Updated Geotechnical Engineering Report
AAFE Mixed-Use Building
Queens, NY

4NYC Housing, Inc.
2 Allen Street, 7th Floor
New York, NY 10002

August 2, 2021

MRCE
built on firm foundations

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August 2, 2021

4NYC Housing, Inc.
2 Allen Street, 7th Floor
New York, NY 10002

Attn: Mr. Thomas Yu

Re: Updated Geotechnical Engineering Report
AAFE Mixed-Use Building
Queens, New York
MRCE File 12629

Dear Mr. Yu,

Mueser Rutledge Consulting Engineers PLLC (MRCE) provides this Updated Geotechnical Engineering Report to address the proposed modifications in site development and results of a supplemental test pit investigation. We summarize herein the results of the subsurface investigations performed at the site, our interpretation of subsurface conditions, and updated recommendations for foundation design and construction. This report supersedes our October 2016 Preliminary Geotechnical Report and our January 2017 Final Geotechnical Report.

EXHIBITS

The following exhibits are attached to illustrate our report:

Drawing No. S-1	Site Location Plan
Drawing No. B-1	Boring Location Plan
Drawing No. GS-1	Geologic Section A-A
Drawing No. GS-2	Geologic Section B-B
Drawing No. GS-R	Geotechnical Reference Standards
Table 1	Summary of Laboratory Test Data
Plate CRS-1	Consolidation Test – Boring MR-2U Sample 15U
Plate CRS-2	Consolidation Test – Boring MR-3U Sample 12U
Appendix A	LBA Boring Logs
Appendix B	MRCE Boring Logs
Appendix C	CPT Data
Appendix D	MRCE Test Pit Logs and Photographs
Appendix E	Roux 2016 Remedial Investigation Report

PROJECT AND SITE DESCRIPTION

The project site is 133-04 39th Avenue in Flushing, Queens, New York, at the southeast corner of College Point Boulevard and 39th Avenue as shown on Drawing No. S-1. The site comprises Block 4973, Lot 6 with a total area of about 13,388 square feet (sq. ft.). The site was previously occupied by a

one-story masonry structure occupying the southern half of the site with an asphalt paved parking lot covering the remainder of the site. The building was demolished to grade and the parking lot surface removed in November 2016.

The site is generally level at around El. +45. A concrete retaining wall supports a drop of about 6 to 7 feet between the site lot and the gas station lot to the south. The west sidewalk also slopes down from north to south to accommodate this grade change with a retaining wall constructed along the west property line to maintain fairly level site grades.

A 2-story commercial building with one cellar level abuts the east property line. The building superstructure is setback from the sidewalk along 39th Avenue, but the cellar level extends to the sidewalk and includes an open courtyard with suspended walkway to facilitate access to the building. A gas station with a one-story building exists in the adjacent lot to the south with the building set back about nine feet from the property line. A New York City Transit (NYCT) subway (7 line) traverses below Roosevelt Avenue to the south of the site. The subway is approximately 100 feet south of the site with the subway bottom approximately 20 to 25 feet below ground surface. A NYCT substation facility abuts the southeast corner of the site. The substation is setback about 25 feet from the property line.

We understand that the proposed development consists of construction of a 7-story building with one cellar level. The proposed building footprint is about 9,700 square feet with the first floor slab at about Elev. +41. Yard space is proposed at the rear of the building in the southeast corner of the site with the proposed building setback about 50 feet from the property line. We understand that the cellar slab is planned at a depth of about 10 to 15 feet, or about Elev. + 30, with the cellar level offset from the east and south property lines.

PROJECT DATUM

Elevations herein are referenced to the North American Vertical Datum (NAVD 1988) where El. 0.0 is 1.625 feet below the Queens Borough Datum.

SITE GEOLOGY

Bedrock was not encountered in any of the borings at the site. According to published data, bedrock lies about 200 feet below ground surface. The oldest and lowest sediments overlying bedrock are of Cretaceous age followed by Pleistocene age glacial deposits.

The site is at the edge of a deep valley carved into the Cretaceous Raritan clay. During the Pleistocene, a series of glaciers flowed across the region. The glaciers scoured the valley deeper, reworked the clay, and redeposited it as glacial sediments. With each advance and retreat, the ice typically deposited in and along the valley layers of till that may contain large slabs of Raritan clay, outwash sand and glacial lake silt and clay derived in part from the Raritan. In the process, the ice glacially sheared and loaded the older sediments below, densifying them, before depositing less dense soil above. Surficial fills placed by man to level and develop the site and surrounding area overlie the natural soil formations.

SUBSURFACE INVESTIGATIONS

Site investigations were made by others in 2006 and more recently by MRCE in 2016 and 2021. The MRCE investigations were made in several phases to accommodate site access constraints and project requirements.

Prior Investigation

Louis Berger & Associates (LBA) performed a limited site investigation in 2006 consisting of two soil borings made in the parking lot along the east property line. Locations of the borings are shown on Drawing No. B-1. The borings (SB-01 and SB-02) were both drilled and sampled continuously to a depth of 50 feet. Temporary well points (TWPs) were installed in each of the borings at completion for observation of groundwater levels. Logs of the LBA borings are provided in Appendix A.

MRCE Preliminary Investigation

Three borings (Borings M-1 through M-3U) and three CPT probes (CPT-1 through CPT-3) were made in paved areas of the site by Craig Test Boring, Inc. of Mays Landing, New Jersey between May 2nd and May 10th, 2016 under the continuous inspection of our Engineer, Mr. Andy Ong. Final locations of the borings and CPT probes were determined by our Engineer by measuring distances off of existing structural features and are shown on Drawing No. B-1.

All borings were hand augered to a depth of six (6) feet below grade to clear shallow utilities prior to drilling. Borings were advanced with truck mounted drill rigs using wash-rotary methods with casing and drilling mud to stabilize the borehole. Soil samples were collected continuously in each boring from the hand auger depth to 12 feet and at five foot intervals thereafter. Soil samples were obtained by performing Standard Penetration Tests (SPT), in which a standard, 2-inch O.D. split-spoon sampler is driven through four 6-inch intervals with a 140-pound hammer, free-falling 30 inches. The SPT resistance, also termed N-value and expressed in blows per foot (bpf), is an indication of the relative density of the material sampled and is calculated by summing the blows from the second and third 6-inch intervals. In some instances, where the sampler was unable to penetrate the full 24 inches due to the presence of dense soils, large gravel, cobbles, boulders, or other obstructions, the sampler was driven until refusal (i.e. 50 to 100 blows were administered) and the actual penetration of the sampler was measured and recorded. Recovered soil samples were classified in the field in accordance with the Unified Soil Classification System (USCS) and placed in jars for preservation and transport to our laboratory.

Three undisturbed samples were obtained for laboratory testing of cohesive (clay) layers in Borings MR-2U and MR-3U. Undisturbed samples were obtained by mechanically pushing a 3-inch diameter tube using a Shelby tube sampler. The length of push and recovery of each tube sample is recorded in the boring logs in Appendix B. Upon recovery, all tube samples were sealed with hot wax and plastic end caps for sample preservation and transported to our laboratory.

Boring MR-1 was terminated at a depth of 100 feet while Borings MR-2U and MR-3U were stopped at 75 feet. Logs of the completed borings are provided in Appendix B.

Due to the asphalt surface pavement and underlying coarse fill, each CPT location was pre-drilled to a depth of 10 feet. The pre-drilled holes were backfilled with sand and then the CPT cone was pushed. The CPT probes were advanced to final depths ranging from 47.1 feet to 56.6 feet. Pore water

pressure dissipation tests were performed in each of the CPT probes at various depths within the finer grained (silt and clay) deposits. CPT records are provided in Appendix C.

MRCE Final Phase Investigation

Two additional borings (Borings MR-4P and MR-5U) were made in the southeast quarter of the site where former structures previously prevented access for drilling. The borings were drilled by Craig Test Boring, Inc. of Mays Landing, New Jersey on December 15th, 2016 under the continuous inspection of our Engineer, Mr. Eric Poon. Locations of the borings were determined by our Engineer by measuring distances from property features and are shown on Drawing No. B-1.

The additional borings was drilled and sampled using the same methods as employed in the preliminary borings. A deep well-point piezometer was installed in Boring MR-4P at completion to monitor water levels. The piezometer consisted of two inch I.D. PVC standpipe installed to a depth of 75 feet. The bottom ten feet of the standpipe is slotted and surrounded by filter sand to allow free water movement into the piezometer without movement of soil particles. A falling head test was performed by filling the standpipe with water and measuring the drop in water level with time to ensure proper operation of the well. Logs of the completed borings are provided in Appendix B.

Test Pit Investigation

A supplemental test pit investigation consisting of two test pits (TP-1 and TP-2) was performed on June 17, 2021. The test pits were excavated by Test Pit Corp. under the continuous inspection of MRCE engineers. The test pits were excavated using a hydraulic excavator and were primarily intended to determine the depth and characteristics of the foundation elements supporting the adjacent structures. Upon completion, the test pits were backfilled using excavation spoil. Detailed logs of the test pits and associated photographs illustrating the test pit findings are included in Appendix D.

TP-1: Test Pit TP-1 was excavated to a depth of about 12 feet along the eastern property line adjacent to the northwest corner of the existing two-story building. The adjacent building has a concrete foundation wall that is supported on an irregular, unformed 4.3 feet thick concrete strip footing bearing at about Elev. 33.3. The concrete strip footing protrudes into the project site between 12 inches and 3 feet beyond the face of the foundation wall. The wider portion of the protrusion may be isolated to the corner of the adjacent building and the courtyard retaining wall extending to 39th Avenue as the footing protrusion appears to become more consistent in dimension and extend only 12 inches into the project site at the southern end of the test pit. Field measurements of the depth of the below grade courtyard of the adjacent building indicate that the top of the courtyard (cellar) slab is about Elev. +33.7 indicating that the cellar slab on grade is bearing at the same elevation as the perimeter footing.

TP-2: Test Pit TP-2 was excavated to a depth of about 9.3 feet along the southern property line adjacent to the existing concrete retaining wall. The adjacent retaining wall consists of formed concrete and bears at about Elev. 34.7. No footing or wall protrusion into the project site was observed, indicating that the retaining wall footing is likely constructed on the adjacent property.

Roux Environmental Investigation

Roux Associates performed an environmental investigation at the site in June 2016 with the results of their investigation summarized in a Remedial Investigation Report, dated September 2016. We refer to the “Executive Summary” from the Remedial Investigation Report included in Appendix E for further

detail on the scope and results of the Roux investigation. The Roux investigation included the installation of three (3) monitoring wells for observations of groundwater levels. Data from the monitoring wells was relied on in developing the groundwater levels reported herein. Monitoring well construction details and water level measurements reported by Roux are also provided in Appendix E.

LABORATORY TESTING PROGRAM

All soil samples were delivered to the MRCE soils laboratory. Samples were reviewed and field descriptions were revised as necessary for conformance with MRCE's Geotechnical Reference Standards, described on Drawing No. GS-R. Individual sample descriptions are provided on the final, typed boring logs in Appendix B.

Laboratory testing included soil index tests (natural water content and Atterberg Limits), unconsolidated undrained (UU) triaxial compression strength tests, and constant rate of strain consolidation tests (CRS). Tests were performed on the cohesive, fine-grained soils (Stratum C). All testing was performed in accordance with applicable ASTM standards. All test results are presented in tabular form on Table No. 1, Summary of Laboratory Test Data.

Index Testing: Natural water contents were determined on all fine-grained soil (silt and clay) samples. The results of the water content determinations are included on the boring logs and geologic sections. Water contents are expressed as a percentage of the sample dry weight.

Atterberg limits were performed on undisturbed samples and were used in classifying material types and evaluating soil plasticity and compressibility.

Triaxial Compression Tests: Triaxial testing consisted of UU tests to evaluate the shear strength of samples of the Stratum C clay. Samples were subjected to a uniform confining pressures equivalent to 80 percent of the estimated effective overburden stress were used in the testing at the sample depth and then sheared immediately without allowing drainage.

Consolidation Tests: Two CRS consolidation tests were performed on samples from Stratum C. Consolidation tests provide information on the maximum past loading conditions and the rates and magnitudes of settlements that may be expected under present and future loading conditions.

The results of individual consolidation tests are presented graphically on Plate Nos. CRS-1 and CRS-2. We estimated the present overburden pressures (P_0) at each sample depth using the estimated effective unit weight of soils above the sample depth and depth to groundwater indicated in the Roux monitoring wells. The maximum past pressures (P_C) were determined from the consolidation curves using the Casagrande method of construction. The compression index (C_C) was obtained from the virgin compression curve and the swell index (C_S) was obtained from the final rebound curve.

SUBSURFACE CONDITIONS

General descriptions of each of the soil strata encountered in the borings and CPT probes, including material classification (Class) in accordance with the New York City Building Code (2014), are summarized below in order of their occurrence with depth. We refer to Geologic Sections A-A and B-B on Drawing Nos. GS-1 and GS-2 for a graphical representation of the variation in soil strata across the site.

Stratum F – Fill (NYC Class 7): The site is covered with fill comprised of natural soils reworked or transported by man. The fill ranges from loose to medium compact, brown fine to coarse sand, some to trace silt, trace to some gravel, trace brick to soft brown clayey silt, some to trace coarse to fine sand. The fill thickness is expected to vary across the site as it ranged between 8 and 13.5 feet in the borings. N-values range from 6 to refusal with an average of 13 bpf. The erratic sampling resistance indicates uncontrolled fill placement with the higher N-values typically the result of large gravel, cobbles, boulders or other obstructions within the fill. Remnant foundations and local concentrations of construction debris are also expected within the fill from prior site construction and the completed demolition of site structures.

Stratum S – Sand (NYC Class 3b): Natural sand underlies the fill in all borings and is interlayered with the underlying Stratum C clay (described below) in Borings MR-1 and MR-3U. Stratum S consists of loose to medium compact, brown fine to medium to fine to coarse sand, trace to some silt, and trace gravel with occasional seams or layers of clayey fine to coarse sand. The thickness of the sand ranges from 35 feet in MR-2U and MR-4P to between 2.5 and 15 feet where the sand is interlayered with Stratum C clay in MR-1 and MR-3U. N-values range from 4 to 36 bpf and average 17 bpf.

Stratum C – Silty Clay (NYC Class 4b): Stiff to hard clay exists below and is typically interlayered with the sand in all borings except Boring MR-4P made in the southeast corner of the site. Stratum C consists of stiff to hard brown, red-brown and gray silty clay, sometimes interlayered or varved with clayey silt, silt or fine to medium sand seams. In MR-2U, Stratum C underlies the Stratum S sand and is ten feet thick. In Borings MR-1 and MR-3U, Stratum C is interlayered with Stratum S and ranges in thickness from five to 17.5 feet. The top of Stratum C varies from 23.5 feet (El. +15) in MR-3U to 48.5 feet (El. -4) in MR-2U. N-values range from 14 to 53 bpf with an average of 26 bpf. Natural water contents range from 25 to 40 percent, with an average value of 31 percent.

Slickensides are evident in many Stratum C samples. Slickensides in a soil are secondary structures that result from prior friction along a fault plane and are found in cohesive material that was disturbed or locally reworked after deposition. These slickensides then become irregular planes of weakness which affect the clay strength. Compression tests on undisturbed samples of Stratum C indicate a range in clay shear strength between 1.9 and 2.1 kips per square foot (ksf).

The consolidation tests indicate that the clay stratum is moderately to heavily over-consolidated with an over-consolidation ratio (OCR) greater than 4. The OCR is the ratio of the pre-consolidation pressure as determined from consolidation testing to the estimated existing overburden pressure at the sample depth.

Stratum T – Till (NYC Class 3a): Glacial till underlies the clay deposits. Stratum T consists of medium compact to very compact, brown to gray fine to coarse sand, trace to some silt with layers and pockets of clayey sand and trace gravel, lignite. The top of the till ranges in depth from 43.5 feet (El. +1) in MR-4P to 58.5 feet (El. -14) in MR-2U. N-values vary between 24 and 107 bpf with an average of 58 bpf. Three fine-grained till samples encountered in Borings MR-1 and MR-3 show an average water content of 21 percent.

Groundwater: Groundwater levels were typically measured during borehole advance and are shown on the boring logs and geologic sections. Borehole levels may not represent stabilized water levels and therefore may not be indicative of the groundwater regime.

Groundwater levels measured in the environmental monitoring wells installed by Roux Associates, Inc. in June 2016 range from a depth of 35 to 36.5 feet below ground surface, or between about El.

+8.3 and El. +9.7. These water levels are indicative of the regional groundwater table. Groundwater levels measured in January 2017 in Piezometer MR-4 range from a depth of 47.9 to 49.7 feet below the standpipe rim, or between El. -2.0 and El. -3.8. These deeper water levels in January 2017 are attributed to dewatering for a deep excavation made across the street from the project site at the northeast corner of the intersection of 39th Avenue and College Point Boulevard. Perched water at the top of the Stratum C clay is also anticipated at the site.

Groundwater levels are expected to vary seasonally throughout the year depending on precipitation levels and surface water infiltration. As such, the groundwater level at the time of construction may be different from levels observed during our field investigations.

RECOMMENDED DESIGN PARAMETERS

Table No. 1 provides recommended soil parameters for the design of foundations and other below ground structures. Tabulated soil properties are average values based on project soil boring and laboratory testing data. In any situation, specific boring and laboratory testing information at the location of interest should be consulted in selecting appropriate values for design.

Table 1 – Soil Design Parameters

Parameter	Soil Stratum			
	F	S	C	T
Total Unit Weight (pcf)	120	120	125	130
Buoyant or Effective Unit Weight (pcf)	58	58	63	68
Angle of Internal Friction, Ø (degrees)	30	32	25	36
Ultimate Friction Factor, S – soil to concrete	N/A	0.5	0.4	0.5
Allowable Bearing Pressure (tsf)	N/A	3	3	6

Groundwater and Flood Levels

The Roux monitoring wells indicate the groundwater level in June 2016 was between about El. +8 and El. +10, or approximately 35 feet below site surface grades. We recommend a design groundwater level at El. +16 to account for seasonal variations and the presence of perched water at the top of the Stratum C clay. These water levels are well below the proposed cellar level and groundwater is therefore not anticipated to influence the proposed building design and construction.

The site is outside the 100-year and 500-year flood zones as indicated on the latest FEMA Flood Zone Maps released in December 2013.

Seismic Design

Structural design of the building foundations must comply with the 2014 NYC Building Code. The Code requires assessment of the potential hazard of soil liquefaction under the seismic event specified by the Code and an evaluation of the seismic Site Class to determine the seismic design parameters.

Liquefaction Potential

Soils below the groundwater level that are within 50 feet of ground surface, sufficiently free of fine grained binder (i.e. silt and clay sizes), and loose in consistency are susceptible to liquefaction during earthquake shaking. Site observation wells indicate that the average depth to groundwater is about 35 feet.

Liquefaction susceptibility was assessed using the Code's Liquefaction Assessment Diagram (Figure 1813.1), which compares field measured SPT N-values with specified liquefaction "screening lines". Soils with SPT N-values plotting to the left of the screening lines are considered potentially liquefiable, while those with values plotting to the right of the liquefaction screening lines are considered unlikely to liquefy. All measured N-values recorded for cohesionless soils below the groundwater plot to the liquefaction unlikely side of Structural Occupancy Category (OC) III and the fine-grained soils present at the site have a plasticity index greater than 20. Liquefaction therefore does not need to be considered in foundation design.

Site Class

Site classification is defined based on the characteristics of the soils below the anticipated foundation level as revealed by the borings and the Code guidelines relating Site Class with measured SPT N-values. On that basis, the site is classified as Site Class D. The seismic design parameters for Site Class D are:

Short period spectral acceleration S_{DS} = 0.294g
1-second period spectral acceleration S_{D1} = 0.117g

Assuming the proposed building is classified as Structural Occupancy Category (OC) III (to be confirmed by the structural engineer), corresponding to Seismic Use Group II, using S_{DS} = 0.294g and S_{D1} = 0.117g results in Seismic Design Category "B" per the Code's §1616.3, Table 1616.3(1) "Seismic Design Category Based on Short-Period Response Accelerations".

FOUNDATION DESIGN RECOMMENDATIONS

Foundation recommendations are provided based on the results of the subsurface investigations and the proposed building construction as described herein. Our recommendations should be reviewed if the scope of the proposed construction changes significantly.

Building Foundations

The uncontrolled fill (Stratum F) is an unsatisfactory bearing material for building foundations. Foundations will have to derive their support in the underlying more competent natural sands and clays. As shown on Geologic Sections A-A and B-B, soils at the anticipated foundation level are expected to consist of medium compact Stratum S sand. On that basis, support of the building on shallow foundations, consisting of either discrete footings or a mat foundation, is viable. The Stratum S sand in undisturbed condition is suitable for an allowable bearing pressure of 3 tons per square foot (tsf). Local over-excavation below proposed foundation level may be required where deeper fill is present with the excavated soils replaced by either compacted structural fill or lean concrete.

If a mat foundation is selected, structural design of the mat should be performed using Winkler springs to represent the load-deformation response of subgrade soils. Such springs are characterized by

coefficients of subgrade reaction or subgrade modulus. The selected values of subgrade modulus used in the analysis of a mat must be compatible with the deformation characteristics of the subgrade including any time dependent soil response such as from consolidation. The use of a single constant subgrade modulus is usually not appropriate and can produce misleading results. Mat design therefore requires an iterative analysis wherein the computed mat deflections by the structural engineer are compared to the subgrade response (mat settlements) predicted by the geotechnical engineer for the range of loads and loading conditions applied to the mat. The effects of geometry and applied loads on the mat deformation must be carefully evaluated, and the subgrade modulus distribution modified accordingly for the structural analysis. Analysis is continued by adjusting the subgrade modulus based on mat contact pressures until computed mat deflections are reasonably compatible with predicted settlements. Mat design should be performed in accordance with ACI 336.2R and the initial values of subgrade modulus refined using an iterative analysis between structural and geotechnical engineers as described above.

Foundation Settlement

The site is underlain by stiff but compressible clay (Stratum) that will influence the settlement of foundations depending on the selected foundation type (footings or mat) and magnitude and distribution of building loads. Settlement estimates and associated values of subgrade modulus can be provided following receipt of the anticipated magnitude and distribution of foundation bearing pressures from the structural engineer.

Cellar Walls

Permanent foundation walls must be designed to withstand long-term, at rest earth pressures, surcharge pressure, and water pressure, consistent with NYC Building Code requirements. We recommend calculating at-rest soil and water pressures as a triangular distribution using an equivalent fluid pressure of 60 pcf above the design groundwater level and 95 pcf below the groundwater level. Foundation walls must also accommodate surcharge pressures in accordance with the NYC Building Code. Lateral pressures from surcharge should be estimated as 50% of the vertical surcharge pressure applied at the ground surface. The use of elevated stress levels is appropriate in the design of foundation walls for these temporary load conditions.

Cellar Slab

The planned cellar slab is above the groundwater and may consist of a mat foundation bearing on the Stratum S sand or a slab on grade bearing on Strata F or S if footings are used for building support. Slab on grade construction should include a 6-inch thick gravel bedding course and a vapor barrier on the slab underside to prevent moisture infiltration through the slab.

Waterproofing

As the proposed cellar slab elevation is above the design groundwater level, damp proofing of cellar walls and floors is required by the NYC Building Code as a minimum to mitigate moisture infiltration in below grade space. Damp proofing of cellar floors should include placement of a vapor barrier below the floor slab as described under slab on grade construction. Membrane waterproofing of foundation walls and slab should be considered if the cellar will serve as high quality habitable space. For spaces below the design groundwater elevation, it will be necessary to install waterproofing at least up to the design water level. For all waterproofed spaces, we recommend using hydrophilic water stops and groutable tubes at construction joints below the water table.

If deep elevator or mechanical pits are required to penetrate below the groundwater table, the pits should be designed as a watertight, pressure-resisting structure to withstand hydrostatic pressure. The design consists of a pressure-resisting structural slab and walls encapsulated by a waterproofing system.

The dampproofing/waterproofing system must be carefully designed and detailed, and construction inspection is vital to provide proper quality control.

CONSTRUCTION CONSIDERATIONS

Cellar construction is expected to require excavations on the order of 15 feet below existing ground surfaces at the perimeter of the site with local, deeper excavation in the area of elevator and mechanical pits. Temporary works including excavation support, construction dewatering, and monitoring systems are therefore expected to facilitate this construction.

Support of Excavation

Temporary construction excavations should be sloped as necessary for safety and stability or supported by sheeting and bracing in accordance with OSHA regulations. Open-cut excavation is permissible for excavations provided that such excavation is stable and does not undermine or cause damage to adjacent structures. Where such conditions permit, the excavations sides in soil should be sloped no steeper than 1V:1.5H.

Soldier piles and lagging are considered suitable for excavation along the street exposures and along the southern perimeter. Typically, these walls can be installed within the sidewalk assuming a sidewalk permit is obtained from the NYC DOT. The use of drilled soldier piles is recommended within 50 feet of existing structures to avoid the potential for damage to nearby structures resulting from vibrations caused by pile driving. The cellar will need to be setback about 3 feet from the southern property line to allow for installation of soldier piles and bracing along this perimeter, unless an access agreement is negotiated with the neighbor to permit soldier pile installation on the adjacent property. Integrated open cut excavations within the site limits are anticipated at the rear yard in the southeast corner of the site.

We understand that the proposed cellar will be setback from the east property line to avoid underpinning of the adjacent building. Based on the findings in Test Pit TP-1, the adjacent building is founded at Elev. +33.3±, about 7 feet above the assumed excavation level for foundation construction. Proposed building foundations along the east property line should be designed to bear at the same elevation as the existing foundations of the adjacent building. Proposed foundations requiring excavation below the bearing subgrade of the adjacent building should be stepped away from the property line outside the influence zone of the adjacent foundations. Proposed foundations should be stepped away from the face of the existing foundation with a minimum 3 foot wide bench maintained 1 foot above the bottom of the adjacent footing followed by a 1V:1.5H slope extending to final excavation subgrade. A lean concrete mud mat should be placed on the bench and slope immediately following exposure to prevent disturbance during subsequent construction operations.

Inclined tiebacks are expected as the primary method of bracing the soldier piles and lagging as excavation proceeds. The use of tiebacks will require drilling under the adjacent streets and private properties. Plans showing the locations and depths of existing utilities in the streets surrounding the property should be prepared to evaluate and inform the contractor if utilities or other underground

interferences exist that would restrict the use of tiebacks. An easement from NYC DOT is required for placement of tiebacks into the streets. Cantilevered excavation support, if viable, or use of internal bracing along the south property line is recommended to avoid tieback installation beneath the gas station site.

The excavation shoring must be designed by a Professional Engineer licensed in the State of New York with the design submitted for review and approval of NYC Department of Buildings (NYC DOB) as part of the foundation permitting process. NYCT review of SOE and foundation plans is also required since the work is within 200 feet of NYCT structures. Given the proposed construction and the setback distance from the NYCT structures adjacent to the southeast corner of the site, we anticipate that NYCT will issue a Letter of No Impact due to the proposed construction for the project.

Excavation

Cellar construction requires excavation in fill and natural soils. These materials can be excavated using conventional earth moving equipment. Existing intact foundations may require removal using pneumatic hammers. Care is necessary to avoid disturbing the soils beneath adjacent structures during demolition work.

Construction Dewatering

Construction dewatering is not required for general site excavation as the proposed cellar is above the groundwater. However, local pumping should be expected to handle water generated from construction operations and rainfall and surface water infiltration after storm events. Local dewatering is expected to consist of sumps and pumps.

Foundation Subgrade Preparation

Care must be exercised to prevent disturbing or loosening of the soil in the sides and bottom of excavations. Proper performance of foundations requires support on undisturbed subgrade. Final subgrade exposure in soils must be made using a smooth edged excavating tool, such as a backhoe or bucket with the teeth shielded, and operating by reach of equipment and working on mats or at least two feet above subgrade. All water must be diverted away from and not allowed to pond in excavations.

All subgrades must be inspected and approved for foundation construction by a qualified geotechnical engineer in accordance with the Special Inspection requirements of the NYC Building Code. Foundation construction should either proceed immediately after subgrade approval or subgrade promptly covered with a lean concrete mud to protect subgrade materials from subsequent deterioration from weather, surface water infiltration and construction traffic in the interim period until foundation construction. The mud mat will also provide a working surface for waterproofing installation and foundation construction.

Subgrade for slab-on-grade construction should be proof rolled prior to slab construction using a heavy static compactor to verify its integrity. Hard points, such as building remnants and boulders, should be removed a minimum of one foot below slab subgrade. If soft, spongy, or otherwise unsatisfactory material is encountered, that material should be removed and replaced with compacted structural fill.

Backfill

Backfill beneath or around footings or mat foundations and behind foundation walls should consist of structural fill, conforming to NYC Building Code requirements for controlled fill. All structural fill should be placed in loose lifts not exceeding 12 inches and compacted to minimum of 95% of Modified Proctor maximum dry density (ASTM D1557). Fill density must be verified using in-place tests with fill placement and compaction subject to special inspection by a qualified geotechnical engineer.

Backfilling is not permitted in freezing weather, with frozen materials, or upon frozen materials. Every effort must be made to prevent surface water runoff from entering excavation and backfill areas using perimeter berms and dikes. Slopes, crowns, and ditches on backfill surfaces should be maintained to ensure proper surface drainage and prevent surface water from ponding or softening backfill surfaces and soil subgrades.

Construction Monitoring

Pre-construction condition surveys of adjacent buildings were performed and have documented existing conditions, including photographs of existing conditions. The New York City Building Code requires a program of monitoring vibration, noise and settlement of adjacent structures during construction. The program should include control points on each of the adjacent structures to measure both vertical and lateral movement. Control points should also be established at regular intervals along each side of the excavation support system for similar movement monitoring as well as installing crack gauges over existing cracks on the inside and outside of the structures on the adjacent properties.

GEOTECHNICAL REVIEW OF FOUNDATION DESIGN & CONSTRUCTION

The borings disclose a complex subsurface profile with interlayered sands and clays expected below foundation subgrade. Interaction between the geotechnical and structural engineer is therefore essential as foundation design progresses to optimize building foundations and provide adequate building performance under the range of service loading conditions. Geotechnical review and assistance in preparation of foundation plans and specifications for below grade work is also recommended so that foundation and construction recommendations provided herein are properly interpreted and implemented in the design.

Recommendations for foundation design and construction in this report are based on the information obtained from the borings and associated field and laboratory testing. However, conditions on the site may vary between discrete boring locations and observed at the time of our subsurface exploration. The nature and extent of variations between borings may not become evident until exposed in construction. Geotechnical observation of foundation construction and testing is recommended to provide an opportunity to observe soil conditions and behavior as exposed during construction, evaluate the applicability of the recommendations provided in this report to the soil conditions encountered, and recommend appropriate changes in design or construction procedures if conditions differ from those described herein. We recommend that all foundation construction be observed by a qualified geotechnical engineer in accordance with the requirements of the NYC Building Code.

CLOSURE

This report is prepared for the sole use of the client and is specific to the project design contemplated at the time of report issue. Recommendations for foundation design and construction should be reviewed if the location, depth or scope of the proposed construction changes from that described herein.

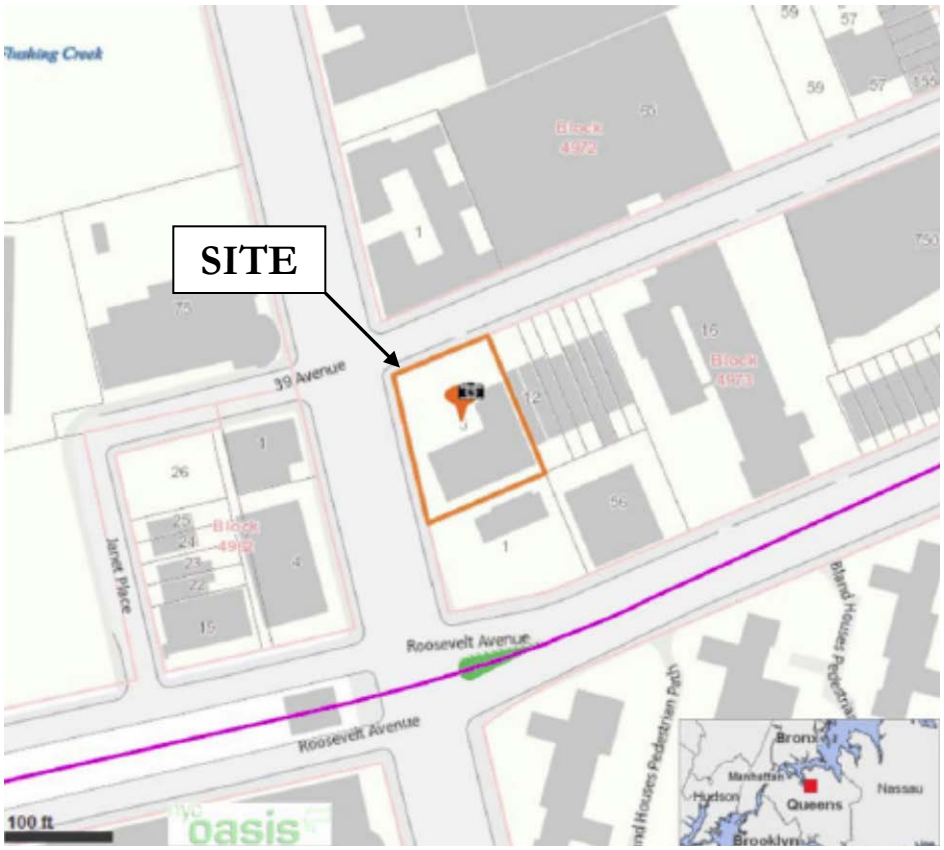
Very truly yours,

MUESER RUTLEDGE CONSULTING ENGINEERS

By: _____
Walter E. Kaeck, Principal

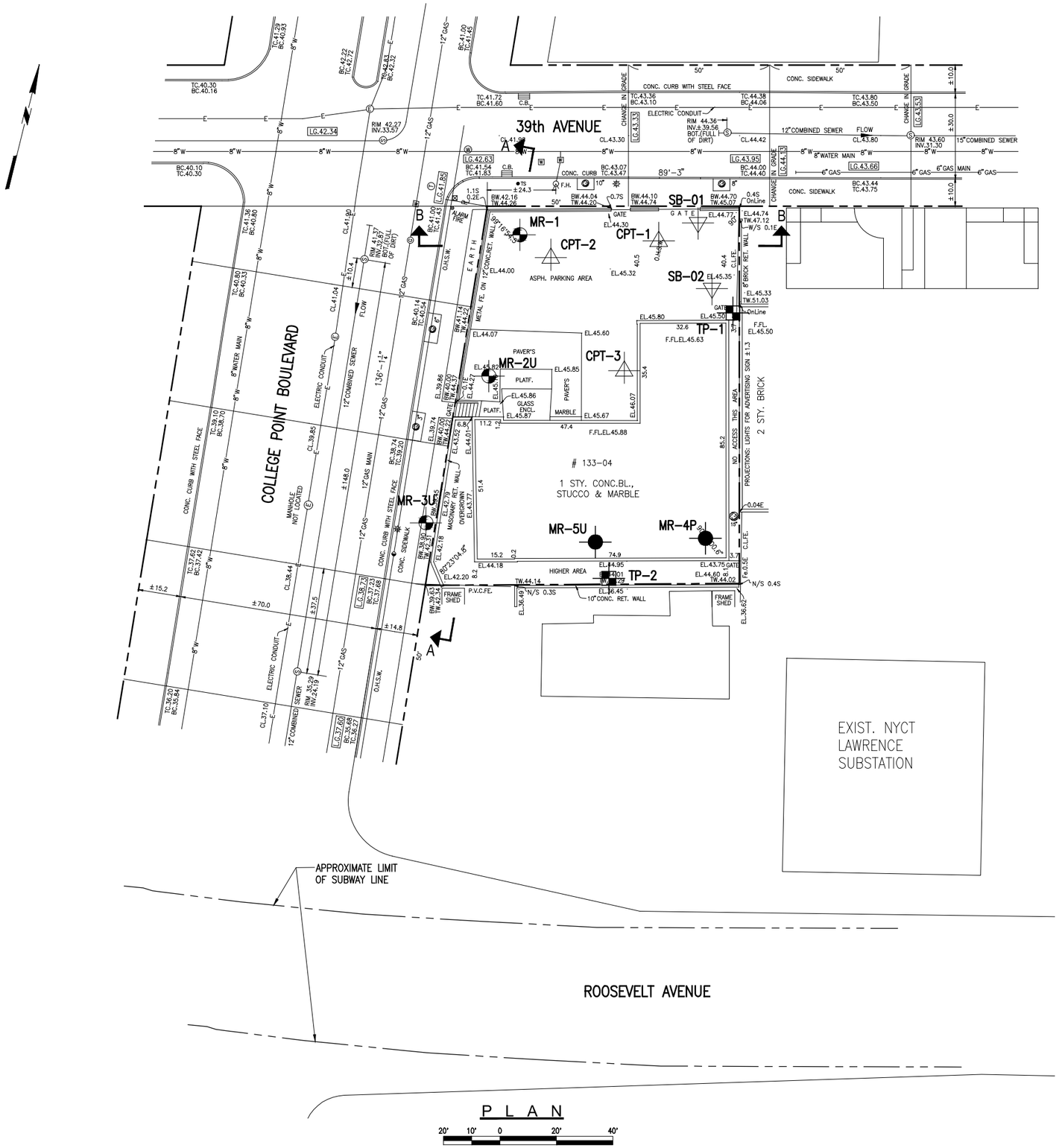
MTM:WEK
F:\126\12629\Geotechnical Investigation\2021 Revised Geotech Report\12629_Updated Geotechnical Report_133-04 39th Avenue.docx

EXHIBITS



NOTE: Map from the Open Accessible Space Information System (OASIS) website, www.oasisnyc.net, retrieved on 6/30/2016

AAFE Mixed-Use Building, Queens, New York	
Mueser Rutledge Consulting Engineers **225 West 34th Street • New York, NY 10122**	06/30/16
Site Location Plan	MRCE 12629



NOTES:

1. THE BASE PLAN FOR THE PROJECT SITE IS FROM THE ARCHITECTURAL SITE SURVEY, DRAWING REFERENCE NO. Q4973–002, PREPARED BY JOSEPH NICOLETTI ASSOCIATES, 499 JERICHO TURNPIKE, SUITE 201, MINEOLA, NEW YORK, 11501, DATED MARCH 1, 2016.
2. THE OUTLINES OF ADJACENT BUILDINGS WERE TAKEN FROM THE NEW YORK CITY DEPARTMENT OF CITY PLANNING ZONING MAP.
3. THE LOCATION OF THE NYCT SUBWAY TUNNEL UNDER ROOSEVELT AVE WAS TAKEN FROM NYCT DRAWING ROUTE NO. 52 – SECTION NO.3, STA. 0 + 00 TO STA. 8 + 30, STRUCTURAL PLAN DWG NO. 28, DATED 4–02–1923.
4. THE LOCATION OF THE NYCT SUBWAY SUBSTATION WAS TAKEN FROM NYCT DRAWING ROUTE NO. 52 – SECTION NO. 3, LAWRENCE SUBSTATION STRUCTURAL PLANS, FIRST FLOOR PLAN. DWG NO. 306, DATED 9–19–1951.
5. THE NYCT STRUCTURES WERE LOCATED BY SCANNING THE REFERENCED DRAWINGS AND SCALING THEM TO FIT ON THE BASE PLAN. ALL LOCATIONS ARE APPROXIMATE.
6. BORINGS MR–1, MR–2U, MR–3U AND CPTS WERE MADE BY CRAIG DRILLING, INC., OF MAYS LANDING, NEW JERSEY, BETWEEN MAY 2, THROUGH MAY 10, 2016, UNDER THE CONTINUOUS INSPECTION OF MUESER RUTLEDGE CONSULTING ENGINEERS (MRCE).
7. BORINGS MR–4P & MR–5U WERE MADE BY CRAIG DRILLING OF MAYS LANDING, NY, ON DECEMBER 15, 2016, UNDER THE CONTINUOUS INSPECTION OF MRCE.
8. BORINGS TWP–01/SB–01 AND TWP–02/SB–02 WERE MADE BY AQUIFER DRILLING AND TESTING, BETWEEN NOVEMBER 4 & 5, 2006, UNDER THE INSPECTION OF LOUIS BERGER AND ASSOCIATES, P.C.
9. TEST PITS TP–1 AND TP–2 WERE MADE BY TEST PIT CORP ON JUNE 17, 2021, UNDER THE CONTINUOUS INSPECTION OF MRCE.
10. ELEVATIONS AT THE BORING AND TEST PIT LOCATIONS WERE ESTIMATED IN REFERENCE TO NAVD88 BASED ON AVAILABLE SITE SURVEY INFORMATION.
11. BORING AND TEST PIT LOCATIONS WERE MEASURED IN THE FIELD OFF OF EXISTING STRUCTURAL FEATURES.
12. GEOLOGIC SECTION A–A IS SHOWN ON DRAWING GS–1 AND GEOLOGIC SECTION B–B IS SHOWN ON DWG. GS–2.

LEGEND:

MR–3U
– 2016 PRELIMINARY PHASE BORING
– "U" UNDISTURBED SAMPLE

MR–4P
– 2016 FINAL PHASE BORING
– "P" PIEZOMETER

CPT–1
– 2016 PRELIMINARY PHASE CPT BY CRAIG TEST

SB–01
– 2006 EXISTING BORING MADE BY AQUIFER DRILLING AND TESTING

TP–1
– 2021 TEST PIT

REV.	DATE	BY	DESCRIPTION
2	06–18–21	J.A.B.	ADDED TEST PIT INVESTIGATION
1	01–12–17	S.O.H.J.	FINAL PHASE

AAFE MIXED USE BUILDING
QUEENS NEW YORK

ASIAN AMERICANS FOR EQUALITY
NEW YORK NEW YORK

MUESER RUTLEDGE CONSULTING ENGINEERS
14 PENN PLAZA – 225 W. 34TH STREET, NY, NY 10122

SCALE	MADE BY: E.C. DATE: 06–07–2016	FILE NUMBER
GRAPHIC	CH'KD BY: S.O.H.J. DATE: 06–07–2016	12629

BORING LOCATION PLAN — DRAWING NUMBER B–1

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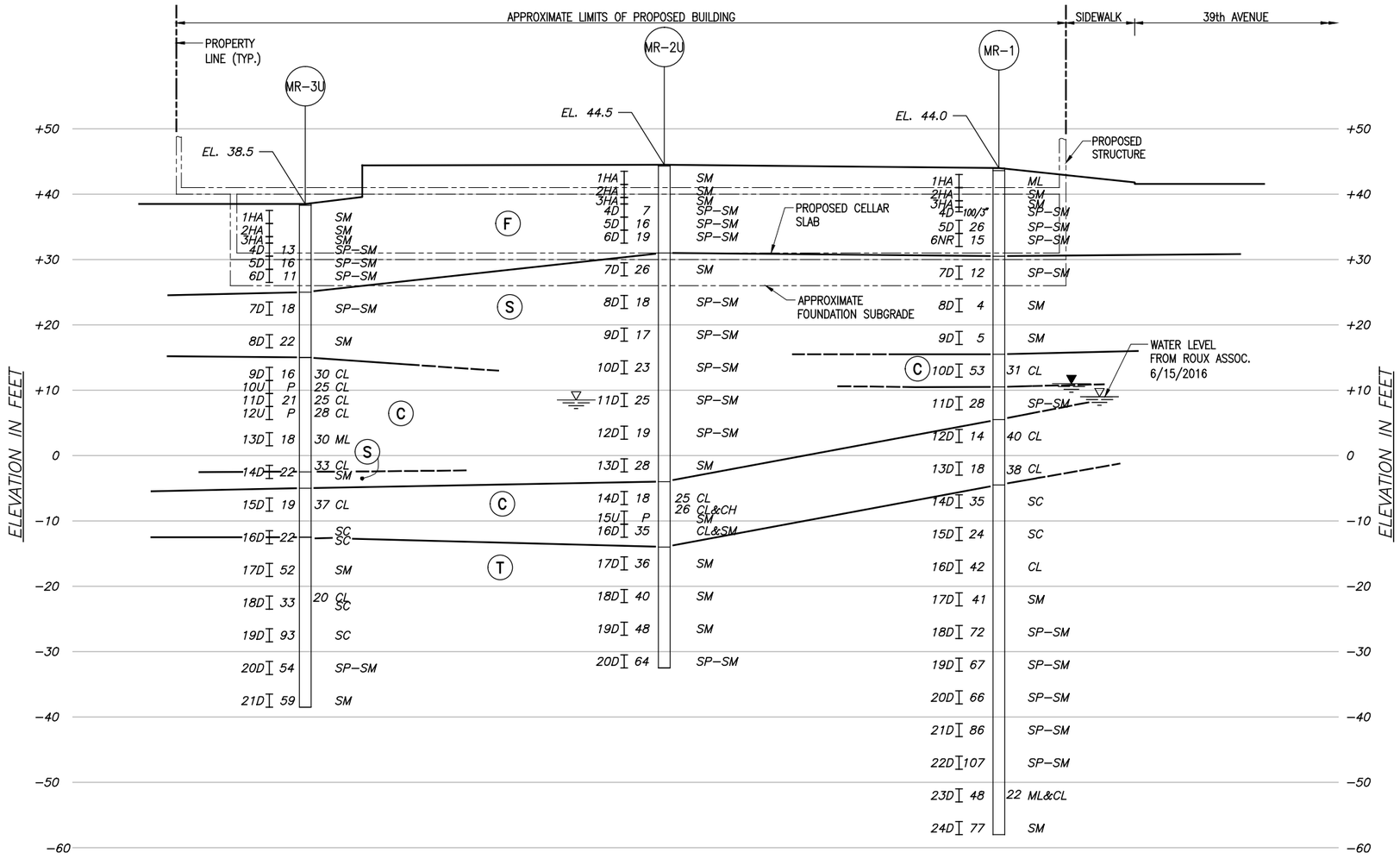

GEOLOGIC SECTION A-A

GENERAL STRATA DESCRIPTIONS:

(F) **FILL** – LOOSE TO MEDIUM COMPACT, BROWN FINE TO COARSE SAND, SOME TO TRACE SILT, TRACE TO SOME GRAVEL.

(S) **SAND** – LOOSE TO MEDIUM COMPACT, BROWN FINE TO COARSE SAND, TRACE TO SOME SILT, TRACE GRAVEL.

(C) **SILTY CLAY** – STIFF TO HARD BROWN, RED–BROWN AND GRAY SILTY CLAY, SOMETIMES INTERLAYERED OR VARVED WITH CLAYEY SILT, SILT OR FINE TO MEDIUM SAND SEAMS.

(T) **TILL** – MEDIUM COMPACT TO VERY COMPACT, BROWN TO GRAY FINE TO COARSE SAND, TRACE TO SOME SILT WITH LAYERS AND POCKETS OF CLAYEY SAND, TRACE GRAVEL, LIGNITE.

GEOLOGIC SECTION NOTES:

1. FOR GENERAL NOTES AND LOCATIONS OF BORINGS AND GEOLOGIC SECTIONS, SEE BORING LOCATION PLAN, DRAWING NO. B–1.
2. FOR BORING LEGEND AND SOIL CLASSIFICATION SYSTEM, SEE GEOTECHNICAL REFERENCE STANDARDS, DRAWING NO. GS–R.
3. BORINGS ILLUSTRATED ON GEOLOGIC SECTIONS ARE IN SOME CASES PROJECTED TO THE SECTION OR OFFSET FOR CLARITY. STRATIFICATIONS SHOWN ON GEOLOGIC SECTIONS ARE NECESSARY INTERPOLATIONS BETWEEN AND BEYOND BORINGS AND MAY NOT REPRESENT ACTUAL SUBSURFACE CONDITIONS.

GRAPHIC SCALE
10' 5' 0 10' 20'

REV.	DATE	BY	DESCRIPTION
2	07–27–21	M.M.	UPDATED PROPOSED STRUCTURE
1	01–12–17	S.O.H.J.	FINAL PHASE

AAFE MIXED USE BUILDING
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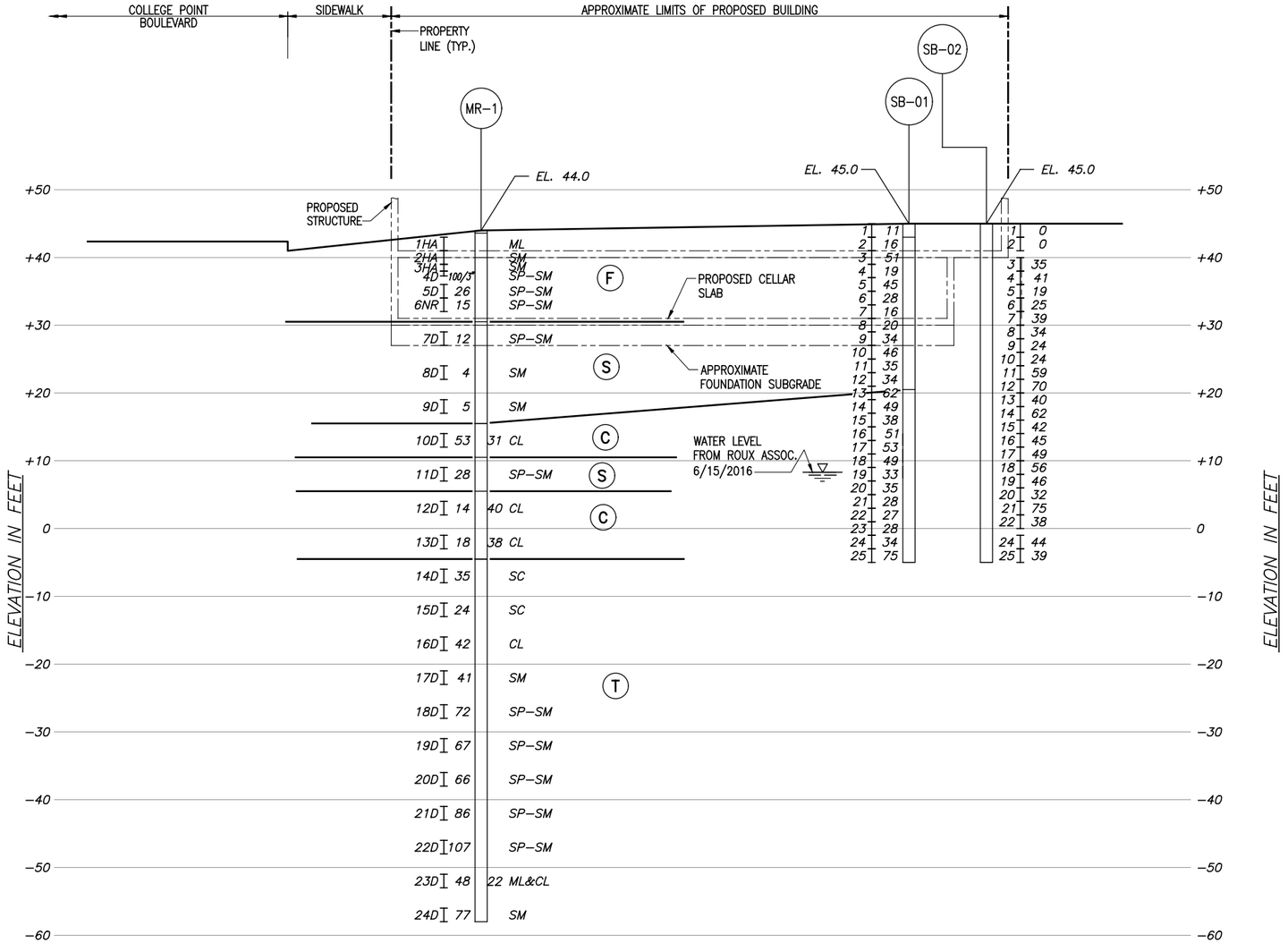
MUESER RUTLEDGE CONSULTING ENGINEERS
14 PENN PLAZA – 225 W. 34TH STREET, NY, NY 10122

SCALE	MADE BY: E.C. DATE: 06–07–2016	FILE NUMBER
GRAPHIC	CH'KD BY: S.O.H.J. DATE: 06–07–2016	12629

GEOLOGIC SECTION A–A — DRAWING NUMBER GS–1



GEOLOGIC SECTION B-B

GENERAL STRATA DESCRIPTIONS:

(F) **FILL** – LOOSE TO MEDIUM COMPACT, BROWN FINE TO COARSE SAND, SOME TO TRACE SILT, TRACE TO SOME GRAVEL.

(S) **SAND** – LOOSE TO MEDIUM COMPACT, BROWN FINE TO COARSE SAND, TRACE TO SOME SILT, TRACE GRAVEL.

(C) **SILTY CLAY** – STIFF TO HARD BROWN, RED–BROWN AND GRAY SILTY CLAY, SOMETIMES INTERLAYERED OR VARVED WITH CLAYEY SILT, SILT OR FINE TO MEDIUM SAND SEAMS.

(T) **TILL** – MEDIUM COMPACT TO VERY COMPACT, BROWN TO GRAY FINE TO COARSE SAND, TRACE TO SOME SILT WITH LAYERS AND POCKETS OF CLAYEY SAND, TRACE GRAVEL, LIGNITE.

NOTES:

FOR NOTES, SEE DRAWING NO. GS–1.

GRAPHIC SCALE

10' 5' 0 10' 20'

REV.	DATE	BY	DESCRIPTION
2	07–27–21	M.M.	UPDATED PROPOSED STRUCTURE
1	01–12–17	S.O.H.J.	FINAL PHASE

AAFE MIXED USE BUILDING

QUEENS NEW YORK

ASIAN AMERICANS FOR EQUALITY

NEW YORK NEW YORK

MUESER RUTLEDGE CONSULTING ENGINEERS
14 PENN PLAZA – 225 W. 34TH STREET, NY, NY 10122

SCALE	MADE BY: E.C. DATE: 06–07–2016	FILE NUMBER
GRAPHIC	CH'KD BY: S.O.H.J. DATE: 06–07–2016	12629

GEOLOGIC SECTION B–B

DRAWING NUMBER GS–2

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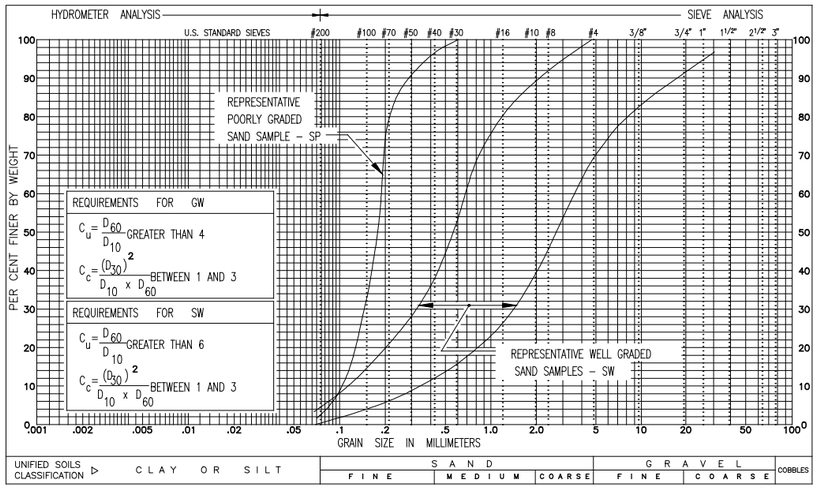
UNIFIED SOIL CLASSIFICATION (INCLUDING IDENTIFICATION AND DESCRIPTION)

1 MAJOR DIVISIONS	2		3 GROUP SYMBOLS	4 TYPICAL NAMES	5 FIELD IDENTIFICATION PROCEDURES (EXCLUDING PARTICLES LARGER THAN 3 IN. AND BASING FRACTIONS ON ESTIMATED WEIGHTS)
COARSE-GRAINED SOILS — MORE THAN HALF OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE — MORE THAN HALF OF MATERIAL IS ABOUT THE SMALLEST PARTICLE VISIBLE TO THE NAKED EYE	GRAVELS — MORE THAN HALF OF COARSE FRACTION IS LARGER THAN NO. 4 SIEVE SIZE. (FOR VISUAL CLASSIFICATION, THE 1/4 -IN. SIZE MAY BE USED AS EQUIVALENT TO THE NO. 4 SIEVE SIZE)	CLEAN GRAVELS (LITTLE OR NO FINES)	GW	WELL GRADED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES.	WIDE RANGE IN GRAIN SIZES AND SUBSTANTIAL AMOUNTS OF ALL INTERMEDIATE PARTICLE SIZES.
			GP	POORLY GRADED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES.	PREDOMINANTLY ONE SIZE OR A RANGE OF SIZES WITH SOME INTERMEDIATE SIZES MISSING.
		GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES)	GM	SILTY GRAVELS, GRAVEL-SAND-SILT-MIXTURES.	NONPLASTIC FINES OR FINES WITH LOW PLASTICITY (FOR IDENTIFICATION PROCEDURES SEE ML BELOW)
			GC	CLAYEY GRAVELS, GRAVEL-SAND-CLAY MIXTURES.	PLASTIC FINES (FOR IDENTIFICATION PROCEDURES SEE CL BELOW)
	SANDS — MORE THAN HALF OF COARSE FRACTION IS SMALLER THAN NO. 4 SIEVE SIZE.	CLEAN SANDS (LITTLE OR NO FINES)	SW	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES.	WIDE RANGE IN GRAIN SIZES AND SUBSTANTIAL AMOUNTS OF ALL INTERMEDIATE PARTICLE SIZES.
			SP	POORLY GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES.	PREDOMINANTLY ONE SIZE OR A RANGE OF SIZES WITH SOME INTERMEDIATE SIZES MISSING.
		SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)	SM	SILTY SANDS, SAND-SILT-MIXTURES.	NONPLASTIC FINES OR FINES WITH LOW PLASTICITY (FOR IDENTIFICATION PROCEDURES SEE ML BELOW)
			SC	CLAYEY SANDS, SAND-CLAY MIXTURES.	PLASTIC FINES (FOR IDENTIFICATION PROCEDURES SEE CL BELOW)
FINE-GRAINED SOILS — MORE THAN HALF OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE — THE NO. 200 SIEVE SIZE IS ABOUT					IDENTIFICATION PROCEDURES ON FRACTION SMALLER THAN NO. 40 SIEVE SIZE
					DRY STRENGTH (CRUSHING CHARACTERISTICS) / DILATANCY (REACTION TO SHAKING) / TOUGHNESS (CONSISTENCY NEAR PL)
	SILTS AND CLAYS — LIQUID LIMIT IS LESS THAN 50		ML	INORGANIC SILTS, SANDY SILTS, ROCK FLOUR, OR CLAYEY SILTS WITH SLIGHT PLASTICITY.	NONE TO SLIGHT / QUICK TO SLOW / NONE
			CL	INORGANIC CLAYS, OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS.	MEDIUM TO HIGH / NONE TO VERY SLOW / MEDIUM
			OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY.	SLIGHT TO MEDIUM / SLOW / SLIGHT
	SILTS AND CLAYS — LIQUID LIMIT IS GREATER THAN 50		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SANDY OR SILTY SOILS, ELASTIC SILTS.	SLIGHT TO MEDIUM / SLOW TO NONE / SLIGHT TO MEDIUM
			CH	INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS.	HIGH TO VERY HIGH / NONE / HIGH
			OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS.	MEDIUM TO HIGH / NONE TO VERY SLOW / SLIGHT TO MEDIUM
HIGHLY ORGANIC SOILS			Pt	PEAT AND OTHER HIGHLY ORGANIC SOILS.	READILY IDENTIFIED BY COLOR, ODOR, SPONGY FEEL AND FREQUENTLY BY FIBROUS TEXTURE.

BOUNDARY CLASSIFICATIONS: SOILS POSSESSING CHARACTERISTICS OF TWO GROUPS ARE DESIGNATED BY COMBINATIONS OF GROUP SYMBOLS, I.E.: SP-SC POORLY GRADED SAND WITH CLAY BINDER.

LABORATORY CLASSIFICATION CRITERIA

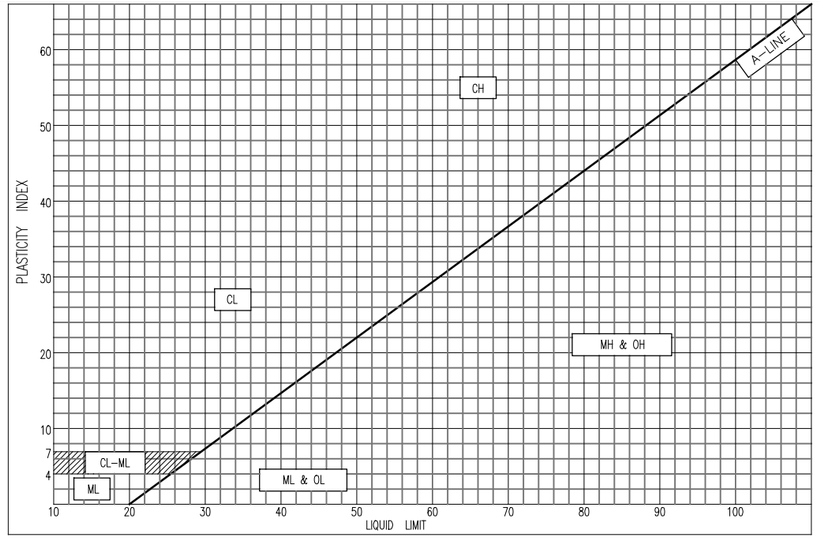


GRAIN SIZE PLOT

COBBLE 3-12"
BOULDER > 12"

DEPENDING ON PERCENTAGE OF FINES (FRACTION SMALLER THAN NO. 200 SIEVE SIZE) COARSE GRAINED SOILS ARE CLASSIFIED AS FOLLOWS:

LESS THAN 5%	GW, GP, SW, SP
MORE THAN 12%	GM, GC, SM, SC
5% TO 12%	BORDERLINE CASES REQUIRING USE OF DUAL SYMBOLS, I.E.: SP-SM, GP-GM.



PLASTICITY CHART FOR CLASSIFICATION OF FINE GRAINED SOILS

TERMINOLOGY USED IN MRCE SOIL DESCRIPTIONS

DEGREE OF COMPACTION FOR NON-PLASTIC SOIL

DEGREE OF COMPACTION	BLOWS* PER FOOT
LOOSE	0 TO 10
MEDIUM COMPACT	11 TO 29
COMPACT	30 TO 50
VERY COMPACT	GREATER THAN 50

* STANDARD PENETRATION RESISTANCE USING 140 LB. HAMMER FREE FALLING 30 INCHES TO DRIVE A 2 INCH O.D. SPLIT-SPOON SAMPLER.

CONSISTENCY OF CLAY AND CLAYEY SILT+

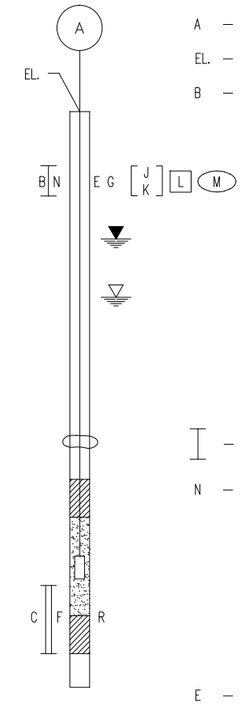
CONSISTENCY	UNCONFINED COMPRESSIVE STRENGTH (TSF)	IDENTIFICATION CHARACTERISTICS
SOFT	LESS THAN 0.5	EASILY REMOLDED WITH SLIGHT FINGER PRESSURE
MEDIUM	0.5 TO 1.0	REQUIRES SUBSTANTIAL PRESSURE FOR REMOLDING
STIFF	1.0 TO 4.0	DIFFICULT TO REMOLD WITH FINGERS
HARD	GREATER THAN 4.0	CANNOT BE REMOLDED WITH FINGERS

\+ NONPLASTIC SILTS ARE DESCRIBED USING DEGREE OF COMPACTION AS PRESENTED FOR NON-PLASTIC SOIL.

DESCRIPTION OF CONSTITUENT PERCENTAGES AS USED IN SOIL SAMPLE CLASSIFICATIONS

- 1% TO 12% - "TRACE"
- 13% TO 30% - "SOME"
- 31% TO 49% - ADJECTIVE FORM OF SOIL GROUP (EG. SANDY)
- EQUAL AMOUNT - "AND" (EG. SAND AND GRAVEL)

BORING LEGEND



- A — NUMBER, TYPE AND LOCATION OF BORING
- EL. — GROUND SURFACE ELEVATION AT BORING
- B — NUMBER AND TYPE OF SAMPLE
  - HA - HAND AUGER SAMPLE
  - D - DRY SAMPLE TAKEN WITH 2 INCH O.D. SPLIT SPOON
  - U - UNDISTURBED SAMPLE TAKEN WITH 3 INCH O.D. FIXED PISTON TYPE SAMPLER
  - UD - UNDISTURBED SAMPLE EXTRUDED IN FIELD AND PLACED IN JAR DUE TO POOR RECOVERY OR DISTURBANCE
  - S - THIN TUBE SAMPLE TAKEN WITH SHELBY TUBE SAMPLER
  - N - THIN TUBE SAMPLE TAKEN WITH DENISON BARREL SAMPLER
  - P - THIN TUBE SAMPLE TAKEN WITH PITCHER BARREL SAMPLER
  - NR - NO RECOVERY
- | — LENGTH OF SAMPLE ATTEMPT
- N — STANDARD PENETRATION RESISTANCE. NUMBER OF BLOWS FROM 140 LB. HAMMER FREE FALLING 30 INCHES REQUIRED TO DRIVE 2 INCH O.D. SPLIT SPOON SAMPLER ONE FOOT AFTER INITIAL PENETRATION OF 6 INCHES, UNLESS A SPECIFIC PENETRATION IS INDICATED.
  - P - PRESSED OR PUSH SAMPLE
  - WH - SAMPLE TAKEN UNDER WEIGHT OF HAMMER AND RODS
  - WR - SAMPLE TAKEN UNDER WEIGHT OF RODS
- E — AVERAGE NATURAL WATER CONTENT OF SAMPLE, IN PERCENT OF DRY WEIGHT
- G — UNIFIED SOIL CLASSIFICATON GROUP SYMBOL OF SAMPLE
- [J / K] = ATTERBERG LIQUID LIMIT VALUE / ATTERBERG PLASTIC LIMIT VALUE
- [L] — COMPRESSIVE STRENGTH IN TSF DETERMINED FROM UNCONFINED COMPRESSION TEST
- (M) — COMPRESSIVE STRENGTH IN TSF DETERMINED FROM UNCONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION TEST
- ▼ — GROUNDWATER LEVEL OBSERVED IN BORING
  - * - MUD LEVEL
- ▽ — GROUNDWATER LEVEL OBSERVED IN PIEZOMETER
- C — ROCK CORE NUMBER
- | — LENGTH OF CORE RUN
- F — LENGTH OF CORE RECOVERED EXPRESSED AS A PERCENT OF THE LENGTH OF CORE RUN
- R — ROCK QUALITY DESIGNATION-THE SUM OF THE LENGTHS OF PIECES OF RECOVERED CORE WHICH ARE EQUAL TO OR GREATER THAN FOUR INCHES IN LENGTH, EXPRESSED AS A PERCENTAGE OF THE TOTAL LENGTH OF CORE RUN. LENGTHS ARE MEASURED BETWEEN IN-SITU SEPARATIONS AND MECHANICAL BREAKS RESULTING FROM CORING ARE IGNORED.
- IMPERVIOUS SEAL
- SAND FILTER SURROUNDING PIEZOMETER INTAKE ELEMENT
- INTAKE ELEMENT
- COBBLE OR BOULDER

REVISED 10-25-2012

MUESER RUTLEDGE CONSULTING ENGINEERS
225 WEST 34th STREET - 14 PENN PLAZA
NEW YORK, NY 10122

GEOTECHNICAL REFERENCE STANDARDS

DRAWING NO. GS-R

TABLE NO. 1

SUMMARY OF LABORATORY TEST DATA

SAMPLE IDENTIFICATION					CLASSIFICATION PROPERTIES								PHYSICAL PROPERTIES												
										UNIFIED SOIL CLASSIFICATION SYSTEM			STRENGTH						CONSOLIDATION						
BORING NUMBER	SAMPLE NUMBER	ELEVATION , FT.	STRATUM DESIGNATION	IN-SITU UNIT WEIGHT, PCF	AVERAGE NATURAL WATER CONTENT, W_n , %	LIQUID LIMIT, W_L , %	PLASTICITY INDEX, I_P , %	NATURAL WATER CONTENT OF LIMIT SAMPLE, W_n , %	SPECIFIC GRAVITY OF SOILIDS, G_s	GROUP SYMBOL	% SAND (< #4 > #200 SIEVE)	% FINES (< #200 SIEVE)	TYPE OF TEST	COMPRESSIVE STRENGTH ($\sigma_1 - \sigma_3$) , TSF	CONFINING PRESSURE TSF	STRAIN AT FAILURE, %	NATURAL WATER CONTENT, W_n , %	WATER CONTENT AT END OF TEST, W_f , %	NATURAL WATER CONTENT, W_n , %	INITIAL VOID RATIO, e_o	EXISTING OVERBURDEN STRESS, P_o , TSF	ESTIMATED PRECONSOLIDATION STRESS, P_c , TSF	COMPRESSION INDEX, C_c	SWELL INDEX, C_S	TEST TYPE OR STRAIN RATE DURING LOADING, %/HR
MR-2U	15U	-9.5	C	128	26	60	31	27.0	2.88	CH			UU	1.89	2.56	19.3	24.3	25.1	28.6	0.860	3.2	12.0	0.32	0.10	0.7
MR-3U	10U	10.5	C	128	25	47	23	25.0		CL			UU	2.07	1.31	7.1	24.9	25.0							
	12U	6.5	C		28	46	24	31.3	2.93	CL									24.8	0.800	1.9	22.0	0.32	0.11	0.4

STRATA DESIGNATIONS

C - Silty Clay

NOTES

1. All tests summarized were performed in the laboratory of Mueser Rutledge Consulting Engineers.
2. The sample elevation is the average of the sampling interval.
3. Ground surface elevations at borings are:

BORING NO.	BORING ELEVATION
MR-2U	44.5±
MR-3U	38.5±

4. "Average natural water content" is a weighted average of all material tested.
5. Strength tests performed were:

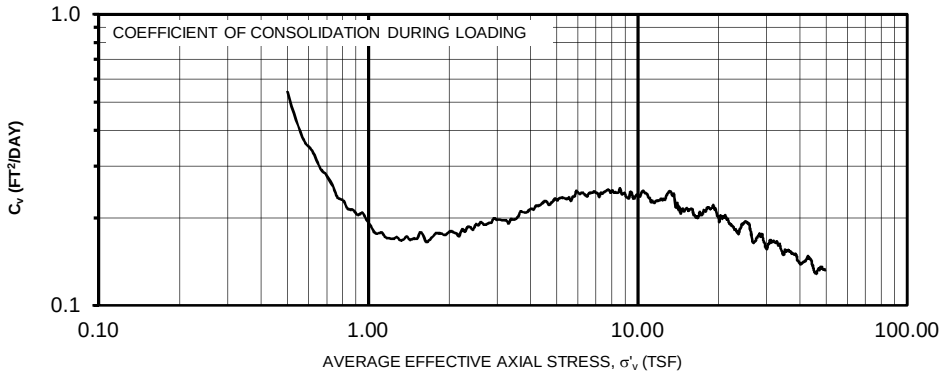
   UU - Unconsolidated Undrained Triaxial Compression

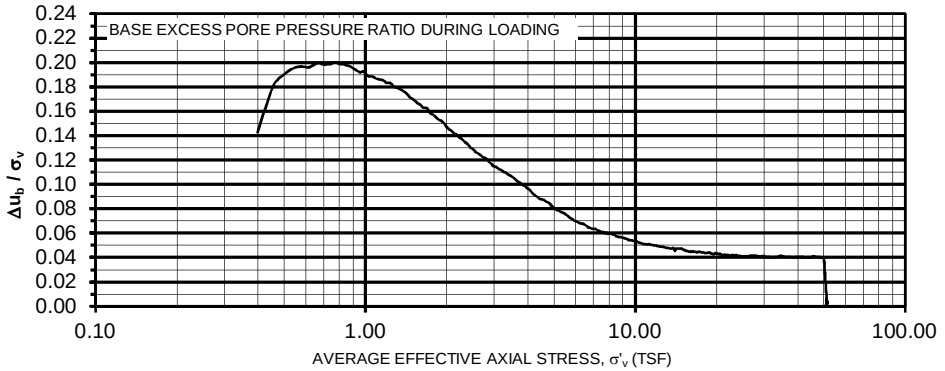
6. Strength tests were performed on specimens 2.8 inches in diameter with height to diameter ratio of approximately 2.
7. Confining pressure for UU compression tests is equivalent to 80 percent of estimated vertical effective overburden stress, unless otherwise noted.
8. UU Strength tests were performed at a rate of strain of approximately 1% per minute.
9. Compression Index, Cc = slope of the virgin compression portion of the e-log p curve.
10. Swelling Index, Cs = slope of the rebound portion of the e-log p curve.
11. Most probable preconsolidation stress, Pc is determined by the Casagrande method of construction.
12. Consolidation tests were performed using constant rate of strain (CRS) method at the strain rate indicated.

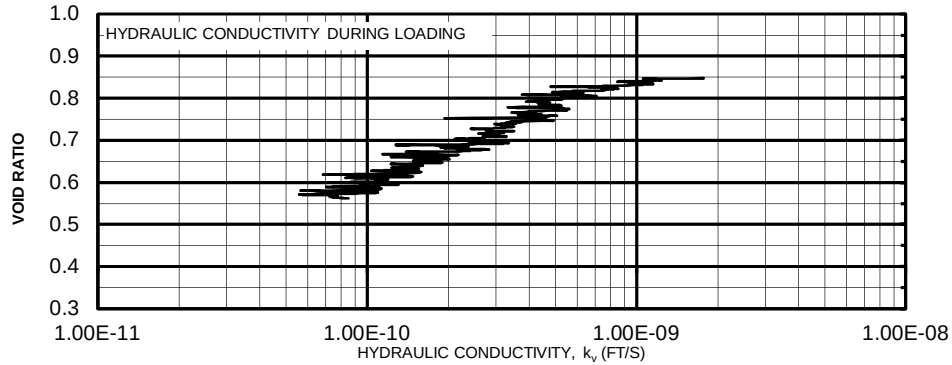
MRCE Form LT-1

MUESER RUTLEDGE CONSULTING ENGINEERS
225 WEST 34th STREET, NEW YORK, N.Y. 10122

AAFE MIXED USE BUILDING
QUEENS **NEW YORK**







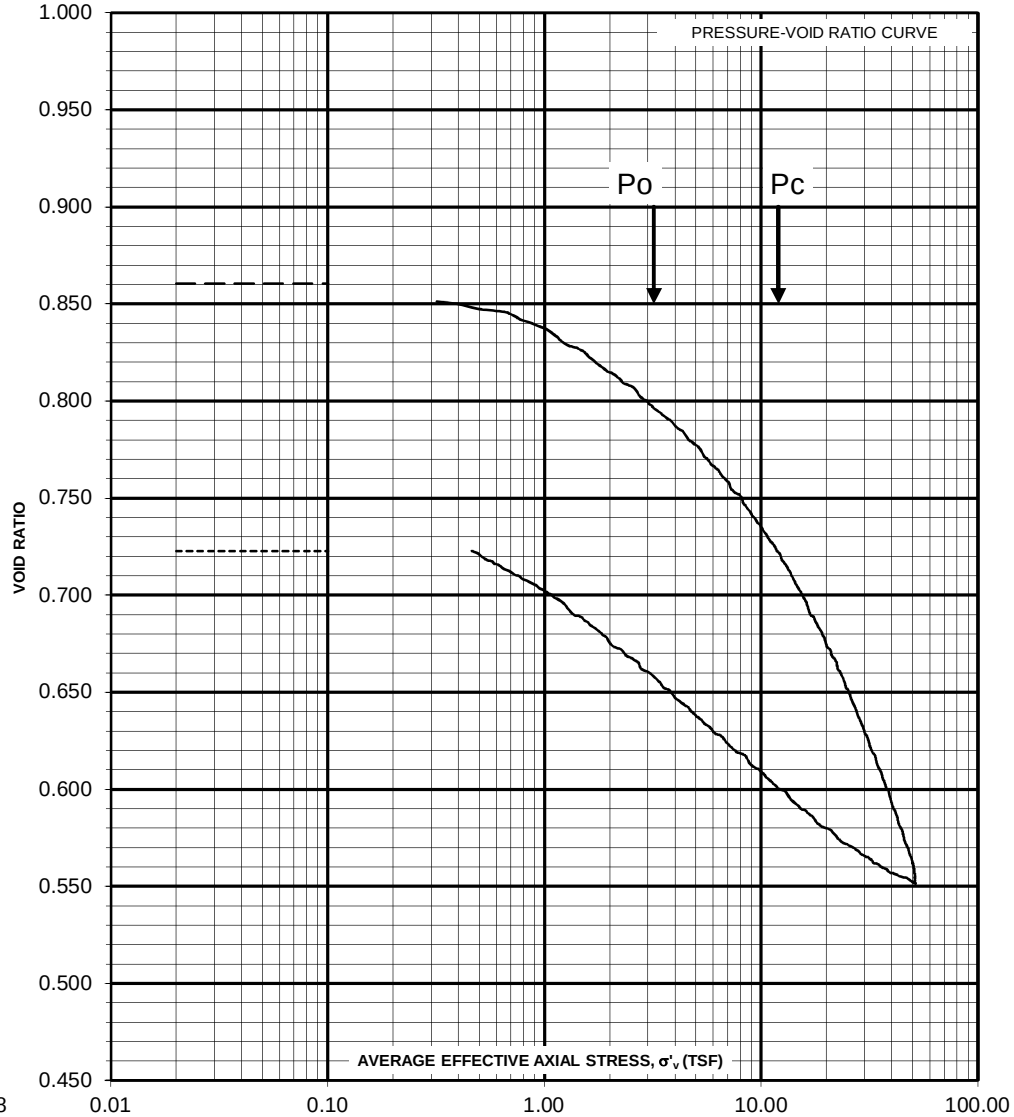


PLATE NO. CRS-1

SPECIMEN DESCRIPTION:	STIFF GRAY BROWN CLAY	STRATUM C

PROPERTIES OF PLASTICITY LIMIT SPECIMEN

UNIFIED SOILS CLASSIFICATION =	CH
LIQUID LIMIT, w_L =	60
PLASTIC LIMIT, w_P =	29
PLASTICITY INDEX, I_P =	31
NATURAL WATER CONT., W_n,% =	27.0
LIQUIDITY INDEX, $(w-w_P)/I_P$ =	-0.08
SPECIFIC GRAVITY, G_s =	2.875

PROPERTIES OF CONSOLIDATION SPECIMEN

SAMPLE ELEVATION (FT) =	-9.2	INITIAL WATER CONTENT, % =	28.6%
SAMPLE DEPTH (FT) =	53.7	FINAL WATER CONTENT, % =	25.8%
TEST TEMPERATURE, °F =	75.2	INITIAL DEG. OF SATURATION, % =	95.5%
INITIAL SPECIMEN MASS (g) =	155.7	BACK PRESSURE, u_b (PSI) =	98.1
INITIAL SPECIMEN HEIGHT (IN) =	0.976	STRAIN AT END OF SAT. $\varepsilon'_{a,s}$, % =	0.5
SPECIMEN DIAMETER (IN) =	2.50	SEATING PRESSURE, $\sigma'_{a,s}$ (TSF) =	0.319
INITIAL TOTAL UNIT WEIGHT (PCF) =	123.8	STRAIN RATE - LOADING (%/HR) =	0.70
INITIAL DRY UNIT WEIGHT (PCF) =	96.3	STRAIN RATE - UNLOAD (%/HR) =	0.32

FINAL PORE PRESSURE RATIO $R_{u,f}$ =	0.040
— — — INITIAL VOID RATIO, e_o =	0.860
------- FINAL VOID RATIO, e_f =	0.723
EST. PRECONSOL. STRESS (TSF) =	12.0
IN-SITU EFF. STRESS, Po (TSF) =	3.2
COMPRESSION INDEX, C_c =	0.318
SWELL INDEX, Cs = 0.099, FROM e =	0.551

AAFE MIXED USE BUILDING

QUEENS NEW YORK

MUESER RUTLEDGE CONSULTING ENGINEERS

225 WEST 34TH STREET, NEW YORK, N.Y. 10122

MADE BY: ALS/CJM DATE: 6-12-2016 FILE NO. **12629**

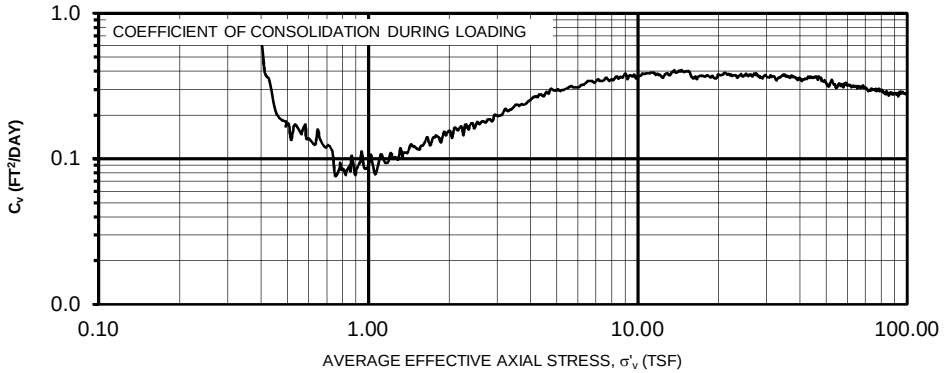
CH'KD BY: LL DATE: 6-20-2016

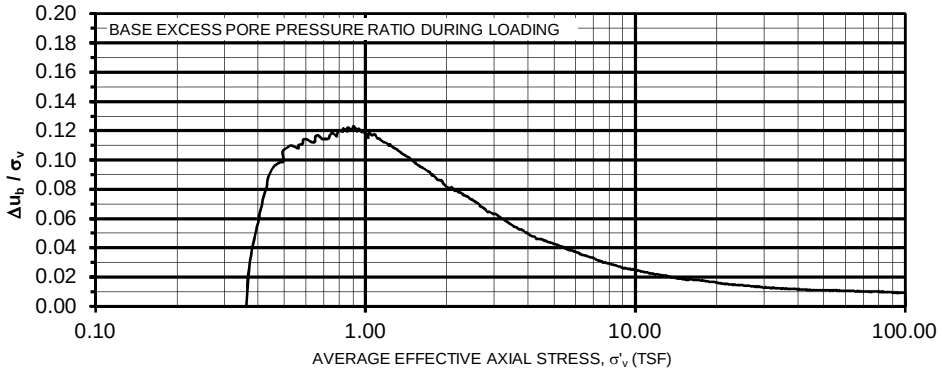
CRS CONSOLIDATION TEST

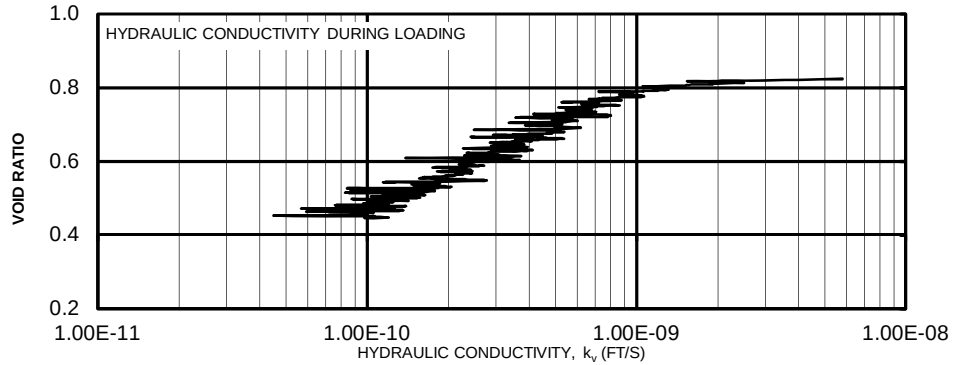
BORING NO. MR-2U SAMPLE NO. 15U

PLATE NO. CRS-1

MRCE Form CRS-1







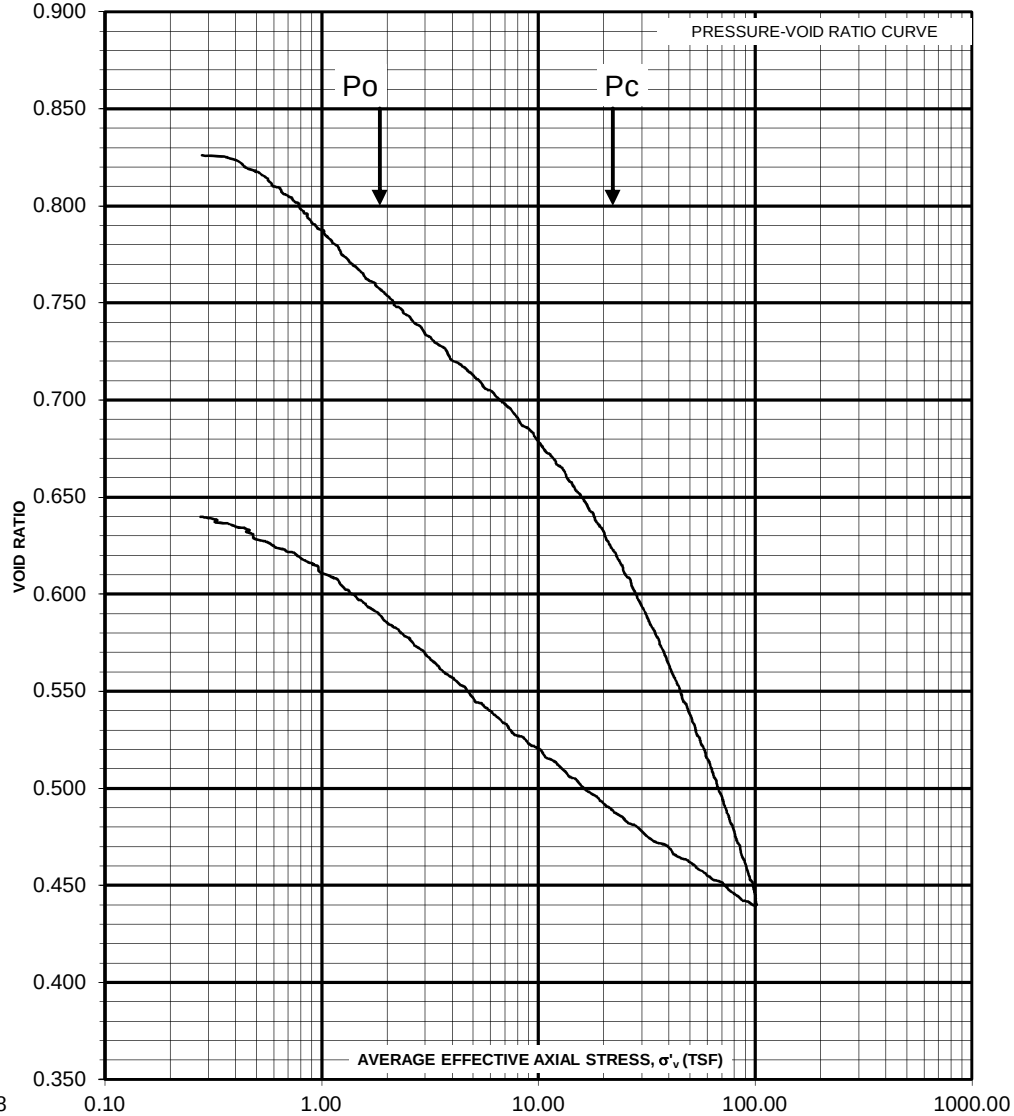


PLATE NO. CRS-2

SPECIMEN DESCRIPTION: STIFF BROWN SILTY CLAY — STRATUM C

PROPERTIES OF PLASTICITY LIMIT SPECIMEN

UNIFIED SOILS CLASSIFICATION = CL
LIQUID LIMIT, w_L = 46
PLASTIC LIMIT, w_P = 22
PLASTICITY INDEX, I_P = 24
NATURAL WATER CONT., W_n,% = 31.3
LIQUIDITY INDEX, $(w-w_P)/I_P$ = 0.38
SPECIFIC GRAVITY, G_s = 2.931

PROPERTIES OF CONSOLIDATION SPECIMEN

SAMPLE ELEVATION (FT) = 6.8
SAMPLE DEPTH (FT) = 31.7
TEST TEMPERATURE, °F = 0.0
INITIAL SPECIMEN MASS (g) = 150.4
INITIAL SPECIMEN HEIGHT (IN) = 0.921
SPECIMEN DIAMETER (IN) = 2.50
INITIAL TOTAL UNIT WEIGHT (PCF) = 126.7
INITIAL DRY UNIT WEIGHT (PCF) = 101.5

INITIAL WATER CONTENT, % = 24.8%
FINAL WATER CONTENT, % = 23.1%
INITIAL DEG. OF SATURATION, % = 91.1%
BACK PRESSURE, u_b (PSI) = 98.3
STRAIN AT END OF SAT. $\varepsilon'_{a,s}$, % = -1.5
SEATING PRESSURE, $\sigma'_{a,s}$ (TSF) = 0.281
STRAIN RATE - LOADING (%/HR) = 0.41
STRAIN RATE - UNLOAD (%/HR) = 0.19

FINAL PORE PRESSURE RATIO $R_{u,f}$ = 0.009
INITIAL VOID RATIO, e_o = 0.800
FINAL VOID RATIO, e_f = 0.640
EST. PRECONSOL. STRESS (TSF) = 22.0
IN-SITU EFF. STRESS, Po (TSF) = 1.9
COMPRESSION INDEX, C_c = 0.317
SWELL INDEX, Cs = 0.110, FROM e = 0.439

AAFE MIXED USE BUILDING

QUEENS NEW YORK

MUESER RUTLEDGE CONSULTING ENGINEERS
225 WEST 34TH STREET, NEW YORK, N.Y. 10122

MADE BY: CJM DATE: 6-21-16 FILE NO. **12629**
CH'KD BY: ALS DATE: 6-21-16

CRS CONSOLIDATION TEST
BORING NO. MR-3U SAMPLE NO. 12U

PLATE NO. CRS-2

MRCE Form CRS-1

APPENDIX A – LBA BORING LOGS

Louis Berger and Assoc., P.C. 199 Water Street, 23rd Floor New York, NY 10038	**Drilling Log** Page 1 of 4	**BORING NO.:** SB01 **WELL NO.:** TWP-1

CLIENT: New York City School Construction Authority		**PROJECT NO:** JG-3259
PROJECT: AAFE		**DATE STARTED:** 11/5/2006
DRILLING CONTRACTOR: Aquifer Drilling and Testing		**DATE FINISHED:** 11/5/2006
DRILLING METHOD: Hollow Stem Auger		**DRILLER:** J.Kamenicek
BOREHOLE DATA	**WELL DATA**	**INSPECTOR:** J.Kass
Diameter (in): 8	**Completion:** 11/5/2006	**NORTHING:** N/A
Total Depth (ft): 50.00	**Total Depth (ft):** 50.00	**EASTING:** N/A
Sampler: Split Spoon	**Screen Length (ft) /Slot (in):** 20	**GROUND ELEVATION:** N/A
Depth to Water (ft): 39.5	**Depth to Water (ft):** 39.5	**TOC ELEVATION:** N/A
Depth to Rock (ft): N/A	**Permit No.:** N/A	

NOTES: Collected groundwater sample from 2" diameter temporary well

Well Construction	Depth	Lithology	USCS	Sample Interval	Sample Recovery	Blows/6 in	PID (ppm)	Description	Remarks
	0		GP			7 6 5 5	0	Olive black (5Y2/1) medium to fine GRAVEL, trace medium to fine Sand; dry.	**Gravel**
	2		SP-SM			9 5 11 20	0	Dark yellowish orange (10YR6/6) medium to fine SAND, little Silt, with 2-inch Gravel layer at 2.2 feet; dry.	**Sand**
	4		SP			11 13 38 33	0	Dark yellowish orange (10YR6/6) medium to fine SAND, trace Silt; dry.	
	6		SP			6 8 11 15	0	Dark yellowish orange (10YR6/6) medium to fine SAND, trace Silt; dry.	
	8		SP			31 29 16	0	Dark yellowish orange (10YR6/6) medium to fine SAND, trace Silt; dry.	

Louis Berger and Assoc., P.C. 199 Water Street, 23rd Floor New York, NY 10038	PROJECT NO.: JG-3259	BORING NO.: SB01
	Page 2 of 4	WELL NO.: TWP-1

Well	Depth	Lith.	USCS	Interval	Rec.	Blows	PID	Description	Remarks
	10		SP			14 17 12	0	Dark yellowish orange (10YR6/6) medium to fine SAND, trace Silt; dry.	
	11					16 15			
	12		SP			8 8	0	Dark yellowish orange (10YR6/6) medium to fine SAND, trace Silt; dry.	
	13					8 8			
	14		SP			10 10	0	Dark yellowish orange (10YR6/6) medium to fine SAND, trace Silt; dry.	
	15					10 11			
	16		SP-SM			8 14	0	Dark yellowish orange (10YR6/6) medium to fine SAND, little Silt; moist.	Sand
	17					20 23			
	18		SP-SM			10 21	0	Grayish orange (10YR7/4) medium to fine SAND, little Silt; moist.	
	19					25 30			
	20		SP-SM			9 19	0	Grayish orange (10YR7/4) medium to fine SAND, little Silt; moist.	
	21					16 19			
	22		SP-SM			10 15	0	Dark yellowish orange (10YR6/6) medium to fine SAND, little Silt; moist.	
	23					19			

Louis Berger and Assoc., P.C. 199 Water Street, 23rd Floor New York, NY 10038	PROJECT NO.: JG-3259	BORING NO.: SB01
	Page 3 of 4	WELL NO.: TWP-1

Well	Depth	Lith.	USCS	Interval	Rec.	Blows	PID	Description	Remarks
	24		SP-SM			18 15	0	Dark yellowish orange (10YR6/6) medium to fine SAND, little Silt; moist.	
	25		ML			30 32 30	0	Moderate yellowish brown (10YR5/4) SILT; moist.	Silt
	26		SP-SM SP			30 23 26 29	0 0	Grayish orange (10YR7/4) medium to fine SAND, little Silt; moist. Dark yellowish orange (10YR6/6) medium to fine SAND, trace Silt; moist.	Sand
	28		ML			33 19 19 42	0	Light olive gray (5Y5/2) SILT; moist.	Silt
	30		SP			40	0	Dark yellowish orange (10YR6/6) medium to fine SAND, trace Silt; moist.	Sand
	31		ML			25 26 30	0	Light olive gray (5Y5/2) SILT; moist.	Silt
	32		ML			11 26 27 30	0	Light olive gray (5Y5/2) SILT; moist.	
	34		SM			22 24 25 30	0	Dark yellowish orange (10YR6/6) medium to fine SAND, some Silt; wet.	Silty Sand, Collected SB01 from 34-35 ft bgs.
	36		ML			13 15 18	0	Dusky yellowish brown (10YR2/2) SILT; wet.	Silt

Louis Berger and Assoc., P.C. 199 Water Street, 23rd Floor New York, NY 10038	PROJECT NO.: JG-3259	BORING NO.: SB01
	Page 4 of 4	WELL NO.: TWP-1

Well	Depth	Lith.	USCS	Interval	Rec.	Blows	PID	Description	Remarks
	38		ML			21 17 18	0	Dark yellowish brown (10YR4/2) SILT; wet.	
	39		ML			17 22	0	Light olive gray (5Y5/2) SILT; saturated.	▽ Water Level at 39.5 ft. bgs.
	40		ML			9 13	0	Light olive gray (5Y5/2) SILT; saturated.	
	41					15 19			
	42		SP			10 12	0	Grayish brown (5YR3/2) medium to fine SAND, trace Silt; saturated.	Sand
	43					15 17			
	44		ML			15 14	0	Grayish orange pink (5YR7/2) SILT; saturated.	Silt
	45					14 20			
	46		SP-SM			10 20	0	Dark yellowish brown (10YR4/2) medium to fine SAND, little Silt; saturated.	Sand
	47					14 14			
	48		SP			30 35	0	Dark yellowish orange (10YR6/6) medium to fine SAND, trace Silt; saturated.	
	49					40 42			End of Boring at 50 ft.
	50								

Louis Berger and Assoc., P.C. 199 Water Street, 23rd Floor New York, NY 10038	**Drilling Log** Page 1 of 4	**BORING NO.:** SB02 **WELL NO.:** TWP-2
CLIENT: New York City School Construction Authority		**PROJECT NO:** JG-3259
PROJECT: AAFE		**DATE STARTED:** 11/4/2006
DRILLING CONTRACTOR: Aquifer Drilling and Testing		**DATE FINISHED:** 11/4/2006
DRILLING METHOD: Hollow Stem Auger		**DRILLER:** J.Kamenicek
BOREHOLE DATA	**WELL DATA**	**INSPECTOR:** J. Kass
Diameter (in): 8	**Completion:** 11/4/2006	**NORTHING:** N/A
Total Depth (ft): 50.00	**Total Depth (ft):**	**EASTING:** N/A
Sampler: Split Spoon	**Screen Length (ft) /Slot (in):** 20	**GROUND ELEVATION:** N/A
Depth to Water (ft): 39	**Depth to Water (ft):** 39	**TOC ELEVATION:** N/A
Depth to Rock (ft): N/A	**Permit No.:** N/A	

NOTES: Collected groundwater sample from 2" diameter temporary well

Well Construction	Depth	Lithology	USCS	Sample Interval	Sample Recovery	Blows/6 in	PID (ppm)	Description	Remarks
	0		SP				0	Top 3 inches Asphalt. Dark yellowish brown (10YR4/2) coarse to fine SAND; dry.	Sand
	1								
	2		SP				0	Moderate yellowish brown (10YR5/4) medium to fine SAND; dry.	
	3								
	4								
	5		SP			5 11	0	Dark yellowish orange (10YR6/6) medium to fine SAND; dry.	
	6					24 28			
	7		SP			48	0	Dark yellowish orange (10YR6/6) medium to fine SAND; dry.	
	8					24 17			
	9					15			

Louis Berger and Assoc., P.C. 199 Water Street, 23rd Floor New York, NY 10038	PROJECT NO.: JG-3259	BORING NO.: SB02
	Page 2 of 4	WELL NO.: TWP-2

Well	Depth	Lith.	USCS	Interval	Rec.	Blows	PID	Description	Remarks
	10		SP			7 9 10 10	0	Dark yellowish orange (10YR6/6) medium to fine SAND; dry.	
	11		SP			20 12	0	Dark yellowish orange (10YR6/6) coarse to fine SAND; dry.	
	12					13 14			
	13		SP			15 18	0	Dark yellowish orange (10YR6/6) medium SAND; dry.	
	14					21 24			
	15		SP-SM			12 15	0	Moderate yellowish brown (10YR5/4) to dark yellowish orange (10YR6/6) medium to fine SAND, little Silt; dry.	
	16					19 20			
	17		SM			21 5	0	Moderate yellowish brown (10YR5/4) to dark yellowish orange (10YR6/6) medium to fine SAND, and Silt; moist.	**Silty Sand**
	18					19 20			
	19		SP			17 24	0	Moderate yellowish brown (10YR5/4) to pale yellowish orange (10YR8/6) medium to fine SAND; moist.	**Sand**
	20					35 35			
	21		SM			34 33	0	Dark yellowish orange (10YR6/6) medium to fine SAND, and Silt; moist.	**Silty Sand**
	22					37 39			

Louis Berger and Assoc., P.C. 199 Water Street, 23rd Floor New York, NY 10038	PROJECT NO.: JG-3259	BORING NO.: SB02
	Page 3 of 4	WELL NO.: TWP-2

Well	Depth	Lith.	USCS	Interval	Rec.	Blows	PID	Description	Remarks
	23		SM			15 19	0	Grayish orange (10YR7/4) medium to fine SAND, and Silt; moist.	**Silty Sand**
	24					21 33			
	25		SM			25	0	Grayish orange (10YR7/4) medium to fine SAND, and Silt, with a 2-inch layer of fine Sand at 25.3 feet; moist.	
			SM			29	0		
	26					33		Grayish orange (10YR7/4) medium to fine SAND, and Silt; moist.	
						39			
	27		ML			15 13	0	Dark yellowish orange (10YR6/6) SILT, some medium to fine Sand; moist.	**Sandy Silt**
	28		SM			29 33	0	Very pale yellowish orange (10YR8/2) medium to fine SAND, some Silt; moist.	**Silty Sand**
	29		SM			20 20	0	Grayish orange (10YR7/4) medium to fine SAND, some Silt; moist.	
	30		ML			25 48	0	Dark yellowish brown (10YR4/2) to olive gray (5Y4/1) SILT; moist.	**Silt**
	31		SM			15 21	0	Olive gray (5Y4/1) SILT; moist.	**Silty Sand**
	32					28 30			
	33		SM			16 25	0	Dark yellowish orange (10YR6/6) medium to fine SAND, some Silt; moist.	
	34					31 40			
	35		SM			15 21	0	Dark yellowish orange (10YR6/6) to light brown (5YR5/6) medium to fine SAND, some Silt, with a 2-inch layer of Silt at 35.25 feet; wet.	**Collected SB02 from 35-39 ft. bgs.**
	36		ML			25	0	Dark greenish gray (5G4/1) SILT; wet.	**Silt**

Louis Berger and Assoc., P.C. 199 Water Street, 23rd Floor New York, NY 10038	PROJECT NO.: JG-3259	BORING NO.: SB02
	Page 4 of 4	WELL NO.: TWP-2

Well	Depth	Lith.	USCS	Interval	Rec.	Blows	PID	Description	Remarks
	37		ML			30 13	0	Dark greenish gray (5G4/1) SILT; wet.	
			SM			15	0	Dark yellowish orange (10YR6/6) medium to fine SAND, some Silt; wet.	**Silty Sand**
	38		SM			17 29	0	Dark greenish gray (5G4/1) medium to fine SAND, some Silt; saturated.	**Water Level at 39 ft. bgs.** ▽
	39		ML			15 35	0	Greenish black (5GY2/1) SILT; saturated.	**Silt**
	40					40 45			
	41		ML			15	0	Greenish black (5GY2/1) SILT; saturated.	
	42		SP-SM			17 21	0	Light olive gray (5Y6/1) medium to fine SAND, little Silt; saturated.	**Sand**
	43		ML			17 21	0	Light olive gray (5Y6/1) SILT; saturated.	**Silt**
	44					22 23			
	45		ML			21 22	0	Greenish black (5GY2/1) SILT; saturated.	
	46					30 35			
	47		ML			25 32	0	Medium bluish gray (5B5/1) SILT; saturated.	
	48					35 39			
	49								**End of Boring at 50 ft.**
	50								

APPENDIX B – MRCE BORING LOGS

MUESER RUTLEDGE CONSULTING ENGINEERS

BORING LOG

BORING NO. MR-1
SHEET 1 OF 3
PROJECT: AAFE MIXED USE BUILDING **FILE NO.** 12629
LOCATION: FLUSHING, QUEENS **SURFACE ELEV.** 44 (±)
RES. ENGR. ANDY ONG

DAILY PROGRESS	SAMPLE NO.	SAMPLE DEPTH	SAMPLE BLOWS/6"	SAMPLE DESCRIPTION	STRATA	DEPTH	CASING BLOWS	REMARKS
09:00					**	**0.4**	DRILLED	**Asphalt & subbase
05-02-16	1HA	1.0	HAND	Brown silt, some fine to medium sand, trace			AHEAD	from 0' to 0.4'.
Monday		3.0	AUGER	gravel (ML)			4"	Hand auger from 0' to 6'.
Cloudy	2HA	3.0	HAND	Brown orange fine to medium sand, some silt,				
50°F		5.0	AUGER	trace gravel (SM)		**5**		
	3HA	5.0	HAND	Do 2HA (SM)				Hard drilling from 6.5' to
		6.0	AUGER					7.5'.
	4D	6.0	14-100/3"	Brown gravelly fine to coarse sand, trace silt	F			REC=6"
		6.7		(SP-SM)				
	5D	8.0	18-18	Brown fine to coarse sand, some gravel, trace		**10**		REC=6"
		10.0	8-11	silt (SP-SM)				
	6NR	10.0	12-7	No recovery				
		12.0	8-9					
						13.5		
						15		
	7D	15.0	5-5	Brown fine to coarse sand, trace silt, gravel				
		17.0	7-6	(SP-SM)				
						20		
	8D	20.0	4-2	Brown-orange fine to medium sand, some silt	S			
		22.0	2-3	(SM)				
						25		
	9D	25.0	2-3	Brown-yellow fine to medium sand, some silt				
		27.0	2-6	(SM)				
						28.5		
					C	**30**		
	10D	30.0	29-24	Stiff brown-yellow silty clay, trace gravel (CL)				WC=31, pp=2.5
		32.0	29-33					REC=6"
						33.5		
						35		
	11D	35.0	8-14	Orange fine to coarse sand, trace silt, gravel	S			
		37.0	14-17	(SP-SM)				
						38.5		
						40		
	12D	40.0	6-6	Hard gray silty clay (CL)				WC=40, pp=4.25
		42.0	8-13					
					C			
						45		
	13D	45.0	6-9	Do 12D, trace vegetation (CL)				WC=38, pp>4.5
		47.0	9-21					
						48.5		
						50		
	14D	50.0	18-15	Brown-black clayey fine to coarse sand, trace	T			
		52.0	20-23	peat (SC)				

MUESER RUTLEDGE CONSULTING ENGINEERS

BORING LOG

BORING NO. MR-1
SHEET 2 OF 3
PROJECT: AAFE MIXED USE BUILDING **FILE NO.** 12629
LOCATION: FLUSHING, QUEENS **SURFACE ELEV.** 44 (±)
RES. ENGR. ANDY ONG

DAILY PROGRESS	SAMPLE NO.	SAMPLE DEPTH	SAMPLE BLOWS/6"	SAMPLE DESCRIPTION	STRATA	DEPTH	CASING BLOWS	REMARKS
Cont'd								
05-02-16								
Monday								
Cloudy								
50°F						**55**		
	15D	55.0	11-14	Brown-gray fine to coarse sand, some gravel,				
		57.0	10-16	clay (SC)				
								Rig chatter from 58' to
								59'.
						60		
	16D	60.0	16-21	Brown gravelly silty clay (CL)				REC=6"
		62.0	21-32					
						65		
	17D	65.0	24-21	Brown fine to coarse sand, some silt, trace				
		67.0	20-42	gravel (SM)				
						70		
	18D	70.0	30-35	Brown fine to medium sand, trace silt, coarse				
		72.0	37-46	sand (SP-SM)				
						75		
	19D	75.0	43-33	Brown fine to coarse sand, trace silt (SP-SM)	**T**			
		77.0	34-42					
						80		
	20D	80.0	43-33	Do 19D (SP-SM)				
		82.0	33-34					
						85		
	21D	85.0	36-46	Brown fine to coarse sand, trace silt, gravel				
		87.0	40-46	(SP-SM)				
						90		
	22D	90.0	44-54	Brown fine to coarse sand, trace silt, gravel				
		92.0	53-101	(SP-SM)				
								WC=Water Content
								in percent of dry
						95		weight.
	23D	95.0	16-21	Hard red brown interlayered silt & clayey silt,				WC=22
		97.0	27-41	some silty clay (ML&CL)				pp=Pocket
								Penetrometer
								Unconfined Compres-
						100		sive Strength in tsf.
	24D	100.0	17-32	Red brown silty fine sand (SM)				
13:30		102.0	45-50			**102**		End of Boring at 102'.

MUESER RUTLEDGE CONSULTING ENGINEERS

BORING NO. MR-1
SHEET 3 **OF** 3

PROJECT AAFE MIXED USE BUILDING
FILE NO. 12629
LOCATION FLUSHING, QUEENS
SURFACE ELEV. 44 (±)
BORING LOCATION SEE BORING LOCATION PLAN
DATUM NAVD 88

BORING EQUIPMENT AND METHODS OF STABILIZING BOREHOLE

		TYPE OF FEED							
TYPE OF BORING RIG		DURING CORING		CASING USED		X	YES		NO
TRUCK	X	MECHANICAL		DIA., IN.	4	DEPTH, FT. FROM	0	TO	10
SKID		HYDRAULIC	X	DIA., IN.		DEPTH, FT. FROM		TO	
BARGE		OTHER		DIA., IN.		DEPTH, FT. FROM		TO	
OTHER									

TYPE AND SIZE OF:

D-SAMPLER 2" O. D. SPLIT SPOON
U-SAMPLER
S-SAMPLER
CORE BARREL
CORE BIT
DRILL RODS NWJ

DRILLING MUD USED X YES NO
DIAMETER OF ROTARY BIT, IN. 3-7/8
TYPE OF DRILLING MUD QUIK GEL

AUGER USED YES X NO
TYPE AND DIAMETER, IN.

CASING HAMMER, LBS. AVERAGE FALL, IN.
*SAMPLER HAMMER, LBS. 140 AVERAGE FALL, IN. 30
*USED AUTOMATIC HAMMER.

WATER LEVEL OBSERVATIONS IN BOREHOLE

DATE	TIME	DEPTH OF HOLE	DEPTH OF CASING	DEPTH TO WATER	CONDITIONS OF OBSERVATION
05-04-16	07:15	102 FT.	10 FT.	33 FT.	MUD LEVEL READING.

PIEZOMETER INSTALLED YES X NO SKETCH SHOWN ON

STANDPIPE:	TYPE		ID, IN.		LENGTH, FT.		TOP ELEV.
INTAKE ELEMENT:	TYPE		OD, IN.		LENGTH, FT.		TIP ELEV.
FILTER:	MATERIAL		OD, IN.		LENGTH, FT.		BOT. ELEV.

PAY QUANTITIES

3.5" DIA. DRY SAMPLE BORING	LIN. FT.	102	NO. OF 3" SHELBY TUBE SAMPLES	
3.5" DIA. U-SAMPLE BORING	LIN. FT.		NO. OF 3" UNDISTURBED SAMPLES	
CORE DRILLING IN ROCK	LIN. FT.		OTHER:	

BORING CONTRACTOR CRAIG TEST BORING
DRILLER KEITH PARENT HELPERS BRIAN GREGOR
REMARKS BOREHOLE BACKFILLED WITH CUTTINGS & SURFACE ASPHALT PATCH UPON COMPLETION.
RESIDENT ENGINEER ANDY ONG DATE 05-02-16
CLASSIFICATION CHECK: CHERYL J. MOSS TYPING CHECK: SARAH O. H. JOHNSON

MUESER RUTLEDGE CONSULTING ENGINEERS

BORING LOG

BORING NO. MR-2U
SHEET 1 OF 3
PROJECT: AAFE MIXED USE BUILDING **FILE NO.** 12629
LOCATION: FLUSHING, QUEENS **SURFACE ELEV.** 44.5 (±)
RES. ENGR. ANDY ONG

DAILY PROGRESS	SAMPLE NO.	SAMPLE DEPTH	SAMPLE BLOWS/6"	SAMPLE DESCRIPTION	STRATA	DEPTH	CASING BLOWS	REMARKS
09:00					**	0.2	DRILLED	**Pavers from 0' to 0.2'
05-04-16	1HA	1.0	HAND	Brown fine to medium sand, some silt (SM)			AHEAD	& sand base from 0.2'
Wednesday		3.0	AUGER				4"	to 0.7'.
Overcast	2HA	3.0	HAND	Do 1HA, trace gravel (SM)				Hand auger from 0' to 6'.
50°F		5.0	AUGER			5		
	3HA	5.0	HAND	Do 1HA, trace coarse sand (SM)				
		6.0	AUGER					
	4D	6.0	3-3	Brown-orange fine to medium sand, trace silt,	F			
		8.0	4-5	coarse sand, gravel (SP-SM)				
	5D	8.0	6-10	Do 4D (SP-SM)		10		
		10.0	6-6					
	6D	10.0	6-10	Brown-orange fine to coarse sand, some gravel,				
		12.0	9-14	trace silt (SP-SM)				
						13.5		
						15		
	7D	15.0	14-14	Brown fine to coarse sand, some silt, trace				
		17.0	12-14	gravel (SM)				
						20		
	8D	20.0	9-9	Brown fine to medium sand, trace silt, coarse				
		22.0	9-13	sand (SP-SM)				
						25		
	9D	25.0	9-8	Do 8D (SP-SM)				
		27.0	9-11					
						30		
	10D	30.0	11-12	Do 8D (SP-SM)				
		32.0	11-14		S			
						35		
	11D	35.0	15-13	Black fine to coarse sand, trace silt (SP-SM)				Petroleum odor.
		37.0	12-16					Sheen in water.
						40		
	12D	40.0	17-9	Brown fine to medium sand, trace silt, coarse				
		42.0	10-12	sand (SP-SM)				
						45		
	13D	45.0	12-13	Brown fine to medium sand, some silt (SM)				
		47.0	15-21					
						48.5		
						50		
	14D	50.0	5-7	Stiff red brown silty clay (CL)	C			WC=25, pp=3.0
		52.0	11-18					

MUESER RUTLEDGE CONSULTING ENGINEERS

BORING LOG

BORING NO. MR-2U
SHEET 2 OF 3
PROJECT: AAFE MIXED USE BUILDING **FILE NO.** 12629
LOCATION: FLUSHING, QUEENS **SURFACE ELEV.** 44.5 (±)
RES. ENGR. ANDY ONG

DAILY PROGRESS	SAMPLE NO.	SAMPLE DEPTH	SAMPLE BLOWS/6"	SAMPLE DESCRIPTION	STRATA	DEPTH	CASING BLOWS	REMARKS
Cont'd								
05-04-16								
Wednesday								
Overcast	15U	53.0	PUSH=24"	Top 19": Stiff brn & gray silty clay & clay (CL&CH)				WC=26, pp=1.75, 3.5
50°F		55.0	REC=24"	Bot: Gray mic silty fine sand, tr brn clay pkts (SM)	C	55		TV=0.7
	16D	55.0	10-19	Interlayered red brown silty clay & gray silty fine				
		57.0	16-23	sand, trace mica (CL&SM)				
						58.5		
						60		
	17D	60.0	38-19	Gray brown fine to coarse sand, some silt, trace				
		62.0	17-27	gravel, lignite (SM)				
						65		
	18D	65.0	23-18	Brown fine to medium sand, some silt, trace				
		67.0	22-29	coarse sand, gravel (SM)				
					T			
						70		
	19D	70.0	24-24	Brown fine to medium sand, some silt, trace				
		72.0	24-35	coarse sand (SM)				
						75		
	20D	75.0	34-31	Brown fine to medium sand, trace silt, coarse				
13:00		77.0	33-37	sand (SP-SM)		77		End of Boring at 77'.
								WC=Water Content
						80		in percent of dry
								weight.
								pp=Pocket
								Penetrometer
						85		Unconfined Compres-
								sive Strength in tsf.
								TV=Torvane Shear
								Strength in tsf.
						90		
						95		
						100		

MUESER RUTLEDGE CONSULTING ENGINEERS

BORING NO. MR-2U
SHEET 3 **OF** 3

PROJECT AAFE MIXED USE BUILDING
FILE NO. 12629
LOCATION FLUSHING, QUEENS
SURFACE ELEV. 44.5 (±)
BORING LOCATION SEE BORING LOCATION PLAN
DATUM NAVD 88

BORING EQUIPMENT AND METHODS OF STABILIZING BOREHOLE

		TYPE OF FEED							
TYPE OF BORING RIG		DURING CORING		CASING USED		X	YES		NO
TRUCK	X	MECHANICAL		DIA., IN.	4	DEPTH, FT. FROM	0	TO	10
SKID		HYDRAULIC	X	DIA., IN.		DEPTH, FT. FROM		TO	
BARGE		OTHER		DIA., IN.		DEPTH, FT. FROM		TO	
OTHER									

TYPE AND SIZE OF:

D-SAMPLER	2" O. D. SPLIT SPOON
U-SAMPLER	SHELBY
S-SAMPLER	
CORE BARREL	
CORE BIT	
DRILL RODS	NWJ

DRILLING MUD USED: X YES ☐ NO
DIAMETER OF ROTARY BIT, IN.: 3-7/8
TYPE OF DRILLING MUD: QUIK GEL

AUGER USED: ☐ YES X NO
TYPE AND DIAMETER, IN.:

CASING HAMMER, LBS. _____ AVERAGE FALL, IN. _____
*SAMPLER HAMMER, LBS. 140 AVERAGE FALL, IN. 30
*USED AUTOMATIC HAMMER.

WATER LEVEL OBSERVATIONS IN BOREHOLE

DATE	TIME	DEPTH OF HOLE	DEPTH OF CASING	DEPTH TO WATER	CONDITIONS OF OBSERVATION
05-04-16	12:30	77	10	16	MUD LEVEL READING.

PIEZOMETER INSTALLED ☐ YES X NO SKETCH SHOWN ON

STANDPIPE:	TYPE		ID, IN.		LENGTH, FT.		TOP ELEV.
INTAKE ELEMENT:	TYPE		OD, IN.		LENGTH, FT.		TIP ELEV.
FILTER:	MATERIAL		OD, IN.		LENGTH, FT.		BOT. ELEV.

PAY QUANTITIES

3.5" DIA. DRY SAMPLE BORING	LIN. FT.	77	NO. OF 3" SHELBY TUBE SAMPLES	1
3.5" DIA. U-SAMPLE BORING	LIN. FT.	2	NO. OF 3" UNDISTURBED SAMPLES	
CORE DRILLING IN ROCK	LIN. FT.		OTHER:	

BORING CONTRACTOR: CRAIG TEST BORING
DRILLER: KEITH PARENT HELPERS: BRIAN GREGOR
REMARKS: BOREHOLE BACKFILLED WITH CUTTINGS & SURFACE ASPHALT PATCH UPON COMPLETION.
RESIDENT ENGINEER: ANDY ONG DATE: 05-02-16
CLASSIFICATION CHECK: CHERYL J. MOSS TYPING CHECK: SARAH O. H. JOHNSON

MUESER RUTLEDGE CONSULTING ENGINEERS

BORING LOG

BORING NO. MR-3U
SHEET 1 OF 3
PROJECT: AAFE MIXED USE BUILDING **FILE NO.** 12629
LOCATION: FLUSHING, QUEENS **SURFACE ELEV.** 38.5 (±)
RES. ENGR. ANDY ONG

DAILY PROGRESS	SAMPLE NO.	SAMPLE DEPTH	SAMPLE BLOWS/6"	SAMPLE DESCRIPTION	STRATA	DEPTH	CASING BLOWS	REMARKS
09:00					**	0.2	DRILLED	**Topsoil from 0' to 0.2'.
05-10-16	1HA	1.0	HAND	Brown fine to coarse sand, some silt, trace			AHEAD	Hand auger from 0' to 6'.
Tuesday		3.0	AUGER	gravel (SM)			4"	Boulders & cobbles
Clear	2HA	3.0	HAND	Do 1HA (SM)				encountered from 1' to
60°F		5.0	AUGER			5		5'.
	3HA	5.0	HAND	Red brown fine to medium sand, some silt,				
		6.0	AUGER	trace gravel (SM)				
	4D	6.0	5-6	Light brown fine to medium sand, trace silt,	F			
		8.0	7-7	coarse sand, gravel (SP-SM)				
	5D	8.0	7-10	Light brown fine to coarse sand, some gravel,		10		
		10.0	6-6	trace silt (SP-SM)				
	6D	10.0	5-5	Light brown fine to medium sand, trace silt,				
		12.0	6-7	coarse sand, gravel (SP-SM)				
						13.5		
						15		
	7D	15.0	7-9	Brown fine to medium sand, trace silt, coarse				
		17.0	9-9	sand (SP-SM)				
					S			
						20		
	8D	20.0	11-11	Brown fine to medium sand, some silt (SM)				
		22.0	11-13					
						23.5		
						25		
	9D	25.0	11-7	Stiff red brown silty clay (CL)				WC=30, pp=3.25
		27.0	9-11					Slickensided.
	10U	27.0	PUSH=24"	Stiff brown silty clay, trace gravel, fine sand				WC=25, pp=2.0, 2.5,
		29.0	REC=24"	pockets (CL)				TV=0.8, 0.9
	11D	29.0	5-10	Stiff brown silty clay (CL)		30		WC=25, pp=3.5
		31.0	11-19					
	12U	31.0	PUSH=24"	Stiff brown silty clay (CL)				WC=28, pp=4.25, 2.5,
		33.0	REC=22"		C			TV=0.35, 0.9
						35		
	13D	35.0	8-8	Gray clayey silt, trace micaceous fine sand (ML)				WC=30
		37.0	10-12					
						40		
	14D	40.0	6-10	Top: Brown silty clay, trace gray silt seams (CL)		41		14D Top: WC=33
		42.0	12-18	Bot: Gray fine to medium sand, some silt (SM)	S			Interlayered with clay.
						43.5		
						45		
	15D	45.0	5-8	Stiff gray & brown silty clay (CL)				WC=37, pp=2.0
		47.0	11-12					
					C			
						50		
	16D	50.0	5-5	Top: Red brown f-m sand, some clay (SC)		51		
		52.0	17-18	Bot: Brown clayey f-c sand, some gravel (SC)	T			

MUESER RUTLEDGE CONSULTING ENGINEERS

BORING LOG

BORING NO. MR-3U
SHEET 2 OF 3
PROJECT: AAFE MIXED USE BUILDING **FILE NO.** 12629
LOCATION: FLUSHING, QUEENS **SURFACE ELEV.** 38.5 (±)
RES. ENGR. ANDY ONG

DAILY PROGRESS	SAMPLE NO.	SAMPLE DEPTH	SAMPLE BLOWS/6"	SAMPLE DESCRIPTION	STRATA	DEPTH	CASING BLOWS	REMARKS
Cont'd					C	51		
05-10-16								Rig chatter from 52' to
Tuesday								55'.
Clear								
60°F						55		
	17D	55.0	16-23	Brown fine to coarse sand, some silt, trace				
		57.0	29-24	gravel, clay (SM)				Rig chatter from 57' to
								60'.
						60		
	18D	60.0	16-15	Top: Stiff brown silty clay, trace fine to coarse				18D Top: WC=20
		62.0	18-26	sand (CL)				
				Bot: Brown clayey fine to coarse sand, trace				Rig chatter from 63' to
				gravel (SC)				64'.
					T	65		
	19D	65.0	20-38	Light brown fine to coarse sand, some clay,				REC=6"
		67.0	55-42	gravel (SC)				
						70		
	20D	70.0	21-27	Brown fine to medium sand, trace silt (SP-SM)				
		72.0	27-28					
						75		
	21D	75.0	25-29	Brown fine to medium sand, some silt (SM)				
13:00		77.0	30-31			77		End of Boring at 77'.
								WC=Water Content
						80		in percent of dry
								weight.
								pp=Pocket
								Penetrometer
						85		Unconfined Compres-
								sive Strength in tsf.
								TV=Torvane Shear
								Strength in tsf.
						90		
						95		
						100		

MUESER RUTLEDGE CONSULTING ENGINEERS

BORING NO. MR-3U
SHEET 3 **OF** 3

PROJECT AAFE MIXED USE BUILDING
FILE NO. 12629
LOCATION FLUSHING, QUEENS
SURFACE ELEV. 38.5 (±)
BORING LOCATION SEE BORING LOCATION PLAN
DATUM NAVD 88

BORING EQUIPMENT AND METHODS OF STABILIZING BOREHOLE

TYPE OF BORING RIG		TYPE OF FEED DURING CORING		CASING USED		X YES		NO		
TRUCK		MECHANICAL		DIA., IN.	4	DEPTH, FT. FROM	0	TO	8.5	
SKID		HYDRAULIC	X	DIA., IN.		DEPTH, FT. FROM		TO		
BARGE		OTHER		DIA., IN.		DEPTH, FT. FROM		TO		
OTHER	TRACK									

TYPE AND SIZE OF:

D-SAMPLER	2" O. D. SPLIT SPOON
U-SAMPLER	SHELBY
S-SAMPLER	
CORE BARREL	
CORE BIT	
DRILL RODS	NWJ

DRILLING MUD USED X YES NO
DIAMETER OF ROTARY BIT, IN. 3-7/8
TYPE OF DRILLING MUD QUIK GEL

AUGER USED YES X NO
TYPE AND DIAMETER, IN.

CASING HAMMER, LBS. AVERAGE FALL, IN.
*SAMPLER HAMMER, LBS. 140 AVERAGE FALL, IN. 30
*USED AUTOMATIC HAMMER.

WATER LEVEL OBSERVATIONS IN BOREHOLE

DATE	TIME	DEPTH OF HOLE	DEPTH OF CASING	DEPTH TO WATER	CONDITIONS OF OBSERVATION
05-10-16	13:00	77	8.5	15	POST BORING MUD LEVEL READING.

PIEZOMETER INSTALLED YES X NO SKETCH SHOWN ON

STANDPIPE:	TYPE		ID, IN.		LENGTH, FT.		TOP ELEV.
INTAKE ELEMENT:	TYPE		OD, IN.		LENGTH, FT.		TIP ELEV.
FILTER:	MATERIAL		OD, IN.		LENGTH, FT.		BOT. ELEV.

PAY QUANTITIES

3.5" DIA. DRY SAMPLE BORING	LIN. FT.	77	NO. OF 3" SHELBY TUBE SAMPLES	2
3.5" DIA. U-SAMPLE BORING	LIN. FT.	4	NO. OF 3" UNDISTURBED SAMPLES	
CORE DRILLING IN ROCK	LIN. FT.		OTHER:	

BORING CONTRACTOR CRAIG TEST BORING
DRILLER ROB DOLLAR HELPERS LYLE DELMEIER
REMARKS BOREHOLE BACKFILLED WITH CUTTINGS UPON COMPLETION.
RESIDENT ENGINEER ANDY ONG DATE 05-10-16
CLASSIFICATION CHECK: CHERYL J. MOSS TYPING CHECK: SARAH O. H. JOHNSON

MUESER RUTLEDGE CONSULTING ENGINEERS

BORING LOG

BORING NO. MR-4P
SHEET 1 OF 4
PROJECT: AAFE MIXED USE BUILDING **FILE NO.** 12629
LOCATION: FLUSHING, QUEENS **SURFACE ELEV.** 44.5±
RES. ENGR. ERIC POON

DAILY PROGRESS	SAMPLE NO.	SAMPLE DEPTH	SAMPLE BLOWS/6"	SAMPLE DESCRIPTION	STRATA	DEPTH	CASING BLOWS	REMARKS
07:00	1D	0.0	7-6	Brown silty fine to medium sand, trace coarse			DRILLED	
12-15-16		2.0	7-9	sand, gravel (Fill) (SM)			AHEAD	
Thursday	2D	2.0	8-7	Do 1D, trace brick (Fill) (SM)			4"	
Overcast		4.0	8-8				↓	
23°F	3D	4.0	6-4	Brown silty fine to medium sand, trace gravel	F	**5**	↓	
		6.0	2-5	(Fill) (SM)			↓	
	4D	6.0	6-6	Brown fine to coarse sand, some silt, trace			↓	
		8.0	5-9	gravel (Fill) (SM)		**8**	↓	
	5D	8.0	15-18	Brown fine to coarse sand, some gravel, silt				REC=6"
		10.0	15-10	(Fill) (SM)		**10**		
	6D	10.0	16-16	Brown fine to coarse sand, some gravel, trace				
		12.0	12-17	silt (SP-SM)				
						15		
	7D	15.0	11-9	Brown fine to coarse sand, some gravel, trace				
		17.0	8-8	silt (SP-SM)				
						20		
	8D	20.0	10-13	Brown fine to medium sand, trace silt, coarse				
		22.0	10-12	sand, gravel (SP-SM)				
						25		
	9D	25.0	12-17	Do 8D (SP-SM)	S			
		27.0	19-18					
						28.5		
						30		
	10D	30.0	18-19	Brown fine to medium sand, some silt (SM)				
		32.0	19-15					
						35		
	11D	35.0	15-18	Brown fine to coarse sand, trace silt, gravel				
		37.0	19-15	(SP-SM)				
						40		
	12D	40.0	17-20	Gray fine sand, some silt, trace coarse sand (SM)				
		42.0	22-22					
						43.5		
						45		
	13D	45.0	16-20	Gray fine to coarse sand, trace silt, gravel				
		47.0	23-17	(SP-SM)				
					T			
						50		
	14D	50.0	20-18	Brown fine to coarse sand, some silt, gravel				
		52.0	20-17	(SP-SM)				

MUESER RUTLEDGE CONSULTING ENGINEERS

BORING LOG

BORING NO. MR-4P
SHEET 2 OF 4
PROJECT: AAFE MIXED USE BUILDING **FILE NO.** 12629
LOCATION: FLUSHING, QUEENS **SURFACE ELEV.** 44.5±
RES. ENGR. ERIC POON

DAILY PROGRESS	SAMPLE NO.	SAMPLE DEPTH	SAMPLE BLOWS/6"	SAMPLE DESCRIPTION	STRATA	DEPTH	CASING BLOWS	REMARKS
Cont'd								
12-15-16								
Thursday								
Overcast								
23°F						**55**		
	15D	55.0	14-19	Gray silty fine to coarse sand, trace gravel (SM)				
		57.0	56-31					
						60		Possible boulder at 60'.
	16NR	60.0	100/0"	No recovery				Rig chatter between 60'
		62.0						to 65'.
					T			
						65		
	17D	65.0	16-22	Brown fine to medium sand, some silt, trace				
		67.0	20-13	coarse sand, gravel (SM)				
						70		
	18D	70.0	25-21	Gray fine to coarse sand, some silt, trace gravel				
		72.0	22-25	(SM)				
						75		
	19D	75.0	22-24	Red to brown fine to medium sand, some silt,				
10:30		77.0	22-22	trace coarse sand (SM)		**77**		End of Boring at 77'.
						80		
						85		
						90		
						95		
						100		

Mueser Rutledge Consulting Engineers
14 Penn Plaza - 225 West 34th Street
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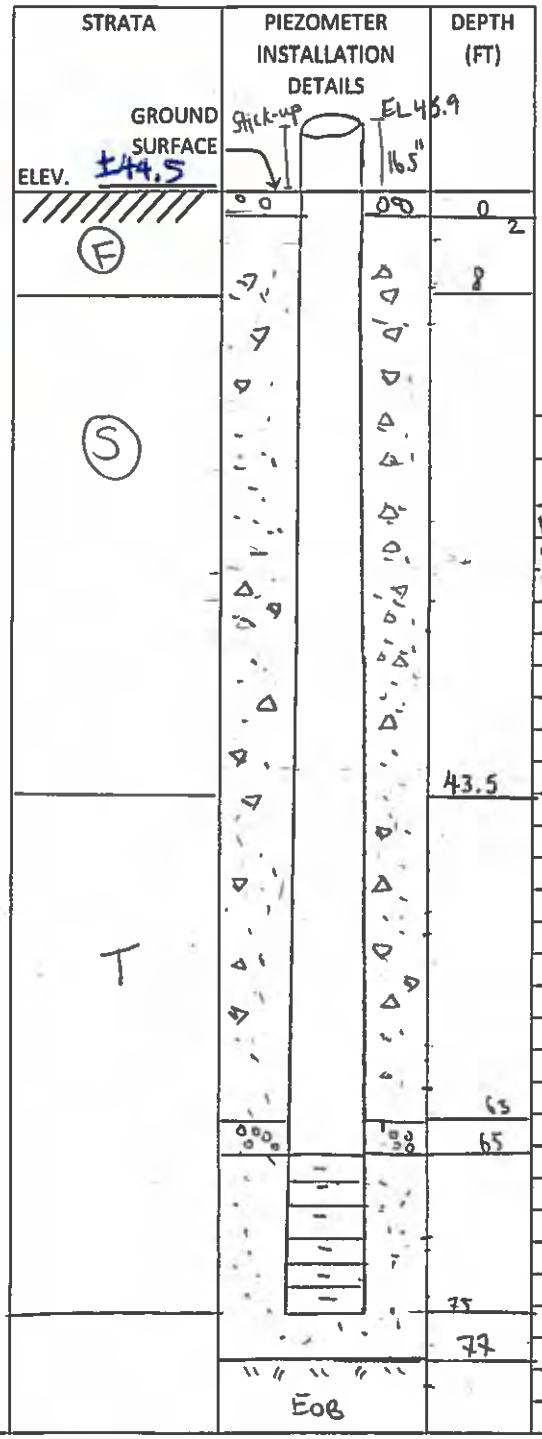
PIEZOMETER RECORD

PIEZOMETER OR BORING NO. MR-4P
SHEET 3 OF 4
FILE NO. 12629
INSTALLATION DATE 12-15-2016
RES ENGR. ERIC POON

PROJECT: AAFE MIXED USE BUILDING
LOCATION: FLUSHING, QUEENS
PIEZOMETER LOCATION: SEE BLP

☐ SEE SKETCH ON BACK



PIEZOMETER TYPE PVC SLOTTED PIPE

INTAKE POINT
depth to bottom, ft = 75
depth to top, ft = 65
length, ft = 10 = L
diameter, in = 2.375" O.D. ft = 0.17 = 2R

STANDPIPE/RISER
elevation of rim, ft = ~ ± 45.9
diameter, in = 2.067" I.D. ft = 0.17 = 2r

READING TIME		DEPTH – RIM TO WATER	ELEVATION OF WATER	REMARKS
DATE	CLOCK			
12-15-2016	14:00	8.3	37.6	UPON COMPLETION
1-4-2017	16:00	47.9	-2.0	SCHEDULED READING
1-9-2017	07:30	49.7	-3.8	SCHEDULED READING

SAND
GRAVEL
BENTONITE
GROUT

GROUND SURFACE ELEV. 44.5 (±)

PIEZOMETER NO. MR-4P

MUESER RUTLEDGE CONSULTING ENGINEERS

BORING NO. MR-4P
SHEET 4 **OF** 4

PROJECT AAFE MIXED USE BUILDING
FILE NO. 12629
LOCATION FLUSHING, QUEENS
SURFACE ELEV. 44.5±
BORING LOCATION SEE BORING LOCATION PLAN
DATUM NAVD 88

BORING EQUIPMENT AND METHODS OF STABILIZING BOREHOLE

TYPE OF BORING RIG		TYPE OF FEED DURING CORING		CASING USED		X YES		NO		
TRUCK	CME-75	MECHANICAL		DIA., IN.	4	DEPTH, FT. FROM	0	TO	8	
SKID		HYDRAULIC	X	DIA., IN.		DEPTH, FT. FROM		TO		
BARGE		OTHER		DIA., IN.		DEPTH, FT. FROM		TO		
OTHER										

TYPE AND SIZE OF:

D-SAMPLER	2" O. D. SPLIT SPOON
U-SAMPLER	
S-SAMPLER	
CORE BARREL	
CORE BIT	
DRILL RODS	NWJ

DRILLING MUD USED X YES NO
DIAMETER OF ROTARY BIT, IN. 3-7/8
TYPE OF DRILLING MUD BIO-BORE

AUGER USED YES X NO
TYPE AND DIAMETER, IN.

*CASING HAMMER, LBS. 300 AVERAGE FALL, IN. 24
*SAMPLER HAMMER, LBS. 140 AVERAGE FALL, IN. 30
*USED AUTOMATIC HAMMER.

WATER LEVEL OBSERVATIONS IN BOREHOLE

DATE	TIME	DEPTH OF HOLE	DEPTH OF CASING	DEPTH TO WATER	CONDITIONS OF OBSERVATION
					SEE PIEZOMETER RECORD SHEET.

PIEZOMETER INSTALLED X YES NO SKETCH SHOWN ON SEE SHEET NO. 3

STANDPIPE:	TYPE	PVC	ID, IN.	1-3/4	LENGTH, FT.	65	TOP ELEV.	45.9
INTAKE ELEMENT:	TYPE	SLOTTED PVC	OD, IN.	2	LENGTH, FT.	10	TIP ELEV.	-29.1
FILTER:	MATERIAL	SAND	OD, IN.	4	LENGTH, FT.	12	BOT. ELEV.	-32.5

PAY QUANTITIES

3.5" DIA. DRY SAMPLE BORING	LIN. FT.	77	NO. OF 3" SHELBY TUBE SAMPLES	
3.5" DIA. U-SAMPLE BORING	LIN. FT.		NO. OF 3" UNDISTURBED SAMPLES	
CORE DRILLING IN ROCK	LIN. FT.		OTHER:	

BORING CONTRACTOR CRAIG GEOTECHNICAL DRILLING
DRILLER JOHN MILLINGTON HELPERS JIMMY MARTINEZ
REMARKS PIEZOMETER INSTALLED.
RESIDENT ENGINEER ERIC POON DATE 12-15-16
CLASSIFICATION CHECK: CHERYL J. MOSS TYPING CHECK: SARAH JOHNSON

MUESER RUTLEDGE CONSULTING ENGINEERS

BORING LOG

BORING NO. MR-5U
SHEET 1 OF 2
PROJECT: AAFE MIXED USE BUILDING **FILE NO.** 12629
LOCATION: FLUSHING, QUEENS **SURFACE ELEV.** +44 (±)
RES. ENGR. ERIC POON

DAILY PROGRESS	SAMPLE NO.	SAMPLE DEPTH	SAMPLE BLOWS/6"	SAMPLE DESCRIPTION	STRATA	DEPTH	CASING BLOWS	REMARKS
12:40	1D	0.0	11-6	Brown fine to coarse sand, trace silt, gravel			DRILLED	REC=1"
12-15-16		2.0	3-4	(Fill) (SM)			AHEAD	
Thursday							4"	
Sunny						**3.5**		
23°F						**5**		
	2D	5.0	WR/12"	Brown clayey silt, some fine to medium sand				WC=21
		7.0	1-2	(ML)	**F**			
						10		
	3D	10.0	6-2	Do 2D, trace coarse sand (ML)				WC=22
		12.0	2-2					
						13.5		
						15		
	4D	15.0	6-5	Brown clayey fine to coarse sand, trace gravel				
		17.0	8-13	(SC)				
					S			
						20		
	5D	20.0	6-10	Brown fine to medium sand, some silt, trace				
		22.0	9-7	coarse sand, gravel (SM)				
						23.5		
						25		
	6D	25.0	4-6	Stiff red brown silty clay, trace fine to coarse				WC=27, pp=2.0
		27.0	9-8	sand (CL)				
	7U	28.0	PUSH=24"	Stiff red brown silty clay (CL)				WC=33, pp=3.0,
		30.0	REC=19"			**30**		slickensided.
	8D	30.0	7-8	Stiff red brown silty clay, trace fine to coarse				WC=28, pp=2.0,
		32.0	11-12	sand (CL)				slickensided.
					C			
						35		
	9D	35.0	5-9	Stiff red brown silty clay (CH)				WC=25, pp=2.5,
		37.0	14-14					slickensided.
						40		
	10D	40.0	9-10	Do 9D (CH)				WC=29, pp=3.0,
14:15		42.0	19-18			**42**		slickensided.
								End of Boring at 42'.
						45		WC=Water Content
								in percent of dry
								weight.
								pp=Pocket
						50		Penetrometer
								Unconfined Compres-
								sive Strength in tsf.

MUESER RUTLEDGE CONSULTING ENGINEERS

BORING NO. MR-5U
SHEET 2 **OF** 2

PROJECT AAFE MIXED USE BUILDING
FILE NO. 12629
LOCATION FLUSHING, QUEENS
SURFACE ELEV. +44 (±)
BORING LOCATION SEE BORING LOCATION PLAN
DATUM NAVD 88

BORING EQUIPMENT AND METHODS OF STABILIZING BOREHOLE

TYPE OF BORING RIG		TYPE OF FEED DURING CORING		CASING USED					
TRUCK	CME-75	MECHANICAL		DIA., IN.	4	DEPTH, FT. FROM	0	TO	10
SKID		HYDRAULIC	X	DIA., IN.		DEPTH, FT. FROM		TO	
BARGE		OTHER		DIA., IN.		DEPTH, FT. FROM		TO	
OTHER									

CASING USED: [X] YES [ ] NO

TYPE AND SIZE OF:

D-SAMPLER	2" O. D. SPLIT SPOON
U-SAMPLER	THIN WALL
S-SAMPLER	
CORE BARREL	
CORE BIT	
DRILL RODS	NWJ

DRILLING MUD USED: [X] YES [ ] NO
DIAMETER OF ROTARY BIT, IN. 3-3/4
TYPE OF DRILLING MUD BIO-BORE

AUGER USED: [ ] YES [X] NO
TYPE AND DIAMETER, IN.

*CASING HAMMER, LBS. 300 AVERAGE FALL, IN. 24
*SAMPLER HAMMER, LBS. 140 AVERAGE FALL, IN. 30
*USED AUTOMATIC HAMMER.

WATER LEVEL OBSERVATIONS IN BOREHOLE

DATE	TIME	DEPTH OF HOLE	DEPTH OF CASING	DEPTH TO WATER	CONDITIONS OF OBSERVATION
					NO WATER OBSERVATIONS MADE.

PIEZOMETER INSTALLED [ ] YES [X] NO SKETCH SHOWN ON

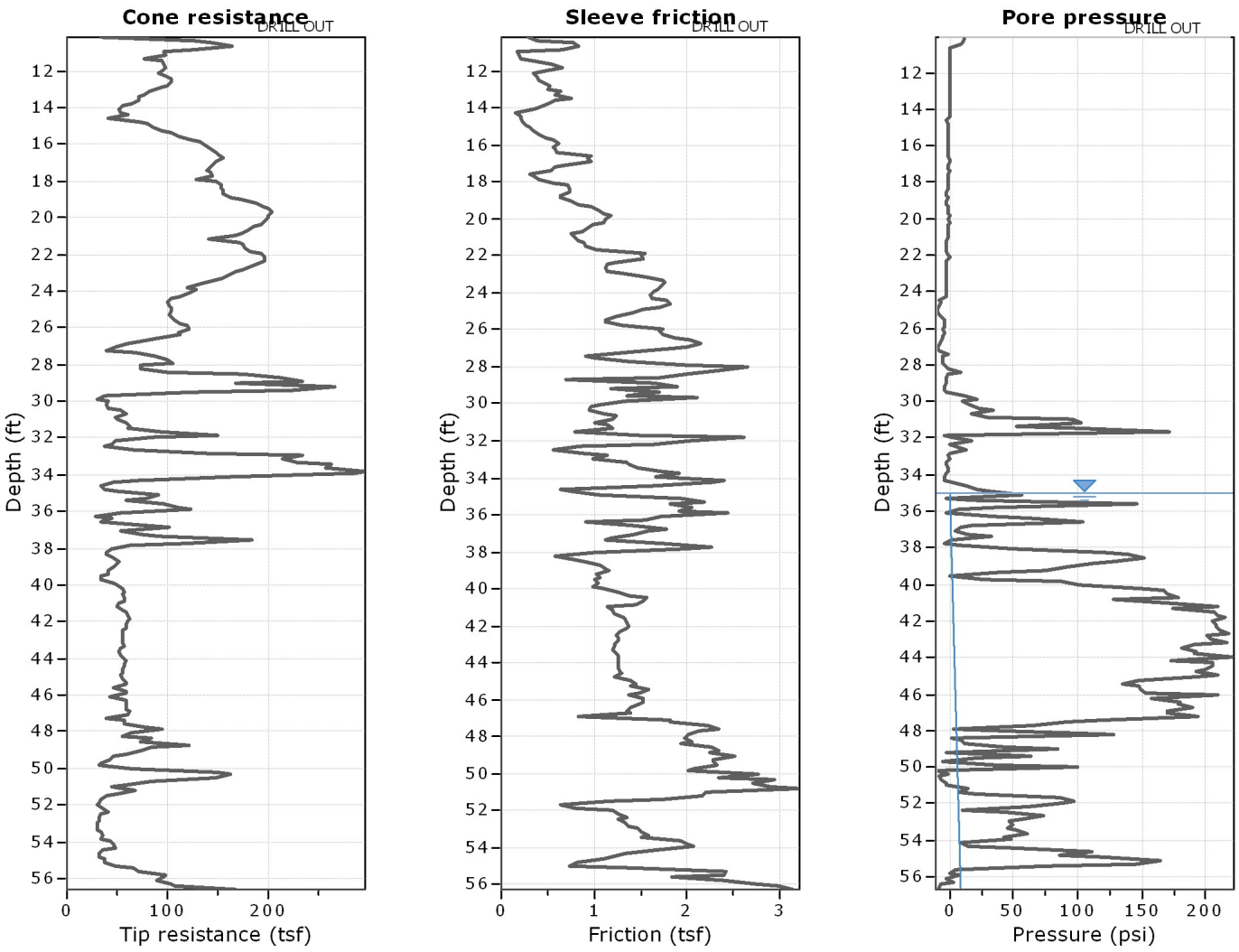
STANDPIPE:	TYPE		ID, IN.		LENGTH, FT.	TOP ELEV.	
INTAKE ELEMENT:	TYPE		OD, IN.		LENGTH, FT.	TIP ELEV.	
FILTER:	MATERIAL		OD, IN.		LENGTH, FT.	BOT. ELEV.	

PAY QUANTITIES

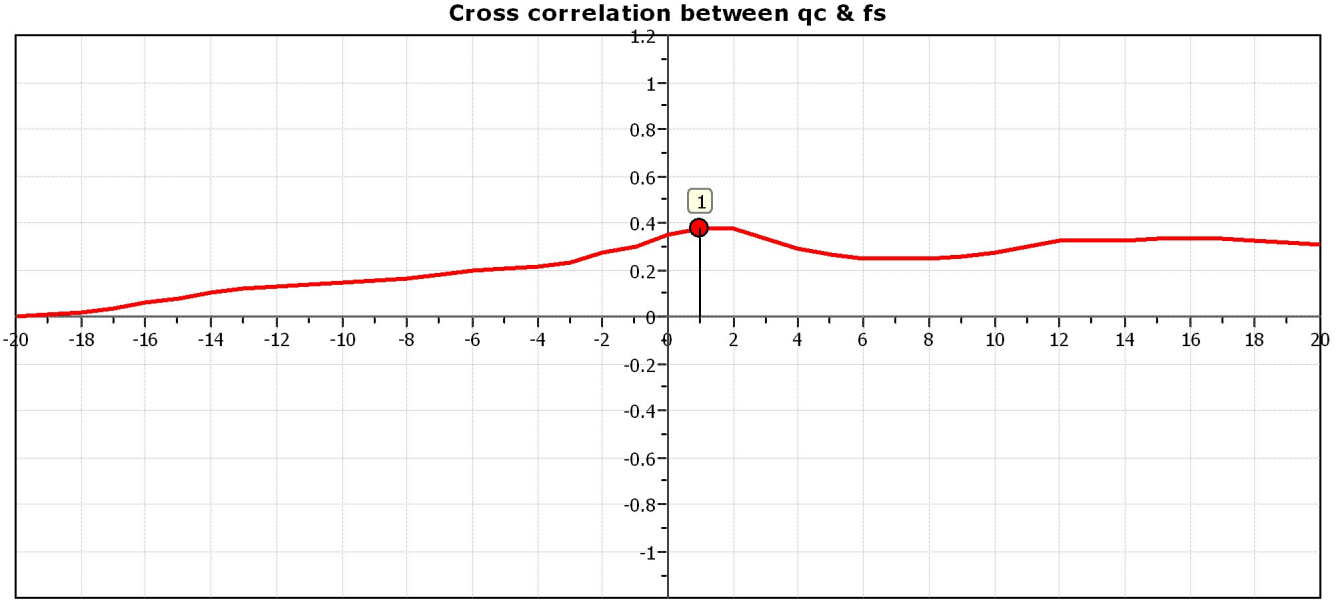
3.5" DIA. DRY SAMPLE BORING	LIN. FT.	42	NO. OF 3" SHELBY TUBE SAMPLES	1
3.5" DIA. U-SAMPLE BORING	LIN. FT.		NO. OF 3" UNDISTURBED SAMPLES	
CORE DRILLING IN ROCK	LIN. FT.		OTHER:	

BORING CONTRACTOR CRAIG GEOTECHNICAL DRILLING
DRILLER JOHN MILLINGTON HELPERS JIMMY MARTINEZ
REMARKS BOREHOLE BACKFILLED WITH CUTTINGS UPON COMPLETION.
RESIDENT ENGINEER ERIC POON DATE 12-15-16
CLASSIFICATION CHECK: CHERYL J. MOSS TYPING CHECK: SARAH JOHNSON

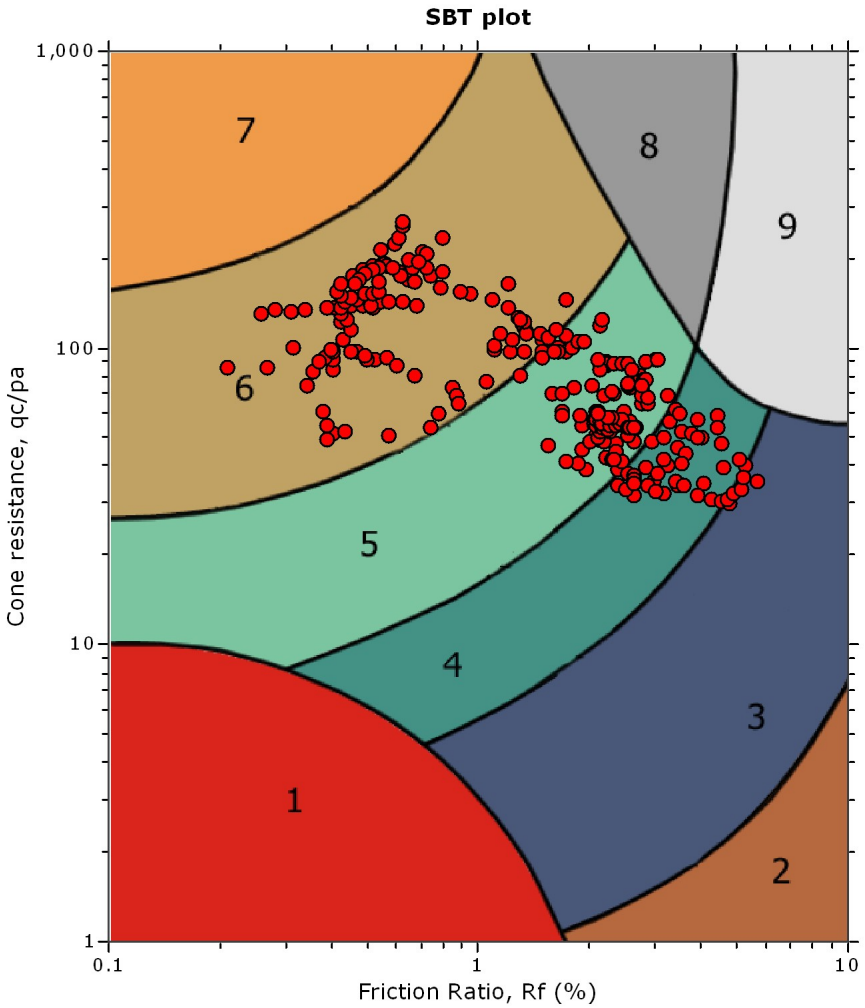
APPENDIX C – CPT DATA

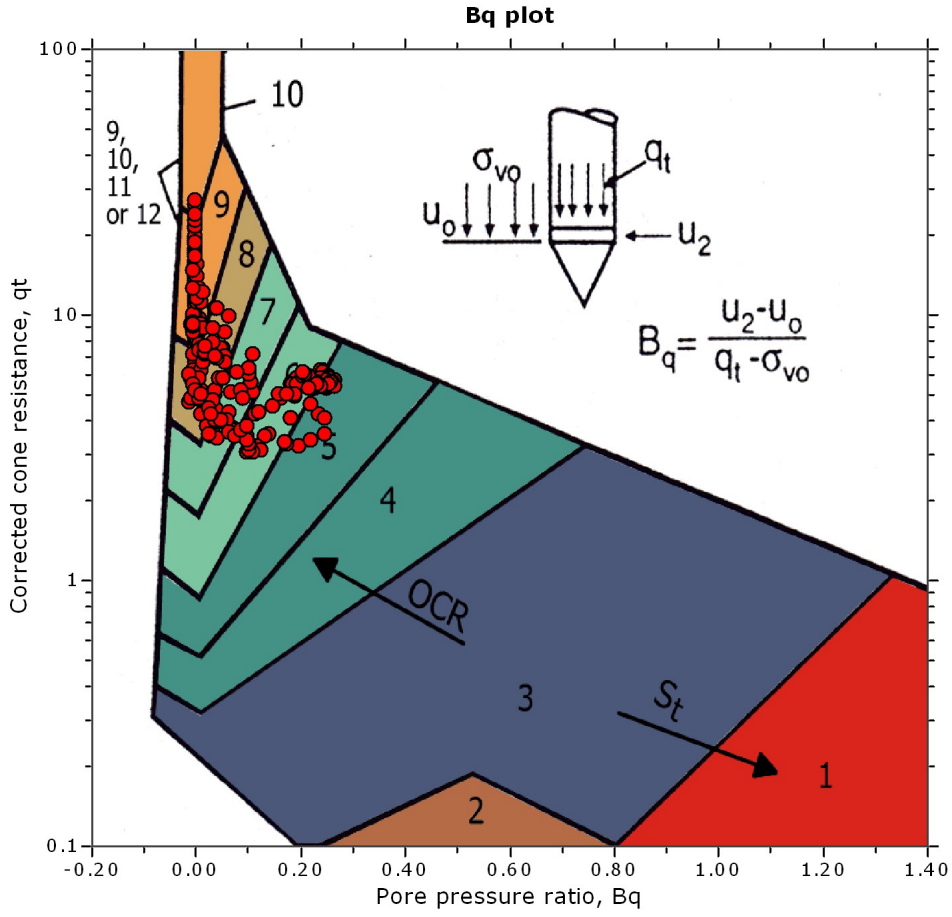


The plot below presents the cross correlation coeficient between the raw qc and fs values (as measured on the field). X axes presents the lag distance (one lag is the distance between two sucessive CPT measurements).



SBT - Bq plots



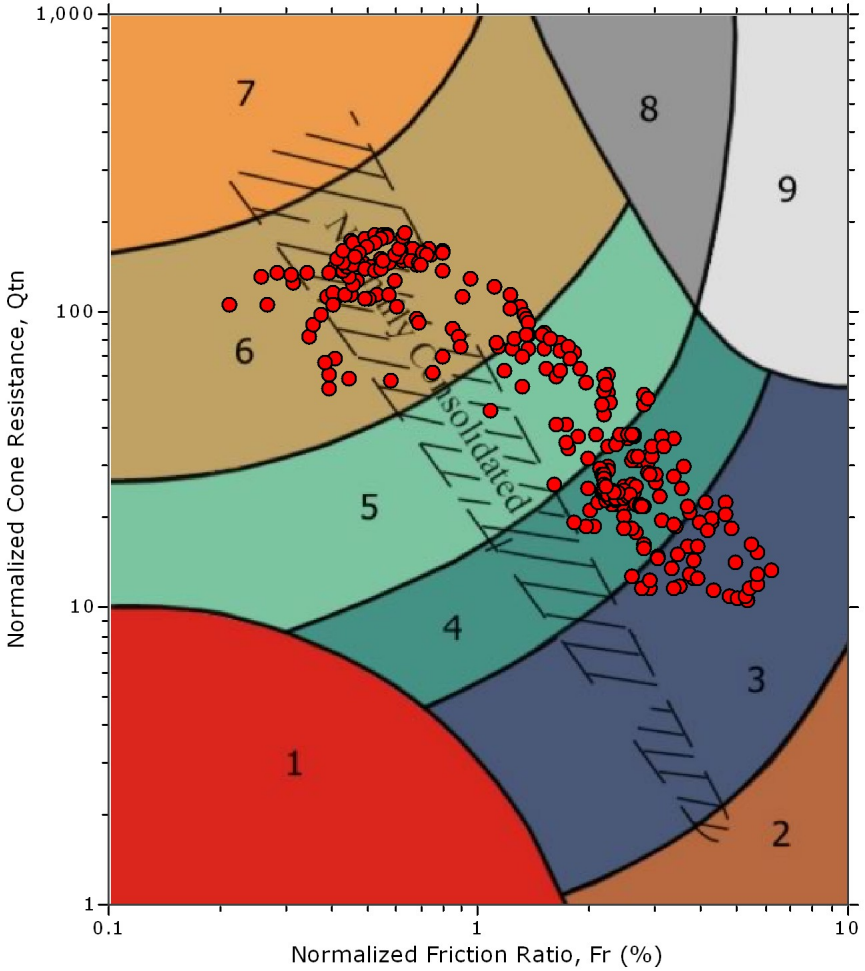


SBT legend

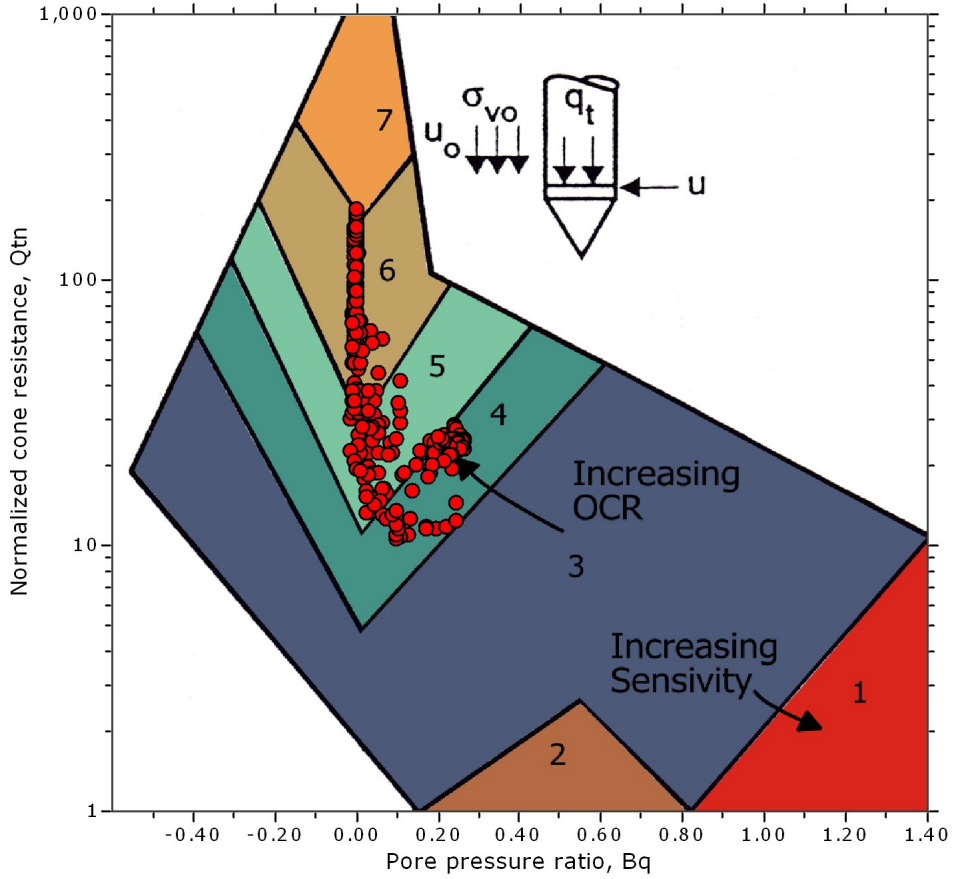
1. Sensitive fine grained	4. Clayey silt to silty clay	7. Gravely sand to sand
2. Organic material	5. Silty sand to sandy silt	8. Very stiff sand to clayey sand
3. Clay to silty clay	6. Clean sand to silty sand	9. Very stiff fine grained

SBT - Bq plots (normalized)

SBTn plot



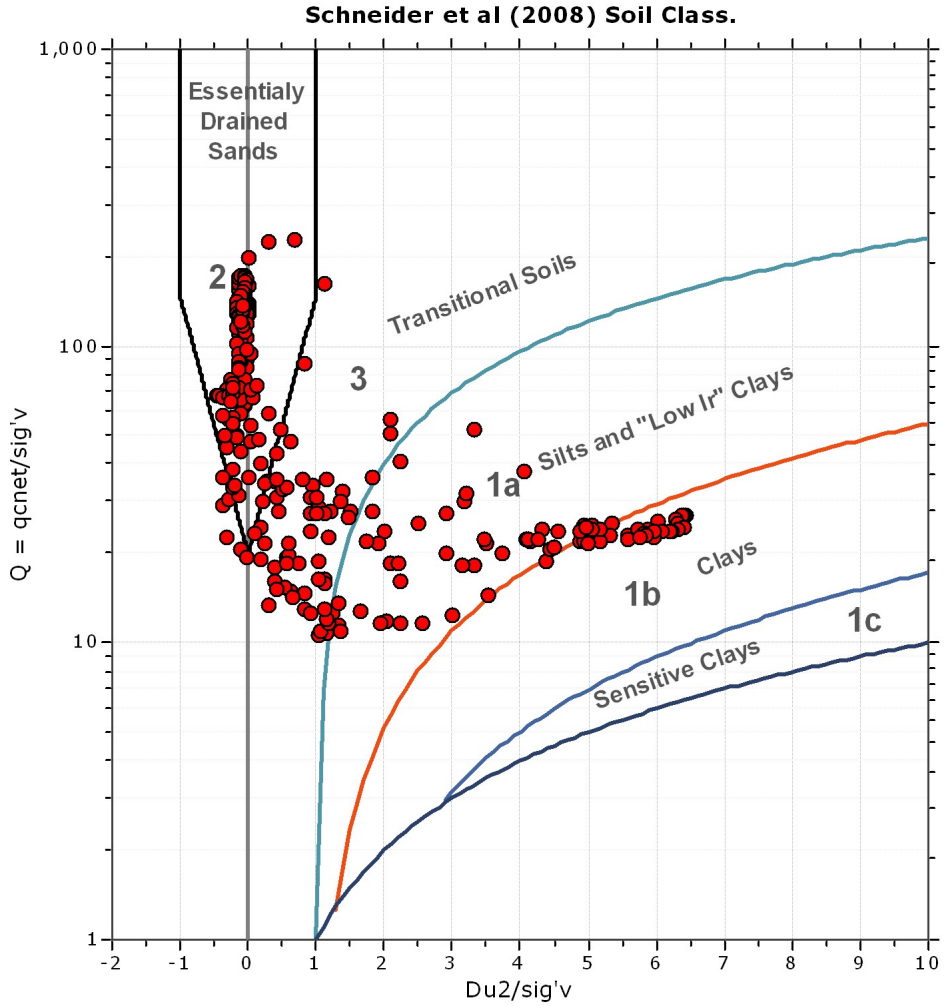
Normalized Bq plot

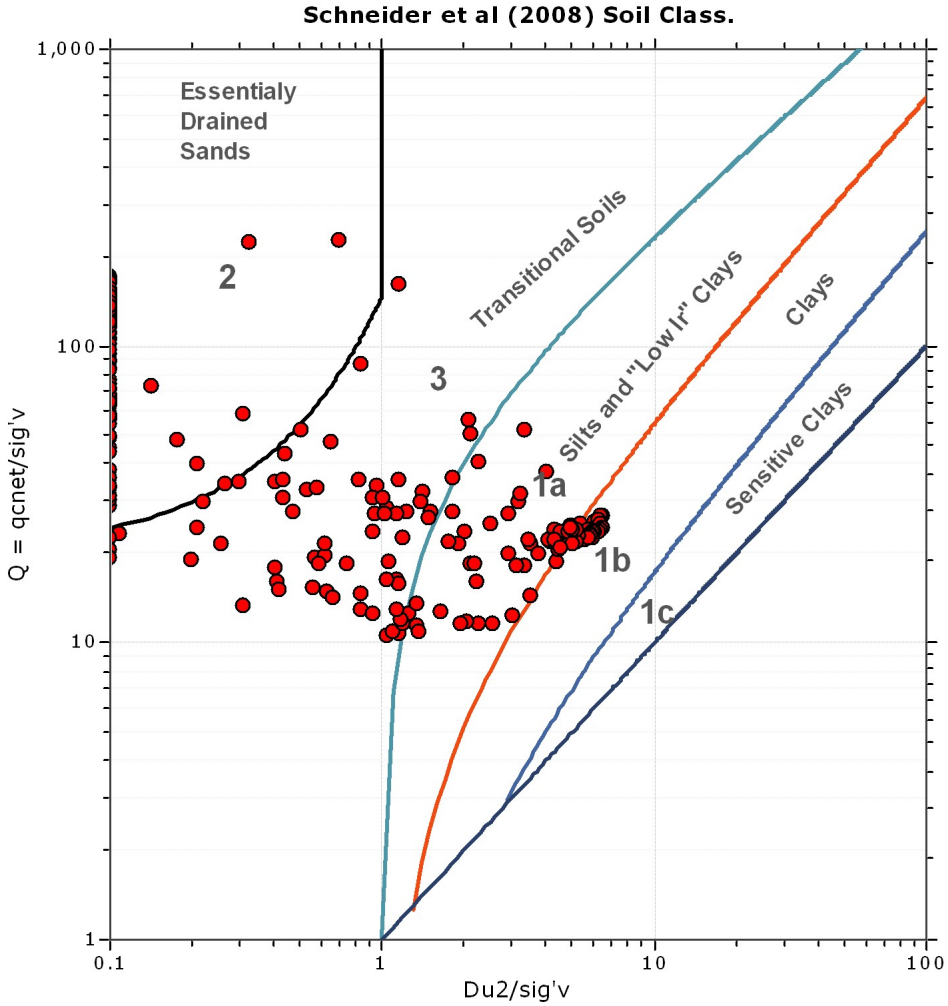


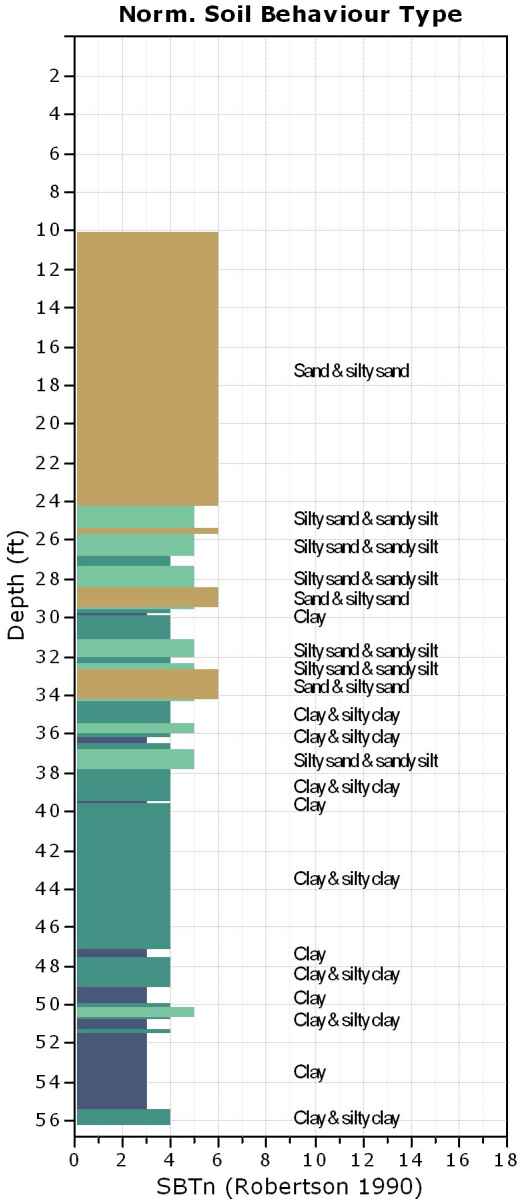
SBTn legend

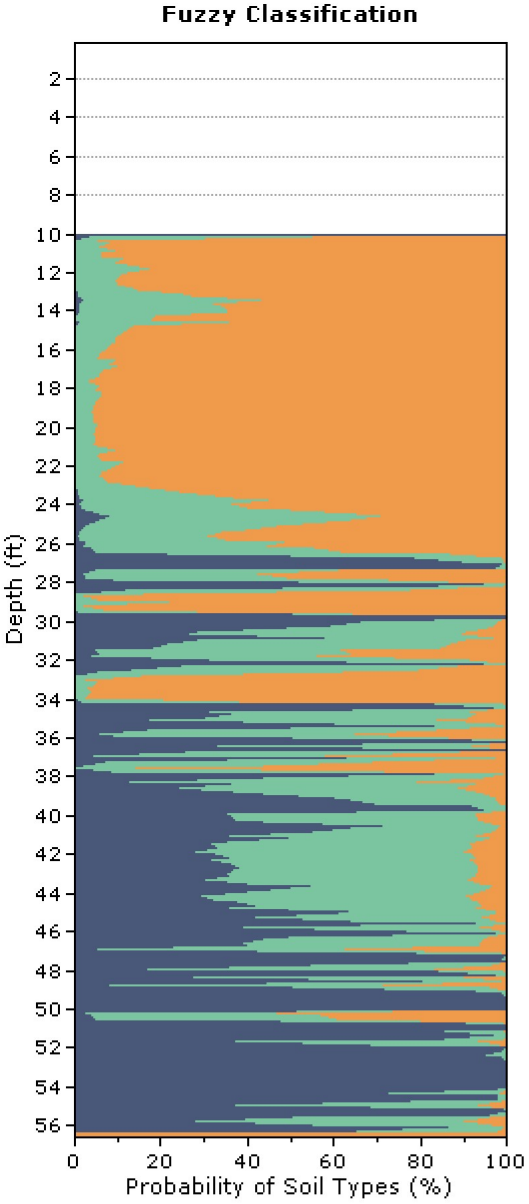
1. Sensitive fine grained	4. Clayey silt to silty clay	7. Gravely sand to sand
2. Organic material	5. Silty sand to sandy silt	8. Very stiff sand to clayey sand
3. Clay to silty clay	6. Clean sand to silty sand	9. Very stiff fine grained

Bq plots (Schneider)



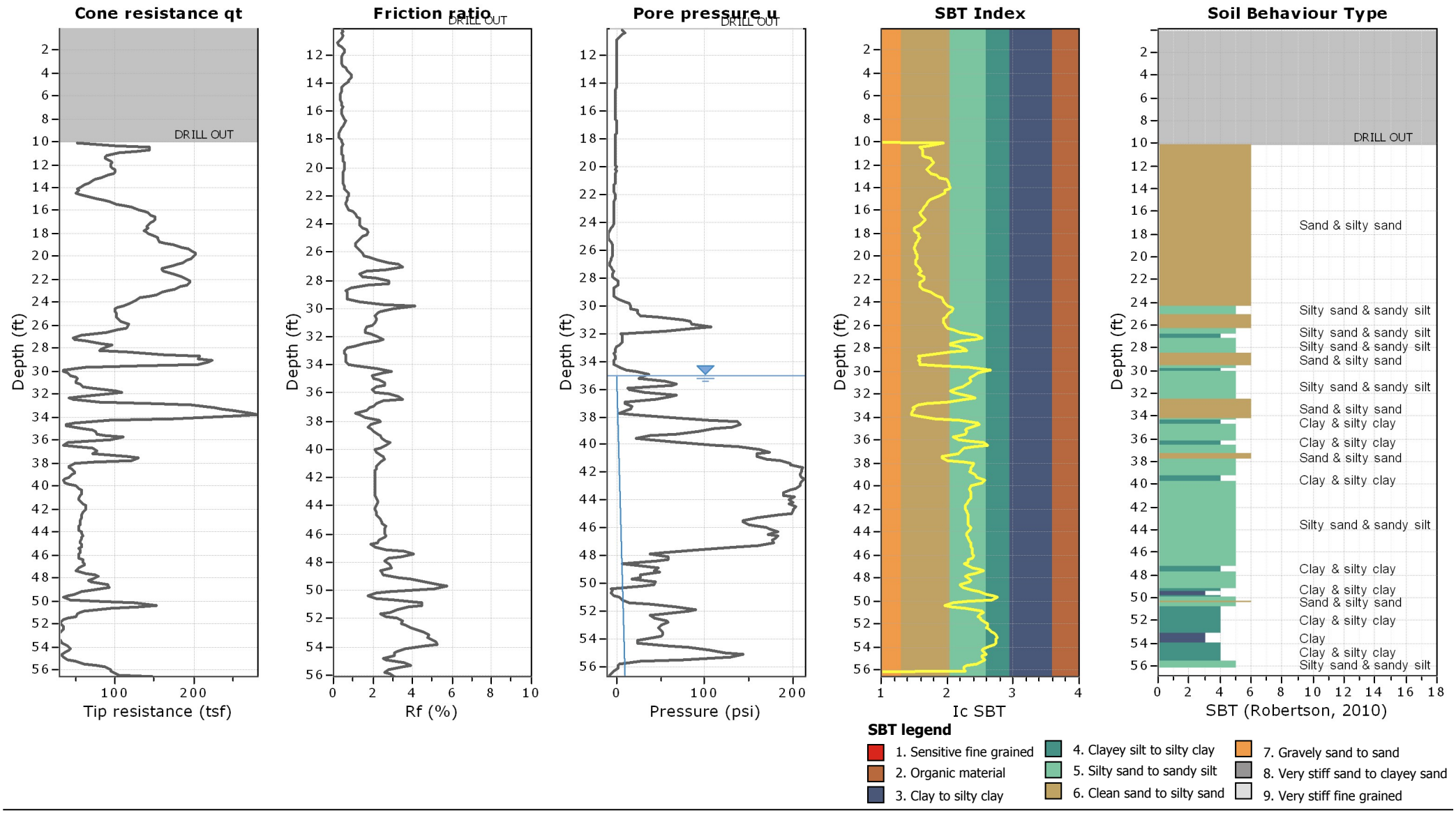


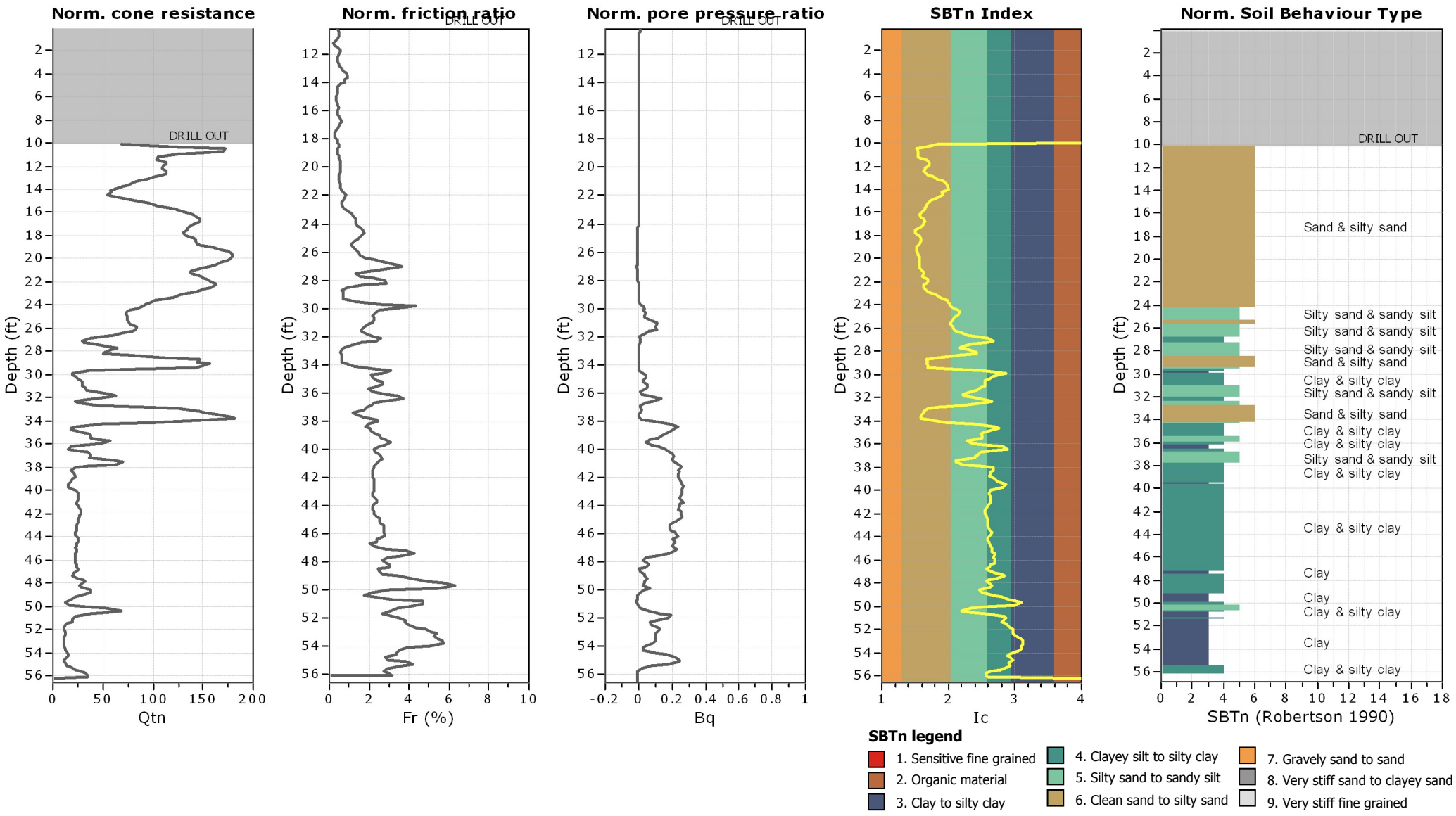

Norm. Soil Behaviour Type
Depth (ft)
SBTn (Robertson 1990)
Sand & silty sand
Silty sand & sandy silt
Silty sand & sandy silt
Silty sand & sandy silt
Sand & silty sand
Clay
Silty sand & sandy silt
Silty sand & sandy silt
Sand & silty sand
Clay & silty clay
Clay & silty clay
Silty sand & sandy silt
Clay & silty clay
Clay
Clay & silty clay
Clay
Clay & silty clay
Clay
Clay & silty clay


Fuzzy Classification
Depth (ft)
Probability of Soil Types (%)

CPT: CPT-01a
Total depth: 56.59 ft, Date: 6/21/2016
Surface Elevation: 0.00 ft
Coords: X:0.00, Y:0.00
Cone Type: Uknown
Cone Operator: Uknown

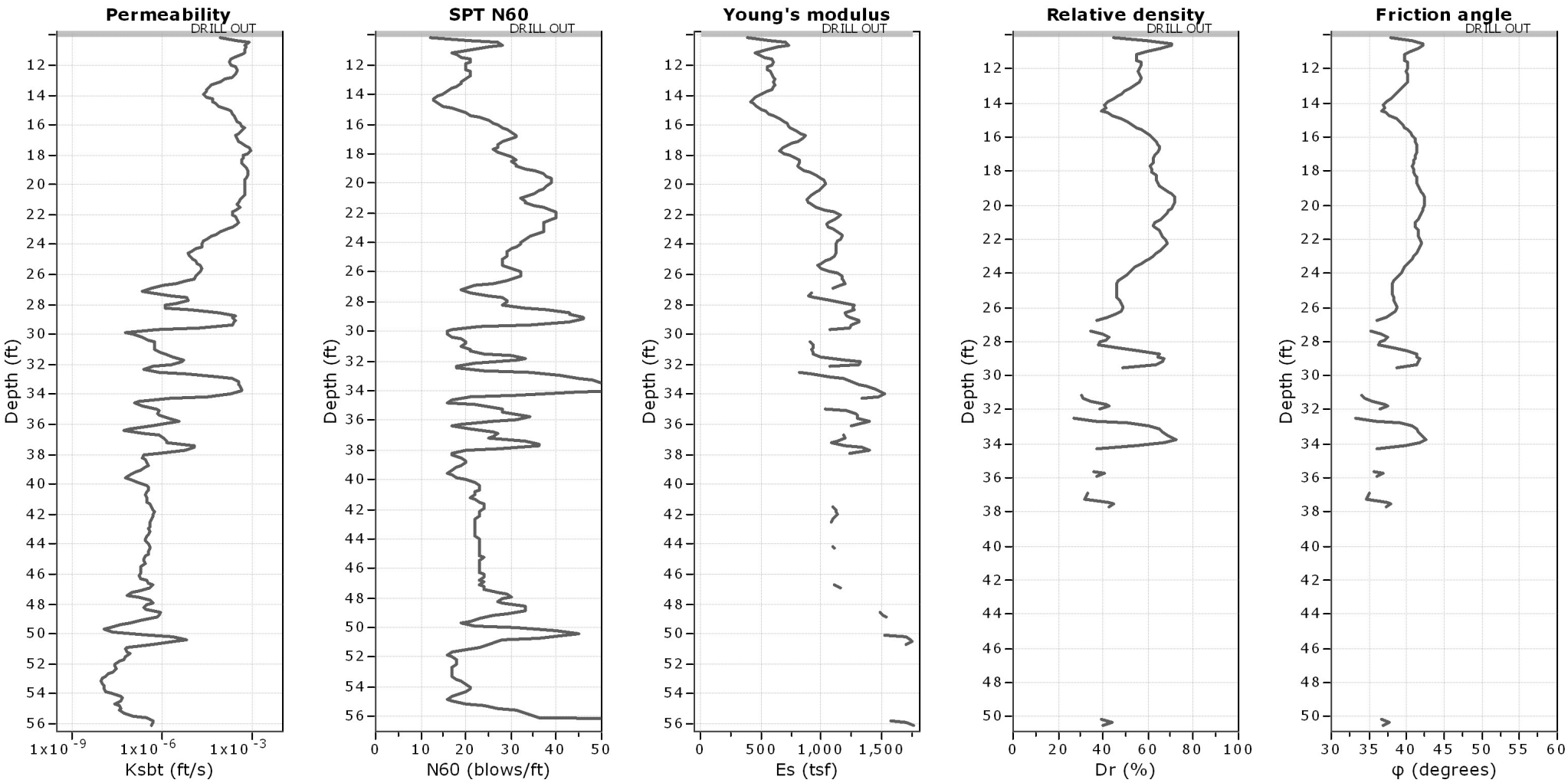
Project: MRCE 12629 - AAFE Mixed-Use Building
Location: 133-04 39th Avenue, Flushing, Queens, NY




Norm. cone resistance
Norm. friction ratio
Norm. pore pressure ratio
SBTn Index
Norm. Soil Behaviour Type
DRILL OUT
Depth (ft)
Qtn
Fr (%)
Bq
Ic
SBTn (Robertson 1990)
Sand & silty sand
Silty sand & sandy silt
Clay & silty clay
Clay
SBTn legend
1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty clay
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to clayey sand
9. Very stiff fine grained

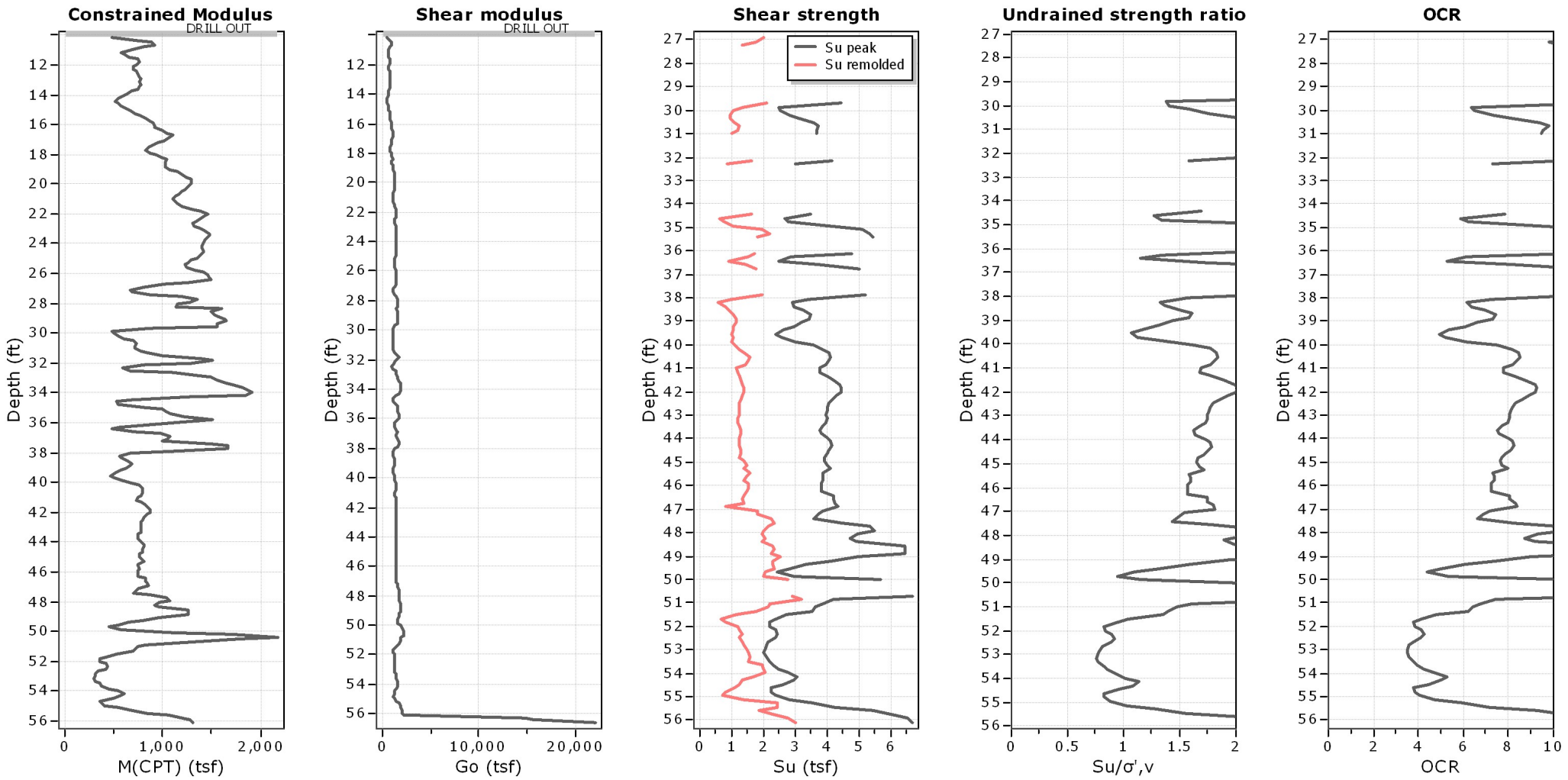
CPT: CPT-01a
Total depth: 56.59 ft, Date: 6/21/2016
Surface Elevation: 0.00 ft
Coords: X:0.00, Y:0.00
Cone Type: Uknown
Cone Operator: Uknown

Project: MRCE 12629 - AAFE Mixed-Use Building
Location: 133-04 39th Avenue, Flushing, Queens, NY



Calculation parameters

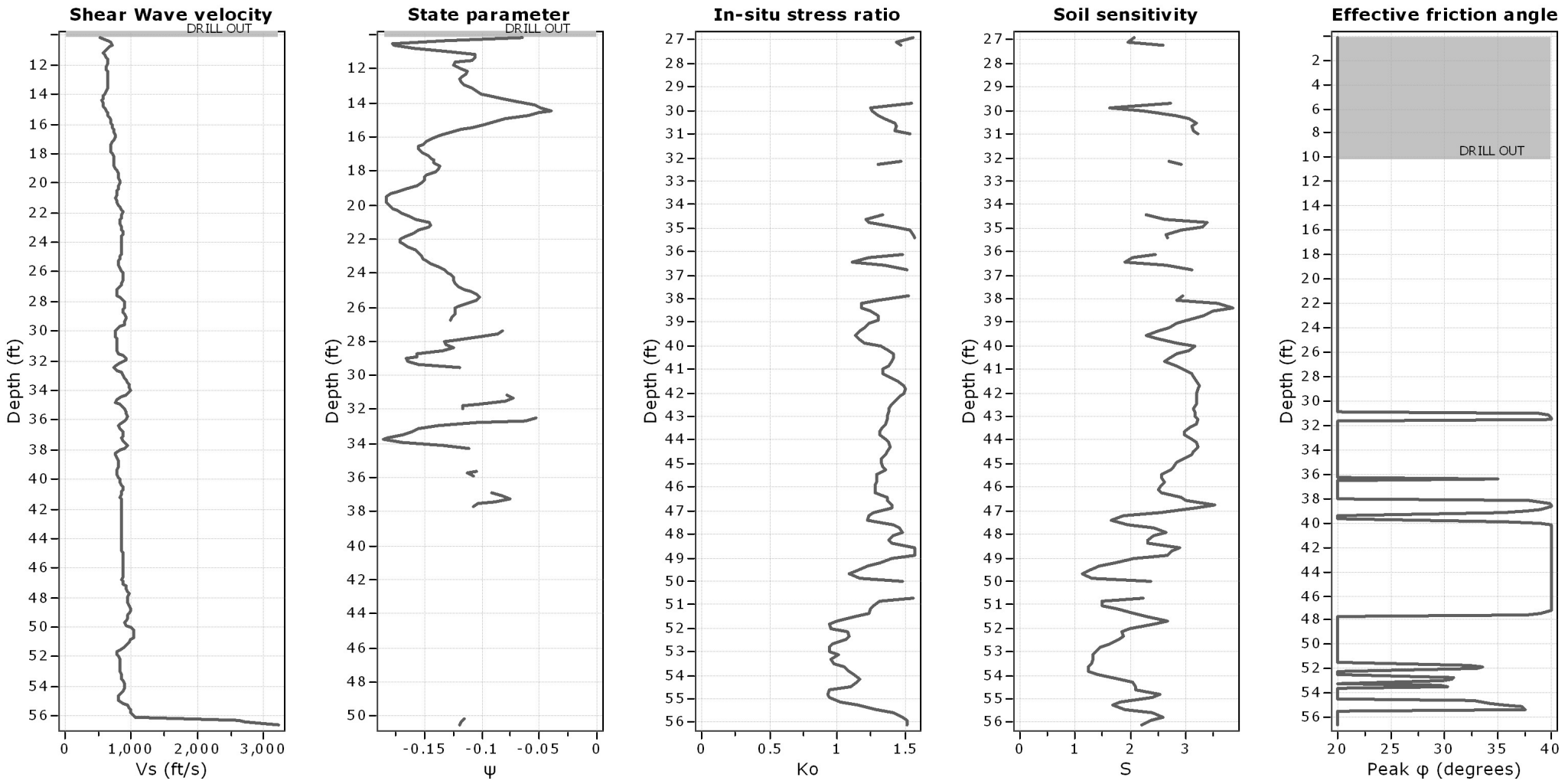
Permeability: Based on SBT_n
SPT N_{60}: Based on I_c and q_t
Young's modulus: Based on variable alpha using I_c (Robertson, 2009)
Relative desnisty constant, C_{Dr}: 350.0
Phi: Based on Kulhawy & Mayne (1990)
User defined estimation data



Calculation parameters

Constrained modulus: Based on variable *alpha* using I_c and Q_{tn} (Robertson, 2009)
Go: Based on variable *alpha* using I_c (Robertson, 2009)
Undrained shear strength cone factor for clays, N_{kt}: 14

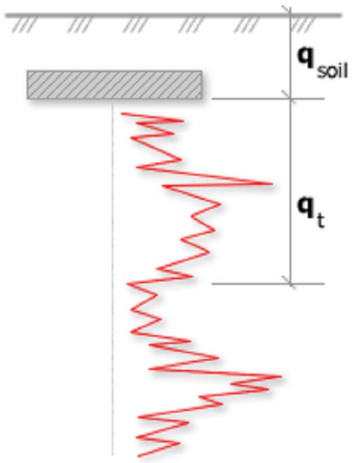
OCR factor for clays, N_{kt}: 0.33
User defined estimation data



Calculation parameters

Soil Sensitivity factor, N_S: 7.00

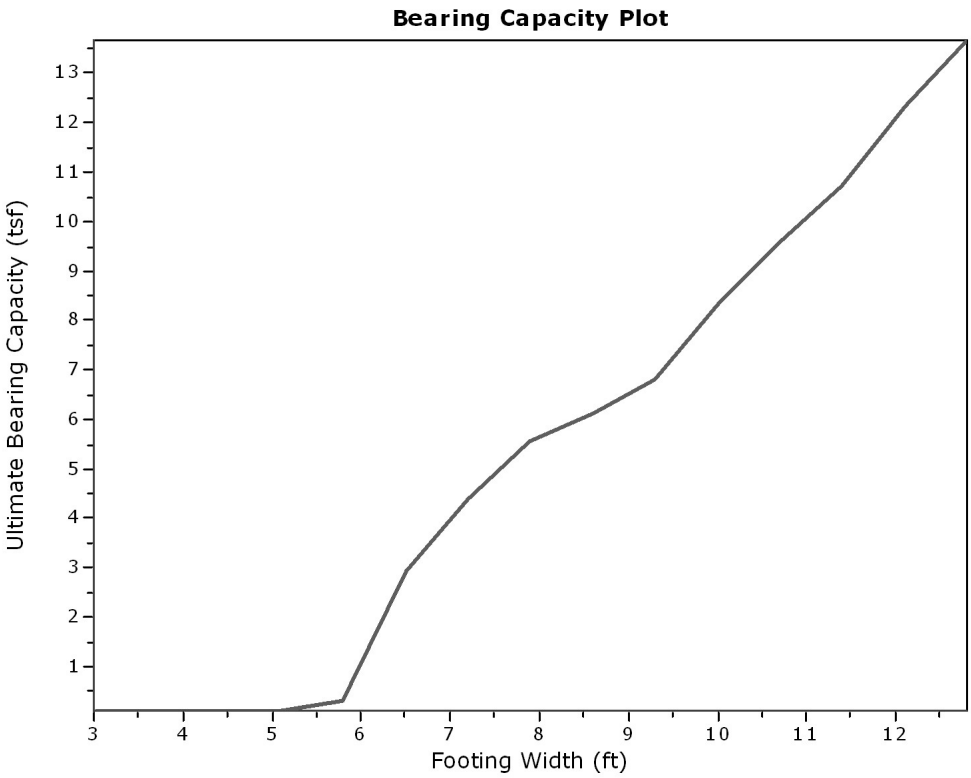
User defined estimation data



Bearing Capacity calculation is perfromed based on the formula:

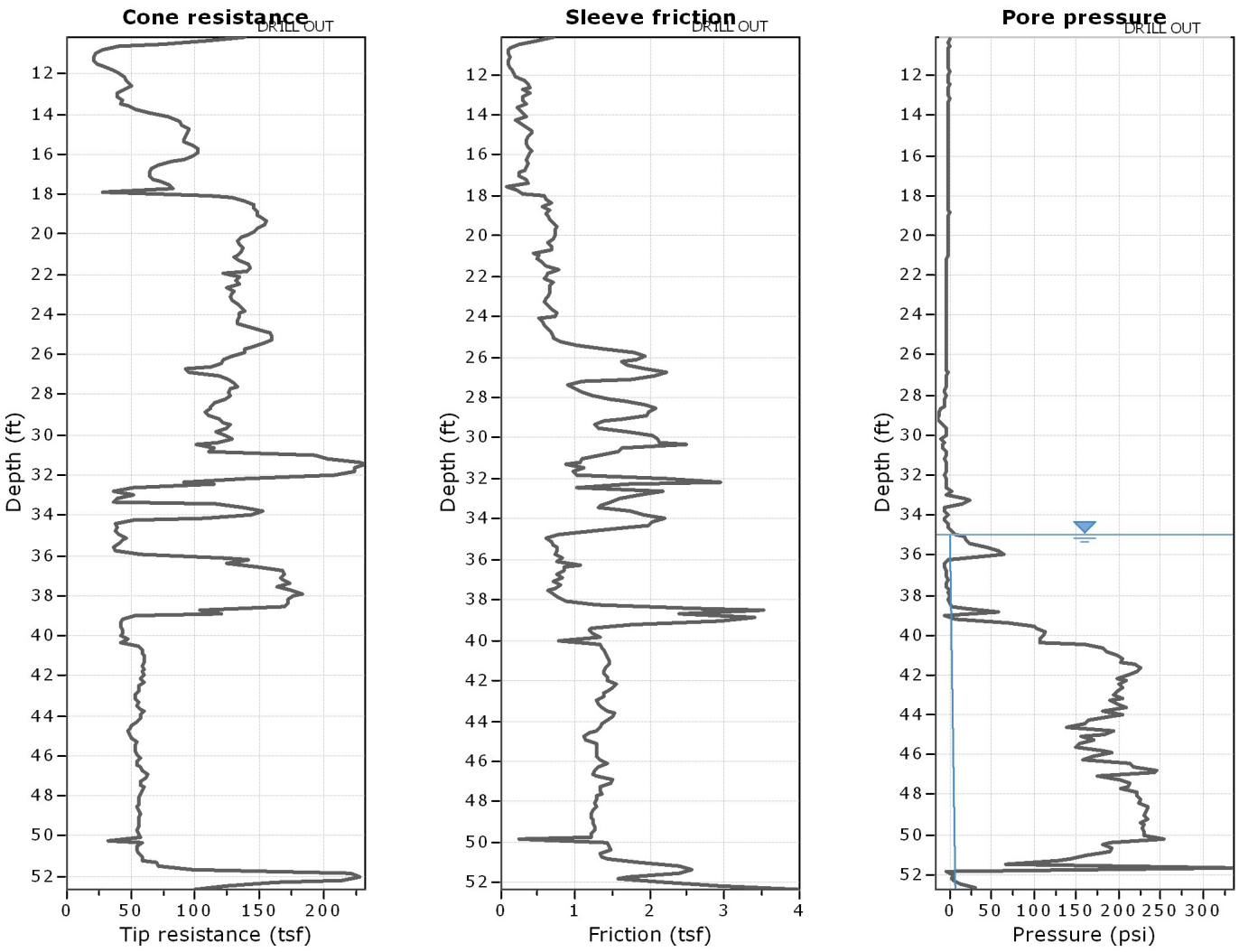
$$Q_{ult} = R_k \times q_t + q_{soil}$$

where:
R_k: Bearing capacity factor
q_t: Average corrected cone resistance over calculation depth
q_{soil}: Pressure applied by soil above footing

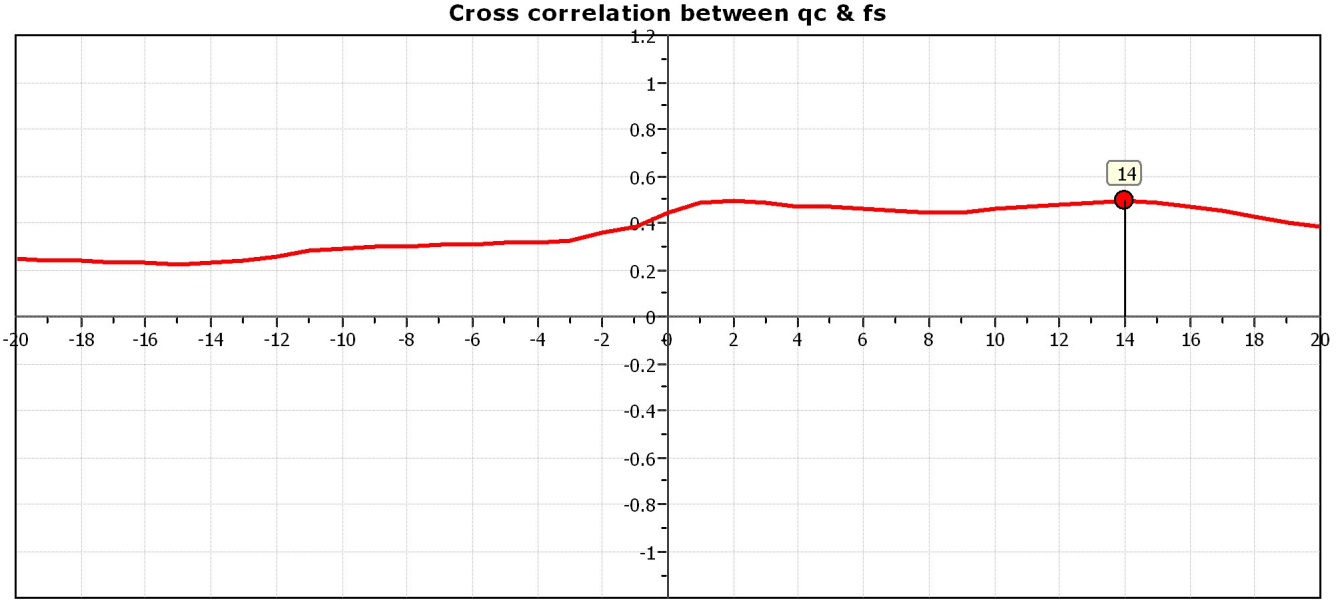


:: Tabular results ::

No	B (ft)	Start Depth (ft)	End Depth (ft)	Ave. q_t (tsf)	R_k	Soil Press. (tsf)	Ult. bearing cap. (tsf)
1	3.00	1.60	6.10	0.00	0.20	0.10	0.10
2	3.70	1.60	7.15	0.00	0.20	0.10	0.10
3	4.40	1.60	8.20	0.00	0.20	0.10	0.10
4	5.10	1.60	9.25	0.00	0.20	0.10	0.10
5	5.80	1.60	10.30	1.00	0.20	0.10	0.30
6	6.50	1.60	11.35	14.06	0.20	0.10	2.91
7	7.20	1.60	12.40	21.32	0.20	0.10	4.36
8	7.90	1.60	13.45	27.16	0.20	0.10	5.53
9	8.60	1.60	14.50	30.06	0.20	0.10	6.11
10	9.30	1.60	15.55	33.60	0.20	0.10	6.82
11	10.00	1.60	16.60	41.19	0.20	0.10	8.33
12	10.70	1.60	17.65	47.50	0.20	0.10	9.60
13	11.40	1.60	18.70	53.16	0.20	0.10	10.73
14	12.10	1.60	19.75	61.19	0.20	0.10	12.33
15	12.80	1.60	20.80	67.84	0.20	0.10	13.66

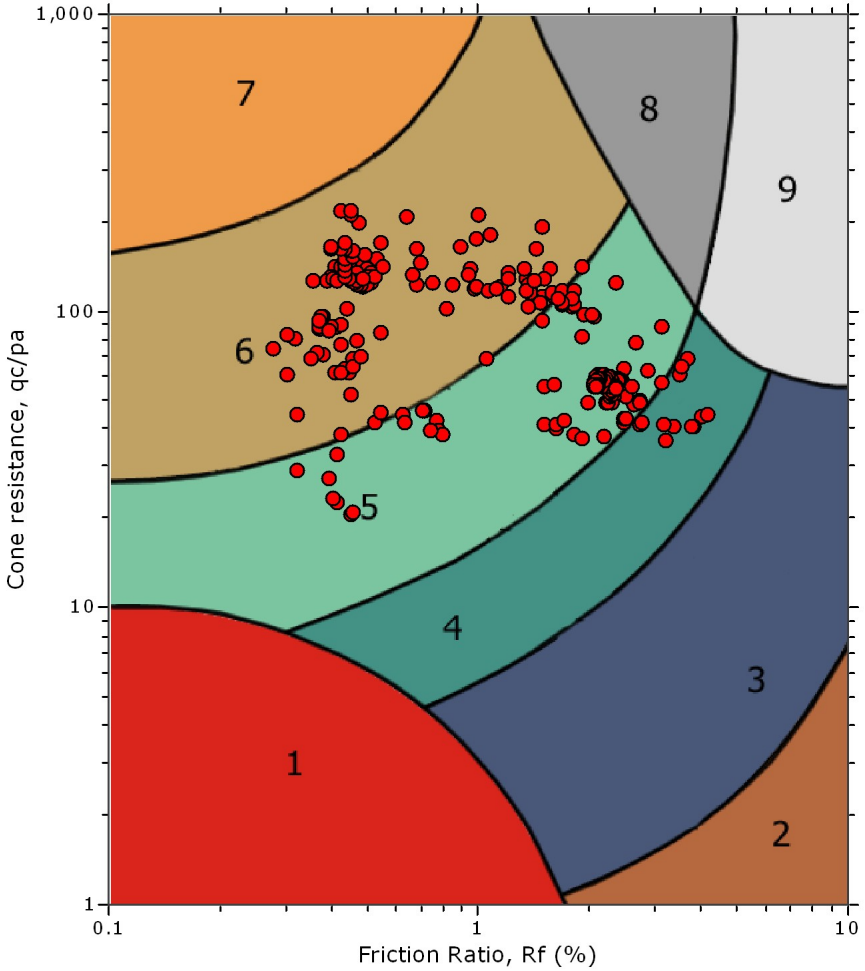


The plot below presents the cross correlation coeficient between the raw qc and fs values (as measured on the field). X axes presents the lag distance (one lag is the distance between two sucessive CPT measurements).

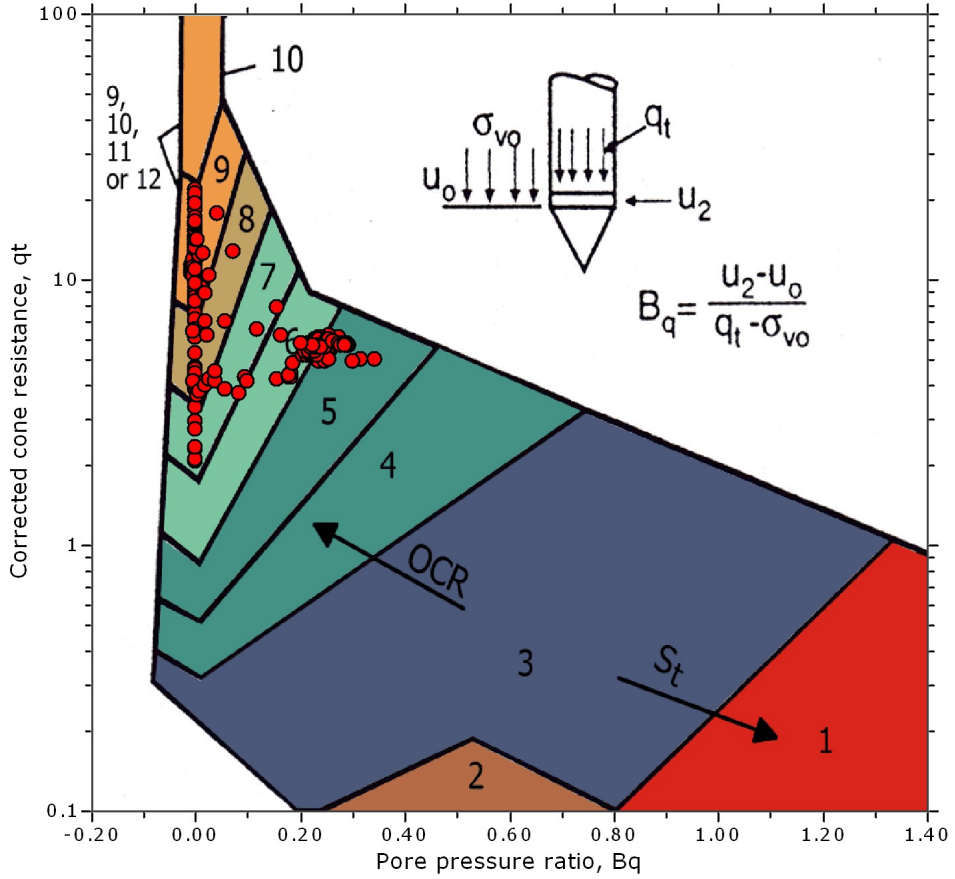


SBT - Bq plots

SBT plot



Bq plot

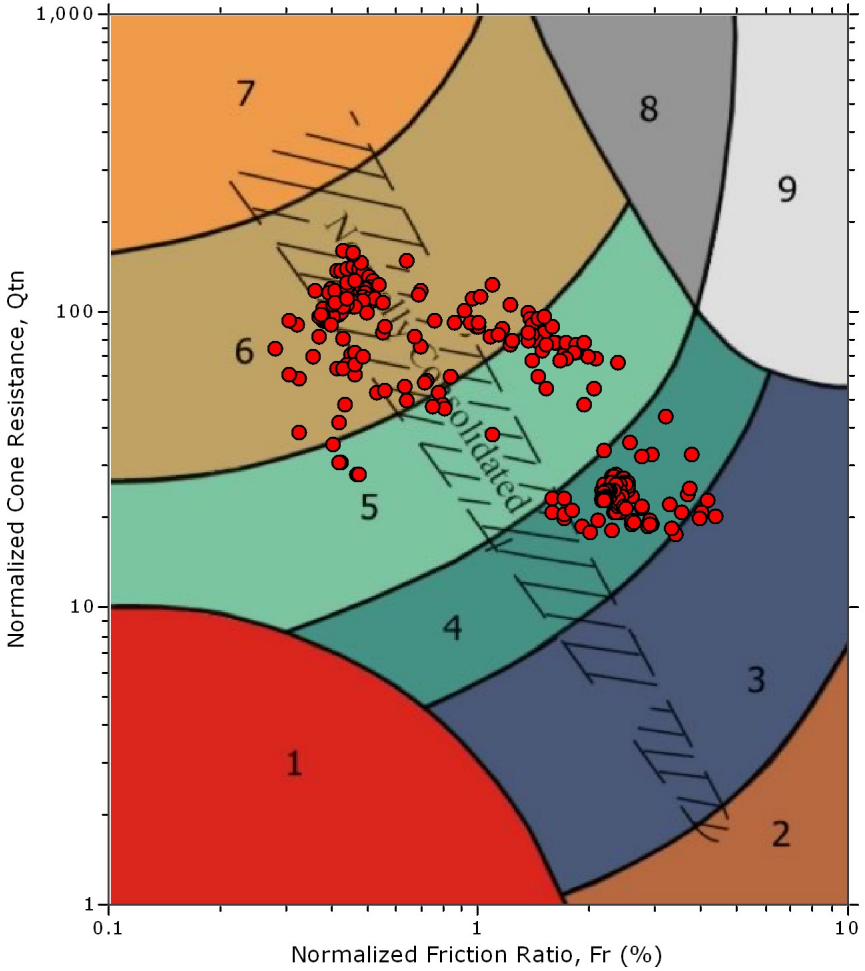


SBT legend

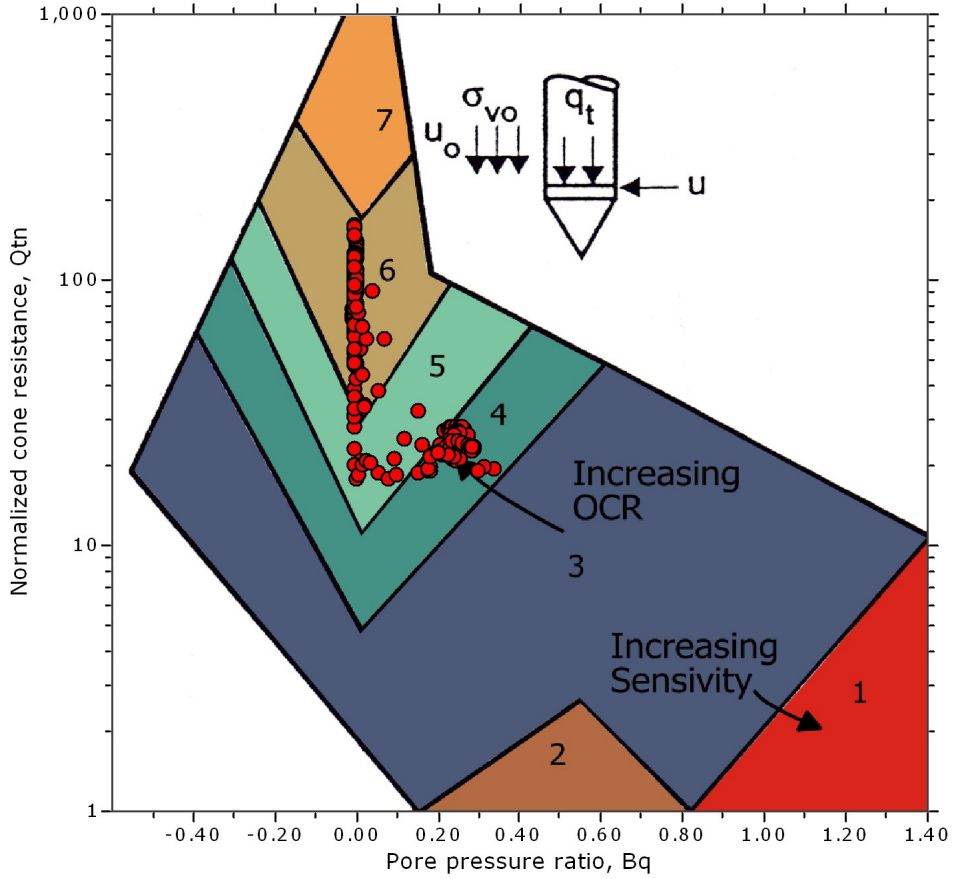
1. Sensitive fine grained	4. Clayey silt to silty clay	7. Gravely sand to sand
2. Organic material	5. Silty sand to sandy silt	8. Very stiff sand to clayey sand
3. Clay to silty clay	6. Clean sand to silty sand	9. Very stiff fine grained

SBT - Bq plots (normalized)

SBTn plot



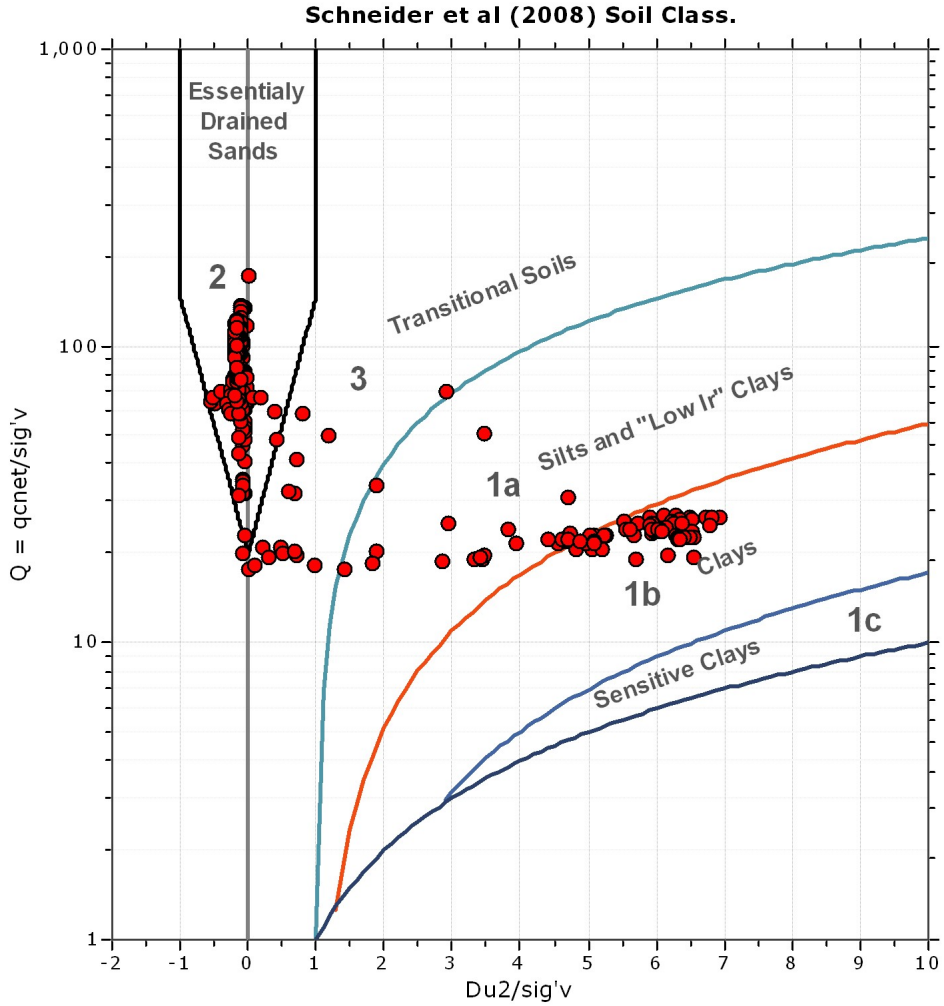
Normalized Bq plot

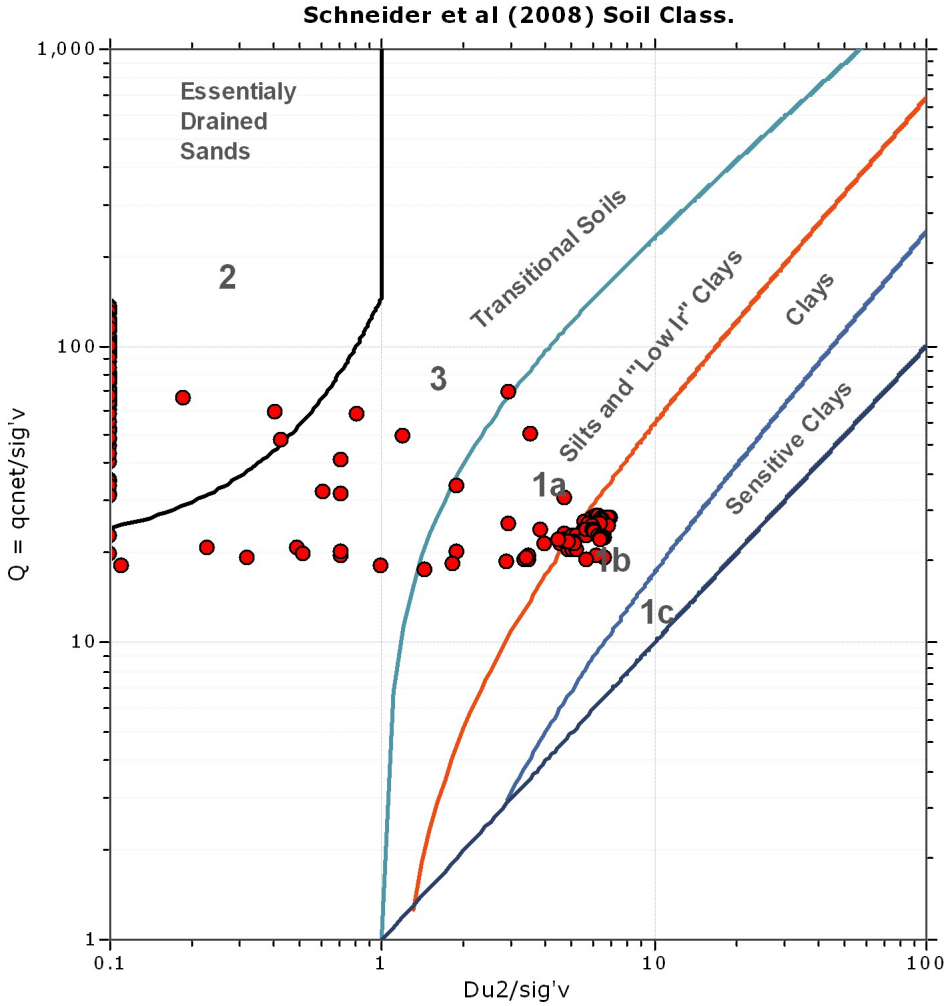


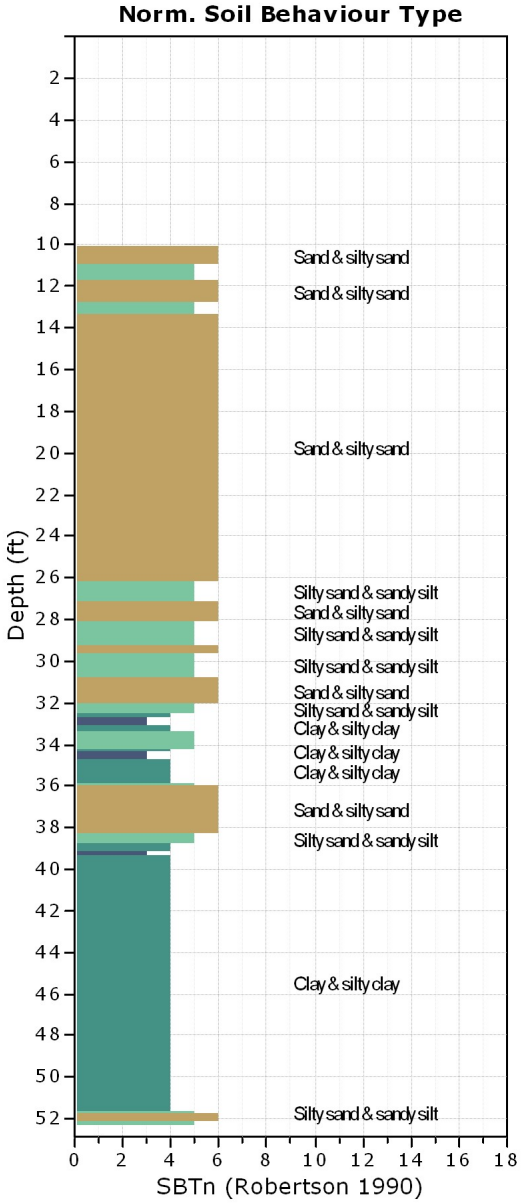
SBTn legend

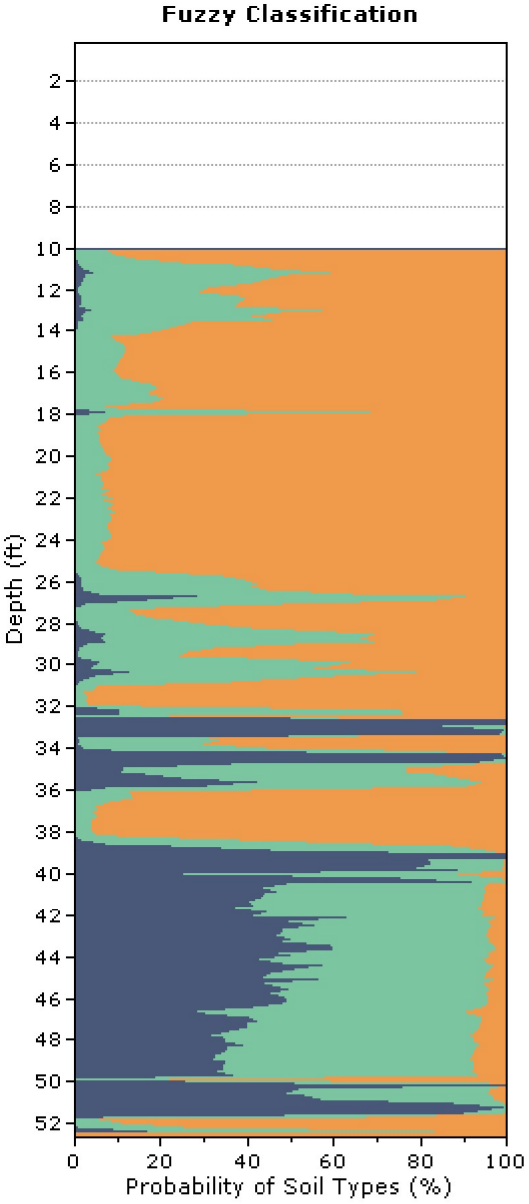
1. Sensitive fine grained	4. Clayey silt to silty clay	7. Gravely sand to sand
2. Organic material	5. Silty sand to sandy silt	8. Very stiff sand to clayey sand
3. Clay to silty clay	6. Clean sand to silty sand	9. Very stiff fine grained

Bq plots (Schneider)



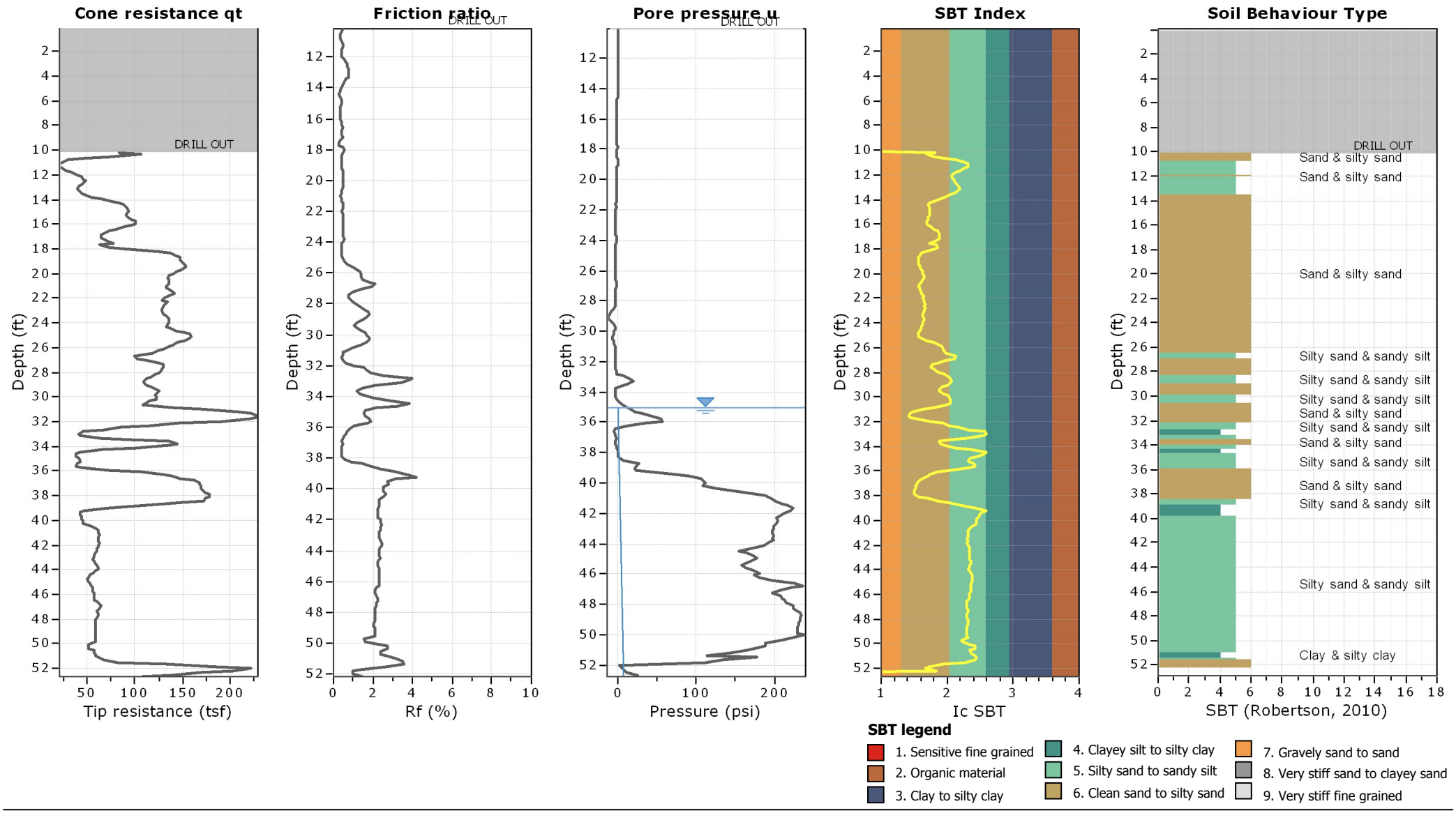


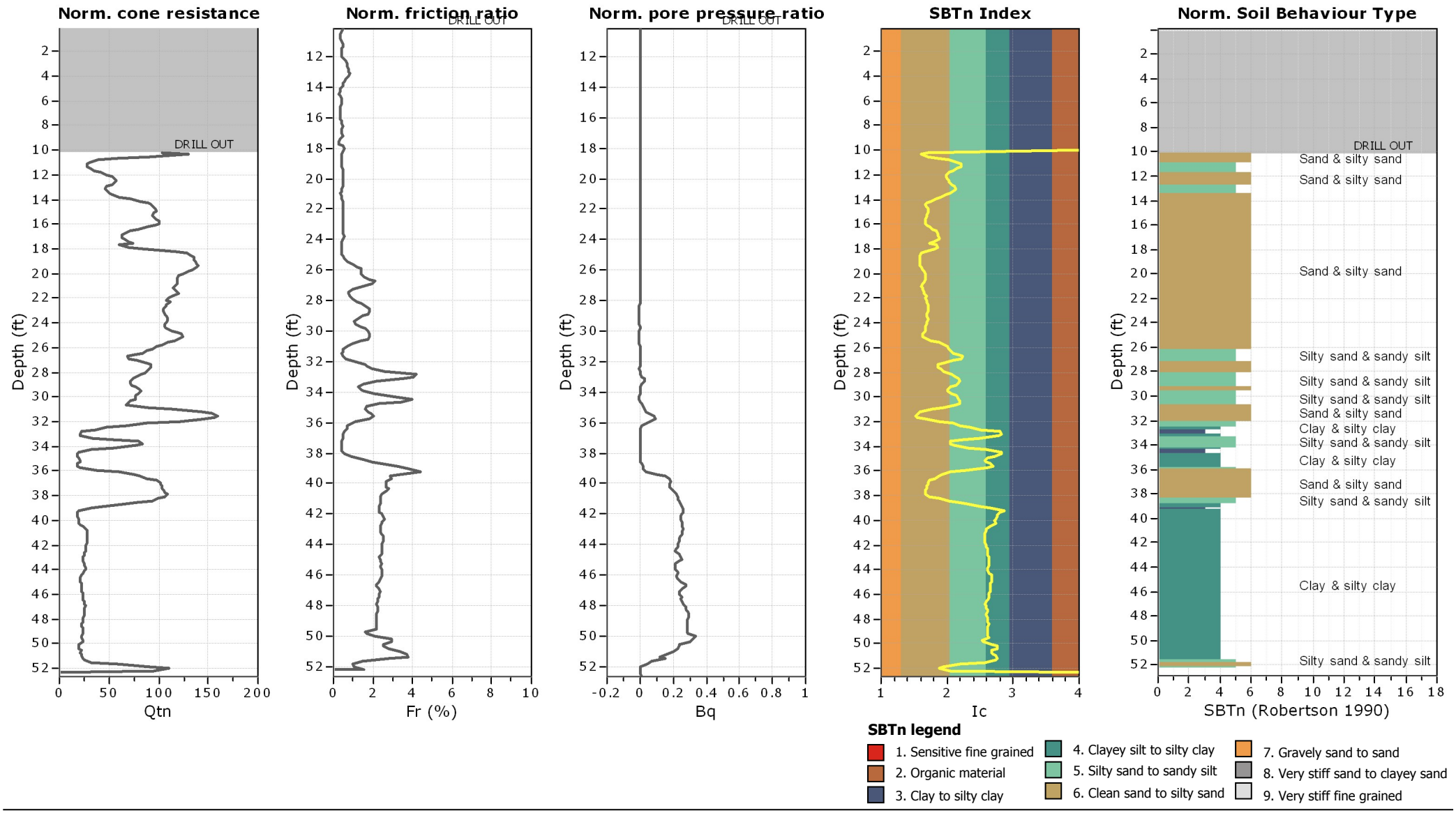

Norm. Soil Behaviour Type
Depth (ft)
SBTn (Robertson 1990)
Sand & silty sand
Sand & silty sand
Sand & silty sand
Silty sand & sandy silt
Sand & silty sand
Silty sand & sandy silt
Silty sand & sandy silt
Sand & silty sand
Silty sand & sandy silt
Clay & silty clay
Clay & silty clay
Clay & silty clay
Sand & silty sand
Silty sand & sandy silt
Clay & silty clay
Silty sand & sandy silt


Fuzzy Classification
Depth (ft)
Probability of Soil Types (%)

CPT: CPT-02
Total depth: 52.66 ft, Date: 6/21/2016
Surface Elevation: 0.00 ft
Coords: X:0.00, Y:0.00
Cone Type: Uknown
Cone Operator: Uknown

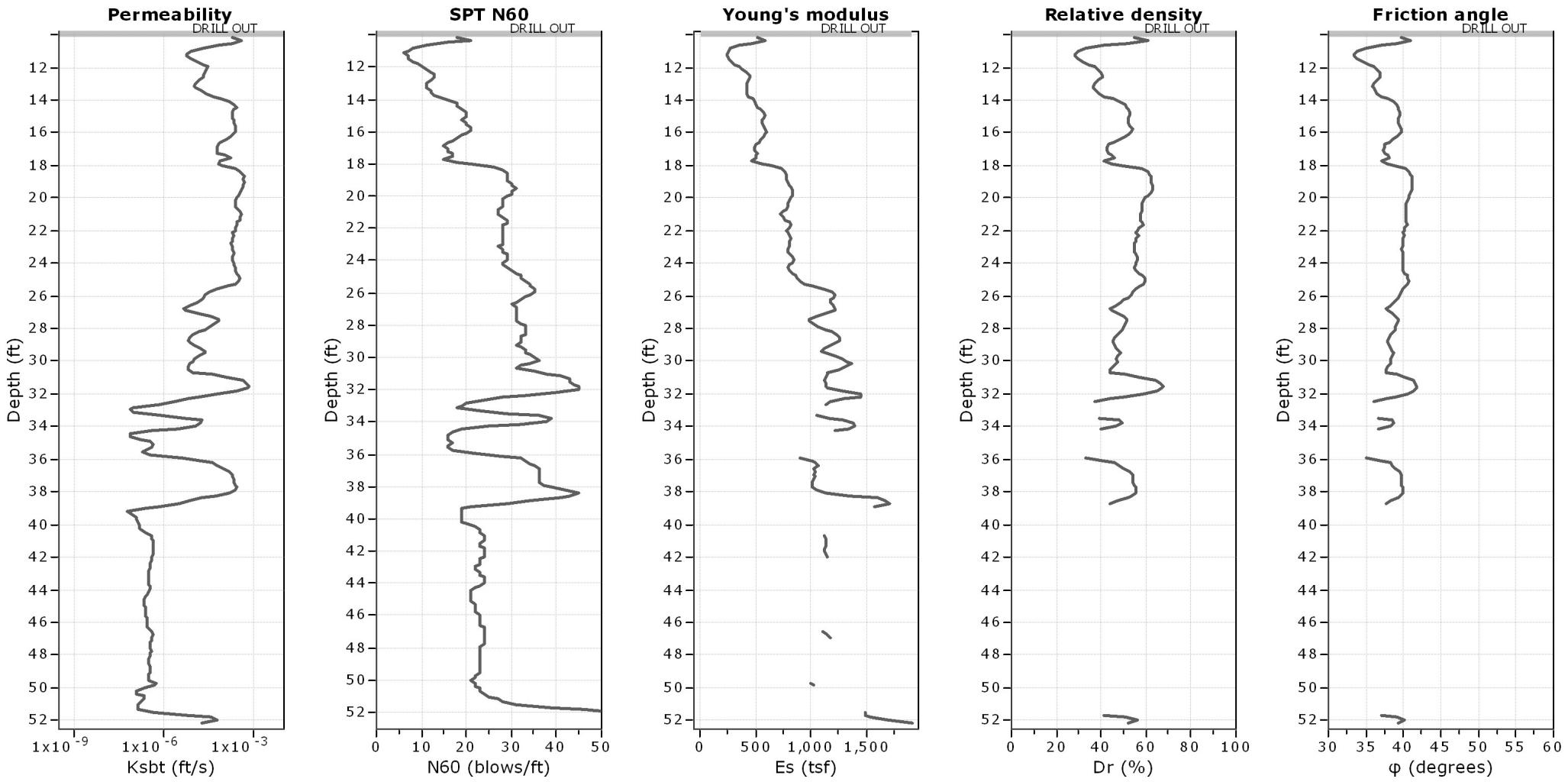
Project: MRCE 12629 - AAFE Mixed-Use Building
Location: 133-04 39th Avenue, Flushing, Queens, NY




Norm. cone resistance
Norm. friction ratio
Norm. pore pressure ratio
SBTn Index
Norm. Soil Behaviour Type
DRILL OUT
Depth (ft)
Qtn
Fr (%)
Bq
Ic
SBTn (Robertson 1990)
Sand & silty sand
Silty sand & sandy silt
Clay & silty clay
SBTn legend
1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty clay
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to clayey sand
9. Very stiff fine grained

CPT: CPT-02
Total depth: 52.66 ft, Date: 6/21/2016
Surface Elevation: 0.00 ft
Coords: X:0.00, Y:0.00
Cone Type: Uknown
Cone Operator: Uknown

Project: MRCE 12629 - AAFE Mixed-Use Building
Location: 133-04 39th Avenue, Flushing, Queens, NY

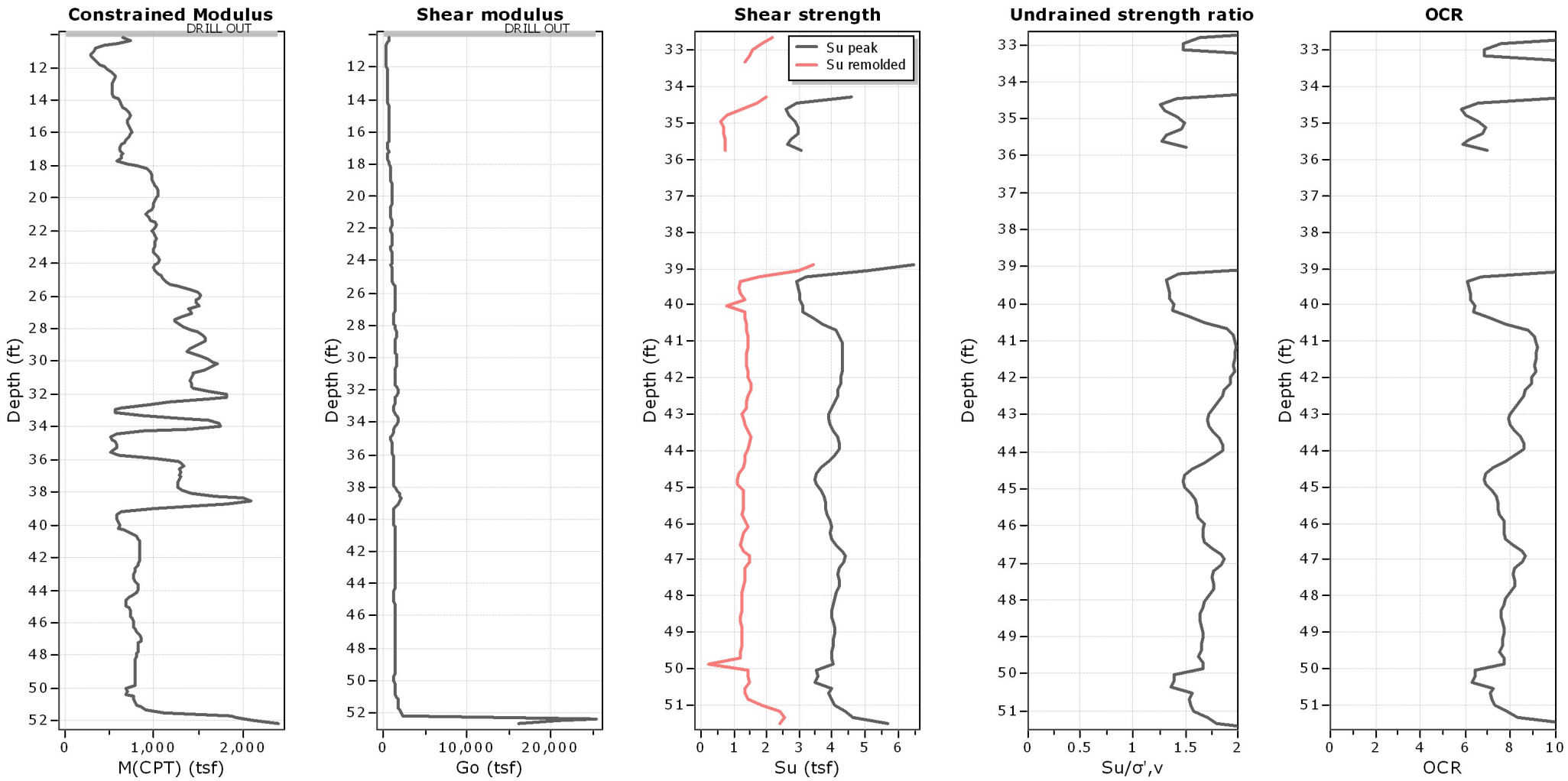


Calculation parameters

Permeability: Based on SBT_n
SPT N_{60}: Based on I_c and q_t
Young's modulus: Based on variable alpha using I_c (Robertson, 2009)
Relative desnisty constant, C_{Dr}: 350.0
Phi: Based on Kulhawy & Mayne (1990)
User defined estimation data

CPT: CPT-02
Total depth: 52.66 ft, Date: 6/21/2016
Surface Elevation: 0.00 ft
Coords: X:0.00, Y:0.00
Cone Type: Uknown
Cone Operator: Uknown

Project: **MRCE 12629 - AAFE Mixed-Use Building**
Location: **133-04 39th Avenue, Flushing, Queens, NY**



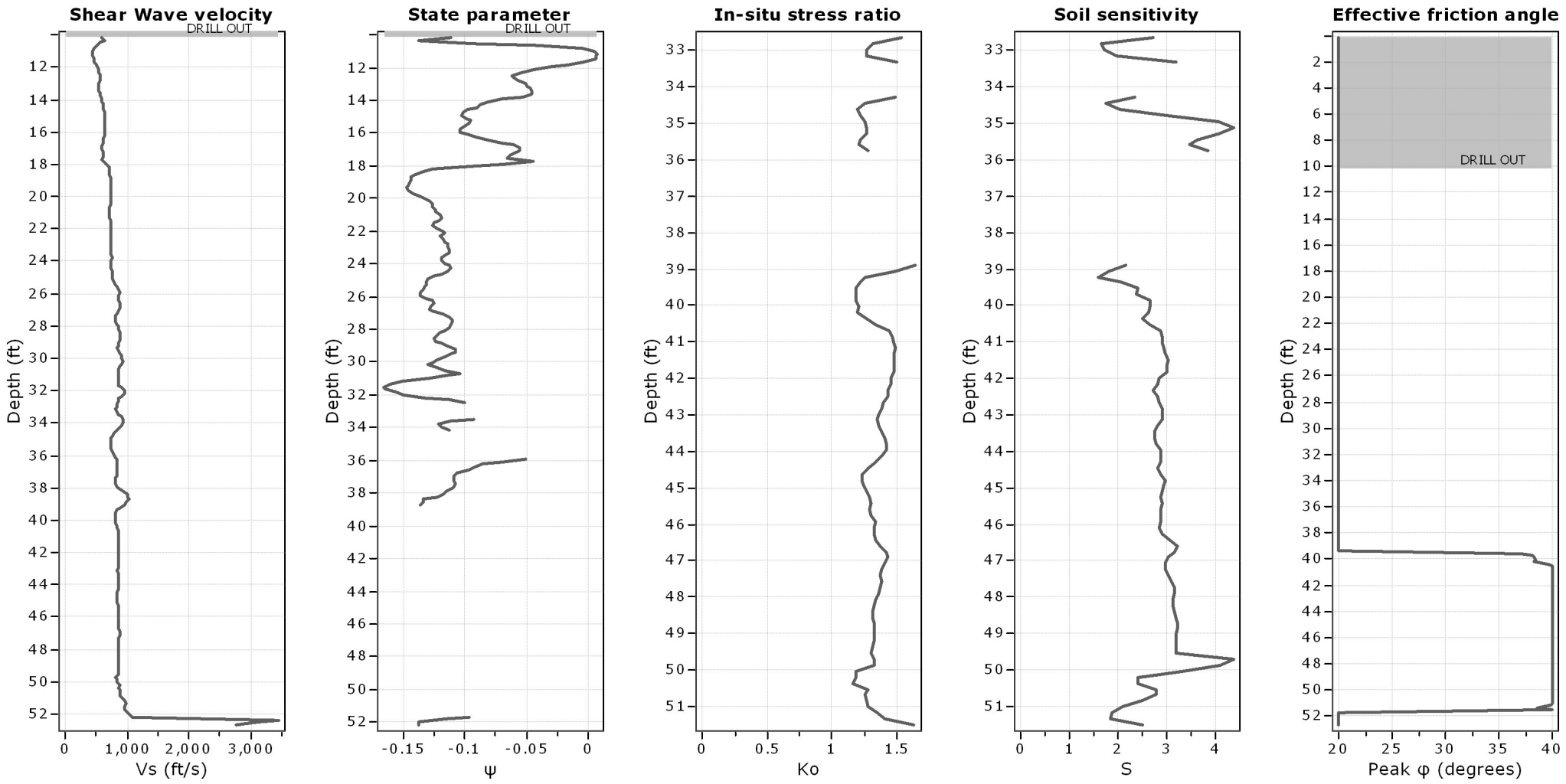
Calculation parameters

Constrained modulus: Based on variable *alpha* using I_c and Q_{tn} (Robertson, 2009)
Go: Based on variable *alpha* using I_c (Robertson, 2009)
Undrained shear strength cone factor for clays, N_{kt}: 14

OCR factor for clays, N_{kt}: 0.33
User defined estimation data

CPT: CPT-02
Total depth: 52.66 ft, Date: 6/21/2016
Surface Elevation: 0.00 ft
Coords: X:0.00, Y:0.00
Cone Type: Uknown
Cone Operator: Uknown

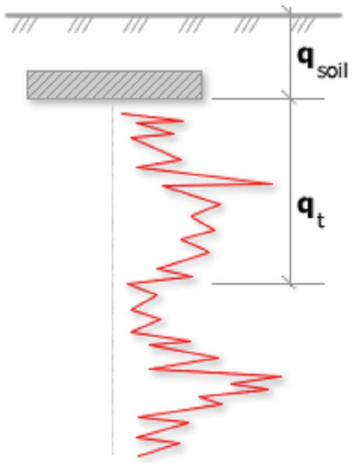
Project: MRCE 12629 - AAFE Mixed-Use Building
Location: 133-04 39th Avenue, Flushing, Queens, NY



Calculation parameters

Soil Sensitivity factor, N_S: 7.00

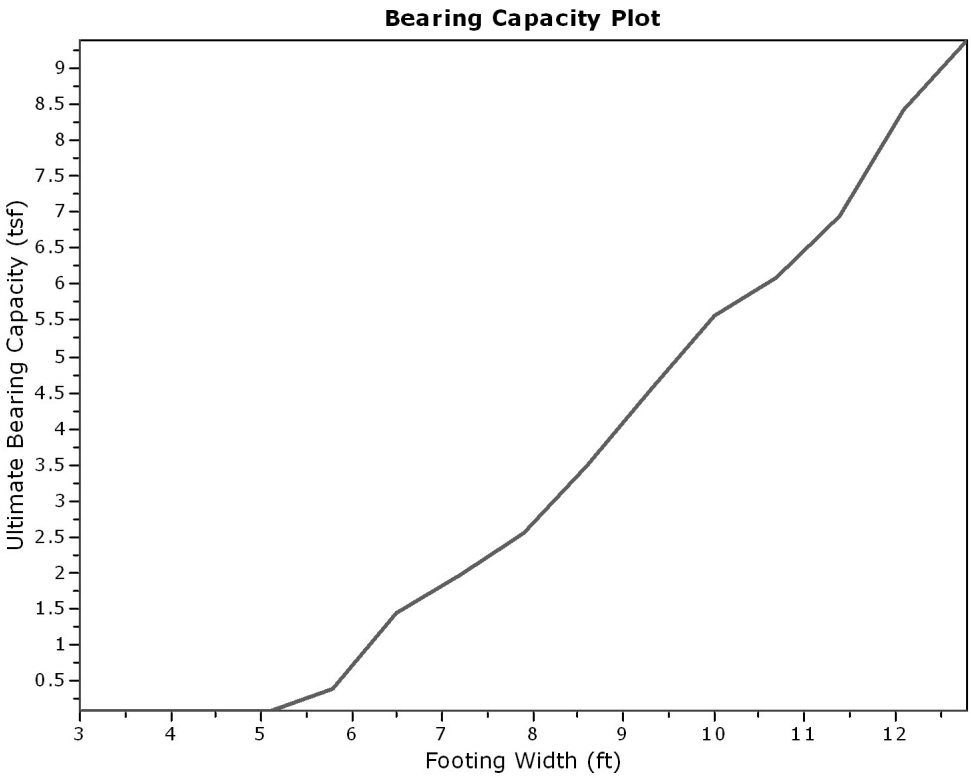
User defined estimation data



Bearing Capacity calculation is perfromed based on the formula:

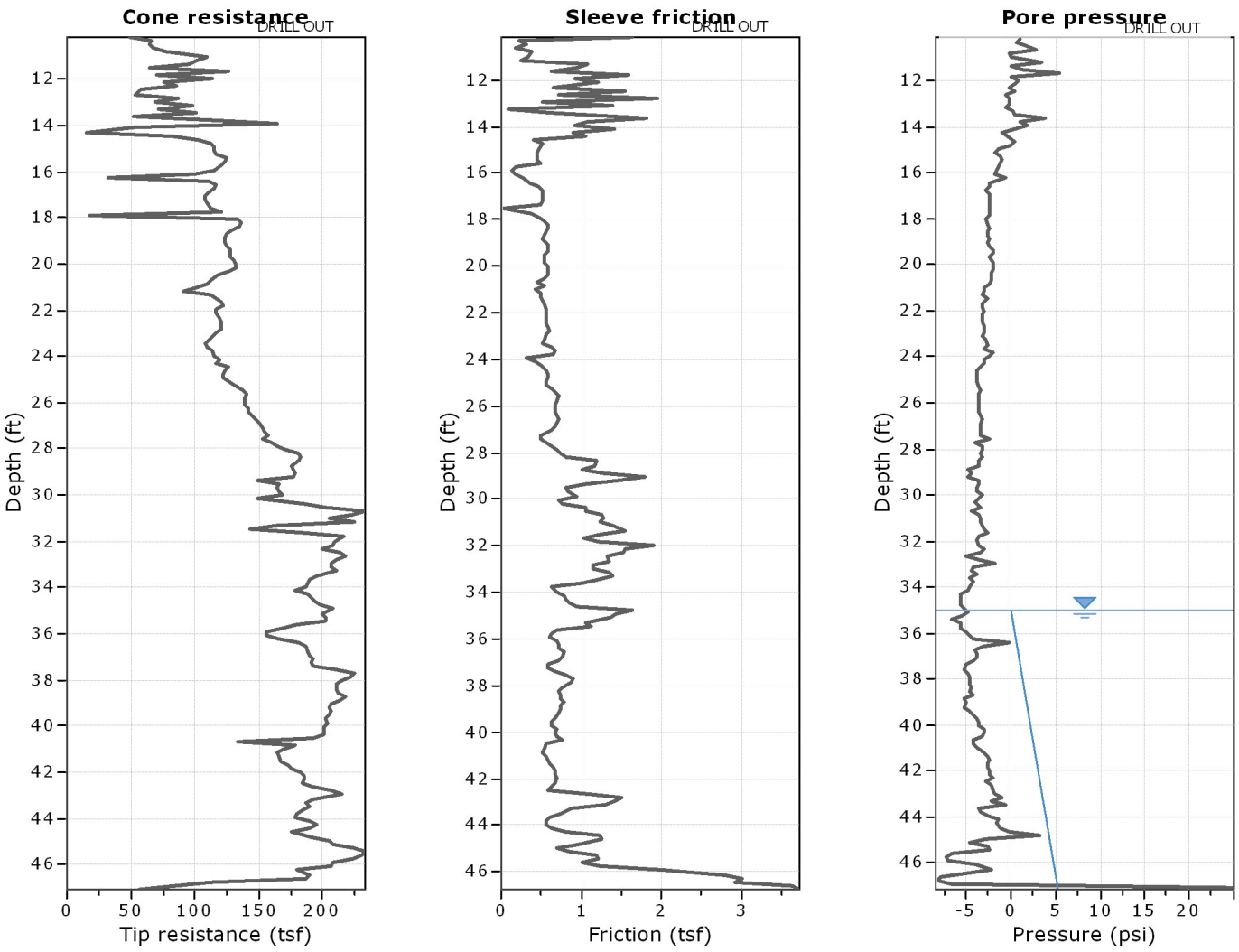
$$Q_{ult} = R_k \times q_t + q_{soil}$$

where:
R_k: Bearing capacity factor
q_t: Average corrected cone resistance over calculation depth
q_{soil}: Pressure applied by soil above footing

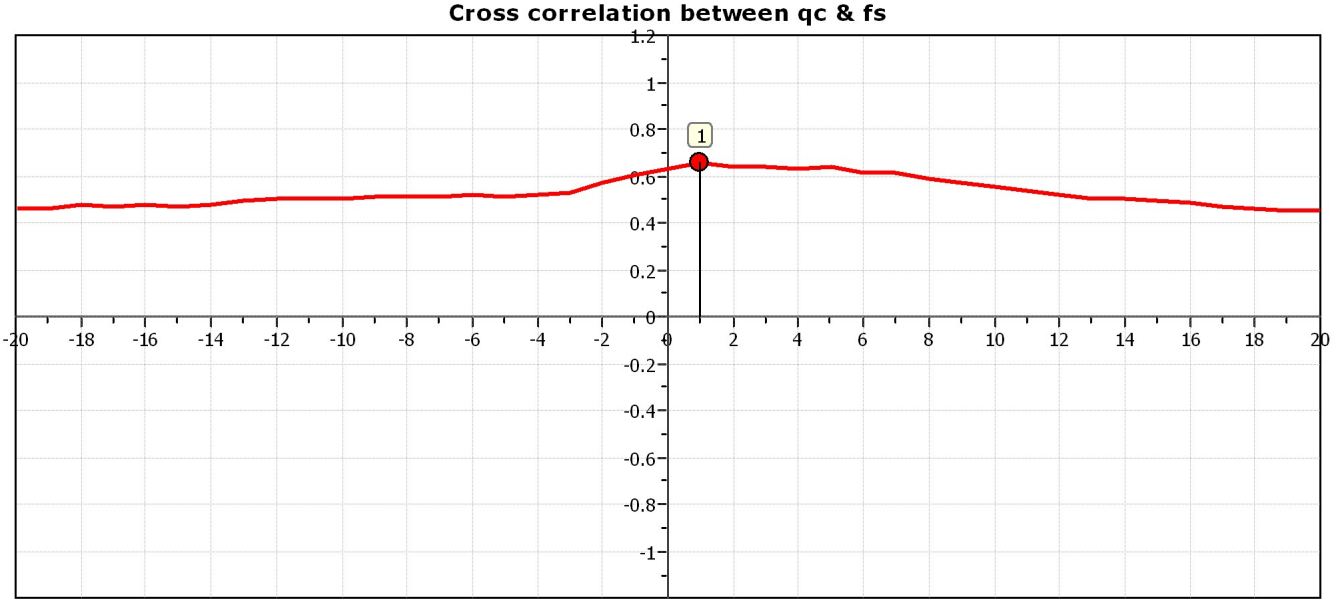


:: Tabular results ::

No	B (ft)	Start Depth (ft)	End Depth (ft)	Ave. q_t (tsf)	R_k	Soil Press. (tsf)	Ult. bearing cap. (tsf)
1	3.00	1.60	6.10	0.00	0.20	0.10	0.10
2	3.70	1.60	7.15	0.00	0.20	0.10	0.10
3	4.40	1.60	8.20	0.00	0.20	0.10	0.10
4	5.10	1.60	9.25	0.00	0.20	0.10	0.10
5	5.80	1.60	10.30	1.54	0.20	0.10	0.40
6	6.50	1.60	11.35	6.72	0.20	0.10	1.44
7	7.20	1.60	12.40	9.38	0.20	0.10	1.97
8	7.90	1.60	13.45	12.25	0.20	0.10	2.55
9	8.60	1.60	14.50	16.93	0.20	0.10	3.48
10	9.30	1.60	15.55	22.20	0.20	0.10	4.54
11	10.00	1.60	16.60	27.40	0.20	0.10	5.58
12	10.70	1.60	17.65	29.95	0.20	0.10	6.09
13	11.40	1.60	18.70	34.28	0.20	0.10	6.95
14	12.10	1.60	19.75	41.52	0.20	0.10	8.40
15	12.80	1.60	20.80	46.43	0.20	0.10	9.38

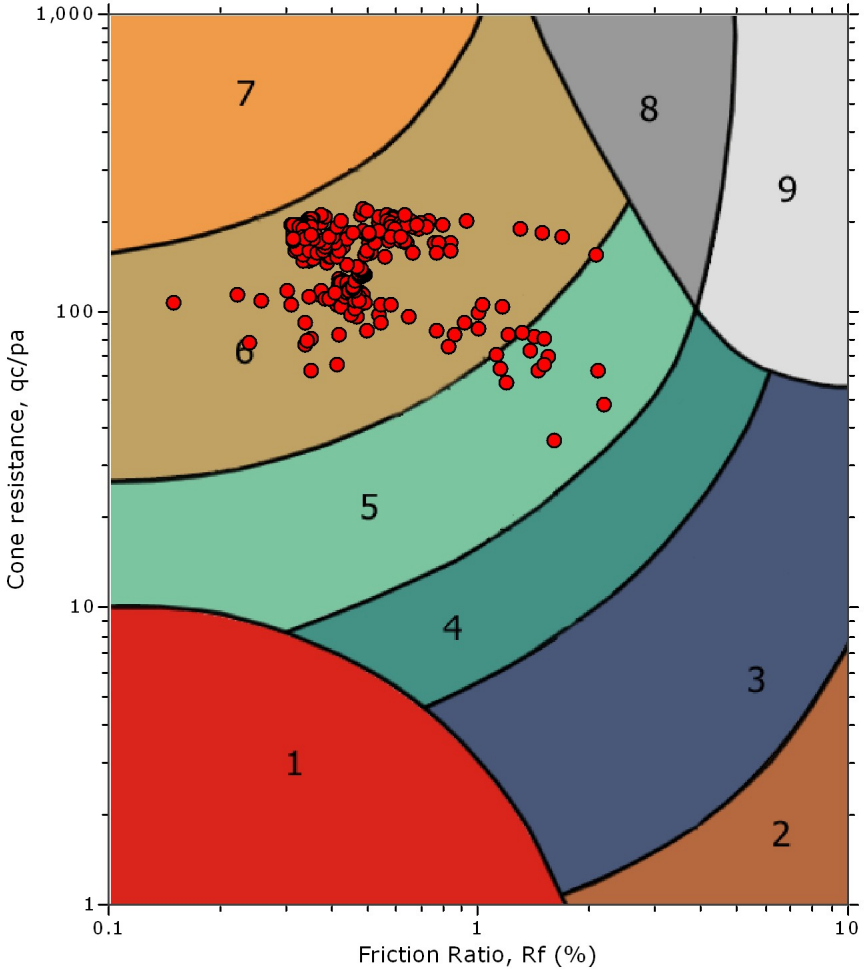


The plot below presents the cross correlation coeficient between the raw qc and fs values (as measured on the field). X axes presents the lag distance (one lag is the distance between two sucessive CPT measurements).

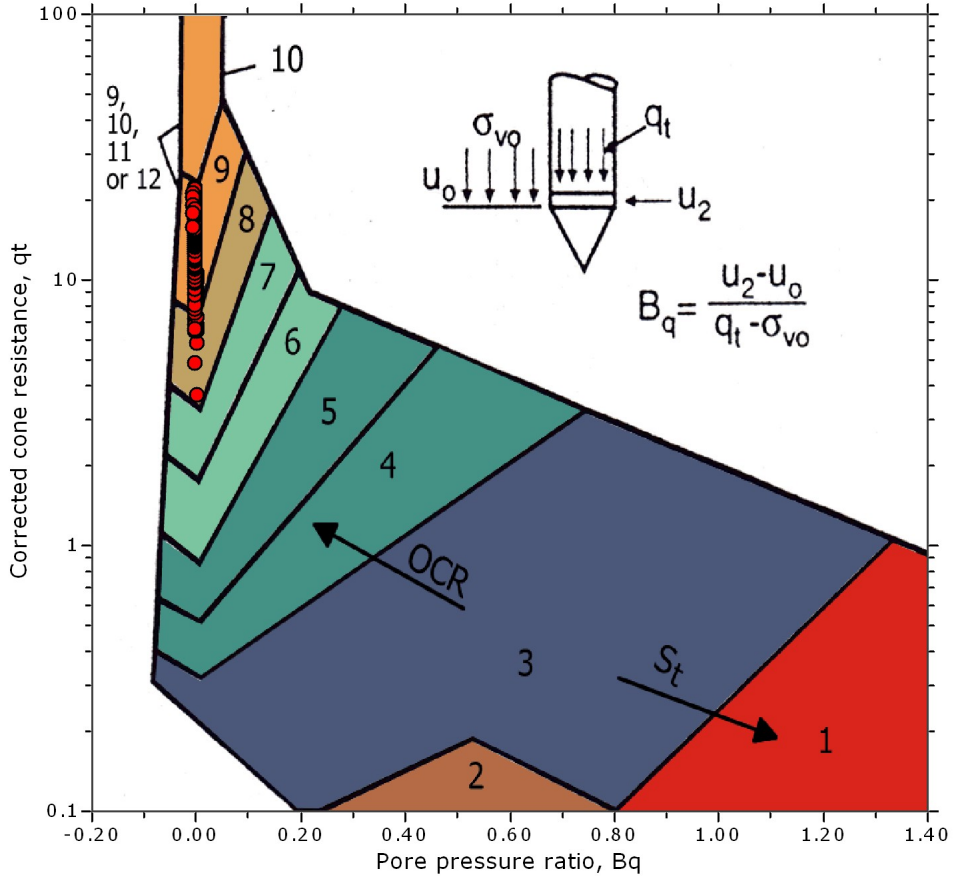


SBT - Bq plots

SBT plot



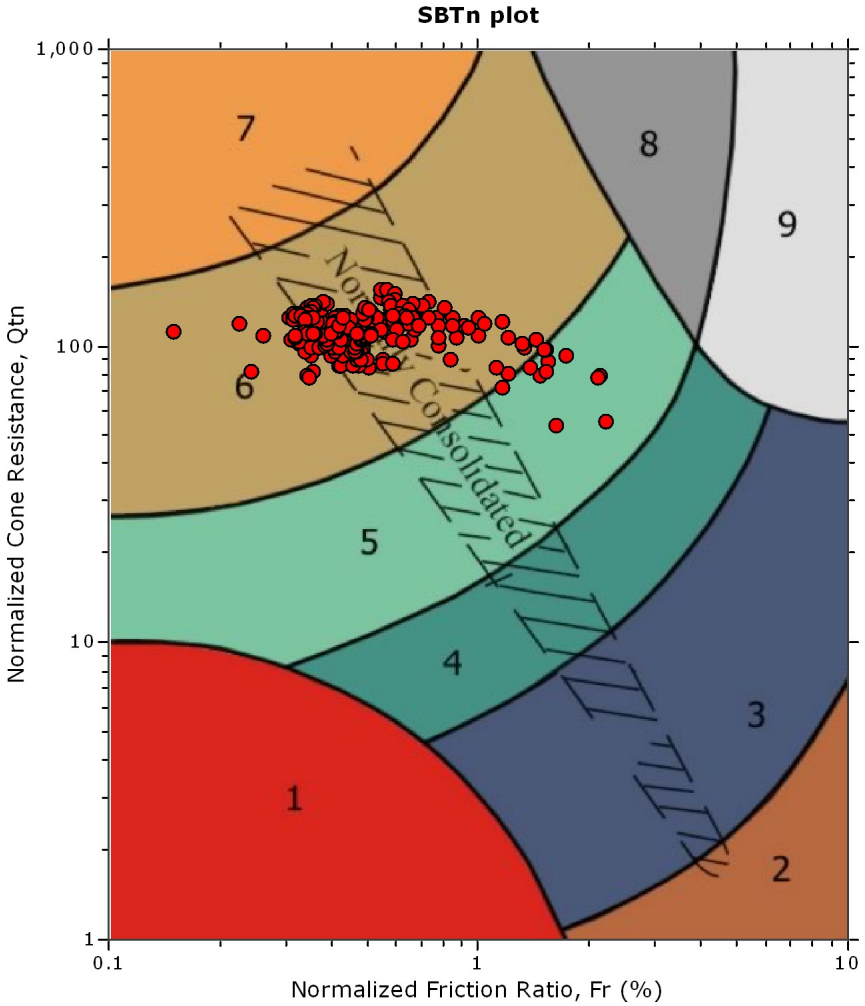
Bq plot

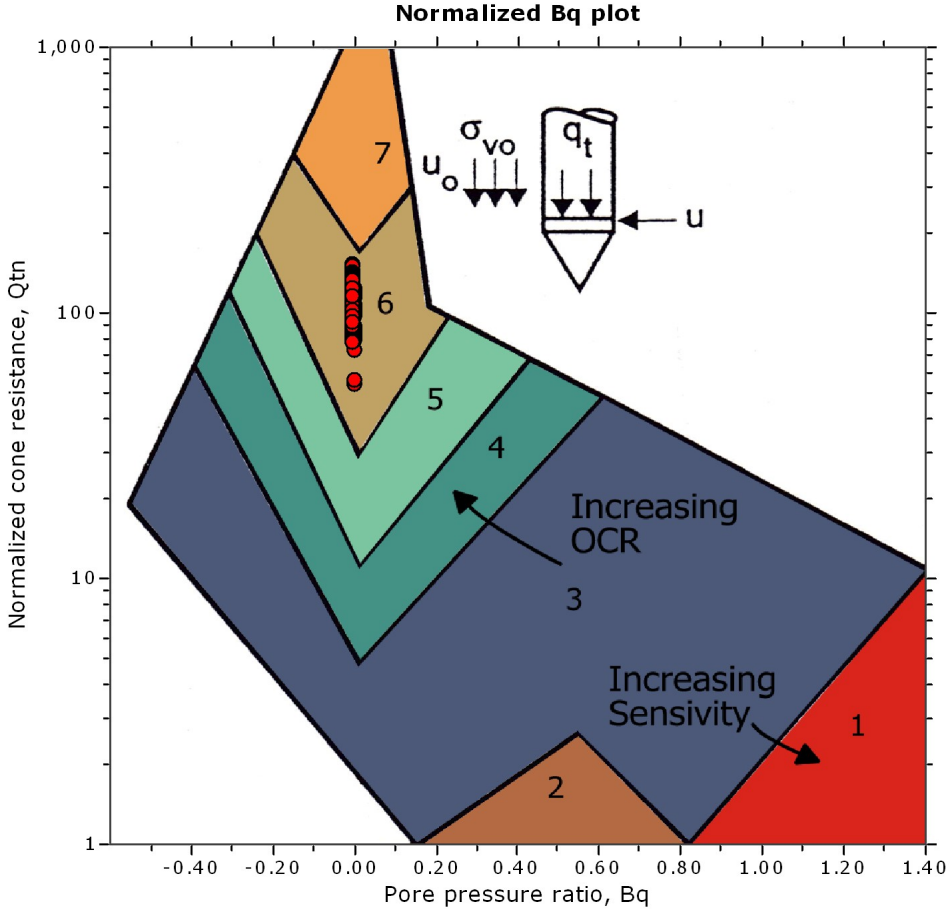


SBT legend

1. Sensitive fine grained	4. Clayey silt to silty clay	7. Gravely sand to sand
2. Organic material	5. Silty sand to sandy silt	8. Very stiff sand to clayey sand
3. Clay to silty clay	6. Clean sand to silty sand	9. Very stiff fine grained

SBT - Bq plots (normalized)

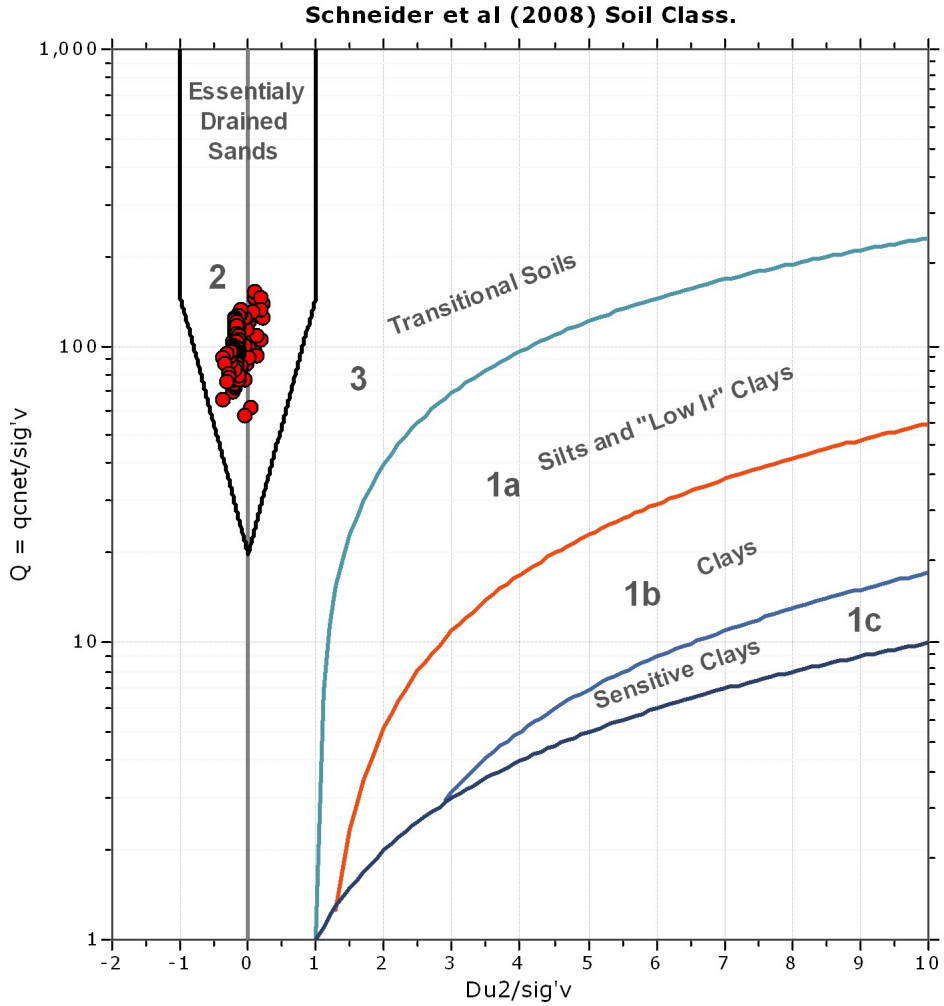


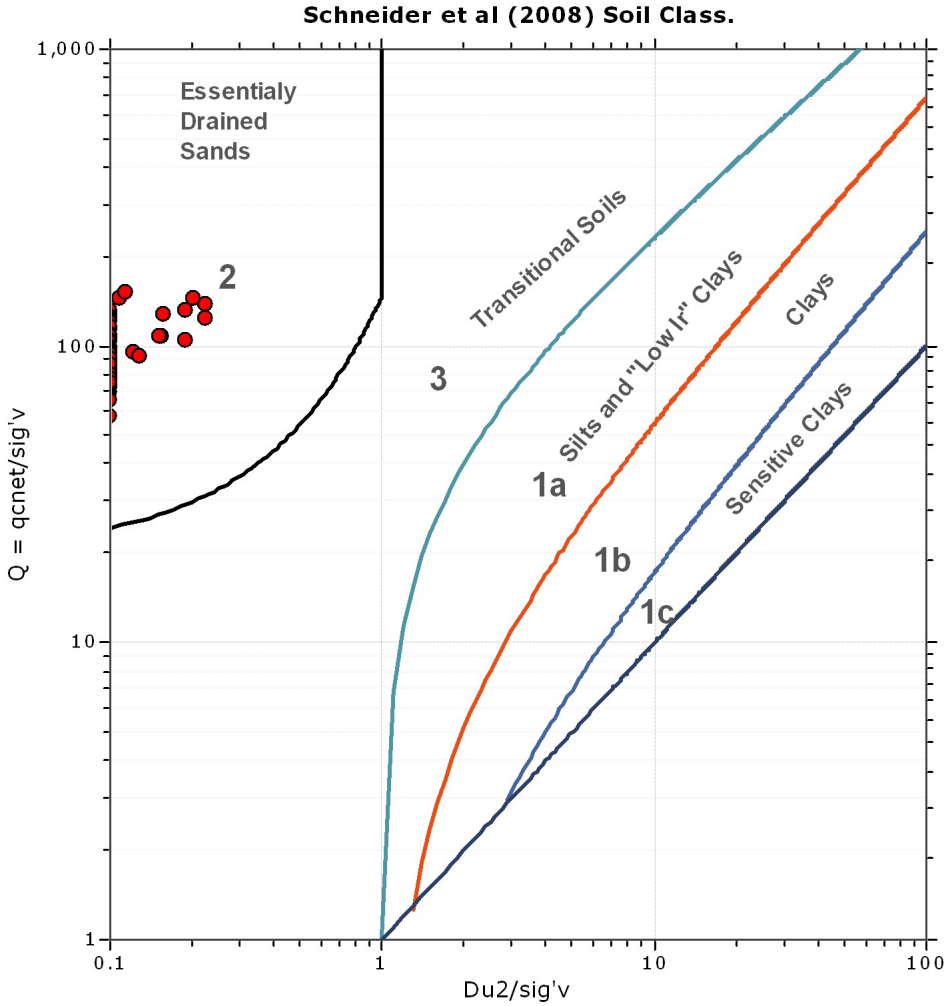


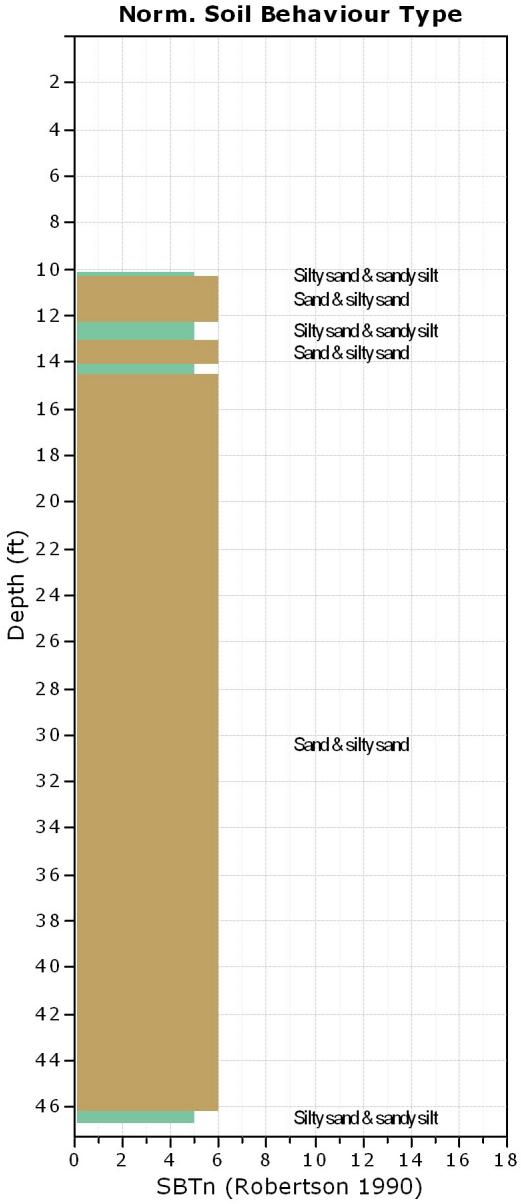
SBTn legend

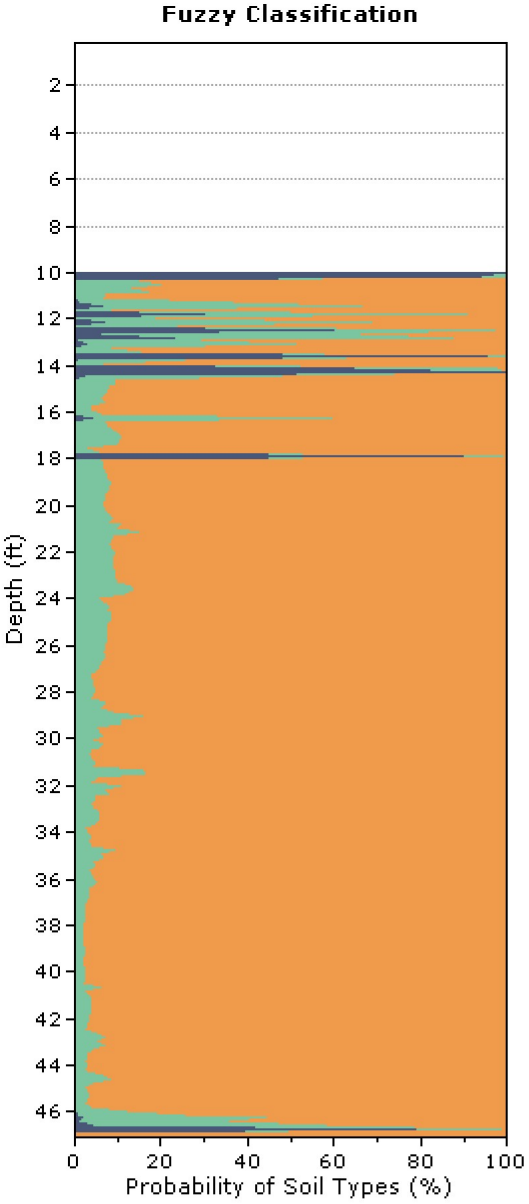
- 1. Sensitive fine grained
- 2. Organic material
- 3. Clay to silty clay
- 4. Clayey silt to silty clay
- 5. Silty sand to sandy silt
- 6. Clean sand to silty sand
- 7. Gravely sand to sand
- 8. Very stiff sand to clayey sand
- 9. Very stiff fine grained

Bq plots (Schneider)



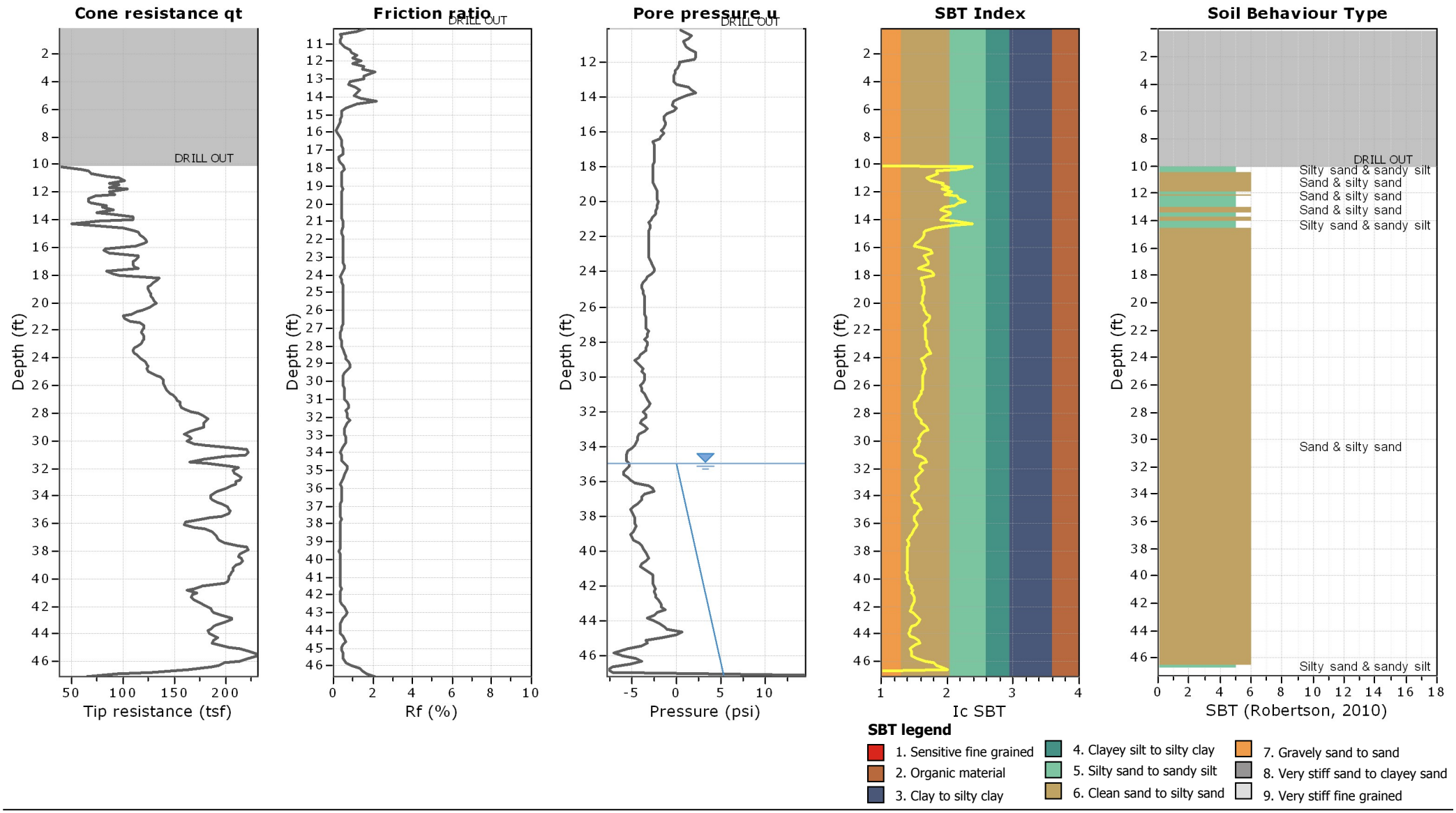



Norm. Soil Behaviour Type
Depth (ft)
Silty sand & sandy silt
Sand & silty sand
Silty sand & sandy silt
Sand & silty sand
Sand & silty sand
Silty sand & sandy silt
SBTn (Robertson 1990)


Fuzzy Classification
Depth (ft)
Probability of Soil Types (%)

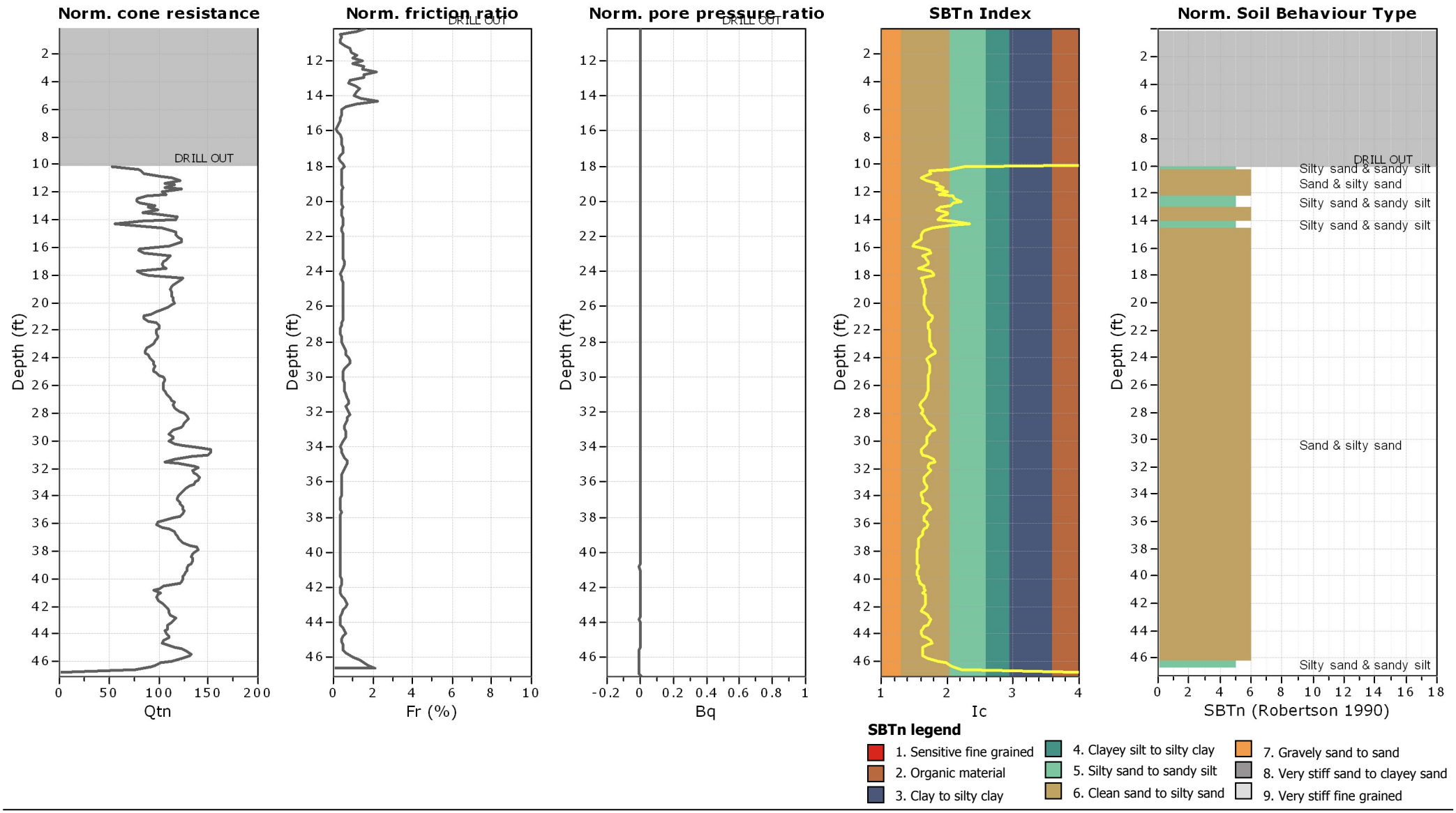
CPT: CPT-03
Total depth: 47.08 ft, Date: 6/22/2016
Surface Elevation: 0.00 ft
Coords: X:0.00, Y:0.00
Cone Type: Uknown
Cone Operator: Uknown

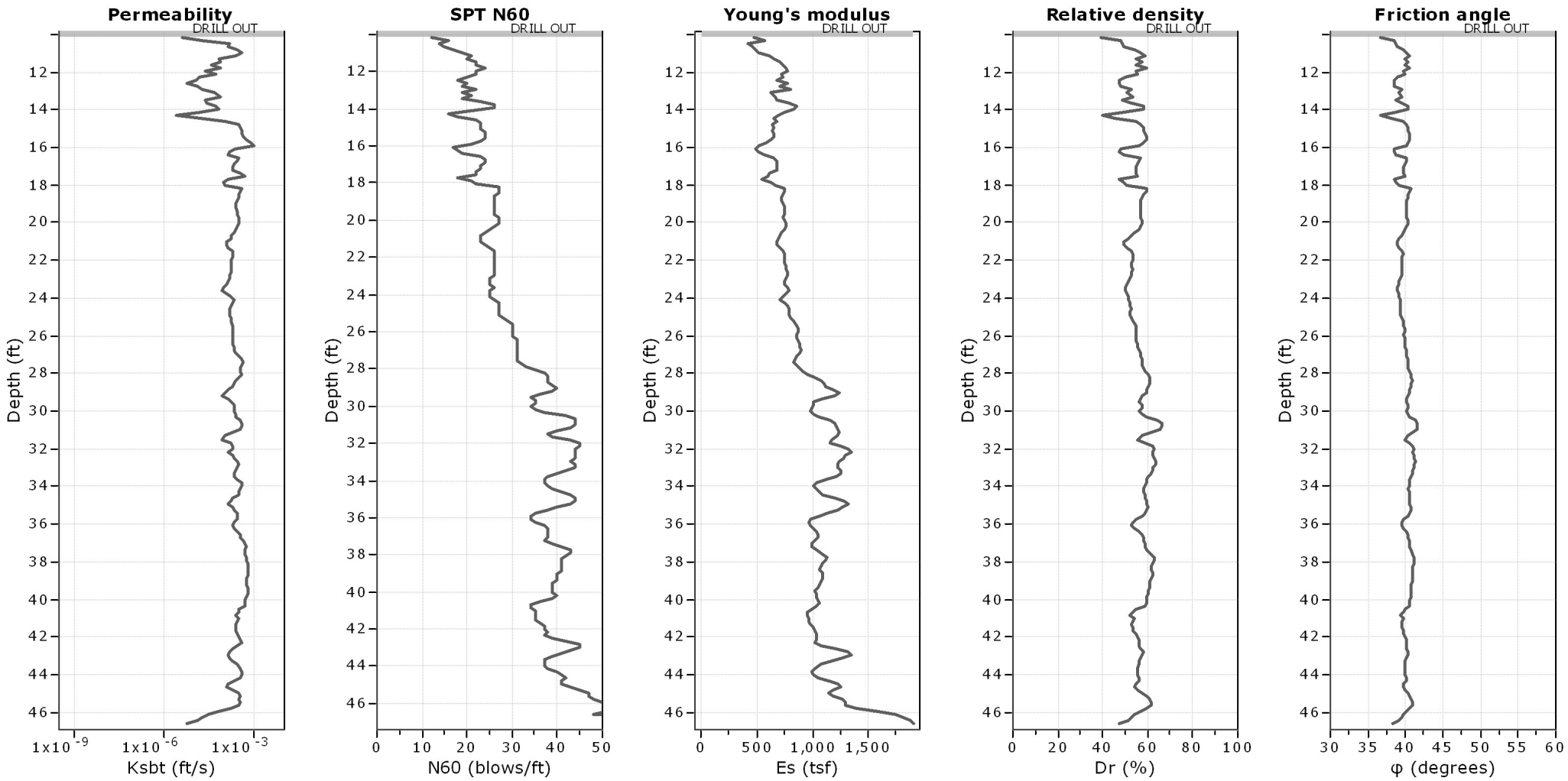
Project: MRCE 12629 - AAFE Mixed-Use Building
Location: 133-04 39th Avenue, Flushing, Queens, NY



CPT: CPT-03
Total depth: 47.08 ft, Date: 6/22/2016
Surface Elevation: 0.00 ft
Coords: X:0.00, Y:0.00
Cone Type: Uknown
Cone Operator: Uknown

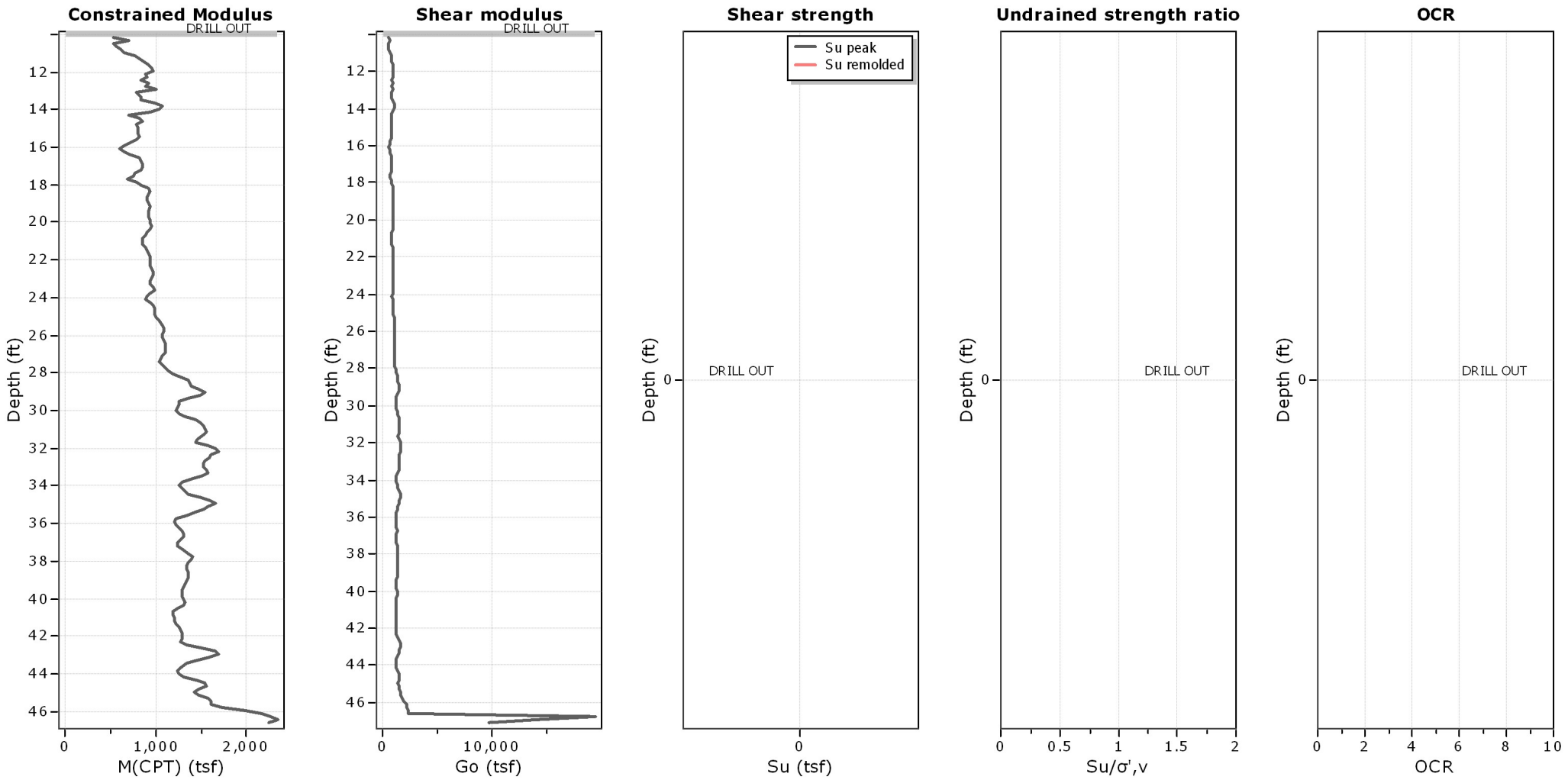
Project: MRCE 12629 - AAFE Mixed-Use Building
Location: 133-04 39th Avenue, Flushing, Queens, NY





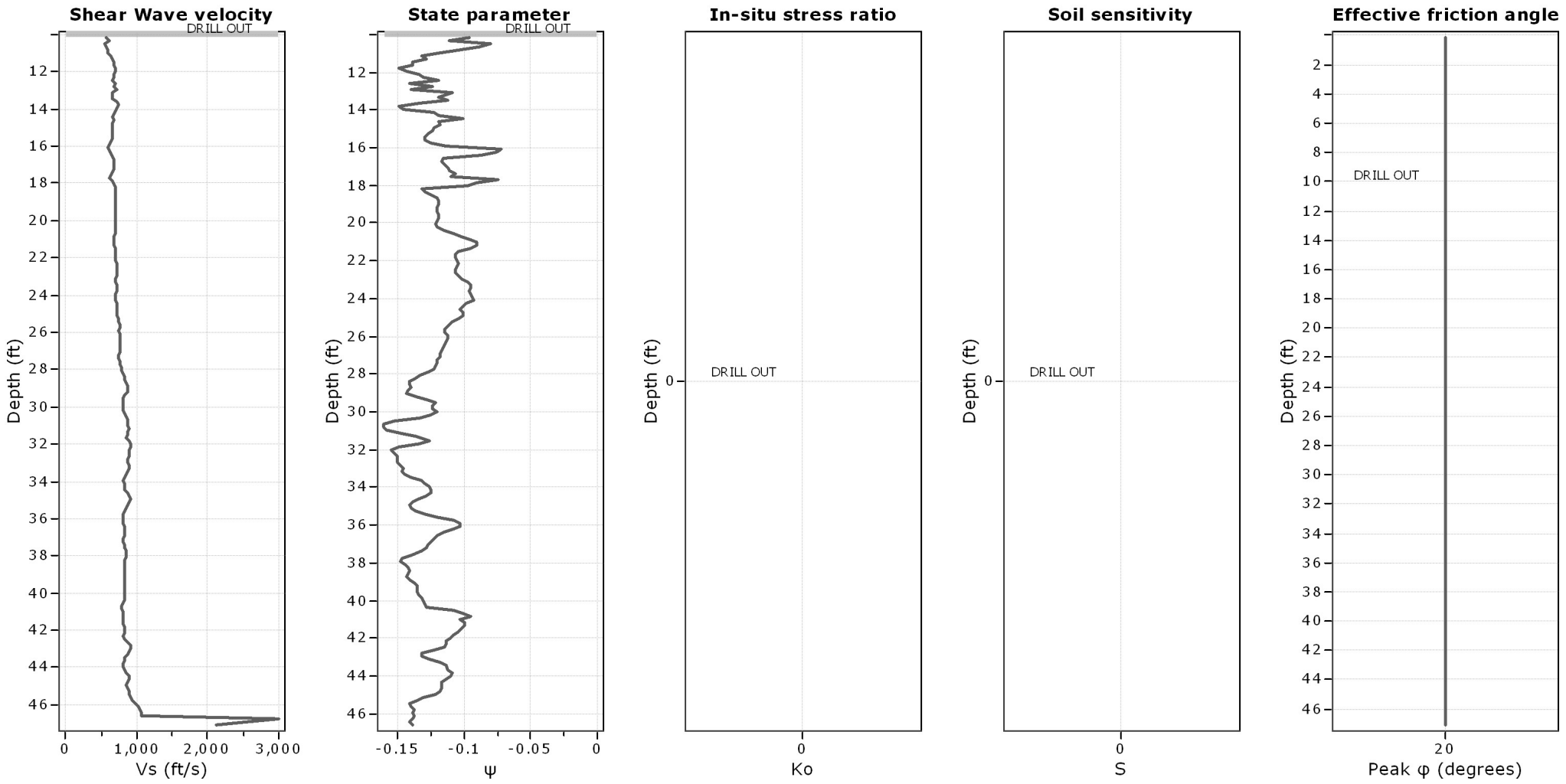
Calculation parameters

Permeability: Based on SBT_n
SPT N_{60}: Based on I_c and q_t
Young's modulus: Based on variable alpha using I_c (Robertson, 2009)
Relative desnisty constant, C_{Dr}: 350.0
Phi: Based on Kulhawy & Mayne (1990)
User defined estimation data



Calculation parameters

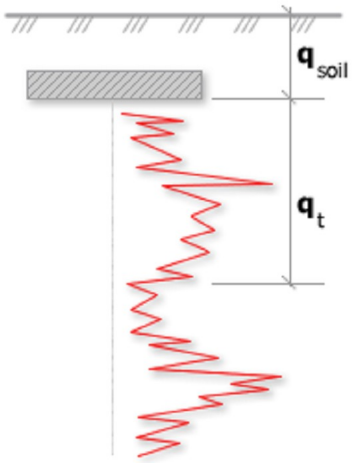
Constrained modulus: Based on variable *alpha* using I_c and Q_{tn} (Robertson, 2009)
Go: Based on variable *alpha* using I_c (Robertson, 2009)
Undrained shear strength cone factor for clays, N_{kt}: 14
OCR factor for clays, N_{kt}: 0.33
User defined estimation data



Calculation parameters

Soil Sensitivity factor, N_S: 7.00

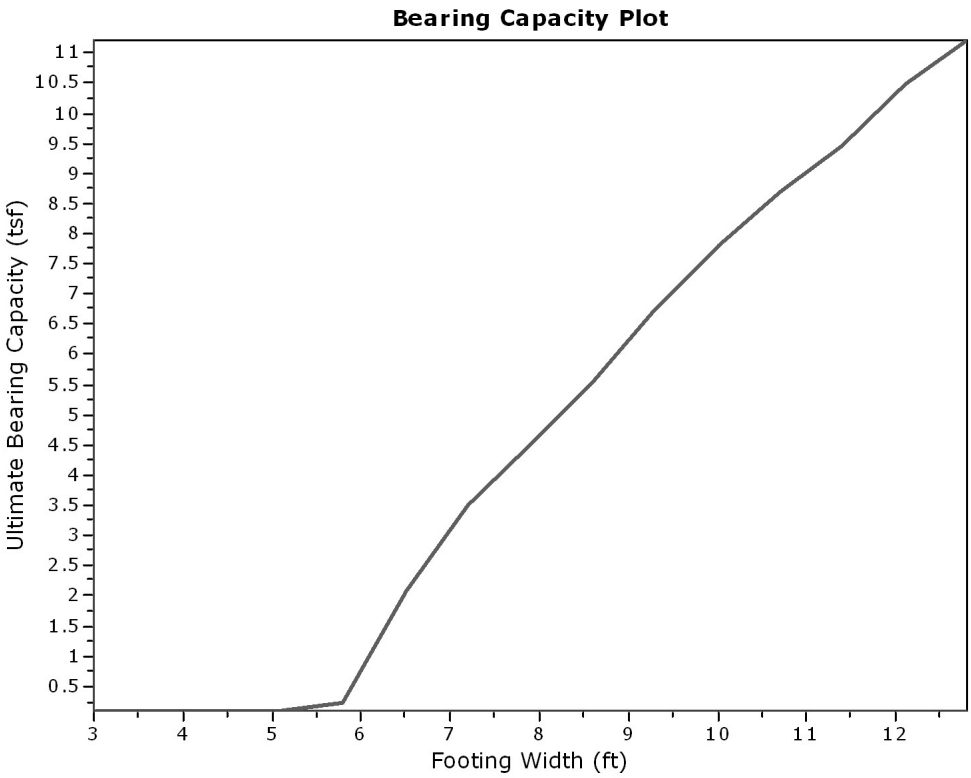
User defined estimation data



Bearing Capacity calculation is perfromed based on the formula:

$$Q_{ult} = R_k \times q_t + q_{soil}$$

where:
R_k: Bearing capacity factor
q_t: Average corrected cone resistance over calculation depth
q_{soil}: Pressure applied by soil above footing



:: Tabular results ::

No	B (ft)	Start Depth (ft)	End Depth (ft)	Ave. q_t (tsf)	R_k	Soil Press. (tsf)	Ult. bearing cap. (tsf)
1	3.00	1.60	6.10	0.00	0.20	0.10	0.10
2	3.70	1.60	7.15	0.00	0.20	0.10	0.10
3	4.40	1.60	8.20	0.00	0.20	0.10	0.10
4	5.10	1.60	9.25	0.00	0.20	0.10	0.10
5	5.80	1.60	10.30	0.71	0.20	0.10	0.24
6	6.50	1.60	11.35	9.91	0.20	0.10	2.08
7	7.20	1.60	12.40	17.07	0.20	0.10	3.51
8	7.90	1.60	13.45	21.92	0.20	0.10	4.48
9	8.60	1.60	14.50	27.23	0.20	0.10	5.54
10	9.30	1.60	15.55	33.28	0.20	0.10	6.75
11	10.00	1.60	16.60	38.53	0.20	0.10	7.80
12	10.70	1.60	17.65	42.96	0.20	0.10	8.69
13	11.40	1.60	18.70	46.88	0.20	0.10	9.47
14	12.10	1.60	19.75	51.84	0.20	0.10	10.46
15	12.80	1.60	20.80	55.56	0.20	0.10	11.21

Presented below is a list of formulas used for the estimation of various soil properties. The formulas are presented in SI unit system and assume that all components are expressed in the same units.

:: Unit Weight, g (kN/m³) ::

$$g = g_w \cdot \left(0.27 \cdot \log(R_f) + 0.36 \cdot \log(\frac{q_t}{p_a}) + 1.236\right)$$

where g_w = water unit weight

:: Permeability, k (m/s) ::

$I_c < 3.27$ and $I_c > 1.00$ then $k = 10^{0.952-3.04 \cdot I_c}$

$I_c \leq 4.00$ and $I_c > 3.27$ then $k = 10^{-4.52-1.37 \cdot I_c}$

:: N_{SPT} (blows per 30 cm) ::

$$N_{60} = \left(\frac{q_c}{P_a}\right) \cdot \frac{1}{10^{1.1268-0.2817 \cdot I_c}}$$

$$N_{1(60)} = Q_{tn} \cdot \frac{1}{10^{1.1268-0.2817 \cdot I_c}}$$

:: Young's Modulus, Es (MPa) ::

$(q_t - \sigma_v) \cdot 0.015 \cdot 10^{0.55 \cdot I_c + 1.68}$

(applicable only to $I_c < I_{c\_cutoff}$)

:: Relative Density, Dr (%) ::

$100 \cdot \sqrt{\frac{Q_{tn}}{k_{DR}}}$ (applicable only to SBT_n: 5, 6, 7 and 8 or $I_c < I_{c\_cutoff}$)

:: State Parameter, ψ ::

$\psi = 0.56 - 0.33 \cdot \log(Q_{tn,cs})$

:: Peak drained friction angle, φ (°) ::

$\varphi = 17.60 + 11 \cdot \log(Q_{tn})$

(applicable only to SBT_n: 5, 6, 7 and 8)

:: 1-D constrained modulus, M (MPa) ::

If $I_c > 2.20$

$\alpha = 14$ for $Q_{tn} > 14$

$\alpha = Q_{tn}$ for $Q_{tn} \leq 14$

$M_{CPT} = \alpha \cdot (q_t - \sigma_v)$

If $I_c \leq 2.20$

$M_{CPT} = (q_t - \sigma_v) \cdot 0.0188 \cdot 10^{0.55 \cdot I_c + 1.68}$

:: Small strain shear Modulus, Go (MPa) ::

$G_0 = (q_t - \sigma_v) \cdot 0.0188 \cdot 10^{0.55 \cdot I_c + 1.68}$

:: Shear Wave Velocity, Vs (m/s) ::

$$V_s = \left(\frac{G_0}{\rho}\right)^{0.50}$$

:: Undrained peak shear strength, Su (kPa) ::

$N_{kt} = 10.50 + 7 \cdot \log(F_r)$ or user defined

$$S_u = \frac{(q_t - \sigma_v)}{N_{kt}}$$

(applicable only to SBT_n: 1, 2, 3, 4 and 9 or $I_c > I_{c\_cutoff}$)

:: Remolded undrained shear strength, Su(rem) (kPa) ::

$S_{u(rem)} = f_s$ (applicable only to SBT_n: 1, 2, 3, 4 and 9 or $I_c > I_{c\_cutoff}$)

:: Overconsolidation Ratio, OCR ::

$$k_{OCR} = \left[\frac{Q_{tn}^{0.20}}{0.25 \cdot (10.50 \cdot +7 \cdot \log(F_r))}\right]^{1.25}$$ or user defined

$OCR = k_{OCR} \cdot Q_{tn}$

(applicable only to SBT_n: 1, 2, 3, 4 and 9 or $I_c > I_{c\_cutoff}$)

:: In situ Stress Ratio, Ko ::

$K_O = (1 - \sin\varphi') \cdot OCR^{\sin\varphi'}$

(applicable only to SBT_n: 1, 2, 3, 4 and 9 or $I_c > I_{c\_cutoff}$)

:: Soil Sensitivity, S_t ::

$$S_t = \frac{N_S}{F_r}$$

(applicable only to SBT_n: 1, 2, 3, 4 and 9 or $I_c > I_{c\_cutoff}$)

:: Effective Stress Friction Angle, φ' (°) ::

$\varphi' = 29.5° \cdot B_q^{0.121} \cdot (0.256 + 0.336 \cdot B_q + \log Q_t)$

(applicable for $0.10 < B_q < 1.00$)

References

• Robertson, P.K., Cabal K.L., Guide to Cone Penetration Testing for Geotechnical Engineering, Gregg Drilling & Testing, Inc., 5th Edition, November 2012

• Robertson, P.K., Interpretation of Cone Penetration Tests - a unified approach., Can. Geotech. J. 46(11): 1337–1355 (2009)

APPENDIX D – MRCE TEST PIT LOGS AND PHOTOGRAPHS

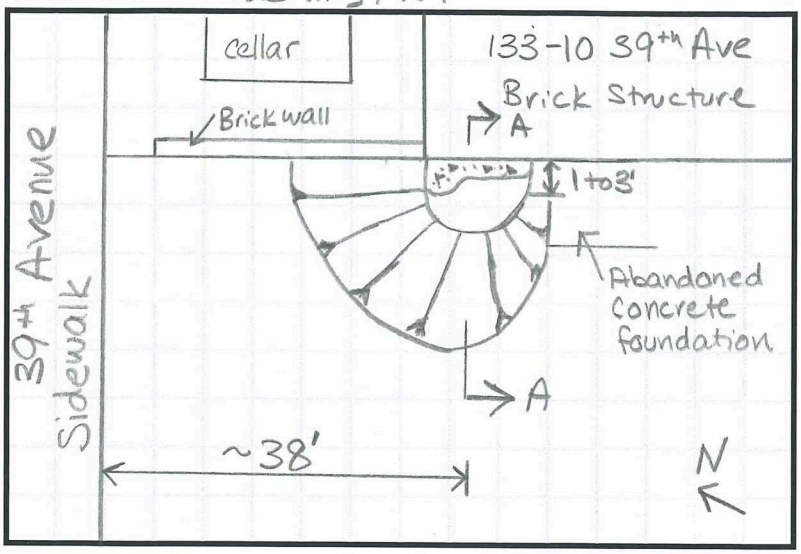
TEST PIT LOG

MRCE
built on firm foundations
Mueser Rutledge Consulting Engineers
14 Penn Plaza, 225 W. 34th Street
New York, NY 10122

ENGINEER: JAB/JPF FILE NO.: 12629

PROJECT: 133-04 39th Ave DATE: 6/17/21 TEST PIT NO: TP-1

LOCATION: Flushing, NY REF. CODES/STDS.: BC 1704.7.4

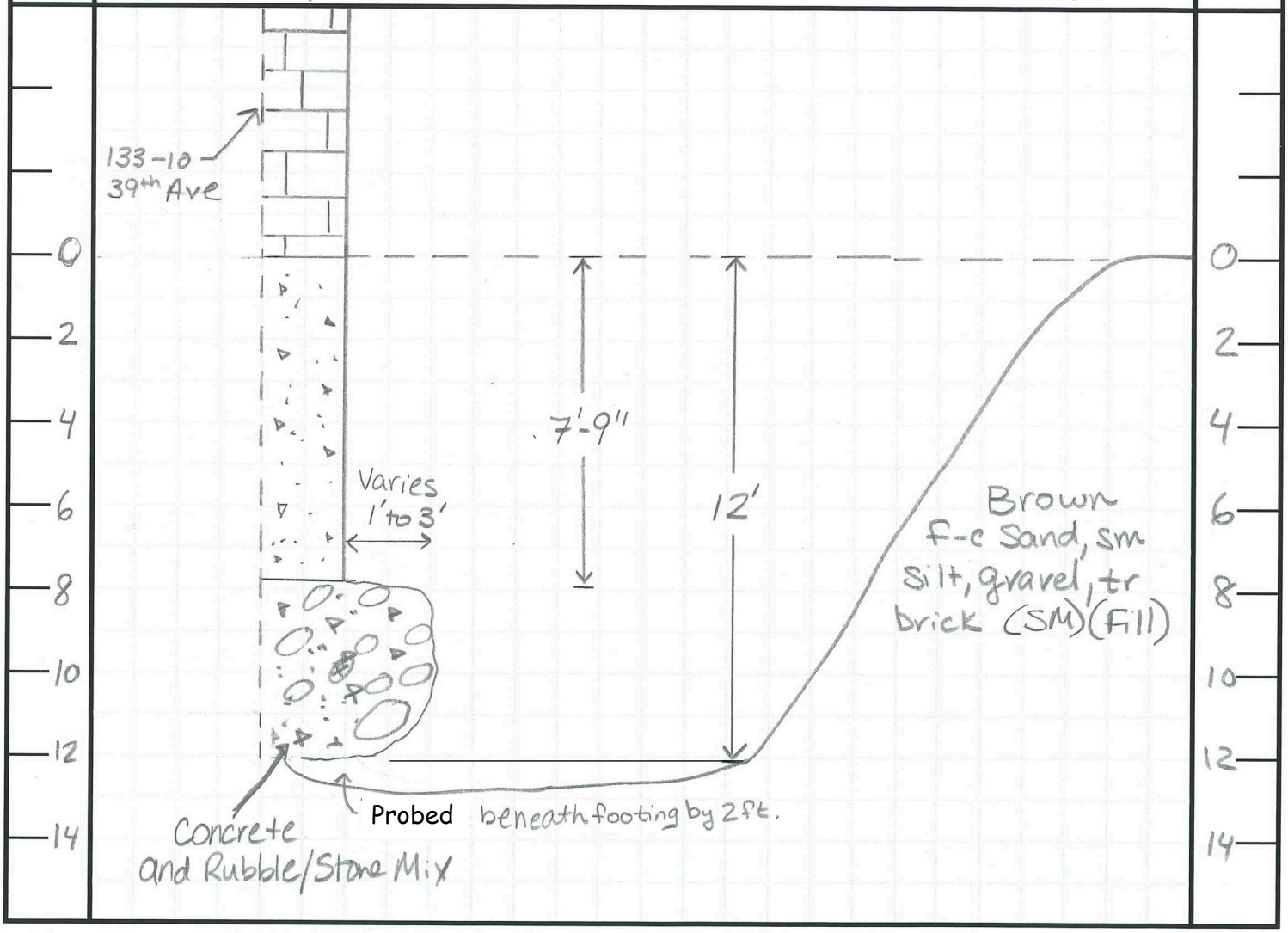


NOTES

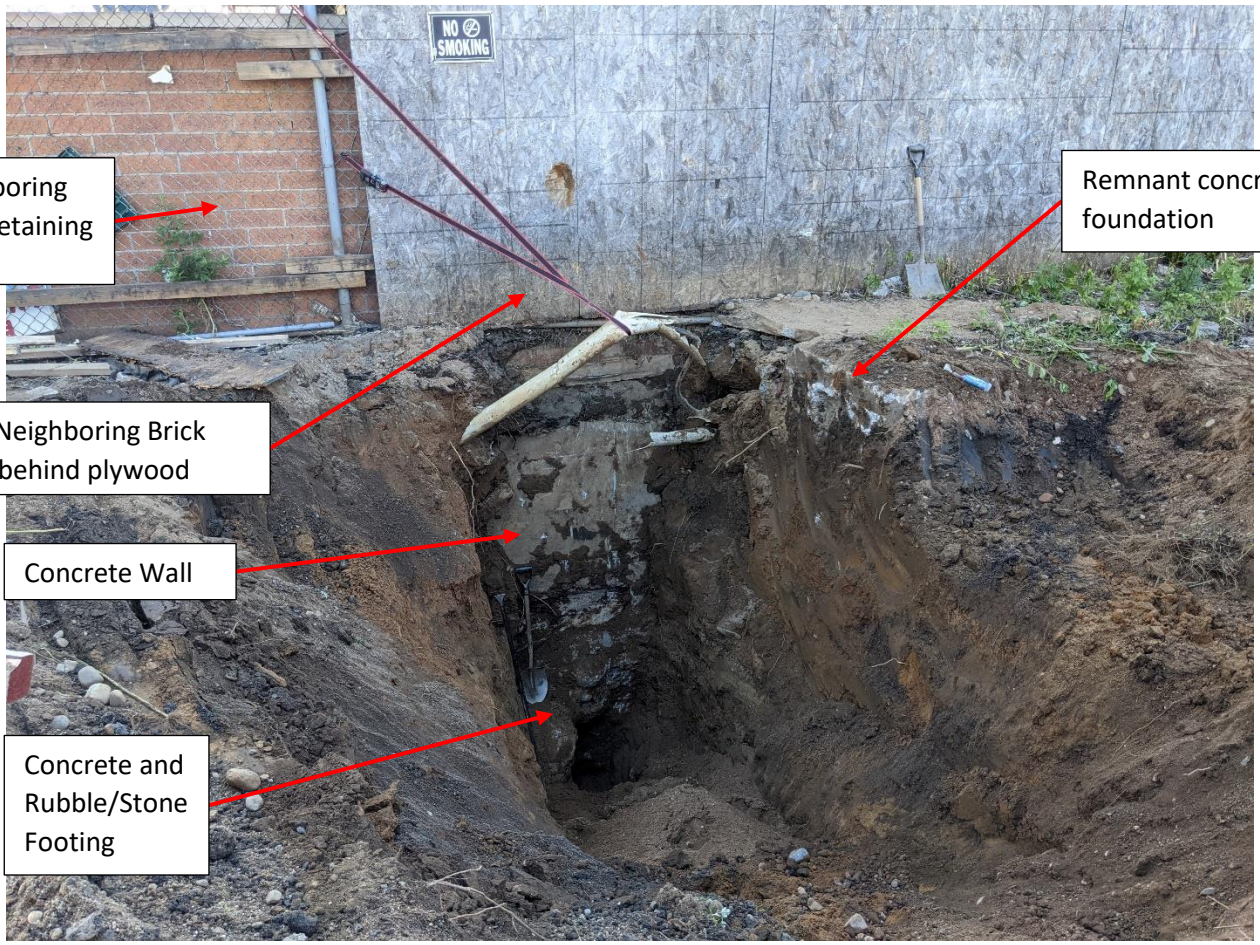
PAGE: 1 OF 1

- Test pit excavated with Bobcat excavator.
- Abandoned utility encountered at ground surface.
- No groundwater observed.
- Test pit backfilled upon completion.

SAMPLE | SECTION: A-A | SCALE: 1:40 | GROUND SURFACE ELEVATION: 45.3± | DEPTH



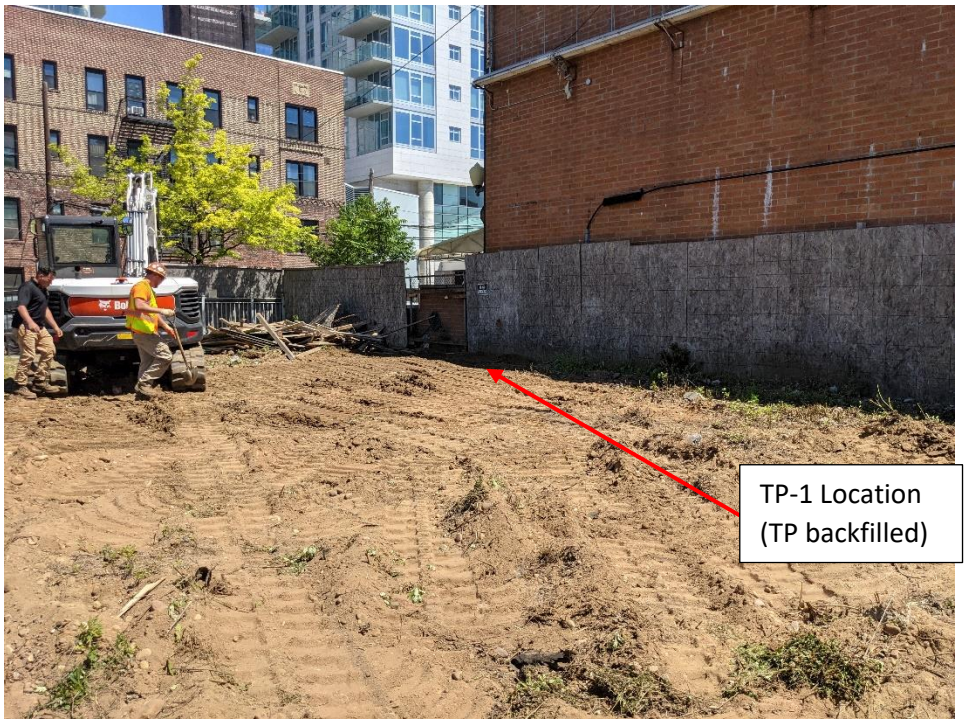
TEST PIT NO: TP-1



TP-1 (Photo 1)

TP-1 (Photo 2)

TP-1 (Photo 3)



TP-1 (Photo 4)

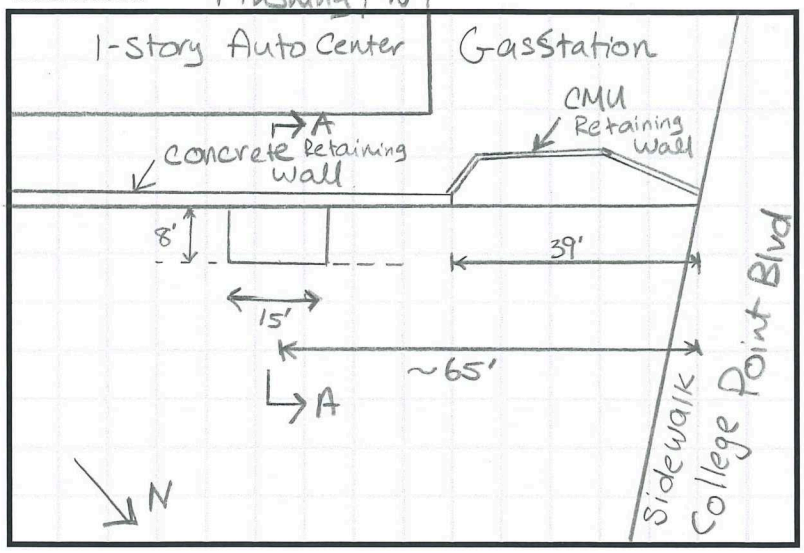
TEST PIT LOG

MRCE
built on firm foundations
Mueser Rutledge Consulting Engineers
14 Penn Plaza, 225 W. 34th Street
New York, NY 10122

ENGINEER: JAB / JPF FILE NO.: 12629

PROJECT: 133-04 39th Ave DATE: 6/17/21 TEST PIT NO: TP-2

LOCATION: Flushing, NY REF. CODES/STDS.: BC 1704.7.4

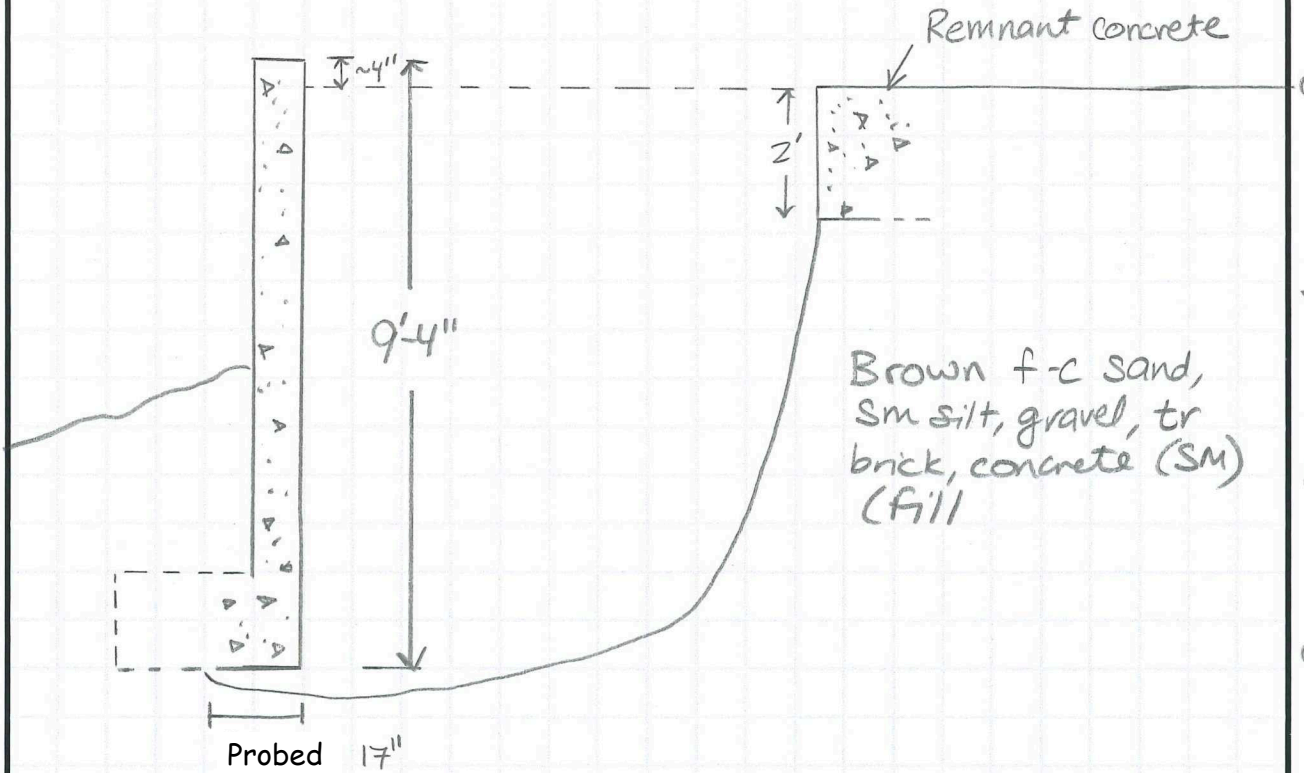


NOTES

PAGE: 1 OF 1

- Test pit excavated with Bobcat excavator.
- No groundwater observed.
- test pit backfilled upon completion.

SAMPLE | SECTION: A-A | SCALE: 1:30 | GROUND SURFACE ELEVATION: 44 ± | DEPTH



TEST PIT NO: TP-2


Top of retaining wall extends about 4” above bottom of plywood
Remnant concrete foundation
Concrete Wall flush with soil. No footing projection observed on project side

TP-2 (Photo 1)

TP-2 (Photo 2)

Retaining Wall Looking north from Gas Station (13311 Roosevelt Ave)

APPENDIX E – ROUX REMEDIAL INVESTIGATION REPORT

ASIAN AMERICANS FOR EQUALITY (AAFE)

QUEENS, NEW YORK

Remedial Investigation Report

OER Project Number: 16EH-N284Q

Prepared for:

Asian Americans for Equality (AAFE)
133-04 39th Avenue
Queens, New York 11368
Kamran@praxismanagementservices.com

Prepared by:

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September 2016

EXECUTIVE SUMMARY

The Remedial Investigation Report ("RIR") provides sufficient information for establishment of remedial action objectives, evaluation of remedial action alternatives, and selection of a remedy pursuant to RCNY§ 43-1407(f). The remedial investigation ("RI") described in this document is consistent with applicable guidance.

Site Location and Current Usage

The Site is located at 133-04 39th Ave in the Flushing section of Queens, New York and is identified as Block 4973 and Lot 6 on the New York City Tax Map. Figure 1 shows the Site location. The Site is 13,399-square feet and is bounded by 39th Avenue to the north; a gasoline service station to the south; a three story mini-mall containing hair salons, accounting offices, an ink stamp and trophy store, and other offices to the east; and College Point Boulevard to the west. A map of the site boundary is shown in Figure 2. Currently, the Site is vacant and scheduled for demolition, however, it was used for a community center and wedding studio as recently as the Spring of 2016. The Site is developed with an asphalt-paved parking lot and a one-story cinderblock structure on a concrete slab with a flat roof.

Summary of Proposed Redevelopment Plan

The proposed future use of the Site will consist of the demolition of all current structures and construction of a new, seven-story, mixed-use building that will include community space, office "incubators," and offices for Asian Americans for Equality ("AAFE"). The building footprint is almost the entire property dimensions. The remaining space will be a concrete apron in front of the building along 39th Street. The new building includes two levels of basement that are both underground parking. The basement will extend to a depth of 22 feet below ground surface ("bgs") resulting in approximately 16,000 tons of soil excavation. The basement levels will encompass the entire property dimensions. The basement will be above the groundwater table. Layout of the proposed site development is presented in Appendix A. The current zoning designation is C4-2.

Summary of Past Uses of Site and Areas of Concern

Based on information presented in a 2002 Phase I Environmental Site Assessment prepared by G.C. Environmental, Inc., the site was previously developed with a three-story residential building from years 1892-1951. As of 1951, the Site was developed with the current existing

one-story building and was used as a furniture warehouse as well as an automotive garage. A copy of the Phase I is included in Appendix B. No specific areas of concern were observed during any of the inspections.

Summary of the Work Performed under the Remedial Investigation

Roux Associates, Inc., on behalf of AAFE performed the following scope of work:

1. Conducted a Site inspection to identify areas of concern ("AOCs") and physical obstructions (i.e. structures, buildings, etc.);

2. Installed eight soil borings across the entire project Site and collected sixteen soil samples for chemical analysis from the soil borings to evaluate soil quality;

3. Installed three groundwater monitoring wells throughout the Site to establish groundwater flow and collected three groundwater samples for chemical analysis to evaluate groundwater quality; and

4. Installed five soil vapor probes around Site perimeter and collected five samples for chemical analysis.

Summary of Environmental Findings

1. Elevation of the property ranges from approximately 40 to 45 feet above mean sea level.

2. Depth to groundwater ranges from 35 to 39 feet below ground surface at the Site.

3. Groundwater flow is generally from east/southeast to west/northwest beneath the Site.

4. Bedrock was not encountered at the Site.

5. The stratigraphy of the site, from the surface down, consists of 1 to 8 feet of fill underlain by sand and silt with lesser amounts of gravel, clay, and cobbles. Varying amounts of clay was observed with most of the northeast corner of the property below 20 feet being clay.

6. Analytical results were compared to NYSDEC 6NYCRR Part 375-6.8 Unrestricted Use Soil Cleanup Objectives (SCOs) and Restricted Commercial Use SCOs. Soil/fill samples collected during the RI showed one volatile organic compound, trichloroethylene (maximum concentration of 78,000 µg/kg), exceeding Unrestricted Use SCOs. SVOCs were not detected in any of the soil samples. Five metals, including chromium (max. 40 mg/kg), manganese (max. 1,700 mg/kg), mercury (max. 0.28 mg/kg), nickel (max. 95 mg/kg), and zinc (max. 3,100 mg/kg), were detected above Unrestricted Use SCOs. The metals arsenic (max. 22 mg/kg), copper (max. 640 mg/kg), and lead (max. 1,300 mg/kg) were detected above Restricted Commercial Use SCOs within two shallow soil samples. Several other metals were detected at trace concentrations. Two pesticides including 4,4-DDE (max. 4.75 µg/kg) and 4,4-DDT (max. 6.64 P µg/kg) were detected slightly exceeding Unrestricted Use SCOs. Soil boring location RXSB-2 is identified as a shallow

hotspot for TCE. Overall, soil chemistry is consistent with data found at sites with shallow urban fill material and does not indicate any disposal of hazardous materials.

7. Groundwater sample results were compared to New York State 6NYCRR Part 703.5 Class GA groundwater quality standards (GQS). Groundwater samples collected during the RI showed one detection of trichloroethylene in the northeast corner of the site (14 micrograms per liter) that exceeded its respective GQS. In addition, and in comparison to 11 total metals in groundwater above standards, only one dissolved metal, manganese (max. 4,630 µg/L), was detected at the site above GQS. No other compounds were detected above standards.

8. Soil vapor samples collected during the RI were compared to the compounds listed in New York State Department of Health (NYSDOH) Vapor Intrusion Matrices. Soil vapor samples collected during the RI showed that 24 of 63 VOCs analyzed were detected in soil vapor including chlorinated solvents and petroleum related compounds. In comparison to NYSDOH Guidance, assessment of results can only definitively say that action could be required for locations primarily on the north side of the site, where the concentration of trichloroethylene (max. 147 $\mu g/m^3$) was within the monitoring level ranges established by the State DOH soil vapor guidance matrix. Elsewhere on the site, chlorinated VOCs including 1,1,1-trichoroethane (max. 1.25 $\mu g/m^3$), carbon tetrachloride (max. 4.83 $\mu g/m^3$), and tetrachloroethylene (max. 161 $\mu g/m^3$) were detected in soil vapor. Petroleum-related VOCs (BTEX) were detected at a maximum concentration of 135 $\mu g/m^3$.

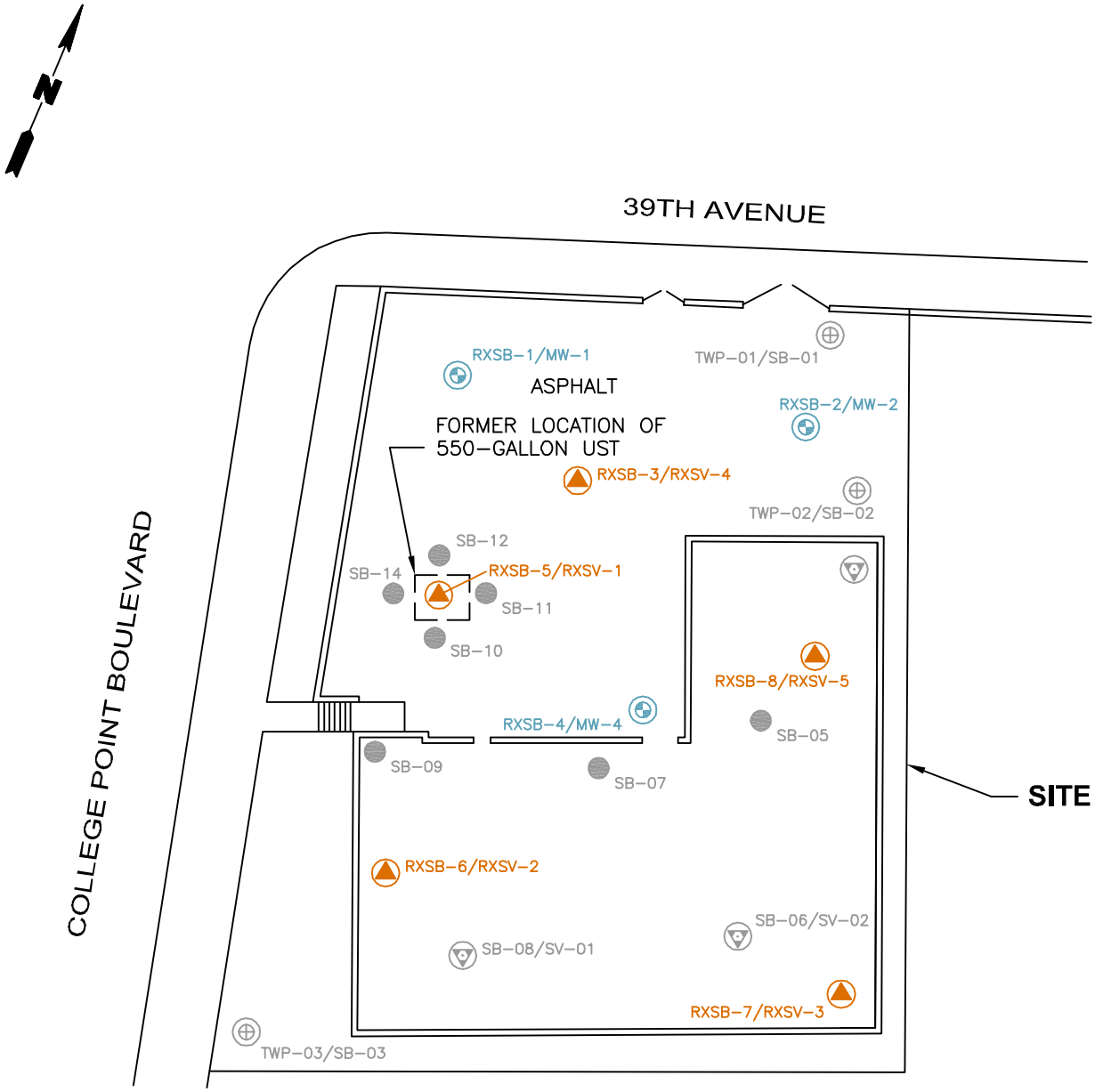
Table 1. Summary of Water Levels, AAFE Multi-Use Building, Queens, New York

Well Designation	Elevation of Measuring Point (ft amsl)	06/07/16 Depth To Water (ft bmp)	06/07/16 Water Table Elevation (ft amsl)	06/15/16 Depth To Water (ft bmp)	06/15/16 Water Table Elevation (ft amsl)
MW-1	44.09	-	-	35.06	9.03
MW-2	44.75	-	-	36.48	8.27
MW-4	45.50	-	-	35.80	9.70

Well Designation	Elevation of Ground Surface (ft amsl)	Depth To Water (ft bgs)	Water Table Elevation (ft amsl)	Depth To Water (ft bgs)	Water Table Elevation (ft amsl)
MW-1	44.37	34.95	9.42	-	-
MW-2	45.29	39.75	5.54	-	-
MW-4	45.81	36.10	9.71	-	-

NOTES:

- - Not measured
amsl - above mean sea level
bmp - below measuring point
bgs - below ground surface
ft - feet



30' 0 30'

LEGEND

- GROUNDWATER AND SOIL SAMPLING LOCATION AND DESIGNATION
- SOIL VAPOR AND SOIL SAMPLING LOCATION AND DESIGNATION
- FORMER SOIL BORING SAMPLE LOCATION
- FORMER SOIL BORING AND TEMPORARY WELL POINT SAMPLE LOCATION
- FORMER SOIL BORING AND SUB-SLAB VAPOR SAMPLE LOCATION

Title:

SAMPLING LOCATIONS

FLUSHING MIXED-USE BUILDING
133-04 39TH AVENUE
FLUSHING, NEW YORK 11354

Prepared For:

ASIAN AMERICANS FOR EQUALITY

ROUX ASSOCIATES, INC.
Environmental Consulting & Management

Compiled by: R.H.	Date: 20JUN16	FIGURE
Prepared by: J.A.D.	Scale: AS SHOWN	2
Project Mgr: M.R.	Project: 2741.0001Y000	
File: 2741.0001Y101.01.DWG		

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WELL CONSTRUCTION LOG

WELL NO. **RXSB-1/MW-1**	NORTHING **Not Measured**	EASTING **Not Measured**		
PROJECT NO./NAME **2741.0001Y / AAFE - Flushing MultiUse**		LOCATION **133-04 39th Ave** **Queens, NY**		
APPROVED BY **M. Roux**	LOGGED BY **M. Diggory**			
DRILLING CONTRACTOR/DRILLER **ADT / CM**		GEOGRAPHIC AREA		
DRILL BIT DIAMETER/TYPE **2-in. / Drive Sampler**	BOREHOLE DIAMETER **2-inches**	DRILLING EQUIPMENT/METHOD **/ Geoprobe**	SAMPLING METHOD **2" Macro-Core**	START-FINISH DATE **6/6/16-6/7/16**
CASING MAT./DIA. **PVC / 1-inch**	SCREEN: TYPE **Slotted** MAT. **PVC**	TOTAL LENGTH **10.0**ft	DIA. **1-inch**	SLOT SIZE **10-Slot**
ELEVATION OF: (Feet ABOVE Site Datum)	GROUND SURFACE **44.09**	TOP OF WELL CASING	TOP & BOTTOM SCREEN **14.1 / 4.1**	GRAVEL PACK SIZES **#1 Sand**

Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
		Asphalt.			Handcleared to 5 ft bls.; sample 'RXSB-1/0-2' collected
		Dark brown; fine SAND and SILT; some F-M Sand; little Gravel; trace Brick; moist (Fill)		3.1	
				2.0	
5		Brown; F-M SAND; little Silt; trace Gravel; moist (SP-SM)			3 foot recovery.
				1.2	
				1.7	
10		Brown; FMC SAND; little Silt, Gravel, Clay; moist (SW-SM)			3.5 foot recovery
				1.1	
				1.2	
15				0.9	4 foot recovery
				2.0	
				3.3	
				3.5	
20				3.0	
		Brown; FMC SAND; little Silt, Gravel, Clay; moist; broken large Gravel/small Cobble in top of sleeve; clumps of Clay observed; 1 to 2 inch thick red-brown layer near ~24ft (SW-SC)			2 foot recovery; sample 'RXSB-1/22-24' collected
				3.5	
				2.1	
25					

2" PVC Riser

BORING/FEET 2741.0001Y.GPJ ROUX.GDT 6/29/16

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WELL CONSTRUCTION LOG

WELL NO.	NORTHING	EASTING
RXSB-1/MW-1	**Not Measured**	**Not Measured**
PROJECT NO./NAME		LOCATION
2741.0001Y / AAFE - Flushing MultiUse		**133-04 39th Ave**
APPROVED BY	LOGGED BY	**Queens, NY**
M. Roux	**M. Diggory**	

Depth, feet	Graphic Log	Visual Description (continued)	Blow Counts per 6"	PID Values (ppm)	REMARKS
		Brown; FMC SAND; little Silt, Gravel, Clay; moist (SW-SM)		0	1.5 foot recovery
30		Brown; FM SAND and SILT; little fine Gravel; trace broken Cobbles; moist; at 30.5 and 33.5 there were 0.3' layers of brown Clay; trace fine Gravel; moist (SM)		2.8 3.3 3.1	5 foot recovery
35		Brown; CMF SAND; little Silt; trace fine Gravel; wet (SW)		0 0	5 foot recovery, set temporary well MW-1 at 40 ft bls
40		gray; dense CLAY; moist (CH)		2.6 3.3 3.4	

Bentonite Seal

2" PVC Riser

10 ft of 2" diameter, 0.10 slot PVC screen

GROUND WATER LEVEL 6/7/16

GROUND WATER LEVEL 6/15/16

BORING/FEET 2741.0001Y.GPJ ROUX.GDT 6/29/16

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WELL CONSTRUCTION LOG

WELL NO.	NORTHING	EASTING
RXSB-2/MW-2	**Not Measured**	**Not Measured**

PROJECT NO./NAME	LOCATION
2741.0001Y / AAFE - Flushing MultiUse	**133-04 39th Ave**
APPROVED BY / LOGGED BY	**Queens, NY**
M. Roux / **M. Diggory**	

DRILLING CONTRACTOR/DRILLER	GEOGRAPHIC AREA
ADT / CM	

DRILL BIT DIAMETER/TYPE	BOREHOLE DIAMETER	DRILLING EQUIPMENT/METHOD	SAMPLING METHOD	START-FINISH DATE
2-in. / Drive Sampler	**2-inches**	**/ Geoprobe**	**2" Macro-Core**	**6/7/16-6/7/16**

CASING MAT./DIA.	SCREEN: TYPE	MAT.	TOTAL LENGTH	DIA.	SLOT SIZE
PVC / 1-inch	**Slotted**	**PVC**	**10.0**ft	**1-inch**	**10-Slot**

ELEVATION OF:	GROUND SURFACE	TOP OF WELL CASING	TOP & BOTTOM SCREEN	GRAVEL PACK SIZES
(Feet ABOVE Site Datum)	**44.75**		**9.8 / -0.3**	**#1 Sand**

Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
		Asphalt			Handcleared to 5 ft bls.; soil sample 'RXSB-2/0-2' collected
		gray; CMF SAND and sand-sized Slag; some fine Gravel, fine gravel-sized Slag; trace Silt; moist (Fill)		0.2	
5		Brown; fine SAND and SILT; little Clay; moist (SM)		1.2	4 foot recovery; soil sample 'RXSB-2/5-7' collected
		Brown; CMF SAND; little Silt, F-C Gravel; trace Clay; moist (SW-SM)		1.0	
10		Brown; F-M SAND; trace Silt, fine Gravel; moist (SP)		0.0	4 foot recovery
				1.5	
15	2" PVC Riser	Brown; fine SAND and SILT; trace Clay, fine Gravel; moist (SP-SM)		2.4	4 foot recovery
				2.8	
				1.6	
		Brown; SILT and CLAY; moist (CL-ML)		1.8	
20		Brown; F-M SAND and SILT; trace Gravel; moist (SP-SM)			5 foot recovery; soil sample 'RXSB-2/22-24' collected
		Light brown; fine SAND and SILT; little Clay; moist (SP-SM)		3.8	
25		increasing amounts of Clay, at 25' grey CLAY (CL-ML)		0.0	

BORING/FEET 2741.0001Y.GPJ ROUX.GDT 6/29/16

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WELL CONSTRUCTION LOG

WELL NO.	NORTHING	EASTING
RXSB-2/MW-2	**Not Measured**	**Not Measured**
PROJECT NO./NAME		LOCATION
2741.0001Y / AAFE - Flushing MultiUse		**133-04 39th Ave**
APPROVED BY	LOGGED BY	**Queens, NY**
M. Roux	**M. Diggory**	

Depth, feet	Graphic Log	Visual Description (continued)	Blow Counts per 6"	PID Values (ppm)	REMARKS
		Grey-brown; CLAY; moist (CH)		2.5	5 foot recovery
				3.6	
30				3.4	30
		Grey-brown; CLAY; moist (CH)		1.4	5 foot recovery
		Orange; CMF SAND; trace Silt; moist (SW)		1.4	
		Grey; CLAY; moist (CH)		0	
35					35
		Dark grey; CLAY; moist (CH)		0.1	5 foot recovery
40				1.2	40
		Orange; F-M SAND; trace Gravel; moist (SP)			5 foot recovery; set bottom of well at 45 ft bls
		Dark grey; CLAY with brown SILT; moist (CL-ML)		0.9	
		Light brown; F-M SAND; trace fine Gravel; moist (SP)			
45		Dark grey; CLAY; moist (CH)		2.2	45

Bentonite Seal

2" PVC Riser

GROUND WATER LEVEL 6/15/16

GROUND WATER LEVEL 6/7/16

10 ft of 2" diameter, 0.10 slot PVC screen

BORING/FEET 2741.0001Y.GPJ ROUX.GDT 6/29/16

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WELL CONSTRUCTION LOG

WELL NO. **RXSB-4/MW-4**	NORTHING **Not Measured**	EASTING **Not Measured**		
PROJECT NO./NAME **2741.0001Y / AAFE - Flushing MultiUse**		LOCATION **133-04 39th Ave** **Queens, NY**		
APPROVED BY **M. Roux**	LOGGED BY **M. Diggory**			
DRILLING CONTRACTOR/DRILLER **ADT / CM**		GEOGRAPHIC AREA		
DRILL BIT DIAMETER/TYPE **2-in. / Drive Sampler**	BOREHOLE DIAMETER **2-inches**	DRILLING EQUIPMENT/METHOD **/ Geoprobe**	SAMPLING METHOD **2" Macro-Core**	START-FINISH DATE **6/6/16-6/6/16**
CASING MAT./DIA. **PVC / 1-inch**	SCREEN: TYPE **Slotted** MAT. **PVC**	TOTAL LENGTH **10.0**ft	DIA. **1-inch**	SLOT SIZE **10-Slot**
ELEVATION OF: (Feet ABOVE Site Datum)	GROUND SURFACE **45.50**	TOP OF WELL CASING	TOP & BOTTOM SCREEN **10.5 / 0.5**	GRAVEL PACK SIZES **#1 Sand**

Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
		Dark brown; fine SAND and SILT, some MC Sand; little Gravel; trace Brick, asphalt, and cobble; moist (FILL)			Handcleared to 5 ft bls.; sample 'RXSB-4/0-2' collected
		Dark brown, M-C SAND; some fine Sand and Silt, Gravel, and Cobble; little Brick; moist (FILL)		0	
5		Dark brown; M-C SAND; some fine Sand, Silt, Gravel, Cobble; little Brick; moist (FILL)			5
		Dark brown; F-M SAND; some fine Sand, Silt; little Gravel, Brick; moist (FILL)			4.5 foot recovery.
		Light brown; fine SAND; some Silt; trace Clay; moist (SM)		0	
10					10
		Dark brown; M-C SAND with GRAVEL; some F-M Sand; trace Silt; moist (SPG)			2 foot recovery
				2.2	
15		2" PVC Riser			15
		Light brown; F-M SAND; trace fine Sand, Gravel; moist (SP)			2 foot recovery
				0	
20					20
		Light brown to light gray; Medium SAND; some fine Sand; little coarse Sand; trace Gravel; moist (SP)			4.5 foot recovery; sample 'RXSB-4/22-24' collected
				2.2	
25					25

BORING/FEET 2741.0001Y.GPJ ROUX.GDT 6/29/16

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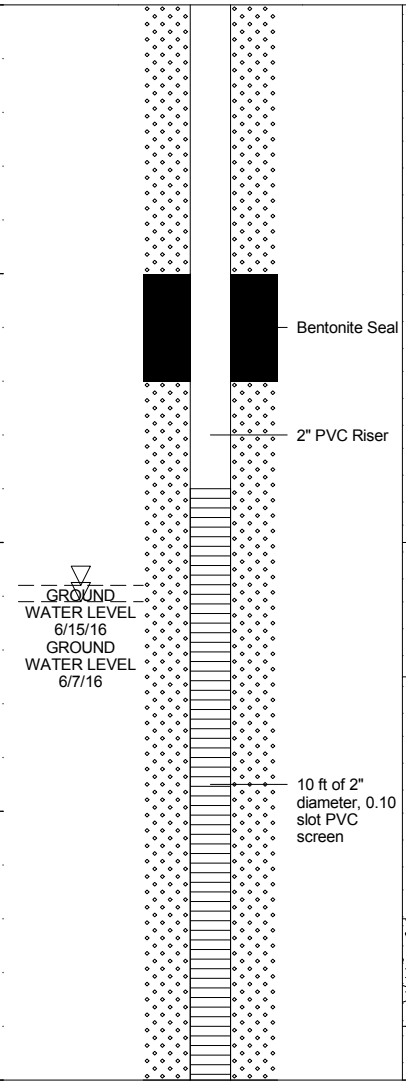
RXSB-4/MW-4	**Not Measured**	**Not Measured**
PROJECT NO./NAME		LOCATION
2741.0001Y / AAFE - Flushing MultiUse		**133-04 39th Ave**
APPROVED BY	LOGGED BY	**Queens, NY**
M. Roux	**M. Diggory**	

Depth, feet	Graphic Log	Visual Description (continued)	Blow Counts per 6"	PID Values (ppm)	REMARKS
		Light brown to light gray; Medium SAND; some fine Sand; little coarse Sand; trace Gravel; moist (SP) *(continued)*		0	4 foot recovery
30					30
				0	
35					35
		Dark brown; F-M SAND; little coarse Sand; trace Gravel; wet (SP)		0	4 foot recovery; apparent water table at 37 ft bls; staining and odor from 37.5 ft bls
		Dark gray; F-M SAND; little coarse Sand; trace Gravel; wet; staining; odor (SP)		258	
40					40
				162	4 foot recovery; staining and odor apparent through to 42 ft bls
		Dark brown; M-C SAND with GRAVEL; little fine Sand; wet (SPG)		0	
45		Greyish brown; F-M SAND; trace Gravel; wet (SP)		17.4	45
					set temporary well MW-4 at 45 ft bls



BORING/FEET 2741.0001Y.GPJ ROUX.GDT 6/29/16