Jessica Phillips
Project Scientist
Site Investigation & Remediation

nationalgrid

July 13, 2020

Ms. Jenelle Gaylord
Assistant Geologist, Bureau E
New York State Department of Environmental Conservation
Division of Environmental Remediation
625 Broadway
Albany, New York 12233-7017

Intrusive Activity Summary Report – Geotechnical Borings
National Grid Glenwood Landing Former Gas Plant Site
Glenwood Landing, New York
Site No. V00351

Dear Ms. Gaylord,

This report is a summary of work completed and data collected during intrusive activities recently conducted at the National Grid Glenwood Landing Former Gas Plant Site (the Site). The project included vacuum excavations to clear utilities at two percolation test locations and six boring locations, advancement of six geotechnical borings, and backfilling of each borehole. The work at the Site was conducted for National Grid Gas Operations (Gas Ops) by Soil Mechanics Drilling Corp. and AB Environmental.

A Notice of Intrusive Activities (NOIA) for the project was submitted to the New York State Department of Environmental Conservation (NYSDEC) on April 23, 2020. National Grid retained GEI Consultants, Inc., P.C. (GEI) to conduct field screening of the soil cuttings using a photo-ionization detector (PID) and environmental oversight for all intrusive activities in accordance with the Site Management Plan (SMP).

GEI was on-Site during the vacuum excavation and geotechnical borings on April 28 and 30, 2020.

Summary of Field Activities

National Grid Gas Ops' contractor AB Environmental performed soil removal activities utilizing a vacuum truck to excavate soil to a depth of five feet and retained Soil Mechanics Drilling Corp. to conduct six geotechnical borings to depths of 30 and 50 feet using hollow-stem auger drill rigs. Following the vacuum excavation on April 28, 2020, two drill rigs were mobilized to the Site to advance the geotechnical borings. Four locations were drilled to a depth of 30 feet (B-1, B-3, B-4, and B-5) and two locations were drilled to a depth of 50 feet (B-2 and B-6). The excavated soil was screened for impacts using visual and olfactory detection methods and a PID. No impacts were observed in five of the six boring locations. A faint creosote odor and fragments of wood were noted in the split-spoon sample taken from a depth of seven to nine feet in boring location B-5. The fragments of wood were screened with the PID and a reading of 298 parts per million (ppm) was observed. Due to limited recovery, the interval could not be sampled. Community Air Monitoring was set up immediately upwind and downwind of the location, following the observation of impacts at B-5. No impacts were noted in the remaining sample intervals at this location.

175 East Old Country Road, Hicksville, NY 11801
T: 516.581.7313 ■ F: 516.545.2582 ■ **Jessica.Phillips@nationalgrid.com** ■ www.nationalgrid.com

The fragments of wood are believed to be from an old bulkhead and not from the former gas plant. This was primarily determined due to historical photos of the former Fyfe Shipyard and the former gas plant property prior to development that show historical bulkheads in the vicinity of the Site (**Attachment 1**). The former Fyfe shipyard was located immediately adjacent to the former gas plant property. Further evidence that the wood is likely from an old bulkhead include the depth of sample interval which was below the water table. Creosote has been known to be used as a wood preservative for old bulkheads.

The approximate location of the geotechnical borings can be found in **Attachment 2.** The geotechnical information gathered from the work conducted can be found in **Attachment 3 – Soil Mechanics Report** and **Attachment 4 – Geotechnical Boring Logs**

Community Air Monitoring Results

Real time air monitoring for total volatile organic compounds (TVOCs) and respirable particulate matter (PM_{10}) was performed during intrusive work at boring location B-5 at upwind and downwind tripod-mounted stations. Each station consisted of a weather-tight enclosure, a PID (RAE systems MiniRAE 3000), and a dust monitor (TSI DustTrak II 8530).

There were no exceedances of the time-weighted average (TWA) for TVOCs or dust measurements during the excavation work. Air monitoring data can be provided upon request.

If you have any questions, please feel free to contact me at 516-581-7313 or by email at jessica.phillips@nationalgrid.com.

Sincerely,

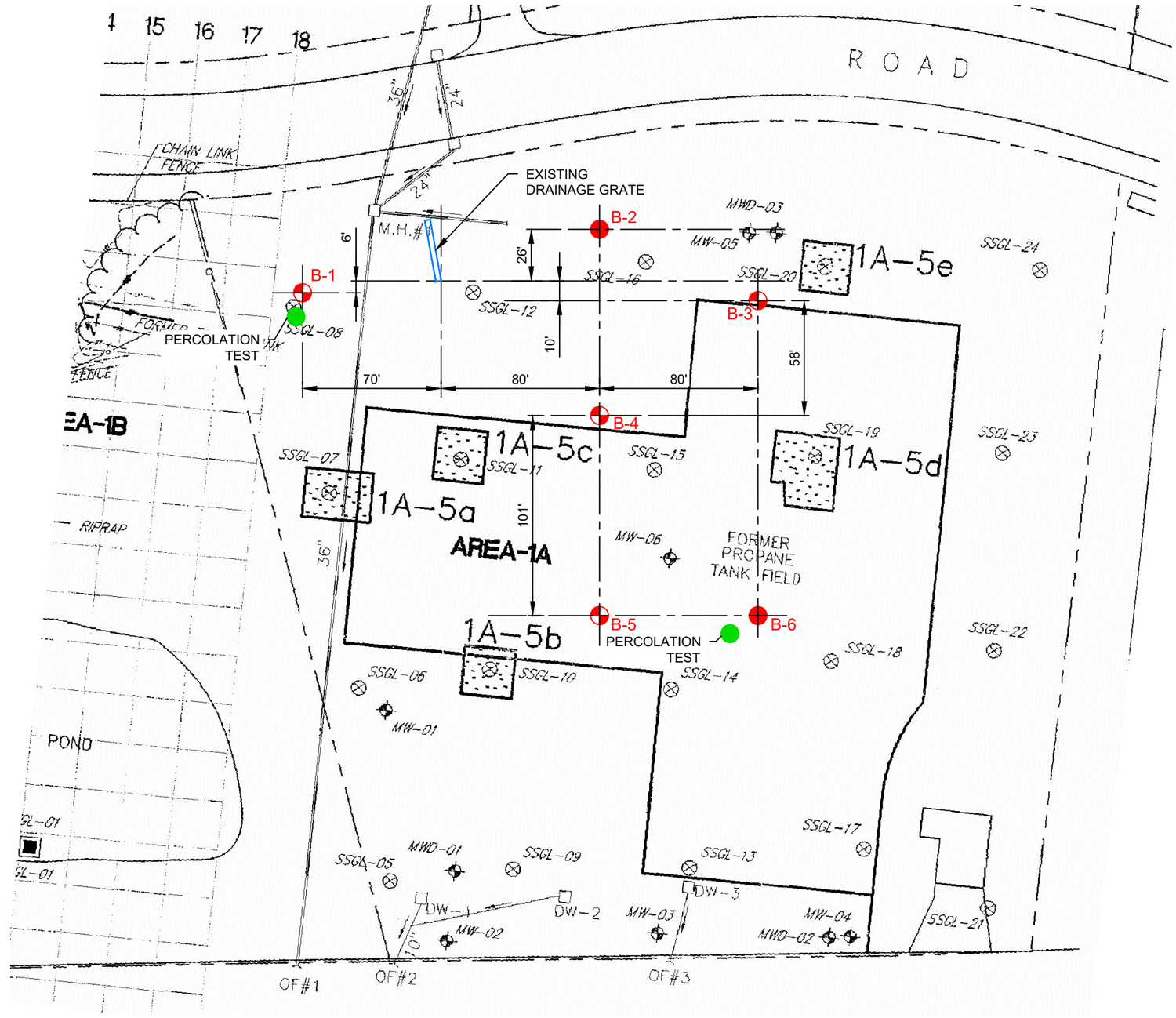
Christopher Morris, P.G.
On behalf of Jessica Phillips.

Attachments
cc: S. Aldridge (National Grid)
J. Mitchell (National Grid)
M. Quinlan (GEI)

LEGEND

- MONITORING WELL
- SOIL BORING
- SURFACE SOIL SAMPLE
- GEOPROBE SAMPLE
- SURFACE WATER/SEDIMENT SAMPLE
- M.H. MANHOLE
- DW DRYWELL
- OF OUTFALL
- C.B. CATCH BASIN
- AS-BUILT MINOR CONTOUR
- AS-BUILT MAJOR CONTOUR
- FORMER MINOR CONTOUR
- FORMER MAJOR CONTOUR
- FORMER TOP OF BANK
- TREE/BRUSH LINE
- RIPRAP

- 30' DEEP SOIL BORING LOCATION
- 50' DEEP SOIL BORING LOCATION
- PERCOLATION TEST LOCATION



SOURCE:

1. PLAN BASED ON FILE PREPARED BY VHB INC. MIDDLETOWN, CONN. TITLED GLENWOOD LANDING GAS PLANT SITE-SITE PLAN DATED MARCH 2003, REV 1 DATED 8/19/03.

0 60 120

SCALE: 1" = 60'

Glenwood Landing
Former Gas Plant Site
Glenwood Landing, New York

nationalgrid

GEI Consultants

APPROXIMATE GEOTECHNICAL BORING LOCATIONS

Project 1702897.25.1 | May 2020 | Fig. 1

\\hts1v-pzcc- \\hts1v-pzcc-01\HTS-DATA\Tech\Environmental Projects\National Grid\OMM Downstate\13 Sites\Glenwood Landing\00_CAD\Figures\NIA\1702897-F1.dwg - 5/13/2020

SUBSOIL
INVESTIGATIONS

SOIL MECHANICS DRILLING CORP.

3770 MERRICK ROAD, SEAFORD, NEW YORK 11783
PH: (516) 221-2333 FAX: (516) 221-0254
EMAIL: SOILMECHANICSDRAFT@EARTHLINK.NET

May 19, 2020

BL Companies
145 Pinelawn Road
Suite 300 South
Melville, NY 11747
Attn: Ian McPhillips, P.E., Sr. Project Mgr.
Via E-Mail: Imcphillips@Blcompanies.com

Re: National Grid Geotech Investigations
Glenwood Landing, NY
Our Job #20-111

Gentlemen:

Forwarded herewith are the logs for six (6) borings drilled recently at the above referenced location. Our drawings also illustrate the set-up and results of two (2) infiltration tests. Our investigation consisted of the drilling of six (6) test borings, two (2) borings to a depth of 50 feet each and four (4) borings to a depth of 30 feet each, at locations shown on our Boring Location Plan. Each infiltration was performed within approximately 5 feet of its companion boring. All of the borehole locations were soft dug to approximately 5 feet to investigate for the presence of any unknown underground services or utilities and avoid damage to same. Upon completion of each boring, the borehole was backfilled with drill cuttings (spoils). All fieldwork was performed in the presence of our environmental field professional who was equipped with an aerosol dust monitor, combustible gas meter and photoionization detector.

The drilling was accomplished with truck mounted drill rigs and hollow stem auger casing. Sample recovery was achieved using a CME automatic SPT trip hammer and a standard 2 inch split spoon sampler following the Standard Penetration Test procedures, ASTM D-1586. The number of blows required to advance the sampler each 6 inch increment were recorded and are shown on our boring logs, along with a written description of the recovered soil sample per our geologist's visual identification of same in accordance with the Unified Soils Classification System. The CME automatic hammer operates with an efficiency of approximately 90%. The original conventional use of rope, cathead and drop weight to conduct the standard penetration test, on the other hand, operates with an efficiency of approximately 60%. As a consequence, the standard penetration test results obtained using the CME auto SPT hammer are on the order of two thirds the value that would have been obtained had the original rope and cathead method been used. This is significant if you are using design charts for soil strength parameters based on historical data associated with the rope and cathead method. If so, you should adjust our data accordingly.

SOIL MECHANICS DRILLING CORP.
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Our boring investigation revealed that the areas drilled were blanketed by from 7 to 16 feet of moderately dense to loose soil fill consisting principally of sand, silt and gravel along with small amounts of brick, wood, concrete and other miscellaneous materials. These upper materials are generally underlain by a moderately dense to dense sand formation with varying amounts of silt and occasional layers of moderately stiff silts or clays.

Ground water, which may be under tidal influence, was encountered at depths ranging from 3'-5" to 6'-8" below existing grade at the time the work was done. An infiltration test was performed approximately 5 feet away from each of Borings B-1 and B-6 following the procedure described in Appendix D of the New York State Stormwater Management Design Manual. The test results provide a mean coefficient of permeability of the soil at the tip of the pipe casing through which the test is performed. The test value is given in cm/sec.

The soil profiles generated by this report best fit that of Site Class "D" per NYC and NYS Building Codes Table 1613.5.2.

The low standard penetration test results of the upper soils along with the high water table indicate that they are liquefiable. Supplemental soils lab data can be found appended to this report.

Based on the results of this investigation, we recommend that any significant structure to be constructed at this site be founded on deep foundation elements, i.e. piles, installed through the upper unsuitable fill and soft organic soils into the underlying more competent material. Consideration must be given to potential drag down or negative skin friction forces that affect the pile's "net" capacity.

Soil samples recovered during drilling operations will be stored in our lab for a period of 30 days after which they will be destroyed. During this period we will deliver these samples to any prescribed location upon request.

If after you examine the enclosed you have any further questions, please feel free to call and discuss them with us.

Billing is enclosed.

Very truly yours,

SOIL MECHANICS DRILLING CORP.

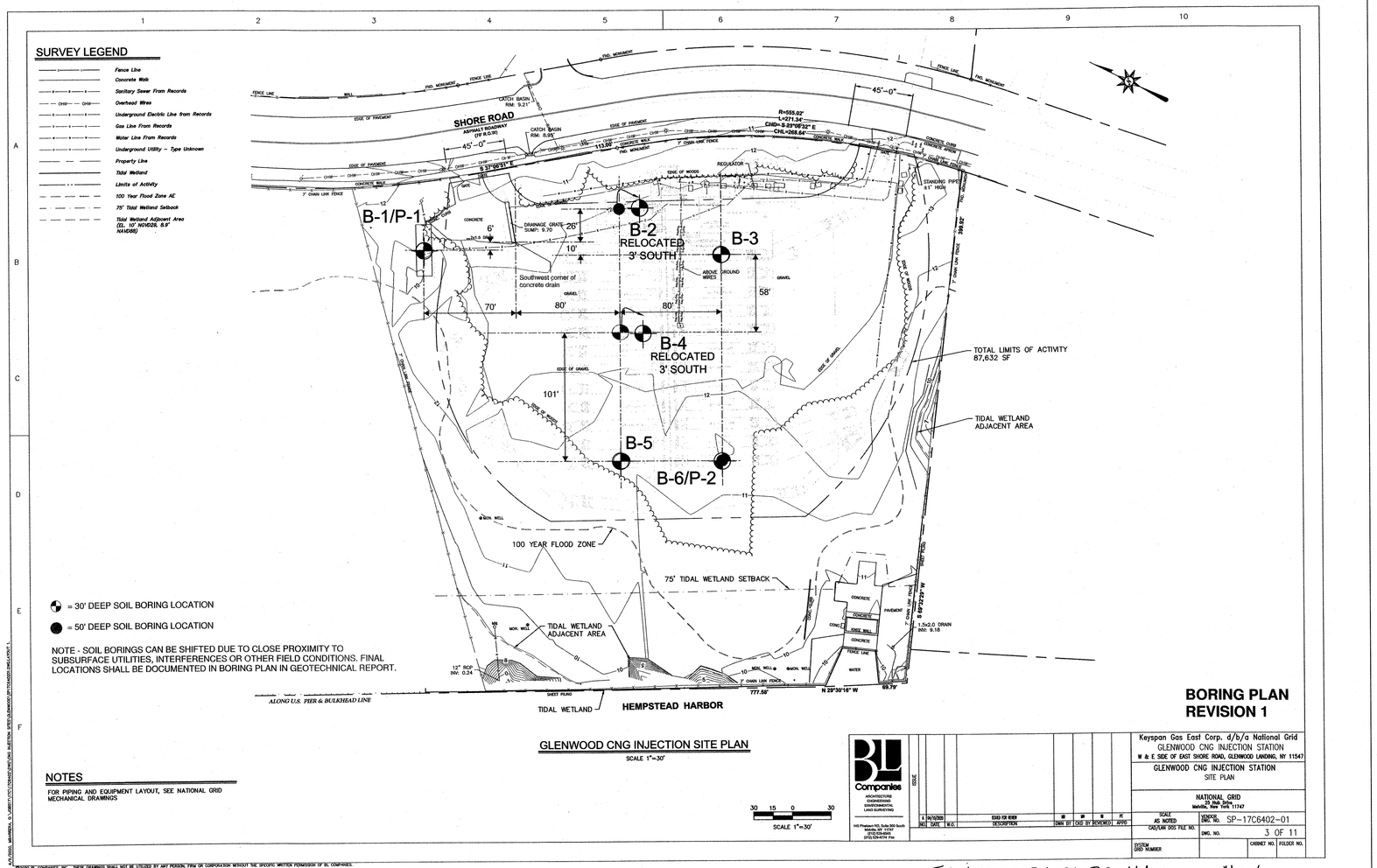
Vincent Nantista
Vice President

VN:sbg
Attachments

BORING LOCATION PLAN

0 50' 100' 150' 200'

DRAWING SCALE: 1" = 50'±



GLENWOOD CNG INJECTION SITE PLAN

SCALE 1"=30'

30 15 0 30

SCALE 1"=30'

NOTES

FOR PIPING AND EQUIPMENT LAYOUT, SEE NATIONAL GRID MECHANICAL DRAWINGS

BORING PLAN REVISION 1

BL Companies
ARCHITECTURE
ENGINEERING
ENVIRONMENTAL
LAND SURVEYING
145 Pinelawn RD, Suite 300 South
Melville, NY 11747
(631) 694-3040
(631) 694-4118 Fax

ISSUE	DATE	DESCRIPTION	BY	CHD	BY	CHD	BY	CHD	APPD
A	04/16/2020	ISSED FOR REVIEW							
REV	DATE	W.O.							

Keyspan Gas East Corp. d/b/a National Grid
GLENWOOD CNG INJECTION STATION
W & E SIDE OF EAST SHORE ROAD, GLENWOOD LANDING, NY 11547

GLENWOOD CNG INJECTION STATION
SITE PLAN

NATIONAL GRID
175 East Old
Melville, New York 11747

SCALE: AS NOTED
DRWG. NO.: SP-17C6402-01
CAD/DAR 'DDS' FILE NO.:
DWG. NO.: 3 OF 11
SYSTEM GRID NUMBER
CABINET NO.
FOLDER NO.

Ticket No. 20094074320-111 4-13-20 MONDAY NEW

NOTES

1. SOIL DESCRIPTIONS ARE BY VISUAL EXAMINATION OF SOIL SAMPLES RECOVERED DURING DRILLING OPERATIONS.
2. SOIL DESCRIPTIONS ARE IN ACCORD WITH THE UNIFIED SOIL CLASSIFICATION SYSTEM.
3. GROUND WATER TABLE WAS MEASURED INSIDE THE DRILL CASING AT THE COMPLETION OF EACH BOREHOLE.
4. SOIL STRATIFICATIONS ARE ACCURATE TO WITHIN TWO FEET VERTICALLY.
5. SOIL SAMPLES WERE OBTAINED USING A CENTRAL MINE EQUIPMENT (CME) AUTOMATIC TRIP HAMMER.
6. SOIL TEST BORING GROUND SURFACE STAKE-OUT AND ELEVATIONS BY OTHERS.
7. SOIL TEST BORINGS DRILLED IN ACCORD WITH THE NEW YORK CITY BUILDING CODE.

UNIFIED SOIL CLASSIFICATION

SOIL GROUPS	TYPICAL NAMES AND SOIL SYMBOLS
1a Thru 1d	BEDROCK
GW	WELL GRADED GRAVELS, GRAVEL SAND MIXTURES, LITTLE OR NO FINES
GP	POORLY GRADED GRAVELS OR GRAVEL SAND MIXTURES. LITTLE OR NO FINES
GM	SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURE
GC	CLAYEY GRAVELS, GRAVEL - SAND - CLAY MIXTURE
SW	WELL GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
SP	POORLY GRADED SANDS OR GRAVELLY SANDS, LITTLE OR NO FINES
SM	SILTY SANDS, SAND - SILT MIXTURES
SC	CLAYEY SANDS, SAND - CLAY MIXTURES
ML	INORGANIC SILTS, VERY FINE SANDS, CLAYEY SILTS, SLIGHT PLASTICITY
CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS SANDY CLAYS, SILTY CLAYS
OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SANDY OR SILTY SOILS, ELASTIC SILTS
CH	INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS
OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
Pt	PEAT AND OTHER HIGHLY ORGANIC SOILS

ALLOWABLE SOIL BEARING PRESSURES, N.Y.C. BLDG. CODE TABLE 1804.1

CLASS OF MATERIALS (Notes 1 and 3) ★	MAXIMUM ALLOWABLE FOUNDATION PRESSURE (TSF)	MAXIMUM ALLOWABLE FOUNDATION PRESSURE (kPa)
1. BEDROCK (NOTES 2 and 7) ★		
1a HARD SOUND ROCK - GNEISS, DIABASE, SCHIST	60	5,746
1b MEDIUM HARD ROCK - MARBLE, SERPENTINE	40	3,830
1c INTERMEDIATE ROCK - SHALE, SANDSTONE	20	1,915
1d SOFT ROCK - WEATHERED ROCK	8	766
2. SANDY GRAVEL & GRAVEL (GW, GP) (NOTES 3, 4, 8, and 9) ★		
2a DENSE	10	958
2b MEDIUM	6	575
3. GRANULAR SOILS (GC, GM, SW, SP, SM, & SC)(NOTES 4, 5, 8, and 9)		
3a DENSE ★	6	575
3b MEDIUM	3	287
4. CLAYS (SC, CL, & CH)(NOTES 4, 6, 8, and 9)		
4a HARD	5	479
4b STIFF	3	287
4c MEDIUM	2	192
5. SILTS & SILTY SOILS (ML & MH)(NOTES 4, 8, and 9) ★		
5a DENSE	3	287
5b MEDIUM	1.5	144
6. ORGANIC SILTS, ORGANIC CLAYS, PEATS, SOFT CLAYS, LOOSE GRANULAR SOILS, & VARVED SILTS	SEE 1804.2.1 ★	SEE 1804.2.1 ★
7. CONTROLLED & UNCONTROLLED FILLS	SEE 1804.2.2 OR 1804.2.3 ★	SEE 1804.2.2 OR 1804.2.3 ★

★ REFER TO SECTION 1804.2 OR NOTES FOLLOWING TABLE 1804.1 IN THE N.Y.C. BLDG. CODE FOR ADDITIONAL INFORMATION

COMPACTION RELATED TO SPOON BLOWS PER FOOT

SAND & SILT		CLAY	
LOOSE	LESS THAN 10	SOFT	4 OR LESS
MEDIUM	10 TO 30	MEDIUM	GREATER THAN 8 TO 30
DENSE	GREATER THAN 31	HARD	GREATER THAN 30

" N " STANDARD PENETRATION TEST - ASTM 1586 2" SPOON, 140lb HAMMER @ 30" FALL

N=17 BLOWS PER FOOT (5 8 9 12)

SPOON BLOW COUNT IS GENERALLY SHOWN IN 6" INCREMENTS FOR 2' DRIVE

TO OBTAIN BLOWS PER FOOT (N) USE THE 2ND & 3RD 6" INCREMENT

	ROTARY CASING	EXTRA HEAVY CASING	SAMPLE SPOON
SIZES, INCHES	2.5		2.0
HAMMER WEIGHT, POUNDS	_____		140
HAMMER FALL, INCHES	_____		30

CB - CASING BLOWSPER 1 FOOT DRIVE
SB - SPOON BLOWS PER 6 INCH DRIVE
P - PUSHED BY WEIGHT OF HAMMER
WOR - WEIGHT OF ROD
UD - UNDISTURBED SOIL SAMPLE
NO - SAMPLE NUMBER
FEET - DEPTH FROM GND. SUR. NOTED AT EACH 5'
WOH - WEIGHT OF HAMMER
REC - SOIL RECOVERY IN INCHES

BL COMPANIES
145 PINELAWN ROAD
SUITE 300 SOUTH
MELVILLE, NEW YORK 11747

PROJECT:
GLENWOOD LANDING CNG INJECTION-NATIONAL GRID PROJECT NO. 17C6402
WEST OF SHORE ROAD
GLENWOOD LANDING, NEW YORK

SOIL MECHANICS DRILLING CORP.
subsoil investigations
3770 MERRICK ROAD * SEAFORD, NEW YORK 11783 * 516 - 221-2333

SUBSURFACE INVESTIGATION

GLENWOOD LANDING CNG INJECTION-NATIONAL GRID PROJECT NO. 17C6402

WEST OF SHORE ROAD

GLENWOOD LANDING, NEW YORK

VERTICAL BORING SCALE:	DRAWING DATE			DRAWING NUMBER
1/4" = 1'-0" UNLESS NOTED OTHERWISE	MAY 4, 2020			20R111.6
DATES OF BORING	DRAWN BY:	CHECKED BY:	REVISED DATE:	SHEET 1 OF 3
APRIL 30, 2020	NAR	CV	MAY 11, 2020	

BORING PLAN

SUBSURFACE INVESTIGATION

DATE: MAY 4, 2020
PROJECT No: 20R111.6
DRAWING BY: NAR
CHK BY: VN
DWG No:
B-001.00

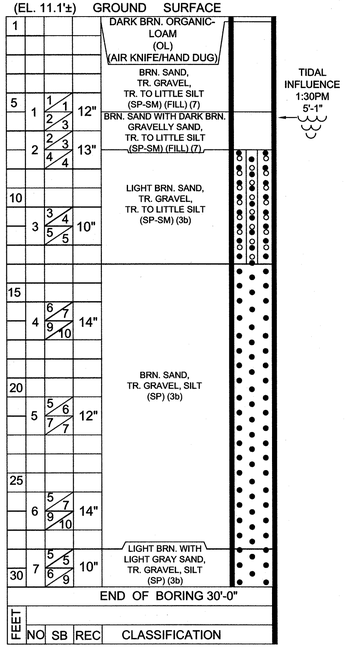
SEAL & SIGNATURE:

CAD FILE No: Z: 20R111.6 | SHEET 1 OF 3

Z: 20RDWGS/20R111.6

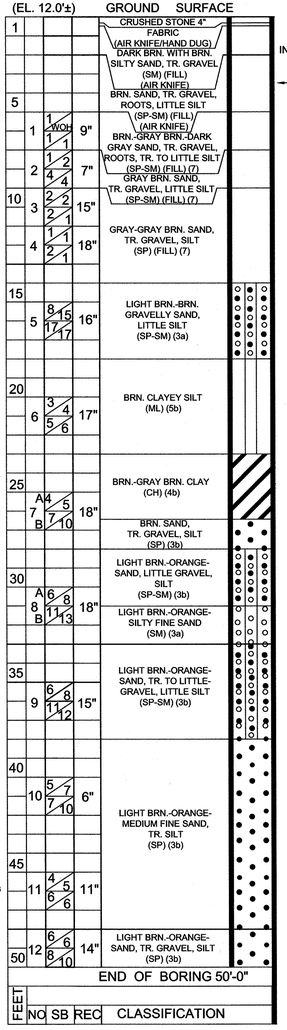
B-1/P-1

(EL. 11.1'±) GROUND SURFACE



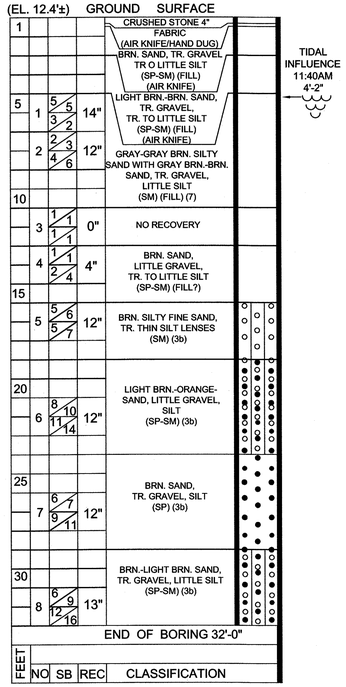
B-2

(EL. 12.0'±) GROUND SURFACE

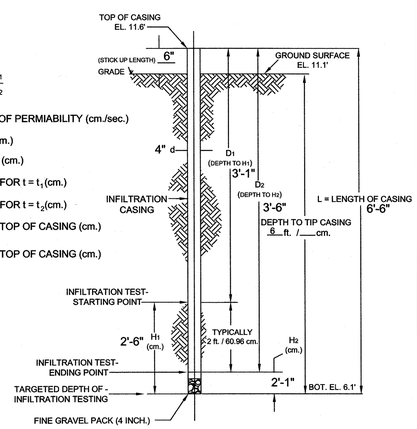


B-3

(EL. 12.4'±) GROUND SURFACE



B-1/P-1



$$K_m = \frac{\pi * d}{11 * (t_2 - t_1)} * \ln \frac{H_1}{H_2}$$

K_m = MEAN COEFFICIENT OF PERMIABILITY (cm./sec.)

d = INSIDE DIAMETER (cm.)

L = LENGTH OF CASING (cm.)

H_1 = PIEZOMETER HEAD FOR $t = t_1$ (cm.)

H_2 = PIEZOMETER HEAD FOR $t = t_2$ (cm.)

D_1 = DEPTH TO H_1 FROM TOP OF CASING (cm.)

D_2 = DEPTH TO H_2 FROM TOP OF CASING (cm.)

t = TIME (sec.)

ln = NATURAL LOG

* WHERE THE G.W.T. IS BELOW THE TIP OF CASING, OTHERWISE IS H1 = DTW - D1 FROM TOP OF CASING D1. * $H_1 = L - D_1$ (cm.)

* WHERE THE G.W.T. IS ABOVE THE TIP OF CASING, OTHERWISE IS H2 = DTW - D2 FROM TOP OF CASING D2. * $H_2 = L - D_2$ (cm.)

JOB NO. 20-111 LOCATION: GLENWOOD LANDING DATE: APRIL 30, 2020

B-1/P-1 FALLING HEAD INFILTRATION TEST DATA

H1 2'-6" ft. X.XX m. XX.X cm.

H2 2'-1" ft. X.XX m. XX.X cm.

	TIME (MIN. & SEC.)			COMMENTS
RUN No.	START (T1)	END (T2)	ELAPSED	
NO. 1	1:20PM	2:20PM	60 MINUTES 0 SECONDS	WATER DRAINED 5"
NO. 2				
NO. 3				
NO. 4				

AVERAGE ELAPSE: WATER DRAINED 5" IN 60 MINUTES

I.D. OF CASING(D) 4 IN. 10.16 CM.

ELEVATION AT BOTTOM OF CASING 6 FT. M.

$$K_m = \frac{\pi * d}{11 * (t_2 - t_1)} * 1n \frac{H_1}{H_2}$$

ALL UNITS IN CM. AND SECONDS

K_m = MEAN COEFFICIENT OF PERMIABILITY (CM/SEC) = 1.47×10^{-4}

Z: 20RDWGS/20R111.6

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7. CONTROLLED & UNCONTROLLED FILLS	SEE 1804.2.2 OR 1804.2.3 *	SEE 1804.2.2 OR 1804.2.3 *

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BL COMPANIES
145 PINELAWN ROAD
SUITE 300 SOUTH
MELVILLE, NEW YORK 11747

PROJECT:
GLENWOOD LANDING CNG INJECTION-NATIONAL GRID PROJECT NO. 17C6402
WEST OF SHORE ROAD
GLENWOOD LANDING, NEW YORK

SOIL MECHANICS DRILLING CORP.
subsoil investigations
3770 MERRICK ROAD * SEAFORD, NEW YORK 11783 * 516 - 221-2333

SUBSURFACE INVESTIGATION

GLENWOOD LANDING CNG INJECTION-NATIONAL GRID PROJECT NO. 17C6402

WEST OF SHORE ROAD

GLENWOOD LANDING, NEW YORK

VERTICAL BORING SCALE: 1/4" = 1'-0" UNLESS NOTED OTHERWISE

DRAWING DATE: MAY 4, 2020

DRAWING NUMBER: 20R111.6

SHEET 2 OF 3

DATES OF BORING: APRIL 30, 2020

DRAWN BY: NAR | CHECKED BY: CV | REVISED DATE: MAY 11, 2020

BORING PLAN

SUBSURFACE INVESTIGATION

DATE: MAY 4, 2020
PROJECT No: 20R111.6
DRAWING BY: NAR
CHK BY: VN
DWG No: B-001.00

SEAL & SIGNATURE:

CAD FILE No: Z: 20R111.6 | SHEET 2 OF 3

B-4

(EL. 12.5'±) GROUND SURFACE

FEET	NO	SB	REC	CLASSIFICATION
1				CRUSHED STONE 4" FABRIC CRUSHED STONE 12" FABRIC (AIR KNIFE/HAND DUG) BRN. SAND, TR. GRAVEL, SILT (SP) (FILL) (AIR KNIFE)
5	1	WOH WOH	11"	BRN. SAND, TR. GRAVEL, TR. TO LITTLE SILT (SP-SM) (FILL) (AIR KNIFE)
	2	2 4 6 7	13"	BRN.-TAN SAND, TR. GRAVEL, CLAY, LITTLE SILT (SP-SM) (FILL) (7)
10	3	5 4 1 WOH	7"	BRN. SAND, TR. GRAVEL, SILT (SP) (FILL) (7) BRN. WITH GRAY SAND, TR. GRAVEL, SILT (SP) (FILL) (7)
15	4	1 1 1 4	13"	GRAY-DARK GRAY SILTY SAND, TR. GRAVEL, CLAY, SHELL FRAGMENTS WITH DARK GRAY SANDY CLAY, TR. GRAVEL, SAND, SHELL FRAGMENT LENSES (SM-CL) (6)
20	5	3 6 10 12	12"	BRN. GRAVELLY SAND, TR. SILT (SP) (3b)
25	6	10 14 16 18	12"	LIGHT BRN. SAND, TR. TO LITTLE GRAVEL, TR. SILT (SP) (3a)
30	7	4 6 8 11	13"	TAN.-BRN. MEDIUM FINE-SAND, TR. GRAVEL, SILT, COARSE SAND (SP) (3b)
				END OF BORING 32'-0"

TIDAL INFLUENCE 3'-11"

B-5

(EL. 11.3'±) GROUND SURFACE

FEET	NO	SB	REC	CLASSIFICATION
1				DARK BRN. ORGANIC LOAM (OL) (AIR KNIFE/HAND DUG) BRN. SAND, TR. GRAVEL, LITTLE SILT (SP-SM) (FILL) (AIR KNIFE)
5	1	1 1 1 2	14"	BRN. SAND, TR. GRAVEL, TR. TO LITTLE SILT (SP-SM) (FILL) (7)
	2	2 2 100/2" -	10"	BRN. SAND, TR. GRAVEL, SILT, CONCRETE (SP) (FILL) (7)
10	3	11 14 22 31	20"	BRN. SILTY SAND, TR. GRAVEL, CLAY, WOOD (SM) (FILL) (7)
15	4	A 9 4 9 B 7 12	12"	W O O D (FILL) (7) BRN. SAND, TR. GRAVEL, SILT (SP) (3b)
20	5	10 11 12 15	12"	BRN. SAND, TR. GRAVEL, SILT (SP) (3a)
25	6	10 10 11 12	16"	BRN. SAND, TR. GRAVEL, SILT (SP) (3b)
30	7	10 11 16	19"	BRN.-LIGHT GRAY BRN. SAND, TR. GRAVEL, SILT (SP) (3a)
				END OF BORING 30'-0"

TIDAL INFLUENCE 8'-0"

B-6/P-2

(EL. 11.0 '±) GROUND SURFACE

FEET	NO	SB	REC	CLASSIFICATION
1				DARK BRN. ORGANIC LOAM (OL) (AIR KNIFE/HAND DUG) BRN. SAND, TR. GRAVEL, THIN FINE ROOTS, LITTLE SILT (SP-SM) (FILL) (AIR KNIFE)
5	1	4 5 5 5	14"	LIGHT BRN.-BRN. SAND, TR. GRAVEL, SILT (SP) (FILL) (AIR KNIFE)
	2	4 5 6 8	16"	BRN. SAND, TR. GRAVEL, SILT (SP) (FILL) (7)
10	3	5 3 4 4	14"	BRN.-GRAY BRN. SAND, LITTLE GRAVEL, TR. BRICK, SILT (SP) (FILL) (7)
15	4	4 4 4 4	12"	BRN.-LIGHT BRN. SAND, TR. GRAVEL, SILT (SP) (3b)
20	5	4 5 6 7	13"	BRN. SAND, TR. TO LITTLE GRAVEL, TR. SILT (SP) (3b)
25	6	10 10 10 15	12"	LIGHT BRN.-TAN MEDIUM FINE SAND, TR. GRAVEL, SILT, COARSE SAND (SP) (3b)
30	7	8 9 10 12	17"	BRN. FINE SAND, TR. GRAVEL, SILT, MEDIUM SAND (SP) (3b)
35	8	5 5 6 7	11"	LIGHT BRN.-TAN SAND, TR. GRAVEL, SILT (SP) (3b)
40	9	5 6 8 10	19"	LIGHT BRN.-MULTICOLORED FINE SAND, TR. TO LITTLE-SILT, TR. MEDIUM SAND (SP-SM) (3b)
45	10	7 8 11 17	20"	LIGHT BRN.-MULTICOLORED FINE SAND, TR. SILT, MEDIUM SAND WITH THIN SILTY FINE SAND-LENSES (SP-SM) (3b)
50	11	5 39 12 17	19"	LIGHT BRN.-MULTICOLORED FINE MEDIUM SAND, TR. SILT (SP) (3b)
				END OF BORING 50'-0"

TIDAL INFLUENCE 6'-8"

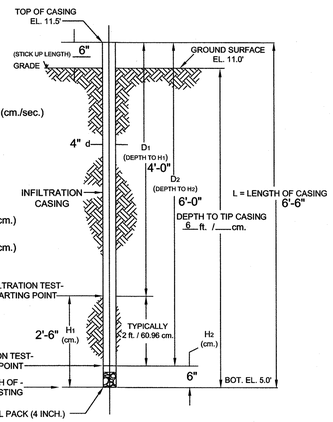
B-6/P-2

$$K_m = \frac{\pi * d}{11 * (t_2 - t_1)} * \ln \frac{H_1}{H_2}$$

K_m = MEAN COEFFICIENT OF PERMIABILITY (cm./sec.)
d = INSIDE DIAMETER (cm.)
L = LENGTH OF CASING (cm.)
H_1 = PIEZOMETER HEAD FOR $t = t_1$ (cm.)
H_2 = PIEZOMETER HEAD FOR $t = t_2$ (cm.)
D_1 = DEPTH TO H_1 FROM TOP OF CASING (cm.)
D_2 = DEPTH TO H_2 FROM TOP OF CASING (cm.)
t = TIME (sec.)
ln = NATURAL LOG

★ $H_1 = L - D_1$ (cm.)

★ $H_2 = L - D_2$ (cm.)



★ WHERE THE G.W.T. IS BELOW THE TIP OF CASING, OTHERWISE IS H1 = DTW - D1 FROM TOP OF CASING D1.

★ WHERE THE G.W.T. IS ABOVE THE TIP OF CASING, OTHERWISE IS H2 = DTW - D2 FROM TOP OF CASING D2.

JOB NO. 20-111 LOCATION: GLENWOOD LANDING DATE: APRIL 30, 2020

B-6/P-2 FALLING HEAD INFILTRATION TEST DATA

H1 4' ft. X.XX m. XX.X cm.
H2 6' ft. X.XX m. XX.X cm.

RUN No.	TIME (MIN. & SEC.) START (T1)	END (T2)	ELAPSED	COMMENTS
NO. 1	9:43:00AM	10:23:10AM	40 MINUTES 10 SECONDS	
NO. 2	10:25:00AM	11:07:20AM	42 MINUTES 20 SECONDS	
NO. 3	11:10:00AM	11:55:12AM	45 MINUTES 12 SECONDS	
NO. 4	11:58:00AM	12:43:38PM	45 MINUTES 38 SECONDS	

AVERAGE ELAPSE: 43 MINUTES 20 SECONDS FOR WATER TO DRAIN 24"

I.D. OF CASING(D) 4 IN. 10.16 CM.

ELEVATION AT BOTTOM OF CASING 6 FT. M.

$$K_m = \frac{\pi * d}{11 * (t_2 - t_1)} * 1n \frac{H_1}{H_2}$$

ALL UNITS IN CM. AND SECONDS
K_m = MEAN COEFFICIENT OF PERMIABILITY (CM/SEC) = $1.72X10^{-3}$

UNIFIED SOIL CLASSIFICATION

SOIL GROUPS	TYPICAL NAMES AND SOIL SYMBOLS
1a Thru 1d	BEDROCK
GW	WELL GRADED GRAVELS, GRAVEL SAND MIXTURES, LITTLE OR NO FINES
GP	POORLY GRADED GRAVELS OR GRAVEL SAND MIXTURES. LITTLE OR NO FINES
GM	SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURE
GC	CLAYEY GRAVELS, GRAVEL - SAND - CLAY MIXTURE
SW	WELL GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
SP	POORLY GRADED SANDS OR GRAVELLY SANDS, LITTLE OR NO FINES
SM	SILTY SANDS, SAND - SILT MIXTURES
SC	CLAYEY SANDS, SAND - CLAY MIXTURES
ML	INORGANIC SILTS, VERY FINE SANDS, CLAYEY SILTS, SLIGHT PLASTICITY
CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS SANDY CLAYS, SILTY CLAYS
OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SANDY OR SILTY SOILS, ELASTIC SILTS
CH	INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS
OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
Pt	PEAT AND OTHER HIGHLY ORGANIC SOILS

ALLOWABLE SOIL BEARING PRESSURES, N.Y.C. BLDG. CODE TABLE 1804.1

CLASS OF MATERIALS (Notes 1 and 3) ★	MAXIMUM ALLOWABLE FOUNDATION PRESSURE (TSF)	MAXIMUM ALLOWABLE FOUNDATION PRESSURE (kPa)
1. BEDROCK (NOTES 2 and 7) ★		
1a HARD SOUND ROCK - GNEISS, DIABASE, SCHIST	60	5,746
1b MEDIUM HARD ROCK - MARBLE, SERPENTINE	40	3,830
1c INTERMEDIATE ROCK - SHALE, SANDSTONE	20	1,915
1d SOFT ROCK - WEATHERED ROCK	8	766
2. SANDY GRAVEL & GRAVEL (GW, GP) (NOTES 3, 4, 8, and 9) ★		
2a DENSE	10	958
2b MEDIUM	6	575
3. GRANULAR SOILS (GC, GM, SW, SP, SM, & SC)(NOTES 4, 5, 8, and 9)		
3a DENSE ★	6	575
3b MEDIUM	3	287
4. CLAYS (SC, CL, & CH)(NOTES 4, 6, 8, and 9)		
4a HARD	5	479
4b STIFF	3	287
4c MEDIUM	2	192
5. SILTS & SILTY SOILS (ML & MH)(NOTES 4, 8, and 9) ★		
5a DENSE	3	287
5b MEDIUM	1.5	144
6. ORGANIC SILTS, ORGANIC CLAYS, PEATS, SOFT CLAYS, LOOSE GRANULAR SOILS, & VARVED SILTS	SEE 1804.2.1 ★	SEE 1804.2.1 ★
7. CONTROLLED & UNCONTROLLED FILLS	SEE 1804.2.2 OR 1804.2.3 ★	SEE 1804.2.2 OR 1804.2.3 ★

★ REFER TO SECTION 1804.2 OR NOTES FOLLOWING TABLE 1804.1 IN THE N.Y.C. BLDG. CODE FOR ADDITIONAL INFORMATION

COMPACTION RELATED TO SPOON BLOWS PER FOOT

SAND & SILT		CLAY	
LOOSE	LESS THAN 10	SOFT	4 OR LESS
MEDIUM	10 TO 30	MEDIUM	GREATER THAN 8 TO 30
DENSE	GREATER THAN 31	HARD	GREATER THAN 30

" N " STANDARD PENETRATION TEST - ASTM 1586 2" SPOON, 140lb HAMMER @ 30" FALL

5/6 9/12 N=17 BLOWS PER FOOT — SPOON BLOW COUNT IS GENERALLY SHOWN IN 6" INCREMENTS FOR 2' DRIVE TO OBTAIN BLOWS PER FOOT (N) USE THE 2ND & 3RD 6" INCREMENT

	ROTARY CASING	EXTRA HEAVY CASING	SAMPLE SPOON
SIZES, INCHES	2.5		2.0
HAMMER WEIGHT, POUNDS			140
HAMMER FALL, INCHES			30

CB - CASING BLOWSPER 1 FOOT DRIVE
SB - SPOON BLOWS PER 6 INCH DRIVE
P - PUSHED BY WEIGHT OF HAMMER
WOR - WEIGHT OF ROD
UD - UNDISTURBED SOIL SAMPLE
NO - SAMPLE NUMBER
FEET - DEPTH FROM GND. SUR. NOTED AT EACH 5'
WOH - WEIGHT OF HAMMER
REC - SOIL RECOVERY IN INCHES

BL COMPANIES
145 PINELAWN ROAD
SUITE 300 SOUTH
MELVILLE, NEW YORK 11747

PROJECT:
GLENWOOD LANDING CNG INJECTION-NATIONAL GRID PROJECT NO. 17C6402
WEST OF SHORE ROAD
GLENWOOD LANDING, NEW YORK

SOIL MECHANICS DRILLING CORP.
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3770 MERRICK ROAD * SEAFORD, NEW YORK 11783 * 516 - 221-2333

SUBSURFACE INVESTIGATION

GLENWOOD LANDING CNG INJECTION-NATIONAL GRID PROJECT NO. 17C6402

WEST OF SHORE ROAD

GLENWOOD LANDING, NEW YORK

VERTICAL BORING SCALE: 1/4" = 1'-0" UNLESS NOTED OTHERWISE
DRAWING DATE: MAY 4, 2020
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DATES OF BORING: APRIL 30, 2020
DRAWN BY: NAR
CHECKED BY: CV
REVISED DATE: MAY 11, 2020
SHEET 3 OF 3

BORING PLAN

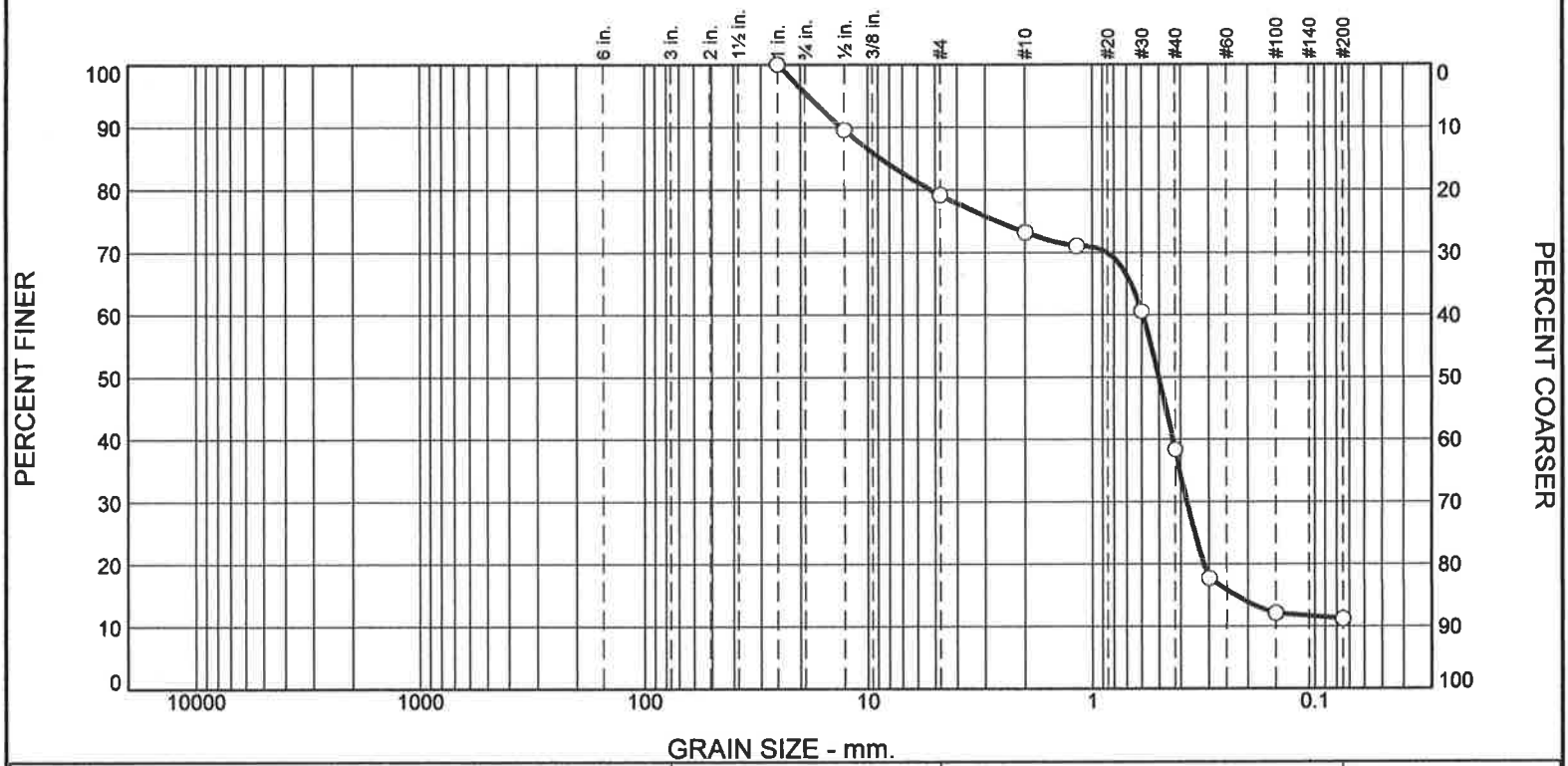
SUBSURFACE INVESTIGATION

DATE: MAY 4, 2020
PROJECT No: 20R111.6
DRAWING BY: NAR
CHK BY: VN
DWG No: B-001.00

SEAL & SIGNATURE:
CAD FILE No: Z: 20R111.6
SHEET 3 OF 3

Z: 20RDWGS/20R111.6

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines
	Coarse	Fine	Coarse	Medium	Fine	Silt
0	5	16	6	35	27	11

Test Results (ASTM C136/AASHTO T27 & ASTM C117/

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
1	100		
.5	90		
#4	79		
#10	73		
#16	71		
#30	61		
#40	38		
#50	18		
#100	12		
#200	11		

* (no specification provided)

Material Description

Boring 1, sample 1, 5 to 7 feet. Brown w/ dark brown gravelly sand, trace to little silt. (SP - SM)(FILL)(7). 11 % silt content in the sample. 13.22 % moisture content in the sample per ASTM C566(ASTM D2217).

Atterberg Limits (ASTM D 4318)

PL= NA LL= NA PI= Non-plastic

Classification

USCS (D 2487)= (SP-SM)(FILL) AASHTO (M 145)= NA

Coefficients

D_{90}= 13.1073 D_{85}= 8.7322 D_{60}= 0.5924
D_{50}= 0.5015 D_{30}= 0.3760 D_{15}= 0.2302
D_{10}= C_u= C_c=

Remarks

Boring 1, sample 1, 5 to 7 feet. Brown w/ dark browm gravelly sand, trace to little silt. (SP-SM)(FILL)(7). 11 % silt content in the sample. 13.22 % moisture content in the sample per ASTM C566(ASTM

Date Received: 5/4/2020 **Date Tested:** 5/12/2020

Tested By: Robert Hill, ACI#00094686

Checked By: Robert Hill, ACI#00094686

Title: Assistant Lab Director

Location: Boring 1, sample 1, 5 to 7 feet **Date Sampled:** 4/30/2020
Sample Number: Boring 1, sample 1 **Depth:** 5 to 7 feet

SOIL MECHANICS DRILLING CORP.
Seaford, NY

Client: BL Companies
Project: CNG Injection - National Grid, West of Shore Road, Glenwood Landing, N.Y.
Project No: 20-111 **Figure**

GRAIN SIZE DISTRIBUTION TEST DATA

5/12/2020

Client: BL Companies
Project: CNG Injection - National Grid, West of Shore Road, Glenwood Landing, N.Y.
Project Number: 20-111
Location: Boring 1, sample 1, 5 to 7 feet
Depth: 5 to 7 feet **Sample Number:** Boring 1, sample 1
Material Description: Boring 1, sample 1, 5 to 7 feet. Brown w/ dark brown gravelly sand, trace to little silt. (SP - SM)(FILL)(7). 11 % silt content in the sample. 13.22 % moisture content in the sample per ASTM C566(ASTM D2217).
Sample Date: 4/30/2020
Date Received: 5/4/2020 **PL:** NA **LL:** NA **PI:** Non-plastic
USCS Classification: (SP-SM)(FILL)(7) **AASHTO Classification:** NA
Grain Size Test Method: ASTM C136/AASHTO T27
#200 Wash Method: ASTM C117/T11 (Method A - water used only)
Testing Remarks: Boring 1, sample 1, 5 to 7 feet. Brown w/ dark browm gravelly sand, trace to little silt. (SP-SM)(FILL)(7). 11 % silt content in the sample. 13.22 % moisture content in the sample per ASTM C566(ASTM D2217).
Tested By: Robert Hill, ACI#00094686 **Test Date:** 5/12/2020
Checked By: Robert Hill, ACI#00094686 **Title:** Assistant Lab Director

Sieve Test Data

Post #200 Wash Test Weights (grams): **Dry Sample and Tare** = 293.00
Tare Wt. = 0.00
Minus #200 from wash = 11.2%

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer	Percent Retained
329.90	0.00	0.00	1	0.00	100	0
			.5	34.40	90	10
			#4	68.70	79	21
			#10	88.50	73	27
			#16	95.60	71	29
			#30	129.90	61	39
			#40	203.30	38	62
			#50	271.40	18	82
			#100	290.10	12	88
			#200	293.00	11	89

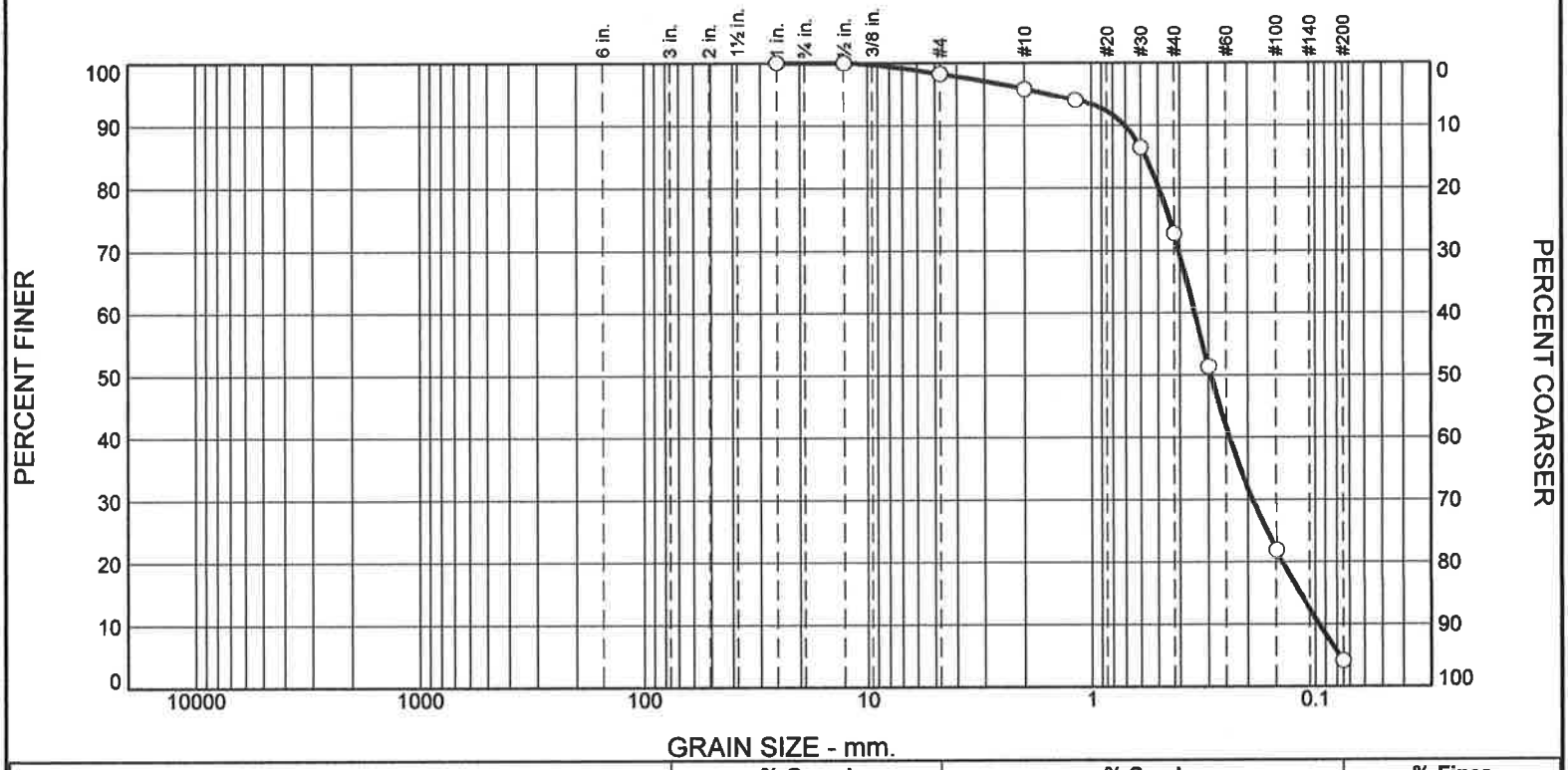
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0	5	16	21	6	35	27	68			11

D_5	D_{10}	D_{15}	D_{20}	D_{30}	D_{40}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
		0.2302	0.3158	0.3760	0.4349	0.5015	0.5924	5.2362	8.7322	13.1073	18.4646

Fineness Modulus
3.04

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines
	Coarse	Fine	Coarse	Medium	Fine	Silt
0	0	2	2	23	69	4

Test Results (ASTM C136/AASHTO T27 & ASTM C117/

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
1	100		
.5	100		
#4	98		
#10	96		
#16	94		
#30	86		
#40	73		
#50	51		
#100	22		
#200	4.2		

* (no specification provided)

Material Description

Boring 1, sample 4, 15 to 17 feet. Brown sand, trace gravel, silt. (SP)(3b). 4.2 % silt content in sample. 11.09 % moisture content in the sample per ASTM C566(ASTMD2217).

Atterberg Limits (ASTM D 4318)

PL= NA **LL=** NA **PI=** Non-plastic

Classification

USCS (D 2487)= (SP)(3b) **AASHTO (M 145)=** NA

Coefficients

D_{90}= 0.7049 D_{85}= 0.5697 D_{60}= 0.3449
D_{50}= 0.2931 D_{30}= 0.1911 D_{15}= 0.1177
D_{10}= 0.0963 C_u= 3.58 C_c= 1.10

Remarks

Boring 1, sample 4, 15 to 17 feet. Brown sand, trace gravel, silt. (SP)(3b). 4.2 % silt content in the sample. 11.09 % silt content per ASTM C566(ASTM D2217).

Date Received: 5/4/2020 **Date Tested:** 5/12/2020

Tested By: Robert Hill, ACI#00094686

Checked By: Robert Hill, ACI#00094686

Title: Assistant Lab Director

Location: Boring 1, sample 4, 15 to 17 feet **Date Sampled:** 4/30/2020

Sample Number: Boring 1, sample 4 **Depth:** 15 to 17 feet

SOIL MECHANICS DRILLING CORP.
Seaford, NY

Client: BL Companies

Project: CNG Injection - National Grid, West of Shore Road, Glenwood Landing, N.Y.

Project No: 20-111 **Figure**

GRAIN SIZE DISTRIBUTION TEST DATA

5/12/2020

Client: BL Companies
Project: CNG Injection - National Grid, West of Shore Road, Glenwood Landing, N.Y.
Project Number: 20-111
Location: Boring 1, sample 4, 15 to 17 feet
Depth: 15 to 17 feet **Sample Number:** Boring 1, sample 4
Material Description: Boring 1, sample 4, 15 to 17 feet. Brown sand, trace gravel, silt. (SP)(3b). 4.2 % silt content in sample. 11.09 % moisture content in the sample per ASTM C566(ASTMD2217).
Sample Date: 4/30/2020
Date Received: 5/4/2020 **PL:** NA **LL:** NA **PI:** Non-plastic
USCS Classification: (SP)(3b) **AASHTO Classification:** NA
Grain Size Test Method: ASTM C136/AASHTO T27
#200 Wash Method: ASTM C117/T11 (Method A - water used only)
Testing Remarks: Boring 1, sample 4, 15 to 17 feet. Brown sand, trace gravel, silt. (SP)(3b). 4.2 % silt content in the sample. 11.09 % silt content per ASTM C566(ASTM D2217).
Tested By: Robert Hill, ACI#00094686 **Test Date:** 5/12/2020
Checked By: Robert Hill, ACI#00094686 **Title:** Assistant Lab Director

Sieve Test Data

Post #200 Wash Test Weights (grams): **Dry Sample and Tare =** 354.20
Tare Wt. = 0.00
Minus #200 from wash = 4.2%

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer	Percent Retained
369.60	0.00	0.00	1	0.00	100	0
			.5	0.00	100	0
			#4	6.50	98	2
			#10	15.50	96	4
			#16	22.20	94	6
			#30	49.90	86	14
			#40	101.20	73	27
			#50	179.80	51	49
			#100	288.90	22	78
			#200	354.20	4.2	95.8

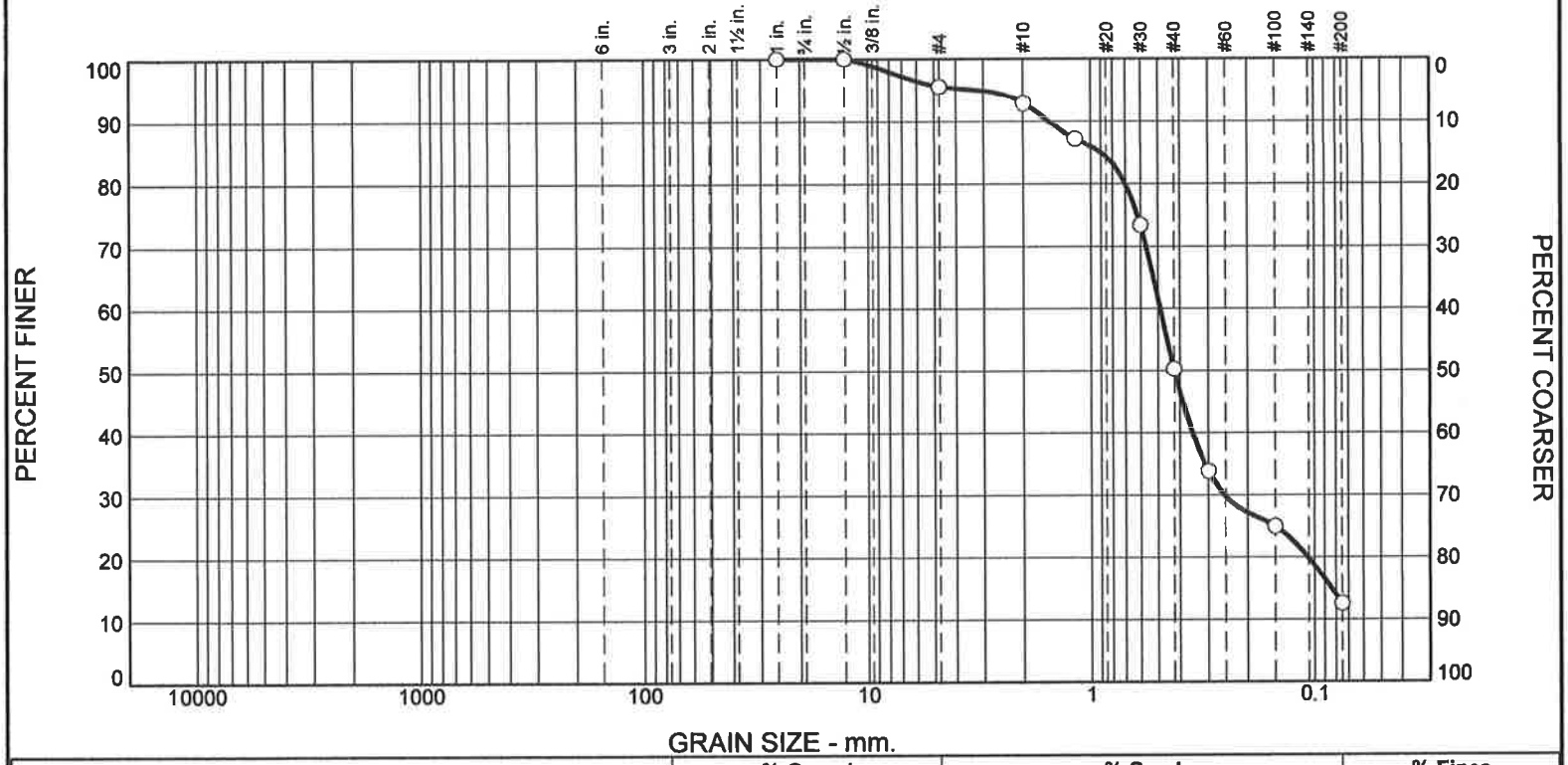
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0	0	2	2	2	23	69	94			4

D_5	D_{10}	D_{15}	D_{20}	D_{30}	D_{40}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.0778	0.0963	0.1177	0.1411	0.1911	0.2422	0.2931	0.3449	0.4959	0.5697	0.7049	1.5799

Fineness Modulus	C_u	C_c
1.52	3.58	1.10

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines
	Coarse	Fine	Coarse	Medium	Fine	Silt
0	0	4	3	43	37	13

Test Results (ASTM C136/AASHTO T27 & ASTM C117/

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
1	100		
.5	100		
#4	96		
#10	93		
#16	87		
#30	73		
#40	50		
#50	34		
#100	25		
#200	13		

* (no specification provided)

Material Description

Boring 2, sample 2, 7 to 9 feet. Gray brown sand, trace gravel, little silt. (SP-SM)(FILL)7). 13 % silt content in sample. 19.04 % moisture content in the sample per ASTM C566(D2217).

Atterberg Limits (ASTM D 4318)

PL= NA LL= NA PI= Non-plastic

Classification

USCS (D 2487)= (SP-SM)(FILL)(7) AASHTO (M 145)= NA

Coefficients

D_{90}= 1.5419 D_{85}= 0.8986 D_{60}= 0.4890
D_{50}= 0.4233 D_{30}= 0.2551 D_{15}= 0.0839
D_{10}= C_u= C_c=

Remarks

Boring 2, sample 2, 7 to 9 feet. Gray brown sand, little silt, trace gravel. (SP-SM)(FILL)(7). 13 % silt content in the sample. 19.04 % moisture content per ASTM C566(ASTM D2217).

Date Received: 5/4/2020 **Date Tested:** 5/12/2020

Tested By: Robert Hill, ACI#00094686

Checked By: Robert Hill, ACI#00094686

Title: Assistant Lab Director

Location: Boring 2, sample 2, 7 to 9 feet **Date Sampled:** 4/30/2020

Sample Number: Boring 2, sample 2 **Depth:** 7 to 9 feet

SOIL MECHANICS DRILLING CORP.
Seaford, NY

Client: BL Companies

Project: CNG Injection - National Grid, West of Shore Road, Glenwood Landing, N.Y.

Project No: 20-111 **Figure**

GRAIN SIZE DISTRIBUTION TEST DATA

5/12/2020

Client: BL Companies
Project: CNG Injection - National Grid, West of Shore Road, Glenwood Landing, N.Y.
Project Number: 20-111
Location: Boring 2, sample 2, 7 to 9 feet
Depth: 7 to 9 feet **Sample Number:** Boring 2, sample 2
Material Description: Boring 2, sample 2, 7 to 9 feet. Gray brown sand, trace gravel, little silt. (SP-SM)(FILL)7). 13 % silt content in sample. 19.04 % moisture content in the sample per ASTM C566(D2217).
Sample Date: 4/30/2020
Date Received: 5/4/2020 **PL:** NA **LL:** NA **PI:** Non-plastic
USCS Classification: (SP-SM)(FILL)(7) **AASHTO Classification:** NA
Grain Size Test Method: ASTM C136/AASHTO T27
#200 Wash Method: ASTM C117/T11 (Method A - water used only)
Testing Remarks: Boring 2, sample 2, 7 to 9 feet. Gray brown sand, little silt, trace gravel. (SP-SM)(FILL)(7). 13 % silt content in the sample. 19.04 % moisture content per ASTM C566(ASTM D2217).
Tested By: Robert Hill, ACI#00094686 **Test Date:** 5/12/2020
Checked By: Robert Hill, ACI#00094686 **Title:** Assistant Lab Director

Sieve Test Data

Post #200 Wash Test Weights (grams): **Dry Sample and Tare** = 218.80
Tare Wt. = 0.00
Minus #200 from wash = 12.5%

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer	Percent Retained
250.10	0.00	0.00	1	0.00	100	0
			.5	0.00	100	0
			#4	11.10	96	4
			#10	17.80	93	7
			#16	32.20	87	13
			#30	66.50	73	27
			#40	124.40	50	50
			#50	165.50	34	66
			#100	187.70	25	75
			#200	218.70	13	87

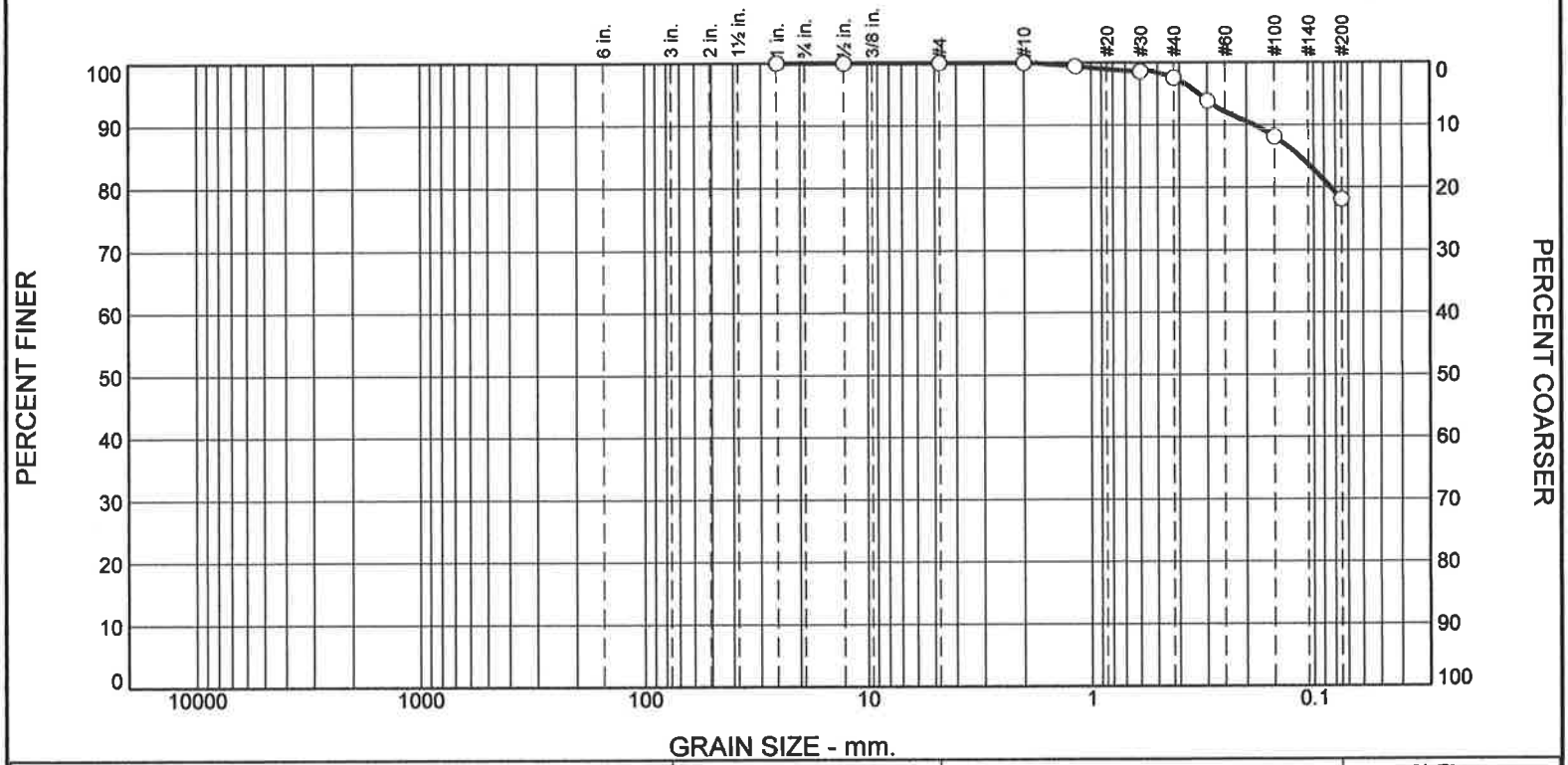
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0	0	4	4	3	43	37	83			13

D_5	D_{10}	D_{15}	D_{20}	D_{30}	D_{40}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
		0.0839	0.1073	0.2551	0.3529	0.4233	0.4890	0.7004	0.8986	1.5419	3.2956

Fineness Modulus
1.92

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines
	Coarse	Fine	Coarse	Medium	Fine	Silt
0	0	0	0	2	20	78

Test Results (ASTM C136/AASHTO T27 & ASTM C117/t11

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
1	100		
.5	100		
#4	100		
#10	100		
#16	99		
#30	99		
#40	98		
#50	94		
#100	88		
#200	78		

* (no specification provided)

Material Description

Boring 2, sample 6, 20 to 22 feet. Brown clayey silt. (ML)(5b). 78 % fines (majority silt). 31.33 % moisture content per ASTM C566(ASTM D2217). PI (Atterberg Limits) = 10.23 % (0.1023).

Atterberg Limits (ASTM D 4318)

PL= 27.45%(0.2745) **LL=** 37.68%(0.3768) **PI=** 10.23%(0.1023)

Classification

USCS (D 2487)= (ML)(5B) **AASHTO (M 145)=** NA

Coefficients

D_{90}= 0.1847 D_{85}= 0.1156 D_{60}=
D_{50}= D_{30}= D_{15}=
D_{10}= C_u= C_c=

Remarks

Boring 2, sample 6, 20 to 22 feet. Brown clayey silt. (ML)(5b). 78 % fines passing #200 screen (majority of fines are silt). 31.33 % moisture content per ASTM C566 (ASTM D2217).

Date Received: 5/4/2020 **Date Tested:** 5/12/2020

Tested By: Robert Hill, ACI#00094686

Checked By: Robert Hill, ACI#00094686

Title: Assistant Lab Director

Location: Boring 2, sample 6, 20 to 22 feet **Date Sampled:** 4/30/2020

Sample Number: Boring 2, sample 6 **Depth:** 20 to 22 feet

SOIL MECHANICS DRILLING CORP.
Seaford, NY

Client: BL Companies

Project: CNG Injection - National Grid, West of Shore Road, Glenwood Landing, N.Y.

Project No: 20-111 **Figure**

GRAIN SIZE DISTRIBUTION TEST DATA

5/12/2020

Client: BL Companies
Project: CNG Injection - National Grid, West of Shore Road, Glenwood Landing, N.Y.
Project Number: 20-111
Location: Boring 2, sample 6, 20 to 22 feet
Depth: 20 to 22 feet **Sample Number:** Boring 2, sample 6
Material Description: Boring 2, sample 6, 20 to 22 feet. Brown clayey silt. (ML)(5b). 78 % fines (majority silt). 31.33 % moisture content per ASTM C566(ASTM D2217). PI (Atterberg Limits) = 10.23 % (0.1023).
Sample Date: 4/30/2020
Date Received: 5/4/2020 **PL:** 27.45%(0.2745) **LL:** 37.68%(0.3768) **PI:** 10.23%(0.1023)
USCS Classification: (ML)(5B) **AASHTO Classification:** NA
Grain Size Test Method: ASTM C136/AASHTO T27
#200 Wash Method: ASTM C117/t11 (Method A - water used only)
Testing Remarks: Boring 2, sample 6, 20 to 22 feet. Brown clayey silt. (ML)(5b). 78 % fines passing #200 screen (majority of fines are silt). 31.33 % moisture content per ASTM C566 (ASTM D2217).
Tested By: Robert Hill, ACI#00094686 **Test Date:** 5/12/2020
Checked By: Robert Hill, ACI#00094686 **Title:** Assistant Lab Director

Sieve Test Data

Post #200 Wash Test Weights (grams): **Dry Sample and Tare** = 32.10
Tare Wt. = 0.00
Minus #200 from wash = 78.0%

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer	Percent Retained
146.00	0.00	0.00	1	0.00	100	0
			.5	0.00	100	0
			#4	0.00	100	0
			#10	0.00	100	0
			#16	0.90	99	1
			#30	2.10	99	1
			#40	3.50	98	2
			#50	9.00	94	6
			#100	17.20	88	12
			#200	32.00	78	22

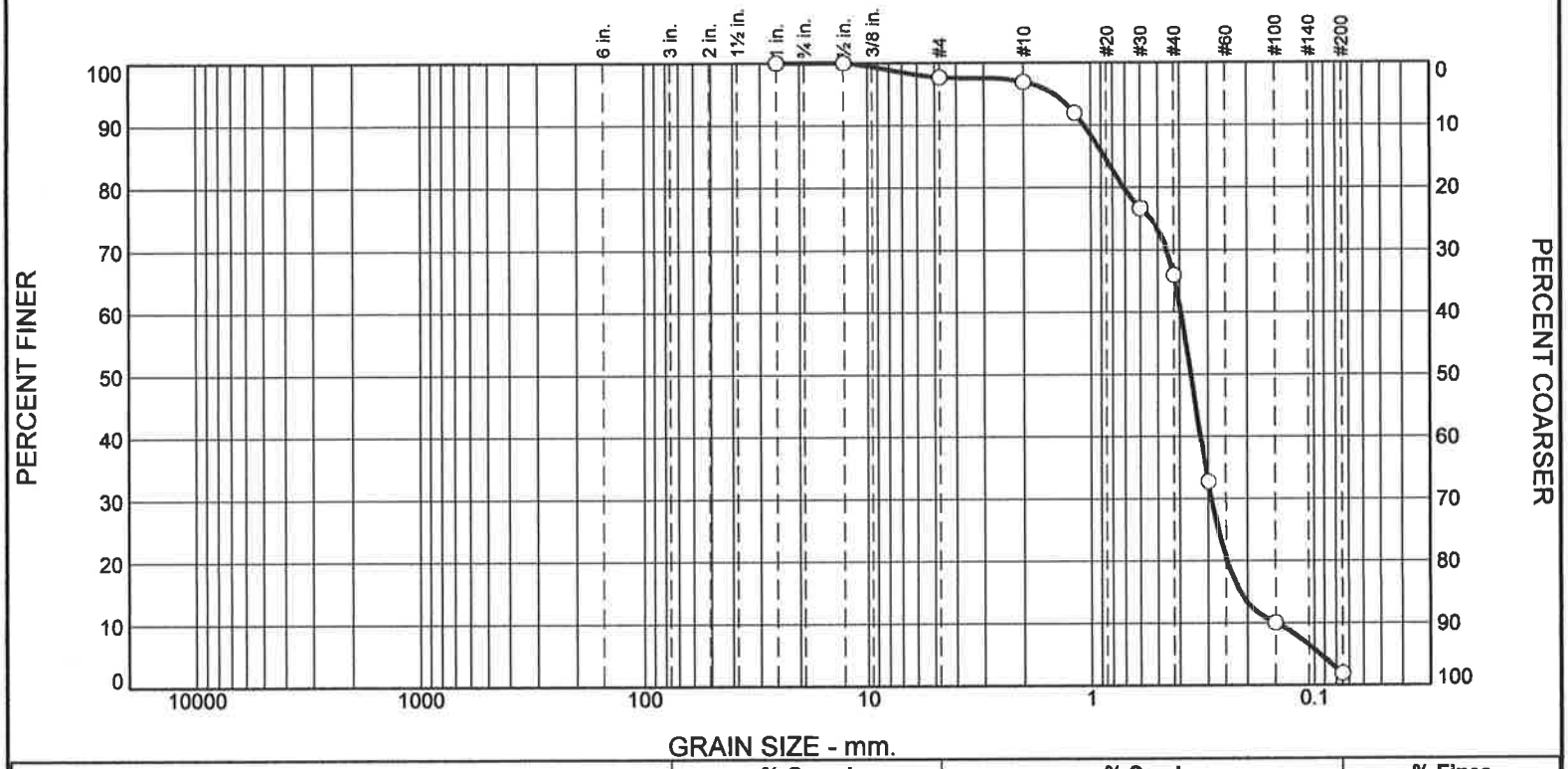
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0	0	0	0	0	2	20	22			78

D_5	D_{10}	D_{15}	D_{20}	D_{30}	D_{40}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
								0.0841	0.1156	0.1847	0.3320

Fineness Modulus
0.20

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines
	Coarse	Fine	Coarse	Medium	Fine	Silt
0	0	2	1	31	64	2

Test Results (ASTM C136/AASHTO T27 & ASTM C117/

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
1	100		
.5	100		
#4	98		
#10	97		
#16	92		
#30	77		
#40	66		
#50	33		
#100	10		
#200	1.9		

* (no specification provided)

Material Description

Boring 2, sample 11, 45 to 47 feet. Light brown - orange medium to fine grained sand, trace silt. (SP)(3b). 1.9 % silt content in the sample per C117. 20.11 % moisture content per ASTM C566(ASTM D2217).

Atterberg Limits (ASTM D 4318)

PL= NA **LL=** NA **PI=** Non-plastic

Classification

USCS (D 2487)= (SP)(3b) **AASHTO (M 145)=** NA

Coefficients

D_{90}= 1.0696 D_{85}= 0.8701 D_{60}= 0.3947
D_{50}= 0.3566 D_{30}= 0.2903 D_{15}= 0.2161
D_{10}= 0.1495 C_u= 2.64 C_c= 1.43

Remarks

Boring 2, sample 11, 45 to 47 feet. Light brown - orange medium to fine grained sand, trace silt. (SP)(3b). 1.9 % wsilt content in the sample. 20.11 % moisture content per ASTM C566(ASTM D2217).

Date Received: 5/4/2020 **Date Tested:** 5/12/2020

Tested By: Robert Hill, ACI#00094686

Checked By: Robert Hill, ACI#00094686

Title: Assistant Lab Director

Location: Boring 2, sample 11, 45 to 47 feet **Date Sampled:** 4/30/2020

Sample Number: Boring 2, sample 11 **Depth:** 45 to 47 feet

SOIL MECHANICS DRILLING CORP.
Seaford, NY

Client: BL Companies

Project: CNG Injection - National Grid, West of Shore Road, Glenwood Landing, N.Y.

Project No: 20-111 **Figure**

GRAIN SIZE DISTRIBUTION TEST DATA

5/12/2020

Client: BL Companies
Project: CNG Injection - National Grid, West of Shore Road, Glenwood Landing, N.Y.
Project Number: 20-111
Location: Boring 2, sample 11, 45 to 47 feet
Depth: 45 to 47 feet **Sample Number:** Boring 2, sample 11
Material Description: Boring 2, sample 11, 45 to 47 feet. Light brown - orange medium to fine grained sand, trace silt. (SP)(3b). 1.9 % silt content in the sample per C117. 20.11 % moisture content per ASTM C566(ASTM D2217).
Sample Date: 4/30/2020
Date Received: 5/4/2020 **PL:** NA **LL:** NA **PI:** Non-plastic
USCS Classification: (SP)(3b) **AASHTO Classification:** NA
Grain Size Test Method: ASTM C136/AASHTO T27
#200 Wash Method: ASTM C117/T11 (Method A - water used only)
Testing Remarks: Boring 2, sample 11, 45 to 47 feet. Light brown - orange medium to fine grained sand, trace silt. (SP)(3b). 1.9 % wsilt content in the sample. 20.11 % moisture content per ASTM C566(ASTM D2217).
Tested By: Robert Hill, ACI#00094686 **Test Date:** 5/12/2020
Checked By: Robert Hill, ACI#00094686 **Title:** Assistant Lab Director

Sieve Test Data

Post #200 Wash Test Weights (grams): **Dry Sample and Tare =** 325.90
Tare Wt. = 0.00
Minus #200 from wash = 1.9%

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer	Percent Retained
332.10	0.00	0.00	1	0.00	100	0
			.5	0.00	100	0
			#4	7.70	98	2
			#10	10.20	97	3
			#16	26.60	92	8
			#30	77.70	77	23
			#40	113.20	66	34
			#50	223.40	33	67
			#100	298.80	10	90
			#200	325.80	1.9	98.1

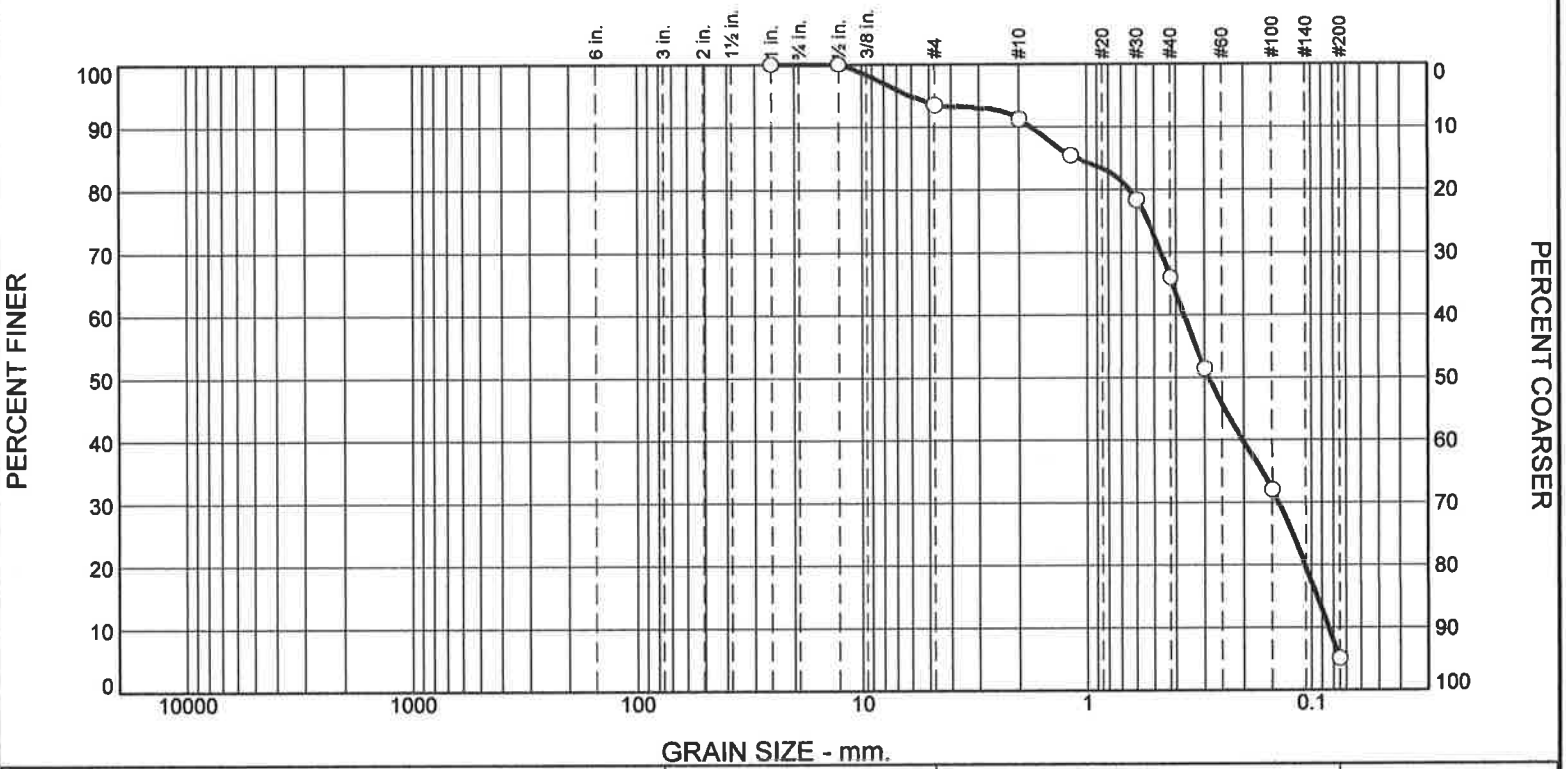
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0	0	2	2	1	31	64	96			2

D_5	D_{10}	D_{15}	D_{20}	D_{30}	D_{40}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.0947	0.1495	0.2161	0.2475	0.2903	0.3238	0.3566	0.3947	0.7106	0.8701	1.0696	1.4645

Fineness Modulus	C_u	C_c
1.94	2.64	1.43

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines
	Coarse	Fine	Coarse	Medium	Fine	Silt
0	0	6	3	25	61	5

Test Results (ASTM C136/AASHTO T27 & ASTM C117/

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
1	100		
.5	100		
#4	94		
#10	91		
#16	85		
#30	78		
#40	66		
#50	51		
#100	32		
#200	5.1		

* (no specification provided)

Material Description

Boring 3, sample 1, 5 to 7 feet. Brown-light brown-gray sand, trace gravel, silt, brick. (SP)(FILL)(7). 5.1 % silt content in the sample. 11.11 % moisture content per ASTM C566.

Atterberg Limits (ASTM D 4318)

PL= NA **LL=** NA **PI=** Non-plastic

Classification

USCS (D 2487)= (SM)(FILL) **AASHTO (M 145)=** NA

Coefficients

D_{90}= 1.7711 D_{85}= 1.1249 D_{60}= 0.3702
D_{50}= 0.2883 D_{30}= 0.1409 D_{15}= 0.0946
D_{10}= 0.0841 C_u= 4.40 C_c= 0.64

Remarks

Boring 3, sample 2, 7 to 9 feet. Brown-light brown-gray sand, trace gravel, silt, brick. (SP)(FILL) (7). 5.1 % silt content in the sample. 11.11 % moisture content.

Date Received: 5/4/2020 **Date Tested:** 5/12/2020

Tested By: Robert Hill, ACI#00094686

Checked By: Robert Hill, ACI#00094686

Title: Assistant Lab Director

Location: Boring 3, sample 1, 5 to 7 feet **Date Sampled:** 4/30/2020

Sample Number: Boring 3, sample 1 **Depth:** 5 to 7 feet

SOIL MECHANICS DRILLING CORP.
Seaford, NY

Client: BL Companies

Project: CNG Injection - National Grid, West of Shore Road, Glenwood Landing, N.Y.

Project No: 20-111 **Figure**

GRAIN SIZE DISTRIBUTION TEST DATA

5/12/2020

Client: BL Companies
Project: CNG Injection - National Grid, West of Shore Road, Glenwood Landing, N.Y.
Project Number: 20-111
Location: Boring 3, sample 1, 5 to 7 feet
Depth: 5 to 7 feet **Sample Number:** Boring 3, sample 1
Material Description: Boring 3, sample 1, 5 to 7 feet. Brown-light brown-gray sand, trace gravel, silt, brick. (SP)(FILL)(7). 5.1 % silt content in the sample. 11.11 % moisture content per ASTM C566.
Sample Date: 4/30/2020
Date Received: 5/4/2020 **PL:** NA **LL:** NA **PI:** Non-plastic
USCS Classification: (SM)(FILL)(7) **AASHTO Classification:** NA
Grain Size Test Method: ASTM C136/AASHTO T27
#200 Wash Method: ASTM C117/T11 (Method A - water used only)
Testing Remarks: Boring 3, sample 2, 7 to 9 feet. Brown-light brown-gray sand, trace gravel, silt, brick. (SP)(FILL) (7). 5.1 % silt content in the sample. 11.11 % moisture content.
Tested By: Robert Hill, ACI#00094686 **Test Date:** 5/12/2020
Checked By: Robert Hill, ACI#00094686 **Title:** Assistant Lab Director

Sieve Test Data

Post #200 Wash Test Weights (grams): **Dry Sample and Tare =** 195.10
Tare Wt. = 0.00
Minus #200 from wash = 5.1%

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer	Percent Retained
205.60	0.00	0.00	1	0.00	100	0
			.5	0.00	100	0
			#4	13.10	94	6
			#10	18.00	91	9
			#16	30.10	85	15
			#30	44.50	78	22
			#40	69.90	66	34
			#50	99.90	51	49
			#100	139.90	32	68
			#200	195.10	5.1	94.9

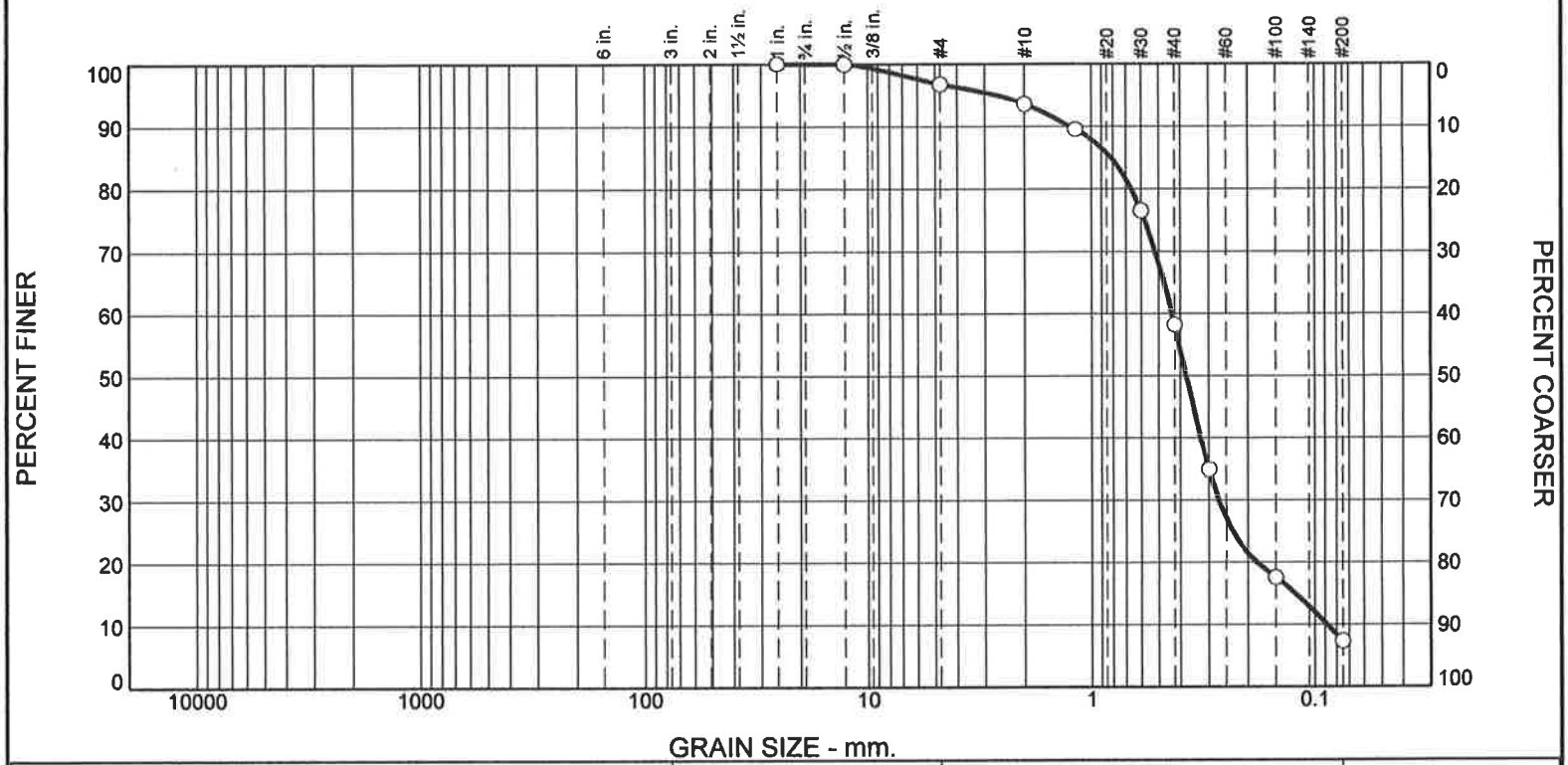
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0	0	6	6	3	25	61	89			5

D_5	D_{10}	D_{15}	D_{20}	D_{30}	D_{40}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
	0.0841	0.0946	0.1070	0.1409	0.2029	0.2883	0.3702	0.6456	1.1249	1.7711	6.1343

Fineness Modulus	C_u	C_c
1.69	4.40	0.64

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines
	Coarse	Fine	Coarse	Medium	Fine	Silt
0	0	3	3	36	51	7

Test Results (ASTM C136/AASHTO T27 & ASTM C117/

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
1	100		
.5	100		
#4	97		
#10	94		
#16	89		
#30	77		
#40	58		
#50	35		
#100	18		
#200	7.3		

* (no specification provided)

Material Description

Boring 4, sample 2, 7 to 9 feet. Brown sand, trace gravel, silt. (SP)(FILL)(7). 7.3 % silt content in the sample. 12.01 % moisture content per ASTM C566(D2217).

Atterberg Limits (ASTM D 4318)

PL= NA **LL=** NA **PI=** Non-plastic(sand)

Classification

USCS (D 2487)= (SP)(FILL) **AASHTO (M 145)=** NA

Coefficients

D_{90}= 1.2484 D_{85}= 0.8151 D_{60}= 0.4372
D_{50}= 0.3778 D_{30}= 0.2713 D_{15}= 0.1232
D_{10}= 0.0885 C_u= 4.94 C_c= 1.90

Remarks

Boring 4, sample 2, 7 to 9 feet. Brown sand, trace gravel, silt. (SP)(FILL)(7). 7.3 % silt content in the sample. 12.01 % moisture content per ASTM C566(ASTM D2217).

Date Received: 5/4/2020 **Date Tested:** 5/12/2020

Tested By: Robert Hill, ACI#00094686

Checked By: Robert Hill, ACI#00094686

Title: Assistant Lab Director

Location: Boring 4, sample 2, 7 to 9 feet **Date Sampled:** 4/30/2020

Sample Number: Boring 4, sample 2 **Depth:** 7 to 9 feet

SOIL MECHANICS DRILLING CORP.
Seaford, NY

Client: BL Companies

Project: CNG Injection - National Grid, West of Shore Road, Glenwood Landing, N.Y.

Project No: 20-111 **Figure**

GRAIN SIZE DISTRIBUTION TEST DATA

5/12/2020

Client: BL Companies
Project: CNG Injection - National Grid, West of Shore Road, Glenwood Landing, N.Y.
Project Number: 20-111
Location: Boring 4, sample 2, 7 to 9 feet
Depth: 7 to 9 feet **Sample Number:** Boring 4, sample 2
Material Description: Boring 4, sample 2, 7 to 9 feet. Brown sand, trace gravel, silt. (SP)(FILL)(7). 7.3 % silt content in the sample. 12.01 % moisture content per ASTM C566(D2217).
Sample Date: 4/30/2020
Date Received: 5/4/2020 **PL:** NA **LL:** NA **PI:** Non-plastic(sand)
USCS Classification: (SP)(FILL)(7) **AASHTO Classification:** NA
Grain Size Test Method: ASTM C136/AASHTO T27
#200 Wash Method: ASTM C117/T11 (Method A - water used only)
Testing Remarks: Boring 4, sample 2, 7 to 9 feet. Brown sand, trace gravel, silt. (SP)(FILL)(7). 7.3 % silt content in the sample. 12.01 % moisture content per ASTM C566(ASTM D2217).
Tested By: Robert Hill, ACI#00094686 **Test Date:** 5/12/2020
Checked By: Robert Hill, ACI#00094686 **Title:** Assistant Lab Director

Sieve Test Data

Post #200 Wash Test Weights (grams): **Dry Sample and Tare =** 175.60
Tare Wt. = 0.00
Minus #200 from wash = 7.3%

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer	Percent Retained
189.50	0.00	0.00	1	0.00	100	0
			.5	0.00	100	0
			#4	6.10	97	3
			#10	12.10	94	6
			#16	19.90	89	11
			#30	44.50	77	23
			#40	79.30	58	42
			#50	123.40	35	65
			#100	156.20	18	82
			#200	175.60	7.3	92.7

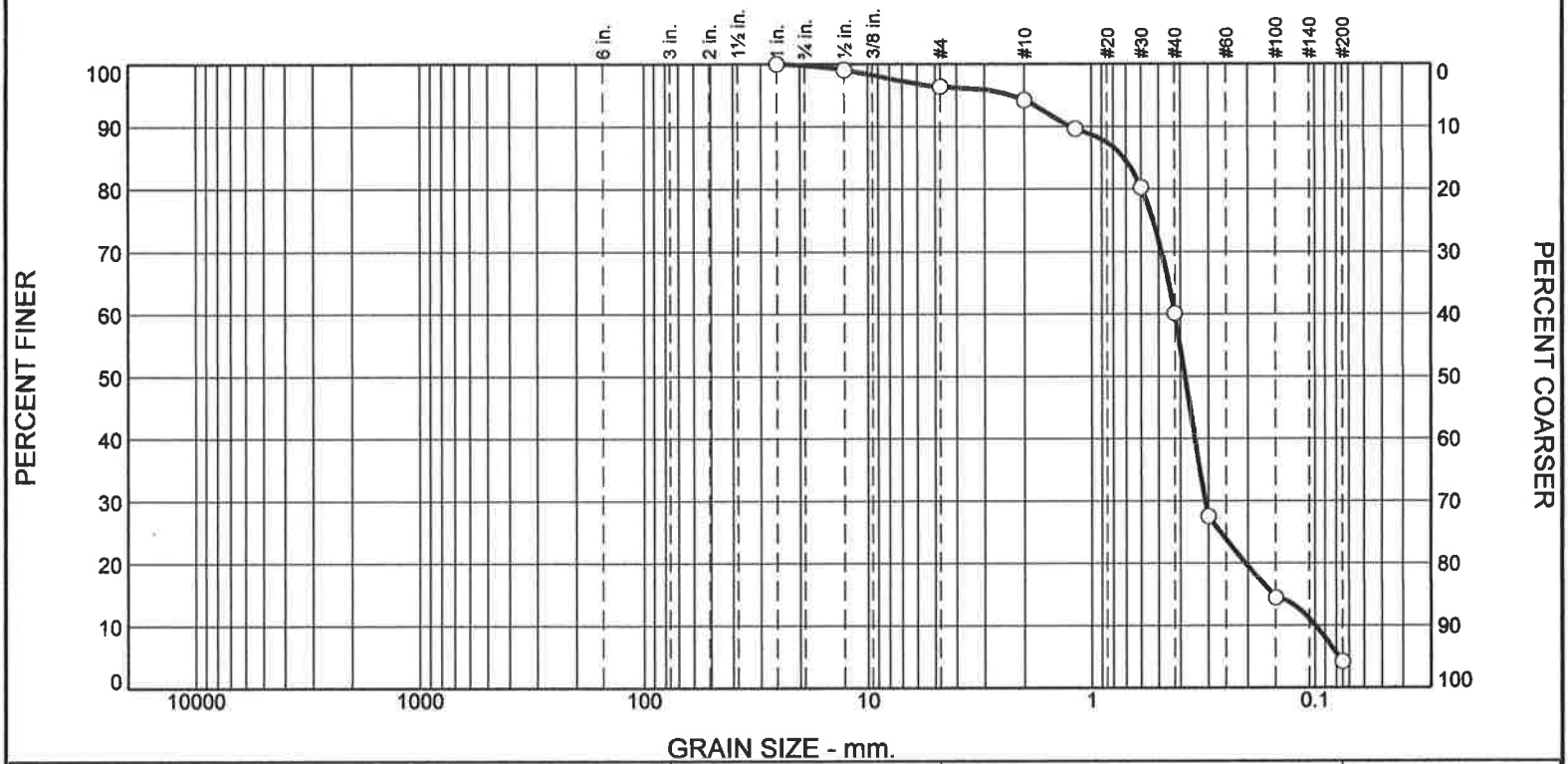
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0	0	3	3	3	36	51	90			7

D_5	D_{10}	D_{15}	D_{20}	D_{30}	D_{40}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
	0.0885	0.1232	0.1830	0.2713	0.3266	0.3778	0.4372	0.6629	0.8151	1.2484	2.6762

Fineness Modulus	C_u	C_c
1.91	4.94	1.90

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines
	Coarse	Fine	Coarse	Medium	Fine	Silt
0	0	4	2	34	56	4

Test Results (ASTM C136/AASHTO T27 & ASTM C117/

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
1	100		
.5	99		
#4	96		
#10	94		
#16	90		
#30	80		
#40	60		
#50	28		
#100	14		
#200	4.2		

* (no specification provided)

Material Description

Boring 6, sample 1, 5 to 7 feet. Brown sand, trace gravel, silt. (SP)(FILL)(7). 4.2 % silt content in the sample. 7.35 % moisture content in the sample per ASTM C566(ASTM D2217).

Atterberg Limits (ASTM D 4318)

PL= NA **LL=** NA **PI=** Non-plastic

Classification

USCS (D 2487)= (SP)(FILL)(7) **AASHTO (M 145)=** NA

Coefficients

D_{90}= 1.2358 D_{85}= 0.7154 D_{60}= 0.4246
D_{50}= 0.3819 D_{30}= 0.3097 D_{15}= 0.1550
D_{10}= 0.0997 C_u= 4.26 C_c= 2.27

Remarks

Boring 6, sample 1, 5 to 7 feet. Brown sand, trace gravel, trace silt content. 4.2 % silt content in the sample per ASTM C117. 7.35 % moisture content per ASTM C566 (ASTM D2217).

Date Received: 5/4/2020 **Date Tested:** 5/12/2020

Tested By: Robert Hill, ACI#00094686

Checked By: Robert Hill, ACI#00094686

Title: Assistant Lab Director

Location: Boring 6, sample 1, 5 to 7 feet **Date Sampled:** 4/30/2020
Sample Number: Boring 6, sample 1 **Depth:** 5 to 7 feet

SOIL MECHANICS DRILLING CORP.
Seaford, NY

Client: BL Companies
Project: CNG Injection - National Grid, West of Shore Road, Glenwood Landing, N.Y.
Project No: 20-111 **Figure**

GRAIN SIZE DISTRIBUTION TEST DATA

5/12/2020

Client: BL Companies
Project: CNG Injection - National Grid, West of Shore Road, Glenwood Landing, N.Y.
Project Number: 20-111
Location: Boring 6, sample 1, 5 to 7 feet
Depth: 5 to 7 feet **Sample Number:** Boring 6, sample 1
Material Description: Boring 6, sample 1, 5 to 7 feet. Brown sand, trace gravel, silt. (SP)(FILL)(7). 4.2 % silt content in the sample. 7.35 % moisture content in the sample per ASTM C566(ASTM D2217).
Sample Date: 4/30/2020
Date Received: 5/4/2020 **PL:** NA **LL:** NA **PI:** Non-plastic
USCS Classification: (SP)(FILL)(7) **AASHTO Classification:** NA
Grain Size Test Method: ASTM C136/AASHTO T27
#200 Wash Method: ASTM C117/T11 (Method A - water used only)
Testing Remarks: Boring 6, sample 1, 5 to 7 feet. Brown sand, trace gravel, trace silt content. 4.2 % silt content in the sample per ASTM C117. 7.35 % moisture content per ASTM C566 (ASTM D2217).
Tested By: Robert Hill, ACI#00094686 **Test Date:** 5/12/2020
Checked By: Robert Hill, ACI#00094686 **Title:** Assistant Lab Director

Sieve Test Data

Post #200 Wash Test Weights (grams): **Dry Sample and Tare =** 323.40
Tare Wt. = 0.00
Minus #200 from wash = 4.2%

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer	Percent Retained
337.70	0.00	0.00	1	0.00	100	0
			.5	3.20	99	1
			#4	12.30	96	4
			#10	19.30	94	6
			#16	34.90	90	10
			#30	66.70	80	20
			#40	134.80	60	40
			#50	244.70	28	72
			#100	288.90	14	86
			#200	323.40	4.2	95.8

Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0	0	4	4	2	34	56	92			4

D_5	D_{10}	D_{15}	D_{20}	D_{30}	D_{40}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.0777	0.0997	0.1550	0.2051	0.3097	0.3456	0.3819	0.4246	0.5958	0.7154	1.2358	2.2504

Fineness Modulus	C_u	C_c
1.99	4.26	2.27