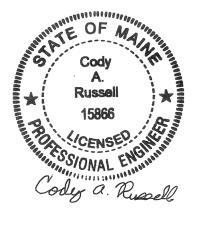
MAINE DEPARTMENT OF TRANSPORTATION HIGHWAY PROGRAM GEOTECHNICAL SECTION AUGUSTA, MAINE

GEOTECHNICAL DESIGN REPORT

For Intersection Improvements on

ROUTE 4 TURNER, MAINE

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Androscoggin County WIN 24201.00 Soils Report 2024-05 Federal No. 2420100

February 7, 2024

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1.0 INTRODUCTION

The purpose of this Geotechnical Design Report is to present subsurface information and make geotechnical design and construction recommendations for the intersection improvements at the intersection Route 4, Route 219, and Bear Pond Road, shown on Sheet 1 – Location Map. The project is needed to address safety concerns at this high crash location. The scope includes realigning the existing 4-leg intersection into two (2) 3-leg intersections and installing highway lighting. Route 4 is a Highway Corridor Priority 1 road.

2.0 GEOLOGIC SETTING

According to the Surficial Geology Map entitled Buckfield Quadrangle, Maine, Open File No. 08-68 (2008) published by the Maine Geological Survey (MGS), the surficial soils at the project site consist of glaciomarine delta (regressive) of the Turner Plains regressive delta consisting of sand and gravel.

According to the MGS map titled Bedrock Geologic Map of Maine (1985) the bedrock along the project is consists of interbedded pelite and limestone and/or dolostone of the Sangerville Formation.

3.0 SUBSURFACE INVESTIGATION

Subsurface conditions at the site were explored by drilling a total of fifteen (15) test borings.

Borings HB-TUR-101 and HB-TUR-102 were drilled on April 12, 2022 by an S.W. Cole drill rig. Borings HB-TUR-201 through HB-TUR-212 were drilled between February 8 and February 10, 2023 by the MaineDOT drill rig. The two (2) 100-series borings and boring HB-TUR-208 were drilled to refusal at depths ranging from approximately 7.5 to 10.0 feet below ground surface (bgs) using solid stem auger and cased wash boring drilling techniques. These three (3) borings were then advanced into bedrock using NQ 2-inch rock core drilling techniques to total depths ranging from approximately 12.5 to 18.2 feet bgs and the Rock Core Designation (RQD) of the core was calculated. Borings HB-TUR-202, HB-TUR-207, and HB-TUR-209 were drilled to depths of approximately 6.2 to 10.3 feet using solid stem auger and cased wash boring drilling techniques, where they encountered a refusal surface. The exact nature of the refusal surface was not determined in these three (3) borings. The remaining nine (9) borings were drilled to a depth of approximately 12.0 feet bgs without encountering a refusal surface using solid stem auger and cased wash boring drilling techniques. Boring locations are shown on Sheet 2 – Boring Location Plan. Boring Logs are presented in Appendix A.

Samples were obtained in the borings at standard 5-foot intervals using Standard Penetration Testing (SPT). The S.W. Cole and MaineDOT drill rigs are equipped with automatic hammers to drive the split spoon. The S.W. Cole and MaineDOT calibrated automatic hammers deliver approximately 52 more energy during driving than the standard rope and cathead system. All N-

values discussed in this report are corrected values (N_{60}) computed by applying an average energy transfer factor of 0.91 to the raw field N-values.

Details and sampling methods used, field data obtained, and soil and groundwater conditions encountered are shown in the Boring Logs in Appendix A. The MaineDOT Geotechnical Team member selected the boring locations, drilling methods, designated type and depth of sampling, reviewed field logs for accuracy and identified field and laboratory testing requirements. A North East Transportation Training and Certification Program (NETTCP) certified subsurface inspector engineer logged the subsurface conditions encountered. The borings were located in the field by taping to site features after completion of the drilling program.

4.0 LABORATORY TESTING

A laboratory testing program was conducted on select soil samples obtained in the test borings and to assist in soil classification, evaluation of engineering properties of the soils and geologic assessment of the project site. Laboratory testing consisted of four (4) standard grain size analyses with natural water content. The results of the laboratory tests are in Appendix B – Laboratory Test Results. Laboratory test results are also summarized on the boring logs in Appendix A.

5.0 SUBSURFACE CONDITIONS

Subsurface conditions encountered at the test borings generally consisted of topsoil or pavement and fill soils overlying native sand overlying bedrock. The boring locations are shown on Sheet 2 – Boring Location Plan. The boring logs are in Appendix A – Boring Logs.

5.1 Topsoil

The 100-series borings were drilled off-road and encountered a layer of topsoil at the ground surface. The thickness of the topsoil was approximately 0.2 feet.

5.2 Pavement and Fill Soils

The 200-series boring were drilled in the travelway or shoulder and encountered pavement at the ground surface underlain by fill soils along the project. The pavement thickness ranged from approximately 4 to 9 inches. The fill soils consisted of:

• Light brown and brown, damp to moist, fine to coarse sand, little to some gravel, trace to little silt, occasional cobbles.

The thickness of the fill ranged from approximately 2.7 feet to 11.7 feet, but the fill soils were not fully penetrated in all the borings. SPT N_{60} -values obtained the in the fill ranged from 11 to 138 blows per foot (bpf) indicating that the fill is medium dense to very dense in consistency.

5.3 Native Sand

Throughout the project the topsoil or fill soils are underlain by native sand. The native sand consisted of:

- Light to dark brown, damp to wet, fine to coarse sand, trace to little gravel, trace to little silt, trace roots.
- Light brown, wet, silty fine to coarse sand, little gravel.
- Light brown, moist, gravelly fine to coarse sand, trace silt.

The thickness of the native sand ranged from approximately 4.0 feet to 9.8 feet but was not fully penetrated in all the borings. Sixteen (16) SPT N_{60} -values obtained the in the native sand ranged from 3 to 39 bpf indicating that the native sand is very loose to dense in consistency.

Water contents from four (4) samples obtained within the native sand ranged from approximately 5.2% to 29.3%. Grain size analyses conducted on four (4) samples of the native sand resulted in the soil being classified as an A-1-b or A-4 under the AASHTO Soil Classification System and an SM, SP, or SP-SM under the Unified Soil Classification System.

5.4 Bedrock

Bedrock was encountered at varying depths along the project. Refusal of the drilling tools varied from a depth of approximately 6.2 to 10.3 feet bgs in six (6) borings. Bedrock was cored in three (3) of the borings where refusal was encountered. The exact nature of the refusal surface was not determined in the remaining three (3) borings.

The bedrock consists of interbedded pelite and limestone and/or dolostone of the Sangerville Formation. The Rock Quality Designation (RQD) of the bedrock was determined range from 0% to 82%, correlating to a Rock Quality of Very Poor to Good. The approximate elevations of the top of bedrock or the refusal surface encountered at the boring locations are presented on the Boring Logs in Appendix A.

5.5 Groundwater

Groundwater levels were observed in two (2) borings. The measured groundwater levels in the borings where groundwater was observed ranged from approximately 2.5 to 5.7 feet bgs. The water levels observed are indicated on the boring logs in Appendix A. Groundwater levels can be expected to fluctuate subject to seasonal variations, local soil conditions, topography, precipitation, and construction activity.

6.0 GEOTECHNICAL RECOMMENDATIONS

The following sections discuss the geotechnical-related design features of this project. Areas of geotechnical concern are:

- Light Pole Foundations
- Oversteepened Slope

6.1 Light Pole Foundations

Twelve (12) 35-foot tall lighting poles are proposed on new foundations along Route 4. The proposed foundations will consist of 30-inch diameter, 8.0-foot long cast-in-place concrete drilled shafts. The foundation design was completed in accordance with LRFD Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals and AASHTO LRFD Bridge Design Specifications 9th Edition 2020 based on estimated loading conditions of the proposed light poles provided by the HNTB on August 4, 2023. The foundation designs are shown on Sheet 3 – Lighting Pole Foundations.

6.2 Oversteepened Slope

A new 1.75H:1V fill slope is proposed between approximate stations 201+67 to 202+70. A critical slope section was identified at approximate station 202+20 and this slope cross section was analyzed to evaluate the proposed slope stability. Geostudio Slope/W software was used to evaluate the slope. The stability analysis was based on subsurface conditions encountered in borings drilled at the proposed crest and toe of the slope. In accordance with AASHTO LRFD Bridge Design Specifications 9th Edition 2020 (LRFD) Article 11.6.3.7 evaluation of earth slopes where geotechnical parameters are well defined shall achieve a factor of safety of 1.3 (equivalent to a resistance factor of 0.75).

The cross section at station 202+20 was analyzed at three (3) slope angles to evaluate the slope stability of the final slope configuration. The slopes steeper than 2H:1V were analyzed with 3 feet of plain riprap while the slope at 2H:1V was analyzed without riprap. The table below provides the results of these analyses:

Station	Proposed Slope Angle	Riprap Type	Riprap Thickness (feet)	Proposed Slope Factor of Safety
202+20	2H:1V	None	None	1.348
202+20	1.75H:1V	Plain	3	1.312
202+20	1.5H:1V	Plain	3	1.141

Based on these analyses the design team determined that the proposed slope would be constructed at the 1.75H:1V slope. Appendix C – Slope Stability Analyses presents the stability results from these analyses. The proposed riprap slope shall be constructed as shown on the project plans and shall be armored with 3 feet of riprap conforming to MaineDOT Standard Specification Section

703.26 Plain Riprap underlain by a 1-foot layer of Protective Aggregate Cushion conforming to MaineDOT Standard Specification 703.19 Granular Borrow Material for Underwater Backfill that is underlain by a non-woven Class 1 Erosion Control Geotextile that meets the requirements for MaineDOT Standard Specification 722.03.

6.3 Settlement

No settlement issues are anticipated for the roadway. No soft or compressible soils were encountered in the area of the proposed fill. Any settlement due to elastic compression of the native granular soils will be immediate and will not have an effect on the final roadway configuration.

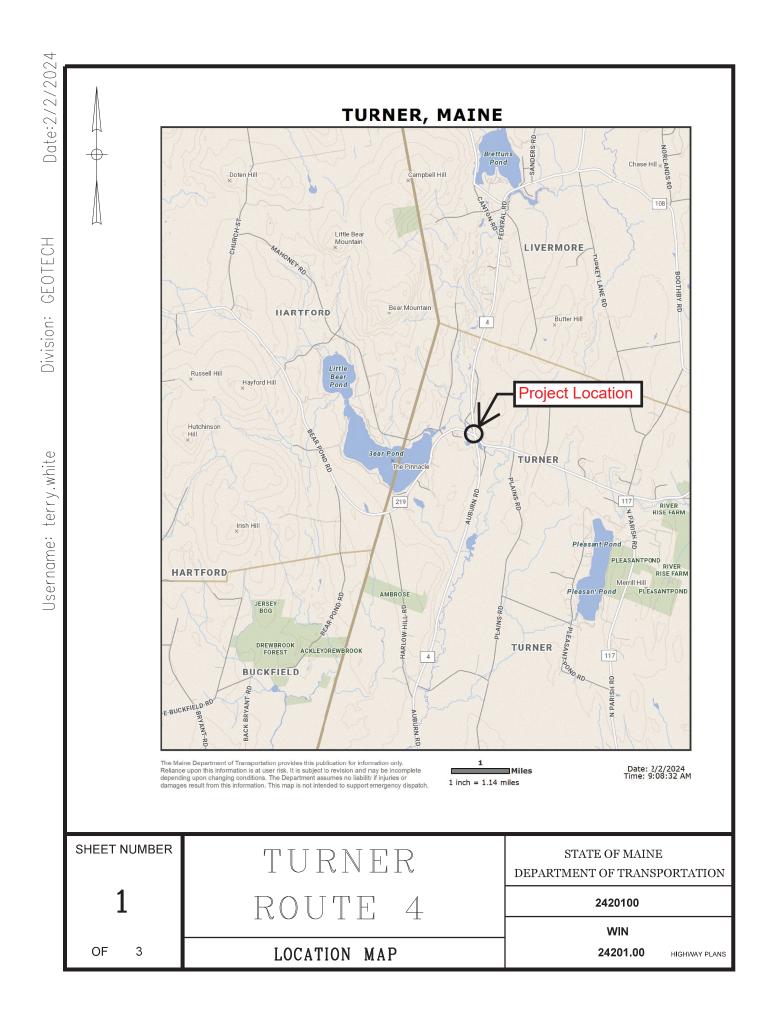
7.0 CLOSURE

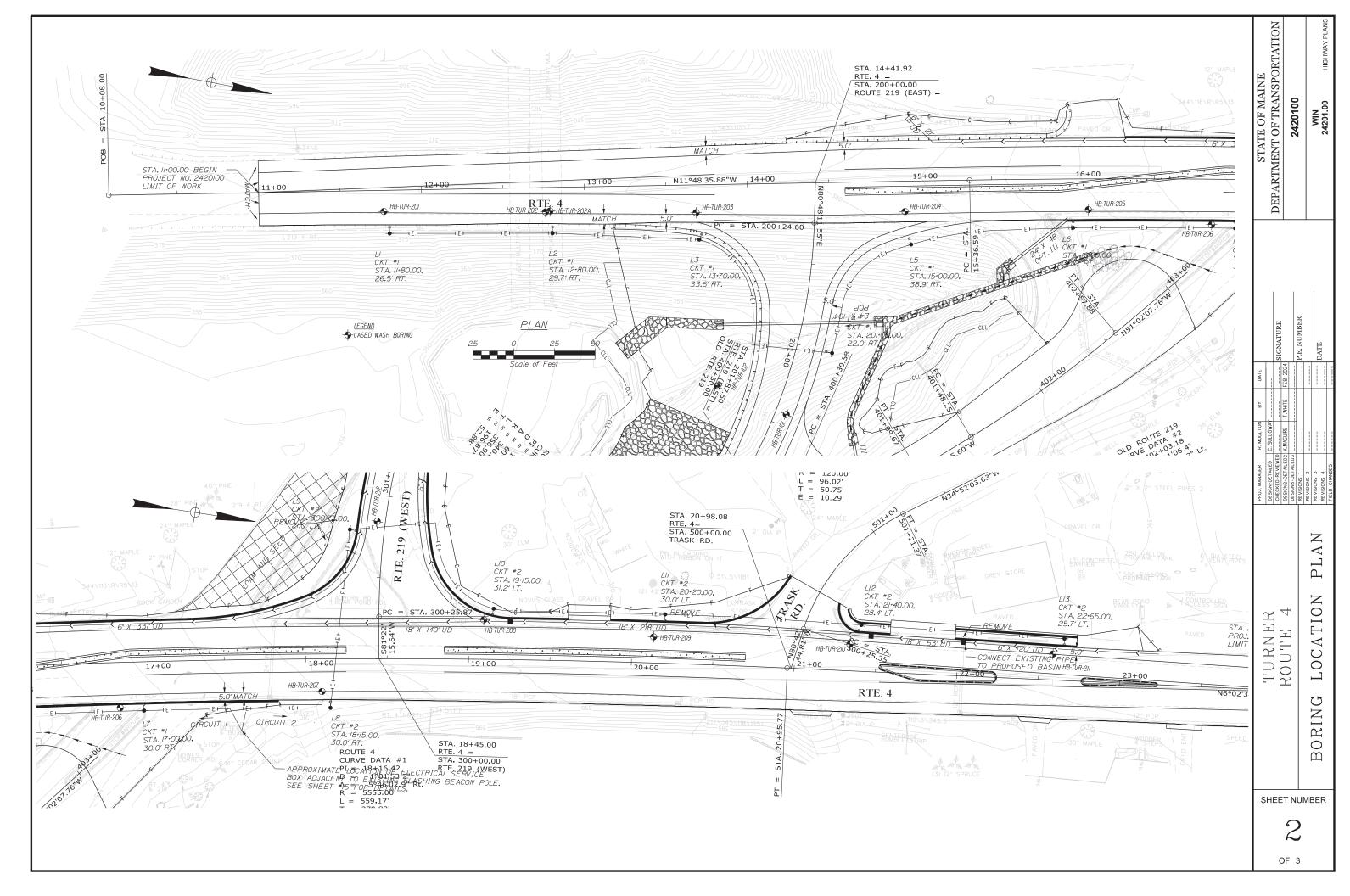
This report has been prepared for the use of the MaineDOT Highway Program for specific application to the proposed intersection improvements on Route 4 in Turner, Maine in accordance with generally accepted geotechnical and foundation engineering practices. No other intended use or warranty is expressed or implied.

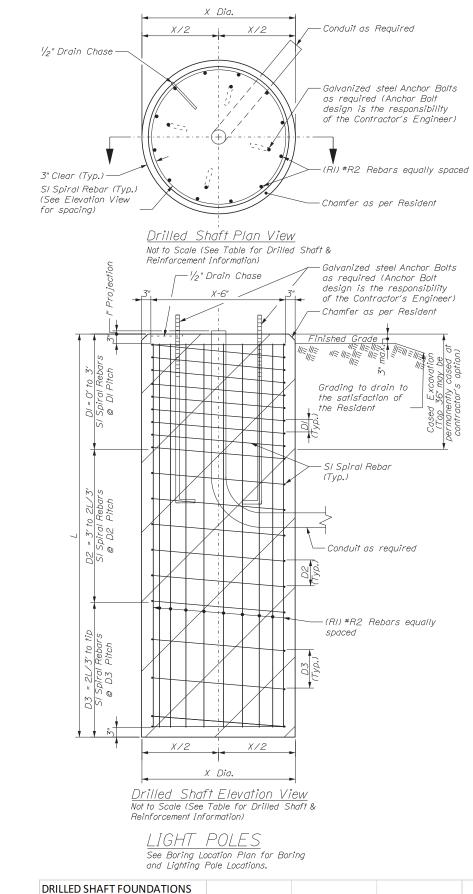
In the event that any changes in the nature, design, or location of the proposed project are planned, this report should be reviewed by a geotechnical engineer to assess the appropriateness of the conclusions and recommendations and to modify the recommendations as appropriate to reflect the changes in design. These analyses and recommendations are based in part upon a limited subsurface investigation at discrete exploratory locations completed at the site. If variations from the conditions encountered during the investigation appear evident during construction, it may also become necessary to re-evaluate the recommendations made in this report.

It is recommended that a geotechnical engineer be provided the opportunity for a review of the design and specifications in order that the earthwork and foundation recommendations and construction considerations presented in this report are properly interpreted and implemented in the design and specifications.

Sheets







NOTES:

I. All reinforcing steel is to be grade 60 and conform to MaineDOT Standard Specification requirements along with any project specific Supplementals or Special Provisions.

2. All rebar shall have 3" cover unless otherwise noted.

3. Should there be a discrepancy between these Details and actual observed field conditions report it to the Resident immediately.

4. Do not proceed with dependent work until any such discrepancy is resolved to the satisfaction of the Resident.

5. Concrete to be Class LP with f'c = 5,000 PSI.

6. Foundation sizes are designed based on estimated loading conditions and are subject to change based on the design of the above-ground components and the actual loading conditions at the top of each foundation submitted by the Contractor in accordance with Standard Specification Section 626.034. Any increase in foundation event by eventual data increase in foundation size based on the submitted loading Conditions shall be paid for at the unit price bid by the Contractor. Any reduction in foundation size shall be to the benefit of the Department at the unit price bid by the Contractor.

DRILLED SHAFT FOUNDATIONS								
	Drilled Shaft	Dimensions		Reinforcing Steel			Spiral Bar Spacing	
	Х	L	R1	R2	S1	D1 (in)	D2 (in)	D3 (in)
			Longitudinal	Longitudinal	Spiral Rebars			
	Diameter (feet)	Length (feet)	Rebars Quantity	Rebars Size	Size	0 to 3 ft	3 ft to 2L/3 ft	2L/3 ft to ti
ALL 35 FOOT TALL LIGHT POLES	2.5	8.0	12	#8	#5	4	8	12

12/

S		PROJ. MANAGER	BY	DATE		STATE OF MAINE
HI	IUKNEK	DESIGN-DETAILED				
		CHECKED-REVIEWED		S	SIGNATURE	DEPARTMENT OF IKANSPORTATION
		DESIGN2-DETAILED2 K.MAGUIRE	T.WHITE F	FEB 2024		
		DESIGN3-DETAILED3				0010010
						14/10/0
) UI		REVISIONS 1		P	P.E. NUMBER	
ME		REVISIONS 2				
3E		REVISIONS 3				MIN
R		REVISIONS 4			AIE	24201 00 HIGHWAY PLANS
		FIELD CHANGES				

<u>Appendix A</u>

Boring Logs

	UNIFIE	ED SOIL C	LASSIFIC	ATION SYSTEM		MODIFIED B	URMISTER S	YSTEM
			GROUP					
COARSE- GRAINED	GRAVELS	CLEAN GRAVELS	SYMBOLS GW	TYPICAL NAMES Well-graded gravels, gravel- sand mixtures, little or no fines.	tra	ive Term_ ace tle	Port	ion of Total (%) 0 - 10 11 - 20
SOILS	(more than half of coarse fraction is larger than No. 4 sieve size)	(little or no fines)	GP	Poorly-graded gravels, gravel sand mixtures, little or no fines.	so adjective (e.g.		S DESCRIBIN	21 - 35 36 - 50
	n half arger ve siz						Y/CONSISTEN	-
al is larger size)	(more tha fraction is l sie	GRAVEL WITH FINES (Appreciable amount of fines)	GM GC	Silty gravels, gravel-sand-silt mixtures. Clayey gravels, gravel-sand-clay mixtures.	sieve): Includes (1) Clayey or Gravelly penetration resistan	<u>bils</u> (more than half of) clean gravels; (2) S sands. Density is ra nce (N-value). sity of	ilty or Clayey gravels ted according to star	; and (3) Silty,
ateria ieve s		lilles)			Cohesion	less Soils		e (blows per foot)
(more than half of material is larger than No. 200 sieve size)	SANDS	CLEAN SANDS	SW	Well-graded sands, Gravelly sands, little or no fines	Very Loo Medium Dei	ose 1 Dense		0 - 4 5 - 10 11 - 30 31 - 50
(more tha than	if coarse than No. 4 ()	(little or no fines)	SP	Poorly-graded sands, Gravelly sand, little or no fines.	Very [Dense <u>s</u> (more than half of n	naterial is smaller tha	> 50
	(more than half of coarse fraction is smaller than No. sieve size)	SANDS WITH FINES	SM	Silty sands, sand-silt mixtures	, , , , , , , , , , , , , , , , , , , ,) Gravelly, Sandy ording to undrained shear
	(more fraction	(Appreciable amount of fines)	SC	Clayey sands, sand-clay mixtures.	Consistency of Cohesive soils	<u>SPT N-Value</u> (blows per foot)	<u>Undrained</u> <u>Shear</u> Strength (psf)	<u>Field</u> Guidelines
			ML	Inorganic silts and very fine sands, rock flour, Silty or Clayey fine sands, or Clayey silts with	Very Soft Soft Medium Stiff	WOH, WOR, WOP, <2 2 - 4 5 - 8	0 - 250 250 - 500 500 - 1000	Fist easily penetrates Thumb easily penetrates Thumb penetrates with
	SILTS AN	ID CLAYS		slight plasticity.	Stiff	9 - 15	1000 - 2000	moderate effort
FINE- GRAINED SOILS	(liquid limit l	ess than 50)	CL	Inorganic clays of low to medium plasticity, Gravelly clays, Sandy clays, Silty clays, lean clays.	Very Stiff Hard	16 - 30 >30	2000 - 4000 over 4000	Indented by thumb with great effort Indented by thumbnail Indented by thumbnail with difficulty
	(inquid infint i	ess man 50)	OL	Organic silts and organic Silty clays of low plasticity.	RQD (%) = s	ignation (RQD): sum of the lengths	of intact pieces of length of core ad	core* > 4 inches
ial is e size					-	*Minimu	im NQ rock core (
half of material is No. 200 sieve size)	SILTS AN	ID CLAYS	MH	Inorganic silts, micaceous or diatomaceous fine Sandy or Silty soils, elastic silts.		Rock Quality Ba <u>Rock Quality</u> Very Poor	ased on RQD <u>RQD (%)</u> ≤25	
(more than h smaller than N			СН	Inorganic clays of high plasticity, fat clays.		Poor Fair Good	26 - 50 51 - 75 76 - 90	
sma sma	(liquid limit gr	eater than 50)	OH	Organic clays of medium to high plasticity, organic silts.	Color (Munsell c			cable):
		ORGANIC	Pt	Peat and other highly organic soils.	Rock Type (gran Hardness (very h	ic, fine-grained, et lite, schist, sandsto hard, hard, mod. h	one, etc.) ard, etc.)	. severe, severe, etc.)
			s order, if	applicable):	Geologic discont	tinuities/jointing:		
Color (Muns Moisture (dr Density/Cor Texture (find Name (Sand Gradation (N	sell color ch. ry, damp, m isistency (fr e, medium, d, Silty Sand well-graded, on-plastic, s ayering, frac all, moderat n (weak, mo rigin (till, ma	art) oist, wet) om above ri coarse, etc. d, Clay, etc. , poorly-grad slightly plast :tures, crack ely, loosely, oderate, or s	ght hand s) , including led, uniforr ic, moderat s, etc.) etc.,) trong)	ide) portions - trace, little, etc.) n, etc.) tely plastic, highly plastic)	Formation (Wate RQD and correla ref: ASTM D60 Site Character Recovery (inch/ii Rock Core Rate	dip (horiz - 0-5 de 35-55 deg., ster spacing (very clos close - 1-3 feet, tightness (tight, op infilling (grain size erville, Ellsworth, C ation to rock quality 32 and FHWA NH ization, Table 4-12 nch and percentag (X.X ft - Y.Y ft (mi	ep - 55-85 deg., ve e - <2 inch, close wide - 3-10 feet, v pen, or healed) , color, etc.) Cape Elizabeth, etc y (very poor, poor, II-16-072 GEC 5 - 2 ge) n:sec))	very wide >10 feet) :.) etc.) Geotechnical
Key	/ to Soil a	Geotechi	<i>nical</i> Sec Descrip	tions and Terms	Sample Conta WIN Bridge Name / Boring Numbe Sample Numb Sample Depth	r	Requirements: Blow Counts Sample Recov Date Personnel Initia	ery

Ι	Main	e Depa	artment	of Transport	ation		Project:	Interse	ection o	of Route 4/219	Boring No.:	HB-TU	JR-101
			Soil/Rock Exp JS CUSTOM				Locatio	n: Turr	ner, Ma	ine	WIN:	2420	01.00
Drill	er:		S.W. Cole		Eleva	ation	(ft.)	368.	1		Auger ID/OD:	5" Solid Stem	
<u> </u>	rator:		Kevin/Brian		Datu		. ()		/D88		Sampler:	Standard Split	Spoon
<u> </u>	ged By:		B. Wilder		Rig T				lrich D	-50	Hammer Wt./Fall:	140#/30"	
	Start/Fi	inish [.]	4/12/2022; 09	·00-11·00	-		lethod:			h Boring	Core Barrel:	NQ-2"	
<u> </u>	ng Loca		201+42.7, 6.9		Casir	-		HW		. Doring	Water Level*:	5.7 ft bgs.	
<u> </u>	-		actor: 0.91	1120	Hami	-		Automa		Hydraulic 🗆	Rope & Cathead		
Definit D = Si MD = U = TI MU = V = Fi	tions: plit Spoon & Unsuccess hin Wall Tu Unsuccess eld Vane S	Sample sful Split Spo ibe Sample sful Thin Wa Shear Test,	oon Sample Atten II Tube Sample A PP = Pocket Pe ne Shear Test Att	Attempt RC = Rolle WOH = We netrometer WOR/C = V	ore Sample d Stem Aug ow Stem Au r Cone ight of 1400 Veight of Re	e ger uger Ib. Ha ods o	mmer r Casing	S _u = S _{u(la} q _p = N-un Hami N ₆₀ :	Peak/Re b) = Lab Unconfin correcte mer Effic = SPT N	emolded Field Vane Undrained She vane Undrained Shear Strength (hed Compressive Strength (ksf) d = Raw Field SPT N-value ciency Factor = Rig Specific Annua l-uncorrected Corrected for Hamme ner Efficiency Factor/60%)*N-unco	sar Strength (psf) Tv = (psf) WC LL = PL I Calibration Value PI = ar Efficiency G =	Pocket Torvane She = Water Content, pere Liquid Limit = Plastic Limit Plasticity Index Grain Size Analysis Consolidation Test	cent
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		scription and Remarks		Laboratory Testing Results/ AASHTO and Unified Class.
0	1D	24/18	0.00 - 2.00	1/1/1/1	2	3	SSA	367.9		0.2 ft Topsoil			G#337035
										1D (0.2-2.0 ft bgs.) Brown,	, moist, loose, fine to coa		A-1-b, SM WC=17.7%
- 5 -	2D	24/17	5.00 - 7.00	2/2/3/3	5	8	13 24 26			silt, trace gravel, roots. Light brown, moist, loose, silt.	fine to coarse SAND, tra	ce gravel, trace	G#337036 A-1-b, SP WC=5.2%
							61	1					
- 10 -							187	358.1			0.1.0	10.0-	
	R1	32.4/31 60/56	10.50 - 13.20	RQD = 0% RQD = 82%			NQ-2			Top of Bedrock at Elev. 35 Roller Coned ahead to 10.5 R1:Bedrock: Interbedded p (Sangerville Formation) Rock Quality = Very poor R1:Core Times (min:sec) 10.5-11.5 ft (2:01) 11.5-12.5 ft (2:07)	i ft bgs. elite and limestone and/o	r dolostone.	
										12.5-13.2 ft (2:00) Core Bl 97% Recovery	ocked		
- 15 -										R2:Bedrock: Interbedded p (Sangerville Formation)	elite and limestone and/o	r dolostone.	
										Rock Quality = Good			
										R2:Core Times (min:sec) 13.2-14.2 ft (2:34)			
							$ \rangle /$			14.2-15.2 ft (1:48)			
							$+ \vee$	349.9		15.2-16.2 ft (2:13) 16.2-17.2 ft (2:16)			
										17.2-18.2 ft (2:48)			
										93% Recovery			
- 20 -										Bottom of Exploration	n at 18.2 feet below grou	ind surface.	
25													
	arks:												
Aut	o Hamme	er #367											
											Dama d 15 d		
Ι.				ndaries between soil types;		-	-				Page 1 of 1		
		-	been made at tim me measuremen	es and under conditions sta ts were made.	ted. Groun	ndwate	er fluctuatio	ns may o	ccur due	e to conditions other	Boring No	HB-TUR-	101

	Main	e Depa	artment	of Transpor	tation	Proj	ect:	Interse	ction o	f Route 4/219	Boring No.:	HB-TU	JR-102
		-	Soil/Rock Exp JS CUSTOM			Loca	atior	1: Turn	er, Ma	ine	WIN:	2420	01.00
Dril	071		S.W. Cole		Elevati			352.2	,		Auger ID/OD:	5" Solid Stem	
	rator:		Kevin/Brian		Datum	()		NAV			Sampler:	Standard Split	Spoon
<u> </u>	ged By:		B. Wilder		Rig Ty				rich D-	50	Hammer Wt./Fall:	140#/30"	зрооп
<u> </u>	e Start/F	inich:	4/12/2022; 09	0.00-11.00		Metho	d.			1 Boring	Core Barrel:	NQ-2"	
L	ing Loca		201+42, 39.1		_	ID/OD:		HW-		Doring	Water Level*:	2.5 ft bgs.	
L	0		actor: 0.91		Hamm			Automa		Hydraulic 🗆	Rope & Cathead	2.0 11 0g3.	
Defin D = S MD = U = T MU = V = F	itions: plit Spoon Unsucces hin Wall Tu Unsucces ield Vane S <u>Unsucces</u>	Sample sful Split Spo ube Sample sful Thin Wa Shear Test, <u>sful Field Va</u>	oon Sample Atter II Tube Sample A PP = Pocket Pe ne Shear Test At	SSA = So mpt HSA = HC RC = Roll Attempt WOH = W onetrometer WOR/C = ttempt WO1P = N Sample Information	Core Sample lid Stem Auger llow Stem Aug er Cone leight of 140lb. Weight of Rod Veight of One I	er Hammer s or Casin		S _u = I S _{u(lal} q _p = I N-uno Hamn N ₆₀ =	Peak/Re _{D)} = Lab Jnconfir corrected ner Effic SPT N- (Hamm	molded Field Vane Undrained She Vane Undrained Shear Strength (led Compressive Strength (ksf) d = Raw Field SPT N-value iency Factor = Rig Specific Annual -uncorrected Corrected for Hamme ler Efficiency Factor/60%)*N-uncor	ear Strength (psf) T _V = psf) WC LL = PL = I Calibration Value PI = or Efficiency G =	Pocket Torvane She: = Water Content, pero Liquid Limit : Plastic Limit Plasticity Index Grain Size Analysis Consolidation Test	
 Depth (ft.) 	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	Casing	Blows	(ft.) (ft.)	Graphic Log		scription and Remarks		Results/ AASHTO and Unified Class.
	1D	24/17	0.00 - 2.00	1/1/1/1	2	3 SS	A	352.0		0.2 ft Topsoil 1D (0.2-2.0 ft bgs.) Dark bi trace silt, trace gravel, root		0.2- coarse SAND,	G#337037 A-1-b, SP-SM WC=29.3%
- 5								349.7		Light brown, wet, medium	dense. Silty fine to coars	2.5-	G#337038
	2D	24/20	5.00 - 7.00	2/6/11/12	17 2	6 1:	_			gravel.	dense, sitty file to coars	SAND, Inte	A-4, SM WC=21.5%
	R1	60/59	7.50 - 12.50	RQD = 52%		a9 NC		344.9		^a 95 blows for 0.3 ft. Top of Bedrock at Elev. 34	4.9 ft.	7.3-	
- 10										Roller Coned ahead to 7.5 f R1:Bedrock: Interbedded p (Sangerville Formation) Rock Quality = Fair R1:Core Times (min:sec)		r dolostone.	
										7.5-8.5 ft (2:02) 8.5-9.5 ft (2:02) 9.5-10.5 ft (2:18)			
								339.7		10.5-11.5 ft (2:16) 11.5-12.5 ft (2:38) 98% Recovery			
- 15										Bottom of Exploration	n at 12.5 feet below grou	ind surface.	
						_							
- 20													
25 Ren	narks:												
	to Hamm	er #367											
Strati	fication line	es represent	approximate bou	indaries between soil types	; transitions ma	y be grad	lual.				Page 1 of 1		
		-	been made at tin me measuremen	nes and under conditions sl nts were made.	ated. Groundv	ater flucti	uatior	ns may oo	cur due	to conditions other	Boring No	.: HB-TUR-	102

I	Main	e Depa	artment	of Transport	ation		Project:	Inters	section	of Route 4/219	Boring No.:	HB-TU	JR-201
			Soil/Rock Exp	-			Locatio	n: Tu	ner, M	ine			
		<u>[</u>	JS CUSTOM	<u>ARY UNITS</u>							WIN:	2420	01.00
Drill	er:		S.W. Cole		Elevat	ion	(ft.)	378	.4		Auger ID/OD:	5" Dia.	
Ope	rator:		Matt/Jay		Datum	n:		NA	VD88		Sampler:	Standard Split	Spoon
Log	ged By:		B. Wilder		Rig Ty	/pe:		Mo	bile B-	8, Track	Hammer Wt./Fall:	140#/30"	
Date	Start/Fi	inish:	2/8/2023; 10:3	30-11:30	Drillin	gМ	lethod:	Sol	id sterr	Auger	Core Barrel:	N/A	
Bori	ng Loca	tion:	11+76.6, 12.9	ft Rt.	Casing	g ID	/OD:	N/A	1		Water Level*:	None Observed	1
		iciency F	actor: 0.91		Hamm	er '	Туре:		atic 🖂		Rope & Cathead		0
MD = U = T MU = V = Fi	plit Spoon Unsuccess hin Wall Tu Unsuccess eld Vane S	sful Split Spo ibe Sample sful Thin Wa Shear Test,	oon Sample Atter II Tube Sample A PP = Pocket Pe ne Shear Test At	SSA = Solie mpt HSA = Holl RC = Rolle Attempt WOH = We enetrometer WOR/C = W	ore Sample d Stem Auge ow Stem Auge r Cone light of 140lb. Veight of Roo eight of One	ger . Hai ds or	Casing	S _{u(l} q _p = N-u Han N ₆₀	ab) = La Uncon ncorrect nmer Ef = SPT	emolded Field Vane Undrained She o Vane Undrained Shear Strength (hed Compressive Strength (ksf) d = Raw Field SPT N-value ciency Factor = Rig Specific Annual l-uncorrected Corrected for Hamme ner Efficiency Factor/60%)*N-uncor	wc LL = PL = Calibration Value PI = or Efficiency G = 0	Pocket Torvane She: = Water Content, pero Liquid Limit Plastic Limit Plasticity Index Grain Size Analysis Consolidation Test	cent
Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N60	Casing Blows	Elevation (ft.)	Graphic Log	Visual De	scription and Remarks		Laboratory Testing Results/ AASHTO and Unified Class.
0							SSA	378.		4" HMA		-0.3-	
	1D	6/4	1.00 - 1.50	50						2.0 ft frost. Brown, moist (frozen), fine (Fill).	to coarse SAND, little sil		
										Boulder from 4.0-5.0 ft bgs			
- 5 -	2D	24/12	5.00 - 7.00	6/11/11/13	22 3	33				Light brown, moist, dense, silt, (Fill).	fine to coarse SAND, littl	e gravel, trace	
- 10 -	3D	24/18	10.00 - 12.00	17/16/22/35	38 5	58				Similar to above, except ve	ry dense, (Fill).		
								366.4	, 888	Bottom of Exploration NO REF	n at 12.0 feet below grou USAL	12.0- nd surface.	
- 15 -													
- 20 -													
25						_							
	l a rks: to Hamme	er #202102	21		1			<u>.</u>	_	1			
Stratif	ication line	s represent	approximate bou	ndaries between soil types;	transitions m	ay b	e gradual.				Page 1 of 1		
			been made at tim me measuremen	nes and under conditions sta ts were made.	ted. Ground	wate	er fluctuation	ns may	occur di	e to conditions other	Boring No.	: HB-TUR-	201

	Main	e Depa	artment	of Transporta	ntion	Pr	oject:	Interse	ection of	of Route 4/219	Boring No.:	HB-TU	JR-202
			Soil/Rock Exp			Lo	catio	n: Turi	ier, Ma	ine	WIN:	2420	01.00
Drill	or:		S.W. Cole		Elevatio	n (ft	• •	378.	5		Auger ID/OD:	5" Dia.	
L	rator:		Matt/Jay		Datum:		•)		/D88		Sampler:	Standard Split	Spoon
<u> </u>	ged By:		B. Wilder		Rig Typ					8, Track	Hammer Wt./Fall:	140#/30"	opoon
	Start/Fi	nish:	2/8/2023; 11:	30-12:00	Drilling		hod.		l stem		Core Barrel:	N/A	
<u> </u>	ng Loca		12+76, 14.9 ft		Casing			N/A	, otenn	. ruger	Water Level*:	None Observed	1
	-		actor: 0.91		Hamme			Automa	ntic 🕅	Hydraulic 🗆	Rope & Cathead □		
Defini D = S MD = U = T MU = V = Fi	tions: plit Spoon Unsuccess hin Wall Tu Unsuccess eld Vane S	Sample sful Split Spo be Sample sful Thin Wal Shear Test,	oon Sample Atter Il Tube Sample A PP = Pocket Pe he Shear Test At	npt HSA = Hollo RC = Roller Attempt WOH = Wei enetrometer WOR/C = W	ore Sample Stem Auger w Stem Auge	er Hamme	er	S _u = S _{u(la} q _p = N-un Hami N ₆₀ =	Peak/R b) = Lal Unconfi correcte mer Effi = SPT N	emolded Field Vane Undrained She v Vane Undrained Shear Strength (hed Compressive Strength (ksf) d = Raw Field SPT N-value ciency Factor = Rig Specific Annual -uncorrected Corrected for Hamme ner Efficiency Factor/60%)*N-unco	ear Strength (psf) T _V psf) W(PL I Calibration Value PI er Efficiency G =	= Pocket Torvane She: C = Water Content, perc = Liquid Limit = Plastic Limit = Plasticity Index = Grain Size Analysis = Consolidation Test	cent
Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected		Blows	Elevation (ft.)	Graphic Log	Visual De	scription and Remark	5	Laboratory Testing Results/ AASHTO and Unified Class.
0							SSA	378.2	****	4" HMA			
	1D	12/12	1.50 - 2.50	43/50						2.0 ft frost.			
		12/12	1.50 - 2.50	43/30			_			Brown, frozen, fine to coar	se SAND, some gravel,	trace silt, (Fill).	
- 5 -										Similar to above, (Fill).			
	2D	14.4/13	5.00 - 6.20	12/19/50(2.4")						Similar to above, (Fiii).			
							V	372.3		Bottom of Exploratio	n at 6.2 feet below gro	6.2-	
										Boulder REFUSAL, 1	n at 6.2 feet below gro noved to HB-TUR-202/	A.	
- 10 -													
						_							
- 15 -													
						_							
- 20 -													
						_							
25													
	o Hamme	er #202102	1										
Stratif	ication line	s represent	approximate hou	ndaries between soil types; ti	ansitions may	v be ar	adual				Page 1 of 1		
				nes and under conditions state				ns may o	ccur du	e to conditions other			
			ne measuremen		ea. Grounaw	ater Til	iotuatio	ns may 0			Boring No	b.: HB-TUR-	202

Ι	Maine	e Depa	artment	of Trans	portat	tion	F	Project:	Inters	ectio	n of Route 4/219	Boring No.:	HB-TU	R-202A
			Soil/Rock Exp	-				_ocatior	n: Tur	ner, I	laine			
		<u>[</u>	JS CUSTOM	<u>ARY UNITS</u>								WIN:	2420	01.00
Drille	er:		S.W. Cole			Elevati	ion ((ft.)	378.	.4		Auger ID/OD:	5" Dia.	
<u> </u>	rator:		Matt/Jay			Datum				VD8	;	Sampler:	Standard Split	Spoon
Log	ged By:		B. Wilder			Rig Ty	pe:		Mol	oile E	-48, Track	Hammer Wt./Fall:	140#/30"	
Date	Start/Fi	nish:	2/8/2023; 12:0	00-12:30		Drilling	g Me	ethod:	Soli	d ste	n Auger	Core Barrel:	N/A	
Bori	ng Locat	tion:	12+78.7, 14.2	ft Rt.		Casing	g ID/	OD:	N/A			Water Level*:	None Observed	ł
		ciency F	actor: 0.91			Hamm	er T	ype:	Autom			Rope & Cathead		2 1
MD = U = Th MU = V = Fi	olit Spoon S Unsuccess nin Wall Tul Unsuccess eld Vane S	ful Split Spo be Sample ful Thin Wa hear Test,	oon Sample Atter II Tube Sample A PP = Pocket Pe ne Shear Test At	npt S R Attempt W enetrometer W	= Rock Core SA = Solid S SA = Hollow C = Roller Co 'OH = Weigh 'OR/C = Wei 'O1P = Weigh nation	tem Auger Stem Aug one at of 140lb. ight of Rod	jer . Ham ls or (Casing	S _{u(la} q _p = N-un Ham N ₆₀	ab) = I Unco Icorre mer E = SP	Remolded Field Vane Undrained She ab Vane Undrained Shear Strength (fined Compressive Strength (ksf) ted = Raw Field SPT N-value fficiency Factor = Rig Specific Annual 'N-uncorrected Corrected for Hamme mmer Efficiency Factor/60%)'N-uncor	wc LL = PL = Calibration Value PI = or Efficiency G = 0	Pocket Torvane She: - Water Content, pero Liquid Limit Plastic Limit Plasticity Index Grain Size Analysis Consolidation Test	sent
Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) . Shear Strength (psf)		N-uncorrected	1N60	Casing Blows	Elevation (ft.)	Granhic Lod	Visual De	scription and Remarks		Laboratory Testing Results/ AASHTO and Unified Class.
- 5 -								SSA			See HB-TUR-202 for mater	rial descriptions.		
- 10 -	1D	24/19	10.00 - 12.00	12/15/18/2		33 5	50				Light brown, moist, dense, silt, (Fill).	fine to coarse SAND, trac	e gravel, trace	
									366.4			n at 12.0 feet below grou USAL	12.0- nd surface.	
- 15 -														
- 20 -														
25 Rem	arks:													
Aut	o Hamme	er #202102												
				ndaries between s								Page 1 of 1		
			been made at tim me measuremen		litions stated	I. Ground	water	fluctuatior	ns may c	occur	lue to conditions other	Boring No.	: HB-TUR-	202A

Ι	Main	e Dep	artment	of Transporta	ation	F	Project:	Inters	ection	of Route 4/219	Boring No.:	HB-TU	UR-203
			Soil/Rock Exp	-			ocatio	n: Tur	ner, M	aine			
		<u>!</u>	JS CUSTOM	<u>ARY UNITS</u>							WIN:	2420	01.00
Drill	er:		S.W. Cole		Elevati	ion ((ft.)	378	.7		Auger ID/OD:	5" Dia.	
Ope	rator:		Matt/Jay		Datum	:		NA	VD88		Sampler:	Standard Split	Spoon
Log	ged By:		B. Wilder		Rig Ty	pe:		Mo	bile B-	48, Track	Hammer Wt./Fall:	140#/30"	
Date	Start/Fi	inish:	2/8/2023; 12:3	30-13:00	Drilling	g Me	thod:	Sol	d sten	Auger	Core Barrel:	N/A	
Bori	ng Loca	tion:	13+68.3, 17.0	ft Rt.	Casing	J ID/	OD:	N/A			Water Level*:	None Observed	d
		iciency F	actor: 0.91		Hamm	er T	ype:	Autom			Rope & Cathead 🗆		
MD = U = TI MU = V = Fi	plit Spoon Unsuccess hin Wall Tu Unsuccess eld Vane S	sful Split Spo ibe Sample sful Thin Wa Shear Test,	oon Sample Atter II Tube Sample A PP = Pocket Pe ne Shear Test At	npt HSA = Hollo RC = Roller Attempt WOH = Wei enetrometer WOR/C = W	Stem Auger w Stem Aug	er Ham Is or (Casing	S _{u(I} q _p = N-u Han N ₆₀	ab) = La Uncon ncorrect imer Ef = SPT	Remolded Field Vane Undrained She b Vane Undrained Shear Strength (ined Compressive Strength (ksf) ed = Raw Field SPT N-value ciciency Factor = Rig Specific Annual N-uncorrected Corrected for Hamme mer Efficiency Factor/60%)*N-uncor	psf) WC LL = PL PL PL Calibration Value PI = er Efficiency G =	Pocket Torvane She = Water Content, per Liquid Limit Plastic Limit Plasticity Index Grain Size Analysis Consolidation Test	cent
 Depth (ft.) 	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	091	Casing Blows	Elevation (ft.)		Visual De	scription and Remarks		Laboratory Testing Results/ AASHTO and Unified Class.
Ű							SSA	378.4		B			
										2.0 ft frost.			
	1D	24/19	2.00 - 4.00	14/13/20/23	33 5	0				Brown, damp, dense, fine to layer of old pavement, (Fill		avel, trace silt,	
- 5 -	20	12/12	5.50 (.50	8/50						Cobble from 4.8-5.4 ft bgs.			
	2D	12/12	5.50 - 6.50	8/50						Brown, damp, dense, fine to (Fill).	o coarse SAND, some g	ravel, trace silt,	
										Cobble from 6.5-6.8 ft bgs.			
								1		8			
										8			
							$ \downarrow /$			8			
							\mathbb{V}			8			
- 10 -	3D	24/20	10.00 - 12.00	6/8/8/10	16 2	4	¥			Light brown, damp, mediur	n dense, fine to coarse S	AND, little gravel,	
		220	10100 12100	0,0,0,10	10 2					trace silt, (Fill).			
								366.7	, 🗱	§		12.0-	
								5001		Bottom of Exploration NO REF	n at 12.0 feet below grou	und surface.	
										NO KEP	USAL		
- 15 -													
15													
						T							
						+							
- 20 -													
						_							
						\uparrow							
25 Rem	arks:									1			L
		er #202102	21										
Stratif	ication line	s represent	approximate bou	ndaries between soil types; t	ransitions ma	ay be	gradual.				Page 1 of 1		
* Wate	er level rea	dings have	been made at tim	nes and under conditions stat	ed. Groundv	water	fluctuatio	ns may	occur d	e to conditions other			
than	those pres	sent at the ti	me measuremen	ts were made.							Boring No	HB-TUR-	203

	Main	e Dep	artment	of Transport	ation	ı	Project:	Inters	ection of	of Route 4/219	Boring No.:	HB-TU	JR-204
			Soil/Rock Exp	-			Locatio	n: Turi	ner, Ma	ine			
		ļ	US CUSTOM	ARY UNITS					,		WIN:	2420	01.00
Drill	er:		S.W. Cole		Elev	/ation	(ft.)	380.	4		Auger ID/OD:	5" Dia.	
Ope	rator:		Matt/Jay		Datu	um:		NAV	/D88		Sampler:	Standard Split	Spoon
Log	ged By:		B. Wilder		Rig	Туре		Mob	ile B-4	8, Track	Hammer Wt./Fall:	140#/30"	
Date	e Start/Fi	inish:	2/8/2023; 13:3	30-14:00	Drill	ling N	lethod:	Soli	l stem	Auger	Core Barrel:	N/A	
Bori	ing Loca	tion:	14+96.6, 18.5	ft Rt.	Cas	ing ID)/OD:	N/A			Water Level*:	None Observed	ł
		ciency F	actor: 0.91				Туре:	Autom			Rope & Cathead 🗆		
MD = U = T MU = V = F	plit Spoon Unsuccess hin Wall Tu Unsuccess ield Vane S	sful Split Spo be Sample sful Thin Wa Shear Test,	oon Sample Atter II Tube Sample A PP = Pocket Pe <u>ne Shear Test At</u>	RC = Roller Attempt WOH = We enetrometer WOR/C = V	d Stem Au ow Stem / r Cone eight of 14 Veight of I	uger Auger Olb. Ha Rods o	r Casing	S _{u(la} q _p = N-un Ham N ₆₀	b) = Lat Unconfil correcte ner Effic = SPT N	emolded Field Vane Undrained She Vane Undrained Shear Strength (ed Compressive Strength (ksf) d = Raw Field SPT N-value ciency Factor = Rig Specific Annual -uncorrected Corrected for Hamme ner Efficiency Factor/60%)*N-uncor	psf) WC LL = PL = I Calibration Value PI = er Efficiency G =	 Pocket Torvane She Water Content, pere Liquid Limit Plastic Limit Plasticity Index Grain Size Analysis Consolidation Test 	cent
 □ Depth (ft.) 	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) . Shear Strength (pst) or RQD (%)	N-uncorrected	N60	Casing Blows	Elevation (ft.)	Graphic Log		scription and Remarks	5	Laboratory Testing Results/ AASHTO and Unified Class.
							SSA	380.0	****	4½" HMA			
								1		2.0 ft frost.			
	1D	24/18	2.00 - 4.00	28/19/15/19	34	52				Brown, damp, very dense, f silt, occasional cobbles, (Fi		ne gravel, trace	
- 5 -	2D	18/14	5.00 - 6.50	43/33/58	91	138				Similar to above, (Fill).			
		10/11				100							
								372.4	****				
- 10 -	3D	24/18	10.00 - 12.00	12/10/9/11	19	29				Light brown, damp, mediun trace silt.	m dense, fine to coarse S	AND, little gravel,	
								368.4				12.0-	
										Bottom of Exploration NO REF	n at 12.0 feet below gro ^P USAL	und surface.	
- 15 -													
- 20 ·					$ \rightarrow $								
25 <u>Rem</u>	arks:				[
Au	to Hamme	er #202102	21										
Stratif	fication line	s represent	approximate bou	ndaries between soil types;	transitions	s may b	e gradual.				Page 1 of 1		
			been made at tim me measuremen	nes and under conditions sta ts were made.	ted. Grou	undwate	er fluctuatio	ns may c	ccur due	e to conditions other	Boring No	HB-TUR-	204

	Main	e Dep	artment	of Transporta	ation	Pro	ject:	Inters	ection of	f Route 4/219	Boring No.:	HB-TU	JR-205
			Soil/Rock Exp	-		Loc	catio	n: Turi	ier, Ma	ine			
		ļ	US CUSTOM	ARY UNITS					,		WIN:	2420	01.00
Drill	er:		S.W. Cole		Elevatio	on (ft.))	382.	7		Auger ID/OD:	5" Dia.	
Ope	rator:		Matt/Jay		Datum:			NA	/D88		Sampler:	Standard Split	Spoon
Log	ged By:		B. Wilder		Rig Typ	e:		Mob	ile B-4	8, Track	Hammer Wt./Fall:	140#/30"	
Date	Start/Fi	inish:	2/8/2023; 14:0	00-14:30	Drilling	Meth	od:	Soli	l stem	Auger	Core Barrel:	N/A	
Bori	ng Loca	tion:	16+09.4, 18.9	ft Rt.	Casing	ID/O	D:	N/A			Water Level*:	None Observed	1
Ham Defini		iciency F	actor: 0.91	R = Rock Co	Hamme	er Typ	e:	Autom		Hydraulic □ molded Field Vane Undrained She	Rope & Cathead	Pocket Torvane She	ar Strength (nef)
D = S MD = U = T MU = V = Fi	plit Spoon S Unsuccess hin Wall Tu Unsuccess eld Vane S	sful Split Spo ibe Sample sful Thin Wa Shear Test,	oon Sample Atter Il Tube Sample A PP = Pocket Pe <u>ne Shear Test At</u>	SSA = Solid mpt HSA = Hollo RC = Roller MUCH = Wei enetrometer WOR/C = W	Stem Auger w Stem Auge	Hamme or Cas	r ing	S _{u(la} q _p = N-un Ham N ₆₀	b) = Lab Unconfii correcte ner Effic = SPT N	Vane Undrained Shear Strength (vane Undrained Shear Strength (vane Undrained Shear Strength (vane Strength (kst) d = Raw Field SPT N-value vancorrected Corrected for Hamme ter Efficiency Factor/60%)*N-uncor	psf) WC LL = PL = PL = PC Calibration Value PI = er Efficiency G =	= Water Content, per = Liquid Limit = Plastic Limit Plasticity Index Grain Size Analysis <u>Consolidation Test</u>	cent
 □ Depth (ft.) 	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	Casing	Blows	Elevation (ft.)	Graphic Log	Visual De	scription and Remarks		Laboratory Testing Results/ AASHTO and Unified Class.
						S	SA	382.3	****	\		0.4-	
										2.0 ft frost.			
	1D	6/6	2.00 - 2.50	50				378.7		Brown, damp, dense, fine to pavement, (Fill). Cobble from 2.5-3.0 ft bgs.	o coarse SAND, some gr	ravel, trace silt, old	
- 5 -	2D	24/17	5.00 - 7.00	14/11/8/8	19 29	,				Light brown, damp, mediur trace silt.	n dense, fine to coarse SA		
										nace sin.			
							,						
							1/						
- 10 -	3D	24/24	10.00 - 12.00	1/1/2/2	3 5		V			Similar to above, except loc	ose.		
						_		370.7				12.0-	
										NO REF	n at 12.0 feet below gro u 'USAL	ind surface.	
- 15 -						_							
20													
- 20 -													
 	arks:												
		er #202102	21										
Stratif	ication line	s represent	approximate bou	ndaries between soil types; tr	ransitions ma	y be gra	adual.				Page 1 of 1		
			been made at tim me measuremen	tes and under conditions state ts were made.	ed. Groundw	ater fluo	ctuatio	ns may c	ccur due	to conditions other	Boring No	.: HB-TUR-	205

I	Main	e Depa	artment	of Trans	portat	ion	Project:	Interse	ection of	of Route 4/219	Boring No.:	HB-TU	JR-206
			Soil/Rock Exp JS CUSTOM				Locatio	n: Turr	ier, Ma	ine	WIN:	2420	01.00
Drill	er:		S.W. Cole			Elevatio	 n (ft)	384.	4		Auger ID/OD:	5" Dia.	
<u> </u>	rator:		Matt/Jay			Datum:	1 (10.)	NAV			Sampler:	Standard Split	Spoon
<u> </u>	ged By:		B. Wilder			Rig Type);			8, Track	Hammer Wt./Fall:	140#/30"	
	Start/Fi	nish:	2/8/2023; 14:3	30-15:15		Drilling I			l stem		Core Barrel:	N/A	
<u> </u>	ng Loca		16+85.4, 27.9			Casing I		N/A		6	Water Level*:	None Observed	
Ham	mer Effi	ciency F	actor: 0.91			Hammer	Type:	Automa	ntic 🖂	Hydraulic 🗆	Rope & Cathead □		
Defini D = Sj MD = U = TI MU = V = Fi	tions: plit Spoon S Unsuccess hin Wall Tu Unsuccess jeld Vane S	Sample sful Split Spo be Sample sful Thin Wa hear Test,	oon Sample Atter Il Tube Sample A PP = Pocket Pe ne Shear Test At	npt HS RC Attempt WC enetrometer WC	= Rock Core A = Solid St A = Hollow C = Roller Co DH = Weight DR/C = Weight D1P = Weight	Sample em Auger Stem Auger	ammer or Casing	S _u = S _{u(la} q _p = N-un Hami N ₆₀ :	Peak/R b) = Lal Unconfi correcte ner Effi = SPT N	emolded Field Vane Undrained She Vane Undrained Shear Strength (hed Compressive Strength (ksf) d = Raw Field SPT N-value eiency Factor = Rig Specific Annual -uncorrected Corrected for Hamme ner Efficiency Factor/60%)*N-uncor	ear Strength (psf) T _v psf) W(PL I Calibration Value PI er Efficiency G S	= Pocket Torvane She: C = Water Content, perc = Liquid Limit = Plastic Limit = Plasticity Index = Grain Size Analysis = Consolidation Test	ar Strength (psf) sent Laboratory
Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf)	or RQD (%)	N60	Casing Blows	Elevation (ft.)	Graphic Log		scription and Remark	s	Testing Results/ AASHTO and Unified Class.
0							SSA	384.0	****	5" HMA		-0.4	
										2.0 ft frost.			
										(Off Auger Flights) Brown, trace silt, (Fill).	, damp, fine to coarse SA	AND, little gravel,	
- 5 -	1D	24/20	5.00 - 7.00	4/4/4/5		8 12				Light brown, damp, mediur	n dense, fine to coarse S		
		24/20	5.00 - 7.00	ן אין אין אין אין אין אין אין אין אין אי						trace silt.			
							++/-						
- 10 -	2D	24/22	10.00 - 12.00	3/3/3/3		5 9	V			Similar to above, loose.			
								372.4		Bottom of Exploration NO REF	n at 12.0 feet below gro TUSAL	12.0- ound surface.	
- 15 -													
- 20 -													
25													
	a rks: to Hamme	er #202102	21										
Stratif	ication line	s represent	approximate bou	ndaries between so	il types; tran	sitions may	be gradual.				Page 1 of 1		
* Wate	er level rea	dings have		es and under condi				ns may o	ccur du	e to conditions other		b.: HB-TUR-	206

	Main	-		of Transport	ation	Proje	ct: Inter	section	of Route 4/219 Boring No.: HB-	TUR-207
			Soil/Rock Exp JS CUSTOM			Locat	ion: Tu	rner, M	wine WIN:	201.00
Drill	er:		S.W. Cole		Elevatio	n (ft)	38	7.0	Auger ID/OD: 5" Dia.	
L	rator:		Matt/Jay		Datum:	/// (10.)		VD88	Sampler: Standard S	alit Spoon
<u> </u>	ged By:		B. Wilder		Rig Typ	e.			48, Track Hammer Wt./Fall: 140#/30"	Jint Speen
	Start/Fi	inich:	2/9/2023; 09:0	00-10:00		Method		lid stem		
<u> </u>	ng Loca		18+09.9, 19.9		Casing		. 50 N/		Water Level*: None Obse	rved
	-		actor: 0.91	It IXI.	Hamme			natic 🖂	Hydraulic Rope & Cathead	ivea
Defini D = S MD = U = T	tions: plit Spoon Unsuccess hin Wall Tu	Sample sful Split Spo ibe Sample	oon Sample Atter	npt HSA = Holle RC = Roller	ore Sample I Stem Auger ow Stem Auge	r	S _u S _u qp N-u	= Peak/F lab) = La = Uncont incorrect	$ \begin{array}{llllllllllllllllllllllllllllllllllll$	
			PP = Pocket Pe ne Shear Test At		leight of Rods		N ₆ N ₆) = SPT ה = (Ham	I-uncorrected Corrected for Hammer Efficiency G = Grain Size Analy mer Efficiency Factor/60%)*N-uncorrected C = Consolidation Te	sis st
				Sample Information						Laboratory
Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	Casing	Elevation	Graphic Log	Visual Description and Remarks	Testing Results/ AASHTO and Unified Class.
0						SSA	386	⁶ xxx	5" HMA	0.4-
	1D	12/8	1.50 - 2.50	40/55					2.0 ft frost Brown, damp, dense (frozen), fine to coarse SAND, some gravel, t silt, (Fill).	
- 5 -							383	5	Light brown, wet, medium dense, fine to coarse SAND, trace grave	3.5-
	2D	24/24	5.00 - 7.00	5/4/5/5	9 14	•	_		trace silt.	
						+			Large cobble from 9.0-9.9 ft bgs.	
- 10 -	3D	2.4/2.4	10.00 - 10.20	50(2.4")		-	376	8	Similar to above.	0.2-
							_		Bottom of Exploration at 10.2 feet below ground surface. REFUSAL	
- 15 -										
- 20 -										
							_			
							-			
25 Rem	arks:								1	
		er #202102	21							
Stratif	ication line	s represent	approximate bou	ndaries between soil types;	ransitions may	/ be gradua	al.		Page 1 of 1	
			been made at tim me measuremen	nes and under conditions sta ts were made.	ed. Groundw	ater fluctua	tions may	occur du	e to conditions other Boring No.: HB-TU	R-207

I	Main	e Depa	artment	of Transport	ation	Proje	ct: I	nterse	ction o	f Route 4/219	Boring No.:	HB-TU	JR-208
			Soil/Rock Exp			Locat	tion:	Turn	er, Mai	ne			
		<u>l</u>	JS CUSTOM	ARY UNITS							WIN:	2420	01.00
Drill	er:		S.W. Cole		Elevatio	on (ft.)		389.1			Auger ID/OD:	5" Solid Stem	
Ope	rator:		Matt/Jay		Datum:			NAV	D88		Sampler:	Standard Split	Spoon
Log	ged By:		B. Wilder		Rig Typ	e:		Mob	le B-4	8, Track	Hammer Wt./Fall:	140#/30"	
Date	Start/Fi	nish:	2/9/2023; 11:0	00-13:00	Drilling	Method	1:	Case	d Wash	n Boring	Core Barrel:	NQ-2"	
Bori	ng Loca	tion:	19+09.1, 24.3	ft Lt.	Casing	ID/OD:		HW-	4"		Water Level*:	None Observe	ł
Ham	mer Effi	ciency F	actor: 0.91		Hamme	r Type:	A	utoma	tic 🖂	Hydraulic 🗆	Rope & Cathead □		
MD = U = TI MU = V = Fi	olit Spoon S Unsuccess nin Wall Tu Unsuccess eld Vane S	ful Split Spo be Sample ful Thin Wa hear Test,	oon Sample Atten II Tube Sample A PP = Pocket Pe <u>ne Shear Test Att</u>	SSA = Solic npt HSA = Hollo RC = Roller ttempt WOH = We netrometer WOR/C = V	ore Sample d Stem Auger ow Stem Auge Cone ight of 140lb. Veight of Rods eight of One F	Hammer or Casing	1	S _{u(lat} q _p = l N-unc Hamn N ₆₀ =) = Lab Jnconfin orrected ner Effic SPT N-	molded Field Vane Undrained She Vane Undrained Shear Strength (ed Compressive Strength (ks) = Raw Field SPT N-value iency Factor = Rig Specific Annual uncorrected Corrected for Hamme er Efficiency Factor/60%)*N-uncor	psf) WC LL = PL = PL = PL = Calibration Value PI = er Efficiency G = 0	Pocket Torvane She = Water Content, per Liquid Limit Plastic Limit Plasticity Index Grain Size Analysis Consolidation Test	
Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	Casing	siows	Elevation (ft.)	Graphic Log	Visual De	scription and Remarks		Laboratory Testing Results/ AASHTO and Unified Class.
	0)	ш.	0.5		~ ~				0	9" HMA			
	1D	24/17	1.50 - 3.50	31/24/16/14	40 6	S\$A		388.4		1.5 ft frost. Brown, damp, very dense, f silt, (Fill).	fine to coarse SAND, son		
- 5 -	2D	24/19	5.00 - 7.00	3/2/2/3	4 6			385.6		Brown, wet, loose, fine to c	oarse SAND, little grave	3.5-	
						a50		381.1		^{a50} blows from 7.5-8.0 ft b	gs.		
	R1	60/57	8.50 - 13.50	RQD = 67%		NQ-	2	380.6		Weathered ROCK. Roller Coned ahead to 8.5 f	theo		
- 10 - - 15 -								375.6		Top of Bedrock at Elev. 38 R1: Bedrock: Interbedded p (Sangerville Formation) Rock Quality = Fair R1: Core Times (min:sec) 8.5-9.5 ft (4:03) 9.5-10.5 ft (5:12) 10.5-11.5 ft (5:11) 11.5-12.5 ft (4:36) 12.5-13.5 ft (5:19) 95% Recovery	0.6 ft.		
- 20 -													
							_						
25													
Aut		er #202102		ndaries between soil types;	transitions ma	y be gradu	al.				Page 1 of 1		
						-		-		to conditions -th	rage rorr		
		-	been made at tim me measuremen	es and under conditions stat ts were made.	ıea. Groundw	ater fluctua	ations	may oo	cur due	to conditions other	Boring No.	: HB-TUR-	208

	Main	e Dep	artment	of Transport	atio	n	Project:	Inters	ection of	of Route 4/219	Boring No.:	HB-TU	UR-209
			Soil/Rock Exp				Locatio	n: Turi	ner, Ma	ine		a (a)	
		<u>!</u>	US CUSTOM	<u>ARY UNITS</u>							WIN:	2420	01.00
Drill	er:		S.W. Cole		Ele	vatior	ı (ft.)	389.	6		Auger ID/OD:	5" Solid Stem	
Ope	rator:		Matt/Jay		Dat	tum:	. ,	NA	/D88		Sampler:	Standard Split	Spoon
Log	ged By:		B. Wilder		Rig	Туре	:	Mot	ile B-4	8, Track	Hammer Wt./Fall:	140#/30"	
Date	Start/F	inish:	2/10/2023; 10	:00-11:30	Dri	lling N	lethod:	Case	ed Was	h Boring	Core Barrel:	NQ-2"	
Bori	ng Loca	tion:	20+13.3, 16.0	ft Lt.	Cas	sing IC	D/OD:	NW	-4"		Water Level*:	None Observe	d
		iciency F	actor: 0.91			nmer	Туре:	Autom		Hydraulic 🗆	Rope & Cathead □		
MD = U = T MU = V = Fi	plit Spoon Unsuccess hin Wall Tu Unsuccess ield Vane S	sful Split Spo ube Sample sful Thin Wa Shear Test,	oon Sample Atten II Tube Sample A PP = Pocket Pe <u>ne Shear Test Att</u>	RC = Rolle word = We enetrometer WOR/C = W	d Stem A ow Stem r Cone eight of 1- Veight of	Auger Auger 40lb. Ha	r Casing	S _{u(la} q _p = N-un Ham N ₆₀	_{ib)} = Lal Unconfi correcte mer Effi = SPT N	emolded Field Vane Undrained Sh vane Undrained Shear Strength (ksf) d = Raw Field SPT N-value ciency Factor = Rig Specific Annua I-uncorrected Corrected for Hamme mer Efficiency Factor/60%)*N-unco	(psf) WC = LL = PL = I Calibration Value PI = er Efficiency G = 0	Pocket Torvane She = Water Content, per Liquid Limit Plastic Limit Plasticity Index Grain Size Analysis Consolidation Test	cent
 □ Depth (ft.) 	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (pst) or RQD (%)	N-uncorrected	N ₆₀	Casing Blows	Elevation (ft.)	Graphic Log	Visual De	escription and Remarks		Laboratory Testing Results/ AASHTO and Unified Class.
							SSA	389.1				0.5	
	1D	24/18	2.00 - 4.00	12/12/16/22	28	42				Brown, damp, dense, fine t (Fill).	o coarse SAND, little gra	vel, trace silt,	
	R1	24/16	4.80 - 6.80				à22			×			
- 5 -							20	384.8		^a 22 blows from 4.8-5.0 ft b R1: Cobbles.	ogs.	4.8	
							36			R1: Core Times (min:sec) 4.8-5.8 ft (2:16)			
							83	382.8	0000 00 000 10 10 000 10 10	5.86.8 ft (0:45) Roller Coned ahead to 8.0	ft bas		
							0.5		ර. ර දි _{ම්ව} කි	S		6.8-	
	2D	24/15	8.00 - 10.00	10/11/15/19	26	39			0000	Light brown, moist, dense,	Gravelly fine to coarse SA	AND, trace silt.	
- 10 -	3D	3.6/3	10.00 - 10.30	50(3.6")				379.3		Similar to above.			
		5.0/5	10.00 10.50	50(5.0)							n at 10.3 feet below grou		
										REFUSAL, possib	le weathered Kock.		
								1					
- 15 -													
								1					
- 20 -													
								-					
25													
Rem	arks:												
Aut	to Hamme	er #202102	21										
				ndaries between soil types;						- An ann dialan - M	Page 1 of 1		
			been made at tim me measuremen	nes and under conditions sta ts were made.	ilea. Gro	undwate	er nuctuatio	ns may c	ocur du		Boring No.	: HB-TUR-	209

I	Main	e Dep	artment	of Transport:	ation		Project:	Inters	ection	of Route 4/219 Borin	g No.:	HB-TU	JR-210
			Soil/Rock Exp	-			Locatio	n: Tui	ner, N	aine			
		<u> </u>	US CUSTOM	<u>ARY UNITS</u>						WIN:		2420	01.00
Drill	er:		S.W. Cole		Eleva	tion	ı (ft.)	390	.0	Auger I	D/OD:	5" Dia.	
Ope	rator:		Matt/Jay		Datur	n:		NA	VD88	Sample	er:	Standard Split	Spoon
Log	ged By:		B. Wilder		Rig T	ype	:	Мо	bile B	48, Track Hamme	er Wt./Fall:	140#/30"	
Date	Start/Fi	inish:	2/10/2023; 11	:30-12:00	Drillir	ng N	lethod:	Sol	d stei	Auger Core Ba	arrel:	N/A	
Bori	ng Loca	tion:	21+33.6, 16.3	ft Lt.	Casin	ng IE	D/OD:	N/A		Water L	_evel*:	None Observed	I
Ham Definit		iciency F	actor: 0.91	R = Rock C	Hamr		Туре:	Auton		Hydraulic Rope & Categoria Rope & Categoria Remolded Field Vane Undrained Shear Strength		ocket Torvane She	ar Strongth (pcf)
D = S MD = U = TI MU = V = Fi	plit Spoon S Unsuccess hin Wall Tu Unsuccess ield Vane S	sful Split Spo ibe Sample sful Thin Wa Shear Test,	oon Sample Atten II Tube Sample A PP = Pocket Pe <u>ne Shear Test Att</u>	SSA = Solid npt HSA = Hollo RC = Roller ttempt WOH = Wei netrometer WOR/C = W	Stem Aug w Stem Au Cone ght of 140ll /eight of Ro	er uger b. Ha ods o	r Casing	S _{u(I} q _p = N-u Han N ₆₀	ab) = l Unco ncorred imer E = SP1	b Vane Undrained Shear Strength (psf) ined Compressive Strength (ksf) ed = Raw Field SPT N-value iciency Factor = Rig Specific Annual Calibration V-uncorrected Corrected for Hammer Efficiency mer Efficiency Factor/60%)*N-uncorrected	WC = V LL = Li PL = P Value PI = PI G = Gr	Water Content, pero quid Limit lastic Limit asticity Index ain Size Analysis <u>nsolidation Test</u>	pent
⊖ 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 Lod	Visual Description a	and Remarks		Laboratory Testing Results/ AASHTO and Unified Class.
Ŭ							SSA	389.:				0.5-	
										2.0 ft frost.			
	1D	24/16	2.00 - 4.00	25/18/13/12	31	47				Brown, moist, dense, fine to coarse S/ (Fill).	AND, little grave	l, trace silt,	
- 5 -								385.:	; 👯				
	2D	24/16	5.00 - 7.00	4/5/5/7	10	15				Light brown, damp, medium dense, fin trace silt.	ne to coarse SAN	ND, little gravel,	
							$ \rangle / $						
- 10 -	3D	24/18	10.00 - 12.00	3/4/8/14	12	18	- V			Similar to above.			
								378.0)	Bottom of Exploration at 12.0 fe	eet below groun	d surface.	
										NO REFUSAL			
- 15 -													
20													
- 20 -													
25													
25 Rem	arks:	1	1				1	I	1	<u> </u>			
Aut	to Hamme	er #202102	21										
Stratif	ication line	s represent	approximate bou	ndaries between soil types; t	ransitions r	may b	e gradual.			Pa	age 1 of 1		
			been made at tim me measuremen	es and under conditions stat ts were made.	ed. Groun	dwate	er fluctuatio	ns may	occur o	e to conditions other	oring No.:	HB-TUR-	210

[]	Main	e Depa	artment	of Transport	ation		Project:	Inters	sectio	n of Route 4/219	Boring No.:	HB-TU	JR-211
			Soil/Rock Exp	-			Locatio	n: Tu	mer, N	laine			
		<u>l</u>	US CUSTOM	ary <u>units</u>							WIN:	2420	01.00
Drill	er:		S.W. Cole		Eleva	tion	(ft.)	390).7		Auger ID/OD:	5" Dia.	
Ope	rator:		Matt/Jay		Datu	m:		NA	VD8	}	Sampler:	Standard Split	Spoon
Log	ged By:		B. Wilder		Rig T	ype		Mo	bile E	-48, Track	Hammer Wt./Fall:	140#/30"	
Date	e Start/F	nish:	2/10/2023; 12	:30-13:00		-	lethod:	Sol	id ste	n Auger	Core Barrel:	N/A	
Bori	ng Loca	tion:	22+58.3, 16.0	ft Lt.	Casir	-		N/A	4		Water Level*:	None Observed	1
Ham Defini		ciency F	actor: 0.91	R = Rock C	Hamr		Туре:	Auton		I Hydraulic □ /Remolded Field Vane Undrained She	Rope & Cathead	Pocket Torvane She	ar Strength (psf)
D = S MD = U = T MU = V = F	plit Spoon Unsuccess hin Wall Tu Unsuccess ield Vane S	sful Split Spo be Sample sful Thin Wa Shear Test,	oon Sample Atter II Tube Sample A PP = Pocket Pe ne Shear Test At	SSA = Solid npt HSA = Holli RC = Roller wWOH = We netrometer WOR/C = V tempt WO1P = W	d Stem Aug ow Stem Au r Cone light of 140 Veight of Re	ler uger b. Ha ods ol	r Casing	S _{u(l} q _p = N-u Han N ₆₀	ab) = I = Unco ncorre nmer E 1 = SP ⁻	An Vane Undrained Shear Strength (nfined Compressive Strength (ksf) ted = Raw Field SPT N-value ficiency Factor = Rig Specific Annual 'N-uncorrected Corrected for Hamme mmer Efficiency Factor/60%)'N-uncor	psf) WC LL = PL = Calibration Value PI = er Efficiency G =	= Water Content, per Liquid Limit = Plastic Limit Plasticity Index Grain Size Analysis Consolidation Test	
Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N60	Casing Blows	Elevation (ft.)	Granhic Lod	Visual De	scription and Remarks		Laboratory Testing Results/ AASHTO and Unified Class.
	0)	ш.	0.5		2	2				6" HMA			
	<u> </u>						S\$A	390.	É	2.0 ft frost.		0.5-	
	1D	24/18	2.00 - 4.00	18/14/11/12	25	38				Light brown, moist, dense, silt, (Fill).	fine to coarse SAND, litt	le gravel, trace	
- 5 -	2D	24/17	5.00 - 7.00	5/6/6/8	12	18				Similar to above, medium of	lense.		
- 10 -										Similar to above.			
	3D	24/20	10.00 - 12.00	3/3/4/4	7	11							
								378.	7	Bottom of Exploration NO REF	n at 12.0 feet below grou 'USAL	12.0- and surface.	
- 15 -													
	<u> </u>												
- 20 -													
25 Rem	arks:												
		er #202102	21										
Stratif	fication line	s represent	approximate bou	ndaries between soil types;	transitions i	may b	e gradual.				Page 1 of 1		
			been made at tim me measuremen	es and under conditions sta ts were made.	ted. Groun	dwate	er fluctuatio	ns may	occur	ue to conditions other	Boring No	.: HB-TUR-	211

	Main	e Dep	artment	of Transport:	ation		Project:	Inters	ection	of Route 4/219	Boring No.:	HB-TU	JR-212
			Soil/Rock Exp	-			Locatio	n: Tur	ner, M	aine			
		ļ	JS CUSTOM	<u>ARY UNITS</u>					,		WIN:	2420	01.00
Drill	er:		S.W. Cole		Eleva	tion	ı (ft.)	387	4		Auger ID/OD:	5" Dia.	
Ope	rator:		Matt/Jay		Datun	n:		NA	VD88		Sampler:	Standard Split	Spoon
Log	ged By:		B. Wilder		Rig T	уре	:	Mo	oile B-	48, Track	Hammer Wt./Fall:	140#/30"	
Date	e Start/Fi	inish:	2/9/2023; 10:3	30-11:00	Drillin	ng N	lethod:	Soli	d stem	Auger	Core Barrel:	N/A	
Bori	ng Loca	tion:	300+83.9, 4.7	ft Lt.	Casin	Ig ID	D/OD:	N/A			Water Level*:	None Observed	1
Ham Defini		iciency F	actor: 0.91	R = Rock C	Hamn		Туре:	Autom		Hydraulic □ temolded Field Vane Undrained She	Rope & Cathead	Pocket Torvane She	ar Strongth (nof)
D = S MD = U = T MU = V = F	plit Spoon Unsuccess hin Wall Tu Unsuccess ield Vane S	sful Split Spo ibe Sample sful Thin Wa Shear Test,	oon Sample Atter Il Tube Sample A PP = Pocket Pe ne Shear Test At	SSA = Solic npt HSA = Holk RC = Roller wOH = Wei workrometer WOR/C = W tempt WO1P = Wei	Stem Auge w Stem Au Cone ght of 140lt /eight of Ro	er iger b. Ha ods oi	r Casing	S _{u(li} q _p = N-ur Harr N ₆₀	ab) = La Unconf correcte mer Eff = SPT I	b Vane Undaviate Shrataned Stea ined Compressive Strength (ksf) d = Raw Field SPT N-value ciency Factor = Rig Specific Annual N-uncorrected Corrected for Hammer Efficiency Factor/60%)*N-uncor	osf) WC = LL = PL = Calibration Value PI = r Efficiency G = 0	e Water Content, per Liquid Limit Plastic Limit Plasticity Index Grain Size Analysis 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 De	scription and Remarks		Laboratory Testing Results/ AASHTO and Unified Class.
0							SSA	387.1	****	4" HMA			
										Cobble from 1.5-2.5 ft bgs.		0.5	
	1D	24/17	2.50 - 4.50	10/9/5/10	14	21				Brown, damp, medium den silt, (Fill).	se, fine to coarse SAND,	little gravel, little	
- 5 -	2D	24/14	5.00 - 7.00	8/6/6/5	12	18		382.9	****	Light brown, moist, mediur	n dense, fine to coarse SA	4.5- AND, little gravel,	
		2011		0.0.0.2	12	10		-		little silt.			
								-					
- 10 -	3D	24/16	10.00 - 12.00	2/3/3/5	6	9	+V			Light brown, moist, loose, t	ine to coarse SAND, trac	e gravel, trace	
								375.4					
								-		Bottom of Exploration NO REF	a at 12.0 feet below grou USAL	nd surface.	
- 15 -													
- 20 -													
								-					
	harks:		<u> </u>]					
Au	to Hamme	er #202102	21										
Stratif	fication line	s represent	approximate bou	ndaries between soil types; t	ransitions n	nay b	e gradual.				Page 1 of 1		
			been made at tim me measuremen	nes and under conditions stat ts were made.	ed. Ground	dwate	er fluctuatio	ns may o	ccur du	e to conditions other	Boring No.	: HB-TUR-	212

Appendix **B**

Laboratory Test Results

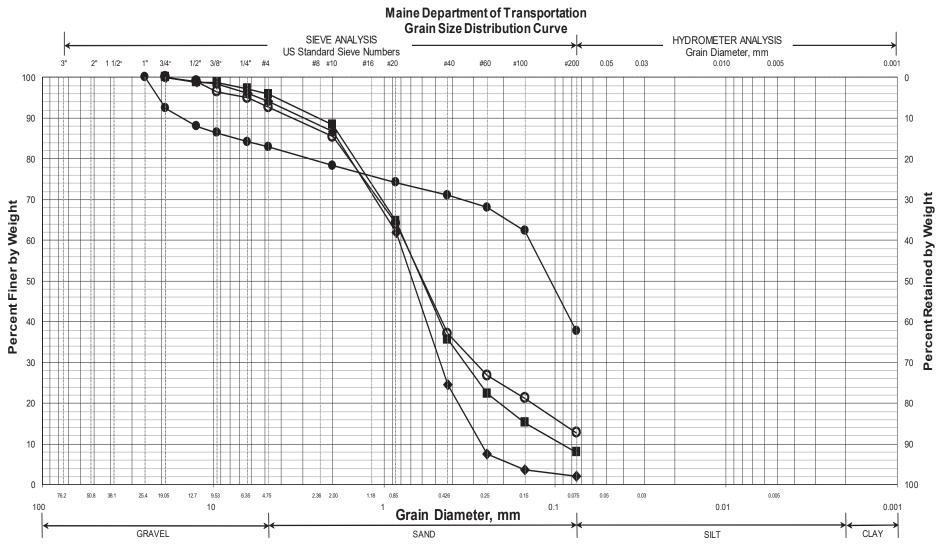
State of Maine - Department of Transportation Laboratory Testing Summary Sheet

Town(s):	Turne	er			Work	κ Nι	ımk	ber	: 242	01.00	
Boring & Sample	Station	Offset	Depth	Reference	G.S.D.C.	W.C.	L.L.	P.I.	Cla	ssification	1
Identification Number	(Feet)	(Feet)	(Feet)	Number	Sheet	%			Unified	AASHTO	
HB-TUR-101, 1D	201+42.7	6.9 Lt.	0.2-2.0	337035	1	17.7			SM	A-1-b	1
HB-TUR-101, 2D	201+42.7	6.9 Lt.	5.0-7.0	337036	1	5.2			SP	A-1-b	0
HB-TUR-102, 1D	201+42	39.1 Rt.	0.2-2.0	337037	1	29.3			SP-SM		0
HB-TUR-102, 2D	201+42	39.1 Rt.	5.0-7.0	337038	1	21.5			SM	A-4	
,											
				1							
				1							
	1			1							
Classification of th	nese soil sami	oles is in ad	ccordance wit	h AASHTO C	lassificatio	on Syst	em M-	145-4	0. This cla	ssification	
is followed by the						-					
The "Frost Sus		-	-						-		
GSDC = Grain Size Distrib											
WC = water content as det			-				_ 00	(p		/	

WC = water content as determined by AASHTO T 265-93 and/or ASTM D 2216-98

LL = Liquid limit as determined by AASHTO T 89-96 and/or ASTM D 4318-98 NP = Non Plastic

PI = Plasticity Index as determined by AASHTO 90-96 and/or ASTM D4318-98



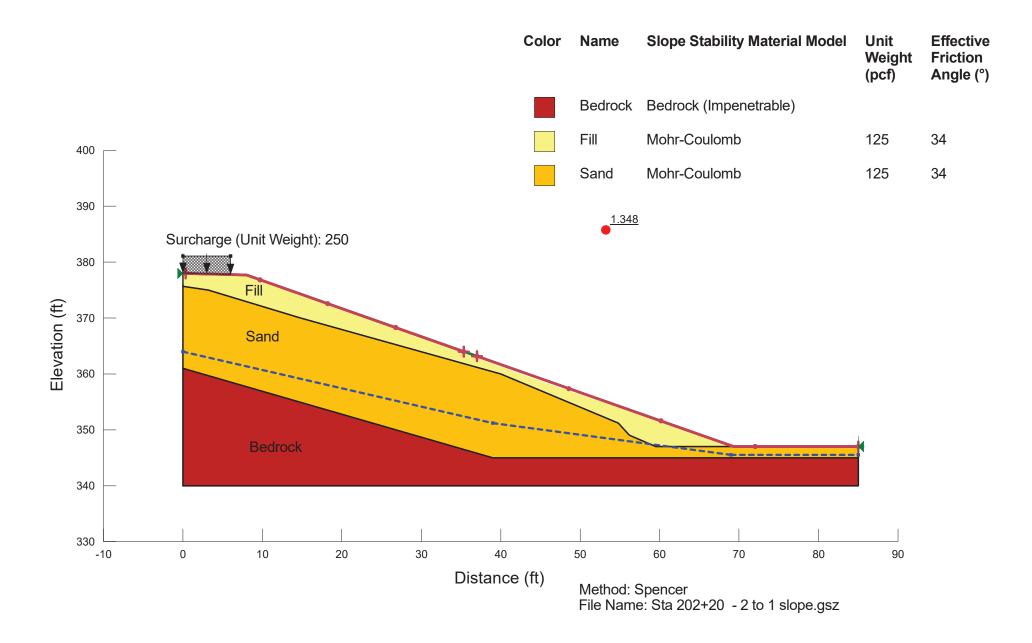
UNIFIED CLASSIFICATION

	Boring/Sample No.	Station	Offset, ft	Depth, ft	Description	WC, %	LL	PL	PI
0	HB-TUR-101/1D	201+42.7	6.9 LT	0.2-2.0	SAND, little silt, trace gravel.	17.7			
•	HB-TUR-101/2D	201+42.7	6.9 LT	5.0-7.0	SAND, trace gravel, trace silt.	5.2			
	HB-TUR-102/1D	201+42	39.1 RT	0.2-2.0	SAND, trace silt, trace gravel.	29.3			
	HB-TUR-102/2D	201+42	39.1 RT	5.0-7.0	Silty SAND, little gravel.	21.5			
X									

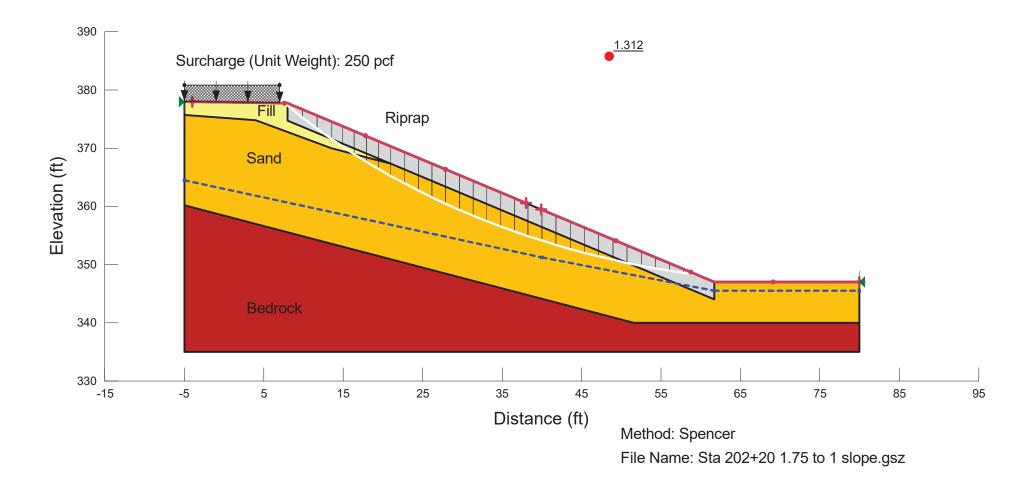
WI	N
024201.00	
Tov	vn
Turner	
Reported	by/Date
WHITE, TERRY A	5/2/2022

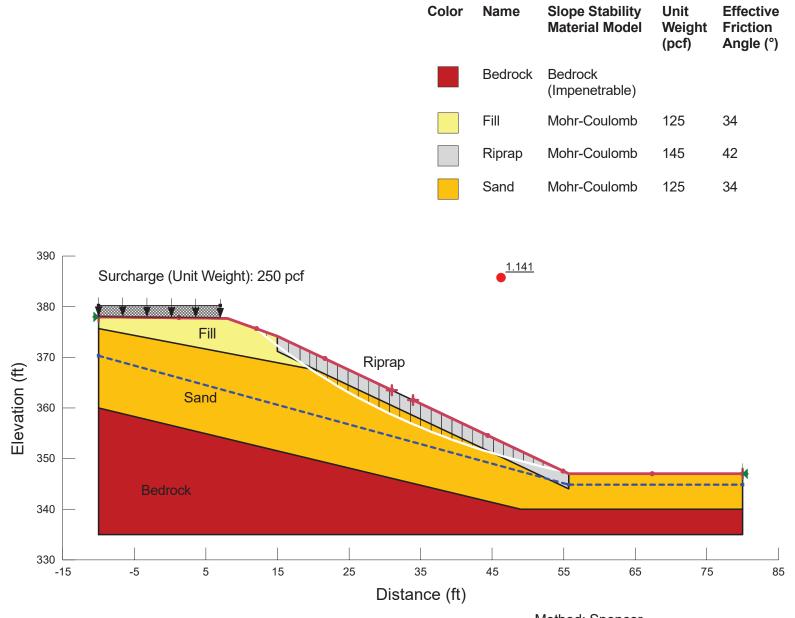
Appendix C

Slope Stability Analyses



Color	Name	Slope Stability Material Model	Unit Weight (pcf)	Effective Friction Angle (°)
	Bedrock	Bedrock (Impenetrable)		
	Fill	Mohr-Coulomb	125	34
	Riprap	Mohr-Coulomb	145	42
	Sand	Mohr-Coulomb	125	34





Method: Spencer File Name: Sta 202+20 - 1.5 to 1 slope.gsz