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SUBSURFACE INVESTIGATION
PROPOSED BOROUGH-BASED JAIL
125 WHITE STREET
NEW YORK, NEW YORK

Submitted To:

TRC Engineers Inc.

1430 Broadway, 10th Floor
New York, NY 10018

October 20, 2021

W.O. 10285.01-REV 1

Submitted By:

Tectonic Engineering Consultants, Geologists & Land Surveyors, D.P.C.

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TRC Engineers Inc.
1430 Broadway, 10th Floor
New York, NY 10018

Attention: Ms. Kirsten Meyers

October 20, 2021

RE: W.O. 10285.01-REV 1
SUBSURFACE INVESTIGATION
PROPOSED BOROUGH-BASED JAIL
125 WHITE STREET
NEW YORK, NEW YORK

Dear Ms. Meyers;

Tectonic Engineering Consultants, Geologists & Land Surveyors, D.P.C. has completed subsurface investigation for the proposed Borough Based Jail building to be constructed at the existing Manhattan Detention Complex and the NYC Criminal Courts Building, at 120 and 125 White Street, New York, New York. The purpose of the investigation was to document the subsurface conditions in the area of a proposed new high-rise building. This report presents our findings.

We appreciate this opportunity to assist you with this project. If you have any questions, please do not hesitate to contact the undersigned.

Sincerely,

TECTONIC ENGINEERING CONSULTANTS, GEOLOGISTS & LAND SURVEYORS, D.P.C.

STATE OF NEW YORK
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SUBSURFACE INVESTIGATION
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125 WHITE STREET
NEW YORK, NEW YORK

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1.0 INTRODUCTION

Tectonic Engineering Consultants, Geologists & Land Surveyors, D.P.C. (Tectonic) has completed a subsurface investigation for the proposed Borough Based Jail building to be constructed at the existing Manhattan Detention Complex and the NYC Criminal Courts Building, at 120 and 125 White Street, New York, New York. The purpose of the investigation was to document the subsurface conditions in the area of a proposed new high-rise building. This report presents our findings.

2.0 SCOPE OF SERVICES

The following services were performed for TRC Engineers, Inc., hereafter referred to as the Client:

- Review information about the proposed construction and previous subsurface investigations, provided by the Client; and review publicly available information about the site and the geologic setting.
- Observe the drilling and sampling of eighteen (18) geotechnical test borings, performed by the Client's drilling subcontractor, to depths as great as 120 feet below existing grade. See the following sections for details about these borings.
- Observe the installation of five (5) groundwater monitoring wells within borings, performed by the Client's drilling subcontractor. See the following sections for details about the groundwater monitoring wells.
- Provide field inspection by geotechnical engineers and engineering geologists, working under the purview of a New York State licensed Professional Engineer, to log and classify all soil samples, and to log the installation of the groundwater monitoring wells and record groundwater levels.
- Perform laboratory testing on soil and rock samples, selected to help in the field classifications and to evaluate the engineering characteristics of the soils and bedrock underlying the site.
- Perform limited geotechnical engineering analyses of the subsurface conditions as they relate to the design and construction of foundations and below grade walls for the proposed building.
- Prepare this subsurface investigation report, for the design and construction of the proposed new jail building.

3.0 SITE AND PROJECT DESCRIPTION

The proposed project is to consist of the construction of one or two high-rise jail buildings that will be located at 120 and 125 White Street, New York, New York. It is anticipated that the building(s) will occupy all of Block 198 (Lot 1) and the location of the northern-most building on Block 167 (Lot 1). At the time that this report was prepared, it was Tectonic's understanding that one building may span both properties, or that two separate buildings might be built.

The site is bound by Centre Street, on the northwest; Baxter Street, on the southeast; and by existing high-rise buildings on the northeast and southwest. At the time of the subsurface investigation, the site was occupied by the Manhattan Detention Complex and the NYC Criminal Courts Building. The Oasis website (http://www.oasisnyc.net/map.aspx) reports that these buildings were built in 1939 and 1985. The existing buildings have 10 floors and 14 floors; however, some portions of the building at 120 White Street are limited to one- to two-stories.

Historic maps of the site show that the site is located where a pond (Collect Pond) and associated wetlands had once existed and that was later in-filled during the development of lower Manhattan (see the Site History and Geology section of the Mueser Rutledge Consulting Engineers' {MRCE's} preliminary report, in Appendix III). Later maps show that the site has been occupied by various structures since at least 1879. Subways also reportedly are located beneath Centre Street, with some tracks turning toward the east, beneath the northern corner of Block 168, to run below Walker Street. The available drawings also show that the subway extends approximately 26 feet below the curb elevation. Based on the limited information available, we estimate that the foundation elevation for the subway is roughly at elevation -13 feet.

Ground surface elevations (provided by the Client) around the buildings range from approximately +13 to +21 feet. Available information also indicates that both existing building include one basement level, with finished floor elevations of +1 and -3 feet. A datum was not provided with the elevation data, but it is our understanding that the datum is the North American Vertical Datum of 1988 (NAVD88), as required by the New York City Building Code (Code).

The purpose of the subsurface investigation and this report is to provide the design-builder with information to use in preparation of the final design and construction documents. Based on MRCE's preliminary report, it is anticipated that the building(s) may be as tall as 16-stories; however, the final height of the building(s) was not provided to Tectonic. It is also anticipated that the building(s) will have two (2) basements with an estimated basement finished floor elevation of approximately -13.5 feet. This approximate basement elevation corresponds to estimated bearing elevations of approximately -15 to -17 feet (if the building were to be constructed upon shallow foundations). It is also our understanding that the planned bottom of excavation elevation will be -18.5 feet.

4.0 SUBSURFACE INVESTIGATION

The subsurface investigation consisted of drilling, sampling, and logging of eighteen (18) test borings, including borings B-3M, B-4M, B-7M, B-9M, B-11M, B-12M/B-12M(A), B-13M, B-14M, B-16M, B-19M, B-21M, B-22M, B-23M, B-24M, B-27M, B-29M, B-31M, B-33M and B-34M. The approximate locations of the borings are shown on the attached *Boring, Groundwater Monitoring Well Plan, With Approximate Bedrock Elevations*, Figure 1.

The subsurface investigation was performed in two phases. In the first phase, the drillers cored through the basement floor slab and then hand-drilled the borings to depths ranging from 1.25 to 6 feet below basement finished floor elevation. This work was performed between March 9, 2020 and March 13, 2020, when work was shut-down due to the COVID-19 pandemic. At that time, the Client informed Tectonic that all work (included on-site work, as well as laboratory testing and engineering analyses) was to halt until further notice.

The subsurface investigation was resumed on April 19, 2021 and continued to August 5, 2021, when the investigation was completed. It should be noted that, as suggested by the boring numbers given in the previous paragraph, at least 34 borings had originally been planned for this site: however, we have been informed that AECOM-Hill and the DDC had elected to reduce the number of borings, when work resumed in 2021. This included their election to not extend borings B-14M, B-21M and B-23M past the depths of hand-clearing (6 feet). The logs for these three borings are included at the end of the boring logs, in Appendix I.

The borings for the subsurface investigation were drilled by Aarco Environmental Services, Incorporated (AARCO), using a limited access drill rig within the buildings, and truck- and ATV-mounted drill rigs outside the buildings. As previously noted, each boring was initially advanced to a depth of 5 to 6 feet by coring through the floor slab or sidewalk, then by hand-excavating, to clear potential underground utilities. The borings that were completed after April 2021 were advanced using 4-inch and 3-inch inside-diameter casing, a 3 $^{7}/_{8}$-inch and/or 2$^{7}/_{8}$-inch diameter tri-cone drill bit, and mud rotary drilling methods.

Standard Penetration Testing (SPT) and split-spoon sampling was generally performed continuously within the top 20 feet of each boring, and at intervals ranging from 2 feet to 5 feet (at greater depths) within the soil, depending upon the conditions encountered. The SPT and split spoon sampling was performed in accordance with the requirements of ASTM Standard D1586 *"Standard Test Method for Penetration Test and Split-Barrel*

Sampling of Soils". SPTs performed within the buildings (with the limited access drill rig) were performed using a donut hammer, while an automatic hammer was used within borings drilled outside the buildings (with the truck- or ATV-mounted drill rigs). The field SPT N-values were recorded for each penetration test and samples of the soils obtained during the investigation were collected by Tectonic's engineers and geologists, retained in glass jars, and saved for potential future testing at our materials testing laboratory.

A 2-inch inside diameter (NQ2) rock core barrel, equipped with a diamond-impregnated bit, was used whenever an obstruction, such as a boulder, was encountered within a boring and to core bedrock. Once a hole was cut through the obstruction with the core barrel, it was then reamed out using the tri-cone bit and the boring was continued. Once bedrock was encountered, at least five (5) feet of rock core was collected, saved in a wooden box, and shipped to our materials testing lab, for future testing and storage.

It is also noted that the Client performed environmental measurements of the split spoon samples. It is our understanding that a complete listing of these readings will be provided by the Client within their separate report for this project.

In addition to the borings noted above, five (5) groundwater monitoring wells (designated MW-1 to MW-5) were installed within borings B-31M, B-19M, B-9M, B-33M and B-7M, respectively, once the borings were completed. In each case, the boring was partially backfilled to the planned well depth and the monitoring well was then installed. Each well consists of 15 to 30 feet of 2-inch PVC well pipe, with 10 feet of slotted section at the bottom of the well, and solid riser pipe extending from the slotted section to the basement floor or ground surface. After the well pipe was installed, No. 2 well sand was placed around the pipe to a height of at least 2 feet above the slotted section. A Bentonite seal was placed above the well sand, and the remainder of the anulus around the well pipe was backfilled with grout. Each well pipe was capped with a lockable plug and a cover was installed into the basement floor slabs or pavement to protect the well. Once each well was installed, it was left for at least 3 days (without bailing), to allow the biodegradable drilling mud to decompose and to allow the water level within each well to stabilize, before water level measurements were taken.

Geotechnical engineers and engineering geologists observed the subsurface investigation and monitoring well installation, and prepared logs of the subsurface conditions under the direction of a Professional Engineer licensed in New York State. The materials encountered were classified in accordance with the New York City

Building Code (Code), the Burmister Soil Classification System, and the Unified Soil Classification System (ASTM D2488). Note, the Code classification numbers are included herein because the Code requires them, the other two systems are incorporated into the boring logs and this report, because it is Tectonic's standard practice. The results of the subsurface investigation are summarized in Section 6, below, and copies of the boring and groundwater monitoring well logs are included in Appendix I.

5.0 LABORATORY TESTING

Laboratory testing was performed on soil samples selected to help identify the field classifications of the soils, and to assist in evaluating the engineering properties of the soils encountered within the borings. Testing included the following:

Table 5.0.1 Laboratory Tests		
Quantity	Description	ASTM Standard
55	Grain Size Distribution	D6913
4	Hydrometer Tests (of Fine-Grained Soils)	D422
7	Atterberg Limits Determination (of Fine-Grained Soils)	D4318
12	Organic Content (Organic Soils)	D2974
3	pH Measurement (Organic Soils)	D4972
28	Natural Moisture Content	D2216
16	Point Load Strength Index of Rock	D5731

The results of the laboratory testing are included in Appendix II, and have been incorporated into the boring logs and in the subsurface conditions described in the following section.

6.0 SUBSURFACE CONDITIONS

The results of our subsurface investigation indicate that, beneath approximately 4 to 15 inches of concrete floor slab or pavement (asphalt, or pavers over concrete), the site is underlain by existing fill and native soils (including shallow pond/wetland deposits – peat, organic silt, and non-organic silts and clay), sands, gravels, decomposed bedrock and bedrock. Generalized descriptions of the encountered subsurface conditions are provided below. More detailed descriptions are provided on the boring logs included in Appendix I.

As noted in Section 4, the drill rigs used for this subsurface investigation were equipped with donut and automatic hammers. Donut hammers are generally less efficient than the standard safety hammer, while automatic hammers are more efficient, and therefore, impart more energy to the split spoon than a safety

hammer. Because the energy from a safety hammer is typically the standard used in most geotechnical analyses, typical energy correction factors have been applied to convert the field N-values (reported on the boring logs), to those of a safety hammer (N_{60}-values). An energy correction of 0.75 has been used for the SPTs conducted with a donut hammer, while an energy correction of 1.3 has been used for the SPTs performed with an automatic hammer. Both the field N-values and the corrected N_{60}-values are presented in the following sub-sections.

6.1 Fill

Existing fill was encountered in all of the borings drilled at the site, except boring B-28M, where the presence of fill could not be readily identified. Fill was not noted in boring B-7M; however, this boring was performed at a previously drilled environmental boring (SB-03) and geotechnical sampling was not performed above a depth of 20 feet (EL = -19 feet). Where encountered, fill extends to elevations as shallow as EL +4.5 feet, in boring B-34M, and to as deep as EL -20 feet, in boring B-4M, and -23 feet in Yu's preliminary boring B-1. It should be noted, however, that the fill depths have been conservatively estimated to extend to the top of the first sample of native soil collected from each boring. It should also be noted that the presence of fill was judged by the occasional presence of debris, and/or by other characteristics, such as unusual or mixed colors, that led our field representatives to judge that a soil is fill.

The fill commonly ranges in color from brown to gray, with shades of red and black. The fill largely consists of a mix of sands and gravels, with less than 20 percent silt. In addition to natural soil particles, the fill also was frequently found to contain fragments of brick and wood, as well as occasional concrete and asphalt, and one steel bolt. The existing fill typically has the Unified Soil Classification (USCS) designations of SP, SW, SP-SM, SW-SM, SM, GP, GP-GM, and to a lesser extent: GM, GC, Pt and ML, and has a Code classification of Class 7. Based on the occasional presence of debris and the widely varying N-values measured within the existing fill (see below), the existing fill should be considered to be uncontrolled fill.

Field SPT N-values within the uncontrolled fill range from 2 to 67 blows per foot (bpf) and there were four splits spoon refusals, which are anticipated to have occurred when over-sized material (cobbles, boulders or debris) was encountered within the fill. When corrected, the N_{60}-values within the fill

(excluding the split spoon refusals) range from 3 bpf to 50 bpf, with an average N_{60}-value of 21 bpf. This indicates that the fill ranges from loose to very dense and is generally in a medium dense condition. However, the presence of brick and other debris can abnormally inflate some of the N-values, and therefore, the fill might be somewhat less dense than the field N-values would make it appear.

6.2 Native Soils

The native soils underlying the fill can generally be divided into two deposits. The first is lacustrine deposits from the former Collect Pond; while the second deposit is layered sands and gravels, with occasional isolated pockets of silt. Each of these will be described and discussed in the following paragraphs.

The lacustrine Collect Pond deposits include peat, organic silts and organic clays, as well as layers of silt and clay, with little or no organic material. These soils were encountered in borings B-3M, B-4M, B-5M, B-9M, B-11M, B-12M, B-13M and B-19M, as well as Yu Associates borings B-1 and B-2, and MRCE's boring MR-1C-M, which were drilled during preliminary investigations. Figure 2, the *Boring, Groundwater Monitoring Well and Fence Location Plan, With Approximate Bottom of Collect Pond Deposits Elevations*, identifies the borings where the Collect Pond deposits were encountered, by a note next to each boring location {e.g.: (CP -43)}, which indicates the approximate elevation of the bottom of the Collect Pond deposits. It should be noted that Figure 2 also shows three additional borings B-27M, Yu Associates boring B-3 (identified on the drawing as YB-3) and MRCE's boring MR-2P-M, which encountered a lean clay deposit immediately below the fill. Given that the bottom of this layer is significantly shallower that the main Collect Pond deposits (Elevations -7 to -8, vs. Elevations -29 to -51), they've been distinguished from the others with a question mark on the drawing, {e.g.: (CP? -8)}. Based upon the planned bottom of excavation elevation (EL = -18.5 feet), it is expected that most of the Collect Pond deposits will remain below the proposed new building's basement.

Laboratory testing of the Collect Pond deposits show that the peat consists of approximately 14 to 76 percent organic matter – indicating that some of the peat is sandy, while other samples are largely made up of plant fibers. Moisture contents within the peat range from 104 to 412 percent, with the higher moisture contents measured in samples with higher organic contents. Furthermore, pH tests

were performed on three (3) peat samples, which measured the pH to range from 4.6 to 6.2, indicating that the peat is mildly acidic, but has a relatively low potential for being corrosive.

Laboratory testing was also performed on the silts and clays, which found that the organic contents of these soils range from 1 to 83 percent, with moisture contents ranging from 24 to 583 percent. As with the peat, the moisture contents of the silts and clays appear to be directly correlated to their organic contents. Several Atterberg limits determinations were also performed on some of the silts and clays, and they were found to have plasticity indices that range from 4 to 14 percent.

Field N-values within the lacustrine soils range from 0 to 63 bpf, with corrected N_{60}-values ranging from 0 to 47 bpf. On average, the Collect Pond deposits have an N_{60}-value of 9 bpf, indicating that the soils range from very soft to hard, and are typically medium stiff. It should also be noted that the portions of these deposits that extend below Elevation -40 feet have N-values of 0 to 6 bpf, indicating that the Collect Pond deposits that might remain below the basement floor have an undrained shear strength of approximately 200 to 750 pounds per square foot psf. These estimates of the undrained shear strength are corroborated by a few pocket penetrometer tests that were performed on these soils. They measured unconfined compressive strengths typically ranging from 0.25 to 0.5 tons per square foot (500 to 1,000 psf). Collectively, mineral clays and silts, the organic clays, organic silts, and the peat have USCS designations of CL, CL-ML, ML, OL and Pt, and have Code classifications of Class 6, 4b, and 5b, depending upon the organic content, soil type and N-value.

It should be noted that it was our understanding, during the subsurface investigation, that the fine-grained Collect Pond soils described above would be mostly, if not completely, removed during building excavation. Subsequently undisturbed sampling and laboratory strength testing was not performed on these materials. Later information revealed that the building will largely be located on or above these materials. Subsequently, if the design-build team needs additional strength information about these soils, additional borings will need to be conducted to collect undisturbed samples of the fine-grained Collect Pond deposits, and the design-build team will have to perform additional laboratory testing on the collected samples.

The layered sands and gravels encountered either below the Collect Pond deposits, or directly beneath the fill, generally consist of layered deposits of relatively clean sand and silty sand, with frequent layers of gravel, and occasionally layers of sandy silt. It should be noted that the preliminary subsurface investigations identified some of these soils as glacial till; however, we could not see any features within the layered sands and gravels that would fit typical glacial till descriptions, and therefore the term glacial till is not used in our soil descriptions.

Burmister soil classification system descriptions of the layered sands and gravels range from red-brown fine SAND, trace Silt (USCS designation: SP); to brown-green-pink coarse to fine Gravel and coarse to fine Sand, little Silt (USCS designation: GW-GM). A typical description of the occasional silt layers is brown SILT, little f Sand (USCS designation: ML). Overall, the layered sands and gravels, with occasional silt layers, have USCS designations of GP, GP-GM, GW-GM, SP, SW, SP-SM, SW-SM and ML. Code classifications for these soils include 2a, 2b, 3a, 3b, 5a, 5b and 6, depending upon the primary soil constituent and the N-value.

It should also be noted that occasional layers that appear to be dominated by cobbles and boulders were encountered in half of the borings. These were encountered within borings B-3M, B-4M, B-5M, B-16M, B-18M, B-24M, B-31M, B-33M and B-34M.

Excluding split spoon refusals that largely occurred on cobbles and boulders, field N-values within the layered sands, gravels and occasional silts, range from 5 to 114 bpf, with corrected N_{60}-values ranging from 4 to 125 bpf. However, the loose samples are rare, with only 10 SPTs measuring an N_{60}-value less than 10 bpf. The native sands and gravels have an average N_{60}-values of 30 bpf (excluding the split spoon refusals), indicating that the native sands and gravels are typically in a medium dense condition.

6.3 Bedrock

A review of the *USGS Bedrock and Engineering Geologic Maps of New York County, and Parts of Kings and Queens Counties, New York, and Parts of Bergen and Hudson Counties, New Jersey* (1994) show that the underlying bedrock at the site is Manhattan Schist, consisting of "Gray medium- to coarse-grained, layered sillimanite – muscovite – biotite – kyanite schist and gneiss interlayered with layered

tourmaline – garnet – plagioclase - biotite quartz schist and gneiss, with black amphibolite layers 3 ft or more thick." Rock cores performed at each of the borings encountered bedrock that is consistent with this description. Overall, the bedrock can be described as gray moderately weathered to fresh, moderately to slightly fractured, coarse to fine grained, moderately hard to hard Schist, of very good to very poor quality, with Code classifications of Class 1a to Class 1d.

More specifically, approximately 2 to 16 feet of Soft Rock (Class 1d) was encountered in eleven (11) out of the eighteen (18) borings drilled for this investigation, before more-competent bedrock was encountered. Of the rock cores collected from the top 5 to 10 feet of bedrock, the rock quality designation (RQD) ranges from 0 to 95 percent, with an average of 57 percent, indicating that the cored bedrock has a Code classification of Class 1b, on average. Furthermore, the rock cores found that the quality (and therefore the class) of the bedrock typically improves with depth; however, in one boring (B-31M), where multiple rock cores were collected, the RQD and Code classification decreased from 40 percent to 34 percent (Class 1c to 1d).

The laboratory testing for this project included several Point Load Strength Index (PLSI) tests of the recovered rock cores (see Appendix II). Table 6.3.1, below, provides a statistical review of the PLSI tests performed. The table has been divided into two columns showing the PLSIs in mega-Pascal (MPa) and pounds per square inch (psi) for the overall sample set.

Table 6.3.1 - Point Load Strength Index Statistics

	PLSI	
Statistical Parameter	(MPa)	(psi)
Minimum	1.343	194.8
Mean - 1 Std. Dev.	3.016	437.4
Average (Mean)	5.344	775.1
Median	4.791	694.8
Standard Deviation	2.329	337.7
Mean + 1 Std. Dev.	7.673	1112.9
Maximum	10.562	1531.9

6.4 Groundwater

Due to the introduction of drilling fluids into the borings, direct measurements of the groundwater depth could not be readily performed within most of the borings. However, as previously noted, five (5) temporary groundwater monitoring wells (MW-1 to MW-5) were installed within the borings. Groundwater depth measurements were made within each of the groundwater monitoring wells after the biodegradable drilling fluid had time to decompose. Table 6.4.1, below, provides the finished floor or ground surface elevations, plus the measured groundwater depths and elevations for each well. Additional details are provided within the Groundwater Observation Well logs, included in Appendix I.

Table 6.4.1 Groundwater Monitoring Data

Monitoring Well Number	Boring Number	Surface Elevation [1] (ft)	Date Measured	Measured Depth (ft)	Groundwater Elevation (ft)
MW-1	B-31M	1	5/4/21	3.12	-2.12
			7/22/21	3.32	-2.32
			8/16/21	3.33	-2.33
MW-2	B-19M	15.9	6/13/21	10.17 [2]	5.73 [2]
			8/16/21	16.50	-0.60
MW-3	B-9M	1	7/2/21	3.33	-2.33
			7/22/21	3.27	-2.27
			8/16/21	3.33	-2.33
MW-4	B-33M	1	7/23/21	1.00	0.00
			7/26/21	2.50	-1.50
			8/16/21	2.33	-1.33
MW-5	B-7M	1	8/6/21	2.92	-1.92
			8/16/21	2.92	-1.92

Notes:
1. Surface Elevation indicates the finished floor elevation or ground surface elevation at each boring location.
2. The 6/13/21 groundwater measurement at MW-2 was performed immediately after the well was installed, and before the water in the well could equilibrate with the surrounding groundwater. Therefore, it is not expected to represent the groundwater elevation, as well as later measurements do.

As can be seen from the table, the groundwater elevations across the site range from -0.6 foot, at MW-2, to -2.33 feet, at MW-1 and MW-3. Overall, the measured groundwater elevations suggest that there is a slight gradient (about 1 foot) from north to south across the site. However, the groundwater elevation appears to be slightly elevated near the center of the site, at MW-2. This could represent a slightly perched condition, above the Collect Pond deposits, or could be caused by a possible leaking utility line.

It should be noted that groundwater levels fluctuate with the seasons and weather conditions. Consequently, groundwater may be encountered at other depths, at other times. It is also noted that because some of the wells were installed near the end of the subsurface investigation, it is recommended that the design-build team be given access to the site to perform additional groundwater depth measurement during their design process.

7.0 DISCUSSION AND LIMITED RECOMMENDATIONS

Based on our analyses and the proposed building's estimated basement elevation, we anticipate that conventional shallow spread footings or a pressure mat foundation will not be suitable for supporting the proposed building(s), because of the presence of the weak Collect Pond deposits beneath the west-central portion of the building(s). It is also expected that the medium dense sands underlying the site might cause excessive settlement of the proposed high-rise building(s) if they were designed to bear upon friction piles embedded into the sands. Finally, with a planned basement finished floor elevation of -13.5 feet and a design groundwater elevation of +2.5 feet, the basement floor slab will need to resist approximately 1,000 pounds per square foot of hydrostatic uplift pressure.

Based upon the conclusions given above, it is recommended that the proposed building(s) be supported by either caisson piles or drilled shafts socketed into competent bedrock (Class 1c or better) and designed in accordance with the Code. The caisson piles or drilled shafts should be fully cased between the pile caps and rock sockets, and the rock sockets should have a bonded length that is at least 5 feet, or twice the socket diameter, whichever is greater. Furthermore, the designers should consider whether the deep foundations should be designed and constructed with or without pile load testing. If caisson piles or drilled shafts are designed in accordance with Section 1810.7.3, they may be constructed without pile load testing, but more piles may be needed to support the building than would be necessary. Conversely, it might be less expensive to designed caisson piles or drilled shafts, with higher bond stresses, as indicated in Section 1810.7.3.1 of the Code, and perform load testing to verify the higher capacity. If the latter is selected, we recommend that the load testing be performed by incorporating an Osterberg cell into the bottom of the rock socket of each pile/drilled shaft to be tested, to directly measure the skin friction and end bearing between the grout or concrete, and the surrounding and underlying bedrock of the rock socket.

As previously described, rock cores performed for this subsurface investigation extended approximately 5 to 10 feet into the bedrock. Section 1802.5.1 requires that a sufficient number of rock cores be performed to "provide assurance of the rock soundness" within 10 feet below the "lowest level of bearing". In the case of rock sockets, this section can be interpreted to require that rock cores extend at least 10 feet below the tip elevation(s) of rock sockets. Therefore, the design-build team should plan to perform additional borings (either immediately after demolition of the existing buildings, or during foundation construction) to obtain rock cores that extend at least 10 feet below the planned deepest rock socket elevations or depths.

In addition to the conclusions noted above, it is anticipated that most of the existing fill and little of the Collect Pond deposits will be removed during excavation of the building's basements. Therefore, these deposits will need to be supported by the temporary support of excavation (SOE) walls. As can be seen from Figure 2, the Collect Pond deposits were encountered in the western and southwestern portions of the site, but were not encountered near the southeastern, eastern or northern portions of the site. Subsequently, it is our recommendation that the SOE walls be designed to resist different loading conditions, depending upon their locations. This will provide adequate support, while eliminating the potential for over-designing the SOE walls in the areas where adverse soil conditions were not encountered. These recommendations will be given in the following subsection.

Another construction-related concern is that the bottom of the excavation will extend into the peat or organic silt of the Collect Pond deposits, within the west-central portion of the site. It is not anticipated that these soils will be sufficiently stable to support excavation and pile or drilled shaft installation equipment. It is anticipated that a working pad of crushed stone, controlled fill or granular on-site soils, potentially stabilized with separation fabric or geogrid, will be needed to provide a stable working surface within the area of the Collect Pond deposits. It should be anticipated that this working pad will need to be some 1 to 3 feet thick, depending on whether geotextiles are used, to provide stable conditions. Alternatively, the contractor could use another stabilization method, such as placing swamp mats above the Collect Pond deposits, as a working surface.

It is our understanding that this project will be a design-build project and that only limited design recommendations are to be provided as part of this report. In particular, the following items were requested:

- Coefficients of lateral earth pressure, base friction, and unit weight of soil for design of below-grade walls.

- Suitability of on-site materials for fill, recommended material type for imported fill and compaction procedures/requirements to achieve stable engineered fills.
- Seismic site classification.

The following limited recommendations are provided to assist the designers in preparing their foundation designs and to assist the contractor during construction.

7.1 Below Grade Walls

It is recommended that foundation walls and walls for support of excavation be designed in accordance with the following criteria:

Table 7.1.1 – Below-Grade Wall Loading Parameters

Soil Parameter	Western (Centre Street) Wall and Western Half of Southern Wall [1]			Northern and Eastern Walls and Eastern Half of Southern Wall [1]		Newly Placed Controlled Fill
	Existing Fill (Above EL = -18 Feet)	Pond Deposits (EL = -18 to -43 Feet)	Native Soils Below EL = - 43 Feet	Existing Fill (Above EL = -5 Feet)	Native Soils Below EL = -5 Feet	
Angle of Internal Friction	31º	0	33º	31º	34º	34º
Undrained Shear Strength (psf)	0	250 [2]	0	0	0	0
Active Earth Pressure Coefficient (Ka) [3, 4]	0.32	1.00	0.29	0.23	0.28	0.28
Passive Earth Pressure Coefficient (Kp) [4]	3.12 [5]	1.00	3.39	3.12 [5]	3.54	3.54
At-Rest Earth Pressure Coefficient (Ko) [4, 6]	0.48 [5]	1.00	0.46	0.48 [5]	0.44	0.44
Total Unit Weight of Soil (pounds per cubic foot) [7]	120	120	125	120	125	130
Allowable Coefficient of Base Friction [8]	NA	NA	0.35	NA	0.33	0.35

Notes:

1) The wall locations given in the table assume that the building will be constructed with four walls (northern, eastern, southern and western walls) and will be constructed with lowest basement at one elevation (approximately -40 feet). Because Collect Pond deposits were found within boring B-9M, it is recommended that the western half of a southern wall be designed in the same manner as the western wall. This recommendation is different than preliminary recommendations provided in a memorandum dated 8/6/21.

2) For effective stress analysis, under drained conditions, we recommend that an effective friction angle of 31 degrees be used, instead of the unconfined compressive strength, as indicated for a normally consolidated undisturbed clay with an average PI of 9 and the -1 standard deviation curve in Figure 11.27 of "An Introduction to Geotechnical Engineering" (1981), by Holtz & Kovacs. This has been provided per the Joint Venture's request.
3) Use only for freestanding walls, where movement of up to 0.0025 X height of wall is both possible and tolerable. Otherwise, use at-rest coefficient.
4) The coefficients provided assume a level backfill and vertical foundation walls. The coefficients should be re-evaluated for other conditions, such as for retaining walls with a sloping backfill.
5) Reduce the passive pressure above a depth of 4 feet below exterior grade by half to account for frost disturbance.
6) Use for walls restrained against lateral movement.
7) Use for soils that are above the design groundwater table (EL = +2.5 feet). Subtract the unit weight of water (62.4 pcf) to obtain the buoyant unit weight, when analyzing soils below the groundwater table.
8) Coefficient of base friction applies to mass concrete placed directly against the soils noted in the table. Note, a reduction factor of 2/3 has already been applied to these factors, and therefore, no additional factor of safety should be applied.
9) The criteria provided above are based on the soil conditions encountered within the borings, experience with native and fill soils encountered within and around New York City, upon standard Rankine earth pressure coefficients for the assigned friction angles, and upon engineering judgement.
10) The friction angles, and subsequent lateral load coefficients, given for the non-cohesive existing soils within the given soil depth range are based on a correlation between the average N_{60} and friction angle (excluding split spoon refusals), developed by Ohsaki, et al (1959), and presented in "Performance and Use of the Standard Penetration Test in Geotechnical Engineering Practice", Virginia Polytechnic Institute and State University, The Charles E. Via Jr. Department of Civil and Environmental Engineering, Center for Geotechnical Practice and Research, 1998. It should be noted that split spoon refusals were excluded because most appear to be largely due to the presence of gravel within the soil samples, which could have artificially inflated the N_{60}-values.

In addition to the recommended design parameters given above, it is noted that the western foundation and support of excavation walls will be located only a few feet from the subway wall. Based on available drawings, it appears that the eastern subway wall is roughly located about 6 feet from the western property line. Subsequently, the western walls are expected to support minimal loads caused by the thin section of soil located between them and the eastern subway wall.

Any additional loading due to temporary and permanent surcharges should be added by the wall designer to the lateral loading exerted by the backfill, when designing below-grade walls. Loads due to supported structures should be applied in appropriate combinations with the lateral loads. Lateral loading coefficients due to sloping back fill should be evaluated using Coulomb's method.

Dampproofing and waterproofing should be provided for all foundation walls where the outside grade is higher than the basement slab elevations. Based on the groundwater measurements made during the project, it is recommended that dampproofing be installed on all exterior foundation walls above an elevation of +5 feet. Waterproofing should be installed beneath the basement floor slabs and on all exterior basement walls that lie below an elevation of +5 feet. The recommended elevation where the

transition from waterproofing to dampproofing occurs (+5 feet) is two and one-half (2.5) feet above the recommended design water elevation (+2.5 feet), which, in turn, is approximately 3 feet above the highest groundwater elevation at the site. The structure should be designed to resist the resulting hydrostatic forces below this elevation. All roof drains should be directed away from the building.

7.2 Groundwater and Dewatering

Groundwater at the site was encountered at an elevation of approximately -1 foot and it is our understanding the basement elevation will be at approximately -15.5 feet. Subsequently, it is anticipated that groundwater will be encountered approximately 14 to 15 feet above the planned foundation elevation during construction, thus requiring dewatering. It is also anticipated that the building will need to be constructed with waterproofing, and with basement walls and floor slabs that are capable of resisting hydrostatic pressures.

It should be further noted that our field personnel note odors (e.g.: gasoline) within some split spoon samples collected from the existing fill. It is our understanding that the specifics of the environmental measurements will be discussed in a separate report prepared by the Client (TRC); however, the potential presence of contaminants within the soils and groundwater will directly affect how the project is constructed. In particular, the potential presence of contaminants may require that the soil and groundwater removed from the site be tested for contaminants and be disposed of and/or treated at a facility capable of handling contaminated materials. Furthermore, the moisture barrier and waterproofing used on the exterior basement walls and below the basement floor slabs should be resistant to the potential contaminants.

Given the depth that the groundwater will need to be depressed to allow for construction of the proposed building in-the-dry (approximately 20 feet), it is anticipated that a significant volume of groundwater will need to be removed and trucked to a treatment facility during construction-phase dewatering, if standard dewatering methods are used. Subsequently, we suggest that the design-build team consider alternative methods for groundwater control, such as deep groundwater cut-off walls, permeation grouting or ground freezing. These methods might allow for construction without, or with minimal dewatering. Note, if permeation grouting is used, the grout should be kept weak enough that caisson piles or drilled shafts can be readily installed through the grouted soils. Regardless of the

method of groundwater control, the potential effects that it might have on neighboring structures, such as the subway tunnel and neighboring buildings, will have to be considered. The dewatering system, if necessary, should be designed by a New York State licensed Professional Engineer.

7.3 Earthwork Construction Recommendations

As indicated in the Code, controlled fill should consist of clean sand, gravel, crushed stone, crushed gravel, recycled concrete aggregate (RCA), or a mixture of these, and should contain no organic matter. The controlled fill materials should meet the following gradation requirements.

Sieve Size	Percent Finer by Weight
3-inch	100
No. 40	0 - 70
No. 200	0 - 10

Note, the above gradation is similar to the New York State Department of Transportation gradation for Select Granular Fill but has been modified to meet Code requirements for maximum particle size and the percent finer that the No. 200 sieve.

Based on field classifications and laboratory testing of the on-site soils, it appears that some of the existing fill, and native sands and gravels within the anticipated depth of excavation, will be suitable for use as controlled fill. However, it should be noted that some of the fill was found to contain debris (brick, concrete, et cetera) that might need to be removed, and that both the fill and native soils were found to contain cobbles and boulders, and fines contents greater than 10 percent. Furthermore, none of the Collect Pond deposits are suitable for use as controlled fill, so the overlying fill and surrounding sands and gravel will need to be separated from the Collect Pond deposits, if the Contractor wishes to use on-site soils as controlled fill. The contractor should also expect that they might need to screen (to remove over-sized particles and/or debris) or remove some of the on-site soils, before they can be used as fill. If the design-build team intends to use on-site materials as controlled fill, it is recommended that they conduct thorough laboratory testing to verify its suitability. A geotechnical engineer should review and approve the use of soils in the field prior to placement.

Controlled fill and backfill should be compacted to at least 95 percent of the maximum dry density, at a near optimum moisture content (±2 percent), as determined by ASTM D1557. The lift thickness for the soils will vary depending on the type of compaction equipment used. Controlled fill should generally be placed in uniform horizontal lifts not exceeding 8 inches in loose thickness when compacted with heavy compaction equipment. In confined areas, the loose lift thickness should be reduced to 4 inches, or less, and each lift should be compacted with sufficient passes of hand operated vibratory or impact compaction equipment. Compaction within 5 feet of below grade walls should only be done with hand-operated equipment. A geotechnical engineer with appropriate field and laboratory support should inspect all subgrades, approve materials for use as controlled fill, and test backfill materials for compliance with the recommended compaction.

Free draining crushed stone, placed as a drainage layer behind below grade walls and below floor slabs (if used), should be Underdrain Filter Type I material, as specified in the New York State Department of Transportation Standard Specifications, and as follows:

Sieve Size	Percent Finer by Weight
1 inch	100
1/2 inch	30 - 100
1/4 inch	0 - 30
No. 4	0 - 10
No. 8	0 – 5

Note, gravel meeting the gradation for ASTM C33 Number 57 stone may also be used as free draining crushed stone.

Flowable fill may also be used as backfill. Flowable fill, should have a minimum 28-day unconfined compressive strength of 250 psi. If specified, flowable fill should meet the requirements for Controlled Low Strength Material (CLSM), as specified in Section 733-01 – "Flowable Fill" of the NYSDOT Standard Specifications.

7.4 Seismic Site Classification and Liquefaction Assessment

As indicated above, representatives of the Joint Venture (the Client's Client) requested that Tectonic provide a seismic site classification for the site. What follows is a description of how we evaluated the site classification and our recommendations.

To provide a seismic site classification, we began with an evaluation of the potential for liquefaction to occur within soils at the site. Liquefaction of soils can be caused by strong vibratory motion due to earthquakes. Both research and historical data indicate that loose, granular soils saturated by a shallow groundwater table are most susceptible to liquefaction. Liquefaction occurs when an earthquake and associated ground shaking of sufficient duration results in the loss of grain-to-grain contact due to a rapid increase in pore-water pressure, causing the soil to behave as a fluid for short periods. Based on the results of the subsurface investigation and the criteria outlined on Figure 1813.1 of the Code, some of the soils underlying the site fall within the range where liquefaction evaluation is required.

Based on the above-noted results, a more-precise analysis was performed to evaluate the liquefaction potential. A procedure recommended by Youd et al (2001) was used in evaluating the liquefaction potential at the site. This method estimates the stresses likely to be induced by an earthquake and the stresses likely to initiate liquefaction using the SPT blow counts, the effective overburden pressure, and the peak horizontal ground acceleration that would be caused by the design seismic event. Based on a preliminary site classification of D, the peak horizontal ground acceleration would be 0.24g, as specified by the Code. The earthquake moment magnitude was taken as 5.49, which is the mean value for the site's location, calculated on the USGS Unified Hazard Tool using the "Dynamic: Conterminous U.S. 2014" model, and a 2 percent probability of exceedance in 50 years (a 2475-year return period).

The factors of safety against liquefaction were computed by the ratio of cyclic shear strength of the soil to the cyclic shear stress induced by the seismic event. The liquefaction analysis indicates that some of the soils underlying the site have a factor of safety against liquefaction less than the generally accepted minimum of 1.0, suggesting that liquefaction might occur. However, this analysis method is intended for granular soils – specifically sands – and a review of the liquefaction analysis reveals that soils with an N_{60}-value less than 6 bpf have a factor of safety less than 1. Comparing these SPTs with the boring logs show that they were performed within the peat and clay of the Collect Pond deposits. Although these soils could lose a small percentage of strength during a design earthquake event, they are unlikely to liquefy, because of their high fines-contents and plasticity. Subsequently, it is our judgement that liquefaction is unlikely to occur if a design earthquake event were to occur.

The second step is to consider the soil profile underlying the site, as a whole. When the average conditions across the whole site are considered, the seismic site classification is Class D. This is based upon using published correlations between the N-values and shear wave velocity for the various soils. However, the building code provides several conditions, which if met require a seismic site classification of Class E or Class F. Per Table 1513.5.2 of the Code, a soil profile that has more than 10 feet of soil with a natural moisture content greater than 40 percent should be classified as a Class E site. Boring B-3M has approximately 24.5 feet of peat and organic clay that meet this requirement below the planned bottom of excavation. Therefore, the site should be considered to have a seismic site classification of Class E. This seismic site classification matches MRCE's preliminary recommendations.

Given that most of the site can be considered to have a seismic site classification of Class D, it may be onerous to design the entire building based on the subsurface conditions encountered within a single boring. Furthermore, it is our understanding that the Joint Venture wishes to have alternatives to designing the building for Class E conditions. There are several options for addressing the unsuitable conditions near boring B-3M. The first option would be to measure the average shear wave velocity of the soil and rock profile near boring B-3M. The most accurate method for doing this is to perform cross-hole shear wave velocity measurements within the top 100 feet of the soil and rock. This requires the drilling of two to three borings to a depth of approximately 100 feet, installation of casing, and measurement of the cross-hole shear wave velocities.

Other methods for evaluating the site's average shear wave velocity within the upper 100 feet of the soil and rock profile include measurements performed from the ground surface. These include Spectral Analysis of Surface Waves (SASW), Multichannel Analysis of Surface Waves (MASW) or Refraction Microtremor (ReMi) seismic survey methods. It should also be noted that these surficial methods of seismic testing can also be used to roughly show the soil profile along the seismic arrays, and therefore, could be used to better map the extent of the Collect Pond deposits along Centre and White Streets. If performed, it is possible that the measured average shear wave velocity would show that the soil meets the requirements for a Class D rating; however, there remains a possibility that this testing could verify the Class E conditions near boring B-3M. It should also be noted that to measure conditions to a depth

of 100 feet, the surficial methods will need to string an array of seismographs over a length of approximately 200 to 300 feet.

The other alternative, or the next step, would be to improve the soil conditions to eliminate the high moisture content conditions within the Collect Pond deposits in the area around boring B-3M (near the intersection of Centre and White Streets and in the southwestern corner of the site). One option would be to remove the peat and fine-grained pond deposit soils and replace them with granular fill. However, these soils were found to extend down to approximately elevation -43 feet in boring B-3M, or about 24.5 feet below the planned bottom of excavation (at EL = -18.5 feet). To reduce the thickness of the soils with a moisture content greater than 40 percent to less than 10 feet, would require undercutting and replacing the Collect Pond soils to a depth of approximately 15 feet below the planned bottom of excavation. This is expected to be a significant volume of removal and replacement that will also require additional dewatering and excavation support walls. However, it is anticipated that the granular soils excavated from elsewhere on the site could be used as the backfill, and this remains a viable option that should be considered.

The complications associated with removal and replacement leads us to consider in-situ mediation options. These include installation of rammed aggregate piers or aggregate columns, to drain and strengthen the pond deposit soils, deep mixing, jet grouting or mass mixing to strengthen the soils with introduced grout, or a more-exotic method like vacuum consolidation, which can be used to reduce the moisture content of the Collect Pond deposit soils. Most, if not all, of these ground improvement methods are familiar to the ground improvement specialty contractors working within New York City. It should also be noted that the options that include the insertion of grout can also be used to minimize the volume of water entering the excavation that will need to be removed during dewatering.

If the designers wish to consider ground improvement, it is recommended that additional borings be performed, perhaps after demolition, near boring B-3M and in the southwestern portion of the site to better identify the extent of the Collect Pond deposit soils that would require improvement. For a conservative preliminary estimate, it is recommended that the design team estimate that the soils that would need improvement extend half-way between boring B-3M and (clockwise from north) borings B-4M, B-13M, B-12M, B-11M and B-39M, and extend to the southern and western walls. The

preliminary estimated depth of improvement should be based on the conditions encountered in B-3M, until otherwise indicated by additional subsurface investigation.

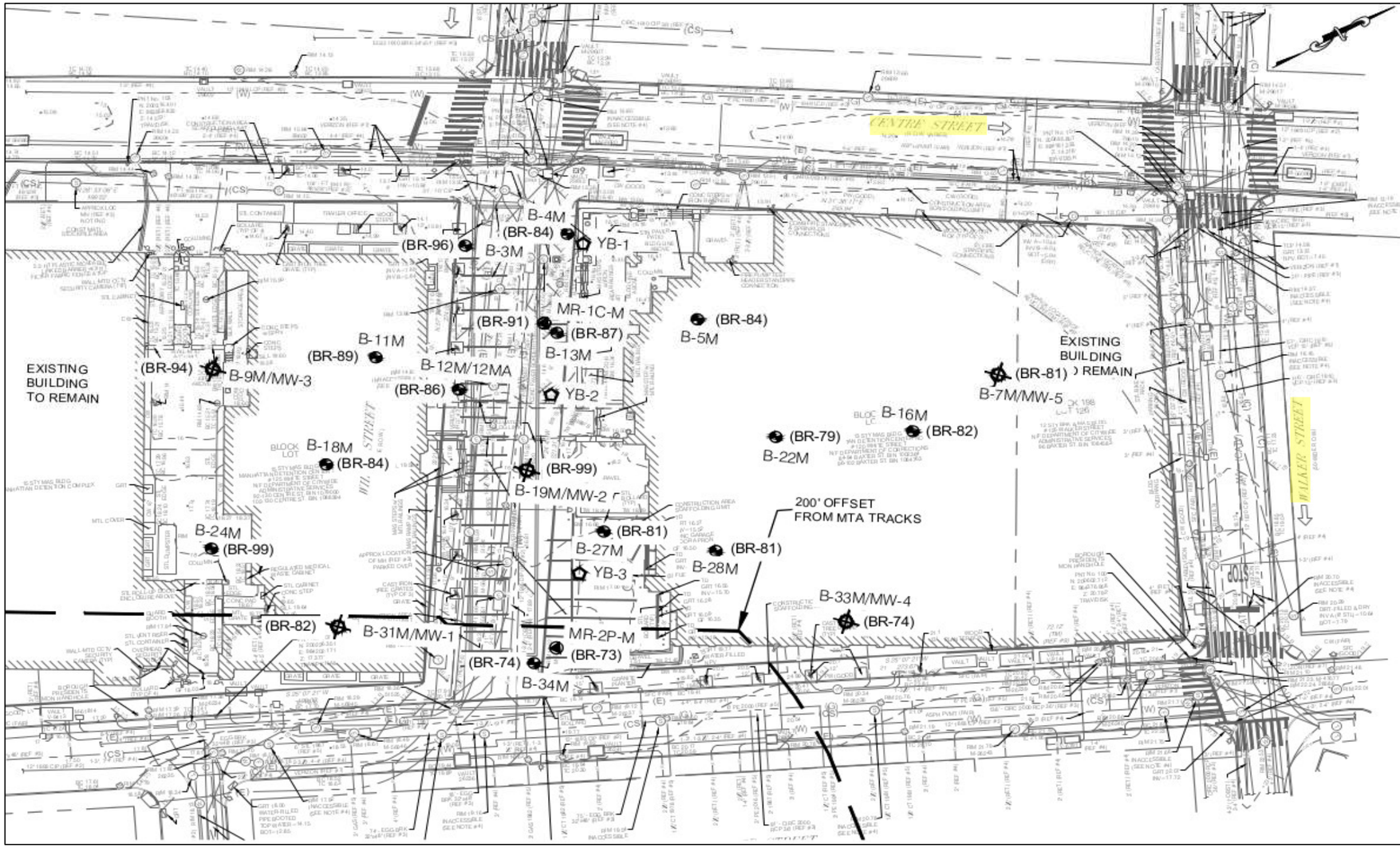
8.0 LIMITATIONS

Our professional services have been performed using that degree of care and skill ordinarily exercised under similar circumstances by reputable geotechnical engineers and geologists practicing in this or similar situations. The interpretation of the field data is based on good judgment and experience; however, no matter how qualified the geotechnical engineer or detailed the investigation, subsurface conditions cannot always be predicted beyond the points of actual sampling and testing. No other warranty, expressed or implied, is made as to the professional advice included in this report.

The limited recommendations contained in this report are only intended to inform the project designers. The recommendations are not intended for final design of the proposed structure(s). Designers, contractors and others involved in the design and construction of this project are advised to make an independent assessment of the soil and groundwater conditions for the purpose of establishing quantities, schedules and construction techniques.

This report has been prepared for the exclusive use of TRC Engineers, Inc. and their agents for the specific application to the proposed building described in this report. We recommend that prior to construction, Tectonic Engineering Consultants, Geologists & Land Surveyors, D.P.C. (Tectonic) review the project plans and specifications. It should be noted that upon review of those documents, some recommendations presented herein might be revised or modified. In the event that any changes in the design or location of the proposed structures are planned, Tectonic shall not consider the conclusions and recommendations contained in this report valid unless reviewed and verified in writing. It is further recommended that Tectonic be retained to provide construction monitoring and inspection services to ensure proper implementation of the recommendations contained herein, which would otherwise limit our professional liability.

FIGURES



LEGEND (SYMBOLS NOT TO SCALE):

	EXISTING BUILDING OUTLINE
	200' OFFSET FROM MTA TRACKS DEMARCATION
B-XM	GEOTECHNICAL BORING LOCATION AND IDENTIFICATION NUMBER
B-XM/MW-X	GEOTECHNICAL BORING & OBSERVATION WELL LOCATION AND IDENTIFICATION NUMBER
MR-X-M	2018 COMPLETED GEOTECHNICAL BORING LOCATION AND IDENTIFICATION NUMBER
YB-X	2017 COMPLETED GEOTECHNICAL BORING LOCATION AND IDENTIFICATION NUMBER
(BR-81)	APPROXIMATE BEDROCK ELEVATION (FT)

NOTES:

1. ACTUAL BORING LOCATIONS WERE NOT SURVEYED.
2. LOCATIONS OF EXISTING SITE FEATURES ARE APPROXIMATE.
3. LOCATION OF HISTORIC GEOTECHNICAL BORING APPROXIMATED FROM PREVIOUS REPORTS.
4. (BR-81) SHOULD BE READ "THE APPROXIMATE BEDROCK ELEATION IS -81 FEET."

0 50 100

Notes:

THIS DRAWING IS BASED ON THE DRAWING "GEOTECHNICAL BORING LOCATIONS, 125 WHITE STREET, NEW YORK, NY 10013" DRAWING, FIGURE 1, DATED JULY 2021, BY TRC.

THE LOCATIONS OF BORINGS B-14M, B-21M AND B-23M ARE NOT SHOWN, BECAUSE THEY WERE NOT DRILLED BEYOND THE DEPTH OF HAND UTILITY CLEARANCE (6'), AFTER BEING TERMINATED PER THE CLIENT'S INSTRUCTIONS.

BORING AND WELL LOCATIONS SHOULD BE CONSIDERED APPROXIMATE.

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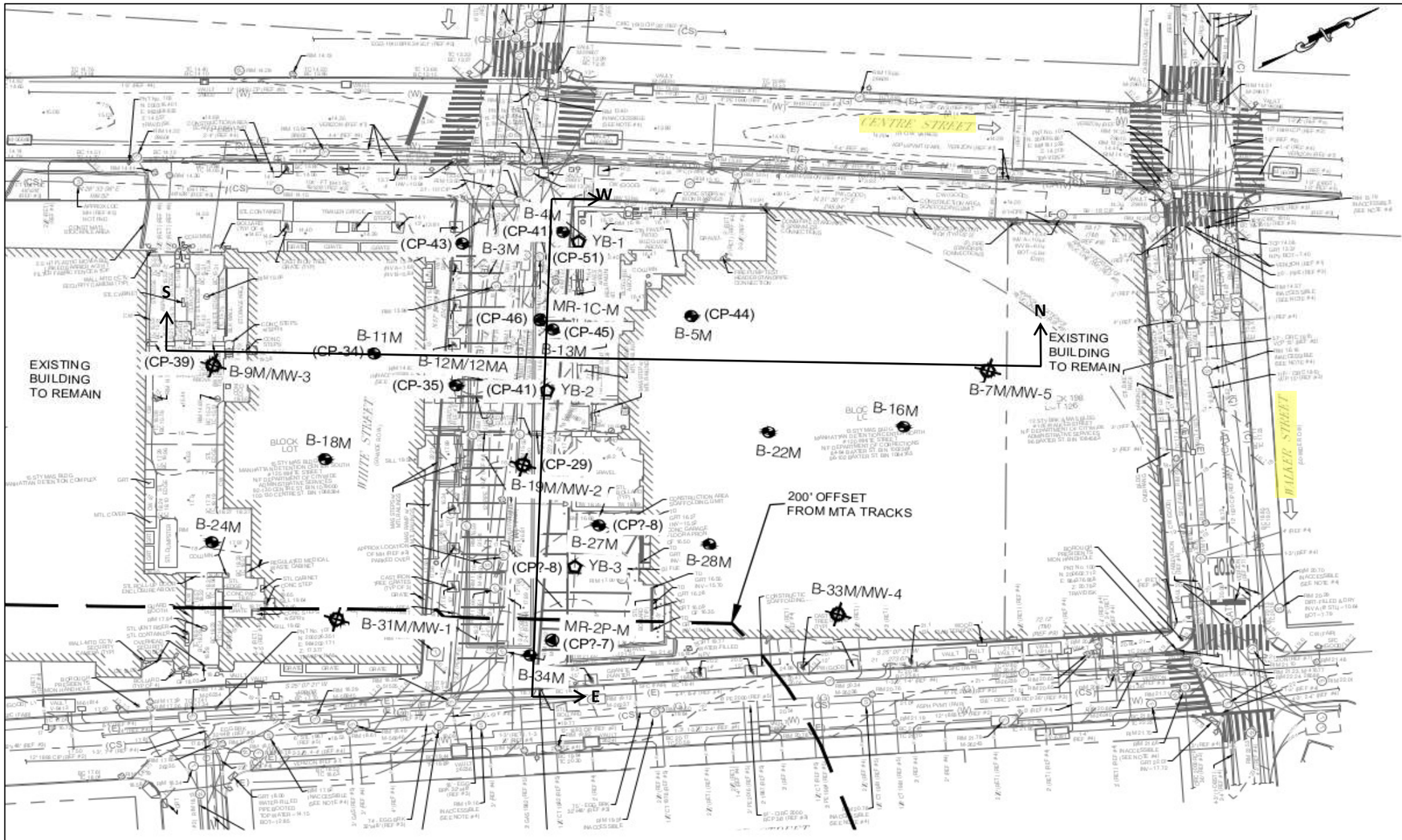
Tectonic Engineering Consultants, Geologists & Land Surveyors D.P.C.
1279 Route 300 Phone: (845) 567-6566
Newburgh, NY 12550 Fax: (845) 567-6248

BORING, GROUNDWATER MONITORING WELL PLAN, WITH APPROXIMATE BEDROCK ELEVATIONS

125 WHITE STREET NEW YORK, NEW YORK

Date	Work Order No.	Drawing No.	Rev. No.
9/3/2021	10285.01	Figure 1	0
Scale: NTS			



LEGEND (SYMBOLS NOT TO SCALE):

	EXISTING BUILDING OUTLINE
	200' OFFSET FROM MTA TRACKS DEMARCATION
B-XM	GEOTECHNICAL BORING LOCATION AND IDENTIFICATION NUMBER
B-XM/MW-X	GEOTECHNICAL BORING & OBSERVATION WELL LOCATION AND IDENTIFICATION NUMBER
MR-X-M	2018 COMPLETED GEOTECHNICAL BORING LOCATION AND IDENTIFICATION NUMBER
YB-X	2017 COMPLETED GEOTECHNICAL BORING LOCATION AND IDENTIFICATION NUMBER
(CP-45)	APPROXIMATE BOTTOM ELEVATION OF COLLECT POND DEPOSITS (FT)

NOTES:

1. ACTUAL BORING LOCATIONS WERE NOT SURVEYED.
2. LOCATIONS OF EXISTING SITE FEATURES ARE APPROXIMATE.
3. LOCATION OF HISTORIC GEOTECHNICAL BORING APPROXIMATED FROM PREVIOUS REPORTS.
4. (CP-45) SHOULD BE READ "THE APPROXIMATE BOTTOM ELEATION OF COLLECT POND DEPOSITS IS -45 FEET."
5. (CP?-8) SHOULD BE READ "THE APPROXIMATE BOTTOM ELEATION OF POSSIBLE COLLECT POND DEPOSITS IS -8 FEET."
6. EXCEPT AS OTHERWISE NOTED, BORINGS GENERALLY ENCOUNTERED GRANULAR FILL, OVER SANDS AND GRAVELS.

0 50 100

Notes:

THIS DRAWING IS BASED ON THE DRAWING "GEOTECHNICAL BORING LOCATIONS, 125 WHITE STREET, NEW YORK, NY 10013" DRAWING, FIGURE 1, DATED JULY 2021, BY TRC.

THE LOCATIONS OF BORINGS B-14M, B-21M AND B-23M ARE NOT SHOWN, BECAUSE THEY WERE NOT DRILLED BEYOND THE DEPTH OF HAND UTILITY CLEARANCE (6'), AFTER BEING TERMINATED PER THE CLIENT'S INSTRUCTIONS.

BORING AND WELL LOCATIONS SHOULD BE CONSIDERED APPROXIMATE.

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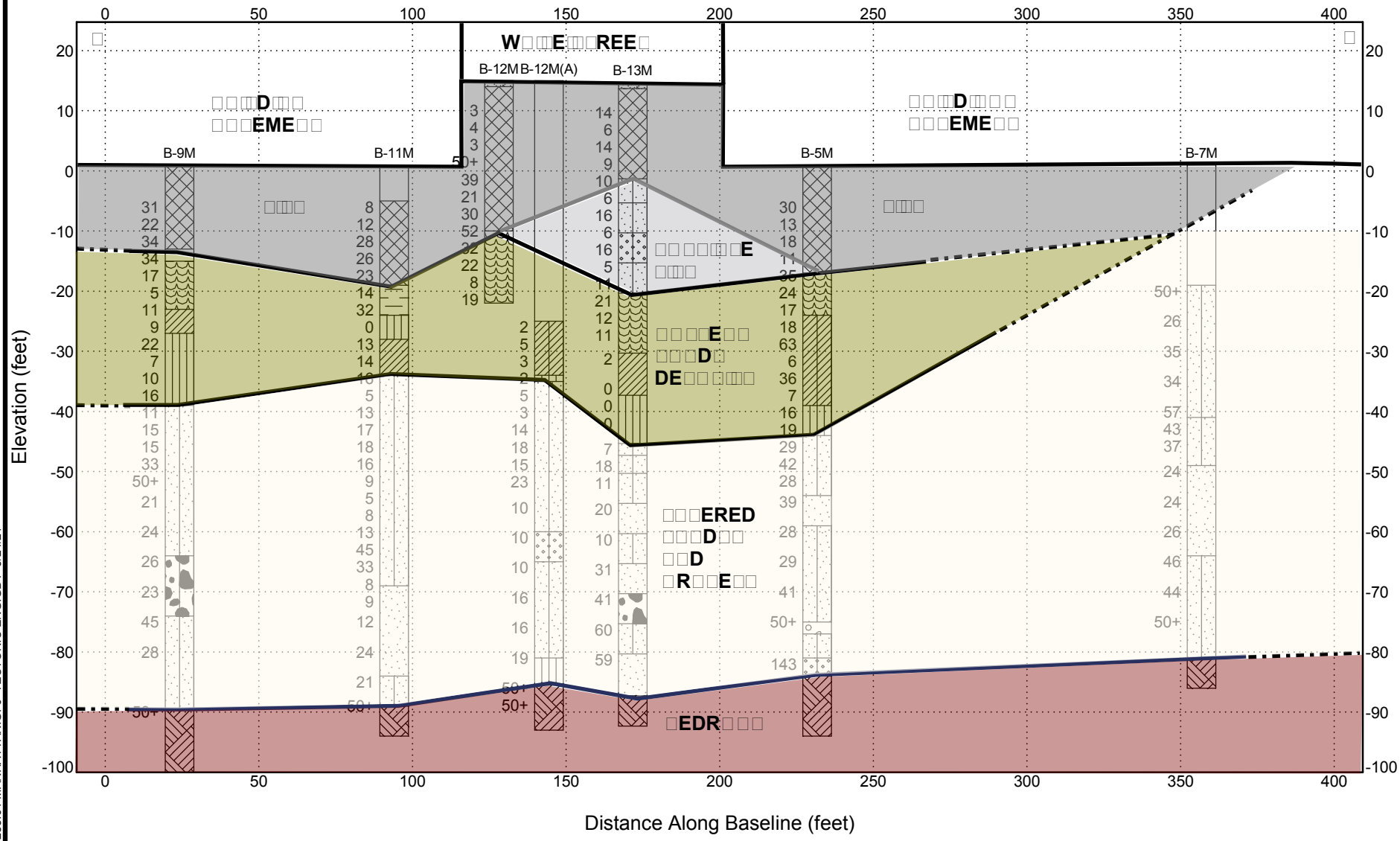
BORING, GROUNDWATER MONITORING WELL AND FENCE LOCATION PLAN, WITH APPROXIMATE BOTTOM OF COLLECT POND DEPOSITS ELEVATIONS

125 WHITE STREET NEW YORK, NEW YORK

Date	Work Order No.	Drawing No.	Rev. No.
9/3/2021	10285.01	Figure 2	0
Scale: NTS			



STRATIGRAPHY & GW 10285.01 MANHATTAN.GPJ TECTONIC ENG.GDT 8/24/21

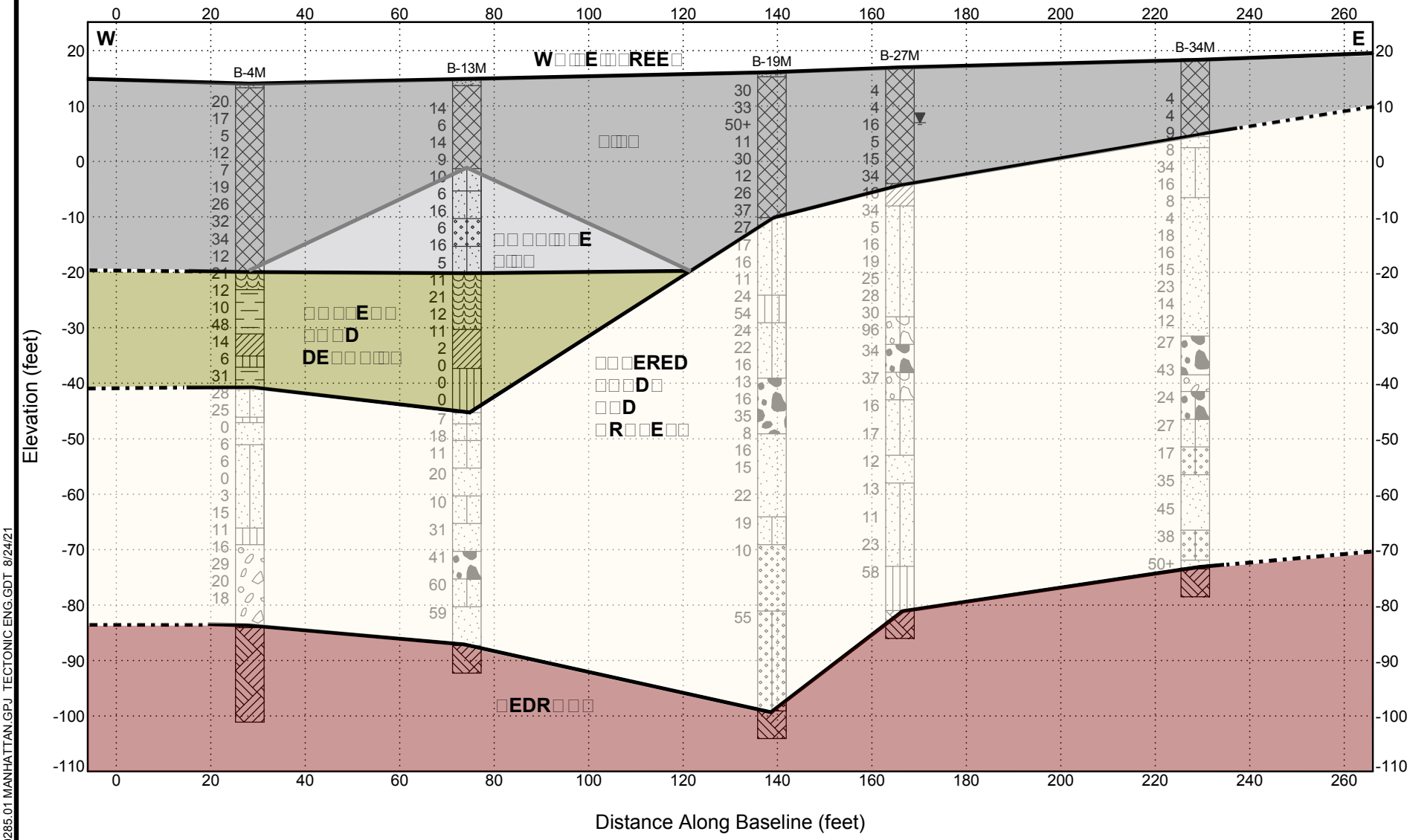
Tectonic

280 Little Britian Road
Newburgh, NY 12550
Telephone: (845) 563-9081 Fax: (845) 563-9085

Project No: **10285.01** Date: **8/24/21**

Project: **BBJ - M**

Location: **Manhattan, NY**



STRATIGRAPHY & GW 10285.01 MANHATTAN.GPJ TECTONIC ENG.GDT 8/24/21

Tectonic

280 Little Britian Road
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Telephone: (845) 563-9081 Fax: (845) 563-9085

Project No: **10285.01** Date: **8/24/21**

Project: **BBJ - M**

Location: **Manhattan, NY**

APPENDIX I

Tectonic

PROJECT No. **10285.01**
PROJECT: **BBJ - M**
LOCATION: **Manhattan, NY**

BORING No. B-3M

SHEET No. 1 of 4

CLIENT: **TRC**
CONTRACTOR: **Aarco Environmental Service Inc**

METHOD OF ADVANCING BORING	DIA.	DEPTH
POWER AUGER:		TO
ROT. DRILL:	3 7/8"	0 TO 90'
CASING:	4"	0 TO 90'
DIAMOND CORE:	2"	110 TO 115'

CME 55 Truck Mounted Drill Rig with Automatic Hammer

GROUND WATER	DATE	TIME	DEPTH

MON. WELL ☐ YES ☒ NO
SCREEN DEPTH: --- TO ---
WEATHER: **Clear** TEMP: **80° F**
DEPTH TO ROCK: **110'**
*CHANGES IN STRATA ARE INFERRED

INSPECTOR: **P. Gregory/M Mars**
DRILLER: **Rodolfo**
SURFACE ELEVATION: **13.8**
DATUM: **See Remarks**
DATE START: **6/19/21**
DATE FINISH: **6/20/21**

UNCONFINED COMPRESS. STRENGTH (TONS/FT) ◓ 1 2 3 4 5
PLASTIC LIMIT % × — WATER CONTENT % ⊗ — LIQUID LIMIT % △ 10 20 30 40 50
STANDARD PENETRATION (BLOWS/FT.) ● 10 20 30 40 50

DEPTH (FT.)	N OR MIN./FT.	PENETRATION RESISTANCE (BL/6 IN.)	SAMPLES: SAMPLE NUMBER	RECOV.: LENGTH (IN.)	RECOV.: RQD (%)	MOISTURE	UNIFIED SOIL CLASS.	DESCRIPTION OF MATERIAL	ELEVATION (FT.)
1			S-1			M	SP-SM	0.33' Asphalt pavement 0.25' Concrete Hand cleared to 3' 1.5' - 3' Bwn c-f SAND, and c-f Gravel, trace Silt with brick pieces (FILL) (Class 7)	
2									
3									
4	5	3 2 3 2	S-2	18		M	SP-SM	Bwn c-f SAND, some f Gravel, trace Silt (FILL) (Class 7)	
5									8.8
6	4	2 2 2 3	S-3	8		M	SP-SM	Same (FILL) (Class 7)	
7									
8	8	3 3 5 5	S-4	3		M	SP-SM	Same (FILL) (Class 7)	
9									
10	5	2 2 3 3	S-5	6		M	SP-SM	Bwn c-f SAND, some c-f Gravel, trace Silt, brick pieces (FILL) (Class 7)	3.8
11									
12	7	5 5 2 2	S-6	12		M	SM	Bwn c-f SAND, some c-f Gravel, little Silt, brick pieces (FILL) (Class 7)	
13									
14	2	WOH 0 2 2	S-7	8		M	SP-SM	Bwn c-f SAND, some f Gravel, little Silt, brick pieces (FILL) (Class 7)	
15									-1.2
16	7	1 3 4 5	S-8	8		W	SM	Bwn m-f SAND, little f Gravel, little Silt (FILL) (Class 7)	
17									
18	8	5 4 4 3	S-9	10		W	SM	Same (FILL) (Class 7)	
19									
20	10	WOH 3 7 6	S-10	14		W	ML SM	Blk CLAYEY SILT, trace f Gravel Bwn c-f SAND, little f Gravel, little Silt (FILL) (Class 7)	-6.2
21									
22	7	4 3 4 7	S-11	12		W	SP-SM	Gy-bwn c-f SAND, some f Gravel, trace Silt (FILL) (Class 7)	
23									
24	6	4 3 3 8	S-12	9		W	ML	Dk gy CLAYEY SILT, some c-f Gravel, little c-f Sand (FILL) (Class 7)	
25									-11.2

REMARKS:
Note, the driller advanced casing from 55' to 65' without sampling. This appears to have been an error.

Tectonic

PROJECT No. **10285.01**
PROJECT: **BBJ - M**
LOCATION: **Manhattan, NY**

BORING No. B-3M

SHEET No. 2 of 4

CLIENT: **TRC**
CONTRACTOR: **Aarco Environmental Service Inc**

DEPTH (FT.)	N OR MIN./FT.	PENETRATION RESISTANCE (BL/6 IN.)	SAMPLES: SAMPLE NUMBER	SAMPLES: RECOV. LENGTH (IN.)	SAMPLES: RECOV. RQD (%)	MOISTURE	UNIFIED SOIL CLASS.	DESCRIPTION OF MATERIAL	ELEVATION (FT.)
26	16	4 10 6 4	S-13	7		W	SM	Gy-bwn c-f SAND, little f Gravel, little Silt (FILL) (Class 7)	
28	5	3 2 3 4	S-14	0				No Recovery	
30									-16.2
31	6	1 3 3 3	S-15	6		W	Pt	Dk bwn PEAT with organic fibers (Class 6)	
33	6	3 3 3 3	S-16	6		W	Pt	Dk bwn PEAT with wood fibers (Class 6)	
35	4	4 2 2 2	S-17	0		W		No soil recovery wood in tip of spoon	-21.2
37	6	2 3 3 4	S-18	18		W	Pt	Dk bwn PEAT with wood fragments (Class 6)	
39	4	2 2 2 3	S-19	10		W	Pt	Same (Class 6)	
40									-26.2
41	6	3 3 3 5	S-20	24		W	OL	Dk gy Organic CLAYEY SILT with roots fibers (Class 6)	
43	5	1 2 3 3	S-21	10		W	OL	Dk gy Organic CLAYEY SILT, trace f Gravel with root fibers (Class 6)	
45									-31.2
46	2	WOH 0 2 2	S-22	20		W	OL	Dk gy Organic CLAYEY SILT (Class 6)	
48	5	WOH 0 5 3	S-23	16		W	OL	Same (Class 6)	
50									-36.2
51	0	WOH WOH WOH WOH	S-24	0				No Recovery	
53	0	WOH WOH WOH WOH	S-25	22		W	CL	Gy CLAY & SILT, trace f Gravel (Class 6) (pocket pen-0.0 - 0.25tsf) (Class 6)	
55									-41.2

LITHOLOGY*

UNCONFINED COMPRESS. STRENGTH (TONS/FT)
1 2 3 4 5
PLASTIC LIMIT % — WATER CONTENT % — LIQUID LIMIT %
10 20 30 40 50
STANDARD PENETRATION (BLOWS/FT.)
10 20 30 40 50

REMARKS:

Note, the driller advanced casing from 55' to 65' without sampling. This appears to have been an error.

BORING LOG 10285.01 MANHATTAN.GPJ TECTONIC ENG.GDT 8/24/21

Tectonic

PROJECT No. **10285.01**
PROJECT: **BBJ - M**
LOCATION: **Manhattan, NY**

BORING No. B-3M

SHEET No. 3 of 4

CLIENT: **TRC**
CONTRACTOR: **Aarco Environmental Service Inc**

DEPTH (FT.)	N OR MIN./FT.	PENETRATION RESISTANCE (BL/6 IN.)	SAMPLES: SAMPLE NUMBER	RECOV.: LENGTH (IN.)	RECOV.: RQD (%)	MOISTURE	UNIFIED SOIL CLASS.	DESCRIPTION OF MATERIAL	ELEVATION (FT.)
56	0	WOR WOR WOR WOR	S-26	22		W	CL	Gy CLAY & SILT (Pocket pen 0.0 -0.5 tsf) (Class 6)	
58	5	4 4 1 2	S-27	18		W	ML	Gy-bwn SILT, some f Sand (Class 6)	
60									-46.2
65									-51.2
66	31	15 15 16 12	S-28	6		W	SM	Gy-bwn f SAND, little Silt, trace organic fibers (Class 3a)	
70									-56.2
71	19	10 10 9 9	S-29	1		W	SP-SM	Gy-bwn f SAND, trace Silt (Class 3b)	
75									-61.2
76	27	4 9 18 18	S-30	2		W	GP-GM	Rd-bwn f GRAVEL, some c-f Sand, little Silt (Class 2b)	
80									-66.2
81	13	8 7 6 7	S-31	6		W	GP-GM	Bwn c-f GRAVEL, and m-f Sand, trace Silt (Class 2b)	
85									-71.2

UNCONFINED COMPRESS. STRENGTH (TONS/FT)
1 2 3 4 5
PLASTIC LIMIT % WATER CONTENT % LIQUID LIMIT %
10 20 30 40 50
STANDARD PENETRATION (BLOWS/FT.)
10 20 30 40 50

REMARKS:

Note, the driller advanced casing from 55' to 65' without sampling. This appears to have been an error.

BORING LOG 10285.01 MANHATTAN.GPJ TECTONIC ENG.GDT 8/24/21

Tectonic

PROJECT No. **10285.01**
PROJECT: **BBJ - M**
LOCATION: **Manhattan, NY**

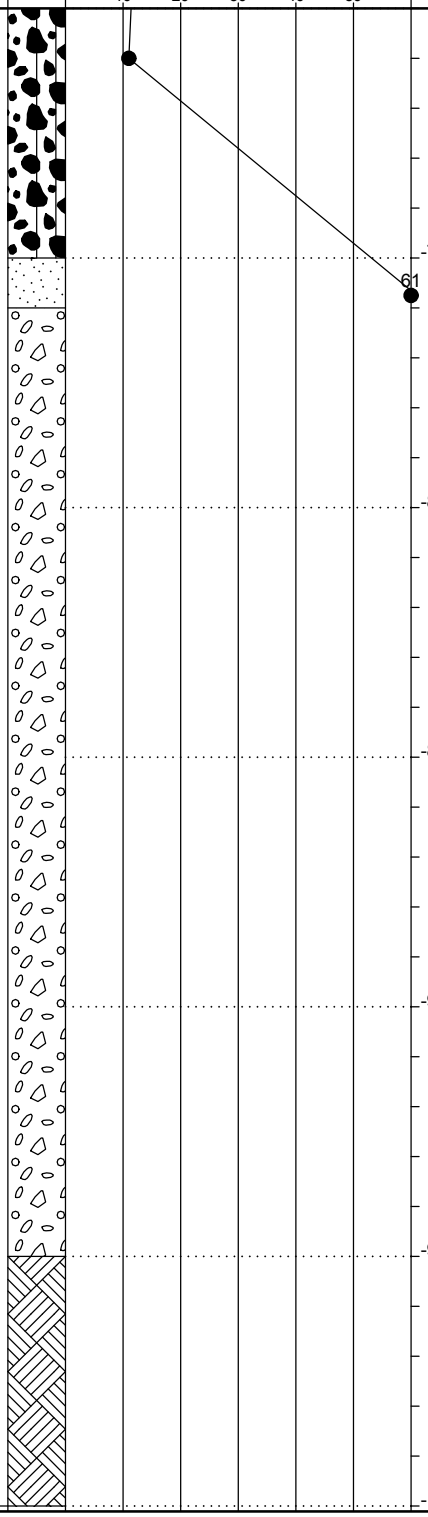
BORING No. B-3M

SHEET No. 4 of 4

CLIENT: **TRC**
CONTRACTOR: **Aarco Environmental Service Inc**

DEPTH (FT.)	N OR MIN./FT.	PENETRATION RESISTANCE (BL/6 IN.)	SAMPLES: SAMPLE NUMBER	RECOV.: LENGTH (IN.)	RECOV.: RQD (%)	MOISTURE	UNIFIED SOIL CLASS.	DESCRIPTION OF MATERIAL	LITHOLOGY*	ELEVATION (FT.)
86	11	5 6 5 7	S-32	0		W		No Recovery		
87										
88								Casing advanced to 90'		
89										
90										-76.2
91	61+	6 11 50/0	S-33			W	SP	Bwn c-f SAND, little Gravel, trace Silt (Class 2a)		
92	2									
93	3		C-1	12/48	0			12" fractured boulders		
94	1									
95	0.5									-81.2
96										
97										
98										
99										
100										-86.2
101								Rotary drilled to 110'		
102										
103										
104										
105										-91.2
106										
107										
108										
109										
110										-96.2
111	9									
112	4									
113	2		C-2	60/60	93			Blk-gy, slighty weathered, slightly fractured, f grained, hard, SCHIST, fractures 30 - 45 degrees from horizontal (Class 1a)		
114	2									
115	5									-101.2

UNCONFINED COMPRESS. STRENGTH (TONS/FT)
1 2 3 4 5
PLASTIC LIMIT % — WATER CONTENT % — LIQUID LIMIT %
10 20 30 40 50
STANDARD PENETRATION (BLOWS/FT.)
10 20 30 40 50



REMARKS:

Note, the driller advanced casing from 55' to 65' without sampling. This appears to have been an error.

End of Boring at 115'

BORING LOG 10285.01 MANHATTAN.GPJ TECTONIC ENG.GDT 8/24/21

Tectonic

PROJECT No. **10285.01**
PROJECT: **BBJ - M**
LOCATION: **Manhattan, NY**

BORING No. B-4M

SHEET No. 1 of 4

CLIENT: **TRC**
CONTRACTOR: **Aarco Environmental Service Inc**
METHOD OF ADVANCING BORING | DIA. | DEPTH
POWER AUGER: | | TO
ROT. DRILL: | **3 7/8"** | **0** TO **110'**
CASING: | **4"** | **0** TO **65'**
DIAMOND CORE: | **2"** | **110** TO **115'**
Geoprobe GP050 with Automatic Hammer

GROUND WATER | DATE | TIME | DEPTH

MON. WELL ☐ YES ☒ NO
SCREEN DEPTH: **---** TO **---**
WEATHER: **Overcast** TEMP: **60° F**
DEPTH TO ROCK: **110'**
*CHANGES IN STRATA ARE INFERRED

INSPECTOR: **Jack Rusk**
DRILLER: **Julio Galarza**
SURFACE ELEVATION: **13.9**
DATUM: **See Remarks**
DATE START: **6/13/21**
DATE FINISH: **6/20/21**

UNCONFINED COMPRESS. STRENGTH (TONS/FT) ● 1 2 3 4 5
PLASTIC LIMIT % × — WATER CONTENT % ⊗ — LIQUID LIMIT % △ 10 20 30 40 50
STANDARD PENETRATION (BLOWS/FT.) ● 10 20 30 40 50

DEPTH (FT.)	N OR MIN./FT.	PENETRATION RESISTANCE (BL/6 IN.)	SAMPLES: SAMPLE NUMBER	RECOV. LENGTH (IN.)	RECOV. RQD (%)	MOISTURE	UNIFIED SOIL CLASS.	DESCRIPTION OF MATERIAL	LITHOLOGY*	ELEVATION (FT.)
1								4" Tile block 6" concrete slab advanced through stone to 2'		
3	20	2 8 12	S-1	10		M	GP-GM	Bwn-gy f GRAVEl, and c-f Sand, trace Silt (FILL) (Class 7)		
5	17	8 9 8 5	S-2	6		M	GP	Gy c-f GRAVEL, trace c-f Sand, trace Silt (FILL) (Class 7)		8.9
7	5	4 3 2 1	S-3	8		M	GM	Bwn-rd c-f GRAVEL, some c-f Sand, little Silt (brick pieces) (FILL) (Class 7)		
9	12	3 5 7 7	S-4	8		W	SM	Bwn c-f SAND, and c-f Gravel, little Silt (FILL) (Class 7)		3.9
11	7	1 4 3 4	S-5	0				No Recovery		
13	19	7 8 11 20	S-6	14		W	GP	Bwn-rd c-f GRAVEL, some c-f Sand, trace Silt (brick pieces) (FILL) (Class 7)		
15	26	14 15 11 15	S-7	6		W	GP	Same (FILL) (Class 7)		-1.1
17	32	15 14 18 18	S-8	24		W	SM	Bwn-gy c-f SAND, little f Gravel, little Silt (brick pieces) (FILL) (Class 7)		
19	34	14 21 13 7	S-9	6		W	GP	Bwn-gy c-f GRAVEL, some c-f Sand, trace Silt (brick pieces) (FILL) (Class 7)		-6.1
21	12	6 8 4 5	S-10	8		W	GP	Same (FILL) (Class 7)		
23										
25										-11.1

REMARKS:
Surface elevation was provided by the Client, based on a previously performed site survey, NAVD 1988.

BORING LOG 10285.01 MANHATTAN.GPJ TECTONIC ENG.GDT 8/24/21

Tectonic

PROJECT No. **10285.01**
PROJECT: **BBJ - M**
LOCATION: **Manhattan, NY**

BORING No. B-4M

SHEET No. 2 of 4

CLIENT: **TRC**
CONTRACTOR: **Aarco Environmental Service Inc**

DEPTH (FT.)	N OR MIN./FT.	PENETRATION RESISTANCE (BL/6 IN.)	SAMPLES: SAMPLE NUMBER	SAMPLES: RECOV. LENGTH (IN.)	SAMPLES: RECOV. RQD (%)	MOISTURE	UNIFIED SOIL CLASS.	DESCRIPTION OF MATERIAL	ELEVATION (FT.)
26	21	5 10 11 7	S-11	6		W	GP	Bwn-rd c-f GRAVEL, and c-f Sand, trace Silt (FILL) (Class 7)	
27									
28	12	6 7 5 7	S-12	8		W	GP	Bwn-dk gy c-f GRAVEL, and c-f Sand (FILL) (Class 7)	
29									
30									-16.1
31	10	10 6 4 3	S-13	14		W	GM	Rd-bwn-gy c-f GRAVEL, and c-f Sand, little Silt, with a Silt layer at spoon tip	
32									
33	48	20 23 25 15	S-14	12		W		Bwn wood with c-f SAND, some Silt (FILL) (Class 7)	
34									
35									-21.1
36	14	9 7 7 8	S-15	14		W	Pt	Bwn PEAT with organic Silt (Class 6)	
37									
38	6	2 3 3 5	S-16	2		W	OL	Bwn Organic SILT, trace c-f Sand (Class 6)	
39									
40	31	13 15 16 13	S-17	22		W	OL	Dk gy-bwn Organic SILT with Peat pockets, trace c-f Sand (Class 6)	-26.1
41									
42	28	12 12 16 15	S-18	14		W	OL	Gy SAME (Class 6)	
43									
44	25	11 12 13 14	S-19	22		W	OL	Gy-bwn Organic CLAYEY SILT (Class 6)	
45									-31.1
46	0	WOR WOR WOR WOR	S-20	22		W	CL	Gy CLAY & SILT with Mica (Class 6)	
47									
48	6	2 3 3 3	S-21	22		W	CL	Gy CLAY & SILT (Class 6)	
49									
50	6	4 3 3 2	S-22	22		W	ML	Bwn-gy SILT with Clay seams (Class 6)	-36.1
51									
52	0	WOR WOR WOR WOR	S-23	14		W	OL	Gy Organic CLAYEY SILT (Class 6)	
53									
54	3	3 1 2 2	S-24	8		W	ML	Bwn-gy CLAYEY SILT (Class 6)	
55									-41.1

LITHOLOGY*

UNCONFINED COMPRESS. STRENGTH (TONS/FT)
1 2 3 4 5
PLASTIC LIMIT % WATER CONTENT % LIQUID LIMIT %
10 20 30 40 50
STANDARD PENETRATION (BLOWS/FT.)
10 20 30 40 50

REMARKS:

Surface elevation was provided by the Client, based on a previously performed site survey, NAVD 1988.

Tectonic

PROJECT No. **10285.01**
PROJECT: **BBJ - M**
LOCATION: **Manhattan, NY**

BORING No. B-4M

SHEET No. 3 of 4

CLIENT: **TRC**
CONTRACTOR: **Aarco Environmental Service Inc**

DEPTH (FT.)	N OR MIN./FT.	PENETRATION RESISTANCE (BL/6 IN.)	SAMPLES: SAMPLE NUMBER	SAMPLES: RECOV. LENGTH (IN.)	SAMPLES: RECOV. RQD (%)	SAMPLES: MOISTURE	UNIFIED SOIL CLASS.	DESCRIPTION OF MATERIAL	ELEVATION (FT.)
56	15	5 6 9 11	S-25	22		W	SP-SM	Bwn c-f SAND, little Silt with mica (Class 3b)	
57									
58									
59									
60									-46.1
61	11	2 4 7 8	S-26	22		W	ML SP	Gy CLAYEY SILT, some f Sand (Class 5b) Bwn-or c-f SAND, some f Gravel, trace Silt (Class 3b)	
62									
63									
64									
65									-51.1
66	16	7 8 8 9	S-27	22		W	SP-SM	Gy-tn c-f SAND, little f Gravel, trace Silt (Class 3b)	
67									
68									
69									
70									-56.1
71	29	11 11 18 18	S-28	22		W	SP-SM	Gy-or bwn c-f SAND, and c-f Gravel, trace Silt (Class 3b)	
72									
73									
74									
75									-61.1
76	20	6 11 9 10	S-29	16		W	SP-SM	Rd-bwn c-f SAND, little f Gravel, trace Silt (Class 3b)	
77									
78									
79									
80									-66.1
81	18	8 8 10 12	S-30	12		W	ML	Rd-bwn SILT, some c-f Sand with mica (Class 5b)	
82									
83									
84								increase in resistance/chatter begins at 83' Rotary advanced to 93'	
85									-71.1

UNCONFINED COMPRESS. STRENGTH (TONS/FT)
1 2 3 4 5
PLASTIC LIMIT % — WATER CONTENT % — LIQUID LIMIT %
10 20 30 40 50
STANDARD PENETRATION (BLOWS/FT.)
10 20 30 40 50

LITHOLOGY*

REMARKS:

Surface elevation was provided by the Client, based on a previously performed site survey, NAVD 1988.

BORING LOG 10285.01 MANHATTAN.GPJ TECTONIC ENG.GDT 8/24/21

Tectonic

PROJECT No. **10285.01**
PROJECT: **BBJ - M**
LOCATION: **Manhattan, NY**

BORING No. B-4M

SHEET No. 4 of 4

CLIENT: **TRC**
CONTRACTOR: **Aarco Environmental Service Inc**

UNCONFINED COMPRESS. STRENGTH (TONS/FT) ● 1 2 3 4 5
PLASTIC LIMIT % × — WATER CONTENT % ⊗ — LIQUID LIMIT % △ 10 20 30 40 50
STANDARD PENETRATION (BLOWS/FT.) ● 10 20 30 40 50

DEPTH (FT.)	N OR MIN./FT.	PENETRATION RESISTANCE (BL/6 IN.)	SAMPLES: SAMPLE NUMBER	SAMPLES: RECOV. LENGTH (IN.)	SAMPLES: RECOV. RQD (%)	MOISTURE	UNIFIED SOIL CLASS.	DESCRIPTION OF MATERIAL	LITHOLOGY*	ELEVATION (FT.)
86										
87										
88										
89										
90										-76.1
91										
92										
93										
94	20									
95	24									-81.1
96	5		C-1	18/60	0			18" Boulder		
97	2									
98	3									
99	4									
100	3		C-2	0/48	0			No Recovery (Sample lost due to malfunctioning core lifter)		-86.1
101	4									
102	4									
103										
104										
105										-91.1
106								Rotary drilled through lost core sample and competent rock to 110'		
107										
108										
109										
110										-96.1
111	6									
112	10									
113	10		C-3	23/60	38			Gy, slightly weathered, slightly fractured, c-f grained, hard SCHIST fracture 45 degrees from horizontal (Class 1c)		
114	10									
115	10									-101.1

REMARKS:

End of Boring at 115'

Surface elevation was provided by the Client, based on a previously performed site survey, NAVD 1988.

BORING LOG 10285.01 MANHATTAN.GPJ TECTONIC ENG.GDT 8/24/21

Tectonic

PROJECT No. **10285.01**
PROJECT: **BBJ - M**
LOCATION: **Manhattan, NY**

BORING No. B-5M

SHEET No. 1 of 4

CLIENT: **TRC**
CONTRACTOR: **Aarco Environmental Service Inc**
METHOD OF ADVANCING BORING | DIA. | DEPTH
POWER AUGER: | | TO
ROT. DRILL: | 3 7/8" | 0 TO 12'
CASING: | 4" | 0 TO 14'
DIAMOND CORE: | 3" | 0 TO 78'
Portable Rig with Cathead Donut Hammer

GROUND WATER | DATE | TIME | DEPTH

MON. WELL ☐ YES ☒ NO
SCREEN DEPTH: --- TO ---
WEATHER: TEMP:
DEPTH TO ROCK: **90'**
*CHANGES IN STRATA ARE INFERRED

INSPECTOR: **Barry Ouimet**
DRILLER: **Jose**
SURFACE ELEVATION: **1.0**
DATUM: **See Remarks**
DATE START: **7/26/21**
DATE FINISH: **7/30/21**

UNCONFINED COMPRESS. STRENGTH (TONS/FT) ● 1 2 3 4 5
PLASTIC LIMIT % ⊗ WATER CONTENT % △ LIQUID LIMIT % 10 20 30 40 50
STANDARD PENETRATION (BLOWS/FT.) ● 10 20 30 40 50

DEPTH (FT.)	N OR MIN./FT.	PENETRATION RESISTANCE (BL/6 IN.)	SAMPLES: SAMPLE NUMBER	RECOV. LENGTH (IN.)	RECOV. RQD (%)	MOISTURE	UNIFIED SOIL CLASS.	DESCRIPTION OF MATERIAL	LITHOLOGY*	ELEVATION (FT.)
1–6								Previously hand cleared to 6' (No soil description provided)		-4.0
7–8	30	9, 12, 18, 6	S-1	4		W	SP-SM	Bwn c-f SAND, trace c-f Gravel, trace Silt (FILL) (Class 7)		
9–10	13	10, 6, 7, 8	S-2	8		W	SP-SM	Bwn f SAND, trace f Gravel, trace Silt (FILL) (Class 7)		-9.0
11–12	18	17, 8, 10, 9	S-3	2		W	SM	Bwn m-f SAND, little Silt, trace c-f Gravel, trace brick, trace wood fragments (FILL) (Class 7)		
13–14	11	10, 8, 3, 3	S-4	4		W	SM	Bwn m-f SAND, some Silt, trace f Gravel (FILL) (Class 7)		
15–16	35	39, 15, 20, 19	S-5	4		W	SM	Bwn m-f SAND, some Silt, some Organics (wood) (FILL) (Class 7)		-14.0
17–18	24	6, 9, 15, 28	S-6	6		W	ML	Bwn SILT, and Organics, trace f Sand (FILL) (Class 7)		
19–20	17	6, 7, 10, 14	S-7	8		W	Pt	Bwn-rd PEAT (Class 6)		-19.0
21–22	18	4, 8, 10, 16	S-8	24		W	Pt	Bwn-rd PEAT, with occasional partings of f Sand (Class 6)		
23–24	63	33, 26, 37, 34	S-9	20		W	Pt	Bwn-rd PEAT, little Clayey Silt (Class 6)		-24.0
25										

REMARKS: Surface elevation was provided by the Client, based on a previously performed site survey, NAVD 1988.

Tectonic

PROJECT No. **10285.01**
PROJECT: **BBJ - M**
LOCATION: **Manhattan, NY**

BORING No. B-5M

SHEET No. 2 of 4

CLIENT: **TRC**
CONTRACTOR: **Aarco Environmental Service Inc**

DEPTH (FT.)	N OR MIN./FT.	PENETRATION RESISTANCE (BL/6 IN.)	SAMPLES: SAMPLE NUMBER	RECOV.: LENGTH (IN.)	RECOV.: RQD (%)	MOISTURE	UNIFIED SOIL CLASS.	DESCRIPTION OF MATERIAL
26	6	2 3 3 4	S-10	14		W	CL-ML	GY CLAYEY SILT, trace organics (Class 6)
28	36	22 19 17 19	S-11	24		W	CL-ML	Gy CLAYEY SILT, with frequent partings of f Sand, trace organics (wood) (Class 5a)
31	7	2 2 5 4	S-12	0		W		No Recovery (Class 6)
33	16	4 7 9 13	S-13	24		W	CL-ML	Gy CLAYEY SILT, with frequent partings of f Sand (Class 5b)
36	19	11 10 9 9	S-14	8		W	CL-ML	Gy CLAYEY SILT, and f Sand, trace organics (Class 5b)
41	29	9 14 15 15	S-15	12		W	ML	Bwn SILT, little f Sand, trace organics (Class 5b)
46	42	16 20 22 22	S-16	10		W	SM	Bwn m-f SAND, little Silt (Class 3a)
51	28	10 13 15 18	S-17	20		W	SM	Rd-bwn c-f SAND, little Silt (Class 3b)

LITHOLOGY*

UNCONFINED COMPRESS. STRENGTH (TONS/FT)
1 2 3 4 5
PLASTIC LIMIT % WATER CONTENT % LIQUID LIMIT %
10 20 30 40 50
STANDARD PENETRATION (BLOWS/FT.)
10 20 30 40 50

ELEVATION (FT.)
-29.0
-34.0
-39.0
-44.0
-49.0
-54.0

REMARKS: Surface elevation was provided by the Client, based on a previously performed site survey, NAVD 1988.

BORING LOG 10285.01 MANHATTAN.GPJ TECTONIC ENG.GDT 8/24/21

Tectonic

PROJECT No. **10285.01**

PROJECT: **BBJ - M**

LOCATION: **Manhattan, NY**

BORING No. B-5M

SHEET No. 3 of 4

CLIENT: **TRC**

CONTRACTOR: **Aarco Environmental Service Inc**

DEPTH (FT.)	N OR MIN./FT.	PENETRATION RESISTANCE (BL/6 IN.)	SAMPLES: SAMPLE NUMBER	RECOV.: LENGTH (IN.)	RECOV.: RQD (%)	MOISTURE	UNIFIED SOIL CLASS.	DESCRIPTION OF MATERIAL
56	39	23 20 19 23	S-18	16		W	SP	Bwn m-f SAND, trace Silt (Class 3a)
57								
58								
59								
60								
61	28	11 16 12 13	S-19	12		W	SP-SM	Rd-bwn m-f SAND, trace Silt, trace c-f Gravel (Class 3b)
62								
63								
64								
65								
66	29	18 15 14 14	S-20	8		W	SP-SM	Same (class 3b)
67								
68								
69								
70								
71	41	23 24 17 17	S-21	6		W	SP-SM	Rd-bwn m-f SAND, little Silt, trace f Gravel (Class 3a)
72								
73								
74								
75								
76	50+	17 50/3	S-22	3		W	SP-SM	Rd-bwn m-f SAND, little Silt, trace c-f Gravel (Class 3a)
77								Boulders/Cobbles to 78'
78								
79								
80								
81								
82								
83	143	47 60 83 50/2	S-23	13		W	SW-SM	Bwn c-f SAND, trace Silt, trace f Gravel (Class 3a)
84								
85								Drilled to 85' on weathered rock

LITHOLOGY*

UNCONFINED COMPRESS. STRENGTH (TONS/FT)
1 2 3 4 5

PLASTIC LIMIT % — WATER CONTENT % — LIQUID LIMIT %
10 20 30 40 50

STANDARD PENETRATION (BLOWS/FT.)
10 20 30 40 50

ELEVATION (FT.)
-59.0
-64.0
-69.0
-74.0
-79.0
-84.0

143

REMARKS: Surface elevation was provided by the Client, based on a previously performed site survey, NAVD 1988.

BORING LOG 10285.01 MANHATTAN.GPJ TECTONIC ENG.GDT 8/24/21

Tectonic

PROJECT No. **10285.01**
PROJECT: **BBJ - M**
LOCATION: **Manhattan, NY**

BORING No. B-5M

SHEET No. 4 of 4

CLIENT: **TRC**
CONTRACTOR: **Aarco Environmental Service Inc**

DEPTH (FT.)	N OR MIN./FT.	PENETRATION RESISTANCE (BL/6 IN.)	SAMPLES: SAMPLE NUMBER	SAMPLES: RECOV. LENGTH (IN.)	SAMPLES: RECOV. RQD (%)	MOISTURE	UNIFIED SOIL CLASS.	DESCRIPTION OF MATERIAL	LITHOLOGY*	UNCONFINED COMPRESS. STRENGTH (TONS/FT) / PLASTIC LIMIT % / WATER CONTENT % / LIQUID LIMIT % / STANDARD PENETRATION (BLOWS/FT.)	ELEVATION (FT.)
86								Drilled 85' to 90' through weathered bedrock			
87											
88											
89											
90											-89.0
91	11.5										
92	14										
93	9.5		C-1	56	53			Gy, slightly weathered, moderately fractured, m-f grained, moderately hard, SCHIST with banding (Class 1b)			
94	9.5										
95	12.5										-94.0
96								End of Boring at 95'			
97											
98											
99											
100											-99.0
101											
102											
103											
104											
105											-104.0
106											
107											
108											
109											
110											-109.0
111											
112											
113											
114											
115											-114.0

REMARKS: Surface elevation was provided by the Client, based on a previously performed site survey, NAVD 1988.

Tectonic

PROJECT No. **10285.01**
PROJECT: **BBJ - M**
LOCATION: **Manhattan, NY**

BORING No. B-7M

SHEET No. 1 of 4

CLIENT: **TRC**
CONTRACTOR: **Aarco Environmental Service Inc**
METHOD OF ADVANCING BORING | DIA. | DEPTH
POWER AUGER: | | TO
ROT. DRILL: | **2 7/8"** | **0** TO **82'**
CASING: | **3"** | **0** TO **75'**
DIAMOND CORE: | **2"** | **82** TO **87'**
Portable Rig with Cathead Donut Hammer

GROUND WATER | DATE | TIME | DEPTH

MON. WELL ☐ YES ☒ NO
SCREEN DEPTH: **---** TO **---**
WEATHER: TEMP:
DEPTH TO ROCK: **82'**
*CHANGES IN STRATA ARE INFERRED

INSPECTOR: **R. Villa / J. Rusk**
DRILLER: **Jose**
SURFACE ELEVATION: **1.0**
DATUM: **See Remarks**
DATE START: **8/2/21**
DATE FINISH: **8/5/21**

UNCONFINED COMPRESS. STRENGTH (TONS/FT) ● 1 2 3 4 5
PLASTIC LIMIT % ⊗ WATER CONTENT % △ LIQUID LIMIT % 10 20 30 40 50
● STANDARD PENETRATION (BLOWS/FT.) 10 20 30 40 50

DEPTH (FT.)	N OR MIN./FT.	PENETRATION RESISTANCE (BL/6 IN.)	SAMPLES: SAMPLE NUMBER	RECOV. LENGTH (IN.)	RECOV. RQD (%)	MOISTURE	UNIFIED SOIL CLASS.	DESCRIPTION OF MATERIAL	LITHOLOGY*	ELEVATION (FT.)
1–5								Previously hand cleared to 6' (No soil description provided)		-4.0
6–10										-9.0
11–15								Environmental boring (SB-03) conducted to 20'		-14.0
16–20										-19.0
21	50+	32 50/6	S-1	8		W	SP-SM	Rd-bwn c-f SAND, some c-f Gravel, little Silt (Class 3a)		
22–25										-24.0

REMARKS: Surface elevation was provided by the Client, based on a previously performed site survey, NAVD 1988.

BORING LOG 10285.01 MANHATTAN.GPJ TECTONIC ENG.GDT 8/24/21

Tectonic

PROJECT No. **10285.01**

PROJECT: **BBJ - M**

LOCATION: **Manhattan, NY**

BORING No. B-7M

SHEET No. 2 of 4

CLIENT: **TRC**

CONTRACTOR: **Aarco Environmental Service Inc**

DEPTH (FT.)	N OR MIN./FT.	PENETRATION RESISTANCE (BL/6 IN.)	SAMPLES: SAMPLE NUMBER	SAMPLES: RECOV. LENGTH (IN.)	SAMPLES: RECOV. RQD (%)	SAMPLES: MOISTURE	UNIFIED SOIL CLASS.	DESCRIPTION OF MATERIAL	ELEVATION (FT.)
26	26	17, 13, 13, 16	S-2	4		W	SP-SM	Rd-bwn c-f SAND, little Silt, trace c-f Gravel (Class 3b)	
27									
28									
29									
30									-29.0
31	35	31, 19, 16, 13	S-3	2		W	SP-SM	Bwn m-f SAND, little Silt, trace f Gravel (Class 3a)	
32									
33									
34									
35									-34.0
36	34	37, 17, 17, 17	S-4	6		W	SP-SM	Same (Class 3a)	
37									
38									
39									
40									-39.0
41	57	31, 29, 28, 24	S-5	0				No Recovery	
42									
43	43	22, 20, 23, 25	S-6	10		W	SM	Bwn c-f SAND, little Silt, little f Gravel (Class 3a)	
44									
45									-44.0
46	37	13, 19, 18, 21	S-7	10		W	SM	Bwn c-f SAND, little Silt, trace f Gravel (Class 3b)	
47									
48									
49									
50									-49.0
51	24	13, 12, 12, 12	S-8	4		W	SP	Bwn c-f SAND, trace Silt, trace f Gravel (Class 3b)	
52									
53									
54									
55									-54.0

LITHOLOGY*

UNCONFINED COMPRESS. STRENGTH (TONS/FT)
1 2 3 4 5

PLASTIC LIMIT % WATER CONTENT % LIQUID LIMIT %
10 20 30 40 50

STANDARD PENETRATION (BLOWS/FT.)
10 20 30 40 50

REMARKS: Surface elevation was provided by the Client, based on a previously performed site survey, NAVD 1988.

Tectonic

PROJECT No. **10285.01**

PROJECT: **BBJ - M**

LOCATION: **Manhattan, NY**

BORING No. B-7M

SHEET No. 3 of 4

CLIENT: **TRC**

CONTRACTOR: **Aarco Environmental Service Inc**

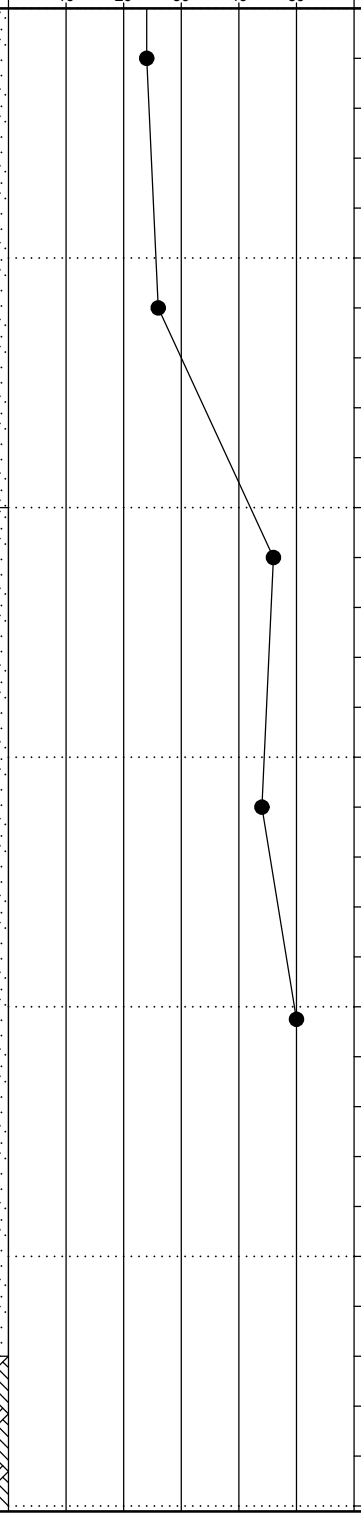
DEPTH (FT.)	N OR MIN./FT.	PENETRATION RESISTANCE (BL/6 IN.)	SAMPLES: SAMPLE NUMBER	SAMPLES: RECOV. LENGTH (IN.)	SAMPLES: RECOV. RQD (%)	MOISTURE	UNIFIED SOIL CLASS.	DESCRIPTION OF MATERIAL	ELEVATION (FT.)
56	24	16, 12, 12, 12	S-9	6		W	SP	Same (Class 3b)	
57									
58									
59									
60									-59.0
61	26	25, 16, 10, 13	S-10	6		W	SP	Bwn c-f SAND, trace Silt, trace f Gravel (Class 3b)	
62									
63									
64									
65									-64.0
66	46	19, 24, 22, 23	S-11	4		W	SM	Bwn-rd f SAND, some Silt, trace f Gravel (Class 3a)	
67									
68									
69									
70									-69.0
71	44	31, 23, 21, 24	S-12	6		W	SM	Bwn c-f SAND, some f Gravel, little Silt (Class 3a)	
72									
73									
74									
75	50+	50/3	S-13	0				No Recovery	-74.0
76									
77									
78									
79									
80									-79.0
81									
82									
83									
84			C-1	59/60	95			Gy, slightly weathered, slightly fractured, c grained, hard SCHIST (Class 1a)	
85									-84.0

LITHOLOGY*

UNCONFINED COMPRESS. STRENGTH (TONS/FT) ● 1 2 3 4 5

PLASTIC LIMIT % × WATER CONTENT % ⊗ LIQUID LIMIT % △ 10 20 30 40 50

STANDARD PENETRATION (BLOWS/FT.) ● 10 20 30 40 50



REMARKS: Surface elevation was provided by the Client, based on a previously performed site survey, NAVD 1988.

BORING LOG 10285.01 MANHATTAN.GPJ TECTONIC ENG.GDT 8/24/21

Tectonic

PROJECT No. **10285.01**

PROJECT: **BBJ - M**

LOCATION: **Manhattan, NY**

BORING No. B-7M

SHEET No. 4 of 4

CLIENT: **TRC**

CONTRACTOR: **Aarco Environmental Service Inc**

UNCONFINED COMPRESS. STRENGTH (TONS/FT)
1 2 3 4 5

PLASTIC LIMIT % | WATER CONTENT % | LIQUID LIMIT %
10 20 30 40 50

STANDARD PENETRATION (BLOWS/FT.)
10 20 30 40 50

DEPTH (FT.)	N OR MIN./FT.	PENETRATION RESISTANCE (BL/6 IN.)	SAMPLES: SAMPLE NUMBER	SAMPLES: RECOV. LENGTH (IN.)	SAMPLES: RECOV. RQD (%)	SAMPLES: MOISTURE	UNIFIED SOIL CLASS.	DESCRIPTION OF MATERIAL	LITHOLOGY*	ELEVATION (FT.)
86										
87										
88								End of Boring at 87'		
89										
90										-89.0
91										
92										
93										
94										
95										-94.0
96										
97										
98										
99										
100										-99.0
101										
102										
103										
104										
105										-104.0
106										
107										
108										
109										
110										-109.0
111										
112										
113										
114										
115										-114.0

REMARKS: Surface elevation was provided by the Client, based on a previously performed site survey, NAVD 1988.

Tectonic

PROJECT No. **10285.01**
PROJECT: **BBJ - M**
LOCATION: **Manhattan, NY**

BORING No. B-9M

SHEET No. 1 of 4

CLIENT: **TRC**
CONTRACTOR: **Aarco Environmental Service Inc**
METHOD OF ADVANCING BORING | DIA. | DEPTH
POWER AUGER: | | TO
ROT. DRILL: | **2 7/8"** | **0** TO **95'**
CASING: | **3"** | **0** TO **80'**
DIAMOND CORE: | | **95** TO **101'**
Acker Portable Rig with Cathead & Donut Hammer

GROUND WATER | DATE | TIME | DEPTH

MON. WELL ☒ YES ☐ NO
SCREEN DEPTH: **5** TO **15'**
WEATHER: TEMP:
DEPTH TO ROCK: **95'**
*CHANGES IN STRATA ARE INFERRED

INSPECTOR: **Barry Ouimet**
DRILLER: **Julio Galarza**
SURFACE ELEVATION: **1.0**
DATUM: **See Remarks**
DATE START: **6/28/21**
DATE FINISH: **7/2/21**

UNCONFINED COMPRESS. STRENGTH (TONS/FT) 1 2 3 4 5
PLASTIC LIMIT % | WATER CONTENT % | LIQUID LIMIT % 10 20 30 40 50
STANDARD PENETRATION (BLOWS/FT.) 10 20 30 40 50

DEPTH (FT.)	N OR MIN./FT.	PENETRATION RESISTANCE (BL/6 IN.)	SAMPLES: SAMPLE NUMBER	RECOV. LENGTH (IN.)	RECOV. RQD (%)	MOISTURE	UNIFIED SOIL CLASS.	DESCRIPTION OF MATERIAL	LITHOLOGY*	ELEVATION (FT.)
1–6								Previously cleared to 6' (No soil description provided)		-4.0
7–8	31	6 18 13 9	S-1	10		M	GM	Bwn-gy c-f GRAVEL, and c-f Sand, little Silt (FILL) (Class 7)		
9–10	22	8 8 14 13	S-2	14		M	GM	Same with brick fragment, with 1" Silt layer seam (FILL) (Class 7)		-9.0
11–12	34	13 16 18 20	S-3	12		W	GM	Bwn-gy c-f GRAVEL, some c-f Sand, little Silt (FILL) (Class 7)		
13–14	34	18 18 16 8	S-4	8		W	GP	Gy c-f GRAVEL, some c-f Sand, trace Silt (FILL) (Class 7)		
15–16	17	20 10 7 6	S-5	10		W	OL	Bwn Wood with organic SILT / PEAT (Class 6)		-14.0
17–18	5	2 2 3 4	S-6	8		W	Pt	Bwn PEAT with Organic Silt (Class 6)		
19–20	11	4 5 6 7	S-7	18		W	Pt	Peat with Organic Silt (Class 6)		-19.0
21–22	9	2 3 6 8	S-8	24		W	Pt	Bwn PEAT with Organic Silt (Class 6)		
23–24	22	18 12 10 11	S-9	18		W	Pt	Bwn-gy PEAT with Organic Clayey Silt (Class 6)		
25		3 3								-24.0

REMARKS: Surface elevation was provided by the Client, based on a previously performed site survey, NAVD 1988.

BORING LOG 10285.01 MANHATTAN.GPJ TECTONIC ENG.GDT 8/24/21

Tectonic

PROJECT No. **10285.01**

PROJECT: **BBJ - M**

LOCATION: **Manhattan, NY**

BORING No. B-9M

SHEET No. 2 of 4

CLIENT: **TRC**

CONTRACTOR: **Aarco Environmental Service Inc**

DEPTH (FT.)	N OR MIN./FT.	PENETRATION RESISTANCE (BL/6 IN.)	SAMPLES: SAMPLE NUMBER	SAMPLES: RECOV. LENGTH (IN.)	SAMPLES: RECOV. RQD (%)	SAMPLES: MOISTURE	UNIFIED SOIL CLASS.	DESCRIPTION OF MATERIAL	LITHOLOGY*	ELEVATION (FT.)
26	7	4 4	S-10	14		W	ML	Gy SILT & CLAY, little f Sand (Class 6)		
27	10	4 5 5 4	S-11	24		W	ML	Same (Class 4b)		
29	16	9 7 9 9	S-12	24		W	ML	Gy CLAYEY SILT, little f Sand, little f Gravel (root structures) (Class 5b)		-29.0
31	11	5 6 5 5	S-13	6		W	ML	Gy CLAYEY SILT, little f Sand (Class 5b)		
36	15	6 8 7 8	S-14	8		W	ML	Gy-bwn CLAYEY SILT, some m-f Sand, little f Gravel (Class 5b)		-34.0
41	15	8 5 10 14	S-15	12		W	SM	Gy-bwn m-f SAND, some Silt, trace f Gravel (Class 3b)		-39.0
46	33	10 16 17 7	S-16	4		W	SM	Bwn-gy c-f SAND, some f Gravel, little Silt (Class 3a)		-44.0
51	96+	44 46 50/5	S-17	3		W	SM	Bwn-gy c-f SAND, some c Gravel, little Silt (Class 3a)		-49.0 96 -54.0

UNCONFINED COMPRESS. STRENGTH (TONS/FT)
1 2 3 4 5
PLASTIC LIMIT % WATER CONTENT % LIQUID LIMIT %
10 20 30 40 50
STANDARD PENETRATION (BLOWS/FT.)
10 20 30 40 50

REMARKS: Surface elevation was provided by the Client, based on a previously performed site survey, NAVD 1988.

Tectonic

PROJECT No. **10285.01**
PROJECT: **BBJ - M**
LOCATION: **Manhattan, NY**

BORING No. B-9M

SHEET No. 3 of 4

CLIENT: **TRC**
CONTRACTOR: **Aarco Environmental Service Inc**

DEPTH (FT.)	N OR MIN./FT.	PENETRATION RESISTANCE (BL/6 IN.)	SAMPLES: SAMPLE NUMBER	RECOV.: LENGTH (IN.)	RECOV.: RQD (%)	MOISTURE	UNIFIED SOIL CLASS.	DESCRIPTION OF MATERIAL
56	21	9, 11, 10, 11	S-18	12		W	SM	Bwn c-f SAND, little f Gravel, little Silt (Class 3b)
57								
58								
59								
60								
61	24	14, 11, 13, 12	S-19	6		W	SM	Bwn c-f SAND, some f Gravel, little Silt (Class 3b)
62								
63								
64								
65								
66	26	12, 13, 13, 10	S-20	12		W	GM	Bwn c-f GRAVEL, some c-f Sand, little Silt (Class 3b)
67								
68								
69								
70								
71	23	17, 15, 8, 8	S-21	8		W	GM	Bwn-gy c-f GRAVEL, little c-f Sand, little Silt (Class 2b)
72								
73								
74								
75								
76	45	10, 20, 25, 13	S-22	6		W	SM	Bwn-gy c-f SAND, little c-f GRavel, little Silt (Class 3a)
77								
78								
79								
80								
81	28	28, 16, 12, 11	S-23	3		W	SM	Bwn c-f SAND, little c-f Gravel, little silt (Class 3b)
82								
83								
84								
85								

LITHOLOGY*

UNCONFINED COMPRESS. STRENGTH (TONS/FT)
1 2 3 4 5
PLASTIC LIMIT % — WATER CONTENT % — LIQUID LIMIT %
10 20 30 40 50
STANDARD PENETRATION (BLOWS/FT.)
10 20 30 40 50

ELEVATION (FT.)
-59.0
-64.0
-69.0
-74.0
-79.0
-84.0

REMARKS: Surface elevation was provided by the Client, based on a previously performed site survey, NAVD 1988.

Tectonic

PROJECT No. **10285.01**
PROJECT: **BBJ - M**
LOCATION: **Manhattan, NY**

BORING No. B-9M

SHEET No. 4 of 4

CLIENT: **TRC**
CONTRACTOR: **Aarco Environmental Service Inc**

DEPTH (FT.)	N OR MIN./FT.	PENETRATION RESISTANCE (BL/6 IN.)	SAMPLES: SAMPLE NUMBER	SAMPLES: RECOV. LENGTH (IN.)	SAMPLES: RECOV. RQD (%)	MOISTURE	UNIFIED SOIL CLASS.	DESCRIPTION OF MATERIAL	LITHOLOGY*	ELEVATION (FT.)
90	50+	50/5	S-24	8		W	SM	Top 6" Bwn-gy c-f SAND, little c-f Gravel, little Silt (Class 3a) Bottom 2" SOFT ROCK (SCHIST) (Class 1d)		-89.0
95			C-1	33/36	27			Gy, slightly weathered, moderately fractured, c grained, moderately hard SCHIST (Class 1d)		-94.0
100			C-2	40/36	57			Gy, slightly weathered, slightly fractured, c grained, moderately hard SCHIST (Class 1b)		-99.0
101								End of Boring at 101'		
105										-104.0
110										-109.0
115										-114.0

UNCONFINED COMPRESS. STRENGTH (TONS/FT)
1 2 3 4 5
PLASTIC LIMIT % WATER CONTENT % LIQUID LIMIT %
10 20 30 40 50
STANDARD PENETRATION (BLOWS/FT.)
10 20 30 40 50

REMARKS: Surface elevation was provided by the Client, based on a previously performed site survey, NAVD 1988.

BORING LOG 10285.01 MANHATTAN.GPJ TECTONIC ENG.GDT 8/24/21

Tectonic

PROJECT No. **10285.01**
PROJECT: **BBJ - M**
LOCATION: **Manhattan, NY**

BORING No. B-11M

SHEET No. 1 of 4

CLIENT: **TRC**
CONTRACTOR: **Aarco Environmental Service Inc**
METHOD OF ADVANCING BORING | DIA. | DEPTH
POWER AUGER: | | TO
ROT. DRILL: | **2 7/8"** | **0** TO **90'**
CASING: | **3"** | **0** TO **85'**
DIAMOND CORE: | **2"** | **90** TO **95'**
Acker Portable Rig with Cathead & Donut Hammer

GROUND WATER | DATE | TIME | DEPTH
MON. WELL ☐ YES ☒ NO
SCREEN DEPTH: **---** TO **---**
WEATHER: TEMP:
DEPTH TO ROCK: **90'**
*CHANGES IN STRATA ARE INFERRED

INSPECTOR: **J. Rusk/B. Ouimet**
DRILLER: **Julio Galarza**
SURFACE ELEVATION: **1.0**
DATUM: **See Remarks**
DATE START: **6/14/21**
DATE FINISH: **6/25/21**

UNCONFINED COMPRESS. STRENGTH (TONS/FT) 1 2 3 4 5
PLASTIC LIMIT % | WATER CONTENT % | LIQUID LIMIT % 10 20 30 40 50
STANDARD PENETRATION (BLOWS/FT.) 10 20 30 40 50

DEPTH (FT.)	N OR MIN./FT.	PENETRATION RESISTANCE (BL/6 IN.)	SAMPLES: SAMPLE NUMBER	RECOV. LENGTH (IN.)	RECOV. RQD (%)	MOISTURE	UNIFIED SOIL CLASS.	DESCRIPTION OF MATERIAL	LITHOLOGY*	ELEVATION (FT.)
1–6								Previously hand cleared to 6' (No soil description provided)		-4.0
7–8	8	3 4 4 10	S-1	8		M	SP	Gy-bwn c-f SAND, some c-f Gravel, trace Silt (FILL) (Class 7)		
9–10	12	1 2 10 7	S-2	6		M	SP	Same (FILL) (Class 7)		-9.0
11–12	28	14 13 15 17	S-3	0				No Recovery		
13–14	26	10 13 13 28	S-4	8		W	SM	Bwn-blk c-f SAND, some c-f Gravel, little Silt (FILL) (Class 7)		
15–16	23	21 12 11 13	S-5	8		W	SP	Gy c-f SAND, some c-f Gravel, trace Silt (wood pieces) (FILL) (Class 7)		-14.0
17–18	14	18 8 6 7	S-6	0				No Recovery		
19–20	32	17 14 18 15	S-7	0				No Recovery		-19.0
21–22	0	WOR WOR WOR WOR	S-8	24		W	OL	Dk bwn Organic SILT, little c-f Sand, little f Gravel (Peat) (Class 6)		
23–24	13	4 5 8 9	S-9	24		W	OL	Dk bwn Organic SILT, some c-f Sand, little f Gravel (Peat) (Class 6)		
25										-24.0

REMARKS: Surface elevation was provided by the Client, based on a previously performed site survey, NAVD 1988.

BORING LOG 10285.01 MANHATTAN.GPJ TECTONIC ENG.GDT 8/24/21

Tectonic

PROJECT No. **10285.01**
PROJECT: **BBJ - M**
LOCATION: **Manhattan, NY**

BORING No. B-11M

SHEET No. 2 of 4

CLIENT: **TRC**
CONTRACTOR: **Aarco Environmental Service Inc**

DEPTH (FT.)	N OR MIN./FT.	PENETRATION RESISTANCE (BL/6 IN.)	SAMPLES: SAMPLE NUMBER	RECOV.: LENGTH (IN.)	RECOV.: RQD (%)	MOISTURE	UNIFIED SOIL CLASS.	DESCRIPTION OF MATERIAL	ELEVATION (FT.)
26	14	3, 5, 9, 9	S-10	18		W	ML	Dk bwn-gy SILT, some c-f Sand, trace f Gravel (root structure) (Class 5b)	
28	16	11, 9, 7, 7	S-11	18		W	ML	Gy-bwn SILT, some Clayey Silt, little c-f Sand, trace f Gravel (root structure) (Class 5b)	
30	5	2, 2, 3, 7	S-12	22		W	CL	Gy SILT & CLAY, little f Sand (Class 6)	-29.0
32	13	3, 4, 9, 10	S-13	24		W	CL	Same (Class 4b)	
34									
36	17	7, 7, 10, 7	S-14	12		W	SM	Gy-bwn c-f SAND, little Clayey Silt, little c-f Gravel (Class 3b)	-34.0
38									
40									-39.0
41	18	1, 9, 9, 12	S-15	10		W	SM	Gy-bwn c-f SAND, little c-f Gravel, little Silt (Class 3b)	
43									
45									-44.0
46	16	10, 8, 8, 7	S-16	0				No Recovery	
48	9	8, 4, 5, 3	S-17	14		W	SM	Bwn c-f SAND, little c-f Gravel, little Silt (Class 6)	
50									-49.0
51	5	2, 1, 4, 5	S-18	6		W	SM	Bwn c-f SAND, some Silt (Class 6)	
53									
55									-54.0

UNCONFINED COMPRESS. STRENGTH (TONS/FT) 1 2 3 4 5
PLASTIC LIMIT % — WATER CONTENT % — LIQUID LIMIT % 10 20 30 40 50
STANDARD PENETRATION (BLOWS/FT.) 10 20 30 40 50

REMARKS: Surface elevation was provided by the Client, based on a previously performed site survey, NAVD 1988.

Tectonic

PROJECT No. **10285.01**
PROJECT: **BBJ - M**
LOCATION: **Manhattan, NY**

BORING No. B-11M

SHEET No. 3 of 4

CLIENT: **TRC**
CONTRACTOR: **Aarco Environmental Service Inc**

DEPTH (FT.)	N OR MIN./FT.	PENETRATION RESISTANCE (BL/6 IN.)	SAMPLES: SAMPLE NUMBER	SAMPLES: RECOV. LENGTH (IN.)	SAMPLES: RECOV. RQD (%)	MOISTURE	UNIFIED SOIL CLASS.	DESCRIPTION OF MATERIAL	ELEVATION (FT.)
56	8	5 4 4 9	S-19	0				No Recovery	
57									
58	13	10 10 3 2	S-20	0				No Recovery	
59									
60									-59.0
61									
62	45	9 18 27 12	S-21	0				No Recovery	
63									
64	33	30 22 11 7	S-22	24		W	SM	Bwn-gy c-f SAND, little f Gravel, little silt (Class 3a)	
65									-64.0
66	8	4 3 5 5	S-23	0				No Recovery	
67									
68									
69									
70									-69.0
71	9	6 6 3 3	S-24	16		W	SP	Bwn-gy c-f SAND, trace f Gravel, trace Silt (Class 6)	
72									
73									
74									
75									-74.0
76	12	6 5 7 9	S-25	24		W	SP	Same (Class 3b)	
77									
78									
79									
80									-79.0
81	24	18 10 14 12	S-26	6		W	SP	Same (Class 3b)	
82									
83									
84									
85									-84.0

LITHOLOGY*

UNCONFINED COMPRESS. STRENGTH (TONS/FT)
1 2 3 4 5
PLASTIC LIMIT % WATER CONTENT % LIQUID LIMIT %
10 20 30 40 50
STANDARD PENETRATION (BLOWS/FT.)
10 20 30 40 50

REMARKS: Surface elevation was provided by the Client, based on a previously performed site survey, NAVD 1988.

Tectonic

PROJECT No. **10285.01**
PROJECT: **BBJ - M**
LOCATION: **Manhattan, NY**

BORING No. B-11M

SHEET No. 4 of 4

CLIENT: **TRC**
CONTRACTOR: **Aarco Environmental Service Inc**

DEPTH (FT.)	N OR MIN./FT.	PENETRATION RESISTANCE (BL/6 IN.)	SAMPLES: SAMPLE NUMBER	SAMPLES: RECOV. LENGTH (IN.)	SAMPLES: RECOV. RQD (%)	SAMPLES: MOISTURE	UNIFIED SOIL CLASS.	DESCRIPTION OF MATERIAL	LITHOLOGY*	ELEVATION (FT.)
86	21	5 7 14 43	S-27	22		W	SM	Bwn-gy c-f SAND, some f Gravel, little Silt (Class 3b)		
87										
88										
89										
	50+	50/0	S-28	0				No Recovery		
90										-89.0
91	2									
92	6									
93	11		C-1	56/60	80			Lgt gy, slightly weathered, moderately to slightly fractured, medium hard, fine grained, SCHIST, fractures 0 to 60 degree from horizontal (Class 1b)		
94	8									
95	9									-94.0
96								End of Boring at 95'		
97										
98										
99										
100										-99.0
101										
102										
103										
104										
105										-104.0
106										
107										
108										
109										
110										-109.0
111										
112										
113										
114										
115										-114.0

UNCONFINED COMPRESS. STRENGTH (TONS/FT)
1 2 3 4 5
PLASTIC LIMIT % WATER CONTENT % LIQUID LIMIT %
10 20 30 40 50
STANDARD PENETRATION (BLOWS/FT.)
10 20 30 40 50

REMARKS: Surface elevation was provided by the Client, based on a previously performed site survey, NAVD 1988.

Tectonic

PROJECT No. **10285.01**
PROJECT: **BBJ - M**
LOCATION: **Manhattan, NY**

BORING No. B-12M

SHEET No. 1 of 2

CLIENT: **TRC**
CONTRACTOR: **Aarco Environmental Service Inc**
METHOD OF ADVANCING BORING | DIA. | DEPTH
POWER AUGER: | | TO
ROT. DRILL: | **3 7/8"** | **0** TO **35'**
CASING: | **4"** | **0** TO **30'**
DIAMOND CORE: | | TO
Geoprobe 7822DT with DH103 Automatic Hammer

GROUND WATER | DATE | TIME | DEPTH

MON. WELL ☐ YES ☒ NO
SCREEN DEPTH: **---** TO **---**
WEATHER: **Clear** TEMP: **65° F**
DEPTH TO ROCK: **---**
*CHANGES IN STRATA ARE INFERRED

INSPECTOR: **Jeffrey VanGrouw**
DRILLER: **Daybis Pachero**
SURFACE ELEVATION: **15.0**
DATUM: **See Remarks**
DATE START: **6/13/21**
DATE FINISH: **6/13/21**

UNCONFINED COMPRESS. STRENGTH (TONS/FT) ● 1 2 3 4 5
PLASTIC LIMIT % | WATER CONTENT % | LIQUID LIMIT % ✕ ⊗ △ 10 20 30 40 50
STANDARD PENETRATION (BLOWS/FT.) ● 10 20 30 40 50

DEPTH (FT.)	N OR MIN./FT.	PENETRATION RESISTANCE (BL/6 IN.)	SAMPLES: SAMPLE NUMBER	RECOV. LENGTH (IN.)	RECOV. RQD (%)	MOISTURE	UNIFIED SOIL CLASS.	DESCRIPTION OF MATERIAL
1								4" Concrete pavers, 8" Concrete
2–4						M	SP	Hand excavated to 4' Bwn c-f SAND, some c-f Gravel, little Silt (FILL) (Class 7)
5–6	3	2 2 1 2	S-1	5		M	GP	Bwn c-f GRAVEL, little c-f Sand, trace Silt (FILL) (Class 7)
7–8	4	3 2 2 3	S-2	10		M	SP	Bwn c-f SAND, little m-f Gravel, trace Silt (FILL) (Class 7)
9–10	3	2 2 1 2	S-3	7		M	SW	Bwn c-f SAND, some f Gravel, trace Silt (FILL) (Class 7)
11–12	114+	3 14 100/2	S-4	10		W	SP-SM	Rd-bwn c-f SAND, little f Gravel, trace Silt (FILL) (Class 7)
13–14	39	8 26 13 19	S-5	13		W	SP-SM	Bwn c-f SAND, little c-f Gravel, trace Silt, wood, brick (FILL) (Class 7)
15–16	21	5 11 10 11	S-6	11		W	SP-SM	Dk bwn c-f SAND, little c-f Gravel, trace Silt (FILL) (Class 7)
17–18	30	11 19 11 8	S-7	1		W	GM	Gy m-f GRAVEL, little Silt, trace c-f Sand (FILL) (Class 7)
19–20	52	18 23 29 31	S-8	10		W	SM	Bwn m-f SAND, some Silt, little f Gravel (FILL) (Class 7)
21–22	32	10 14 18 18	S-9	1		W	SP-SM	Bwn c-f SAND, little c-f Gravel, little Silt (FILL) (Class 7)
23–25								

LITHOLOGY*

ELEVATION (FT.): 10.0, 5.0, 0.0, -5.0, -10.0

114

REMARKS: Surface elevation was provided by the Client, based on a previously performed site survey, NAVD 1988.

Tectonic

PROJECT No. **10285.01**
PROJECT: **BBJ - M**
LOCATION: **Manhattan, NY**

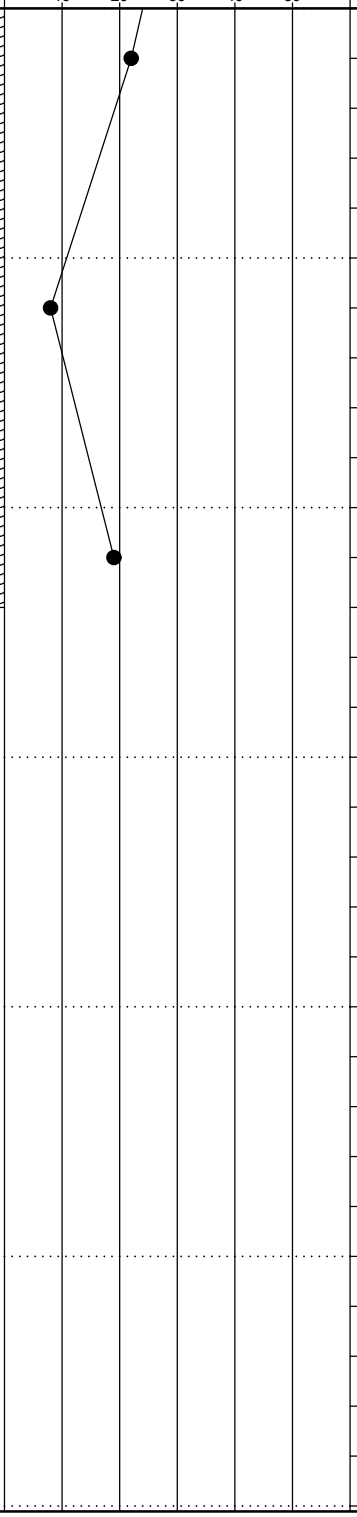
BORING No. B-12M

SHEET No. 2 of 2

CLIENT: **TRC**
CONTRACTOR: **Aarco Environmental Service Inc**

DEPTH (FT.)	N OR MIN./FT.	PENETRATION RESISTANCE (BL/6 IN.)	SAMPLES: SAMPLE NUMBER	SAMPLES: RECOV. LENGTH (IN.)	SAMPLES: RECOV. RQD (%)	MOISTURE	UNIFIED SOIL CLASS.	DESCRIPTION OF MATERIAL	LITHOLOGY*
26	22	8 11 11 13	S-10	12		W W	SP-SM	Top 8" - Bwn c-f SAND, little c-f Gravel, Silt (Class 3b) Bottom 4" - Wood (possible timber pile)	
27									
28									
29									
30									
31	8	6 4 4 5	S-11	21		W	Pt	Bwn wood, some Peat (Class 6)	
32									
33									
34									
35									
36	19	8 9 10 11	S-12	24		W		Bwn Wood (Class 6) Discontinued boring due to wood obstruction, and offset to drill boring B-12M(A).	
37									
38								End of Boring at 37'	
39									
40									
41									
42									
43									
44									
45									
46									
47									
48									
49									
50									
51									
52									
53									
54									
55									

UNCONFINED COMPRESS. STRENGTH (TONS/FT)
1 2 3 4 5
PLASTIC LIMIT % — WATER CONTENT % — LIQUID LIMIT %
10 20 30 40 50
STANDARD PENETRATION (BLOWS/FT.)
10 20 30 40 50



ELEVATION (FT.)
-15.0
-20.0
-25.0
-30.0
-35.0
-40.0

REMARKS: Surface elevation was provided by the Client, based on a previously performed site survey, NAVD 1988.

Tectonic

PROJECT No. **10285.01**
PROJECT: **BBJ - M**
LOCATION: **Manhattan, NY**

BORING No. B-12M(A)

SHEET No. 1 of 4

CLIENT: **TRC**
CONTRACTOR: **Aarco Environmental Service Inc**
METHOD OF ADVANCING BORING | DIA. | DEPTH
POWER AUGER: | | TO
ROT. DRILL: | **3 7/8"** | **0** TO **103'**
CASING: | **4"** | **0** TO **30'**
DIAMOND CORE: | **2"** | **103** TO **108'**
Geoprobe GP050 with Automatic Hammer

GROUND WATER: DATE | TIME | DEPTH

INSPECTOR: **Michael Bastien**
DRILLER: **Nick**
SURFACE ELEVATION: **15.0**
DATUM: **See Remarks**
DATE START: **6/19/21**
DATE FINISH: **6/19/21**
MON. WELL ☐ YES ☒ NO
SCREEN DEPTH: **---** TO **---**
WEATHER: **Clear** TEMP: **85° F**
DEPTH TO ROCK: **101.2'**
*CHANGES IN STRATA ARE INFERRED

UNCONFINED COMPRESS. STRENGTH (TONS/FT) ● 1 2 3 4 5
PLASTIC LIMIT % | WATER CONTENT % | LIQUID LIMIT %
10 20 30 40 50
STANDARD PENETRATION (BLOWS/FT.) ● 10 20 30 40 50

DEPTH (FT.)	N OR MIN./FT.	PENETRATION RESISTANCE (BL/6 IN.)	SAMPLES: SAMPLE NUMBER	RECOV.: LENGTH (IN.)	RECOV.: RQD (%)	MOISTURE	UNIFIED SOIL CLASS.	DESCRIPTION OF MATERIAL	LITHOLOGY*	ELEVATION (FT.)
1–25								Drilled adjacent to boring B-12M. See boring 12M for details about the soils encountered above a depth of 40'		10.0, 5.0, 0.0, -5.0, -10.0

REMARKS: Surface elevation was provided by the Client, based on a previously performed site survey, NAVD 1988.

BORING LOG 10285.01 MANHATTAN.GPJ TECTONIC ENG.GDT 8/24/21

Tectonic

PROJECT No. **10285.01**
PROJECT: **BBJ - M**
LOCATION: **Manhattan, NY**

BORING No. B-12M(A)

SHEET No. 2 of 4

CLIENT: **TRC**
CONTRACTOR: **Aarco Environmental Service Inc**

DEPTH (FT.)	N OR MIN./FT.	PENETRATION RESISTANCE (BL/6 IN.)	SAMPLES: SAMPLE NUMBER	SAMPLES: RECOV. LENGTH (IN.)	SAMPLES: RECOV. RQD (%)	SAMPLES: MOISTURE	UNIFIED SOIL CLASS.	DESCRIPTION OF MATERIAL	LITHOLOGY*
40									
41	2	WOH 1 1 1	S-1	24		W	CL-ML	Dk gy CLAYEY SILT, trace wood debris, organics (Class 6)	
42									
43	5	WOH 3 2 2	S-2	24		W	CL-ML	Gy CLAYEY SILT (Class 4c)	
44									
45	3	WOH 1 2 2	S-3	24		W	CL-ML	Gy CLAYEY SILT, trace f Sand, Sandy lens @ 44.25 (Class 6)	
46									
47	2	WOH 0 2 2	S-4	0				No Recovery	
48									
49	5	1 1 4 3	S-5	24		W	CL-ML ML	4" Gy CLAYEY SILT 20" Bwn-gy CLAYEY SILT, some c-f Sand (Class 4c)	
50									
51	3	1 1 2 2	S-6	14		W	SM	Bwn-gy m-f SAND, some Clayey Silt (Class 6)	
52									
53	14	4 5 9 13	S-7	20		W	SM	Bwn c-f SAND, little Clayey Silt, trace wood debris (Class 3b)	
54									
55									

UNCONFINED COMPRESS. STRENGTH (TONS/FT)
1 2 3 4 5
PLASTIC LIMIT % — WATER CONTENT % — LIQUID LIMIT %
10 20 30 40 50
STANDARD PENETRATION (BLOWS/FT.)
10 20 30 40 50

ELEVATION (FT.)
-15.0
-20.0
-25.0
-30.0
-35.0
-40.0

REMARKS: Surface elevation was provided by the Client, based on a previously performed site survey, NAVD 1988.

Tectonic

PROJECT No. **10285.01**
PROJECT: **BBJ - M**
LOCATION: **Manhattan, NY**

BORING No. B-12M(A)

SHEET No. 3 of 4

CLIENT: **TRC**
CONTRACTOR: **Aarco Environmental Service Inc**

DEPTH (FT.)	N OR MIN./FT.	PENETRATION RESISTANCE (BL/6 IN.)	SAMPLES: SAMPLE NUMBER	RECOV.: LENGTH (IN.)	RECOV.: RQD (%)	MOISTURE	UNIFIED SOIL CLASS.	DESCRIPTION OF MATERIAL
56	18	5 7 11 14	S-8	14		W	SM	Bwn c-f SAND, little c-f Gravel, trace Clayey Silt (Class 3b)
57								
58								
59								
60								
61	15	10 8 7 12	S-9	10		W	SM	Bwn c-f SAND, trace c-f Gravel, trace Clayey Silt (Class 3b)
62								
63								
64								
65								
66	23	12 8 15 9	S-10	5		W	SM	Bwn c-f SAND, some c-f Gravel, trace Clayey Silt (Class 3b)
67								
68								
69								
70								
71	10	7 5 5 5	S-11	8		W	SM	Bwn c-f SAND, trace c-f Gravel, trace Silt (Class 3b)
72								
73								
74								
75								
76	10	8 5 5 7	S-12	18		W	SW-SM	Bwn-blk c-m SAND, and f Gravel, trace Silt (Class 3b)
77								
78								
79								
80								
81	10	7 5 5 6	S-13	4		W	SM	Bwn c-f SAND, little c-f Gravel, little Silt (Class 3b)
82								
83								
84								
85								

LITHOLOGY*

UNCONFINED COMPRESS. STRENGTH (TONS/FT)
1 2 3 4 5
PLASTIC LIMIT % WATER CONTENT % LIQUID LIMIT %
10 20 30 40 50
STANDARD PENETRATION (BLOWS/FT.)
10 20 30 40 50

ELEVATION (FT.)
-45.0
-50.0
-55.0
-60.0
-65.0
-70.0

REMARKS: Surface elevation was provided by the Client, based on a previously performed site survey, NAVD 1988.

Tectonic

PROJECT No. **10285.01**
PROJECT: **BBJ - M**
LOCATION: **Manhattan, NY**

BORING No. B-12M(A)

SHEET No. 4 of 4

CLIENT: **TRC**
CONTRACTOR: **Aarco Environmental Service Inc**

DEPTH (FT.)	N OR MIN./FT.	PENETRATION RESISTANCE (BL/6 IN.)	SAMPLES: SAMPLE NUMBER	RECOV.: LENGTH (IN.)	RECOV.: RQD (%)	MOISTURE	UNIFIED SOIL CLASS.	DESCRIPTION OF MATERIAL
86	16	10 8 8 13	S-14	8		W	SM	Bwn c-f SAND, some c-f Gravel, trace Silt (Class 3b)
87								
88								
89								
90								
91	16	11 7 9 11	S-15	12		W	SM	Bwn c-f SAND, little c-f Gravel, trace Silt (Class 3b)
92								
93								
94								
95								
96	19	6 10 9 13	S-16	8		W W	SM ML	6" c-f SAND, little Silt (Class 3b) 2" Tn CLAYEY SILT (Class 5b)
97								
98								
99								
100								
101	88+	33 38 50/2	S-17	3		W W	ML GP	2" Same SOFT ROCK, which when sampled broke into Gy c-f GRAVEL (Class 1d)
102								
103	50+	50/0	S-18	1		W	GP	
104	6							
105	5							
106	4		C-1	54/60	79			Gy-bl-rd, slightly weathered, slightly fractured, m-f grained hard, SCHIST (Class 1b)
107	6							
108	5							
109								End of Boring at 108'
110								
111								
112								
113								
114								
115								

LITHOLOGY*

UNCONFINED COMPRESS. STRENGTH (TONS/FT)
1 2 3 4 5
PLASTIC LIMIT % WATER CONTENT % LIQUID LIMIT %
10 20 30 40 50
STANDARD PENETRATION (BLOWS/FT.)
10 20 30 40 50

ELEVATION (FT.)
-75.0
-80.0
-85.0
-90.0
-95.0
-100.0

88

REMARKS: Surface elevation was provided by the Client, based on a previously performed site survey, NAVD 1988.

Tectonic

PROJECT No. **10285.01**
PROJECT: **BBJ - M**
LOCATION: **Manhattan, NY**

BORING No. B-13M

SHEET No. 1 of 4

CLIENT: **TRC**
CONTRACTOR: **Aarco Environmental Service Inc**
METHOD OF ADVANCING BORING | DIA. | DEPTH
POWER AUGER: | | TO
ROT. DRILL: | **3 7/8"** | **0** TO **102'**
CASING: | **4"** | **0** TO **45'**
DIAMOND CORE: | **2"** | **102** TO **107'**
Geoprobe 7822DT with DH103 Automatic Hammer

GROUND WATER | DATE | TIME | DEPTH
MON. WELL ☐ YES ☒ NO
SCREEN DEPTH: **---** TO **---**
WEATHER: **Overcast** TEMP: **70° F**
DEPTH TO ROCK: **102'**
*CHANGES IN STRATA ARE INFERRED

INSPECTOR: **Ryan Villa**
DRILLER: **Daybi**
SURFACE ELEVATION: **14.7**
DATUM: **See Remarks**
DATE START: **6/12/21**
DATE FINISH: **6/12/21**

UNCONFINED COMPRESS. STRENGTH (TONS/FT) ● 1 2 3 4 5
PLASTIC LIMIT % × | WATER CONTENT % ⊗ | LIQUID LIMIT % △ 10 20 30 40 50
STANDARD PENETRATION (BLOWS/FT.) ● 10 20 30 40 50

DEPTH (FT.)	N OR MIN./FT.	PENETRATION RESISTANCE (BL/6 IN.)	SAMPLES: SAMPLE NUMBER	RECOV. LENGTH (IN.)	RECOV. RQD (%)	MOISTURE	UNIFIED SOIL CLASS.	DESCRIPTION OF MATERIAL	LITHOLOGY*	ELEVATION (FT.)
1–4								4" Pavers 8" Concrete Gravel Subbase Hand excavated to 6' (No soil descriptionprovided)		
5–6	14	9 7 7 5	S-1	6		M	SP	Rd-bwn m-f SAND, and c-f Gravel, trace Silt (FILL) (Class 7)		9.7
7–8	6	4 3 3 4	S-2	4		M	SP	Rd-bwn m-f SAND, trace c-f Gravel, trace Silt, trace brick (FILL) (Class 7)		
9–10	14	7 7 7 7	S-3	8		W	SP	Rd-bwn m-f SAND, trace f Gravel, trace Silt, trace brick (FILL) (Class 7)		4.7
11–12	9	4 6 3 2	S-4	4		W	SM	Rd-bwn c-f SAND, little c-f Gravel, little Silt, trace brick (FILL) (Class 7)		
13–14	10	1 0 10 23	S-5	24		W	SM	Rd-bwn c-f SAND, little Silt, trace c-f Gravel, trace brick FILL) (Class 7)		
15–16	6	4 2 4 6	S-6	6		W	SM	Bwn-blk m-f SAND, some Silt, trace f Gravel, trace organics (FILL) (Class 7)		-0.3
17–18	16	6 7 9 9	S-7	16		W	SP-SM	Gy-blk m-f SAND, some f Gravel, trace Silt (Class 3b) (POSSIBLE FILL)		
19–20	6	2 5 1 2	S-8	0				No Recovery		-5.3
21–22	16	2 4 12 15	S-9	12		W	SM	Rd-bwn m-f SAND, little Silt, trace c-f Gravel (Class 3b) (POSSIBLE FILL)		
23–25										-10.3

REMARKS: Surface elevation was provided by the Client, based on a previously performed site survey, NAVD 1988.

BORING LOG 10285.01 MANHATTAN.GPJ TECTONIC ENG.GDT 8/24/21

Tectonic

PROJECT No. **10285.01**
PROJECT: **BBJ - M**
LOCATION: **Manhattan, NY**

BORING No. B-13M

SHEET No. 2 of 4

CLIENT: **TRC**
CONTRACTOR: **Aarco Environmental Service Inc**

DEPTH (FT.)	N OR MIN./FT.	PENETRATION RESISTANCE (BL/6 IN.)	SAMPLES: SAMPLE NUMBER	SAMPLES: RECOV. LENGTH (IN.)	SAMPLES: RECOV. RQD (%)	SAMPLES: MOISTURE	UNIFIED SOIL CLASS.	DESCRIPTION OF MATERIAL	ELEVATION (FT.)
26	5	3 3 2 WOH	S-10	6		W	SW-SM	Rd-bwn c-f SAND, some f Gravel, trace Silt (Class 6) (POSSIBLE FILL)	
28	11	8 5 6 8	S-11	10		W	SW-SM	Same (Class 3b) (POSSIBLE FILL)	
30									-15.3
31	21	7 10 11 11	S-12	10		W	SM	Gy-bwn m-f SAND, some Silt, little c-f Gravel (Class 3b) (POSSIBLE FILL)	
35									-20.3
36	12	6 4 8 13	S-13	10		W	Pt	Rd-bwn PEAT (Class 6)	
40									-25.3
41	11	4 5 6 8	S-14	2		W	Pt	Bwn PEAT (Class 6)	
45									-30.3
46	2	WOH 1 1 1	S-15	24		W	CL	Gy CLAY & SILT (Class 6)	
50									-35.3
51	0	WOH WOH WOH WOH	S-16	24		W	CL	Same (Class 6)	
53	0	WOH WOH WOH WOH	S-17	24		W	ML	Gy CLAY & SILT, trace Organics (Class 6)	
55									-40.3

LITHOLOGY*

UNCONFINED COMPRESS. STRENGTH (TONS/FT)
1 2 3 4 5
PLASTIC LIMIT % WATER CONTENT % LIQUID LIMIT %
10 20 30 40 50
STANDARD PENETRATION (BLOWS/FT.)
10 20 30 40 50

REMARKS: Surface elevation was provided by the Client, based on a previously performed site survey, NAVD 1988.

Tectonic

PROJECT No. **10285.01**
PROJECT: **BBJ - M**
LOCATION: **Manhattan, NY**

BORING No. B-13M

SHEET No. 3 of 4

CLIENT: **TRC**
CONTRACTOR: **Aarco Environmental Service Inc**

DEPTH (FT.)	N OR MIN./FT.	PENETRATION RESISTANCE (BL/6 IN.)	SAMPLES: SAMPLE NUMBER	SAMPLES: RECOV. LENGTH (IN.)	SAMPLES: RECOV. RQD (%)	SAMPLES: MOISTURE	UNIFIED SOIL CLASS.	DESCRIPTION OF MATERIAL	ELEVATION (FT.)
56	0	WOH WOH WOH WOH	S-18	12		W	ML	Bwn SILT, trace Organics (Class 6)	
57									
58									
59									
60									-45.3
61	7	3 3 4 5	S-19	16		W	SP-SM	Rd-bwn f SAND, trace Silt (Class 6)	
62									
63	18	5 6 12 14	S-20	22		W	SM	Bwn f SAND, little Silt (Class 3b)	
64									
65									-50.3
66	11	5 5 6 6	S-21	12		W	SP-SM	Lgt bwn m-f SAND, little c Gravel, trace Silt (Class 3b)	
67									
68									
69									
70									-55.3
71	20	8 11 9 8	S-22	12		W	SP	Rd-bwn-or m-f SAND, little c-f Gravel, trace Silt (Class 3b)	
72									
73									
74									
75									-60.3
76	10	5 5 5 6	S-23	12		W	SP-SM	Rd-bwn-or m-f SAND, trace f Gravel, trace Silt (Class 3b)	
77									
78									
79									
80									-65.3
81	31	17 17 14 13	S-24	4		W	SP	Rd-bwn m-f SAND, trace c-f Gravel, trace Silt (Class 3a)	
82									
83									
84									
85									-70.3

LITHOLOGY*

UNCONFINED COMPRESS. STRENGTH (TONS/FT)
1 2 3 4 5
PLASTIC LIMIT % WATER CONTENT % LIQUID LIMIT %
10 20 30 40 50
STANDARD PENETRATION (BLOWS/FT.)
10 20 30 40 50

REMARKS: Surface elevation was provided by the Client, based on a previously performed site survey, NAVD 1988.

Tectonic

PROJECT No. **10285.01**

PROJECT: **BBJ - M**

LOCATION: **Manhattan, NY**

BORING No. B-13M

SHEET No. 4 of 4

CLIENT: **TRC**

CONTRACTOR: **Aarco Environmental Service Inc**

UNCONFINED COMPRESS. STRENGTH (TONS/FT)
1 2 3 4 5
PLASTIC LIMIT % WATER CONTENT % LIQUID LIMIT %
10 20 30 40 50
STANDARD PENETRATION (BLOWS/FT.)
10 20 30 40 50

DEPTH (FT.)	N OR MIN./FT.	PENETRATION RESISTANCE (BL/6 IN.)	SAMPLES: SAMPLE NUMBER	SAMPLES: RECOV. LENGTH (IN.)	SAMPLES: RECOV. RQD (%)	MOISTURE	UNIFIED SOIL CLASS.	DESCRIPTION OF MATERIAL	LITHOLOGY*	ELEVATION (FT.)
86	41	34 20 21 23	S-25	2		W	GP	Blk c-f GRAVEL, little m-f Sand, trace Silt (Class 2a)		
87										
88										
89										
90										-75.3
91	60	29 28 32 19	S-26	10		W	SM	Rd-bwn c-f SAND, some c-f Gravel, little Silt (Class 3a)		
92										
93										
94										
95										-80.3
96	59	50 30 29 34	S-27	14		W	SP	Bwn c-f SAND, and c-f Gravel, trace Silt (Class 3a)		
97										
98										
99										
100										-85.3
101										
102										
103	5									
104	5									
105	5		C-1	48/60	62			Gy, slightly weathered, moderately fractured, c grained medium hard, SCHIST, fracturing 0 - 45 degrees, with Quartz and Garnet		-90.3
106	6									
107	5									
108								End of Boring at 107'		
109										
110										-95.3
111										
112										
113										
114										
115										-100.3

REMARKS: Surface elevation was provided by the Client, based on a previously performed site survey, NAVD 1988.

Tectonic

PROJECT No. **10285.01**
PROJECT: **BBJ - M**
LOCATION: **Manhattan, NY**

BORING No. B-16M

SHEET No. 1 of 4

CLIENT: **TRC**
CONTRACTOR: **Aarco Environmental Service Inc**
METHOD OF ADVANCING BORING | DIA. | DEPTH
POWER AUGER: | | TO
ROT. DRILL: | **2 7/8"** | **0** TO **85'**
CASING: | **4" & 3"** | **0** TO **75'**
DIAMOND CORE: | **3"** | **85** TO **90'**
Acker Portable Rig with Cathead & Donut Hammer

GROUND WATER | DATE | TIME | DEPTH

MON. WELL ☐ YES ☒ NO
SCREEN DEPTH: **---** TO **---**
WEATHER: TEMP: **83° F**
DEPTH TO ROCK: **83'**
*CHANGES IN STRATA ARE INFERRED

INSPECTOR: **Jack Rusk**
DRILLER: **Julio Galarza**
SURFACE ELEVATION: **1.0**
DATUM: **See Remarks**
DATE START: **7/7/21**
DATE FINISH: **7/13/21**

UNCONFINED COMPRESS. STRENGTH (TONS/FT) 1 2 3 4 5
PLASTIC LIMIT % | WATER CONTENT % | LIQUID LIMIT % 10 20 30 40 50
STANDARD PENETRATION (BLOWS/FT.) 10 20 30 40 50

DEPTH (FT.)	N OR MIN./FT.	PENETRATION RESISTANCE (BL/6 IN.)	SAMPLES: SAMPLE NUMBER	RECOV. LENGTH (IN.)	RECOV. RQD (%)	MOISTURE	UNIFIED SOIL CLASS.	DESCRIPTION OF MATERIAL	LITHOLOGY*	ELEVATION (FT.)
1–6								Hand excavated to 6' (No soil description provided)		-4.0
7–8	3	1 2 1 3	S-1	12		M	SM	Bwn-gy c-f SAND, little Silt, little c-f Gravel (FILL) (Class 7)		
9–10	14	2 5 9 9	S-2	3		M	SM	Bwn-gy c-f SAND, little Silt, little f Gravel (gasoline odor) (FILL) (Class 7)		-9.0
11–12	26	7 13 13 12	S-3	16		M	SM	Bwn-gy c-f SAND, little Silt, little f Gravel (roots) (Class 3b)		
13–14	58	14 20 38 40	S-4	22		W	SM	Bwn m-f SAND, little Silt, trace f Gravel (Class 3a)		
15–16	34	10 14 20 20	S-5	20		W	SM	Bwn-gy c-f SAND, little Silt, little c-f Gravel (Class 3a)		-14.0
17–18	45	19 28 17 19	S-6	18		W	SM	Same (Class 3a)		
19–20	49	11 21 28 31	S-7	24		W	SM	Bwn c-f SAND, little Silt, little f Gravel (Class 3a)		-19.0
21–22	40	16 21 19 14	S-8	14		W	SM	Same (Class 3a)		
23–25										-24.0

REMARKS: Surface elevation was provided by the Client, based on a previously performed site survey, NAVD 1988.

BORING LOG 10285.01 MANHATTAN.GPJ TECTONIC ENG.GDT 8/24/21

Tectonic

PROJECT No. **10285.01**
PROJECT: **BBJ - M**
LOCATION: **Manhattan, NY**

BORING No. B-16M

SHEET No. 2 of 4

CLIENT: **TRC**
CONTRACTOR: **Aarco Environmental Service Inc**

DEPTH (FT.)	N OR MIN./FT.	PENETRATION RESISTANCE (BL/6 IN.)	SAMPLES: SAMPLE NUMBER	SAMPLES: RECOV. LENGTH (IN.)	SAMPLES: RECOV. RQD (%)	MOISTURE	UNIFIED SOIL CLASS.	DESCRIPTION OF MATERIAL	LITHOLOGY*	ELEVATION (FT.)
26	26	12, 13, 13, 13	S-9	12		W	SM	Bwn c-f SAND, little Silt (Class 3b)		
27										
28										
29										
30										-29.0
31	33	11, 10, 23, 25	S-10	12		W	SM	Gy-bwn c-f SAND, little Silt, little f Gravel (Class 3a)		
32										
33										
34										
35										-34.0
36	34	16, 18, 16, 17	S-11	10		W	SM	Gy-bwn c-f SAND, some c-f Gravel, little Silt (Class 3a)		
37										
38										
39										
40										-39.0
41	30	14, 12, 18, 15	S-12	8		W	SM	Bwn c-f SAND, some c-f Gravel, little Silt (Class 3b)		
42										
43										
44										
45										-44.0
46	33	16, 15, 18, 16	S-13	8		W	SW-SM	Bwn m-f SAND, little f Gravel, trace Silt (Class 3a)		
47										
48										
49										
50										-49.0
51	21	14, 9, 12, 16	S-14	8		W	SM	Bwn c-f SAND, little f Gravel, little Silt (Class 3b)		
52										
53										
54										
55										-54.0

UNCONFINED COMPRESS. STRENGTH (TONS/FT)
1 2 3 4 5
PLASTIC LIMIT % WATER CONTENT % LIQUID LIMIT %
10 20 30 40 50
STANDARD PENETRATION (BLOWS/FT.)
10 20 30 40 50

REMARKS: Surface elevation was provided by the Client, based on a previously performed site survey, NAVD 1988.

Tectonic

PROJECT No. **10285.01**
PROJECT: **BBJ - M**
LOCATION: **Manhattan, NY**

BORING No. B-16M

SHEET No. 3 of 4

CLIENT: **TRC**
CONTRACTOR: **Aarco Environmental Service Inc**

DEPTH (FT.)	N OR MIN./FT.	PENETRATION RESISTANCE (BL/6 IN.)	SAMPLES: SAMPLE NUMBER	RECOV.: LENGTH (IN.)	RECOV.: RQD (%)	MOISTURE	UNIFIED SOIL CLASS.	DESCRIPTION OF MATERIAL
56	35	15, 17, 18, 22	S-15	8		W	SM	Bwn c-f SAND, little Silt (Class 3a)
57								
58								
59								
60								
61	36	16, 16, 20, 16	S-16	10		W	SM	Bwn-gy c-f SAND, little f Gravel, little Silt (Class 3a)
62								
63								
64								
65								
66	36	16, 15, 21, 24	S-17	8		W	SM	Bwn-gy c-f SAND, little Silt (Class 3a)
67								
68								
69								
70	50+	50/1	S-18	0				No Recovery
71								
72								
73								
74	12:44							
75	12:48		C-1	3	0			Two small pieces of boulder
76	12:51							
77	1:00							
78								
79								
80								
81	40	10, 18, 22, 50/4	S-19	0				No Recovery
82								
83								Bedrock begins at 83'
84								drilled through to competent rock @ 85'
85								

LITHOLOGY*

UNCONFINED COMPRESS. STRENGTH (TONS/FT)
1 2 3 4 5
PLASTIC LIMIT % WATER CONTENT % LIQUID LIMIT %
10 20 30 40 50
STANDARD PENETRATION (BLOWS/FT.)
10 20 30 40 50

ELEVATION (FT.)
-59.0
-64.0
-69.0
-74.0
-79.0
-84.0

REMARKS: Surface elevation was provided by the Client, based on a previously performed site survey, NAVD 1988.

Tectonic

PROJECT No. **10285.01**

PROJECT: **BBJ - M**

LOCATION: **Manhattan, NY**

BORING No. B-16M

SHEET No. 4 of 4

CLIENT: **TRC**

CONTRACTOR: **Aarco Environmental Service Inc**

UNCONFINED COMPRESS. STRENGTH (TONS/FT)
1 2 3 4 5

PLASTIC LIMIT % | WATER CONTENT % | LIQUID LIMIT %
10 20 30 40 50

STANDARD PENETRATION (BLOWS/FT.)
10 20 30 40 50

DEPTH (FT.)	N OR MIN./FT.	PENETRATION RESISTANCE (BL/6 IN.)	SAMPLES: SAMPLE NUMBER	SAMPLES: RECOV. LENGTH (IN.)	SAMPLES: RECOV. RQD (%)	MOISTURE	UNIFIED SOIL CLASS.	DESCRIPTION OF MATERIAL	LITHOLOGY*	ELEVATION (FT.)
86	1:00									
87	1:17									
88	1:32		C-2	60/60	87			Gy, slightly weathered, slightly fractured, c grained, hard SCHIST (Class 1a)		
89	1:55									
90	2:16									-89.0
91								End of Boring at 90'		
92										
93										
94										
95										-94.0
96										
97										
98										
99										
100										-99.0
101										
102										
103										
104										
105										-104.0
106										
107										
108										
109										
110										-109.0
111										
112										
113										
114										
115										-114.0

REMARKS: Surface elevation was provided by the Client, based on a previously performed site survey, NAVD 1988.

Tectonic

PROJECT No. **10285.01**
PROJECT: **BBJ - M**
LOCATION: **Manhattan, NY**

BORING No. B-18M

SHEET No. 1 of 4

CLIENT: **TRC**
CONTRACTOR: **Aarco Environmental Service Inc**
METHOD OF ADVANCING BORING | DIA. | DEPTH
POWER AUGER: | | TO
ROT. DRILL: | **2 7/8"** | **0** TO **87'**
CASING: | **3"** | **0** TO **81'**
DIAMOND CORE: | **2"** | **87** TO **92'**
Acker Portable Rig with Cathead & Donut Hammer

GROUND WATER: DATE | TIME | DEPTH

MON. WELL ☐ YES ☒ NO
SCREEN DEPTH: **---** TO **---**
WEATHER: TEMP:
DEPTH TO ROCK: **87'**
*CHANGES IN STRATA ARE INFERRED

INSPECTOR: **Barry Ouimet**
DRILLER: **Julio Gonzolez**
SURFACE ELEVATION: **1.0**
DATUM: **See Remarks**
DATE START: **6/3/21**
DATE FINISH: **6/11/21**

UNCONFINED COMPRESS. STRENGTH (TONS/FT) ● 1 2 3 4 5
PLASTIC LIMIT % ⊗ WATER CONTENT % △ LIQUID LIMIT % 10 20 30 40 50
STANDARD PENETRATION (BLOWS/FT.) ● 10 20 30 40 50

DEPTH (FT.)	N OR MIN./FT.	PENETRATION RESISTANCE (BL/6 IN.)	SAMPLES: SAMPLE NUMBER	RECOV. LENGTH (IN.)	RECOV. RQD (%)	MOISTURE	UNIFIED SOIL CLASS.	DESCRIPTION OF MATERIAL	LITHOLOGY*	ELEVATION (FT.)
1–6								Hand excavated to 6' (No soil description provided)		
										-4.0
7–8	25	23 12 13 11	S-1	2		M	GP	Wht tn f GRAVEL, and c-m Sand, trace Silt (FILL) (Class 7)		
9–10	10	5 7 3 4	S-2	12		M	GP	Bwn-gy c-f GRAVEL, and c-f Sand, trace Silt (FILL) (Class 7)		
										-9.0
11–12	11	4 5 6 7	S-3	2		W	GP	Gy-wh c-f GRAVEL, little c-f Sand with wood (FILL) CLass 7)		
13–14										
15	50+	18 50/4	S-4	8		W	GM	Bwn Organic SILT, and c-f Gravel, little c-f Sand (FILL) (Class 7)		-14.0
16–17	82+	WOH 28 54/6	S-5	12		W	ML	Bwn SILT, and c-f SAND, trace f Gravel (Class 5a)		82
18–20								18 - 20' Possible boulder rotary advanced to 20'		-19.0
21–22	104	37 50 54 54	S-6	14		W	SM	Bwn m-f SAND, some Silt (Class 3a)		104
23–25										-24.0

REMARKS: Surface elevation was provided by the Client, based on a previously performed site survey, NAVD 1988.

BORING LOG 10285.01 MANHATTAN.GPJ TECTONIC ENG.GDT 8/24/21

Tectonic

PROJECT No. **10285.01**
PROJECT: **BBJ - M**
LOCATION: **Manhattan, NY**

BORING No. B-18M

SHEET No. 2 of 4

CLIENT: **TRC**
CONTRACTOR: **Aarco Environmental Service Inc**

DEPTH (FT.)	N OR MIN./FT.	PENETRATION RESISTANCE (BL/6 IN.)	SAMPLES: SAMPLE NUMBER	SAMPLES: RECOV. LENGTH (IN.)	SAMPLES: RECOV. RQD (%)	MOISTURE	UNIFIED SOIL CLASS.	DESCRIPTION OF MATERIAL	ELEVATION (FT.)
26	47	21 23 24 25	S-7	14		W	SM	Bwn-gy c-f SAND, little f Gravel, little Silt (Class 3a)	
27									
28									
29									
30									-29.0
31	49	11 25 24 18	S-8	12		W	SP	Gy-bwn m-f SAND, little c-f Gravel, trace Silt (Class 3a)	
32									
33									
34									
35									-34.0
36	23	9 11 12 11	S-9	18		W	SP-SM	Bwn-gy c-f SAND, little Silt, trace f Gravel (Class 3b)	
37									
38									
39									
40									-39.0
41	27	8 8 19 20	S-10	0				No Recovery	
42									
43	22	5 9 13 9	S-11	18		W	SP	Bwn-gy c-f SAND, trace Silt (Class 3b)	
44									
45									-44.0
46	20	11 14 6 19	S-12	18		W	SM	Bwn m-f SAND, little Silt (Class 3b)	
47									
48									
49									
50								Boulder at 50'	-49.0
51									
52									
53									
54									
55									-54.0

LITHOLOGY*

UNCONFINED COMPRESS. STRENGTH (TONS/FT)
1 2 3 4 5
PLASTIC LIMIT % WATER CONTENT % LIQUID LIMIT %
10 20 30 40 50
STANDARD PENETRATION (BLOWS/FT.)
10 20 30 40 50

REMARKS: Surface elevation was provided by the Client, based on a previously performed site survey, NAVD 1988.

Tectonic

PROJECT No. **10285.01**
PROJECT: **BBJ - M**
LOCATION: **Manhattan, NY**

BORING No. B-18M

SHEET No. 3 of 4

CLIENT: **TRC**
CONTRACTOR: **Aarco Environmental Service Inc**

DEPTH (FT.)	N OR MIN./FT.	PENETRATION RESISTANCE (BL/6 IN.)	SAMPLES: SAMPLE NUMBER	SAMPLES: RECOV. LENGTH (IN.)	SAMPLES: RECOV. RQD (%)	MOISTURE	UNIFIED SOIL CLASS.	DESCRIPTION OF MATERIAL	ELEVATION (FT.)
	50+	50/0	S-13	0				No recovery	
56									
57									
58									
59									
60									-59.0
61									
62			C-1	0/60				No Recovery Boulder 55' to 57' Void 57' to 58' Boulder 58' to 60'	
63									
64									
65									-64.0
66	14	10 7 7 8	S-14	10		W	SP	Bwn c-f SAND, trace f Gravel, trace Silt (Class 3b)	
67									
68									
69									
70									-69.0
71	28	19 10 18 13	S-15	24		W	SP	Bwn-gy c-f SAND, little f Gravel, trace Silt (Class 3b)	
72									
73									
74									
75									-74.0
76	10	13 4 6 13	S-16	0				No Recovery	
77									
78	35	16 18 17 8	S-17	22		W	SW	Bwn-gy c-f SAND, little f Gravel, trace Silt (Class 3a)	
79									
80									-79.0
81	75	50 32 43 46	S-18	10		W	SM	Bwn f SAND, little Silt (Class 3a)	
82									
83									
84									
85									-84.0

LITHOLOGY*

UNCONFINED COMPRESS. STRENGTH (TONS/FT)
1 2 3 4 5
PLASTIC LIMIT % — WATER CONTENT % — LIQUID LIMIT %
10 20 30 40 50
STANDARD PENETRATION (BLOWS/FT.)
10 20 30 40 50

75

REMARKS: Surface elevation was provided by the Client, based on a previously performed site survey, NAVD 1988.

BORING LOG 10285.01 MANHATTAN.GPJ TECTONIC ENG.GDT 8/24/21

Tectonic

PROJECT No. **10285.01**

PROJECT: **BBJ - M**

LOCATION: **Manhattan, NY**

BORING No. B-18M

SHEET No. 4 of 4

CLIENT: **TRC**

CONTRACTOR: **Aarco Environmental Service Inc**

DEPTH (FT.)	N OR MIN./FT.	PENETRATION RESISTANCE (BL/6 IN.)	SAMPLES: SAMPLE NUMBER	SAMPLES: RECOV. LENGTH (IN.)	SAMPLES: RECOV. RQD (%)	MOISTURE	UNIFIED SOIL CLASS.	DESCRIPTION OF MATERIAL	LITHOLOGY*	ELEVATION (FT.)
86	50+	96 50/0	S-19	0				No recovery		
87										
88										
89										
90			C-2	60/60	93			Gy, moderately weathered, slightly fractured, c-f grained, hard SCHIST; fractures 60 degrees from horizontal (Class 1a)		-89.0
91										
92										
93								End of Boring at 92'		
94										
95										-94.0
96										
97										
98										
99										
100										-99.0
101										
102										
103										
104										
105										-104.0
106										
107										
108										
109										
110										-109.0
111										
112										
113										
114										
115										-114.0

UNCONFINED COMPRESS. STRENGTH (TONS/FT)
1 2 3 4 5

PLASTIC LIMIT % — WATER CONTENT % — LIQUID LIMIT %
10 20 30 40 50

STANDARD PENETRATION (BLOWS/FT.)
10 20 30 40 50

REMARKS: Surface elevation was provided by the Client, based on a previously performed site survey, NAVD 1988.

BORING LOG 10285.01 MANHATTAN.GPJ TECTONIC ENG.GDT 8/24/21

Tectonic

PROJECT No. **10285.01**
PROJECT: **BBJ - M**
LOCATION: **Manhattan, NY**

BORING No. B-19M

SHEET No. 1 of 5

CLIENT: **TRC**
CONTRACTOR: **Aarco Environmental Service Inc**
METHOD OF ADVANCING BORING | DIA. | DEPTH
POWER AUGER: | | TO
ROT. DRILL: | 3 7/8" | 0 TO 115'
CASING: | 4" | 0 TO 85'
DIAMOND CORE: | 2" | 115 TO 120'
Geoprobe GP050 with Automatic Hammer

GROUND WATER | DATE | TIME | DEPTH

MON. WELL ☒ YES ☐ NO
SCREEN DEPTH: 20 TO 30'
WEATHER: **Overcast** TEMP: **60° F**
DEPTH TO ROCK: **110'**
*CHANGES IN STRATA ARE INFERRED

INSPECTOR: **Barry Ouimet**
DRILLER: **Julio Galarza**
SURFACE ELEVATION: **15.9**
DATUM: **See Remarks**
DATE START: **6/12/21**
DATE FINISH: **6/13/21**

UNCONFINED COMPRESS. STRENGTH (TONS/FT) 1 2 3 4 5
PLASTIC LIMIT % | WATER CONTENT % | LIQUID LIMIT % 10 20 30 40 50
STANDARD PENETRATION (BLOWS/FT.) 10 20 30 40 50

DEPTH (FT.)	N OR MIN./FT.	PENETRATION RESISTANCE (BL/6 IN.)	SAMPLES: SAMPLE NUMBER	RECOV. LENGTH (IN.)	RECOV. RQD (%)	MOISTURE	UNIFIED SOIL CLASS.	DESCRIPTION OF MATERIAL	LITHOLOGY*	ELEVATION (FT.)
1								6" Concrete slab Advanced through clean stone to 2'		
2										
3	30	6 16 14 9	S-1	16		M	GM	Bwn c-f GRAVEL, and c-f Sand, little Silt with brick and concrete particles (FILL) (Class 7)		
4										
5	33	19 24 9 10	S-2	12		M	GM	Gy-bwn c-f GRAVEL, some c-f Sand, little Silt (FILL) (Class 7)		10.9
6										
7	75+	17 75/4	S-3	6		M	GP	Bwn-gy c-f GRAVEL, some c-f Sand, trace Silt (FILL) (Class 7)		75
8										
9	11	8 3 8 16	S-4	14		W	GP	Bwn-gy-rd c-f GRAVEL, some c-f Sand, trace Silt with significant brick fragments (FILL) (Class 7)		
10										5.9
11	30	14 15 15 7	S-5	8		W	GP	Bwn-gy-rd Same, with brick fragments (FILL) (Class 7)		
12										
13	12	3 6 6 9	S-6	0				No recovery		
14										
15	26	10 13 13 10	S-7	8		W	GP	Bwn c-f GRAVEL, some c-f Sand, trace Silt (FILL) (Class 7)		0.9
16										
17	37	3 16 21 24	S-8	16		W	GP	Bwn c-f GRAVEL, some c-f Sand, trace Silt, semi-layered brick particles (FILL) (Class 7)		
18										
19	27	12 13 14 16	S-9	16		W	SP	Bwn c-f SAND, and c-f Gravel, trace Silt with brick particles (FILL) (Class 7)		
20										-4.1
21	17	5 7 10 12	S-10	5		W	SP	Gy c-f SAND, trace f Gravel, trace Silt (FILL) (Class 7)		
22										
23	16	10 11 5 4	S-11	12		W	SM	Bwn-gy c-f SAND, some f Gravel, little Clayey Silt (FILL) (Class 7)		
24										
25		4 5								-9.1

REMARKS: Surface elevation was provided by the Client, based on a previously performed site survey, NAVD 1988.

BORING LOG 10285.01 MANHATTAN.GPJ TECTONIC ENG.GDT 8/24/21

Tectonic

PROJECT No. **10285.01**
PROJECT: **BBJ - M**
LOCATION: **Manhattan, NY**

BORING No. B-19M

SHEET No. 3 of 5

CLIENT: **TRC**
CONTRACTOR: **Aarco Environmental Service Inc**

DEPTH (FT.)	N OR MIN./FT.	PENETRATION RESISTANCE (BL/6 IN.)	SAMPLES: SAMPLE NUMBER	SAMPLES: RECOV. LENGTH (IN.)	SAMPLES: RECOV. RQD (%)	SAMPLES: MOISTURE	UNIFIED SOIL CLASS.	DESCRIPTION OF MATERIAL	ELEVATION (FT.)
56	35	9, 26, 9, 6	S-20	20		W	GP	Bwn c-f GRAVEL, some c-f Sand, trace Silt (Class 2a)	
57									
58									
59									
60									-44.1
61	8	6, 5, 3, 4	S-21	8		W	GP	Bwn c-f GRAVEL, some c-f Sand, trace Silt (Class 6)	
62									
63									
64									
65									-49.1
66	16	9, 7, 9, 10	S-22	8		W	SP	Bwn c-m SAND, some f Gravel, trace Silt (Class 3b)	
67									
68									
69									
70									-54.1
71	15	7, 8, 7, 9	S-23	10		W	SP	Bwn c-f SAND, some c-f Gravel, trace Silt (Class 3b)	
72									
73									
74									
75									-59.1
76	22	9, 9, 13, 12	S-24	22		W	SP	Bwn c-f SAND, some f Gravel, trace Silt (Class 3b)	
77									
78									
79									
80									-64.1
81	19	7, 10, 9, 9	S-25	20		W	SP-SM	Gy-or-bwn c-f SAND, some f Gravel, trace Silt Bottom 2" Dk gy f SAND, little Silt (Class 3b)	
82									
83									
84									
85									-69.1

LITHOLOGY*

UNCONFINED COMPRESS. STRENGTH (TONS/FT)
1 2 3 4 5
PLASTIC LIMIT % WATER CONTENT % LIQUID LIMIT %
10 20 30 40 50
STANDARD PENETRATION (BLOWS/FT.)
10 20 30 40 50

REMARKS: Surface elevation was provided by the Client, based on a previously performed site survey, NAVD 1988.

Tectonic

PROJECT No. **10285.01**
PROJECT: **BBJ - M**
LOCATION: **Manhattan, NY**

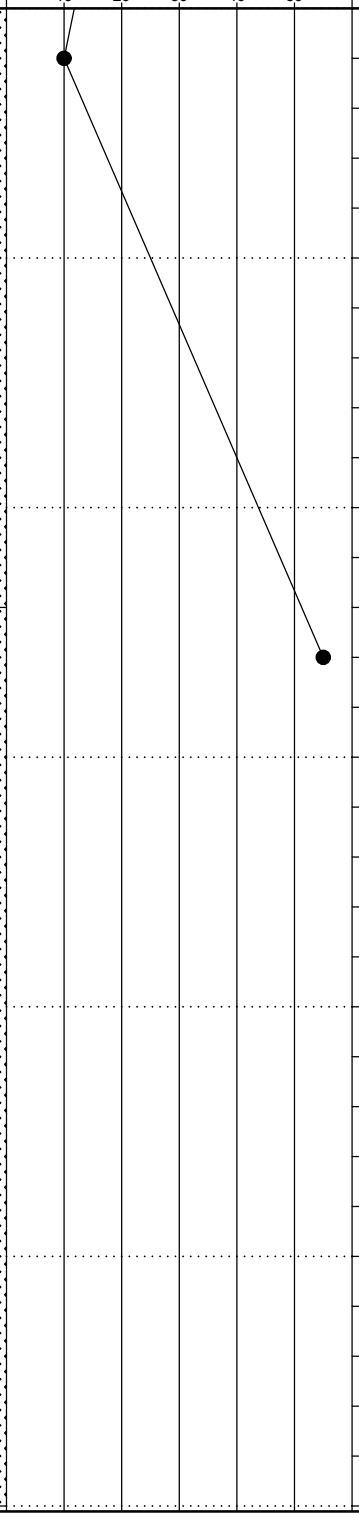
BORING No. B-19M

SHEET No. 4 of 5

CLIENT: **TRC**
CONTRACTOR: **Aarco Environmental Service Inc**

DEPTH (FT.)	N OR MIN./FT.	PENETRATION RESISTANCE (BL/6 IN.)	SAMPLES: SAMPLE NUMBER	SAMPLES: RECOV. LENGTH (IN.)	SAMPLES: RECOV. RQD (%)	SAMPLES: MOISTURE	UNIFIED SOIL CLASS.	DESCRIPTION OF MATERIAL	LITHOLOGY*	ELEVATION (FT.)
86	10	6 6 4 3	S-26	16		W	SW	Dk bwn c-f SAND, trace f Gravel, trace Silt (Class 3b)		
87										
88										
89										
90								Resistance at 90' Rotary advanced to 97'		-74.1
91										
92										
93										
94										
95										-79.1
96										
97										
98	55	10 20 35 48	S-27	22		W	SW-SM	Lgt bwn-gy c-f SAND, trace Silt, trace f Gravel (Possible decomposed bedrock) (Class 3a)		
99										
100										-84.1
101										
102										
103										
104										
105										-89.1
106								Drilled through weathered bedrock		
107										
108										
109										
110										-94.1
111										
112										
113										
114										
115										-99.1

UNCONFINED COMPRESS. STRENGTH (TONS/FT)
1 2 3 4 5
PLASTIC LIMIT % WATER CONTENT % LIQUID LIMIT %
10 20 30 40 50
STANDARD PENETRATION (BLOWS/FT.)
10 20 30 40 50



REMARKS: Surface elevation was provided by the Client, based on a previously performed site survey, NAVD 1988.

Tectonic

PROJECT No. **10285.01**

PROJECT: **BBJ - M**

LOCATION: **Manhattan, NY**

BORING No. B-19M

SHEET No. 5 of 5

CLIENT: **TRC**

CONTRACTOR: **Aarco Environmental Service Inc**

DEPTH (FT.)	N OR MIN./FT.	PENETRATION RESISTANCE (BL/6 IN.)	SAMPLES: SAMPLE NUMBER	SAMPLES: RECOV. LENGTH (IN.)	SAMPLES: RECOV. RQD (%)	MOISTURE	UNIFIED SOIL CLASS.	DESCRIPTION OF MATERIAL	LITHOLOGY*	UNCONFINED COMPRESS. STRENGTH (TONS/FT) / PLASTIC LIMIT % / WATER CONTENT % / LIQUID LIMIT % / STANDARD PENETRATION (BLOWS/FT.)	ELEVATION (FT.)
116								Gy, moderately weathered, slightly to moderately fractured, c-f grained, moderately hard, SCHIST, fractures 45 and 60 degrees from horizontal (Class 1b)			
117											
118			C-1	60/60	60						
119											
120											-104.1
121								End of Boring at 120'			
122											
123											
124											
125											-109.1
126											
127											
128											
129											
130											-114.1
131											
132											
133											
134											
135											-119.1
136											
137											
138											
139											
140											-124.1
141											
142											
143											
144											
145											-129.1

REMARKS: Surface elevation was provided by the Client, based on a previously performed site survey, NAVD 1988.

Tectonic

PROJECT No. **10285.01**
PROJECT: **BBJ - M**
LOCATION: **Manhattan, NY**

BORING No. B-22M

SHEET No. 1 of 4

CLIENT: **TRC**
CONTRACTOR: **Aarco Environmental Service Inc**
METHOD OF ADVANCING BORING | DIA. | DEPTH
POWER AUGER: | | TO
ROT. DRILL: | **3 7/8"** | **0** TO **80'**
CASING: | **4"** | **0** TO **80'**
DIAMOND CORE: | | TO
Portable Rig with Cathead Donut Hammer

GROUND WATER | DATE | TIME | DEPTH

MON. WELL ☐ YES ☒ NO
SCREEN DEPTH: **---** TO **---**
WEATHER: TEMP:
DEPTH TO ROCK: **82'**
*CHANGES IN STRATA ARE INFERRED

INSPECTOR: **Jack Rusk**
DRILLER: **Jose**
SURFACE ELEVATION: **1.0**
DATUM: **See Remarks**
DATE START: **7/15/21**
DATE FINISH: **7/22/21**

UNCONFINED COMPRESS. STRENGTH (TONS/FT) ● 1 2 3 4 5
PLASTIC LIMIT % | WATER CONTENT % | LIQUID LIMIT % ✕ ⊗ △ 10 20 30 40 50
STANDARD PENETRATION (BLOWS/FT.) ● 10 20 30 40 50

DEPTH (FT.)	N OR MIN./FT.	PENETRATION RESISTANCE (BL/6 IN.)	SAMPLES: SAMPLE NUMBER	RECOV. LENGTH (IN.)	RECOV. RQD (%)	MOISTURE	UNIFIED SOIL CLASS.	DESCRIPTION OF MATERIAL	LITHOLOGY*	ELEVATION (FT.)
1–5								Hand cleared to 5' 5" (No soil description provided)		
6										-4.0
7–8	9	9 4 5 6	S-1	6		M	SM	Bwn c-f SAND, some Silt, little f Gravel (FILL) (Class 7)		
9–10	28	9 14 14 16	S-2	10		M	SM	Top 6" Same (FILL) (Class 7) Bottom 4" Bwn-blk f SAND, some Silt, little f Gravel, little Peat (roots, possible buried topsoil) (Class 3b)		-9.0
11–12	41	12 8 33 32	S-3	22		W	SM	Top 12" Same (Class 3b) Bottom 10" Bwn-gy c-f SAND, some Silt, little f Gravel (roots) (Class 3a)		
13–14	73	50 41 32 37	S-4	14		W	SM	Bwn c-f SAND, little Silt, little f Gravel (Class 3a)		73
15–16	38	10 17 21 18	S-5	10		W	SM	Bwn c-f SAND, little Silt (Class 3a)		-14.0
17–20										-19.0
21–22	38	12 18 20 21	S-6	12		W	SM	Bwn c-f SAND, little Silt (Class 3a)		
23–25										-24.0

REMARKS: Surface elevation was provided by the Client, based on a previously performed site survey, NAVD 1988.

Tectonic

PROJECT No. **10285.01**
PROJECT: **BBJ - M**
LOCATION: **Manhattan, NY**

BORING No. B-22M

SHEET No. 2 of 4

CLIENT: **TRC**
CONTRACTOR: **Aarco Environmental Service Inc**

DEPTH (FT.)	N OR MIN./FT.	PENETRATION RESISTANCE (BL/6 IN.)	SAMPLES: SAMPLE NUMBER	SAMPLES: RECOV. LENGTH (IN.)	SAMPLES: RECOV. RQD (%)	MOISTURE	UNIFIED SOIL CLASS.	DESCRIPTION OF MATERIAL	ELEVATION (FT.)
26	23	9, 12, 11, 11	S-7	8		W	SM	Bwn f SAND, some Silt (Class 3b)	
27									
28									
29									
30									-29.0
31	39	10, 20, 19, 15	S-8	10		W	SM	Bwn c-f SAND, some Silt (Class 3a)	
32									
33									
34									
35	50+	50/4	S-9	1		W	SM	Gy f SAND, some Silt, little f Gravel (Class 3a)	-34.0
36									
37									
38									
39									
40									-39.0
41	29	17, 15, 14, 15	S-10	6		W	SM	Bwn c-f SAND, little Silt, little f Gravel (Class 3b)	
42									
43									
44									
45									-44.0
46	36	35, 19, 17, 16	S-11	6		W	SM	Bwn c-f SAND, some f Gravel, little Silt (Class 3a)	
47									
48									
49									
50									-49.0
51	30	14, 16, 14, 16	S-12	8		W	SP	Bwn c-f SAND, some f Gravel, trace Silt (Class 3b)	
52									
53									
54									
55									-54.0

LITHOLOGY*

UNCONFINED COMPRESS. STRENGTH (TONS/FT)
1 2 3 4 5
PLASTIC LIMIT % WATER CONTENT % LIQUID LIMIT %
10 20 30 40 50
STANDARD PENETRATION (BLOWS/FT.)
10 20 30 40 50

REMARKS: Surface elevation was provided by the Client, based on a previously performed site survey, NAVD 1988.

Tectonic

PROJECT No. **10285.01**
PROJECT: **BBJ - M**
LOCATION: **Manhattan, NY**

BORING No. B-22M

SHEET No. 3 of 4

CLIENT: **TRC**
CONTRACTOR: **Aarco Environmental Service Inc**

DEPTH (FT.)	N OR MIN./FT.	PENETRATION RESISTANCE (BL/6 IN.)	SAMPLES: SAMPLE NUMBER	RECOV.: LENGTH (IN.)	RECOV.: RQD (%)	MOISTURE	UNIFIED SOIL CLASS.	DESCRIPTION OF MATERIAL
56	31	13 17 14 15	S-13	6		W	SM	Bwn-blk c-f SAND, little f Gravel, little Silt (Class 3a)
57								
58								
59								
60								
61	41	25 21 20 22	S-14	10		W	SM	Bwn c-f SAND, some c-f Gravel, little Silt (Class 3a)
62								
63								
64								
65								
66	27	16 15 12 13	S-15	8		W	SM	Bwn c-f SAND, little f Gravel, little Silt (Class 3b)
67								
68								
69								
70								
71	36	12 19 17 13	S-16	10		W	SP	Bwn c-f SAND, some f Gravel, trace Silt (Class 3a)
72								
73								
74								
75								
76	50+	28 50/3	S-17	8		W	SM	Bwn-rd c-f SAND, little Silt (Class 3a)
77								
78								
79								
80			S-18	0				No Recovery
81								
82								Gy, moderately weathered, moderately fractured, c grained, moderately hard SCHIST / GNEISS (Class 1d)
83			C-1	26/60	32			
84								
85								

LITHOLOGY*

UNCONFINED COMPRESS. STRENGTH (TONS/FT)
1 2 3 4 5
PLASTIC LIMIT % WATER CONTENT % LIQUID LIMIT %
10 20 30 40 50
STANDARD PENETRATION (BLOWS/FT.)
10 20 30 40 50

ELEVATION (FT.)
-59.0
-64.0
-69.0
-74.0
-79.0
-84.0

REMARKS: Surface elevation was provided by the Client, based on a previously performed site survey, NAVD 1988.

Tectonic

PROJECT No. **10285.01**

PROJECT: **BBJ - M**

LOCATION: **Manhattan, NY**

BORING No. B-22M

SHEET No. 4 of 4

CLIENT: **TRC**

CONTRACTOR: **Aarco Environmental Service Inc**

DEPTH (FT.)	N OR MIN./FT.	PENETRATION RESISTANCE (BL/6 IN.)	SAMPLES: SAMPLE NUMBER	SAMPLES: RECOV. LENGTH (IN.)	SAMPLES: RECOV. RQD (%)	MOISTURE	UNIFIED SOIL CLASS.	DESCRIPTION OF MATERIAL	LITHOLOGY*	ELEVATION (FT.)
86										
87			C-2	36/48	83			Gy slightly weathered, slightly fractured, c grained, hard SCHIST (Class 1b)		
88										
89										
90								End of Boring at 89'		-89.0
91										
92										
93										
94										
95										-94.0
96										
97										
98										
99										
100										-99.0
101										
102										
103										
104										
105										-104.0
106										
107										
108										
109										
110										-109.0
111										
112										
113										
114										
115										-114.0

UNCONFINED COMPRESS. STRENGTH (TONS/FT)
1 2 3 4 5

PLASTIC LIMIT % — WATER CONTENT % — LIQUID LIMIT %
10 20 30 40 50

STANDARD PENETRATION (BLOWS/FT.)
10 20 30 40 50

REMARKS: Surface elevation was provided by the Client, based on a previously performed site survey, NAVD 1988.

Tectonic

PROJECT No. **10285.01**
PROJECT: **BBJ - M**
LOCATION: **Manhattan, NY**

BORING No. B-24M

SHEET No. 1 of 4

CLIENT: **TRC**
CONTRACTOR: **Aarco Environmental Service Inc**
METHOD OF ADVANCING BORING | DIA. | DEPTH
POWER AUGER: | | TO
ROT. DRILL: | **2 7/8"** | **0** TO **98'**
CASING: | **4" & 3"** | **0** TO **85'**
DIAMOND CORE: | **2"** | **98** TO **103'**
Portable Rig with Cathead Donut Hammer

GROUND WATER | DATE | TIME | DEPTH
| **6/2/21** | **9:42 AM** | **2.4'**
MON. WELL ☐ YES ☒ NO
SCREEN DEPTH: **---** TO **---**
WEATHER: **Clear** TEMP: **60° F**
DEPTH TO ROCK: **98'**
*CHANGES IN STRATA ARE INFERRED

INSPECTOR: **Liam McGrath/Barry Ouimet**
DRILLER: **Julio Galarza**
SURFACE ELEVATION: **-3.0**
DATUM: **See Remarks**
DATE START: **3/9/20**
DATE FINISH: **6/2/21**

UNCONFINED COMPRESS. STRENGTH (TONS/FT) ● 1 2 3 4 5
PLASTIC LIMIT % | WATER CONTENT % | LIQUID LIMIT % ⊗ 10 20 30 40 50
STANDARD PENETRATION (BLOWS/FT.) ● 10 20 30 40 50

DEPTH (FT.)	N OR MIN./FT.	PENETRATION RESISTANCE (BL/6 IN.)	SAMPLES: SAMPLE NUMBER	RECOV. LENGTH (IN.)	RECOV. RQD (%)	MOISTURE	UNIFIED SOIL CLASS.	DESCRIPTION OF MATERIAL	LITHOLOGY*	ELEVATION (FT.)
1								15" Concrete slab		
2								Hand cleared to 6' ▼		
3								(No soil description provided)		
4										
5										-8.0
6										
7	4	13 3 1 7	S-1	8		W	GP	Bwn-gy c-f GRAVEL, little m-f Sand, trace Silt (FILL) (Class 7)		
8										
9	20	5 10 10 9	S-2	16		W	SM	Bwn c-f SAND, little f Gravel, little Silt (Class 3b)		
10										-13.0
11	41	12 18 23 22	S-3	14		W	SP	Bwn-gy m-f SAND, trace Silt (Class 3a)		
12										
13										
14										
15										-18.0
16										
17	36	15 17 19 16	S-4	12		W	SP	Bwn c-f SAND, trace f Gravel, trace Silt (Class 3a)		
18										
19										
20										-23.0
21	22	6 10 12 11	S-5	14		W	SP-SM	Bwn c-f SAND, trace Silt (Class 3b)		
22										
23										
24										
25										-28.0

REMARKS: Surface elevation was provided by the Client, based on a previously performed site survey, NAVD 1988.

BORING LOG 10285.01 MANHATTAN.GPJ TECTONIC ENG.GDT 8/24/21

Tectonic

PROJECT No. **10285.01**

PROJECT: **BBJ - M**

LOCATION: **Manhattan, NY**

BORING No. B-24M

SHEET No. 2 of 4

CLIENT: **TRC**

CONTRACTOR: **Aarco Environmental Service Inc**

DEPTH (FT.)	N OR MIN./FT.	PENETRATION RESISTANCE (BL/6 IN.)	SAMPLES: SAMPLE NUMBER	SAMPLES: RECOV. LENGTH (IN.)	SAMPLES: RECOV. RQD (%)	SAMPLES: MOISTURE	UNIFIED SOIL CLASS.	DESCRIPTION OF MATERIAL	ELEVATION (FT.)
26	18	6 8 10 9	S-6	12		W	SP-SM	Gy-bwn c-f SAND, trace Silt, trace f Gravel (Class 3b)	
27									
28									
29									
30									-33.0
31	34	22 16 18 17	S-7	10		W	SM	Gy-bwn m-f SAND, some f Gravel, little Silt (Class 2a)	
32									
33									
34									
35									-38.0
36	67	100 40 27 20	S-8	3		W	SP	Bwn-gy c-f SAND, and c-f Gravel, trace Silt (Class 3a)	
37									
38									
39									
40									-43.0
41	16	36 10 6 8	S-9	20		W	SP	Bwn-gy c-m SAND, trace f Gravel, trace Silt (Class 3b)	
42									
43									
44									
45									-48.0
46									
47									
48									
49									
50									-53.0
51	11	4 2 9 9	S-10	24		W	SP	Same (Class 3b)	
52									
53									
54									
55									-58.0

LITHOLOGY*

UNCONFINED COMPRESS. STRENGTH (TONS/FT)
1 2 3 4 5

PLASTIC LIMIT % — WATER CONTENT % — LIQUID LIMIT %
10 20 30 40 50

STANDARD PENETRATION (BLOWS/FT.)
10 20 30 40 50

67

REMARKS: Surface elevation was provided by the Client, based on a previously performed site survey, NAVD 1988.

Tectonic

PROJECT No. **10285.01**
PROJECT: **BBJ - M**
LOCATION: **Manhattan, NY**

BORING No. B-24M

SHEET No. 3 of 4

CLIENT: **TRC**
CONTRACTOR: **Aarco Environmental Service Inc**

DEPTH (FT.)	N OR MIN./FT.	PENETRATION RESISTANCE (BL/6 IN.)	SAMPLES: SAMPLE NUMBER	SAMPLES: RECOV. LENGTH (IN.)	SAMPLES: RECOV. RQD (%)	MOISTURE	UNIFIED SOIL CLASS.	DESCRIPTION OF MATERIAL
56	21	16 10 11 14	S-11	24		W	SP	Bwn-gy c-f SAND, little c-f Gravel, trace Silt (Class 3b)
57								
58								
59								
60								
61	26	7 11 15 20	S-12	18		W	SP	Bwn-gy c-f SAND, trace Silt (Class 3b)
62								
63								
64								
65								
66	22	12 11 11 9	S-13	24		W	SP	Bwn-gy c-f SAND, trace f Gravel, trace Silt (Class 3b)
67								
68								Boulder & Cobbles 68' to 70'
69								
70								
71	15	10 11 4 3	S-14	1		W	SM	Gy c-f SAND, little Silt (Class 3b) Running sands to 75'
72								
73								
74								
75								
76	35	17 13 22 10	S-15	0				No Recovery
77								
78								
79								
80	60+	60/5	S-16	5		W	SM	Top 3" - Bwn f SAND, and Silt with mica Bottom 2" - Gy c-f SAND, with c Gravel fragments in spoot tip (Class 3a)
81								
82								
83								
84								
85								

LITHOLOGY*

UNCONFINED COMPRESS. STRENGTH (TONS/FT)
1 2 3 4 5
PLASTIC LIMIT % WATER CONTENT % LIQUID LIMIT %
10 20 30 40 50
STANDARD PENETRATION (BLOWS/FT.)
10 20 30 40 50

ELEVATION (FT.)
-63.0
-68.0
-73.0
-78.0
-83.0
-88.0

REMARKS: Surface elevation was provided by the Client, based on a previously performed site survey, NAVD 1988.

BORING LOG 10285.01 MANHATTAN.GPJ TECTONIC ENG.GDT 8/24/21

Tectonic

PROJECT No. **10285.01**
PROJECT: **BBJ - M**
LOCATION: **Manhattan, NY**

BORING No. B-24M

SHEET No. 4 of 4

CLIENT: **TRC**
CONTRACTOR: **Aarco Environmental Service Inc**

DEPTH (FT.)	N OR MIN./FT.	PENETRATION RESISTANCE (BL/6 IN.)	SAMPLES: SAMPLE NUMBER	SAMPLES: RECOV. LENGTH (IN.)	SAMPLES: RECOV. RQD (%)	MOISTURE	UNIFIED SOIL CLASS.	DESCRIPTION OF MATERIAL	LITHOLOGY*	ELEVATION (FT.)
86	2									
87	9									
88	3		C-1	16/60				Cobbles		
89	3									
90	5									-93.0
91										
92										
93								Rotary drilled through boulders to 96'		
94										
95										-98.0
96								Resistant drilling 96' to 98' (possible weathered bedrock)		
97										
98										
99	8									
100	6							Gy, slightly weathered to fresh, moderately fractured, fine grained, medium hard, SCHIST fractures 0 to 60 degrees with near vertical fracture 98 - 99' (Class 1c)		-103.0
101	5		C-2	56/60	35					
102	9									
103	12									
104								End of Boring at 103'		
105										-108.0
106										
107										
108										
109										
110										-113.0
111										
112										
113										
114										
115										-118.0

UNCONFINED COMPRESS. STRENGTH (TONS/FT)
1 2 3 4 5
PLASTIC LIMIT % WATER CONTENT % LIQUID LIMIT %
10 20 30 40 50
STANDARD PENETRATION (BLOWS/FT.)
10 20 30 40 50

REMARKS: Surface elevation was provided by the Client, based on a previously performed site survey, NAVD 1988.

Tectonic

PROJECT No. **10285.01**
PROJECT: **BBJ - M**
LOCATION: **Manhattan, NY**

BORING No. B-27M

SHEET No. 1 of 4

CLIENT: **TRC**
CONTRACTOR: **Aarco Environmental Service Inc**
METHOD OF ADVANCING BORING | DIA. | DEPTH
POWER AUGER: | | TO
ROT. DRILL: | 3 7/8" | 0 TO 98'
CASING: | 4" | 0 TO 55'
DIAMOND CORE: | 2" | 98 TO 102'
Geoprobe 7822DT with DH103 Automatic Hammer

GROUND WATER | DATE | TIME | DEPTH
| 6/5/21 | 10:00 AM | 10'

MON. WELL ☐ YES ☒ NO
SCREEN DEPTH: --- TO ---
WEATHER: **Clear** TEMP: **80° F**
DEPTH TO ROCK: **98'**
*CHANGES IN STRATA ARE INFERRED

INSPECTOR: **Michael Bastien**
DRILLER: **Daybi**
SURFACE ELEVATION: **17.0**
DATUM: **See Remarks**
DATE START: **6/5/21**
DATE FINISH: **6/5/21**

UNCONFINED COMPRESS. STRENGTH (TONS/FT) 1 2 3 4 5
PLASTIC LIMIT % | WATER CONTENT % | LIQUID LIMIT %
10 20 30 40 50
STANDARD PENETRATION (BLOWS/FT.) 10 20 30 40 50

DEPTH (FT.)	N OR MIN./FT.	PENETRATION RESISTANCE (BL/6 IN.)	SAMPLES: SAMPLE NUMBER	RECOV. LENGTH (IN.)	RECOV. RQD (%)	MOISTURE	UNIFIED SOIL CLASS.	DESCRIPTION OF MATERIAL	LITHOLOGY*	ELEVATION (FT.)
1								Hand cleared to 3'		
2								(No soil description provided)		
3										
4	4	3 2 2 4	S-1	8		M	GP	Tn c-f GRAVEL, little c-f Sand, trace Silt (FILL) (Class 7)		
5										12.0
6	4	3 2 2 3	S-2	8		M	GP	Same		
7										
8	16	5 9 7 8	S-3	10		M	GP	2" Same		
9						M	GM	8" Bwn-gn-rd c-f SAND, some c-f Gravel, little Clayey Silt (FILL) (Class 7)		
10	5	2 2 3 5	S-4	14		W	Pt	6" Blk Peat (possible old topsoil) (FILL) (Class 7) ▼		7.0
11						W	SC	8" Dk bwn CLAYEY SILT, some m-f Sand, trace c-f Gravel (FILL) (Class 7)		
12	15	2 5 10 12	S-5	14		W	SM	Bwn-rd c-f SAND, some c-f Gravel, little Clayey Silt (FILL) (Class 7)		
13										
14	34	11 10 24 12	S-6	6		W	SM	Bwn-rd-blk c-f SAND, and c-f Gravel, little Clayey Silt (FILL) (Class 7)		
15										2.0
16	16	13 7 9 10	S-7	2		W	GM	Gy-rd c-f GRAVEL, some c-f Sand, little Clayey Silt, organic odor (FILL) (Class 7)		
17										
18	34	12 14 20 24	S-8	2		W	GP	Gy c-f GRAVEL, little c-f Sand (FILL) (Class 7)		
19										
20	5	3 2 3 6	S-9	1		W		Old, square-head steel bolt (FILL)		-3.0
21										
22	16	6 6 10 15	S-10	1		W	CL	Bwn-gy SILTY CLAY, and c-f Sand (Class 4b)		
23										
24										
25										-8.0

REMARKS: Surface elevation was provided by the Client, based on a previously performed site survey, NAVD 1988.

Tectonic

PROJECT No. **10285.01**
PROJECT: **BBJ - M**
LOCATION: **Manhattan, NY**

BORING No. B-27M

SHEET No. 2 of 4

CLIENT: **TRC**
CONTRACTOR: **Aarco Environmental Service Inc**

DEPTH (FT.)	N OR MIN./FT.	PENETRATION RESISTANCE (BL/6 IN.)	SAMPLES: SAMPLE NUMBER	SAMPLES: RECOV. LENGTH (IN.)	SAMPLES: RECOV. RQD (%)	SAMPLES: MOISTURE	UNIFIED SOIL CLASS.	DESCRIPTION OF MATERIAL	ELEVATION (FT.)
26	19	7 8 11 14	S-11	16		W	SM	Bwn c-f SAND, some Clayey Silt (Class 3b)	
27									
28									
29									
30									-13.0
31	25	11 12 13 14	S-12	16		W	SM	Bwn m-f SAND, little Clayey Silt (Class 3b)	
32									
33									
34									
35									-18.0
36	28	13 12 16 19	S-13	16		W	SM	Bwn m-f SAND, little Silt, trace c Gravel (Class 3b)	
37									
38									
39									
40									-23.0
41	30	13 14 16 13	S-14	16		W	SM	Same (Class 3a)	
42									
43									
44									
45									-28.0
46	96	24 50 46 28	S-15	16		W	GW-GM	Bwn-blk-gn c-f Gravel, and c-f Sand, little Silt (Class 2a)	
47									
48									
49									
50									-33.0
51	34	15 17 17 17	S-16	6		W	GP	Bwn c-f GRAVEL, little c-f Sand, trace Silty Clay (Class 2a)	
52									
53									
54									
55									-38.0

LITHOLOGY*

UNCONFINED COMPRESS. STRENGTH (TONS/FT)
1 2 3 4 5
PLASTIC LIMIT % WATER CONTENT % LIQUID LIMIT %
10 20 30 40 50
STANDARD PENETRATION (BLOWS/FT.)
10 20 30 40 50

96

REMARKS: Surface elevation was provided by the Client, based on a previously performed site survey, NAVD 1988.

Tectonic

PROJECT No. **10285.01**
PROJECT: **BBJ - M**
LOCATION: **Manhattan, NY**

BORING No. B-27M

SHEET No. 3 of 4

CLIENT: **TRC**
CONTRACTOR: **Aarco Environmental Service Inc**

DEPTH (FT.)	N OR MIN./FT.	PENETRATION RESISTANCE (BL/6 IN.)	SAMPLES: SAMPLE NUMBER	RECOV.: LENGTH (IN.)	RECOV.: RQD (%)	MOISTURE	UNIFIED SOIL CLASS.	DESCRIPTION OF MATERIAL
56	37	53 22 15 20	S-17	6		W	GW-GM	Bwn-blk-gn c-f Gravel, and c-f Sand, little Silt (Class 3a)
57								
58								
59								
60								
61	16	21 7 9 12	S-18	12		W	SM	Bwn c-f SAND, little c-f Gravel, little Clayey Silt (Class 3b)
62								
63								
64								
65								
66	17	9 9 8 10	S-19	14		W	SM	Bwn c-f SAND, little Clayey Silt (Class 3b)
67								
68								
69								
70								
71	12	6 6 6 5	S-20	16		W	SP	Bwn m-f SAND, trace f Gravel, trace Silt (Class 3b)
72								
73								
74								
75								
76	13	11 6 7 5	S-21	1		W	SM	Bwn c-f SAND, little Clayey Silt, trace f Gravel (Class 3b)
77								
78								
79								
80								
81	11	4 5 6 9	S-22	14		W	SM	Bwn c-f SAND, little Clayey Silt, trace f Gravel (Class 3b)
82								
83								
84								
85								

LITHOLOGY*

UNCONFINED COMPRESS. STRENGTH (TONS/FT)
1 2 3 4 5
PLASTIC LIMIT % WATER CONTENT % LIQUID LIMIT %
10 20 30 40 50
STANDARD PENETRATION (BLOWS/FT.)
10 20 30 40 50

ELEVATION (FT.)
-43.0
-48.0
-53.0
-58.0
-63.0
-68.0

REMARKS: Surface elevation was provided by the Client, based on a previously performed site survey, NAVD 1988.

BORING LOG 10285.01 MANHATTAN.GPJ TECTONIC ENG.GDT 8/24/21

Tectonic

PROJECT No. **10285.01**
PROJECT: **BBJ - M**
LOCATION: **Manhattan, NY**

BORING No. B-27M

SHEET No. 4 of 4

CLIENT: **TRC**
CONTRACTOR: **Aarco Environmental Service Inc**

DEPTH (FT.)	N OR MIN./FT.	PENETRATION RESISTANCE (BL/6 IN.)	SAMPLES: SAMPLE NUMBER	SAMPLES: RECOV. LENGTH (IN.)	SAMPLES: RECOV. RQD (%)	SAMPLES: MOISTURE	UNIFIED SOIL CLASS.	DESCRIPTION OF MATERIAL	LITHOLOGY*	ELEVATION (FT.)
86	23	14 11 12 18	S-23	16		W	SM	Bwn c-f SAND, some Clayey Silt, little c-f Gravel (Class 3b)		
87										
88										
89										
90										-73.0
91	58	24 29 29 29	S-24	18		W	ML	Bwn SILT, little c-f Sand (Class 5a)		
92										
93										
94										
95										-78.0
96										
97										
98										
99	7									
100	7									-83.0
101	5		C-1	60/60	83			Gy, fresh, slightly fractured, fine grained hard SCHIST (Class 1b)		
102	6.5									
103	8									
104								End of Boring at 103'		
105										-88.0
106										
107										
108										
109										
110										-93.0
111										
112										
113										
114										
115										-98.0

UNCONFINED COMPRESS. STRENGTH (TONS/FT)
1 2 3 4 5
PLASTIC LIMIT % WATER CONTENT % LIQUID LIMIT %
10 20 30 40 50
STANDARD PENETRATION (BLOWS/FT.)
10 20 30 40 50

REMARKS: Surface elevation was provided by the Client, based on a previously performed site survey, NAVD 1988.

Tectonic

PROJECT No. **10285.01**
PROJECT: **BBJ - M**
LOCATION: **Manhattan, NY**

BORING No. B-28M

SHEET No. 1 of 4

CLIENT: **TRC**
CONTRACTOR: **Aarco Environmental Service Inc**
METHOD OF ADVANCING BORING | DIA. | DEPTH
POWER AUGER: | | TO
ROT. DRILL: | **2 7/8"** | **0** TO **82'**
CASING: | **3"** | **0** TO **77'**
DIAMOND CORE: | **2"** | **82** TO **89'**
Portable Rig with Cathead Donut Hammer

GROUND WATER | DATE | TIME | DEPTH
MON. WELL ☐ YES ☒ NO
SCREEN DEPTH: **---** TO **---**
WEATHER: TEMP: **82° F**
DEPTH TO ROCK: **---**
*CHANGES IN STRATA ARE INFERRED

INSPECTOR: **Jack Rusk**
DRILLER: **Julio Galarza**
SURFACE ELEVATION: **1.0**
DATUM: **See Remarks**
DATE START: **7/26/21**
DATE FINISH: **8/3/21**

UNCONFINED COMPRESS. STRENGTH (TONS/FT) ● 1 2 3 4 5
PLASTIC LIMIT % | WATER CONTENT % | LIQUID LIMIT % 10 20 30 40 50
STANDARD PENETRATION (BLOWS/FT.) ● 10 20 30 40 50

DEPTH (FT.)	N OR MIN./FT.	PENETRATION RESISTANCE (BL/6 IN.)	SAMPLES: SAMPLE NUMBER	RECOV. LENGTH (IN.)	RECOV. RQD (%)	MOISTURE	UNIFIED SOIL CLASS.	DESCRIPTION OF MATERIAL	LITHOLOGY*	ELEVATION (FT.)
1–5								Hand cleared to 5' (No soil description provided)		
6–7	12	8 6 6 6	S-1	12		W	SM	Bwn c-f SAND, little f Gravel, little Silt (roots) (Class 3b)		-4.0
8–9	21	11 13 8 9	S-2	10		W	SM	Bwn c-f SAND, little f Gravel, little Silt (roots) (Class 3b)		
10–11	16	6 5 11 20	S-3	24		W	SM	Same (Class 3b)		-9.0
12–13	40	8 19 21 23	S-4	14		W	SM	Bwn c-f SAND, little f Gravel, little Silt (Class 3a)		
14–15	22	4 8 14 21	S-5	24		W	SM	Same (Class 3b)		-14.0
16–17	36	20 17 19 27	S-6	14		W	SM	Bwn c-f SAND, little Silt (Class 3a)		
18–19	39	12 16 23 25	S-7	14		W	SM	Bwn c-f SAND, little Silt, little f Gravel (Class 3a)		
20–21	70	34 33 37 39	S-8	14		W	SM	Bwn-gy c-f SAND, little Silt, little f Gravel (Class 3a)		70 -19.0
22–25										-24.0

REMARKS: Surface elevation was provided by the Client, based on a previously performed site survey, NAVD 1988.

BORING LOG 10285.01 MANHATTAN.GPJ TECTONIC ENG.GDT 8/24/21

Tectonic

PROJECT No. **10285.01**
PROJECT: **BBJ - M**
LOCATION: **Manhattan, NY**

BORING No. B-28M

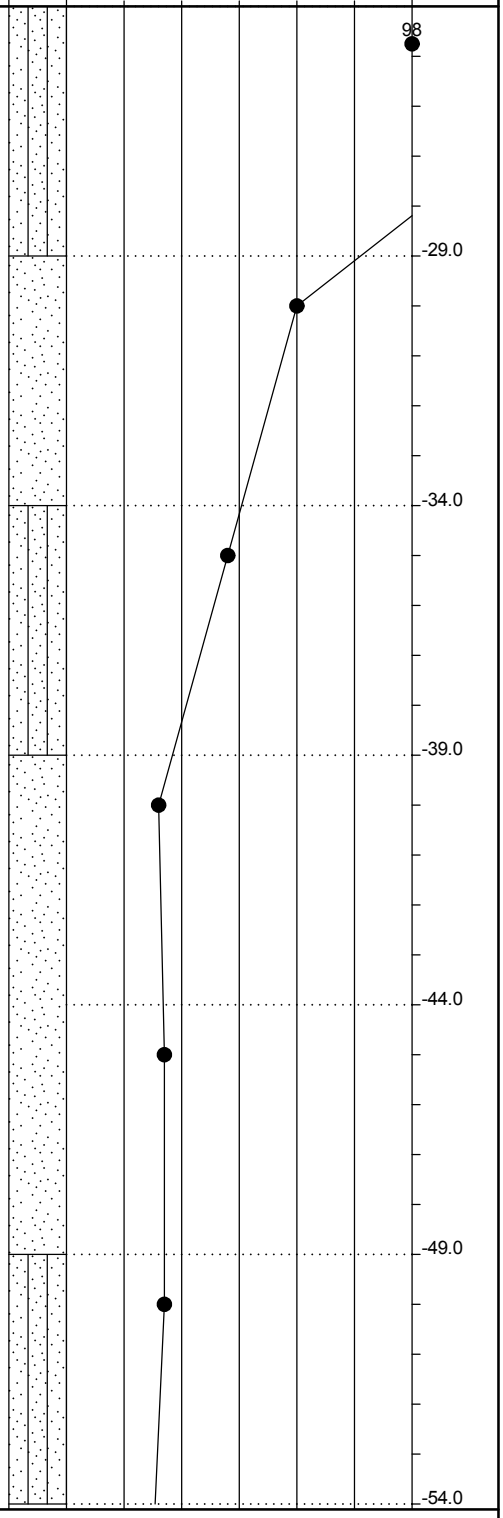
SHEET No. 2 of 4

CLIENT: **TRC**
CONTRACTOR: **Aarco Environmental Service Inc**

DEPTH (FT.)	N OR MIN./FT.	PENETRATION RESISTANCE (BL/6 IN.)	SAMPLES: SAMPLE NUMBER	SAMPLES: RECOV. LENGTH (IN.)	SAMPLES: RECOV. RQD (%)	MOISTURE	UNIFIED SOIL CLASS.	DESCRIPTION OF MATERIAL
26	98+	35 48 50/5	S-9	12		W	SM	Bwn-gy c-f SAND, little Silt (Class 3a)
27								
28								
29								drilled through boulder/cobbles to 30'
30								
31	40	15 17 23 29	S-10	10		W	SP	Bwn c-f SAND, some c-f Gravel, trace Silt (Class 3a)
32								
33								
34								
35								
36	28	12 12 16 17	S-11	3		W	SM	Bwn c-f SAND, and c-f Gravel, little Silt (Class 3b)
37								
38								
39								
40								
41	16	9 8 8 9	S-12	8		W	SP	Bwn c-f SAND, little f Gravel, trace Silt (Class 3b)
42								
43								
44								
45								
46	17	8 7 10 12	S-13	10		W	SP	Bwn c-f SAND, trace Silt (Class 3b)
47								
48								
49								
50								
51	17	10 8 9 11	S-14	8		W	SM	Bwn c-f SAND, little Silt (Class 3b)
52								
53								
54								
55								

LITHOLOGY*

UNCONFINED COMPRESS. STRENGTH (TONS/FT)
1 2 3 4 5
PLASTIC LIMIT % WATER CONTENT % LIQUID LIMIT %
10 20 30 40 50
STANDARD PENETRATION (BLOWS/FT.)
10 20 30 40 50



ELEVATION (FT.)

REMARKS: Surface elevation was provided by the Client, based on a previously performed site survey, NAVD 1988.

Tectonic

PROJECT No. **10285.01**
PROJECT: **BBJ - M**
LOCATION: **Manhattan, NY**

BORING No. B-28M

SHEET No. 3 of 4

CLIENT: **TRC**
CONTRACTOR: **Aarco Environmental Service Inc**

DEPTH (FT.)	N OR MIN./FT.	PENETRATION RESISTANCE (BL/6 IN.)	SAMPLES: SAMPLE NUMBER	RECOV.: LENGTH (IN.)	RECOV.: RQD (%)	MOISTURE	UNIFIED SOIL CLASS.	DESCRIPTION OF MATERIAL
56	15	12 8 7 9	S-15	8		W	SP	Bwn c-f SAND, and c-f Gravel, trace Silt (Class 3b)
57								
58								
59								
60								
61	90+	36 40 50/4	S-16	8		W	SM	Bwn f SAND, little f Gravel, little Silt (Class 3a)
62								
63								
64								
65								
66	77+	7 27 50/3	S-17	2		W	SM	Same (Class 3a)
67								
68								
69								
70								
71	90+	36 40 50/4	S-18	0				No Recovery
72								
73								
74								drilled through boulder/cobbles to 75'
75								
76	77	21 35 42 46	S-19	8		W	SM	Bwn f SAND, some Silt (Class 3a)
77								
78								
79								
80								
81	50+	35 50/5	S-20	11		W	SM	Bwn c-f SAND, little Silt (Class 3a)
82								
83	8		C-1	12/24	0			Gy, moderately weathered, moderately fractured, c grained, hard, GNEISS / SCHIST (Class 1d)
84	9							
85	9							

LITHOLOGY*

UNCONFINED COMPRESS. STRENGTH (TONS/FT)
1 2 3 4 5
PLASTIC LIMIT % WATER CONTENT % LIQUID LIMIT %
10 20 30 40 50
STANDARD PENETRATION (BLOWS/FT.)
10 20 30 40 50

ELEVATION (FT.)
-59.0
-64.0
-69.0
-74.0
-79.0
-84.0

90
77
90
77

REMARKS: Surface elevation was provided by the Client, based on a previously performed site survey, NAVD 1988.

BORING LOG 10285.01 MANHATTAN.GPJ TECTONIC ENG.GDT 8/24/21

Tectonic

PROJECT No. **10285.01**
PROJECT: **BBJ - M**
LOCATION: **Manhattan, NY**

BORING No. B-28M

SHEET No. 4 of 4

CLIENT: **TRC**
CONTRACTOR: **Aarco Environmental Service Inc**

UNCONFINED COMPRESS. STRENGTH (TONS/FT)
1 2 3 4 5
PLASTIC LIMIT % | WATER CONTENT % | LIQUID LIMIT %
10 20 30 40 50
STANDARD PENETRATION (BLOWS/FT.)
10 20 30 40 50

DEPTH (FT.)	N OR MIN./FT.	PENETRATION RESISTANCE (BL/6 IN.)	SAMPLES: SAMPLE NUMBER	SAMPLES: RECOV. LENGTH (IN.)	SAMPLES: RECOV. RQD (%)	MOISTURE	UNIFIED SOIL CLASS.	DESCRIPTION OF MATERIAL	LITHOLOGY*	ELEVATION (FT.)
86	10									
87	10		C-2	60/60	53			Gy, moderately weathered, slightly fractured, c grained, hard, SCHIST (Class 1b)		
88	11									
89	1									
90								End of Boring at 89'		-89.0
91										
92										
93										
94										
95										-94.0
96										
97										
98										
99										
100										-99.0
101										
102										
103										
104										
105										-104.0
106										
107										
108										
109										
110										-109.0
111										
112										
113										
114										
115										-114.0

REMARKS: Surface elevation was provided by the Client, based on a previously performed site survey, NAVD 1988.

Tectonic

PROJECT No. **10285.01**
PROJECT: **BBJ - M**
LOCATION: **Manhattan, NY**

BORING No. B-31M

SHEET No. 1 of 4

CLIENT: **TRC**
CONTRACTOR: **Aarco Environmental Service Inc**
METHOD OF ADVANCING BORING | DIA. | DEPTH
POWER AUGER: | | TO
ROT. DRILL: | **2 7/8"** | **0** TO **110'**
CASING: | **4" & 3"** | **0** TO **50'**
DIAMOND CORE: | **2"** | **83** TO **90'**
Acker Portable Rig with Cathead & Donut Hammer

GROUND WATER	DATE	TIME	DEPTH
	4/20/21	**11:00 AM**	**12'**

MON. WELL ☐ YES ☒ NO
SCREEN DEPTH: **---** TO **---**
WEATHER: TEMP:
DEPTH TO ROCK: **82.0'**
*CHANGES IN STRATA ARE INFERRED

INSPECTOR: **Barry Ouimet**
DRILLER: **Julio Galarza**
SURFACE ELEVATION: **1.0**
DATUM: **See Remarks**
DATE START: **4/19/21**
DATE FINISH: **4/20/21**

UNCONFINED COMPRESS. STRENGTH (TONS/FT) ● 1 2 3 4 5
PLASTIC LIMIT % | WATER CONTENT % | LIQUID LIMIT % ✕ ⊗ △ 10 20 30 40 50
STANDARD PENETRATION (BLOWS/FT.) ● 10 20 30 40 50

DEPTH (FT.)	N OR MIN./FT.	PENETRATION RESISTANCE (BL/6 IN.)	SAMPLES: SAMPLE NUMBER	RECOV. LENGTH (IN.)	RECOV. RQD (%)	MOISTURE	UNIFIED SOIL CLASS.	DESCRIPTION OF MATERIAL	LITHOLOGY*	ELEVATION (FT.)
1–6								Previously hand Augered to 6.0' (encountered 2 slabs) (no soil description available)		-4.0
7	34	9 20 14 18	S-1	14		M	SM	6" Gy SILTY CLAY, some f Gravel, little c-f Sand (FILL) (Class 7) Rd-bwn c-f SAND, little Silt (Class 3a)		
9	38	13 20 18 18	S-2	20		M	SM	Rd-bwn c-f SAND, little Silt (Class 3a)		-9.0
11	42	14 20 22 23	S-3	0				No Recovery		
13	9	2 2 7 5	S-4	14		W	SM	Bwn m-f SAND, some Silt, with silt seams		-14.0
15	38	11 16 22 25	S-5	14		W	SM	Bwn-gy c-f SAND, little Silt (Class 3a)		
17	46	8 18 28 25	S-6	18		W	SM	Gy-bwn c-f SAND, little Silt (Class 3a)		-19.0
19–20										
21	31	14 16 15 15	S-7	14		W	SM	Rd-bwn c-f SAND, little Silt (Class 3a)		
23–25										-24.0

REMARKS: Surface elevation was provided by the Client, based on a previously performed site survey, NAVD 1988.

BORING LOG 10285.01 MANHATTAN.GPJ TECTONIC ENG.GDT 8/24/21

Tectonic

PROJECT No. **10285.01**

PROJECT: **BBJ - M**

LOCATION: **Manhattan, NY**

BORING No. B-31M

SHEET No. 2 of 4

CLIENT: **TRC**

CONTRACTOR: **Aarco Environmental Service Inc**

DEPTH (FT.)	N OR MIN./FT.	PENETRATION RESISTANCE (BL/6 IN.)	SAMPLES: SAMPLE NUMBER	SAMPLES: RECOV. LENGTH (IN.)	SAMPLES: RECOV. RQD (%)	MOISTURE	UNIFIED SOIL CLASS.	DESCRIPTION OF MATERIAL	ELEVATION (FT.)
26	39	14 18 21 27	S-8	16		W	SM	Rd-bwn c-f SAND, little Silt, trace f Gravel with Silt seams (Class 3a)	
27									
28									
29									
30									-29.0
31	41	8 15 26 18	S-9	20		W	SW-SM	Rd-bwn m-f SAND, trace Silt, trace f Gravel (Class 3a)	
32									
33								Drilling resistance at 32.0' to 35.0'	
34									
35									-34.0
36	39	15 18 21 21	S-10	14		W	ML	Bwn SILT, some f Sand with mica (Class 5a)	
37									
38									
39									
40									-39.0
41	37	12 19 18 21	S-11	14		W	ML	Same (Class 5a)	
42									
43								Drilling resistance at 43.0' Gravel layer at 43.0 to 45'	
44									
45									-44.0
46	64	43 28 36 38	S-12	12		W	GM	Bwn-gy c-f GRAVEL, some c-f Sand, little Silt (Class 2a)	
47									
48	50+	45 50/3	S-13	6		W	GM	Same (Class 2a)	
49									
50	5								-49.0
51	14		C-1	14/48	0			Cobbles and Boulders	
52	6								
53	15								
54									
55									-54.0

LITHOLOGY*

UNCONFINED COMPRESS. STRENGTH (TONS/FT)
1 2 3 4 5

PLASTIC LIMIT % | WATER CONTENT % | LIQUID LIMIT %
10 20 30 40 50

STANDARD PENETRATION (BLOWS/FT.)
10 20 30 40 50

64

REMARKS: Surface elevation was provided by the Client, based on a previously performed site survey, NAVD 1988.

BORING LOG 10285.01 MANHATTAN.GPJ TECTONIC ENG.GDT 8/24/21

Tectonic

PROJECT No. **10285.01**
PROJECT: **BBJ - M**
LOCATION: **Manhattan, NY**

BORING No. B-31M

SHEET No. 3 of 4

CLIENT: **TRC**
CONTRACTOR: **Aarco Environmental Service Inc**

DEPTH (FT.)	N OR MIN./FT.	PENETRATION RESISTANCE (BL/6 IN.)	SAMPLES: SAMPLE NUMBER	SAMPLES: RECOV. LENGTH (IN.)	SAMPLES: RECOV. RQD (%)	MOISTURE	UNIFIED SOIL CLASS.	DESCRIPTION OF MATERIAL
56								
57	100+	100/6	S-14	6		W	SP	Bwn c-f SAND, trace Silt, trace f Gravel (Class 3a)
58								
59								
60								
61	67	30 32 35 30	S-15	18		W	SP-SM	Bwn-gy m-f SAND, little c Gravel, trace Silt (Class 3a)
62								
63								
64								
65								
66	114	38 54 60 62	S-16	20		W	SP-SM	Same (Class 3a)
67								
68								
69								
70								
71								
72								
73								
74								
75								
76	8	2 2 6 7	S-17	8		W	ML	Bwn-gy c-f SAND, some Silt (Class 6)
77								
78								
79								
80								
81	33	18 18 15 13	S-18A S-18B	16		W	ML SP	6" Gy Micaceous SILT (Class 5a) Bwn c-f SAND, some f Gravel, trace Silt (Class 3a)
82								
83								
84	4 5							
85								

LITHOLOGY*

UNCONFINED COMPRESS. STRENGTH (TONS/FT)
1 2 3 4 5
PLASTIC LIMIT % WATER CONTENT % LIQUID LIMIT %
10 20 30 40 50
STANDARD PENETRATION (BLOWS/FT.)
10 20 30 40 50

ELEVATION (FT.)
100
-59.0
67
-64.0
114
-69.0
-74.0
-79.0
-84.0

REMARKS: Surface elevation was provided by the Client, based on a previously performed site survey, NAVD 1988.

BORING LOG 10285.01 MANHATTAN.GPJ TECTONIC ENG.GDT 8/24/21

Tectonic

PROJECT No. **10285.01**

PROJECT: **BBJ - M**

LOCATION: **Manhattan, NY**

BORING No. B-31M

SHEET No. 4 of 4

CLIENT: **TRC**

CONTRACTOR: **Aarco Environmental Service Inc**

DEPTH (FT.)	N OR MIN./FT.	PENETRATION RESISTANCE (BL/6 IN.)	SAMPLES: SAMPLE NUMBER	SAMPLES: RECOV. LENGTH (IN.)	SAMPLES: RECOV. RQD (%)	MOISTURE	UNIFIED SOIL CLASS.	DESCRIPTION OF MATERIAL	LITHOLOGY*	ELEVATION (FT.)
86	4		C-2	58/60	40			Gy, fresh, moderately fractured, c grained moderately hard, Micaceous SCHIST fractures at 20 to 60 degrees with Pyrite (Class 1c)		
87	5									
88	9									
89	9		C-3	10/24	34			Same (Class 1d)		
90	7									-89.0
91								End of Boring at 90'		
92										
93										
94										
95										-94.0
96										
97										
98										
99										
100										-99.0
101										
102										
103										
104										
105										-104.0
106										
107										
108										
109										
110										-109.0
111										
112										
113										
114										
115										-114.0

UNCONFINED COMPRESS. STRENGTH (TONS/FT)
1 2 3 4 5

PLASTIC LIMIT % — WATER CONTENT % — LIQUID LIMIT %
10 20 30 40 50

STANDARD PENETRATION (BLOWS/FT.)
10 20 30 40 50

REMARKS: Surface elevation was provided by the Client, based on a previously performed site survey, NAVD 1988.

BORING LOG 10285.01 MANHATTAN.GPJ TECTONIC ENG.GDT 8/24/21

Tectonic

PROJECT No. **10285.01**
PROJECT: **BBJ - M**
LOCATION: **Manhattan, NY**

BORING No. B-33M

SHEET No. 1 of 3

CLIENT: **TRC**
CONTRACTOR: **Aarco Environmental Service Inc**
METHOD OF ADVANCING BORING | DIA. | DEPTH
POWER AUGER: | | TO
ROT. DRILL: | 3 7/8" | 0 TO 62'
CASING: | 3" | 0 TO 66'
DIAMOND CORE: | | TO
Portable Rig with Cathead Donut Hammer

GROUND WATER | DATE | TIME | DEPTH
MON. WELL [X] YES [ ] NO
SCREEN DEPTH: 5 TO 15'
WEATHER: TEMP:
DEPTH TO ROCK: 79'
*CHANGES IN STRATA ARE INFERRED

INSPECTOR: **Barry Ouimet**
DRILLER: **Julio Galarza**
SURFACE ELEVATION: **1.0**
DATUM: **See Remarks**
DATE START: **7/8/21**
DATE FINISH: **7/21/21**

UNCONFINED COMPRESS. STRENGTH (TONS/FT) 1 2 3 4 5
PLASTIC LIMIT % | WATER CONTENT % | LIQUID LIMIT % 10 20 30 40 50
STANDARD PENETRATION (BLOWS/FT.) 10 20 30 40 50

DEPTH (FT.)	N OR MIN./FT.	PENETRATION RESISTANCE (BL/6 IN.)	SAMPLES: SAMPLE NUMBER	RECOV. LENGTH (IN.)	RECOV. RQD (%)	MOISTURE	UNIFIED SOIL CLASS.	DESCRIPTION OF MATERIAL	LITHOLOGY*	ELEVATION (FT.)
1-6								Previously hand cleared to 6' (No soil description provided)		-4.0
7-8	54	17 32 22 30	S-1	22		M	SP	Bwn-rd c-f SAND, and c-f Gravel, trace Silt (FILL) (Class 7)		
9-10	51	7 15 36 50/6	S-2	14		M	SM	Bwn c-f SAND, some Silt, trace f Gravel (FILL) (Class 7)		-9.0
11-12	58	32 37 21 20	S-3			W	SP	Bwn c-f SAND, some c-f Gravel, trace Silt (FILL) (Class 7)		
13-14	67	35 43 24 50/1	S-4	14		W	GP	Bwn-rd c-f GRAVEL, and c-f Sand, trace Silt (FILL) (Class 7)		67
	50+	50/0	S-5	0				No Recovery		
15-16			C-1	2				Cored C-1 from 14' - 16' boulder / cobbles		-14.0
17-18	24	15 11 13 11	S-6	8		W	SP	Bwn-rd c-f SAND, little c-f Gravel, trace Silt (Class 3b)		
19-20	56	16 36 20 33	S-7	22		W	GP	Bwn c-f GRAVEL, and c-f Sand, trace Silt (Class 2a)		-19.0
21-22	34	20 21 13 11	S-8	3		W	GP	Same (Class 2a)		
23-25										-24.0

REMARKS: Surface elevation was provided by the Client, based on a previously performed site survey, NAVD 1988.

BORING LOG 10285.01 MANHATTAN.GPJ TECTONIC ENG.GDT 8/24/21

Tectonic

PROJECT No. **10285.01**
PROJECT: **BBJ - M**
LOCATION: **Manhattan, NY**

BORING No. B-33M

SHEET No. 2 of 3

CLIENT: **TRC**
CONTRACTOR: **Aarco Environmental Service Inc**

DEPTH (FT.)	N OR MIN./FT.	PENETRATION RESISTANCE (BL/6 IN.)	SAMPLES: SAMPLE NUMBER	SAMPLES: RECOV. LENGTH (IN.)	SAMPLES: RECOV. RQD (%)	MOISTURE	UNIFIED SOIL CLASS.	DESCRIPTION OF MATERIAL
26	90	28 70 20 16	S-9	8		W	GP	Same (Class 2a)
27								
28								
29								
30								
31	32	10 14 18 5	S-10	2		W	GP	Blk-bwn c-f GRAVEL, trace c-f Sand, trace Silt (Class 2a)
32								
33								
34								
35								
36	41	29 18 23 22	S-11	6		W	SP	Bwn c-f SAND, little f Gravel, trace Silt (Class 3a)
37								
38								
39								
40								
41	37	13 14 23 27	S-12	14		W	SP	Bwn c-f SAND, trace Silt, trace f Gravel (Class 3a)
42								
43								
44								
45								
46	34	18 14 20 18	S-13	22		W	SP	Bwn c-f SAND, little f Gravel, trace Silt (Class 3a)
47								
48								
49								
50								
51								
52								
53								
54								
55								

LITHOLOGY*

UNCONFINED COMPRESS. STRENGTH (TONS/FT)
1 2 3 4 5
PLASTIC LIMIT % WATER CONTENT % LIQUID LIMIT %
10 20 30 40 50
STANDARD PENETRATION (BLOWS/FT.)
10 20 30 40 50

ELEVATION (FT.)
90
-29.0
-34.0
-39.0
-44.0
-49.0
-54.0

REMARKS: Surface elevation was provided by the Client, based on a previously performed site survey, NAVD 1988.

Tectonic

PROJECT No. **10285.01**
PROJECT: **BBJ - M**
LOCATION: **Manhattan, NY**

BORING No. B-33M

SHEET No. 3 of 3

CLIENT: **TRC**
CONTRACTOR: **Aarco Environmental Service Inc**

DEPTH (FT.)	N OR MIN./FT.	PENETRATION RESISTANCE (BL/6 IN.)	SAMPLES: SAMPLE NUMBER	SAMPLES: RECOV. LENGTH (IN.)	SAMPLES: RECOV. RQD (%)	MOISTURE	UNIFIED SOIL CLASS.	DESCRIPTION OF MATERIAL	ELEVATION (FT.)
56	60	17 26 34 34	S-14	24		W	SP	Rd-bwn c-f SAND, trace c-f Gravel, trace Silt (Class 3a)	
57									
58									
59									
60									-59.0
61	48	17 22 26 23	S-15	24		W	SM	Rd-bwn c-f SAND, and Silt, trace c-f Gravel (Class 3a)	
62									
63									
64									
65									-64.0
66	97	30 37 60 50/5	S-16	24		W	SP	Rd-bwn m-f SAND, trace Silt (Class 3a)	
67									
68									
69									
70									-69.0
71	60	15 30 30 19	S-17	24		W	SP	Same (Class 3a)	
72									
73									
74									
75									-74.0
76									
77			C-1	12/48	10			Gy-blk, slightly to moderately weathered, moderately fractured, c-f grained, medium hard, SCHIST, fractured 45 - 180 degrees (Class 1d)	
78									
79									
80	44								-79.0
81	50								
82	38		C-2	60/60	48			Gy-blk, slightly to moderately weathered, moderately fractured, c-f grained, medium hard, SCHIST, fractured 45 degrees from horizontal (Class 1c)	
83	38								
84	36								
85								End of Boring at 84'	-84.0

UNCONFINED COMPRESS. STRENGTH (TONS/FT)
1 2 3 4 5
PLASTIC LIMIT % WATER CONTENT % LIQUID LIMIT %
10 20 30 40 50
STANDARD PENETRATION (BLOWS/FT.)
10 20 30 40 50

97

REMARKS: Surface elevation was provided by the Client, based on a previously performed site survey, NAVD 1988.

BORING LOG 10285.01 MANHATTAN.GPJ TECTONIC ENG.GDT 8/24/21

Tectonic

PROJECT No. **10285.01**
PROJECT: **BBJ - M**
LOCATION: **Manhattan, NY**

BORING No. B-34M

SHEET No. 1 of 4

CLIENT: **TRC**
CONTRACTOR: **Aarco Environmental Service Inc**
METHOD OF ADVANCING BORING | DIA. | DEPTH
POWER AUGER: | | TO
ROT. DRILL: | 3 7/8" | 6 TO 92'
CASING: | 4" | 0 TO 60'
DIAMOND CORE: | 2" | 92 TO 97'
Geoprobe with Automatic Hammer

GROUND WATER | DATE | TIME | DEPTH
MON. WELL ☐ YES ☒ NO
SCREEN DEPTH: --- TO ---
WEATHER: **Rain** TEMP: **50° F**
DEPTH TO ROCK: **92'**
*CHANGES IN STRATA ARE INFERRED

INSPECTOR: **Matt Grimm**
DRILLER: **Payby Pacheco**
SURFACE ELEVATION: **18.5**
DATUM: **See Remarks**
DATE START: **5/8/21**
DATE FINISH: **5/9/21**

UNCONFINED COMPRESS. STRENGTH (TONS/FT) ● 1 2 3 4 5
PLASTIC LIMIT % | WATER CONTENT % | LIQUID LIMIT % 10 20 30 40 50
STANDARD PENETRATION (BLOWS/FT.) ● 10 20 30 40 50

DEPTH (FT.)	N OR MIN./FT.	PENETRATION RESISTANCE (BL/6 IN.)	SAMPLES: SAMPLE NUMBER	RECOV. LENGTH (IN.)	RECOV. RQD (%)	MOISTURE	UNIFIED SOIL CLASS.	DESCRIPTION OF MATERIAL	LITHOLOGY*	ELEVATION (FT.)
1–6								Hand augered to 6' 14" - 24" Gy-bwn c-f GRAVEL, some c-f SAND, little Silt, contains brick & asphalt (FILL) 24" - 72" Bwn c-f SAND, some Gravel, trace Silt, contains brick & asphalt (FILL)		13.5
7–8	4	1 2 2 1	S-1	6		M	GM	Gy c-f GRAVEL, some Sand, little Silt brick, concrete, asphalt (FILL) (Class 7)		
9–10	4	1 2 2 2	S-2	4		M	GM	Gy c-f GRAVEL, some Sand, little Silt, brick, concrete, asphalt (FILL) (Class 7)		8.5
11–12	9	7 5 4 4	S-3	8		M	SP	Bwn c-f SAND, and c-f Gravel, trace Silt, brick, concrete, asphalt (FILL) (Class 7)		
13–14	8	4 4 4 11	S-4	2		M	SP	Same (FILL) (Class 7)		
15–16	34	12 15 19 12	S-5	10		W	SP	Bwn c-f SAND, and c-f Gravel, trace Silt (Class 3a)		3.5
17–18	16	13 12 4 6	S-6	12		W	SM	Rd-bwn c-f SAND, little Silt, trace Gravel (Class 3b)		
19–20	8	4 2 6 6	S-7	14		W	SM	Bwn-gy c-m SAND, little f Gravel, little Silt (Class 6)		-1.5
21–22	4	1 2 2 4	S-8	4		W	SM	Bwn-gy c-f SAND, little m-f Gravel, little Silt (Class 6)		
23–24	18	7 8 10 11	S-9	18		W	SM	Bwn-gy c-f SAND, little m-f Gravel, little Silt (Class 3b)		
25										-6.5

REMARKS: Surface elevation was provided by the Client, based on a previously performed site survey, NAVD 1988.

Tectonic

PROJECT No. **10285.01**

PROJECT: **BBJ - M**

LOCATION: **Manhattan, NY**

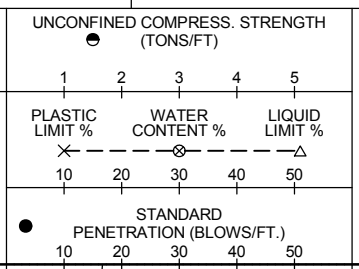
BORING No. B-34M

SHEET No. 2 of 4

CLIENT: **TRC**

CONTRACTOR: **Aarco Environmental Service Inc**

DEPTH (FT.)	N OR MIN./FT.	PENETRATION RESISTANCE (BL/6 IN.)	SAMPLES: SAMPLE NUMBER	SAMPLES: RECOV. LENGTH (IN.)	SAMPLES: RECOV. RQD (%)	MOISTURE	UNIFIED SOIL CLASS.	DESCRIPTION OF MATERIAL	LITHOLOGY*	ELEVATION (FT.)
26	16	7 9 7 9	S-10	14		W	SP	Rd-bwn c-f SAND, trace Silt (Class 3b)		
27										
28										
29										
30										-11.5
31	15	6 7 8 10	S-11	10		W	SP	Same (Class 3b)		
32										
33										
34										
35										-16.5
36	23	11 11 12 11	S-12	0				No Recovery		
37										
38										
39										
40										-21.5
41	14	5 7 7 7	S-13	16		W	SP	Rd-bwn c-f SAND, trace Silt (Class 3b)		
42										
43										
44										
45										-26.5
46	12	3 6 6 8	S-14	20		W	SP	Bwn c-f SAND, trace Silt (Class 3b)		
47										
48										
49										
50										-31.5
51	27	12 8 19 16	S-15	12		W	GP	Bwn-gn c-f GRAVEL, and c-f Sand, trace Silt (Class 2b)		
52										
53										
54										
55										-36.5



REMARKS: Surface elevation was provided by the Client, based on a previously performed site survey, NAVD 1988.

BORING LOG 10285.01 MANHATTAN.GPJ TECTONIC ENG.GDT 8/24/21

Tectonic

PROJECT No. **10285.01**
PROJECT: **BBJ - M**
LOCATION: **Manhattan, NY**

BORING No. B-34M

SHEET No. 3 of 4

CLIENT: **TRC**
CONTRACTOR: **Aarco Environmental Service Inc**

DEPTH (FT.)	N OR MIN./FT.	PENETRATION RESISTANCE (BL/6 IN.)	SAMPLES: SAMPLE NUMBER	SAMPLES: RECOV. LENGTH (IN.)	SAMPLES: RECOV. RQD (%)	SAMPLES: MOISTURE	UNIFIED SOIL CLASS.	DESCRIPTION OF MATERIAL	LITHOLOGY*	ELEVATION (FT.)
56	43	23 19 24 14	S-16	4		W	GP	Gy-bwn c-f GRAVEL, some c-f Sand, trace Silt (Class 2a)		
57										
58	5 7 9		C-1	6				Boulder		
59										
60										-41.5
61	24	18 13 11 11	S-17	4		W	GM	Gn c-f GRAVEL, some Sand, little Silt (Class 2b)		
62										
63										
64										
65										-46.5
66	27	25 14 13 15	S-18	14		W	SM	Bwn-gy c-f SAND, some c-f Gravel, little Silt (Class 3b)		
67										
68										
69										
70										-51.5
71	17	11 8 9 16	S-19	20		W	SW-SM	Bwn c-f SAND, little f Gravel, trace Silt (Class 3b)		
72										
73										
74										
75										-56.5
76	35	20 18 17 23	S-20	12		W	SP	Bwn c-f SAND, some m-f Gravel, trace Silt (Class 3a)		
77										
78										
79										
80										-61.5
81	45	27 25 20 22	S-21	20		W	SP	Same (Class 3a)		
82										
83										
84										
85										-66.5

UNCONFINED COMPRESS. STRENGTH (TONS/FT)
1 2 3 4 5
PLASTIC LIMIT % WATER CONTENT % LIQUID LIMIT %
10 20 30 40 50
STANDARD PENETRATION (BLOWS/FT.)
10 20 30 40 50

REMARKS: Surface elevation was provided by the Client, based on a previously performed site survey, NAVD 1988.

Tectonic

PROJECT No. **10285.01**
PROJECT: **BBJ - M**
LOCATION: **Manhattan, NY**

BORING No. B-34M

SHEET No. 4 of 4

CLIENT: **TRC**
CONTRACTOR: **Aarco Environmental Service Inc**

DEPTH (FT.)	N OR MIN./FT.	PENETRATION RESISTANCE (BL/6 IN.)	SAMPLES: SAMPLE NUMBER	SAMPLES: RECOV. LENGTH (IN.)	SAMPLES: RECOV. RQD (%)	MOISTURE	UNIFIED SOIL CLASS.	DESCRIPTION OF MATERIAL	LITHOLOGY*	ELEVATION (FT.)
86	38	14 19 19 14	S-22	18		W	SW-SM	Bwn m-f SAND, trace Silt, trace f Gravel (Class 3a)		
87										
88										
89										
90	50+	50/6	S-23	6		W	SP	Gy-bwn c-f SAND, trace f Gravel, trace Silt, (Class 3a)		-71.5
91										
92										
93	7									
94	9									
95	10		C-2	60/60	66			Gy, moderately weathered, moderately fractured, c-f grained hard SCHIST fractured 20 degrees (Class 1b)		-76.5
96	8									
97	9									
98								End of Boring at 97'		
99										
100										-81.5
101										
102										
103										
104										
105										-86.5
106										
107										
108										
109										
110										-91.5
111										
112										
113										
114										
115										-96.5

UNCONFINED COMPRESS. STRENGTH (TONS/FT)
1 2 3 4 5
PLASTIC LIMIT % WATER CONTENT % LIQUID LIMIT %
10 20 30 40 50
STANDARD PENETRATION (BLOWS/FT.)
10 20 30 40 50

REMARKS: Surface elevation was provided by the Client, based on a previously performed site survey, NAVD 1988.

BORING LOG 10285.01 MANHATTAN.GPJ TECTONIC ENG.GDT 8/24/21

Tectonic

PROJECT No. **10285.01**
PROJECT: **BBJ - M**
LOCATION: **Manhattan, NY**

BORING No. B-14M

SHEET No. 1 of 1

CLIENT: **TRC**
CONTRACTOR: **Aarco Environmental Service Inc**
METHOD OF ADVANCING BORING | DIA. | DEPTH
POWER AUGER: | | TO
ROT. DRILL: | | TO
CASING: | | TO
DIAMOND CORE: | | TO

GROUND WATER | DATE | TIME | DEPTH

MON. WELL ☐ YES ☒ NO
SCREEN DEPTH: --- TO ---
WEATHER: **Rain** TEMP: **50° F**
DEPTH TO ROCK: ---
*CHANGES IN STRATA ARE INFERRED

INSPECTOR: **Liam McGrath**
DRILLER: **Julio Galarza**
SURFACE ELEVATION: ---
DATUM: **See Remarks**
DATE START: **3/13/20**
DATE FINISH: **3/13/20**

UNCONFINED COMPRESS. STRENGTH (TONS/FT) ◓ — 1 2 3 4 5
PLASTIC LIMIT % — WATER CONTENT % — LIQUID LIMIT % — 10 20 30 40 50
STANDARD PENETRATION (BLOWS/FT.) ● — 10 20 30 40 50

DEPTH (FT.)	N OR MIN./FT.	PENETRATION RESISTANCE (BL/6 IN.)	SAMPLES: SAMPLE NUMBER	RECOV.: LENGTH (IN.)	RECOV.: RQD (%)	MOISTURE	UNIFIED SOIL CLASS.	DESCRIPTION OF MATERIAL	LITHOLOGY*
1								12" Concrete slab	
2								Hand excavated to 6'	
3									
4								Bwn c-f SAND, some Silt, some c-f Gravel (brick & concrete debris present) (FILL) (Class 7)	
5									
6									
7								End of Boring at 6'	
8–25									

REMARKS: This boring was discontinued by the Client after hand clearing and after the COVID-19 Pandemic.

BORING LOG 10285.01 MANHATTAN.GPJ TECTONIC ENG.GDT 8/24/21

Tectonic

PROJECT No. **10285.01**
PROJECT: **BBJ - M**
LOCATION: **Manhattan, NY**

BORING No. B-21M

SHEET No. 1 of 1

CLIENT: **TRC**
CONTRACTOR: **Aarco Environmental Service Inc**
METHOD OF ADVANCING BORING | DIA. | DEPTH
POWER AUGER: | | TO
ROT. DRILL: | | TO
CASING: | | TO
DIAMOND CORE: | | TO

GROUND WATER | DATE | TIME | DEPTH

MON. WELL ☐ YES ☒ NO
SCREEN DEPTH: --- TO ---
WEATHER: **Rain** TEMP: **50° F**
DEPTH TO ROCK: ---
*CHANGES IN STRATA ARE INFERRED

INSPECTOR: **Liam McGrath**
DRILLER: **Julio Galarza**
SURFACE ELEVATION: ---
DATUM: **See Remarks**
DATE START: **3/13/20**
DATE FINISH: **3/13/20**

UNCONFINED COMPRESS. STRENGTH (TONS/FT) ◓ 1 2 3 4 5
PLASTIC LIMIT % | WATER CONTENT % | LIQUID LIMIT %
10 20 30 40 50
● STANDARD PENETRATION (BLOWS/FT.) 10 20 30 40 50

DEPTH (FT.)	N OR MIN./FT.	PENETRATION RESISTANCE (BL/6 IN.)	SAMPLES: SAMPLE NUMBER	RECOV. LENGTH (IN.)	RECOV. RQD (%)	MOISTURE	UNIFIED SOIL CLASS.	DESCRIPTION OF MATERIAL	LITHOLOGY*	DEPTH (FT.)
1								4" Concrete slab		1
2								Hand excavated to 6'		2
3								Bwn c-f SAND, some c-f Gravel, some Silt (FILL) (Class 7)		3
4										4
5										5
6								End of Boring at 6'		6
7										7
8										8
9										9
10										10
11										11
12										12
13										13
14										14
15										15
16										16
17										17
18										18
19										19
20										20
21										21
22										22
23										23
24										24
25										25

REMARKS: This boring was discontinued by the Client after hand clearing and after the COVID-19 Pandemic.

BORING LOG 10285.01 MANHATTAN.GPJ TECTONIC ENG.GDT 8/24/21

Tectonic

PROJECT No. **10285.01**
PROJECT: **BBJ - M**
LOCATION: **Manhattan, NY**

BORING No. B-23M

SHEET No. 1 of 1

CLIENT: **TRC**
CONTRACTOR: **Aarco Environmental Service Inc**
METHOD OF ADVANCING BORING | DIA. | DEPTH
POWER AUGER: | | TO
ROT. DRILL: | | TO
CASING: | | TO
DIAMOND CORE: | | TO

GROUND WATER | DATE | TIME | DEPTH
| | | |

MON. WELL ☐ YES ☒ NO
SCREEN DEPTH: --- TO ---
WEATHER: TEMP:
DEPTH TO ROCK: ---
*CHANGES IN STRATA ARE INFERRED

INSPECTOR: **Liam McGrath**
DRILLER: **Julio Galarza**
SURFACE ELEVATION: ---
DATUM: **See Remarks**
DATE START: **3/11/20**
DATE FINISH: **3/11/20**

UNCONFINED COMPRESS. STRENGTH (TONS/FT) ● 1 2 3 4 5
PLASTIC LIMIT % | WATER CONTENT % | LIQUID LIMIT %
10 20 30 40 50
● STANDARD PENETRATION (BLOWS/FT.) 10 20 30 40 50

DEPTH (FT.)	N OR MIN./FT.	PENETRATION RESISTANCE (BL/6 IN.)	SAMPLES: SAMPLE NUMBER	RECOV.: LENGTH (IN.)	RECOV.: RQD (%)	MOISTURE	UNIFIED SOIL CLASS.	DESCRIPTION OF MATERIAL	LITHOLOGY*
1								15" Concrete slab	
2								Hand excavated to 6'	
3									
4								Bwn c-f SAND, some Silt, some c-f Gravel (FILL) (Class 7)	
5									
6									
7								End of Boring at 6'	
8									
9									
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									
21									
22									
23									
24									
25									

DEPTH (FT.)

REMARKS: This boring was discontinued by the Client after hand clearing and after the COVID-19 Pandemic.

BORING LOG 10285.01 MANHATTAN.GPJ TECTONIC ENG.GDT 8/24/21

Tectonic
PRACTICAL SOLUTIONS. EXCEPTIONAL SERVICE.

LEGEND FOR SOIL DESCRIPTION

COARSE GRAINED SOIL (Coarser then No. 200 Sieve)

DESCRIPTIVE TERM & GRAIN SIZE

TERM	SAND					GRAVEL
coarse - c	No.	4	Sieve to No.	10	Sieve	3" to 3/4"
medium - m	No.	10	Sieve to No.	40	Sieve	3/4" to 3/16"
fine - f	No,	40	Sieve to No.	200	Sieve	

COBBLES 3" to 10"

BOULDERS 10" +

GRADATION DESIGNATIONS	PROPORTIONS OF COMPONENT
fine, f	Less than 10% coarse to medium
medium to fine, m-f	Less than 10% coarse
medium, m	Less than 10% coarse and fine
coarse to medium, c-m	Less than 10% fine
coarse, c	Less than 10% medium and fine
coarse to fine, c-f	All greater than 10%

FINE GRAINED SOIL (Finer than No. 200 Sieve)

DESCRIPTION	PLASTICITY INDEX	PLASTICITY
Silt	0 - 1	none
Clayey Silt	2 - 5	slight
Silt & Clay	6 - 10	low
Clay & Silt	11 - 20	medium
Silty Clay	21 - 40	high
Clay	greater than 40	very high

PROPORTION

DESCRIPTIVE TERM	PERCENT OF SAMPLE WEIGHT
trace	1 - 10
little	10 - 20
some	20 - 35
and	35 - 50

The primary component is fully capitalized

COLOR

Blue - blue	Gy - gray	Wh - white
Blk - black	Or - orange	Yl - yellow
Bwn - brown	Rd - red	Lgt - light
Gn - green	Tn - tan	Dk - dark

SAMPLE NOTATION

S - Split Spoon Soil Sample
U - Undisturbed Tube Sample
C - Core Sample
B - Bulk Soil Sample
NR - No Recovery of Sample

WOC - Weight of Casing
WOR - Weight of Rods
WOH - Weight of Hammer
PPR - Compressive Strength based on Pocket Penetrometer
TV - Shear Strength (tsf) based on Torvane

ADDITIONAL CLASSIFICATIONS

New York City Building Code soil classifications are given in parentheses at the end of each description of material, if applicable. See sections 1804.2 of the 2008 Building Code for further details.

OBSERVATION WELL INSTALLATION LOG

PROJECT: Borough Based Jail - Manhattan W.O.#: 10285.01 WELL #: MW-1 BORING #: B-31M

LOCATION: 125 White Street, New York, NY DATE INSTALLED: 5/4/2021

CONTRACTOR: Aarco Environmental Services, Inc. TEC ENGINEER: Barry Ouimet

DIRECT MEASUREMENTS: CASING TO PVC: 2 In. CASING TO GROUND: 0 In.

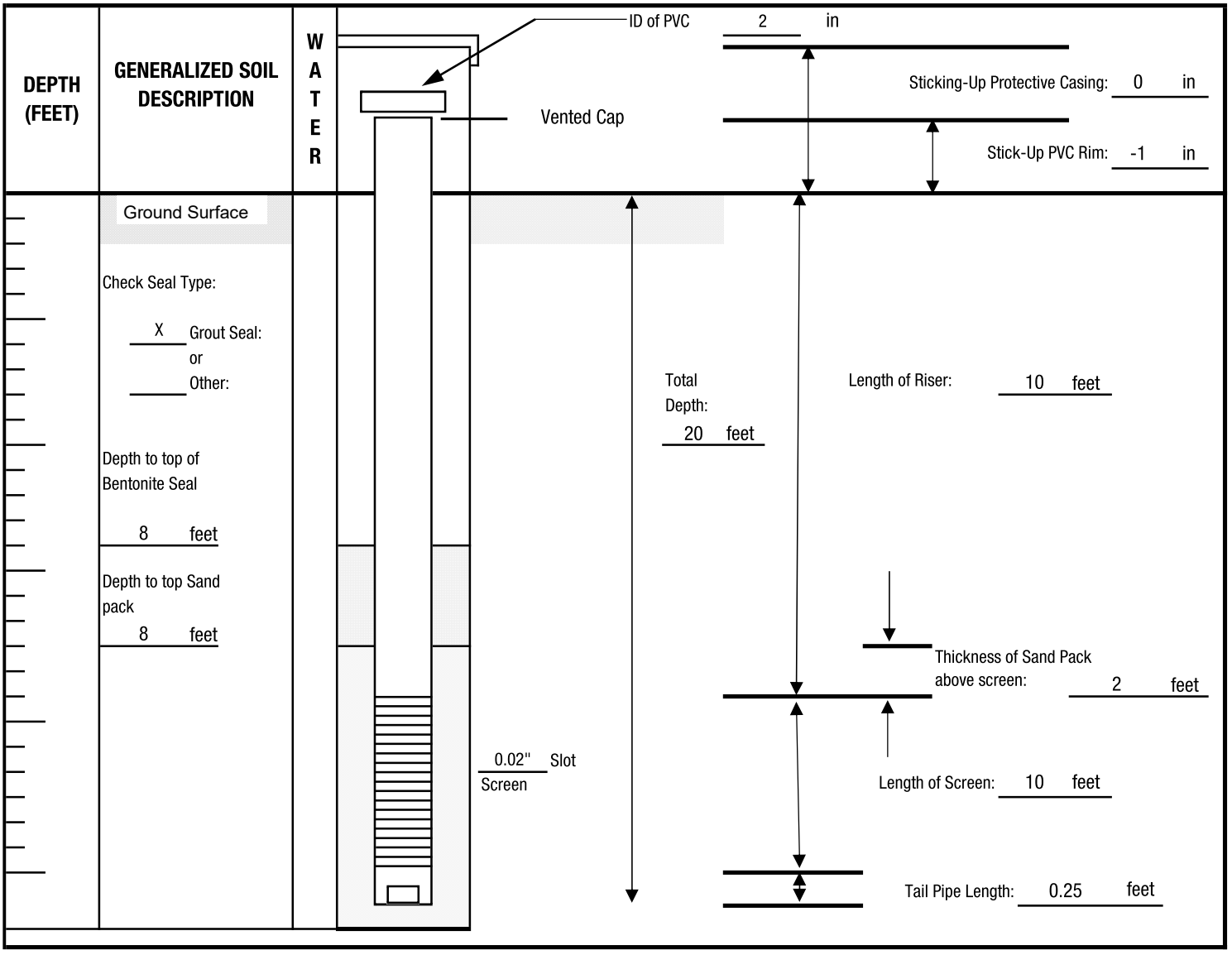
SURFACE ELEV.: 1 Ft. PVC ELEV.: 0.83 Ft. PROTECTIVE CASING: 0.83 Ft.

GROUNDWATER:

	DATE:	TIME:	DEPTH:	ELEV.:
	5/4/2021	11:10 AM	3.12 Ft.	-2.12 Ft.
	7/22/2021		3.32 Ft.	-2.32 Ft.
	8/16/2021	9:02 AM	3.33 Ft.	-2.33 Ft.

DEVELOPMENT: DATE: NA RATE AND VOL. REMOVED:

OBSERVATIONS / NOTES: Surface elevation, and resulting elevations are approximate.



OBSERVATION WELL INSTALLATION LOG

PROJECT: Borough Based Jail - Manhattan | W.O.#: 10285.01 | WELL #: MW-2 | BORING #: B-19M

LOCATION: 125 White Street, New York, NY | DATE INSTALLED: 6/13/2021

CONTRACTOR: Aarco Environmental Services, Inc. | TEC ENGINEER: Jack Rusk

DIRECT MEASUREMENTS: | CASING TO PVC: 2 In. | CASING TO GROUND: 0 In.

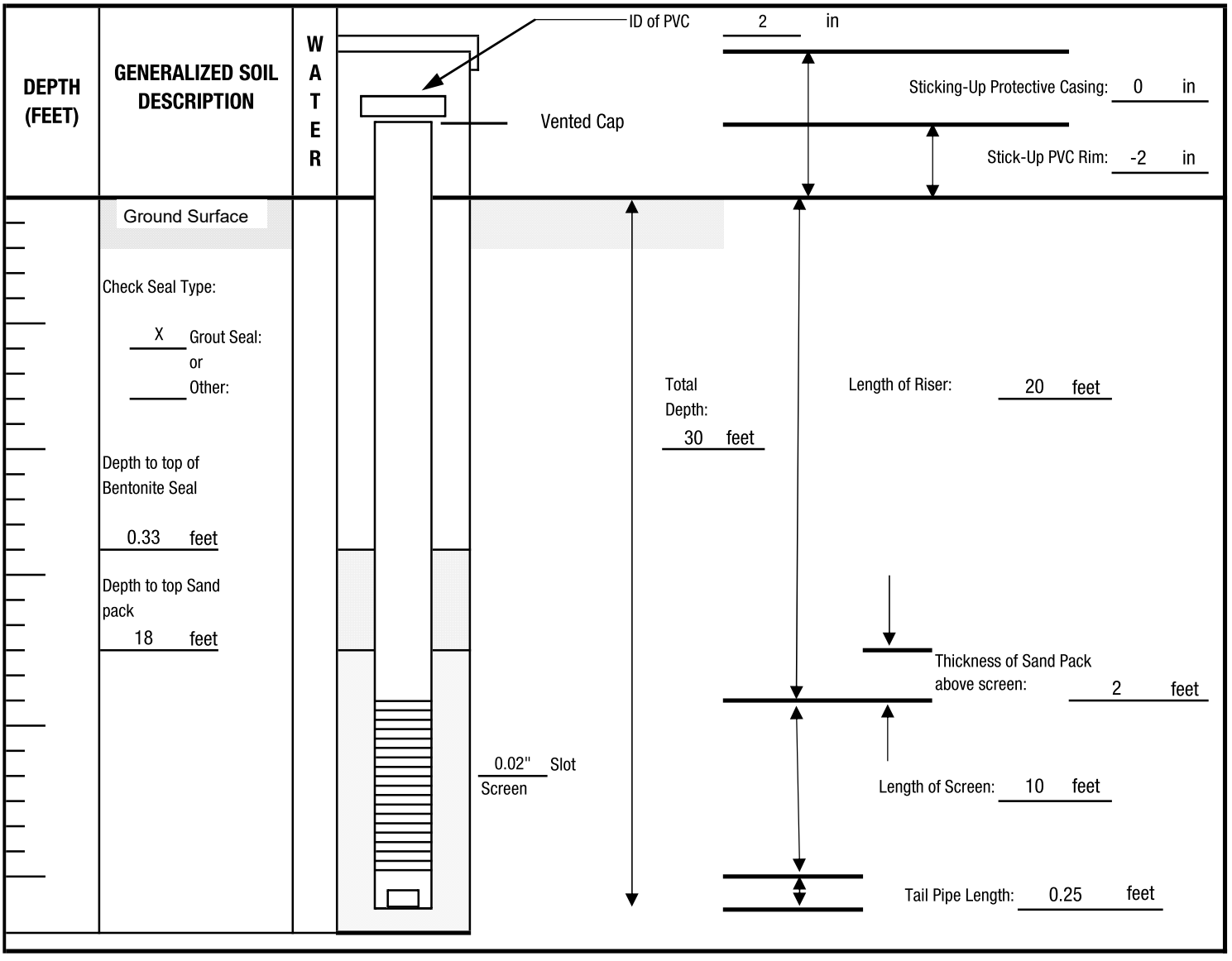
SURFACE ELEV.: 15.9 Ft. | PVC ELEV.: 15.83 Ft. | PROTECTIVE CASING: 15.9 Ft.

GROUNDWATER: DATE: 6/13/2021 | TIME: 1:00 PM | DEPTH: 10.17 Ft. | ELEV.: 5.73 Ft.

DATE: 8/16/2021 | TIME: 9:30 AM | DEPTH: 16.50 Ft. | ELEV.: -0.60 Ft.

DEVELOPMENT: DATE: NA | RATE AND VOL. REMOVED:

OBSERVATIONS / NOTES: Surface elevation, and resulting elevations are approximate.



OBSERVATION WELL INSTALLATION LOG

PROJECT: Borough Based Jail - Manhattan W.O.#: 10285.01 WELL #: MW-3 BORING #: B-9M

LOCATION: 125 White Street, New York, NY DATE INSTALLED: 7/2/2021

CONTRACTOR: Aarco Environmental Services, Inc. TEC ENGINEER: Jack Rusk

DIRECT MEASUREMENTS: CASING TO PVC: 2 In. CASING TO GROUND: 0 In.

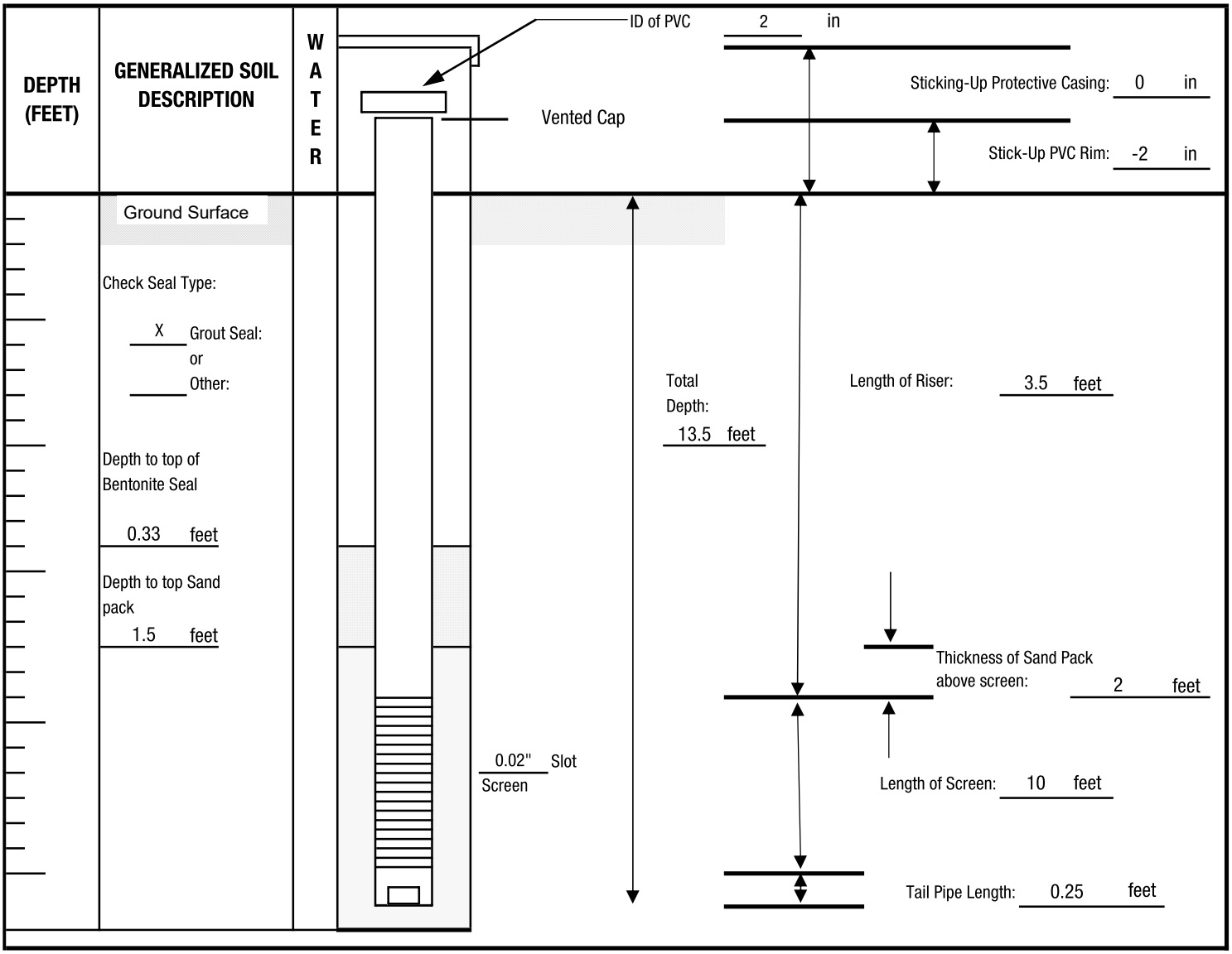
SURFACE ELEV.: 1 Ft. PVC ELEV.: 0.83 Ft. PROTECTIVE CASING: 1 Ft.

GROUNDWATER:

	DATE:	TIME:	DEPTH:	ELEV.:
	7/2/2021	8:37 AM	3.33 Ft.	-2.33 Ft.
	7/22/2021		3.27 Ft.	-2.27 Ft.
	8/16/2021	8:52 AM	3.33 Ft.	-2.33 Ft.

DEVELOPMENT: DATE: NA RATE AND VOL. REMOVED:

OBSERVATIONS / NOTES: Surface elevation, and resulting elevations are approximate.



OBSERVATION WELL INSTALLATION LOG

Tectonic
PRACTICAL SOLUTIONS. EXCEPTIONAL SERVICE.

PROJECT: Borough Based Jail - Manhattan W.O.#: 10285.01 WELL #: MW-4 BORING #: B-33M

LOCATION: 125 White Street, New York, NY DATE INSTALLED: 7/22/2021

CONTRACTOR: Aarco Environmental Services, Inc. TEC ENGINEER: Ryan Villa

DIRECT MEASUREMENTS: CASING TO PVC: 3 In. CASING TO GROUND: 0 In.

SURFACE ELEV.: 1 Ft. PVC ELEV.: 0.75 Ft. PROTECTIVE CASING: 1 Ft.

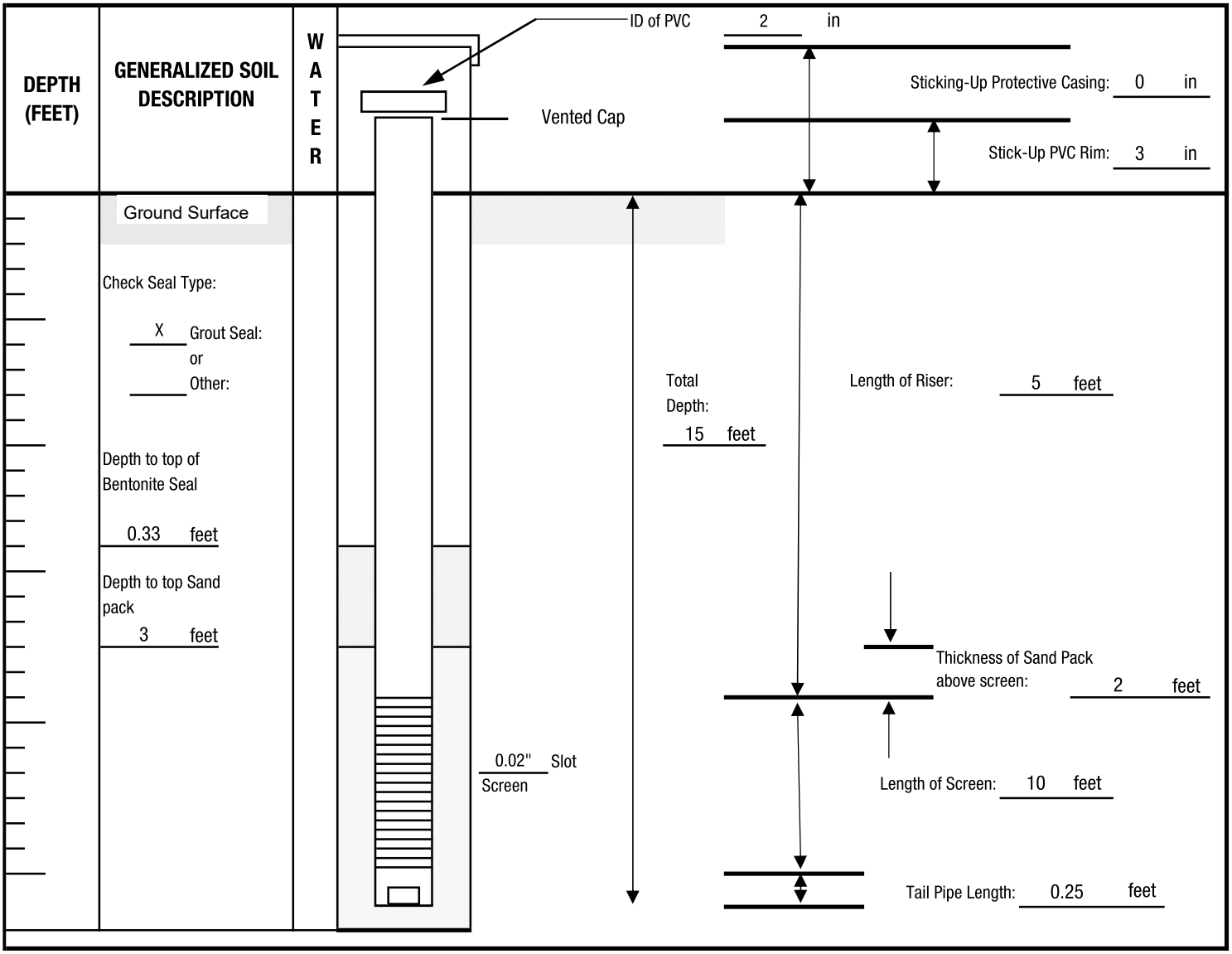
GROUNDWATER: DATE: 7/23/2021 TIME: 8:00 AM DEPTH: 1.00 Ft. ELEV.: 0.00 Ft.

DATE: 7/26/2021 TIME: 8:00 AM DEPTH: 2.50 Ft. ELEV.: -1.50 Ft.

DATE: 8/16/2021 TIME: 8:42 AM DEPTH: 2.33 Ft. ELEV.: -1.33 Ft.

DEVELOPMENT: DATE: NA RATE AND VOL. REMOVED:

OBSERVATIONS / NOTES: Surface elevation, and resulting elevations are approximate.



OBSERVATION WELL INSTALLATION LOG

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PRACTICAL SOLUTIONS. EXCEPTIONAL SERVICE.

PROJECT: Borough Based Jail - Manhattan W.O.#: 10285.01 WELL #: MW-5 BORING #: B-7M

LOCATION: 125 White Street, New York, NY DATE INSTALLED: 8/5/2021

CONTRACTOR: Aarco Environmental Services, Inc. TEC ENGINEER: Jack Rusk

DIRECT MEASUREMENTS: CASING TO PVC: 4 In. CASING TO GROUND: 0 In.

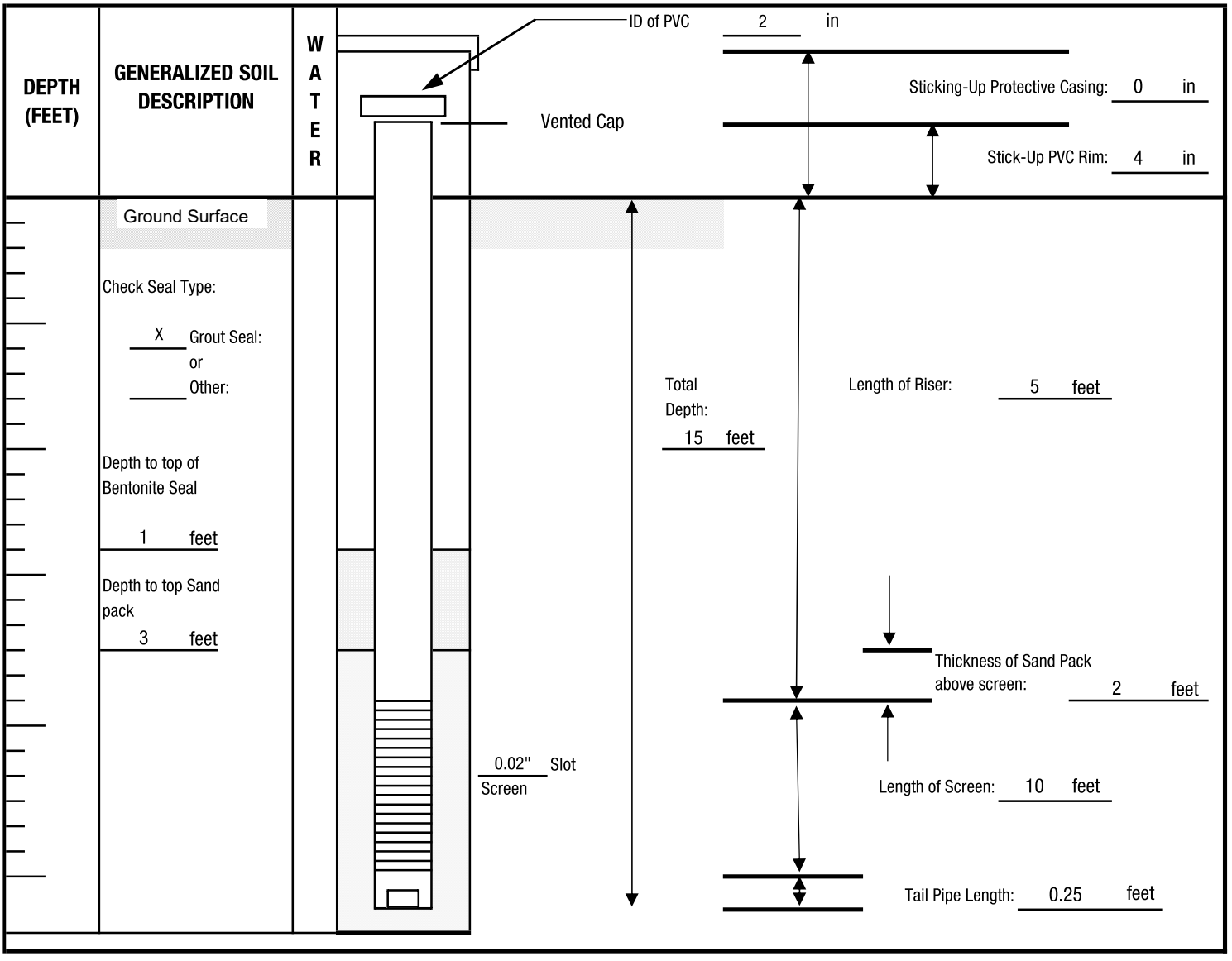
SURFACE ELEV.: 1 Ft. PVC ELEV.: 0.67 Ft. PROTECTIVE CASING: 1 Ft.

GROUNDWATER: DATE: 8/6/2021 TIME: 9:50 AM DEPTH: 2.92 Ft. ELEV.: -1.92 Ft.

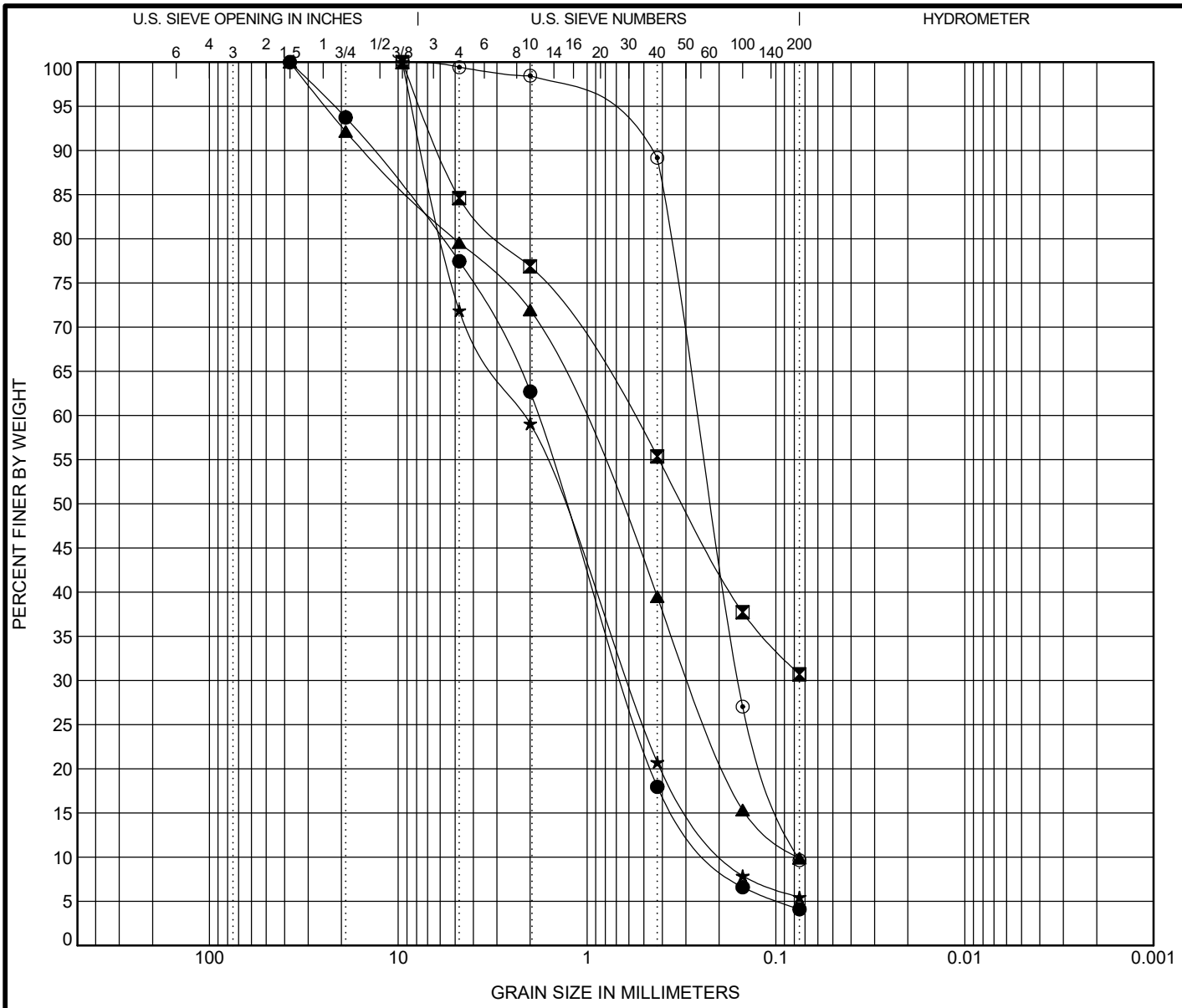
DATE: 8/16/2021 TIME: 8:31 AM DEPTH: 2.92 Ft. ELEV.: -1.92 Ft.

DEVELOPMENT: DATE: NA RATE AND VOL. REMOVED:

OBSERVATIONS / NOTES: Surface elevation, and resulting elevations are approximate.



APPENDIX II



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Sample Identification			Classification	WC%	LL	PL	PI	Cc	Cu
●	B-12M	8.0	S-3	Bwn c-f SAND, some f Gravel, trace Silt	13.9				1.11	8.89
⊠	B-12M	18.0	S-8	Bwn m-f SAND, some Silt, little f Gravel	17.1					
▲	B-13M	16.0	S-7	Gy-Blk m-f SAND, some f Gravel, trace Silt	14.1				0.92	14.84
★	B-13M	25.0	S-10	Rd-Bwn c-f SAND, some f Gravel, trace Silt	15.3				1.01	11.97
⊙	B-13M	60.0	S-19	Rd-Bwn f SAND, trace Silt	22.8				1.25	3.43

	Sample Identification			D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay	Source of Material
●	B-12M	8.0	S-3	37.5	1.822	0.645	0.205	22.5	73.4	4.1		Boring
⊠	B-12M	18.0	S-8	9.5	0.593			15.4	53.9	30.7		Boring
▲	B-13M	16.0	S-7	37.5	1.131	0.282	0.076	20.4	69.7	9.9		Boring
★	B-13M	25.0	S-10	9.5	2.13	0.618	0.178	28.1	66.4	5.5		Boring
⊙	B-13M	60.0	S-19	9.5	0.261	0.158	0.076	0.6	89.8	9.6		Boring

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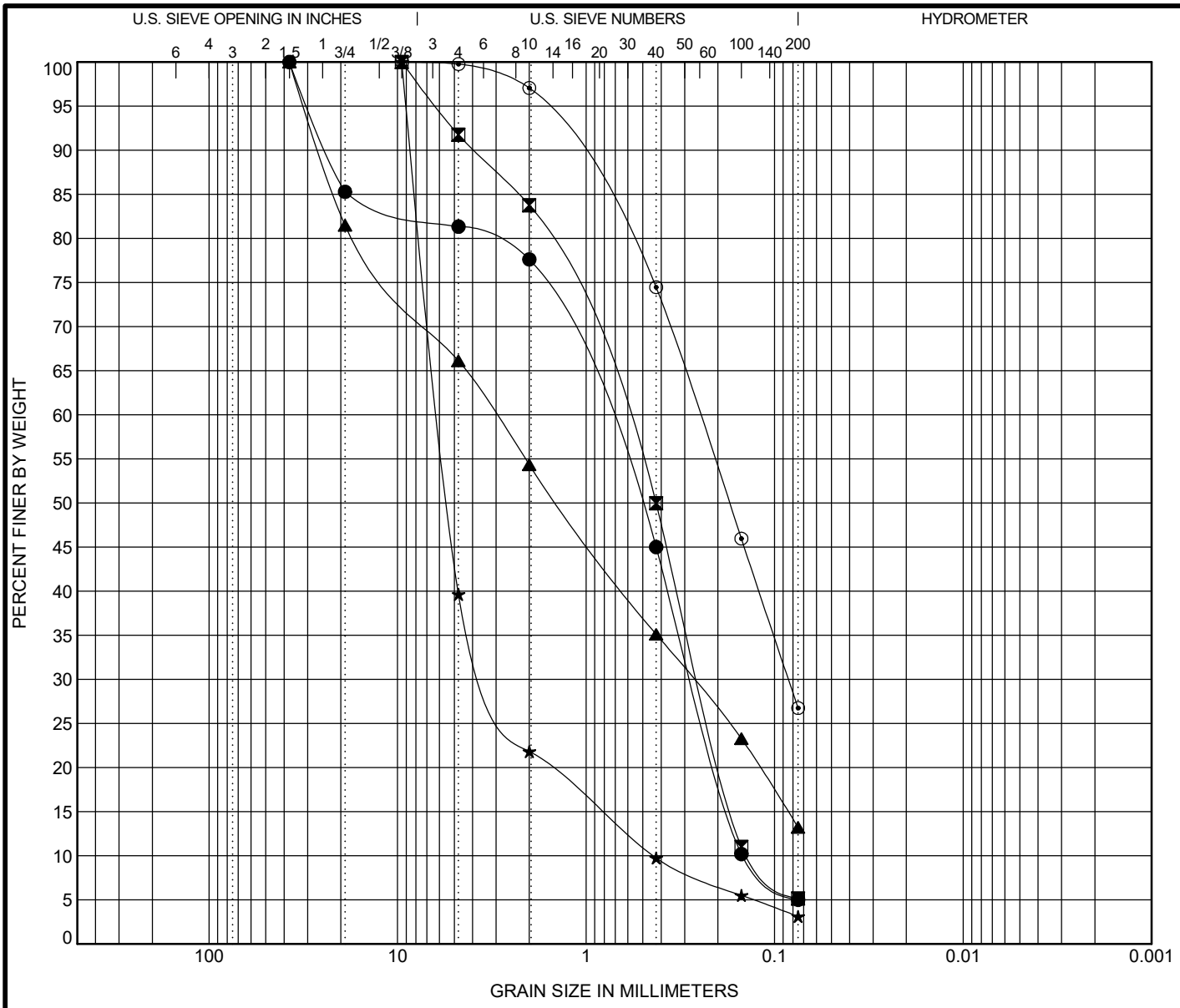
GRAIN SIZE DISTRIBUTION

Project No: **10285.01** Date: **8/5/21**

Project: **BBJ - Manhattan**

Location: **Manhattan, NY**



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Sample Identification	Classification	WC%	LL	PL	PI	Cc	Cu
●	B-13M 65.0 S-21	Lgt Bwn m-f SAND, little c Gravel, trace Silt	17.0				0.58	5.92
⊠	B-13M 75.0 S-23	Rd-Bwn-Or m-f SAND, trace f Gravel, trace Silt	18.5				0.69	5.06
▲	B-13M 90.0 S-26	Rd-Bwn c-f SAND, some c-f Gravel, little Silt	13.6					
★	B-18M 6.0 S-1	Wh-Tn f GRAVEL, and c-m Sand, trace Silt	6.7				3.36	13.66
⊙	B-18M 20.0 S-6	Bwn m-f SAND, some Silt	16.1					

	Sample Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay	Source of Material
●	B-13M 65.0 S-21	37.5	0.866	0.271	0.146	18.7	76.3	5.0		Boring
⊠	B-13M 75.0 S-23	9.5	0.673	0.249	0.133	8.2	86.6	5.1		Boring
▲	B-13M 90.0 S-26	37.5	3.031	0.271		33.9	52.9	13.2		Boring
★	B-18M 6.0 S-1	9.5	6.001	2.975	0.439	60.4	36.5	3.1		Boring
⊙	B-18M 20.0 S-6	9.5	0.251	0.084		0.2	73.0	26.7		Boring

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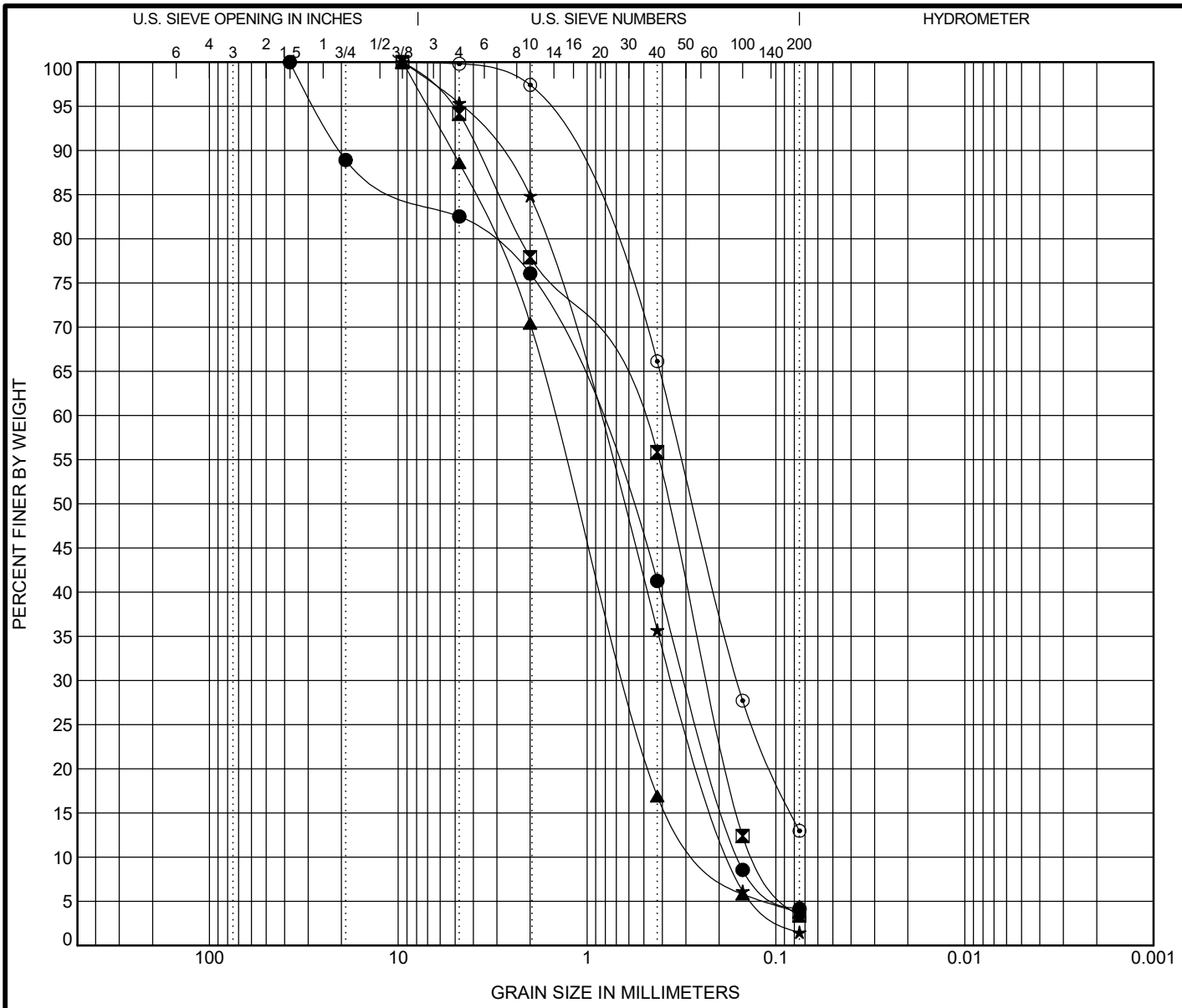
GRAIN SIZE DISTRIBUTION

Project No: **10285.01** Date: **8/5/21**

Project: **BBJ - Manhattan**

Location: **Manhattan, NY**



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Sample Identification	Classification	WC%	LL	PL	PI	Cc	Cu
●	B-18M 30.0 S-8	Gy-Bwn m-f SAND, little c-f Gravel, trace Silt	15.3				0.57	6.23
⊠	B-18M 65.0 S-14	Bwn c-f SAND, trace f Gravel, trace Silt	21.1				0.74	4.55
▲	B-18M 77.0 S-17	Bwn-Gy c-f SAND, little f Gravel, trace Silt	17.1				1.17	6.65
★	B-19M 20.0 S-10	Gy c-f SAND, trace f Gravel, trace Silt	19.8				0.77	5.32
⊙	B-19M 30.0 S-15	Bwn m-f SAND, little Silt	17.8					

	Sample Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay	Source of Material
●	B-18M 30.0 S-8	37.5	0.978	0.297	0.157	17.5	78.4	4.2		Boring
⊠	B-18M 65.0 S-14	9.5	0.568	0.229	0.125	5.9	90.8	3.4		Boring
▲	B-18M 77.0 S-17	9.5	1.479	0.621	0.222	11.4	84.9	3.7		Boring
★	B-19M 20.0 S-10	9.5	0.914	0.348	0.172	4.6	93.9	1.5		Boring
⊙	B-19M 30.0 S-15	9.5	0.36	0.16		0.2	86.8	13.0		Boring

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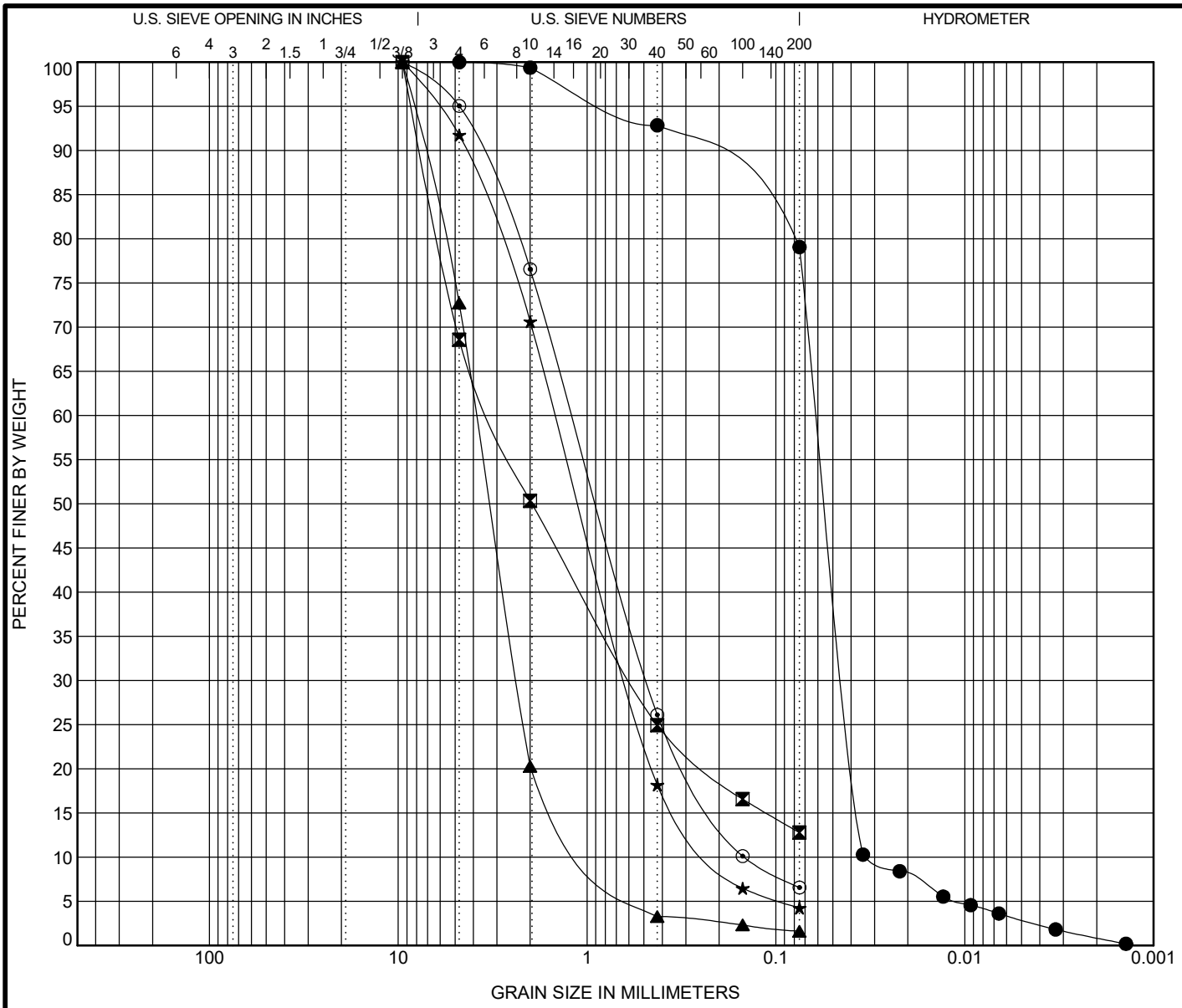
Project No: **10285.01** Date: **8/5/21**

Project: **BBJ - Manhattan**

Location: **Manhattan, NY**



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Sample Identification	Classification	WC%	LL	PL	PI	Cc	Cu
●	B-19M 40.0 S-17	Bwn-Gy SILT, some f Sand	0.4				0.95	1.87
⊠	B-19M 50.0 S-19	Gy-Or c-f SAND, some f Gravel, little Silt	12.1					
▲	B-19M 65.0 S-22	Bwn c-m SAND, some f Gravel, trace Silt	13.9				1.83	4.91
★	B-19M 85.0 S-26	Drk Bwn c-f SAND, trace f Gravel, trace Silt	18.5				1.21	7.12
⊙	B-19M 97.0 S-27	Lgt Bwn-Gy c-f SAND, trace Silt, trace f Gravel	16.0				1.30	8.21

	Sample Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay	Source of Material
●	B-19M 40.0 S-17	4.75	0.061	0.043	0.032	0.0	20.9	76.2	2.9	Boring
⊠	B-19M 50.0 S-19	9.5	3.162	0.578		31.4	55.8	12.8		Boring
▲	B-19M 65.0 S-22	9.5	3.851	2.348	0.784	27.3	71.1	1.6		Boring
★	B-19M 85.0 S-26	9.5	1.461	0.603	0.205	8.3	87.5	4.2		Boring
⊙	B-19M 97.0 S-27	9.5	1.203	0.479	0.147	5.0	88.5	6.6		Boring

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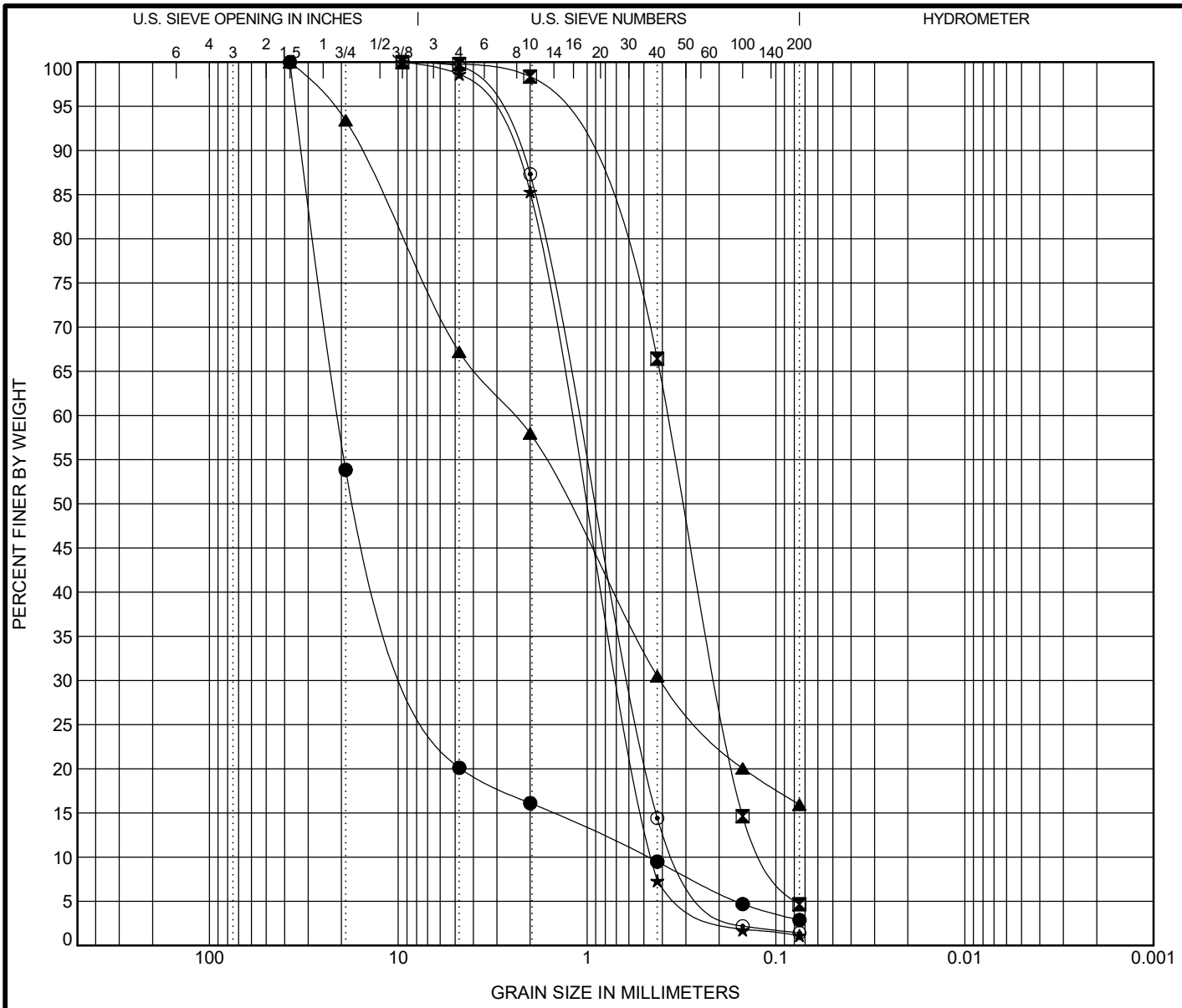
Project No: **10285.01** Date: **8/5/21**

Project: **BBJ - Manhattan**

Location: **Manhattan, NY**



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Sample Identification			Classification	WC%	LL	PL	PI	Cc	Cu
●	B-24M	6.0	S-1	Bwn-Gy c-f GRAVEL, little m-f Sand, trace Silt	10.6				5.10	43.43
⊠	B-24M	10.0	S-3	Bwn-Gy m-f SAND, trace Silt	19.0				1.03	3.44
▲	B-24M	30.0	S-7	Gy-Bwn m-f SAND, some f Gravel, little Silt	11.7					
★	B-24M	40.0	S-9	Bwn-Gy c-m SAND, trace f Gravel, trace Silt	23.6				0.82	2.70
⊙	B-24M	60.0	S-12	Bwn-Gy c-f SAND, trace Silt	21.1				1.07	3.84

	Sample Identification			D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay	Source of Material
●	B-24M	6.0	S-1	37.5	20.803	7.131	0.479	79.9	17.2	2.9		Boring
⊠	B-24M	10.0	S-3	9.5	0.374	0.204	0.109	0.2	95.1	4.7		Boring
▲	B-24M	30.0	S-7	37.5	2.421	0.405		32.8	51.2	15.9		Boring
★	B-24M	40.0	S-9	9.5	1.21	0.667	0.448	1.4	97.5	1.1		Boring
⊙	B-24M	60.0	S-12	9.5	1.119	0.592	0.292	0.4	98.2	1.4		Boring

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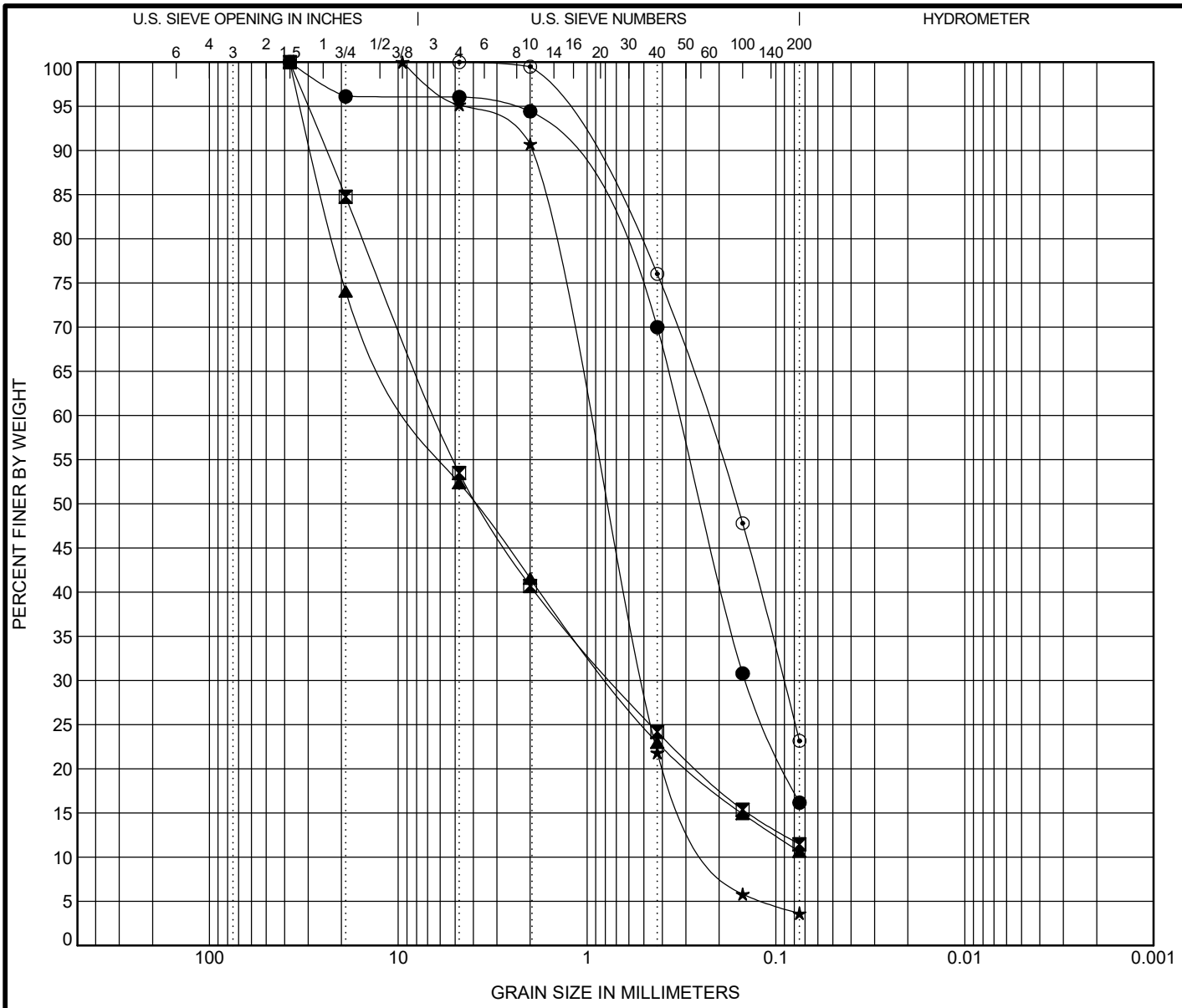
GRAIN SIZE DISTRIBUTION

Project No: **10285.01** Date: **8/5/21**

Project: **BBJ - Manhattan**

Location: **Manhattan, NY**



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Sample Identification	Classification	WC%	LL	PL	PI	Cc	Cu
●	**B-27M 35.0 S-13**	**Bwn m-f SAND, little Silt, trace c Gravel**	**16.9**					
⊠	**B-27M 45.0 S-15**	**Bwn-Gn-Pk c-f Gravel, and c-f Sand, little Silt**	**11.5**				**1.47**	**109.50**
▲	**B-27M 55.0 S-17**	**Bwn-Blk-Gn c-f Gravel, and c-f Sand, little Silt**	**10.8**				**1.11**	**114.21**
★	**B-27M 70.0 S-20**	**Bwn m-f SAND, trace f Gravel, trace Silt**	**20.1**				**1.32**	**5.09**
⊙	**B-31M 12.0 S-4**	**Bwn m-f SAND, some Silt**	**19.1**					

	Sample Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay	Source of Material
●	**B-27M 35.0 S-13**	**37.5**	**0.326**	**0.144**		**3.9**	**79.9**	**16.2**		**Boring**
⊠	**B-27M 45.0 S-15**	**37.5**	**6.341**	**0.734**		**46.5**	**42.0**	**11.5**		**Boring**
▲	**B-27M 55.0 S-17**	**37.5**	**7.743**	**0.764**		**47.6**	**41.7**	**10.6**		**Boring**
★	**B-27M 70.0 S-20**	**9.5**	**1.003**	**0.511**	**0.197**	**4.8**	**91.6**	**3.6**		**Boring**
⊙	**B-31M 12.0 S-4**	**4.75**	**0.235**	**0.091**		**0.0**	**76.8**	**23.2**		**Boring**

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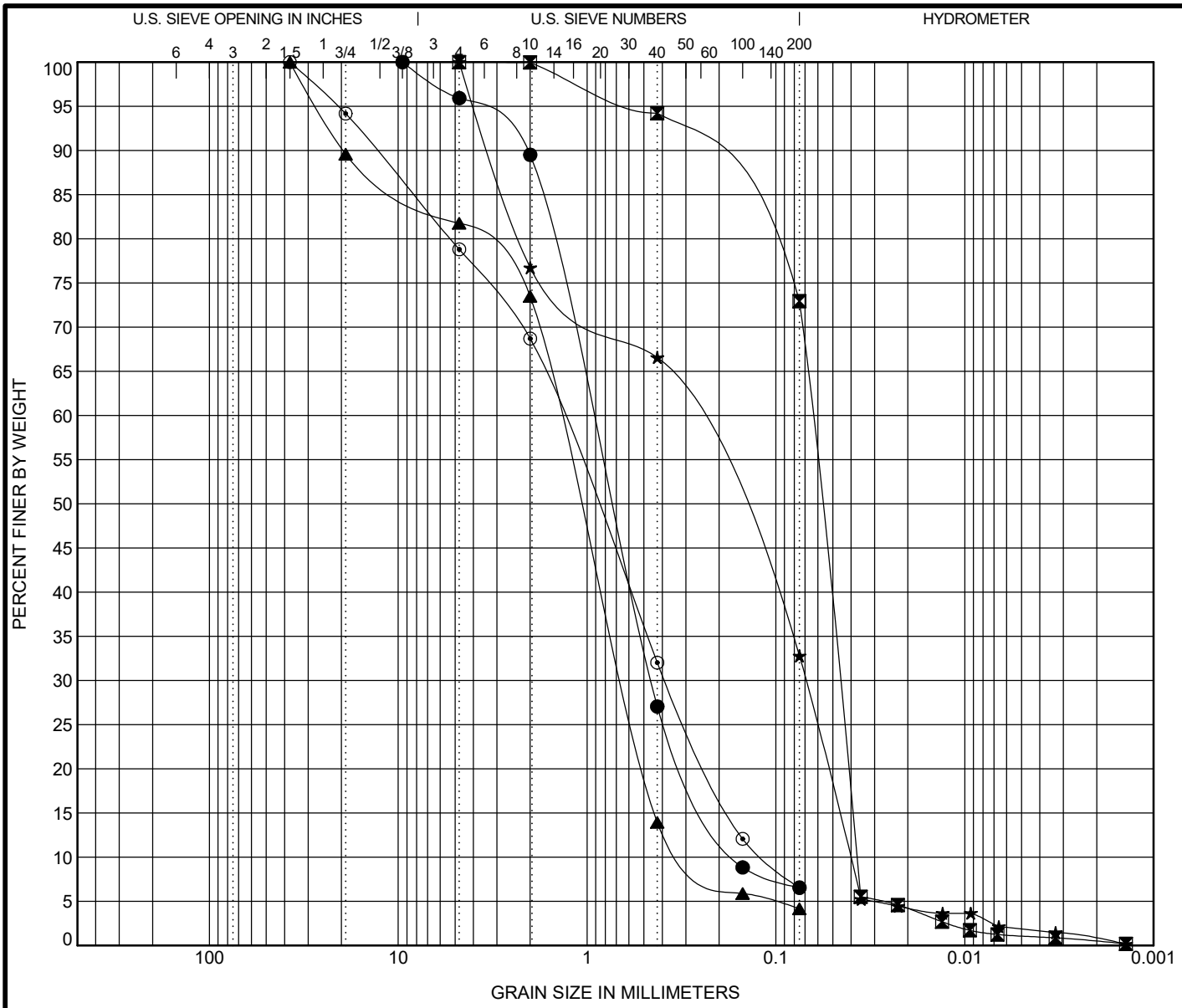
GRAIN SIZE DISTRIBUTION

Project No: **10285.01** Date: **8/5/21**

Project: **BBJ - Manhattan**

Location: **Manhattan, NY**



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Sample Identification	Classification	WC%	LL	PL	PI	Cc	Cu
●	B-31M 30.0 S-9	Rd-Bwn m-f SAND, trace Silt, trace f Gravel	18.8				1.36	6.00
⊠	B-31M 35.0 S-10	Bwn SILT, some f Sand	0.4				0.90	1.74
▲	B-31M 60.0 S-15	Bwn-Gy m-f SAND, little c Gravel, trace Silt	17.0				1.16	5.51
★	B-31M 75.0 S-17	Bwn-Gy c-f SAND, some Silt	0.5				0.40	7.54
⊙	B-3M 3.0 S-2	Bwn c-f SAND, some f Gravel, trace Silt	5.6				0.91	11.97

	Sample Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay	Source of Material
●	B-31M 30.0 S-9	9.5	0.962	0.457	0.16	4.1	89.4	6.5		Boring
⊠	B-31M 35.0 S-10	4.75	0.065	0.047	0.037	0.0	27.1	71.9	1.1	Boring
▲	B-31M 60.0 S-15	37.5	1.408	0.646	0.256	18.2	77.6	4.1		Boring
★	B-31M 75.0 S-17	4.75	0.303	0.069	0.04	0.0	67.2	30.9	1.9	Boring
⊙	B-3M 3.0 S-2	37.5	1.385	0.383	0.116	21.2	72.3	6.5		Boring

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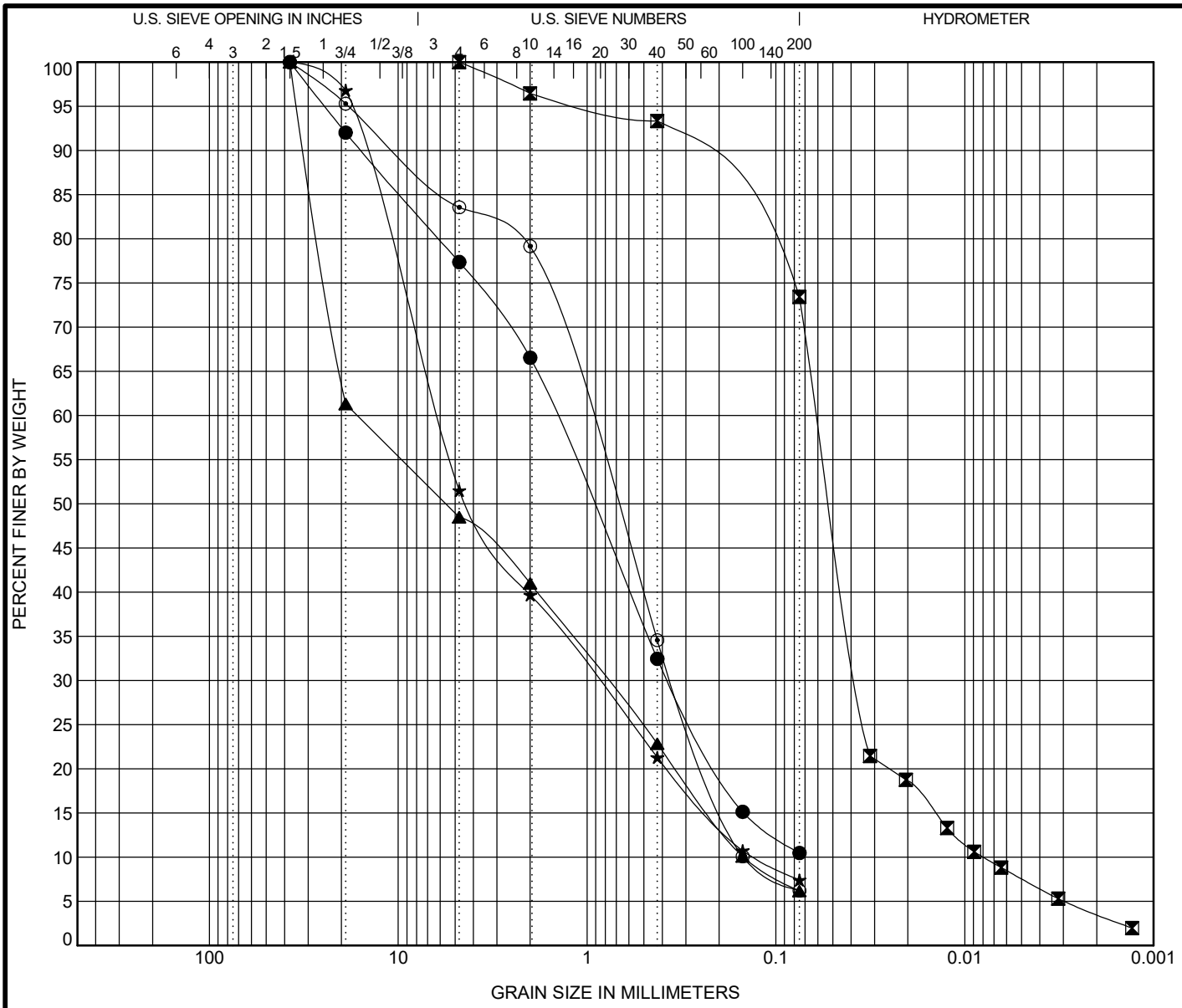
GRAIN SIZE DISTRIBUTION

Project No: **10285.01** Date: **8/5/21**

Project: **BBJ - Manhattan**

Location: **Manhattan, NY**



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Sample Identification			Classification	WC%	LL	PL	PI	Cc	Cu
●	B-3M	13.0	S-7	Bwn c-f SAND, some f Gravel, little Silt	6.9				1.30	21.26
⊠	B-3M	57.0	S-27	Gy-Bwn SILT, some f Sand	0.5				2.79	7.55
▲	B-3M	80.0	S-31	Bwn c-f GRAVEL, and m-f Sand, trace Silt	13.5				0.25	111.63
★	B-4M	2.0	S-1	Bwn-Gy f GRAVEl, and c-f Sand, trace Silt	13.0				0.99	47.90
⊙	B-4M	65.0	S-27	Gy-Tn m-f SAND, little f Gravel, trace Silt	14.7				0.81	6.96

	Sample Identification			D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay	Source of Material
●	B-3M	13.0	S-7	37.5	1.486	0.367		22.6	66.9	10.5		Boring
⊠	B-3M	57.0	S-27	4.75	0.06	0.037	0.008	0.0	26.6	65.9	7.6	Boring
▲	B-3M	80.0	S-31	37.5	16.512	0.783	0.148	51.5	42.3	6.2		Boring
★	B-4M	2.0	S-1	37.5	6.159	0.885	0.129	48.5	44.1	7.4		Boring
⊙	B-4M	65.0	S-27	37.5	1.028	0.35	0.148	16.4	77.4	6.2		Boring

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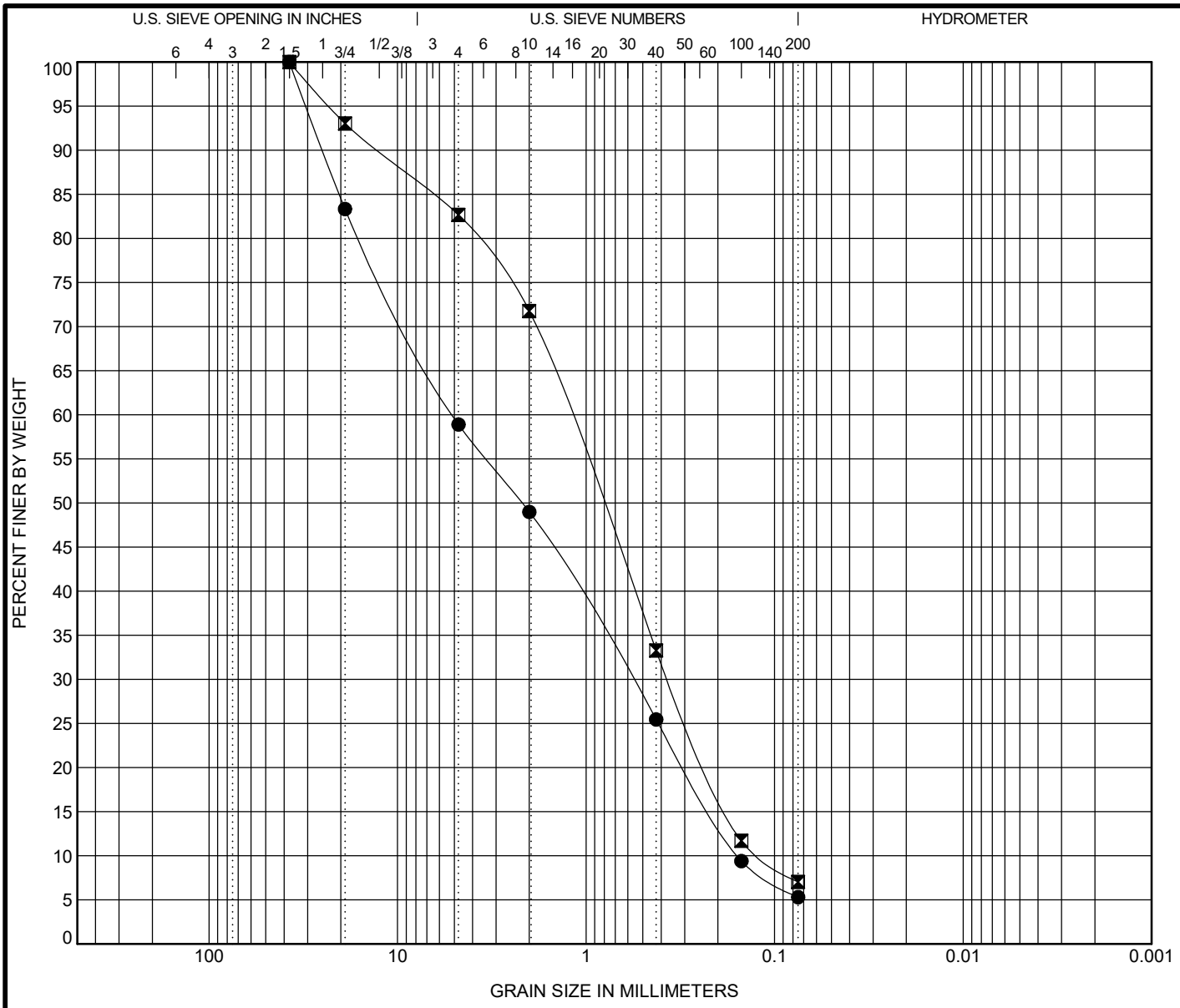
GRAIN SIZE DISTRIBUTION

Project No: **10285.01** Date: **8/5/21**

Project: **BBJ - Manhattan**

Location: **Manhattan, NY**



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Sample Identification			Classification	WC%	LL	PL	PI	Cc	Cu
●	**B-4M**	**70.0**	**S-28**	**Gy-Or-Bwn c-f SAND, and c-f Gravel, trace Silt**	**9.1**				**0.42**	**32.40**
⊠	**B-4M**	**75.0**	**S-29**	**Rd-Bwn c-f SAND, little f Gravel, trace Silt**	**14.7**				**0.91**	**10.68**

	Sample Identification			D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay	Source of Material
●	**B-4M**	**70.0**	**S-28**	**37.5**	**5.056**	**0.573**	**0.156**	**41.1**	**53.6**	**5.3**		**Boring**
⊠	**B-4M**	**75.0**	**S-29**	**37.5**	**1.246**	**0.363**	**0.117**	**17.3**	**75.6**	**7.0**		**Boring**

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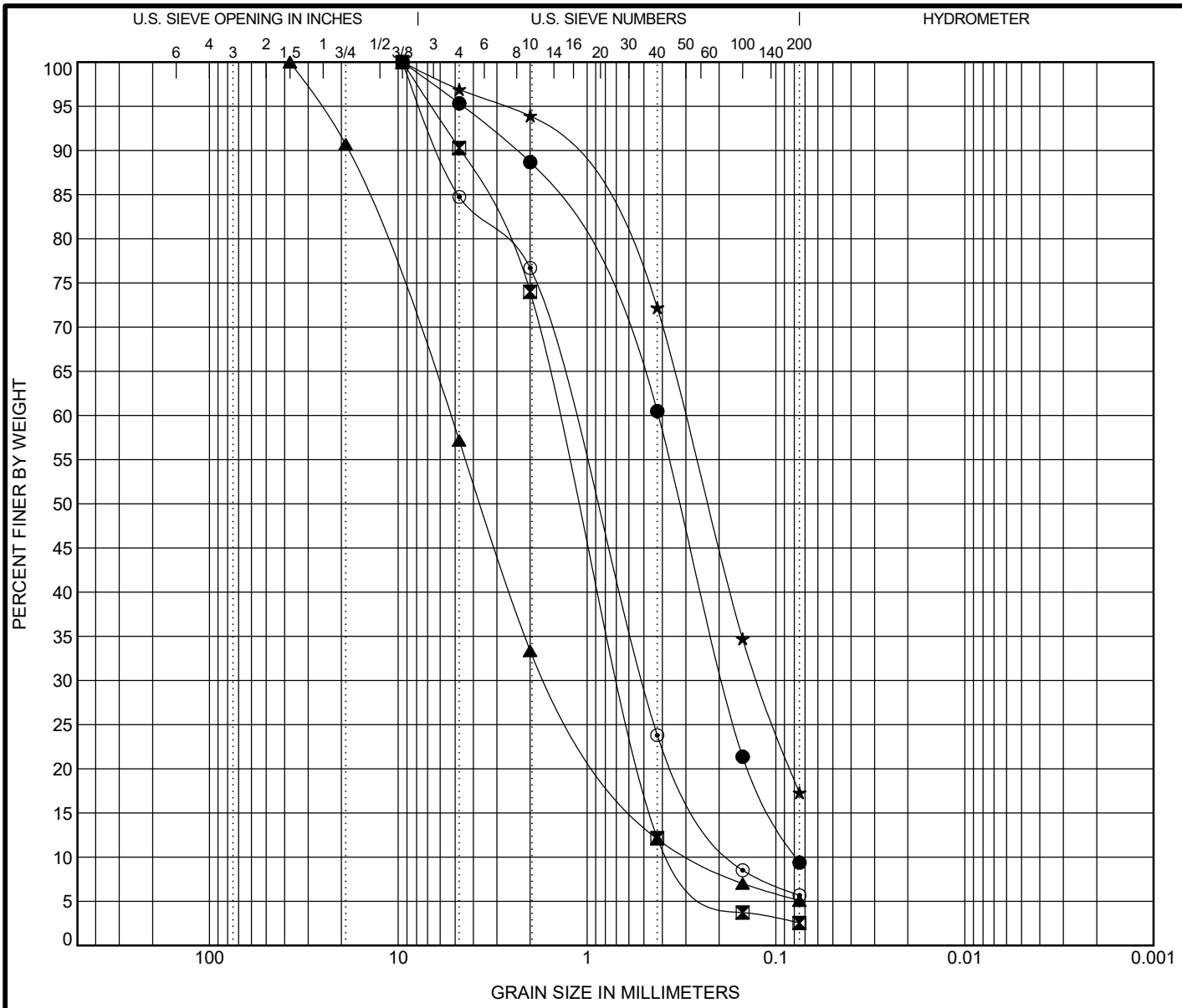
GRAIN SIZE DISTRIBUTION

Project No: **10285.01** Date: **8/5/21**

Project: **BBJ - Manhattan**

Location: **Manhattan, NY**



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Sample Identification	Classification	WC%	LL	PL	PI	Cc	Cu
●	B-11M 50.0 S-18	Bwn m-f SAND, trace Silt, trace f Gravel	20.0				1.09	5.40
⊠	B-11M 70.0 S-24	Bwn-Gy c-f SAND, trace f Gravel, trace Silt	19.9				0.96	4.32
▲	B-12M(A) 75.0 S-12	Bwn-Blk c-m SAND, and f Gravel, trace Silt	11.6				1.65	19.19
★	B-16M 12.0 S-4	Bwn m-f SAND, little Silt, trace f Gravel	19.7					
⊙	B-16M 45.0 S-13	Bwn m-f SAND, little f Gravel, trace Silt	18.1				1.28	7.39

	Sample Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay	Source of Material
●	B-11M 50.0 S-18	9.5	0.42	0.189	0.078	4.7	85.9	9.4		Boring
⊠	B-11M 70.0 S-24	9.5	1.408	0.665	0.326	9.7	87.7	2.6		Boring
▲	B-12M(A) 75.0 S-12	37.5	5.339	1.567	0.278	42.8	52.1	5.1		Boring
★	B-16M 12.0 S-4	9.5	0.303	0.124		3.1	79.6	17.3		Boring
⊙	B-16M 45.0 S-13	9.5	1.227	0.51	0.166	15.2	79.1	5.7		Boring

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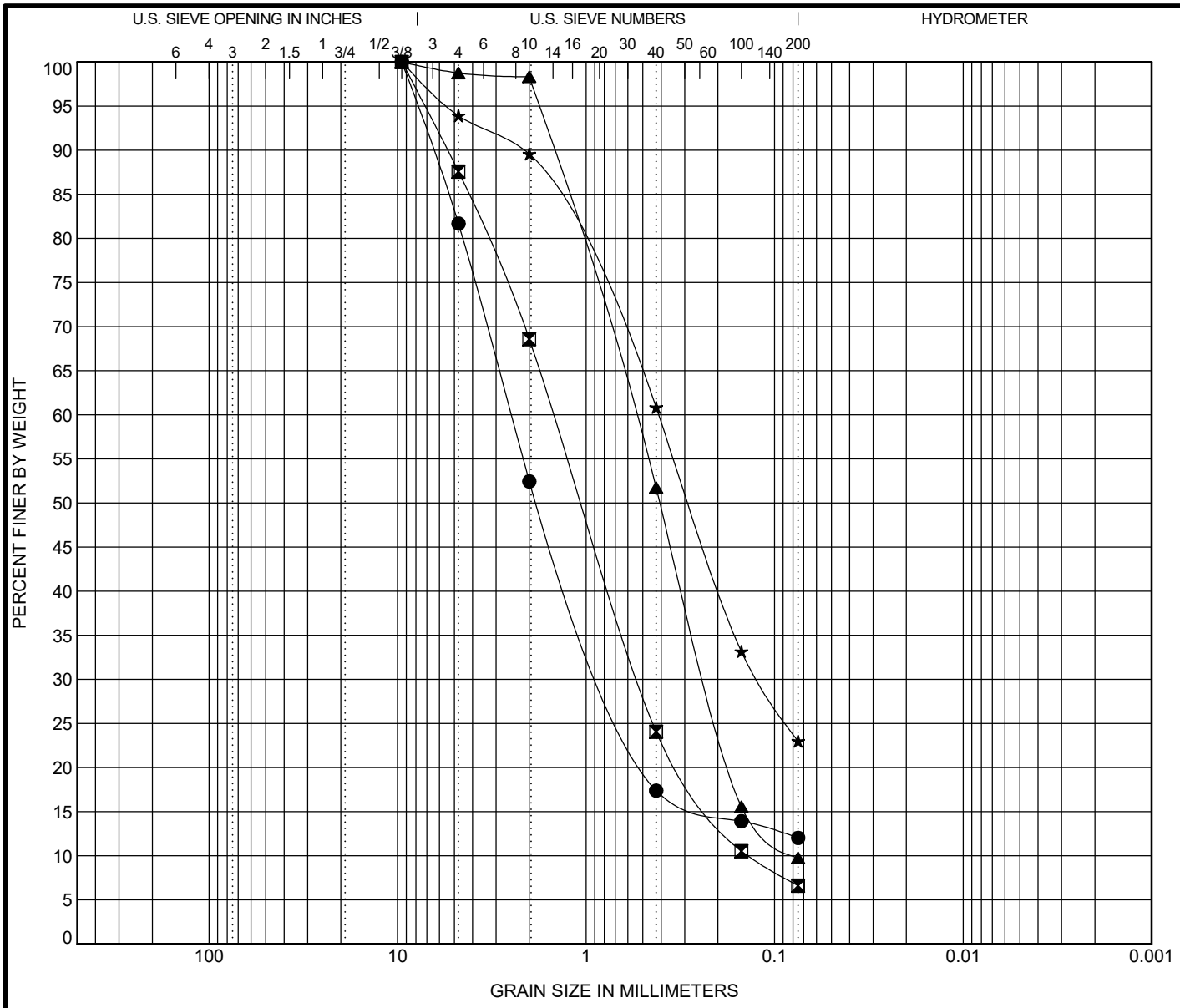
GRAIN SIZE DISTRIBUTION

Project No: **10285.01** Date: **8/10/21**

Project: **BBJ - Manhattan**

Location: **Manhattan, NY**



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Sample Identification			Classification	WC%	LL	PL	PI	Cc	Cu
●	B-34M	20.0	S-8	Bwn-Gy c-m SAND, little f Gravel, little Silt	18.0				6.17	70.14
⊠	B-34M	70.0	S-19	Bwn c-f SAND, little f Gravel, trace Silt	13.2				1.35	10.86
▲	B-34M	85.0	S-22	Bwn m-f SAND, trace Silt, trace f Gravel	17.4				1.20	7.25
★	B-9M	40.0	S-15	Gy-Bwn m-f SAND, some Silt, trace f Gravel	18.1					

	Sample Identification			D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay	Source of Material
●	B-34M	20.0	S-8	9.5	2.501	0.742		18.3	69.7	12.0		Boring
⊠	B-34M	70.0	S-19	9.5	1.484	0.523	0.137	12.4	81.0	6.6		Boring
▲	B-34M	85.0	S-22	9.5	0.559	0.227	0.077	1.2	89.0	9.8		Boring
★	B-9M	40.0	S-15	9.5	0.412	0.121		6.1	70.9	23.0		Boring

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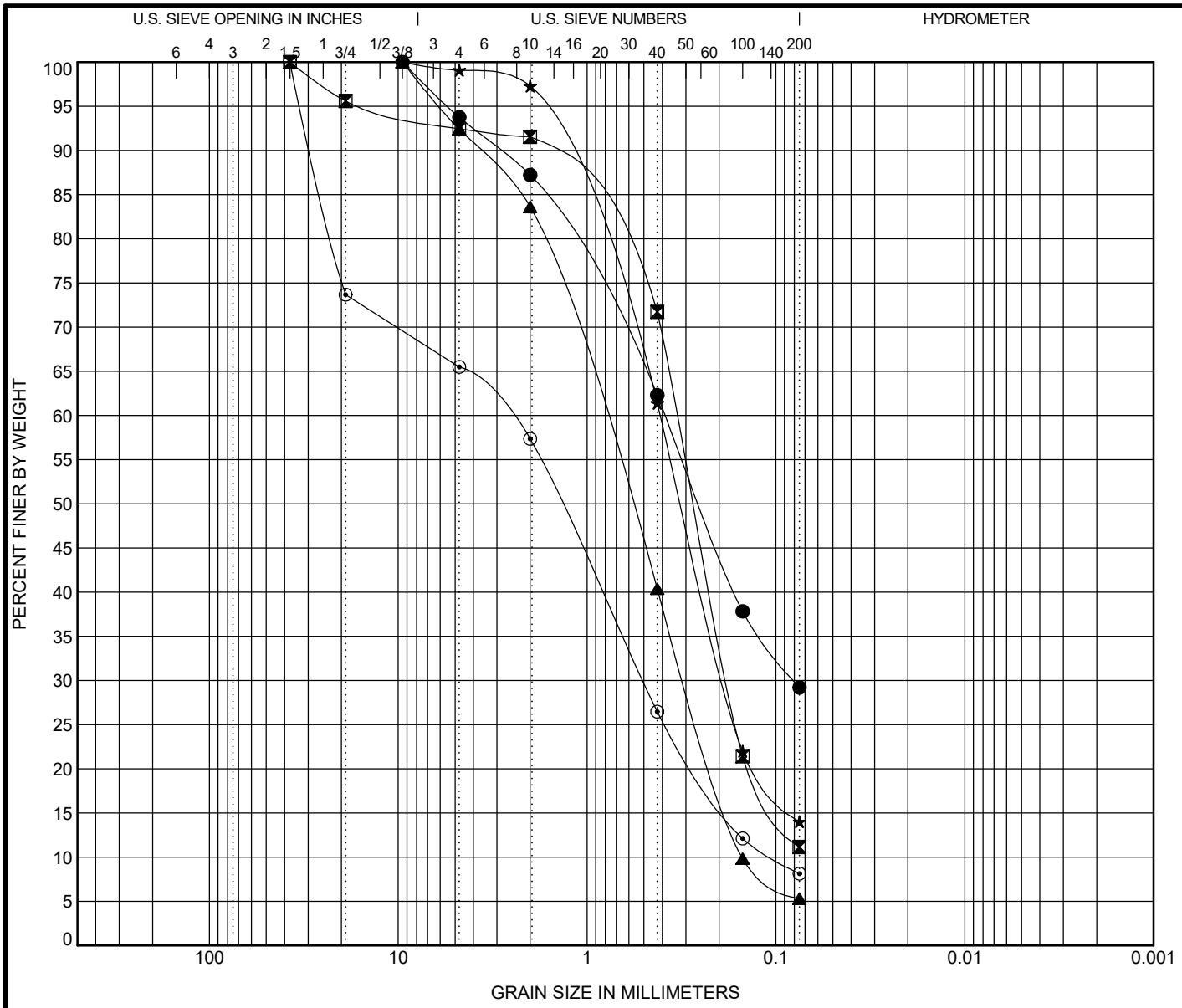
GRAIN SIZE DISTRIBUTION

Project No: **10285.01** Date: **8/10/21**

Project: **BBJ - Manhattan**

Location: **Manhattan, NY**



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Sample Identification			Classification	WC%	LL	PL	PI	Cc	Cu
●	B-22M	10.0	S-3	Bwn-Gy m-f SAND, some Silt, little f Gravel	43.0					
⊠	B-22M	40.0	S-10	Bwn m-f SAND, little Silt, trace c-f Gravel	20.1				1.39	4.80
▲	B-22M	70.0	S-16	Bwn m-f SAND, trace f Gravel, trace Silt	16.5				0.69	5.69
★	B-33M	8.0	S-2	Bwn m-f SAND, little Silt	12.3					
⊙	B-33M	18.0	S-7	Bwn m-f SAND, some f Gravel, trace Silt	9.0				0.94	25.54

	Sample Identification			D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay	Source of Material
●	B-22M	10.0	S-3	9.5	0.385	0.08		6.2	64.5	29.2		Boring
⊠	B-22M	40.0	S-10	37.5	0.333	0.179		7.5	81.3	11.1		Boring
▲	B-22M	70.0	S-16	9.5	0.858	0.298	0.151	7.6	87.1	5.3		Boring
★	B-33M	8.0	S-2	9.5	0.41	0.185		0.9	85.1	14.0		Boring
⊙	B-33M	18.0	S-7	37.5	2.65	0.507	0.104	34.5	57.4	8.1		Boring

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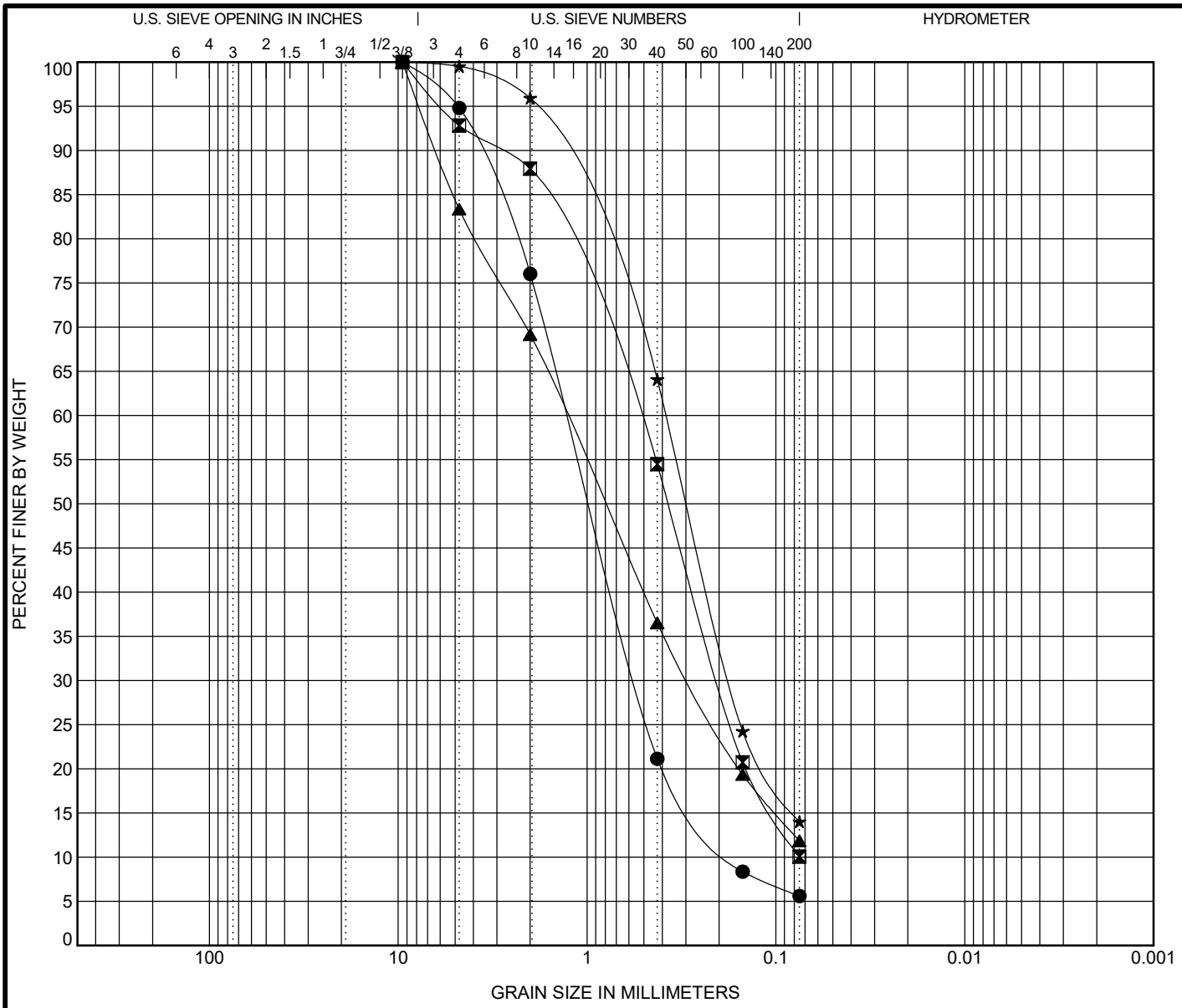
GRAIN SIZE DISTRIBUTION

Project No: **10285.01** Date: **8/25/21**

Project: **BBJ - Manhattan**

Location: **Manhattan, NY**



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Sample Identification			Classification	WC%	LL	PL	PI	Cc	Cu
●	B-33M	45.0	S-13	Bwn c-f SAND, trace Silt, trace f Gravel	15.6				1.37	7.42
⊠	B-5M	8.0	S-2	Bwn m-f SAND, little Silt, trace f Gravel	18.1				0.97	7.35
▲	B-5M	12.0	S-4	Bwn c-f SAND, little f Gravel, little Silt	20.2				1.00	20.50
★	B-5M	82.0	S-23	Bwn m-f SAND, little Silt	19.8					

	Sample Identification			D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay	Source of Material
●	B-33M	45.0	S-13	9.5	1.272	0.546	0.171	5.2	89.2	5.6		Boring
⊠	B-5M	8.0	S-2	9.5	0.549	0.2		7.2	82.8	10.1		Boring
▲	B-5M	12.0	S-4	9.5	1.296	0.286		16.7	71.5	11.9		Boring
★	B-5M	82.0	S-23	9.5	0.382	0.174		0.5	85.5	14.0		Boring

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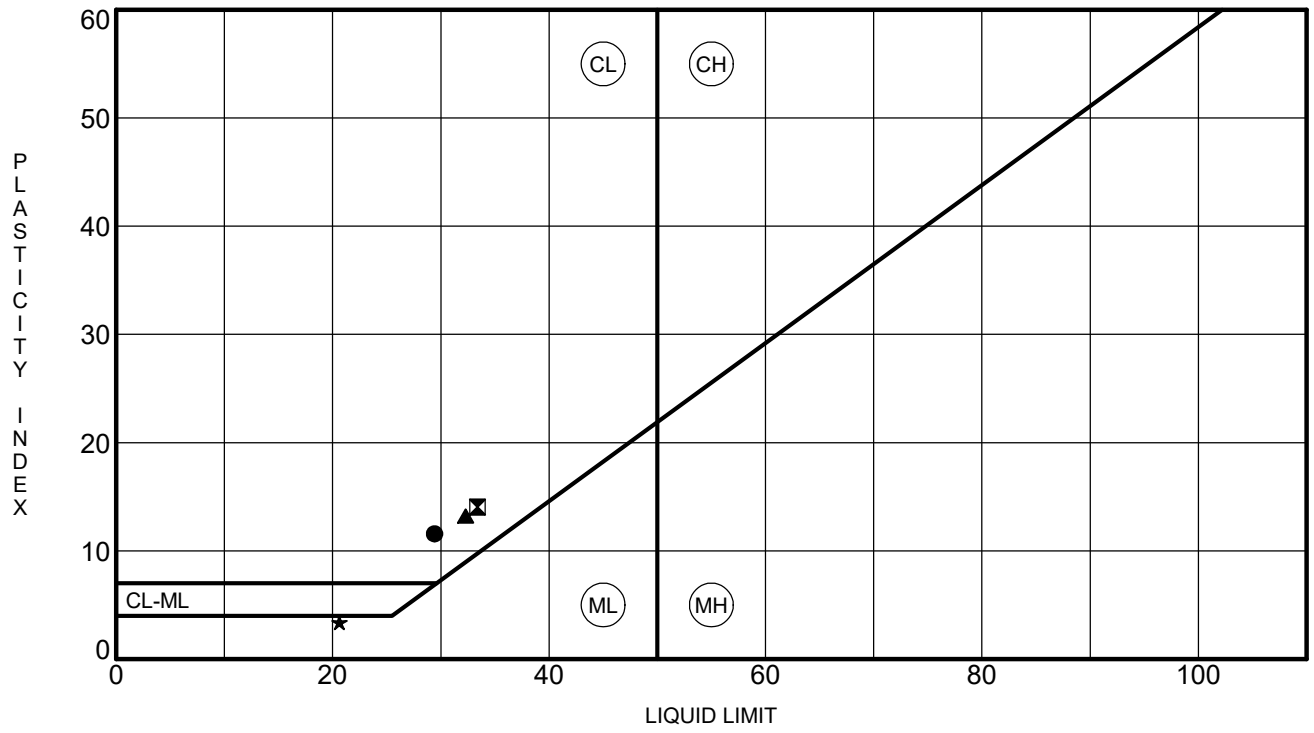
GRAIN SIZE DISTRIBUTION

Project No: **10285.01** Date: **8/25/21**

Project: **BBJ - Manhattan**

Location: **Manhattan, NY**



	Sample Identification			LL	PL	PI	Fines %	WC %	Classification
●	B-13M	45.0	S-15	29	18	11	NA	28.7	Gy CLAY & SILT
⊠	B-3M	52.0	S-25	33	19	14	NA	39.6	Gy CLAY & SILT, trace f Gravel
▲	B-4M	45.0	S-20	32	19	13	NA	36.5	Gy CLAY & SILT with Mica
★	B-4M	53.0	S-24	21	17	4	NA	33.1	Bwn-Gy CLAYEY SILT

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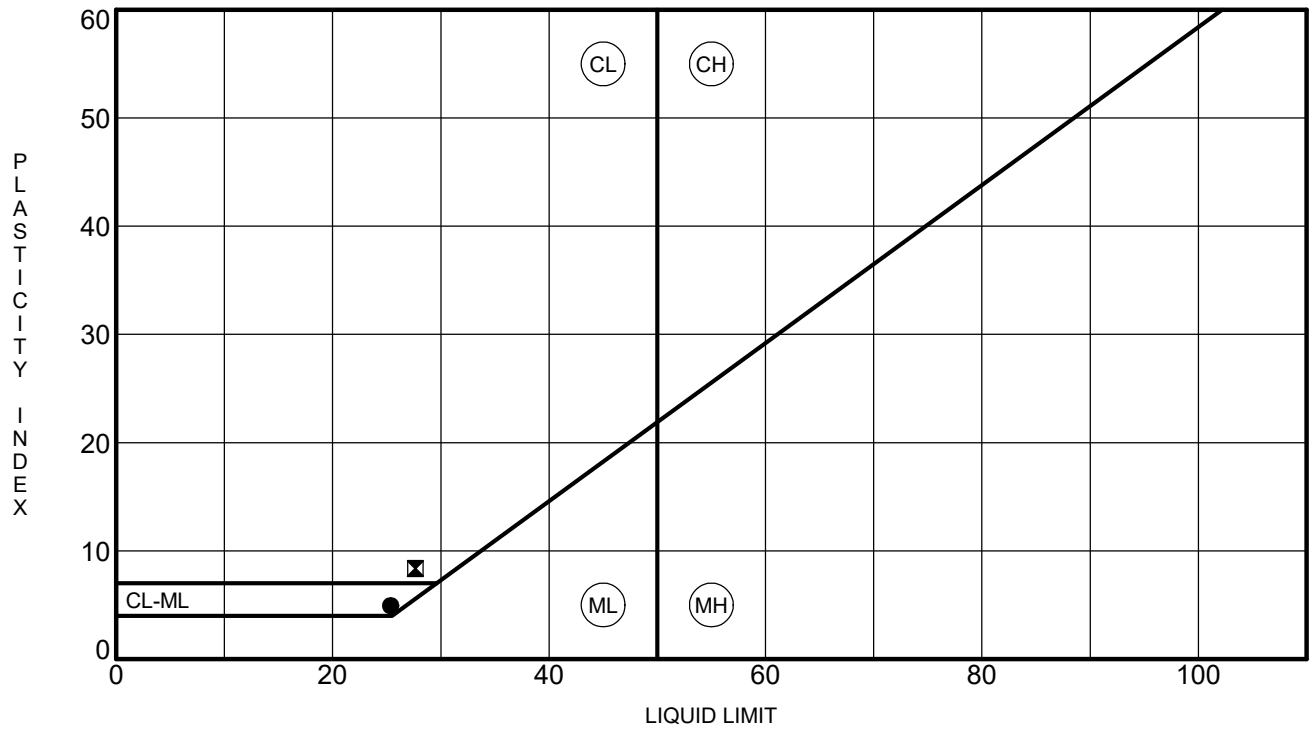
ATTERBERG LIMITS' RESULTS

Project No: **10285.01** Date: **8/5/21**

Project: **BBJ - Manhattan**

Location: **Manhattan, NY**



	Sample Identification			LL	PL	PI	Fines %	WC %	Classification
●	**B-12M(A)**	**42.0**	**S-2**	**25**	**20**	**5**	**NA**	**24.1**	**Gy CLAYEY SILT**
⊠	**B-9M**	**26.0**	**S-11**	**28**	**19**	**9**	**NA**	**28.0**	**Gy SILT & CLAY, little f Sand**

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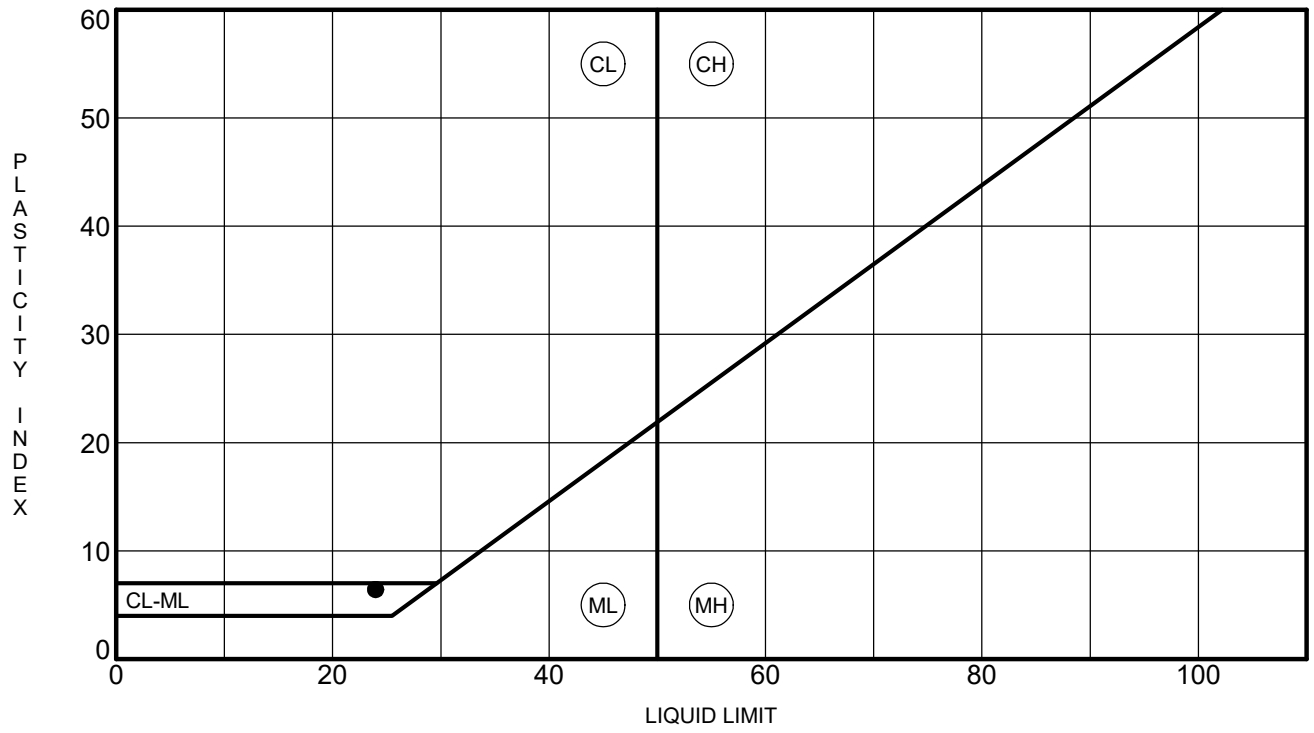
ATTERBERG LIMITS' RESULTS

Project No: **10285.01** Date: **8/10/21**

Project: **BBJ - Manhattan**

Location: **Manhattan, NY**



Sample Identification	LL	PL	PI	Fines %	WC %	Classification
● **B-5M 25.0 S-10**	**24**	**18**	**6**	**NA**	**31.5**	**Gy SILT & CLAY**

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ATTERBERG LIMITS' RESULTS

Project No: **10285.01** Date: **8/31/21**

Project: **BBJ - Manhattan**

Location: **Manhattan, NY**

Tectonic
PRACTICAL SOLUTIONS. EXCEPTIONAL SERVICE.

Point Load Strength Test

ASTM D 5731-08

Date: July 21, 2021
Project: BBJ - Manhattan
W.O.#: 10285.01

Boring No.	Depth (ft)	Length (in)	Diameter (in)	Diameter (mm)	Load Direction	Maximum Load (kN)	Point Load Strength Index (MPa)	Description
B-9M, C-2 (A)	98 - 101	6.6085	1.8265	46.39	Diametrical	22.73	10.562	Gy, slightly weathered, slightly fractured, c grained, moderately hard SCHIST
B-9M, C-2 (B)	98 - 101	4.089	1.967	49.96	Diametrical	24.15	9.676	
						AVERAGE	**10.119**	
B-11M, C-1 (A)	90 - 95	6.8365	1.967	49.96	Diametrical	3.35	1.343	Lgt gy, slightly weathered, moderately to slightly fractured, medium hard, fine grained SCHIST
B-11M, C-1 (B)	90 - 95	4.968	1.969	50.01	Diametrical	23.73	9.486	
						AVERAGE	**5.415**	
B-12M, C-1 (A)	103 - 108	6.072	1.968	49.99	Diametrical	16.17	6.472	Gy-bl-rd, slightly weathered, slightly fractured, m-f grained hard, SCHIST
B-12M, C-1 (B)	103 - 108	6.459	1.967	49.96	Diametrical	14.00	5.610	
						AVERAGE	**6.041**	
B-16M, C-2 (A)	85 - 90	7.7685	1.97	50.04	Diametrical	13.56	5.415	Gy, slightly weathered, slightly fractured, c grained, hard SCHIST
B-16M, C-2 (B)	85 - 90	7.3255	1.977	50.22	Diametrical	15.39	6.103	
						AVERAGE	**5.759**	
B-34M, C-2 (A)	92 - 97	8.102	1.981	50.32	Diametrical	6.92	2.734	Gy, moderately fractured hard SCHIST
B-34M, C-2 (B)	92 - 97	7.973	1.978	50.24	Diametrical	8.88	3.517	
						AVERAGE	**3.126**	

Tectonic Engineering
280 Little Britain Road, Bldg.#2
Newburgh, NY 12550

Tectonic
PRACTICAL SOLUTIONS. EXCEPTIONAL SERVICE.

Point Load Strength Test

ASTM D 5731-08

Date: June 28, 2021
Project: Borough Based Jail - Manhattan
W.O.#: 10285.01

Boring No.	Depth (ft)	Length (in)	Diameter (in)	Diameter (mm)	Load Direction	Maximum Load (kN)	Point Load Strength Index (MPa)	Description
B-3M, C-2 (A)	110 - 115	7.543	1.976	50.19	Diametrical	12.13	4.814	Blk-gy, slighty weathered, slightly fractured, f grained, hard, SCHIST
B-3M, C-2 (B)	110 - 115	7.852	1.975	50.17	Diametrical	9.23	3.668	
						AVERAGE	**4.241**	
B-4M, C-3 (A)	110 - 115	5.252	1.974	50.14	Diametrical	11.79	4.690	Gy slightly weathered, slightly fractured c-f grained hard SCHIST
B-4M, C-3 (B)	110 - 115	5.412	1.971	50.06	Diametrical	15.75	6.282	
						AVERAGE	**5.486**	
B-13M, C-1 (A)	102 - 107	6.987	1.971	50.06	Diametrical	14.38	5.737	Gy, slightly weathered, moderately fractured, medium hard SCHIST
B-13M, C-1 (B)	102 - 107	7.503	1.967	49.96	Diametrical	19.01	7.614	
						AVERAGE	**6.676**	
B-18M, C-2 (A)	87 - 90	8.089	1.978	50.24	Diametrical	11.05	4.378	Gy moderately weathered, slightly fractured, c-f grained hard SCHIST
B-18M, C-2 (B)	87 - 90	5.645	1.974	50.14	Diametrical	9.81	3.902	
						AVERAGE	**4.140**	
B-19M, C-1 (A)	115 - 120	5.849	1.971	50.06	Diametrical	4.06	1.619	Gy, moderately weathered, slightly to moderately fractured, c-f grained, moderately hard, SCHIST
B-19M, C-1 (B)	115 - 120	5.012	1.971	50.06	Diametrical	8.40	3.353	
						AVERAGE	**2.486**	
B-24M, C-2 (A)	98 - 103	5.51	1.979	50.27	Diametrical	9.71	3.842	Gy, slightly weathered to fresh moderately fractured, fine grained, medium hard, SCHIST
B-24M, C-2 (B)	98 - 103	6.088	1.98	50.29	Diametrical	5.36	2.119	
						AVERAGE	**2.980**	
B-27M, C-1 (A)	98 - 103	6.862	1.967	49.96	Diametrical	15.12	6.056	Gy, hard, unweathered, slightly fractured, fine grained SCHIST
B-27M, C-1 (B)	98 - 103	6.323	1.972	50.09	Diametrical	11.76	4.687	
						AVERAGE	**5.371**	
B-31M, C-2 (A)	83 - 88	7.746	1.958	49.73	Diametrical	6.87	2.778	Gy, fresh, moderately fractured, moderately hard, SCHIST
B-31M, C-2 (B)	83 - 88	4.141	1.97	50.04	Diametrical	11.24	4.488	
						AVERAGE	**3.633**	

Tectonic Engineering
280 Little Britain Road, Bldg.#2
Newburgh, NY 12550

Point Load Strength Test

ASTM D 5731-08

Date: August 6, 2021
Project: BBJ - Manhattan
W.O.#: 10285.01

Boring No.	Depth (ft)	Length (in)	Diameter (in)	Diameter (mm)	Load Direction	Maximum Load (kN)	Point Load Strength Index (MPa)	Description
B-7M, C-1 (A)	82 - 87	6.16	1.978	50.24	Diametrical	17.60	6.971	Gy, slightly weathered, slightly fractured, c grained, hard SCHIST
B-7M, C-1 (B)	82 - 87	4.932	1.982	50.34	Diametrical	14.51	5.726	
						AVERAGE	**6.348**	
B-22M, C-2 (A)	86 - 89	4.287	1.974	50.14	Diametrical	21.75	8.650	Gy slightly weathered, slightly fractured, c grained, hard, SCHIST
B-22M, C-2 (B)	86 - 89	4.418	1.978	50.24	Diametrical	26.43	10.472	
						AVERAGE	**9.561**	
B-28M, C-2 (A)	84 - 89	6.12	1.975	50.17	Diametrical	11.81	4.691	Gy, moderately weathered, slightly fractured, c grained, hard, SCHIST
B-28M, C-2 (B)	84 - 89	4.938	1.98	50.29	Diametrical	11.31	4.471	
						AVERAGE	**4.581**	
B-33M, C-2 (A)	79 - 84	3.703	1.979	50.27	Diametrical	12.67	5.013	Gy-bk slightly - moderately weathered, slightly - moderately fractured, c-f grained, hard SCHIST
B-33M, C-2 (B)	79 - 84	6.232	1.986	50.44	Diametrical	12.13	4.767	
						AVERAGE	**4.890**	

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Boring #	Depth (Ft.)	Sample #	Specimen Description % Gravel % Sand % Fines	USCS	Water Content	Liquid Limit	Plastic Limit	Plasticity Index	Penetro-meter (tsf)	Specific Gravity	Organic Content (%)	pH	Average PLSI (Mpa)
B-3M	3.0	S-2	Bwn c-f SAND, some f Gravel, trace Silt 21.2 72.3 6.5	SP-SM	6								
B-3M	13.0	S-7	Bwn c-f SAND, some f Gravel, little Silt 22.6 66.9 10.5	SW-SM	7								
B-3M	30.0	S-15	Dk Bwn PEAT w/ Organic Fibers	Pt	113						13.9		
B-3M	32.0	S-16	Dk Bwn PEAT w/ Wood Fibers	Pt	269								
B-3M	36.0	S-18	Dk Bwn PEAT w/ Wood Fragments	Pt	104						20.0		
B-3M	38.0	S-19	Dk Bwn PEAT w/ Wood Fragments	Pt	412								
B-3M	40.0	S-20	Dk Gy Organic CLAYEY SILT	OL	339								
B-3M	42.0	S-21	Dk Gy Organic CLAYEY SILT, trace f Gravel w/ Root Fibers	OL	212								
B-3M	45.0	S-22	Dk Gy CLAYEY SILT **NON-PLASTIC: WILL N	OL	104								
B-3M	47.0	S-23	Dk-Gy CLAYEY SILT	CL	59								
B-3M	52.0	S-25	Gy CLAY & SILT, trace f Gravel	CL	40	33	19	14					
B-3M	54.0	S-26	Gy CLAY & SILT	CL	44								
B-3M	57.0	S-27	Gy-Bwn SILT, some f Sand 0 26.6 73.4	ML	1								
B-3M	80.0	S-31	Bwn c-f GRAVEL, and m-f Sand, trace Silt 51.5 42.3 6.2	GP-GM	14								
B-3M	110.0	C-1	Blk-gy, slighty weathered, slightly fractured, f grained, hard, SCHIST										4.241
B-4M	2.0	S-1	Bwn-Gy f GRAVEl, and c-f Sand, trace Silt 48.5 44.1 7.4	GP-GM	13								
B-4M	35.0	S-15	Bwn PEAT w/ Organic Silt	Pt	336						76.1		
B-4M	37.0	S-16	Bwn Organic SILT, trace c-f Sand	OL	583						83.6		

Tectonic

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Summary of Laboratory Results

Project No: **10285.01** Date: **8/31/2021**

Project: **BBJ - Manhattan**

Location: **New York, New York**

Boring #	Depth (Ft.)	Sample #	Specimen Description % Gravel % Sand % Fines	USCS	Water Content	Liquid Limit	Plastic Limit	Plasticity Index	Penetro-meter (tsf)	Specific Gravity	Organic Content (%)	pH	Average PLSI (Mpa)
B-4M	39.0	S-17	Dk Gy-Bwn Organic SILT w/ Peat Pockets, trace c-f Sand	OL	238								
B-4M	41.0	S-18	Dk Gy-Bwn Organic SILT w/ Peat Pockets, trace c-f Sand	OL	153						23.3		
B-4M	43.0	S-19	Gy-Bwn Organic CLAYEY SILT	OL	129						17.2		
B-4M	45.0	S-20	Gy CLAY & SILT, with Mica	CL	36	32	19	13					
B-4M	47.0	S-21	Gy CLAY & SILT	CL	36							6.1	
B-4M	49.0	S-22	Bwn-Gy SILT, with Clay Layers **NON-PLASTIC: WILL NOT ROLL TO 1/8"***	ML	27								
B-4M	51.0	S-23	Gy Organic SILTY CLAY	OL	114						6.4		
B-4M	53.0	S-24	Bwn-Gy CLAYEY SILT	ML	33	21	17	4					
B-4M	65.0	S-27	Gy-Tn m-f SAND, little f Gravel, trace Silt 16.4 77.4 6.2	SP-SM	15								
B-4M	70.0	S-28	Gy-Or-Bwn c-f SAND, and c-f Gravel, trace Silt 41.1 53.6 5.3	SP-SM	9								
B-4M	75.0	S-29	Rd-Bwn c-f SAND, little f Gravel, trace Silt 17.3 75.6 7	SP-SM	15								
B-4M	110.0	C-1	Gy, slightly weathered, slightly fractured, c-f grained, hard SCHIST										5.486
B-5M	8.0	S-2	Bwn m-f SAND, little Silt, trace f Gravel 7.2 82.8 10.1	SP-SM	18								
B-5M	12.0	S-4	Bwn c-f SAND, little f Gravel, little Silt 16.7 71.5 11.9	SW-SM	20								
B-5M	18.0	S-7	Bwn-Rd PEAT	Pt	441						77.3		
B-5M	20.0	S-8	Bwn PEAT, w/ occasional partings of f Sand	Pt	428								
B-5M	22.0	S-9	Bwn-Rd PEAT, little Clayey Silt	Pt	155						26.9		
B-5M	25.0	S-10	Gy SILT & CLAY	CL-ML	32	24	18	6					

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Summary of Laboratory Results

Project No: **10285.01** Date: **8/31/2021**

Project: **BBJ - Manhattan**

Location: **New York, New York**

Boring #	Depth (Ft.)	Sample #	Specimen Description % Gravel % Sand % Fines	USCS	Water Content	Liquid Limit	Plastic Limit	Plasticity Index	Penetro-meter (tsf)	Specific Gravity	Organic Content (%)	pH	Average PLSI (Mpa)
B-5M	82.0	S-23	Bwn m-f SAND, little Silt 0.5 85.5 14	SM	20								
B-7M	82.0	C-1	Gy, slightly weathered, slightly fractured, c grained, hard SCHIST										6.348
B-9M	18.0	S-7	Peat w/ Organic Silt	Pt	358						82.6	4.64	
B-9M	26.0	S-11	Gy SILT & CLAY, little f Sand	CL	28	28	19	9					
B-9M	40.0	S-15	Gy-Bwn m-f SAND, some Silt, trace f Gravel 6.1 70.9 23	SM	18								
B-9M	98.0	C-2	gy, slightly weathered, slightly fractured, moderately hard, course grained SCHIST										10.119
B-11M	20.0	S-8	Dk Bwn SILT, little c-f Sand, little F Gravel		112								
B-11M	50.0	S-18	Bwn m-f SAND, trace Silt, trace f Gravel 4.7 85.9 9.4	SP-SM	20								
B-11M	70.0	S-24	Bwn-Gy c-f SAND, trace f Gravel, trace Silt 9.7 87.7 2.6	SP	20								
B-11M	90.0	C-1	Lgt gy, slightly weathered, moderately to slightly fractured, medium hard, fine grained SCHIST										5.415
B-12M	8.0	S-3	Bwn c-f SAND, some f Gravel, trace Silt 22.5 73.4 4.1	SW	14								
B-12M	18.0	S-8	Bwn m-f SAND, some Silt, little f Gravel 15.4 53.9 30.7	SM	17								
B-12M(A)	42.0	S-2	Gy CLAYEY SILT	CL-ML	24	25	20	5					
B-12M(A)	75.0	S-12	Bwn-Blk c-m SAND, and f Gravel, trace Silt 42.8 52.1 5.1	SW-SM	12								
B-12M(A)	103.0	C-1	Gy-bl-rd, slightly weathered, slightly fractured, m-f grained hard, GNEISS										6.041
B-13M	16.0	S-7	Gy-Blk m-f SAND, some f Gravel, trace Silt 20.4 69.7 9.9	SP-SM	14								
B-13M	25.0	S-10	Rd-Bwn c-f SAND, some f Gravel, trace Silt 28.1 66.4 5.5	SW-SM	15								
B-13M	35.0	S-13	Rd-Bwn PEAT	Pt	288						68.9		
B-13M	40.0	S-14	Bwn PEAT	Pt	295								

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Summary of Laboratory Results

Project No: **10285.01** Date: **8/31/2021**

Project: **BBJ - Manhattan**

Location: **New York, New York**

Boring #	Depth (Ft.)	Sample #	Specimen Description % Gravel % Sand % Fines	USCS	Water Content	Liquid Limit	Plastic Limit	Plasticity Index	Penetro-meter (tsf)	Specific Gravity	Organic Content (%)	pH	Average PLSI (Mpa)
B-13M	45.0	S-15	Gy CLAY & SILT	CL	29	29	18	11					
B-13M	50.0	S-16	Gy CLAY & SILT	CL	39								
B-13M	52.0	S-17	Gy CLAY & SILT, trace Organics	CL	24						0.6	5.2	
B-13M	55.0	S-18	Bwn SILT, trace Organics **NON-PLASTIC: WILL NOT ROLL TO 1/8"***	ML	24								
B-13M	60.0	S-19	Rd-Bwn f SAND, trace Silt 0.6 89.8 9.6	SP-SM	23								
B-13M	65.0	S-21	Lgt Bwn m-f SAND, little c Gravel, trace Silt 18.7 76.3 5	SP-SM	17								
B-13M	75.0	S-23	Rd-Bwn-Or m-f SAND, trace f Gravel, trace Silt 8.2 86.6 5.1	SP-SM	19								
B-13M	90.0	S-26	Rd-Bwn c-f SAND, some c-f Gravel, little Silt 33.9 52.9 13.2	SM	14								
B-13M	102.0	C-1	Gy, slightly weathered, moderately fractured, medium hard SCHIST										6.676
B-16M	12.0	S-4	Bwn m-f SAND, little Silt, trace f Gravel 3.1 79.6 17.3	SM	20								
B-16M	45.0	S-13	Bwn m-f SAND, little f Gravel, trace Silt 15.2 79.1 5.7	SW-SM	18								
B-16M	85.0	C-2	Gy, slightly weathered, slightly fractured, c grained, hard SCHIST										5.759
B-18M	6.0	S-1	Wh-Tn f GRAVEL, and c-m Sand, trace Silt 60.4 36.5 3.1	GP	7								
B-18M	20.0	S-6	Bwn m-f SAND, some Silt 0.2 73 26.7	SM	16								
B-18M	30.0	S-8	Gy-Bwn m-f SAND, little c-f Gravel, trace Silt 17.5 78.4 4.2	SP	15								
B-18M	65.0	S-14	Bwn c-f SAND, trace f Gravel, trace Silt 5.9 90.8 3.4	SP	21								
B-18M	77.0	S-17	Bwn-Gy c-f SAND, little f Gravel, trace Silt 11.4 84.9 3.7	SW	17								
B-18M	87.0	C-1	Gy, moderately weathered, slightly fractured, c-f grained, hard SCHIST										4.140
B-19M	30.0	S-15	Bwn m-f SAND, little Silt 0.2 86.8 13	SM	18								

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Project: **BBJ - Manhattan**

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Boring #	Depth (Ft.)	Sample #	Specimen Description % Gravel % Sand % Fines	USCS	Water Content	Liquid Limit	Plastic Limit	Plasticity Index	Penetro-meter (tsf)	Specific Gravity	Organic Content (%)	pH	Average PLSI (Mpa)
B-19M	40.0	S-17	Bwn-Gy SILT, some f Sand 0 20.9 79.1	ML	0								
B-19M	50.0	S-19	Gy-Or c-f SAND, some f Gravel, little Silt 31.4 55.8 12.8	SM	12								
B-19M	65.0	S-22	Bwn c-m SAND, some f Gravel, trace Silt 27.3 71.1 1.6	SP	14								
B-19M	85.0	S-26	Drk Bwn c-f SAND, trace f Gravel, trace Silt 8.3 87.5 4.2	SW	19								
B-19M	97.0	S-27	Lgt Bwn-Gy c-f SAND, trace Silt, trace f Gravel 5 88.5 6.6		16								
B-19M	115.0	C-1	Gy, moderately weathered, slightly to moderately fractured, c-f grained, moderately hard, SCHIST										2.486
B-22M	10.0	S-3	Bwn-Gy m-f SAND, some Silt, little f Gravel 6.2 64.5 29.2	SM	43								
B-22M	40.0	S-10	Bwn m-f SAND, little Silt, trace c-f Gravel 7.5 81.3 11.1	SW-SM	20								
B-22M	70.0	S-16	Bwn m-f SAND, trace f Gravel, trace Silt 7.6 87.1 5.3	SP-SM	17								
B-22M	86.0	C-2	Gy slightly weathered, slightly fractured, c grained, hard, SCHIST										9.561
B-24M	6.0	S-1	Bwn-Gy c-f GRAVEL, little m-f Sand, trace Silt 79.9 17.2 2.9	GP	11								
B-24M	10.0	S-3	Bwn-Gy m-f SAND, trace Silt 0.2 95.1 4.7	SP	19								
B-24M	30.0	S-7	Gy-Bwn m-f SAND, some f Gravel, little Silt 32.8 51.2 15.9	SM	12								
B-24M	40.0	S-9	Bwn-Gy c-m SAND, trace f Gravel, trace Silt 1.4 97.5 1.1	SP	24								
B-24M	60.0	S-12	Bwn-Gy c-f SAND, trace Silt 0.4 98.2 1.4	SP	21								
B-24M	98.0	C-2	Gy, slightly weathered to fresh moderately fractured, fine grained, medium hard, Micaceous GNEISS										2.980
B-27M	35.0	S-13	Bwn m-f SAND, little Silt, trace c Gravel 3.9 79.9 16.2	SM	17								
B-27M	45.0	S-15	Bwn-Gn-Pk c-f Gravel, and c-f Sand, little Silt 46.5 42 11.5	GW-GM	11								
B-27M	55.0	S-17	Bwn-Blk-Gn c-f Gravel, and c-f Sand, little Silt 47.6 41.7 10.6	GW-GM	11								

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Boring #	Depth (Ft.)	Sample #	Specimen Description % Gravel % Sand % Fines	USCS	Water Content	Liquid Limit	Plastic Limit	Plasticity Index	Penetro-meter (tsf)	Specific Gravity	Organic Content (%)	pH	Average PLSI (Mpa)
B-27M	70.0	S-20	Bwn m-f SAND, trace f Gravel, trace Silt 4.8 91.6 3.6	SP	20								
B-27M	90.0	S-24	Bwn CLAYEY SILT, little c-f Sand **NON-PLASTIC: WILL NOT ROLL TO 1/8"***	ML	23								
B-27M	98.0	C-1	Gy, hard, unweathered, slightly fractured, fine grained SCHIST										5.371
B-28M	84.0	C-1	Gy, moderately weathered, slightly fractured, c grained, hard, GNEISS										4.581
B-31M	12.0	S-4	Bwn m-f SAND, some Silt 0 76.8 23.2	SM	19								
B-31M	30.0	S-9	Rd-Bwn m-f SAND, trace Silt, trace f Gravel 4.1 89.4 6.5	SW-SM	19								
B-31M	35.0	S-10	Bwn SILT, some f Sand 0 27.1 72.9	ML	0								
B-31M	60.0	S-15	Bwn-Gy m-f SAND, little c Gravel, trace Silt 18.2 77.6 4.1	SP	17								
B-31M	75.0	S-17	Bwn-Gy c-f SAND, some Silt 0 67.2 32.8	SM	0								
B-31M	83.0	C-2	Gy, fresh, moderately fractured, moderately hard, Micaceous SCHIST										
B-33M	8.0	S-2	Bwn m-f SAND, little Silt 0.9 85.1 14.0	SM	12								
B-33M	18.0	S-7	Bwn m-f SAND, some f Gravel, trace Silt 34.5 57.4 8.1	SP-SM	9								
B-33M	45.0	S-13	Bwn c-f SAND, trace Silt, trace f Gravel 5.2 89.2 5.6	SW-SM	16								
B-33M	79.0	C-2	Gy-bk slightly - moderately weathered, slightly - moderately fractured, c-f grained, hard SHIST										4.890
B-34M	20.0	S-8	Bwn-Gy c-m SAND, little f Gravel, little Silt 18.3 69.7 12	SP-SM	18								
B-34M	70.0	S-19	Bwn c-f SAND, little f Gravel, trace Silt 12.4 81 6.6	SW-SM	13								
B-34M	85.0	S-22	Bwn m-f SAND, trace Silt, trace f Gravel 1.2 89 9.8	SW-SM	17								
B-34M	92.0	C-1	Gy, moderately fractured, hard SCHIST										3.126

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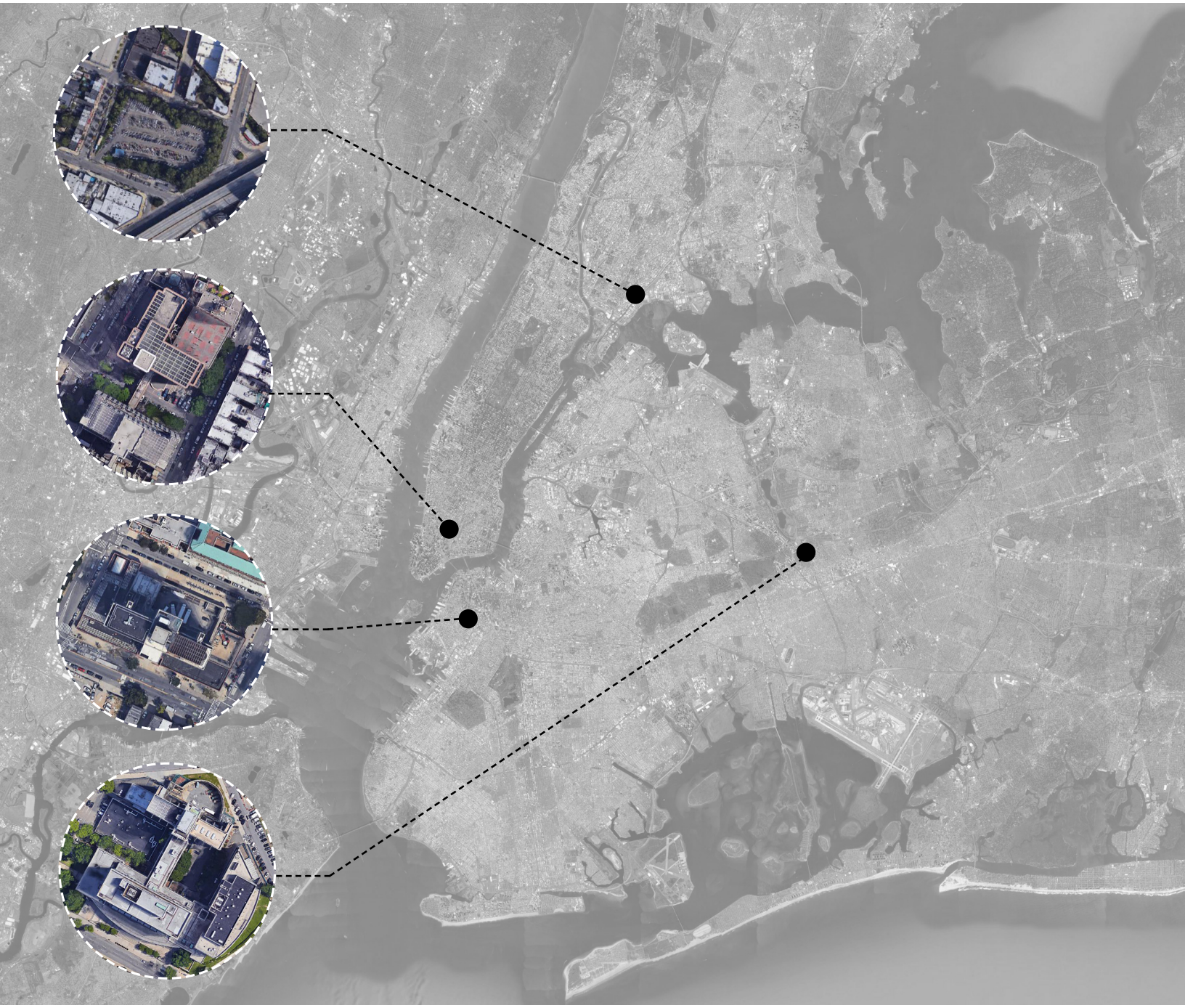
APPENDIX III



PERKINS EASTMAN

Master Plan for the Borough Based NYC Jail System
Task 5.3c.1 Final Geotechnical Testing Report - Manhattan
November 1, 2018

built on firm foundations

November 1, 2018

Perkins Eastman
115 Fifth Avenue
New York, New York 10003

Attn: Ms. Maria Petrakaki-Spyropoulos, AIA, Associate Principal

Re: Preliminary Geotechnical Report
Master Plan for Borough Based NYC Jail System
Manhattan Facilities – 120&125 White Street
Manhattan, New York
MRCE File No. 13176

Greetings:

In accordance with Task 5.3c of our proposal dated May 7, 2018, Mueser Rutledge Consulting Engineers (MRCE) has completed a preliminary subsurface investigation for the referenced project. We provide herein a summary of the investigation, our interpretation of subsurface conditions, and preliminary recommendations for foundation design and construction, including geotechnical design parameters. We note that no comments were received for our Draft Report issued for Task 5.3b.

We will be pleased to answer questions regarding this report and further assist in foundation design, construction and other geotechnical aspects of the project.

Very truly yours,

M□E□ER R□□□ED□E□□□□□□□□□□□E□□□□EER□□

Robert T. Wisniewski, PE

Roderic A. Ellman Jr., PE

STATE OF NEW YORK
RODERIC A. ELLMAN JR.
No. 092270
LICENSED PROFESSIONAL ENGINEER

YN:PED:RTW:RAE: F:\131\13176\Geotechnical Investigation\Reports\Manhattan\North - 120&125 White Street\Final Report\13176_Geotech_Report_Manhattan - 120 &125 White Street_text.docx.

E□□□□□□□

The following exhibits are attached to illustrate our report:

Exhibit	Description
Figure No. 1	Site Location Plan
Figure No. 2	1865 Viele Map
Figure No. 3	1879 Bromley Map
Figure No. 4	1930 Bromley Map
Figure No. 5	1955 Bromley Map
Figure No. 6	Surficial Geology Map
Figure No. 7	Bedrock Geology Map
Drawing No. B-1-M	Boring Location Plan – 120 & 125 White Street
Drawing No. GS-1-M	Geologic Section A-A
Drawing No. GS-R	Geotechnical Reference Standards
Drawing No. RC-1	Rock Core Classification Criteria
Appendix A	Boring Records - 2017 YU Investigation
Appendix B	MRCE Boring Logs
Appendix C	Geothermal Assessment

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Two sites are under consideration in the Borough of Manhattan, New York, as shown on Figure No. 1. The north project site, 120/125 White Street, is the subject of this report. The site is along both sides of White Street between the intersections with Baxter Street to the east and Centre Street to the west, occupying the south portion of Block 198 and the northern portion of Block 167, as shown on the 2018 Topographic Survey by Matrix New World Engineering, Land Surveying and Landscape Architecture, P.C. (Matrix). The other project site, 80 Centre Street, is about 400 to 500 feet to the south and is discussed in a separate report.

In general, topography slopes up from west to east. Along White Street, street grades range from about El. + 14 at the intersection with Centre Street to about El. +19 at Baxter Street.

New York City Transit (NYCT) J and Z subway lines run in a 4-track tunnel below Centre Street along the west side of the sites. The bottom of the subway structure is at about El. -18, corresponding to a depth of approximately 35 below street grade, as shown on Drawing No. GS-1-M. The subway structure curves beneath the northwest corner of Block 198.

The site is currently occupied by the Manhattan Detention Complex on Block 198 and NYC Criminal Courts Building on Block 167.

D□□□M

Elevations in this report are referenced to North American Vertical Datum of 1988 (NAVD88). NYCT Datum is 98.4 feet below NAVD88.

□R□□□□ED□□□□□R□□□□□

The proposed development consists of construction of a new jail facility consisting of a 27-story building with a footprint area of about 70,000 square feet, and a single basement level at El. +1. The basement may include depressed areas for elevator pits, sump pits, and underground fuel tanks.

□□□□□□□E□□□□□RM□□□□□

We were provided with information about the site:

- 120/125 White Street Topographic Survey, Drawing No. V101.00, by Matrix New World Engineering, Land Surveying and Landscape Architecture, P.C. (Matrix), dated 6/2/2018.
- 120/125 White Street Utilities Survey, Drawing No. V102.00, by Matrix, dated 6/2/2018.
- EDR Aerial Photo Decade Package, dated March, 2018.
- Certified Sanborn Map Report, dated March, 2018.
- EDR Historical Topo Map Report, dated March, 2018.
- Manhattan Programmatic Diagram, dated July, 2018.
- Master Plan drawings for three schemes, including site plans, floor plans, and stacking diagrams, by Perkins Eastman, dated 8/26/2018.
- Investigation Report: Plaza Settlement Study, by Superstructures Engineers and Architects, dated 10/17/2017.
- Geotechnical Engineering Report for Manhattan Detention Complex, by Yu & Associates, Geotechnical, Environmental, and Civil Engineering, dated 5/15/2017.

We also visited the NYCT Archives and obtained drawings for the subway lines beneath Centre Street (Lines J and Z, Route 9, Section 2), dated 1915. In addition, we reviewed our files for previous work in the vicinity of the site for a general understanding of subsurface conditions.

□□E□□□□R□□□D□E□□□□□

Published historic topographic maps show that a majority of the project site previously contained a body of water called Collect Pond and bordering marshland (Figure No. 2). The pond and the surrounding area were eventually filled for land development and the street grid was established. Some watercourses and marshes in southern Manhattan were initially filled with soils from nearby sand hills. Early development consisted of smaller residential and commercial buildings (Figure No. 3). Eventually those buildings were replaced by larger municipal structures used for jail and court facilities as shown in Figures Nos. 4 (80 Center Street site) and 5. Manmade fill was placed as demolition and construction occurred.

Based on available information, we anticipate that the site is underlain by a surficial layer of manmade fill overlying natural soils (Figure No. 6), all underlain by bedrock. The lower portion of the fill stratum may consist of natural soils from the previous sand hills. Published geologic information shown on Figure No. 6 indicate that natural soils generally consist of stratified drift resulting from previous glaciation. Organic deposits in previous watercourses and marshes are also likely to be present. Bedrock is mapped as the Manhattan Schist Formation with top of rock at depths of about 100 to 150 feet, as shown on Figure No. 7.

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In April 2017, three borings, Nos. B-1, B-2, and B-3, were made along the north side of White Street. That investigation was performed by Warren George Inc. under inspection by Yu & Associates. The borings were advanced to depths of 52 to 72 feet, prior to encountering deeper, more compact soils or bedrock. The report by Yu describes a subsurface profile consisting of 23.5 to 37 feet of fill overlying up to 10 feet of peat and up to 16.5 feet of organic silty clay, underlain by sand with gravel and silt. The easternmost boring, No. B-3 encountered very little peat or organic soils. The investigation included one observation well, No. B-2 (OW), in which the groundwater level was measured at a depth of about 15 feet,

corresponding to El. -0.5. Boring locations are shown on Drawing No. B-1-M, and boring logs are included in Appendix A.

MRCE developed a preliminary subsurface investigation program consisting of three (3) borings. Two borings, MR-1-M and MR-2P-M, were proposed along White Street. The third boring was proposed at the 80 Centre Street site. One observation well piezometer was planned to monitor the groundwater level in one of the borings along White Street.

Review and approval of the proposed borings was required by NYCT since the borings are within 200 feet of the NYCT subway structure. We prepared a plan and section showing the site and proposed borings with respect to the subway structure. We submitted drawings and obtained approval from NYCT to perform the borings.

We prepared a boring location plan and specifications, obtained bid prices, and awarded the work to Craig Geotechnical Drilling Co., Inc. (Craig) of Mays Landing, New Jersey. The borings were made by Craig between August 14 and August 21, 2018 under the continuous inspection of our engineer, Mr. Yuta Nakamura, who prepared Daily Field Reports and field boring logs.

The borings were made in an open area of the site or on the adjacent sidewalk using a CME-55 track-mounted drill rig. The top 5 feet of each boring was advanced using a hand-auger to clear utilities. The borings were then advanced using rotary drilling techniques with a tri-cone roller bit and a combination of drilling fluid and/or casing to stabilize the borehole. Five soil samples were obtained in the first ten feet of each boring, including material recovered in hand-augering, and at five-foot intervals thereafter. Soil samples were obtained by driving a two-inch outer diameter, split-spoon sampler with an automatic 140-lb hammer, free falling 30 inches. The number of hammer blows required to advance the sampler through each of four, six-inch intervals was recorded. The Standard Penetration Test (SPT) resistance expressed in blows per foot (bpf), also termed N-Value, 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, large gravel, cobbles, boulders, or other obstructions, the sampler was driven until 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 glass jars for preservation and transportation to our laboratory.

Numerous obstructions were encountered at shallow depth while attempting to advance Boring MR-1-M leading to multiple offset boring attempts. Offset borings are given a suffix following the boring number beginning with “A”, followed by “B”, then “C”, etc. Borings MR-1-M through MR-1B-M were abandoned after encountering an obstruction at a depth of about 2 feet. Boring MR-1C-M was advanced through this depth and drilled to completion.

All borings were terminated after coring 5 feet into bedrock. Bedrock was sampled using an NX-size double-tube core barrel equipped with a diamond bit, recovering nominal 2-inch diameter core. Percent recovery and Rock Quality Designation (RQD) were determined for each core run. Recovery is the length of core recovered expressed as a percentage of the total core run. RQD is defined as the sum of the length of recovered core pieces greater than four inches in length between natural breaks expressed as a percentage of the total core run. RQD is an indication of the relative frequency of jointing or natural fracturing of the bedrock. Sketches of recovered rock cores were prepared in the field and are attached to the boring logs. Rock cores were stored in wooden boxes for shipment to our laboratory.

An open standpipe piezometer was installed in Boring MR-2P-M following completion of drilling to measure the groundwater level. The piezometer consists of a 2-inch I.D. PVC standpipe extending to a depth of 30 feet. The bottom 10-foot section 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 surface was installed for protection and to facilitate future water level readings. A rising head test was performed following piezometer installation to confirm proper operation. The rising head test consisted of bailing water out of the piezometer standpipe and measuring the rise in the water level with time. Piezometer construction details and water level readings are recorded on the Piezometer Record accompanying the boring log in Appendix B. The results of the rising head test are also included in the boring log.

Borings MR-1-M through MR-1C-M were backfilled with soil cuttings and patched with cold-patch asphalt or concrete upon completion. Final boring locations were measured from existing structures and site features (i.e. adjacent buildings, curb lines etc.) by our engineer and are shown on Drawing No. B-1-M. Ground surface elevations at as-drilled boring locations were estimated using surface elevations shown on the topographic survey prepared by Matrix.

R R RE EW D E

Upon completion of the subsurface investigation, all soil samples and rock cores were delivered to our in-house laboratory. Field soil and rock descriptions were reviewed and field log records revised for conformance with MRCE Geotechnical Reference Standards and the USCS, described on Drawing No. GS-R. Rock Core Classification Criteria are described on Drawing No. RC-1. Final typed logs incorporating the results of our laboratory review are included in Appendix B.

R E D

Our interpretations of subsurface conditions are illustrated on Geologic Section A-A on Drawing No. GS-1-M. Boring information shown on the sections include sample number and position, SPT resistance (N-value) in blows per foot, and the USCS symbol for each soil sample. Core number and position, percent recovery, and RQD are shown for each core run. A description of the Boring Legend is shown on Drawing No. GS-R.

R

General descriptions of the soil strata encountered in the borings and their classification in accordance with the New York City Building Code are summarized below in order of their occurrence with depth. The results from all borings made under our inspection have been included in determining general stratifications and descriptions.

The uppermost material encountered in the borings is a layer of manmade fill, ranging from 18.5 to 19 feet thick. Stratum F consists of loose to medium compact brown, gray brown, and dark gray fine to coarse sand, some to trace silt, trace to some gravel, trace brick fragments, concrete. N-values range from 2 to 21, averaging 10.

A sand layer was encountered beneath the fill in Boring MR-1C-M 17-feet thick, but not encountered in Boring MR-2P-M. The sand appears to be comprised of natural materials and may represent initial filling of watercourses and marshes using nearby soils including sand hills that existed prior to development. Stratum S1 consists of medium compact to loose gray brown, red brown, and brown coarse to fine sand, some gravel, trace to some silt. N-values of Stratum S1 range from 8 to 26, with an average of 17.

In Boring MR-1C-M, Stratum S1 is underlain by 8.5 feet of peat. Peat is an organic marsh deposit, and was not encountered in Boring MR-2P-M. Stratum Pt consists of medium dark brown peat and wood, some fine to coarse sand. N-values range from 11 to 23 with an average of 17. Two water contents measured in Stratum Pt were 62% and 364%.

In Boring MR-1C-M, Stratum Pt is underlain by 14 feet of organic silty clay. Stratum O is also a marsh deposit, and was not encountered in Boring MR-2P-M. Stratum O consists of medium gray organic silty clay, trace shells, trace fine sand, grading to red brown clayey fine sand, trace mica. N-values range from weight of hammer to 6 with an average of 5. Four water contents measured in Stratum O ranged from 34% to 38%, and averaged 36%.

A clay layer is present below Stratum F in Boring MR-2P-M. Stratum C was not encountered in Boring MR-1C-M. Stratum C ranges in thickness from 3.5 to 5 feet, and consists of medium gray brown silty clay and clayey silt, some to trace fine to medium sand, trace gravel. N-values range from 4 to 7, with an average of 6. Two water contents measured in Stratum C were 20% and 25%.

Stratum S2 was encountered in all three borings beneath the soils described above. Stratum S2 ranges in thickness from 20 feet to 117 feet, and consists of medium compact brown, gray brown, and red brown fine to medium sand, trace gravel to gravelly, trace silt, mica, coarse sand. N-values range from 10 to 74, with an average of 21.

Stratum T, glacial till, was encountered beneath Stratum S2 in Boring MR-1C-M. Stratum T ranges from 16 feet to 24 feet thick, and consists of compact to very compact brown, gray brown, and red brown fine to coarse sand, gravelly to some gravel, some to trace silt, trace mica, trace silt pockets. N-values range from 38 to 91, with an average of 69.

Decomposed rock with thickness ranging from 0.5 to 2 feet was encountered overlying intact bedrock in Boring MR-2P-M. Stratum DR consists of very compact gray and brown gravelly fine to coarse sand, some silt. SPT N-values were in excess of 50 blows over 4-inches.

All borings were terminated after penetrating 5 feet into intact bedrock, termed Stratum R. Bedrock consists of hard unweathered to slightly weathered gray gneissic schist, blocky to closely jointed with weathered joints. Core recoveries range from 95% to 100% with an average of 98%. RQD varies from 90% to 92%, with an average of 91%. Depth to bedrock in Borings MR-1C-M and MR-2P-M varies from 91.5 to 102.5 feet, corresponding to El. -73 to El. -88.3.

Groundwater levels were measured during the investigation in the piezometer installed in Boring MR-2P-M. Groundwater levels measured in the piezometer range from El. -0.3 to El. -0.9. The 2017 investigation by Yu & Associates included one observation well in which the groundwater level was measured at about El. -1.

Groundwater levels are expected to vary seasonally throughout the year depending on precipitation levels. As such, the groundwater level at the time of construction may be different from levels observed at the time of the field investigation.

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The recommended soil and rock design parameters are listed in Table 1, for use in the design of foundations and temporary construction works such as excavation shoring.

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Parameter	Stratum						
	F, S1	Pt, O	C	S2	T	DR	R
Total Unit Weight (pcf)	115	105	115	115	130	130	160
Buoyant or Effective Unit Weight (pcf)	55	45	55	55	70	70	100
Angle of Internal Friction (degrees)	30	0	0	32	38	38	-
Cohesion (psf)	0	500	500	0	0	0	-
Ultimate Friction Factor, S - soil/rock to concrete	-	-	-	0.5	0.6	0.6	0.7
Allowable Bearing pressure (tsf)	-	-	-	3.0	6.0	8.0	60

Table 1 Notes:

1. Effective unit weights should be used below the groundwater table and water pressure should be added. Surcharge loads above the ground surface should be included in accordance with the NYC Building Code.
2. For basement walls restrained at the top and bottom (rigid walls), use at-rest pressures. For walls restrained at the bottom and free at the top (flexible), use active earth pressures.
3. Active and passive pressures may be computed using Rankine or Coulomb earth pressure theory.
4. Allowable bearing pressure is net bearing pressure to be applied at the foundation level, in excess of the stabilized overburden pressure, as per the NYC Building Code.

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Groundwater levels measured at the time of our investigation ranged between El. -0.3 and El. -0.9, corresponding to a range between 18.8 feet to 19.4 feet below street grade. The groundwater level measured in a well installed in one of the borings reported by Yu showed a range between El. -0.5 and El. -1.0 for one week in April, 2017. Accordingly, we recommend a design hydrostatic groundwater level at El. +4, allowing for some seasonal variation.

Based on the most recent Flood Insurance Rate Maps (FIRM) available, produced by the Federal Emergency Management Agency, the project site is within Zone X, indicating area of minimal flood hazard. In addition, the western portion of White Street (White Street and Centre Street) is in an area with 0.2 percent annual-chance flood event (500-year flood). Facility design must account for these flood events.

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We evaluated seismic parameters based on the NYC Building Code. Our evaluation addressed liquefaction potential and seismic Site Class.

Soils that are below the groundwater level, sufficiently free of fine grained binder (i.e. silt and clay sizes), and loose in consistency are susceptible to liquefaction during earthquake shaking. A majority of the samples from the borings, particularly in Stratum S, had sufficiently high blow counts to make the possibility of liquefaction unlikely. The few exceptions represent isolated zones. Using the Code specified guidelines, our analysis indicates that underlying soils are not susceptible to liquefaction, and it need not be considered in design.

Based on the preliminary MRCE borings and the 2017 investigation performed by Yu & Associates, seismic Site Class E is appropriate. The seismic design spectral response parameters with respect to g, the acceleration of gravity, are S_{DS} = 0.444g and S_{D1} = 0.170g.

RECOMMENDATIONS

Preliminary foundation recommendations are provided based on the results of the subsurface investigation and our understanding of the current building design schemes. The recommendations are intended to satisfy the requirements of the NYC Building Code, and to provide information for foundation and substructure design. Our recommendations should be reviewed if the scope of the proposed construction changes or if additional subsurface information is obtained.

The subsurface investigation reveals a general subsurface profile consisting of a surficial layer of fill underlain by organic peat and clay, sand, till, and decomposed rock, all overlying bedrock. The thickness of the compressible organic stratum is greatest towards the western side of the site, decreasing towards the east, and not present in borings made along the east side. This suggests that the site is near the edge of the previous pond and bordering marsh. The depth to bedrock along White Street ranges from about 92 feet to 102 feet.

Foundations

Strata F, S1, Pt, O and C are unsatisfactory bearing materials for building foundations. Therefore, foundations will have to derive support in the underlying more competent natural soils or bedrock. The proposed basement level at El. +1 will be within Stratum F, approximately 10 to 45 feet above competent soil strata capable of supporting the proposed building.

Therefore, deep foundation elements such as driven or drilled piles are recommended for building support. Driven piles, such as steel H-piles or concrete-filled steel pipe piles can provide an allowable design load of about 75 tons if bearing in dense soil (Strata T and DR), and about 150 tons if driven to bedrock (Stratum R). Drilled pile elements such as mini-piles or caissons can penetrate into bedrock to develop much higher capacities. Rock-socketed pile capacities cover a large range depending on size and socket depth. The allowable resistance provided by the bond of concrete to bedrock (Class 1c or better) can be regarded as 200 pounds per square inch (psi). For example, a 13.375 inch drilled pile with a 12 foot long rock socket in bedrock can achieve an allowable design load of 600 tons in compression. Rock socket lengths can be adjusted for uplift capacity, if needed, based on an allowable bond stress of 100 psi for uplift. Larger diameter drilled piles may be more appropriate if higher lateral design loads are required. Selection of the most economical pile size will depend on the magnitude of both vertical and lateral loads and associated tolerable deflections, and can be further evaluated as building design progresses.

Piles installed through compressible soils such as the Strata Pt and O are subject to downward frictional loading (downdrag) by settling soils contacting the pile. Downdrag acts to increase pile loads. Settlement,

resulting in downdrag, could be caused by an increase in site grades or changes in the groundwater level from future dewatering activities. We recommend an allowance of 40 tons per pile for downdrag. Since the proposed piles will develop resistance primarily by end bearing in the till or rock strata, the piles must have sufficient structural capacity to accommodate this additional load.

A minimum center to center spacing of no less than 3 times the pile diameter or diagonal dimension is recommended between piles. No group reduction factors are necessary for axial design loads at that spacing. For lateral loading, group effects must be considered at piles spacing less than 6 times the diameter. Group reduction factors depend on actual pile group arrangement and pile spacing.

All foundations must bear below a 1V:1H influence line extending up from the bottom of the NYCT structure. Piles through the zone of influence must be sleeved down to the influence line to avoid load transfer to the subway structure. Considering the depth of the proposed basement, the foundations along the west side of the proposed development on either site may be within the NYCT influence zone and require provisions to avoid transferring load to the subway structure.

d

Settlement of deep foundations bearing on or in bedrock will be negligible and will include elastic shortening of piles. For piles bearing in soil, settlements can be estimated once foundation loads are determined and a foundation type is chosen.

r **d** **r**

The top of the proposed basement slab is planned at El. +1. The slab will bear on the fill stratum which may undergo settlement, including differential settlement, from the underlying organic soil deposits which vary in thickness across the site. Therefore, the basement slab should be designed as a structural slab supported by the building foundations.

Assuming a 12 inch slab thickness, the bottom of slab will be 4 feet below the design groundwater level and will encounter hydrostatic uplift loading. In addition, elevator and sump pits and the underground fuel tank will extend below the design groundwater level. Where the substructure is submerged, groundwater will produce a hydrostatic uplift pressure that must be resisted by the dead load of the structure or other positive measures provided to resist or relieve excess uplift pressure.

We recommend using a minimum factor of safety of 1.2 in evaluating uplift resistance under the normal design water level. Uplift resistance should be calculated using only the dead weight of the structure in place. Live load within the structure should not be taken as a resisting force to counter uplift pressures. If the dead weight of the structure is not sufficient or the slab design cannot accommodate the full uplift pressure, tiedown anchors, tension piles or other positive measures must be provided to resist the excess uplift pressures.

d **W**

Permanent foundation walls should be designed to withstand long-term, at rest earth pressures, surcharge pressure, and water pressure, consistent with NYC Building Code requirements. At-rest soil and water pressures can be calculated using equivalent fluid pressure of 60 pounds per cubic foot (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 or temporary rise in groundwater level of five feet above the design groundwater level such as may occur due to a water main break or during a flood. Surcharge pressures are based on a uniform vertical loading of 600 psf. This can be converted to lateral pressures of 240 psf to a depth of 10 feet, and 100 psf from 10 to 20 feet deep.

The use of elevated stress levels is appropriate in the design of foundation walls for temporary load conditions.

W[illegible]r[illegible]

We understand the basement is intended as habitable space, including building support, mechanical areas, storage, and parking. In order to provide a dry basement, it will be necessary to install waterproofing below slabs and outside below-grade substructures that extend below the water level. We recommend using a membrane waterproofing system below the bottom slab/mat and outside foundation walls below El. +5, including walls and bottom slabs of elevator/mechanical pits that extend below the water table. We recommend waterstops at construction joints. The waterproofing system must be carefully designed and detailed, and construction inspection is vital to provide proper quality control. It has been our experience that waterproofed cellars may eventually develop leaks, in some cases due to slab cracking or gaps in the membrane despite good construction practice and inspection. Remedial grouting may be needed to stem minor leakage. At a minimum, the remainder of the height of below grade walls should be dampproofed.

[illegible]RE[illegible]M[illegible]R[illegible]R[illegible]DER[illegible]

Cellar construction will require excavation to depths of about 15 to 19 feet below sidewalk level and to within a few feet of the groundwater table measured at the time of our investigation. Deeper local excavation is anticipated for construction of elevators and other mechanical pits and a fuel tank. Temporary works including excavation support and underpinning, dewatering, and monitoring systems are required to facilitate below grade construction

[illegible]E[illegible]

Basement and foundation construction requires excavation in fill (Stratum F) soils. The bulk of the excavation can be done with conventional earth moving equipment. Existing intact foundations from previous buildings or other demolition debris on the site may require removal using pneumatic hammers. Care is necessary to avoid disturbing the soils beneath the adjacent buildings during demolition work.

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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 shallow excavations, such as for local excavations within the general basement excavation, provided groundwater is properly controlled in advance of excavation and such excavation is stable and does not undermine or cause damage to adjacent structures and facilities. Where such conditions permit, the excavations sides should be sloped no steeper than 1V:1.5H.

The basement excavation will require temporary shoring for earth retention on all faces of the excavation that are not adjacent to existing buildings. The excavation support system must be carefully installed in advance of excavation and must have sufficient stiffness so that lateral movements do not lead to subsidence of sidewalks or damage to the subway structure and buried utilities. Soldier piles and timber lagging braced laterally with tieback anchors or raker bracing are suitable for excavation support provided groundwater is properly controlled. Typically, these walls can be installed within the sidewalk assuming a sidewalk permit is obtained from the NYC DOT. Drilled-in soldier piles are recommended to avoid pile driving and consequent potential for damage to nearby structures and the utilities beneath the sidewalks and streets. On excavation faces that are adjacent to existing buildings, a stiffer excavation support system, such as a secant pile wall, may be needed.

The use of tiebacks will require drilling under the adjacent streets and existing buildings. Plans showing the locations and depths of existing NYCT facilities and 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. If tiebacks are installed below the adjacent properties, authorization from the property owners is required. Where tiebacks are not feasible, such as where NYCT facilities are present, internal bracing such as rakers will be necessary.

Recommended parameters for design of excavation support systems are included in Table No. 1. Appropriate surface surcharge pressures per NYC Building Code should be considered such as from adjacent roadways and sidewalks, and potential temporary construction loads. 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 NYCT and NYC Department of Buildings (NYC DOB) as part of the foundation permitting process.

Underpinning of Adjacent Buildings

The site is abutted by buildings along the north and south sides and the NYCT subway structure beneath Centre Street. Details of existing foundations must be obtained either by research of building drawings and/or a test pit investigation. In the event that adjacent building foundations bear higher than El. 0, underpinning of the adjacent foundations will be required, or a stiff support of excavation system installed. Excavation will not extend below the subway structure, so underpinning of NYCT facilities will not be required.

Conventional pit underpinning methods are viable provided groundwater is properly controlled. Pit underpinning involves sequenced excavation of small pits beneath the existing foundation. Individual pits are excavated and shored by hand to just below the new foundation depth. The pit is then filled with concrete leaving a 2 to 3-inch gap at the top for future load transfer using steel plates and wedges with drypack. Subsequent pits are excavated and constructed in a sequenced manner to prevent instability and form a continuous wall. Depending on the depth of underpinning, lateral bracing of underpinning pits may be required. Bracing can consist of tiebacks or internal bracing such as inclined rakers, if permission to install tiebacks beneath adjacent buildings is not obtained. If the underpinning extends below the water table, dewatering will be required in advance of excavation of underpinning pits.

Soils below the adjacent buildings are anticipated to include sands with limited fine grained binder. In this case, grouting of soils below adjacent foundations using microfine cement or sodium silicate is recommended to stabilize the soils in advance of underpinning.

Dewatering and Groundwater Control

The general basement excavation to approximately El. 0 will extend to about the groundwater level measured at the time of our investigation. Depending on the depth of pits, sumps, and the fuel tank, and the thickness of foundation elements, portions of the proposed basement excavation will extend below the groundwater level measured at the time of our investigation. Dewatering during construction will therefore be necessary to provide and maintain dry, undisturbed subgrades for construction. The dewatering system should be designed and maintained with the intent of lowering and maintaining the groundwater level a minimum of two feet below subgrade at all stages of the work. Improperly dewatered soil subgrades are easily disturbed during construction, which will increase settlement and provide poor substructure and foundation performance.

The effects of lowering the water table outside the excavation must be evaluated by the dewatering system designer. The effects of dewatering and extent of depressurization should be monitored with piezometers installed both within and around the excavation. The dewatering system, including

monitoring, should be designed by a Professional Engineer experienced in this work. The NYC Department of Environmental Protection (NYCDEP) requires discharge permits for groundwater extracted from temporary, construction-related sources.

The basement slab and other substructures will be supported on the deep foundations supporting the building. Nevertheless, care should be exercised to prevent disturbing or loosening the soil in the sides and bottom of excavations to facilitate construction of slabs, pits/sumps, and pile caps. All subgrades should be free of water and inspected and approved for construction by a qualified geotechnical engineer. If soft, spongy, or otherwise unsuitable materials are encountered at the planned subgrade level, those materials should be removed and replaced with compacted Structural Fill or lean concrete.

Driven or drilled pile installation must be performed by experienced specialty subcontractors and carefully monitored by a qualified geotechnical engineer to assure the integrity of each pile. The Code requires Special Inspection of pile installation.

We recommend the use of cased drilling methods with internal flush in advancing drilled piles through overburden soils to reduce the risks of ground loss particularly where piles are installed in close proximity to existing structures. The use of drilling methods involving external flush should not be permitted. The use of a percussion hammer or a rotary core drill is appropriate for rock socket construction provided the percussion hammer is only used after the drill casing is properly sealed into sound bedrock. The rock socket should be flushed with clean water following drilling and grouted the same day that drilling is completed to provide a good bond between pile concrete and rock.

The presence of demolition debris in the fill stratum and boulders in the glacial till (Stratum T) should be factored in the selection of pile driving or drilling equipment. Drilling through obstructions and boulders will be slow and may cause significant wear on drilling equipment. The Contractor should expect to pre-excavate and/or spud through the fill to avoid obstructions in order to drive the piles through the fill without damage.

Under the Building Code, driven piles must undergo compression load testing to confirm design loads and pile driving criteria. Static load testing can be supplemented with dynamic testing as described in the Code. Drilled piles or caissons socketed in bedrock do not require load tests provided that each rock socket is inspected by a Professional Engineer using video survey to confirm rock quality. The pile load testing program should include lateral load tests to confirm design loads in excess of one ton per pile.

Structural Fill is recommended for use beneath structures and slabs, and as backfill adjacent to foundation walls. Structural Fill should conform to NYC Building Code requirements for Controlled Fill, consisting of a well graded sand, gravel, crushed rock, recycled concrete aggregate, or a mixture of these containing no organic matter, wood, brick or other deleterious materials or equivalent materials with a maximum particle size of 3 inches and a maximum of 10 percent passing the No. 200 sieve. Structural Fill should be placed in loose lifts not exceeding 12 inches in thickness (six inches where hand operated equipment is used), at its optimum moisture content plus or minus 2 percent, and compacted to a minimum of 95% of the Modified Proctor maximum dry density (ASTM D 1557).

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A pre-construction condition survey of adjacent buildings and NYCT facilities should be made to establish existing conditions. This survey should include photographing existing conditions and installing crack gages over existing cracks on the inside and outside of the structures. A post-construction survey may be needed to verify building conditions.

A program of monitoring vibration and movement of adjacent structures during construction is recommended and required by NYCT. The program should include seismographs and control points on adjacent buildings and NYCT structures to measure construction vibrations, and 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. Monitoring should occur on a regular basis during demolition, excavation, and foundation construction. Noise monitoring can be considered depending on community issues.

The surrounding streets and sidewalks should also be regularly inspected for cracks, lateral movement, and settlement. If progressive movement is observed, corrective measures must be taken immediately.

Dewatering systems must include the installation of piezometers to monitor groundwater lowering and verify that the required drawdown is achieved in advance of excavation to avoid instability and softening in subgrade soils.

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GI Energy performed a desk top evaluation of geothermal heating and cooling solutions. Options considered included closed loop and open loop systems, and energy piles. For the Manhattan - 120 & 125 White Street site, energy piles can be considered since deep foundations will likely be used. General details for the energy piles, a closed loop system using 80 boreholes, and an open loop system using one pair of boreholes are summarized in Appendix C.

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This report presents the results of our initial investigation and our preliminary recommendations for foundation design and construction for the proposed structure. We will be pleased to answer questions regarding this report and further assist in design and construction of the project as work progresses. Once the building scheme finalized in a future phase, a subsurface investigation that satisfies the requirements of the NYC Building Code will need to be developed and conducted.

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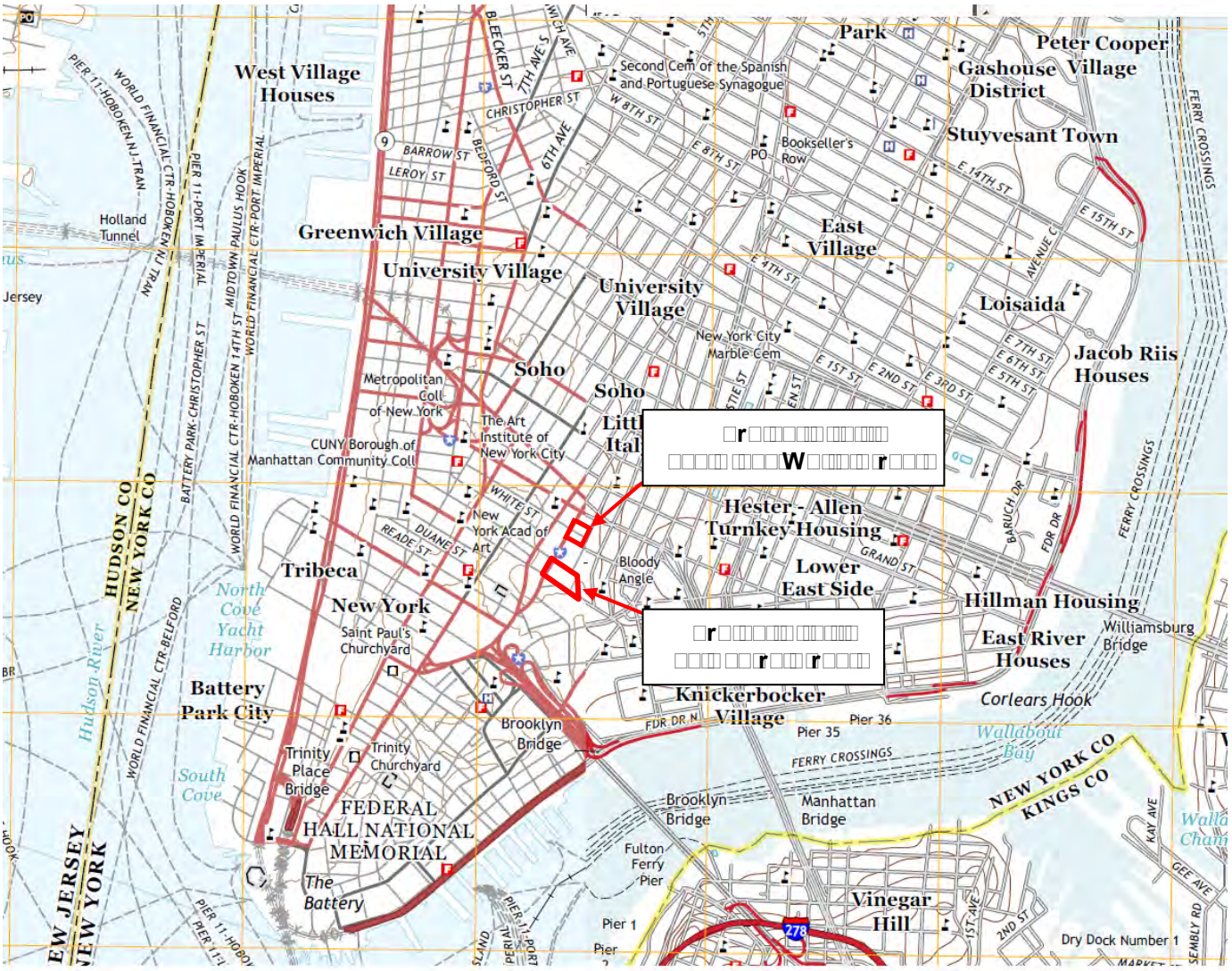

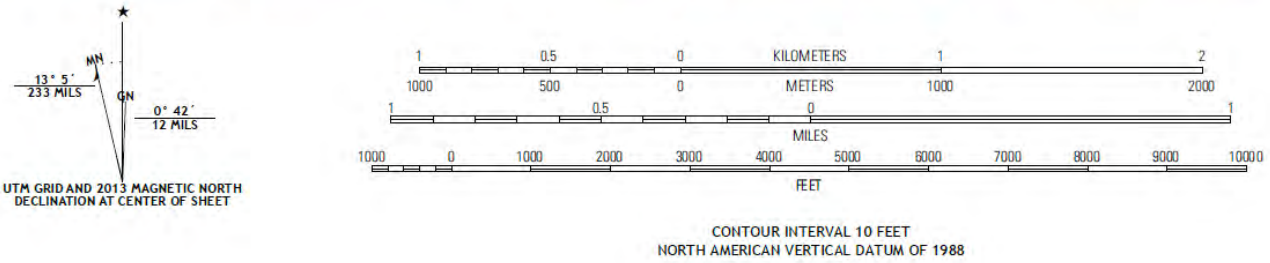

CONTOUR INTERVAL 10 FEET
NORTH AMERICAN VERTICAL DATUM OF 1988

SOURCE:

USGS Topographic Maps:

- Brooklyn, NY, Dated 2013.
- Jersey City, NJ-NY, Dated 2014.

NEW YORK			NEW YORK
14 PENN PLAZA – 225 W 34TH STREET, NEW YORK NY 10122			
SCALE	MADE BY: YN	DATE: 8-13-2018	FILE No.
-	CH'KD BY: PED	DATE: 9-21-2018	13176
SITE LOCATION PLAN			Figure No. 1

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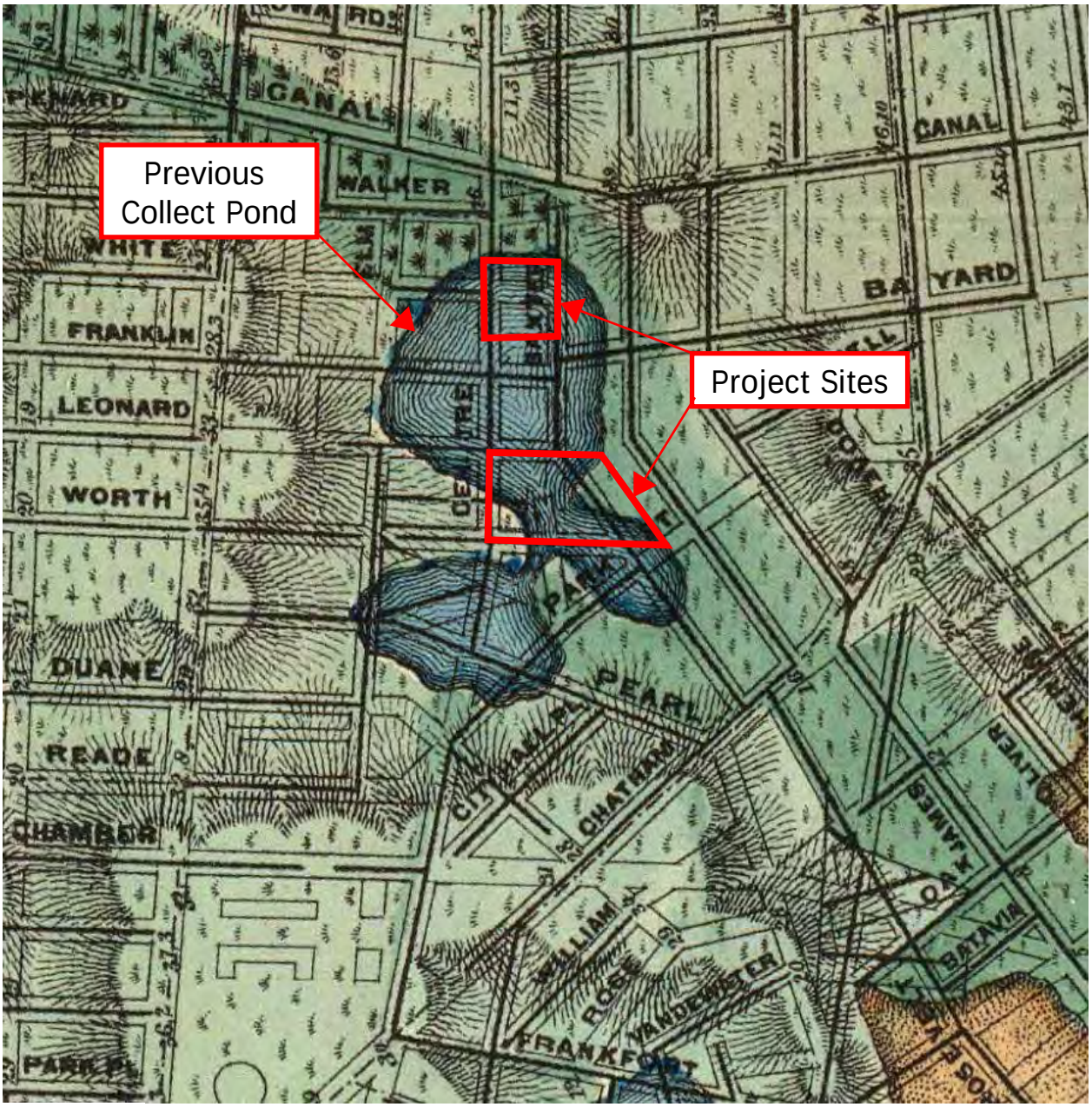

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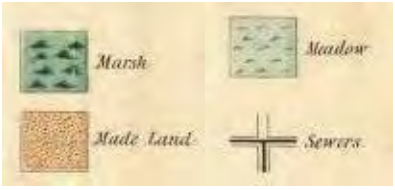

SOURCE:

Sanitary & Topographical Map of the City and Island of New York. Egbert L. Viele, 1865.

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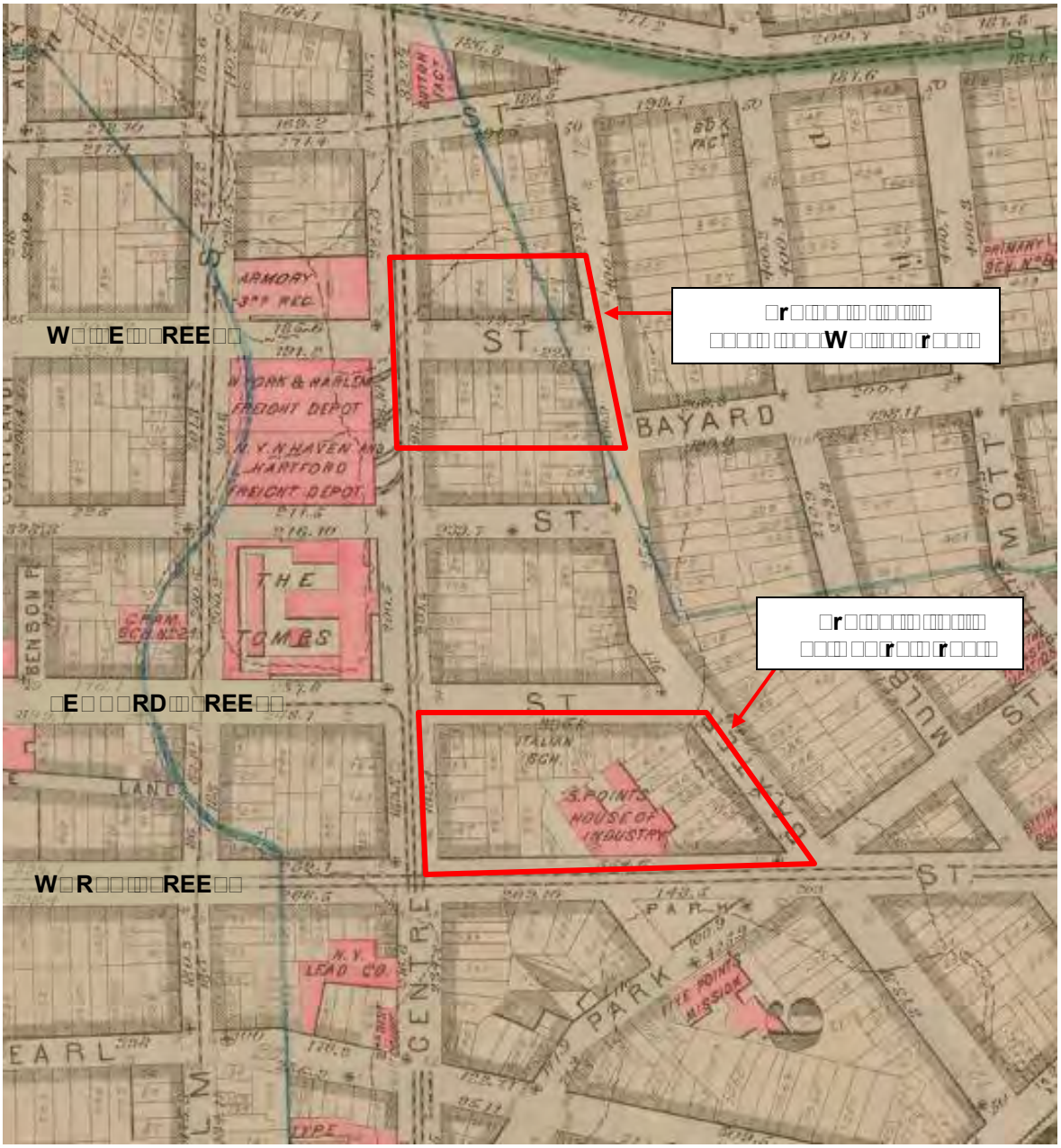
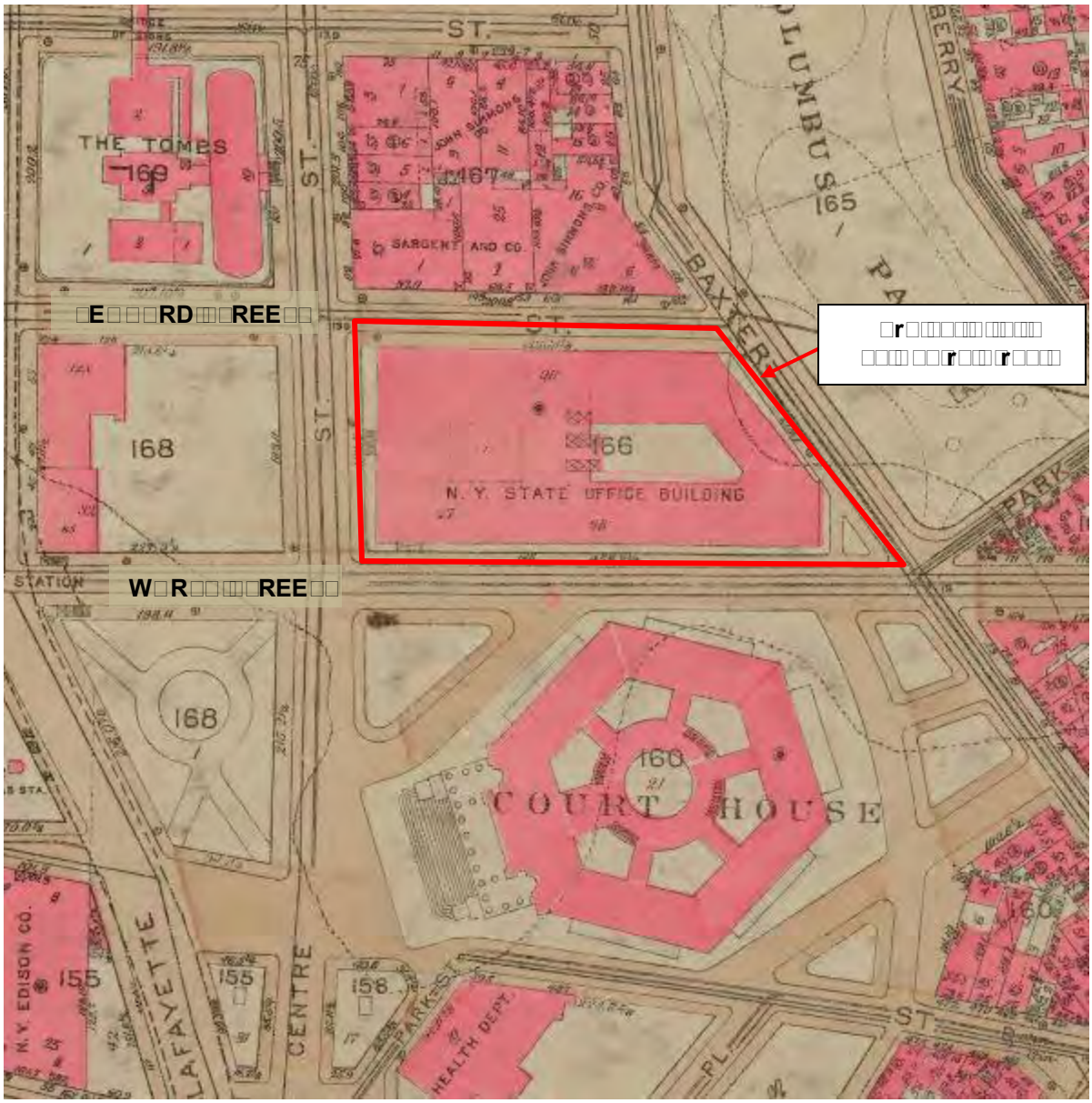
1865 VIELE MAP			Figure No. 2



SOURCE:

Atlas of the Entire City of New York, by G. W. Bromley & E. Robinson, Dated 1879. (digitalcollections.nypl.org/collections/atlases-of-new-york-city)

NEW YORK		NEW YORK
14 PENN PLAZA – 225 W 34TH STREET, NEW YORK NY 10122		
SCALE -	MADE BY: YN CH'KD BY: PED	DATE: 8-23-2018 DATE: 9-21-2018
1879 BROMLEY MAP		FILE No. 13176 Figure No. 3

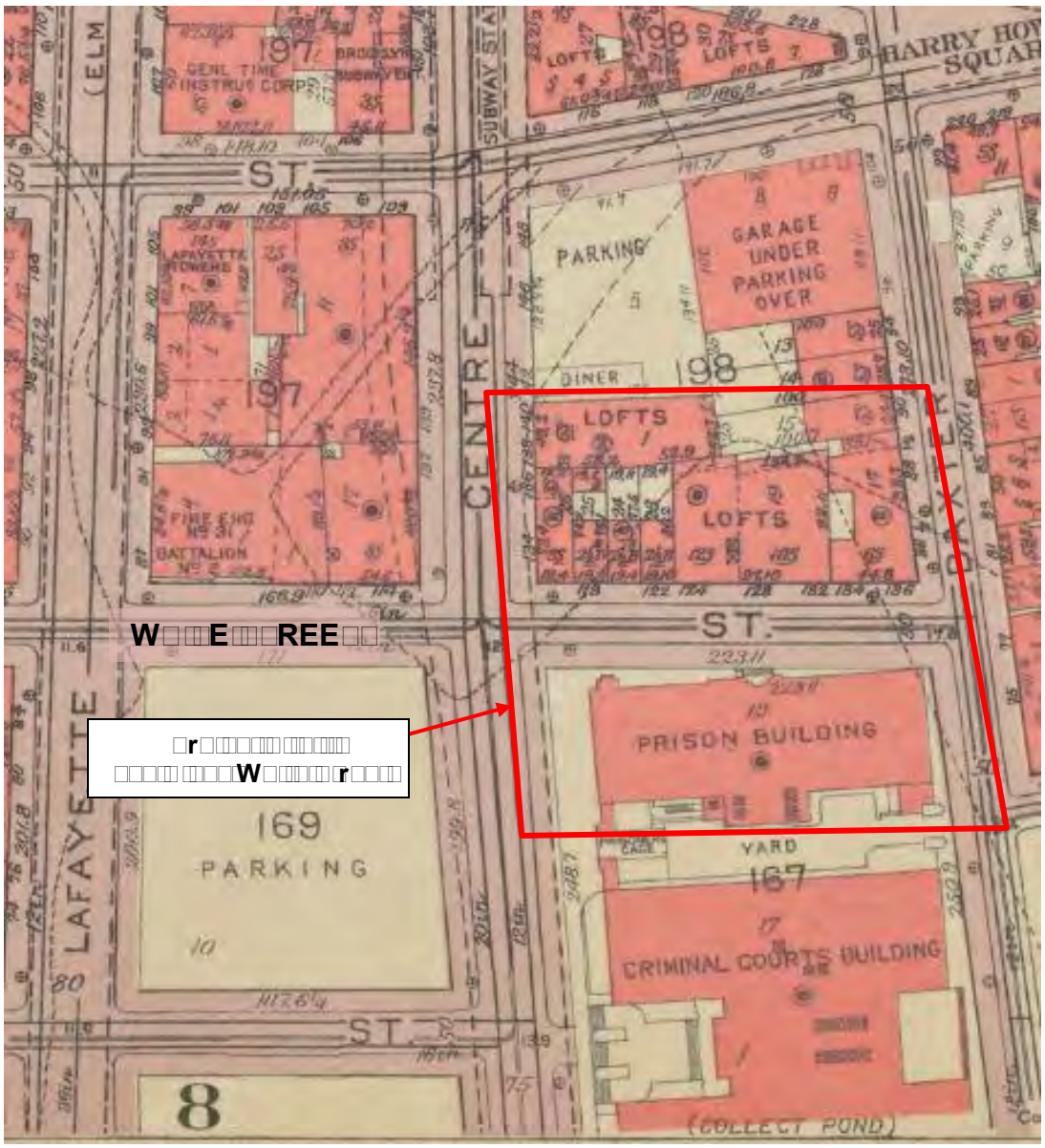


SOURCE:

Land Book of the Borough of Manhattan, City of New York, by G.W. Bromley & Co., Dated 1930. (digitalcollections.nypl.org)

NEW YORK			NEW YORK
14 PENN PLAZA – 225 W 34TH STREET, NEW YORK NY 10122			
SCALE	MADE BY: YN	DATE: 8-23-2018	FILE No.
-	CH'KD BY: PED	DATE: 9-21-2018	13176
1930 BROMLEY MAP			Figure No. 4

N



SOURCE:

Manhattan Land Book of the City of New York, by G. W. Bromley & Co., Dated 1955. (digitalcollections.nypl.org)

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14 PENN PLAZA – 225 W 34TH STREET, NEW YORK NY 10122			
SCALE	MADE BY: YN	DATE: 8-23-2018	FILE No.
-	CH'KD BY: PED	DATE: 9-21-2018	13176
1955 BROMLEY MAP			Figure No. 5

N

LEGEND

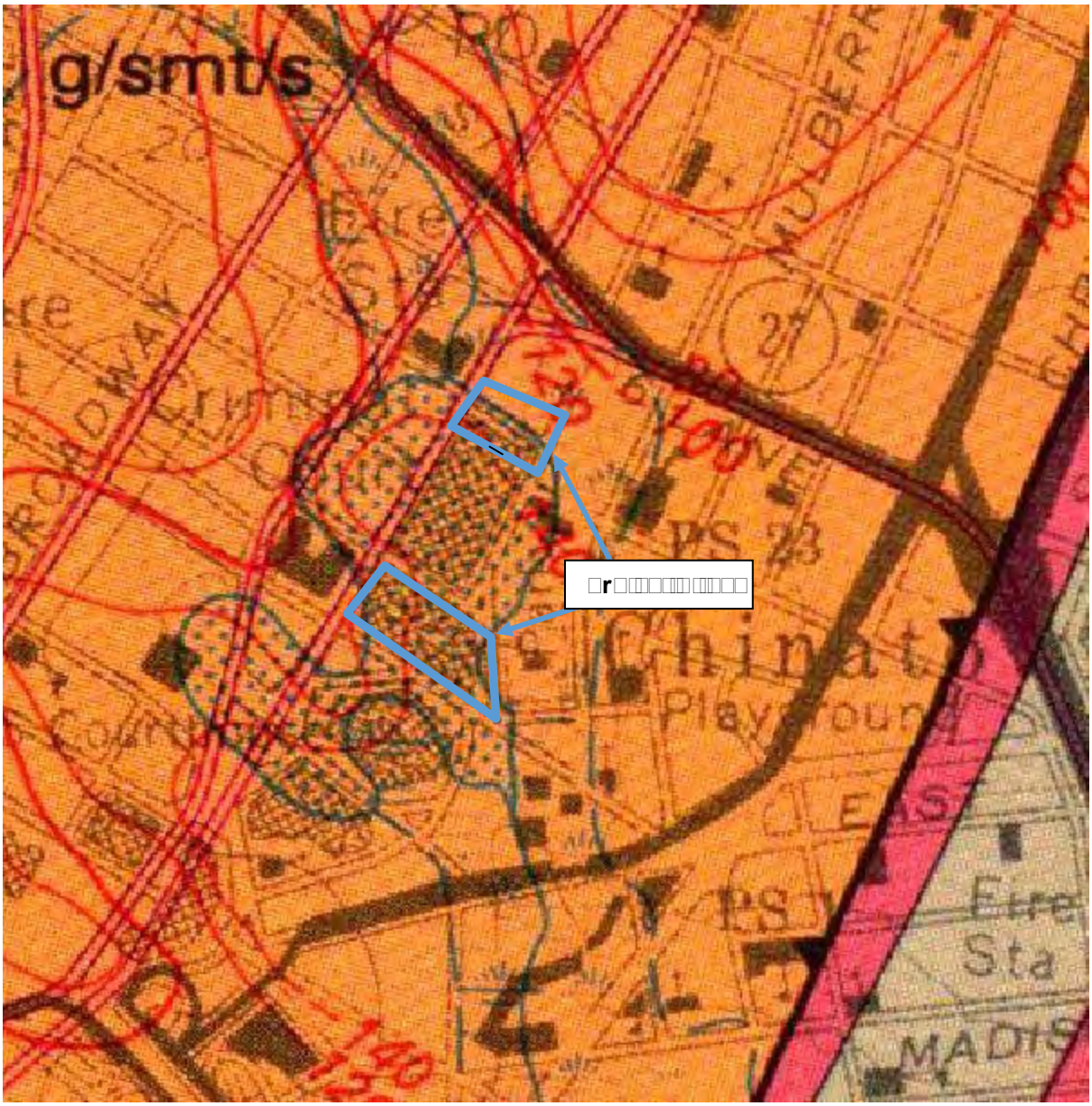
Pml — Manmade Land

Psd — Stratified Drift

SOURCE:

Surficial Geology Sheet, Brooklyn, Staten Island Quadrangle, Dated 1901.

NEW YORK			NEW YORK
14 PENN PLAZA – 225 W 34TH STREET, NEW YORK NY 10122			
SCALE	MADE BY: YN	DATE: 8-24-2018	FILE No.
-	CH'KD BY: PED	DATE: 9-21-2018	13176
SURFICIAL GEOLOGY MAP			Figure No. 6



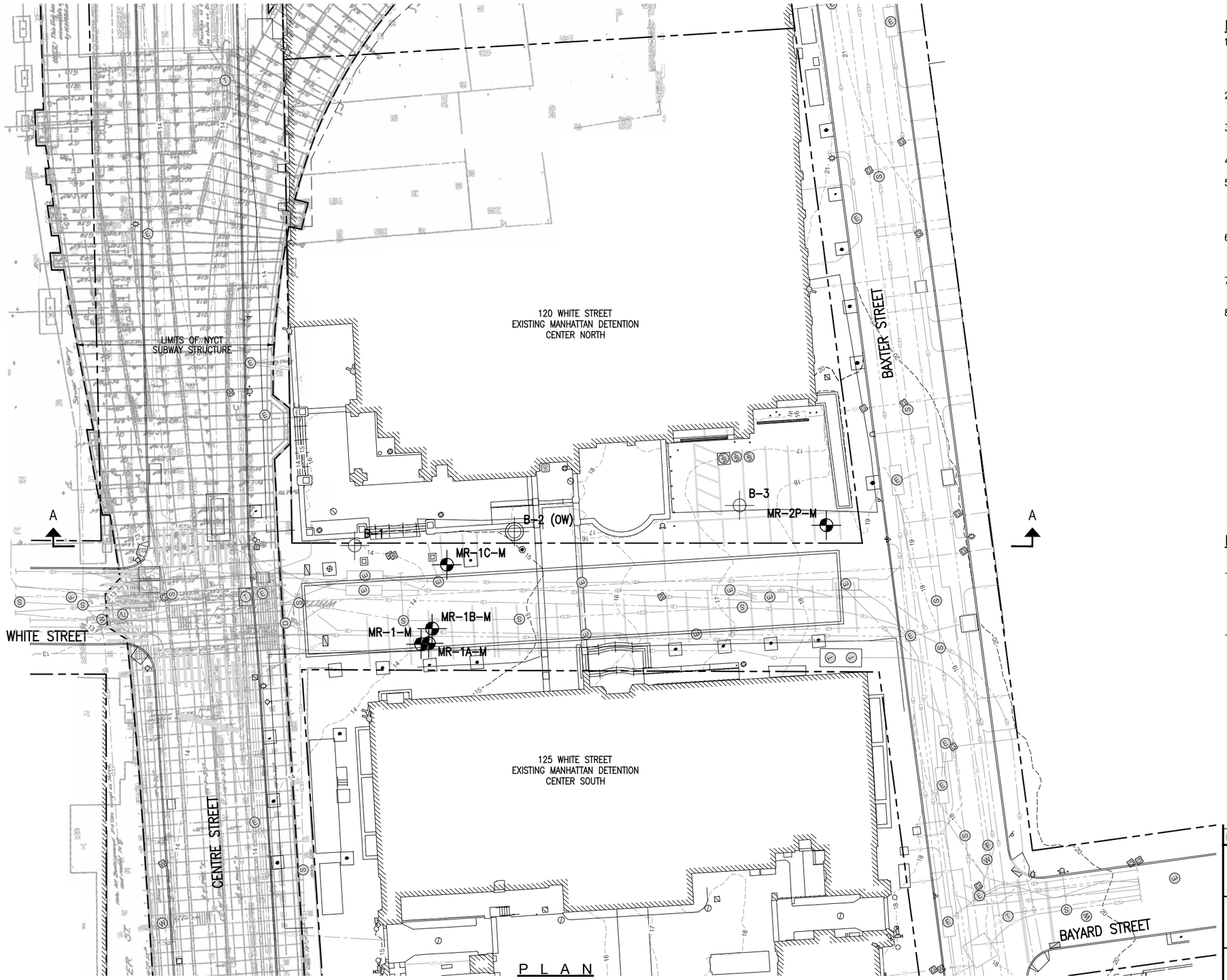
LEGEND

g/smt/s Gray sillimanite-muscovite-tourmaline schist (Manhattan Schist)

SOURCE:

Bedrock and Engineering Geologic Maps.
Charles A. Baskerville, 1994.

NEW YORK			NEW YORK
14 PENN PLAZA – 225 W 34TH STREET, NEW YORK NY 10122			
SCALE	MADE BY: YN	DATE: 8-13-2018	FILE No.
-	CH'KD BY: PED	DATE: 9-21-2018	13176
BEDROCK GEOLOGY MAP			Figure No. 7



P L A N

GRAPHIC SCALE
20' 10' 0 20' 40'

NOTES:

1. BASE PLAN OF EXISTING BUILDINGS AND FEATURES OBTAINED FROM TOPOGRAPHICAL SURVEY, MANHATTAN DETENTION CENTER, PREPARED BY MATRIX NEW WORLD, DATED JUNE 2, 2018, AND GOOGLE MAPS, 2018.
2. LOCATIONS OF NYCT STRUCTURES ARE APPROXIMATE AND WERE OBTAINED FROM NYCT RECORDS OF ROUTE 9, SECTION 2.
3. ELEVATIONS ARE IN FEET AND REFER TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88).
4. FOR SECTION A–A SEE DRAWING NO. GS–1–M.
5. ALL BORINGS WERE MADE IN ACCORDANCE WITH THE NEW YORK CITY BUILDING CODE AND THE STANDARD SPECIFICATIONS FOR SUBSURFACE BORING AND SAMPLING BY MUESER RUTLEDGE CONSULTING ENGINEERS (MRCE).
6. 2018 BORINGS WERE PERFORMED BY CRAIG TEST BORING BETWEEN AUGUST 14, 2018 AND AUGUST 17, 2018 UNDER CONTINUOUS INSPECTION OF MRCE.
7. 2017 BORINGS WERE PERFORMED BY WARREN GEORGE INC. IN APRIL 2017 UNDER THE DIRECTION OF YU & ASSOCIATES.
8. FOR MR BORINGS, LOCATIONS WERE MEASURED AND GROUND SURFACE ELEVATIONS WERE ESTIMATED FROM EXISTING SURVEYED REFERENCE POINTS.

LEGEND:

MR–1 – 2018 MRCE BORING.
– "P" INDICATES PIEZOMETER
– "A","B" INDICATES OFFSET FROM ORIGINAL LOCATION.

B–1 – 2017 YU & ASSOCIATES BORING.

REV.	DATE	BY	DESCRIPTION

BOROUGH BASED NYC JAILS SYSTEM
MAN. FACILITY–120 & 125 WHITE ST.
MANHATTAN NEW YORK

PERKINS EASTMAN
NEW YORK NEW YORK

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

SCALE			FILE NUMBER
GRAPHIC	MADE BY: L.F.C.	DATE: 10–23–2018	13176
	CH'KD BY: P.E.D.	DATE: 10–23–2018	

BORING LOCATION PLAN
120 & 125 WHITE STREET

DRAWING NUMBER
B–1–M

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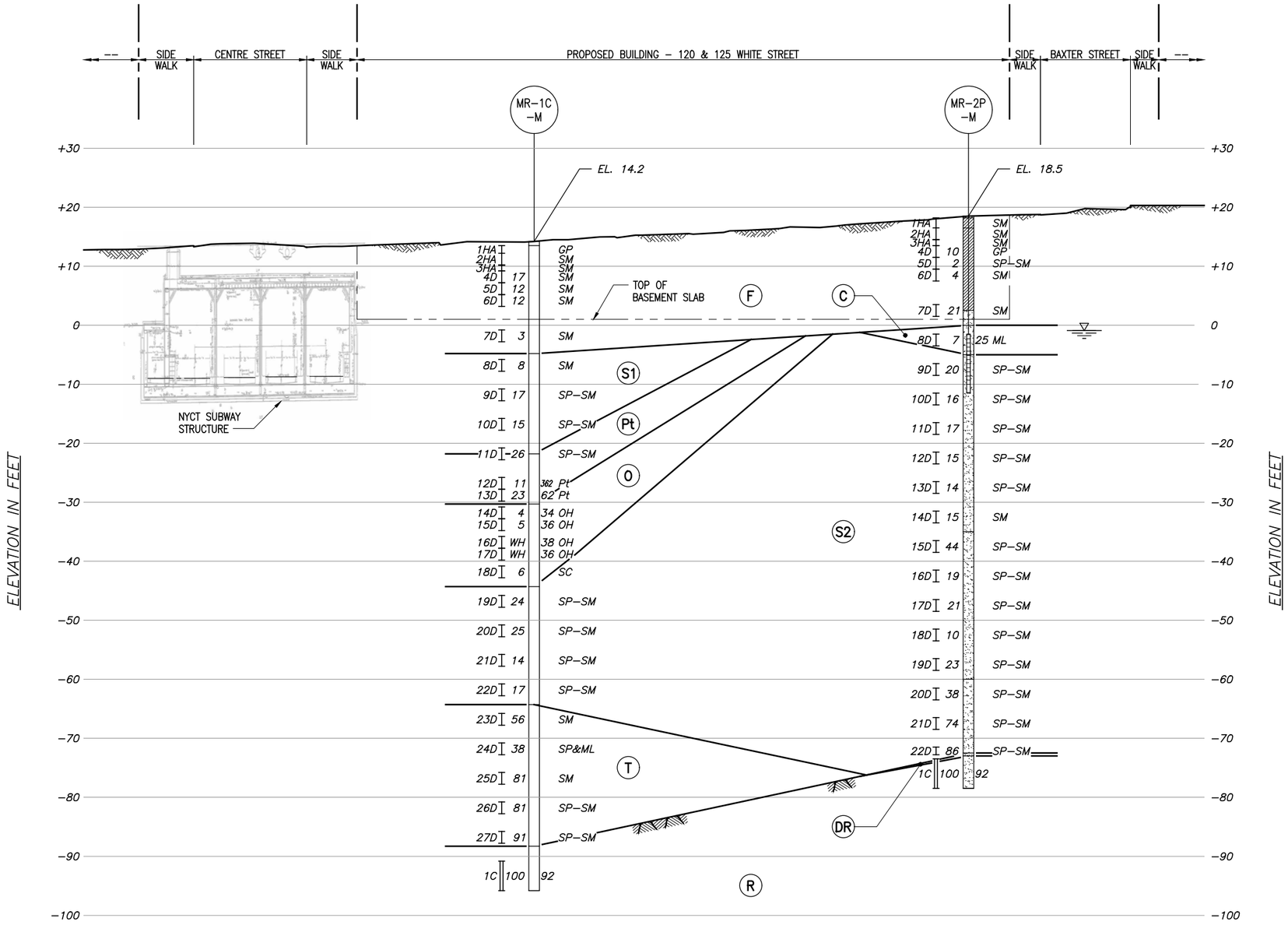

SECTION A-A

HORIZONTAL: 20' 10' 0 20' 40'

VERTICAL: 10' 5' 0 10' 20'

NOTES:

1. FOR BORING AND SECTION LOCATION AND PLAN NOTES, SEE DRAWING B–1–M.
2. STRATIFICATION AND GROUND SURFACE SHOWN ARE INTERPOLATIONS BETWEEN AND BEYOND BORINGS AND MAY NOT REPRESENT ACTUAL SUBSURFACE CONDITIONS.
3. SEE DRAWING GS–R FOR BORING LEGEND AND SUMMARY OF UNIFIED SOIL CLASSIFICATION SYSTEM. SEE DRAWING RC–1 FOR ROCK CORE CLASSIFICATION CRITERIA.
4. BORING LOGS WITH INDIVIDUAL SAMPLE DESCRIPTIONS WERE MADE BY MRCE AND INCLUDED IN APPENDIX A.

GENERAL STRATA DESCRIPTIONS:

(F) **FILL** – LOOSE TO MEDIUM COMPACT BROWN, GRAY BROWN, AND DARK GRAY FINE TO COARSE SAND, SOME TO TRACE SILT, TRACE TO SOME GRAVEL, TRACE BRICK FRAGMENTS, CONCRETE.

(S1) **UPPER SAND** – MEDIUM COMPACT TO LOOSE GRAY BROWN, RED BROWN, AND BROWN COARSE TO FINE SAND, SOME GRAVEL, TRACE SOME SILT.

(Pt) **PEAT** – MEDIUM DARK BROWN PEAT AND WOOD, SOME FINE TO COARSE SAND.

(O) **ORGANIC SILTY CLAY** – MEDIUM GRAY ORGANIC SILTY CLAY, TRACE SHELLS, TRACE FINE SAND, GRADING TO RED BROWN CLAYEY FINE SAND, TRACE MICA.

(C) **CLAY** – MEDIUM GRAY BROWN SILTY CLAY AND CLAYEY SILT, SOME TO TRACE FINE TO MEDIUM SAND, TRACE GRAVEL.

(S2) **LOWER SAND** – MEDIUM COMPACT BROWN, GRAY BROWN, AND RED BROWN FINE TO MEDIUM SAND, TRACE GRAVEL TO GRAVELLY, TRACE SILT, MICA, COARSE SAND.

(T) **GLACIAL TILL** – COMPACT TO VERY COMPACT BROWN, GRAY BROWN, AND RED BROWN FINE TO COARSE SAND, GRAVELLY TO SOME GRAVEL, SOME TO TRACE SILT, TRACE MICA, TRACE SILT POCKETS.

(DR) **DECOMPOSED ROCK** – VERY COMPACT GRAY AND BROWN GRAVELLY FINE TO COARSE SAND, SOME SILT.

(R) **ROCK** – HARD UNWEATHERED TO SLIGHTLY WEATHERED GRAY GNEISSIC SCHIST, BLOCKY TO CLOSELY JOINTED WITH WEATHERED JOINTS.

REV.	DATE	BY	DESCRIPTION

BOROUGH BASED NYC JAILS SYSTEM
MAN. FACILITY–120 & 125 WHITE ST.
MANHATTAN NEW YORK

PERKINS EASTMAN
NEW YORK NEW YORK

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

SCALE	MADE BY: L.F.C. DATE: 10–23–2018	FILE NUMBER
GRAPHIC	CH'KD BY: P.E.D. DATE: 10–23–2018	13176

GEOLOGIC SECTION A–A

DRAWING NUMBER **GS–1–M**

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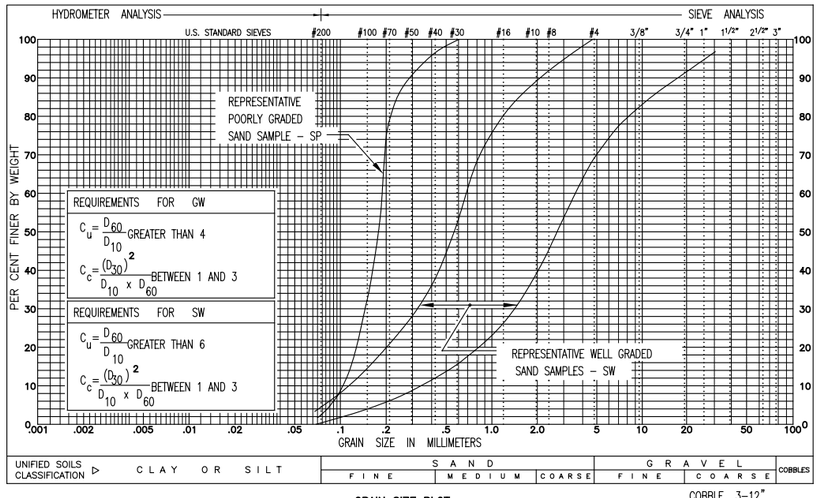
UNIFIED SOIL CLASSIFICATION (INCLUDING IDENTIFICATION AND DESCRIPTION)

MAJOR DIVISIONS			GROUP SYMBOLS	TYPICAL NAMES	FIELD IDENTIFICATION PROCEDURES (EXCLUDING PARTICLES LARGER THAN 3 IN. AND BASING FRACTIONS ON ESTIMATED WEIGHTS)
1	2		3	4	5
COARSE-GRAINED SOILS MORE THAN HALF OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE (THE NO. 200 SIEVE SIZE 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. (FOR VISUAL CLASSIFICATION, THE 1/4 -IN. SIZE MAY BE USED AS EQUIVALENT TO THE 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 THE SMALLEST PARTICLE VISIBLE TO THE NAKED EYE)					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

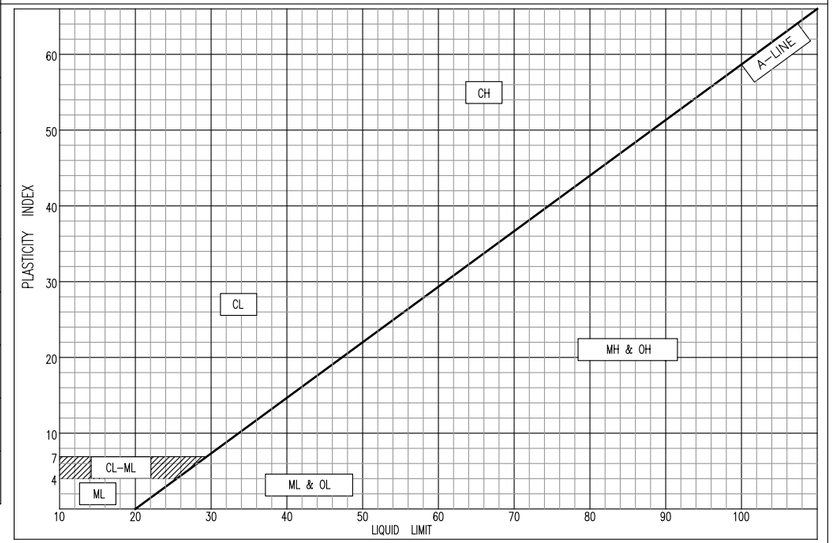


GRAIN SIZE PLOT

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
  - 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
  - W - WASH SAMPLE
  - 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 = ATTERBERG LIQUID LIMIT VALUE
- K] = 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

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

GEOTECHNICAL REFERENCE STANDARDS

DRAWING NO. GS-R

TABLE R–1 ROCK CORE CLASSIFICATION CRITERIA

HARDNESS/SOUNDNESS CLASSIFICATION	TYPICAL GEOLOGIC CLASSIFICATION	IDENTIFICATION CHARACTERISTICS	GENERAL MINIMUM CORING CHARACTERISTICS				INTACT SPECIMEN TYPICAL MINIMUM COMPRESSIVE STRENGTH
			NX OR LARGER		BX OR SMALLER		
			REC	RQD	REC	RQD	PSI
HARD ROCK UNWEATHERED MAY BE JOINTED	–CRYSTALLINE IGNEOUS, OR METAMORPHIC ROCKS –HIGHLY SILICEOUS SEDIMENTARY ROCKS	– UNWEATHERED FABRIC – RINGS WHEN STRUCK WITH BAR – SHARP AND HARD FRACTURE SURFACE WHEN BROKEN MECHANICALLY – MAY BE JOINTED, BUT JOINTS ARE GENERALLY TIGHT. JOINTS MAY BE IRON STAINED. – DOES NOT DISINTEGRATE UPON EXPOSURE – DOES NOT SLAKE IN WATER	95 OR MORE	85 OR MORE	85 OR MORE	75 OR MORE	3000
MEDIUM HARD ROCK SLIGHTLY WEATHERED MAY BE CLOSELY JOINTED	AS FOR HARD ROCKS AND: – MODERATELY SILICEOUS SEDIMENTARY ROCKS – CERTAIN CALCAREOUS ROCKS	AS FOR HARD ROCK, EXCEPT: – FABRIC MAY BE IRON STAINED – MAY BE CLOSELY JOINTED, BUT JOINTS ARE GENERALLY TIGHT. JOINTS HAVE SLIGHT WEATHERING OR MAY BE IRON STAINED.	70	50	50	40	1500
INTERMEDIATE ROCK MODERATELY WEATHERED MAY BE CLOSELY JOINTED	AS FOR MEDIUM HARD ROCKS AND: – MOST SEDIMENTARY ROCKS OTHER THAN COMPACTION SHALES – MOST CALCAREOUS ROCKS WHICH ARE NOT POROUS	AS FOR MEDIUM HARD ROCK, EXCEPT: – MODERATELY WEATHERED FABRIC – WEATHERED JOINTS – THUDS WHEN STRUCK BY BAR – CAN BE INDENTED WITH A STEEL NAIL – BREAKS READILY WITH HAMMER – PIECES OF WEATHERED SURFACE CAN BE BROKEN OFF BY HAND – DOES NOT DISINTEGRATE UPON EXPOSURE – UNWEATHERED PIECES DO NOT SLAKE	50	35	35	25	500
WEATHERED ROCK HIGHLY WEATHERED MAY BE BROKEN	AS FOR INTERMEDIATE ROCKS AND: – COMPACTION SEDIMENTARIES – CALCAREOUS ROCKS WITH SOIL–FILLED CAVITIES	AS FOR INTERMEDIATE ROCK, EXCEPT: – HIGHLY WEATHERED FABRIC – CAN BE BROKEN EASILY, CRUMBLES WITH DIFFICULTY BY HAND – CAN BE SCRAPED BY KNIFE – MAY SOFTEN UPON EXPOSURE – MAY SLAKE IN WATER – STANDARD PENETRATION RESISTANCE EXCEEDS 50 BLOWS/FOOT	LESS THAN 50	LESS THAN 35	LESS THAN 35	LESS THAN 25	150
		WHEN RECOVERED WITH SOIL SAMPLING TECHNIQUES, DESCRIBED AS FOR SOILS INCLUDING USC GROUP SYMBOLS. (WTHD ROCK) ADDED TO DESCRIPTION.					
DECOMPOSED ROCK (RESIDUAL SOILS)	ALL ROCK TYPES	– ROCK TEXTURE AND STRUCTURE OFTEN PRESERVED – GENERALLY SOIL–LIKE IN CONSISTENCY – CAN BE CRUMPLED BY SLIGHT HAND PRESSURE – CAN BE PEELED WITH A KNIFE – STANDARD PENETRATION RESISTANCE LESS THAN 50 BLOWS/FOOT	GENERALLY RECOVERED WITH SOIL SAMPLING TECHNIQUES AND DESCRIBED AS FOR SOILS INCLUDING USC GROUP SYMBOLS. (DEC ROCK) ADDED TO DESCRIPTION.				

NOTES:

1. ROCK CORE DESCRIPTIONS REPRESENT ONLY THE MATERIAL RECOVERED IN THE CORING OPERATIONS.
2. GENERAL MINIMUM CORING CHARACTERISTICS ASSUME ROCK CORING WITH A DOUBLE TUBE SERIES "M" OR EQUIVALENT CORE BARREL USING GOOD CORING TECHNIQUES AND EQUIPMENT.
3. REC – RECOVERY IS THE LENGTH OF CORE RECOVERED, EXPRESSED AS A PERCENTAGE OF THE LENGTH OF CORE RUN.
4. RQD – ROCK QUALITY DESIGNATION IS THE SUM OF THE LENGTHS OF CORE PIECES FOUR INCHES OR LONGER EXPRESSED AS A PERCENTAGE OF THE TOTAL LENGTH OF CORE RUN. LENGTHS ARE MEASURED BETWEEN IN–STU SEPARATIONS; MECHANICAL BREAKS RESULTING FROM CORING AND VERTICAL JOINTS ARE IGNORED.

TABLE R–2 WEATHERING AND JOINTING DEFINITIONS

DEGREE OF FABRIC WEATHERING

FABRIC WEATHERING		CHARACTERISTIC
Unweathered	UnW	No decomposition or discoloration rings when struck
Slightly Weathered	SlW	Iron Stained Rings when struck
Moderately Weathered	MdW	Deteriorated fabric Thuds when struck
Highly Weathered	HiW	Friable, easily broken by hand
Decomposed	Dec	Soil–like

DEGREE OF JOINT WEATHERING

JOINT WEATHERING		CHARACTERISTIC
Iron stained joints	FeJtS	Indicates movement of water along joints
Weathered joints	WJts	Joints are not tight and do not match. Joints have friable edges.

DEGREE OF JOINTING

JOINTING		JOINT FREQUENCY
Massive	Mssv	Less than 1 joint in 4 feet
Blocky	Blky	1 joint every 2 to 4 feet
Moderately Jointed	MdJtd	1 joint every foot to 2 feet
Jointed	Jtd	1 to 2 joints per foot
Closely Jointed	ClJtd	2 to 4 joints per foot
Broken	Bkn	More than 4 joints per foot

Vertical joints are ignored in RQD and joint frequency evaluations, but are noted in written descriptions and and on core sketches.

TABLE R–3 ABBREVIATIONS FOR ROCK CORE CLASSIFICATION

Blocky	Blky	Intermediate	Int
Broken	Bkn	Light	Lt
Brown	brn	Lignite	lign
Calcareous or Calcite	calc	Limestone	lms
Cavities	cvts	Jointed	Jtd
Chlorite	chl	Joints	Jts
Clay, Clayey	cl	Massive	Mssv
Closely Jointed	ClJtd	Medium Hard	MdHd
Coating on joint surface	coat	Mica, Micaceous	Mic
Crushed	crsh	Moderately Jointed	MdJtd
Dark	dk	Moderately Weathered	MdW
Decomposed	Dec	Pockets	pkts
Ditto	do	Quartz	qtz
Dolomite, Dolomitic	Dol	Recovery	Rec
Iron stained Joints	FeJts	Rock Quality Designation	RQD
Iron Stained	FeStn	Sand	sa
Feldspar	feld	Sandstone	ss
Foliation	Fol	Schist, Schistose	sch
Fractured	frct	Shale	sh
Fragments	fgmts	Shear zone	Sz
Gneiss, Gneissic	gns	Siliceous	sil
Gouge	gog	Silt	si
Granite, Granitic	gr	Slickensided	slks
Gray	gry	Slightly Weathered	SlW
Hard	Hd	Unweathered	UnW
Highly Weathered	HiW	Weathered	Wthd
Hornblende	Hbl	Weathered Joints	WJts
Injected	inj	Vein	Vn
Interbedded	Intrbd	Vertical Joints	VJts

TABLE R–4 ROCK CORE SKETCH KEY

SKETCH SYMBOLS

- Joint
- Healed Joint
- Broken
- Part of Core Not Recovered
- Cavities or Vugs in Core
- Clay
- Sand

JOINT ORIENTATION AND CONDITION

			SURFACE – CONDITION			
Parallel	–	//	Curved	– C	Slick	– 1
Crossing	–	X	Irregular	– I	Smooth	– 2
Foliation	–	F	Straight	– S	Rough	– 3
Stratification	–	S				
Unfoliated or Unstratified	–	U				
Mechanical Break	–	MB				

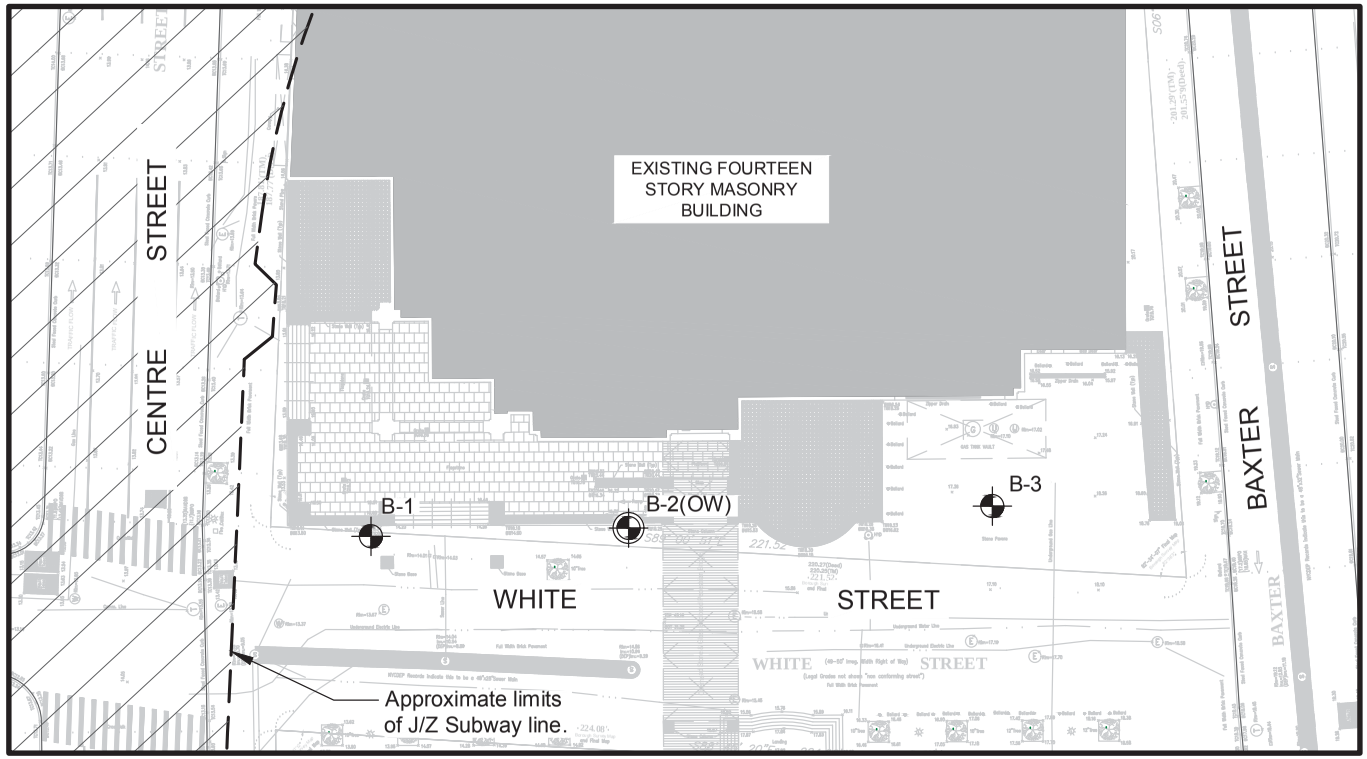
MUESER RUTLEDGE CONSULTING ENGINEERS
225 WEST 34th STREET – 14 PENN PLAZA
NEW YORK, NY 10122

ROCK CORE CLASSIFICATION CRITERIA

DRAWING NO. RC–1

□□□E□D□□□□□

□□R□□□RE□□RD□□□□□□□□□□□□□□□□□E□□□□□□□□□□



Legend:

- Location of Boring
- Location of Boring with Groundwater Observation Well

Notes:

1. Borings were performed between April 1 and April 8, 2017 by Warren George Inc., under the continuous inspection of YU.
2. Base plan was developed from a drawing titled "Architectural Survey" prepared by New York City Land Surveyors, PC., dated February 17, 2017.
3. Elevations shown refer to the North American Vertical Datum of 1988 (NAVD88).
4. Boring locations shown are based on field measurements from permanent site features and are approximate.

YU & Associates
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BORING LOCATION PLAN
MANHATTAN DETENTION COMPLEX

125 WHITE STEET

MANHATTAN NEW YORK

JOB NO.: 15173	SCALE: As Shown	DATE: 05/11/17	FIG. 5

YU & Associates

BORING LOG

BORING NUMBER: **B-1**
SHEET NUMBER: 1 of 3
PROJECT NUMBER: **15173**

PROJECT: **Manhattan Detention Complex**
LOCATION: **125 White Street, Manhattan, New York**
CLIENT: **SuperStructures Engineers and Architects**
CONTRACTOR: **Warren George Inc.**
DRILLER: **C. Moriera**
INSPECTOR: **M. Policastro**
DRILLING METHOD: **Mud Rotary**
RIG TYPE: **Mobile B-58 Truck Mounted Drill Rig**

LOCATION: **See Plan**
COORD. **Not Surveyed**
SURFACE ELEV.: **14.0± feet**
☐ surveyed
☒ estimated from: **2017 Survey**
DATUM: **NAVD88**
START DATE: **4/2/17** TIME: **9:00 am**
FINISH DATE: **4/2/17** TIME: **4:30 pm**

	Casing	2" Split Spoon	3" Split Spoon	Grab	Core Barrel
Type/Symbol	HW	S ☒	S* ☒	G ☒	C ☐
I.D.	4.0"	1.375"	2.375"		
O.D.	4.5"	2.0"	3.0"		
Length	35'	24"	24"		
Hammer Wt.	140 lbs	140 lbs	140 lbs	Drill Rod Size (OD): 2.625"	
Hammer Fall	30"	30"	30"	Hammer Type: Automatic	

Backfill Type: Soil Cuttings.
Observation Well Installed ☐ YES ☒ NO
Estimated Groundwater Level el -1 ±
Based On ☐ Soil Moisture ☐ Mud Level ☒ Observation Well Reading
NOTES: See Groundwater Records in Appendix C for B-2 (OW).

DEPTH (feet)	GRAPHIC LOG	CASING (Blows/ft) CORING (Min./ft)	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE SYMBOL	SAMPLE DEPTH (feet)	SPT (Blows/6 in.) 0"-6"	6"-12"	12"-18"	18"-24"	REC. (in.)	CORING RUN (in.)	CORING REC (in.)	CORING REC (%)	CORING L>4 (in.)	CORING RQD (%)	FIELD CLASSIFICATION AND REMARKS
																	Depth / Elev.
																	4" Paver, 4" Concrete, 6" Subbase. 1.2 / 12.8
																	Hand cleared to 5' for utility clearance.
		SPIN															
		SPIN															
		SPIN															
5		SPIN	S	1		5.0 - 7.0						5	2	5	3	8	Brown c-f SAND, little Silt, little c-f Gravel, frequent brick fragments, moist, (SM), (FILL NYCBC Class 7).
		85															
		38	S	2		7.0 - 9.0						4	3	4	10	8	Brown c-f SAND, little Silt, little c-f Gravel, moist, (SM), (FILL NYCBC Class 7).
		12															
		14	S	3		9.0 - 11.0						5	6	5	4	10	Brown c-f SAND, some Silt, trace f Gravel, moist, (SM), (FILL NYCBC Class 7).
10		18															
		20															
		25															
		20															
		18															
15		17	S	4/5		15.0 - 17.0						5	5	7	10	0	No sample recovery, sample obtained using 3" spoon.
		25															Black c-f SAND, trace Silt, trace f Gravel, (SP-SM), (FILL NYCBC Class 7).
		30															
		37															
		36															

YU & Associates

BORING LOG
(continued)

BORING NUMBER: **B-1**
SHEET NUMBER: 2 of 3
PROJECT NUMBER: **15173**

PROJECT: **Manhattan Detention Complex**
LOCATION: **125 White Street, Manhattan, New York**
CLIENT: **SuperStructures Engineers and Architects**

CONTRACTOR: **WGI**
DRILLER: **C. Moriera**
INSPECTOR: **M. Policastro**

DEPTH (feet)	GRAPHIC LOG	CASING (Blows/ft) CORING (Min./ft)	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE SYMBOL	SAMPLE DEPTH (feet)	SPT (Blows/6 in.) 0"-6"	SPT 6"-12"	SPT 12"-18"	SPT 18"-24"	SPT REC. (in.)	CORING RUN (in.)	CORING REC (in.)	CORING REC (%)	CORING L>4 (in.)	CORING RQD (%)	FIELD CLASSIFICATION AND REMARKS
		45	S	6		20.0 - 22.0	6	5	5	9	6						Black-Brown c-f SAND, little Clayey Silt, moist, (SM), (FILL NYCBC Class 7).
		40															
		38															
		42															
		50															
25		47	S	7		25.0 - 27.0	2	1	1	13	0						No sample recovery.
		80															
		27															
		32															
		30															
30		25	S	8		30.0 - 32.0	16	12	11	11	4						Brown c-f SAND, little Silt, little c-f Gravel, wet, (SM), (FILL NYCBC Class 7).
		29															
		38															
		36															
		48															
35			S	9		35.0 - 37.0	6	8	6	8	1						Brown Organic SILT, and m-f Sand, trace f Gravel, wet, (OL), (FILL NYCBC Class 7).
																	37.0 -23.0
			S	10		37.0 - 39.0	3	2	4	8	12						Brown PEAT, little Silty Clay, wet, (PT), (NYCBC Class 6).
40																	
			S	11		40.0 - 42.0	3	3	5	9	4						Brown PEAT, little Silty Clay, wet, (PT), (NYCBC Class 6).
			U	1		42.0 - 44.0	P	U	S	H	10						Brown PEAT, little Silty Clay, wet, (PT), (NYCBC Class 6).
45			S	12		44.0 - 46.0	4	7	7	8	24						Brown-Black PEAT, little Silt, PP=3.0tsf, moist, (PT), (NYCBC Class 6).
																	47.0 -33.0
			S	13		47.0 - 49.0	3	2	1	1	24						Top 12": Dark Gray Organic Silty CLAY, PP=1.75tsf, (OH),

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BORING LOG
(continued)

BORING NUMBER: **B-1**
SHEET NUMBER: 3 of 3
PROJECT NUMBER: **15173**

PROJECT: **Manhattan Detention Complex**
LOCATION: **125 White Street, Manhattan, New York**
CLIENT: **SuperStructures Engineers and Architects**

CONTRACTOR: **WGI**
DRILLER: **C. Moriera**
INSPECTOR: **M. Policastro**

DEPTH (feet)	GRAPHIC LOG	CASING (Blows/ft) CORING (Min./ft)	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE SYMBOL	SAMPLE DEPTH (feet)	SPT (Blows/6 in.) 0"-6"	SPT 6"-12"	SPT 12"-18"	SPT 18"-24"	SPT REC. (in.)	CORING RUN (in.)	CORING REC (in.)	CORING REC (%)	CORING L>4 (in.)	CORING RQD (%)	FIELD CLASSIFICATION AND REMARKS
50			U	2		49.0 - 51.0	P	U	S	H	24						(NYCBC Class 6). Bottom 12": Gray Organic Silty CLAY trace f Sand, PP=0.25tsf, moist, (OL), (NYCBC Class 6). Gray Organic Silty CLAY, trace f Sand, PP=0.25tsf, moist, (OL), (NYCBC Class 6).
			S	14		51.0 - 53.0	3	2	3	3	24						Gray Organic Silty CLAY, trace f Sand, PP=0.25tsf, moist, (OL), (NYCBC Class 6).
55			S	15		55.0 - 57.0	WOH	WOH	WOH	WOH	24						Gray Organic Silty CLAY, trace f Sand, PP=0.25tsf, moist, (OL), (NYCBC Class 6).
60			S	16		60.0 - 62.0	WOR	WOR	WOR	WOR	24						Gray Silty CLAY, little f Sand, PP=0.25tsf, moist, (CL), (NYCBC Class 6).
																	63.5 -49.5
65			S	17		65.0 - 67.0	7	6	9	8	10						Light brown c-f SAND, trace Silt, trace f Gravel, wet, (SP), (NYCBC Class 3b).
																	Rig chatter at 69'.
70			S	18		70.0 - 72.0	23	18	14	15	12						Light brown c-f SAND, little c-f Gravel, trace Silt, wet, (SP-SM), (NYCBC Class 3a).
																	72.0 -58.0
																	End of Boring at 72 feet
75																	

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BORING LOG

BORING NUMBER: **B-2 (OW)**
SHEET NUMBER: 1 of 3
PROJECT NUMBER: **15173**

PROJECT: **Manhattan Detention Complex**
LOCATION: **125 White Street, Manhattan, New York**
CLIENT: **SuperStructures Engineers and Architects**
CONTRACTOR: **Warren George Inc.**
DRILLER: **C. Moriera**
INSPECTOR: **M. Policastro**
DRILLING METHOD: **Mud Rotary**
RIG TYPE: **Mobile B-58 Truck Mounted Drill Rig**

LOCATION: **See Plan**
COORD. **Not Surveyed**
SURFACE ELEV.: **14.5± feet**
☐ surveyed
☒ estimated from: **2017 Survey**
DATUM: **NAVD88**
START DATE: **4/1/17** TIME: **8:00 am**
FINISH DATE: **4/1/17** TIME: **5:00 pm**

	Casing	2" Split Spoon	3" Split Spoon	Grab	Core Barrel
Type/Symbol	HW	S ☒	S* ☒	G ☒	C ☐
I.D.	4.0"	1.375"	2.375"		
O.D.	4.5"	2.0"	3.0"		
Length	15'	24"	24"		
Hammer Wt.	140 lbs	140 lbs	140 lbs	Drill Rod Size (OD): 2.625"	
Hammer Fall	30"	30"	30"	Hammer Type: Automatic	

Backfill Type: Soil Cuttings / #2 Sand.
Observation Well Installed ☒ YES ☐ NO
Estimated Groundwater Level el -1 ±
Based On ☐ Soil Moisture ☐ Mud Level ☒ Observation Well Reading
NOTES: See Groundwater Records in Appendix C.

DEPTH (feet)	GRAPHIC LOG	CASING (Blows/ft) CORING (Min./ft)	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE SYMBOL	SAMPLE DEPTH (feet)	SPT (Blows/6 in.) 0"-6"	6"-12"	12"-18"	18"-24"	REC. (in.)	CORING RUN (in.)	CORING REC (in.)	CORING REC (%)	CORING L>4 (in.)	CORING RQD (%)	FIELD CLASSIFICATION AND REMARKS
																	Depth / Elev.
																	4" Paver, 4" Concrete, 6" Subbase. 1.2 / 13.3
																	Hand cleared to 5' for utility clearance.
5		SPIN															Obstruction at 5', drilled to 6'.
		SPIN	S	1		6.0 - 8.0	32	48	22	1	0						No sample recovery, Gravel in tip.
		SPIN															
		SPIN	S	2		8.0 - 10.0	12	8	4	5	4						Dark gray c-f SAND, some f Gravel, little Silt, frequent brick, concrete, glass and slate fragments, petroleum odor, moist, (SM), (FILL NYCBC Class 7).
		SPIN															
10		SPIN	S	3		10.0 - 12.0	50	62	35	30	20						Dark gray c-f SAND, some c-f Gravel, little Silt, frequent brick, concrete, glass and slate fragments, moist, (SM), (FILL NYCBC Class 7).
		SPIN															
		SPIN	S	4		12.0 - 14.0	5	18	11	9	6						Brown GRAVEL, some c-f Sand, little Silt, frequent concrete fragments, moist, (GM), (FILL NYCBC Class 7).
		SPIN															
		SPIN	S	5		14.0 - 16.0	14	15	23	16	2						Brown m-f SAND, trace Silt, wet, (SP), (FILL NYCBC Class 7).
15			S	6		16.0 - 18.0	10	12	15	17	6						Brown c-f SAND, little Silt, little f Gravel, moist, (SM), (FILL NYCBC Class 7).
			S	7		18.0 - 20.0	13	16	17	23	22						Brown c-f SAND, some c-f Gravel, little Silt, moist, (SM), (FILL NYCBC Class 7).

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BORING LOG
(continued)

BORING NUMBER: **B-2 (OW)**
SHEET NUMBER: 2 of 3
PROJECT NUMBER: **15173**

PROJECT: **Manhattan Detention Complex**
LOCATION: **125 White Street, Manhattan, New York**
CLIENT: **SuperStructures Engineers and Architects**

CONTRACTOR: **WGI**
DRILLER: **C. Moriera**
INSPECTOR: **M. Policastro**

DEPTH (feet)	GRAPHIC LOG	CASING (Blows/ft) CORING (Min./ft)	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE SYMBOL	SAMPLE DEPTH (feet)	SPT (Blows/6 in.) 0"-6"	SPT 6"-12"	SPT 12"-18"	SPT 18"-24"	REC. (in.)	CORING RUN (in.)	CORING REC (in.)	CORING REC (%)	CORING L>4 (in.)	CORING RQD (%)	FIELD CLASSIFICATION AND REMARKS Depth	Elev.
			S	8		20.0 - 22.0	10	10	21	19	6						Brown c-f GRAVEL, trace c-f Sand, trace Silt, wet, (GP), (FILL NYCBC Class 7).	
25			S	9		25.0 - 27.0	10	17	17	12	6						Brown c-f GRAVEL, little c-f Sand, little Silt, wet, (GM), (FILL NYCBC Class 7).	
30			S	10		30.0 - 32.0	19	30	40	58	22						Top 10": Brown-black Silty CLAY, occasional organic matter, PP=0.25tsf, moist, (OL), (FILL NYCBC Class 7). Bottom 12": wood.	32.0 -17.5
			S	11		32.0 - 34.0	3	5	5	4	8						Brown PEAT, trace f Gravel, moist, (PT), (NYCBC Class 6).	
35			S	12		35.0 - 37.0	3	3	5	9	14						Brown-black PEAT, moist, (PT), (NYCBC Class 6).	38.5 -24.0
40			S	13		40.0 - 42.0	WOH	WOH	WOH	WOH	20						Gray Organic CLAY & SILT, occasional f Sand partings, PP=0.5tsf, moist, (OL), (NYCBC Class 6).	
			U	1		42.0 - 44.0	P	U	S	H	0						No sample recovery.	
45			S	14		44.0 - 46.0	WOH	WOH	WOH	WOH	24						Gray Silty CLAY, occasional f Sand partings, PP=0.25tsf, moist, (OL), (NYCBC Class 6).	
			U	2		46.0 - 48.0	P	U	S	H	17						Gray Silty CLAY, occasional f Sand partings, PP=0.25tsf, moist, (OL), (NYCBC Class 6).	

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BORING LOG
(continued)

BORING NUMBER: **B-2 (OW)**
SHEET NUMBER: 3 of 3
PROJECT NUMBER: **15173**

PROJECT: **Manhattan Detention Complex**
LOCATION: **125 White Street, Manhattan, New York**
CLIENT: **SuperStructures Engineers and Architects**

CONTRACTOR: **WGI**
DRILLER: **C. Moriera**
INSPECTOR: **M. Policastro**

DEPTH (feet)	GRAPHIC LOG	CASING (Blows/ft) CORING (Min./ft)	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE SYMBOL	SAMPLE DEPTH (feet)	SPT (Blows/6 in.) 0"-6"	6"-12"	12"-18"	18"-24"	REC. (in.)	CORING RUN (in.)	CORING REC (in.)	CORING REC (%)	CORING L>4 (in.)	CORING RQD (%)	FIELD CLASSIFICATION AND REMARKS
50			S	15		48.0 - 50.0	WOH	WOH	WOH	WOH	12						Gray CLAY & SILT, little f Sand, PP=0.25tsf, wet, (OL), (NYCBC Class 6).
			S	16		50.0 - 52.0	3	5	5	5	0						No sample recovery.
																	53.5 -39.0
55			S	17		55.0 - 57.0	8	12	7	14	8						Light brown c-f SAND, trace Silt, little f Gravel, wet, (SP), (NYCBC Class 3b).
																	Rig chatter 58'-59'.
60			S	18		60.0 - 62.0	15	20	18	24	4						Brown c-f SAND, and c-f Gravel, trace Silt, wet, (SP-SM), (NYCBC Class 3a).
																	62.0 -47.5
																	End of Boring at 62 feet
65																	
70																	
75																	

Depth Elev.

YU BORING LOG-SCA 15173 DATABASE.GPJ 17105 BPBORINGS_LIBRARY REV.GLB 5/15/17

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BORING LOG

BORING NUMBER: **B-3**
SHEET NUMBER: 1 of 3
PROJECT NUMBER: **15173**

PROJECT: **Manhattan Detention Complex**
LOCATION: **125 White Street, Manhattan, New York**
CLIENT: **SuperStructures Engineers and Architects**
CONTRACTOR: **Warren George Inc.**
DRILLER: **C. Moriera**
INSPECTOR: **M. Policastro**
DRILLING METHOD: **Mud Rotary**
RIG TYPE: **Mobile B-58 Truck Mounted Drill Rig**

LOCATION: **See Plan**
COORD. **Not Surveyed**
SURFACE ELEV.: **17.5± feet**
☐ surveyed
☒ estimated from: **2017 Survey**
DATUM: **NAVD88**
START DATE: **4/8/17** TIME: **8:15 am**
FINISH DATE: **4/8/17** TIME: **1:00 pm**

	Casing	2" Split Spoon	3" Split Spoon	Grab	Core Barrel
Type/Symbol	HW	S ☒	S* ☒	G ☒	C ☐
I.D.	4.0"	1.375"	2.375"		
O.D.	4.5"	2.0"	3.0"		
Length	30'	24"	24"		
Hammer Wt.	140/300 lbs	140 lbs	140 lbs	Drill Rod Size (OD): 2.625"	
Hammer Fall	30"	30"	30"	Hammer Type: Automatic/ Donut	

Backfill Type: Soil Cuttings.
Observation Well Installed ☐ YES ☒ NO
Estimated Groundwater Level el -1 ±
Based On ☐ Soil Moisture ☐ Mud Level ☒ Observation Well Reading
NOTES: See Groundwater Records in Appendix C for B-2 (OW).

DEPTH (feet)	GRAPHIC LOG	CASING (Blows/ft) CORING (Min./ft)	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE SYMBOL	SAMPLE DEPTH (feet)	SPT (Blows/6 in.) 0"-6"	6"-12"	12"-18"	18"-24"	REC. (in.)	CORING RUN (in.)	CORING REC (in.)	CORING REC (%)	CORING L>4 (in.)	CORING RQD (%)	FIELD CLASSIFICATION AND REMARKS
																	Depth / Elev.
																	4" Paver, 1" Asphalt, 11" Concrete, 6" Subbase. 1.8 / 15.7
																	Hand cleared to 5' for utility clearance.
5			S	1		5.0 - 7.0	6	11	15	19	6						Red-brown c-f SAND, little c-f Gravel, trace Silt, frequent brick and concrete fragments, dry, (SP-SM), (FILL NYCBC Class 7).
		26															
		30	S	2		7.0 - 9.0	12	20	24	30	12						Brown c-f SAND, trace f Gravel, trace Silt, frequent brick fragments, dry, (SP-SM), (FILL NYCBC Class 7).
		32															
		28	S	3		9.0 - 11.0	13	30	97	60	10						Brown c-f SAND, little Silt, trace f Gravel, frequent brick fragments, moist, (SM), (FILL NYCBC Class 7).
10		48															
		180															
		200															
		160															300 lb. hammer used to advance casing from 11' to 16' below existing grade.
		185															
15		176	S	4		15.0 - 17.0	12	15	19	12	6						Brown c-f SAND, little Silt, trace f Gravel, moist, (SM), (FILL NYCBC Class 7).
		SPIN															
		SPIN															
		SPIN															
		SPIN															

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BORING LOG
(continued)

BORING NUMBER: **B-3**
SHEET NUMBER: 2 of 3
PROJECT NUMBER: **15173**

PROJECT: **Manhattan Detention Complex**
LOCATION: **125 White Street, Manhattan, New York**
CLIENT: **SuperStructures Engineers and Architects**

CONTRACTOR: **WGI**
DRILLER: **C. Moriera**
INSPECTOR: **M. Policastro**

DEPTH (feet)	GRAPHIC LOG	CASING (Blows/ft) CORING (Min./ft)	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE SYMBOL	SAMPLE DEPTH (feet)	SPT (Blows/6 in.) 0"-6"	SPT 6"-12"	SPT 12"-18"	SPT 18"-24"	SPT REC. (in.)	CORING RUN (in.)	CORING REC (in.)	CORING REC (%)	CORING L>4 (in.)	CORING RQD (%)	FIELD CLASSIFICATION AND REMARKS
		SPIN	S	5		20.0 - 22.0	9	6	15	12	4						Dark gray Silty CLAY, and m-f Sand, frequent (75%) wood fibers, moist, (OL), (FILL NYCBC Class 7).
		SPIN															
		SPIN															
		SPIN															23.5 -6.0
		SPIN															
25		SPIN	S	6		25.0 - 27.0	18	20	19	21	9						Brown c-f SAND, trace Silt, trace f Gravel, wet, (SP-SM), (NYCBC Class 3a).
		SPIN															
		SPIN															
		SPIN															
		SPIN															
30			S	7		30.0 - 32.0	11	13	15	16	10						Brown c-f SAND, trace Silt, wet, (SP), (NYCBC Class 3b).
35			S	8		35.0 - 37.0	15	18	20	19	10						Brown c-f SAND, trace Silt, wet, (SP), (NYCBC Class 3a).
40			S	9		40.0 - 42.0	9	10	9	11	12						Red-brown m-f SAND, trace Silt, wet, (SP), (NYCBC Class 3b).
45			S	10		45.0 - 47.0	11	10	12	12	10						Red-brown c-f SAND, trace Silt, wet, (SP), (NYCBC Class 3b).

YU BORING LOG-SCA 15173 DATABASE.GPJ 17105 BPBORINGS_LIBRARY REV.GLB 5/15/17

YU & Associates

BORING LOG
(continued)

BORING NUMBER: **B-3**
SHEET NUMBER: 3 of 3
PROJECT NUMBER: **15173**

PROJECT: **Manhattan Detention Complex**
LOCATION: **125 White Street, Manhattan, New York**
CLIENT: **SuperStructures Engineers and Architects**

CONTRACTOR: **WGI**
DRILLER: **C. Moriera**
INSPECTOR: **M. Policastro**

DEPTH (feet)	GRAPHIC LOG	CASING (Blows/ft) CORING (Min./ft)	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE SYMBOL	SAMPLE DEPTH (feet)	SPT (Blows/6 in.) 0"-6"	6"-12"	12"-18"	18"-24"	REC. (in.)	CORING RUN (in.)	CORING REC (in.)	CORING REC (%)	CORING L>4 (in.)	CORING RQD (%)	FIELD CLASSIFICATION AND REMARKS Depth / Elev.
50			S	11		50.0 - 52.0	9	15	20	19	6						Red-brown c-f SAND, little c-f Gravel, trace Silt, wet, (SP-SM), (NYCBC Class 3a). 52.0 / -34.5
																	End of Boring at 52 feet
55																	
60																	
65																	
70																	
75																	

YU BORING LOG-SCA 15173 DATABASE.GPJ 17105 BPBORINGS_LIBRARY REV.GLB 5/15/17

MUESER RUTLEDGE CONSULTING ENGINEERS

BORING LOG

BORING NO. MR-1-M
SHEET 1 OF 2
FILE NO. 13176
SURFACE ELEV. 14.2±
RES. ENGR. YUTA NAKAMURA

PROJECT: BOROUGH BASED NYC JAIL SYSTEM - MANHATTAN FACILITY
LOCATION: NEW YORK, NEW YORK

DAILY PROGRESS	SAMPLE NO.	SAMPLE DEPTH	SAMPLE BLOWS/6"	SAMPLE DESCRIPTION	STRATA	DEPTH	CASING BLOWS	REMARKS
07:00	1HA	0.2	HAND	Gray gravelly fine to coarse sand, trace silt	**	0.2		**Brick tiles from 0' to 2'.
08-14-18		2.0	AUGER	(Fill) (SP-SM)	F	2		Hand auger from 0.2' to 2'.
Tues., Cldy.								
72°F, 07:30						5		Obstruction at 2'; concrete; potential utility. Borehole offset to Boring MR-1A-M.
						10		End of Boring at 2'.
						15		
						20		
						25		
						30		
						35		
						40		
						45		
						50		

MUESER RUTLEDGE CONSULTING ENGINEERS

BORING NO. MR-1-M
SHEET 2 **OF** 2

PROJECT BOROUGH BASED NYC JAIL SYSTEM - MANHATTAN FACILITY
FILE NO. 13176
LOCATION NEW YORK, NEW YORK
SURFACE ELEV. 14.2±
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	[ ] YES	[X] NO		
TRUCK		MECHANICAL		DIA., IN.		DEPTH, FT. FROM		TO
SKID		HYDRAULIC		DIA., IN.		DEPTH, FT. FROM		TO
BARGE		OTHER		DIA., IN.		DEPTH, FT. FROM		TO
OTHER	TRACK							

TYPE AND SIZE OF

D-SAMPLER
U-SAMPLER
S-SAMPLER
CORE BARREL
CORE BIT
DRILL RODS

DRILLING MUD USED [ ] YES [X] NO

DIAMETER OF ROTARY BIT, IN.
TYPE OF DRILLING MUD

AUGER USED [X] YES [ ] NO

TYPE AND DIAMETER, IN. 5" HAND AUGER

CASING HAMMER, LBS. AVERAGE FALL, IN.
SAMPLER HAMMER, LBS. AVERAGE FALL, IN.

WATER LEVEL OBSERVATIONS IN BOREHOLE

DATE	TIME	DEPTH OF HOLE	DEPTH OF CASING	DEPTH TO WATER	CONDITIONS OF OBSERVATION
					NO WATER LEVEL 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.	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: HAND AUGER	2'

BORING CONTRACTOR CRAIG GEOTECHNICAL DRILLING
DRILLER NICK BEEHLER **HELPERS** MYLES NEIPERT
REMARKS OBSTRUCTION AT 2'. BOREHOLE OFFSET TO BORING MR-1A-M.
BOREHOLE BACKFILLED WITH CUTTINGs & CONCRETE, & PATCHED WITH ASPHALT.
RESIDENT ENGINEER YUTA NAKAMURA **DATE** 08-14-18
CLASSIFICATION CHECK: CHERYL J. MOSS **TYPING CHECK:** PATRICK DONALDSON

MUESER RUTLEDGE CONSULTING ENGINEERS

BORING LOG

BORING NO. MR-1A-M
SHEET 1 OF 2
PROJECT: BOROUGH BASED NYC JAIL SYSTEM - MANHATTAN FACILITY
FILE NO. 13176
LOCATION: NEW YORK, NEW YORK
SURFACE ELEV. 14.2±
RES. ENGR. YUTA NAKAMURA

DAILY PROGRESS	SAMPLE NO.	SAMPLE DEPTH	SAMPLE BLOWS/6"	SAMPLE DESCRIPTION	STRATA	DEPTH	CASING BLOWS	REMARKS
07:30								Hand auger from 0.2'
08-14-18						2		to 2'.
Tues., Cldy.								Obstruction at 2';
74°F, 07:45								concrete.
						5		Borehole offset to
								Boring MR-1B-M.
								End of Boring at 2'.
						10		
						15		
						20		
						25		
						30		
						35		
						40		
						45		
						50		

MRCE Form BL-1

BORING NO. MR-1A-M

MUESER RUTLEDGE CONSULTING ENGINEERS

BORING NO. MR-1A-M
SHEET 2 **OF** 2

PROJECT BOROUGH BASED NYC JAIL SYSTEM - MANHATTAN FACILITY **FILE NO.** 13176
LOCATION NEW YORK, NEW YORK **SURFACE ELEV.** 14.2±
BORING LOCATION SEE BORING LOCATION PLAN **DATUM** NAVD 88

BORING EQUIPMENT AND METHODS OF STABILIZING BOREHOLE

TYPE OF BORING RIG
TRUCK
SKID
BARGE
OTHER TRACK - CME-55

TYPE OF FEED DURING CORING
MECHANICAL
HYDRAULIC
OTHER

CASING USED [ ] YES [X] NO
DIA., IN. / DEPTH, FT. FROM / TO

TYPE AND SIZE OF
D-SAMPLER
U-SAMPLER
S-SAMPLER
CORE BARREL
CORE BIT
DRILL RODS

DRILLING MUD USED [ ] YES [X] NO
DIAMETER OF ROTARY BIT, IN.
TYPE OF DRILLING MUD

AUGER USED [X] YES [ ] NO
TYPE AND DIAMETER, IN. 5" HAND AUGER

CASING HAMMER, LBS. AVERAGE FALL, IN.
SAMPLER HAMMER, LBS. AVERAGE FALL, IN.

WATER LEVEL OBSERVATIONS IN BOREHOLE

DATE	TIME	DEPTH OF HOLE	DEPTH OF CASING	DEPTH TO WATER	CONDITIONS OF OBSERVATION
					NO WATER LEVEL 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.	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: HAND AUGER	2'

BORING CONTRACTOR CRAIG GEOTECHNICAL DRILLING
DRILLER NICK BEEHLER **HELPERS** MYLES NEIPERT
REMARKS OBSTRUCTION AT 2'. BOREHOLE OFFSET TO BORING MR-1B-M.
BOREHOLE BACKFILLED WITH CUTTINGS & CONCRETE, & PATCHED WITH ASPHALT.
RESIDENT ENGINEER YUTA NAKAMURA **DATE** 08-14-18
CLASSIFICATION CHECK: CHERYL J. MOSS **TYPING CHECK:** PATRICK DONALDSON

MUESER RUTLEDGE CONSULTING ENGINEERS

BORING LOG

BORING NO. MR-1B-M
SHEET 1 OF 2
PROJECT: BOROUGH BASED NYC JAIL SYSTEM - MANHATTAN FACILITY
FILE NO. 13176
LOCATION: NEW YORK, NEW YORK
SURFACE ELEV. 14.2±
RES. ENGR. YUTA NAKAMURA

DAILY PROGRESS	SAMPLE NO.	SAMPLE DEPTH	SAMPLE BLOWS/6"	SAMPLE DESCRIPTION	STRATA	DEPTH	CASING BLOWS	REMARKS
08:40								Hand auger from 0.2'
08-14-18						2		to 2'.
Tues., Clear								Obstruction at 2';
76°F, 08:50								concrete.
						5		Borehole offset to
								Boring MR-1C-M.
								End of Boring at 2'.
						10		
						15		
						20		
						25		
						30		
						35		
						40		
						45		
						50		

BORING NO. MR-1B-M

MUESER RUTLEDGE CONSULTING ENGINEERS

BORING NO. MR-1B-M
SHEET 2 **OF** 2

PROJECT BOROUGH BASED NYC JAIL SYSTEM - MANHATTAN FACILITY **FILE NO.** 13176
LOCATION NEW YORK, NEW YORK **SURFACE ELEV.** 14.2±
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		MECHANICAL		DIA., IN.		DEPTH, FT. FROM		TO	
SKID		HYDRAULIC		DIA., IN.		DEPTH, FT. FROM		TO	
BARGE		OTHER		DIA., IN.		DEPTH, FT. FROM		TO	
OTHER	TRACK - CME-55								

[ ] YES [X] NO

TYPE AND SIZE OF

D-SAMPLER
U-SAMPLER
S-SAMPLER
CORE BARREL
CORE BIT
DRILL RODS

DRILLING MUD USED [ ] YES [X] NO

DIAMETER OF ROTARY BIT, IN.
TYPE OF DRILLING MUD

AUGER USED [X] YES [ ] NO

TYPE AND DIAMETER, IN. 5" HAND AUGER

CASING HAMMER, LBS. AVERAGE FALL, IN.
SAMPLER HAMMER, LBS. AVERAGE FALL, IN.

WATER LEVEL OBSERVATIONS IN BOREHOLE

DATE	TIME	DEPTH OF HOLE	DEPTH OF CASING	DEPTH TO WATER	CONDITIONS OF OBSERVATION
					NO WATER LEVEL 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.	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: HAND AUGER	2'

BORING CONTRACTOR CRAIG GEOTECHNICAL DRILLING
DRILLER NICK BEEHLER **HELPERS** MYLES NEIPERT
REMARKS OBSTRUCTION AT 2'.
BOREHOLE BACKFILLED WITH CUTTINGS & CONCRETE, & PATCHED WITH ASPHALT.
RESIDENT ENGINEER YUTA NAKAMURA **DATE** 08-14-18
CLASSIFICATION CHECK: CHERYL J. MOSS **TYPING CHECK:** PATRICK DONALDSON

MUESER RUTLEDGE CONSULTING ENGINEERS

BORING LOG

BORING NO. MR-1C-M
SHEET 1 OF 5
PROJECT: BOROUGH BASED NYC JAIL SYSTEM - MANHATTAN FACILITY
FILE NO. 13176
LOCATION: NEW YORK, NEW YORK
SURFACE ELEV. 14.2±
RES. ENGR. YUTA NAKAMURA

DAILY PROGRESS	SAMPLE NO.	SAMPLE DEPTH	SAMPLE BLOWS/6"	SAMPLE DESCRIPTION	STRATA	DEPTH	CASING BLOWS		REMARKS
08:50	1HA	0.7	HAND	Gray concrete & gravel, some coarse to fine	**	**0.7**	DRILLED		**Brick tiles & concrete
08-16-18		2.0	AUGER	sand, trace silt (Subbase) (GP)			AHEAD		from 0' to 0.7'.
Thursday	2HA	2.0	HAND	Brown fine to coarse sand, some gravel, silt,			4"		Hand auger from 0.7'
Clear		4.0	AUGER	trace concrete, brick fragments (Fill) (SM)					to 5'.
78°F	3HA	4.0	HAND	Brown fine to medium sand, some silt, trace		**5**			
		5.0	AUGER	gravel, brick fragments (Fill) (SM)					
	4D	5.0	11-8	Brown fine to medium sand, some silt, brick					
		7.0	9-9	fragments (Fill) (SM)					
	5D	7.0	5-4	Do 4D (Fill) (SM)					
		9.0	8-9		F	**10**		36	
	6D	9.0	4-3	Brown fine to medium sand, some silt, brick					
		11.0	9-3	fragments (Fill) (SM)				24	
								17	
								34	
						15		41	
	7D	15.0	1-2	Brown fine to coarse sand, some silt, brick					
		17.0	1-5	fragments (Fill) (SM)					
								38	Rig chatter from 18.5'
						19		24	to 20'.
						20		26	Mud color change at 19'
	8D	20.0	6-4	Gray brown fine to medium sand, some silt,					First attempt: REC=0",
		22.0	4-4	gravel (SM)					gravel in tip.
									Second attempt: 3" SS,
								67	REC=15".
						25		76	
	9D	25.0	22-11	Red brown fine to coarse sand, some gravel,					REC=3"
		27.0	6-4	trace silt (SP-SM)					Rig chatter from 27' to
					S1			28	28'.
								37	Rig chatter from 29' to
						30		53	30'.
	10D	30.0	12-10	Gray brown & red brown coarse to fine sand,					REC=3"
		32.0	5-8	some gravel, trace silt (SP-SM)					Rig chatter from 30' to
								66	35'.
								51	
						35		125	
	11D	35.0	15-12	Brown wood & gray brown coarse to fine sand,		**36**			REC=4"
		37.0	14-13	some gravel, trace silt (SP-SM)					Drilling mud color
									change at 38'.
						40			
	12D	40.0	3-4	Dark brown peat & wood (Pt)	Pt				WC=364, pp=0.25 to
		42.0	7-9						0.50
	13D	42.0	9-11	Dark brown peat, some fine to coarse sand (Pt)					WC=62
		44.0	12-10						
						44.5			
	14D	45.0	WH-1	Medium gray organic silty clay (OH)					WC=34, pp=0.5 to
		47.0	3-1						0.75
	15D	47.0	3-3	Medium gray organic silty clay, trace shells (OH)					WC=36, pp=0.25 to
		49.0	2-2		O				0.50
						50			

MUESER RUTLEDGE CONSULTING ENGINEERS

BORING LOG

BORING NO. MR-1C-M
SHEET 2 OF 5
PROJECT: BOROUGH BASED NYC JAIL SYSTEM - MANHATTAN FACILITY **FILE NO.** 13176
LOCATION: NEW YORK, NEW YORK **SURFACE ELEV.** 14.2±
RES. ENGR. YUTA NAKAMURA

DAILY PROGRESS	SAMPLE NO.	SAMPLE DEPTH	SAMPLE BLOWS/6"	SAMPLE DESCRIPTION	STRATA	DEPTH	CASING BLOWS	REMARKS
Cont'd	16D	50.0	WH/24"	Medium gray organic silty clay, trace shells (OH)				WC=38, pp=0.05
08-16-18		52.0						
Thursday	17D	52.0	WH/18"	Medium gray organic silty clay, trace fine sand				WC=36, pp=0.5
Clear		54.0	3	(OH)				
78°F					O	55		
	18D	55.0	WR-3	Red brown clayey fine sand, trace mica (SC)				
		57.0	3-3					
						58.5		
						60		
	19D	60.0	10-12	Red brown fine to medium sand, trace silt,				
		62.0	12-11	mica (SP-SM)				
						65		
	20D	65.0	17-17	Brown fine to medium sand, trace silt, coarse				
		67.0	8-7	sand, mica (SP-SM)				
					S2			
13:45						70		
07:40	21D	70.0	7-6	Do 20D (SP-SM)				Drilling mud added.
08-17-18		72.0	8-7					
Friday								
Clear								
80°F						75		Minor rig chatter from
	22D	75.0	8-8	Do 20D, trace gravel (SP-SM)				76' to 80'.
		77.0	9-6					Drilling mud added.
						78.5		
						80		Rig chatter from 83' to
	23D	80.0	17-17	Brown & light brown fine to coarse sand, some				85'.
		82.0	39-14	gravel, silt (SM)				
						85		
	24D	85.0	21-19	Red brown coarse to fine sand, some gravel,				REC=3"
		87.0	19-7	silt pockets (SP&ML)				Minor rig chatter from
								86' to 90'.
						90		
	25D	90.0	39-48	Gray brown fine to coarse sand, some gravel,	T			REC=1"
		92.0	33-32	silt (SM)				
								Rig chatter & hard
								drilling from 93.5' to
						95		95'.
	26D	95.0	33-38	Red brown fine to coarse sand, some gravel,				Minor rig chatter from
		97.0	43-28	trace silt (SP-SM)				90' to 95'.
						100		

MUESER RUTLEDGE CONSULTING ENGINEERS

BORING LOG

BORING NO. MR-1C-M
SHEET 3 OF 5
PROJECT: BOROUGH BASED NYC JAIL SYSTEM - MANHATTAN FACILITY **FILE NO.** 13176
LOCATION: NEW YORK, NEW YORK **SURFACE ELEV.** 14.2±
RES. ENGR. YUTA NAKAMURA

DAILY PROGRESS	SAMPLE NO.	SAMPLE DEPTH	SAMPLE BLOWS/6"	SAMPLE DESCRIPTION	STRATA	DEPTH	CASING BLOWS	REMARKS
Cont'd	27D	100.0	37-43	Gray brown fine to coarse sand, some gravel,	T			
08-17-18		102.0	48-23	trace silt (SP-SM)				
Friday						**102.5**		Hard drilling at 102.5'.
Clear								
80°F						**105**		Drilled ahead to 105.
	1C	105.0	REC=100%	Hard unweathered to slightly weathered gray	R		5*	*Coring time in
		110.0	RQD=92%	gneissic schist, moderately jointed to closely			6*	minutes per foot.
				jointed, weathered joints			6*	
							2*	
09:55						**110**	3*	End of Boring at 110'.
								WC=Water Content
								in percent of dry
								weight.
						115		
								pp=Pocket
								Penetrometer
								Unconfined Compres-
								sive Strength in tsf.
						120		
						125		
						130		
						135		
						140		
						145		
						150		

ROCK CORE SKETCH

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

built on firm foundations

BORING NO. MR-1C-M
SHEET 4 OF 5
FILE NO. 13176
SURFACE ELEV.
RES ENGR. YUTA NAKAMURA

PROJECT: NYC JAILS (MANHATTAN)
LOCATION: NEW YORK, NEW YORK
TEST/INSP. EQUIPMENT
REF. CODES/STANDARDS

Run No.	REC/RQD

Run No.	REC/RQD

Run No.	REC/RQD
1C	100/92

Run No.	REC/RQD

TOP | TOP | TOP 105 | TOP

MR-3-M 1C

MR-2P-M 1C

1
J0XFS2
J0XFI3
J5°XFI3
WS+S
2
J30°XFI3
3
J0°XFI3 4
MB

BOTTOM | BOTTOM | BOTTOM 110 | BOTTOM

SCALE: 1 division = 0.1 feet

ROCK CORE SKETCH
LEGEND

JOINTING
J - Joint
MB - Mechanical Break
∢ - Angle w/ Horizontal
// - Parallel
X - Crossing
F - Foliation
S - Stratification
U - Unfoliated or Unstratified

JOINT SURFACE
C - Curved
I - Irregular
S - Straight

JOINT CONDITION
1 - Slick
2 - Smooth
3 - Rough

SKETCH SYMBOLS
Joint
Healed Joint
Broken
Part of Core Not Recovered
Cavities or Vugs in Core
Clay
Sand
Empty Space

NOTES

MUESER RUTLEDGE CONSULTING ENGINEERS

BORING NO. MR-1C-M
SHEET 5 **OF** 5

PROJECT BOROUGH BASED NYC JAIL SYSTEM - MANHATTAN FACILITY
FILE NO. 13176
LOCATION NEW YORK, NEW YORK
SURFACE ELEV. 14.2±
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	35
SKID		HYDRAULIC	X	DIA., IN.		DEPTH, FT. FROM		TO	
BARGE		OTHER		DIA., IN.		DEPTH, FT. FROM		TO	
OTHER	TRACK - CME-55								

TYPE AND SIZE OF

D-SAMPLER	2" & 3" O. D. SPLIT SPOONS
U-SAMPLER	
S-SAMPLER	
CORE BARREL	
CORE BIT	
DRILL RODS	NWJ

DRILLING MUD USED X YES NO

DIAMETER OF ROTARY BIT, IN. 2-15/16, 3-7/8
TYPE OF DRILLING MUD EZ MUD/QUIK GEL

AUGER USED X YES NO

TYPE AND DIAMETER, IN. 4" HAND AUGER

*CASING HAMMER, LBS. 140 AVERAGE FALL, IN. 30
*SAMPLER HAMMER, LBS. 140 AVERAGE FALL, IN. 30
*HAMMER TYPE (DONUT/SAFETY/AUTOMATIC): AUTOMATIC

WATER LEVEL OBSERVATIONS IN BOREHOLE

DATE	TIME	DEPTH OF HOLE	DEPTH OF CASING	DEPTH TO WATER	CONDITIONS OF OBSERVATION
					NO WATER LEVEL 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.		NO. OF 3" SHELBY TUBE SAMPLES	
3.5" DIA. U-SAMPLE BORING	LIN. FT.	100	NO. OF 3" UNDISTURBED SAMPLES	
CORE DRILLING IN ROCK	LIN. FT.	5	OTHER: HAND AUGER	5'

BORING CONTRACTOR CRAIG GEOTECHNICAL DRILLING
DRILLER NICK BEEHLER **HELPERS** MYLES NEIPERT/STEVE SCHULTZ
REMARKS BOREHOLE BACKFILLED WITH SOIL CUTTINGS & CONCRETE, & PATCHED WITH ASPHALT UPON COMPLETION
RESIDENT ENGINEER YUTA NAKAMURA **DATE** 08-17-18
CLASSIFICATION CHECK: CHERYL J. MOSS **TYPING CHECK:** PATRICK DONALDSON

MUESER RUTLEDGE CONSULTING ENGINEERS

BORING LOG

BORING NO. MR-2P-M
SHEET 1 OF 6
PROJECT: BOROUGH BASED NYC JAIL SYSTEM - MANHATTAN FACILITY **FILE NO.** 13176
LOCATION: NEW YORK, NEW YORK **SURFACE ELEV.** 18.5±
RES. ENGR. YUTA NAKAMURA

DAILY PROGRESS	SAMPLE NO.	SAMPLE DEPTH	SAMPLE BLOWS/6"	SAMPLE DESCRIPTION	STRATA	DEPTH	CASING BLOWS		REMARKS
10:00	1HA	0.3	HAND	Brown & gray brown fine to coarse sand, some	**	**0.3**	DRILLED		**Brick tiles from 0' to
08-14-18		2.0	AUGER	silt, tr gravel, brick fragments, concrete (Fill) (SM)			AHEAD		0.3'.
Tuesday	2HA	2.0	HAND	Brown coarse to fine sand, some silt, trace			4"		Hand auger from 0.3'
Clear		4.0	AUGER	gravel (Fill) (SM)					to 5'.
74°F	3HA	4.0	HAND	Brown & gray brown fine to coarse sand, some		**5**			
		5.0	AUGER	silt, tr gravel, concrete, brick fragments (Fill) (SM)					
	4D	5.0	7-6	Red brick fragments (Fill) (GP)					REC=3"
		7.0	4-6						
	5D	7.0	2-1	Black fine to coarse sand, some gravel, trace					REC=3"
		9.0	1-12	brick fragments, silt, concrete (Fill) (SP-SM)	**F**	**10**		15	
	6D	9.0	12-3	Light brown & brown fine to coarse sand, some					Drilling mud added.
		11.0	1-1	silt, gravel, trace brick fragments (Fill) (SM)				27	REC=4"
								45	
								45	
						15		56	
	7D	15.0	14-9	Brown fine to medium sand, some silt, trace					REC=6"
		17.0	12-16	gravel, coarse sand, concrete (Fill) (SM)					
						18.5			
						20			
	8D	20.0	2-3	Medium gray brown clayey silt, some fine sand,	**C**				WC=25, pp=0.75
		22.0	4-3	trace gravel (ML)					
						23.5			
						25			
	9D	25.0	13-9	Brown fine to medium sand, trace silt, mica					
		27.0	11-11	(SP-SM)					
						30			
	10D	30.0	7-7	Do 9D (SP-SM)					
		32.0	9-10						
						35			
	11D	35.0	8-7	Do 9D (SP-SM)					Drilling mud added.
		37.0	10-8						
					S2				
						40			
	12D	40.0	7-7	Do 9D (SP-SM)					
		42.0	8-8						
						45			
	13D	45.0	6-6	Do 9D (SP-SM)					
		47.0	8-7						
						50			
	14D	50.0	7-5	Brown fine to medium sand, some silt, trace					
		52.0	10-12	silt pockets, gravel (SM)				▼	

MUESER RUTLEDGE CONSULTING ENGINEERS

BORING LOG

BORING NO. MR-2P-M
SHEET 2 OF 6
PROJECT: BOROUGH BASED NYC JAIL SYSTEM - MANHATTAN FACILITY **FILE NO.** 13176
LOCATION: NEW YORK, NEW YORK **SURFACE ELEV.** 18.5±
RES. ENGR. YUTA NAKAMURA

DAILY PROGRESS	SAMPLE NO.	SAMPLE DEPTH	SAMPLE BLOWS/6"	SAMPLE DESCRIPTION	STRATA	DEPTH	CASING BLOWS	REMARKS
Cont'd							DRILLED	
08-14-18							AHEAD	
Tuesday							4"	
Clear								
74°F						**55**		
	15D	55.0	17-25	Gray brown gravelly coarse to fine sand, trace				Drilling mud added.
		57.0	19-25	silt (SP-SM)				REC=1"
								Gravel in tip; possible
								wash.
						60		Rig chatter from 57' to
	16D	60.0	9-9	Gray brown fine to coarse sand, some gravel,				60'.
13:45		62.0	10-11	trace silt (SP-SM)				16D: REC=4"
07:20								
8-15-18								
Wednesday						**65**		
Clear	17D	65.0	12-10	Brown fine to coarse sand, some gravel, trace				REC=3"
72°F		67.0	11-8	silt (SP-SM)				
							52	
							44	
						70	48	
	18D	70.0	3-4	Brown gravelly coarse to fine sand, trace silt	**S2**			REC=3"
		72.0	6-6	(SP-SM)				Drilling mud added.
						75		
	19D	75.0	11-9	Brown coarse to fine sand, trace gravel, silt				WC=Water Content
		77.0	14-9	(SP-SM)				in percent of dry
								weight.
						80		pp=Pocket
	20D	80.0	14-18	Brown fine to medium sand, trace silt, mica				Penetrometer
		82.0	20-17	(SP-SM)				Unconfined Compres-
								sive Strength in tsf.
						85		
	21D	85.0	24-34	Do 20D (SP-SM)				Silt in spoon tip.
		87.0	40-35					REC=4"
								***Decomposed rock
								from 91' to 91.5'.
						90		Spoon bouncing at
	22D	90.0	22-36	Brown fine to coarse sand, trace rock fragments,		**91**		91.3'.
		91.3	50/4"	silt (SP-SM)	***	**91.5**		Drilled to 92'.
	1C	92.0	REC=100%	Hard unweathered gray gneissic schist, blocky			6*	
		97.0	RQD=92%	to jointed, weathered joints			7*	*Coring time in
					R	**95**	7*	minutes per foot.
							9*	
10:20						**97**	7*	End of Boring at 97'.
						100		

MRCE Form BL-1

BORING NO. MR-2P-M

ROCK CORE SKETCH

MRCE
built on firm foundations

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

PROJECT: NYC JAILS (MANHATTAN)
LOCATION: NEW YORK, NEW YORK
TEST/INSP. EQUIPMENT
REF. CODES/STANDARDS

BORING NO. MR-2P-M
SHEET 3 OF 6
FILE NO. 13176
SURFACE ELEV. 16.5±
RES ENGR. YUTA NAKAMURA

Run No.	REC/RQD

Run No.	REC/RQD

Run No.	REC/RQD

Run No.	REC/RQD
1C	100/92

TOP

TOP

TOP

TOP 92'

MR-3-M 1C

MR-1C-M 1C

J2XF-S2

J3XF13, Wets

J5XFS2

J4XFS3

J3XFS3

SCALE: 1 division = 0.1 feet

BOTTOM

BOTTOM

BOTTOM

BOTTOM 97'

ROCK CORE SKETCH LEGEND

JOINTING
J - Joint
MB - Mechanical Break
Θ - Angle w/ Horizontal
// - Parallel
X - Crossing
F - Foliation
S - Stratification
U - Unfoliated or Unstratified

JOINT SURFACE
C - Curved
I - Irregular
S - Straight

JOINT CONDITION
1 - Slick
2 - Smooth
3 - Rough

SKETCH SYMBOLS
Joint
Healed Joint
Broken
Part of Core Not Recovered
Cavities or Vugs in Core
Clay
Sand
Empty Space

NOTES

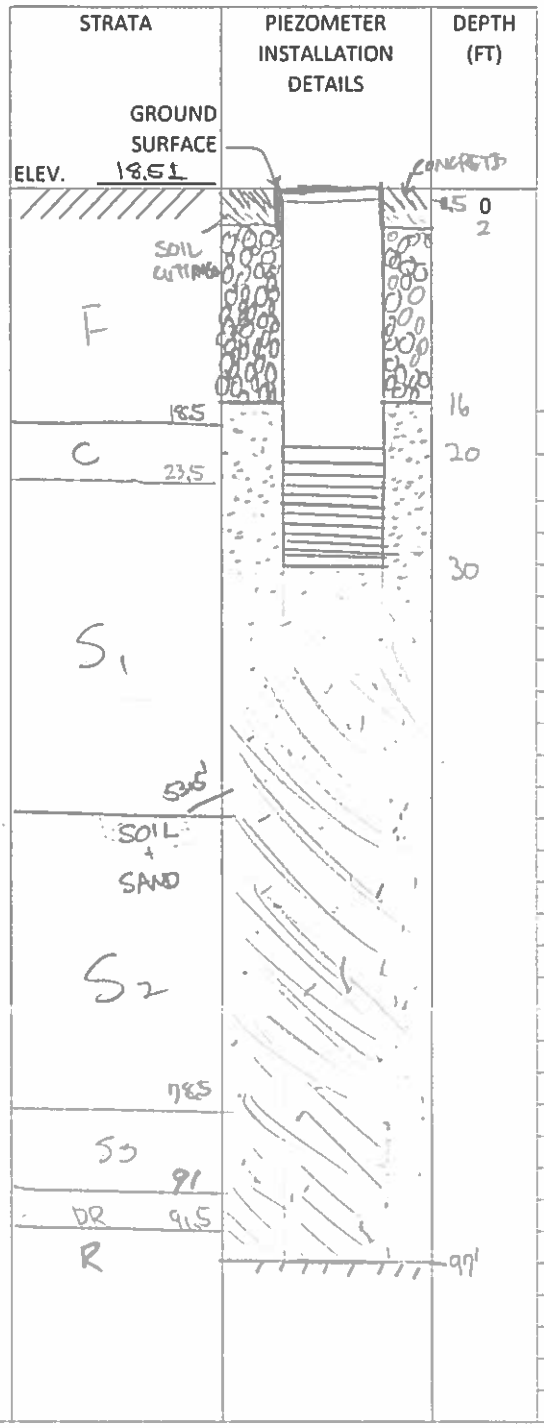
PIEZOMETER RECORD

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

PIEZOMETER OR BORING NO. MR-2P-M
SHEET 4 OF 6
FILE NO. 13176
INSTALLATION DATE 8/15, 8/16
RES ENGR. YUTA NAKAMURA

PROJECT: NYC JAILS (MANHATTAN)
LOCATION:
PIEZOMETER LOCATION:

☐ SEE SKETCH ON BACK



PIEZOMETER TYPE PVC

INTAKE POINT
depth to bottom, ft = 97
depth to top, ft = 16
length, ft = 81 = L
diameter, in = 4 , ft = 0.33 = 2R

STANDPIPE/RISER
elevation of rim, ft = 18.0±
diameter, in = 2 , ft = 0.17 = 2r

READING TIME		DEPTH – RIM TO WATER	ELEVATION OF WATER	REMARKS
DATE	CLOCK			
8/16	0935	18.3'	-0.3	POST-INSTALLATION
	1355	18.9'	-0.9	END OF DAY
8/17	1030	18.9'	-0.9	
8/20	1425	18.9'	-0.9	

SAND
GRAVEL
BENTONITE
GROUT

GROUND SURFACE ELEV. 18.5±

PIEZOMETER NO. MR-2P-M

VARIABLE HEAD PERMEABILITY TEST

MRCE
built on firm foundations

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

☐ BOREHOLE OR ☑ PIEZOMETER NO. MR-2P-M

TEST NO. 1

FILE NO. 13176

RES ENGR. Y. NAKAMURA

PROJECT: NYC JAILS (MANHATTAN)

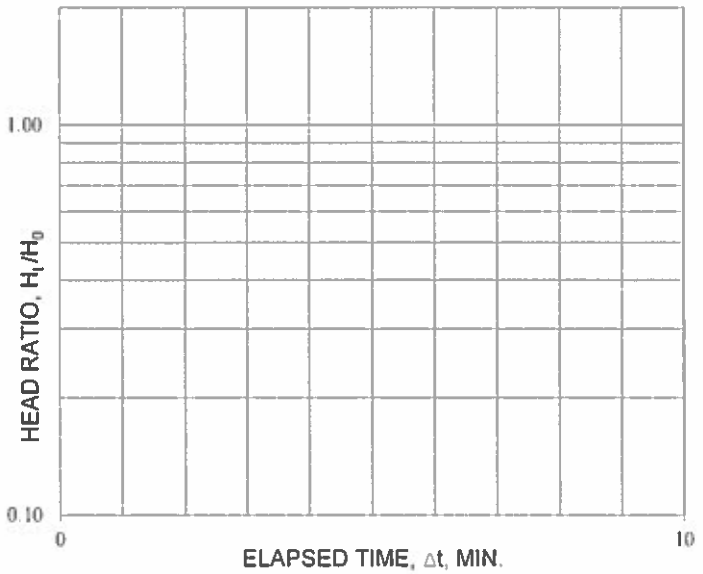
LOCATION: NEW YORK, NEW YORK

CALC. BY _____ DATE _____

PIEZOMETER LOCATION: _____

CH'KD BY _____ DATE _____

SHEET NO. 5 OF 6



INTAKE POINT

Depth to bottom, ft = 97

Depth to top, ft = 16

Length, ft = 81 = L

Diameter, in = 4 ft = 0.3 = 2R

STANDPIPE/RISER

elevation of rim, ft = 18±

Diameter, in = 2 ft = 0.17 = 2r

BOREHOLE

Depth of casing, ft = _____

Diameter, in = _____ ft = _____ = 2R

Depth to which standpipe/casing was bailed or filled to, ft = 19.31 = Z_0

READING TIME			TEST DEPTH, RIM TO WATER Z_t (ft.)	INITIAL UNBALANCED HEAD $H_0 = \lvert Z_0 - Z_{STATIC} \rvert$ (ft.)	UNBALANCED HEAD $H_t = \lvert Z_t - Z_{STATIC} \rvert$ (ft.)	HEAD RATIO H_t/H_0	REMARKS
DATE	CLOCK	Δt MIN.					☐ Falling Head Test ☑ Rising Head Test
8/20	1425	STATIC	18.9		-	-	STATIC WATER LEVEL
	1435	0.00	19.3				
	1436	1.00	19.2				
	1437	2.00	19.1				
	1438	3.00	19.05				
	1439	4.00	19.0				
	1440	5.00	18.95				
	1445	10.00	18.9				
	1450	15.00	18.9				

NOTES _____

PIEZOMETER NO. MR-2P-M

MUESER RUTLEDGE CONSULTING ENGINEERS

BORING NO. MR-2P-M
SHEET 6 **OF** 6

PROJECT BOROUGH BASED NYC JAIL SYSTEM - MANHATTAN FACILITY **FILE NO.** 13176
LOCATION NEW YORK, NEW YORK **SURFACE ELEV.** 18.5±
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	70
SKID		HYDRAULIC	X	DIA., IN.		DEPTH, FT. FROM		TO	
BARGE		OTHER		DIA., IN.		DEPTH, FT. FROM		TO	
OTHER	TRACK - CME-55								

TYPE AND SIZE OF		DRILLING MUD USED	X YES / NO
D-SAMPLER	2" O. D. SPLIT SPOON	DIAMETER OF ROTARY BIT, IN.	3-7/8, 2-15/16
U-SAMPLER		TYPE OF DRILLING MUD	EZ MUD/QUIK GEL
S-SAMPLER			
CORE BARREL	NX DOUBLE BARREL	**AUGER USED**	X YES / NO
CORE BIT	NX DIAMOND	TYPE AND DIAMETER, IN.	5" HAND AUGER
DRILL RODS	NWJ		

*CASING HAMMER, LBS. 140 AVERAGE FALL, IN. 30
*SAMPLER HAMMER, LBS. 140 AVERAGE FALL, IN. 30
*HAMMER TYPE (DONUT/SAFETY/AUTOMATIC): AUTOMATIC

WATER LEVEL OBSERVATIONS IN BOREHOLE

DATE	TIME	DEPTH OF HOLE	DEPTH OF CASING	DEPTH TO WATER	CONDITIONS OF OBSERVATION
08-15-18	10:50	97	30	19.4	POST-DRILLING MUD-LEVEL READING.
					SEE PIEZOMETER RECORD.

PIEZOMETER INSTALLED X YES / NO **SKETCH SHOWN ON** SEE SHEET NO. 4

STANDPIPE:	TYPE	PVC	ID, IN.	1-3/4	LENGTH, FT.	20	TOP ELEV.	18±
INTAKE ELEMENT:	TYPE	SLOTTED PVC	OD, IN.	2	LENGTH, FT.	10	TIP ELEV.	-12±
FILTER:	MATERIAL	SAND	OD, IN.	4	LENGTH, FT.	14	BOT. ELEV.	-12±

PAY QUANTITIES

3.5" DIA. DRY SAMPLE BORING	LIN. FT.	87	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.	5	OTHER: HAND AUGER	5'

BORING CONTRACTOR CRAIG GEOTECHNICAL DRILLING
DRILLER NICK BEEHLER **HELPERS** MYLES NEIPERT
REMARKS PIEZOMETER INSTALLED UPON COMPLETION.
RESIDENT ENGINEER YUTA NAKAMURA **DATE** 08-15-18
CLASSIFICATION CHECK: CHERYL J. MOSS **TYPING CHECK:** PATRICK DONALDSON

MUESER RUTLEDGE CONSULTING ENGINEERS

BORING LOG

BORING NO. MR-3-M
SHEET 1 OF 6
PROJECT: BOROUGH BASED NYC JAIL SYSTEM - MANHATTAN FACILITY **FILE NO.** 13176
LOCATION: NEW YORK, NEW YORK **SURFACE ELEV.** 20±
RES. ENGR. YUTA NAKAMURA

DAILY PROGRESS	SAMPLE NO.	SAMPLE DEPTH	SAMPLE BLOWS/6"	SAMPLE DESCRIPTION	STRATA	DEPTH	CASING BLOWS		REMARKS
11:30	1HA	0.5	HAND	Dark gray gravelly coarse to fine sand, trace	**	**0.5**	DRILLED		**Concrete from 0' to
08-17-18		2.0	AUGER	concrete, silt (Fill) (SP-SM)			AHEAD		0.5'.
Friday	2HA	2.0	HAND	Dark gray & gray brown gravelly coarse to fine			4"		Hand auger from 0.5'
Partly Cloudy		4.0	AUGER	sand, tr silt, concrete, brick fgmts (Fill) (SP-SM)					to 5'.
86°F	3HA	4.0	HAND	Gray brown fine to coarse sand, some gravel,		**5**			
		5.0	AUGER	silt, trace concrete, brick fragments (Fill) (SM)					Rig chatter from 5' to 9'.
	4D	5.0	1-6	Dark gray gravelly fine to coarse sand, some					REC=4"
		7.0	11-13	silt (Fill) (SM)					
	5D	7.0	3-2	Dark brown silty fine to medium sand, trace					
		9.0	3-3	coarse sand, gravel (Fill) (SM)	**F**	**10**		28	
	6D	9.0	6-6	Red brick fragments, some brown fine to					REC=4"
		11.0	6-2	medium sand, trace silt (GP-GM)				34	Minor rig chatter from
								38	12.5' to 15'.
								49	
						15		39	
	7D	15.0	5-3	Brown fine to coarse sand, some clay, trace					REC=2"
		17.0	3-2	gravel (Fill) (SC)					
								38	
						18.5		44	
						20		30	
	8D	20.0	1-2	Medium gray brown silty clay, trace to some	**C**				WC=20, pp=0.5
		22.0	2-3	fine to medium sand (CL)		**22**			
								59	
								193	
						25		117	
	9D	25.0	19-21	Brown fine to medium sand, trace silt (SP-SM)					
		27.0	23-18						
						30			
	10D	30.0	9-10	Brown fine to medium sand, trace silt, mica					Drilling mud added.
		32.0	13-14	(SP-SM)					
						35			
	11D	35.0	9-10	Do 10D (SP-SM)					
		37.0	16-12						
					S2				
						40			
	12D	40.0	7-8	Do 10D (SP-SM)					
		42.0	11-9						
						45			
	13D	45.0	9-22	Do 10D, trace gravel (SP-SM)					
13:30		47.0	14-12						
07:10									
08-20-18									
Mon., Cloudy						**50**			
69°F									

MUESER RUTLEDGE CONSULTING ENGINEERS

BORING LOG

BORING NO. MR-3-M
SHEET 2 OF 6
PROJECT: BOROUGH BASED NYC JAIL SYSTEM - MANHATTAN FACILITY **FILE NO.** 13176
LOCATION: NEW YORK, NEW YORK **SURFACE ELEV.** 20±
RES. ENGR. YUTA NAKAMURA

DAILY PROGRESS	SAMPLE NO.	SAMPLE DEPTH	SAMPLE BLOWS/6"	SAMPLE DESCRIPTION	STRATA	DEPTH	CASING BLOWS	REMARKS
Cont'd	14D	50.0	9-7	Brown fine to medium sand, trace gravel, coarse				
08-20-18		52.0	8-7	sand, silt, mica (SP-SM)				
Monday								
Cloudy								
69°F						**55**		
	15D	55.0	8-8	Do 14D (SP-SM)				
		57.0	11-9					Rig chatter from 57' to 58'.
						60		
	16D	60.0	5-6	Brown fine to medium sand, trace silt, coarse				
		62.0	8-7	sand, mica (SP-SM)				Drilling mud added.
						65		
	17D	65.0	4-5	Do 16D (SP-SM)				
		67.0	6-6					
						70		
	18D	70.0	8-6	Brown fine to coarse sand, trace silt, mica				
		72.0	8-7	(SP-SM)				
						75		
	19D	75.0	8-7	Brown fine to medium sand, trace silt, coarse	**S2**			
		77.0	9-8	sand, mica (SP-SM)				Drilling mud added.
						80		
	20D	80.0	7-7	Brown fine to coarse sand, some gravel, trace				
		82.0	7-5	silt, mica (SP-SM)				
						85		
	21D	85.0	6-6	Brown fine to coarse sand, trace silt, mica,				
		87.0	6-7	gravel (SP-SM)				
						90		Minor rig chatter at 90'.
	22D	90.0	7-7	Do 21D (SP-SM)				
		92.0	9-9					
								Rig chatter from 94' to
						95		95'.
	23D	95.0	7-7	Do 21D (SP-SM)				Rig chatter from 96' to
		97.0	7-7					97'.
						100		

MUESER RUTLEDGE CONSULTING ENGINEERS

BORING LOG

BORING NO. MR-3-M
SHEET 3 OF 6
PROJECT: BOROUGH BASED NYC JAIL SYSTEM - MANHATTAN FACILITY
FILE NO. 13176
LOCATION: NEW YORK, NEW YORK
SURFACE ELEV. 20±
RES. ENGR. YUTA NAKAMURA

DAILY PROGRESS	SAMPLE NO.	SAMPLE DEPTH	SAMPLE BLOWS/6"	SAMPLE DESCRIPTION	STRATA	DEPTH	CASING BLOWS	REMARKS
Cont'd	24D	100.0	7-8	Brown coarse to fine sand, trace gravel, silt,				
08-20-18		102.0	9-7	mica (SP-SM)				
Monday								
Cloudy								
69°F						**105**		Rig chatter at 105'.
	25D	105.0	17-13	Brown fine to medium sand, trace silt, mica				
		107.0	15-13	(SP-SM)				Drilling mud added.
						110		
	26D	110.0	14-13	Do 25D (SP-SM)				
		112.0	16-14					
						115		
	27D	115.0	10-7	Brown fine to coarse sand, trace silt, mica				
		117.0	13-15	(SP-SM)				
					S2	**120**		
	28D	120.0	7-7	Do 27D (SP-SM)				
		122.0	9-9					
						125		
	29D	125.0	7-7	Do 27D (SP-SM)				Drilling mud added.
		127.0	10-9					
						130		
	30D	130.0	6-6	Do 27D (SP-SM)				
		132.0	8-7					
						135		
	31D	135.0	8-9	Do 27D, trace gravel (SP-SM)				
		137.0	8-11					Drilling mud added.
						139		Rig chatter from 139'
						140		to 140'.
	32D	140.0	45-38	Brown gravelly fine to coarse sand, some silt				Rig chatter from 140'
		142.0	48-33	(SM)				to 144'.
								Minor rig chatter from
						145		145' to 149'.
	33D	145.0	24-22	Brown fine to coarse sand, some gravel, trace	**T**			
		147.0	26-21	silt (SP-SM)				
						150		

MUESER RUTLEDGE CONSULTING ENGINEERS

BORING LOG

BORING NO. MR-3-M
SHEET 4 OF 6
PROJECT: BOROUGH BASED NYC JAIL SYSTEM - MANHATTAN FACILITY
FILE NO. 13176
LOCATION: NEW YORK, NEW YORK
SURFACE ELEV. 20±
RES. ENGR. YUTA NAKAMURA

DAILY PROGRESS	SAMPLE NO.	SAMPLE DEPTH	SAMPLE BLOWS/6"	SAMPLE DESCRIPTION	STRATA	DEPTH	CASING BLOWS	REMARKS
	34D	150.0	16-24	Brown fine to medium sand, some silt, trace				
14:00		152.0	44-31	mica (SM)				
07:20					**T**			
08-21-18								
Tuesday						**155**		Rig chatter at 155'.
Clear	35D	155.0	50/1"	Gray and brown gravelly fine to coarse sand,	**DR**			Spoon bouncing at
68°F		155.1		some silt (SM)		**157**		155'; drilled to 157'.
	1C	157.0	REC=95%	Hard unweathered to slightly weathered gray			8*	35D: REC=1"
		162.0	RQD=90%	gneissic schist, moderately jointed to closely			9*	Rig chatter from 155'
				jointed, weathered joints	**R**	**160**	11*	to 157'.
							11*	*Coring time in
10:00						**162**	9*	minutes per foot.
								End of Boring at 162'.
						165		WC=Water Content in percent of dry weight.
						170		pp=Pocket Penetrometer Unconfined Compressive Strength in tsf.
						175		
						180		
						185		
						190		
						195		
						200		

ROCK CORE SKETCH

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

PROJECT: NYC JAILS (MANHATTAN)
LOCATION: NEW YORK, NEW YORK
TEST/INSP. EQUIPMENT
REF. CODES/STANDARDS

BORING NO. MR-3-M
SHEET 5 OF 6
FILE NO. 13176
SURFACE ELEV.
RES ENGR. YUTA NAKAMURA

Run No.	REC/RQD

Run No.	REC/RQD
1C	95/90

Run No.	REC/RQD

Run No.	REC/RQD

TOP | TOP 157 | TOP | TOP

J35FS3
J60XFI3
J60/IFS2
J60/IFS2
J60/IFS2
J30XFI2
J45XFI2

MR-1C-M 1C

MR-2P-M 1C

BOTTOM | BOTTOM 162 | BOTTOM | BOTTOM

SCALE: 1 division = 0.1 feet

ROCK CORE SKETCH LEGEND

JOINTING
J - Joint
MB - Mechanical Break
θ - Angle w/ Horizontal
// - Parallel
X - Crossing
F - Foliation
S - Stratification
U - Unfoliated or Unstratified

JOINT SURFACE
C - Curved
I - Irregular
S - Straight

JOINT CONDITION
1 - Slick
2 - Smooth
3 - Rough

SKETCH SYMBOLS
Joint
Healed Joint
Broken
Part of Core Not Recovered
Cavities or Vugs in Core
Clay
Sand
Empty Space

NOTES

MUESER RUTLEDGE CONSULTING ENGINEERS

BORING NO. MR-3-M
SHEET 6 **OF** 6

PROJECT BOROUGH BASED NYC JAIL SYSTEM - MANHATTAN FACILITY **FILE NO.** 13176
LOCATION NEW YORK, NEW YORK **SURFACE ELEV.** 20±
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	25
SKID		HYDRAULIC	X	DIA., IN.		DEPTH, FT. FROM		TO	
BARGE		OTHER		DIA., IN.		DEPTH, FT. FROM		TO	
OTHER	TRACK - CME-55								

TYPE AND SIZE OF		DRILLING MUD USED	X YES	NO
D-SAMPLER	2" O. D. SPLIT SPOON	DIAMETER OF ROTARY BIT, IN.	2-15/16, 3-7/8	
U-SAMPLER		TYPE OF DRILLING MUD	QUIK GEL/EZ MUD	
S-SAMPLER				
CORE BARREL	NX DOUBLE BARREL	**AUGER USED**	X YES	NO
CORE BIT	NX DIAMOND	TYPE AND DIAMETER, IN.	4" HAND AUGER	
DRILL RODS	NWJ			

*CASING HAMMER, LBS. 140 AVERAGE FALL, IN. 30
*SAMPLER HAMMER, LBS. 140 AVERAGE FALL, IN. 30
*HAMMER TYPE (DONUT/SAFETY/AUTOMATIC): AUTOMATIC

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.	152	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.	5	OTHER: HAND AUGER	5'

BORING CONTRACTOR CRAIG GEOTECHNICAL DRILLING
DRILLER NICK BEEHLER **HELPERS** MYLES NEIPERT/STEVE SCHULTZ
REMARKS BOREHOLE BACKFILLED WITH SOIL CUTTINGS & BENTONITE
& PATCHED WITH CONCRETE UPON COMPLETION.
RESIDENT ENGINEER YUTA NAKAMURA **DATE** 08-21-18
CLASSIFICATION CHECK: CHERYL J. MOSS **TYPING CHECK:** PATRICK DONALDSON

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NY Correctional Facilities				Likely Output		
Site 1 Manhattan		**No**	**Depth (FT)**	**Heating**	**Cooling**	**Remarks**
Boreholes	Yes	80	400-500	1920-2400kBtu/Hr	160-200T	Assumed Heating output 60Btu/ft & Cooling Output 2.0 - 2.5T/ borehole
Energy Piles	Yes	195	100	1131kBtu/hr	68.25T	Assume average spacing is 25 x 25 ft grid, average configuration is a 3-pile cluster, each pile 100feet with single loop = 195 piles. The resulting total geo pile/ borehole length used iis 19,500 feet.
Open Loop Well	Yes	1 pair	350-400	112T		Based upon a Flow rate of 190 GPM

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