

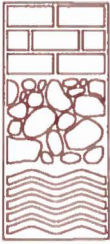
Appendix Document A
Geotechnical Data Report

**GEOTECHNICAL DATA REPORT
BAY PARK SEWAGE TREATMENT PLANT
PERIMETER FLOOD PROTECTION**

**ARCADIS U.S., Inc.
27-01 Queens Plaza North, Suite 800
Long Island City, New York 11101**

**Mueser Rutledge Consulting Engineers
14 Penn Plaza, 225 West 34th Street
New York, NY 10122**

January 8, 2014



Mueser Rutledge Consulting Engineers

14 Penn Plaza • 225 West 34th Street • New York, NY 10122

Tel: (917) 339-9300 • Fax: (917) 339-9400

www.mrce.com

Alfred H. Brand
David M. Cacoilo
Peter W. Deming
Roderic A. Ellman, Jr.
Francis J. Arland
Partners

David R. Good
Walter E. Kaeck
Associate Partners

James L. Kaufman
Hugh S. Lacy
Joel Moskowitz
George J. Tamaro
Elmer A. Richards
John W. Fowler
Consultants

Thomas R. Wendel
Domenic D'Argenzio
Robert K. Radske
Ketan H. Trivedi
Hiren J. Shah
Alice Arana
Joel L. Volterra
Tony D. Canale
Jan Cermak
Sissy Nikolaou
Anthony DeVito
Frederick C. Rhyner
Sitotaw Y. Fantaye
Senior Associates

Michael J. Chow
Douglas W. Christie
Gregg V. Piazza
Pablo V. Lopez
Steven R. Lowe
Ira A. Beer
James M. Tantalla
Andrew R. Tognon
T. C. Michael Law
Andrew Pontecorvo
Renzo D. Verastegui
Associates

Joseph N. Courtade
*Director of Finance
and Administration*

Martha J. Huguet
Director of Marketing

January 8, 2014

ARCADIS U.S., Inc.
27-01 Queens Plaza North, Suite 800
Long Island City, New York 11101

Attention: Greg Bazydola

Re: Geotechnical Data Report
Bay Park Sewage Treatment Plant – Perimeter Flood Protection
Bay Park, New York
MRCE File No. 12047

Greetings:

In accordance with your authorization dated November 12, 2013, Mueser Rutledge Consulting Engineers (MRCE) has completed a subsurface investigation for the referenced project. Our scope of work included laboratory testing and preparing a geotechnical data report. This report presents the geotechnical data for the project, including boring logs, cone penetrometer records, and summaries of laboratory testing.

EXHIBITS

The following exhibits are attached to illustrate our report:

Figure No. 1	Topographic Map
Drawing No. B-1	Boring and CPTU Location Plan
Drawing No. GS-R	Geotechnical Reference Standards
Plate No. 1	Plot of Groundwater Levels
Table No. 1	Summary of Laboratory Testing Data
Plates Nos. P-1 and P-2	Plasticity Charts
Plates Nos. C-1 to C-4	Consolidation Tests
Plates Nos. G-1 to G-23	Gradation Curves
Plates Nos. D-1 and D-2	Direct Shear Test Summary
Appendix A	MRCE Boring Logs
Appendix B	ConeTec Field Report

SITE AND PROJECT DESCRIPTION

The project site is the Bay Park Sewage Treatment Plant (STP) in Bay Park, Nassau County, New York. The plant is within the area bordered by Marjorie Lane and Compton Street to the north, Harbor Road to the south, Marjorie Lane to the east and First Avenue to the west. The area is on a peninsula extending into Hewlett Bay to the south and bordered by Mill River to the east. The plant

abuts a residential area to the north, park areas to the east and west, and a golf course to the south.

Site topography is fairly flat, gradually sloping down toward the waterways. Plant grades vary from approximately El. +4 to El. +12. The plant is bordered by an embankment, primarily along the east and west portions of the perimeter, rising to as high as El. +13. All elevations reported in this report are in reference to North American Vertical Datum of 1988 (NAVD88).

The existing plant contains several facilities related to sewage treatment, including primary, aeration and final settling tanks, sludge digesters, and effluent screening and pumping facilities. The plant structures also include maintenance buildings, a boiler plant, and generation building.

The project consists of design of a perimeter flood protection system extending to El. +17. The component will be chosen based on available space, and will consist of a full-height earthen levee, a partial-height earthen levee with an I-wall, and T-walls. Gates will be installed to allow access to the plant site.

SITE GEOLOGY AND HISTORY

During the Pleistocene a series of glaciations deposited layers of glacial sediments above Cretaceous coastal plains soils, ultimately building up Long Island. An earlier Wisconsin aged glacial advance deposited the Ronkonkoma Moraine, which forms the south fork of Long Island. Outwash (Merrick Formation) was deposited to the south of the moraine. As the ice retreated, sea-level rose and marine clays were deposited above the old outwash sand. This layer has been named the Wantagh Formation, and is commonly referred to as the "20 Foot Clay". During the late Wisconsin the glacier re-advanced across the region, lowering sea-level and depositing the Harbor Hill Terminal Moraine, which forms the north fork of Long Island. Outwash from this advance (Bellmore Formation) blanketed what remained of the older glacial and inter-stadial formations. Final retreat of this glaciation caused sea-level to rise to its current position along the south shore of Long Island. Recent marsh deposits follow along the shoreline.

Based on historic maps of the site dating to the late 1800s, the site was once marshland bordering waterways connected to the Atlantic Ocean. The marshlands were filled to allow development of the area, including construction of the Bay Park STP.

SUBSURFACE INVESTIGATIONS

Previous Investigations: We were provided with a comprehensive boring location plan of the site showing borings made between 1976 and 2013 as reported by other firms. Those borings were primarily made for plant facilities and did not cover the site perimeter.

Current Investigation: You provided us with a plan dated July 31, 2013 consisting of an aerial photo showing a subsurface investigation consisting of 17 borings and 40 piezocone soundings. We prepared specifications for the drilling and cone penetrometer work and solicited bids from three drilling contractors and one cone penetrometer contractor. We attended a site meeting on August 27, 2013 with prospective drilling and cone penetration contractors, representatives of Arcadis U.S., and plant personnel to observe site conditions and proposed boring and cone penetration locations. It was noted that several of the borings and cone soundings were planned on the existing perimeter embankment. The embankment was heavily vegetated and mostly inaccessible to truck-mounted drilling equipment. After internal consultation by Arcadis U.S., borings and cone soundings were moved to either side of the existing embankment, thereby

making all of the borings and cone penetrometer locations accessible to truck-mounted equipment.

The boring contract was awarded to Warren George, Inc. of Jersey City, New Jersey, and the cone soundings were awarded to ConeTec, Inc. of West Berlin, New Jersey. The borings, Nos. B-1 through B-17, were made between October 4 and 23, 2013 under continuous inspection by our resident engineer, Patrick Donaldson. The cone penetrometer soundings, Nos. CPTU-1 through CPTU-40, except No. CPTU-36, were made between October 7 and 17, 2013. Cone No. CPTU-36 was deleted from the program by Arcadis U.S. Boring and cone sounding locations were laid out by Arcadis and representatives of the plant using utility information to adjust locations. In cases where a boring encountered obstructions, the boring was offset and drilled to completion. The suffix "A" in the boring number indicates the offset location. As-drilled boring and cone sounding locations and ground surface elevations were surveyed by Munoz Engineering P.C. and are shown on Drawing No. B-1.

All borings were made with truck-mounted drill rigs using rotary drilling methods and a combination of casing and drilling mud to stabilize the borehole. Since available plans showed utilities in the vicinity of borings and cone probes, locations were cleared by hand augering or vacuuming to a depth of six feet. Soils samples were obtained continuously to a depth of 12 feet, below which sampling continued either continuously for the entire depth of the boring or at 5-foot intervals on center. Samples were obtained from the hand augering and vacuuming for the upper portion of each boring. Below a depth of 6 feet, samples were obtained using a 2-inch O.D. split-spoon sampler driven with a drop hammer weighing 140 pounds and falling through a height of 30 inches. The number of hammer blows required to advance the split-spoon sampler through each of four, six-inch drive intervals was recorded. The Standard Penetration Test (STP) resistance or N-value, expressed in blows per foot, is an indication of the relative density of the material sampled and is calculated by summing the blows from the second and third six-inch intervals. In some instances, where the sampler was unable to penetrate the full 24 inches due to the presence of dense soils or other obstructions, the sampler was driven until 50 blows were administered and the actual penetration of the sampler was measured and recorded. Recovered soil samples were classified in the field and placed in jars for preservation and transport to our laboratory.

Five undisturbed tube samples of organic silty clay were recovered in Borings Nos. B-3U, B-7UP, and BH-8U. Undisturbed samples were taken with 3-inch diameter fixed-piston sampler. Upon recovery, all tubes were sealed with hot wax and plastic caps. All tubes were transported to our laboratory for testing.

Piezometers were installed in the completed boreholes in Borings Nos. B-2P, B-7UP, and B-13P to monitor groundwater levels. The piezometers consist of two-inch diameter PVC standpipes extending to depths of 20 to 30 feet. The bottom 10 feet of the standpipe is slotted and surrounded by filter sand to allow free water movement without movement of soil particles. A cap flush with the surrounding ground surface was installed at each well for protection and to facilitate future readings. Following installation, we confirmed proper operation of each piezometer by performing a falling head test by filling the standpipe with water and measuring the drop in water level with time. We measured water levels during the exploration program. Following completion of the field investigation, we installed vibrating wire piezometer instrumentation in each well. We also installed a standpipe in the adjacent tidal waterway by mounting to the bulkhead and installing the same instrumentation. Approximately weekly, we

downloaded the data from the instruments and took manual readings. The instrumentation was demobilized on December 8, 2013. Piezometer construction details and water level readings are recorded on the Piezometer Records accompanying the boring logs in Appendix A. The records also include the results of the falling head tests. Groundwater levels are summarized on Plate No. 1.

The results of the cone penetrometer soundings are provided in the ConeTec Field Report, dated October 21, 2013, attached as Appendix B.

LABORATORY TESTING PROGRAM

All soil jar samples and five undisturbed samples were delivered to our in-house soils laboratory upon completion of the borings for verification of field classifications and laboratory testing. All samples were classified by our laboratory staff, using test data where appropriate, in accordance with ASTM D 2487 and the Unified Soil Classification System. Samples descriptions are given in the boring logs in Appendix A.

MRCE was provided with a Geotechnical Laboratory Test Assignment Sheet prepared by Arcadis. The following tests were performed:

Test Type	ASTM Designation	Quantity
Moisture Content	D 2216	21
Atterberg Limits	D 4318	21
Gradation, percent passing #200 sieve	D 1140	5
Gradation, sieve analysis	D 422	114
Gradation, sieve with hydrometer	D 422	24
Unconsolidated Undrained Triaxial	D 2850	4
Consolidation	D 2435	4
Specific Gravity, for consolidation	D 854	4
Organic Content	D 2974	7
Direct Shear, one normal stress	D 3080	10

In general, all tests were performed in accordance with ASTM procedures. Two modifications were implemented for gradation analyses to improve efficiency and to accommodate oversize particles. For all gradation analyses that did not include hydrometer testing the “dry preparation” practice described in ASTM D 421 was not employed. The intent of the air-drying procedure is to avoid agglomeration of soil fines into larger sized particles during oven drying, which could affect hydrometer results. We used the full ASTM D 421 “dry preparation” practice for all samples receiving hydrometer analysis. Most of the samples scheduled for gradation analysis were jar samples which contain insufficient material to perform gradation testing where particles larger than 3/8 inch are present. In those cases, we manually removed and weighed particles larger than 3/8 inch prior to sieving. Since this process was performed visually, there are some particles slightly larger than 3/8 inch in the gradation specimen. The gradation curves reflect the material sieved, and we have noted the percentage of the entire sample, by weight, that was removed and excluded as oversize from the sieve analysis specimen.

In some cases there was insufficient sample quantity to perform the required testing. In those cases, we conferred with Arcadis to determine which tests should be given higher priority. As a result, scheduled consolidated drained triaxial testing was substituted with direct shear testing.

The normal/consolidation load for direct shear testing was determined by estimating the effective overburden stress in an attempt to duplicate the in-situ relative density and state of stress.

The results of laboratory testing are summarized on Table No. 1. In general, results are provided in sequence based on boring number and sample number. Moisture contents are also shown on the boring logs. The results of Atterberg limits testing are summarized on the plasticity charts on Plates Nos. P-1 and P-2. Gradation analyses, including those with hydrometer tests, are shown on the gradation curves on Plates Nos. G-1 through G-23.

Consolidation tests were performed on four of the undisturbed samples. The consolidation test results are presented on Plates Nos. C-1 through C-4 showing plots of void ratio versus the logarithm of pressure and deflection versus the logarithm of time for select loading intervals. Preconsolidation pressures, the maximum past stresses that a particular soil has felt, ranged from about 0.9 to 1.1 tsf, 0.4 to 0.6 tsf above present effective overburden stress, indicating that Stratum O is slightly preconsolidated. Preconsolidation may have resulted from previous construction at the site including lowering of the groundwater level, perhaps for initial construction of the plant.

Compressive strengths were determined for four samples using unconsolidated undrained (UU) triaxial tests. Confining pressures were assigned by Arcadis. Compressive strengths ranged from 0.5 to 0.9 tons per square foot (tsf). Cohesion is defined as one half of the compressive strength. The ratio of cohesion to preconsolidation stress, termed c/p ratio, ranges from about 0.25 to 0.45.

The results of direct shear testing are summarized on Plates Nos. D-1 and D-2. The direct shear tests were performed under a normal stress equal to the calculated effective overburden pressure. Once the test specimen responded to the imposed normal stress, the shear test began at a rate of 0.01 inches per minute. Shearing continued until a peak and residual stress were defined, typically about 15 percent strain. The four samples at lower normal stress were from the fill stratum and are presented on Plate No. D-1. The remaining samples were from the underlying natural sand and are shown on Plate No. D-2. Based on the best fit straight line, the fill stratum samples exhibit a peak and residual angle of internal friction of 27 degrees. The sand stratum exhibits a peak angle of 33 degrees and a residual angle of 25 degrees.

SUBSURFACE CONDITIONS

Sample descriptions are provided on the boring logs in Appendix A including moisture content where obtained and the Unified Soil Classification System (USCS) symbol. Soil description guidelines and an explanation of the USCS are shown on Drawing No. GS-R. General descriptions of materials encountered in the borings are summarized below in order of increasing depth.

Stratum F – Fill. The uppermost stratum encountered in all of the borings is fill, ranging in thickness from 4 to 13.5 feet, averaging 8.2 feet. The fill consists of loose to very compact brown and tan fine to coarse sand, trace to some silt and gravel, occasionally silty, gravelly, with trace organic silty clay layers, wood, vegetation, or glass. The majority of the samples were obtained with a hand auger, but where obtained with a split spoon sampler the SPT N-values range from 4 to 68 blows per foot (bpf) and average 17 bpf. The erratic sampling resistance suggests uncontrolled fill placement and varied composition. We note that we were informed that the existing perimeter embankment contains construction debris.

Stratum O – Organic Silty Clay with Peat. In 11 of 17 borings (along the eastern and southern edges of the site) the fill is underlain by a layer of recent organic marine deposits ranging from 0.3 to 15 feet thick, averaging 7.4 feet thick. The organic layer consists of soft to medium gray organic silty clay, with peat, trace shells and fine sand. It occasionally contains layers of sand or grades into the sand stratum below, which accounts for some of the higher SPT resistance. N-values range from weight of hammer to 13 bpf, averaging 5 bpf. Natural water content ranges from 35% to 267%, averaging 112%, the higher values indicating the presence of peat.

Stratum S – Sand. The above-described materials are underlain by a sand stratum in which all of the borings were terminated after penetrations of 3.1 to 48 feet. Stratum S consists of medium compact to very compact tan, brown, orange, gray or green brown fine to coarse sand, with trace to some gravel, trace to some silt, and occasionally gravelly. Some samples contain trace amounts of organic silt or vegetation at the contact with the overlying Stratum O. This stratum often has some silt or clay, or trace layers of gray silty clay or silt at the contact with, or near the elevation of Stratum C, interbedded within the sand stratum and described below. SPT N-values in the sand above Stratum C range from 4 bpf to 109 bpf, with an average of 29 bpf. The sand below Stratum C has N-values ranging from 10 to 148 bpf, with an average of 68 bpf. The increase in compactness generally occurs between Els. -20 and -33. The lower, more compact sand is the older outwash deposited by the Ronkonkoma glacial advance, while the upper sand is the outwash deposited by the later Harbor Hill advance.

Stratum C – Clay. In two of the borings in the NW corner of the site, a thin, but distinctive layer of gray silty clay is present within Stratum S between Els. -23 and -25. Water contents obtained in two samples of this layer are 31% and 39%, and N-values are approximately 8 to 10 bpf. Stratum C ranges in thickness from 0.5 to 0.7 feet, but the surrounding sand stratum often contains layers of silty clay and silt at a similar elevation, as shown in the cone penetration soundings. This layer is what remains of the inter-stadial marine Wantagh Formation, also called the “20 Foot Clay”.

Groundwater. Stabilized groundwater levels were not measured in boreholes since drilling mud was used to stabilize the borehole. The bentonite based drilling fluid coats the borehole perimeter and therefore the mud level recorded is not representative of a stable groundwater level. Piezometers were installed without the use of drilling mud. Groundwater levels were measured in the piezometers during the field investigation by our inspection engineer. Between November 2 and December 7, 2013 data loggers were installed to continuously monitor water levels in the three piezometers and in the standpipe in the adjacent tidal waterway. Water level readings are summarized on Plate No. 1.

During the time of measurement the daily tidal range varied from about 3 to 6 feet, ranging between El. +4 and -3.5. The piezometers in Borings Nos. B-2P and B-7UP show a clear connection with tidal variations. Boring No. B-2P exhibited a daily variation of less than one foot and ranged from El. +0.5 to El. -2. Boring No. B-7UP, closer to the open waterway, exhibited a daily variation of about 1 to 3 feet, ranging from El. +1 to El. -2. Boring No. B-13P, near the Aeration Tanks, does not exhibit a tidal variation, and ranges from El. -4 to -7. This piezometer, after reading at El. -4 consistently for a week, showed an abrupt drop on November 12, followed by a steep rise and fall 2 weeks later. Based on the lower water levels and abrupt changes, there appears to be an artificial influence at this location, possibly due to nearby plant facilities.

DISCUSSION

The subsurface investigation, planned by Arcadis and described herein, has defined subsurface conditions along the perimeter of the plant. Stratification is shown on the borings logs and is supplemented by the records of the cone penetration soundings. Laboratory testing results have been summarized.

If you have any questions regarding this data report, please contact us.

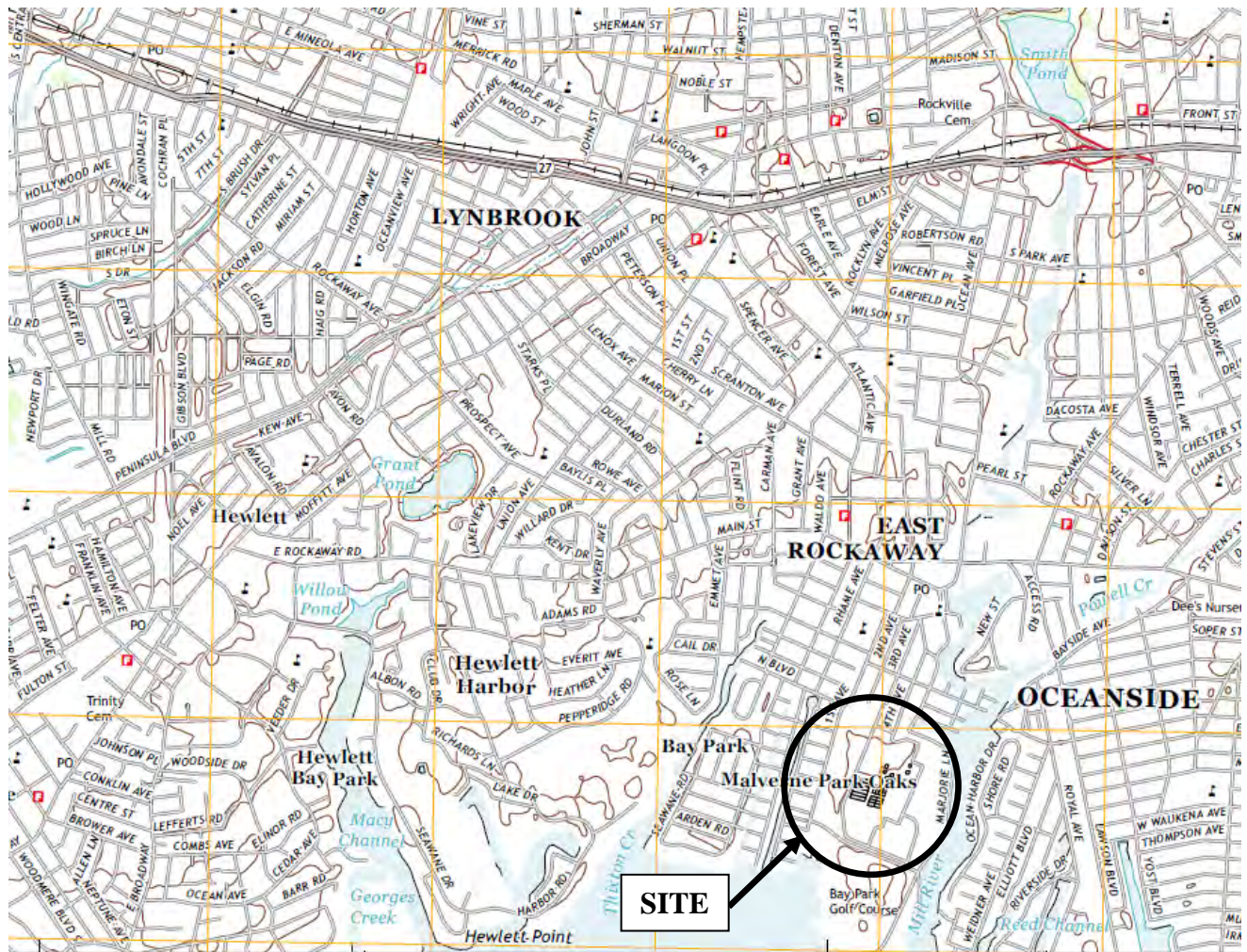
Very truly yours,

MUESER RUTLEDGE CONSULTING ENGINEERS

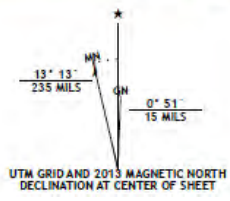
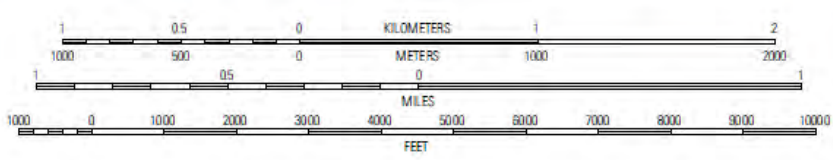
By: Robert T. Wisniewski
Robert T. Wisniewski, PE

By: Francis J. Arland
Francis J. Arland, PE

EXHIBITS



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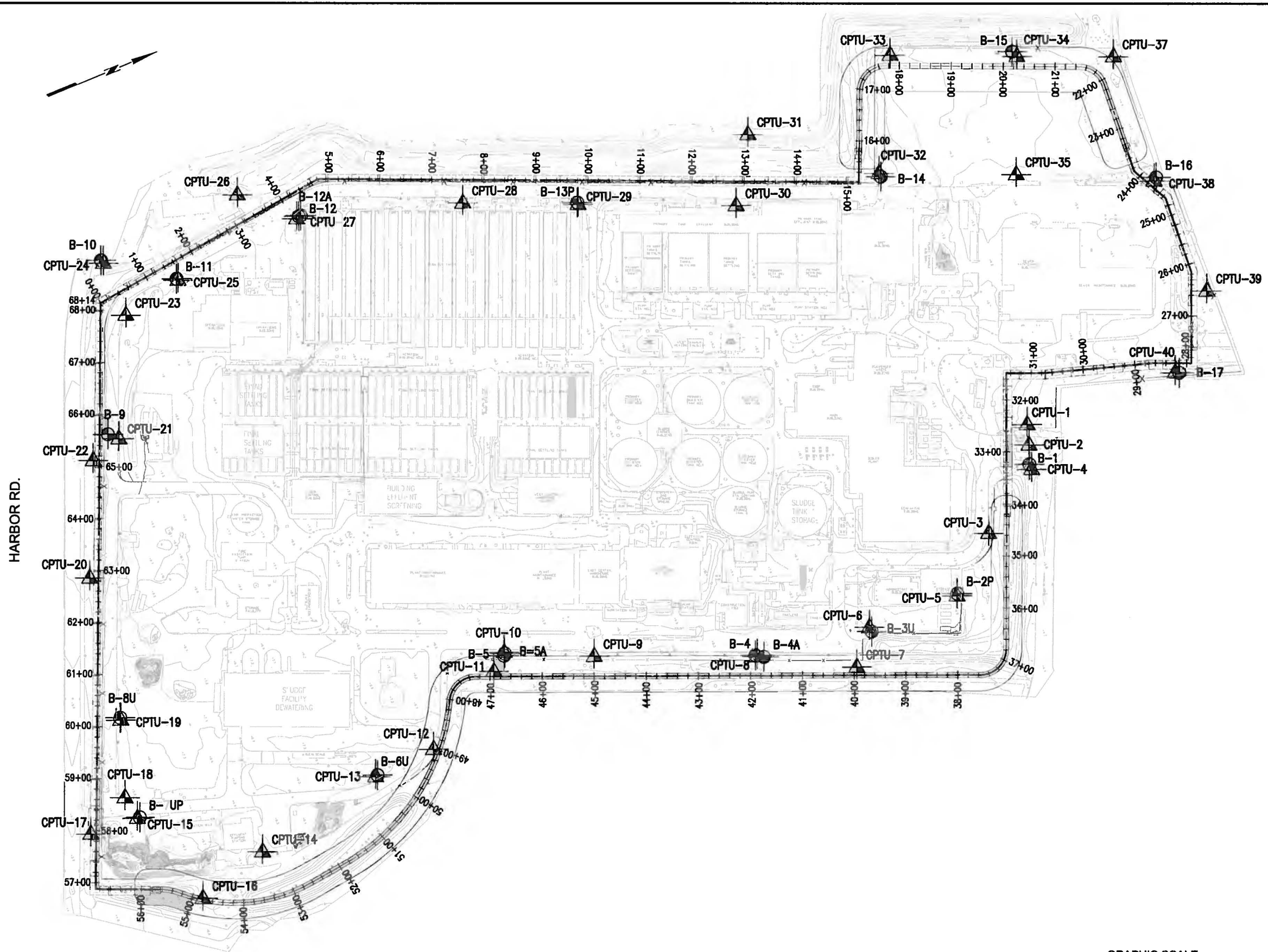


SOURCE:

USGS TOPOGRAPHIC MAP, LYNBROOK QUADRANGLE, NEW YORK, DATED 2013.

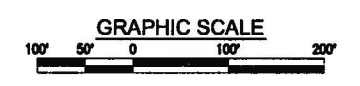
BAY PARK SEWAGE TREATMENT PLANT PERIMETER FLOOD PROTECTION			
BAY PARK		NEW YORK	
BAY PARK SEWAGE TREATMENT PLANT			
BAY PARK		NEW YORK	
MUESER RUTLEDGE CONSULTING ENGINEERS			
225 WEST 34 TH STREET, NEW YORK, NY 10122			
SCALE	MADE BY: PED CH'KD BY:	DATE: 01-02-14 DATE:	FILE NO. 12047
TOPOGRAPHIC MAP			FIGURE NO. 1

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- NOTES:**
1. BASE PLAN IS ELECTRONIC FILE PROVIDED ARCADIS-US.
 2. BORING AND CPTU LOCATIONS AND GROUND SURFACE ELEVATIONS WERE SURVEYED BY MUNOZ ENGINEERING P.C. AS SHOWN ON DRAWING NO. BP-1 DATED 10-23-2013.
 3. BORINGS NOS. B-1 THROUGH B-17 WERE MADE BY WARREN GEORGE, INC. BETWEEN OCTOBER 4 AND 23, 2013 UNDER CONTINUOUS INSPECTION BY MUESER RUTLEDGE CONSULTING ENGINEERS (MRCE).
 4. CPTU SOUNDINGS NOS. CPTU-1 THROUGH CPTU-35 AND CPTU-37 THROUGH CPTU-40 WERE MADE BY CONETEC, INC. BETWEEN OCTOBER 7 AND 17, 2013.

- LEGEND:**
- B-1 - BORING MADE IN 2013.
 - U - INDICATES UNDISTURBED SAMPLING.
 - P - INDICATES PIEZOMETER INSTALLATION.
 - A - INDICATES OFFSET FROM ORIGINAL LOCATION.
 - CPTU-1 - PIEZOCONE SOUNDING MADE IN 2013.



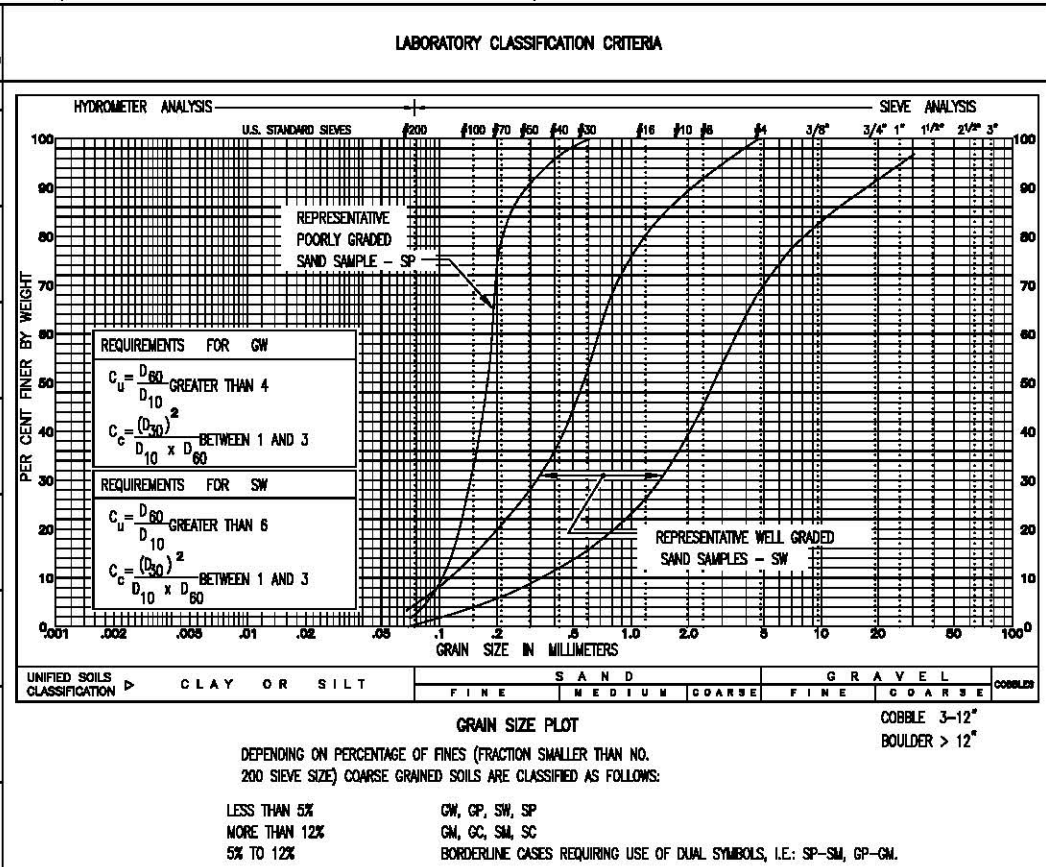
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THIS DRAWING IS THE PROPERTY OF MUESER RUTLEDGE CONSULTING ENGINEERS (MRCE), IS FURNISHED SUBJECT TO RETURN ON DEMAND AND ON THE CONDITION THAT THE INFORMATION AND TECHNOLOGY EMBODIED HEREIN SHALL NOT BE DISCLOSED OR USED AND THE DRAWING SHALL NOT BE REPRODUCED OR COPIED IN WHOLE OR IN PART EXCEPT AS PREVIOUSLY AUTHORIZED IN WRITING BY MRCE. ANY PERSON WHO MAY RECEIVE OR OBSERVE THIS DRAWING WILL BE HELD STRICTLY LIABLE FOR ANY VIOLATION OF THIS NOTICE, WHETHER WILLFUL OR NEGLIGENT.

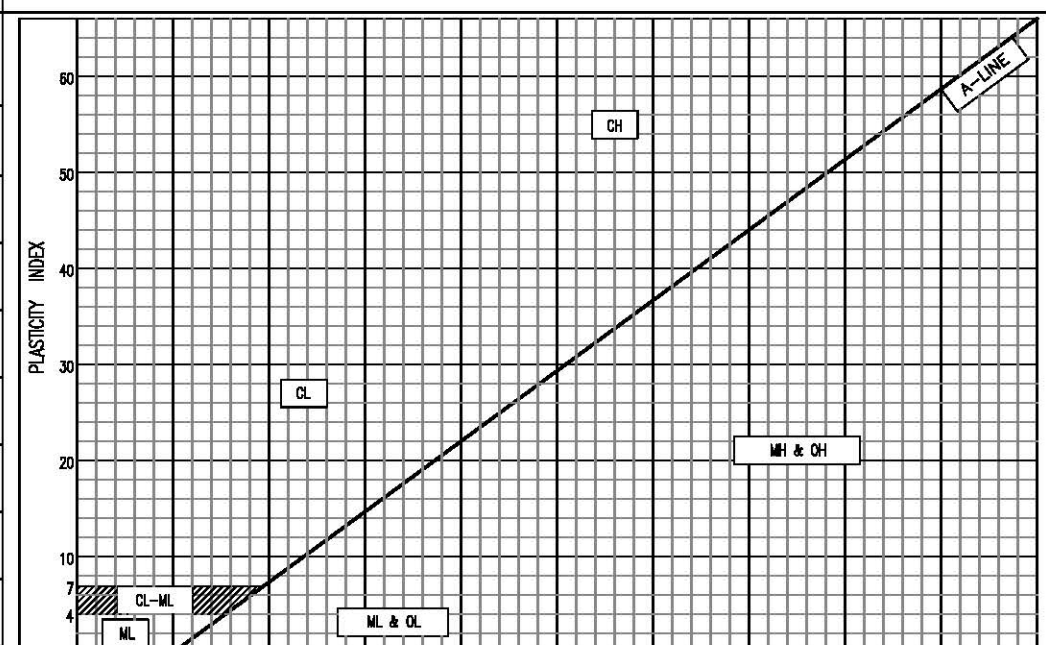
REV.	DATE	BY	DESCRIPTION
BAY PARK SEWAGE TREATMENT PLANT PERIMETER FLOOD PROTECTION			
BAY PARK		NEW YORK	
ARCADIS - U.S.			
LONG ISLAND CITY		NEW YORK	
MUESER RUTLEDGE CONSULTING ENGINEERS			
14 PENN PLAZA - 225 W. 34TH STREET, NY, NY 10122			
SCALE	MADE BY: E.C.	DATE: 01-03-2014	FILE NUMBER
GRAPHIC	CHKD BY: R.T.W.	DATE: 01-03-2014	12047
BORING AND CPTU LOCATION PLAN			B-1

UNIFIED SOIL CLASSIFICATION (INCLUDING IDENTIFICATION AND DESCRIPTION)

MAJOR DIVISIONS	GROUP SYMBOLS	TYPICAL NAMES	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 (FOR VISUAL CLASSIFICATION, THE 1/4 -IN. SIZE MAY BE USED AS EQUIVALENT TO THE NO. 4 SIEVE SIZE)	GRAVELS MORE THAN HALF OF COARSE FRACTION IS LARGER THAN NO. 4 SIEVE SIZE	GW	WELL GRADED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES.	
		GP	POORLY GRADED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES.	
		GM	SILTY GRAVELS, GRAVEL-SAND-SILT-MIXTURES.	
		GC	CLAYEY GRAVELS, GRAVEL-SAND-CLAY MIXTURES.	
	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.
			SP	POORLY GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES.
		SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)	SM	SILTY SANDS, SAND-SILT-MIXTURES.
			SC	CLAYEY SANDS, SAND-CLAY MIXTURES.



FINE-GRAINED SOILS MORE THAN HALF OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE IS ABOUT THE SMALLEST PARTICLE VISIBLE TO THE NAKED EYE	SILTS AND CLAYS LIQUID LIMIT IS LESS THAN 50	SILTS AND CLAYS LIQUID LIMIT IS GREATER THAN 50	IDENTIFICATION PROCEDURES ON FRACTION SMALLER THAN NO. 40 SIEVE SIZE				
			DRY STRENGTH (CRUSHING CHARACTERISTICS)	DILATANCY (REACTION TO SHAKING)	TOUGHNESS (CONSISTENCY NEAR PL)		
MORE THAN HALF OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE IS ABOUT THE SMALLEST PARTICLE VISIBLE TO THE NAKED EYE	SILTS AND CLAYS LIQUID LIMIT IS LESS THAN 50	SILTS AND CLAYS LIQUID LIMIT IS GREATER 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	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	PL	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.

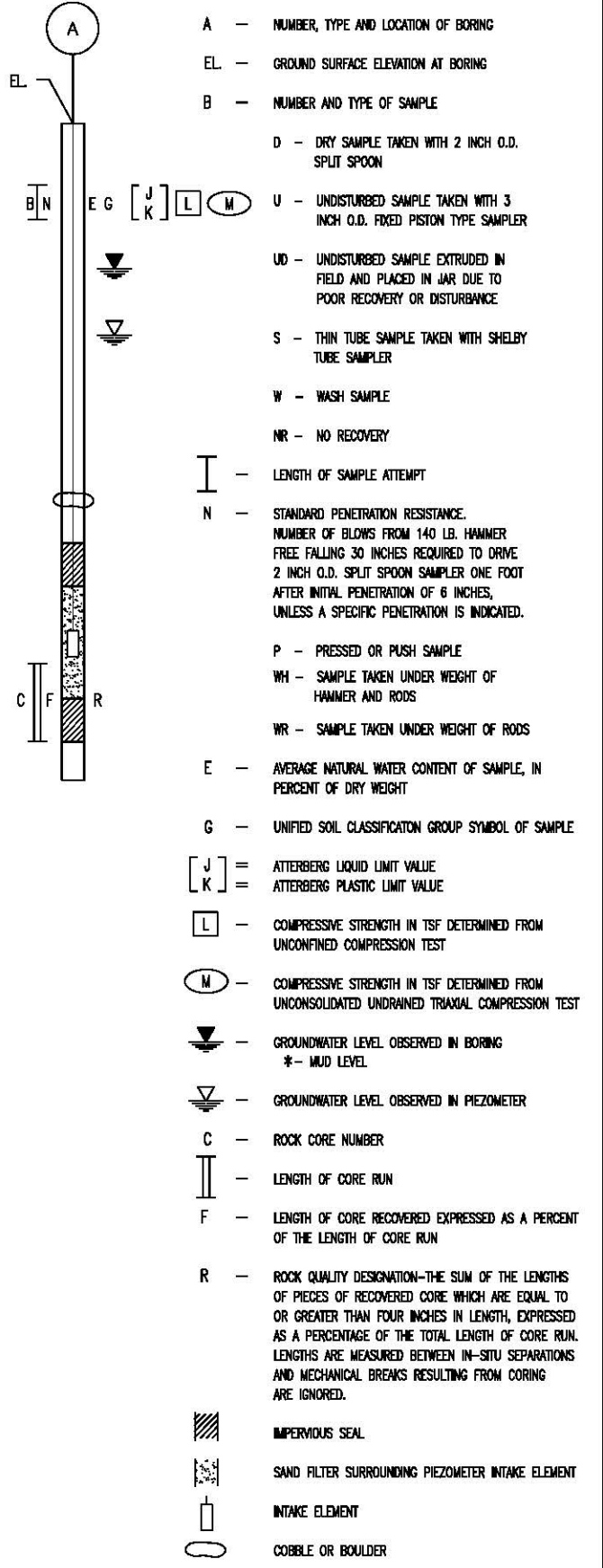
TERMINOLOGY USED IN MRCE SOIL DESCRIPTIONS

DEGREE OF COMPACTION FOR NON-PLASTIC SOIL		CONSISTENCY OF CLAY AND CLAYEY SILT ⁺			DESCRIPTION OF CONSTITUENT PERCENTAGES AS USED IN SOIL SAMPLE CLASSIFICATIONS
DEGREE OF COMPACTION	BLOWS* PER FOOT	CONSISTENCY	UNCONFINED COMPRESSIVE STRENGTH (TSF)	IDENTIFICATION CHARACTERISTICS	
LOOSE	0 TO 10	SOFT	LESS THAN 0.5	EASILY REMOLDED WITH SLIGHT FINGER PRESSURE	1% TO 12% - "TRACE"
MEDIUM COMPACT	11 TO 29	MEDIUM	0.5 TO 1.0	REQUIRES SUBSTANTIAL PRESSURE FOR REMOLDING	13% TO 30% - "SOME"
COMPACT	30 TO 50	STIFF	1.0 TO 4.0	DIFFICULT TO REMOLD WITH FINGERS	31% TO 49% - ADJECTIVE FORM OF SOIL GROUP (EG. SANDY)
VERY COMPACT	GREATER THAN 50	HARD	GREATER THAN 4.0	CANNOT BE REMOLDED WITH FINGERS	EQUAL AMOUNT - "AND" (EG. SAND AND GRAVEL)

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

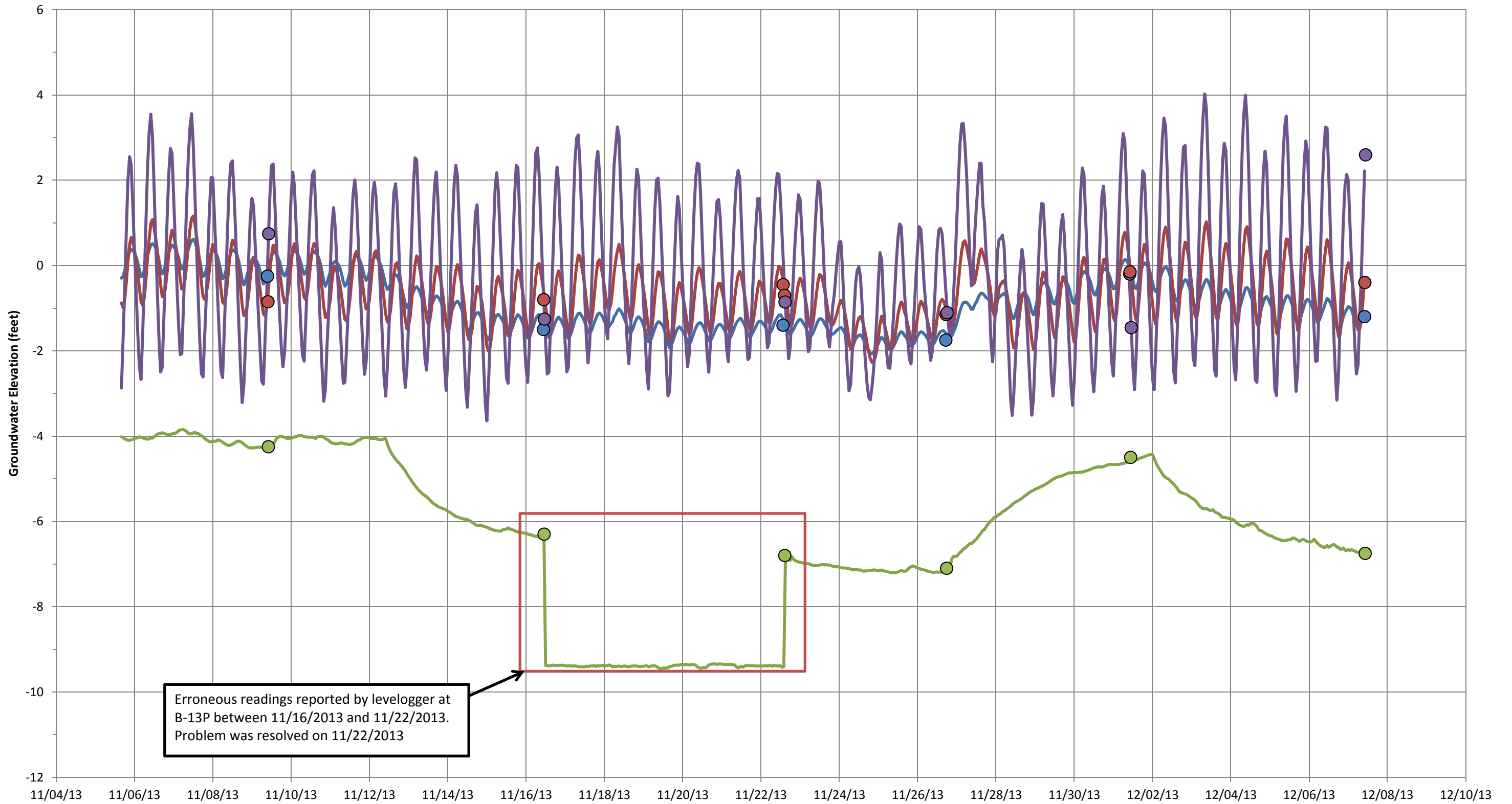
⁺ NONPLASTIC SILTS ARE DESCRIBED USING DEGREE OF COMPACTION AS PRESENTED FOR NON-PLASTIC SOIL.

BORING LEGEND



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

Plot of Groundwater Levels



— B-2P — B-7UP — B-13P — Canal (Depth from top of PVC) ● B-2P Manual Readings ● B-7UP Manual Readings ● B-13P Manual Readings ● Canal (Depth from top of PVC) Manual Readings