MAINE TURNPIKE AUTHORITY

ADDENDUM NO. 1

CONTRACT 2018.19

BRIDGE REPLACEMENT CUMMINGS ROAD UNDERPASS MILE 44.6

The bid opening date is Tuesday 10/16/2018 at 11:00 am.

The following changes are made to the Proposal, Specifications and Plans.

GENERAL

Addendum No. 2, if necessary, is scheduled to be issued on October 12, 2018 (Friday). All questions regarding Contract 2018.19 should be submitted by the 5:00 pm on October 10, 2018 (Wednesday) to be answered in this addendum. Questions received after that time may not be answered. All questions and inquiries regarding proposed material substitutions shall be in writing and shall be directed to Nate Carll, Purchasing Manager, of the Maine Turnpike Authority. Fax No. (207) 871-7739. Email ncarll@maineturnpike.com

The geotechnical report associated with this project has been posted on the Maine Turnpike Authority's website.

PROPOSAL

Proposal Sheets P-2, P-3 and P-12 are deleted and replaced with P-2 (Revised 10/3/2018), P-3 (Revised 10/3/2018) and P-12 (Revised 10/3/2018) attached hereto. The revisions to these proposal sheets are to revise the quantity of leveling sand, aggregate subbase course gravel and flaggers.

SPECIFICATIONS

- Page SP-14 Special Provision Section 107.4.6 Prosecution of Work, the second bullet shall be deleted and replaced with the following: Steel H-pile and/or sheet pile driving shall not occur between the hours of 9:00 PM 7:00 AM. H-pile driving will not be allowed within 10 feet of traffic.
- Page SP-117 Special Provision Section 652 Maintenance of Traffic, Specific Project Maintenance of Traffic Requirements, Cummings Road Traffic Control Requirements, the first paragraph shall be deleted and is replaced with the following:

Maintenance of traffic plans have been developed for the work on the Cummings Road bridge and approach roadways. Two lanes of traffic (one lane in each direction) shall be maintained at all times with the exception of the 7:00 PM and 7:00 AM Sunday through Thursday nights. During this overnight period, traffic may be reduced to a single lane of alternating one-way traffic. In addition, for installation of temporary earth support system(s) along Cummings Rd and paving operations, traffic may be reduced to a single lane of alternating one-way traffic between 9:00 AM and 3:00 PM Monday through Friday.

PLANS

Plan Sheet EQ-01, sheet 2 Estimated Quantities, is being reissued for revisions to Items 203.45 Leveling Sand, 304.10 Aggregate Subbase Course Gravel and 652.38 Flaggers.

Plan Sheets TYP-02, sheet 6 Geofoam Special Details and GT-01 and GT-02, sheets 64 and 65 Geofoam Longitudinal Profiles, are reissued to clarify and include a depiction of longitudinal extents of the concrete distribution slab.

Plan Sheets S-03 through S-11, sheets 78 through 86 Boring Logs are reissued with improved quality.

OUESTIONS

The following are questions asked at the pre-bid meeting held on October 2, 2018 or submitted to the Maine Turnpike Authority in writing. Answers to the questions are noted. Bidders shall utilize this information in preparing their bid.

Question 1: Page 6 shows a 4" thick concrete distribution slab and refers to Sheets GT-01 and GT-02 but doesn't define the longitudinal limits of the slab. Can you clarify the longitudinal limits?

<u>Answer:</u> The concrete distribution slab shall generally be installed above the top layer of geofoam blocks within the paved width of the embankment and extend longitudinally 6" beyond the edge of geofoam. Plan Sheets Typ-02, GT-01 and GT-02 are reissued with this Addendum for additional clarity.

- Question 2: Will the MTA allow 20% RAP in pavement?
 Answer: Special Provision 403, Complementary Note C, "A Maximum of 15% RAP may be used" is not applicable to any mix incorporated on the project.
- Question 3: Is the intention to do all earthwork and pavement at night? Are there windows of time where paving can be completed during the day?
 Answer: The lane closure window on Cummings Road will be opened to allow a single lane of alternating traffic during the hours of 9AM to 3PM Monday through Friday. Special Provision Section 652 is updated with this Addendum.

Question 4: Plans state that preaugering for wick drain installation may be necessary. Are there any specific requirements?

Answer: Preaugering for installation of Prefabricated Vertical Drains (PVD) (wick drains) may be required if the ground is frozen and Contractor's equipment doesn't allow installation of wick drains through frozen ground. Specific requirements related to depth of frost at the time of PVD installation are not included within this contract and are solely dependent on the contractor's means and methods. Preaugering, if necessary, will not be paid for separately, but is included in the cost of the Prefabricated Vertical Drains

Question 5: Do we have to worry about frozen material during placement of the surcharge?

<u>Answer:</u> Per Note 7 on Sheet GT-10, "Borrow, sand, and/or subbase material placed as part of the surcharge, and will subsequently be left in place to for the roadway embankment, shall be placed in accordance with Specifications sections 200 and 300 as applicable". Specific requirements for installation of preload borrow material that will be removed from the project site are not made within the bid documents.

Question 6: With the proposed phasing and prohibition of crane loads on the surcharge per Special Provision 107.4.7, is the intent that sheeting installation happens after the surcharge is removed? Sheeting needs to be in place for geofoam to be installed.

Answer: Temporary earth support systems may be installed prior to installation of the surcharge or after removal of the surcharge to facilitate construction of the remaining portions of the embankment, including installation of geofoam. Daytime lane closures on Cummings Road are allowed on weekends with approval of the Resident and weekday, daytime lane closures on Cummings Road are allowed per this Addendum to allow more opportunities for installation.

ATTACHMENTS

Proposal Sheets P-2 (Revised 10/3/2018), P-3 (Revised 10/3/2018) and P-12 (Revised 10/3/2018) (3 pages)
USACOE Maine General Permit (13 pages)
Pre-Bid Agenda (6 pages)
Pre-Bid Sign-In Sheet (1 page)
Revised Plan Sheets (13 Sheets)

Notes: The above items shall be considered as part of the bid submittal.

The total number of pages included with this addendum is Forty (40).

All bidders are requested to acknowledge the receipt of the Addendum No. 1 by signing below and faxing this sheet to Nathaniel Carll, Purchasing Department, Maine Turnpike Authority at 207-871-7739. Bidders are also required to acknowledge receipt of this Addendum No. 1 on Page P-14 of the bid package.

Business Name	-
Print Name and Title	_
Signature	-
Date October 3, 2018	-
	Very truly yours,
	MAINE TURNPIKE AUTHORITY
	Nathaniel Carll Purchasing Department Maine Turnpike Authority

SCHEDULE OF BID PRICES CONTRACT NO. 2018.19 Bridge Replacement Cummings Road Underpass

Item No	Item Description	Units	Approx. Quantities	Unit Prices in Numbers		Bid Amount in Numbers	
140	item bescription	Office	Quantities	Dollars	Cents	Dollars	Cents
201.11	Clearing	Acre	2				
202.19	Removing Existing Bridge (Structural Steel = 112 Tons, Concrete = 580 CY)	Lump Sum	1				
202.202	Removing Pavement Surface	Square Yard	1,120				
203.20	Common Excavation	Cubic Yard	18,600				
203.24	Common Borrow	Cubic Yard	10,000				
203.25	Granular Borrow	Cubic Yard	1,500				
203.43	Geofoam Lightweight Fill	Cubic Yard	5,400				
203.45	Leveling Sand	Cubic Yard	1,450				
203.46	Sand Drainage Blanket	Cubic Yard	3,800				
206.082	Structural Earth Excavation - Major Structures, Plan Quantity	Cubic Yard	600				
206.10	Structural Earth Excavation - Piers	Cubic Yard	690				

		raiu			 		
203.20	Common Excavation	Cubic Yard	18,600		 		
203.24	Common Borrow	Cubic Yard	10,000				
203.25	Granular Borrow	Cubic Yard	1,500				
203.43	Geofoam Lightweight Fill	Cubic Yard	5,400				
203.45	Leveling Sand	Cubic Yard	1,450		1		
203.46	Sand Drainage Blanket	Cubic Yard	3,800				
206.082	Structural Earth Excavation - Major Structures, Plan Quantity	Cubic Yard	600				
206.10	Structural Earth Excavation - Piers	Cubic Yard	690				
	-						
				CARRIED F	ORWARD		

CARRIED	FORWA	RD:	

CONTRACT NO: 2018.19

		1	1		CONTR	ACT NO: 2018	.19
Item No	Item Description	Units	Approx. Quantities	Unit Prices in Numbers		Bid Amou	
				Dollars	Cents	Dollars	Cents
				BROUGHT FORWA	ARD:		
209.29	Prefabricated Vertical Drains	Linear Foot	183,000				
304.10	Aggregate Subbase Course - Gravel	Cubic Yard	4,900				1
304.14	Aggregate Base Course - Type A	Cubic Yard	800				
403.207	Hot Mix Asphalt, 19.0 mm Nominal Maximum Size	Ton	950				
403.208	Hot Mix Asphalt, 12.5 mm Nominal Maximum Size	Ton	1,160				1
403.2084	Hot Mix Asphalt, 12.5 mm Nominal Maximum Size (sidewalks, drives, islands & incidentals)	Ton	40				
403.212	Hot Mix Asphalt, 4.75 mm Nominal Maximum Size	Ton	30				
403.213	Hot Mix Asphalt, 12.5 mm Nominal Maximum Size (Base and Intermediate Course)	Ton	570				
409.15	Bituminous Tack Coat, Applied	Gallon	590				
419.30	Sawing Bituminous Pavement	Linear Foot	990				
501.231	Dynamic Loading Test	Each	4				
501.54	Steel H-beam Piles 117 lb/ft, delivered	Linear Foot	11,300				
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		CARRIED FORW	ARD:	
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CONTRACT NO: 2018.19

		_	T		CONTRACT I	NO: 2018.1	9
Item No	Item Description	Units	Approx. Quantities	Unit Prices in Numbers		Bid Amount n Numbers	
				Dollars C	ents D	ollars	Cents
				BROUGHT FORWA	RD:		
652.30	Flashing Arrow	Each	2	-			
652.312	Type III Barricades	Each	18	1			
652.33	Drum	Each	170	1			
652.34	Cone	Each	80	1			
652.35	Construction Signs	Square Foot	1,200	1			
652.361	Maintenance of Traffic Control Devices	Lump Sum	1	1			
652.38	Flaggers	Hour	1,400				
652.41	Portable-Changeable Message Sign	Each	3				
652.45	Truck Mounted Attenuator	Calendar Day	130	1			
652.452	Automated Trailer Mounted Speed Limit Sign	Each	2	1			
656.50	Baled Hay, in place	Each	25				
656.60	Temporary Berms	Linear Foot	2,100	1			
L	ı	1	l .				<u> </u>

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			CARRIED FORW	ARD:	



DEPARTMENT OF THE ARMY

NEW ENGLAND DISTRICT, CORPS OF ENGINEERS 696 VIRGINIA ROAD CONCORD, MASSACHUSETTS 01742-2751

MAINE GENERAL PERMIT (GP) AUTHORIZATION LETTER AND SCREENING SUMMARY

RALPH NORWOOD IV				NAE 2049 04700
MAINE TURNPIKE AUTHORITY			CORPS PERMIT #	NAE-2018-01709 18-482
2360 CONGRESS STREET PORTLAND, MAINE 04102			CORPS GP ID# STATE ID#	PBR
PORTLAND, WAINE 04102			OTATE 10#	
DESCRIPTION OF WORK:				
Place temporary and permanent				
South Portland, Maine in order t Maine Turnpike and its approach				
8,014 s.f. of temporary wetland i				
Bridge Underpass Replacement P	Project, South Port	land, Maine" in	one sheet dated "7	/17/2017" and
"BRIDGE REPLACEMENT, CUMM	INGS ROAD UNDE	RPASS" in nine	sheets dated "7/18	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
_AT/LONG COORDINATES : 43.62	8470° N _	-70.348378°	W USGS QUAD	PORTLAND WEST, ME
. CORPS DETERMINATION:				
Based on our review of the information you pr	rovided, we have determ	nined that your project	will have only minimal inc	dividual and cumulative impacts on
waters and wetlands of the United States. You				ers under the enclosed Federal
Permit, the Maine General Permit (GP). Ad	scordingly, we do not pla	an to take any furtner	action on this project.	
You must perform the activity authorized here				
and any conditions placed on the State 401 V				
ncluding the GP conditions beginning on pag requirements; therefore you should be certain				
conditions of this authorization with your cont	ractor to ensure the cont	tractor can accomplis	h the work in a manner tha	at conforms to all requirements.
f you change the plans or construction metho	ods for work within our i	riediction places con	taat ua immadiataly ta dia	auga modification of this
authorization. This office must approve any c			tact us infinediately to dis	suss modification of this
Condition 38 of the GP (page 16) provides on of the GP on October 13, 2020. You will need				
2021.	1 to apply for readmonze	ation for any work with	iii oorps jurisalolloli triat	3 not completed by October 10,
This authorization presumes the work shown	on your plane noted abo	wa io in waters of the	II.C. Chauld you dooire t	a appeal our juris disting places
submit a request for an approved jurisdictiona			U.S. Should you desire to	s appear our jurisdiction, please
No work may be started unless and until all o imited to a Flood Hazard Development Pe			es and permits have been	obtained. This includes but is not
miliou to a rioca riazara Borolopinone ro	Time looded by the town	ii ii iioooooaiy.		
I. STATE ACTIONS: PENDING [X],	ISSUED[], DEI	NIED [] DATE_		
APPLICATION TYPE: PBR: X , TIER	1 <u>:</u> , TIER 2 <u>:</u>	_, TIER 3 <u>:</u> , L	.URC: DMR LEA	ASE: NA:
II. FEDERAL ACTIONS:				
JOINT PROCESSING MEETING: 7/20)/18 LEVEL C	OF REVIEW: CATE	GORY 1: CAT	EGORY 2: X
AUTHORITY (Based on a review of plans a	nd/or State/Federal appl	lications): SEC 10	, 404X10)/404, 103
EXCLUSIONS: The exclusionary criteria id	entified in the general pe	ermit do not apply to t	his project.	
FEDERAL RESOURCE AGENCY OBJ	ECTIONS: EPA_NO_	, USF&WS <u>NO</u> , N	MFS_NO	
f you have any questions on this matter, plea you, we would appreciate your completing ou				
11(1)		111	10	

JAY/L. CLEMENT

SENIOR PROJECT MANAGER MAINE PROJECT OFFICE

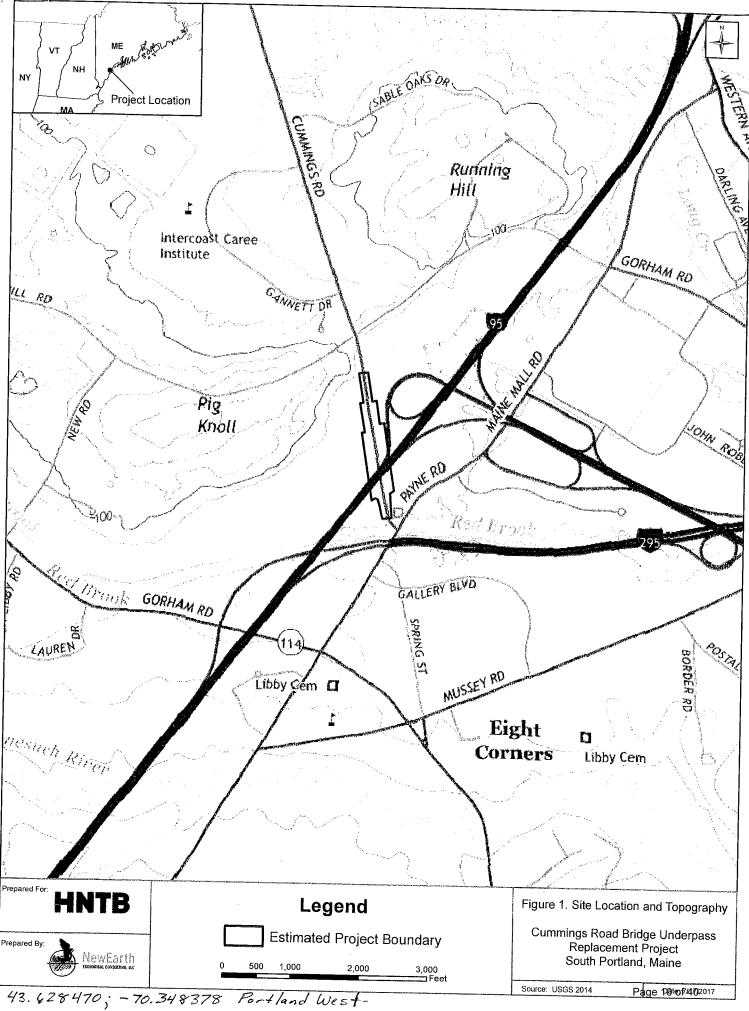
FRANK J. DEL GIUDICE DAT CHIEF, PERMITS & ENFORCEMENT BRANCH

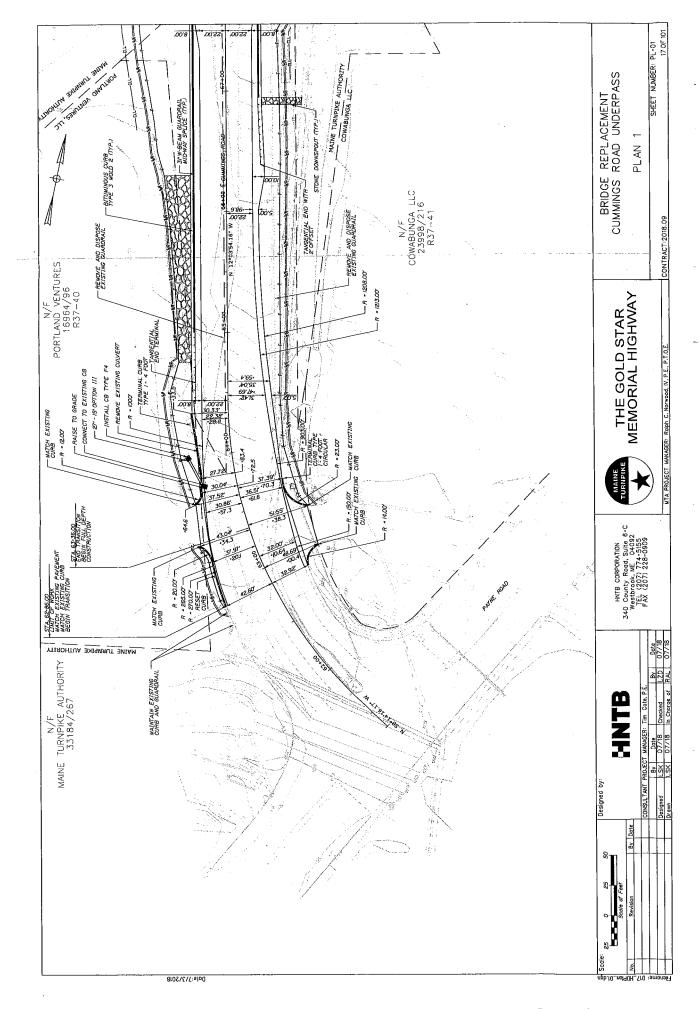
REGULATORY DIVISION

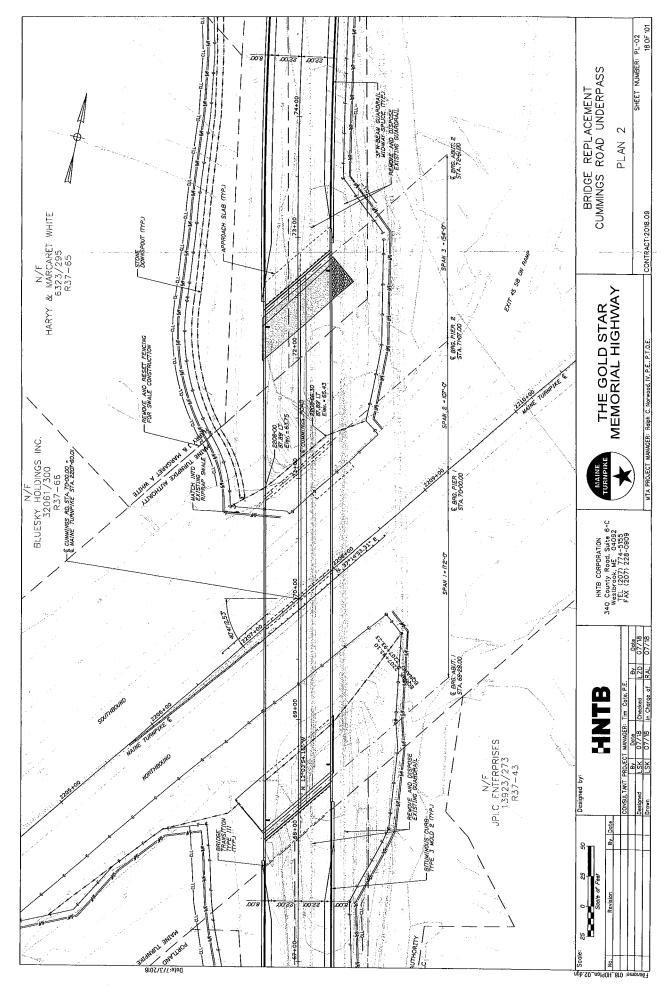


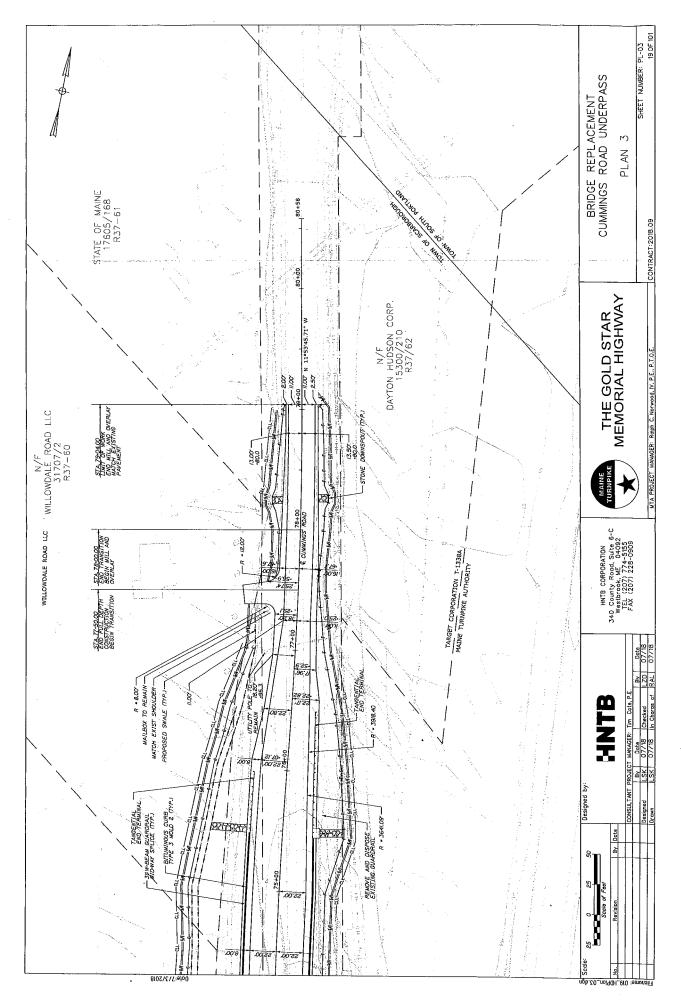
PLEASE NOTE THE FOLLOWING CONDITIONS FOR DEPARTMENT OF THE ARMY GENERAL PERMIT NO. NAE-2018-01709

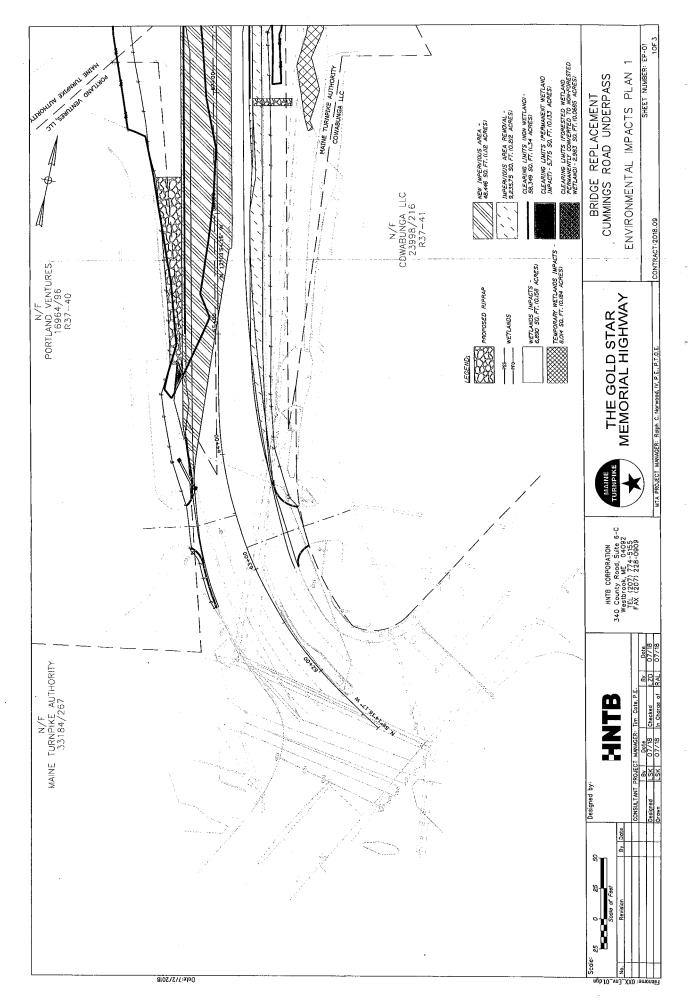
- 1. This authorization requires you to 1) notify us before beginning work so we may inspect the project, and 2) submit a Compliance Certification Form. You must complete and return the enclosed Work Start Notification Form(s) to this office at least two weeks before the anticipated starting date. You must complete and return the enclosed Compliance Certification Form within one month following the completion of the authorized work and any required mitigation (but not mitigation monitoring, which requires separate submittals).
- 2. The permittee shall assure that a copy of this permit is at the work site whenever work is being performed and that all personnel performing work at the site of the work authorized by this permit are fully aware of the terms and conditions of the permit. This permit, including its drawings and any appendices and other attachments, shall be made a part of any and all contracts and sub-contracts for work which affects areas of Corps of Engineers' jurisdiction at the site of the work authorized by this permit. This shall be done by including the entire permit in the specifications for the work. If the permit is issued after construction specifications but before receipt of bids or quotes, the entire permit shall be included as an addendum to the specifications. The term "entire permit" includes permit amendments. Although the permittee may assign various aspects of the work to different contractors or sub-contractors, all contractors and sub-contractors shall be obligated by contract to comply with all environmental protection provisions of the entire permit, and no contract or sub-contract shall require or allow unauthorized work in areas of Corps of Engineers jurisdiction.
- 3. Adequate sedimentation and erosion control devices, such as geotextile silt fences or other devices capable of filtering the fines involved, shall be installed and properly maintained to minimize impacts during construction. These devices must be removed upon completion of work and stabilization of disturbed areas. The sediment collected by these devices must also be removed and placed upland, in a manner that will prevent its later erosion and transport to a waterway or wetland.
- 4. All exposed soils resulting from the construction will be promptly seeded and mulched in order to achieve vegetative stabilization.
- 5. All areas of temporary fill shall be restored to their original contour and character upon completion of the work.
- 6. All tree cutting shall occur between October 16 and April 19 of any year to the maximum extent practicable and no tree cutting shall occur between June 1 and July 31 of any year in order to minimize potential impacts to federally listed northern long-eared bats.

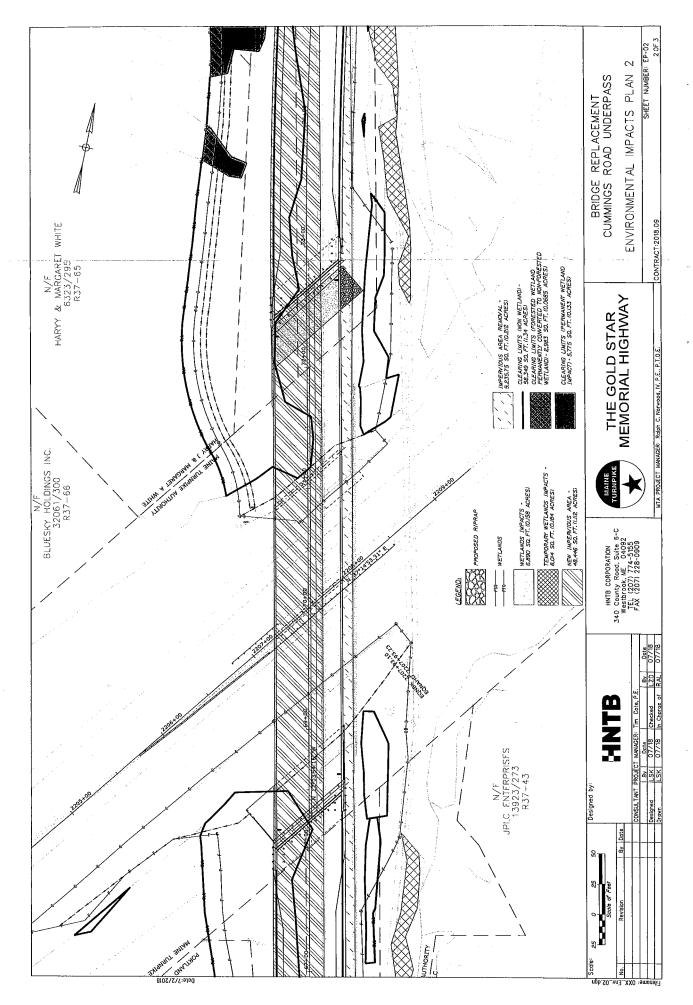


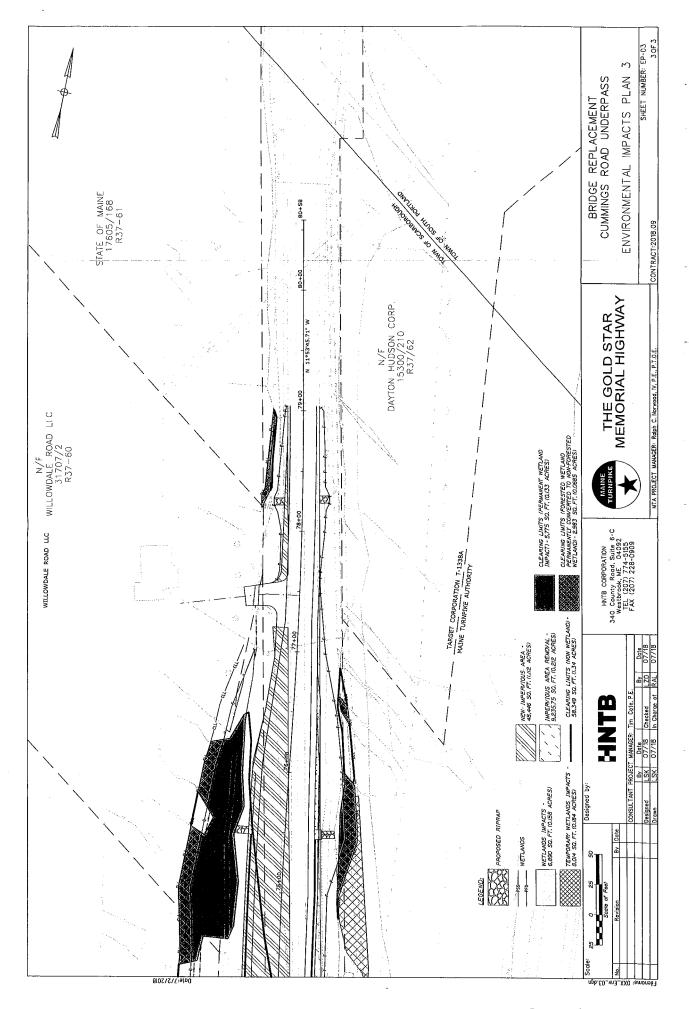


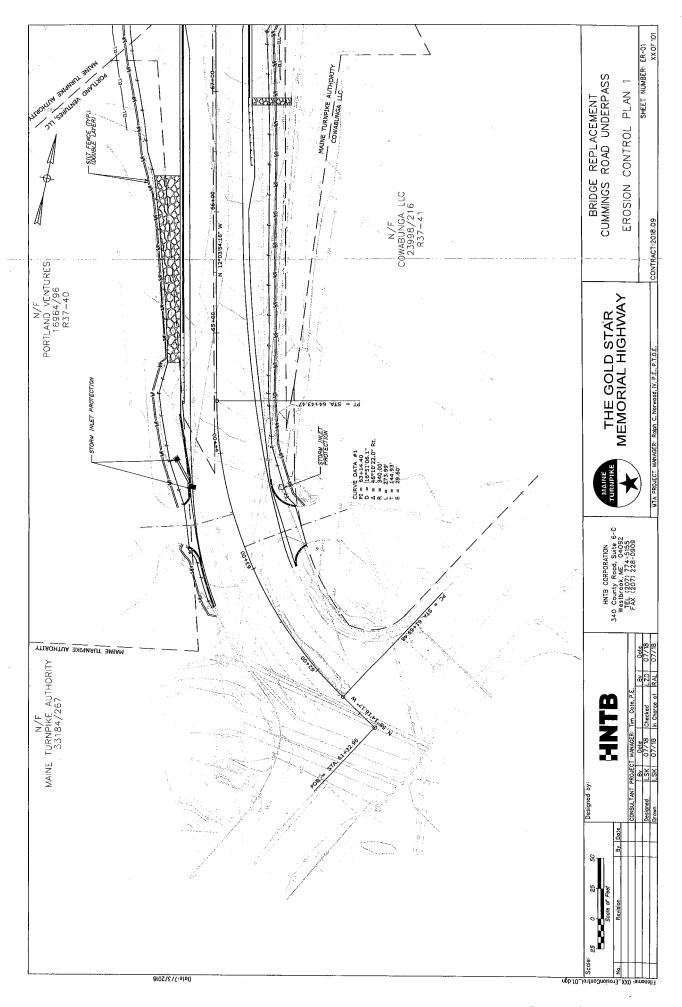


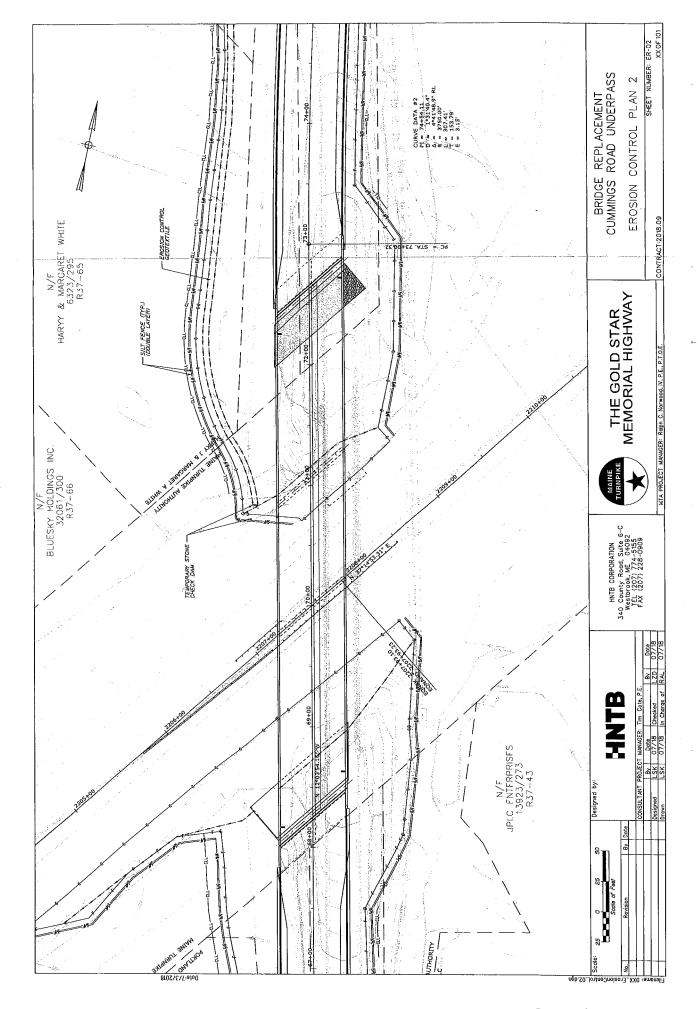


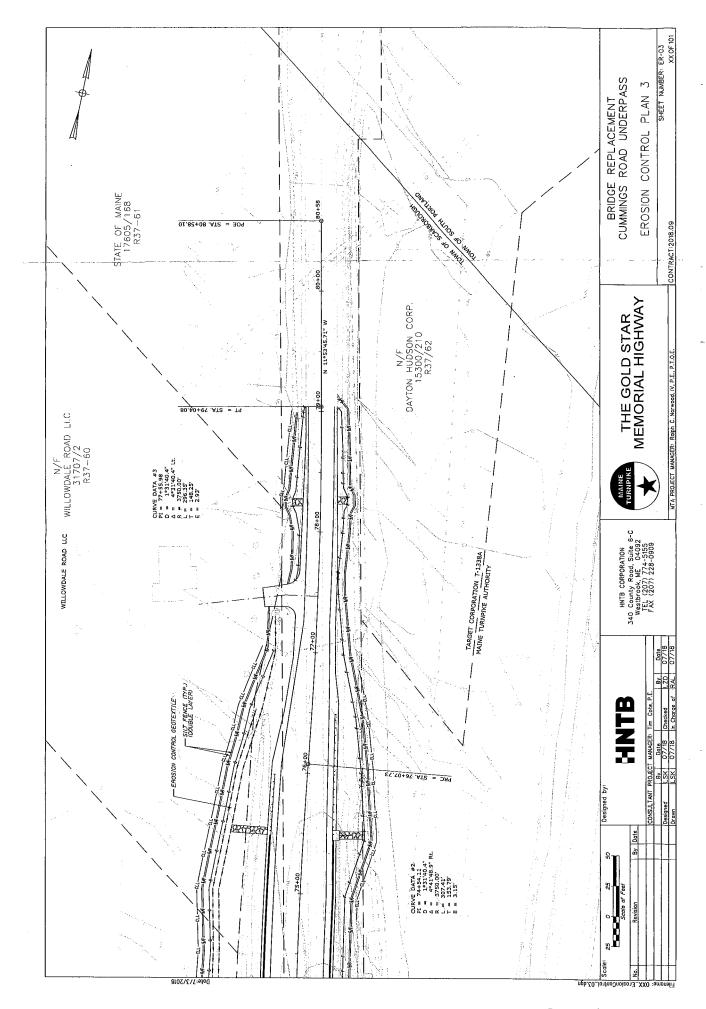














GENERAL PERMIT WORK-START NOTIFICATION FORM

(Minimum Notice: Two weeks before work begins)

***************	**********
* MAIL TO: U.S. Army Corps of Engineers, New Eng	gland District *
* Permits and Enforcement Branch * Pagulatory Division	*
* Regulatory Division* 696 Virginia Road	*
* Concord, Massachusetts 01742-2751	*
****************	**********
Corps of Engineers Permit No. NAE-2018-01709 was issue on . This work is located in freshwand the Maine Turnpike at South Portland, Maine. The per temporary and permanent fill in freshwater wetlands in ordeteriorated Cummings Road overpass over the Maine Turnwill result in approximately 6,890 s.f. of permanent and 8,0 The people (e.g., contractor) listed below will do the work, conditions and limitations. PLEASE PRINT OR TYPE Name of Person/Firm: Business Address:	ater wetlands off Cummings Road mit authorized the permittee to place er to reconstruct the existing applies and its approaches. The project of 14 s.f. of temporary wetland impact. and they understand the permit's
Telephone Numbers: ()	()
Proposed Work Dates: Start:	Finish:
Permittee/Agent Signature:	Date:
Printed Name:	Title:
Date Permit Issued:	Date Permit Expires:
FOR USE BY THE CORPS OF 1	
TOR USE DI THE CORPS OF	DITOINEDIS
PM: Clement Submittals R	equired: No
Inspection Recommendation: Inspect as convenient	

MAINE TURNPIKE AUTHORITY

Pre-Bid Conference

CONTRACT 2018.19

BRIDGE REPLACEMENT CUMMINGS ROAD UNDERPASS MILE 44.6

October 2, 2018, 10:00 A.M.

1) Location:

The general limits of work are as shown on the Contract Plans at Mile 44.6.

2) General Description:

The work consists of replacing the Cummings Road Bridge over the Maine Turnpike in the Town of Scarborough, Maine. The work includes phased construction of a new three span steel girder bridge, demolition of the existing bridge, ground improvements, construction of lightweight fill approach embankments, maintenance of traffic through the project site, and all other work incidental thereto in accordance with the Plans and Specifications.

3) Bid:

- a) Opening: October 16, 2018 at 11:00 A.M. at MTA Headquarters 2360 Congress Street, Portland.
- b) All bid and contractual questions shall be directed to Nate Carll. Phone No.: (207) 482-8115. E-Mail: ncarll@maineturnpike.com.
- c) All questions on plans and specifications shall be in writing and shall be directed to Nate Carll, Purchasing Manager, of the Maine Turnpike Authority. Fax No. (207) 871-7739. Email ncarll@maineturnpike.com

4) Notification:

a) Contractor shall notify and obtain approval from the Authority prior to visiting the Project sites for field inspection. The contact person is Mr. Steve Tartre at startre@maineturnpike.com

5) Contract Specifications

- a) The Specifications are divided into three parts: Part I, Supplemental Specifications, Part II, Special Provisions, and Part III Appendices.
- b) The Maine Turnpike Supplemental Specifications are additions and alterations to the 2014 Maine Department of Transportation Standard Specifications and are available on MTA's website.

1

- 6) Maine Department of Labor Fair Hourly Wages (Special Provision 104.3.8)
 - a) Contract includes "Heavy & Bridge" and "Highway & Earth" wage rates.

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7) <u>Utility Coordination (Special Provision 104.4.6)</u>

- a) Five aerial facilities are present along the east side of Cummings Road: CMP, Consolidated Communications, MCI World Communications, FirstLight, and Charter Communications. These services will be relocated permanently on new poles west of the proposed bridge by the respective utility companies during the fall of 2019.
- b) An underground waterline owned by Portland Water District crosses the Turnpike east of Cummings Road and more or less parallels the existing northeast toe of slope. Relocation of this facility is not planned.

8) <u>Cooperation With Other Contractors (Special Provision 104.4.7):</u>

- A. MTA Contract 2016.08 Interchange 44 Barrier Toll Plaza ORT Conversion, MM 44.3
- B. MTA Contract 2018.02 Rand Road Intersection Improvements, MM 47.3
- C. MTA Contract 2018.13 Guide Sign Modifications, Phase III Maine Turnpike Exits 32, 36, 42, 44 and 45. Mile 16.9 to 50.5.
- D. MTA Contract 2019.01 Scarborough/South Portland/Portland Mainline Pavement Rehabilitation, MM 42 44.3 and Exit 44 NB Ramp Improvements
- E. MTA Contract 2019.08 Scarborough/South Portland/Portland Median Safety Improvements, MM 43 49
- F. MTA Contract 2019.09 MCRR Overpass Bridge Widening and Rehabilitation, MM 47.9
- G. MTA Contract 2019.13 Exit 45 Interchange Reconstruction Pre-Load, MM 44.9
- H. MTA Contract 2019.16 Stroudwater River Overpass Bridge Widening and Rehabilitation, MM 46.7
- I. MTA Contract 2020.XX Exit 45 Interchange Reconstruction, MM 44.9
- J. MTA Contract 2020.XX Saco/Scarborough Mainline Pavement Rehabilitation, MM 35.5 42.0
- K. MTA Contract 2020.XX Mainline Widening and Median Safety Improvements, MM 44 49.3

9) Lead Paint (Special Provision 105.2.4.2)

a) The Contractor shall presume that the existing Cummings Road bridge contains lead based paint. Paint samples were not taken on this structure, therefore a Lead Determination Report is not available. The Contractor shall institute every precaution when working with materials coated with lead based paints.

10) Permit Requirements (Special Provision 105.8.2)

a) The Project is being constructed under the Maine Department of Environmental Protection (DEP) Natural Resources Protection Act Permit by Rule regulations, Section 11 – State Transportation Facilities, updated June 8, 2012. A copy of the Section 11 – State Transportation Facilities Permit by Rule regulations are attached in Appendix A.

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- b) The Project is being permitted under Section 404 of the Clean Water Act, through the US Army Corps of Engineers Programmatic General Permit, Category II. Final permit authorization was granted on September 24, 2018. A Contract Addendum will be issued acknowledging receipt of the permit and providing the actual US Army Corps of Engineer's permit conditions
- c) Maine Pollutant Discharge Elimination System (MPDES) General Permit for Stormwater Discharge from Construction Activity shall be followed.
- d) Limit of Disturbance Plan shall be submitted prior to any disturbance.
- e) The project is within an MS4 Area and the Contractor will be required to follow and sign the MS4 Awareness plan provided in Appendix C of the special provisions.

11) Construction Schedule/Substantial Completion:

- a) October 18, 2018 Contract Award Date
- b) April 6, 2019 Complete installation of wick drains and placement of ground improvement surcharge embankments.
- c) November 20, 2020 Construction of the proposed Cummings Road Underpass bridge shall be substantially complete.
- d) June 25, 2021 Contract Completion Date

12) Prosecution of Work (107.4.6) & Limits of Operations (Special Provision 107.4.7)

- a) Surface pavement, curbing, and guardrail within the Cummings Road approach roadways shall not be placed until May 15, 2021 to allow for expected settlement.
- b) Steel H-pile and/or sheet pile driving shall not occur between the hours of 8:00 PM 6:00 AM. H-pile driving will not be allowed within 10 feet of traffic.
- c) The installation of wick drains and placement of ground improvement surcharge embankments shall be complete on or before April 6, 2019 and shall remain in place for a minimum of four months.
- d) The longitudinal closure placement in the bridge deck shall be cast and cured for a minimum of 24 hours without traffic on the bridge.
- e) Due to the presence of marine deposits, material stockpiles exceeding 25 cubic yards will not be permitted on the project site to minimize the potential for slope instability. To the extent practical, the Contractor shall spread materials delivered for embankment construction as they arrive on site.
- f) Except as required for construction of the embankment surcharge, the Contractor will not be permitted to operate any cranes, heavy equipment or vehicles with a gross weight exceeding 5 tons on surcharged embankments. This restriction will be lifted following removal of the embankment surcharge.
- g) No permanent staging areas are allowed adjacent to the Exit 45 SB On-Ramp.
- h) Temporary lane shifts, lane closures, and shoulder closures along the Turnpike shall only be used during periods of activity. During periods of inactivity planned to last longer than one month, the

3 Page 23 of 40

Contractor shall shift or relocate temporary barrier and other maintenance of traffic devices to reestablish normal traffic conditions.

i) Turnpike median lane shifts, lane closures, and shoulder closures will not be allowed between December 1 and February 28.

13) Specific Contract Items

- a) Earthwork Summary and Preload Sequence (Plan Sheet 3)
- b) Section 203 Excavation and Embankment (Geofoam Lightweight Fill)
 - i) This work shall include furnishing all qualifications, shop drawings, material and equipment, placing and providing approved field quality control personnel to oversee and certify the installation of the Geofoam Lightweight Fill as shown on the approved shop drawings. Geofoam is referred to in this Specification as expanded polystyrene (EPS).
- c) Geofoam Lightweight Fill will be paid for at the Contract unit price per cubic yard which shall be full compensation for furnishing all qualifications, on-site supervision from supplier, shop drawings, labor, materials, equipment, dewatering and incidentals necessary to complete the work.
- d) Section 203 Excavation and Embankment (Sand Drainage Blanket)
 - i) Placed beneath the surcharge material and prior to installing prefabricated vertical drains.
 - ii) The material may remain in-place, including beneath geofoam in-lieu of leveling sand.
- e) Section 209 Wick Drains (Prefabricated Vertical Drains)
 - i) Pre-auguring for installation through frozen ground may be necessary; incidental to Item.
- f) Section 511 Cofferdams (Temporary Earth Support Systems)
 - i) Paid as one lump sum for any/all support systems used on the project, including systems required to be left in-place.
 - ii) Conceptually shown on the Plans contractor to locate and design as necessary.
 - iii) Removal limitations exist near geofoam refer to Plan Sheet 9 (MOT-03).
- g) Section 526 Concrete Barrier (Temporary Concrete Barrier, Anchored)
 - i) Thru-bolting prohibited
- h) Section 639 Instrumentation (Geotechnical)
 - i) Installation to be performed by the contractor; readings to be taken by the Authority.

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- i) Section 646 Settlement Platforms (Geotechnical)
 - i) Installation to be performed by the contractor; survey after installation to be performed by the Authority.
- j) Section 652 Maintenance of Traffic
 - i) Cummings Road temporary lane closure windows are 7:00PM to 7:00AM, Sunday through Thursday nights. Additional closure windows and allowances with Resident approval.
 - ii) Cummings Road temporary lane closure windows near the Payne Road intersection are: All lanes at all legs of the intersection shall be maintained at all times with the exception of between 9:00 p.m. and 6:00 a.m. Sunday through Thursday nights. During this overnight period, southbound Cummings Rd traffic may be reduced from four lanes to two lanes provided right and left turn movements onto Payne Rd are maintained.
 - iii) If approved by the Resident, Cummings Road may be reduced to a single lane of alternating one-way traffic on Saturdays and Sunday from 7 a.m. until 7 p.m. with the exception of weekends between Thanksgiving and Christmas.
 - iv) A single weekend closure of Cummings Road, with an off-site detour for the purpose of placing and curing the bridge deck closure joint, is permitted as defined in Subsection 107.4.6 Prosecution of Work.
 - v) In addition, with approval by the Resident, Cummings Road between STA 64+50 and 77+00 may be closed to traffic from 10:00 p.m. until 5:30 a.m. to accommodate specific construction operations that promote safety of the traveling public, reduce traffic impacts along the Turnpike, and/or provide a better final product.
 - vi) Maine Turnpike temporary lane closures times are included in tables in the SP's. In general daytime lane closures are not permitted.
 - vii) The Automated Speed Limit Sign Special Provision has been revised and the Contractor shall fill out the price in the bid form. Automated Trailer Mounted Speed Limit Signs shall only be used when a work zone speed limit is in place during temporary lane closures. The Contractor shall manage the utilization and operation of the Automated Trailer Mounted Speed Limit Signs and if at least one is not used when work zone speed limits are in place then it will be considered a Traffic Control Plan violation and result in a reduction of payment as outlined in Section 652.
 - viii) When a pay item for a Truck Mounted Attenuator (TMA) is included in the contract at least one TMA will be required on the project and its use will be required. The Truck Mounted Attenuator shall be utilized in lane closures and other construction operations where workers are exposed to traffic and not protected by other positive means. The Contractor shall manage the utilization and operation of the TMA and if at least one is not used as described above then it will be considered a Traffic Control Plan violation and result in a reduction of payment as outlined in Section 652.

5 Page 25 of 40

14) Anticipated Addendum Items (To be issued following pre-bid meeting):

- a) Updated Special Provision language in Section 105.8.2 regarding the recently received ACOE permit.
- b) Piezometer readings in SP 646 (SP-107, paragraph 5 vs Plan sheet73, note 2)

15) Questions

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6

Contract 2018.19 Cummings Road Underpass Bridge Replacement

SIGN-IN SHEET Please Print

PRE-BID MEETING

October 2, 2018

Name	Company and/or Address	Phone	E-Mail
Josh Geno	HANB	228-0813	Solude Liebson
Nate Carll	MTH	GB3-8115	1 Carlle mainetumoike. Com
Lake Driscoll	HATS	228-0884	lansell@hito.com
Jim Wentwost	HI Red! Reed	319-8530	Lientworth Crash - Lord - Land
Stor Tarthe	MIA	831-58/4	Sto he empiretury of to con
Mat Gillahan	Gudden	856-4869990	Mathaliden Daving, Con
ART BURGESS	graff Sons Inc.	345-3311	avto gratandsons, net
JOSH HART	R.J. Grand on and Sons	2411-1168	estimators and inconstruction.com
Loren Blair	LASairezikairelustries.	240 -9247	LBlair Roj Keindustries, Com
JAKE ALJAMS	SWADAMSOCPM CONSTLUCTORS	1270AS 837-5381	
Scott Warehol	CIPA CONSTRUCTORS NATA	168	suxizhole manetumpike.com

ITEM NO.	ITEM DESCRIPTION	UNIT	CIVIL QUANTITY	BRIDGE QUANTITY	TOTAL QUANTITY	
201.11	Clearing	AC	2		2	
202.19	Removing Existing Bridge (Structural Steel = 112 Tons, Concrete = 580 CY)	LS		1	1	
202.202	Removing Pavement Surface	SY	1120		1,120	1
203.20	Common Excavation	CY	18,600		18,600	1
203.24	Common Borrow	CY	10,000		10,000	1
203.25	Granular Borrow	CY	850	650	1,500	1 ,
203.43	Geofoam Lightweight Fill	CY	5,400		5,400	1//
203.45	Leveling Sand	CY (1,450		1,450	∀ ′
203.46	Sand Drainage Blanket	CY	3,800		3,800	1
206.082	Structural Earth Excavation - Major Structures, Plan Quantity	CY	2,000	600	600	1
206.10	Structural Earth Excavation - Piers	CY		690	690	
209.29	Prefabricated Vertical Drains	LF	183,000		183,000	//
304.10	Aggregate Subbase Course - Gravel	CY (4,900		4,900	₩
304.14	Aggregate Base Course - Type A	CY	800		800	ľ
403.207	Hot Mix Asphalt, 19.0 mm Nominal Maximum Size	TON	950		950	
403.208	Hot Mix Asphalt, 12.5 mm Nominal Maximum Size	TON	760	400	1,160	-
403.2084	Hot Mix Asphalt, 12.5 mm Nominal Maximum Size (sidewalks, drives, islands & incidentals)	TON	40	100	40	
403.212	Hot Mix A sphalt, 4.75 mm Nominal Maximum Size	TON	30		30	1
403.213	Hot Mix Asphalt, 12.5 mm Nominal Maximum Size (Base and Intermediate Course)	TON	570		570	-
409.15	Bituminous Tack Coat, Applied	GAL	430	160	590	1
419.30	Sawing Bituminous Pavement	LF	990	100	990	1
501.231	Dynamic Loading Test	EA		4	4	1
501.54	Steel H-beam Piles 117 lb/ft, delivered	LF		11,300	11,300	-
501.541	Steel H-beam Piles 117 lb/ft, in place	LF		10,600	10,600	-
501.90	Pile Tips	EA		112	112	-
501.91	Pile Splices	EA		336	336	-
501.92	Pile Driving Equipment Mobilization	LS		1	1	
502.219	Structural Concrete, Abutments and Retaining Walls (635 CY)	LS		1	1	1
502.239	Structural Concrete, Piers (593 CY)	LS		1	1	1
502.26	Structural Concrete Roadway and Sidewalk Slab on Steel Bridges (737 CY)	LS		1	1	
502.264	Structural Concrete, Parapet (102 CY)	LS		1	1	1
502.31	Structural Concrete Approach Slab (107 CY)	LS		1	1	1
502.452	Structural Concrete Distribution Slab (350 CY)	LS		1	1	-
503.14	Epoxy-Coated Reinforcing Steel, Fabricated and Delivered	LB		479,900	479,900	
503.14	Epoxy-Coated Reinforcing Steel, Placing	LB		479,900	479,900	1
503.17	Mechanical/Welded Splice	EA		330	330	1
504.702	Structural steel fabricated and delivered, welded (1190000 LB)	LS		1	1	-
504.702	Structural steel erection (1190000 LB)	LS		1	1	-
505.08	Shear Connectors (8176 EA)	LS		1	1	
506.9104	Thermal Spray Coating (Shop Applied)	LS		1	1	1
507.091	Aluminum Bridge Railing, 1 Bar (882 LF)	LS		1	1	1
	High Performance Waterproofing Membrane (2700 SY)	LS		1 1	1	-
508.14	Temporary Earth Support Systems			1	1	\cdot
511.091		LS		100	1 400	-
513.09	Slope Protection - Portland Cement Concrete	SY		400	400	

ITEM NO.	ITEM DESCRIPTION	UNIT	CIVIL QUANTITY	BRIDGE QUANTITY	TOTAL QUANTITY
513.22	Crushed Stone Slope Protection	SY		320	320
514.06	Curing Box for Concrete Cylinders	EA		1	1
515.202	Clear Protective Coating for Concrete Surfaces	SY		1,800	1,800
520.21	Expansion Device - Gland Seal (150 LF)	EA		2	2
523.52	Bearing Installation	EA		28	28
523.5401	Laminated Elastomeric Bearings, Fixed	EA		7	7
523.5402	Laminated Elastomeric Bearings, Expansion	EA		21	21
524.40	Protective Shielding - Steel Girders	SY		2,050	2,050
526.304	Temporary Concrete Barrier, Anchored (440 LF)	LS		1	1
526.306	Temporary Concrete Barrier, Type I - Supplied by Authority	LS	1		1
<i>J</i> 20.300	(2,860 LF)	Lo	1		1
527.341	Work Zone Crash Cushions - TL-3	UN	2		2
527.342	Work Zone Crash Cushions - TL-2	UN	2		2
603.169	15 Inch Culvert Pipe Option III	LF	20		20
604.184	Rebuild Catch Basin to Grade - Type II	EA	1		1
604.301	Special Catch Basin - Bioscape Vault Basin	EA	1		1
604.302	Special Catch Basin - Standard Offline Basin	EA	2		2
605.10	6 inch Underdrain Outlet	LF	20		20
606.13	31" W-Beam Guardrail - Mid-Way Splice (7' Steel Post, 8" Offset Blocks, Single Faced)	LF	970		970
000.13	31" W-Beam Guardrail - Mid-Way Splice Tangential Terminal	EA	2		2
606.1306	(31" Height)	LAX			2
606.1351	Terminal End - Anchored End - 31" W-Beam Guardrail	EA	2		2
606.1723	Bridge Transition Type III	EA	4		4
606.178	Guardrail Beam	LF	820		820
606.24	Guardrail Type 3d - Single Rail	LF	50		50
606.278	Terminal End - Anchored End	EA	2		2
606.352	Reflectorized Beam Guardrail Delineator	EA	7		7
606.356	Underdrain Delineator Post	EA	2		2
606.3561	Delineator Post - Remove and Reset	EA	9		9
606.3605	Guardrail - Remove, Modify and Reset Single Rail	LF	390		390
606.3606	Guardrail - Remove, Modify and Reset Double Rail	LF	220		220
606.47	Single Wood Post	EA	1		1
606.48	Single Galvanized Steel Post	EA	96		96
607.17	Chain Link Fence – 6 foot	LF	690		690
607.23	Chain Link Fence Gate	EA	2		2
607.32	Bracing Assembly Type I - Metal Posts	EA	6		6
607.33	Bracing Assembly Type II - Metal Posts	EA	8		8
609.11	Vertical Curb Type 1	LF	62		62
609.12	Vertical Curb Type 1 - Circular	LF	43		43
609.15	Slope Curb Type 1	LF		950	950
609.234	Terminal Curb Type 1 - 4 foot	EA	1		1
609.2341	Terminal Curb Type 1 - 4 foot - Circular	EA	1		1
609.31	Curb Type 3	LF	950		950
609.38	Reset Curb Type 1	LF	80		80
610.08	Plain Riprap	CY	250		250
610.181	Temporary Stone Check Dam	CY	2		2
613.319	Erosion Control Blanket	SY	6,150		6,150
	<u> </u>	~ -	- 7		1 -, -, -,

ITEM NO.	ITEM DESCRIPTION	UNIT	CIVIL QUANTITY	BRIDGE QUANTITY	TOTAL QUANTITY
615.07	Loam	CY	1,200		1,200
618.13	Seeding Method Number 1	UN	9		9
618.14	Seeding Method Number 2	UN	87		87
619.1201	Mulch, Plan Quantity	UN	96		96
619.1202	Temporary Mulch	LS	1		1
620.58	Erosion Control Geotextile	SY	140		140
620.70	HDPE Geomembrane	SY	4,950		4,950
626.33	30 Inch Foundation, 8 feet or less Foundation	EA	2		2
627.712	White or Yellow Pavement Marking Line	LF	10,700		10,700
627.73	Temporary 6 Inch Pavement Marking Tape	LF	1,300		1,300
627.75	White or Yellow Pavement & Curb Marking	SF	130		130
627.77	Removing Existing Pavement Marking	SF	9,600		9,600
627.78	Temporary Pavement Marking Line, White or Yellow	LF	22,100		22,100
627.812	Temporary Raised Pavement Markers	EA	2,600		2,600
629.05	Hand Labor, Straight Time	HR	60		60
631.10	Air Compressor (including operator)	HR	20		20
631.11	Air Tool (including operator)	HR	40		40
631.12	All Purpose Excavator (including operator)	HR	10		10
631.171	Truck - small (including operator)	HR	35		35
631.172	Truck - large (including operator)	HR	35		35
631.22	Front end loader (Including Operator)	HR	35		35
631.32	Culvert Cleaner (including Operator)	HR	10		10
631.36	Foreman	HR	20		20
639.18	Field Office, Type A	EA	1		1
639.26	Instrumentation - Geotechnical	LS	1		1
645.272	Regulatory, Warning and Bridge Number Signs, Type I - Supplied by Authority	EA	2		2
645.292	Regulatory, Warning, Confirmation and Route Marker Assembly Signs Type II	EA	2		2
645.503	Remove and Reset Bridge Mounted Guide Sign to Ground Mounted	LS	1		1
645.504	Remove and Reset Mainline Sign	LS	1		1
646.091	Settlement Platforms	LS	1		1
652.30	Flashing Arrow	EA	2		2
652.312	Type III Barricades	EA	18		18
652.33	Drum	EA	170		170
652.34	Cone	EA	80		80
652.35	Construction Signs	SF	1,200		1,200
652.361	Maintenance of Traffic Control Devices	LS	1		1
652.38	Flaggers	HR	1,400		1,400
652.41	Portable-Changeable Message Sign	EA	3		3
652.45	Truck Mounted Attenuator	CD	130		130
652.452	Automated Trailer Mounted Speed Limit Sign	EA	2		2
656.50	Baled Hay, in place	EA	25		25
656.60	Temporary Berms	LF	2,100		2,100
656.62	Temporary Slope Drains	LF	200		200
656.632	30 inch Temporary Silt Fence	LF	6,000		6,000
659.10	Mobilization	LS	1		1

Scale:				Designed by	:				
No.						HN	ITD		
110.	Revision	Ву	Date	-					
/	QUANTITY CHANGES	LZD	10/18						
1				CONSULTANT	PROJEC	T MANAGER:	Tim Cote, P.E.	•	
					Ву	Date		Ву	Date
				Designed	LSK	08\18	Checked	LZD	08\1
				Drawn	LSK	08\18	In Charge of	RAL	08\1

HNTB CORPORATION

340 County Road, Suite 6-C
Westbrook, ME 04092
TEL (207) 774-5155
FAX (207) 228-0909



THE GOLD STAR MEMORIAL HIGHWAY

BRIDGE REPLACEMENT CUMMINGS ROAD UNDERPASS

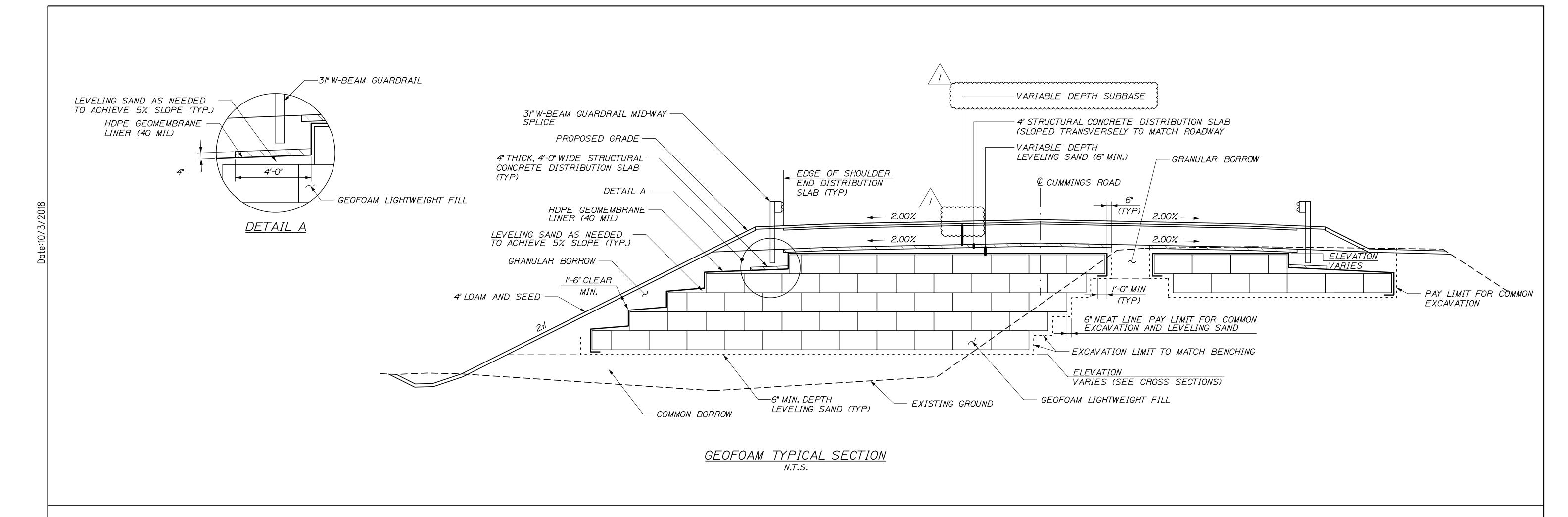
ESTIMATED QUANTITIES

CONTRACT:2018.19

SHEET NUMBER: EQ-01

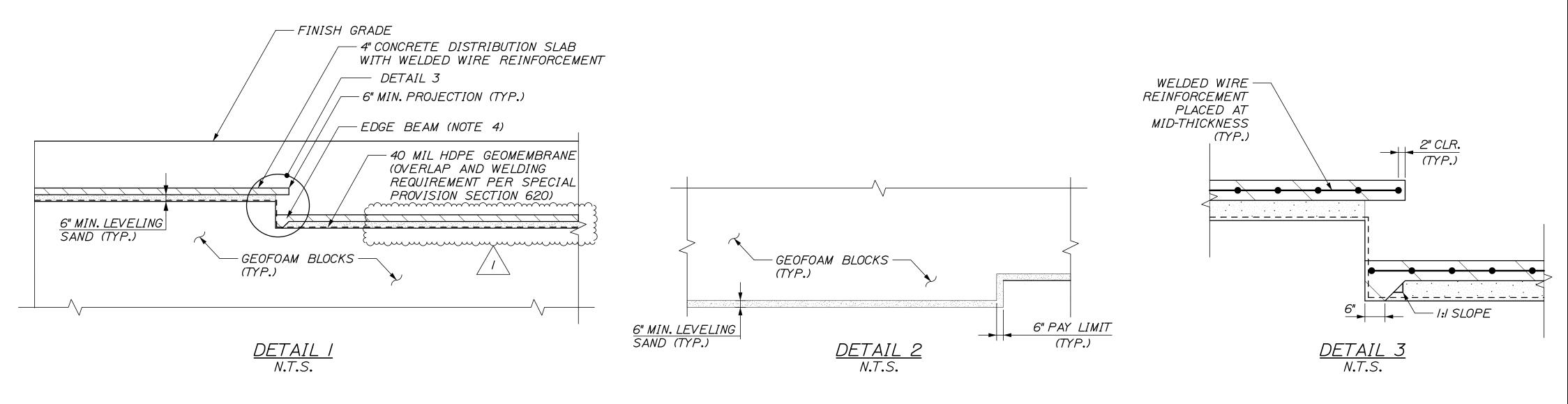
MTA PROJECT MANAGER: Ralph C. Norwood, IV, P.E., P.T.O.E.

2 OF 135



GOEFOAM NOTES:

- I. GEOFOAM LIGHTWEIGHT FILL SHALL BE INSTALLED IN ACCORDANCE WITH THE PROJECT SPECIAL PROVISIONS.
- 2. WELDED WIRE REINFORCEMENT SHALL BE INCIDENTAL TO PAY ITEM 502.452, STRUCTURAL CONCRETE DISTRIBUTION SLAB.
- 3. STRUCTURAL WELDED WIRE REINFORCEMENT SHALL BE UNCOATED 6x6-W5.5xW5.5.
- 4. EDGE BEAMS SHALL BE FORMED AT ALL LONGITUDINAL STEPS IN GEOFOAM EMBANKMENT AND WHERE THE CONCRETE DISTRIBUTION SLAB ABUTS CONCRETE WINGWALLS AND ABUTMENTS.



LONGITUDINAL DETAILS
(SEE SHEET GT-01 AND GT-02 FOR DETAIL LOCATION)

Spe	Scal	e:				Designed b	y:					
eofoam								HN	ITB			
-66	No.		Revision	Ву	Date							ن ا
900	1	SUBBASE	DEPTH CLARIFICATION	JKO	10/18							
						CONSULTANT	PROJEC	T MANAGER:	Tim Cote, P.E	,		
ıme							Ву	Date		Ву	Date	
ilename						Designed	BAM	08\18	Checked	JKO	08\18	
E						Drawn	EDD	08\18	In Charge of	RAL	08\18	

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BRIDGE REPLACEMENT
CUMMINGS ROAD UNDERPASS

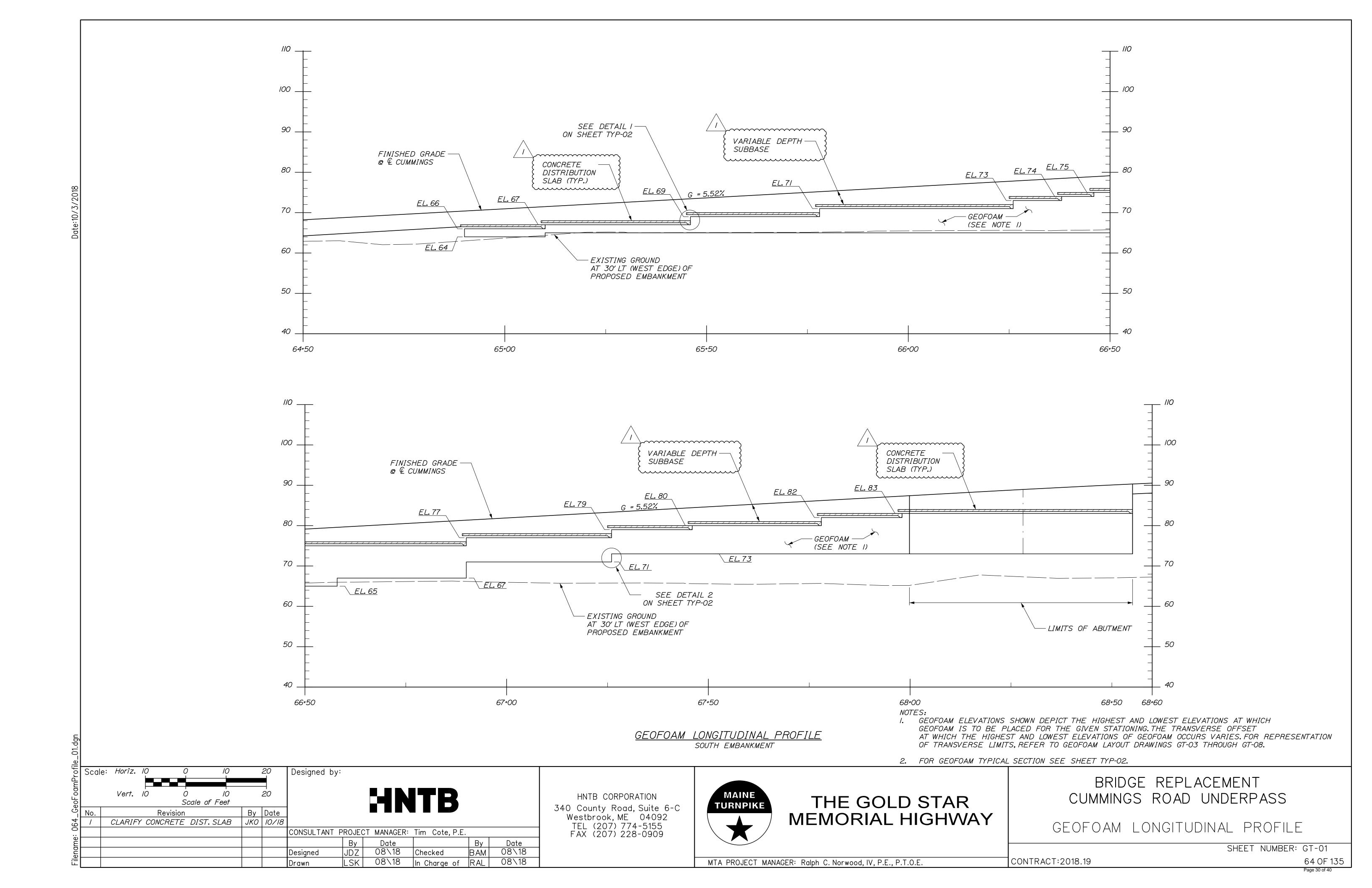
GEOFOAM SPECIAL DETAILS

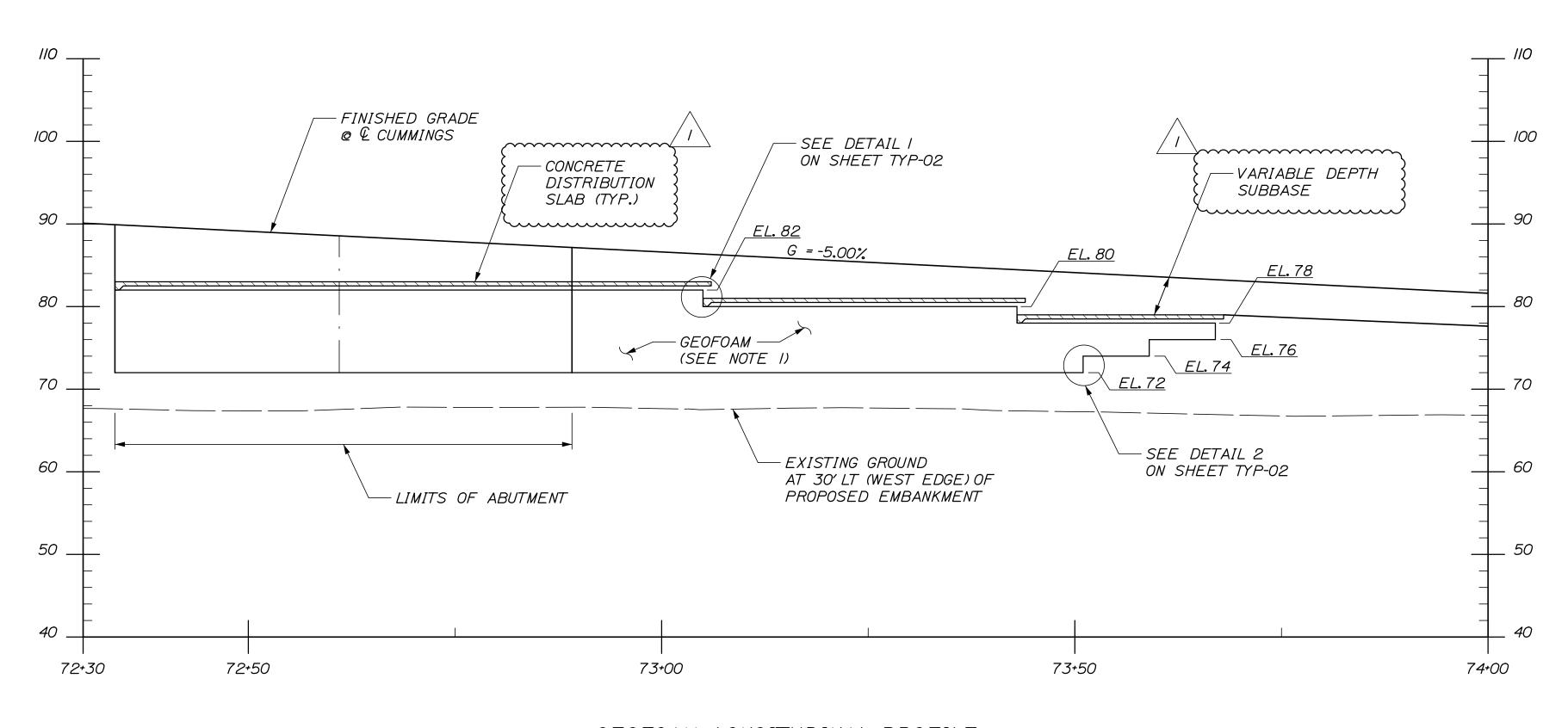
SHEET NUMBER: TYP-02 6 OF 135

MTA PROJECT MANAGER: Ralph C. Norwood, IV, P.E., P.T.O.E.

CONTRACT:2018.19

nge 29 of 40





GEOFOAM LONGITUDINAL PROFILE NORTH EMBANKMENT

I. GEOFOAM ELEVATIONS SHOWN DEPICT THE HIGHEST AND LOWEST ELEVATIONS AT WHICH GEOFOAM IS TO BE PLACED FOR THE GIVEN STATIONING. THE TRANSVERSE OFFSET AT WHICH THE HIGHEST AND LOWEST ELEVATIONS OF GEOFOAM OCCURS VARIES. FOR REPRESENTATION OF TRANSVERSE LIMITS, REFER TO GEOFOAM LAYOUT DRAWINGS GT-03 THROUGH GT-08.

2. FOR GEOFOAM TYPICAL SECTION SEE SHEET TYP-02.

Scale: Horiz. 10 Designed by: HNTB By Date

JKO 10/18 Revision CLARIFY CONCRETE DIST. SLAB CONSULTANT PROJECT MANAGER: Tim Cote, P.E. By Date
JDZ 08\18 By BAM Date 08\18 Designed Checked In Charge of RAL

HNTB CORPORATION 340 County Road, Suite 6-C Westbrook, ME 04092 TEL (207) 774-5155 FAX (207) 228-0909



THE GOLD STAR MEMORIAL HIGHWAY

BRIDGE REPLACEMENT CUMMINGS ROAD UNDERPASS

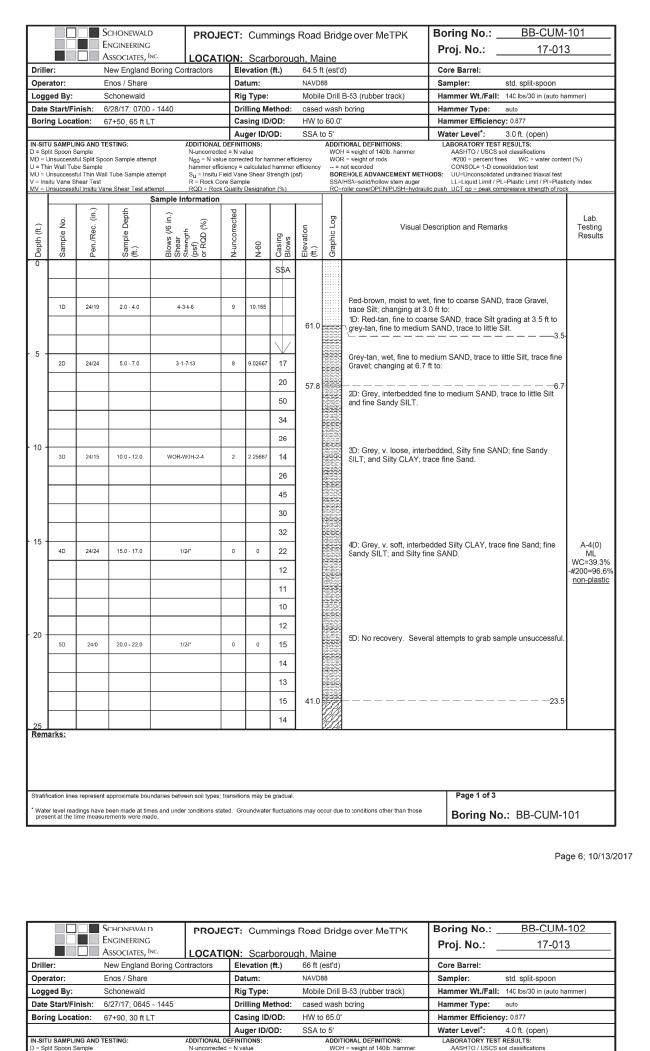
GEOFOAM LONGITUDINAL PROFILE

SHEET NUMBER: GT-02

MTA PROJECT MANAGER: Ralph C. Norwood, IV, P.E., P.T.O.E.

CONTRACT:2018.19

65 OF 135 Page 31 of 40



		Schonewald	PRO	JECT:	Çum	minas	Roac	Brid	ge over MeTPK Boring No.: BB-CUM-102
		Engineering	1.100			_			Proj. No.: 17-013
		Associates, In	1-0-071						· -
			Boring Contractors	_		(ft.)			Core Barrel:
									Sampler: std. split-spoon
			4445	$\overline{}$		-411-			B-53 (rubber track) Hammer Wt./Fall: 140 lbs/30 in (auto hammer)
				$\overline{}$					bering Hammer Type: auto Hammer Efficiency: 0.677
Local	uon.	67+90, 30 π L	ı	_					Water Level*: 4.0 ft. (open)
		TESTING:		L DEFINI	TIONS:	JD.	30A	ADDI	IONAL DEFINITIONS: LABORATORY TEST RESULTS:
successf Wall Tub successf Vane Sl	ul Split Sp be Sample ul Thin Wa hear Test	all Tube Sample att	pt N ₆₀ = N va hammer eft tempt S _u = Insitu R = Rock C	lue corre- ficiency = Field Var Core Sam	cted for ha calculated ne Shear S ple	l hammer trength (p	efficiency	WOI BOF SSA	= veight of 140lb. hammer
successfi	ul Insitu V				Designati	on (%)		RC=	oller cone/OPEN/PUSH=hydraulic push UCT ap = peak compressive strength of rock
ample No.	en./Rec. (in.)	Depth	•		09-7	asing	:levation t.)	raphic Log	Visual Description and Remarks Testing Results
o o		00 E	B 0 0 5 0			SSA	ш	31.	
							1		
10	24/44	20.40	2015		6 77		1		Tan, damp to moist, loose, fine to coarse SAND, little to some
10	24/14	2.0 - 4.0	J=Z=4=U	1 0	0.77				Gravel, trace to little Silt; changing at 3.4 ft to:
							62.6		1D: Red brown, fine to medium SAND, trace Silt, trace Gravel, SP-SN
									trace coarse Sand; minor organics (roots) at 3.4 π. WC=17.2
2D	24/16	5.0 - 7.0	5-6-4-7	12	13.54	115	1		Red tan, wet, fine to coarse SAND, trace Gravel, trace Silt; changing at 6. 0 ft to:
							60.0		2D: Grey tan, wet, fine to medium SAND, trace to little Silt, with
						67	59.2		one 2-inch layer fine Sandy SILT in bottom of sample.
						35			6.8
						32	1		
						20	1		
									3D: Grey, medium dense, interbedded fine SAND, little Silt; fine
3D	24/12	10.0 - 12.0	5-5-9-7	14	15.7967	47			to medium SAND, trace SIIt; and fine Sandy SILT.
						48			
						56	1		
							-		
						52			
						66			
4D	24/9	15.0 - 17.0	3-2-1-2	5	5.64167	53			4D: Grey, loose, fine to medium SAND, trace Silt.
$\neg \neg$						45	1		
				-	_		-		
				_		38			
						46			
						49]		
50	24/19	20.0 22.0	VANE INTERVAL			49	1		5D: Grey, interbedded, fine Sandy SILT; Silty CLAY, trace fine
5D V1	24/19	20.0 - 22.0 20.6 - 21.0	VANE INTERVAL Su= 467 ' 41 psf	_	_		-		Sand; and fine SAND, some Silt. V1: Tu=17 / Tr=1.5 ft-lbs (65 mm x 130 mm vane); sand lenses
ΜV		21.6 - 21.8				33			apparent. MV: Unable to push vane past 21.8 ft.
		1				45			, , , , , , , , , , , , , , , , , , , ,
_						40	1		
		1			1		1		
		1			1	48		PETER 3	I
S S S S S S S S S S S S S S S S S S S	or: d By: Loca SAMPLI Expon S SAMPLI Spoon S SAMPLI Spoon S SAMPLI Spoon S SAMPLI Spoon S SAMPLI 30 SAMPLI	Or: d By: tart/Finish: Location: SAMPLING AND I Spoon Sample successful Split Syll Syll Syll Syll Syll Syll Syll Syl	Core Enos / Share	New England Boring Contractors	New England Boring Contractors Elicor: Enos / Share Da	New England Boring Contractors Elevation Datum: Cor: Enos / Share Datum: Cor: Co	New England Boring Contractors	New England Boring Contractors	New England Boring Contractors

HNTB

Checked

In Charge of RAL

CONSULTANT PROJECT MANAGER: Tim Cote, P.E.

By Date
JKO 08\18

PEB 08\18

Designed by:

Designed

By Date

Scale:

Revision

	=	CHONEWALD) РЕ	ROJE	CT:	Cum	mings	Road	Brid	ge over MeTPK Boring No.: BB-CUM-101
		NGINEERING SSOCIATES, I					_			Proj. No. : 17-013
					_		boroug			Core Barrel;
			Borning Contracti	ЛБ	-		(11.)			<u>'</u>
					+					Sampler: std. split-spoon
_					+-					B-53 (rubber track) Hammer Wt./Fall: 140 lbs/30 in (auto hammer
					_					
Location	: 67	7+50, 65 ft L			-					Hammer Efficiency: 0.677
poon Samp uccessful St Vall Tube St uccessful Th Vane Shear	le plit Spooi ample nin Wall ⁻ Test	n Sample attem Tube Sample at	N-und pt N ₆₀ = hamn tempt S _u = R = R	orrected N value er efficie nsitu Fie ock Core	DEFINIT I = N va e correct ency = celd Vane e Samp	IONS: lue led for ha calculated Shear S	mmer effi I hammer strength (p	ciency efficiency	WOI WOI BOF	Water Level*: 3.0 ft. (open) Laboratory TEST RESULTS: + weight of 140lb, hammer = weight of 140lb, hammer = weight of 140lb, hammer = weight of rods = Weight of rods + 200 = percent fines
			Sample Informa	tion						
Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf)	(%)	N-uncorrected	09-N	Casing Blows	Elevation (ft.)	Graphic Log	Visual Description and Remarks
6D 2	4/24	25.0 - 27.0	VANE INTERVA				15		8/1/8	6D: Grey, Silty CLAY, with numerous partings and seams of fine Sandy SILT.
V1 V2							12			V1: Tu=11 / Tr=0.5 ft-lbs (65 mm x 130 mm vane)
+			<u> </u>	+						V2: Tu=14 / Tr=1 ft-lbs (65 mm x 130 mm vane)
				\dashv						
				-						
				+						U1: Dark grey with black streaks, Silty CLAY.
U1 2	4/21	30.0 - 32.0	HYD PUSH							
				+						
7D ,	4/24	35,0 - 37 n	VANE INTERVA							7D: Dark grey with black streaks, Silty CLAY.
V3										V3: Tu=12.5 / Tr=0.5 ft-lbs (65 mm x 130 mm vane)
**		30.0 - 37.0	00-407714 ps	+						V4: Tu=17 / Tr=0.5 ft-lbs (65 mm x 130 mm vane)
				-						
				-						U2: Dark grey with black streaks, Silty CLAY with shell
U2 2	4/21	40.0 - 42.0	HYD PUSH	\perp						fragments. WC LL
\perp				\dashv						PI <u>P</u>
				_			9			
				\dashv						
				\dashv			-			8D: Dark grey with black streaks, Silty CLAY with soft concretions
8D 2 V5	4/20	45.0 - 47.0 45.6 - 46.0	VANE INTERVA Su= 618 / 14 ps	-			12			throughout. V5: Tu=22.5 / Tr=0.5 ft-lbs (65 mm x 130 mm vane)
V6		46.6 - 47.0	Su= 522 / 14 ps				9			V6: Tu=19 / Tr=0.5 ft-lbs (65 mm x 130 mm vane)
				\perp			10			
				_			10			
							9		1///	
1 2 L F F 1 V 1 V 1 C 1 C 1 C 1 C 1 C 1 C 1 C 1 C	CONTROL OF THE PROPERTY OF THE	### EBY: Single Sin	### Enos / Share By: Schonewald ###################################	Second	By: Schonewald art/Finish: 6/28/17: 0700 - 1440 Location: 67+50, 65 ft LT AMPLING AND TESTING: Doon Sample Coessful Silk Spoon Sample attempt all Tube Sample attempt and Shear Test attempt To a Shear Test Sample Information Sample Information ON 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Second S	By Schonewald Rig Type:	By: Schonewald Rig Type: Datum: Rig Type: Drilling Method: Casing ID/OD: Augur I	Schonewald Rig Type: Mobil ArtiFinian: 6/28/17: 0700 - 1440 Drilling Method: Casset Cass	Schonewald Rig Type: Mobile Drill

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			Schonewald Engineering	PROJ	ECT:	Cum	mings	Road	Brid	ge over MeTPK Boring No.: BB-CUM-	
		==	Associates, In	c. LOCA	ΓΙΟΝ:	Scar	borou	gh, Ma	aine	Proj. No.: 17-013	3
Orille				Boring Contractors	$\overline{}$	evation	(ft.)	66 ft		Core Barrel:	
•	ator:		Enos / Share		_	tum:		NAVD		Sampler: std. split-spoon	
	ed By: Start/Fi		Schonewald 6/27/17; 0645	1445	$\overline{}$	g Type: illing M				B-53 (rubber track) Hammer Wt./Fall: 140 lbs/30 in (auto haboring Hammer Type: auto	immer)
	ng Locat		67+90, 30 ft LT		$\overline{}$	sing ID			65.0	boring Hammer Type: auto Hammer Efficiency: 0.677	
	.9		07 - 00, 00 11 21	'	_	ger ID/		SSA		Water Level*: 4.0 ft. (open)	
	J SAMPLI lit Spoon S		TESTING:	ADDITIONAL N-uncorrec						TONAL DEFINITIONS: LABORATORY TEST RESULTS: H = weight of 140lb, hammer AASHTO / USCS soil classifications	
) = ไ = Th	Insuccessf in Wall Tub	ul Səlit Sp e Sample	oon Sample attempall Tube Sample att	ot N ₆₀ = N va hammer eft	lue correcticiency =	cted for ha	ammer effi d hammer	ciency efficiency	WOF	R = weight of rods -#200 = percent fines WC = water content recorded CONSOL= 1-D consolidation test	nt (%)
: Ins	itu Vane Sl	hear Test		R = Rock C	ore Samp	ole		sf)	SSA	REHOLE ADVANCEMENT METHODS: UU=Unconsolidated undrained triaxial test /HSA=solid/hollow stem auger	city Index
/ = L	Insuccessf	ul Insitu Va	ane Shear Test atte	empt RQD = Roo Sample Information		Designati	ion (%)		RC=	roller cone/OPEN/PUSH=hvdraulic push UCT qp = peak compressive strength of roc	k
Deptin (n.)	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	Lab. Testing Results
<u>5</u>								⊞€	Ō	6D: Grey, v. soft, Silty CLAY, with one 1-inch and one 1/4-inch	
	6D	24/24	25.0 - 27.0	WOR/24"	0	0	45	40.0	PR	seams fine Sandy SILT near top of sample.	
							33				
							32				
							31				
_							35				
0 -	U1	24/24	30.0 - 32.0	HYD PUSH			37			U1: Grey, Silty CLAY.	CONSOL
							41				WC=42.6% LL=35.0
							45				PL=23.8 PI=11.2
							50				
							53				
5 -			250 270							7D: Dark grey with black streaks, Silty CLAY; strong organic	WC=35.1%
	7D V2	24/14	35.0 - 37.0 35.6 - 36.0	VANE INTERVAL Su= 440 / 27 psf			49			odor. V2: Tu=16 / Tr=1 ft-lbs (65 mm x 130 mm vane)	LL=34.7 PL=23.2
	V3		36.6 - 37.0	Su= 481 / 27 psf			40			V3: Tu=17.5 / Tr=1 ft-lbs (65 mm x 130 mm vane)	<u>PI=11.5</u>
							41				
							44				
0 -							47			LIO Destruction O'II OLAY	
	U2	24/18	40.0 - 42.0	HYD PUSH			46			U2: Dark grey, Silty CLAY.	
							39				
							36				
							42				
							45				
5 -	MD	24/0	45.0 - 47.0	VANE INTERVAL			37			MD: No recovery.	
	MD V4	£4/U	45.0 - 47.0 45.6 - 46.0	VANE INTERVAL Su= 508 / 14 psf						V4: Tu=18.5 / Tr=0.5 ft-lbs (65 mm x 130 mm vane)	
	V5		46.6 - 47.0	Su= 536 / 14 psf			38			V5: Tu=19.5 / Tr=0.5 ft-lbs (65 mm x 130 mm vane)	
							40				
							46				
-0							44				

PROJECT: Cummings Road Bridge over MeTPK Boring No.: BB-CUM-101 Proj. No.: 17-013 LOCATION: Scarborough, Maine Driller: New England Boring Contractors Elevation (ft.) 64.5 ft (est'd) Core Barrel: Drilling Method: cased wash boring Date Start/Finish: 6/28/17: 0700 - 1440 Hammer Type: auto Casing ID/OD: HW to 60.0' Hammer Efficiency: 0.677 Auger ID/OD: SSA to 5' Water Level*: 3.0 ft. (open)

IN-SITU SAMPLING AND TESTING: ADDITIONAL DEFINITIONS: ADDITIONAL DEFINITIONS: LABORATORY TEST RESULTS: Non-considerable attempt and the supplemental processful Spin Spon Sample attempt by Lorsuccessful Thin Wall Tube Sample

MU = Unsuccessful Thin Wall Tube Sample attempt by Lorsuccessful Thin Wall Tube Sample Information by Lorsuccessful Thin Wall Tube Sam Visual Description and Remarks U3 24/19 50.0 - 52.0 HYD PUSH 52.6 - 53.0 Su= 618 / 41 psf V7: Tu=22.5 / Tr=1.5 ft-lbs (65 mm x 130 mm vane) 53.6 - 54.0 Su= 604 / 14 psf V8: Tu=22 / Tr=0.5 ft-lbs (65 mm x 130 mm vane) U4: Dark grey, Silty CLAY. 59 ft: Gravel in wash water. 9D: Dark grey, Silty GRAVEL, some fine to coarse Sand. TILL Bottom of Exploration at 62.0 feet below ground surface. ater level readings have been made at times and under conditions stated. Groundwater fluctuations may occur due to conditions other than those esent at the time measurements were made. Boring No.: BB-CUM-101

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	Associates, New England I Enos / Share Schonewald	Boring Contractors	Ele	Scar evation		ah M	_:	Proj. No.:17-013	,
	Enos / Share		Ele				ame		
					(ft.)		(est'd)	Core Barrel:	
			I Da	tum:		NAVI	, ,	Sampler: std. split-spoon	
			_	g Type:				3-53 (rubber track) Hammer W:./Fall: 140 lbs/30 in (auto ha	mmer)
	6/27/17; 0645	1445	$\overline{}$	illing M	othod:		d wash		
			$\overline{}$						
tion:	67+90, 30 ft L	I	_	sing ID			0 65.0	Hammer Efficiency: 0.677	
Sample ful Split Sp be Sample ful Thin Wa ihear Test	oon Sample attem all Tube Sample att ane Shear Test atte	N-uncorrect pt N ₆₀ = N val hammer effit tempt S _u = Insitu I R = Rock C empt RQD = Roci	DEFINI ed = N v ue corre ciency = field Var ore Sam k Quality	TIONS: alue cted for ha calculated ne Shear S ple	mmer effi I hammer trength (p	ciency efficienc	ADDIT WOR WOR y = 1 BOR SSA	ONAL DEFINITIONS: = weight of 140lb. hammer = weight of 170lb. hammer = weight of 170lb. hammer = weight of rock of the state of the s	city Index
_				1			-		
Pen./Rec. (in.	Sample Deptt (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	09-N	Casing Blows	Elevation (ft.)	Graphic Log	Visual Description and Remarks	Lab. Testing Results
								U3: Dark grey with black streaks, Silty CLAY.	
	1 02.0			-	71				
					39				
24/20	52.0 - 54.0	WOR/24"	n	n	44			8D: Dark grey, v. soft, Silty CLAY, with soft concretions	
				1				inroughout and shell fragments.	
					44				
					52				
24/12	55.0. 57.0	VANE INTERVAL			50			9D: Dark grey, Silty CLAY.	WC=36.1
24/13	55.6 - 56.0	Su= 549 / 14 psf			52			V6: Tu=20 / Tr=0.5 ft-lbs (65 mm x 130 mm vane)	LL=33.6 PL=21.5
	56.6 - 57.0	Su= 604 / 27 psf			52			V7: Tu=22 / Tr=1 ft-lbs (65 mm x 130 mm vane)	PI=12.1
					46			,	
					50				
					55				
0.4100		W.O.D.(101.0.10						Dark grey with black streaks, Silty CLAY, with soft concretions	
24/20	60.0 - 62.0	WOR/12'-6-12	°	9.02007	50			· · · · · · · · · · · · · · · · · · ·	
					64	4.1		10D: Grey, fine to medium SAND, some Silt, little Gravel, trace	
					75		100	coarse Sand. TILL	
				 	400		, ·		
					103				
					100				
22/10	65.0 66.0	15 16 36 50/5"	52	59 6722			. 1	11D: Grey, v. dense, Silty GRAVEL, some fine to medium Sand,	
23/10	03.0 - 00.5	10-10-30-30/3	52	30.0733			14.	trace coarse Sand. HLL	
						٥		86 0	
						-0.3		Bottom of Exploration at 66.9 feet below ground surface. No refusal.	
				1					
				1					
	1			1					
f	ample ul Split Sp ee Sample ul Thin Wa hear Test ul Insitu Vi	ul Spiti Spoon Sample attem to Sample ul Thin Wall Tube Sample at lear Test ul Insitu Vane Shear Test att ul Insitu Vane Shear	ample us Sample attempt hear Test Sample attempt hear Test with Wall Tube Sample attempt hear Test with Wall Tube Sample attempt hear Test with Wall Tube Sample attempt hear Test with Wall Sample Information (ui) with Wall Wall Sample Information (ui) with Wall Sample Infor	NG AND TESTING: ADDITIONAL DEFINI N-uncorrected = N v Nog = N value corrected = N value correc	NG AND TESTING: ample Itspit Spit Spon Sample attempt Research Spit Spit Spon Sample attempt Research Spit Spit	Authorized = N value us Spilt Spoon Sample attempt te Sample Name of the Sample of the Sample attempt the sample at	NG AND TESTING: ample ADDITIONAL DEFINITIONS: Number of the process of the pr	No. AND TESTING: ADDITIONAL DEFINITIONS: Number of the property of the p	MAND TESTING: ADDITIONAL DEPIRTIONS: ADDITIONAL DEPIRTMENT ADD

CONTRACT:2018.19

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Date 08\18

Ву

TJP

HNTB CORPORATION

340 County Road, Suite 6-C
Westbrook, ME 04092
TEL (207) 774-5155
FAX (207) 228-0909



THE GOLD STAR MEMORIAL HIGHWAY

BRIDGE REPLACEMENT CUMMINGS ROAD UNDERPASS

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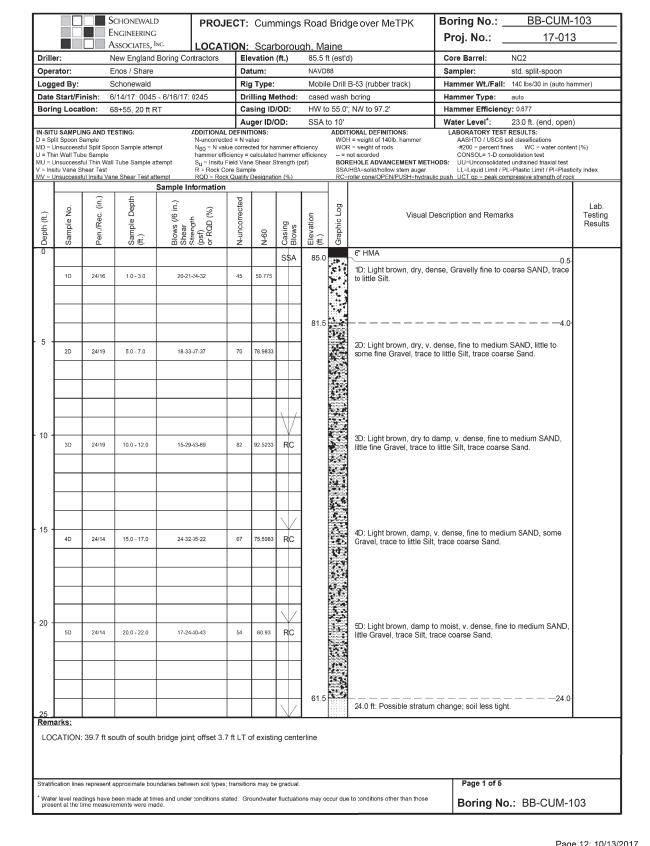
BORING LOGS I

SHEET NUMBER: S-03

MTA PROJECT MANAGER: Ralph C. Norwood, IV, P.E., P.T.O.E.

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			CHONEWALE NGINEERING	,	PROJ	EGT:	Cum	ımıngs	Road	BLIC	ge over MeTPK	Boring No.: BB-CUN	
			SSOCIATES, ^I	NC.	LOCAT	ION-	Scar	borou	ah. M	aine		Proj. No. :17-01	13
Drille	r:		lew England				vation			ft (est	d)	Core Barrel: NQ2	
Opera	ator:	E	nos / Share			Da	tum:		NAVE	88		Sampler: std. split-spoon	
Logge	ed By:	S	chonewald			Rig	ј Туре:		Mobi	le Drill	B-53 (rubber track)	Hammer Wt./Fall: 140 lbs/30 in (auto	hammer)
Date S	Start/Fi	nish: 6	/14/17: 0045	- 6/16/17:	0245	Dri	lling M	ethod:	case	d wash	n boring	Hammer Type: auto	
Borin	g Loca	ion: 6	8+55, 20 ft R	T		Ca	sing ID	/OD:	HW t	o 55.0	'; NW to 97.2'	Hammer Efficiency: 0.677	
							ger ID/	OD:	SSA	to 10'		Water Level*: 23.0 ft. (end, ope	en)
D = Split MD = Ur U = Thir MU = Ur V = Insit	t Spoon S nsuccessf n Wall Tub nsuccessf tu Vane Sl	ul Səlit Spoo e Sample ul Thin Wall neaı Test	on Sample attem Tube Sample at ne Shear Test att	tempt empt	ADDITIONAL N-uncorrect N ₆₀ = N val hammer effi S _u = Insitu I R = Rock Co	ed = N va ue correcticiency = Field Van ore Samp k Quality	ilue ited for ha calculated e Shear S ile	d hammer Strength (p	efficiency	WO WO = BOI SSA	VHSA=solid/hollow stem auger	LABORATORY TEST RESULTS: ASHTO / USCS sol classifications +#200 = percent fines	t sticity Index
ŀ				Sample Ir	nformation		_			-			
Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear	Strength (psf) or RQD (%)	N-uncorrected	09-N	Casing Blows	Elevation (ft.)	Graphic Log		Description and Remarks	Lab. ⊺esting Results
25	6D	24/11	25.0 - 27.0	3-5	i-7-6	12	13.54					dense, fine to medium SAND, little to trace coarse Sand; organic odor.	AASHTC CORROSIV
Γ								41			Grading to grey fine san	nd in tip of spoon.	SERIES
ŀ								45	58.5			27.	0-
-								45					
							L	42					
								48					
30	7D	24/9	30.0 - 32.0	9.5	3-3-3	6	6.77	51	55.5			medium SAND, trace Silt, with one 1-inc	
-		L-7/3	55.5 - 52.0	3-4	. 0-0	-	0.77					trace fine Sand at top of sample.	
								46					1
								57					1
ŀ								55					
. 35								70			9D: Groy Joseph For CA	AND, trace Silt with one 1-inch layer Gre	,
	8D	24/10	35.0 - 37.0	2-3	3-3-1	6	6.77	56			SILT, some fine Sand.	TIND, TRACE OIL WITH OHE 1-HICH RAYER GIE	Ί
								51					
ŀ								60					
-							-						
								59					
ſ								45					1
40	9D	24/1	40.0 - 42.0	4.	24"	0	0	51			9D: Grey, fine Sandy SI	LT.	1
-		-7/1		1/		Ļ	Ť						1
								57					
								59					
ŀ								61					
-							\vdash						
45								55			10D: Gray interheddad	Silty fine SAND and Clayey SILT, little	A-4(0)
	10D	24/10	45.0 - 47.0	3-1	1/18"	0	0	49			fine Sand.	only file oatho and Clayey SILT, little	MĽ
								55					WC=26.49 -#200=87.3
							\vdash	_					non-plasti
-							<u> </u>	67					
								61	37.0	781	48.5 ft: Inferred stratum	48.	5-
[13.0 II. IIIIGII GU SII AUIII	onango.	
50 Rema	rks:									V.S.A.	1		1
			outh of south						erline			Page 2 of 5	
		-p. 2001/10	, ,			,		g uuul.				1	
* 187 :	to and	en en e				-44	and the second				e to conditions other than those	Boring No.: BB-CUM-	

PROJECT: Cummings Road Bridge over MeTPK

| Boring No.: | BB-CUM-103 Proj. No.: 17-013 LOCATION: Scarborough, Maine Driller:New England Boring ContractorsElevation (ft.)85.5 ft (est'd) Core Barrel: NQ2 Drilling Method: cased wash boring Hammer Type: auto Date Start/Finish: 6/14/17; 0045 - 6/16/17; 0245 Casing ID/OD: HW to 55.0'; NW to 97.2' Hammer Efficiency: 0.677 Auger ID/OD: SSA to 10' Water Level*: 23.0 ft. (end, open)

IN-SITU SAMPLING AND TESTING: ADDITIONAL DEFINITIONS: ADDITIONAL DEFINITIONS: LABORATORY TEST RESULTS:

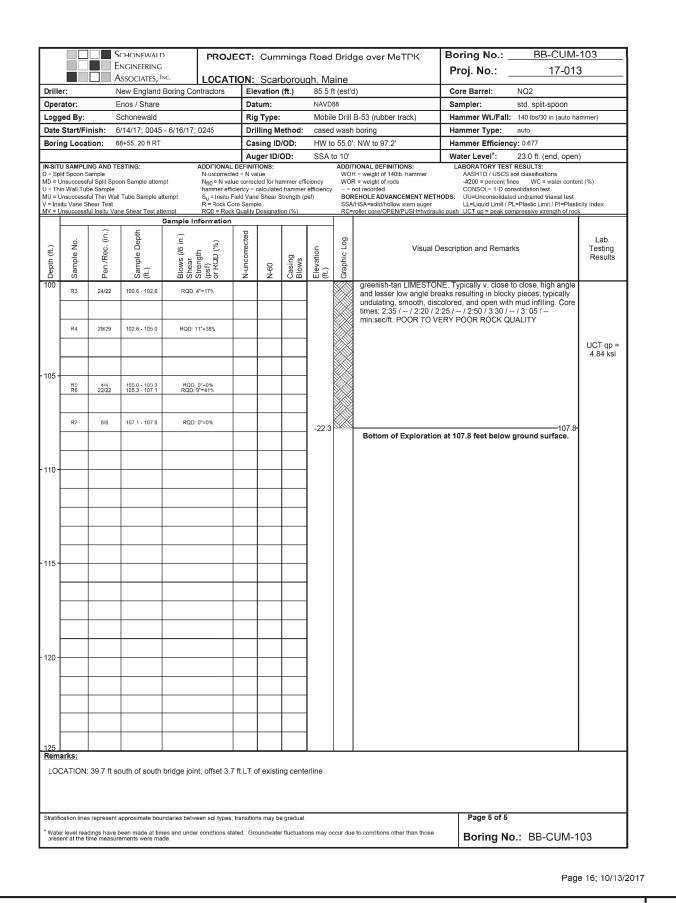
No = N value corrected = N value WOR = weight of 140lb, hammer WOR = weight of 140lb hammer work = not recorded for hammer efficiency hammer efficiency hammer efficiency = calculated hammer efficiency solutions with the sample work = not recorded to the sample w Visual Description and Remarks 11D: Dark grey, Silty CLAY with 3 partings Silty fine SAND. V1: Tu=20.5/Tr=2 ft-lbs (65 mm x 130 mm vane) 11D 24/24 50.0 - 52.0 VANE INTERVAL V1 50.6 - 51.0 Su=563 / 55 pef /2 51.6 - 52.0 Su=549 / 55 psf V2: Tu=20/Tr=2 ft-lbs (65 mm x 130 mm vane) U1: Dark grey, Silty CLAY. 12D: Dark grey, Silty CLAY. 12D 24/19 60.0 - 62.0 VANE INTERVAL V3 60.6 - 61.0 Su=604 / 27 psf V3: Tu=22/Tr=1 ft-lbs (65 mm x 130 mm vane) 61.6 - 62.0 Su=673 / 27 psf V4: Tu=24.5/Tr=1 ft-lbs (65 mm x 130 mm vane) U2: Dark grey, Silty CLAY. U2 24/22 65.0 - 67.0 HYD PUSH LL=39.9 PL=23.7 <u>PI=16.2</u> 13D: Dark grev, Silty CLAY. 3D 24/20 70.0 - 72.0 VANE INTERVAL V5 70.6 - 71.0 Su=646 / 27 psf V5: Tu=23.5/Tr=1 ft-lbs (65 mm x 130 mm vane) V6 71.6 - 72.0 Su=646 / 27 psf V6: Tu=23.5/Tr=1 ft-lbs (65 mm x 130 mm vane) LOCATION: 39.7 ft south of south bridge joint; offset 3.7 ft LT of existing centerline ater level readings have been made at times and under conditions stated. Groundwater fluctuations may occur due to conditions other than those esent at the time measurements were made. Boring No.: BB-CUM-103

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			ASSOCIATES, In		LOCA	$\overline{}$			วนด				Proj. No.:17-013	
Drille			New England	Boring Co	ntractors	$\overline{}$	evation	(ft.)			t (est'o	i)	Core Barrel: NQ2	
Oper			Enos / Share			-	itum:			NAVD		D 50 ()	Sampler: std. split-spoon	
	ed By:		Schonewald	0/40/47	0045	$\overline{}$	g Type:		٠.			B-53 (rubber track)	Hammer Wt./Fall: 140 lbs/30 in (auto ha	mmer)
	Start/Fi		8/14/17; 0045	- 6/16/1/;	UZ45	_	illing M					boring	Hammer Type: auto	
Borin	ng Loca	ion:	88+55, 20 ft RT			_	sing ID ger ID/			SSA t		; NW to 97.2'	Hammer Efficiency: 0.677 Water Level*: 23.0 ft. (end, open)	
IN-SITU	J SAMPLI	NG AND T	STING:		ADDITIONAL			JD:		55A I		TONAL DEFINITIONS:	Water Level*: 23.0 ft. (end, open) LABORATORY TEST RESULTS:	
MD = U U = Thii MU = U V = Insi	n Wall Tub Insuccessf itu Vane Si	ul Split Spo e Sample ul Thin Wa near Test	on Sample attem I Tube Sample at	tempt empt	N-uncorrect N ₆₀ = N va hammer eff S _u = Insitu R = Rock C RQD = Roc formation	lue correcticiency = Field Van ore Samp k Quality	cted for ha calculated se Shear S ple	t hamr trengt	ner e th (ps	efficiency	WOF = r BOR SSA	H = weight of 140lb. hammer R = weight of rods not recorded EHOLE ADVANCEMENT METHO HSA=solid/hollow stem auger roller cone/OPEN/PUSH=hydraulie	AASHTO / USCS soil classifications #20(= percent fines WC = water conter CONSOL= 1-D consolidation test UU=Unconsolidated undrained triaxial test LL=Lquid limit / PL=Plastic Limit / Pl=Plastic c gush UCT 1p = peak compressive strength of rock	
ı		2		•					П		1			
Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in. Shear	Surengun (psf) or RQD (%)	N-uncorrected	09-N	Casing	Blows	Elevation (ft.)	Graphic Log	Visual De	escription and Remarks	Lab. Testing Results
75	U3	24/16	75.0 - 77.0	HYD					П			U3: Dark grey, Silty CLA	Y.	
ŀ								H	\dashv					
							-	\vdash	4					
							L	Ш		8.0		77.5 ft.: Stratum change;	77.5-	
								\prod	/1				, g //J·	
ŀ								1	Н		4			
80								<u> </u>	\dashv			14D: Grey, dense, Grave	elly fine to coarse SAND, some Silt. TILL	
	14D	24/8	80.0 - 82.0	23-16	-22-22	38	42.8767	22				<i>y,</i> ,,	. ,	
								67			.			
-								55	5					
ŀ								56	\parallel					
ŀ							-	\vdash	\dashv		* . :			
85								57	\square			450.0		
55	15D	24/8	85.0 - 87.0	24-49	-79-47	128	144.427	72	2			15D: Grey, v. dense, Silty trace coarse Sand. TILL	y fine to medium SAND, some Gravel,	
Ì							İ	17:	2					
ŀ								10	\dashv		1			
ŀ							-	10	7					
							<u> </u>	-	Ц			88.6 ft.: Casing refusal.		
_	MR	50/6	89.0 - 93.2					DRI	VE			MR: Cored as though soil by pieces recovered.	il with cobbles and boulders; confirmed	
90								П	\dashv			,,		
ŀ						 	<u> </u>	\vdash	\dashv					
ļ							_	\sqcup	4					
Į								Ш						
Ì								П	\dashv					
95	400	0467	05.2.2.		47.04		400.55	H	\dashv				e, Silty GRAVEL, some fine to coarse	
	16D	24/15	95.0 - 97.0	38-47	-47-61	94	106.063		\dashv			Sand. TILL Changing at		
							\bot	oxdot		-10.9		16D-A: White-green deco	96.4- omposed rock; talc-like; very thin	
	R1	23/18	97.2 - 99.1	RQD:	0*=0%				\neg	-11.7		laminations.	97.2-	
ŀ							1		\dashv				slightly weathered, aphanitic to fine .LITE with veining and typically high	
ŀ		,	00.1.10		OF 00:				\dashv			angle remnant bedding, i	interbedded with thick layers of soft to	
100	R2	18/12	99.1 - 100.6	RQD:	0"=0%				\perp			medium, slightly weather	red, aphantic to medium grained,	
Rema														
LOC	CATION:	39.7 ft s	outh of south	bridge join	t; offset 3.	/ ft LT (of existir	ng ce	ente	rline				
Stratific	cation lines	represent	approximate bour	ndaries betwe	en soil types	; transitio	ns may be	grad	ual.				Page 4 of 5	
* 10/oto:	r lovel rec	linge have	heen made at tim	es and under	conditions st	ated Gr	oundwate	r fluctu	ıatioi	ns may o	ccur due	to conditions other than those	Boring No.: BB-CUM-1	00



Designed by: Scale: HNTB By Date Revision CONSULTANT PROJECT MANAGER: Tim Cote, P.E. Date 08\18 By JKO 08\18 TJP Designed Checked 08\18 08\18 In Charge of RAL

HNTB CORPORATION 340 County Road, Suite 6-C Westbrook, ME 04092 TEL (207) 774-5155 FAX (207) 228-0909

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THE GOLD STAR MEMORIAL HIGHWAY

BRIDGE REPLACEMENT CUMMINGS ROAD UNDERPASS

BORING LOGS II

CONTRACT:2018.19

SHEET NUMBER: S-04

MTA PROJECT MANAGER: Ralph C. Norwood, IV, P.E., P.T.O.E.

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SCHONEWALD ENGINEERING PROJECT: Cummings Road Bridge over MeTPK Proj. No.: 17-013 LOCATION: Scarborough, Maine Driller: New England Boring Contractors Elevation (ft.) 65 ft (est'd) Core Barrel:
 Date Start/Finish:
 6/23/17: 0700 - 0915
 Drilling Method:
 cased wash bcring

 Boring Location:
 offset approx. 8 feet westerly from BB-CLIM-104
 Casing ID/OD:
 NW to 15.0'
 Hammer Type: rope & cathead Hammer Efficiency: 0.60 Visual Description and Remarks 1D: Red brown, loose, fine to coarse SAND, trace Silt. 1D 24/8 5.0 - 7.0 8.5.3-4 10 10 4 2D: Red tan grading to grey, loose, fine to coarse SAND, trace Gravel, trace Silt. 2D 24/11 10.0 - 12.0 3-4-4-6 Bottom of Exploration at 15.0 feet below ground surface. Boring advanced for the installation of a groundwater level observation well. Observation well: 1-inch dia. PVC; well screen 14.5 to 9.5 ft BGS; riser to 3 ft stick up. Filter sand 15.0 to 7.0 ft BGS; bentonite plug 7.0 to 2.5 ft BGS. Locking protective casing set; stick up without cover 3.21 ft. Vater 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. Boring No.: BB-CUM-104 OW Page 17; 10/13/2017

			Schonewald Engineering		PROJ	ECT:	Cum	mings	Road	Brid	ge over MeTPK	Boring No.: _	BB-CUM- 17-01:	
		==	Associates, I		LOCA	ION-	Scar	horou	ah M	aine		Proj. No.: _	17-01	3
Drille	r:		New England			$\overline{}$	vation			(est'd)		Core Barrel:		
Oper			Schaefer / Titu			_	tum:	()	NAVE			Sampler:	std. split-spoon	
				J3		_					D E4 (t	Hammer Wt./Fall:		
	ed By:		Schonewald	0/00//7		-	y Type:				B-51 (track)			
	Start/Fir		6/21/17: 1025		1530	_		ethod:			n boring	Hammer Type:	rope & cathead	
Borin	ig Locat	ion:	72+95, 90 ft L	ļ.		-	sing ID		SSA	0.08 0		Hammer Efficienc		
D = Spli MD = U U = Thir MU = U V = Insi	n Wall Tub Insuccessfu tu Vane Sh	amrle ul Solit Sr e Sample ul Thin W near Test	ooon Sample attem e all Tube Sample at	apt ttempt	ADDITIONAL N-uncorrect N ₆₀ = N val hammer eff S _u = Insitu R = Rock C RQD = Roc	DEFINIT ed = N va ue correct iciency = Field Van ore Samp	alue sted for ha calculate e Shear S ale	ammer eff d hammer Strength (p	ciency efficiency	ADDI' WO WOI y = BOF	TIONAL DEFINITIONS: H = weight of 140lb. hammer R = weight of rods not recorded REHOLE ADVANCEMENT METH A'HSA-solid/hollow stem auger Troller cone/OPEN/PUSH-hydrauli	LL=Liquid Limit / P	oil classifications es WC = water conte asolidation test d undrained triaxial test L=Plastic Limit / PI=Plast	icity Index
				Sample In										
Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	slows (/6 in.)	Strength (psf) or RQD (%)	N-uncorrected	N-60	Casing Blows	Elevation (ft.)	Graphic Log	Visual D	escription and Remar	ks	Lak Testi Resu
0	0)	<u>п</u>	0) €	шос	, 50				ше	10				
								S\$A						
ŀ	1D	24/16	2.0 - 4.0	44.04	-22-12	46	46		1		1D: Dark red brown, moi		rse SAND, trace to	
	טי	A4/ 10	2.0 - 4.0	14-24	-4-14	+0	+0	\vdash			little Silt, trace fine Grave	eı.		
								\ /	1					
- 5							\vdash	\vdash^{\vee}	l		2D: Red tan, wet, v. loos	se, fine to coarse SAN	D, trace Silt, trace	A-1-
l	2D	24/14	5.0 - 7.0	2-1	-1-2	2	2	push			fine Gravel.			SF
								4						WC=2 -#200=
ŀ								 	l					
								7						
								10						
ŀ								12	1					
10								12			3D: Red tan, loose, fine	to coarse SAND trac	e Silt_trace fine	
	3D	24/13	10.0 - 12.0	2-3	-4-4	7	7	4			Gravel; grading to fine to		,	
								6						
ŀ								45	1					
								15						
								15	51.5					
ı								30	1					
15								1 30			4D: Grey, medium dense	e fine to medium SAN	ID trace Silt	
	4D	24/12	15.0 - 17.0	4-6-1	10-12	16	16	25			4D. Groy, modium dono	o, mio to modiam or ti	4D, 11400 Ont.	
- [25						
ŀ			+				\vdash							
								21						
								16						
ŀ								15	1					
20							-		45.0				20.0	
	5D	24/	20.0 - 22.0	3-5	-4-1	9	9	10			5D: Grey, loose, fine SA Sandy SILT.	ND, trace Silt, with tw	o 1-inch layers fine	
								12						
ŀ							\vdash		1					
ļ								12						
								13						
ŀ								12	1					
25	and an							12	<u> </u>	-436				
Rema	ai NS;													
01												B * * * *		
Stratific	cation lines	represer	nt approximate bou	ndaries betwe	en soil types	; transitio	ns may b	e gradual.				Page 1 of 4		

PROJECT: Cummings Road Bridge over MeTPK

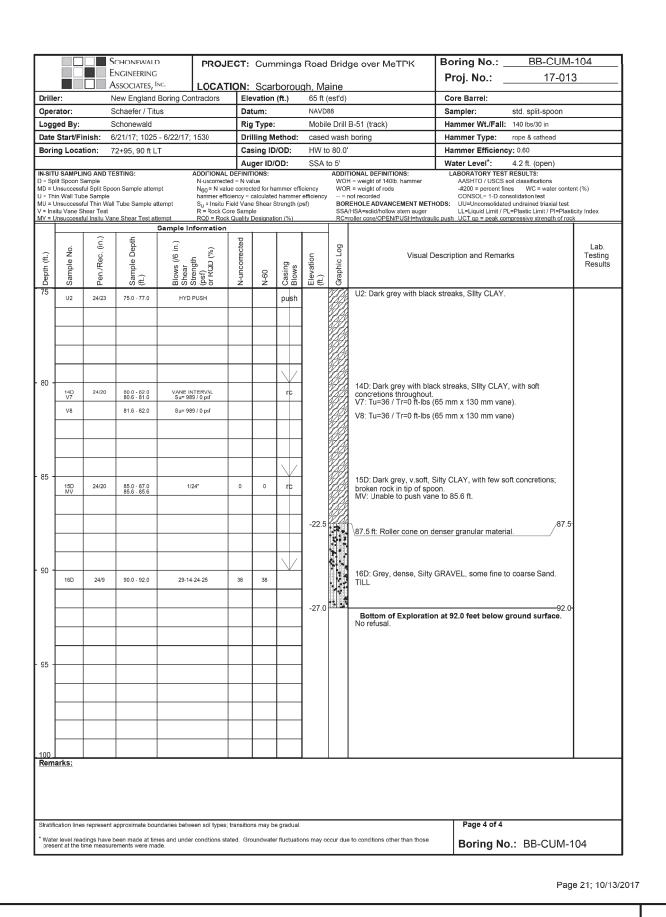
| Boring No.: | BB-CUM-104| Proj. No.: 17-013 LOCATION: Scarborough, Maine Driller: New England Boring Contractors Elevation (ft.) 65 t (est'd) Core Barrel: Date Start/Finish: 6/21/17: 1025 - 6/22/17: 1530 Drilling Method: cased wash boring Hammer Type: rope & cathead Boring Location: 72+95, 90 ft LT Casing ID/OD: HW to 80.0' Hammer Efficiency: 0.60 Auger ID/OD: SSA to 5'

| Natirus SAMPLING AND TESTING: | ADDITIONAL DEFINITIONS: | ASSETTION TEST RESULTS: | ASSETTION TE Visual Description and Remarks 6D: Grey, v. soft, interbedded Silty CLAY and Silty fine SAND. 6D 24/22 25.0 - 27.0 3-1/18" 0 0 13 7D: Grey, v. soft, interbedded Silty CLAY; fine Sandy SILT; and fine SAND, trace Silt. 8D: Grey, v. soft, Silty CLAY with partirgs and two 1-inch layers Silty fine SAND. 9D: Grey, v. loose, interbedded Silty fine SAND and Silty CLAY, trace fine Sand. 9D 24/24 40.0 - 42.0 3-WOH/18" non-plastic 10D: Grey, v. soft, Silty CLAY, with one 1-inch layer fine Sandy ater level readings have been made at times and under conditions stated. Groundwater fluctuations may occur due to conditions other than those esent at the time measurements were made. Boring No.: BB-CUM-104

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			Associates, In	C.	LOCAT	ION:	Scart	orou	igh, M	aine		Proj. No.:17-0	10
Drille	er:		New England E	Boring Con	tractors	Ele	vation ((ft.)	65 ft	(est'd)		Core Barrel:	
Oper	rator:		Schaefer / Titu	s		Dat	tum:		NAV		·	Sampler: std. split-spoon	
Logg	ged By:		Schonewald			Rig	Туре:		Mob	le Drill	B-51 (track)	Hammer Wt./Fall: 140 lbs/30 in	
Date	Start/Fir	ish:	6/21/17; 1025 -	- 6/22/17; ·	1530	Dri	lling Me	thod:	case	d wash	boring	Hammer Type: rope & cathead	
Bori	ng Locati	on:	72+95, 90 ft LT	-		Cas	sing ID/	OD:	HW t	0.08 0:		Hammer Efficiency: 0.60	
					ADDITIONAL		ger ID/C	D:	SSA			Water Level*: 4.2 ft. (open)	
D = Sp MD = U U = Thi MU = U V = Ins	in Wall Tube Jnsuccessfu situ Vane Sh	mple I Split Spe Sample I Thin Wa ear Test	oon Sample attemp II Tube Sample att	ot empt	N-uncorrecte N ₆₀ = N valu hammer effic S _u = Insitu F R = Rock Co RQD = Rock	ed = N va ue correc ciency = o ield Vane ore Samp	lue ted for har calculated e Shear Si le	hamme rength (r efficienc	WOI WOI y = 1 BOF SSA	IONAL DEFINITIONS: 1 = weight of 140lb. hammer R = weight of rods not recorded IEHOLE ADVANCEMENT MET I/ISA=solid/hollow stem auger roller cone/OPEN/PUSH=hydra	LABORATORY TEST RESULTS: ANSHTO / USCs sol classifications #200 = percent fines	st asticity Index
	—			Sample Inf	ormation					-			
Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength	(pst) or RQD (%)	N-uncorrected	09-N	Casing Blows	Elevation (ft.)	Graphic Log	Visual	Description and Remarks	Lab. Testing Results
50	11D	24/24	50.0 - 52.0	WOR				push		8/1/8	11D: Dark grey with m	inor black streaks, v. soft, Silty CLAY.	
									-				
- 55 -	120	24/22	55.0 - 57.0	VANE IN	FERVAL			push	-			ack streaks, Silty CLAY.	
	12D V1	24122	55.0 - 57.0 55.6 - 56.0	VANE IN Su= 536	/ 14 psf			pusii	-		V1: Tu=19.5 / Tr=0.5 ft	t-lbs (65 mm x 130 mm vane).	
	V2		56.6 - 57.0	Su= 467	/ 14 psf				$\left\{ \right.$		V2: Tu=17 / Tr=0.5 ft-II	bs (65 mm x 130 mm vane).	
· 60 - · 65 -	V3 V4 V4 V6	24/23	60.0 - 62.0 65.6 - 66.0 66.6 - 67.0 70.0 - 72.0 70.6 - 71.0 71.6 - 72.0	Su= 563 Su= 604 VANE IN: Su= 742	/ 14 psf / 0 psf 			push			V3: Tu=20.5 / Tr=0.5 ft V4: Tu=22 / Tr=0 ft-lbs 13D: Dark grey with bl V5: Tu=25.5 / Tr=0 ft-ll	LAY, with fine Sand partings. Libs (65 mm x 130 mm vane). 1 (65 mm x 130 mm vane). ack streaks, Silty CLAY. bs (65 mm x 130 mm vane).	CONSO UU WC=37.6 LL=39.5 PL=23.5 Pl=16.0 WC= LL=32.0 PL=21.2 Pl=10.8
75								\bigvee	1				
Rem	arks:							•	-	VII 8			•
Stratifi	ication lines	represent	approximate boun	daries betwe	en soil types;	transition	ns may be	gradual				Page 3 of 4	
					y,		,					1 -	



Designed by: Scale: HNTB By Date Revision CONSULTANT PROJECT MANAGER: Tim Cote, P.E. By Date 08\18 JKO 08\18 TJP Checked Designed

In Charge of RAL

HNTB CORPORATION 340 County Road, Suite 6-C Westbrook, ME 04092 TEL (207) 774-5155 FAX (207) 228-0909

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MTA PROJECT MANAGER: Ralph C. Norwood, IV, P.E., P.T.O.E.

THE GOLD STAR MEMORIAL HIGHWAY

BRIDGE REPLACEMENT CUMMINGS ROAD UNDERPASS

BORING LOGS III

SHEET NUMBER: S-05 80 OF 135

CONTRACT:2018.19

PROJECT: Cummings Road Bridge over MeTPK Proj. No.: 17-013 LOCATION: Scarborough, Maine Driller: New England Boring Contractors Elevation (ft.) 67 ft (est'd) Core Barrel: Hammer Type: rope & cathead Drilling Method: cased wash boring Date Start/Finish: 6/19/17; 1215 - 6/21/17; 0955 Casing ID/OD: HW to 70.0' Hammer Efficiency: 0.60 Auger ID/OD: SSA to 5'

Water Level*: 4.2' (overnight)

N-SITU SAMPLING AND TESTING:

> Split Spoon Sample

Joe I husuccessful Split Spoon Sample attempt

Joe I husuccessful Split Spoon Sample

Jule Unsuccessful Thin Wall Tube Sample

Mull — Unsuccessful Thin Wall Tube Sample

All — Rock Core Sample

Reack Core Samp IN-SITU SAMPLING AND TESTING: Visual Description and Remarks 1D 24/19 2.0 - 4.0 2-2-7-10 9 9 to medium SAND, trace to little Silt, trace Gravel, trace coarse 2D: Red brown, wet, m. dense, fine to coarse SAND, some 2D 24/16 5.0 - 7.0 6-138-7 21 21 3D: Grey tan, loose, fine to medium SAND, trace Silt, trace 3D 24/9 10.0 - 12.0 2-4-4-6 4D: Grey, loose, fine SAND, trace to little Silt. 4D 24/9 15.0 - 17.0 3-3-2-5 5 5 5D: Grey, loose, fine SAND, trace Silt. later level readings have been made at times and under conditions stated. Groundwater fluctuations may occur due to conditions other than those resent at the time measurements were made. Boring No.: BB-CUM-105

PROJECT: Cummings Road Bridge over MeTPK **Proj. No.**: 17-013 LOCATION: Scarborough, Maine Driller: New England Boring Contractors Elevation (ft.) 67 ft (est'd) Core Barrel: Hammer Type: rope & cathead Date Start/Finish: 6/19/17: 1215 - 6/21/17: 0955 Drilling Method: cased wash boring Casing ID/OD: HW to 70.0' Boring Location: 72+10, 47 ft LT Auger ID/OD: SSA to 5'

ADDITIONAL DEFINITIONS: ADDITIONAL DEFINITIONS: WOH = weight of 140lb. hammer WOR = weight of froots and the substitution of the substitution Auger ID/OD: SSA to 5' Water Level*: 4.2' (overnight)

I-SITU SAMPLING AND TESTING:
Split Spoon Sample
De Unsuccessful Shit Spoon Sample attempt
Thiw Wall Tube Sample attempt
Under Shear Test attempt
Sourcessful Institu Vane Shear Test attempt
V = Unsuccessful Institut Vane Shear Test attempt
V = Unsuccessful Institut Vane Shear Test attempt
V = Unsuccessful Institut Vane Shear IN-SITU SAMPLING AND TESTING: Visual Description and Remarks 6D: Grey, loose, interbedded, fine SAND, trace to little Silt and fine Sandy SILT, with one 4-inch layer Silty CLAY at top of sample. 6D 24/19 25.0 - 27.0 1-1-6-6 7 7 40 7D: Grey, v. soft, interbedded Silty CLAY, little fine Sand and fine Sandy SILT. 8D: Grey, soft, interbedded Silty CLAY, trace fine Sand; Silty fine A-4(0) 9D 24/24 40.0 - 42.0 WOR/24* 0 0 push 9D: Grey, v. soft, Silty CLAY, with multiple partings and seams Silty fine SAND. 10D: Grey, Silty CLAY, with multiple seams and layers fine 10D 24/-- 45.0 - 47.0 VANE INTERVAL V1 45.6 - 46.0 Su= 522 / 55 psf SAND, some Silt. V1: Tu=19 / Tr=2 ft-lbs (65 mm x 130 mm vane). V2 46.6 - 47.0 Su= 522 / 41 psf V2: Tu=19 / Tr=1.5 ft-lbs (65 mm x 130 mm vane). 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 neasurements were made. Boring No.: BB-CUM-105

PROJECT: Cummings Road Bridge over MeTPK Proj. No.: 17-013 LOCATION: Scarborough, Maine New England Boring Contractors **Elevation (ft.)** 67 t (est'd) Core Barrel: Drilling Method: cased wash boring Hammer Type: rope & cathead Date Start/Finish: 6/19/17; 1215 - 6/21/17; 0955 Casing ID/OD: HW to 70.0' Hammer Efficiency: 0.60 Auger ID/OD: SSA to 5'

Water Level*: 4.2' (overnight)

N-SITU SAMPLING AND TESTING:

I Split Spoon Sample

ID: Unsuccessful Split Spoon Sample attempt

ID: Unsuccessful Split Spoon Sample attempt

ID: Unsuccessful Thin Wall Tube Sample

ID: Unsu Visual Description and Remarks 1D: Grey, v. soft, Silty CLAY. 11D 24/24 50.0 - 52.0 WOR/24" 12D: Grey with darker grey streaks, Silty CLAY. 2D 24/24 55.0 - 57.0 VANE INTERVAL 3 55.6 - 56.0 Su= 467 / 14 psf V3: Tu=17 / Tr=0.5 ft-lbs (65 mm x 130 mm vane). 56.6 - 57.0 Su= 522 / 14 psf V4: Tu=19 / Tr=0.5 ft-lbs (65 mm x 130 mm vane). U1:Grey to dark grey with darker streaks, Silty CLAY. 13D: Dark grey with black streaks, Silty CLAY. V5: Tu=26 / Tr=0 ft-lbs (65 mm x 130 mm vane). 66.6 - 67.0 Su= 797 / 0 psf V6: Tu=29 / Tr=0 ft-lbs (65 mm x 130 mm vane). 65 to 70 ft: Open hole necks in; advance HW casing by hydraulic push to 70 ft. 14D: Dark grey with black streaks, Silty CLAY 70.0 - 72.0 VANE INTERVAL 70.6 - 71.0 Su= 659 / 14 psf V7: Tu=24 / Tr=0.5 ft-lbs (65 mm x 130 mm vane). V8 71.6 - 72.0 Su= 893 / 0 psf V8: Tu=32.5 / Tr=0 ft-lbs (65 mm x 130 mm vane). ter level readings have been made at times and under conditions stated. Groundwater fluctuations may occur due to conditions other than those seen at the time measurements were made. Boring No.: BB-CUM-105

Proj. No.: 17-013 LOCATION: Scarborough, Maine Driller: New England Boring Contractors Elevation (ft.) 67 ft (est'd) Core Barrel: Rig Type: Mobile Drill B-51 (track) Hammer Wt./Fall: 140 lbs/30 in Hammer Type: rope & cathead Drilling Method: cased wash boring Boring Location: 72+10, 47 ft LT Casing ID/OD: HW to 70.0' Hammer Efficiency: 0.60 Auger ID/OD: SSA to 5' Water Level*: 4.2' (overnight)

IN-SITU SAMPLING ANDTESTING:
D = Split Spoon Sample
MD = Unsuccessful Split Spoon Sample attempt
U = Thin Wall Tube Sample
MU = Unsuccessful Thin Wall Tube Sample attempt
V = Insitu Vane Shear Tes
MD = Unsuccessful Insitu Vane Shear Steength (psf)
Nuncreded = N value
Nun Visual Description and Remarks U2 24/23 75.0 - 77.0 HYD PUSH 15D: Dark grey, Silty CLAY. 15D 24/24 80.0 - 82.0 VANE INTERVAL V9 80.6 - 81.0 Su= 659 / 0 psf V10 81.6 - 82.0 Su= 783 / 0 psf V10: Tu=28.5 / Tr=0 ft-lbs (65 mm x 130 mm vane). 16D: Dark grey, v. soft, Silty CLAY, with significant concretion

17D 24/24 90.0 - 92.0 WOR/24"

PROJECT: Cummings Road Bridge over MeTPK Boring No.: BB-CUM-105

18D: Dark grey, v. soft, Silty CLAY, with concretions (coarse sand to fine gravel size) throughout.

PROJECT: Cummings Road Bridge over MeTPK Proj. No.: ______17-013 LOCATION: Scarborough, Maine New England Boring Contractors Elevation (ft.) 67 ft (est'd) Core Barrel: Rig Type: Mobile Drill B-51 (track) Hammer Wt./Fall: 140 lbs/30 in Drilling Method: cased wash boring Hammer Type: rope & cathead Boring Location: 72+10, 47 ft LT Casing ID/OD: HW to 70.0' Hammer Efficiency: 0.60 Auger ID/OD: SSA to 5'

| Number | March | Mar Visual Description and Remarks 19D: Dark grey, v. soft, Silty CLAY, with concretions (coarse D 24/21 100.0 - 102.0 WOR/24" 0 2.0 ft: Split-spoon abruptly stops. Boney under roller cone Boring No.: BB-CUM-105

HNTB CORPORATION

340 County Road, Suite 6-C
Westbrook, ME 04092
TEL (207) 774-5155
FAX (207) 228-0909

Boring No.: BB-CUM-105



BRIDGE REPLACEMENT CUMMINGS ROAD UNDERPASS

CONTRACT:2018.19

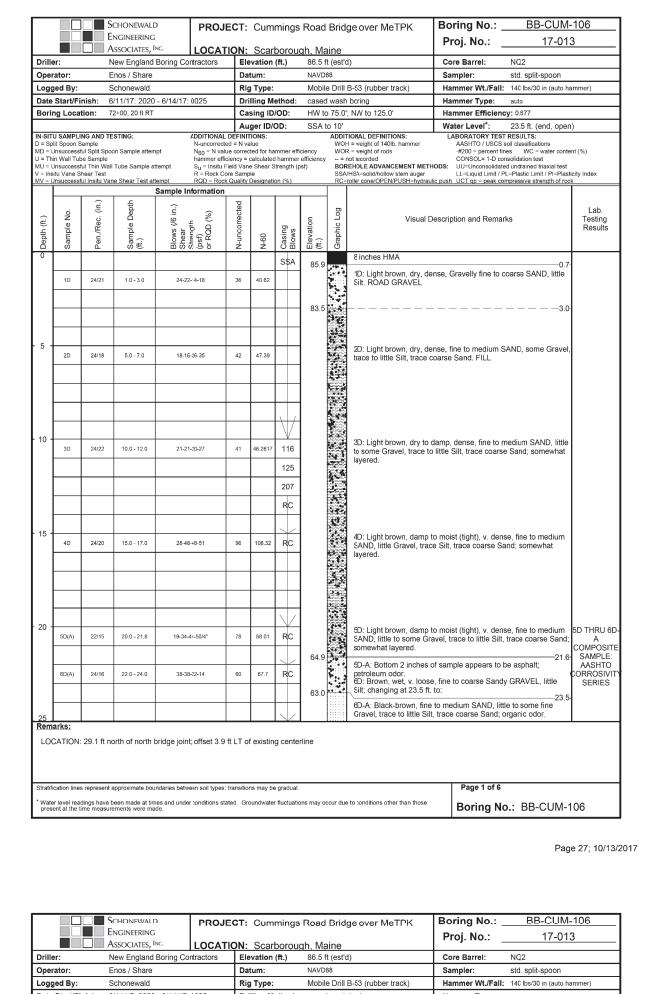
BORING LOGS IV

Page 24; 10/13/2017

SHEET NUMBER: S-06

MTA PROJECT MANAGER: Ralph C. Norwood, IV, P.E., P.T.O.E.

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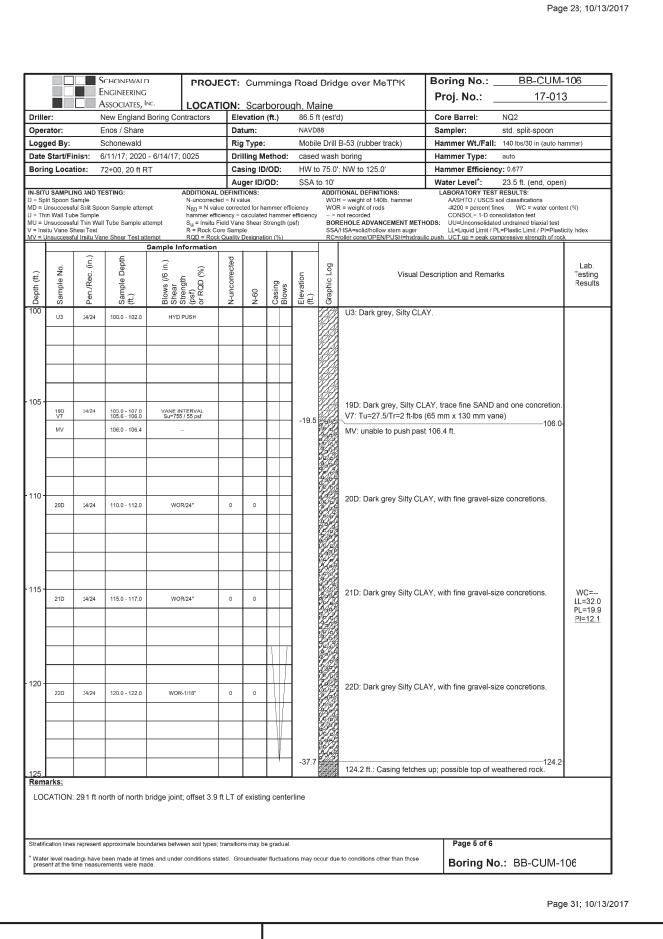


Drille	er:	1	New England	Boring Cor	ntractors	Ele	vation	(ft.)	86.5	ft (est'o	d)	Core Barrel:	NQ2	
Oper			Enos / Share	_ = = = = = = = = = = = = = = = = = = =		-	tum:	,	NAVE			Sampler:	std. split-spoon	
	ed By:		Schonewald			-	Type:				B-53 (rubber track)	-	140 lbs/30 in (auto ha	mmer)
	Start/Fi		6/11/17; 2020	- 6/14/17·	0025	_	Iling M	ethod:			boring	Hammer Type:	auto)
	ng Locat		72+00, 20 ft R		JJ2U	$\overline{}$	sing ID				; NW to 125.0'	Hammer Efficience		
2011	.g Local	.511.	2 100, 20 IL F	<u> </u>		-	ger ID/0			to 10'	, 1117 10 120.0	Water Level*:	23.5 ft. (end, open)	١
IN-SITU	U SAMPLII	NG AND TI	ESTING:		ADDITIONAL			JD.	JJA		FIONAL DEFINITIONS:	LABORATORY TEST		'
MD = U U = Thi MU = U V = Insi	in Wall Tub Insuccessfi itu Vane Sh	ul Solit Spo e Sample ul Thin Wal nean Test	on Sample attem I Tube Sample at	ttempt	N-uncorrecte N ₆₀ = N value hammer effic S _u = Insitu F R = Rock Co RQD = Rock	ue correctiency = Field Van ore Samp	ted for ha calculated e Shear S ble	hammer trength (p	efficiency	WOI = BOF SSA	H = weight of 140lb. hammer R = weight of rods not recorded REHOLE ADVANCEMENT METH //HSA=solid/hollow stem auger roller cone/OPEN/PUSH=hydrau	LL=Liquid Limit / F	nes WC = water conter nsolidation test ed undrained triaxial test L=Plastic Limit / PI=Plastic	city Inde
				Sample In										
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 C	escription and Reman	rks	L Tes Re
25	7D	24/14	25.0 - 27.0	15-23-		55	62.0583	RC			7D: Red brown, wet, v.	dense, fine to coarse	SAND, trace to little	
											Silt, trace Gravel.			
30								-			(split-spoon empty; resa	ample: overdrive to 32	5 ft)	
	8D(A)	30/0	30.0 - 32.5	2-5-	4-3	9	10.155	100			8D: Red brown, wet, loc	se, fine to coarse SA		
								95			trace Silt; changing at 3	∠.ο π. το:	l	
ŀ								110	54.2				32.3	
-											8D-A: Grey, wet, fine Sa	andy SILT.	l	
								113					l	
								117					l	
35	MD	24/0	35.0 - 37.0	2-4-	-5-7	9	10.155	104			(split-spoon empty; resa Grey, fine SAND, some	ample; overdrive to 38	ft; no recovery)	
ŀ		•			•		-				Grey, line SAND, some	SIIL III UP OT SPOOM.	l	
ļ								113					l	
								141					l	
								159					l	
ŀ													l	
40								137			(enlit engage amphi: accid	s cample 40 to 45 ft)	l	
	9D	24/0	40.0 - 42.0	1-2-	4-4	6	6.77	RC			(split-spoon empty; grat 9D: Greyish-tan, loose,	sample 40 to 45 ft) fine to coarse SAND,	trace Silt.	
Ì													l	
ŀ								$\vdash\vdash$					l	
Į													l	
													l	
								\ /					l	
45	40-	24.7	45.0 :	_		-		H			10D: Grey, v. loose, fine			
	10D	24/6	45.0 - 47.0	2-2-	-1-4	3	3.385	113			with Silty fine SAND lay			
								124					l	
İ								121					l	
ŀ													l	
								128					l	
50								123					l	
Rema	arks:													
LOC	CATION:	29.1 ft n	orth of north I	oridge joint	; offset 3.9	ft LT o	f existin	g center	rline					
Stratific	cation lines	regresent	approximate bou	ndaries betwe	en soil types;	transitio	ns may be	gradual.				Page 2 of 6		

PROJECT: Cummings Road Bridge over MeTPK Boring No.: BB-CUM-106

Drille			Associates, I New England		LOCAT		vation			ft (est	4)	Core Barrel: NQ2	
	rator:		Enos / Share	Donny CO	ni aciolo	_	tum:	(16.)	NAVE		ч,	Sampler: std. split-spoon	
_	ged By:		Schonewald			_	Type:				B-53 (rubber track)	Hammer W:./Fall: 140 lbs/30 in (auto h	ammer)
_	Start/Fi	nish:	6/11/17; 2020	- 6/14/17:	0025	_	Iling M	ethod:			n boring	Hammer Type: auto	
Bori	ng Locat	tion:	72+00, 20 ft F			Ca	sing ID	OD:	HW1	o 75.0	'; NW to 125.0'	Hammer Efficiency: 0.677	
							ger ID/0	OD:	SSA	to 10'		Water Level*: 23.5 ft. (end, oper	1)
D = Sp MD = U U = Th MU = U V = Ins	in Wall Tub Jnsuccessf situ Vane Si	ample ul Split S e Sample ul Thin W hear Test	poon Sample atten all Tube Sample a ane Shear Test at	npt Itempt Iempt	ADDITIONAL N-uncorrecte N ₆₀ = N valu hammer effic S _U = Insitu F R = Rock Co RQD = Rock	ed = N va ue correct ciency = field Van ore Samp	alue eted for ha calculated e Shear S ele	I hammer trength (p	efficienc	WO WO y= BOF SSA	TIONAL DEFINITIONS: H = weight of 140lb. hammer R = weight of rods not recorded REHOLE ADVANCEMENT METI VHSA=solid/hollow stem auger roller cone/OPEN/PUSH=hydrau	LABORATORY TEST RESULTS: ASHTO, USCS soil classifications -#200 = precent fines	icity Index
		·		· ·	formation	ъ				┨			
Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear	strengtin (psf) or RQD (%)	N-uncorrected	N-60	Casing Blows	Elevation (ft.)	Graphic Log		Description and Remarks	Lab. Testing Results
50	11D	24/5	50.0 - 52.0	WOR-W	OH/12"-1	0	0	132			11D: Grey, v. loose, Silt	ty fine SAND.	
								128					
								124					
								116					
								121					
55 -	12D	24/4	55.0 - 57.0	WOH	/18"-2	0	0	124			12D: Grey, v. loose, fine	e SAND, trace to little Silt.	
								121					
								127					
								133					
								132					
60 -	13D	24/24	60.0 - 62.0	1/12"	-1/12"	1	1.12833		26.0)	13D: Grey, v. soft, Silty ∖significant fine SAND.	CLAY; upper 6 inches of sample contains	
												6 0.5	
65 -	14D	24/11	65.0 - 67.0	WOI	R/24"	0	0	114			14D: Grey, v. soft, inter sand layers apparent from	bedded, Silty CLAY and fine Sandy SILT; om hesitations under weight of hammer.	
								121					
								129					
								113					
								119					
70 -	MV 15D	6/	70.0 - 70.5 70.5 - 72.5	4.0	-	0	0	121			MV: unable to push van 15D: Grev. v. soft. inter	ne past 70.5 ft. bedded Silty CLAY and fine Sandy SILT.	
	IOD	24/	10.5 - 12.5	1/3	27			117			32. 3.27, 1. 331, 11101	Out of the first outlay of the	
								121					
								124	13.0			73.5	
								136					
75 Rem	arks:		1							VAA.	1		
		29.1 ft	north of north	bridge joint	; offset 3.9	ft LT o	f existin	g center	rline				

Orille Oper			SCHONEWALE		PROJE	CT:	Cum	mings	Road	Brid	ge over MeTPK	Boring No.: _	DD-CUIVI-	106
		==	ENGINEERING					-				Proj. No.:	17-01:	3
			Associates, I		LOCATI	_	Scarl vation				4)	-		
			New England Enos / Share	Boring Col	ntractors	+-	vation um:	(π.)	NAVD	t (est'o	1)		NQ2 std. split-spoon	
	ed By:		Schonewald			-	Type:				B-53 (rubber track)	Hammer Wt./Fall:		ımmer)
_	Start/Fi	nish:	6/11/17; 2020	- 6/14/17·	0025	+	lling M	ethod:			bcring		auto	illillel)
	g Loca		72+00, 20 ft R		0020	_	sing ID				; NW to 125.0'	Hammer Efficiency		
			72 00, 20 1111			_	ger ID/0		SSA		,		23.5 ft. (end, open)
= Spl	it Spoon S	Sample	TESTING: poon Sample attern		N-uncorrected N ₆₀ = N value	d = N va	lue	mmer eff	iciency	WOI	TIONAL DEFINITIONS: H = weight of 140lb. hammer R = weight of rods	LABORATORY TEST F AASHTO / USCS so -#200 = percent fine		nt (%)
	n Wall Tub		e /all Tube Sample at	tempt	hammer effici S _u = Insitu Fi	ency = o	alculated Shear S	hammer trength (r	efficiency		not recorded REHOLE ADVANCEMENT METH	CONSOL= 1-D cons HODS: UU=Unconsolidated	olidation test undrained triaxial test	
= Insi	tu Vane S	hear Test			R = Rock Cor RQD = Rock	e Samp	le		•	SSA	/HSA=solid/hollow stem auger roller cone/OPEN/PUSH=hydraul	LL=Liquid Limit / PL:	=Plastic Limit / PI=Plast	icity Index
Ĭ	110400000			Sample In		ocurry .	3 0 0 1 g 1 l d d 1	,,,,,,			Total Collection Collection (Collection)	no paon do rap pour com	<u> </u>	
	_	(in.)	Depth	Ë.	_	ted				_ Б				Lab.
Œ.	Sample No.))	De De		. (%)	N-uncorrected			5	Graphic Log	Visual D	escription and Remark	S	Testing
Depth (ft.)	mple	Pen./Rec.	Sample (ft.)	Blows (/6 Shear	(psf) or RQD	DCO	0	Casing Blows	Elevation (ft.)	phic				Results
	Sal	Pe	San (ft.)	S S S	(ps	ž	09-N	S S	# (;	မ်				
75	16D V1	24/24	75.0 - 77.0 75.6 - 76.0	VANE IN Su=522	TERVAL			open			16D: Grey, Silty CLAY v V1: Tu=19/Tr=1 ft-lbs (6		parting.	
ŀ	V2		76.6 - 77.0	Su=522					1		,	,		
-	**		.0.0 - 11.0	Ou-#01	, poi				1		V2: Tu=17.5/Tr=1 ft-lbs	(65 mm x 130 mm vane	9)	
Į														
					T									
ŀ									1					
80 🖁									ļ		U1: Grey, Silty CLAY.			
	U1	24/18	80.0 - 82.0	HYD	FUSH									
ı	V3		82.6 - 83.0	Su=591	//1 nef				1					
ŀ	***		02.0 - 05.0	00-551	141 psi				ļ		V3: Tu=21.5/Tr=1.5 ft-lb	s (65 mm x 130 mm va	ne)	
	V4		83.6 - 84.0	Su=646	27 psf						V4: Tu=23.5/Tr=1 ft-lbs	(65 mm x 130 mm vane	e)	
85 🕇	17D	24/24	85.0 - 87.0	WOR	224"				1		17D: Dark grey with blac	ck streaks, Silty CLAY.		
ŀ			00.0 07.0	****	\L-T				-					
ı									1					
ŀ									-					
90 											IIO. Dark same Cilt. Ol A			CONICOL
	U2	24/24	90.0 - 92.0	HYD	PUSH						U2: Dark grey, Silty CLA	ΛT.		CONSOL UU
ı									1					WC=42.3% LL=47.8
ł		-							1					PL=24.4
														PI=23.4
-		L												
95	180	24/24	95.0 - 07.0	V/ANIE IN	ITERVAL				1		18D: Dark grey with blac			WC=37.7%
ļ	18D V5	24/24	95.0 - 97.0 95.6 - 96.0	VANE IN Su=673	55 psf						V5: Tu=24.5/Tr=2 ft-lbs	(65 mm x 130 mm vane	9)	LL=29.1 PL=19.3
Į	V6		96.6 - 97.0	Su=893	14 psf						V6: Tu=32.5/Tr=0.5 ft-lb	s (65 mm x 130 mm va	ne)	PI=9.8
					T									
ı									1					
ŀ		-			-				1					
00										9/1/S)				
	arks:													
LOC	CATION	: 29.1 ft	north of north t	oridge joint	; offset 3.9 f	t LT of	existin	g cente	rline					
Stratific	ation line	s represer	nt approximate bou	ndaries betwe	en soil types; t	ransitior	ns may be	gradual.				Page 4 of 6		
									ons mav o	ccur du	e to conditions other than those	-	.: BB-CUM-1	00



			SCHONEWALD		PROJI	ECT:	Cum	mings	Rosc	Brid	ge over MeTPK	Boring No.:	BB-CUM-	106
		=	ENGINEERING	ic.			0					Proj. No.:	17-013	3
Drille	Nr.		Associates, IN		LOCAT	_					4)	Core Barrel:	NQ2	
	ator:		Enos / Share	Joining Co	IIII dUUIS	_	vation tum:	(11.)	NAVE	ft (est'o	1)	Sampler:	std. split-spoon	
_	ed By:		Schonewald			_	Type:				B-53 (rubber track)	 	140 lbs/30 in (auto ha	mmer)
	Start/Fi	nish:	6/11/17; 2020	- 6/1 <u>4</u> /17·	0025	$\overline{}$	illing M				boring	Hammer Type:	auto	minol)
	ng Loca		72+00. 20 ft R		0020	$\overline{}$	sing ID				; NW to 125.0'	Hammer Efficier		
D0111	ig Look		72.00.20111			_	ger ID/			to 10'	, 1111 to 120.0	Water Level*:	23.5 ft. (end, open)	
D = Sp MD = U U = Thi MU = U V = Ins	lit Spoon S Jnsuccess in Wall Tul Jnsuccess itu Vane S	Sample ful Split Sp be Sample ful Thin W shear Test	/all Tube Sample att : /ane Shear Test atte	pt empt empt	ADDITIONAL N-uncorrecte N ₆₀ = N valu hammer effic S _u = Insitu F R = Rock Co RQD = Rock	ed = N va le correct liency = lield Van lield Samp	alue cted for ha calculated e Shear S ble	d hammer Strength (p	efficiency	WOI WOI /= I BOF SSA	TONAL DEFINITIONS: I = weight of 140lb. hammer R = weight of rods not recorded IEHOLE ADVANCEMENT MET IHSA=solid/hollow stem auger roller cone/OPEN/PUSH=hydra	-#200 = percent CONSOL= 1-D o HODS: UU=Unconsolida LL=Liquid Limit /	s soil classifications fines WC = water conter onsolidation test ted undrained triaxial test PL=Plastic Limit / PI=Plastic	city Index
		(in.)		•						1				
Depth (ft.)	Sample No.	Pen./Rec. (ir	Sample Depth (ft.)	Blows (/6 in.	Strength (psf) or RQD (%)	N-uncorrected	N-60	Casing Blows	Elevation (ft.)	Graphic Log	Visual I	Description and Rema		Lab. Testing Results
125	R1	31/31	125.0 - 127.6		0"=0%				-38.5		R1: Medium hard to ha	rd, slightly to modera		
											aphanitic to fine graine tightly spaced and high close, moderately dipp	ly undulating folation ng to high angle brea	. Very close to ks. Typically	
	R2	32/25	127.6 - 130.3	RQD:	0*=0%		L				undulating, smooth, di clay infilling. Highly bro			
											1:40 / min:sec/ft. R2: Same as R1. No re			
									1		1:25 / / min:sec/ft.	120.0 to 129.	on. Core unies /	
130 -			1											
	R3	25/22	130.3 - 132.4	RQD:	5*-20%						R3: Same as R1. Highl Core times: / 1:45 /		en 132.0 to 132.4 ft.	UCT qp : 0.44 ksi
	R4	31/18	132.4 - 135.0	POD:	0"=0%						D4: C D4 15-b1		#	
	154	31/16	132.4 * 133.0	NQD.	0 =076						R4: Same as R1. Highl times: / 3:05 / 2:45 r	y weathered and brok nin:sec/ft.	ten throughout. Core	
													l	
135 -	R5	47/26	135.0 - 138.9	ROD:	7*=15%						R5: Same as R1. Highl		en below 135.9 ft.	
	- 1.0		10010				-				Core times: 2:00 / 1:55	/ 2:35 / min:sec/π.		UCT qp : 1.71 ksi
							-		-52.4		Pottom of Evaloration	n at 129 9 fact holes	138.9	
140 -											Bottom of Exploration	in at 136.5 leet belov	v ground surface.	
140														
									1					
							-							
													l	
145 -														
													l	
							-	\vdash					l	
45.														
150 Rem	arks:		1											
		: 29.1 ft	north of north b	ridge joint	t; offset 3.9	ft LT o	f existin	g cente	rline					
Stratifi	cation line	s represer	nt approximate bour	ndaries between	een soil types;	transitio	ns may be	e gradual.				Page 6 of 6		
* Wate	r level rea	dings hav	e been made at tim- urements were ma	es and under	r conditions sta	ited. Gro	oundwate	r fluctuatio	ons may o	occur du	to conditions other than those	Boring N	o.: BB-CUM-1	06
pres	ent at the t													

CONTRACT:2018.19

Scale:

No. Revision

By Date

CONSULTANT PROJECT MANAGER: Tim Cote, P.E.

Designed

JKO 08\18

PEB 08\18

HNTB CORPORATION

340 County Road, Suite 6-C
Westbrook, ME 04092
TEL (207) 774-5155
FAX (207) 228-0909

Date 08\18

Ву

TJP

Checked

In Charge of RAL



THE GOLD STAR MEMORIAL HIGHWAY BRIDGE REPLACEMENT
CUMMINGS ROAD UNDERPASS

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Page 29; 10/13/2017

BORING LOGS V

SHEET NUMBER: S-07

MTA PROJECT MANAGER: Ralph C. Norwood, IV, P.E., P.T.O.E.

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Boring No.: BB-CUM-201 (OW) PROJECT: Cummings Road Bridge over MeTPK Proj. No.: 18-001 LOCATION: Scarborough, Maine Driller: New England Boring Contractors Elevation (ft.) 65.5 Core Barrel: n/a Drilling Method: cased wash boring Hammer Type: auto Date Start/Finish: 2/19/18; 1010-2/20/18; 0945 Casing ID/OD: HW to 19 ft Boring Location: 66+25, 31 ft LT Hammer Efficiency: 0.677 Auger ID/OD: SSA to 4 ft Water Level*: 3.1 ft (open); 7.0 ft (19 hours)

IN-SITU SAMPLING AND TESTING:
D = Split Spoon Sample
MD = Unsuccessful Thin Wall Tube Sample
MU = Unsuccessful Thin Wall Tube Sample attempt
V = Insitu Vane Shear Test attempt
MV = Unsuccessful Insitu Vane Shear Test attempt
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MV = Unsuccessful Insitu Vane Shear Test attempt
MV = Unsuccessful Insitu Vane She Visual Description and Remarks 1D: Red tan changing to white brown changing to red brown, camp to moist, m. dense, fine to medium SAND, little Silt. Olive brown, mottled, SILT, little fine Sand in tip of spoon. FILL 1D 24/16 2.0 - 4.0 2-6-3-2 2D: Red brown, wet, m. dense, fine Sandy SILT. Changing to grey at 5.6 ft. 3D: Grey, v. soft, interbedded, Silty CLAY, little very fine Sand; 3D 24/24 9.0 - 11.0 WOH/18*-1 0 4D: Grey with dark grey streaks, v soft, Silty CLAY, trace very 5D: Dark grey with black streaks in bottom 12 inches of sample, v. soft, Silty CLAY, trace very fine Sand, with one 1/8-inch seam very fine Sandy SILT in upper half of sample. 5D 24/24 19.0 - 21.0 WOR24" Groundwater level observation well installed upon completion of test boring. Observation well:
1-inch dia. PVC; well screen 25 to 15 ft BGS; riser to 2.5 ft stick up.
Caved at 47 ft BGS; Gravel 47 to 33 ft BGS; Filter sand 33.0 to 12.0 ft BGS; Bentonite plug 12.0 to 6.5 ft BGS. Vater 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. Boring No.: BB-CUM-201 (OW)

			Schonewald Engineering		i KOJI	_01.	ouiii	ıııııy	S 17(Jau	۱u	ge over MeTPK	Boring No.: <u>BB-CUM-20</u> Proj. No.: 18-00	
			Associates, I		LOCAT	ION:	Scar	boro	ugh,	Ма	ine		10-00	1
Drille			New England		ntractors	-	vation	(ft.)		5.5			Core Barrel: n/a	
_	ator:		Enos/ Steen/	Cotter		$\overline{}$	tum:			AVD8			Sampler: std. split-spoon	
	jed By:		Schonewald				g Type:					B-53 (rubber track)	Hammer Wt./Fall: 140 lbs/30 in (auto h	ammer)
	Start/Fi		2/19/18; 1010	-2/20/18; 0	945	$\overline{}$	illing M					boring	Hammer Type: auto	
Borir	ng Locat	ion:	66+25, 31 ft LT			$\overline{}$	sing ID				19 ft		Hammer Efficiency: 0.677	
IN-SIT	U SAMPLII	NG 7ND .	TESTING:		ADDITIONAL		iger ID/	OD:	S	SA to	ΔDDI	TIONAL DEFINITIONS:	Water Level*: 3.1 ft (open); 7.0 ft LABORATORY TEST RESULTS:	t (19 hours)
MD = U U = Thi MU = U V = Ins	in Wall Tub Insuccessf itu Vane Sl	ul Salit Sp e Sample ul Thin W near Test	all Tube Sample a ane Shear Test at	ttempt tempt	N-uncorrected N ₆₀ = N value hammer efficiency S _U = Insitu F R = Rock Corrected RQD = Rock	ie correctiency = ield Van re Samp	cted for ha calculated e Shear S ble	t hamme Strength	er effic		WOR WOR = I BOR SSA	H = weight of 140lb. hammer R = weight of rods not recorded EHOLE ADVANCEMENT METH /HSA=solid/hollow stem auger roller cone/OPEN/PUSH=hydrauli	AASHTO / USCS soil classifications #200 = percent fines WC = water control cONSOLE 1-D consolidation test UU=Unconsolidated undrained triaxial test LL=Liquid Limit / PL=Plastic Limit / PI=Plas	ticity Index
		·			formation	70			Т					
Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear	strengtn (psf) or RQD (%)	N-uncorrected	09-N	Casing Blows	Elevation	(ft.)	Graphic Log	Visual D	escription and Remarks	Lab. ⊺esting Results
25	6D	24/21	25.0 - 27.0 25.6 - 26.0	VANE IN Su= 371	I				\top		11/2		ty CLAY, trace very fine Sand.	WC=39.9%
	V1							\vdash	+			V1: Tu=13.5 / Tr=1.5 ft-li	bs (65 mm x 130 mm vane)	LL=38.9 PL=19.7
	V2		26.6 - 27.0	Su= 371	1 / 27 psf				1			V2: Tu=13.5 / Tr=1 ft-lbs	s (65 mm x 130 mm vane)	PI=19.2
								\vdash	1					
			+				-	\vdash	+					
30 -									╛					
50	U1	24/19	30.0 - 32.0	HYD	PUSH							U1: Dark grey black, Silt	ty CLAY.	
									1		148) 148)			
									-					
									7					
									+					
35 -									4			7D: Dark grov black Silt	ty CLAY, with occasional nodules;	
	7D V3	24/22	35.0 - 37.0 35.6 - 36.0	VANE IN Su= 440	ITERVAL) / 27 psf							organic odor.		
	V4		36.6 - 37.0	Su= 343	3 / 14 psf				1			V3: Tu=16 / Tr=1 ft-lbs (6	•	
									┨			V4. Tu=12.57 TI=0.5 It-II	bs (65 mm x 130 mm vane)	
								\vdash	4					
									7					
40 -									┨				ample retrieved; extrude sample and jar:	
	MU	24/11	40.0 - 42.0	HYD	PUSH				4			Dark grey, Silty CLAY, w concretions.	with 2-inch layer fine Sandy SILT; three	
												controlled to the control of the con		
								\sqcap	٦,	23.0	132		42.5	
			+				-	\vdash	┤ '			42.5 ft: Apparent stratum		
								\sqcup	4					
,,														
45 -	8D	·8/18	45.0 - 46.5	16-1	9-19				1			8D: Grey, Silty fine to co	parse SAND, some Gravel. TILL	
			+					\vdash	\dashv					
							_	\sqcup	4					
									.					
									7		* *			
			+				-	HH	+		. []			
50														
	arks:													
			bservation we					oring.	Obse	rvati	on we	II:		
Cav	ed at 47	ft BGS	Gravel 47 to	33 ft BGS;	Filter sand	33.0 to		BGS;	Bent	onite	plug	12.0 to 6.5 ft BGS.		
Loc	king prot	ectve c	asing set; sticl	k up withou	it cover 2.3	4 ft.								
Stratifi	cation lines	represer	t approximate bou	ındaries betwe	een soil types;	transitio	ns may be	e gradua	ıl.				Page 2 of 3	
													I	

PROJECT: Cummings Road Bridge over MeTPK Boring No.: BB-CUM-201 (OW) Proj. No.: 18-001 LOCATION: Scarborough, Maine **Driller:** New England Boring Contractors **Elevation (ft.)** 65.5 Core Barrel: n/a Sampler: std. split-spoon Drilling Method: cased wash boring **Date Start/Finish:** 2/19/18: 1010-2/20/18: 0945 Hammer Type: auto Casing ID/OD: HW to 19 ft Boring Location: 66+25, 31 ft LT Hammer Efficiency: 0.677 Auger ID/OD: SSA to 4 ft Water Level*: 3.1 ft (open); 7.0 ft (19 hours)

IN-SITU SAMPLING AND TESTING: De Split Spoon Sample

MD = Unsuccessful Split Spoon Sample attempt
U = Thin Wall Tube Sample
MU = Unsuccessful Ihm Wall Tube Sample attempt
U = Insitu Vane Shear Test attempt
MV = Unsuccessful Insitu Vane Shear Stat attempt
MV = Unsuccessful Insitu Vane Shear Stat attempt
Sample Information

Sample Information

ADDITIONAL DEFINITIONS: LABORATORY TEST RESULTS:
WCH = weight of 140lb. hammer
MCPR = weight of 140lb. hammer
MCPR = weight of 140lb. hammer
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MCPR = weight of 140lb. hammer Visual Description and Remarks 9D: Grey, m. dense, Silty fine to medium SAND, trace to little 9D 24/12 50.0 - 52.0 13-14-14 28 32 Bottom of Exploration at 52.0 feet below ground surface. Groundwater level observation well installed upon completion of test boring. Observation well:
1-inch dia. PVC; well screen 25 to 15 ft BGS; riser to 2.5 ft stick up.
Caved at 47 ft BGS; Gravel 47 to 33 ft BGS; Filter sand 33.0 to 12.0 ft BGS; Bentonte plug 12.0 to 6.5 ft BGS. Vater 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. Boring No.: BB-CUM-201 (OW)

PROJECT: Cummings Road Bridge over MeTPK Boring No.: BB-CUM-201A Proj. No.: 18-001 LOCATION: Scarborough, Maine
 Driller:
 New England Boring Contractors
 Elevation (ft.)
 65.5

 Operator:
 Enos/ Steen
 Datum:
 NAVD88
 Core Barrel: n/a Rig Type: Mobile Drill B-53 (rubber track) Hammer Wt./Fall: 140 lbs/30 in (aut Drilling Method: cased wash boring Hammer Type: auto Casing ID/OD: HW to 20 ft Boring Location: 66+37, 37 ft LT Hammer Efficiency: 0.677 Auger ID/OD: SSA to 5 ft Water Level*: —

SITU SAMPLING AND TESTING:
Split Spoon Sample
Unsuccessful Split Spoon Sample
Unsuccessful Thin Wall Tube Sample
Unsuccessful Thin Wall Tube Sample
Unsuccessful Thin Wall Tube Sample
Unsuccessful Thin Wall Tube Sample
Unsuccessful Thin Wall Tube Sample
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Unsuccessful Thin Wall Tube
Unsuccessful Thin Wall IN-SITU SAMPLING ANDTESTING:
D = Split Spoon Sample
MD = Unsuccessful Split Spoon Sample attempt
U = Thin Wall Tube Sample
MU = Unsuccessful Thin Wall Tube Sample attempt
V = Insitu Vane Shear Tes Visual Description and Remarks 1D: Grey, v. soft, Silty CLAY, trace very fine Sand, with two 1-inch seams Silty fine SAND. 3D 24/20 20.0 - 22.0 VANE INTERVAL V3 20.6 - 21.0 Su= 357 / 27 psf V4 21.6 - 22.0 Su= 330 / 27 psf Sand. V3: Tu=13 / Tr=1 ft-lbs (65 mm x 130 mm vane); sand seams noted during push.
V4: Tu=12 / Tr=1 ft-lbs (65 mm x 130 mm vane); sand seams noted during push. Boring No.: BB-CUM-201A

			SCHONEWALD ENGINEERING		PROJE	ECT:	Cum	min	gз	Road	Brid	ge over MeTPK	Boring No.: BB-CUM	
		==	Engineering Associates, In		LOCAT	ION:	S00-	hor	0115	ah M	nino		Proj. No. :18-0	01
rille			New England			$\overline{}$	vation		out	65.5	anne		Core Barrel: n/a	
	ator:		Enos/ Steen	Bonning Goo	illiaotoro	_	tum:	(11.)		NAVD	88		Sampler: std. split-spoon	
•	ed By:		Schonewald			-	Type:					B-53 (rubber track)	Hammer Wt./Fall: 140 lbs/30 in (auto	hammer)
_	Start/Fi		2/20/18; 1010-	-1510		$\overline{}$	Iling M		d:			boring	Hammer Type: auto	
	ng Local		66+37, 37 ft LT			_	sing ID				20 ft	2011119	Hammer Efficiency: 0.677	
	9		*			_	ger ID/			SSA			Water Level*:	
= Spi ID = U = Thi IU = U = Ins	it Spoon S Insuccessin Wall Tub Insuccessi itu Vane Si	ample ul Split Sp e Sample ul Thin Wa near Test	all Tube Sample at ane Shear Test att	pt tempt empt	ADDITIONAL N-uncorrecte N ₆₀ = N valu hammer effic S _u = Insitu F R = Rock Co RQD = Rock	DEFINIT ed = N va le correc ciency = o ield Vane re Samp	TIONS: ilue ted for ha calculated e Shear S	mmer I hami Strengt	mer e th (pe	ciency efficiency	WOR WOR = I BOR SSA	TIONAL DEFINITIONS: H = weight of 140lb, hammer R = weight of rods not recorded REHOLE ADVANCEMENT METH RHAS=solid/hollow stem auger roller cone/OPEN/PUSH=hydraul	LABORATORY TEST RESULTS: AASHTO / USCS soil classifications #200 = percent fines WC = water co CONSOL= 1-D consolidation test	st asticity Index
		(in.)				þ					1			
Depth (ft.)	Sample No.	Pen./Rec. (ir	Sample Depth (ft.)	Blows (/6 in.) Shear	strengtn (psf) or RQD (%)	N-uncorrected	09-N	Casing	Blows	Elevation (ft.)	Graphic Log		escription and Remarks	Lab. Testing Results
25	MU	24/7	25.0 - 27.0	HYD	PUSH							MU: Dark grey black, Sil	Ity CLAY	
								\Box	\dashv					
	U1	24/24	27.0 - 29.0	HYD	PUSH							U1: Dark grey black, Silt	ly CLAY.	CONSOL (Cv, Cα) WC=40.6% LL=38.4 PL=21.7 <u>Pl=16.7</u>
30 -								Н	\dashv			4D: Dark grev black Silt	ty CLAY with occasional nodules.	
	4D V5	24/21	30.0 - 32.0 30.6 - 31.0	VANE IN Su= 371	ITERVAL I / 27 psf								s (65 mm x 130 mm vane).	
	V6		31.6 - 32.0	Su= 398	3 / 14 psf							\/O. T14 5 / T0 5 6 !!	h- (05 100 1	
					-			H	\dashv			V6: Tu=14.5 / Tr=0.5 ft-I	bs (65 mm x 130 mm vane).	
									\Box					
									١					
								\vdash	\dashv					
35 -									\Box				-	
35]	U2	24/22	35.0 - 37.0	HYD	PUSH							U2: Dark grey black, Silt	ty CLAY.	CONSOL (Cv, Cα)
								Н	\dashv					WC=45.7% LL=44.6
								Ш	_					PL=23.5
									١					PI=21.1
								Н	┪					
									_					
									١					
10 -	5D	24/19	40.0 - 42.0	VANE IN	ITERVAL			П	┨		833		ty CLAY, with nodules throughout.	
	5D V7		40.0 - 42.0 40.6 - 41.0	Su= 494	/ 14 psf			Н	\dashv			V7: Tu=18 / Tr=0.5 ft-lbs	s (65 mm x 130 mm vane).	
	V8		41.6 - 42.0	Su= 591	/ 14 psf			١, ١	Ы			V8: Tu=21.5 / Tr=0.5 ft-I	bs (65 mm x 130 mm vane).	
								П	П					
								H	\mathcal{H}		110			
								\sqcup	Ц					
	ΜV				Ţ			₩				MAG III- 11 1	1 AF C #	
45 -	6D	24/24	45.0 - 47.0	(WOR)	1.4.10	5	6	<u> </u>	\dashv			MV: Unable to push pas Dark grey, Silty CLAY, c	น 45.6 π. changing at 46.0 ft to:	
	<u>ο</u> υ	24/24	+3.U - 47.U	(WOR)	- 1-4- IU	5	l °	_	4	19.5	1///		46	.0-
												6D: Dark grey, Silty fine TILL	to medium SAND, trace coarse Sand.	
									\dashv	18.5	AMITTED N	\	47	.0-
			+					\vdash	\dashv			Bottom of Exploration No refusal.	n at 47.0 feet below ground surface.	
_									7					
50 Rem :	arks:								_					
Stratifi	cation lines	represen	t approximate bour	ndaries betwe	een soil types;	transitior	ns may be	grad	lual.				Page 2 of 2	
													1	

HNTB CORPORATION

340 County Road, Suite 6-C
Westbrook, ME 04092
TEL (207) 774-5155
FAX (207) 228-0909



THE GOLD STAR MEMORIAL HIGHWAY

BRIDGE REPLACEMENT
CUMMINGS ROAD UNDERPASS

BORING LOGS VI

SHEET NUMBER: S-08
CONTRACT: 2018.19
83 OF 135

MTA PROJECT MANAGER: Ralph C. Norwood, IV, P.E., P.T.O.E.

age 37 of 40

5-11-9-8

4D 24/19 15.0 - 17.0 3-7-9-9 16 18 2

			CHONEWALE		PROJ	ECT:	Cum	mings	Road	d Brid	ge over MeTPK	1	BB-CUM-	
			ngineering Associates, ^I		LOCAT	ION:	Scor	horo	ah M	aino		Proj. No.: _	18-001	
Drille	r:		New England			_	vation		411 <u>, IVI</u> 68.5	anie		Core Barrel:	NQ2	
Oper			Enos / Share			$\overline{}$	tum:	()	NAVE	088		Sampler:	std. split-spoon	
Logg	ed By:		Schonewald			Rig	Type:		Mobi	le Drill	B-53 (rubber track)	Hammer Wt./Fall:	140 lbs/30 in (auto ha	mmer)
Date	Start/Fi	nish: 2	2/26/18; 2035	-2/28/18; 00	005	Dri	lling M	ethod:	case	d wash	boring	Hammer Type:	auto	
Borir	ıg Locat	ion: 7	70+00, 1 ft LT			Ca	sing ID	/OD:	HW t	o 45 ft	; NW to 81.7 ft	Hammer Efficience	y: 0.677	
					ADDITIONAL		ger ID/	OD:	SSA	to 5 ft	FIONAL DEFINITIONS:	Water Level*:	5.0 ft (open)	
D = Spl MD = U U = Thi MU = U V = Insi	it Spoon Si Insuccessfi In Wall Tub Insuccessfi tu Vane Sh	ul Split Spo e Sample ul Thin Wal near Test	on Sample attem I Tube Sample at ne Shear Test att	npt ttempt	N-uncorrecte N ₆₀ = N valu hammer effic S _u = Insitu F R = Rock Co RQD = Rock	ed = N va ue correc ciency = o rield Vano ore Samp	ilue ited for ha calculated e Shear S ile	t hammer strength (p	efficienc	WOI WOI y = I BOF SSA	H = weight of 140lb. hammer R = weight of rods not recorded REHOLE ADVANCEMENT METI //HSA=solid/hollow stem auger roller cone/OPEN/PUSH=hydra.	LL=Lauid Limit / P	oil classifications es WC = water conter asolidation test d undrained triaxial test L=Plastic Limit / PI=Plasti	city Inde
ŀ						ō				1				
Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength	(psf) or RQD (%)	N-uncorrected	09-N	Casing Blows	Elevation (ft.)	Graphic Log	Visual [Description and Remar	ks	La Tes Res
25	6D	24/8	25.0 - 27.0	2-3-		5	6	61			6D: Grey, loose, fine SA	AND, trace Silt.		
								47						
								50						
								56						
								56						
30	7D	24/17	30.0 - 32.0	WOR/12"-	WOH/12"	0	0	62			7D: Grey, v. soft, interb Sand; and fine Sandy S		ce to little very fine	
ı								54						
ı								62						
								63						
ı								68						
35	8D	24/4	35.0 - 37.0	1/2	4"	0	0	65			8D: Grey, v. loose, intel SILT; and Silty CLAY, li			
								52			fine GRAVEL, some ve spoon)	ry fine Sand. (resample	ed with 3-inch dia.	
								54						
								60	30.0	777			38.5-	
40								59						
⁴⁰]	9D	24/21	40.0 - 42.0	WOH	/24"	0	0	73			9D: Olive grey, v. soft,	Silty CLAY, race very	fine Sand.	
								50						
								59						
								62						
45								64			10D: Dark grey black, S	Silty CLAV with acces	anal nadulas	
	10D V1	24/24	45.0 - 47.0 45.6 - 46.0	VANE IN Su= 442	FERVAL / 27 psf			OPEN			V1: Tu=16 / Tr=1 ft-lbs	•		
	V2		46.6 - 47.0	Su= 398	/ 14 psf						V2: Tu=14.5 / Tr=0.5 ft-	lbs (65 mm x 130 mm	vane)	
50														
Rema												l Pour Codd		
			approximate bou						ins may	necur dire	e to conditions other than those	Page 2 of 4	BE B 1011	•-
vvale	nt at the ti	mıyə (läve ne measılı	been made at tim ements were ma	neo anu unuer de	COTTUINONS ST	ateu. Gr	JunuWa(0	nuctuatio	нь шау (Julian alli	s to conditions other than those	Boring No	.: BB-CUM-2	02

			CHONEWALE		IECT:	Cum	mings	Road	Brid	ge over MeTPK	Boring No.: BB-CUM	
			ASSOCIATES, I	I	TION:	Scar	borou	gh, Ma	aine		Proj. No.: <u>18-00</u>	1
Drille	er:	1	New England	Boring Contractors		evation		65			Core Barrel: NQ2	
_	rator:		Enos / Steen		-	tum:		NAVD			Sampler: std. split-spoon	
_	ged By: Start/F		Schonewald	2/22/48: 4440	$\overline{}$	Type:				B-53 (rubber track)	Hammer Wt./Fall: 140 lbs/30 in (auto ha	ammer)
	ng Loca		0+96, 5 ft LT	-2/22/18; 1440	$\overline{}$	illing M sing ID				boring NW to 93.5 ft	Hammer Type: auto Hammer Efficiency: 0.677	
					-	ger ID/		SSA		, , , , , , , , , , , , , , , , , , , ,	Water Level*: 2.0 ft (open)	
D = Sp MD = U U = Th MU = U V = Ins	olit Spoon S Jnsuccess in Wall Tu Jnsuccess situ Vane S	ful Split Spo be Sample ful Thin Wal Shear Test	on Sample attem I Tube Sample at ne Shear Test att	hammer eft tempt S _u = Insitu R = Rock 0	ted = N vi lue correct ficiency = Field Van core Samp k Quality	alue cted for ha calculated se Shear S ole	d hammer Strength (p	efficiency	WOI WOI = I BOF SSA	ITONAL DEFINITIONS: H = weight of 140lb. hammer R = weight of rods not recorded REHOLE ADVANCEMENT METH I/HSA=solid/hollow stem auger roller cone/OPEN/PUSH=hydrau	LABORATORY TEST RESULTS: AASHTO / USCS soil classifications #200 = percent fines	icity Index
Depth (ft.)	Sample No.	Pen./Rec. (in.)	Depth	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected		ng 'S	Elevation (ft.)	Graphic Log	Visual D	Description and Remarks	Lab. Testing Results
Dept	Sam	Pen.	Sample I (ft.)	Blow Shei Strer (psf) or R(N-un-N	09-N	Casing Blows	Elev (ft.)	Grap			
25	6D	24/22	25.0 - 27.0	1/12"-1-1	1	1	30			6D: Grey, v. loose, inter fine Sand; and Silty CLA	bedded, fine SAND, little Silt; Silt, some AY, trace very fine Sand.	
							22					
							20	1]
							17	1				
							15		333			
30 -										7D: Grey, v. loose, inter	bedded, fine SAND, little Silt; Silt, some	
	7D V1	24/24	30.0 - 32.0 30.6 - 31.0	(WOR/12")-1-1 Su= 591 / 55 psf			20			fine Sand; and Silty CLA V1: Tu=21.5 / Tr=2 ft-lbs	AY, trace very fine Sand. s (65 mm x 130 mm vane)	
	MV						13			MV: Unable to push van	ne past 31.4 ft.	
							13					
							14					
	MV						17	1		MO () la alala ta accela consta	05 4	
- 35 -	8D	24/22	35.0 - 37.0	WOR/12"-1-4	1	1	26	1			bedded, fine SAND, little Silt; Silt, some	
							10			fine Sand; and Silty CLA	AT, trace very line Sand.	
							9					
							8					
40 -	MV						12			MV: Unable to push van	ne at 40 ft.	
	9D	24/22	40.0 - 42.0	WOR/18"-WOH	0	0	18			inch seam Silty fine SA	CLAY, trace very fine Sand, with one 2-ND.	
							19					
							30					
							38	1				
	M∨						32	1				
45 -		24/24	45.0 - 47.0	WOLLOW	-	_				MV: Unable to push var 10D: Grey, v. soft, Silty	ne at 45 ft. CLAY, trace very fine Sand, with two 4-	
	10D	24/24	45.0 - 47.0	WOH/24"	0	0	40	19.0	1011		SILT in upper 12 inches of sample. — — — — — — — — — — 46.0-	
	<u> </u>						38					
							35					
							35					
50							37					
	arks:							•	V11 V A	•		•

		E	CHONEWALE NGINEERING ASSOCIATES, I					-			ge over MeTPK Boring No. : <u>BB-CUM-202</u> Proj. No. : <u>18-001</u>	
Drille	or.			Boring Contractors		evation			68.5	anie	Core Barrel: NQ2	
Oper			Enos / Share	Borning Continuacio	_	atum:	(16.		NAVE	100	Sampler: std. split-spoon	
					_							
	ed By:		Schonewald		-	g Type			Mobi	ie Drill	B-53 (rubber track) Hammer Wt./Fall: 140 lbs/30 in (auto hammer)	
Date	Start/Fi			-2/28/18: 0005	$\overline{}$	illing N					boring Hammer Type: auto	
Borir	ng Loca	tion: 7	70+00, 1 ft LT		Ca	sing II	0/0):	HW t	o 45 ft;	NW to 81.7 ft Hammer Efficiency: 0.677	
						iger ID	OD	:	SSA	to 5 ft	Water Level*: 5.0 ft (open)	
D = Spl MD = U U = Thi MU = U V = Insi	lit Spoon S Insuccesst in Wall Tub Insuccesst itu Vane S	ul Split Spo ne Sample ul Thin Wal hear Test	ESTING: on Sample attem I Tube Sample al ne Shear Test att	hammer e tempt S _U = Insitu R = Rock (ted = N v alue corre ficiency = Field Var Core Sam	alue cted for h calculate ne Shear ple	d hai Stren	mmer igth (p	efficiency	WOH WOF y = r BOR SSA	IONAL DEFINITIONS: LABORATORY TEST RESULTS: 1 = weight of 140lb, hammer AASHTO / USCs 90 icl assifications #200 = percent fines	эx
				Sample Information	1		_					
Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	09-N	Casing	Blows	Elevation (ft.)	Graphic Log	Visual Description and Remarks Te	ab. stin
50	11D V3	24/24	50.0 - 52.0 50.6 - 51.0	VANE INTERVAL Su= 618 / 27 psf			Π			1//	11D: Dark grey black, Silty CLAY, with nodules throughout.	
ŀ					+	+	+	\vdash		120	V3: Tu=22.5 / Tr=1 ft-lbs (65 mm x 130 mm vane)	
	V4		51.6 - 52.0	Su= 494 / 14 psf			H				V4: Tu=18 / Tr=0.5 ft-lbs (65 mm x 130 mm vane)	
55 -											42D: Dody group blook Ciths CLAV with a study of the surface of	
	12D V5	24/20	55.0 - 57.0 55.6 - 56.0	VANE INTERVAL Su= 646 / 14 psf		1					12D: Dark grey black, Silty CLAY, with nodules throughout. V5: Tu=23.5 / Tr=0.5 ft-lbs (65 mm x 130 mm vane)	
ŀ					+	+	+			12/2	V3. 10-23.57 11-0.5 (65 11111 x 130 11111 valle)	
	V6		56.6 - 57.0	Su= 632 / 14 psf							V6: Tu=23 / Tr=0.5 ft-lbs (65 mm x 130 mm vane)	
60 -											13D: Dark grey black, Silty CLAY, with nodules throughout, some	
	13D V7	24/21	60.0 - 62.0 60.6 - 61.0	VANE INTERVAL Su= 797 / 27 psf							hardening.	
- 1	V8		61.6 - 62.0	Su= 632 / 14 psf			T				V7: Tu=29 / Tr=1 ft-lbs (65 mm x 130 mm vane)	
											V8: Tu=23 / Tr=0.5 ft-lbs (65 mm x 130 mm vane)	
65 -							L				14D: Dark grey black, Silty CLAY, with nodules throughout and	
	14D V9	24/20	65.0 - 67.0 65.6 - 66.0	VANE INTERVAL Su= 577 / 27 psf		1					occasional concretions.	
	V10		66.6 - 67.0	Su= 907 / 27 csf		\top	T				V9: Tu=21 / Tr=1 ft-lbs (65 mm x 130 mm vane)	
	V10		30.0 - 07.0	Ou- 301 / 27 psi							V10: Tu=33 / Tr=1 ft-lbs (65 mm x 130 mm vane); concretions noted during push.	
70 -							-				15D: Dark grey black, Silty CLAY, with nodules throughout and	
	15D V11	24/15	70.0 - 72.0 70.6 - 71.0	VANE INTERVAL Su= 907 / 27 psf			\perp				occasional concretions. V11: Tu=33 / Tr=1 ft-lbs (65 mm x 130 mm vane)	
	MV						1				, ,	
ŀ					+	+	+	+	-3.5		MV: Unable to push vane past 71.7 ft.	
							\mathbb{H}	\parallel			-72.0	
							H	\forall				
75 Rem :	arke:						_	Í				
Rema	arks:											
Stratific	cation lines	s represent	approximate bou	ndaries between scil type	s; transitio	ons may b	e gra	dual.			Page 3 of 4	
							-		una merer			
											Boring No.: BB-CUM-202	

			CHONEWALD	PR	OJEC	T:	Cum	ming	зR	Road	Brid	ge over MeTPK	Boring No.: BB-CUN	
		==	ASSOCIATES, I	c. Loc	CATIO	N:	Scar	boroı	uah	ı. Ma	aine		Proj. No.:18-00	01
Drille	er:	1	New England	Boring Contracto			vation			65			Core Barrel: NQ2	
<u> </u>	rator:		Enos / Steen				um:			NAVD			Sampler: std. split-spoon	
_	ged By:		Schonewald	0.000.40.4440		_	Type:	-411				B-53 (rubber track)	Hammer Wt./Fall: 140 lbs/30 in (auto	hammer)
-	Start/Fi		70+96. 5 ft LT	-2/22/18; 1440			ling Mo					boring NW to 93.5 ft	Hammer Type: auto Hammer Efficiency: 0.677	
	ng Loon		0.00,01121				ger ID/0				to 2 ft	1444 10 00:0 10	Water Level*: 2.0 ft (open)	
D = Sp MD = U U = Th MU = U V = Ins	olit Spoon S Jnsuccess Jin Wall Tul Jnsuccess Situ Vane S	ful Split Spo be Sample ful Thin Wal hear Test	on Sample attem I Tube Sample at ne Shear Test att	N-unce pt N ₆₀ =	DNAL DE prected = N value c er efficien esitu Field eck Core S Rock Qu	N val orrecto cy = c Vane Sample	ue ed for ha alculated Shear S e	hamme trength	er effi	iciency	WOI WOI = I BOF SSA	IONAL DEFINITIONS: I = weight of 140lb. hammer R = weight of rods not recorded IEHOLE ADVANCEMENT METH I/HSA=solid/hollow stem auger roller cone/OPEN/PUSH=hvdrau	LABORATORY TEST RESULTS: AASHTO / USCS soil classifications #200 = percent fines	t sticity Index
		2		Sample Informa		₀			Т		1			
Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf)		N-uncorrected	N-60	Casing Blows		Elevation (ft.)	Graphic Log	Visual D	Description and Remarks	Lab. Testin Result
50	11D V2	24/22	50.0 - 52.0 50.6 - 51.0	VANE INTERVAL Su= 522 / 27 psf				OPEN	۷			11D: Dark grey with dar SAND, with occasional	ker grey streaks, Silty CLAY, trace fine	
	V2 V3		51.6 - 52.0	Su= 522 / 2/ psf Su= 453 / 14 psf		\dashv			1			V2: Tu=19 / Tr=1 ft-lbs ((65 mm x 130 mm vane)	
												v3. Tu=10.57 T1=0.5 II-I	lbs (65 mm x 130 mm vane)	
- 55 -	12D V4	24/22	55.0 - 57.0 55.6 - 56.0	VANE INTERVAL Su= 549 / 27 psf		1			1			• •	ilty CLAY, with nodules throughout.	
	V4 V5		55.6 - 56.0 56.6 - 57.0	Su= 549 / 27 psf Su= 508 / 27 psf		\dashv			┨			V4: Tu=20 / Tr=1 ft-lbs ((65 mm x 130 mm vane)	
												V3. 14-16.37 11-1 16-108	s (65 mm x 130 mm vane)	
- 60 -	13D V6	24/23	60.0 - 62.0 60.6 - 61.0	VANE INTERVAL Su= 591 / 27 psf		\neg			1				ilty CLAY, with nodules throughout.	
	V6 V7		61.6 - 62.0	Su= 591 / 27 psf Su= 728 / 14 psf		\dashv			┨				s (65 mm x 130 mm vane)	
												V7: Tu=26.5 / Tr=0.5 ft-l	lbs (65 mm x 130 mm vane)	
- 65 -	14D	24/22	65.0 - 67.0	VANE INTERVAL		\dashv			┨				ilty CLAY, with shell fragments and	
	14D V8 V9	- // -	65.0 - 67.0 65.6 - 66.0 66.6 - 67.0	VANE INTERVAL Su= 783 / 27 psf Su= 728 / 14 psf		\dashv			+			nodules throughout. V8: Tu=28.5 / Tr=1 ft-lbs	s (65 mm x 130 mm vane)	
	79		66.6 - 67.0	Su= /28 / 14 pst								V9: Tu=26.5 / Tr=0.5 ft-l	lbs (65 mm x 130 mm vane)	
- 70 -						\Box						4ED Ded 11 1 5	Site, OLAV, with an electrical	
آ ا	15D V10	24/20	70.0 - 72.0 70.6 - 71.0	VANE INTERVAL Su= 797 / 41 psf									ilty CLAY, with nodules throughout. bs (65 mm x 130 mm vane)	
	V11		71.6 - 72.0	Su= 934 / 27 psf					1				(65 mm x 130 mm vane)	
						\dashv			1			• 71. 14-047 H-11t-108	. (SS mill A 100 mill valle)	
75						\neg								
Rem	arks:										V(7 F X			
Stratif	ication line	s represent	approximate bour	ndaries between scil	ypes; trar	sition	s may be	gradua	ıl.				Page 3 of 4	

			CHONEWALE		PROJE	CT:	Cum	mings	Road	Brid	ge over MeTPK Boring No.: BB-CUM-202
			ASSOCIATES, I		LOCATI	ON:	Scarl	borou	gh, Ma	aine	Proj. No.: 18-001
Drille	r:	١	lew England	Boring Co		_	vation		68.5		Core Barrel: NQ2
Oper	ator:	Е	nos / Share			Dat	um:		NAVD	88	Sampler: std. split-spoon
	ed By:		Schonewald			+	Type:				B-53 (rubber track) Hammer Wt./Fall: 140 lbs/30 in (auto hammer)
	Start/Fi		2/26/18; 2035	i-2/28/18; 0	005	_	lling Me				boring Hammer Type: auto
Borin	ng Locat	ion: 7	0+00, 1 ft LT			+	sing ID				NW to 81.7 ft Hammer Efficiency: 0.677
IN-SITU	J SAMPLII	NG AND TE	STING:		ADDITIONAL D		ger ID/O	טט:	SSA	to 5 ft	Water Level*: 5.0 ft (open)
MD = U U = Thi MU = U V = Insi	n Wall Tub Insuccessfi itu Vane Sl	ul Split Spor e Sample ul Thin Wall near Tes. ul Insitu Var		ttempt tempt Sample In	N-uncorrected N ₆₀ = N value hammer efficie S _U = Insitu Fie R = Rock Corr RQD = Rock (e correct ency = c eld Vane e Sampl Quality [ted for ha calculated s Shear S le	I hammer trength (p	efficiency	WO = BOF SSA	= weight of 140lb. hammer
Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear	strength (psf) or RQD (%)	N-uncorrected	09-N	Casing Blows	Elevation (ft.)	Graphic Log	Visual Description and Remarks La Res
75	16D	24/9	75.0 - 77.0	18-18	-18-21	36	41	83			16D: Grey, dense, fine to coarse Sandy GRAVEL, some Silt. TILL
ŀ								78 98			
								256			
80								76			
	17D	18/11	80.0 - 81.5		23-30/0"	38	43	55			17D: Grey brown, dense, Silty GRAVEL, some fine to coarse Sand.
	R1	60/60	81.7 - 86.7	RQD: 4	1" = 73%				-13.0		
ŀ											dipping and planar) and few calcsilicate veins (typically weathered). Typically moderately spaced and moderately dipping breaks; undulating, rough, typically fresh and open. One open
85											fracture at 83.3 ft. Core imes: 2:40/ 2:05/ 2:15/ 1:55/ 2:00 min:sec/tt. GOOD TO FAIR ROCK QUALITY
-											
											Bottom of Exploration at 86.7 feet below ground surface.
90 -											
-											
95 -											
}											
100											
	arks:		1								I

Page 10

Drille	er:		Associates, In New England	Boring Contractors	$\overline{}$	vation		65	anie	Core Barrel: NQ2	
Oper			Enos / Steen	5	_	tum:	,	NAVI	D88	Sampler: std. split-spoor	1
	ed By:		Schonewald		_	Type:				B-53 (rubber track) Hammer Wt./Fall: 140 lbs/30 in (au	
	Start/Fi		2/21/18; 0915-	2/22/18: 1440	-	Iling M				boring Hammer Type: auto	/
	ng Loca		70+96, 5 ft LT			sing ID				; NW to 93.5 ft Hammer Efficiency: 0.677	
_+111	. <u> </u>		, = .		_	ger ID/			to 2 ft	Water Level*: 2.0 ft (open)	
D = Spl MD = U U = Thi MU = U V = Insi	n Wall Tut Insuccessi itu Vane S	ample ul Split So e Sampla ul Thin Wa hear Tes	ESTING: Don Sample attem Ill Tube Sample atten ane Shear Test atte	hammer ef tempt S _u = Insitu R = Rock (L DEFINIT sted = N value correct ficiency = Field Van- Core Samp	TIONS: ilue ted for ha calculated e Shear S ile	mmer ef I hamme strength (ficiency r efficienc	ADDI WO WO sy = BOI SSA	TIONAL DEFINITIONS: LABORATORY TEST RESULTS: H = weight of 140lib. hammer AASHTO / USCS soil classifications #200 = percent fines WC = water cont recorded CONSOL= 1-D consolidation test REHOLE ADVANCEMENT METHODS: UII-Unconsolidated undrained triaxial ILL=Liquid Limit / Pl=Plastic Limit / Pl= roller cone/OPEN/PUSH=hydraulc push UCT op = peak compressive strength or	est Plasticity Index
				Sample Information							
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	Lal Testi Resi
75	16D V12	24/20	75.0 - 77.0 75.6 - 76.0	VANE INTERVAL Su= 1,044/27psf						16D: Dark grey black, Slty CLAY, with nodules throughout; so hardening.	me
ľ	V12		76.6 - 77.0	Su= 907 / 27 psf	1			1		V12: Tu=38 / Tr=1 ft-lbs (65 mm x 130 mm vane)	
ļ	V 10		10.0-11.0	Ou- 507 / 21 psi	-	-	\vdash	-		V13: Tu=33 / Tr=1 ft-lbs (65 mm x 130 mm vane)	
						L					
ŀ						\vdash	\vdash	1	J.A.		
. ₈₀							$\sqcup \!\!\! \perp$	1		17D: Dark grow black Sity CLAV with podulos throughout:	any
	17D V14	24/24	80.0 - 82.0 80.6 - 81.0	VANE INTERVAL Su= 838 / 27 psf						17D: Dark grey black, Slty CLAY, with nodules throughout; m hardening.	arry
İ	V15		81.6 - 82.0	Su> 1,099/-psf				1		V14: Tu=30.5 / Tr=1 ft-lbs (65 mm x 130 mm vane)	
ŀ					+	\vdash	\vdash	1		V15: Tu>40 / Tr= ft-lbs (65 mm x 130 mm vane)	
					1		oxdot	1			
ŀ							\vdash	1			
85							\vdash	-		18D: Dark grey black, Slty CLAY, with nodules throughout an	.
	18D V16	24/21	85.0 - 87.0 85.6 - 86.0	VANE INTERVAL Su= 1,071/41psf]		occasional concretions. V16: Tu=39 / Tr=1.5 ft-lbs (65 mm x 130 mm vane)	
	MV										
ŀ							\vdash	1		MV: Unable to push vane beyond 86.7 ft.	
							H	1			
							Ш	-24.0			9.0-
							$ \setminus \top $	-24.0		89.0 ft: Stratum change based on drilling behavior.	٥.٠
90	19D	24/9	90.0 - 92.0	18-25-31-24	56	63	HH	1		19D: Dark grey, v. densə, Silty GRAVEL, some Sand. TILL	
	ישט	2419	50.0 - 92.0	10-20-31-24	50	93		-	1.1		
									13.		
]	1-4		
ŀ		***	00 7 41 7	BOD *** ****		-	H	·	نانل		3.4-
	R1	60/57	93.5 - 98.5	RQD: 36" = 60%		<u> </u>	<u> </u>	-28.4	'	93.4 ft: Possible top of rock based on drilling behavior.	
_										R1: Hard, fresh to slightly weathered, aphanitic to fine grained grey, interbedded PHYLLITE and METASANDSTONE, with the	
95								1		bedding foliation (both moderately dipping, planar; and highly undulating) and calcsilicate veins (typically weathered). Typic	
ŀ						-	_	1		moderately spaced and moderately dipping breaks, often alon	
Į								1		foliation; undulating, rough, typically fresh and open. Two drill breaks (95.2 and 97.4 ft.) Core times: 1:55/ 1:45/ 1:50/ 1:35/ 1	:50
										min:sec/ft. FAIR ROCK QUALITY	
					1			1			
						<u> </u>	\vdash	1		Bottom of Exploration at 98.5 feet below ground surface	
100						L	L_	L	\perp		
Rema	arks:										
Ctratific	nation line	renresse	annrovimata harr	ndaries between soil type:	e: transitie:	ne movie	aradus			Page 4 of 4	
		- represell	. approximate DOUI	ruaries periveen son (ype:	s, u ansili0	ы пиду Об	yrauual			Faye 4 OI 4	

No. Revision

By Date

CONSULTANT PROJECT MANAGER: Tim Cote, P.E.

By Date

By Date

By Date

By Date

Designed JKO 08\18 Checked TJP 08\18

Drawn PEB 08\18 In Charge of RAL 08\18

Boring No.: BB-CUM-203

Visual Description and Remarks

2D: Red brown, loose, fine to coarse SAND, little fine Gravel,

3D: Tan, v. loose, fine to medium SAND, trace coarse Sand, trace Silt.

5D: Grey, v. loose, interbedded SILT, trace very fine Sand; fine SAND, some Silt; and Silty CLAY, little very fine SAND.

HNTB CORPORATION

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FAX (207) 228-0909



THE GOLD STAR MEMORIAL HIGHWAY BRIDGE REPLACEMENT CUMMINGS ROAD UNDERPASS

BORING LOGS VII

CONTRACT:2018.19

SHEET NUMBER: S-09

MTA PROJECT MANAGER: Ralph C. Norwood, IV, P.E., P.T.O.E.

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ge 38 of 40

PROJECT: Cummings Road Bridge over MeTPK Boring No.: BB-CUM-204 (OW) Proj. No.: _____18-001 LOCATION: Scarborough, Maine **Driller:** New England Boring Contractors **Elevation (ft.)** 66.5 Core Barrel: n/a Date Start/Finish: 2/15/18; 1005-2/16/18; 1410 Drilling Method: cased wash boring Hammer Type: auto Casing ID/OD: HW to 49 ft Boring Location: 74+15, 33 ft LT Auger ID/OD: SSA to 5 ft Water Level*: 3.0 ft (open)

IN-SITU SAMPLING AND TESTING:
D = Split Spoon Sample
MD = Unsuccessful Injury and Tube Sample attempt
V = Insitu Vane Shear Test
MV = Unsuccessful Injury and Shear Test attempt
MV = Unsuccessful Injury and Shear Test attempt
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MV = Unsuccessful Injury And Shear Test attempt
MV = Unsuccessful Injury And Shear Test And Shear MV = Machine Injury And Shear Test An Visual Description and Remarks Tan, moist, m. dense, fine to medium SAND, trace Silt; changing at 3.6 ft to: 1D: Dark red brown, wet, fine to coarse SAND, trace to little Silt. 1D 24/15 2.0 - 4.0 5-4-8-9 2D: Dark red brown, wet, m. dense, fine to coarse SAND, trace 1-6-8-6 14 16 SPIN 3D: Red tan, v. loose, fine to medium SAND, trace fine Gravel, 4D: Grey, v. loose, interbedded fine SAND, trace to little Silt; Silty very fine SAND; and SILT, little to some very fine Sand. 5D: Grey with two dark grey pockets, v. loose, fine SAND, trace to little Silt; organic odor. 5D 24/13 19.0 - 21.0 WOH-1-3-3 4 5 40 6D: Grey with two dark grey seams, v. loose, fine SAND, trace Silt; organic odor. 2 2 30 6D 24/6 24.0 - 26.0 1-1-1-1 Groundwater level observation well installed upon completion of test boring. Observation well: 2-inch dia. PVC; well screen 25 to 15 ft BGS; riser to 2.5 ft stick up. Bentonite plug 48 to 38.8 ft BGS; Filter sand 38.8 to 4.0 ft BGS. Locking protective casing set; stick up without cover 2.30 ft. Vater level readings have been made at times and under conditions stated. Groundwater fluctuations may occur due to conditions other than those resent at the time measurements were made. Boring No.: BB-CUM-204 (OW)

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nish:	Enos / Cotter Schonewald	Boring Contractors	El-	Scar evation atum:		gh, M 66.5		Proj. No.: 18-001	l
nish:	Enos / Cotter Schonewald	Boring Contractors	El-	evation				Core Barrel: n/a	
nish:	Schonewald		_	atum:					
nish:			Ri			NAVI	D88	Sampler: std. split-spoon	
Start/Finish: 2/15/18; 1005-2/16/18; 1410 ng Location: 74+15, 33 ft LT				g Type:		Mob	ile Drill	B-53 (rubber track) Hammer Wt./Fall: 140 lbs/30 in (auto ha	mmer)
				illing M	ethod:	case	d wash	n boring Hammer Type: auto	
ing Location: 74+15, 33 ft LT					/OD:	HW	to 49 ft	Hammer Efficiency: 0.677	
			Αι	uger ID/	OD:	SSA	to 5 ft	Water Level*: 3.0 ft (open)	
oe Sample ful Thin Wa hear Tes:	oon Sample attem all Tube Sample at ane Shear Test att	pt N ₆₀ = N val hammer effi tempt S _u = Insitu F R = Rock Co empt RQD = Rocl	ed = N v ue corre ciency = ield Var ore Sam	alue cted for ha calculated ne Shear S ple	d hammei Strength (r efficienc	WO WO y = BOI SSA	not recorded CONSOL= 1-D consolidation test REHOLE ADVANCEMENT METHODS: UU=Unconsolidated undrained triaxial test VHSA=solid/hollow stem auger LL=Liquid Limit / PL=Plastic Limit / Pl=Plastic	city Index
·			ъ	1			1		
Pen./Rec. (in	Sample Dept (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrecte	09-N	Casing Blows	Elevation (ft.)	Graphic Log	Visual Description and Remarks	Lab. Testing Results
24/21	50.0 - 52.0			Π				11D: Dark grey with darker grey streaks, Silty CLAY, trace fine	WC=40.39 LL=40.5
	50.6 - 51.0 51.6 - 52.0	Su= 426 / 14 psf Su= 440 / 14 psf				-		V1: Tu=15.5 / Tr=0.5 ft-lbs (65 mm x 130 mm vane) V2: Tu=16 / Tr=0.5 ft-lbs (65 mm x 130 mm vane)	PL=22.3 PI=18.2
								III. Dark gray black Silhy CLAV	CONSOL (Cv, Cα) WC=58.0% LL=41.4
24/24	55.0 - 57.0	HYD PUSH		\vdash				on bango, ban, on, obt	
									PL=21.1 <u>PI=20.3</u>
				_		-			
24/21	60.0 - 62.0 60.6 - 61.0	VANE INTERVAL				-		12D: Dark grey black, Silty CLAY, with nodules throughout. V3: Tu=23.5 / Tr=0.5 ft-lbs (65 mm x 130 mm vane)	WC=47.19 LL=49.8
	61.6 - 62.0	Su= 577 / 14 psf						V4: Tu=21 / Tr=0.5 ft-lbs (65 mm x 130 mm vane)	PL=24.3 PI=25.5
				+	\vdash	-		U2: Dark grey black, Silty CLAY.	
24/24	65.0 - 67.0	HYD PUSH							
24/22	70.0. 70.0	VANE INTERNAL						13D: Dark grey black, Silty CLAY, with large nodules throughout.	
24122	70.6 - 71.0	Su= 687 / 41 psf		-	\vdash	-		V5: Tu=25 / Tr=1.5 ft-lbs (65 mm x 130 mm vane)	
	71.6 - 72.0	Su= 879 / 27 psf						V6: Tu=32 / Tr=1 ft-lbs (65 mm x 130 mm vane)	
				_		-			
							V/ P	1	
	(ul Spit Sp es Sample Sp es Sam	Lul Spit Spoon Sample attern	Us Spit Spoon Sample attempt Nego = N value Nego =	(ul. Spitt Spoon Sample attempt hear Tess and will institute a special plants) Nega = N value correspondents se Sample full Thin Wall Tube Sample attempt thear Tess Su = Institute Field Var RCDe Fack Austitute Research full Thin Wall Tube Sample attempt thear Test attempt Sample Information Sample Information (ul.) Had a great the part of the pa	Us Spit Spoon Sample attempt Spit Spoon Sample attempt Sample Spit Spoon Sample attempt Sample Spit Spoon Sample Spit Spoon Spit Spit Spit Spit Spit Spit Spit Spit	Magna	No. 2 Nalue corrected for hammer efficiency and marked filters No. 2 2 2 2 2 2 2 2 2	Us Spit Spoon Sample attempt Spit Spoon Sample attempt Spit Spoon Sample Spit Spoon Sample Spit Spoon Sample Spit Spoon Sample Spit Spoon Spit Spit Spit Spit Spit Spit Spit Spit	Use Section Sample atternation Neg = N to be corrected for humanner efficiency post activated harmer and conscisor of scalable Not N

Boring No.: BB-CUM-204 (OW) PROJECT: Cummings Road Bridge over MeTPK **Proj. No.**: ______18-001 LOCATION: Scarborough, Maine Driller: New England Boring Contractors Elevation (ft.) 66.5 Core Barrel: n/a Drilling Method: cased wash boring Hammer Type: auto **Date Start/Finish:** 2/15/18: 1005-2/16/18: 1410 Boring Location: 74+15, 33 ft LT Casing ID/OD: HW to 49 ft Hammer Efficiency: 0.677 Visual Description and Remarks 7D: Grey, v. soft, interbedded, Silty CLAY, trace very fine Sand; and fine SAND, little to some Silt. 24/20 34.0 - 36.0 WOR/18"-WOH 9D: Grey, v. soft, Silty CLAY, trace fine Sand, with two 2-inch 10D: Grey, v. soft, Silty CLAY, trace fine Sand, with occasional seams and partings fine Sandy SILT. 24/21 44.0 - 46.0 WOR/18"-1 Groundwater level observation well installed upon completion of test boring. Observation well: 2-inch dia. PVC; well screen 25 to 15 ft BGS; riser to 2.5 ft stck up.
Bentonite pug 48 to 38.8 ft BGS; Filter sand 38.8 to 4.0 ft BGS.
Locking protective casing set; stick up without cover 2.30 ft. ater level readings have been made at times and under conditions stated. Groundwater fluctuations may occur due to conditions other than those esent at the fine measurements were made. Boring No.: BB-CUM-204 (OW)

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			SCHONEWALD PROJECT: Cummings Road Bridge over MeTPK ENGINEERING									Boring No.: BB-CUN	
		==	Associates, In		LOCAT	ION:	Soor	hore	nuah	Maine		Proj. No.:18	3-001
Orille			New England			$\overline{}$	evation		66 66			Core Barrel: n/a	
Opera			Enos / Cotter	Dorning Con	illactors	_		(11.)				Sampler: std. split-spc	non
	ed By:		Schonewald			-	Datum: NAVD88 Rig Type: Mobile Drill B-53 (rubber track)					Hammer Wt./Fall: 140 lbs/30 in (
	Start/Fir		2/15/18; 1005-	2/16/19: 1.	110	$\overline{}$	illing M				h boring	Hammer Type: auto	auto nammer)
			74+15, 33 ft LT	-2/10/10, 14	+10	_	sing ID			V to 49		'	
БОПП	g Locat	ion.	74+15, 55 11 L1			_	ger ID/			A to 5		Water Level*: 3.0 ft (open)	
N-SITU	SAMPLI	NG AND T	ESTING:		ADDITIONAL			OD.	30		ITIONAL DEFINITIONS:	Water Level*: 3.0 ft (open) LABORATORY TEST RESULTS:	
ID = Ur Thir IU = Ur Insit	Wall Tub successi u Vane Sh	ul Split Spo e Sample ul Thin Wa near Test	oon Sample attem Il Tube Sample at une Shear Test atte	pt tempt empt	N-uncorrecte N ₆₀ = N valu hammer effic S _u = Insitu F R = Rock Co RQD = Rock	ed = N va ue correc ciency = o rield Vano ore Samp	alue cted for ha calculated e Shear S ble	d hamr Strengt	ner efficie h (psf)	/ W ency B S	DH = weight of 140lb. hammer DR = weight of rods • not recorded PREHOLE ADVANCEMENT METI A/HSA=solid/hollow stem auger	AASHTO / USCS soil classifications -#200 = percent fines WC = wate CONSOL= 1-D consolidation test	al test I=Plasticity Index
ŀ		·		Sample In		ъ		Г	\top				
Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength	(psf) or RQD (%)	N-uncorrected	N-60	Casing	Casing Blows Elevation (ft.)		Visual [Description and Remarks	Lab. Testing Results
75	U3	24/24	75.0 - 77.0	HYD F				П		(ft.)	U3: Dark grey, Silty CL/	AY.	CONSOL
80 -	14D V7	24/24	80.0 - 82.0 80.6 - 81.0 81.6 - 82.0	VANE IN Su= 879 Su= 714							nodules throughout. V7: Tu=32 / Tr=1 ft-lbs	silty CLAY, with few concretions and (65 mm x 130 mm vane) (65 mm x 130 mm vane)	(Cv, Ca) WC=40.0% LL=40.0 PL=23.4 PI=16.6
85 -	U4	24/23	85.0 - 87.0	HYD F	PUSH						U4: Dark grey black, Sil	ty CLAY.	
								Ш	П	1/2			
H								Н	Н	1/2			
-								W	-2	1.5	88.0 ft: Possible top of a	weathered rock based on drilling bel- ock based on drilling behavior.	-88.0- navior.
90							-	Н	- -2	3.5			-90.0-
-											Roller cone refusal.	n at 90.0 feet below ground surfac	
95									+				
ŀ													
-									\dashv				
ŀ	-+						-	\vdash	\dashv				
- 1								L	\bot				

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HNTB CORPORATION

340 County Road, Suite 6-C
Westbrook, ME 04092
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FAX (207) 228-0909



THE GOLD STAR MEMORIAL HIGHWAY

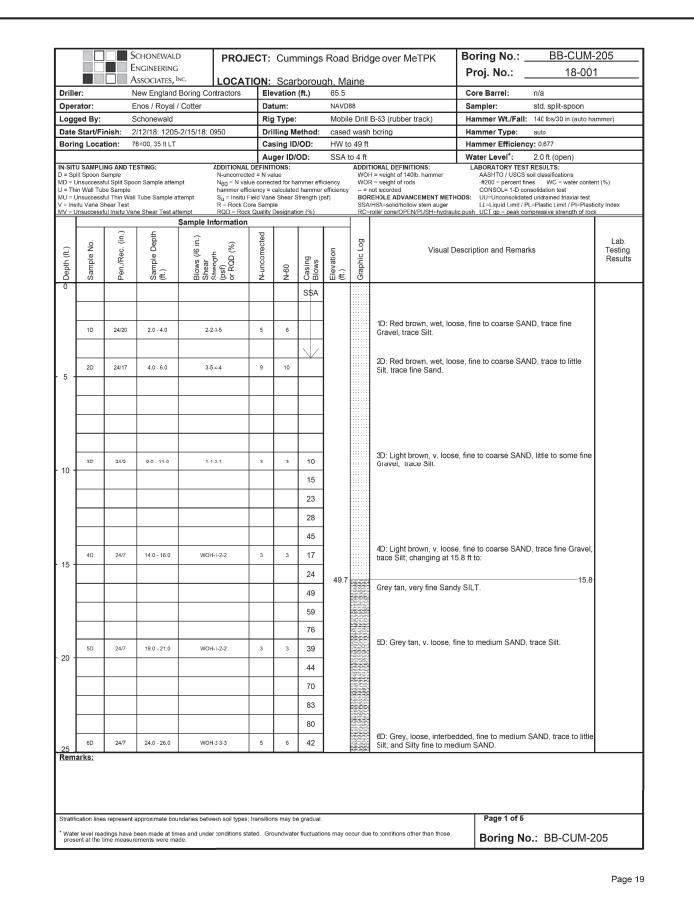
BRIDGE REPLACEMENT
CUMMINGS ROAD UNDERPASS

BORING LOGS VIII

SHEET NUMBER: S-10
CONTRACT:2018.19
85 OF 1

MTA PROJECT MANAGER: Ralph C. Norwood, IV, P.E., P.T.O.E.

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			SCHONEWALE Engineering		PROJ	ECT:	Cum	mıngs	Road	1 Brid	ge over MeTPK	Boring No.:	BB-CUM-2			
			Associates, I		LOCAT	TION:	Scar	borou	gh, M	aine		Proj. No.:	18-001			
Drille	er:		New England	Boring Co		$\overline{}$	vation		65.5			Core Barrel: n/a				
Ope	rator:		Enos / Royal /	Cotter		Da	tum:		NAVE	88	· ·	Sampler: std	. split-spoon			
	ged By:		Schonewald			_	Type:				B-53 (rubber track)		lbs/30 in (auto har	nmer)		
	Start/Fi		2/12/18: 1205	-2/15/18; (0950	$\overline{}$	Iling M				boring	Hammer Type: auto				
Bori	ng Locat	ion:	76+00, 35 ft LT			_	sing ID			o 49 ft		Hammer Efficiency: 0.				
	U SAMPLII		TESTING:		ADDITIONAL	DEFINIT		טט:	55A		TIONAL DEFINITIONS:	LABORATORY TEST RESI				
MD = U J = Th MU = U √ = Ins	in Wall Tub Jnsuccessfi itu Vane Sh	ul Solit Sp e Sample ul Thin Wa near Test ul Insitu V	all Tube Sample at	ttempt tempt	N-uncorrect N ₆₀ = N val hammer effi S _u = Insitu R = Rock C RQD = Roc	lue correcticiency = Field Van ore Samp k Quality	cted for ha calculated e Shear S ble	d hammer Strength (p	efficienc	WOF = I BOF SSA	H = weight of 140lb. hammer R = weight of rods not recorded IEHOLE ADVANCEMENT METI /HSA=solid/hollow stem auger roller cone/OPEN/PUSH=hydrau	AASHTO / USCS soil cla -#200 = percent fines CONSOL= 1-D consolidated UU=Unconsolidated und LL=Liquid Limit /PL=Pla ulic push UCT qp = peak compres	WC = water content ation test rained triaxial test stic Limit / PI=Plastic			
Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear	Strength (psf) or RQD (%)	N-uncorrected	09-N	Casing Blows	Elevation (ft.)	Graphic Log	Visual [Description and Remarks	Lab. Testing Results			
25								45					i			
							55									
								62								
								78	1							
	7D	24/24	29.0 - 31.0	WOH	I-2-3-2	5	6	60			7D: Grey, loose, interbe Silt; and Silty CLAY, littl	edded, fine to medium SAN	D, trace to little			
30 -	30							66			one, and only obtr, no	io vory imo dana.				
								61	1							
								61								
								54	1							
	8D	24/24	34.0 - 36.0	WO	H/24"	0	0	63				rbedded, Silty fine to mediu				
35 -			34.5 - 30.5	***	1044	_	_	60			CLAY, trace fine Sand;	and fine to medium SAND,	little Silt.			
								48								
								43								
	9D	24/21	39.0 - 41.0	1-2	2-2-1	4	5	38				sterbedded, fine to medium SAND, trace to trace fine Sand; and Silty fine to medium				
40 -								33			SAND.	ace line Sand, and Sity line				
								28								
								30	23.0	77.77			- — —42.5			
								31								
	10D	24/21	44.0 - 46.0	wo	R/24"	0	0	29			10D: Grey, v. soft, Silty	CLAY, trace fine Sand.				
45 -								23								
								24								
								25								
								23								
50	11D V1	24/22	49.0 - 51.0 49.6 - 50.0	VANE IN	NTERVAL 9 / 41 psf			open			11D: Grey with occasio medium SAND as parti	nal black streaks, Silty CLA ngs and lenses.	Y, trace fine to	WC=37.9% LL=35.1		
	arks:	represer	nt approximate bou	indaries betw	een soil types	; transitio	ns may be	e gradual.				Page 2 of 5				
* Wate pres	er level reac ent at the ti	lings have ne neasi	e been made at tim urements were ma	nes and unde ide.	r conditions st	ated. Gr	oundwate	r fluctuatio	ons may o	occur due	e to conditions other than those	Boring No.:	BB-CUM-2	05		

Opera Logge Date S			DIGINA FUGIONAL					184 1		OF F			Once Bassels 12	
Logge	TOP'				ntractors	_	vation	(Tt.)		65.5			Core Barrel: n/a	
			Enos / Royal /	Cotter		-	tum:			NAVD8		D 50 (Sampler: std. split-spoon	
Date S			Schonewald			_	Type:		_			B-53 (rubber track)	Hammer W:./Fall: 140 lbs/30 in (auto h	ammer)
Desire			2/12/18; 1205-	:2/15/18; C	1950	_	Drilling Method: Casing ID/OD:					boring	Hammer Type: auto	
Boring	g Loca	tion:	76+00, 35 ft LT			_				HW to			Hammer Efficiency: 0.677 Water Level*: 2.0 ft (open)	
D = Split MD = Un U = Thin MU = Un V = Insitu	Spoon S successf Wall Tub successf u Vane Si	ul Split Sp e Sample ul Thin Wa hear Test	oon Sample attem all Tube Sample att ane Shear Test atte	pt tempt empt	ADDITIONAL N-uncorrecte N ₆₀ = N valu hammer effic S _U = Insitu F R = Rock Co RQD = Rock	DEFINIT d = N va le correctiency = d ield Vane re Samp	lue ted for ha calculated Shear S le	mmer hamr trengt	mer e	efficiency	WOH WOF = I BOR	IONAL DEFINITIONS: 1 = weight of 140lb, hammer R = weight of rods tot recorded EHOLE ADVANCEMENT METH HSA=solid/hollow stem auger roller cone/OPEN/PUSH=hydrauli	LABORATORY TEST RESULTS: AASHTO , USCS soil classifications #200 = percent fines WC = water conte CONSOL= 1-D consolidation test	icity Index
H		_		Sample In	formation	_			\neg					
Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear	Strength (psf) or RQD (%)	N-uncorrected	09-N	Casing	Blows	Elevation (ft.)	Graphic Log		al Description and Remarks	
50	V2		50.6 - 51.0	Su= 440) / 27 psf				- 1			V1: Tu=20 / Tr=1.5 π-IDS V2: Tu=16 / Tr=1 ft-Ibs (6	65 mm x 130 mm vane)	PL=20.5 <u>Pl=14.6</u>
-														
55								\dashv	\dashv			12D: Dark grey with occa	asional black streaks, Silty CLAY, trace	
	12D V3	24/22	55.0 - 57.0 55.6 - 56.0	VANE IN Su= 508	ITERVAL 3 / 27 psf				╝			very fine SAND, with sm		
	V4		56.6 - 57.0	Su= 494	1 / 14 psf				- 1				(65 mm x 130 mm vane)	
60 -	U1	24/24	60.0 - 62.0	НУД	PUSH							U1: Dark grey black, Silt tube crimped and side gr pushed against a drop st	y CLAY, trace very fine Sand. Bottom of ouged up to 61.3 ft; appears to have tone.	CONSOL (Cv) WC=49.29 LL=42.1 PL=23.1 PI=19.0
65 -	13D V5 V6	24/24	65.0 - 67.0 65.6 - 66.0 66.6 - 67.0	VANE III Su= 52: Su= 611	ITERVAL 2 / 27 psf 3 / 14 psf							throughout. Changing at V5: Tu=19 / Tr=1 ft-lbs (6	Ity CLAY, trace very fine Sand; nodules t 86.5 ft. to gre _f , Silty CLAY. 35 mm x 130 mm vane) os (65 mm x 130 mm vane)	WC=39.39 LL=38.9 PL=21.1 PI=17.8
									\dashv					
70 -	U2	24/24	70.0 - 72.0	HYD	PUSH							U2: Dark grey, Silty CLA	Υ.	CONSOL (Cv) WC=43.0% LL=47.5 PL=22.8 PI=24.7
75									-					
Rema	rks:				'									•
Stratifica	ation lines	s represen	t approximate bour	ndaries betw	een soil types;	transitior	ns may be	gradu	ual.				Page 3 of 5	

		Schonewald -	11100	JECT:	Cum	mir	ngs	Road	Brid	ge over MeTPK Boring No.: BB-CUM-205				
		Engineering					-			Proj. No.:18-001				
		Associates, I	1 = 0 = 1						aine	-				
:				_		(Tt.)			00					
			Cotter	_										
			0/45/40, 0050	_		- 41								
			-2/15/18; 0950	_						-				
Locati	on:	70+00, 35 ILL1		_			•							
SAMPLIN	G AND T	ESTING:	ADDITIONA			JD.		33A		11.7				
successful Wall Tube successful Vane She	Split Sp Sample Thin Wa ear Tes	all Tube Sample al	N-uncorrect N ₆₀ = N v ₆	oted = N va alue correct ficiency = Field Van Core Samp ck Quality	alue sted for ha calculated e Shear S ble	l ham treng	mer ith (p	efficiency	WOI BOF SSA	R = weight of rods #200 = percent fines WC = water content (%) tot recorded CONSOL= 1-D consolidation test EHOLE ADVANCEMENT METHODS: UU=Unconsolidated undrained triaxial test LL=Liquid Limit / PL=Plastic Limit / Pl=Plasti	ex			
			Sample Information						-					
Sample No.	Pen./Rec. (in.	Sample Depth it.)	Blows (/6 in.) Shear Strength psf) or RQD (%)	N-uncorrected	N-60	Casing	Slows	Elevation ft.)	Graphic Log	Visual Description and Remarks Te	.ab. sting esult:			
				_	_	Ť			11/1/2	14D: Dark grey, Silty CLAY, with nodules throughout.				
				-		\vdash	\dashv			V7: Tu=29.5 / Tr=1 ft-lbs (65 mm x 130 mm vane)				
V8		76.6 - 77.0	Su= 907 / 27 psf							V8: Tu=33 / Tr=1 ft-lbs (65 mm x 130 mm vane)				
										U3: Dark grev. Silty CLAY.				
U3 24/24	80.0 - 82.0	HYD PUSH												
15D	24/24	85.0 - 87.0 VANE INTERVAL							15D: Dark grey with occasional black streaks, Silty CLAY, trace					
MV MV		85.6 - 86.0	Su= 810 / 41 psf							V9: Tu=29.5 / Tr=1.5 ft-lbs (65 mm x 130 mm vane) MV: Unable to push past 86.5 ft.				
MU	24/	90.0 - 92.0	HYD PUSH							MU: Sampler slipped when brought to surface; dropped 90 ft; sampler and tube retrieved, but tube discarded; sample field extruded and jarred: Dark grey, Silty CLAY, with one significant Sandy SILT seam at 90.6 ft and two concretions below seam.				
						+								
						\perp	Ш			LIA Dark seek O'th OLAY				
U4	24/24	95.0 - 97.0	HYD PUSH							U4: Dark grey, Silty CLAY.				
$\neg \uparrow$						\forall	H							
\rightarrow				-		\forall	\mathbb{H}							
						\		-33.0		98.5				
\dashv						Н	\vdash			98.5 ft: Possible top of weathered rock based on drilling behavior. 99.0 ft: Possible top of rock based on drilling behavior.				
- 1														
t t	or: d By: tart/Fin Locati Loca	or: d By: tart/Finish: Location: SAMPLING ANDI Spoon Sample successful Split Sy vane Shear Tes successful Insitu V O D D D D D D D D D D D D D D D D D D	or: Enos / Royal / By: Schonewald tart/Finish: 2/12/18; 1205 Location: 76+00, 35 ft LT SAMPLING ANDTESTING: Spoon Sample uccessful Split Spoon Sample uccessful Insitu Vane Shear Test at Vane Shear Test	Schonewald Sc	Schonewald Right	Schonewald Cotter Datum:	Schonewald Cotter Datum: Casing ID/OD Cas	Sample S	Semple Semple	Sample Information Sample Information Sample Information Sample Information Sample Information Sample Information I	Section Sect			

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THE GOLD STAR MEMORIAL HIGHWAY

BRIDGE REPLACEMENT
CUMMINGS ROAD UNDERPASS

BORING LOGS IX

SHEET NUMBER: S-11 CONTRACT:2018.19 86 OF 13

MTA PROJECT MANAGER: Ralph C. Norwood, IV, P.E., P.T.O.E.

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