Geotechnical Evaluation Report

GEODESIGN INCORPORATED

GEOTECHNICAL | CONSTRUCTION | ENVIRONMENTAL
ENGINEERS and SCIENTISTS

GEOTECHNICAL EVALUATION REPORT

PROPOSED 22 STORY BUILDING
1700 PARK AVENUE
NEW YORK, NEW YORK

Prepared for:
Marvel Architects
145 Hudson Street
New York, NY 10013

Prepared By:
Geo**Design**, Inc.
241West 30th Street, 5th Floor
New York, NY 10001

Geo**Design** File No. 3765-003
June 2016

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GEODESIGN INCORPORATED

GEOTECHNICAL | CONSTRUCTION | ENVIRONMENTAL
ENGINEERS and SCIENTISTS

June 14, 2016
File No. 3765-003

Tim Fryatt
Marvel Architects
145 Hudson Street
New York, NY 10013

Re: Geotechnical Evaluation Report
1700 Park Avenue, New York, New York

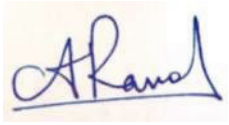
Dear Mr. Fryatt:

Geo**Design**, Inc. P.C. (GeoDesign) is pleased to submit this geotechnical evaluation report for the referenced project site.

We appreciate the opportunity to work with you. Please call if you have any questions.

Sincerely,

Geo**Design**, Inc. P.C.



Ansuman H. Raval, P.E.
Project Engineer

Thomas G. Thomann, PhD, P.E.
Project Principal / Reviewer

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1.0 INTRODUCTION AND OBJECTIVES

1.1 GENERAL

This report provides geotechnical recommendations for the design and construction of a proposed 22 story building at 1700 Park Avenue in New York, New York (see Figure 1). Authorization to proceed was obtained in the form of an agreement between Marvel Architects PLLC and GeoDesign Incorporated PC, dated June 13, 2016.

The geotechnical evaluations and recommendations presented herein are in general accordance with the 2014 NYC Building Code (Code).

1.2 SITE CONDITIONS AND PROJECT UNDERSTANDING

The project site is located at 1700 Park Avenue in Manhattan (Block 1746, Lot 33). The lot area is approximately 20,183 sq. ft. and, at the time of this report, was being used as a surface parking lot. The ground surface elevation of the site varies from approximately el. +27 to el. +29 feet[1].

East 120th Street is located along the northern property line, two 4 story buildings, with rear yards, are located along the western property line, the MNR elevated rail line is located along Park Avenue, and East 119th Street is located along the southern property line.

It is proposed to construct a 22 story building. We understand that the majority of the building will not contain a cellar level.

1.3 OBJECTIVES AND SCOPE OF SERVICES

The objectives of this investigation were to evaluate the subsurface conditions at the site and provide geotechnical recommendations for the design and construction of the proposed building. The following scope of services was performed to achieve these objectives:

1. Retained a subcontractor to drill test borings;
2. Provided full time special inspection of the test boring operations;
3. Performed engineering evaluations and prepared this final geotechnical evaluation report that includes the following:
    i. An Introductory Section presenting the project background information and the scope of services;
    ii. A Subsurface Conditions section that includes the following:
        - A description of the test boring and laboratory testing procedures and results;
        - A plan showing the location of the as-drilled test borings;
        - A description of the subsurface conditions;
    iii. A Design Recommendations section that includes the following:
        - Recommended foundation type, estimated capacity, and bearing elevation;
        - Seismic site classification and liquefaction potential;
        - Lateral soil and groundwater pressures on below-grade walls;

[1] All elevations provided in this report are referenced to NAVD88.

- Permanent groundwater control measures;
- Support of the cellar slab;

iv. A Construction Recommendations section that includes the following:

- Subgrade preparation recommendations;
- Support of excavation and underpinning considerations;
- Temporary groundwater control considerations, if necessary;
- Backfill and compaction control recommendations;
- Protection of adjacent structures;
- Construction inspection and monitoring considerations.

v. Summary and Conclusions

vi. Appendices that include test boring and laboratory test results.

1.4 REPORT ORGANIZATION

This report is divided into five sections. Section 1 presents an introduction and the objectives of the study. Section 2 includes a description of the subsurface investigation methods and results. Section 3 provides engineering evaluation results and the foundation design and construction recommendations. A summary and conclusions are included in Section 5. Limitations of the subsurface explorations, analyses, and recommendations are included in Section 6. Tables and Figures are provided at the end of the text.

2.0 SUBSURFACE CONDITIONS

2.1 GENERAL

The subsurface investigation included a field investigation that included drilling test borings, installing a groundwater observation well, and performing laboratory tests. Details of the subsurface investigation and the conditions encountered are described in the following sections.

2.2 SUBSURFACE INVESTIGATION

Eight test borings, designated as B-1 through B-8, were drilled on May 12 and May 13, 2016, at the locations shown in Figure 2. Special inspection of the test borings were performed on a continuous basis by an engineer under the direction of Mr. Thomas Thomann, PE of GeoDesign.

The test borings were performed by Craig Geotechnical Drilling (Craig) of Mays Landing, New Jersey using a truck mounted CME-75 drill rig. The boreholes were advanced using mud rotary drilling techniques with a 2-7/8 inch diameter tri-cone roller bit and a 4-inch diameter flush joint casing. Soil samples were obtained using techniques and equipment in general accordance with the American Society for Testing and Materials (ASTM) Standard Specification D1586-Standard Penetration Test (SPT). The SPT consists of driving a 2 inch O.D. split spoon sampler for a distance of 24 inches, with repeated blows of a 140 lb. hammer free falling a distance of 30 inches. The standard penetration, or N-value, is determined as the number of blows required to advance the sampler 12 inches after the initial 6 inches of penetration. The recovered split-spoon samples were placed in jars, labeled with the project name and number, boring number, sample, depth, SPT blow counts and the amount of recovery.

Rock coring was performed using a five-foot long NX (2-1/8 in. O.D.) core barrel. The top of rock was estimated based on the drilling operations (e.g., excessive rig chatter, difficult penetration) and practical spoon refusal, as indicated by blow counts greater than 100 for a 6 inch interval. Rock coring was performed to verify the presence of rock, as opposed to cobbles/boulders, and to assess its relative quality, as indicated by Core Recovery[2] and Rock Quality Designation (RQD)[3].

Upon completion of Boring B-4, a groundwater observation well was installed. The well was constructed of nominal 2-inch diameter Schedule 40 PVC pipe with a 10-foot screen between depths of approximately 8 and 18 feet and 8 feet of riser pipe. The annulus between the pipe and the wall of the borehole was backfilled with filter sand. A flush-mount cap was installed at the top of the well.

The test boring logs are included in Appendix A.

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[2] The Core Recovery is defined as the ratio (expressed as a percent) of the total length of recovered core to the length cored.

[3] The Rock Quality Designation (RQD) is defined as the ratio (expressed as a percentage) of the total length of recovered core samples having a length of at least twice the core diameter (e.g., about 4 in for NX-core) to the total length of core.

2.3 GENERALIZED SUBSURFACE CONDITIONS

The following generalized strata descriptions are based on interpretations of the subsurface investigation results:

Stratum 1 – Uncontrolled Fill [7]: This stratum generally consisted of brown and gray medium fine sand with trace amounts of silt and gravel and miscellaneous fill material such as bricks, cinder, wood, glass etc. The N-values typically ranged from 1 to 33 bpf, with an average N-value of 14, indicative of a medium dense material. The thickness of this stratum is estimated to be less than approximately 10 feet.

Stratum 2 – Sand [3a, 3b]: This stratum generally consisted of brown fine to coarse sand, with trace amounts of silt and gravel and decomposed rock fragments. The N-values typically ranged from 13 bpf to split-spoon refusal, indicative of a medium to very dense material. The thickness of this stratum is estimated to vary from zero to less than 10 feet.

Stratum 3 – Soft Rock [1d]: This stratum, when encountered, consisted of black and gray decomposed schist bedrock. The N-values were typically greater than 50 bpf, indicative of a very dense material. The thickness of this stratum, which was encountered in Borings B-3, B-4, and B-6, was typically less than approximately 5 feet.

Stratum 4 – Intermediate to Hard Bedrock [1c to 1a]: This stratum consisted of black and gray medium grained schist that was moderately to slightly fractured with slightly weathered joints. The Core Recovery ranged from 83% to 100% and the RQD ranged from 57% to 100%. Except for Boring B-7, the depth to the top of bedrock varied from 8 feet (el. +19.5 feet) to 18 feet (el +10 feet). At Boring B-7, bedrock was encountered at a depth of 1 foot (el. +27 feet).

2.4 GROUNDWATER LEVEL

A groundwater observation well was installed at Boring B-4 on May 13, 2016. Groundwater was measured at a depth of 9 feet on May 13, 2016, corresponding to approximately el. +19 feet. The measured groundwater is approximately 4.5 feet above soft rock. Rock has a relatively low permeability, which reduces the flow of water through it, and results in groundwater being "trapped" on top of it. Therefore, it is believed that the measured value represents a trapped groundwater condition.

Groundwater measurements were not taken over an extended period of time; therefore, the measurements do not adequately reflect seasonal or other time dependent variations that may occur. See the limitations in Section 5.

3.0 – ANALYSES AND RECOMMENDATIONS

3.1 GENERAL

This section presents engineering analyses, evaluations, and recommendations related to the design and construction of the foundations and below grade structures. The evaluations and recommendations are based on the available subsurface information, our experience on other projects, and the design requirements provided herein for the proposed structure.

3.2 FOUNDATION DESIGN

3.2.1 Seismic Recommendations

As indicated in the next section, it is recommended that the foundation bear on rock. Considering this, we recommend a seismic site classification of Site Class "B". In accordance with the Code, if the building is in Risk Category I&II, or III, the Seismic Design Category is "B". The appropriate Risk Category should be determined by the Architect or Structural Engineer.

Liquefaction is considered unlikely for this site.

3.2.2 Foundation Recommendations

3.2.2.1 Columns and Walls

Considering that the majority of the building will not have a cellar level, the minimum foundation depth would be 4 feet. It is anticipated that uncontrolled fill soils (i.e., Stratum 1) will be encountered at this depth and at some locations. The Code allows buildings to be supported on suitable fill materials and a maximum allowable bearing capacity of 2 tsf. The building loads have not been provided to us; however, based on our experience with similar size buildings, the bearing stresses will be greater than 2 tsf. Therefore, Code requirements are not likely to allow this building to be supported on fill material.

The depth to intermediate to hard rock (Stratum 4) varied from 1 foot to 18 feet, but typically varied from 8 to 11 feet. Considering this, it is possible that the building could be supported on footings bearing on rock (i.e., Strata 3 or 4). We recommend an allowable bearing capacity of 8 tsf for a foundation bearing on Stratum 3, and 20 tsf for a foundation bearing on Stratum 4.

At some locations, acceptable rock conditions may be below the proposed bottom of the foundation. At these locations, overexcavation and construction of a "pier-to-rock" could be performed. If the overexcavation depth exceeds approximately 10 feet, construction of a pier-to-rock is not practical and caissons would be required. Based on the boring information and assuming that the majority of the building will not have a cellar level, caissons may be necessary at some locations.

All foundations that bear on Stratum 3 or 4 should be a minimum of 1 feet below final grade. The portion of the foundation located next to adjacent structures should bear at the same level as the foundation of the adjacent structure. If these requirements, or other

factors, result in the new foundations being below the influence zone of adjacent building foundations, appropriate adjacent building support will be required.

3.2.2.2 Ground Floor Slab

Assuming that the majority of the building will not have a cellar level, the subsurface conditions at the ground floor slab level will consist of uncontrolled fill (i.e., Stratum 1) at some locations. The slab could be designed as a slab-on-grade, if certain requirements are met. If the fill contains voids or a large amount of unsuitable material (e.g., wood, refuse, metal, etc.), it will be necessary to remove the material and replace it with acceptable backfill. If the fill contains limited amounts of unsuitable material, as determined by the Geotechnical Engineer, it will be necessary, at a minimum, to remove two feet of fill, compact the subgrade, place a geotextile, and place and compact structural fill or ¾" crushed stone. The specific preparation details will depend on the fill conditions and will need to be finalized after performing test pits during construction.

At locations where suitable subgrade material is encountered, the subgrade should be properly prepared, as indicated in Section 3.3.4.

If the bottom of the slab is below the design groundwater elevation, the slab should be designed to resist the hydrostatic pressures.

3.2.3 Lateral Earth Pressures

The design lateral pressures for permanent below grade walls consist of static and seismic pressures that are influenced by the thickness and type of overburden material, and wall bracing conditions. We recommend that the below grade walls above and below the groundwater level be designed for a static equivalent hydrostatic lateral soil pressure of 45 pcf and 85 pcf, respectively. (i.e., soil wall pressure is a triangular pressure).

In addition, a seismic lateral soil force of $6H^2$ (lb./ft. of wall), where H is the total vertical height of the wall, in feet, should be included. This force should be applied at a distance of H/3 from the top of the wall (i.e., seismic wall pressure is an inverted triangle).

The recommended lateral pressures do not include any surcharge loads adjacent to the walls or at the ground surface. We recommend that a uniform (i.e., rectangular) lateral pressure distribution of 0.40 times the design surcharge be added to the lateral soil pressure distribution. The structural engineer should determine the magnitude of the design surcharge loads (i.e., live loads).

3.2.4 Permanent Groundwater Control

Groundwater measurements were not taken over an extended period of time; therefore, they do not reflect potential seasonal, or other time dependent variations, which could result in shallower groundwater depths. Therefore, we recommend a design groundwater elevation of +22 feet.

If the bottom of the foundation and other foundation elements (e.g., elevator and ejector pits) will be above the design groundwater elevation, the below grade walls and the foundation, at a minimum, should be damproofed. Damproofing should be performed at the bottom of the

slab by installing a membrane, such as Grace Construction Products Florprufe, or approved equal. Damproofing of the below grade walls should be performed with a liquid applied membrane (LAM), such as Grace Construction Products Procor, or approved equal, for 2-sided forms, or a membrane, such as Grace Construction Products Preprufe, or approved equal, for blind-sided forms.

If the bottom of the foundation and other foundation elements (e.g., elevator and ejector pits) will be below the design groundwater elevation, the below grade walls and slab should be designed to resist groundwater pressures and should be waterproofed. Waterproofing materials should be installed on the outside of the perimeter walls (Grace Construction Products Bituthene 3000 for two-sided form applications and Preprufe 160R for blind side applications, or approved equivalent) and directly beneath the cellar floor slab (Grace Construction Products Preprufe 300R, or equivalent). The waterproofing on the perimeter walls is typically installed to the ground surface. Waterstops should be installed at applicable locations.

The installation of all waterproofing elements should be inspected on a full time basis to confirm that the waterproofing is being applied as per the manufacturer's specifications and details.

If the foundation is significantly below the design groundwater elevation, the project team should consider the benefits of a "sandwich" slab, which consists of the pressure slab, a gravel filled layer with perforated pipes connected to a sump pit, and a wearing slab. This system minimizes penetrations through the pressure slab and provides for management of water that may leak through the mat, at the connection between the mat and the foundation walls, or at other critical locations.

3.3 CONSTRUCTION

3.3.1 Excavation Considerations

It is anticipated that soil and rock excavations will be required at this site. The following sections provide recommendations for the excavation of soil and rock.

3.3.1.1 Rock

The effort required to excavate rock is dependent on many factors, including the extent of rock fracturing, the rock hardness and strength, and the abrasiveness of the rock. Blasting is not likely to be cost effective because of the relatively small amount of rock to be removed. The contractor may use a ho-ram mounted on an excavator and other conventional methods to excavate rock.

The measured rock core recoveries and RQD values are indicative of rock that is typically moderately fractured and weathered. For these conditions, the use of a ho-ram may be applicable for the majority of the rock. At locations where the rock fracturing is limited, expansive chemicals or hydraulic fracturing tools may be needed to assist in fracturing the rock and making conventional rock excavation equipment more practical.

Special attention should be given to the excavation of rock along the limits of the excavation. It is recommended that line drilling be performed to reduce the amount of

overbreak and to reduce vibrations. The line drilling should be performed so that it creates minimum of 50% rock removal (e.g., drill 3 inch diameter holes at 6 inch spacing). Proper line drilling will also assist in limiting the extent of the rock support that will be needed. At locations close to the adjacent buildings, the use of mechanical or hydraulic splitters or chemicals may be required to reduce the amount of rock overbreak and to limit the vibrations.

Excavated rock faces should be inspected by the geotechnical engineer to determine if rock stabilization measures are required. The need for rock stabilization will depend on the nature, location, extent, and orientation of discontinuities such as joints, shears, and foliation surfaces. These discontinuities, together with the orientation of the excavation face, could form unstable rock wedges and slabs on the rock walls. The use of rock bolts, prestressed rock anchors, concrete buttresses, and/or shotcrete may be required to stabilize potentially unstable rock blocks. The type, number, and location of rock stabilization are determined in the field after the rock face is exposed. The location and installation of the rock stabilization measures should be approved and inspected by the geotechnical engineer.

3.3.1.2 Soil

Local temporary soil excavations above the natural groundwater level can have cut slopes as steep as 1H:1V (horizontal to vertical). Temporary soil excavations below the natural groundwater level should be no steeper than 2H:1V. The slopes of any excavations adjacent to the existing structures should be no steeper than 2H:1V, unless approved by the SOE engineer.

All vertical soil faces will require temporary support until the new cellar walls and foundations are constructed and the area is properly backfilled. Considering the subsurface conditions and the proposed excavation depths, a feasible support system could consist of soldier piles and timber lagging with sufficient lateral restraint (e.g., anchors, rakers, bracing, etc.), as required. Design of the lateral bracing must also consider the protection of surrounding subsurface utilities and other adjacent infrastructure.

Vibration measurements should be made at selected adjacent structures (preferably on the ground surface next to the building) during installation of the support system and during excavation activities. The maximum allowable vibration levels should be established as part of the pre-construction condition survey of the adjacent structures.

The design and construction of any slopes and/or temporary excavation support systems should be the responsibility of a licensed New York Professional Engineer. All excavations and temporary support systems should conform to pertinent OSHA and local safety regulations.

3.3.2 Adjacent Building Support

Adjacent building support (e.g., underpinning or secant pile walls) will be required at locations where the new foundations will be placed within the influence zone of the adjacent building foundations.

Underpinning typically consists of installing a series of interconnected concrete panels which create a continuous concrete wall that transfers the foundation loads from the present bearing

level to a level that is below the new building foundation level. Underpinning requires permission of the adjacent building owner and is difficult to perform below the groundwater. Underpinning should transfer the foundation loads from their present bearing level to a level that results in the new foundations being outside the influence zone of the existing adjacent foundations.

A secant pile wall system is installed prior to excavation, close to the adjacent buildings, and includes overlapping drilled and cased piles that go below the excavation depth. This wall system does not require adjacent building owner permission and can be installed below the groundwater. Since the secant pile wall is installed within the property, there will be some loss of below grade space.

We recommend that the buildings located along the lot lines be visited for the purpose of determining the extent and depth of any cellar levels and any other features (e.g., elevator pits, ejector pits, etc.) that may affect the design and construction of the new building.

The adjacent building information should then be used to develop a test pit plan. The purposes of the test pits are to document the size, depth, and type of adjacent building foundations, and below-grade encroachments that may be present. This information should then be used to develop the final SOE and adjacent building support drawings.

The analysis and design of any adjacent building support systems should be performed by a licensed New York Professional Engineer. The installation of the support system should be inspected full time during construction by an engineer acting under the direction of the design engineer.

3.3.3 Temporary Groundwater Control

The groundwater level should be maintained at least 2 feet below the bottom of the excavation. The extent of the dewatering system will depend on the groundwater level at the time of construction, the lowest excavation depth, and the bedrock conditions.

Based on the measured groundwater elevation of el. +19 and assuming that portions of the foundation excavation may go below this elevation, it should be anticipated that dewatering will be required. As indicated previously, it is believed that the measured groundwater represents a trapped condition. Trapped groundwater typically results in less volume of water than if the excavation goes below the actual groundwater elevation. Therefore, it may be possible to control the trapped groundwater with localized dewatering using sumps and pumps.

A NYCDEP permit will be required to temporarily discharge groundwater into the sewer system.

3.3.4 Subgrade Preparation

Subgrade surfaces for the foundations and slabs should be level and cleaned of loose soil, mud, and other material (such as concrete, brick, wood, debris, etc.) that can have a negative impact on the performance of the foundation or slab. Excavations to reach final soil subgrades should use a smooth edged bucket and/or hand tools.

If directed by the Special Inspector, the soil subgrade should be proof-rolled with a minimum of 6 passes of a smooth drum roller with a minimum 1,500 lb. static weight and minimum centrifugal force of 4,000 lbs., or similar approved equipment. Any unstable areas which cannot be stabilized by additional compaction should be excavated to competent material and the area backfilled with compacted structural fill or ¾" stone. The proof-rolling should not be performed when the subgrade is wet, muddy, or frozen.

If the foundation is constructed in the winter, the subgrade should be protected from frost to limit possible subgrade deterioration resulting from freezing and thawing cycles. Concrete should not be poured if the subgrade is wet, muddy, or frozen.

A 6-inch thick layer of compacted coarse aggregate, commonly known as ¾" gravel or crushed stone, or a "mud-slab" (i.e., 2 inches of lean concrete), should be placed on the approved subgrade to protect the subgrade from disturbance.

3.3.5 Backfill and Compaction Requirements

Select backfill or structural backfill should consist of granular soils free of cinder, brick, asphalt, ash, and other unsuitable materials. Such material should not contain any boulders or cobbles larger than about 4 inches across, and should have a fines content (material passing the No. 200 sieve) of less than 15 percent. The soil subgrade underneath the backfill should be properly prepared prior to the placement of backfill.

All backfill should be placed in lifts not exceeding 8-in. in loose thickness. Backfill placed beneath slabs-on-grade, behind below-grade walls, and underneath sidewalks should be compacted to a minimum of 90% of the maximum dry density.

3.3.7 Pre-construction Condition Survey and Monitoring

A pre-construction condition survey of the adjacent structures should be performed for the protection of the new building owner in the event of a future damage claim and is required by the NYC Building Department. The report should include detailed documentation and photographs of the existing condition of the structures.

Based on the survey results, a monitoring program should be developed for the purpose of checking the performance of the adjacent structures and for monitoring construction procedures. The monitoring program should include, at a minimum, recommendations for the location of survey points to monitor vertical and horizontal movements, locations for crack gauges, and locations for monitoring vibrations during key construction activities. The monitoring program should also include threshold levels for allowable movements and vibrations, and the procedures to be implemented if the threshold levels are exceeded during construction.

3.3.8 Construction Monitoring

We recommend that a geotechnical engineer familiar with the subsurface conditions and foundation design criteria, review and approve the foundation contractors procedures and

provide inspection services during excavation and foundation construction. Geotechnical related inspection services must include:

- Review and approval of contractor submittals related to foundation construction;
- Observation and documentation of all phases of excavation and foundation construction.
- Special inspection of the foundation subgrade.
- Special inspection of the support of excavation and adjacent building support.
- Monitoring of adjacent structures and interpretation of the monitoring data.

4.0 – SUMMARY AND CONCLUSIONS

This report provides geotechnical recommendations for the design and construction of a 22 story building at 1700 Park Avenue in New York, New York.

Based on eight test borings performed at the site, the subsurface conditions above the rock generally consist of less than 10 feet of uncontrolled fill, less than 10 feet of medium dense sand (Stratum 2) and less than approximately 5 feet of soft rock (Stratum 3). The top of intermediate to hard schist rock (Stratum 4) was encountered at depths varying from 1 to 18 feet, corresponding to approximately el. +27 to +10 feet.

Groundwater was measured at a depth of 9 feet (el. +19 feet). Since this depth is approximately 4.5 feet above soft rock, it is believed that the measured value represents a trapped groundwater condition.

The recommended seismic site classification is Site Class "B". If the Risk Category is I&II, or III, the Seismic Design Category is "B". Liquefaction is considered unlikely for this site.

The depth to intermediate to hard rock (Stratum 4) typically varied from 8 to 11 feet. Considering this, it is possible that the building could be supported on footings bearing on rock (i.e., Strata 3 or 4). We recommend an allowable bearing capacity of 8 tsf for a foundation bearing on Stratum 3, and 20 tsf for a foundation bearing on Stratum 4.

At some locations, acceptable rock conditions may be below the proposed bottom of the foundation. At these locations, overexcavation and construction of a "pier-to-rock" could be performed. If the overexcavation depth exceeds approximately 10 feet, construction of a pier-to-rock is not practical and caissons would be required. Based on the boring information and assuming that the majority of the building will not have a cellar level, caissons may be necessary at some locations.

Assuming that the majority of the building will not have a cellar level, the subsurface conditions at the ground floor slab level will likely consist of uncontrolled fill (i.e., Stratum 1). This slab could be designed as a slab-on-grade, if the requirements included in the report are met.

The recommended design groundwater elevation is +22 feet. If the bottom of the foundation or slab will be above the design groundwater elevation, we recommend that, at a minimum, the below grade walls and the foundation should be damproofed. If the bottom of the foundation or slab will be below the design groundwater elevation, we recommend that the below grade walls and foundation or slab be designed to resist the groundwater pressures and be waterproofed.

We recommend that the buildings located along the lot lines be visited for the purpose of determining the extent and depth of any cellar levels and any other features (e.g., elevator pits, ejector pits, etc.) that may affect the design and construction of the new building. We also recommend that test pits be performed to document the size, depth, and type of adjacent building foundations, and below-grade encroachments that may be present.

The report includes additional information regarding the subsurface conditions and foundation design recommendations and additional recommendations regarding excavation considerations, adjacent building support, subgrade preparation, temporary groundwater control, backfill and

compaction requirements, pre-construction condition surveys and monitoring, and construction inspection and monitoring.

5.0 – LIMITATIONS

Explorations

1. The analysis and recommendations submitted in this report are based in part upon the data obtained from widely spaced subsurface explorations. The nature and extent of variations between these explorations may not become evident until construction. If variations then appear evident, it will be necessary to reevaluate the recommendations of this report.
2. The generalized soil profile described in the text is intended to convey trends in subsurface conditions. The boundaries between strata are approximate and idealized and have been developed by interpretations of widely spaced explorations and samples; actual soil transitions are probably more erratic. For specific information, refer to the boring logs.
3. Water level readings have been made in the drill holes at times and under conditions stated on the logs. These data have been reviewed and interpretations made in the text of this report. However, it must be noted that fluctuations in the level of the groundwater may occur due to variations in rainfall, temperature and other factors occurring since the time measurements were made.

Review

4. In the event that any changes in the nature, design, or location of the proposed structures are planned, the conclusions and recommendations contained in this report shall not be considered valid unless the changes are reviewed and conclusions of this report modified or verified in writing by GeoDesign. It is recommended that this firm be provided the opportunity for a general review of final design and specifications in order that earthwork and foundation recommendations may be properly interpreted and implemented in the design and specifications.

Construction

5. It is recommended that this firm be retained to provide soil engineering services during construction of the excavation and foundation phases of the work. This is to observe compliance with the design concepts, specifications, and recommendations and to allow design changes in the event that subsurface conditions differ from those anticipated prior to start of construction.

Uses of Report

6. This report has been prepared for the exclusive use of Marvel Architects for specific application to the proposed structure at 1700 Park Avenue, in New York, NY in accordance with generally accepted soil and foundation engineering practices. No other warranty, express or implied, is made.

FIGURES

SITE LOCATION MAP

MANHATTAN, NY

GEODESIGN INCORPORATED P.C.
241 W 30th Street, New York, NY

DR. BY:	SCALE: NTS	PROJ:
	DATE:	FIG. NO: 1

C:\Users\Araval\Desktop\230 E 54th street\Fig1-SiteLocationPlan

LEGEND

B-1 — TEST BORING NO. AND LOCATION

B-4 — TEST BORING WITH WELL NO. AND LOCATION

DESIGNED BY TGT						
DRAWN BY RH						
CHECKED BY TGT						
APPROVED BY TGT	NO.	DATE	REVISIONS	DRWN	CHKD	APPVD

SCALE 1" = 30'
0 15 30 60

MARVEL ARCHITECTS
145 HUDSON STREET
NEW YORK, NY 10013

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PROJECT
1700 PARK AVENUE
NEW YORK, NY

DWG. TITLE
AS-DRILLED BORING LOCATION PLAN
1700 PARK AVENUE

PROJECT NO. 3765-003.02
SCALE AS SHOWN DATE 05/17/16
DRAWING NO. 2
SHEET 1 OF 1

C:\GeoDesign\C&\3765-BFCPartners\003-1678_1700ParkAve\Field_cad\Data\AsDrilledBLP.dwg Thomas Thomsen 6/13/2016 4:24 PM GD-STD_2.0.ctb

APPENDIX A
TEST BORING LOGS

GEODESIGN INCORPORATED
D/B/A GeoDesign, Inc. P.C.
Geotechnical | Construction | Environmental
Engineers and Scientists
60 Park Place, Suite 302
Newark, NJ 07102
Tel: 973.803.4515

BORING LOG

Project Name

1700 Park Ave

New York, NY

Boring No.: B-1
Page No.: 1 of 1
File No.: 3765-003.02
Checked By:

Boring Company:	Craig Geotechnical Drilling		
Foreman:	Mike Gorski		
GeoDesign Rep.:	Eric Blumberg		
Date Started:	May 13, 2016	Date Finished:	May 13, 2016
N. Coordinate:		E. Coordinate:	
Ground Surface Elevation (feet):	28.5		
Station:		Offset: ft	

	Casing:	Sampler:
Type:	FJ	SS
I.D.:	4.0 in.	1.38 in.
Hammer Wt.:	140 lbs	140 lbs
Hammer Fall:	30 in.	30 in.
Rig Type:	CME 75	
Hammer Type:	Safety - Cathead	

Groundwater Observations

Date	Depth (ft)	Elev. (ft)	Notes
▼			
▼			
▼			
▼			

Depth (ft)	Casing Blows/ft	Sample Information: Number	Type	Penetration (inches)	Recovery (inches)	Depth (ft)	Blows / 6 inch Interval: 0 - 6	6 - 12	12 - 18	18 - 24	Coring Time (min./ft)	Moisture Content (%)	Strata Description: Depth & Elevation(feet)	Symbol	Sample Description (Classification System: Modified Burmister)
		1	SS	24	6	0.0	9	7	4	6			Asphalt 28.2		
													Fill		[FILL] Gray m-f to coarse SAND and GRAVEL, some brick fragments (7)
5															
		2	SS	24	3	5.0	5	5	3	3					[FILL] Wood and brick fragments, some m-f Sand, little silt (7)
													8.5		
													Sand 20.0		
10															
		3	SS	24	16	10.0	13	16	10	19		16.2			[SM] Brown SAND, little silt (3b)
													14.0		
15		C-1	C	60	59	14.0	[REC= 98%; RQD= 80%]				2.5		Bedrock 14.5		[BEDROCK] Gray and black Mica Schist. Medium to coarse grained, slightly weathered, with fractures inclined at 45 degrees from horizontal. Vein of quartz at 14' (1b)
											2				
											2				
											2				
											1.5				
20		C-1	C	60	58	19.0	[REC= 97%; RQD= 97%]				2				[BEDROCK] Same as above with vein of quartz at 22'. Little weathering in fractures (1a)
											2				
											2				
											2				
											2		24.0		
25													Bottom of Exploration at 24.0 ft 4.5		
30															

Remarks

1. Hard drilling at 8'
2. Hard drilling at 14', decomposed schist in cuttings. Core to confirm bedrock
3. Start core 8:18am, end 8:28am
4. Start core 2 8:43am, end 8:53am

Notes:
1) Stratification lines represent approximate boundary between material types, transitions may be gradual.
2) Water level readings have been made at times and under conditions stated, fluctuations of groundwater may occur due to other factors than those present at the time measurements were made. AC = After coring; NR = Not Recorded.
3) Abbreviations: A = Auger; C = Core; MC=Macrocore; D = Driven; G = Grab; PS = Piston Sample; SS = Split Spoon; SSL = 3.5 Inch ID Split Spoon; ST = Shelby Tube; V = Vane; WOR/H = Weight of Rod/Hammer
4) Proportions Used: Trace = 1-10%; Little = 10-20%; Some = 20-35%; And = 35-50%

Boring No.: B-1

11. NJ BORING LOG MC 1700 PARK AVE BORING LOGS.GPJ GEODESIGN STANDARD .GDT 6/14/16

GEODESIGN INCORPORATED
D/B/A GeoDesign, Inc. P.C.
Geotechnical | Construction | Environmental
Engineers and Scientists
60 Park Place, Suite 302
Newark, NJ 07102
Tel: 973.803.4515

BORING LOG

Project Name

1700 Park Ave

New York, NY

Boring No.: B-2
Page No.: 1 of 1
File No.: 3765-003.02
Checked By:

Boring Company:	Craig Geotechnical Drilling		
Foreman:	Mike Gorski		
GeoDesign Rep.:	Eric Blumberg		
Date Started:	May 13, 2016	Date Finished:	May 13, 2016
N. Coordinate:		E. Coordinate:	
Ground Surface Elevation (feet):	27.5		
Station:		Offset: ft	

	Casing:	Sampler:
Type:	FJ	SS
I.D.:	4.0 in.	1.38 in.
Hammer Wt.:	140 lbs	140 lbs
Hammer Fall:	30 in.	30 in.
Rig Type:	CME 75	
Hammer Type:	Safety - Cathead	

Groundwater Observations

Date	Depth (ft)	Elev. (ft)	Notes
▼			
▼			
▼			
▼			

Depth (ft)	Casing Blows/ft	Sample Info: Number	Type	Penetration (inches)	Recovery (inches)	Depth (ft)	Blows / 6 inch Interval: 0 - 6	6 - 12	12 - 18	18 - 24	Coring Time (min./ft)	Moisture Content (%)	Strata Description (Depth & Elevation(feet))	Symbol	Sample Description (Classification System: Modified Burmister)
		1	SS	24	14	0.0	26	11	11	7			Asphalt 27.2 Fill		[FILL] Brown and gray fine to coarse SAND, some gravel, some rock and brick fragments (7)
5		2	SS	24	6	5.0	5	3	1	2					[FILL] Gray and black, loose m-f SAND, some fine gravel, trace glass (7)
		C-1	C	60	60	8.0	[REC= 100%; RQD= 95%]				2		8.0 Bedrock 19.5		[BEDROCK] Gray and black Mica Schist, med-grained with fractures at 45 and 60 degrees from horizontal. Slightly weathered. (1a)
10											1.5				
											1.5				
											1.5				
											1.5		13.0 Bottom of Exploration at 13.0 ft 14.5		
15															
20															
25															
30															

Remarks

1. Hard drilling at 8', decomposed schist in cuttings, core to confirm rock
2. Start core 12:46pm, stop 12:57pm
3. Water loss at 9'

Notes:
1) Stratification lines represent approximate boundary between material types, transitions may be gradual.
2) Water level readings have been made at times and under conditions stated, fluctuations of groundwater may occur due to other factors than those present at the time measurements were made. AC = After coring; NR = Not Recorded.
3) Abbreviations: A = Auger; C = Core; MC=Macrocore; D = Driven; G = Grab; PS = Piston Sample; SS = Split Spoon; SSL = 3.5 Inch ID Split Spoon; ST = Shelby Tube; V = Vane; WOR/H = Weight of Rod/Hammer
4) Proportions Used: Trace = 1-10%; Little = 10-20%; Some = 20-35%; And = 35-50%

Boring No.: B-2

11. NJ BORING LOG MC 1700 PARK AVE BORING LOGS.GPJ GEODESIGN STANDARD .GDT 6/14/16

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Engineers and Scientists
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Newark, NJ 07102
Tel: 973.803.4515

BORING LOG

Project Name

1700 Park Ave

New York, NY

Boring No.: B-3
Page No.: 1 of 1
File No.: 3765-003.02
Checked By:

Boring Company:	Craig Geotechnical Drilling		
Foreman:	Mike Gorski		
GeoDesign Rep.:	Eric Blumberg		
Date Started:	May 12, 2016	Date Finished:	May 12, 2016
N. Coordinate:		E. Coordinate:	
Ground Surface Elevation (feet):	27.0		
Station:		Offset: ft	

	Casing:	Sampler:
Type:	FJ	SS
I.D.:	4.0 in.	1.38 in.
Hammer Wt.:	140 lbs	140 lbs
Hammer Fall:	30 in.	30 in.
Rig Type:	CME 75	
Hammer Type:	Safety - Cathead	

Groundwater Observations

Date	Depth (ft)	Elev. (ft)	Notes
▼			
▼			
▼			
▼			

Depth (ft)	Casing Blows/ft	Sample Info: Number	Type	Penetration (inches)	Recovery (inches)	Depth (ft)	Blows / 6 inch Interval: 0 - 6	6 - 12	12 - 18	18 - 24	Coring Time (min./ft)	Moisture Content (%)	Strata Description: Depth & Elevation(feet)	Symbol	Sample Description (Classification System: Modified Burmister)
		1	SS	24	6	0.0	4	1	WOH	3			Asphalt 26.7		
													Fill		[FILL] Brown loose m-f to coarse SAND, some gravel, some brick fragments (7)
5															
		2	SS	24	9	5.0	4	3	3	3		24			[FILL] Gray Brown GRAVEL, some sand, little silt and brick fragments (7)
													8.5		
													Soft Rock 18.5		
10															
		3	SS	15	4	10.0	11	50/3"					11.0		[SOFT ROCK] Decomposed mica schist bedrock fragments (1d)
		C-1	C	60	50	11.0	[REC= 83%; RQD= 70%]				3.5		Bedrock 16.0		[BEDROCK] Gray-black Mica schist. Medium grained, slightly weathered, fractures rising at 45 degrees from horizontal (1b)
											3				
											3				
15											2				
											2				
		C-2	C	60	60	16.0	[REC= 100%; RQD= 100%]				2.5				[BEDROCK] Same as above with veins of quartz at 18' and 19'. Fracture inclined at 30 degrees from horizontal (1a)
											2				
											1.5				
20											6				
											3.5		21.0		
													Bottom of Exploration at 21.0 ft 6.0		
25															
30															

Remarks

1. Spoon refusal at 10.5', core @ 11' to confirm bedrock
2. Start core 1 12:44pm, end 12:58pm
3. Start core 2 1:17pm, end 1:35pm

Notes:
1) Stratification lines represent approximate boundary between material types, transitions may be gradual.
2) Water level readings have been made at times and under conditions stated, fluctuations of groundwater may occur due to other factors than those present at the time measurements were made. AC = After coring; NR = Not Recorded.
3) Abbreviations: A = Auger; C = Core; MC=Macrocore; D = Driven; G = Grab; PS = Piston Sample; SS = Split Spoon; SSL = 3.5 Inch ID Split Spoon; ST = Shelby Tube; V = Vane; WOR/H = Weight of Rod/Hammer
4) Proportions Used: Trace = 1-10%; Little = 10-20%; Some = 20-35%; And = 35-50%

Boring No.: B-3

11. NJ BORING LOG MC 1700 PARK AVE BORING LOGS.GPJ GEODESIGN STANDARD .GDT 6/14/16

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BORING LOG

Project Name

1700 Park Ave

New York, NY

Boring No.: B-4
Page No.: 1 of 1
File No.: 3765-003.02
Checked By:

Boring Company:	Craig Geotechnical Drilling		
Foreman:	Mike Gorski		
GeoDesign Rep.:	Eric Blumberg		
Date Started:	May 13, 2016	Date Finished:	May 13, 2016
N. Coordinate:		E. Coordinate:	
Ground Surface Elevation (feet):	28.0		
Station:		Offset: ft	

	Casing:	Sampler:
Type:	FJ	SS
I.D.:	4.0 in.	1.38 in.
Hammer Wt.:	140 lbs	140 lbs
Hammer Fall:	30 in.	30 in.
Rig Type:	CME 75	
Hammer Type:	Safety - Cathead	

Groundwater Observations

Date	Depth (ft)	Elev. (ft)	Notes
5/13/16	9.0	19.0	

Depth (ft)	Casing Blows/ft	Sample Info: Number	Type	Penetration (inches)	Recovery (inches)	Depth (ft)	Blows / 6 inch Interval: 0 - 6	6 - 12	12 - 18	18 - 24	Coring Time (min./ft)	Moisture Content (%)	Strata Description (Depth & Elevation(feet))	Symbol	Sample Description (Classification System: Modified Burmister)	Well Log
		1	SS	24	18	0.0	23	10	8	8			Asphalt 27.7 Fill		[FILL] Gray, medium dense fine to coarse SAND and GRAVEL, some brick fragments (7)	
5		2	SS	24	4	5.0	100	30	3	3					[FILL] Gray, dense m-f SAND and GRAVEL, some silt and brick fragments (7)	
													8.5 Sand 19.5			
10		3	SS	24	7	10.0	10	14	23	23					[SP] Bottom 6" Brown dense m-f SAND, little silt, trace gravel, trace rock fragments (3b)	
													13.5 Soft Rock 14.5			
15		4	SS	24	9	15.0	29	31	34	28		9.1			[SM / SOFT ROCK] Grayish Brown SAND, some gravel, little silt and Decomposed mica schist (3a / 1d)	
													18.0			
		C-1	C	60	55	18.0	[REC= 92%; RQD= 57%]				5.5		Bedrock 10.0		[BEDROCK] Top 6" vein of moderately decomposed Quartz, coarse grained. Bottom 49" Gray and black Mica Schist. Medium grained with fractures at 15, 30, and 45 degrees. Moderate weathering in fractures (1b)	
20											2					
											1.5					
											1.5					
											1.5		23.0			
													Bottom of Exploration at 23.0 ft 5.0			
25																
30																

Remarks

1. Hard drilling at 13'
2. Hard drilling at 18', core to confirm bedrock
3. Start core 10:34am, stop 10:46am
4. Well installed to 18'. 10' Screen on bottom, 8' riser on top.

Notes:
1) Stratification lines represent approximate boundary between material types, transitions may be gradual.
2) Water level readings have been made at times and under conditions stated, fluctuations of groundwater may occur due to other factors than those present at the time measurements were made. AC = After coring; NR = Not Recorded.
3) Abbreviations: A = Auger; C = Core; MC=Macrocore; D = Driven; G = Grab; PS = Piston Sample; SS = Split Spoon; SSL = 3.5 Inch ID Split Spoon; ST = Shelby Tube; V = Vane; WOR/H = Weight of Rod/Hammer
4) Proportions Used: Trace = 1-10%; Little = 10-20%; Some = 20-35%; And = 35-50%

Boring No.: B-4

11. NJ BORING LOG MC 1700 PARK AVE BORING LOGS.GPJ GEODESIGN STANDARD .GDT 6/14/16

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BORING LOG

Project Name

1700 Park Ave

New York, NY

Boring No.: B-5
Page No.: 1 of 1
File No.: 3765-003.02
Checked By:

Boring Company:	Craig Geotechnical Drilling		
Foreman:	Mike Gorski		
GeoDesign Rep.:	Eric Blumberg		
Date Started:	May 13, 2016	Date Finished:	May 13, 2016
N. Coordinate:		E. Coordinate:	
Ground Surface Elevation (feet):	27.5		
Station:		Offset: ft	

	Casing:	Sampler:
Type:	FJ	SS
I.D.:	4.0 in.	1.38 in.
Hammer Wt.:	140 lbs	140 lbs
Hammer Fall:	30 in.	30 in.
Rig Type:	CME 75	
Hammer Type:	Safety - Cathead	

Groundwater Observations

Date	Depth (ft)	Elev. (ft)	Notes
▼			
▼			
▼			
▼			

Depth (ft)	Casing Blows/ft	Sample Number	Sample Type	Penetration (inches)	Recovery (inches)	Sample Depth (ft)	Blows / 6 inch Interval 0 - 6	6 - 12	12 - 18	18 - 24	Coring Time (min./ft)	Moisture Content (%)	Strata Description (Depth & Elevation (feet))	Symbol	Sample Description (Classification System: Modified Burmister)
		1	SS	24	12	0.0	18	8	8	5			Asphalt 27.2 Fill		[FILL] Gray medium dense fine to coarse SAND, little gravel and silt, some brick fragments (7)
													4.0		
5													Sand 23.5		
		2	SS	24	8	5.0	2	5	8	8		24.2			[SM] Grayish Brown, fine to coarse SAND, little gravel, little silt (3b)
													8.0		
		C-1	C	60	56	8.0	[REC= 93%; RQD= 82%]				2.5		Bedrock 19.5		[BEDROCK] Gray and black Mica Schist. Medium grained with fractures inclined at 45 and 60 degrees. Small veins of Quartz from 9' to 11' (1b)
10											2				
											2				
											2				
											2.5		13.0		
													Bottom of Exploration at 13.0 ft 14.5		
15															
20															
25															
30															

Remarks

1. Hard drilling at 8'. Mica Schist fragments in cuttings. Core to confirm rock.
2. Start core 2:01pm, stop 2:14pm.

Notes:
1) Stratification lines represent approximate boundary between material types, transitions may be gradual.
2) Water level readings have been made at times and under conditions stated, fluctuations of groundwater may occur due to other factors than those present at the time measurements were made. AC = After coring; NR = Not Recorded.
3) Abbreviations: A = Auger; C = Core; MC=Macrocore; D = Driven; G = Grab; PS = Piston Sample; SS = Split Spoon; SSL = 3.5 Inch ID Split Spoon; ST = Shelby Tube; V = Vane; WOR/H = Weight of Rod/Hammer
4) Proportions Used: Trace = 1-10%; Little = 10-20%; Some = 20-35%; And = 35-50%

Boring No.: B-5

11. NJ BORING LOG MC 1700 PARK AVE BORING LOGS.GPJ GEODESIGN STANDARD .GDT 6/14/16

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Tel: 973.803.4515

BORING LOG

Project Name

1700 Park Ave

New York, NY

Boring No.: B-6
Page No.: 1 of 1
File No.: 3765-003.02
Checked By:

Boring Company:	Craig Geotechnical Drilling		
Foreman:	Mike Gorski		
GeoDesign Rep.:	Eric Blumberg		
Date Started:	May 12, 2016	Date Finished:	May 12, 2016
N. Coordinate:		E. Coordinate:	
Ground Surface Elevation (feet):	27.5		
Station:		Offset: ft	

	Casing:	Sampler:
Type:	FJ	SS
I.D.:	4.0 in.	1.38 in.
Hammer Wt.:	140 lbs	140 lbs
Hammer Fall:	30 in.	30 in.
Rig Type:	CME 75	
Hammer Type:	Safety - Cathead	

Groundwater Observations

Date	Depth (ft)	Elev. (ft)	Notes
▼			
▼			
▼			
▼			

Depth (ft)	Casing Blows/ft	Sample Info: Number	Type	Penetration (inches)	Recovery (inches)	Depth (ft)	Blows / 6 inch Interval: 0 - 6	6 - 12	12 - 18	18 - 24	Coring Time (min./ft)	Moisture Content (%)	Strata Description: Depth & Elevation(feet)	Symbol	Sample Description (Classification System: Modified Burmister)
		1	SS	24	8	0.0	33	8	6	5			Asphalt 27.2		
													Fill		[FILL] Gray, medium dense m-f to coarse SAND and fine to coarse GRAVEL (7)
5															
		2	SS	24	4	5.0	2	1	3	2					[FILL] Brown, loose fine SAND and SILT. Some brick fragments (7)
													8.5		
													Soft Rock 19.0		
10															
		3	SS	2	1	10.0	50/2"						11.0		[SOFT ROCK] Decomposed Mica Schist (1d)
		C-1	C	60	54	11.0	[REC= 90%; RQD= 88%]				3		Bedrock 16.5		[BEDROCK] Gray and black Mica Schist. Medium grained with fractures inclined at 20 degrees. Some veins of quartz throughout. Fresh rock with little weathering at 11.5'. (1a)
											3				
											2.3				
15											2.5				
											2.5		16.0		
													Bottom of Exploration at 16.0 ft 11.5		
20															
25															
30															

Remarks

1. Spoon refusal at 10.5'. Core at 11' to confirm rock
2. Start core 2:20pm, stop 2:35pm

Notes:
1) Stratification lines represent approximate boundary between material types, transitions may be gradual.
2) Water level readings have been made at times and under conditions stated, fluctuations of groundwater may occur due to other factors than those present at the time measurements were made. AC = After coring; NR = Not Recorded.
3) Abbreviations: A = Auger; C = Core; MC=Macrocore; D = Driven; G = Grab; PS = Piston Sample; SS = Split Spoon; SSL = 3.5 Inch ID Split Spoon; ST = Shelby Tube; V = Vane; WOR/H = Weight of Rod/Hammer
4) Proportions Used: Trace = 1-10%; Little = 10-20%; Some = 20-35%; And = 35-50%

Boring No.: B-6

11. NJ BORING LOG MC 1700 PARK AVE BORING LOGS.GPJ GEODESIGN STANDARD .GDT 6/14/16

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60 Park Place, Suite 302
Newark, NJ 07102
Tel: 973.803.4515

BORING LOG

Project Name

1700 Park Ave

New York, NY

Boring No.: B-7
Page No.: 1 of 1
File No.: 3765-003.02
Checked By:

Boring Company:	Craig Geotechnical Drilling		
Foreman:	Mike Gorski		
GeoDesign Rep.:	Eric Blumberg		
Date Started:	May 13, 2016	Date Finished:	May 13, 2016
N. Coordinate:		E. Coordinate:	
Ground Surface Elevation (feet):	28.0		
Station:		Offset: ft	

	Casing:	Sampler:
Type:	FJ	SS
I.D.:	4.0 in.	1.38 in.
Hammer Wt.:	140 lbs	140 lbs
Hammer Fall:	30 in.	30 in.
Rig Type:	CME 75	
Hammer Type:	Safety - Cathead	

Groundwater Observations

Date	Depth (ft)	Elev. (ft)	Notes
▼			
▼			
▼			
▼			

Depth (ft)	Casing Blows/ft	Sample Info: Number	Type	Penetration (inches)	Recovery (inches)	Depth (ft)	Blows / 6 inch Interval: 0 - 6	6 - 12	12 - 18	18 - 24	Coring Time (min./ft)	Moisture Content (%)	Strata Description (Depth & Elevation(feet))	Symbol	Sample Description (Classification System: Modified Burmister)
		1	SS	8	6	0.0	8	50/2					1.0 Asphalt 27.7		[FILL] Top 2" Fill (7)
		C-1	C	60	60	1.0	[REC= 100%; RQD= 82%]				3.5		Fill / Bedrock 27.0		[DECOMPOSED BEDROCK] Bottom 4" Decomposed Mica Schist
											2.5				[BEDROCK] Gray and black Mica Schist. Medium grained with fractures inclined at 15, 45, and 60 degrees from horizontal. Slightly weathered in fractures. Vein of Quartz from 1' to 1.5'. Vein of Quartz/Pegmatite from 3.5' to 4'. (1b)
											3.5				
5											2.5				
											3		6.0		
													Bottom of Exploration at 6.0 ft 22.0		
10															
15															
20															
25															
30															

Remarks

1. Spoon refusl at 8". Core to confirm bedrock.
2. Start core 11:29am, stop 11:46am.

Notes:
1) Stratification lines represent approximate boundary between material types, transitions may be gradual.
2) Water level readings have been made at times and under conditions stated, fluctuations of groundwater may occur due to other factors than those present at the time measurements were made. AC = After coring; NR = Not Recorded.
3) Abbreviations: A = Auger; C = Core; MC=Macrocore; D = Driven; G = Grab; PS = Piston Sample; SS = Split Spoon; SSL = 3.5 Inch ID Split Spoon; ST = Shelby Tube; V = Vane; WOR/H = Weight of Rod/Hammer
4) Proportions Used: Trace = 1-10%; Little = 10-20%; Some = 20-35%; And = 35-50%

Boring No.: B-7

11. NJ BORING LOG MC 1700 PARK AVE BORING LOGS.GPJ GEODESIGN STANDARD .GDT 6/14/16

GEODESIGN INCORPORATED
D/B/A GeoDesign, Inc. P.C.
Geotechnical | Construction | Environmental
Engineers and Scientists
60 Park Place, Suite 302
Newark, NJ 07102
Tel: 973.803.4515

BORING LOG

Project Name

1700 Park Ave

New York, NY

Boring No.: B-8
Page No.: 1 of 1
File No.: 3765-003.02
Checked By:

Boring Company:	Craig Geotechnical Drilling		
Foreman:	Mike Gorski		
GeoDesign Rep.:	Eric Blumberg		
Date Started:	May 12, 2016	Date Finished:	May 12, 2016
N. Coordinate:		E. Coordinate:	
Ground Surface Elevation (feet):	27.5		
Station:		Offset: ft	

	Casing:	Sampler:
Type:	FJ	SS
I.D.:	4.0 in.	1.38 in.
Hammer Wt.:	140 lbs	140 lbs
Hammer Fall:	30 in.	30 in.
Rig Type:	CME 75	
Hammer Type:	Safety - Cathead	

Groundwater Observations

Date	Depth (ft)	Elev. (ft)	Notes
▼			
▼			
▼			
▼			

Depth (ft)	Casing Blows/ft	Sample Info: Number	Type	Penetration (inches)	Recovery (inches)	Depth (ft)	Blows / 6 inch Interval: 0 - 6	6 - 12	12 - 18	18 - 24	Coring Time (min./ft)	Moisture Content (%)	Strata Description (Depth & Elevation(feet))	Symbol	Sample Description (Classification System: Modified Burmister)
		1	SS	24	9	0.0	9	12	16	13			Asphalt 27.2 Fill		[FILL] Dark Grey medium dense SAND, some silt, little gravel, bottom 7" brick fragments (7)
													4.0		
5													Sand 23.5		
		2	SS	21	8	5.0	3	10	60	50/3"		12.5			[SM] Brown dense m-f SAND, little silt and gravel, decomposed rock fragments in tip (3a)
													8.0		
		C-1	NX	60	57	8.0	[REC= 95%; RQD= 92%]				3		Bedrock 19.5		[BEDROCK] Gray and black Mica Schist, medium grained with fractures inclined at 30 degrees from horizontal. Vein of quartz at 9' (1a)
10											1.5				
											2				
											2				
											2		13.0		
													Bottom of Exploration at 13.0 ft 14.5		
15															
20															
25															
30															

Remarks

1. Hard drilling at 8'. Decomposed rock fragments in cuttings. Core to confirm rock.
2. Start core 3:28pm, end 3:38pm

Notes:
1) Stratification lines represent approximate boundary between material types, transitions may be gradual.
2) Water level readings have been made at times and under conditions stated, fluctuations of groundwater may occur due to other factors than those present at the time measurements were made. AC = After coring; NR = Not Recorded.
3) Abbreviations: A = Auger; C = Core; MC=Macrocore; D = Driven; G = Grab; PS = Piston Sample; SS = Split Spoon; SSL = 3.5 Inch ID Split Spoon; ST = Shelby Tube; V = Vane; WOR/H = Weight of Rod/Hammer
4) Proportions Used: Trace = 1-10%; Little = 10-20%; Some = 20-35%; And = 35-50%

Boring No.: B-8

11. NJ BORING LOG MC 1700 PARK AVE BORING LOGS.GPJ GEODESIGN STANDARD .GDT 6/14/16

APPENDIX B
LABORATORY TEST RESULTS

GeoDesign Inc. #3765-003
1700 Park Avenue - NY, NY
LABORATORY TESTING DATA SUMMARY

BORING NO.	SAMPLE NO.	DEPTH (ft)	IDENTIFICATION TESTS			REMARKS
			WATER CONTENT (%)	USCS SYMB. (1)	SIEVE MINUS NO. 200 (%)	
B-1	S-3	10-12	16.2	SM	24.4	
B-3	S-2	5-7	24.0	GP-GM	9.9	
B-4	S-4	15-17	9.1	SM	13.8	
B-5	S-2	5-7	24.2	SM	14.1	
B-8	S-2	5-7	12.5	SM	13.9	

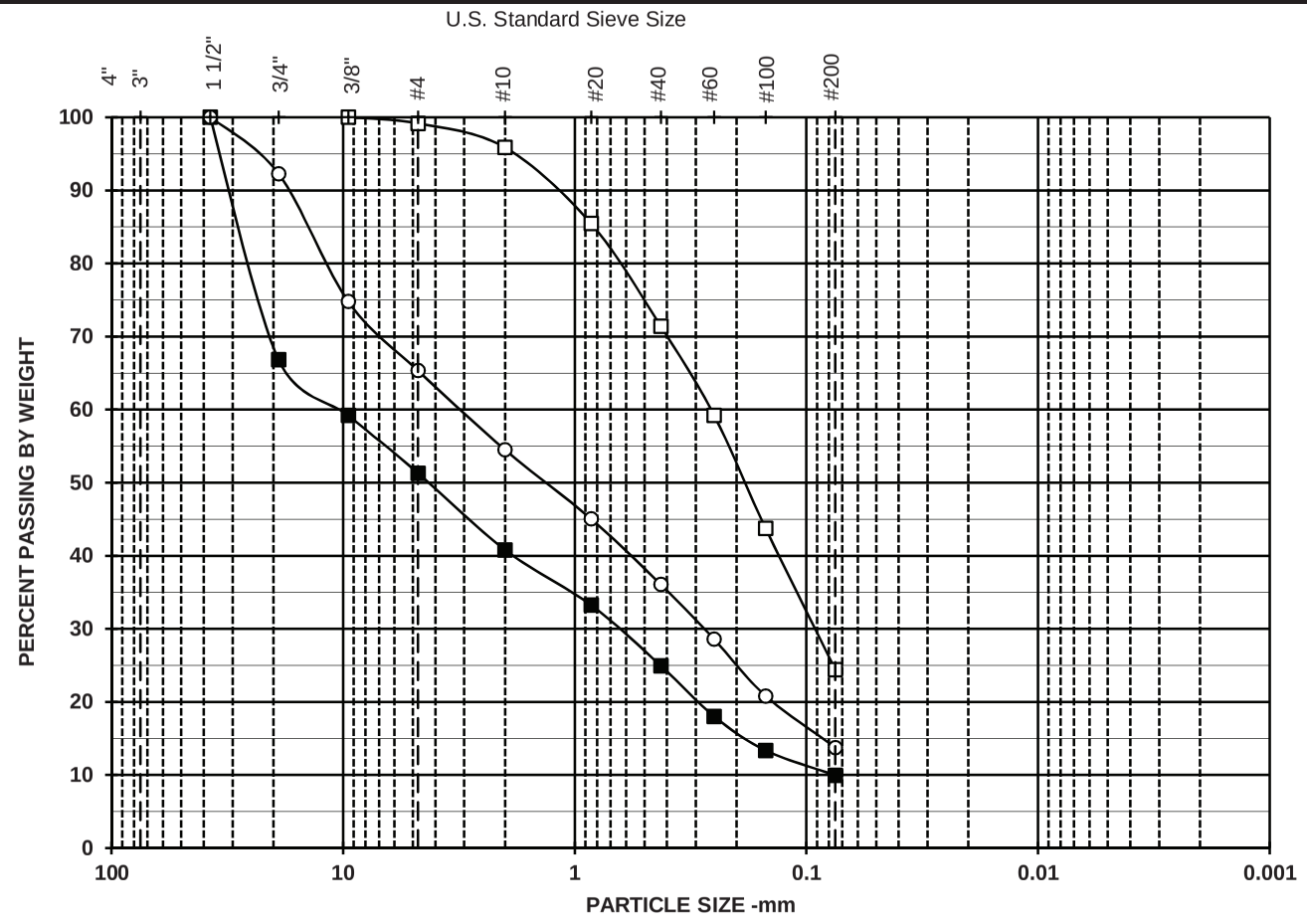
Note: (1) USCS symbol based on visual observation and Sieve reported.

Prepared by: NG
Reviewed by: CMJ
Date: 5/26/2016

TerraSense, LLC
45H Commerce Way
Totowa, NJ 07512

Project No.: 8110-16012
File: Indx1.xls
Page 1 of 1

COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	



SYMBOL	w (%)	LL	PL	PI	USCS	DESCRIPTION AND REMARKS	Date Tested
□	16.2				SM	Brown, Silty sand	5/16/2016
■	24.0				GP-GM	Brown, Poorly-graded gravel with silt and sand	5/19/2016
○	9.1				SM	Grayish brown, Silty sand with gravel	5/19/2016

Symbol	□	■	○
Boring	B-1	B-3	B-4
Sample	S-3	S-2	S-4
Depth	10-12	5-7	15-17
% +3"	0.0	0.0	0.0
% Gravel	0.8	48.7	34.7
% SAND	74.8	41.4	51.5
%C SAND	3.3	10.5	10.8
%M SAND	24.5	15.9	18.4
%F SAND	47.0	15.0	22.3
% FINES	24.4	9.9	13.8
% -2μ			
D_{100} (mm)	9.50	37.50	37.50
D_{60} (mm)	0.26	10.51	3.40
D_{30} (mm)	0.10	0.68	0.28
D_{10} (mm)		0.08	
Cc		0.6	
Cu		138.0	

Particle Size	PERCENT FINER		
(Sieve #)	□	■	○
4"			
3"			
1 1/2"		100.0	100.0
3/4"		66.8	92.3
3/8"	100.0	59.2	74.8
4	99.2	51.3	65.3
10	95.9	40.8	54.5
20	85.5	33.2	45.0
40	71.4	24.9	36.1
60	59.2	18.0	28.6
100	43.8	13.4	20.8
200	24.4	9.9	13.8

TerraSense, LLC	GeoDesign Inc.
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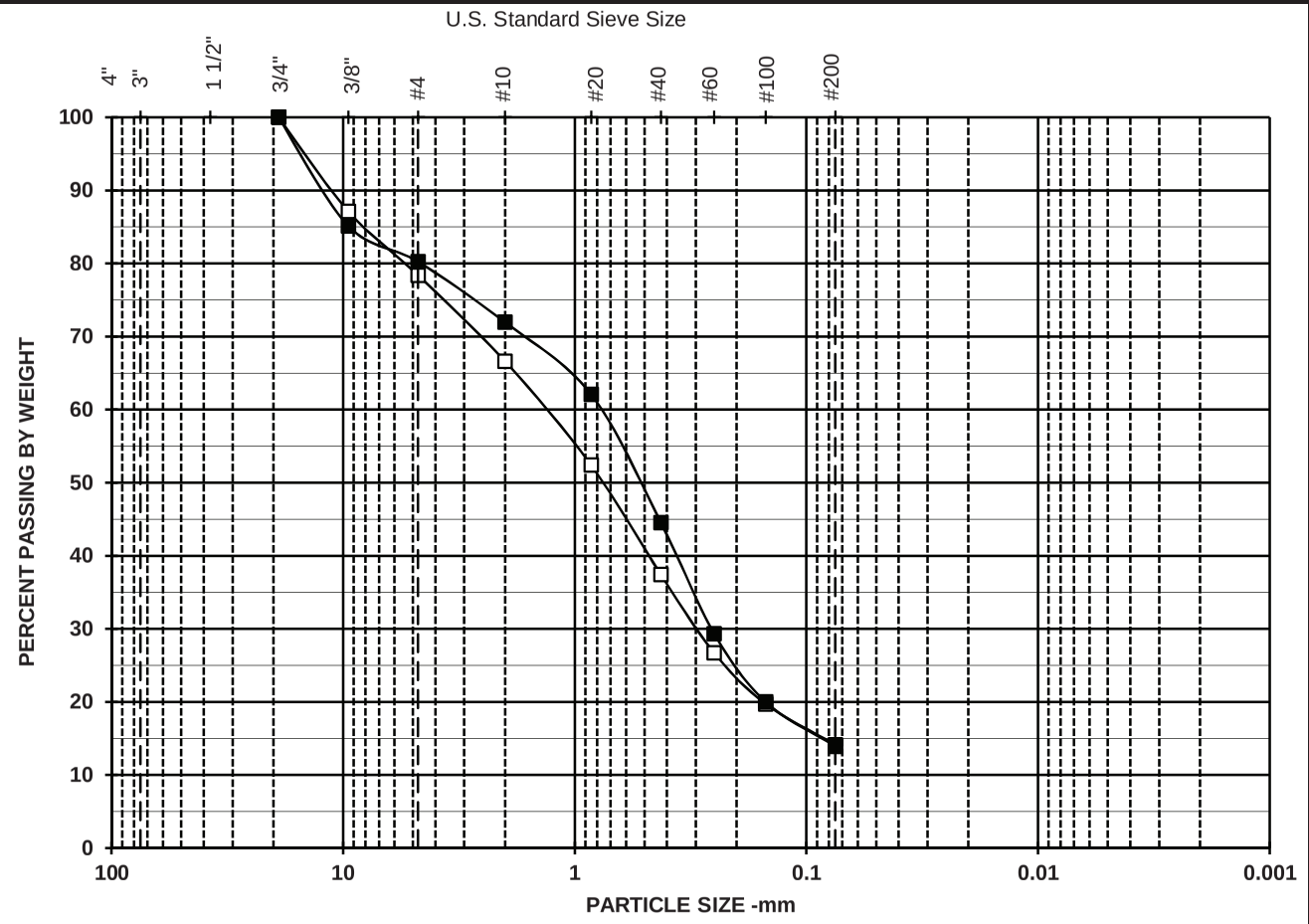
PARTICLE SIZE DISTRIBUTION
1700 Park Avenue - NY, NY

Analysis File: 3SV-MasterRev4b

Siev1a.xls 5/26/2016

COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	



SYMBOL	w (%)	LL	PL	PI	USCS	DESCRIPTION AND REMARKS	Date Tested
□	24.2				SM	Grayish brown, Silty sand with gravel	5/19/2016
■	12.5				SM	Brown, Silty sand with gravel	5/19/2016
○							

Symbol	□	■	○
Boring	B-5	B-8	
Sample	S-2	S-2	
Depth	5-7	5-7	
% +3"	0.0	0.0	
% Gravel	21.6	19.8	
% SAND	64.3	66.3	
%C SAND	11.8	8.3	
%M SAND	29.2	27.4	
%F SAND	23.3	30.6	
% FINES	14.1	13.9	
% -2μ			
D_{100} (mm)	19.00	19.00	
D_{60} (mm)	1.47	0.80	
D_{30} (mm)	0.30	0.26	
D_{10} (mm)			
Cc			
Cu			

Particle Size	PERCENT FINER		
(Sieve #)	□	■	○
4"			
3"			
1 1/2"			
3/4"	100.0	100.0	
3/8"	87.1	85.1	
4	78.4	80.2	
10	66.6	72.0	
20	52.4	62.1	
40	37.4	44.6	
60	26.7	29.3	
100	19.7	20.0	
200	14.1	13.9	

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PARTICLE SIZE DISTRIBUTION
1700 Park Avenue - NY, NY

Analysis File: 3SV-MasterRev4b

Siev1b.xls 5/26/2016

LEGEND

B-1 — PROPOSED TEST BORING NO. AND LOCATION BY GEODESIGN, INC.

B-7 — PROPOSED TEST BORING WITH WELL NO. AND LOCATION BY GEODESIGN, INC.

DESIGNED BY TGT						
DRAWN BY RH						
CHECKED BY TGT	NO.	DATE	REVISIONS	DRWN	CHKD	APPVD
APPROVED BY TGT						

SCALE 1" = 30'
0 15 30 60

MARVEL ARCHITECTS
145 HUDSON STREET
NEW YORK, NY 10013

GEODESIGN INCORPORATED
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Engineers and Scientists
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TELEPHONE: 973.803.4515
www.geodesign.net

PROJECT
1678 PARK AVENUE
NEW YORK, NY

DWG. TITLE
PROPOSED BORING LOCATION PLAN
1678 PARK AVENUE

PROJECT NO. 3765-003.01
SCALE AS SHOWN
DATE 05/17/16
DRAWING NO. 1
SHEET 1 OF 1

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LEGEND

B-1 — PROPOSED TEST BORING NO. AND LOCATION BY GEODESIGN, INC.

B-4 — PROPOSED TEST BORING WITH WELL NO. AND LOCATION BY GEODESIGN, INC.

DESIGNED BY TGT						
DRAWN BY RH						
CHECKED BY TGT	NO.	DATE	REVISIONS	DRWN	CHKD	APPVD
APPROVED BY TGT						

SCALE 1" = 30'
0 15 30 60

MARVEL ARCHITECTS
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NEW YORK, NY 10013

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PROJECT: 1700 PARK AVENUE
NEW YORK, NY

DWG. TITLE: PROPOSED BORING LOCATION PLAN
1700 PARK AVENUE

PROJECT NO. 3765-003.02
SCALE AS SHOWN
DATE 05/17/16
DRAWING NO. 1
SHEET 1 OF 1

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