirm that the recommendations were properly interpreted and applied.

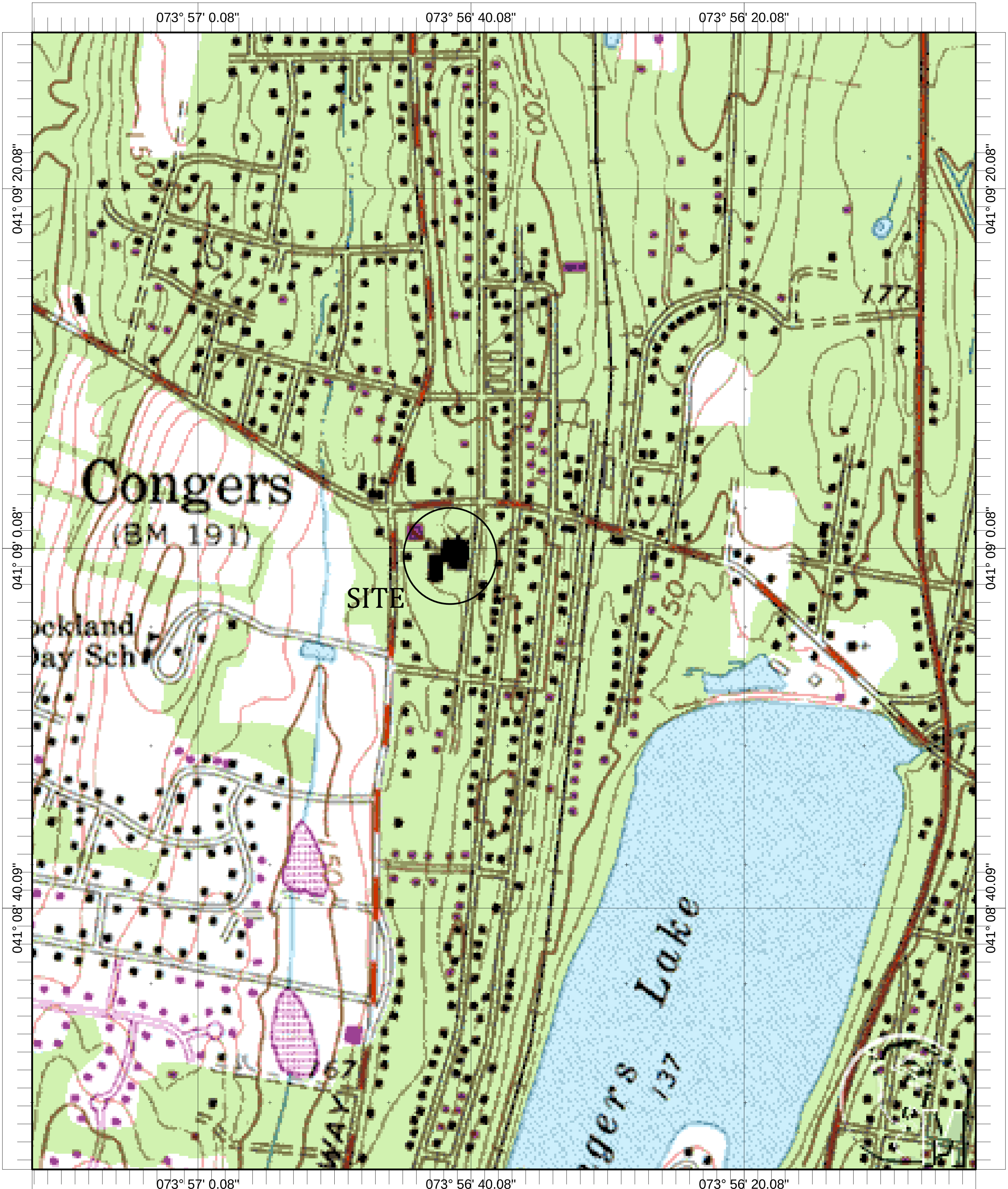
This report was prepared using methods and practices common to Geotechnical Engineering, no other warranties expressed or implied are made.

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.

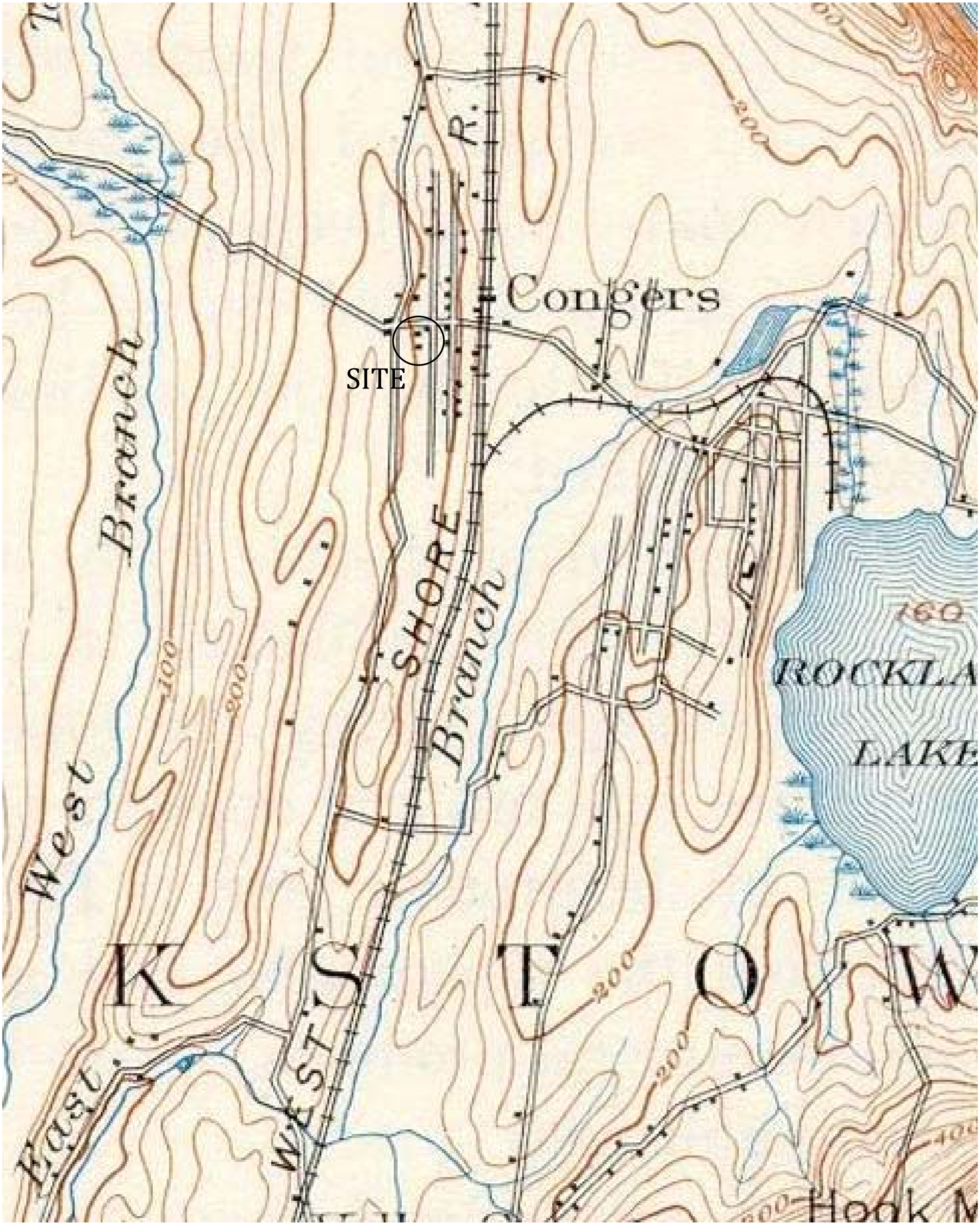
Fred A. Dente, P.E.
President

APPENDIX A



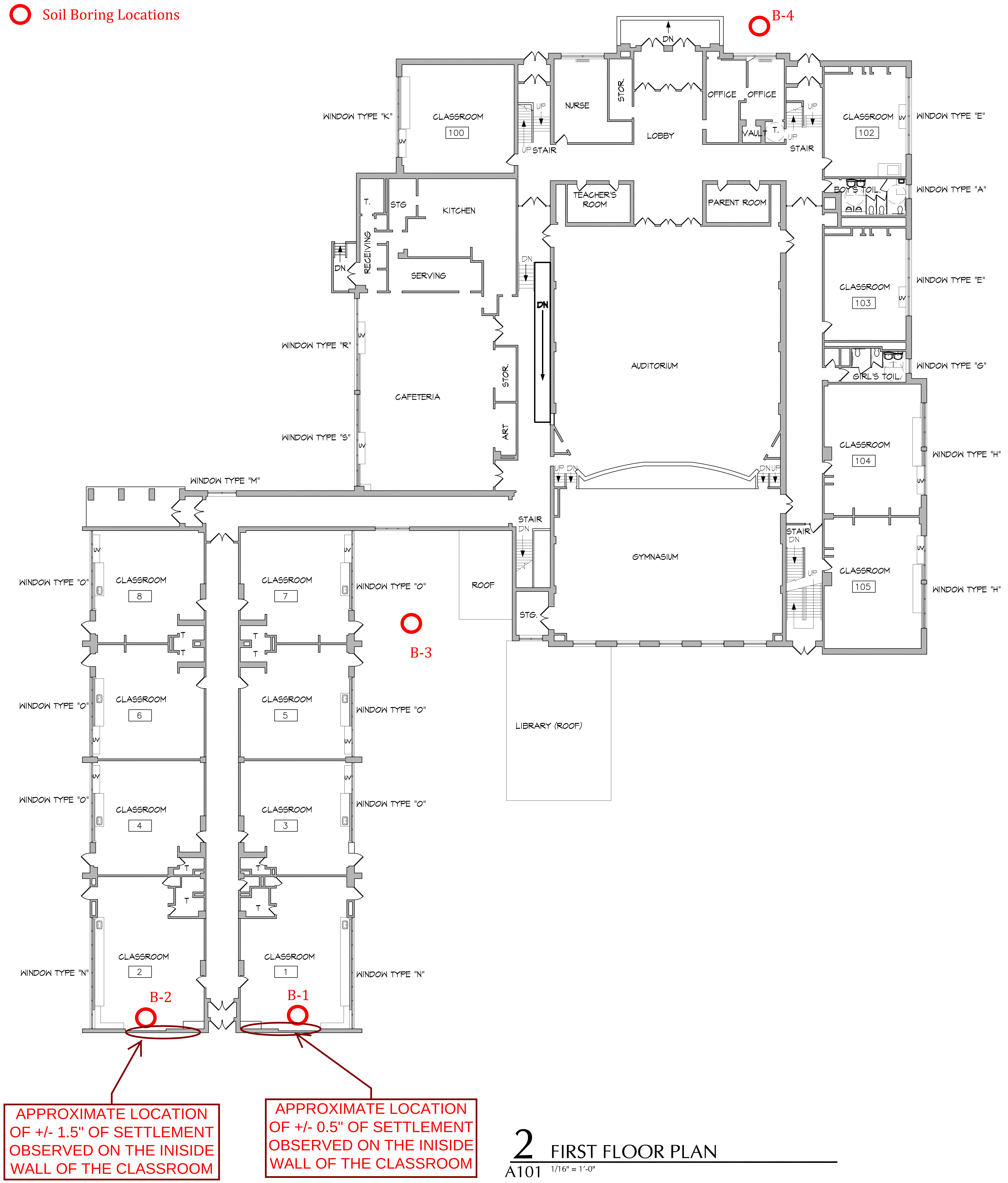
Name: HAVERSTRAW
Date: 6/17/114
Scale: 1 inch equals 666 feet

Location: 041° 08' 57.2" N 073° 56' 37.7" W
Caption: CONGERS ELEMENTARY
NEW CITY, NEW YORK
FDE-14-108



Congers Elementary School, New City, New York 1902, FDE-14-108

APPENDIX B



2 FIRST FLOOR PLAN
A101 1/16" = 1'-0"

APPENDIX C

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

PROJECT: Congers Elementary School	DATE	START: 6/10/14	FINISH: 6/10/14

LOCATION: New City, New York	**METHODS:** 2" x 24" Split Spoon with Handheld
CLIENT: CS Arch	Driving Methods
JOB NUMBER: FDE-14-108	**SURFACE ELEVATION:**
DRILL TYPE:	**CLASSIFICATION:** O.Burns

SAMPLE		BLOWS ON SAMPLER					CLASSIFICATION / OBSERVATIONS
DEPTH	#	6"	12"	18"	24"	N	+/- 5.5" Concrete Slab
	1						**FILL**: Red SILT, Little F-M Sand, Coal, and Fine Gravel (MOIST)
	2						Grades Little Brick **(MOIST)**
5'							End of boring 5.0' depth.
							No void was observed between the bottom of the concrete slab and the soil beneath. Soils were observed to be relatively loose, however.
10'							
15'							
20'							
25'							
30'							

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

PROJECT: Congers Elementary School	**DATE**	START: 6/10/14	FINISH: 6/10/14

LOCATION: New City, New York	**METHODS:** 2" x 24" Split Spoon with Handheld
CLIENT: CS Arch	Driving Methods
JOB NUMBER: FDE-14-108	**SURFACE ELEVATION:**
DRILL TYPE:	**CLASSIFICATION:** O.Burns

SAMPLE		BLOWS ON SAMPLER					CLASSIFICATION / OBSERVATIONS
DEPTH	#	6"	12"	18"	24"	N	+/- 6.5" Concrete Slab, +/- 2.5" Base
	1						**FILL**: Brown/Red Mottled SILT, Some F-M Sand, Little Cinders, Coal, and Brick
	2						Grades Dark Brown F-C SAND and CINDERS **(MOIST)**
5'							End of boring 5.0' depth.
							No void was observed between the bottom of the concrete slab and the soil beneath. Soil was observed to be relatively loose, however.
10'							
15'							
20'							
25'							
30'							

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

PROJECT: Congers Elementary School	**DATE**	START: 6/10/14	FINISH: 6/10/14

LOCATION: New City, New York	**METHODS:** 3 1/4" Hollow Stem Augers, ASTM
CLIENT: CS Arch	D1586 Drilling Methods with Auto Hammer
JOB NUMBER: FDE-14-108	**SURFACE ELEVATION:**
DRILL TYPE: CME 45C	**CLASSIFICATION:** O.Burns

SAMPLE		BLOWS ON SAMPLER					CLASSIFICATION / OBSERVATIONS
DEPTH	#	6"	12"	18"	24"	N	+/- 5" Asphalt, +/- 2" Base
							FILL: Red Mottled SILT, Little F-M Sand and
	1	2	1				Gravel **(MOIST, LOOSE)**
				2	2	3	– – – – – – – – – – – – – – – – –
	2	2	5				Red SILT, trace sand **(MOIST, LOOSE)**
				8	17	13	**TILL**: Red SILT, Some F-C Sand, Little
5'	3	5	8				Gravel, Grades to Red F-C SAND, SILT, and
				15	18	23	GRAVEL
	4	20	20				
				25	34	45	
10'	5	8	10				
				15	22	25	
							(MOIST, FIRM AND COMPACT)
							Red SHALE Fragments, Little Silt and F-M
							Sand **(WET, VERY COMPACT)**
15'	6	50/.1				50+	
							End of boring 15.1' depth with split spoon
							refusal.
							Groundwater measured at 14.8' depth within
20'							auger casings after Sample #6.
25'							
30'							

DENTE ENGINEERING, P.C.	SUBSURFACE LOG B-4

PROJECT: Congers Elementary School	**DATE**	START: 6/10/14	FINISH: 6/10/14

LOCATION: New City, New York	**METHODS:** 3 1/4" Hollow Stem Augers, ASTM
CLIENT: CS Arch	D1586 Drilling Methods with Auto Hammer
JOB NUMBER: FDE-14-108	**SURFACE ELEVATION:**
DRILL TYPE: CME 45C	**CLASSIFICATION:** O.Burns

SAMPLE		**BLOWS ON SAMPLER**					**CLASSIFICATION / OBSERVATIONS**
DEPTH	#	6"	12"	18"	24"	N	+/- 5" Asphalt, +/- 5" Base
	1	2	3				**FILL**: Black CINDERS, Some Brown Silt
				1	4	4	(MOIST)
	2	2	5				Grades Brown SILT, Little Asphalt, F-M
5'				2	2	7	Sand and Gravel, trace brick **(MOIST, LOOSE)**
	3	1	1				
				3	5	4	Red SILT, trace sand **(MOIST, LOOSE)**
	4	5	8				**TILL**: Red SILT, Some F-C Sand, Little
				8	10	16	Gravel
10'							
	5	7	10				
				12	15	22	
15'							**(MOIST, FIRM TO VERY COMPACT)**
	6	18	50/.3			50+	
							End of boring 15.8' depth with split spoon refusal.
20'							Groundwater measured at 15.1' depth within auger casings after Sample #6.
25'							
30'							

APPENDIX D

VIEW OF BORING/SLAB CORE #1. SETTLEMENT CAN BE SEEN ALONG WALL IN BACKGROUND

VIEW OF BORING/SLAB CORE #2. SETTLEMENT CAN BE SEEN ALONG WALL IN BACKGROUND

VIEW LOOKING WEST AND EAST ALONG THE SOUTHERN OUTISDE WALL OF CLASSROOMS 2 (LEFT) AND 1 (RIGHT)

CLOSEUP VIEW OF LOCATION OF BORING #3 (LEFT) AND ZOOMED OUT VIEW (RIGHT)


VIEW OF LOCATION OF BORING #4 (LEFT) AND
CLOSE UP VIEW OF NEARTEST CORNER (RIGHT)


VIEW OF OF OUTSIDE SOUTHERN WALLS OF
GYMNASIUM