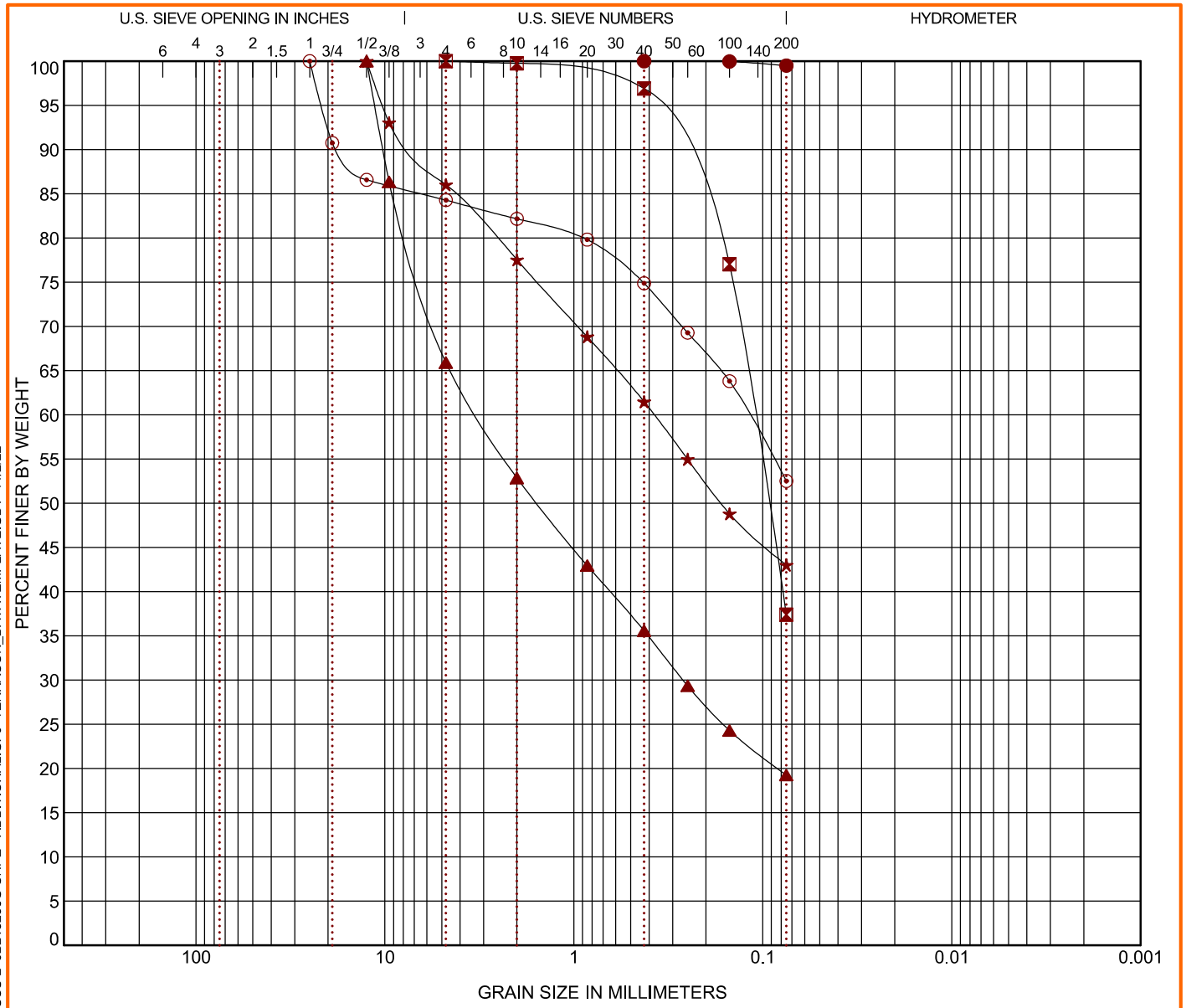
GRAIN SIZE DISTRIBUTION

ASTM D422 / ASTM C136



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Boring ID	Depth (Ft)	USCS Classification	WC (%)	LL	PL	PI	Cc	Cu
●	KB-135.8	40 - 42	LEAN CLAY (CL)	28.3	28	17	11		
⊠	KB-160.6	2 - 4	SILTY SAND (SM)	12.2					
▲	KB-163.1	4 - 6	SILTY SAND with GRAVEL (SM)	11.7					
★	KB-163.2	8 - 10	SILTY SAND (SM)	12.1					
⊙	KB-169.0-3.3	6 - 8	SILTY SAND with GRAVEL (SM)	12.0					

	Boring ID	Depth (Ft)	D_{100}	D_{60}	D_{30}	D_{10}	%Cobbles	%Gravel	%Sand	%Silt	%Fines	%Clay
●	KB-135.8	40 - 42	0.425				0.0	0.0	0.5		99.5	
⊠	KB-160.6	2 - 4	4.75	0.111			0.0	0.0	62.6		37.4	
▲	KB-163.1	4 - 6	12.5	3.213	0.264		0.0	34.1	46.6		19.3	
★	KB-163.2	8 - 10	12.5	0.376			0.0	14.0	43.0		43.0	
⊙	KB-169.0-3.3	6 - 8	25	0.119			0.0	15.7	31.8		52.5	

PROJECT: CHPE - Additional HDD Borings - Phase 3

PROJECT NUMBER: JB215256G

SITE: Fort Ann to Coxsackie, NY

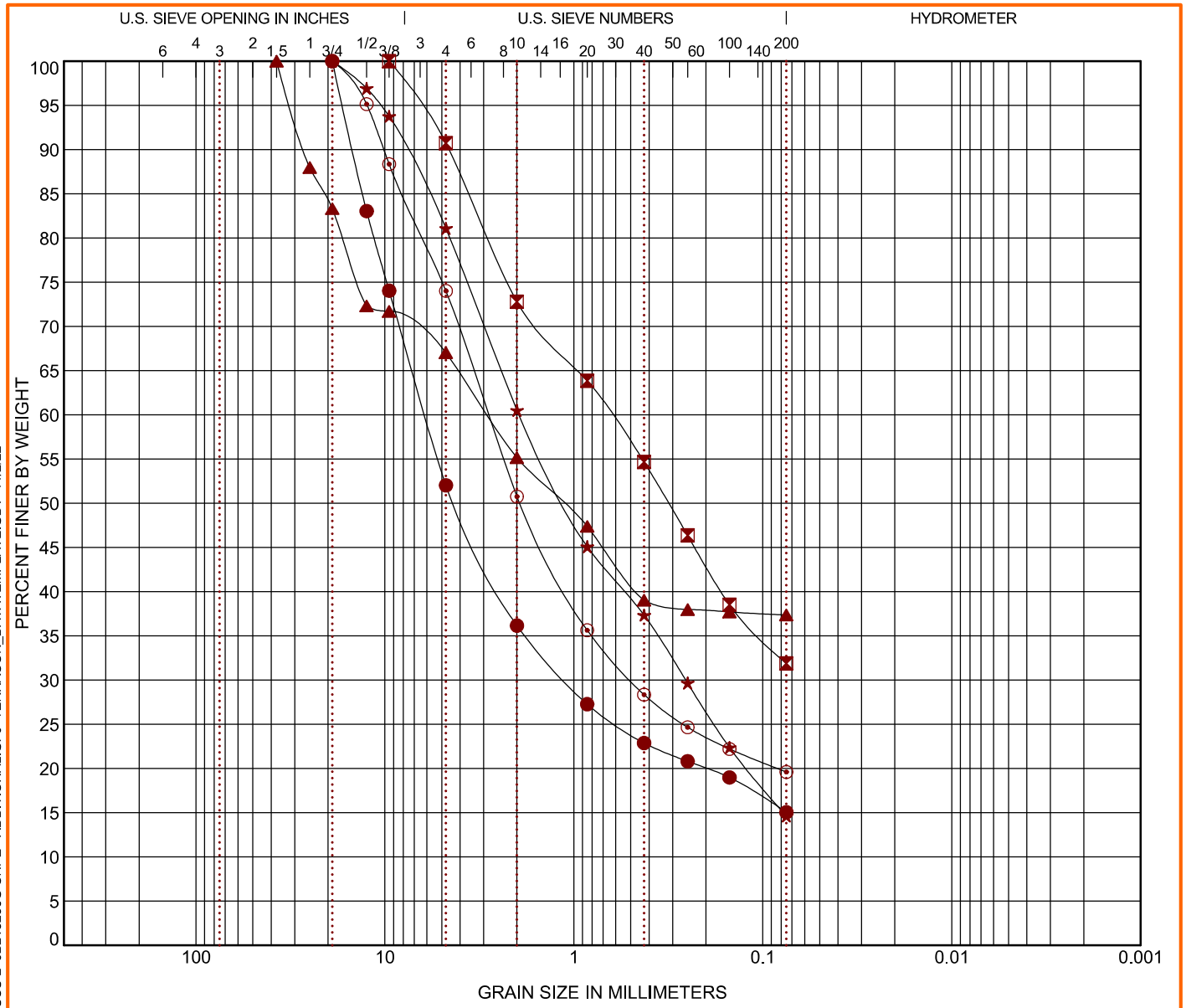
30 Corporate Cir Ste 201
Albany, NY

CLIENT: Kiewit Engineering (NY) Corp
Lone Tree, CO

LABORATORY TESTS ARE NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GRAIN SIZE: USCS-2 JB215256G CHPE - ADDITIONAL.GPJ TERRACON_DATATEMPLATE.GDT 11/2/22

GRAIN SIZE DISTRIBUTION

ASTM D422 / ASTM C136



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Boring ID	Depth (Ft)	USCS Classification	WC (%)	LL	PL	PI	Cc	Cu
●	KB-169.0-3.3	25 - 27	SILTY GRAVEL with SAND (GM)	11.5					
⊠	KB-169.0-3.3	35 - 37	SILTY SAND (SM)	8.4					
▲	KB-177.1	10 - 12	SANDY SILT with GRAVEL (ML)	8.9					
★	KB-177.1	25 - 27	SILTY SAND with GRAVEL (SM)	11.5					
⊙	KB-177.1	40 - 42	SILTY SAND with GRAVEL (SM)	11.2					

	Boring ID	Depth (Ft)	D_{100}	D_{60}	D_{30}	D_{10}	%Cobbles	%Gravel	%Sand	%Silt	%Fines	%Clay
●	KB-169.0-3.3	25 - 27	19	6.106	1.106		0.0	48.0	37.0		15.0	
⊠	KB-169.0-3.3	35 - 37	9.5	0.636			0.0	9.3	58.9		31.9	
▲	KB-177.1	10 - 12	37.5	2.846			0.0	33.0	29.7		37.4	
★	KB-177.1	25 - 27	19	1.944	0.256		0.0	18.9	66.5		14.6	
⊙	KB-177.1	40 - 42	19	2.821	0.498		0.0	26.0	54.4		19.6	

PROJECT: CHPE - Additional HDD Borings - Phase 3

PROJECT NUMBER: JB215256G

SITE: Fort Ann to Coxsackie, NY

30 Corporate Cir Ste 201
Albany, NY

CLIENT: Kiewit Engineering (NY) Corp
Lone Tree, CO

LABORATORY TESTS ARE NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GRAIN SIZE: USCS-2 JB215256G CHPE - ADDITIONAL.GPJ TERRACON_DATATEMPLATE.GDT 11/2/22

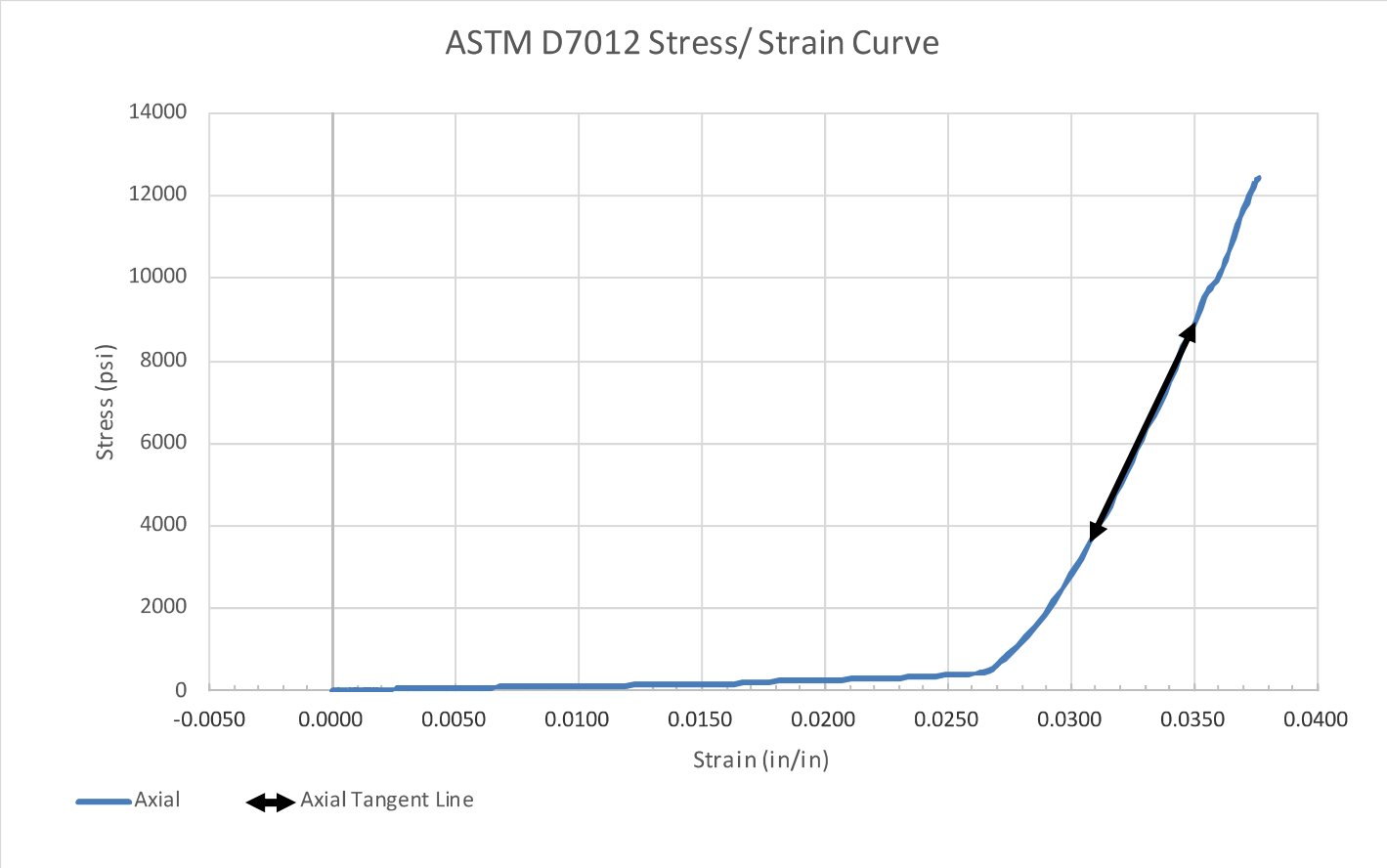
Rock Core D7012 Method C

Terracon

Client
Kiewit Engineering Corp

Project
Champlain-Hudson Power Express Project

Project No. JB215256



SAMPLE LOCATION

Site:	Champlain-Hudson Power Express Project		
Description:	Shale		
Boring:	KB-169.0-3.3	Depth (feet):	50.0-55.0

SPECIMEN INFORMATION

Sample No.:		Mass (g):	571.35
Length (in.):	4.10	Diameter (in.):	2.00
L/D Ratio:	2.05	Density (pcf):	168.984

TEST RESULTS

Failure Load (lbs):	38650
Failure Strain (in/in):	0.038
Unconfined Compressive Strength (psi):	12,427
Elastic Modulus, E, (ksi):	1243
Time of Failure (min):	03:21
Rate of Loading (in/sec):	0.04
Moisture Content Post-break:	0.06%

Rock Core D7012 Method C

Client	Project
Kiewit Engineering Corp	Champlain-Hudson Power Express Project
	Project No. JB215256

Equipment:	TICCS ID:
Calipers	W-44049
Scale	B-71466
Dial Indicator	C-70608
Compression (spherically seated)	C-48999

Samples were prepared and tested in accordance with ASTM D4543 and D7012. Deviations, if any, are noted below:
Notes:

Per ASTM D4543, this specimen has not met the requirements for perpendicularity, by exceeding 0.250º.
Per ASTM D4543, this specimen has not met the requirements for flatness, by exceeding 0.001 inches.
Per ASTM D4543, this specimen has not met the requirements for parallelism, by exceeding 0.25º.
Per ASTM D4543, this specimen has not met the requirements for flatness, by exceeding 0.001 inches.
Per ASTM D4543 and ASTM D7012, the desired specimen length to diameter are between 2.0:1 and 2.5:1.

According to ASTM D7012 Section 8.2.1, this specimen, although not meeting all requirements of ASTM D4543 is acceptable for testing. However, the results reported may differ from results obtained from a test specimen that meets the requirements of D4543.

Client
Kiewit Engineering Corp

Project
Champlain-Hudson Power Express Project

Project No. JB215256

Splitting Tensile Strength of Intact Rock Core Specimens, ASTM D3967

Boring	KB-169.0-3.3	**Material Description**	Shale
Sample No		**Equipment Used**	Tinius Olsen (120,000lbs)
Depth (ft)	50.0-55.0	**TICCS ID/Serial No.**	C-48999, 118285
Lab No	8002	**Calibration Date**	11/2/2021

	TENSILE STRENGTH				
Lab No.	1	2	3	4	5
Diameter (in)	1.98	1.98	1.98	1.98	1.98
Length (in)	0.58	0.6	0.62	0.58	0.55
Length Diameter Ratio	0.29	0.30	0.31	0.29	0.28
Rate of Loading	0.058	0.06	0.062	0.058	0.055
Moisture Condition	0.73%	0.73%	0.73%	0.73%	0.73%
Maximum Applied Load (lbf)	4448	5074	3879	4120	3132
Splitting Tensile Strength (psi)	2467.0	2720.4	2012.6	2285.1	1831.9

	TENSILE STRENGTH				
Lab No.	6	7	8	9	10
Diameter (in)	1.98	1.98	1.98	1.98	1.98
Length (in)	0.69	0.57	0.6	0.55	0.61
Length Diameter Ratio	0.35	0.29	0.30	0.28	0.31
Rate of Loading	0.069	0.057	0.060	0.055	0.061
Moisture Condition	0.73%	0.73%	0.73%	0.73%	0.73%
Maximum Applied Load (lbf)	4563	4563	5770	3908	4597
Splitting Tensile Strength (psi)	2127.3	2575.2	3093.6	2285.7	2424.3

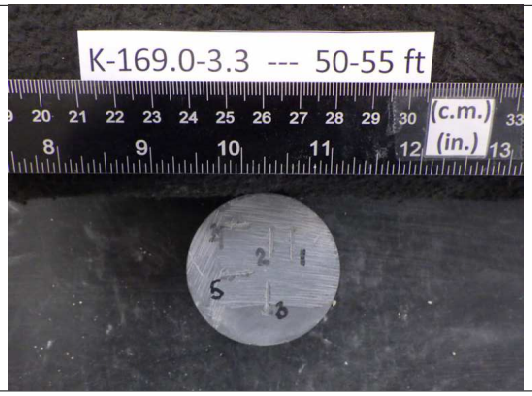
Client:	Terracon Consultants, Inc.				
Project:	Champlain-Hudson Power Express				
Location:				Project No:	GTX-315284
Boring ID:	KB-169.0-3.3	Sample Type:	cylinder	Tested By:	tlm
Sample ID:	---	Test Date:	09/14/22	Checked By:	smd
Depth :	50-55 ft	Test Id:	684383		
Test Comment:	---				
Visual Description:	---				
Sample Comment:	---				

Abrasiveness of Rock Using the Cerchar Method by ASTM D7625

Boring ID	Sample ID	Depth	Stylus No	Reading 1	Reading 2	Average	Comments
K169.0-3.3	---	50-55 ft	1	0.3	0.3	0.30	
			2	0.3	0.3	0.30	
			3	0.7	0.4	0.55	
			4	0.8	0.9	0.85	
			5	0.8	1.2	1.00	
			Average CAIs			0.6	
			Average CAI *			1.07	
					CERCHAR Abrasiveness Index Classification	**Medium abrasiveness**	

Notes

Test Surface: Saw Cut
Moisture Condition: As Received
Apparatus Type: Original CERCHAR
Stylus Hardness: Rockwell Hardess 54/56 HRC
Stylus Displacement Relative to Rock Fabric:
Styli 1-3: Normal; Styli 4-5: Parallel
* CAI = (0.99 * CAIs) + 0.48
CAIs = CERCHAR index for smooth (saw cut) surface
CAI = CERCHAR index for natural surface
Comments:



Rock Core – Boring KB-163.2 Run 3 (continued)

Rock Core – Boring KB-169.0-3.3

Package 4B Phase 4 Borings Rev 1

Champlain Hudson Power Express

New York

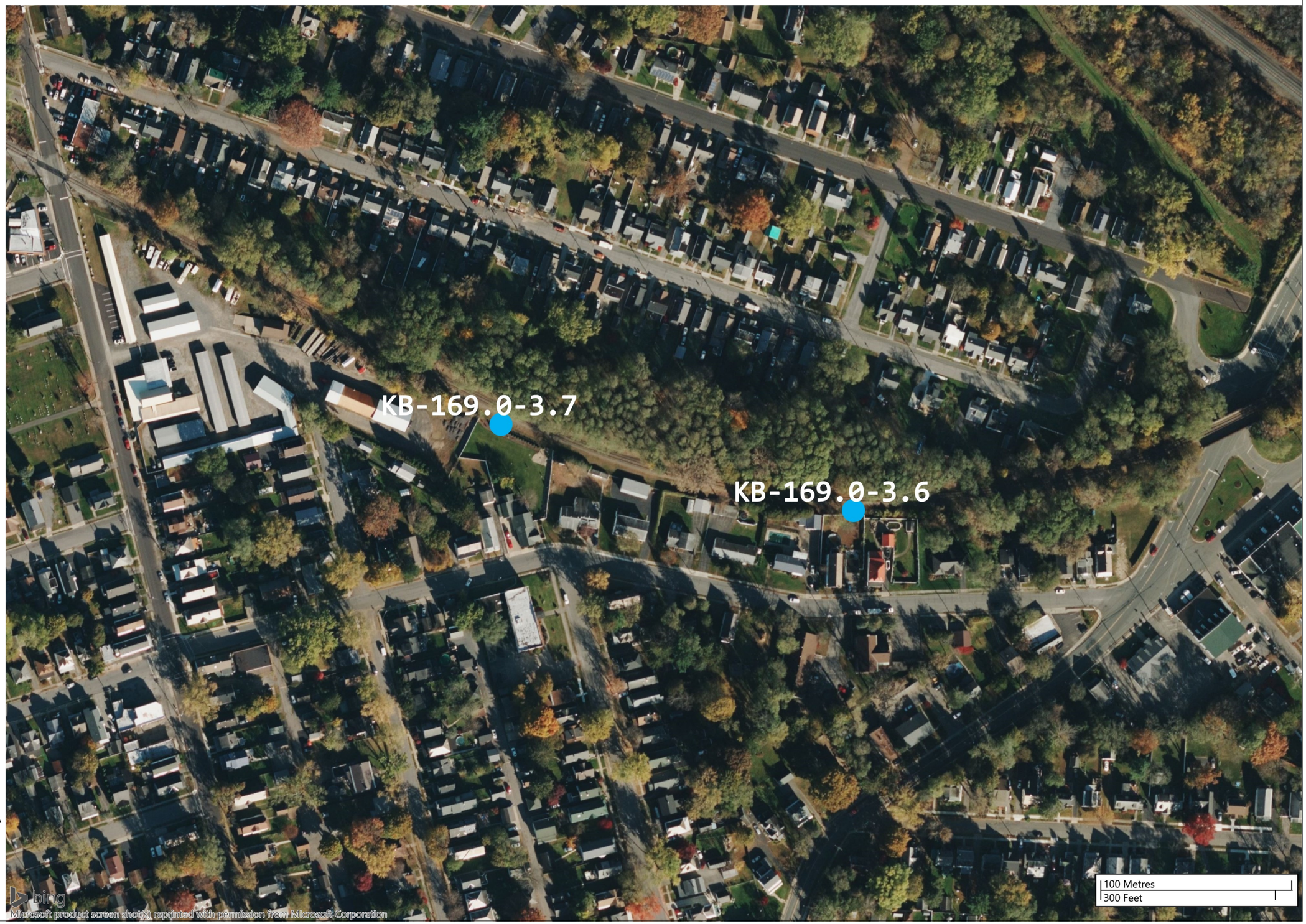
PROJECT NUMBER 20001480

CREATED BY Kiewit

DATE 03/31/2023

Legend Key

- Kiewit Borings



EXPLORATORY BORING LOG

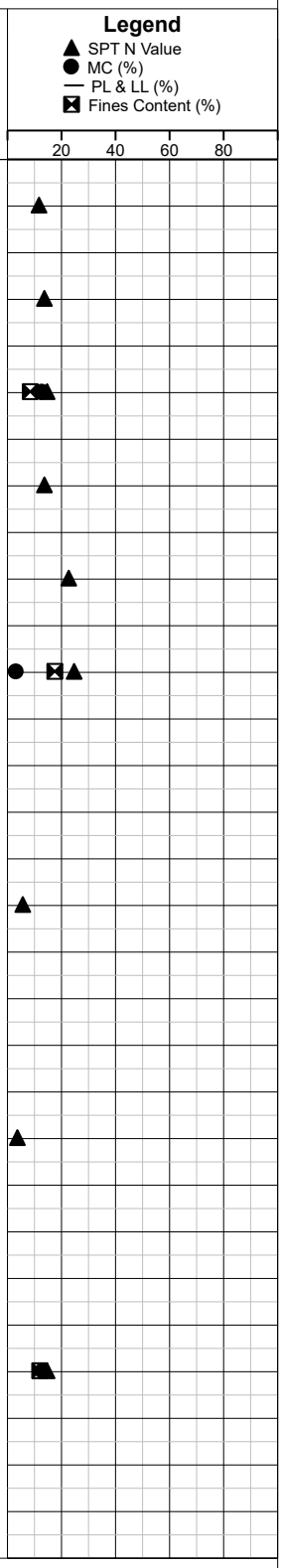
Champlain Hudson Power Express

New York

BORING NO: KB-169.0-3.6

PROJECT NUMBER	20001480	**LOGGED BY**	P. Tsouroukdissian	**COORDINATES**	N 1457794.03 E 637407.46
START DATE	12/19/2022	**DRILLER/RIG**	John / Geoprobe 7822DT	**GROUND ELEV.**	267.8 ft
FINISH DATE	12/22/2022	**DRILL CONTRACTOR**	ADT Inc.	**HAMMER TYPE/EFF.**	Automatic

Depth (ft)	Elevation (ft)	Material Description	Sample Type	Core Run No.	Recovery % RQD	Pocket Pen. (tsf)	Blow Counts (N Value)	Notes
		FILL: Clayey SAND (SC), dark brown, trace organics		1	38%		1-3-9-6 (12)	
	265.8	FILL: GRAVEL with Silt and Sand (GP-GM), brown, medium dense, few fine gravel		2	38%		6-7-7-3 (14)	
5				3	20%		7-8-7-5 (15)	
	261.8	Silty SAND (SM), brown, very loose to medium dense, moist, fine grained		4	75%		6-8-6-8 (14)	
				5	75%		10-10-13-12 (23)	
10				6	88%		12-14-11-13 (25)	
15				7	50%		3-3-3-3 (6)	
20				8	62%		2-2-2-2 (4)	
25		brown to gray, fine to medium grained		9	38%		7-8-7-7 (15)	
30								



EXPLORATORY BORING LOG

Champlain Hudson Power Express

New York

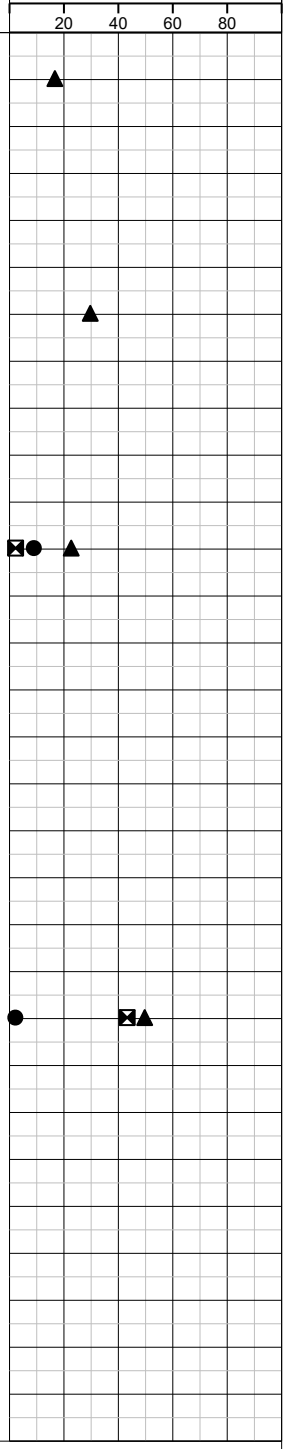
BORING NO: KB-169.0-3.6

PROJECT NUMBER	20001480	**LOGGED BY**	P. Tsouroukdissian	**COORDINATES**	N 1457794.03 E 637407.46
START DATE	12/19/2022	**DRILLER/RIG**	John / Geoprobe 7822DT	**GROUND ELEV.**	267.8 ft
FINISH DATE	12/22/2022	**DRILL CONTRACTOR**	ADT Inc.	**HAMMER TYPE/EFF.**	Automatic

Depth (ft)	Elevation (ft)	Material Description	Sample Type	Core Run No.	Recovery % RQD	Pocket Pen. (tsf)	Blow Counts (N Value)	Notes
		Silty SAND (SM), gray, medium dense		10	38%		3-5-12-10 (17)	
35	232.8	GRAVEL with Sand (GW), gray, medium dense to dense, sub-rounded, coarse sand to fine gravel		11	33%		10-14-16-12 (30)	
40				12	25%		6-16-7-14 (23)	
45				13	25%		32-36-27-27	3-inch ring sampler
	218.8	Silty SAND (SM), gray, very dense (possible glacial till)						
50				14	66%		25-35-15-31 (50)	
55	212.8	SHALE, gray, closely to moderately spaced discontinuities, fair RQD		1	85% 61			3-inch casing set to 55 feet UCS = 2,757 psi
60								

Legend

- ▲ SPT N Value
- ● MC (%)
- — PL & LL (%)
- ⊠ Fines Content (%)



EXPLORATORY BORING LOG

Champlain Hudson Power Express

New York

BORING NO: KB-169.0-3.6

PROJECT NUMBER	20001480	**LOGGED BY**	P. Tsouroukdissian	**COORDINATES**	N 1457794.03 E 637407.46
START DATE	12/19/2022	**DRILLER/RIG**	John / Geoprobe 7822DT	**GROUND ELEV.**	267.8 ft
FINISH DATE	12/22/2022	**DRILL CONTRACTOR**	ADT Inc.	**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
			SHALE, gray, closely to moderately spaced discontinuities, fair RQD		2	87% / 68			Significant amount of water loss during coring
65			poor RQD		3	100% / 44			
70			good RQD		4	100% / 84			
75	192.8		Boring Terminated at 75ft						
80									
85									
90									

Legend
- ▲ SPT N Value
- ● MC (%)
- — PL & LL (%)
- ⊠ Fines Content (%)

20 40 60 80

Champlain Hudson Power Express
Kiewit Engineering (NY) Corp.

KB-169.0-3.6 - Runs 1 through 4

EXPLORATORY BORING LOG

Champlain Hudson Power Express

New York

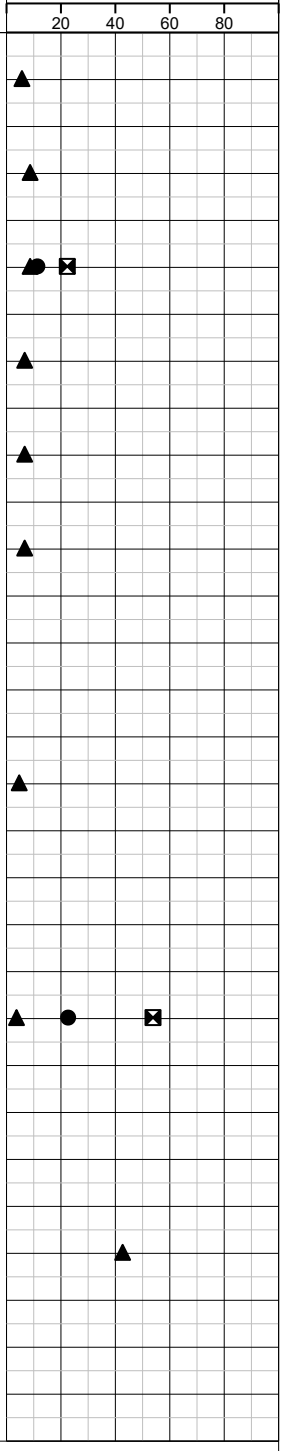
BORING NO: KB-169.0-3.7

PROJECT NUMBER	20001480	**LOGGED BY**	J. Techel	**COORDINATES**	N 1457938.54 E 636796.97
START DATE	12/19/2022	**DRILLER/RIG**	Eric / Geoprobe 7822DT	**GROUND ELEV.**	268.2 ft
FINISH DATE	12/22/2022	**DRILL CONTRACTOR**	ADT Inc.	**HAMMER TYPE/EFF.**	Automatic

Depth (ft)	Elevation (ft)	Material Description	Sample Type	Core Run No.	Recovery % RQD	Pocket Pen. (tsf)	Blow Counts (N Value)	Notes
		FILL: Gravelly SAND (SP), yellow brown to black, loose, contain rootlets		1	21%		1-2-4-4 (6)	
	266.2	Silty SAND (SM), dark yellow brown to brown, loose, fine grained		2	33%		4-4-5-4 (9)	
5				3	92%		4-4-5-5 (9)	
				4	75%		3-4-3-4 (7)	
				5	75%		3-3-4-4 (7)	
10	258.2	Sandy SILT (ML), dark brown to dark yellow brown, soft to firm, fine to medium grained		6	84%		3-3-4-4 (7)	
15				7	25%		3-2-3-3 (5)	
20				8	75%		1-2-2-3 (4)	
25	242.2	GRAVEL with Sand (GP), brown to grayish brown, dense, fine to coarse grained		9	58%		11-17-26-49 (43)	Lost drill mud into gravel. Set casing to 30 feet
30								

Legend

- ▲ SPT N Value
- ● MC (%)
- — PL & LL (%)
- ⊠ Fines Content (%)



EXPLORATORY BORING LOG

Champlain Hudson Power Express

New York

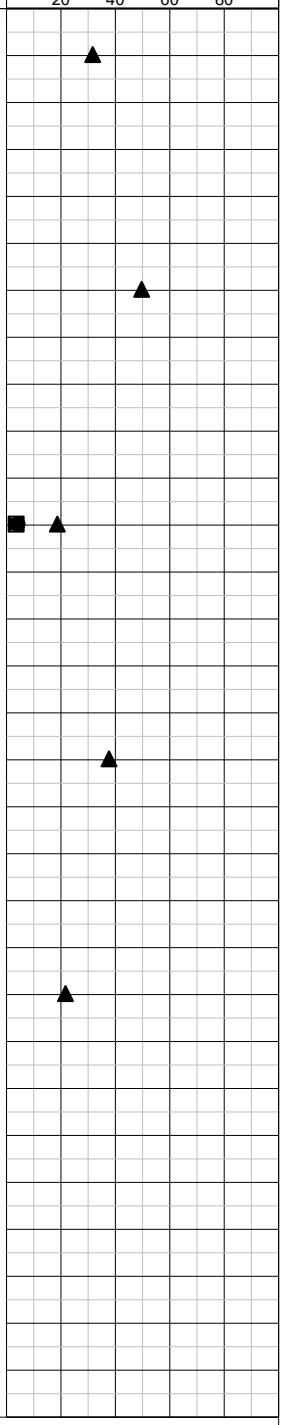
BORING NO: KB-169.0-3.7

PROJECT NUMBER	20001480	**LOGGED BY**	J. Techel	**COORDINATES**	N 1457938.54 E 636796.97
START DATE	12/19/2022	**DRILLER/RIG**	Eric / Geoprobe 7822DT	**GROUND ELEV.**	268.2 ft
FINISH DATE	12/22/2022	**DRILL CONTRACTOR**	ADT Inc.	**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
			GRAVEL with Sand (GP), brown to grayish brown, dense, fine to coarse grained		10	38%		12-19-13-24 (32)	
35	233.2		SAND with Gravel (SP), gray to brown, dense, medium to coarse grained, few fine to coarse gravel		11	50%		33-30-20-31 (50)	
40	228.2		GRAVEL with Sand (GP), multi-colored, medium dense to dense, coarse grained		12	54%		9-9-10-15 (19)	
45					13	58%		30-20-18-16 (38)	
50					14	21%		16-10-12-18 (22)	
55					1			26-30-28-33	3-inch ring sampler
60									

Legend

- ▲ SPT N Value
- ● MC (%)
- — PL & LL (%)
- ⊠ Fines Content (%)



EXPLORATORY BORING LOG

Champlain Hudson Power Express

New York

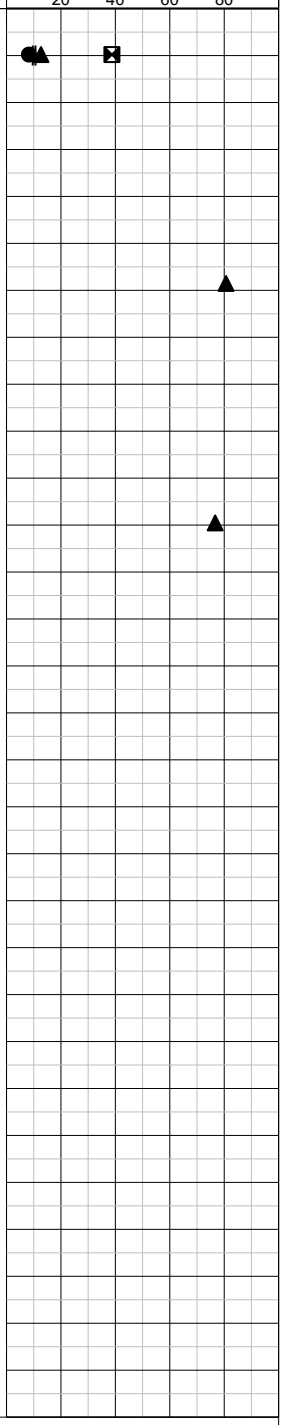
BORING NO: KB-169.0-3.7

PROJECT NUMBER	20001480	**LOGGED BY**	J. Techel	**COORDINATES**	N 1457938.54 E 636796.97
START DATE	12/19/2022	**DRILLER/RIG**	Eric / Geoprobe 7822DT	**GROUND ELEV.**	268.2 ft
FINISH DATE	12/22/2022	**DRILL CONTRACTOR**	ADT Inc.	**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
	208.2		Silty SAND (SM), dark gray, medium dense to very dense (possible glacial till)		15	71%		6-7-6-11 (13)	
65					16	71%		48-38-43-55/3" (81)	
70					17	100%		15-29-48-55/5" (77)	
	195.2		SHALE						Roller bit advanced to 75ft
75	193.2		Boring Terminated at 75ft						
80									
85									
90									

Legend

- ▲ SPT N Value
- ● MC (%)
- — PL & LL (%)
- ⊠ Fines Content (%)



Summary of Laboratory Results

BORING ID	Depth (Ft.)	Water Content (%)
KB-169.0-1.0	4-6	18.6
KB-169.0-1.0	10-12	22.8
KB-169.0-1.0	20-22	29.0
KB-169.0-1.0	35-37	26.2
KB-169.0-1.0	50-52	25.1
KB-169.0-2.4	4-6	9.7
KB-169.0-2.4	20-22	20.1
KB-169.0-2.4	35-37	29.8
KB-169.0-2.4	55-57	23.6
KB-169.0-2.5	4-6	18.0
KB-169.0-2.5	10-12	18.5
KB-169.0-2.5	30-32	28.0
KB-169.0-2.5	40-42	24.7
KB-169.0-3.6	4-6	13.0
KB-169.0-3.6	10-12	3.4
KB-169.0-3.6	25-27	13.3
KB-169.0-3.6	40-42	9.3
KB-169.0-3.6	50-52	2.5
KB-169.0-3.7	4-6	11.7
KB-169.0-3.7	20-22	23.0
KB-169.0-3.7	40-42	4.4
KB-169.0-3.7	60-62	8.6
KB-169.0-7.9	4-6	18.1
KB-221.0B	4-6	11.0
KB-221.0B	10-12	40.8
KB-221.0B	30-32	37.4
KB-221.0B	50-52	29.6
KB-221.8B	4-6	32.1
KB-221.8B	20-22	44.4
KB-221.8B	35-37	46.6
KB-221.8B	55-57	39.2
KB-222.8	6-8	33.6
KB-222.8	20-22	43.2
KB-222.8	45-47	39.4
KB-222.8	65-67	45.0

PROJECT: Lab Testing

SITE: Champlain to Hudsdon Power Express

Terracon
30 Corporate Cir Ste 201
Albany, NY

PROJECT NUMBER: JB215256H

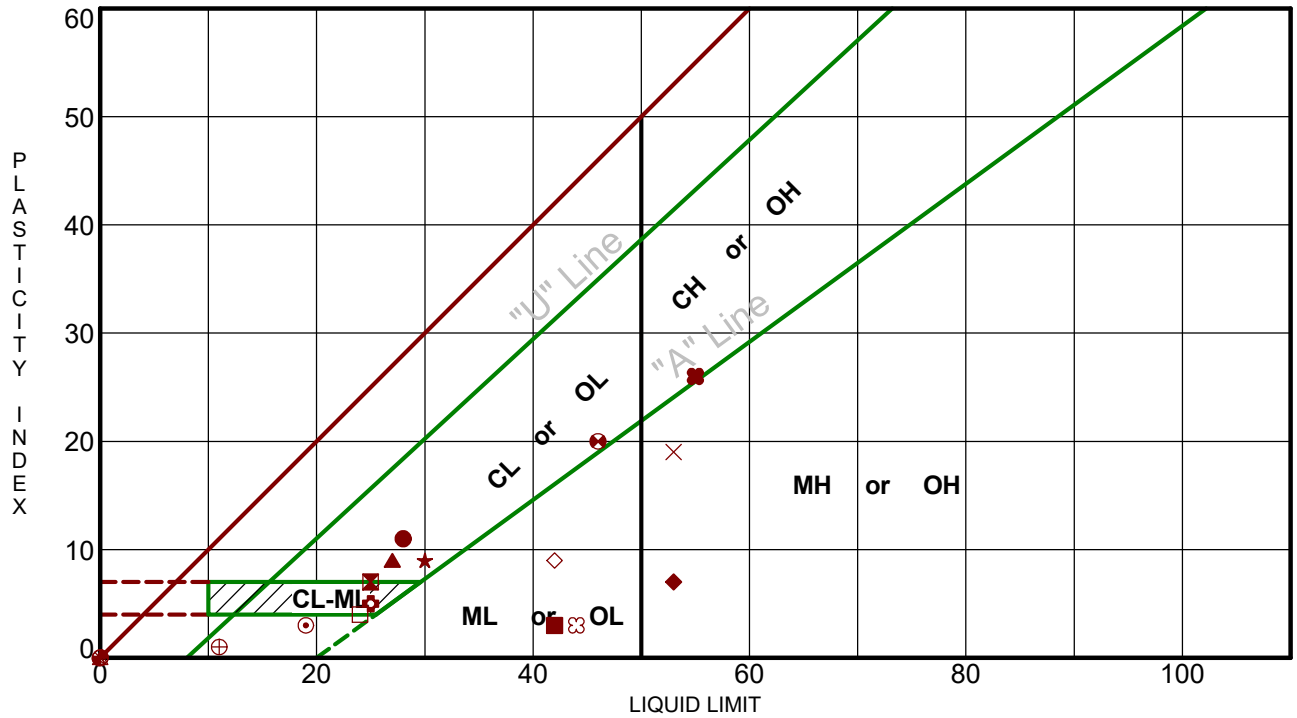
CLIENT: Kiewit Engineering (NY) Corp
Lone Tree, CO

EXHIBIT: B-1

LABORATORY TESTS ARE NOT VALID IF SEPARATED FROM ORIGINAL REPORT. SMART LAB SUMMARY-PORTRAIT JB215256H LAB TESTING.GPJ TERRACON_DATATEMPLATE.GDT 2/14/23

ATTERBERG LIMITS RESULTS

ASTM D4318



	Boring ID	Depth (Ft)	LL	PL	PI	Fines	USCS	Description
●	KB-169.0-1.0	20 - 22	28	17	11	93.4	CL	LEAN CLAY
⊠	KB-169.0-1.0	35 - 37	25	18	7	97.1	CL-ML	SILTY CLAY
▲	KB-169.0-1.0	50 - 52	27	18	9	99.4	CL	LEAN CLAY
★	KB-169.0-2.4	20 - 22	30	21	9	73.6	ML	SANDY SILT
⊙	KB-169.0-2.4	35 - 37	19	16	3	87.9	ML	SILT
✿	KB-169.0-2.5	30 - 32	25	20	5	92.5	CL-ML	SILTY CLAY
○	KB-169.0-2.5	40 - 42	NP	NP	NP	95.7	ML	SILT
△	KB-169.0-3.6	4 - 6	NP	NP	NP	8.8	GP-GM	POORLY GRADED GRAVEL with SILT and SAND
⊗	KB-169.0-3.6	50 - 52	NP	NP	NP	43.6	SM	SILTY SAND
⊕	KB-169.0-3.7	60 - 62	11	10	1	39.1	SM	SILTY SAND
□	KB-221.0B	4 - 6	24	20	4	16.9	SC-SM	SILTY, CLAYEY SAND with GRAVEL
⊗	KB-221.0B	10 - 12	46	26	20	96.3	CL	LEAN CLAY
◕	KB-221.0B	30 - 32	NP	NP	NP	96.0	ML	SILT
☆	KB-221.0B	50 - 52	NP	NP	NP	99.4	ML	SILT
✿	KB-221.8B	4 - 6	44	41	3	72.3	ML	SILT with GRAVEL
■	KB-221.8B	20 - 22	42	39	3	98.3	ML	SILT
◆	KB-221.8B	35 - 37	53	46	7	95.5	MH	ELASTIC SILT
◇	KB-221.8B	55 - 57	42	33	9	99.6	ML	SILT
×	KB-222.8	6 - 8	53	34	19	97.5	MH	ELASTIC SILT
✖	KB-222.8	20 - 22	55	29	26	92.8	CH	FAT CLAY

PROJECT: Lab Testing

SITE: Champlain to Hudsdon Power Express

Terracon
30 Corporate Cir Ste 201
Albany, NY

PROJECT NUMBER: JB215256H

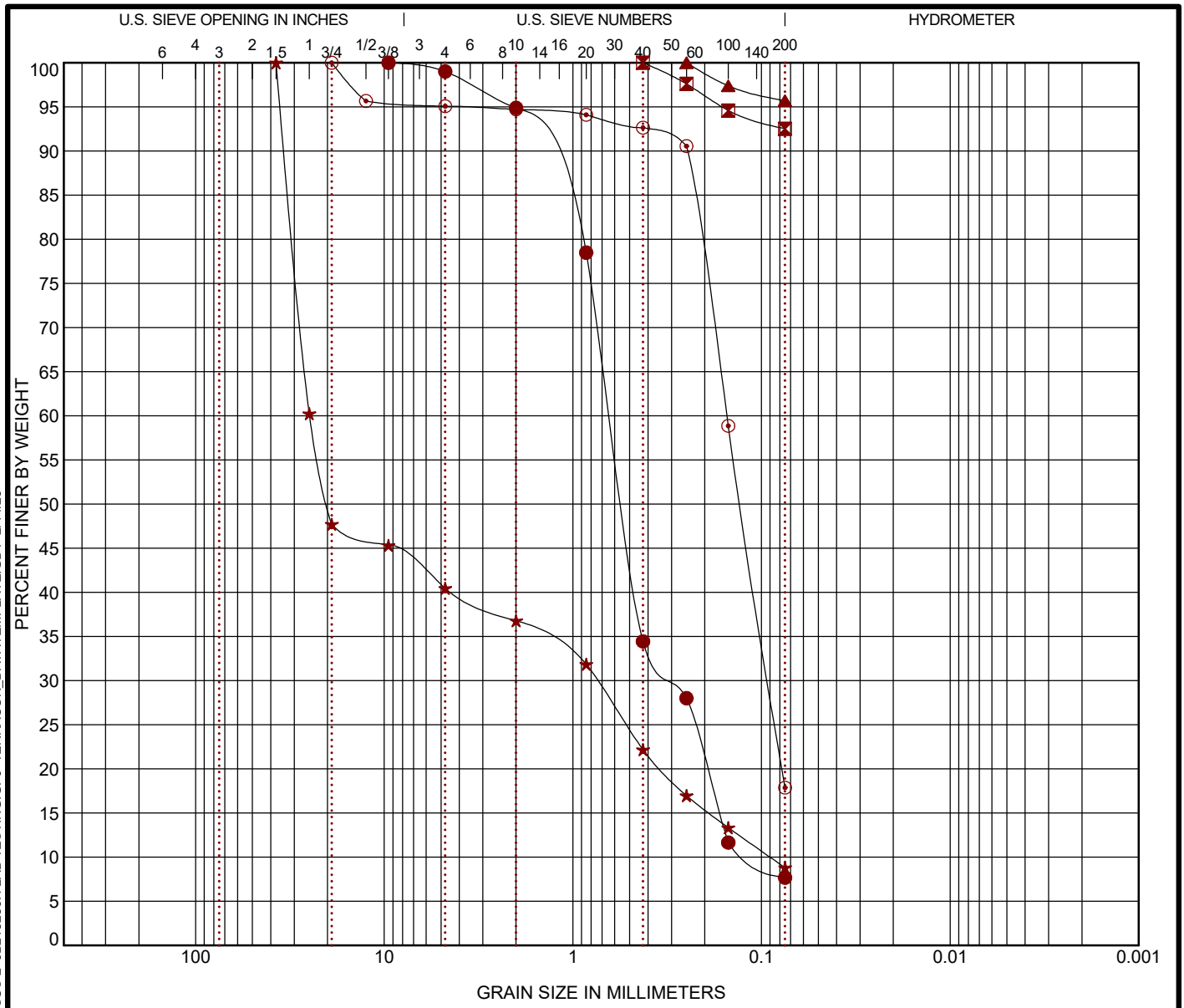
CLIENT: Kiewit Engineering (NY) Corp
Lone Tree, CO

EXHIBIT: B-1

LABORATORY TESTS ARE NOT VALID IF SEPARATED FROM ORIGINAL REPORT. ATTERBERG LIMITS JB215256H LAB TESTING.GPJ TERRACON_DATATEMPLATE.GDT 2/14/23

GRAIN SIZE DISTRIBUTION

ASTM D422 / ASTM C136



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Boring ID	Depth (Ft)	USCS Classification	WC (%)	LL	PL	PI	Cc	Cu
●	KB-169.0-2.5	10 - 12	POORLY GRADED SAND with SILT (SP-SM)	18.5				1.21	5.65
⊠	KB-169.0-2.5	30 - 32	SILTY CLAY (CL-ML)	28.0	25	20	5		
▲	KB-169.0-2.5	40 - 42	SILT (ML)	24.7	NP	NP	NP		
★	KB-169.0-3.6	4 - 6	POORLY GRADED GRAVEL with SILT and SAND (GP-GM)	13.0	NP	NP	NP	0.25	276.06
⊙	KB-169.0-3.6	10 - 12	SILTY SAND (SM)	3.4					

	Boring ID	Depth (Ft)	D_{100}	D_{60}	D_{30}	D_{10}	%Cobbles	%Gravel	%Sand	%Silt	%Fines	%Clay
●	KB-169.0-2.5	10 - 12	9.5	0.635	0.295	0.113	0.0	1.0	91.3		7.7	
⊠	KB-169.0-2.5	30 - 32	0.425				0.0	0.0	7.5		92.5	
▲	KB-169.0-2.5	40 - 42	0.25				0.0	0.0	4.3		95.7	
★	KB-169.0-3.6	4 - 6	37.5	24.866	0.745	0.09	0.0	59.5	31.7		8.8	
⊙	KB-169.0-3.6	10 - 12	19	0.153	0.092		0.0	4.9	77.2		17.9	

PROJECT: Lab Testing

SITE: Champlain to Hudsdon Power Express

Terracon
30 Corporate Cir Ste 201
Albany, NY

PROJECT NUMBER: JB215256H

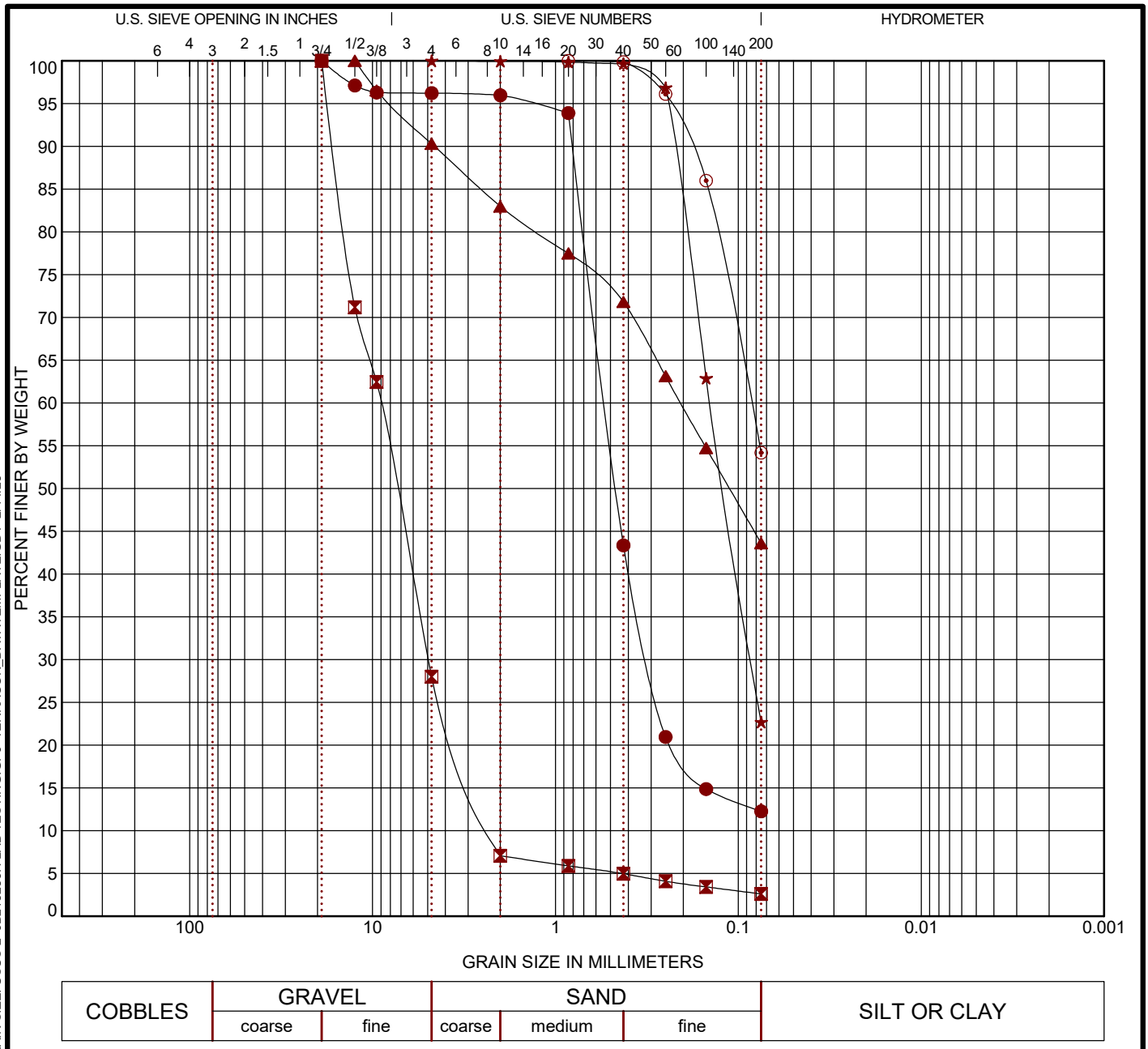
CLIENT: Kiewit Engineering (NY) Corp
Lone Tree, CO

EXHIBIT: B-3

LABORATORY TESTS ARE NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GRAIN SIZE: USCS-2 JB215256H LAB TESTING.GPJ TERRACON_DATATEMPLATE.GDT 2/14/23

GRAIN SIZE DISTRIBUTION

ASTM D422 / ASTM C136



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Boring ID	Depth (Ft)	USCS Classification	WC (%)	LL	PL	PI	Cc	Cu
●	KB-169.0-3.6	25 - 27	SILTY SAND (SM)	13.3				4.38	13.01
⊠	KB-169.0-3.6	40 - 42	WELL-GRADED GRAVEL with SAND (GW)	9.3				1.20	4.01
▲	KB-169.0-3.6	50 - 52	SILTY SAND (SM)	2.5	NP	NP	NP		
★	KB-169.0-3.7	4 - 6	SILTY SAND (SM)	11.7					
⊙	KB-169.0-3.7	20 - 22	SANDY SILT (ML)	23.0					

	Boring ID	Depth (Ft)	D_{100}	D_{60}	D_{30}	D_{10}	%Cobbles	%Gravel	%Sand	%Silt	%Fines	%Clay
●	KB-169.0-3.6	25 - 27	19	0.534	0.31		0.0	3.8	84.0		12.3	
⊠	KB-169.0-3.6	40 - 42	19	9.044	4.945	2.258	0.0	72.0	25.4		2.6	
▲	KB-169.0-3.6	50 - 52	12.5	0.207			0.0	9.7	46.7		43.6	
★	KB-169.0-3.7	4 - 6	4.75	0.143	0.085		0.0	0.0	77.3		22.7	
⊙	KB-169.0-3.7	20 - 22	0.85	0.085			0.0	0.0	45.8		54.2	

PROJECT: Lab Testing

SITE: Champlain to Hudsdon Power Express

Terracon
30 Corporate Cir Ste 201
Albany, NY

PROJECT NUMBER: JB215256H

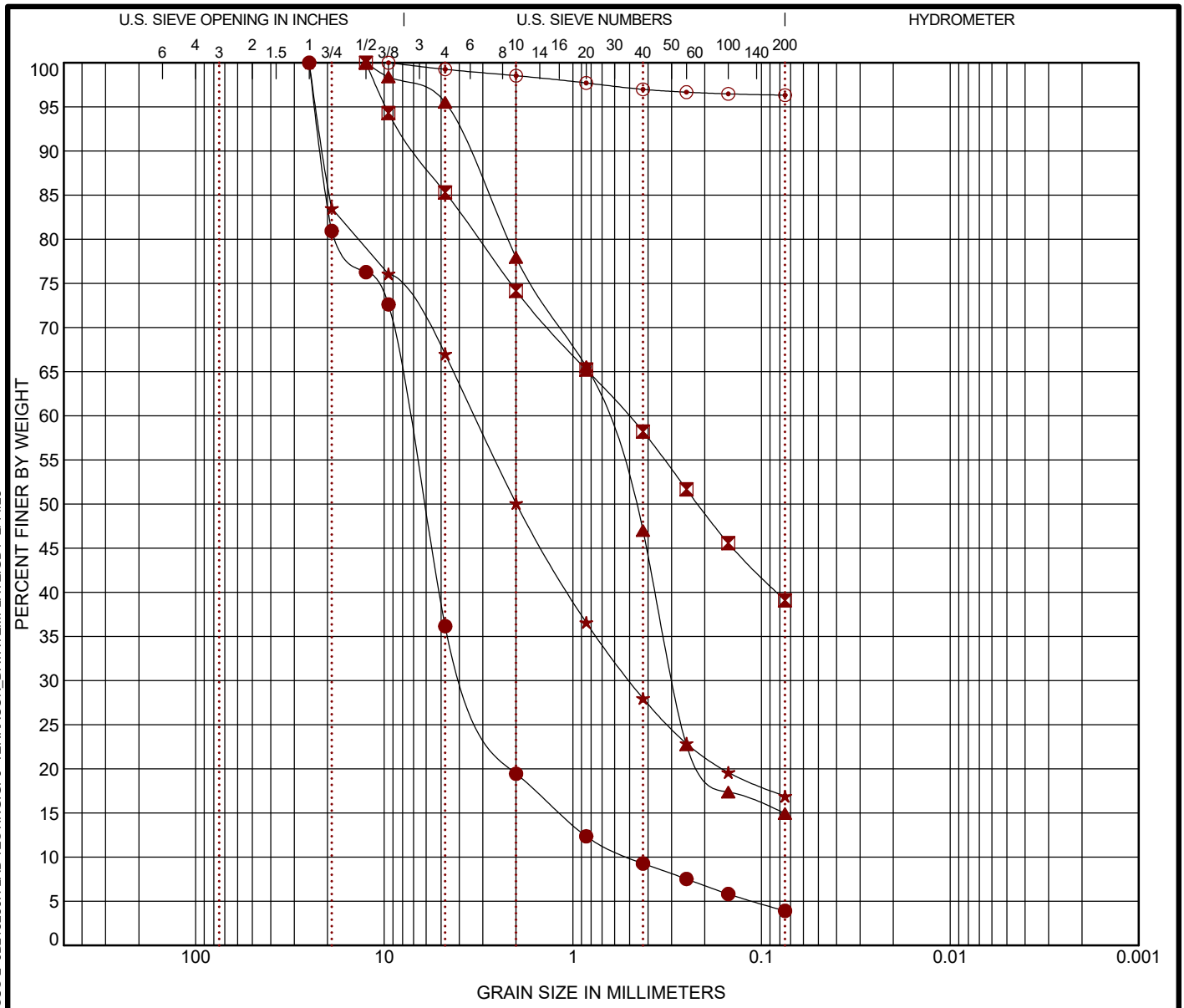
CLIENT: Kiewit Engineering (NY) Corp
Lone Tree, CO

EXHIBIT: B-4

LABORATORY TESTS ARE NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GRAIN SIZE: USCS-2 JB215256H LAB TESTING.GPJ TERRACON_DATATEMPLATE.GDT 2/14/23

GRAIN SIZE DISTRIBUTION

ASTM D422 / ASTM C136



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Boring ID	Depth (Ft)	USCS Classification	WC (%)	LL	PL	PI	Cc	Cu
●	KB-169.0-3.7	40 - 42	POORLY GRADED GRAVEL with SAND (GP)	4.4				3.19	14.93
⊠	KB-169.0-3.7	60 - 62	SILTY SAND (SM)	8.6	11	10	1		
▲	KB-169.0-7.9	4 - 6	SILTY SAND (SM)	18.1					
★	KB-221.0B	4 - 6	SILTY, CLAYEY SAND with GRAVEL (SC-SM)	11.0	24	20	4		
⊙	KB-221.0B	10 - 12	LEAN CLAY (CL)	40.8	46	26	20		

	Boring ID	Depth (Ft)	D_{100}	D_{60}	D_{30}	D_{10}	%Cobbles	%Gravel	%Sand	%Silt	%Fines	%Clay
●	KB-169.0-3.7	40 - 42	25	7.474	3.454	0.501	0.0	63.8	32.2		3.9	
⊠	KB-169.0-3.7	60 - 62	12.5	0.507			0.0	14.7	46.2		39.1	
▲	KB-169.0-7.9	4 - 6	12.5	0.69	0.293		0.0	4.5	80.6		14.9	
★	KB-221.0B	4 - 6	25	3.323	0.5		0.0	33.0	50.1		16.9	
⊙	KB-221.0B	10 - 12	9.5				0.0	0.7	2.9		96.3	

PROJECT: Lab Testing

SITE: Champlain to Hudsdon Power Express

Terracon
30 Corporate Cir Ste 201
Albany, NY

PROJECT NUMBER: JB215256H

CLIENT: Kiewit Engineering (NY) Corp
Lone Tree, CO

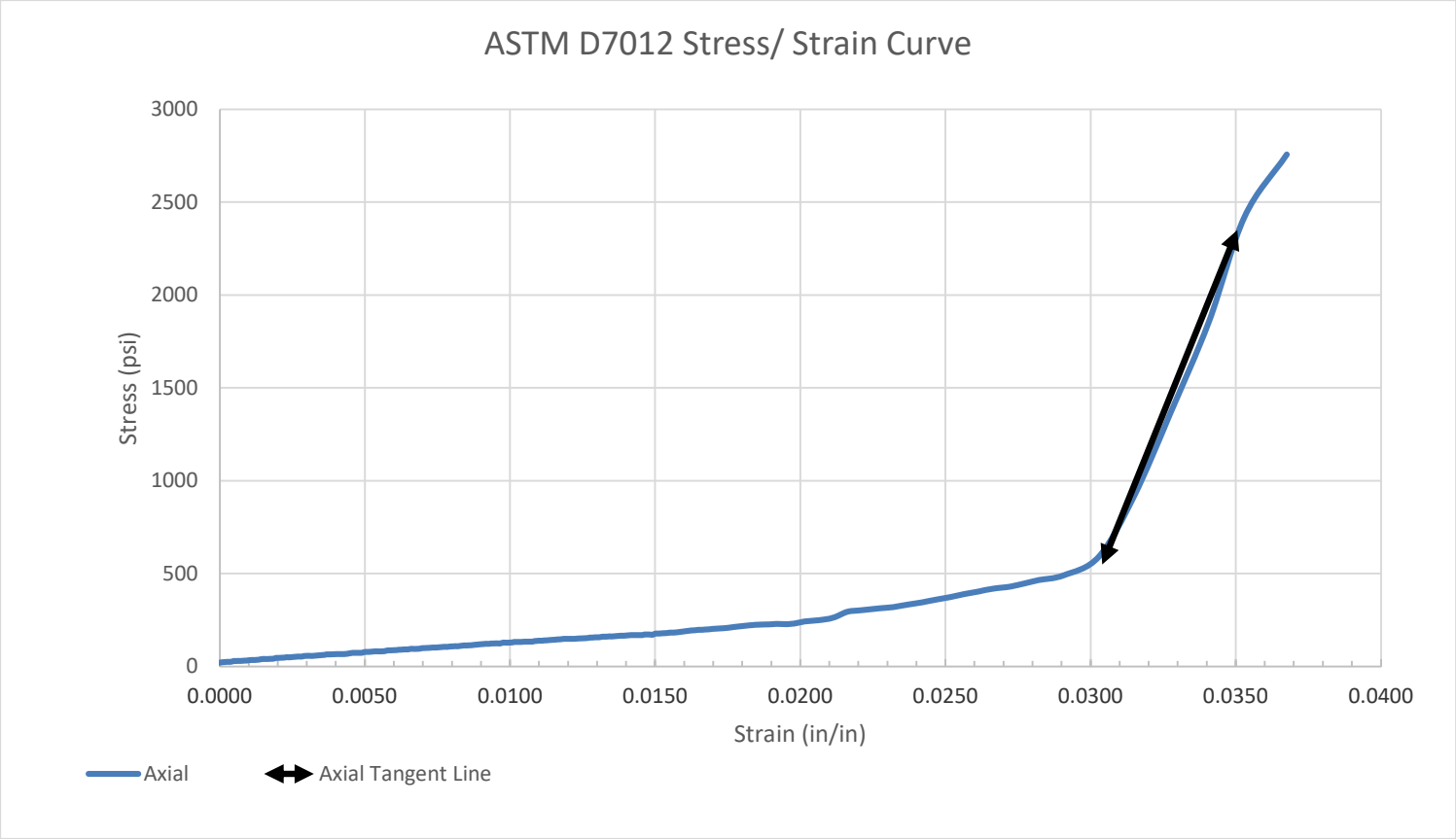
EXHIBIT: B-5

LABORATORY TESTS ARE NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GRAIN SIZE: USCS-2 JB215256H LAB TESTING.GPJ TERRACON_DATATEMPLATE.GDT 2/14/23

Rock Core D7012 Method C

Client	Project
Kiewit Engineering Corp	Lab Testing

Project No. JB215256H



SAMPLE LOCATION

Site:	JB215256H		
Description:	Limestone		
Boring:	KB-169.0-3.6	Depth (feet):	59

SPECIMEN INFORMATION

Sample No.:	RC-1	Mass (g):	553.63
Length (in.):	4.12	Diameter (in.):	1.97
L/D Ratio:	2.091	Density (pcf):	167.949

TEST RESULTS

Failure Load (lbs):	8403
Failure Strain (in/in):	0.045
Unconfined Compressive Strength (psi):	2,757
Elastic Modulus, E, (ksi):	387
Time of Failure (min):	02:04
Rate of Loading (in/sec):	0.04
Moisture Content Post-break:	0.41%

Rock Core D7012 Method C

Terracon

Client	Project
Kiewit Engineering Corp	Lab Testsing
	Project No. JB215256H

Equipment:

	TICCS ID:
Calipers	W-44049
Scale	B-71466
Dial Indicator	C-70608
Compression (spherically seated)	C-48999

Samples were prepared and tested in accordance with ASTM D4543 and D7012. Deviations, if any, are noted below:

Notes:

Per ASTM D4543, this specimen has not met the requirements for perpendicularity, by exceeding 0.250º.
Per ASTM D4543, this specimen has not met the requirements for flatness, by exceeding 0.001 inches.
Per ASTM D4543, this specimen has not met the requirements for parallelism, by exceeding 0.25º.

Per ASTM D4543, this specimen has not met the requirements for flatness, by exceeding 0.001 inches.

Per ASTM D4543 and ASTM D7012, the desired specimen length to diameter are between 2.0:1 and 2.5:1. According to ASTM D7012 Section 8.2.1, this specimen, although not meeting all requirements of ASTM D4543 is acceptable for testing. However, the results reported may differ from results obtained from a test specimen that meets the requirements of D4543.

Kiewit

MEMORANDUM

DATE: January 26, 2023

TO: Antonio Marruso, P.E.; CHA Consulting, Inc.

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

SUBJECT: Geotechnical Data: Segment 7 - Package 4B - HDD Crossing 66 – Revision 1
Champlain Hudson Power Express Project
Scotia, 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 Scotia, New York. The approximate station for the start of HDD crossing Number 66 is STA 45229+00 (42.8384°N, 73.9717°W).

The geotechnical data at this HDD crossing is attached. The available data is from the previous investigation by AECOM and data from a recent investigation by Atlantic Testing Laboratories (ATL), referenced below.

- AECOM, Geotechnical Data Report, Upland Segments: Putnam Station, Washington County, to Cementon, Green County, NY, Champlain Hudson Power Express, dated May 28, 2021.
- Atlantic Testing Laboratories, Subsurface Investigation Services, Champlain Hudson Power Express, Design Package 4B, Glenville to Scotia, New York, dated June 15, 2022.

Contact us if you have questions or require additional information.

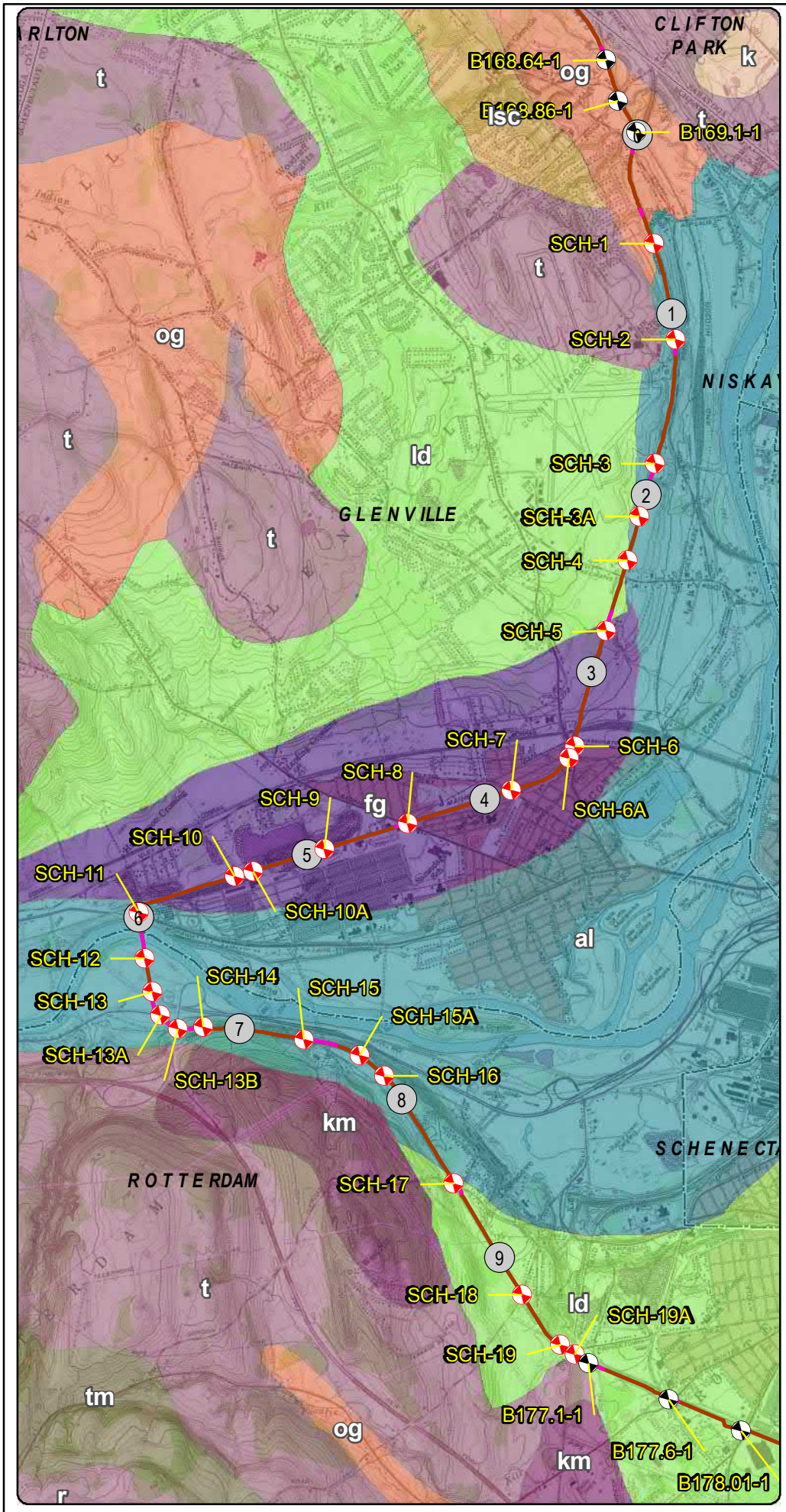
HDD 66
Borings K-169.0-4.4, SCH-8,
K-169.0-4.5
Segment 7 - Design Package 4B

CHPE Segment 7 Package 4B
Soil Boring Coordinates and Elevations

Firm	Boring	Northing (feet)	Easting (feet)	Ground Surface Elevation (feet)
TRC*	B169.1-1	1469045.0	651801.8	236.7
AECOM**	SCH-1	1466449.8	649931.4	279.8
	SCH-2	1464095.5	648426.9	288.3
	SCH-3	1462008.4	645522.0	286.8
	SCH-3A	1461257.5	644144.0	287.3
	SCH-4	1460618.5	643021.4	285.4
	SCH-5	1459621.8	641171.4	279.3
	SCH-6	1457944.8	638238.9	241.7
	SCH-6A	1457817.7	637889.5	249.6
	SCH-7	1458325.7	636073.8	271.1
	SCH-8	1459763.1	633330.0	287.2
	SCH-9	1460902.6	631152.2	297.0
	SCH-10	1462154.8	628796.0	290.3
	SCH-10A	1461888.1	629265.0	291.0
	SCH-11	1463366.6	626127.1	289.2
	SCH-12	1462321.8	625339.2	227.3
	SCH-13	1461493.8	624804.4	229.1
	SCH-13A	1460855.7	624513.9	272.0
	SCH-13B	1460233.8	624596.1	295.4
	SCH-14	1459768.5	625134.5	281.3
	SCH-15	1457493.3	626917.2	338.6
	SCH-15A	1456046.5	627705.8	352.4
	SCH-16	1455146.0	627794.1	350.1
	SCH-17	1451579.9	627027.1	357.8
	SCH-18	1447982.8	626167.9	354.4
NYS DOT ***	DAB-6(2)	1460628.7	625081.5	248
	DH-24S	1460655.9	625133.7	237
	DH-25S	1460602.7	625066.5	236
	DH-26S	1460543.7	624985.5	235
	DH-27S	1460696.2	625101.3	236
	DH-28S	1460650.3	625027.7	235
	DH-29S	1460597.5	624949.4	234.5

Notes:
- Northings and Eastings are provided in NAD83 New York State Plane East Zone.
- Elevations are referenced to the NAVD88 datum.
* TRC boring coordinates as shown in Table 1-6 in AECOM report (reference below). Boring elevations estimated from November 2021 topographic survey by Williams Aerial.
** AECOM boring coordinates and elevations as shown in Table 1-6 in AECOM report.
*** NYS DOT boring coordinates and elevations are approximated from drawing D257014 Sheet 170 "GENERAL SUBSURFACE PROFILE, STRUCTURE #3 - RAMP TWY OVER I-890"
**** Kiewit boring coordinates and elevations are noted on the boring logs.

Reference:
AECOM, Geotechnical Data Report, Upland Segments: Putnam Station, Washington County, to Cementon, Green County, NY, Champlain Hudson Power Express, dated May 28, 2021.



LEGEND

- 2021 Boring Location
- Previous (2013) Boring Location
- Terrestrial Route HVDC
- Submarine Route HVDC
- Terrestrial Route HVAC
- Preliminary HDD Locations
- Preliminary Pipe Bridge Location
- Town Boundary
- County Boundary

Surficial Geology

- al - Recent alluvium
- fg - Fluvial sand and/or gravel
- k - Kame deposits
- km - Kame moraine
- ld - Lacustrine delta
- lsc - Lacustrine silt and clay
- og - Outwash sand and gravel
- r - Bedrock
- t - Till
- tm - Till moraine

N

0.4 0.2 0 0.4 Miles

Transmission Developers Inc.

Champlain Hudson Power Express Project

Champlain Hudson Power Express Inc.

Surficial Geology and Geotechnical Borings Schenectady Preferred Alt Figure 3-7

Prepared on 4/27/2021

by: AECOM

DATA SOURCES: ESRI, NYSDOT, NOAA, USACE, NYDOS, TDI, TRC

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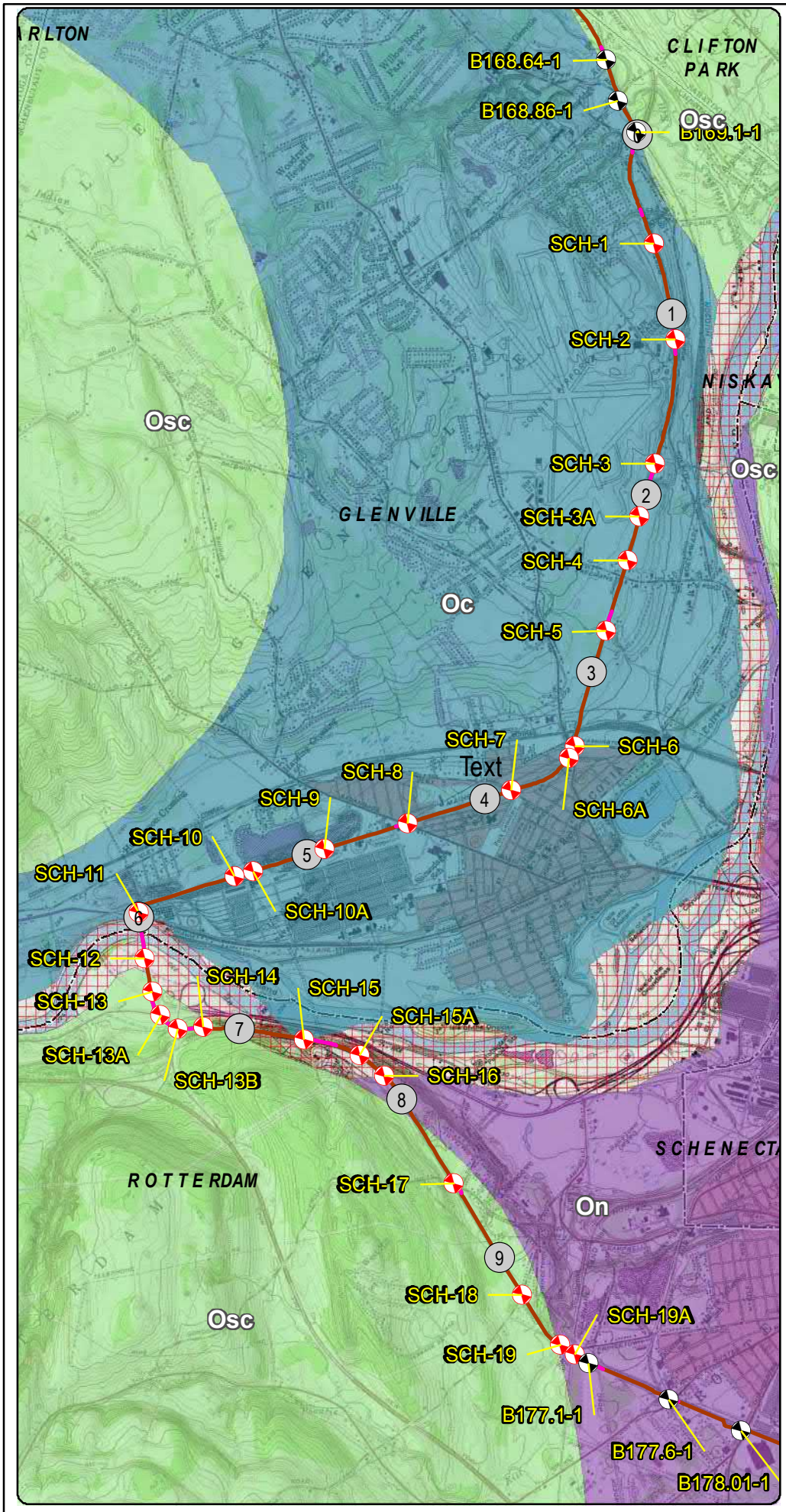


LEGEND

- 2021 Boring Location
- Previous (2013) Boring Location
- Terrestrial Route HVDC
- Submarine Route HVDC
- Terrestrial Route HVAC
- Preliminary HDD Locations
- Preliminary Pipe Bridge Location
- Town Boundary
- County Boundary

Bedrock Geology

- No Label
- Oc - Canajoharie Shale
- On - Normanskill Shale
- Osc - Schenectady Formation

* Schenectady Formation includes: graywacke, sandstone, siltstone, shale

0.4 0.2 0 0.4 Miles

Transmission Developers Inc.

Champlain Hudson Power Express Project

Champlain Hudson Power Express Inc.

Bedrock Geology and Geotechnical Borings Schenectady Preferred Alt Figure 4-7

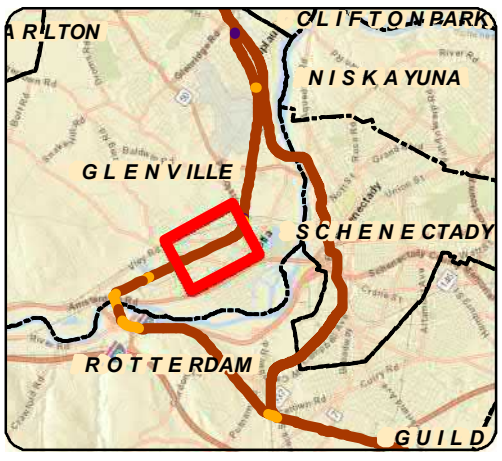
Prepared on 4/29/2021

by: AECOM

DATA SOURCES: ESRI, NYSDOT, NOAA, USACE, NYDOS, TDI, TRC

Y:\Projects\CHPE\IRoute\Consensus_Alternative_Routes\MXD\Alt_5_Routes_DZ_20190\Boring_Locations\Maps_for_May_2021_Report\Alt_Route_Schenectady_Boring_Locations_Bedrock_Map_May_2021_Report.mxd

SCH-6A
3.6
3.7
3.8
SCH-7
3.9
GLENVILLE
4.1
4.2
4.3
4.4
SCH-8
4.5
4.6
4.7
0
1,000
Feet



LEGEND

- 111.8 Certified Milepost - Tenths
- 135 Certified Milepost
- 111.8 Preferred Alternative Milepost - Tenths
- 135 Preferred Alternative Milepost
- Terrestrial Route HVDC
- Submarine Route HVDC
- Terrestrial Route HVAC
- Preliminary HDD Locations
- Preliminary Pipe Bridge Location
- 2021 Boring Location
- Previous (2013) Boring Location
- Streams/Ditches
- Railroad ROW
- Deviation Zone
- Deviation Zone Outside ROW
- Preferred Alternative Deviation Zone
- Preferred Alternative Deviation Zone Outside ROW
- Town Boundary
- Village Boundary
- State Park (OPRHP)

Parcel Ownership: TOWN NAME

Road Name: Village Name

Transmission Developers Inc.

Champlain Hudson Power Express Project

Champlain Hudson Power Express Inc.

BORING LOCATION PLAN

Schenectady Preferred Alternative

Figure A-7

Sheet 4 of 8

Prepared by: AECOM 4/27/2021

DATA SOURCES: ESRI, NETWORK MAPPING 2010, NYSDOT, OPRHP, TDI, TRC

Y:\Projects\CHPEI\Route\Consensus_Alternative_Routes\MXD\Alt_5_Routes_DZ_201909\Boring_Locations\Maps_for_May_2021_Report\Alt_Route_Schenectady_Boring_Locations_Mapset_May_2021_Report.mxd

BORING CONTRACTOR: ADT	AECOM	SHEET 1 OF 1
DRILLER: Matt Murtaugh		PROJECT NAME: CHPE -
		PROJECT NO.: 60323056
		HOLE NO.: **SCH-8**
SOILS ENGINEER/GEOLOGIST: Mike Izdebski	**Boring Log**	START DATE: 03/12/2021
		FINISH DATE: 03/12/21
LOCATION: Schenectady, NY MP 4.43		OFFSET: N/A

GROUND WATER OBSERVATIONS		CASING	SAMPLER	DRILL BIT	CORE BARREL	DRILL RIG: Geoprobe 7822DT
	TYPE	Flush Joint Steel	California Modified	Tricone Roller Bit		BORING TYPE: SPT
	SIZE I.D.	4"	2.5"	- -		BORING O.D.: 4.5"
	SIZE O.D.	4.5"	3"	3 7/8"		SURFACE ELEV.:
	HAMMER WT.	140 lbs	140 lbs			LONGITUDE:
	HAMMER FALL	30"	30"			LATITUDE:

DEPTH	CORING RATE MIN/FT	SAMPLE DEPTHS FROM - TO (FEET)	TYPE AND NO.	PEN. in	REC. in	BLOWS PER 6 in ON SAMPLER (ROCK QUALITY DESIGNATION)				N Corr.(2)	USCS CLASS.	STRAT. CHNG. DEPTH	FIELD IDENTIFICATION OF SOILS
		0'-5'				Hand Cleared							Black fine to coarse SAND, little fine to medium subrounded gravel, little silt
1.0													1.0': Brown SAA
2.0													3.0': Gray COBBLES, little fine to coarse sand, little fine to coarse gravel
3.0		3'-5'	S-1										TR-1; (3.0'-5.0')
4.0											SM		4.5': Light brown fine to medoum SAND, some silt, trace rounded fine gravel
5.0		5'-7'	S-2	24"	24"	3	4	5	4	6	SP		Brown fine to medium SAND, little silt, wet
6.0													
7.0		7'-9'	S-3	24"	24"	4	4	5	3	6	SP		Brown fine to coarse SAND, trace medium rounded gravel, wet
8.0												Alluvial SAND	TR-2; (8.5'-9.0')
9.0		9'-11'	S-4	24"	24"	4	2	2	3	3	SP		SAA
10.0													
11.0		11'-'13'	S-5	24"	12"	2	2	3	3	3	SP		SAA
12.0													TR-3; (12.0'-12.5')
13.0		13'-15'	S-6	24"	24"	3	4	4	5	5	SP		Brown fine to coarse SAND, trace medium rounded gravel
14.0													TR-4; (14.0'-14.5')
15.0		15'-17'	S-7	24"	24"	4	5	6	6	7	SP		SAA
16.0													
17.0													SCH-8 terminated at 17 fbg
18.0													
19.0													
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: $N_{corr}=N*(2.0^2-1.375^2)in./(3.0^2-2.4^2)in. = N*0.65$.

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%

Boring Location Plans Page 7 of 9	Drawn by: ADW	Scale: Not to scale	Project No.: CD10279	Date: May 2022

Champlain Hudson Power Express
Design Package 4B
Glenville to Scotia, New York

***ATLANTIC TESTING LABORATORIES*, Limited**

Albany, NY	Binghamton, NY	Canton, NY	Elmira, NY	Plattsburgh, NY
Poughkeepsie, NY	Syracuse, NY	Rochester, NY	Utica, NY	Watertown, NY

ATLANTIC TESTING LABORATORIES, Limited

Subsurface Investigation

Report No.: CD10279D-01-05-22

Client: Kiewit Engineering (NY) Corp.

Boring Location: See Boring Location Plan

Project: Subsurface Investigation
Champlain Hudson Power Express, Design Package 4B
Various Locations, New York

Start Date: 3/31/2022 Finish Date: 3/31/2022

Boring No.: K-169.0-4.4 Sheet 1 of 2

Groundwater Observations

Date	Time	Depth	Casing
3/31/2022	PM	*12.6'	15.0'

Coordinates
Northing 1459666.11
Easting 633512.72

Sampler Hammer
Weight: 140 lbs.
Fall: 30 in.
Hammer Type: Automatic

Ground Elev.: 286.8

Boring Advance By: HW (4") Casing/3 7/8" Wet Rotary

*May be affected by water utilized to advance the borehole.

DEPTH	METHOD OF ADVANCE	SAMPLE NO.	DEPTH OF SAMPLE From	DEPTH OF SAMPLE To	SAMPLE TYPE	BLOWS ON SAMPLER PER 6" 2" O.D. SAMPLER	DEPTH OF CHANGE	CLASSIFICATION OF MATERIAL (f - fine, m - medium, c - coarse; and - 35-50%, some - 20-35%, little - 10-20%, trace - 0-10%)	Recovery (Inches)
1	CASING	1	0.0	2.0	SS	3 9 15 5	2.0	Brown cmf SAND; some cm GRAVEL; trace SILT (moist, non-plastic) FILL SW	4
2–3		2	2.0	4.0	SS	2 4 5 5	4.0	Blackish-Brown CLAY; little mf GRAVEL; trace mf SAND; trace SILT (moist, plastic) Possible FILL CL	7
4–5		3	4.0	6.0	SS	5 5 6 6		Brown cmf SAND; trace f GRAVEL; trace SILT (moist, non-plastic) SW	12
6–7		4	6.0	8.0	SS	6 5 5 9		Greyish-Brown Similar Soil (moist, non-plastic) SW	18
8–13		5	8.0	10.0	SS	12 11 10 9		Greyish-Brown c-m+f SAND; trace SILT; trace mf+ GRAVEL (moist, non-plastic) w = 5.4%, % Fines = 9.4% SP-SM	24
14–18	WET ROTARY	6	14.0	16.0	SS	17 5 2 2		Advanced casing to 15.0 feet and began advancing 3 7/8" tri-cone roller bit wet rotary open hole within the borehole. Grey cmf GRAVEL; some cmf SAND; trace SILT (wet, non-plastic) GW	5
19–22		7	19.0	21.0	SS	5 6 7 7	22.0	Brown cmf SAND; trace f GRAVEL; trace SILT (moist, non-plastic) SW	3
23–25		ST-1A	23.0	25.0	SS	14 11 12 12		(3" Brass Lined Split Spoon) Brownish-Grey cmf SAND; trace SILT (moist, non-plastic) SW	12

SS Split Spoon Sample
NX Rock Core
SH Undisturbed Sample (Shelby Tube)
Estimated Groundwater

Drillers: Jeffrey Donovan; Chase Bertrand

Inspector: James LaMarco (ATL)

ATLANTIC TESTING LABORATORIES, Limited

Subsurface Investigation

Boring No.: K-169.0-4.4 Report No.: CD10279D-01-05-22 Sheet 2 of 2

DEPTH	METHOD OF ADVANCE	SAMPLE NO.	DEPTH OF SAMPLE From	DEPTH OF SAMPLE To	SAMPLE TYPE	BLOWS ON SAMPLER PER 6" 2" O.D. SAMPLER	DEPTH OF CHANGE	CLASSIFICATION OF MATERIAL (f - fine, m - medium, c - course; and - 35-50%, some - 20-35%, little - 10-20%, trace - 0-10%)	RECOVERY (inches)
		ST-1B	25.0	27.0	SS	11 13 14 18		(3" Brass Lined Split Spoon) Similar Soil (moist, non-plastic) SW	18
26									
27		ST-1C	27.0	29.0	SS	12 15 20 15		(3" Brass Lined Split Spoon) Brownish-Grey c-mf+ SAND; little SILT; trace m GRAVEL (moist, non-plastic) w = 15.8%	
28								% Fines = 17.0% SM	
29		8	29.0	31.0	SS	7 8 8 7		Brownish-Grey Similar Soil (moist, non-plastic) SM	8
30									
31							31.0		
32								Boring terminated at 31.0 feet.	
33									
34								Notes:	
35								1. Borehole backfilled with cement-bentonite grout.	
36								2. Soil classifications based on ATL Field Engineer's field classifications.	
37								3. Borehole was advanced with ATL's Geoprobe 7822D7 (Rig Unit No. CDGV706) drill rig.	
38									
39									
40									
41									
42									
43									
44									
45									
46									
47									
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61									
62									

ATL-LOG1 NE CD10279 KIEWIT INFRASTRUCTURE CO - VARIOUS LOCATIONS (PACKAGE 4B).GPJ ATL4-08.GDT 6/7/22

ATLANTIC TESTING LABORATORIES, Limited

Subsurface Investigation

Report No.: CD10279D-01-05-22

Client: Kiewit Engineering (NY) Corp.

Boring Location: See Boring Location Plan

Project: Subsurface Investigation
Champlain Hudson Power Express, Design Package 4B
Various Locations, New York

Start Date: 3/31/2022 Finish Date: 4/1/2022

Boring No.: K-169.0-4.5 Sheet 1 of 2

Groundwater Observations

Date	Time	Depth	Casing
3/31/2022	PM	*15.6'	15.0'

Coordinates
Northing 1459868.29
Easting 633125.8

Sampler Hammer
Weight: 140 lbs.
Fall: 30 in.
Hammer Type: Automatic

Ground Elev.: 287.5

Boring Advance By: HW (4") Casing/3 7/8" Wet Rotary

*May be affected by water utilized to advance the borehole.

DEPTH	METHOD OF ADVANCE	SAMPLE NO.	DEPTH OF SAMPLE From	DEPTH OF SAMPLE To	SAMPLE TYPE	BLOWS ON SAMPLER PER 6" 2" O.D. SAMPLER	DEPTH OF CHANGE	CLASSIFICATION OF MATERIAL (f - fine, m - medium, c - coarse; and - 35-50%, some - 20-35%, little - 10-20%, trace - 0-10%)	Recovery (Inches)
1	CASING	1	0.0	2.0	SS	3 5 4 2	2.0	Blackish-Grey cmf SAND; and cmf GRAVEL; trace SILT (moist, non-plastic) SW	8
2		2	2.0	4.0	SS	2 1 1 1	4.0	Brown CLAY; little mf SAND; trace SILT (moist, plastic) CL	17
4		3	4.0	6.0	SS	3 3 3 3		Brown c-m+f SAND; little SILT; trace f GRAVEL (moist, non-plastic) w = 10.6%, % Fines = 17.0% SM	16
6		4	6.0	8.0	SS	4 4 4 5	8.0	Similar Soil (moist, non-plastic) SM	6
8		5	8.0	10.0	SS	3 4 4 5		Grey cm SAND; trace SILT (moist, non-plastic) COBBLE Fragments in split spoon shoe SP	2
14		6	14.0	16.0	SS	7 6 6 9		Greyish-Brown cm+f SAND; trace SILT (moist, non-plastic) SP	7
19		7	19.0	21.0	SS	4 6 5 4	22.0	Greyish-Brown c-mf+ SAND; little SILT; little mf+ GRAVEL (moist, non-plastic) w = 11.5%, % Fines = 19.0% SM	10
23								Advanced casing to 25.0 feet and began advancing 3 7/8" tri-cone roller bit wet rotary open hole within the borehole.	

SS Split Spoon Sample
NX Rock Core
SH Undisturbed Sample (Shelby Tube)
Estimated Groundwater

Drillers: Jeffrey Donovan; Chase Bertrand

Inspector: James LaMarco (ATL)

ATLANTIC TESTING LABORATORIES, Limited

Subsurface Investigation

Boring No.: K-169.0-4.5 Report No.: CD10279D-01-05-22 Sheet 2 of 2

DEPTH	METHOD OF ADVANCE	SAMPLE NO.	DEPTH OF SAMPLE From	DEPTH OF SAMPLE To	SAMPLE TYPE	BLOWS ON SAMPLER PER 6" 2" O.D. SAMPLER	DEPTH OF CHANGE	CLASSIFICATION OF MATERIAL (f - fine, m - medium, c - course; and - 35-50%, some - 20-35%, little - 10-20%, trace - 0-10%)	RECOVERY (inches)
	WETROTARY	ST-1A	25.0	27.0	SS	8 20 19 19		(3" Brass Lined Split Spoon) Grey Similar Soil (moist, non-plastic) SM	6
26									
27		ST-1B	27.0	29.0	SS	10 10 10 13		(3" Brass Lined Split Spoon) Grey Similar Soil (moist, non-plastic) SM	18
28									
29		8	29.0	31.0	SS	14 13 12 15		(3" Brass Lined Split Spoon) Grey mf+ SAND; little SILT (moist, non-plastic) w = 17.7%, % Fines = 12.0% SP-SM	16
30									
31							31.0		
32								Boring terminated at 31.0 feet.	
33									
34								Notes:	
35								1. Borehole backfilled with cement-bentonite grout.	
36								2. Soil classifications based on ATL Field Engineer's field classifications.	
37								3. Borehole was advanced with ATL's Geoprobe 7822D7 (Rig Unit No. CDGV706) drill rig.	
38									
39									
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62									

ATLANTIC TESTING LABORATORIES

LABORATORY TEST SUMMARY TABLE

ATL No. CD10279: Kiewit Infrastructure Co. - Champlain Hudson Power Express

Boring ID	Sample No.	Sample Depth (ft.)	Soil/Rock Description	Percent Finer No. 200 Sieve	Moisture Content (%)	Atterburg Limits			Organic Content (%)	Water-Soluble Sulfate (ppm)	Water-Soluble Chloride (ppm)	pH	Resistivity (ohm-cm)	Rock Unconfined Compressive Strength (psi)	Rock Splitting Tensile Strength (psi)	Rock CERCHAR Abrasiveness Corrected CAI
						LL	PL	PI								
K-169.0-2.0	S-2	2.0-4.0	Brown cmf+ SAND; some mf GRAVEL; trace SILT	--	12.1	--	--	--	--	--	--	--	--	--	--	--
	S-4	6.0-8.0	Brown mf+ SAND; little SILT	13.0	24.5	--	--	--	--	--	--	--	--	--	--	--
	S-7	18.0-20.0	Grey SILT; little CLAY; trace f SAND	96.5	28.9	37	20	17	--	--	--	--	--	--	--	--
	S-9	22.0-24.0	Grey CLAY; some SILT; trace f SAND	97.9	29.5	34	20	14	--	--	--	--	--	--	--	--
K-169.0-2.6	S-5	8.0-10.0	Grey c-mf SAND; little f GRAVEL; trace SILT	9.4	16.1	--	--	--	--	--	--	--	--	--	--	--
	S-8	24.0-26.0	Grey CLAY; some SILT; trace f SAND	97.6	26.7	26	14	12	--	--	--	--	--	--	--	--
	S-9	32.0-34.0	Grey f SAND; some SILT	24.2	22.7	NP	NP	NP	--	--	--	--	--	--	--	--
K-169.0-2.7	S-4	6.0-8.0	Brown mf+ SAND; and SILT; trace CLAY	53.0	23.1	--	--	--	--	--	--	--	--	--	--	--
	S-7	19.0-21.0	Grey CLAY; some SILT; trace f SAND	98.7	29.5	36	19	17	--	--	--	--	--	--	--	--
	ST-1	28.0-30.0	Grey CLAY; some SILT; little mf SAND	89.4	39.3	25	13	12	--	--	--	--	--	--	--	--
K-169.0-4.4	S-3/4	4.0-8.0	Brown cmf SAND; trace f GRAVEL; trace SILT	--	--	--	--	--	--	300	20	8.6	139,320	--	--	--
	S-5	8.0-10.0	Greish-Brown c-m+f SAND; trace SILT; trace mf+ GRAVEL	9.4	5.4	--	--	--	--	--	--	--	--	--	--	--
	ST-1c	27.0-29.0	Brownish-Grey c-mf+ SAND; little SILT; trace m GRAVEL	17.0	15.8	--	--	--	--	--	--	--	--	--	--	--
K-169.0-4.5	S-3	4.0-6.0	Brown c-m+f SAND; little SILT; trace f GRAVEL	17.0	10.6	--	--	--	--	--	--	--	--	--	--	--
	S-7	19.0-21.0	Greyish-Brown c-mf+ SAND; little SILT; little mf+ GRAVEL	19.0	11.5	--	--	--	--	--	--	--	--	--	--	--
	S-8	29.0-31.0	Grey mf+ SAND; little SILT	12.0	17.7	--	--	--	--	--	--	--	--	--	--	--
K-169.0-6.0	S-6	13.0-15.0	Brown mf+ SAND; trace SILT	--	21.3	--	--	--	--	--	--	--	--	--	--	--
	S-9	28.0-30.0	Brown f SAND; little SILT	--	22.3	--	--	--	--	--	--	--	--	--	--	--
	S-11	38.0-40.0	Brown f SAND; trace SILT	--	26.0	--	--	--	--	--	--	--	--	--	--	--
	S-13	48.0-50.0	Brown f SAND; little SILT	--	24.0	--	--	--	--	--	--	--	--	--	--	--
	S-15	58.0-60.0	Brown f SAND; little SILT	--	23.8	--	--	--	--	--	--	--	--	--	--	--
	S-17	68.0-70.0	Brown f SAND; little SILT	--	27.8	--	--	--	--	--	--	--	--	--	--	--
K-169.0-6.1	S-4	6.0-8.0	Grey cmf GRAVEL; some cmf SAND; little CLAY	--	8.4	--	--	--	--	--	--	--	--	--	--	--
	S-10	33.0-35.0	Grey cmf+ SAND; trace SILT; trace f GRAVEL	--	25.1	--	--	--	--	--	--	--	--	--	--	--
	S-14	53.0-55.0	Grey f SAND; little SILT	--	22.3	--	--	--	--	--	--	--	--	--	--	--
	S-18	73.0-75.0	Grey cmf+ SAND; little SILT; trace mf GRAVEL	--	19.1	--	--	--	--	--	--	--	--	--	--	--

ATLANTIC TESTING LABORATORIES

WBE certified company

LABORATORY DETERMINATION OF MOISTURE CONTENT OF SOILS

ASTM D 2216

PROJECT INFORMATION

Client: Kiewit Intrastructure Co.
Project: Champlain Hudson Power Express
United Cable Installation
Various Locations, New York

ATL Report No.: CD10279E-14-04-22
Report Date: April 29, 2022
Date Received: April 19, 2022

TEST DATA

Boring No.	Sample No.	Depth (ft)	Moisture Content (%)
K-169.0-0.1A	S-4	6-8	10.4
	S-8	27-29	14.4
K-169.0-2.6	S-5	8-10	16.1
	S-8	24-26	26.7
	S-9	32-34	22.7
K-169.0-2.7	S-4	6-8	23.1
	S-7	19-21	29.5
	ST-1	28-30	39.3
K-169.0-4.4	S-5 [1]	8-10	5.4
	ST-1c [1]	27-29	15.8
K-169.0-4.5	S-3	4-6	10.6
	S-7 [1]	19-21	11.5
	S-8	29-31	17.7
K-169.0-6.4	S-4 [1]	6-8	6.2
	S-6 [1]	14-16	9.4
	ST-1c [1]	27-29	6.0
	S-10 [1]	39-41	22.0

Remarks

1. Sample mass was less than the minimum mass outlined in the referenced test method.

Reviewed By: _____ Date: 04/29/22

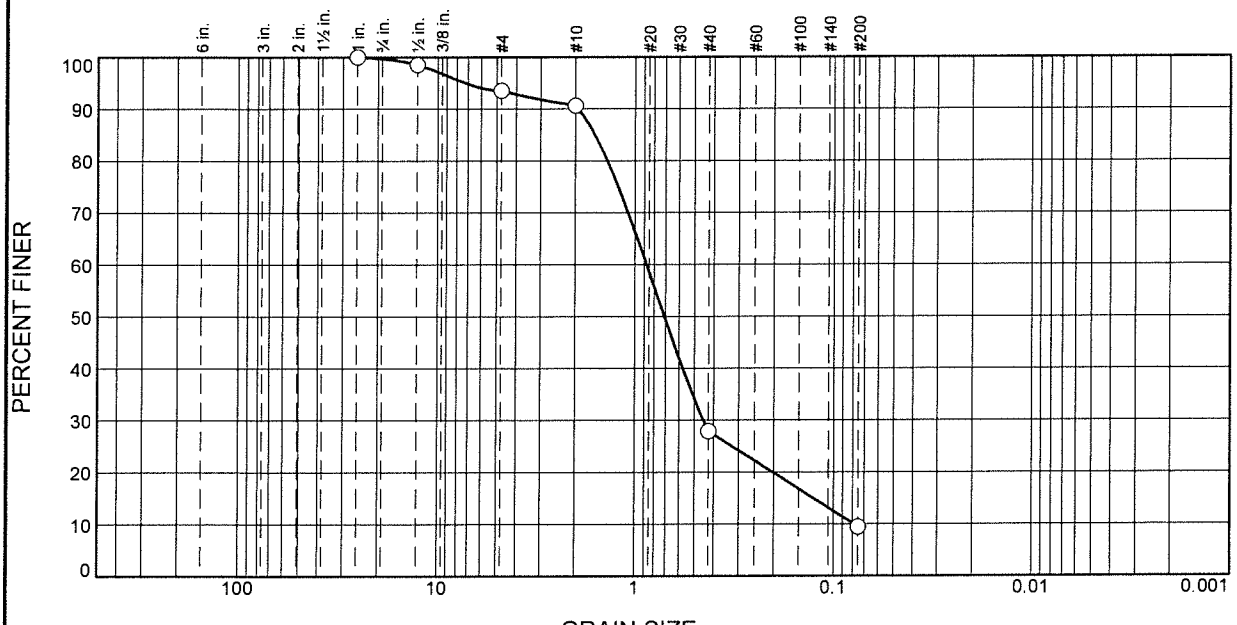
ATLANTIC TESTING LABORATORIES

Particle Size Distribution Report

Project: Champlain Hudson Power Express United Cable Install **Report No.:** CD10279E-14-04-22

Client: Kiewit Intrastructure Co. **Date:** 04/29/22

Sample No: K-169.0-4.4 **Source of Sample:** Boring Sample
Location: In-place **Elev./Depth:** 8-10'



% Cobbles	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	0	6	3	63	19	9	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	OUT OF SPEC. (X)
1"	100		
1/2"	99		
#4	94		
#10	91		
#40	28		
#200	9.4		

* (no specification provided)

Soil Description

Greyish Brown c-m+f SAND; trace SILT; trace mf+ GRAVEL

Atterberg Limits

PL= -- LL= -- PI= --

Coefficients

D_{85}= 1.5994 D_{60}= 0.8761 D_{50}= 0.7116
D_{30}= 0.4508 D_{15}= 0.1266 D_{10}= 0.0791
C_u= 11.08 C_c= 2.93

Classification

USCS= AASHTO=

Remarks

Moisture Content= 5.4%

Figure

ATLANTIC TESTING LABORATORIES, LIMITED

Reviewed by: _____ Date: 04/29/22

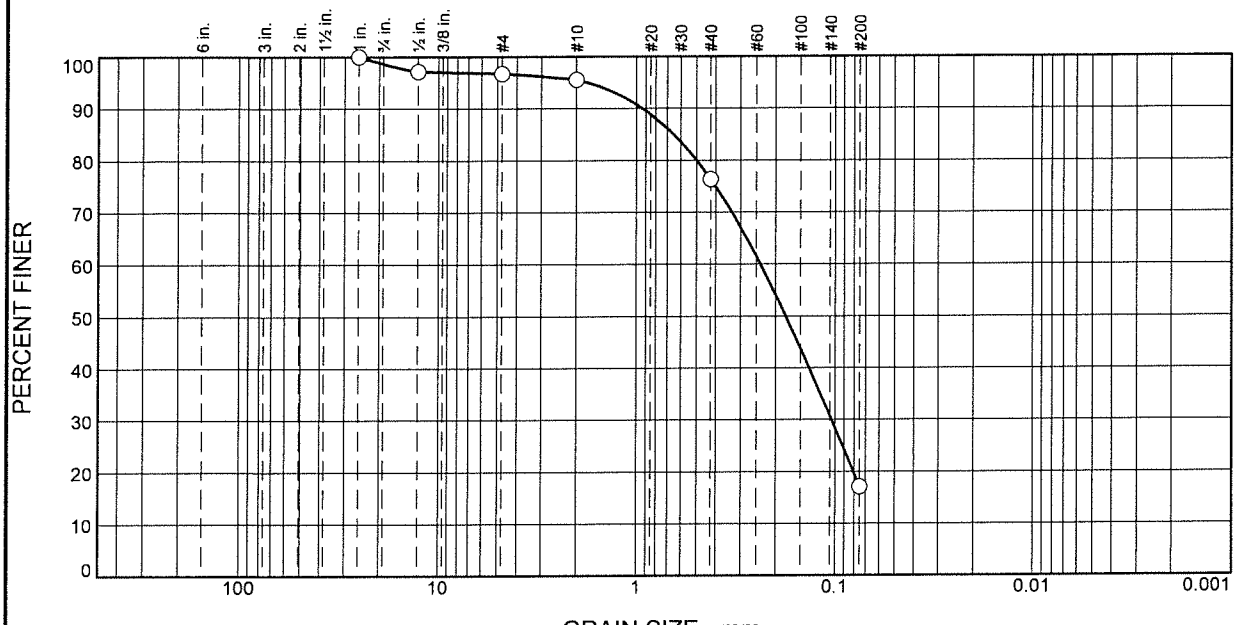
ATLANTIC TESTING LABORATORIES

Particle Size Distribution Report

Project: Champlain Hudson Power Express United Cable Install **Report No.:** CD10279E-14-04-22

Client: Kiewit Intrastructure Co. **Date:** 04/29/22

Sample No: K-169.0-4.4 **Source of Sample:** Boring Sample
Location: In-place **Elev./Depth:** 27-29'



% Cobbles	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	1	2	1	20	59	17	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	OUT OF SPEC. (X)
1"	100		
1/2"	97		
#4	97		
#10	96		
#40	76		
#200	17		

* (no specification provided)

Soil Description

Brownish Grey c-mf+ SAND; little SILT; trace m GRAVEL

Atterberg Limits

PL= -- LL= -- PI= --

Coefficients

D_{85}= 0.6542 D_{60}= 0.2386 D_{50}= 0.1779
D_{30}= 0.1043 D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= AASHTO=

Remarks

Moisture Content= 15.8%

Figure

ATLANTIC TESTING LABORATORIES, LIMITED

Reviewed by: _____ Date: 04/29/22

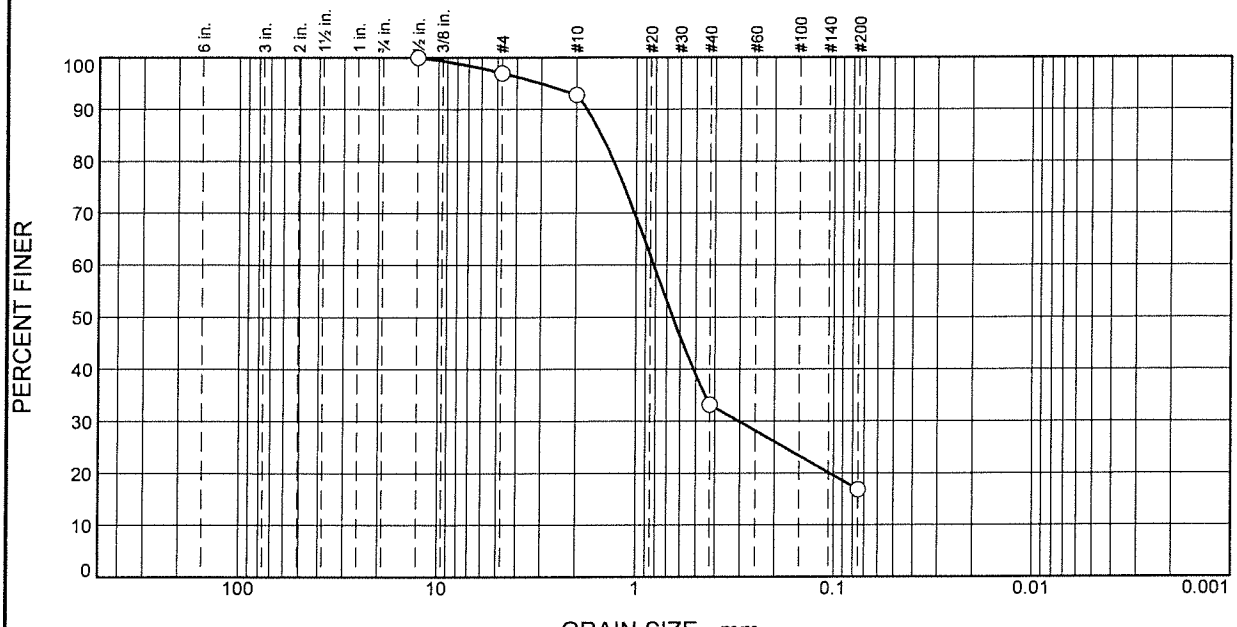
ATLANTIC TESTING LABORATORIES

Particle Size Distribution Report

Project: Champlain Hudson Power Express United Cable Install **Report No.:** CD10279E-14-04-22

Client: Kiewit Intrastructure Co. **Date:** 04/29/22

Sample No: K-169.0-4.5 **Source of Sample:** Boring Sample
Location: In-place **Elev./Depth:** 4-6'



% Cobbles	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	0	3	4	60	16	17	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	OUT OF SPEC. (X)
1/2"	100		
#4	97		
#10	93		
#40	33		
#200	17		

* (no specification provided)

Soil Description

Brown c-m+f SAND; little SILT; trace f GRAVEL

Atterberg Limits

PL= -- LL= -- PI= --

Coefficients

D_{85}= 1.4988 D_{60}= 0.8170 D_{50}= 0.6536
D_{30}= 0.3035 D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= AASHTO=

Remarks

Moisture Content= 10.6%

Figure

ATLANTIC TESTING LABORATORIES, LIMITED

Reviewed by: Date: 04/29/22

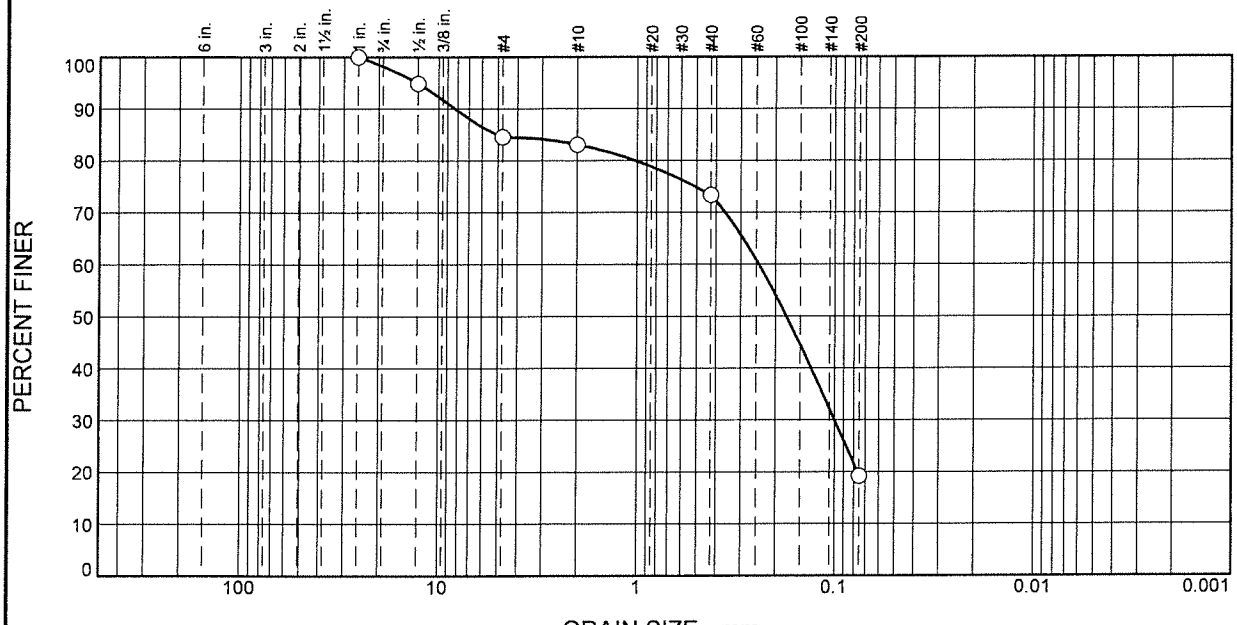
ATLANTIC TESTING LABORATORIES

Particle Size Distribution Report

Project: Champlain Hudson Power Express United Cable Install **Report No.:** CD10279E-14-04-22

Client: Kiewit Intrastructure Co. **Date:** 04/29/22

Sample No: K-169.0-4.5 **Source of Sample:** Boring Sample
Location: In-place **Elev./Depth:** 19-21'



% Cobbles	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	2	13	2	10	54	19	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	OUT OF SPEC. (X)
1"	100		
1/2"	95		
#4	85		
#10	83		
#40	73		
#200	19		

* (no specification provided)

Soil Description

Greyish Brown c-mf+ SAND; little SILT; little mf+ GRAVEL

Atterberg Limits

PL= -- LL= -- PI= --

Coefficients

D_{85}= 5.0647 D_{60}= 0.2431 D_{50}= 0.1761
D_{30}= 0.1001 D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= AASHTO=

Remarks

Moisture Content= 11.5%

Figure

ATLANTIC TESTING LABORATORIES, LIMITED

Reviewed by: Date: 04/29/22

ATLANTIC TESTING LABORATORIES

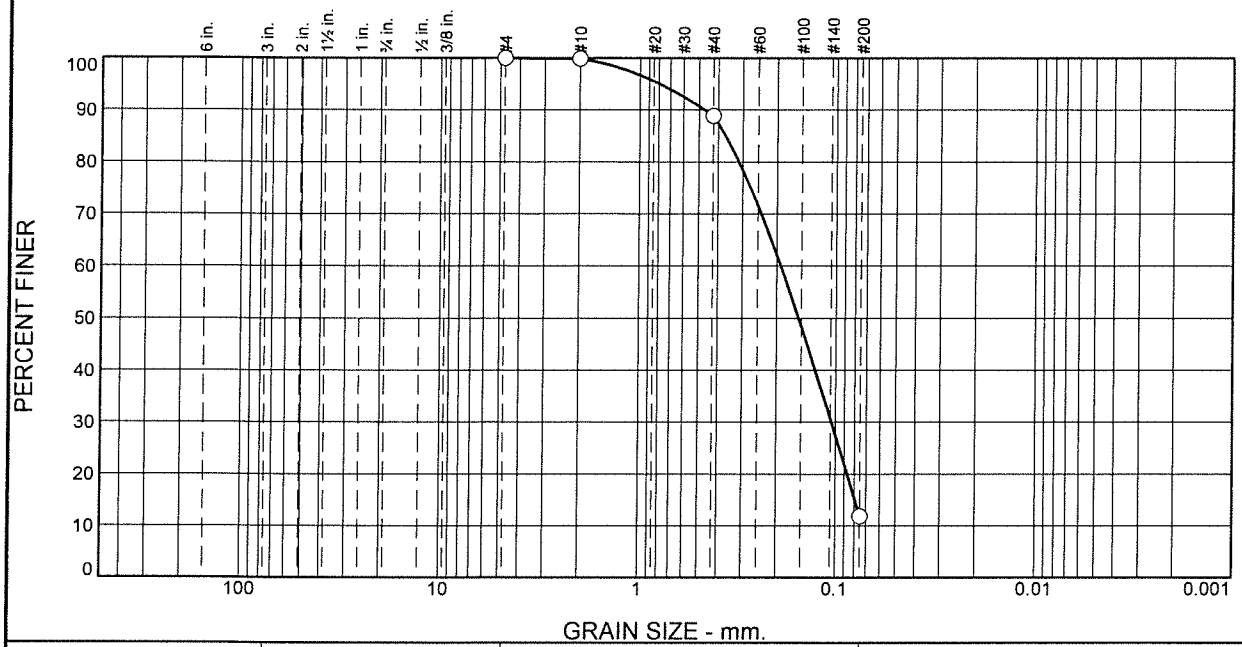
Particle Size Distribution Report

Project: Champlain Hudson Power Express United Cable Install **Report No.:** CD10279E-14-04-22

Client: Kiewit Intrastructure Co. **Date:** 04/29/22

Sample No: K-169.0-4.5 **Source of Sample:** Boring Sample

Location: In-place **Elev./Depth:** 29-31'



% Cobbles	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	0	0	0	11	77	12	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	OUT OF SPEC. (X)
#4	100		
#10	100		
#40	89		
#200	12		

Soil Description

Grey mf+ SAND; little SILT

Atterberg Limits

PL= -- LL= -- PI= --

Coefficients

D_{85}= 0.3680 D_{60}= 0.1910 D_{50}= 0.1547
D_{30}= 0.1049 D_{15}= 0.0794 D_{10}=
C_u= C_c=

Classification

USCS= AASHTO=

Remarks

Moisture Content= 17.7%

* (no specification provided)

Figure

ATLANTIC TESTING LABORATORIES, LIMITED

Reviewed by: _____ Date: 04/29/22

ATLANTIC TESTING LABORATORIES

CORROSION ANALYSIS SUITE

Client: Kiewit Intrastructure Co.
Project: Champlain Hudson Power Express
United Cable Installation
Location: Various Locations, New York

ATL Report No. CD10279E-14-04-22
Report Date: April 29, 2022
Date Received: April 19, 2022

Sample: K-169.0-4.4, S-3/4 **Depth (ft):** 4-8

MEASURING pH OF SOIL FOR USE IN CORROSION TESTING
ASTM G 51

Type of Test	Soil Temperature (°C)	pH Readings			Average
Laboratory	22.5	8.57	8.56	8.56	8.56

pH of calibration standards used: 7.00

MEASUREMENT OF SOIL RESISITIVITY USING THE TWO-ELECTRODE SOIL BOX METHOD
ASTM G 187 (LABORATORY)

Test Date: 04/20/22 Performed by: E. Hannon
Meter Used: Miller 400A Soil Box Factor: 1.29

Date Collected	Temperature at Collection (°C)	Measured Resistance (Ω)	Calculated Resistivity (Ω/cm)
Not Provided	Not Provided	108,000	139,320

WATER-SOLUBLE CHLORIDE ION CONTENT IN SOIL
AASHTO T 291, Method A

Chloride by Mass of Soil (mg/kg)
20

WATER-SOLUBLE SULFATE IN SOIL
ASTM C 1580

Sulfate by Mass of Sample (%)	Sulfate by Mass of Sample (mg/kg)
0.03	300

Reviewed By: Date: 04/29/22

Kiewit

MEMORANDUM

DATE: January 26, 2023

TO: Antonio Marruso, P.E.; CHA Consulting, Inc.

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

SUBJECT: Geotechnical Data: Segment 7 - Package 4B - HDD Crossing 67 – Revision 1
Champlain Hudson Power Express Project
Scotia, 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 Scotia, New York. The approximate station for the start of HDD crossing Number 67 is STA 45280+00 (42.8450°N, 73.9885°W).

The geotechnical data at this HDD crossing is attached. The available data is from the previous investigation by AECOM.

- AECOM, Geotechnical Data Report, Upland Segments: Putnam Station, Washington County, to Cementon, Green County, NY, Champlain Hudson Power Express, dated May 28, 2021.

Contact us if you have questions or require additional information.

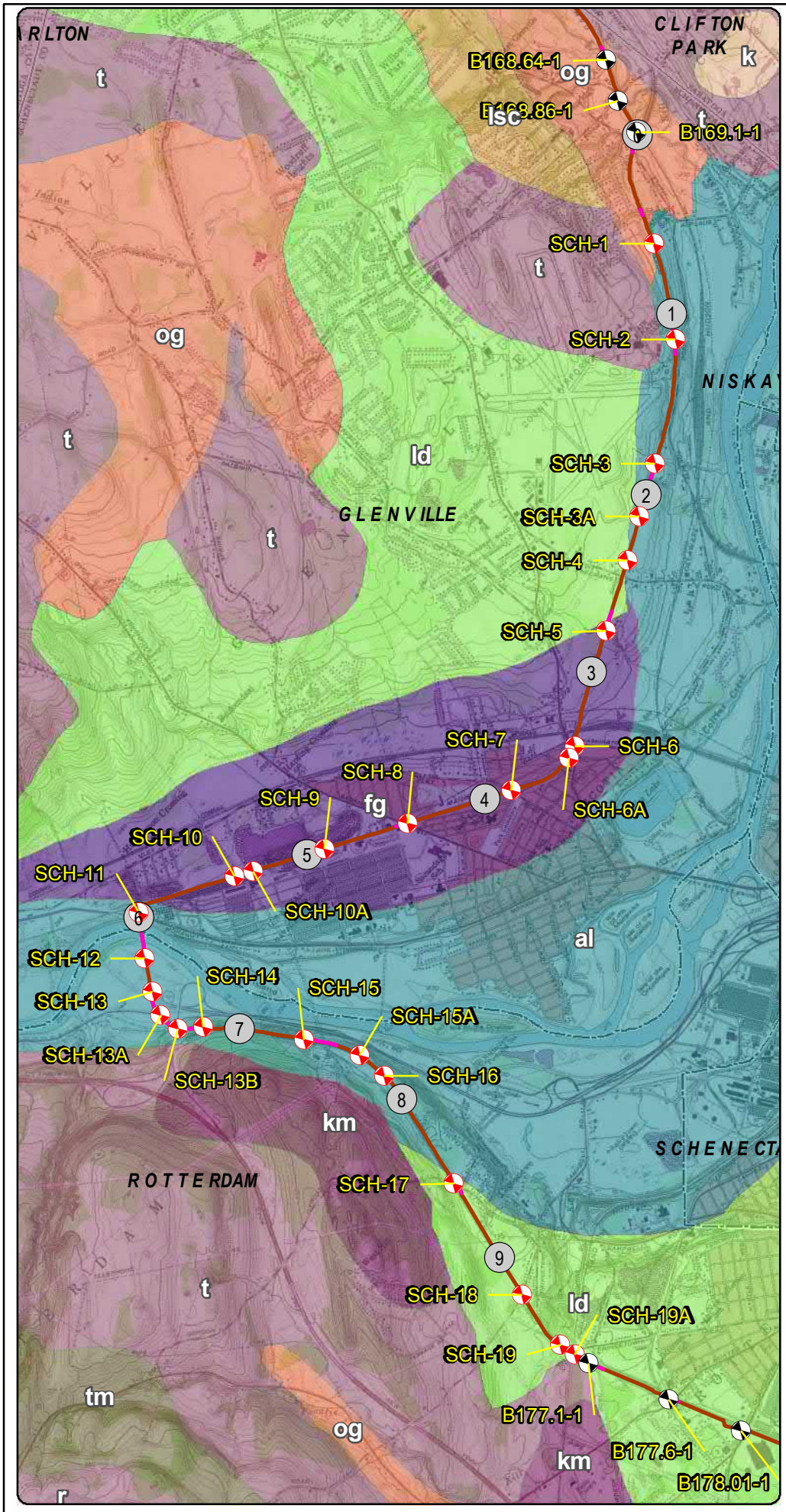
HDD 67
Borings SCH-10A, SCH-10
Segment 7 - Design Package 4B

CHPE Segment 7 Package 4B
Soil Boring Coordinates and Elevations

Firm	Boring	Northing (feet)	Easting (feet)	Ground Surface Elevation (feet)
TRC*	B169.1-1	1469045.0	651801.8	236.7
AECOM**	SCH-1	1466449.8	649931.4	279.8
	SCH-2	1464095.5	648426.9	288.3
	SCH-3	1462008.4	645522.0	286.8
	SCH-3A	1461257.5	644144.0	287.3
	SCH-4	1460618.5	643021.4	285.4
	SCH-5	1459621.8	641171.4	279.3
	SCH-6	1457944.8	638238.9	241.7
	SCH-6A	1457817.7	637889.5	249.6
	SCH-7	1458325.7	636073.8	271.1
	SCH-8	1459763.1	633330.0	287.2
	SCH-9	1460902.6	631152.2	297.0
	SCH-10	1462154.8	628796.0	290.3
	SCH-10A	1461888.1	629265.0	291.0
	SCH-11	1463366.6	626127.1	289.2
	SCH-12	1462321.8	625339.2	227.3
	SCH-13	1461493.8	624804.4	229.1
	SCH-13A	1460855.7	624513.9	272.0
	SCH-13B	1460233.8	624596.1	295.4
	SCH-14	1459768.5	625134.5	281.3
	SCH-15	1457493.3	626917.2	338.6
	SCH-15A	1456046.5	627705.8	352.4
	SCH-16	1455146.0	627794.1	350.1
	SCH-17	1451579.9	627027.1	357.8
	SCH-18	1447982.8	626167.9	354.4
NYS DOT ***	DAB-6(2)	1460628.7	625081.5	248
	DH-24S	1460655.9	625133.7	237
	DH-25S	1460602.7	625066.5	236
	DH-26S	1460543.7	624985.5	235
	DH-27S	1460696.2	625101.3	236
	DH-28S	1460650.3	625027.7	235
	DH-29S	1460597.5	624949.4	234.5

Notes:
- Northings and Eastings are provided in NAD83 New York State Plane East Zone.
- Elevations are referenced to the NAVD88 datum.
* TRC boring coordinates as shown in Table 1-6 in AECOM report (reference below). Boring elevations estimated from November 2021 topographic survey by Williams Aerial.
** AECOM boring coordinates and elevations as shown in Table 1-6 in AECOM report.
*** NYS DOT boring coordinates and elevations are approximated from drawing D257014 Sheet 170 "GENERAL SUBSURFACE PROFILE, STRUCTURE #3 - RAMP TWY OVER I-890"
**** Kiewit boring coordinates and elevations are noted on the boring logs.

Reference:
AECOM, Geotechnical Data Report, Upland Segments: Putnam Station, Washington County, to Cementon, Green County, NY, Champlain Hudson Power Express, dated May 28, 2021.



LEGEND

- 2021 Boring Location
- Previous (2013) Boring Location
- Terrestrial Route HVDC
- Submarine Route HVDC
- Terrestrial Route HVAC
- Preliminary HDD Locations
- Preliminary Pipe Bridge Location
- Town Boundary
- County Boundary

Surficial Geology

- al - Recent alluvium
- fg - Fluvial sand and/or gravel
- k - Kame deposits
- km - Kame moraine
- ld - Lacustrine delta
- lsc - Lacustrine silt and clay
- og - Outwash sand and gravel
- r - Bedrock
- t - Till
- tm - Till moraine

N

0.4 0.2 0 0.4 Miles

Transmission Developers Inc.

Champlain Hudson Power Express Project

Champlain Hudson Power Express Inc.

Surficial Geology and Geotechnical Borings Schenectady Preferred Alt Figure 3-7

Prepared on 4/27/2021

by: AECOM

DATA SOURCES: ESRI, NYSDOT, NOAA, USACE, NYDOS, TDI, TRC

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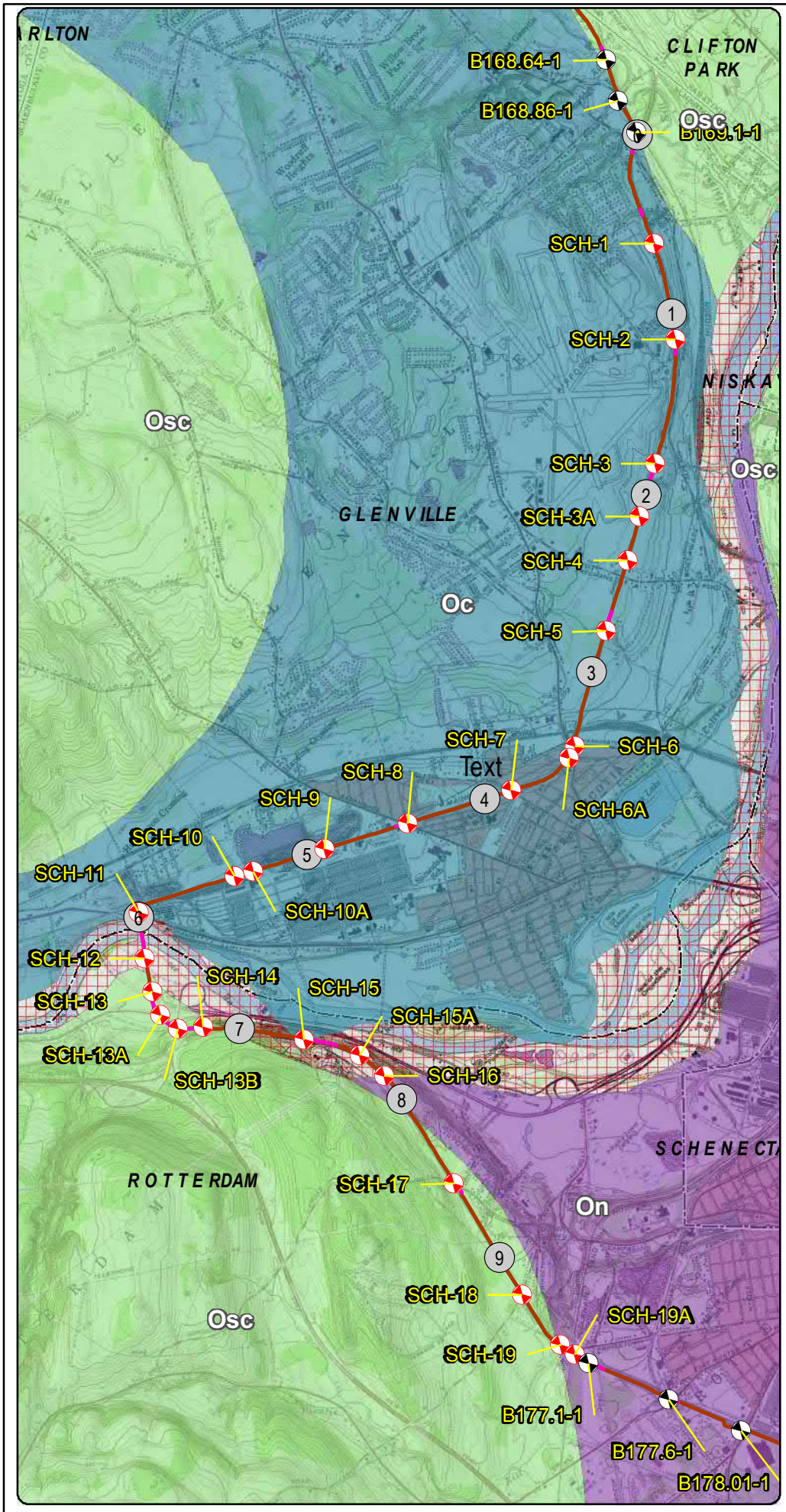


LEGEND

- 2021 Boring Location
- Previous (2013) Boring Location
- Terrestrial Route HVDC
- Submarine Route HVDC
- Terrestrial Route HVAC
- Preliminary HDD Locations
- Preliminary Pipe Bridge Location
- Town Boundary
- County Boundary

Bedrock Geology

- No Label
- Oc - Canajoharie Shale
- On - Normanskill Shale
- Osc - Schenectady Formation

* Schenectady Formation includes: graywacke, sandstone, siltstone, shale

0.4 0.2 0 0.4 Miles

Transmission Developers Inc.

Champlain Hudson Power Express Project

Champlain Hudson Power Express Inc.

Bedrock Geology and Geotechnical Borings Schenectady Preferred Alt Figure 4-7

Prepared on 4/29/2021

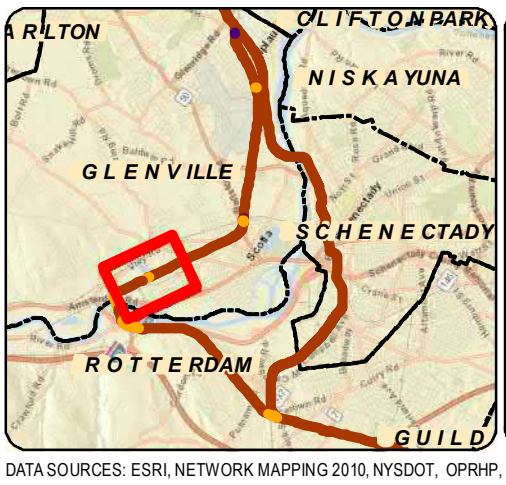
by: AECOM

DATA SOURCES: ESRI, NYSDOT, NOAA, USACE, NYDOS, TDI, TRC

Y:\Projects\CHPE\IRoute\Consensus_Alternative_Routes\MXD\Alt_5_Routes_DZ_20190\Boring_Locations\Maps_for_May_2021_Report\Alt_Route_Schenectady_Boring_Locations_Bedrock_Map_May_2021_Report.mxd

4.7
4.8
SCH-9
5
5.1
GLENVILLE
5.2
SCH-10A
SCH-10
5.5
5.6
5.7
5.8
ROTTERDAM
5.9

0 1,000
Feet



LEGEND

- 111.8 Certified Milepost - Tenths
- 135 Certified Milepost
- 111.8 Preferred Alternative Milepost - Tenths
- 135 Preferred Alternative Milepost
- Terrestrial Route HVDC
- Submarine Route HVDC
- Terrestrial Route HVAC
- Preliminary HDD Locations
- Preliminary Pipe Bridge Location
- 2021 Boring Location
- Previous (2013) Boring Location
- Streams/Ditches
- Railroad ROW
- Deviation Zone
- Deviation Zone Outside ROW
- Preferred Alternative Deviation Zone
- Preferred Alternative Deviation Zone Outside ROW
- Town Boundary
- Village Boundary
- State Park (OPRHP)

Parcel Ownership: TOWN NAME

Road Name: Village Name

Transmission Developers Inc.

Champlain Hudson Power Express Project

Champlain Hudson Power Express Inc.

BORING LOCATION PLAN

Schenectady Preferred Alternative

Figure A-7

Sheet 5 of 8

Prepared by: AECOM 4/27/2021

DATA SOURCES: ESRI, NETWORK MAPPING 2010, NYSDOT, OPRHP, TDI, TRC

Y:\Projects\CHPE\Route\Consensus_Alternative_Routes\MXD\Alt_5_Routes_DZ_201909\Boring_Locations\Maps_for_May_2021_Report\Alt_Route_Schenectady_Boring_Locations_Mapset_May_2021_Report.mxd

BORING CONTRACTOR: ADT	AECOM	SHEET 1 OF 2
DRILLER: Matt Murtaugh		PROJECT NAME: CHPE -
		PROJECT NO.: 60323056
		HOLE NO.: **SCH-10**
SOILS ENGINEER/GEOLOGIST: Mike Izdebski		START DATE: 03/16/2021
	Boring Log	FINISH DATE: 03/16/2021
LOCATION: Schenectady, NY MP 5.41		OFFSET: N/A

GROUND WATER OBSERVATIONS		CASING	SAMPLER	DRILL BIT	CORE BARREL	DRILL RIG: Geoprobe 7822DT
	TYPE	Flush Joint Steel	California Modified	Tricone Roller Bit		BORING TYPE: SPT
	SIZE I.D.	4"	2.5"	- -		BORING O.D.: 4.5"
	SIZE O.D.	4.5"	3"	3 7/8"		SURFACE ELEV.:
	HAMMER WT.	140 lbs	140 lbs			LONGITUDE:
	HAMMER FALL	30"	30"			LATITUDE:

DEPTH	CORING RATE MIN/FT	SAMPLE DEPTHS FROM - TO (FEET)	TYPE AND NO.	PEN. in	REC. in	BLOWS PER 6 in ON SAMPLER (ROCK QUALITY DESIGNATION)				N Corr.(2)	USCS CLASS.	STRAT. CHNG. DEPTH	FIELD IDENTIFICATION OF SOILS
		0'-5'				Hand Cleared					GP	SAND & GRAVEL	Dark Brown fine to coarse GRAVEL, some fine to coarse sand, little silt
1.0											SP		0.5': Brown fine to coarse SAND, some fine to coarse gravel, little silt, little cobbles, trace organics
2.0													
3.0													3.0': Boulder
		3'-5'	S-1										TR-1; (3.0'-5.0')
4.0											ML		4.5': Brown Clayey SILT, some fine to coarse subangular gravel, little fine to coarse sand
5.0													
		5'-7'	S-2	24"	24"	7	17	17	26	22	SP		Dark brown fine to coarse SAND, some fine to coarse subangular gravel, little silt
6.0											MH		6.0': Brown silt, some fine to coarse sand, some fine to coarse subrounded gravel, little cobbles
7.0													
		7'-9'	S-3	11"	9"	26	50/5"				SP		Brown fine to coarse SAND, some silt, some fine to coarse angular gravel
8.0													7.5': Gray cobble fragment, refusal
9.0													
		9'-11'	S-4	8"	8"	44	50/2"				SP		Brown coarse SAND, some angular fine gravel, little fine to medium sand; TR-2; (9.0'-9.5')
10.0													
11.0													9.5': Brown fine to coarse subrounded GRAVEL, some fine to coarse sand
		11'-'13'	S-5	18"	14"	18	34	50/6"			SP		Brown fine to coarse SAND, little fine to medium subrounded gravel
12.0													
13.0											GP		11.5': Brown subrounded GRAVEL, little fine to coarse sand
		13'-15'	S-6	24"	10"	8	25	25	31	33	GP		Fine to medium angular GRAVEL and coarse sand
14.0													14.5': Brown medium to coarse subrounded GRAVEL, trace silt
15.0													
		15'-17'	S-7	6"	2"	50/6"					GP		Brown, red, gray fine to medium angular GRAVEL, little coarse sand
16.0													
17.0													
18.0													
19.0													
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: $N_{corr}=N*(2.0^2-1.375^2)in./(3.0^2-2.4^2)in. = N*0.65$.

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%

BORING CONTRACTOR: ADT	AECOM	SHEET 2 OF 2
DRILLER: Matt Murtaugh		PROJECT NAME: CHPE -
		PROJECT NO.: 60323056
		HOLE NO.: **SCH-10**
SOILS ENGINEER: Mike Izdebski		START DATE: 03/16/2021
	Boring Log	FINISH DATE: 03/16/2021
LOCATION: Schenectady, NY MP 5.41		OFFSET: N/A

DEPTH	CORING RATE MIN/FT	DEPTHS FROM - TO (FEET)	TYPE AND NO.	PEN. in	REC. in	BLOWS PER 6 in ON SAMPLER (ROCK QUALITY DESIGNATION)				N Corr.	USCS CLASS.	STRAT. CHNG. DEPTH	FIELD IDENTIFICATION OF SOILS
		20'-22'	S-8	11"	11"	26	50/5"				GP		Brown, red, gray fine to coarse subrounded GRAVEL
21.0													TR-3; (20.5'-21.0')
											SP		20.5': Brown fine to coarse SAND and dine to coarse subrounded gravel
22.0													
23.0													
24.0													
25.0													
		25'-27'	S-9	24"	21"	35	46	47	47	60	GP		Red, brown, gray fine to medium subrounded GRAVEL
26.0											GW		25.5': Brown fine to coarse SAND and fine to coarse subrounded GRAVEL
27.0													
28.0													
29.0													
30.0													
		30'-32'	S-10	8"	8"	40	50/2"				GP	SAND & GRAVEL	Red, brown, gray fine to medium subrounded GRAVEL, little coarse sand TR-4; (30.0'-30.5')
31.0													
											GW		30.5': Brown subrounded GRAVEL and fine to coarse SAND, wet
32.0													
33.0													
34.0													
35.0													
		35'-37'	S-11	2"	0"	50/2"							No recovery
36.0													
37.0													
38.0													
39.0													
40.0													
		40'-42'	S-12	4"	4"	50/4"					GP		Brown fine to coarse subrounded GRAVEL, some fine to coarse sand
41.0													
42.0													
													SCH-10 terminated at 42 fbg
43.0													
44.0													
45.0													

NOTES:

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%

BORING CONTRACTOR: ADT	AECOM	SHEET 1 OF 2
DRILLER: Matt Murtaugh		PROJECT NAME: CHPE -
		PROJECT NO.: 60323056
		HOLE NO.: **SCH-10A**
SOILS ENGINEER/GEOLOGIST: Mike Izdebski	**Boring Log**	START DATE: 03/15/2021
		FINISH DATE: 03/15/2021
LOCATION: Schenectady, NY MP 5.30		OFFSET: N/A

GROUND WATER OBSERVATIONS		CASING	SAMPLER	DRILL BIT	CORE BARREL	DRILL RIG: Geoprobe 7822DT
	TYPE	Flush Joint Steel	California Modified	Tricone Roller Bit		BORING TYPE: SPT
	SIZE I.D.	4"	2.5"	- -		BORING O.D.: 4.5"
	SIZE O.D.	4.5"	3"	3 7/8"		SURFACE ELEV.:
	HAMMER WT.	140 lbs	140 lbs			LONGITUDE:
	HAMMER FALL	30"	30"			LATITUDE:

DEPTH	CORING RATE MIN/FT	SAMPLE DEPTHS FROM - TO (FEET)	TYPE AND NO.	PEN. in	REC. in	BLOWS PER 6 in ON SAMPLER (ROCK QUALITY DESIGNATION)				N Corr.(2)	USCS CLASS.	STRAT. CHNG. DEPTH	FIELD IDENTIFICATION OF SOILS
		0'-5'				Hand Cleared							Dark Brown fine to coarse SAND, some subrounded fine to coarse gravel, little cobbles, little silt, trace organics
1.0											SP		
2.0													
3.0													
		3'-5'	S-1										TR-1; (3.0'-5.0')
4.0													
5.0													
		5'-7'	S-2	24"	24"	8	16	22	34	25	SP		Brown fine to coarse SAND, some fine to coarse subrounded gravel, little silt
6.0													
7.0													
		7'-9'	S-3	11"	9"	15	14	30	50/6"	29	SP		SAA
8.0													
9.0													
		9'-11'	S-4	8"	8"	31	44	50/5"			GP/SP	SAND & GRAVEL	Brown fine to medium subrounded GRAVEL, some fine to coarse sand, little silt
10.0													
													TR-2; (10.0'-10.5')
11.0													
		11'-'13'	S-5	18"	14"	25	35	38	44	47	GP/SP		Brown fine to coarse GRAVEL, some fine to coarse sand, little silt
12.0													
13.0													
		13'-15'	S-6	24"	0"	22	50/5"						No recovery
14.0													
15.0													
		15'-17'	S-7	6"	2"	50	40	32	35	47	GP/SP		Grey cobble fragment
16.0													15.5': Brown fine to coarse subangular GRAVEL and fine to coarse SAND, little silt
17.0													
18.0													
19.0													
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: $N_{corr}=N*(2.0^2-1.375^2)in./(3.0^2-2.4^2)in. = N*0.65$.

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%

BORING CONTRACTOR: ADT	AECOM	SHEET 2 OF 2
DRILLER: Matt Murtaugh		PROJECT NAME: CHPE -
		PROJECT NO.: 60323056
		HOLE NO.: **SCH-10A**
SOILS ENGINEER: Mike Izdebski		START DATE: 03/15/2021
	Boring Log	FINISH DATE: 03/15/2021
LOCATION: Schenectady, NY MP 5.30		OFFSET: N/A

DEPTH	CORING RATE MIN/FT	DEPTHS FROM - TO (FEET)	TYPE AND NO.	PEN. in	REC. in	BLOWS PER 6 in ON SAMPLER (ROCK QUALITY DESIGNATION)				N Corr.	USCS CLASS.	STRAT. CHNG. DEPTH	FIELD IDENTIFICATION OF SOILS
		20'-22'	S-8	12"	12"	13	65/6"				GP/SP	SAND & GRAVEL	Fine to medium angular GRAVEL, brown little fine to coarse sand
21.0													
													20.5': fine to medium subrounded GRAVEL, some brown fine to coarse sand
22.0											GP/SP		
													TR-3; (20.5'-21.0')
23.0													
24.0													
25.0													
		25'-27'	S-9	10"	8"	36	50/4"				GP/SP		Brown fine to coarse subangular GRAVEL, some fine to coarse sand
26.0													
27.0													
28.0													
29.0													
30.0													
		30'-32'	S-10	10"	8"	32	50/4"				GP/SP		Brown fine to coarse subrounded GRAVEL, some fine to coarse sand
31.0													
													TR-4; (30.5'-31.0')
32.0													
33.0													
34.0													
35.0													
		35'-37'	S-11	4"	4"	50/4"					GP/SP		Brown fine to medium subrounded GRAVEL, some fine to
36.0													
37.0													
38.0													
39.0													
40.0													
		40'-42'	S-12	10"	8"	45	50/4"				GP/SP		Brown fine to coarse GRAVEL, some fine to coarse sand, wet
41.0													
													TR-5; (40.5-41.0')
42.0													
													SCH-10 terminated at 42 fbg
43.0													
44.0													
45.0													

NOTES:

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.

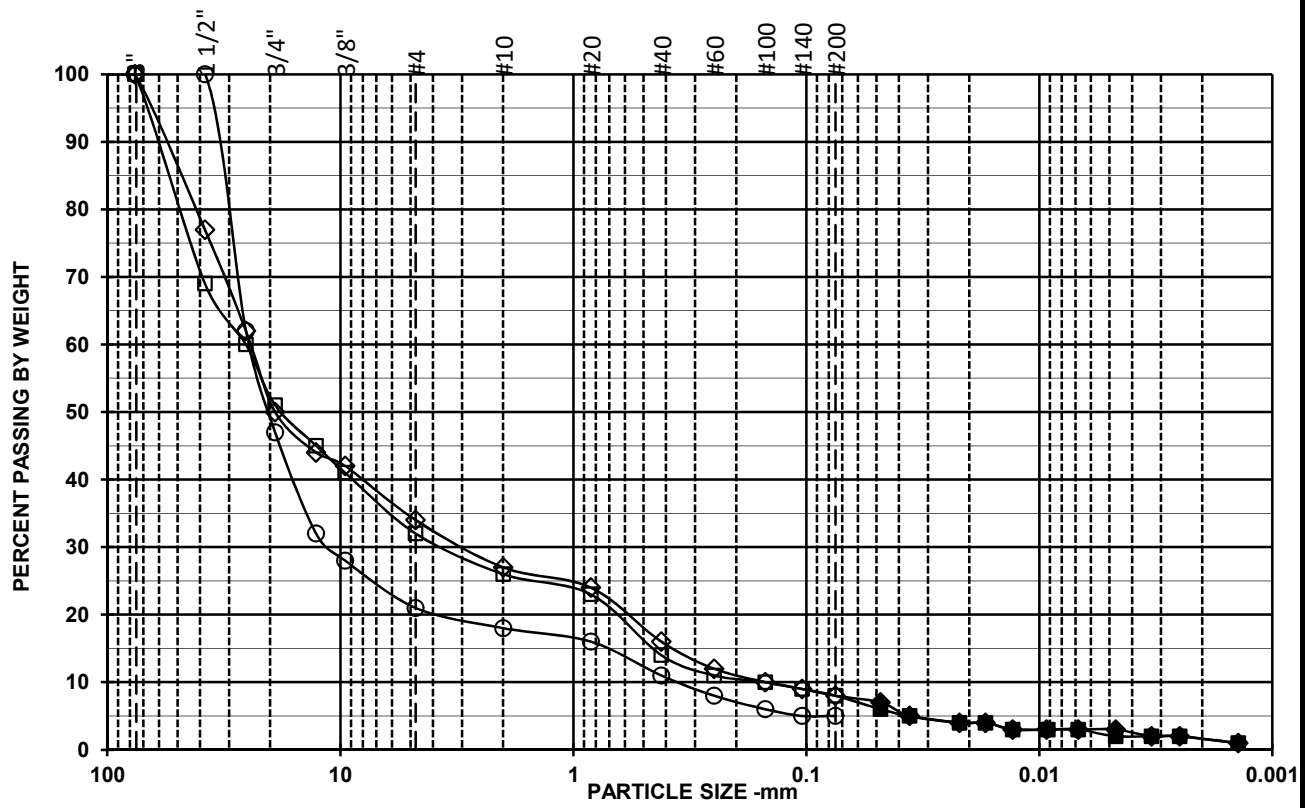
SAMPLE TYPE: S= SPLIT SPOON U=SHELBY TUBE R=ROCK CORE

PROPORTIONS: TRACE=1-10% LITTLE=10-20% SOME=20-35% AND=35-50%

Aquifer
CHPE - Schenectady Bypass 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 (%)	HYDROMETER % MINUS 2 μm (%)	ORGANIC CONTENT (burnoff) (%)	
SCH-3	S-4	9-11	12.1				SC	19	6		
SCH-3	S-6	13-15	15.8				SM	19	6		
SCH-3	S-10	30-32	6.0				SM	32	10		
SCH-3A	S-3	7-9	22.9				SP-SM	12	3		
SCH-3A	S-7	15-17	15.2				SP-SM	12	4		
SCH-3A	S-9	25-27	26.3				CL	99.1	40		
SCH-6	S-3	7-9	8.8	36	21	15	GC	14	5		
SCH-6	S-7	15-17	10.4				GC	17	5		
SCH-7	S-2	5-7	21.6	25	19	6	CL-ML	79.3	16		
SCH-7	S-4	9-11	13.9				SM	39	7		
SCH-10A	S-3	7-9	6.3				GP-GM	8	2		
SCH-10A	S-6	15-17	4.6				GW-GM	8	2		
SCH-10A	S-10	30-32	4.0				GP-GM	5			
SCH-11	S-3	7-9	9.6				SC	21	6		
SCH-11	S-16	60-62	5.6				SW-SM	12	3		
SCH-11	S-20	80-82	19.3				SM	17.5	3		
SCH-11	S-25	105-107	21.1				SM	24.3	3		
SCH-12	S-3	7-9	28.5	33	19	14	CL	85	18		
SCH-12	S-9	25-27	23.3				SM	19.8	3		
SCH-12	S-14	50-52	18.3				SM	15	3		
SCH-12	S-19	75-77	7.6	18	11	7	SC-SM	41	14		
SCH-12	S-25	105-107	7.6	19	11	8	SC	41	14		
SCH-13	S-3	7-9	7.0				GP-GM	6	2		
SCH-13	S-6	13-15	0.3				GW	2	1		
SCH-13	S-11	35-37	20.9				SM	18.4	3		
SCH-13B	S-2	5-7	12.8				GC	19	6		
SCH-13B	S-3	7-9	11.3				GC	22	6		
SCH-17	S-2	5-7	9.1				GM	28	5		
SCH-17	S-4	9-11	8.5				GP-GM	10	3		
SCH-19	S-2	5-7	10.7				SM	19	5		
SCH-19	S-7	15-17	7.8				GP-GM	11	3		
SCH-19	S-10	30-32	13.9	22	12	10	SC	28	11		

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



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

Symbol	□	◇	○
Boring	SCH-10A	SCH-10A	SCH-10A
Sample	S-3	S-6	S-10
Depth	7-9	15-17	30-32
% +3"	0	0	0
% Gravel	68	66	79
% SAND	24	26	16
%C SAND	6	7	3
%M SAND	12	11	7
%F SAND	6	8	6
% FINES	8	8	5
D_{100} (mm)	76.2	76.2	38.1
D_{60} (mm)	25.4	24.2	24.4
D_{30} (mm)	3.6	2.9	11
D_{10} (mm)	0.15	0.15	0.35
Cc	3.4	2.3	14.2
Cu	169.3	161.3	69.7

Sieve Size/ID #	Percent Finer Data		
6"	100	100	100
4"	100	100	100
3"	100	100	100
1 1/2"	69	77	100
1"	60	62	62
3/4"	51	50	47
1/2"	45	44	32
3/8"	41	42	28
#4	32	34	21
#10	26	27	18
#20	23	24	16
#40	14	16	11
#60	11	12	8
#100	10	10	6
#140	9	9	5
#200	8	8	5
5μ m	2	3	
2μ m	2	2	
1μ m	0	0	

SYMBOL	w (%)	LL	PL	PI	USCS	AASHTO	USCS DESCRIPTION AND REMARKS	DATE
□	6.3				GP-GM		Brown, Poorly graded gravel with silt and sand, Insufficient sample size	04/27/21
◇	4.6				GW-GM		Brown, Well-graded gravel with silt and sand, Insufficient sample size	04/27/21
○	4.0				GP-GM		Brown, Poorly graded gravel with silt and sand, Insufficient sample size	04/27/21

Aquifer

TerraSense, LLC #7853-21006

CHPE - Schenectady Bypass Borings

PARTICLE SIZE DISTRIBUTION
ASTM D6913 & ASTM D7928

TerraSense Analysis File: GrainSizeV6Rev1a14

Siev1e.xlsx 5/7/2021

Kiewit

MEMORANDUM

DATE: January 26, 2023

TO: Antonio Marruso, P.E.; CHA Consulting, Inc.

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

SUBJECT: Geotechnical Data: Segment 7 - Package 4B - HDD Crossing 68 – Revision 1
Champlain Hudson Power Express Project
Schenectady, 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 near Schenectady, New York. The approximate station for the start of HDD crossing Number 68 is STA 45313+50 (42.8492°N, 73.9997°W).

The geotechnical data at this HDD crossing is attached. The available data is from the previous investigation by AECOM and data from recent investigations by Atlantic Testing Laboratories (ATL) referenced below.

- AECOM, Geotechnical Data Report, Upland Segments: Putnam Station, Washington County, to Cementon, Green County, NY, Champlain Hudson Power Express, dated May 28, 2021.
- Atlantic Testing Laboratories, Subsurface Investigation Services, Champlain Hudson Power Express, Design Package 4B, Glenville to Scotia, New York, dated June 15, 2022.

Contact us if you have questions or require additional information.

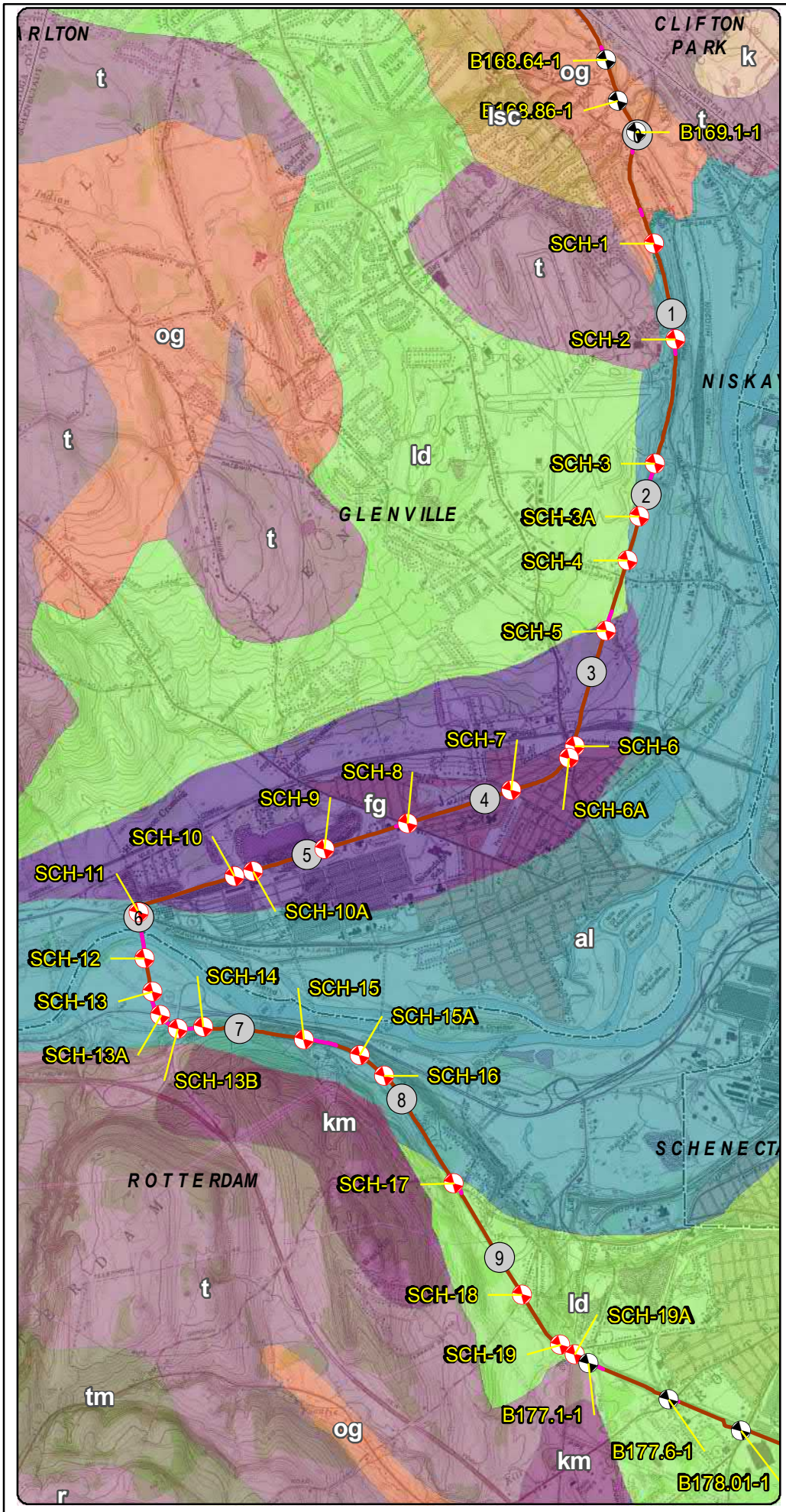
HDD 68
Borings SCH-11, K-169.0-6.0,
K-169.0-6.1, SCH-12
Segment 7 - Design Package 4B

CHPE Segment 7 Package 4B
Soil Boring Coordinates and Elevations

Firm	Boring	Northing (feet)	Easting (feet)	Ground Surface Elevation (feet)
TRC*	B169.1-1	1469045.0	651801.8	236.7
AECOM**	SCH-1	1466449.8	649931.4	279.8
	SCH-2	1464095.5	648426.9	288.3
	SCH-3	1462008.4	645522.0	286.8
	SCH-3A	1461257.5	644144.0	287.3
	SCH-4	1460618.5	643021.4	285.4
	SCH-5	1459621.8	641171.4	279.3
	SCH-6	1457944.8	638238.9	241.7
	SCH-6A	1457817.7	637889.5	249.6
	SCH-7	1458325.7	636073.8	271.1
	SCH-8	1459763.1	633330.0	287.2
	SCH-9	1460902.6	631152.2	297.0
	SCH-10	1462154.8	628796.0	290.3
	SCH-10A	1461888.1	629265.0	291.0
	SCH-11	1463366.6	626127.1	289.2
	SCH-12	1462321.8	625339.2	227.3
	SCH-13	1461493.8	624804.4	229.1
	SCH-13A	1460855.7	624513.9	272.0
	SCH-13B	1460233.8	624596.1	295.4
	SCH-14	1459768.5	625134.5	281.3
	SCH-15	1457493.3	626917.2	338.6
	SCH-15A	1456046.5	627705.8	352.4
	SCH-16	1455146.0	627794.1	350.1
	SCH-17	1451579.9	627027.1	357.8
	SCH-18	1447982.8	626167.9	354.4
NYS DOT ***	DAB-6(2)	1460628.7	625081.5	248
	DH-24S	1460655.9	625133.7	237
	DH-25S	1460602.7	625066.5	236
	DH-26S	1460543.7	624985.5	235
	DH-27S	1460696.2	625101.3	236
	DH-28S	1460650.3	625027.7	235
	DH-29S	1460597.5	624949.4	234.5

Notes:
- Northings and Eastings are provided in NAD83 New York State Plane East Zone.
- Elevations are referenced to the NAVD88 datum.
* TRC boring coordinates as shown in Table 1-6 in AECOM report (reference below). Boring elevations estimated from November 2021 topographic survey by Williams Aerial.
** AECOM boring coordinates and elevations as shown in Table 1-6 in AECOM report.
*** NYS DOT boring coordinates and elevations are approximated from drawing D257014 Sheet 170 "GENERAL SUBSURFACE PROFILE, STRUCTURE #3 - RAMP TWY OVER I-890"
**** Kiewit boring coordinates and elevations are noted on the boring logs.

Reference:
AECOM, Geotechnical Data Report, Upland Segments: Putnam Station, Washington County, to Cementon, Green County, NY, Champlain Hudson Power Express, dated May 28, 2021.



LEGEND

- 2021 Boring Location
- Previous (2013) Boring Location
- Terrestrial Route HVDC
- Submarine Route HVDC
- Terrestrial Route HVAC
- Preliminary HDD Locations
- Preliminary Pipe Bridge Location
- Town Boundary
- County Boundary

Surficial Geology

- al - Recent alluvium
- fg - Fluvial sand and/or gravel
- k - Kame deposits
- km - Kame moraine
- ld - Lacustrine delta
- lsc - Lacustrine silt and clay
- og - Outwash sand and gravel
- r - Bedrock
- t - Till
- tm - Till moraine

N

0.4 0.2 0 0.4 Miles

Transmission Developers Inc.

Champlain Hudson Power Express Project

Champlain Hudson Power Express Inc.

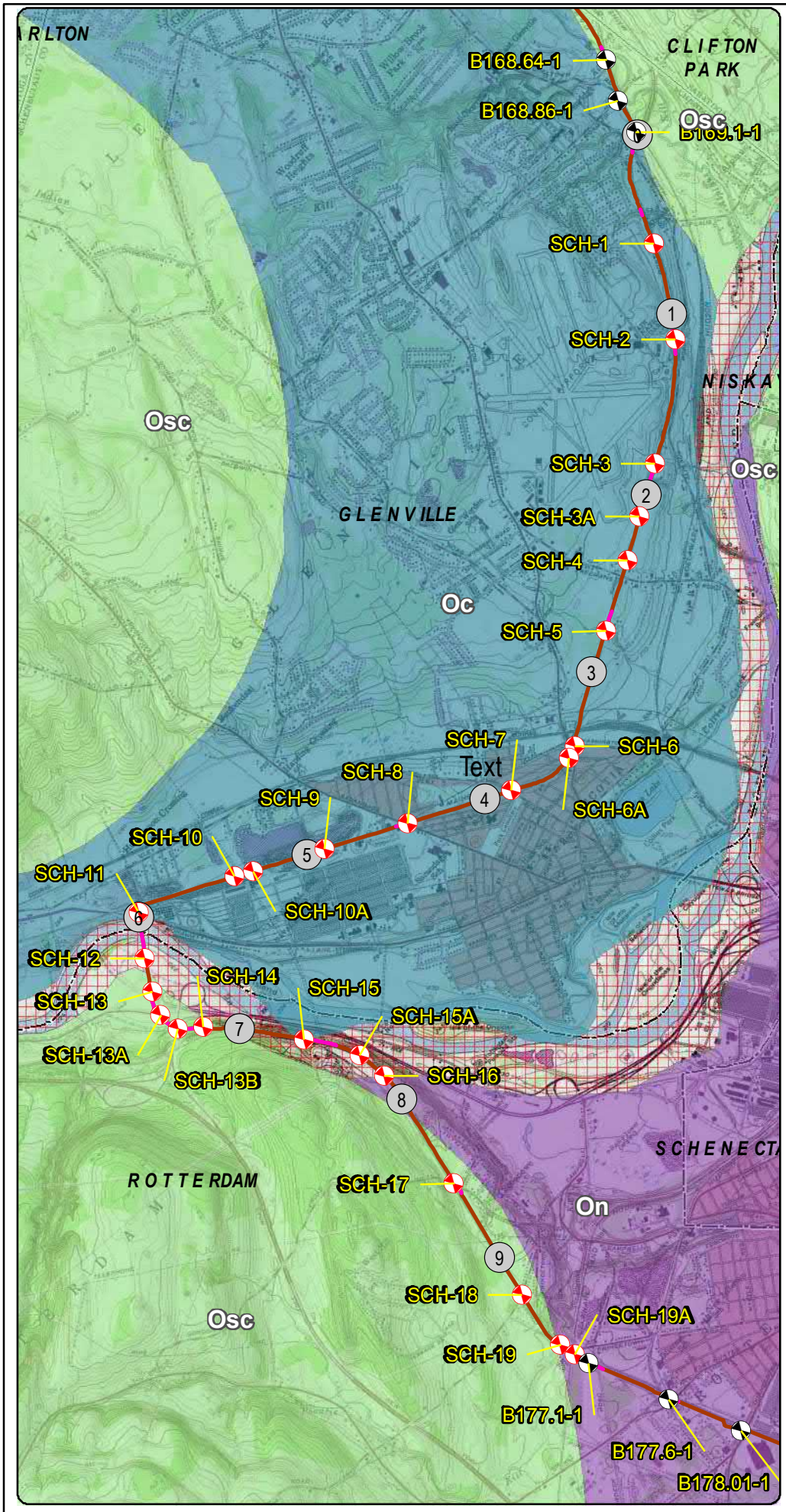
Surficial Geology and Geotechnical Borings Schenectady Preferred Alt Figure 3-7

Prepared on 4/27/2021

by: AECOM

DATA SOURCES: ESRI, NYSDOT, NOAA, USACE, NYDOS, TDI, TRC

Y:\Projects\CHPE\Route\Consensus_Alternative_Routes\MXD\Alt_5_Routes_DZ_20190\Boring_Locations\Maps_for_May_2021_Report\Alt_Route_Schenectady_Boring_Locations_Surficial_Map_May_2021_Report.mxd



LEGEND

- 2021 Boring Location
- Previous (2013) Boring Location
- Terrestrial Route HVDC
- Submarine Route HVDC
- Terrestrial Route HVAC
- Preliminary HDD Locations
- Preliminary Pipe Bridge Location
- Town Boundary
- County Boundary

Bedrock Geology

- No Label
- Oc - Canajoharie Shale
- On - Normanskill Shale
- Osc - Schenectady Formation

* Schenectady Formation includes: graywacke, sandstone, siltstone, shale

0.4 0.2 0 0.4 Miles

Transmission Developers Inc.

Champlain Hudson Power Express Project

Champlain Hudson Power Express Inc.

Bedrock Geology and Geotechnical Borings Schenectady Preferred Alt Figure 4-7

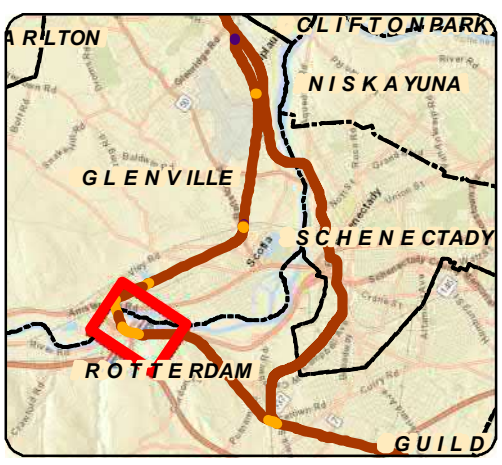
Prepared on 4/29/2021

by: AECOM

DATA SOURCES: ESRI, NYSDOT, NOAA, USACE, NYDOS, TDI, TRC

Y:\Projects\CHPE\IRoute\Consensus_Alternative_Routes\MXD\Alt_5_Routes_DZ_20190\Boring_Locations\Maps_for_May_2021_Report\Alt_Route_Schenectady_Boring_Locations_Bedrock_Map_May_2021_Report.mxd

SCH-11
5.9
6
5.8
5.7
5.6
6.1
6.2
SCH-12
6.3
GLENVILLE
SCH-13
6.5
SCH-13A
6.6
SCH-13B
ROTTERDAM
6.8
SCH-14
6.9
7
7.1
7.2
7.3
SCH-15
7.4
0
1,000
Feet



LEGEND

- 111.8 Certified Milepost - Tenths
- 135 Certified Milepost
- 111.8 Preferred Alternative Milepost - Tenths
- 135 Preferred Alternative Milepost
- Terrestrial Route HVDC
- Submarine Route HVDC
- Terrestrial Route HVAC
- Preliminary HDD Locations
- Preliminary Pipe Bridge Location
- 2021 Boring Location
- Previous (2013) Boring Location
- Streams/Ditches
- Railroad ROW
- Deviation Zone
- Deviation Zone Outside ROW
- Preferred Alternative Deviation Zone
- Preferred Alternative Deviation Zone Outside ROW
- Town Boundary
- Village Boundary
- State Park (OPRHP)

Parcel Ownership: TOWN NAME

Road Name: Village Name

Transmission Developers Inc.

Champlain Hudson Power Express Project

Champlain Hudson Power Express Inc.

BORING LOCATION PLAN

Schenectady Preferred Alternative

Figure A-7

Sheet 6 of 8

Prepared by: AECOM 4/27/2021

DATA SOURCES: ESRI, NETWORK MAPPING 2010, NYSDOT, OPRHP, TDI, TRC

Y:\Projects\CHPE\Route\Consensus_Alternative_Routes\MXD\Alt_5_Routes_DZ_201909\Boring_Locations\Maps_for_May_2021_Report\Alt_Route_Schenectady_Boring_Locations_Mapset_May_2021_Report.mxd

BORING CONTRACTOR: ADT	AECOM	SHEET 1 OF 5
DRILLER: Chris Chaillou		PROJECT NAME: CHPE -
		PROJECT NO.: 60323056
		HOLE NO.: **SCH-11**
SOILS ENGINEER/GEOLOGIST: Chris French		START DATE: 03/17/2021
	Boring Log	FINISH DATE: 03/18/2021
LOCATION: Schenectady, NY MP 5.97		OFFSET: N/A

GROUND WATER OBSERVATIONS		CASING	SAMPLER	DRILL BIT	CORE BARREL	DRILL RIG: CME LC-55
Water at 65' (inferred)	TYPE	Flush Joint Steel	California Modified	Tricone Roller Bit		BORING TYPE: SPT
	SIZE I.D.	4"	2.5"	- -		BORING O.D.: 4.5"
	SIZE O.D.	4.5"	3"	3 7/8"		SURFACE ELEV.:
	HAMMER WT.	140 lbs	140 lbs			LONGITUDE:
	HAMMER FALL	30"	30"			LATITUDE:

DEPTH	CORING RATE MIN/FT	SAMPLE DEPTHS FROM - TO (FEET)	TYPE AND NO.	PEN. in	REC. in	BLOWS PER 6 in ON SAMPLER (ROCK QUALITY DESIGNATION)				N Corr.(2)	USCS CLASS.	STRAT. CHNG. DEPTH	FIELD IDENTIFICATION OF SOILS
		0'-5'				Hand Cleared					SP	SAND	Dark brown fine to coarse SAND, little silt, trace rounded to subrounded gravel, trace rounded cobbles, dense, moist
1.0													
2.0													
3.0													
		3'-5'	S-1										TR-1; (3.0'-5.0')
4.0													
5.0													
		5'-7'	S-2	24"	24"	11	30	45	66	49	SP		Brown, black, tan medium to coarse SAND, little fine sand, little silt, trace angular to subrounded gravel, very dense, moist (fill)
6.0													
7.0													
		7'-9'	S-3	24"	24"	71	91	51	29		SP		Brown fine to coarse SAND, little silt, trace subrounded to rounded gravel, very dense, moist
8.0													TR-2; (8.0'-8.5')
9.0													8.7': Orange-brown fine to medium SAND, some silt, little coarse sand, dense, moist
		9'-11'	S-4	24"	6"	12	13	26	41				
10.0											GP/SP	SAND & GRAVEL	Light brown rounded to subrounded GRAVEL and fine to coarse SAND, little silt, very dense, saturated
11.0													
		11'-'13'	S-5	15"	9"	21	62	65/3"			GP/SP		SAA
12.0													
13.0													
		13'-15'	S-6	7"	3"	75	46/1"				GP/SP		SAA
14.0													Drilling very difficult, lots of chatter, infer cobbles, boulders and gravel
15.0													
		15'-17'	S-7	3"	0"	72/3"							No recovery
16.0													
17.0													
18.0													
19.0													
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: $N_{corr}=N*(2.0^2-1.375^2)in./(3.0^2-2.4^2)in. = N*0.65$.

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%

BORING CONTRACTOR: ADT	AECOM	SHEET 2 OF 5
DRILLER: Chris Chaillou		PROJECT NAME: CHPE -
		PROJECT NO.: 60323056
		HOLE NO.: **SCH-11**
SOILS ENGINEER: Chris French		START DATE: 03/17/2021
	Boring Log	FINISH DATE: 03/18/2021
LOCATION: Schenectady, NY MP 5.97		OFFSET: N/A

DEPTH	CORING RATE MIN/FT	DEPTHS FROM - TO (FEET)	TYPE AND NO.	PEN. in	REC. in	BLOWS PER 6 in ON SAMPLER (ROCK QUALITY DESIGNATION)				N Corr.	USCS CLASS.	STRAT. CHNG. DEPTH	FIELD IDENTIFICATION OF SOILS
		20'-22'	S-8	4"	3"	88/4"					GP/SP	SAND & GRAVEL	Brown/tan rounded to subrounded GRAVEL, little fine to coarse sand, trace silt, very dense, saturated
21.0													
22.0													
23.0													
24.0													
25.0													
		25'-27'	S-9	5"	2"	105/5"					GP/SP		SAA
26.0													
27.0													
28.0													
29.0													
30.0													
		30'-32'	S-10	4"	3"	104/4"					GP/SP		Brown/tan rounded to angular GRAVEL, trace fine to coarse sand, trace silt, very dense, saturated
31.0													
32.0													
33.0													
34.0													
35.0													
		35'-37'	S-11	4"	2"	80/3"					GP/SP		SAA
36.0													
37.0													
38.0													
39.0													
40.0													
		40'-42'	S-12	4"	2"	112/4"					GP/SP		SAA
41.0													
42.0													
43.0													
44.0													
45.0													

NOTES:

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%

BORING CONTRACTOR: ADT	AECOM	SHEET 3 OF 5
DRILLER: Chris Chaillou		PROJECT NAME: CHPE -
		PROJECT NO.: 60323056
		HOLE NO.: **SCH-11**
SOILS ENGINEER: Chris French		START DATE: 03/17/2021
	Boring Log	FINISH DATE: 03/18/2021
LOCATION: Schenectady, NY MP 5.97		OFFSET: N/A

DEPTH	CORING RATE MIN/FT	DEPTHS FROM - TO (FEET)	TYPE AND NO.	PEN. in	REC. in	BLOWS PER 6 in ON SAMPLER (ROCK QUALITY DESIGNATION)				N Corr.	USCS CLASS.	STRAT. CHNG. DEPTH	FIELD IDENTIFICATION OF SOILS
		45'-47'	S-13	4"	2"	115/4"					GP/SP	SAND & GRAVEL	Brown subrounded to rounded GRAVEL, little fine to coarse sand, trace silt, very dense, saturated
46.0													Drilling smooths out significantly at ~46'. No discernable change in sample composition
47.0													
48.0													
49.0													
50.0													
		50'-52'	s-14	1"	1"	128/1"							SAA
51.0													
52.0													
53.0													
54.0													
55.0													
		55'-57'	S-15	3"	2"	100/3"							SAA
56.0													
57.0													
58.0													
59.0													
60.0													
		60'-62'	S-16	24"	14"	87	76	72	50	96	GP/SP		Brown rounded to subrounded GRAVEL and fine to coarse SAND, trace silt, very dense, saturated
61.0													TR-3; (61.0'-61.5')
62.0													63' (*inferred*)
63.0											GP/SP SP	SAND	
64.0													
65.0													
		65'-67'	S-17	24"	14"	37	46	49	73	62			SAA
66.0													65.8': Brown fine SAND, trace silt, very dense, saturated
67.0													
68.0													
69.0													
70.0													

NOTES:

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 DMJM Harris 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%

BORING CONTRACTOR:	AECOM	SHEET 4 OF 5
SOILS ENGINEER:		PROJECT NAME: CHPE-
DRILLER:		PROJECT NO.: 60323056
Chris Chaillou		HOLE NO.: **SCH-11**
SOILS ENGINEER:		START DATE: 3/17/21
Chris French	**Boring Log**	FINISH DATE: 3/18/21
LOCATION: Schenectady, NY MP 5.97		OFFSET: N/A

DEPT	CORING RATE MIN/FT	DEPTHS FROM - TO (FEET)	TYPE AND NO.	PEN. in	REC. in	BLOWS PER 6 in ON SAMPLER (ROCK QUALITY DESIGNATION)				N Corr.	USCS CLASS.	STRAT. CHNG. DEPTH	FIELD IDENTIFICATION OF SOILS
		70'-72'	S-18	24"	18"	34	38	39	32	50	SP		SAA
71.0													
72.0													
73.0													
74.0													
75.0													
		75'-77'	S-19	24"	17"	38	40	47	55	57	SP		SAA
76.0													
77.0													
78.0													
79.0													
80.0													
		80'-82'	S-20	24"	19"	27	34	37	38	46	SP		SAA
81.0													
82.0													
83.0												SAND	
84.0													
85.0													
		85'-87'	S-21	24"	24"	35	43	50	52	60	SP		SAA
86.0													
87.0													
88.0													
89.0													
90.0													
		90'-92'	S-22	24"	17"	26	40	36	36	49	SP		SAA
91.0													TR-4; (91.0'-91.5')
92.0													
93.0													
94.0													
95.0													

NOTES:

Soil description represents a field identification after D.M. Burmister unless otherwise noted.

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SAMPLE TYPE: S= SPLIT SPOON U=SHELBY TUBE R=ROCK CORE

PROPORTIONS: TRACE=1-10% LITTLE=10-20% SOME=20-35% AND=35-50%

BORING CONTRACTOR:	AECOM	SHEET 5 OF 5
SOILS ENGINEER:		PROJECT NAME: CHPE-
DRILLER:		PROJECT NO.: 60323056
Chris Chaillou		HOLE NO.: **SCH-11**
SOILS ENGINEER:		START DATE: 3/17/21
Chris French	**Boring Log**	FINISH DATE: 3/18/21
LOCATION: Schenectady, NY MP 5.97		OFFSET: N/A

DEPT	CORING RATE MIN/FT	DEPTHS FROM - TO (FEET)	TYPE AND NO.	PEN. in	REC. in	BLOWS PER 6 in ON SAMPLER (ROCK QUALITY DESIGNATION)				N Corr.	USCS CLASS.	STRAT. CHNG. DEPTH	FIELD IDENTIFICATION OF SOILS
		95'-97'	S-23	24"	19"	40	43	57	61	65	SP		SAA
96.0													
97.0													
98.0													
99.0													
100.0													
		100'-102'	S-24	24"	22"	33	58	59	69	76	SP		SAA
101.0													
102.0													
103.0													
104.0													
105.0													
		105'-107'	S-25	24"	18"	50	69	73	85	92	SP		SAA
106.0													
107.0													
108.0												SAND	
109.0													
110.0													
		110'-112'	S-26	24"	18"	39	51	65	70	75	SP		SAA
111.0													
112.0													
113.0													
114.0													
115.0													
		115'-117'	S-27	24"	19"	44	61	59	61	78	SP		SAA
116.0													
117.0													
118.0													
		118'-120'	S-28	24"	18"	57	83	87	103	111	SP		SAA
119.0													TR-5; (119.0'-119.5')
120.0													SCH-11 terminated at 120 fbg

NOTES:

Soil description represents a field identification after D.M. Burmister unless otherwise noted.

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SAMPLE TYPE:	S= SPLIT SPOON	U=SHELBY TUBE	R=ROCK CORE	
PROPORTIONS:	TRACE=1-10%	LITTLE=10-20%	SOME=20-35%	AND=35-50%

BORING CONTRACTOR: ADT	AECOM	SHEET 1 OF 5
DRILLER: Chris Chaillou		PROJECT NAME: CHPE -
		PROJECT NO.: 60323056
		HOLE NO.: **SCH-12**
SOILS ENGINEER/GEOLOGIST: Chris French		START DATE: 03/16/2021
	Boring Log	FINISH DATE: 03/16/2021
LOCATION: Bike Path at I-890 West Exit Ramp to Rt. 5S West - Schenectady, NY (MP 6.22)		OFFSET: N/A

GROUND WATER OBSERVATIONS		CASING	SAMPLER	DRILL BIT	CORE BARREL	DRILL RIG: CME LC-55
Water at 14' (inferred)	TYPE	Flush Joint Steel	California Modified	Tricone Roller Bit		BORING TYPE: SPT
	SIZE I.D.	4"	2.5"	- -		BORING O.D.: 4.5"
	SIZE O.D.	4.5"	3"	3 7/8"		SURFACE ELEV.:
	HAMMER WT.	140 lbs	140 lbs			LONGITUDE:
	HAMMER FALL	30"	30"			LATITUDE:

DEPTH	CORING RATE MIN/FT	SAMPLE DEPTHS FROM - TO (FEET)	TYPE AND NO.	PEN. in	REC. in	BLOWS PER 6 in ON SAMPLER (ROCK QUALITY DESIGNATION)				N Corr.(2)	USCS CLASS.	STRAT. CHNG. DEPTH	FIELD IDENTIFICATION OF SOILS
		0'-5'				Hand Cleared					OL	Sandy SILT (alluvium)	Dark brown silt, trace fine sand, trace organics, medium stiff, moist
1.0											ML		1.7': Brown SILT, trace fine sand, medium stiff, moist
2.0													
3.0													
		3'-5'	S-1										TR-1; (3.0'-5.0')
4.0													
5.0													
6.0													
		6'-7'	S-2	12"	12"	2	4				ML		SAA
7.0													
		7'-9'	S-3	24"	24"	4	7	9	7	10	ML		SAA
8.0													
9.0													
		9'-11'	S-4	24"	24"	6	4	5	4	6	ML		Brown Clayey SILT, thin fine sand lamination, soft, moist
10.0													
11.0													
		11'-'13'	S-5	24"	24"	6	6	5	17	7	ML		Brown Clayey SILT, thin fine to medium sand lamination, trace subrounded gravel, soft, moist
12.0													
13.0													
		13'-15'	S-6	24"	13"	25	30	29	23	38	SM	SAND & GRAVEL	Brown fine to coarse SAND, little clayey silt, little subrounded to rounded gravel, very dense, saturated
14.0													TR-2; (14.0'-14.5')
15.0													
		15'-17'	S-7	24"	8"	24	20	17	15	24	SM		SAA
16.0													
17.0													
18.0													
19.0													
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: $N_{corr}=N*(2.0^2-1.375^2)in./(3.0^2-2.4^2)in. = N*0.65$.

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SAMPLE TYPE:	S= SPLIT SPOON	U=SHELBY TUBE	R=ROCK CORE	
PROPORTIONS:	TRACE=1-10%	LITTLE=10-20%	SOME=20-35%	AND=35-50%

BORING CONTRACTOR: ADT	AECOM	SHEET 2 OF 5
DRILLER: Chris Chaillou		PROJECT NAME: CHPE -
		PROJECT NO.: 60323056
		HOLE NO.: **SCH-12**
SOILS ENGINEER: Chris French		START DATE: 03/16/2021
	Boring Log	FINISH DATE: 03/16/2021
LOCATION: Bike Path at I-890 West Exit Ramp to Rt. 5S West - Schenectady, NY (MP 6.22)		OFFSET: N/A

DEPTH	CORING RATE MIN/FT	DEPTHS FROM - TO (FEET)	TYPE AND NO.	PEN. in	REC. in	BLOWS PER 6 in ON SAMPLER (ROCK QUALITY DESIGNATION)				N Corr.	USCS CLASS.	STRAT. CHNG. DEPTH	FIELD IDENTIFICATION OF SOILS
		20'-22'	S-8	24"	9"	23	27	26	22	34	SM/SP	SAND & GRAVEL	SAA
21.0													21.8': Brown fine SAND, trace silt, dense, saturated
22.0													
23.0													
24.0													
25.0													
		25'-27'	S-9	24"	17"	27	29	27	26	36	SP		Brown fine SAND, trace silt, very dense, saturated
26.0													
27.0													
28.0													
29.0													
30.0													
		30'-32'	S-10	24"	24"	21	28	27	26	36	SP		Brown/tan rounded to angular GRAVEL, trace fine to coarse sand, trace silt, very dense, saturated
31.0													
32.0													
33.0													
34.0													
35.0													
		35'-37'	S-11	24"	24"	25	32	48	58	52	SP		Gray fine SAND, trace silt, very dense, saturated
36.0													TR-3; (36.0'-36.5')
37.0													
38.0													38.5' (*inferred*)
39.0												Sandy, Gravelly Silt (dense till)	
40.0													
		40'-42'	S-12	16"	13"	63	62	97/4"		103	ML		Gray clayey SILT, little fine to coarse SAND, little rounded to subrounded gravel, hard, moist (Till)
41.0													
42.0													TR-4; (41.0'-41.5')
43.0													
44.0													
45.0													

NOTES:

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SAMPLE TYPE:	S= SPLIT SPOON	U=SHELBY TUBE	R=ROCK CORE	
PROPORTIONS:	TRACE=1-10%	LITTLE=10-20%	SOME=20-35%	AND=35-50%

BORING CONTRACTOR: ADT	AECOM	SHEET 3 OF 5
DRILLER: Chris Chaillou		PROJECT NAME: CHPE -
		PROJECT NO.: 60323056
		HOLE NO.: **SCH-12**
SOILS ENGINEER: Chris French		START DATE: 03/16/2021
	Boring Log	FINISH DATE: 03/16/2021
LOCATION: Bike Path at I-890 West Exit Ramp to Rt. 5S West - Schenectady, NY (MP 6.22)		OFFSET: N/A

DEPTH	CORING RATE MIN/FT	DEPTHS FROM - TO (FEET)	TYPE AND NO.	PEN. in	REC. in	BLOWS PER 6 in ON SAMPLER (ROCK QUALITY DESIGNATION)				N Corr.	USCS CLASS.	STRAT. CHNG. DEPTH	FIELD IDENTIFICATION OF SOILS
		45'-47'	S-13	24"	18"	43	73	102	103	114	ML	Sandy, Gravelly Silt (dense till)	SAA
46.0													
47.0													
48.0													
49.0													
50.0													
		50'-52'	S-14	24"	24"	45	64	69	67	86	ML/SP		SAA
51.0													51': Gray fine SAND, trace silt, very dense, saturated
52.0													
53.0													
54.0													
55.0													
		55'-57'	S-15	24"	24"	59	69	90	111	103	SP		Gray fine SAND, trace silt, very dense, saturated
56.0													
57.0													
58.0													
59.0													
60.0													
		60'-62'	S-16	24"	24"	56	60	66	64	82	SP		SAA
61.0													TR-5; (61.0'-61.5')
62.0													
63.0													
64.0													
65.0													
		65'-67'	S-17	9"	0"	103	106/3"						No Recovery
66.0													
67.0													
68.0													
69.0													
70.0													

NOTES:

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SAMPLE TYPE:	S= SPLIT SPOON	U=SHELBY TUBE	R=ROCK CORE	
PROPORTIONS:	TRACE=1-10%	LITTLE=10-20%	SOME=20-35%	AND=35-50%

BORING CONTRACTOR: ADT	AECOM	SHEET 4 OF 5
DRILLER: Chris Chaillou		PROJECT NAME: CHPE -
SOILS ENGINEER: Chris French		PROJECT NO.: 60323056
		HOLE NO.: **SCH-12**
		START DATE: 03/16/2021
		FINISH DATE: 03/16/2021
LOCATION: Bike Path at I-890 West Exit Ramp to Rt. 5S West - Schenectady, NY (MP 6.22)		OFFSET: N/A

DEPT	CORING RATE MIN/FT	DEPTHS FROM - TO (FEET)	TYPE AND NO.	PEN. in	REC. in	BLOWS PER 6 in ON SAMPLER (ROCK QUALITY DESIGNATION)				N Corr.	USCS CLASS.	STRAT. CHNG. DEPTH	FIELD IDENTIFICATION OF SOILS
		70'-72'	S-18	24"	0"	43	51	62	76	73			No Recovery
71.0													
72.0													
73.0													
74.0													
75.0													
		75'-77'	S-19	24"	24"	31	24	33	41	37	ML/SP		Gray clayey SILT, some fine to coarse sand, little subangular to subrounded gravel, stiff, moist
76.0													
77.0													
78.0													
79.0													
80.0													
		80'-82'	S-20	24"	0"	28	35	48	42	54		Sandy, Gravelly Silt (dense till)	No Recovery
81.0													
82.0													
83.0													
84.0													
85.0													
		85'-87'	S-21	24"	24"	14	26	32	38	38	ML/SP		Gray clayey SILT, some fine to coarse sand, little subangular to subrounded gravel, medium stiff, wet
86.0													
87.0													
88.0													
89.0													
90.0													
		90'-92'	S-22	24"	24"	11	18	27	29	29	ML/SP		SAA TR-6; (91.0'-91.5')
91.0													
92.0													
93.0													
94.0													
95.0													

NOTES:

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SAMPLE TYPE:	S= SPLIT SPOON	U=SHELBY TUBE	R=ROCK CORE	
PROPORTIONS:	TRACE=1-10%	LITTLE=10-20%	SOME=20-35%	AND=35-50%

BORING CONTRACTOR: ADT	AECOM	SHEET 5 OF 5
DRILLER: Chris Chaillou		PROJECT NAME: CHPE -
		PROJECT NO.: 60323056
		HOLE NO.: **SCH-12**
SOILS ENGINEER: Chris French		START DATE: 03/16/2021
		FINISH DATE: 03/16/2021
LOCATION: Bike Path at I-890 West Exit Ramp to Rt. 5S West - Schenectady, NY (MP 6.22)		OFFSET: N/A

DEPT	CORING RATE MIN/FT	DEPTHS FROM - TO (FEET)	TYPE AND NO.	PEN. in	REC. in	BLOWS PER 6 in ON SAMPLER (ROCK QUALITY DESIGNATION)				N Corr.	USCS CLASS.	STRAT. CHNG. DEPTH	FIELD IDENTIFICATION OF SOILS
		95'-97'	S-23	24"	24"	18	50	34	37	55	ML/SP	Silty, Gravelly SAND (till)	SAA
96.0													
97.0													
98.0													
99.0													
100.0													
		100'-102'	S-24	9"	5"	26	55/3"				ML/SP		SAA
101.0													
102.0													
103.0													
104.0													
105.0													
		105'-107'	S-25	24"	24"	17	29	38	40	44	ML/SP		SAA
106.0													
107.0													
108.0													
109.0													
110.0													
		110'-112'	S-26	24"	24"	42	24	29	30	34	ML/SP		SAA
111.0													
112.0													
113.0													
114.0													
115.0													
		115'-117'	S-27	24"	24"	16	26	37	53	41	ML/SP		Gray clayey SILT, some fine to coarse SAND, trace subangular to subrounded gravel, medium stiffness, wet
116.0													
117.0													
118.0													
		118'-120'	S-28	24"	23"	23	51	63	84	74	ML/SP		SAA TR-7; (119.0'-119.5')
119.0													
120.0													SCH-12 terminated at 120 fbg

NOTES:

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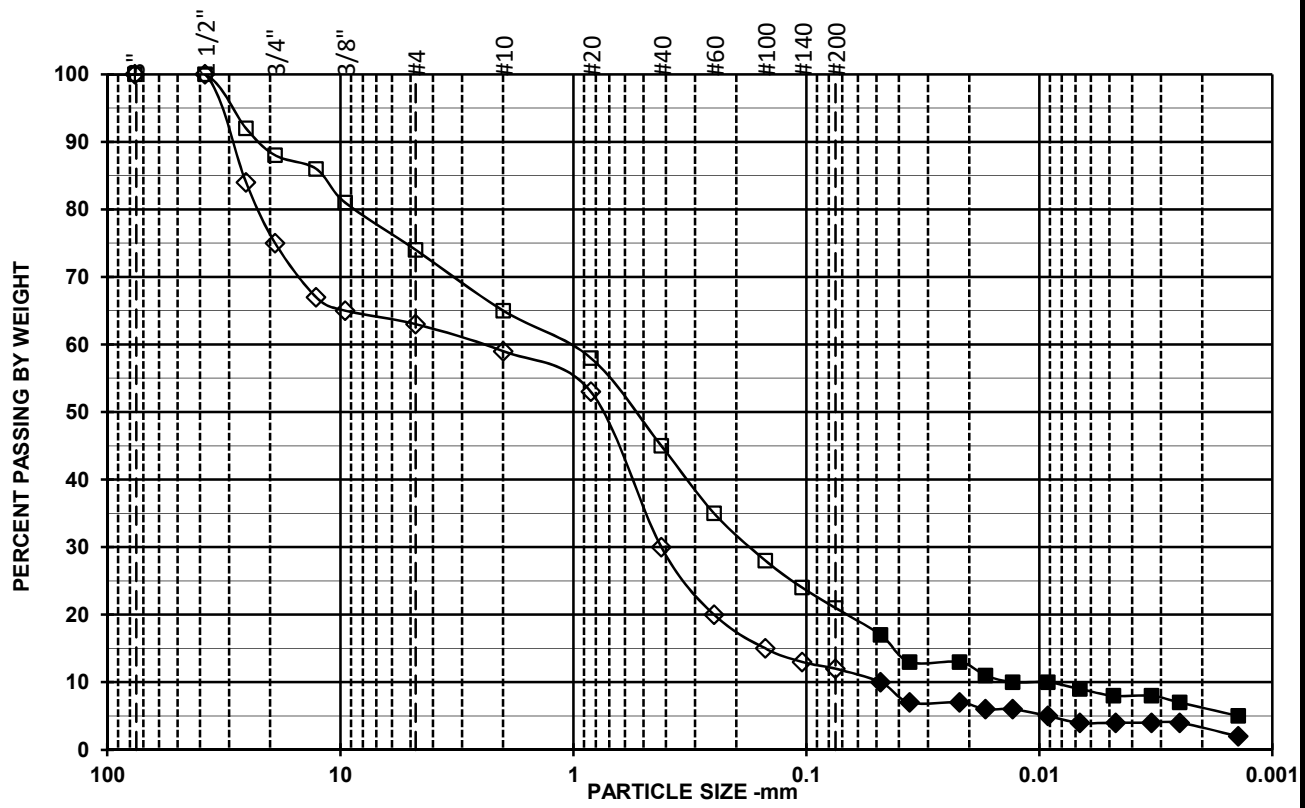
SAMPLE TYPE: S= SPLIT SPOON U=SHELBY TUBE R=ROCK CORE

PROPORTIONS: TRACE=1-10% LITTLE=10-20% SOME=20-35% AND=35-50%

Aquifer
CHPE - Schenectady Bypass 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 (%)	HYDROMETER % MINUS 2 μm (%)	ORGANIC CONTENT (burnoff) (%)	
SCH-3	S-4	9-11	12.1				SC	19	6		
SCH-3	S-6	13-15	15.8				SM	19	6		
SCH-3	S-10	30-32	6.0				SM	32	10		
SCH-3A	S-3	7-9	22.9				SP-SM	12	3		
SCH-3A	S-7	15-17	15.2				SP-SM	12	4		
SCH-3A	S-9	25-27	26.3				CL	99.1	40		
SCH-6	S-3	7-9	8.8	36	21	15	GC	14	5		
SCH-6	S-7	15-17	10.4				GC	17	5		
SCH-7	S-2	5-7	21.6	25	19	6	CL-ML	79.3	16		
SCH-7	S-4	9-11	13.9				SM	39	7		
SCH-10A	S-3	7-9	6.3				GP-GM	8	2		
SCH-10A	S-6	15-17	4.6				GW-GM	8	2		
SCH-10A	S-10	30-32	4.0				GP-GM	5			
SCH-11	S-3	7-9	9.6				SC	21	6		
SCH-11	S-16	60-62	5.6				SW-SM	12	3		
SCH-11	S-20	80-82	19.3				SM	17.5	3		
SCH-11	S-25	105-107	21.1				SM	24.3	3		
SCH-12	S-3	7-9	28.5	33	19	14	CL	85	18		
SCH-12	S-9	25-27	23.3				SM	19.8	3		
SCH-12	S-14	50-52	18.3				SM	15	3		
SCH-12	S-19	75-77	7.6	18	11	7	SC-SM	41	14		
SCH-12	S-25	105-107	7.6	19	11	8	SC	41	14		
SCH-13	S-3	7-9	7.0				GP-GM	6	2		
SCH-13	S-6	13-15	0.3				GW	2	1		
SCH-13	S-11	35-37	20.9				SM	18.4	3		
SCH-13B	S-2	5-7	12.8				GC	19	6		
SCH-13B	S-3	7-9	11.3				GC	22	6		
SCH-17	S-2	5-7	9.1				GM	28	5		
SCH-17	S-4	9-11	8.5				GP-GM	10	3		
SCH-19	S-2	5-7	10.7				SM	19	5		
SCH-19	S-7	15-17	7.8				GP-GM	11	3		
SCH-19	S-10	30-32	13.9	22	12	10	SC	28	11		

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



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

SYMBOL	w (%)	LL	PL	PI	USCS	AASHTO	USCS DESCRIPTION AND REMARKS	DATE
□	9.6				SC		Brown, Clayey sand with gravel, Insufficient sample size	04/27/21
◇	5.6				SW-SM		Brown, Well-graded sand with silt and gravel, Insufficient sample size	04/27/21
○								

Symbol	□	◇	○
Boring	SCH-11	SCH-11	
Sample	S-3	S-16	
Depth	7-9	60-62	
% +3"	0	0	
% Gravel	26	37	
% SAND	53	51	
%C SAND	9	4	
%M SAND	20	29	
%F SAND	24	18	
% FINES	21	12	
D_{100} (mm)	38.1	38.1	
D_{60} (mm)	1.08	2.48	
D_{30} (mm)	0.17	0.42	
D_{10} (mm)	0.013	0.048	
Cc	2.1	1.5	
Cu	83.1	51.7	

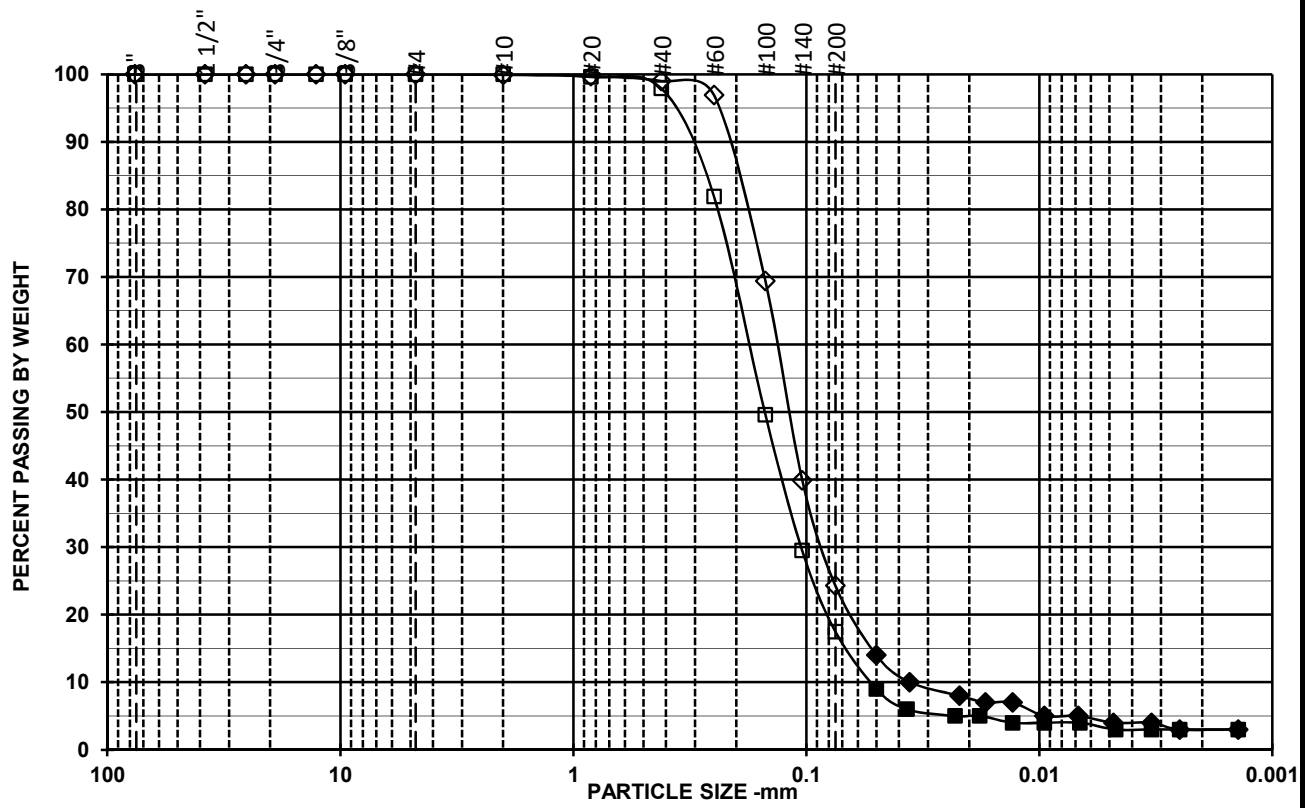
Sieve Size/ID #	Percent Finer Data		
6"	100	100	
4"	100	100	
3"	100	100	
1 1/2"	100	100	
1"	92	84	
3/4"	88	75	
1/2"	86	67	
3/8"	81	65	
#4	74	63	
#10	65	59	
#20	58	53	
#40	45	30	
#60	35	20	
#100	28	15	
#140	24	13	
#200	21	12	
5μ m	8	4	
2μ m	6	3	
1μ m	4	1	

Aquifer

TerraSense, LLC #7853-21006

CHPE - Schenectady Bypass Borings

PARTICLE SIZE DISTRIBUTION
ASTM D6913 & ASTM D7928



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

Symbol	□	◇	○
Boring	SCH-11	SCH-11	
Sample	S-20	S-25	
Depth	80-82	105-107	
% +3"	0	0	
% Gravel	0	0	
% SAND	82.5	75.7	
%C SAND	0	0.1	
%M SAND	2.1	0.9	
%F SAND	80.4	74.7	
% FINES	17.5	24.3	
D_{100} (mm)	2	4.75	
D_{60} (mm)	0.176	0.133	
D_{30} (mm)	0.11	0.085	
D_{10} (mm)	0.052	0.036	
Cc	1.3	1.5	
Cu	3.4	3.7	

Sieve Size/ID #	Percent Finer Data		
6"	100.0	100.0	
4"	100.0	100.0	
3"	100.0	100.0	
1 1/2"	100.0	100.0	
1"	100.0	100.0	
3/4"	100.0	100.0	
1/2"	100.0	100.0	
3/8"	100.0	100.0	
#4	100.0	100.0	
#10	100.0	99.9	
#20	99.6	99.7	
#40	97.9	99.0	
#60	81.9	96.9	
#100	49.6	69.4	
#140	29.5	39.9	
#200	17.5	24.3	
5μ m	3	4	
2μ m	3	3	
1μ m	3	3	

SYMBOL	w (%)	LL	PL	PI	USCS	AASHTO	USCS DESCRIPTION AND REMARKS	DATE
□	19.3				SM		Brown, Silty sand	04/27/21
◇	21.1				SM		Brown, Silty sand	04/28/21
○								

Aquifer

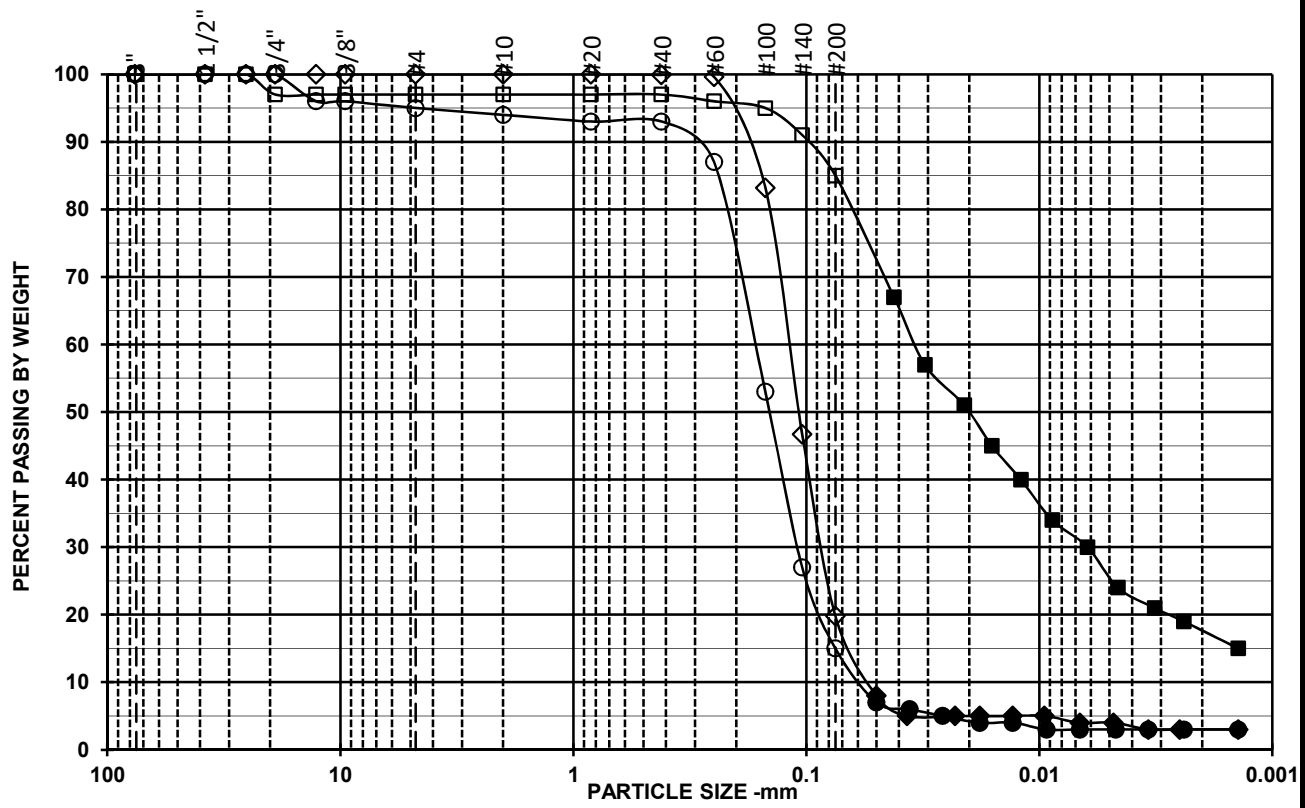
TerraSense, LLC #7853-21006

CHPE - Schenectady Bypass Borings

PARTICLE SIZE DISTRIBUTION
ASTM D6913 & ASTM D7928

TerraSense Analysis File: GrainSizeV6Rev1a14

Siev1g.xlsx 5/7/2021



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

SYMBOL	w (%)	LL	PL	PI	USCS	AASHTO	USCS DESCRIPTION AND REMARKS	DATE
□	28.5	33	19	14	CL		Brown, Lean clay with sand, Insufficient sample size	04/29/21
◇	23.3				SM		Brown, Silty sand	04/29/21
○	18.3				SM		Gray, Silty sand, Insufficient sample size	04/28/21

Symbol	□	◇	○
Boring	SCH-12	SCH-12	SCH-12
Sample	S-3	S-9	S-14
Depth	7-9	25-27	50-52
% +3"	0	0	0
% Gravel	3	0	5
% SAND	12	80.2	80
%C SAND	0	0	1
%M SAND	0	0.1	1
%F SAND	12	80.1	78
% FINES	85	19.8	15
D_{100} (mm)	25.4	2	19.1
D_{60} (mm)	0.034	0.119	0.166
D_{30} (mm)	0.006	0.085	0.11
D_{10} (mm)		0.054	0.058
Cc		1.1	1.3
Cu		2.2	2.9

Sieve Size/ID #	Percent Finer Data		
6"	100	100.0	100
4"	100	100.0	100
3"	100	100.0	100
1 1/2"	100	100.0	100
1"	100	100.0	100
3/4"	97	100.0	100
1/2"	97	100.0	96
3/8"	97	100.0	96
#4	97	100.0	95
#10	97	100.0	94
#20	97	100.0	93
#40	97	99.9	93
#60	96	99.6	87
#100	95	83.2	53
#140	91	46.7	27
#200	85	19.8	15
5μ m	26	4	3
2μ m	18	3	3
1μ m	13	3	3

Aquifer

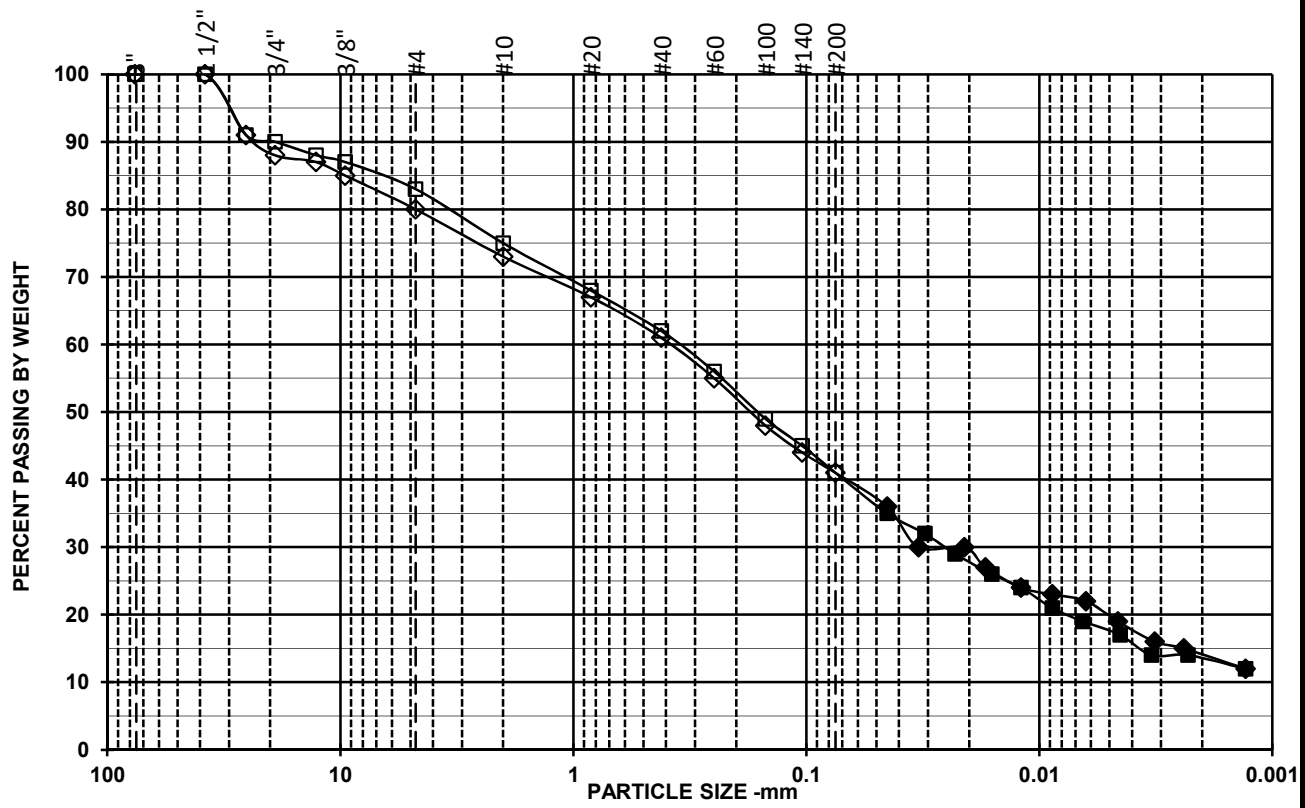
TerraSense, LLC #7853-21006

CHPE - Schenectady Bypass Borings

PARTICLE SIZE DISTRIBUTION
ASTM D6913 & ASTM D7928

TerraSense Analysis File: GrainSizeV6Rev1a14

Siev1h.xlsx 5/7/2021



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

Symbol	□	◇	○
Boring	SCH-12	SCH-12	
Sample	S-19	S-25	
Depth	75-77	105-107	
% +3"	0	0	
% Gravel	17	20	
% SAND	42	39	
%C SAND	8	7	
%M SAND	13	12	
%F SAND	21	20	
% FINES	41	41	
D_{100} (mm)	38.1	38.1	
D_{60} (mm)	0.352	0.384	
D_{30} (mm)	0.025	0.033	
D_{10} (mm)			
Cc			
Cu			

Sieve Size/ID #	Percent Finer Data		
6"	100	100	
4"	100	100	
3"	100	100	
1 1/2"	100	100	
1"	91	91	
3/4"	90	88	
1/2"	88	87	
3/8"	87	85	
#4	83	80	
#10	75	73	
#20	68	67	
#40	62	61	
#60	56	55	
#100	49	48	
#140	45	44	
#200	41	41	
5μ m	18	20	
2μ m	14	14	
1μ m	11	11	

SYMBOL	w (%)	LL	PL	PI	USCS	AASHTO	USCS DESCRIPTION AND REMARKS	DATE
□	7.6	18	11	7	SC-SM		Gray, Silty, clayey sand with gravel, Insufficient sample size	04/28/21
◇	7.6	19	11	8	SC		Gray, Clayey sand with gravel, Insufficient sample size	04/27/21
○								

Aquifer

TerraSense, LLC #7853-21006

CHPE - Schenectady Bypass Borings

PARTICLE SIZE DISTRIBUTION
ASTM D6913 & ASTM D7928

Boring Location Plans Page 8 of 9	Drawn by: ADW	Scale: Not to scale	Project No.: CD10279	Date: May 2022

Champlain Hudson Power Express
Design Package 4B
Glenville to Scotia, New York

***ATLANTIC TESTING LABORATORIES*, Limited**

Albany, NY	Binghamton, NY	Canton, NY	Elmira, NY	Plattsburgh, NY
Poughkeepsie, NY	Syracuse, NY	Rochester, NY	Utica, NY	Watertown, NY

ATLANTIC TESTING LABORATORIES, Limited

Subsurface Investigation

Report No.: CD10279D-01-05-22

Client: Kiewit Engineering (NY) Corp.

Boring Location: See Boring Location Plan

Project: Subsurface Investigation
Champlain Hudson Power Express, Design Package 4B
Various Locations, New York

Start Date: 5/25/2022 Finish Date: 5/26/2022

Boring No.: K-169.0-6.0 Sheet 1 of 3

Groundwater Observations			
Date	Time	Depth	Casing

Coordinates
Northing 1463063.309
Easting 625931.34

Sampler Hammer
Weight: 140 lbs.
Fall: 30 in.
Hammer Type: Automatic

Ground Elev.: ±208 (Mudline)

Boring Advance By: HW (4") Casing/3 7/8" Wet Rotary

Depth of Water Column = 17.0 feet
Depth of Sample referenced from top of mudline.

DEPTH	METHOD OF ADVANCE	SAMPLE NO.	DEPTH OF SAMPLE From	DEPTH OF SAMPLE To	SAMPLE TYPE	BLOWS ON SAMPLER PER 6" 2" O.D. SAMPLER	DEPTH OF CHANGE	CLASSIFICATION OF MATERIAL (f - fine, m - medium, c - coarse; and - 35-50%, some - 20-35%, little - 10-20%, trace - 0-10%)	Recovery (Inches)
1	CASING	1	0.0	2.0	SS	6 5 5 8		Brown cmf GRAVEL; little cm SAND (wet, non-plastic) GP	2
2		2	2.0	2.7	SS	27 50/2"		NO RECOVERY	0
4		3	4.0	6.0	SS	14 9 6 6	6.0	Brown c-mf SAND; some mf GRAVEL; trace SILT (wet, non-plastic) GP-SP	10
6		4	6.0	8.0	SS	4 6 5 6	8.0	Brown mf SAND; trace SILT (wet, non-plastic) SP	8
8		5	8.0	10.0	SS	6 11 6 7	11.0	Brown cmf SAND; little f GRAVEL; trace SILT (wet, non-plastic) SP	5
13		6	13.0	15.0	SS	18 23 24 40		Brown mf+ SAND; trace SILT (wet, non-plastic) w = 21.3% SP	18
18		7	18.0	20.0	SS	15 22 28 34		Similar Soil (wet, non-plastic) SP	14
23		8	23.0	25.0	SS	5 7 10 13		Similar Soil (saturated, non-plastic) SP	6

SS Split Spoon Sample
NX Rock Core
SH Undisturbed Sample (Shelby Tube)
Estimated Groundwater

Drillers: Brad Perry; Jake Crary

Inspector:

ATLANTIC TESTING LABORATORIES, Limited

Subsurface Investigation

Boring No.: K-169.0-6.0 Report No.: CD10279D-01-05-22 Sheet 2 of 3

DEPTH	METHOD OF ADVANCE	SAMPLE NO.	DEPTH OF SAMPLE From	DEPTH OF SAMPLE To	SAMPLE TYPE	BLOWS ON SAMPLER PER 6" 2" O.D. SAMPLER	DEPTH OF CHANGE	CLASSIFICATION OF MATERIAL (f - fine, m - medium, c - course; and - 35-50%, some - 20-35%, little - 10-20%, trace - 0-10%)	RECOVERY (inches)
28		9	28.0	30.0	SS	9 13 17 21		Brown f SAND; little SILT (wet, non-plastic) w = 22.3% SM	22
33		10	33.0	35.0	SS	8 13 20 20		Similar Soil (wet, non-plastic) SM	15
38		11	38.0	40.0	SS	6 10 10 14		Brown f SAND; trace SILT (wet, non-plastic) w = 26.0% SP	12
40		TR-1	40.0	42.0	SS	11 14 15 15		(3" Brass Lined Split Spoon) Similar Soil (wet, non-plastic) SP	20
43		12	43.0	45.0	SS	7 9 13 20		Brown mf SAND; little SILT (wet, non-plastic) SM	16
48		13	48.0	50.0	SS	8 11 21 30		Similar Soil (wet, non-plastic) w = 24.1% SM	22
53		14	53.0	55.0	SS	10 10 20 22		Similar Soil (wet, non-plastic) SM	18
58		15	58.0	60.0	SS	13 15 25 26		Similar Soil (wet, non-plastic) w = 23.8% SM	20
60		TR-2	60.0	61.9	SS	13 23 38 50/5"		(3" Brass Lined Split Spoon) Similar Soil (wet, non-plastic) SM	20

ATLANTIC TESTING LABORATORIES, Limited

Subsurface Investigation

Boring No.: K-169.0-6.0 Report No.: CD10279D-01-05-22 Sheet 3 of 3

DEPTH	METHOD OF ADVANCE	SAMPLE NO.	DEPTH OF SAMPLE From	DEPTH OF SAMPLE To	SAMPLE TYPE	BLOWS ON SAMPLER PER 6" 2" O.D. SAMPLER	DEPTH OF CHANGE	CLASSIFICATION OF MATERIAL (f - fine, m - medium, c - course; and - 35-50%, some - 20-35%, little - 10-20%, trace - 0-10%)	RECOVERY (inches)
63		16	63.0	65.0	SS	9 17 22 25		Brown mf SAND; trace SILT (wet, non-plastic) SP	16
64									
65									
66									
67									
68		17	68.0	70.0	SS	7 8 10 13		Similar Soil (saturated, non-plastic) w = 27.8% SP	22
69									
70									
71									
72									
73		18	73.0	75.0	SS	9 12 12 15		Similar Soil (saturated, non-plastic) SP	20
74									
75									
76									
77									
78		19	78.0	80.0	SS	6 9 15 17		Similar Soil (saturated, non-plastic) SP	21
79									
80							80.0	Boring terminated at 80.0 feet.	
81									
82								Notes:	
83								1. Borehole backfilled with cement-bentonite grout.	
84								2. Borehole was advanced with ATL's Barge 45 Trailer (Rig Unit No. CDGA429) drill rig.	
85									
86									
87									
88									
89									
90									
91									
92									
93									
94									
95									
96									
97									
98									
99									
100									

ATLANTIC TESTING LABORATORIES, Limited

Subsurface Investigation

Report No.: **CD10279D-01-05-22**

Client: **Kiewit Engineering (NY) Corp.**

Boring Location: **See Boring Location Plan**

Project: **Subsurface Investigation**
Champlain Hudson Power Express, Design Package 4B
Various Locations, New York

Start Date: **5/26/2022** Finish Date: **5/27/2022**

Boring No.: **K-169.0-6.1** Sheet **1** of **3**

Groundwater Observations			
Date	Time	Depth	Casing

Coordinates
Northing **1462731.988**
Easting **625639.409**

Sampler Hammer
Weight: **140** lbs.
Fall: **30** in.
Hammer Type: **Automatic**

Ground Elev.: **±216 (Mudline)**

Boring Advance By: **HW (4") Casing/3 7/8" Wet Rotary**

Depth of Water Column = 9.0 feet
Depth of Sample referenced from top of mudline.

DEPTH	METHOD OF ADVANCE	SAMPLE NO.	DEPTH OF SAMPLE From	DEPTH OF SAMPLE To	SAMPLE TYPE	BLOWS ON SAMPLER PER 6" 2" O.D. SAMPLER	DEPTH OF CHANGE	CLASSIFICATION OF MATERIAL (f - fine, m - medium, c - coarse; and - 35-50%, some - 20-35%, little - 10-20%, trace - 0-10%)	Recovery (Inches)
1	CASING	1	0.0	2.0	SS	6 8 8 10		Brown mf GRAVEL; some cmf SAND; little SILT (saturated, non-plastic) GP	10
2		2	2.0	4.0	SS	9 10 11 11		Brown cmf SAND; some f GRAVEL; little SILT (saturated, non-plastic) GP-SP	12
4		3	4.0	6.0	SS	7 7 8 8		Similar Soil (saturated, non-plastic) GP-SP	14
6		4	6.0	8.0	SS	8 9 13 15		Brown cmf GRAVEL; some cmf SAND; little CLAY (saturated, very slightly plastic) w = 8.4% GP	8
8		5	8.0	10.0	SS	12 15 17 20		Brown mf GRAVEL; little cmf SAND; trace CLAY (saturated, very slightly plastic) GP Encountered COBBLES and BOULDERS from 8.0 to 13.0 feet.	3
13		6	13.0	15.0	SS	12 19 13 16		Similar Soil (wet, non-plastic) GP	2
18		7	18.0	20.0	SS	28 32 37 16		Brown mf GRAVEL; some cmf SAND; trace SILT (wet, non-plastic) GP	8
23		8	23.0	25.0	SS	24 35 41 40		Brown mf GRAVEL; and cmf SAND; trace SILT (wet, non-plastic) GP	4

SS Split Spoon Sample
NX Rock Core
SH Undisturbed Sample (Shelby Tube)
Estimated Groundwater

Drillers: **Brad Perry; Jake Crary**

Inspector:

ATLANTIC TESTING LABORATORIES, Limited

Subsurface Investigation

Boring No.: K-169.0-6.1 Report No.: CD10279D-01-05-22 Sheet 2 of 3

DEPTH	METHOD OF ADVANCE	SAMPLE NO.	DEPTH OF SAMPLE From	DEPTH OF SAMPLE To	SAMPLE TYPE	BLOWS ON SAMPLER PER 6" 2" O.D. SAMPLER	DEPTH OF CHANGE	CLASSIFICATION OF MATERIAL (f - fine, m - medium, c - course; and - 35-50%, some - 20-35%, little - 10-20%, trace - 0-10%)	RECOVERY (inches)
26									
27									
28	WET ROTARY	9	28.0	28.4	SS	50/5"		NO RECOVERY - Probable BOULDER	0
29								Difficulties spinning casing past 28.0 feet. Switched to drive and wash methods.	
30									
31							31.0		
32									
33		10	33.0	35.0	SS	8 6 8 9		Brown cmf+ SAND; trace SILT; trace f GRAVEL (saturated, non-plastic) w = 25.1% SP	8
34									
35									
36									
37									
38		11	38.0	40.0	SS	2 4 4 4		Brown c-mf SAND; trace SILT (saturated, non-plastic) SP	18
39									
40		TR-1	40.0	42.0	SS	3 4 6 6		(3" Brass Lined Split Spoon) Similar Soil (saturated, non-plastic) SP	24
41									
42									
43		12	43.0	45.0	SS	4 5 4 5		Similar Soil (wet, non-plastic) SP	20
44									
45									
46									
47							47.0		
48		13	48.0	50.0	SS	14 20 22 19		Grey f SAND; little SILT (wet, non-plastic) SM	22
49									
50									
51									
52									
53		14	53.0	55.0	SS	12 17 20 23		Grey f SAND; little SILT (wet, non-plastic) w = 22.3% SM	20
54									
55									
56									
57									
58		15	58.0	60.0	SS	18 24 25 31		Similar Soil (wet, non-plastic) SM	14
59									
60		TR-2	60.0	62.0	SS	25 33 47 53		(3" Brass Lined Split Spoon) Similar Soil (wet, non-plastic) SM	24
61									
62									

ATLANTIC TESTING LABORATORIES, Limited

Subsurface Investigation

Boring No.: K-169.0-6.1 Report No.: CD10279D-01-05-22 Sheet 3 of 3

DEPTH	METHOD OF ADVANCE	SAMPLE NO.	DEPTH OF SAMPLE From	DEPTH OF SAMPLE To	SAMPLE TYPE	BLOWS ON SAMPLER PER 6" 2" O.D. SAMPLER	DEPTH OF CHANGE	CLASSIFICATION OF MATERIAL (f - fine, m - medium, c - course; and - 35-50%, some - 20-35%, little - 10-20%, trace - 0-10%)	RECOVERY (inches)
63		16	63.0	65.0	SS	14 16 20 25		Similar Soil (wet, non-plastic) SM	20
64									
65									
66									
67									
68		17	68.0	70.0	SS	11 15 21 27		Similar Soil (wet, non-plastic) SM	18
69									
70									
71									
72									
73		18	73.0	75.0	SS	22 20 19 15		Grey cmf+ SAND; little SILT; trace mf GRAVEL (wet, non-plastic) w = 19.1% SP	12
74									
75									
76									
77									
78		19	78.0	80.0	SS	13 17 25 30		Similar Soil (wet, non-plastic) SP	15
79									
80							80.0	Boring terminated at 80.0 feet.	
81									
82								Notes:	
83								1. Borehole backfilled with cement-bentonite grout.	
84								2. Borehole was advanced with ATL's Barge 45 Trailer (Rig Unit No. CDGA429) drill rig.	
85									
86									
87									
88									
89									
90									
91									
92									
93									
94									
95									
96									
97									
98									
99									
100									

ATL-LOG1 NE CD10279 KIEWIT INFRASTRUCTURE CO - VARIOUS LOCATIONS (PACKAGE 4B).GPJ ATL4-08.GDT 6/15/22

ATLANTIC TESTING LABORATORIES

LABORATORY TEST SUMMARY TABLE

ATL No. CD10279: Kiewit Infrastructure Co. - Champlain Hudson Power Express

Boring ID	Sample No.	Sample Depth (ft.)	Soil/Rock Description	Percent Finer No. 200 Sieve	Moisture Content (%)	Atterburg Limits			Organic Content (%)	Water-Soluble Sulfate (ppm)	Water-Soluble Chloride (ppm)	pH	Resistivity (ohm-cm)	Rock Unconfined Compressive Strength (psi)	Rock Splitting Tensile Strength (psi)	Rock CERCHAR Abrasiveness Corrected CAI
						LL	PL	PI								
K-169.0-2.0	S-2	2.0-4.0	Brown cmf+ SAND; some mf GRAVEL; trace SILT	--	12.1	--	--	--	--	--	--	--	--	--	--	--
	S-4	6.0-8.0	Brown mf+ SAND; little SILT	13.0	24.5	--	--	--	--	--	--	--	--	--	--	--
	S-7	18.0-20.0	Grey SILT; little CLAY; trace f SAND	96.5	28.9	37	20	17	--	--	--	--	--	--	--	--
	S-9	22.0-24.0	Grey CLAY; some SILT; trace f SAND	97.9	29.5	34	20	14	--	--	--	--	--	--	--	--
K-169.0-2.6	S-5	8.0-10.0	Grey c-mf SAND; little f GRAVEL; trace SILT	9.4	16.1	--	--	--	--	--	--	--	--	--	--	--
	S-8	24.0-26.0	Grey CLAY; some SILT; trace f SAND	97.6	26.7	26	14	12	--	--	--	--	--	--	--	--
	S-9	32.0-34.0	Grey f SAND; some SILT	24.2	22.7	NP	NP	NP	--	--	--	--	--	--	--	--
K-169.0-2.7	S-4	6.0-8.0	Brown mf+ SAND; and SILT; trace CLAY	53.0	23.1	--	--	--	--	--	--	--	--	--	--	--
	S-7	19.0-21.0	Grey CLAY; some SILT; trace f SAND	98.7	29.5	36	19	17	--	--	--	--	--	--	--	--
	ST-1	28.0-30.0	Grey CLAY; some SILT; little mf SAND	89.4	39.3	25	13	12	--	--	--	--	--	--	--	--
K-169.0-4.4	S-3/4	4.0-8.0	Brown cmf SAND; trace f GRAVEL; trace SILT	--	--	--	--	--	--	300	20	8.6	139,320	--	--	--
	S-5	8.0-10.0	Greish-Brown c-m+f SAND; trace SILT; trace mf+ GRAVEL	9.4	5.4	--	--	--	--	--	--	--	--	--	--	--
	ST-1c	27.0-29.0	Brownish-Grey c-mf+ SAND; little SILT; trace m GRAVEL	17.0	15.8	--	--	--	--	--	--	--	--	--	--	--
K-169.0-4.5	S-3	4.0-6.0	Brown c-m+f SAND; little SILT; trace f GRAVEL	17.0	10.6	--	--	--	--	--	--	--	--	--	--	--
	S-7	19.0-21.0	Greyish-Brown c-mf+ SAND; little SILT; little mf+ GRAVEL	19.0	11.5	--	--	--	--	--	--	--	--	--	--	--
	S-8	29.0-31.0	Grey mf+ SAND; little SILT	12.0	17.7	--	--	--	--	--	--	--	--	--	--	--
K-169.0-6.0	S-6	13.0-15.0	Brown mf+ SAND; trace SILT	8.0	21.3	--	--	--	--	--	--	--	--	--	--	--
	S-9	28.0-30.0	Brown f SAND; little SILT	13.0	22.3	--	--	--	--	--	--	--	--	--	--	--
	S-11	38.0-40.0	Brown f SAND; trace SILT	8.2	26.0	--	--	--	--	--	--	--	--	--	--	--
	S-13	48.0-50.0	Brown f SAND; little SILT	19.0	24.0	--	--	--	--	--	--	--	--	--	--	--
	S-15	58.0-60.0	Brown f SAND; little SILT	18.0	23.8	--	--	--	--	--	--	--	--	--	--	--
	S-17	68.0-70.0	Brown f SAND; little SILT	11.0	27.8	--	--	--	--	--	--	--	--	--	--	--
K-169.0-6.1	S-4	6.0-8.0	Grey cmf GRAVEL; some cmf SAND; little CLAY	11.0	8.4	--	--	--	--	--	--	--	--	--	--	--
	S-10	33.0-35.0	Grey cmf+ SAND; trace SILT; trace f GRAVEL	4.8	25.1	--	--	--	--	--	--	--	--	--	--	--
	S-14	53.0-55.0	Grey f SAND; little SILT	11.0	22.3	--	--	--	--	--	--	--	--	--	--	--
	S-18	73.0-75.0	Grey cmf+ SAND; little SILT; trace mf GRAVEL	14.0	19.1	--	--	--	--	--	--	--	--	--	--	--

ATLANTIC TESTING LABORATORIES

WBE certified company

LABORATORY DETERMINATION OF MOISTURE CONTENT OF SOILS
ASTM D 2216

PROJECT INFORMATION

Client: Kiewit Intrastructure Co.
Project: Champlain Hudson Power Express United Cable Install

ATL Report No.: CD10279E-18-06-22
Report Date: June 7, 2022
Date Received: June 3, 2022

TEST DATA

Boring No.	Sample No.	Depth (ft)	Moisture Content (%)
K169.0-6.0	S-6	13-15	21.3
	S-9	28-30	22.3
	S-11	38-40	26.0
	S-13	48-50	24.0
	S-15	58-60	23.8
	S-17 [1]	68-70	27.8
K169.0-6.1	S-4 [1]	6-8	8.4
	S-10 [1]	33-35	25.1
	S-14	53-55	22.3
	S-18 [1]	73-75	19.1

REMARKS

1. Sample mass was less than the minimum mass outlined in the referenced test method.

Reviewed By: _____ Date: 6/9/22

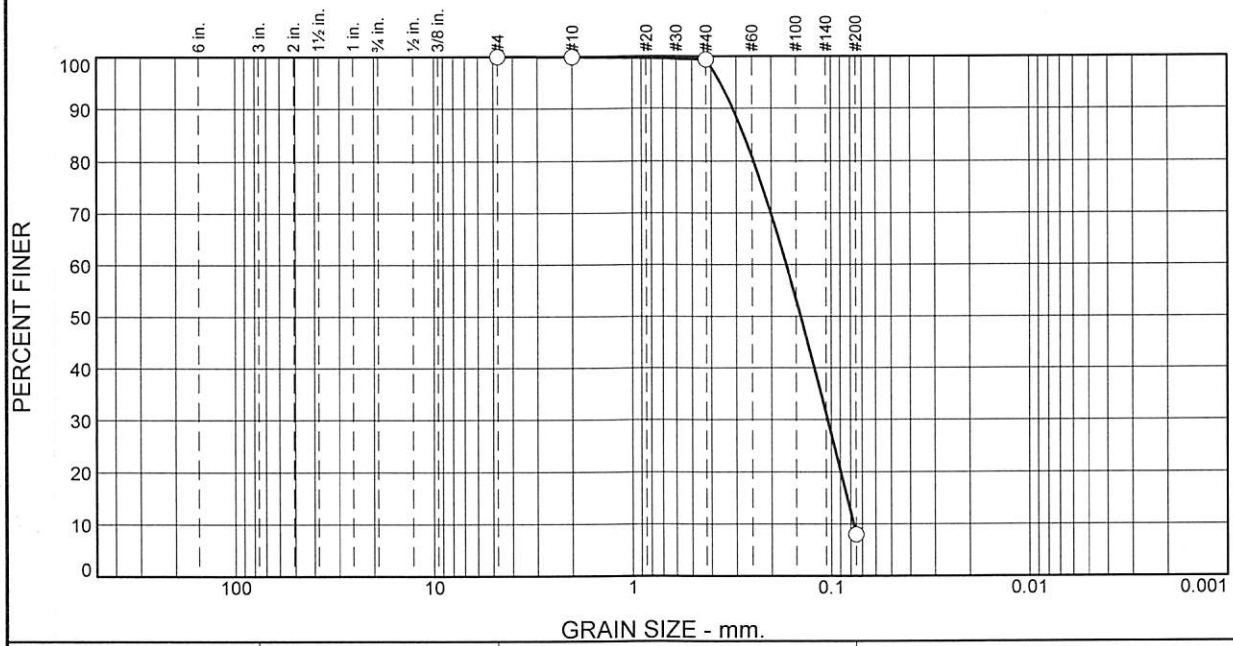
ATLANTIC TESTING LABORATORIES

Particle Size Distribution Report

Project: Champlain Hudson Power Express United Cable Install **Report No.:** CD10279E-18-06-22

Client: Kiewit Intrastructure Co. **Date:** 06/07/2022

Sample No: K169.0-6.0, S-6 **Source of Sample:** Boring Sample
Location: In-place **Elev./Depth:** 13-15'



% Cobbles	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	0	0	0	1	91	8	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	OUT OF SPEC. (X)
#4	100		
#10	100		
#40	99		
#200	8.0		

* (no specification provided)

Soil Description

Brown mf+ SAND; trace SILT

Atterberg Limits

PL= -- LL= -- PI= --

Coefficients

D_{85}= 0.2752 D_{60}= 0.1682 D_{50}= 0.1423
D_{30}= 0.1041 D_{15}= 0.0832 D_{10}= 0.0773
C_u= 2.18 C_c= 0.83

Classification

USCS= AASHTO=

Remarks

Moisture Content = 21.3%

Figure

ATLANTIC TESTING LABORATORIES, LIMITED

Reviewed by: _____ Date: 06/09/22

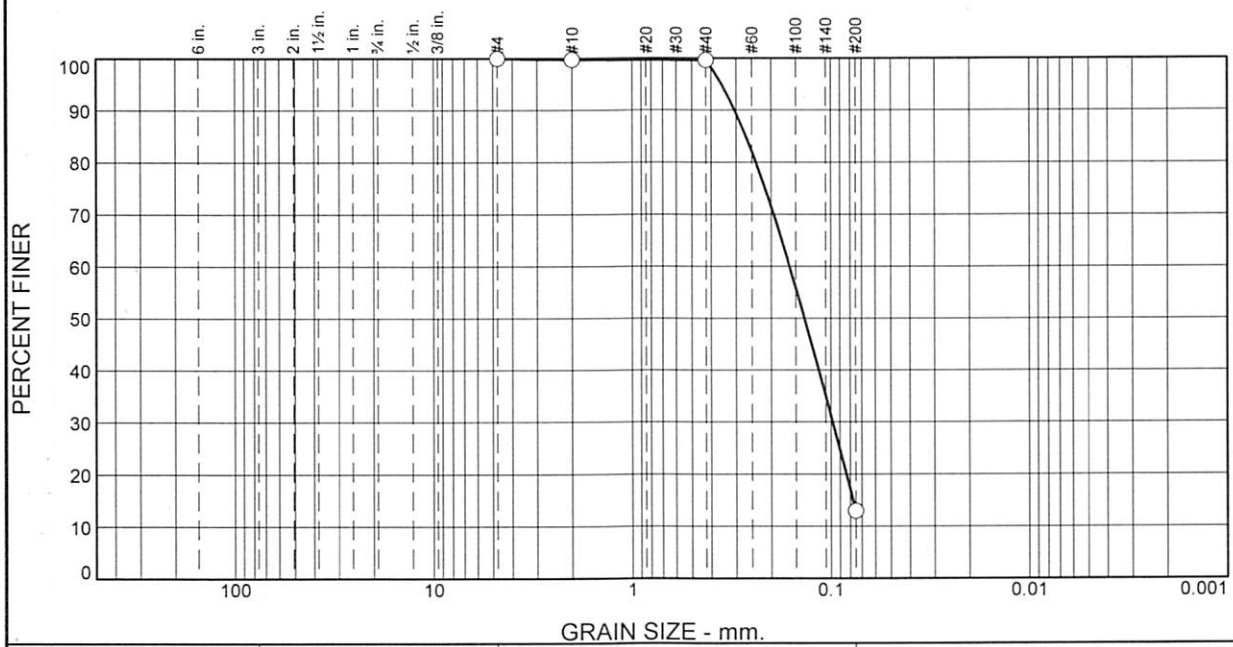
ATLANTIC TESTING LABORATORIES

Particle Size Distribution Report

Project: Champlain Hudson Power Express United Cable Install **Report No.:** CD10279E-18-06-22

Client: Kiewit Intrastructure Co. **Date:** 06/07/2022

Sample No: K169.0-6.0, S-9 **Source of Sample:** Boring Sample
Location: In-place **Elev./Depth:** 28-30'



% Cobbles	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	0	0	0	0	87	13	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	OUT OF SPEC. (X)
#4	100		
#10	100		
#40	100		
#200	13		

* (no specification provided)

Soil Description

Brown f SAND; little SILT

Atterberg Limits

PL= -- LL= -- PI= --

Coefficients

D_{85}= 0.2682 D_{60}= 0.1612 D_{50}= 0.1356
D_{30}= 0.0979 D_{15}= 0.0774 D_{10}=
C_u= C_c=

Classification

USCS= AASHTO=

Remarks

Moisture Content = 22.3%

Figure

ATLANTIC TESTING LABORATORIES, LIMITED

Reviewed by: _____ Date: 06/09/22

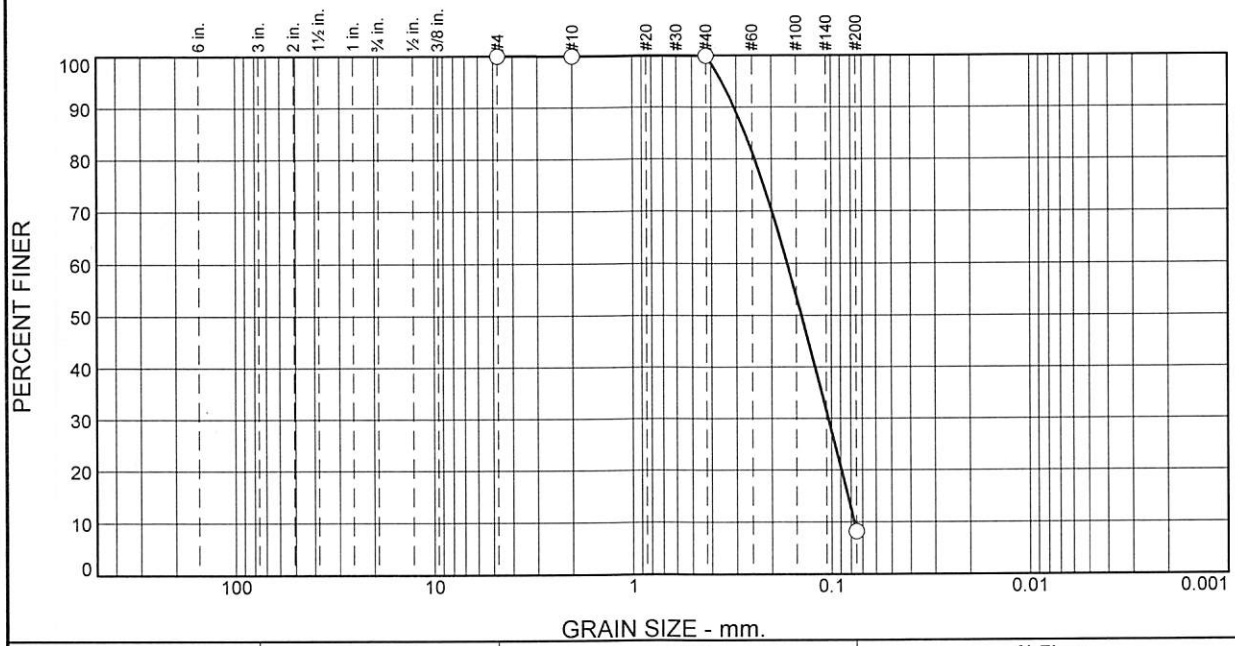
ATLANTIC TESTING LABORATORIES

Particle Size Distribution Report

Project: Champlain Hudson Power Express United Cable Install **Report No.:** CD10279E-18-06-22

Client: Kiewit Intrastructure Co. **Date:** 06/07/2022

Sample No: K169.0-6.0, S-11 **Source of Sample:** Boring Sample
Location: In-place **Elev./Depth:** 38-40'



% Cobbles	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	0	0	0	0	92	8	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	OUT OF SPEC. (X)
#4	100		
#10	100		
#40	100		
#200	8.2		

* (no specification provided)

Soil Description

Brown f SAND; trace SILT

Atterberg Limits

PL= -- LL= -- PI= --

Coefficients

D_{85}= 0.2716 D_{60}= 0.1668 D_{50}= 0.1413
D_{30}= 0.1036 D_{15}= 0.0829 D_{10}= 0.0770
C_u= 2.17 C_c= 0.84

Classification

USCS= AASHTO=

Remarks

Moisture Content = 26.0%

Figure

ATLANTIC TESTING LABORATORIES, LIMITED

Reviewed by: _____ Date: 06/09/22

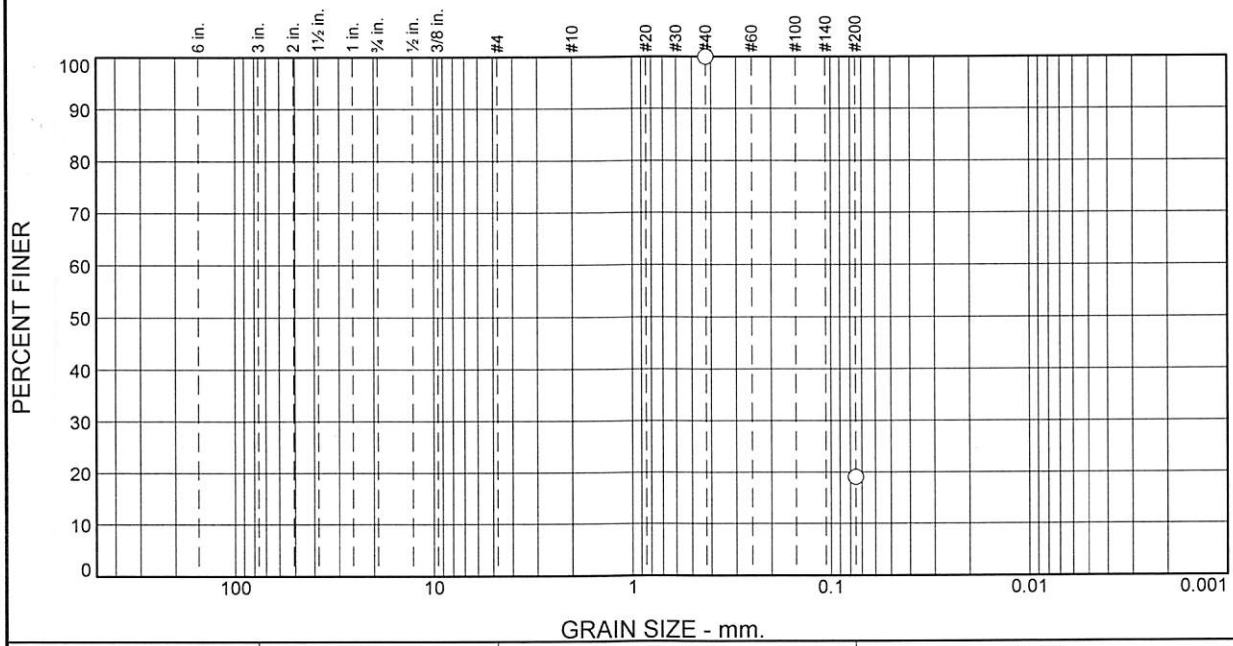
ATLANTIC TESTING LABORATORIES

Particle Size Distribution Report

Project: Champlain Hudson Power Express United Cable Install **Report No.:** CD10279E-18-06-22

Client: Kiewit Intrastructure Co. **Date:** 06/07/2022

Sample No: K169.0-6.0, S-13 **Source of Sample:** Boring Sample
Location: In-place **Elev./Depth:** 48-50'



% Cobbles	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	0	0	0	0	81	19	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	OUT OF SPEC. (X)
#40	100		
#200	19		

* (no specification provided)

Soil Description

Brown f SAND; little SILT

Atterberg Limits

PL= -- LL= -- PI= --

Coefficients

D_{85}= 0.3082 D_{60}= 0.1803 D_{50}= 0.1456
D_{30}= 0.0948 D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= AASHTO=

Remarks

Moisture Content = 24.1%

Figure

ATLANTIC TESTING LABORATORIES, LIMITED

Reviewed by: _____ Date: 06/09/22

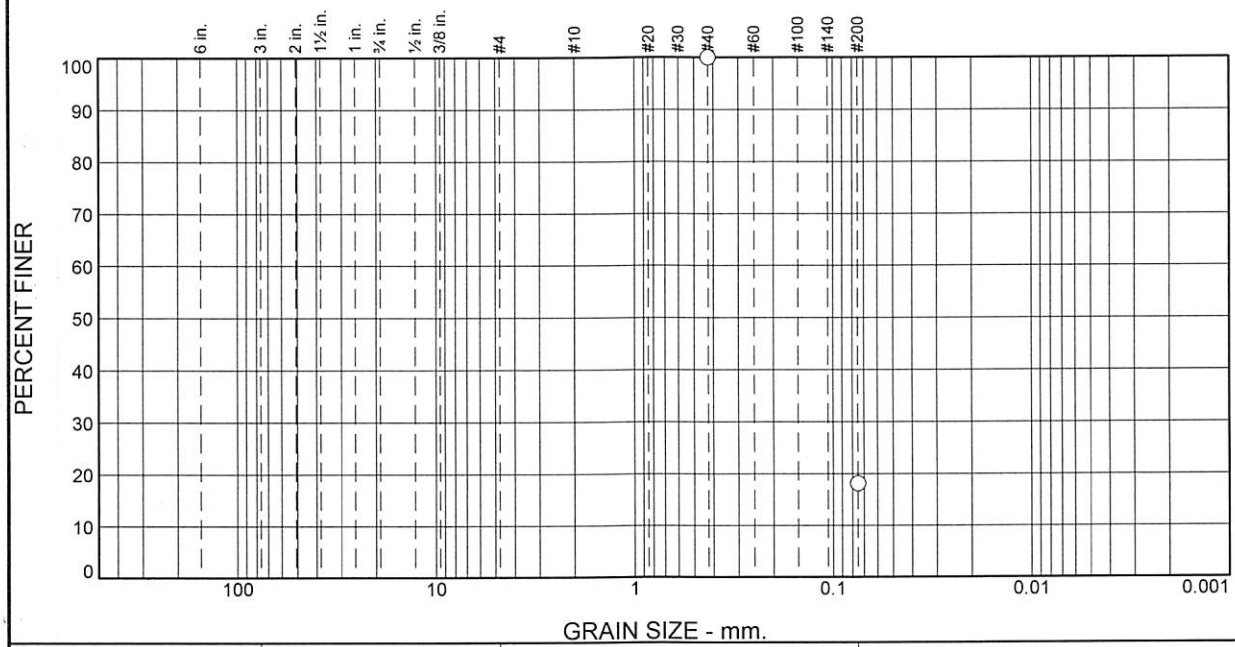
ATLANTIC TESTING LABORATORIES

Particle Size Distribution Report

Project: Champlain Hudson Power Express United Cable Install **Report No.:** CD10279E-18-06-22

Client: Kiewit Intrastructure Co. **Date:** 06/07/2022

Sample No: K169.0-6.0, S-15 **Source of Sample:** Boring Sample
Location: In-place **Elev./Depth:** 58-60'



% Cobbles	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	0	0	0	0	82	18	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	OUT OF SPEC. (X)
#40	100		
#200	18		

* (no specification provided)

Soil Description

Brown f SAND; little SILT

Atterberg Limits

PL= -- LL= -- PI= --

Coefficients

D_{85}= 0.3093 D_{60}= 0.1821 D_{50}= 0.1474
D_{30}= 0.0965 D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= AASHTO=

Remarks

Moisture Content = 23.8%

Figure

ATLANTIC TESTING LABORATORIES, LIMITED

Reviewed by: _____ Date: 06/09/22

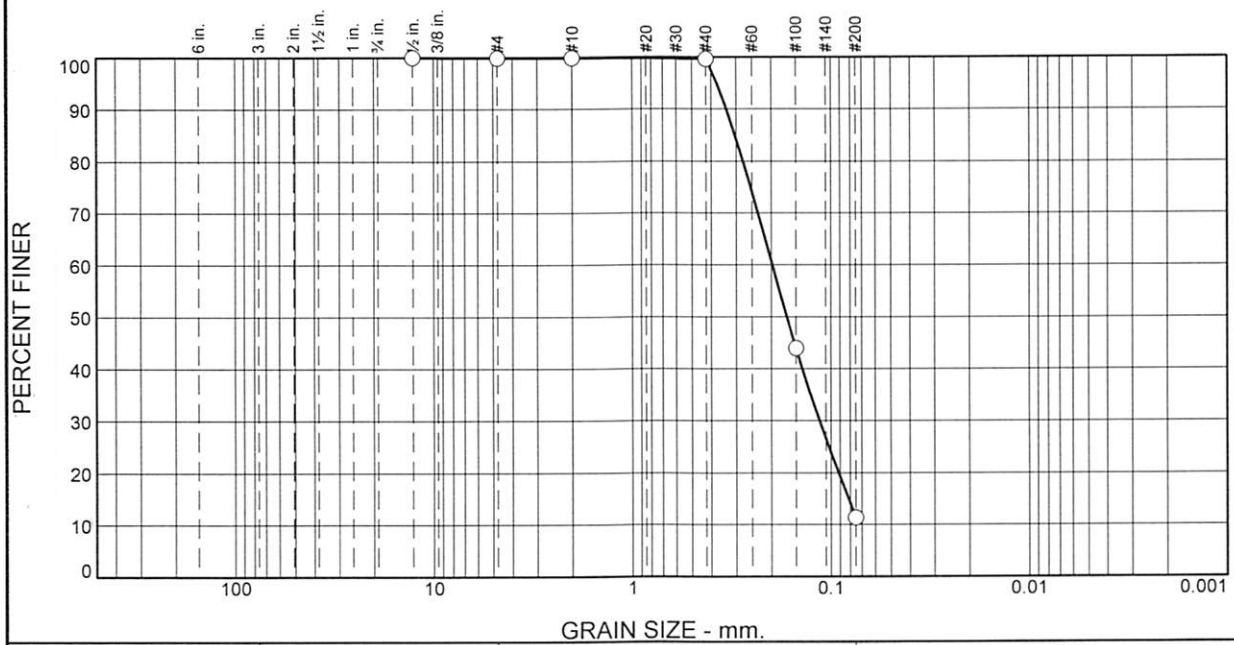
ATLANTIC TESTING LABORATORIES

Particle Size Distribution Report

Project: Champlain Hudson Power Express United Cable Install **Report No.:** CD10279E-18-06-22

Client: Kiewit Intrastructure Co. **Date:** 06/07/2022

Sample No: K169.0-6.0, S-17 **Source of Sample:** Boring Sample
Location: In-place **Elev./Depth:** 68-70'



% Cobbles	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	0	0	0	0	89	11	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	OUT OF SPEC. (X)
1/2"	100		
#4	100		
#10	100		
#40	100		
#100	44		
#200	11		

* (no specification provided)

Soil Description

Brown f SAND; little SILT

Atterberg Limits

PL= -- LL= -- PI= --

Coefficients

D_{85}= 0.3041 D_{60}= 0.1977 D_{50}= 0.1670
D_{30}= 0.1140 D_{15}= 0.0816 D_{10}=
C_u= C_c=

Classification

USCS= AASHTO=

Remarks

Moisture Content = 27.8%

Figure

ATLANTIC TESTING LABORATORIES, LIMITED

Reviewed by: Date: 06/09/22

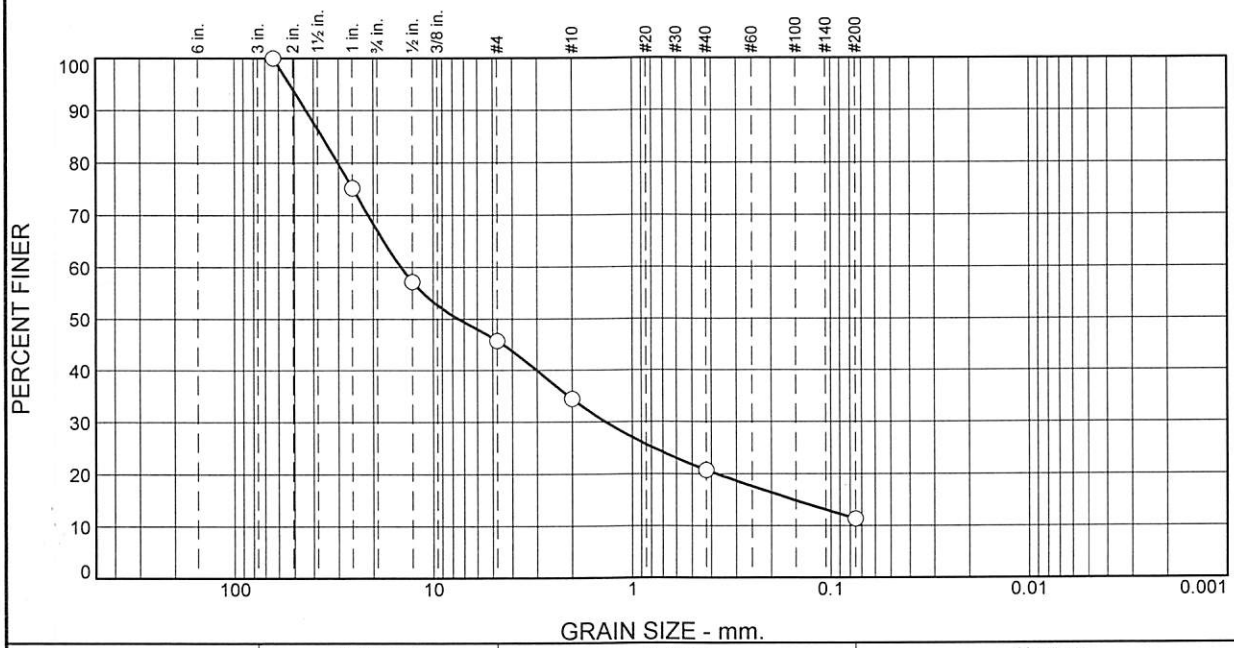
ATLANTIC TESTING LABORATORIES

Particle Size Distribution Report

Project: Champlain Hudson Power Express United Cable Install **Report No.:** CD10279E-18-06-22

Client: Kiewit Intrastructure Co. **Date:** 06/07/2022

Sample No: K169.0-6.1, S-4 **Source of Sample:** Boring Sample
Location: In-place **Elev./Depth:** 6-8'



% Cobbles	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	33	21	12	13	10	11	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	OUT OF SPEC. (X)
2-1/2"	100		
1"	75		
1/2"	57		
#4	46		
#10	34		
#40	21		
#200	11		

* (no specification provided)

Soil Description

Grey cmf GRAVEL; some cmf SAND; little CLAY

Atterberg Limits

PL= -- LL= -- PI= --

Coefficients

D_{85}= 36.2148 D_{60}= 14.4738 D_{50}= 7.4606
D_{30}= 1.3620 D_{15}= 0.1543 D_{10}=
C_u= C_c=

Classification

USCS= AASHTO=

Remarks

Moisture Content = 8.4%

Figure

ATLANTIC TESTING LABORATORIES, LIMITED

Reviewed by: _____ Date: 06/09/22

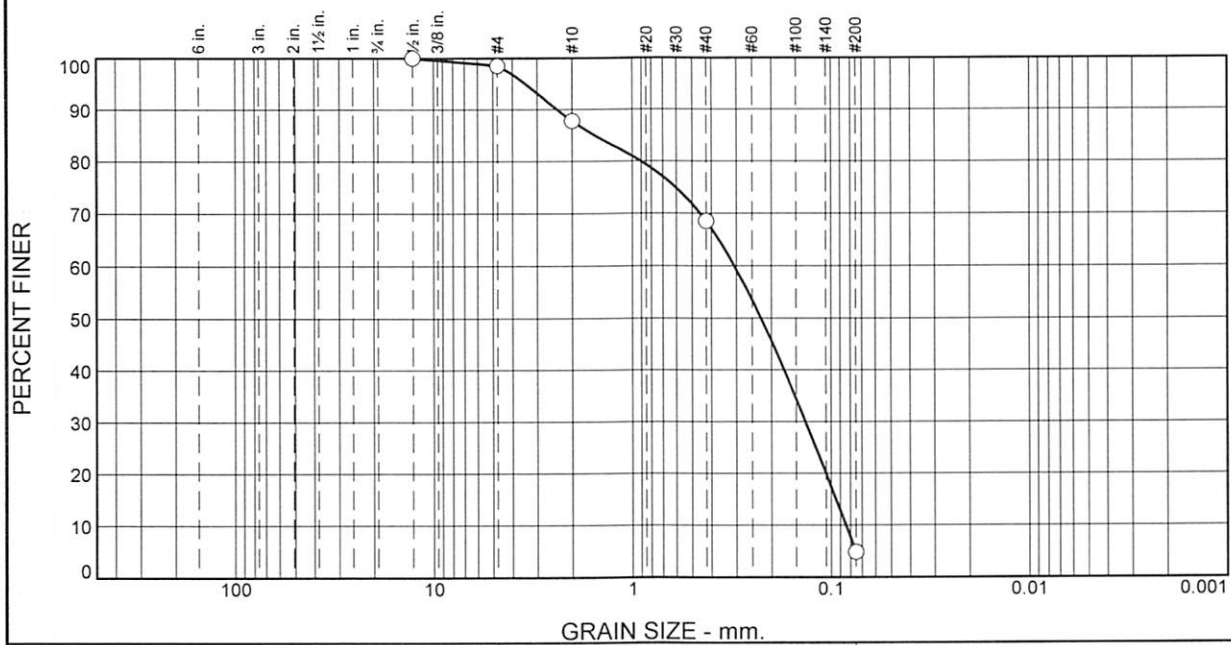
ATLANTIC TESTING LABORATORIES

Particle Size Distribution Report

Project: Champlain Hudson Power Express United Cable Install **Report No.:** CD10279E-18-06-22

Client: Kiewit Intrastructure Co. **Date:** 06/07/2022

Sample No: K169.0-6.1, S-10 **Source of Sample:** Boring Sample
Location: In-place **Elev./Depth:** 33-35'



% Cobbles	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	0	1	11	19	64	5	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	OUT OF SPEC. (X)
1/2"	100		
#4	99		
#10	88		
#40	69		
#200	4.8		

* (no specification provided)

Soil Description

Grey cmf+ SAND; trace SILT; trace f GRAVEL

Atterberg Limits

PL= -- LL= -- PI= --

Coefficients

D_{85}= 1.5445 D_{60}= 0.3069 D_{50}= 0.2257
D_{30}= 0.1346 D_{15}= 0.0947 D_{10}= 0.0844
C_u= 3.64 C_c= 0.70

Classification

USCS= SP AASHTO=

Remarks

Moisture Content = 25.1%

Figure

ATLANTIC TESTING LABORATORIES, LIMITED

Reviewed by: _____ Date: 06/09/22

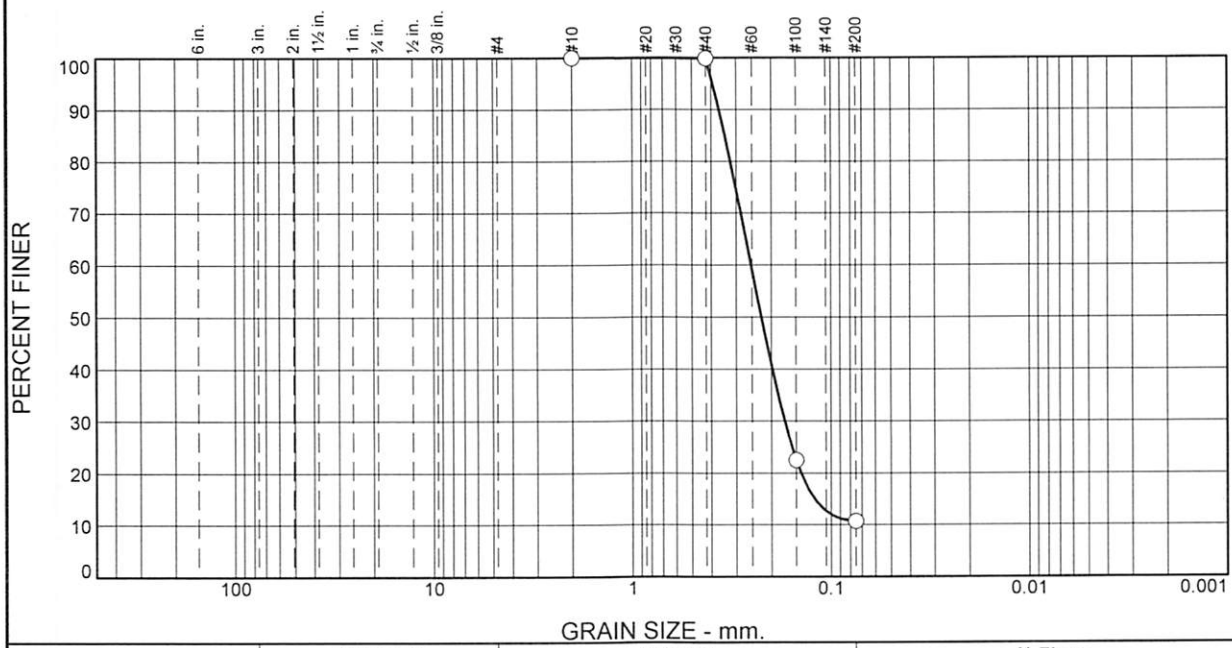
ATLANTIC TESTING LABORATORIES

Particle Size Distribution Report

Project: Champlain Hudson Power Express United Cable Install **Report No.:** CD10279E-18-06-22

Client: Kiewit Intrastructure Co. **Date:** 06/07/2022

Sample No: K169.0-6.1, S-14 **Source of Sample:** Boring Sample
Location: In-place **Elev./Depth:** 53-55'



% Cobbles	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	0	0	0	0	89	11	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	OUT OF SPEC. (X)
#10	100		
#40	100		
#100	23		
#200	11		

* (no specification provided)

Soil Description

Grey f SAND; little SILT

Atterberg Limits

PL= -- LL= -- PI= --

Coefficients

D_{85}= 0.3421 D_{60}= 0.2530 D_{50}= 0.2245
D_{30}= 0.1715 D_{15}= 0.1209 D_{10}=
C_u= C_c=

Classification

USCS= AASHTO=

Remarks

Moisture Content = 22.3%

Figure

ATLANTIC TESTING LABORATORIES, LIMITED

Reviewed by: _____ Date: 06/09/22

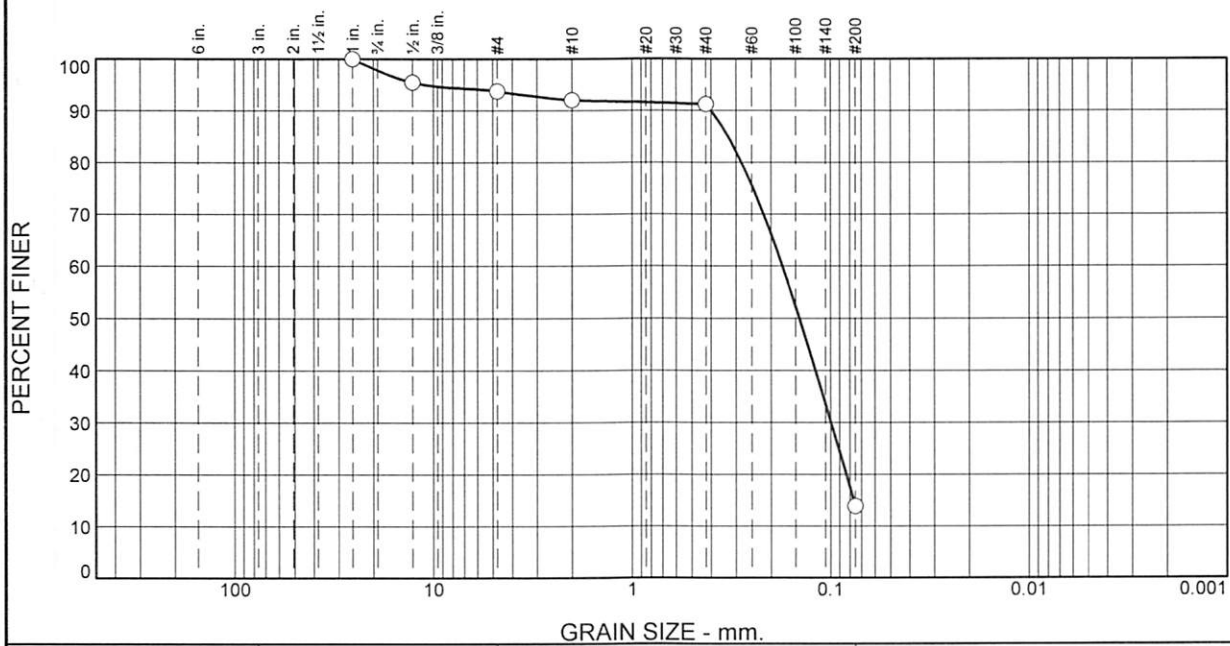
ATLANTIC TESTING LABORATORIES

Particle Size Distribution Report

Project: Champlain Hudson Power Express United Cable Install **Report No.:** CD10279E-18-06-22

Client: Kiewit Intrastructure Co. **Date:** 06/07/2022

Sample No: K169.0-6.1, S-18 **Source of Sample:** Boring Sample
Location: In-place **Elev./Depth:** 73-75'



% Cobbles	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	2	4	2	1	77	14	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	OUT OF SPEC. (X)
1"	100		
1/2"	95		
#4	94		
#10	92		
#40	91		
#200	14		

* (no specification provided)

Soil Description

Grey cmf+ SAND; little SILT; trace mf GRAVEL

Atterberg Limits

PL= -- LL= -- PI= --

Coefficients

D_{85}= 0.3289 D_{60}= 0.1752 D_{50}= 0.1435
D_{30}= 0.0994 D_{15}= 0.0764 D_{10}=
C_u= C_c=

Classification

USCS= AASHTO=

Remarks

Moisture Content = 19.1%

Figure

ATLANTIC TESTING LABORATORIES, LIMITED

Reviewed by: _____ Date: 06/09/22

Kiewit

MEMORANDUM

DATE: April 13, 2023

TO: Antonio Marruso, P.E.; CHA Consulting, Inc.

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

SUBJECT: Geotechnical Data: Segment 7 - Package 4B - HDD Crossing 69 – Revision 2
Champlain Hudson Power Express Project
Schenectady, 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 near Schenectady, New York. The approximate station for the start of HDD crossing Number 69 is STA 45337+00 (42.8443°N, 74.0051°W).

The geotechnical data at this HDD crossing is attached. The available data is from investigations by AECOM, Atlantic Testing Laboratories (ATL), Terracon and Kiewit, referenced below. Additional boring logs from New York State Department of Transportation Record Plans are also provided.

- AECOM, Geotechnical Data Report, Upland Segments: Putnam Station, Washington County, to Cementon, Green County, NY, Champlain Hudson Power Express, dated May 28, 2021.
- Atlantic Testing Laboratories, Subsurface Investigation Services, Champlain Hudson Power Express, Design Package 4B, Glenville to Scotia, New York, dated June 15, 2022.
- Clough, Harbour & Associates LLP, Record Plans, Reconstruction on I-890 and Route 5S (D257014), Rotterdam, New York, dated June 1996.
- Terracon, Field Exploration and Laboratory Testing Results, Champlain-Hudson Power Express Project-Package 4b, Schenectady, dated June 24, 2022.
- Terracon Field Exploration and Laboratory Testing Results, Champlain-Hudson Power Express Project-Package 3, 4A and 4B, Fort Edward to Schenectady, dated April 11, 2023.
- Kiewit Engineering (NY) Corp., Package 4B Phase 4 Borings Rev. 1, Champlain Hudson Power Express, New York, dated March 31, 2023.

Contact us if you have questions or require additional information.

HDD 69

AECOM Borings
SCH-13, SCH-13A, SCH-13B, SCH-14

CHA/DOT Borings
DAB-6(2), DH24S, DH25S, DH26S, DH27S, DH28S, DH29S

ATL Borings
K-169.0-6.4, K-169.0-6.7

Terracon Borings
K-169.0-6.9, KB-169.0-6.6A, KB-169.0-6.7, KB-169.0-6.8

Kiewit Boring
KB-169.0-6.6

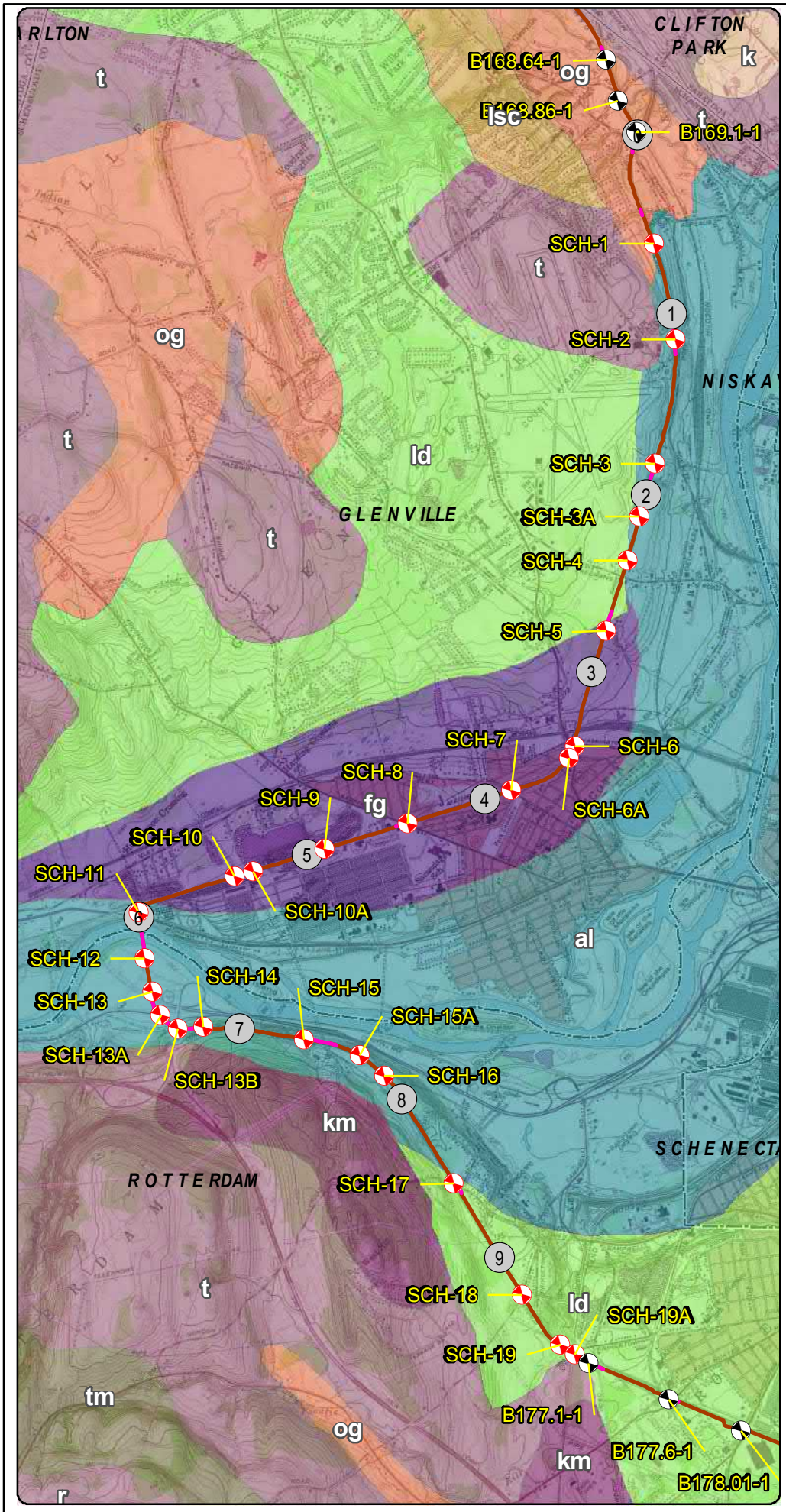
Segment 7 - Design Package 4B

CHPE Segment 7 Package 4B
Soil Boring Coordinates and Elevations

Firm	Boring	Northing (feet)	Easting (feet)	Ground Surface Elevation (feet)
TRC*	B169.1-1	1469045.0	651801.8	236.7
AECOM**	SCH-1	1466449.8	649931.4	279.8
	SCH-2	1464095.5	648426.9	288.3
	SCH-3	1462008.4	645522.0	286.8
	SCH-3A	1461257.5	644144.0	287.3
	SCH-4	1460618.5	643021.4	285.4
	SCH-5	1459621.8	641171.4	279.3
	SCH-6	1457944.8	638238.9	241.7
	SCH-6A	1457817.7	637889.5	249.6
	SCH-7	1458325.7	636073.8	271.1
	SCH-8	1459763.1	633330.0	287.2
	SCH-9	1460902.6	631152.2	297.0
	SCH-10	1462154.8	628796.0	290.3
	SCH-10A	1461888.1	629265.0	291.0
	SCH-11	1463366.6	626127.1	289.2
	SCH-12	1462321.8	625339.2	227.3
	SCH-13	1461493.8	624804.4	229.1
	SCH-13A	1460855.7	624513.9	272.0
	SCH-13B	1460233.8	624596.1	295.4
	SCH-14	1459768.5	625134.5	281.3
	SCH-15	1457493.3	626917.2	338.6
	SCH-15A	1456046.5	627705.8	352.4
	SCH-16	1455146.0	627794.1	350.1
	SCH-17	1451579.9	627027.1	357.8
	SCH-18	1447982.8	626167.9	354.4
NYS DOT ***	DAB-6(2)	1460628.7	625081.5	248
	DH-24S	1460655.9	625133.7	237
	DH-25S	1460602.7	625066.5	236
	DH-26S	1460543.7	624985.5	235
	DH-27S	1460696.2	625101.3	236
	DH-28S	1460650.3	625027.7	235
	DH-29S	1460597.5	624949.4	234.5

Notes:
- Northings and Eastings are provided in NAD83 New York State Plane East Zone.
- Elevations are referenced to the NAVD88 datum.
* TRC boring coordinates as shown in Table 1-6 in AECOM report (reference below). Boring elevations estimated from November 2021 topographic survey by Williams Aerial.
** AECOM boring coordinates and elevations as shown in Table 1-6 in AECOM report.
*** NYS DOT boring coordinates and elevations are approximated from drawing D257014 Sheet 170 "GENERAL SUBSURFACE PROFILE, STRUCTURE #3 - RAMP TWY OVER I-890"
**** Kiewit boring coordinates and elevations are noted on the boring logs.

Reference:
AECOM, Geotechnical Data Report, Upland Segments: Putnam Station, Washington County, to Cementon, Green County, NY, Champlain Hudson Power Express, dated May 28, 2021.



LEGEND

- 2021 Boring Location
- Previous (2013) Boring Location
- Terrestrial Route HVDC
- Submarine Route HVDC
- Terrestrial Route HVAC
- Preliminary HDD Locations
- Preliminary Pipe Bridge Location
- Town Boundary
- County Boundary

Surficial Geology

- al - Recent alluvium
- fg - Fluvial sand and/or gravel
- k - Kame deposits
- km - Kame moraine
- ld - Lacustrine delta
- lsc - Lacustrine silt and clay
- og - Outwash sand and gravel
- r - Bedrock
- t - Till
- tm - Till moraine

N

0.4 0.2 0 0.4 Miles

Transmission Developers Inc.

Champlain Hudson Power Express Project

Champlain Hudson Power Express Inc.

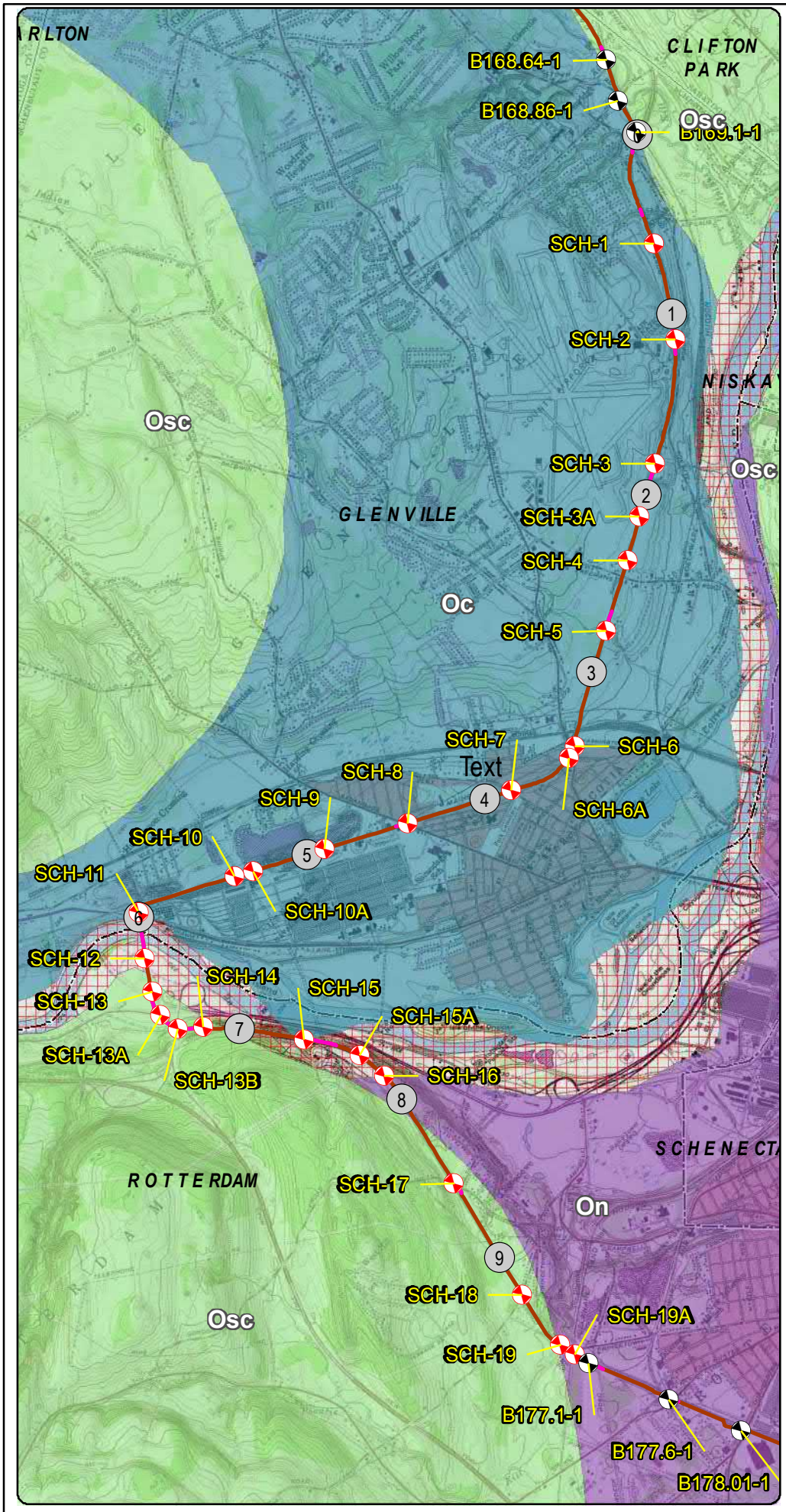
Surficial Geology and Geotechnical Borings Schenectady Preferred Alt Figure 3-7

Prepared on 4/27/2021

by: AECOM

DATA SOURCES: ESRI, NYSDOT, NOAA, USACE, NYDOS, TDI, TRC

Y:\Projects\CHPE\Route\Consensus_Alternative_Routes\MXD\Alt_5_Routes_DZ_20190\Boring_Locations\Maps_for_May_2021_Report\Alt_Route_Schenectady_Boring_Locations_Surficial_Map_May_2021_Report.mxd



LEGEND

- 2021 Boring Location
- Previous (2013) Boring Location
- Terrestrial Route HVDC
- Submarine Route HVDC
- Terrestrial Route HVAC
- Preliminary HDD Locations
- Preliminary Pipe Bridge Location
- Town Boundary
- County Boundary

Bedrock Geology

- No Label
- Oc - Canajoharie Shale
- On - Normanskill Shale
- Osc - Schenectady Formation

* Schenectady Formation includes: graywacke, sandstone, siltstone, shale

0.4 0.2 0 0.4 Miles

Transmission Developers Inc.

Champlain Hudson Power Express Project

Champlain Hudson Power Express Inc.

Bedrock Geology and Geotechnical Borings Schenectady Preferred Alt Figure 4-7

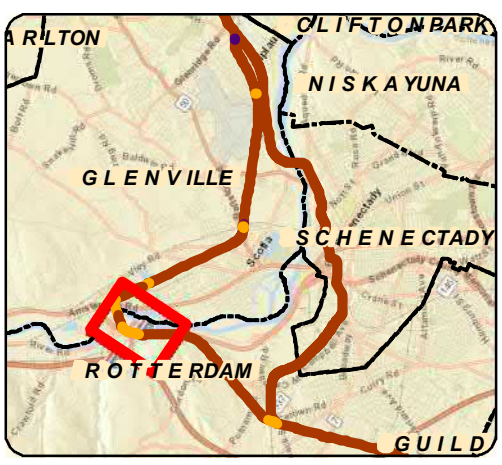
Prepared on 4/29/2021

by: AECOM

DATA SOURCES: ESRI, NYSDOT, NOAA, USACE, NYDOS, TDI, TRC

Y:\Projects\CHPE\IRoute\Consensus_Alternative_Routes\MXD\Alt_5_Routes_DZ_20190\Boring_Locations\Maps_for_May_2021_Report\Alt_Route_Schenectady_Boring_Locations_Bedrock_Map_May_2021_Report.mxd

SCH-11
5.9
6
5.8
5.7
5.6
6.1
6.2
SCH-12
6.3
GLENVILLE
SCH-13
6.5
SCH-13A
6.6
SCH-13B
ROTTERDAM
6.8
SCH-14
6.9
7
7.1
7.2
7.3
SCH-15
7.4
0
1,000
Feet



LEGEND

- 111.8 Certified Milepost - Tenths
- 135 Certified Milepost
- 111.8 Preferred Alternative Milepost - Tenths
- 135 Preferred Alternative Milepost
- Terrestrial Route HVDC
- Submarine Route HVDC
- Terrestrial Route HVAC
- Preliminary HDD Locations
- Preliminary Pipe Bridge Location
- 2021 Boring Location
- Previous (2013) Boring Location
- Streams/Ditches
- Railroad ROW
- Deviation Zone
- Deviation Zone Outside ROW
- Preferred Alternative Deviation Zone
- Preferred Alternative Deviation Zone Outside ROW
- Town Boundary
- Village Boundary
- State Park (OPRHP)

Parcel Ownership: TOWN NAME

Road Name: Village Name

Transmission Developers Inc.

Champlain Hudson Power Express Project

Champlain Hudson Power Express Inc.

BORING LOCATION PLAN

Schenectady Preferred Alternative

Figure A-7

Sheet 6 of 8

Prepared by: AECOM 4/27/2021

DATA SOURCES: ESRI, NETWORK MAPPING 2010, NYSDOT, OPRHP, TDI, TRC

Y:\Projects\CHPE\Route\Consensus_Alternative_Routes\MXD\Alt_5_Routes_DZ_201909\Boring_Locations\Maps_for_May_2021_Report\Alt_Route_Schenectady_Boring_Locations_Mapset_May_2021_Report.mxd

BORING CONTRACTOR: ADT	AECOM	SHEET 1 OF 3
DRILLER: Francisco Martinez		PROJECT NAME: CHPE -
		PROJECT NO.: 60323056
		HOLE NO.: **SCH-13**
SOILS ENGINEER/GEOLOGIST: Michael Izdebski		START DATE: 2/22/2021
		FINISH DATE: 2/22/2021
LOCATION: North side of I-890 Westbound/South of Exit Ramp to Rt. 5S West -Schenectady, NY MP - 6.40		OFFSET: N/A

GROUND WATER OBSERVATIONS		CASING	SAMPLER	DRILL BIT	CORE BARREL	DRILL RIG: Geoprobe 7822DT
Water at 8'	TYPE	Flush Joint Steel	California Modified	Tricone Roller Bit		BORING TYPE: SPT
	SIZE I.D.	4"	2.5"	- -		BORING O.D.: 4.5"
	SIZE O.D.	4.5"	3"	3 7/8"		SURFACE ELEV.:
	HAMMER WT.	140 lbs	140 lbs			LONGITUDE:
	HAMMER FALL	30"	30"			LATITUDE:

DEPTH	CORING RATE MIN/FT	SAMPLE DEPTHS FROM - TO (FEET)	TYPE AND NO.	PEN. in	REC. in	BLOWS PER 6 in ON SAMPLER (ROCK QUALITY DESIGNATION)				N Corr.(2)	USCS CLASS.	STRAT. CHNG. DEPTH	FIELD IDENTIFICATION OF SOILS
		0'-5'				Hand Cleared					GM	SAND & GRAVEL	Dark gray fine SILT, some subangular gravel (1"-3"), little fine sand
1.0													
2.0													
3.0													
		3'-5'	S-1										
4.0													
5.0													
		5'-7'	S-2	24"	24"	4	18	29	14	31	GM		SAA
6.0													
													TR-1; (5.0'-5.5')
7.0													
		7'-9'	S-3	24"	24"	23	34	17	18	33	GP/SP		Brown medium to fine GRAVEL, some coarse-medium-fine sand, trace silt; wet, loose
8.0													
9.0													
		9'-11'	S-4	24"	24"	21	17	9	9	17	GM/SP		Brown medium to fine GRAVEL and coarse to fine sand, some silt; firm, wet
10.0													
													TR-2; (10.0'-10.5')
11.0													
		11'-'13'	S-5	24"	12"	14	16	11	8	18	GP/SP		Gray medium to fine subrounded GRAVEL, some coarse to fine sand; wet,
12.0													
													TR-3; (12.0'-12.5')
13.0													
		13'-15'	S-6	24"	24"	9	9	10	8	12	GP		Gray-brown coarse to fine GRAVEL, little coarse to medium sand; wet
14.0													
15.0													
		15'-17'	S-7	24"	0"	8	23	20	12	28	GP		No recovery
16.0													
													Difficult/cobbly drilling 15 - 20 ft.
17.0													Lost drill water advancing to 20 ft. Added bentonite but still no returns. Advance casing.
18.0													
19.0													
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: $N_{corr}=N*(2.0^2-1.375^2)in./(3.0^2-2.4^2)in. = N*0.65$.

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%

BORING CONTRACTOR: ADT	AECOM	SHEET 2 OF 3
DRILLER: Francisco Martinez		PROJECT NAME: CHPE -
		PROJECT NO.: 60323056
		HOLE NO.: **SCH-13**
SOILS ENGINEER: Michael Izdebski		START DATE: 2/22/2021
		FINISH DATE: 2/22/2021
LOCATION: North side of I-890 Westbound/South of Exit Ramp to Rt. 5S West -Schenectady, NY MP - 6.40		OFFSET: N/A

DEPTH	CORING RATE MIN/FT	DEPTHS FROM - TO (FEET)	TYPE AND NO.	PEN. in	REC. in	BLOWS PER 6 in ON SAMPLER (ROCK QUALITY DESIGNATION)				N Corr.	USCS CLASS.	STRAT. CHNG. DEPTH	FIELD IDENTIFICATION OF SOILS
		20'-22'	S-8	24"	1.2"	5	7	8	5	10	GP		Gray coarse to medium GRAVEL, subrounded
21.0													
22.0													Continued difficult/cobbly drilling with poor recovery
23.0													
24.0													
25.0													
		25'-27'	S-9	24"	0"	5	8	5	5	8			No recovery
26.0													
27.0													
28.0													
29.0													
30.0													
		30'-32'	S-10	24"	0"	17	15	21	28	23		SAND & GRAVEL	No recovery, gravel fragment in tip
31.0													
32.0													
33.0													
34.0													
35.0													
		35'-37'	S-11	24"	12"	21	28	26	20	35	SP		Brown fine SAND, little silt
36.0													TR-4; (36.0'-36.5')
37.0													
38.0													
39.0													
40.0													
		40'-42'	S-12	24"	18"	14	19	19	25	25	SP		SAA
41.0													41.0'-41.5'; Gray coarse-fine SAND, some coarse gravel
42.0													TR-5; (41.0'-41.5')
43.0													43.5' (*inferred*)
44.0												Silty SAND	
45.0													

NOTES:

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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%

BORING CONTRACTOR: ADT	AECOM	SHEET 3 OF 3
DRILLER: Francisco Martinez		PROJECT NAME: CHPE -
		PROJECT NO.: 60323056
		HOLE NO.: **SCH-13**
SOILS ENGINEER: Michael Izdebski		START DATE: 2/22/2021
		FINISH DATE: 2/22/2021
LOCATION: North side of I-890 Westbound/South of Exit Ramp to Rt. 5S West -Schenectady, NY MP - 6.40		OFFSET: N/A

DEPTH	CORING RATE MIN/FT	DEPTHS FROM - TO (FEET)	TYPE AND NO.	PEN. in	REC. in	BLOWS PER 6 in ON SAMPLER (ROCK QUALITY DESIGNATION)				N Corr.	USCS CLASS.	STRAT. CHNG. DEPTH	FIELD IDENTIFICATION OF SOILS
		45'-47'	S-13	24"	18"	22	21	20	16	27	SM	Silty SAND	Brown fine SAND, some silt; firm, wet
46.0													
47.0													
48.0													
49.0													
50.0													
		50'-52'	S-14	24"	18"	24	28	28	34	36	SM		Brown fine SAND, some silt; firm
51.0													
52.0													
													SCH-13 terminated at 52', backfilled and grouted to surface
53.0													
54.0													
55.0													
56.0													
57.0													
58.0													
59.0													
60.0													
61.0													
62.0													
63.0													
64.0													
65.0													
66.0													
67.0													
68.0													
69.0													
70.0													

NOTES:

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 DMJM Harris 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%

BORING CONTRACTOR: ADT	AECOM	SHEET 1 OF 3
DRILLER: Francisco Martinez		PROJECT NAME: CHPE -
		PROJECT NO.: 60323056
		HOLE NO.: **SCH-13A**
SOILS ENGINEER/GEOLOGIST: Alexandra Golden	**Boring Log**	START DATE: 02/24/2021
		FINISH DATE: 02/24/2021
LOCATION: Median of I-890 Eastbound/NYS Rt. 5S Eastbound Ramps to Thruway Toll Plaza, Schenectady, NY MP - 6.57		OFFSET: N/A

GROUND WATER OBSERVATIONS		CASING	SAMPLER	DRILL BIT	CORE BARREL	DRILL RIG: Geoprobe 7822 DT
	TYPE	Flush Joint Steel	California Modified	Tricone Roller Bit		BORING TYPE: SPT
	SIZE I.D.	4"	2.5"	- -		BORING O.D.: 4.5"
	SIZE O.D.	4.5"	3"	3 7/8"		SURFACE ELEV.:
	HAMMER WT.	140 lbs	140 lbs			LONGITUDE:
	HAMMER FALL	30"	30"			LATITUDE:

DEPTH	CORING RATE MIN/FT	SAMPLE DEPTHS FROM - TO (FEET)	TYPE AND NO.	PEN. in	REC. in	BLOWS PER 6 in ON SAMPLER (ROCK QUALITY DESIGNATION)				N Corr.(2)	USCS CLASS.	STRAT. CHNG. DEPTH	FIELD IDENTIFICATION OF SOILS
		0'-5'				Hand Cleared							
1.0											SP/GP		Brown medium to coarse SAND, some silt, some cobbles 5"-6", little medium to coarse gravel, poorly sorted
2.0													
3.0													TR-1; (5.0'-5.5')
		3'-5'	S-1										
4.0													
5.0													
		5'-7'	S-2	24"	12"	28	36	50	47	56	SP		Brown medium to coarse SAND, loose, wet
6.0													
7.0													
		7'-8'	S-3	12"	0"	55/1"						Silty, Sandy GRAVEL (till)	Boulder obstruction
8.0													
		8'-10'	S-4	24"	6"	14	32	24	33	36	GP/SP		Gray fine to coarse subangular GRAVEL, some fine to coarse sand, trace silt, poorly sorted (till)
9.0													
10.0													
		10'-12'	S-5	24"	24"	31	32	25	37	37	GM		Brown SILT, some fine gravel, trace coarse sand
11.0													TR-2; (10.0'-10.5')
12.0													
		12'-14'	S-6	24"	24"	34	43	49	45	60	GW		Gray fine to coarse subangular GRAVEL, little fine to coarse sand, trace silt, poorly sorted (till)
13.0													
14.0													
		14'-16'	S-7	24"	24"	20	31	50	27	53	GW		SAA
15.0													15.0': Brown silty SAND, some small subangular gravel
16.0													
17.0													
18.0													
19.0													
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: $N_{corr}=N*(2.0^2-1.375^2)in./(3.0^2-2.4^2)in. = N*0.65$.

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%

BORING CONTRACTOR: ADT	AECOM	SHEET 2 OF 3
DRILLER: Francisco Martinez		PROJECT NAME: CHPE -
		PROJECT NO.: 60323056
		HOLE NO.: **SCH-13A**
SOILS ENGINEER: Alexandra Golden		START DATE: 02/24/2021
	Boring Log	FINISH DATE: 02/24/2021
LOCATION: Median of I-890 Eastbound/NYS Rt. 5S Eastbound Ramps to Thruway Toll Plaza, Schenectady, NY MP - 6.57		OFFSET: N/A

DEPTH	CORING RATE MIN/FT	DEPTHS FROM - TO (FEET)	TYPE AND NO.	PEN. in	REC. in	BLOWS PER 6 in ON SAMPLER (ROCK QUALITY DESIGNATION)				N Corr.	USCS CLASS.	STRAT. CHNG. DEPTH	FIELD IDENTIFICATION OF SOILS
		20'-22'	S-8	60"	24"	17	18	49	35	44	GM		Gray fine to coarse subangular GRAVEL, little fine to coarse sand (till)
21.0													20.5': Brown silty SAND, some fine to coarse subangular gravel TR-3; (20.5'-21.0')
22.0													
23.0													
24.0													
25.0													
		25'-27'	S-9	24"	24"	30	47	42	50	58	GW		SAA
26.0													
27.0													
28.0													
29.0													
30.0													
		30'-32'	S-10	24"	24"	25	30	31	32	40	GM	Silty, Sandy Gravel (till)	SAA
31.0													TR-4; (30.0'-30.5')
32.0													
33.0													
34.0													
35.0													
		35'-37'	S-11	24"	24"	30	47	42	50	58	GM		SAA
36.0													
37.0													
38.0													
39.0													
40.0		40'-42'	S-12	24"	24"	32	39	45	31	55	GM		Brown fine to medium SAND, little silt, little coarse subangular gravel throughout
41.0													TR-5; (40.0'-40.5')
42.0													
43.0													
44.0													
45.0													

NOTES:

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%

BORING CONTRACTOR: ADT	AECOM	SHEET 3 OF 3
DRILLER: Francisco Martinez		PROJECT NAME: CHPE -
		PROJECT NO.: 60323056
		HOLE NO.: **SCH-13A**
SOILS ENGINEER: Alexandra Golden		START DATE: 02/24/2021
	Boring Log	FINISH DATE: 02/24/2021
LOCATION: Median of I-890 Eastbound/NYS Rt. 5S Eastbound Ramps to Thruway Toll Plaza, Schenectady, NY MP - 6.57		OFFSET: N/A

DEPTH	CORING RATE MIN/FT	DEPTHS FROM - TO (FEET)	TYPE AND NO.	PEN. in	REC. in	BLOWS PER 6 in ON SAMPLER (ROCK QUALITY DESIGNATION)				N Corr.	USCS CLASS.	STRAT. CHNG. DEPTH	FIELD IDENTIFICATION OF SOILS
		45'-47'	S-13	24"	24"	9	13	9	10	22	SW	Silty, Sandy GRAVEL (till)	Brown SILT and CLAY, trace small subrounded gravel
46.0													
47.0													
48.0													
49.0													
50.0													
		50'-52'	S-14	24"	24"	13	14	10	13	16	GW		Gray fine to coarse subrounded GRAVEL, little fine to coarse brown sand
51.0													TR-6; (50.5'-51.0')
52.0													
													SCH-13A terminated at 52 fbg
53.0													
54.0													
55.0													
56.0													
57.0													
58.0													
59.0													
60.0													
61.0													
62.0													
63.0													
64.0													
65.0													
66.0													
67.0													
68.0													
69.0													
70.0													

NOTES:

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 DMJM Harris 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%

BORING CONTRACTOR: ADT	AECOM	SHEET 1 OF 3
DRILLER: Francisco Martinez		PROJECT NAME: CHPE -
		PROJECT NO.: 60323056
		HOLE NO.: **SCH-13B**
SOILS ENGINEER/GEOLOGIST: Alexandra Golden/Michael Izdebski		START DATE: 2/23/21
		FINISH DATE: 2/23/21
LOCATION: Median of Ramps from Thruway Toll Plaza to I-890 Eastbound/I-890 Westbound , Schenectady, NY MP - 6.67		OFFSET: N/A

GROUND WATER OBSERVATIONS		CASING	SAMPLER	DRILL BIT	CORE BARREL	DRILL RIG: Geoprobe 7822DT
No water observed	TYPE	Flush Joint Steel	California Modified	Tricone Roller Bit		BORING TYPE: SPT
	SIZE I.D.	4"	2.5"	- -		BORING O.D.: 4.5"
	SIZE O.D.	4.5"	3"	3 7/8"		SURFACE ELEV.:
	HAMMER WT.	140 lbs	140 lbs			LONGITUDE:
	HAMMER FALL	30"	30"			LATITUDE:

DEPTH	CORING RATE MIN/FT	SAMPLE DEPTHS FROM - TO (FEET)	TYPE AND NO.	PEN. in	REC. in	BLOWS PER 6 in ON SAMPLER (ROCK QUALITY DESIGNATION)				N Corr.(2)	USCS CLASS.	STRAT. CHNG. DEPTH	FIELD IDENTIFICATION OF SOILS
		0'-5'				Hand Cleared					GM	Silty SAND & GRAVEL	Brown angular COBBLE, some fine to medium gravel, some clayey silt
1.0													
2.0													
3.0													
		3'-5'	S-1										
4.0													
5.0													
		5'-7'	S-2	24"	24"	4	22	15	9	24	GM		Brown to Gray fine to medium GRAVEL, some clayey silt
6.0													
													TR-1; (5.0'-5.5')
7.0													
		7'-9'	S-3	24"	24"	11	17	18	20	23	GM		Brown fine to coarse GRAVEL, some sandy silt
8.0													8'-9'; Brown coarse to fine GRAVEL, some silty sand
9.0													
		9'-11'	S-4	19"	19"	8	10	22	57/1"	21	GM		Brown medium to fine GRAVEL, some sandy silt
10.0													
													10'-11'; Brown fine to medium GRAVEL, some silty sand
11.0													
		11'-'13'	R-1	24"	0"								TR-2; (9.5'-10.0')
12.0													11': Boulder obstruction
13.0													
		13'-15'	S-5	12"	7"	5	50/6"						Gray TILL, drilled down to 15'
14.0													
15.0													
		15'-17'	S-6	24"	24"	17	16	17	25	21	GM		SAA
16.0													
17.0													
18.0													
19.0													
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: $N_{corr}=N*(2.0^2-1.375^2)in./(3.0^2-2.4^2)in. = N*0.65$.

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%

BORING CONTRACTOR: ADT	AECOM	SHEET 2 OF 3
DRILLER: Francisco Martinez		PROJECT NAME: CHPE -
		PROJECT NO.: 60323056
		HOLE NO.: **SCH-13B**
SOILS ENGINEER: Alexandra Golden/Michael Izdebski		START DATE: 2/23/21
		FINISH DATE: 2/23/21
LOCATION: Median of Ramps from Thruway Toll Plaza to I-890 Eastbound/I-890 Westbound , Schenectady, NY MP - 6.67		OFFSET: N/A

DEPTH	CORING RATE MIN/FT	DEPTHS FROM - TO (FEET)	TYPE AND NO.	PEN. in	REC. in	BLOWS PER 6 in ON SAMPLER (ROCK QUALITY DESIGNATION)				N Corr.	USCS CLASS.	STRAT. CHNG. DEPTH	FIELD IDENTIFICATION OF SOILS
		20'-22'	S-7	24"	24"	5	17	17	21	22	GM		SAA
21.0													21.5': Brown SILT, little fine gravel, trace clay
													TR-3; (20.5'-21.0')
22.0													
23.0													
24.0													
25.0													
		25'-27'	S-8	24"	24"	4	19	34	50	34	MH		Brown SILT, little clay, trace fine gravel
26.0													
27.0													
28.0													
29.0													
30.0													
		30'-32'	S-9	24"	6"								Broken boulder piece
31.0													
32.0													
33.0													
34.0													
35.0													
		35'-37'	S-10	24"	24"	6	7	10	35	11	MH		Brown SILT, little clay, some fine to coarse gravel
36.0													
													TR-4; (35.0'-35.5')
37.0													
38.0													
39.0													
40.0													
		40'-42'	S-11	24"	12"	15	50/6"			-	MH		Brown SILT and fine to coarse SAND, trace fine gravel
41.0													
													TR-5; (40.5'-41.0')
42.0													
43.0													
44.0													
45.0													

Silty, Sandy GRAVEL

NOTES:

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%

BORING CONTRACTOR: ADT	AECOM	SHEET 3 OF 3
DRILLER: Francisco Martinez		PROJECT NAME: CHPE -
		PROJECT NO.: 60323056
		HOLE NO.: **SCH-13B**
SOILS ENGINEER: Alexandra Golden/Michael Izdebski		START DATE: 2/23/21
		FINISH DATE: 2/23/21
LOCATION: Median of Ramps from Thruway Toll Plaza to I-890 Eastbound/I-890 Westbound , Schenectady, NY MP - 6.67		OFFSET: N/A

DEPTH	CORING RATE MIN/FT	DEPTHS FROM - TO (FEET)	TYPE AND NO.	PEN. in	REC. in	BLOWS PER 6 in ON SAMPLER (ROCK QUALITY DESIGNATION)				N Corr.	USCS CLASS.	STRAT. CHNG. DEPTH	FIELD IDENTIFICATION OF SOILS
		45'-47'	S-12	24"	12"	9	8	11	13	12	GC	Silty, Sandy GRAVEL	Brown fine to coarse GRAVEL, some silt, little clay
46.0													
47.0													46': Brown SILT and clay with fine to coarse gravel.
48.0													
49.0													
50.0													
		50'-52'	S-13	24"	24"	7	15	28	50	28	MH		Gray SILT, little fine to coarse gravel, trace organics
51.0													TR-6; (50.0'-50.5')
52.0													
													SCH-13B terminated at 52 fbg
53.0													
54.0													
55.0													
56.0													
57.0													
58.0													
59.0													
60.0													
61.0													
62.0													
63.0													
64.0													
65.0													
66.0													
67.0													
68.0													
69.0													
70.0													

NOTES:

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SAMPLE TYPE:	S= SPLIT SPOON	U=SHELBY TUBE	R=ROCK CORE	
PROPORTIONS:	TRACE=1-10%	LITTLE=10-20%	SOME=20-35%	AND=35-50%

BORING CONTRACTOR: ADT	AECOM	SHEET 1 OF 3
DRILLER: Chris Chaillou		PROJECT NAME: CHPE -
		PROJECT NO.: 60323056
		HOLE NO.: **SCH-14**
SOILS ENGINEER/GEOLOGIST: Chris French		START DATE: 03/17/2021
	Boring Log	FINISH DATE: 03/17/2021
LOCATION: Embankment on South Side of Ramp from Thruway Toll Plaza to I-890 Eastbound, Schenectady, NY MP - 6.81		OFFSET: N/A

GROUND WATER OBSERVATIONS		CASING	SAMPLER	DRILL BIT	CORE BARREL	DRILL RIG: CME LMC-55
Water at 2 fbg (observed)	TYPE	Flush Joint Steel	California Modified	Tricone Roller Bit	NQ	BORING TYPE: SPT/Core
	SIZE I.D.	4"	2.5"	- -	1 7/8"	BORING O.D.: 4.5"/3"
	SIZE O.D.	4.5"	3"	3 7/8"	3"	SURFACE ELEV.:
	HAMMER WT.	140 lbs	140 lbs			LONGITUDE:
	HAMMER FALL	30"	30"			LATITUDE:

DEPTH	CORING RATE MIN/FT	SAMPLE DEPTHS FROM - TO (FEET)	TYPE AND NO.	PEN. in	REC. in	BLOWS PER 6 in ON SAMPLER (ROCK QUALITY DESIGNATION)	N Corr.(2)	USCS CLASS.	STRAT. CHNG. DEPTH	FIELD IDENTIFICATION OF SOILS
		0'-4'				Hand Cleared		SM		Dark brown fine to coarse SAND, some silt, trace subrounded gravel, medium dense, moist
1.0								ML		1.0': Brown clayey SILT, some fine to coarse sand, little angular to subangular gravel, stiff, moist
2.0								GW		2.0': Brown and gray angular to subangular GRAVEL, some fine to coarse sand, little silt,
3.0								GW		4.0': Gray angular GRAVEL, trace fine to coarse sand, trace silt, very dense, moist
4.0		4'-6'	S-1	6.5"	6"	76 52/.5"				TR-1; (4.0'-4.5')
5.0	4.2	6'-11'	R-1	60"	56.5"	RQD: 4.5" = 8%			SHALE	Gray SHALE, thinly laminated to very thinly bedded, slightly weathered, bedding plane appx. 0°
6.0										
7.0										6.9': Heavily jointed, parallel with bedding plane
8.0										
9.0										
10.0										
11.0										10.5'-10.75': Light gray SANDSTONE
	1.4	11'-16'	R-2	60"	60"	RQD: 49.5" = 83%				Gray SHALE, moderately jointed
12.0										12.7': interbedded SANDSTONE, unjointed, 60°
13.0										
14.0										
15.0										
16.0										TR-2; (15.4'-16.0')
	1.4	16'-21'	R-3	60"	58.5"	RQD: 58" = 97%				Gray SHALE, interbedded with gray sandstone, very lightly jointed, thin sandstone lamination
17.0										
18.0										
19.0										
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: $N_{corr}=N*(2.0^2-1.375^2)in./(3.0^2-2.4^2)in. = N*0.65$.

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SAMPLE TYPE:	S= SPLIT SPOON	U=SHELBY TUBE	R=ROCK CORE	
PROPORTIONS:	TRACE=1-10%	LITTLE=10-20%	SOME=20-35%	AND=35-50%

BORING CONTRACTOR: ADT	AECOM	SHEET 2 OF 3
DRILLER: Chris Chaillou		PROJECT NAME: CHPE -
		PROJECT NO.: 60323056
		HOLE NO.: **SCH-14**
SOILS ENGINEER/GEOLOGIST: Chris French	**Boring Log**	START DATE: 03/17/2021
		FINISH DATE: 03/17/2021
LOCATION: Embankment on South Side of Ramp from Thruway Toll Plaza to I-890 Eastbound, Schenectady, NY MP - 6.81		OFFSET: N/A

DEPTH	CORING RATE MIN/FT	DEPTHS FROM - TO (FEET)	TYPE AND NO.	PEN. in	REC. in	BLOWS PER 6 in ON SAMPLER (ROCK QUALITY DESIGNATION)	N Corr.	USCS CLASS.	STRAT. CHNG. DEPTH	FIELD IDENTIFICATION OF SOILS
21.0										
	1.8	21'-26'	R-4	60"	60"	RQD: 60" = 100%				SAA, unjointed
22.0										TR-3; (21.45'-21.95')
23.0										
24.0										
25.0										
26.0										
	1.6	26'-31'	R-5	60"	60"	RQD: 54" = 90%				Gray interbedded SHALE and SANDSTONE, lightly jointed
27.0										TR-4; (26.0'-26.6')
28.0										
29.0										
30.0										
31.0										
	2.6	31'-33.9'	R-6	35"	35"	RQD: 20" = 57%				SAA, 75° fractures
32.0									SHALE	
33.0										
34.0										
	2.3	33.9'-36'	R-7	25"	24"	RQD: 24" = 96%				SAA, very lightly jointed
35.0										
36.0										
	1.8	36'-41'	R-8	60"	58.5"	RQD: 54.5" = 91%				SAA, lightly jointed
37.0										TR-5; (37.25'-37.8')
38.0										
39.0										
40.0										
41.0										
	2.3	41'-46'	R-9	60"	60"	RQD: 59.5" = 99%				SAA, very lightly jointed, decreasing presence of interbedded sandstone
42.0										
43.0										
44.0										
45.0										

NOTES:

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SAMPLE TYPE:	S= SPLIT SPOON	U=SHELBY TUBE	R=ROCK CORE	
PROPORTIONS:	TRACE=1-10%	LITTLE=10-20%	SOME=20-35%	AND=35-50%

BORING CONTRACTOR: ADT	AECOM	SHEET 3 OF 3
DRILLER: Chris Chaillou		PROJECT NAME: CHPE -
		PROJECT NO.: 60323056
		HOLE NO.: **SCH-14**
SOILS ENGINEER: Chris French		START DATE: 03/17/2021
	Boring Log	FINISH DATE: 03/17/2021
LOCATION: Embankment on South Side of Ramp from Thruway Toll Plaza to I-890 Eastbound, Schenectady, NY MP - 6.81		OFFSET: N/A

DEPTH	CORING RATE MIN/FT	DEPTHS FROM - TO (FEET)	TYPE AND NO.	PEN. in	REC. in	BLOWS PER 6 in ON SAMPLER (ROCK QUALITY DESIGNATION)	N Corr.	USCS CLASS.	STRAT. CHNG. DEPTH	FIELD IDENTIFICATION OF SOILS
46.0										
	2.1	46'-50'	R-10	51"	50.5"	RQD: 50.5" = 99%				SAA, very lightly jointed, sandstone bedding continuously decreasing
47.0									SHALE	
48.0										TR-6; (48.3'-49.0')
49.0										
50.0										
										SCH-14 terminated at 50.2' then grouted to surface
51.0										
52.0										
53.0										
54.0										
55.0										
56.0										
57.0										
58.0										
59.0										
60.0										
61.0										
62.0										
63.0										
64.0										
65.0										
66.0										
67.0										
68.0										
69.0										
70.0										

NOTES:

Soil description represents a field identification after D.M. Burmister unless otherwise noted.

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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
CHPE - Schenectady Bypass Borings
LABORATORY SOIL TESTING DATA SUMMARY

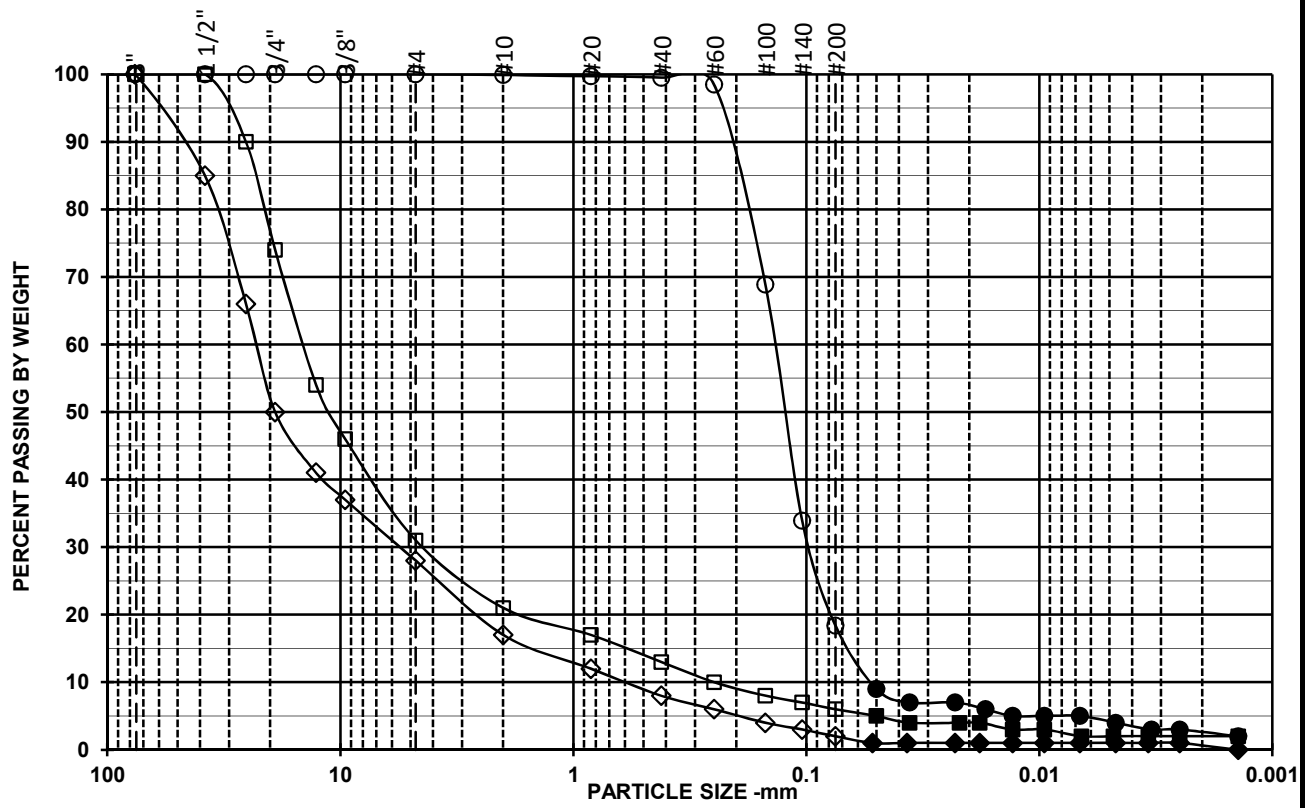
BORING NO.	SAMPLE NO.	DEPTH (ft)	IDENTIFICATION TESTS								REMARKS
			WATER CONTENT (%)	LIQUID LIMIT (-)	PLASTIC LIMIT (-)	PLAS. INDEX (-)	USCS SYMB. (1)	SIEVE MINUS NO. 200 (%)	HYDROMETER % MINUS 2 μm (%)	ORGANIC CONTENT (burnoff) (%)	
SCH-3	S-4	9-11	12.1				SC	19	6		
SCH-3	S-6	13-15	15.8				SM	19	6		
SCH-3	S-10	30-32	6.0				SM	32	10		
SCH-3A	S-3	7-9	22.9				SP-SM	12	3		
SCH-3A	S-7	15-17	15.2				SP-SM	12	4		
SCH-3A	S-9	25-27	26.3				CL	99.1	40		
SCH-6	S-3	7-9	8.8	36	21	15	GC	14	5		
SCH-6	S-7	15-17	10.4				GC	17	5		
SCH-7	S-2	5-7	21.6	25	19	6	CL-ML	79.3	16		
SCH-7	S-4	9-11	13.9				SM	39	7		
SCH-10A	S-3	7-9	6.3				GP-GM	8	2		
SCH-10A	S-6	15-17	4.6				GW-GM	8	2		
SCH-10A	S-10	30-32	4.0				GP-GM	5			
SCH-11	S-3	7-9	9.6				SC	21	6		
SCH-11	S-16	60-62	5.6				SW-SM	12	3		
SCH-11	S-20	80-82	19.3				SM	17.5	3		
SCH-11	S-25	105-107	21.1				SM	24.3	3		
SCH-12	S-3	7-9	28.5	33	19	14	CL	85	18		
SCH-12	S-9	25-27	23.3				SM	19.8	3		
SCH-12	S-14	50-52	18.3				SM	15	3		
SCH-12	S-19	75-77	7.6	18	11	7	SC-SM	41	14		
SCH-12	S-25	105-107	7.6	19	11	8	SC	41	14		
SCH-13	S-3	7-9	7.0				GP-GM	6	2		
SCH-13	S-6	13-15	0.3				GW	2	1		
SCH-13	S-11	35-37	20.9				SM	18.4	3		
SCH-13B	S-2	5-7	12.8				GC	19	6		
SCH-13B	S-3	7-9	11.3				GC	22	6		
SCH-17	S-2	5-7	9.1				GM	28	5		
SCH-17	S-4	9-11	8.5				GP-GM	10	3		
SCH-19	S-2	5-7	10.7				SM	19	5		
SCH-19	S-7	15-17	7.8				GP-GM	11	3		
SCH-19	S-10	30-32	13.9	22	12	10	SC	28	11		

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

Aquifer
CHPE - Schenectady Bypass Borings
SUMMARY OF ROCK TESTING

SAMPLE IDENTIFICATION			STATE PROPERTIES			ENGINEERING PROPERTY TESTS							REMARKS
Boring	Run	Depth	WATER CONTENT (1) (%)	TOTAL UNIT WGT. (pcf)	DRY UNIT WGT. (pcf)	TEST TYPE (2)	Mohs HARDNESS (-)	POINT LOAD TEST (ASTM D5731) STRENGTH INDEX Is(50) (MPa)	ESTIMATED (4) COMPRESSIVE STRENGTH (psi)	UNCONFINED COMPRESSION TESTS (ASTM D7012) COMPRESSIVE STRENGTH (psi)	AXIAL STRAIN @ FAILURE (%)	ESTIMATED (5) ELASTIC MODULUS (psi)	
SCH-2	R-2	10.7-11.1	1.2	170	167	UC				11960	0.55	2E+06	
SCH-2	R-2	11.3-11.6				M	3						
SCH-2	R-5	25.3-25.7				M	4						
SCH-2	R-5	28.5-26.2	2.7	79.6	77.5	UC				12670	0.64	2E+06	
SCH-6	R-2	24.0-24.2	1.10			PL		0.4	1375				
SCH-6	R-2	24.0-24.2				PL		3.3	9964				
SCH-6	R-2	24.6				M	3						
SCH-14	R-2	15.2				M	3						
SCH-14	R-3	17.8				M	4						
SCH-14	R-3	17.95-18.35	1.2	168	166	UC				8570	0.45	2E+06	
SCH-14	R-5	30.4				M	3-4						
SCH-14	R-5	30.4-30.55	1.10			PL		0.3	917				
SCH-14	R-5	30.4-30.55				PL		2.2	5910				

Notes: (1) Water contents determined after trimming and shearing.
(2) Test Type Abbreviations: M: Mohs Hardness, PL: Pont Load, UC: UC Compression test with estimated elastic moduli
(5) Modulus estimated based on corrected gross deformations.



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

Symbol	□	◇	○
Boring	SCH-13	SCH-13	SCH-13
Sample	S-3	S-6	S-11
Depth	7-9	13-15	35-37
% +3"	0	0	0
% Gravel	69	72	0
% SAND	25	26	81.6
%C SAND	10	11	0.1
%M SAND	8	9	0.4
%F SAND	7	6	81.1
% FINES	6	2	18.4
D_{100} (mm)	38.1	76.2	4.75
D_{60} (mm)	14.3	22.8	0.137
D_{30} (mm)	4.4	5.5	0.096
D_{10} (mm)	0.25	0.59	0.052
Cc	5.4	2.2	1.3
Cu	57.2	38.6	2.6

Sieve Size/ID #	Percent Finer Data		
6"	100	100	100.0
4"	100	100	100.0
3"	100	100	100.0
1 1/2"	100	85	100.0
1"	90	66	100.0
3/4"	74	50	100.0
1/2"	54	41	100.0
3/8"	46	37	100.0
#4	31	28	100.0
#10	21	17	99.9
#20	17	12	99.7
#40	13	8	99.5
#60	10	6	98.5
#100	8	4	68.9
#140	7	3	33.9
#200	6	2	18.4
5μ m	2	1	4
2μ m	2	1	3
1μ m	2		1

SYMBOL	w (%)	LL	PL	PI	USCS	AASHTO	USCS DESCRIPTION AND REMARKS	DATE
□	7.0				GP-GM		Brown, Poorly graded gravel with silt and sand, Insufficient sample size	04/27/21
◇	0.3				GW		Brown, Well-graded gravel with sand, Insufficient sample size	04/27/21
○	20.9				SM		Brown, Silty sand	04/27/21

Aquifer

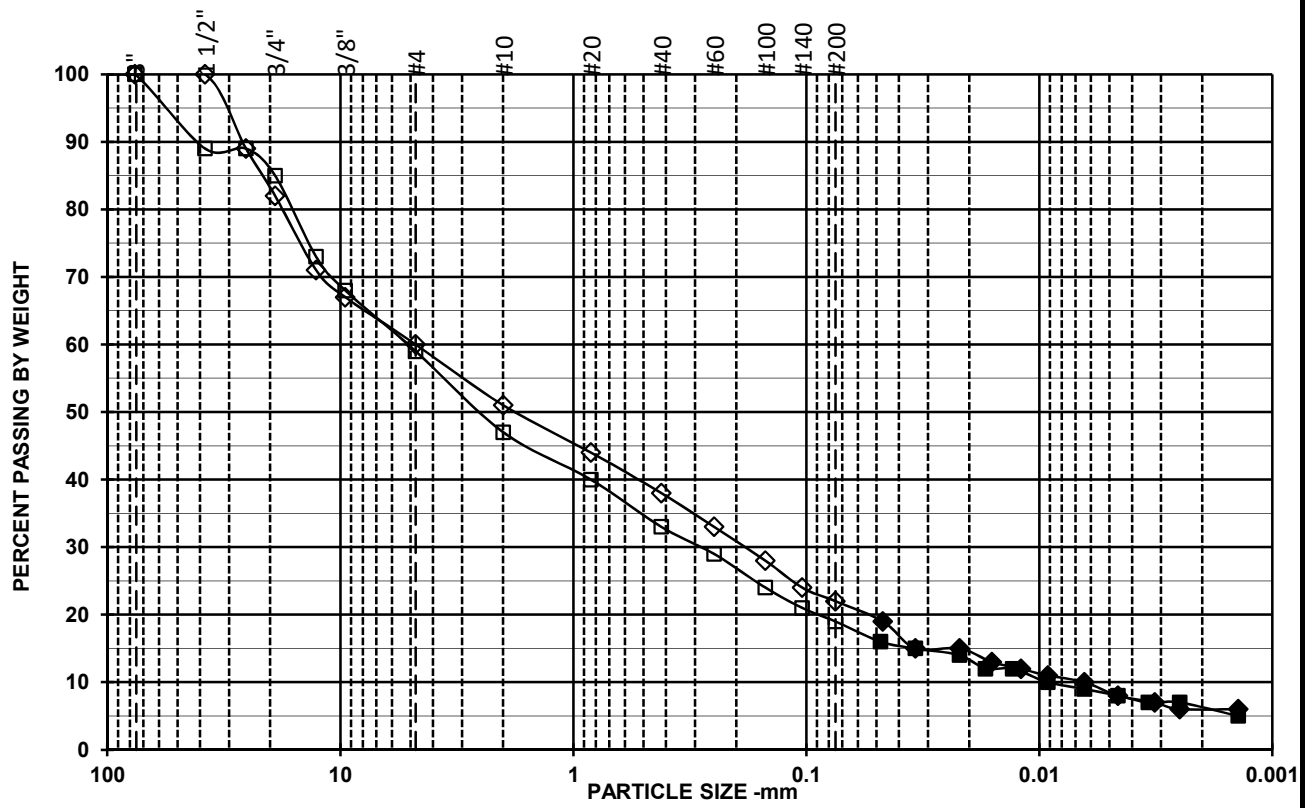
TerraSense, LLC #7853-21006

CHPE - Schenectady Bypass Borings

PARTICLE SIZE DISTRIBUTION
ASTM D6913 & ASTM D7928

TerraSense Analysis File: GrainSizeV6Rev1a14

Siev1j.xlsx 5/7/2021



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

SYMBOL	w (%)	LL	PL	PI	USCS	AASHTO	USCS DESCRIPTION AND REMARKS	DATE
□	12.8				GC		Brown, Clayey gravel with sand, Insufficient sample size	04/27/21
◇	11.3				GC		Brown, Clayey gravel with sand, Insufficient sample size	04/29/21
○								

Symbol	□	◇	○
Boring	SCH-13B	SCH-13B	
Sample	S-2	S-3	
Depth	5-7	7-9	
% +3"	0	0	
% Gravel	41	40	
% SAND	40	38	
%C SAND	12	9	
%M SAND	14	13	
%F SAND	14	16	
% FINES	19	22	
D_{100} (mm)	76.2	38.1	
D_{60} (mm)	5.13	4.75	
D_{30} (mm)	0.28	0.18	
D_{10} (mm)	0.009	0.006	
Cc	1.7	1.1	
Cu	557.6	742.2	

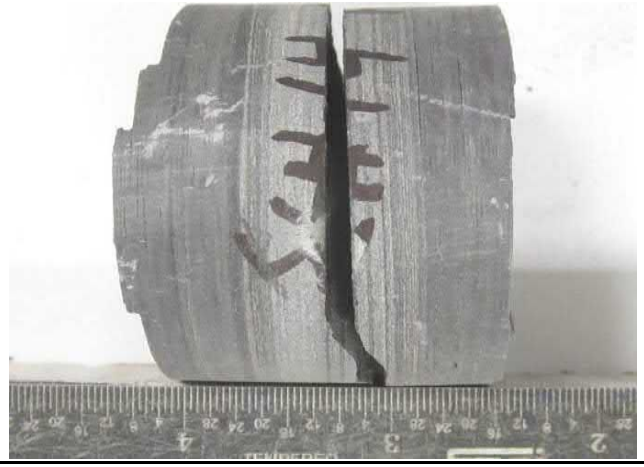
Sieve Size/ID #	Percent Finer Data		
6"	100	100	
4"	100	100	
3"	100	100	
1 1/2"	89	100	
1"	89	89	
3/4"	85	82	
1/2"	73	71	
3/8"	68	67	
#4	59	60	
#10	47	51	
#20	40	44	
#40	33	38	
#60	29	33	
#100	24	28	
#140	21	24	
#200	19	22	
5μ m	8	9	
2μ m	6	6	
1μ m	4	6	

Aquifer

TerraSense, LLC #7853-21006

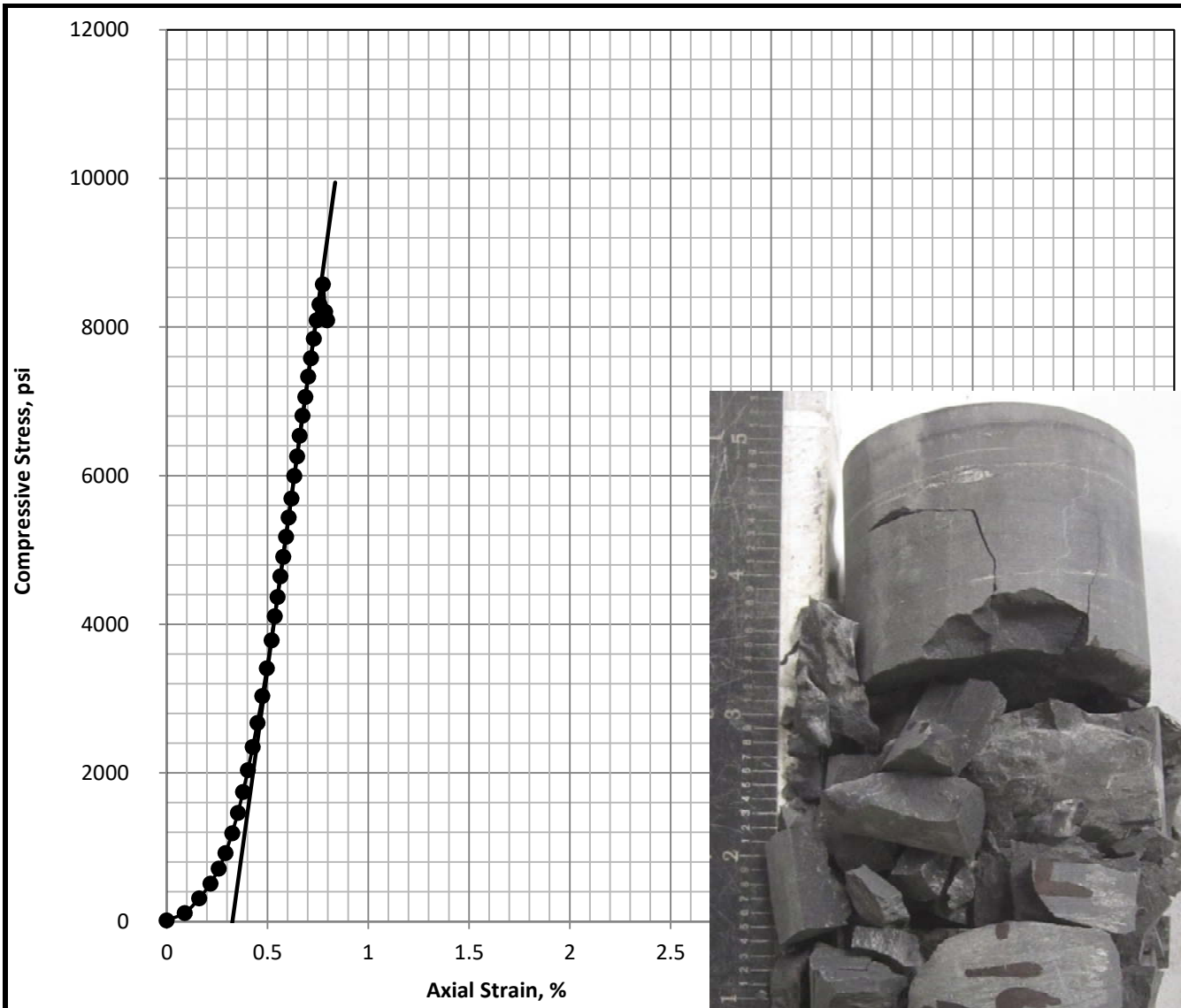
CHPE - Schenectady Bypass Borings

PARTICLE SIZE DISTRIBUTION
ASTM D6913 & ASTM D7928

Load Orientation:	Diametral	Axial
Length to nearest free end, L (mm)	23.7	25.1
Specimen Width, W1 (mm)		50.2
Specimen Width, W2 (mm)		50.2
D (mm)	49.0	11.0
D' (mm)	49.0	11.0
D_e (mm)	49.0	26.5
Failure Load, P (lb)	147	467
Point Load (N)	654	2077
Point Load (Mpa)	**0.27**	**2.22**
Index, Is50 (psi)	**40**	**320**
Unconfined Compressive Strength (psi)	**917**	**5910**
Specimen /Failure Sketch		
Tare No.	M-25	
Wet + Tare (gm)	159.53	
Dry + Tare (gm)	158.35	
Tare (gm)	51.04	
Water Content%	**1.10**	
Comments		

Test by: MT Test Date: 4/13/2021 Reviewed by: GET

CHPE - Schenectady Bypass Borings		**POINT LOAD STRENGTH INDEX OF ROCK ASTM D5731**
Aquifer	602201207	**Boring: SCH-14 Run: R-5**
TerraSense, LLC	7853-21006	**Depth: 30.4-30.55**



Specimen Information

Water Content (%)	Wet Unit Weight (pcf)	Dry Unit Weight (pcf)	Length (inch)	Diameter (inch)
1.23	168	166	4.431	1.969

Specimen meets ASTM D4543 shape tolerances

FAILURE PHOTO

Test Summary

Strain Rate (%/min)	Corrected Strain Strain to Peak (%)	q_u (psi)	Estimated (shown) Elastic Modulus (psi)
0.17	0.45	8570	2E+06

Test by: DM
Test Date: Apr-13-21
Reviewed by: GET

Aquifer	**CHPE - Schenectady Bypass Borings**	**COMPRESSIVE STRESS VS STRAIN UNCONFINED COMPRESSIVE STRENGTH TEST**
TerraSense, LLC Project # 7853-21006		**Boring: SCH-14 Run: R-3 Depth 17.95-18.35 ft.**

ROCK CORE PHOTOGRAPHIC LOG

AECOM Project No: **60323056**
Project Name: **CHPE – Upstate New York Upland Geotechnical Investigation**
Location: **Schenectady Bypass Segment**

Note: Black foam inserts represent core pieces that were removed for geotechnical and/or thermal resistivity laboratory testing

Boring No.	Depth (ft.)
SCH-6	22.0-37.0

Boring No.	Depth (ft.)
SCH-14	6.0-26.0

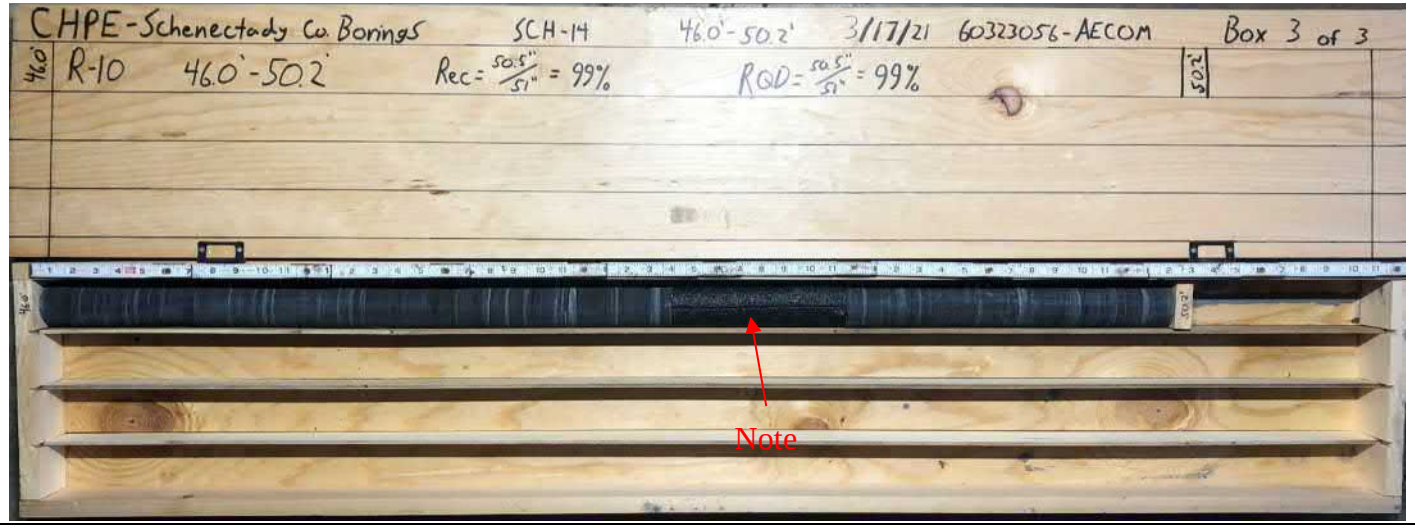
Note: Black foam inserts represent core pieces that were removed for geotechnical and/or thermal resistivity laboratory testing

ROCK CORE PHOTOGRAPHIC LOG

AECOM Project No: **60323056**
Project Name: **CHPE – Upstate New York Upland Geotechnical Investigation**
Location: **Schenectady Bypass Segment**

Boring No.	Depth (ft.)
SCH-14	26.0-46.0

Boring No.	Depth (ft.)
SCH-14	46.0-50.2

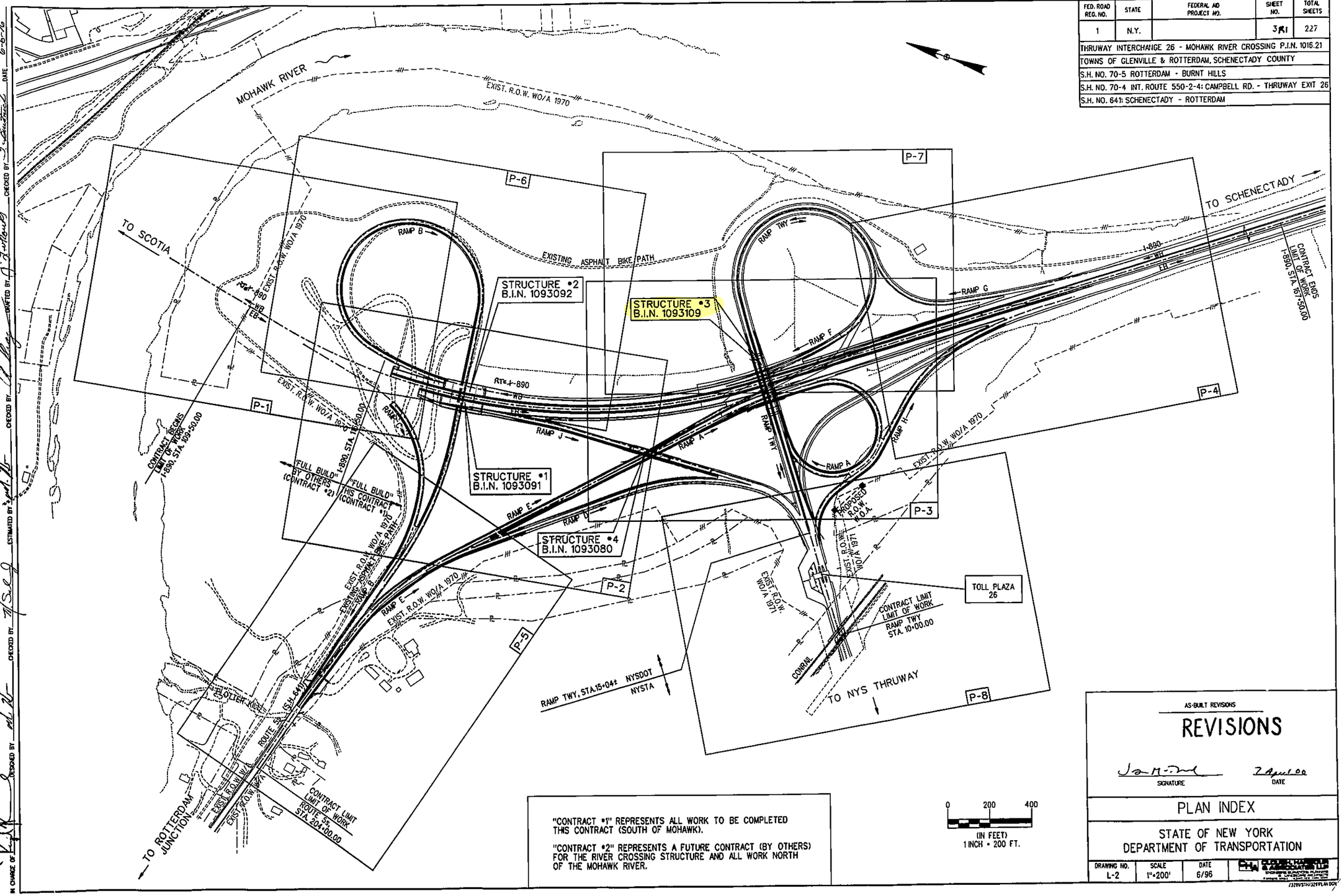


Note: Black foam inserts represent core pieces that were removed for geotechnical and/or thermal resistivity laboratory testing

D257014

FED. ROAD REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	N.Y.		3	227

THRUWAY INTERCHANGE 26 - MOHAWK RIVER CROSSING P.I.N. 1016.21
TOWNS OF GLENVILLE & ROTTERDAM, SCHENECTADY COUNTY
S.H. NO. 70-5 ROTTERDAM - BURNT HILLS
S.H. NO. 70-4 INT. ROUTE 550-2-4: CAMPBELL RD. - THRUWAY EXIT 26
S.H. NO. 641: SCHENECTADY - ROTTERDAM



"CONTRACT #1" REPRESENTS ALL WORK TO BE COMPLETED THIS CONTRACT (SOUTH OF MOHAWK).

"CONTRACT #2" REPRESENTS A FUTURE CONTRACT (BY OTHERS) FOR THE RIVER CROSSING STRUCTURE AND ALL WORK NORTH OF THE MOHAWK RIVER.

AS-BUILT REVISIONS

REVISIONS

SIGNATURE — DATE 7 April 00

PLAN INDEX

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

DRAWING NO.	SCALE	DATE
L-2	1"=200'	6/96

PAUL RITTER & ASSOCIATES LLP
CONSULTING ENGINEERS
SURVEYORS
ENVIRONMENTAL SCIENTISTS
ENGINEERS
ARCHITECTS
PLANNERS

IN CHARGE OF — DESIGNED BY — CHECKED BY — ESTIMATED BY — CHECKED BY — INVITED BY — CHECKED BY — DATE 6-6-96

D257014

FED. ROAD REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	N.Y.		170	227

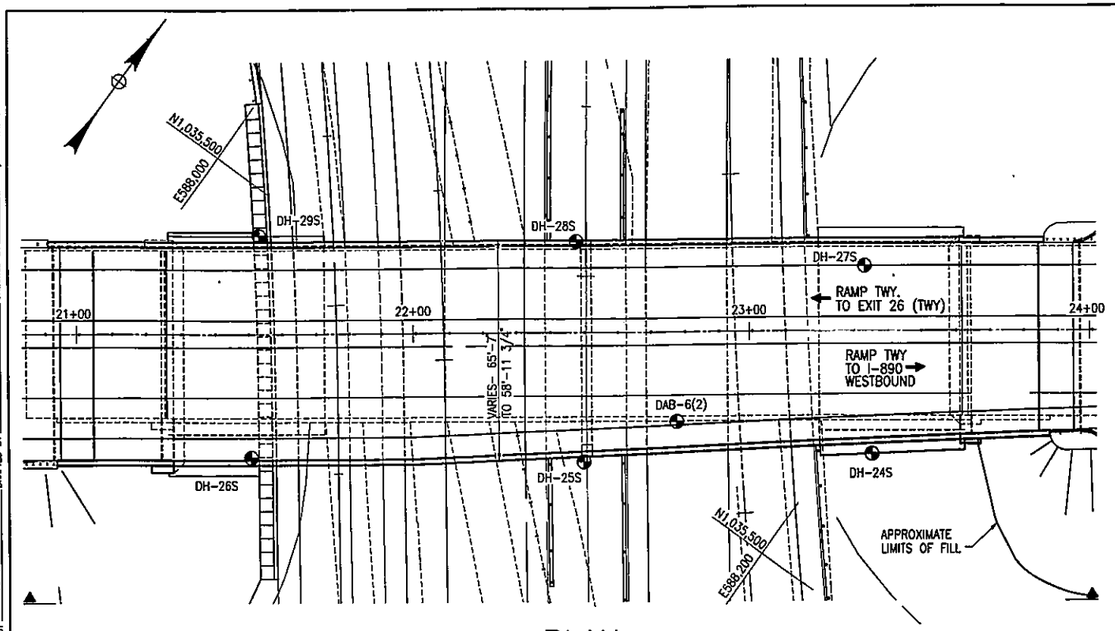
THRUWAY INTERCHANGE 26 – MOHAWK RIVER CROSSING P.I.N. 1016.21

TOWNS OF GLENVILLE & ROTTERDAM, SCHENECTADY COUNTY

S.H. NO. 70-5 ROTTERDAM – BURNT HILLS

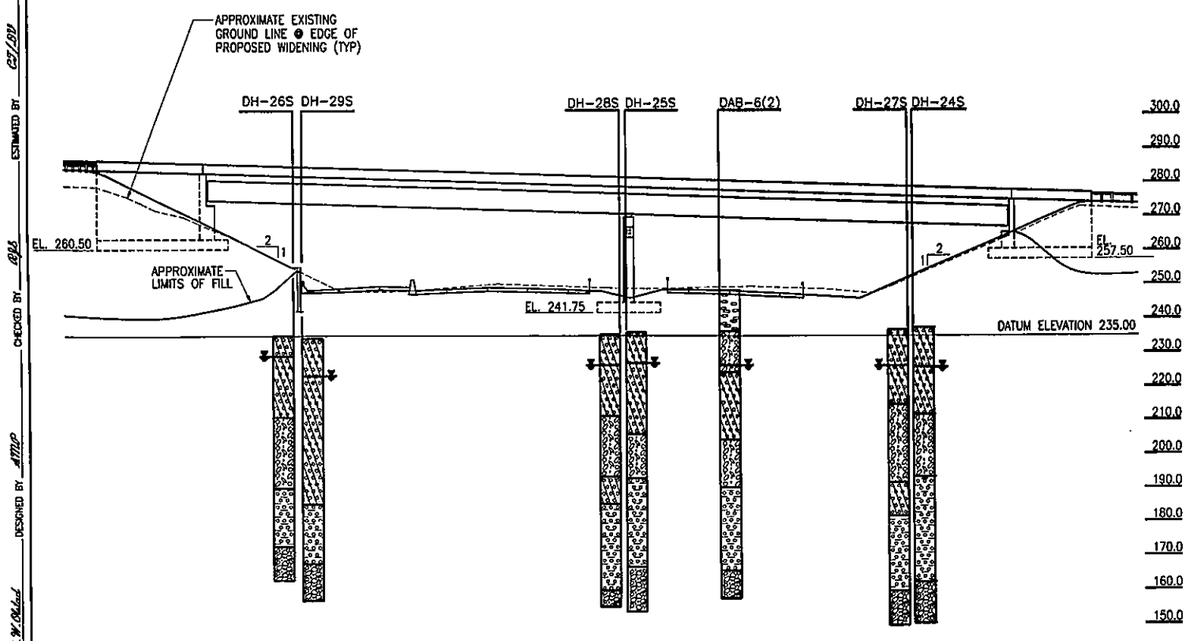
S.H. NO. 70-4 INT. ROUTE 550-2-4; CAMPBELL RD. – THRUWAY EXIT 26

S.H. NO. 641; SCHENECTADY – ROTTERDAM



PLAN

1" = 20'-0"



ELEVATION

1" = 20'-0"

ADDITIONAL NOTES:

1) Borings DH-24S, DH-25S, DH-26S DH-27S, DH-28S and DH-29S performed in 1968. Boring DAB-6(2) performed in 1993.

REFERENCE PLANS

Preliminary Structure Plans used for analysis were:

Prepared by: Clough, Harbour & Associates

Scale:	Date:
1"=20'	4/94

Prepared by: C.S.H.

Drawn by: M.C.

Reviewed by: C.H.F.

Checked by: J.K.S.

GENERAL NOTES

1) General soil and rock (where encountered) stratum descriptions and indicated boundaries are based on an engineering interpretation performed by Clough, Harbour and Associates of all available subsurface information provided by the Geotechnical Engineering Bureau and may not necessarily reflect the actual variation in subsurface conditions between borings and samples. Detailed data and field interpretations of conditions encountered in individual borings are shown on the subsurface exploration logs.

2) The observed water levels and/or conditions indicated on the subsurface profiles are as recorded at the time of exploration. Actual water levels may differ from the observed water levels because of limitations in the number and duration of observations and will vary with changes in climate and rainfall.

3) Sound engineering judgement was exercised in preparing the subsurface information presented hereon. This information was prepared and is intended for State design and estimate purposes only. Its presentation on the plans or elsewhere is for the purpose of providing intended users with access to the same information available to the State. This is not intended as a substitute for personal investigation, independent interpretations or judgement of the Contractor.

4) All structure details shown hereon are for illustrative purposes only and may not be indicative of the final design conditions shown on the Contract plans.

5) Footing elevations shown are as indicated at the time of this drawing's preparation.

LEGEND

The following tables sumarize the descriptive information used on this profile.

Density (Non-plastic soils)	No. of blows per foot of penetration of a 2 inch O.D. (1-3/8 inch I.D.) sampler using a 300 lb. drop hammer, 18 inch fall.
Very Loose	0-3
Loose	4-8
Medium Compact	9-20
Compact	21-35
Very Compact	over 35

Density (Non-plastic soils)
Very Soft
Soft
Firm
Stiff
Hard

The system for describing soil material shown on this drawing is detailed in "Soil Description Procedures" Official Issuance No. 7.41-5 STP 2/75 and Engineering Bulletin EB 88-17, both prepared by the NYSDOT Soil Mechanics Bureau.

SYMBOLS

DRILL HOLE — DAB

OBSERVED WATER LEVEL

FILL: Medium Compact to Very Compact, Brown Silty SAND, Gravelly and Sandy GRAVEL.

Loose to Medium Compact, Brown Gravelly SAND, Silty and Silty SAND, Gravelly and Sandy GRAVEL.

Medium Compact to Compact, Brown Gravelly SAND, Silty and Silty SAND, Gravelly and Sandy GRAVEL.

Medium Compact to Compact, Brown-Gray Silty SAND.

Very Compact GLACIAL TILL with Boulders.

B.I.N. 1093109

AS-BUILT REVISIONS

SIGNATURE DATE

GENERAL SUBSURFACE PROFILE

STRUCTURE #3 – RAMP TWY OVER I-890

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

DRAWING NO.	SCALE	DATE	
RT-2	AS SHOWN	6/96	CLOUGH, HARBOUR & ASSOCIATES LLP

IN CHARGE OF ... DESIGNED BY ... CHECKED BY ... DRAFTED BY ... CHECKED BY ... ESTIMATED BY ... CHECKED BY ... DATE 6/96

Boring Location Plans Page 9 of 9	Drawn by: ADW	Scale: Not to scale	Project No.: CD10279	Date: May 2022
Champlain Hudson Power Express Design Package 4B Glenville to Scotia, New York	***ATLANTIC TESTING LABORATORIES*, Limited** Albany, NY · Binghamton, NY · Canton, NY · Elmira, NY · Plattsburgh, NY Poughkeepsie, NY · Syracuse, NY · Rochester, NY · Utica, NY · Watertown, NY			

ATLANTIC TESTING LABORATORIES, Limited

Subsurface Investigation

Report No.: CD10279D-01-05-22

Client: Kiewit Engineering (NY) Corp.

Boring Location: See Boring Location Plan

Project: Subsurface Investigation
Champlain Hudson Power Express, Design Package 4B
Various Locations, New York

Start Date: 4/14/2022 Finish Date: 4/14/2022

Boring No.: K-169.0-6.4 Sheet 1 of 2

Groundwater Observations

Date	Time	Depth	Casing
4/14/2022	PM	DRY	35.0'

Coordinates
Northing 1461375.52
Easting 624568.1

Sampler Hammer
Weight: 140 lbs.
Fall: 30 in.
Hammer Type: Automatic

Ground Elev.: 257.4

Boring Advance By:
HW (4") Casing/3 7/8" Wet Rotary

DEPTH	METHOD OF ADVANCE	SAMPLE NO.	DEPTH OF SAMPLE From	DEPTH OF SAMPLE To	SAMPLE TYPE	BLOWS ON SAMPLER PER 6" 2" O.D. SAMPLER	DEPTH OF CHANGE	CLASSIFICATION OF MATERIAL (f - fine, m - medium, c - coarse; and - 35-50%, some - 20-35%, little - 10-20%, trace - 0-10%)	Recovery (Inches)
1	CASING	1	0.0	2.0	SS	2 2 8 6		Brown CLAY; and cmf SAND; trace SILT; trace ORGANIC MATERIAL (moist, plastic) CL	10
2		2	2.0	4.0	SS	4 5 4 9		Brown cmf SAND; some CLAY; trace mf GRAVEL; trace SILT; trace ORGANIC MATERIAL (moist, moderately plastic) OC = 1.4% SC	7
4		3	4.0	6.0	SS	10 17 25 37	4.0	Grey cmf GRAVEL; some cmf SAND; trace SILT; trace CLAY (moist, very slightly plastic) GW	18
6		4	6.0	8.0	SS	10 22 33 29		Grey cmf SAND; some cmf GRAVEL; little SILT; trace CLAY (moist, very slightly plastic) w = 6.2%, % Fines = 20.0% SM	24
8		5	8.0	10.0	SS	17 18 19 29		Grey Similar Soil (moist, very slightly plastic) SM	24
10	WET ROTARY							Advanced casing to 10.0 feet and began advancing 3 7/8" tri-cone roller bit wet rotary open hole within the borehole.	
14		6	14.0	16.0	SS	20 23 25 17		Brownish-Grey cmf SAND; some mf+ GRAVEL; little SILT; trace CLAY (moist, very slightly plastic) w = 9.4%, % Fines = 21.0% SM	16
19		7	19.0	21.0	SS	14 14 10 11		Grey Similar Soil (moist, very slightly plastic) SM	13
23		ST-1A	23.0	25.0	SS	14 15 14 15		(3" Brass Lined Split Spoon) Brown cmf SAND; and mf GRAVEL; trace SILT (wet, non-plastic) SW	12

SS Split Spoon Sample
NX Rock Core
SH Undisturbed Sample (Shelby Tube)
Estimated Groundwater

Drillers: Jeffrey Donovan; Chase Bertrand

Inspector: James LaMarco (ATL); Camren Campeau (ATL)

ATLANTIC TESTING LABORATORIES, Limited

Subsurface Investigation

Boring No.: K-169.0-6.4 Report No.: CD10279D-01-05-22 Sheet 2 of 2

DEPTH	METHOD OF ADVANCE	SAMPLE NO.	DEPTH OF SAMPLE From	DEPTH OF SAMPLE To	SAMPLE TYPE	BLOWS ON SAMPLER PER 6" 2" O.D. SAMPLER	DEPTH OF CHANGE	CLASSIFICATION OF MATERIAL (f - fine, m - medium, c - course; and - 35-50%, some - 20-35%, little - 10-20%, trace - 0-10%)	RECOVERY (inches)
		ST-1B	25.0	26.8	SS	20 24 39 50/3"		(3" Brass Lined Split Spoon) Similar Soil (wet, non-plastic) SW	12
26									
27		ST-1C	27.0	29.0	SS	37 47 35 27		(3" Brass Lined Split Spoon) Brown cmf GRAVEL; some cmf SAND; trace SILT (wet, non-plastic) w = 6.0%, % Fines = 6.6% GW	12
28									
29		8	29.0	31.0	SS	6 10 13 11		Brown cmf SAND; and mf GRAVEL; trace SILT (moist, non-plastic) SW	4
30									
31									
32									
33									
34		9	34.0	36.0	SS	18 9 7 11		Similar Soil (moist, non-plastic) SW	3
35									
36									
37							37.0		
38									
39		10	39.0	41.0	SS	13 12 12 18		Brown cmf SAND; trace f GRAVEL; trace SILT (moist, non-plastic) w = 22.0%, % Fines = 4.1% SW	4
40									
41									
42									
43		11	43.0	45.0	SS	10 7 5 11		Brown Similar Soil (moist, non-plastic) SW	3
44									
45							45.0		
46								Boring terminated at 45.0 feet.	
47									
48								Notes:	
49								1. Borehole backfilled with cement-bentonite grout.	
50								2. Soil classifications based on ATL Field Engineer's field classifications.	
51								3. Borehole was advanced with ATL's Geoprobe 7822D7 (Rig Unit No. CDGV706) drill rig.	
52									
53									
54									
55									
56									
57									
58									
59									
60									
61									
62									

ATL-LOG1 NE CD10279 KIEWIT INFRASTRUCTURE CO - VARIOUS LOCATIONS (PACKAGE 4B).GPJ ATL4-08.GDT 6/15/22

ATLANTIC TESTING LABORATORIES, Limited

Subsurface Investigation

Report No.: CD10279D-01-05-22

Client: Kiewit Engineering (NY) Corp.

Boring Location: See Boring Location Plan

Project: Subsurface Investigation
Champlain Hudson Power Express, Design Package 4B
Various Locations, New York

Start Date: 4/15/2022 Finish Date: 4/15/2022

Boring No.: K-169.0-6.7 Sheet 1 of 2

Groundwater Observations

Date	Time	Depth	Casing
4/15/2022	AM	7.2'	10.0'
4/15/2022	PM	*6.6'	10.0'

Coordinates
Northing 1460001.33
Easting 625060.16

Sampler Hammer
Weight: 140 lbs.
Fall: 30 in.
Hammer Type: Automatic

Ground Elev.: 260.6

Boring Advance By: HW (4") Casing/3 7/8" Wet Rotary/NX Core

*May be affected by water utilized to advance the borehole.

DEPTH	METHOD OF ADVANCE	SAMPLE NO.	DEPTH OF SAMPLE From	DEPTH OF SAMPLE To	SAMPLE TYPE	BLOWS ON SAMPLER PER 6" 2" O.D. SAMPLER	DEPTH OF CHANGE	CLASSIFICATION OF MATERIAL (f - fine, m - medium, c - coarse; and - 35-50%, some - 20-35%, little - 10-20%, trace - 0-10%)	Recovery (Inches)
1	CASING	1	0.0	2.0	SS	2 5 15 17		Brown cm GRAVEL; little cmf SAND; trace SILT; trace CLAY (moist, very slightly plastic) GP	14
2		2	2.0	4.0	SS	10 15 12 14		Brown mf GRAVEL; some mf SAND; trace SILT; trace CLAY (moist, very slightly plastic) GP	20
3							4.0		
4		3	4.0	6.0	SS	9 11 14 15		Greyish-Brown CLAY; little mf GRAVEL; trace mf SAND; trace SILT (moist, plastic) CL	6
5							6.0		
6		4	6.0	8.0	SS	12 13 16 14		Brown cmf+ SAND; little mf GRAVEL; little SILT; little CLAY (moist, slightly plastic) w = 10.0%, % Fines = 33.0% SM	20
7									
8		5	8.0	10.0	SS	13 9 9 11		Similar Soil (moist, slightly plastic) SM	20
9									
10	WET ROTARY							Advanced casing to 10.0 feet and began advancing 3 7/8" tri-cone roller bit wet rotary open hole within the borehole.	
11									
12							12.0		
13									
14		6	14.0	16.0	SS	3 5 5 7		Grey cmf SAND; little f GRAVEL; little SILT; little CLAY (moist, slightly plastic) SM	10
15									
16									
17									
18									
19		7	19.0	21.0	SS	1 1 3 5		Grey cmf SAND; little f GRAVEL; little SILT; little CLAY (moist, slightly plastic) w = 18.7%, % Fines = 31.0% SM	15
20									
21									
22									
23							23.0		
24		8	24.0	25.4	SS	10 49 50/5"		Possible WEATHERED ROCK Fragments	8
25									

SS Split Spoon Sample
NX Rock Core
SH Undisturbed Sample (Shelby Tube)
Estimated Groundwater

Drillers: Jeffrey Donovan; Chase Bertrand

Inspector: James LaMarco (ATL)

ATL-LOG1 NE CD10279 KIEWIT INFRASTRUCTURE CO - VARIOUS LOCATIONS (PACKAGE 4B).GPJ ATL4-08.GDT 6/15/22

ATLANTIC TESTING LABORATORIES, Limited

Subsurface Investigation

Boring No.: K-169.0-6.7 Report No.: CD10279D-01-05-22 Sheet 2 of 2

DEPTH	METHOD OF ADVANCE	SAMPLE NO.	DEPTH OF SAMPLE From	DEPTH OF SAMPLE To	SAMPLE TYPE	BLOWS ON SAMPLER PER 6" 2" O.D. SAMPLER	DEPTH OF CHANGE	CLASSIFICATION OF MATERIAL (f - fine, m - medium, c - course; and - 35-50%, some - 20-35%, little - 10-20%, trace - 0-10%)	RECOVERY (inches)
26								Advanced 3 7/8" tri-cone roller bit wet rotary open hole to 27.0 feet and began coring.	
27							27.0		
28	NX CORE (WET)		27.0	32.0	NX	RUN 1		Greyish-Black SHALE 58" or 97% Recovery 17 Pieces (32") - 45% Chips and Fragments 2 Pieces longer than 4" (9") - RQD = 15%	58
32							32.0		
33			32.0	37.0	NX	RUN 2		Greyish-Black SHALE 49" or 82% Recovery 2 Pieces (8") - 84% Chips and Fragments 1 Piece longer than 4" (5") - RQD = 8%	49
37							37.0		
38			37.0	42.0	NX	RUN 3		Greyish-Black SHALE 55" or 92% Recovery 6 Pieces (32") - 42% Chips and Fragments 4 Pieces longer than 4" (25") - RQD = 42%	55
42							42.0		
43			42.0	47.0	NX	RUN 4		Greyish-Black SHALE 58" or 97% Recovery 15 Pieces (49") - 16% Chips and Fragments 4 Pieces longer than 4" (30") - RQD = 50%	58
47							47.0		
48								Boring terminated at 47.0 feet.	

Notes:
1. Borehole backfilled with cement-bentonite grout.
2. Soil classifications based on ATL Field Engineer's field classifications.
3. Borehole was advanced with ATL's Geoprobe 7822D7 (Rig Unit No. CDGV706) drill rig.

ATLANTIC TESTING LABORATORIES

LABORATORY TEST SUMMARY TABLE

ATL No. CD10279: Kiewit Infrastructure Co. - Champlain Hudson Power Express

Boring ID	Sample No.	Sample Depth (ft.)	Soil/Rock Description	Percent Finer No. 200 Sieve	Moisture Content (%)	Atterburg Limits			Organic Content (%)	Water-Soluble Sulfate (ppm)	Water-Soluble Chloride (ppm)	pH	Resistivity (ohm-cm)	Rock Unconfined Compressive Strength (psi)	Rock Splitting Tensile Strength (psi)	Rock CERCHAR Abrasiveness Corrected CAI
						LL	PL	PI								
K-169.0-6.4	S-2	2.0-4.0	Brown cmf SAND; some CLAY; trace mf GRAVEL; trace SILT; trace OM	--	--	--	--	--	1.4	--	--	--	--	--	--	--
	S-4	6.0-8.0	Grey cmf SAND; some cmf GRAVEL; little SILT; trace CLAY	20.0	6.2	--	--	--	--	--	--	--	--	--	--	--
	S-6	14.0-16.0	Brownish-Grey cmf SAND; some mf+ GRAVEL; little SILT; trace CLAY	21.0	9.4	--	--	--	--	--	--	--	--	--	--	--
	ST-1c	27.0-29.0	Brown cmf GRAVEL; some cmf SAND; trace SILT	6.6	6.0	--	--	--	--	--	--	--	--	--	--	--
	S-10	39.0-41.0	Brown cmf SAND; trace f GRAVEL; trace SILT	4.1	22.0	--	--	--	--	--	--	--	--	--	--	--
K-169.0-6.7	S-4	6.0-8.0	Brown cmf+ SAND; little mf GRAVEL; little SILT; little CLAY	33.0	10.0	--	--	--	--	--	--	--	--	--	--	--
	S-7	19.0-21.0	Grey cmf SAND; little f GRAVEL; little SILT; little CLAY	31.0	18.7	--	--	--	--	--	--	--	--	--	--	--
	RC-3	37.0-42.0	Black SHALE	--	--	--	--	--	--	--	--	--	--	7,200	470	1.12

ATLANTIC TESTING LABORATORIES

WBE certified company

LABORATORY DETERMINATION OF MOISTURE CONTENT OF SOILS

ASTM D 2216

PROJECT INFORMATION

Client: Kiewit Intrastructure Co.
Project: Champlain Hudson Power Express
United Cable Installation
Various Locations, New York

ATL Report No.: CD10279E-14-04-22
Report Date: April 29, 2022
Date Received: April 19, 2022

TEST DATA

Boring No.	Sample No.	Depth (ft)	Moisture Content (%)
K-169.0-0.1A	S-4	6-8	10.4
	S-8	27-29	14.4
K-169.0-2.6	S-5	8-10	16.1
	S-8	24-26	26.7
	S-9	32-34	22.7
K-169.0-2.7	S-4	6-8	23.1
	S-7	19-21	29.5
	ST-1	28-30	39.3
K-169.0-4.4	S-5 [1]	8-10	5.4
	ST-1c [1]	27-29	15.8
K-169.0-4.5	S-3	4-6	10.6
	S-7 [1]	19-21	11.5
	S-8	29-31	17.7
K-169.0-6.4	S-4 [1]	6-8	6.2
	S-6 [1]	14-16	9.4
	ST-1c [1]	27-29	6.0
	S-10 [1]	39-41	22.0

Remarks

1. Sample mass was less than the minimum mass outlined in the referenced test method.

Reviewed By: _____ Date: 04/29/22

ATLANTIC TESTING LABORATORIES

WBE certified company

LABORATORY DETERMINATION OF MOISTURE CONTENT OF SOILS

ASTM D 2216

PROJECT INFORMATION

Client: Kiewit Intrastructure Co.
Project: Champlain Hudson Power Express
United Cable Installation
Various Locations, New York

ATL Report No.: CD10279E-15-04-22
Report Date: April 29, 2022
Date Received: April 26, 2022

TEST DATA

Boring No.	Sample No.	Depth (ft)	Moisture Content (%)
K-169.0-6.7	S-4 [1]	6-8	10.0
	S-7	19-21	18.7

Remarks

1. Sample mass was less than the minimum mass outlined in the referenced test method.

Reviewed By: _____ Date: 04/29/22

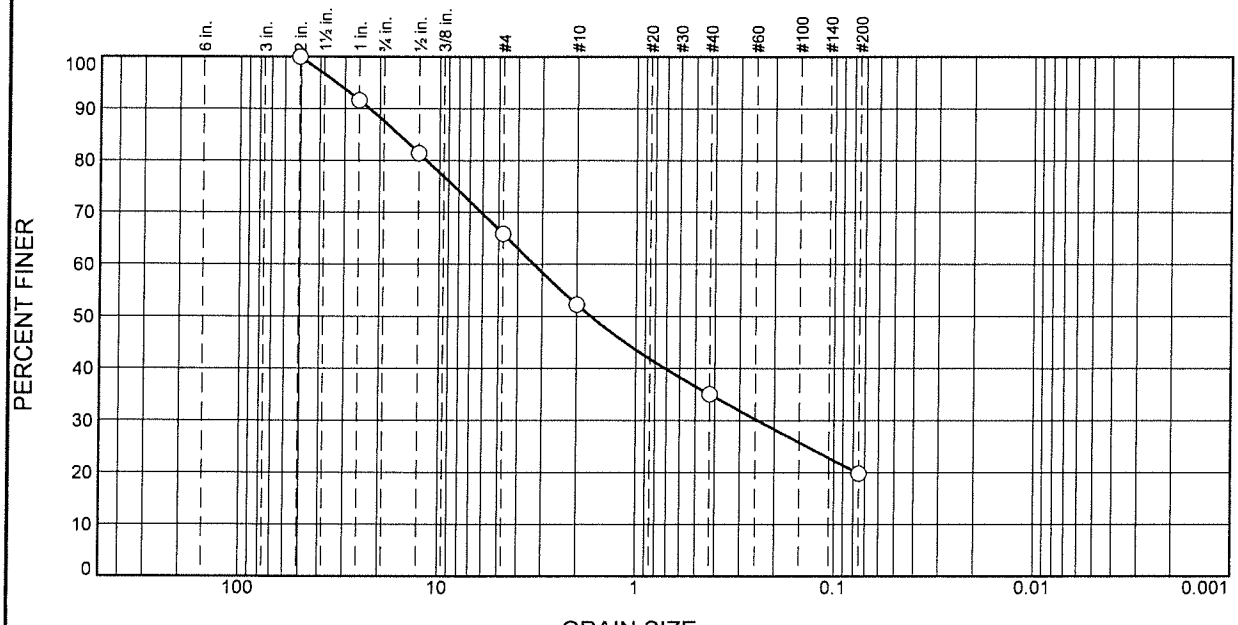
ATLANTIC TESTING LABORATORIES

Particle Size Distribution Report

Project: Champlain Hudson Power Express United Cable Install **Report No.:** CD10279E-14-04-22

Client: Kiewit Intrastructure Co. **Date:** 04/29/22

Sample No: K-169.0-6.4 **Source of Sample:** Boring Sample
Location: In-place **Elev./Depth:** 6-8'



% Cobbles	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	12	22	14	17	15	20	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	OUT OF SPEC. (X)
2"	100		
1"	92		
1/2"	81		
#4	66		
#10	52		
#40	35		
#200	20		

Soil Description

Grey cmf SAND; some cmf GRAVEL; little SILT; trace CLAY

Atterberg Limits

PL= -- LL= -- PI= --

Coefficients

D_{85}= 16.0720 D_{60}= 3.3054 D_{50}= 1.6969
D_{30}= 0.2429 D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= AASHTO=

Remarks

Moisture Content= 6.2%

* (no specification provided)

Figure

ATLANTIC TESTING LABORATORIES, LIMITED

Reviewed by: Date: 04/29/22

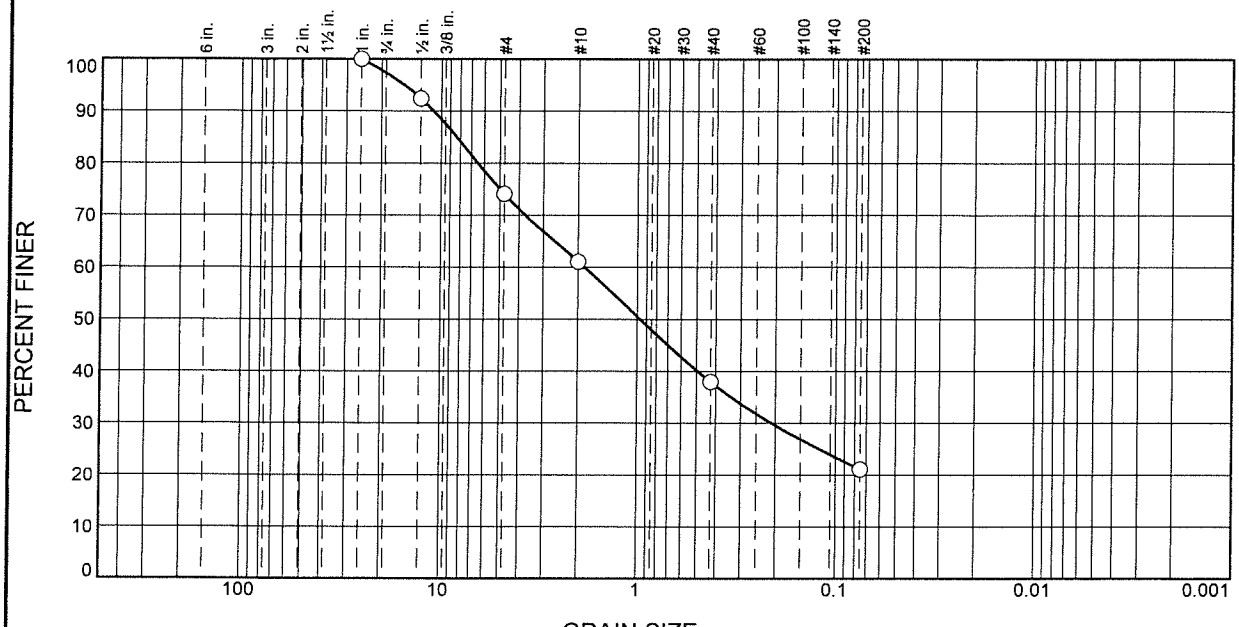
ATLANTIC TESTING LABORATORIES

Particle Size Distribution Report

Project: Champlain Hudson Power Express United Cable Install **Report No.:** CD10279E-14-04-22

Client: Kiewit Intrastructure Co. **Date:** 04/29/22

Sample No: K-169.0-6.4 **Source of Sample:** Boring Sample
Location: In-place **Elev./Depth:** 14-16'



% Cobbles	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	3	23	13	23	17	21	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	OUT OF SPEC. (X)
1"	100		
1/2"	92		
#4	74		
#10	61		
#40	38		
#200	21		

* (no specification provided)

Soil Description

Brownish Grey cmf SAND; some mf+ GRAVEL; little SILT; trace CLAY

Atterberg Limits

PL= -- LL= -- PI= --

Coefficients

D_{85}= 8.3355 D_{60}= 1.8573 D_{50}= 0.9685
D_{30}= 0.2093 D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= AASHTO=

Remarks

Moisture Content= 9.4%

Figure

ATLANTIC TESTING LABORATORIES, LIMITED

Reviewed by: Date: 04/29/22

ATLANTIC TESTING LABORATORIES

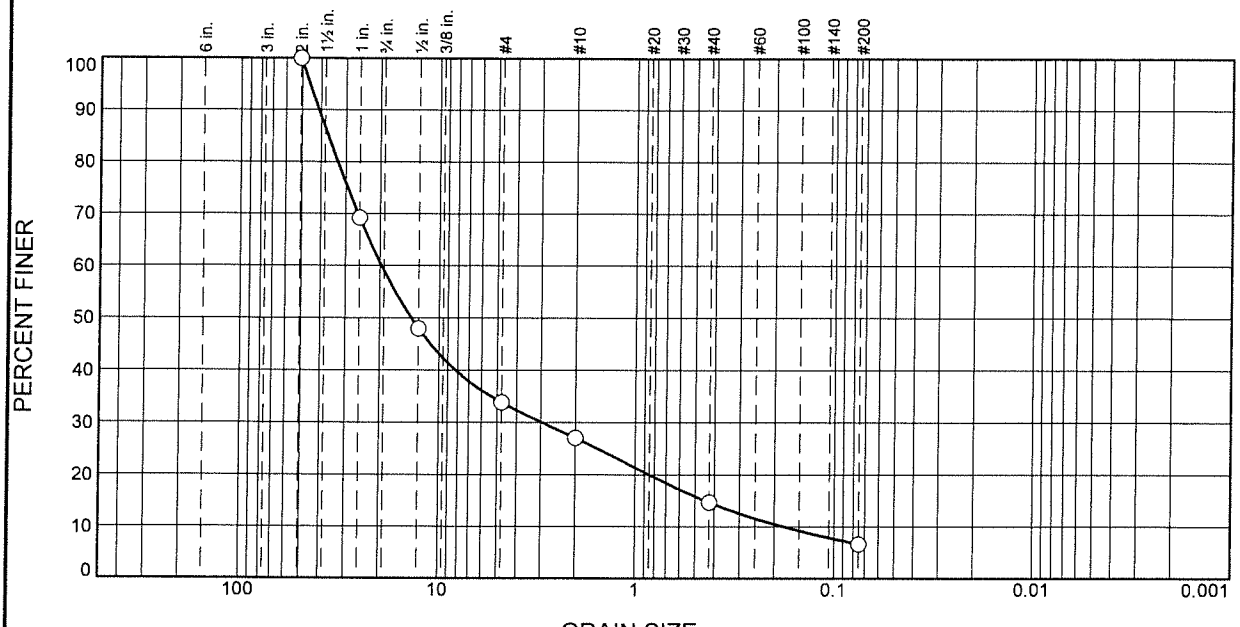
Particle Size Distribution Report

Project: Champlain Hudson Power Express United Cable Install **Report No.:** CD10279E-14-04-22

Client: Kiewit Intrastructure Co. **Date:** 04/29/22

Sample No: K-169.0-6.4 **Source of Sample:** Boring Sample

Location: In-place **Elev./Depth:** 27-29'



% Cobbles	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	41	25	7	12	8	7	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	OUT OF SPEC. (X)
2"	100		
1"	69		
1/2"	48		
#4	34		
#10	27		
#40	15		
#200	6.6		

* (no specification provided)

Soil Description

Brown cmf GRAVEL; some cmf SAND; trace SILT

Atterberg Limits

PL= -- LL= -- PI= --

Coefficients

D_{85}= 36.8321 D_{60}= 19.6407 D_{50}= 13.8422
D_{30}= 2.9581 D_{15}= 0.4450 D_{10}= 0.1793
C_u= 109.54 C_c= 2.48

Classification

USCS= AASHTO=

Remarks

Moisture Content= 6.0%

Figure

ATLANTIC TESTING LABORATORIES, LIMITED

Reviewed by: _____ Date: 04/29/22

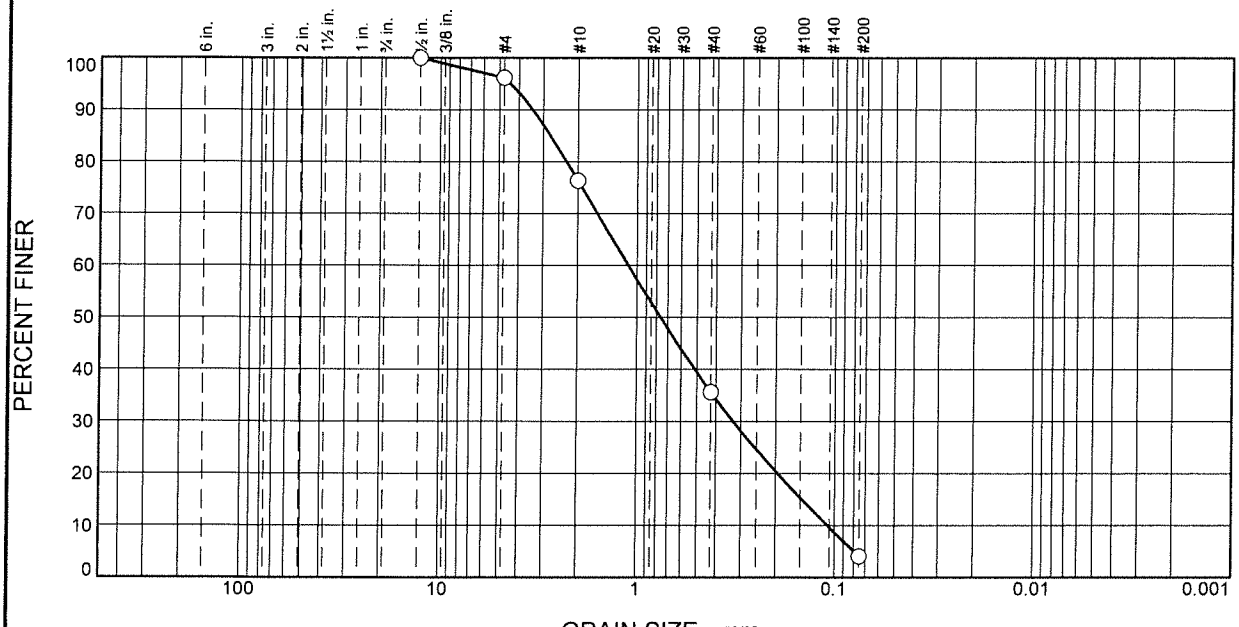
ATLANTIC TESTING LABORATORIES

Particle Size Distribution Report

Project: Champlain Hudson Power Express United Cable Install **Report No.:** CD10279E-14-04-22

Client: Kiewit Intrastructure Co. **Date:** 04/29/22

Sample No: K-169.0-6.4 **Source of Sample:** Boring Sample
Location: In-place **Elev./Depth:** 39-41'



% Cobbles	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	0	4	20	40	32	4	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	OUT OF SPEC. (X)
1/2"	100		
#4	96		
#10	76		
#40	36		
#200	4.1		

* (no specification provided)

Soil Description

Brown cmf SAND; trace f GRAVEL; trace SILT

Atterberg Limits

PL= -- LL= -- PI= --

Coefficients

D_{85}= 2.7609 D_{60}= 1.1080 D_{50}= 0.7631
D_{30}= 0.3277 D_{15}= 0.1465 D_{10}= 0.1084
C_u= 10.22 C_c= 0.89

Classification

USCS= SP AASHTO=

Remarks

Moisture Content= 22.0%

Figure

ATLANTIC TESTING LABORATORIES, LIMITED

Reviewed by: Date: 04/29/22

ATLANTIC TESTING LABORATORIES

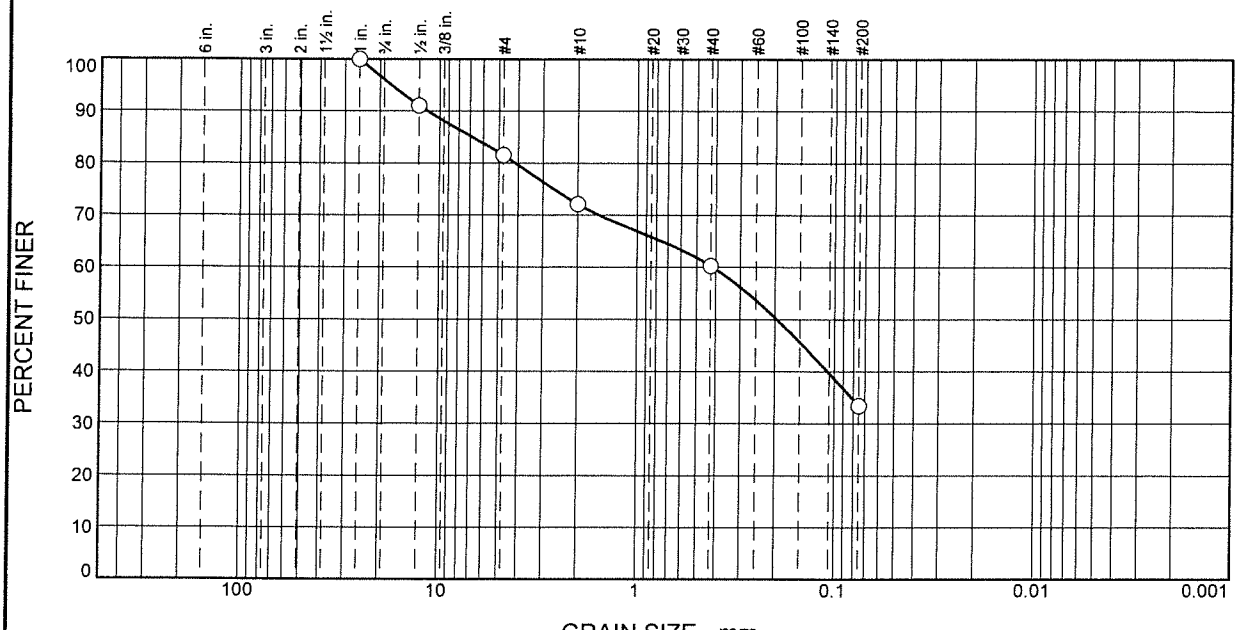
Particle Size Distribution Report

Project: Champlain Hudson Power Express United Cable Install **Report No.:** CD10279E-15-04-22

Client: Kiewit Intrastructure Co. **Date:** 04/29/22

Sample No: K-169.0-6.7 **Source of Sample:** Boring Sample

Location: In-place **Elev./Depth:** 6-8'



% Cobbles	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	4	15	9	12	27	33	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	OUT OF SPEC. (X)
1"	100		
1/2"	91		
#4	81		
#10	72		
#40	60		
#200	33		

* (no specification provided)

Soil Description

Brown cmf+ SAND; little mf GRAVEL; little SILT; little CLAY

Atterberg Limits

PL= -- LL= -- PI= --

Coefficients

D_{85}= 6.8307 D_{60}= 0.4136 D_{50}= 0.1955
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= AASHTO=

Remarks

Moisture Content= 10.0%

Figure

ATLANTIC TESTING LABORATORIES, LIMITED

Reviewed by: Date: 04/29/22

ATLANTIC TESTING LABORATORIES

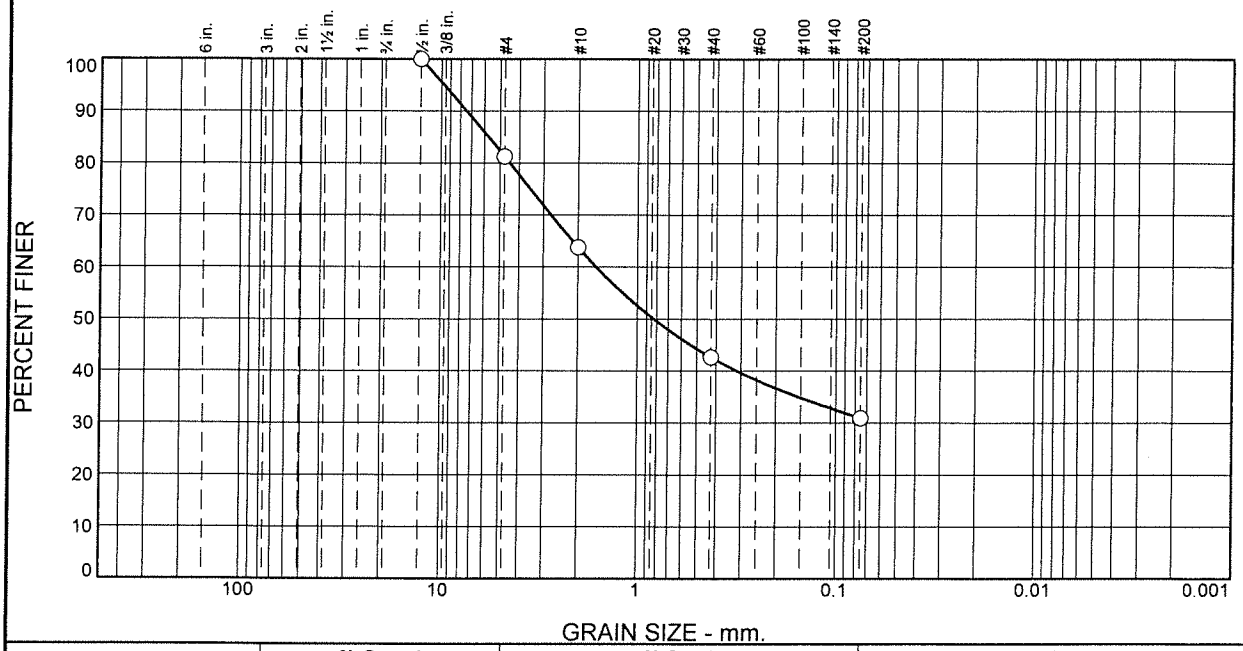
Particle Size Distribution Report

Project: Champlain Hudson Power Express United Cable Install **Report No.:** CD10279E-15-04-22

Client: Kiewit Intrastructure Co. **Date:** 04/29/22

Sample No: K-169.0-6.7 **Source of Sample:** Boring Sample

Location: **Elev./Depth:** 19-21'



% Cobbles	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	0	19	17	21	12	31	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	OUT OF SPEC. (X)
1/2"	100		
#4	81		
#10	64		
#40	43		
#200	31		

Soil Description

Grey cmf SAND; little f GRAVEL; little SILT; little CLAY

Atterberg Limits

PL= -- LL= -- PI= --

Coefficients

D_{85}= 5.7220 D_{60}= 1.6203 D_{50}= 0.8283
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= AASHTO=

Remarks

Moisture Content= 18.7%

* (no specification provided)

Figure

ATLANTIC TESTING LABORATORIES, LIMITED

Reviewed by: Date: 04/29/22

ATLANTIC TESTING LABORATORIES

WBE certified company

PROJECT INFORMATION

Client:	Kiewit Intrastructure Co.	**ATL Report No.:**	CD10279E-14-04-22
Project:	Champlain Hudson Power Express	**Report Date:**	April 29, 2022
	United Cable Installation	**Date Received:**	April 19, 2022
	Various Locations, New York		

PERCENT ORGANICS, ASH CONTENT, AND MOISTURE CONTENT

ASTM D 2974

Boring No.	Sample No.	Organics (%)	Ash (%)	Moisture (%)	Test Method	Furnace Temperature (°C)
K-169.0-0.1A	S-2	2.0	98.0	7.5	A	440
K-169.0-6.4	S-2	1.4	98.6	12.7	A	440

Reviewed By: _____ Date: 04/29/22

ATLANTIC TESTING LABORATORIES

WBE certified company

PROJECT INFORMATION

Client:	Kiewit Intrastructure Co.	**ATL Report No.:**	CD10279E-15-04-22
Project:	Champlain Hudson Power Express	**Report Date:**	May 3, 2022
	United Cable Installation	**Date Received:**	April 26, 2022
	Various Locations, New York		

UNCONFINED COMPRESSIVE STRENGTH OF INTACT ROCK CORE SPECIMENS
ASTM D 7012, Method C

Boring No.	Sample No.	Depth (ft)	Diameter (in)	Length (in)	Load Rate (lbs/sec)	Total Load (lbs)	Area (in^2)	Compressive Strength (psi)
K-169.0-6.7	R4	39.8-40.1	1.99	4.04	300	22,390	3.11	7,200

Failure Pictures
K-169.0-6.7, R4, 39.8 - 40.1'

Reviewed By: _____ Date: May 3, 2022

CERCHAR Abrasiveness
ASTM D7625

CLIENT	Atlantic Testing Labs LTD	JOB NO.	2161-016
PROJECT	Champlain Hudson Power Express	LOCATION	--
PROJECT NO.	CD10279		

BORING NO.	
DEPTH	41.0
SAMPLE NO.	K-169.0-6.7
DATE SAMPLED	
DATE TESTED	05/06/22
TECHNICIAN	HN
ROCK TYPE	

Surface Type:	Saw Cut
Moisture Condition	As Received
Reading A.1 (in):	0.00189
Reading A.2 (in):	0.00323
Reading A.3 (in):	0.00315
Reading A.4 (in):	0.00228
Reading A.5 (in):	0.00228
Reading B.1 (in):	0.00199
Reading B.2 (in):	0.00394
Reading B.3 (in):	0.00268
Reading B.4 (in):	0.00197
Reading B.5 (in):	0.00189
Average Reading (in):	0.00253
Average Reading (mm):	0.0643
Uncorrected CAI or CAI_s:	**0.64**
Corrected CAI:	**1.12**

NOTES

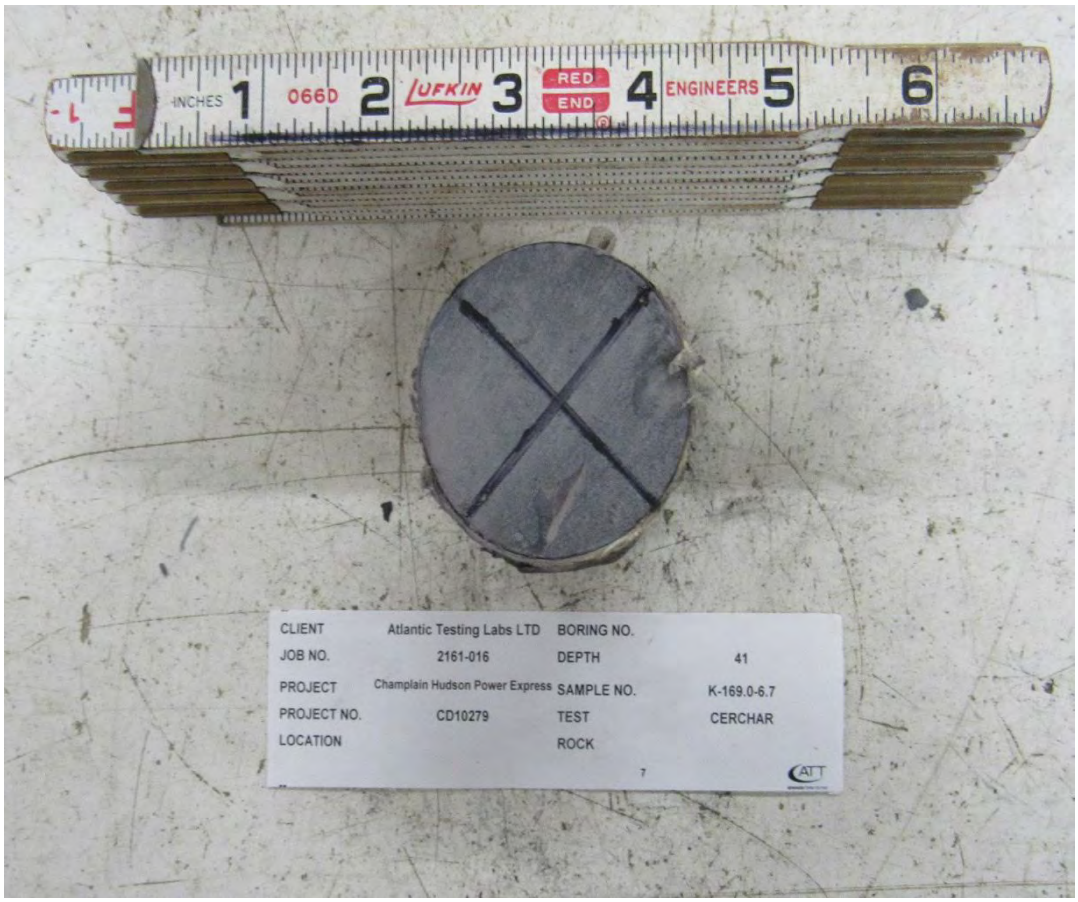
CAI_s is the CAI calculated on saw cut specimens.
Corrected CAI for saw cut specimens based on R. Plinger and H. Kasling
Suggested formula CAI = 0.99*CAIs + 0.48.
Applied pins had a Rockwell Hardness of 54-56.
* Test surface area was broken.

Data entry by:	HN	Date:	05/06/22
Checked by:	DL	Date:	05/06/22
File name:	2161016__CHERCHAR ASTM D7625_1.xlsm		

CHERCHAR Abrasiveness
ASTM D7625

CLIENT	Atlantic Testing Labs LTD	BORING NO.	--
JOB NO.	2161-016	DEPTH	41.0
PROJECT	Champlain Hudson Power Express	SAMPLE NO.	K-169.0-6.7
PROJECT NO.	CD10279	DATE SAMPLED	--
LOCATION	--	DATE TESTED	05/06/22
		TECHNICIAN	HN
		ROCK TYPE	--

Before Picture



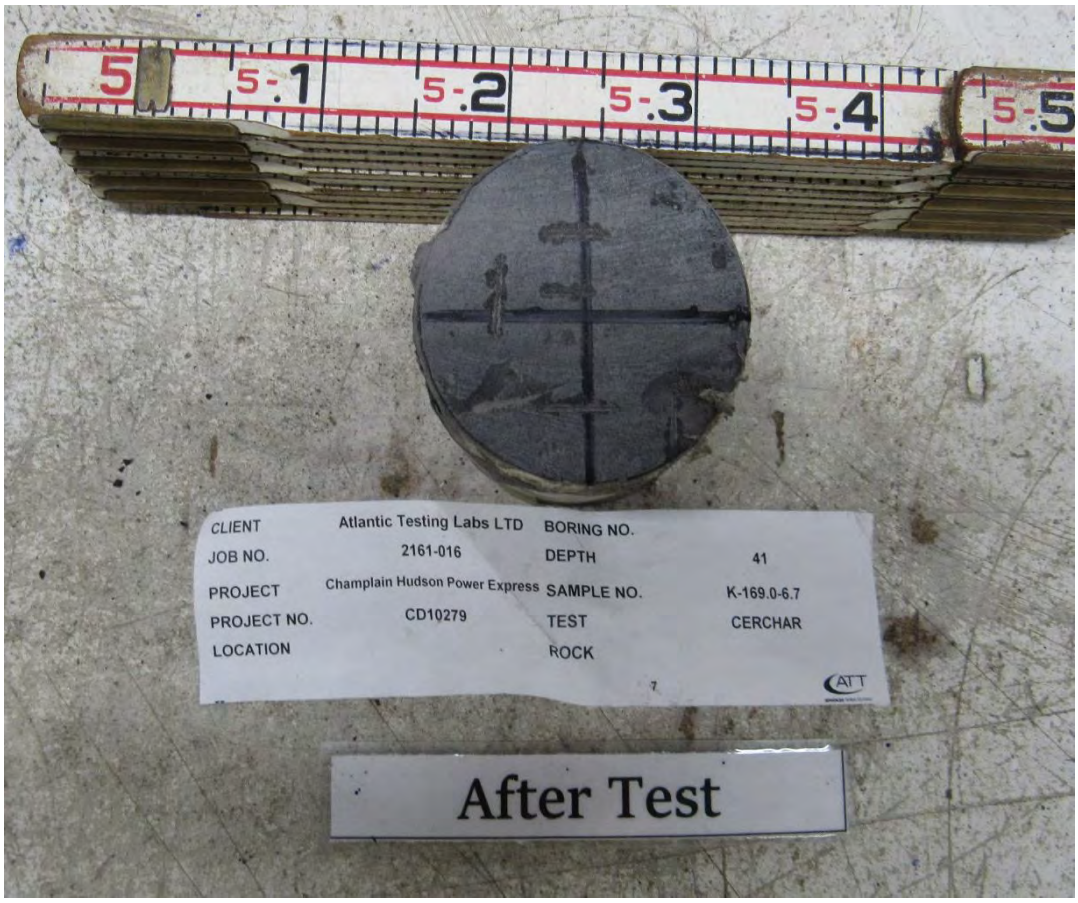
NOTES	* Test surface area was broken.

Picture File: 7.JPG
File name: 2161016__CHERCHAR ASTM D7625_1.xlsm

CHERCHAR Abrasiveness
ASTM D7625

CLIENT	Atlantic Testing Labs LTD	BORING NO.	--
JOB NO.	2161-016	DEPTH	41.0
PROJECT	Champlain Hudson Power Express	SAMPLE NO.	K-169.0-6.7
PROJECT NO.	CD10279	DATE SAMPLED	--
LOCATION	--	DATE TESTED	05/06/22
		TECHNICIAN	HN
		ROCK TYPE	--

After Picture



NOTES	* Test surface area was broken.

Picture File: 7a.JPG
File name: 2161016__CHERCHAR ASTM D7625_1.xlsm

ADVANCED TERRA TESTING

Splitting Tensile Strength
ASTM D3967

CLIENT	Atlantic Testing Labs LTD	JOB NO.	2161-016
PROJECT	Champlain Hudson Power Express	LOCATION	--
PROJECT NO.	CD10279		

BORING NO.	
DEPTH	41
SAMPLE NO.	K-169.0-6.7
DATE SAMPLED	
DATE TESTED	05/03/22
TECHNICIAN	DL
ROCK TYPE	
Diameter (in):	1.982
Height (in):	1.106
Mass of Wet Rock (g):	147.80
Wet Density (lbs/ft³):	165.0
Wet Density (g/cm³):	2.643
Peak Load (lbs):	1619
Splitting Tensile Strength (psi):	470
Splitting Tensile Strength (kPa):	3241
Failure Type:	Single Plane
NOTES	

Data entry by:	DL	Date:	05/03/22
Checked by:	HN	Date:	05/05/22
File name:	2161016__Brazilian ASTM D3967_0.xlsm		

ADVANCED TERRA TESTING

Splitting Tensile
ASTM D3967

CLIENT	Atlantic Testing Labs LTD	BORING NO.	
JOB NO.	2161-016	DEPTH	41
PROJECT	Champlain Hudson Power Express	SAMPLE NO.	K-169.0-6.7
PROJECT NO.	CD10279	DATE SAMPLED	
LOCATION	--	DATE TESTED	05/03/22
		TECHNICIAN	DL
		ROCK TYPE	

Before Picture

NOTES

Picture File: 7.JPG
File name: 2161016__Brazilian ASTM D3967_0.xlsm

ADVANCED TERRA TESTING

Splitting Tensile
ASTM D3967

CLIENT	Atlantic Testing Labs LTD	BORING NO.	
JOB NO.	2161-016	DEPTH	41
PROJECT	Champlain Hudson Power Express	SAMPLE NO.	K-169.0-6.7
PROJECT NO.	CD10279	DATE SAMPLED	
LOCATION	--	DATE TESTED	05/03/22
		TECHNICIAN	DL
		ROCK TYPE	

After Picture

NOTES

Picture File: 7a.JPG
File name: 2161016__Brazilian ASTM D3967_0.xlsm

6.6
6.7
890
6.8
6.9
K-169.0-6.9
890
Mohawk River
7
7.1
N
Google Earth
1000 ft

BORING LOG NO. K-169.0-6.9

PROJECT: Champlain-Hudson Power Express Package 4b

CLIENT: Kiewit Engineering (NY) Corp
Lone Tree, CO

SITE: Champlain to Hudson HDD Crossings
Schenectady, NY

LOCATION See Exploration Plan

Latitude: 42.8380° Longitude: -74.0032°

Surface Elev.: 340.32 (Ft.)

DEPTH	ELEVATION (Ft.)	Description
		FILL - SILTY SAND WITH GRAVEL, black, loose to medium dense
6.0	334.5	
		SILTY SAND WITH GRAVEL (SM), brown, loose
8.0	332.5	
		SILTY GRAVEL WITH SAND (GM), brown, loose
12.0	328.5	
		WEATHERED ROCK, gray
15.0	325.5	
		SHALE, moderately weathered, very close fractured, very poor RQD, gray
20.0	320.5	
		SHALE, moderately weathered, very close fractured, very poor RQD, gray
25.0	315.5	
		SHALE, moderately weathered, very close to close fractured, very poor RQD, gray

DEPTH (Ft.)	RECOVERY (In.)	FIELD TEST RESULTS	WATER CONTENT (%)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
	10	5-5-5-4 N=10			
	0	3-2-3-3 N=5			
5	0	2-3-3-5 N=6	9.2		14
	6	2-3-4-3 N=7			
	10	2-3-3-2 N=6	12.1		15
10	13	2-3-6-12 N=9			
15		REC = 91% RQD = 0%			
20		REC = 100% RQD = 0%			
25		REC = 100% RQD = 0%			

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
3 1/4 HSA

Abandonment Method:
Boring backfilled with bentonite grout upon completion

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevations provided by Kiewit

Notes:

Logged by CS
Hammer Efficiency Summary:
Energy Transfer Ratio: 77.4% +/-2.7%
Hammer Efficiency Correction (CE):1.29

WATER LEVEL OBSERVATIONS

No measurable groundwater prior to grouting

Terracon
30 Corporate Cir Ste 201
Albany, NY

Boring Started: 05-04-2022
Boring Completed: 05-04-2022
Drill Rig: CME 550x
Driller: S. Kahn
Project No.: JB215256F

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL JB215256F CHAMPLAIN-HUDSON .GPJ TERRACON_DATATEMPLATE.GDT 6/22/22

BORING LOG NO. K-169.0-6.9

PROJECT: Champlain-Hudson Power Express Package 4b

CLIENT: Kiewit Engineering (NY) Corp
Lone Tree, CO

SITE: Champlain to Hudson HDD Crossings
Schenectady, NY

LOCATION See Exploration Plan

Latitude: 42.8380° Longitude: -74.0032°

Surface Elev.: 340.32 (Ft.)

DEPTH	ELEVATION (Ft.)	Description	DEPTH (Ft.)	FIELD TEST RESULTS
		SHALE, moderately weathered, very close to close fractured, very poor RQD, gray *(continued)*		
30.0	310.5	**SHALE**, slightly weathered, very close to close fractured, very poor RQD, gray	30	REC = 100% RQD = 7%
35.0	305.5	**SHALE**, unweathered, close fractured, good RQD, gray	35	REC = 100% RQD = 88%
40.0	300.5	**SHALE**, unweathered, moderate fractured, good RQD, gray	40	REC = 100% RQD = 78%
45.0	295.5	**SHALE**, unweathered, moderate fractured, excellent RQD, gray	45	REC = 100% RQD = 97%
50.0	290.5	***Boring Terminated at 50 Feet***	50	

GRAPHIC LOG | WATER LEVEL OBSERVATIONS | SAMPLE TYPE | RECOVERY (In.) | WATER CONTENT (%) | ATTERBERG LIMITS LL-PL-PI | PERCENT FINES

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
3 1/4 HSA

Abandonment Method:
Boring backfilled with bentonite grout upon completion

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevations provided by Kiewit

Notes:

Logged by CS
Hammer Efficiency Summary:
Energy Transfer Ratio: 77.4% +/-2.7%
Hammer Efficiency Correction (CE):1.29

WATER LEVEL OBSERVATIONS

No measurable groundwater prior to grouting

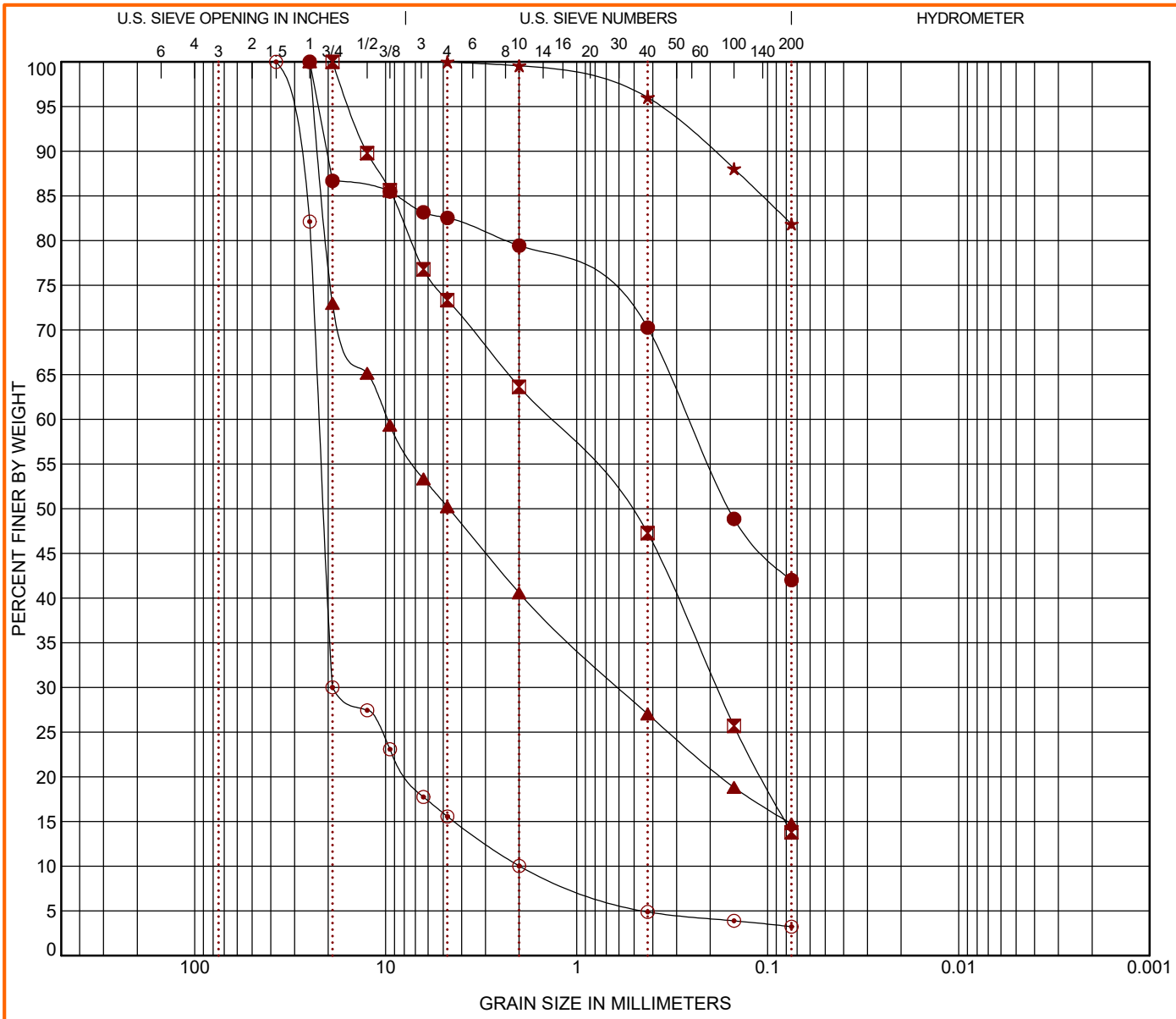
Terracon
30 Corporate Cir Ste 201
Albany, NY

Boring Started: 05-04-2022	Boring Completed: 05-04-2022
Drill Rig: CME 550x	Driller: S. Kahn
Project No.: JB215256F	

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL JB215256F CHAMPLAIN-HUDSON .GPJ TERRACON_DATATEMPLATE.GDT 6/22/22

GRAIN SIZE DISTRIBUTION

ASTM D422 / ASTM C136



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Boring ID	Depth (Ft)	USCS Classification	WC (%)	LL	PL	PI	Cc	Cu
●	K-121.0	6 - 8	SILTY SAND with GRAVEL (SM)	20.3					
⊠	K-169.0-6.9	4 - 6	SILTY SAND with GRAVEL (SM)	9.2					
▲	K-169.0-6.9	8 - 10	SILTY GRAVEL with SAND (GM)	12.1					
★	K-169.0-7.4	4 - 6	LEAN CLAY with SAND (CL)	26.3	34	22	12		
⊙	K-169.0-8.5	15 - 17	POORLY GRADED GRAVEL (GP)	13.5				8.14	11.21

	Boring ID	Depth (Ft)	D_{100}	D_{60}	D_{30}	D_{10}	%Cobbles	%Gravel	%Sand	%Silt	%Fines	%Clay
●	K-121.0	6 - 8	25	0.258			0.0	17.5	40.5		42.0	
⊠	K-169.0-6.9	4 - 6	19	1.418	0.185		0.0	26.7	59.5		13.8	
▲	K-169.0-6.9	8 - 10	25	9.802	0.597		0.0	49.8	35.5		14.7	
★	K-169.0-7.4	4 - 6	4.75				0.0	0.0	18.1		81.9	
⊙	K-169.0-8.5	15 - 17	37.5	22.25	18.959	1.984	0.0	84.4	12.3		3.2	

PROJECT: Champlain-Hudson Power Express Package 4b

SITE: Champlain to Hudson HDD Crossings Schenectady, NY

Terracon
30 Corporate Cir Ste 201
Albany, NY

PROJECT NUMBER: JB215256F

CLIENT: Kiewit Engineering (NY) Corp Lone Tree, CO

LABORATORY TESTS ARE NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GRAIN SIZE: USCS-2 JB215256F CHAMPLAIN-HUDSON .GPJ TERRACON_DATATEMPLATE.GDT 6/16/22

K-169.0-6.9 - Run 1

K-169.0-6.9 - Runs 2-5