GEO DESIGN

UNDERGROUND INTELLIGENCE

GEOTECHNICAL EVALUATION REPORT

PROPOSED 5-STORY BUILDING
221 GLENMORE AVENUE
BROOKLYN, NEW YORK

Prepared for:
Camber Property Group LLC
116 East 27th Street, 11th Floor
New York, NY 10016

Prepared By:
GEODesign, Inc. P.C.
307 West 38th Street, #1414
New York, NY 10018

GEODesign Project No. 3887-011
July 2022

GEO DESIGN

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(212) 221-6651

July 26, 2022
Project No.: 3887-011

Alejandra Ramos
Camber Property Group LLC
116 East 27th Street, 11th Floor
New York, NY 10016

Re: Geotechnical Evaluation Report
221 Glenmore Avenue, Brooklyn, New York

Dear Ms. Ramos:

GEODesign, 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 contact us if you have any questions or need additional information.

Sincerely,

GEODesign, Inc. P.C.

Emma Gretina, PE
Senior Project Engineer

Thomas G. Thomann, PhD, PE
Senior 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 building at 221 Glenmore Avenue in the Brooklyn, New York (see Figure 1). Authorization to proceed was obtained in the form of an agreement between Camber Property Group LLC and GEODesign, Inc. P.C. (GEODesign) dated April 4, 2022.

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 221-241 Glenmore Avenue (Block 3697, Lots 1 & 33) in Brooklyn, New York (see Figure 1). The lots are currently occupied by 1-story warehouses. The sidewalk ground surface varies from approximately el. +49 to +52 feet[1].

The site is bound by Glenmore Avenue to the south, Snediker Avenue to the east, a 2-story building and asphalt surface parking lot to the north, and Van Sinderen Avenue to the west. A 1-story metal frame garage and driveway are located between the two lots. Information regarding the adjacent building foundation types and depths were not provided to us.

Based on the April 4, 2022 architectural drawings, it is proposed to demolish the existing buildings and construct a new 5-story building with one cellar level. Based on discussions, we understand that the cellar level will be centrally located and encompass a portion of the new building footprint as shown on the "Cellar Option 2" architectural drawings. We have not been provided with the cellar height; however, for the purpose of this report, we have assumed that the cellar will have a floor-to-floor height of 10 feet. The estimated building footprint is approximately 14,500 sq. ft and will encompass a portion of the site.

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 and managed subcontractors to perform test borings, permeability tests, and laboratory testing;
2. Provided full time inspection of the test boring and permeability test operations;
3. Performed engineering evaluations and prepared this geotechnical evaluation report that includes the following:
    a. An Introductory Section presenting project background information and the scope of services;

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

b. A Subsurface Conditions section that includes the following:
   - A description of the test boring, laboratory testing, and permeability test procedures and results;
   - A final test boring and permeability test location plan;
   - A description of the subsurface conditions;

c. An Analyses and Recommendations section regarding the Foundation Design that includes the following:
   - Seismic site classification and liquefaction potential;
   - Foundation type, estimated capacity, and bearing elevation;
   - Ground floor slab support;
   - Permanent below grade wall lateral pressures;
   - Permanent groundwater control measures;

d. A Construction Recommendations section that includes the following:
   - Excavation and temporary support of excavation considerations;
   - Adjacent building support considerations;
   - Temporary groundwater control;
   - Subgrade preparation;
   - Backfill and compaction control recommendations;
   - Pre-construction condition surveys;
   - Construction inspection and monitoring considerations;

e. A Summary and Conclusions section;

f. Appendices that include test boring logs, laboratory test results, and permeability test logs.

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 4. Limitations of the subsurface explorations, analyses, and recommendations are included in Section 5. Tables and Figures are provided at the end of the text.

2.0 – SUBSURFACE CONDITIONS

2.1 GENERAL

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

2.2 SUBSURFACE INVESTIGATION

2.2.1 Test Boring Program

Six test borings, designated B-1 through B-6, were performed on April 22, 2022 and between May 2 and 18, 2022, at the locations shown in Figure 2. Special inspection of the test borings was performed on a continuous basis by GEODesign personnel under the direction of Ms. Emma Gretina, PE and Mr. Thomas Thomann, PE of GEODesign.

Five test borings were performed by Municipal Testing Laboratory, LLC of Hauppauge, NY using a track mounted Fordia 300 drilling rig and track mounted Geoprobe 7822DT drilling rig. One test boring was performed by Coastal Environmental Solutions, Inc. of Medford, NY using a track mounted Geoprobe 7822DT drilling rig. The boreholes were advanced using mud rotary drilling techniques with a 2-7/8 or 3-7/8-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.

Upon completion of Boring B-3, a groundwater observation well was installed. The well was constructed of nominal 2-inch diameter Schedule 25 PVC pipe with a 20 foot long screen between depths of approximately 20 and 40 feet, and 20 feet of riser pipe. The annulus between the pipe and the borehole wall was backfilled with filter sand to the ground surface. A flush-mount cap was installed at the top of the completed borehole.

Two environmental wells were installed in boreholes B-1B and PT-1B. The wells were constructed with a 10 foot long screen between depths of approximately 40 and 50 feet, and 40 feet of riser pipe. The annulus between the pipe and the borehole wall was backfilled with filter sand to approximately two and three feet above the top of the screen with a 1 foot thick bentonite seal above. The remainder of the annulus was backfilled with drill cuttings to the ground surface. A flush-mount cap was installed at the top of the completed boreholes. No groundwater readings were taken in the environmental wells by GEODesign personnel.

The test boring logs are included in Appendix A.

2.2.2 Laboratory Testing

Geotechnical laboratory testing was conducted on representative soil samples to verify the field classifications and assist in engineering evaluations. The laboratory tests, which include sieve analyses and percent fines are included in Appendix B.

2.2.3 Permeability Test Program

Four permeability tests, designated PT-1 through PT-4, were performed between May 18 and 25, 2022, at the locations shown in Figure 2. The permeability tests were performed in accordance with the 2014 NYC Plumbing Code and the NYC Department of Environmental Protection.

The permeability tests were performed by Municipal Testing Laboratory, LLC of Hauppauge, NY with a 4-inch diameter steel flush joint casing. Inspection of the permeability tests was performed by GEODesign personnel under the direction of Ms. Emma Gretina, PE of GEODesign.

The permeability tests were performed at various depths below grade. Upon reaching the desired test depth, the hole was cleaned and approximately six to eight inches of coarse sand and gravel was placed at the bottom of the casing and flushed with clean water. The soils at the bottom of the casing were presoaked by filling the casing to the top with clean water. Upon completion of the presoaking period, the casing was filled with clean water and the water level within the casing was measured at specified intervals. The test was repeated for the purpose of obtaining additional information at each test location.

The results of the permeability tests are summarized below:

Test ID	Test Depth (ft)	Permeability (inches/hour)
PT-1A	3	0.00
	5	0.08
	7	1.50
	10	2.78
PT-1B	3	2.97
	5	6.34
PT-2	3	3.51
	5	8.02
	10	1.49
PT-3	3	1.29
	5	17.69
	10	21.46
PT-4	3	3.34
	5	0.04
	10	1.36

The permeability logs and results are included in Appendix C.

2.3 GENERALIZED SUBSURFACE CONDITIONS

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

Stratum 1 – Uncontrolled Fill [7][2]: This stratum consists of gray and brown sand with varying amounts of gravel, silt, and miscellaneous fill such as asphalt, brick, and concrete. The N-values typically range from 6 blows per foot (bpf) to split spoon refusal (i.e., more than 50 blows per 6 inches of penetration), with an average of 55 bpf. The thickness of this stratum is typically 5 feet, but, at some locations, is approximately 7 to 10 feet.

Stratum 2 – Sand and Gravel [3b, 3a, 2a]: This stratum consists of brown and gray coarse to fine sand and gravel with varying amounts of silt. The N-values range from 14 bpf to split-spoon refusal, with an average of 63 bpf, indicative of very dense material. The thickness of this stratum is approximately to 15 to 25 feet.

Stratum 3 – Sand [3b, 3a]: This stratum consists of brown fine sand with varying amounts of silt and gravel. The N-values range from 27 bpf to split-spoon refusal, with an average of 44 bpf, indicative of a very dense material. This stratum extends to a depth of at least 100 feet.

2.4 GROUNDWATER LEVEL

The well was dry on May 18, 2022; therefore, groundwater is estimated to be deeper than 40 feet.

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 limitations in Section 5.

[2] The numbers in parentheses refer to the 2014 NYC Building Code classification system.

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

Based on the soil profile, the recommended seismic site classification is Site Class "D". In accordance with the Code, if the Risk Category is I&II, or III, the Seismic Design Category is "B". If the Risk Category is IV, the Seismic Design Category is "C". The appropriate Risk Category and Seismic Design Category should be determined by the Architect or Structural Engineer.

The Code requires that a liquefaction potential assessment be performed for non-cohesive soils located below the groundwater and to a maximum depth of 50 feet. The groundwater is below 40 feet and the N-values between 40 and 50 feet do not require a liquefaction evaluation. Therefore, liquefaction does not need to be considered in the foundation design.

3.2.2 Foundation Recommendations

The building is proposed to have a cellar level that encompasses a portion of the building. Considering this, the foundation depths will be variable. The following sections provide recommendations for the cellar and first floor foundations.

3.2.2.1 Cellar Foundations

Assuming a total slab and foundation thickness of approximately 4 feet, the bottom of the new cellar foundations will be at a depth of approximately 14 feet. It is anticipated that Stratum 2 (sand and gravel) will be encountered at this depth. Considering this, we recommend that consideration initially be given to supporting the new building on spread and wall footings bearing on Stratum 2 with an allowable bearing capacity of 4 tons per square foot (tsf).

If the spread/wall footing stresses exceed the allowable bearing capacity or the spread/wall footing configuration is inefficient, we recommend that consideration be given to a mat foundation bearing on Stratum 2. The mat stresses and deformations are estimated by performing structural analyses, which require an allowable bearing capacity and modulus of subgrade reaction value. For a mat foundation bearing on Stratum 2, we recommend an allowable bearing capacity of 4 tsf and a modulus of subgrade reaction value of 120 pci. The structural engineer's plots of estimated mat stresses and settlements should be provided to us for review. If the mat stresses or settlements are greater than the recommended values, especially close to any adjacent buildings, settlement reducing elements (i.e., piles) may be required at specific locations.

3.2.2.2 First Floor Foundations

The first floor foundations should be placed at least 4 feet below final grade. Considering this and the boring results it is anticipated that Stratum 1 (uncontrolled fill) will be encountered at this depth. The uncontrolled fill includes inconsistent and variable materials, including, construction debris and possibly voids, which could result in unacceptable differential settlements. Therefore, we do not recommend constructing shallow foundations that bear on Stratum 1.

We recommend that consideration be given to bearing the first floor foundations on spread and wall footings bearing on Stratum 2 with an allowable bearing capacity of 4 tsf. If spread/wall footings are not feasible, we recommend that consideration be given to a mat foundation bearing on Stratum 2 with the same bearing capacity and modulus of subgrade reaction provided in the previous section.

Based on the test boring information, the top of Stratum 2 is generally estimated to be approximately 5 to 10 feet deep. Therefore, it should be anticipated that over excavation to reach Stratum 2 will be required for this portion of the building. The spread or mat foundations could bear directly on Stratum 2 or structural backfill could be placed from the top of Stratum 2 to the proposed bottom depth of the spread or mat foundation.

We recommend that test pits be performed to provide additional information about the depth to the top of Stratum 2.

All foundations should bear a minimum of 4 feet below final grade and be placed on the appropriate bearing stratum. If the appropriate bearing material is not encountered at the foundation elevation, the unsuitable material should be removed until the appropriate bearing material is encountered.

A soil influence line of 1H:1V above the groundwater level and 2H:1V below the groundwater level should be used for determining the placement of new foundations relative to new or existing foundations.

If the adjacent building foundations are lower than the proposed building foundations, the proposed foundations should be moved vertically or laterally so that they are located outside the influence zone of the adjacent building. If the adjacent building foundations are higher than the new foundations and are located within the influence zone of the adjacent building foundations, appropriate adjacent building support (e.g., underpinning) will be required.

If the new building is supported on spread/wall footings, the ground floor slabs can be designed as a slab-on-grade. If there is unsuitable material at the bottom of the slab, the material should be removed and replaced with structural backfill.

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 design 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, if the building is in Seismic Design Category D, 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

Considering that groundwater is estimated to be more than 40 feet deep, the need for permanent groundwater control does not appear to be necessary.

In accordance with the Code, the below grade walls and the foundation should, at a minimum, be damproofed. Damproofing should be performed at the bottom of the foundation 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.

3.3 CONSTRUCTION RECOMMENDATIONS

3.3.1 Excavation Considerations

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 groundwater should be no steeper than 2H:1V. The slopes of any excavations adjacent to any 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 foundation 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 sloped excavations and soldier piles and timber lagging with lateral restraint (e.g., tiebacks, rakers, bracing, etc.), as required. Design of the excavation support system and lateral bracing must also consider the protection of surrounding subsurface utilities and other adjacent improvements.

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

Considering the proximity of the adjacent buildings, the vibrations from driving or vibrating soldier piles may cause damage to the adjacent buildings or exceed the vibration threshold levels. Therefore, it may be necessary to install some of the soldier piles using drilling

methods. At locations where driven piles are acceptable, the continuous vibrations from a vibratory hammer could increase the potential for settlement of adjacent structures; therefore, we recommend that a hydraulic impact hammer be used because the stroke of the hammer can be varied thereby providing some vibration control.

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, typically underpinning, will be required at locations where the new foundations will be placed below and within the influence zone of 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 results in the new foundations being outside the influence zone of the existing adjacent foundations. Underpinning requires permission of the adjacent building owner and is typically difficult to perform below the groundwater. The underpinning designer should review all subsurface investigation results and adjacent building information and select and design appropriate underpinning methods.

The foundation type and depth of the adjacent buildings are currently unknown. We recommend that the adjacent buildings be visited to document 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 foundation. This information should then be used to develop a test pit plan. The purpose of the test pits is 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 methods and procedures for performing construction close to the adjacent buildings.

The analysis and design of any underpinning or other building support systems should be performed by a licensed New York Professional Engineer. Adjacent building support installation should be inspected full time by a qualified engineer acting under the direction of the design engineer.

3.3.3 Temporary Groundwater Control

The groundwater level should be maintained sufficiently below the bottom of the excavation so that the foundation bearing surface can be adequately prepared. The need for temporary groundwater control will depend on the groundwater level at the time of construction and the proposed excavation depths.

Considering that groundwater is estimated to be more than 40 feet deep, it is not anticipated that groundwater pumping will be required. However, the contractor should be prepared to collect and discharge groundwater, rain water, and surface water runoff so that the subgrade can be properly prepared and concrete for the foundations can be poured. At a minimum, sump pits and pumps will be needed.

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 (e.g., concrete, brick, wood, debris, etc.) that can have a negative impact on the performance of the foundation or slab and bear on the recommended material. If the appropriate bearing material is not encountered at the foundation level, the geotechnical engineer should be contacted regarding how to proceed. Excavations to reach final subgrades should use a smooth edged bucket and/or hand tools.

If necessary, 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. The proof-rolling should not be performed when the subgrade is wet, muddy, or frozen.

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 3/4" stone. 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 minimum 4-inch thick layer of compacted coarse aggregate, commonly known as 3/4" gravel or crushed stone, or a "mud-slab" (i.e., 2 inches of lean concrete) should be placed below any slabs on grade and on the approved building foundation 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) between 5 and 15 percent. The subgrade underneath the backfill should be properly prepared and inspected (building foundations only) prior to placement of backfill.

All backfill should be placed in lifts not exceeding 8 inches in loose thickness. Backfill placed beneath shallow foundations should be compacted to a minimum of 95% of the maximum dry density and in-situ density tests should be performed to confirm that the required compaction has been achieved. 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.

3.3.6 Pre-construction Condition Survey and Monitoring

A pre-construction condition survey of the adjacent structures that may be affected by the construction should be performed for the protection of the new building owner in the event of a future damage claim. It is also required by the New York City Department of Buildings. The report should include detailed documentation and photographs of the existing condition of the structures.

Based on the survey results, a program should be developed for the purpose of monitoring the performance of the adjacent structures and 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.

3.3.7 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 should include the following:

- Review and approval of contractor submittals related to foundation construction;
- Special inspection of the support of excavation;
- Special inspection of adjacent building support; if applicable
- Special inspection of foundation subgrades;
- Special inspection of structural fill placement and compaction;
- 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 new 5-story building located at 221 Glenmore Avenue in the Brooklyn, New York.

Based on six test borings, the subsurface conditions generally consist of approximately 5 to 10 feet of uncontrolled sandy fill (Stratum 1), 15 to 25 feet of very dense sand and gravel (Stratum 2), and very dense sand (Stratum 3) that extends to a depth of at least 100 feet.

The recommended seismic site classification is Site Class "D". If the new building is in Risk Category I&II, or III, the Seismic Design Category is "B". If the Risk Category is IV, the Seismic Design Category is "C". Liquefaction does not need to be considered in the foundation design.

The building is proposed to have a cellar level that encompasses a portion of the building. Considering this, the foundation depths will be variable. It is anticipated that Stratum 2 (sand and gravel) will be encountered at the new cellar foundations. The first floor foundations should be placed at least 4 feet below final grade. Considering this and the boring results it is anticipated that Stratum 1 (uncontrolled fill) will be encountered at this depth. We do not recommend constructing shallow foundations that bear on Stratum 1. Considering this, we recommend that consideration initially be given to supporting the new building on spread and wall footings bearing on Stratum 2 with an allowable bearing capacity of 4 tsf. It should be anticipated that over excavation to reach Stratum 2 will be required for the portion of the building without a cellar.

If it is determined that spread footings are not feasible or are inefficient, we recommend that consideration be given to a mat foundation bearing on Stratum 2 with an allowable bearing capacity of 4 tsf and a modulus of subgrade reaction value of 120 pci. If the mat stresses or settlements calculated by the structural engineer are greater than the recommended values, settlement reducing elements (i.e., piles) may be required at specific locations.

Considering that groundwater is estimated to be more than 40 feet deep, the need for permanent groundwater control does not appear to be necessary. In accordance with the Code, the below grade walls and foundation should, at a minimum, be damproofed.

We recommend that the adjacent buildings be visited to document 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 foundation. This information should then be used to develop a test pit plan. The purpose of the test pits is 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 methods and procedures for performing construction close to the adjacent buildings.

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

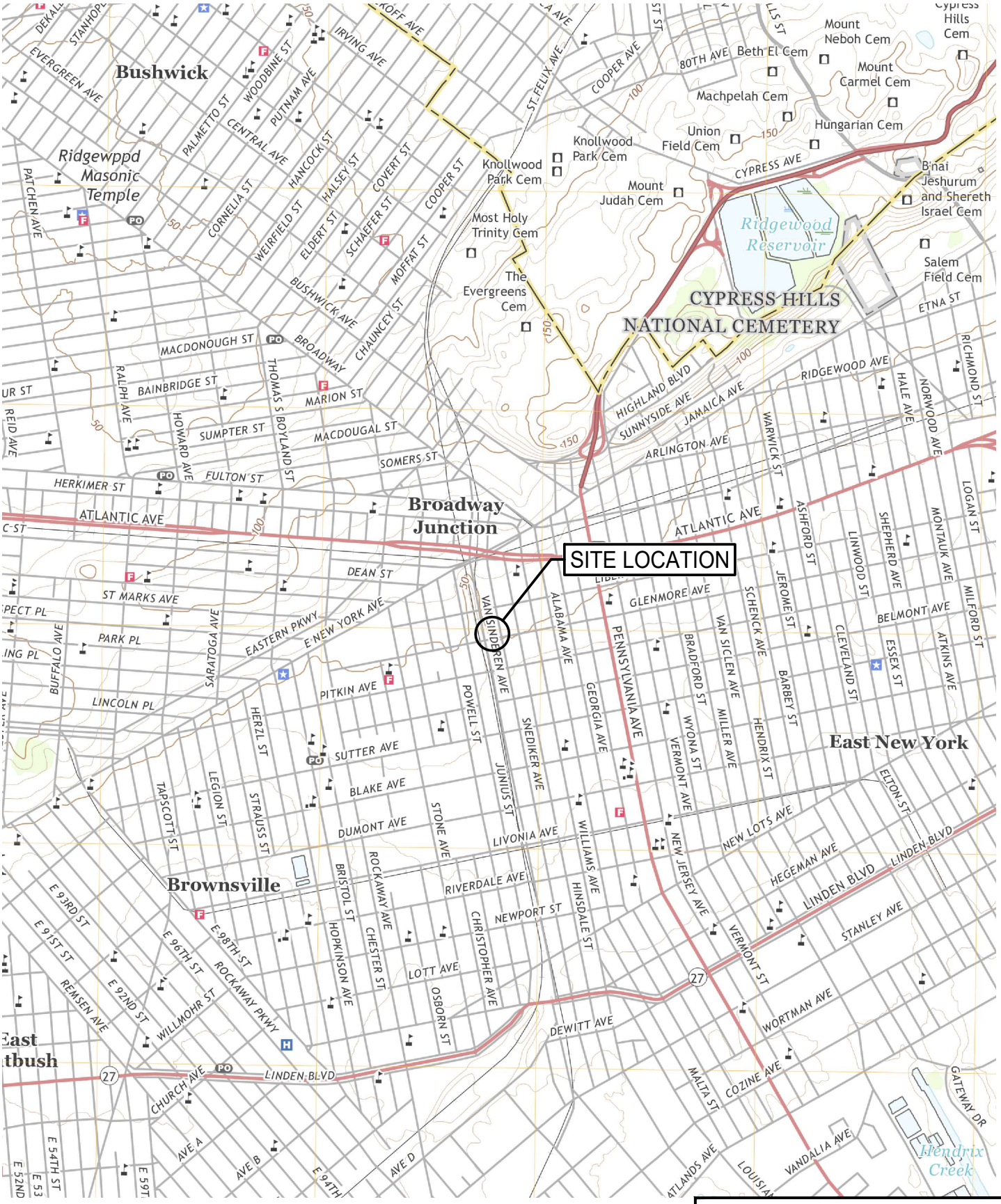
Construction

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 Camber Property Group LLC for specific application to the proposed structure located at 221 Glenmore Avenue in Brooklyn, NY in accordance with generally accepted soil and foundation engineering practices. No other warranty, express or implied, is made.

FIGURES



MAP SOURCE: UNITED STATES GEOLOGICAL SURVEY, 2019, THE NATIONAL MAP BROOKLYN QUADRANGLE, 7.5 MINUTE SERIES

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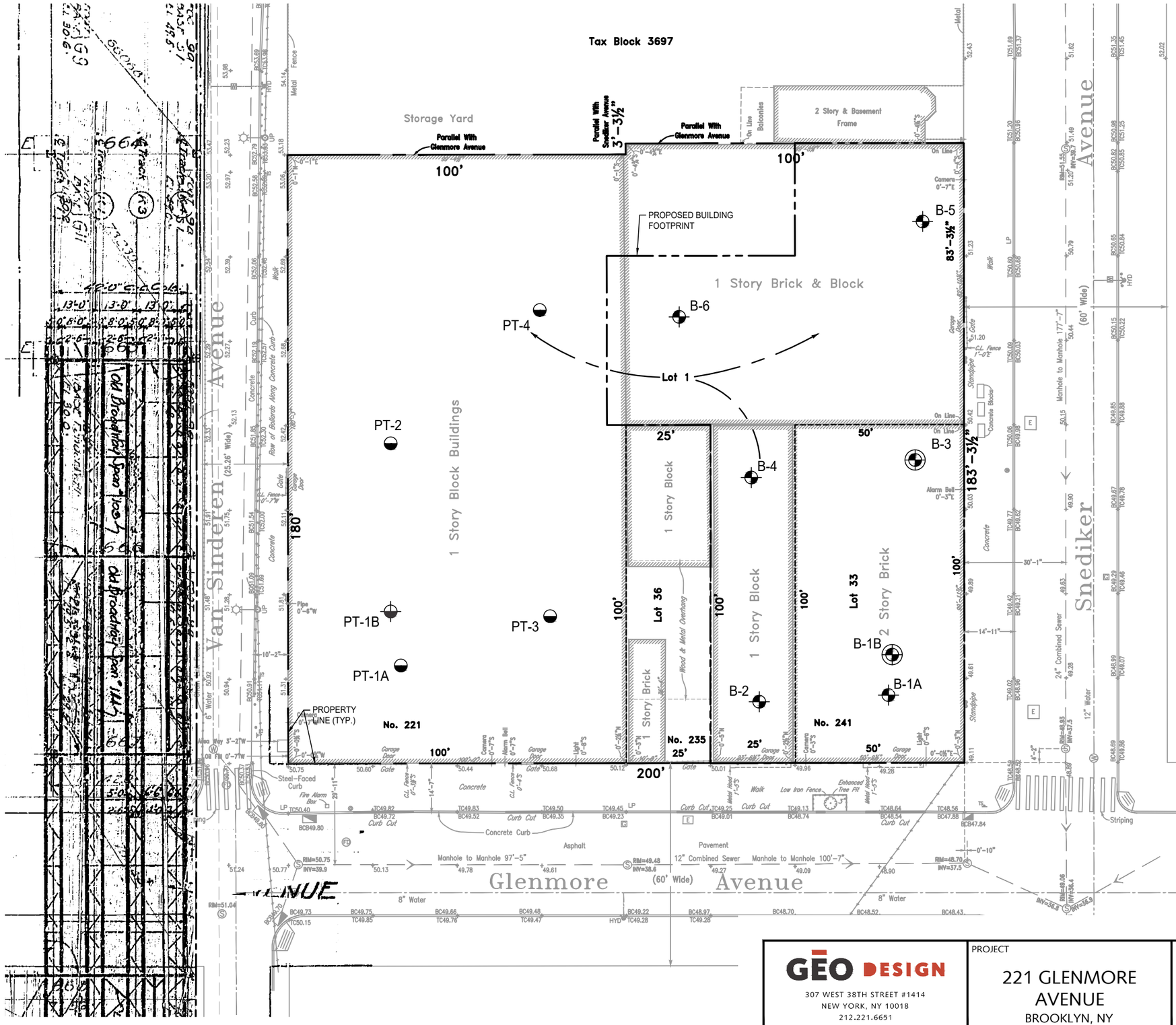
PROJECT
221 GLENMORE AVENUE
BROOKLYN, NY

DRAWING TITLE
SITE LOCATION PLAN

PROJECT NO.	3887-011
SCALE	1" = 2000'
DATE	05/17/2022
DESIGNED BY	N/A
DRAWN BY	AJS
APPROVED BY	N/A

DRAWING NO.
FIGURE 1
01 OF 01

M:\CL\3887 Camber Property Group\011_221-241GlenmoreAve\Drawings\Figure1_SiteLocationPlan.dwg 5/17/2022 4:15 PM GD-STD_3.0.ctb



0 15 30 60

SCALE (FEET)

LEGEND

B-1	TEST BORING BY GEODESIGN, INC. NO. AND LOCATION
B-2	TEST BORING WITH GROUNDWATER OBSERVATION WELL BY GEODESIGN, INC. NO. AND LOCATION
PT-1	PERMEABILITY TEST BY GEODESIGN, INC. NO. AND LOCATION
PT-1B	PERMEABILITY TEST WITH GROUNDWATER OBSERVATION WELL BY GEODESIGN, INC. NO. AND LOCATION

NOTES:

1. BASE MAPS DEVELOPED FROM THE SURVEY PREPARED BY ERLANDSEN-CROWELL & SHAW, DATED 01/19/2022 AND REVISED 02/04/2022 AND THE ARCHITECTRUAL DRAWINGS PREPARED BY CURTIS GINSBERG ARCHITECTS, DATED 04/04/2022
2. ELEVATIONS REFER TO NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88).
3. BORINGS WERE PERFORMED BY MUNICIPAL TESTING LABORATORY, INC. OF HAUPPAUGE, NY AND COASTAL ENVIRONMENTAL SOLUTIONS, INC. OF MEDFORD, NY AND WERE OBSERVED AND LOGGED BY GEODESIGN PERSONNEL.
4. THE LOCATIONS OF THE BORINGS WERE DETERMINED BY TAPING AND VISUAL ESTIMATES FROM EXISTING SITE FEATURES.

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PROJECT
221 GLENMORE AVENUE
BROOKLYN, NY

DRAWING TITLE
BORING & PERMEABILITY LOCATION PLAN

PROJECT NO.	3887-011
SCALE	AS INDICATED
DATE	06/02/2022
DESIGNED BY	ESG
DRAWN BY	JJ
APPROVED BY	TGT

DRAWING NO.
FIGURE 2
1 OF 1

M:\CL\3887 Camber Property Group\011_221-241GlenmoreAve\Drawings\BLP\AsDrilledBLP.dwg 7/25/2022 5:59 PM GD-STD_3.0.ctb

APPENDIX A
TEST BORING LOGS

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BORING LOG

PROJECT NAME

221 Glenmore Avenue

Brooklyn, NY

Boring No.: **B-1A**

Page No.: 1 of 1

File No.: 3887-011

Boring Company:	Coastal Environmental Solutions	Date Started:	4/22/2022
Foreman:	Thomas Fitzpatrick	Date Completed:	4/22/2022
GeoDesign Rep.:	Adam Eisen	Surface El. (ft):	50 (NAVD88)
Rig Type:	Geoprobe 7822DT	Total Depth (ft):	5
Coordinates:		Rock Depth (ft):	

	Barrel	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.
Hammer Type:		Automatic - Hydraulic	

GROUNDWATER OBSERVATIONS

DATE	DEPTH (ft)	ELEV. (ft)	NOTES
▼			
▼			
▼			

Depth (ft)	SAMPLE INFORMATION: GENERAL Type	Number	Recovery (inches)	SOIL Pen. Resist (blows/6 in.)	ROCK Coring Time (min./ft)	Recovery (%)	RQD (%)	LAB Liquid Limit	Plastic Limit	Moisture Content (%)	Percent Fines	STRATA Depth & Elevation (ft)	SYMBOL	SAMPLE DESCRIPTION	REMARKS/ OTHER TESTS
0												Concrete 0.7 / 49.3		8" Concrete Slab	
	SS	1	18	10 12 13 10								Fill 1.5 / 48.5 Sand and Sllt		Top 10": (FILL) Gray fine SAND and SILT, little asphalt, trace brick fragments [7] Bottom 8": (SM) Brown fine SAND and SILT [3b]	
	SS	2	0	50/2"										No Recovery	Attempted sample at 4', no recovery
5												5.0 / 45.0		Bottom of Exploration at 5.0 ft	Installed 5' of casing. Difficult drilling at 5'. Boring terminated at 5' due to underground obstruction.
10															
15															
20															
25															

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 = Large 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%
5) (SP) = Unified Soil Classification System symbol; [3a] = NYC Building Code Classification

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BORING LOG

PROJECT NAME

221 Glenmore Avenue

Brooklyn, NY

Boring No.: B-1B

File No.: 3887-011

Boring Company:	Municipal Testing Laboratory, Inc.	Date Started:	5/12/2022
Foreman:	Ahnan	Date Completed:	5/18/2022
GeoDesign Rep.:	Jason Jimenez	Surface El. (ft):	50 (NAVD88)
Rig Type:	Geoprobe 7822DT	Total Depth (ft):	102
Coordinates:		Rock Depth (ft):	

	Barrel	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.
Hammer Type:		Automatic - Hydraulic	

GROUNDWATER OBSERVATIONS

DATE	DEPTH (ft)	ELEV. (ft)	NOTES
▼			
▼			
▼			

Depth (ft)	SAMPLE INFORMATION: GENERAL Type	Number	Recovery (inches)	SOIL Pen. Resist (blows/6 in.)	ROCK Coring Time (min./ft)	Recovery (%)	RQD (%)	LAB Liquid Limit	Plastic Limit	Moisture Content (%)	Percent Fines	STRATA Depth & Elevation (ft)	SYMBOL	SAMPLE DESCRIPTION	WELL LOG	REMARKS/ OTHER TESTS
0												Concrete 0.7 / 49.3		8" Concrete Slab		
	SS	1	12	13 18 10 5								Fill		(FILL) Brown fine SAND, some silt, trace brick [7]		
	SS	2	9	5 9 15 42								5.0 / 45.0		(FILL) Brown fine SAND, little silt, trace brick, trace concrete [7]		Rig chatter at 4'
5	SS	3	12	7 26 23 33						9.2	7	Sand & Gravel		(SP-SM) Brown fine SAND, some gravel, trace silt [3a]		Installed 5' casing Rig chatter 5'-7'
	SS	4	14	9 26 26 42										(SP/GP) Brown fine SAND and white/gray GRAVEL, trace silt [3a/2a]		
																Rig chatter at 9'
10	SS	5	16	10 27 26 28										(SP/GP) Red/brown fine SAND and GRAVEL, trace silt [3a/2a]		Rig chatter 10'-11'
15	SS	6	12	4 39 31 33						7.6	10			(GP-GM) White/gray GRAVEL, some brown fine sand, trace silt [2a]		15' casing total installed. Rig chatter from 14' - 15'. Rig chatter from 17'-19'
20	SS	7	13	22 25 32 31										(GP) Dark gray/gray GRAVEL, some brown fine sand, trace silt [2a]		Rig chatter at 20'
												23.5 / 26.5 Sand				
25																

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 = Large 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%
5) (SP) = Unified Soil Classification System symbol; [3a] = NYC Building Code Classification

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BORING LOG

PROJECT NAME

221 Glenmore Avenue

Brooklyn, NY

Boring No.: **B-1B**

File No.: 3887-011

Depth (ft)	SAMPLE INFORMATION: GENERAL Type	Number	Recovery (inches)	SOIL Pen. Resist (blows/6 in.)	ROCK Coring Time (min./ft)	Recovery (%)	RQD (%)	LAB Liquid Limit	Plastic Limit	Moisture Content (%)	Percent Fines	STRATA Depth & Elevation (ft)	SYMBOL	SAMPLE DESCRIPTION	WELL LOG	REMARKS/ OTHER TESTS
25	SS	8	8	12 21 33 33								Sand *(Continued)*		(SP) Brown fine SAND, little gravel, trace silt [3a]		
																Rig chatter @ 29'.
30	SS	9	12	10 14 29 24										(SP) Brown fine SAND, trace gravel, trace silt [3a]		
35	SS	10	18	13 21 26 31										(SP) Brown fine SAND, trace gravel, trace silt [3a]		
40	SS	11	17	14 18 21 21										(SP) Brown m-f SAND, trace gravel, trace silt [3a]		
45	SS	12	11	11 14 16 21										(SP) Brown fine SAND, trace silt [3a]		
												48.5 1.5				
50	SS	13	15	14 29 40 44										(GP) Dark gray/gray GRAVEL, some fine sand, trace silt [2a]		Refer to environmental report for well readings
																Rig chatter from 51' - 52'.
												53.5 -3.5				
55																

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Boring No.: **B-1B**

File No.: 3887-011

Depth (ft)	SAMPLE INFORMATION: GENERAL Type	Number	Recovery (inches)	SOIL Pen. Resist (blows/6 in.)	ROCK Coring Time (min./ft)	Recovery (%)	RQD (%)	LAB Liquid Limit	Plastic Limit	Moisture Content (%)	Percent Fines	STRATA Depth & Elevation (ft)	SYMBOL	SAMPLE DESCRIPTION	WELL LOG	REMARKS/ OTHER TESTS
55	SS	14	10	11 14 14 20										(SP) Brown fine SAND, trace gravel, trace silt [3b]		
60	SS	15	8	10 13 15 21								63.5 -13.5		(SP) Brown fine SAND, little silt [3b]		
65	SS	16	8	19 22 27 30										(SM) Brown fine SAND, some silt [3a]		
70	SS	17	10	11 16 20 18										(SM) Brown fine SAND, some silt [3a]		
75	SS	18	12	13 23 20 23										(SM) Brown fine SAND, some silt [3a]		
80	SS	19	10	11 15 18 18										(SM) Brown fine SAND, some silt [3a]		
85																

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BORING LOG

PROJECT NAME

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Brooklyn, NY

Boring No.: **B-1B**

File No.: 3887-011

Depth (ft)	SAMPLE INFORMATION: GENERAL Type	Number	Recovery (inches)	SOIL Pen. Resist (blows/6 in.)	ROCK Coring Time (min./ft)	Recovery (%)	RQD (%)	LAB Liquid Limit	Plastic Limit	Moisture Content (%)	Percent Fines	STRATA Depth & Elevation (ft)	SYMBOL	SAMPLE DESCRIPTION	WELL LOG	REMARKS/ OTHER TESTS
85	SS	20	20	26 30 22 31										(SM) Brown m-f SAND, some silt [3a]		
90	SS	21	15	18 13 19 23								93.5 -43.5		(SM) Brown c-f SAND and SILT [3a]		
95	SS	22	10	17 17 24 24								98.5 -48.5		(SP) Brown m-f SAND, little silt [3a]		
100	SS	23	24	13 24 29 28								102.0 -52.0		(SM) Brown fine SAND, some silt [3a]		
														Bottom of Exploration at 102.0 ft		
105																
110																
115																

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BORING LOG

PROJECT NAME

221 Glenmore Avenue

Brooklyn, NY

Boring No.: B-2
Page No.: 1 of 2
File No.: 3887-011

Boring Company:	Coastal Environmental Solutions	Date Started:	4/22/2022
Foreman:	Thomas Fitzpatrick	Date Completed:	4/22/2022
GeoDesign Rep.:	Adam Eisen	Surface El. (ft):	51 (NAVD88)
Rig Type:	Geoprobe 7822DT	Total Depth (ft):	42
Coordinates:		Rock Depth (ft):	

	Barrel	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.
Hammer Type:		Automatic - Hydraulic	

GROUNDWATER OBSERVATIONS

DATE	DEPTH (ft)	ELEV. (ft)	NOTES
▼			
▼			
▼			

Depth (ft)	Type	Number	Recovery (inches)	Pen. Resist (blows/6 in.)	Coring Time (min./ft)	Recovery (%)	RQD (%)	Liquid Limit	Plastic Limit	Moisture Content (%)	Percent Fines	Depth & Elevation (ft)	SYMBOL	SAMPLE DESCRIPTION	REMARKS/ OTHER TESTS
0												Concrete 0.7 50.3		8" Concrete Slab	
												Fill			
	SS	1	5	33 88 24 2										(FILL) Brown m-f SAND and SILT, little gravel [7]	
	SS	2	2	5 16 31 50/3"										(FILL) Brown m-f SAND and SILT, little gravel, little brick [7]	
5												5.0 46.0			
	SS	3	12	5 8 6 12								Sand & Gravel		(SM) Brownish gray c-f SAND and GRAVEL, some silt [3b]	Installed 5' of casing Lost water return at 5'
	SS	4	18	14 19 18 15										(SM) Brown m-f SAND, some gravel, some silt [3a]	
10	SS	5	18	34 77 36 27						9	10			(SP-SM) Brown m-f SAND, some gravel, little silt [3a]	Installed 10' of casing
15	SS	6	14	11 27 20 19										(SM) Brown and multicolored c-f SAND and GRAVEL, some silt [3a]	
												18.5 32.5			
												Sand			
20	SS	7	10	20 27 30 24						9	11			(SP-SM) Brown m-f SAND, some gravel, little silt [3a]	
25															

NOTES:
1) Stratification lines represent approximate boundary between material types, transitions may be gradual.
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3) Abbreviations: A = Auger; C = Core; MC=Macrocore; D = Driven; G = Grab; PS = Piston Sample; SS = Split Spoon; SSL = Large 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%
5) (SP) = Unified Soil Classification System symbol; [3a] = NYC Building Code Classification

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BORING LOG

PROJECT NAME

221 Glenmore Avenue

Brooklyn, NY

Boring No.: B-2
Page No.: 2 of 2
File No.: 3887-011

Depth (ft)	SAMPLE INFORMATION: GENERAL Type	Number	Recovery (inches)	SOIL Pen. Resist (blows/6 in.)	ROCK Coring Time (min./ft)	Recovery (%)	RQD (%)	LAB Liquid Limit	Plastic Limit	Moisture Content (%)	Percent Fines	STRATA Depth & Elevation (ft)	SYMBOL	SAMPLE DESCRIPTION	REMARKS/ OTHER TESTS
25	SS	8	7	9 14 23 32								Sand *(Continued)*		(SM) Brown m-f SAND and SILT, little gravel [3a]	
30	SS	9	7	10 12 17 24										(SM) Brown fine SAND and SILT, trace gravel [3b]	
35	SS	10	9	8 10 17 25										(SM) Brown fine SAND and SILT [3b]	
40	SS	11	7	13 18 18 36								42.0 9.0		(SM) Brown fine SAND and SILT [3a]	
45														Bottom of Exploration at 42.0 ft	
50															
55															

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BORING LOG

PROJECT NAME

221 Glenmore Avenue

Brooklyn, NY

Boring No.: B-3

File No.: 3887-011

Boring Company:	Municipal Testing Laboratory, Inc.	Date Started:	5/3/2022
Foreman:	Jerry	Date Completed:	5/9/2022
GeoDesign Rep.:	Jason Jimenez	Surface El. (ft):	50 (NAVD88)
Rig Type:	Fordia 300	Total Depth (ft):	42
Coordinates:		Rock Depth (ft):	

	Barrel	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.
Hammer Type:		Automatic - Hydraulic	

GROUNDWATER OBSERVATIONS

DATE	DEPTH (ft)	ELEV. (ft)	NOTES
▼ 5/9/22	14.5	35.5	Flushed
▼ 5/11/22	32.0	18.0	
▼ 5/18/22	Dry		Greater than 40'

Depth (ft)	GENERAL Type	Number	Recovery (inches)	SOIL Pen. Resist (blows/6 in.)	ROCK Coring Time (min./ft)	Recovery (%)	RQD (%)	LAB Liquid Limit	Plastic Limit	Moisture Content (%)	Percent Fines	STRATA Depth & Elevation (ft)	SYMBOL	SAMPLE DESCRIPTION	WELL LOG	REMARKS/ OTHER TESTS
0												Concrete 1.0 49.0		11" Concrete Slab		
												Fill				
	SS	1	8	1 4 6 13										(Fill) Brown fine SAND, trace concrete, trrace brick [7]		
	SS	2	0	35/0"								3.5 46.5 Inferred Obstruction 5.0 45.0		Inferred Obstruction		Obstruction at 3.5', no sample recovered
5												Sand & Gravel				
	SS	3	8	97 73 52 63						8.5	11			(GP-GM) Gray GRAVEL, little fine sand, little silt [2a]		
	SS	4	12	16 58 65 47										(GP) Reddish - gray GRAVEL, little fine sand [2a]		
10	SS	5	10	22 23 25 19										(SP-GP) Brown fine SAND and gray GRAVEL, trace silt [3a/2a]		
												13.0 37.0 Inferred Obstruction				Rig chatter at 13'
15	SS	6	0	60/4"								20.0 30.0		Inferred Obstruction		Refusal, no recovery. After SS-6, the rig was replaced with a Geoprobe 7822DT Hard drilling 16' - 20'.
20	SS	7	10	10 18 25 39								Sand		(SP) Brown fine SAND, some gravel, trace silt [3a]		
												23.5 26.5 Inferred Obstruction				Rig chatter at 23'
25																

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 = Large 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%
5) (SP) = Unified Soil Classification System symbol; [3a] = NYC Building Code Classification

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BORING LOG

PROJECT NAME

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Brooklyn, NY

Boring No.: B-3
Page No.: 2 of 2
File No.: 3887-011

Depth (ft)	SAMPLE INFORMATION: GENERAL Type	Number	Recovery (inches)	SOIL Pen. Resist (blows/6 in.)	ROCK Coring Time (min./ft)	Recovery (%)	RQD (%)	LAB Liquid Limit	Plastic Limit	Moisture Content (%)	Percent Fines	STRATA Depth & Elevation (ft)	SYMBOL	SAMPLE DESCRIPTION	WELL LOG	REMARKS/ OTHER TESTS
25	SS	8	0	50/4"								Inferred Obstruction *(Continued)*		Inferred Obstruction		Refusal, no recovery. Driller does not have 3" spoon
												30.0 20.0				Rig chatter at 28' - 30'
30	SS	9	12	14 16 18 20						4.6	6	Sand		(SP-SM) Brown fine SAND, trace gravel, trace silt [3a]		
																Slight rig chatter at 33'
35	SS	10	14	14 20 21 20										(SP) Brown fine SAND [3a]		
40	SS	11	12	14 18 19 19								42.0 8.0		(SP) Brown fine SAND, trace silt [3a]		
														Bottom of Exploration at 42.0 ft		
45																
50																
55																

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BORING LOG

PROJECT NAME

221 Glenmore Avenue

Brooklyn, NY

Boring No.: B-4
Page No.: 1 of 2
File No.: 3887-011

Boring Company:	Municipal Testing Laboratory, Inc.	Date Started:	5/10/2022
Foreman:	Ahnan	Date Completed:	5/10/2022
GeoDesign Rep.:	Jason Jimenez	Surface El. (ft):	50 (NAVD88)
Rig Type:	Geoprobe 7822DT	Total Depth (ft):	42
Coordinates:		Rock Depth (ft):	

	Barrel	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.
Hammer Type:		Automatic - Hydraulic	

GROUNDWATER OBSERVATIONS

DATE	DEPTH (ft)	ELEV. (ft)	NOTES
▼			
▼			
▼			

Depth (ft)	SAMPLE INFORMATION: GENERAL Type	Number	Recovery (inches)	SOIL Pen. Resist (blows/6 in.)	ROCK Coring Time (min./ft)	Recovery (%)	RQD (%)	LAB Liquid Limit	Plastic Limit	Moisture Content (%)	Percent Fines	STRATA Depth & Elevation (ft)	SYMBOL	SAMPLE DESCRIPTION	REMARKS/ OTHER TESTS
0												Concrete 1.0 / 49.0		11" Concrete Slab	
	SS	1	21	4 3 3 4								Fill		(Fill) Brown fine SAND, little silt, trace brick, trace concrete [7]	
	SS	2	8	8 30 34 34								5.0 / 45.0		(Fill) Brown fine SAND, little silt, trace brick, trace concrete [7]	
5	SS	3	24	34 34 30 33						2.9	4	Sand & Gravel		(GP) Gray GRAVEL, some m-f sand, trace silt [2a]	
	SS	4	11	38 41 39 37										(SP) Brown fine SAND, little reddish - gray gravel [3a]	
10	SS	5	13	12 20 29 30										(SP) Brown fine SAND, some gravel, trace silt [3a]	10' Casing installed. Rig Chatter at 10'.
															Rig chatter at 13' - 15'.
15	SS	6	9	9 22 28 26										(SP-GP) Brown fine SAND and white - gray GRAVEL, trace silt [3a/2a]	
															Rig chatter at 18' - 19'.
20	SS	7	0	26 33 32 27								21.0 / 29.0 Sand		NO RECOVERY	
															Rig chatter at 23'.
25															

NOTES:
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4) Proportions Used: Trace = 1-10%; Little = 10-20%; Some = 20-35%; And = 35-50%
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BORING LOG

PROJECT NAME

221 Glenmore Avenue

Brooklyn, NY

Boring No.: B-4
Page No.: 2 of 2
File No.: 3887-011

Depth (ft)	SAMPLE INFORMATION: GENERAL Type	Number	Recovery (inches)	SOIL Pen. Resist (blows/6 in.)	ROCK Coring Time (min./ft)	Recovery (%)	RQD (%)	LAB Liquid Limit	Plastic Limit	Moisture Content (%)	Percent Fines	STRATA Depth & Elevation (ft)	SYMBOL	SAMPLE DESCRIPTION	REMARKS/ OTHER TESTS
25	SS	8	10	17 22 19 17						3.8	6	Sand *(Continued)*		(SP-SM) Brown fine SAND, some gravel, trace silt [3a]	
30	SS	9	12	17 15 18 20										(SP) Brown fine SAND, trace silt, trace gravel [3a]	
35	SS	10	17	14 18 22 22										(SP) Brown fine SAND, trace silt, trace gravel [3a]	
40	SS	11	10	16 23 28 25								42.0 8.0		(SP) Brown fine SAND, trace silt [3a]	
														Bottom of Exploration at 42.0 ft	
45															
50															
55															

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BORING LOG

PROJECT NAME

221 Glenmore Avenue

Brooklyn, NY

Boring No.: B-5
Page No.: 1 of 2
File No.: 3887-011

Boring Company:	Municipal Testing Laboratory, Inc.	Date Started:	5/2/2022
Foreman:	Jerry	Date Completed:	5/3/2022
GeoDesign Rep.:	Jason Jimenez	Surface El. (ft):	51 (NAVD88)
Rig Type:	Fordia 300	Total Depth (ft):	42
Coordinates:		Rock Depth (ft):	

	Barrel	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.
Hammer Type:		Automatic - Hydraulic	

GROUNDWATER OBSERVATIONS

DATE	DEPTH (ft)	ELEV. (ft)	NOTES
▼			
▼			
▼			

Depth (ft)	Type	Number	Recovery (inches)	Pen. Resist (blows/6 in.)	Coring Time (min./ft)	Recovery (%)	RQD (%)	Liquid Limit	Plastic Limit	Moisture Content (%)	Percent Fines	Depth & Elevation (ft)	SYMBOL	SAMPLE DESCRIPTION	REMARKS/ OTHER TESTS
0												0.5 Concrete		6" Concrete Slab	
												Fill			
	SS	1	19	6 11 12 15										(FILL) Brown fine SAND, some silt, little gravel, little brick [7]	
	SS	2	12	28 45 54 78										(FILL) Light brown fine SAND, some gravel, little silt, trace brick [7]	
5	SS	3	13	30 44 39 47								7.0	44.0	(FILL) Light brown fine SAND, some gravel, little brick [7]	
	SS	4	13	20 29 36 36								Sand & Gravel		(SM) Brown c-f SAND, some gravel, little silt [3a]	
															Rig chatter at 9'
10	SS	5	9	53 39 45 48						13.2	7			(SP-SM) Brown m-f SAND, some gray GRAVEL, trace silt [3a]	
															Rig chatter at 13'
15	SS	6	16	20 33 48 52										(SM/GP) Brown m-f SAND and gray GRAVEL, little silt [3a/2a]	
															Rig chatter and hard drilling at 18'
20	SS	7	8	29 47 57 48										(GP) Gray-dark GRAVEL, trace sand [2a]	
												23.5	27.5		
												Sand			
25															

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 = Large 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%
5) (SP) = Unified Soil Classification System symbol; [3a] = NYC Building Code Classification

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BORING LOG

PROJECT NAME

221 Glenmore Avenue

Brooklyn, NY

Boring No.: B-5
Page No.: 2 of 2
File No.: 3887-011

Depth (ft)	SAMPLE INFORMATION: GENERAL Type	Number	Recovery (inches)	SOIL Pen. Resist (blows/6 in.)	ROCK Coring Time (min./ft)	Recovery (%)	RQD (%)	LAB Liquid Limit	Plastic Limit	Moisture Content (%)	Percent Fines	STRATA Depth & Elevation (ft)	SYMBOL	SAMPLE DESCRIPTION	REMARKS/ OTHER TESTS
25	SS	8	10	14 19 26 26								Sand *(Continued)*		(SP) Brown fine SAND, some gravel, trace silt [3a]	
30	SS	9	24	17 22 27 37										(SP) Brown fine SAND, some gravel, trace silt [3a]	
35	SS	10	18	22 21 24 30						16.3	7.3			(SP-SM) Brown fine SAND, trace gravel, trace silt [3a]	
40	SS	11	20	16 21 23 26								42.0 9.0		(SP) Brown fine SAND, trace gravel, trace silt [3a]	
														Bottom of Exploration at 42.0 ft	
45															
50															
55															

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BORING LOG

PROJECT NAME

221 Glenmore Avenue

Brooklyn, NY

Boring No.: B-6

File No.: 3887-011

Boring Company:	Municipal Testing Laboratory, Inc.	Date Started:	5/11/2022
Foreman:	Ahnan	Date Completed:	5/12/2022
GeoDesign Rep.:	Jason Jimenez	Surface El. (ft):	50 (NAVD88)
Rig Type:	Geoprobe 7822DT	Total Depth (ft):	102
Coordinates:		Rock Depth (ft):	

	Barrel	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.
Hammer Type:		Automatic - Hydraulic	

GROUNDWATER OBSERVATIONS

DATE	DEPTH (ft)	ELEV. (ft)	NOTES
▼			
▼			
▼			

Depth (ft)	SAMPLE INFORMATION: GENERAL Type	Number	Recovery (inches)	SOIL Pen. Resist (blows/6 in.)	ROCK Coring Time (min./ft)	Recovery (%)	RQD (%)	LAB Liquid Limit	Plastic Limit	Moisture Content (%)	Percent Fines	STRATA Depth & Elevation (ft)	SYMBOL	SAMPLE DESCRIPTION	REMARKS/ OTHER TESTS
0												0.5 Concrete		5" Concrete Slab	
												Fill			
	SS	1	22	2 5 5 7										(Fill) Brown fine SAND, little silt, trace brick, trace concrete [7]	
	SS	2	18	7 18 27 27										(Fill) Brown fine SAND, little concrete, trace silt [7]	
5	SS	3	10	30 58 45 30										(Fill) Brown fine SAND, little gravel, little concrete, trace silt [7]	
	SS	4	9	18 37 37 27										(Fill) Brown fine SAND, some gravel, little cncrete, trace blue rubber plastic [7]	
												9.5 — 40.5			Installed 10' casing
10	SS	5	13	19 30 30 27								Sand & Gravel		(SP) Brown fine SAND, some red - dark gray gravel, trace silt [3a]	Rig chatter at 10'
															Rig chatter 13' - 14'
15	SS	6	10	17 17 17 19						6.6	7			(SP-SM) Brown m-f SAND, trace gravel, trace silt [3a]	
															Slight rig chatter at 18'
20	SS	7	12	14 21 23 25										(SP) Brown fine SAND, some red - white gravel [3a]	
															Rig chatter 24'
25															

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 = Large 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%
5) (SP) = Unified Soil Classification System symbol; [3a] = NYC Building Code Classification

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BORING LOG

PROJECT NAME

221 Glenmore Avenue

Brooklyn, NY

Boring No.: B-6
Page No.: 2 of 4
File No.: 3887-011

Depth (ft)	SAMPLE INFORMATION: GENERAL Type	Number	Recovery (inches)	SOIL Pen. Resist (blows/6 in.)	ROCK Coring Time (min./ft)	Recovery (%)	RQD (%)	LAB Liquid Limit	Plastic Limit	Moisture Content (%)	Percent Fines	STRATA Depth & Elevation (ft)	SYMBOL	SAMPLE DESCRIPTION	REMARKS/ OTHER TESTS
25	SS	8	11	14 23 23 21								Sand & Gravel *(Continued)*		(SP) Brown fine SAND, some red - gray gravel [3a]	
												28.5 — 21.5 Sand			
30	SS	9	12	10 14 18 16										(SP) Brown fine SAND, trace silt [3a]	
35	SS	10	10	16 21 21 23										(SP) Brown fine SAND, trace silt, trace gravel [3a]	
40	SS	11	14	18 25 28 24						8.8	6			(SP-SM) Brown fine SAND, trace silt, trace gravel [3a]	
45	SS	12	15	16 19 23 23										(SP) Brown fine SAND, trace silt, trace gravel [3a]	
50	SS	13	20	23 28 32 44										(SP) Brown m-f SAND, some gravel, trace silt [3a]	
55															

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BORING LOG

PROJECT NAME

221 Glenmore Avenue

Brooklyn, NY

Boring No.: B-6

File No.: 3887-011

Depth (ft)	SAMPLE INFORMATION: GENERAL Type	Number	Recovery (inches)	SOIL Pen. Resist (blows/6 in.)	ROCK Coring Time (min./ft)	Recovery (%)	RQD (%)	LAB Liquid Limit	Plastic Limit	Moisture Content (%)	Percent Fines	STRATA Depth & Elevation (ft)	SYMBOL	SAMPLE DESCRIPTION	REMARKS/ OTHER TESTS
55	SS	14	16	19 28 20 24								Sand *(Continued)*		(SP) Brown m-f SAND, trace silt, trace gravel [3a]	
60	SS	15	14	15 19 21 19										(SP) Brown m-f SAND, trace silt, trace gravel [3a]	
65	SS	16	12	14 14 23 28										(SP) Brown m-f SAND, trace silt, trace gravel [3a]	
70	SS	17	11	15 18 20 22										(SP) Brown fine SAND, trace silt [3a]	
75	SS	18	13	20 31 33 38										(SP) Brown m-f SAND, trace silt, trace gravel [3a]	
80	SS	19	12	18 20 20 31										(SP) Brown fine SAND, trace silt, trace gravel [3a]	
85															

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BORING LOG

PROJECT NAME

221 Glenmore Avenue

Brooklyn, NY

Boring No.: B-6

File No.: 3887-011

Depth (ft)	SAMPLE INFORMATION: GENERAL Type	Number	Recovery (inches)	SOIL Pen. Resist (blows/6 in.)	ROCK Coring Time (min./ft)	Recovery (%)	RQD (%)	LAB Liquid Limit	Plastic Limit	Moisture Content (%)	Percent Fines	STRATA Depth & Elevation (ft)	SYMBOL	SAMPLE DESCRIPTION	REMARKS/ OTHER TESTS
85	SS	20	17	23 32 31 30								Sand *(Continued)*		(SP) Brown fine SAND, trace silt, trace gravel [3a]	
90	SS	21	9	18 26 24 26										(SP) Brown fine SAND, trace silt [3a]	
95	SS	22	11	14 17 30 41										(SP) Brown fine SAND, trace silt [3a]	
100	SS	23	12	17 19 29 38								102.0 -52.0		(SP) Brown fine SAND, trace silt, trace gravel [3a]	
														Bottom of Exploration at 102.0 ft	
105															
110															
115															

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BORING LOG

PROJECT NAME

221 Glenmore Avenue

Brooklyn, NY

Boring No.: **PT-1B**

Page No.: 1 of 2

File No.: 3887-011

Boring Company:	Municipal Testing Laboratory, Inc.	Date Started:	5/19/2022
Foreman:	Ahnan	Date Completed:	5/19/2022
GeoDesign Rep.:	Jason Jimenez	Surface El. (ft):	51 (NAVD88)
Rig Type:	Geoprobe 7822DT	Total Depth (ft):	50
Coordinates:		Rock Depth (ft):	

	Barrel	Casing	Sampler
Type:		FJ	
I.D.:		4.0 in.	in.
Hammer Wt.:		140 lbs	
Hammer Fall:		30 in.	
Hammer Type:			

GROUNDWATER OBSERVATIONS

DATE	DEPTH (ft)	ELEV. (ft)	NOTES
▼			
▼			
▼			

SAMPLE INFORMATION

Depth (ft)	GENERAL Type	GENERAL Number	GENERAL Recovery (inches)	SOIL Pen. Resist (blows/6 in.)	ROCK Coring Time (min./ft)	ROCK Recovery (%)	ROCK RQD (%)	LAB Liquid Limit	LAB Plastic Limit	LAB Moisture Content (%)	LAB Percent Fines	STRATA Depth & Elevation (ft)	SYMBOL
0													
5													
10													
15													
20													
25													

SAMPLE DESCRIPTION

WELL LOG

REMARKS/ OTHER TESTS

Refer to permeability test log for test results.

Drilled without sampling to 50' upon completion of permeability test.

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 = Large 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%
5) (SP) = Unified Soil Classification System symbol; [3a] = NYC Building Code Classification

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BORING LOG

PROJECT NAME

221 Glenmore Avenue

Brooklyn, NY

Boring No.: **PT-1B**

File No.: 3887-011

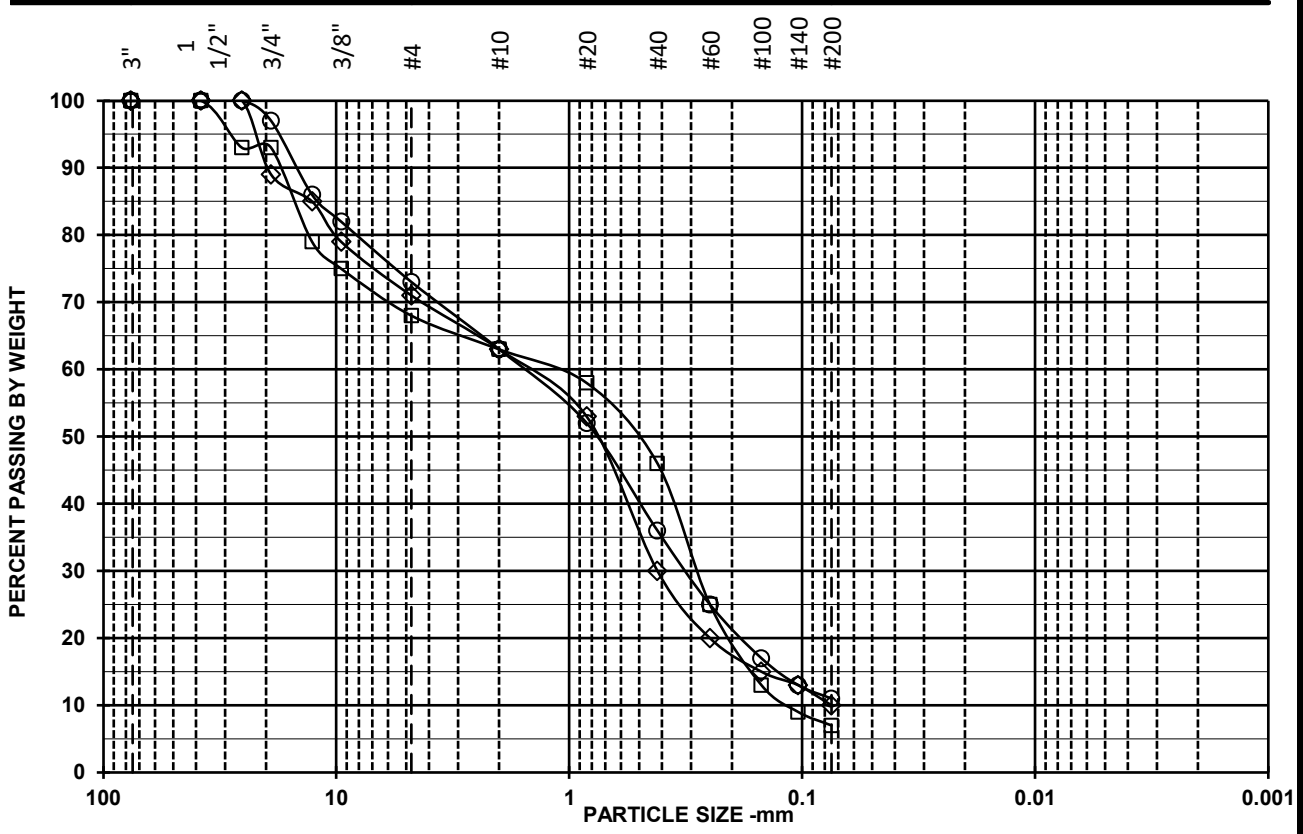
Depth (ft)	SAMPLE INFORMATION: GENERAL Type	GENERAL Number	GENERAL Recovery (inches)	SOIL Pen. Resist (blows/6 in.)	ROCK Coring Time (min./ft)	ROCK Recovery (%)	ROCK RQD (%)	LAB Liquid Limit	LAB Plastic Limit	LAB Moisture Content (%)	LAB Percent Fines	STRATA Depth & Elevation (ft)	SYMBOL	SAMPLE DESCRIPTION	WELL LOG	REMARKS/ OTHER TESTS
25																
30																
35																
40																
45																
50																Refer to environmental report for well readings.
55																

APPENDIX B
LABORATORY TEST RESULTS

GeoDesign #3887-011
221 Glenmore Avenue
LABORATORY TESTING DATA SUMMARY

BORING NO.	SAMPLE NO.	DEPTH (ft)	IDENTIFICATION TESTS			REMARKS
			WATER CONTENT (%)	USCS SYMB. (1)	SIEVE MINUS NO. 200 (%)	
B-1B	S-3	5-7	9.2	SP-SM	7	
B-1B	S-6	15-17	7.6	GP-GM	10	
B-2	S-5	10-12	9.0	SW-SM	10	
B-2	S-7	20-22	9.0	SP-SM	11	
B-3	S-3	6-8	8.5	GP-GM	11	
B-3	S-9	30-32	4.6	SP-SM	6	
B-4	S-3	5-7	2.9	GW	4	
B-4	S-8	25-27	3.8	SW-SM	6	
B-5	S-5	10-12	13.2	SW-SM	7	
B-5	S-10	35-37	16.3	SP-SM	7.3	
B-6	S-6	15-17	6.6	SP-SM	7	
B-6	S-11	40-42	8.8	SP-SM	6	

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



Open Symbols: Sieve analysis by ASTM D6913
Filled symbols: Hydrometer analysis by ASTM D7928 corrected for complete sample

SYMBOL	w (%)	LL	PL	PI	USCS	AASHTO	USCS DESCRIPTION AND REMARKS	DATE
□	9.2				SP-SM		Brown, Poorly graded sand with silt and gravel, Insufficient sample size	05/24/22
◇	9.0				SW-SM		Brown, Well-graded sand with silt and gravel, Insufficient sample size	05/24/22
○	9.0				SP-SM		Brown, Poorly graded sand with silt and gravel, Insufficient sample size	05/24/22

GeoDesign #3887-011

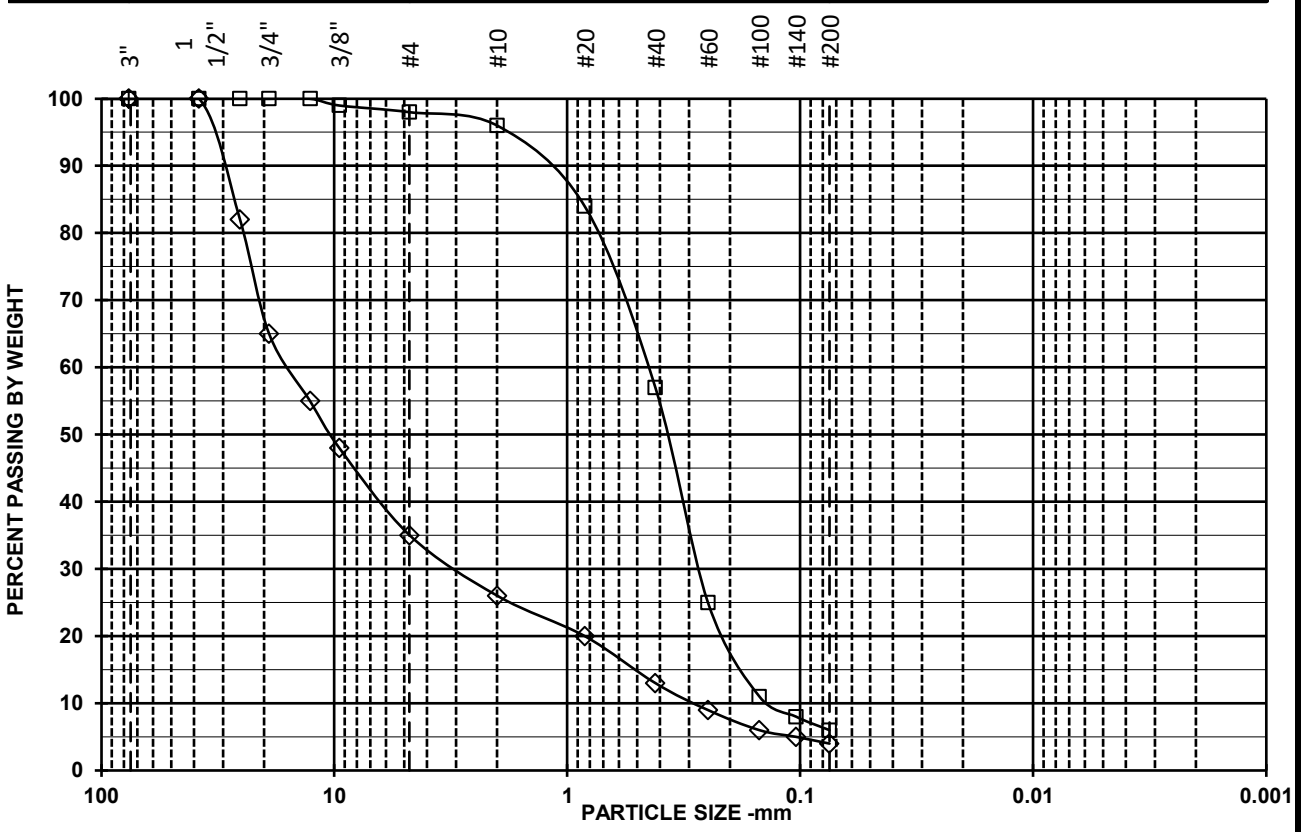
TerraSense #22004824A

221 Glenmore Avenue

Symbol	□	◇	○
Boring	B-1B	B-2	B-2
Sample	S-3	S-5	S-7
Depth	5-7	10-12	20-22
% +3"	0	0	0
% Gravel	32	29	27
% SAND	61	61	62
%C SAND	5	8	10
%M SAND	17	33	27
%F SAND	39	20	25
% FINES	7	10	11
D_{100} (mm)	38.1	25.4	25.4
D_{60} (mm)	1.19	1.54	1.58
D_{30} (mm)	0.28	0.42	0.32
D_{10} (mm)	0.11	0.075	
Cc	0.6	1.5	
Cu	10.8	20.5	

Sieve Size/ID #	Percent Finer Data		
6"	100	100	100
4"	100	100	100
3"	100	100	100
1 1/2"	100	100	100
1"	93	100	100
3/4"	93	89	97
1/2"	79	85	86
3/8"	75	79	82
#4	68	71	73
#10	63	63	63
#20	58	53	52
#40	46	30	36
#60	25	20	25
#100	13	15	17
#140	9	13	13
#200 5μ m	7	10	11
2μ m			
1μ m			

PARTICLE SIZE DISTRIBUTION
ASTM D6913 & ASTM D7928



Open Symbols: Sieve analysis by ASTM D6913
Filled symbols: Hydrometer analysis by ASTM D7928 corrected for complete sample

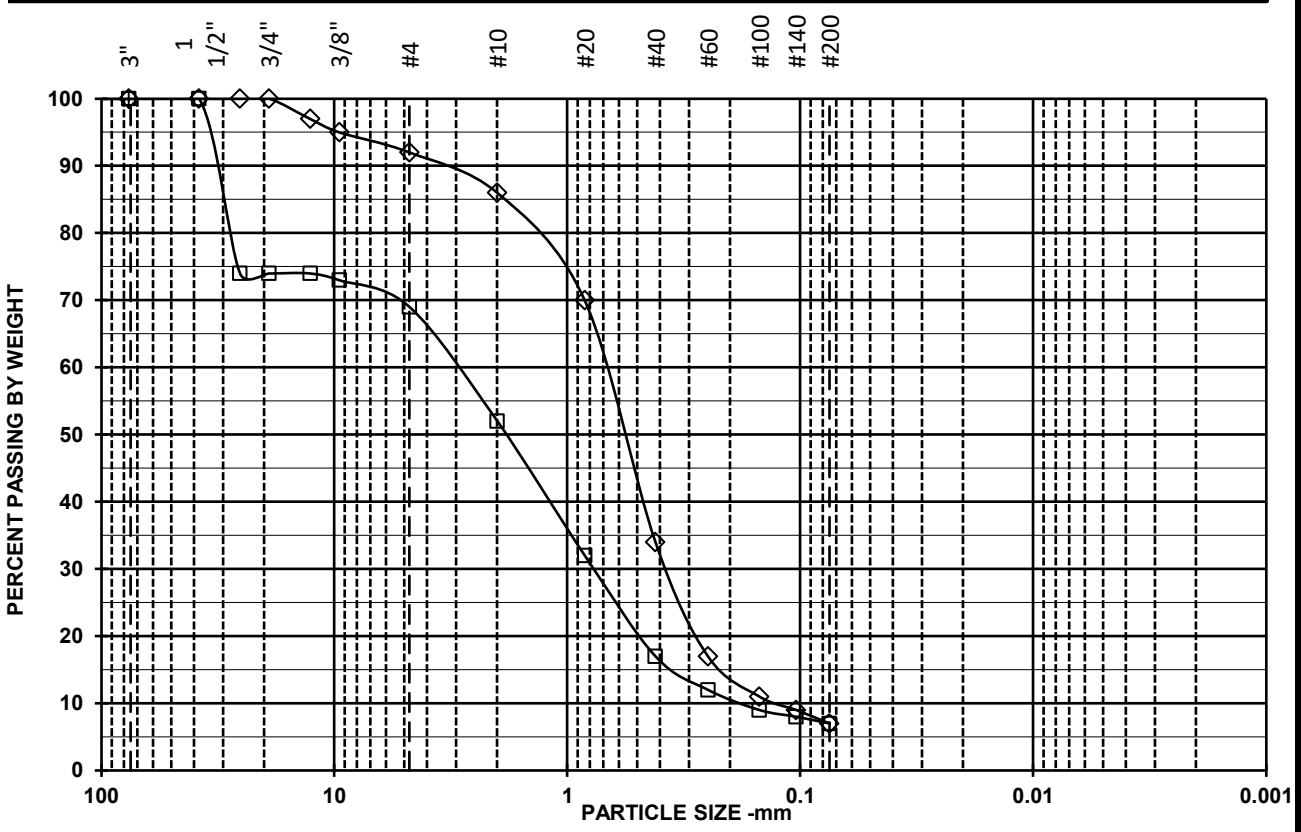
SYMBOL	w (%)	LL	PL	PI	USCS	AASHTO	USCS DESCRIPTION AND REMARKS	DATE
□	4.6				SP-SM		Brown, Poorly graded sand with silt	05/24/22
◇	2.9				GW		Brown, Well-graded gravel with sand, Insufficient sample size	05/24/22
○								

GeoDesign	#3887-011	221 Glenmore Avenue
TerraSense	#22004824A	

Symbol	□	◇	○
Boring	B-3	B-4	
Sample	S-9	S-3	
Depth	30-32	5-7	
% +3"	0	0	
% Gravel	2	65	
% SAND	92	31	
%C SAND	2	9	
%M SAND	39	13	
%F SAND	51	9	
% FINES	6	4	
D_{100} (mm)	12.7	38.1	
D_{60} (mm)	0.453	15.6	
D_{30} (mm)	0.27	2.9	
D_{10} (mm)	0.13	0.28	
Cc	1.2	1.9	
Cu	3.5	55.7	

Sieve Size/ID #	Percent Finer Data		
6"	100	100	
4"	100	100	
3"	100	100	
1 1/2"	100	100	
1"	100	82	
3/4"	100	65	
1/2"	100	55	
3/8"	99	48	
#4	98	35	
#10	96	26	
#20	84	20	
#40	57	13	
#60	25	9	
#100	11	6	
#140	8	5	
#200	6	4	
5μ m			
2μ m			
1μ m			

PARTICLE SIZE DISTRIBUTION
ASTM D6913 & ASTM D7928



Open Symbols: Sieve analysis by ASTM D6913
Filled symbols: Hydrometer analysis by ASTM D7928 corrected for complete sample

SYMBOL	w (%)	LL	PL	PI	USCS	AASHTO	USCS DESCRIPTION AND REMARKS	DATE
□	13.2				SW-SM		Brown, Well-graded sand with silt and gravel, Insufficient sample size	05/24/22
◇	6.6				SP-SM		Brown, Poorly graded sand with silt, Insufficient sample size	05/24/22
○								

GeoDesign	#3887-011
TerraSense	#22004824A

221 Glenmore Avenue

Symbol	□	◇	○
Boring	B-5	B-6	
Sample	S-5	S-6	
Depth	10-12	15-17	
% +3"	0	0	
% Gravel	31	8	
% SAND	62	85	
%C SAND	17	6	
%M SAND	35	52	
%F SAND	10	27	
% FINES	7	7	
D_{100} (mm)	38.1	19.1	
D_{60} (mm)	3	0.693	
D_{30} (mm)	0.77	0.37	
D_{10} (mm)	0.18	0.12	
Cc	1.1	1.6	
Cu	16.7	5.8	

Sieve Size/ID #	Percent Finer Data		
6"	100	100	
4"	100	100	
3"	100	100	
1 1/2"	100	100	
1"	74	100	
3/4"	74	100	
1/2"	74	97	
3/8"	73	95	
#4	69	92	
#10	52	86	
#20	32	70	
#40	17	34	
#60	12	17	
#100	9	11	
#140	8	9	
#200	7	7	
5μ m			
2μ m			
1μ m			

PARTICLE SIZE DISTRIBUTION
ASTM D6913 & ASTM D7928

APPENDIX C
PERMEABILITY TEST LOGS

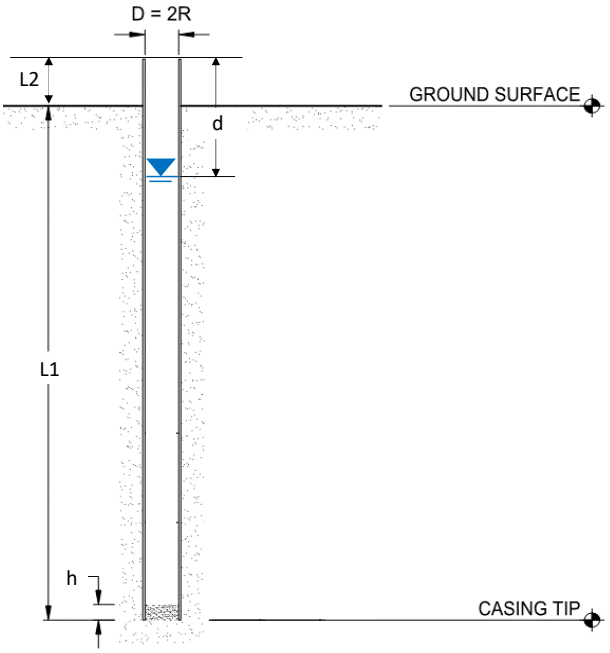
Permeability Field Test Log

Project Information

Project Name:	221 Glenmore Ave	Test ID:	PT-1A @3 feet
Project Location:	Brooklyn, NY	Inspector:	Jason Jimenez
Project No.:	3887-011	Date:	5/18/2022
Contractor:	MTL	Foreman/Helper:	Anand

Test Information

Ground Surface Elevation:	51	feet (NAVD88)
Depth to Bottom of Casing from GS (Test Depth), L1:	36.0	inches
Casing Stick-Up above GS, L2:	30.0	inches
Casing Diameter (inside), D:	4.0	inches
Height of Sand/Gravel, h:	6.0	inches
Depth to Groundwater (If Encountered):	NE	feet



Saturation Period

Depth to Water from Top of Casing at Start of Saturation Period, d:	0.0	inches
Depth to Water from Top of Casing at End of Saturation Period, d:	0.0	inches
Duration of Saturation Period:	30	minutes

Test Data

Test #1	
Water Temp., T (^{O}C):	Depth to Water from Top of Casing at Start, d (in):
Time, t (min)	Depth to Water from Top of Casing, d (in)
1	
2	
3	
4	
5	
10	
15	

Test #2	
Water Temp., T (^{O}C):	Depth to Water from Top of Casing at Start, d (in):
Time, t (min)	Depth to Water from Top of Casing, d (in)
1	
2	
3	
4	
5	
10	
15	

Test #3	
Water Temp., T (^{O}C):	Depth to Water from Top of Casing at Start, d (in):
Time, t (min)	Depth to Water from Top of Casing, d (in)
1	
2	
3	
4	
5	
10	
15	

Notes:

Water level did not drop during saturation period

At test depth: (FILL) Brown fine SILT and gray GRAVEL, some concrete, trace brick

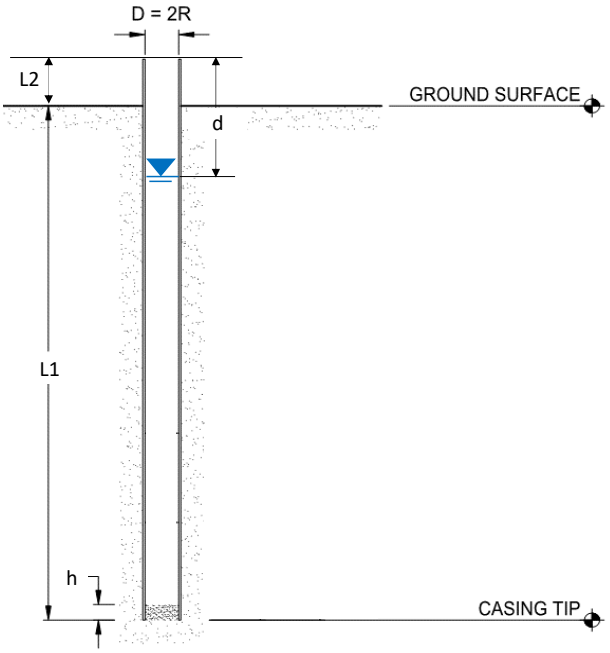
Permeability Field Test Log

Project Information

Project Name:	221 Glenmore Ave	Test ID:	PT-1A @5 feet
Project Location:	Brooklyn, NY	Inspector:	Jason Jimenez
Project No.:	3887-011	Date:	5/18/2022
Contractor:	MTL	Foreman/Helper:	Anand

Test Information

Ground Surface Elevation:	51	feet (NAVD88)
Depth to Bottom of Casing from GS (Test Depth), L1:	63.0	inches
Casing Stick-Up above GS, L2:	33.0	inches
Casing Diameter (inside), D:	4.0	inches
Height of Sand/Gravel, h:	7.0	inches
Depth to Groundwater (If Encountered):	NE	feet



Saturation Period

Depth to Water from Top of Casing at Start of Saturation Period, d:	0.0	inches
Depth to Water from Top of Casing at End of Saturation Period, d:	4.0	inches
Duration of Saturation Period:	30	minutes

Test Data

Test #1	
Water Temp., T (^{O}C):	Depth to Water from Top of Casing at Start, d (in):
	0
Time, t (min)	Depth to Water from Top of Casing, d (in)
1	0.00
3	0.38
6	0.75
10	1.50
15	2.00
25	3.38
40	5.50

Test #2	
Water Temp., T (^{O}C):	Depth to Water from Top of Casing at Start, d (in):
Time, t (min)	Depth to Water from Top of Casing, d (in)
1	
2	
3	
4	
5	
10	
15	

Test #3	
Water Temp., T (^{O}C):	Depth to Water from Top of Casing at Start, d (in):
Time, t (min)	Depth to Water from Top of Casing, d (in)
1	
2	
3	
4	
5	
10	
15	

Notes:

At test depth: (SM/GP) Brown fine SILT and black gray GRAVEL

GEO DESIGN

PERMEABILITY TEST LOG

Project Name:	Test Location No.:	Ground Surface Elevation, ft. (NAVD88):	Casing Diameter (inside), D, inches:	
221 Glenmore Ave	PT-1A @5 feet	51	4	
Project Location:	**Inspector:**	**Depth to Bottom of Casing from GS (Test Depth), L1, inches:**	**Depth to Groundwater (If Encountered), ft.:**	
Brooklyn, NY	Jason Jimenez	63	NE	
Project No.:	**Date/Time Test:**	**Casing Stick-Up above GS, L2, inches:**	**Contractor:**	MTL
3887-011	5/18/2022	33	**Foreman/Helper:**	Anand

PERMEABILITY TEST DATA

TEST #1

Water Temp., T: ____ °C R_t = 1.0000

Depth to Water from Top of Casing at Start, d: 0 inches $R_t = \frac{2.2902(0.9842^T)}{T^{0.1702}}$

FIELD DATA		CALCULATED DATA				
Time, t (min)	Depth to Water from Top of Casing, d (in)	Water Height, H (in.)	Ht/Ho	Ln(H1/H2)	t2 - t1 (hr)	Coeff. of Perm. k (in/hr)
1	0.00	96.00	1.000	0.0000	0.0167	0.000
3	0.38	95.63	0.996	0.0039	0.0333	0.134
6	0.75	95.25	0.992	0.0039	0.0500	0.090
10	1.50	94.50	0.984	0.0079	0.0667	0.135
15	2.00	94.00	0.979	0.0053	0.0833	0.073
25	3.38	92.63	0.965	0.0147	0.1667	0.101
40	4.50	91.50	0.953	0.0122	0.2500	0.056
			#N/A			
			#N/A			
			#N/A			
			#N/A			
					Time Weighted Average Coefficent of Permeability, k (in/hr)	0.082

TEST #2

Water Temp., T: ____ °C R_t = 1.0000

Depth to Water from Top of Casing at Start, d: ____ inches $R_t = \frac{2.2902(0.9842^T)}{T^{0.1702}}$

FIELD DATA		CALCULATED DATA				
Time, t (min)	Depth to Water from Top of Casing, d (in)	Water Height, H (in.)	Ht/Ho	Ln(H1/H2)	t2 - t1 (hr)	Coeff. of Perm. k (in/hr)
			#N/A			
			#N/A			
			#N/A			
			#N/A			
			#N/A			
			#N/A			
			#N/A			
			#N/A			
			#N/A			
			#N/A			
					Time Weighted Average Coefficent of Permeability, k (in/hr)	NA()

TEST #3

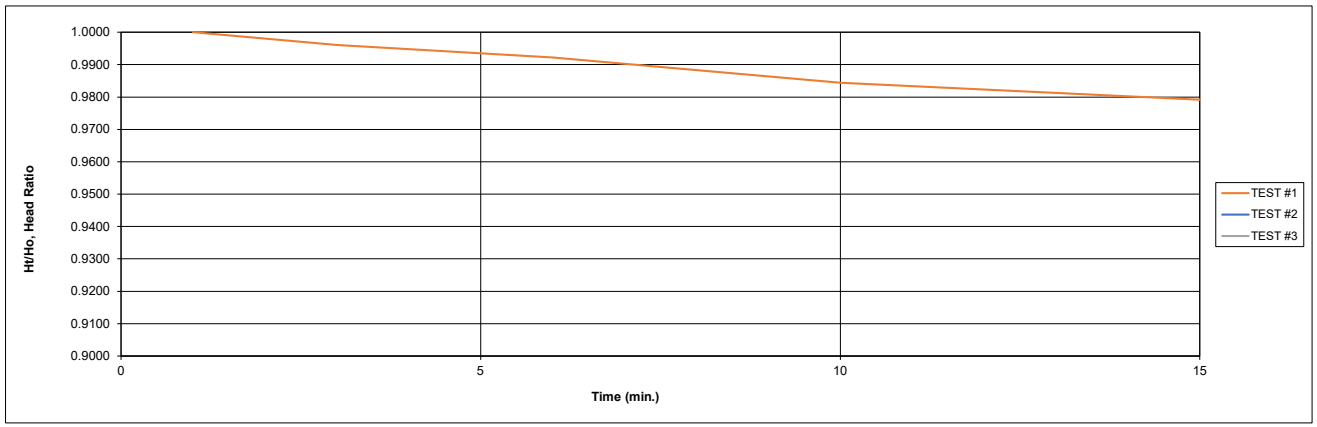
Water Temp., T: ____ °C R_t = 1.0000

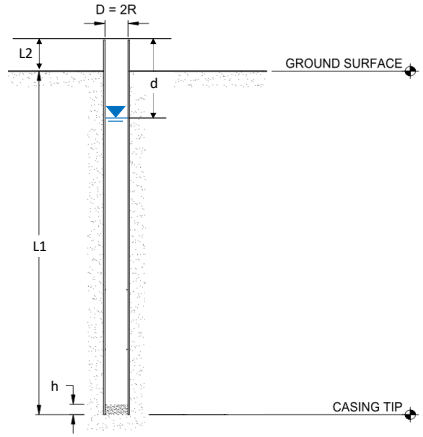
Depth to Water from Top of Casing at Start, d: ____ inches $R_t = \frac{2.2902(0.9842^T)}{T^{0.1702}}$

FIELD DATA		CALCULATED DATA				
Time, t (min)	Depth to Water from Top of Casing, d (in)	Water Height, H (in.)	Ht/Ho	Ln(H1/H2)	t2 - t1 (hr)	Coeff. of Perm. k (in/hr)
			#N/A			
			#N/A			
			#N/A			
			#N/A			
			#N/A			
			#N/A			
			#N/A			
			#N/A			
			#N/A			
			#N/A			
					Time Weighted Average Coefficent of Permeability, k (in/hr)	NA()

Average Coefficent of Permeability, k (in/hr) @ PT-1A @5 feet:	0.082

$$k = R_t \frac{\pi D}{11\,(t_2 - t_1)} \ln \frac{H_1}{H_2}$$





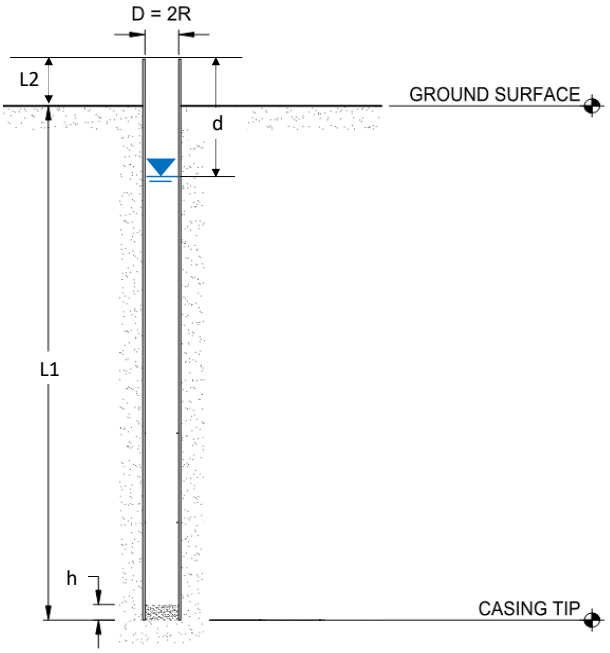
Permeability Field Test Log

Project Information

Project Name:	221 Glenmore Ave	Test ID:	PT-1A @7 feet
Project Location:	Brooklyn, NY	Inspector:	Jason Jimenez
Project No.:	3887-011	Date:	5/18/2022
Contractor:	MTL	Foreman/Helper:	Anand

Test Information

Ground Surface Elevation:	51	feet (NAVD88)
Depth to Bottom of Casing from GS (Test Depth), L1:	84.0	inches
Casing Stick-Up above GS, L2:	12.0	inches
Casing Diameter (inside), D:	4.0	inches
Height of Sand/Gravel, h:	6.0	inches
Depth to Groundwater (If Encountered):	NE	feet



Saturation Period

Depth to Water from Top of Casing at Start of Saturation Period, d:	0.0	inches
Depth to Water from Top of Casing at End of Saturation Period, d:	39.0	inches
Duration of Saturation Period:	30	minutes

Test Data

Test #1	
Water Temp., T (^{O}C):	Depth to Water from Top of Casing at Start, d (in):
	0
Time, t (min)	Depth to Water from Top of Casing, d (in)
1	4.00
2	6.00
3	8.00
4	9.00
5	13.00
10	20.00
15	28.00

Test #2	
Water Temp., T (^{O}C):	Depth to Water from Top of Casing at Start, d (in):
	0
Time, t (min)	Depth to Water from Top of Casing, d (in)
1	3.00
2	4.00
3	6.38
4	8.50
5	10.50
10	19.00
15	26.50

Test #3	
Water Temp., T (^{O}C):	Depth to Water from Top of Casing at Start, d (in):
	0
Time, t (min)	Depth to Water from Top of Casing, d (in)
1	3.00
2	3.88
3	5.63
4	8.00
5	9.63
10	20.00
15	26.00

Notes:

At test depth: (SP/GP) Brown fine SAND and gray GRAVEL, trace brick, trace silt

GEO DESIGN

PERMEABILITY TEST LOG

Project Name:	Test Location No.:	Ground Surface Elevation, ft. (NAVD88):	Casing Diameter (inside), D, inches:	
221 Glenmore Ave	PT-1A @7 feet	51	4	
Project Location:	**Inspector:**	**Depth to Bottom of Casing from GS (Test Depth), L1, inches:**	**Depth to Groundwater (If Encountered), ft.:**	
Brooklyn, NY	Jason Jimenez	84	NE	
Project No.:	**Date/Time Test:**	**Casing Stick-Up above GS, L2, inches:**	**Contractor:**	MTL
3887-011	5/18/2022	12	**Foreman/Helper:**	Anand

PERMEABILITY TEST DATA

TEST #1

Water Temp., T: ____ °C R_t = 1.0000

Depth to Water from Top of Casing at Start, d: 0 inches $R_t = \frac{2.2902(0.9842^T)}{T^{0.1702}}$

FIELD DATA		CALCULATED DATA				
Time, t (min)	Depth to Water from Top of Casing, d (in)	Water Height, H (in.)	Ht/Ho	Ln(H1/H2)	t2 - t1 (hr)	Coeff. of Perm. k (in/hr)
1	4.00	92.00	0.958	0.0426	0.0167	2.917
2	6.00	90.00	0.938	0.0220	0.0167	1.507
3	8.00	88.00	0.917	0.0225	0.0167	1.540
4	9.00	87.00	0.906	0.0114	0.0167	0.783
5	13.00	83.00	0.865	0.0471	0.0167	3.226
10	20.00	76.00	0.792	0.0881	0.0833	1.208
15	28.00	68.00	0.708	0.1112	0.0833	1.525
			#N/A			
			#N/A			
			#N/A			
			#N/A			
					Time Weighted Average Coefficent of Permeability, k (in/hr)	1.576

TEST #2

Water Temp., T: ____ °C R_t = 1.0000

Depth to Water from Top of Casing at Start, d: 0 inches $R_t = \frac{2.2902(0.9842^T)}{T^{0.1702}}$

FIELD DATA		CALCULATED DATA				
Time, t (min)	Depth to Water from Top of Casing, d (in)	Water Height, H (in.)	Ht/Ho	Ln(H1/H2)	t2 - t1 (hr)	Coeff. of Perm. k (in/hr)
1	3.00	93.00	0.969	0.0317	0.0167	2.176
2	4.00	92.00	0.958	0.0108	0.0167	0.741
3	6.38	89.63	0.934	0.0262	0.0167	1.793
4	8.50	87.50	0.911	0.0240	0.0167	1.645
5	10.50	85.50	0.891	0.0231	0.0167	1.585
10	19.00	77.00	0.802	0.1047	0.0833	1.435
15	26.50	69.50	0.724	0.1025	0.0833	1.405
			#N/A			
			#N/A			
			#N/A			
			#N/A			
					Time Weighted Average Coefficent of Permeability, k (in/hr)	1.476

TEST #3

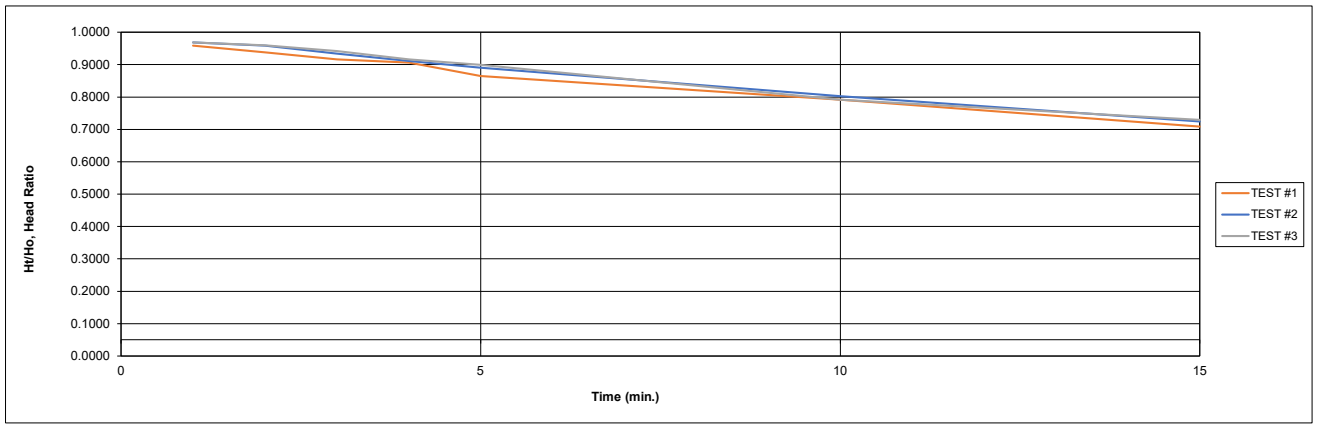
Water Temp., T: ____ °C R_t = 1.0000

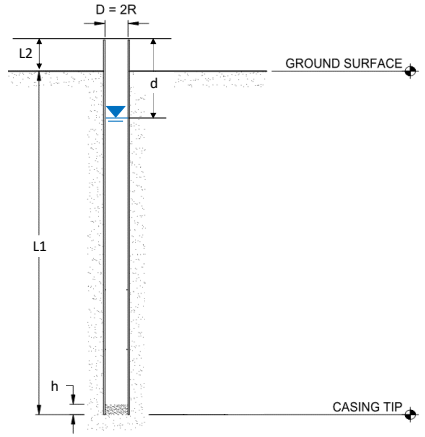
Depth to Water from Top of Casing at Start, d: 0 inches $R_t = \frac{2.2902(0.9842^T)}{T^{0.1702}}$

FIELD DATA		CALCULATED DATA				
Time, t (min)	Depth to Water from Top of Casing, d (in)	Water Height, H (in.)	Ht/Ho	Ln(H1/H2)	t2 - t1 (hr)	Coeff. of Perm. k (in/hr)
1	3.00	93.00	0.969	0.0317	0.0167	2.176
2	3.88	92.13	0.960	0.0095	0.0167	0.648
3	5.63	90.38	0.941	0.0192	0.0167	1.315
4	8.00	88.00	0.917	0.0266	0.0167	1.825
5	9.63	86.38	0.900	0.0186	0.0167	1.278
10	20.00	76.00	0.792	0.1280	0.0833	1.754
15	26.00	70.00	0.729	0.0822	0.0833	1.127
			#N/A			
			#N/A			
			#N/A			
			#N/A			
					Time Weighted Average Coefficent of Permeability, k (in/hr)	1.443

Average Coefficent of Permeability, k (in/hr) @ PT-1A @7 feet:	1.498

$$k = R_t \frac{\pi D}{11\,(t_2 - t_1)} \ln \frac{H_1}{H_2}$$





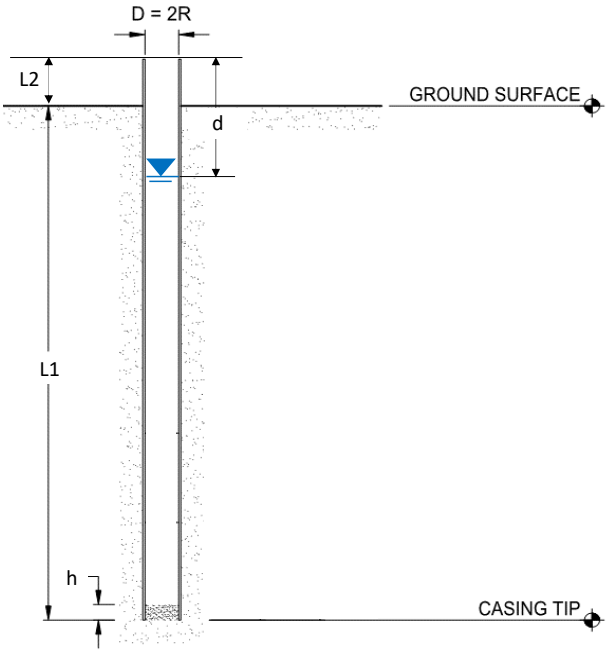
Permeability Field Test Log

Project Information

Project Name:	221 Glenmore Ave	Test ID:	PT-1A @10 feet
Project Location:	Brooklyn, NY	Inspector:	Jason Jimenez
Project No.:	3887-011	Date:	5/19/2022
Contractor:	MTL	Foreman/Helper:	Anand

Test Information

Ground Surface Elevation:	51	feet (NAVD88)
Depth to Bottom of Casing from GS (Test Depth), L1:	120.0	inches
Casing Stick-Up above GS, L2:	30.0	inches
Casing Diameter (inside), D:	4.0	inches
Height of Sand/Gravel, h:	13.0	inches
Depth to Groundwater (If Encountered):	NE	feet



Saturation Period

Depth to Water from Top of Casing at Start of Saturation Period, d:	0.0	inches
Depth to Water from Top of Casing at End of Saturation Period, d:	134.0	inches
Duration of Saturation Period:	30	minutes

Test Data

Test #1	
Water Temp., T (^{O}C):	Depth to Water from Top of Casing at Start, d (in):
	0
Time, t (min)	Depth to Water from Top of Casing, d (in)
1	25.00
2	38.00
3	40.50
4	45.00
5	51.00
10	66.00
15	74.00

Test #2	
Water Temp., T (^{O}C):	Depth to Water from Top of Casing at Start, d (in):
	0
Time, t (min)	Depth to Water from Top of Casing, d (in)
1	21.00
2	32.00
3	39.00
4	43.00
5	48.00
10	60.00
15	64.00

Test #3	
Water Temp., T (^{O}C):	Depth to Water from Top of Casing at Start, d (in):
	0
Time, t (min)	Depth to Water from Top of Casing, d (in)
1	19.00
2	30.50
3	37.00
4	42.00
5	45.00
10	60.00
15	67.00

Notes:

At test depth: (GP) Black gray GRAVEL, little sand

GEO DESIGN

PERMEABILITY TEST LOG

Project Name:	Test Location No.:	Ground Surface Elevation, ft. (NAVD88):	Casing Diameter (inside), D, inches:	
221 Glenmore Ave	PT-1A @10 feet	51	4	
Project Location:	**Inspector:**	**Depth to Bottom of Casing from GS (Test Depth), L1, inches:**	**Depth to Groundwater (If Encountered), ft.:**	
Brooklyn, NY	Jason Jimenez	120	NE	
Project No.:	**Date/Time Test:**	**Casing Stick-Up above GS, L2, inches:**	**Contractor:**	MTL
3887-011	5/19/2022	30	**Foreman/Helper:**	Anand

PERMEABILITY TEST DATA

TEST #1

Water Temp., T: ____ °C R_t = 1.0000

Depth to Water from Top of Casing at Start, d: 0 inches $R_t = \frac{2.2902(0.9842^T)}{T^{0.1702}}$

FIELD DATA		CALCULATED DATA				
Time, t (min)	Depth to Water from Top of Casing, d (in)	Water Height, H (in.)	Ht/Ho	Ln(H1/H2)	t2 - t1 (hr)	Coeff. of Perm. k (in/hr)
1	25.00	125.00	0.833	0.1823	0.0167	12.497
2	38.00	112.00	0.747	0.1098	0.0167	7.527
3	40.50	109.50	0.730	0.0226	0.0167	1.547
4	45.00	105.00	0.700	0.0420	0.0167	2.876
5	51.00	99.00	0.660	0.0588	0.0167	4.033
10	66.00	84.00	0.560	0.1643	0.0833	2.252
15	74.00	76.00	0.507	0.1001	0.0833	1.372
			#N/A			
			#N/A			
			#N/A			
			#N/A			
					Time Weighted Average Coefficent of Permeability, k (in/hr)	3.107

TEST #2

Water Temp., T: ____ °C R_t = 1.0000

Depth to Water from Top of Casing at Start, d: 0 inches $R_t = \frac{2.2902(0.9842^T)}{T^{0.1702}}$

FIELD DATA		CALCULATED DATA				
Time, t (min)	Depth to Water from Top of Casing, d (in)	Water Height, H (in.)	Ht/Ho	Ln(H1/H2)	t2 - t1 (hr)	Coeff. of Perm. k (in/hr)
1	21.00	129.00	0.860	0.1508	0.0167	10.338
2	32.00	118.00	0.787	0.0891	0.0167	6.109
3	39.00	111.00	0.740	0.0612	0.0167	4.192
4	43.00	107.00	0.713	0.0367	0.0167	2.516
5	48.00	102.00	0.680	0.0479	0.0167	3.280
10	60.00	90.00	0.600	0.1252	0.0833	1.716
15	64.00	86.00	0.573	0.0455	0.0833	0.623
			#N/A			
			#N/A			
			#N/A			
			#N/A			
					Time Weighted Average Coefficent of Permeability, k (in/hr)	2.542

TEST #3

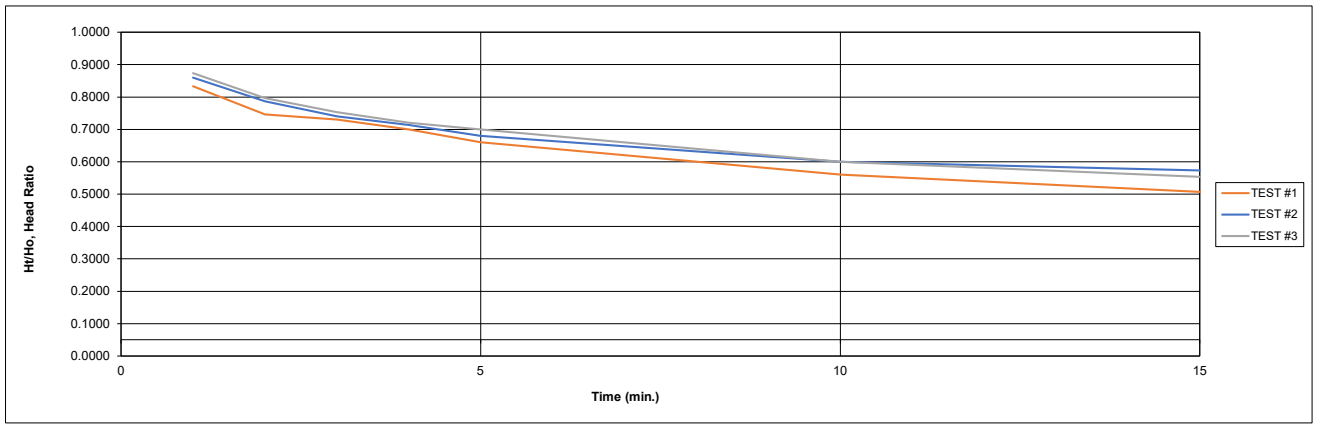
Water Temp., T: ____ °C R_t = 1.0000

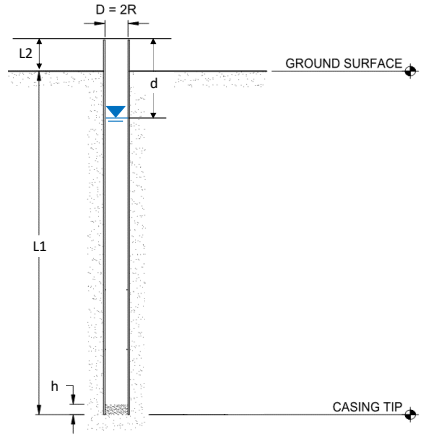
Depth to Water from Top of Casing at Start, d: 0 inches $R_t = \frac{2.2902(0.9842^T)}{T^{0.1702}}$

FIELD DATA		CALCULATED DATA				
Time, t (min)	Depth to Water from Top of Casing, d (in)	Water Height, H (in.)	Ht/Ho	Ln(H1/H2)	t2 - t1 (hr)	Coeff. of Perm. k (in/hr)
1	19.00	131.00	0.873	0.1354	0.0167	9.283
2	30.50	119.50	0.797	0.0919	0.0167	6.298
3	37.00	113.00	0.753	0.0559	0.0167	3.834
4	42.00	108.00	0.720	0.0453	0.0167	3.102
5	45.00	105.00	0.700	0.0282	0.0167	1.931
10	60.00	90.00	0.600	0.1542	0.0833	2.113
15	67.00	83.00	0.553	0.0810	0.0833	1.110
			#N/A			
			#N/A			
			#N/A			
			#N/A			
					Time Weighted Average Coefficent of Permeability, k (in/hr)	2.704

Average Coefficent of Permeability, k (in/hr) @ PT-1A @10 feet:	2.784

$$k = R_t \frac{\pi D}{11\,(t_2 - t_1)} \ln \frac{H_1}{H_2}$$





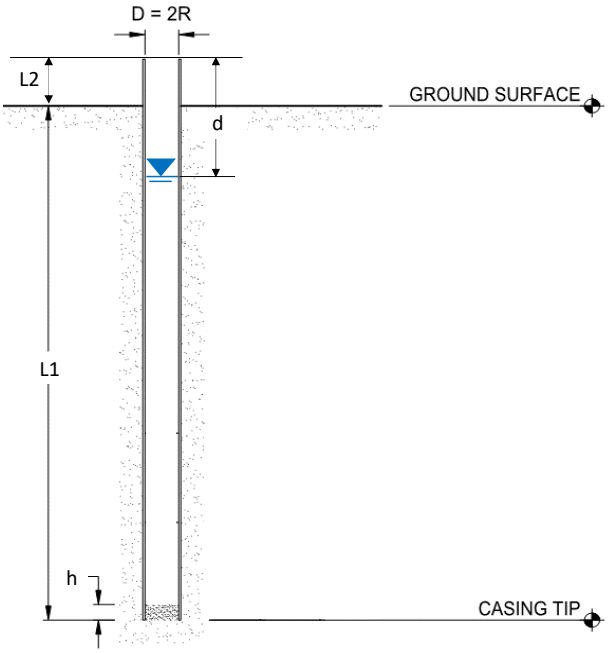
Permeability Field Test Log

Project Information

Project Name:	221 Glenmore Ave	Test ID:	PT-1B @3 feet
Project Location:	Brooklyn, NY	Inspector:	Jason Jimenez
Project No.:	3887-011	Date:	5/19/2022
Contractor:	MTL	Foreman/Helper:	Anand

Test Information

Ground Surface Elevation:	51	feet (NAVD88)
Depth to Bottom of Casing from GS (Test Depth), L1:	38.5	inches
Casing Stick-Up above GS, L2:	27.5	inches
Casing Diameter (inside), D:	4.0	inches
Height of Sand/Gravel, h:	6.0	inches
Depth to Groundwater (If Encountered):	NE	feet



Saturation Period

Depth to Water from Top of Casing at Start of Saturation Period, d:	0.0	inches
Depth to Water from Top of Casing at End of Saturation Period, d:	37.0	inches
Duration of Saturation Period:	30	minutes

Test Data

Test #1	
Water Temp., T (^{O}C):	Depth to Water from Top of Casing at Start, d (in):
	0
Time, t (min)	Depth to Water from Top of Casing, d (in)
1	13.00
2	20.00
3	25.50
4	27.00
5	27.50
10	30.00
15	32.00

Test #2	
Water Temp., T (^{O}C):	Depth to Water from Top of Casing at Start, d (in):
	0
Time, t (min)	Depth to Water from Top of Casing, d (in)
1	8.00
2	18.50
3	24.00
4	26.00
5	26.50
10	29.50
15	31.00

Test #3	
Water Temp., T (^{O}C):	Depth to Water from Top of Casing at Start, d (in):
	0
Time, t (min)	Depth to Water from Top of Casing, d (in)
1	18.00
2	25.00
3	26.50
4	28.00
5	28.50
10	30.00
15	31.50

Notes:

At test depth: (GP) gray GRAVEL, some fine silt, trace brick

GEO DESIGN

PERMEABILITY TEST LOG

Project Name:	Test Location No.:	Ground Surface Elevation, ft. (NAVD88):	Casing Diameter (inside), D, inches:	
221 Glenmore Ave	PT-1B @3 feet	51	4	
Project Location:	**Inspector:**	**Depth to Bottom of Casing from GS (Test Depth), L1, inches:**	**Depth to Groundwater (If Encountered), ft.:**	
Brooklyn, NY	Jason Jimenez	38.5	NE	
Project No.:	**Date/Time Test:**	**Casing Stick-Up above GS, L2, inches:**	**Contractor:**	MTL
3887-011	5/19/2022	27.5	**Foreman/Helper:**	Anand

PERMEABILITY TEST DATA

TEST #1

Water Temp., T: ____ °C R_t = 1.0000

Depth to Water from Top of Casing at Start, d: 0 inches $R_t = \frac{2.2902(0.9842^T)}{T^{0.1702}}$

FIELD DATA		CALCULATED DATA				
Time, t (min)	Depth to Water from Top of Casing, d (in)	Water Height, H (in.)	Ht/Ho	Ln(H1/H2)	t2 - t1 (hr)	Coeff. of Perm. k (in/hr)
1	13.00	53.00	0.803	0.2194	0.0167	15.036
2	20.00	46.00	0.697	0.1417	0.0167	9.709
3	25.50	40.50	0.614	0.1273	0.0167	8.728
4	27.00	39.00	0.591	0.0377	0.0167	2.587
5	27.50	38.50	0.583	0.0129	0.0167	0.884
10	30.00	36.00	0.545	0.0671	0.0833	0.920
15	32.00	34.00	0.515	0.0572	0.0833	0.784
			#N/A			
			#N/A			
			#N/A			
			#N/A			
					Time Weighted Average Coefficent of Permeability, k (in/hr)	3.031

TEST #2

Water Temp., T: ____ °C R_t = 1.0000

Depth to Water from Top of Casing at Start, d: 0 inches $R_t = \frac{2.2902(0.9842^T)}{T^{0.1702}}$

FIELD DATA		CALCULATED DATA				
Time, t (min)	Depth to Water from Top of Casing, d (in)	Water Height, H (in.)	Ht/Ho	Ln(H1/H2)	t2 - t1 (hr)	Coeff. of Perm. k (in/hr)
1	8.00	58.00	0.879	0.1292	0.0167	8.857
2	18.50	47.50	0.720	0.1997	0.0167	13.689
3	24.00	42.00	0.636	0.1231	0.0167	8.435
4	26.00	40.00	0.606	0.0488	0.0167	3.344
5	26.50	39.50	0.598	0.0126	0.0167	0.862
10	29.50	36.50	0.553	0.0790	0.0833	1.083
15	31.00	35.00	0.530	0.0420	0.0833	0.575
			#N/A			
			#N/A			
			#N/A			
			#N/A			
					Time Weighted Average Coefficent of Permeability, k (in/hr)	2.899

TEST #3

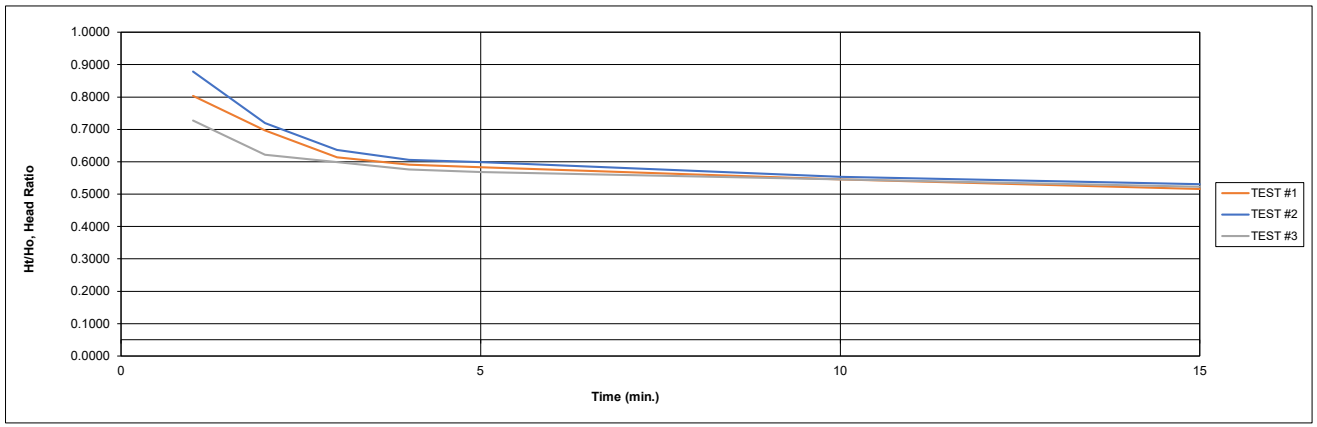
Water Temp., T: ____ °C R_t = 1.0000

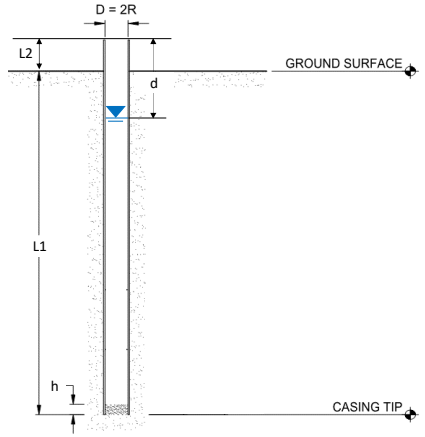
Depth to Water from Top of Casing at Start, d: 0 inches $R_t = \frac{2.2902(0.9842^T)}{T^{0.1702}}$

FIELD DATA		CALCULATED DATA				
Time, t (min)	Depth to Water from Top of Casing, d (in)	Water Height, H (in.)	Ht/Ho	Ln(H1/H2)	t2 - t1 (hr)	Coeff. of Perm. k (in/hr)
1	18.00	48.00	0.727	0.3185	0.0167	21.828
2	25.00	41.00	0.621	0.1576	0.0167	10.804
3	26.50	39.50	0.598	0.0373	0.0167	2.555
4	28.00	38.00	0.576	0.0387	0.0167	2.654
5	28.50	37.50	0.568	0.0132	0.0167	0.908
10	30.00	36.00	0.545	0.0408	0.0833	0.560
15	31.50	34.50	0.523	0.0426	0.0833	0.583
			#N/A			
			#N/A			
			#N/A			
			#N/A			
					Time Weighted Average Coefficent of Permeability, k (in/hr)	2.964

Average Coefficent of Permeability, k (in/hr) @ PT-1B @3 feet:	2.965

$$k = R_t \frac{\pi D}{11\,(t_2 - t_1)} \ln \frac{H_1}{H_2}$$





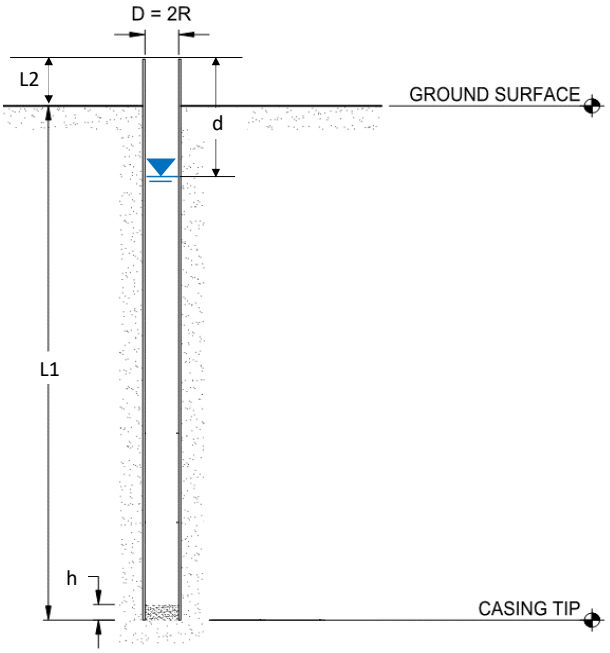
Permeability Field Test Log

Project Information

Project Name:	221 Glenmore Ave	Test ID:	PT-1B @5 feet
Project Location:	Brooklyn, NY	Inspector:	Jason Jimenez
Project No.:	3887-011	Date:	5/19/2022
Contractor:	MTL	Foreman/Helper:	Anand

Test Information

Ground Surface Elevation:	51	feet (NAVD88)
Depth to Bottom of Casing from GS (Test Depth), L1:	60.0	inches
Casing Stick-Up above GS, L2:	6.0	inches
Casing Diameter (inside), D:	4.0	inches
Height of Sand/Gravel, h:	7.0	inches
Depth to Groundwater (If Encountered):	NE	feet



Saturation Period

Depth to Water from Top of Casing at Start of Saturation Period, d:	0.0	inches
Depth to Water from Top of Casing at End of Saturation Period, d:	See Notes	inches
Duration of Saturation Period:	30	minutes

Test Data

Test #1	
Water Temp., T (^{O}C):	Depth to Water from Top of Casing at Start, d (in):
	0
Time, t (min)	Depth to Water from Top of Casing, d (in)
1	13.00
2	19.00
3	26.00
4	30.00
5	33.00
10	48.00
15	50.00

Test #2	
Water Temp., T (^{O}C):	Depth to Water from Top of Casing at Start, d (in):
	0
Time, t (min)	Depth to Water from Top of Casing, d (in)
1	12.00
2	18.00
3	24.50
4	28.00
5	31.50
10	44.50
15	49.00

Test #3	
Water Temp., T (^{O}C):	Depth to Water from Top of Casing at Start, d (in):
	0
Time, t (min)	Depth to Water from Top of Casing, d (in)

Notes:

Saturation Period: took 12 minutes to drain completely, refilled and took 14 minutes to drain completely
refilled and remaining 4 minutes (of 30 minute saturation period) water was 30" from top of casing
At test depth: (SP) Brown fine SAND and dark gray GRAVEL, trace silt

GEO DESIGN

PERMEABILITY TEST LOG

Project Name:	Test Location No.:	Ground Surface Elevation, ft. (NAVD88):	Casing Diameter (inside), D, inches:	
221 Glenmore Ave	PT-1B @5 feet	51	4	
Project Location:	**Inspector:**	**Depth to Bottom of Casing from GS (Test Depth), L1, inches:**	**Depth to Groundwater (If Encountered), ft.:**	
Brooklyn, NY	Jason Jimenez	60	NE	
Project No.:	**Date/Time Test:**	**Casing Stick-Up above GS, L2, inches:**	**Contractor:**	MTL
3887-011	5/19/2022	6	**Foreman/Helper:**	Anand

PERMEABILITY TEST DATA

TEST #1

Water Temp., T: ____ °C R_t = 1.0000

Depth to Water from Top of Casing at Start, d: 0 inches $R_t = \frac{2.2902(0.9842^T)}{T^{0.1702}}$

FIELD DATA		CALCULATED DATA				
Time, t (min)	Depth to Water from Top of Casing, d (in)	Water Height, H (in.)	Ht/Ho	Ln(H1/H2)	t2 - t1 (hr)	Coeff. of Perm. k (in/hr)
1	13.00	53.00	0.803	0.2194	0.0167	15.036
2	19.00	47.00	0.712	0.1201	0.0167	8.235
3	26.00	40.00	0.606	0.1613	0.0167	11.054
4	30.00	36.00	0.545	0.1054	0.0167	7.222
5	33.00	33.00	0.500	0.0870	0.0167	5.964
10	48.00	18.00	0.273	0.6061	0.0833	8.309
15	50.00	16.00	0.242	0.1178	0.0833	1.615
			#N/A			
			#N/A			
			#N/A			
			#N/A			
					Time Weighted Average Coefficent of Permeability, k (in/hr)	6.475

TEST #2

Water Temp., T: ____ °C R_t = 1.0000

Depth to Water from Top of Casing at Start, d: 0 inches $R_t = \frac{2.2902(0.9842^T)}{T^{0.1702}}$

FIELD DATA		CALCULATED DATA				
Time, t (min)	Depth to Water from Top of Casing, d (in)	Water Height, H (in.)	Ht/Ho	Ln(H1/H2)	t2 - t1 (hr)	Coeff. of Perm. k (in/hr)
1	12.00	54.00	0.818	0.2007	0.0167	13.755
2	18.00	48.00	0.727	0.1178	0.0167	8.073
3	24.50	41.50	0.629	0.1455	0.0167	9.974
4	28.00	38.00	0.576	0.0881	0.0167	6.039
5	31.50	34.50	0.523	0.0966	0.0167	6.623
10	44.50	21.50	0.326	0.4729	0.0833	6.483
15	49.00	17.00	0.258	0.2348	0.0833	3.219
			#N/A			
			#N/A			
			#N/A			
			#N/A			
					Time Weighted Average Coefficent of Permeability, k (in/hr)	6.198

TEST #3

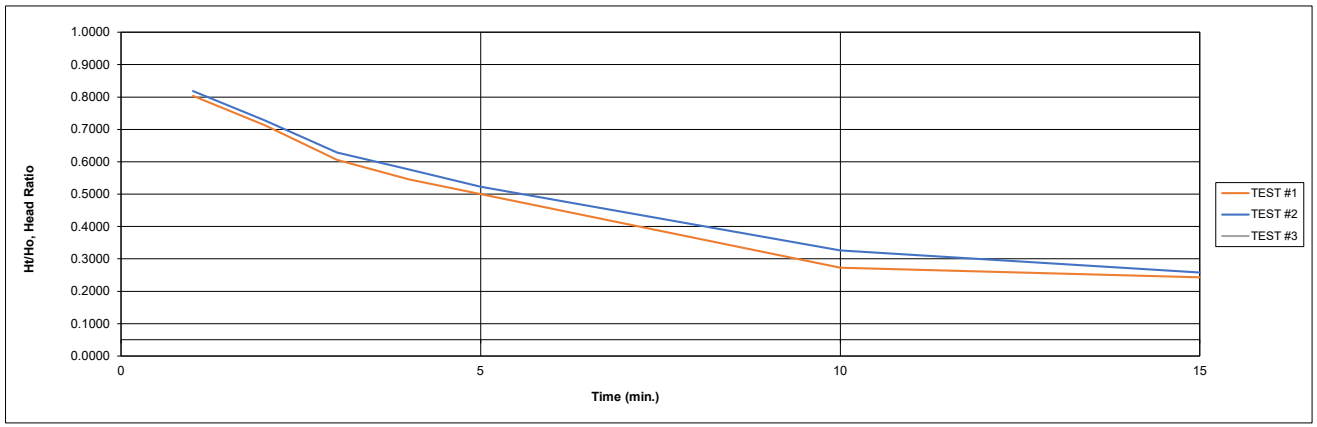
Water Temp., T: ____ °C R_t = 1.0000

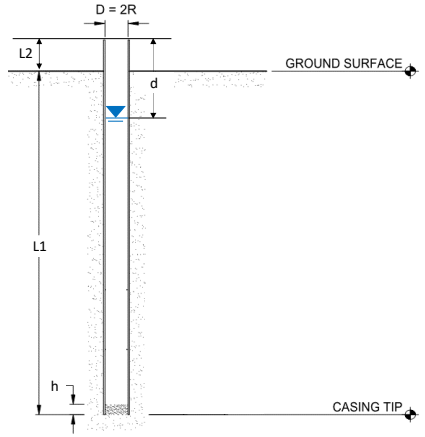
Depth to Water from Top of Casing at Start, d: 0 inches $R_t = \frac{2.2902(0.9842^T)}{T^{0.1702}}$

FIELD DATA		CALCULATED DATA				
Time, t (min)	Depth to Water from Top of Casing, d (in)	Water Height, H (in.)	Ht/Ho	Ln(H1/H2)	t2 - t1 (hr)	Coeff. of Perm. k (in/hr)
			#N/A			
			#N/A			
			#N/A			
			#N/A			
			#N/A			
					Time Weighted Average Coefficent of Permeability, k (in/hr)	NA()

Average Coefficent of Permeability, k (in/hr) @ PT-1B @5 feet:	6.337

$$k = R_t \frac{\pi D}{11\,(t_2 - t_1)} \ln \frac{H_1}{H_2}$$





Permeability Field Test Log

Project Information

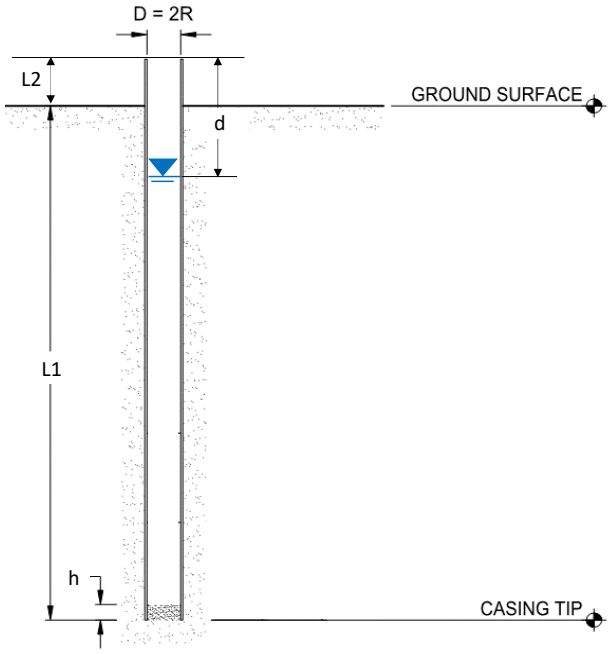
Project Name:	221 Glenmore Ave	Test ID:	PT-2 @3 feet
Project Location:	Brooklyn, NY	Inspector:	Ansuman Raval
Project No.:	3887-011	Date:	5/23/2022
Contractor:	MTL	Foreman/Helper:	Anand

Test Information

Ground Surface Elevation:	52	feet (NAVD88)
Depth to Bottom of Casing from GS (Test Depth), L1:	36.0	inches
Casing Stick-Up above GS, L2:	28.0	inches
Casing Diameter (inside), D:	4.0	inches
Height of Sand/Gravel, h:	6.0	inches
Depth to Groundwater (If Encountered):	NE	feet

Saturation Period

Depth to Water from Top of Casing at Start of Saturation Period, d:	0.0	inches
Depth to Water from Top of Casing at End of Saturation Period, d:	50.0	inches
Duration of Saturation Period:	40	minutes



Test Data

Test #1	
Water Temp., T (^{O}C):	Depth to Water from Top of Casing at Start, d (in):
	0
Time, t (min)	Depth to Water from Top of Casing, d (in)
1	3.50
2	6.00
3	10.00
5	15.00
10	26.75
15	35.5

Test #2	
Water Temp., T (^{O}C):	Depth to Water from Top of Casing at Start, d (in):
	0
Time, t (min)	Depth to Water from Top of Casing, d (in)
1	3.00
2	6.00
3	8.50
5	13.75
10	24.50
15	33.00

Test #3	
Water Temp., T (^{O}C):	Depth to Water from Top of Casing at Start, d (in):
	0
Time, t (min)	Depth to Water from Top of Casing, d (in)

Notes:

At test depth: (SP) Brown fine SAND, some concrete, trace silt

GEO DESIGN

PERMEABILITY TEST LOG

Project Name:	Test Location No.:	Ground Surface Elevation, ft. (NAVD88):	Casing Diameter (inside), D, inches:	
221 Glenmore Ave	PT-2 @3 feet	52	4	
Project Location:	**Inspector:**	**Depth to Bottom of Casing from GS (Test Depth), L1, inches:**	**Depth to Groundwater (If Encountered), ft.:**	
Brooklyn, NY	Ansuman Raval	36	NE	
Project No.:	**Date/Time Test:**	**Casing Stick-Up above GS, L2, inches:**	**Contractor:**	MTL
3887-011	5/23/2022	28	**Foreman/Helper:**	Anand

PERMEABILITY TEST DATA

TEST #1

Water Temp., T: ____ °C R_t = 1.0000

Depth to Water from Top of Casing at Start, d: 0 inches $R_t = \frac{2.2902(0.9842^T)}{T^{0.1702}}$

FIELD DATA		CALCULATED DATA				
Time, t (min)	Depth to Water from Top of Casing, d (in)	Water Height, H (in.)	Ht/Ho	Ln(H1/H2)	t2 - t1 (hr)	Coeff. of Perm. k (in/hr)
1	3.50	60.50	0.945	0.0562	0.0167	3.855
2	6.00	58.00	0.906	0.0422	0.0167	2.893
3	10.00	54.00	0.844	0.0715	0.0167	4.898
5	15.00	49.00	0.766	0.0972	0.0333	3.330
10	26.75	37.25	0.582	0.2742	0.0833	3.759
15	35.50	28.50	0.445	0.2677	0.0833	3.670
			#N/A			
			#N/A			
			#N/A			
			#N/A			
			#N/A			
			Time Weighted Average Coefficent of Permeability, k (in/hr)			3.697

TEST #2

Water Temp., T: ____ °C R_t = 1.0000

Depth to Water from Top of Casing at Start, d: 0 inches $R_t = \frac{2.2902(0.9842^T)}{T^{0.1702}}$

FIELD DATA		CALCULATED DATA				
Time, t (min)	Depth to Water from Top of Casing, d (in)	Water Height, H (in.)	Ht/Ho	Ln(H1/H2)	t2 - t1 (hr)	Coeff. of Perm. k (in/hr)
1	3.00	61.00	0.953	0.0480	0.0167	3.291
2	6.00	58.00	0.906	0.0504	0.0167	3.457
3	8.50	55.50	0.867	0.0441	0.0167	3.020
5	13.75	50.25	0.785	0.0994	0.0333	3.406
10	24.50	39.50	0.617	0.2407	0.0833	3.300
15	33.00	31.00	0.484	0.2423	0.0833	3.322
			#N/A			
			#N/A			
			#N/A			
			#N/A			
			#N/A			
			Time Weighted Average Coefficent of Permeability, k (in/hr)			3.312

TEST #3

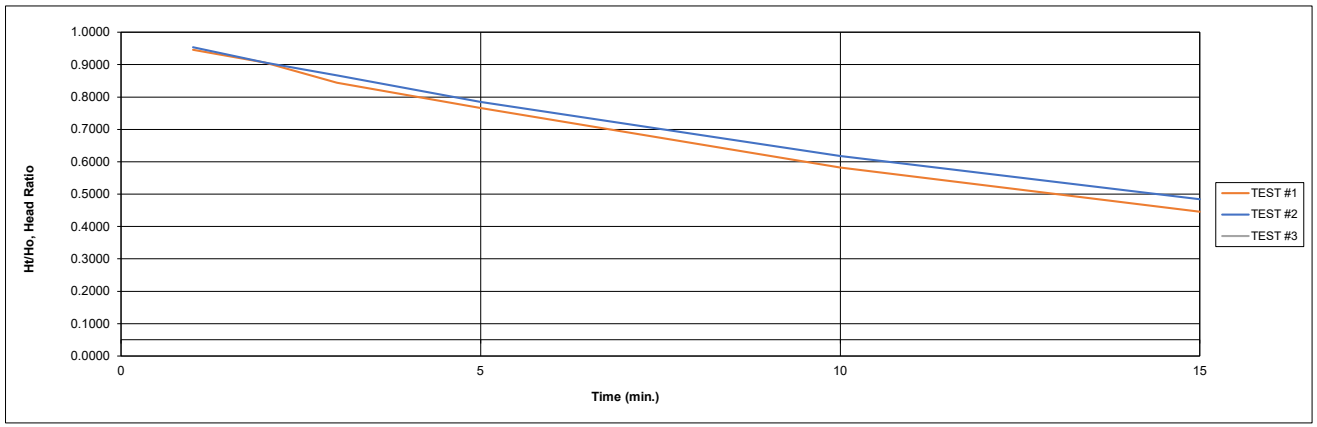
Water Temp., T: ____ °C R_t = 1.0000

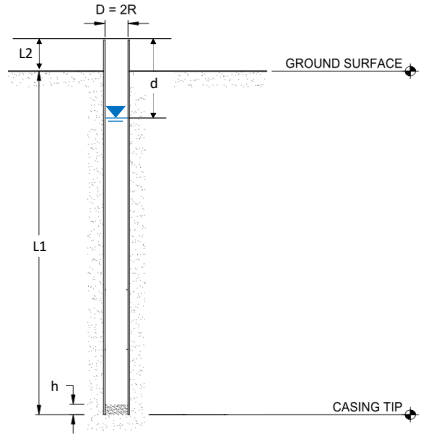
Depth to Water from Top of Casing at Start, d: 0 inches $R_t = \frac{2.2902(0.9842^T)}{T^{0.1702}}$

FIELD DATA		CALCULATED DATA				
Time, t (min)	Depth to Water from Top of Casing, d (in)	Water Height, H (in.)	Ht/Ho	Ln(H1/H2)	t2 - t1 (hr)	Coeff. of Perm. k (in/hr)
			#N/A			
			#N/A			
			#N/A			
			#N/A			
			#N/A			
			#N/A			
			#N/A			
			Time Weighted Average Coefficent of Permeability, k (in/hr)			NA()

Average Coefficent of Permeability, k (in/hr) @ PT-2 @3 feet:	3.505

$$k = R_t \frac{\pi D}{11\,(t_2 - t_1)} \ln \frac{H_1}{H_2}$$





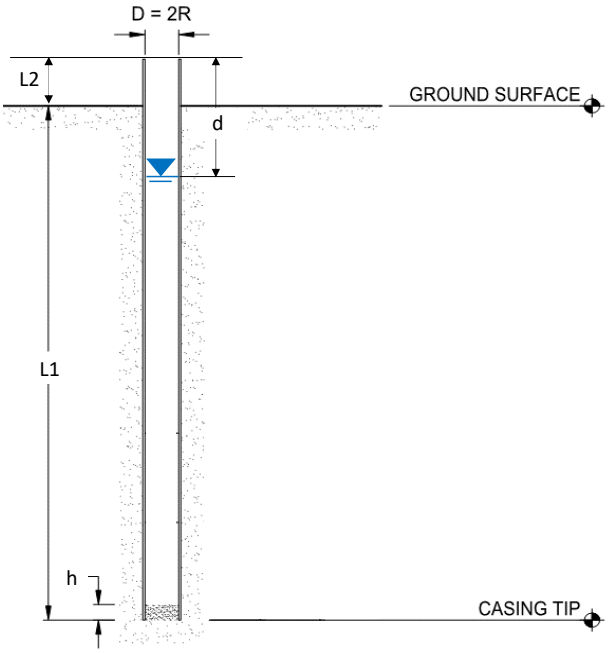
Permeability Field Test Log

Project Information

Project Name:	221 Glenmore Ave	Test ID:	PT-2 @5 feet
Project Location:	Brooklyn, NY	Inspector:	Jason Jimenez
Project No.:	3887-011	Date:	5/24/2022
Contractor:	MTL	Foreman/Helper:	Anand

Test Information

Ground Surface Elevation:	52	feet (NAVD88)
Depth to Bottom of Casing from GS (Test Depth), L1:	60.0	inches
Casing Stick-Up above GS, L2:	6.0	inches
Casing Diameter (inside), D:	4.0	inches
Height of Sand/Gravel, h:	4.0	inches
Depth to Groundwater (If Encountered):	NE	feet



Saturation Period

Depth to Water from Top of Casing at Start of Saturation Period, d:	0.0	inches
Depth to Water from Top of Casing at End of Saturation Period, d:	61.0	inches
Duration of Saturation Period:	30	minutes

Test Data

Test #1	
Water Temp., T (^{O}C):	Depth to Water from Top of Casing at Start, d (in):
	0
Time, t (min)	Depth to Water from Top of Casing, d (in)
1	9.00
2	17.00
3	24.00
4	30.00
5	34.50
10	50.00
15	56.00

Test #2	
Water Temp., T (^{O}C):	Depth to Water from Top of Casing at Start, d (in):
	0
Time, t (min)	Depth to Water from Top of Casing, d (in)
1	7.00
2	14.50
3	20.50
4	27.00
5	31.00
10	44.00
15	53.00

Test #3	
Water Temp., T (^{O}C):	Depth to Water from Top of Casing at Start, d (in):
	0
Time, t (min)	Depth to Water from Top of Casing, d (in)

Notes:

At test depth: (GP) gray GRAVEL, some fine sand, trace silt

GEO DESIGN

PERMEABILITY TEST LOG

Project Name:	Test Location No.:	Ground Surface Elevation, ft. (NAVD88):	Casing Diameter (inside), D, inches:	
221 Glenmore Ave	PT-2 @5 feet	52	4	
Project Location:	**Inspector:**	**Depth to Bottom of Casing from GS (Test Depth), L1, inches:**	**Depth to Groundwater (If Encountered), ft.:**	
Brooklyn, NY	Jason Jimenez	60	NE	
Project No.:	**Date/Time Test:**	**Casing Stick-Up above GS, L2, inches:**	**Contractor:**	MTL
3887-011	5/24/2022	6	**Foreman/Helper:**	Anand

PERMEABILITY TEST DATA

TEST #1

Water Temp., T: ____ °C R_t = 1.0000

Depth to Water from Top of Casing at Start, d: 0 inches $R_t = \frac{2.2902(0.9842^T)}{T^{0.1702}}$

FIELD DATA		CALCULATED DATA				
Time, t (min)	Depth to Water from Top of Casing, d (in)	Water Height, H (in.)	Ht/Ho	Ln(H1/H2)	t2 - t1 (hr)	Coeff. of Perm. k (in/hr)
1	9.00	57.00	0.864	0.1466	0.0167	10.049
2	17.00	49.00	0.742	0.1512	0.0167	10.366
3	24.00	42.00	0.636	0.1542	0.0167	10.566
4	30.00	36.00	0.545	0.1542	0.0167	10.566
5	34.50	31.50	0.477	0.1335	0.0167	9.153
10	50.00	16.00	0.242	0.6774	0.0833	9.286
15	56.00	10.00	0.152	0.4700	0.0833	6.443
			#N/A			
			#N/A			
			#N/A			
			#N/A			
			Time Weighted Average Coefficent of Permeability, k (in/hr)			8.623

TEST #2

Water Temp., T: ____ °C R_t = 1.0000

Depth to Water from Top of Casing at Start, d: 0 inches $R_t = \frac{2.2902(0.9842^T)}{T^{0.1702}}$

FIELD DATA		CALCULATED DATA				
Time, t (min)	Depth to Water from Top of Casing, d (in)	Water Height, H (in.)	Ht/Ho	Ln(H1/H2)	t2 - t1 (hr)	Coeff. of Perm. k (in/hr)
1	7.00	59.00	0.894	0.1121	0.0167	7.685
2	14.50	51.50	0.780	0.1360	0.0167	9.319
3	20.50	45.50	0.689	0.1239	0.0167	8.490
4	27.00	39.00	0.591	0.1542	0.0167	10.566
5	31.00	35.00	0.530	0.1082	0.0167	7.417
10	44.00	22.00	0.333	0.4643	0.0833	6.365
15	53.00	13.00	0.197	0.5261	0.0833	7.212
			#N/A			
			#N/A			
			#N/A			
			#N/A			
			Time Weighted Average Coefficent of Permeability, k (in/hr)			7.424

TEST #3

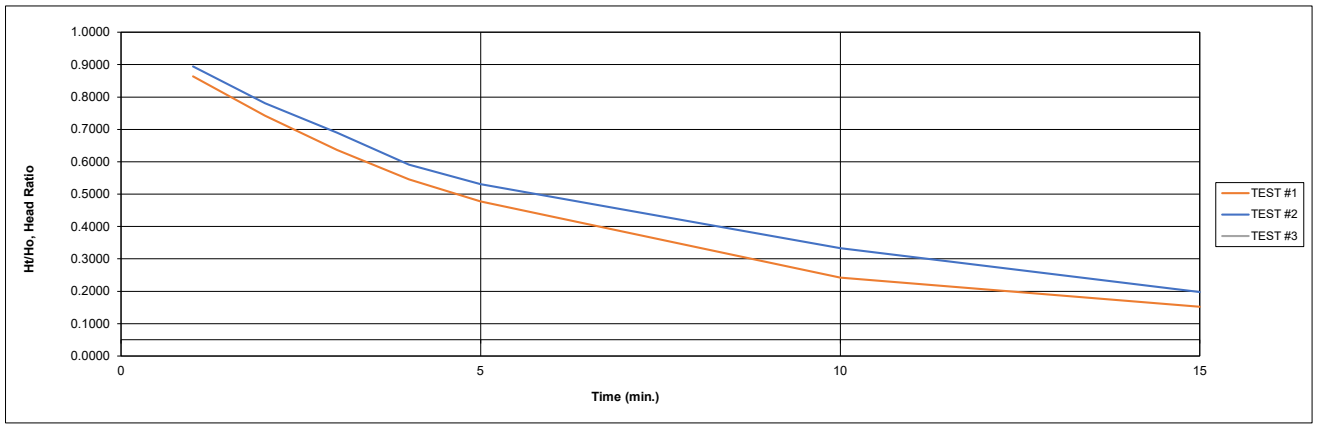
Water Temp., T: ____ °C R_t = 1.0000

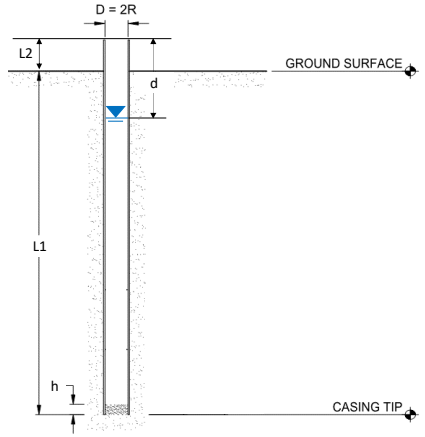
Depth to Water from Top of Casing at Start, d: 0 inches $R_t = \frac{2.2902(0.9842^T)}{T^{0.1702}}$

FIELD DATA		CALCULATED DATA				
Time, t (min)	Depth to Water from Top of Casing, d (in)	Water Height, H (in.)	Ht/Ho	Ln(H1/H2)	t2 - t1 (hr)	Coeff. of Perm. k (in/hr)
			#N/A			
			#N/A			
			#N/A			
			#N/A			
			#N/A			
			Time Weighted Average Coefficent of Permeability, k (in/hr)			NA()

Average Coefficent of Permeability, k (in/hr) @ PT-2 @5 feet:	8.024

$$k = R_t \frac{\pi D}{11\,(t_2 - t_1)} \ln \frac{H_1}{H_2}$$





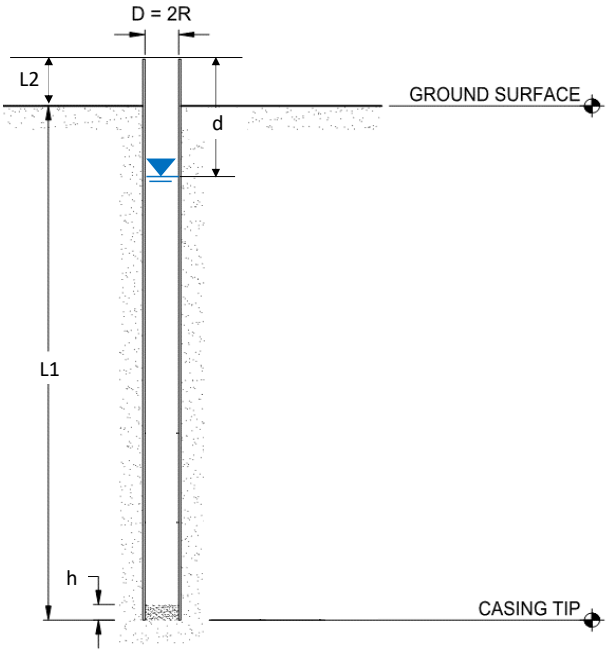
Permeability Field Test Log

Project Information

Project Name:	221 Glenmore Ave	Test ID:	PT-2 @10 feet
Project Location:	Brooklyn, NY	Inspector:	Jason Jimenez
Project No.:	3887-011	Date:	5/24/2022
Contractor:	MTL	Foreman/Helper:	Anand

Test Information

Ground Surface Elevation:	52	feet (NAVD88)
Depth to Bottom of Casing from GS (Test Depth), L1:	119.0	inches
Casing Stick-Up above GS, L2:	7.0	inches
Casing Diameter (inside), D:	4.0	inches
Height of Sand/Gravel, h:	5.0	inches
Depth to Groundwater (If Encountered):	NE	feet



Saturation Period

Depth to Water from Top of Casing at Start of Saturation Period, d:	0.0	inches
Depth to Water from Top of Casing at End of Saturation Period, d:	74.0	inches
Duration of Saturation Period:	30	minutes

Test Data

Test #1	
Water Temp., T (^{O}C):	Depth to Water from Top of Casing at Start, d (in):
	0
Time, t (min)	Depth to Water from Top of Casing, d (in)
1	3.50
2	7.40
3	10.50
4	13.00
5	16.00
10	27.00
15	37.00

Test #2	
Water Temp., T (^{O}C):	Depth to Water from Top of Casing at Start, d (in):
	0
Time, t (min)	Depth to Water from Top of Casing, d (in)
1	2.50
2	5.00
3	7.50
4	10.00
5	12.00
10	23.50
15	33.00

Test #3	
Water Temp., T (^{O}C):	Depth to Water from Top of Casing at Start, d (in):
	0
Time, t (min)	Depth to Water from Top of Casing, d (in)

Notes:

At test depth: (GP) Black gray GRAVEL

GEO DESIGN

PERMEABILITY TEST LOG

Project Name:	Test Location No.:	Ground Surface Elevation, ft. (NAVD88):	Casing Diameter (inside), D, inches:	
221 Glenmore Ave	PT-2 @10 feet	52	4	
Project Location:	**Inspector:**	**Depth to Bottom of Casing from GS (Test Depth), L1, inches:**	**Depth to Groundwater (If Encountered), ft.:**	
Brooklyn, NY	Jason Jimenez	119	NE	
Project No.:	**Date/Time Test:**	**Casing Stick-Up above GS, L2, inches:**	**Contractor:**	MTL
3887-011	5/24/2022	7	**Foreman/Helper:**	Anand

PERMEABILITY TEST DATA

TEST #1

Water Temp., T: ____ °C R_t = 1.0000

Depth to Water from Top of Casing at Start, d: 0 inches $R_t = \frac{2.2902(0.9842^T)}{T^{0.1702}}$

FIELD DATA		CALCULATED DATA				
Time, t (min)	Depth to Water from Top of Casing, d (in)	Water Height, H (in.)	Ht/Ho	Ln(H1/H2)	t2 - t1 (hr)	Coeff. of Perm. k (in/hr)
1	3.50	122.50	0.972	0.0282	0.0167	1.931
2	7.40	118.60	0.941	0.0324	0.0167	2.218
3	10.50	115.50	0.917	0.0265	0.0167	1.815
4	13.00	113.00	0.897	0.0219	0.0167	1.500
5	16.00	110.00	0.873	0.0269	0.0167	1.844
10	27.00	99.00	0.786	0.1054	0.0833	1.444
15	37.00	89.00	0.706	0.1065	0.0833	1.460
			#N/A			
			#N/A			
			#N/A			
			#N/A			
					Time Weighted Average Coefficent of Permeability, k (in/hr)	1.589

TEST #2

Water Temp., T: ____ °C R_t = 1.0000

Depth to Water from Top of Casing at Start, d: 0 inches $R_t = \frac{2.2902(0.9842^T)}{T^{0.1702}}$

FIELD DATA		CALCULATED DATA				
Time, t (min)	Depth to Water from Top of Casing, d (in)	Water Height, H (in.)	Ht/Ho	Ln(H1/H2)	t2 - t1 (hr)	Coeff. of Perm. k (in/hr)
1	2.50	123.50	0.980	0.0200	0.0167	1.374
2	5.00	121.00	0.960	0.0205	0.0167	1.402
3	7.50	118.50	0.940	0.0209	0.0167	1.431
4	10.00	116.00	0.921	0.0213	0.0167	1.462
5	12.00	114.00	0.905	0.0174	0.0167	1.192
10	23.50	102.50	0.813	0.1063	0.0833	1.458
15	33.00	93.00	0.738	0.0973	0.0833	1.333
			#N/A			
			#N/A			
			#N/A			
			#N/A			
					Time Weighted Average Coefficent of Permeability, k (in/hr)	1.388

TEST #3

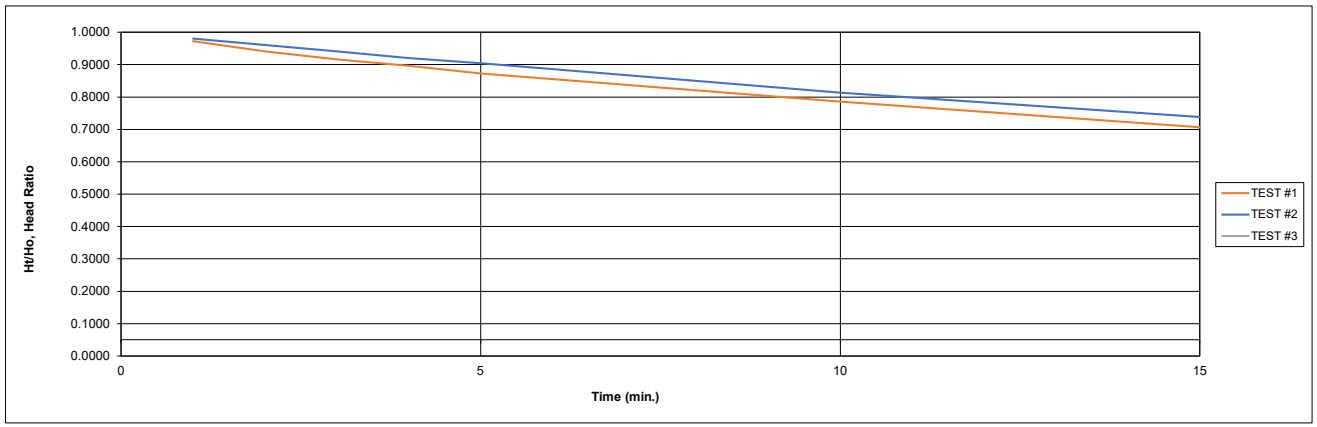
Water Temp., T: ____ °C R_t = 1.0000

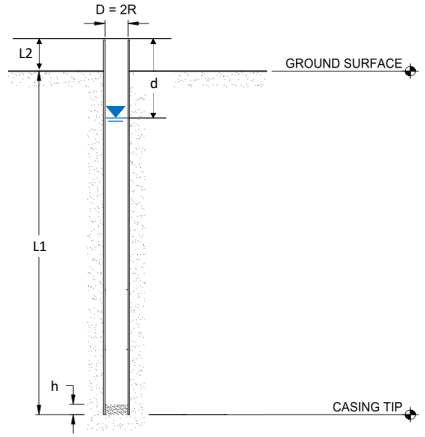
Depth to Water from Top of Casing at Start, d: 0 inches $R_t = \frac{2.2902(0.9842^T)}{T^{0.1702}}$

FIELD DATA		CALCULATED DATA				
Time, t (min)	Depth to Water from Top of Casing, d (in)	Water Height, H (in.)	Ht/Ho	Ln(H1/H2)	t2 - t1 (hr)	Coeff. of Perm. k (in/hr)
			#N/A			
			#N/A			
			#N/A			
			#N/A			
					Time Weighted Average Coefficent of Permeability, k (in/hr)	NA()

Average Coefficent of Permeability, k (in/hr) @ PT-2 @10 feet:	1.488

$$k = R_t \frac{\pi D}{11\,(t_2 - t_1)} \ln \frac{H_1}{H_2}$$





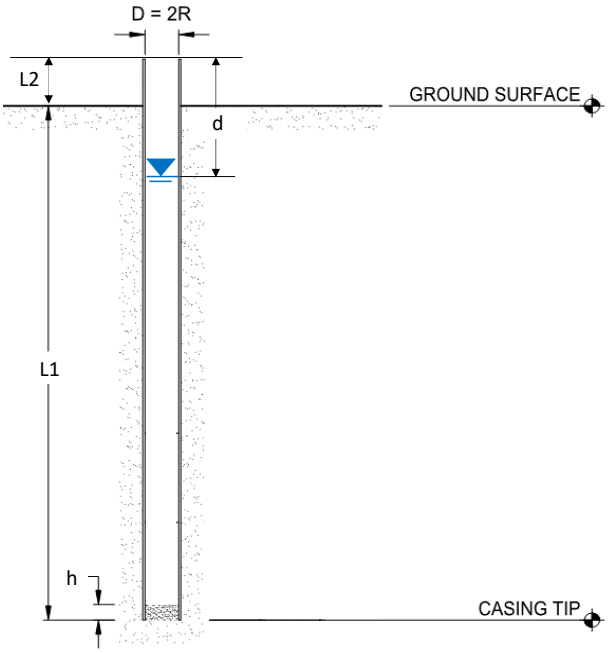
Permeability Field Test Log

Project Information

Project Name:	221 Glenmore Ave	Test ID:	PT-3 @3 feet
Project Location:	Brooklyn, NY	Inspector:	Jason Jimenez
Project No.:	3887-011	Date:	5/24/2022
Contractor:	MTL	Foreman/Helper:	Anand

Test Information

Ground Surface Elevation:	51	feet (NAVD88)
Depth to Bottom of Casing from GS (Test Depth), L1:	38.0	inches
Casing Stick-Up above GS, L2:	28.0	inches
Casing Diameter (inside), D:	4.0	inches
Height of Sand/Gravel, h:	5.0	inches
Depth to Groundwater (If Encountered):	NE	feet



Saturation Period

Depth to Water from Top of Casing at Start of Saturation Period, d:	0.0	inches
Depth to Water from Top of Casing at End of Saturation Period, d:	33.0	inches
Duration of Saturation Period:	30	minutes

Test Data

Test #1	
Water Temp., T (^{O}C):	Depth to Water from Top of Casing at Start, d (in):
	0
Time, t (min)	Depth to Water from Top of Casing, d (in)
1	1.50
2	2.50
3	4.00
4	5.00
5	6.50
10	12.00
15	17.00

Test #2	
Water Temp., T (^{O}C):	Depth to Water from Top of Casing at Start, d (in):
	0
Time, t (min)	Depth to Water from Top of Casing, d (in)
1	1.00
2	2.00
3	3.00
4	4.50
5	5.50
10	10.50
15	15.50

Test #3	
Water Temp., T (^{O}C):	Depth to Water from Top of Casing at Start, d (in):
	0
Time, t (min)	Depth to Water from Top of Casing, d (in)

Notes:

At test depth: (FILL) Gray CONCRETE

GEO DESIGN

PERMEABILITY TEST LOG

Project Name:	Test Location No.:	Ground Surface Elevation, ft. (NAVD88):	Casing Diameter (inside), D, inches:	
221 Glenmore Ave	PT-3 @3 feet	51	4	
Project Location:	**Inspector:**	**Depth to Bottom of Casing from GS (Test Depth), L1, inches:**	**Depth to Groundwater (If Encountered), ft.:**	
Brooklyn, NY	Jason Jimenez	38	NE	
Project No.:	**Date/Time Test:**	**Casing Stick-Up above GS, L2, inches:**	**Contractor:**	MTL
3887-011	5/24/2022	28	**Foreman/Helper:**	Anand

PERMEABILITY TEST DATA

TEST #1

Water Temp., T: ____ °C R_t = 1.0000

Depth to Water from Top of Casing at Start, d: 0 inches $R_t = \frac{2.2902(0.9842^T)}{T^{0.1702}}$

FIELD DATA		CALCULATED DATA				
Time, t (min)	Depth to Water from Top of Casing, d (in)	Water Height, H (in.)	Ht/Ho	Ln(H1/H2)	t2 - t1 (hr)	Coeff. of Perm. k (in/hr)
1	1.50	64.50	0.977	0.0230	0.0167	1.576
2	2.50	63.50	0.962	0.0156	0.0167	1.071
3	4.00	62.00	0.939	0.0239	0.0167	1.639
4	5.00	61.00	0.924	0.0163	0.0167	1.115
5	6.50	59.50	0.902	0.0249	0.0167	1.707
10	12.00	54.00	0.818	0.0970	0.0833	1.330
15	17.00	49.00	0.742	0.0972	0.0833	1.332
			#N/A			
			#N/A			
			#N/A			
			#N/A			
					Time Weighted Average Coefficent of Permeability, k (in/hr)	1.361

TEST #2

Water Temp., T: ____ °C R_t = 1.0000

Depth to Water from Top of Casing at Start, d: 0 inches $R_t = \frac{2.2902(0.9842^T)}{T^{0.1702}}$

FIELD DATA		CALCULATED DATA				
Time, t (min)	Depth to Water from Top of Casing, d (in)	Water Height, H (in.)	Ht/Ho	Ln(H1/H2)	t2 - t1 (hr)	Coeff. of Perm. k (in/hr)
1	1.00	65.00	0.985	0.0153	0.0167	1.046
2	2.00	64.00	0.970	0.0155	0.0167	1.063
3	3.00	63.00	0.955	0.0157	0.0167	1.079
4	4.50	61.50	0.932	0.0241	0.0167	1.652
5	5.50	60.50	0.917	0.0164	0.0167	1.124
10	10.50	55.50	0.841	0.0863	0.0833	1.183
15	15.50	50.50	0.765	0.0944	0.0833	1.294
			#N/A			
			#N/A			
			#N/A			
			#N/A			
					Time Weighted Average Coefficent of Permeability, k (in/hr)	1.223

TEST #3

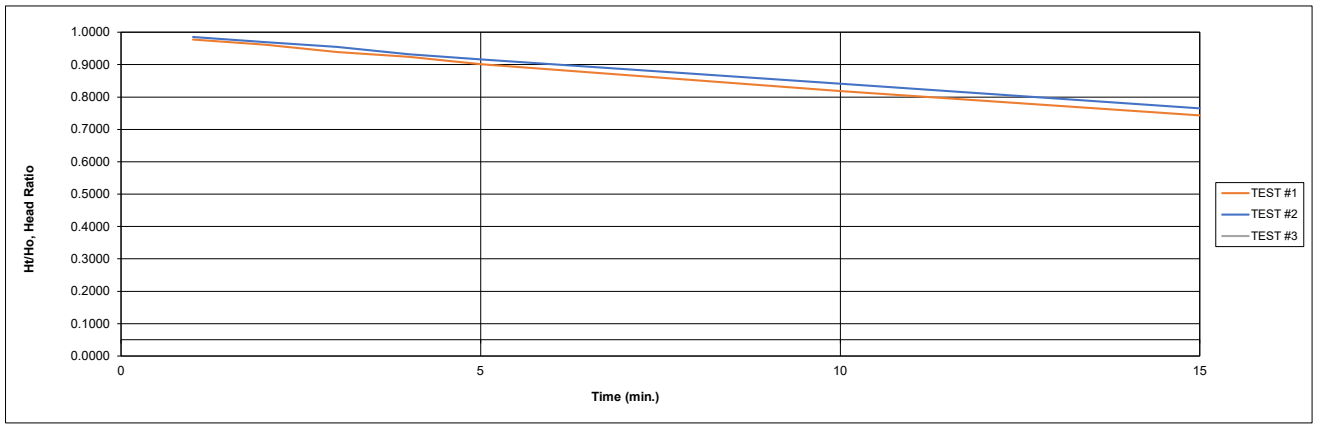
Water Temp., T: ____ °C R_t = 1.0000

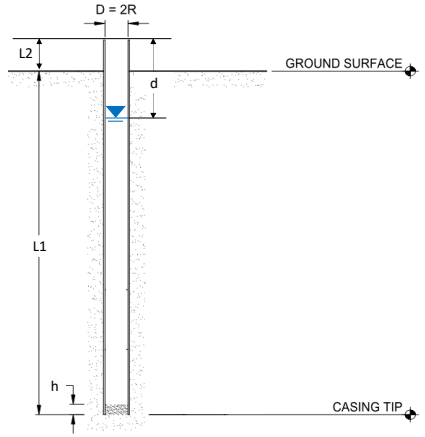
Depth to Water from Top of Casing at Start, d: 0 inches $R_t = \frac{2.2902(0.9842^T)}{T^{0.1702}}$

FIELD DATA		CALCULATED DATA				
Time, t (min)	Depth to Water from Top of Casing, d (in)	Water Height, H (in.)	Ht/Ho	Ln(H1/H2)	t2 - t1 (hr)	Coeff. of Perm. k (in/hr)
			#N/A			
			#N/A			
			#N/A			
			#N/A			
					Time Weighted Average Coefficent of Permeability, k (in/hr)	NA()

Average Coefficent of Permeability, k (in/hr) @ PT-3 @3 feet:	1.292

$$k = R_t \frac{\pi D}{11\,(t_2 - t_1)} \ln \frac{H_1}{H_2}$$





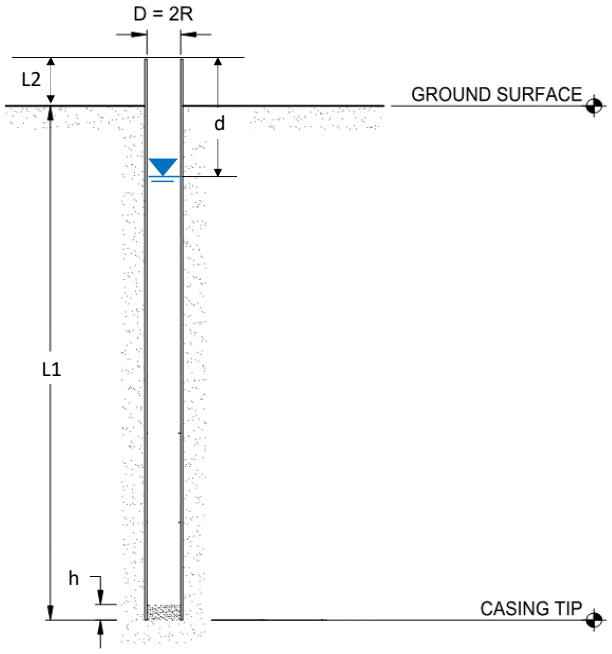
Permeability Field Test Log

Project Information

Project Name:	221 Glenmore Ave	Test ID:	PT-3 @5 feet
Project Location:	Brooklyn, NY	Inspector:	Jason Jimenez
Project No.:	3887-011	Date:	5/24/2022
Contractor:	MTL	Foreman/Helper:	Anand

Test Information

Ground Surface Elevation:	51	feet (NAVD88)
Depth to Bottom of Casing from GS (Test Depth), L1:	61.0	inches
Casing Stick-Up above GS, L2:	5.0	inches
Casing Diameter (inside), D:	4.0	inches
Height of Sand/Gravel, h:	4.0	inches
Depth to Groundwater (If Encountered):	NE	feet



Saturation Period

Depth to Water from Top of Casing at Start of Saturation Period, d:	0.0	inches
Depth to Water from Top of Casing at End of Saturation Period, d:	See Notes	inches
Duration of Saturation Period:	30	minutes

Test Data

Test #1	
Water Temp., T (^{O}C):	Depth to Water from Top of Casing at Start, d (in):
	0
Time, t (min)	Depth to Water from Top of Casing, d (in)
1	17.00
2	28.50
3	39.50
4	45.00
5	52.00
10	61.00

Test #2	
Water Temp., T (^{O}C):	Depth to Water from Top of Casing at Start, d (in):
	0
Time, t (min)	Depth to Water from Top of Casing, d (in)
1	17.00
2	28.00
3	37.50
4	44.00
5	50.50
10	61.00

Test #3	
Water Temp., T (^{O}C):	Depth to Water from Top of Casing at Start, d (in):
	0
Time, t (min)	Depth to Water from Top of Casing, d (in)

Notes:

Saturation Period: took 6 minutes to drain completely, refilled and took 6 minutes to drain completely

At test depth: (SP) Brown fine SAND, some gray gravel

GEO DESIGN

PERMEABILITY TEST LOG

Project Name:	Test Location No.:	Ground Surface Elevation, ft. (NAVD88):	Casing Diameter (inside), D, inches:	
221 Glenmore Ave	PT-3 @5 feet	51	4	
Project Location:	**Inspector:**	**Depth to Bottom of Casing from GS (Test Depth), L1, inches:**	**Depth to Groundwater (If Encountered), ft.:**	
Brooklyn, NY	Jason Jimenez	61	NE	
Project No.:	**Date/Time Test:**	**Casing Stick-Up above GS, L2, inches:**	**Contractor:**	MTL
3887-011	5/24/2022	5	**Foreman/Helper:**	Anand

PERMEABILITY TEST DATA

TEST #1

Water Temp., T: ____ °C R_t = 1.0000

Depth to Water from Top of Casing at Start, d: 0 inches $R_t = \frac{2.2902(0.9842^T)}{T^{0.1702}}$

FIELD DATA		CALCULATED DATA				
Time, t (min)	Depth to Water from Top of Casing, d (in)	Water Height, H (in.)	Ht/Ho	Ln(H1/H2)	t2 - t1 (hr)	Coeff. of Perm. k (in/hr)
1	17.00	49.00	0.742	0.2978	0.0167	20.415
2	28.50	37.50	0.568	0.2675	0.0167	18.334
3	39.50	26.50	0.402	0.3472	0.0167	23.798
4	45.00	21.00	0.318	0.2326	0.0167	15.945
5	52.00	14.00	0.212	0.4055	0.0167	27.792
10	61.00	5.00	0.076	1.0296	0.0833	14.115
			#N/A			
			#N/A			
			#N/A			
			#N/A			
			#N/A			
			Time Weighted Average Coefficent of Permeability, k (in/hr)			17.686

TEST #2

Water Temp., T: ____ °C R_t = 1.0000

Depth to Water from Top of Casing at Start, d: 0 inches $R_t = \frac{2.2902(0.9842^T)}{T^{0.1702}}$

FIELD DATA		CALCULATED DATA				
Time, t (min)	Depth to Water from Top of Casing, d (in)	Water Height, H (in.)	Ht/Ho	Ln(H1/H2)	t2 - t1 (hr)	Coeff. of Perm. k (in/hr)
1	17.00	49.00	0.742	0.2978	0.0167	20.415
2	28.00	38.00	0.576	0.2542	0.0167	17.426
3	37.50	28.50	0.432	0.2877	0.0167	19.719
4	44.00	22.00	0.333	0.2589	0.0167	17.743
5	50.50	15.50	0.235	0.3502	0.0167	24.004
10	61.00	5.00	0.076	1.1314	0.0833	15.510
			#N/A			
			#N/A			
			#N/A			
			#N/A			
			#N/A			
			Time Weighted Average Coefficent of Permeability, k (in/hr)			17.686

TEST #3

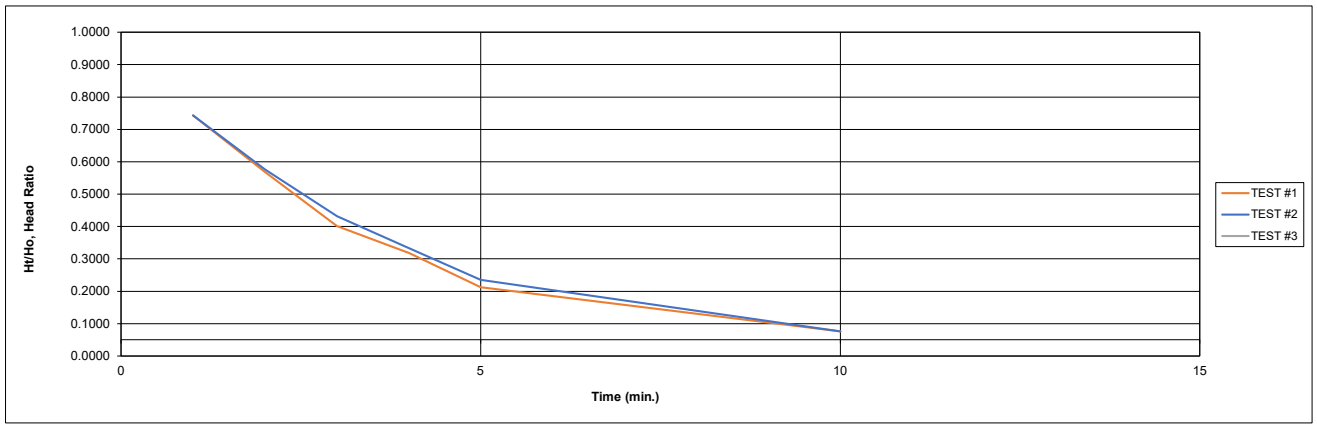
Water Temp., T: ____ °C R_t = 1.0000

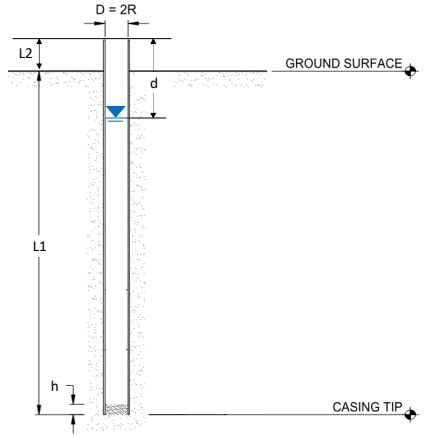
Depth to Water from Top of Casing at Start, d: 0 inches $R_t = \frac{2.2902(0.9842^T)}{T^{0.1702}}$

FIELD DATA		CALCULATED DATA				
Time, t (min)	Depth to Water from Top of Casing, d (in)	Water Height, H (in.)	Ht/Ho	Ln(H1/H2)	t2 - t1 (hr)	Coeff. of Perm. k (in/hr)
			#N/A			
			#N/A			
			#N/A			
			#N/A			
			#N/A			
			#N/A			
			Time Weighted Average Coefficent of Permeability, k (in/hr)			NA()

Average Coefficent of Permeability, k (in/hr) @ PT-3 @5 feet:	17.686

$$k = R_t \frac{\pi D}{11\,(t_2 - t_1)} \ln \frac{H_1}{H_2}$$





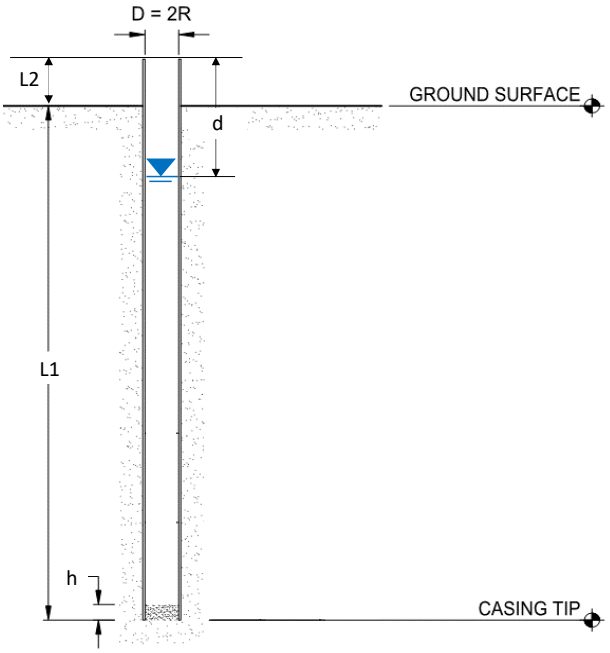
Permeability Field Test Log

Project Information

Project Name:	221 Glenmore Ave	Test ID:	PT-3 @10 feet
Project Location:	Brooklyn, NY	Inspector:	Jason Jimenez
Project No.:	3887-011	Date:	5/25/2022
Contractor:	MTL	Foreman/Helper:	Anand

Test Information

Ground Surface Elevation:	51	feet (NAVD88)
Depth to Bottom of Casing from GS (Test Depth), L1:	120.5	inches
Casing Stick-Up above GS, L2:	5.5	inches
Casing Diameter (inside), D:	4.0	inches
Height of Sand/Gravel, h:	6.0	inches
Depth to Groundwater (If Encountered):	NE	feet



Saturation Period

Depth to Water from Top of Casing at Start of Saturation Period, d:	0.0	inches
Depth to Water from Top of Casing at End of Saturation Period, d:	See Notes	inches
Duration of Saturation Period:	11.5	minutes

Test Data

Test #1	
Water Temp., T (^{O}C):	Depth to Water from Top of Casing at Start, d (in):
	0
Time, t (min)	Depth to Water from Top of Casing, d (in)
1	36.00
2	61.00
3	79.00
4	94.00
5	104.50
10	120.50

Test #2	
Water Temp., T (^{O}C):	Depth to Water from Top of Casing at Start, d (in):
	0
Time, t (min)	Depth to Water from Top of Casing, d (in)
1	31.00
2	54.50
3	71.00
4	87.00
5	98.00
10	120.50

Test #3	
Water Temp., T (^{O}C):	Depth to Water from Top of Casing at Start, d (in):
	0
Time, t (min)	Depth to Water from Top of Casing, d (in)

Notes:

Saturation Period: took 5.5 minutes to drain completely, refilled and took 6 minutes to drain completely.

At test depth: (SP-GP) Brown f SAND and white gray GRAVEL, trace silt

GEO DESIGN

PERMEABILITY TEST LOG

Project Name:	Test Location No.:	Ground Surface Elevation, ft. (NAVD88):	Casing Diameter (inside), D, inches:	
221 Glenmore Ave	PT-3 @10 feet	51	4	
Project Location:	**Inspector:**	**Depth to Bottom of Casing from GS (Test Depth), L1, inches:**	**Depth to Groundwater (If Encountered), ft.:**	
Brooklyn, NY	Jason Jimenez	120.5	NE	
Project No.:	**Date/Time Test:**	**Casing Stick-Up above GS, L2, inches:**	**Contractor:**	MTL
3887-011	5/25/2022	5.5	**Foreman/Helper:**	Anand

PERMEABILITY TEST DATA

TEST #1

Water Temp., T: ____ °C R_t = 1.0000

Depth to Water from Top of Casing at Start, d: 0 inches $R_t = \frac{2.2902(0.9842^T)}{T^{0.1702}}$

FIELD DATA		CALCULATED DATA				
Time, t (min)	Depth to Water from Top of Casing, d (in)	Water Height, H (in.)	Ht/Ho	Ln(H1/H2)	t2 - t1 (hr)	Coeff. of Perm. k (in/hr)
1	36.00	90.00	0.714	0.3365	0.0167	23.063
2	61.00	65.00	0.516	0.3254	0.0167	22.306
3	79.00	47.00	0.373	0.3242	0.0167	22.225
4	94.00	32.00	0.254	0.3844	0.0167	26.349
5	104.50	21.50	0.171	0.3977	0.0167	27.259
10	120.50	5.50	0.044	1.3633	0.0833	18.689
			#N/A			
			#N/A			
			#N/A			
			#N/A			
			#N/A			
			Time Weighted Average Coefficent of Permeability, k (in/hr)			21.465

TEST #2

Water Temp., T: ____ °C R_t = 1.0000

Depth to Water from Top of Casing at Start, d: 0 inches $R_t = \frac{2.2902(0.9842^T)}{T^{0.1702}}$

FIELD DATA		CALCULATED DATA				
Time, t (min)	Depth to Water from Top of Casing, d (in)	Water Height, H (in.)	Ht/Ho	Ln(H1/H2)	t2 - t1 (hr)	Coeff. of Perm. k (in/hr)
1	31.00	95.00	0.754	0.2824	0.0167	19.357
2	54.50	71.50	0.567	0.2842	0.0167	19.479
3	71.00	55.00	0.437	0.2624	0.0167	17.983
4	87.00	39.00	0.310	0.3438	0.0167	23.563
5	98.00	28.00	0.222	0.3314	0.0167	22.712
10	120.50	5.50	0.044	1.6275	0.0833	22.310
			#N/A			
			#N/A			
			#N/A			
			#N/A			
			#N/A			
			Time Weighted Average Coefficent of Permeability, k (in/hr)			21.465

TEST #3

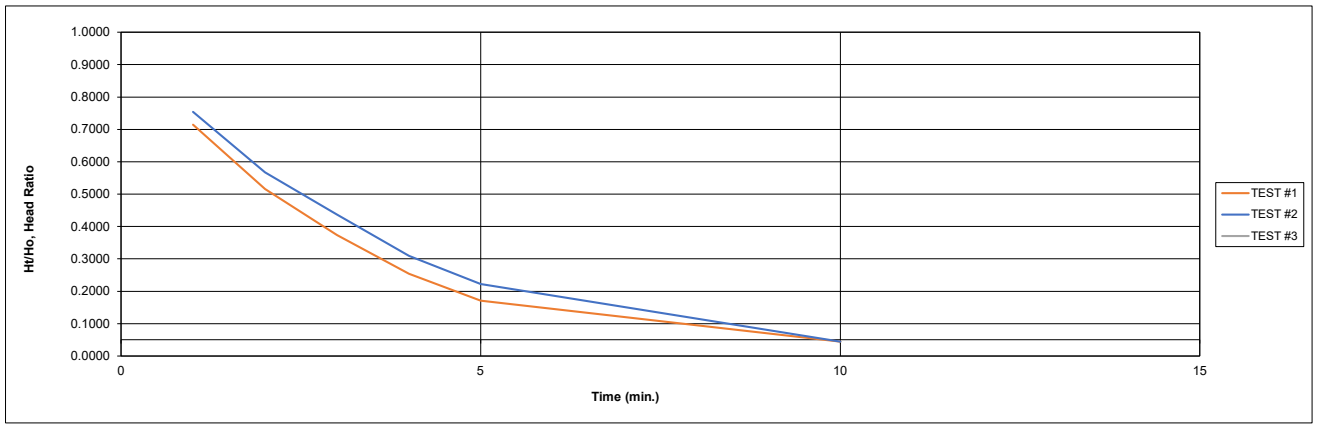
Water Temp., T: ____ °C R_t = 1.0000

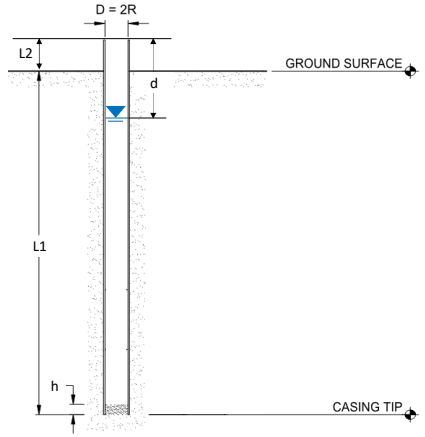
Depth to Water from Top of Casing at Start, d: 0 inches $R_t = \frac{2.2902(0.9842^T)}{T^{0.1702}}$

FIELD DATA		CALCULATED DATA				
Time, t (min)	Depth to Water from Top of Casing, d (in)	Water Height, H (in.)	Ht/Ho	Ln(H1/H2)	t2 - t1 (hr)	Coeff. of Perm. k (in/hr)
			#N/A			
			#N/A			
			#N/A			
			#N/A			
			#N/A			
			Time Weighted Average Coefficent of Permeability, k (in/hr)			NA()

Average Coefficent of Permeability, k (in/hr) @ PT-3 @10 feet:	21.465

$$k = R_t \frac{\pi D}{11\,(t_2 - t_1)} \ln \frac{H_1}{H_2}$$





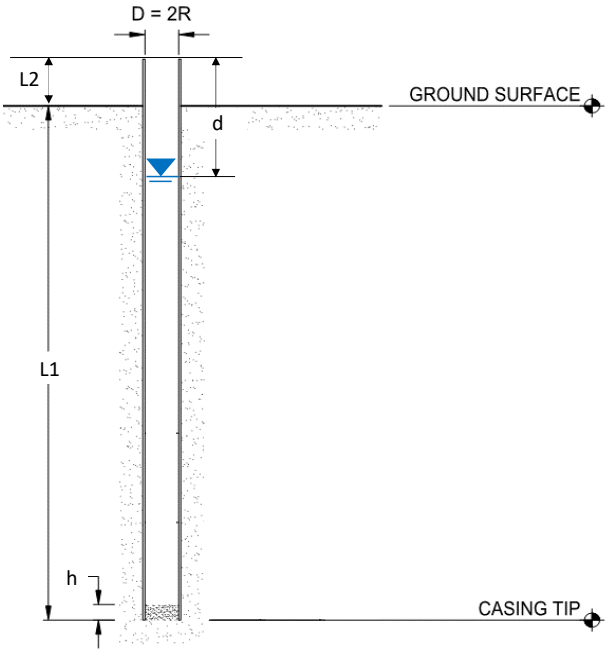
Permeability Field Test Log

Project Information

Project Name:	221 Glenmore Ave	Test ID:	PT-4 @3 feet
Project Location:	Brooklyn, NY	Inspector:	Anusman Raval
Project No.:	3887-011	Date:	5/23/2022
Contractor:	MTL	Foreman/Helper:	Anand

Test Information

Ground Surface Elevation:	51	feet (NAVD88)
Depth to Bottom of Casing from GS (Test Depth), L1:	36.0	inches
Casing Stick-Up above GS, L2:	28.0	inches
Casing Diameter (inside), D:	4.0	inches
Height of Sand/Gravel, h:	6.0	inches
Depth to Groundwater (If Encountered):	NE	feet



Saturation Period

Depth to Water from Top of Casing at Start of Saturation Period, d:	0.0	inches
Depth to Water from Top of Casing at End of Saturation Period, d:	46.0	inches
Duration of Saturation Period:	45	minutes

Test Data

Test #1	
Water Temp., T (^{O}C):	Depth to Water from Top of Casing at Start, d (in):
	0
Time, t (min)	Depth to Water from Top of Casing, d (in)
1	3.50
2	7.00
3	10.00
5	16.75
7	22.00
9	25.00
10	26.50
12	29.25
15	32.5

Test #2	
Water Temp., T (^{O}C):	Depth to Water from Top of Casing at Start, d (in):
	0
Time, t (min)	Depth to Water from Top of Casing, d (in)
1	7.50
2	15.00
3	21.00
5	25.00
7	27.25
9	29.25
10	30.00
12	32
15	33.5

Test #3	
Water Temp., T (^{O}C):	Depth to Water from Top of Casing at Start, d (in):
	0
Time, t (min)	Depth to Water from Top of Casing, d (in)
1	8.00
3	21.00
5	25.50
7	27.50
10	30.00
12	32.00
15	33.50

Notes:

Sample was saturated ahead of time by the driler for 45 minutes.

SPT Sample 3' to 5' (17-24-24-34), Brown c-f SAND, some gravel, little silt (SP/GP) [3a/2a].

GEO DESIGN

PERMEABILITY TEST LOG

Project Name:	Test Location No.:	Ground Surface Elevation, ft. (NAVD88):	Casing Diameter (inside), D, inches:	
221 Glenmore Ave	PT-4 @3 feet	51	4	
Project Location:	**Inspector:**	**Depth to Bottom of Casing from GS (Test Depth), L1, inches:**	**Depth to Groundwater (If Encountered), ft.:**	
Brooklyn, NY	Anusman Raval	36	NE	
Project No.:	**Date/Time Test:**	**Casing Stick-Up above GS, L2, inches:**	**Contractor:**	MTL
3887-011	5/23/2022	28	**Foreman/Helper:**	Anand

PERMEABILITY TEST DATA

TEST #1

Water Temp., T: ____ °C R_t = 1.0000

Depth to Water from Top of Casing at Start, d: 0 inches $R_t = \frac{2.2902(0.9842^T)}{T^{0.1702}}$

FIELD DATA		CALCULATED DATA				
Time, t (min)	Depth to Water from Top of Casing, d (in)	Water Height, H (in.)	Ht/Ho	Ln(H1/H2)	t2 - t1 (hr)	Coeff. of Perm. k (in/hr)
1	3.50	60.50	0.945	0.0562	0.0167	3.855
2	7.00	57.00	0.891	0.0596	0.0167	4.085
3	10.00	54.00	0.844	0.0541	0.0167	3.706
5	16.75	47.25	0.738	0.1335	0.0333	4.576
7	22.00	42.00	0.656	0.1178	0.0333	4.037
9	25.00	39.00	0.609	0.0741	0.0333	2.540
10	26.50	37.50	0.586	0.0392	0.0167	2.688
12	29.25	34.75	0.543	0.0762	0.0333	2.610
15	32.50	31.50	0.492	0.0982	0.0500	2.243
			#N/A			
			#N/A			
					Time Weighted Average Coefficent of Permeability, k (in/hr)	3.239

TEST #2

Water Temp., T: ____ °C R_t = 1.0000

Depth to Water from Top of Casing at Start, d: 0 inches $R_t = \frac{2.2902(0.9842^T)}{T^{0.1702}}$

FIELD DATA		CALCULATED DATA				
Time, t (min)	Depth to Water from Top of Casing, d (in)	Water Height, H (in.)	Ht/Ho	Ln(H1/H2)	t2 - t1 (hr)	Coeff. of Perm. k (in/hr)
1	7.50	56.50	0.883	0.1246	0.0167	8.543
2	15.00	49.00	0.766	0.1424	0.0167	9.762
3	21.00	43.00	0.672	0.1306	0.0167	8.953
5	25.00	39.00	0.609	0.0976	0.0333	3.346
7	27.25	36.75	0.574	0.0594	0.0333	2.037
9	29.25	34.75	0.543	0.0560	0.0333	1.918
10	30.00	34.00	0.531	0.0218	0.0167	1.496
12	32.00	32.00	0.500	0.0606	0.0333	2.078
15	33.50	30.50	0.477	0.0480	0.0500	1.097
			#N/A			
			#N/A			
					Time Weighted Average Coefficent of Permeability, k (in/hr)	3.387

TEST #3

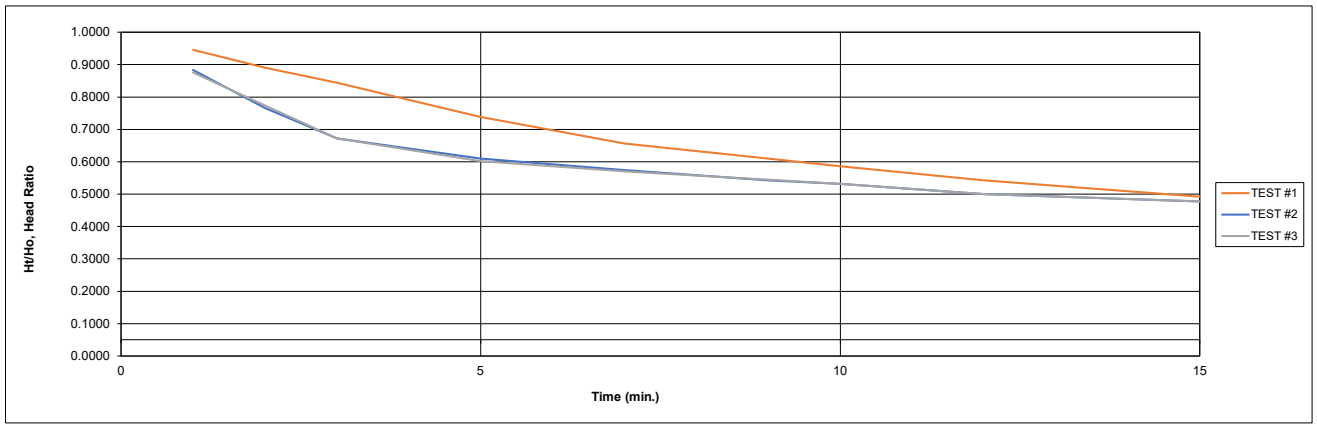
Water Temp., T: ____ °C R_t = 1.0000

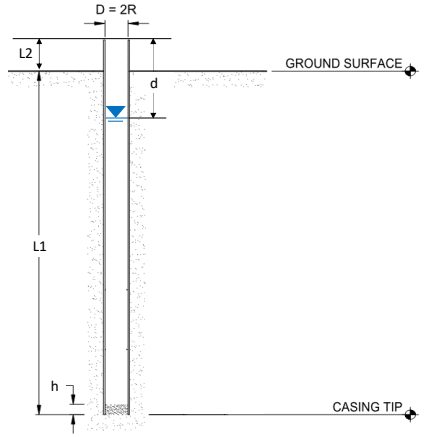
Depth to Water from Top of Casing at Start, d: 0 inches $R_t = \frac{2.2902(0.9842^T)}{T^{0.1702}}$

FIELD DATA		CALCULATED DATA				
Time, t (min)	Depth to Water from Top of Casing, d (in)	Water Height, H (in.)	Ht/Ho	Ln(H1/H2)	t2 - t1 (hr)	Coeff. of Perm. k (in/hr)
1	8.00	56.00	0.875	0.1335	0.0167	9.153
3	21.00	43.00	0.672	0.2642	0.0333	9.053
5	25.50	38.50	0.602	0.1105	0.0333	3.788
7	27.50	36.50	0.570	0.0533	0.0333	1.828
10	30.00	34.00	0.531	0.0710	0.0500	1.621
12	32.00	32.00	0.500	0.0606	0.0333	2.078
15	33.50	30.50	0.477	0.0480	0.0500	1.097
			#N/A			
			#N/A			
			#N/A			
					Time Weighted Average Coefficent of Permeability, k (in/hr)	3.387

Average Coefficent of Permeability, k (in/hr) @ PT-4 @3 feet:	3.338

$$k = R_t \frac{\pi D}{11\,(t_2 - t_1)} \ln \frac{H_1}{H_2}$$





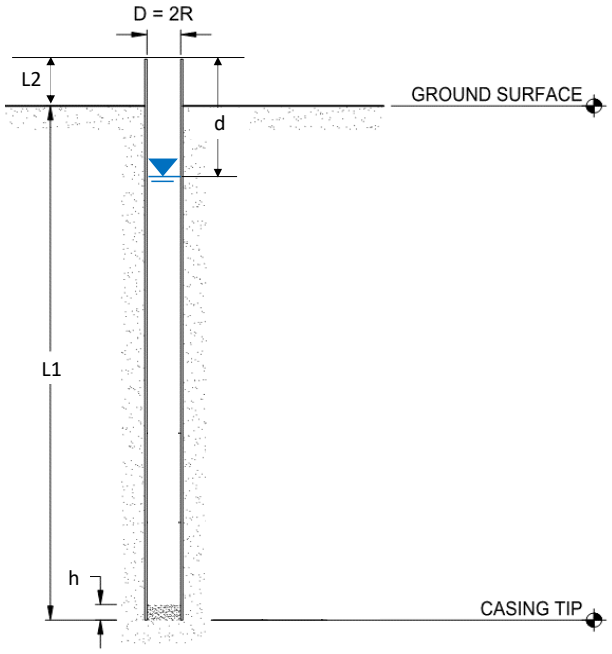
Permeability Field Test Log

Project Information

Project Name:	221 Glenmore Ave	Test ID:	PT-4 @5 feet
Project Location:	Brooklyn, NY	Inspector:	Anusman Raval
Project No.:	3887-011	Date:	5/23/2022
Contractor:	MTL	Foreman/Helper:	Anand

Test Information

Ground Surface Elevation:	51	feet (NAVD88)
Depth to Bottom of Casing from GS (Test Depth), L1:	60.0	inches
Casing Stick-Up above GS, L2:	6.0	inches
Casing Diameter (inside), D:	4.0	inches
Height of Sand/Gravel, h:	6.0	inches
Depth to Groundwater (If Encountered):	NE	feet



Saturation Period

Depth to Water from Top of Casing at Start of Saturation Period, d:	0.0	inches
Depth to Water from Top of Casing at End of Saturation Period, d:	0.5	inches
Duration of Saturation Period:	45	minutes

Test Data

Test #1	
Water Temp., T (^{O}C):	Depth to Water from Top of Casing at Start, d (in):
	0
Time, t (min)	Depth to Water from Top of Casing, d (in)
2	0.19
5	0.38
10	0.50
15	0.63

Test #2	
Water Temp., T (^{O}C):	Depth to Water from Top of Casing at Start, d (in):
	0
Time, t (min)	Depth to Water from Top of Casing, d (in)
2	0.19
5	0.31
10	0.50
15	0.75
30	0.94

Test #3	
Water Temp., T (^{O}C):	Depth to Water from Top of Casing at Start, d (in):
	0
Time, t (min)	Depth to Water from Top of Casing, d (in)

Notes:

SPT Sample 5' to 7' (14-36-42-48), Brown c-f SAND, some silt and gravel (SM/GM) [3a/2a].

GEO DESIGN

PERMEABILITY TEST LOG

Project Name:	Test Location No.:	Ground Surface Elevation, ft. (NAVD88):	Casing Diameter (inside), D, inches:	
221 Glenmore Ave	PT-4 @5 feet	51	4	
Project Location:	**Inspector:**	**Depth to Bottom of Casing from GS (Test Depth), L1, inches:**	**Depth to Groundwater (If Encountered), ft.:**	
Brooklyn, NY	Anusman Raval	60	NE	
Project No.:	**Date/Time Test:**	**Casing Stick-Up above GS, L2, inches:**	**Contractor:**	MTL
3887-011	5/23/2022	6	**Foreman/Helper:**	Anand

PERMEABILITY TEST DATA

TEST #1

Water Temp., T: ____ °C R_t = 1.0000

Depth to Water from Top of Casing at Start, d: 0 inches $R_t = \frac{2.2902(0.9842^T)}{T^{0.1702}}$

FIELD DATA		CALCULATED DATA				
Time, t (min)	Depth to Water from Top of Casing, d (in)	Water Height, H (in.)	Ht/Ho	Ln(H1/H2)	t2 - t1 (hr)	Coeff. of Perm. k (in/hr)
2	0.19	65.81	0.997	0.0028	0.0333	0.098
5	0.38	65.62	0.994	0.0029	0.0500	0.067
10	0.50	65.50	0.992	0.0018	0.0833	0.025
15	0.63	65.37	0.990	0.0020	0.0833	0.027
			#N/A			
			#N/A			
			#N/A			
			#N/A			
			#N/A			
			#N/A			
			#N/A			
		Time Weighted Average Coefficent of Permeability, k (in/hr)				0.044

TEST #2

Water Temp., T: ____ °C R_t = 1.0000

Depth to Water from Top of Casing at Start, d: 0 inches $R_t = \frac{2.2902(0.9842^T)}{T^{0.1702}}$

FIELD DATA		CALCULATED DATA				
Time, t (min)	Depth to Water from Top of Casing, d (in)	Water Height, H (in.)	Ht/Ho	Ln(H1/H2)	t2 - t1 (hr)	Coeff. of Perm. k (in/hr)
2	0.19	65.81	0.997	0.0028	0.0333	0.098
5	0.31	65.69	0.995	0.0019	0.0500	0.043
10	0.50	65.50	0.992	0.0029	0.0833	0.040
15	0.75	65.25	0.989	0.0038	0.0833	0.052
30	0.94	65.06	0.986	0.0029	0.2500	0.013
			#N/A			
			#N/A			
			#N/A			
			#N/A			
			#N/A			
			#N/A			
		Time Weighted Average Coefficent of Permeability, k (in/hr)				0.033

TEST #3

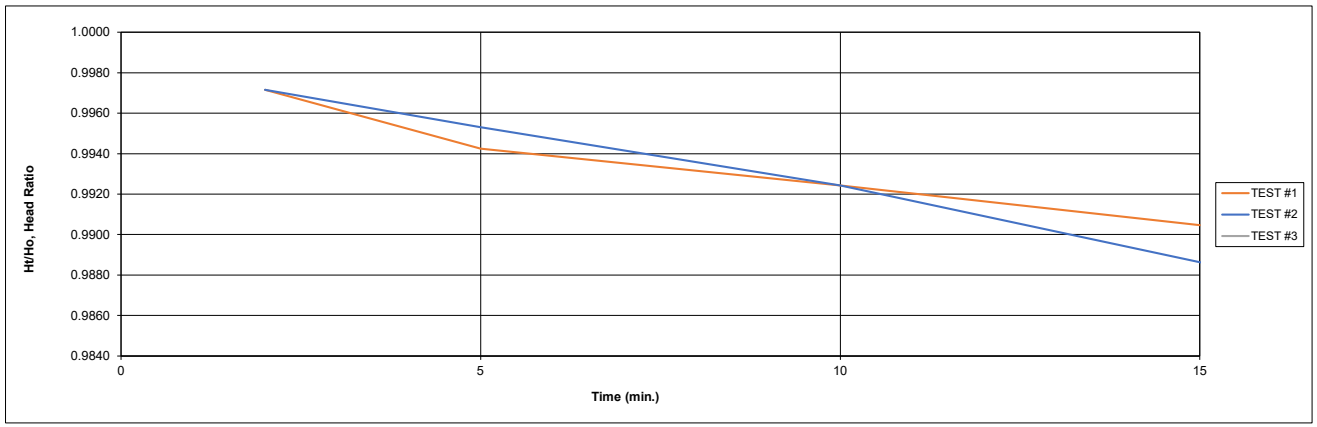
Water Temp., T: ____ °C R_t = 1.0000

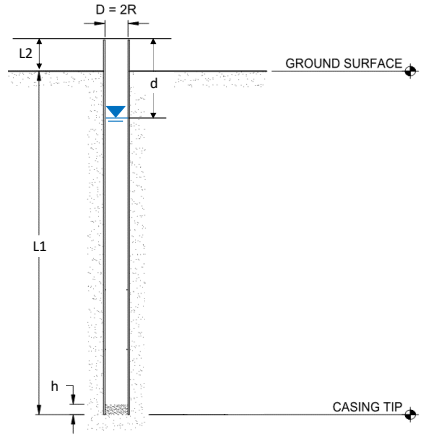
Depth to Water from Top of Casing at Start, d: ____ inches $R_t = \frac{2.2902(0.9842^T)}{T^{0.1702}}$

FIELD DATA		CALCULATED DATA				
Time, t (min)	Depth to Water from Top of Casing, d (in)	Water Height, H (in.)	Ht/Ho	Ln(H1/H2)	t2 - t1 (hr)	Coeff. of Perm. k (in/hr)
			#N/A			
			#N/A			
			#N/A			
			#N/A			
			#N/A			
			#N/A			
			#N/A			
		Time Weighted Average Coefficent of Permeability, k (in/hr)				NA()

Average Coefficent of Permeability, k (in/hr) @ PT-4 @5 feet:	0.038

$$k = R_t \frac{\pi D}{11\,(t_2 - t_1)} \ln \frac{H_1}{H_2}$$





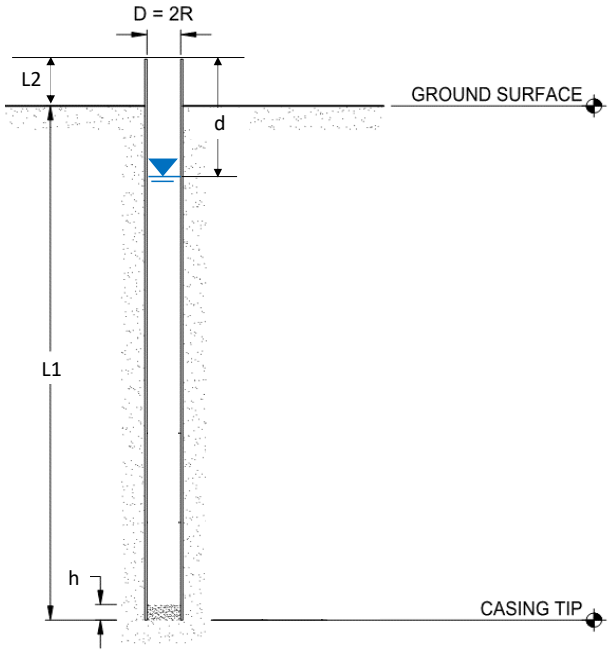
Permeability Field Test Log

Project Information

Project Name:	221 Glenmore Ave	Test ID:	PT-4 @10 feet
Project Location:	Brooklyn, NY	Inspector:	Anusman Raval
Project No.:	3887-011	Date:	5/23/2022
Contractor:	MTL	Foreman/Helper:	Anand

Test Information

Ground Surface Elevation:	51	feet (NAVD88)
Depth to Bottom of Casing from GS (Test Depth), L1:	120.0	inches
Casing Stick-Up above GS, L2:	6.0	inches
Casing Diameter (inside), D:	4.0	inches
Height of Sand/Gravel, h:	6.0	inches
Depth to Groundwater (If Encountered):	NE	feet



Saturation Period

Depth to Water from Top of Casing at Start of Saturation Period, d:	0.0	inches
Depth to Water from Top of Casing at End of Saturation Period, d:	71.0	inches
Duration of Saturation Period:	45	minutes

Test Data

Test #1	
Water Temp., T (^{O}C):	Depth to Water from Top of Casing at Start, d (in):
	0
Time, t (min)	Depth to Water from Top of Casing, d (in)
1	3.50
2	6.50
3	8.50
4	10.50
5	13.00
7	19.00
10	25.50
15	34.5

Test #2	
Water Temp., T (^{O}C):	Depth to Water from Top of Casing at Start, d (in):
	0
Time, t (min)	Depth to Water from Top of Casing, d (in)
1	2.50
2	4.75
3	8.00
4	9.50
5	12.25
7	16.50
10	21.00
15	30.5

Test #3	
Water Temp., T (^{O}C):	Depth to Water from Top of Casing at Start, d (in):
	0
Time, t (min)	Depth to Water from Top of Casing, d (in)

Notes:

SPT Sample 10' to 12' (13-15-22-21), Brown c-f SAND, some gravel, little to trace silt (SP/GP) [3a/2a].

GEO DESIGN

PERMEABILITY TEST LOG

Project Name:	Test Location No.:	Ground Surface Elevation, ft. (NAVD88):	Casing Diameter (inside), D, inches:	
221 Glenmore Ave	PT-4 @10 feet	51	4	
Project Location:	**Inspector:**	**Depth to Bottom of Casing from GS (Test Depth), L1, inches:**	**Depth to Groundwater (If Encountered), ft.:**	
Brooklyn, NY	Anusman Raval	120	NE	
Project No.:	**Date/Time Test:**	**Casing Stick-Up above GS, L2, inches:**	**Contractor:**	MTL
3887-011	5/23/2022	6	**Foreman/Helper:**	Anand

PERMEABILITY TEST DATA

TEST #1

Water Temp., T: ____ °C R_t = 1.0000

Depth to Water from Top of Casing at Start, d: 0 inches $R_t = \frac{2.2902(0.9842^T)}{T^{0.1702}}$

FIELD DATA		CALCULATED DATA				
Time, t (min)	Depth to Water from Top of Casing, d (in)	Water Height, H (in.)	Ht/Ho	Ln(H1/H2)	t2 - t1 (hr)	Coeff. of Perm. k (in/hr)
1	3.50	122.50	0.972	0.0282	0.0167	1.931
2	6.50	119.50	0.948	0.0248	0.0167	1.700
3	8.50	117.50	0.933	0.0169	0.0167	1.157
4	10.50	115.50	0.917	0.0172	0.0167	1.177
5	13.00	113.00	0.897	0.0219	0.0167	1.500
7	19.00	107.00	0.849	0.0546	0.0333	1.870
10	25.50	100.50	0.798	0.0627	0.0500	1.432
15	34.50	91.50	0.726	0.0938	0.0833	1.286
			#N/A			
			#N/A			
			#N/A			
					Time Weighted Average Coefficent of Permeability, k (in/hr)	1.462

TEST #2

Water Temp., T: ____ °C R_t = 1.0000

Depth to Water from Top of Casing at Start, d: 0 inches $R_t = \frac{2.2902(0.9842^T)}{T^{0.1702}}$

FIELD DATA		CALCULATED DATA				
Time, t (min)	Depth to Water from Top of Casing, d (in)	Water Height, H (in.)	Ht/Ho	Ln(H1/H2)	t2 - t1 (hr)	Coeff. of Perm. k (in/hr)
1	2.50	123.50	0.980	0.0200	0.0167	1.374
2	4.75	121.25	0.962	0.0184	0.0167	1.260
3	8.00	118.00	0.937	0.0272	0.0167	1.862
4	9.50	116.50	0.925	0.0128	0.0167	0.877
5	12.25	113.75	0.903	0.0239	0.0167	1.637
7	16.50	109.50	0.869	0.0381	0.0333	1.305
10	21.00	105.00	0.833	0.0420	0.0500	0.959
15	30.50	95.50	0.758	0.0948	0.0833	1.300
			#N/A			
			#N/A			
			#N/A			
					Time Weighted Average Coefficent of Permeability, k (in/hr)	1.266

TEST #3

Water Temp., T: ____ °C R_t = 1.0000

Depth to Water from Top of Casing at Start, d: ____ inches $R_t = \frac{2.2902(0.9842^T)}{T^{0.1702}}$

FIELD DATA		CALCULATED DATA				
Time, t (min)	Depth to Water from Top of Casing, d (in)	Water Height, H (in.)	Ht/Ho	Ln(H1/H2)	t2 - t1 (hr)	Coeff. of Perm. k (in/hr)
			#N/A			
			#N/A			
			#N/A			
					Time Weighted Average Coefficent of Permeability, k (in/hr)	NA()

Average Coefficent of Permeability, k (in/hr) @ PT-4 @10 feet:	1.364

$$k = R_t \frac{\pi D}{11\,(t_2 - t_1)} \ln \frac{H_1}{H_2}$$