STRUCTURAL
ENGINEERING
TECHNOLOGIES, P.C.

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PRELIMINARY GEOTECHNICAL REPORT

1460 39TH STREET
BROOKLYN, N.Y. 11218

PREPARED FOR:

Mr. Philip Lepine
SNL CONSTRUCTION
3333 New Hyde Park Road, Suite 2000
Lake Success, NY 11042

PREPARED BY:

STRUCTURAL ENGINEERING TECHNOLOGIES, P.C.
40-12 28th Street
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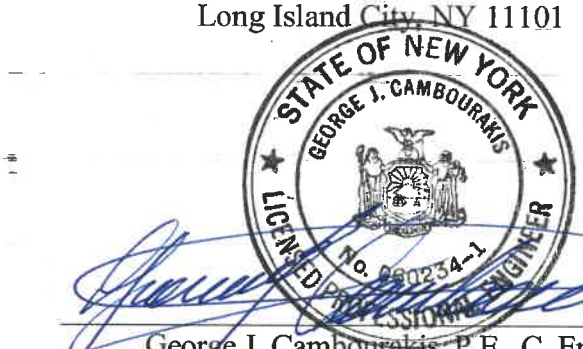

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New York Professional Engineer
License No. 060234-1
Date: April 23, 2019

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This preliminary report presents the results of the geotechnical investigation for the proposed development at 1460 39th Street, Brooklyn, New York. The purposes of this study were to investigate subsurface conditions and develop recommendations for feasible foundation systems based on a subsurface investigation. Our findings and recommendations are presented herein.

Site Description

The site occupies Block 5346, Lots 15, 16, 17, 26 and 28 in Brooklyn, New York. The site is located on the south side of 39th Street between 14 Avenue and 15 Avenue. The site is bordered to the northwest by a 1-story building, to the southeast by a 1-story building, to the south by multiple rear yards and building extensions. Currently the site is occupied by two 2-story buildings, one large 1-story building with an on-grade parking area next to it, and another two 1-story buildings. The site has a combined lot area of approximately 28,713-ft^2 according to New York City Department of Buildings (DOB) website *oasisnyc.net*.

Proposed Construction

We understand that the proposed construction will consist of a 4-story building with two below grade levels. The proposed cellar footprint area is 24,125-ft^2. The subgrade will be approximately 24-ft below site grade.

Subsurface Information

We recommended drilling nine borings to comply with the 2014 New York City Building Code (NYCBC) requirements. We understand that this preliminary subsurface investigation consisted of six borings, identified as B-1 to B-6. This report provides preliminary subsurface conditions and general foundation recommendations based on the initial six borings. Our recommendations will be finalized after the remaining three borings are drilled. We also understand that four test pits will be performed for designing the Support of Excavation (SOE) for the site.

Borings B-1 to B-4 and B-6 were advanced to a depth of 52-ft below grade; B-5 was advanced to a depth of 102-ft below grade. Standard Penetration Test (SPT) was performed at every 5-ft interval to obtain split spoon samples in all borings.

See Appendix A for boring logs prepared by Structural Engineering Technologies and boring location plan prepared by PG Environmental Services.

The descriptions of the reported subsurface strata are as follows:

Uncontrolled Fill [Class 7]

The Uncontrolled Fill stratum was found immediately below ground surface (bgs). It generally consisted of a mixture of sand, silt, gravel, wood, cobbles, boulders, and concrete and is considered Class 7 in accordance with NYCBC. The N-values varied from 3- to 60-blows/ft (bpf). Typically, the high resistances (above 30-bpf) were encountered below the depth of about 6-ft. The high N-values most likely are due to the presence of concrete, cobble, and boulder fragments. The explorations indicated that the Uncontrolled Fill generally extends to about 6- to 12-ft bgs.

Till [Class 3a]

The Glacial Till stratum consisting of fine to coarse sand with varying percentages of silt, clay, gravel, cobbles and boulders underlies the Uncontrolled Fill. Isolated pockets of silt and clay were encountered at various depths in borings B-1, B-3, and B-5. Typical N-values were over 50-bpf with some samples reaching refusal (over 100-bpf). The high N-values may reflect the presence of cobbles and boulders. The Glacial Till is classified as Class 3a, with isolated pockets of 4a, and 5a per NYCBC.

All borings terminated in this stratum.

Groundwater

Groundwater was reportedly encountered at approximately 45-ft below grade during the preliminary boring investigation.

Groundwater levels may vary with weather conditions, seasonal factors, or other unknown conditions.

Design Recommendations

Seismic Site Class

The NYCBC assigns a seismic site class based on the type, thickness, and average properties in the top 100-ft of bearing stratum. Based on the soil profile, and in accordance with Table 1613.5.2 of the NYCBC, the site is assigned to Site Class C (very dense soil and soft rock), and the corresponding site coefficients for short periods (F_a) and 1-second period (F_v) are 1.20 and 1.70, respectively.

Design spectral accelerations were determined in accordance with Section 1613.5.1 of the NYCBC. The maximum considered earthquake spectral accelerations at short periods (S_{MS}) and 1-second period (S_{M1}) are 0.337 g and 0.124 g, respectively.

Liquefaction Potential

The NYCBC requires evaluation of the liquefaction potential if non-cohesive soil below groundwater table and less than 50-ft below the ground surface. Liquefaction need not be considered because of the soil condition and deep groundwater level.

Foundation Recommendations

We understand that the proposed building foundations will be approximately 24-ft below site grade. Therefore, the proposed subgrade will be within the Till stratum. We considered shallow foundations for supporting the proposed structure.

Shallow Foundation

In our opinion, shallow foundations (spread footings or mat) bearing within the Till stratum would be appropriate for the proposed building. The foundation may be designed with a net allowable bearing value of 6-tons/ft^2 and a coefficient of subgrade reaction for a 1-ft x 1-ft plate of up to 250-tons/ft^3.

Total settlement for the new foundation could be on the order of ½-in occurring mainly during construction. Differential settlements could be half as much. Settlement estimates are based on assumed 1200-psf structural loads on spread footings. This should be confirmed by the project structural engineer.

We recommend that the foundation subgrade be compacted with at least four (4) passes of a walk-behind vibratory plate or drum roller.

In accordance with the NYCBC requirements for controlled inspection, a professional geotechnical engineer should inspect and approve the foundation subgrade to assure the material is adequate to provide the recommended allowable bearing pressure. Footing bearing surfaces should be level and clear of debris, standing or frozen water, and other deleterious materials.

Groundwater Control

We understand that the excavation subgrade will be significantly above the groundwater table. Therefore, unusual groundwater control will not be necessary during and after construction. However, at the minimum a perimeter footing drain with granular drainage fill or equivalent should be provided adjacent to the walls. The perimeter drain should consist of a 6-in diameter perforated PVC pipe surrounded by crushed stone having a maximum particle size of 1-in with zero passing the No. 200 sieve. The stone should be surrounded by non-woven geotextile. The drain should discharge into the building's sanitary system. Also, the contractor should be prepared to remove storm water infiltration using sumps and pumps, as may be necessary.

You may want to consider an under-slab drainage system designed to protect the slab against a possible water main break. The under-slab system should consist of a non-woven geotextile placed on the subgrade with at least 6-in of crushed stone or gravel (maximum particle size of 1-in with zero passing the No. 200 sieve) over the geotextile and 6-in diameter perforated PVC drainage pipes spaced about 20-ft apart within the drainage medium. Cleanouts should be provided at bends. The pipes should be surrounded by at least 6-in of crushed stone or gravel and pitched to drain to sumps equipped with self-activating duplex electric pumps.

Permanent below Grade Walls

Any permanent below grade walls should be designed to resist static and active earth pressures, and proposed building surcharge loads.

We recommend the walls be designed using a lateral triangular earth pressure distribution increasing at a rate of 63-psf per foot of depth. The walls should be checked to be "fail-safe" under a worst-case scenario of a water main break, with the water level at the ground surface and lateral pressures (including hydrostatic pressures) increasing at a rate of 93-psf per foot of depth. Lateral

pressures from sidewalk and any other surcharge loads should be added as a uniform soil pressure equal to one-half the vertical pressure, applied over the full height of the wall.

We also recommend the walls be designed for active earth pressure plus seismic pressures using a triangular pressure distribution with a seismic earth pressure coefficient of 0.42 and soil unit weight of 125-pcf. The point of application of the lateral loading should be taken as 0.43 x height of wall above the base of wall.

Waterproofing and/or damp proofing should be provided in accordance with the NYCBC requirements.

Additional Recommendations

Temporary Support of Excavation

Construction of the proposed cellar will require an approximately 24-ft excavation. During excavation, lateral support of excavation sides will be required. The potential movement of adjacent structures and streets must be avoided. The site is bordered by a street to the north, buildings to the west and east, multiple rear yards and building extensions to the south. Lateral support could generally be provided through the use of soldier piles and lagging, stable soil slope, or other support systems. Tie-backs or internal bracing could be used to resist active earth pressures using soil parameters provided above.

Temporary excavation side slopes in soil with existing surface loads above the groundwater table should not be steeper than 1V:1H. In addition, concrete spray should be used on top of soil slope to stabilize the slope and minimize erosion due to rain or other construction activities.

Soldier piles within 30-ft of existing buildings should be drilled or installed in pre-augered holes with casings and backfilled with grout or lean concrete to minimize vibrations and possible settlements. Adequate spacing should be provided between laggings for drainage. Filter fabric or hay should be installed between laggings to minimize migration of soil into the excavation. Voids behind lagging shall be back-packed with sand or cement.

Underpinning may be required below adjacent existing footings if the proposed subgrade extends below an influence line drawn at a slope of 1V:1.5H from the bottom of the existing footing to the bottom of the proposed excavation. The underpinning should extend to at least 12-in below the

depth of the proposed foundation subgrade. The underpinning design should consider lateral earth pressures and lateral stresses caused by building surcharge.

Should underpinning be required, feasible underpinning schemes shall be determined based on existing test pit logs. Underpinning piers shall be constructed in one vertical lift. Underpinning subgrade shall be of equal or better quality of the existing footing subgrade. Final design of the shoring system and underpinning method should be selected and designed by the foundation contractor. If underpinning is undesirable, the excavation and basement slab should be benched provided it is not within the 1V:1.5H influence zone above the groundwater table and 1V:2H influence zone below the groundwater table, and a curb or bench should be designed to stabilize the footing and foundation wall.

Excavation of the proposed development must not undermine any existing foundations. Tight timber lagging should be used in all underpinning pits and adjacent to existing floor slabs to prevent migration of fines into the excavation or underpinning pits. No uncontrolled open excavations should be allowed adjacent to existing slabs or foundations.

Support of excavation design must be prepared by a licensed engineer in the state of New York and filed with the DOB prior to commencement of construction activities.

Fill Material, Placement, and Compaction Criteria

Fill material to be placed should be controlled Fill as defined by the NYCBC. Controlled Fill should consist of sand, gravel, crushed stone, crushed gravel, or a mixture of these and must be free of organic, frozen, and other deleterious materials.

Pre-construction Survey

A pre-construction survey of the adjacent buildings should be performed. The survey would provide the Owner and foundation contractor with documentation of existing conditions in the event of a future damage claim. On the basis of this survey, an observational and instrumentation program should be designed for monitoring the performance of adjacent structures and evaluating construction procedures.

Potential Effects on Adjacent Structures

We anticipate no significant effects on adjacent structures and facilities. However, excavation in granular fill or sands could result in slight settlement of adjacent ground or structures. Typically,

these settlements adjacent to the retaining wall may be about 0.25% to 0.5% of the depth of excavation, or about 0.72- to 1.44-in for the anticipated depth of excavation. The settlements usually diminish over a distance of about 1.5 times the excavation depth, or about 36-ft.

Underpinning may result in about 0.5-in settlement of the structure being underpinned. This could result in cosmetic cracking of the structure.

Monitoring Program

Before and during support of excavation construction and/or during active pile drilling, a precise optical survey program should be implemented to monitor for vertical and horizontal movements of adjacent structures, and retaining structures supporting the excavation. Survey control points should also be established to monitor lateral movement of the excavation bracing system. Excavation should be temporarily stopped if movements (vertical or horizontal) exceed established limits. Criteria for allowable movements of structures should be finalized after a pre-construction survey is completed.

Adjacent buildings may experience slight vibrations during excavation, underpinning, and drilling. The vibrations should be monitored during construction. Monitoring data should be reviewed by a qualified engineer on a daily basis during construction to verify that no unforeseen problems are developing. Benchmark vibration levels should be established at least one week before start of demolition or construction.

Visual observations should be taken daily for cracks in adjacent buildings, pavements, sidewalks, local settlements, etc. The information should be provided to the contractor who may modify the means and methods of construction in response to the information.

Additional Investigation

As indicated earlier, additional three borings will be required to meet the code and four test pits will be required to determine the locations and elevations of the adjacent buildings' foundations. We will modify our preliminary recommendations accordingly.

Limitations

This preliminary report is intended for use at 1460 39th Street building site. Structural Engineering Technologies, P.C. cannot take responsibility for the use of this report at any other site. The

conclusions and recommendations provided herein are based on subsurface conditions inferred from borings at specific site areas, and from limited verbal description of the proposed project. Recommendations given are contingent upon one another and no recommendation should be followed independent of the others. This report has been prepared to assist the Architect and Structural Engineer in the design. It is intended for use based on the provided information. Any changes in structures or locations should be brought to our attention so that we may review the impact such changes may affect our conclusions and recommendations.

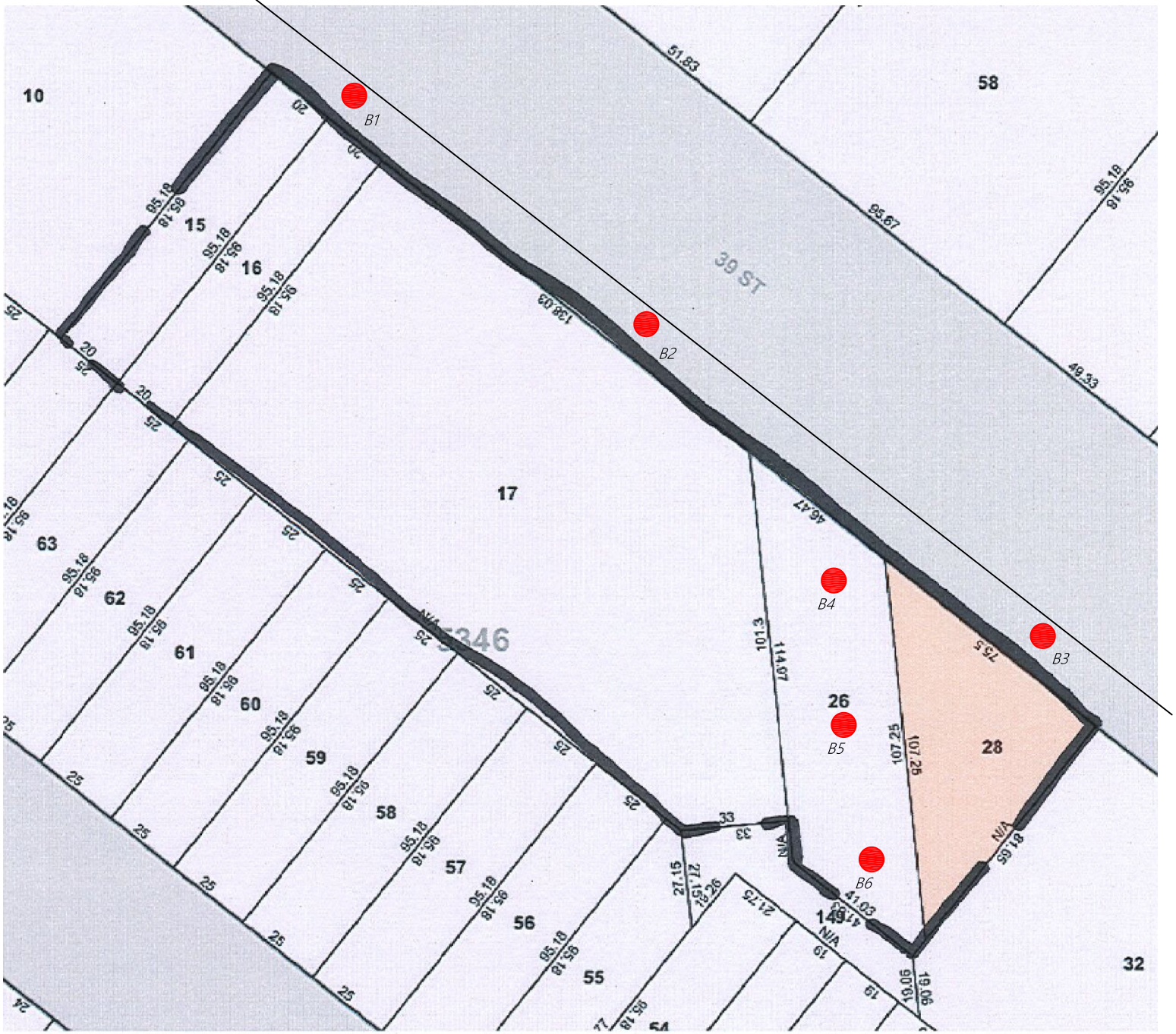
Respectfully Yours,
STRUCTURAL ENGINEERING TECHNOLOGIES, P.C.

Rui (Ray), Guo, Ph.D., P.E.
Chief Geotechnical Engineer

George J. Cambourakis, P.E., C. Eng
President

APPENDIX A

BORING LOGS



PG Environmental Services, Inc.

OFFICE
175 COMMERCE DRIVE, UNIT P
HAUPPAUGE, NY 11788
631-901-1888
WWW.PGENVIRO.COM

1460 39th Street
Brooklyn, NY

Drawn By:	C.Q.
Reviewed By:	C.Q.
Approved By:	C.Q.
Date:	04/18/2019
Scale:	AS NOTED

TITLE:

FIGURE 1: SITE PLAN

STRUCTURAL ENGINEERING TECHNOLOGIES, P.C.
40-12 28th Street, Long Island City, NY 11101
Tel: 718.706.7196 E-mail: info@set-ny.com
www.set-ny.com

GEOTECHNICAL BORING LOG

Boring #: B-1

Client: SNL CONSTRUCTION
Date Start: 04-01-19
Date Finish: 04-01-19
Project: 1460 39TH STREET, BROOKLYN, NY
Block: 5346
Lot(s): 15, 16, 17, 26&28
Drilling Agency: PG ENVIRONMENTAL SERVICES, INC.
Driller: Jonathan
Helper: Anderson
Elevation & Datum: Sidewalk Grade 0'-0"
Groundwater Depth: 45-ft±
Rock Depth: N/A

DEPTH FROM/TO	SAMPLES	MATERIAL DESCRIPTION	REC. IN SOIL	SPOON BLOWS PER 6" INTERVAL		REMARKS
0.0'-2.0'	S-1	Fill: Brown, sandy silt with gravel, and cobbles	12"	10 6	10 7	FILL (7)
2.0'-4.0'	S-2	Fill: Brown, sandy silt	10"	3 2	3 2	FILL (7)
4.0'-6.0'	S-3	Fill: Brown, poorly graded sand with silt, gravel, and cobbles	11"	3 1	2 7	FILL (7)
6.0'-8.0'	S-4	Fill: same as above	14"	17 22	17 24	FILL (7)
8.0'-10.0'	S-5	Fill: same as above	14"	17 21	15 21	FILL (7)
10.0'-12.0'	S-6	Fill: Brown, poorly graded sand with silt, gravel, cobbles, and concrete	16"	22 34	26 31	FILL (7)
12.0'-14.0'	S-7	Brown, poorly graded sand with silt, gravel, and cobbles	12"	35 55	51 47	SAND (3a)

Drilling Equipment:
Year: 2010
Make: GEOPROBE
Model: 7730DT
Mounting: TRACK

Spoon Hammer Type: Automatic Trip Hammer
Spoon Hammer Drop: 30 INCH.
Spoon Hammer Weight: 140 LBS.
Spoon Size: 24 INCH
Rock Core Barrel Size: N/A

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Driller: Jonathan
Helper: Anderson
Elevation & Datum: Sidewalk Grade 0'-0"
Groundwater Depth: 45-ft±
Rock Depth: N/A

DEPTH FROM/TO	SAMPLES	MATERIAL DESCRIPTION	REC. IN SOIL	SPOON BLOWS PER 6" INTERVAL		REMARKS
15.0'-17.0'	S-8	Brown, sandy silt with gravel and cobbles	10"	51	52	SILT (5a)
				47	33	
20.0'-22.0'	S-9	Brown, poorly graded sand with silt and gravel	12"	42	37	SAND (3a)
				38	30	
25.0'-27.0'	S-10	Brown, poorly graded sand with silt, gravel, and boulders	6"	80	90	SAND (3a)
				94	100	
30.0'-32.0'	S-11	Same as above	7"	58	46	SAND (3a)
				42	40	
35.0'-37.0'	S-12	Same as above	13"	44	36	SAND (3a)
				34	36	
40.0'-42.0'	S-13	Same as above	8"	54	47	SAND (3a)
				51	40	
45.0'-47.0'	S-14	Brown, poorly graded sand with clay Brown, sandy lean clay	5"	60	55	SAND (3a) CLAY (4a)
				43	51	

Drilling Equipment:
Year: 2010
Make: GEOPROBE
Model: 7730DT
Mounting: TRACK

Spoon Hammer Type: Automatic Trip Hammer
Spoon Hammer Drop: 30 INCH.
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Spoon Size: 24 INCH
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Drilling Agency: PG ENVIRONMENTAL SERVICES, INC.
Driller: Jonathan
Helper: Anderson
Elevation & Datum: Sidewalk Grade 0'-0"
Groundwater Depth: 45-ft±
Rock Depth: N/A

DEPTH FROM/TO	SAMPLES	MATERIAL DESCRIPTION	REC. IN SOIL	SPOON BLOWS PER 6" INTERVAL		REMARKS
50.0'-52.0'	S-15	Brown, poorly graded sand with clay and gravel	7"	57 51	46 60	SAND (3a)
						End of boring @ 52-ft

Drilling Equipment:
Year: 2010
Make: GEOPROBE
Model: 7730DT
Mounting: TRACK

Spoon Hammer Type: Automatic Trip Hammer
Spoon Hammer Drop: 30 INCH.
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Spoon Size: 24 INCH
Rock Core Barrel Size: N/A

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GEOTECHNICAL BORING LOG

Boring #: B-2

Client: SNL CONSTRUCTION
Date Start: 04-02-19
Date Finish: 04-02-19
Project: 1460 39TH STREET, BROOKLYN, NY
Block: 5346
Lot(s): 15, 16, 17, 26&28
Drilling Agency: PG ENVIRONMENTAL SERVICES, INC.
Driller: Oscar
Helper: Munoz
Elevation & Datum: Sidewalk Grade 0'-0"
Groundwater Depth: 45-ft±
Rock Depth: N/A

DEPTH FROM/TO	SAMPLES	MATERIAL DESCRIPTION	REC. IN SOIL	SPOON BLOWS PER 6" INTERVAL		REMARKS
0.0'-2.0'	S-1	Fill: Brown, poorly graded sand with silt, gravel and concrete	14"	12 / 9	8 / 11	FILL (7)
2.0'-4.0'	S-2	Fill: Brown, poorly graded sand with silt, gravel, concrete, and boulders	12"	4 / 4	2 / 3	FILL (7)
4.0'-6.0'	S-3	Fill: Brown, poorly graded sand with silt, gravel, and cobbles	13"	6 / 2	2 / 4	FILL (7)
6.0'-8.0'	S-4	Fill: Brown, poorly graded sand with silt, gravel, cobbles, and concrete	17"	13 / 20	14 / 24	FILL (7)
8.0'-10.0'	S-5	Brown, poorly graded sand with silt, gravel, and cobbles	12''	14 / 19	17 / 20	SAND (3a)
10.0'-12.0'	S-6	Same as above	8"	27 / 37	31 / 29	SAND (3a)
12.0'-14.0'	S-7	Same as above	5"	34 / 49	78 / 52	SAND (3a)

Drilling Equipment:
Year: 2013
Make: GEOPROBE
Model: 7822DT
Mounting: TRACK

Spoon Hammer Type: Automatic Trip Hammer
Spoon Hammer Drop: 30 INCH.
Spoon Hammer Weight: 140 LBS.
Spoon Size: 24 INCH
Rock Core Barrel Size: N/A

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Driller: Oscar
Helper: Munoz
Elevation & Datum: Sidewalk Grade 0'-0"
Groundwater Depth: 45-ft±
Rock Depth: N/A

DEPTH FROM/TO	SAMPLES	MATERIAL DESCRIPTION	REC. IN SOIL	SPOON BLOWS PER 6" INTERVAL		REMARKS
15.0'-17.0'	S-8	Same as above	12"	27	31	SAND (3a)
				48	38	
20.0'-22.0'	S-9	Same as above	16"	30	28	SAND (3a)
				44	51	
25.0'-27.0'	S-10	Same as above	16"	44	39	SAND (3a)
				59	28	
30.0'-32.0'	S-11	Same as above	12"	34	47	SAND (3a)
				52	50	
35.0'-37.0'	S-12	Same as above	13"	44	31	SAND (3a)
				39	27	
40.0'-42.0'	S-13	Same as above	11"	34	48	SAND (3a)
				42	50	
45.0'-47.0'	S-14	Brown, clayey sand and boulders	15"	44	36	SAND (3a)
				48	40	

Drilling Equipment:
Year: 2013
Make: GEOPROBE
Model: 7822DT
Mounting: TRACK

Spoon Hammer Type: Automatic Trip Hammer
Spoon Hammer Drop: 30 INCH.
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Helper: Munoz
Elevation & Datum: Sidewalk Grade 0'-0"
Groundwater Depth: 45-ft±
Rock Depth: N/A

DEPTH FROM/TO	SAMPLES	MATERIAL DESCRIPTION	REC. IN SOIL	SPOON BLOWS PER 6" INTERVAL		REMARKS
50.0'-52.0'	S-15	Brown, clayey sand	14"	43 44	58 50	SAND (3a)
						End of boring @ 52-ft

Drilling Equipment:
Year: 2013
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Spoon Hammer Type: Automatic Trip Hammer
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Spoon Size: 24 INCH
Rock Core Barrel Size: N/A

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GEOTECHNICAL BORING LOG

Boring #: B-3

Client: SNL CONSTRUCTION
Date Start: 04-03-19
Date Finish: 04-03-19
Project: 1460 39TH STREET, BROOKLYN, NY
Block: 5346
Lot(s): 15, 16, 17, 26&28
Drilling Agency: PG ENVIRONMENTAL SERVICES, INC.
Driller: Jonathan
Helper: Anderson
Elevation & Datum: Sidewalk Grade 0'-0"
Groundwater Depth: 45-ft±
Rock Depth: N/A

DEPTH FROM/TO	SAMPLES	MATERIAL DESCRIPTION	REC. IN SOIL	SPOON BLOWS PER 6" INTERVAL		REMARKS
0.0'-2.0'	S-1	Fill: Brown, poorly graded sand with silt, gravel and boulder	11"	10 9	12 13	FILL (7)
2.0'-4.0'	S-2	Fill: same as above	16"	19 4	3 3	FILL (7)
4.0'-6.0'	S-3	Fill: same as above	14"	4 6	2 5	FILL (7)
6.0'-8.0'	S-4	Brown, poorly graded sand with silt, gravel and boulder	14"	44 12	26 14	SAND (3a)
8.0'-10.0'	S-5	Same as above	14''	24 18	16 14	SAND (3a)
10.0'-12.0'	S-6	Same as above	8"	28 30	35 46	SAND (3a)
12.0'-14.0'	S-7	Same as above	16"	64 54	46 42	SAND (3a)

Drilling Equipment:
Year: 2010
Make: GEOPROBE
Model: 7730DT
Mounting: TRACK

Spoon Hammer Type: Automatic Trip Hammer
Spoon Hammer Drop: 30 INCH.
Spoon Hammer Weight: 140 LBS.
Spoon Size: 24 INCH
Rock Core Barrel Size: N/A

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GEOTECHNICAL BORING LOG

Boring #: B-3

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Date Start: 04-03-19
Date Finish: 04-03-19
Project: 1460 39TH STREET, BROOKLYN, NY
Block: 5346
Lot(s): 15, 16, 17, 26&28
Drilling Agency: PG ENVIRONMENTAL SERVICES, INC.
Driller: Jonathan
Helper: Anderson
Elevation & Datum: Sidewalk Grade 0'-0"
Groundwater Depth: 45-ft±
Rock Depth: N/A

DEPTH FROM/TO	SAMPLES	MATERIAL DESCRIPTION	REC. IN SOIL	SPOON BLOWS PER 6" INTERVAL		REMARKS
15.0'-17.0'	S-8	Same as above	11"	16 42	58 36	SAND (3a)
20.0'-22.0'	S-9	Brown, poorly graded sand with silt	18"	72 51	49 42	SAND (3a)
25.0'-27.0'	S-10	Brown, poorly graded sand with silt, gravel and boulder	17"	40 54	37 31	SAND (3a)
30.0'-32.0'	S-11	Same as above	12"	54 41	30 26	SAND (3a)
35.0'-37.0'	S-12	Same as above	6"	33 61	57 48	SAND (3a)
40.0'-42.0'	S-13	Same as above	10"	42 36	38 34	SAND (3a)
45.0'-47.0'	S-14	Brown, silty clay and boulder	12"	41 37	47 32	CLAY (4a)

Drilling Equipment:
Year: 2010
Make: GEOPROBE
Model: 7730DT
Mounting: TRACK

Spoon Hammer Type: Automatic Trip Hammer
Spoon Hammer Drop: 30 INCH.
Spoon Hammer Weight: 140 LBS.
Spoon Size: 24 INCH
Rock Core Barrel Size: N/A

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GEOTECHNICAL BORING LOG

Boring #: B-3

Client: SNL CONSTRUCTION
Date Start: 04-03-19
Date Finish: 04-03-19
Project: 1460 39TH STREET, BROOKLYN, NY
Block: 5346
Lot(s): 15, 16, 17, 26&28
Drilling Agency: PG ENVIRONMENTAL SERVICES, INC.
Driller: Jonathan
Helper: Anderson
Elevation & Datum: Sidewalk Grade 0'-0"
Groundwater Depth: 45-ft±
Rock Depth: N/A

DEPTH FROM/TO	SAMPLES	MATERIAL DESCRIPTION	REC. IN SOIL	SPOON BLOWS PER 6" INTERVAL		REMARKS
50.0'-52.0'	S-15	Brown, sandy lean clay and boulder	14"	41	47	CLAY (4a)
				49	36	
						End of boring @ 52-ft

Drilling Equipment:
Year: 2010
Make: GEOPROBE
Model: 7730DT
Mounting: TRACK

Spoon Hammer Type: Automatic Trip Hammer
Spoon Hammer Drop: 30 INCH.
Spoon Hammer Weight: 140 LBS.
Spoon Size: 24 INCH
Rock Core Barrel Size: N/A

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GEOTECHNICAL BORING LOG

Boring #: B-4

Client: SNL CONSTRUCTION
Date Start: 03-30-19
Date Finish: 03-30-19
Project: 1460 39TH STREET, BROOKLYN, NY
Block: 5346
Lot(s): 15, 16, 17, 26&28
Drilling Agency: PG ENVIRONMENTAL SERVICES, INC.
Driller: Oscar
Helper: Munoz
Elevation & Datum: Sidewalk Grade 0'-0"
Groundwater Depth: 45-ft±
Rock Depth: N/A

DEPTH FROM/TO	SAMPLES	MATERIAL DESCRIPTION	REC. IN SOIL	SPOON BLOWS PER 6" INTERVAL		REMARKS
0.0'-2.0'	S-1	Fill: Brown, silt with sand	12"	11 / 5	13 / 7	FILL (7)
2.0'-4.0'	S-2	Fill: Brown, silt	14"	5 / 4	6 / 4	FILL (7)
4.0'-6.0'	S-3	Fill: Brown, sandy silt	12"	3 / 6	4 / 11	FILL (7)
6.0'-8.0'	S-4	Brown, poorly graded sand with silt, gravel and boulder	12"	22 / 24	33 / 29	SAND (3a)
8.0'-10.0'	S-5	Same as above	15''	22 / 21	20 / 26	SAND (3a)
10.0'-12.0'	S-6	Same as above	13"	34 / 24	22 / 55	SAND (3a)
12.0'-14.0'	S-7	Same as above	13"	75 / 35	40 / 46	SAND (3a)

Drilling Equipment:
Year: 2013
Make: GEOPROBE
Model: 7822DT
Mounting: TRACK

Spoon Hammer Type: Automatic Trip Hammer
Spoon Hammer Drop: 30 INCH.
Spoon Hammer Weight: 140 LBS.
Spoon Size: 24 INCH
Rock Core Barrel Size: N/A

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GEOTECHNICAL BORING LOG

Boring #: B-4

Client: SNL CONSTRUCTION
Date Start: 03-30-19
Date Finish: 03-30-19
Project: 1460 39TH STREET, BROOKLYN, NY
Block: 5346
Lot(s): 15, 16, 17, 26&28
Drilling Agency: PG ENVIRONMENTAL SERVICES, INC.
Driller: Oscar
Helper: Munoz
Elevation & Datum: Sidewalk Grade 0'-0"
Groundwater Depth: 45-ft±
Rock Depth: N/A

DEPTH FROM/TO	SAMPLES	MATERIAL DESCRIPTION	REC. IN SOIL	SPOON BLOWS PER 6" INTERVAL		REMARKS
14.0'-16.0'	S-8	Same as above	11"	46 50	54 32	SAND (3a)
16.0'-18.0'	S-9	Same as above	8"	15 77	69 79	SAND (3a)
18.0'-20.0'	S-10	Same as above	8"	44 55	52 62	SAND (3a)
20.0'-22.0'	S-11	Same as above	12"	38 40	40 36	SAND (3a)
25.0'-27.0'	S-12	Same as above	9"	40 41	41 39	SAND (3a)
30.0'-32.0'	S-13	Same as above	6"	52 59	54 60	SAND (3a)
35.0'-37.0'	S-14	Same as above	12"	39 42	40 42	SAND (3a)

Drilling Equipment:
Year: 2013
Make: GEOPROBE
Model: 7822DT
Mounting: TRACK

Spoon Hammer Type: Automatic Trip Hammer
Spoon Hammer Drop: 30 INCH.
Spoon Hammer Weight: 140 LBS.
Spoon Size: 24 INCH
Rock Core Barrel Size: N/A

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GEOTECHNICAL BORING LOG

Boring #: B-4

Client: SNL CONSTRUCTION
Date Start: 03-30-19
Date Finish: 03-30-19
Project: 1460 39TH STREET, BROOKLYN, NY
Block: 5346
Lot(s): 15, 16, 17, 26&28
Drilling Agency: PG ENVIRONMENTAL SERVICES, INC.
Driller: Oscar
Helper: Munoz
Elevation & Datum: Sidewalk Grade 0'-0"
Groundwater Depth: 45-ft±
Rock Depth: N/A

DEPTH FROM/TO	SAMPLES	MATERIAL DESCRIPTION	REC. IN SOIL	SPOON BLOWS PER 6" INTERVAL		REMARKS
40.0'-42.0'	S-15	Brown, clayey sand	8"	38	40	SAND (3a)
				40	45	
45.0'-47.0'	S-16	Brown, silty sand with gravel	8"	44	47	SAND (3a)
				50	50	
50.0'-52.0'	S-17	Brown, silty sand and boulder	7"	48	46	SAND (3a)
				56	52	
						End of boring @ 52-ft

Drilling Equipment:
Year: 2013
Make: GEOPROBE
Model: 7822DT
Mounting: TRACK

Spoon Hammer Type: Automatic Trip Hammer
Spoon Hammer Drop: 30 INCH.
Spoon Hammer Weight: 140 LBS.
Spoon Size: 24 INCH
Rock Core Barrel Size: N/A

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GEOTECHNICAL BORING LOG

Boring #: B-5

Client: SNL CONSTRUCTION
Date Start: 04-03-19
Date Finish: 04-04-19
Project: 1460 39TH STREET, BROOKLYN, NY
Block: 5346
Lot(s): 15, 16, 17, 26&28
Drilling Agency: PG ENVIRONMENTAL SERVICES, INC.
Driller: Oscar
Helper: Munoz
Elevation & Datum: Sidewalk Grade 0'-0"
Groundwater Depth: 45-ft±
Rock Depth: N/A

DEPTH FROM/TO	SAMPLES	MATERIAL DESCRIPTION	REC. IN SOIL	SPOON BLOWS PER 6" INTERVAL		REMARKS
0.0'-2.0'	S-1	Fill: Brown, silt	14"	14 / 3	7 / 3	FILL (7)
2.0'-4.0'	S-2	Fill: Brown, silt with gravel	13"	4 / 3	4 / 3	FILL (7)
4.0'-6.0'	S-3	Fill: Brown, silty sand with gravel	13"	2 / 5	2 / 9	FILL (7)
6.0'-8.0'	S-4	Brown, poorly graded sand with silt, gravel and boulder	11"	24 / 20	35 / 27	SAND (3a)
8.0'-10.0'	S-5	Same as above	16''	20 / 18	18 / 24	SAND (3a)
10.0'-12.0'	S-6	Same as above	12"	32 / 22	20 / 57	SAND (3a)
12.0'-14.0'	S-7	Same as above	12"	79 / 32	44 / 40	SAND (3a)

Drilling Equipment:
Year: 2013
Make: GEOPROBE
Model: 7822DT
Mounting: TRACK

Spoon Hammer Type: Automatic Trip Hammer
Spoon Hammer Drop: 30 INCH.
Spoon Hammer Weight: 140 LBS.
Spoon Size: 24 INCH
Rock Core Barrel Size: N/A

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GEOTECHNICAL BORING LOG

Boring #: B-5

Client: SNL CONSTRUCTION
Date Start: 04-03-19
Date Finish: 04-04-19
Project: 1460 39TH STREET, BROOKLYN, NY
Block: 5346
Lot(s): 15, 16, 17, 26&28
Drilling Agency: PG ENVIRONMENTAL SERVICES, INC.
Driller: Oscar
Helper: Munoz
Elevation & Datum: Sidewalk Grade 0'-0"
Groundwater Depth: 45-ft±
Rock Depth: N/A

DEPTH FROM/TO	SAMPLES	MATERIAL DESCRIPTION	REC. IN SOIL	SPOON BLOWS PER 6" INTERVAL		REMARKS
14.0'-16.0'	S-8	Same as above	10"	48 / 49	52 / 29	SAND (3a)
16.0'-18.0'	S-9	Same as above	9"	13 / 79	76 / 81	SAND (3a)
18.0'-20.0'	S-10	Same as above	7"	43 / 57	54 / 61	SAND (3a)
20.0'-22.0'	S-11	Brown, poorly graded sand with silt and gravel	11"	39 / 37	37 / 34	SAND (3a)
25.0'-27.0'	S-12	No refusal	N/A	100 / -	- / -	SAND (3a)
30.0'-32.0'	S-13	Brown, poorly graded sand with silt, gravel and boulder	5"	48 / 56	51 / 61	SAND (3a)
35.0'-37.0'	S-14	Same as above	11"	38 / 41	39 / 40	SAND (3a)

Drilling Equipment:
Year: 2013
Make: GEOPROBE
Model: 7822DT
Mounting: TRACK

Spoon Hammer Type: Automatic Trip Hammer
Spoon Hammer Drop: 30 INCH.
Spoon Hammer Weight: 140 LBS.
Spoon Size: 24 INCH
Rock Core Barrel Size: N/A

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GEOTECHNICAL BORING LOG

Boring #: B-5

Client: SNL CONSTRUCTION
Date Start: 04-03-19
Date Finish: 04-04-19
Project: 1460 39TH STREET, BROOKLYN, NY
Block: 5346
Lot(s): 15, 16, 17, 26&28
Drilling Agency: PG ENVIRONMENTAL SERVICES, INC.
Driller: Oscar
Helper: Munoz
Elevation & Datum: Sidewalk Grade 0'-0"
Groundwater Depth: 45-ft±
Rock Depth: N/A

DEPTH FROM/TO	SAMPLES	MATERIAL DESCRIPTION	REC. IN SOIL	SPOON BLOWS PER 6" INTERVAL		REMARKS
40.0'-42.0'	S-15	Same as above	6"	36	38	SAND (3a)
				41	43	
45.0'-47.0'	S-16	Brown, silty sand and boulder	4"	43	45	SAND (3a)
				49	51	
50.0'-52.0'	S-17	Brown, silty sand with gravel	5"	45	47	SAND (3a)
				49	51	
55.0'-57.0'	S-18	Same as above	6"	52	49	SAND (3a)
				53	50	
60.0'-62.0'	S-19	Brown, silty sand with gravel and boulder	6"	48	52	SAND (3a)
				49	53	
65.0'-67.0'	S-20	Brown, silty sand with gravel	5"	46	54	SAND (3a)
				49	53	
70.0'-72.0'	S-21	Same as above	8"	49	48	SAND (3a)
				49	50	

Drilling Equipment:
Year: 2013
Make: GEOPROBE
Model: 7822DT
Mounting: TRACK

Spoon Hammer Type: Automatic Trip Hammer
Spoon Hammer Drop: 30 INCH.
Spoon Hammer Weight: 140 LBS.
Spoon Size: 24 INCH
Rock Core Barrel Size: N/A

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GEOTECHNICAL BORING LOG

Boring #: B-5

Client: SNL CONSTRUCTION
Date Start: 04-03-19
Date Finish: 04-04-19
Project: 1460 39TH STREET, BROOKLYN, NY
Block: 5346
Lot(s): 15, 16, 17, 26&28
Drilling Agency: PG ENVIRONMENTAL SERVICES, INC.
Driller: Oscar
Helper: Munoz
Elevation & Datum: Sidewalk Grade 0'-0"
Groundwater Depth: 45-ft±
Rock Depth: N/A

DEPTH FROM/TO	SAMPLES	MATERIAL DESCRIPTION	REC. IN SOIL	SPOON BLOWS PER 6" INTERVAL		REMARKS
75.0'-77.0'	S-22	Same as above	8"	51 / 50	52 / 50	SAND (3a)
80.0'-82.0'	S-23	Brown, silty sand with gravel and boulder	12"	62 / 80	75 / 91	SAND (3a)
85.0'-87.0'	S-24	Brown, silt	10"	77 / 75	81 / 100	SILT (5a)
90.0'-92.0'	S-25	Brown, silty sand with gravel and boulder	14"	63 / 47	51 / 44	SAND (3a)
95.0'-97.0'	S-26	Same as above	12"	52 / 60	63 / 51	SAND (3a)
100.0'-102.0'	S-27	Brown, silty sand with gravel	16"	47 / 48	57 / 41	SAND (3a)
						End of boring @ 102-ft

Drilling Equipment:
Year: 2017
Make: ACKER
Model: SOIL MECHANIC
Mounting: SKID

Spoon Hammer Type: Automatic Trip Hammer
Spoon Hammer Drop: 30 INCH.
Spoon Hammer Weight: 140 LBS.
Spoon Size: 24 INCH
Rock Core Barrel Size: N/A

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GEOTECHNICAL BORING LOG

Boring #: B-6

Client: SNL CONSTRUCTION
Date Start: 03-30-19
Date Finish: 03-30-19
Project: 1460 39TH STREET, BROOKLYN, NY
Block: 5346
Lot(s): 15, 16, 17, 26&28
Drilling Agency: PG ENVIRONMENTAL SERVICES, INC.
Driller: Jonathan
Helper: Anderson
Elevation & Datum: Sidewalk Grade 0'-0"
Groundwater Depth: 45-ft±
Rock Depth: N/A

DEPTH FROM/TO	SAMPLES	MATERIAL DESCRIPTION	REC. IN SOIL	SPOON BLOWS PER 6" INTERVAL		REMARKS
0.0'-2.0'	S-1	Fill: Gray&Brown, silt, concrete and wood	16"	13	9	FILL (7)
				5	4	
2.0'-4.0'	S-2	Fill: Gray&Brown, silt and concrete	14"	6	5	FILL (7)
				4	2	
4.0'-6.0'	S-3	Fill: Brown, poorly graded sand with silt, gravel and boulder	14"	3	4	FILL (7)
				4	10	
6.0'-8.0'	S-4	Brown, poorly graded sand with silt, gravel and boulder	12"	22	36	SAND (3a)
				22	28	
8.0'-10.0'	S-5	Brown, poorly graded sand with silt and gravel	18''	22	20	SAND (3a)
				21	22	
10.0'-12.0'	S-6	Brown, poorly graded sand with silt, gravel and boulder	13"	32	22	SAND (3a)
				21	58	
12.0'-14.0'	S-7	Same as above	13"	80	45	SAND (3a)
				33	42	

Drilling Equipment:
Year: 2010
Make: GEOPROBE
Model: 7730DT
Mounting: TRACK

Spoon Hammer Type: Automatic Trip Hammer
Spoon Hammer Drop: 30 INCH.
Spoon Hammer Weight: 140 LBS.
Spoon Size: 24 INCH
Rock Core Barrel Size: N/A

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GEOTECHNICAL BORING LOG

Boring #: B-6

Client: SNL CONSTRUCTION
Date Start: 03-30-19
Date Finish: 03-30-19
Project: 1460 39TH STREET, BROOKLYN, NY
Block: 5346
Lot(s): 15, 16, 17, 26&28
Drilling Agency: PG ENVIRONMENTAL SERVICES, INC.
Driller: Jonathan
Helper: Anderson
Elevation & Datum: Sidewalk Grade 0'-0"
Groundwater Depth: 45-ft±
Rock Depth: N/A

DEPTH FROM/TO	SAMPLES	MATERIAL DESCRIPTION	REC. IN SOIL	SPOON BLOWS PER 6" INTERVAL		REMARKS
14.0'-16.0'	S-8	Same as above	12"	50 49	50 31	SAND (3a)
16.0'-18.0'	S-9	Brown, poorly graded sand with silt and boulder	11"	15 75	74 82	SAND (3a)
18.0'-20.0'	S-10	Brown, poorly graded sand with silt, gravel and boulder	9"	45 55	52 64	SAND (3a)
20.0'-22.0'	S-11	Same as above	12"	44 40	38 38	SAND (3a)
25.0'-27.0'	S-12	Same as above	10"	41 40	40 39	SAND (3a)
30.0'-32.0'	S-13	Brown, poorly graded sand with silt and gravel	7"	46 55	52 58	SAND (3a)
35.0'-37.0'	S-14	Brown, silty sand and boulder	12"	35 40	37 42	SAND (3a)

Drilling Equipment:
Year: 2010
Make: GEOPROBE
Model: 7730DT
Mounting: TRACK

Spoon Hammer Type: Automatic Trip Hammer
Spoon Hammer Drop: 30 INCH.
Spoon Hammer Weight: 140 LBS.
Spoon Size: 24 INCH
Rock Core Barrel Size: N/A

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GEOTECHNICAL BORING LOG

Boring #: B-6

Client: SNL CONSTRUCTION
Date Start: 03-30-19
Date Finish: 03-30-19
Project: 1460 39TH STREET, BROOKLYN, NY
Block: 5346
Lot(s): 15, 16, 17, 26&28
Drilling Agency: PG ENVIRONMENTAL SERVICES, INC.
Driller: Jonathan
Helper: Anderson
Elevation & Datum: Sidewalk Grade 0'-0"
Groundwater Depth: 45-ft±
Rock Depth: N/A

DEPTH FROM/TO	SAMPLES	MATERIAL DESCRIPTION	REC. IN SOIL	SPOON BLOWS PER 6" INTERVAL		REMARKS
40.0'-42.0'	S-15	Brown, silty sand with gravel and boulder	8"	35 42	40 46	SAND (3a)
45.0'-47.0'	S-16	Brown, silty sand with gravel	10"	49 47	50 49	SAND (3a)
50.0'-52.0'	S-17	Same as above	11"	50 40	50 52	SAND (3a)
						End of boring @ 52-ft

Drilling Equipment:
Year: 2010
Make: GEOPROBE
Model: 7730DT
Mounting: TRACK

Spoon Hammer Type: Automatic Trip Hammer
Spoon Hammer Drop: 30 INCH.
Spoon Hammer Weight: 140 LBS.
Spoon Size: 24 INCH
Rock Core Barrel Size: N/A