LERA

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20 June 2016
File: P1069

Mr. Simon Koster
JDS
104 Fifth Avenue, 9th Floor
New York, NY 10011
Via E-mail: skoster@jdsdevelopment.com

9 DeKalb Avenue Structural Engineering Peer Review Report

Dear Mr. Koster:

At the request of JDS, Leslie E. Robertson Associates, R.L.L.P. has conducted a Structural Peer Review of the design of 9 DeKalb Avenue as required by New York City Building Code Section 1617. This report summarizes the extent and findings of our review.

We have reviewed the following:

- Plans listed in Appendix A.
- *Geotechnical Report, 9 DeKalb Avenue*, dated 9 June 2016, by Mueser Rutledge Consulting Engineers, attached to this report as Appendix B.
- Structural Design Criteria shown in Drawing FO-001.00 dated 21 April 2016 and attached herewith as Appendix C.
- Structural Wind Loads, dated 16 June, 2016, by RWDI, attached to this report as Appendix D.

Through our review, we have confirmed the following aspects of the structural design, as required by Section 1617.5.1:

- the design loads conform to the Building Code;
- the design criteria and design assumptions conform to the Building Code;
- the design properly incorporates the recommendations of the geotechnical engineer;
- the design properly incorporates the recommendations of the wind tunnel laboratory;
- the structure has a complete load path;

- based on our independent calculations of representative foundations, columns, walls, beams and slabs, we find that the design of the structure has adequate strength;
- the structural plans are in general conformance with the architectural plans regarding loads and other conditions that affect the structural design; and
- the structural plans are generally complete.

Accordingly, we find the design of the structure to be in general conformance with the structural and foundation design provisions of the Building Code.

The opinions expressed in this letter represent our professional view, based on the information made available to us. In developing these opinions, we have exercised a degree of care and skill commensurate with that exercised by professional engineers licensed in the State of New York for similar types of projects. No other warranty, expressed or implied, is made as to the professional advice included in this letter.

Very truly yours,

LESLIE E. ROBERTSON ASSOCIATES, R.L.L.P.

William J. Faschan

WJF/pi

cc: Ms. Susan Erdelyi Hamos, WSPCS
Via e-mail: Susan.ErdelyiHamos@wspcs.com

APPENDIX A

Plans Reviewed

Architectural Drawings, for DOB Submission, dated 4/21/2016;
Structural Drawings, FO/SOE Purchasing Set, dated 4/21/2016.

APPENDIX B

Geotechnical Report

GEOTECHNICAL REPORT
Phase 1 Boring Investigation
9 DeKalb Avenue
(340 Flatbush Ave Extension)
Brooklyn, New York

JDS Development Group
104 Fifth Ave
New York, New York 10011

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

June 9, 2016

Mueser Rutledge Consulting Engineers

14 Penn Plaza · 225 West 34th Street · New York, NY 10122
Tel: (917) 339-9300 · Fax: (917) 339-9400
www.mrce.com

June 9, 2016

JDS Development Group
104 Fifth Ave
New York, New York 10011

Attention: Mr. Simon Koster

Re: Geotechnical Report
Phase 1 Boring Investigation
9 DeKalb (340 Flatbush Ave Extension)
Brooklyn, New York
MRCE File No. 12319

Dear Mr. Koster,

As per your request, Mueser Rutledge Consulting Engineers (MRCE) has completed a Phase 1 subsurface boring investigation for the referenced project. This report presents a summary of our investigation, our interpretation of subsurface conditions encountered in the borings, and general foundation recommendations for the proposed construction.

PROJECT AND SITE DESCRIPTION

We understand that you are planning a high-rise tower development at the referenced site in Brooklyn, New York (See Figure No. S-1). The development will include two cellar levels and will incorporate the existing landmarked bank building. The footprint of the new structure is about 16,700 square feet.

Prior to development, the site was occupied by two buildings. The north building with two stories was demolished down to the first floor slab prior to our investigation. The five to six story south building will be demolished at a later date. Phase 1 investigation was performed for construction to be performed prior to demolition of the south building.

NYC Transit subway lines run underneath Flatbush Avenue adjacent to the site. MRCE submitted drawings detailing the subsurface investigations to NYC Transit and received approval to perform the investigations.

Sidewalk grades around the site range from Elev. +37.5 to Elev. +42.8. All elevations in this report are referenced to the North American Vertical Datum of 1988 (NAVD 88).

EXHIBITS

The following exhibits are attached:

Exhibit	Description
Figure No. S-1	Site Location Plan
Drawing No. B-1	Boring Location Plan
Drawing No. GS-R	Geotechnical Reference Standards
Drawing No. RC-1	Rock Classification Criteria

Appendix	Description
Appendix A	MRCE Boring Logs

SUBSURFACE INVESTIGATION

MRCE developed a twelve-boring subsurface investigation program to provide adequate information on subsoil conditions for foundation design and to meet NYC Building Code (Code) requirements for a building supported on deep foundations. Phase 1 included eleven borings, Borings M-1 and M-3 to M12P. Phase 2 will include the remaining one boring, Boring M-2, and will be completed at a later time following demolition of the south building.

All Phase 1 borings were drilled by Aquifer Drilling and Testing, Inc. (ADT) between June 2015 and April 2016 under the continuous inspection of our resident engineers, Mr. Andy Ong and Mr. Matthew Kramer, who prepared field logs for each boring. Drawing No. B-1 shows the as-drilled boring locations as measured by our resident engineers. The borings were made with a track mounted drill rig and restricted access electric drill rig using rotary techniques with casing and drilling mud to stabilize the borehole. Some borings were advanced from the existing cellars. Samples were obtained using a 2-inch O.D. split-spoon sampler driven with a 140-pound hammer falling 30 inches. The number of hammer blows required to advance the split-spoon sampler through each of four six-inch drive intervals was recorded. The Standard Penetration Test (SPT) resistance or N-value, expressed in blows per foot, is an indication of the relative density of the material sampled and is calculated by summing the blows from the second and third six-inch intervals. In some instances where the sampler was unable to penetrate the full 24 inches due to the presence of dense soils, large gravel, cobbles, boulders, or other obstructions, the sampler was driven until 50 to 100 blows were administered and the actual penetration of the sampler was measured and recorded.

Each boring cored at least ten feet of bedrock. Bedrock was cored using an NX-size, double-tube core barrel equipped with a diamond bit, recovering a nominal 2-inch diameter rock core. Percent recovery and Rock Quality Designation (RQD) were determined for each core run. RQD is defined as the sum of the lengths of recovered core pieces greater than four inches in length between natural breaks expressed as a percentage of the total core run. RQD is an indication of the relative

frequency of jointing or natural fracturing of the bedrock. Rock cores were stored in wooden boxes for shipment to our laboratory for verification of field classifications

After completion of the boring program, all soil samples and rock cores were delivered to our in-house laboratory for verification of field classifications. Individual soil sample descriptions are provided on the typed logs in Appendix A. The MRCE soil classification system is shown on Drawing No. GS-R. Sketches of recovered cores prepared in the field are also attached to the boring logs. Rock core classification terminology and criteria used are shown on Drawing No. RC-1.

A slotted standpipe piezometer (groundwater observation well) was installed in Borings M-4PA and M-12P to measure depth to groundwater. The piezometer sketches are attached to the borings logs. The well was flushed with clean water. A falling head test was performed in each piezometer to confirm it is functional.

SUBSURFACE CONDITIONS

Site Geology Paleozoic bedrock lies below the site roughly at about Elev. -100. A series of glaciations crossed the region during the Pleistocene epoch. The glacial ice scoured away older soil and deposited assorted layers of glacial sediments above the rock. The most recent glacier stopped about a mile to the southeast, building up a terminal moraine. At the end of the last ice age the glacier retreated northward, depositing outwash sand behind the terminal moraine. Minor re-advances of the glacial ice during the final retreat densified the soil below and deposited layers of till above the older outwash sand. Shallow man-made fills were used to facilitate development of the area.

General descriptions of the materials encountered below the cellar slab are summarized below in order of their occurrence with depth:

Stratum F – Fill (NYC Class 7) All borings encountered an up to 10 foot thick layer of fill below the cellar slab consisting of brown fine to coarse sand with some silt, gravel, and traces of concrete, brick, and asphalt. N values ranged from 0 (weight of rods) to over 100 blows per foot (bpf), with an average of about 25 bpf. Rock fragments and obstructions were observed in this layer.

Strata S & T – Glacial Sand and Upper Till (NYC Class 3) All borings encountered a thick layer of assorted densities of glacial sand and till below the fill. The thickness of these deposits typically ranges from 80 to 100 feet. These strata generally consist of brown fine to medium sand, with trace gravel and silt present. Typical N-values range from 20 bpf to over 100 bpf with an average of about 50 bpf.

Stratum C – Clay (NYC Class 4) Most borings encountered a layer of clay underlying the above glacial deposits. Typical N-values range from 20 to over 100 bpf with an average of about 42 bpf. This layer consisted of dense gray clay, with trace mica present in some samples.

Stratum T – Lower Till (NYC Class 3) Some borings encountered a layer of lower till up to about 10 feet thick below Stratum C. This layer was encountered when sampling reached refusal and coring was required, and most of the granular material was washed out of the sample during coring.

The cores recovered within the lower till consisted of gray and brown gravel and cobbles. N-values were not obtained.

Stratum R – Bedrock (NYC Class 1) The top of rock depths generally ranges from 100 to 120 feet below sidewalk. The bedrock typically consisted of slightly weathered to unweathered gray schistose gneiss, broken to massive, with iron stained and weathered joints. Rock core recoveries ranged from 40% to 100% and RQD values ranged from 0% to 93%.

Groundwater Groundwater level observations in the two piezometers installed in Boring M-4PA and M-12P measured at Elev. +2.5 to Elev. +3.4 during our investigations.

GENERAL FOUNDATION RECOMMENDATIONS

Foundation design must take into account the existing subsurface conditions and presence of adjacent structures including the landmark bank building and subway tunnels. Considering typical column and shear wall loads for proposed tower, subsurface conditions, and presence of the subway tunnel, deep caisson foundations drilled into bedrock should be used to support the proposed tower. Drilled mini-caissons and footings bearing directly on natural sand deposits underlying the site should also be considered for smaller load columns within the low rise portions of the development. The foundation design will be governed by demands for compression, lateral and uplift capacities.

The intent of using drilled elements is to penetrate the existing dense overburden soils (and boulders) with limited installation vibrations. In order to meet NYC Transit criteria for foundations adjacent to subway tunnels, drilled foundations within the subway influence lines must be installed with internal flush drill methods, and a permanent frictionless casing extended below the tunnel influence lines. Such installation methods will also reduce risk of significantly impacting adjacent buildings. For sandy soils, the subway influence lines typically have a slope of 1 to 1.5 horizontal to 1 vertical from the base of the subway structure. Within ten feet of the subway tunnel, foundations will need to develop their capacity below the base of the tunnel. Drilled caissons or min-caissons can be installed a minimum of three feet from the subway, measured from the edge of the pile or casing to the wall of the subway. Note that remnants of support of excavation used for the tunnel construction may potentially interfere with foundation drilling near the subway.

Basement Slab and Walls The basement slab should be designed as a structural slab spanning between pile caps and beams. The foundation walls should be designed to resist at-rest earth pressures and surcharges consistent with the Code. As the proposed basement is above the natural groundwater table measured during our subsurface investigation, long term groundwater pressure does not need to be considered. The design of the walls should however consider short-term groundwater pressure (say 5 feet of pressure head) for an extreme condition of a large water main break.

Waterproofing of the basement is not required and only a damp proofing requirement is included in the Code. However, if higher quality spaces are to be located in the basement you should consider waterproofing the cellar to limit infiltration of surface water seepage (e.g., from rain) and limit problems in the event of a utility break underneath the street.

Seismic Design The site is in seismic Site Class D as per the Code. Site Class D results in Seismic Design Category (SDC) B. A site specific study could improve the design accelerations by up to 20 percent when compared with the Code accelerations but would not improve the SDC.

Adjacent Structures Consideration should be given during construction to protection, instrumentation, and monitoring of the adjacent structures that include the landmark bank building and subway structures abutting the project site. NYC Transit approval will be required for support of excavation and foundation design.

We trust this report will allow you to proceed with the design of the project. More detailed recommendations will be provided as needed.

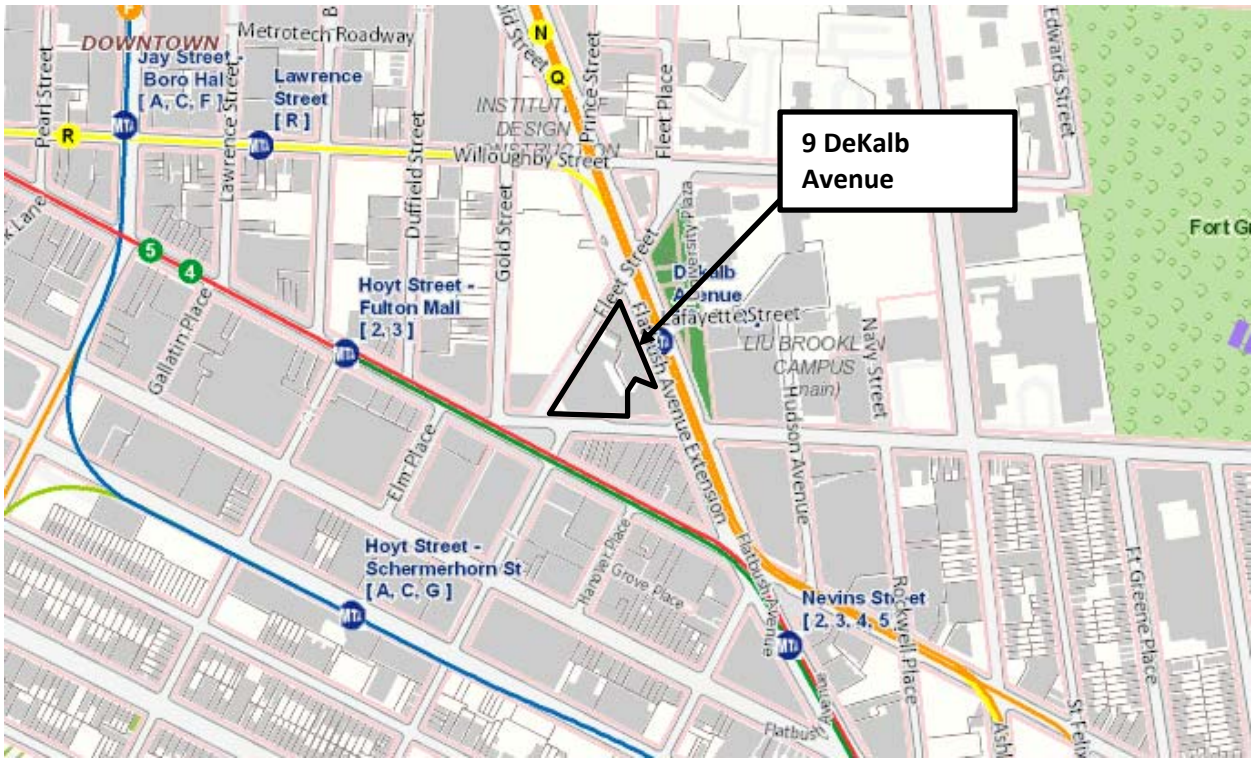
Very truly yours,

MUESER RUTLEDGE CONSULTING ENGINEERS

By: _____
Jan Cermak, P.E.

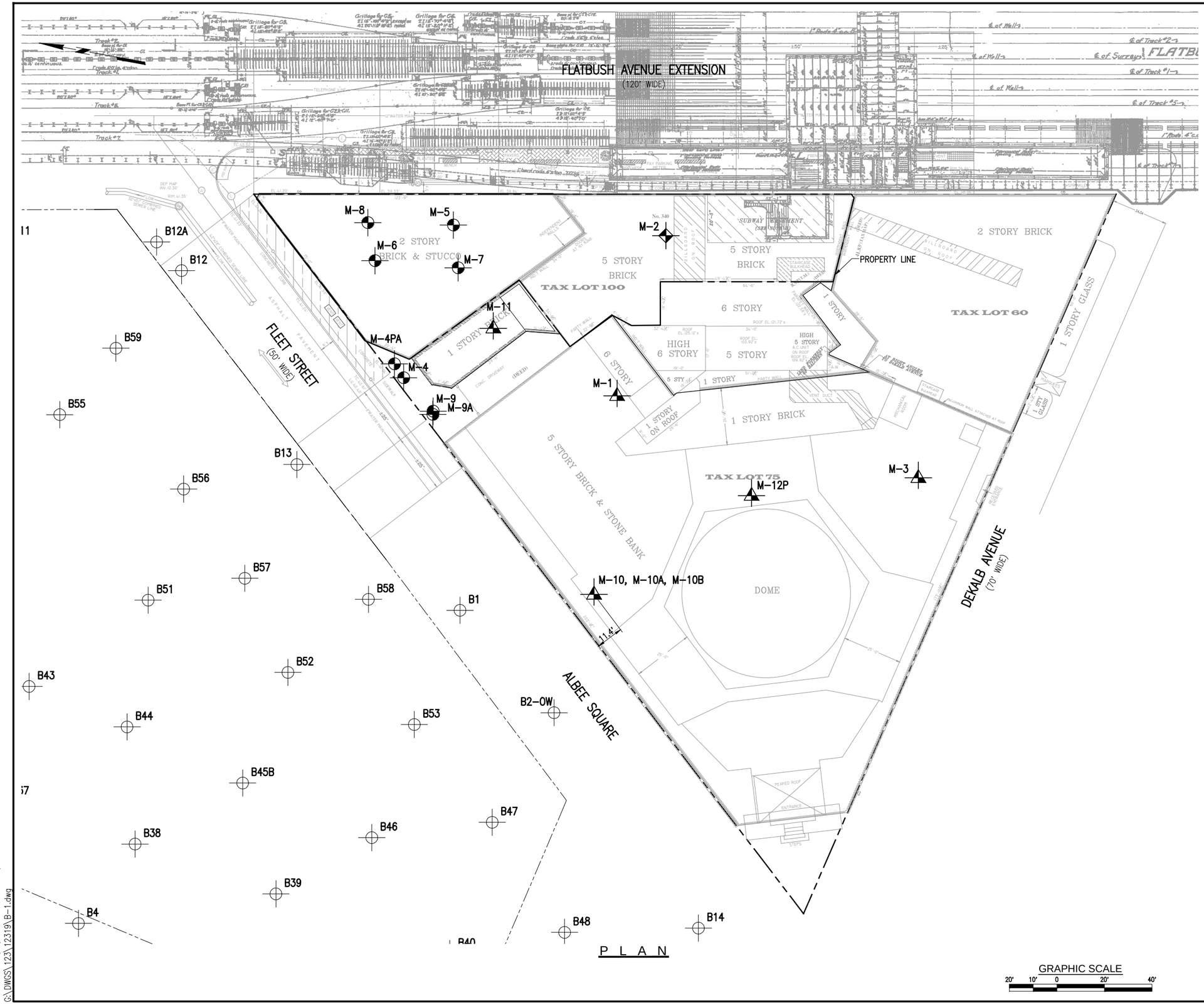
AEP:JC:F:\123\12319\Geotechnical Report\Geotech Report 12319.docx

EXHIBITS



NOTE: PLAN OBTAINED FROM NYC OASIS.
NOT TO SCALE.

9 DeKalb Avenue Extension, Brooklyn, NY	
Mueser Rutledge Consulting Engineers 225 West 34th Street • New York, NY 10122	MRCE File No. 12319
SITE LOCATION PLAN	FIGURE NO. **S-1**



P L A N

GRAPHIC SCALE
20' 10' 0 20' 40'

NOTES:

1. BASE PLAN OBTAINED FROM ARCHITECTURAL SURVEY BY EMPIRE STATE LAYOUT, INC. DATED 5/28/2014.
2. SUBWAY LOCATIONS AND ELEVATIONS WERE OBTAINED FROM NYCT DRAWINGS.
3. AS-DRILLED LOCATIONS WERE MEASURED IN THE FIELD BY OUR RESIDENT ENGINEERS.
4. BORINGS WERE MADE IN ACCORDANCE WITH THE NEW YORK CITY BUILDING CODE AND THE STANDARD SPECIFICATIONS FOR SUBSURFACE BORING AND SAMPLING BY MUESER RUTLEDGE CONSULTING ENGINEERS (MRCE).
5. ALL BORINGS WERE MADE UNDER THE CONTINUOUS INSPECTION OF MRCE.
6. PHASE 1 BORINGS WERE MADE BY AQUIFER DRILLING AND TESTING (ADT) BETWEEN JUNE 2015 AND APRIL 2016. PHASE 2 BORING TO BE MADE AT A LATER DATE FOLLOWING FURTHER DEMOLITION. ALL BORINGS WERE MADE USING ROTARY DRILLING METHODS EMPLOYING CASING AND DRILING MUD TO MAINTAIN A STABLE BOREHOLE.
7. SOIL SAMPLES WERE COLLECTED USING A 2-INCH DIAMETER SPLIT-SPOON SAMPLER ADVANCED WITH A 140-POUND HAMMER FALLING 30 INCHES.
8. ROCK CORING WAS PERFORMED USING A NX-SIZE DOUBLE-BARREL CORE SAMPLER WITH A DIAMOND BIT.
9. BORINGS NOT RECEIVING A PIEZOMETER WERE GROUTED UPON COMPLETION.
10. ELEVATIONS REFER TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88).

LEGEND:

M-1P – AS DRILLED PHASE 1 MRCE BORING "P" – PIEZOMETER

M-3P

M-2 – PROPOSED PHASE 2 MRCE BORING

B1 – EXISTING BORING BY OTHERS

REV.	DATE	BY	DESCRIPTION
2	04-04-16	A.O.	ADDED COMPLETED BORINGS
1	07-23-15	A.E.P.	ADDED COMPLETED BORINGS

9 DEKALB AVENUE

BROOKLYN NEW YORK

JDS DEVELOPMENT GROUP

NEW YORK NEW YORK

MUESER RUTLEDGE CONSULTING ENGINEERS

14 PENN PLAZA – 225 W. 34TH STREET, NY, NY 10122

SCALE	MADE BY: A.E.P.	DATE: 01-07-2016	FILE NUMBER
GRAPHIC	CH'KD BY: J.C.	DATE: 01-07-2016	12319

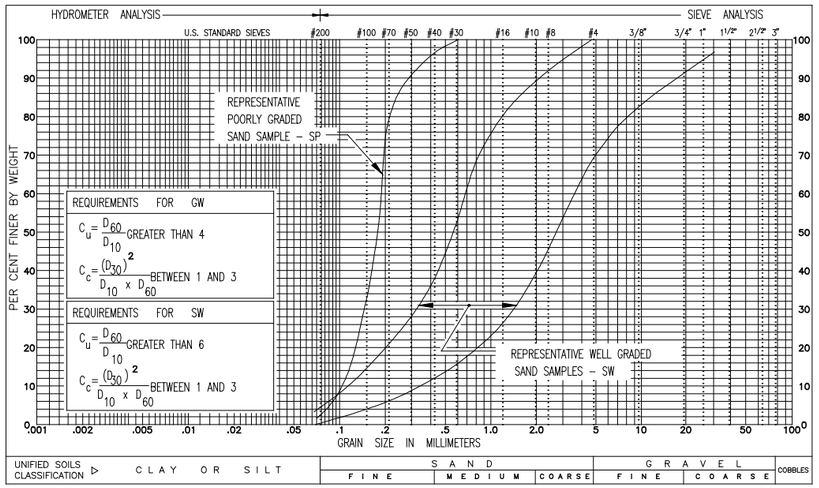
BORING LOCATION PLAN — DRAWING NUMBER B-1

UNIFIED SOIL CLASSIFICATION (INCLUDING IDENTIFICATION AND DESCRIPTION)

1 MAJOR DIVISIONS	2		3 GROUP SYMBOLS	4 TYPICAL NAMES	5 FIELD IDENTIFICATION PROCEDURES (EXCLUDING PARTICLES LARGER THAN 3 IN. AND BASING FRACTIONS ON ESTIMATED WEIGHTS)
COARSE-GRAINED SOILS: MORE THAN HALF OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE. THE NO. 200 SIEVE SIZE IS ABOUT THE SMALLEST PARTICLE VISIBLE TO THE NAKED EYE	GRAVELS: MORE THAN HALF OF COARSE FRACTION IS LARGER THAN NO. 4 SIEVE SIZE. (FOR VISUAL CLASSIFICATION, THE 1/4 -IN. SIZE MAY BE USED AS EQUIVALENT TO THE NO. 4 SIEVE SIZE)	CLEAN GRAVELS (LITTLE OR NO FINES)	GW	WELL GRADED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES.	WIDE RANGE IN GRAIN SIZES AND SUBSTANTIAL AMOUNTS OF ALL INTERMEDIATE PARTICLE SIZES.
			GP	POORLY GRADED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES.	PREDOMINANTLY ONE SIZE OR A RANGE OF SIZES WITH SOME INTERMEDIATE SIZES MISSING.
		GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES)	GM	SILTY GRAVELS, GRAVEL-SAND-SILT-MIXTURES.	NONPLASTIC FINES OR FINES WITH LOW PLASTICITY (FOR IDENTIFICATION PROCEDURES SEE ML BELOW)
			GC	CLAYEY GRAVELS, GRAVEL-SAND-CLAY MIXTURES.	PLASTIC FINES (FOR IDENTIFICATION PROCEDURES SEE CL BELOW)
	SANDS: MORE THAN HALF OF COARSE FRACTION IS SMALLER THAN NO. 4 SIEVE SIZE.	CLEAN SANDS (LITTLE OR NO FINES)	SW	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES.	WIDE RANGE IN GRAIN SIZES AND SUBSTANTIAL AMOUNTS OF ALL INTERMEDIATE PARTICLE SIZES.
			SP	POORLY GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES.	PREDOMINANTLY ONE SIZE OR A RANGE OF SIZES WITH SOME INTERMEDIATE SIZES MISSING.
		SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)	SM	SILTY SANDS, SAND-SILT-MIXTURES.	NONPLASTIC FINES OR FINES WITH LOW PLASTICITY (FOR IDENTIFICATION PROCEDURES SEE ML BELOW)
			SC	CLAYEY SANDS, SAND-CLAY MIXTURES.	PLASTIC FINES (FOR IDENTIFICATION PROCEDURES SEE CL BELOW)
FINE-GRAINED SOILS: MORE THAN HALF OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE. THE NO. 200 SIEVE SIZE IS ABOUT					IDENTIFICATION PROCEDURES ON FRACTION SMALLER THAN NO. 40 SIEVE SIZE
					DRY STRENGTH (CRUSHING CHARACTERISTICS) / DILATANCY (REACTION TO SHAKING) / TOUGHNESS (CONSISTENCY NEAR PL)
	SILTS AND CLAYS: LIQUID LIMIT IS LESS THAN 50		ML	INORGANIC SILTS, SANDY SILTS, ROCK FLOUR, OR CLAYEY SILTS WITH SLIGHT PLASTICITY.	NONE TO SLIGHT / QUICK TO SLOW / NONE
			CL	INORGANIC CLAYS, OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS.	MEDIUM TO HIGH / NONE TO VERY SLOW / MEDIUM
			OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY.	SLIGHT TO MEDIUM / SLOW / SLIGHT
	SILTS AND CLAYS: LIQUID LIMIT IS GREATER THAN 50		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SANDY OR SILTY SOILS, ELASTIC SILTS.	SLIGHT TO MEDIUM / SLOW TO NONE / SLIGHT TO MEDIUM
			CH	INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS.	HIGH TO VERY HIGH / NONE / HIGH
			OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS.	MEDIUM TO HIGH / NONE TO VERY SLOW / SLIGHT TO MEDIUM
HIGHLY ORGANIC SOILS			Pt	PEAT AND OTHER HIGHLY ORGANIC SOILS.	READILY IDENTIFIED BY COLOR, ODOR, SPONGY FEEL AND FREQUENTLY BY FIBROUS TEXTURE.

BOUNDARY CLASSIFICATIONS: SOILS POSSESSING CHARACTERISTICS OF TWO GROUPS ARE DESIGNATED BY COMBINATIONS OF GROUP SYMBOLS, I.E.: SP-SC POORLY GRADED SAND WITH CLAY BINDER.

LABORATORY CLASSIFICATION CRITERIA

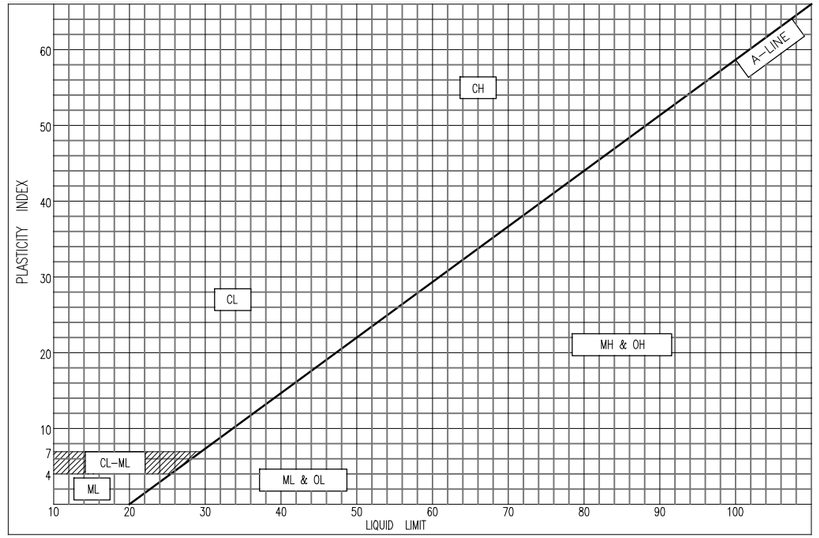


GRAIN SIZE PLOT

COBBLE 3-12"
BOULDER > 12"

DEPENDING ON PERCENTAGE OF FINES (FRACTION SMALLER THAN NO. 200 SIEVE SIZE) COARSE GRAINED SOILS ARE CLASSIFIED AS FOLLOWS:

LESS THAN 5%	GW, GP, SW, SP
MORE THAN 12%	GM, GC, SM, SC
5% TO 12%	BORDERLINE CASES REQUIRING USE OF DUAL SYMBOLS, I.E.: SP-SM, GP-GM.



PLASTICITY CHART FOR CLASSIFICATION OF FINE GRAINED SOILS

TERMINOLOGY USED IN MRCE SOIL DESCRIPTIONS

DEGREE OF COMPACTION FOR NON-PLASTIC SOIL

DEGREE OF COMPACTION	BLOWS* PER FOOT
LOOSE	0 TO 10
MEDIUM COMPACT	11 TO 29
COMPACT	30 TO 50
VERY COMPACT	GREATER THAN 50

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

CONSISTENCY OF CLAY AND CLAYEY SILT+

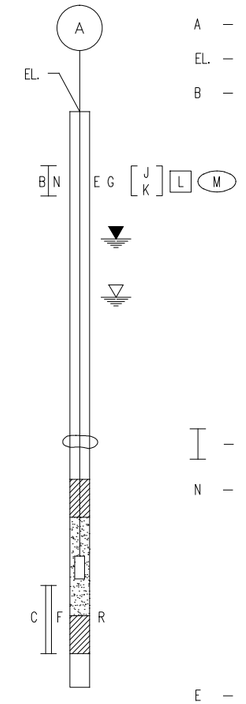
CONSISTENCY	UNCONFINED COMPRESSIVE STRENGTH (TSF)	IDENTIFICATION CHARACTERISTICS
SOFT	LESS THAN 0.5	EASILY REMOLDED WITH SLIGHT FINGER PRESSURE
MEDIUM	0.5 TO 1.0	REQUIRES SUBSTANTIAL PRESSURE FOR REMOLDING
STIFF	1.0 TO 4.0	DIFFICULT TO REMOLD WITH FINGERS
HARD	GREATER THAN 4.0	CANNOT BE REMOLDED WITH FINGERS

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

DESCRIPTION OF CONSTITUENT PERCENTAGES AS USED IN SOIL SAMPLE CLASSIFICATIONS

- 1% TO 12% - "TRACE"
- 13% TO 30% - "SOME"
- 31% TO 49% - ADJECTIVE FORM OF SOIL GROUP (EG. SANDY)
- EQUAL AMOUNT - "AND" (EG. SAND AND GRAVEL)

BORING LEGEND



- A — NUMBER, TYPE AND LOCATION OF BORING
- EL. — GROUND SURFACE ELEVATION AT BORING
- B — NUMBER AND TYPE OF SAMPLE
  - HA - HAND AUGER SAMPLE
  - D - DRY SAMPLE TAKEN WITH 2 INCH O.D. SPLIT SPOON
  - U - UNDISTURBED SAMPLE TAKEN WITH 3 INCH O.D. FIXED PISTON TYPE SAMPLER
  - UD - UNDISTURBED SAMPLE EXTRUDED IN FIELD AND PLACED IN JAR DUE TO POOR RECOVERY OR DISTURBANCE
  - S - THIN TUBE SAMPLE TAKEN WITH SHELBY TUBE SAMPLER
  - N - THIN TUBE SAMPLE TAKEN WITH DENISON BARREL SAMPLER
  - P - THIN TUBE SAMPLE TAKEN WITH PITCHER BARREL SAMPLER
  - NR - NO RECOVERY
- | — LENGTH OF SAMPLE ATTEMPT
- N — STANDARD PENETRATION RESISTANCE. NUMBER OF BLOWS FROM 140 LB. HAMMER FREE FALLING 30 INCHES REQUIRED TO DRIVE 2 INCH O.D. SPLIT SPOON SAMPLER ONE FOOT AFTER INITIAL PENETRATION OF 6 INCHES, UNLESS A SPECIFIC PENETRATION IS INDICATED.
  - P - PRESSED OR PUSH SAMPLE
  - WH - SAMPLE TAKEN UNDER WEIGHT OF HAMMER AND RODS
  - WR - SAMPLE TAKEN UNDER WEIGHT OF RODS
- E — AVERAGE NATURAL WATER CONTENT OF SAMPLE, IN PERCENT OF DRY WEIGHT
- G — UNIFIED SOIL CLASSIFICATON GROUP SYMBOL OF SAMPLE
- [J / K] = ATTERBERG LIQUID LIMIT VALUE / ATTERBERG PLASTIC LIMIT VALUE
- [L] — COMPRESSIVE STRENGTH IN TSF DETERMINED FROM UNCONFINED COMPRESSION TEST
- (M) — COMPRESSIVE STRENGTH IN TSF DETERMINED FROM UNCONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION TEST
- ▼ — GROUNDWATER LEVEL OBSERVED IN BORING
  - * - MUD LEVEL
- ▽ — GROUNDWATER LEVEL OBSERVED IN PIEZOMETER
- C — ROCK CORE NUMBER
- | — LENGTH OF CORE RUN
- F — LENGTH OF CORE RECOVERED EXPRESSED AS A PERCENT OF THE LENGTH OF CORE RUN
- R — ROCK QUALITY DESIGNATION-THE SUM OF THE LENGTHS OF PIECES OF RECOVERED CORE WHICH ARE EQUAL TO OR GREATER THAN FOUR INCHES IN LENGTH, EXPRESSED AS A PERCENTAGE OF THE TOTAL LENGTH OF CORE RUN. LENGTHS ARE MEASURED BETWEEN IN-SITU SEPARATIONS AND MECHANICAL BREAKS RESULTING FROM CORING ARE IGNORED.
- IMPERVIOUS SEAL
- SAND FILTER SURROUNDING PIEZOMETER INTAKE ELEMENT
- INTAKE ELEMENT
- COBBLE OR BOULDER

REVISED 10-25-2012

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

GEOTECHNICAL REFERENCE STANDARDS

DRAWING NO. GS-R

TABLE R–1 ROCK CORE CLASSIFICATION CRITERIA

HARDNESS/SOUNDNESS CLASSIFICATION	TYPICAL GEOLOGIC CLASSIFICATION	IDENTIFICATION CHARACTERISTICS	GENERAL MINIMUM CORING CHARACTERISTICS				INTACT SPECIMEN TYPICAL MINIMUM COMPRESSIVE STRENGTH
			NX OR LARGER		BX OR SMALLER		
			REC	RQD	REC	RQD	PSI
HARD ROCK UNWEATHERED MAY BE JOINTED	–CRYSTALLINE IGNEOUS, OR METAMORPHIC ROCKS –HIGHLY SILICEOUS SEDIMENTARY ROCKS	– UNWEATHERED FABRIC – RINGS WHEN STRUCK WITH BAR – SHARP AND HARD FRACTURE SURFACE WHEN BROKEN MECHANICALLY – MAY BE JOINTED, BUT JOINTS ARE GENERALLY TIGHT. JOINTS MAY BE IRON STAINED. – DOES NOT DISINTEGRATE UPON EXPOSURE – DOES NOT SLAKE IN WATER	95 OR MORE	85 OR MORE	85 OR MORE	75 OR MORE	3000
MEDIUM HARD ROCK SLIGHTLY WEATHERED MAY BE CLOSELY JOINTED	AS FOR HARD ROCKS AND: – MODERATELY SILICEOUS SEDIMENTARY ROCKS – CERTAIN CALCAREOUS ROCKS	AS FOR HARD ROCK, EXCEPT: – FABRIC MAY BE IRON STAINED – MAY BE CLOSELY JOINTED, BUT JOINTS ARE GENERALLY TIGHT. JOINTS HAVE SLIGHT WEATHERING OR MAY BE IRON STAINED.	70	50	50	40	1500
INTERMEDIATE ROCK MODERATELY WEATHERED MAY BE CLOSELY JOINTED	AS FOR MEDIUM HARD ROCKS AND: – MOST SEDIMENTARY ROCKS OTHER THAN COMPACTION SHALES – MOST CALCAREOUS ROCKS WHICH ARE NOT POROUS	AS FOR MEDIUM HARD ROCK, EXCEPT: – MODERATELY WEATHERED FABRIC – WEATHERED JOINTS – THUDS WHEN STRUCK BY BAR – CAN BE INDENTED WITH A STEEL NAIL – BREAKS READILY WITH HAMMER – PIECES OF WEATHERED SURFACE CAN BE BROKEN OFF BY HAND – DOES NOT DISINTEGRATE UPON EXPOSURE – UNWEATHERED PIECES DO NOT SLAKE	50	35	35	25	500
WEATHERED ROCK HIGHLY WEATHERED MAY BE BROKEN	AS FOR INTERMEDIATE ROCKS AND: – COMPACTION SEDIMENTARIES – CALCAREOUS ROCKS WITH SOIL–FILLED CAVITIES	AS FOR INTERMEDIATE ROCK, EXCEPT: – HIGHLY WEATHERED FABRIC – CAN BE BROKEN EASILY, CRUMBLES WITH DIFFICULTY BY HAND – CAN BE SCRAPED BY KNIFE – MAY SOFTEN UPON EXPOSURE – MAY SLAKE IN WATER – STANDARD PENETRATION RESISTANCE EXCEEDS 50 BLOWS/FOOT	LESS THAN 50	LESS THAN 35	LESS THAN 35	LESS THAN 25	150
		WHEN RECOVERED WITH SOIL SAMPLING TECHNIQUES, DESCRIBED AS FOR SOILS INCLUDING USC GROUP SYMBOLS. (WTHD ROCK) ADDED TO DESCRIPTION.					
DECOMPOSED ROCK (RESIDUAL SOILS)	ALL ROCK TYPES	– ROCK TEXTURE AND STRUCTURE OFTEN PRESERVED – GENERALLY SOIL–LIKE IN CONSISTENCY – CAN BE CRUMPLED BY SLIGHT HAND PRESSURE – CAN BE PEELED WITH A KNIFE – STANDARD PENETRATION RESISTANCE LESS THAN 50 BLOWS/FOOT	GENERALLY RECOVERED WITH SOIL SAMPLING TECHNIQUES AND DESCRIBED AS FOR SOILS INCLUDING USC GROUP SYMBOLS. (DEC ROCK) ADDED TO DESCRIPTION.				

NOTES:

1. ROCK CORE DESCRIPTIONS REPRESENT ONLY THE MATERIAL RECOVERED IN THE CORING OPERATIONS.
2. GENERAL MINIMUM CORING CHARACTERISTICS ASSUME ROCK CORING WITH A DOUBLE TUBE SERIES "M" OR EQUIVALENT CORE BARREL USING GOOD CORING TECHNIQUES AND EQUIPMENT.
3. REC – RECOVERY IS THE LENGTH OF CORE RECOVERED, EXPRESSED AS A PERCENTAGE OF THE LENGTH OF CORE RUN.
4. RQD – ROCK QUALITY DESIGNATION IS THE SUM OF THE LENGTHS OF CORE PIECES FOUR INCHES OR LONGER EXPRESSED AS A PERCENTAGE OF THE TOTAL LENGTH OF CORE RUN. LENGTHS ARE MEASURED BETWEEN IN–SITU SEPARATIONS; MECHANICAL BREAKS RESULTING FROM CORING AND VERTICAL JOINTS ARE IGNORED.

TABLE R–2 WEATHERING AND JOINTING DEFINITIONS

DEGREE OF FABRIC WEATHERING

FABRIC WEATHERING		CHARACTERISTIC
Unweathered	UnW	No decomposition or discoloration rings when struck
Slightly Weathered	SlW	Iron Stained Rings when struck
Moderately Weathered	MdW	Deteriorated fabric Thuds when struck
Highly Weathered	HiW	Friable, easily broken by hand
Decomposed	Dec	Soil–like

DEGREE OF JOINT WEATHERING

JOINT WEATHERING		CHARACTERISTIC
Iron stained joints	FeJtS	Indicates movement of water along joints
Weathered joints	WJts	Joints are not tight and do not match. Joints have friable edges.

DEGREE OF JOINTING

JOINTING		JOINT FREQUENCY
Massive	Mssv	Less than 1 joint in 4 feet
Blocky	Blky	1 joint every 2 to 4 feet
Moderately Jointed	MdJtd	1 joint every foot to 2 feet
Jointed	Jtd	1 to 2 joints per foot
Closely Jointed	ClJtd	2 to 4 joints per foot
Broken	Bkn	More than 4 joints per foot

Vertical joints are ignored in RQD and joint frequency evaluations, but are noted in written descriptions and and on core sketches.

TABLE R–3 ABBREVIATIONS FOR ROCK CORE CLASSIFICATION

Blocky	Blky	Intermediate	Int
Broken	Bkn	Light	Lt
Brown	brn	Lignite	lign
Calcareous or Calcite	calc	Limestone	lms
Cavities	cvts	Jointed	Jtd
Chlorite	chl	Joints	Jts
Clay, Clayey	cl	Massive	Mssv
Closely Jointed	ClJtd	Medium Hard	MdHd
Coating on joint surface	coat	Mica, Micaceous	Mic
Crushed	crsh	Moderately Jointed	MdJtd
Dark	dk	Moderately Weathered	MdW
Decomposed	Dec	Pockets	pkts
Ditto	do	Quartz	qtz
Dolomite, Dolomitic	Dol	Recovery	Rec
Iron stained Joints	FeJts	Rock Quality Designation	RQD
Iron Stained	FeStn	Sand	sa
Feldspar	feld	Sandstone	ss
Foliation	Fol	Schist, Schistose	sch
Fractured	frct	Shale	sh
Fragments	fgmts	Shear zone	Sz
Gneiss, Gneissic	gns	Siliceous	sil
Gouge	gog	Silt	si
Granite, Granitic	gr	Slickensided	slks
Gray	gry	Slightly Weathered	SlW
Hard	Hd	Unweathered	UnW
Highly Weathered	HiW	Weathered	Wthd
Hornblende	Hbl	Weathered Joints	WJts
Injected	inj	Vein	Vn
Interbedded	Intrbd	Vertical Joints	VJts

TABLE R–4 ROCK CORE SKETCH KEY

SKETCH SYMBOLS

- Joint
- Healed Joint
- Broken
- Part of Core Not Recovered
- Cavities or Vugs in Core
- Clay
- Sand

JOINT ORIENTATION AND CONDITION

			SURFACE – CONDITION			
Parallel	–	//	Curved	– C	Slick	– 1
Crossing	–	X	Irregular	– I	Smooth	– 2
Foliation	–	F	Straight	– S	Rough	– 3
Stratification	–	S				
Unfoliated or Unstratified	–	U				
Mechanical Break	–	MB				

MUESER RUTLEDGE CONSULTING ENGINEERS
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NEW YORK, NY 10122

ROCK CORE CLASSIFICATION CRITERIA

DRAWING NO. RC–1

APPENDIX A

MRCE BORING LOGS

MUESER RUTLEDGE CONSULTING ENGINEERS

BORING LOG

BORING NO. M-4P
SHEET 1 OF 2
PROJECT: 340 FAE **FILE NO.** 12319
LOCATION: BROOKLYN, NEW YORK **SURFACE ELEV.** 42.5
RES. ENGR. MATTHEW KRAMER

DAILY PROGRESS	SAMPLE NO.	SAMPLE DEPTH	SAMPLE BLOWS/6"	SAMPLE DESCRIPTION	STRATA	DEPTH	CASING BLOWS	REMARKS
08:00	1D	0.3	2-3	Gray black fine to coarse sand, some gravel,	**	0.3		**Concrete slab from
06-04-15		2.3	1-4	trace brick, concrete, silt (Fill) (SP-SM)				0' to 0.3'.
Thursday	2D	2.3	3-2	Brown silty fine to coarse sand, trace gravel,	F			1D: REC=4"
Overcast		4.3	2-2	brick, concrete (Fill) (SM)				Rig chatter at 3'.
60°F, 09:00						4.5		**Concrete from 4.5' to
					**	5		5'.
								Boring offset to inside
								property line.
								End of Boring at 5'.
						10		
						15		
						20		
						25		
						30		
						35		
						40		
						45		
						50		

MUESER RUTLEDGE CONSULTING ENGINEERS

BORING NO. M-4P
SHEET 2 **OF** 2

PROJECT 340 FAE
FILE NO. 12319
LOCATION BROOKLYN, NEW YORK
SURFACE ELEV. 42.5
BORING LOCATION SEE BORING LOCATION PLAN
DATUM NAVD 88

BORING EQUIPMENT AND METHODS OF STABILIZING BOREHOLE

TYPE OF BORING RIG	TYPE OF FEED DURING CORING		CASING USED					
TRUCK	MECHANICAL		DIA., IN.		DEPTH, FT. FROM		TO	
SKID	HYDRAULIC	X	DIA., IN.		DEPTH, FT. FROM		TO	
BARGE	OTHER		DIA., IN.		DEPTH, FT. FROM		TO	
OTHER	CME LC55							

TYPE AND SIZE OF:		DRILLING MUD USED					
D-SAMPLER	2" O. D. SPLIT SPOON	DIAMETER OF ROTARY BIT, IN.	2-7/8				
U-SAMPLER		TYPE OF DRILLING MUD	REVERT/QUIK MUD				
S-SAMPLER							
CORE BARREL	NX DOUBLE TUBE	AUGER USED					
CORE BIT	NX DIAMOND	TYPE AND DIAMETER, IN.					
DRILL RODS	NWJ						

*CASING HAMMER, LBS. 140 AVERAGE FALL, IN. 30
*SAMPLER HAMMER, LBS. 140 AVERAGE FALL, IN. 30
*USED AUTOMATIC HAMMER.

WATER LEVEL OBSERVATIONS IN BOREHOLE

DATE	TIME	DEPTH OF HOLE	DEPTH OF CASING	DEPTH TO WATER	CONDITIONS OF OBSERVATION
					NO WATER LEVEL OBSERVATIONS MADE.

PIEZOMETER INSTALLED [ ] YES [X] NO SKETCH SHOWN ON

STANDPIPE:	TYPE	ID, IN.	LENGTH, FT.	TOP ELEV.			
INTAKE ELEMENT:	TYPE	OD, IN.	LENGTH, FT.	TIP ELEV.			
FILTER:	MATERIAL	OD, IN.	LENGTH, FT.	BOT. ELEV.			

PAY QUANTITIES

3.5" DIA. DRY SAMPLE BORING	LIN. FT.	4.3	NO. OF 3" SHELBY TUBE SAMPLES	
3.5" DIA. U-SAMPLE BORING	LIN. FT.		NO. OF 3" UNDISTURBED SAMPLES	
CORE DRILLING IN ROCK	LIN. FT.		OTHER:	

BORING CONTRACTOR AQUIFER DRILLING & TESTING CO., INC.
DRILLER JAMES HELPERS DANNY
REMARKS BOREHOLE GROUTED UPON COMPLETION.
RESIDENT ENGINEER MATTHEW KRAMER DATE 06-04-15
CLASSIFICATION CHECK: CHERYL J. MOSS TYPING CHECK: ALEXANDRA PATRONE

MUESER RUTLEDGE CONSULTING ENGINEERS

BORING LOG

BORING NO. M-4PA
SHEET 1 OF 7
PROJECT: 340 FAE **FILE NO.** 12319
LOCATION: BROOKLYN, NEW YORK **SURFACE ELEV.** 42.5
RES. ENGR. MATTHEW KRAMER

DAILY PROGRESS	SAMPLE NO.	SAMPLE DEPTH	SAMPLE BLOWS/6"	SAMPLE DESCRIPTION	STRATA	DEPTH	CASING BLOWS 4"	CASING BLOWS 3"	REMARKS
12:30					**	0.3	DRILLED		**Concrete from 0' to
06-04-15							AHEAD		0.3'.
Thursday									Drilled ahead to 15'.
Overcast									
65°F						5			
					CELLAR				
						10			
						12.5			
					CONC SLAB				
						15			
	1D	15.0	14-16	Brown gray silty fine to medium sand, some	F				
		17.0	18-20	gravel (Fill) (SM)		17			
	2D	17.0	13-19	Brown fine to coarse sand, some silt, gravel					
		19.0	16-19	(SM)					
	3D	19.0	12-15	Brown fine to coarse sand, some silt, trace		20			
14:30		21.0	29-20	gravel (SM)					
07:30	4NR	21.0	33-35	No recovery					No recovery after 2
06-05-15		23.0	28-30						attempts.
Friday	5D	23.0	23-15	Brown fine to coarse sand, some silt, trace					
Overcast		25.0	18-18	gravel (SM)		25			
60°F									
						30			
	6D	30.0	17-33	Brown gravelly fine to coarse sand, some silt					
		32.0	38-48	(SM)					
					T				
						35			
	7D	35.0	47-49	Red brown fine to coarse sand, some gravel,					
		37.0	42-54	silt (SM)					
						40			
	8D	40.0	12-18	Red brown fine to coarse sand, trace silt, gravel					
		42.0	21-24	(SP-SM)					
						45			
	9D	45.0	13-15	Red brown fine to coarse sand, some gravel,					
		47.0	20-21	trace silt (SP-SM)					Wet sample at 47'.
						48.5			
					S	50			
	10D	50.0	6-11	Top: Brown f-m sand, trace silt (SP-SM)		51			
		52.0	18-36	Bot: Brown f-c sand, sm gravel, tr silt (SP)	G				

MUESER RUTLEDGE CONSULTING ENGINEERS

BORING LOG

BORING NO. M-4PA
SHEET 2 OF 7
PROJECT: 340 FAE **FILE NO.** 12319
LOCATION: BROOKLYN, NEW YORK **SURFACE ELEV.** 42.5
RES. ENGR. MATTHEW KRAMER

DAILY PROGRESS	SAMPLE NO.	SAMPLE DEPTH	SAMPLE BLOWS/6"	SAMPLE DESCRIPTION	STRATA	DEPTH	CASING BLOWS	REMARKS
Cont'd							DRILLED	
06-05-15							AHEAD	
Friday							4" 3"	
Overcast							↓	
60°F						**55**		
	11D	55.0	6-15	Brown fine to medium sand, trace gravel,				
		57.0	21-24	coarse sand, silt (SP-SM)				
						60		
	12D	60.0	15-21	Brown fine to medium sand, trace silt, coarse				
		62.0	24-25	sand (SP-SM)				
						65		
	13D	65.0	16-20	Brown fine to medium sand, trace silt (SP-SM)				
14:15		67.0	21-27					
07:30								
06-08-15								
Monday						**70**		
Overcast	14D	70.0	19-21	Brown fine to medium sand, trace silt (SP-SM)				
70°F		72.0	23-25					
						75		
	15D	75.0	23-22	Brown fine to medium sand, trace silt (SP-SM)				
		77.0	24-29		**S**			
						80		
	16D	80.0	19-24	Brown fine to medium sand, trace silt, mica				
		82.0	28-30	(SP-SM)				
						85		
	17D	85.0	21-28	Brown fine to medium sand, trace silt, mica				
		87.0	27-34	(SP-SM)				
						90		
	18D	90.0	32-33	Brown fine to coarse sand, trace silt, mica				
		92.0	36-41	(SP-SM)				
						95		
	19D	95.0	24-27	Brown fine to medium sand, trace silt, coarse				
		97.0	32-32	sand (SP-SM)				
						100		
	20D	100.0	23-27	Brown fine to medium sand, trace silt, mica				
		102.0	30-29	(SP-SM)			↓	

MUESER RUTLEDGE CONSULTING ENGINEERS

BORING LOG

BORING NO. M-4PA
SHEET 3 OF 7
PROJECT: 340 FAE **FILE NO.** 12319
LOCATION: BROOKLYN, NEW YORK **SURFACE ELEV.** 42.5
RES. ENGR. MATTHEW KRAMER

DAILY PROGRESS	SAMPLE NO.	SAMPLE DEPTH	SAMPLE BLOWS/6"	SAMPLE DESCRIPTION	STRATA	DEPTH	CASING BLOWS	REMARKS
Cont'd							DRILLED	
06-08-15							AHEAD	
Monday					S		3"	
Overcast								
70°F						105		
12:00	21D	105.0	27-100/3"	Top: Brown fine sand, some silt (SM)		105.5		
07:30		105.8		Bot: Stiff gray org silty clay, trace shells (OH)	C	105.8		21D Bot: WC=20
06-09-15	1C	105.0	REC=40%	Gray gravel & cobbles			2*	*Coring time in
Tuesday		107.5	RQD=NA				6*	minutes per foot.
Overcast	2C	107.5	REC=88%	Gray & brown gravel & cobbles	T	110	15*/1*	
65°F		109.0	RQD=NA				3*	
	3C	109.0	REC=30%	Gray gravel & cobbles			5*	
		111.5	RQD=NA			112.5	6*	
	4C	111.5	REC=86.6%	Medium hard slightly weathered to unweathered			4*/1*	
		116.5	RQD=80%	gray gneiss, jointed, iron stained & WJts		115	3*	
	5C	116.5	REC=94%	Medium hard unweathered gray gneiss,			3*	
		121.5	RQD=73%	closely jointed to jointed, iron stained &	R		3.5*	
				weathered joints			3.5*	
							1.5*/1*	
						120	2*	
							4*	
14:45						121.5	4*	End of Boring at 121.5'.
							5*	
							2*	WC=Water Content
						125		in percent of dry
								weight.
						130		
						135		
						140		
						145		
						150		

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ROCK CORE SKETCH

BORING NO. M-4PA
SHEET 4 OF 7
FILE NO. 12319
SURFACE ELEV. 42.5
RES ENGR. Matthew Kramer

PROJECT: 340 FAE
LOCATION: Brooklyn NY
TEST/INSP. EQUIPMENT
REF. CODES/STANDARDS

Run No.	REC/RQD

TOP

BOTTOM

Run No.	REC/RQD
5C	94/73.3

TOP

J20°XFI3
J0°XF82
J0°XFS2
J0°XFS2
J0°XFS2
J30°XFS2
J30°XFC2
J16°XFS2
MB10°XFI2
MB10°XFI2
J10°XFS2

BOTTOM

Run No.	REC/RQD
4C	86.6/80

TOP

gravel + cobbles
J30°XFS2 fe+wjt
J60°//FC2
J30°XFI2 fe+wjt

BOTTOM

Run No.	REC/RQD
1C	40/NA
2C	883/NA
3C	30/NA

TOP

MB15°XFS2
J10°//FS2
gravel + cobbles
1C↓ 2C↓
gvl+cobbles
J60°XFS2
MB0°//FS2
J20°XSS2
2C↑ 3C↓
J60°XFS↑
J30°XFS2
gvl+cobbles

BOTTOM

SCALE: 1 division = 0.1 feet

ROCK CORE SKETCH
LEGEND

JOINTING
J - Joint
MB - Mechanical Break
Θ - Angle w/ Horizontal
// - Parallel
X - Crossing
F - Foliation
S - Stratification
U - Unfoliated or Unstratified

JOINT SURFACE
C - Curved
I - Irregular
S - Straight

JOINT CONDITION
1 - Slick
2 - Smooth
3 - Rough

SKETCH SYMBOLS
Joint
Healed Joint
Broken
Part of Core Not Recovered
Cavities or Vugs in Core
Clay
Sand
Empty Space

NOTES

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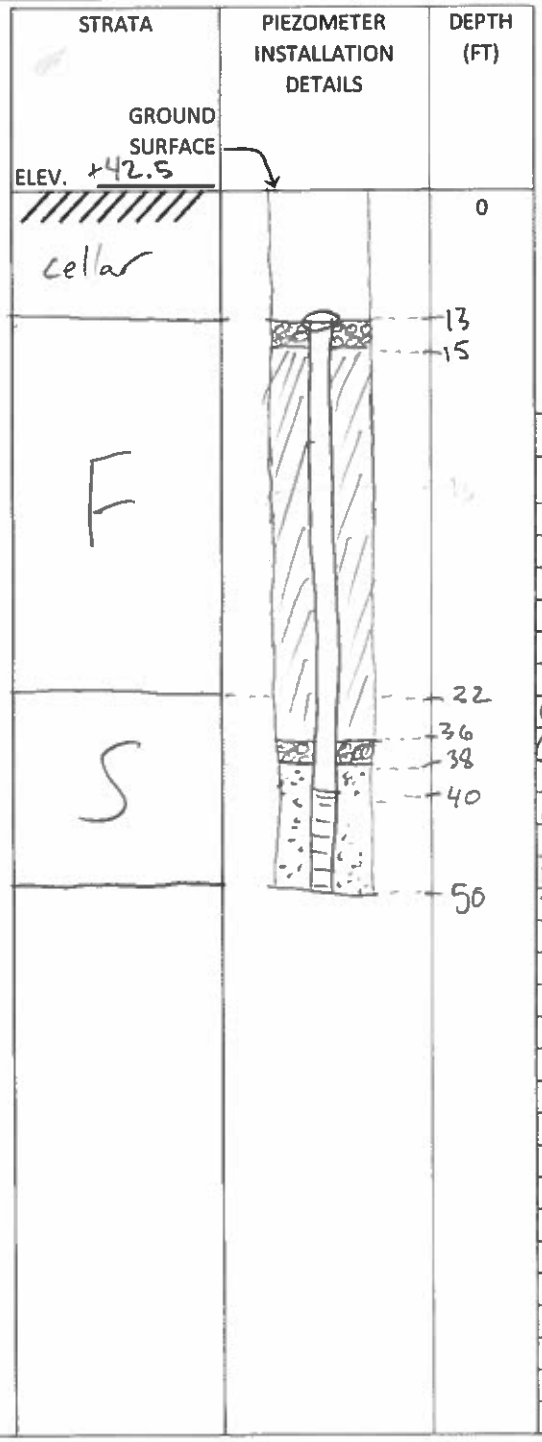
PIEZOMETER RECORD

PIEZOMETER OR BORING NO. M-4PA
SHEET 5 OF 7
FILE NO. 12319
INSTALLATION DATE 6/10/15
RES ENGR. Matthew Kramer

PROJECT: 340 FAE
LOCATION: Brooklyn NY
PIEZOMETER LOCATION: See BLP

☐ SEE SKETCH ON BACK



PIEZOMETER TYPE PVC

INTAKE POINT
depth to bottom, ft = 50
depth to top, ft = 38
length, ft = 12 = L
diameter, in = 4", ft = .337 = 2R

STANDPIPE/RISER
elevation of rim, ft = +29.5
diameter, in = 2", ft = 0.167 = 2r

READING TIME		DEPTH – RIM TO WATER	ELEVATION OF WATER	REMARKS
DATE	CLOCK			
6/15	8:30	26'	+3.5'	
6/16	7:30	27'	+2.5'	
6/17	7:00	27'	+2.5'	
6/18	7:00	27'	+2.5'	
6/22	7:20	27'	+2.5'	
6/23	7:00	26.5'	+3'	
6/24	7:15	26.5'	+3'	
6/25	7:20	27'	+2.5'	
6/26	7:15	27'	+2.5	
6/29	7:00	26.5'	+3'	
6/30	7:00	26.5'	+3'	
7/2	7:30	26.5'	+3'	
7/6	8:30	26.5'	+3'	

SAND
GRAVEL
BENTONITE
GROUT

GROUND SURFACE ELEV. +42.5

PIEZOMETER NO. M-4PA

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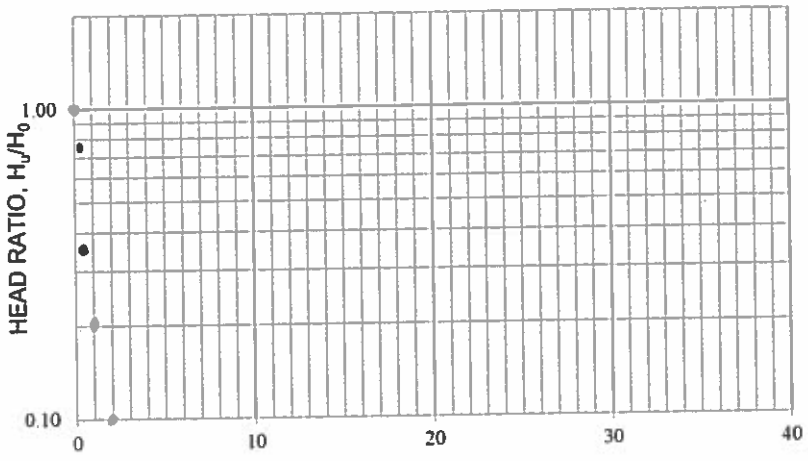
VARIABLE HEAD PERMEABILITY TEST

☐ BOREHOLE OR ☑ PIEZOMETER NO. M-4PA

PROJECT: 340 FAE
LOCATION: Brooklyn
PIEZOMETER LOCATION: See BLP

SHEET 6 OF 7
FILE NO. 12319
TEST NO. 1
RES ENGR. Matthew Kra...
CALC. BY ____ DATE ____
CH'KD BY ____ DATE ____



INTAKE POINT
depth to bottom, ft = 50'
depth to top, ft = 40'
length, ft = 10' = L
diameter, in = 2", ft = ____ = 2R

STANDPIPE/RISER
elevation of rim, ft = ____
diameter, in = 2", ft = ____ = 2r

depth of casing, ft = 80'

depth to which stand-pipe was bailed, ft = ____ = Z
or height filled to

READING TIME			TEST DEPTH, RIM TO WATER	DEPTH RIM TO TIDE OR GWL	UNBALANCED HEAD	HEAD RATIO	REMARKS
DATE	CLOCK	Δt MIN.	H_t (ft.)	H_{STATIC} (ft.)	$H_u = \lvert H_t - H_{STATIC} \rvert$ (ft.)	H_u/H_0	
6/30	8:15	STATIC	0.00	26.5'	-	-	
		15 sec	7'		19.5	.736	
		30 sec	17'		9.5	.358	
		1 min	21'		5.5	.207	
		2 min	24'		2.5	.094	
		4 min	26'		.5	.0189	
		8 min	26.2'		.3	.0113	
		15 min	26.4'		.1	.004	
		30 min	26.4'		.1	.004	
		1 hr	26.4"		.1	.004	
		2 hr	26.5'		0	0	

PIEZOMETER NO. ____

MUESER RUTLEDGE CONSULTING ENGINEERS

BORING NO. M-4PA
SHEET 7 **OF** 7

PROJECT 340 FAE
FILE NO. 12319
LOCATION BROOKLYN, NEW YORK
SURFACE ELEV. 42.5
BORING LOCATION SEE BORING LOCATION PLAN
DATUM NAVD 88

BORING EQUIPMENT AND METHODS OF STABILIZING BOREHOLE

TYPE OF BORING RIG		TYPE OF FEED DURING CORING		CASING USED					
					X	YES		NO	
TRUCK		MECHANICAL		DIA., IN.	4	DEPTH, FT. FROM	0	TO	55
SKID		HYDRAULIC	X	DIA., IN.	3	DEPTH, FT. FROM	0	TO	115
BARGE		OTHER		DIA., IN.		DEPTH, FT. FROM		TO	
OTHER	CME LC55								

TYPE AND SIZE OF:

D-SAMPLER	2" O. D. SPLIT SPOON
U-SAMPLER	
S-SAMPLER	
CORE BARREL	NX DOUBLE TUBE
CORE BIT	NX DIAMOND
DRILL RODS	NWJ

DRILLING MUD USED: X YES ☐ NO
DIAMETER OF ROTARY BIT, IN.: 2-7/8
TYPE OF DRILLING MUD: QUIK MUD

AUGER USED: ☐ YES X NO
TYPE AND DIAMETER, IN.:

*CASING HAMMER, LBS. 140 AVERAGE FALL, IN. 30
*SAMPLER HAMMER, LBS. 140 AVERAGE FALL, IN. 30
*USED AUTOMATIC HAMMER.

WATER LEVEL OBSERVATIONS IN BOREHOLE

DATE	TIME	DEPTH OF HOLE	DEPTH OF CASING	DEPTH TO WATER	CONDITIONS OF OBSERVATION
06-05-15	07:05	23	23		MUDLINE NOT DETECTED BY WATER LEVEL.
06-08-15	07:10	65	55	39	MUDLINE 39', BELOW GROUND SURFACE.
06-09-15	07:00	106.25	95	8	DRILLER MUD OBSERVERED AT 8' BELOW GROUND SURFACE.
06-10-15	07:10	121.25	115	39	MUDLINE 39' BELOW GROUND SURFACE.

PIEZOMETER INSTALLED: X YES ☐ NO SKETCH SHOWN ON

STANDPIPE:	TYPE		ID, IN.		LENGTH, FT.		TOP ELEV.
INTAKE ELEMENT:	TYPE		OD, IN.		LENGTH, FT.		TIP ELEV.
FILTER:	MATERIAL		OD, IN.		LENGTH, FT.		BOT. ELEV.

PAY QUANTITIES

3.5" DIA. DRY SAMPLE BORING	LIN. FT.	105	NO. OF 3" SHELBY TUBE SAMPLES	
3.5" DIA. U-SAMPLE BORING	LIN. FT.		NO. OF 3" UNDISTURBED SAMPLES	
CORE DRILLING IN ROCK	LIN. FT.	16.5	OTHER:	

BORING CONTRACTOR: AQUIFER DRILLING & TESTING CO., INC.
DRILLER: JAMES HELPERS: DANNY
REMARKS: PIEZOMETER INSTALLED.
RESIDENT ENGINEER: MATTHEW KRAMER DATE: 06-09-15
CLASSIFICATION CHECK: CHERYL J. MOSS TYPING CHECK: ALEXANDRA PATRONE

MUESER RUTLEDGE CONSULTING ENGINEERS

BORING LOG

BORING NO. M-5
SHEET 1 OF 5
PROJECT: 340 FAE **FILE NO.** 12319
LOCATION: BROOKLYN, NEW YORK **SURFACE ELEV.** +42.5
RES. ENGR. MATTHEW KRAMER

DAILY PROGRESS	SAMPLE NO.	SAMPLE DEPTH	SAMPLE BLOWS/6"	SAMPLE DESCRIPTION	STRATA	DEPTH	CASING BLOWS	REMARKS
09:30					**	0.5	DRILLED	**Concrete from 0' to
06-22-15					VOID	2	AHEAD	0.5'.
Monday					**	2.5	4" 3"	**Concrete from 2' to
Sunny								2.5'.
80°F						5		
					CELLAR			
						10		
						12.5		**Concrete from 12.5' to
					**	13		13'.
	1D	14.0	12-6	Brown fine to medium sand, some silt, trace		15		
		16.0	6-5	coarse sand, gravel (SM)				
	2D	16.0	2-9	Brown fine to coarse sand, some gravel, silt (SM)	F			
		18.0	11-13					
	3D	18.0	6-4	Brown fine to coarse sand, some silt, trace				
		20.0	11-13	gravel (SM)		20		
	4D	20.0	16-10	Top: Brown fine sand, sm silt, tr gravel (SM)				
		22.0	8-9	Bot: Brown fine to medium sand, trace silt				
				(SP-SM)				
						25		
	5D	25.0	9-8	Brown fine to coarse sand, some gravel, trace				REC=6"
		27.0	9-11	silt, silt pockets (SP-SM)				
						30		
	6D	30.0	7-8	Brown fine to medium sand, trace coarse sand,				
		32.0	10-14	gravel, silt (SP-SM)				
						35		
	7D	35.0	5-14	Brown gravelly fine to coarse sand, trace silt				
		37.0	14-19	(SP-SM)	S			
						40		
	8D	40.0	6-13	Brown fine to coarse sand, trace silt, gravel				Wet sample.
		42.0	19-19	(SP-SM)				
						45		
	9D	45.0	6-12	Brown fine to medium sand, trace coarse sand,				
		47.0	12-12	gravel, silt (SP-SM)				
						50		
	10D	50.0	12-15	Brown fine to medium sand, trace coarse sand,				
14:25		52.0	19-19	gravel, silt (SP-SM)				

MUESER RUTLEDGE CONSULTING ENGINEERS

BORING LOG

BORING NO. M-5
SHEET 2 OF 5
PROJECT: 340 FAE **FILE NO.** 12319
LOCATION: BROOKLYN, NEW YORK **SURFACE ELEV.** +42.5
RES. ENGR. MATTHEW KRAMER

DAILY PROGRESS	SAMPLE NO.	SAMPLE DEPTH	SAMPLE BLOWS/6"	SAMPLE DESCRIPTION	STRATA	DEPTH	CASING BLOWS	REMARKS
							DRILLED	
							AHEAD	
07:50							3"	
06-23-15								
Tuesday						**55**		
Sunny	11D	55.0	12-21	Brown fine to medium sand, trace silt, silty				
80°F		57.0	20-19	fine sand seams (SP-SM)				
						60		
	12D	60.0	12-14	Brown fine to medium sand, trace silt (SP-SM)				
		62.0	19-22					
						65		
	13D	65.0	16-15	Do 12D (SP-SM)				
		67.0	18-18					
						70		
	14D	70.0	18-18	Do 12D (SP-SM)				
		72.0	25-21					
						75		
	15D	75.0	24-26	Brown fine to medium sand, trace silt, mica				
		77.0	29-27	(SP-SM)	**S**			
						80		
	16D	80.0	20-27	Do 15D (SP-SM)				
		82.0	30-32					
						85		
	17D	85.0	24-31	Do 15D (SP-SM)				
		87.0	31-43					
						90		
	18D	90.0	30-28	Brown fine to medium sand, trace fine gravel,				
		92.0	32-36	coarse sand, silt, mica (SP-SM)				
						95		
	19D	95.0	20-24	Brown fine to medium sand, trace silt, mica				
		57.0	23-31	(SP-SM)				
						100		
	20D	100.0	19-21	Brown fine to coarse sand, trace gravel, coarse				
		102.0	25-27	sand, silt (SP-SM)				

MUESER RUTLEDGE CONSULTING ENGINEERS

BORING LOG

BORING NO. M-5
SHEET 3 OF 5
PROJECT: 340 FAE **FILE NO.** 12319
LOCATION: BROOKLYN, NEW YORK **SURFACE ELEV.** +42.5
RES. ENGR. MATTHEW KRAMER

DAILY PROGRESS	SAMPLE NO.	SAMPLE DEPTH	SAMPLE BLOWS/6"	SAMPLE DESCRIPTION	STRATA	DEPTH	CASING BLOWS	REMARKS
Cont'd							DRILLED	
06-23-15							AHEAD	
Tuesday							3"	
Sunny								
80°F, 14:45					S	105		
07:30	21D	105.0	24-26	Brown fine sand, trace silt, mica (SP-SM)				
06-24-15		107.0	28-30					
Wednesday								
Sunny						108.5		
75°F						110		
	22D	110.0	8-16	Stiff gray organic silty clay, trace shells (OH)				WC=30, pp=2.2
		112.0	20-21		C			
						115		
	23D	115.0	100/6"	Stiff gray organic silty clay, trace fine sand, shells		115.5	4*	WC=38, pp=2.0
		115.5		(OH)	T	116	5*	Bedrock at 115.5'.
	1C	115.0	REC=80%	Medium hard slightly weathered to unweathered			5*	Coring starting at 115'.
		120.0	RQD=70%	gray gneiss, jointed, weathered joints			5*	*Coring time in
						120	5*	minutes per foot.
	2C	120.0	REC=87%	Hard unweathered gray gneiss, blocky	R		20*	
		124.0	RQD=80%				10*	
							7*	
						124	9*	
	3C	124.0	REC=100%	Top 1': Blk f-m sand, sm organic silt, tr mica (SM)	S	125	4*	
		126.0	RQD=42%	Bot: Hard unweathered gray gneiss, jointed			25*	
	4C	126.0	REC=100%	Hard unweathered gray gneiss, blocky				
		131.0	RQD=90%		R			
						130		
14:45						131		End of Boring at 131'.
								WC=Water Content
								in percent of dry
						135		weight.
								pp=Pocket
								Penetrometer
								Unconfined Compres-
						140		sive Strength in tsf.
						145		
						150		

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ROCK CORE SKETCH

BORING NO. M-5
SHEET 4 OF 5
FILE NO. 12319
SURFACE ELEV. +42.5
RES ENGR. Matthew Kramer

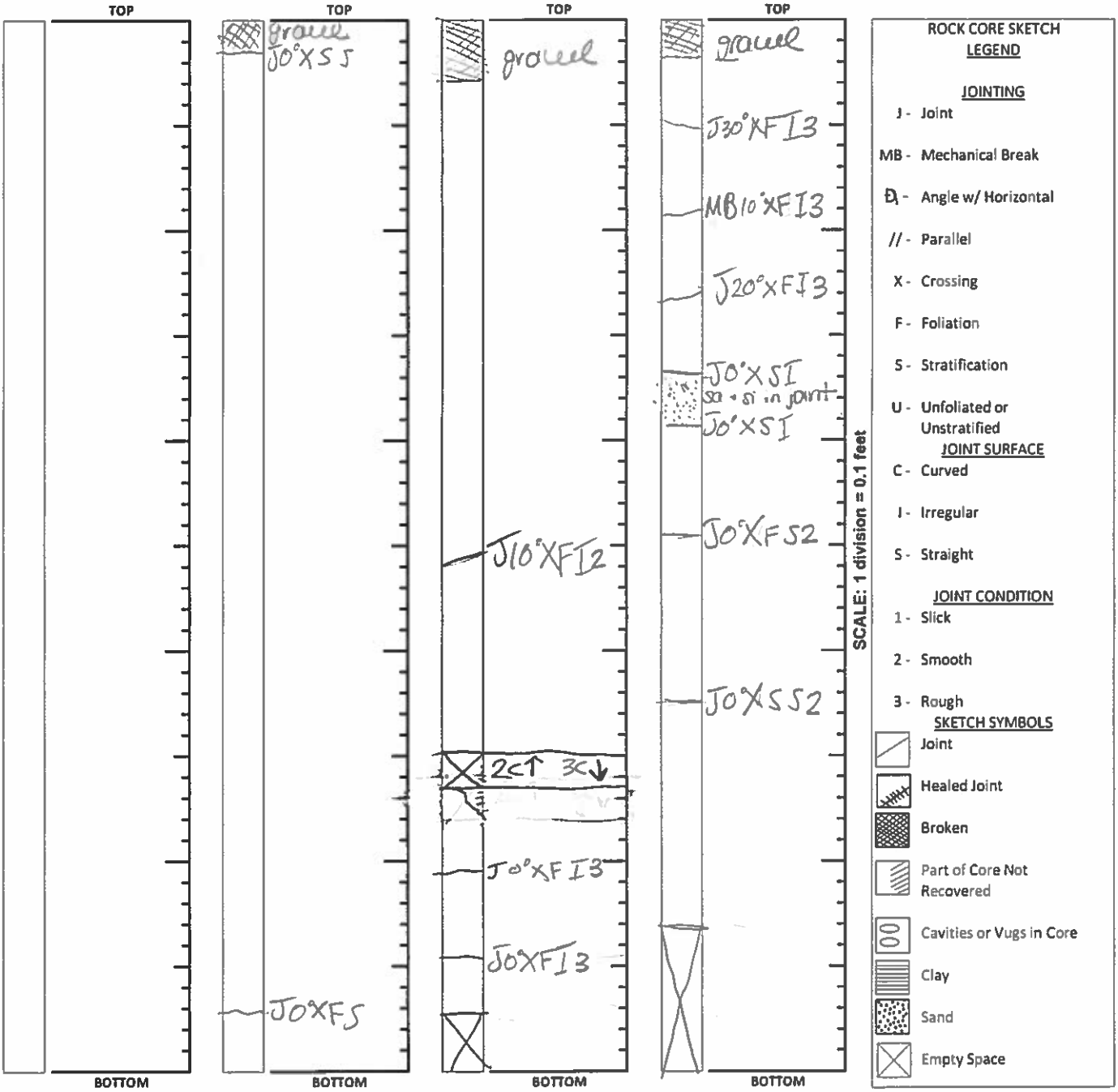
PROJECT: 340 FAE
LOCATION: Brooklyn
TEST/INSP. EQUIPMENT CME 55 LC55
REF. CODES/STANDARDS

Run No.	REC/RQD

Run No.	REC/RQD
4C	100/90

Run No.	REC/RQD
2C	87.5/80
3C	100/42

Run No.	REC/RQD
1C	80/70



ROCK CORE SKETCH
LEGEND

JOINTING
J - Joint
MB - Mechanical Break
Θ - Angle w/ Horizontal
// - Parallel
X - Crossing
F - Foliation
S - Stratification
U - Unfoliated or Unstratified

JOINT SURFACE
C - Curved
I - Irregular
S - Straight

JOINT CONDITION
1 - Slick
2 - Smooth
3 - Rough

SKETCH SYMBOLS
Joint
Healed Joint
Broken
Part of Core Not Recovered
Cavities or Vugs in Core
Clay
Sand
Empty Space

NOTES

MUESER RUTLEDGE CONSULTING ENGINEERS

BORING NO. M-5
SHEET 5 **OF** 5

PROJECT 340 FAE
FILE NO. 12319
LOCATION BROOKLYN, NEW YORK
SURFACE ELEV. +42.5
BORING LOCATION SEE BORING LOCATION PLAN
DATUM NAVD 88

BORING EQUIPMENT AND METHODS OF STABILIZING BOREHOLE

TYPE OF BORING RIG		TYPE OF FEED DURING CORING		CASING USED						
					X	YES		NO		
TRUCK		MECHANICAL		DIA., IN.	4	DEPTH, FT. FROM	0	TO	40	
SKID		HYDRAULIC	X	DIA., IN.	3	DEPTH, FT. FROM	0	TO	115	
BARGE		OTHER		DIA., IN.		DEPTH, FT. FROM		TO		
OTHER	CME LC55									

TYPE AND SIZE OF:

D-SAMPLER 2" O. D. SPLIT SPOON
U-SAMPLER
S-SAMPLER
CORE BARREL NQ
CORE BIT NQ 2"
DRILL RODS 2"

DRILLING MUD USED X YES NO
DIAMETER OF ROTARY BIT, IN. 2-7/8, 3-7/8
TYPE OF DRILLING MUD BENTONITE GEL

AUGER USED YES X NO
TYPE AND DIAMETER, IN.

*CASING HAMMER, LBS. 140 AVERAGE FALL, IN. 30
*SAMPLER HAMMER, LBS. 140 AVERAGE FALL, IN. 30
*USED AUTOMATIC HAMMER.

WATER LEVEL OBSERVATIONS IN BOREHOLE

DATE	TIME	DEPTH OF HOLE	DEPTH OF CASING	DEPTH TO WATER	CONDITIONS OF OBSERVATION
06-23-15	07:00	50	40	50	MUDLINE AT BOTTOM OF HOLE.

PIEZOMETER INSTALLED YES X NO SKETCH SHOWN ON

STANDPIPE:	TYPE		ID, IN.		LENGTH, FT.		TOP ELEV.		
INTAKE ELEMENT:	TYPE		OD, IN.		LENGTH, FT.		TIP ELEV.		
FILTER:	MATERIAL		OD, IN.		LENGTH, FT.		BOT. ELEV.		

PAY QUANTITIES

3.5" DIA. DRY SAMPLE BORING	LIN. FT.	115	NO. OF 3" SHELBY TUBE SAMPLES	
3.5" DIA. U-SAMPLE BORING	LIN. FT.		NO. OF 3" UNDISTURBED SAMPLES	
CORE DRILLING IN ROCK	LIN. FT.	116	OTHER:	

BORING CONTRACTOR AQUIFER DRILLING & TESTING CO., INC.
DRILLER JAMES HELPERS
REMARKS BOREHOLE GROUTED UPON COMPLETION.
RESIDENT ENGINEER MATTHEW KRAMER DATE 06-22-15
CLASSIFICATION CHECK: CHERYL J. MOSS TYPING CHECK: ALEXANDRA PATRONE

MUESER RUTLEDGE CONSULTING ENGINEERS

BORING LOG

BORING NO. M-6
SHEET 1 OF 5
PROJECT: 340 FAE **FILE NO.** 12319
LOCATION: BROOKLYN, NEW YORK **SURFACE ELEV.** +42.5
RES. ENGR. MATTHEW KRAMER

DAILY PROGRESS	SAMPLE NO.	SAMPLE DEPTH	SAMPLE BLOWS/6"	SAMPLE DESCRIPTION	STRATA	DEPTH	CASING BLOWS	REMARKS
13:30					**CONC**	**1**	DRILLED	**Asphalt from 0' to 0.4'.
06-30-15							AHEAD	
Tuesday							4" 3"	
Sunny								
80°F						**5**		
					CELLAR			
						10		
						12.5		**Concrete from 12.5'
					**			
	1D	13.0	6-8	Brown fine to coarse sand, some silt, trace				to 13'.
		15.0	13-13	gravel, brick (Fill) (SP-SM)		**15**		
	2D	15.0	14-19	Brown fine to coarse sand, some silt, trace				
		17.0	13-17	brick, concrete (Fill) (SM)	**F**			
	3D	17.0	20-26	Brown fine to coarse sand, some silt, trace				
		19.0	27-30	gravel (SM)				
	4D	19.0	8-28	Brown fine to coarse sand, some silt, gravel		**20**		REC=6"
14:30		20.8	34-80/3"	(SM)		**20.8**		Rock fragments in
07:30								tip.
07-01-15								
Wednesday								Boulder from 23' to 25'.
Overcast					**T**	**25**		
70°F	5D	25.0	21-22	Red brown fine to coarse sand, some silt, gravel				
		27.0	19-16	(SM)				
						28.5		
						30		
	6D	30.0	11-12	Brown fine to medium sand, trace coarse				
		32.0	13-15	sand, gravel, silt (SP-SM)				
					S			
						35		
	7D	35.0	12-16	Brown fine to medium sand, trace gravel,				
		37.0	18-28	coarse sand, silt (SP-SM)				
						38.5		
						40		
	8D	40.0	17-20	Brown gravelly fine to coarse sand, some silt	**T**			
		42.0	14-31	(SM)				
						45		
	9D	45.0	13-15	Brown fine to coarse sand, trace gravel, silt				Wet sample.
		47.0	13-12	(SP-SM)				
					S			
						50		
	10D	50.0	14-16	Brown fine to medium sand, trace silt (SP-SM)				
		52.0	17-16					

MUESER RUTLEDGE CONSULTING ENGINEERS

BORING LOG

BORING NO. M-6
SHEET 2 OF 5
PROJECT: 340 FAE **FILE NO.** 12319
LOCATION: BROOKLYN, NEW YORK **SURFACE ELEV.** +42.5
RES. ENGR. MATTHEW KRAMER

DAILY PROGRESS	SAMPLE NO.	SAMPLE DEPTH	SAMPLE BLOWS/6"	SAMPLE DESCRIPTION	STRATA	DEPTH	CASING BLOWS	REMARKS
Cont'd							DRILLED	
07-01-15							AHEAD	
Wednesday							3"	
Overcast								
70°F						**55**		
	11D	55.0	15-18	Brown fine to medium sand, trace coarse				
		57.0	18-20	sand, silt (SP-SM)				
						60		
	12D	60.0	14-18	Do 11D (SP-SM)				
		62.0	19-23					
						65		
	13D	65.0	17-21	Do 11D (SP-SM)				
		67.0	24-27					
						70		
	14D	70.0	21-26	Do 11D (SP-SM)				
		72.0	29-29					
						75		
	15D	75.0	21-26	Do 11D (SP-SM)				
		77.0	33-31		**S**			
						80		
	16D	80.0	20-28	Do 11D (SP-SM)				
		82.0	28-36					
						85		
	17D	85.0	31-42	Do 11D (SP-SM)				
		87.0	45-51					
						90		
	18D	90.0	30-28	Do 11D (SP-SM)				
		92.0	45-41					
						95		
	19D	95.0	23-28	Do 11D (SP-SM)				
		97.0	30-36					
14:45						**100**		
07:15	20D	100.0	20-21	Brown fine to medium sand, trace gravel,				
07-02-15		102.0	27-36	coarse sand, silt (SP-SM)				

MUESER RUTLEDGE CONSULTING ENGINEERS

BORING LOG

BORING NO. M-6
SHEET 3 OF 5
PROJECT: 340 FAE **FILE NO.** 12319
LOCATION: BROOKLYN, NEW YORK **SURFACE ELEV.** +42.5
RES. ENGR. MATTHEW KRAMER

DAILY PROGRESS	SAMPLE NO.	SAMPLE DEPTH	SAMPLE BLOWS/6"	SAMPLE DESCRIPTION	STRATA	DEPTH	CASING BLOWS	REMARKS
Cont'd							DRILLED	
07-02-15							AHEAD	
Thursday							3"	
Sunny								
75°F					S	**105**		
	21D	105.0	19-24	Brown fine to medium sand, trace silt (SP-SM)				
		107.0	25-40					
						108.5		
						110		
	22D	110.0	11-17	Stiff gray organic silty clay, some fine to coarse	C			WC=25
		112.0	22-36	sand, trace shells (OH)				Rig chatter.
						113		Rig chatter from 113' to
	1C	113.0	REC=96%	Hard slightly weathered to unweathered gray			5*	118'.
		118.0	RQD=90%	gneiss, blocky, weathered joints		**115**	6*	*Coring time in
							7*	minutes per foot.
							5*	
	2C	118.0	REC=100%	Hard to medium hard slightly weathered to			5*	
		123.0	RQD=77%	unweathered gray gneiss, jointed, weathered	R		6*	
				joints		**120**	6*	
							6*	
							6*	
						123	6*	End of Boring at 123'.
						125		WC=Water Content
								in percent of dry
								weight.
						130		
						135		
						140		
						145		
						150		

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ROCK CORE SKETCH

BORING NO. M-6
SHEET 4 OF 5
FILE NO. 12319
SURFACE ELEV. +42.5
RES ENGR. Matthew Kramer

PROJECT: 340 FAE
LOCATION: Brooklyn
TEST/INSP. EQUIPMENT LC55 CME55
REF. CODES/STANDARDS

Run No.	REC/RQD

Run No.	REC/RQD

Run No.	REC/RQD
2C	100/76

Run No.	REC/RQD
1C	96/90

TOP

J30°XFS3
J20°XFS3
J20°XFI3
J20°XFI2
J20°//FS3
J30°//FS3

J20°XFS3
J30°XFS3
J10°XFI3
J10°XFI2

BOTTOM

SCALE: 1 division = 0.1 feet

ROCK CORE SKETCH
LEGEND

JOINTING
J - Joint
MB - Mechanical Break
Ø - Angle w/ Horizontal
// - Parallel
X - Crossing
F - Foliation
S - Stratification
U - Unfoliated or Unstratified

JOINT SURFACE
C - Curved
I - Irregular
S - Straight

JOINT CONDITION
1 - Slick
2 - Smooth
3 - Rough

SKETCH SYMBOLS
Joint
Healed Joint
Broken
Part of Core Not Recovered
Cavities or Vugs in Core
Clay
Sand
Empty Space

NOTES

MUESER RUTLEDGE CONSULTING ENGINEERS

BORING NO. M-6
SHEET 5 **OF** 5

PROJECT 340 FAE
FILE NO. 12319
LOCATION BROOKLYN, NEW YORK
SURFACE ELEV. +42.5
BORING LOCATION SEE BORING LOCATION PLAN
DATUM NAVD 88

BORING EQUIPMENT AND METHODS OF STABILIZING BOREHOLE

TYPE OF BORING RIG		TYPE OF FEED DURING CORING		CASING USED						
TRUCK		MECHANICAL		DIA., IN.	4	DEPTH, FT. FROM	0	TO	45	
SKID		HYDRAULIC	X	DIA., IN.	3	DEPTH, FT. FROM	0	TO	113	
BARGE		OTHER		DIA., IN.		DEPTH, FT. FROM		TO		
OTHER	CME LC55									

TYPE AND SIZE OF:		DRILLING MUD USED	X YES / NO
D-SAMPLER	2" O. D. SPLIT SPOON	DIAMETER OF ROTARY BIT, IN.	2-7/8, 3-7/8
U-SAMPLER		TYPE OF DRILLING MUD	BENTONITE GEL
S-SAMPLER			
CORE BARREL	NQ	AUGER USED	YES / X NO
CORE BIT	NQ 2"	TYPE AND DIAMETER, IN.	
DRILL RODS	2"		

*CASING HAMMER, LBS. 140 AVERAGE FALL, IN. 30
*SAMPLER HAMMER, LBS. 140 AVERAGE FALL, IN. 30
*USED AUTOMATIC HAMMER.

WATER LEVEL OBSERVATIONS IN BOREHOLE

DATE	TIME	DEPTH OF HOLE	DEPTH OF CASING	DEPTH TO WATER	CONDITIONS OF OBSERVATION
					NO WATER LEVEL OBSERVATIONS MADE.

PIEZOMETER INSTALLED ☐ YES ☒ NO SKETCH SHOWN ON

STANDPIPE:	TYPE	ID, IN.	LENGTH, FT.	TOP ELEV.			
INTAKE ELEMENT:	TYPE	OD, IN.	LENGTH, FT.	TIP ELEV.			
FILTER:	MATERIAL	OD, IN.	LENGTH, FT.	BOT. ELEV.			

PAY QUANTITIES

3.5" DIA. DRY SAMPLE BORING	LIN. FT.	113	NO. OF 3" SHELBY TUBE SAMPLES	
3.5" DIA. U-SAMPLE BORING	LIN. FT.		NO. OF 3" UNDISTURBED SAMPLES	
CORE DRILLING IN ROCK	LIN. FT.	10	OTHER:	

BORING CONTRACTOR AQUIFER DRILLING & TESTING CO., INC.
DRILLER JAMES HELPERS DANNY
REMARKS BOREHOLE GROUTED UPON COMPLETION.
RESIDENT ENGINEER MATTHEW KRAMER DATE 06-30-15
CLASSIFICATION CHECK: CHERYL J. MOSS TYPING CHECK: ALEXANDRA PATRONE

MUESER RUTLEDGE CONSULTING ENGINEERS

BORING LOG

BORING NO. M-7
SHEET 1 OF 5
PROJECT: 340 FAE **FILE NO.** 12319
LOCATION: BROOKLYN, NEW YORK **SURFACE ELEV.** +42.5
RES. ENGR. MATTHEW KRAMER

DAILY PROGRESS	SAMPLE NO.	SAMPLE DEPTH	SAMPLE BLOWS/6"	SAMPLE DESCRIPTION	STRATA	DEPTH	CASING BLOWS	REMARKS
08:45					**	0.5	DRILLED	**Concrete from 0' to
06-25-15							AHEAD	0.5'.
Thursday							4" 3"	Drilled ahead to 13'.
Sunny								
85°F						5		
					CELLAR			
						10		
					**	12.5		**Concrete from 12.5'
	1D	13.0	4-7	Brown fine sand, some silt, trace gravel,				to 13'.
		15.0	7-13	concrete (Fill) (SM)	F	15		
	2D	15.0	13-18	Brown fine to medium sand, some silt, gravel				
		17.0	22-21	(Fill) (SM)		17		
	3D	17.0	12-16	Brown fine to coarse sand, some gravel (SM)				
		19.0	18-19					
	4D	19.0	4-14	Brown gravelly fine to coarse sand, trace silt,		20		
		21.0	17-21	brick (SP-SM)				
						25		
	5D	25.0	10-10	Brown fine to coarse sand, trace gravel, silt				
		27.0	14-26	(SP-SM)				
					T			
						30		
	6D	30.0	11-13	Brown fine to coarse sand, some gravel, trace				
		32.0	11-15	silt (SP-SM)				
						35		
	7D	35.0	8-19	Brown gravelly fine to coarse sand, trace silt				REC=6"; rock fragments
		37.0	27-25	(SP-SM)				in tip of spoon.
						38.5		
						40		
	8D	40.0	13-12	Brown fine to coarse sand, trace gravel, silt				Wet sample.
		42.0	15-14	(SP-SM)				
						45		
	9D	45.0	15-18	Brown fine to coarse sand, trace gravel, silt	S			
		47.0	23-22	(SP-SM)				
						50		
	10D	50.0	12-13	Brown fine to medium sand, trace silt (SP-SM)				
		52.0	15-20					

MUESER RUTLEDGE CONSULTING ENGINEERS

BORING LOG

BORING NO. M-7
SHEET 2 OF 5
PROJECT: 340 FAE **FILE NO.** 12319
LOCATION: BROOKLYN, NEW YORK **SURFACE ELEV.** +42.5
RES. ENGR. MATTHEW KRAMER

DAILY PROGRESS	SAMPLE NO.	SAMPLE DEPTH	SAMPLE BLOWS/6"	SAMPLE DESCRIPTION	STRATA	DEPTH	CASING BLOWS	REMARKS
Cont'd							DRILLED	
06-25-15							AHEAD	
Thursday							3"	
Sunny								
85°F						**55**		
	11D	55.0	15-16	Brown fine to medium sand, trace silt (SP-SM)				
14:30		57.0	16-21					
07:30								
06-26-15								
Friday						**60**		
Overcast	12D	60.0	15-16	Do 11D (SP-SM)				
75°F		62.0	19-32					
						65		
	13D	65.0	12-15	Do 11D (SP-SM)				
		67.0	15-27					
						70		
	14D	70.0	17-23	Do 11D (SP-SM)				
		72.0	23-28					
						75		
	15D	75.0	22-29	Do 11D (SP-SM)				
		77.0	32-49		**S**			
						80		
	16D	80.0	20-29	Do 11D (SP-SM)				
		82.0	29-41					
						85		
	17D	85.0	30-36	Do 11D (SP-SM)				
		87.0	32-40					
						90		
	18D	90.0	26-30	Do 11D (SP-SM)				
		92.0	35-34					
						95		
	19D	95.0	30-40	Do 11D (SP-SM)				
		97.0	47-50					
						100		
	20D	100.0	26-29	Brown fine to medium sand, trace silt (SP-SM)				
		102.0	30-31				▼	

MUESER RUTLEDGE CONSULTING ENGINEERS

BORING LOG

BORING NO. M-7
SHEET 3 OF 5
PROJECT: 340 FAE **FILE NO.** 12319
LOCATION: BROOKLYN, NEW YORK **SURFACE ELEV.** +42.5
RES. ENGR. MATTHEW KRAMER

DAILY PROGRESS	SAMPLE NO.	SAMPLE DEPTH	SAMPLE BLOWS/6"	SAMPLE DESCRIPTION	STRATA	DEPTH	CASING BLOWS	REMARKS
Cont'd							DRILLED	
06-26-15							AHEAD	
Friday							3"	
Overcast								
75°F					S	105		
	21D	105.0	21-28	Brown fine to medium sand, trace silt (SP-SM)				
		107.0	33-49					
						108.5		
						110		
	22D	110.0	8-11	Stiff gray organic silty clay, trace fine sand (OH)				WC=22, pp=2.25
		112.0	17-21					
					C			
						115		
	23D	115.0	9-13	Stiff gray organic silty clay, trace fine sand, peat,				WC=47, pp=3.0
14:30		116.8	25-50/3"	mica (OH)		116.8		
08:30	1C	117.0	REC=73%	Medium hard slightly weathered to unweathered	T		1*	*Coring time in
06-29-15		122.0	RQD=64%	gray gneiss, jointed to moderately jointed, iron		118.5	2*	minutes per foot.
Monday				stained & weathered joints		120	4*	
Sunny							2*	
80°F							3*	
	2C	122.0	REC=90%	Hard slightly weathered to unweathered gray			5*	
		127.0	RQD=80%	gneiss, blocky, iron stained joints			4*	
						125	6*	
					R		5*	
							5*	
	3C	127.0	REC=100%	Hard unweathered gray gneiss, blocky,			8*	
		132.0	RQD=93%	weathered joints			8*	
						130	8*	
							8*	
13:30						132	8*	End of Boring at 132'.
								WC=Water Content
						135		in percent of dry
								weight.
								pp=Pocket
								Penetrometer
						140		Unconfined Compres-
								sive Strength in tsf.
						145		
						150		

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Mueser Rutledge Consulting Engineers
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ROCK CORE SKETCH

PROJECT: 340 FAE
LOCATION: Brooklyn
TEST/INSP. EQUIPMENT
REF. CODES/STANDARDS

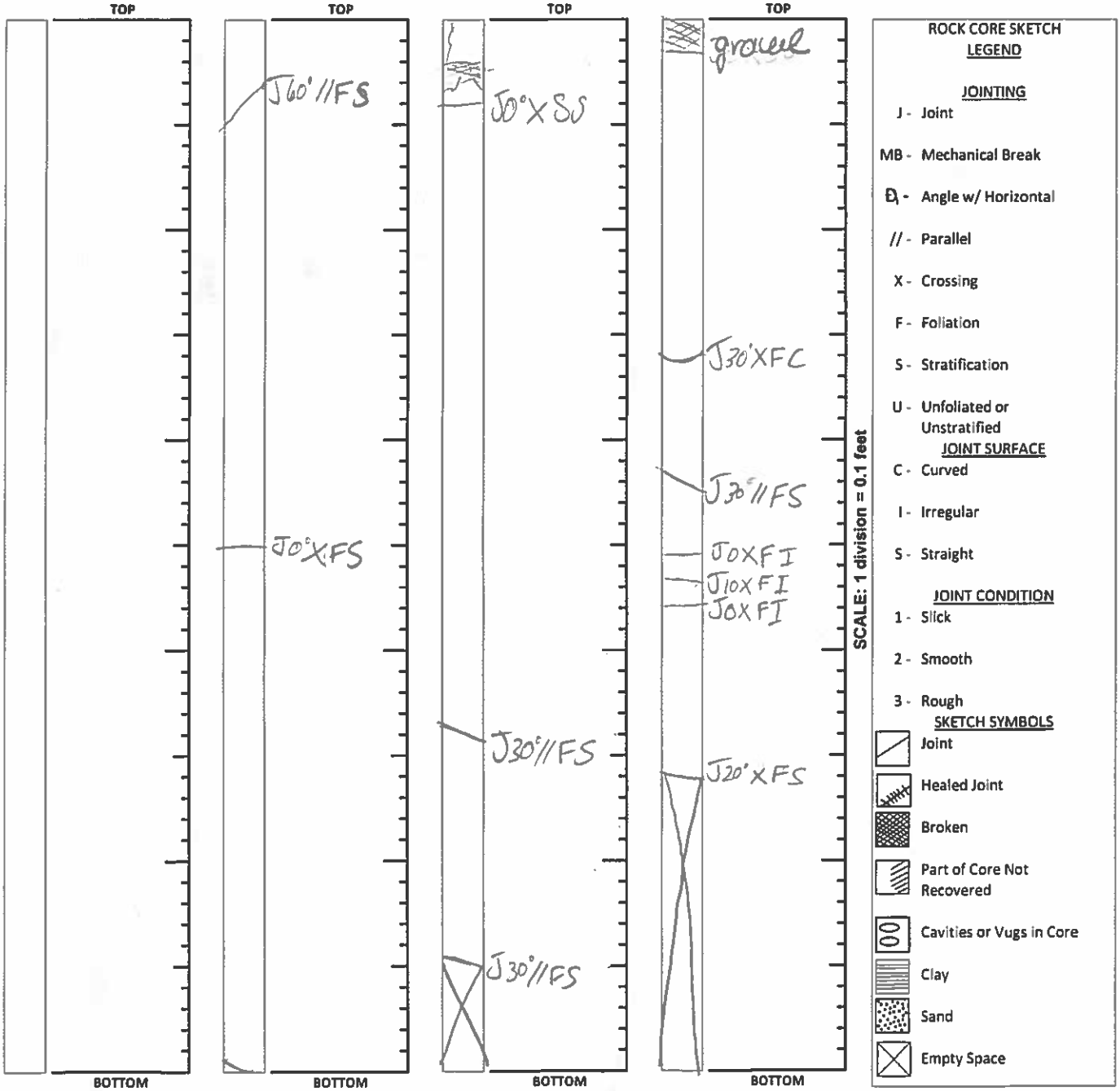
BORING NO. M-7
SHEET 4 OF 5
FILE NO. 12319
SURFACE ELEV. +42.5
RES ENGR. Matthew Kramer

Run No.	REC/RQD

Run No.	REC/RQD
3C	100/93

Run No.	REC/RQD
2C	90/80

Run No.	REC/RQD
1C	73/67.3



ROCK CORE SKETCH
LEGEND

JOINTING
J - Joint
MB - Mechanical Break
Ø - Angle w/ Horizontal
// - Parallel
X - Crossing
F - Foliation
S - Stratification
U - Unfoliated or Unstratified

JOINT SURFACE
C - Curved
I - Irregular
S - Straight

JOINT CONDITION
1 - Slick
2 - Smooth
3 - Rough

SKETCH SYMBOLS
Joint
Healed Joint
Broken
Part of Core Not Recovered
Cavities or Vugs in Core
Clay
Sand
Empty Space

NOTES

MUESER RUTLEDGE CONSULTING ENGINEERS

BORING NO. M-7
SHEET 5 **OF** 5

PROJECT 340 FAE
FILE NO. 12319
LOCATION BROOKLYN, NEW YORK
SURFACE ELEV. +42.5
BORING LOCATION SEE BORING LOCATION PLAN
DATUM NAVD 88

BORING EQUIPMENT AND METHODS OF STABILIZING BOREHOLE

TYPE OF BORING RIG		TYPE OF FEED DURING CORING		CASING USED						
TRUCK		MECHANICAL		DIA., IN.	4	DEPTH, FT. FROM	0	TO	50	
SKID		HYDRAULIC	X	DIA., IN.	3	DEPTH, FT. FROM	0	TO	117	
BARGE		OTHER		DIA., IN.		DEPTH, FT. FROM		TO		
OTHER	CME LC55									

CASING USED: [X] YES [ ] NO

TYPE AND SIZE OF:

D-SAMPLER	2" O. D. SPLIT SPOON
U-SAMPLER	
S-SAMPLER	
CORE BARREL	NQ
CORE BIT	NQ 2"
DRILL RODS	2"

DRILLING MUD USED: [X] YES [ ] NO
DIAMETER OF ROTARY BIT, IN.: 2-7/8, 3-7/8
TYPE OF DRILLING MUD: BENTONITE GEL

AUGER USED: [ ] YES [X] NO
TYPE AND DIAMETER, IN.:

*CASING HAMMER, LBS. 140 AVERAGE FALL, IN. 30
*SAMPLER HAMMER, LBS. 140 AVERAGE FALL, IN. 30
*USED AUTOMATIC HAMMER.

WATER LEVEL OBSERVATIONS IN BOREHOLE

DATE	TIME	DEPTH OF HOLE	DEPTH OF CASING	DEPTH TO WATER	CONDITIONS OF OBSERVATION
06-26-15	07:15	60	50	20	MUDLINE AT 20'.

PIEZOMETER INSTALLED [ ] YES [X] NO SKETCH SHOWN ON

STANDPIPE:	TYPE		ID, IN.		LENGTH, FT.	TOP ELEV.	
INTAKE ELEMENT:	TYPE		OD, IN.		LENGTH, FT.	TIP ELEV.	
FILTER:	MATERIAL		OD, IN.		LENGTH, FT.	BOT. ELEV.	

PAY QUANTITIES

3.5" DIA. DRY SAMPLE BORING	LIN. FT.	117	NO. OF 3" SHELBY TUBE SAMPLES	
3.5" DIA. U-SAMPLE BORING	LIN. FT.		NO. OF 3" UNDISTURBED SAMPLES	
CORE DRILLING IN ROCK	LIN. FT.	15	OTHER:	

BORING CONTRACTOR: AQUIFER DRILLING & TESTING CO., INC.
DRILLER: JAMES HELPERS: DANNY
REMARKS: BOREHOLE UPON COMPLETION.
RESIDENT ENGINEER: MATTHEW KRAMER DATE: 06-25-15
CLASSIFICATION CHECK: CHERYL J. MOSS TYPING CHECK: ALEXANDRA PATRONE

MUESER RUTLEDGE CONSULTING ENGINEERS

BORING LOG

BORING NO. M-8
SHEET 1 OF 5
PROJECT: 340 FAE **FILE NO.** 12319
LOCATION: BROOKLYN, NEW YORK **SURFACE ELEV.** +42.5
RES. ENGR. MATTHEW KRAMER

DAILY PROGRESS	SAMPLE NO.	SAMPLE DEPTH	SAMPLE BLOWS/6"	SAMPLE DESCRIPTION	STRATA	DEPTH	CASING BLOWS	REMARKS
10:00					CONC		DRILLED	Concrete topping slab.
07-06-15						1.5	AHEAD	Drilled ahead to 13'.
Monday							4" 3"	
Sunny								
80°F						5		
					CELLAR			
						10		
						12.5		**Concrete from 12.5'
					**			
	1D	13.0	5-7	Brown fine to medium sand, some silt, trace				to 13'.
		15.0	11-14	gravel, coarse sand (Fill) (SM)	F	15		
	2D	15.0	12-14	Do 1D (Fill) (SM)				
		17.0	17-21			17		
	3D	17.0	23-22	Brown fine to coarse sand, some gravel, silt				
		19.0	9-63	(SM)				
	4D	19.0	10-5	Brown gravelly fine to coarse sand, trace silt		20		
		21.0	40-23	(SP-SM)				
					T			
						25		Boulder from 25' to 28'.
	5NR	25.0	50/0"	No recovery				
		27.0						
						29		
						30		
	6D	30.0	13-14	Brown fine to medium sand, trace silt, gravel,				
14:45		32.0	15-22	coarse sand (SP-SM)				
07:15								
07-07-15					S			
Tuesday						35		
Overcast	7D	35.0	12-15	Brown fine to coarse sand, trace gravel, silt				
80°F		37.0	16-20	(SP-SM)				
						38.5		
						40		
	8D	40.0	27-45	Brown fine to coarse sandy gravel, some silt	T			Rock in spoon tip.
		42.0	32-22	(GM)				
						43.5		
						45		
	9D	45.0	5-17	Brown fine to coarse sand, trace gravel, silt				
		47.0	15-17	(SP-SM)				
					S			
						50		
	10D	50.0	13-16	Brown fine to medium sand, trace coarse sand,				
		52.0	22-18	gravel, silt (SP-SM)				

MUESER RUTLEDGE CONSULTING ENGINEERS

BORING LOG

BORING NO. M-8
SHEET 2 OF 5
PROJECT: 340 FAE **FILE NO.** 12319
LOCATION: BROOKLYN, NEW YORK **SURFACE ELEV.** +42.5
RES. ENGR. MATTHEW KRAMER

DAILY PROGRESS	SAMPLE NO.	SAMPLE DEPTH	SAMPLE BLOWS/6"	SAMPLE DESCRIPTION	STRATA	DEPTH	CASING BLOWS	REMARKS
Cont'd							DRILLED	
07-07-15							AHEAD	
Tuesday							4" 3"	
Overcast							↓	
80°F						**55**		
	11D	55.0	11-16	Brown fine to medium sand, trace silt (SP-SM)				
		57.0	17-23					
						60		
	12D	60.0	16-19	Do 11D (SP-SM)				
		62.0	20-22					
						65		
	13D	65.0	15-20	Brown fine to medium sand, trace silt (SP-SM)				
		67.0	24-36					
						70		
	14D	70.0	15-16	Brown fine to medium sand, trace silt (SP-SM)				
		72.0	24-25					
						75		
	15D	75.0	21-21	Brown fine to medium sand, trace silt (SP-SM)	**S**			
		77.0	23-28					
						80		
	16D	80.0	20-27	Brown fine to medium sand, trace silt (SP-SM)				
		82.0	29-30					
						85		
	17D	85.0	24-36	Brown fine to medium sand, trace silt (SP-SM)				
		87.0	34-40					
						90		
	18D	90.0	26-33	Brown fine to medium sand, trace coarse				
		92.0	40-40	sand, silt (SP-SM)				
						95		
	19D	95.0	29-29	Brown fine to medium sand, trace silt, mica				
		97.0	35-30	(SP-SM)				
						100		
	20D	100.0	24-28	Brown fine sand, trace silt (SP-SM)				
		102.0	34-32				↓	

MUESER RUTLEDGE CONSULTING ENGINEERS

BORING LOG

BORING NO. M-8
SHEET 3 OF 5
PROJECT: 340 FAE **FILE NO.** 12319
LOCATION: BROOKLYN, NEW YORK **SURFACE ELEV.** +42.5
RES. ENGR. MATTHEW KRAMER

DAILY PROGRESS	SAMPLE NO.	SAMPLE DEPTH	SAMPLE BLOWS/6"	SAMPLE DESCRIPTION	STRATA	DEPTH	CASING BLOWS	REMARKS
Cont'd							DRILLED	
07-07-15							AHEAD	
Tuesday							3"	
Overcast								
80°F					S	**105**		
	21D	105.0	21-24	Brown fine to medium sand, trace coarse				
		107.0	25-30	sand, silt, mica (SP-SM)				
						108.5		
						110		
	22D	110.0	13-10	Stiff gray organic silty clay, trace shells (OH)				WC=31, pp=1.8
15:00		112.0	13-17					
07:15					C			
07-08-15								
Wednesday						**115**		
Overcast	23D	115.0	5-9	Top: Stiff gray organic silty clay, trace mica (OH)		**116**		23D Top: WC=39,
75°F		117.0	19-38	Bot: Black peat, some wood (Pt)	O			pp=1.25
						118		23D Bot: WC=127
	1C	118.0	REC=68%	Intermediate slightly weathered to moderately			4*	*Coring time in
		123.0	RQD=40%	weathered gray schistose gneiss, jointed to		**120**	4*	minutes per foot.
				closely jointed, weathered joints			4*	
							4*	
							4*	
	2C	123.0	REC=90%	Weathered slightly weathered gray schistose			20*	
		124.0	RQD=0%	gneiss, broken, weathered joints		**125**	4*	
	3C	124.0	REC=74%	Medium hard slightly weathered to unweathered			4*	
		129.0	RQD=74%	gray schistose gneiss, blocky, iron stained &	R		4*	
				weathered joints			4*	
							4*	
	4C	129.0	REC=93%	Hard unweathered gray schistose gneiss,		**130**	5*	
		134.0	RQD=93%	blocky, iron stained joints			5*	
							5*	
							5*	
15:00						**134**	5*	End of Boring at 134'.
						135		
								WC=Water Content
								in percent of dry
								weight.
						140		pp=Pocket
								Penetrometer
								Unconfined Compres-
								sive Strength in tsf.
						145		
						150		

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ROCK CORE SKETCH

BORING NO. M-8
SHEET 4 OF 5
FILE NO. 12319
SURFACE ELEV. +42.5
RES ENGR. MCK

PROJECT: 340 FAE
LOCATION: Brooklyn
TEST/INSP. EQUIPMENT CME55 IC55
REF. CODES/STANDARDS

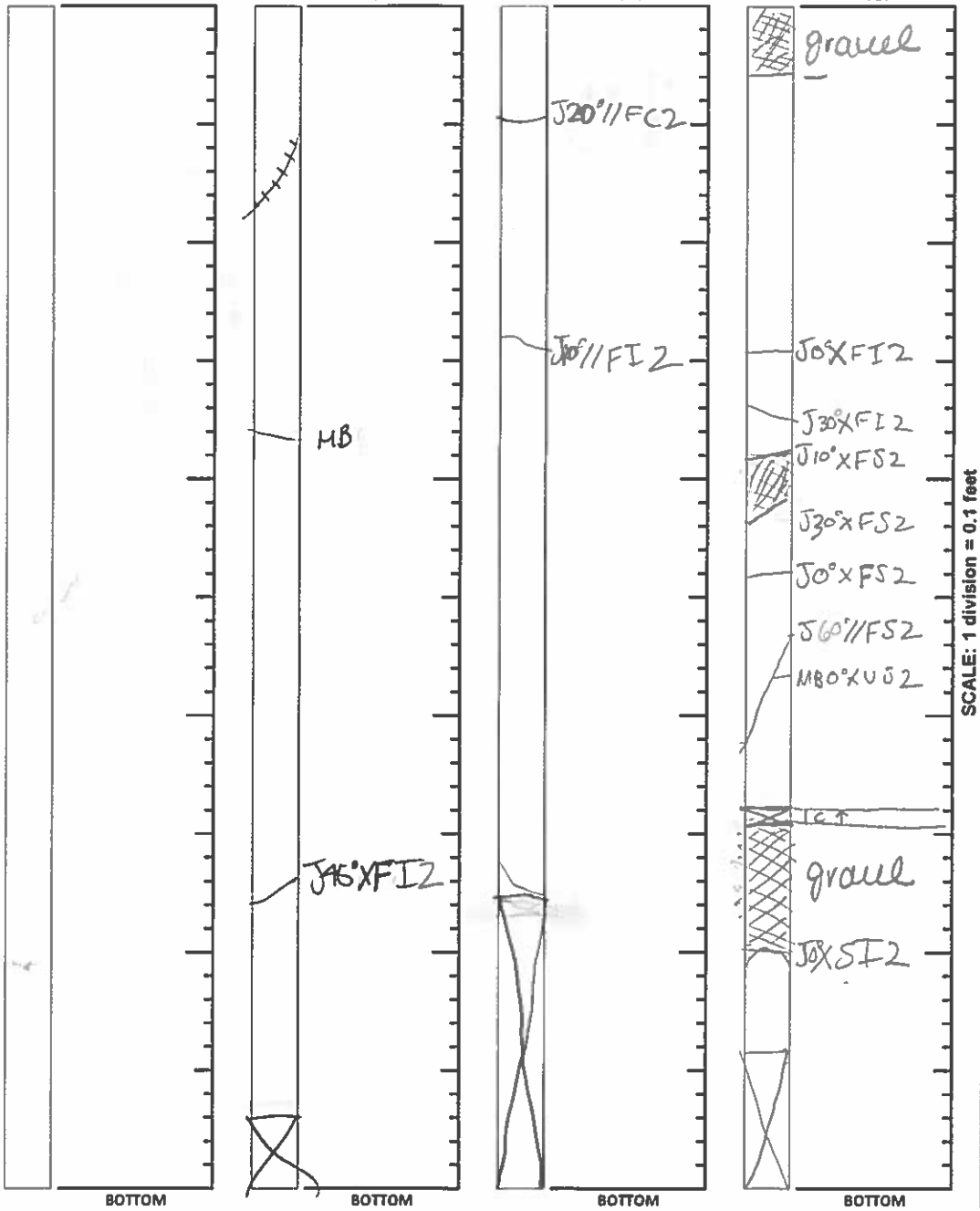
Run No.	REC/RQD

Run No.	REC/RQD
4C	93/93

Run No.	REC/RQD
3C	74/74

Run No.	REC/RQD
1C	68/40
2C	90/0

TOP



BOTTOM

ROCK CORE SKETCH LEGEND

JOINTING
J - Joint
MB - Mechanical Break
Θ - Angle w/ Horizontal
// - Parallel
X - Crossing
F - Foliation
S - Stratification
U - Unfoliated or Unstratified

JOINT SURFACE
C - Curved
I - Irregular
S - Straight

JOINT CONDITION
1 - Slick
2 - Smooth
3 - Rough

SKETCH SYMBOLS
Joint
Healed Joint
Broken
Part of Core Not Recovered
Cavities or Vugs in Core
Clay
Sand
Empty Space

NOTES

MUESER RUTLEDGE CONSULTING ENGINEERS

BORING NO. M-8
SHEET 5 **OF** 5

PROJECT 340 FAE
FILE NO. 12319
LOCATION BROOKLYN, NEW YORK
SURFACE ELEV. +42.5
BORING LOCATION SEE BORING LOCATION PLAN
DATUM

BORING EQUIPMENT AND METHODS OF STABILIZING BOREHOLE

TYPE OF BORING RIG		TYPE OF FEED DURING CORING		CASING USED						
TRUCK		MECHANICAL		DIA., IN.	4	DEPTH, FT. FROM	0	TO	55	
SKID		HYDRAULIC	X	DIA., IN.	3	DEPTH, FT. FROM	0	TO	124	
BARGE		OTHER		DIA., IN.		DEPTH, FT. FROM		TO		
OTHER	CM3 LC55									

CASING USED: [X] YES [ ] NO

TYPE AND SIZE OF:

D-SAMPLER	2" O. D. SPLIT SPOON
U-SAMPLER	
S-SAMPLER	
CORE BARREL	NQ
CORE BIT	NQ 2"
DRILL RODS	2"

DRILLING MUD USED: [X] YES [ ] NO
DIAMETER OF ROTARY BIT, IN.: 2-7/8, 3-7/8
TYPE OF DRILLING MUD: BENTONITE GEL

AUGER USED: [ ] YES [X] NO
TYPE AND DIAMETER, IN.:

*CASING HAMMER, LBS. 140 AVERAGE FALL, IN. 30
*SAMPLER HAMMER, LBS. 140 AVERAGE FALL, IN. 30
*USED AUTOMATIC HAMMER.

WATER LEVEL OBSERVATIONS IN BOREHOLE

DATE	TIME	DEPTH OF HOLE	DEPTH OF CASING	DEPTH TO WATER	CONDITIONS OF OBSERVATION
					NO WATER LEVEL OBSERVATIONS MADE.

PIEZOMETER INSTALLED [ ] YES [X] NO SKETCH SHOWN ON

STANDPIPE:	TYPE		ID, IN.		LENGTH, FT.		TOP ELEV.		
INTAKE ELEMENT:	TYPE		OD, IN.		LENGTH, FT.		TIP ELEV.		
FILTER:	MATERIAL		OD, IN.		LENGTH, FT.		BOT. ELEV.		

PAY QUANTITIES

3.5" DIA. DRY SAMPLE BORING	LIN. FT.	118	NO. OF 3" SHELBY TUBE SAMPLES	
3.5" DIA. U-SAMPLE BORING	LIN. FT.		NO. OF 3" UNDISTURBED SAMPLES	
CORE DRILLING IN ROCK	LIN. FT.	16	OTHER:	

BORING CONTRACTOR: AQUIFER DRILLING & TESTING CO., INC.
DRILLER: JAMES HELPERS: DANNY
REMARKS: BOREHOLE GROUTED UPON COMPLETION.
RESIDENT ENGINEER: MATTHEW KRAMER DATE: 07-06-15
CLASSIFICATION CHECK: CHERYL J. MOSS TYPING CHECK: ALEXANDRA PATRONE

MUESER RUTLEDGE CONSULTING ENGINEERS

BORING LOG

BORING NO. M-9
SHEET 1 OF 2
PROJECT: 340 FAE **FILE NO.** 12319
LOCATION: BROOKLYN, NEW YORK **SURFACE ELEV.** +42.5
RES. ENGR. MATTHEW KRAMER

DAILY PROGRESS	SAMPLE NO.	SAMPLE DEPTH	SAMPLE BLOWS/6"	SAMPLE DESCRIPTION	STRATA	DEPTH	CASING BLOWS	REMARKS
08:45					**	0.7	DRILLED	**Concrete from 0' to
06-15-15	1D	1.0	3-3	Brown fine to medium sand, trace silt (Fill) (SP)			AHEAD	0.7'.
Monday		3.0	4-6				4"	
Overcast	2D	3.0	4-7	Brown fine to medium sand, trace coarse sand,			↓	
60°F		5.0	6-7	silt (Fill) (SP)	F	5	↓	
	3D	5.0	5-5	Brown fine to medium sand, trace coarse sand,				
		7.0	5-5	gravel, brick, concrete, silt (Fill) (SP)				
	4D	7.0	4-9	Brown fine to medium sand, trace gravel,				Concrete in spoon.
10:00		8.3	50/3"	concrete, coarse sand, silt (Fill) (SP)		8.3		Boring offset.
						10		End of Boring at 8.3'.
						15		
						20		
						25		
						30		
						35		
						40		
						45		
						50		

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BORING NO. M-9

MUESER RUTLEDGE CONSULTING ENGINEERS

BORING NO. M-9
SHEET 2 **OF** 2

PROJECT 340 FAE
FILE NO. 12319
LOCATION BROOKLYN, NEW YORK
SURFACE ELEV. +42.5
BORING LOCATION SEE BORING LOCATION PLAN
DATUM NAVD 88

BORING EQUIPMENT AND METHODS OF STABILIZING BOREHOLE

TYPE OF BORING RIG		TYPE OF FEED DURING CORING		CASING USED						
TRUCK		MECHANICAL		DIA., IN.	4	DEPTH, FT. FROM	0	TO	5	
SKID		HYDRAULIC	X	DIA., IN.		DEPTH, FT. FROM		TO		
BARGE		OTHER		DIA., IN.		DEPTH, FT. FROM		TO		
OTHER	CME LC55									

TYPE AND SIZE OF:					
D-SAMPLER	2" O. D. SPLIT SPOON	DRILLING MUD USED		YES	X NO
U-SAMPLER		DIAMETER OF ROTARY BIT, IN.			
S-SAMPLER		TYPE OF DRILLING MUD			
CORE BARREL	NQ	AUGER USED		YES	X NO
CORE BIT	NQ 2"	TYPE AND DIAMETER, IN.			
DRILL RODS	2"				

*CASING HAMMER, LBS. 140 AVERAGE FALL, IN. 30
*SAMPLER HAMMER, LBS. 140 AVERAGE FALL, IN. 30
*USED AUTOMATIC HAMMER.

WATER LEVEL OBSERVATIONS IN BOREHOLE

DATE	TIME	DEPTH OF HOLE	DEPTH OF CASING	DEPTH TO WATER	CONDITIONS OF OBSERVATION
					NO WATER LEVEL OBSERVATIONS MADE.

PIEZOMETER INSTALLED YES X NO SKETCH SHOWN ON

STANDPIPE:	TYPE	ID, IN.	LENGTH, FT.	TOP ELEV.			
INTAKE ELEMENT:	TYPE	OD, IN.	LENGTH, FT.	TIP ELEV.			
FILTER:	MATERIAL	OD, IN.	LENGTH, FT.	BOT. ELEV.			

PAY QUANTITIES

3.5" DIA. DRY SAMPLE BORING	LIN. FT.	8.3	NO. OF 3" SHELBY TUBE SAMPLES	
3.5" DIA. U-SAMPLE BORING	LIN. FT.		NO. OF 3" UNDISTURBED SAMPLES	
CORE DRILLING IN ROCK	LIN. FT.		OTHER:	

BORING CONTRACTOR AQUIFER DRILLING & TESTING CO., INC.
DRILLER JAMES HELPERS DANNY
REMARKS BOREHOLE BACKFILLED UPON COMPLETION.
RESIDENT ENGINEER MATTHEW KRAMER DATE 06-15-15
CLASSIFICATION CHECK: CHERYL J. MOSS TYPING CHECK: ALEXANDRA PATRONE

MUESER RUTLEDGE CONSULTING ENGINEERS

BORING LOG

BORING NO. M-9A
SHEET 1 OF 5
PROJECT: 340 FAE **FILE NO.** 12319
LOCATION: BROOKLYN, NEW YORK **SURFACE ELEV.** +42.5
RES. ENGR. MATTHEW KRAMER

DAILY PROGRESS	SAMPLE NO.	SAMPLE DEPTH	SAMPLE BLOWS/6"	SAMPLE DESCRIPTION	STRATA	DEPTH	CASING BLOWS	REMARKS
10:00							DRILLED	
06-15-15							AHEAD	
Monday							4" 3"	
Overcast								
70°F						**5**		
						10		
						15		
	1D	15.0	8-14	Brown fine to medium sand, some silt, trace				
		17.0	13-13	gravel (SM)				
						20		
	2D	20.0	10-14	Brown fine to medium sand, some silt, trace				
		22.0	13-9	gravel, coarse sand (SM)				
						25		
	3NR	25.0	100/5"	No recovery				
		27.0						
	4D	27.0	37-51	Red, brown fine to medium sand, some silt,				
		29.0	50-51	trace gravel, coarse sand (SM)				
					T	**30**		
	5D	30.0	23-33	Brown fine to coarse sand, some silt, trace				
		32.0	32-26	gravel (SM)				
						35		
	6D	35.0	21-20	Brown fine to medium sand, some silt, trace				
		37.0	18-24	gravel, coarse sand (SM)				
						40		
	7D	40.0	24-25	Red brown fine to coarse sand, some gravel,				
		42.0	21-25	silt (SM)				
						43.5		
						45		
	8D	45.0	18-17	Red brown fine to medium sand, trace silt,				No recovery on 2" spoon,
14:45		47.0	16-18	gravel (SP-SM)				take 3" spoon.
07:30					**S**			
06-16-15								
Tuesday						**50**		
Overcast	9D	50.0	10-10	Red brown fine to medium sand, trace silt,				Wet sample.
70°F		52.0	13-15	coarse sand (SP-SM)				

MUESER RUTLEDGE CONSULTING ENGINEERS

BORING LOG

BORING NO. M-9A
SHEET 2 OF 5
PROJECT: 340 FAE **FILE NO.** 12319
LOCATION: BROOKLYN, NEW YORK **SURFACE ELEV.** +42.5
RES. ENGR. MATTHEW KRAMER

DAILY PROGRESS	SAMPLE NO.	SAMPLE DEPTH	SAMPLE BLOWS/6"	SAMPLE DESCRIPTION	STRATA	DEPTH	CASING BLOWS	REMARKS
Cont'd							DRILLED	
06-16-15							AHEAD	
Wednesday							3"	
Overcast								
70°F						**55**		
	10D	55.0	12-13	Brown fine to medium sand, trace coarse sand,				
		57.0	17-18	silt (SP-SM)				
						60		
	11D	60.0	18-17	Brown fine to medium sand, trace coarse sand,				
		62.0	20-20	silt (SP-SM)				
						65		
	12D	65.0	21-22	Brown fine to medium sand, trace silt (SP-SM)				
		67.0	25-25					
						70		
	13D	70.0	21-22	Do 12D (SP-SM)				
		72.0	25-28					
						75		
	14D	75.0	17-22	Brown fine to medium sand, trace coarse				
		77.0	24-24	sand, silt (SP-SM)	**S**			
						80		
	15D	80.0	23-28	Brown fine to medium sand, trace silt (SP-SM)				
		82.0	33-34					
						85		
	16D	85.0	27-29	Do 15D (SP-SM)				
		87.0	30-33					
						90		
	17D	90.0	28-30	Do 15D (SP-SM)				
		92.0	30-32					
						95		
	18D	95.0	22-30	Brown fine sand, trace silt, mica (SP-SM)				
		97.0	34-35					
						100		
	19D	100.0	25-31	Do 8D (SP-SM)				
		102.0	33-36					

MUESER RUTLEDGE CONSULTING ENGINEERS

BORING LOG

BORING NO. M-9A
SHEET 3 OF 5
PROJECT: 340 FAE **FILE NO.** 12319
LOCATION: BROOKLYN, NEW YORK **SURFACE ELEV.** +42.5
RES. ENGR. MATTHEW KRAMER

DAILY PROGRESS	SAMPLE NO.	SAMPLE DEPTH	SAMPLE BLOWS/6"	SAMPLE DESCRIPTION	STRATA	DEPTH	CASING BLOWS	REMARKS
							DRILLED	
14:30					S		AHEAD	
07:00						103	↓ 3"	
06-17-15	1C	103.0	REC=66%	Gray gravel & cobbles			4*	*Coring time in
Wednesday		106.0	RQD=13%		T	105	6*	minutes per foot.
Sunny						106	6*	
70°F	2C	106.0	REC=100%	Medium hard unweathered to slightly weathered			8*	
		111.0	RQD=80%	gray gneiss, moderately jointed to jointed, iron			4*	
				stained & weathered joints			4*	
						110	4*	
							4*	
	3C	111.0	REC=43%	Weathered highly weathered gray gneiss,			8*	Black decomposed
		113.5	RQD=22%	broken, iron stained & weathered joints	R		8/6"*	rock in between rock
	4C	113.5	REC=93%	Hard unweathered to slightly weathered gray			5*	fragments.
		118.5	RQD=87%	gneiss, blocky, iron stained & weathered joints		115	4*	
							4*	
							4*	
							3*	
14:00						118.5		End of Boring at 118.5'.
						120		
						125		
						130		
						135		
						140		
						145		
						150		

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ROCK CORE SKETCH

BORING NO. M-9A
SHEET 4 OF 5
FILE NO. 12319
SURFACE ELEV. +42.5
RES ENGR. Matthew Kramer

PROJECT: 340 FAE
LOCATION: Brooklyn
TEST/INSP. EQUIPMENT
REF. CODES/STANDARDS

Run No.	REC/RQD

TOP / BOTTOM

Run No.	REC/RQD
4C	93/87

TOP / BOTTOM

MB
J0°XFS
J20°XFS wjts
J30°XFI
J10XFI
J20°//FS
BOTTOM

Run No.	REC/RQD
2C	100/80

BOT. ~~TOP~~ / TOP ~~BOTTOM~~

J10°XFS
J0°XFS wjt
J60°//FC
MB0°/FS
MB0°//FS
J60°XFS wjt
J20°XFS
MB6°//FI

Run No.	REC/RQD
1C	66.6/13.7
3C	43.3/22.2

TOP / BOTTOM

J60°XFS
J20°//FS
J30°//FI
gravel + cobbles
J60°XFI
J60°XFI
J60°XFI
J30°//FS
1C ↑ 3C ↓
J30°XFI → Blk Sa
J10°XFI

SCALE: 1 division = 0.1 feet

ROCK CORE SKETCH LEGEND

JOINTING
- J - Joint
- MB - Mechanical Break
- Θ - Angle w/ Horizontal
- // - Parallel
- X - Crossing
- F - Foliation
- S - Stratification
- U - Unfoliated or Unstratified

JOINT SURFACE
- C - Curved
- I - Irregular
- S - Straight

JOINT CONDITION
- 1 - Slick
- 2 - Smooth
- 3 - Rough

SKETCH SYMBOLS
- Joint
- Healed Joint
- Broken
- Part of Core Not Recovered
- Cavities or Vugs in Core
- Clay
- Sand
- Empty Space

NOTES

MUESER RUTLEDGE CONSULTING ENGINEERS

BORING NO. M-9A
SHEET 5 **OF** 5

PROJECT 340 FAE
FILE NO. 12319
LOCATION BROOKLYN, NEW YORK
SURFACE ELEV. +42.5
BORING LOCATION SEE BORING LOCATION PLAN
DATUM NAVD 88

BORING EQUIPMENT AND METHODS OF STABILIZING BOREHOLE

TYPE OF BORING RIG		TYPE OF FEED DURING CORING		CASING USED						
TRUCK		MECHANICAL		DIA., IN.	4	DEPTH, FT. FROM	0	TO	45	
SKID		HYDRAULIC	X	DIA., IN.	3	DEPTH, FT. FROM	0	TO	103	
BARGE		OTHER		DIA., IN.		DEPTH, FT. FROM		TO		
OTHER	CME LC55									

CASING USED: [X] YES [ ] NO

TYPE AND SIZE OF:

D-SAMPLER	2" O. D. SPLIT SPOON
U-SAMPLER	
S-SAMPLER	
CORE BARREL	NQ
CORE BIT	NQ 2"
DRILL RODS	2"

DRILLING MUD USED: [X] YES [ ] NO
DIAMETER OF ROTARY BIT, IN.: 2-7/8, 3-7/8
TYPE OF DRILLING MUD: BENTONITE GEL

AUGER USED: [ ] YES [X] NO
TYPE AND DIAMETER, IN.:

*CASING HAMMER, LBS. 140 AVERAGE FALL, IN. 30
*SAMPLER HAMMER, LBS. 140 AVERAGE FALL, IN. 30
*USED AUTOMATIC HAMMER.

WATER LEVEL OBSERVATIONS IN BOREHOLE

DATE	TIME	DEPTH OF HOLE	DEPTH OF CASING	DEPTH TO WATER	CONDITIONS OF OBSERVATION
06-16-15	07:30	40	40	23	
06-17-15	07:00	103	103	14	

PIEZOMETER INSTALLED [ ] YES [X] NO SKETCH SHOWN ON

STANDPIPE:	TYPE		ID, IN.		LENGTH, FT.	TOP ELEV.	
INTAKE ELEMENT:	TYPE		OD, IN.		LENGTH, FT.	TIP ELEV.	
FILTER:	MATERIAL		OD, IN.		LENGTH, FT.	BOT. ELEV.	

PAY QUANTITIES

3.5" DIA. DRY SAMPLE BORING	LIN. FT.	103	NO. OF 3" SHELBY TUBE SAMPLES	
3.5" DIA. U-SAMPLE BORING	LIN. FT.		NO. OF 3" UNDISTURBED SAMPLES	
CORE DRILLING IN ROCK	LIN. FT.	15.5	OTHER:	

BORING CONTRACTOR: AQUIFER DRILLING & TESTING CO., INC.
DRILLER: JAMES HELPERS: DANNY
REMARKS: BOREHOLE GROUTED UPON COMPLETION.
RESIDENT ENGINEER: MATTHEW KRAMER DATE: 06-15-15
CLASSIFICATION CHECK: CHERYL J. MOSS TYPING CHECK: ALEXANDRA PATRONE

MUESER RUTLEDGE CONSULTING ENGINEERS

BORING LOG

BORING NO. M-1
SHEET 1 OF 2
PROJECT: 340 FLATBUSH AVENUE EXTENSION **FILE NO.** 12319
LOCATION: BROOKLYN, NEW YORK **SURFACE ELEV.** +13.0
RES. ENGR. ANDY ONG

DAILY PROGRESS	SAMPLE NO.	SAMPLE DEPTH	SAMPLE BLOWS/6"	SAMPLE DESCRIPTION	STRATA	DEPTH	CASING BLOWS	REMARKS
09:45							DRILLED	Concrete from 0' to 3.5'.
03-31-16					CONC		AHEAD	
Thursday							4"	
						3.5	↓	
15:00	1D	4.0	1-8	Brown fine to medium sand, trace gravel, silt,		5		
07:00		6.0	10-15	coarse sand (SP-SM)	F		↓	
04-01-16	2D	6.0	18-32	Brown fine to coarse sand, trace silt (SP-SM)				
Friday		8.0	40-52			8		
	3D	8.0	20-31	Brown fine to coarse sand, trace gravel, silt				Rig chatter from 9' to
		10.0	40-53	(SP-SM)		10		10'.
	4D	10.0	51-45	Brown fine to coarse sandy gravel, trace silt				2 Samples.
		11.15	50/2"	(GP-GM)				Rig chatter from 11' to
								13'.
								Rig chatter from 14' to
						15		to 15'.
	5D	15.0	34-35	Do 4D (GP-GM)				
		17.0	35-24		T			Rig chatter from 17' to
								to 19'.
						20		
	6D	20.0	43-27	Brown fine to coarse sand, trace gravel, silt				
		22.0	23-30	(SP-SM)				
	7D	23.0	21-18	Do 6D (SP-SM)				REC=4"
13:00		25.0	21-30			25		End of Boring at 25'.
						30		
						35		
						40		
						45		
						50		

MRCE Form BL-1

BORING NO. M-1

MUESER RUTLEDGE CONSULTING ENGINEERS

BORING NO. M-1
SHEET 2 **OF** 2

PROJECT 340 FLATBUSH AVENUE EXTENSION
FILE NO. 12319
LOCATION BROOKLYN, NEW YORK
SURFACE ELEV. +13.0
BORING LOCATION SEE BORING LOCATION PLAN
DATUM NAVD-88

BORING EQUIPMENT AND METHODS OF STABILIZING BOREHOLE

TYPE OF BORING RIG		TYPE OF FEED DURING CORING		CASING USED		X YES		NO		
TRUCK		MECHANICAL		DIA., IN.	4	DEPTH, FT. FROM	0	TO	6.5
SKID	X	HYDRAULIC	X	DIA., IN.		DEPTH, FT. FROM		TO	
BARGE		OTHER		DIA., IN.		DEPTH, FT. FROM		TO	
OTHER									

TYPE AND SIZE OF:

D-SAMPLER	2" O. D. SPLIT SPOON
U-SAMPLER	
S-SAMPLER	
CORE BARREL	
CORE BIT	
DRILL RODS	

DRILLING MUD USED X YES NO
DIAMETER OF ROTARY BIT, IN. 3-3/4
TYPE OF DRILLING MUD QUIK GEL

AUGER USED YES X NO
TYPE AND DIAMETER, IN.

CASING HAMMER, LBS. AVERAGE FALL, IN.
*SAMPLER HAMMER, LBS. 140 AVERAGE FALL, IN. 30
*USED CATHEAD WITH DONUT HAMMER.

WATER LEVEL OBSERVATIONS IN BOREHOLE

DATE	TIME	DEPTH OF HOLE	DEPTH OF CASING	DEPTH TO WATER	CONDITIONS OF OBSERVATION
					NO WATER LEVEL OBSERVATIONS MADE.

PIEZOMETER INSTALLED YES X NO SKETCH SHOWN ON

STANDPIPE:	TYPE		ID, IN.		LENGTH, FT.		TOP ELEV.
INTAKE ELEMENT:	TYPE		OD, IN.		LENGTH, FT.		TIP ELEV.
FILTER:	MATERIAL		OD, IN.		LENGTH, FT.		BOT. ELEV.

PAY QUANTITIES

3.5" DIA. DRY SAMPLE BORING	LIN. FT.	25	NO. OF 3" SHELBY TUBE SAMPLES	
3.5" DIA. U-SAMPLE BORING	LIN. FT.		NO. OF 3" UNDISTURBED SAMPLES	
CORE DRILLING IN ROCK	LIN. FT.		OTHER:	

BORING CONTRACTOR AQUIFER DRILLING & TESTING CO., INC.
DRILLER MATT FUCETO HELPERS PAT CUMO /SCOTT ODWYER
REMARKS BOREHOLE TERMINATED AT 25' DUE TO BUDGET CONSTRAINTS
RESIDENT ENGINEER ANDY ONG DATE 03-31-16
CLASSIFICATION CHECK: CHERYL J. MOSS TYPING CHECK:

MUESER RUTLEDGE CONSULTING ENGINEERS

BORING LOG

BORING NO. M-3
SHEET 1 OF 5
PROJECT: 340 FLATBUSH AVENUE EXTENSION **FILE NO.** 12319
LOCATION: BROOKLYN, NEW YORK **SURFACE ELEV.** +13.0
RES. ENGR. ANDY ONG

DAILY PROGRESS	SAMPLE NO.	SAMPLE DEPTH	SAMPLE BLOWS/6"	SAMPLE DESCRIPTION	STRATA	DEPTH	CASING BLOWS	REMARKS
09:30					**	0.5	DRILLED	**Concrete slab from 0'
03-11-16	1D	1.0	5-4	Brown gravelly fine to coarse sand, trace silt			AHEAD	to 0.5'. REC=6"
Friday		3.0	6-5	(SP-SM)	F		5"	Possible cobble from
	2D	3.0	47-36	Brown fine to coarse sand, some gravel, silt				3' to 4'.
		5.0	28-11	(SM)		5		Boulder & cobble at
	3D	5.0	42-50/0"	Brown fine to coarse sand, some gravel, silt	***	5.5		5.5'.
		5.5		(SM)	BLDR	6.5		Hard drilling & coring
	4D	7.0	10-35	Red brown fine to medium sand, some silt,				from 5.5' to 6.5'.
		9.0	41-47	trace gravel, coarse sand (SM)				Hard drilling at 11'
						10		and from 13' to 14'.
	5D	10.0	31-50	Brown fine to medium sand, some silt, trace				
15:00		11.15	50/3"	gravel, coarse sand (SM)				
08:00					T			
03-14-16								
Monday						15		
	6D	15.0	10-10	Brown fine to medium sand, some clayey silt,				
		16.3	10-100/4"	fine to coarse gravel, trace coarse sand (SM)				Hard drilling from 16.5'
								to 18.5'.
						18.5		
						20		
	7D	20.0	15-17	Brown fine to coarse sand, trace silt, gravel				
		22.0	D & GROUTE	(SP-SM)				
								Rig chatter from 23' to
								25'.
						25		
	8D	25.0	41-18	Brown fine to coarse sand, some gravel, trace				Hard drilling & rig
13:00		27.0	22-20	silt (SP-SM)				chatter from 27' to 30'.
07:00								
03-15-16								
Tuesday						30		
	9D	30.0	12-13	Brown fine to coarse sand, trace gravel, silt				
		32.0	16-19	(SP-SM)				
						35		
	10D	35.0	10-14	Brown fine to coarse sand, trace silt (SP-SM)	S			
		37.0	18-22					
						40		
	11D	40.0	12-16	Brown fine to medium sand, trace coarse sand,				
		42.0	20-22	silt (SP-SM)				
						45		
	12D	45.0	19-22	Do 11D (SP-SM)				
		47.0	21-23					
14:30						50		
07:00	13D	50.0	19-26	Do 11D (SP-SM)				
03-16-16		52.0	28-30					

MUESER RUTLEDGE CONSULTING ENGINEERS

BORING LOG

BORING NO. M-3
SHEET 2 OF 5
PROJECT: 340 FLATBUSH AVENUE EXTENSION **FILE NO.** 12319
LOCATION: BROOKLYN, NEW YORK **SURFACE ELEV.** +13.0
RES. ENGR. ANDY ONG

DAILY PROGRESS	SAMPLE NO.	SAMPLE DEPTH	SAMPLE BLOWS/6"	SAMPLE DESCRIPTION	STRATA	DEPTH	CASING BLOWS	REMARKS
Cont'd								
03-16-16								
Wednesday								
						55		
	14D	55.0	24-30	Brown fine to medium sand, trace coarse				
		57.0	50-60	sand, silt (SP-SM)				
						60		
	15D	60.0	25-36	Do 14D (SP-SM)				
		62.0	68-72					
						65		
	16D	65.0	24-33	Do 14D (SP-SM)				
		67.0	57-65		**S**			
						70		
15:00	17D	70.0	71-100/4"	Do 14D (SP-SM)				REC=6"
07:00		70.8						
03-17-16								
Thursday								
						75		Rig chatter at 75'.
	18D	75.0	43-56	Do 14D (SP-SM)				
		76.1	50/2"					
						80		
	19D	80.0	65-50/1"	Do 14D (SP-SM)				REC=6"
		80.6						
						83.5		Gray clay on roller bit
						85		at 85'.
	20D	85.0	35-39	Stiff gray black organic silty clay (OH)				WC=30, pp=2.25
		87.0	51-60	*	**C**			*Slight odor
						90		Rig chatter at 90'.
13:00	21NR	90.0	50/1"	No recovery			11*	*Coring time in
07:00		90.1					10*	minutes per foot.
03-18-16	1C	90.0	REC=53%	Gray boulder, cobbles & gravel			8*	
Friday		95.0	RQD=NA				5*	
					T	**95**	3*	
	2C	95.0	REC=81.7%	Top 2': Gray boulder & gravel			17*	
		100.0	RQD=NA	Bot: Medium hard gray gneiss, unweathered to			13*	
				slightly weathered, jointed, iron stained &			8*	
				weathered joints		**97.8**	8*	
						100	10*	
	3C	100.0	REC=98.3%	Hard unweathered gray gneiss, moderately	**R**		11*	
		105.0	RQD=88.3%	jointed to blocky, weathered joints			11*	

MUESER RUTLEDGE CONSULTING ENGINEERS

BORING LOG

BORING NO. M-3
SHEET 3 OF 5
PROJECT: 340 FLATBUSH AVENUE EXTENSION **FILE NO.** 12319
LOCATION: BROOKLYN, NEW YORK **SURFACE ELEV.** +13.0
RES. ENGR. ANDY ONG

DAILY PROGRESS	SAMPLE NO.	SAMPLE DEPTH	SAMPLE BLOWS/6"	SAMPLE DESCRIPTION	STRATA	DEPTH	CASING BLOWS	REMARKS
Cont'd								
03-18-16								
Friday					R		10*	
							10*	
15:30						105	10*	End of Boring at 105'.

WC=Water Content in percent of dry weight.

pp=Pocket Penetrometer Unconfined Compressive Strength in tsf.

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ROCK CORE SKETCH

BORING NO. M-3
SHEET 4 OF 5
FILE NO. 12319
SURFACE ELEV. +13
RES ENGR. A. ONG

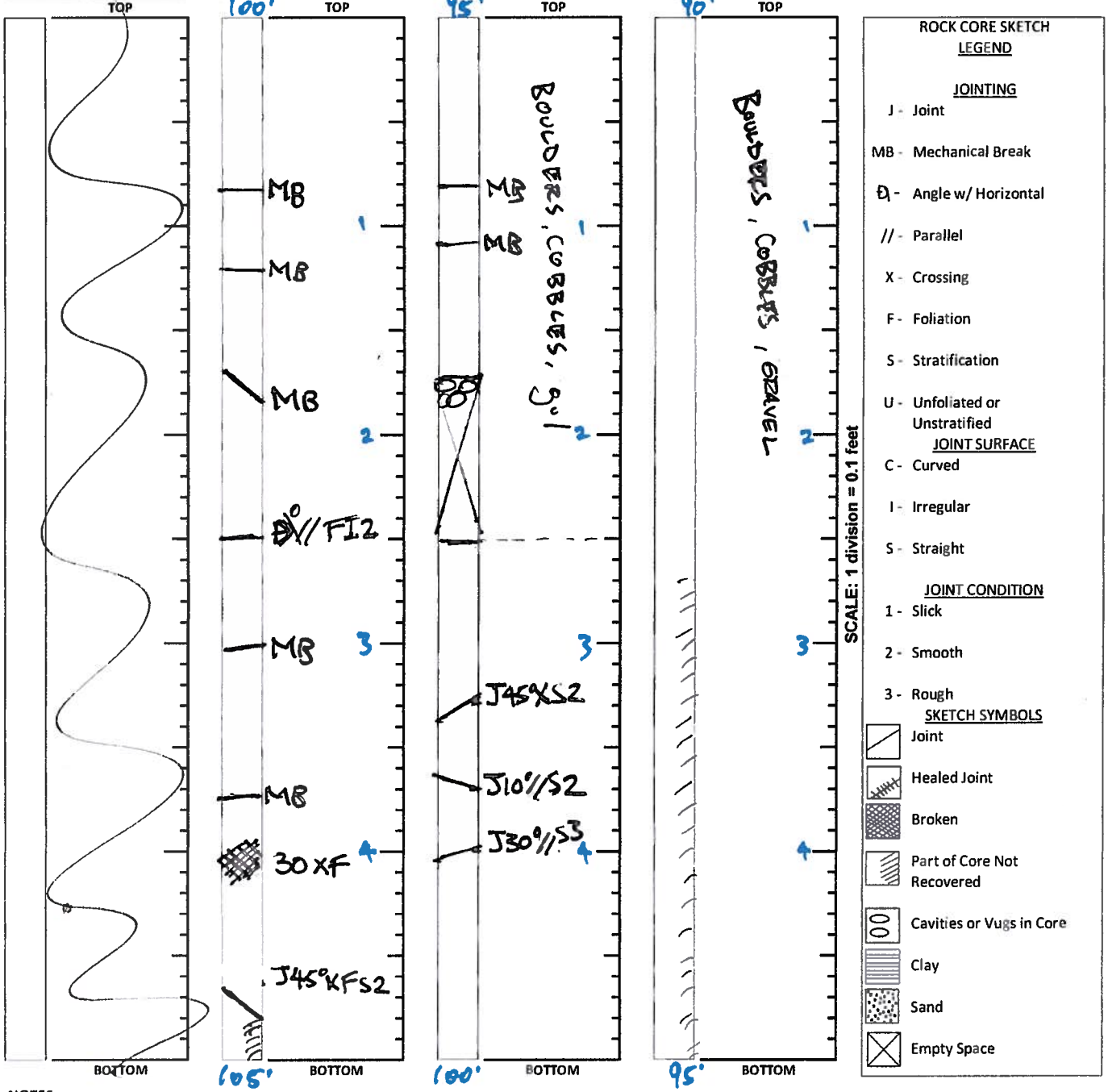
PROJECT: 340 F.A.E
LOCATION: BROOKLYN, NY
TEST/INSP. EQUIPMENT
REF. CODES/STANDARDS

Run No.	REC/RQD

Run No.	REC/RQD
3C	REC = 98% RQD = 88%

Run No.	REC/RQD
2C	REC = 81.7% RQD = 70.8%

Run No.	REC/RQD
1C	REC = 53% RQD = 25%



ROCK CORE SKETCH
LEGEND

JOINTING
J - Joint
MB - Mechanical Break
Θ - Angle w/ Horizontal
// - Parallel
X - Crossing
F - Foliation
S - Stratification
U - Unfoliated or Unstratified

JOINT SURFACE
C - Curved
I - Irregular
S - Straight

JOINT CONDITION
1 - Slick
2 - Smooth
3 - Rough

SKETCH SYMBOLS
Joint
Healed Joint
Broken
Part of Core Not Recovered
Cavities or Vugs in Core
Clay
Sand
Empty Space

NOTES
POSSIBLE BOULDERS & COBBLES/TILL TO ~ -97 ft DUE TO EVIDENCE OF GRAVEL FOUND IN THE MID OF 1C & 2C.

MUESER RUTLEDGE CONSULTING ENGINEERS

BORING NO. M-3
SHEET 5 **OF** 5

PROJECT 340 FLATBUSH AVENUE EXTENSION
FILE NO. 12319
LOCATION BROOKLYN, NEW YORK
SURFACE ELEV. +13.0
BORING LOCATION SEE BORING LOCATION PLAN
DATUM NAVD-88

BORING EQUIPMENT AND METHODS OF STABILIZING BOREHOLE

TYPE OF BORING RIG		TYPE OF FEED DURING CORING		CASING USED		X YES		NO		
TRUCK		MECHANICAL		DIA., IN.	5	DEPTH, FT. FROM	0	TO	11	
SKID	X	HYDRAULIC	X	DIA., IN.		DEPTH, FT. FROM		TO		
BARGE		OTHER		DIA., IN.		DEPTH, FT. FROM		TO		
OTHER										

TYPE AND SIZE OF:

D-SAMPLER	2" O. D. SPLIT SPOON
U-SAMPLER	
S-SAMPLER	
CORE BARREL	NX DOUBLE BARREL
CORE BIT	NX DIAMOND
DRILL RODS	NWJ

DRILLING MUD USED X YES NO
DIAMETER OF ROTARY BIT, IN. 5-7/8, 3-3/4
TYPE OF DRILLING MUD E-Z MUD

AUGER USED YES X NO
TYPE AND DIAMETER, IN.

*CASING HAMMER, LBS. 300 AVERAGE FALL, IN.
*SAMPLER HAMMER, LBS. 140 AVERAGE FALL, IN. 30
*USED CATHEAD WITH DONUT HAMMER.

WATER LEVEL OBSERVATIONS IN BOREHOLE

DATE	TIME	DEPTH OF HOLE	DEPTH OF CASING	DEPTH TO WATER	CONDITIONS OF OBSERVATION
03-15-16	07:00	27	11	7	MUD LEVEL READING.
03-16-16	07:00	50	11	9.2	MUD LEVEL READING.
03-17-16	07:00	71	11		COLLAPSED HOLE AT '-9.5'.
03-18-16	07:00	90	11	7	MUD LEVEL READING.
03-21-16	07:00	105	11	9	MUD LEVEL READING.

PIEZOMETER INSTALLED YES X NO SKETCH SHOWN ON

STANDPIPE:	TYPE		ID, IN.		LENGTH, FT.		TOP ELEV.
INTAKE ELEMENT:	TYPE		OD, IN.		LENGTH, FT.		TIP ELEV.
FILTER:	MATERIAL		OD, IN.		LENGTH, FT.		BOT. ELEV.

PAY QUANTITIES

3.5" DIA. DRY SAMPLE BORING	LIN. FT.	90	NO. OF 3" SHELBY TUBE SAMPLES	
3.5" DIA. U-SAMPLE BORING	LIN. FT.		NO. OF 3" UNDISTURBED SAMPLES	
CORE DRILLING IN ROCK	LIN. FT.	15	OTHER:	

BORING CONTRACTOR AQUIFER DRILLING & TESTING CO., INC.
DRILLER GUS SURI HELPERS SCOTT ODWYER
REMARKS BOREHOLE BACKFILLED & GROUTED UPON COMPLETION.
RESIDENT ENGINEER ANDY ONG DATE 03-11-16
CLASSIFICATION CHECK: CHERYL J. MOSS TYPING CHECK:

MUESER RUTLEDGE CONSULTING ENGINEERS

BORING LOG

BORING NO. M-10
SHEET 1 OF 2

PROJECT: 340 FLATBUSH AVENUE EXTENSION
FILE NO. 12319

LOCATION: BROOKLYN, NEW YORK
SURFACE ELEV. +13.0

RES. ENGR. A. ONG

DAILY PROGRESS	SAMPLE NO.	SAMPLE DEPTH	SAMPLE BLOWS/6"	SAMPLE DESCRIPTION	STRATA	DEPTH	CASING BLOWS	REMARKS
13:00					**	0.25	DRILLED	**Concrete from 0' to
03-28-16	1D	1.0	15-13	Top 1': Black f-c sand, tr silt, gravel (SM)			AHEAD	0.25'.
Monday		2.7	15-50/2"	Bot: Brn f-m sand, sm gravel, silt, brick (SM)	F		4"	2 Samples at 1D.
	2D	3.0	10-17	Brown fine to medium sand, some gravel, silt			↓	Rig chatter at 2.7'.
		5.0	13-14	(SM)		5		REC=6"
								Driller dropped
15:00								equipment into
07:00								borehole;
03-29-16								borehole abandoned
Tues., 12:00						10		at 5 ft.
						15		
						20		
			KFILLED UP(					
						25		
						30		
						35		
						40		
						45		
						50		

MUESER RUTLEDGE CONSULTING ENGINEERS

BORING NO. M-10
SHEET 2 **OF** 2

PROJECT 340 FLATBUSH AVENUE EXTENSION
FILE NO. 12319
LOCATION BROOKLYN, NEW YORK
SURFACE ELEV. +13.0
BORING LOCATION SEE BORING LOCATION PLAN
DATUM NAVD-88

BORING EQUIPMENT AND METHODS OF STABILIZING BOREHOLE

TYPE OF BORING RIG		TYPE OF FEED DURING CORING		CASING USED		X YES		NO		
TRUCK		MECHANICAL		DIA., IN.	4	DEPTH, FT. FROM	0	TO	4.5
SKID	X	HYDRAULIC	X	DIA., IN.		DEPTH, FT. FROM		TO	
BARGE		OTHER		DIA., IN.		DEPTH, FT. FROM		TO	
OTHER									

TYPE AND SIZE OF: DRILLING MUD USED X YES NO

D-SAMPLER	2" O. D. SPLIT SPOON	Drill er drop ped	DIAMETER OF ROTARY BIT, IN.	3-3/4
U-SAMPLER			TYPE OF DRILLING MUD	QUIK GEL
S-SAMPLER		equipment into		
CORE BARREL			AUGER USED	YES X NO
CORE BIT		borehole;	TYPE AND DIAMETER, IN.	
DRILL RODS				

borehole abando CASING HAMMER, LBS. _____ AVERAGE FALL, IN. _____
*SAMPLER HAMMER, LBS. 140 AVERAGE FALL, IN. 30
at 5 ft. *USED CATHEAD WITH DONUT HAMMER.

WATER LEVEL OBSERVATIONS IN BOREHOLE

DATE	TIME	DEPTH OF HOLE	DEPTH OF CASING	DEPTH TO WATER	CONDITIONS OF OBSERVATION
					NO WATER LEVEL OBSERVATIONS MADE.

PIEZOMETER INSTALLED YES X NO SKETCH SHOWN ON

STANDPIPE:	TYPE		ID, IN.		LENGTH, FT.		TOP ELEV.		
INTAKE ELEMENT:	TYPE		OD, IN.		LENGTH, FT.		TIP ELEV.		
FILTER:	MATERIAL		OD, IN.		LENGTH, FT.		BOT. ELEV.		

PAY QUANTITIES

3.5" DIA. DRY SAMPLE BORING	LIN. FT.	5	NO. OF 3" SHELBY TUBE SAMPLES	
3.5" DIA. U-SAMPLE BORING	LIN. FT.		NO. OF 3" UNDISTURBED SAMPLES	
CORE DRILLING IN ROCK	LIN. FT.		OTHER:	

BORING CONTRACTOR AQUIFER DRILLING & TESTING CO., INC.
DRILLER MATT FUCETO HELPERS PAT CUMO
REMARKS BOREHOLE BACKFILLED UPON COMPLETION
RESIDENT ENGINEER ANDY ONG DATE 03-28-16

MUESER RUTLEDGE CONSULTING ENGINEERS

BORING LOG

BORING NO. M-10A
SHEET 1 OF 2
PROJECT: 340 FLATBUSH AVENUE EXTENSION **FILE NO.** 12319
LOCATION: BROOKLYN, NEW YORK **SURFACE ELEV.** +13.0
RES. ENGR. ANDY ONG

DAILY PROGRESS	SAMPLE NO.	SAMPLE DEPTH	SAMPLE BLOWS/6"	SAMPLE DESCRIPTION	STRATA	DEPTH	CASING BLOWS	REMARKS
13:15					**	**0.25**	DRILLED	**Concrete from 0' to
03-29-16							AHEAD	0.25'.
Tues., 15:00	1W	2.5		Gray fine to medium sand, trace silt (SP-SM)			5"	Boulder at 2'.
07:00		3.0						Boulder cuttings.
03-30-16						**5**		Drilled ahead 5" at 3'.
Wed., 14:00								Rig chatter at 4'.
								Boring M-10A
								terminated at 3' due to
								large boulder.
						10		End of Boring at 3'.
						15		
						20		
						25		
						30		
						35		
						40		
						45		
						50		

MUESER RUTLEDGE CONSULTING ENGINEERS

BORING NO. M-10A
SHEET 2 **OF** 2

PROJECT 340 FLATBUSH AVENUE EXTENSION
FILE NO. 12319
LOCATION BROOKLYN, NEW YORK
SURFACE ELEV. +13.0
BORING LOCATION SEE BORING LOCATION PLAN
DATUM NAVD-88

BORING EQUIPMENT AND METHODS OF STABILIZING BOREHOLE

TYPE OF BORING RIG		TYPE OF FEED DURING CORING		CASING USED		X YES		NO		
TRUCK		MECHANICAL		DIA., IN.	5	DEPTH, FT. FROM	0	TO	3	
SKID	X	HYDRAULIC	X	DIA., IN.		DEPTH, FT. FROM		TO		
BARGE		OTHER		DIA., IN.		DEPTH, FT. FROM		TO		
OTHER										

TYPE AND SIZE OF:

D-SAMPLER 2" O. D. SPLIT SPOON
U-SAMPLER
S-SAMPLER
CORE BARREL
CORE BIT
DRILL RODS

DRILLING MUD USED X YES NO
DIAMETER OF ROTARY BIT, IN. 3-3/4
TYPE OF DRILLING MUD QUIK GEL

AUGER USED YES X NO
TYPE AND DIAMETER, IN.

CASING HAMMER, LBS. AVERAGE FALL, IN.
*SAMPLER HAMMER, LBS. 140 AVERAGE FALL, IN. 30
*USED CATHEAD WITH DONUT HAMMER.

WATER LEVEL OBSERVATIONS IN BOREHOLE

DATE	TIME	DEPTH OF HOLE	DEPTH OF CASING	DEPTH TO WATER	CONDITIONS OF OBSERVATION
					NO WATER LEVEL OBSERVATIONS MADE.

PIEZOMETER INSTALLED YES X NO SKETCH SHOWN ON

STANDPIPE:	TYPE		ID, IN.		LENGTH, FT.		TOP ELEV.		
INTAKE ELEMENT:	TYPE		OD, IN.		LENGTH, FT.		TIP ELEV.		
FILTER:	MATERIAL		OD, IN.		LENGTH, FT.		BOT. ELEV.		

PAY QUANTITIES

3.5" DIA. DRY SAMPLE BORING	LIN. FT.	NO. OF 3" SHELBY TUBE SAMPLES	
3.5" DIA. U-SAMPLE BORING	LIN. FT.	NO. OF 3" UNDISTURBED SAMPLES	
CORE DRILLING IN ROCK	LIN. FT.	OTHER:	

BORING CONTRACTOR AQUIFER DRILLING & TESTING CO., INC.
DRILLER MATT FUCETO HELPERS SCOTT ODWYER
REMARKS BOREHOLE TERMINATED DUE TO LARGE BOULDER.
RESIDENT ENGINEER ANDY ONG DATE 03-29-16
CLASSIFICATION CHECK: CHERYL J. MOSS TYPING CHECK:

MUESER RUTLEDGE CONSULTING ENGINEERS

BORING LOG

BORING NO. M-10B
SHEET 1 OF 2
PROJECT: 340 FLATBUSH AVENUE EXTENSION **FILE NO.** 12319
LOCATION: BROOKLYN, NEW YORK **SURFACE ELEV.** +13.0
RES. ENGR. ANDY ONG

DAILY PROGRESS	SAMPLE NO.	SAMPLE DEPTH	SAMPLE BLOWS/6"	SAMPLE DESCRIPTION	STRATA	DEPTH	CASING BLOWS	REMARKS
14:00					**	0.25		**Concrete from 0' to
03-30-16								0.25'.
Wed., 15:00								Boring M-108 terminated
								at 3'.
						5		End of Boring at 3'.
						10		
						15		
						20		
						25		
						30		
						35		
						40		
						45		
						50		

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BORING NO. M-10B

MUESER RUTLEDGE CONSULTING ENGINEERS

BORING NO. M-10B
SHEET 2 **OF** 2

PROJECT 340 FLATBUSH AVENUE EXTENSION
FILE NO. 12319
LOCATION BROOKLYN, NEW YORK
SURFACE ELEV. +13.0
BORING LOCATION SEE BORING LOCATION PLAN
DATUM NAVD-88

BORING EQUIPMENT AND METHODS OF STABILIZING BOREHOLE

TYPE OF BORING RIG		TYPE OF FEED DURING CORING		CASING USED					
TRUCK		MECHANICAL		DIA., IN.		DEPTH, FT. FROM		TO	
SKID	X	HYDRAULIC	X	DIA., IN.		DEPTH, FT. FROM		TO	
BARGE		OTHER		DIA., IN.		DEPTH, FT. FROM		TO	
OTHER									

CASING USED [ ] YES [X] NO

TYPE AND SIZE OF:

D-SAMPLER 2" O. D. SPLIT SPOON
U-SAMPLER
S-SAMPLER
CORE BARREL
CORE BIT
DRILL RODS

DRILLING MUD USED [ ] YES [X] NO
DIAMETER OF ROTARY BIT, IN. 3-3/4
TYPE OF DRILLING MUD

AUGER USED [ ] YES [X] NO
TYPE AND DIAMETER, IN.

CASING HAMMER, LBS. _____ AVERAGE FALL, IN. _____
*SAMPLER HAMMER, LBS. 140 AVERAGE FALL, IN. 30
*USED CATHEAD WITH DONUT HAMMER.

WATER LEVEL OBSERVATIONS IN BOREHOLE

DATE	TIME	DEPTH OF HOLE	DEPTH OF CASING	DEPTH TO WATER	CONDITIONS OF OBSERVATION
					NO WATER LEVEL OBSERVATIONS MADE.

PIEZOMETER INSTALLED [ ] YES [X] NO SKETCH SHOWN ON

STANDPIPE:	TYPE		ID, IN.		LENGTH, FT.		TOP ELEV.
INTAKE ELEMENT:	TYPE		OD, IN.		LENGTH, FT.		TIP ELEV.
FILTER:	MATERIAL		OD, IN.		LENGTH, FT.		BOT. ELEV.

PAY QUANTITIES

3.5" DIA. DRY SAMPLE BORING	LIN. FT.		NO. OF 3" SHELBY TUBE SAMPLES
3.5" DIA. U-SAMPLE BORING	LIN. FT.		NO. OF 3" UNDISTURBED SAMPLES
CORE DRILLING IN ROCK	LIN. FT.		OTHER:

BORING CONTRACTOR AQUIFER DRILLING & TESTING CO., INC.
DRILLER MATT FUCETO HELPERS PAT CUMO/SCOTT ODWYER
REMARKS BOREHOLE TERMINATED DUE TO PRESENCE OF BOULDERS.
RESIDENT ENGINEER ANDY ONG DATE 03-30-16
CLASSIFICATION CHECK: CHERYL J. MOSS TYPING CHECK:

MUESER RUTLEDGE CONSULTING ENGINEERS

BORING LOG

BORING NO. M-11
SHEET 1 OF 5
PROJECT: 340 FLATBUSH AVENUE EXTENSION **FILE NO.** 12319
LOCATION: BROOKLYN, NEW YORK **SURFACE ELEV.** 42.5
RES. ENGR. ANDY ONG

DAILY PROGRESS	SAMPLE NO.	SAMPLE DEPTH	SAMPLE BLOWS/6"	SAMPLE DESCRIPTION	STRATA	DEPTH	CASING BLOWS	REMARKS
08:30					**	0.5	DRILLED	**Concrete slab from
03-14-16	1D	1.0	4-5	Gray brown fine to coarse sand, some silt,			AHEAD	0' to 0.5'.
Monday		3.0	13-26	trace gravel (SM)			4"	
	2D	3.0	5-5	Brown fine to coarse sand, some silt, gravel,				REC=7"
		5.0	2-2	trace clay pockets (SM)		5		
	3D	5.0	3-1	Brown fine to medium sand, some clay (SC)	F			REC=2"
		7.0	1-1					
	4D	7.0	WH-1	Brown clayey fine to medium sand (SC)				
		9.0	1-1					
						9.5		
	5NR	10.0	10-16	No recovery				REC=0", 2nd attempt
		12.0	15-17					made with 3" spoon,
								REC=0", no recovery.
								Cuttings; fine to medium
						15		sand, some silt.
	6D	15.0	8-9	Brown clayey fine to medium sand (SC)				
		17.0	15-24					Hard drilling & water
								loss; possible boulder
								at 19'.
						20		
	7D	20.0	13-14	Brown fine to coarse sand, some silt, gravel				
		22.0	19-36	(SM)				
15:00						25		
07:00	8D	25.0	6-14	Brown fine to coarse sand, trace silt, gravel				
03-15-16		27.0	13-14	(SP-SM)				
Tuesday								
						30		
	9D	30.0	10-15	Do 8D (SP-SM)	S			
		32.0	16-19					
								Rig chatter from 33' to
								34'.
						35		
	10D	35.0	26-21	Brown fine to coarse sand, some gravel, trace				
		37.0	19-28	silt (SP-SM)				
						40		
	11D	40.0	10-12	Brown fine to coarse sand, trace silt (SP-SM)				
		42.0	13-13					
						45		
	12D	45.0	13-13	Do 11D, trace gravel (SP-SM)				
		47.0	14-13					
						50		
	13D	50.0	11-14	Brown fine to medium sand, trace silt, gravel,				
		52.0	15-17	coarse sand (SP-SM)				

MUESER RUTLEDGE CONSULTING ENGINEERS

BORING LOG

BORING NO. M-11
SHEET 2 OF 5
PROJECT: 340 FLATBUSH AVENUE EXTENSION **FILE NO.** 12319
LOCATION: BROOKLYN, NEW YORK **SURFACE ELEV.** 42.5
RES. ENGR. ANDY ONG

DAILY PROGRESS	SAMPLE NO.	SAMPLE DEPTH	SAMPLE BLOWS/6"	SAMPLE DESCRIPTION	STRATA	DEPTH	CASING BLOWS	REMARKS
Cont'd								
03-15-16								
Tuesday								
						55		
	14D	55.0	11-16	Brown fine to medium sand, trace silt, coarse				
		57.0	18-19	sand (SP-SM)				
						60		
	15D	60.0	15-19	Do 14D (SP-SM)				
		62.0	24-22					
						65		
	16D	65.0	14-25	Brown fine to coarse sand, trace silt (SP-SM)				
		68.0	22-27					
						70		
	17D	70.0	15-19	Brown fine to medium sand, trace silt (SP-SM)				
		72.0	23-29					
						75		
	18D	75.0	16-23	Do 17D (SP-SM)				
		77.0	27-23		**S**			
						80		
	19D	80.0	25-32	Do 17D (SP-SM)				
		82.0	35-40					
						85		
	20D	85.0	26-42	Do 17D, trace coarse sand, gravel (SP-SM)				
		87.0	42-52					
14:30						**90**		
07:00	21D	90.0	20-32	Do 17D (SP-SM)				
03-16-16		92.0	42-40					
Tuesday								
						95		
	22D	95.0	21-28	Brown fine to medium sand, trace silt, coarse				
		97.0	29-33	sand (SP-SM)				
						100		
	23D	100.0	23-25	Do 22D (SP-SM)				
		102.0	26-24					

MUESER RUTLEDGE CONSULTING ENGINEERS

BORING LOG

BORING NO. M-11
SHEET 3 OF 5
PROJECT: 340 FLATBUSH AVENUE EXTENSION **FILE NO.** 12319
LOCATION: BROOKLYN, NEW YORK **SURFACE ELEV.** 42.5
RES. ENGR. ANDY ONG

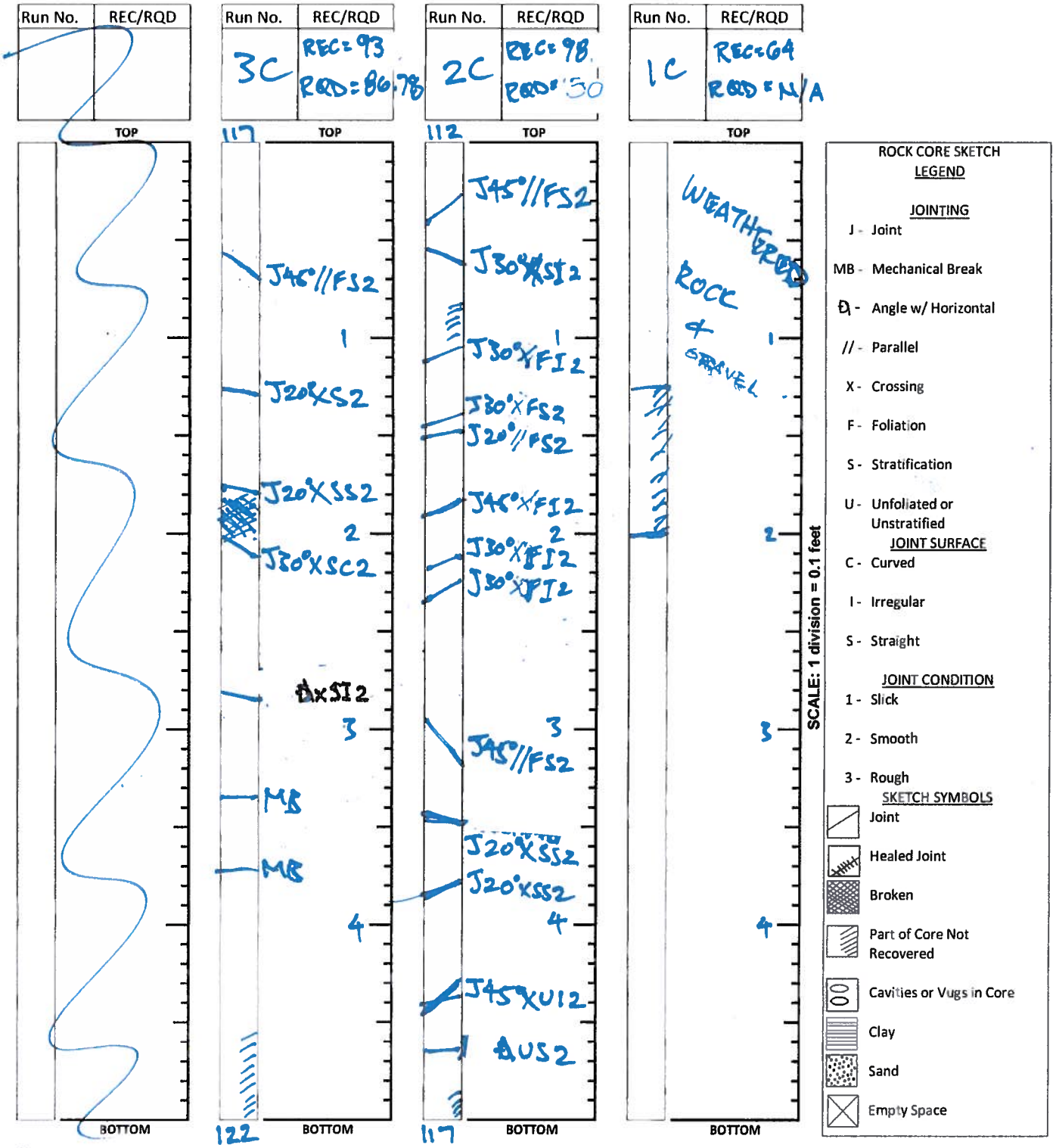
DAILY PROGRESS	SAMPLE NO.	SAMPLE DEPTH	SAMPLE BLOWS/6"	SAMPLE DESCRIPTION	STRATA	DEPTH	CASING BLOWS	REMARKS
Cont'd								
03-16-16								
Tuesday					S			
						105		
	24D	105.0	23-30	Top: Brown fine to medium sand, some silt (SM)		106		
		107.0	37-25	Bot: Hard gray black organic silty clay (OH)	C			24D Bot: WC=20, pp>4.5
								2 Samples taken.
						110		Rig chatter at 110'.
	25D	110.0	50/1"	No recovery	T		2*	REC=0"
	1C	110.0	REC=64%	Gray cobbles & gravel		12	4*	*Coring time in
		112.0	RQD=NA				6*	minutes per foot.
	2C	112.0	REC=98%	Medium hard slightly weathered to unweathered			5*	
		117.0	RQD=50%	gray gneiss, jointed to broken, iron stained &		115	7*	
				weathered joints			6*	
							7*	
	3C	117.0	REC=93%	Do 2C	R		6*	
		122.0	RQD=86.7%				6*	
						120	7*	
							7*	
14:00						122	7*	End of Boring at 122'.
								WC=Water Content
								in percent of dry
						125		weight.
								pp=Pocket
								Penetrometer
						130		Unconfined Compres-
								sive Strength in tsf.
						135		
						140		
						145		
						150		

Mueser Rutledge Consulting Engineers
14 Penn Plaza - 225 West 34th Street
New York, NY 10122
T: 917 339-9300 F: 917 339-9400
www.mrce.com

ROCK CORE SKETCH

PROJECT: 340 F.A.E
LOCATION: BROOKLYN, NY
TEST/INSP. EQUIPMENT
REF. CODES/STANDARDS

BORING NO. M-11
SHEET 4 OF 5
FILE NO. 12319
SURFACE ELEV. ~+42.5
RES ENGR. AONG



NOTES
TOP OF ROCK @ ~112 ft

MUESER RUTLEDGE CONSULTING ENGINEERS

BORING NO. M-11
SHEET 5 **OF** 5

PROJECT 340 FLATBUSH AVENUE EXTENSION
FILE NO. 12319
LOCATION BROOKLYN, NEW YORK
SURFACE ELEV. 42.5
BORING LOCATION SEE BORING LOCATION PLAN
DATUM NAVD-88

BORING EQUIPMENT AND METHODS OF STABILIZING BOREHOLE

TYPE OF BORING RIG		TYPE OF FEED DURING CORING		CASING USED		X YES		NO		
TRUCK		MECHANICAL		DIA., IN.	4	DEPTH, FT. FROM	0	TO	25	
SKID		HYDRAULIC	X	DIA., IN.		DEPTH, FT. FROM		TO		
BARGE		OTHER		DIA., IN.		DEPTH, FT. FROM		TO		
OTHER	CME-LC 55									

TYPE AND SIZE OF:

D-SAMPLER	2" O. D. SPLIT SPOON
U-SAMPLER	
S-SAMPLER	
CORE BARREL	NX DOUBLE BARREL
CORE BIT	NX DIAMOND
DRILL RODS	NWJ

DRILLING MUD USED X YES NO
DIAMETER OF ROTARY BIT, IN. 3-3/4
TYPE OF DRILLING MUD QUIK GEL

AUGER USED YES X NO
TYPE AND DIAMETER, IN.

CASING HAMMER, LBS. AVERAGE FALL, IN.
*SAMPLER HAMMER, LBS. 140 AVERAGE FALL, IN. 30
*USED AUTOMATIC HAMMER.

WATER LEVEL OBSERVATIONS IN BOREHOLE

DATE	TIME	DEPTH OF HOLE	DEPTH OF CASING	DEPTH TO WATER	CONDITIONS OF OBSERVATION
03-16-16	07:15	90	25	-20.7	MUD LEVEL READING.

PIEZOMETER INSTALLED YES X NO SKETCH SHOWN ON

STANDPIPE:	TYPE		ID, IN.		LENGTH, FT.		TOP ELEV.
INTAKE ELEMENT:	TYPE		OD, IN.		LENGTH, FT.		TIP ELEV.
FILTER:	MATERIAL		OD, IN.		LENGTH, FT.		BOT. ELEV.

PAY QUANTITIES

3.5" DIA. DRY SAMPLE BORING	LIN. FT.	110	NO. OF 3" SHELBY TUBE SAMPLES	
3.5" DIA. U-SAMPLE BORING	LIN. FT.		NO. OF 3" UNDISTURBED SAMPLES	
CORE DRILLING IN ROCK	LIN. FT.	12	OTHER:	

BORING CONTRACTOR AQUIFER DRILLING & TESTING CO., INC.
DRILLER DOMENIC PEPE HELPERS GEORGE RAYMOND
REMARKS BOREHOLE BACKFILLED & GROUTED UPON COMPLETION.
RESIDENT ENGINEER ANDY ONG DATE 03-14-16
CLASSIFICATION CHECK: CHERYL J. MOSS TYPING CHECK:

MUESER RUTLEDGE CONSULTING ENGINEERS

BORING LOG

BORING NO. M-12P
SHEET 1 OF 6
PROJECT: 340 FLATBUSH AVENUE EXTENSION **FILE NO.** 12319
LOCATION: BROOKLYN, NEW YORK **SURFACE ELEV.** +13.0
RES. ENGR. ANDY ONG

DAILY PROGRESS	SAMPLE NO.	SAMPLE DEPTH	SAMPLE BLOWS/6"	SAMPLE DESCRIPTION	STRATA	DEPTH	CASING BLOWS	REMARKS
07:00					**	0.5	DRILLED	**Concrete from 0' to
03-22-16	1D	1.0	4-6	Black brown fine to coarse sand, some gravel,			AHEAD	0.5'.
Tuesday		3.0	5-1	trace silt (SP-SM)			5" 4"	1D: REC=6"
	2D	3.0	4-9	Brown fine to coarse sand, some gravel, trace	F			
		5.0	18-18	silt (SP-SM)		5		
	3D	5.0	21-44	Brown black fine to coarse sand, some silt,				REC=6"
		6.25	100/3"	gravel (SM)		7		Rig chatter from 6' to 7'.
	4NR	7.0	37-70	No recovery				No recovery; gravel in
		8.1	50/2"					jar; after two attempts.
	5D	9.0	45-45	Brown gravel, some fine to coarse sand, trace		10		REC<6"
		11.0	51-23	silt (SM)				
	6D	11.0	18-40	Brown fine to coarse sand, trace gravel, trace				
		13.0	59-60	silt (SP-SM)				
								Rig chatter from 14' to
						15		15.5'.
	7D	15.5	46-52	Brown gravelly fine to coarse sand, trace silt	T			
		17.5	48-40	(SP-SM)				
								Hard drilling from 18' to
								19'.
15:00						20		
07:00	8D	20.0	34-46	Do 7D (SP-SM)				REC=6"
03-23-16		22.0	STALLED UP(					
Wednesday								
						23.5		
						25		
	9D	25.0	25-31	Brown fine to coarse sand, trace silt (SP-SM)				
		27.0	29-30					
						30		
	10D	30.0	25-36	Brown fine to medium sand, trace coarse sand,				
		32.0	65-59	silt (SP-SM)				
						35		
	11D	35.0	32-40	Do 10D (SP-SM)				
		37.0	56-61					
					S			
						40		
	12D	40.0	30-45	Do 10D (SP-SM)				
		41.85	70-50/2"					
						45		
	13D	45.0	33-45	Brown fine to medium sand, trace silt (SP-SM)				
		46.25	100/4"					
						50		
	14D	50.0	44-73	Brown fine to medium sand, trace silt (SP-SM)				
		51.8	50/2"					

MUESER RUTLEDGE CONSULTING ENGINEERS

BORING LOG

BORING NO. M-12P
SHEET 2 OF 6
PROJECT: 340 FLATBUSH AVENUE EXTENSION **FILE NO.** 12319
LOCATION: BROOKLYN, NEW YORK **SURFACE ELEV.** +13.0
RES. ENGR. ANDY ONG

DAILY PROGRESS	SAMPLE NO.	SAMPLE DEPTH	SAMPLE BLOWS/6"	SAMPLE DESCRIPTION	STRATA	DEPTH	CASING BLOWS	REMARKS
Cont'd								
03-23-16								
Wednesday								
15:00						**55**		
07:00	15D	55.0	34-61	Brown fine to medium sand, trace coarse sand,				
03-24-16		56.3	63-50/2"	silt (SP-SM)				
Thursday								
						60		
	16D	60.0	48-95	Brown fine to medium sand, trace silt (SP-SM)				
		61.3	100/4"					
					S	**65**		
	17D	65.0	49-48	Do 16D (SP-SM)				
		67.0	47-56					
						70		
	18D	70.0	28-36	Do 16D, trace coarse sand (SP-SM)				
		72.0	43-42					
						75		
	19D	75.0	16-15	Do 16D (SP-SM)				
		77.0	18-29					
						78.5		
					C	**80**		
15:00	20D	80.0	39-50/1"	Hard gray black organic silty clay (OH)		**80.6**		WC=22, pp>4.5
07:00		80.6			**T**	**82**	4*	REC=4"
03-25-16	1C	81.5	REC=93%	Weathered slightly weathered gray gneiss,			9*	Rig chatter from 81' to
Friday		86.5	RQD=25%	closely jointed to broken, iron stained &			10*	81.5'.
				weathered mineral coated joints		**85**	12*	*Coring time in
							16*	minutes per foot.
	2C	86.5	REC=96%	Medium hard slightly weathered to unweathered			10*	
		91.5	RQD=68%	gray gneiss, jointed to closely jointed, iron			10*	
				stained & weathered & mineral coated joints			8*	
					R	**90**	11*	
							10*	
	3C	91.5	REC=96%	Hard to medium hard unweathered gray gneiss,			10*	
		96.5	RQD=80%	blocky, iron stained & weathered & mineral			10*	WC=Water Content
				coated joints			8*	in percent of dry
						95	8*	weight.
							8*	
14:00						**96.5**		End of Boring at 96.5'.
								pp=Pocket
						100		Penetrometer
								Unconfined Compres-
								sive Strength in tsf.

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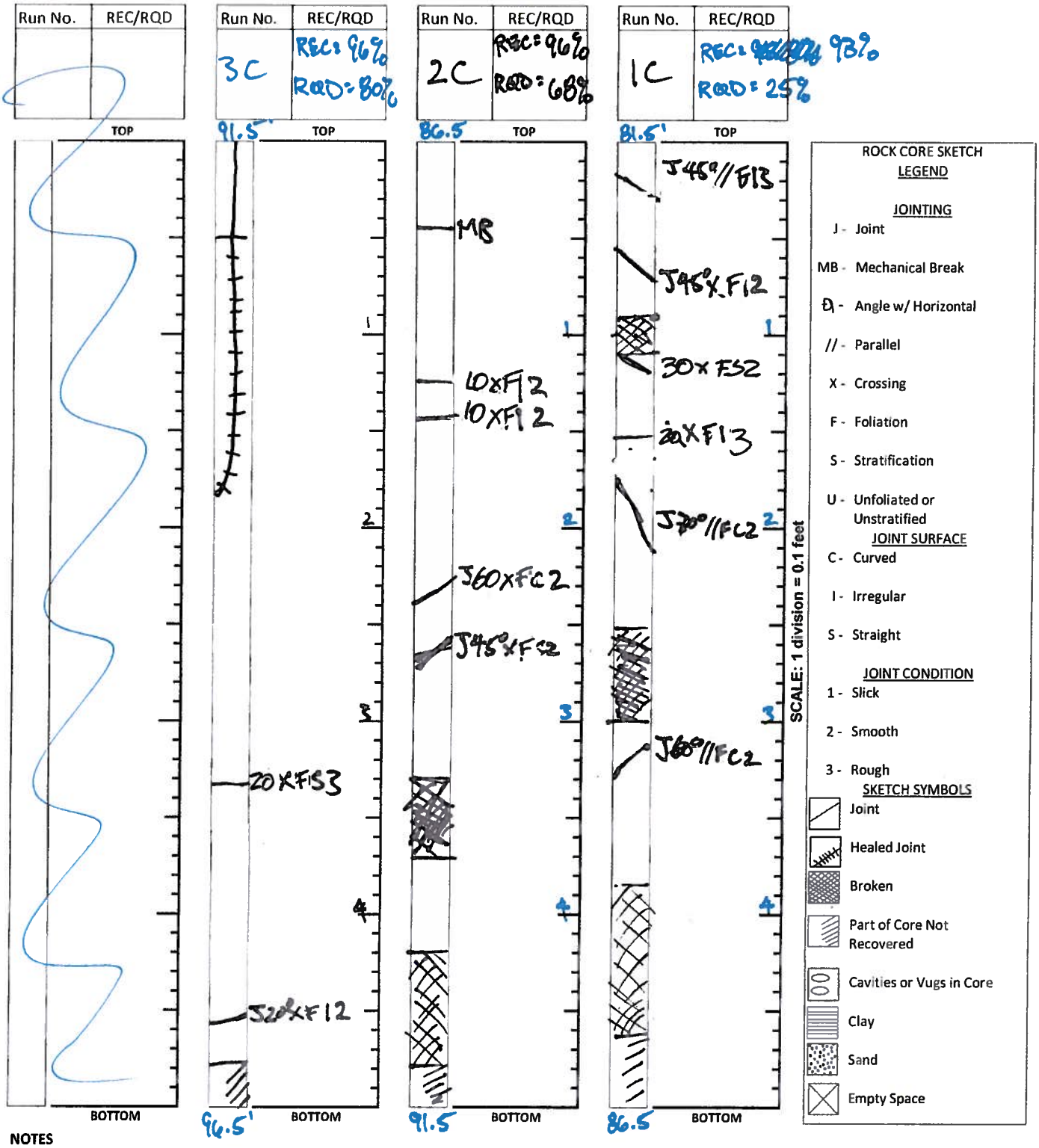
ROCK CORE SKETCH

BORING NO. M-12P
SHEET 3 OF 6
FILE NO. 12319
SURFACE ELEV. ~+18.0
RES ENGR. A.ONG

PROJECT: 340 F.A.E
LOCATION: BROOKLYN, NY
TEST/INSP. EQUIPMENT
REF. CODES/STANDARDS



NOTES

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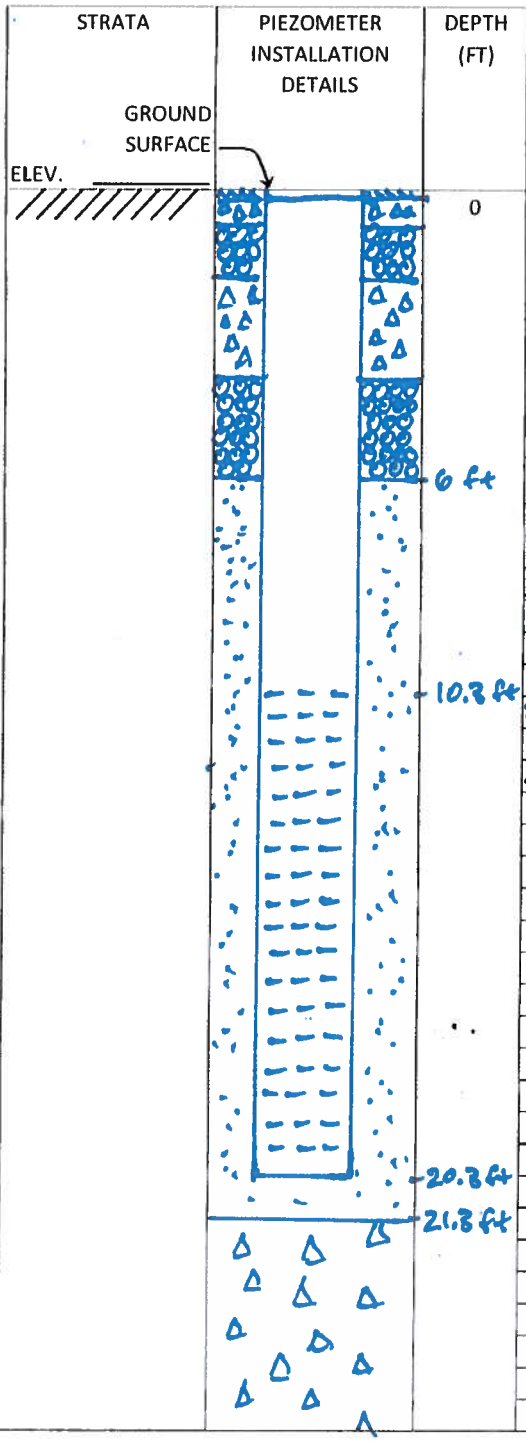
PIEZOMETER RECORD

PIEZOMETER OR BORING NO. M-12P
SHEET 4 OF 6
FILE NO. 12319
INSTALLATION DATE 3/28/16
RES ENGR. A. Ohlig

PROJECT: 340 F.A.E
LOCATION: BROOKLYN, NY
PIEZOMETER LOCATION: SUB-CELLAR

☐ SEE SKETCH ON BACK



PIEZOMETER TYPE PVC PIPE

INTAKE POINT
depth to bottom, ft = 20.3
depth to top, ft = 10.3
length, ft = 10 = L
diameter, in = 5 , ft = 0.42 = 2R

STANDPIPE/RISER
elevation of rim, ft = +13.0
diameter, in = 2 , ft = 0.17 = 2r

READING TIME		DEPTH – RIM TO WATER	ELEVATION OF WATER	REMARKS
DATE	CLOCK			
3/28/16	1500	-9.6	3.4	
3/29/16	0700	-9.7	3.3	
3/29/16	1500	-9.7	3.3	
3/30/16	0700	-9.7	3.3	
3/30/16	1500	-9.7	3.3	
3/31/16	0700	-9.7	3.3	
3/31/16	1500	-9.7	3.3	
4/1/16	0700	-9.65	3.35	
4/1/16	1300	-9.65	3.35	

SAND
GRAVEL
BENTONITE
GROUT

GROUND SURFACE ELEV. +13.0

PIEZOMETER NO. M-12P

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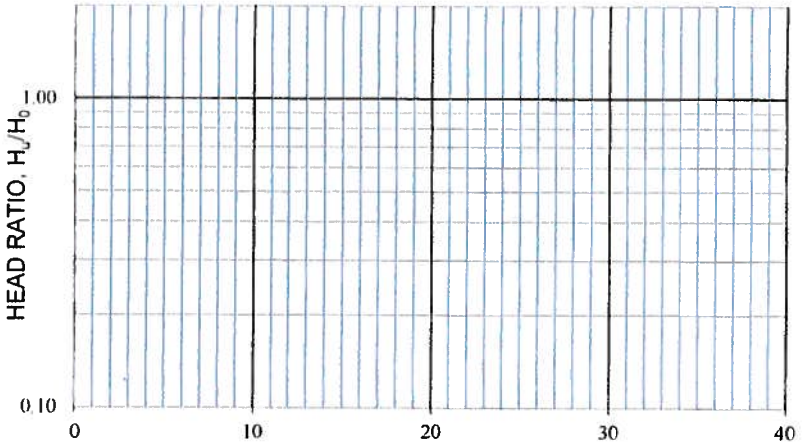
VARIABLE HEAD PERMEABILITY TEST

☑ BOREHOLE OR ☐ PIEZOMETER NO. M-12P

PROJECT: 340 F.A.E
LOCATION: BROOKLYN, NY
PIEZOMETER LOCATION: SUB-CELLAR

SHEET 5 OF 6
FILE NO. 12319
TEST NO. 1
RES ENGR. A. ONG
CALC. BY ____ DATE ____
CH'KD BY ____ DATE ____



INTAKE POINT
depth to bottom, ft = 20.3
depth to top, ft = 10.3
length, ft = 10 = L
diameter, in = 5, ft = 0.42 = 2R

STANDPIPE/RISER
elevation of rim, ft = ____
diameter, in = 2, ft = 0.17 = 2r

depth of casing, ft = 20.3

depth to which stand-pipe was bailed, or height filled to, ft = ____ = Z

READING TIME DATE	READING TIME CLOCK	Δt MIN.	TEST DEPTH, RIM TO WATER H_t (ft.)	DEPTH RIM TO TIDE OR GWL H_{STATIC} (ft.)	UNBALANCED HEAD $H_u = \lvert H_t - H_{STATIC} \rvert$ (ft.)	HEAD RATIO H_u/H_0	REMARKS
3/28/16		STATIC			-	-	- HIGH PERM. IN SURROUNDING SOILS
	1205	1	9.5				- WATER LEVEL DROPPED RAPIDLY
	1206	2	9.6				
	1207	3	9.6				
	1208	4	9.6				
	1209	5	9.6				
	1215	10	9.6				
	1230	15	9.6				
	1235	30	9.6				
	1305	60	9.6				
	1405	120	9.6				

PIEZOMETER NO. M-12P

MUESER RUTLEDGE CONSULTING ENGINEERS

BORING NO. M-12P
SHEET 6 **OF** 6

PROJECT 340 FLATBUSH AVENUE EXTENSION
FILE NO. 12319
LOCATION BROOKLYN, NEW YORK
SURFACE ELEV. +13.0
BORING LOCATION SEE BORING LOCATION PLAN
DATUM NAVD-88

BORING EQUIPMENT AND METHODS OF STABILIZING BOREHOLE

TYPE OF BORING RIG		TYPE OF FEED DURING CORING		CASING USED		X YES		NO		
TRUCK		MECHANICAL		DIA., IN.	5	DEPTH, FT. FROM	0	TO	13
SKID	X	HYDRAULIC	X	DIA., IN.	4	DEPTH, FT. FROM	0	TO	39
BARGE		OTHER		DIA., IN.		DEPTH, FT. FROM		TO	
OTHER									

TYPE AND SIZE OF:

D-SAMPLER	2" O. D. SPLIT SPOON
U-SAMPLER	
S-SAMPLER	
CORE BARREL	NX DOUBLE BARREL
CORE BIT	NX DIAMOND
DRILL RODS	NWJ

DRILLING MUD USED [ ] YES [X] NO
DIAMETER OF ROTARY BIT, IN. 5-7/8, 3-3/4
TYPE OF DRILLING MUD
AUGER USED [ ] YES [X] NO
TYPE AND DIAMETER, IN.

*CASING HAMMER, LBS. 300 AVERAGE FALL, IN.
*SAMPLER HAMMER, LBS. 140 AVERAGE FALL, IN. 30
*USED CATHEAD WITH DONUT HAMMER.

WATER LEVEL OBSERVATIONS IN BOREHOLE

DATE	TIME	DEPTH OF HOLE	DEPTH OF CASING	DEPTH TO WATER	CONDITIONS OF OBSERVATION
03-23-16	07:00	-20	13	-9.7	WATER LEVEL READING.
03-24-16	07:00	-55	21	-5.6	WATER LEVEL READING.
03-25-16	07:00	-81.5	39	-6.1	WATER LEVEL READING.
03-28-16	07:00	-28	29	-9.7	WATER LEVEL READING.
03-28-16	12:00	-20.3	20	-9.7	WELL READING.

PIEZOMETER INSTALLED [X] YES [ ] NO SKETCH SHOWN ON

STANDPIPE:	TYPE	PVC	ID, IN.	2	LENGTH, FT.	10	TOP ELEV.	+12.5
INTAKE ELEMENT:	TYPE	PVC	OD, IN.	2	LENGTH, FT.	10	TIP ELEV.	+3.0
FILTER:	MATERIAL	SAND	OD, IN.	5	LENGTH, FT.	15	BOT. ELEV.	-2.0

PAY QUANTITIES

3.5" DIA. DRY SAMPLE BORING	LIN. FT.	81.5	NO. OF 3" SHELBY TUBE SAMPLES	
3.5" DIA. U-SAMPLE BORING	LIN. FT.	15	NO. OF 3" UNDISTURBED SAMPLES	
CORE DRILLING IN ROCK	LIN. FT.		OTHER:	

BORING CONTRACTOR AQUIFER DRILLING & TESTING CO., INC.
DRILLER GUS SURI HELPERS SCOTT ODWYER
REMARKS PIEZOMETER INSTALLED UPON COMPLETION.
RESIDENT ENGINEER ANDY ONG DATE 03-21-16
CLASSIFICATION CHECK: CHERYL J. MOSS TYPING CHECK:

APPENDIX C

Structural Design Criteria

ABBREVIATIONS:

AB	ANCHOR BOLT
ABV	ABOVE
AC	AIR CONDITIONER
ACI	AMERICAN CONCRETE INSTITUTE
ADD'L	ADDITIONAL
ADJ	ADJACENT
AFF	ABOVE FINISHED FLOOR
AISC	AMERICAN INSTITUTE OF STEEL CONSTRUCTION
ALT	ALTERNATE ALUM ALUMINUM
ANCH	ANCHOR
ANG	ANGLE
APPD	APPROVED
APPROX	APPROXIMATE
ARCH	ARCHITECTURAL
ASTM	AMERICAN SOCIETY FOR TESTING AND MATERIALS
AVG	AVERAGE
AWS	AMERICAN WELDING SOCIETY
B	BASE
BETW	BETWEEN
BF	BRACE FRAME
BKT	BRACKET
BL	BUILDING LINE
BLDG	BUILDING
BM	BEAM
BOTT	BOTTOM
BRK	BRICK
B/STL	BOTTOM OF STEEL
BS	BOTH SIDES
CANT	CANTILEVER
CC	MINI PILE CAP
C	CAISSON CAP
CF	CUBIC FOOT
CG	CENTER OF GRAVITY
CIP	CAST IN PLACE
C.JT	CONCRETE JOINT
CL	CENTER LINE
CLG	CEILING
CLR	CLEAR
CM	CONSTRUCTION MANAGER
CMU	CONCRETE MASONRY UNITS
COL	COLUMN
CONC	CONCRETE
COND	CONDITIONS
CONN	CONNECTION
CONST	CONSTRUCTIONS
CONT	CONTINUOUS
CONTR	CONTRACTOR
COORD	COORDINATE
CORR	CORRUGATED
CY	CUBIC YARD
DEMO	DEMOLITION
DEPT	DEPARTMENT
DET	DETAIL
DIA	DIAMETER
DIM	DIMENSION
DIR	DIRECTION
DN	DOWN
DWL	DOWEL
DWG	DRAWING
E	EAST
EA	EACH
EF	EACH FACE
EL	ELEVATION
ELEC	ELECTRIC
ELEV	ELEVATOR
EMBD	EMBEDMENT
ENCL	ENCLOSURE
EOR	ENGINEER OF RECORD
EOS	EDGE OF SLAB
EP	EMBEDDED PLATE
EQ	EQUAL
EQUIP	EQUIPMENT
ETC	ETCETERA
EW	EACH WAY
E–W	EAST WEST
EXIST	EXISTING
EXP	EXPANSION
EXP JT	EXPANSION JOINT
EXT	EXTENSION
EXTR	EXTERIOR
FL	FLOOR
FND	FOUNDATION
FOB	FACE OF BUILDING
FP	FIRE PROOFING
FT	FOOT
FTG	FOOTING
GA	GAUGE
GALV	GALVANIZED
GC	GENERAL CONTRACTOR
GB	GRADE BEAM
GRTG	GRATING
GYP. BD	GYPSUM BOARD
H	HIGH
HDR	HEADER
HGT	HEIGHT
HORIZ	HORIZONTAL
HP	HIGH POINT
HR	HOUR
HS	HIGH STRENGTH
HVAC	HEAT, VENTILATION & AIR CONDITIONING
ID	INSIDE DIAMETER
IF	INTERIOR FACE
IN	INCH
INCL	INCLUDING
INFO	INFORMATION
INSUL	INSULATION
JT	JOINT

K	KIP (1000 POUNDS)
KPF	KIPS PER SQUARE FOOT
KSI	KIPS PER SQUARE INCH
L	LOW
LB	LINK BEAM
LBS	POUNDS
LB/FT	POUNDS PER FOOT
Ld	DEVELOPMENT LENGTH
LG	LONG
LL	LIVE LOAD
LLRS	LATERAL LOAD RESISTING SYSTEM
LP	LOW POINT
LRFD	LOAD RESISTANCE FACTOR DESIGN
LT	LIGHT
LW	LIGHT WEIGHT
MAX	MAXIMUM
MAS	MASONRY
MATER	MATERIAL
MAX	MAXIMUM
MC	MOMENT CONNECTION
MD	METAL DECK
MECH	MECHANICAL
MEP	MECHANICAL ELECTRICAL AND PLUMBING
MEZZ	MEZZANINE
MF	MOMENT FRAME
MFG	MANUFACTURER
MIN	MINIMUM
MISC	MISCELLANEOUS
N	NORTH
NA	NOT APPLICABLE
NIC	NOT IN CONTRACT
NO	NUMBER
N–S	NORTH–SOUTH
NTS	NOT TO SCALE
NW	NORMAL WEIGHT
O/C	ON CENTER
OPNG	OPENING
OPP	OPPOSITE
PCF	POUNDS PER CUBIC FEET
PL	PLATE
PLF	POUNDS PER LINEAR FOOT
PSF	POUNDS PER SQUARE FOOT
PSI	POUNDS PER SQUARE INCH
PT	POST TENSION
RC	REINFORCED CONCRETE
RD	ROOF DRAIN
REF	REFERENCE
REINF	REINFORCEMENT
REQ'D	REQUIRED
RFI	REQUEST FOR INFORMATION
S	SOUTH
SB	SPANDREL BEAM
SCHED	SCHEDULE
SECT	SECTION
SF	SQUARE FOOT
SHT	SHEET
SL	SLAB
SPA	SPACING
SPEC	SPECIFICATIONS
SQ	SQUARE
SR	STUDRAIL
STD	STANDARD
STIFF	STIFFENER
STL	STEEL
STRUCT	STRUCTURAL
SW	SHEARWALL
SIM	SIMILAR
T&B	TOP AND BOTTOM
THK	THICK
T/	TOP OF
TBD	TO BE DETERMINED
TEMP	TEMPORARY
TSF	TONS PER SQUARE FOOT
TYP	TYPICAL
UON	UNLESS OTHERWISE NOTED
U	UPTURNED BEAM
VERT	VERTICAL
VIF	VERIFY IN FIELD
W	WEST
W/	WITH
W/O	WITH OUT
WF	WIDE FLANGE
WP	WORKING POINT
WPG	WATER PROOFING
WS	WATER STOP
WT	WIND TRUSS
WWF	WELDED WIRE FABRIC
℄	CENTERLINE
⅊	PLATE
∟	ANGLE
&	AND
ø	DIAMETER
@	AT

GENERAL NOTES:

1. ALL WORK TO BE PERFORMED IN COMPLIANCE WITH THE NEW YORK CITY BUILDING CODE, LATEST EDITION AND ALL SUPPLEMENTS.
2. CONTRACTOR SHALL VERIFY ALL CONDITIONS AND DIMENSIONS IN THE FIELD AND BE RESPONSIBLE FOR ACCURATE COORDINATION WHERE POSSIBLE. EXISTING FRAMING DIMENSIONS WERE TAKEN FROM EXISTING DWGS. AND SHALL BE VERIFIED ON SITE. DISCREPANCIES SHALL BE REPORTED TO ARCH. AND ENGINEER BEFORE PROCEEDING.
3. TEMPORARY SHORING IS REQUIRED AT ALL LOCATIONS WHERE PARTIAL REMOVAL OF BEAMS IS REQUIRED. CONTRACTOR IS RESPONSIBLE FOR ENGINEERING AND CONTROLLED INSPECTION OF TEMPORARY SYSTEMS.
4. THE CONTRACTOR SHALL USE THESE DRAWINGS IN CONJUNCTION WITH THE ARCHITECTURAL AND MECHANICAL DRAWINGS. IN THE EVENT OF CONFLICTS, THE CONTRACTOR SHALL NOTIFY THE ARCHITECT AND THE ENGINEER.
5. ALL UNDERPINNING, SHEETING, SHORING OR OTHER CONSTRUCTION REQUIRED FOR THE SUPPORT OF ADJACENT PROPERTIES, BUILDINGS, SIDEWALKS, UTILITIES, ETC., SHALL BE SUBJECT TO SPECIAL INSPECTION AS REQUIRED BY THE CODE. THE CONTRACTOR SHALL RETAIN A LICENSED PROFESSIONAL ENGINEER ACCEPTABLE TO THE ENGINEER OF RECORD TO PROVIDE THE NECESSARY DESIGN AND THE REQUIRED INSPECTION. THE CONTRACTOR'S PROFESSIONAL ENGINEER SHALL PREPARE AND FILE THE REQUIRED FORMS FOR THE WORK WITH THE BUILDING DEPARTMENT.

FOUNDATION NOTES:

1. FOUNDATION DESIGN IS BASED ON GEOTECHNICAL REPORT BY MUESER RUTLEDGE CONSULTING EWC.
2. THE STRUCTURE TO BE SUPPORTED ON CAISSONS AS RECOMMENDED BY MUESER RUTLEDGE CONSULTING EWC GEOTECHNICAL REPORT.
3. WHERE EXISTING FOOTING OR FOUNDATIONS OF ADJACENT PROPERTY IS LOWER THAN ELEVATIONS SHOWN, NEW FOUNDATIONS ARE TO BE LOWERED TO SAME ELEVATION. WHERE NEW FOUNDATION IS LOWER THAN EXISTING FOUNDATION CONTRACTOR IS TO UNDERPIN EXISTING FOUNDATION.
4. DESIGN IS PERFORMED IN ACCORDANCE WITH MUSER RUTLEDGE CONSULTANT ENGINEERS GEOTECHNICAL REPORT.
5. VERTICAL CONSTRUCTION JOINTS IN ALL FOUNDATION WALLS SHALL BE USED ONLY IF UNAVOIDABLE, OR UNLESS OTHERWISE NOTED, AND TO BE LOCATED AT LEAST 4'-0" FROM ANY SUPPORTING COLUMN OR WALL OPENING. DISTANCE BETWEEN JOINTS IN WALL SHALL BE ALLOWED AS PER SPECIFICATIONS. NO HORIZONTAL CONSTRUCTION JOINTS WILL BE ALLOWED IN GRADE BEAMS.
6. IN NO CASE SHALL TRUCKS, BULLDOZERS, OR OTHER HEAVY EQUIPMENT BE PERMITTED CLOSER THAN 8'-0" FROM ANY FOUNDATION WALL UNLESS APPROVED BY THE ENGINEER.
7. TEMPORARY BRACING SHALL BE PROVIDED FOR ALL BUTTRESSES. WHERE BUTTRESSES DO NOT EXIST OR SPACING BETWEEN BUTTRESSES EXCEED 25 FEET, AND WHERE THE DIFFERENCE IN LEVEL BETWEEN INSIDE AND OUTSIDE GRADE IS MORE THAN 4'-0", INTERMEDIATE BRACING SHALL BE PROVIDED. WHERE RAMPS OCCUR, THE GRADE ELEVATION OUTSIDE OF RAMP WALLS SHALL BE USED IN FIGURING THE DIFFERENCE IN LEVEL. CORNER BUTTRESSES NEED NOT BE BRACED. NO BACKFILLING IS TO BE DONE BEFORE ALL SLABS BRACING WALLS ARE IN PLACE UNLESS APPROVED BY THE ENGINEER. PROVIDE TEMPORARY BRACING FOR ALL PIERS AND SUMP PITS.
8. CONTRACTOR TO INSTALL ALL PIPE SLEEVES, BOXED OPENINGS, ANCHOR BOLTS, ETC., AS REQUIRED FOR THE VARIOUS TRADES. WALL POCKETS TO RECEIVE BEAMS AND SLABS SHALL BE PROVIDED AS REQUIRED FOR THE SUPERSTRUCTURE. SHOP DRAWINGS SHOWING THE POSITION OF OPENINGS SHALL BE SUBMITTED TO THE STRUCTURAL ENGINEER PRIOR TO PLACING CONCRETE.
9. MINIMUM COVER FOR REINFORCING STEEL SHALL BE 1½" FOR SLABS AND INTERIOR WALL SURFACES EXPOSED TO VEHICULAR/PEDESTRIAN TRAFFIC; AND COLUMNS (TIES, STIRRUPS OR PRIMARY REINFORCEMENT). FOR ALL CONCRETE EXPOSED TO WEATHER AND EARTH FILL, COVER SHALL BE 2". FOR CONCRETE PLACED AGAINST EARTH, MINIMUM COVER SHALL BE 3". TOP COVER FOR REINFORCEMENT IN RETAIL SLABS TO BE 3/4".
10. THE STRUCTURAL ENGINEER OR HIS FIELD QUALIFIED REPRESENTATIVE MUST CHECK AND APPROVE ALL STEEL REINFORCING PRIOR TO CONCRETE PLACEMENT.
11. NO STRUCTURAL ELEMENTS WILL BE SUPPORTED BY STRUCTURAL FILL

CAISSONS NOTES:

1. THE DESIGN AND INSTALLATION OF CAISSON, PILE CAPS, AND RELATED CONSTRUCTION IS TO CONFORM TO THE REQUIREMENTS SET FORTH IN THE NEW YORK CITY BUILDING CODE AND THE SPECIFICATIONS.
2. DRILLED CAISSONS SHALL HAVE THE FOLLOWING PARAMETERS AS PER RECOMMENDATION FROM GEOTECHNICAL ENGINEER:
   A. 9.625" ø, 16" ø MINI CAISSONS AND 40" ø CAISSONS SEE FO–200 FOR BALANCE OF INFO.
   B. UPLIFT AND LATERAL LOAD FIELD TEST ARE REQUIRED.
4. CAISSON INSTALLATION TO BE SUPERVISED BY A LICENSED PROFESSIONAL ENGINEER.
5. CAISSON OPERATIONS TO BE IN ACCORDANCE WITH THE NEW YORK CITY BUILDING CODE, AND ARE SUBJECT TO SPECIAL INSPECTION IN ACCORDANCE WITH NEW YORK CITY BUILDING CODE.
6. A PLAN SHOWING THE IDENTIFICATION OF ALL CAISSON AND A CAISSON NUMBERING PLAN IS TO BE SUBMITTED TO THE ENGINEER OF RECORD FOR FILING WITH THE BUILDING DEPARTMENT PRIOR TO COMMENCEMENT OF DRIVING OPERATIONS.
7. ALL CAISSON GROUPS AND CAPS TO BE CONCENTRIC WITH COLUMNS AND WALLS ABOVE UNLESS OTHERWISE NOTED ON PLAN.
8. RECORDS OF PENETRATION OF EVERY CAISSON AND THE BEHAVIOUR OF SAME DURING DRILLING ARE TO BE SUBMITTED TO THE ENGINEER OF RECORD.
9. AN "AS–DRIVEN" CAISSON LOCATION PLAN AND CAISSON LOGS ARE TO BE SUBMITTED TO THE ENGINEER OF RECORD FOR APPROVAL, NO MINI–PILES CAPS ARE TO BE PLACED BEFORE THIS IS DONE.
10. ESTIMATED AVERAGE CAISSON LENGTH IS PER GEOTECHNICAL CONSULTANT. CAISSON LENGTH COULD VARY DUE TO ACTUAL SOIL CONDITION.
11. FOR DETAILS REFER TO GEOTECHNICAL CONSULTANT REPORT AND SPECIFICATIONS.

CAISSON INSTALLATION PROCEDURE

1. MONITOR SUBWAY STRUCTURES FOR VIBRATIONS DURING DRILLED PILE INSTALLATION (AS A MINIMUM MONITOR ALL POINTS WITHIN 100 FEET OF DRILLED PILE INSTALLATION).
2. DRILL PILE CASING THROUGH SOIL OVERBURDEN USING INTERNAL FLUSH ROTARY DRILLING METHODS AND POSITIVE HEAD ON DRILLING FLUIDS. EXTERNAL FLUSH WILL NOT BE PERMITTED. GENERALLY KEEP TIP OF CASING PLUGGED WITH TWO FEET OF SOIL WHILE ADVANCING THE CASING. NO SOIL REMOVAL IS PERMITTED BEYOND TIP OF CASING.
3. DOWN–THE–HOLE HAMMER WILL NOT BE PERMITTED EXCEPT FOR PENETRATING OBSTRUCTION OR BOULDERS IN THE SOIL AND FOR DRILLING ROCK SOCKETS.
4. DRILL BIT SHALL GENERALLY NOT EXTEND BEYOND CASING TIP. USE OF COMPRESSED AIR WILL NOT BE PERMITTED, EXCEPT WHEN DRILLING WITH DOWN–THE–HOLE HAMMER.
5. FOR ROCK SOCKET BOND PILES, DRILL THE ROCK SOCKET AND LOWER THE REINFORCEMENT BAR WITH CENTRALIZERS AND TREMIE–GROUT TUBE TO BOTTOM OF ROCK SOCKET. THEN FILL SOCKET AND CASING WITH 6000 OR 8000 PSI TREMIE GROUT DEPENDING ON FINAL COMPRESSIVE MINI PILE CAPACITY, UNTIL CLEAN UNCONTAMINATED GROUT FLOWS OUT FROM TOP OF PILE.
6. PILE CASING SHALL NOT BE INSTALLED CLOSER THAN 10 FEET FROM ADJACENT COMPLETED PILE THAN IS LESS THAN 48 HOURS OLD.
7. A SET OF SIX GROUT CUBES SHALL BE MADE FOR EACH PILE FOR THE 6000 PSI GROUT AND TESTED FOR 3, 7 AND 28 DAYS COMPRESSIVE STRENGTH.
8. CATALOG CUTS FOR THE DRILLING RIG/S TO BE USED FOR INSTALLATION OF THE OUTER AND INNER CASING WILL BE PROVIDED TO NYCT PRIOR TO BEGINNING INSTALLATION.

CONCRETE NOTES

A. CONCRETE

1. ALL CONCRETE SHALL BE NORMAL WEIGHT CONTROLLED CONCRETE, U.O.N. , AND COMPLY WITH THE A.C.I. BUILDING CODE AND THE CURRENT NEW YORK CITY BUILDING CODE.
2. CONCRETE STRENGTH SHALL BE AS FOLLOWS, UNLESS OTHERWISE NOTED, ON PLAN.

FOUNDATION, PIERS, CAISSON CAPS & MAT	10000 PSI
SLAB ON GROUND	7000 PSI
BUTTRESS & FND WALL	7000 PSI, USE 14000 PSI FOR SW PART OF FND. WALL.
SHEAR WALLS	SEE COLUMN SCHEDULE
COLUMNS	SEE COLUMN SCHEDULE

   ALTERNATE IF SUPPORTING COLUMN STRENGTH IS 5950 PSI OR GREATER THE CONCRETE SLABS (IF POURED BEFORE THE COLUMNS ABOVE) MUST BE OF A STRENGTH ACCORDING TO THE "DETAIL OF BEAM AND SLAB CONCRETE PLACEMENT AT HIGH STRENGTH COLUMN." DWG. S–961.
3. NO CONCRETE SHALL BE PLACED UNTIL THE CONTRACTOR HAS INSTALLED ALL THE INSERTS AND DOVETAILS NECESSARY TO PROVIDE SUPPORT FOR MULLIONS, APPLIED FINISHES, PARTITIONS, PIPES, DUCTS, EQUIPMENT, ETC., AS REQUIRED IN ARCHITECTURAL, H.V.A.C. AND STRUCTURAL DRAWINGS. WHERE BRICK VENEER EXCEEDS 18" IN HEIGHT, PROVIDE DOVETAIL TYPE MASONRY ANCHORS SPACED AT 24" O/C IN ALL BACK UP VERTICAL CONCRETE SURFACES.
4. CONTRACTOR SHALL VERIFY LOCATIONS AND DIMENSIONS OF ALL SLOTS, PIPE SLEEVES, DUCTS AND ANY OTHER CONCRETE PENETRATIONS AS REQUIRED FOR VARIOUS TRADES BEFORE CONCRETE IS PLACED.

   SHOP DRAWINGS SHOWING COMPOSITE LAYOUT OF ALL PENETRATIONS MUST BE SUBMITTED TO THE ENGINEER FOR APPROVAL PRIOR TO CONSTRUCTION.

5. ALL PLUMBING AND ELECTRICAL SLOTS SHALL BE FILLED WITH CONCRETE TO THE SAME DEPTH AS FLOOR AFTER CONDUITS AND/OR PIPES ARE INSTALLED. 6. NO PIPES OR CONDUITS EXCEEDING 1/3 SLAB THICKNESS IN OUTSIDE DIAMETER NOR OVER NOMINAL 2" INSIDE DIAMETER SHALL BE EMBEDDED IN THE STRUCTURAL CONCRETE FLOOR OR SLAB. NO PIPES AND/OR CONDUITS SHOULD BE PLACED CLOSER THAN 3 DIAMETER ON CENTER NOR PASS WITHIN 24" OF COLUMN FACE, U.O.N. JUNCTION BOXES MAY BE PLACED IN STRUCTURAL CONCRETE SLAB BUT SHALL NOT EXCEED 4½" X 4½" X 3½" IN DEPTH AND SHALL BE SEPARATED FROM OTHER JUNCTION BOXES BY NOT LESS THAN 8" OF CONCRETE.
7. ALL MEMBERS IN THE FLOOR SYSTEM INCLUDING BEAMS, BRACKETS, COLUMN CAPITALS AND HAUNCHES SHALL BE PLACED MONOLITHICALLY. WHERE VERTICAL CONSTRUCTION JOINTS ARE NECESSARY, MAY BE MADE AT CENTER OF BEAM OR SLAB USING APPROVED BULKHEADS AND ADDITIONAL REINFORCING AS SHOWN ON DETAILS.
8. NO CONCRETE FLOOR SYSTEM IS TO BE INSTALLED UNTIL AT LEAST TWO HOURS HAVE PASSED AFTER THE SUPPORTING COLUMNS AND WALLS ARE PLACED.
9. WHEN PLACING CONCRETE AGAINST AN ADJACENT BUILDING OR AT EXPANSION JOINT, AT LEAST 1" (U.O.N.) OF HIGH DENSITY STYROFOAM SHALL BE PLACED AT THE INTERFACE BETWEEN THE EXISTING AND NEW CONCRETE. IN ADDITION, THE CONTRACTOR MUST TAKE ALL THE NECESSARY MEASURES SO AS NOT TO CREATE ANY DAMAGE TO THE EXISTING CONSTRUCTION WHILE PLACING THE NEW CONCRETE.
10. ALL WORK MARKED S.S. (SUPERSTRUCTURE) IN FOUNDATION DRAWINGS SHALL BE PART OF THE SUPERSTRUCTURE CONTRACT.
11. ALL SLABS ON GROUND ARE IN SUPERSTRUCTURE CONTRACT (U.O.N.). SLABS WITHIN THE BUILDING ARE FRAMED (REINFORCED) SLABS SUPPORTED BY PILE CAPS AND GRADE BEAMS. SEE GROUND FLOOR FRAMING PLANS.
12. TEMPORARY SHORING AND RESHORING SHALL REMAIN IN PLACE AT LEAST 28 DAYS AFTER PLACEMENT OF CONCRETE.
13. NO DEVIATION FROM THE STRUCTURAL PLANS SHALL BE PERMITTED WITHOUT THE EXPRESS WRITTEN CONSENT OF THE STRUCTURAL ENGINEER.

B. REINFORCEMENT

1. ALL STEEL REINFORCEMENT (STIRRUPS AND TIES INCLUSIVE) SHALL HAVE AN ULTIMATE TENSILE STRENGTH OF 90,000 PSI AS PER A.S.T.M. A615 GRADE 60. THE CONTRACTOR SHALL FURNISH AND INSTALL ALL THE CHAIRS, REBARS, TIES, SPACERS, ETC., TO SECURE AND SUPPORT THE REINFORCING WHILE PLACING THE CONCRETE.
2. THE CONTRACTOR MUST SUBMIT REINFORCING SHOP DRAWINGS TO THE STRUCTURAL ENGINEER FOR REVIEW. NO CONSTRUCTION IS TO BE STARTED UNTIL THE SHOP DRAWINGS ARE REVIEWED BY THE ENGINEER.
3. THE STRUCTURAL ENGINEER OR HIS FIELD QUALIFIED REPRESENTATIVE MUST CHECK AND APPROVE ALL STEEL REINFORCEMENT PRIOR TO CONCRETE PLACEMENT.
4. ALL REINFORCING BARS MARKED CONTINUOUS SHALL BE LAPPED AT SPLICES AND CORNERS IN CONFORMANCE WITH LAP SPLICE TABLES IN TYPICAL DETAILS UNLESS OTHERWISE NOTED. LAP CONTINUOUS TOP BARS AT CENTER BETWEEN SUPPORTS AS REQUIRED. TERMIN– ATE CONTINUOUS BARS AT END SUPPORTS WITH STANDARD HOOKS, U.O.N.
5. MINIMUM COVER FOR REINFORCING STEEL SHALL BE ¾" FOR INTERIOR SLABS AND INTERIOR WALL SURFACES; 1½" FOR BEAMS, GIRDERS AND COLUMNS (TIES, STIRRUPS OR PRIMARY REINFORCEMENT). FOR ALL CONCRETE EXPOSED TO WEATHER AND EARTH FILL, COVER SHALL BE 2" (1½" FOR STIRRUPS). FOR CONCRETE PLACED AGAINST EARTH, MINIMUM COVER SHALL BE 3".

C. CODES AND TESTS

1. THIS STRUCTURE HAS BEEN DESIGNED UNDER THE PROVISIONS OF THE NEW YORK CITY BUILDING CODE AS AMENDED AND A.C.I. 318.
2. ALL CONTROLLED CONCRETE SHALL COMPLY WITH THE A.C.I. 318 BUILDING CODE. APPLICATION FOR CONTROLLED CONCRETE WITH CONCRETE TESTS AND CURVES OF TESTS FOR THE PRELIMINARY DESIGN MIX PREPARED BY AN APPROVED LABORATORY MUST BE SUBMITTED TO THE ENGINEER FOR FILING WITH THE BUILDING DEPARTMENT. NO CONCRETE SHALL BE PLACED WITHOUT THE DESIGN MIX BEING APPROVED BY THE BUILDING DEPARTMENT.
3. DESIGN AND CONSTRUCTION OF FORMWORK IS TO COMPLY WITH THE A.C.I. 318–89 BUILDING CODE AND NEW YORK CITY BUILDING CODE AS AMENDED.
4. THE DESIGN DETAILS AND NOTES INCLUDED HEREIN ARE IN COMPLIANCE WITH LOCAL LAW 17/95.

D. SEISMIC AND WIND CRITERIA

1. THE STRUCTURE HAS BEEN DESIGNED IN ACCORDANCE WITH THE LATEST NEW YORK CITY BUILDING CODE (NYCBC 2014).
2. WIND DESIGN DATA:

   BASED ON PROJECT SPECIFIC WIND TUNNEL TEST – RWDI – DATED 04/13/2015
   - DESIGN BASE SHEAR (V) — E–W: 4400 kips; N–S: 2600 kips
3. EARTHQUAKE DESIGN DATA:
   - SEISMIC IMPORTANCE FACTOR = 1
   - STRUCTURAL OCCUPANCY CATEGORY: II
   - S_S = 0.281g, S_1=0.073g
   - SITE CLASS = C
   - S_{DS} = 0.225g, S_{D1}=0.083g
   - SEISMIC DESIGN CATEGORY = B
   - SEISMIC FORCE RESISTING SYSTEM = ORDINARY REINFORCED CONCRETE SHEAR WALLS
   - DESIGN BASE SHEAR (V): E/W = 2400 kips; N/S = 2400 kips
   - SEISMIC RESPONSE COEFFICIENT (C_S): E/W = 0.01; N/S = 0.01
   - RESPONSE MODIFICATION FACTOR: R = 5
   - ANALYSIS PROCEDURE USED = EQUIVALENT LATERAL FORCE PROCEDURE
4. SNOW DESIGN DATA:
   - GROUND SNOW LOAD, Pg = 25 psf
   - FLAT–ROOF SNOW LOAD, Pf = 20 psf
   - SNOW EXPOSURE FACTOR, Ce = 0.9
   - SNOW EXPOSURE FACTOR, Is = 1.0
   - THERMAL EXPOSURE FACTOR, Ct = 1.0
5. STRUCTURAL SEPARATIONS, (NYCBC–1613.7): ALL STRUCTURES SHALL BE SEPARATED FROM ADJACENT STRUCTURES. WHEN A STRUCTURE ADJOINS A PROPERTY LINE NOT COMMON TO A PUBLIC WAY (TYPICALLY SIDE OR REAR LOT LINES), THAT STRUCTURE SHALL ALSO BE SET BACK FROM THE PROPERTY LINE BY AT LEAST 1 INCH FOR EACH 50 FEET OF HEIGHT AND A MINIMUM OF 1 INCH FOR STRUCTURES WITH HEIGHTS LESS THAN 50 FEET. SMALLER SEPARATIONS OR PROPERTY LINE SETBACKS SHALL BE PERMITTED WHEN JUSTIFIED BY RATIONAL ANALYSIS BASED ON MAXIMUM EXPECTED GROUND MOTIONS WITH A MINIMUM SEPARATION OF 1 INCH ALONG THE FULL HEIGHT OF THE STRUCTURE.

MASONRY NOTES

1. SEE ARCHITECTURAL DRAWINGS AND SPECIFICATIONS FOR COMPLETE REQUIREMENTS FOR C.M.U. MASONRY CONSTRUCTION AND APPEARANCE. DETAILS AND NOTES SHOWN ON THE STRUCTURAL DRAWINGS ARE INTENDED TO SUPPLEMENT ARCHITECTURAL REQUIREMENTS AND TO DEFINE ELEMENTS WHICH PROVIDE STRUCTURAL STRENGTH AND STABILITY.
2. DETAILS, SECTIONS, SCHEDULES, ETC. AND THESE NOTES, REPRESENT THE MINIMUM REQUIREMENTS FOR STRUCTURAL ADEQUACY. WHERE ARCHITECTURAL REQUIREMENTS DIFFER FROM STRUCTURAL, THE MORE STRINGENT SHALL BE FOLLOWED.
3. CODE: MASONRY WALL CONSTRUCTION SHALL CONFORM TO THE NEW YORK CITY BUILDING CODE AND TO ACI 530/ASCE–5 AS REFERENCED BY THE NYC CODE.
4. MASONRY UNITS SHALL BE LIGHTWEIGHT HOLLOW LOAD BEARING CONCRETE MASONRY (CMU). COMPRESSIVE STRENGTH OF MASONRY F'M SHALL BE A MINIMUM OF 1,500 PSI.
5. MORTAR SHALL BE TYPE M OR S.
6. HORIZONTAL JOINT REINFORCEMENT SHALL BE TRUSS TYPE GALVANIZED COLD–DRAWN STEEL WIRE CONFORMING TO ASTM A 951.
7. PROVIDE HORIZONTAL JOINT REINFORCEMENT IN EVERY OTHER JOINT (16" O.C. VERTICALLY) UNLESS PLANS OR DETAILS CALL FOR CLOSER SPACING OR ADDITIONAL REINFORCEMENT.
8. BAR REINFORCEMENT: ASTM A 615 GRADE 60, PER SCHEDULE. FOR ADDITIONAL REINFORCEMENT SEE WALL REINFORCEMENT ELEVATION.
9. ALL CELLS WITH REINFORCEMENT SHALL BE GROUTED SOLID FOR THE FULL EXTENT OF BAR, VERTICAL AND HORIZONTAL.
10. GROUT SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 2,000 PSI. GROUT SHALL BE "FINE" AS DEFINED BY ASTM C 476.
11. STEEL ANGLES: ASTM A 36. STEEL IN AN EXTERIOR WALL OR EXPOSED TO THE EXTERIOR SHALL BE GALVANIZED. 12. CONTRACTOR SHALL COORDINATE ALL MASONRY WORK WITH WORK OF OTHER TRADES: ARCHITECTURAL, STRUCTURAL, MEP.

NON–STRUCTURAL ITEMS SHOWN ON THE STRUCTURAL/FOUNDATION DRAWINGS

1. THE FOLLOWING NON–STRUCTURAL ITEMS MAY BE SHOWN ON THE STRUCTURAL AND/OR FOUNDATION DRAWINGS FOR THE PURPOSE OF CLARITY IN INTERFACE WITH STRUCTURAL AND/OR FOUNDATION WORK. ITEMS BELOW MAY NOT BE FULLY DEFINED ON THE STRUCTURAL/FOUNDATION DRAWINGS. THE INFORMATION FOR NON–STRUCTURAL ELEMENTS IS FURNISHED BY OTHER CONSULTANTS AS LISTED BELOW. ALL RFI AND SHOP DRAWINGS RELATED TO THESE NON–STRUCTURAL ITEMS SHALL BE SUBMITTED TO THE CONSULTANTS LISTED BELOW FOR THEIR REVIEW AND APPROVAL.

GEOTECHNICAL ENGINEER:
- SUPPORT OF EXCAVATION
- DRIVEN CAISSONS AND MINI PILES INCLUDING REINFORCEMENT

ARCHITECT OF RECORD:
- SUMP PITS
- FOUNDATION/UNDERSLAB WATERPROOFING, DAMPPROOFING SYSTEMS
- WALL AND UNDERSLAB DRAINAGE SYSTEM, INCLUDING SUMP PITS, GRAVEL & PIPING, CLEANOUTS
- WATERPROOFING/DAMPPROOFING APPLIED TO EXPOSED SURFACES, ELEVATOR OR SUMP PIT INTERIOR SURFACES
- PAINT
- FIREPROOFING
- CONCRETE CURBS: HEIGHT, WIDTH, EXTENT, LOCATION
- BRICK, BLOCK, TILE MASONRY, METAL PANELS, PRECAST FACADE PANELS, CURTAIN WALLS AND ALL OTHER FACADE SYSTEMS
- ROOFING SYSTEMS, DRAIN LOCATIONS, SLOPES TO DRAINS FILLS, INSULATION, PAVERS OR GRAVEL
- FLOATING/SECONDARY SLABS

LOADING SCHEDULE

OCCUPANCY	PARTITION/FILL &/OR FINISHES (PSF)	CEIL. & MECH. (PSF)	LIVE LOAD
ROOF	30	5	100
STAIRS	–	5	100
CORRIDORS	30	5	100
RESIDENTIAL	12	5	40
MECHANICAL ROOMS	20	5	75
PUBLIC ROOF	50	5	100
LOBBIES/ PUBLIC TERRACE/ RETAIL	30	5	100
PRIVATE TERRACE	30	5	60

MONITORING SYSTEM NOTES:

1. INSTALLATION AND MAINTENANCE OF THE MONITORING SYSTEM SHALL BE PERFORMED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS AND AS SHOWN ON TABLE 1 THROUGH 3 ON THIS DRAWING..
2. MONITORING RESULTS SHALL BE PROVIDED TO THE OWNER'S ENGINEER ON A DAILY BASIS. RESULTS SHALL BE PRESENTED IN A CLEAR FORMAT AND SHALL INCLUDE PREVIOUS READINGS. SUCH RESULTS SHALL BE PROVIDED TO NYCT FIELD INSPECTOR AND COPY TO NYCT OUTSIDE PROJECTS GENERALLY ON A WEEKLY BASIS. IF MONITORING RESULTS EXCEED NYCT GUIDELINES, RESULTS SHALL BE PROVIDED TO NYCT ON A DAILY BASIS..
3. MONITORING FREQUENCY MAY BE ALTERED DURING THE WORK WITH NYCT APPROVAL.
4. OWNER'S ENGINEER SHALL BE NOTIFIED IMMEDIATELY IF ANY PORTION OF THE MONITORING PLAN CANNOT BE IMPLEMENTED.
5. ALL VIBRATION MONITORING INSTRUMENTS SHALL BE WIRED OR TRANSMITTED TO A CENTRAL LOCATION ON THE SITE.
6. A REMOTE SENSOR SUCH AS A LIGHT OR BEEPER SHALL BE ACTIVATED AUTOMATICALLY IF THE AMBER VIBRATION LEVELS ARE EXCEEDED.

LEGEND:

a.	[...]	INDICATES BOTTOM OF FOUNDATION WALL ELEVATION
b.	<...>	INDICATES TOP OF FOUNDATION WALL ELEVATION
c.	(XXxXX)	INDICATES SIZE OF PIER IN INCHES, FIRST DIMENSION SHOWN IS IN THE EAST–WEST DIRECTION.
d.		INDICATES ADDITIONAL TOP REINFORCEMENT AT SUPPORTS
e.		INDICATES ADD'L BOTTOM REINFORCING AT SUPPORTS
f.		INDICATES ADDITIONAL TOP REINFORCEMENT CONTINUOUS BETWEEN SUPPORTS
g.		INDICATES ADDITIONAL BOTTOM REINFORCEMENT CONTINUOUS BETWEEN SUPPORTS
h.		INDICATES CHANGE IN ELEVATION
i.		INDICATES CONCRETE COLUMN/SHEARWALL/FOUNDATION WALL
j.		INDICATES CONCRETE COLUMN/FOUNDATION WALL/SHEARWALL BELOW
k.		INDICATES SLAB OPENING (FIRST DIMENSION IS IN EAST–WEST DIRECTION)
l.		INDICATES COLUMN/POST/HANGER ABOVE OR BELOW
m.	(XX)	INDICATES COLUMN DESIGNATION
n.	(P)	INDICATES POST DESIGNATION
x.	(H)	INDICATES HANGER DESIGNATION
y.	(SW–X)	INDICATES SHEARWALL DESIGNATION
z.		INDICATES STRRIPS

SPECIAL INSPECTIONS

(TERMINOLOGY PER CURRENT TR–1) SPECIAL INSPECTION	CURRENT CODE REFERENCES
CONCRETE – CAST IN PLACE	1704.4
CONCRETE TEST CYLINDERS* (TR2)	1905.6
CONCRETE DESIGN MIX* (TR3)	1905.3
SOILS – SITE PREPARATION	1704.7.1
PILE FOUNDATIONS & DRILLED PIER INSTALLATION (TR5)	1704.8
STRUCTURAL SAFETY – STRUCTURAL STABILITY	1704.19
EXCAVATION – SHEETING, SHORING AND BRACING	1704.19 & 3304.4.1

* THESE TEST MUST BE PERFORMED BY A LICENSED CONCRETE TESTING LAB.

NOTES:

1. REFER TO THE PROJECT SPECIFICATIONS FOR ADDITIONAL INFORMATION ON SCOPE AND DETAILED REQUIREMENTS FOR INSPECTIONS.
2. ALL SPECIAL INSPECTIONS SHALL BE PERFORMED UNDER THE SUPERVISION OF A PROFESSIONAL ENGINEER LICENSED IN THE STATE OF NEW YORK.
3. REPORTS OF RESULTS SHALL BE SUBMITTED TO THE OWNER AND ARCHITECT FOR REVIEW. SIGNED COPIES OF ALL TESTS AND INSPECTION REPORTS SHALL BE FILED WITH THE BUILDING DEPARTMENT (THROUGH THE APPLICANT).
4. REPORTS SHALL STATE WHETHER RESULTS COMPLY WITH CONTRACT REQUIREMENTS, SUMMARIZE THE TYPE OF TEST, THE LOCATION OR COMPONENT TESTED, AND RECOMMEND ANY REMEDIAL MEASURES REQUIRED. REPORT SHOULD NOTE ANY OTHER DEVIATIONS FROM THE CONTRACT DOCUMENTS.
5. FOR ITEMS OF WORK OF OTHER TRADES WHICH ARE SUBJECT TO SPECIAL INSPECTION, SEE THE CITY OF NEW YORK BUILDING CODE, AS WELL AS ARCHITECTURAL, MECHANICAL, ELECTRICAL, PLUMBING, ETC. DRAWINGS AND SPECIFICATIONS.
6. IN ADDITION TO THE ABOVE REQUIREMENTS, ALL COLUMN SPLICE, BEAM MOMENT CONNECTIONS AT BEAMS DESIGNATED AS "LLRS" AND BRACE FRAME OR WIND TRUSS CONNECTIONS (PER S–940 SERIES OF DWGS.) SHALL COMPLY WITH THE INSPECTION REQUIREMENTS OF AWS D1.8 "STRUCTURAL WELDING CODE–SEISMIC SUPPLEMENT", IF WELDING IS PRESENT IN CONNECTION.

ISSUED FOR FOUNDATION
PEER REVIEW 06-01-16

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NEW YORK, NY 10011
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MEP ENGINEER
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STRUCTURAL ENGINEER
WSP CANTOR SEINUK
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ELEVATOR CONSULTANT
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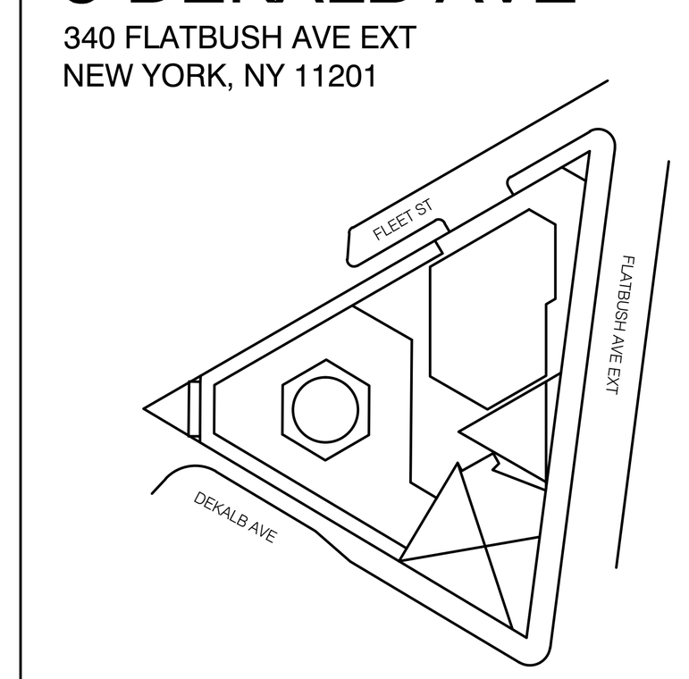

SITE DIAGRAM

NO.	DATE	REVISION
5.	5/4/2016	FO/SOE PURCHASING SET (FOR CAISSON BID ONLY)
4.	10/30/2015	TA COMMENTS
3.	10/16/2015	TA COMMENTS
2.	07/10/2015	MTA SUBMISSION
1.	03/13/2015	100% SD

DATE ISSUE

NOT FOR CONSTRUCTION

DRAWING TITLE

GENERAL NOTES, LEGENDS AND ABBREVIATIONS

SEAL & SIGNATURE

DATE	04/21/16
PROJECT NO.	1490086
DRAWN BY	CADD
CHECKED BY	SH
DOB NO.	
DRAWING NUMBER	FO-001.00

4/19/2016 5:17:17 PM

APPENDIX D

Structural Wind Loads

Preliminary Results - Wind-Induced Structural Responses
9 DeKalb - Brookly, NY - RWDI Project #1602345
June 16, 2016

The wind loads provided in this report include the effects of directionality in the local wind climate. These loads do not contain safety or load factors and are to be applied to the building's structural system in the same manner as would wind loads calculated by code analytical methods.

Table 2a: Summary of Predicted Peak Overall Structural Wind Loads
64' Wind Floor Open Option

Configuration	My (lb-ft)	Mx (lb-ft)	Mz (lb-ft)	Fx (lb)	Fy (lb)
Existing	2.51E+09	1.75E+09	4.54E+07	4.10E+06	2.67E+06
Future	**2.52E+09**	**1.78E+09**	**4.54E+07**	**4.15E+06**	**2.68E+06**

Notes:

(1) The above loads are the cumulative summation of the wind-induced loads at the structural level '1' (i.e. grade) centered about the reference axis shown in Figure 4, exclusive of combination factors.

(2) A total damping ratio of 2.0% of critical was used for structural load calculations.

(3) The above loads are based on the structural properties as provided on May 9, 2016. The natural building frequencies were as follows:

Mode 1: 0.100 Hz (Primarily X-Sway)
Mode 2: 0.111 Hz (Primarily Y-Sway)
Mode 3: 0.274 Hz (Primarily Torsion)

(4) The above loads correspond to a 50-year return period basic wind speed (3-second gust) of 98 mph.

Table 3a: Effective Static Floor-by-Floor Wind Loads
Worst Case Test Configuration
64' Wind Floor Open Option

Floor	Height (ft) Above '1'	Fx (lb)	Fy (lb)	Mz (lb-ft)
1	0.0	61300	20700	1757000
2	27.2	96300	29300	2733000
3	38.5	59000	17200	1668000
4	49.8	68800	19300	1940000
5	63.9	44600	19400	1062000
6	78.9	43600	19000	907000
7	102.9	40600	17500	783000
8	114.9	27300	11500	484000
9	126.9	27600	11500	486000
10	138.9	28200	11700	495000
11	150.9	28800	11600	517000
12	162.9	29400	12200	525000
13	174.9	30000	12900	537000
14	186.9	29700	13400	530000
15	198.9	29000	13200	462000
16	210.9	29300	13700	463000
17	222.9	29600	14400	470000
18	234.9	30300	15100	482000
19	246.9	30900	15700	487000
20	258.9	31000	16100	488000
21	270.9	30700	16300	482000
22	282.9	30900	16600	464000
23	294.9	31300	17300	470000
24	306.9	31900	18000	478000
25	318.9	32600	18900	489000
26	330.9	63600	41100	1186000
27	360.9	66400	45000	1220000
28	372.9	31600	19000	420000
29	384.9	31600	18600	383000
30	396.9	32300	19200	392000
31	408.9	32800	19900	396000
32	420.9	33800	20800	407000
33	432.9	34700	21600	415000
34	444.9	35200	22500	417000
35	456.9	35300	22800	400000
36	468.9	36300	23800	408000
37	480.9	37500	24600	415000
38	492.9	38400	25600	421000
39	504.9	39300	26800	430000
40	516.9	39300	27300	426000
41	528.9	39500	27100	406000
42	540.9	40600	28000	412000
43	552.9	41700	28800	418000
44	564.9	42900	29500	420000
45	576.9	43400	29600	410000
46	588.9	44400	30500	416000
47	600.9	45600	31300	423000
48	612.9	97200	74500	1105000
49 WIND	636.9	115900	87200	1227000
50	660.9	61500	41100	482000
51	672.9	48400	33500	393000
52	684.9	49300	34100	396000
53	696.9	50500	35100	402000
54	708.9	51700	36000	408000
55	720.9	52600	36900	412000
56	732.9	52000	36700	386000

Table 4a: Recommended Wind Load Combination Factors
64' Wind Floor Open Option

Load Case	Factor for Simultaneous Application of Loads in Table 3a		
	X Forces (Fx)	Y Forces (Fy)	Torsion (Mz)
1	+100%	+30%	+30%
2	+100%	+30%	-55%
3	+100%	-50%	+30%
4	+100%	-50%	-55%
5	-95%	+35%	+65%
6	-95%	+35%	-30%
7	-95%	-50%	+65%
8	-95%	-50%	-30%
9	+30%	+95%	+35%
10	+30%	+95%	-30%
11	+65%	-100%	+50%
12	+65%	-100%	-55%
13	-40%	+95%	+35%
14	-40%	+95%	-30%
15	-50%	-100%	+50%
16	-50%	-100%	-55%
17	+30%	+30%	+100%
18	+65%	+45%	-90%
19	+30%	-50%	+100%
20	+65%	-50%	-90%
21	-65%	+30%	+100%
22	-35%	+45%	-90%
23	-65%	-50%	+100%
24	-35%	-50%	-90%

Note:

(1) Load combination factors have been produced through consideration of the structure's response to various wind directions, modal coupling, correlation of wind gusts, and the directionality of strong winds in the local wind climate.

57	744.9	53200	37600	391000
58	756.9	54300	38500	393000
59	768.9	55600	39500	402000
60	780.9	56200	40800	405000
61	792.9	55400	40100	379000
62	804.9	56700	41000	383000
63	816.9	58000	42100	391000
64 WIND	828.9	67100	47800	409000
65	852.9	77600	57100	509000
66	864.9	59600	44100	364000
67	876.9	60400	45100	367000
68	888.9	61300	45600	365000
69	900.9	62100	46900	370000
70	912.9	61200	46200	349000
71	924.9	135200	110200	812000
72	940.9	143700	115400	842000
73	956.9	113500	90100	600000
74	968.9	129000	96100	698000
75	1002.9	125500	82300	546000
76	1021.7	163100	116100	795000
77	1077.2	86600	52100	121000
SUMS	**-**	**4.15E+06**	**2.68E+06**	**4.54E+07**

Notes:

(1) The loads given in this table should be used with the load combination factors given in Table 4a.

(2) The loads given in this table are centered about the reference axis shown in Figure 4.

(3) The above loads correspond to a 50-year return period basic wind speed (3-second gust) of 98 mph.

STRUCTURAL PEER REVIEW STATEMENT

This structural peer review and report, dated 20 June 2016, is complete for the foundation and superstructure submission.

Structural Peer Reviewer Name: William J. Faschan
Leslie E. Robertson Associates

Structural Peer Reviewer Address: 40 Wall Street, FL 23
New York, NY 10005

Project Address: 9 DeKalb Avenue, Block #149, Lot #100

Department Application Number for Structural Work: #320914338

Structural Peer Reviewer Statement:

I, William J. Faschan, am a qualified and independent NYS licensed and registered engineer in accordance with BC Section 1627.4, and I have reviewed the structural plans, specifications, and supplemental reports for 9 DeKalb Avenue, Block #149, Lot #100, Application #320914338 and found that the structural design shown on the plans and specifications generally conforms to the foundation and structural requirements of Title 28 of the Administrative Code and the 2008 NYC Construction Codes. The Structural Peer Review Report is attached.

New York State Registered Design Professional
(for Structural Peer Review only)

Name William J. Faschan

Signature _____ Date 06/20/16

Cc: Project Owner: Mr. Simon Koster
Project Registered Design Professional: Mr. Silvian Marcus