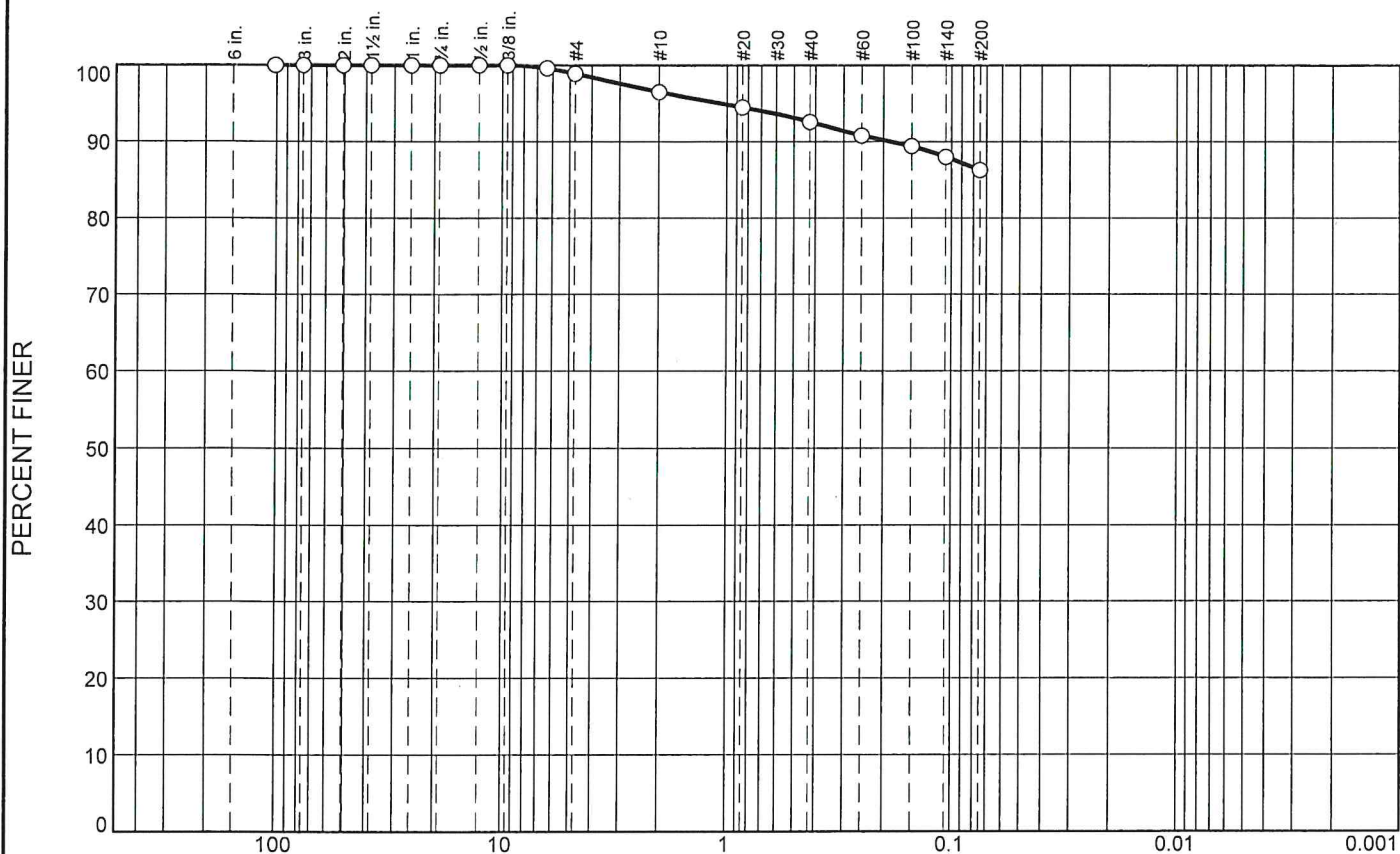


Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	1.1	2.4	3.9	6.3	86.3	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
4	100.0		
3	100.0		
2	100.0		
1.5	100.0		
1	100.0		
3/4	100.0		
1/2	100.0		
3/8	100.0		
1/4	99.6		
#4	98.9		
#10	96.5		
#20	94.5		
#40	92.6		
#60	90.8		
#100	89.4		
#140	88.0		
#200	86.3		

* (no specification provided)

Material Description
 SS-3

Atterberg Limits
 PL= LL= PI=

Coefficients
 D₉₀= 0.1846 D₈₅= D₆₀=
 D₅₀= D₃₀= D₁₅=
 D₁₀= C_u= C_c=

Classification
 USCS= AASHTO=

Remarks
 ASTM D6913, D2216
 Moisture Content- 19.4%

Source of Sample: 2.9B
Sample Number: 01-050422

Depth: 13'-15'

Date: 05-04-22

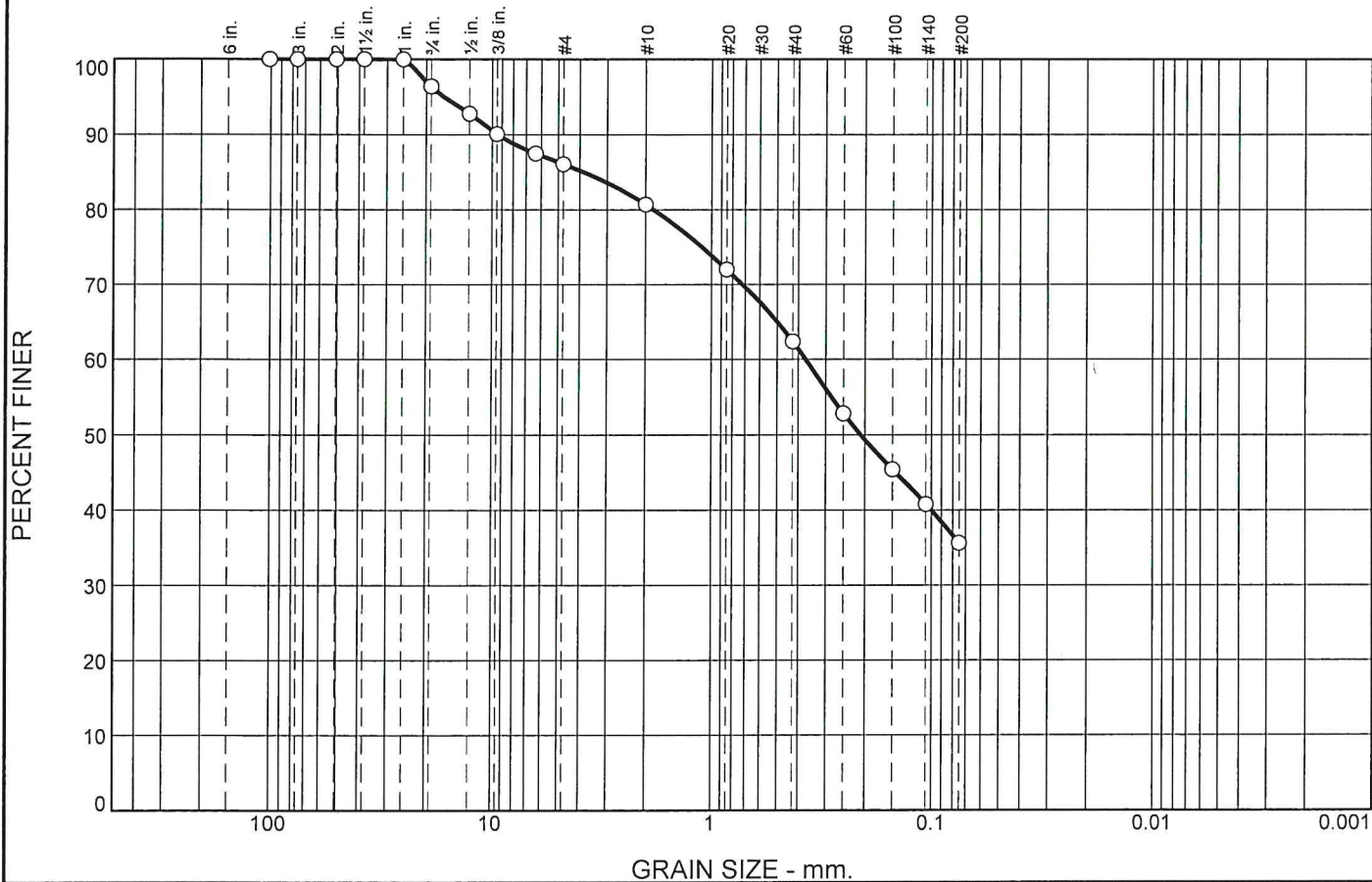
**FAIRWAY
TESTING
CO., INC.**

Client: Kiewit Engineering (NY) Corp.
Project: Champlain Hudson Power Express

Project No: K-294.9

Figure

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	3.6	10.3	5.4	18.3	26.8	35.6	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
4	100.0		
3	100.0		
2	100.0		
1.5	100.0		
1	100.0		
3/4	96.4		
1/2	92.8		
3/8	90.1		
1/4	87.5		
#4	86.1		
#10	80.7		
#20	72.0		
#40	62.4		
#60	52.8		
#100	45.4		
#140	40.8		
#200	35.6		

* (no specification provided)

Material Description
MC-9

Atterberg Limits
PL= LL= PI=

Coefficients
D₉₀= 9.4145 D₈₅= 3.8304 D₆₀= 0.3712
D₅₀= 0.2095 D₃₀= D₁₅=
D₁₀= C_u= C_c=

Classification
USCS= AASHTO=

Remarks
ASTM D6913, D2216
Moisture Content- 9.9%

Source of Sample: 2.9B
Sample Number: 02-050422

Depth: 28'-30'

Date: 05-04-22

**FAIRWAY
TESTING
CO., INC.**

Client: Kiewit Engineering (NY) Corp.
Project: Champlain Hudson Power Express

Project No: K-294.9

Figure

**FAIRWAY TESTING**

22 North Liberty Drive
P.O. Box 578
Stony Point, NY 10980
Telephone 845.942.2088
Fax 845.942.0995

Report Date: 6/22/22
Project: Champlain Hudson Power Express

Client: Kiewit Engineering (NY) Corp.

REPORT: Soil Analysis

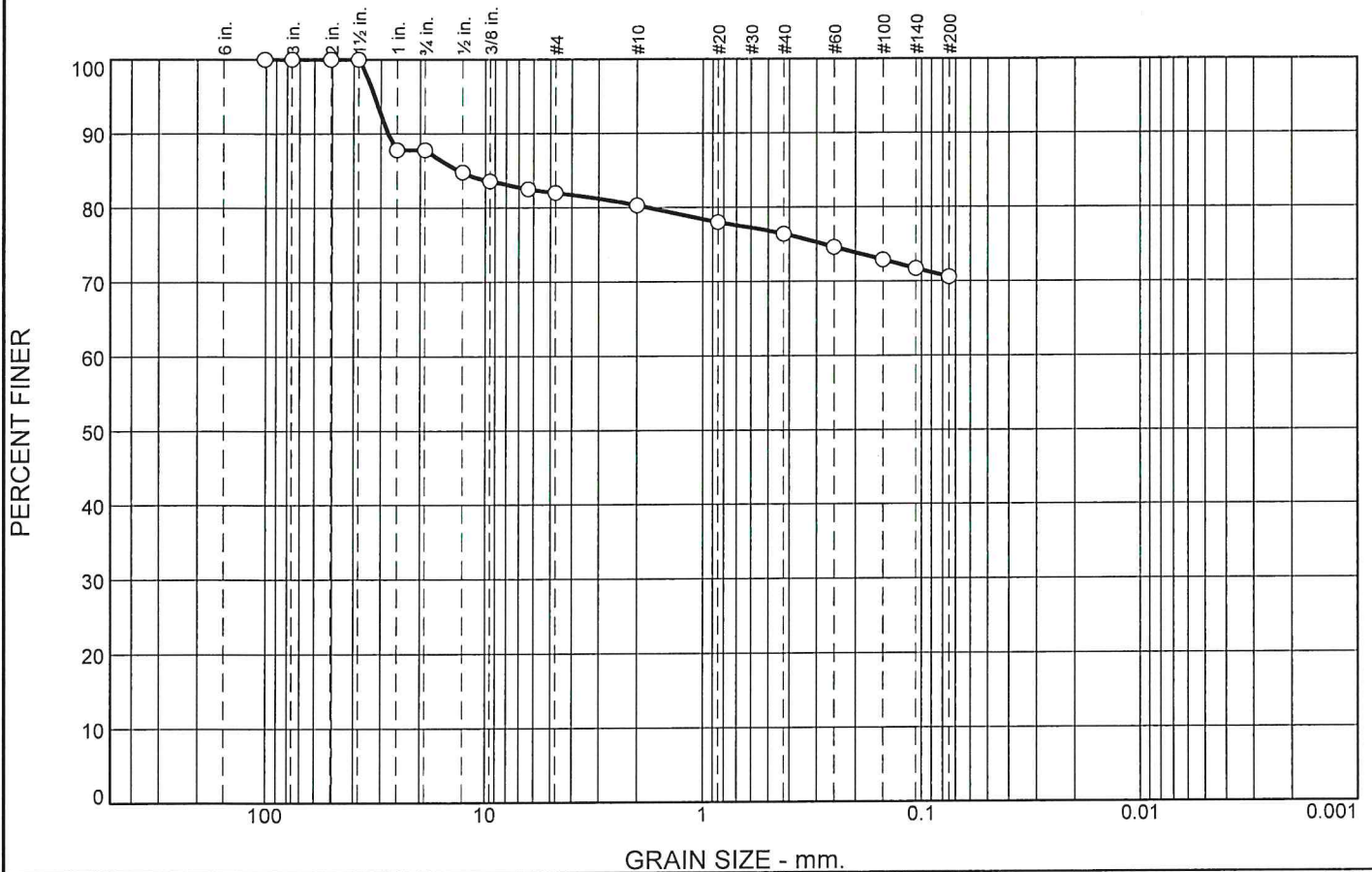
See attached reports for testing requested by the client as per attached submittals for locations K.294.9- 3.0. Moisture content test results are listed below.

Sample ID (sample depth, ft.)	Moisture Content
SS-4 (23'- 25')	10.3%
SS-8 (43'- 45')	18.5%

Respectfully Submitted,
Fairway Testing

Gabriel J. O'Connell, P.E.

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	12.2	5.8	1.7	3.9	5.8	70.6	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
4	100.0		
3	100.0		
2	100.0		
1.5	100.0		
1	87.8		
3/4	87.8		
1/2	84.8		
3/8	83.6		
1/4	82.5		
#4	82.0		
#10	80.3		
#20	78.0		
#40	76.4		
#60	74.6		
#100	72.9		
#140	71.7		
#200	70.6		

* (no specification provided)

Material Description

GS-1
silty clay with gravel

Atterberg Limits

PL= 18 LL= 25 PI= 7

Coefficients

D₉₀= 27.8601 D₈₅= 13.1556 D₆₀=
D₅₀= D₃₀= D₁₅=
D₁₀= C_u= C_c=

Classification

USCS= CL-ML AASHTO= A-4(3)

Remarks

ASTM D6913, D4318, D2216
Moisture Content- 14.6%

Source of Sample: 3.0 Depth: 30'-35'
Sample Number: 01-042622

Date: 04-26-22

**FAIRWAY
TESTING
CO., INC.**

Client: Kiewit Engineering (NY) Corp.
Project: Champlain Hudson Power Express

Project No: K-294.9

Figure

DATE: July 14, 2022

TO: Zachary Bauer; Tetra Tech Rooney

FROM: Matthew Hawley, P.E.; Kiewit Engineering (NY) Corp. **mkh**
Jaren Knighton; Kiewit Engineering (NY) Corp.

SUBJECT: Geotechnical Data: Segment 12 - Package 7B - HDD Crossing 129/130
Champlain Hudson Power Express Project
West Haverstraw, New York

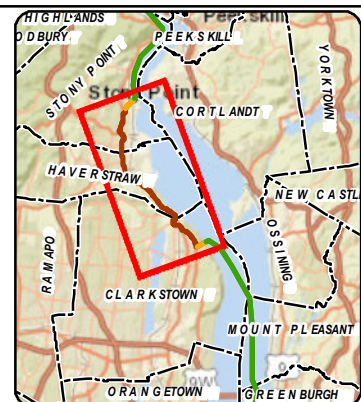
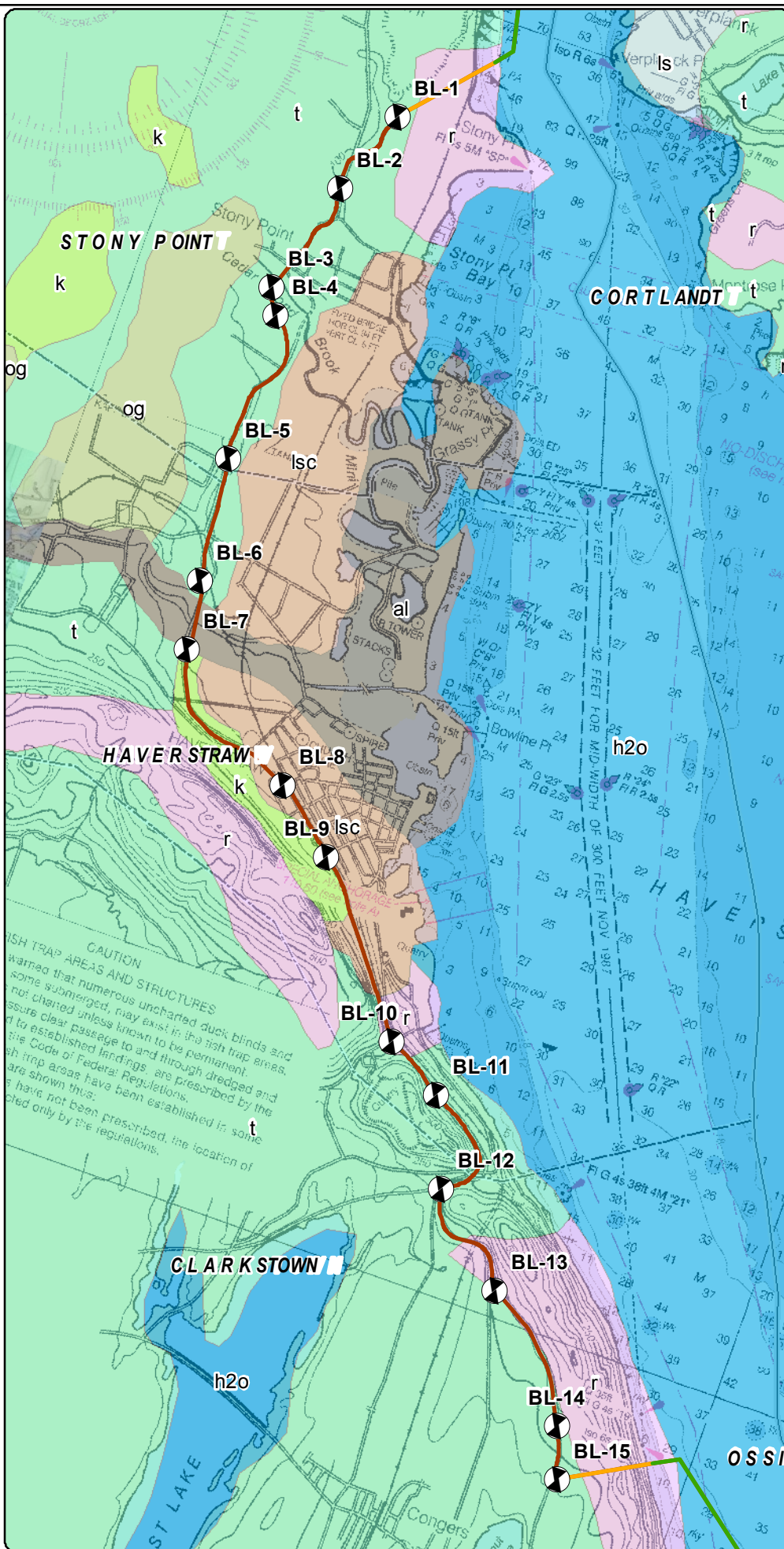
Kiewit Engineering is providing the attached geotechnical data for use in the horizontal direction drill (HDD) design for the Champlain Hudson Power Express project in Upstate New York. This HDD crossing is located in West Haverstraw, New York. The approximate station for the start of HDD crossing number 129/130 is STA 72636+00 (41.2065° N, 73.9845° W).

The geotechnical data at this HDD crossing is attached. The available data is taken from the previous investigation by AECOM and data from a recent investigation by Kiewit, referenced below.

- AECOM, Geotechnical Data Report, Upland Segment, Rockland County, NY, Champlain Hudson Power Express, dated September 18, 2020.
- Kiewit Engineering (NY) Corp., Segment 12 Package 7B HDD Borings - Rockland, Champlain-Hudson Power Express, dated July 5, 2022.

Contact us if you have questions or require additional information.

HDD 129/130
Borings K-294.9-3.3, K-294.9-3.3R,
K-294.9-3.4A, K-294.9-3.4B, BL-7,
K-294.9-3.6
Segment 12 - Design Package 7B



LEGEND

- Approximate Boring Locations
 - Terrestrial Route HVDC
 - Submarine Route HVDC
 - Terrestrial Route HVAC
 - Preliminary HDD Locations
 - Preliminary Pipe Bridge Location
- Surficial Geology**
- af- Artificial fill
 - al- Recent alluvium, fine sand to gravel
 - alf- Alluvial fan
 - b- Beach, sand and gravel deposit at marine shorelines
 - bi- Barrier island, sand and gravel deposit as barrier islands
 - h2o- Water
 - k- Kame deposits, coarse to fine gravel and/or sand
 - km- Kame moraine, variable texture from boulders to sand
 - ld- Lacustrine delta, coarse to fine gravel and sand
 - ls- Lacustrine sand, generally quartz sand, well sorted, stratified
 - lsc- Lacustrine silt and clay, generally laminated silt and clay
 - og- Outwash sand and gravel, coarse to fine gravel with sand
 - pm- Swamp deposits, peat-muck, organic silt and sand in poorly drained area
 - r- Bedrock, exposed or generally within 1 meter of surface
 - t- Till, variable texture (boulders to silt)
 - tm- Till moraine, variable texture (size and sorting)
- [] Town Boundary
□ County Boundary



0.35 0.175 0 0.35 Miles



Champlain Hudson Power Express Project

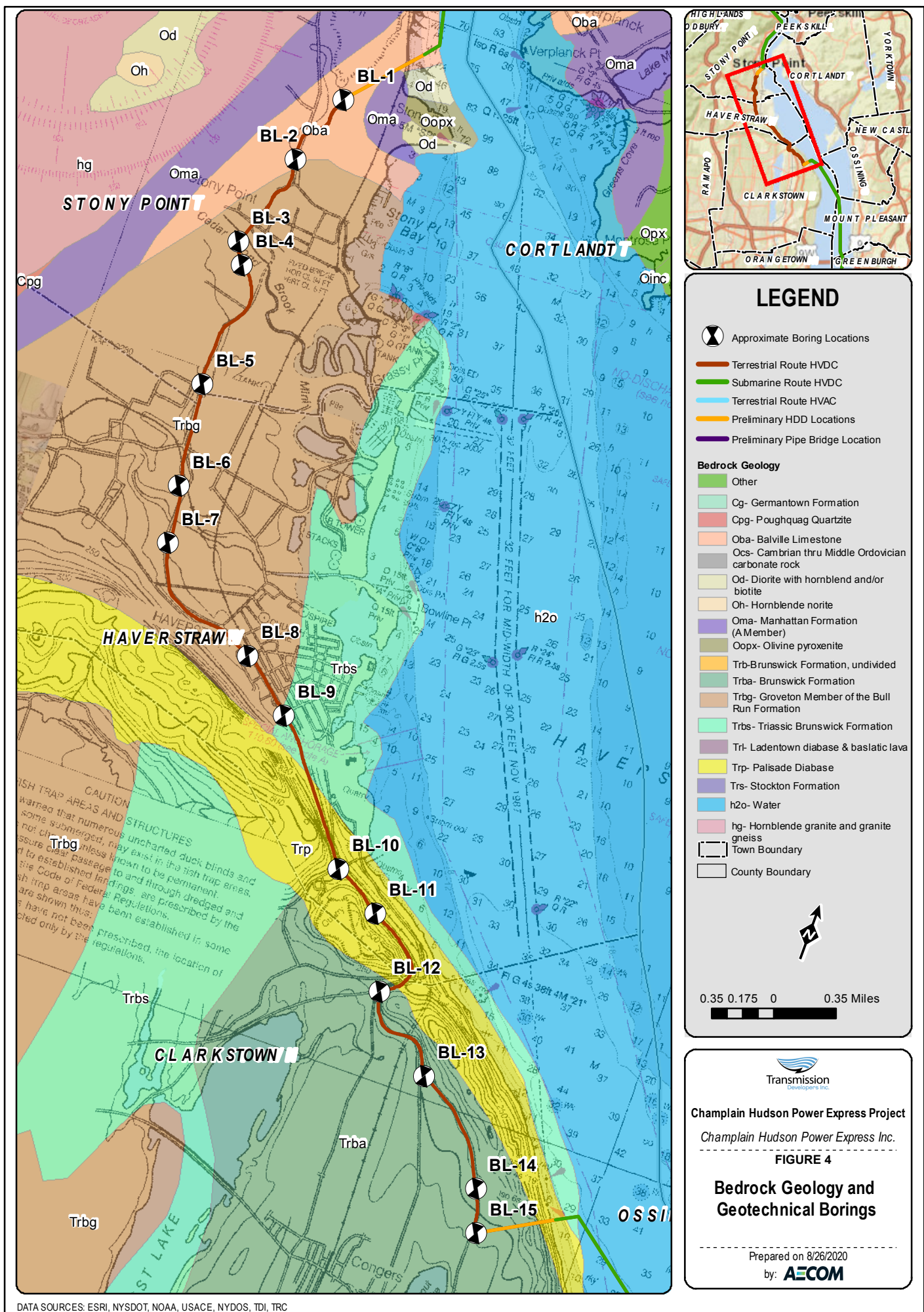
Champlain Hudson Power Express Inc.


FIGURE 3

Surficial Geology and Geotechnical Borings

Prepared on 8/25/2020

by: **AECOM**

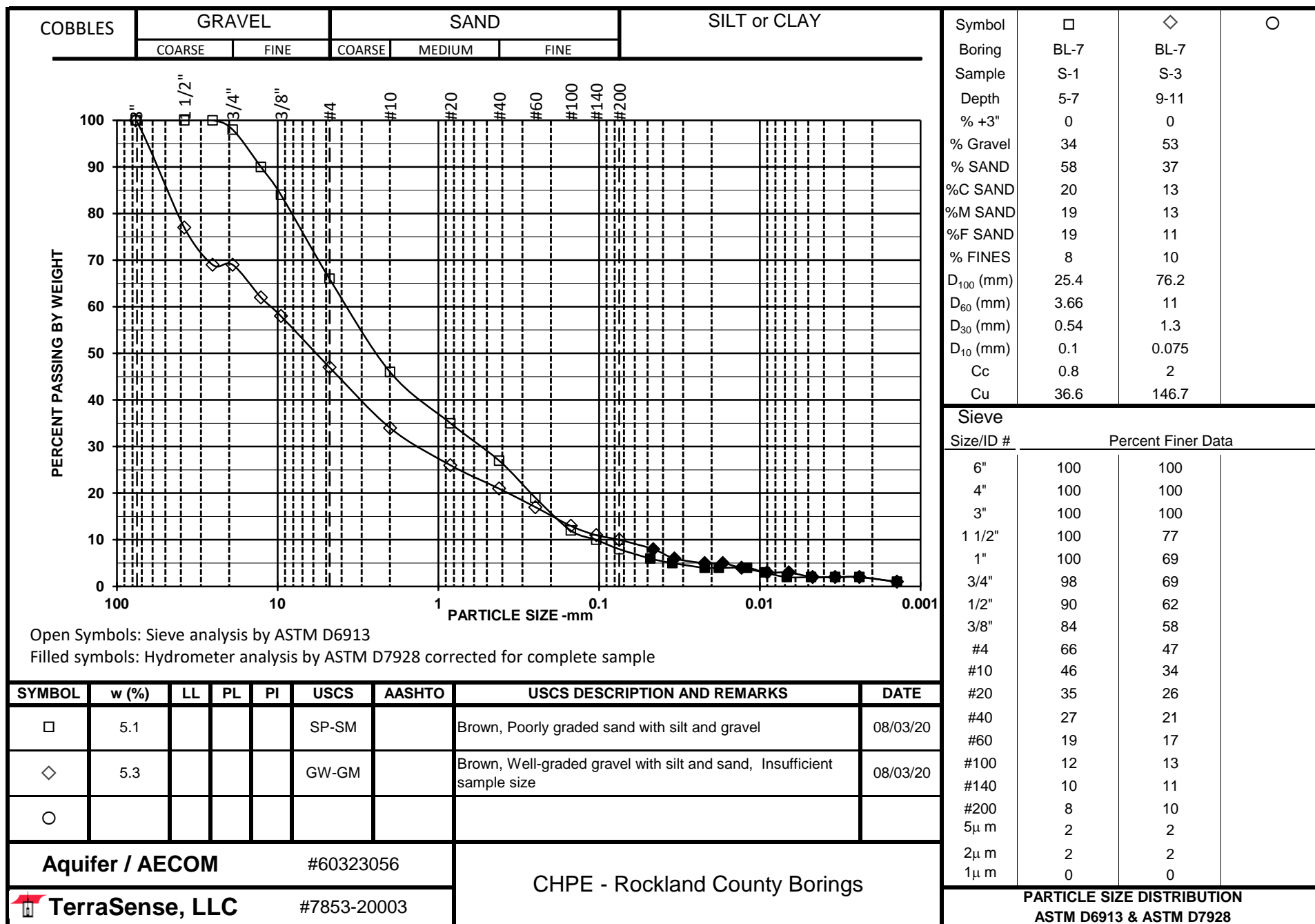


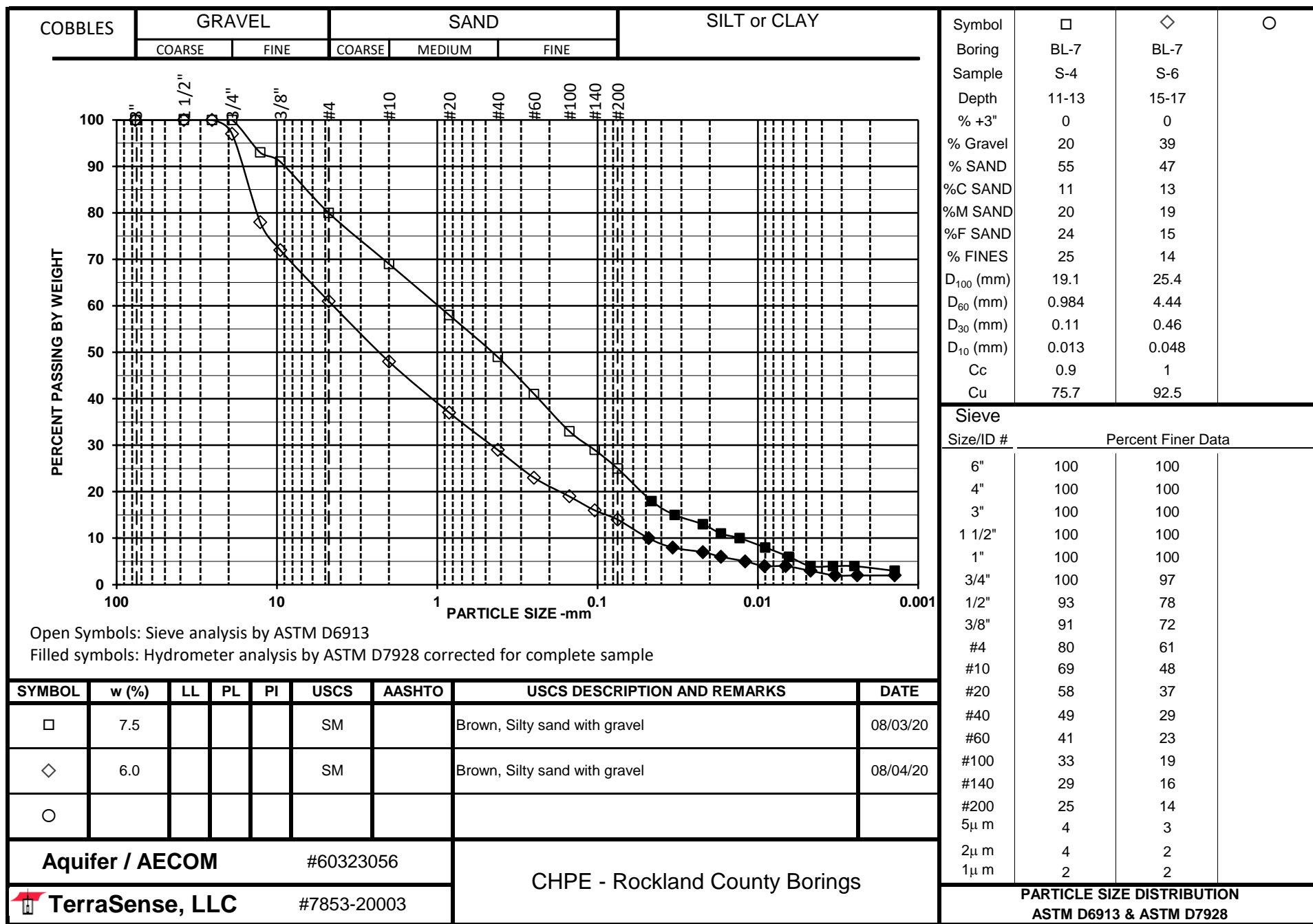
BORING CONTRACTOR: ADT												SHEET 1 OF 1	
DRILLER: Chris Chaillou												PROJECT NAME: CHPE - Rockland Co. Borings	
SOILS ENGINEER: Roberto Lucidi												PROJECT NO.: 60323056	
BORING LOG												HOLE NO.: BL-7	
LOCATION: Hillside Avenue and Route 9W, Haverstraw, NY												START DATE: 7/8/2020	
												FINISH DATE: 7/8/2020	
GROUND WATER OBSERVATIONS												DRILL RIG: Geoprobe	
10' below grade on 7/8/2020 at 2 pm		TYPE		Casing		SAMPLER		DRILL BIT		CORE BARREL		BORING TYPE: SPT	
		SIZE I.D.		4.0"		2.4"		-		-		BORING O.D.: 4.5"	
		SIZE O.D.		4.5"		3.0"		-		-		SURFACE ELEV.: 106.175	
		HAMMER WT.		140 lb (AUTO)		140 lb		-		-		NORTHING 863383.514	
		HAMMER FALL		30"		30"		-		-		EASTING 634098.781	
D E P T H	CORING RATE MIN/FT	S A M P L E		HAMMER	FALL	BLOWS PER 6 in ON SAMPLER (ROCK QUALITY DESIGNATION)				N Corr. ⁽²⁾	USCS CLASS.	STRAT. CHNG. DEPTH	FIELD IDENTIFICATION OF SOILS
1.0													6" Asphalt
2.0		Hand Cleared 0.0 - 5.0									SM	Sandy Fill	Brown, f-m-c SAND, some f-m-c gravel, little silt, moist
3.0													TR ⁽³⁾ -1 (3.0'-5.0')
4.0													
5.0													
6.0		5.0 - 7.0	S-1	24.0	16.0	11	21	25	22	30	SP-SM		S-1: Brown, f-m SAND, some fine gravel, trace silt, moist, medium dense
7.0													TR-2 (6.0'-6.5')
8.0		7.0 - 9.0	S-2	24.0	20.0	20	23	14	13	24	SP		S-2: Same as above, moist, medium dense
9.0													
10.0		9.0 - 11.0	S-3	24.0	16.0	14	21	19	14	26	GW-GM		S-3: Brown, f-m-c GRAVEL, and f-m-c sand, little silt, wet, medium dense
11.0													TR-3 (10.0'-10.5')
12.0		11.0 - 13.0	S-4	24.0	18.0	28	41	18	17	38	SP		S-4: Same as above, wet, dense
13.0													
14.0		13.0 - 15.0	S-5	24.0	12.0	Direct Push ⁽⁴⁾				-	SM		S-5: Brown, f-m SAND, some f-m-c gravel, little silt, wet, very dense
15.0													TR-4 (14.0'-14.5')
16.0		15.0 - 17.0	S-6	24.0	12.0	Direct Push				-	SM		S-6: Same as above, wet, very dense
17.0													
18.0													End of boring at 17.0' below grade
19.0													Borehole grouted
20.0													
NOTES: (1) Thick-wall ring lined drive sampler (California sampler) used for SPT samples. Rings dimensions = 2-1/2" O.D. by 2-7/16" I.D. by 6" length. (2) Correction factor: $N_{corr} = N \cdot (2.0^2 - 1.375^2) \text{ in.} / (3.0^2 - 2.4^2) \text{ in.} = N \cdot 0.65$. (3) TR = sample for thermal resistivity testing. (4) SPT sampler driven by Geoprobe direct push device to attempt recovery of high density soil. Soil description represents a field identification after D.M. Burmister unless otherwise noted.												The information contained on this log is not warranted to show the actual subsurface condition. The contractor agrees that he will make no claims against AECOM if he finds that the actual conditions do not conform to those indicated by this log.	
SAMPLE TYPE:		S= SPLIT SPOON		U=SHELBY TUBE		R=ROCK CORE							
PROPORTIONS:		TRACE=1-10%		LITTLE=10-20%		SOME=20-35%		AND=35-50%					

Aquifer / AECOM #60323056
CHPE - Rockland County Borings
LABORATORY SOIL TESTING DATA SUMMARY

BORING NO.	SAMPLE NO.	DEPTH (ft)	IDENTIFICATION TESTS								REMARKS
			WATER CONTENT (%)	LIQUID LIMIT (-)	PLASTIC LIMIT (-)	PLAS. INDEX (-)	USCS SYMB. (1)	SIEVE MINUS NO. 200 (%)	HYDRO. % MINUS 2 μ m (%)	SPECIFIC GRAVITY (-)	
BL-2	S-1b	7.2-8.0	22.1	28	19	9	CL	86	17		
BL-2	S-2	8-10	18.6	27	19	8	CL	75	13		
BL-3	S-1	6-8	12.5				ML	96.1	20		
BL-3	S-2	8-10	16.3				ML	93	14		
BL-3	S-3	10-10.7	12.4				ML	66	14		
BL-5	S-1	5-7	10.6				SM	40	8		
BL-5	S-3	9-11	7.0				SM	23	4	2.728	
BL-5	S-4	11-13	8.6				SM	24	4		
BL-5	S-6	15-17	8.2				SM	22	3		
BL-6	S-1	4-6	4.1				GW-GM	7	2		
BL-7	S-1	5-7	5.1				SP-SM	8	2		
BL-7	S-3	9-11	5.3				GW-GM	10	2		
BL-7	S-4	11-13	7.5				SM	25	4		
BL-7	S-6	15-17	6.0				SM	14	2		
BL-8	S-1	6-8	17.9	35	20	15	CL	51	11		
BL-8	S-3	10-12	10.2				SM	32	6		
BL-9	S-1	6-8	10.0				SP-SM	9	2		
BL-9	S-3	10-12	7.0				SM	14	3		
BL-9	S-5	14-16	4.9				SW-SM	11	3		
BL-11	S-4	11-13	10.1				SM	24	5		
BL-12	S-1	6-8	8.9				SM	24	6		
BL-13	S-1	4.5-6.5	9.3				SM	15	4	2.722	
BL-13	S-3	8.5-10.5	6.6				SM	13	3		
BL-13	S-4	10.5-12.5	9.9				SM	19	5		
BL-14	S-1	6-8	10.0				SM	27	6		
BL-14	S-2	8-10	8.1				SM	24	5		
BL-15	S-3	9-11	9.5				SM	32	8		
BL-15	S-9	21-23	7.9				SM	26	4		
BL-15	S-14	31-33	6.1				SM	33	4		
BL-15	S-17	45-47	11.9				SM	20	3		
BL-15	S-21	65-67	8.2				SP-SM	10	1		

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





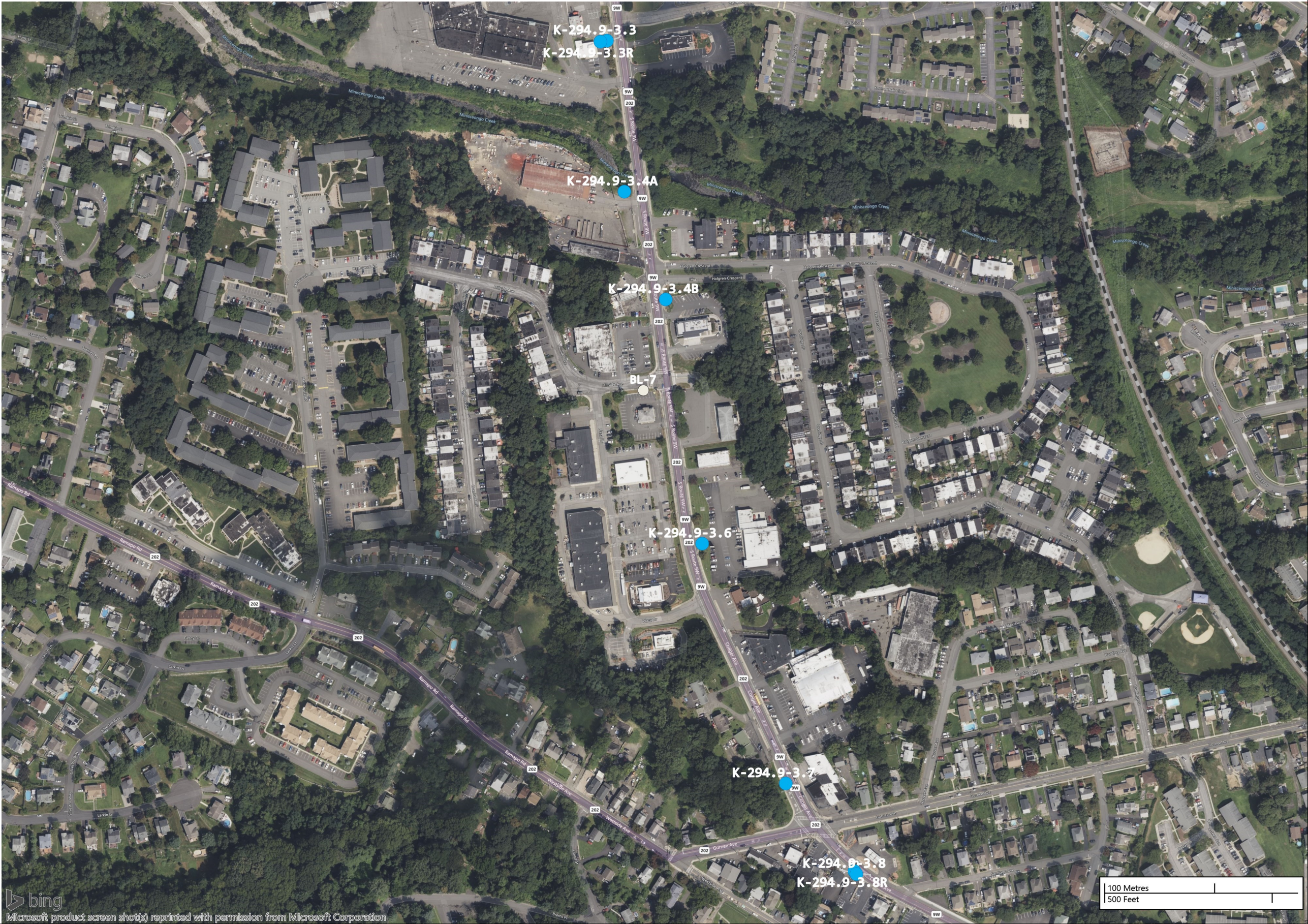


Segment 12 Package 7B HDD Borings - Rockland
Champlain Hudson Power Express
New York

PROJECT NUMBER 20001480

CREATED BY Kiewit
DATE 07/05/2022

- Legend Key
- Kiewit Borings (2022)
 - Borings by Others





Kiewit

EXPLORATORY BORING LOG

Champlain Hudson Power Express
New York

BORING NO: K-294.9-3.3

PROJECT NUMBER	20001480	LOGGED BY	Jialin Li	COORDINATES	N 864428.84 E 633983.02
START DATE	04/12/2022	DRILLER/RIG	Corey Brown / CME 550	GROUND ELEV.	87.2 ft
FINISH DATE	04/13/2022	DRILL CONTRACTOR	Parratt Wolff	HAMMER TYPE/EFF.	Automatic

Depth (ft)	Elevation (ft)	Graphic Log	Material Description	Sample Type	Core Run No.	Recovery %	RQD	Pocket Pen. (tsf)	Blow Counts (N Value)	Notes	Legend
											▲ SPT N Value ● MC (%) — PL & LL (%) ☒ Fines Content (%)
	86.7		6" Asphalt							Boring advanced with 3.5" ID HSA	
			SILT (ML), with sand (based on observations of excavated materials)								
			0 - 6.3 ft was excavated by air knife and vacuum truck								
5											
	80.9		Clayey and Silty SAND (SC-SM), fine to medium coarse, gray, very loose to very dense								
						16%			2-2-2-4 (4)		
10											
									50/3"		
15											
	70.7		Silty SAND (SM), with cobbles and boulders, gray, dry			0%	0			Soil description based on observations from redrill (K-294.9-3.3R)	
						0%	0				
20											
						0%	0				
25											
						0%	0				
30											



Kiewit

EXPLORATORY BORING LOG

Champlain Hudson Power Express
New York

BORING NO: K-294.9-3.3

PROJECT NUMBER 20001480
START DATE 04/12/2022
FINISH DATE 04/13/2022

LOGGED BY Jialin Li
DRILLER/RIG Corey Brown / CME 550
DRILL CONTRACTOR Parratt Wolff

COORDINATES N 864428.84
E 633983.02
GROUND ELEV. 87.2 ft
HAMMER TYPE/EFF. Automatic

Depth (ft)	Elevation (ft)	Graphic Log	Material Description	Sample Type	Core Run No.	Recovery % RQD	Pocket Pen. (tsf)	Blow Counts (N Value)	Notes	Legend			
										▲ SPT N Value	● MC (%)	— PL & LL (%)	☒ Fines Content (%)
			Silty SAND (SM), with cobbles and boulders, gray, dry			0%							
						0							
35	52.2		Boring Terminated at 35 ft										
40													
45													
50													
55													
60													



Kiewit

EXPLORATORY BORING LOG

Champlain Hudson Power Express
New York

BORING NO: K-294.9-3.3R

PROJECT NUMBER 20001480
START DATE 04/26/2022
FINISH DATE 04/27/2022

LOGGED BY Rafael Salas
DRILLER/RIG Corey B. / CME 550
DRILL CONTRACTOR Parratt Wolff

COORDINATES N 864425.80
E 633963.27
GROUND ELEV. 87.2 ft
HAMMER TYPE/EFF. Automatic

Depth (ft)	Elevation (ft)	Graphic Log	Material Description	Sample Type	Core Run No.	Recovery % RQD	Pocket Pen. (tsf)	Blow Counts (N Value)	Notes	Legend			
										▲ SPT N Value	● MC (%)	— PL & LL (%)	☒ Fines Content (%)
										20	40	60	80
			Silty GRAVEL (GM), with sand, fine to coarse sand, fine to coarse gravel, subrounded, with cobbles, brown, dry						Boring advanced with 3.25" ID HSA				
5									Soil description based on observed drill cuttings				
10	77.2		Silty SAND (SM), with gravel, fine sand, fine gravel, gray, dry						Boring advanced to 33 ft without sampling				
15													
20													
25													
30													



New York

BORING NO:K-294.9-3.3R

HAMMER TYPE/EFF. Automatic

Page 2 of 3



Champlain Hudson Power Express

BORING NO: K-294.9-3.3R

HAMMER TYPE/EFF. Automatic

Page 3 of 3



Kiewit

EXPLORATORY BORING LOG

Champlain Hudson Power Express
New York

BORING NO: K-294.9-3.4A

PROJECT NUMBER 20001480
START DATE 04/14/2022
FINISH DATE 04/18/2022

LOGGED BY Rafael Salas
DRILLER/RIG Corey B. / CME 550
DRILL CONTRACTOR Parratt Wolff

COORDINATES N 863977.56
E 634037.90
GROUND ELEV. 82.6 ft
HAMMER TYPE/EFF. Automatic

Depth (ft)	Elevation (ft)	Graphic Log	Material Description	Sample Type	Core Run No.	Recovery %	Pocket Pen. (tsf)	Blow Counts (N Value)	Notes	Legend
										▲ SPT N Value ● MC (%) — PL & LL (%) ☒ Fines Content (%)
5			Silty GRAVEL (GM), with sand (based on observations of excavated materials) 0 - 7 ft was excavated by air knife and vacuum truck						Boring advanced with 3.5" ID HSA	
75.6			Silty SAND (SM), with gravel, fine to coarse, possible small cobble, brown, medium dense to dense, dry			25%		6-8-6-16 (14)		● ▲ ☒
10			Rig grinding and moderate chatter, possible large cobble or boulder							
15						21%		40-23-20-30 (43)		▲
64.6			Clayey and Silty SAND (SC-SM), with gravel, fine grained, subangular, brown, loose to dense, moist			29%		24-9-12-15 (21)		▲
20										
25						54%		7-15-20-32 (35)		● ☒
30						66%		3-4-4-5 (8)		▲ ● ☒



Kiewit

EXPLORATORY BORING LOG

Champlain Hudson Power Express
New York

BORING NO: K-294.9-3.4A

PROJECT NUMBER 20001480
START DATE 04/14/2022
FINISH DATE 04/18/2022

LOGGED BY Rafael Salas
DRILLER/RIG Corey B. / CME 550
DRILL CONTRACTOR Parratt Wolff

COORDINATES N 863977.56
E 634037.90
GROUND ELEV. 82.6 ft
HAMMER TYPE/EFF. Automatic

Depth (ft)	Elevation (ft)	Graphic Log	Material Description	Sample Type	Core Run No.	Recovery %	Pocket Pen. (tsf)	Blow Counts (N Value)	Notes	Legend			
										▲	●	—	☒
										SPT N Value	MC (%)	PL & LL (%)	Fines Content (%)
										20	40	60	80
35			Clayey and Silty SAND (SC-SM), with gravel, fine grained, subangular, brown, loose to dense, moist	☒		100%		2-7-9-13 (16)		▲			
44.6			Clayey SAND (SC), fine to coarse sand, little gravel, fine, brown, medium dense, moist	☒		84%		6-12-12-12 (24)			▲	☒	
39.6			Silty SAND (SM), with gravel, fine to coarse sand, fine to coarse gravel, subrounded to subangular, reddish brown, very dense, moist	☒		119%		50/5"					▲
45				☒		100%		50/4"	3-inch ring sampler	●	☒		
50				☒		77%		14-50/3"					▲
				☒		100%		50/4"					▲
55				☒		100%		50/3"					▲
60	22.6		Boring Terminated at 60 ft										



Kiewit

EXPLORATORY BORING LOG

Champlain Hudson Power Express
New York

BORING NO: K-294.9-3.4B

PROJECT NUMBER 20001480
START DATE 04/19/2022
FINISH DATE 04/20/2022

LOGGED BY Rafael Salas
DRILLER/RIG Corey B. / CME 550
DRILL CONTRACTOR Parratt Wolff

COORDINATES N 863655.85
E 634164.01
GROUND ELEV. 98.7 ft
HAMMER TYPE/EFF. Automatic

Depth (ft)	Elevation (ft)	Graphic Log	Material Description	Sample Type	Core Run No.	Recovery %	Pocket Pen. (tsf)	Blow Counts (N Value)	Notes	Legend
										▲ SPT N Value ● MC (%) — PL & LL (%) ☒ Fines Content (%)
	98.4		4" Topsoil						Boring advanced with 3.25" ID HSA	
			Silty SAND (SM) (based on observations of excavated materials) 0 - 7 ft was excavated by air knife and vacuum truck							
5										
	91.7		Silty SAND (SM) with gravel, medium coarse to coarse sand, fine to coarse gravel, angular to subangular, brown, medium dense, dry			75%		25-9-9-23 (18)		
10										
						42%		44-21-8-7 (29)		
15										
						29%		10-10-13-9 (23)		
20										
	75.7		SILT (ML), with gravel and sand, coarse gravel, subangular, coarse sand, brown, very stiff, dry			62%		8-13-14-20 (27)		
25										
	70.7		Silty SAND (SM), with gravel, fine sand, fine to coarse gravel, subrounded to subangular, brown with reddish brown, very dense, silt seams, moist			100%		16-31-50-50/3"		
30										



Kiewit

EXPLORATORY BORING LOG

Champlain Hudson Power Express
New York

BORING NO: K-294.9-3.4B

PROJECT NUMBER 20001480
START DATE 04/19/2022
FINISH DATE 04/20/2022

LOGGED BY Rafael Salas
DRILLER/RIG Corey B. / CME 550
DRILL CONTRACTOR Parratt Wolff

COORDINATES N 863655.85
E 634164.01
GROUND ELEV. 98.7 ft
HAMMER TYPE/EFF. Automatic

Depth (ft)	Elevation (ft)	Graphic Log	Material Description	Sample Type	Core Run No.	Recovery %	RQD	Pocket Pen. (tsf)	Blow Counts (N Value)	Notes	Legend			
											▲	●	—	■
									(81)					
35			Silty SAND (SM), with gravel, fine sand, fine to coarse gravel, subrounded to subangular, brown with reddish brown, very dense, silt seams, moist	☒		100%			37-50/3"					
				☒		100%			20-90/5"	3-inch ring sampler		●		■
40				☒		100%			80/4"					
				☒		100%			50/4"					
55.7			SILT (ML), with some sand and gravel, fine gravel, coarse sand, brown, hard, dry	☒		100%			37-50/4"			●		■
45														
50.7			Lean CLAY (CL), with sand, possibly weathered siltstone/sandstone, some cementation, red, hard, dry	☒		100%			50/6"					
50														
				☒		100%			50/4"			●		
55				☒		100%			50/1"					
60														



Kiewit

EXPLORATORY BORING LOG

Champlain Hudson Power Express
New York

BORING NO: K-294.9-3.4B

PROJECT NUMBER 20001480
START DATE 04/19/2022
FINISH DATE 04/20/2022

LOGGED BY Rafael Salas
DRILLER/RIG Corey B. / CME 550
DRILL CONTRACTOR Parratt Wolff

COORDINATES N 863655.85
E 634164.01
GROUND ELEV. 98.7 ft
HAMMER TYPE/EFF. Automatic

Depth (ft)	Elevation (ft)	Graphic Log	Material Description	Sample Type	Core Run No.	Recovery %	RQD	Pocket Pen. (tsf)	Blow Counts (N Value)	Notes	Legend			
											▲	●	—	⊠
											SPT N Value	MC (%)	PL & LL (%)	Fines Content (%)
											20	40	60	80
			Lean CLAY (CL), with sand, possibly weathered siltstone/sandstone, some cementation, red, hard, dry											
						96%			50/1"					
65						100%			60/1"	3-inch ring sampler	●	⊠		
						100%			50/3"					
70	28.7		Sandstone, weathered, coarse grained, dark red, weak to strong rock, closely spaced fractures			63%	7							
75	23.7		Siltstone, fresh, red, very strong, very fine grained, moderately spaced fractures			100%	73							
80	18.7		Boring Terminated at 80 ft											
85														
90														



Kiewit

EXPLORATORY BORING LOG

Champlain Hudson Power Express
New York

BORING NO: K-294.9-3.6

PROJECT NUMBER	20001480	LOGGED BY	Jialin Li	COORDINATES	N 862925.98 E 634278.00
START DATE	04/18/2022	DRILLER/RIG	Rick / Diedrich D-90	GROUND ELEV.	100.4 ft
FINISH DATE	04/18/2022	DRILL CONTRACTOR	Parratt Wolff	HAMMER TYPE/EFF.	Automatic

Depth (ft)	Elevation (ft)	Graphic Log	Material Description	Sample Type	Core Run No.	Recovery %	RQD	Pocket Pen. (tsf)	Blow Counts (N Value)	Notes	Legend
											▲ SPT N Value ● MC (%) — PL & LL (%) ☒ Fines Content (%)
	100.2		3" Topsoil							Boring advanced with 3.5" ID HSA	
			Silty SAND (SM) (based on observations of excavated materials)								
			0 - 7.42 ft was excavated by air knife and vacuum truck								
5										Water added to hole	
	93.0		Silty SAND (SM), with gravel, trace clay, reddish brown, dense, dry to moist			50%			20-12-22-14 (34)		
10											
						0%			18-20-27-13 (47)		
15											
						0%			27-15-16-23 (31)		
20	80.4		Clayey SAND (SC), with gravel, grayish brown, very dense, moist			100%			100/3"	3-inch ring sampler	
						0%			100/1"		
25	75.4		Siltstone, fresh, closely spaced fractures, fine grained, maroon, very strong			100%	67				
						89%	25				
30											



Champlain Hudson Power Express New York















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



HAMMER TYPE/EFF. Automatic

Page 2 of 2

SOIL LEGEND

Explanation of Symbols and Terms Used on Boring and Test Pit
Logs for Sampling and Description of Soils

SAMPLE AND DRILL METHODS		COMMON ABBREVIATIONS AND ACRONYMS			
	Standard Penetration Split-Spoon Sample	MR	Mud Rotary	Bulk	Bulk Sample
	Undisturbed Sample	HSA	Hollow Stem Auger	EOB	End of Boring
	Piston Sampler	SSA	Solid Stem Auger	AR	Auger Refusal
	Grab Sample	SS	Split Spoon Sampler	N-Value	Sum of blows for last two 6-in. increments of SPT
	Bulk Sample	UD	Undisturbed Sample	USCS	Unified Soil Classification System
	Auger Cuttings	WOR	Weight of Rods		
	Rock Core	WOH	Weight of Hammer		
	Modified California Sample	SPT	Standard Penetration Test		
WATER LEVEL SYMBOLS		REC	Recovery		
	Observation at time of drilling	RQD	Rock Quality Designation		
	Observation after drilling	MC	Moisture Content		
	Delayed observation	PI	Plasticity Index		
	Perched water observed at drilling	PL	Plastic Limit		
	Observed Seepage	LL	Liquid Limit		
	Cave-in Depth	CPT	Cone Penetration Test		
		PP	Pocket Penetrometer		

CROSS SECTION LEGEND	
	N(bpf)
	Recovery %
	RQD %
	Material Symbol
% Moisture Content symbol" data-bbox="755 334 775 354"/>	% Moisture Content

RELATIVE DENSITY / CONSISTENCY				
Coarse-grained Soils		Fine-grained Soils		
N-Value	Density	N-Value	Consistency	Pocket Pen (TSF)
0 - 4	Very Loose	0 - 1	Very Soft	0.0 - 0.25
5 - 10	Loose	2 - 4	Soft	0.25 - 0.50
11 - 30	Medium	5 - 8	Firm	0.51 - 1.00
31 - 50	Dense	9 - 15	Stiff	1.01 - 2.00
> 50	Very Dense	16 - 30	Very Stiff	2.01-4.00
		> 30	Hard	> 4.00

RELATIVE PROPORTIONS OF GRAVEL, SAND, AND FINES	
Trace	> 5 %
Few	5 to 10 %
Little	15 to 25 %
Some	30 - 45 %
Mostly	50 to 100 %

SOIL GRAIN SIZE



























U.S. Standard Sieve





6"		3"		3/4"		4		10		40		200	
Boulders	Cobbles	Gravel		Sand			Silt				Clay		
		Coarse	Fine	Coarse	Medium	Fine							
152	76.2	19.1	4.76	2.00	0.420	0.074	0.002				(mm)		

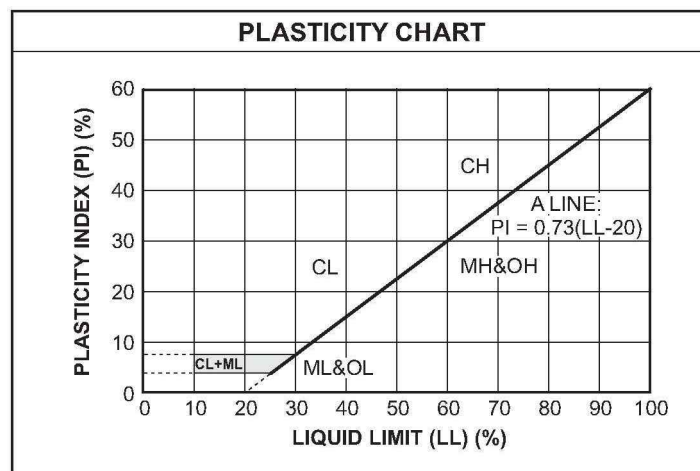
CRITERIA FOR DESCRIBING MOISTURE CONDITION		CRITERIA FOR DESCRIBING CEMENTATION	
Description	Criteria	Description	Criteria
Dry	Absence of moisture, dusty, dry to the touch	Weak	Crumbles or breaks with handling or little finger pressure
Moist	Damp but no visible free water	Moderate	Crumbles or breaks with considerable finger pressure
Wet	Visible free water, typically soil is below water table	Strong	Will not crumble or break with finger pressure

CRITERIA FOR DESCRIBING STRUCTURE	
Description	Criteria
Stratified	Alternating layers of varying material or color with layers at least 1/4 in. thick; note thickness
Laminated	Alternating layers of varying material or color with the layers less than 1/4 in. thick; note thickness
Fissured	Breaks along definite planes of fracture with little resistance to fracturing
Slickensided	Fracture planes appear polished or glossy, sometimes striated
Blocky	Cohesive soil that can be broken down into small angular lumps which resist further breakdown
Lensed	Inclusion of small pockets of different soils, such as lenses of sand scattered through a mass of clay; note thickness
Homogeneous	Same color and appearance throughout

SOIL SYMBOLS

USCS SOIL TYPES		
Symbol	Group	Description
	GW	Well-graded gravels, gravel sand mixtures with trace or no fines
	GP	Poorly-graded gravels, gravel-sand mixtures with trace or no fines
	GW-GM	Well-graded gravels, gravel-sand mixtures with silt fines
	GW-GC	Well-graded gravels, gravel-sand mixtures with clay fines
	GP-GM	Poorly-graded gravels, gravel-sand mixtures with silt fines
	GP-GC	Poorly-graded gravels, gravel-sand mixtures with clay fines
	GM	Silty gravels, gravel-silt-sand mixtures
	GC	Clayey gravels, gravel-sand-clay mixtures
	GC-GM	Clayey gravels, gravel-sand-clay-silt mixtures
	SW	Well-graded sands, sand-gravel mixtures with trace or no fines
	SP	Poorly-graded sands, sand-gravel mixtures with trace or no fines
	SW-SM	Well-graded sands, sand-gravel mixtures with silt fines
	SW-SC	Well-graded sands, sand-gravel mixtures with clay fines
	SP-SM	Poorly-graded sands, sand-gravel mixtures with silt fines
	SP-SC	Poorly-graded sands, sand-gravel mixtures with clay fines
	SM	Silty sands, sand-gravel-silt mixtures
	SC	Clayey sands, sand-gravel-clay mixtures
	SC-SM	Clayey sands, sand-gravel-clay-silt mixtures
	ML	Inorganic silts with low plasticity
	CL	Inorganic clays of low plasticity, gravelly or sandy clays, silty clays, lean clays
	CL-ML	Inorganic clay-silts of low plasticity, gravelly clays, sandy clays, silty clays, lean clays
	OL	Organic silts and organic silty clays of low plasticity
	MH	Inorganic silts of high plasticity, elastic silts
	CH	Inorganic clays of high plasticity, fat clays
	OH	Organic clays and organic silts of high plasticity
	PT	Peat, humus, swamp soils with high organic contents

OTHER MATERIALS	
Symbol	Description
	Asphalt
	Concrete
	Crushed Stone/Aggregate Base
	Fill



ROCK LEGEND

Explanation of Symbols and Terms Used on Boring and Test Pit
Logs for Sampling and Description of Rock

TERMS AND ABBREVIATIONS	
Fracture	Collective term for any separation in a geologic formation
Joint (JT)	Natural break in a layer or body of rock that lacks visible offset
Bedding	Layers of sedimentary rocks that are distinctly different from overlying and underlying beds
Mechanical Break (MB)	Breaks due to drilling or handling in rock or sediment cores
RQD	Rock Quality Designation
REC	Percent Recovery
Shear (SH)	Surface of differential movement evident by presence of slickensides, striations, or polishing
Shear Zone (SZ)	Zone of gouge and rock fragments bounded by planar shear surfaces
Fault (FT)	Planar fracture with significant displacement

ROCK HARDNESS	
Very Soft	Can be deformed by hand (has a rock-like character but can be broken easily by hand)
Soft	Can be scratched by fingernail (cannot be crumbled between fingers but can be easily pitted with light blows of a geology hammer)
Moderately Hard	Can be scratched easily with a knife; cannot be scratched with a fingernail (can be pitted with moderate blows of a geology hammer)
Hard	Difficult to scratch with a knife (cannot be pitted with a geology hammer but can be chipped with moderate blows of the hammer)
Very Hard	Cannot be scratched with a knife (chips can be broken off only with heavy blows of the geology hammer)

BEDDING THICKNESS		
Laminated	< 0.04 in.	< 1 mm
Parting	0.04 - 1/4 in.	1 - 6 mm
Banded	1/4 - 1 in.	6 mm - 3 cm
Thin	1 - 4 in.	3 - 9.1 cm
Medium	4 in. - 1 ft.	9.1 - 30.5 cm
Thick	1 - 3 ft.	30.5 cm - 1 m
Massive	> 3 ft.	> 1 m

























JOINT AND FRACTURE DENSITY		
Very Tight	< 2 in.	< 5.1 cm
Tight	2 in. - 1 ft.	5.1 - 30.5 cm
Moderately tight	1 - 3 ft.	30.5 - 91.4 cm
Wide	3 - 10 ft.	91.4 cm - 3 m




VOIDS	
Porous	Smaller than a pinhead. Their presence is indicated by the degree of absorbency.
Pitted	Pinhead size to a 1/4 in. If only thin walls separate the individual pits, the core may be described as honeycombed.
Vug	1/4 in. to the diameter of the core. The upper limit will vary with core size.
Cavity	Larger than the diameter of the core.

TEXTURE	
Aphanitic	Individual grains or crystals are too small to be seen with the naked eye.
Fine-grained, finely crystalline	Grain diameters between 0.1 and 1 mm; grains or crystals can be seen with naked eye.
Medium-grained, crystalline	Grain diameters between 1 and 5 mm.
Coarse-grained, coarsely crystalline	Grain diameters greater than 5 mm.

WEATHERING	
Unweathered	No evidence of any mechanical or chemical alteration.
Slightly	Superficial discoloration, alteration, and/or discoloration along discontinuities; less than 10% of the rock volume is altered; strength is essentially unaffected.
Moderately	Discoloration is evident; surface is pitted and altered, with alterations penetrating well below rock surfaces; 10 to 50% of the rock is altered; strength is noticeably less than unweathered rock.
Highly	Entire section is discolored; alteration is greater than 50%; some areas of slightly weathered rock are present; some minerals are leached away; retains only a fraction of its original strength (wet strength is usually lower than dry strength).
Decomposed	Saprolite; rock is essentially reduced to a soil with a relic rock texture; can be molded or crumbled by hand.

ROCK SYMBOLS

ROCK TYPES		
Sedimentary Rocks		Shale
		Siltstone
		Sandstone
		Conglomerate
		Breccia
		Limestone
		Dolomite
		Gypsum
		Coal
		Coral
		Chalk
		Slate
Metamorphic Rocks		Schist
		Gneiss
		Quartzite
		Serpentinite
		Greenstone
		Granite
Igneous Rocks		Tuff
		Rhyolite
		Dacite
		Andesite
		Basalt
		Basalt

OTHER MATERIALS		
Other		Asphalt
		Concrete
		Bedrock

ROCK QUALITY DESIGNATION (RQD) AND RECOVERY		
% RQD	Quality	$\text{Recovery (\%)} = \frac{\text{Length of Core Sample Recovered}}{\text{Length of the Core Run}} \times 100$ $\text{RQD (\%)} = \frac{\text{Sum of Lengths of Intact Rock Pieces of 4 in. and Longer}}{\text{Length of the Core Run}} \times 100$
< 25	Very Poor	
25 - 50	Poor	
50 - 75	Fair	
75 - 90	Good	
90 - 100	Excellent	



FAIRWAY TESTING

22 North Liberty Drive
P.O. Box 578
Stony Point, NY 10980
Telephone 845.942.2088
Fax 845.942.0995

Report Date: 6/20/22
Project: Champlain Hudson Power Express

Client: Kiewit Engineering (NY) Corp.

REPORT: Soil Analysis

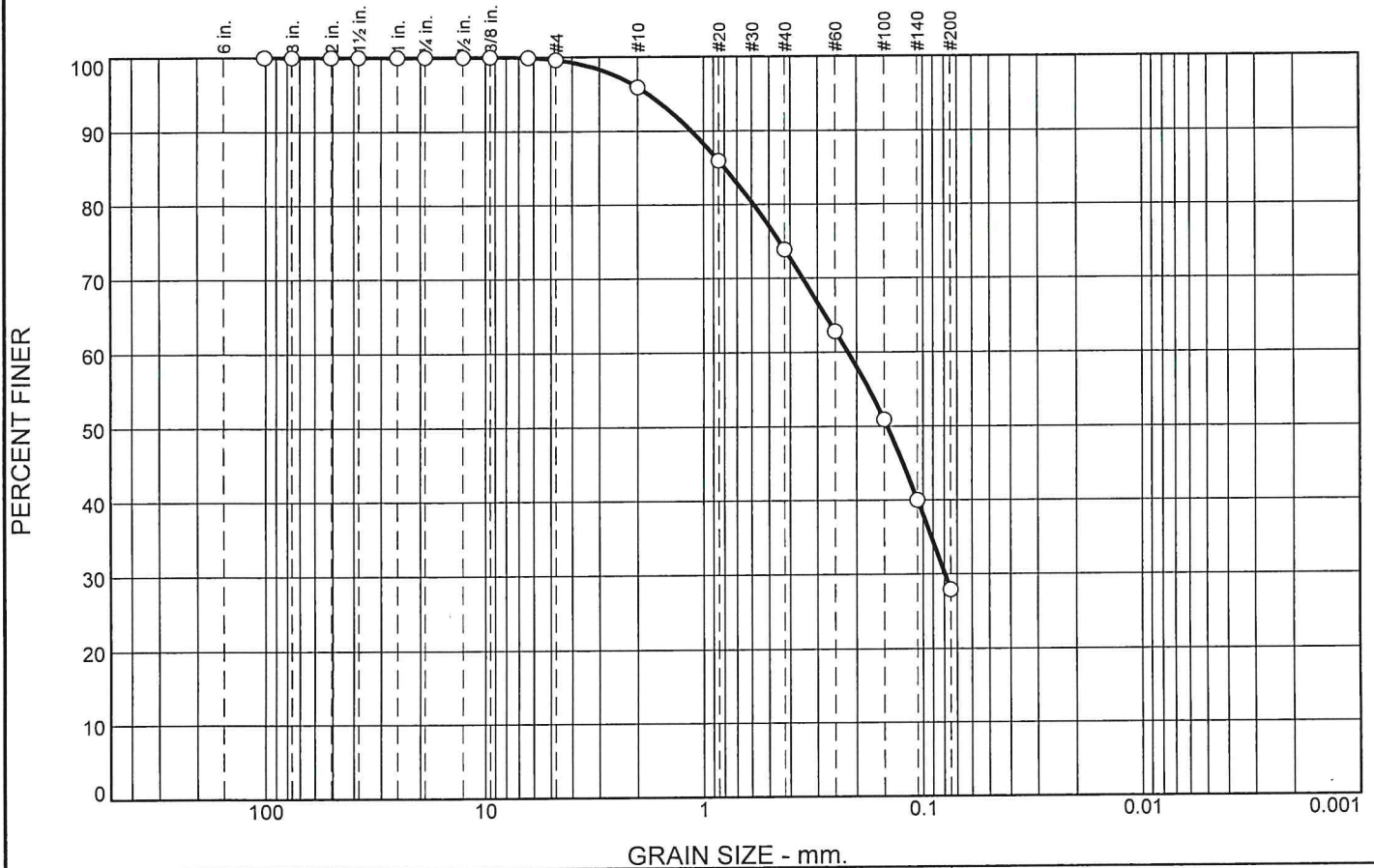
See attached reports for testing requested by the client as per attached submittals for locations K.294.9-3.3.

Respectfully Submitted,
Fairway Testing

A handwritten signature in black ink, reading 'Gabriel J. O'Connell'. The signature is written in a cursive, flowing style with a large, prominent 'G' and 'O'.

Gabriel J. O'Connell, P.E.

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.4	3.7	22.0	46.0	27.9	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
4	100.0		
3	100.0		
2	100.0		
1.5	100.0		
1	100.0		
3/4	100.0		
1/2	100.0		
3/8	100.0		
1/4	99.9		
#4	99.6		
#10	95.9		
#20	86.0		
#40	73.9		
#60	62.8		
#100	50.9		
#140	40.0		
#200	27.9		

* (no specification provided)

Material Description

S-1
silty, clayey sand

Atterberg Limits

PL= 10 LL= 16 PI= 6

Coefficients

D₉₀= 1.1324 D₈₅= 0.7961 D₆₀= 0.2192
D₅₀= 0.1453 D₃₀= 0.0796 D₁₅=
D₁₀= C_u= C_c=

Classification

USCS= SC-SM AASHTO= A-2-4(0)

Remarks

ASTM D6913
Moisture Content- 25.1%

Source of Sample: 3.3 Depth: 8'-15'
Sample Number: 01-042022

Date: 04-20-22

**FAIRWAY
TESTING
CO., INC.**

Client: Kiewit Engineering (NY) Corp.
Project: Champlain Hudson Power Express

Project No: K-294.9

Figure

**FAIRWAY TESTING**

22 North Liberty Drive
P.O. Box 578
Stony Point, NY 10980
Telephone 845.942.2088
Fax 845.942.0995

Report Date: 6/24/2022
Project: Champlain Hudson Power Express

Client: Kiewit Engineering (NY) Corp.
REPORT: Soil Analysis

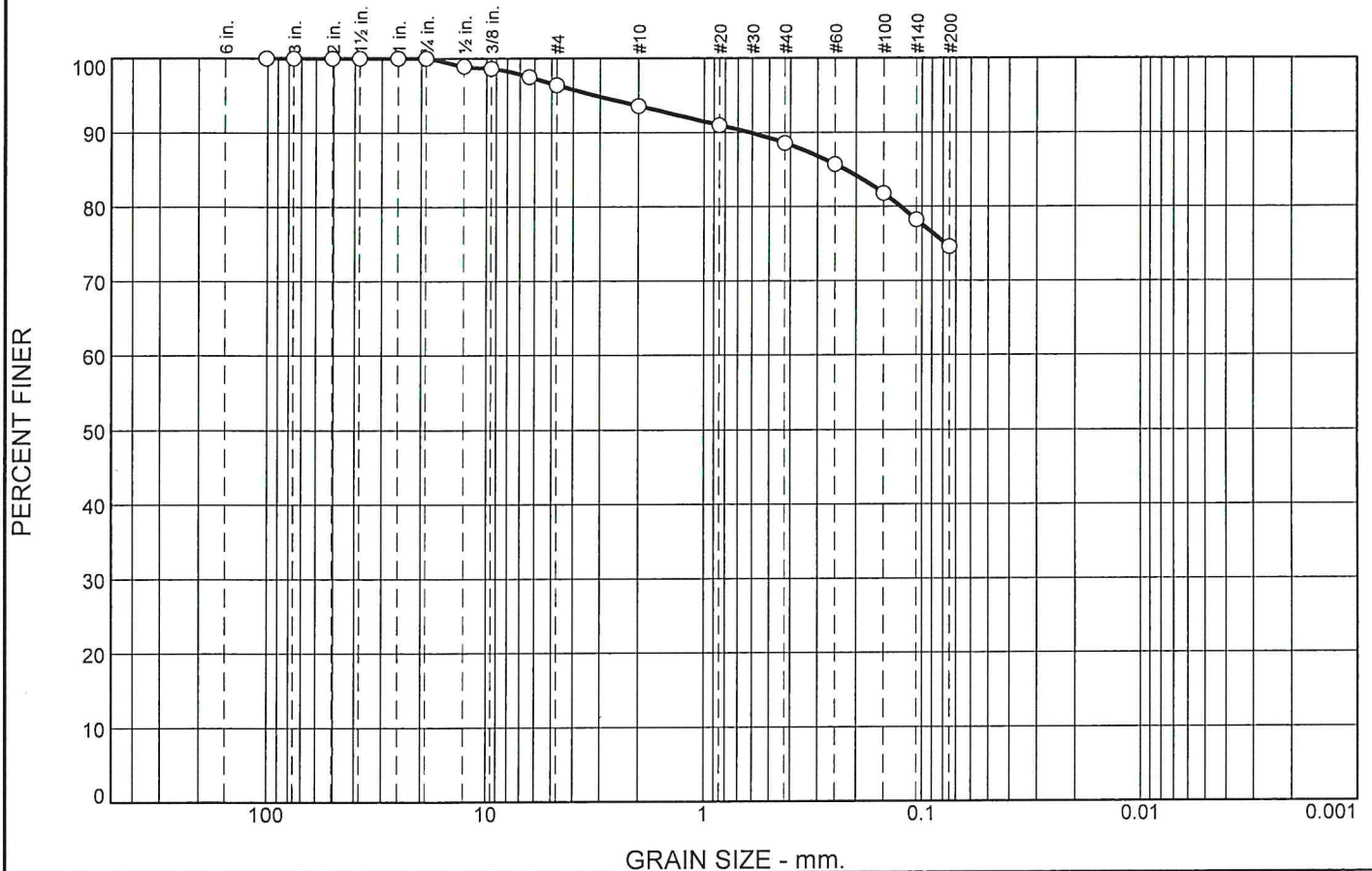
See attached reports for testing requested by the client as per attached submittals for locations K.294.9-3.3R. Moisture content test results are listed below.

Sample ID (sample depth, ft.)	Moisture Content
SS-4 (43'-45')	7.7%

Respectfully Submitted,
Fairway Testing

Gabriel J. O'Connell, P.E.

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	3.6	2.8	5.0	14.0	74.6	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
4	100.0		
3	100.0		
2	100.0		
1.5	100.0		
1	100.0		
3/4	100.0		
1/2	98.9		
3/8	98.6		
1/4	97.5		
#4	96.4		
#10	93.6		
#20	91.0		
#40	88.6		
#60	85.7		
#100	81.8		
#140	78.2		
#200	74.6		

* (no specification provided)

Material Description

SS-1
lean clay with sand

Atterberg Limits

PL= 12 LL= 24 PI= 12

Coefficients

D₉₀= 0.6149 D₈₅= 0.2246 D₆₀=
D₅₀= D₃₀= D₁₅=
D₁₀= C_u= C_c=

Classification

USCS= CL AASHTO= A-6(6)

Remarks

ASTM D6913, D4318, D2216
Moisture Content- 14.3%

Source of Sample: 3.3R
Sample Number: 01-050422

Depth: 33'-35'

Date: 05-04-22

**FAIRWAY
TESTING
CO., INC.**

Client: Kiewit Engineering (NY) Corp.
Project: Champlain Hudson Power Express

Project No: K-294.9

Figure



FAIRWAY TESTING

22 North Liberty Drive
P.O. Box 578
Stony Point, NY 10980
Telephone 845.942.2088
Fax 845.942.0995

Report Date: 6/20/22
Project: Champlain Hudson Power Express

Client: Kiewit Engineering (NY) Corp.
REPORT: Soil Analysis

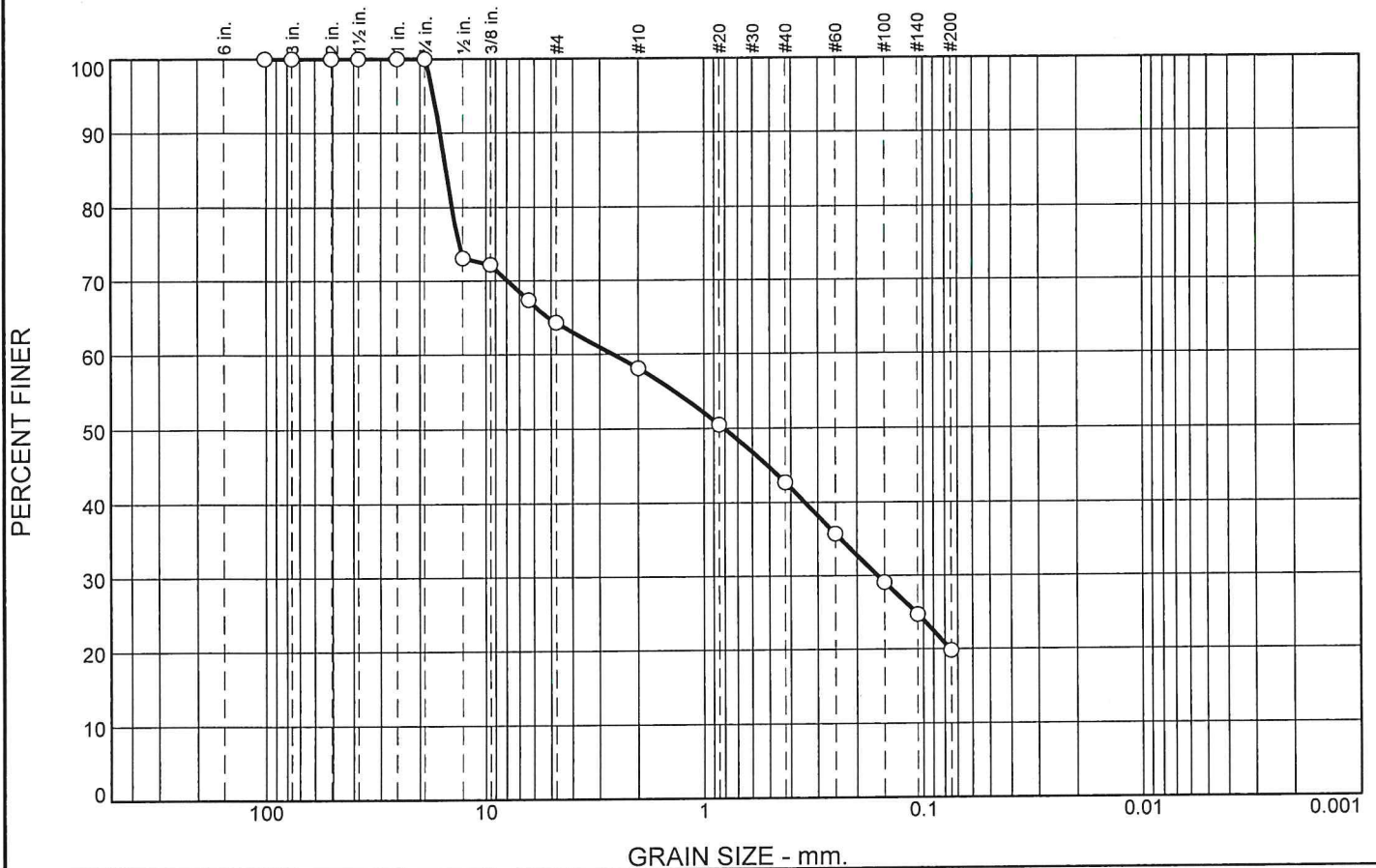
See attached reports for testing requested by the client as per attached submittals for locations K.294.9-3.4A.

Respectfully Submitted,
Fairway Testing

A handwritten signature in black ink, reading 'Gabriel J. O'Connell'. The signature is written in a cursive, flowing style with a large, prominent 'G' and 'O'.

Gabriel J. O'Connell, P.E.

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	35.7	6.2	15.4	22.9	19.8	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
4	100.0		
3	100.0		
2	100.0		
1.5	100.0		
1	100.0		
3/4	100.0		
1/2	73.1		
3/8	72.2		
1/4	67.4		
#4	64.3		
#10	58.1		
#20	50.5		
#40	42.7		
#60	35.7		
#100	29.1		
#140	24.7		
#200	19.8		

* (no specification provided)

Material Description

SS-1

PL=

Atterberg Limits

LL=

PI=

D₉₀= 16.2296
D₅₀= 0.8094
D₁₀=

Coefficients

D₈₅= 15.2512
D₃₀= 0.1612
C_u=

D₆₀= 2.6101
D₁₅=
C_c=

USCS=

Classification

AASHTO=

Remarks

ASTM D6913
Moisture Content- 6.8%

Source of Sample: 3.4A
Sample Number: 01-042022

Depth: 8'-10'

Date: 04-20-22

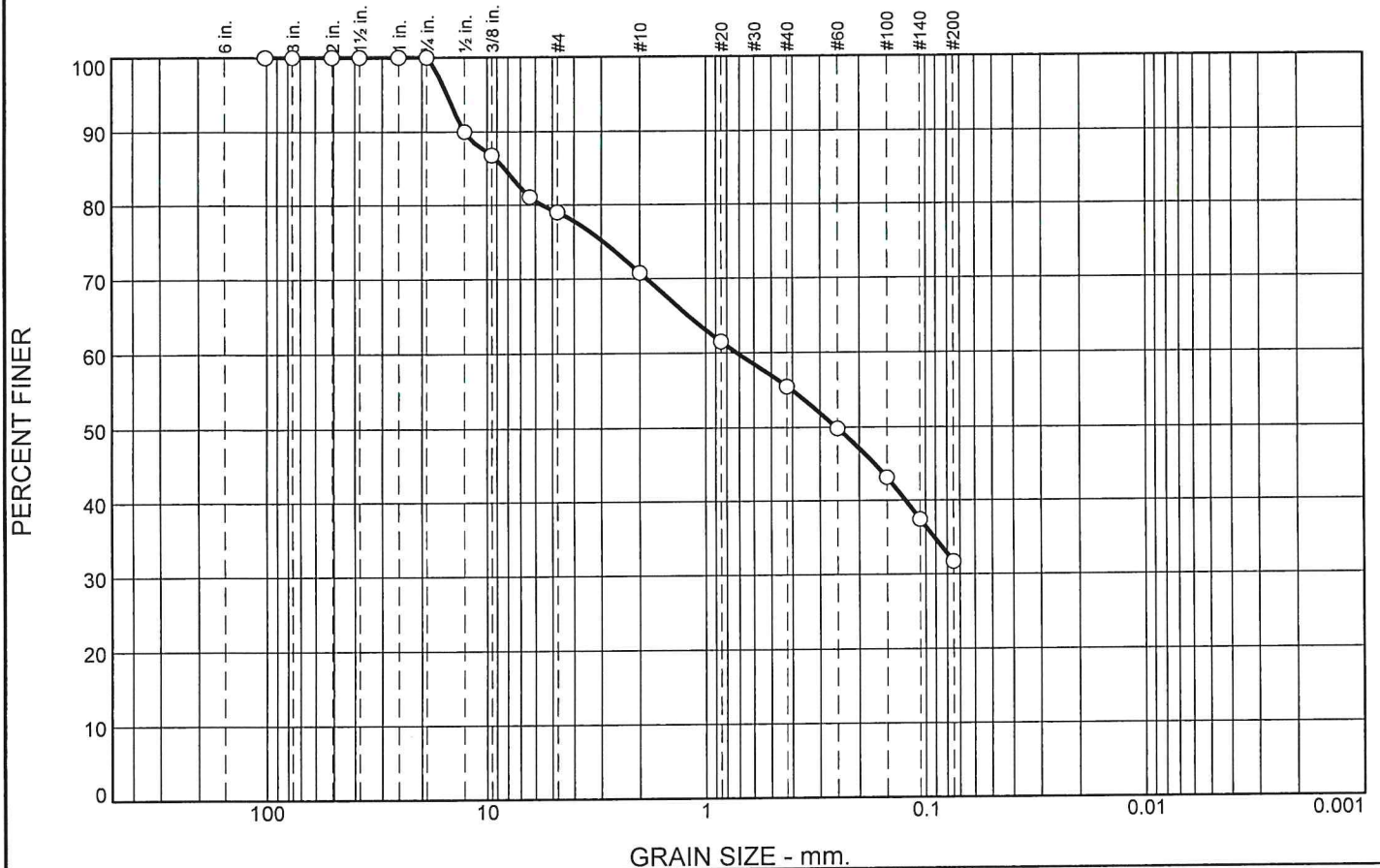
**FAIRWAY
TESTING
CO., INC.**

Client: Kiewit Engineering (NY) Corp.
Project: Champlain Hudson Power Express

Project No: K-294.9

Figure

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	21.0	8.2	15.3	23.8	31.7	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
4	100.0		
3	100.0		
2	100.0		
1.5	100.0		
1	100.0		
3/4	100.0		
1/2	90.0		
3/8	86.8		
1/4	81.1		
#4	79.0		
#10	70.8		
#20	61.5		
#40	55.5		
#60	49.8		
#100	43.1		
#140	37.4		
#200	31.7		

* (no specification provided)

Material Description

SS-4
silty, clayey sand with gravel

Atterberg Limits

PL= 8 LL= 15 PI= 7

Coefficients

D₉₀= 12.7000 D₈₅= 8.3063 D₆₀= 0.7181
D₅₀= 0.2543 D₃₀= D₁₅=
D₁₀= C_u= C_c=

Classification

USCS= SC-SM AASHTO= A-2-4(0)

Remarks

ASTM D6913, D4318
Moisture Content- 10.1%

Source of Sample: 3.4A
Sample Number: 02-042022

Depth: 23'-25'

Date: 04-20-22

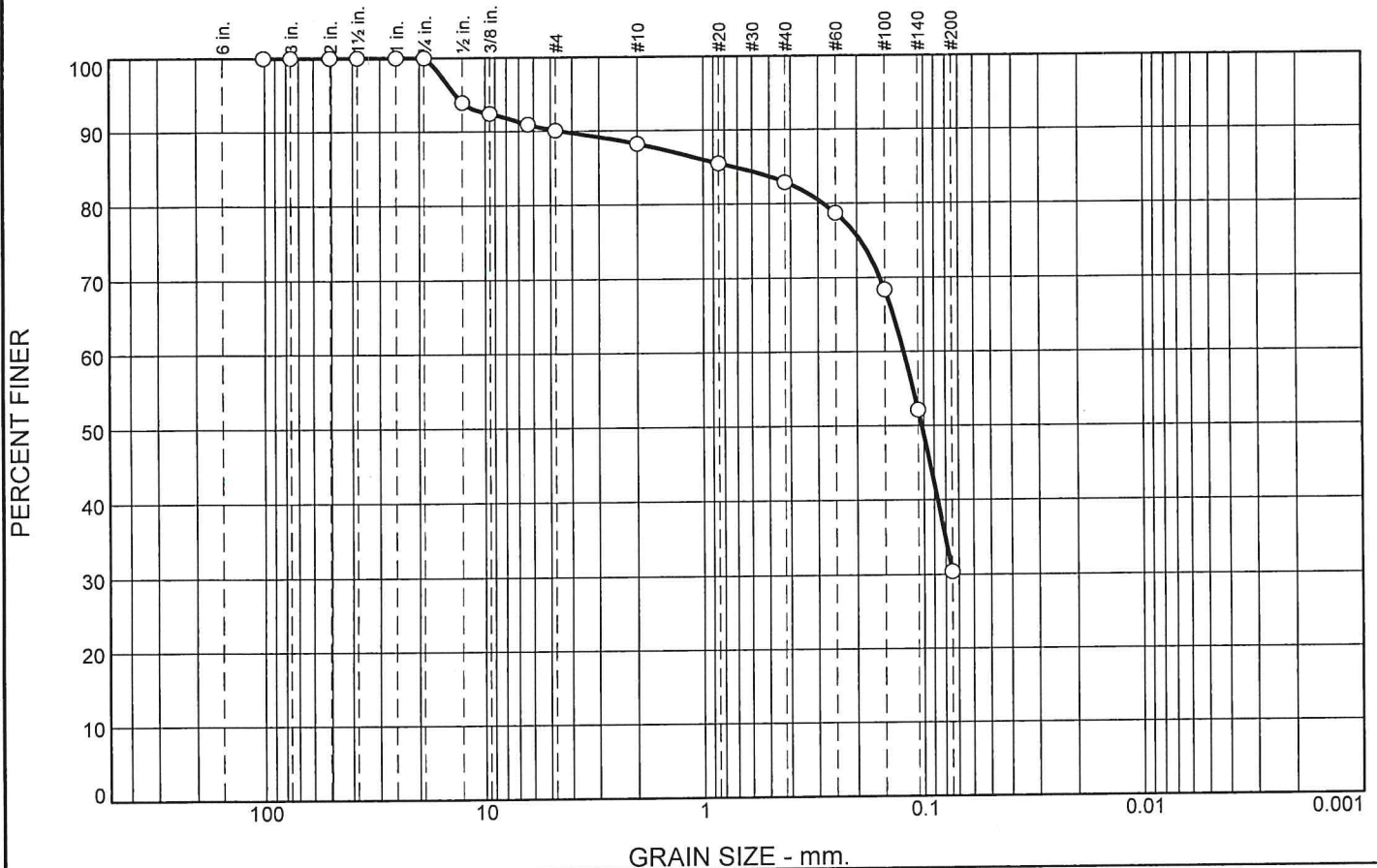
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TESTING
CO., INC.**

Client: Kiewit Engineering (NY) Corp.
Project: Champlain Hudson Power Express

Project No: K-294.9

Figure

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	9.9	1.9	5.3	52.5	30.4	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
4	100.0		
3	100.0		
2	100.0		
1.5	100.0		
1	100.0		
3/4	100.0		
1/2	93.9		
3/8	92.4		
1/4	90.9		
#4	90.1		
#10	88.2		
#20	85.5		
#40	82.9		
#60	78.7		
#100	68.4		
#140	52.1		
#200	30.4		

* (no specification provided)

Material Description

SS-7

PL= Atterberg Limits LL= PI=

Coefficients
D₉₀= 4.5440 D₈₅= 0.7238 D₆₀= 0.1230
D₅₀= 0.1022 D₃₀= D₁₅=
D₁₀= C_u= C_c=

Classification
USCS= AASHTO=

Remarks

ASTM D6913
Moisture Content- 19.6%

Source of Sample: 3.4A
Sample Number: 03-042022

Depth: 28'-30'

Date: 04-20-22

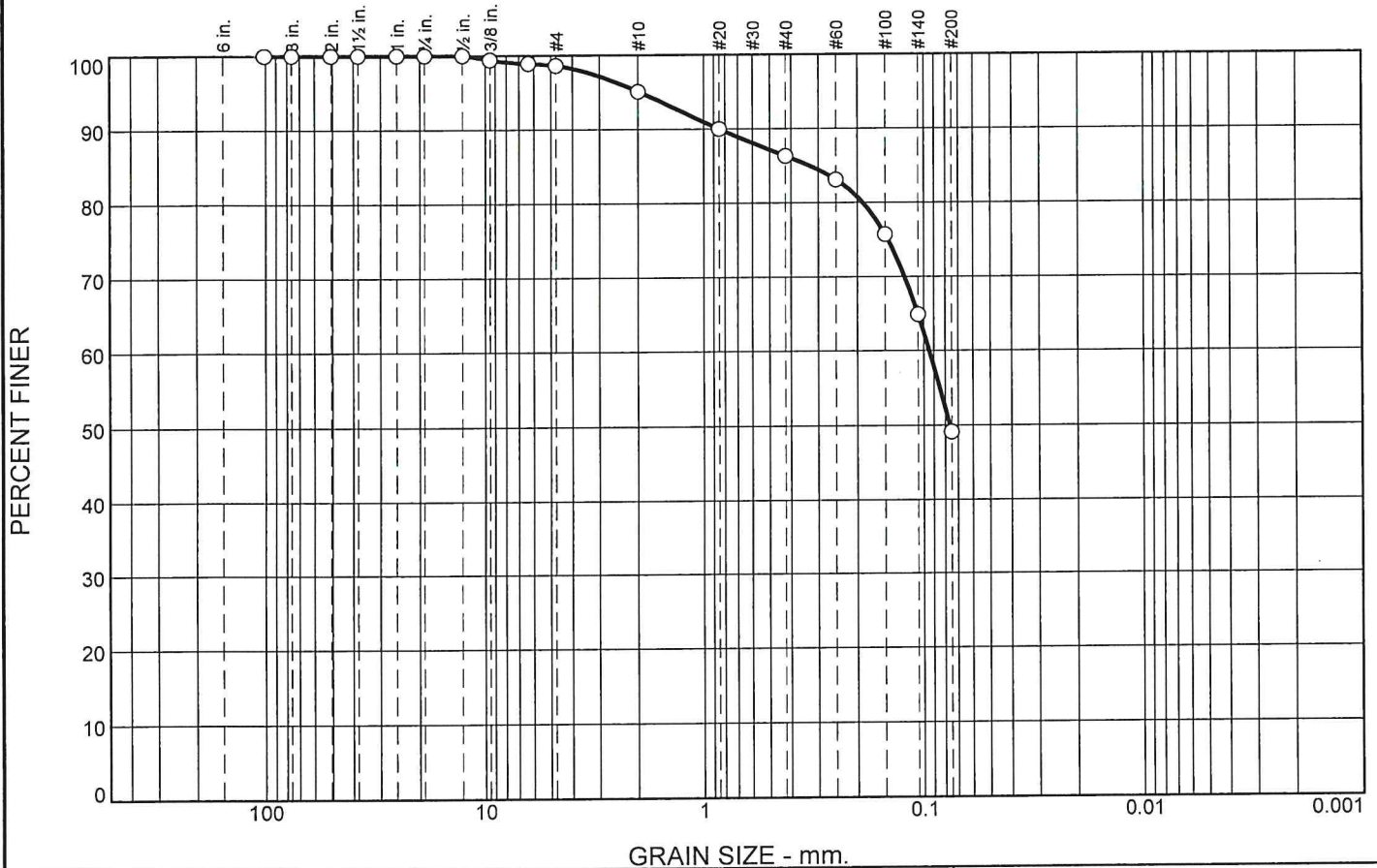
**FAIRWAY
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CO., INC.**

Client: Kiewit Engineering (NY) Corp.
Project: Champlain Hudson Power Express

Project No: K-294.9

Figure

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	1.4	3.5	8.8	37.2	49.1	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
4	100.0		
3	100.0		
2	100.0		
1.5	100.0		
1	100.0		
3/4	100.0		
1/2	100.0		
3/8	99.4		
1/4	98.9		
#4	98.6		
#10	95.1		
#20	90.0		
#40	86.3		
#60	83.1		
#100	75.7		
#140	64.9		
#200	49.1		

Material Description

SS-10
clayey sand

Atterberg Limits

PL= 13 LL= 24 PI= 11

Coefficients

D₉₀= 0.8500 D₈₅= 0.3300 D₆₀= 0.0944
D₅₀= 0.0764 D₃₀= D₁₅=
D₁₀= C_u= C_c=

Classification

USCS= SC AASHTO= A-6(2)

Remarks

ASTM D6913, D4318

* (no specification provided)

Source of Sample: 3.4A
Sample Number: 04-042022

Depth: 38'-40'

Date: 04-20-22

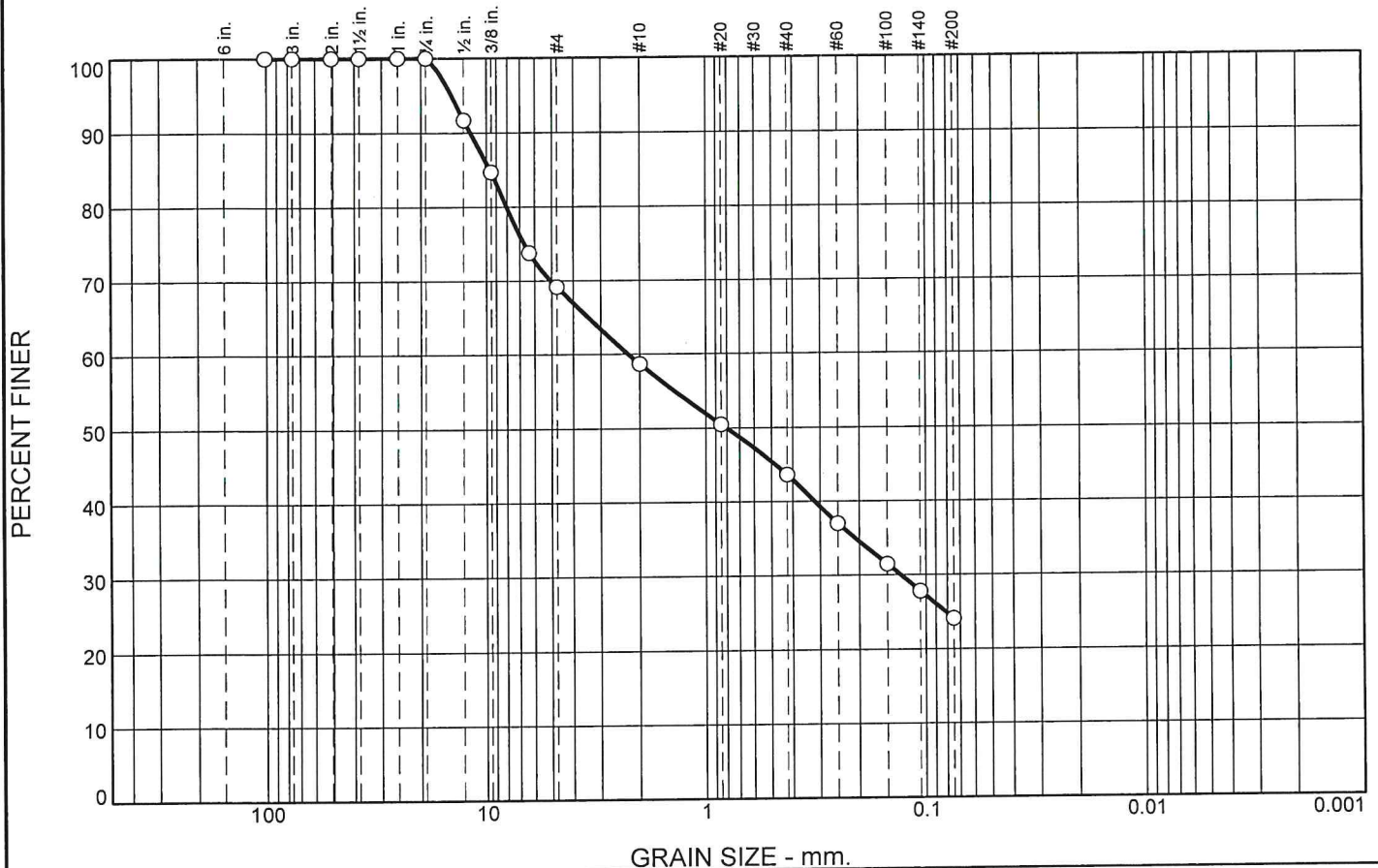
**FAIRWAY
TESTING
CO., INC.**

Client: Kiewit Engineering (NY) Corp.
Project: Champlain Hudson Power Express

Project No: K-294.9

Figure

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	30.8	10.5	15.1	19.5	24.1	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
4	100.0		
3	100.0		
2	100.0		
1.5	100.0		
1	100.0		
3/4	100.0		
1/2	91.7		
3/8	84.7		
1/4	73.8		
#4	69.2		
#10	58.7		
#20	50.5		
#40	43.6		
#60	37.0		
#100	31.5		
#140	27.8		
#200	24.1		

* (no specification provided)

Material Description

MC-13

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 11.8351 D₈₅= 9.6344 D₆₀= 2.2505
D₅₀= 0.8043 D₃₀= 0.1302 D₁₅=
D₁₀= C_u= C_c=

Classification

USCS= AASHTO=

Remarks

ASTM D6913
Moisture Content- 13.6%

Source of Sample: 3.4A
Sample Number: 05-042022

Depth: 48'

Date: 04-20-22

**FAIRWAY
TESTING
CO., INC.**

Client: Kiewit Engineering (NY) Corp.
Project: Champlain Hudson Power Express

Project No: K-294.9

Figure

**FAIRWAY TESTING**

22 North Liberty Drive
P.O. Box 578
Stony Point, NY 10980
Telephone 845.942.2088
Fax 845.942.0995

Report Date: 6/22/22
Project: Champlain Hudson Power Express

Client: Kiewit Engineering (NY) Corp.
REPORT: Soil Analysis

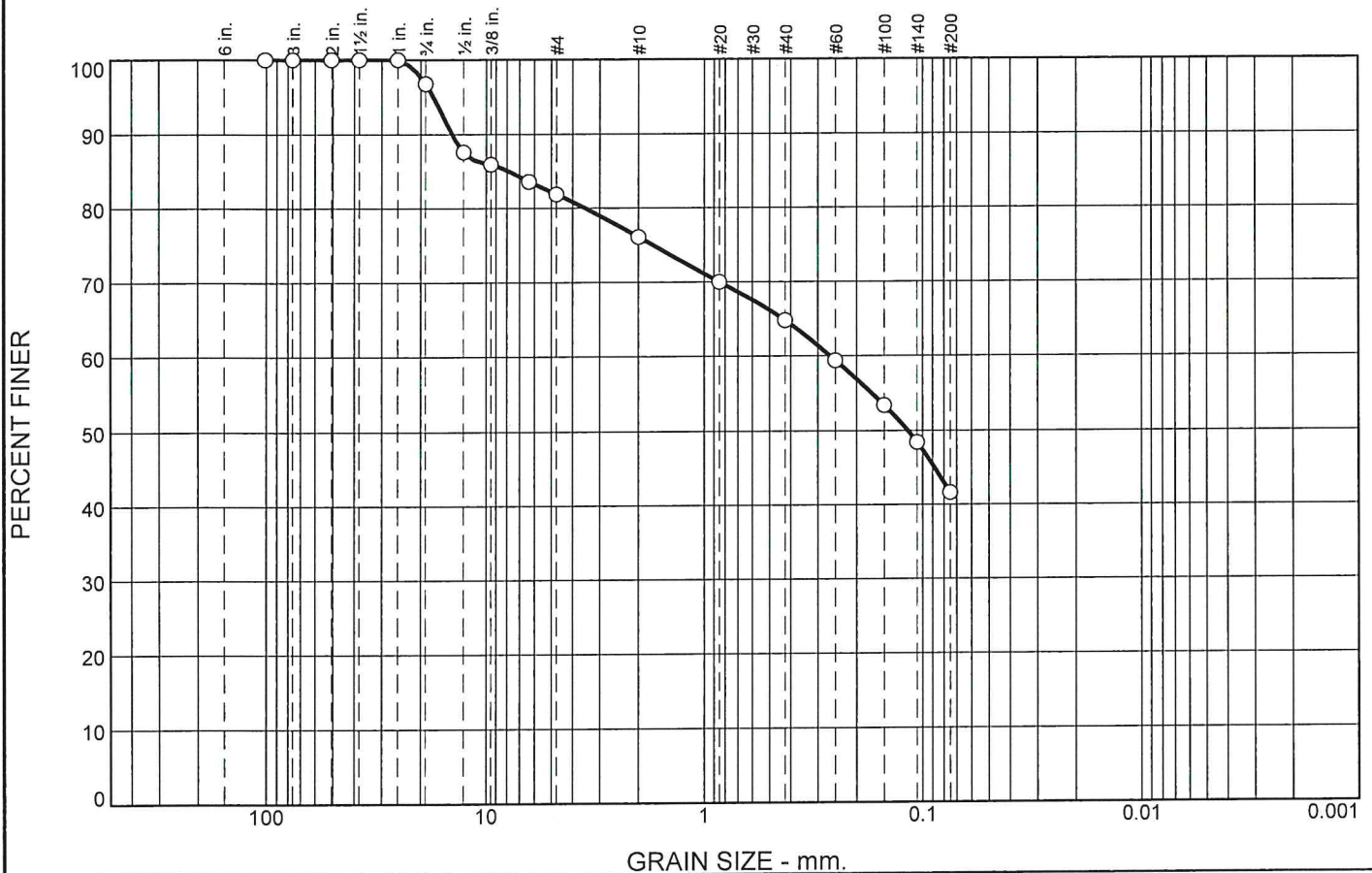
See attached reports for testing requested by the client as per attached submittals for locations K.294.9- 3.4B. Moisture content test results are listed below.

Sample ID (sample depth, ft.)	Moisture Content
SS-1/SS-2 (8'- 10')	4.4%
SS-5/SS-6 (23'-25')	9.0%
SS-19 (53'- 55')	7.4%

Respectfully Submitted,
Fairway Testing

Gabriel J. O'Connell, P.E.

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	3.2	14.9	5.8	11.3	23.2	41.6	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
4	100.0		
3	100.0		
2	100.0		
1.5	100.0		
1	100.0		
3/4	96.8		
1/2	87.6		
3/8	85.9		
1/4	83.6		
#4	81.9		
#10	76.1		
#20	70.0		
#40	64.8		
#60	59.4		
#100	53.4		
#140	48.4		
#200	41.6		

* (no specification provided)

Material Description

MC-10

PL=

Atterberg Limits

LL=

PI=

Coefficients

D₉₀= 14.3830

D₈₅= 7.9001

D₆₀= 0.2640

D₅₀= 0.1170

D₃₀=

D₁₅=

D₁₀=

C_u=

C_c=

Classification

USCS=

AASHTO=

Remarks

ASTM D6913, D2216

Moisture Content - 9.7%

Source of Sample: 3.4B
Sample Number: 01-042622

Depth: 37'-38'

Date: 04-26-22

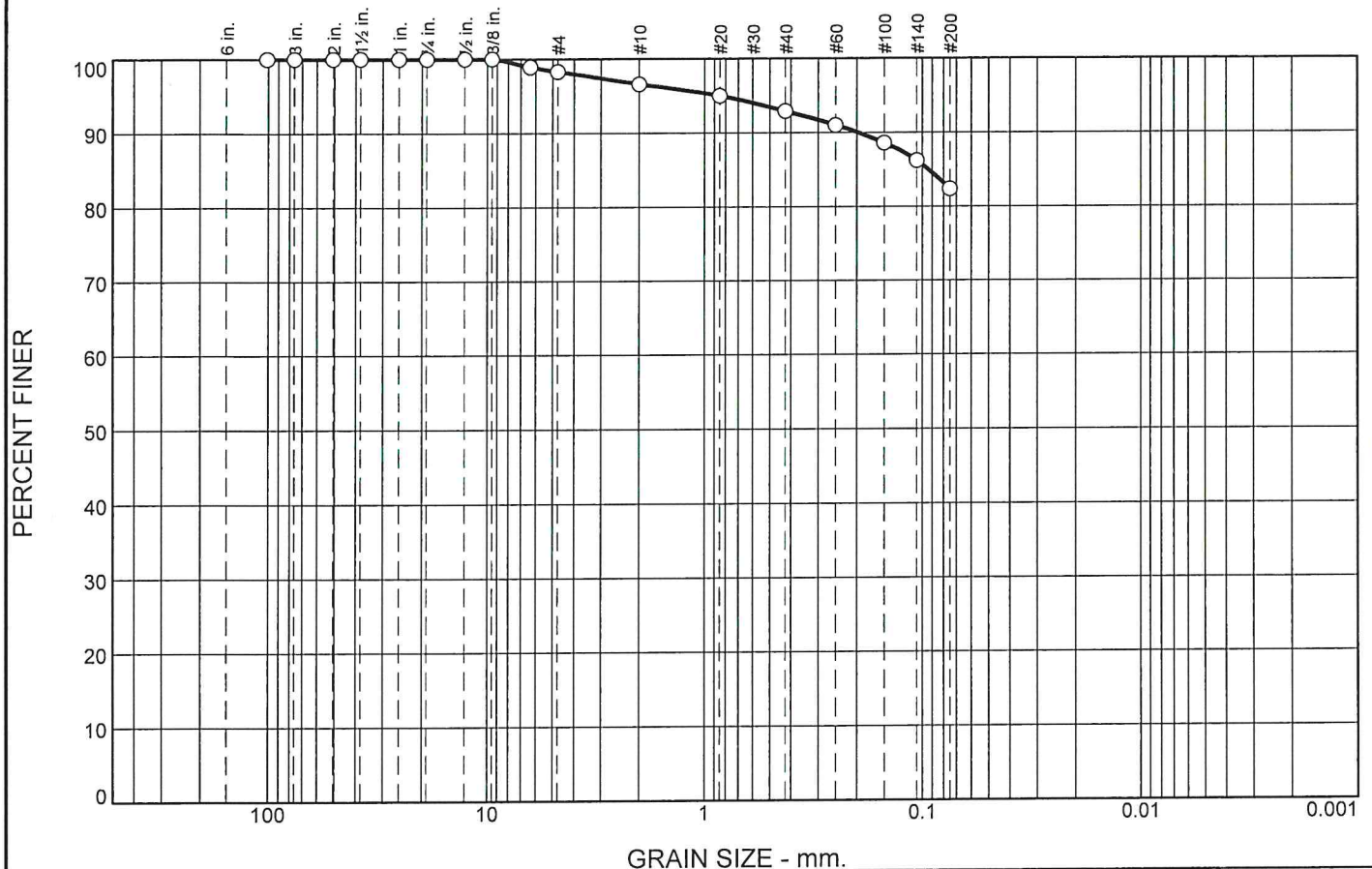
**FAIRWAY
TESTING
CO., INC.**

Client: Kiewit Engineering (NY) Corp.
Project: Champlain Hudson Power Express

Project No: K-294.9

Figure

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	1.7	1.7	3.7	10.5	82.4	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
4	100.0		
3	100.0		
2	100.0		
1.5	100.0		
1	100.0		
3/4	100.0		
1/2	100.0		
3/8	100.0		
1/4	98.9		
#4	98.3		
#10	96.6		
#20	95.0		
#40	92.9		
#60	91.0		
#100	88.6		
#140	86.2		
#200	82.4		

* (no specification provided)

Material Description

SS-13/SS-14
silt with sand

Atterberg Limits

PL= NP LL= 21 PI= NV

Coefficients

D₉₀= 0.1980 D₈₅= 0.0940 D₆₀=
D₅₀= D₃₀= D₁₅=
D₁₀= C_u= C_c=

Classification

USCS= ML AASHTO= A-4(0)

Remarks

ASTM D6913, D4318, D2216
Moisture Content- 18.1%

Source of Sample: 3.4B Depth: 43'-45'
Sample Number: 02-042622

Date: 04-26-22

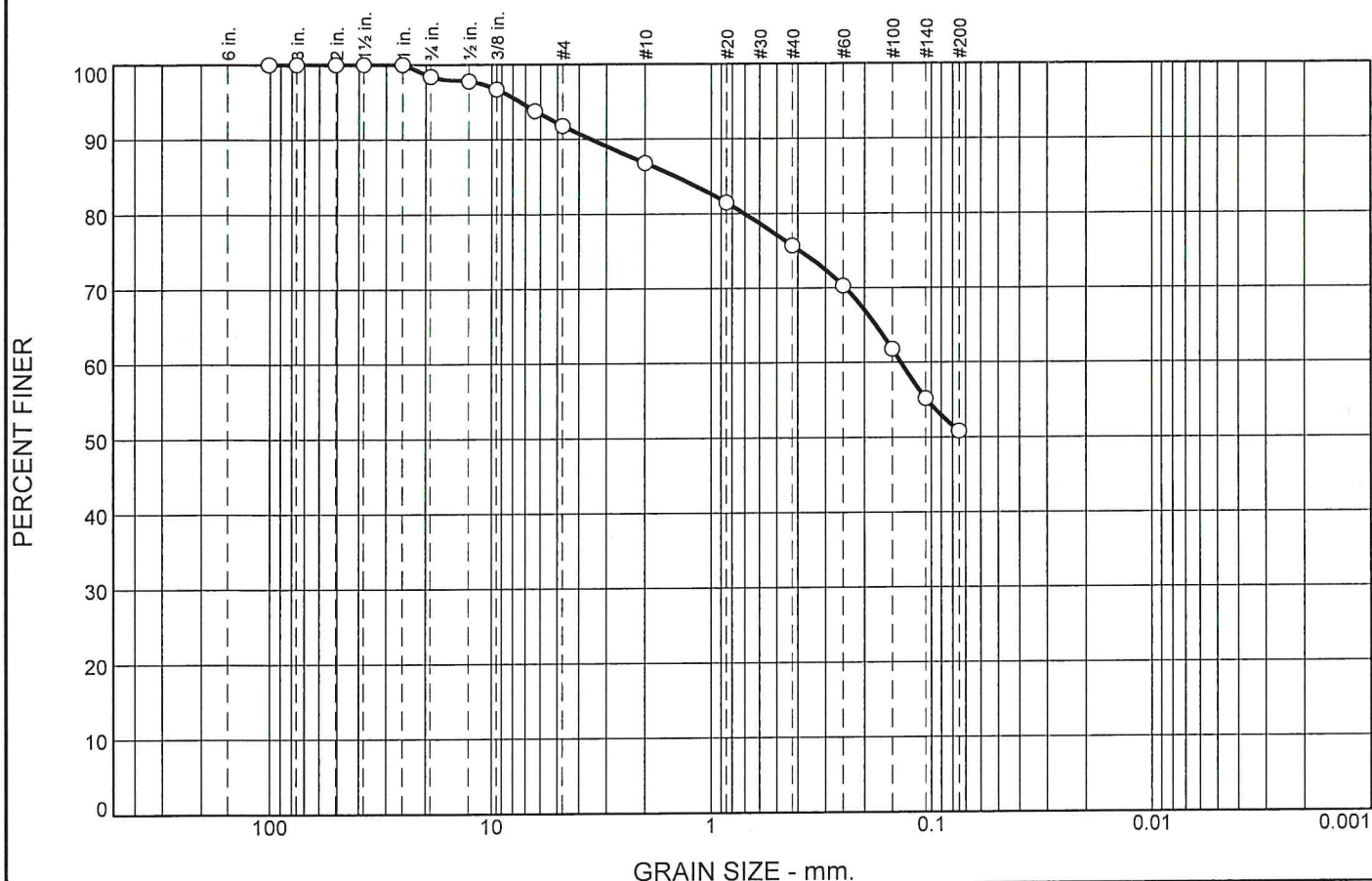
**FAIRWAY
TESTING
CO., INC.**

Client: Kiewit Engineering (NY) Corp.
Project: Champlain Hudson Power Express

Project No: K-294.9

Figure

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	1.6	6.6	5.0	11.1	24.9	50.8	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
4	100.0		
3	100.0		
2	100.0		
1.5	100.0		
1	100.0		
3/4	98.4		
1/2	97.8		
3/8	96.7		
1/4	93.8		
#4	91.8		
#10	86.8		
#20	81.5		
#40	75.7		
#60	70.3		
#100	61.8		
#140	55.2		
#200	50.8		

* (no specification provided)

Material Description

GS-26
sandy lean clay

Atterberg Limits

PL= 10 LL= 19 PI= 9

Coefficients

D₉₀= 3.5417 D₈₅= 1.4532 D₆₀= 0.1370
D₅₀= D₃₀= D₁₅=
D₁₀= C_u= C_c=

Classification

USCS= CL AASHTO= A-4(1)

Remarks

ASTM D6913, D4318, D2216
Moisture Content- 14.8%

Source of Sample: 3.4B
Sample Number: 03-042622

Depth: 65'-70'

Date: 04-26-22

**FAIRWAY
TESTING
CO., INC.**

Client: Kiewit Engineering (NY) Corp.
Project: Champlain Hudson Power Express

Project No: K-294.9

Figure



FAIRWAY TESTING

22 North Liberty Drive

P.O. Box 578

Stony Point, NY 10980

Telephone 845.942.2088

Fax 845.942.0995

Report Date: 6/20/22
Project: Champlain Hudson Power Express

Client: Kiewit Engineering (NY) Corp.
REPORT: Soil Analysis

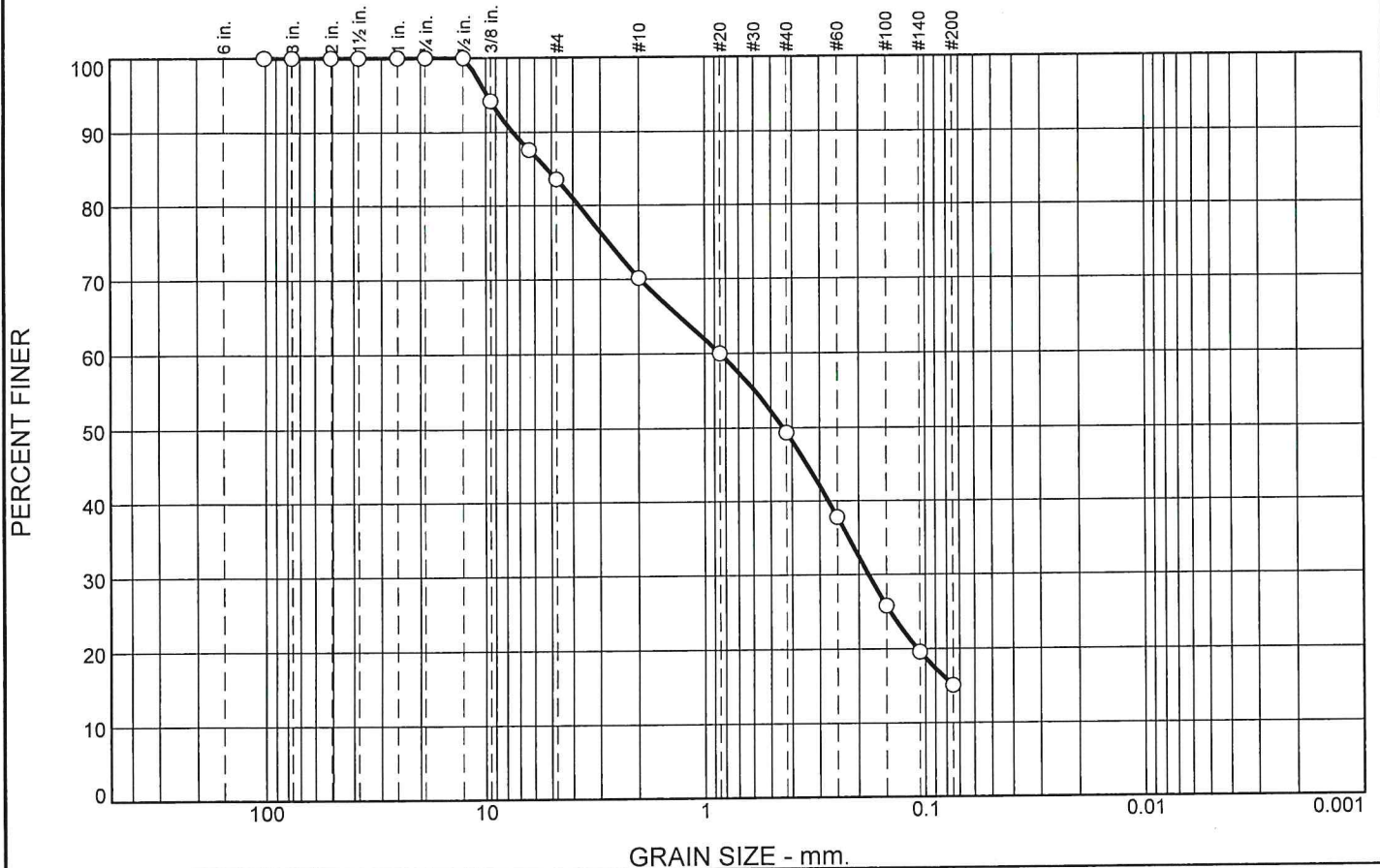
See attached reports for testing requested by the client as per attached submittals for locations K.294.9-3.6.

Respectfully Submitted,
Fairway Testing

A handwritten signature in black ink, reading 'Gabriel J. O'Connell'.

Gabriel J. O'Connell, P.E.

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	16.4	13.4	20.9	34.2	15.1	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
4	100.0		
3	100.0		
2	100.0		
1.5	100.0		
1	100.0		
3/4	100.0		
1/2	100.0		
3/8	94.2		
1/4	87.6		
#4	83.6		
#10	70.2		
#20	60.0		
#40	49.3		
#60	37.8		
#100	25.8		
#140	19.6		
#200	15.1		

* (no specification provided)

Material Description		
SS-1		
<div> <div>Atterberg Limits</div> <div> <div>PL=</div> <div>LL=</div> <div>PI=</div> </div> </div>		
<div> <div>Coefficients</div> <div> <div>D₉₀= 7.5309</div> <div>D₈₅= 5.2436</div> <div>D₆₀= 0.8500</div> <div>D₅₀= 0.4412</div> <div>D₃₀= 0.1810</div> <div>D₁₅=</div> <div>D₁₀=</div> <div>C_u=</div> <div>C_c=</div> </div> </div>		
<div> <div>Classification</div> <div> <div>USCS=</div> <div>AASHTO=</div> </div> </div>		
<div> <div>Remarks</div> <div> <div>ASTM D6913</div> <div>Moisture Content- 11.9%</div> </div> </div>		

Source of Sample: 3.6 Depth: 8'-10'
Sample Number: 01-042022

Date: 04-20-22

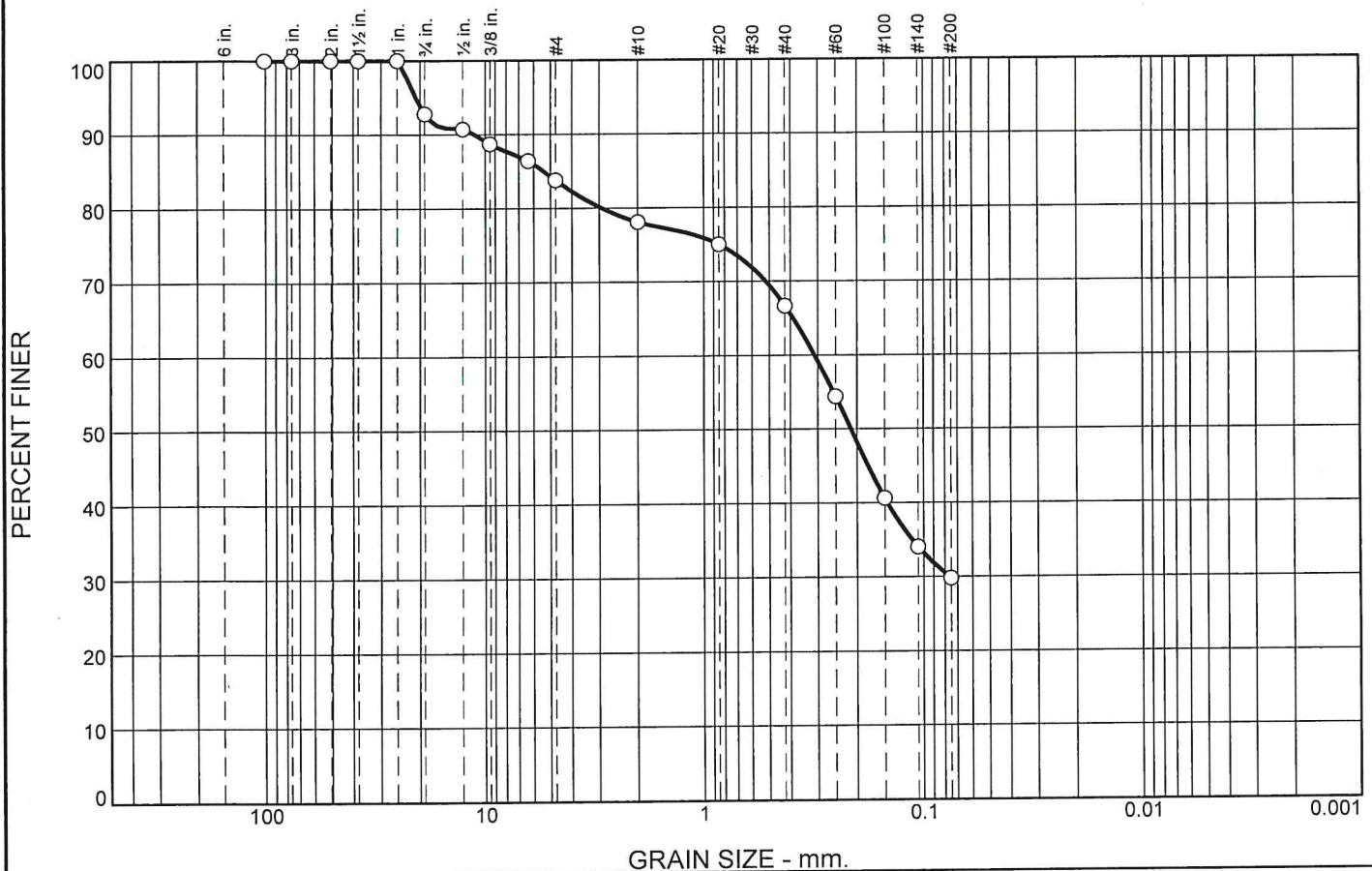
**FAIRWAY
TESTING
CO., INC.**

Client: Kiewit Engineering (NY) Corp.
Project: Champlain Hudson Power Express

Project No: K-294.9

Figure

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	7.2	9.0	5.7	11.4	36.9	29.8	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
4	100.0		
3	100.0		
2	100.0		
1.5	100.0		
1	100.0		
3/4	92.8		
1/2	90.7		
3/8	88.7		
1/4	86.4		
#4	83.8		
#10	78.1		
#20	75.0		
#40	66.7		
#60	54.4		
#100	40.6		
#140	34.0		
#200	29.8		

* (no specification provided)

Material Description

MC-1

PL=

Atterberg Limits

LL=

PI=

Coefficients

D₉₀= 11.2207

D₈₅= 5.3859

D₆₀= 0.3107

D₅₀= 0.2135

D₃₀= 0.0764

D₁₅=

D₁₀=

C_u=

C_c=

Classification

USCS=

AASHTO=

Remarks

ASTM D6913

Moisture Content- 16.1%

Source of Sample: 3.6 Depth: 21'-23'
Sample Number: 02-042022

Date: 04-20-22

**FAIRWAY
TESTING
CO., INC.**

Client: Kiewit Engineering (NY) Corp.
Project: Champlain Hudson Power Express

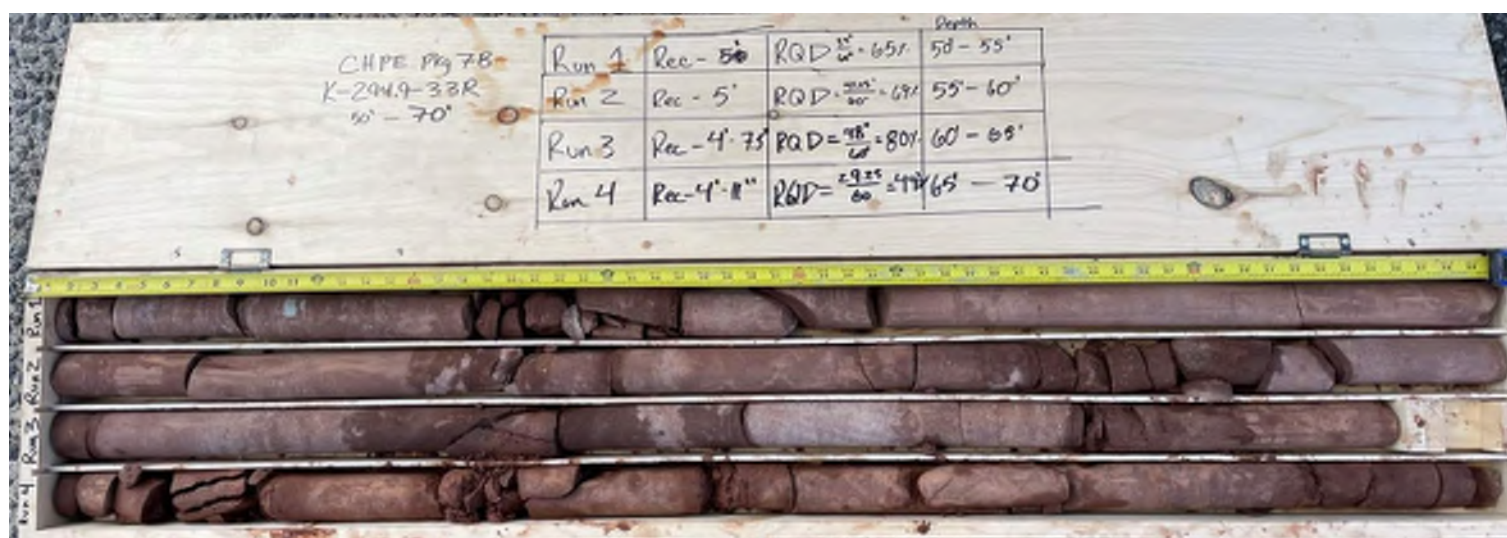
Project No: K-294.9

Figure

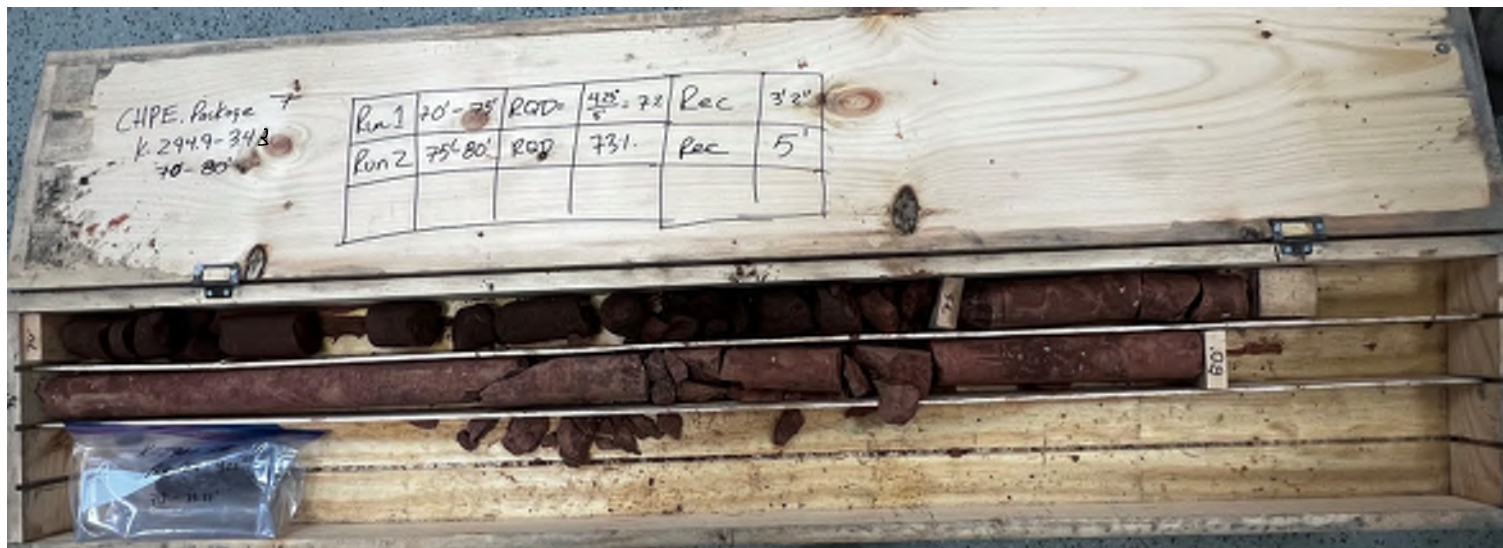
K-294.9-1.3 - Run 1 through 3



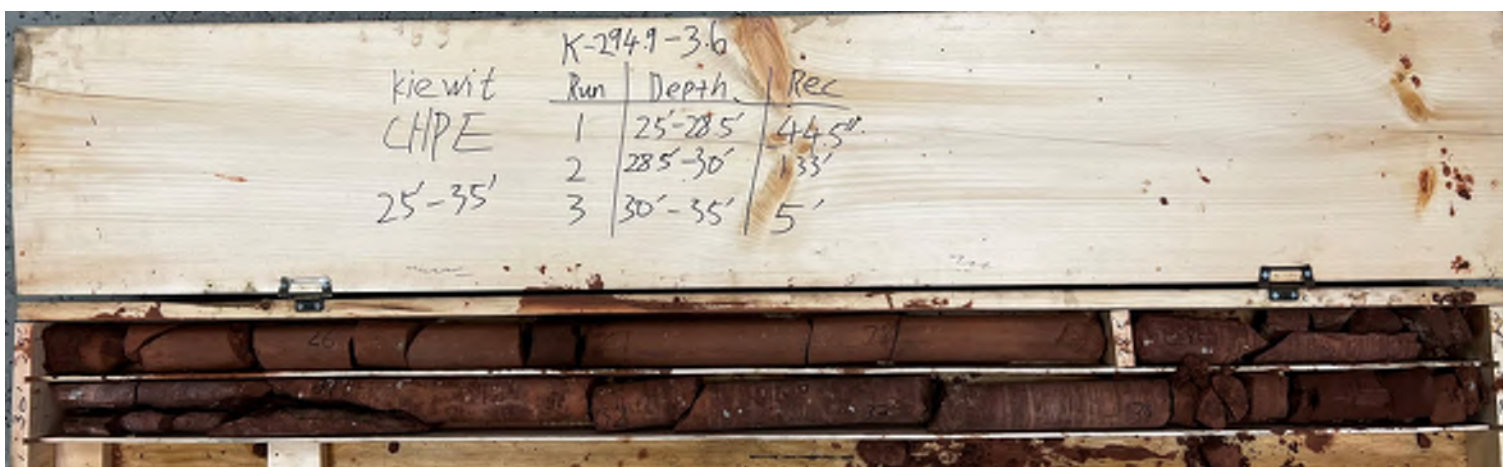
K-294.9-3.3R - Runs 1 through 4



K-294.9-3.4B - Runs 1 and 2



K-294.9-3.6 - Runs 1 through 3



**CERCHAR Abrasiveness
ASTM D7625**

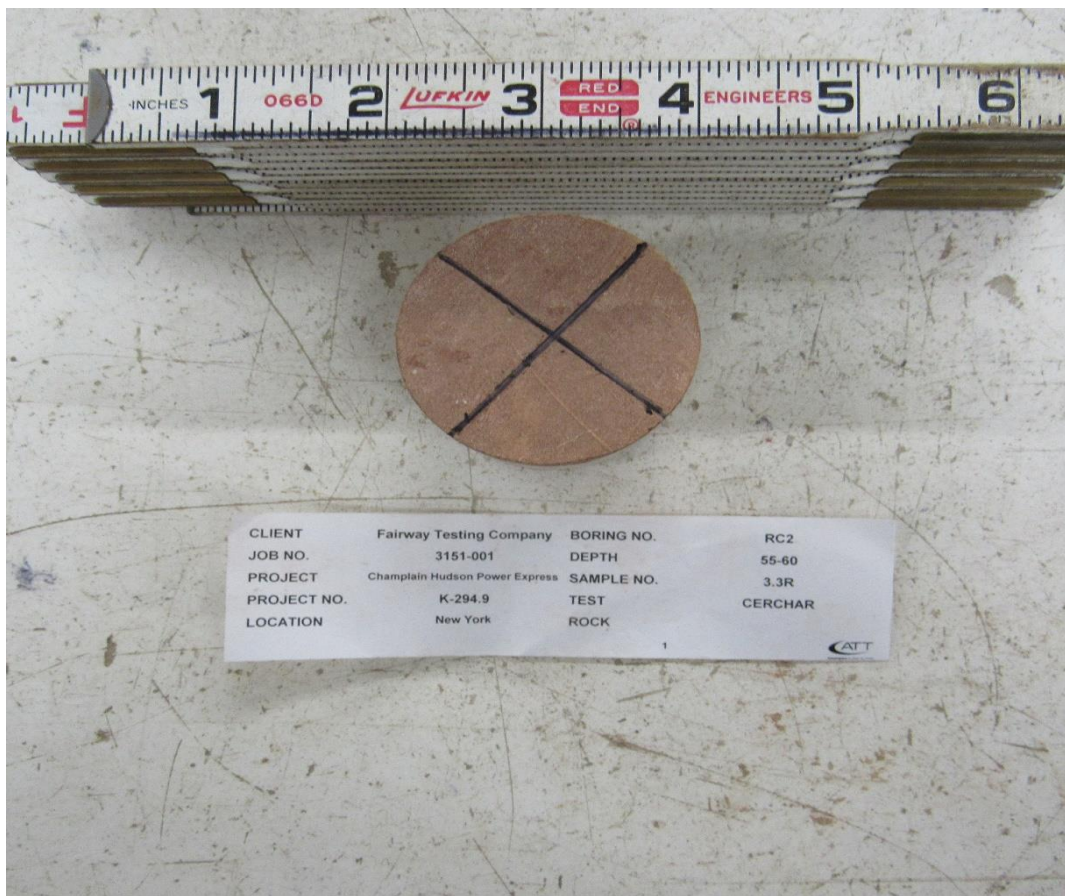
CLIENT	Fairway Testing Company			JOB NO.	3151-001
PROJECT	Champlain Hudson Power Express			LOCATION	New York
PROJECT NO.	K-294.9				
BORING NO.	RC2	RC2	RC2	RC1	
DEPTH	55.0-60.0	28.5-30.0	75.0-80.0	25.0-30.0	
SAMPLE NO.	3.3R	3.6	3.4B	4.2A	
DATE SAMPLED					
DATE TESTED	06/16/22	06/16/22	06/16/22	06/16/22	
TECHNICIAN	HN	HN	HN	HN	
ROCK TYPE					
Surface Type:	Saw Cut	Saw Cut	Saw Cut	Saw Cut	
Moisture Condition	As Received	As Received	As Received	As Received	
Reading A.1 (in):	0.00360	0.00330	0.00300	0.00330	
Reading A.2 (in):	0.00380	0.00430	0.00380	0.00350	
Reading A.3 (in):	0.00360	0.00540	0.00220	0.00420	
Reading A.4 (in):	0.00510	0.00360	0.00260	0.00300	
Reading A.5 (in):	0.00490	0.00370	0.00260	0.00430	
Reading B.1 (in):	0.00310	0.00320	0.00260	0.00370	
Reading B.2 (in):	0.00300	0.00420	0.00380	0.00350	
Reading B.3 (in):	0.00390	0.00460	0.00300	0.00320	
Reading B.4 (in):	0.00480	0.00380	0.00220	0.00500	
Reading B.5 (in):	0.00550	0.00380	0.00330	0.00420	
Average Reading (in):	0.00413	0.00399	0.00291	0.00379	
Average Reading (mm):	0.1049	0.1013	0.0739	0.0963	
Uncorrected CAI or CAI _s :	1.05	1.01	0.74	0.96	
Corrected CAI:	1.52	1.48	1.21	1.43	
NOTES	<p>CAI_s is the CAI calculated on saw cut specimens. Corrected CAI for saw cut specimens based on R. Plinger and H. Kasling Suggested formula CAI = 0.99*CAI_s + 0.48. Applied pins had a Rockwell Hardness of 54-56.</p>				
Data entry by:	HN	Date: 06/17/22			
Checked by:	DL	Date: 06/17/22			
File name:	3151001_CERCHAR ASTM D7625_0.xlsm				

CHERCHAR Abrasiveness ASTM D7625

CLIENT Fairway Testing Company
 JOB NO. 3151-001
 PROJECT Champlain Hudson Power Express
 PROJECT NO. K-294.9
 LOCATION New York

BORING NO. RC2
 DEPTH 55.0-60.0
 SAMPLE NO. 3.3R
 DATE SAMPLED --
 DATE TESTED 06/16/22
 TECHNICIAN HN
 ROCK TYPE --

Before Picture



NOTES

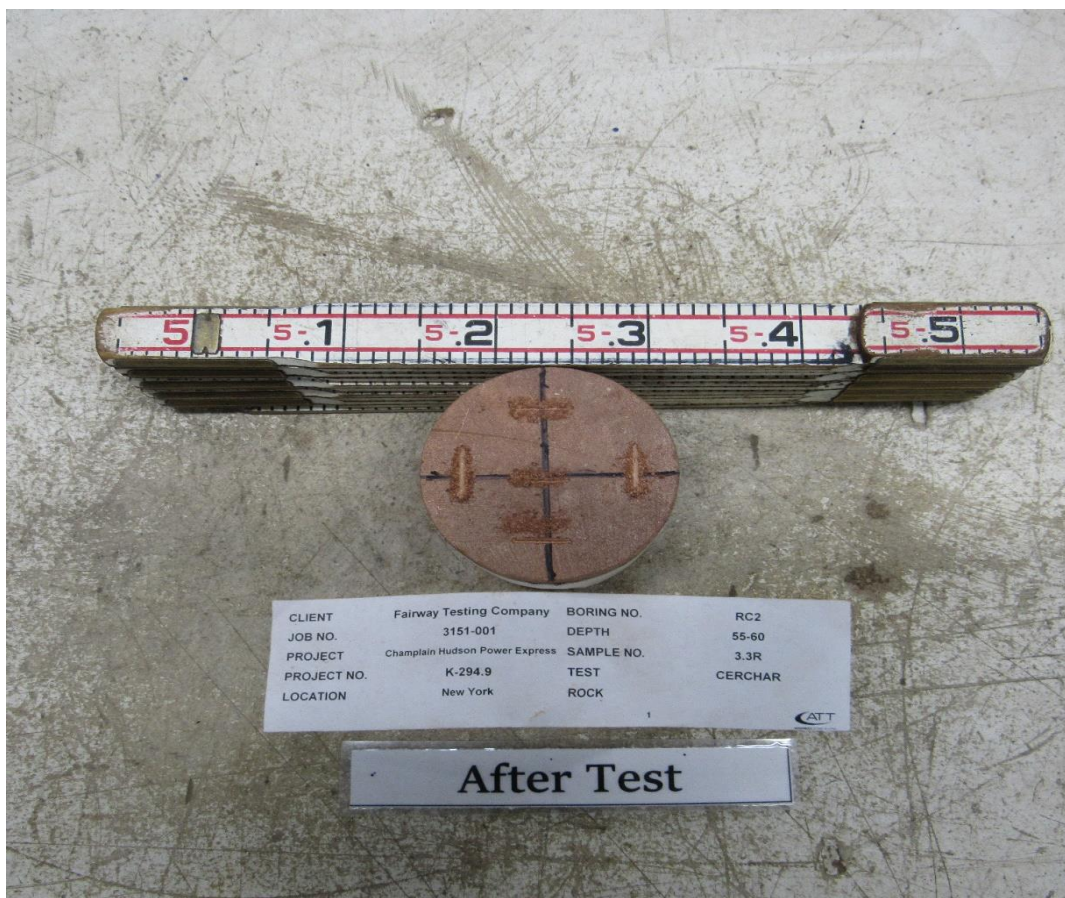
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CHERCHAR Abrasiveness ASTM D7625

CLIENT Fairway Testing Company
 JOB NO. 3151-001
 PROJECT Champlain Hudson Power Express
 PROJECT NO. K-294.9
 LOCATION New York

BORING NO. RC2
 DEPTH 55.0-60.0
 SAMPLE NO. 3.3R
 DATE SAMPLED --
 DATE TESTED 06/16/22
 TECHNICIAN HN
 ROCK TYPE --

After Picture



NOTES

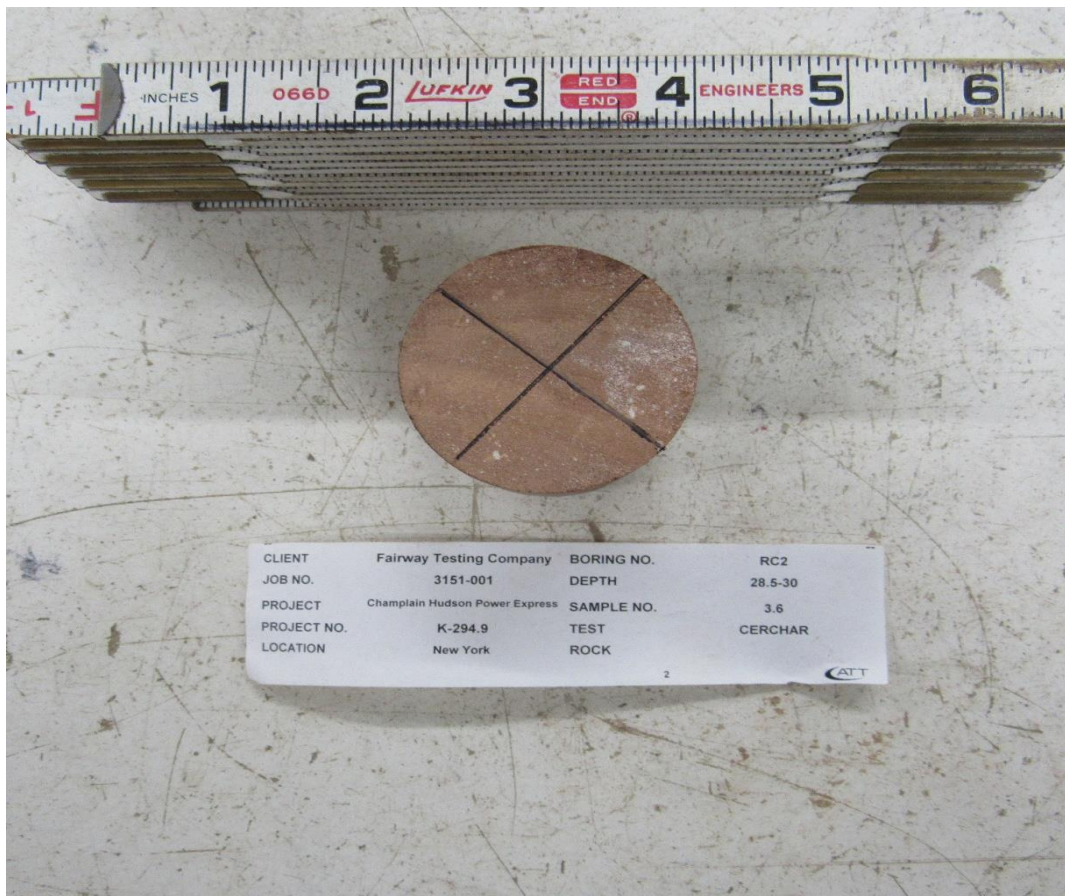
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CHERCHAR Abrasiveness ASTM D7625

CLIENT Fairway Testing Company
 JOB NO. 3151-001
 PROJECT Champlain Hudson Power Express
 PROJECT NO. K-294.9
 LOCATION New York

BORING NO. RC2
 DEPTH 28.5-30.0
 SAMPLE NO. 3.6
 DATE SAMPLED --
 DATE TESTED 06/16/22
 TECHNICIAN HN
 ROCK TYPE --

Before Picture



NOTES

Picture File: 2.JPG
 File name: 3151001__CHERCHAR ASTM D7625_0.xlsm

CHERCHAR Abrasiveness ASTM D7625

CLIENT Fairway Testing Company
 JOB NO. 3151-001
 PROJECT Champlain Hudson Power Express
 PROJECT NO. K-294.9
 LOCATION New York

BORING NO. RC2
 DEPTH 28.5-30.0
 SAMPLE NO. 3.6
 DATE SAMPLED --
 DATE TESTED 06/16/22
 TECHNICIAN HN
 ROCK TYPE --

After Picture



After Test

NOTES

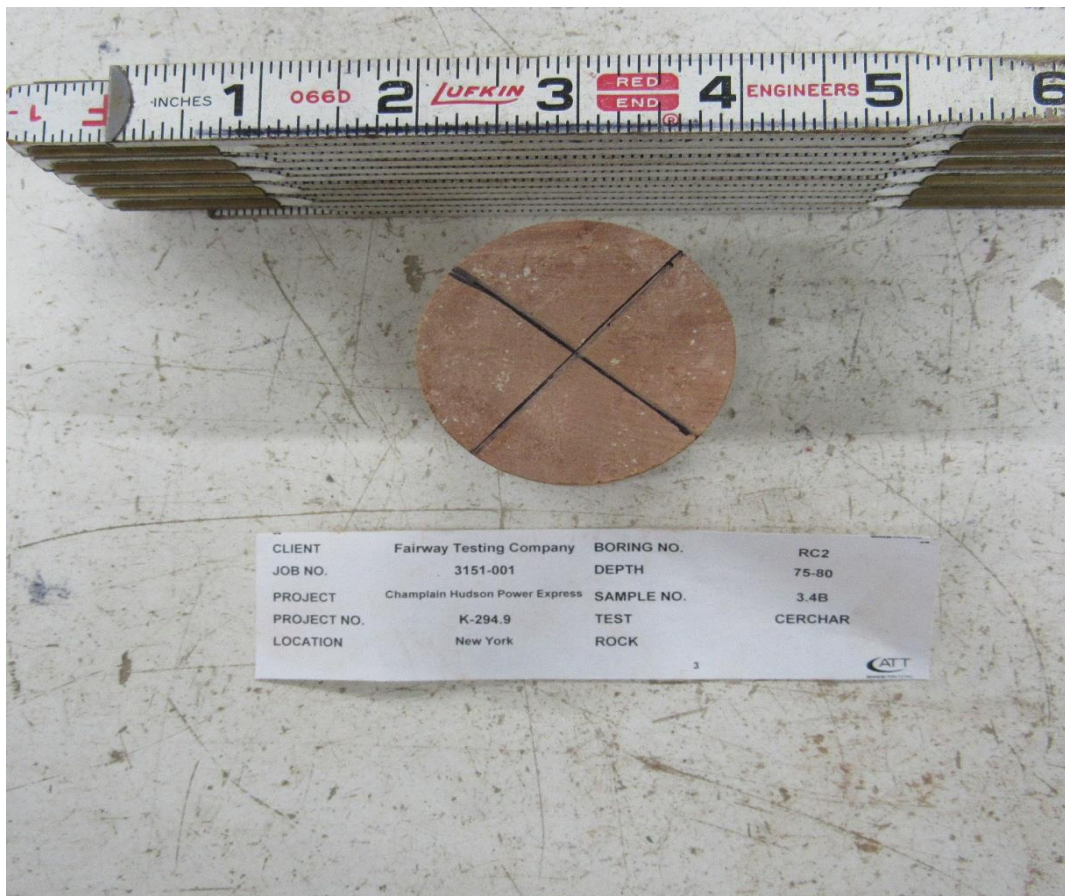
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CHERCHAR Abrasiveness ASTM D7625

CLIENT Fairway Testing Company
 JOB NO. 3151-001
 PROJECT Champlain Hudson Power Express
 PROJECT NO. K-294.9
 LOCATION New York

BORING NO. RC2
 DEPTH 75.0-80.0
 SAMPLE NO. 3.4B
 DATE SAMPLED --
 DATE TESTED 06/16/22
 TECHNICIAN HN
 ROCK TYPE --

Before Picture



NOTES

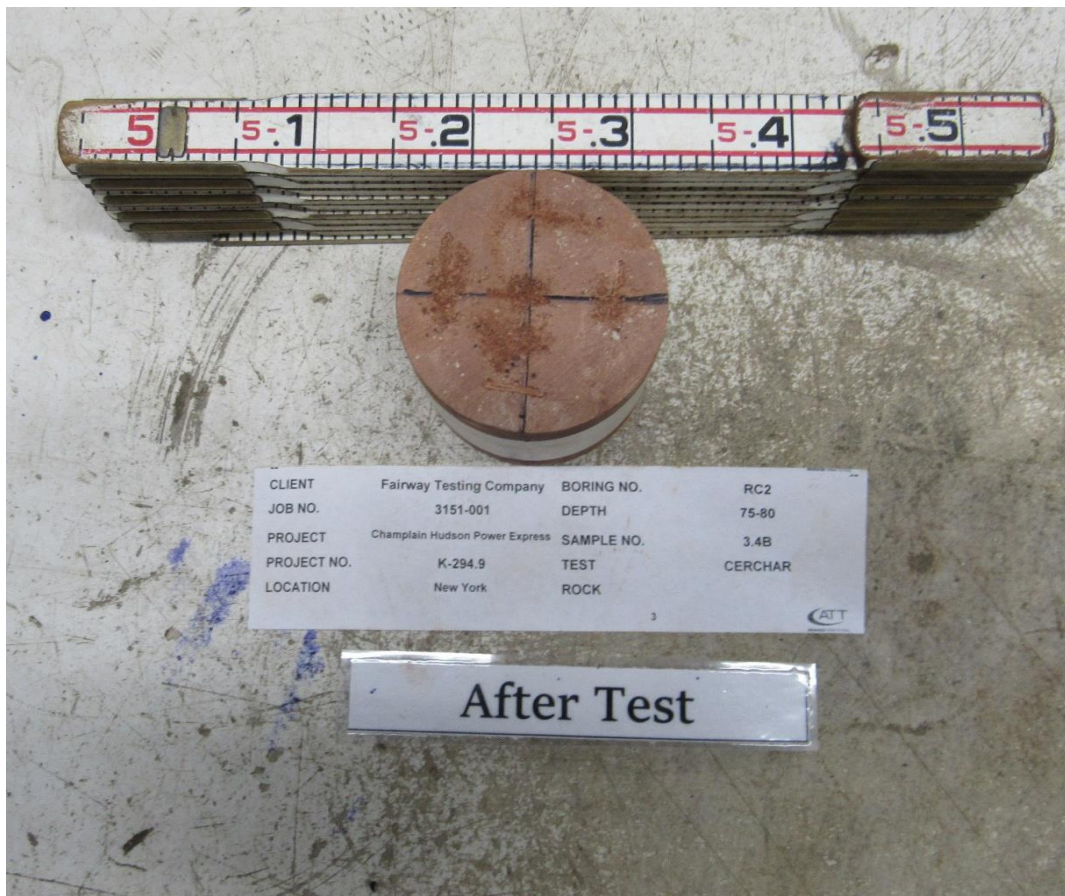
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 File name: 3151001__CHERCHAR ASTM D7625_0.xlsm

**CHERCHAR Abrasiveness
ASTM D7625**

CLIENT Fairway Testing Company
 JOB NO. 3151-001
 PROJECT Champlain Hudson Power Express
 PROJECT NO. K-294.9
 LOCATION New York

BORING NO. RC2
 DEPTH 75.0-80.0
 SAMPLE NO. 3.4B
 DATE SAMPLED --
 DATE TESTED 06/16/22
 TECHNICIAN HN
 ROCK TYPE --

After Picture



NOTES

Picture File: 3a.JPG
 File name: 3151001__CHERCHAR ASTM D7625_0.xlsm

Splitting Tensile Strength ASTM D3967

CLIENT	Fairway Testing Company	JOB NO.	3151-001		
PROJECT	Champlain Hudson Power Express	LOCATION	New York		
PROJECT NO.	K-294.9				

BORING NO.	RC2	RC2	RC2	RC1	RC3
DEPTH	55-60	28.5-30	75-80	25-30	21-26
SAMPLE NO.	3.3R	3.6	3.4B	4.2A	0.7
DATE SAMPLED					
DATE TESTED	06/16/22	06/16/22	06/16/22	06/16/22	06/16/22
TECHNICIAN	DL	DL	DL	DL	DL
ROCK TYPE					

Diameter (in):	1.971	1.982	1.979	1.966	1.989
Height (in):	0.999	1.018	1.084	1.093	1.036
Mass of Wet Rock (g):	127.50	131.70	134.40	137.10	138.20
Wet Density (lbs/ft³):	159.4	159.7	153.6	157.4	163.6
Wet Density (g/cm³):	2.553	2.559	2.460	2.522	2.620
Peak Load (lbs):	3099	1286	1128	2924	4536
Splitting Tensile Strength (psi):	1002	406	335	866	1401
Splitting Tensile Strength (kPa):	6907	2799	2307	5972	9662
Failure Type:	Single Plane	Single Plane	Multiple Plane	Single Plane	Single Plane

BORING NO.	
DEPTH	
SAMPLE NO.	
DATE SAMPLED	
DATE TESTED	
TECHNICIAN	
ROCK TYPE	

Diameter (in):	
Height (in):	
Mass of Wet Rock (g):	
Wet Density (lbs/ft³):	
Wet Density (g/cm³):	
Peak Load (lbs):	
Splitting Tensile Strength (psi):	
Splitting Tensile Strength (kPa):	
Failure Type:	

NOTES	
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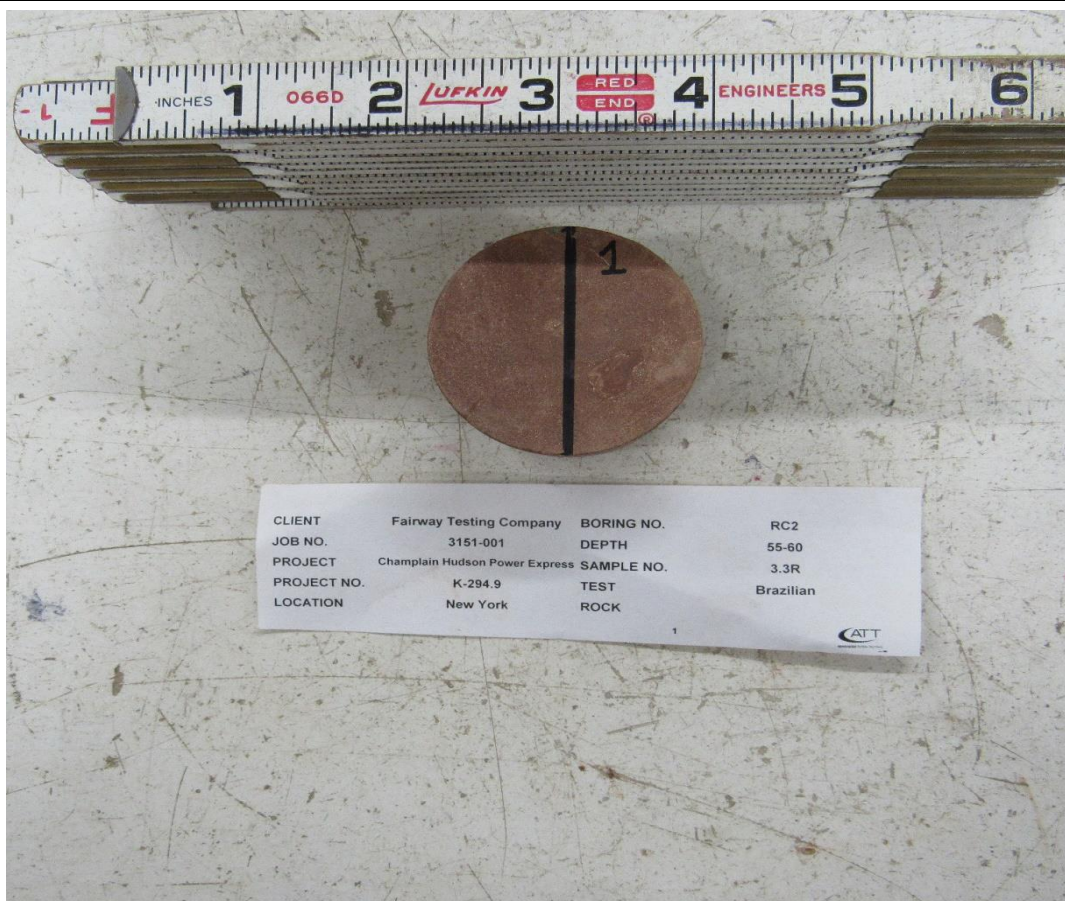
Data entry by:	DL		Date: 06/16/22
Checked by:	HN		Date: 06/17/22
File name:	3151001_Brazilian ASTM D3967_0.xlsm		

Splitting Tensile ASTM D3967

CLIENT Fairway Testing Company
 JOB NO. 3151-001
 PROJECT Champlain Hudson Power Express
 PROJECT NO. K-294.9
 LOCATION New York

BORING NO. RC2
 DEPTH 55-60
 SAMPLE NO. 3.3R
 DATE SAMPLED
 DATE TESTED 06/16/22
 TECHNICIAN DL
 ROCK TYPE

Before Picture



NOTES

Picture File: 1.JPG
 File name: 3151001__Brazilian ASTM D3967_0.xlsm

Splitting Tensile ASTM D3967

CLIENT	Fairway Testing Company	BORING NO.	RC2
JOB NO.	3151-001	DEPTH	55-60
PROJECT	Champlain Hudson Power Express	SAMPLE NO.	3.3R
PROJECT NO.	K-294.9	DATE SAMPLED	
LOCATION	New York	DATE TESTED	06/16/22
		TECHNICIAN	DL
		ROCK TYPE	

After Picture



NOTES

Picture File: 1a.JPG
 File name: 3151001__Brazilian ASTM D3967_0.xlsm

Splitting Tensile ASTM D3967

CLIENT Fairway Testing Company
 JOB NO. 3151-001
 PROJECT Champlain Hudson Power Express
 PROJECT NO. K-294.9
 LOCATION New York

BORING NO. RC2
 DEPTH 28.5-30
 SAMPLE NO. 3.6
 DATE SAMPLED
 DATE TESTED 06/16/22
 TECHNICIAN DL
 ROCK TYPE

Before Picture



NOTES

Picture File: 2.JPG
 File name: 3151001__Brazilian ASTM D3967_0.xlsm

Splitting Tensile ASTM D3967

CLIENT Fairway Testing Company
 JOB NO. 3151-001
 PROJECT Champlain Hudson Power Express
 PROJECT NO. K-294.9
 LOCATION New York

BORING NO. RC2
 DEPTH 28.5-30
 SAMPLE NO. 3.6
 DATE SAMPLED
 DATE TESTED 06/16/22
 TECHNICIAN DL
 ROCK TYPE

After Picture



NOTES

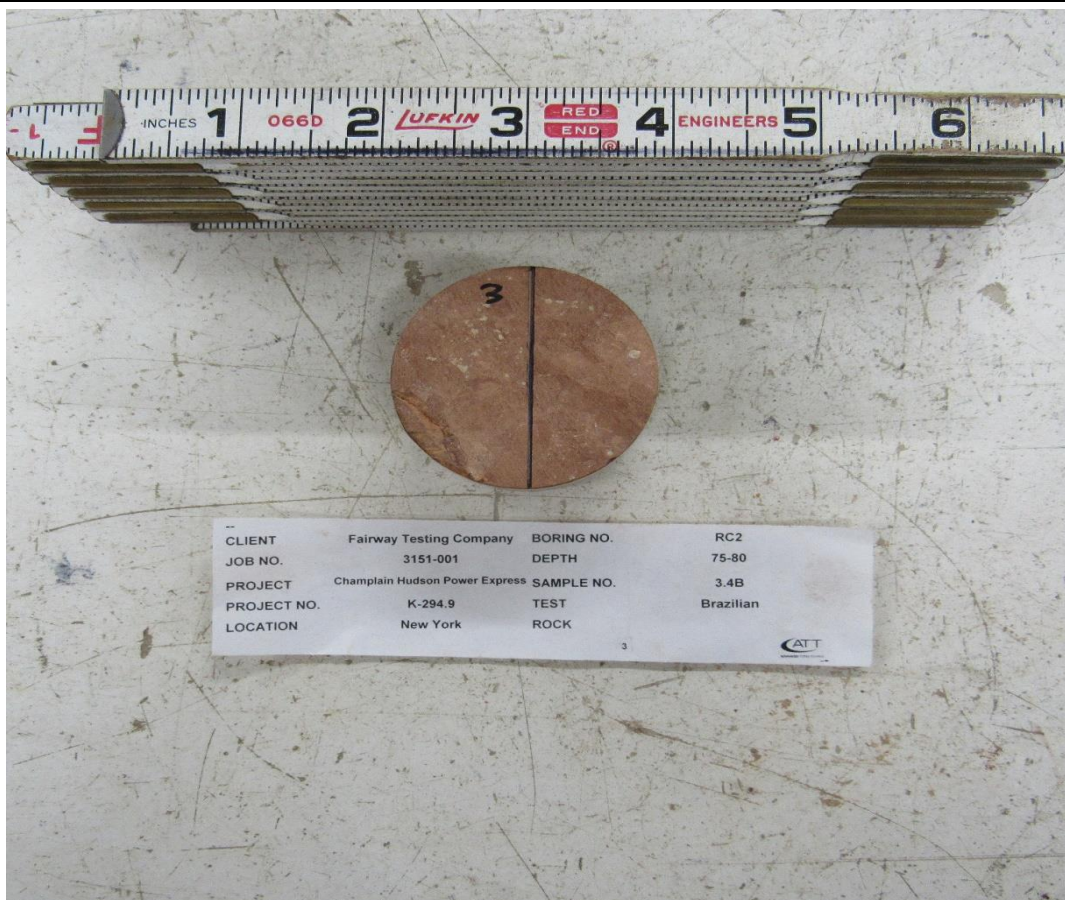
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Splitting Tensile ASTM D3967

CLIENT Fairway Testing Company
 JOB NO. 3151-001
 PROJECT Champlain Hudson Power Express
 PROJECT NO. K-294.9
 LOCATION New York

BORING NO. RC2
 DEPTH 75-80
 SAMPLE NO. 3.4B
 DATE SAMPLED
 DATE TESTED 06/16/22
 TECHNICIAN DL
 ROCK TYPE

Before Picture



NOTES

Picture File: 3.JPG
 File name: 3151001__Brazilian ASTM D3967_0.xlsm

Splitting Tensile ASTM D3967

CLIENT Fairway Testing Company
 JOB NO. 3151-001
 PROJECT Champlain Hudson Power Express
 PROJECT NO. K-294.9
 LOCATION New York

BORING NO. RC2
 DEPTH 75-80
 SAMPLE NO. 3.4B
 DATE SAMPLED
 DATE TESTED 06/16/22
 TECHNICIAN DL
 ROCK TYPE

After Picture



NOTES

Picture File: 3a.JPG
 File name: 3151001__Brazilian ASTM D3967_0.xlsm

Unconfined Compressive Strength ASTM D7012 Method C

CLIENT	Fairway Testing Company	JOB NO.	3151-001		
PROJECT	Champlain Hudson Power Express	LOCATION	New York		
PROJECT NO.	K-294.9				
BORING NO.	RC2	RC2	RC2	RC1	RC3
DEPTH	55-60	28.5-30	75-80	25-30	21-26
SAMPLE NO.	3.3R	3.6	3.4B	4.2A	0.7
DATE SAMPLED					
DATE TESTED	06/17/22	06/17/22	06/17/22	06/17/22	06/17/22
TECHNICIAN	DL	DL	DL	DL	DL
ROCK TYPE					
Diameter (in):	1.975	1.975	1.973	1.974	1.982
Height (in):	4.194	3.954	4.075	4.321	3.977
Mass of Wet Rock (g):	527.20	511.20	525.10	550.40	542.30
Wet Density (lbs/ft³):	156.3	160.8	160.6	158.6	168.4
Wet Density (g/cm³):	2.50	2.58	2.57	2.54	2.70
Peak Load (lbs):	38252	19993	14999	28736	28043
Compressive Strength (psi)	12486	6526	4906	9389	9089
Compressive Strength (MPa)	86	45	34	65	63
Failure Type:	Shear / Fracture	Fracture / Void	Shear	Fracture / Bedding	Fracture / Bedding
BORING NO.					
DEPTH					
SAMPLE NO.					
DATE SAMPLED					
DATE TESTED					
TECHNICIAN					
ROCK TYPE					
Diameter (in):					
Height (in):					
Mass of Wet Rock (g):					
Wet Density (lbs/ft³):					
Wet Density (g/cm³):					
Peak Load (lbs):					
Compressive Strength (psi)					
Compressive Strength (MPa)					
Failure Type:					
NOTES					
Data entry by:	DL			Date: 06/17/22	
Checked by:	HN			Date: 06/17/22	
File name:	3151001_Rock UCS-TCS ASTM D7012 Method A and C_0.xlsm				

Unconfined Compressive Strength ASTM D7012 Method C

CLIENT	Fairway Testing Company	BORING NO.	RC2
JOB NO.	3151-001	DEPTH	55-60
PROJECT	Champlain Hudson Power Express	SAMPLE NO.	3.3R
PROJECT NO.	K-294.9	DATE SAMPLED	
LOCATION	New York	DATE TESTED	06/17/22
		TECHNICIAN	DL
		ROCK TYPE	

Before Picture



NOTES

Picture File: 1.JPG
 File name: 3151001__Rock UCS-TCS ASTM D7012 Method A and C_0.xlsm

Unconfined Compressive Strength ASTM D7012 Method C

CLIENT	Fairway Testing Company	BORING NO.	RC2
JOB NO.	3151-001	DEPTH	55-60
PROJECT	Champlain Hudson Power Express	SAMPLE NO.	3.3R
PROJECT NO.	K-294.9	DATE SAMPLED	
LOCATION	New York	DATE TESTED	06/17/22
		TECHNICIAN	DL
		ROCK TYPE	

After Picture



NOTES

Picture File: 1a.JPG
 File name: 3151001__Rock UCS-TCS ASTM D7012 Method A and C_0.xlsm

Unconfined Compressive Strength ASTM D7012 Method C

CLIENT Fairway Testing Company
 JOB NO. 3151-001
 PROJECT Champlain Hudson Power Express
 PROJECT NO. K-294.9
 LOCATION New York

BORING NO. RC2
 DEPTH 28.5-30
 SAMPLE NO. 3.6
 DATE SAMPLED
 DATE TESTED 06/17/22
 TECHNICIAN DL
 ROCK TYPE

Before Picture



NOTES

Picture File: 2.JPG
 File name: 3151001__Rock UCS-TCS ASTM D7012 Method A and C_0.xlsm

Unconfined Compressive Strength ASTM D7012 Method C

CLIENT Fairway Testing Company
 JOB NO. 3151-001
 PROJECT Champlain Hudson Power Express
 PROJECT NO. K-294.9
 LOCATION New York

BORING NO. RC2
 DEPTH 28.5-30
 SAMPLE NO. 3.6
 DATE SAMPLED
 DATE TESTED 06/17/22
 TECHNICIAN DL
 ROCK TYPE

After Picture



NOTES

Picture File: 2a.JPG
 File name: 3151001__Rock UCS-TCS ASTM D7012 Method A and C_0.xlsm

Unconfined Compressive Strength ASTM D7012 Method C

CLIENT Fairway Testing Company
 JOB NO. 3151-001
 PROJECT Champlain Hudson Power Express
 PROJECT NO. K-294.9
 LOCATION New York

BORING NO. RC2
 DEPTH 75-80
 SAMPLE NO. 3.4B
 DATE SAMPLED
 DATE TESTED 06/17/22
 TECHNICIAN DL
 ROCK TYPE

Before Picture



CLIENT Fairway Testing Company BORING NO. RC2
 JOB NO. 3151-001 DEPTH 75-80
 PROJECT Champlain Hudson Power Express SAMPLE NO. 3.4B
 PROJECT NO. K-294.9 TEST UCS
 LOCATION New York ROCK

NOTES

Picture File: 3.JPG
 File name: 3151001__Rock UCS-TCS ASTM D7012 Method A and C_0.xlsm

Unconfined Compressive Strength ASTM D7012 Method C

CLIENT Fairway Testing Company
 JOB NO. 3151-001
 PROJECT Champlain Hudson Power Express
 PROJECT NO. K-294.9
 LOCATION New York

BORING NO. RC2
 DEPTH 75-80
 SAMPLE NO. 3.4B
 DATE SAMPLED
 DATE TESTED 06/17/22
 TECHNICIAN DL
 ROCK TYPE

After Picture



NOTES

Picture File: 3a.JPG
 File name: 3151001__Rock UCS-TCS ASTM D7012 Method A and C_0.xlsm

DATE: July 14, 2022

TO: Zachary Bauer; Tetra Tech Rooney

FROM: Matthew Hawley, P.E.; Kiewit Engineering (NY) Corp. **mkh**
Jaren Knighton; Kiewit Engineering (NY) Corp.

SUBJECT: Geotechnical Data: Segment 12 - Package 7B - HDD Crossing 131
Champlain Hudson Power Express Project
Haverstraw, New York

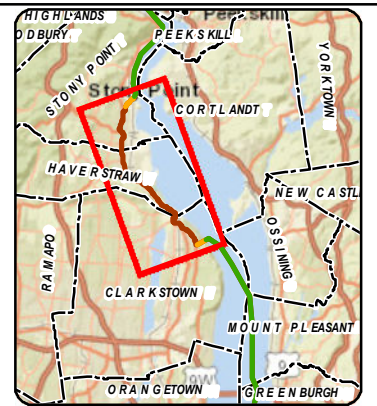
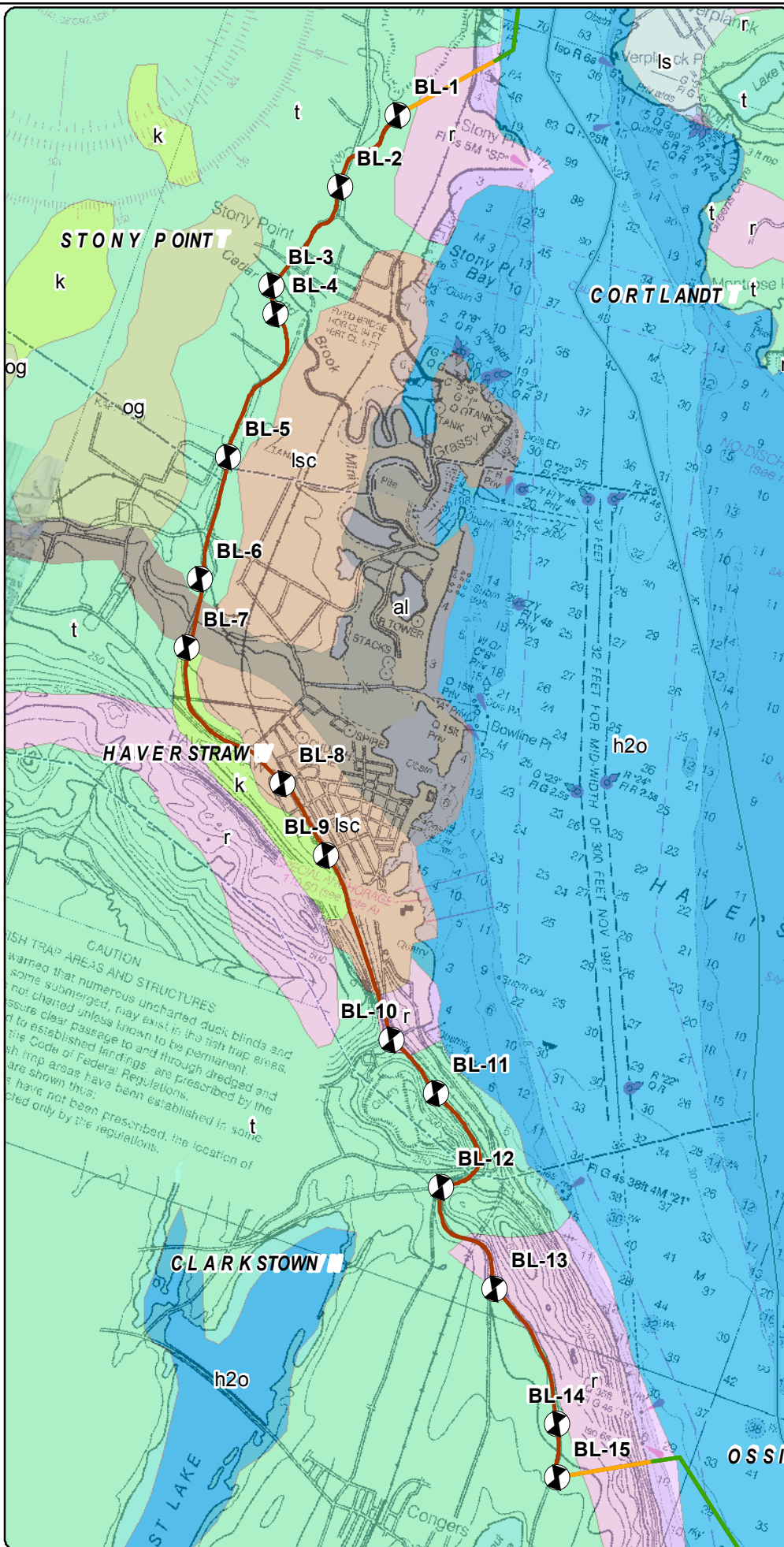
Kiewit Engineering is providing the attached geotechnical data for use in the horizontal direction drill (HDD) design for the Champlain Hudson Power Express project in Upstate New York. This HDD crossing is located in Haverstraw, New York. The approximate station for the start of HDD crossing number 131 is STA 72656+00 (41.2010° N, 73.9835° W).

The geotechnical data at this HDD crossing is attached. The available data is taken from the data from a recent investigation by Kiewit, referenced below.

- Kiewit Engineering (NY) Corp., Segment 12 Package 7B HDD Borings - Rockland, Champlain-Hudson Power Express, dated July 5, 2022.

Contact us if you have questions or require additional information.

HDD 131
Borings K-294.9-3.6, K-294.9-3.7,
K-294.9-3.8, K-294.9-3.8R
Segment 12 - Design Package 7B



LEGEND

- Approximate Boring Locations
 - Terrestrial Route HVDC
 - Submarine Route HVDC
 - Terrestrial Route HVAC
 - Preliminary HDD Locations
 - Preliminary Pipe Bridge Location
- Surficial Geology**
- af- Artificial fill
 - al- Recent alluvium, fine sand to gravel
 - alf- Alluvial fan
 - b- Beach, sand and gravel deposit at marine shorelines
 - bi- Barrier island, sand and gravel deposit as barrier islands
 - h2o- Water
 - k- Kame deposits, coarse to fine gravel and/or sand
 - km- Kame moraine, variable texture from boulders to sand
 - ld- Lacustrine delta, coarse to fine gravel and sand
 - ls- Lacustrine sand, generally quartz sand, well sorted, stratified
 - lsc- Lacustrine silt and clay, generally laminated silt and clay
 - og- Outwash sand and gravel, coarse to fine gravel with sand
 - pm- Swamp deposits, peat-muck, organic silt and sand in poorly drained area
 - r- Bedrock, exposed or generally within 1 meter of surface
 - t- Till, variable texture (boulders to silt)
 - tm- Till moraine, variable texture (size and sorting)
- [] Town Boundary
 [] County Boundary



0.35 0.175 0 0.35 Miles



Champlain Hudson Power Express Project

Champlain Hudson Power Express Inc.

FIGURE 3

Surficial Geology and Geotechnical Borings

Prepared on 8/25/2020

by: **AECOM**

