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VIA EMAIL

TO: Ms. Mackenzie Kersbergen
Maine Department of Transportation
16 State house Station
Augusta, Maine 04333-0016

FROM: Nicholas Williams, P.E.
Christopher L. Snow, P.E.
GZA GeoEnvironmental, Inc.

DATE: January 13, 2023

FILE NO.: 09.0026057.01

SUBJECT: Fort Kent and Frenchville Riverbank Slope Stabilization
WIN 024899.00
Test Boring Information

Three test borings, RB-MNR-245.25, RB-MNR-258.28, and RB-MNR-258.58 were drilled between April 7 and April 16, 2020 using a hi-rail-mounted drill rig with a rope-and-cathead safety hammer driving system. GZA personnel monitored the drilling work and prepared logs of each boring which are attached. The locations are shown on the drawings.

Vibrating wire piezometers were installed in RB-MNR-245.25 and RB-MNR-258.28 to assess groundwater levels during and after the exploration program. Water level measurements were taken via the vibrating wire piezometers each day during the test boring program, and once during a follow-up site visit and are tabulated below.

Boring ID	Water Level Depth (ft)					Last Measured Elevation (ft)
	Ground Surface Elevation (Est.)	Immediately After Drilling	24 Hrs. After Drilling	48 Hrs. After Drilling	50-60 Days after Drilling (ft)	
RB-MNR-245.25	540	5.3	19.8	--	20.2	519.8
RB-MNR-258.28	500	18.7	19.5	19.4	18.8	479.2

We trust this information meets current project needs. Please feel free to call Nicholas Williams at (207) 245-8444 with any questions.

NVW/CLS:idm
C:\Users\nicholas.williams\AppData\Local\Microsoft\Windows\INetCache\Content.Outlook\FMDFP7Z0\09.0026057.01_CoverLetter_01.13.2023.docx

Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: Northern Rail Line

Location: Fort Kent/Frenchville/Madawaska, Maine

Boring No.: RB-MNR-245.25

WIN: 024899.00

Driller:	New England Boring Contractors	**Elevation (ft.)**	540 (est.)	**Auger ID/OD:**	
Operator:	Brad Enos	**Datum:**	NAVD88	**Sampler:**	Standard Splitspoon
Logged By:	B. Woodman	**Rig Type:**	Hi-Rail	**Hammer Wt./Fall:**	140#/30"
Date Start/Finish:	4/16/2020-4/16/2020	**Drilling Method:**	Drive & Wash	**Core Barrel:**	NA
Boring Location:	N1314852, E961382	**Casing ID/OD:**	4.0/3.0"	**Water Level*:**	5.3, 20.2
Hammer Efficiency Factor: 0.6		**Hammer Type:**	Automatic ☐ Hydraulic ☐ Rope & Cathead ☒		

Definitions:
D = Split Spoon Sample
MD = Unsuccessful Split Spoon Sample Attempt
U = Thin Wall Tube Sample
MU = Unsuccessful Thin Wall Tube Sample Attempt
V = Field Vane Shear Test, PP = Pocket Penetrometer
MV = Unsuccessful Field Vane Shear Test Attempt
R = Rock Core Sample
SSA = Solid Stem Auger
HSA = Hollow Stem Auger
RC = Roller Cone
WOH = Weight of 140lb. Hammer
WOR/C = Weight of Rods or Casing
WO1P = Weight of One Person
S_u = Peak/Remolded Field Vane Undrained Shear Strength (psf)
$S_{u(lab)}$ = Lab Vane Undrained Shear Strength (psf)
q_p = Unconfined Compressive Strength (ksf)
N-uncorrected = Raw Field SPT N-value
Hammer Efficiency Factor = Rig Specific Annual Calibration Value
N_{60} = SPT N-uncorrected Corrected for Hammer Efficiency
N_{60} = (Hammer Efficiency Factor/60%)*N-uncorrected
T_v = Pocket Torvane Shear Strength (psf)
WC = Water Content, percent
LL = Liquid Limit
PL = Plastic Limit
PI = Plasticity Index
G = Grain Size Analysis
C = Consolidation Test

Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N_{60}	Casing Blows	Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.
0										0'-1.0': Ballast.	
								539.0		1.0	
	1D	20/12	1.0 - 2.7	11-19-23-29/2"	42	42				Brown, moist, dense, fine to coarse SAND, some gravel, trace silt, (Fill).	
	2D	24/9	4.0 - 6.0	26-32-28-36	60	60				Grey/brown, dry, very dense, fine to coarse SAND, some gravel.	
5											
								534.0		6.0	
	3D	24/16	6.0 - 8.0	24-42-51-45	93	93				Grey, moist, hard, Clayey SILT, little gravel, little sand, (Glacial Till).	
	4D	20/19	9.0 - 10.7	23-29-31-34	60	60				Brown/grey, wet, hard, Clayey SILT, little gravel, little sand, (Glacial Till).	
10											
	5D	24/13	14.0 - 16.0	24-31-37-43	68	68				Brown/grey, moist, very dense, fine to coarse SAND, little gravel, trace silt.	
15											
	6D	24/14	19.0 - 21.0	17-23-42-49	65	65				Grey, wet, hard, Clayey SILT, little sand, trace gravel, (Glacial Till).	
20											
	7D	24/17	24.0 - 26.0	25-38-46-49	84	84				Grey, wet, hard, sandy, Clayey SILT, trace gravel, with sand seams, (Glacial Till).	
25											

Remarks:

1. As-drilled coordinates were collected by GZA using a hand-held GPS unit with 10+/- ft accuracy. Elevations were interpolated from LiDAR-based elevation contour data.
2. Ground surface was measured from the top of ballast.
3. Ground water was measured from piezometer immediately and >30 days after completion. GW Depth above references both readings respectively.
4. Piezometer was installed to a depth of 58.0', backfilled with filter sand up to 1.0' below the bottom of ballast, bentonite seal at 1.0'-2.0'.

Stratification lines represent approximate boundaries between soil types; transitions may be gradual.

* Water level readings have been made at times and under conditions stated. Groundwater fluctuations may occur due to conditions other than those present at the time measurements were made.

Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: Northern Rail Line

Location: Fort Kent/Frenchville/Madawaska, Maine

Boring No.: RB-MNR-245.25

WIN: 024899.00

Driller:	New England Boring Contractors	**Elevation (ft.)**	540 (est.)	**Auger ID/OD:**	
Operator:	Brad Enos	**Datum:**	NAVD88	**Sampler:**	Standard Splitspoon
Logged By:	B. Woodman	**Rig Type:**	Hi-Rail	**Hammer Wt./Fall:**	140#/30"
Date Start/Finish:	4/16/2020-4/16/2020	**Drilling Method:**	Drive & Wash	**Core Barrel:**	NA
Boring Location:	N1314852, E961382	**Casing ID/OD:**	4.0/3.0"	**Water Level*:**	5.3, 20.2
Hammer Efficiency Factor: 0.6		**Hammer Type:**	Automatic ☐ Hydraulic ☐ Rope & Cathead ☒		

Definitions:
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SSA = Solid Stem Auger
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WO1P = Weight of One Person
S_u = Peak/Remolded Field Vane Undrained Shear Strength (psf)
$S_{u(lab)}$ = Lab Vane Undrained Shear Strength (psf)
q_p = Unconfined Compressive Strength (ksf)
N-uncorrected = Raw Field SPT N-value
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N_{60} = (Hammer Efficiency Factor/60%)*N-uncorrected
T_v = Pocket Torvane Shear Strength (psf)
WC = Water Content, percent
LL = Liquid Limit
PL = Plastic Limit
PI = Plasticity Index
G = Grain Size Analysis
C = Consolidation Test

Depth (ft.)	Sample Information: Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N_{60}	Casing Blows	Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.
25											
	8D	21/15	29.0 - 30.8	30-70-69-50/2"	139	139				Grey, wet, hard, Clayey SILT, some fine sand, trace gravel, fine sand seams, (Glacial Till).	
30											
	9D	24/20	34.0 - 36.0	19-29-32-43	61	61				Grey, wet, hard, Clayey SILT, with one seam of fine sand from 35.7'-35.9', (Glacial Till).	
35											
	10D	24/16	39.0 - 41.0	36-45-41-36	86	86				Grey, wet, hard, Clayey SILT, trace sand, trace gravel, (Glacial Till).	
40											
	11D	24/20	44.0 - 46.0	11-23-26-40	49	49				Grey, wet, hard, Clayey SILT, trace sand, trace gravel, (Glacial Till).	
45											
	12D	24/14	49.0 - 51.0	18-29-46-59	75	75				Grey, wet, hard, Clayey SILT, (Glacial Till).	
50											

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Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: Northern Rail Line

Location: Fort Kent/Frenchville/Madawaska, Maine

Boring No.: RB-MNR-245.25

WIN: 024899.00

Driller:	New England Boring Contractors	**Elevation (ft.)**	540 (est.)	**Auger ID/OD:**	
Operator:	Brad Enos	**Datum:**	NAVD88	**Sampler:**	Standard Splitspoon
Logged By:	B. Woodman	**Rig Type:**	Hi-Rail	**Hammer Wt./Fall:**	140#/30"
Date Start/Finish:	4/16/2020-4/16/2020	**Drilling Method:**	Drive & Wash	**Core Barrel:**	NA
Boring Location:	N1314852, E961382	**Casing ID/OD:**	4.0/3.0"	**Water Level*:**	5.3, 20.2
Hammer Efficiency Factor: 0.6		**Hammer Type:**	Automatic ☐ Hydraulic ☐ Rope & Cathead ☒		

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S_u = Peak/Remolded Field Vane Undrained Shear Strength (psf)
$S_{u(lab)}$ = Lab Vane Undrained Shear Strength (psf)
q_p = Unconfined Compressive Strength (ksf)
N-uncorrected = Raw Field SPT N-value
Hammer Efficiency Factor = Rig Specific Annual Calibration Value
N_{60} = SPT N-uncorrected Corrected for Hammer Efficiency
N_{60} = (Hammer Efficiency Factor/60%)*N-uncorrected
T_v = Pocket Torvane Shear Strength (psf)
WC = Water Content, percent
LL = Liquid Limit
PL = Plastic Limit
PI = Plasticity Index
G = Grain Size Analysis
C = Consolidation Test

Depth (ft.)	Sample Information: Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N_{60}	Casing Blows	Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.
50											
	13D	24/11	54.0 - 56.0	20-24-34-45	58	58				Grey, wet, hard, Clayey SILT, (Glacial Till).	
55											
	14D	24/6	59.0 - 61.0	25-35-45-55	80	80				Grey, wet, hard, Clayey SILT, some fine sand, trace gravel, (Glacial Till).	
60											
								479.0		61.0	
										Bottom of Exploration at 61.0 feet below ground surface.	
65											
70											
75											

Remarks:

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3. Ground water was measured from piezometer immediately and >30 days after completion. GW Depth above references both readings respectively.
4. Piezometer was installed to a depth of 58.0', backfilled with filter sand up to 1.0' below the bottom of ballast, bentonite seal at 1.0'-2.0'.

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Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: Northern Rail Line

Location: Fort Kent/Frenchville/Madawaska, Maine

Boring No.: RB-MNR-258.28

WIN: 024889.00

Driller:	New England Boring Contractors	**Elevation (ft.)**	500 (est.)	**Auger ID/OD:**	
Operator:	Brad Enos	**Datum:**	NAVD88	**Sampler:**	Standard Splitspoon
Logged By:	B. Woodman	**Rig Type:**	Hi-Rail	**Hammer Wt./Fall:**	140#/30"
Date Start/Finish:	4/8/2020-4/9/2020	**Drilling Method:**	Drive & Wash	**Core Barrel:**	NA
Boring Location:	N1327534, E1014066	**Casing ID/OD:**	4.0/3.0"	**Water Level*:**	18.7, 18.8
Hammer Efficiency Factor: 0.6		**Hammer Type:**	Automatic ☐ Hydraulic ☐ Rope & Cathead ☒		

Definitions:
D = Split Spoon Sample
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MV = Unsuccessful Field Vane Shear Test Attempt
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SSA = Solid Stem Auger
HSA = Hollow Stem Auger
RC = Roller Cone
WOH = Weight of 140lb. Hammer
WOR/C = Weight of Rods or Casing
WO1P = Weight of One Person
S_u = Peak/Remolded Field Vane Undrained Shear Strength (psf)
$S_{u(lab)}$ = Lab Vane Undrained Shear Strength (psf)
q_p = Unconfined Compressive Strength (ksf)
N-uncorrected = Raw Field SPT N-value
Hammer Efficiency Factor = Rig Specific Annual Calibration Value
N_{60} = SPT N-uncorrected Corrected for Hammer Efficiency
N_{60} = (Hammer Efficiency Factor/60%)*N-uncorrected
T_v = Pocket Torvane Shear Strength (psf)
WC = Water Content, percent
LL = Liquid Limit
PL = Plastic Limit
PI = Plasticity Index
G = Grain Size Analysis
C = Consolidation Test

Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N_{60}	Casing Blows	Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.
0							SSA			0'-3.0': Ballast.	
	1D	24/6	1.0 - 3.0	17-12-16-11	28	28				Grey/brown, dry, medium dense, Gravelly fine to coarse SAND, with ballast material, (Fill-Ballast).	
								497.0		3.0	
	2D	24/10	3.0 - 5.0	12-10-8-4	18	18				Grey/black, dry, medium dense, Gravelly fine to coarse SAND, (Fill).	
5	3D	24/3	5.0 - 7.0	20-18-18-12	36	36				Brown, wet, dense, fine to coarse SAND, some gravel, little silt, (Fill).	
	4D	24/9	7.0 - 9.0	11-6-6-11	12	12				Brown, wet, medium dense, fine to coarse SAND, little gravel, little silt, trace wood pieces, (Fill).	
								491.0		9.0	
	5D	24/3	9.0 - 11.0	7-6-6-6	12	12				Brown, wet, loose, fine to coarse SAND, little gravel, little silt, (Alluvium).	
10	6D	24/5	11.0 - 13.0	5-6-5-3	11	11				Brown, wet, medium dense, fine to coarse SAND, little silt, trace gravel, (Alluvium).	
	7D	24/4	13.0 - 15.0	11-7-6-4	13	13				Brown, wet, medium dense, fine to coarse SAND, little gravel, little silt, (Alluvium).	
15	8D	24/7	15.0 - 17.0	4-5-5-5	10	10				Brown, wet, loose, medium to coarse SAND, trace gravel, trace silt, (Alluvium).	
	9D	24/8	17.0 - 19.0	9-7-5-6	12	12				Brown, wet, medium dense, fine to coarse SAND, trace silt, (Alluvium).	
	10D	24/9	19.0 - 21.0	11-7-6-9	13	13				Brown, wet, medium dense, fine to coarse SAND, trace gravel, trace silt, (Alluvium).	
20	11D	24/9	21.0 - 23.0	7-10-9-6	19	19				Brown, wet, medium dense, fine to coarse SAND, trace gravel, trace silt, (Alluvium).	
								477.0		23.0	
	12D	24/14	23.0 - 25.0	4-11-16-22	27	27	178			Grey, wet, very stiff, Clayey SILT, (Glacial Till).	
25							256				

Remarks:

1. As-drilled coordinates were collected by GZA using a hand-held GPS unit with 10+/- ft accuracy. Elevations were interpolated from LiDAR-based elevation contour data.
2. Ground surface was measured from the top of ballast.
3. Ground water was measured from piezometer immediately and >30 days after completion. GW Depth above references both readings respectively.
4. Piezometer was installed to a depth of 57.5', backfilled with filter sand up to 1.0' below the bottom of ballast, bentonite seal at 3.0'-4.0'.

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Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: Northern Rail Line

Location: Fort Kent/Frenchville/Madawaska, Maine

Boring No.: RB-MNR-258.28

WIN: 024889.00

Driller:	New England Boring Contractors	**Elevation (ft.)**	500 (est.)	**Auger ID/OD:**	
Operator:	Brad Enos	**Datum:**	NAVD88	**Sampler:**	Standard Splitspoon
Logged By:	B. Woodman	**Rig Type:**	Hi-Rail	**Hammer Wt./Fall:**	140#/30"
Date Start/Finish:	4/8/2020-4/9/2020	**Drilling Method:**	Drive & Wash	**Core Barrel:**	NA
Boring Location:	N1327534, E1014066	**Casing ID/OD:**	4.0/3.0"	**Water Level*:**	18.7, 18.8
Hammer Efficiency Factor: 0.6		**Hammer Type:**	Automatic ☐ Hydraulic ☐ Rope & Cathead ☒		

Definitions:
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LL = Liquid Limit
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C = Consolidation Test

Depth (ft.)	Sample Information: Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N_{60}	Casing Blows	Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.
25							RC				
	13D	23/18	29.0 - 30.9	16-24-36-51/3"	60	60				Grey, wet, hard, Clayey SILT, (Glacial Till).	
30											
	14D	20/18	34.0 - 35.7	27-36-48-50/2"	84	84				Grey, wet, hard, Clayey SILT, (Glacial Till).	
35											
	15D	24/24	39.0 - 41.0	27-41-63-72	104	104				Grey, wet, hard, Clayey SILT, trace fine to medium sand, (Glacial Till).	
40											
	16D	20/20	44.0 - 45.7	25-53-53-50/1"	106	106				Grey, wet, hard, Clayey SILT, trace fine sand, (Glacial Till).	
45											
	17D	18/16	49.0 - 50.5	36-46-62	108	108				Grey, wet, hard, Clayey SILT, little fine to coarse sand, trace gravel, (Glacial Till).	
50											

Remarks:

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Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: Northern Rail Line

Location: Fort Kent/Frenchville/Madawaska, Maine

Boring No.: RB-MNR-258.28

WIN: 024889.00

Driller:	New England Boring Contractors	**Elevation (ft.)**	500 (est.)	**Auger ID/OD:**	
Operator:	Brad Enos	**Datum:**	NAVD88	**Sampler:**	Standard Splitspoon
Logged By:	B. Woodman	**Rig Type:**	Hi-Rail	**Hammer Wt./Fall:**	140#/30"
Date Start/Finish:	4/8/2020-4/9/2020	**Drilling Method:**	Drive & Wash	**Core Barrel:**	NA
Boring Location:	N1327534, E1014066	**Casing ID/OD:**	4.0/3.0"	**Water Level*:**	18.7, 18.8
Hammer Efficiency Factor: 0.6		**Hammer Type:**	Automatic ☐ Hydraulic ☐ Rope & Cathead ☒		

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Depth (ft.)	Sample Information: Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N_{60}	Casing Blows	Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.
50											
55											
	18D	18/17	59.0 - 60.5	51-44-88	132	132				Grey, wet, hard, Clayey SILT, some fine sand, (Glacial Till).	
60								439.5		60.5	
										Bottom of Exploration at 60.5 feet below ground surface.	
65											
70											
75											

Remarks:

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2. Ground surface was measured from the top of ballast.
3. Ground water was measured from piezometer immediately and >30 days after completion. GW Depth above references both readings respectively.
4. Piezometer was installed to a depth of 57.5', backfilled with filter sand up to 1.0' below the bottom of ballast, bentonite seal at 3.0'-4.0'.

Stratification lines represent approximate boundaries between soil types; transitions may be gradual.

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Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: Northern Rail Line

Location: Fort Kent/Frenchville/Madawaska, Maine

Boring No.: RB-MNR-258.58

WIN: 024889.00

Driller:	New England Boring Contractors	**Elevation (ft.)**	497 (est.)	**Auger ID/OD:**	
Operator:	Brad Enos	**Datum:**	NAVD88	**Sampler:**	Standard Splitspoon
Logged By:	B. Woodman	**Rig Type:**	Hi-Rail	**Hammer Wt./Fall:**	140#/30"
Date Start/Finish:	4/13/2020-4/13/2020	**Drilling Method:**	Drive & Wash	**Core Barrel:**	NA
Boring Location:	N1329744, E1013950	**Casing ID/OD:**	4.0/3.0"	**Water Level*:**	6.0
Hammer Efficiency Factor: 0.6		**Hammer Type:**	Automatic ☐ Hydraulic ☐ Rope & Cathead ☒		

Definitions:
D = Split Spoon Sample
MD = Unsuccessful Split Spoon Sample Attempt
U = Thin Wall Tube Sample
MU = Unsuccessful Thin Wall Tube Sample Attempt
V = Field Vane Shear Test, PP = Pocket Penetrometer
MV = Unsuccessful Field Vane Shear Test Attempt
R = Rock Core Sample
SSA = Solid Stem Auger
HSA = Hollow Stem Auger
RC = Roller Cone
WOH = Weight of 140lb. Hammer
WOR/C = Weight of Rods or Casing
WO1P = Weight of One Person
S_u = Peak/Remolded Field Vane Undrained Shear Strength (psf)
$S_{u(lab)}$ = Lab Vane Undrained Shear Strength (psf)
q_p = Unconfined Compressive Strength (ksf)
N-uncorrected = Raw Field SPT N-value
Hammer Efficiency Factor = Rig Specific Annual Calibration Value
N_{60} = SPT N-uncorrected Corrected for Hammer Efficiency
N_{60} = (Hammer Efficiency Factor/60%)*N-uncorrected
T_v = Pocket Torvane Shear Strength (psf)
WC = Water Content, percent
LL = Liquid Limit
PL = Plastic Limit
PI = Plasticity Index
G = Grain Size Analysis
C = Consolidation Test

Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N_{60}	Casing Blows	Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.
0										0'-1.0': Ballast.	
	1D	18/0	1.0 - 2.5	1-6-6-7	12	12				Ballast fragments.	
								494.5		2.5	
	2D	24/5	3.0 - 5.0	8-6-5-10	11	11				Grey, wet, medium dense, GRAVEL, little sand, (Fill).	
5											
	3D	24/4	5.0 - 7.0	7-7-8-7	15	15				Grey, wet, medium dense, medium to coarse SAND, some gravel, (Fill).	
								490.0		7.0	
	4D	24/9	7.0 - 9.0	5-4-7-12	11	11				Grey, wet, stiff, Clayey SILT, little sand, (Glacial Till).	
	5D	24/18	9.0 - 11.0	12-17-20-21	37	37				Grey, wet, hard, Clayey SILT, trace fine sand, (Glacial Till).	
10											
	6D	24/14	14.0 - 16.0	11-19-22-26	41	41				Grey, wet, hard, Clayey SILT, trace fine sand, (Glacial Till).	
15											
	7D	24/24	19.0 - 21.0	15-21-39-52	50	50				Grey, wet, hard, Clayey SILT, (Glacial Till).	
20											
	8D	24/24	24.0 - 26.0	24-40-70-95	110	110				Grey, wet, hard, Clayey SILT, (Glacial Till).	
25											

Remarks:

1. As-drilled coordinates were collected by GZA using a hand-held GPS unit with 10+/- ft accuracy. Elevations were interpolated from LiDAR-based elevation contour data.
2. Ground surface was measured immediately after casing was removed.
3. Ground water was measured from piezometer >48 hours after completion.
4. Fine-Grained Soil Descriptions on this log are based on plasticity estimated using visual-manual classification techniques or laboratory Atterberg Limit tests if available, rather than the MaineDOT Standard based on percentages passing specific grain sizes.

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Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: Northern Rail Line

Location: Fort Kent/Frenchville/Madawaska, Maine

Boring No.: RB-MNR-258.58

WIN: 024889.00

Driller:	New England Boring Contractors	**Elevation (ft.)**	497 (est.)	**Auger ID/OD:**	
Operator:	Brad Enos	**Datum:**	NAVD88	**Sampler:**	Standard Splitspoon
Logged By:	B. Woodman	**Rig Type:**	Hi-Rail	**Hammer Wt./Fall:**	140#/30"
Date Start/Finish:	4/13/2020-4/13/2020	**Drilling Method:**	Drive & Wash	**Core Barrel:**	NA
Boring Location:	N1329744, E1013950	**Casing ID/OD:**	4.0/3.0"	**Water Level*:**	6.0
Hammer Efficiency Factor: 0.6		**Hammer Type:**	Automatic ☐ Hydraulic ☐ Rope & Cathead ☒		

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Depth (ft.)	Sample Information: Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N_{60}	Casing Blows	Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.
25											
	9D	20/16	29.0 - 30.7	32-58-89-50/1"	147	147				Grey, wet, hard, Clayey SILT, (Glacial Till).	
30											
	10D	22/17	34.0 - 35.8	33-41-52-53/2"	93	93				Grey, wet, hard, Clayey SILT, little fine sand, fine sand seams, (Glacial Till).	
35											
	11D	18/18	39.0 - 40.5	73-90-28	118	118				Grey, wet, very dense, Clayey SILT, some fine to coarse sand, trace gravel, (Glacial Till). Coarse sand / angular flat pieces of similar rock type.	
40											
	12D	18/10	44.0 - 45.5	30-49-73	122	122				Grey, wet, hard, Clayey SILT, trace fine sand, (Glacial Till).	
45											
	13D	20/15	49.0 - 50.7	25-38-70-50/1"	108	108				Grey, wet, hard, Clayey SILT, trace fine sand, fine sand lenses (± 1") from 50.0'-50.7', (Glacial Till).	
50											

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Location: Fort Kent/Frenchville/Madawaska, Maine

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50											
55											
	14D	8/6	59.0 - 59.7	110-50/1"	R			437.3		Grey, moist, Silty fine to coarse SAND, little gravel, (Glacial Till). 59.7	
60										**Bottom of Exploration at 59.7 feet below ground surface.**	
65											
70											
75											

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