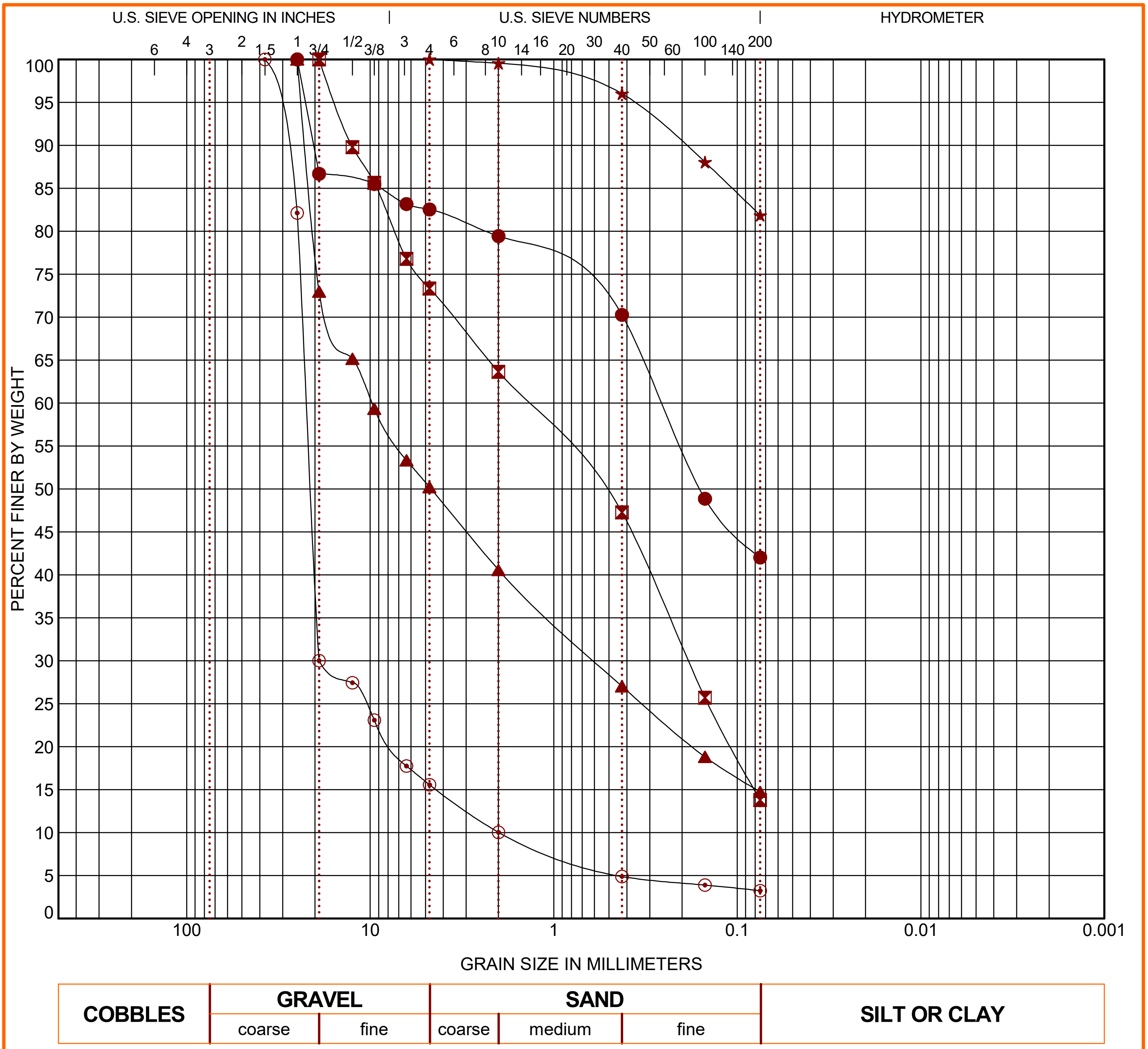
GRAIN SIZE DISTRIBUTION

ASTM D422 / ASTM C136



Boring ID	Depth (Ft)	USCS Classification	WC (%)	LL	PL	PI	Cc	Cu
● K-121.0	6 - 8	SILTY SAND with GRAVEL (SM)	20.3					

[redacted]

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	

[redacted]

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

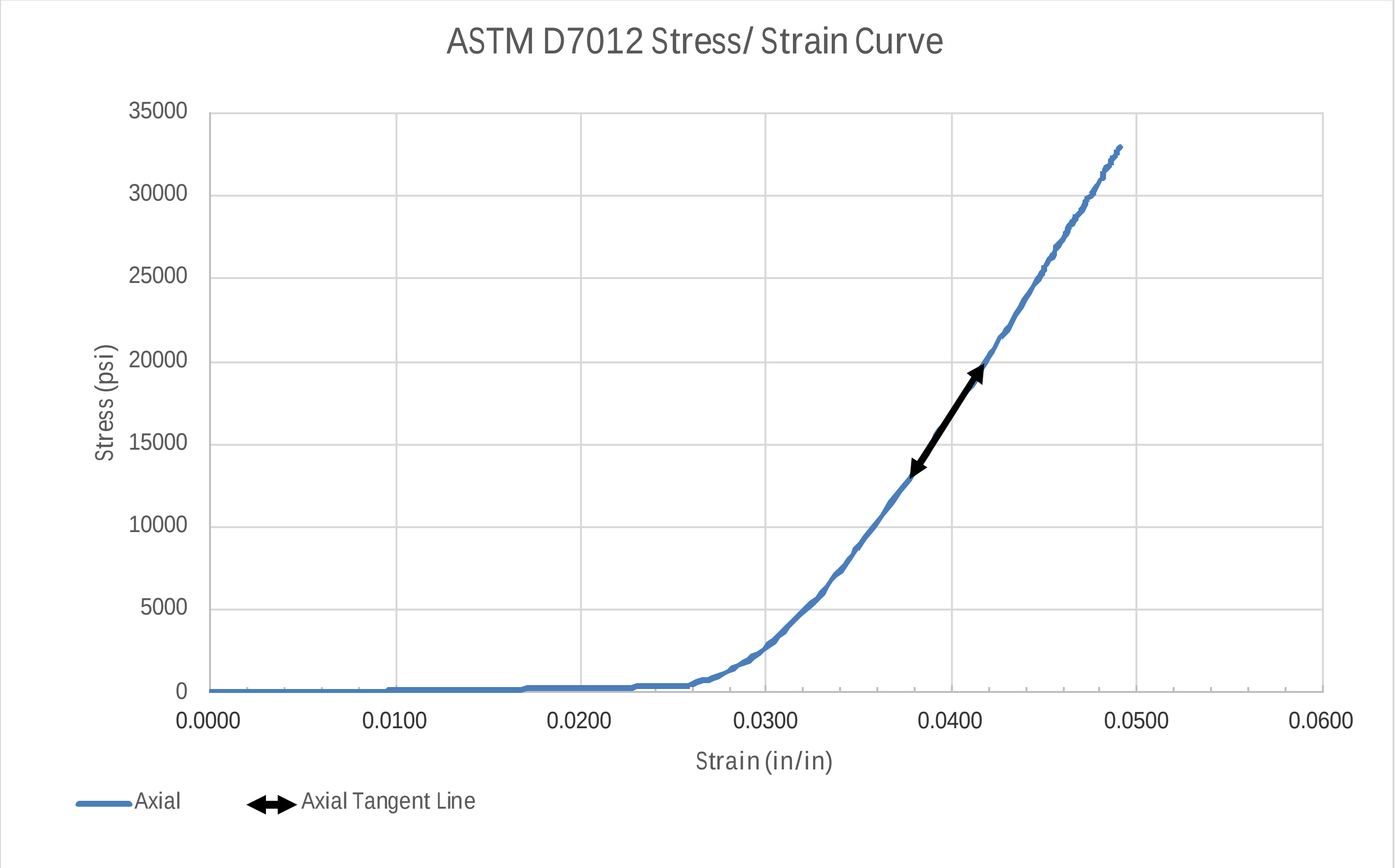
CLIENT: Kiewit Engineering (NY) Corp
Lone Tree, CO

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

Rock Core D7012 Method C

Client	**Project**
Kiewit Engineering Corp	Champlain-Hudson Power Express Project

Project No. JB215256



SAMPLE LOCATION

Site:	Kiewit Engineering Corp.		
Description:	Quartzite		
Boring:	K-121.0	Depth (feet):	25.0-30.0

SPECIMEN INFORMATION

Sample No.:	Lab: 5067	Mass (g):	553.55
Length (in.):	4.19	Diameter (in.):	1.99
L/D Ratio:	2.106	Density (pcf):	161.817

TEST RESULTS

Failure Load (lbs):	102374
Failure Strain (in/in):	0.056
Unconfined Compressive Strength (psi):	32,915
Elastic Modulus, E, (ksi):	1720
Time of Failure (min):	04:33
Rate of Loading (in/sec):	0.04
Moisture Content Post-break:	0.11%

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.

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	K-121.0	**Material Description**	Quartzite
Sample No		**Equipment Used**	Tinius Olsen (120,000lbs)
Depth (ft)	25-30	**TICCS ID/Serial No.**	C-48999, 118285
Lab No	5067	**Calibration Date**	11/2/2021

	TENSILE STRENGTH				
Lab No.	1	2	3	4	5
Diameter (in)	1.99	1.99	1.99	1.99	1.99
Length (in)	0.7	0.67	0.69	0.7	0.7
Length Diameter Ratio	0.35	0.34	0.35	0.35	0.35
Rate of Loading	0.007	0.0067	0.0069	0.007	0.007
Moisture Condition	0.16%	0.16%	0.16%	0.16%	0.16%
Maximum Applied Load (lbf)	8511	6925	4867	4442	4925
Splitting Tensile Strength (psi)	3891.6	3308.2	2257.7	2031.1	2251.9

	TENSILE STRENGTH				
Lab No.	6	7	8	9	10
Diameter (in)	1.99	1.99	1.99	1.99	1.99
Length (in)	0.68	0.57	0.6	0.57	0.63
Length Diameter Ratio	0.34	0.29	0.30	0.29	0.32
Rate of Loading	0.0052	0.0057	0.006	0.0057	0.0063
Moisture Condition	0.16%	0.16%	0.16%	0.16%	0.16%
Maximum Applied Load (lbf)	4000	5701	3764	3143	5994
Splitting Tensile Strength (psi)	1882.8	3201.3	2007.9	1764.9	3045.3

GeoTesting
EXPRESS

Client: Terracon Consultants, Inc.
Project: Champlain-Hudson Power Express
Location:
Project No: GTX-315284

Boring ID: K-121
Sample ID: ---
Depth : 25-30 ft
Sample Type: cylinder
Test Date: 06/17/22
Test Id: 670473
Tested By: tlm
Checked By: smd

Test Comment: ---
Visual Description: ---
Sample Comment: ---

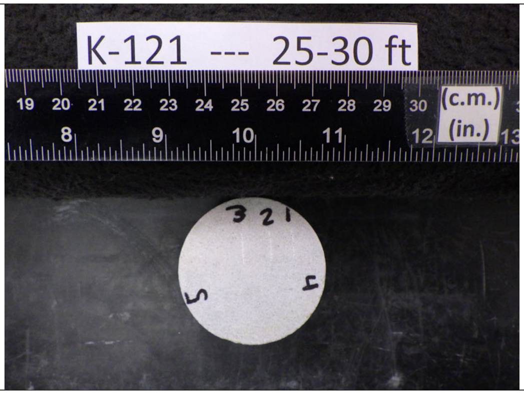
Abrasiveness of Rock Using the Cerchar Method
by ASTM D7625

Boring ID	Sample ID	Depth	Stylus No	Reading 1	Reading 2	Average	Comments
K-121	---	25-30 ft	1	4.9	4.2	4.55	
			2	2.5	2.7	2.60	
			3	5.3	4.6	4.95	
			4	5.9	5.6	5.75	
			5	5.7	7.3	6.50	
			Average CAIs			4.87	
			Average CAI *			5.30	

CERCHAR Abrasiveness Index Classification **Extreme 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:



Client

Kiewit Engineering (NY) Corp
Lone Tree, CO

Project

Champlain-Hudson Power Express Project
JB215256

Date Received: 5/31/2022

Results from Corrosion Testing

Sample Location	K-121.0
Sample Depth (ft.)	2'-6'
pH Analysis, ASTM G 51	7.89
Water Soluble Sulfate (SO4), ASTM C 1580 (ppm)	15
Sulfides, AWWA 4500-S D, (mg/kg)	Nil
Chlorides, ASTM D 512, (ppm)	146
Red-Ox, ASTM G 200, (mV)	+444
Total Salts, AWWA 2520 B, (mg/kg)	182
Resistivity (Saturated), ASTM G 57, (ohm-cm)	4960

Analyzed By: Kyle Lemcke
Laboratory Supervisor

Kiewit

MEMORANDUM

DATE: September 23, 2022

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 3 – Package 2 - HDD Crossing 12.A – Revision 1
Champlain Hudson Power Express Project
Fort Ann, 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 north of Fort Ann, New York. The approximate station for the start of HDD crossing Number 12.A is STA 20199+00 (43.4313° N, 73.4624° 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, Champlain Hudson Power Express, dated May 28, 2021.

Contact us if you have questions or require additional information.

HDD 12.A
Boring WFE-9B
Segment 3 - Design Package 2

CHPE Segment 3 - Package 2
HDD Soil Boring Coordinates and Elevations

Firm	Boring	Northing (feet)	Easting (feet)	Ground Surface Elevation (feet)
TRC*	B122.4-1	1673988.1	762589.1	134.0
	B123.1-1	1670533.1	761581.7	134.0
	B127.6-1	1650236.9	759369.7	143.0
	B130.8-1	1633732.2	749229.1	144.0
	B131.5-1	1630565.5	746543.8	148.0
AECOM**	WFE-2	1693039.7	776227.9	125.9
	WFE-6	1683884.0	771830.6	128.7
	WFE-6A	1683645.5	771707.7	129.0
	WFE-7	1683295.0	771591.2	128.7
	WFE-9	1677994.3	769427.4	133.9
	WFE-9A	1678043.5	769246.8	140.2
	WFE-9B	1676842.4	767745.7	141.7
	WFE-12	1657680.6	760822.6	135.3
	WFE-16	1645866.1	757602.8	145.2
	WFE-18	1637293.5	752138.0	143.6
	WFE-18A	1630756.2	746790.9	144.9
	WFE-19	1628651.1	745226.2	139.1
	WFE-19A	1625848.4	743218.4	139.0

Notes:

- Northings and Eastings are provided in NAD83 New York State Plane East Zone.
- Elevations are referenced to the NAVD88 datum.

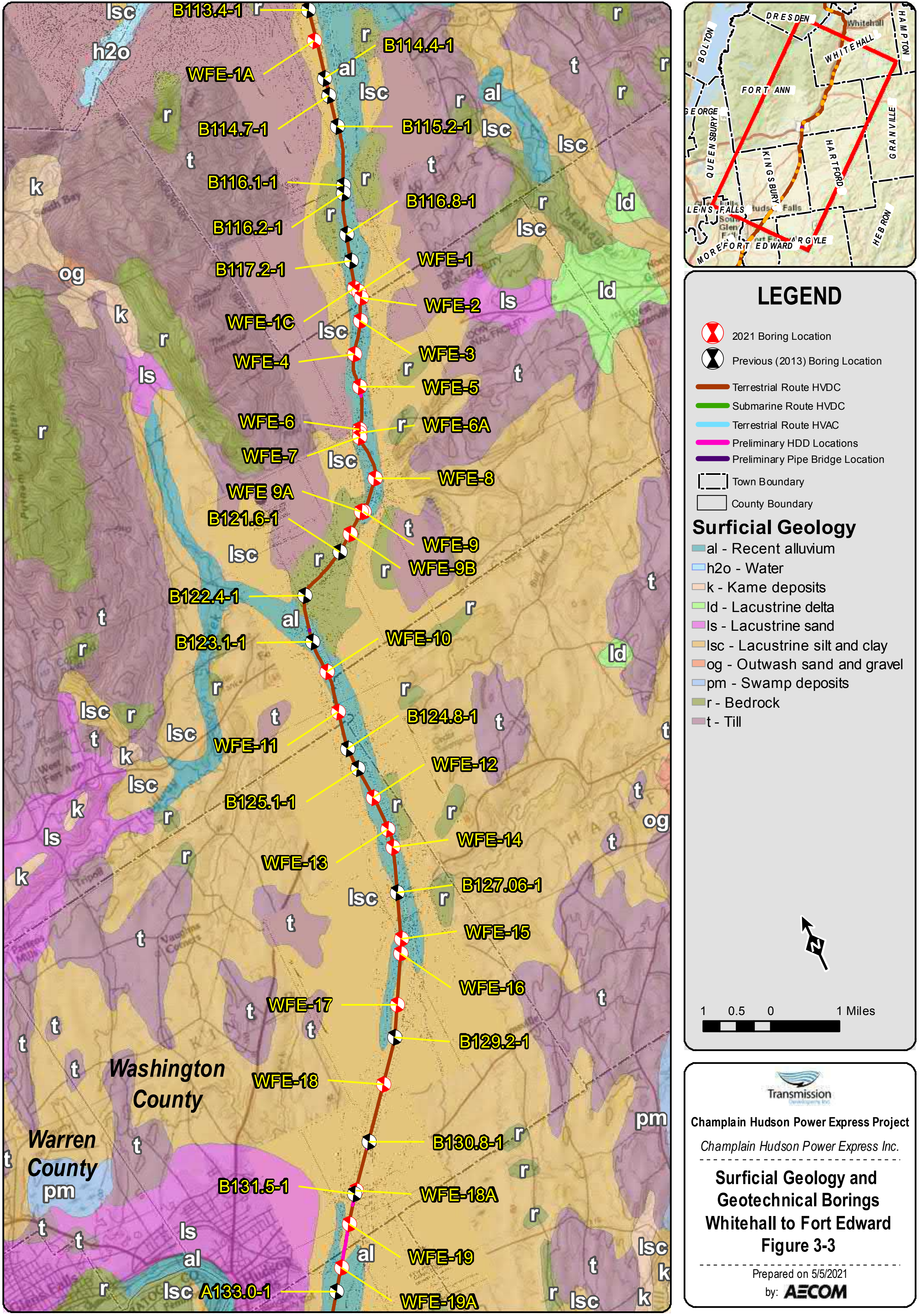
* TRC boring coordinates as shown in Table 1-6 in AECOM report (reference below). Boring elevations estimated from November 2021 topographic survey by Williams Aerial.

** AECOM boring coordinates and elevations as shown in Table 1-6 in AECOM report.

*** 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
- h2o - Water
- k - Kame deposits
- ld - Lacustrine delta
- ls - Lacustrine sand
- lsc - Lacustrine silt and clay
- og - Outwash sand and gravel
- pm - Swamp deposits
- r - Bedrock
- t - Till

Transmission Developers Inc.

Champlain Hudson Power Express Project

Champlain Hudson Power Express Inc.

Surficial Geology and Geotechnical Borings Whitehall to Fort Edward
Figure 3-3

Prepared on 5/5/2021
by: AECOM

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

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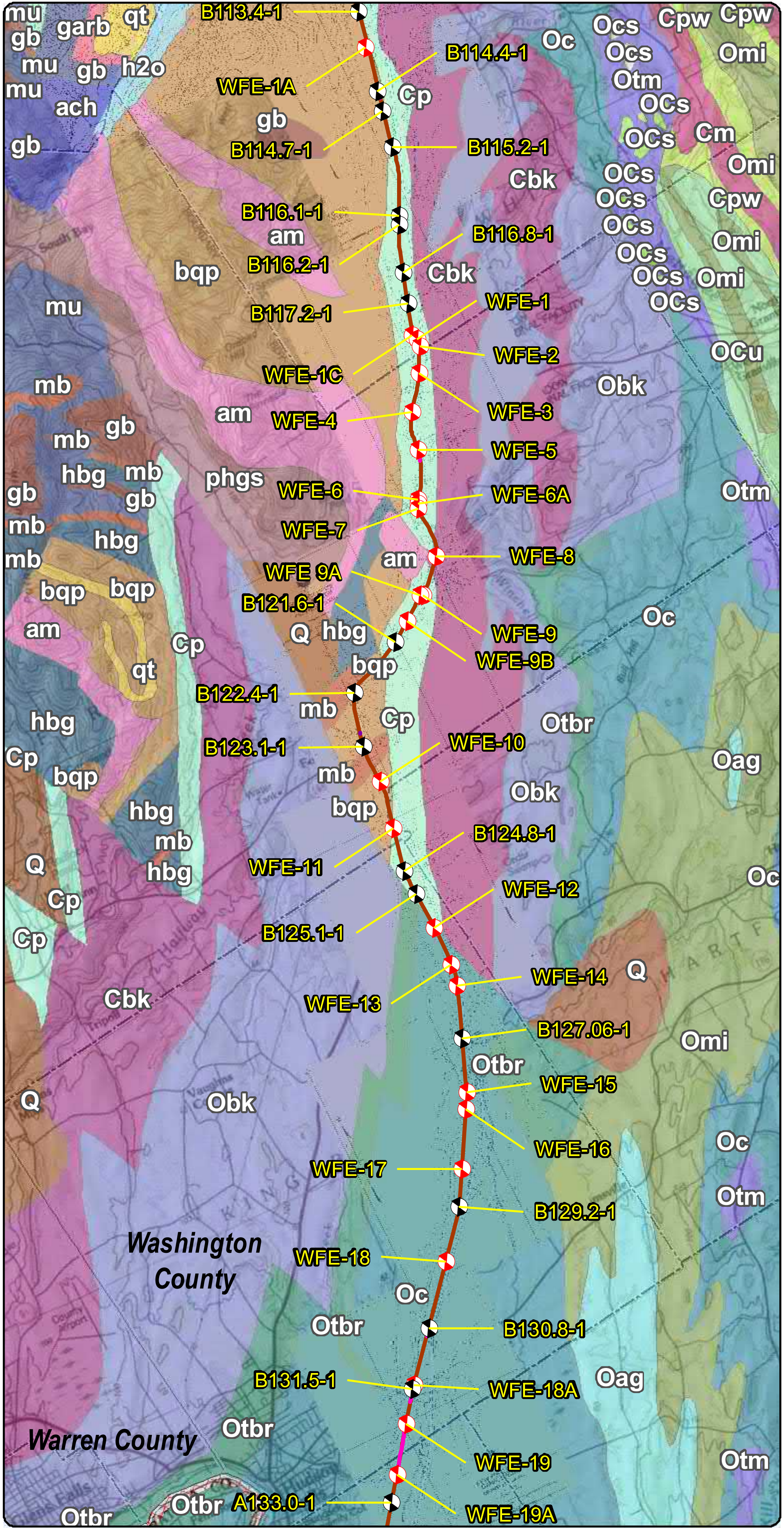

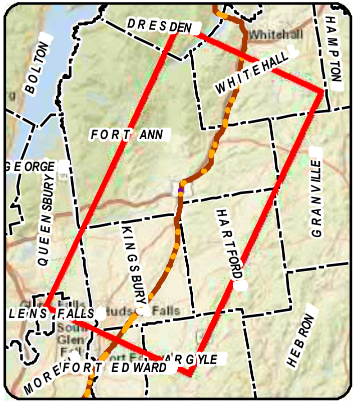

LEGEND

- 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

- Cbk - Beekmantown Group
- Cm - Mettawee Formation
- Cp - Potsdam Sandstone
- Cpw - Poultney Formation ("A" Member)
- No Label
- OCs - Cambrian-Middle Ordovician carbonate
- OCu - Undivided Ordovician and Cambrian
- Oag - Austin Glen Formation
- Obk - Beekmantown Group
- Oc - Canajoharie Shale
- Omi - Mount Merino Formation
- Op - Poultney Formation ("B" and "C")
- Otbr - Dolgeville Formation
- Otm - Taconic Melange
- Q - Glacial and Alluvial Deposits
- ach - metanorthosite and anorthositic
- am - Amphibolite, pyroxenic amphibolite
- bqp - Biotite-quartz-plagioclase
- garb - Quartz-feldspar paragneiss
- gb - Olivine metagabbro
- h2o - Water
- hbg - Biotite and or hornblende granite gneiss
- mb Calcitic and dolomitic marble
- mu - Undivided metased rock and migmatite
- phgs - Charnockite, granitic, quartz syenite
- qt - Quartzite

N

1 0.5 0 1 Miles

Transmission Developers Inc.

Champlain Hudson Power Express Project

Champlain Hudson Power Express Inc.

Bedrock Geology and Geotechnical Borings Whitehall to Fort Edward Figure 4-3

Prepared on 5/5/2021
by: AECOM

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

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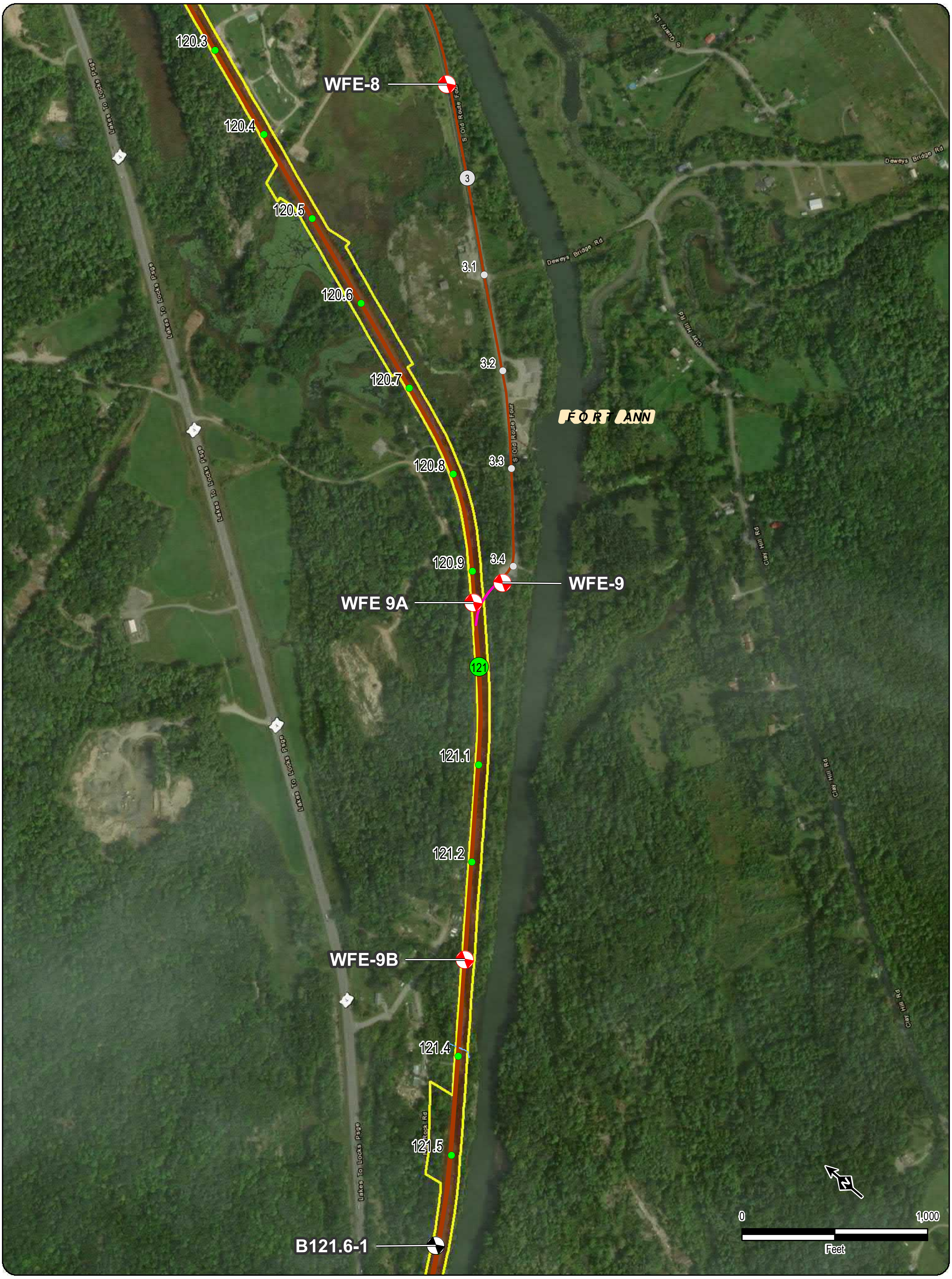

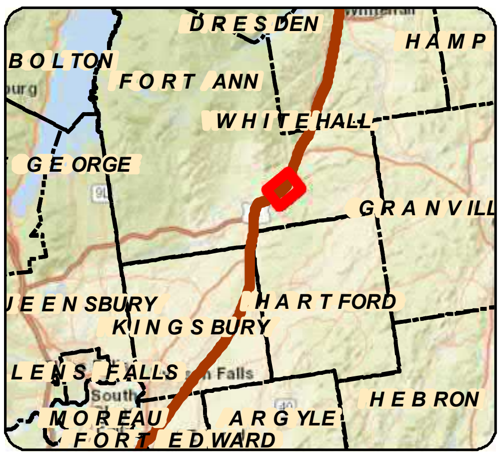

LEGEND

- ● Certified Milepost - Tenths
- ● Certified Milepost
- ○ Preferred Alternative Milepost - Tenths
- ○ 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

Whitehall to Fort Edward

Figure A-3

Sheet 7 of 16

Prepared by: AECOM

5/19/2021

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

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BORING CONTRACTOR: ADT	AECOM	SHEET 1 OF 1
		PROJECT NAME: CHPE -
DRILLER: Chris Chaillou		PROJECT NO.: 60323056
		HOLE NO.: **WFE-9B**
SOILS ENGINEER/GEOLOGIST: Chris French		START DATE: 1/5/21
	BORING LOG	FINISH DATE: 1/5/21
LOCATION: MP - 121.3 (CP Rail)		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		NQ	BORING TYPE: Core
	SIZE I.D.	4"	2.5"		1 7/8"	BORING O.D.: 3"
	SIZE O.D.	4.5"	3"		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)	SAMPLE 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'-1'				Hand Cleared				Black fine-coarse SAND, some angular gravel, little silt, loose, moist-wet
1.0										
	3.8	1'-2.2'	R-1	14"	13.5"	RQD: 4" = 28.6%				Gray and purple sandstone, fine grained, light-moderate weathering, moderate mechanical jointing, 1 fracture with oxidation staining at 25°
2.0										
	4.2	2.2'-6'	R-2	46"	40"	RQD: 34" = 74%				
3.0										Sandstone, Light mechanical jointing
4.0										
5.0										
										TR-1; (5.35'-6.0')
6.0										
	4.6	6'-11'	R-3	60"	53"	RQD: 38.5" = 64%				SAA, Moderate jointing (mechanical), moderately weathered section from 9.0'-9.5'
7.0										
8.0									Sandstone	TR-2; (7.85'-8.35')
9.0										
10.0										
11.0										
	5.5	11.0'-16.1'	R-4	61.5"	61.5"	RQD: 53.5" = 87%				SAA, Light mechanical jointing
12.0										
13.0										TR-3; (13.0'-13.7')
14.0										
15.0										
16.0										
										WFE-9B complete, terminated at 16.1'. Grouted to surface.
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%

Aquifer
CHPE - Whitehall-Ft. Edward Borings
SUMMARY OF ROCK TESTING

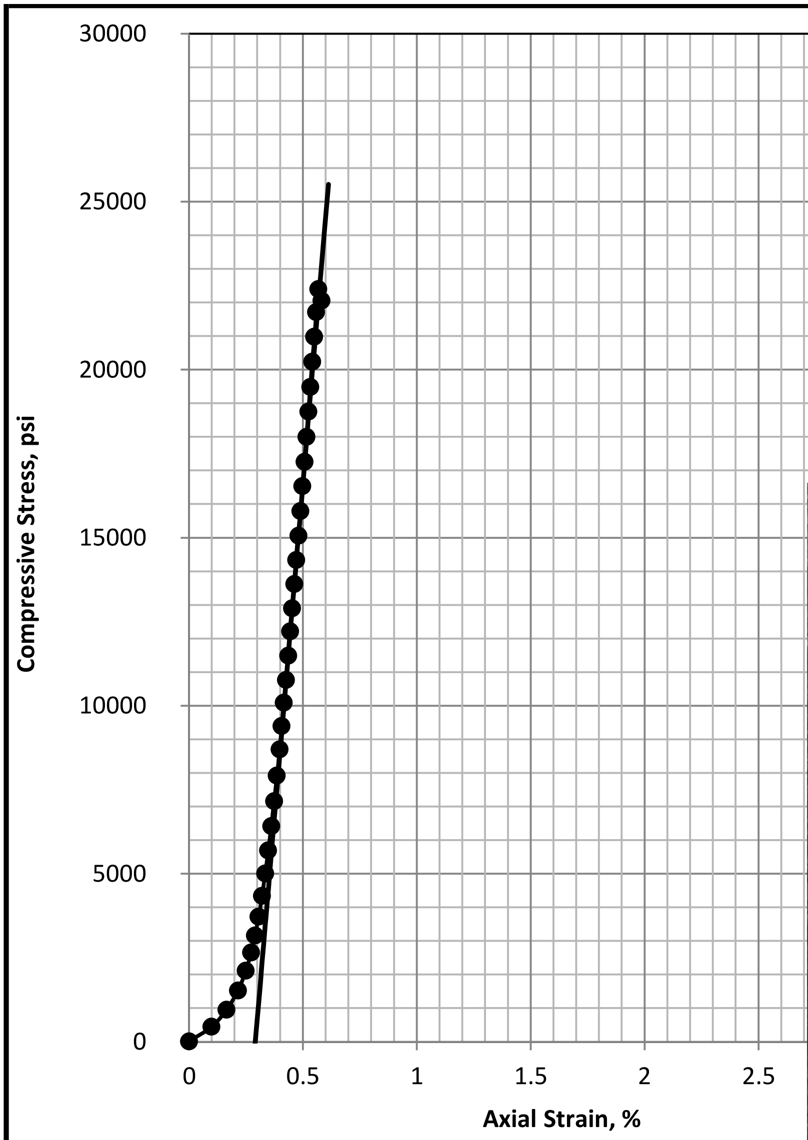
SAMPLE IDENTIFICATION			STATE PROPERTIES			ENGINEERING PROPERTY TESTS					REMARKS
Boring	Run	Depth	WATER CONTENT (1)	TOTAL UNIT WGT.	DRY UNIT WGT.	TEST TYPE (2)	Mohs HARDNESS	UNCONFINED COMPRESSION TESTS (ASTM D7012)			
								COMPRESSIVE STRENGTH	AXIAL STRAIN @ FAILURE	ESTIMATED (5) ELASTIC MODULUS	
			(%)	(pcf)	(pcf)		(-)	(psi)	(%)	(psi)	
WFE-7	R-3	13.6-13.9				M	9				
WFE-7	R-3	14.5-14.9	0.1	165	165	UC		29870	0.38	9E+06	
WFE-7	R-6	20.6-20.8				M	9				
WFE-7	R-6	23.1-23.5	0.2	164	163	UC		20830	0.29	7E+06	
WFE-9A	R-1	7.0-7.3				M	9				
WFE-9A	R-1	7.3-7.7	0.2	161	160	UC		32720	0.44	9E+06	
WFE-9A	R-7	28.4-28.8	0.1	169	168	UC		38760	0.35	1E+07	
WFE-9A	R-7	29.1-29.4				M	9				
WFE-9B	R-2	3.2-3.5				M	8				
WFE-9B	R-2	3.6-4	0.2	167	166	UC		22400	0.28	8E+06	
WFE-9B	R-3	7.4-7.6				M	7-8				
WFE-9B	R-3	7.6-8	0.1	170	170	UC		40230	0.41	1E+07	
WFE-14	R-2	27.85-28.25	0.6	169	168	UC		7460	0.25	3E+06	
WFE-14	R-2	29.4-29.7				M	3-4				

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

Prepared by: RT
Reviewed by: GET
Date: 5/13/2021

TerraSense, LLC
45H Commerce Way
Totowa, NJ 07512

Project No.: 7853-21003
File: RockSummary3



Specimen Information

Water Content (%)	Wet Unit Weight (pcf)	Dry Unit Weight (pcf)	Length (inch)	Diameter (inch)
0.20	167	166	4.390	1.972

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)
0.09	0.28	22400	8E+06

Test by: DM
Test Date: Apr-12-21
Reviewed by: GET

Aquifer	**CHPE - Whitehall-Ft. Edward Borings**	**COMPRESSIVE STRESS VS STRAIN UNCONFINED COMPRESSIVE STRENGTH TEST**
TerraSense, LLC Project # 7853-21003		**Boring: WFE-9B Run: R-2 Depth 3.6-4 ft.**

Analysis File: UCrock7rev1 (3/11)

5/13/2021
Uwfe9br2

ROCK CORE PHOTOGRAPHIC LOG

AECOM Project No: **60323056**
Project Name: **CHPE – Upstate New York Upland Geotechnical Investigation**
Location: **Whitehall – Fort Edward Segment**

Boring No.	**Depth (ft.)**	
WFE-9B	1.0-16.1	

Boring No.	**Depth (ft.)**	
WFE-14	25.0-40.1	

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

Kiewit

MEMORANDUM

DATE: September 23, 2022

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 3 - Package 2 - HDD Crossing 13 – Revision 1
Champlain Hudson Power Express Project
Fort Ann, 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 north of Fort Ann, New York. The approximate station for the start of HDD crossing Number 13 is STA 20253+00 (43.424392° N, 73.480765° W)

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

- TRC, Geotechnical Data Report, Champlain Hudson Power Express, Canadian Pacific Railway Borings MP 113.1-177.1, dated March 29, 2013.
- Atlantic Testing Laboratories, Subsurface Investigation Services, Champlain Hudson Power Express, Design Package 2, Whitehall to Glens Falls, New York, dated June 15, 2022.

Contact us if you have questions or require additional information.

HDD 13
Borings B122.4-1, K-122.35, K-122.4
Segment 3

CHPE Segment 3 - Package 2
HDD Soil Boring Coordinates and Elevations

Firm	Boring	Northing (feet)	Easting (feet)	Ground Surface Elevation (feet)
TRC*	B122.4-1	1673988.1	762589.1	134.0
	B123.1-1	1670533.1	761581.7	134.0
	B127.6-1	1650236.9	759369.7	143.0
	B130.8-1	1633732.2	749229.1	144.0
	B131.5-1	1630565.5	746543.8	148.0
AECOM**	WFE-2	1693039.7	776227.9	125.9
	WFE-6	1683884.0	771830.6	128.7
	WFE-6A	1683645.5	771707.7	129.0
	WFE-7	1683295.0	771591.2	128.7
	WFE-9	1677994.3	769427.4	133.9
	WFE-9A	1678043.5	769246.8	140.2
	WFE-9B	1676842.4	767745.7	141.7
	WFE-12	1657680.6	760822.6	135.3
	WFE-16	1645866.1	757602.8	145.2
	WFE-18	1637293.5	752138.0	143.6
	WFE-18A	1630756.2	746790.9	144.9
	WFE-19	1628651.1	745226.2	139.1
	WFE-19A	1625848.4	743218.4	139.0

Notes:

- Northings and Eastings are provided in NAD83 New York State Plane East Zone.
- Elevations are referenced to the NAVD88 datum.

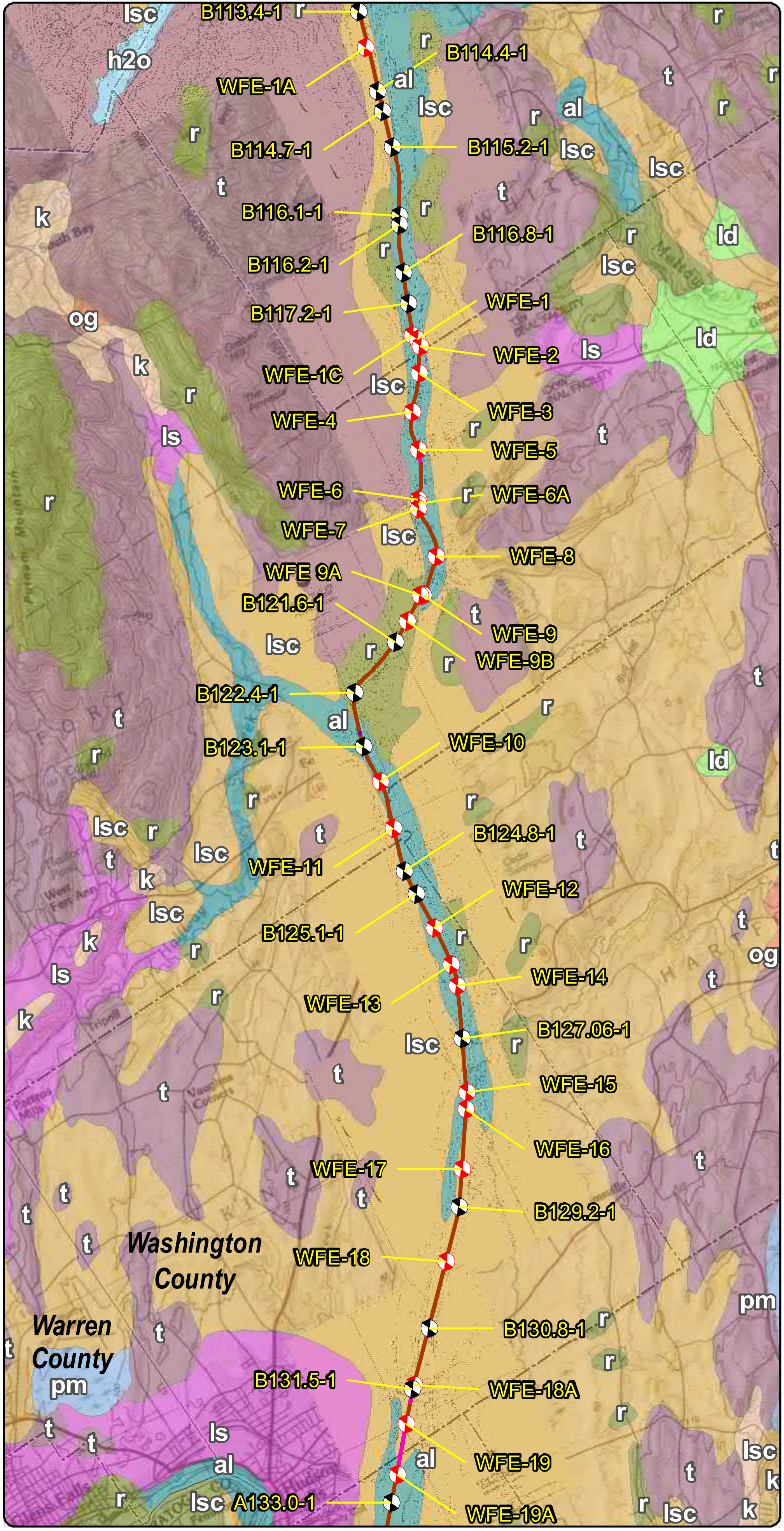
* TRC boring coordinates as shown in Table 1-6 in AECOM report (reference below). Boring elevations estimated from November 2021 topographic survey by Williams Aerial.

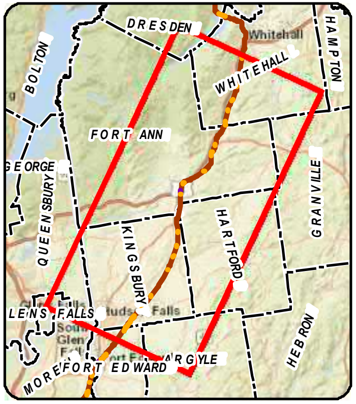
** AECOM boring coordinates and elevations as shown in Table 1-6 in AECOM report.

*** 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
- h2o - Water
- k - Kame deposits
- ld - Lacustrine delta
- ls - Lacustrine sand
- lsc - Lacustrine silt and clay
- og - Outwash sand and gravel
- pm - Swamp deposits
- r - Bedrock
- t - Till

1 0.5 0 1 Miles

Transmission Developers Inc.

Champlain Hudson Power Express Project

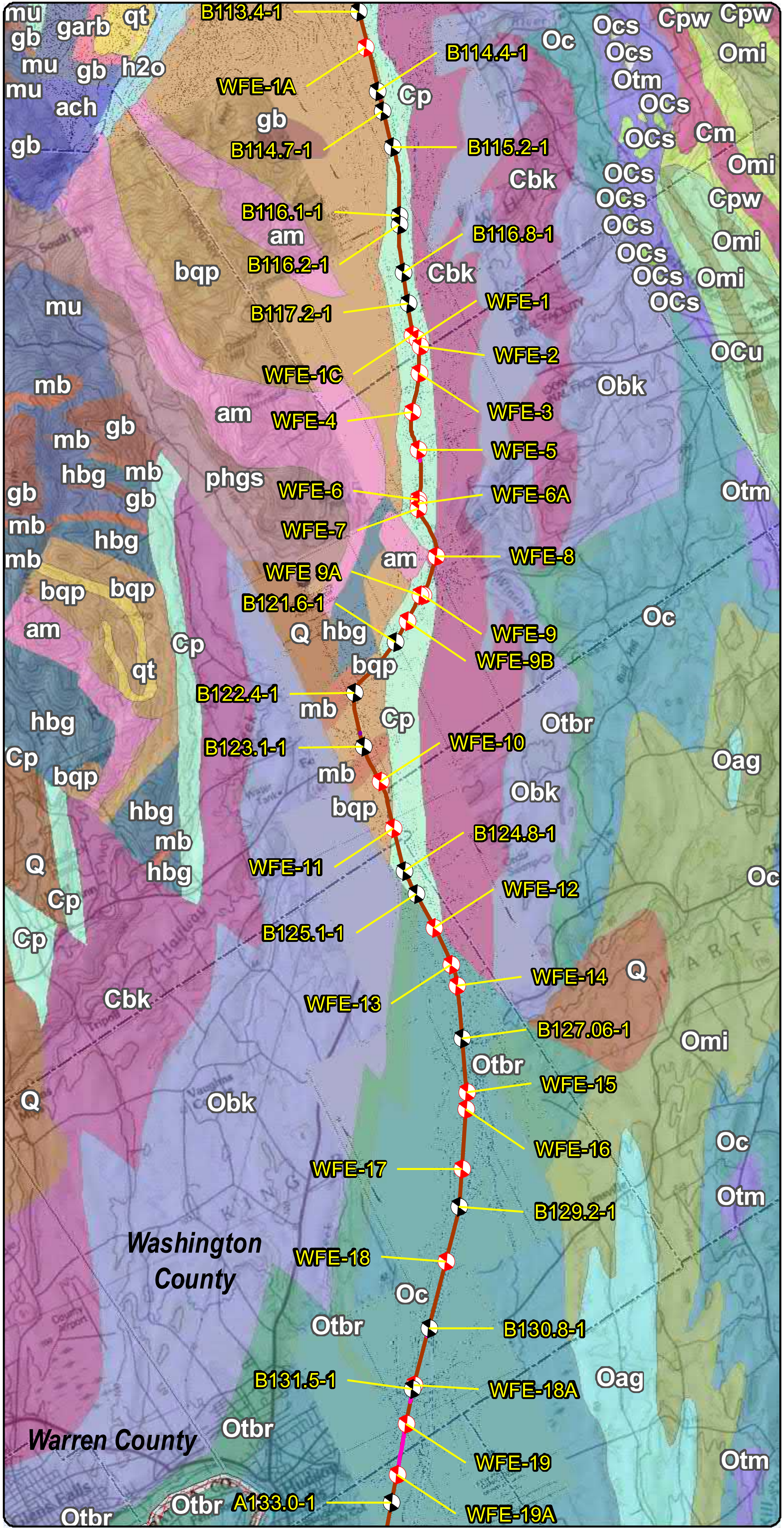
Champlain Hudson Power Express Inc.

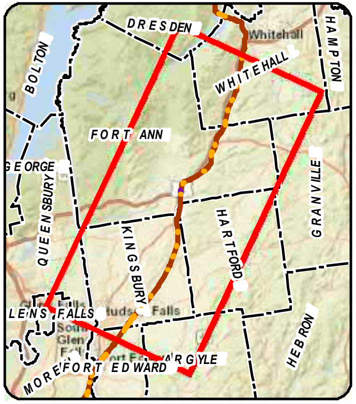
Surficial Geology and Geotechnical Borings Whitehall to Fort Edward Figure 3-3

Prepared on 5/5/2021
by: AECOM

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

Y:\Projects\CHPEI\Route\Consensus_Alternative_Routes\MXD\Alt_5_Routes_DZ_201909\Boring_Locations\Maps_for_May_2021_Report\Whitehall_to_Ft_Ed_Boring_Locations_Surficial_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

- Cbk - Beekmantown Group
- Cm - Mettawee Formation
- Cp - Potsdam Sandstone
- Cpw - Poultney Formation ("A" Member)
- No Label
- OCs - Cambrian-Middle Ordovician carbonate
- OCu - Undivided Ordovician and Cambrian
- Oag - Austin Glen Formation
- Obk - Beekmantown Group
- Oc - Canajoharie Shale
- Omi - Mount Merino Formation
- Op - Poultney Formation ("B" and "C")
- Otbr - Dolgeville Formation
- Otm - Taconic Melange
- Q - Glacial and Alluvial Deposits
- ach - metanorthosite and anorthositic
- am - Amphibolite, pyroxenic amphibolite
- bqp - Biotite-quartz-plagioclase
- garb - Quartz-feldspar paragneiss
- gb - Olivine metagabbro
- h2o - Water
- hbg - Biotite and or hornblende granite gneiss
- mb Calcitic and dolomitic marble
- mu - Undivided metased rock and migmatite
- phgs - Charnockite, granitic, quartz syenite
- qt - Quartzite

N

1 0.5 0 1 Miles

Transmission Developers Inc.

Champlain Hudson Power Express Project

Champlain Hudson Power Express Inc.

Bedrock Geology and Geotechnical Borings Whitehall to Fort Edward Figure 4-3

Prepared on 5/5/2021
by: AECOM

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

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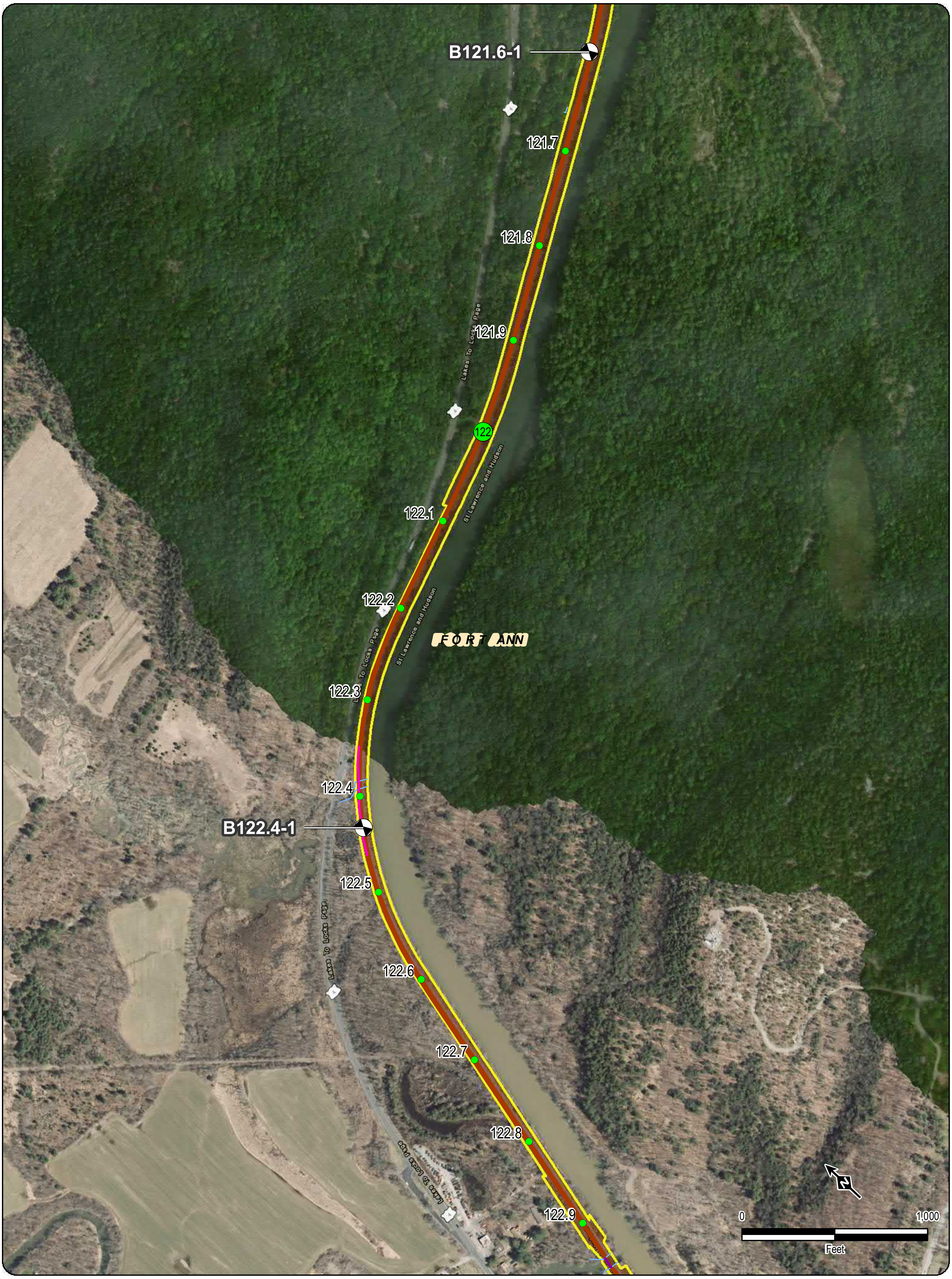
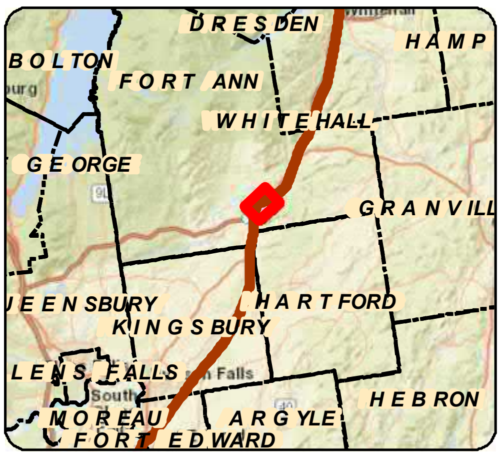




LEGEND

- ● Certified Milepost - Tenths
- ● Certified Milepost
- ○ Preferred Alternative Milepost - Tenths
- ○ 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

Whitehall to Fort Edward

Figure A-3

Sheet 8 of 16

Prepared by: AECOM 5/19/2021

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\Whitehall_to_Edward_Boring_Locations_Mapset_May_2021_Report.mxd

TRC

TEST BORING LOG

BORING	**B122.4-1**
G.S. ELEV.	N/A
FILE	195651
SHEET	1 OF 1

PROJECT: TDI CHAMPLAIN HUDSON POWER EXPRESS
LOCATION: CP RAILROAD ROW, NY

GROUNDWATER DATA

FIRST ENCOUNTERED NR ▽

DEPTH	HOUR	DATE	ELAPSED TIME	
22.5'	3PM	12/13	0 HR	▼

METHOD OF ADVANCING BOREHOLE

a	FROM 0.0 '	TO	10.0 '	
d	FROM 10.0 '	TO	30.0 '	

DRILLER P. PLANTIER
HELPER M. NAGEY
INSPECTOR C. POPPE
DATE STARTED 12/13/2012
DATE COMPLETED 12/13/2012

DEPTH	A	B	C	DESCRIPTION	Wn	REMARKS
	S-1	1 1 3 3	2.0	***BLACK M/C SAND, SM F/ GRAVEL SIZED ROCK FRAGMENTS, TR SILT (FILL)***	16.7	
	S-2	4 5 5 2	4.0	***BROWN M/C SAND, SM F/C GRAVEL (FILL)***		
5	S-3	4 6 4 2		***LIGHT BROWN F/ SAND, SM SILT, TR CLAY***		
	S-4	1 3 3 2	8.0			
10	S-5	1 1 1 1			23.5	
15	S-6	2 2 2		***BROWN TO GRAY SILT, SM F/ SAND***	24.7	
			18.5			
20	S-7	1 2 1		***GRAY SILTY F/M SAND, TR ORGANICS***	39.8	
▼			23.5			
25	S-8	1 3 1		***GRAY M/F/C SAND, TR SILT***	22.6	
30	S-9	2 1 2	30.0			
				END OF BORING AT 30'		
35						

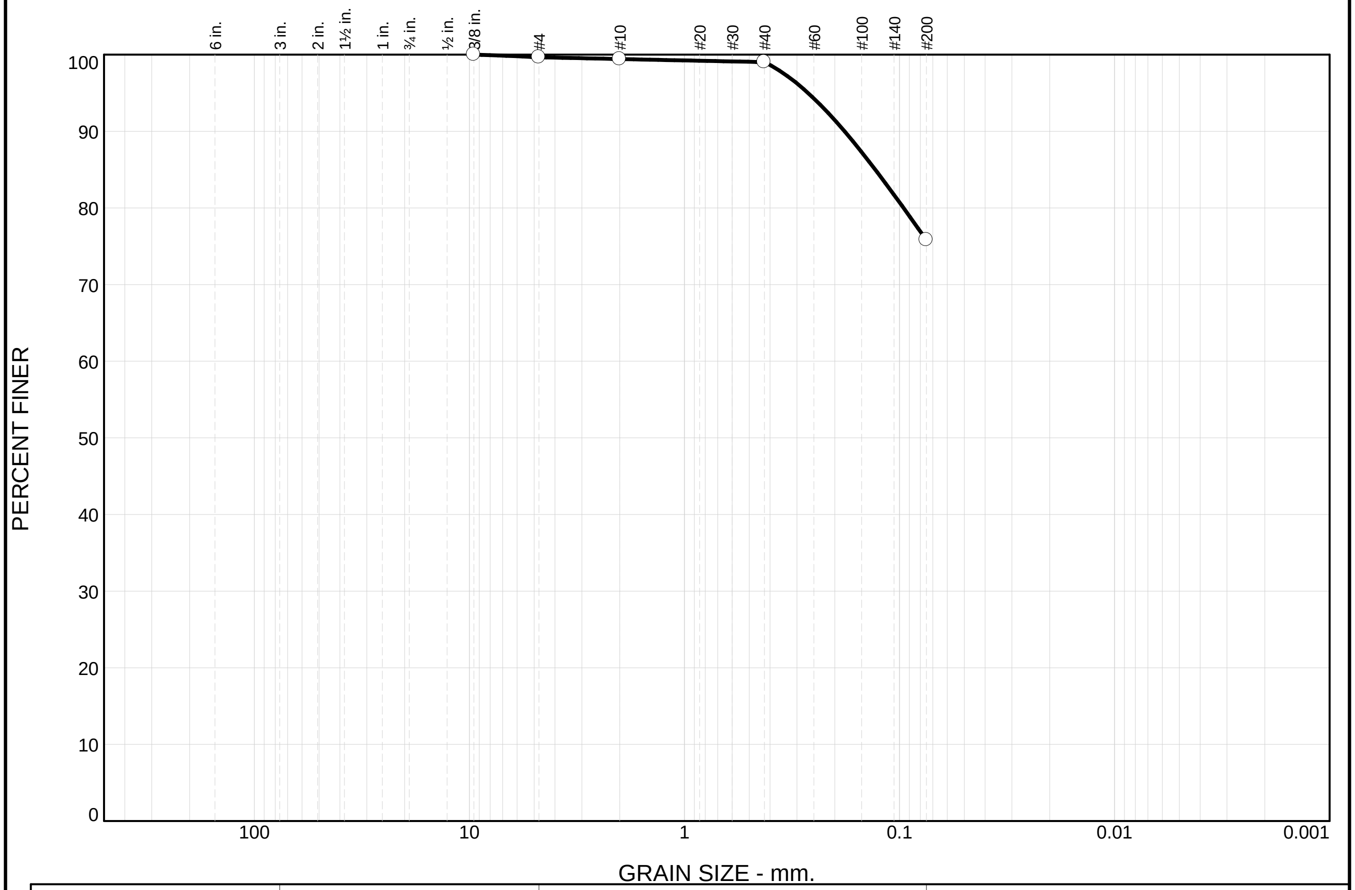
DRN. CMP
CKD. PWK

SUMMARY OF LABORATORY TEST DATA

Project Name: TDI Champlain Hudson Power Express – CP
Client Name: Transmission Developers, Inc.
TRC Project #: 195651

SAMPLE IDENTIFICATION			Soil Group (USCS System)	GRAIN SIZE DISTRIBUTION				PLASTICITY				Specific Gravity	Moisture Content (%)	Unit Weight (pcf)	Compressive Strength (tsf)	Organic Content (%)
Boring #	Sample #	Depth (ft)		Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Liquidity Index)					
B120.1-1	R-1	1.7-2.3	-	-	-	-	-	-	-	-	-	-	-	165.1	1120	-
A120.8-1	S-1	0.0-2.0	-	-	-	-	-	-	-	-	-	-	4.0	-	-	-
	S-2	2.0-4.0	-	-	-	-	-	-	-	-	-	-	9.8	-	-	-
	R-1	6.1-6.8	-	-	-	-	-	-	-	-	-	-	-	170.4	1340	-
B121.6-1	R-1	6.3-6.6	-	-	-	-	-	-	-	-	-	-	-	168.7	430	-
B122.4-1	S-1	0.0-2.0	-	-	-	-	-	-	-	-	-	-	16.7	-	-	-
	S-5	8.0-10.0	-	0.3	23.9	75.8		-	-	-	-	-	23.5	-	-	-
	S-6	13.5-15.0	-	-	-	-	-	-	-	-	-	-	24.7	-	-	-
	S-7	18.5-20.0	SM	0.0	67.6	32.4		-	-	-	-	-	39.8	-	-	4.4
	S-8	23.5-25.0	SW-SM	0.5	93.4	6.1		-	-	-	-	-	22.6	-	-	-
B123.1-1	S-1	0.0-2.0	-	-	-	-	-	-	-	-	-	-	8.0	-	-	-
	S-3	4.0-6.0	-	-	-	-	-	-	-	-	-	-	44.6	77.9	-	-
	S-4	6.0-8.0	CH	-	-	-	-	58	29	29	0.1	-	33.0	89.6	-	-

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.3	0.3	0.4	23.2	75.8	

☒	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			0.1296							

Material Description	USCS	AASHTO
○ BROWN TO GRAY SILT, SM F/ SAND		

Project No. 195651 **Client:** TDI CHAMPLAIN HUDSON POWER EXPRESS - CP

Project: TRANSMISSION DEVELOPERS, INC.

○ **Source of Sample:** B122.4-1 **Depth:** 8.0-10.0 FT **Sample Number:** S-5

Remarks:

○SAMPLE DESCRIPTION BASED ON VISUAL IDENTIFICATION AND LABORATORY ANALYSIS

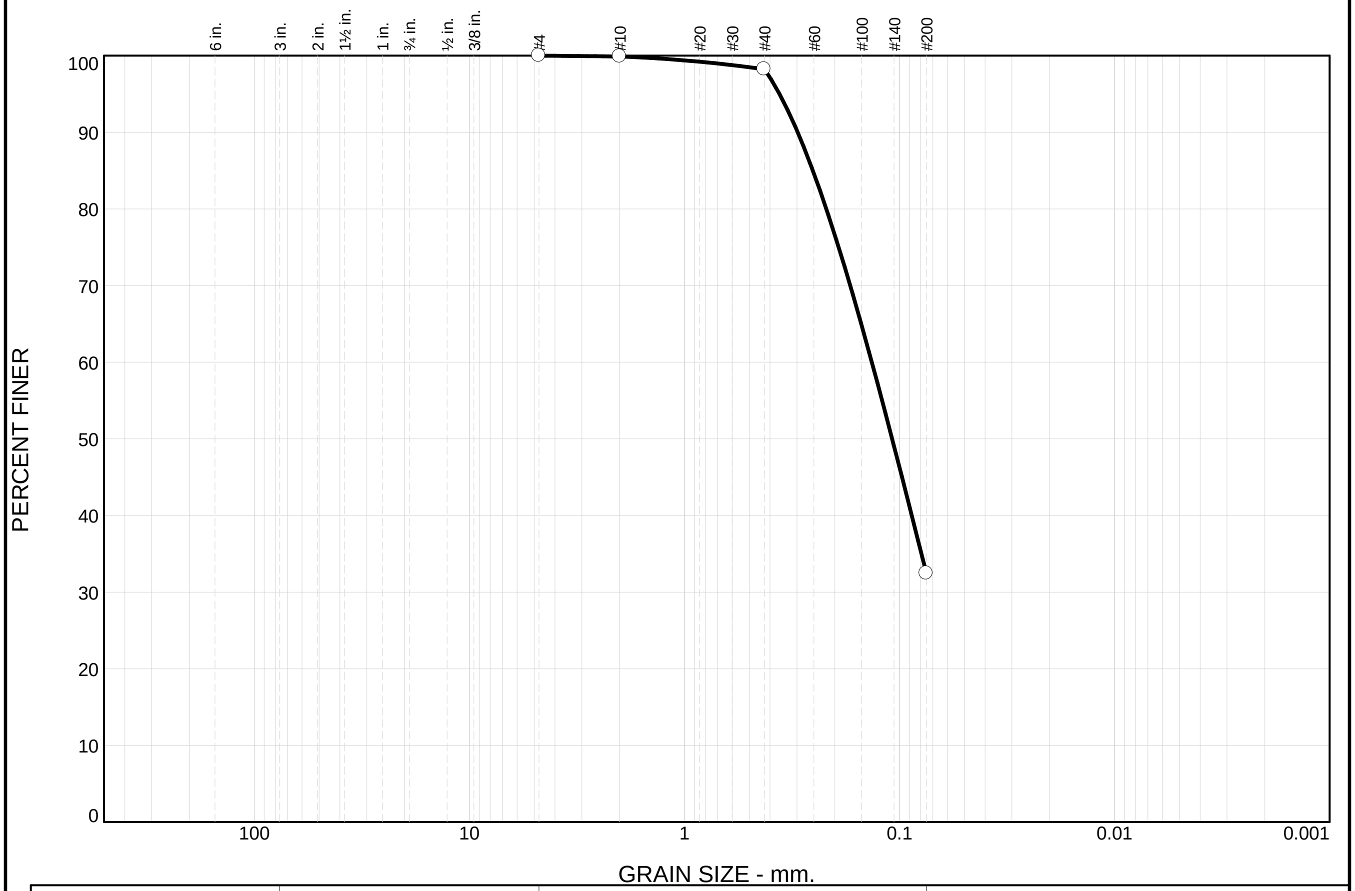
TRC Engineers, Inc.

Mt. Laurel, NJ

Figure 19

Tested By: BMH 02/11/13 **Checked By:** ____________

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.1	1.7	65.8	32.4	

☒	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			0.2529	0.1345	0.1082					

Material Description	USCS	AASHTO
○ DARK GRAY-BROWN SILTY F/M SAND, TR ORGANICS	SM	

Project No. 195651 **Client:** TDI CHAMPLAIN HUDSON POWER EXPRESS - CP

Project: TRANSMISSION DEVELOPERS, INC.

○ **Source of Sample:** B122.4-1 **Depth:** 18.5-20.0 FT **Sample Number:** S-7

Remarks:

○SAMPLE DESCRIPTION BASED ON VISUAL IDENTIFICATION AND LABORATORY ANALYSIS

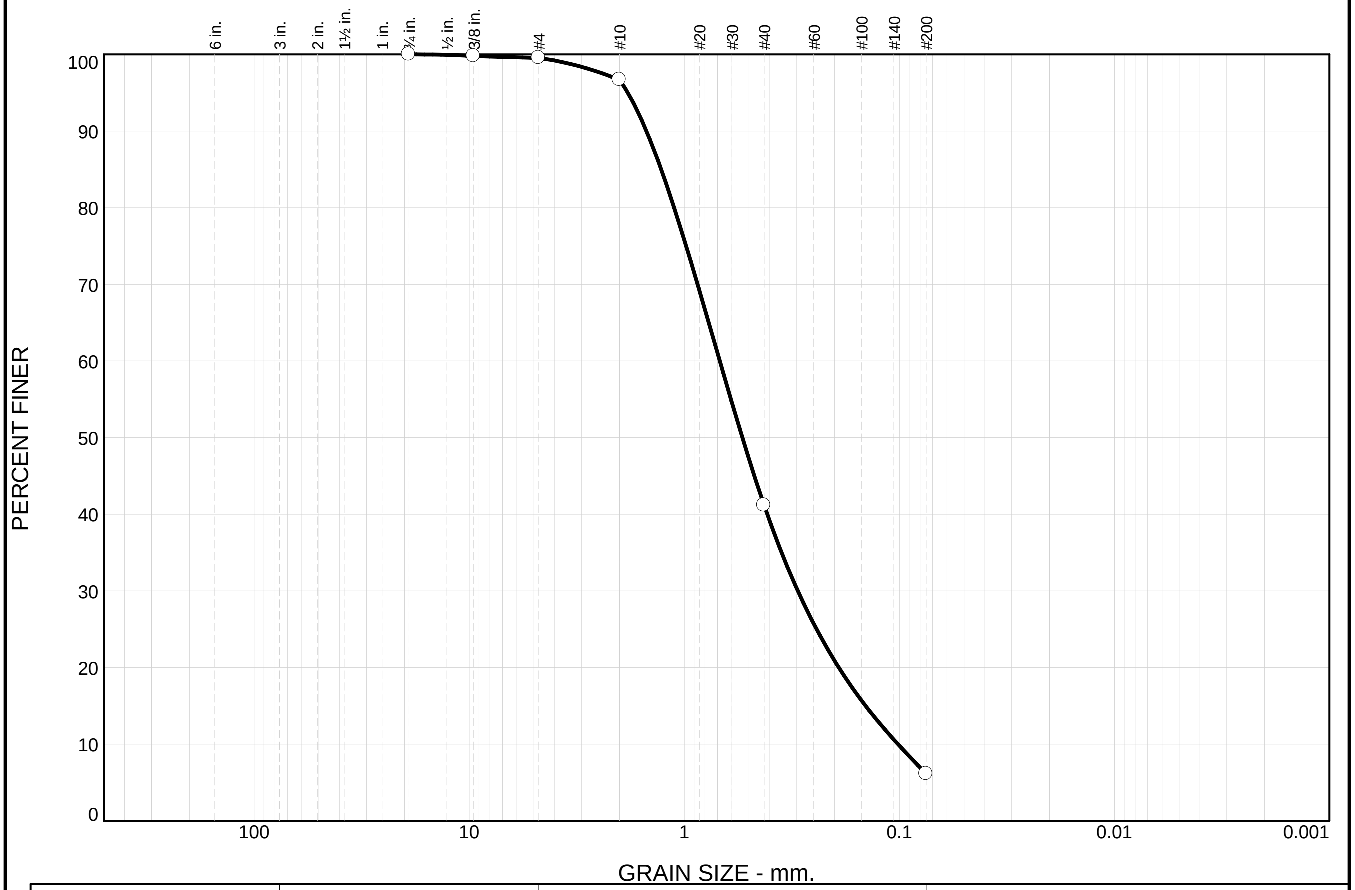
TRC Engineers, Inc.

Mt. Laurel, NJ

Figure 20

Tested By: BMH 02/13/13 **Checked By:** ____________________

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.5	2.8	55.5	35.1	6.1	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			1.2801	0.6831	0.5365	0.2963	0.1434	0.1013	1.27	6.74

Material Description	USCS	AASHTO
○ BROWN M/F/C SAND, TR SILT	SW-SM	

Project No. 195651 **Client:** TDI CHAMPLAIN HUDSON POWER EXPRESS - CP

Project: TRANSMISSION DEVELOPERS, INC.

○ **Source of Sample:** B122.4-1 **Depth:** 23.5-25.0 FT **Sample Number:** S-8

Remarks:

○SAMPLE DESCRIPTION BASED ON VISUAL IDENTIFICATION AND LABOROTORY ANALYSIS

TRC Engineers, Inc.

Mt. Laurel, NJ

Figure 21

Tested By: BMH 02/13/13 **Checked By:** ____________

Boring Location Plans Page 5 of 12	Drawn by: ADW	Scale: Not to scale	Project No.: CD10279	Date: March 2022

Champlain Hudson Power Express
Design Package 2
Whitehall to Glens Falls, 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-01-03-22**

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

Boring Location: **See Boring Location Plan**

Project: **Subsurface Investigation**
Champlain Hudson Power Express, Design Package 2
Various Locations, New York

Start Date: **1/18/2022** Finish Date: **1/18/2022**

Boring No.: **K-122.35** Sheet **1** of **3**

Coordinates
Northing **762879.602**
Easting **1674289.793**

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

Ground Elev.: **135.753**

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

Groundwater Observations

Date	Time	Depth	Casing
1/18/2022	AM	DRY	OPEN
1/18/2022	AM	*9.5'	14.0'
1/18/2022	PM	*12.6'	14.0'

***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)
	CASING	1	0.0	2.0	SS	14	6	5	5	0.2	2" TOPSOIL & ORGANIC MATERIAL	6
1										2.0	Brownish-Black mf GRAVEL; some DEBRIS (cinders); little cmf SAND; trace SILT (wet, non-plastic) GP Possible FILL	
2		2	2.0	4.0	SS	6	6	4	3		Brown SILT; little cmf SAND (wet, non-plastic) ML	8
3												
4		3	4.0	6.0	SS	3	3	4	2		Orangish-Brown SILT; trace f SAND (saturated, non-plastic) ML w = 23.5%, LL = NP, PL = NP, PI = NP	14
5												
6		4	6.0	8.0	SS	4	4	4	5		Orangish-Brown SILT; trace f SAND; trace ORGANIC MATERIAL (roots) (saturated, non-plastic) ML OC = 4.5%	10
7										8.0		
8		5	8.0	10.0	SS	3	7	7	7		NO RECOVERY - COBBLE Fragment in split spoon shoe	0
9												
10										11.0		
11												
12											Advanced casing to 14.0 feet and began advancing 3 7/8" tri-cone roller bit wet rotary open hole within the borehole.	
13												
14	WET ROTARY	6	14.0	16.0	SS	5	3	5	6		Brown mf+ SAND; trace SILT (saturated, non-plastic) SP	16
15												
16												
17												
18												
19		7	19.0	21.0	SS	5	8	5	7		Brown cmf SAND; some f GRAVEL; little SILT (saturated, non-plastic) SW-SM	17
20												
21												
22												
23												
24		8	24.0	26.0	SS	5	5	6	4		Brown c-mf SAND; little SILT; trace f GRAVEL (saturated,	8
25												

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

Drillers: **Mark Childs; John Trathen**

Inspector: **Tom Hunter (ATL); Tom Kimmins (Kiewit)**

Boring No.: **K-122.35** Report No.: **CD10279D-01-03-22** 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)
											non-plastic) SM w = 23.8% % Fines = 13.0%	
26											Began utilizing mudded water at 24.0 feet.	
29		9	29.0	31.0	SS	3	5	8	10		Brown cmf SAND; trace f GRAVEL; trace SILT (saturated, non-plastic) SW	16
32										32.0		
35		10	35.0	37.0	SS	9	6	9	10		(3" Brass Lined Split Spoon) Black mf+ SAND; trace SILT (saturated, non-plastic) SP	10
37		11	37.0	39.0	SS	7	9	8	9		(3" Brass Lined Split Spoon) Black mf+ SAND; little SILT (saturated, non-plastic) SP-SM	19
39		12	39.0	41.0	SS	9	10	10	14		(3" Brass Lined Split Spoon) Black c-m+f SAND; trace SILT; trace f GRAVEL (saturated, non-plastic) SP-SM w = 17.8% % Fines = 4.8%	20
44		13	44.0	46.0	SS	7	8	9	7		Blackish-Grey f SAND; trace SILT (saturated, non-plastic) SP	10
49		14	49.0	51.0	SS	5	5	12	14		Greyish-Black mf+ SAND; trace SILT (saturated, non-plastic) SP Encountered Blackish-Grey SAND lense from 49.0 to 50.0 feet.	12
54		15	54.0	56.0	SS	4	5	5	5		Blackish-Grey c-mf+ SAND; trace SILT; trace f GRAVEL (saturated, non-plastic) SP-SM	16
55										55.6	w = 27.2%, LL = NP, PL = NP, PI = NP % Fines = 9.4%	
57										57.0	Blackish-Grey SILT; little mf SAND (saturated, non-plastic) ML	
59		16	59.0	61.0	SS	8	10	16	17		Greyish-Black cmf+ SAND; little f GRAVEL; trace SILT (saturated, non-plastic) SW	6
61										61.0	Boring terminated at 61.0 feet.	
62												

ATLANTIC TESTING LABORATORIES, Limited

Subsurface Investigation

Boring No.: **K-122.35** Report No.: **CD10279D-01-03-22** Sheet **3** of **3**

DEPTH	METHOD OF ADVANCE	SAMPLE NO.	DEPTH OF SAMPLE		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)
			From	To					
63								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 CME 45 Trailer (Rig Unit No. CDGV429) drill rig.	
64									
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99									
100									

ATLANTIC TESTING LABORATORIES, Limited

Subsurface Investigation

Report No.: **CD10279D-01-03-22**

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

Boring Location: **See Boring Location Plan**

Project: **Subsurface Investigation**
Champlain Hudson Power Express, Design Package 2
Various Locations, New York

Start Date: **1/18/2022** Finish Date: **1/19/2022**

Boring No.: **K-122.4** Sheet **1** of **3**

Coordinates
Northing **762676.175**
Easting **1674100.08**

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

Ground Elev.: **135.937**

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

Groundwater Observations

Date	Time	Depth	Casing
1/18/2022	PM	DRY	OPEN
1/19/2022	AM	DRY	4.0'
1/19/2022	AM	*12.3'	19.0'
1/19/2022	PM	*13.2'	19.0'

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

f - fine
m - medium
c - coarse

and - 35-50%
some - 20-35%
little - 10-20%
trace - 0-10%

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	Recovery (Inches)
	CASING	1	0.0	2.0	SS	11 4 6 5	0.1	1" TOPSOIL & ORGANIC MATERIAL Black DEBRIS (cinders); some cmf SAND; little mf GRAVEL; trace SILT (moist, non-plastic) SW FILL Encountered frozen soil to 0.5 feet.	15
		2	2.0	4.0	SS	7 7 6 5	4.0	Similar Soil (wet, non-plastic) SW FILL	3
		3	4.0	6.0	SS	7 7 3 2	6.0	NO RECOVERY	0
		4	6.0	8.0	SS	3 3 2 1	7.5	Brown cmf GRAVEL; little cmf SAND; trace SILT (saturated, non-plastic) GW Possible FILL	4
		5	8.0	10.0	SS	3 2 1 2		Brown SILT; and mf- SAND (saturated, non-plastic) ML w = 24.8%, LL = NP, PL = NP, PI = NP % Fines = 57.0%	12
		6	14.0	16.0	SS	4 2 2 4	17.0	Grey Similar Soil (saturated, non-plastic) ML	1
								Advanced casing to 19.0 feet and began advancing 3 7/8" tri-cone roller bit wet rotary open hole within the borehole.	
	WET ROTARY	7	19.0	21.0	SS	2 5 5 4		Grey mf+ SAND; trace SILT (saturated, non-plastic) SP Encountered WOOD fragments from 19.0 to 19.2 feet.	12
		8	24.0	26.0	SS	4 8 8 7		Grey mf+ SAND; trace SILT (saturated, non-plastic) SP	10

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

Drillers: **Mark Childs; John Trathen**

Inspector: **Tom Hunter (ATL); Tom Kimmins (Kiewit)**

ATLANTIC TESTING LABORATORIES, Limited

Subsurface Investigation

Boring No.: **K-122.4**　Report No.: **CD10279D-01-03-22**　Sheet **2** of **3**

CLASSIFICATION OF MATERIAL

f - fine
m - medium
c - course

and - 35-50%
some - 20-35%
little - 10-20%
trace - 0-10%

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	RECOVERY (inches)
29		9	29.0	31.0	SS	6 5 7 9		Similar Soil (saturated, non-plastic) SP w = 17.5%	12
34		10	34.0	36.0	SS	6 6 7 8	35.3	Similar Soil (saturated, non-plastic) SP	10
35								Grey f SAND; some SILT (saturated, non-plastic) SM Encountered WOOD fragments from 35.3 to 35.4 feet.	
39		11	39.0	41.0	SS	4 8 15 22		Grey f SAND; little SILT (saturated, non-plastic) SM	11
43							43.0		
44		12	44.0	46.0	SS	2 1 6 4	45.2	Blackish-Grey SILT (saturated, non-plastic) ML	10
45								Greyish-Black mf+ SAND; trace SILT (saturated, non-plastic) SP	
49		13	49.0	51.0	SS	4 2 5 9		Greyish-Black c-mf SAND; little SILT; trace mf GRAVEL (saturated, non-plastic) SM w = 21.7% % Fines = 19.0%	16
54		14	54.0	56.0	SS	9 12 12 10		(3" Brass Lined Split Spoon) Greyish-Black mf+ SAND; trace SILT (saturated, non-plastic) SP	20
56		15	56.0	58.0	SS	9 8 10 13		(3" Brass Lined Split Spoon) Similar Soil (saturated, non-plastic) SP	24
58		16	58.0	60.0	SS	12 14 13 16	60.0	(3" Brass Lined Split Spoon) Greyish-Black cm+f SAND; trace SILT (saturated, non-plastic) SP w = 9.9% % Fines = 1.7%	19
61								Boring terminated at 60.0 feet.	

ATL-LOG1 NE CD10279 KIEWIT INFRASTRUCTURE CO - VARIOUS LOCATIONS (PACKAGE 2).GPJ ATL4-08.GDT 4/12/22

ATLANTIC TESTING LABORATORIES, Limited

Subsurface Investigation

Boring No.: **K-122.4**　Report No.: **CD10279D-01-03-22**　Sheet **3** of **3**

DEPTH	METHOD OF ADVANCE	SAMPLE NO.	DEPTH OF SAMPLE		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)
			From	To					
63								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 CME 45 Trailer (Rig Unit No. CDGV429) drill rig.	
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100									

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-117.6-0.2	S-4	6.0 - 8.0	Brownish-Grey mf SAND; and SILT	41.7	25.3	NP	NP	NP	--	--	--	--	--	--	--	--
	S-7	19.0 - 21.0	Grey mf SAND; some SILT	23.5	18.3	NP	NP	NP	--	--	--	--	--	--	--	--
	S-9	28.0 - 30.0	Grey CLAY; trace SILT; trace f SAND	99.7	55.0	65	26	39	--	--	--	--	--	--	--	--
K-117.6-1.6A	S-2	4.0 - 6.0	Brown cmf+ SAND; little f GRAVEL; trace SILT	--	--	--	--	--	--	400	25	8.20	14,190	--	--	--
	S-3	6.0 - 8.0	Brown cmf SAND; some SILT; trace f GRAVEL	21.0	6.8	--	--	--	--	--	--	--	--	--	--	--
	S-6	19.0 - 21.0	Grey CLAY; little SILT; little f SAND	--	25.3	46	20	26	--	--	--	--	--	--	--	--
	S-8	28.0 - 30.0	Grey CLAY; some mf SAND; trace SILT	70.0	33.3	47	19	28	--	--	--	--	--	--	--	--
K-117.6-1.6B	S-4	6.0 - 7.2	Brown cmf SAND; and f GRAVEL; trace SILT	--	10.0	--	--	--	--	--	--	--	--	--	--	--
	S-7	19.0 - 21.0	Orangish-Greyish-Brown c-mf+ SAND; little SILT; trace f GRAVEL	20.0	18.2	--	--	--	--	--	--	--	--	--	--	--
	S-9	28.0 - 30.0	Grey CLAY; and cmf+ SAND; trace f GRAVEL; trace SILT	48.0	26.7	43	18	25	--	--	--	--	--	--	--	--
K-117.6-1.6C	S-4	8.0 - 9.3	Greyish-Brown SILT; little cmf+ SAND; trace f GRAVEL	--	17.6	--	--	--	--	--	--	--	--	--	--	--
	S-6	19.0 - 21.0	Greyish-Brown c-mf SAND; some SILT; trace mf+ GRAVEL	26.0	12.4	--	--	--	--	--	--	--	--	--	--	--
	S-8	28.0 - 30.0	Grey CLAY; and cmf- SAND; trace f GRAVEL; trace SILT	55.2	35.1	44	18	25	--	--	--	--	--	--	--	--
K-117.6-2.1	S-4	6.0 - 8.0	Grey SILT; little f SAND	--	15.4	--	--	--	--	--	--	--	--	--	--	--
	S-6	14.0 - 16.0	Mottled Brownish-Grey CLAY; and mf SAND; little SILT; trace ORGANIC MATERIAL (vegetation)	57.2	47.9	41	19	22	--	--	--	--	--	--	--	--
	S-9	29.0 - 31.0	Orangish-Brown cm+f SAND; trace SILT; trace f GRAVEL	8.1	16.4	--	--	--	--	--	--	--	--	--	--	--
	S-11	38.0 - 40.0	Orangish-Brown c-m+f SAND; trace SILT; trace mf GRAVEL	5.6	16.4	--	--	--	--	--	--	--	--	--	--	--
K-117.6-2.3	S-4	6.0 - 8.0	Brown c-mf+ SAND; some SILT; little m+f GRAVEL	25.0	13.7	--	--	--	--	--	--	--	--	--	--	--
	RC-4	30.1 - 31.2	Grey SANDSTONE	--	--	--	--	--	--	--	--	--	--	--	1,311	4.43
	RC-4	32.7 - 33.0	Grey SANDSTONE	--	--	--	--	--	--	--	--	--	--	20,440	--	--
K-122.35	S-3	4.0 - 6.0	Orangish-Brown SILT; trace f SAND	--	23.5	NP	NP	NP	--	--	--	--	--	--	--	--
	S-4	6.0 - 8.0	Orangish-Brown SILT; trace f SAND; trace ORGANIC MATERIAL (roots)	--	--	--	--	--	4.5	--	--	--	--	--	--	--
	S-8	24.0 - 26.0	Brown c-mf SAND; little SILT; trace f GRAVEL	13.0	23.8	--	--	--	--	--	--	--	--	--	--	--

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								
	S-12	39.0 - 41.0	Black c-m+f SAND; trace SILT; trace f GRAVEL	4.8	17.8	--	--	--	--	--	--	--	--	--	--	--
	S-15	54.0 - 56.0	Blackish-Grey c-mf+ SAND; trace SILT; trace f GRAVEL	9.4	27.2	NP	NP	NP	--	--	--	--	--	--	--	--
K-122.4	S-5	8.0 - 10.0	Brown SILT; and mf- SAND	57.0	24.8	NP	NP	NP	--	--	--	--	--	--	--	--
	S-9	29.0 - 31.0	Grey mf+ SAND; trace SILT	--	17.5	--	--	--	--	--	--	--	--	--	--	--
	S-13	49.0 - 51.0	Greyish-Black c-mf SAND; little SILT; trace mf GRAVEL	19.0	21.7	--	--	--	--	--	--	--	--	--	--	--
	S-16	58.0 - 60.0	Greyish-Black cm+f SAND; trace SILT	1.7	9.9	--	--	--	--	--	--	--	--	--	--	--
K-123.2	S-3	4.0 - 6.0	Brown SILT; little mf SAND; trace CLAY	--	22.3	--	--	--	--	--	--	--	--	--	--	--
	S-4	6.0 - 8.0	Brown f SAND; some SILT	--	31.3	--	--	--	--	--	--	--	--	--	--	--
	S-6	10.0 - 12.0	Grey CLAY; little SILT; trace f SAND	--	28.4	48	20	28	--	--	--	--	--	--	--	--
	S-8	19.0 - 21.0	Grey c-m+f SAND; trace SILT	10.0	29.8	--	--	--	--	--	--	--	--	--	--	--
	S-10	28.0 - 30.0	Grey CLAY; little SILT; trace f SAND	97.0	65.5	67	21	46	--	--	--	--	--	--	--	--
	ST-1	30.0 - 32.0	Grey CLAY; little SILT; trace f SAND	--	--	--	--	--	--	1,400	15	8.24	5,418	--	--	--
K-123.7	S-3	4.0 - 6.0	Mottled Blackish-Grey CLAY; trace SILT; trace f SAND; trace ORGANIC MATERIAL (roots)	--	41.4	--	--	--	7.5	--	--	--	--	--	--	--
	S-6	14.0 - 16.0	Mottled Orangish-Grey CLAY; trace SILT	100.0	25.9	79	23	56	--	--	--	--	--	--	--	--
	S-9	28.0 - 30.0	Grey CLAY; trace SILT	100.0	48.4	73	20	53	--	--	--	--	--	--	--	--
	S-11	40.0 - 42.0	Grey CLAY; trace SILT	--	37.3	--	--	--	--	--	--	--	--	--	--	--
K-123.8	S-3	4.0 - 6.0	Orangish-Brown cmf+ SAND; little SILT	16.0	18.1	--	--	--	--	--	--	--	--	--	--	--
	S-6	14.0 - 16.0	Blackish-Grey CLAY; little SILT; trace f SAND; trace ORGANIC MATERIAL (root hairs, wood fragments)	--	66.5	54	23	31	6.9	--	--	--	--	--	--	--
	S-9	28.0 - 30.0	Mottled Orangish-Greyish-Brown CLAY; trace SILT	100.0	37.2	67	18	49	--	--	--	--	--	--	--	--
	S-11	40.0 - 42.0	Bluish-Grey CLAY; trace SILT	--	33.5	--	--	--	--	--	--	--	--	--	--	--
K-125.5	S-3	4.0 - 6.0	Orangish-Brown SILT; trace f SAND	--	21.4	NP	NP	NP	--	--	--	--	--	--	--	--
	S-5	8.0 - 10.0	Grey CLAY; trace SILT	--	27.5	--	--	--	--	--	--	--	--	--	--	--
	S-6	14.0 - 16.0	Greyish-Black mf+ SAND; trace SILT	7.7	--	--	--	--	--	--	--	--	--	--	--	--
	S-7	19.0 - 21.0	Grey CLAY; trace SILT	--	51.5	--	--	--	--	--	--	--	--	--	--	--
	S-9	28.0 - 30.0	Grey CLAY; trace SILT; trace mf SAND	94.0	38.0	70	21	49	--	--	--	--	--	--	--	--

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-01-01-22
Report Date: January 31, 2022
Date Received: January 25, 2022

TEST DATA

Boring No.	Sample No.	Depth (ft)	Moisture Content (%)
K-122.35	S-3	4-6	23.5
	S-8	24-26	23.8
	S-12	39-41	17.8
	S-15	54-56	27.2
K-123.2	S-3 [1]	4-6	22.3
	S-4	6-8	31.3
	S-6	10-12	28.4
	S-8	19-21	29.8
	S-10	28-30	65.5
K-123.7	S-3	4-6	41.4
	S-6	14-16	25.9
	S-9	28-30	48.4
	S-11	40-42	37.3
K-123.8	S-3	4-6	18.1
	S-6	14-16	66.5
	S-9	28-30	37.2
	S-11	40-42	33.5

TEST DATA (continued)

Boring No.	Sample No.	Depth (ft)	Moisture Content (%)
K-125.5	S-3	4-6	21.4
	S-5	8-10	27.5
	S-7	19-21	51.5
	S-9	28-30	38.0
K-127.0	S-3	4-6	32.8
	S-4	6-8	31.2
	S-6	14-16	22.8
	S-9	30-32	81.7
	S-11	39-41	63.9
K-127.1	S-3	4-6	30.7
	S-7	19-21	71.7
	S-9	30-32	58.0

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

Reviewed By: ______________________ Date: 01/31/22

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-02-02-22

Report Date: February 7, 2022

Date Received: February 1, 2022

TEST DATA

Boring No.	Sample No.	Depth (ft)	Moisture Content (%)
K-117.6-1.6A	S-3	6-8	6.8
	S-6 [1]	19-21	25.3
	S-8	28-30	33.3
K-122.4	S-5	8-10	24.8
	S-9 [1]	29-31	17.5
	S-13 [1]	49-51	21.7
	S-16	58-60	9.9
K-125.6	S-3	4-6	17.8
	S-5	8-10	24.7
	S-7	19-21	49.2
	ST-1	28-30	49.4
K-127.9	S-4	6-8	30.0
	S-6	14-16	32.4
	S-8	24-26	28.8
	ST-1	38-40	30.0
K-128.0	S-5	8-10	28.0
	S-7	19-21	39.2
	S-9	29-31	30.3
	ST-1	38-40	51.2

TEST DATA (continued)

Boring No.	Sample No.	Depth (ft)	Moisture Content (%)
K-129.9A	S-5	8-10	134.2
	S-8	24-26	31.1
	S-10	34-36	52.6
	ST-1	41-43	40.5
K-129.9B	S-6	14-16	88.0
	S-8	24-26	18.3
	ST-1	27-29	51.2
	S-10	34-36	50.8

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

Reviewed By: ______________________ Date: 02/07/22

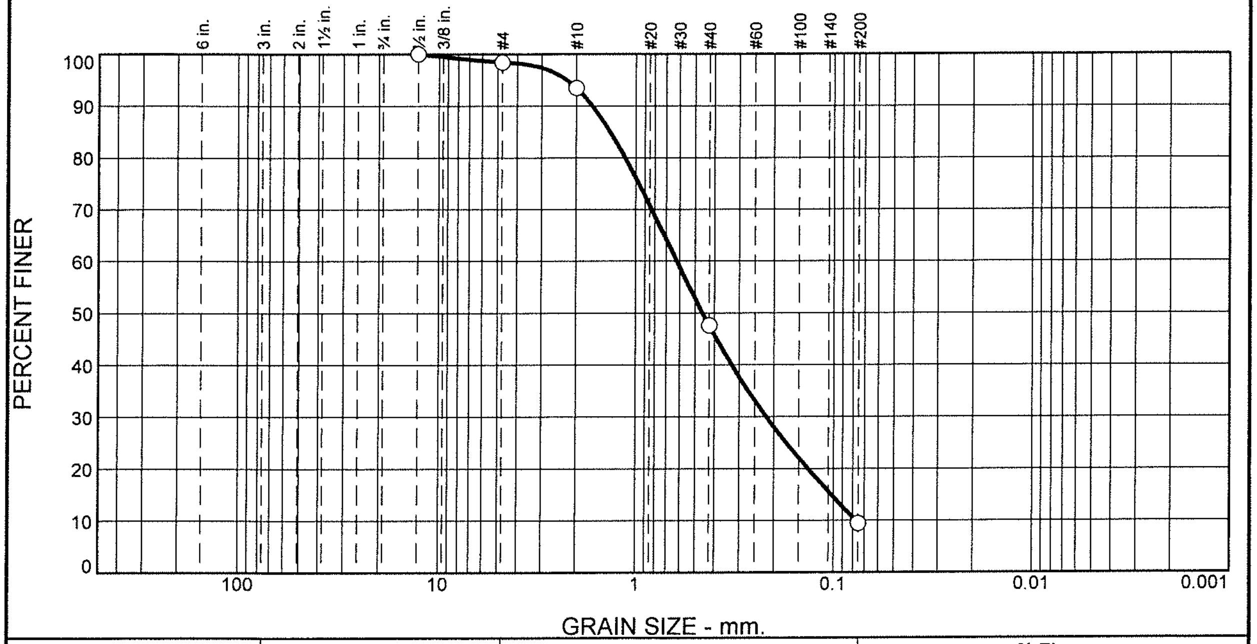
ATLANTIC TESTING LABORATORIES

Particle Size Distribution Report

Project: Champlain Hudson Power Express United Cable Install **Report No.:** CD10279E-01-01-22

Client: Kiewit Intrastructure Co. **Date:** 01/31/22

Sample No: K-122.35, S-15 **Source of Sample:** Boring Sample
Location: In-place **Elev./Depth:** 54-56'



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	0	2	5	45	39	9	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	OUT OF SPEC. (X)
1/2"	100		
#4	98		
#10	93		
#40	48		
#200	9.4		

* (no specification provided)

Soil Description

Blackish Grey c-mf SAND; trace SILT; trace f GRAVEL

Atterberg Limits

PL= NP LL= NP PI= NP

Coefficients

D_{85}= 1.3516 D_{60}= 0.6206 D_{50}= 0.4596
D_{30}= 0.2184 D_{15}= 0.1026 D_{10}= 0.0774
C_u= 8.02 C_c= 0.99

Classification

USCS= SP-SM AASHTO= A-1-b

Remarks

Moisture Content= 27.2%

Figure

ATLANTIC TESTING LABORATORIES, LIMITED

Reviewed by: Kyp

Date: 01/31/22

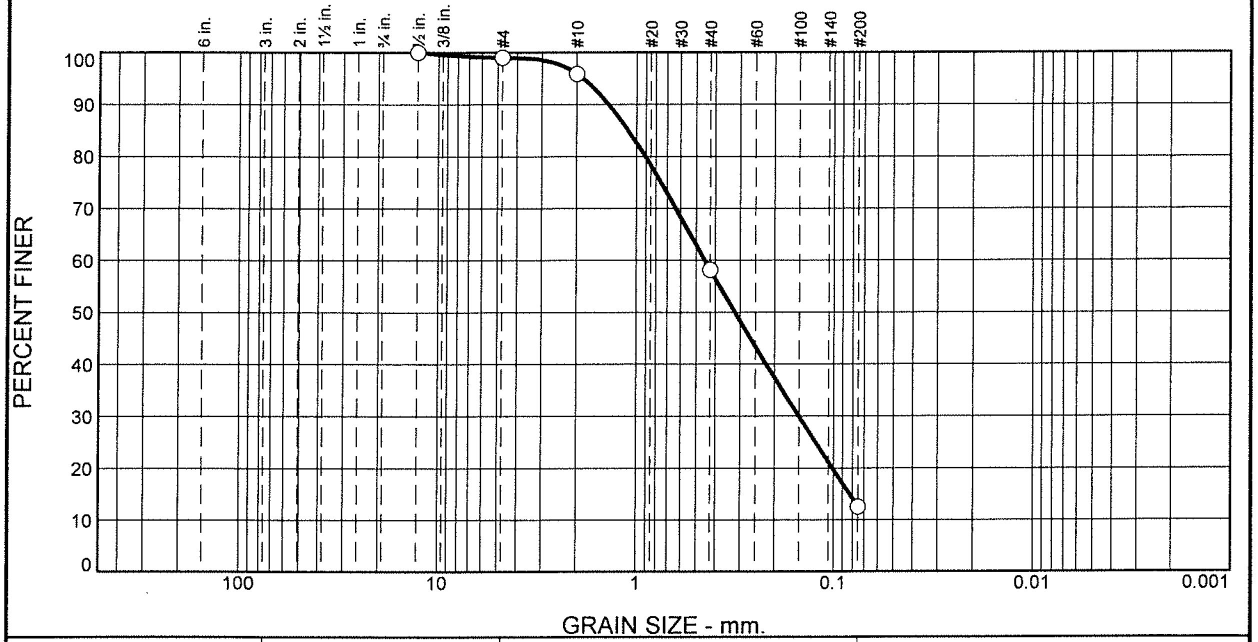
ATLANTIC TESTING LABORATORIES

Particle Size Distribution Report

Project: Champlain Hudson Power Express United Cable Install **Report No.:** CD10279E-01-01-22

Client: Kiewit Intrastructure Co. **Date:** 01/31/22

Sample No: K-122.35, S-8 **Source of Sample:** Boring Sample
Location: In-place **Elev./Depth:** 24-26'



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	0	1	3	38	45	13	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	OUT OF SPEC. (X)
1/2"	100		
#4	99		
#10	96		
#40	58		
#200	13		

Soil Description

Brown c-mf SAND; little SILT; trace f GRAVEL

Atterberg Limits

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

Coefficients

D_{85}= 1.1029 D_{60}= 0.4528 D_{50}= 0.3190
D_{30}= 0.1503 D_{15}= 0.0829 D_{10}=
C_u= C_c=

Classification

USCS= AASHTO=

Remarks

Moisture Content= 23.8%

* (no specification provided)

Figure

ATLANTIC TESTING LABORATORIES, LIMITED

Reviewed by: Date: 01/31/22

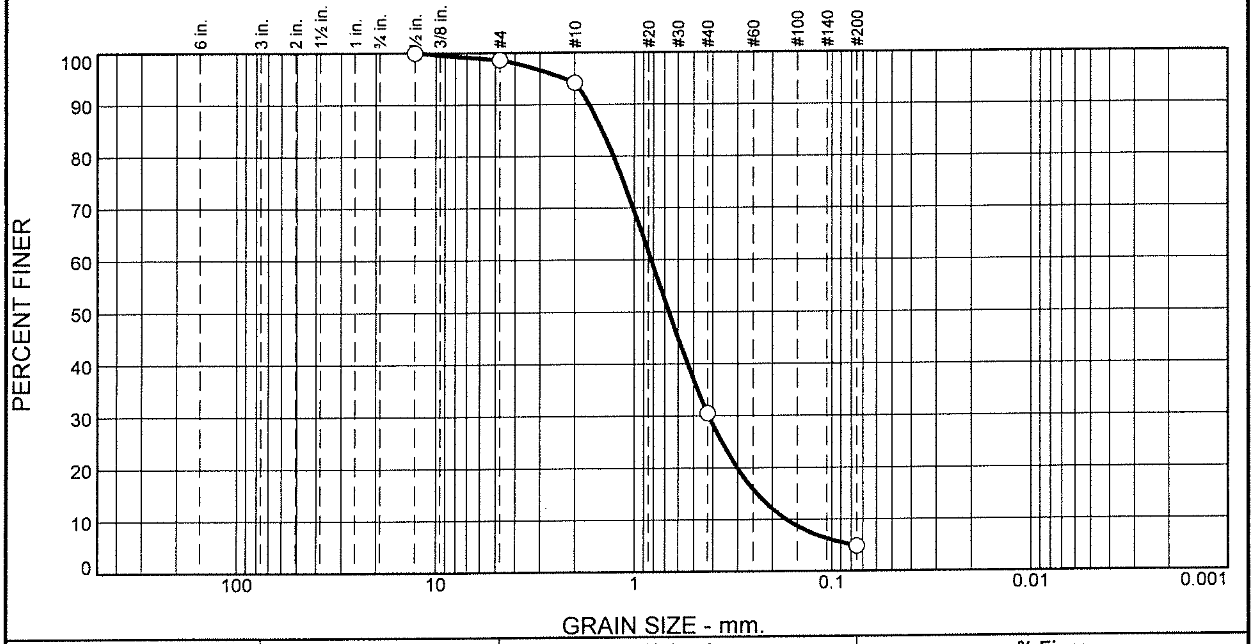
ATLANTIC TESTING LABORATORIES

Particle Size Distribution Report

Project: Champlain Hudson Power Express United Cable Install **Report No.:** CD10279E-01-01-22

Client: Kiewit Intrastructure Co. **Date:** 01/31/22

Sample No: K-122.35, S-12 **Source of Sample:** Boring Sample
Location: In-place **Elev./Depth:** 39-41'



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	0	1	5	63	26	5	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	OUT OF SPEC. (X)
1/2"	100		
#4	99		
#10	94		
#40	31		
#200	4.8		

Soil Description

Black c-m+f SAND; trace SILT; trace f GRAVEL

Atterberg Limits

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

Coefficients

D_{85}= 1.4553 D_{60}= 0.8225 D_{50}= 0.6676
D_{30}= 0.4187 D_{15}= 0.2390 D_{10}= 0.1699
C_u= 4.84 C_c= 1.25

Classification

USCS= SP AASHTO=

Remarks

Moisture Content= 17.8%

* (no specification provided)

Figure

ATLANTIC TESTING LABORATORIES, LIMITED

Reviewed by:

Date: 01/31/22

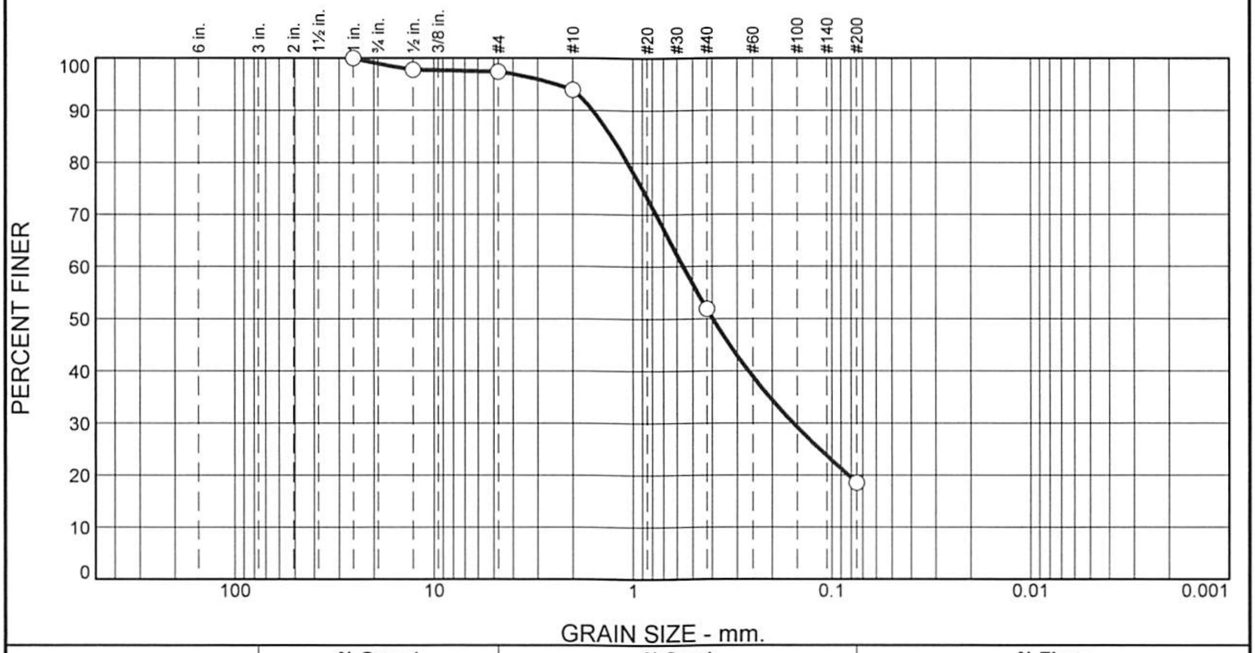
ATLANTIC TESTING LABORATORIES

Particle Size Distribution Report

Project: Champlain Hudson Power Express United Cable Install **Report No.:** CD10279E-02-02-22

Client: Kiewit Intrastructure Co. **Date:** 02/07/22

Sample No: K-122.4, S-13 **Source of Sample:** Boring Sample
Location: In-place **Elev./Depth:** 49-51'



% Cobbles	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	1	2	3	42	33	19	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	OUT OF SPEC. (X)
1"	100		
1/2"	98		
#4	97		
#10	94		
#40	52		
#200	19		

Soil Description

Greyish Black c-mf SAND; little SILT; trace mf GRAVEL

Atterberg Limits

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

Coefficients

D_{85}= 1.2811 D_{60}= 0.5586 D_{50}= 0.3970
D_{30}= 0.1564 D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= AASHTO=

Remarks

Moisture Content= 21.7%

* (no specification provided)

Figure

ATLANTIC TESTING LABORATORIES, LIMITED

Reviewed by:

Date: 02/07/22

ATLANTIC TESTING LABORATORIES

WBE certified company

AMOUNT OF MATERIAL IN SOILS FINER THAN THE NO. 200 SIEVE
ASTM D 1140

PROJECT INFORMATION

Client:	Kiewit Intrastructure Co.	**ATL Report No.:**	CD10279E-02-02-22
Project:	Champlain Hudson Power Express	**Report Date:**	February 7, 2022
	United Cable Installation	**Test Date:**	February 3, 2022
	Various Locations, New York	**Performed By:**	M. White

TEST DATA

Boring No.	Sample No.	Depth (ft)	Method (A or B)	Soak Time (min)	Initial Dry Weight (g)	% Finer than #200
K-117.6-1.6A	S-8	28-30	A	10	672.08	70
K-122.4	S-5	8-10	A	10	339.75	57
K-125.6	ST-1	28-30	A	10	257.41	100
K-127.9	S-4	6-8	A	10	164.08	95
K-127.9	ST-1	38-40	A	10	392.67	100
K-128.0	S-7	19-21	A	10	163.31	100
K-128.0	ST-1	38-40	A	10	216.36	100
K-129.9A	S-5	8-10	A	10	136.68	24
K-129.9A	ST-1	41-43	A	10	240.79	100
K-129.9B	ST-1	27-29	A	10	186.13	100

Reviewed By: ______________________ Date: February 7, 2022

LIQUID LIMIT, PLASTIC LIMIT, AND PLASTICITY INDEX OF SOIL
ASTM D 4318

PROJECT INFORMATION

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

ATL Report No.: CD10279E-01-01-22
Report Date: January 31, 2022
Date Received: January 25, 2022

TEST DATA

Boring No.	Sample No.	LL	PL	PI
K-122.35	S-3	NP	NP	NP
K-122.35	S-15	NP	NP	NP
K-123.2	S-6	48	20	28
K-123.2	S-10	67	21	46
K-123.7	S-6	79	23	56
K-123.7	S-9	73	20	53
K-123.8	S-6	54	23	31
K-123.8	S-9	67	18	49
K-125.5	S-3	NP	NP	NP
K-125.5	S-9	70	21	49
K-127.0	S-4	51	22	29
K-127.0	S-9	72	20	52
K-127.1	S-3	34	22	12
K-127.1	S-9	68	19	49

SAMPLE INFORMATION

Boring No.	Sample No.	Maximum Grain Size (mm)	Estimated Amount of Sample Retained on No. 40 Sieve (%)	As Received Moisture Content (%)
K-122.35	S-3	2	5	23.5
K-122.35	S-15	4.76	52	27.2
K-123.2	S-6	2	1	28.4
K-123.2	S-10	6.35	1	65.5
K-123.7	S-6	0.297	0	25.9
K-123.7	S-9	0.297	0	48.4
K-123.8	S-6	2	7	66.5
K-123.8	S-9	0.297	0	37.2
K-125.5	S-3	2	5	21.4
K-125.5	S-9	9.51	2	38.0
K-127.0	S-4	2	2	31.2
K-127.0	S-9	9.51	2	81.7
K-127.1	S-3	6.35	24	30.7
K-127.1	S-9	2	1	58.0

PREPARATION INFORMATION

Boring No.	Sample No.	Preparation	Method of Removing Oversized Material
K-122.35	S-3	Air Dry	Pulverizing and Screening
K-122.35	S-15	Air Dry	Pulverizing and Screening
K-123.2	S-6	Air Dry	Pulverizing and Screening
K-123.2	S-10	Air Dry	Pulverizing and Screening
K-123.7	S-6	Air Dry	Not Necessary
K-123.7	S-9	Air Dry	Not Necessary
K-123.8	S-6	Air Dry	Pulverizing and Screening
K-123.8	S-9	Air Dry	Not Necessary
K-125.5	S-3	Air Dry	Pulverizing and Screening
K-125.5	S-9	Air Dry	Pulverizing and Screening
K-127.0	S-4	Air Dry	Pulverizing and Screening
K-127.0	S-9	Air Dry	Pulverizing and Screening
K-127.1	S-3	Air Dry	Pulverizing and Screening
K-127.1	S-9	Air Dry	Pulverizing and Screening

EQUIPMENT INFORMATION

Liquid Limit Procedure:	Multipoint - Method A	☒	Single Point - Method B	☐
Liquid Limit Apparatus:	Manual	☒	Motor Driven	☐
Liquid Limit Grooving Tool Material:	Plastic	☒	Metal	☐
Liquid Limit Grooving Tool Shape:	Flat	☒	Curved (AASHTO Only)	☐
Plastic Limit:	Hand Rolled	☒	Mechanical Rolling Device	☐

Reviewed By: ______________________

Date: 01/31/22

LIQUID LIMIT, PLASTIC LIMIT, AND PLASTICITY INDEX OF SOIL
ASTM D 4318

PROJECT INFORMATION

Client:	Kiewit Instrastructure Co.	**ATL Report No.:**	CD10279E-02-02-22
Project:	Champlain Hudson Power Express	**Report Date:**	February 7, 2022
	United Cable Installation	**Date Received:**	February 1, 2022
	Various Locations, New York		

TEST DATA

Boring No.	Sample No.	LL	PL	PI
K-117.6-1.6A	S-6	46	20	26
K-117.6-1.6A	S-8	47	19	28
K-122.4	S-5	NP	NP	NP
K-125.6	S-5	50	22	28
K-125.6	ST-1	60	20	40
K-127.9	S-4	70	25	45
K-127.9	ST-1	30	17	13
K-128.0	S-7	78	23	55
K-128.0	ST-1	43	18	25
K-129.9A	S-5	NP	NP	NP
K-129.9A	ST-1	44	20	24
K-129.9B	S-6	96	49	47
K-129.9B	ST-1	55	20	35

SAMPLE INFORMATION

Boring No.	Sample No.	Maximum Grain Size (mm)	Estimated Amount of Sample Retained on No. 40 Sieve (%)	As Received Moisture Content (%)
K-117.6-1.6A	S-6	4.76	19	25.3
K-117.6-1.6A	S-8	6.35	28	33.3
K-122.4	S-5	2	5	24.8
K-125.6	S-5	0.42	2	24.7
K-125.6	ST-1	0.177	0	49.4
K-127.9	S-4	2	13	30.0
K-127.9	ST-1	0.177	0	30.0
K-128.0	S-7	0.149	0	39.2
K-128.0	ST-1	0.177	0	51.2
K-129.9A	S-5	2	25	134.2
K-129.9A	ST-1	0.177	0	40.5
K-129.9B	S-6	0.841	9	88.0
K-129.9B	ST-1	0.177	0	51.2

Client: Kiewit Instrastructure Co.
Project: Champlain Hudson Power Express

ATL Report No. CD10279E-02-02-22
Date: February 7, 2022

PREPARATION INFORMATION

Boring No.	Sample No.	Preparation	Method of Removing Oversized Material
K-117.6-1.6A	S-6	Air Dry	Pulverizing and Screening
K-117.6-1.6A	S-8	Air Dry	Pulverizing and Screening
K-122.4	S-5	Air Dry	Pulverizing and Screening
K-125.6	S-5	Air Dry	Pulverizing and Screening
K-125.6	ST-1	Air Dry	Not Necessary
K-127.9	S-4	Air Dry	Pulverizing and Screening
K-127.9	ST-1	Air Dry	Not Necessary
K-128.0	S-7	Air Dry	Not Necessary
K-128.0	ST-1	Air Dry	Not Necessary
K-129.9A	S-5	Air Dry	Pulverizing and Screening
K-129.9A	ST-1	Air Dry	Not Necessary
K-129.9B	S-6	Air Dry	Pulverizing and Screening
K-129.9B	ST-1	Air Dry	Not Necessary

EQUIPMENT INFORMATION

Liquid Limit Procedure:	Multipoint - Method A	☒	Single Point - Method B	☐
Liquid Limit Apparatus:	Manual	☒	Motor Driven	☐
Liquid Limit Grooving Tool Material:	Plastic	☒	Metal	☐
Liquid Limit Grooving Tool Shape:	Flat	☒	Curved (AASHTO Only)	☐
Plastic Limit:	Hand Rolled	☒	Mechanical Rolling Device	☐

Reviewed By: ____________________

Date: 02/07/22

ATLANTIC TESTING LABORATORIES

WBE certified company

PROJECT INFORMATION

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

ATL Report No.: CD10279E-01-01-22
Report Date: January 31, 2022
Date Received: January 25, 2022

PERCENT ORGANICS, ASH CONTENT, AND MOISTURE CONTENT

ASTM D 2974

Boring No.	Sample No.	Organics (%)	Ash (%)	Moisture (%)	Test Method	Furnace Temperature (°C)
K-122.35	S-4	4.5	95.5	22.8	A	440
K-123.7	S-3	7.5	92.5	41.4	A	440
K-123.8	S-6	6.9	93.1	66.5	A	440
K-127.1	S-3	4.5	95.5	30.7	A	440

Reviewed By: ____________________

Date: 01/31/22

Kiewit

MEMORANDUM

DATE: September 23, 2022

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 3 - HDD Crossing 14.A – Revision 1
Champlain Hudson Power Express Project
Fort Ann, 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 south of Fort Ann, New York. The approximate station for the start of HDD crossing Number 14.A is STA 20331+00 (43.405228° N, 73.485808° W).

The geotechnical data at this HDD crossing is attached. The available data is from the recent investigation by Atlantic Testing Laboratories, referenced below.

- Atlantic Testing Laboratories, Geotechnical Data Report, Champlain Hudson Power Express, dated April 12, 2022.

Contact us if you have questions or require additional information.

HDD 14.A
Borings K-123.7, K123.8
Segment 3

CHPE Segment 3 - Package 2
HDD Soil Boring Coordinates and Elevations

Firm	Boring	Northing (feet)	Easting (feet)	Ground Surface Elevation (feet)
TRC*	B122.4-1	1673988.1	762589.1	134.0
	B123.1-1	1670533.1	761581.7	134.0
	B127.6-1	1650236.9	759369.7	143.0
	B130.8-1	1633732.2	749229.1	144.0
	B131.5-1	1630565.5	746543.8	148.0
AECOM**	WFE-2	1693039.7	776227.9	125.9
	WFE-6	1683884.0	771830.6	128.7
	WFE-6A	1683645.5	771707.7	129.0
	WFE-7	1683295.0	771591.2	128.7
	WFE-9	1677994.3	769427.4	133.9
	WFE-9A	1678043.5	769246.8	140.2
	WFE-9B	1676842.4	767745.7	141.7
	WFE-12	1657680.6	760822.6	135.3
	WFE-16	1645866.1	757602.8	145.2
	WFE-18	1637293.5	752138.0	143.6
	WFE-18A	1630756.2	746790.9	144.9
	WFE-19	1628651.1	745226.2	139.1
	WFE-19A	1625848.4	743218.4	139.0

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.

*** 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.

Boring Location Plans

Page 6 of 12

Drawn by: ADW

Scale: Not to scale

Project No.: CD10279

Date: March 2022

Champlain Hudson Power Express
Design Package 2
Whitehall to Glens Falls, 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-01-03-22**

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

Boring Location: **See Boring Location Plan**

Project: **Subsurface Investigation**
Champlain Hudson Power Express, Design Package 2
Various Locations, New York

Start Date: **1/20/2022** Finish Date: **1/20/2022**

Boring No.: **K-123.7** Sheet **1** of **2**

Coordinates
Northing **761644.556**
Easting **1667254.963**

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

Ground Elev.: **135.778**

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

Groundwater Observations

Date	Time	Depth	Casing
1/20/2022	AM	DRY	OPEN
1/20/2022	AM	3.5'	9.0'
1/20/2022	AM	*13.0'	9.0'
1/20/2022	AM	*14.4'	9.0'

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

f - fine
m - medium
c - coarse

and - 35-50%
some - 20-35%
little - 10-20%
trace - 0-10%

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	Recovery (Inches)
0 1	CASING	1	0.0	2.0	SS	8 4 5 4	0.2 0.8 1.0 2.0	2" TOPSOIL & ORGANIC MATERIAL Brownish-Black mf SAND; little SILT (frozen, non-plastic) SM FILL	19
2 3		2	2.0	4.0	SS	6 6 5 5	3.4	Black DEBRIS (cinders) FILL Brown f GRAVEL; and cmf SAND; trace SILT (wet, non-plastic) GP Possible FILL	15
4 5		3	4.0	6.0	SS	2 1 2 2		Orangish-Brown mf SAND; and SILT (wet, non-plastic) SM Possible FILL	10
6 7		4	6.0	8.0	SS	3 6 4 5		Grey CLAY; trace SILT (wet, plastic) CH	11
8 9 10 11 12 13	WET ROTARY	5	8.0	10.0	SS	1 4 5 7		Mottled Blackish-Grey CLAY; trace SILT; trace f SAND; trace ORGANIC MATERIAL (roots) (saturated, plastic) CH w = 41.4%, OC = 7.5% Bluish-Grey CLAY; trace SILT (saturated, plastic) CH Mottled Orangish-Grey CLAY; trace SILT (saturated, plastic) CH Advanced casing to 9.0 feet and began advancing 3 7/8" tri-cone roller bit wet rotary open hole within the borehole.	20
14 15 16 17 18		6	14.0	16.0	SS	3 3 4 5		Mottled Orangish-Grey CLAY; trace SILT (saturated, plastic) CH w = 25.9%, LL = 79, PL = 23, PI = 56 % Fines = 100.0%	22
19 20 21 22 23		7	19.0	21.0	SS	1 2 4 4		Grey Similar Soil (saturated, plastic) CH	23
24 25		8	24.0	26.0	SS	2 2 4 4		Mottled Orangish-Brownish-Grey CLAY; trace SILT (saturated,	24

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

Drillers: **Mark Childs; John Trathen**

Inspector: **Tom Hunter (ATL); Tom Kimmins (Kiewit)**

ATLANTIC TESTING LABORATORIES, Limited

Subsurface Investigation

Boring No.: **K-123.7**

Report No.: **CD10279D-01-03-22**

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)
								plastic) CH	
26									
27									
28		9	28.0	30.0	SS	4 5 6 8		(3" Brass Lined Split Spoon) Grey CLAY; trace SILT (saturated, plastic) CH w = 48.4%, LL = 73, PL = 20, PI = 53 % Fines = 100.0%	24
29									
30									
31									
32									
33									
34		10	34.0	36.0	SS	2 3 3 5		Grey CLAY; trace SILT (saturated, plastic) CH	24
35									
36									
37									
38									
39									
40		11	40.0	42.0	SS	WH/12" 2 4		Similar Soil (saturated, plastic) CH w = 37.3%	24
41							42.0		
42									
43								Boring terminated at 42.0 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 CME 45 Trailer (Rig Unit No. CDGV429) drill rig.	
44									
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ATLANTIC TESTING LABORATORIES, Limited

Subsurface Investigation

Report No.: **CD10279D-01-03-22**

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

Boring Location: **See Boring Location Plan**

Project: **Subsurface Investigation**
Champlain Hudson Power Express, Design Package 2
Various Locations, New York

Start Date: **1/20/2022** Finish Date: **1/20/2022**

Boring No.: **K-123.8** Sheet **1** of **2**

Coordinates
Northing **761589.137**
Easting **1666853.935**

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

Ground Elev.: **135.861**

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

Groundwater Observations

Date	Time	Depth	Casing
1/20/2022	PM	DRY	OPEN
1/20/2022	PM	7.3'	9.0'
1/20/2022	PM	*8.9'	9.0'
1/20/2022	PM	*13.1'	9.0'

***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	Recovery (Inches)
0–2	CASING	1	0.0	2.0	SS	15 8 2 1	0.2 2.0	2" TOPSOIL & ORGANIC MATERIAL Brownish-Black cmf SAND; little mf GRAVEL; trace DEBRIS (cinders); trace SILT (frozen, non-plastic) SW FILL	11
2–4		2	2.0	4.0	SS	3 1 1 1		Orangish-Brown f SAND; trace SILT (saturated, non-plastic) SP	14
4–6		3	4.0	6.0	SS	1 1 2 2		Orangish-Brown cmf+ SAND; little SILT (saturated, non-plastic) SM w = 18.1% % Fines = 16.0%	7
6–8		4	6.0	8.0	SS	10 6 2 1	7.4 8.0	Orangish-Brown cmf+ SAND; little SILT (saturated, non-plastic) SM	6
8–10	WET ROTARY	5	8.0	10.0	SS	1 1 2 1		Blackish-Brown cmf SAND; some cmf GRAVEL; trace SILT (saturated, non-plastic) SW COBBLE Fragments Orangish-Greyish-Brown CLAY; trace SILT (saturated, plastic) CH	10
10–14								Advanced casing to 9.0 feet and began advancing 3 7/8" tri-cone roller bit wet rotary open hole within the borehole.	
14–16		6	14.0	16.0	SS	WH/18" 1		Blackish-Grey CLAY; little SILT; trace f SAND; trace ORGANIC MATERIAL (root hairs, wood fragments) (saturated, plastic) CH w = 66.5%, LL = 54, PL = 23, PI = 31, OC = 6.9%	17
16–19									
19–21		7	19.0	21.0	SS	1 3 4 5		Mottled Orangish-Greyish-Brown CLAY; trace SILT (saturated, plastic) CH	22
21–24									
24–25		8	24.0	26.0	SS	1 3 3 4		Similar Soil (saturated, plastic) CH	24

f - fine
m - medium
c - coarse

and - 35-50%
some - 20-35%
little - 10-20%
trace - 0-10%

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

Drillers: **Mark Childs; John Trathen**

Inspector: **Tom Hunter (ATL); Tom Kimmins (Kiewit)**

ATLANTIC TESTING LABORATORIES, Limited

Subsurface Investigation

Boring No.: **K-123.8** Report No.: **CD10279D-01-03-22** 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									
27									
28		9	28.0	30.0	SS	4 5 7 8		(3" Brass Lined Split Spoon) Similar Soil (saturated, plastic) CH w = 37.2%, LL = 67, PL = 18, PI = 49 % Fines = 100.0%	24
29									
30									
31									
32									
33									
34		10	34.0	36.0	SS	1 3 3 5		Bluish-Grey CLAY; trace SILT (saturated, plastic) CH	24
35									
36									
37									
38									
39									
40		11	40.0	42.0	SS	1 1 3 3		Similar Soil (saturated, plastic) CH w = 33.5%	24
41									
42							42.0		
43								Boring terminated at 42.0 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 CME 45 Trailer (Rig Unit No. CDGV429) drill rig.	
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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								
	S-12	39.0 - 41.0	Black c-m+f SAND; trace SILT; trace f GRAVEL	4.8	17.8	--	--	--	--	--	--	--	--	--	--	--
	S-15	54.0 - 56.0	Blackish-Grey c-mf+ SAND; trace SILT; trace f GRAVEL	9.4	27.2	NP	NP	NP	--	--	--	--	--	--	--	--
K-122.4	S-5	8.0 - 10.0	Brown SILT; and mf- SAND	57.0	24.8	NP	NP	NP	--	--	--	--	--	--	--	--
	S-9	29.0 - 31.0	Grey mf+ SAND; trace SILT	--	17.5	--	--	--	--	--	--	--	--	--	--	--
	S-13	49.0 - 51.0	Greyish-Black c-mf SAND; little SILT; trace mf GRAVEL	19.0	21.7	--	--	--	--	--	--	--	--	--	--	--
	S-16	58.0 - 60.0	Greyish-Black cm+f SAND; trace SILT	1.7	9.9	--	--	--	--	--	--	--	--	--	--	--
K-123.2	S-3	4.0 - 6.0	Brown SILT; little mf SAND; trace CLAY	--	22.3	--	--	--	--	--	--	--	--	--	--	--
	S-4	6.0 - 8.0	Brown f SAND; some SILT	--	31.3	--	--	--	--	--	--	--	--	--	--	--
	S-6	10.0 - 12.0	Grey CLAY; little SILT; trace f SAND	--	28.4	48	20	28	--	--	--	--	--	--	--	--
	S-8	19.0 - 21.0	Grey c-m+f SAND; trace SILT	10.0	29.8	--	--	--	--	--	--	--	--	--	--	--
	S-10	28.0 - 30.0	Grey CLAY; little SILT; trace f SAND	97.0	65.5	67	21	46	--	--	--	--	--	--	--	--
	ST-1	30.0 - 32.0	Grey CLAY; little SILT; trace f SAND	--	--	--	--	--	--	1,400	15	8.24	5,418	--	--	--
K-123.7	S-3	4.0 - 6.0	Mottled Blackish-Grey CLAY; trace SILT; trace f SAND; trace ORGANIC MATERIAL (roots)	--	41.4	--	--	--	7.5	--	--	--	--	--	--	--
	S-6	14.0 - 16.0	Mottled Orangish-Grey CLAY; trace SILT	100.0	25.9	79	23	56	--	--	--	--	--	--	--	--
	S-9	28.0 - 30.0	Grey CLAY; trace SILT	100.0	48.4	73	20	53	--	--	--	--	--	--	--	--
	S-11	40.0 - 42.0	Grey CLAY; trace SILT	--	37.3	--	--	--	--	--	--	--	--	--	--	--
K-123.8	S-3	4.0 - 6.0	Orangish-Brown cmf+ SAND; little SILT	16.0	18.1	--	--	--	--	--	--	--	--	--	--	--
	S-6	14.0 - 16.0	Blackish-Grey CLAY; little SILT; trace f SAND; trace ORGANIC MATERIAL (root hairs, wood fragments)	--	66.5	54	23	31	6.9	--	--	--	--	--	--	--
	S-9	28.0 - 30.0	Mottled Orangish-Greyish-Brown CLAY; trace SILT	100.0	37.2	67	18	49	--	--	--	--	--	--	--	--
	S-11	40.0 - 42.0	Bluish-Grey CLAY; trace SILT	--	33.5	--	--	--	--	--	--	--	--	--	--	--
K-125.5	S-3	4.0 - 6.0	Orangish-Brown SILT; trace f SAND	--	21.4	NP	NP	NP	--	--	--	--	--	--	--	--
	S-5	8.0 - 10.0	Grey CLAY; trace SILT	--	27.5	--	--	--	--	--	--	--	--	--	--	--
	S-6	14.0 - 16.0	Greyish-Black mf+ SAND; trace SILT	7.7	--	--	--	--	--	--	--	--	--	--	--	--
	S-7	19.0 - 21.0	Grey CLAY; trace SILT	--	51.5	--	--	--	--	--	--	--	--	--	--	--
	S-9	28.0 - 30.0	Grey CLAY; trace SILT; trace mf SAND	94.0	38.0	70	21	49	--	--	--	--	--	--	--	--

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-01-01-22
Report Date: January 31, 2022
Date Received: January 25, 2022

TEST DATA

Boring No.	Sample No.	Depth (ft)	Moisture Content (%)
K-122.35	S-3	4-6	23.5
	S-8	24-26	23.8
	S-12	39-41	17.8
	S-15	54-56	27.2
K-123.2	S-3 [1]	4-6	22.3
	S-4	6-8	31.3
	S-6	10-12	28.4
	S-8	19-21	29.8
	S-10	28-30	65.5
K-123.7	S-3	4-6	41.4
	S-6	14-16	25.9
	S-9	28-30	48.4
	S-11	40-42	37.3
K-123.8	S-3	4-6	18.1
	S-6	14-16	66.5
	S-9	28-30	37.2
	S-11	40-42	33.5

TEST DATA (continued)

Boring No.	Sample No.	Depth (ft)	Moisture Content (%)
K-125.5	S-3	4-6	21.4
	S-5	8-10	27.5
	S-7	19-21	51.5
	S-9	28-30	38.0
K-127.0	S-3	4-6	32.8
	S-4	6-8	31.2
	S-6	14-16	22.8
	S-9	30-32	81.7
	S-11	39-41	63.9
K-127.1	S-3	4-6	30.7
	S-7	19-21	71.7
	S-9	30-32	58.0

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

Reviewed By: __________ Date: 01/31/22

ATLANTIC TESTING LABORATORIES

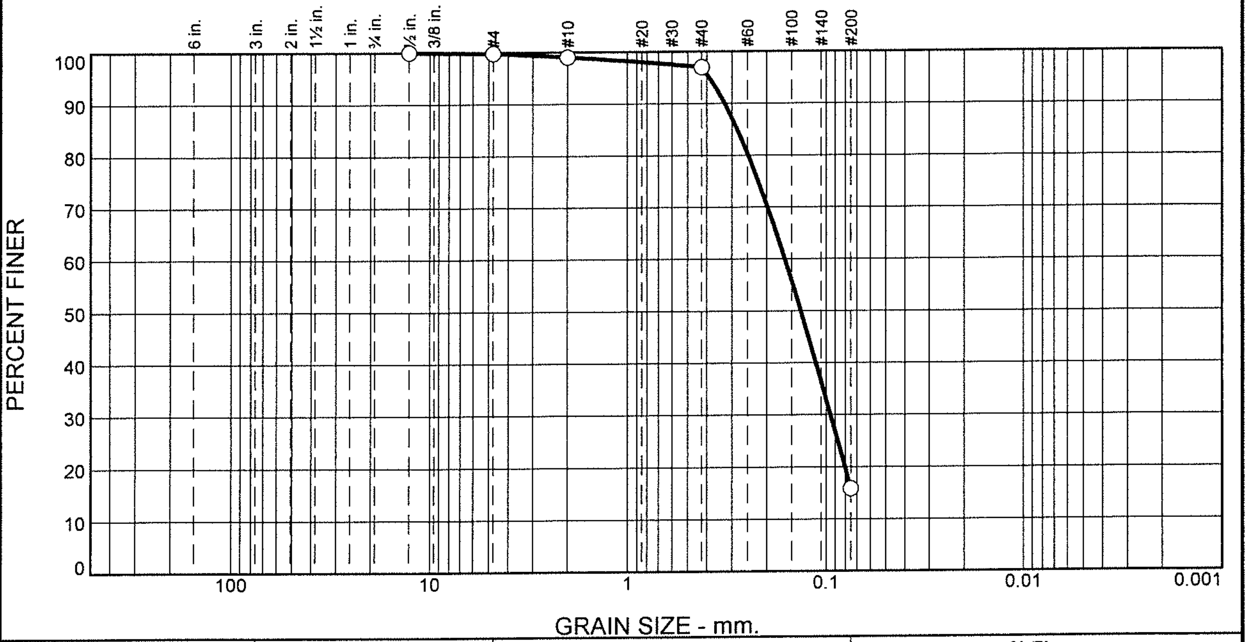
Particle Size Distribution Report

Project: Champlain Hudson Power Express United Cable Install **Report No.:** CD10279E-01-01-22

Client: Kiewit Intrastructure Co. **Date:** 01/31/22

Sample No: K-123.8, S-3 **Source of Sample:** Boring Sample

Location: In-place **Elev./Depth:** 4-6'



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	0	0	1	2	81	16	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	OUT OF SPEC. (X)
1/2"	100		
#4	100		
#10	99		
#40	97		
#200	16		

* (no specification provided)

Soil Description

Orangish Brown cmf+ SAND; little SILT

Atterberg Limits

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

Coefficients

D_{85}= 0.2819 D_{60}= 0.1622 D_{50}= 0.1347

D_{30}= 0.0951 D_{15}= D_{10}=

C_u= C_c=

Classification

USCS= AASHTO=

Remarks

Moisture Content= 18.1%

Figure

ATLANTIC TESTING LABORATORIES, LIMITED

Reviewed by:

Date: 01/31/22

ATLANTIC TESTING LABORATORIES

WBE certified company

AMOUNT OF MATERIAL IN SOILS FINER THAN THE NO. 200 SIEVE
ASTM D 1140

PROJECT INFORMATION

Client:	Kiewit Intrastructure Co.	**ATL Report No.:**	CD10279E-01-01-22
Project:	Champlain Hudson Power Express	**Report Date:**	January 31, 2022
	United Cable Installation	**Test Date:**	January 25, 2022
	Various Locations, New York	**Performed By:**	R. Parrow

TEST DATA

Boring No.	Sample No.	Depth (ft)	Method (A or B)	Soak Time (min)	Initial Dry Weight (g)	% Finer than #200
K-123.2	S-10	28-30	A	10	107.62	97
K-123.7	S-6	14-16	A	10	78.62	100
K-123.7	S-9	28-30	A	10	120.67	100
K-123.8	S-9	28-30	A	10	219.15	100
K-125.5	S-9	28-30	A	10	219.28	94
K-127.0	S-9	30-32	A	10	119.17	96
K-127.1	S-9	30-32	A	10	124.57	100

Reviewed By: ______________________ Date: January 31, 2022

LIQUID LIMIT, PLASTIC LIMIT, AND PLASTICITY INDEX OF SOIL
ASTM D 4318

PROJECT INFORMATION

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

ATL Report No.: CD10279E-01-01-22
Report Date: January 31, 2022
Date Received: January 25, 2022

TEST DATA

Boring No.	Sample No.	LL	PL	PI
K-122.35	S-3	NP	NP	NP
K-122.35	S-15	NP	NP	NP
K-123.2	S-6	48	20	28
K-123.2	S-10	67	21	46
K-123.7	S-6	79	23	56
K-123.7	S-9	73	20	53
K-123.8	S-6	54	23	31
K-123.8	S-9	67	18	49
K-125.5	S-3	NP	NP	NP
K-125.5	S-9	70	21	49
K-127.0	S-4	51	22	29
K-127.0	S-9	72	20	52
K-127.1	S-3	34	22	12
K-127.1	S-9	68	19	49

SAMPLE INFORMATION

Boring No.	Sample No.	Maximum Grain Size (mm)	Estimated Amount of Sample Retained on No. 40 Sieve (%)	As Received Moisture Content (%)
K-122.35	S-3	2	5	23.5
K-122.35	S-15	4.76	52	27.2
K-123.2	S-6	2	1	28.4
K-123.2	S-10	6.35	1	65.5
K-123.7	S-6	0.297	0	25.9
K-123.7	S-9	0.297	0	48.4
K-123.8	S-6	2	7	66.5
K-123.8	S-9	0.297	0	37.2
K-125.5	S-3	2	5	21.4
K-125.5	S-9	9.51	2	38.0
K-127.0	S-4	2	2	31.2
K-127.0	S-9	9.51	2	81.7
K-127.1	S-3	6.35	24	30.7
K-127.1	S-9	2	1	58.0

PREPARATION INFORMATION

Boring No.	Sample No.	Preparation	Method of Removing Oversized Material
K-122.35	S-3	Air Dry	Pulverizing and Screening
K-122.35	S-15	Air Dry	Pulverizing and Screening
K-123.2	S-6	Air Dry	Pulverizing and Screening
K-123.2	S-10	Air Dry	Pulverizing and Screening
K-123.7	S-6	Air Dry	Not Necessary
K-123.7	S-9	Air Dry	Not Necessary
K-123.8	S-6	Air Dry	Pulverizing and Screening
K-123.8	S-9	Air Dry	Not Necessary
K-125.5	S-3	Air Dry	Pulverizing and Screening
K-125.5	S-9	Air Dry	Pulverizing and Screening
K-127.0	S-4	Air Dry	Pulverizing and Screening
K-127.0	S-9	Air Dry	Pulverizing and Screening
K-127.1	S-3	Air Dry	Pulverizing and Screening
K-127.1	S-9	Air Dry	Pulverizing and Screening

EQUIPMENT INFORMATION

Liquid Limit Procedure:	Multipoint - Method A	X	Single Point - Method B	☐
Liquid Limit Apparatus:	Manual	X	Motor Driven	☐
Liquid Limit Grooving Tool Material:	Plastic	X	Metal	☐
Liquid Limit Grooving Tool Shape:	Flat	X	Curved (AASHTO Only)	☐
Plastic Limit:	Hand Rolled	X	Mechanical Rolling Device	☐

Reviewed By: ______________________ Date: 01/31/22

ATLANTIC TESTING LABORATORIES

WBE certified company

PROJECT INFORMATION

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

ATL Report No.: CD10279E-01-01-22
Report Date: January 31, 2022
Date Received: January 25, 2022

PERCENT ORGANICS, ASH CONTENT, AND MOISTURE CONTENT
ASTM D 2974

Boring No.	Sample No.	Organics (%)	Ash (%)	Moisture (%)	Test Method	Furnace Temperature (°C)
K-122.35	S-4	4.5	95.5	22.8	A	440
K-123.7	S-3	7.5	92.5	41.4	A	440
K-123.8	S-6	6.9	93.1	66.5	A	440
K-127.1	S-3	4.5	95.5	30.7	A	440

Reviewed By: ______________________

Date: 01/31/22

Kiewit

MEMORANDUM

DATE: September 23, 2022

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 3 - Package 2 - HDD Crossing 14 – Revision 1
Champlain Hudson Power Express Project
Fort Ann, 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 south of Fort Ann, New York. The approximate station for the start of HDD crossing Number 14 is STA 20292+00 (43.414530° N, 73.485734° W)

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

- TRC, Geotechnical Data Report, Champlain Hudson Power Express, Canadian Pacific Railway Borings MP 113.1-177.1, dated March 29, 2013.
- Atlantic Testing Laboratories, Subsurface Investigation Services, Champlain Hudson Power Express, Design Package 2, Whitehall to Glens Falls, New York, dated June 15, 2022.

Contact us if you have questions or require additional information.

HDD 14
Borings B123.1-1, K-123.2
Segment 3

CHPE Segment 3 - Package 2
HDD Soil Boring Coordinates and Elevations

Firm	Boring	Northing (feet)	Easting (feet)	Ground Surface Elevation (feet)
TRC*	B122.4-1	1673988.1	762589.1	134.0
	B123.1-1	1670533.1	761581.7	134.0
	B127.6-1	1650236.9	759369.7	143.0
	B130.8-1	1633732.2	749229.1	144.0
	B131.5-1	1630565.5	746543.8	148.0
AECOM**	WFE-2	1693039.7	776227.9	125.9
	WFE-6	1683884.0	771830.6	128.7
	WFE-6A	1683645.5	771707.7	129.0
	WFE-7	1683295.0	771591.2	128.7
	WFE-9	1677994.3	769427.4	133.9
	WFE-9A	1678043.5	769246.8	140.2
	WFE-9B	1676842.4	767745.7	141.7
	WFE-12	1657680.6	760822.6	135.3
	WFE-16	1645866.1	757602.8	145.2
	WFE-18	1637293.5	752138.0	143.6
	WFE-18A	1630756.2	746790.9	144.9
	WFE-19	1628651.1	745226.2	139.1
	WFE-19A	1625848.4	743218.4	139.0

Notes:

- Northings and Eastings are provided in NAD83 New York State Plane East Zone.
- Elevations are referenced to the NAVD88 datum.

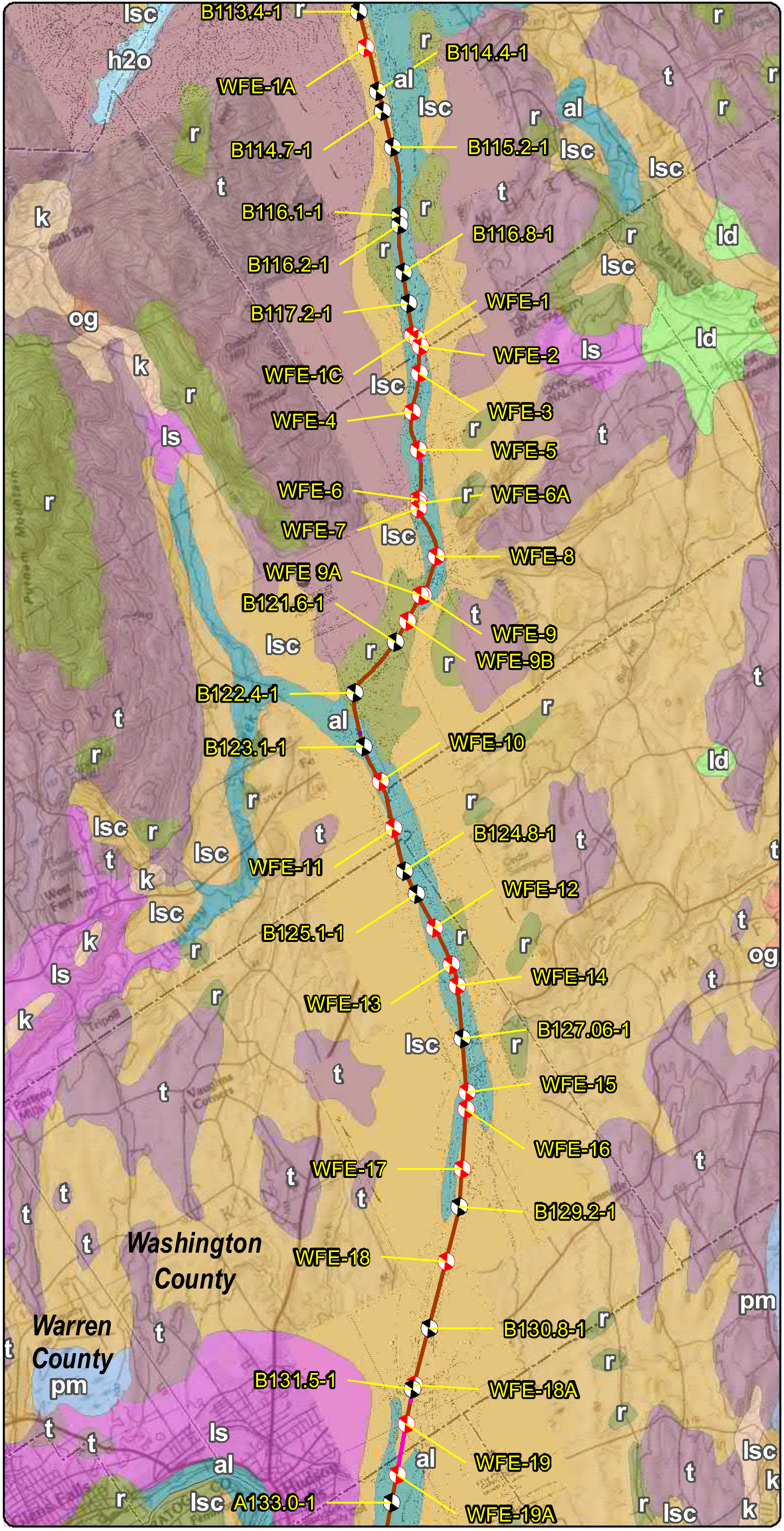
* TRC boring coordinates as shown in Table 1-6 in AECOM report (reference below). Boring elevations estimated from November 2021 topographic survey by Williams Aerial.

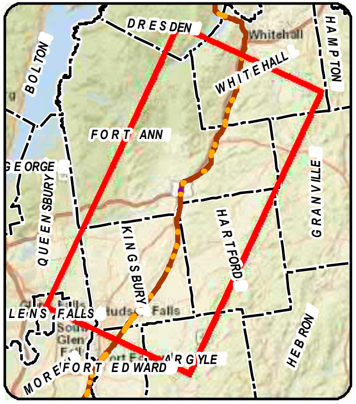
** AECOM boring coordinates and elevations as shown in Table 1-6 in AECOM report.

*** 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
- h2o - Water
- k - Kame deposits
- ld - Lacustrine delta
- ls - Lacustrine sand
- lsc - Lacustrine silt and clay
- og - Outwash sand and gravel
- pm - Swamp deposits
- r - Bedrock
- t - Till

N

1 0.5 0 1 Miles

Transmission Developers Inc.

Champlain Hudson Power Express Project

Champlain Hudson Power Express Inc.

Surficial Geology and Geotechnical Borings Whitehall to Fort Edward

Figure 3-3

Prepared on 5/5/2021
by: AECOM

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

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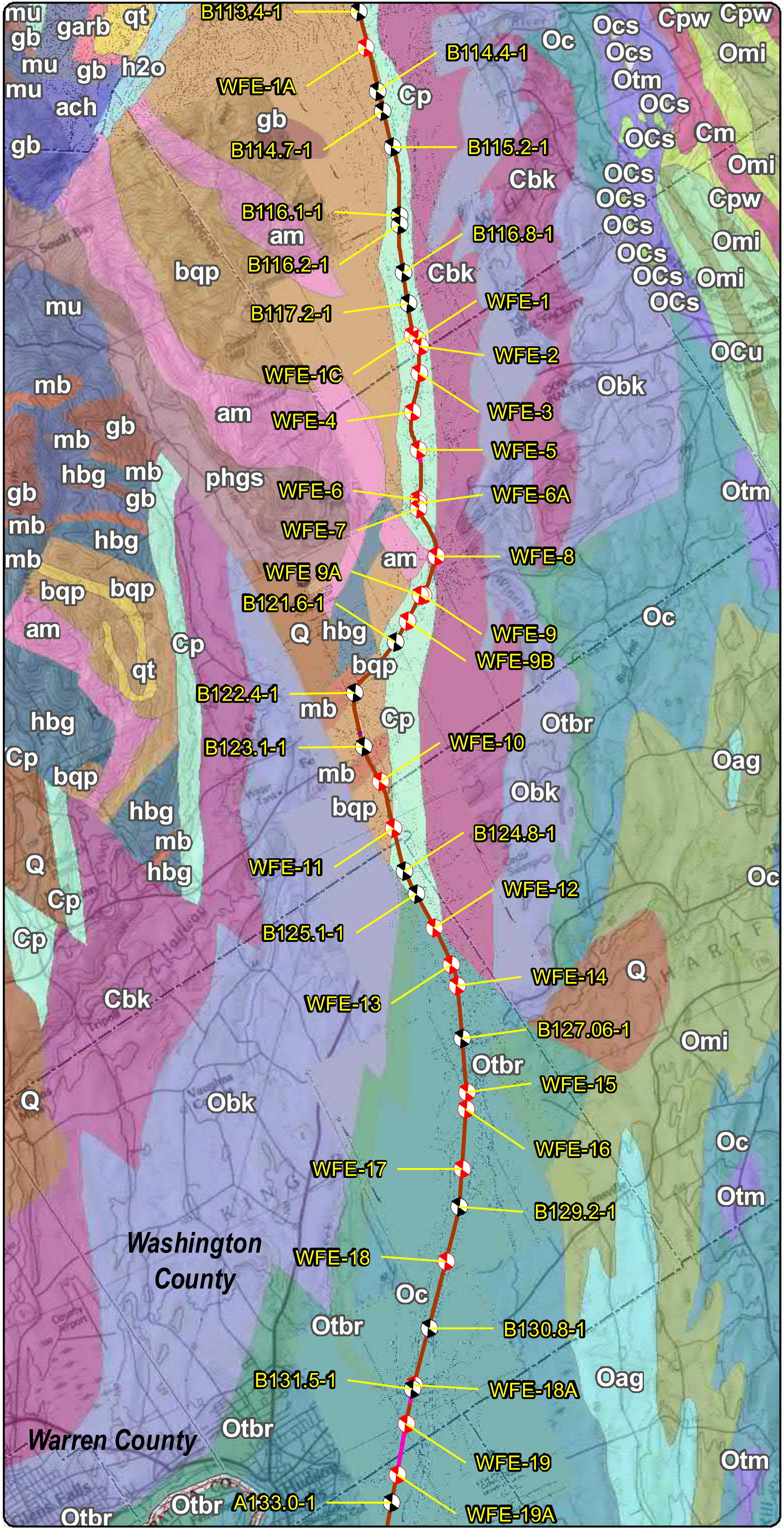

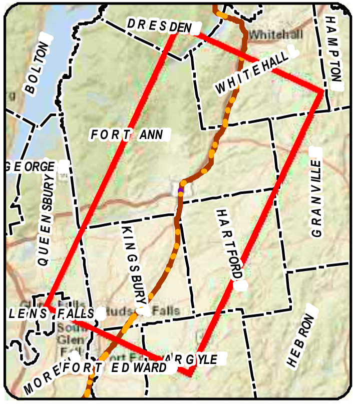

LEGEND

- 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

- Cbk - Beekmantown Group
- Cm - Mettawee Formation
- Cp - Potsdam Sandstone
- Cpw - Poultney Formation ("A" Member)
- No Label
- OCs - Cambrian-Middle Ordovician carbonate
- OCu - Undivided Ordovician and Cambrian
- Oag - Austin Glen Formation
- Obk - Beekmantown Group
- Oc - Canajoharie Shale
- Omi - Mount Merino Formation
- Op - Poultney Formation ("B" and "C")
- Otbr - Dolgeville Formation
- Otm - Taconic Melange
- Q - Glacial and Alluvial Deposits
- ach - metanorthosite and anorthositic
- am - Amphibolite, pyroxenic amphibolite
- bqp - Biotite-quartz-plagioclase
- garb - Quartz-feldspar paragneiss
- gb - Olivine metagabbro
- h2o - Water
- hbg - Biotite and or hornblende granite gneiss
- mb Calcitic and dolomitic marble
- mu - Undivided metased rock and migmatite
- phgs - Charnockite, granitic, quartz syenite
- qt - Quartzite

N

1 0.5 0 1 Miles

Transmission

Champlain Hudson Power Express Project

Champlain Hudson Power Express Inc.

Bedrock Geology and Geotechnical Borings Whitehall to Fort Edward Figure 4-3

Prepared on 5/5/2021
by: AECOM

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

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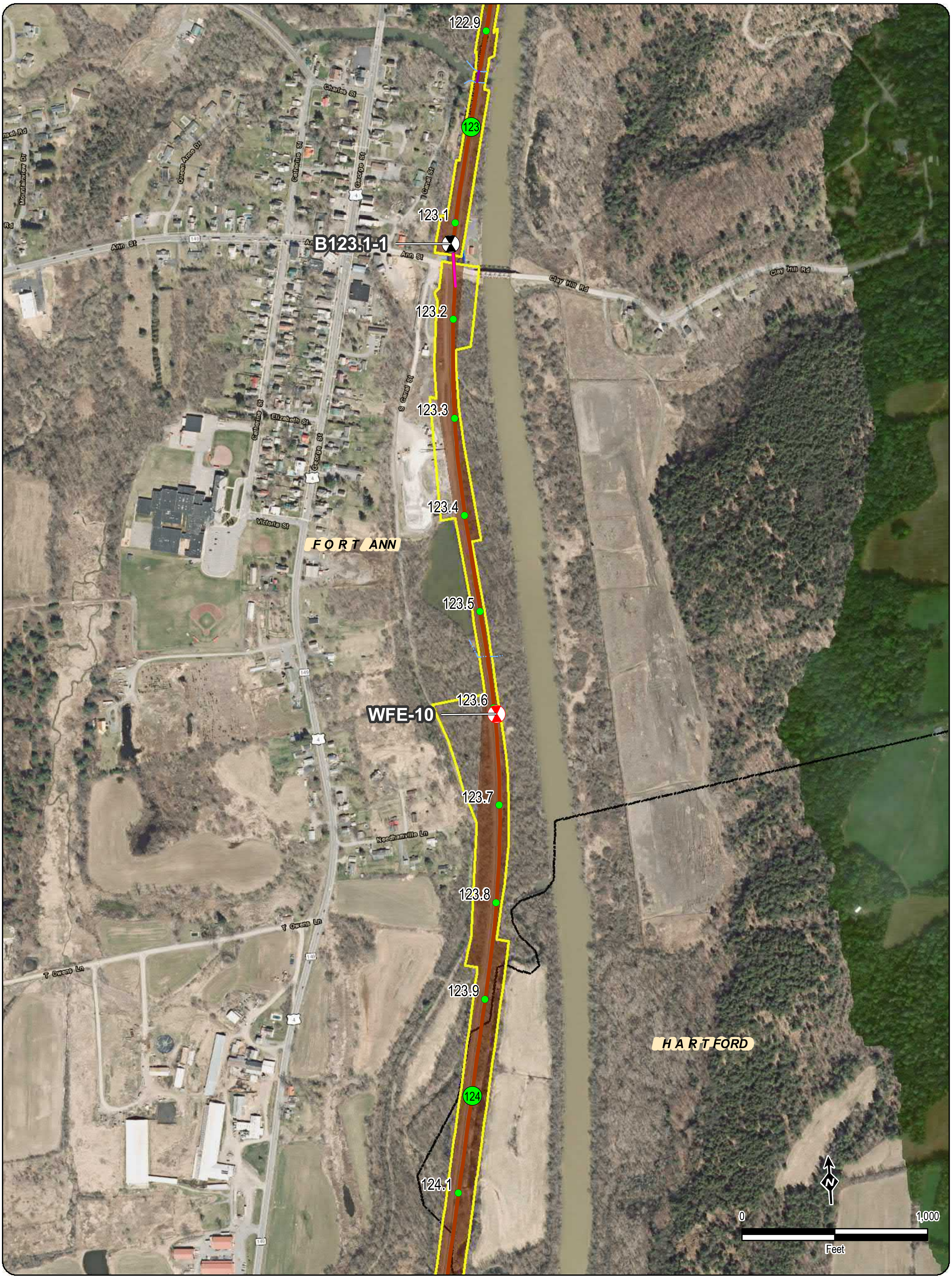


LEGEND

- 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

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

Transmission Developers Inc.

Champlain Hudson Power Express Project

Champlain Hudson Power Express Inc.

BORING LOCATION PLAN

Whitehall to Fort Edward

Figure A-3

Sheet 9 of 16

Prepared by: AECOM 5/19/2021

Y:\Projects\CHPE\Route\Consensus_Alternative_Routes\MXD\Alt_5_Routes_DZ_201909\Boring_Locations\Maps_for_May_2021_Report\Whitehall_to_Edward_Boring_Locations_Mapset_May_2021_Report.mxd

TRC

TEST BORING LOG

BORING	**B123.1-1**
G.S. ELEV.	N/A
FILE	195651
SHEET	1 OF 1

PROJECT: TDI CHAMPLAIN HUDSON POWER EXPRESS

LOCATION: CP RAILROAD ROW, NY

GROUNDWATER DATA			
FIRST ENCOUNTERED NR			
DEPTH	HOUR	DATE	ELAPSED TIME
15.8'	NR	12/13	0 HR

METHOD OF ADVANCING BOREHOLE				
a	FROM	0.0 '	TO	10.0 '
c_2	FROM	10.0 '	TO	25.0 '

DRILLER R. CARUSO
HELPER C. SMART
INSPECTOR C. POPPE
DATE STARTED 12/13/2012
DATE COMPLETED 12/13/2012

DEPTH	A	B	C	DESCRIPTION	Wn	REMARKS
	S-1	12 11 13 19	2.0	*BROWN F/M SANDY SILT, TR-SM F/ GRAVEL (FILL)*	8.0	
	S-2	11 7 8 9	4.0	*BROWN AND GRAY CLAYEY SILT, SM F/ SAND*		
5	S-3	4 5 4 7			44.6	
	S-4	5 7 8 12			33.0	
10	S-5	7 11 12 13		*GRAY CLAY, TR SILT*	36.7	
			13.5			
15	S-6	3 3 4			29.0	
▼			18.5	*BROWN AND GRAY F/M/C SANDY CLAY, TR TO SM SILT*		
20	S-7	5 6 5			23.8	
25	S-8	4 4 5	25.0	*GRAY CLAY, TR TO SM SM SILT, TR TO SM F/M SAND*		
				END OF BORING AT 25'		
30						
35						

DRN. CMP
CKD. PWK

SUMMARY OF LABORATORY TEST DATA

Project Name: TDI Champlain Hudson Power Express – CP
Client Name: Transmission Developers, Inc.
TRC Project #: 195651

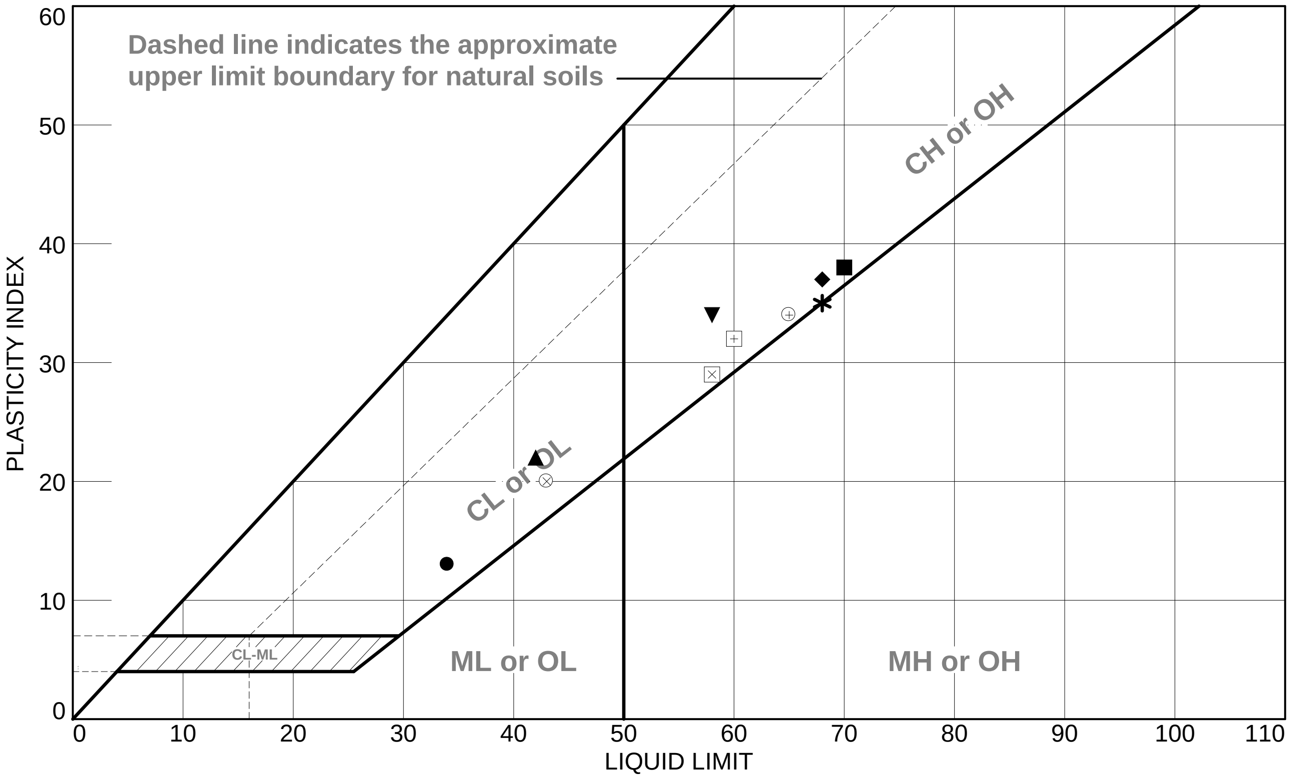
SAMPLE IDENTIFICATION			Soil Group (USCS System)	GRAIN SIZE DISTRIBUTION				PLASTICITY				Specific Gravity	Moisture Content (%)	Unit Weight (pcf)	Compressive Strength (tsf)	Organic Content (%)
Boring #	Sample #	Depth (ft)		Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Liquidity Index)					
B120.1-1	R-1	1.7-2.3	-	-	-	-	-	-	-	-	-	-	-	165.1	1120	-
A120.8-1	S-1	0.0-2.0	-	-	-	-	-	-	-	-	-	-	4.0	-	-	-
	S-2	2.0-4.0	-	-	-	-	-	-	-	-	-	-	9.8	-	-	-
	R-1	6.1-6.8	-	-	-	-	-	-	-	-	-	-	-	170.4	1340	-
B121.6-1	R-1	6.3-6.6	-	-	-	-	-	-	-	-	-	-	-	168.7	430	-
B122.4-1	S-1	0.0-2.0	-	-	-	-	-	-	-	-	-	-	16.7	-	-	-
	S-5	8.0-10.0	-	0.3	23.9	75.8		-	-	-	-	-	23.5	-	-	-
	S-6	13.5-15.0	-	-	-	-	-	-	-	-	-	-	24.7	-	-	-
	S-7	18.5-20.0	SM	0.0	67.6	32.4		-	-	-	-	-	39.8	-	-	4.4
	S-8	23.5-25.0	SW-SM	0.5	93.4	6.1		-	-	-	-	-	22.6	-	-	-
B123.1-1	S-1	0.0-2.0	-	-	-	-	-	-	-	-	-	-	8.0	-	-	-
	S-3	4.0-6.0	-	-	-	-	-	-	-	-	-	-	44.6	77.9	-	-
	S-4	6.0-8.0	CH	-	-	-	-	58	29	29	0.1	-	33.0	89.6	-	-

SUMMARY OF LABORATORY TEST DATA

Project Name: TDI Champlain Hudson Power Express – CP
Client Name: Transmission Developers, Inc.
TRC Project #: 195651

SAMPLE IDENTIFICATION			Soil Group (USCS System)	GRAIN SIZE DISTRIBUTION				PLASTICITY				Specific Gravity	Moisture Content (%)	Unit Weight (pcf)	Compressive Strength (tsf)	Organic Content (%)
Boring #	Sample #	Depth (ft)		Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Liquidity Index)					
	S-5	8.0-10.0	-	-	-	-	-	-	-	-	-	-	36.7	-	-	-
	S-6	13.5-15.0	-	0.4	36.8	62.8		-	-	-	-	-	29.0	-	-	-
	S-7	18.5-20.0	-	-	-	-	-	-	-	-	-	-	23.8	-	-	-
B124.8-1	S-2	2.0-4.0	-	-	-	-	-	-	-	-	-	-	13.7	-	-	-
	S-4	6.0-8.0	-	-	-	-	-	-	-	-	-	-	22.6	107.1	-	-
	S-5	8.0-10.0	-	0.0	22.1	77.9		-	-	-	-	-	6.2	-	-	-
B125.1-1	S-1	0.0-2.0	SW-SM	29.5	60.3	10.2		-	-	-	-	-	17.9	-	-	-
	S-2	2.0-4.0														
	S-5	8.0-10.0	SP-SM	0.3	90.5	9.2		-	-	-	-	-	19.1	-	-	-
	S-6	13.5-15.0														
	S-8	23.5-25.0	CH	-	-	-	-	53	25	28	0.1	-	29.1	-	-	-
B127.06-1	S-3	4.0-6.0	-	-	-	-	-	-	-	-	-	-	26.8	-	-	-
	S-5	8.0-10.0	-	0.0	6.7	7.8	85.5	-	-	-	-	2.80	29.3	-	-	-

LIQUID AND PLASTIC LIMITS TEST REPORT



SOIL DATA

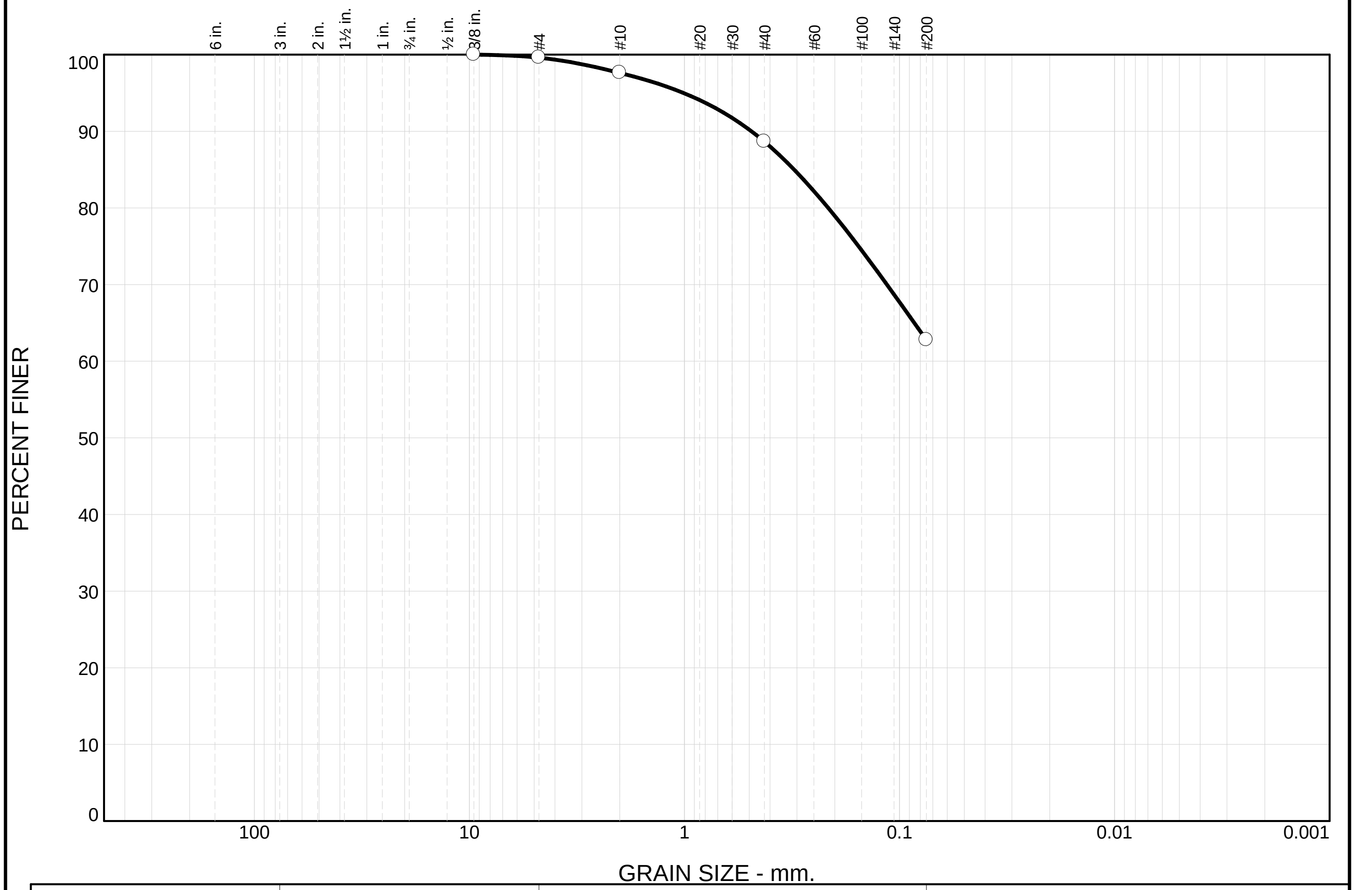
	SOURCE	SAMPLE NO.	DEPTH	NATURAL WATER CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	USCS
●	B113.1-1	S-7	18.5-20.0 FT	27.3	21	34	13	CL
■	B113.1-1	S-9	28.5-30.0 FT	38.8	32	70	38	CH/OH
▲	B113.4-1	S-3 & S-4	4.0-8.0 FT	27.3	20	42	22	CL
◆	B113.4-1	S-8	23.5-25.0 FT	50.3	31	68	37	CH
▼	B114.4-1	S-9	28.5-30.0 FT	49.2	24	58	34	CH
✱	B114.4-1	S-7	18.5-20.0 FT	49.7	33	68	35	CH/MH
⊕	B115.2-1	S-7	18.5-20.0 FT	45.6	31	65	34	CH
⊞	B116.8-1	S-12	43.5-45.0 FT	52.2	28	60	32	CH
⊗	B119.2-1	S-4 & S-5	7.0-11.0 FT	26.7	23	43	20	CL
⊠	B123.1-1	S-4	6.0-8.0 FT	33.0	29	58	29	CH

TRC
Engineers, Inc.
Mt. Laurel, NJ

Client: TDI CHAMPLAIN HUDSON POWER EXPRESS - CP
Project: TRANSMISSION DEVELOPERS, INC.

Project No.: 195651 **Figure** 1

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.4	2.0	8.9	25.9	62.8	

☒	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			0.3091							

Material Description	USCS	AASHTO
○ GRAY TO LIGHT BROWN F/M/C SANDY CLAY, TR TO SM SILT		

Project No. 195651 **Client:** TDI CHAMPLAIN HUDSON POWER EXPRESS - CP

Project: TRANSMISSION DEVELOPERS, INC.

○ **Source of Sample:** B123.1-1 **Depth:** 13.5-15.0 FT **Sample Number:** S-6

Remarks:

○SAMPLE DESCRIPTION BASED ON VISUAL IDENTIFICATION AND LABORATORY ANALYSIS

TRC Engineers, Inc.

Mt. Laurel, NJ

Figure 22

Tested By: BMH 01/25/13 **Checked By:** ______________________

Boring Location Plans Page 5 of 12	Drawn by: ADW	Scale: Not to scale	Project No.: CD10279	Date: March 2022

Champlain Hudson Power Express
Design Package 2
Whitehall to Glens Falls, 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-01-03-22**

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

Boring Location: **See Boring Location Plan**

Project: **Subsurface Investigation**
Champlain Hudson Power Express, Design Package 2
Various Locations, New York

Start Date: **1/13/2022** Finish Date: **1/13/2022**

Boring No.: **K-123.2** Sheet **1** of **2**

Coordinates
Northing **761528.799**
Easting **1670196.072**

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

Ground Elev.: **135.342**

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

Groundwater Observations

Date	Time	Depth	Casing
1/13/2022	PM	*6.2'	14.0'
1/13/2022	PM	*9.3'	14.0'

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

f - fine
m - medium
c - coarse

and - 35-50%
some - 20-35%
little - 10-20%
trace - 0-10%

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	Recovery (Inches)
1	CASING	1	0.0	2.0	SS	44 19 11 8	0.5	6" CRUSHED STONE	18
2								Black cmf SAND; trace SILT; trace f GRAVEL (moist, non-plastic) SW Possible FILL	
3		2	2.0	4.0	SS	11 15 11 6		Grey cmf SAND; some mf GRAVEL; trace SILT (moist, non-plastic) SW Possible FILL	14
4							4.0		
5		3	4.0	6.0	SS	5 4 2 1		Brown SILT; little mf SAND; trace CLAY (wet, very slightly plastic) ML w = 22.3%	8
6							6.0		
7		4	6.0	8.0	SS	1 1 2 1		Brown f SAND; some SILT (saturated, non-plastic) SM w = 31.3%	12
8									
9		5	8.0	10.0	SS	3 1 1 1		Greyish-Brown mf SAND; some SILT; trace CLAY (wet, very slightly plastic) SM	1
10							10.0		
11		6	10.0	12.0	SS	3 3 3 4		Grey CLAY; little SILT; trace f SAND lenses throughout sample (wet, plastic) CL w = 28.4%, LL = 48, PL = 20, PI = 28	12
12									
13							13.0		
14									
15	WET ROTARY	7	14.0	16.0	SS	WH/12" 2 2		Grey f SAND; little SILT; little CLAY (wet, slightly plastic) SM-SC	24
16								Advanced casing to 14.0 feet and began advancing 3 7/8" tri-cone roller bit wet rotary open hole within the borehole.	
17							17.0		
18									
19									
20		8	19.0	21.0	SS	2 1 1 1		Grey c-m+f SAND; trace SILT (saturated, non-plastic) SP-SM w = 29.8% % Fines = 10.0%	24
21									
22									
23									
24									
25		9	24.0	26.0	SS	6 5 4 5		Similar Soil (wet, non-plastic) SP-SM	12

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

Drillers: **Mark Childs; Ian Ross**

Inspector: **Aaron Woods (ATL); Rae Kim (Kiewit)**

ATLANTIC TESTING LABORATORIES, Limited

Subsurface Investigation

Boring No.: **K-123.2** Report No.: **CD10279D-01-03-22** Sheet **2** of **2**

f - fine
m - medium
c - course

and - 35-50%
some - 20-35%
little - 10-20%
trace - 0-10%

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	RECOVERY (inches)
26									
27							27.0		
28		10	28.0	30.0	SS	WH/12" 3 2		(3" Brass Lined Split Spoon) Grey CLAY; little SILT; trace f SAND (wet, plastic) CH w = 65.5%, LL = 67, PL = 21, PI = 46 % Fines = 97.0%	24
29									
30		ST-1	30.0	32.0	SH	SHELBY TUBE		Similar Soil (wet, plastic) CH	22
31									
32									
33							33.0		
34		11	34.0	36.0	SS	3 3 5 3		Grey SILT; little CLAY; trace f SAND (wet, slightly plastic) ML	24
35									
36							36.0		
37								Boring terminated at 36.0 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 CME 45 Trailer (Rig Unit No. CDGV429) drill rig.	
38									
39									
40									
41									
42									
43									
44									
45									
46									
47									
48									
49									
50									
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53									
54									
55									
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57									
58									
59									
60									
61									
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								
	S-12	39.0 - 41.0	Black c-m+f SAND; trace SILT; trace f GRAVEL	4.8	17.8	--	--	--	--	--	--	--	--	--	--	--
	S-15	54.0 - 56.0	Blackish-Grey c-mf+ SAND; trace SILT; trace f GRAVEL	9.4	27.2	NP	NP	NP	--	--	--	--	--	--	--	--
K-122.4	S-5	8.0 - 10.0	Brown SILT; and mf- SAND	57.0	24.8	NP	NP	NP	--	--	--	--	--	--	--	--
	S-9	29.0 - 31.0	Grey mf+ SAND; trace SILT	--	17.5	--	--	--	--	--	--	--	--	--	--	--
	S-13	49.0 - 51.0	Greyish-Black c-mf SAND; little SILT; trace mf GRAVEL	19.0	21.7	--	--	--	--	--	--	--	--	--	--	--
	S-16	58.0 - 60.0	Greyish-Black cm+f SAND; trace SILT	1.7	9.9	--	--	--	--	--	--	--	--	--	--	--
K-123.2	S-3	4.0 - 6.0	Brown SILT; little mf SAND; trace CLAY	--	22.3	--	--	--	--	--	--	--	--	--	--	--
	S-4	6.0 - 8.0	Brown f SAND; some SILT	--	31.3	--	--	--	--	--	--	--	--	--	--	--
	S-6	10.0 - 12.0	Grey CLAY; little SILT; trace f SAND	--	28.4	48	20	28	--	--	--	--	--	--	--	--
	S-8	19.0 - 21.0	Grey c-m+f SAND; trace SILT	10.0	29.8	--	--	--	--	--	--	--	--	--	--	--
	S-10	28.0 - 30.0	Grey CLAY; little SILT; trace f SAND	97.0	65.5	67	21	46	--	--	--	--	--	--	--	--
	ST-1	30.0 - 32.0	Grey CLAY; little SILT; trace f SAND	--	--	--	--	--	--	1,400	15	8.24	5,418	--	--	--
K-123.7	S-3	4.0 - 6.0	Mottled Blackish-Grey CLAY; trace SILT; trace f SAND; trace ORGANIC MATERIAL (roots)	--	41.4	--	--	--	7.5	--	--	--	--	--	--	--
	S-6	14.0 - 16.0	Mottled Orangish-Grey CLAY; trace SILT	100.0	25.9	79	23	56	--	--	--	--	--	--	--	--
	S-9	28.0 - 30.0	Grey CLAY; trace SILT	100.0	48.4	73	20	53	--	--	--	--	--	--	--	--
	S-11	40.0 - 42.0	Grey CLAY; trace SILT	--	37.3	--	--	--	--	--	--	--	--	--	--	--
K-123.8	S-3	4.0 - 6.0	Orangish-Brown cmf+ SAND; little SILT	16.0	18.1	--	--	--	--	--	--	--	--	--	--	--
	S-6	14.0 - 16.0	Blackish-Grey CLAY; little SILT; trace f SAND; trace ORGANIC MATERIAL (root hairs, wood fragments)	--	66.5	54	23	31	6.9	--	--	--	--	--	--	--
	S-9	28.0 - 30.0	Mottled Orangish-Greyish-Brown CLAY; trace SILT	100.0	37.2	67	18	49	--	--	--	--	--	--	--	--
	S-11	40.0 - 42.0	Bluish-Grey CLAY; trace SILT	--	33.5	--	--	--	--	--	--	--	--	--	--	--
K-125.5	S-3	4.0 - 6.0	Orangish-Brown SILT; trace f SAND	--	21.4	NP	NP	NP	--	--	--	--	--	--	--	--
	S-5	8.0 - 10.0	Grey CLAY; trace SILT	--	27.5	--	--	--	--	--	--	--	--	--	--	--
	S-6	14.0 - 16.0	Greyish-Black mf+ SAND; trace SILT	7.7	--	--	--	--	--	--	--	--	--	--	--	--
	S-7	19.0 - 21.0	Grey CLAY; trace SILT	--	51.5	--	--	--	--	--	--	--	--	--	--	--
	S-9	28.0 - 30.0	Grey CLAY; trace SILT; trace mf SAND	94.0	38.0	70	21	49	--	--	--	--	--	--	--	--

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-01-01-22

Report Date: January 31, 2022

Date Received: January 25, 2022

TEST DATA

Boring No.	Sample No.	Depth (ft)	Moisture Content (%)
K-122.35	S-3	4-6	23.5
	S-8	24-26	23.8
	S-12	39-41	17.8
	S-15	54-56	27.2
K-123.2	S-3[1]	4-6	22.3
	S-4	6-8	31.3
	S-6	10-12	28.4
	S-8	19-21	29.8
	S-10	28-30	65.5
K-123.7	S-3	4-6	41.4
	S-6	14-16	25.9
	S-9	28-30	48.4
	S-11	40-42	37.3
K-123.8	S-3	4-6	18.1
	S-6	14-16	66.5
	S-9	28-30	37.2
	S-11	40-42	33.5

TEST DATA (continued)

Boring No.	Sample No.	Depth (ft)	Moisture Content (%)
K-125.5	S-3	4-6	21.4
	S-5	8-10	27.5
	S-7	19-21	51.5
	S-9	28-30	38.0
K-127.0	S-3	4-6	32.8
	S-4	6-8	31.2
	S-6	14-16	22.8
	S-9	30-32	81.7
	S-11	39-41	63.9
K-127.1	S-3	4-6	30.7
	S-7	19-21	71.7
	S-9	30-32	58.0

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

Reviewed By: ______________________

Date: 01/31/22

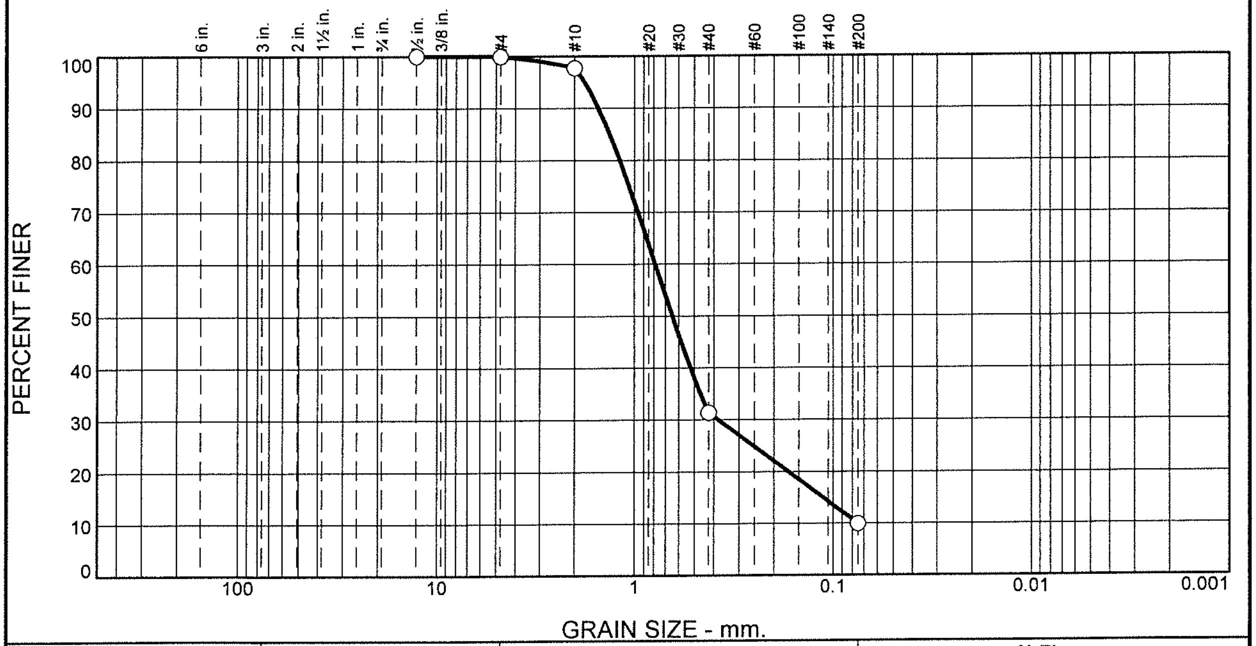
ATLANTIC TESTING LABORATORIES

Particle Size Distribution Report

Project: Champlain Hudson Power Express United Cable Install **Report No.:** CD10279E-01-01-22

Client: Kiewit Intrastructure Co. **Date:** 01/31/22

Sample No: K-123.2, S-8 **Source of Sample:** Boring Sample
Location: In-place **Elev./Depth:** 19-21'



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	0	0	2	67	21	10	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	OUT OF SPEC. (X)
1/2"	100		
#4	100		
#10	98		
#40	31		
#200	10.0		

Soil Description

Grey c-m+f SAND; trace SILT

Atterberg Limits

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

Coefficients

D_{85}= 1.3334 D_{60}= 0.7878 D_{50}= 0.6459
D_{30}= 0.3800 D_{15}= 0.1127 D_{10}= 0.0752
C_u= 10.48 C_c= 2.44

Classification

USCS= AASHTO=

Remarks

Moisture Content= 29.8%

* (no specification provided)

Figure

ATLANTIC TESTING LABORATORIES, LIMITED

Reviewed by:

Date: 01/31/22

AMOUNT OF MATERIAL IN SOILS FINER THAN THE NO. 200 SIEVE
ASTM D 1140

PROJECT INFORMATION

Client:	Kiewit Intrastructure Co.	**ATL Report No.:**	CD10279E-01-01-22
Project:	Champlain Hudson Power Express	**Report Date:**	January 31, 2022
	United Cable Installation	**Test Date:**	January 25, 2022
	Various Locations, New York	**Performed By:**	R. Parrow

TEST DATA

Boring No.	Sample No.	Depth (ft)	Method (A or B)	Soak Time (min)	Initial Dry Weight (g)	% Finer than #200
K-123.2	S-10	28-30	A	10	107.62	97
K-123.7	S-6	14-16	A	10	78.62	100
K-123.7	S-9	28-30	A	10	120.67	100
K-123.8	S-9	28-30	A	10	219.15	100
K-125.5	S-9	28-30	A	10	219.28	94
K-127.0	S-9	30-32	A	10	119.17	96
K-127.1	S-9	30-32	A	10	124.57	100

Reviewed By: ____________________

Date: January 31, 2022

ATLANTIC TESTING LABORATORIES

WBE certified company

LIQUID LIMIT, PLASTIC LIMIT, AND PLASTICITY INDEX OF SOIL
ASTM D 4318

PROJECT INFORMATION

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

ATL Report No.: CD10279E-01-01-22
Report Date: January 31, 2022
Date Received: January 25, 2022

TEST DATA

Boring No.	Sample No.	LL	PL	PI
K-122.35	S-3	NP	NP	NP
K-122.35	S-15	NP	NP	NP
K-123.2	S-6	48	20	28
K-123.2	S-10	67	21	46
K-123.7	S-6	79	23	56
K-123.7	S-9	73	20	53
K-123.8	S-6	54	23	31
K-123.8	S-9	67	18	49
K-125.5	S-3	NP	NP	NP
K-125.5	S-9	70	21	49
K-127.0	S-4	51	22	29
K-127.0	S-9	72	20	52
K-127.1	S-3	34	22	12
K-127.1	S-9	68	19	49

SAMPLE INFORMATION

Boring No.	Sample No.	Maximum Grain Size (mm)	Estimated Amount of Sample Retained on No. 40 Sieve (%)	As Received Moisture Content (%)
K-122.35	S-3	2	5	23.5
K-122.35	S-15	4.76	52	27.2
K-123.2	S-6	2	1	28.4
K-123.2	S-10	6.35	1	65.5
K-123.7	S-6	0.297	0	25.9
K-123.7	S-9	0.297	0	48.4
K-123.8	S-6	2	7	66.5
K-123.8	S-9	0.297	0	37.2
K-125.5	S-3	2	5	21.4
K-125.5	S-9	9.51	2	38.0
K-127.0	S-4	2	2	31.2
K-127.0	S-9	9.51	2	81.7
K-127.1	S-3	6.35	24	30.7
K-127.1	S-9	2	1	58.0

PREPARATION INFORMATION

Boring No.	Sample No.	Preparation	Method of Removing Oversized Material
K-122.35	S-3	Air Dry	Pulverizing and Screening
K-122.35	S-15	Air Dry	Pulverizing and Screening
K-123.2	S-6	Air Dry	Pulverizing and Screening
K-123.2	S-10	Air Dry	Pulverizing and Screening
K-123.7	S-6	Air Dry	Not Necessary
K-123.7	S-9	Air Dry	Not Necessary
K-123.8	S-6	Air Dry	Pulverizing and Screening
K-123.8	S-9	Air Dry	Not Necessary
K-125.5	S-3	Air Dry	Pulverizing and Screening
K-125.5	S-9	Air Dry	Pulverizing and Screening
K-127.0	S-4	Air Dry	Pulverizing and Screening
K-127.0	S-9	Air Dry	Pulverizing and Screening
K-127.1	S-3	Air Dry	Pulverizing and Screening
K-127.1	S-9	Air Dry	Pulverizing and Screening

EQUIPMENT INFORMATION

Liquid Limit Procedure:	Multipoint - Method A	☒	Single Point - Method B	☐
Liquid Limit Apparatus:	Manual	☒	Motor Driven	☐
Liquid Limit Grooving Tool Material:	Plastic	☒	Metal	☐
Liquid Limit Grooving Tool Shape:	Flat	☒	Curved (AASHTO Only)	☐
Plastic Limit:	Hand Rolled	☒	Mechanical Rolling Device	☐

Reviewed By: ________________

Date: 01/31/22

Kiewit

MEMORANDUM

DATE: September 23, 2022

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 3 - Package 2 - HDD Crossing 15 – Revision 1
Champlain Hudson Power Express Project
Fort Ann, 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 south of Fort Ann, New York. The approximate station for the start of HDD crossing Number 15 is STA 20418+00 (43.380563° N, 73.489523° W).

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

- AECOM, Geotechnical Data Report, Upland Segments, Champlain Hudson Power Express, dated May 28, 2021.
- Atlantic Testing Laboratories, Subsurface Investigation Services, Champlain Hudson Power Express, Design Package 2, Whitehall to Glens Falls, New York, dated June 15, 2022.

Contact us if you have questions or require additional information.

HDD 14B
Borings WFE-12, K-125.5, K-125.6
Segment 3

CHPE Segment 3 - Package 2
HDD Soil Boring Coordinates and Elevations

Firm	Boring	Northing (feet)	Easting (feet)	Ground Surface Elevation (feet)
TRC*	B122.4-1	1673988.1	762589.1	134.0
	B123.1-1	1670533.1	761581.7	134.0
	B127.6-1	1650236.9	759369.7	143.0
	B130.8-1	1633732.2	749229.1	144.0
	B131.5-1	1630565.5	746543.8	148.0
AECOM**	WFE-2	1693039.7	776227.9	125.9
	WFE-6	1683884.0	771830.6	128.7
	WFE-6A	1683645.5	771707.7	129.0
	WFE-7	1683295.0	771591.2	128.7
	WFE-9	1677994.3	769427.4	133.9
	WFE-9A	1678043.5	769246.8	140.2
	WFE-9B	1676842.4	767745.7	141.7
	WFE-12	1657680.6	760822.6	135.3
	WFE-16	1645866.1	757602.8	145.2
	WFE-18	1637293.5	752138.0	143.6
	WFE-18A	1630756.2	746790.9	144.9
	WFE-19	1628651.1	745226.2	139.1
	WFE-19A	1625848.4	743218.4	139.0

Notes:
- Northings and Eastings are provided in NAD83 New York State Plane East Zone.
- Elevations are referenced to the NAVD88 datum.

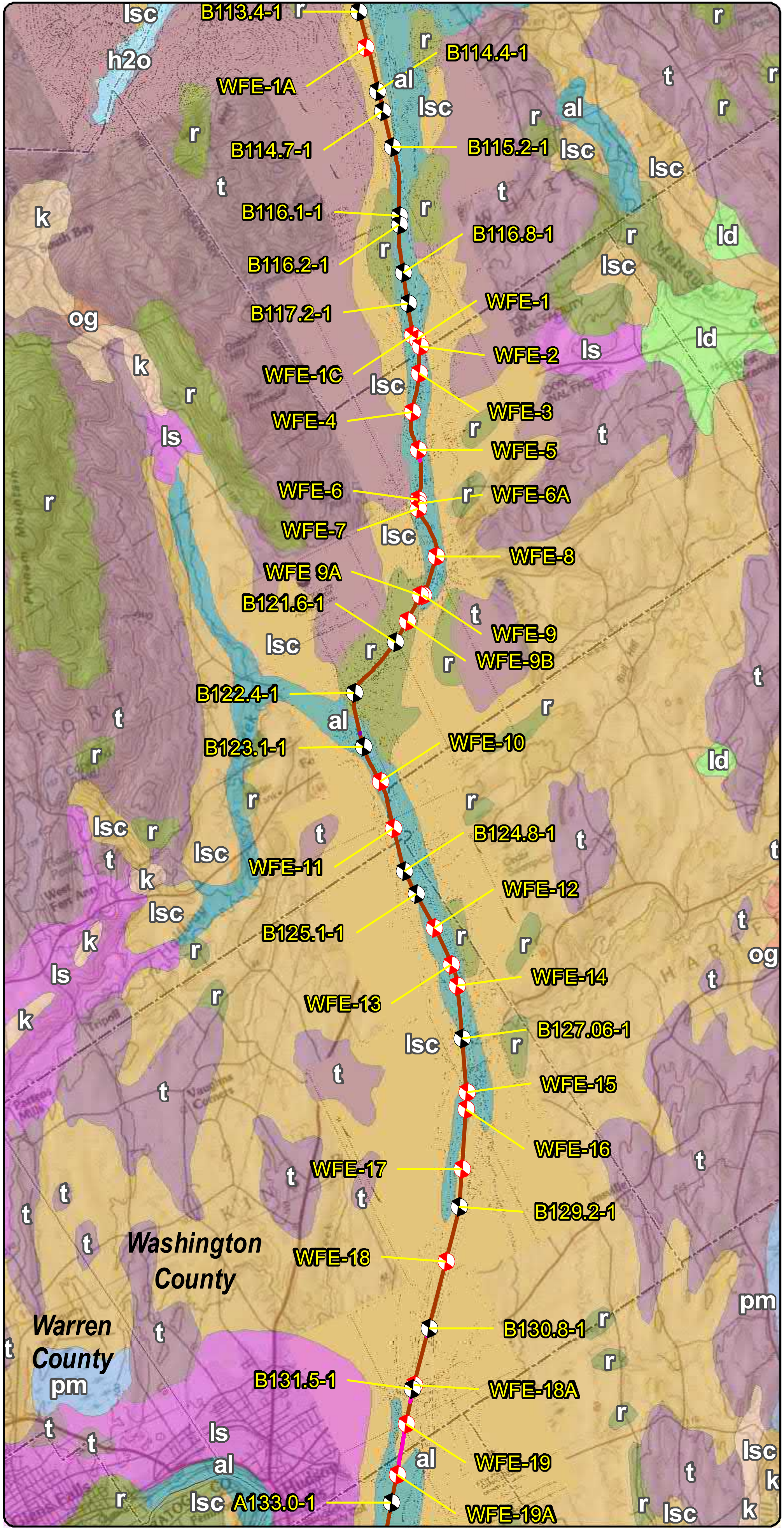
* TRC boring coordinates as shown in Table 1-6 in AECOM report (reference below). Boring elevations estimated from November 2021 topographic survey by Williams Aerial.

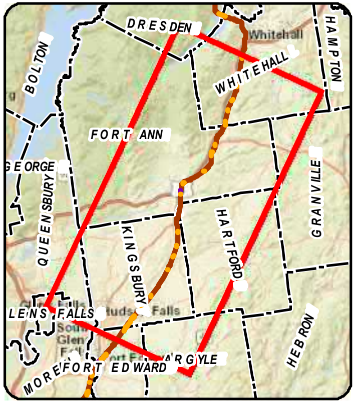
** AECOM boring coordinates and elevations as shown in Table 1-6 in AECOM report.

*** 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
- h2o - Water
- k - Kame deposits
- ld - Lacustrine delta
- ls - Lacustrine sand
- lsc - Lacustrine silt and clay
- og - Outwash sand and gravel
- pm - Swamp deposits
- r - Bedrock
- t - Till

N

1 0.5 0 1 Miles

Transmission Developers Inc.

Champlain Hudson Power Express Project

Champlain Hudson Power Express Inc.

Surficial Geology and Geotechnical Borings Whitehall to Fort Edward Figure 3-3

Prepared on 5/5/2021
by: AECOM

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

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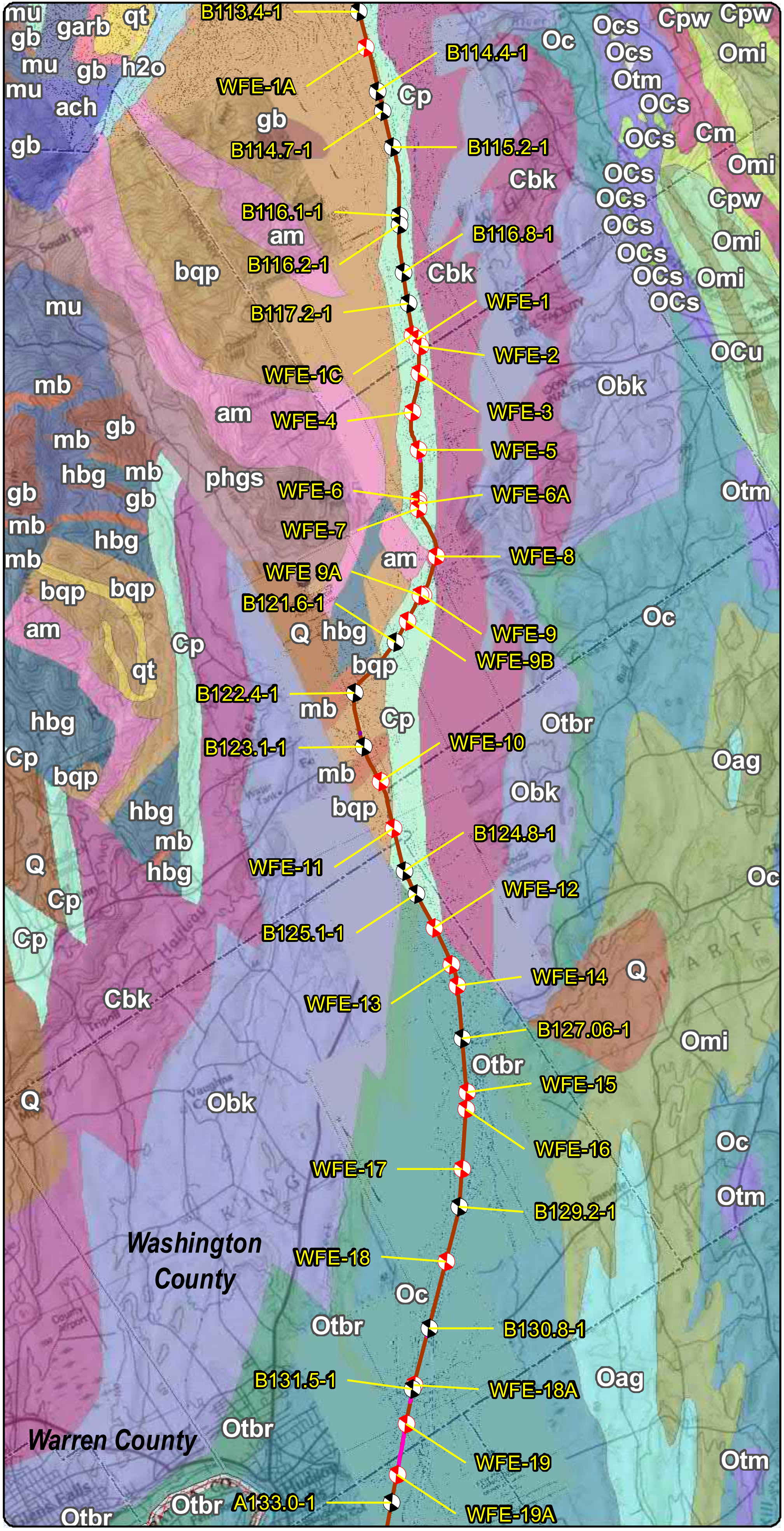

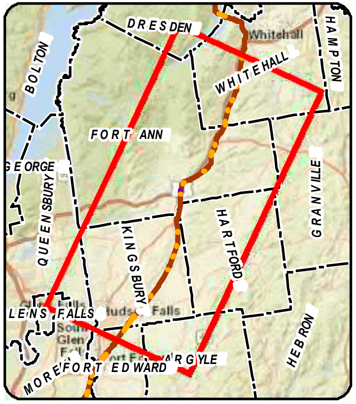

LEGEND

- 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

- Cbk - Beekmantown Group
- Cm - Mettawee Formation
- Cp - Potsdam Sandstone
- Cpw - Poultney Formation ("A" Member)
- No Label
- OCs - Cambrian-Middle Ordovician carbonate
- OCu - Undivided Ordovician and Cambrian
- Oag - Austin Glen Formation
- Obk - Beekmantown Group
- Oc - Canajoharie Shale
- Omi - Mount Merino Formation
- Op - Poultney Formation ("B" and "C")
- Otbr - Dolgeville Formation
- Otm - Taconic Melange
- Q - Glacial and Alluvial Deposits
- ach - metanorthosite and anorthositic
- am - Amphibolite, pyroxenic amphibolite
- bqp - Biotite-quartz-plagioclase
- garb - Quartz-feldspar paragneiss
- gb - Olivine metagabbro
- h2o - Water
- hbg - Biotite and or hornblende granite gneiss
- mb Calcitic and dolomitic marble
- mu - Undivided metased rock and migmatite
- phgs - Charnockite, granitic, quartz syenite
- qt - Quartzite

N

1 0.5 0 1 Miles

Transmission Developers Inc.

Champlain Hudson Power Express Project

Champlain Hudson Power Express Inc.

Bedrock Geology and Geotechnical Borings Whitehall to Fort Edward Figure 4-3

Prepared on 5/5/2021
by: AECOM

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

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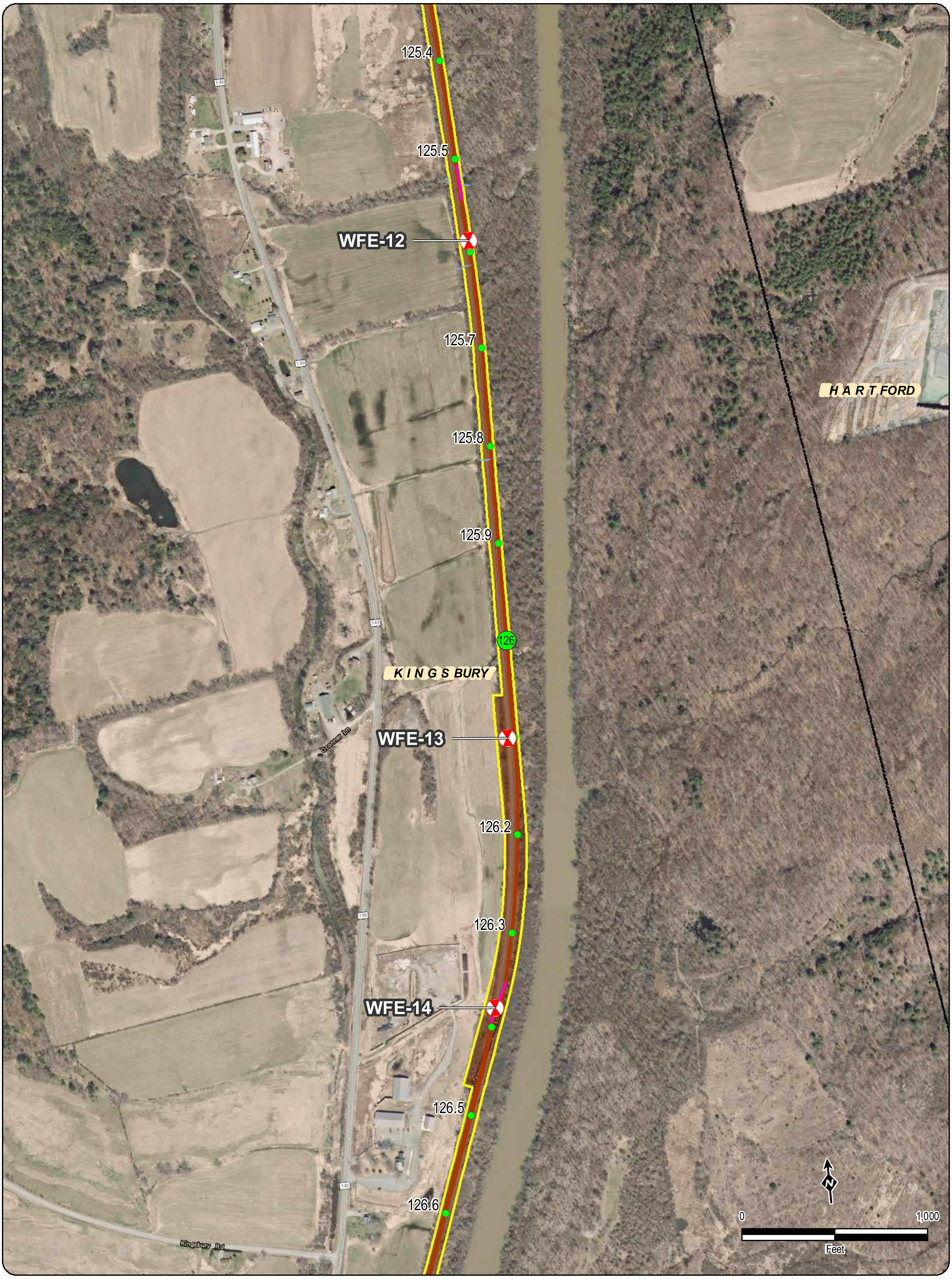

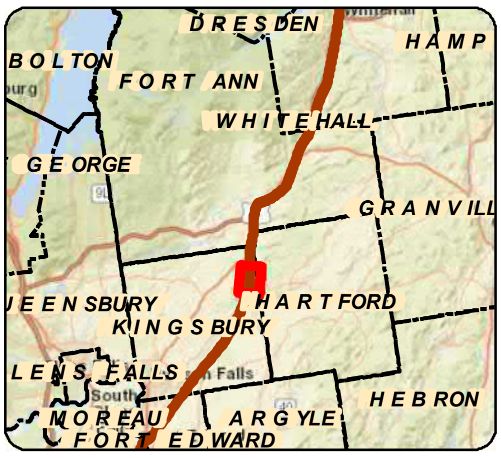

LEGEND

- ● Certified Milepost - Tenths
- ● Certified Milepost
- ○ Preferred Alternative Milepost - Tenths
- ○ 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

Whitehall to Fort Edward

Figure A-3

Sheet 11 of 16

Prepared by: AECOM

5/19/2021

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

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BORING CONTRACTOR: ADT		SHEET 1 OF 1
		PROJECT NAME: CHPE -
DRILLER: Chris Chaillou		PROJECT NO.: 60323056
		HOLE NO.: **WFE-12**
SOILS ENGINEER/GEOLOGIST: Chris French		START DATE: 1/7/21
	BORING LOG	FINISH DATE: 1/7/21
LOCATION: MP - 125.6 (CP Rail)		OFFSET: N/A

GROUND WATER OBSERVATIONS		CASING	SAMPLER	DRILL BIT	CORE BARREL	
						DRILL RIG: Geoprobe 7822DT
Water at 11' (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)	SAMPLE 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						SAND	0'-0.5'; Brown fine-coarse SAND, some angular gravel, little silt; loose, moist
1.0											SW		0.5'-5.0'; Brown fine-medium SAND, little coarse sand, trace silt
2.0													
3.0		3'-5'	S-1										TR-1; (3.0'-5.0')
4.0													
5.0													
		5'-7'	S-2	24"	8"	4	4	5	7	6	ML	CLAYEY SILT	Brown clayey SILT; medium stiff, moist
6.0													
7.0													
		7'-9'	S-3	24"	24"	8	9	10	8	7	ML/SM		Brown and Gray SILT, little clay, little fine sand; stiff, moist
8.0													TR-2; (8.0'-8.5')
9.0													
		9'-11'	S-4	24"	24"	10	9	10	23	12	ML/SM		SAA
10.0													
11.0											SP/SM	SAND	10.7'-11.0'; Brown fine SAND, little silt, medium dense; moist
		11'-13'	S-5	24"	16"	11	9	7	7	10	SP		Brown medium SAND, little fine sand, trace silt; loose, saturated
12.0													TR-3; (12.0'-12.5')
13.0													
		13'-15'	S-6	24"	18"	6	7	7	8	9	SP		SAA
14.0													
15.0													
		15'-17'	S-7	24"	18"	3	8	8	10	10	SP		Gray medium SAND, little fine sand, trace silt; very loose, saturated
16.0													TR-4; (16.0'-16.5')
17.0													
													WFE-12 terminated at 17' then grouted to surface.
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: $Ncorr=N*(2.0^2-1.375^2)in./(3.0^2-2.4^2)in. = N*0.65$.

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%

Aquifer
CHPE- Whitehall-Ft. Edward Borings
LABORATORY SOIL TESTING DATA SUMMARY

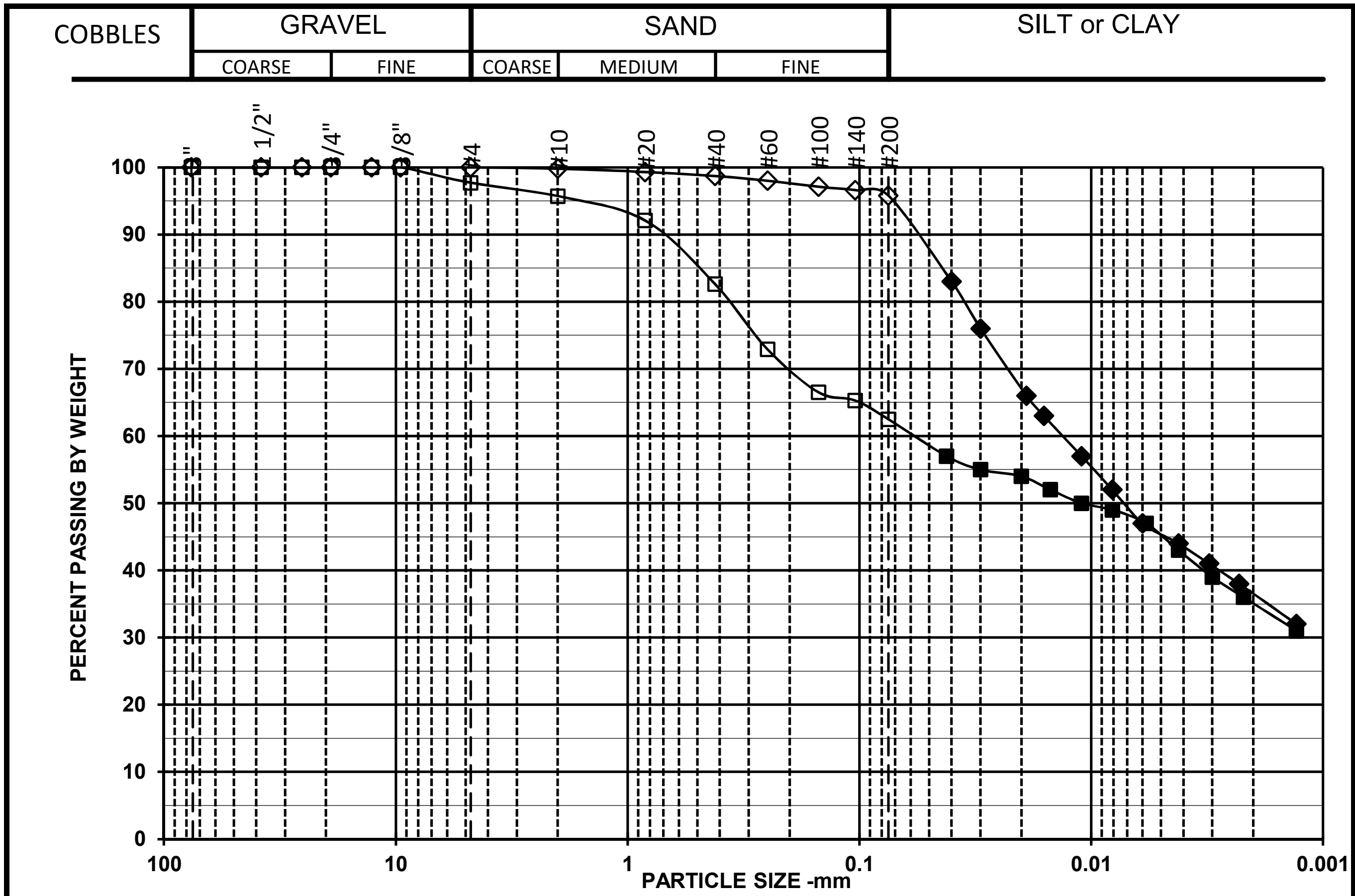
BORING NO.	SAMPLE NO.	DEPTH (ft)	IDENTIFICATION TESTS								REMARKS
			WATER CONTENT (%)	LIQUID LIMIT (-)	PLASTIC LIMIT (-)	PLAS. INDEX (-)	USCS SYMB. (1)	SIEVE MINUS NO. 200 (%)	HYDROMETER % MINUS 2 μm (%)	ORGANIC CONTENT (burnoff) (%)	
WFE-1A	S-2	5-7	24.4	44	17	27	CL	93	39		
WFE-1A	S-5	11-13	43.0	68	23	45	CH	99.8	84		
WFE-1C	S-3	7-9	44.5				CH	99.3	86		
WFE-1C	S-7	15-17	44.5	78	27	51	CH	100	94		
WFE-1C	S-10	30-32	45.7	61	23	38	CH	100	87		
WFE-2	S-2	5-7	7.3				SW-SM	10.7	3		
WFE-2	S-7	15-17	26.0				SC	28.5	13		
WFE-2	S-9	25-27	66.0	71	26	45	CH	100	90		
WFE-4	S-2	5-7	18.0				SC	34	13		
WFE-4	S-4	9-11	18.3				SM	17	5		
WFE-5	S-2	5-7	19.9				SM	19	3		
WFE-5	S-4	9-11	18.6	28	15	13	CL	91	28		
WFE-6A	S-2	5-7	13.6				SP-SC	9	3		
WFE-6A	S-4	9-11	17.4				SP-SM	7	2		
WFE-8	S-3	6-8	24.9				SC	48.5	12		
WFE-8	S-4	8-10	88.5	128	53	75	MH	94	43		
WFE-10	S-2	5-7	38.0	71	24	47	CH	94	76		
WFE-10	S-4	9-11	22.5				CL	83.9	32		
WFE-12	S-2	5-7	23.5	49	20	29	CL	62.5	35		
WFE-12	S-4	9-11	28.3				CL	95.8	37		
WFE-14	S-3	7-9	25.7				CL	75.7	44		
WFE-14	S-5	13-15	22.5				ML	53.9	17		
WFE-16	S-3	7-9	36.7	75	25	50	CH	100	90		
WFE-16	S-9	25-27	37.1	73	24	49	CH	100	80		
WFE-18	S-3	7-9	229.7	293	93	200	OH	58	43	34.1	
WFE-18	S-8	20-22	34.3	30	21	9	CL	95	26		
WFE-18	S-10	30-32	64.3	56	21	35	CH	100	87		
WFE-18A	S-2	5-7	19.9	30	13	17	CL	88.5	29		
WFE-18A	S-7	15-17	18.9				SM	14.3	1		
WFE-18A	S-10	30-32	62.9	62	22	40	CH	99	86		
WFE-19A	S-3	7-9	38.1				SP-SM	8	3		
WFE-19A	S-8	20-22	31.8				SP-SM	8.3	2		
WFE-19A	S-10	30-32	17.6				SW-SM	8	1		

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

Prepared by: NG
Reviewed by: CMJ
Date: 4/30/2021

TerraSense, LLC
45H Commerce Way
Totowa, NJ 07512

Project No.: 7853-21003
File: Indx1.xlsx



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
□	23.5	49	20	29	CL		Brown, Sandy lean clay	04/22/21
◇	28.3				CL		Brown, Lean clay	04/26/21
○								

Aquifer

TerraSense, LLC #7853-21003

CHPE- Whitehall-Ft. Edward Borings

Symbol	□	◇	○
Boring	WFE-12	WFE-12	
Sample	S-2	S-4	
Depth	5-7	9-11	
% +3"	0	0	
% Gravel	2.3	0	
% SAND	35.2	4.2	
%C SAND	2	0.2	
%M SAND	13.1	1.1	
%F SAND	20.1	2.9	
% FINES	62.5	95.8	
D_{100} (mm)	9.53	4.75	
D_{60} (mm)	0.058	0.013	
D_{30} (mm)			
D_{10} (mm)			
Cc			
Cu			

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	97.7	100.0	
#10	95.7	99.8	
#20	92.1	99.3	
#40	82.6	98.7	
#60	72.9	98.0	
#100	66.5	97.1	
#140	65.3	96.6	
#200	62.5	95.8	
5μ m	45	46	
2μ m	35	37	
1μ m	29	29	

PARTICLE SIZE DISTRIBUTION
ASTM D6913 & ASTM D7928

TerraSense Analysis File: GrainSizeV6Rev1a14

Siev1i.xlsx 4/30/2021

Boring Location Plans
Page 7 of 12

Drawn by:	Scale:	Project No.:	Date:
ADW	Not to scale	CD10279	March 2022

Champlain Hudson Power Express
Design Package 2
Whitehall to Glens Falls, 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-01-03-22**

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

Boring Location: **See Boring Location Plan**

Project: **Subsurface Investigation**
Champlain Hudson Power Express, Design Package 2
Various Locations, New York

Start Date: **1/21/2022** Finish Date: **1/21/2022**

Boring No.: **K-125.5** Sheet **1** of **2**

Coordinates
Northing **760754.315**
Easting **1658219.899**

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

Ground Elev.: **137.002**

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

Groundwater Observations

Date	Time	Depth	Casing
1/21/2022	AM	DRY	OPEN
1/21/2022	AM	*13.3'	9.0'
1/21/2022	PM	*17.8'	9.0'

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

f - fine
m - medium
c - coarse

and - 35-50%
some - 20-35%
little - 10-20%
trace - 0-10%

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	Recovery (Inches)
	CASING	1	0.0	2.0	SS	17 4 4 3	0.2	2" TOPSOIL & ORGANIC MATERIAL	9
1								Greyish-Black cmf SAND; some DEBRIS (cinders); trace SILT (frozen, non-plastic) SW FILL	
2		2	2.0	4.0	SS	4 7 7 6		Black cmf SAND; and DEBRIS (cinders); trace m GRAVEL; trace SILT (wet, non-plastic) SW FILL	8
3							4.0		
4		3	4.0	6.0	SS	5 4 4 4		Orangish-Brown SILT; trace f SAND (saturated, non-plastic) ML w = 21.4%, LL = NP, PL = NP, PI = NP	10
5							6.0		
6		4	6.0	8.0	SS	3 2 4 4		NO RECOVERY	0
7							8.0		
8		5	8.0	10.0	SS	1 2 2 2		Grey CLAY; trace SILT (wet, plastic) CH w = 27.5%	16
9	WET ROTARY								
10							11.0		
11									
12								Advanced casing to 9.0 feet and began advancing 3 7/8" tri-cone roller bit wet rotary open hole within the borehole.	
13									
14		6	14.0	16.0	SS	4 9 14 12		Greyish-Black mf+ SAND; trace SILT (saturated, non-plastic) SP-SM % Fines = 7.7%	12
15									
16							17.0		
17									
18									
19		7	19.0	21.0	SS	WR WH/18"		Grey CLAY; trace SILT (saturated, plastic) CH w = 51.5%	24
20									
21									
22									
23									
24		8	24.0	26.0	SS	WR/12" WH/12"		Similar Soil (saturated, plastic) CH	20
25									

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

Drillers: **Mark Childs; John Trathen**

Inspector: **Tom Hunter (ATL); Tom Kimmins (Kiewit)**

ATLANTIC TESTING LABORATORIES, Limited

Subsurface Investigation

Boring No.: **K-125.5**　　Report No.: **CD10279D-01-03-22**　　Sheet **2** of **2**

f - fine
m - medium
c - course

and - 35-50%
some - 20-35%
little - 10-20%
trace - 0-10%

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	RECOVERY (inches)
26									
27									
28		9	28.0	30.0	SS	1 1 2 2		(3" Brass Lined Split Spoon) Grey CLAY; trace SILT; trace mf SAND (saturated, plastic) CH w = 38.0%, LL = 70, PL = 21, PI = 49 % Fines = 94.0%	24
29									
30									
31									
32									
33									
34		10	34.0	36.0	SS	WR WH/18"		Grey CLAY; trace SILT (saturated, plastic) CH	22
35									
36									
37							37.0		
38									
39		11	39.0	41.0	SS	WH/24"		Orangish-Brown SILT; trace f SAND; trace ORGANIC MATERIAL (roots) (saturated, non-plastic) ML	14
40									
41							41.0		
42								Boring terminated at 41.0 feet.	
43									
44								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 CME 45 Trailer (Rig Unit No. CDGV429) drill rig.	
45									
46									
47									
48									
49									
50									
51									
52									
53									
54									
55									
56									
57									
58									
59									
60									
61									
62									

ATLANTIC TESTING LABORATORIES, Limited

Subsurface Investigation

Report No.: **CD10279D-01-03-22**

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

Boring Location: **See Boring Location Plan**

Project: **Subsurface Investigation**
Champlain Hudson Power Express, Design Package 2
Various Locations, New York

Start Date: **1/24/2022** Finish Date: **1/25/2022**

Boring No.: **K-125.6** Sheet **1** of **2**

Coordinates
Northing **760776.207**
Easting **1657836.86**

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

Groundwater Observations

Date	Time	Depth	Casing
1/25/2022	PM	*7.9'	10.0'

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

Ground Elev.: **136.928**

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

CLASSIFICATION OF MATERIAL

f - fine
m - medium
c - coarse

and - 35-50%
some - 20-35%
little - 10-20%
trace - 0-10%

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	Recovery (Inches)
	CASING	1	0.0	2.0	SS	7 8 4 9		Whitish-Grey cmf SAND; trace f GRAVEL; trace SILT (moist,	6
1								non-plastic) SW FILL	
2		2	2.0	4.0	SS	5 8 8 9		Brownish-Black mf SAND; trace SILT (moist, non-plastic) SP	6
3							4.0	FILL	
4		3	4.0	6.0	SS	6 8 8 5		Brown mf+ SAND; and SILT (moist, non-plastic) SM	12
5							6.0	w = 17.8% % Fines = 48.0%	
6		4	6.0	8.0	SS	9 6 5 4		Greyish-Brown f SAND; little SILT; little CLAY (wet, slightly	16
7							8.0	plastic) SM-SC	
8		5	8.0	10.0	SS	5 5 6 9		Brownish-Grey CLAY; trace mf SAND; trace SILT (moist, plastic)	8
9								CL w = 24.7%, LL = 50, PL = 22, PI = 28	
10	WET ROTARY						11.0		
11									
12								Advanced casing to 10.0 feet and began advancing 3 7/8" tri-cone	
13								roller bit wet rotary open hole within the borehole.	
14		6	14.0	16.0	SS	8 7 6 8		Grey mf SAND; trace SILT (wet, non-plastic) SP	10
15									
16							17.0		
17									
18									
19		7	19.0	21.0	SS	WH/24"		Grey CLAY; little SILT; trace mf SAND (wet, plastic) CH	24
20								w = 49.2%	
21									
22									
23									
24		8	24.0	26.0	SS	WH/24"		Grey CLAY; little SILT (saturated, plastic) CH	20
25									

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

Drillers: **Jeffrey Donovan; John Trathen**

Inspector: **James LaMarco (ATL)**

ATLANTIC TESTING LABORATORIES, Limited

Subsurface Investigation

Boring No.: **K-125.6** Report No.: **CD10279D-01-03-22** Sheet **2** of **2**

f - fine
m - medium
c - course

and - 35-50%
some - 20-35%
little - 10-20%
trace - 0-10%

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	RECOVERY (inches)
26									
27									
28		ST-1	28.0	30.0	SS	WH/24"		(3" Brass Lined Split Spoon) Similar Soil (saturated, plastic) CH w = 49.4%, LL = 60, PL = 20, PI = 40 % Fines = 100.0%	24
29									
30									
31									
32									
33									
34		9	34.0	36.0	SS	WH/24"		Similar Soil (saturated, plastic) CH	24
35									
36									
37									
38		10	38.0	40.0	SS	WH/24"		Similar Soil (saturated, plastic) CH	24
39									
40							40.0		
41								Boring terminated at 40.0 feet.	
42								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.	
43									
44									
45									
46									
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48									
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59									
60									
61									
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								
	S-12	39.0 - 41.0	Black c-m+f SAND; trace SILT; trace f GRAVEL	4.8	17.8	--	--	--	--	--	--	--	--	--	--	--
	S-15	54.0 - 56.0	Blackish-Grey c-mf+ SAND; trace SILT; trace f GRAVEL	9.4	27.2	NP	NP	NP	--	--	--	--	--	--	--	--
K-122.4	S-5	8.0 - 10.0	Brown SILT; and mf- SAND	57.0	24.8	NP	NP	NP	--	--	--	--	--	--	--	--
	S-9	29.0 - 31.0	Grey mf+ SAND; trace SILT	--	17.5	--	--	--	--	--	--	--	--	--	--	--
	S-13	49.0 - 51.0	Greyish-Black c-mf SAND; little SILT; trace mf GRAVEL	19.0	21.7	--	--	--	--	--	--	--	--	--	--	--
	S-16	58.0 - 60.0	Greyish-Black cm+f SAND; trace SILT	1.7	9.9	--	--	--	--	--	--	--	--	--	--	--
K-123.2	S-3	4.0 - 6.0	Brown SILT; little mf SAND; trace CLAY	--	22.3	--	--	--	--	--	--	--	--	--	--	--
	S-4	6.0 - 8.0	Brown f SAND; some SILT	--	31.3	--	--	--	--	--	--	--	--	--	--	--
	S-6	10.0 - 12.0	Grey CLAY; little SILT; trace f SAND	--	28.4	48	20	28	--	--	--	--	--	--	--	--
	S-8	19.0 - 21.0	Grey c-m+f SAND; trace SILT	10.0	29.8	--	--	--	--	--	--	--	--	--	--	--
	S-10	28.0 - 30.0	Grey CLAY; little SILT; trace f SAND	97.0	65.5	67	21	46	--	--	--	--	--	--	--	--
	ST-1	30.0 - 32.0	Grey CLAY; little SILT; trace f SAND	--	--	--	--	--	--	1,400	15	8.24	5,418	--	--	--
K-123.7	S-3	4.0 - 6.0	Mottled Blackish-Grey CLAY; trace SILT; trace f SAND; trace ORGANIC MATERIAL (roots)	--	41.4	--	--	--	7.5	--	--	--	--	--	--	--
	S-6	14.0 - 16.0	Mottled Orangish-Grey CLAY; trace SILT	100.0	25.9	79	23	56	--	--	--	--	--	--	--	--
	S-9	28.0 - 30.0	Grey CLAY; trace SILT	100.0	48.4	73	20	53	--	--	--	--	--	--	--	--
	S-11	40.0 - 42.0	Grey CLAY; trace SILT	--	37.3	--	--	--	--	--	--	--	--	--	--	--
K-123.8	S-3	4.0 - 6.0	Orangish-Brown cmf+ SAND; little SILT	16.0	18.1	--	--	--	--	--	--	--	--	--	--	--
	S-6	14.0 - 16.0	Blackish-Grey CLAY; little SILT; trace f SAND; trace ORGANIC MATERIAL (root hairs, wood fragments)	--	66.5	54	23	31	6.9	--	--	--	--	--	--	--
	S-9	28.0 - 30.0	Mottled Orangish-Greyish-Brown CLAY; trace SILT	100.0	37.2	67	18	49	--	--	--	--	--	--	--	--
	S-11	40.0 - 42.0	Bluish-Grey CLAY; trace SILT	--	33.5	--	--	--	--	--	--	--	--	--	--	--
K-125.5	S-3	4.0 - 6.0	Orangish-Brown SILT; trace f SAND	--	21.4	NP	NP	NP	--	--	--	--	--	--	--	--
	S-5	8.0 - 10.0	Grey CLAY; trace SILT	--	27.5	--	--	--	--	--	--	--	--	--	--	--
	S-6	14.0 - 16.0	Greyish-Black mf+ SAND; trace SILT	7.7	--	--	--	--	--	--	--	--	--	--	--	--
	S-7	19.0 - 21.0	Grey CLAY; trace SILT	--	51.5	--	--	--	--	--	--	--	--	--	--	--
	S-9	28.0 - 30.0	Grey CLAY; trace SILT; trace mf SAND	94.0	38.0	70	21	49	--	--	--	--	--	--	--	--

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-125.6	S-3	4.0 - 6.0	Brown mf+ SAND; and SILT	48.0	17.8	--	--	--	--	--	--	--	--	--	--	--
	S-5	8.0 - 10.0	Brownish-Grey CLAY; trace mf SAND; trace SILT	--	24.7	50	22	28	--	--	--	--	--	--	--	--
	S-7	19.0 - 21.0	Grey CLAY; little SILT; trace mf SAND	--	49.2	--	--	--	--	--	--	--	--	--	--	--
	ST-1	28.0 - 30.0	Grey CLAY; little SILT	100.0	49.4	60	20	40	--	--	--	--	--	--	--	--
K-127.0	S-3	4.0 - 6.0	Brown CLAY; and SILT; trace f SAND	--	32.8	--	--	--	--	--	--	--	--	--	--	--
	S-4	6.0 - 8.0	Brown CLAY; and SILT; trace f SAND	--	31.3	51	22	29	--	--	--	--	--	--	--	--
	S-6	14.0 - 16.0	Brown mf+ SAND; some SILT	25.0	22.8	--	--	--	--	--	--	--	--	--	--	--
	S-9	30.0 - 32.0	Grey CLAY; trace SILT; trace mf SAND	96.0	81.7	72	20	52	--	--	--	--	--	--	--	--
	S-10	34.0 - 36.0	Grey CLAY; trace SILT; trace mf SAND	--	--	--	--	--	--	7,100	35	8.75	1,548	--	--	--
	S-11	39.0 - 41.0	Grey CLAY; trace SILT; trace mf SAND	--	63.9	--	--	--	--	--	--	--	--	--	--	--
K-127.1	S-3	4.0 - 6.0	Blackish-Brown SILT; some CLAY; some mf SAND; trace DEBRIS (cinders); trace ORGANIC MATERIAL (root hairs)	--	30.7	34	22	12	4.5	--	--	--	--	--	--	--
	S-6	14.0 - 16.0	Blackish-Grey c-mf+ SAND; trace SILT; trace f GRAVEL	4.4	--	--	--	--	--	--	--	--	--	--	--	--
	S-7	19.0 - 21.0	Grey CLAY; trace SILT	--	71.7	--	--	--	--	--	--	--	--	--	--	--
	S-9	30.0 - 32.0	Grey CLAY; trace SILT	100.0	58.0	68	19	49	--	--	--	--	--	--	--	--
K-127.9	S-3	4.0 - 6.0	Brownish-Grey CLAY; little SILT; trace f SAND	--	--	--	--	--	--	300	65	7.93	1,170	--	--	--
	S-4	6.0 - 8.0	Brownish-Grey CLAY; little SILT; trace f SAND	95.0	30.0	70	25	45	--	--	--	--	--	--	--	--
	S-6	14.0 - 16.0	Greyish-Brown CLAY; trace f SAND; trace SILT	--	32.4	--	--	--	--	--	--	--	--	--	--	--
	S-8	24.0 - 26.0	Greyish-Brown CLAY; trace SILT	--	28.8	--	--	--	--	--	--	--	--	--	--	--
	ST-1	38.0 - 40.0	Grey CLAY; trace SILT	100.0	30.0	30	17	13	--	--	--	--	--	--	--	--
K-128.0	S-5	8.0 - 10.0	Brownish-Grey CLAY; some mf SAND; trace SILT	--	28.0	--	--	--	--	--	--	--	--	--	--	--
	S-7	19.0 - 21.0	Grey CLAY; trace SILT	100.0	39.2	78	23	55	--	--	--	--	--	--	--	--
	S-9	29.0 - 31.0	Grey CLAY; trace SILT	--	30.3	--	--	--	--	--	--	--	--	--	--	--
	ST-1	38.0 - 40.0	Grey CLAY; trace SILT	100.0	51.2	43	18	25	--	--	--	--	--	--	--	--
K-129.9A	S-5	8.0 - 10.0	Brown SILT; some mf SAND; little ORGANIC MATERIAL (root hairs)	24.0	134.2	NP	NP	NP	16.8	--	--	--	--	--	--	--
	S-8	24.0 - 26.0	Grey c-mf+ SAND; little SILT	20.0	31.1	--	--	--	--	--	--	--	--	--	--	--
	S-10	34.0 - 36.0	Grey CLAY; trace SILT		52.6	--	--	--	--	--	--	--	--	--	--	--
	ST-1	41.0 - 43.0	Grey CLAY; trace SILT	100.0	40.5	44	20	24	--	--	--	--	--	--	--	--

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-01-01-22
Report Date: January 31, 2022
Date Received: January 25, 2022

TEST DATA

Boring No.	Sample No.	Depth (ft)	Moisture Content (%)
K-122.35	S-3	4-6	23.5
	S-8	24-26	23.8
	S-12	39-41	17.8
	S-15	54-56	27.2
K-123.2	S-3 [1]	4-6	22.3
	S-4	6-8	31.3
	S-6	10-12	28.4
	S-8	19-21	29.8
	S-10	28-30	65.5
K-123.7	S-3	4-6	41.4
	S-6	14-16	25.9
	S-9	28-30	48.4
	S-11	40-42	37.3
K-123.8	S-3	4-6	18.1
	S-6	14-16	66.5
	S-9	28-30	37.2
	S-11	40-42	33.5

TEST DATA (continued)

Boring No.	Sample No.	Depth (ft)	Moisture Content (%)
K-125.5	S-3	4-6	21.4
	S-5	8-10	27.5
	S-7	19-21	51.5
	S-9	28-30	38.0
K-127.0	S-3	4-6	32.8
	S-4	6-8	31.2
	S-6	14-16	22.8
	S-9	30-32	81.7
	S-11	39-41	63.9
K-127.1	S-3	4-6	30.7
	S-7	19-21	71.7
	S-9	30-32	58.0

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

Reviewed By: ______________________ Date: 01/31/22

ATLANTIC TESTING LABORATORIES

WBE certified company

LABORATORY DETERMINATION OF MOISTURE CONTENT OF SOILS

ASTM D 2216

PROJECT INFORMATION

Client:	Kiewit Intrastructure Co.	**ATL Report No.:**	CD10279E-02-02-22
Project:	Champlain Hudson Power Express United Cable Installation Various Locations, New York	**Report Date:**	February 7, 2022
		Date Received:	February 1, 2022

TEST DATA

Boring No.	Sample No.	Depth (ft)	Moisture Content (%)
K-117.6-1.6A	S-3	6-8	6.8
	S-6 [1]	19-21	25.3
	S-8	28-30	33.3
K-122.4	S-5	8-10	24.8
	S-9 [1]	29-31	17.5
	S-13 [1]	49-51	21.7
	S-16	58-60	9.9
K-125.6	S-3	4-6	17.8
	S-5	8-10	24.7
	S-7	19-21	49.2
	ST-1	28-30	49.4
K-127.9	S-4	6-8	30.0
	S-6	14-16	32.4
	S-8	24-26	28.8
	ST-1	38-40	30.0
K-128.0	S-5	8-10	28.0
	S-7	19-21	39.2
	S-9	29-31	30.3
	ST-1	38-40	51.2

TEST DATA (continued)

Boring No.	Sample No.	Depth (ft)	Moisture Content (%)
K-129.9A	S-5	8-10	134.2
	S-8	24-26	31.1
	S-10	34-36	52.6
	ST-1	41-43	40.5
K-129.9B	S-6	14-16	88.0
	S-8	24-26	18.3
	ST-1	27-29	51.2
	S-10	34-36	50.8

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

Reviewed By: ______________________ Date: 02/07/22

ATLANTIC TESTING LABORATORIES

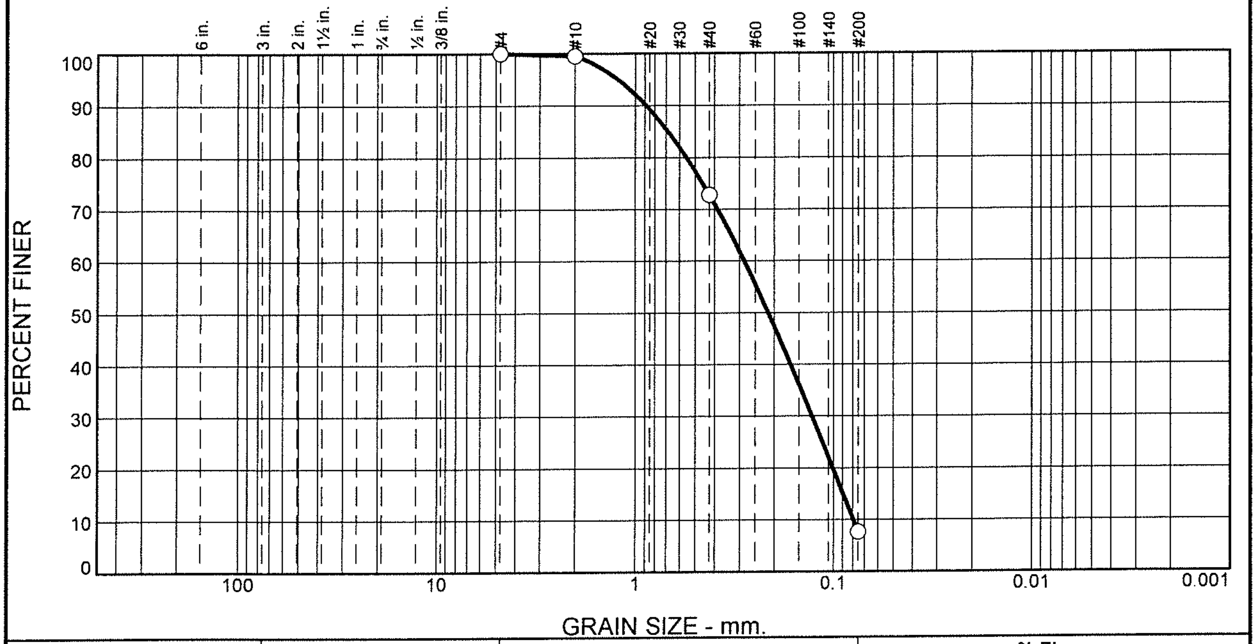
Particle Size Distribution Report

Project: Champlain Hudson Power Express United Cable Install **Report No.:** CD10279E-01-01-22

Client: Kiewit Intrastructure Co. **Date:** 01/31/22

Sample No: K-125.5, S-6 **Source of Sample:** Boring Sample

Location: In-place **Elev./Depth:** 14-16'



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	0	0	0	27	65	8	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	OUT OF SPEC. (X)
#4	100		
#10	100		
#40	73		
#200	7.7		

* (no specification provided)

Soil Description

Greyish Black mf+ SAND; trace SILT

Atterberg Limits

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

Coefficients

D_{85}= 0.6869 D_{60}= 0.2840 D_{50}= 0.2147

D_{30}= 0.1286 D_{15}= 0.0894 D_{10}= 0.0793

C_u= 3.58 C_c= 0.73

Classification

USCS= AASHTO=

Remarks

Figure

ATLANTIC TESTING LABORATORIES, LIMITED

Reviewed by:

Date: 01/31/22

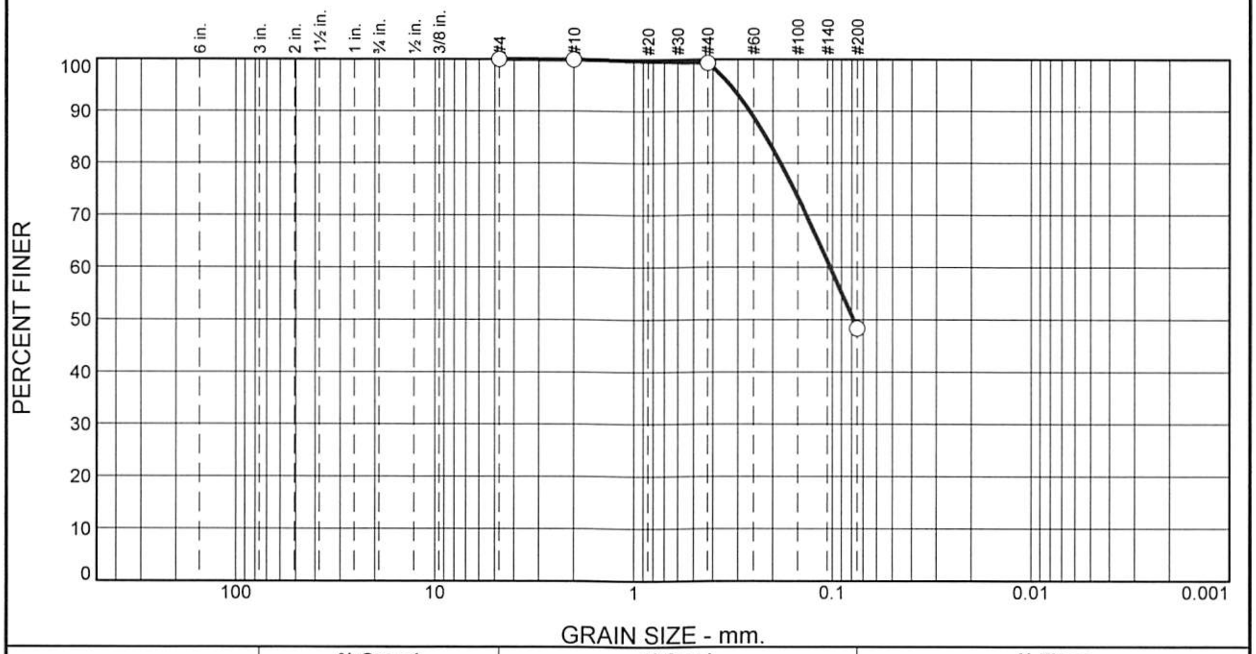
ATLANTIC TESTING LABORATORIES

Particle Size Distribution Report

Project: Champlain Hudson Power Express United Cable Install **Report No.:** CD10279E-02-02-22

Client: Kiewit Intrastructure Co. **Date:** 02/07/22

Sample No: K-125.6, S-3 **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	0	0	1	51	48	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	OUT OF SPEC. (X)
#4	100		
#10	100		
#40	99		
#200	48		

Soil Description

Brown mf+ SAND; and SILT

Atterberg Limits

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

Coefficients

D_{85}= 0.2168 D_{60}= 0.1026 D_{50}= 0.0785
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= AASHTO=

Remarks

Moisture Content= 17.8%

* (no specification provided)

Figure

ATLANTIC TESTING LABORATORIES, LIMITED

Reviewed by:

Date: 02/07/22

ATLANTIC TESTING LABORATORIES

WBE certified company

AMOUNT OF MATERIAL IN SOILS FINER THAN THE NO. 200 SIEVE

ASTM D 1140

PROJECT INFORMATION

Client: Kiewit Intrastructure Co.

Project: Champlain Hudson Power Express
United Cable Installation
Various Locations, New York

ATL Report No.: CD10279E-01-01-22

Report Date: January 31, 2022

Test Date: January 25, 2022

Performed By: R. Parrow

TEST DATA

Boring No.	Sample No.	Depth (ft)	Method (A or B)	Soak Time (min)	Initial Dry Weight (g)	% Finer than #200
K-123.2	S-10	28-30	A	10	107.62	97
K-123.7	S-6	14-16	A	10	78.62	100
K-123.7	S-9	28-30	A	10	120.67	100
K-123.8	S-9	28-30	A	10	219.15	100
K-125.5	S-9	28-30	A	10	219.28	94
K-127.0	S-9	30-32	A	10	119.17	96
K-127.1	S-9	30-32	A	10	124.57	100

Reviewed By: ____________________

Date: January 31, 2022

AMOUNT OF MATERIAL IN SOILS FINER THAN THE NO. 200 SIEVE
ASTM D 1140

PROJECT INFORMATION

Client:	Kiewit Intrastructure Co.	**ATL Report No.:**	CD10279E-02-02-22
Project:	Champlain Hudson Power Express	**Report Date:**	February 7, 2022
	United Cable Installation	**Test Date:**	February 3, 2022
	Various Locations, New York	**Performed By:**	M. White

TEST DATA

Boring No.	Sample No.	Depth (ft)	Method (A or B)	Soak Time (min)	Initial Dry Weight (g)	% Finer than #200
K-117.6-1.6A	S-8	28-30	A	10	672.08	70
K-122.4	S-5	8-10	A	10	339.75	57
K-125.6	ST-1	28-30	A	10	257.41	100
K-127.9	S-4	6-8	A	10	164.08	95
K-127.9	ST-1	38-40	A	10	392.67	100
K-128.0	S-7	19-21	A	10	163.31	100
K-128.0	ST-1	38-40	A	10	216.36	100
K-129.9A	S-5	8-10	A	10	136.68	24
K-129.9A	ST-1	41-43	A	10	240.79	100
K-129.9B	ST-1	27-29	A	10	186.13	100

Reviewed By: ______________________ Date: February 7, 2022

ATLANTIC TESTING LABORATORIES

WBE certified company

Page 1 of 2

LIQUID LIMIT, PLASTIC LIMIT, AND PLASTICITY INDEX OF SOIL
ASTM D 4318

PROJECT INFORMATION

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

ATL Report No.: CD10279E-01-01-22
Report Date: January 31, 2022
Date Received: January 25, 2022

TEST DATA

Boring No.	Sample No.	LL	PL	PI
K-122.35	S-3	NP	NP	NP
K-122.35	S-15	NP	NP	NP
K-123.2	S-6	48	20	28
K-123.2	S-10	67	21	46
K-123.7	S-6	79	23	56
K-123.7	S-9	73	20	53
K-123.8	S-6	54	23	31
K-123.8	S-9	67	18	49
K-125.5	S-3	NP	NP	NP
K-125.5	S-9	70	21	49
K-127.0	S-4	51	22	29
K-127.0	S-9	72	20	52
K-127.1	S-3	34	22	12
K-127.1	S-9	68	19	49

SAMPLE INFORMATION

Boring No.	Sample No.	Maximum Grain Size (mm)	Estimated Amount of Sample Retained on No. 40 Sieve (%)	As Received Moisture Content (%)
K-122.35	S-3	2	5	23.5
K-122.35	S-15	4.76	52	27.2
K-123.2	S-6	2	1	28.4
K-123.2	S-10	6.35	1	65.5
K-123.7	S-6	0.297	0	25.9
K-123.7	S-9	0.297	0	48.4
K-123.8	S-6	2	7	66.5
K-123.8	S-9	0.297	0	37.2
K-125.5	S-3	2	5	21.4
K-125.5	S-9	9.51	2	38.0
K-127.0	S-4	2	2	31.2
K-127.0	S-9	9.51	2	81.7
K-127.1	S-3	6.35	24	30.7
K-127.1	S-9	2	1	58.0

PREPARATION INFORMATION

Boring No.	Sample No.	Preparation	Method of Removing Oversized Material
K-122.35	S-3	Air Dry	Pulverizing and Screening
K-122.35	S-15	Air Dry	Pulverizing and Screening
K-123.2	S-6	Air Dry	Pulverizing and Screening
K-123.2	S-10	Air Dry	Pulverizing and Screening
K-123.7	S-6	Air Dry	Not Necessary
K-123.7	S-9	Air Dry	Not Necessary
K-123.8	S-6	Air Dry	Pulverizing and Screening
K-123.8	S-9	Air Dry	Not Necessary
K-125.5	S-3	Air Dry	Pulverizing and Screening
K-125.5	S-9	Air Dry	Pulverizing and Screening
K-127.0	S-4	Air Dry	Pulverizing and Screening
K-127.0	S-9	Air Dry	Pulverizing and Screening
K-127.1	S-3	Air Dry	Pulverizing and Screening
K-127.1	S-9	Air Dry	Pulverizing and Screening

EQUIPMENT INFORMATION

Liquid Limit Procedure:	Multipoint - Method A	X	Single Point - Method B	
Liquid Limit Apparatus:	Manual	X	Motor Driven	
Liquid Limit Grooving Tool Material:	Plastic	X	Metal	
Liquid Limit Grooving Tool Shape:	Flat	X	Curved (AASHTO Only)	
Plastic Limit:	Hand Rolled	X	Mechanical Rolling Device	

Reviewed By: ______________________ Date: 01/31/22

ATLANTIC TESTING LABORATORIES

WBE certified company

LIQUID LIMIT, PLASTIC LIMIT, AND PLASTICITY INDEX OF SOIL
ASTM D 4318

PROJECT INFORMATION

Client:	Kiewit Instrastructure Co.	**ATL Report No.:**	CD10279E-02-02-22
Project:	Champlain Hudson Power Express United Cable Installation Various Locations, New York	**Report Date:**	February 7, 2022
		Date Received:	February 1, 2022

TEST DATA

Boring No.	Sample No.	LL	PL	PI
K-117.6-1.6A	S-6	46	20	26
K-117.6-1.6A	S-8	47	19	28
K-122.4	S-5	NP	NP	NP
K-125.6	S-5	50	22	28
K-125.6	ST-1	60	20	40
K-127.9	S-4	70	25	45
K-127.9	ST-1	30	17	13
K-128.0	S-7	78	23	55
K-128.0	ST-1	43	18	25
K-129.9A	S-5	NP	NP	NP
K-129.9A	ST-1	44	20	24
K-129.9B	S-6	96	49	47
K-129.9B	ST-1	55	20	35

SAMPLE INFORMATION

Boring No.	Sample No.	Maximum Grain Size (mm)	Estimated Amount of Sample Retained on No. 40 Sieve (%)	As Received Moisture Content (%)
K-117.6-1.6A	S-6	4.76	19	25.3
K-117.6-1.6A	S-8	6.35	28	33.3
K-122.4	S-5	2	5	24.8
K-125.6	S-5	0.42	2	24.7
K-125.6	ST-1	0.177	0	49.4
K-127.9	S-4	2	13	30.0
K-127.9	ST-1	0.177	0	30.0
K-128.0	S-7	0.149	0	39.2
K-128.0	ST-1	0.177	0	51.2
K-129.9A	S-5	2	25	134.2
K-129.9A	ST-1	0.177	0	40.5
K-129.9B	S-6	0.841	9	88.0
K-129.9B	ST-1	0.177	0	51.2

PREPARATION INFORMATION

Boring No.	Sample No.	Preparation	Method of Removing Oversized Material
K-117.6-1.6A	S-6	Air Dry	Pulverizing and Screening
K-117.6-1.6A	S-8	Air Dry	Pulverizing and Screening
K-122.4	S-5	Air Dry	Pulverizing and Screening
K-125.6	S-5	Air Dry	Pulverizing and Screening
K-125.6	ST-1	Air Dry	Not Necessary
K-127.9	S-4	Air Dry	Pulverizing and Screening
K-127.9	ST-1	Air Dry	Not Necessary
K-128.0	S-7	Air Dry	Not Necessary
K-128.0	ST-1	Air Dry	Not Necessary
K-129.9A	S-5	Air Dry	Pulverizing and Screening
K-129.9A	ST-1	Air Dry	Not Necessary
K-129.9B	S-6	Air Dry	Pulverizing and Screening
K-129.9B	ST-1	Air Dry	Not Necessary

EQUIPMENT INFORMATION

Liquid Limit Procedure:	Multipoint - Method A	X	Single Point - Method B	
Liquid Limit Apparatus:	Manual	X	Motor Driven	
Liquid Limit Grooving Tool Material:	Plastic	X	Metal	
Liquid Limit Grooving Tool Shape:	Flat	X	Curved (AASHTO Only)	
Plastic Limit:	Hand Rolled	X	Mechanical Rolling Device	

Reviewed By: ____________________

Date: 02/07/22

Kiewit

MEMORANDUM

DATE: September 23, 2022

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 3 - Package 2 - HDD Crossing 16 – Revision 1
Champlain Hudson Power Express Project
Fort Ann, 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 south of Fort Ann, New York. The approximate station for the start of HDD crossing Number 16 is STA 20499+00 (43.359146° N, 73.494706° W)

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

- TRC, Geotechnical Data Report, Champlain Hudson Power Express, Canadian Pacific Railway Borings MP 113.1-177.1, dated March 29, 2013.
- Atlantic Testing Laboratories, Subsurface Investigation Services, Champlain Hudson Power Express, Design Package 2, Whitehall to Glens Falls, New York, dated June 15, 2022.

Contact us if you have questions or require additional information.

HDD 16
Borings B127.06-1, K-127.0, K-127.1
Segment 3

CHPE Segment 3 - Package 2
HDD Soil Boring Coordinates and Elevations

Firm	Boring	Northing (feet)	Easting (feet)	Ground Surface Elevation (feet)
TRC*	B122.4-1	1673988.1	762589.1	134.0
	B123.1-1	1670533.1	761581.7	134.0
	B127.6-1	1650236.9	759369.7	143.0
	B130.8-1	1633732.2	749229.1	144.0
	B131.5-1	1630565.5	746543.8	148.0
AECOM**	WFE-2	1693039.7	776227.9	125.9
	WFE-6	1683884.0	771830.6	128.7
	WFE-6A	1683645.5	771707.7	129.0
	WFE-7	1683295.0	771591.2	128.7
	WFE-9	1677994.3	769427.4	133.9
	WFE-9A	1678043.5	769246.8	140.2
	WFE-9B	1676842.4	767745.7	141.7
	WFE-12	1657680.6	760822.6	135.3
	WFE-16	1645866.1	757602.8	145.2
	WFE-18	1637293.5	752138.0	143.6
	WFE-18A	1630756.2	746790.9	144.9
	WFE-19	1628651.1	745226.2	139.1
	WFE-19A	1625848.4	743218.4	139.0

Notes:

- Northings and Eastings are provided in NAD83 New York State Plane East Zone.
- Elevations are referenced to the NAVD88 datum.

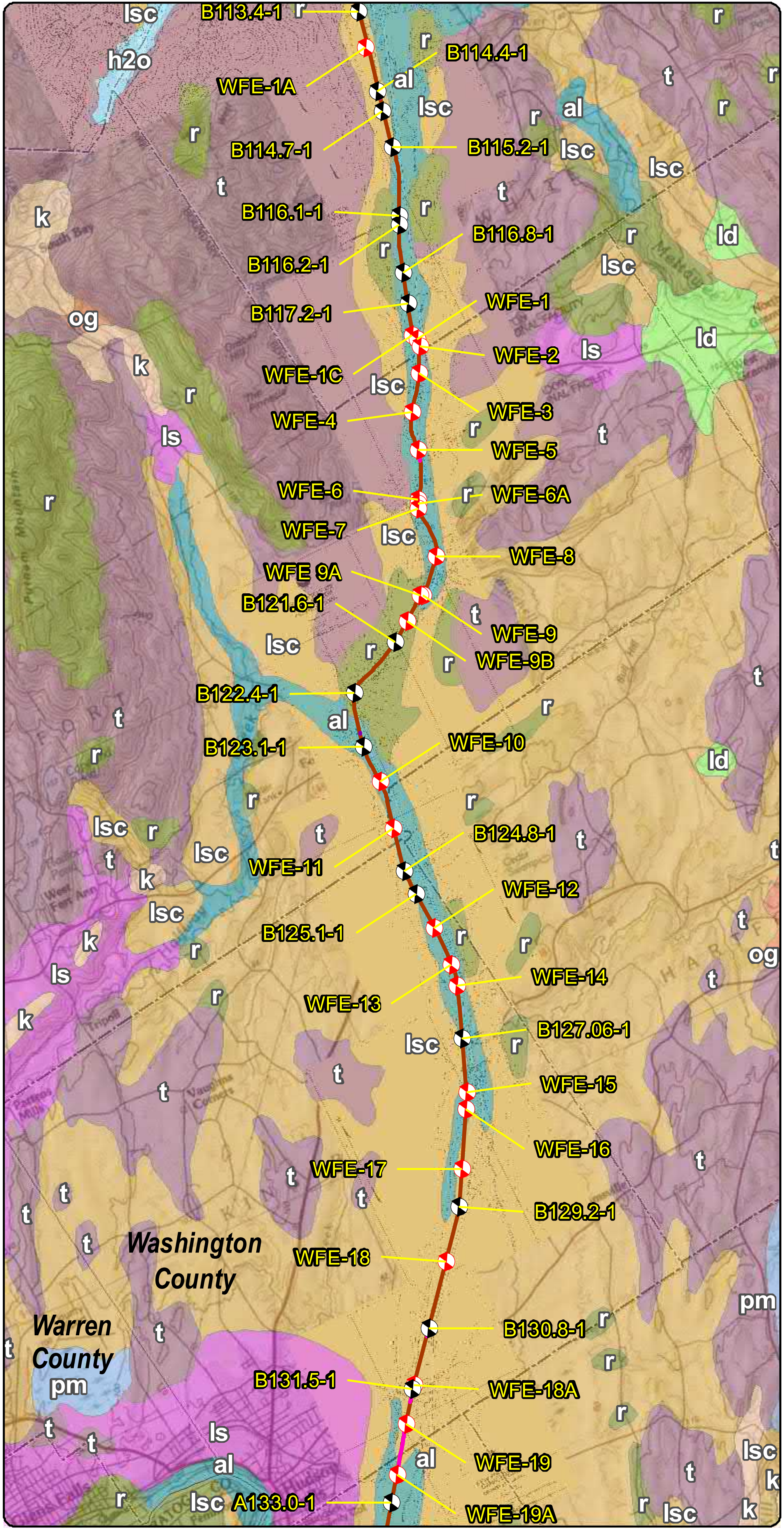
* TRC boring coordinates as shown in Table 1-6 in AECOM report (reference below). Boring elevations estimated from November 2021 topographic survey by Williams Aerial.

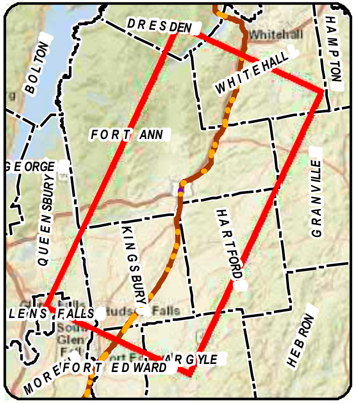
** AECOM boring coordinates and elevations as shown in Table 1-6 in AECOM report.

*** 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
- h2o - Water
- k - Kame deposits
- ld - Lacustrine delta
- ls - Lacustrine sand
- lsc - Lacustrine silt and clay
- og - Outwash sand and gravel
- pm - Swamp deposits
- r - Bedrock
- t - Till

N

1 0.5 0 1 Miles

Transmission Developers Inc.

Champlain Hudson Power Express Project

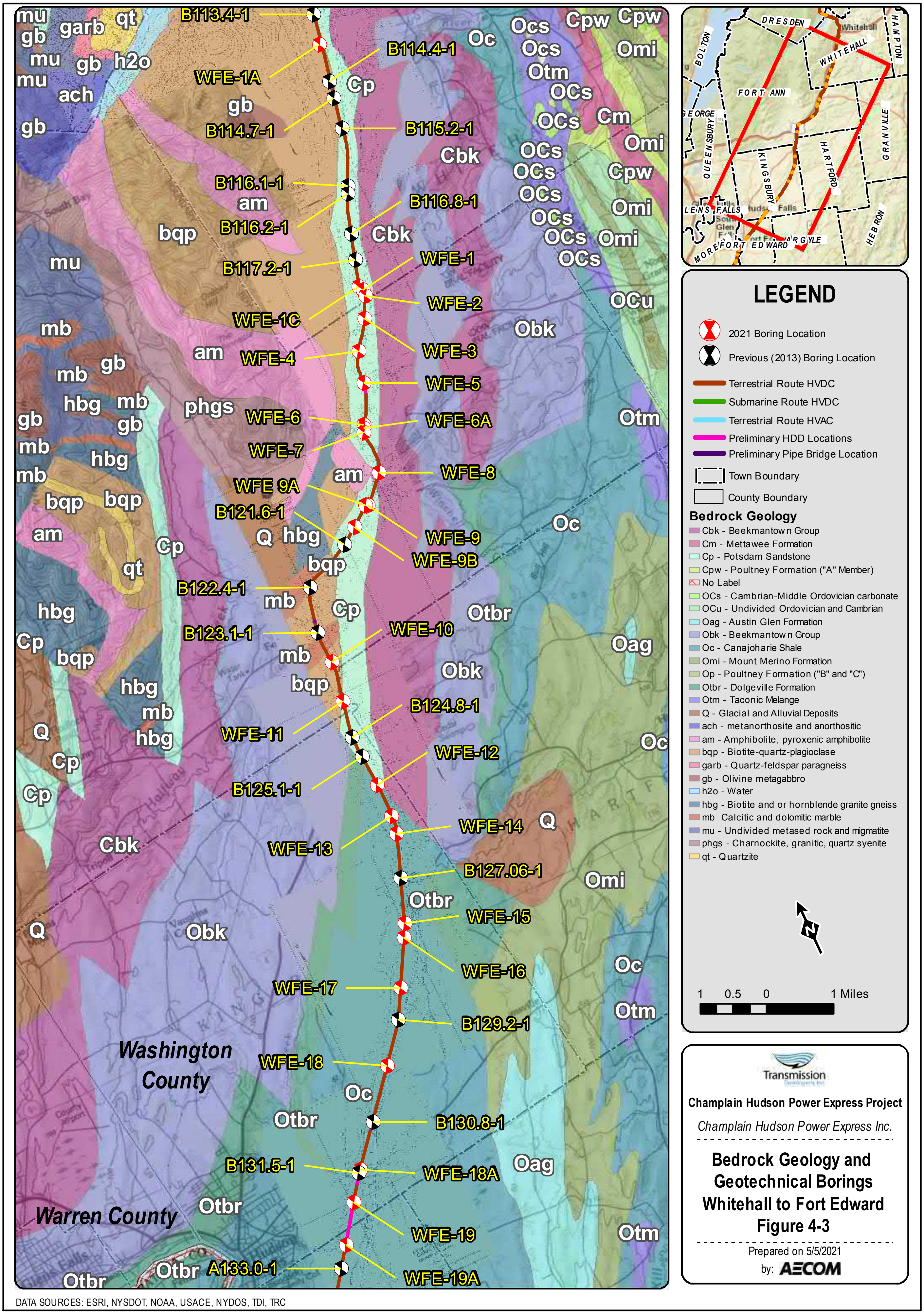
Champlain Hudson Power Express Inc.

Surficial Geology and Geotechnical Borings Whitehall to Fort Edward Figure 3-3

Prepared on 5/5/2021
by: AECOM

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

Y:\Projects\CHPE\Route\Consensus_Alternative_Routes\MXD\Alt_5_Routes_DZ_201909\Boring_Locations\Maps_for_May_2021_Report\Whitehall_to_Ft_Ed_Boring_Locations_Surficial_May_2021_Report.mxd



Transmission Developers Inc.

Champlain Hudson Power Express Project

Champlain Hudson Power Express Inc.

Bedrock Geology and Geotechnical Borings Whitehall to Fort Edward
Figure 4-3

Prepared on 5/5/2021
by: AECOM

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

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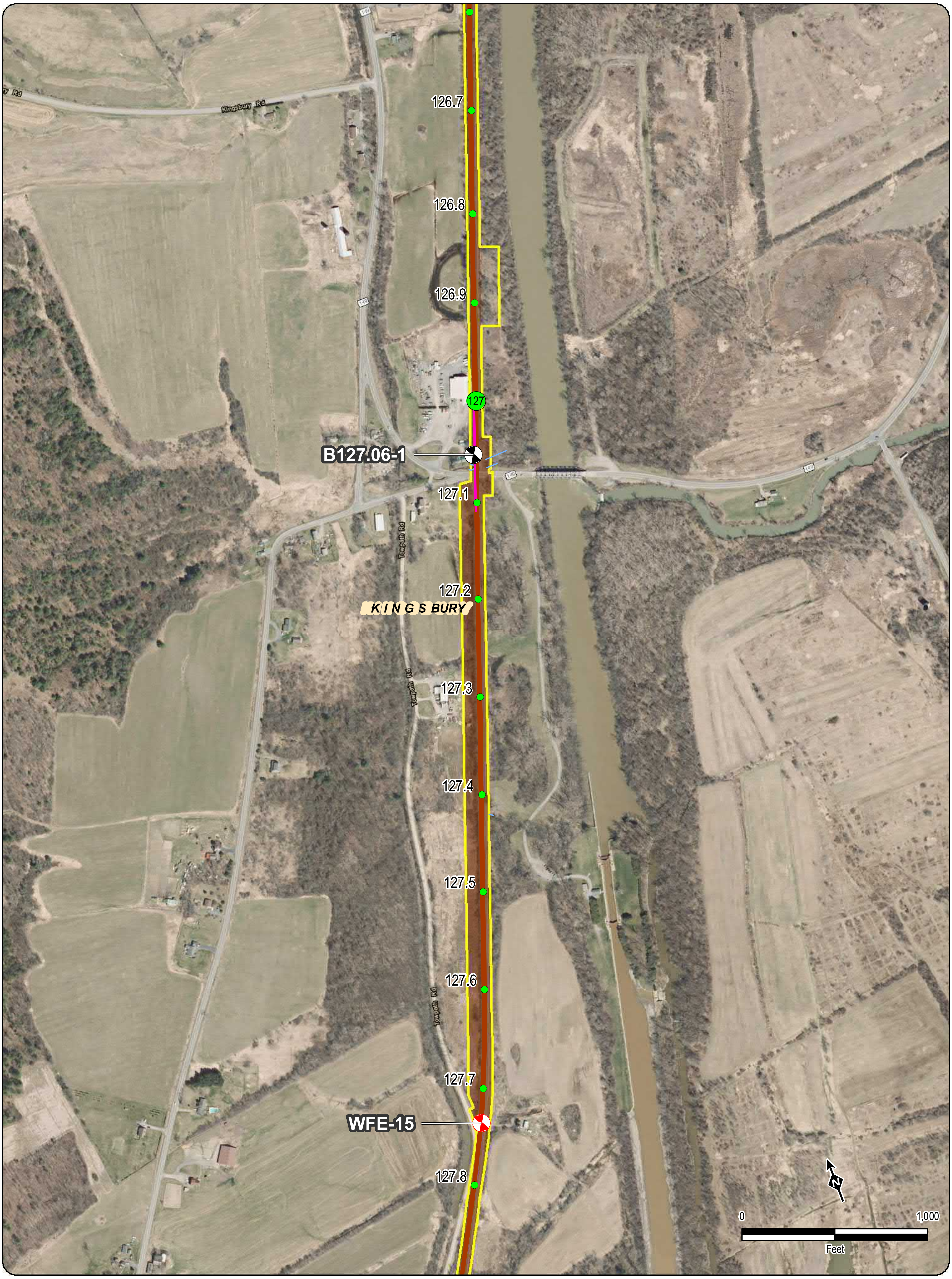
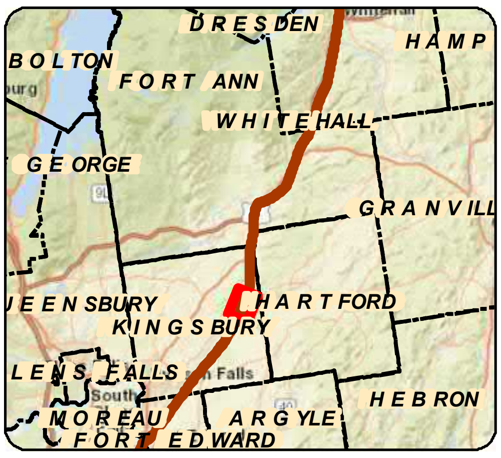




LEGEND

- ● 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

Whitehall to Fort Edward

Figure A-3

Sheet 12 of 16

Prepared by: AECOM

5/19/2021

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\Whitehall_to_Edward_Boring_Locations_Mapset_May_2021_Report.mxd

TRC

TEST BORING LOG

BORING	**B127.06-1**
G.S. ELEV.	N/A
FILE	195651
SHEET	1 OF 1

PROJECT: TDI CHAMPLAIN HUDSON POWER EXPRESS
LOCATION: CP RAILROAD ROW, NY

GROUNDWATER DATA

FIRST ENCOUNTERED 2.0 ' ▽

DEPTH	HOUR	DATE	ELAPSED TIME

▼

METHOD OF ADVANCING BOREHOLE

a	FROM	0.0 '	TO	10.0 '
d	FROM	10.0 '	TO	30.0 '

DRILLER J. MEHALICK
HELPER M. KERLIN
INSPECTOR J. STAPLETON
DATE STARTED 01/07/2013
DATE COMPLETED 01/07/2013

DEPTH		A	B	C	DESCRIPTION	Wn	REMARKS
▽		S-1	4 6 4 3	2.0	***DARK BROWN SILT, TR TO SM F/ SAND, TR F/ GRAVEL (FILL)***		
		S-2	3 2 3 3	4.0	***BROWN F/ GRAVEL-SIZED ROCK FRAGMENTS, SM CLAY, SM SILT, TR F/ SAND (FILL)***		
5		S-3	4 3 4 5			26.8	
		S-4	5 8 10 9				
10		S-5	10 12 13 13		***BROWN CLAY, TR SILT, TR F/M SAND***	29.3	
				13.5			
15		S-6	6 7 13			24.7	
20		S-7	4 2 2		***BROWN SILT, TR TO SM F/ SAND***		
				23.5			
25		S-8	1 1 1			61.2	
					GRAY CLAY, TR SILT		
30		S-9	1 1 1	30.0			
					END OF BORING AT 30'		
35							

DRN. CMP
CKD. PWK

SUMMARY OF LABORATORY TEST DATA

Project Name: TDI Champlain Hudson Power Express – CP
Client Name: Transmission Developers, Inc.
TRC Project #: 195651

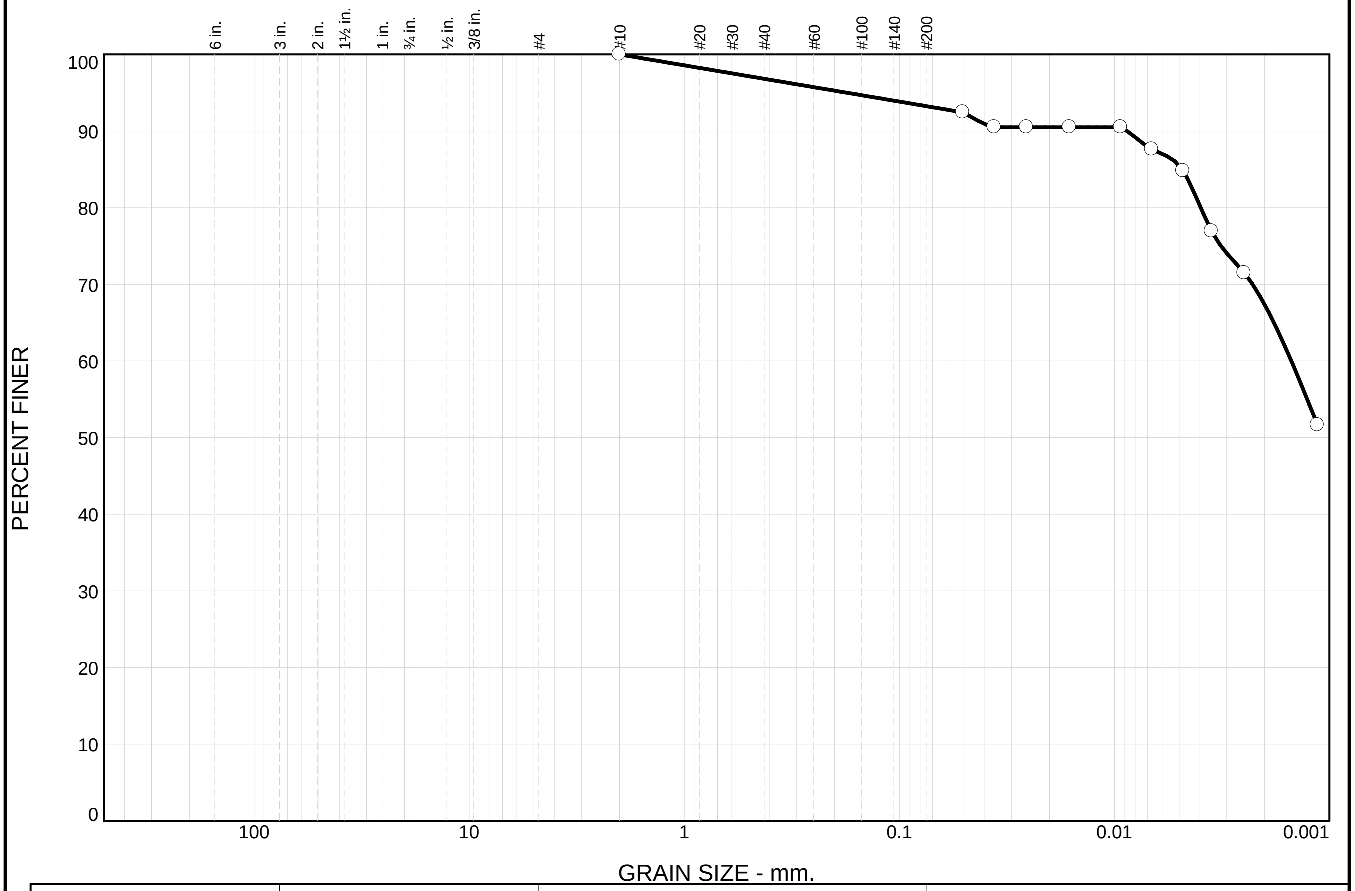
SAMPLE IDENTIFICATION			Soil Group (USCS System)	GRAIN SIZE DISTRIBUTION				PLASTICITY				Specific Gravity	Moisture Content (%)	Unit Weight (pcf)	Compressive Strength (tsf)	Organic Content (%)
Boring #	Sample #	Depth (ft)		Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Liquidity Index)					
	S-5	8.0-10.0	-	-	-	-	-	-	-	-	-	-	36.7	-	-	-
	S-6	13.5-15.0	-	0.4	36.8	62.8		-	-	-	-	-	29.0	-	-	-
	S-7	18.5-20.0	-	-	-	-	-	-	-	-	-	-	23.8	-	-	-
B124.8-1	S-2	2.0-4.0	-	-	-	-	-	-	-	-	-	-	13.7	-	-	-
	S-4	6.0-8.0	-	-	-	-	-	-	-	-	-	-	22.6	107.1	-	-
	S-5	8.0-10.0	-	0.0	22.1	77.9		-	-	-	-	-	6.2	-	-	-
B125.1-1	S-1	0.0-2.0	SW-SM	29.5	60.3	10.2		-	-	-	-	-	17.9	-	-	-
	S-2	2.0-4.0														
	S-5	8.0-10.0	SP-SM	0.3	90.5	9.2		-	-	-	-	-	19.1	-	-	-
	S-6	13.5-15.0														
	S-8	23.5-25.0	CH	-	-	-	-	53	25	28	0.1	-	29.1	-	-	-
B127.06-1	S-3	4.0-6.0	-	-	-	-	-	-	-	-	-	-	26.8	-	-	-
	S-5	8.0-10.0	-	0.0	6.7	7.8	85.5	-	-	-	-	2.80	29.3	-	-	-

SUMMARY OF LABORATORY TEST DATA

Project Name: TDI Champlain Hudson Power Express – CP
Client Name: Transmission Developers, Inc.
TRC Project #: 195651

SAMPLE IDENTIFICATION			Soil Group (USCS System)	GRAIN SIZE DISTRIBUTION				PLASTICITY				Specific Gravity	Moisture Content (%)	Unit Weight (pcf)	Compressive Strength (tsf)	Organic Content (%)
Boring #	Sample #	Depth (ft)		Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Liquidity Index)					
	S-6	13.5-15.0	-	-	-	-	-	-	-	-	-	-	24.7	-	-	-
	S-8	23.5-25.0	-	-	-	-	-	-	-	-	-	-	61.2	-	-	-
B129.2-1	S-4	6.0-8.0	-	-	-	-	-	-	-	-	-	-	39.1	-	-	-
	S-5	8.0-10.0	-	-	-	-	-	-	-	-	-	-	62.5	60.1	-	-
	S-6	13.5-15.0	-	-	-	-	-	-	-	-	-	-	42.1	80.5	-	-
B130.8-1	S-4	6.0-8.0	-	-	-	-	-	-	-	-	-	-	33.2	-	-	-
	S-6	13.5-15.0	CL	-	-	-	-	35	17	18	1.6	-	45.7	-	-	-
	S-7	18.5-20.0														
	S-8	23.5-25.0	-	-	-	-	-	-	-	-	-	-	23.8	-	-	-
B131.5-1	S-2	2.0-4.0	-	-	-	-	-	-	-	-	-	-	21.7	-	-	-
	S-3	4.0-6.0	CL	-	-	-	-	48	23	25	0.3	-	30.0	97.0	-	-
	S-5	8.0-10.0	-	0.0	14.2	85.8		-	-	-	-	-	34.7	-	-	-
	S-6	13.5-15.0	CL	0.0	15.7	41.0	43.3	47	21	26	0.2	2.74	25.5	-	-	-

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	3.2	3.5	7.8	85.5

☒	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			0.0048	0.0015						

Material Description	USCS	AASHTO
○ BROWN CLAY, TR SILT, TR F/M SAND		

Project No. 195651 **Client:** TDI CHAMPLAIN HUDSON POWER EXPRESS - CP

Project: TRANSMISSION DEVELOPERS, INC.

○ **Source of Sample:** B127.06-1 **Depth:** 8.0-10.0 FT **Sample Number:** S-5

Remarks:

○SAMPLE DESCRIPTION BASED ON VISUAL IDENTIFICATION AND LABORATORY ANALYSIS

TRC Engineers, Inc.

Mt. Laurel, NJ

Figure 26

Tested By: TBT 02/26/13 **Checked By:** ____________

Boring Location Plans

Page 8 of 12

Drawn by: ADW	Scale: Not to scale	Project No.: CD10279	Date: March 2022

Champlain Hudson Power Express
Design Package 2
Whitehall to Glens Falls, 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-01-03-22**

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

Boring Location: **See Boring Location Plan**

Project: **Subsurface Investigation**
Champlain Hudson Power Express, Design Package 2
Various Locations, New York

Start Date: **1/14/2022** Finish Date: **1/14/2022**

Boring No.: **K-127.0** Sheet **1** of **2**

Coordinates
Northing **759451.404**
Easting **1650434.627**

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

Ground Elev.: **141.47**

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

Groundwater Observations

Date	Time	Depth	Casing
1/14/2022	AM	4.2'	8.0'
1/14/2022	AM	*3.3'	9.0'
1/14/2022	PM	*9.9'	9.0'

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

CLASSIFICATION OF MATERIAL

f - fine
m - medium
c - coarse

and - 35-50%
some - 20-35%
little - 10-20%
trace - 0-10%

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	Recovery (Inches)
	C	1	0.0	2.0	SS	16 11 6 5	0.7	8" TOPSOIL & ORGANIC MATERIAL	12
1	A S							Black cmf SAND; little SILT; trace f GRAVEL (moist, non-plastic)	
2	I N	2	2.0	4.0	SS	7 7 3 3	3.0	SM FILL	10
3	G							Brown SILT; and CLAY; trace f SAND (moist, moderately plastic)	
4		3	4.0	6.0	SS	2 2 3 5		ML/CL Brown CLAY; and SILT; trace f SAND (moist, plastic) CL/ML	12
5								w = 32.8%	
6		4	6.0	8.0	SS	4 4 5 8		Similar Soil (moist, plastic) CL/ML	12
7								w = 31.2%, LL = 51, PL = 22, PI = 29	
8		5	8.0	10.0	SS	3 3 5 7	9.0		24
9	WET R							Brown mf SAND; some SILT; little CLAY (moist, slightly plastic)	
10	O							SM-SC	
11	T A							Advanced casing to 9.0 feet and began advancing 3 7/8" tri-cone	
12	R Y							roller bit wet rotary open hole within the borehole.	
13									
14		6	14.0	16.0	SS	9 8 7 6		Brown mf+ SAND; some SILT (wet, non-plastic) SM	18
15								w = 22.8% % Fines = 25.0%	
16							17.0		
17									
18									
19		7	19.0	21.0	SS	2 1 WH 2		Grey CLAY; little SILT (wet, plastic) CH	24
20									
21									
22									
23									
24		8	24.0	26.0	SS	WH/18" 1		Grey CLAY; trace SILT (wet, plastic) CH	16
25									

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

Drillers: **Mark Childs; Ian Ross**

Inspector: **Aaron Woods (ATL); Rae Kim (Kiewit)**

ATLANTIC TESTING LABORATORIES, Limited

Subsurface Investigation

Boring No.: **K-127.0** Report No.: **CD10279D-01-03-22** 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									
27									
28		ST-1	28.0	30.0	SH	SHELBY TUBE		NO RECOVERY	0
29									
30		9	30.0	32.0	SS	WH 1 2 2		(3" Brass Lined Split Spoon) Grey CLAY; trace SILT; trace mf SAND (saturated, plastic) CH w = 81.7%, LL = 72, PL = 20, PI = 52 % Fines = 96.0%	24
31									
32									
33									
34		10	34.0	36.0	SS	WR/18" WH		Similar Soil (saturated, plastic) CH	24
35									
36									
37									
38									
39		11	39.0	41.0	SS	WR/12" WH/12"		Similar Soil (saturated, plastic) CH w = 63.9%	24
40									
41							41.0		
42								Boring terminated at 41.0 feet.	
43								Notes: 1. Borehole backfilled with cement-bentonite grout. 2. Soil classifications based on ATL Field Engineer's field classification. 3. Borehole was advanced with ATL's CME 45 Trailer (Rig Unit No. CDGV429) drill rig.	
44									
45									
46									
47									
48									
49									
50									
51									
52									
53									
54									
55									
56									
57									
58									
59									
60									
61									
62									

ATLANTIC TESTING LABORATORIES, Limited

Subsurface Investigation

Report No.: **CD10279D-01-03-22**

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

Boring Location: **See Boring Location Plan**

Project: **Subsurface Investigation**
Champlain Hudson Power Express, Design Package 2
Various Locations, New York

Start Date: **1/17/2022** Finish Date: **1/17/2022**

Boring No.: **K-127.1** Sheet **1** of **2**

Coordinates
Northing **759281.613**
Easting **1649993.938**

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

Ground Elev.: **141.015**

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

Groundwater Observations

Date	Time	Depth	Casing
1/17/2022	**PM**	**DRY**	**4.0'**
1/17/2022	**PM**	**4.5'**	**9.0'**
1/17/2022	**PM**	***7.8'**	**9.0'**
1/17/2022	**PM**	***10.7'**	**9.0'**

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

f - fine
m - medium
c - coarse

and - 35-50%
some - 20-35%
little - 10-20%
trace - 0-10%

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	Recovery (Inches)
1 2	CASING	1	0.0	2.0	SS	10 27 7 4	0.3 2.0	3" TOPSOIL & ORGANIC MATERIAL Blackish-Reddish-Grey cmf GRAVEL; some cmf SAND; trace SILT; trace DEBRIS (cinders) (moist, non-plastic) GW FILL	12
3 4		2	2.0	4.0	SS	4 4 4 3	2.2 4.0	Brownish-Grey SILT; some CLAY (saturated, moderately plastic) ML Possible FILL	10
5 6		3	4.0	6.0	SS	4 2 2 3		Brownish-Grey cmf SAND; some cmf GRAVEL; little SILT; little CLAY (wet, slightly plastic) SW-SC Possible FILL	14
7 8		4	6.0	8.0	SS	6 5 4 6		Blackish-Brown SILT; some CLAY; some mf SAND; trace DEBRIS (cinders); trace ORGANIC MATERIAL (root hairs) (saturated, moderately plastic) ML/CL	0
9 10	WET ROTARY	5	8.0	10.0	SS	4 7 10 10		w = 30.7%, LL = 34, PL = 22, PI = 12, OC = 4.5% NO RECOVERY Greyish-Brown CLAY; little SILT; trace f GRAVEL; trace cmf SAND (saturated, plastic) CL	6
11 12 13 14							12.0	Advanced casing to 9.0 feet and began advancing 3 7/8" tri-cone roller bit wet rotary open hole within the borehole.	
15 16		6	14.0	16.0	SS	5 5 5 6		Blackish-Grey c-mf+ SAND; trace SILT; trace f GRAVEL (saturated, non-plastic) SP % Fines = 4.4%	7
17 18 19							17.0		
20 21 22 23 24		7	19.0	21.0	SS	WR/12" WH/12"		Grey CLAY; trace SILT (saturated, plastic) CH w = 71.7%	21
25		8	24.0	26.0	SS	WR/12" WH/12"		Similar Soil (saturated, plastic) CH	22

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

Drillers: **Mark Childs; John Trathen**

Inspector: **Tom Hunter (ATL); Tom Kimmins (Kiewit)**

ATLANTIC TESTING LABORATORIES, Limited

Subsurface Investigation

Boring No.: **K-127.1** Report No.: **CD10279D-01-03-22** Sheet **2** of **2**

f - fine
m - medium
c - course

and - 35-50%
some - 20-35%
little - 10-20%
trace - 0-10%

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	RECOVERY (inches)
26									
27									
28									
29									
30		9	30.0	32.0	SS	WR/12" WH/12"		(3" Brass Lined Split Spoon) Grey CLAY; trace SILT (saturated, plastic) CH w = 58.0%, LL = 68, PL = 19, PI = 49 % Fines = 100.0%	12
31									
32									
33									
34		10	34.0	36.0	SS	WR/12" WH/12"		Similar Soil (saturated, plastic) CH	22
35									
36							36.0		
37								Boring terminated at 36.0 feet.	
38								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 CME 45 Trailer (Rig Unit No. CDGV429) drill rig.	
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-125.6	S-3	4.0 - 6.0	Brown mf+ SAND; and SILT	48.0	17.8	--	--	--	--	--	--	--	--	--	--	--
	S-5	8.0 - 10.0	Brownish-Grey CLAY; trace mf SAND; trace SILT	--	24.7	50	22	28	--	--	--	--	--	--	--	--
	S-7	19.0 - 21.0	Grey CLAY; little SILT; trace mf SAND	--	49.2	--	--	--	--	--	--	--	--	--	--	--
	ST-1	28.0 - 30.0	Grey CLAY; little SILT	100.0	49.4	60	20	40	--	--	--	--	--	--	--	--
K-127.0	S-3	4.0 - 6.0	Brown CLAY; and SILT; trace f SAND	--	32.8	--	--	--	--	--	--	--	--	--	--	--
	S-4	6.0 - 8.0	Brown CLAY; and SILT; trace f SAND	--	31.3	51	22	29	--	--	--	--	--	--	--	--
	S-6	14.0 - 16.0	Brown mf+ SAND; some SILT	25.0	22.8	--	--	--	--	--	--	--	--	--	--	--
	S-9	30.0 - 32.0	Grey CLAY; trace SILT; trace mf SAND	96.0	81.7	72	20	52	--	--	--	--	--	--	--	--
	S-10	34.0 - 36.0	Grey CLAY; trace SILT; trace mf SAND	--	--	--	--	--	--	7,100	35	8.75	1,548	--	--	--
	S-11	39.0 - 41.0	Grey CLAY; trace SILT; trace mf SAND	--	63.9	--	--	--	--	--	--	--	--	--	--	--
K-127.1	S-3	4.0 - 6.0	Blackish-Brown SILT; some CLAY; some mf SAND; trace DEBRIS (cinders); trace ORGANIC MATERIAL (root hairs)	--	30.7	34	22	12	4.5	--	--	--	--	--	--	--
	S-6	14.0 - 16.0	Blackish-Grey c-mf+ SAND; trace SILT; trace f GRAVEL	4.4	--	--	--	--	--	--	--	--	--	--	--	--
	S-7	19.0 - 21.0	Grey CLAY; trace SILT	--	71.7	--	--	--	--	--	--	--	--	--	--	--
	S-9	30.0 - 32.0	Grey CLAY; trace SILT	100.0	58.0	68	19	49	--	--	--	--	--	--	--	--
K-127.9	S-3	4.0 - 6.0	Brownish-Grey CLAY; little SILT; trace f SAND	--	--	--	--	--	--	300	65	7.93	1,170	--	--	--
	S-4	6.0 - 8.0	Brownish-Grey CLAY; little SILT; trace f SAND	95.0	30.0	70	25	45	--	--	--	--	--	--	--	--
	S-6	14.0 - 16.0	Greyish-Brown CLAY; trace f SAND; trace SILT	--	32.4	--	--	--	--	--	--	--	--	--	--	--
	S-8	24.0 - 26.0	Greyish-Brown CLAY; trace SILT	--	28.8	--	--	--	--	--	--	--	--	--	--	--
	ST-1	38.0 - 40.0	Grey CLAY; trace SILT	100.0	30.0	30	17	13	--	--	--	--	--	--	--	--
K-128.0	S-5	8.0 - 10.0	Brownish-Grey CLAY; some mf SAND; trace SILT	--	28.0	--	--	--	--	--	--	--	--	--	--	--
	S-7	19.0 - 21.0	Grey CLAY; trace SILT	100.0	39.2	78	23	55	--	--	--	--	--	--	--	--
	S-9	29.0 - 31.0	Grey CLAY; trace SILT	--	30.3	--	--	--	--	--	--	--	--	--	--	--
	ST-1	38.0 - 40.0	Grey CLAY; trace SILT	100.0	51.2	43	18	25	--	--	--	--	--	--	--	--
K-129.9A	S-5	8.0 - 10.0	Brown SILT; some mf SAND; little ORGANIC MATERIAL (root hairs)	24.0	134.2	NP	NP	NP	16.8	--	--	--	--	--	--	--
	S-8	24.0 - 26.0	Grey c-mf+ SAND; little SILT	20.0	31.1	--	--	--	--	--	--	--	--	--	--	--
	S-10	34.0 - 36.0	Grey CLAY; trace SILT		52.6	--	--	--	--	--	--	--	--	--	--	--
	ST-1	41.0 - 43.0	Grey CLAY; trace SILT	100.0	40.5	44	20	24	--	--	--	--	--	--	--	--

TEST DATA (continued)

Boring No.	Sample No.	Depth (ft)	Moisture Content (%)
K-125.5	S-3	4-6	21.4
	S-5	8-10	27.5
	S-7	19-21	51.5
	S-9	28-30	38.0
K-127.0	S-3	4-6	32.8
	S-4	6-8	31.2
	S-6	14-16	22.8
	S-9	30-32	81.7
	S-11	39-41	63.9
K-127.1	S-3	4-6	30.7
	S-7	19-21	71.7
	S-9	30-32	58.0

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

Reviewed By: ____________________ Date: 01/31/22

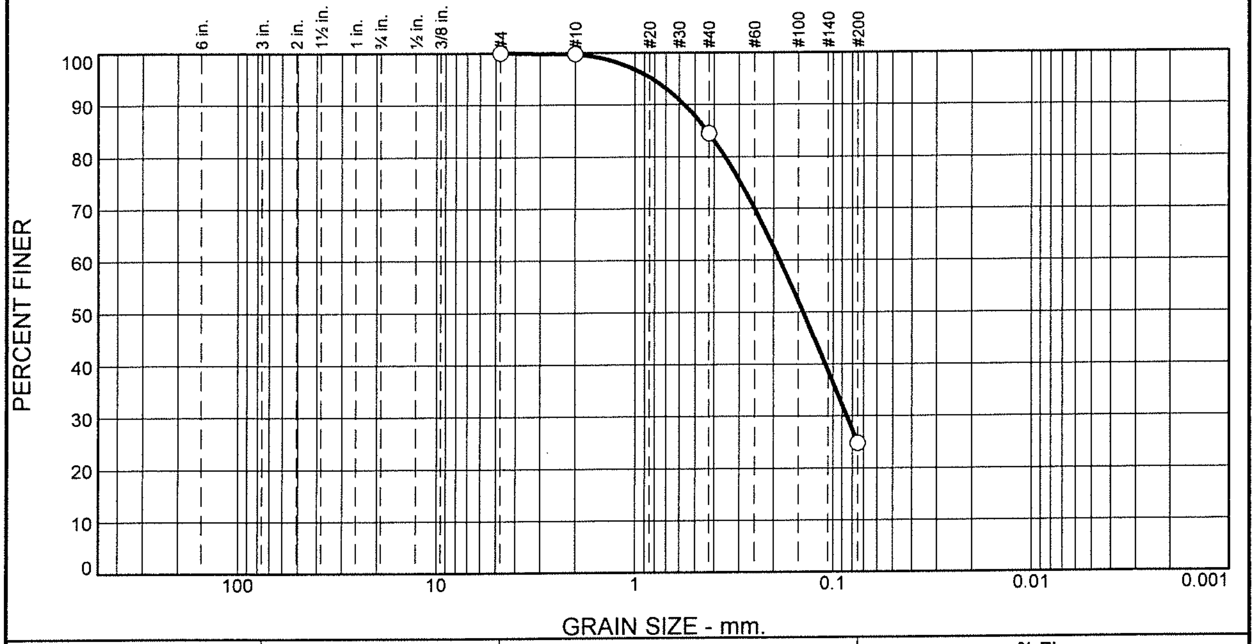
ATLANTIC TESTING LABORATORIES

Particle Size Distribution Report

Project: Champlain Hudson Power Express United Cable Install **Report No.:** CD10279E-01-01-22

Client: Kiewit Intrastructure Co. **Date:** 01/31/22

Sample No: K-127.0, S-6 **Source of Sample:** Boring Sample
Location: In-place **Elev./Depth:** 14-16'



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	0	0	0	16	59	25	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	OUT OF SPEC. (X)
#4	100		
#10	100		
#40	84		
#200	25		

Soil Description

Brown mf+ SAND; some SILT

Atterberg Limits

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

Coefficients

D_{85}= 0.4359 D_{60}= 0.1858 D_{50}= 0.1416
D_{30}= 0.0854 D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= AASHTO=

Remarks

Moisture Content= 22.8%

* (no specification provided)

Figure

ATLANTIC TESTING LABORATORIES, LIMITED

Reviewed by:

Date: 01/31/22

ATLANTIC TESTING LABORATORIES

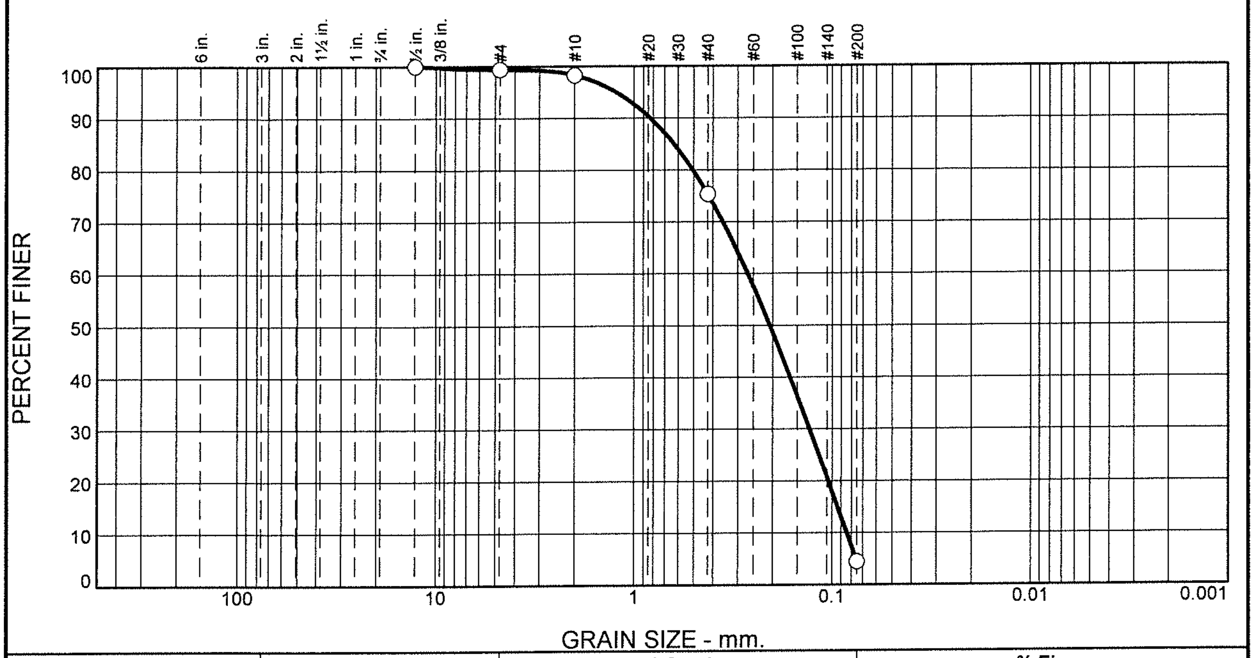
Particle Size Distribution Report

Project: Champlain Hudson Power Express United Cable Install **Report No.:** CD10279E-01-01-22

Client: Kiewit Intrastructure Co. **Date:** 01/31/22

Sample No: K-127.1, S-6 **Source of Sample:** Boring Sample

Location: In-place **Elev./Depth:** 14-16'



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	0	1	1	23	71	4	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	OUT OF SPEC. (X)
1/2"	100		
#4	99		
#10	98		
#40	75		
#200	4.4		

Soil Description

Blackish Grey c-mf+ SAND; trace SILT; trace f GRAVEL

Atterberg Limits

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

Coefficients

D_{85}= 0.6308 D_{60}= 0.2671 D_{50}= 0.2067

D_{30}= 0.1300 D_{15}= 0.0939 D_{10}= 0.0844

C_u= 3.16 C_c= 0.75

Classification

USCS= SP AASHTO=

Remarks

* (no specification provided)

Figure

ATLANTIC TESTING LABORATORIES, LIMITED

Reviewed by:

Date: 01/31/22

ATLANTIC TESTING LABORATORIES

WBE certified company

AMOUNT OF MATERIAL IN SOILS FINER THAN THE NO. 200 SIEVE
ASTM D 1140

PROJECT INFORMATION

Client:	Kiewit Intrastructure Co.	**ATL Report No.:**	CD10279E-01-01-22
Project:	Champlain Hudson Power Express United Cable Installation Various Locations, New York	**Report Date:**	January 31, 2022
		Test Date:	January 25, 2022
		Performed By:	R. Parrow

TEST DATA

Boring No.	Sample No.	Depth (ft)	Method (A or B)	Soak Time (min)	Initial Dry Weight (g)	% Finer than #200
K-123.2	S-10	28-30	A	10	107.62	97
K-123.7	S-6	14-16	A	10	78.62	100
K-123.7	S-9	28-30	A	10	120.67	100
K-123.8	S-9	28-30	A	10	219.15	100
K-125.5	S-9	28-30	A	10	219.28	94
K-127.0	S-9	30-32	A	10	119.17	96
K-127.1	S-9	30-32	A	10	124.57	100

Reviewed By: ______________________

Date: January 31, 2022

LIQUID LIMIT, PLASTIC LIMIT, AND PLASTICITY INDEX OF SOIL
ASTM D 4318

PROJECT INFORMATION

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

ATL Report No.: CD10279E-01-01-22
Report Date: January 31, 2022
Date Received: January 25, 2022

TEST DATA

Boring No.	Sample No.	LL	PL	PI
K-122.35	S-3	NP	NP	NP
K-122.35	S-15	NP	NP	NP
K-123.2	S-6	48	20	28
K-123.2	S-10	67	21	46
K-123.7	S-6	79	23	56
K-123.7	S-9	73	20	53
K-123.8	S-6	54	23	31
K-123.8	S-9	67	18	49
K-125.5	S-3	NP	NP	NP
K-125.5	S-9	70	21	49
K-127.0	S-4	51	22	29
K-127.0	S-9	72	20	52
K-127.1	S-3	34	22	12
K-127.1	S-9	68	19	49

SAMPLE INFORMATION

Boring No.	Sample No.	Maximum Grain Size (mm)	Estimated Amount of Sample Retained on No. 40 Sieve (%)	As Received Moisture Content (%)
K-122.35	S-3	2	5	23.5
K-122.35	S-15	4.76	52	27.2
K-123.2	S-6	2	1	28.4
K-123.2	S-10	6.35	1	65.5
K-123.7	S-6	0.297	0	25.9
K-123.7	S-9	0.297	0	48.4
K-123.8	S-6	2	7	66.5
K-123.8	S-9	0.297	0	37.2
K-125.5	S-3	2	5	21.4
K-125.5	S-9	9.51	2	38.0
K-127.0	S-4	2	2	31.2
K-127.0	S-9	9.51	2	81.7
K-127.1	S-3	6.35	24	30.7
K-127.1	S-9	2	1	58.0

Client: Kiewit Instrastructure Co.
Project: Champlain Hudson Power Express

ATL Report No. CD10279E-01-01-22
Date: January 31, 2022

PREPARATION INFORMATION

Boring No.	Sample No.	Preparation	Method of Removing Oversized Material
K-122.35	S-3	Air Dry	Pulverizing and Screening
K-122.35	S-15	Air Dry	Pulverizing and Screening
K-123.2	S-6	Air Dry	Pulverizing and Screening
K-123.2	S-10	Air Dry	Pulverizing and Screening
K-123.7	S-6	Air Dry	Not Necessary
K-123.7	S-9	Air Dry	Not Necessary
K-123.8	S-6	Air Dry	Pulverizing and Screening
K-123.8	S-9	Air Dry	Not Necessary
K-125.5	S-3	Air Dry	Pulverizing and Screening
K-125.5	S-9	Air Dry	Pulverizing and Screening
K-127.0	S-4	Air Dry	Pulverizing and Screening
K-127.0	S-9	Air Dry	Pulverizing and Screening
K-127.1	S-3	Air Dry	Pulverizing and Screening
K-127.1	S-9	Air Dry	Pulverizing and Screening

EQUIPMENT INFORMATION

Liquid Limit Procedure:	Multipoint - Method A	☒	Single Point - Method B	☐
Liquid Limit Apparatus:	Manual	☒	Motor Driven	☐
Liquid Limit Grooving Tool Material:	Plastic	☒	Metal	☐
Liquid Limit Grooving Tool Shape:	Flat	☒	Curved (AASHTO Only)	☐
Plastic Limit:	Hand Rolled	☒	Mechanical Rolling Device	☐

Reviewed By: ______________________

Date: 01/31/22

ATLANTIC TESTING LABORATORIES

WBE certified company

PROJECT INFORMATION

Client: Kiewit Intrastructure Co.

Project: Champlain Hudson Power Express
United Cable Installation
Various Locations, New York

ATL Report No.: CD10279E-01-01-22

Report Date: January 31, 2022

Date Received: January 25, 2022

PERCENT ORGANICS, ASH CONTENT, AND MOISTURE CONTENT

ASTM D 2974

Boring No.	Sample No.	Organics (%)	Ash (%)	Moisture (%)	Test Method	Furnace Temperature (°C)
K-122.35	S-4	4.5	95.5	22.8	A	440
K-123.7	S-3	7.5	92.5	41.4	A	440
K-123.8	S-6	6.9	93.1	66.5	A	440
K-127.1	S-3	4.5	95.5	30.7	A	440

Reviewed By: ______________________

Date: 01/31/22

Kiewit

MEMORANDUM

DATE: September 23, 2022

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 3 - Package 2 - HDD Crossing 17 – Revision 1
Champlain Hudson Power Express Project
Fort Ann, 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 south of Fort Ann, New York. The approximate station for the start of HDD crossing Number 17 is STA 20545+00 (43.347016° N, 73.501611° W).

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

- AECOM, Geotechnical Data Report, Upland Segments, Champlain Hudson Power Express, dated May 28, 2021.
- Atlantic Testing Laboratories, Subsurface Investigation Services, Champlain Hudson Power Express, Design Package 2, Whitehall to Glens Falls, New York, dated June 15, 2022.

Contact us if you have questions or require additional information.

HDD 17
Borings WFE-16, K-127.9, K-128.0
Segment 3

CHPE Segment 3 - Package 2
HDD Soil Boring Coordinates and Elevations

Firm	Boring	Northing (feet)	Easting (feet)	Ground Surface Elevation (feet)
TRC*	B122.4-1	1673988.1	762589.1	134.0
	B123.1-1	1670533.1	761581.7	134.0
	B127.6-1	1650236.9	759369.7	143.0
	B130.8-1	1633732.2	749229.1	144.0
	B131.5-1	1630565.5	746543.8	148.0
AECOM**	WFE-2	1693039.7	776227.9	125.9
	WFE-6	1683884.0	771830.6	128.7
	WFE-6A	1683645.5	771707.7	129.0
	WFE-7	1683295.0	771591.2	128.7
	WFE-9	1677994.3	769427.4	133.9
	WFE-9A	1678043.5	769246.8	140.2
	WFE-9B	1676842.4	767745.7	141.7
	WFE-12	1657680.6	760822.6	135.3
	WFE-16	1645866.1	757602.8	145.2
	WFE-18	1637293.5	752138.0	143.6
	WFE-18A	1630756.2	746790.9	144.9
	WFE-19	1628651.1	745226.2	139.1
	WFE-19A	1625848.4	743218.4	139.0

Notes:

- Northings and Eastings are provided in NAD83 New York State Plane East Zone.
- Elevations are referenced to the NAVD88 datum.

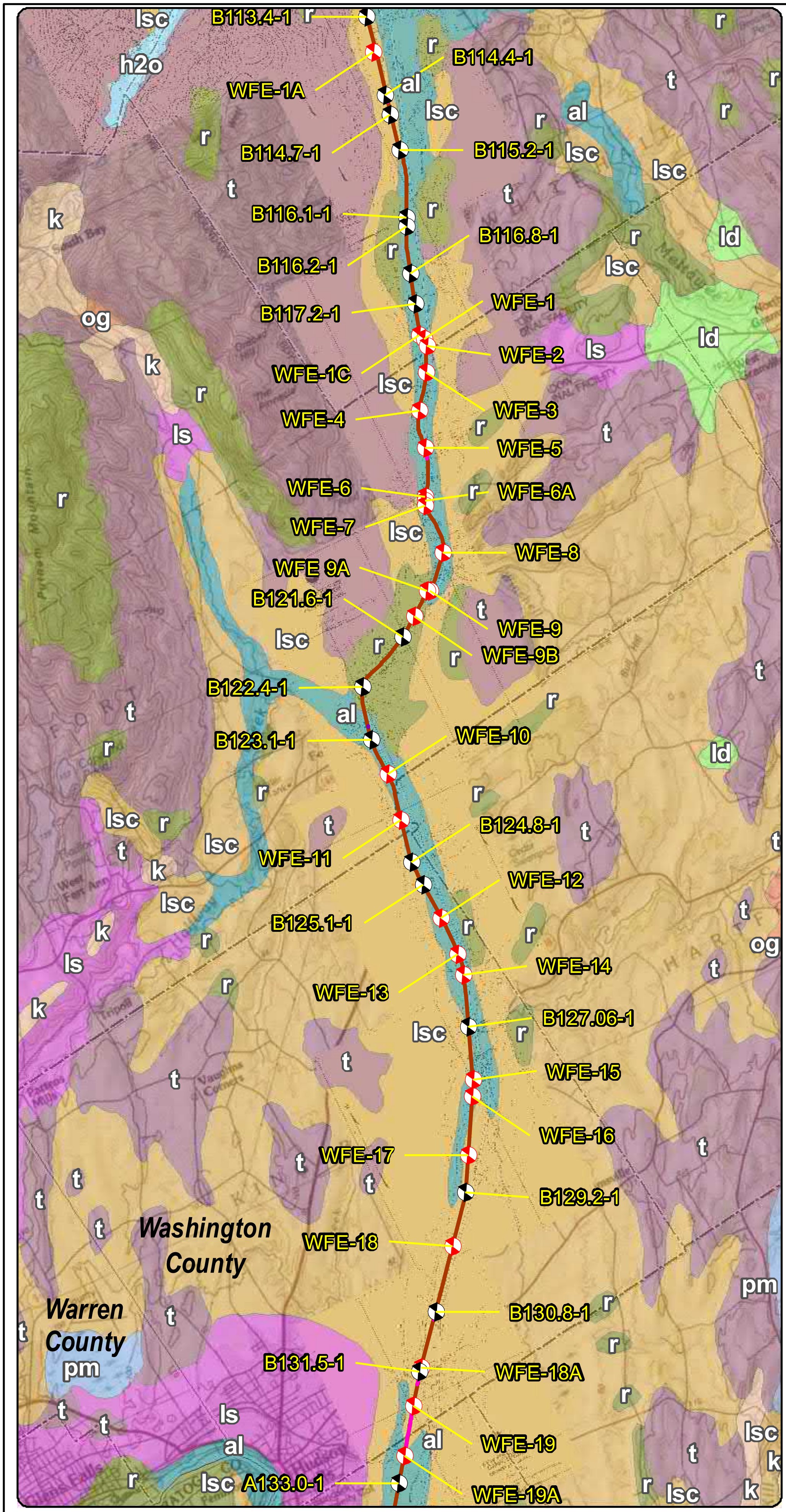
* TRC boring coordinates as shown in Table 1-6 in AECOM report (reference below). Boring elevations estimated from November 2021 topographic survey by Williams Aerial.

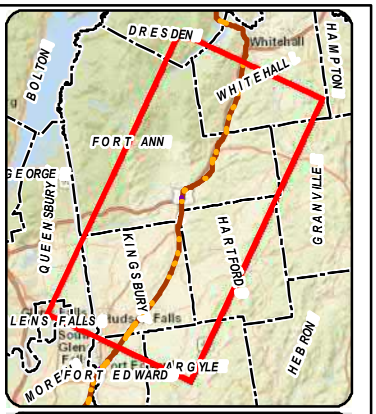
** AECOM boring coordinates and elevations as shown in Table 1-6 in AECOM report.

*** 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
- h2o - Water
- k - Kame deposits
- ld - Lacustrine delta
- ls - Lacustrine sand
- lsc - Lacustrine silt and clay
- og - Outwash sand and gravel
- pm - Swamp deposits
- r - Bedrock
- t - Till

N

1 0.5 0 1 Miles

Transmission Developers Inc.

Champlain Hudson Power Express Project

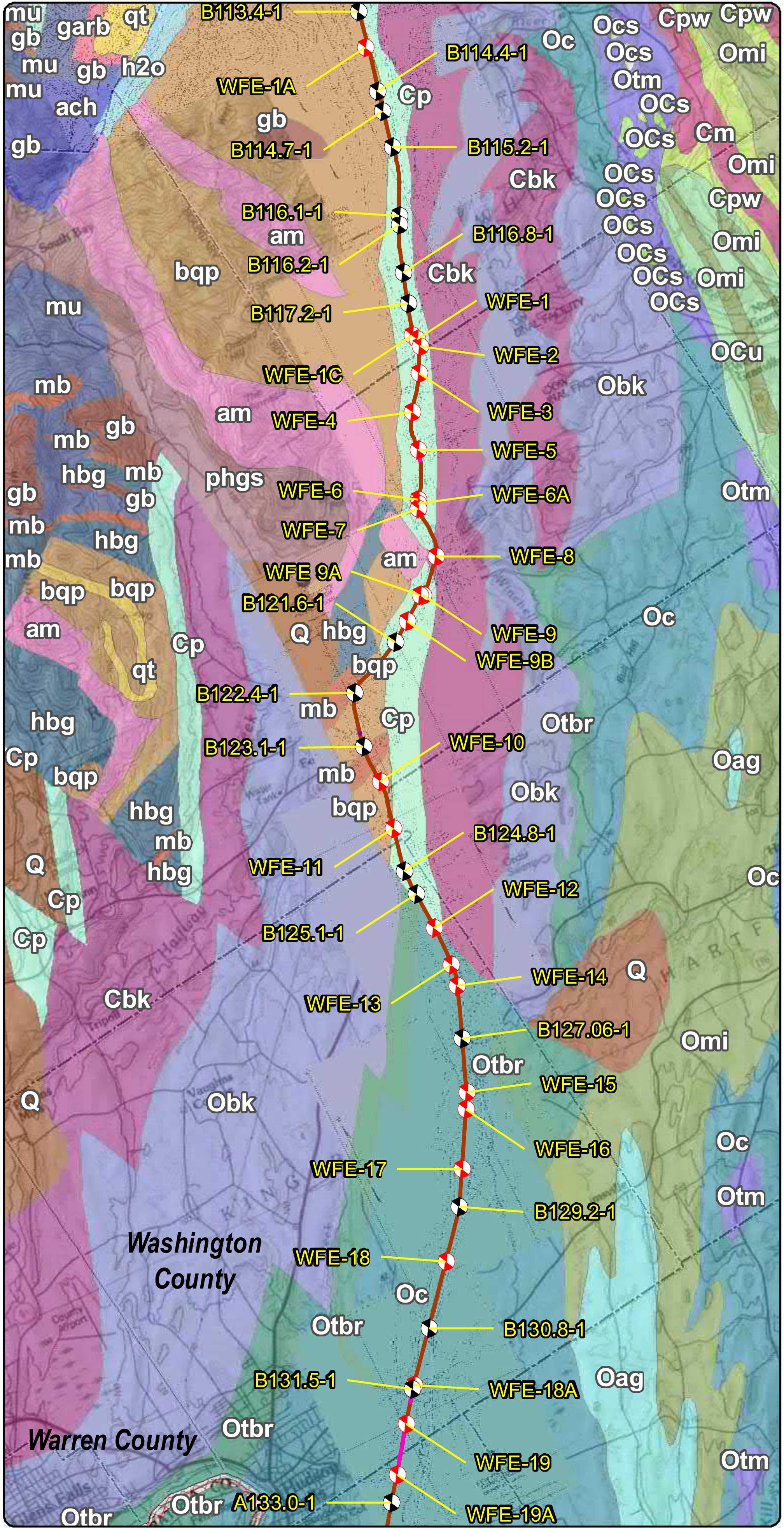
Champlain Hudson Power Express Inc.

Surficial Geology and Geotechnical Borings Whitehall to Fort Edward Figure 3-3

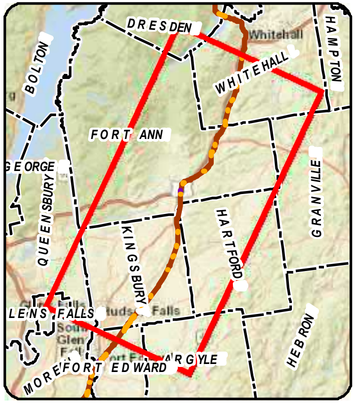
Prepared on 5/5/2021
by: AECOM

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

Y:\Projects\CHPE\Route\Consensus_Alternative_Routes\MXD\Alt_5_Routes_DZ_201909\Boring_Locations\Maps_for_May_2021_Report\Whitehall_to_Ft_Ed_Boring_Locations_Surficial_May_2021_Report.mxd



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



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

- Cbk - Beekmantown Group
- Cm - Mettawee Formation
- Cp - Potsdam Sandstone
- Cpw - Poultney Formation ("A" Member)
- No Label
- OCs - Cambrian-Middle Ordovician carbonate
- OCu - Undivided Ordovician and Cambrian
- Oag - Austin Glen Formation
- Obk - Beekmantown Group
- Oc - Canajoharie Shale
- Omi - Mount Merino Formation
- Op - Poultney Formation ("B" and "C")
- Otbr - Dolgeville Formation
- Otm - Taconic Melange
- Q - Glacial and Alluvial Deposits
- ach - metanorthosite and anorthositic
- am - Amphibolite, pyroxenic amphibolite
- bqp - Biotite-quartz-plagioclase
- garb - Quartz-feldspar paragneiss
- gb - Olivine metagabbro
- h2o - Water
- hbg - Biotite and or hornblende granite gneiss
- mb Calcitic and dolomitic marble
- mu - Undivided metased rock and migmatite
- phgs - Charnockite, granitic, quartz syenite
- qt - Quartzite

N

1 0.5 0 1 Miles

Transmission Developers Inc.

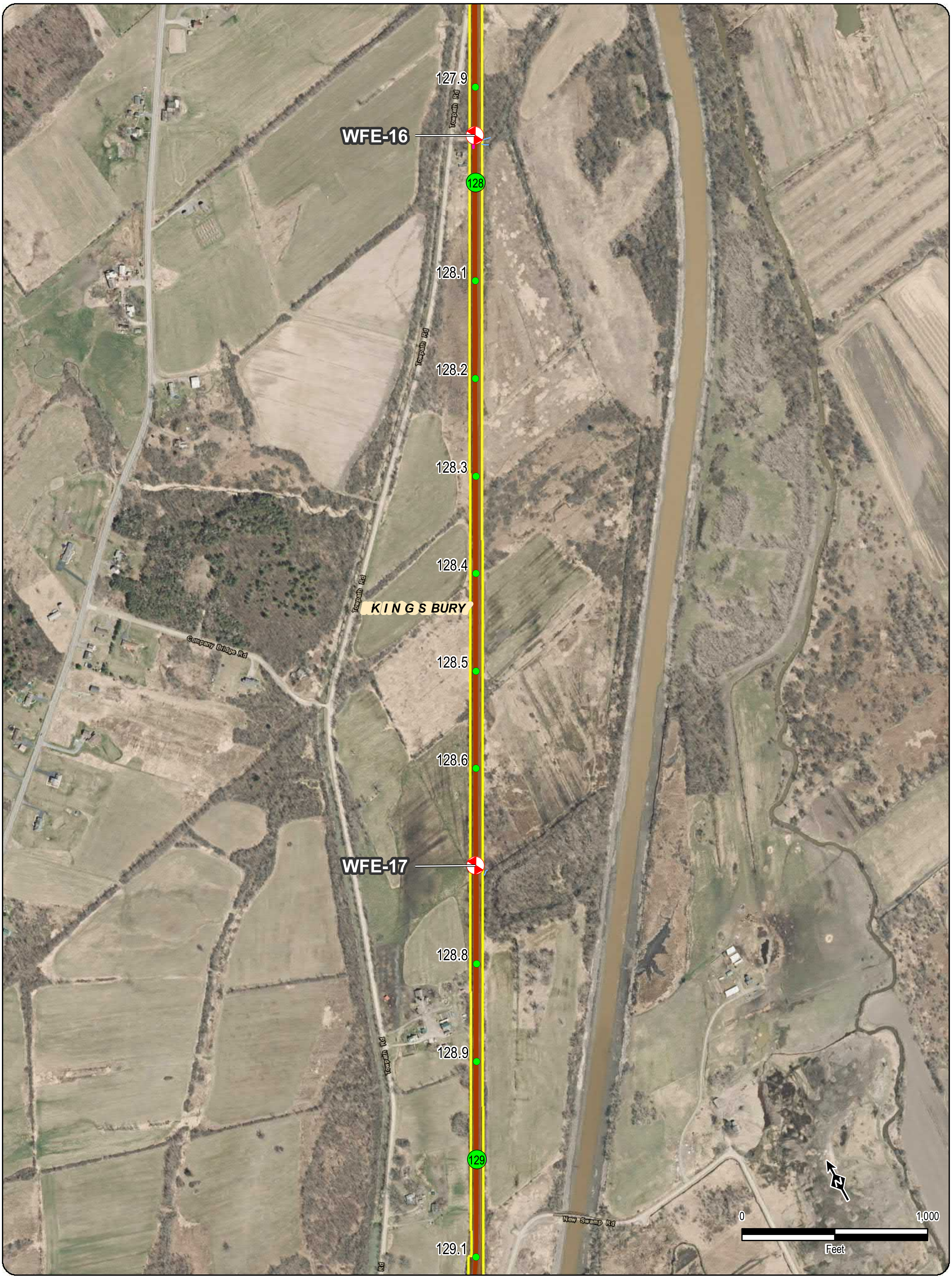
Champlain Hudson Power Express Project

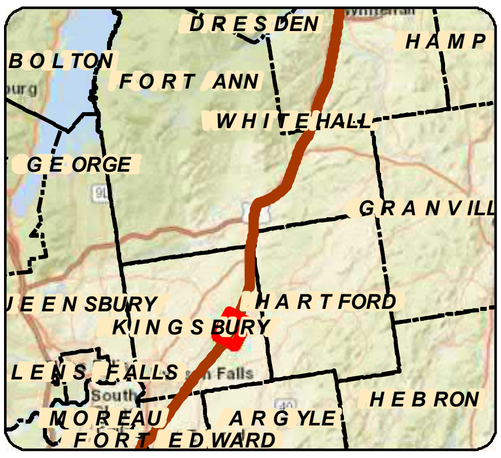
Champlain Hudson Power Express Inc.

Bedrock Geology and Geotechnical Borings Whitehall to Fort Edward
Figure 4-3

Prepared on 5/5/2021
by: AECOM

Y:\Projects\CHPE\Route\Consensus_Alternative_Routes\MXD\Alt_5_Routes_DZ_201909\Boring_Locations\Maps_for_May_2021_Report\Whitehall_to_Ft_Ed_Boring_Locations_Bedrock_May_2021_Report.mxd





LEGEND

● Certified Milepost - Tenths
● Certified Milepost
○ Preferred Alternative Milepost - Tenths
○ 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
T O W N N AME
Road Name
Village Name

Transmission Developers Inc.

Champlain Hudson Power Express Project

Champlain Hudson Power Express Inc.

BORING LOCATION PLAN

Whitehall to Fort Edward

Figure A-3

Sheet 13 of 16

Prepared by: AECOM 5/19/2021

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\Whitehall_to_Edward_Boring_Locations_Mapset_May_2021_Report.mxd

BORING CONTRACTOR: ADT	AECOM	SHEET 1 OF 2
		PROJECT NAME: CHPE -
DRILLER: Chris Chaillou		PROJECT NO.: 60323056
		HOLE NO.: **WFE-16**
SOILS ENGINEER/GEOLOGIST: Chris French		START DATE: 1/8/21
	BORING LOG	FINISH DATE: 1/8/21
LOCATION: M.P. - 127.95 (CP Rail)		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			NORTHING
	HAMMER FALL	30"	30"			EASTING

DEPTH	CORING RATE MIN/FT	SAMPLE DEPTHS FROM - TO (FEET)	SAMPLE 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						SAND	0.0'-0.5'; Black fine-coarse SAND, some angular gravel; frozen
1.0													0.5'-1.5'; Black fine-coarse SAND, llittle silt, little angular gravel; loose, moist
2.0											SP/SM		1.5'-4.0'; Light brown fine-medium SAND, little silt, loose, moist
3.0													
		3'-5'	S-1										
4.0													
											ML/CL	SILT AND CLAY	4.0'-5.0'; Gray SILT and clay; medium stiff, moist
5.0													TR-1; (3.0'-5.0')
		5'-7'	S-2	24"	18"	7	6	8	9	9	CL/ML		Gray CLAY and silt, trace fine sand; stiff, moist
6.0													
7.0													
		7'-9'	S-3	24"	24"	6	9	13	11	8	ML/CL		Gray and brown SILT, some clay; stiff, moist
8.0													TR-2; (8.0'-8.5')
9.0													
		9'-11'	S-4	24"	24"	12	12	17	17	19	ML/CL		SAA
10.0													
11.0													
		11'-13'	S-5	24"	12"	8	7	10	11	11	ML/CL		Gray SILT, some clay; medium stiff, moist
12.0													
13.0													
		13'-15'	S-6	24"	16"	12	11	10	14	14	CL/ML	SILTY CLAY	Brown CLAY and silt; very stiff, moist
14.0													
15.0													
		15'-17'	S-7	24"	24"	3	4	4	5	5	CL		Brown silty CLAY; stiff, moist
16.0													TR-3; (16.0'-16.5')
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: $Ncorr=N*(2.0^2-1.375^2)in./(3.0^2-2.4^2)in. = N*0.65$.

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

DRILLER:
Chris Chaillou

SOILS ENGINEER:
Chris French

AECOM

BORING LOG

SHEET 2 OF 2
PROJECT NAME: CHPE -
PROJECT NO.: 60323056
HOLE NO.: **WFE-16**
START DATE: 1/8/21
FINISH DATE: 1/8/21

LOCATION: M.P. - 127.95 (CP Rail)
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"	24"	3	5	6	7	7	CL	SILTY CLAY	SAA
21.0													
22.0													
23.0													
24.0													
25.0													
		25'-27'	S-9	24"	24"	2	4	5	8	6	CL		Gray silty CLAY; medium stiff, moist TR-4; (26.0'-26.5')
26.0													
27.0													
28.0													
29.0													
30.0													
		30'-32'	S-10	24"	24"	2	4	6	14	7	CL		SAA
31.0													
32.0													
33.0													
34.0													
35.0													
		35'-37'	S-11	24"	24"	3	5	6	13	7	CL		Gray silty CLAY; soft, moist TR-5; (36.0'-36.5')
36.0													
37.0													
38.0													
		38'-40'	S-12	24"	24"	WOH	2	4	7	4	CL		SAA
39.0													
40.0													
													WFE-16 terminated at 40' then grouted to surface
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%

Aquifer
CHPE- Whitehall-Ft. Edward Borings
LABORATORY SOIL TESTING DATA SUMMARY

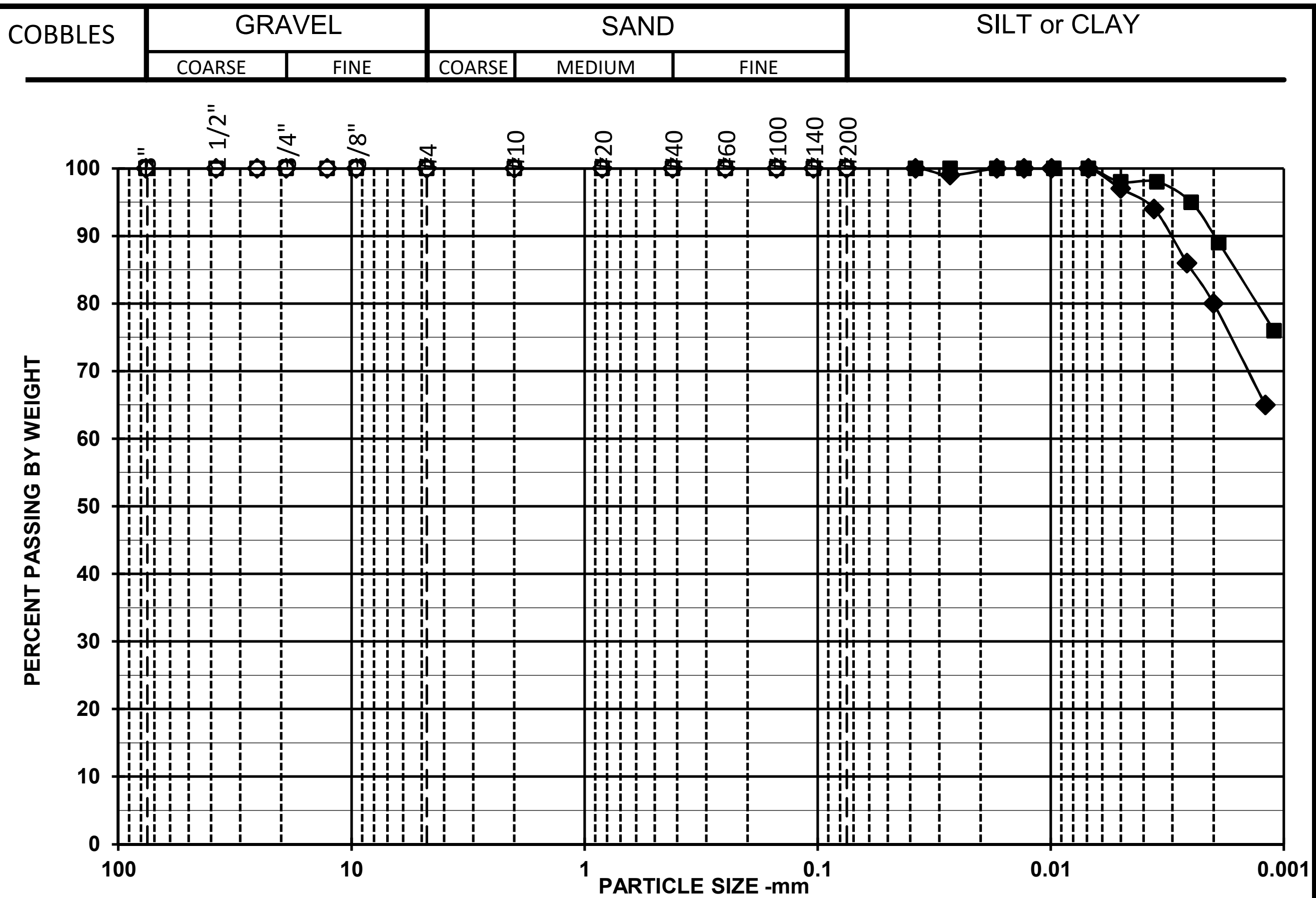
BORING	SAMPLE	DEPTH	IDENTIFICATION TESTS								REMARKS
NO.	NO.	(ft)	WATER CONTENT (%)	LIQUID LIMIT (-)	PLASTIC LIMIT (-)	PLAS. INDEX (-)	USCS SYMB. (1)	SIEVE MINUS NO. 200 (%)	HYDROMETER % MINUS 2 μm (%)	ORGANIC CONTENT (burnoff) (%)	
WFE-1A	S-2	5-7	24.4	44	17	27	CL	93	39		
WFE-1A	S-5	11-13	43.0	68	23	45	CH	99.8	84		
WFE-1C	S-3	7-9	44.5				CH	99.3	86		
WFE-1C	S-7	15-17	44.5	78	27	51	CH	100	94		
WFE-1C	S-10	30-32	45.7	61	23	38	CH	100	87		
WFE-2	S-2	5-7	7.3				SW-SM	10.7	3		
WFE-2	S-7	15-17	26.0				SC	28.5	13		
WFE-2	S-9	25-27	66.0	71	26	45	CH	100	90		
WFE-4	S-2	5-7	18.0				SC	34	13		
WFE-4	S-4	9-11	18.3				SM	17	5		
WFE-5	S-2	5-7	19.9				SM	19	3		
WFE-5	S-4	9-11	18.6	28	15	13	CL	91	28		
WFE-6A	S-2	5-7	13.6				SP-SC	9	3		
WFE-6A	S-4	9-11	17.4				SP-SM	7	2		
WFE-8	S-3	6-8	24.9				SC	48.5	12		
WFE-8	S-4	8-10	88.5	128	53	75	MH	94	43		
WFE-10	S-2	5-7	38.0	71	24	47	CH	94	76		
WFE-10	S-4	9-11	22.5				CL	83.9	32		
WFE-12	S-2	5-7	23.5	49	20	29	CL	62.5	35		
WFE-12	S-4	9-11	28.3				CL	95.8	37		
WFE-14	S-3	7-9	25.7				CL	75.7	44		
WFE-14	S-5	13-15	22.5				ML	53.9	17		
WFE-16	S-3	7-9	36.7	75	25	50	CH	100	90		
WFE-16	S-9	25-27	37.1	73	24	49	CH	100	80		
WFE-18	S-3	7-9	229.7	293	93	200	OH	58	43	34.1	
WFE-18	S-8	20-22	34.3	30	21	9	CL	95	26		
WFE-18	S-10	30-32	64.3	56	21	35	CH	100	87		
WFE-18A	S-2	5-7	19.9	30	13	17	CL	88.5	29		
WFE-18A	S-7	15-17	18.9				SM	14.3	1		
WFE-18A	S-10	30-32	62.9	62	22	40	CH	99	86		
WFE-19A	S-3	7-9	38.1				SP-SM	8	3		
WFE-19A	S-8	20-22	31.8				SP-SM	8.3	2		
WFE-19A	S-10	30-32	17.6				SW-SM	8	1		

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

Prepared by: NG
Reviewed by: CMJ
Date: 4/30/2021

TerraSense, LLC
45H Commerce Way
Totowa, NJ 07512

Project No.: 7853-21003
File: Indx1.xlsx



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
□	36.7	75	25	50	CH		Brown, Fat clay	04/26/21
◇	37.1	73	24	49	CH		Gray, Fat clay	04/26/21
○								

Aquifer

TerraSense, LLC #7853-21003

CHPE- Whitehall-Ft. Edward Borings

Symbol	□	◇	○
Boring	WFE-16	WFE-16	
Sample	S-3	S-9	
Depth	7-9	25-27	
% +3"	0	0	
% Gravel	0	0	
% SAND	0	0	
%C SAND	0	0	
%M SAND	0	0	
%F SAND	0	0	
% FINES	100	100	
D_{100} (mm)	4.75	0.075	
D_{60} (mm)			
D_{30} (mm)			
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"	100	100	
3/4"	100	100	
1/2"	100	100	
3/8"	100	100	
#4	100	100	
#10	100	100	
#20	100	100	
#40	100	100	
#60	100	100	
#100	100	100	
#140	100	100	
#200	100	100	
5μ m	98	97	
2μ m	90	80	
1μ m	74	60	

PARTICLE SIZE DISTRIBUTION
ASTM D6913 & ASTM D7928

TerraSense Analysis File: GrainSizeV6Rev1a14

Siev1k.xlsx 4/30/2021

Boring Location Plans Page 9 of 12	Drawn by: ADW	Scale: Not to scale	Project No.: CD10279	Date: March 2022

Champlain Hudson Power Express
Design Package 2
Whitehall to Glens Falls, 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-01-03-22**

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

Boring Location: **See Boring Location Plan**

Project: **Subsurface Investigation**
Champlain Hudson Power Express, Design Package 2
Various Locations, New York

Start Date: **1/26/2022** Finish Date: **1/26/2022**

Boring No.: **K-127.9** Sheet **1** of **2**

Coordinates
Northing **757681.003**
Easting **1646016.024**

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

Ground Elev.: **145.159**

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

Groundwater Observations

Date	Time	Depth	Casing
1/26/2022	PM	*7.3'	7.0'

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

f - fine
m - medium
c - coarse

and - 35-50%
some - 20-35%
little - 10-20%
trace - 0-10%

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	Recovery (Inches)
	CASING	1	0.0	2.0	SS	13 15 8 7		Black cmf SAND; trace f GRAVEL; trace SILT (frozen, non-plastic) SW FILL	8
		2	2.0	4.0	SS	4 8 10 7	4.0	Brown cmf SAND; trace f GRAVEL; trace SILT (wet, non-plastic) SW Possible FILL	4
		3	4.0	6.0	SS	7 6 6 7		Brownish-Grey CLAY; little SILT; trace f SAND (wet, plastic) CH	12
		4	6.0	8.0	SS	7 7 8 8		Similar Soil (wet, plastic) CH w = 30.0%, LL = 70, PL = 25, PI = 45 % Fines = 95.0%	24
		5	8.0	10.0	SS	10 8 8 8		Brownish-Grey CLAY; some mf SAND; trace SILT (moist, plastic) CH	20
	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.	
							12.0		
		6	14.0	16.0	SS	2 2 2 2		Greyish-Brown CLAY; trace f SAND; trace SILT (wet, plastic) CL w = 32.4%	22
		7	19.0	21.0	SS	1 2 3 4		Brown CLAY; trace SILT (wet, plastic) CL	24
		8	24.0	26.0	SS	1 2 2 5		Greyish-Brown CLAY; trace SILT (wet, plastic) CL	24

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

Drillers: **Jeffrey Donovan; John Trathen**

Inspector: **James LaMarco (ATL)**

ATLANTIC TESTING LABORATORIES, Limited

Subsurface Investigation

Boring No.: **K-127.9** Report No.: **CD10279D-01-03-22** Sheet **2** of **2**

f - fine
m - medium
c - course

and - 35-50%
some - 20-35%
little - 10-20%
trace - 0-10%

DEPTH	METHOD OF ADVANCE	SAMPLE NO.	DEPTH OF SAMPLE		SAMPLE TYPE	BLOWS ON SAMPLER PER 6" 2" O.D. SAMPLER	DEPTH OF CHANGE	CLASSIFICATION OF MATERIAL	RECOVERY (inches)
			From	To					
26								w = 28.8%	
29		9	29.0	31.0	SS	3 4 4 5		Similar Soil (wet, plastic) CL	24
34		10	34.0	36.0	SS	WH/18" 2		Grey CLAY; trace SILT (saturated, plastic) CL	24
38		ST-1	38.0	40.0	SS	WH/18" 4		(3" Brass Lined Split Spoon) Similar Soil (saturated, plastic) CL w = 30.0%, LL = 30, PL = 17, PI = 13 % Fines = 100.0%	24
43		11	43.0	45.0	SS	WH/24"		Similar Soil (wet, plastic) CL	24
45							45.0		
46								Boring terminated at 45.0 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, Limited

Subsurface Investigation

Report No.: **CD10279D-01-03-22**

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

Boring Location: **See Boring Location Plan**

Project: **Subsurface Investigation**
Champlain Hudson Power Express, Design Package 2
Various Locations, New York

Start Date: **1/26/2022** Finish Date: **1/26/2022**

Boring No.: **K-128.0** Sheet **1** of **2**

Coordinates
Northing **757486.435**
Easting **1645655.384**

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

Ground Elev.: **145.207**

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

Groundwater Observations

Date	Time	Depth	Casing
1/27/2022	AM	*12.3'	10.0'

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

f - fine
m - medium
c - coarse

and - 35-50%
some - 20-35%
little - 10-20%
trace - 0-10%

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	Recovery (Inches)
1	CASING	1	0.0	2.0	SS	19 15 7 5	2.0	Black and Brown cmf SAND; little mf GRAVEL; trace SILT (moist, non-plastic) SW FILL	18
3		2	2.0	4.0	SS	7 7 7 7		Brown CLAY; some mf SAND; trace f GRAVEL; trace SILT (moist, plastic) CL	8
5		3	4.0	6.0	SS	4 4 4 4		Brownish-Grey CLAY; trace f SAND; trace SILT (moist, plastic) CL	6
7		4	6.0	8.0	SS	4 5 6 7		Grey CLAY; little SILT (moist, plastic) CL	23
9		5	8.0	10.0	SS	8 7 8 8		Brownish-Grey CLAY; some mf SAND; trace SILT (moist, plastic) CL w = 28.0%	18
11	WET ROTARY						12.0	Advanced casing to 10.0 feet and began advancing 3 7/8" tri-cone roller bit wet rotary open hole within the borehole.	
15		6	14.0	16.0	SS	1 3 3 4		Brownish-Grey CLAY; trace SILT (wet, plastic) CH	24
20		7	19.0	21.0	SS	1 2 3 4		Grey CLAY; trace SILT (moist, plastic) CH w = 39.2%, LL = 78, PL = 23, PI = 55 % Fines = 100.0%	24
25		8	24.0	26.0	SS	1 2 2 2		Grey CLAY; trace SILT (wet, plastic) CH	24

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

Drillers: **Jeffrey Donovan; John Trathen**

Inspector: **James LaMarco (ATL)**

ATLANTIC TESTING LABORATORIES, Limited

Subsurface Investigation

Boring No.: **K-128.0** Report No.: **CD10279D-01-03-22** Sheet **2** of **2**

DEPTH	METHOD OF ADVANCE	SAMPLE NO.	DEPTH OF SAMPLE		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)
			From	To					
26									
27									
28									
29		9	29.0	31.0	SS	WH/12" 1 4		Similar Soil (wet, plastic) CH w = 30.3%	24
30									
31									
32									
33									
34		10	34.0	36.0	SS	WH/12" 1 4		Similar Soil (wet, plastic) CH	24
35									
36									
37									
38		ST-1	38.0	40.0	SS	WH 2 4 5		(3" Brass Lined Split Spoon) Grey CLAY; trace SILT (wet, plastic) CL w = 51.2%, LL = 43, PL = 18, PI = 25 % Fines = 100.0%	24
39									
40									
41									
42									
43		11	43.0	45.0	SS	WH/18" 2		Similar Soil (saturated, plastic) CL	24
44									
45							45.0		
46								Boring terminated at 45.0 feet.	
47									
48								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.	
49									
50									
51									
52									
53									
54									
55									
56									
57									
58									
59									
60									
61									
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-125.6	S-3	4.0 - 6.0	Brown mf+ SAND; and SILT	48.0	17.8	--	--	--	--	--	--	--	--	--	--	--
	S-5	8.0 - 10.0	Brownish-Grey CLAY; trace mf SAND; trace SILT	--	24.7	50	22	28	--	--	--	--	--	--	--	--
	S-7	19.0 - 21.0	Grey CLAY; little SILT; trace mf SAND	--	49.2	--	--	--	--	--	--	--	--	--	--	--
	ST-1	28.0 - 30.0	Grey CLAY; little SILT	100.0	49.4	60	20	40	--	--	--	--	--	--	--	--
K-127.0	S-3	4.0 - 6.0	Brown CLAY; and SILT; trace f SAND	--	32.8	--	--	--	--	--	--	--	--	--	--	--
	S-4	6.0 - 8.0	Brown CLAY; and SILT; trace f SAND	--	31.3	51	22	29	--	--	--	--	--	--	--	--
	S-6	14.0 - 16.0	Brown mf+ SAND; some SILT	25.0	22.8	--	--	--	--	--	--	--	--	--	--	--
	S-9	30.0 - 32.0	Grey CLAY; trace SILT; trace mf SAND	96.0	81.7	72	20	52	--	--	--	--	--	--	--	--
	S-10	34.0 - 36.0	Grey CLAY; trace SILT; trace mf SAND	--	--	--	--	--	--	7,100	35	8.75	1,548	--	--	--
	S-11	39.0 - 41.0	Grey CLAY; trace SILT; trace mf SAND	--	63.9	--	--	--	--	--	--	--	--	--	--	--
K-127.1	S-3	4.0 - 6.0	Blackish-Brown SILT; some CLAY; some mf SAND; trace DEBRIS (cinders); trace ORGANIC MATERIAL (root hairs)	--	30.7	34	22	12	4.5	--	--	--	--	--	--	--
	S-6	14.0 - 16.0	Blackish-Grey c-mf+ SAND; trace SILT; trace f GRAVEL	4.4	--	--	--	--	--	--	--	--	--	--	--	--
	S-7	19.0 - 21.0	Grey CLAY; trace SILT	--	71.7	--	--	--	--	--	--	--	--	--	--	--
	S-9	30.0 - 32.0	Grey CLAY; trace SILT	100.0	58.0	68	19	49	--	--	--	--	--	--	--	--
K-127.9	S-3	4.0 - 6.0	Brownish-Grey CLAY; little SILT; trace f SAND	--	--	--	--	--	--	300	65	7.93	1,170	--	--	--
	S-4	6.0 - 8.0	Brownish-Grey CLAY; little SILT; trace f SAND	95.0	30.0	70	25	45	--	--	--	--	--	--	--	--
	S-6	14.0 - 16.0	Greyish-Brown CLAY; trace f SAND; trace SILT	--	32.4	--	--	--	--	--	--	--	--	--	--	--
	S-8	24.0 - 26.0	Greyish-Brown CLAY; trace SILT	--	28.8	--	--	--	--	--	--	--	--	--	--	--
	ST-1	38.0 - 40.0	Grey CLAY; trace SILT	100.0	30.0	30	17	13	--	--	--	--	--	--	--	--
K-128.0	S-5	8.0 - 10.0	Brownish-Grey CLAY; some mf SAND; trace SILT	--	28.0	--	--	--	--	--	--	--	--	--	--	--
	S-7	19.0 - 21.0	Grey CLAY; trace SILT	100.0	39.2	78	23	55	--	--	--	--	--	--	--	--
	S-9	29.0 - 31.0	Grey CLAY; trace SILT	--	30.3	--	--	--	--	--	--	--	--	--	--	--
	ST-1	38.0 - 40.0	Grey CLAY; trace SILT	100.0	51.2	43	18	25	--	--	--	--	--	--	--	--
K-129.9A	S-5	8.0 - 10.0	Brown SILT; some mf SAND; little ORGANIC MATERIAL (root hairs)	24.0	134.2	NP	NP	NP	16.8	--	--	--	--	--	--	--
	S-8	24.0 - 26.0	Grey c-mf+ SAND; little SILT	20.0	31.1	--	--	--	--	--	--	--	--	--	--	--
	S-10	34.0 - 36.0	Grey CLAY; trace SILT		52.6	--	--	--	--	--	--	--	--	--	--	--
	ST-1	41.0 - 43.0	Grey CLAY; trace SILT	100.0	40.5	44	20	24	--	--	--	--	--	--	--	--

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-02-02-22

Report Date: February 7, 2022

Date Received: February 1, 2022

TEST DATA

Boring No.	Sample No.	Depth (ft)	Moisture Content (%)
K-117.6-1.6A	S-3	6-8	6.8
	S-6 [1]	19-21	25.3
	S-8	28-30	33.3
K-122.4	S-5	8-10	24.8
	S-9 [1]	29-31	17.5
	S-13 [1]	49-51	21.7
	S-16	58-60	9.9
K-125.6	S-3	4-6	17.8
	S-5	8-10	24.7
	S-7	19-21	49.2
	ST-1	28-30	49.4
K-127.9	S-4	6-8	30.0
	S-6	14-16	32.4
	S-8	24-26	28.8
	ST-1	38-40	30.0
K-128.0	S-5	8-10	28.0
	S-7	19-21	39.2
	S-9	29-31	30.3
	ST-1	38-40	51.2

AMOUNT OF MATERIAL IN SOILS FINER THAN THE NO. 200 SIEVE
ASTM D 1140

PROJECT INFORMATION

Client:	Kiewit Intrastructure Co.	**ATL Report No.:**	CD10279E-02-02-22
Project:	Champlain Hudson Power Express	**Report Date:**	February 7, 2022
	United Cable Installation	**Test Date:**	February 3, 2022
	Various Locations, New York	**Performed By:**	M. White

TEST DATA

Boring No.	Sample No.	Depth (ft)	Method (A or B)	Soak Time (min)	Initial Dry Weight (g)	% Finer than #200
K-117.6-1.6A	S-8	28-30	A	10	672.08	70
K-122.4	S-5	8-10	A	10	339.75	57
K-125.6	ST-1	28-30	A	10	257.41	100
K-127.9	S-4	6-8	A	10	164.08	95
K-127.9	ST-1	38-40	A	10	392.67	100
K-128.0	S-7	19-21	A	10	163.31	100
K-128.0	ST-1	38-40	A	10	216.36	100
K-129.9A	S-5	8-10	A	10	136.68	24
K-129.9A	ST-1	41-43	A	10	240.79	100
K-129.9B	ST-1	27-29	A	10	186.13	100

Reviewed By: ______________________

Date: February 7, 2022

LIQUID LIMIT, PLASTIC LIMIT, AND PLASTICITY INDEX OF SOIL
ASTM D 4318

PROJECT INFORMATION

Client:	Kiewit Instrastructure Co.	**ATL Report No.:**	CD10279E-02-02-22
Project:	Champlain Hudson Power Express	**Report Date:**	February 7, 2022
	United Cable Installation	**Date Received:**	February 1, 2022
	Various Locations, New York		

TEST DATA

Boring No.	Sample No.	LL	PL	PI
K-117.6-1.6A	S-6	46	20	26
K-117.6-1.6A	S-8	47	19	28
K-122.4	S-5	NP	NP	NP
K-125.6	S-5	50	22	28
K-125.6	ST-1	60	20	40
K-127.9	S-4	70	25	45
K-127.9	ST-1	30	17	13
K-128.0	S-7	78	23	55
K-128.0	ST-1	43	18	25
K-129.9A	S-5	NP	NP	NP
K-129.9A	ST-1	44	20	24
K-129.9B	S-6	96	49	47
K-129.9B	ST-1	55	20	35

SAMPLE INFORMATION

Boring No.	Sample No.	Maximum Grain Size (mm)	Estimated Amount of Sample Retained on No. 40 Sieve (%)	As Received Moisture Content (%)
K-117.6-1.6A	S-6	4.76	19	25.3
K-117.6-1.6A	S-8	6.35	28	33.3
K-122.4	S-5	2	5	24.8
K-125.6	S-5	0.42	2	24.7
K-125.6	ST-1	0.177	0	49.4
K-127.9	S-4	2	13	30.0
K-127.9	ST-1	0.177	0	30.0
K-128.0	S-7	0.149	0	39.2
K-128.0	ST-1	0.177	0	51.2
K-129.9A	S-5	2	25	134.2
K-129.9A	ST-1	0.177	0	40.5
K-129.9B	S-6	0.841	9	88.0
K-129.9B	ST-1	0.177	0	51.2

Client: Kiewit Instrastructure Co.
Project: Champlain Hudson Power Express

ATL Report No. CD10279E-02-02-22
Date: February 7, 2022

PREPARATION INFORMATION

Boring No.	Sample No.	Preparation	Method of Removing Oversized Material
K-117.6-1.6A	S-6	Air Dry	Pulverizing and Screening
K-117.6-1.6A	S-8	Air Dry	Pulverizing and Screening
K-122.4	S-5	Air Dry	Pulverizing and Screening
K-125.6	S-5	Air Dry	Pulverizing and Screening
K-125.6	ST-1	Air Dry	Not Necessary
K-127.9	S-4	Air Dry	Pulverizing and Screening
K-127.9	ST-1	Air Dry	Not Necessary
K-128.0	S-7	Air Dry	Not Necessary
K-128.0	ST-1	Air Dry	Not Necessary
K-129.9A	S-5	Air Dry	Pulverizing and Screening
K-129.9A	ST-1	Air Dry	Not Necessary
K-129.9B	S-6	Air Dry	Pulverizing and Screening
K-129.9B	ST-1	Air Dry	Not Necessary

EQUIPMENT INFORMATION

Liquid Limit Procedure:	Multipoint - Method A	☒	Single Point - Method B	☐
Liquid Limit Apparatus:	Manual	☒	Motor Driven	☐
Liquid Limit Grooving Tool Material:	Plastic	☒	Metal	☐
Liquid Limit Grooving Tool Shape:	Flat	☒	Curved (AASHTO Only)	☐
Plastic Limit:	Hand Rolled	☒	Mechanical Rolling Device	☐

Reviewed By: ____________________

Date: 02/07/22

Kiewit

MEMORANDUM

DATE: September 23, 2022

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 3 - Package 2 - HDD Crossing 18 – Revision 1
Champlain Hudson Power Express Project
Fort Ann, 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 south of Fort Ann, New York. The approximate station for the start of HDD crossing Number 18 is STA 20648+00 (43.323835° N, 73.522193° W).

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

- AECOM, Geotechnical Data Report, Upland Segments, Champlain Hudson Power Express, dated May 28, 2021.
- Atlantic Testing Laboratories, Subsurface Investigation Services, Champlain Hudson Power Express, Design Package 2, Whitehall to Glens Falls, New York, dated June 15, 2022.

Contact us if you have questions or require additional information.

HDD 18
Borings WFE-18, K-129.9A, K-129.9B
Segment 3

CHPE Segment 3 - Package 2
HDD Soil Boring Coordinates and Elevations

Firm	**Boring**	**Northing (feet)**	**Easting (feet)**	**Ground Surface Elevation (feet)**
TRC*	B122.4-1	1673988.1	762589.1	134.0
	B123.1-1	1670533.1	761581.7	134.0
	B127.6-1	1650236.9	759369.7	143.0
	B130.8-1	1633732.2	749229.1	144.0
	B131.5-1	1630565.5	746543.8	148.0
AECOM**	WFE-2	1693039.7	776227.9	125.9
	WFE-6	1683884.0	771830.6	128.7
	WFE-6A	1683645.5	771707.7	129.0
	WFE-7	1683295.0	771591.2	128.7
	WFE-9	1677994.3	769427.4	133.9
	WFE-9A	1678043.5	769246.8	140.2
	WFE-9B	1676842.4	767745.7	141.7
	WFE-12	1657680.6	760822.6	135.3
	WFE-16	1645866.1	757602.8	145.2
	WFE-18	1637293.5	752138.0	143.6
	WFE-18A	1630756.2	746790.9	144.9
	WFE-19	1628651.1	745226.2	139.1
	WFE-19A	1625848.4	743218.4	139.0

Notes:

- Northings and Eastings are provided in NAD83 New York State Plane East Zone.
- Elevations are referenced to the NAVD88 datum.

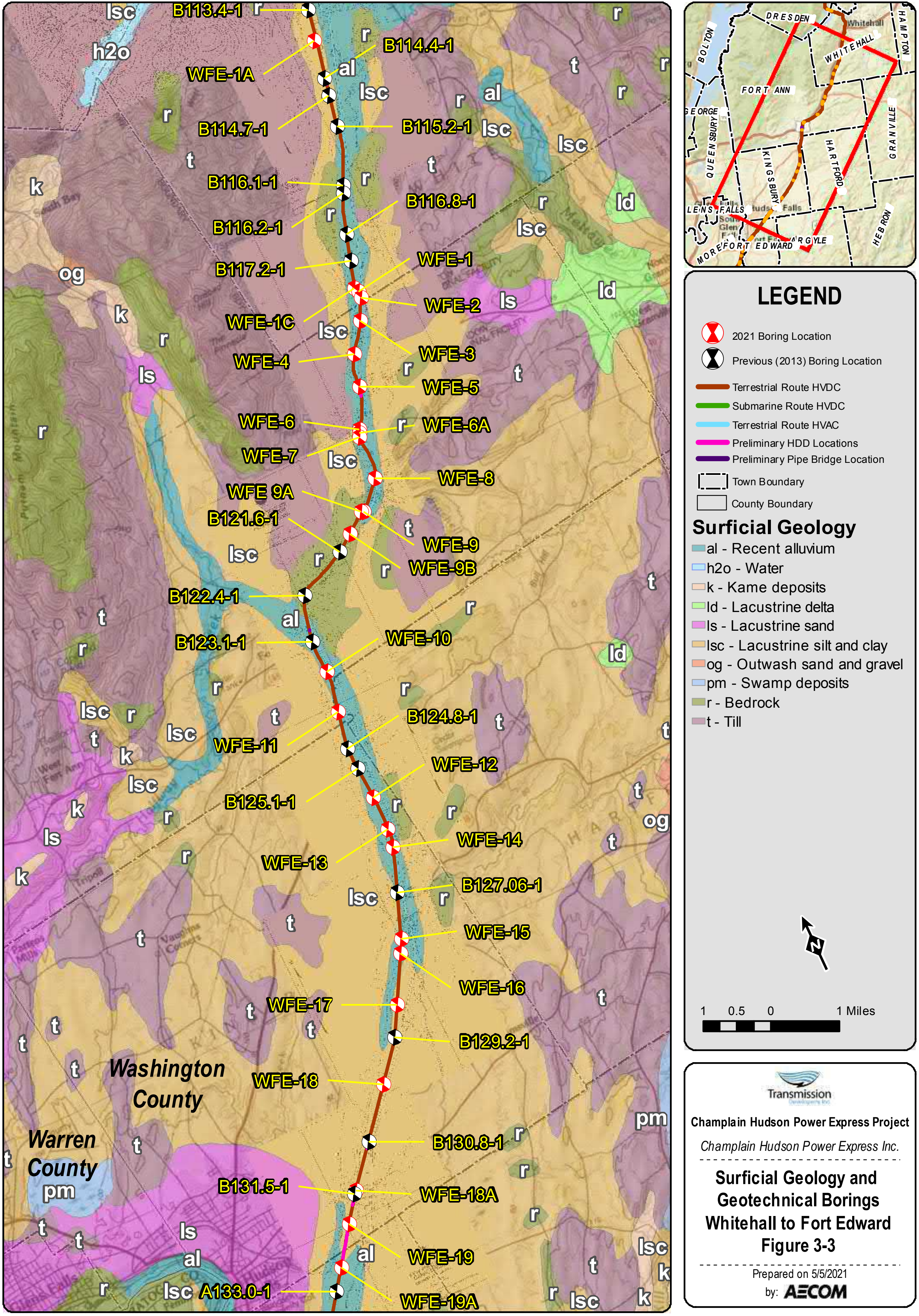
* TRC boring coordinates as shown in Table 1-6 in AECOM report (reference below). Boring elevations estimated from November 2021 topographic survey by Williams Aerial.

** AECOM boring coordinates and elevations as shown in Table 1-6 in AECOM report.

*** 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
- h2o - Water
- k - Kame deposits
- ld - Lacustrine delta
- ls - Lacustrine sand
- lsc - Lacustrine silt and clay
- og - Outwash sand and gravel
- pm - Swamp deposits
- r - Bedrock
- t - Till

Transmission Developers Inc.

Champlain Hudson Power Express Project

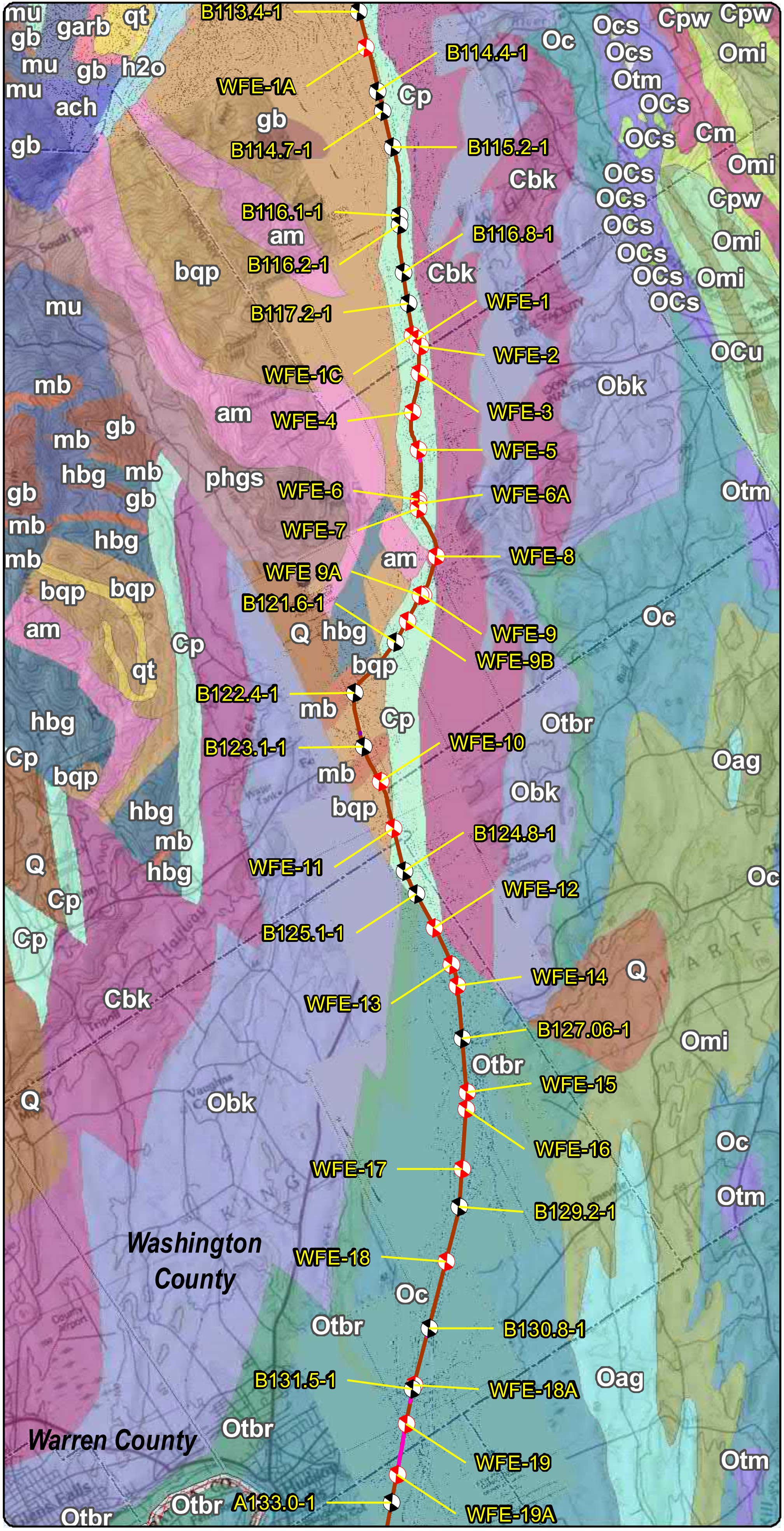
Champlain Hudson Power Express Inc.

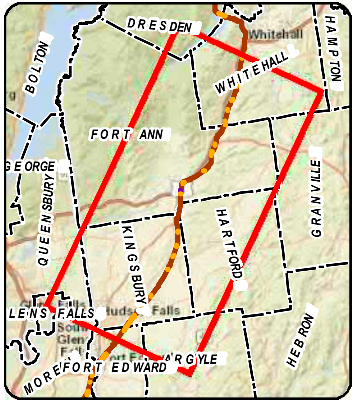
Surficial Geology and Geotechnical Borings Whitehall to Fort Edward Figure 3-3

Prepared on 5/5/2021
by: AECOM

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

Y:\Projects\CHPE\Route\Consensus_Alternative_Routes\MXD\Alt_5_Routes_DZ_201909\Boring_Locations\Maps_for_May_2021_Report\Whitehall_to_Ft_Ed_Boring_Locations_Surficial_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

- Cbk - Beekmantown Group
- Cm - Mettawee Formation
- Cp - Potsdam Sandstone
- Cpw - Poultney Formation ("A" Member)
- No Label
- OCs - Cambrian-Middle Ordovician carbonate
- OCu - Undivided Ordovician and Cambrian
- Oag - Austin Glen Formation
- Obk - Beekmantown Group
- Oc - Canajoharie Shale
- Omi - Mount Merino Formation
- Op - Poultney Formation ("B" and "C")
- Otbr - Dolgeville Formation
- Otm - Taconic Melange
- Q - Glacial and Alluvial Deposits
- ach - metanorthosite and anorthositic
- am - Amphibolite, pyroxenic amphibolite
- bqp - Biotite-quartz-plagioclase
- garb - Quartz-feldspar paragneiss
- gb - Olivine metagabbro
- h2o - Water
- hbg - Biotite and or hornblende granite gneiss
- mb Calcitic and dolomitic marble
- mu - Undivided metased rock and migmatite
- phgs - Charnockite, granitic, quartz syenite
- qt - Quartzite

N

1 0.5 0 1 Miles

Transmission Developers Inc.

Champlain Hudson Power Express Project

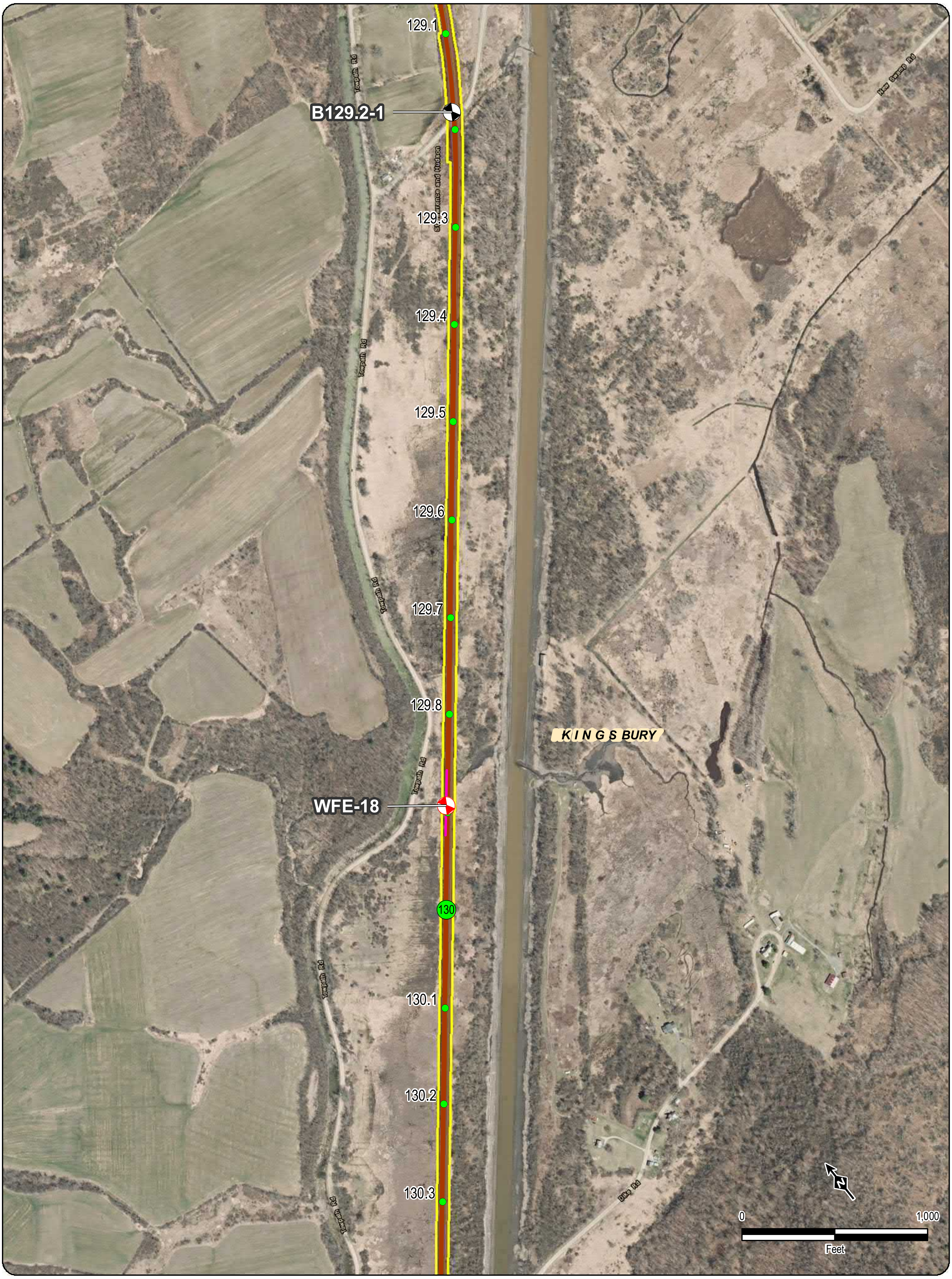
Champlain Hudson Power Express Inc.

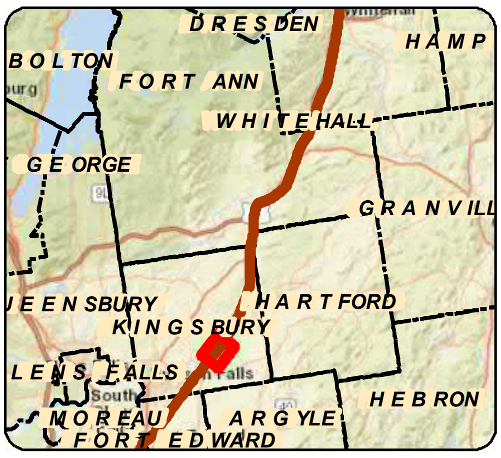
Bedrock Geology and Geotechnical Borings Whitehall to Fort Edward
Figure 4-3

Prepared on 5/5/2021
by: AECOM

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

Y:\Projects\CHPE\Route\Consensus_Alternative_Routes\MXD\Alt_5_Routes_DZ_201909\Boring_Locations\Maps_for_May_2021_Report\Whitehall_to_Ft_Ed_Boring_Locations_Bedrock_May_2021_Report.mxd





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
T O W N N AME

Road Name
Village Name

Transmission Developers Inc.

Champlain Hudson Power Express Project
Champlain Hudson Power Express Inc.

BORING LOCATION PLAN
Whitehall to Fort Edward
Figure A-3
Sheet 14 of 16

Prepared by: AECOM
5/19/2021

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\Whitehall_to_Edward_Boring_Locations_Mapset_May_2021_Report.mxd

BORING CONTRACTOR: ADT		SHEET 1 OF 2
DRILLER: Chris Chaillou		PROJECT NAME: CHPE - PROJECT NO.: 60323056
SOILS ENGINEER/GEOLOGIST: Chris French		HOLE NO.: **WFE-18** START DATE: 1/11/21
	BORING LOG	FINISH DATE: 1/11/21
LOCATION: M.P. - 129.89 (CP Rail)		OFFSET: N/A

GROUND WATER OBSERVATIONS		CASING	SAMPLER	DRILL BIT	CORE BARREL	DRILL RIG: CME LC-55
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			NORTHING
	HAMMER FALL	30"	30"			EASTING

DEPTH	CORING RATE MIN/FT	SAMPLE DEPTHS FROM - TO (FEET)	SAMPLE 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						SAND	0.0'-2.5'; Black fine-coarse SAND, little silt, little angular to subrounded gravel, trace cobbles; loose, moist
1.0													
2.0													
3.0													2.5'-3.5'; Brown fine-medium SAND; very loose, moist
		3'-5'	S-1										
4.0											ML/SM		3.5'-5.0'; Gray SILT and fine sand; medium stiff TR-1; (3.0'-5.0')
5.0													
		5'-7'	S-2	24"	0"	6	3	4	4	5		SILT/organic Silt	No recovery
6.0													
7.0													
		7'-9'	S-3	24"	24"	3	2	3	2	2	ML/OL		Dark brown SILT, organics (organic silt); stiff, moist
8.0													TR-2; (7.0'-9.0')
9.0													
		9'-11'	S-4	24"	24"	3	3	3	3	4	ML/OL		SAA
10.0													
11.0													
		11'-13'	S-5	24"	24"	3	3	4	3	5	ML/OL		Gray SILT, trace fine sand, very thin decomposing organics and organic silt laminates; soft, moist
12.0													
13.0													
		13'-15'	S-6	24"	24"	2	4	5	5	6	ML/OL		SAA
14.0													
15.0													
		15'-17'	S-7	24"	24"	WOH	1	2	3	2	ML/OL		Dark brown SILT, little decomposing organics; soft, moist
16.0													
17.0													TR-3; (16.0'-16.5')
18.0													18.5' (*inferred*)
19.0												Silty SAND	
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: Ncorr=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
		PROJECT NAME: CHPE -
DRILLER: Chris Chaillou		PROJECT NO.: 60323056
		HOLE NO.: **WFE-18**
SOILS ENGINEER: Chris French		START DATE: 1/11/21
	BORING LOG	FINISH DATE: 1/11/21
LOCATION: M.P. - 129.89 (CP Rail)		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"	24"	WOH	3	4	3	5	ML/SM	Silty SAND	Gray SILT, little fine sand, trace clay; soft, moist
21.0													
22.0													
23.0													
24.0													
25.0													
		25'-27'	S-9	24"	10"	11	19	13	7	21	SP		Gray medium SAND, little fine sand, trace silt; very loose, saturated
26.0													
27.0													
28.0													28.5' (*inferred*)
29.0												Silty CLAY	
30.0													
		30'-32'	S-10	24"	24"	WOH	WOH	WOH	3		CL		Gray silty CLAY; soft, moist
31.0													
32.0													
33.0													
34.0													
35.0													
		35'-37'	S-11	24"	24"	WOH	WOH	WOH	2		CL		SAA
36.0													TR-4; (36.0'-36.5')
37.0													
38.0													
		38'-40'	S-12	24"	24"	WOH	WOH	WOH	3		CL		SAA
39.0													
40.0													
													WFE-18 terminated at 40', grouted to surface
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%

Aquifer
CHPE- Whitehall-Ft. Edward Borings
LABORATORY SOIL TESTING DATA SUMMARY

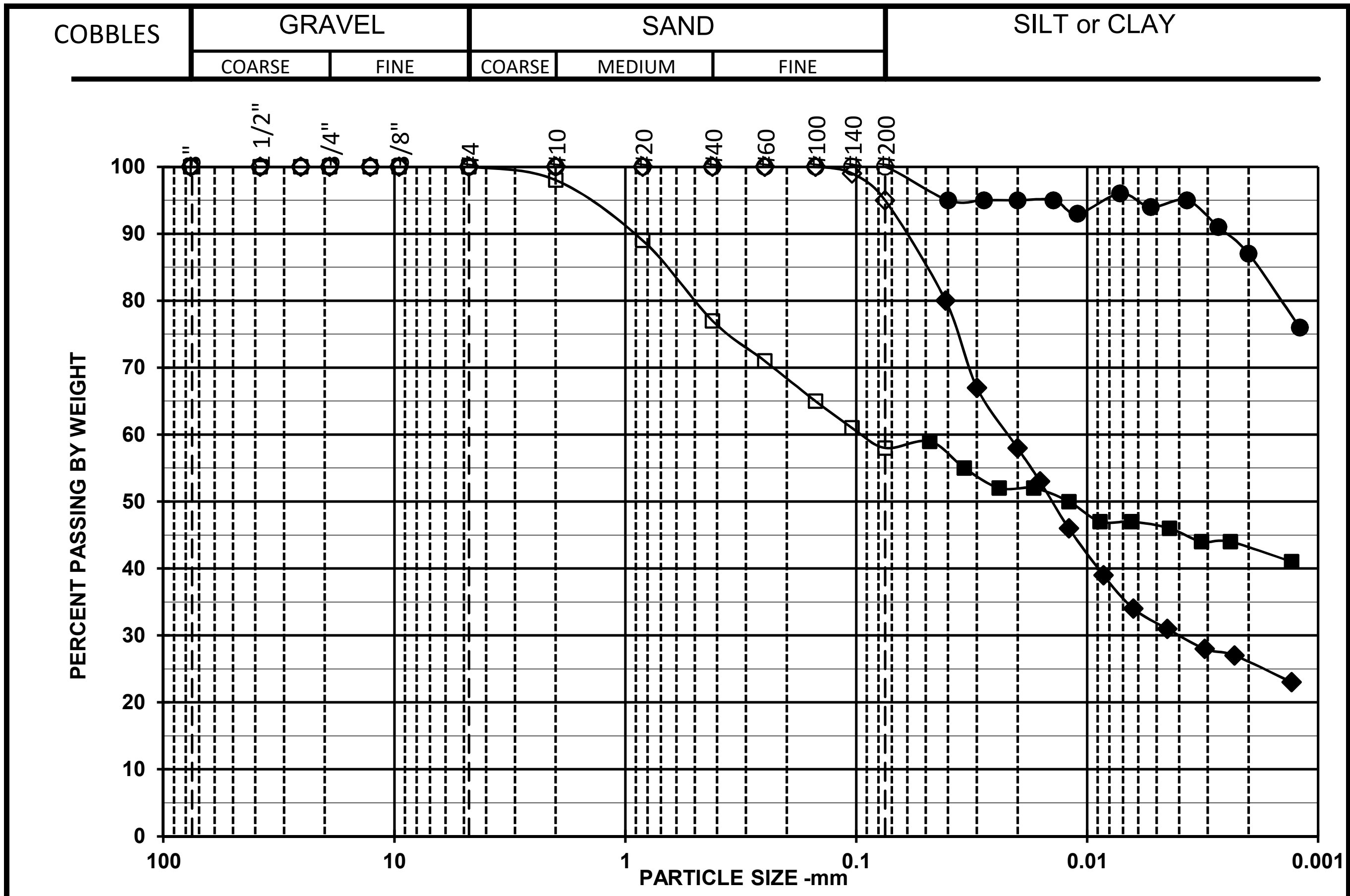
BORING NO.	SAMPLE NO.	DEPTH (ft)	IDENTIFICATION TESTS								REMARKS
			WATER CONTENT (%)	LIQUID LIMIT (-)	PLASTIC LIMIT (-)	PLAS. INDEX (-)	USCS SYMB. (1)	SIEVE MINUS NO. 200 (%)	HYDROMETER % MINUS 2 μm (%)	ORGANIC CONTENT (burnoff) (%)	
WFE-1A	S-2	5-7	24.4	44	17	27	CL	93	39		
WFE-1A	S-5	11-13	43.0	68	23	45	CH	99.8	84		
WFE-1C	S-3	7-9	44.5				CH	99.3	86		
WFE-1C	S-7	15-17	44.5	78	27	51	CH	100	94		
WFE-1C	S-10	30-32	45.7	61	23	38	CH	100	87		
WFE-2	S-2	5-7	7.3				SW-SM	10.7	3		
WFE-2	S-7	15-17	26.0				SC	28.5	13		
WFE-2	S-9	25-27	66.0	71	26	45	CH	100	90		
WFE-4	S-2	5-7	18.0				SC	34	13		
WFE-4	S-4	9-11	18.3				SM	17	5		
WFE-5	S-2	5-7	19.9				SM	19	3		
WFE-5	S-4	9-11	18.6	28	15	13	CL	91	28		
WFE-6A	S-2	5-7	13.6				SP-SC	9	3		
WFE-6A	S-4	9-11	17.4				SP-SM	7	2		
WFE-8	S-3	6-8	24.9				SC	48.5	12		
WFE-8	S-4	8-10	88.5	128	53	75	MH	94	43		
WFE-10	S-2	5-7	38.0	71	24	47	CH	94	76		
WFE-10	S-4	9-11	22.5				CL	83.9	32		
WFE-12	S-2	5-7	23.5	49	20	29	CL	62.5	35		
WFE-12	S-4	9-11	28.3				CL	95.8	37		
WFE-14	S-3	7-9	25.7				CL	75.7	44		
WFE-14	S-5	13-15	22.5				ML	53.9	17		
WFE-16	S-3	7-9	36.7	75	25	50	CH	100	90		
WFE-16	S-9	25-27	37.1	73	24	49	CH	100	80		
WFE-18	S-3	7-9	229.7	293	93	200	OH	58	43	34.1	
WFE-18	S-8	20-22	34.3	30	21	9	CL	95	26		
WFE-18	S-10	30-32	64.3	56	21	35	CH	100	87		
WFE-18A	S-2	5-7	19.9	30	13	17	CL	88.5	29		
WFE-18A	S-7	15-17	18.9				SM	14.3	1		
WFE-18A	S-10	30-32	62.9	62	22	40	CH	99	86		
WFE-19A	S-3	7-9	38.1				SP-SM	8	3		
WFE-19A	S-8	20-22	31.8				SP-SM	8.3	2		
WFE-19A	S-10	30-32	17.6				SW-SM	8	1		

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

Prepared by: NG
Reviewed by: CMJ
Date: 4/30/2021

TerraSense, LLC
45H Commerce Way
Totowa, NJ 07512

Project No.: 7853-21003
File: Indx1.xlsx



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
☐	229.7	293	93	200	OH		Dark brown, Sandy Organic silt organic mat'l noted, Insufficient sample size	04/23/21
◇	34.3	30	21	9	CL		Gray, Lean clay	04/22/21
○	64.3	56	21	35	CH		Gray, Fat clay	04/20/21

Aquifer

TerraSense, LLC #7853-21003

CHPE- Whitehall-Ft. Edward Borings

Symbol	☐	◇	○
Boring	WFE-18	WFE-18	WFE-18
Sample	S-3	S-8	S-10
Depth	7-9	20-22	30-32
% +3"	0	0	0
% Gravel	0	0	0
% SAND	42	5	0
%C SAND	2	0	0
%M SAND	21	0	0
%F SAND	19	5	0
% FINES	58	95	100
D_{100} (mm)	4.75	2	0.075
D_{60} (mm)	0.093	0.022	
D_{30} (mm)		0.004	
D_{10} (mm)			
Cc			
Cu			

Sieve Size/ID #	Percent Finer Data		
6"	100	100	100
4"	100	100	100
3"	100	100	100
1 1/2"	100	100	100
1"	100	100	100
3/4"	100	100	100
1/2"	100	100	100
3/8"	100	100	100
#4	100	100	100
#10	98	100	100
#20	89	100	100
#40	77	100	100
#60	71	100	100
#100	65	100	100
#140	61	99	100
#200	58	95	100
5µ m	46	32	94
2µ m	43	26	87
1µ m	40	21	72

PARTICLE SIZE DISTRIBUTION
ASTM D6913 & ASTM D7928

Boring Location Plans Page 10 of 12	Drawn by: ADW	Scale: Not to scale	Project No.: CD10279	Date: March 2022

Champlain Hudson Power Express
Design Package 2
Whitehall to Glens Falls, 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-01-03-22**

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

Boring Location: **See Boring Location Plan**

Project: **Subsurface Investigation**
Champlain Hudson Power Express, Design Package 2
Various Locations, New York

Start Date: **1/27/2022** Finish Date: **1/27/2022**

Boring No.: **K-129.9A** Sheet **1** of **2**

Coordinates
Northing **752271.857**
Easting **1637451.428**

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

Ground Elev.: **143.39**

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

Groundwater Observations

Date	Time	Depth	Casing
1/27/2022	PM	*14.3'	10.0'

***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)
	CASING	1	0.0	2.0	SS	14 6 3 3	2.0	Blackish-Grey cmf GRAVEL; some c-m SAND; trace SILT (frozen, non-plastic) GW FILL	6
2		2	2.0	4.0	SS	4 3 5 6		Brown CLAY; little f SAND; trace SILT (moist, plastic) CL	16
4		3	4.0	6.0	SS	2 2 2 2		Brown cmf SAND; and CLAY; little SILT; trace f GRAVEL (moist, plastic) SC	12
6		4	6.0	8.0	SS	2 3 3 2	8.0	Brown CLAY; little SILT; trace f SAND (moist, plastic) CL	14
8		5	8.0	10.0	SS	WH/12" 1 1	12.0	Brown SILT; some mf SAND; little ORGANIC MATERIAL (root hairs) (wet, non-plastic) ML w = 134.2% LL = NP, PL = NP, PI = NP, OC = 16.8% % Fines = 24.0% Advanced casing to 10.0 feet and began advancing 3 7/8" tri-cone roller bit wet rotary open hole within the borehole.	16
10	WET ROTARY								
14		6	14.0	16.0	SS	WH/24"	22.0	Brown SILT; and CLAY; trace f SAND (wet, plastic) ML/CL	18
19		7	19.0	21.0	SS	WH/24"		Grey CLAY; little SILT; trace f SAND (wet, plastic) CL	24
24		8	24.0	26.0	SS	4 5 9 14		Grey c-mf+ SAND; little SILT (wet, non-plastic) SM	10

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

Drillers: **Jeffrey Donovan; John Trathen**

Inspector: **James LaMarco (ATL)**

ATLANTIC TESTING LABORATORIES, Limited

Subsurface Investigation

Boring No.: **K-129.9A** Report No.: **CD10279D-01-03-22** Sheet **2** of **2**

f - fine
m - medium
c - course

and - 35-50%
some - 20-35%
little - 10-20%
trace - 0-10%

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	RECOVERY (inches)
26								w = 31.1% % Fines = 20.0%	
27							27.0		
29		9	29.0	31.0	SS	WR/12" WH/12"		Grey CLAY; trace SILT (wet, plastic) CL	24
34		10	34.0	36.0	SS	WH/24"		Similar Soil (wet, plastic) CL w = 52.6%	24
39		11	39.0	41.0	SS	WH/24"		Similar Soil (wet, plastic) CL	21
41		ST-1	41.0	43.0	SS	WH 2 2 3		(3" Brass Lined Split Spoon) Similar Soil (wet, plastic) CL w = 40.5%, LL = 44, PL = 20, PI = 24 % Fines = 100.0%	24
48		12	48.0	50.0	SS	1 WH/12" 2		Similar Soil (wet, plastic) CL	24
50							50.0		
51								Boring terminated at 50.0 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, Limited

Subsurface Investigation

Report No.: **CD10279D-01-03-22**

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

Boring Location: **See Boring Location Plan**

Project: **Subsurface Investigation**
Champlain Hudson Power Express, Design Package 2
Various Locations, New York

Start Date: **1/27/2022** Finish Date: **1/28/2022**

Boring No.: **K-129.9B** Sheet **1** of **2**

Coordinates
Northing **752027.252**
Easting **1637156.904**

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

Groundwater Observations

Date	Time	Depth	Casing
1/28/2022	AM	*9.3'	10.0'

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

Ground Elev.: **143.756**

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 2	C A S	1	0.0	2.0	SS	21 18 12 5	2.0	Brown cmf GRAVEL; some cmf SAND; trace SILT (frozen, non-plastic) GW Possible FILL	8
3 4	I N G	2	2.0	4.0	SS	5 4 3 3	4.0	Brown cmf SAND; little SILT; trace CLAY (moist, very slightly plastic) SM Possible FILL	10
5 6		3	4.0	6.0	SS	2 2 2 2	6.0	Brown CLAY; and mf SAND; trace SILT (moist, plastic) CL	13
7 8		4	6.0	8.0	SS	2 2 1 1	8.0	Brown CLAY; some ORGANIC MATERIAL (root hairs); trace SILT (moist, plastic) OH OC = 34.9%	14
9 10		5	8.0	10.0	SS	WH/24"		Grey CLAY; trace SILT (moist, plastic) CH	18
11 12 13 14	WET R O T A R Y							Advanced casing to 10.0 feet and began advancing 3 7/8" tri-cone roller bit wet rotary open hole within the borehole.	
15 16 17 18 19		6	14.0	16.0	SS	WH/24"		Grey CLAY; little SILT; trace f SAND (moist, plastic) CH w = 88.0%, LL = 96, PL = 49, PI = 47	24
20 21 22 23 24		7	19.0	21.0	SS	WH/12" 1 1	22.0	Grey CLAY; some f SAND; trace SILT (wet, plastic) CL	18
25		8	24.0	26.0	SS	4 5 8 10		Grey c-mf SAND; trace SILT; trace f GRAVEL (moist, non-plastic)	8

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

Drillers: **Jeffrey Donovan; John Trathen**

Inspector: **James LaMarco (ATL)**

ATLANTIC TESTING LABORATORIES, Limited

Subsurface Investigation

Boring No.: **K-129.9B** Report No.: **CD10279D-01-03-22** 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)
							26.0	SP-SM w = 18.3% % Fines = 7.0%	
26									
27		ST-1	27.0	29.0	SS	WH/18" 2		(3" Brass Lined Split Spoon) Grey CLAY; trace SILT (wet, plastic) CH w = 51.2%, LL = 55, PL = 20, PI = 35 % Fines = 100.0%	24
28									
29		9	29.0	31.0	SS	WH/18" 1		Similar Soil (wet, plastic) CH	24
30									
31									
32									
33									
34		10	34.0	36.0	SS	WH/24"		Similar Soil (wet, plastic) CH w = 50.8%	24
35									
36									
37									
38		11	38.0	40.0	SS	WH/24"		Similar Soil (wet, plastic) CH	24
39							40.0		
40									
41								Boring terminated at 40.0 feet.	
42								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.	
43									
44									
45									
46									
47									
48									
49									
50									
51									
52									
53									
54									
55									
56									
57									
58									
59									
60									
61									
62									

ATL-LOG1 NE CD10279 KIEWIT INFRASTRUCTURE CO - VARIOUS LOCATIONS (PACKAGE 2).GPJ ATL4-08.GDT 4/12/22

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-125.6	S-3	4.0 - 6.0	Brown mf+ SAND; and SILT	48.0	17.8	--	--	--	--	--	--	--	--	--	--	--
	S-5	8.0 - 10.0	Brownish-Grey CLAY; trace mf SAND; trace SILT	--	24.7	50	22	28	--	--	--	--	--	--	--	--
	S-7	19.0 - 21.0	Grey CLAY; little SILT; trace mf SAND	--	49.2	--	--	--	--	--	--	--	--	--	--	--
	ST-1	28.0 - 30.0	Grey CLAY; little SILT	100.0	49.4	60	20	40	--	--	--	--	--	--	--	--
K-127.0	S-3	4.0 - 6.0	Brown CLAY; and SILT; trace f SAND	--	32.8	--	--	--	--	--	--	--	--	--	--	--
	S-4	6.0 - 8.0	Brown CLAY; and SILT; trace f SAND	--	31.3	51	22	29	--	--	--	--	--	--	--	--
	S-6	14.0 - 16.0	Brown mf+ SAND; some SILT	25.0	22.8	--	--	--	--	--	--	--	--	--	--	--
	S-9	30.0 - 32.0	Grey CLAY; trace SILT; trace mf SAND	96.0	81.7	72	20	52	--	--	--	--	--	--	--	--
	S-10	34.0 - 36.0	Grey CLAY; trace SILT; trace mf SAND	--	--	--	--	--	--	7,100	35	8.75	1,548	--	--	--
	S-11	39.0 - 41.0	Grey CLAY; trace SILT; trace mf SAND	--	63.9	--	--	--	--	--	--	--	--	--	--	--
K-127.1	S-3	4.0 - 6.0	Blackish-Brown SILT; some CLAY; some mf SAND; trace DEBRIS (cinders); trace ORGANIC MATERIAL (root hairs)	--	30.7	34	22	12	4.5	--	--	--	--	--	--	--
	S-6	14.0 - 16.0	Blackish-Grey c-mf+ SAND; trace SILT; trace f GRAVEL	4.4	--	--	--	--	--	--	--	--	--	--	--	--
	S-7	19.0 - 21.0	Grey CLAY; trace SILT	--	71.7	--	--	--	--	--	--	--	--	--	--	--
	S-9	30.0 - 32.0	Grey CLAY; trace SILT	100.0	58.0	68	19	49	--	--	--	--	--	--	--	--
K-127.9	S-3	4.0 - 6.0	Brownish-Grey CLAY; little SILT; trace f SAND	--	--	--	--	--	--	300	65	7.93	1,170	--	--	--
	S-4	6.0 - 8.0	Brownish-Grey CLAY; little SILT; trace f SAND	95.0	30.0	70	25	45	--	--	--	--	--	--	--	--
	S-6	14.0 - 16.0	Greyish-Brown CLAY; trace f SAND; trace SILT	--	32.4	--	--	--	--	--	--	--	--	--	--	--
	S-8	24.0 - 26.0	Greyish-Brown CLAY; trace SILT	--	28.8	--	--	--	--	--	--	--	--	--	--	--
	ST-1	38.0 - 40.0	Grey CLAY; trace SILT	100.0	30.0	30	17	13	--	--	--	--	--	--	--	--
K-128.0	S-5	8.0 - 10.0	Brownish-Grey CLAY; some mf SAND; trace SILT	--	28.0	--	--	--	--	--	--	--	--	--	--	--
	S-7	19.0 - 21.0	Grey CLAY; trace SILT	100.0	39.2	78	23	55	--	--	--	--	--	--	--	--
	S-9	29.0 - 31.0	Grey CLAY; trace SILT	--	30.3	--	--	--	--	--	--	--	--	--	--	--
	ST-1	38.0 - 40.0	Grey CLAY; trace SILT	100.0	51.2	43	18	25	--	--	--	--	--	--	--	--
K-129.9A	S-5	8.0 - 10.0	Brown SILT; some mf SAND; little ORGANIC MATERIAL (root hairs)	24.0	134.2	NP	NP	NP	16.8	--	--	--	--	--	--	--
	S-8	24.0 - 26.0	Grey c-mf+ SAND; little SILT	20.0	31.1	--	--	--	--	--	--	--	--	--	--	--
	S-10	34.0 - 36.0	Grey CLAY; trace SILT		52.6	--	--	--	--	--	--	--	--	--	--	--
	ST-1	41.0 - 43.0	Grey CLAY; trace SILT	100.0	40.5	44	20	24	--	--	--	--	--	--	--	--

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-129.9B	S-4	6.0 - 8.0	Brown CLAY; some ORGANIC MATERIAL (root hairs); trace SILT	--	--	--	--	--	34.9	--	--	--	--	--	--	--
	S-6	14.0 - 16.0	Grey CLAY; little SILT; trace f SAND	--	88.0	96	49	47	--	--	--	--	--	--	--	--
	S-8	24.0 - 26.0	Grey c-mf SAND; trace SILT; trace f GRAVEL	7.0	18.3	--	--	--	--	--	--	--	--	--	--	--
	ST-1	27.0 - 29.0	Grey CLAY; trace SILT	100.0	51.2	55	20	35	--	--	--	--	--	--	--	--
	S-10	34.0 - 36.0	Grey CLAY; trace SILT	--	50.8	--	--	--	--	--	--	--	--	--	--	--
K-130.9	S-4	6.0 - 8.0	Grey CLAY; little SILT; little mf SAND	85.8	46.6	39	18	21	--	--	--	--	--	--	--	--
	S-6	14.0 - 16.0	Grey c-mf+ SAND; some SILT; trace CLAY	35.0	65.2	--	--	--	--	--	--	--	--	--	--	--
	RC-2	30.5 - 31.5	Dark Grey SHALE	--	--	--	--	--	--	--	--	--	--	--	1,153	2.75
	RC-2	31.5 - 31.8	Dark Grey SHALE	--	--	--	--	--	--	--	--	--	--	7,220	--	--
K-131.6	S-4	6.0 - 8.0	Grey CLAY; trace mf SAND; trace SILT	96.9	48.7	41	20	21	--	--	--	--	--	--	--	--
	S-7	19.0 - 21.0	Grey c-mf+ SAND; little SILT	15.0	22.6	--	--	--	--	--	--	--	--	--	--	--
	ST-1	35.0 - 37.0	Grey CLAY; trace f SAND; trace SILT	99.9	55.9	62	25	37	--	--	--	--	--	--	--	--
K-131.7A	S-3	4.0 - 6.0	Blackish-Brown cmf SAND; some mf GRAVEL; trace SILT	--	--	--	--	--	--	500	35	7.69	42,570	--	--	--
	S-4	6.0 - 8.0	Grey mf+ SAND; and SILT; trace CLAY	50.0	23.3	--	--	--	--	--	--	--	--	--	--	--
	S-7	19.0 - 21.0	Grey SILT; some CLAY; little f SAND; trace ORGANIC MATERIAL (root hairs, wood fragments)	78.3	43.6	53	21	32	--	--	--	--	--	--	--	--
	S-9	29.0 - 31.0	Grey CLAY; little SILT; trace f SAND	--	70.9	--	--	--	--	--	--	--	--	--	--	--
	ST-1	45.0 - 47.0	Grey CLAY; little mf SAND; trace SILT	86.6	66.4	53	25	28	--	--	--	--	--	--	--	--
K-131.7B	S-5	8.0 - 10.0	Brownish-Grey CLAY; little SILT; little ORGANIC MATERIAL (root hairs); trace mf SAND	--	--	--	--	--	10.5	--	--	--	--	--	--	--
	S-6	14.0 -16.0	Black ORGANIC MATERIAL (peat, root hairs); trace SILT	3.1	178.4	NP	NP	NP	--	--	--	--	--	--	--	--
	S-9	29.0 - 31.0	Grey CLAY; trace SILT	--	60.9	--	--	--	--	--	--	--	--	--	--	--
	ST-1	45.0 - 47.0	Grey CLAY; trace SILT; trace f SAND	99.8	58.7	55	19	36	--	--	--	--	--	--	--	--
K-131.9	S-5	8.0 - 10.0	Black ORGANIC MATERIAL (peat, root hairs); trace mf SAND; trace SILT	2.0	411.1	NP	NP	NP	--	--	--	--	--	--	--	--
	S-8	24.0 - 36.0	Grey c-m SAND; trace CLAY; trace SILT	--	62.8	--	--	--	--	--	--	--	--	--	--	--

TEST DATA (continued)

Boring No.	Sample No.	Depth (ft)	Moisture Content (%)
K-129.9A	S-5	8-10	134.2
	S-8	24-26	31.1
	S-10	34-36	52.6
	ST-1	41-43	40.5
K-129.9B	S-6	14-16	88.0
	S-8	24-26	18.3
	ST-1	27-29	51.2
	S-10	34-36	50.8

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

Reviewed By: ______________________ Date: 02/07/22

ATLANTIC TESTING LABORATORIES

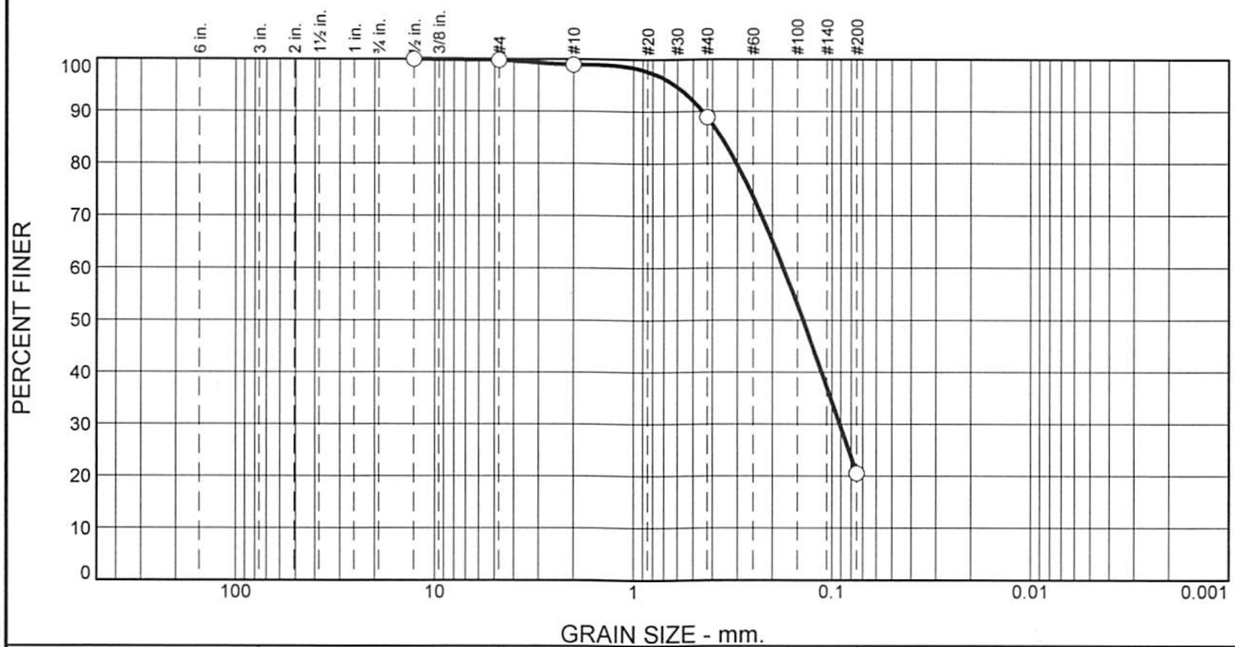
Particle Size Distribution Report

Project: Champlain Hudson Power Express United Cable Install **Report No.:** CD10279E-02-02-22

Client: Kiewit Intrastructure Co. **Date:** 02/07/22

Sample No: K-129.9A, S-8 **Source of Sample:** Boring Sample

Location: In-place **Elev./Depth:** 24-26'



% Cobbles	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	0	0	1	10	69	20	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	OUT OF SPEC. (X)
1/2"	100		
#4	100		
#10	99		
#40	89		
#200	20		

Soil Description

Grey c-mf+ SAND; little SILT

Atterberg Limits

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

Coefficients

D_{85}= 0.3609 D_{60}= 0.1763 D_{50}= 0.1401
D_{30}= 0.0914 D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= AASHTO=

Remarks

Moisture Content= 31.1%

* (no specification provided)

Figure

ATLANTIC TESTING LABORATORIES, LIMITED

Reviewed by:

Date: 02/07/22

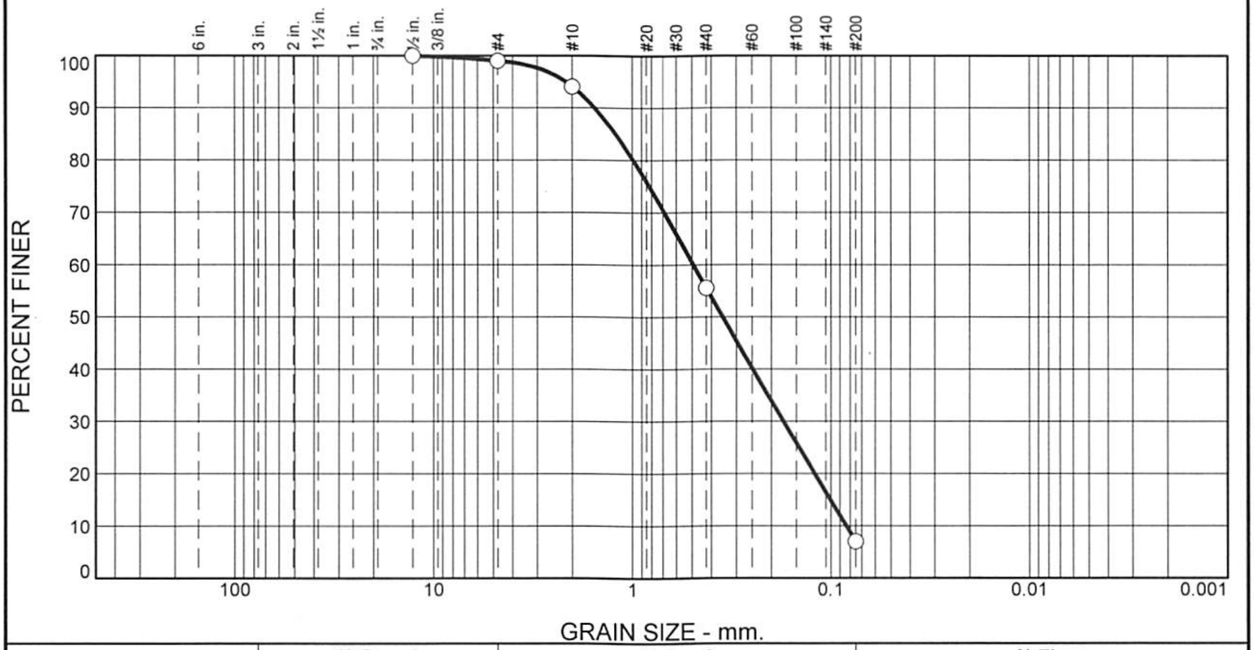
ATLANTIC TESTING LABORATORIES

Particle Size Distribution Report

Project: Champlain Hudson Power Express United Cable Install **Report No.:** CD10279E-02-02-22

Client: Kiewit Intrastructure Co. **Date:** 02/07/22

Sample No: K-129.9B, S-8 **Source of Sample:** Boring Sample
Location: In-place **Elev./Depth:** 24-26'



% Cobbles	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	0	1	5	38	49	7	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	OUT OF SPEC. (X)
1/2"	100		
#4	99		
#10	94		
#40	56		
#200	7.0		

* (no specification provided)

Soil Description

Grey c-mf SAND; trace SILT; trace f GRAVEL

Atterberg Limits

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

Coefficients

D_{85}= 1.2169 D_{60}= 0.4924 D_{50}= 0.3512
D_{30}= 0.1736 D_{15}= 0.1006 D_{10}= 0.0837
C_u= 5.88 C_c= 0.73

Classification

USCS= AASHTO=

Remarks

Moisture Content= 18.3%

Figure

ATLANTIC TESTING LABORATORIES, LIMITED

Reviewed by:

Date: 02/07/22

AMOUNT OF MATERIAL IN SOILS FINER THAN THE NO. 200 SIEVE
ASTM D 1140

PROJECT INFORMATION

Client:	Kiewit Intrastructure Co.	**ATL Report No.:**	CD10279E-02-02-22
Project:	Champlain Hudson Power Express	**Report Date:**	February 7, 2022
	United Cable Installation	**Test Date:**	February 3, 2022
	Various Locations, New York	**Performed By:**	M. White

TEST DATA

Boring No.	Sample No.	Depth (ft)	Method (A or B)	Soak Time (min)	Initial Dry Weight (g)	% Finer than #200
K-117.6-1.6A	S-8	28-30	A	10	672.08	70
K-122.4	S-5	8-10	A	10	339.75	57
K-125.6	ST-1	28-30	A	10	257.41	100
K-127.9	S-4	6-8	A	10	164.08	95
K-127.9	ST-1	38-40	A	10	392.67	100
K-128.0	S-7	19-21	A	10	163.31	100
K-128.0	ST-1	38-40	A	10	216.36	100
K-129.9A	S-5	8-10	A	10	136.68	24
K-129.9A	ST-1	41-43	A	10	240.79	100
K-129.9B	ST-1	27-29	A	10	186.13	100

Reviewed By: ______________________ Date: February 7, 2022

LIQUID LIMIT, PLASTIC LIMIT, AND PLASTICITY INDEX OF SOIL
ASTM D 4318

PROJECT INFORMATION

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

ATL Report No.: CD10279E-02-02-22
Report Date: February 7, 2022
Date Received: February 1, 2022

TEST DATA

Boring No.	Sample No.	LL	PL	PI
K-117.6-1.6A	S-6	46	20	26
K-117.6-1.6A	S-8	47	19	28
K-122.4	S-5	NP	NP	NP
K-125.6	S-5	50	22	28
K-125.6	ST-1	60	20	40
K-127.9	S-4	70	25	45
K-127.9	ST-1	30	17	13
K-128.0	S-7	78	23	55
K-128.0	ST-1	43	18	25
K-129.9A	S-5	NP	NP	NP
K-129.9A	ST-1	44	20	24
K-129.9B	S-6	96	49	47
K-129.9B	ST-1	55	20	35

SAMPLE INFORMATION

Boring No.	Sample No.	Maximum Grain Size (mm)	Estimated Amount of Sample Retained on No. 40 Sieve (%)	As Received Moisture Content (%)
K-117.6-1.6A	S-6	4.76	19	25.3
K-117.6-1.6A	S-8	6.35	28	33.3
K-122.4	S-5	2	5	24.8
K-125.6	S-5	0.42	2	24.7
K-125.6	ST-1	0.177	0	49.4
K-127.9	S-4	2	13	30.0
K-127.9	ST-1	0.177	0	30.0
K-128.0	S-7	0.149	0	39.2
K-128.0	ST-1	0.177	0	51.2
K-129.9A	S-5	2	25	134.2
K-129.9A	ST-1	0.177	0	40.5
K-129.9B	S-6	0.841	9	88.0
K-129.9B	ST-1	0.177	0	51.2

Client: Kiewit Instrastructure Co.
Project: Champlain Hudson Power Express

ATL Report No. CD10279E-02-02-22
Date: February 7, 2022

PREPARATION INFORMATION

Boring No.	Sample No.	Preparation	Method of Removing Oversized Material
K-117.6-1.6A	S-6	Air Dry	Pulverizing and Screening
K-117.6-1.6A	S-8	Air Dry	Pulverizing and Screening
K-122.4	S-5	Air Dry	Pulverizing and Screening
K-125.6	S-5	Air Dry	Pulverizing and Screening
K-125.6	ST-1	Air Dry	Not Necessary
K-127.9	S-4	Air Dry	Pulverizing and Screening
K-127.9	ST-1	Air Dry	Not Necessary
K-128.0	S-7	Air Dry	Not Necessary
K-128.0	ST-1	Air Dry	Not Necessary
K-129.9A	S-5	Air Dry	Pulverizing and Screening
K-129.9A	ST-1	Air Dry	Not Necessary
K-129.9B	S-6	Air Dry	Pulverizing and Screening
K-129.9B	ST-1	Air Dry	Not Necessary

EQUIPMENT INFORMATION

Liquid Limit Procedure:	Multipoint - Method A	☒	Single Point - Method B	☐
Liquid Limit Apparatus:	Manual	☒	Motor Driven	☐
Liquid Limit Grooving Tool Material:	Plastic	☒	Metal	☐
Liquid Limit Grooving Tool Shape:	Flat	☒	Curved (AASHTO Only)	☐
Plastic Limit:	Hand Rolled	☒	Mechanical Rolling Device	☐

Reviewed By: ____________________

Date: 02/07/22

PROJECT INFORMATION

Client:	Kiewit Intrastructure Co.	**ATL Report No.:**	CD10279E-02-02-22
Project:	Champlain Hudson Power Express United Cable Installation Various Locations, New York	**Report Date:**	February 7, 2022
		Date Received:	February 1, 2022

PERCENT ORGANICS, ASH CONTENT, AND MOISTURE CONTENT

ASTM D 2974

Boring No.	Sample No.	Organics (%)	Ash (%)	Moisture (%)	Test Method	Furnace Temperature (°C)
K-129.9A	S-5	16.8	83.2	134.2	A	440
K-129.9B	S-4	34.9	65.1	219.6	A	440

Reviewed By: ______________________

Date: 02/07/22

Kiewit

MEMORANDUM

DATE: September 23, 2022

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 3 - Package 2 - HDD Crossing 19 – Revision 1
Champlain Hudson Power Express Project
Hudson Falls, 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 east of Hudson Falls, New York. The approximate station for the start of HDD crossing Number 19 is STA 20696+00 (43.3134° N, 73.5341° W).

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

- TRC, Geotechnical Data Report, Champlain Hudson Power Express, Canadian Pacific Railway Borings MP 113.1-177.1, dated March 29, 2013.
- Atlantic Testing Laboratories, Subsurface Investigation Services, Champlain Hudson Power Express, Design Package 2, Whitehall to Glens Falls, New York, dated June 15, 2022.

Contact us if you have questions or require additional information.