

**GEOTECHNICAL DATA REPORT – PART II
TEMPORARY ROADWAY DIVERSION FOR
INTERSTATE 95 OVER SOUADABSCOOK STREAM WEST,
CENTER, EAST AND EMERSON MILL ROAD/B&A RAILROAD
HAMPDEN, MAINE
MAINEDOT WINS 21673, 21728, 21729, 21730**

by Haley & Aldrich, Inc.
Portland, Maine

for Maine Department of Transportation
Augusta, Maine

File No. 129380-002/003/004/005
June 2019



SIGNATURE PAGE FOR

GEOTECHNICAL DATA REPORT - PART II

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HAMPDEN, MAINE
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**PREPARED FOR
MAINE DEPARTMENT OF TRANSPORTATION
AUGUSTA, MAINE**

PREPARED BY:

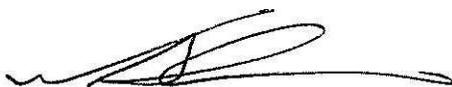


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File No. 129380-002/003/004/005

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Attention: Laura Krusinski, P.E.
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Subject: Geotechnical Data Report – Part II
Temporary Roadway Diversion for
Interstate 95 over Souadabscook Stream West, Center, East
and Emerson Mill Road/B&A Railroad
Hampden, Maine
MaineDOT WINS 21673, 21728, 21729, 21730

Ladies and Gentlemen:

This geotechnical data report – Part II (GDR-Part II) presents the results of additional subsurface investigation and geotechnical laboratory testing programs in support of the temporary roadway diversion for the Hampden Bridge Bundle. This work has been completed in accordance with our proposal dated 3 April 2019, and your subsequent authorization. Four geotechnical data reports (GDRs) presenting results of subsurface investigation and laboratory testing programs for the replacement bridges over Souadabscook Stream West, East, Center and Emerson Mill Road/B&A Railroad were submitted under separate cover dated February 2019.

It is our understanding that the project is being bid using a design-build delivery process. To provide design-build teams with “basis of bid” information regarding subsurface conditions for the replacement bridges and the temporary roadway diversion, Haley & Aldrich conducted subsurface investigations and completed geotechnical laboratory testing programs on behalf of MaineDOT, and summarized the data in the four GDRs and this GDR-Part II.

Project Understanding

The project consists of the replacement of four pairs of bridges that carry Interstate 95 over the Souadabscook Stream West, Center, and East and Emerson Mill Road/B&A Railroad. A temporary roadway diversion with four temporary bridges is anticipated to be constructed in the median. The location of the project is shown on Figure 1, Project Locus.

Horizontal Coordinate System and Elevation Datum

Plan locations of test borings are reported as northing and easting coordinates relative to the Maine State Plane Coordinate System, North American Datum of 1983 (NAD 83), Maine 2000 Central Zone (refer to Table I and boring logs in Appendix A). Elevations referenced herein are in feet and reference the North American Vertical Datum of 1988 (NAVD 88).

Geologic Setting

According to Maine Geological Survey's Hermon Quadrangle, Maine (2013), surficial geologic units mapped within the project alignment and vicinity consist largely of Wetland Deposits and Presumpscot Formation with minor areas of Glacial Till. Refer to Figure 13 for the surficial geology map. The historic test borings drilled at the West, Center and East Bridge sites and adjacent areas encountered wetland deposits (i.e., peat, silt and sand) overlying the Presumpscot Formation (i.e., glaciomarine clays, silts and sands), overlying glacial till (i.e. silt, sand and gravel). Emerson Mill Road bridge historic borings encountered Presumpscot Formation glaciomarine sediments overlying glacial till.

The recent (2017 and 2019) test borings drilled at the site sequentially encountered below ground surface man-placed fill, wetland deposits, and Presumpscot Formation overlying glacial till. Deposition of the Presumpscot Formation occurred as a result of melting glacial ice in conjunction with sea level rise during deglaciation in Late Wisconsinan time. Glacial till directly overlies bedrock. A thin layer of alluvial deposits (i.e. fine to coarse gravel and sand) were encountered below the fill and overlying the Presumpscot Formation intermittently throughout the project alignment. Alluvial and wetland deposits were absent in the boring locations on the eastern side of the East Bridges and also at Emerson Mill Road Bridge. These borings encountered man placed Fill overlying Presumpscot Formation overlying glacial till.

According to Maine Geological Survey's Bedrock Geology of the Bangor Quadrangle, Maine (1976), bedrock at the site is mapped as Silurian-Ordovician age rocks of the Vassalboro Formation. Bedrock core samples collected for this site investigation consisted of metamorphic rocks composed of phyllite and quartzite. Refer to Figure 14 for the bedrock geology map.

Subsurface Explorations

PRELIMINARY DESIGN PHASE II EXPLORATIONS BY HALEY & ALDRICH

Haley & Aldrich conducted a preliminary design, Phase II, geotechnical exploration program along the conceptual temporary roadway diversion. A total of twenty-two test borings (BB-HSS-201 through BB-HSS-220, BB-HSS-207A, and BB-HSS-219A) were completed to identify subsurface conditions. Test borings BB-HSS-202, BB-HSS-203 (West bridge), BB-HSS-208, BB-HSS-209 (Center bridge), BB-HSS-213, BB-HSS-214 (East bridge), BB-HSS-218 and BB-HSS-219 (Emerson Mill Road and B&A Railroad bridge) were drilled at anticipated temporary bridge structure locations. Borings BB-HSS-201, BB-HSS-204, BB-HSS-205 (West bridge area), BB-HSS-206, BB-HSS-207, BB-HSS-210 (Center bridge area), BB-HSS-211, BB-HSS-212, BB-HSS-215, BB-HSS-216 (East bridge area), BB-HSS-217 and BB-HSS-220 (Emerson Mill Road and B&A Railroad bridge area) were drilled along the conceptual temporary roadway as shown on Figures 2 through 12.

Boring locations were laid out in the field using a handheld GPS unit and by taping distances from existing site features. "As-drilled" locations and ground surface elevations at boring locations were determined by MaineDOT using GPS survey methods. As-drilled boring locations are shown on Figures 2 through 12. Coordinate location data and ground surface elevations at exploration locations are provided on individual test boring logs provided in Appendix A and are summarized in Table I.

All test borings were drilled by New England Boring Contractors of Hermon, Maine using either a track-mounted Mobile B-53 drill rig or a track-mounted M-1 drill rig depending on individual boring location access. Test borings were drilled to depths ranging from 6.5 ft to 56.5 ft below ground surface (BGS).

Test borings were advanced using cased-wash drilling methods by either driving or spinning casing. Casing consisted of 4.0-in. (HW-size) inside diameter (ID) steel casing and/or 3.0-in. (NW-size) ID steel casing. Casing blow count data is provided on the logs in Appendix A. Soil samples were generally collected continuously through the man-placed fill and then typically at 5-ft intervals once native soils were encountered. Approximately 10 ft of bedrock core was collected in temporary bridge structure test borings (BB-HSS-202, BB-HSS-203, BBB-HSS-208, BB-HSS-209, BB-HSS-213, BB-HSS-214, BB-HSS-218, BB-HSS-219). Proposed diversion roadway borings were terminated in dense granular soil beneath marine silt or clay deposits.

Soils samples were collected by driving a 1-3/8-in. ID split-spoon sampler with a 140-lb hammer dropped from a height of 30 in., as indicated on the test boring logs. Drilling and sampling were performed in accordance with MaineDOT specifications. The Mobile B-53 drill rig was equipped with an automatic hammer calibrated annually per MaineDOT requirements (Appendix A of MaineDOT Geotechnical Drilling Contract Specifications, revised June 2007). A calculated hammer efficiency of 0.7122 was used for the calibrated automatic hammer system for the steel track-mounted Mobile Drill B-53 rig. Cathead with a rope and hammer system was used on the rubber track-mounted Mobile Drill M-1 rig. A hammer efficiency of 0.6 was used for the rope and cathead system.

The number of hammer blows required to advance the sampler through each 6-in. interval was recorded and is provided on the test boring logs. The uncorrected SPT N-value is defined as the total number of blows required to advance the sampler through the middle 12 in. of the 24-in. sampling interval. The energy-corrected SPT N-value (N₆₀) is equal to the uncorrected N-value multiplied by the hammer efficiency factor divided by 0.6 (i.e., 60 percent theoretical hammer efficiency). Both the raw blow count data and the corrected N-values are shown on the boring logs.

Samples of the in-situ fill soils collected during the explorations were screened in the field with a photoionization detector (PID) to assess the presence of volatile organic compounds (VOCs). No elevated PID readings were detected during the subsurface explorations. No visual or olfactory signs of contamination/environmentally impacted soils were observed during the subsurface explorations.

The test borings sampled 6.9 to 13.6 ft of bedrock using a 2.0-in. (NQ-size) ID diamond-tipped core barrel. Refer to rock core photographs provided in Appendix B for detailed information on bedrock core samples collected.

All soil and bedrock samples were classified in accordance with the MaineDOT classification system and were preserved in glass sample jars and wooden core boxes. The samples that were not submitted for

laboratory testing are available for review upon request. Soil and bedrock samples are being stored at the Haley & Aldrich laboratory facility in Portland, Maine.

Generalized Subsurface Conditions

The subsurface conditions encountered throughout the project site alignment in the recent Phase II test borings consist of the following sequence of geologic units presented in order of increasing depth below ground surface: man-placed fill, organic deposits, marine deposits, glacial till and bedrock. Note that certain geologic units may be absent at some test boring locations.

SOIL UNIT AND BEDROCK DESCRIPTIONS

Soil

Refer to Table II for a summary of the soil units and encountered thicknesses at each test boring location. A description of each soil unit is provided separately, below. Detailed soil descriptions are provided on the test boring logs in Appendix A. Please note that the soil descriptions provided on the test boring logs and summarized below do not represent actual field conditions other than at specific test boring locations. The actual conditions will vary from those described and shown herein.

Souadabscook Stream West Area

Unit		Approximate Range in Encountered Thickness (ft)	Generalized Description
Topsoil		0.2 to 0.5	Soft SILT, trace medium to fine sand, trace fine gravel, trace organics (ML) <i>(encountered in all test borings except BB-HSS-201)</i>
Fill		1.7 to 5.9	Medium stiff fine to coarse sandy SILT, trace fine gravel (ML); medium stiff to very stiff silty CLAY, some to little sand, trace roots (CL); very loose to medium dense silty fine to coarse SAND, trace fine gravel (SM); fine to coarse SAND, some to little silt, little to trace fine to coarse gravel, roots (SM, SW-SM); medium dense fine to coarse gravel, little silt (GW-GM) <i>(encountered in all test borings, BB-HSS-201 through BB-HSS-205)</i>
Organic Deposit		0.6 to 2.1	Very soft to soft PEAT (OH); silty CLAY and PEAT, little sand (CL/OH) Organic deposits were interbedded within the marine silt/clay deposits in BB-HSS-201 through BB-HSS-204 <i>(encountered in all test borings except BB-HSS-205)</i>
Marine Deposit	Silt/Clay	6.6 to 26.7	Medium stiff to stiff clayey SILT, little to trace fine to coarse sand, trace gravel, little to trace peat, organics (ML); very soft to very stiff silty CLAY, little to trace fine sand, trace fine gravel, trace organics (CL); soft to medium stiff sandy CLAY (CL); stiff fine sandy SILT to clayey SILT (ML) <i>(encountered in all test borings, BB-HSS-201 through BB-HSS-205)</i>
	Sand	0.8 to >11.5	Loose clayey fine SAND with silty clay layers (SC); very loose to loose fine SAND, little to trace silt (SP-SM, SM) <i>(encountered in all test borings except BB-HSS-203 and BB-HSS-205)</i>
Glacial Till		4.8 to >11.9	Medium dense to very dense fine to coarse SAND, some to little silt/or clay, some to trace fine to coarse gravel (SW-SM, SM); gravelly fine to coarse SAND, trace silt (SW), very stiff SILT, some fine to coarse sand and gravel (ML) The glacial till was moderately bonded and contained occasional boulders <i>(encountered in all test borings except BB-HSS-201 which was not drilled deep enough to determine presence of stratum)</i>

Souadabscook Stream Center Area

Unit	Approximate Range in Encountered Thickness (ft)	Generalized Description
Topsoil	0.1 to 0.5	Soft fine to coarse sandy SILT, trace fine gravel, contains organics (ML, OL) <i>(encountered in all test borings except BB-HSS-209 and BB-HSS-210)</i>
Fill	0.5 to 15.5	Stiff fine to coarse sandy SILT, trace fine gravel, trace organics (ML); very soft silty CLAY, trace fine to medium sand, contains roots (CL); loose fine to coarse SAND, little fine to coarse gravel, trace silt (SW); very loose to medium dense fine to coarse SAND, some to little fine to coarse gravel, little silt (SW-SM); loose to dense silty fine to coarse SAND, some to trace fine to coarse gravel, trace organics; loose fine to coarse SAND, some silt, little fine to coarse gravel (SM) <i>(encountered in all test borings, BB-HSS-206 through BB-HSS-210)</i>
Organic Deposit	1.3 to 6.5	Very soft to soft PEAT, little fine sand, little silt, contains roots, reeds, wood (OH); organic SILT (OH) Organic deposits were interbedded within the marine silt/clay deposits in BB-HSS-209 and BB-HSS-210 <i>(encountered in all test borings except BB-HSS-206)</i>
Marine Deposit	5.5 to 27.0	Very soft to soft clayey SILT, some organics, layered (ML); soft SILT, trace fine sand (ML); very soft to soft silty CLAY, trace peat, contains roots (CL); very soft to medium stiff silty CLAY, little to trace fine to medium sand, trace fine gravel, trace organics (CL) <i>(encountered in all test borings, BB-HSS-206 through BB-HSS-210)</i>
Glacial Till	>1.8 to 7.5	Medium dense to very dense fine to coarse GRAVEL, some fine to coarse sand, some silt; sandy GRAVEL, little clay (GM); very dense fine to coarse GRAVEL, some fine to coarse sand, trace silt (GW); very dense gravelly SAND, little silt (SW-SM); loose clayey SAND, little gravel (SC) The glacial till was loosely to moderately bonded and contained occasional cobbles <i>(encountered in all test borings except BB-HSS-207 which was not drilled deep enough to determine presence of stratum)</i>

Souadabscook Stream East Area

Unit	Approximate Range in Encountered Thickness (ft)	Generalized Description
Topsoil	0.2 to 1.0	Very soft SILT (frozen soil), contains roots, organics <i>(encountered in all test borings except BB-HSS-211 and BB-HSS-213)</i>
Fill	3.7 to 7.8	Medium stiff to very stiff SILT, some to little fine to coarse sand, little to trace fine to coarse gravel, trace organics (ML); loose silty fine to coarse SAND, some fine to coarse gravel (SM) <i>(only encountered in test borings BB-HSS-214 and BB-HSS-216)</i>
Probable Organic Deposit ¹	2.5 ¹	Soft SILT, organics (OL/ML) ¹ <i>(only encountered in test boring BB-HSS-214)</i>
Marine Deposit	1.5 to 12.3	Very soft to soft clayey SILT, some organics, layered (ML); soft SILT, trace fine sand (ML); very soft to soft silty CLAY, trace peat, contains roots (CL); very soft to medium stiff silty CLAY, little to trace fine to medium sand, trace fine gravel, trace organics (CL) <i>(encountered in all test borings except BB-HSS-215 and BB-HSS-216)</i>
Glacial Till	4.7 to >17.0	Medium dense to very dense fine to coarse GRAVEL, some fine to coarse sand, some silt; sandy GRAVEL, little clay (GM); very dense fine to coarse GRAVEL, some fine to coarse sand, trace silt (GW); very dense gravelly SAND, little silt (SW-SM); loose clayey SAND, little gravel (SC) The glacial till was loosely to moderately bonded and contained occasional cobbles <i>(encountered in all test borings except BB-HSS-211 and BB-HSS-212)</i>

Notes:

¹ Probable organic deposit based on drill action, casing blows and observation of wash water contents. Approximate thickness of the deposit and conditions described are specific to boring BB-HSS-214.

Emerson Mill Road/B&A Railroad Area

Unit	Approximate Range in Encountered Thickness (ft)	Generalized Description
Topsoil	0.1 to 0.3	Very soft SILT, organics (ML) <i>(encountered in all test borings except BB-HSS-218)</i>
Fill	0.5 to 4.6	Very loose silty coarse to fine SAND, little gravel, contains roots (SM); soft SILT, some coarse to fine sand, trace gravel (ML) <i>(encountered in all test borings, BB-HSS-217 through BB-HSS-220)</i>
Marine Deposit	5.3 to 17.7	Medium stiff to hard silty CLAY, little to trace fine sand, occasional fine sand partings (CL); medium stiff fine sandy CLAY, frequent fine sand partings (CL) <i>(encountered in all test borings, BB-HSS-217 through BB-HSS-220)</i>
Glacial Till	>4.5 to 12.2	Medium dense to dense silty fine to coarse SAND, little gravel, contains weathered bedrock (SM); fine to coarse SAND, little silt, little gravel (SM, SW-SM); loose clayey SAND (SC); dense to very dense coarse to fine GRAVEL, some fine to coarse sand, little silt (GM, GW-GM) The glacial till was loosely to well bonded and contained occasional to frequent cobbles and boulders <i>(encountered in all test borings, BB-HSS-217 through BB-HSS-220)</i>

Bedrock

Bedrock was cored in temporary bridge structure borings (BB-HSS-202, BB-HSS-203, BB-HSS-208, BB-HSS-209, BB-HSS-213, BB-HSS-214, BB-HSS-218, BB-HSS-219). Approximate depth to top of bedrock and approximate elevation of top of bedrock is summarized in the table below.

Bridge Location	Test Boring No.	Ground Surface Elevation	Approximate Top of Bedrock Depth (ft)	Approximate Elevation of Top of Bedrock	RQD (%)	Average RQD (%) ¹
West Bridge	BB-HSS-202	126.1	38.1	88.0	89, 93	91
	BB-HSS-203	126.3	34.2	92.1	0, 100, 97	66
Center Bridge	BB-HSS-208	125.3	32.1	93.2	66, 98 ²	82 ²
	BB-HSS-209	125.8	43.5	82.3	16, 8, 65	30
East Bridge	BB-HSS-213	124.5	18.8	105.7	8, 45, 56	36
	BB-HSS-214	124.4	18.4	106.0	64, 64	64
Emerson Mill Road Bridge	BB-HSS-218	139.6	15.9	123.7	43, 90, 90	74
	BB-HSS-219A	138.9	23.0	115.9	48, 100, 100	49

¹ Average RQD is the mean of RQDs recorded for each test boring.

² RQD for weathered rock in BB-HSS-208 not included.

Detailed bedrock descriptions are provided on test boring logs in Appendix A. Weathered bedrock and approximate thickness recorded was encountered in the following borings overlying bedrock: BB-HSS-203, 0.5 ft (West Bridge), BB-HSS-208, 5.6 ft (Center Bridge), BB-HSS-211, 2.7 ft, BB-HSS-212, 1.6 ft, BB-HSS-213, 1.8 ft (East Bridge). Weathered bedrock was not encountered in the recent test

borings drilled at Emerson Mill Road Bridge. Bedrock encountered at the site typically consisted of hard to very hard PHYLLITE and QUARTZITE with occasional soft to moderately hard zones.

Rock quality designation (RQD) is a common parameter that is used to help assess the competency of sampled bedrock. RQD is defined as the sum of pieces of recovered bedrock greater than 4 in. in length divided by the total length of the core run. RQD values for bedrock encountered at the site ranged between 0 and 100 percent, this correlates to a Rock Mass Quality rating of very poor to excellent.

WATER ELEVATIONS

Observation wells were not installed in any of the completed boreholes. As a result, long term static water levels at test boring locations were not determined. Water levels were measured in the completed boreholes after the casing had been extracted from the borehole and are summarized in the table below.

Bridge Location	Test Boring No.	Ground Surface Elevation	Approximate Depth to Water Below Ground Surface (ft)	Approximate Water Elevation (ft)
West Bridge	BB-HSS-201	126.7	6.1	120.6
	BB-HSS-202	126.1	2.5	123.6
	BB-HSS-203	126.3	2.1	124.2
	BB-HSS-204	128.3	3.5	124.8
	BB-HSS-205	132.8	5.4	127.4
Center Bridge	BB-HSS-206	138.5	4.3	134.2
	BB-HSS-207	125.7	0.5	125.2
	BB-HSS-207A	125.7	0.5	125.2
	BB-HSS-208	125.3	1.0	124.3
	BB-HSS-209	125.8	5.9	119.9
	BB-HSS-210	124.6	0.4	124.2
East Bridge	BB-HSS-211	130.0	4.3	125.7
	BB-HSS-212	128.4	0.0	128.4
	BB-HSS-213	124.5	0.3	124.2
	BB-HSS-214	124.4	0.3	124.1
	BB-HSS-215	125.6	5.3	120.3
	BB-HSS-216	126.1	0.0	126.1
Emerson Mill Road Bridge	BB-HSS-217	138.1	5.4	132.7
	BB-HSS-218	139.6	4.5	135.1
	BB-HSS-219	139.1	4.3	134.8
	BB-HSS-219A	138.9	4.3	134.6
	BB-HSS-220	136.5	4.3	132.2

Please note that the visual observations made during drilling and water levels measured in the completed boreholes may have been affected by drilling means/methods and may not be representative of actual static water levels at the site.

In general, groundwater levels can be expected to fluctuate, subject to seasonal variation, local soil conditions, topography and precipitation. Groundwater levels encountered during construction may differ from those observed in the test borings.

Flood levels in the Souadabscook Stream, as provided by McFarland-Johnson, are summarized below.

Discharge	Headwater (ft, NAVD 88)
Q _{1.1}	El. 122.07
Q ₅₀	El. 127.18
Q ₁₀₀	El. 128.55 (FEMA)
Record Flood	El. 130.05 (FEMA)

Laboratory Testing Program

A preliminary laboratory testing program was undertaken on soil samples collected during the field investigation to assist in soil classification/identification and to define engineering properties of the soft, compressible soils. In general, laboratory testing was performed on disturbed soil samples collected during SPT sampling and undisturbed tube samples. All laboratory soil testing was performed by GeoTesting Express, Inc. of Acton, Massachusetts. Geotechnical laboratory testing was performed in accordance with applicable American Society for Testing Materials (ASTM) testing procedures.

The testing program included twenty grain size analyses (sieve only, no hydrometer), four moisture and organic content analyses, eight Atterberg Limits analyses, four consolidated undrained triaxial shear tests and four consolidation tests. A summary of laboratory test results is provided below.

Laboratory Test	ASTM Test Designation	Soil Unit	No. of Tests Completed	Range in Test Results
Grain Size	ASTM D 422 (Sieve Only)	Fill	5	AASHTO Classification: A-4, A-1-b USCS Classification: GW, SM, ML
		Marine Clay and Silt	5	AASHTO Classification: A-4 USCS Classification: CL, ML
		Glacial Till	9	AASHTO Classification: A-1-a(1), A-1-b, A-2-4, A-4 USCS Classification: GM, GW-GM, SM, ML
		Weathered Rock	1	AASHTO Classification: A-2-4 USCS Classification: SM
Moisture content and organic matter	ASTM D 2974	Organic Deposit	4	Moisture Content: 213% to 425% Organic Matter: 44.6% to 61.1%
Atterberg Limits	ASTM D 4318	Marine Clay	7	USCS Classification: CL Moisture Content: 28% to 37% Liquid Limit: 26 to 33 Plastic Limit: 13 to 20 Plasticity Index: 9 to 17
		Organic Silt	1	USCS Classification: OH Moisture Content: 351% Liquid Limit: 495 Plastic Limit: 356 Plasticity Index: 139
Consolidated Undrained Triaxial Shear	ASTM D 4767	Marine Clay	4	Shear Strength: 288 to 845 psf
One Dimensional Consolidation	ASTM D 2435 Method B	Marine Clay	4	Refer to Appendix C

Refer to the laboratory test results provided in Appendix C of this report.

Limitations

This report is prepared for the exclusive use of MaineDOT and prospective Design/Build teams relative to the subject project. There are no intended beneficiaries other than MaineDOT. Haley & Aldrich shall owe no duty whatsoever to any other person or entity on account of the Agreement or the report. Use of this report by any person or entity other than MaineDOT for any purpose whatsoever is expressly forbidden unless such other person or entity obtains written authorization from MaineDOT and Haley & Aldrich. Use of this report by such other person or entity without the written authorization of MaineDOT and Haley & Aldrich shall be at such other person's or entities sole risk and shall be without legal exposure or liability to Haley & Aldrich.

Use of this report by any person or entity, including by MaineDOT, for a purpose other than relative to the subject project is expressly prohibited unless such person or entity obtains written authorization from Haley & Aldrich indicating that the report is adequate for such other use. Use of this report by any other person or entity for such other purpose without written authorization by Haley & Aldrich shall be at such person's or entities sole risk and shall be without legal exposure or liability to Haley & Aldrich.

The information provided herein is based, in part, upon the data obtained from the referenced subsurface explorations. The nature and extent of variations between explorations may not become evident until construction. If variations then appear, it may be necessary to reevaluate the recommendations of this report.

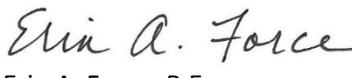
It is our understanding that this report may be included as a reference document in the documents that will be provided to the prospective Design/Build teams for bidding. Please note that the recommendations included herein are superseded by the information contained in the documents and that the information contained in the documents takes precedence over the information provided in this report.

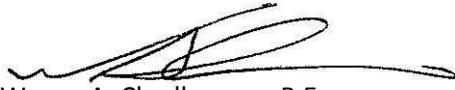
Closure

We appreciate the opportunity to provide geotechnical services on this project. Please do not hesitate to call if you have any questions or comments.

Sincerely yours,
HALEY & ALDRICH, INC.


Marleigh L. Snow
Technical Geologist


Erin A. Force, P.E.
Project Manager


Wayne A. Chadbourne, P.E.
Senior Associate

Enclosures:

- Table I – Summary of Subsurface Explorations – Location Data
- Table II – Summary of Subsurface Explorations – Subsurface Data
- Figure 1 – Project Locus
- Figures 2 through 12 – Boring Location Plans
- Figure 13 – Surficial Geology
- Figure 14 – Bedrock Geology
- Appendix A – Test Boring Logs
- Appendix B – Rock Core Photographs
- Appendix C – Laboratory Test Results

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TABLES

TABLE I**Summary of Subsurface Explorations - Location Data**

Temporary Roadway Diversion for
 Interstate 95 over Souadabscook Stream West, Center, East, and Emerson Mill Road/B&A Railroad
 Hampden, Maine
 MaineDOT WINS 21673, 21728, 21729, 21730

	Test Boring No. ¹	Ground Surface Elevation ^{3,4}	Coordinates ²	
			Easting	Northing
West Bridge	BB-HSS-201	126.7	1,693,286	460,832
	BB-HSS-202	126.1	1,693,722	460,727
	BB-HSS-203	126.3	1,693,877	460,669
	BB-HSS-204	128.3	1,694,321	460,571
	BB-HSS-205	132.8	1,694,754	460,477
Center Bridge	BB-HSS-206	138.5	1,695,464	460,390
	BB-HSS-207	125.7	1,695,900	460,380
	BB-HSS-207A	125.7	1,695,889	460,380
	BB-HSS-208	125.3	1,696,353	460,393
	BB-HSS-209	125.8	1,696,491	460,396
	BB-HSS-210	124.6	1,696,946	460,481
East Bridge	BB-HSS-211	130.0	1,699,666	461,140
	BB-HSS-212	128.4	1,699,952	461,212
	BB-HSS-213	124.5	1,700,223	461,265
	BB-HSS-214	124.4	1,700,433	461,299
	BB-HSS-215	125.6	1,700,712	461,379
	BB-HSS-216	126.1	1,701,000	461,468
Emerson Mill Road Bridge	BB-HSS-217	138.1	1,706,504	463,132
	BB-HSS-218	139.6	1,706,794	463,267
	BB-HSS-219	139.1	1,706,946	463,326
	BB-HSS-219A	138.9	1,706,950	463,329
	BB-HSS-220	136.5	1,707,096	463,386

Notes:

- ¹ Test boring locations are shown on Figures 2 through 12, Boring Location Plans.
² As-drilled coordinates of test borings were determined by MaineDOT using GPS survey equipment and reference NAD 83, Maine 2000 Central Zone coordinate system.
³ Ground surface elevations at as-drilled test boring locations were determined by MaineDOT using GPS survey equipment.
⁴ Elevations are measured in feet and reference the National Geodetic Vertical Datum of 1988 (NAVD 88).

	Individual	Date
Prepared By:	NLK	5/23/2019
Checked By:	EAF	6/5/2019
Reviewed By:	WAC	6/6/2019

TABLE II
Summary of Subsurface Explorations - Subsurface Data

Temporary Roadway Diversion for
 Interstate 95 over Souadabscook Stream West, Center, East, and Emerson Mill Road/B&A Railroad
 Hampden, Maine
 MaineDOT WINS 21673, 21728, 21729, 21730

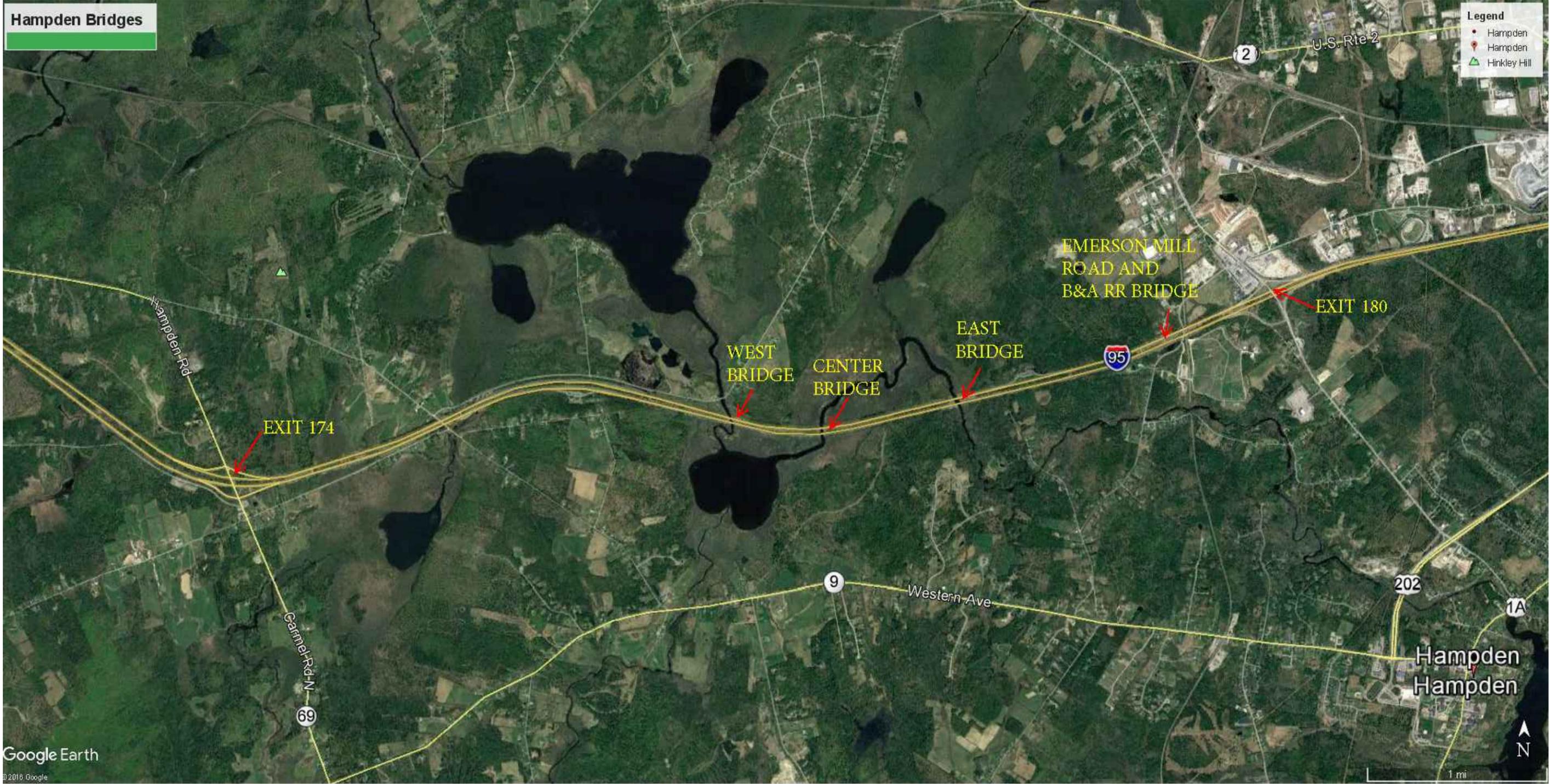
	Test Boring No. ¹	Ground Surface Elevation ^{2,3}	Approximate Strata Thickness ^{4,5} (ft)							Approximate Top of Bedrock Depth (ft) ^{4,5}	Approximate Elevation of Top of Bedrock ^{2,3,4,5}	Approximate Bottom of Exploration Depth (ft)	Approximate Elevation of Bottom of Exploration ^{2,3}
			Topsoil	Fill	Organic Deposit ⁶	Marine Deposit Clay ⁶	Marine Deposit Sand	Glacial Till	Weathered Bedrock				
West Bridge	BB-HSS-201	126.7	NE	1.7	2.1	26.7	>11.5	--	--	--	--	42.0	84.7
	BB-HSS-202	126.1	0.5	4.2	1.0	18.7	8.9	4.8	NE	38.1	88.0	48.2	77.9
	BB-HSS-203	126.3	0.2	5.9	0.6	16.7	NE	9.3	0.5	34.2	92.1	44.2	82.1
	BB-HSS-204	128.3	0.2	3.5	1.7	8.6	0.8	>7.2	--	--	--	22.0	106.3
	BB-HSS-205	132.8	0.2	3.3	NE	6.6	NE	>11.9	--	--	--	22.0	110.8
Center Bridge	BB-HSS-206	138.5	0.1	1.0	NE	11.7	NE	3.3	NE	16.1	122.4	16.3	122.2
	BB-HSS-207	125.7	0.1	1.6	6.5	>15.8	--	--	--	--	--	24.0	101.7
	BB-HSS-207A ⁷	125.7	--	--	--	>9.5	NE	>2.5	--	--	--	37.0	88.7
	BB-HSS-208	125.3	0.5	15.5	2.0	5.5	NE	3.0	5.6	32.1	93.2	39.0	86.3
	BB-HSS-209	125.8	NE	7.0	2.0	27.0	NE	7.5	NE	43.5	82.3	56.5	69.3
	BB-HSS-210	124.6	NE	0.5	1.3	23.2	NE	>1.8	--	--	--	26.8	97.8
East Bridge	BB-HSS-211	130.0	NE	NE	NE	7.8	NE	NE	2.7	10.5	119.5	11.5	118.5
	BB-HSS-212	128.4	1.0	NE	NE	2.0	NE	NE	1.6	4.6	123.8	6.5	121.9
	BB-HSS-213	124.5	NE	NE	NE	12.3	NE	4.7	1.8	18.8	105.7	32.4	92.1
	BB-HSS-214	124.4	0.2	7.8	2.5	1.5	NE	6.4	NE	18.4	106.0	29.0	95.4
	BB-HSS-215	125.6	0.3	NE	NE	NE	NE	9.3	NE	9.6	116.0	12.0	113.6
	BB-HSS-216	126.1	0.3	3.7	NE	NE	NE	>17	--	--	--	21.0	105.1
Emerson Mill Rd Bridge	BB-HSS-217	138.1	0.1	0.5	NE	12.6	NE	5.4	NE	18.6	119.5	20.0	118.1
	BB-HSS-218	139.6	NE	2.5	NE	5.3	NE	8.1	NE	15.9	123.7	26.6	113.0
	BB-HSS-219	139.1	0.3	1.4	NE	8.1	NE	>10.4	--	--	--	20.2	118.9
	BB-HSS-219A ⁸	138.9	0.1	1.9	NE	8.8	NE	12.2	NE	23.0	115.9	34.3	104.6
	BB-HSS-220	136.5	0.2	4.6	NE	17.7	NE	>4.5	--	--	--	27.0	109.5

Notes:

- ¹ Test boring locations are shown on Figures 2 through 12, Boring Location Plans.
- ² Ground surface elevations at as-drilled test boring locations were determined by MaineDOT using GPS survey equipment.
- ³ Elevations are measured in feet and reference the National Geodetic Vertical Datum of 1988 (NAVD 88).
- ⁴ "NE" indicates stratum was not encountered in test boring.
- ⁵ "--" indicates test boring was not drilled deep enough to determine presence of stratum.
- ⁶ Organic deposits were interbedded within the marine clay deposits in BB-HSS-201 through BB-HSS-204, BB-HSS-207, BB-HSS-209, and BB-HSS-210.
- ⁷ No samples were collected from 0 to 25 ft in BB-HSS-207A. Refer to BB-HSS-207 for additional overburden details.
- ⁸ No samples were collected from 0 to 20 ft in BB-HSS-219A. Strata thicknesses indicated were based on observations of drill behavior and drill cuttings.

	Individual	Date
Prepared By:	NLK	5/15/2019
Checked By:	MLS/EAF	6/5/2019
Reviewed By:	WAC	6/6/2019

FIGURES



Hampden Bridges

Legend

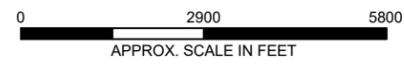
- Hampden
- 📍 Hampden
- ▲ Hinkley Hill

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Google Earth
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NOTES

1. IMAGE TAKEN FROM GOOGLE EARTH IMAGES, 2016.



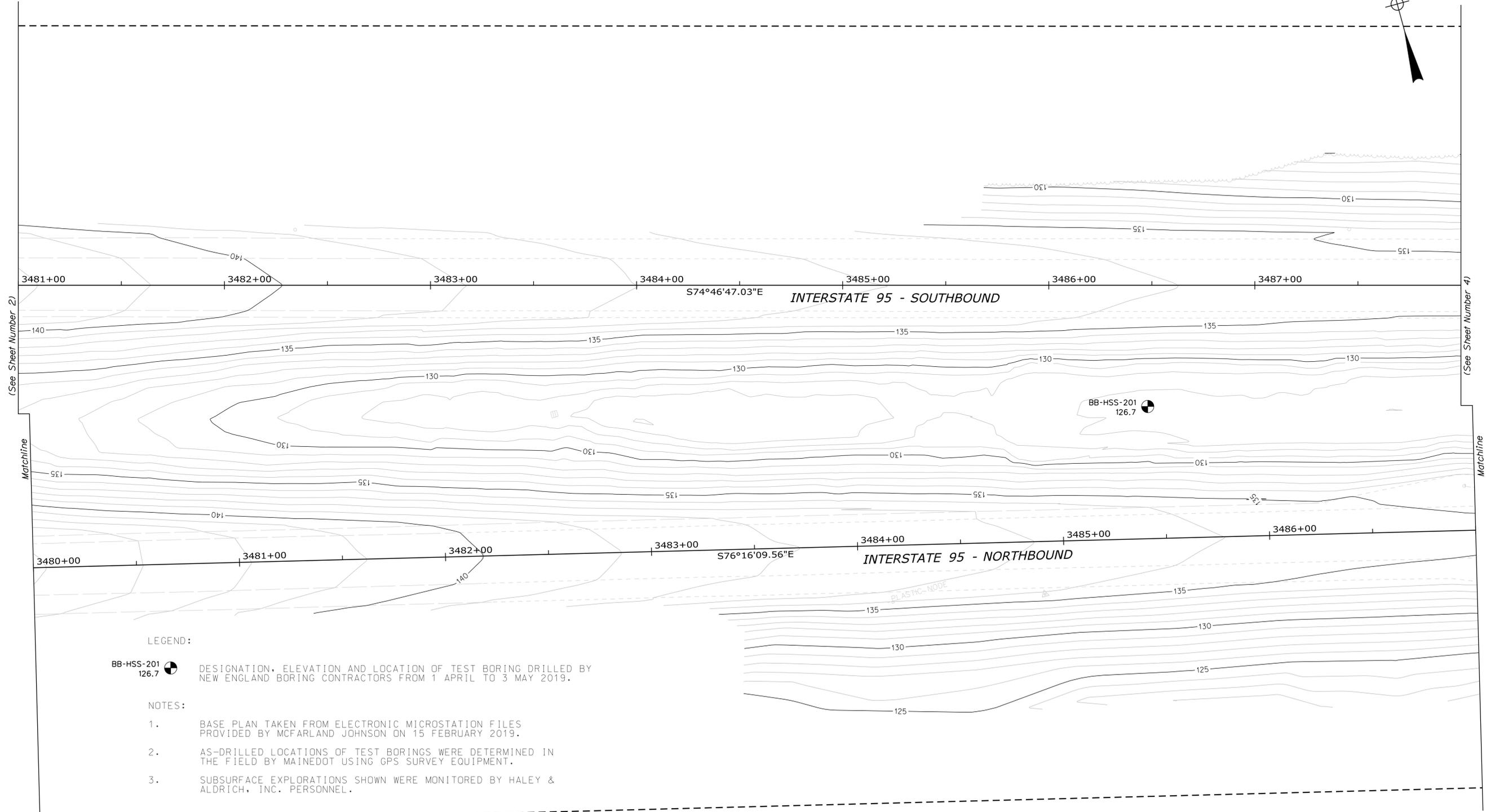
HALEY ALDRICH

TEMPORARY ROADWAY DIVERSION FOR INTERSTATE 95 OVER SOUADABSCOOK STREAM WEST, CENTER, EAST AND EMERSON MILL ROAD/B&A RAILROAD HAMPDEN, MAINE
 MAINEDOT WINS 21673, 21728, 21729, 21730

PROJECT LOCUS

SCALE: AS SHOWN
 JUNE 2019

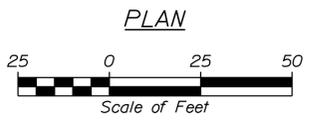
FIGURE 1



LEGEND:

BB-HSS-201
126.7 DESIGNATION, ELEVATION AND LOCATION OF TEST BORING DRILLED BY NEW ENGLAND BORING CONTRACTORS FROM 1 APRIL TO 3 MAY 2019.

- NOTES:**
1. BASE PLAN TAKEN FROM ELECTRONIC MICROSTATION FILES PROVIDED BY MCFARLAND JOHNSON ON 15 FEBRUARY 2019.
 2. AS-DRILLED LOCATIONS OF TEST BORINGS WERE DETERMINED IN THE FIELD BY MAINEDOT USING GPS SURVEY EQUIPMENT.
 3. SUBSURFACE EXPLORATIONS SHOWN WERE MONITORED BY HALEY & ALDRICH, INC. PERSONNEL.



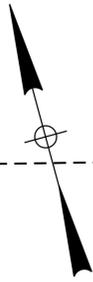
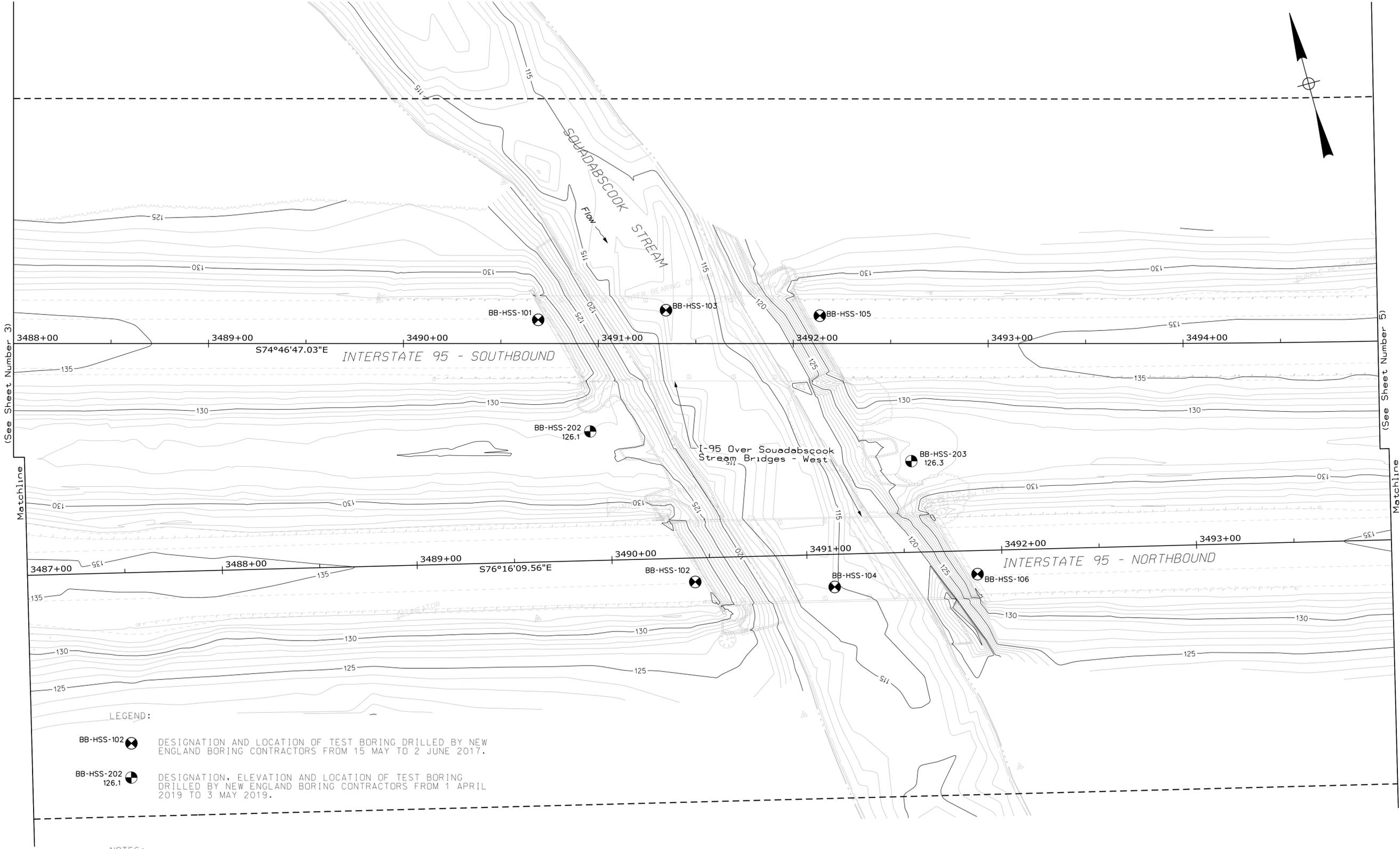
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PROJ. MANAGER	BY	DATE	DESIGN-DETAILED	CHECKED-REVIEWED	DESIGN-DETAILED	REVISIONS 1	REVISIONS 2	REVISIONS 3	REVISIONS 4
	K. POST E. FORCE	06-07-19							
		SIGNATURE		P.E. NUMBER		DATE			

Date: 6/5/2019

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Division:

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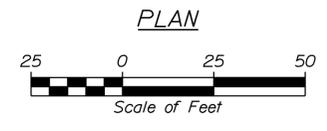


LEGEND:

- BB-HSS-102** DESIGNATION AND LOCATION OF TEST BORING DRILLED BY NEW ENGLAND BORING CONTRACTORS FROM 15 MAY TO 2 JUNE 2017.
- BB-HSS-202**
126.1 DESIGNATION, ELEVATION AND LOCATION OF TEST BORING DRILLED BY NEW ENGLAND BORING CONTRACTORS FROM 1 APRIL 2019 TO 3 MAY 2019.

NOTES:

1. BASE PLAN TAKEN FROM ELECTRONIC MICROSTATION FILES PROVIDED BY MCFARLAND JOHNSON ON 15 FEBRUARY 2019.
2. AS-DRILLED LOCATIONS OF TEST BORINGS WERE DETERMINED IN THE FIELD BY MAINEDOT USING GPS SURVEY EQUIPMENT.
3. SUBSURFACE EXPLORATIONS SHOWN WERE MONITORED BY HALEY & ALDRICH, INC. PERSONNEL.



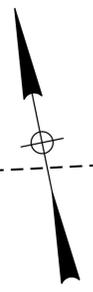
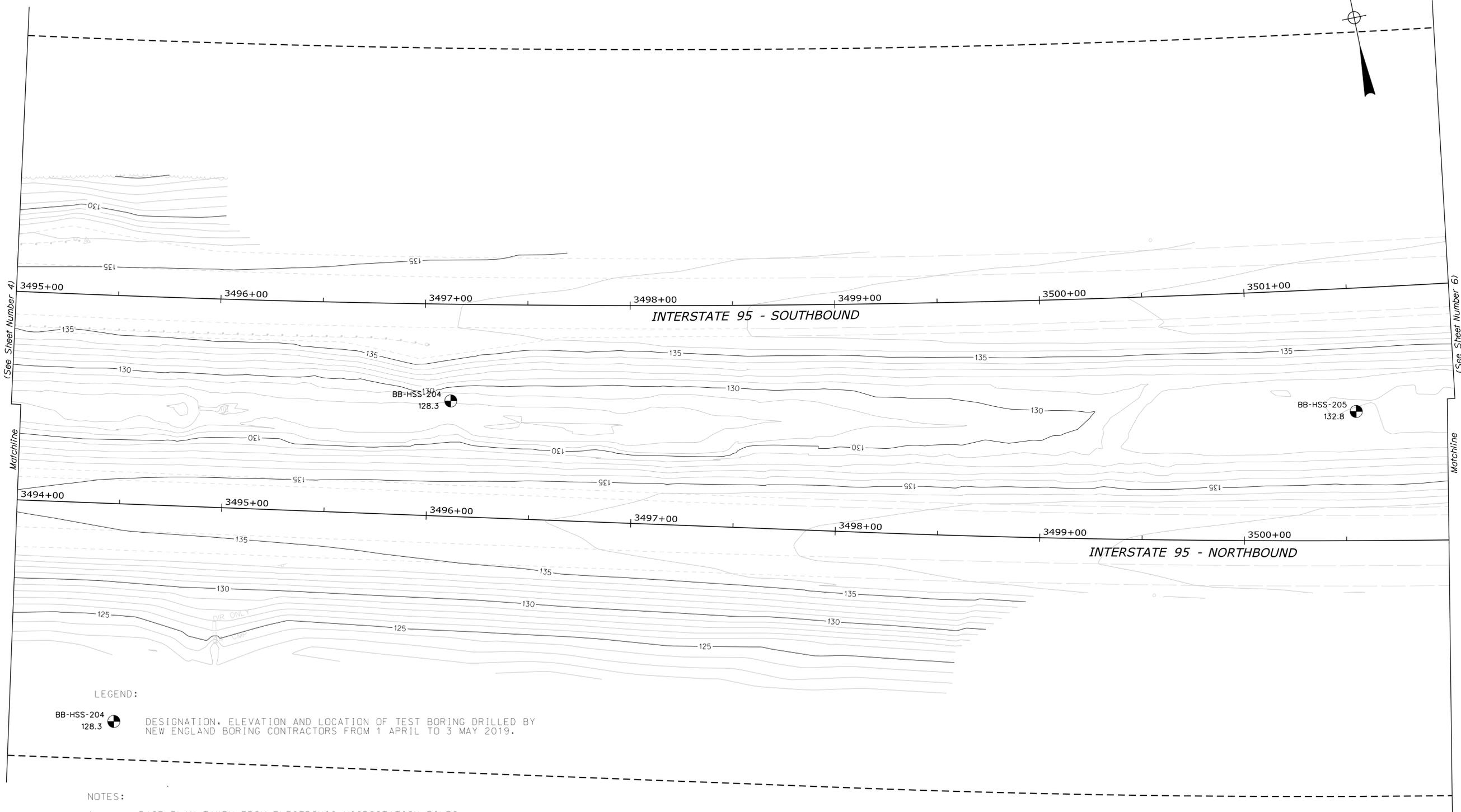
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BORING LOCATION PLAN		BRIDGE PLANS	
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CHECKED/REVIEWED	E. FORCE	E. FORCE	06-07-19
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		OF 14	

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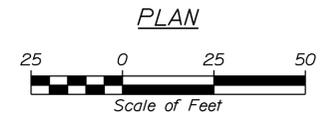
Division:

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LEGEND:
 BB-HSS-204 128.3 DESIGNATION, ELEVATION AND LOCATION OF TEST BORING DRILLED BY NEW ENGLAND BORING CONTRACTORS FROM 1 APRIL TO 3 MAY 2019.

- NOTES:**
1. BASE PLAN TAKEN FROM ELECTRONIC MICROSTATION FILES PROVIDED BY MCFARLAND JOHNSON ON 15 FEBRUARY 2019.
 2. AS-DRILLED LOCATIONS OF TEST BORINGS WERE DETERMINED IN THE FIELD BY MAINEDOT USING GPS SURVEY EQUIPMENT.
 3. SUBSURFACE EXPLORATIONS SHOWN WERE MONITORED BY HALEY & ALDRICH, INC. PERSONNEL.



STATE OF MAINE
 DEPARTMENT OF TRANSPORTATION

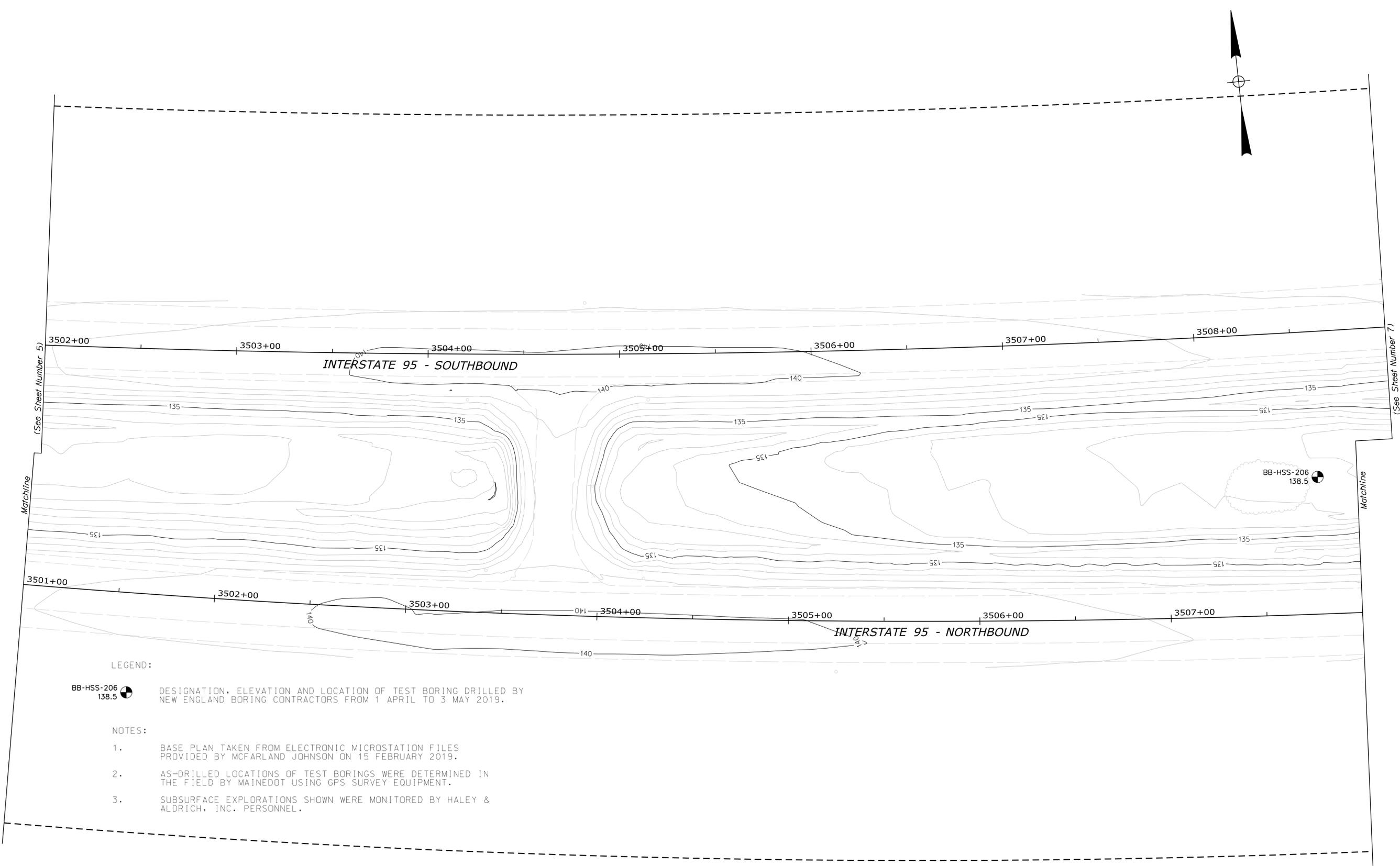
HAMPDEN BRIDGE BUNDLE
 INTERSTATE 95
 HAMPDEN, MAINE PENOBSCOT COUNTY

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REVISIONS 3		
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FIELD CHANGES		

BORING LOCATION PLAN

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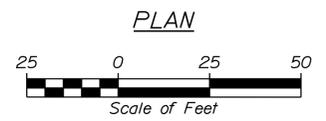


LEGEND:

BB-HSS-206
138.5  DESIGNATION, ELEVATION AND LOCATION OF TEST BORING DRILLED BY NEW ENGLAND BORING CONTRACTORS FROM 1 APRIL TO 3 MAY 2019.

NOTES:

1. BASE PLAN TAKEN FROM ELECTRONIC MICROSTATION FILES PROVIDED BY MCFARLAND JOHNSON ON 15 FEBRUARY 2019.
2. AS-DRILLED LOCATIONS OF TEST BORINGS WERE DETERMINED IN THE FIELD BY MAINEDOT USING GPS SURVEY EQUIPMENT.
3. SUBSURFACE EXPLORATIONS SHOWN WERE MONITORED BY HALEY & ALDRICH, INC. PERSONNEL.



STATE OF MAINE DEPARTMENT OF TRANSPORTATION		MULTI		WIN		BRIDGE NOS. MULTIPLE		BRIDGE PLANS	
HAMPDEN BRIDGE BUNDLE INTERSTATE 95 HAMPDEN, MAINE PENOBSCOT COUNTY		BORING LOCATION PLAN		SHEET NUMBER		5		OF 14	
PROJ. MANAGER	BY	DATE	SIGNATURE	P.E. NUMBER	DATE				
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FIELD CHANGES									



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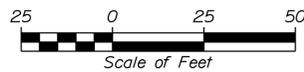
BB-HSS-207
125.7

DESIGNATION, ELEVATION AND LOCATION OF TEST BORING DRILLED BY NEW ENGLAND BORING CONTRACTORS FROM 1 APRIL TO 3 MAY 2019.

NOTES:

1. BASE PLAN TAKEN FROM ELECTRONIC MICROSTATION FILES PROVIDED BY MCFARLAND JOHNSON ON 15 FEBRUARY 2019.
2. AS-DRILLED LOCATIONS OF TEST BORINGS WERE DETERMINED IN THE FIELD BY MAINEDOT USING GPS SURVEY EQUIPMENT.
3. SUBSURFACE EXPLORATIONS SHOWN WERE MONITORED BY HALEY & ALDRICH, INC. PERSONNEL.

PLAN



STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

BRIDGE NOS. MULTIPLE
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BRIDGE PLANS

DESIGNER
SIGNATURE

DATE
06-07-19

BY
E. FORCE

PROJ. MANAGER
K. POST

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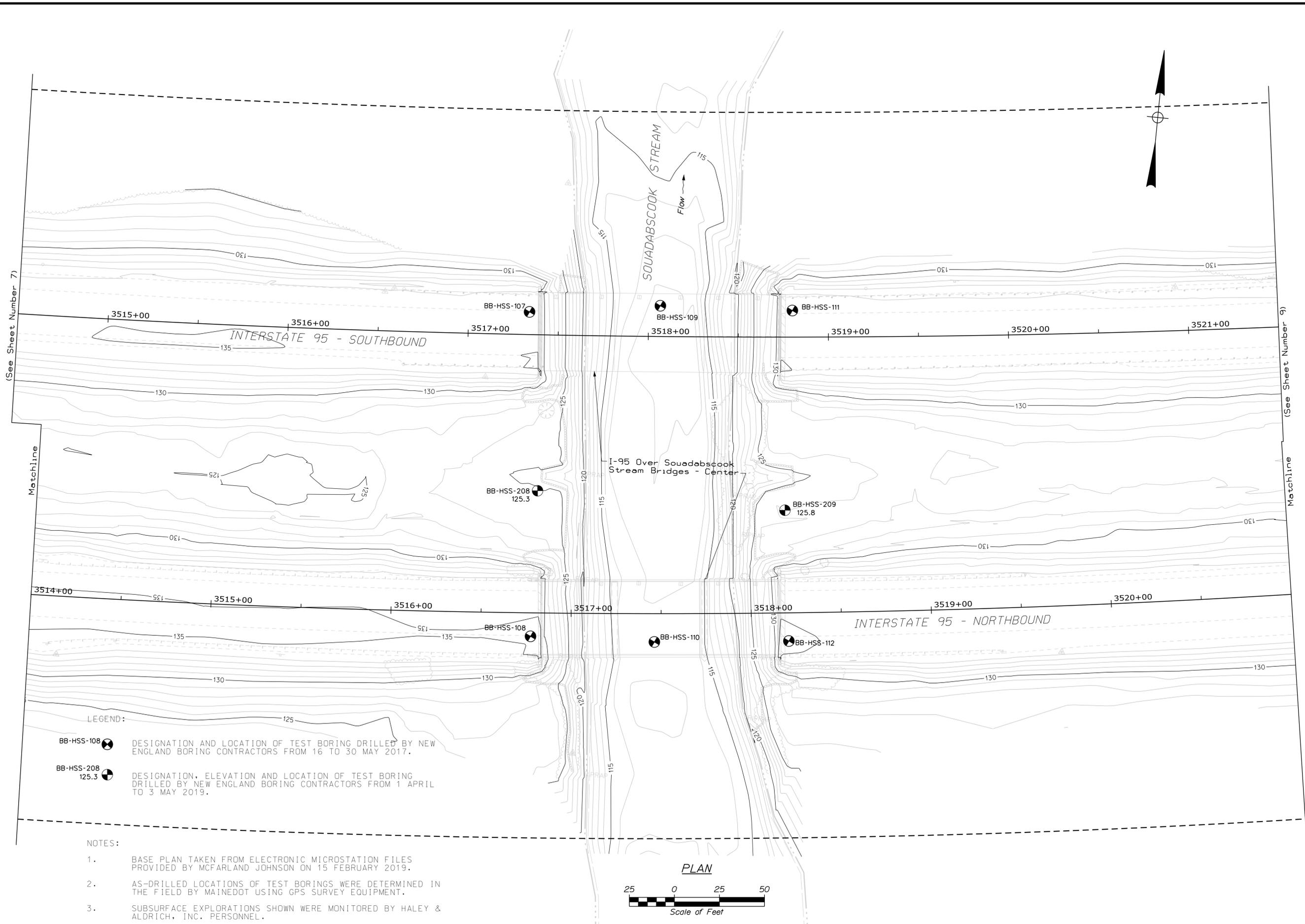
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HAMPDEN BRIDGE BUNDLE
INTERSTATE 95
HAMPDEN, MAINE PENOBSCOT COUNTY
BORING LOCATION PLAN

SHEET NUMBER

6

OF 14



(See Sheet Number 7)

(See Sheet Number 9)

Matchline

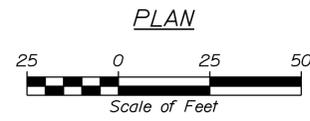
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LEGEND:

- BB-HSS-108 DESIGNATION AND LOCATION OF TEST BORING DRILLED BY NEW ENGLAND BORING CONTRACTORS FROM 16 TO 30 MAY 2017.
- BB-HSS-208
125.3 DESIGNATION, ELEVATION AND LOCATION OF TEST BORING DRILLED BY NEW ENGLAND BORING CONTRACTORS FROM 1 APRIL TO 3 MAY 2019.

NOTES:

1. BASE PLAN TAKEN FROM ELECTRONIC MICROSTATION FILES PROVIDED BY MCFARLAND JOHNSON ON 15 FEBRUARY 2019.
2. AS-DRILLED LOCATIONS OF TEST BORINGS WERE DETERMINED IN THE FIELD BY MAINE DOT USING GPS SURVEY EQUIPMENT.
3. SUBSURFACE EXPLORATIONS SHOWN WERE MONITORED BY HALEY & ALDRICH, INC. PERSONNEL.



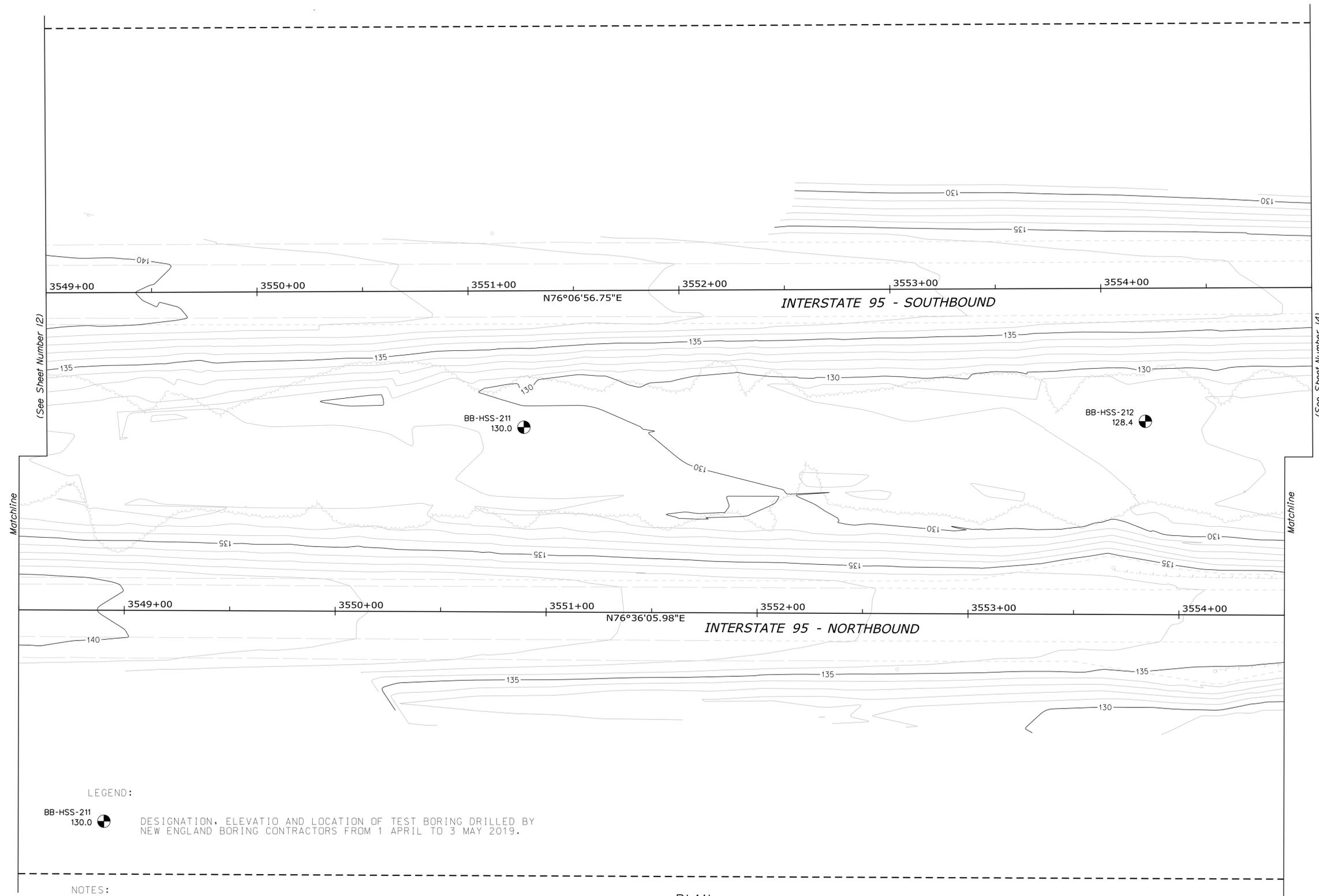
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	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>PROJ. MANAGER</th> <th>E. FORCE</th> <th>BY</th> <th>DATE</th> </tr> <tr> <td>DESIGN-DETAILED</td> <td>K. POST</td> <td></td> <td>06-07-19</td> </tr> <tr> <td>CHECKED-REVIEWED</td> <td>E. FORCE</td> <td></td> <td>06-07-19</td> </tr> <tr> <td>DESIGN-DETAILED2</td> <td></td> <td></td> <td></td> </tr> <tr> <td>DESIGN-DETAILED3</td> <td></td> <td></td> <td></td> </tr> <tr> <td>REVISIONS 1</td> <td></td> <td></td> <td></td> </tr> <tr> <td>REVISIONS 2</td> <td></td> <td></td> <td></td> </tr> <tr> <td>REVISIONS 3</td> <td></td> <td></td> <td></td> </tr> <tr> <td>REVISIONS 4</td> <td></td> <td></td> <td></td> </tr> <tr> <td>FIELD CHANGES</td> <td></td> <td></td> <td></td> </tr> </table>	PROJ. MANAGER	E. FORCE	BY	DATE	DESIGN-DETAILED	K. POST		06-07-19	CHECKED-REVIEWED	E. FORCE		06-07-19	DESIGN-DETAILED2				DESIGN-DETAILED3				REVISIONS 1				REVISIONS 2				REVISIONS 3				REVISIONS 4				FIELD CHANGES				<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>SIGNATURE</th> <th>P.E. NUMBER</th> <th>DATE</th> </tr> <tr> <td></td> <td></td> <td></td> </tr> </table>	SIGNATURE	P.E. NUMBER	DATE				
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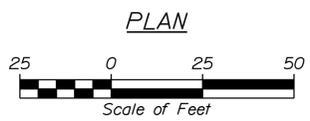


LEGEND:

BB-HSS-211
130.0  DESIGNATION, ELEVATION AND LOCATION OF TEST BORING DRILLED BY NEW ENGLAND BORING CONTRACTORS FROM 1 APRIL TO 3 MAY 2019.

NOTES:

1. BASE PLAN TAKEN FROM ELECTRONIC MICROSTATION FILES PROVIDED BY MCFARLAND JOHNSON ON 15 FEBRUARY 2019.
2. AS-DRILLED LOCATIONS OF TEST BORINGS WERE DETERMINED IN THE FIELD BY MAINEDOT USING GPS SURVEY EQUIPMENT.
3. SUBSURFACE EXPLORATIONS SHOWN WERE MONITORED BY HALEY & ALDRICH, INC. PERSONNEL.



STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

MULTI
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BRIDGE NOS. MULTIPLE
BRIDGE PLANS

DESIGNED	DATE
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REVISIONS 1	
REVISIONS 2	
REVISIONS 3	
REVISIONS 4	
FIELD CHANGES	

PROJ. MANAGER	BY	DATE
DESIGNED	K. POST	06-07-19
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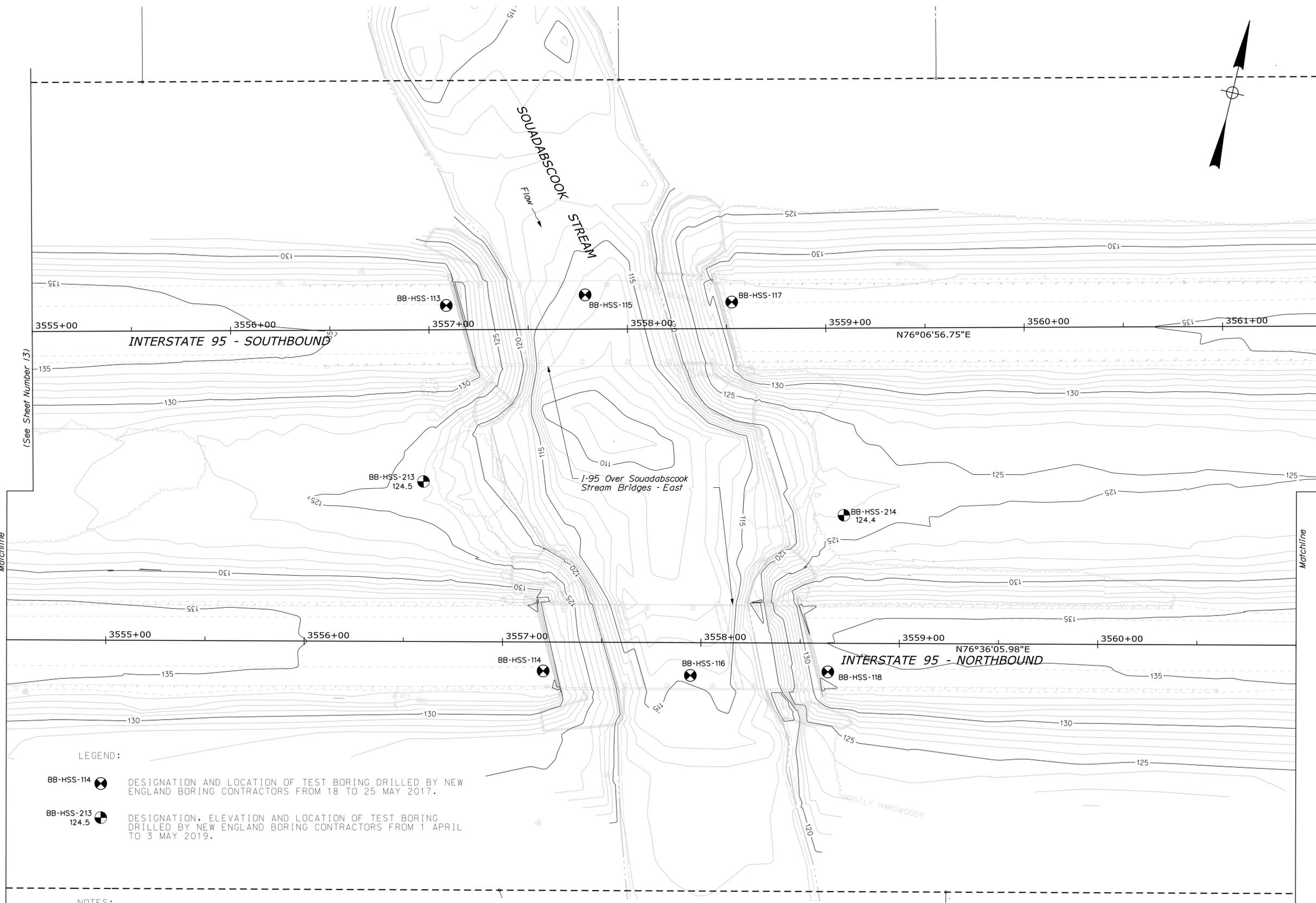
HAMPDEN BRIDGE BUNDLE
INTERSTATE 95
HAMPDEN, MAINE PENOBSCOT COUNTY

BORING LOCATION PLAN

SHEET NUMBER

9

OF 14



(See Sheet Number 13)

(See Sheet Number 15)

Matchline

Matchline

LEGEND:

- BB-HSS-114 DESIGNATION AND LOCATION OF TEST BORING DRILLED BY NEW ENGLAND BORING CONTRACTORS FROM 18 TO 25 MAY 2017.
- BB-HSS-213 124.5 DESIGNATION, ELEVATION AND LOCATION OF TEST BORING DRILLED BY NEW ENGLAND BORING CONTRACTORS FROM 1 APRIL TO 3 MAY 2019.

NOTES:

1. BASE PLAN TAKEN FROM ELECTRONIC MICROSTATION FILES PROVIDED BY MCFARLAND JOHNSON ON 15 FEBRUARY 2019.
2. AS-DRILLED LOCATIONS OF TEST BORINGS WERE DETERMINED IN THE FIELD BY MAINE DOT USING GPS SURVEY EQUIPMENT.
3. SUBSURFACE EXPLORATIONS SHOWN WERE MONITORED BY HALEY & ALDRICH, INC. PERSONNEL.

PLAN



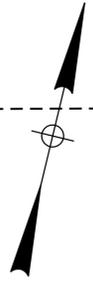
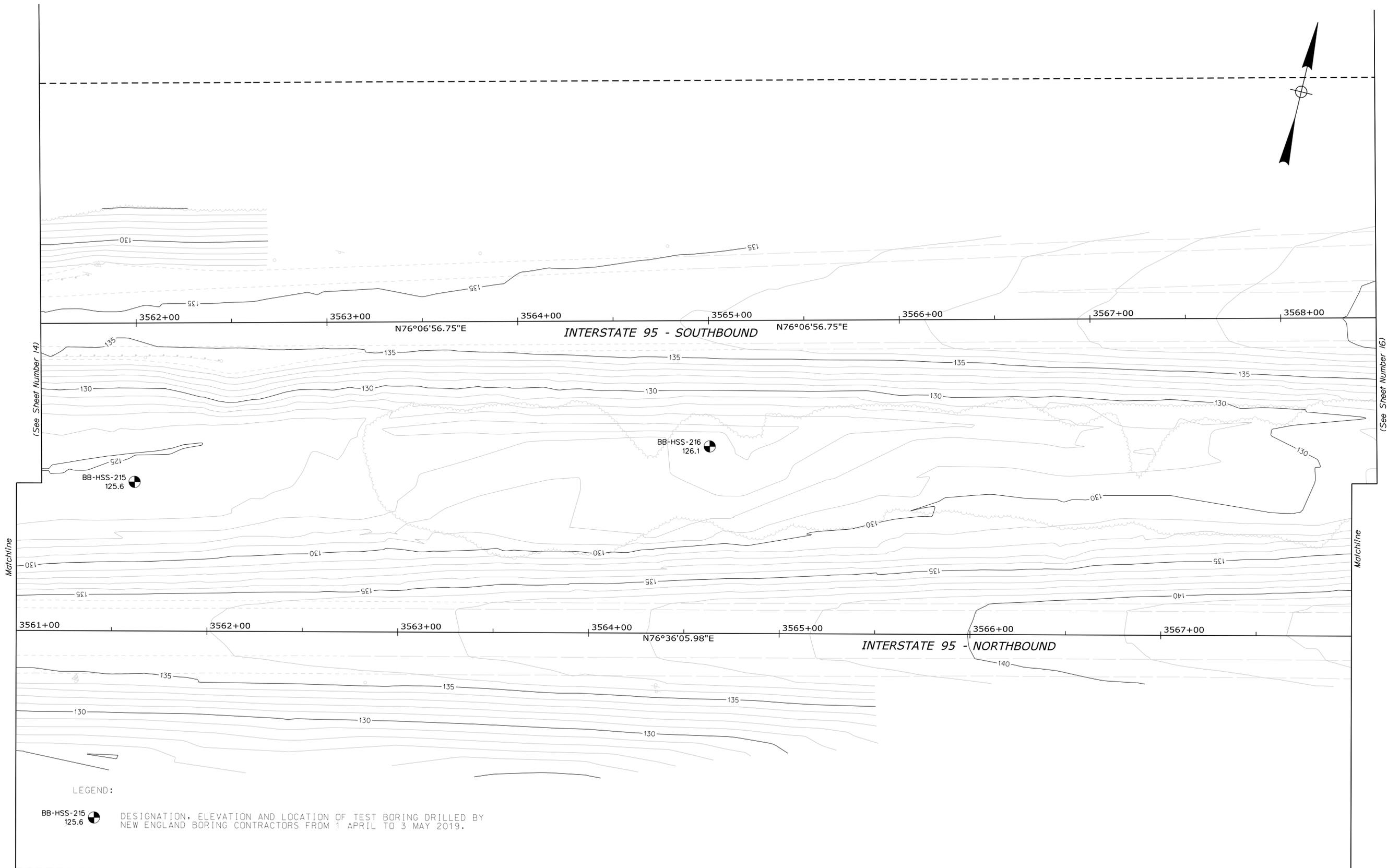
STATE OF MAINE DEPARTMENT OF TRANSPORTATION		MULTI		BRIDGE NOS. MULTIPLE MULTI		WIN		BRIDGE PLANS	
HAMPDEN BRIDGE BUNDLE INTERSTATE 95		HAMPDEN, MAINE		PENOBSCOT COUNTY		BORING LOCATION PLAN		SHEET NUMBER	
10		OF 14		DATE		SIGNATURE		P.E. NUMBER	
DATE		BY		E. FORCE		K. POST		E. FORCE	
02-21-19		02-21-19		02-21-19		02-21-19		02-21-19	
FIELD CHANGES		REVISIONS 1		REVISIONS 2		REVISIONS 3		REVISIONS 4	

Date: 6/5/2019

Username:

Division:

Filename: ... \CAD\129380_BDPlan_12.dgn

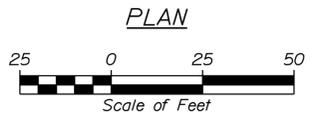


LEGEND:

BB-HSS-215
125.6 DESIGNATION, ELEVATION AND LOCATION OF TEST BORING DRILLED BY NEW ENGLAND BORING CONTRACTORS FROM 1 APRIL TO 3 MAY 2019.

NOTES:

1. BASE PLAN TAKEN FROM ELECTRONIC MICROSTATION FILES PROVIDED BY MCFARLAND JOHNSON ON 15 FEBRUARY 2019.
2. AS-DRILLED LOCATIONS OF TEST BORINGS WERE DETERMINED IN THE FIELD BY MAINE DOT USING GPS SURVEY EQUIPMENT.
3. SUBSURFACE EXPLORATIONS SHOWN WERE MONITORED BY HALEY & ALDRICH, INC. PERSONNEL.



STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

MULTI

BRIDGE NOS. MULTIPLE WIN MULTI BRIDGE PLANS

SIGNATURE	P.E. NUMBER
DATE	DATE

PROJ. MANAGER	BY	DATE	
DESIGNED/DETAILED	K. POST	06-07-19	
CHECKED/REVIEWED	E. FORCE	06-07-19	
DESIGNED/DETAILED			
REVISIONS 1			
REVISIONS 2			
REVISIONS 3			
REVISIONS 4			
FIELD CHANGES			

HAMPDEN BRIDGE BUNDLE
INTERSTATE 95
HAMPDEN, MAINE PENOBSCOT COUNTY

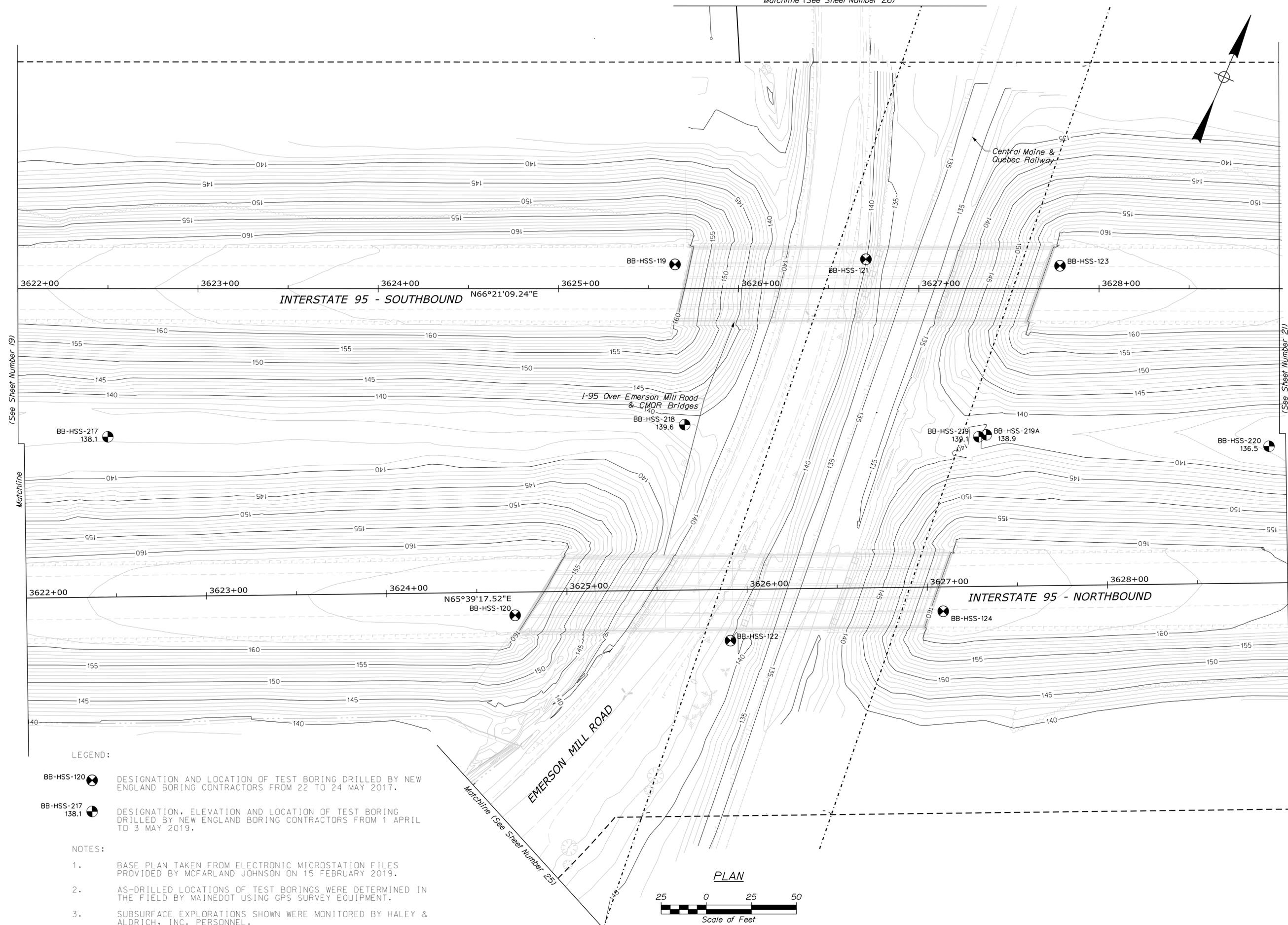
BORING LOCATION PLAN

SHEET NUMBER

11

OF 14

Matchline (See Sheet Number 26)

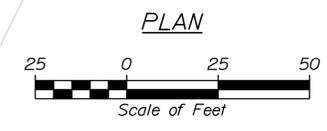


(See Sheet Number 19)

(See Sheet Number 21)

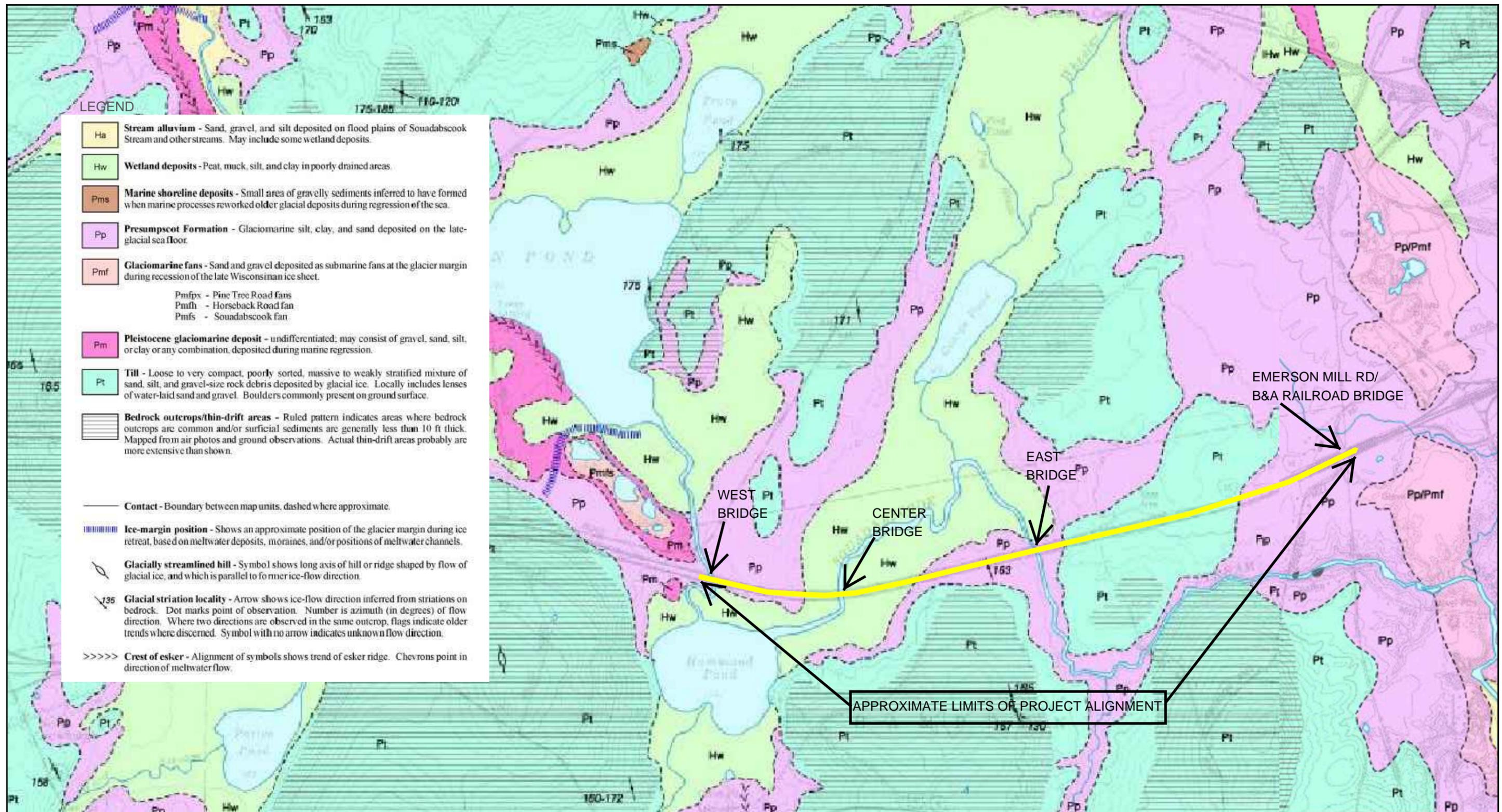
- LEGEND:**
- BB-HSS-120 DESIGNATION AND LOCATION OF TEST BORING DRILLED BY NEW ENGLAND BORING CONTRACTORS FROM 22 TO 24 MAY 2017.
 - BB-HSS-217 138.1 DESIGNATION, ELEVATION AND LOCATION OF TEST BORING DRILLED BY NEW ENGLAND BORING CONTRACTORS FROM 1 APRIL TO 3 MAY 2019.

- NOTES:**
1. BASE PLAN TAKEN FROM ELECTRONIC MICROSTATION FILES PROVIDED BY MCFARLAND JOHNSON ON 15 FEBRUARY 2019.
 2. AS-DRILLED LOCATIONS OF TEST BORINGS WERE DETERMINED IN THE FIELD BY MAINE DOT USING GPS SURVEY EQUIPMENT.
 3. SUBSURFACE EXPLORATIONS SHOWN WERE MONITORED BY HALEY & ALDRICH, INC. PERSONNEL.



STATE OF MAINE DEPARTMENT OF TRANSPORTATION		MULTI	
HAMPDEN BRIDGE BUNDLE INTERSTATE 95 HAMPDEN, MAINE PENOBSCOT COUNTY		BORING LOCATION PLAN	
SHEET NUMBER		BRIDGE NOS. MULTIPLE MULTI	
12		W/N MULTI	
OF 14		BRIDGE PLANS	
PROJ. MANAGER	E. FORCE	BY	DATE
DESIGNED/DETAILED	K. POST	K. POST	06-07-19
CHECKED/REVIEWED	E. FORCE	E. FORCE	06-07-19
DESIGNED/DETAILED			SIGNATURE
REVISIONS 1			P.E. NUMBER
REVISIONS 2			DATE
REVISIONS 3			
REVISIONS 4			
FIELD CHANGES			

Printed: 6/7/2019 2:20 PM Sheet: HA-FIG-BL-L-H
DRAFTING.DWG



- BASE MAP SOURCE :
1. WEDDLE, THOMAS K, SURFICIAL GEOLOGY, HERMON QUADRANGLE, MAINE, MAINE GEOLOGICAL SURVEY, AUGUSTA, MAINE, OPEN FILE NO. 13-13, 2013.
 2. SYVERSON, KENT M, THOMPSON, ANDREW H, SURFICIAL GEOLOGY, BANGOR QUADRANGLE, MAINE, MAINE GEOLOGICAL SURVEY, AUGUSTA, MAINE, OPEN FILE NO. 11-6, 2011.



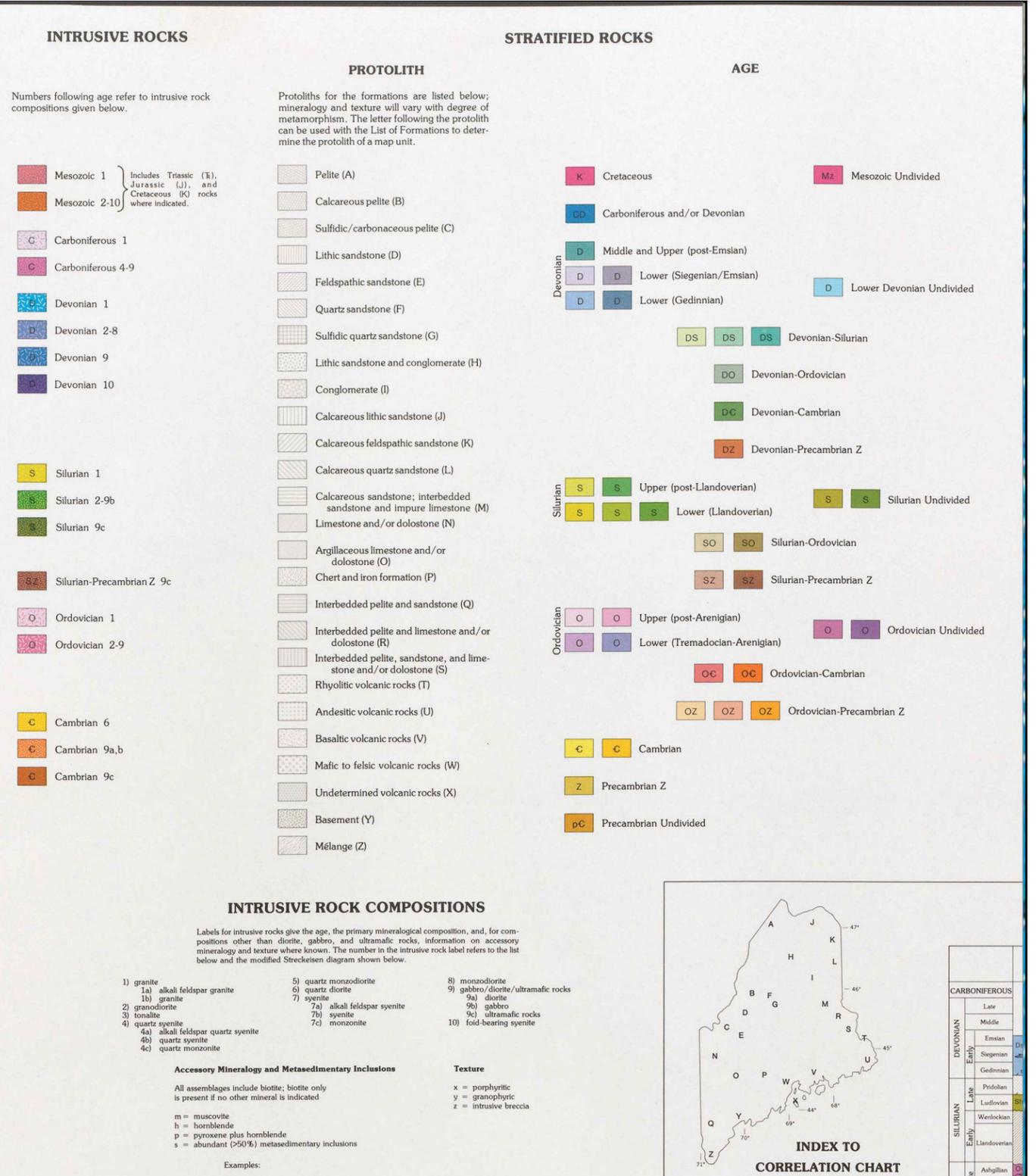
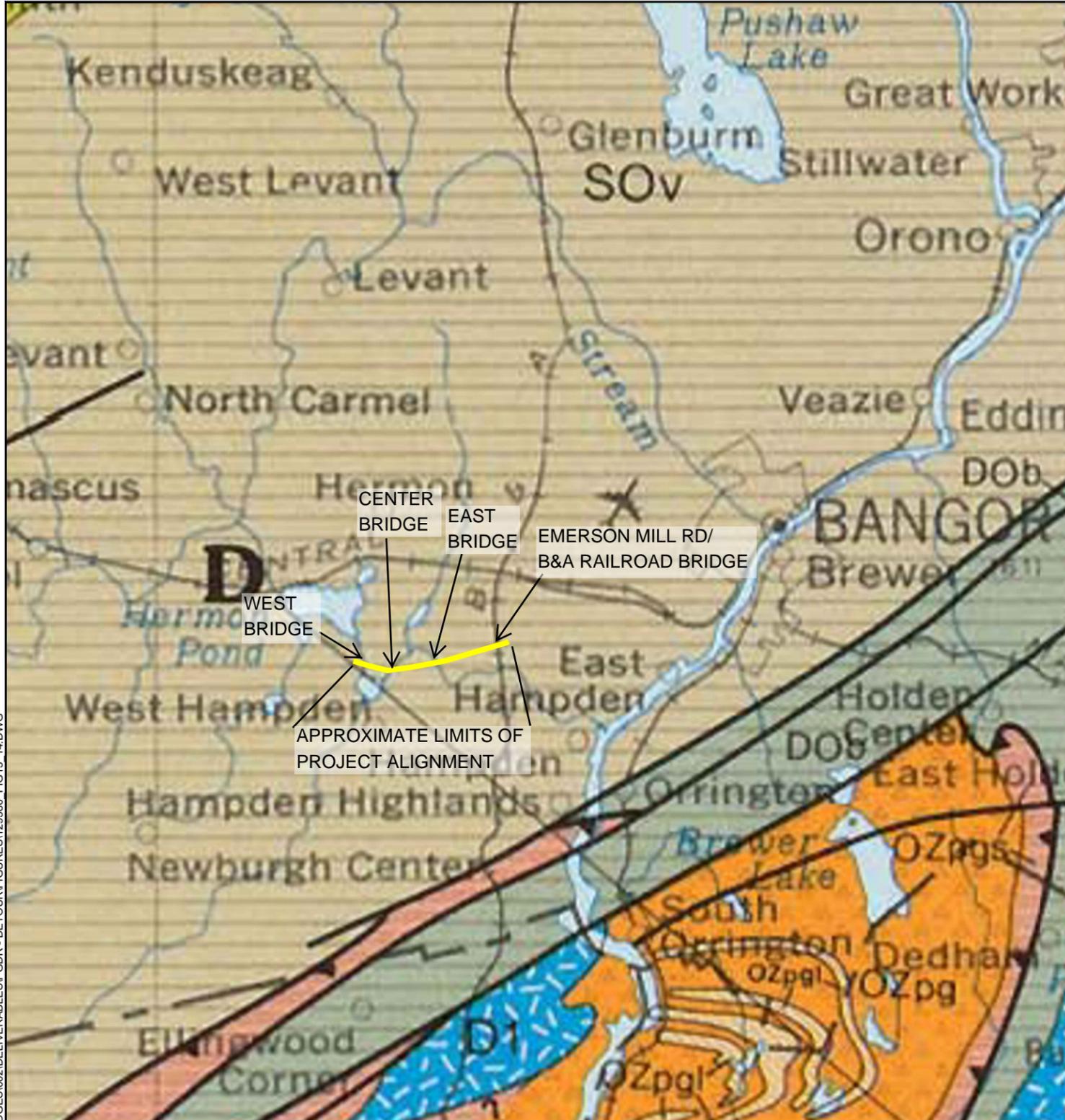
HALEY ALDRICH

TEMPORARY ROADWAY DIVERSION FOR INTERSTATE 95 OVER SOUADABSCOOK STREAM WEST, CENTER, EAST AND EMERSON MILL ROAD/B&A RAILROAD HAMPDEN, MAINE
MAINEDOT WINS 21673, 21728, 21729, 21730

SURFICIAL GEOLOGY

SCALE: AS SHOWN
JUNE 2019

FIGURE 13



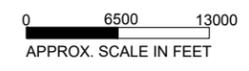
Printed: 6/7/2019 10:17 AM Sheet: LAYOUT5-HA-FIG-13-BL
 G:\PROJECTS\129380 - HAMPDEN BRIDGES\02\DELIVERABLES\PGDR - DETOUR\FIGURES\129380 FIG13 14.DWG
 MLS
 G:\PROJECTS\129380 - HAMPDEN BRIDGES\02\DELIVERABLES\PGDR - DETOUR\FIGURES\129380 FIG13 14.DWG

NOTES

1. BASE MAP SOURCE: OSBERG, PHILIP H, HUSSEY II, ARTHUR M, BOONE, GARY M. (1985). BEDROCK GEOLOGIC MAP OF MAINE, MAINE GEOLOGICAL SURVEY, DEPARTMENT OF CONSERVATION, AUGUSTA, MAINE.

LEGEND

SOv - VASSALBORO FORMATION



TEMPORARY ROADWAY DIVERSION FOR INTERSTATE 95 OVER SOUADABSCOOK STREAM WEST, CENTER, EAST AND EMERSON MILL ROAD/B&A RAILROAD HAMPDEN, MAINE
 MAINE DOT WINS 21673, 21728, 21729, 21730

BEDROCK GEOLOGY

SCALE: AS SHOWN
 JUNE 2019

APPENDIX A

Test Boring Logs

Souadabscook Stream West

Maine Department of Transportation Soil/Rock Exploration Log US CUSTOMARY UNITS		Project: Souadabscook Stream West Bridges	Boring No.: BB-HSS-201
		Location: Hampden, Maine	WIN: 21730.00/21730.10
Driller: New England Boring Contractors	Elevation (ft.): 126.7	Auger ID/OD: --	
Operator: T. Shaffer	Datum: NAVD 88	Sampler: Split-Spoon-1.375 in. ID	
Logged By: N. Klausmeyer	Rig Type: Track-Mounted Mobile B53	Hammer Wt./Fall: SS-140#/30;HW-300#/16	
Date Start/Finish: 4-17-2019/4-17-2019	Drilling Method: HW Drive	Core Barrel: --	
Boring Location: N460832; E1693286	Casing ID/OD: HW-4.0 in. ID	Water Level*: 6.1 ft	

Hammer Efficiency Factor: 0.7122 **Hammer Type:** Automatic Hydraulic Rope & Cathead

Definitions: R = Rock Core Sample S_u = Peak/Remolded Field Vane Undrained Shear Strength (psf) T_v = Pocket Torvane Shear Strength (psf)
D = Split Spoon Sample SSA = Solid Stem Auger S_u(lab) = Lab Vane Undrained Shear Strength (psf) WC = Water Content, percent
MD = Unsuccessful Split Spoon Sample Attempt HSA = Hollow Stem Auger q_p = Unconfined Compressive Strength (ksf) LL = Liquid Limit
U = Thin Wall Tube Sample RC = Roller Cone N-uncorrected = Raw Field SPT N-value PL = Plastic Limit
MU = Unsuccessful Thin Wall Tube Sample Attempt WOH = Weight of 140lb. Hammer Hammer Efficiency Factor = Rig Specific Annual Calibration Value PI = Plasticity Index
V = Field Vane Shear Test, PP = Pocket Penetrometer WOR/C = Weight of Rods or Casing N₆₀ = SPT N-uncorrected Corrected for Hammer Efficiency G = Grain Size Analysis
MV = Unsuccessful Field Vane Shear Test Attempt WO1P = Weight of One Person N₆₀ = (Hammer Efficiency Factor/60%)*N-uncorrected C = Consolidation Test

Depth (ft.)	Sample Information								Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/AASHTO and Unified Class.
	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N ₆₀	Casing Blows	Push				
0	1D	24/17	0.00 - 2.00	1/4/2/5	6	7	Push		125.0	Dark brown, wet, medium stiff, fine to coarse sandy SILT, trace fine gravel, contains organics -FILL-(ML)		
	2D	24/10	2.00 - 4.00	3/4/5/5	9	11			122.7	Dark grey, mottled, wet, medium stiff, clayey SILT, trace fine sand, trace organics -MARINE DEPOSIT-(ML) Dark grey, mottled, wet, stiff, clayey SILT, trace fine to coarse sand, trace organics -MARINE DEPOSIT-(ML)		
5	3D	24/7	4.00 - 6.00	WOH/WOH/WOH/ WOH					120.6	Dark brown, wet, very soft, PEAT, loosely bonded, organic odor -ORGANIC DEPOSIT-(OL)	G#502182 A-4 ML	
	4D	24/16	6.00 - 8.00	2/5/5/5	10	12			116.7	Dark grey, wet, stiff, SILT, some fine to coarse sand, some clay, trace gravel, trace organics -MARINE DEPOSIT-(ML) Olive-grey to light brown, mottled, wet, medium stiff, clayey SILT, little fine sand, trace organics -MARINE DEPOSIT-(ML)		
10	6D	24/22	10.00 - 12.00	WOH/WOH/WOH/3						Olive-grey with light brown and black streaking, mottled, wet, very soft, silty CLAY, trace fine sand, trace organics -MARINE DEPOSIT-(CL)		
	7D	24/24	12.00 - 14.00	1/2/2/4	4	5				Olive-grey grading to grey-brown, mottled, wet, soft, silty CLAY, trace fine sand, trace organics -MARINE DEPOSIT-(CL)		
15	8D	24/24	15.00 - 17.00	WOH/WOH/1/2	1	1				Grey with some light brown, mottled, wet, very soft, silty CLAY, trace fine sand, trace organics -MARINE DEPOSIT-(CL)		
20	9D V1 V2	24/24	20.00 - 22.00 20.64 - 21.00 21.64 - 22.00	WOH/WOH/WOH/ WOH Su=580/155 psf Su=620/155 psf						Grey with occasional black streaks, wet, very soft, silty CLAY, trace organics -MARINE DEPOSIT-(CL) 55x110 mm vane raw torque readings: V1: 150/40 in.-lbs V2: 160/40 in.-lbs	G#502179 WC=32% LL=31, PL=19 PI=12 CL	
25												

Remarks:

Maine Department of Transportation Soil/Rock Exploration Log US CUSTOMARY UNITS	Project: Souadabscook Stream West Bridges	Boring No.: BB-HSS-201
	Location: Hampden, Maine	WIN: 21730.00/21730.10

Driller: New England Boring Contractors	Elevation (ft.): 126.7	Auger ID/OD: --
Operator: T. Shaffer	Datum: NAVD 88	Sampler: Split-Spoon-1.375 in. ID
Logged By: N. Klausmeyer	Rig Type: Track-Mounted Mobile B53	Hammer Wt./Fall: SS-140#/30;HW-300#/16
Date Start/Finish: 4-17-2019/4-17-2019	Drilling Method: HW Drive	Core Barrel: --
Boring Location: N460832; E1693286	Casing ID/OD: HW-4.0 in. ID	Water Level*: 6.1 ft

Hammer Efficiency Factor: 0.7122	Hammer Type: Automatic <input checked="" type="checkbox"/> Hydraulic <input type="checkbox"/> Rope & Cathead <input type="checkbox"/>
---	--

Definitions:
 D = Split Spoon Sample
 MD = Unsuccessful Split Spoon Sample Attempt
 U = Thin Wall Tube Sample
 MU = Unsuccessful Thin Wall Tube Sample Attempt
 V = Field Vane Shear Test, PP = Pocket Penetrometer
 MV = Unsuccessful Field Vane Shear Test Attempt

R = Rock Core Sample
 SSA = Solid Stem Auger
 HSA = Hollow Stem Auger
 RC = Roller Cone
 WOH = Weight of 140 lb. Hammer
 WOR/C = Weight of Rods or Casing
 WO1P = Weight of One Person

S_u = Peak/Remolded Field Vane Undrained Shear Strength (psf)
 S_u(lab) = Lab Vane Undrained Shear Strength (psf)
 q_p = Unconfined Compressive Strength (ksf)
 N-uncorrected = Raw Field SPT N-value
 Hammer Efficiency Factor = Rig Specific Annual Calibration Value
 N₆₀ = SPT N-uncorrected Corrected for Hammer Efficiency
 N₆₀ = (Hammer Efficiency Factor/60%)*N-uncorrected

T_v = Pocket Torvane Shear Strength (psf)
 WC = Water Content, percent
 LL = Liquid Limit
 PL = Plastic Limit
 PI = Plasticity Index
 G = Grain Size Analysis
 C = Consolidation Test

Depth (ft.)	Sample Information							Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/AASHTO and Unified Class.
	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows/(6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N ₆₀	Casing Blows				
25	10D V3 V4	24/24	25.00 - 27.00 25.64 - 26.00 26.64 - 27.00	WOH/WOH/WOH/ WOH Su=545/115 psf Su=580/80 psf			Push			Grey, wet, very soft, silty CLAY -MARINE DEPOSIT-(CL) 55x110 mm vane raw torque readings: V3: 140/30 in.-lbs V4: 150/20 in.-lbs	
30	11D MV	24/24	30.00 - 32.00 30.64 - 31.00	WOH/WOH/1/2	1	1		96.2		Grey, wet, very loose, clayey fine SAND, poorly-graded with distinct layers of silty clay -MARINE DEPOSIT-(SC) Note: Attempted vane shear test, no penetration at 30.64 ft.	
35	12D	24/16	35.00 - 37.00	2/3/2/3	5	6		91.7		Grey, wet, loose, fine SAND, little silt -MARINE DEPOSIT-(SM)	
40	13D	24/9	40.00 - 42.00	1/6/7/7	13	15		89.2		Grey, wet, medium dense, fine to coarse SAND, trace silt, trace fine gravel, well-graded -MARINE DEPOSIT-(SW)	
								84.7		Bottom of Exploration at 42.0 feet below ground surface.	

Remarks:

Maine Department of Transportation Soil/Rock Exploration Log US CUSTOMARY UNITS		Project: Souadabscook Stream West Bridges	Boring No.: BB-HSS-202
		Location: Hampden, Maine	WIN: 21730.00/21730.10
Driller: New England Boring Contractors	Elevation (ft.): 126.1	Auger ID/OD: --	
Operator: T. Shaffer	Datum: NAVD 88	Sampler: Split-Spoon-1.375 in. ID	
Logged By: N. Klausmeyer	Rig Type: Track-Mounted Mobile B53	Hammer Wt./Fall: SS-140#/30;HW-300#/16	
Date Start/Finish: 4-16-2019/4-17-2019	Drilling Method: HW Drive	Core Barrel: --	
Boring Location: N460727; E1693722	Casing ID/OD: HW-4.0 in. ID	Water Level*: 2.5 ft	

Hammer Efficiency Factor: 0.7122	Hammer Type: Automatic <input checked="" type="checkbox"/> Hydraulic <input type="checkbox"/> Rope & Cathead <input type="checkbox"/>
Definitions: D = Split Spoon Sample MD = Unsuccessful Split Spoon Sample Attempt U = Thin Wall Tube Sample MU = Unsuccessful Thin Wall Tube Sample Attempt V = Field Vane Shear Test, PP = Pocket Penetrometer MV = Unsuccessful Field Vane Shear Test Attempt	R = Rock Core Sample SSA = Solid Stem Auger HSA = Hollow Stem Auger RC = Roller Cone WOH = Weight of 140lb. Hammer WOR/C = Weight of Rods or Casing WO1P = Weight of One Person
S_u = Peak/Remolded Field Vane Undrained Shear Strength (psf) $S_{u(lab)}$ = Lab Vane Undrained Shear Strength (psf) q_u = Unconfined Compressive Strength (ksf) N-uncorrected = Raw Field SPT N-value Hammer Efficiency Factor = Rig Specific Annual Calibration Value N_{60} = SPT N-uncorrected Corrected for Hammer Efficiency N_{60} = (Hammer Efficiency Factor/60%)*N-uncorrected	T_v = Pocket Torvane Shear Strength (psf) WC = Water Content, percent LL = Liquid Limit PL = Plastic Limit PI = Plasticity Index G = Grain Size Analysis C = Consolidation Test

Depth (ft.)	Sample Information							Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/AASHTO and Unified Class.
	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N ₆₀	Casing Blows				
0	1D	24/15	0.00 - 2.00	1/10/11/9	21	25	Push	125.6		Brown, moist, soft, SILT, trace fine to medium sand, trace fine gravel, trace organics -TOPSOIL-(ML)	
	2D	24/11	2.00 - 4.00	9/8/15/10	23	27				Brown to red-brown, moist, medium dense, fine to coarse SAND, some silt, little fine to coarse gravel, trace organics, well-graded -FILL-(SM) Red-brown, wet grading to moist, medium dense, sandy fine to coarse GRAVEL, little silt, well-graded -FILL-(GW-GM)	G#502183 A-1-b GW-GM
5	3D	24/19	4.00 - 6.00	1/2/8/10	10	12		121.4		Note: Drill action indicates granular material. Red-brown, wet, very loose, fine to coarse SAND, little silt, little fine gravel, trace organics, well-graded -FILL-(SW-SM)	
	4D	24/12	7.00 - 9.00	3/2/7/7	9	11		119.1		Olive-grey, mottled, damp, stiff, clayey SILT, trace fine sand, trace organics -MARINE DEPOSIT-(ML) Note: Due to cave-in, washed out to 7.0 ft.	G#502188 WC=316% OC=57%
10	5D	24/13	9.00 - 11.00	2/2/4/4	6	7		117.1		Dark brown, moist, medium stiff, PEAT, organic odor -ORGANIC DEPOSIT-(OL)	
	6D	24/21	11.00 - 13.00	WOH/3/4/6	7	8		115.1		Grey, wet, stiff, fine sandy SILT, trace clay, trace organics -MARINE DEPOSIT-(ML)	
	7D	24/23	13.00 - 15.00	1/2/4/5	6	7		113.1		Grey, wet, medium stiff, clayey SILT, trace fine sand, trace organics -MARINE DEPOSIT-(ML)	
15	8D	24/??	15.00 - 17.00	1/2/3/3	5	6				Grey to light brown, mottled, wet, medium stiff, silty CLAY, trace fine sand, trace organics -MARINE DEPOSIT-(CL) Grey to light brown, mottled, wet, medium stiff, silty CLAY, trace fine sand, trace organics -MARINE DEPOSIT-(CL) U1: Grey, silty CLAY	G#502178 LL=31, PL=20 PI=11 CL
	U1	24/24	17.00 - 19.00								
20	9D V1	24/21	19.00 - 21.00	WOH/WOH/WOH/ WOH						Grey to light grey, mottled, wet, medium stiff, silty CLAY, trace organics -MARINE DEPOSIT-(CL) 55x110 mm vane raw torque readings: V1: 195/40 in.-lbs V2: 200/45 in.-lbs	
	V2		19.64 - 20.00	Su=755/155 psf							
	V3		20.64 - 21.00	Su=775/175 psf							
	10D	24/6	21.00 - 23.00	WOR/WOH/WOH/ WOH						Grey, wet, medium stiff, silty CLAY -MARINE DEPOSIT-(CL)	
25	11D V3 MV	24/0	23.00 - 25.00	WOR/WOH/WOH/ WOH						55x110 mm vane raw torque readings: V3: 90/10 in.-lbs. Note: Attempted vane shear test, no penetration at 24.0 ft.	
			23.64 - 24.00	Su=350/40 psf				101.7			

Remarks:
OC = Organic Content

Driller: New England Boring Contractors	Elevation (ft.): 126.1	Auger ID/OD: --
Operator: T. Shaffer	Datum: NAVD 88	Sampler: Split-Spoon-1.375 in. ID
Logged By: N. Klausmeyer	Rig Type: Track-Mounted Mobile B53	Hammer Wt./Fall: SS-140#/30;HW-300#/16
Date Start/Finish: 4-16-2019/4-17-2019	Drilling Method: HW Drive	Core Barrel: --
Boring Location: N460727; E1693722	Casing ID/OD: HW-4.0 in. ID	Water Level*: 2.5 ft
Hammer Efficiency Factor: 0.7122		

Hammer Type: Automatic Hydraulic Rope & Cathed

Definitions:
 D = Split Spoon Sample
 MD = Unsuccessful Split Spoon Sample Attempt
 U = Thin Wall Tube Sample
 MU = Unsuccessful Thin Wall Tube Sample Attempt
 V = Field Vane Shear Test, PP = Pocket Penetrometer
 MV = Unsuccessful Field Vane Shear Test Attempt

R = Rock Core Sample
 SSA = Solid Stem Auger
 HSA = Hollow Stem Auger
 RC = Roller Cone
 WOH = Weight of 140 lb. Hammer
 WOR/C = Weight of Rods or Casing
 WO1P = Weight of One Person

S_u = Peak/Remolded Field Vane Undrained Shear Strength (psf)
 $S_{u(lab)}$ = Lab Vane Undrained Shear Strength (psf)
 q_u = Unconfined Compressive Strength (ksf)
 N-uncorrected = Raw Field SPT N-value
 Hammer Efficiency Factor = Rig Specific Annual Calibration Value
 N_{60} = SPT N-uncorrected Corrected for Hammer Efficiency
 N_{60} = (Hammer Efficiency Factor/60%)*N-uncorrected

T_v = Pocket Torvane Shear Strength (psf)
 WC = Water Content, percent
 LL = Liquid Limit
 PL = Plastic Limit
 PI = Plasticity Index
 G = Grain Size Analysis
 C = Consolidation Test

Depth (ft.)	Sample Information							Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/AASHTO and Unified Class.
	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows/(6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N ₆₀	Casing Blows				
25	12D	24/24	25.00 - 27.00	WOH/WOH/2/2	2	2	Push	24.4			
								99.1			
	13D	24/24	27.00 - 29.00	WOH/1/2/2	3	4		97.1			
30	14D	24/13	29.00 - 31.00	2/2/2/3	4	5		92.8			
								88.0			
35	15D	24/6	35.00 - 37.00	3/6/7/8	13	15	65				
							60				
							150				
	R1	60/60	38.20 - 43.20	RQD = 89%							
40											
	R2	60/60	43.20 - 48.20	RQD = 93%							
45											
50								77.9			
Bottom of Exploration at 48.2 feet below ground surface.											

Remarks:
OC = Organic Content

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

Driller: New England Boring Contractors	Elevation (ft.): 128.3	Auger ID/OD: --
Operator: T. Shaffer	Datum: NAVD 88	Sampler: Split-Spoon-1.375 in. ID
Logged By: K. Russ	Rig Type: Track-Mounted Mobile B53	Hammer Wt./Fall: SS-140#/30;HW-300#/16
Date Start/Finish: 4-23-2019/4-23-2019	Drilling Method: HW Drive	Core Barrel: NQ-2.0 in. ID
Boring Location: N460571; E1694321	Casing ID/OD: HW-4.0 in. ID	Water Level*: 3.5 ft

Hammer Efficiency Factor: 0.7122 **Hammer Type:** Automatic Hydraulic Rope & Cathead

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

Depth (ft.)	Sample Information							Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/AASHTO and Unified Class.
	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N ₆₀	Casing Blows				
0	1D	24/9	0.00 - 2.00	WOH(12.0")/1/3	1	1	Push	128.1	TOPSOIL-		
	2D/A	24/18	2.00 - 4.00	3/3/3/5	6	7			Olive-brown, moist, very loose, silty fine to coarse SAND, trace fine gravel, contains roots, reworked naturally-deposited soils -FILL-(SM)		
	3D	24/9	4.00 - 6.00	3/4/2/2	6	7		124.6	Olive-brown, moist, loose, silty fine to coarse SAND, trace fine gravel, reworked naturally-deposited soils -FILL-(SM)		
5	4D/A	24/10	6.00 - 8.00	1/2/2/4	4	5	5		Olive-grey, moist, medium stiff, sandy CLAY, trace gravel, depositional layering -MARINE DEPOSIT-(CL)		
							9		Olive-grey, moist, medium stiff, sandy CLAY, trace fine gravel, depositional layering -MARINE DEPOSIT-(CL)		
							12		Olive-brown to olive-grey, wet, soft, sandy CLAY, trace silt, trace roots -MARINE DEPOSIT-(CL)		
10	5D/A	24/15	9.50 - 11.50	1/1/WOH/WOH	1	1	20	118.8	Olive-brown to dark brown, wet, very soft, silty CLAY and PEAT, little sand, one piece of wood -ORGANIC DEPOSIT-(CL/OL)		
							45	117.8	Note: Drill wash contains sandy silt, trace peat to 9.5 ft.		
							34		Olive-grey, wet, very soft, SILT, trace clay, little fine to coarse sand and peat, trace gravel -MARINE DEPOSIT-(ML)		G#502185 A-4 ML G#502181 WC=28%
							28		Olive-grey, wet, very soft, silty CLAY, trace fine sand -MARINE DEPOSIT-(CL)		LL=26, PL=17 PI=9 CL
							28				
							29	114.3	Note: Drill wash contains marine sand from 14.0 to 14.8 ft. Drill action indicates gravel at 14.8 ft.		
15	6D	24/4	15.00 - 17.00	1/7/11/15	18	21	46	113.5	Olive-brown, wet, medium dense, fine to coarse SAND, little silt and gravel, well-graded, moderately bonded -GLACIAL TILL-(SW-SM)		
							35				
							42				
							43				
							50				
20	7D	24/8	20.00 - 22.00	10/11/7/4	18	21			Olive-brown, wet, medium dense, fine to coarse SAND, little silt and gravel, well-graded, well bonded -GLACIAL TILL-(SW-SM)		
								106.3			
									Bottom of Exploration at 22.0 feet below ground surface.		

Remarks:

Maine Department of Transportation Soil/Rock Exploration Log US CUSTOMARY UNITS				Project: Souadabscook Stream West Bridges Location: Hampden, Maine				Boring No.: BB-HSS-205 WIN: 21730.00/21730.10							
Driller: New England Boring Contractors				Elevation (ft.): 132.8				Auger ID/OD: --							
Operator: T. Shaffer				Datum: NAVD 88				Sampler: Split-Spoon-1.375 in. ID							
Logged By: K. Russ				Rig Type: Track-Mounted Mobile B53				Hammer Wt./Fall: SS-140#/30;HW-300#/16							
Date Start/Finish: 4-24-2019/4-24-2019				Drilling Method: HW Drive				Core Barrel: NQ-2.0 in. ID							
Boring Location: N460477; E1694754				Casing ID/OD: HW-4.0 in. ID				Water Level*: 5.4 ft							
Hammer Efficiency Factor: 0.7122				Hammer Type: Automatic <input checked="" type="checkbox"/> Hydraulic <input type="checkbox"/> Rope & Cathead <input type="checkbox"/>											
Definitions: D = Split Spoon Sample MD = Unsuccessful Split Spoon Sample Attempt U = Thin Wall Tube Sample MU = Unsuccessful Thin Wall Tube Sample Attempt V = Field Vane Shear Test, PP = Pocket Penetrometer MV = Unsuccessful Field Vane Shear Test Attempt				R = Rock Core Sample SSA = Solid Stem Auger HSA = Hollow Stem Auger RC = Roller Cone WOH = Weight of 140lb. Hammer WOR/C = Weight of Rods or Casing WO1P = Weight of One Person				S _u = Peak/Remolded Field Vane Undrained Shear Strength (psf) S _u (lab) = Lab Vane Undrained Shear Strength (psf) q _p = Unconfined Compressive Strength (ksf) N-uncorrected = Raw Field SPT N-value Hammer Efficiency Factor = Rig Specific Annual Calibration Value N ₆₀ = SPT N-uncorrected Corrected for Hammer Efficiency N ₆₀ = (Hammer Efficiency Factor/60%)*N-uncorrected				T _v = Pocket Torvane Shear Strength (psf) WC = Water Content, percent LL = Liquid Limit PL = Plastic Limit PI = Plasticity Index G = Grain Size Analysis C = Consolidation Test			
Depth (ft.)	Sample Information							Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/AASHTO and Unified Class.				
	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N ₆₀	Casing Blows								
0	1D	24/16	0.00 - 2.00	WOR/WOR/3/6	3	4	Push	132.6	TOPSOIL-						
	2D/A	24/24	2.00 - 4.00	6/7/9/12	16	19		129.3	Olive-brown, wet, medium stiff, silty CLAY, some sand, trace roots, reworked naturally-deposited soils -FILL-(CL) Olive-brown, moist, very stiff, silty CLAY, little fine sand, trace roots, reworked naturally-deposited soils -FILL-(CL)						
5	3D	24/15	4.00 - 6.00	3/3/5/6	8	9	52		Olive-brown, mottled and varved, moist, very stiff, silty CLAY, little fine sand -MARINE DEPOSIT-(CL) Olive-brown, mottled and varved, moist, medium stiff, silty CLAY, little fine sand -MARINE DEPOSIT-(CL) Olive-brown and dark brown, mottled and varved, moist, very stiff, silty CLAY, little fine sand -MARINE DEPOSIT-(CL) Note: Drill wash water contains olive-brown silty CLAY from 8.0 to 10.0 ft.						
	4D	24/24	6.00 - 8.00	8/9/11/10	20	24	51								
							58								
							59								
							67								
10	5D	24/18	10.00 - 12.00	17/38/47/17	85	101	58	122.7	Olive-brown, moist, very dense, fine to coarse SAND, little silt, trace gravel, weakly bonded -GLACIAL TILL-(SM)						
							52								
							65								
							41								
							64								
15	6D	24/7	15.00 - 17.00	8/10/12/13	22	26	44	117.8	Grey, moist, very stiff, SILT, some fine to coarse sand, some gravel, well bonded -GLACIAL TILL-(ML)	G#502186 A-4 ML					
							50								
							49								
							96								
							75								
20	7D	24/10	20.00 - 22.00	6/4/4/6	8	9		112.8	Grey, moist, loose, fine to coarse SAND, some silt and clay, trace gravel, moderately bonded -GLACIAL TILL-(SM)						
								110.8							
									Bottom of Exploration at 22.0 feet below ground surface.						

Remarks:

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

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

Souadabscook Stream Center

Maine Department of Transportation Soil/Rock Exploration Log US CUSTOMARY UNITS		Project: Souadabscook Stream Center Bridges	Boring No.: BB-HSS-207
		Location: Hampden, Maine	WIN: 21728.00/21728.10
Driller: New England Boring Contractors	Elevation (ft.): 125.7	Auger ID/OD: --	
Operator: M. Porter	Datum: NAVD 88	Sampler: Split Spoon Sampler-1.375 in.	
Logged By: K. Russ	Rig Type: Track-Mounted Mobile B53	Hammer Wt./Fall: SS-140#/30;HW-300#/16	
Date Start/Finish: 4-19-2019/4-22-2019	Drilling Method: HW Drive	Core Barrel: NQ-2.0 in. ID	
Boring Location: N460380; 1695900	Casing ID/OD: HW-4.0 in. ID	Water Level*: 0.5 ft	

Hammer Efficiency Factor: 0.7122	Hammer Type: Automatic <input checked="" type="checkbox"/> Hydraulic <input type="checkbox"/> Rope & Cathead <input type="checkbox"/>
Definitions: D = Split Spoon Sample MD = Unsuccessful Split Spoon Sample Attempt U = Thin Wall Tube Sample MU = Unsuccessful Thin Wall Tube Sample Attempt V = Field Vane Shear Test, PP = Pocket Penetrometer MV = Unsuccessful Field Vane Shear Test Attempt	R = Rock Core Sample SSA = Solid Stem Auger HSA = Hollow Stem Auger RC = Roller Cone WOH = Weight of 140lb. Hammer WOR/C = Weight of Rods or Casing WO1P = Weight of One Person
S_u = Peak/Remolded Field Vane Undrained Shear Strength (psf) $S_{u(lab)}$ = Lab Vane Undrained Shear Strength (psf) q_p = Unconfined Compressive Strength (ksf) N-uncorrected = Raw Field SPT N-value Hammer Efficiency Factor = Rig Specific Annual Calibration Value N_{60} = SPT N-uncorrected Corrected for Hammer Efficiency N_{60} = (Hammer Efficiency Factor/60%)*N-uncorrected	T_v = Pocket Torvane Shear Strength (psf) WC = Water Content, percent LL = Liquid Limit PL = Plastic Limit PI = Plasticity Index G = Grain Size Analysis C = Consolidation Test

Depth (ft.)	Sample Information							Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/AASHTO and Unified Class.
	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or ROD (%)	N-uncorrected	N ₆₀	Casing Blows				
0	1D	24/24	0.00 - 2.00	2/1(12.0")/1	1	1	Push	125.6	TOPSOIL-	0.1	
								124.0	Brown, wet and frozen, very soft, SILT, little clay, little fine to coarse sand, trace fine gravel, contains roots, reworked naturally-deposited soils -FILL-(ML)	1.7	G#502196 A-4 ML
	2D	24/15	2.00 - 4.00	WOH/WOH/WOH/ WOH				121.7	Brown to olive-grey, moist, very soft, PEAT interlayered with clayey SILT, little fine sand, contains roots, reeds and organics -ORGANIC DEPOSIT-(ML/OL)	4.0	
5	3D/A	24/14	4.00 - 6.00	WOH/WOH/WOH/ WOH				120.0	Dark brown, moist, very soft, PEAT, little silt, contains roots, reeds and organics -ORGANIC DEPOSIT-(OL)	5.7	
	MV		6.00 - 6.00					117.8	Olive-grey, wet, very soft, silty CLAY, trace peat, contains roots -MARINE DEPOSIT-(CL) Note: Attempted vane shear test, vane refusal at 6.0 ft.	7.9	
	5D	24/24	8.00 - 10.00	WOH/WOH/1/1	1	1	2		Dark brown, wet, very soft, PEAT, contains roots and wood -ORGANIC DEPOSIT-(OL)-	10.4	#502200 WC=411% OC=61.1%
10	6D V1	24/24	10.00 - 12.00	WO1P/24"				115.3	Olive-grey, wet, medium stiff, silty CLAY -MARINE DEPOSIT-(CL) 65x130 mm vane raw torque readings: V1: 210/50 in.-lbs V2: 300/65 in.-lbs		
	V2		11.17 - 11.60	Su=710/155 psf					Olive-grey, wet, medium stiff, silty CLAY -MARINE DEPOSIT-(CL) 65x130 mm vane raw torque readings: V3: 415/60 in.-lbs Note: Attempted vane shear test, vane refusal at 13.2 ft. Note: Drill open hole from 14.0 to 20.0 ft, drill wash contains olive-grey, silty clay, trace fine sand, trace fine gravel.		
	7D V3	24/19	12.00 - 14.00	WOH/WOH/WO1P/ 12"							
	MV		13.20 - 13.20	Su=985/140 psf							
20	U1	24/24	20.00 - 22.00						U1: Olive-grey, soft, silty CLAY		G#502191 WC=37% LL=32, PL=20 PI=12 CL
	8D V4	24/24	22.00 - 24.00	WOR/WOR/WOR/ WOR					Olive-grey, wet, soft, silty CLAY -MARINE DEPOSIT-(CL) 65x130 mm vane raw torque readings: V4: 150/10 in.-lbs V5: 170/10 in.-lbs		
	V5		23.57 - 24.00	Su=355/25 psf Su=405/25 psf							
25								101.7	Bottom of Exploration at 24.0 feet below ground surface.	24.0	

Remarks:
OC = Organic Content

Maine Department of Transportation Soil/Rock Exploration Log US CUSTOMARY UNITS	Project: Souadabscook Stream Center Bridges	Boring No.: BB-HSS-207A
	Location: Hampden, Maine	WIN: 21728.00/21728.10

Driller: New England Boring Contractors	Elevation (ft.): 125.7	Auger ID/OD: --
Operator: M. Porter	Datum: NAVD 88	Sampler: Split Spoon Sampler-1.375 in.
Logged By: K. Russ	Rig Type: Track-Mounted Mobile B53	Hammer Wt./Fall: SS-140#/30;HW-300#/16
Date Start/Finish: 5-3-2019/5-3-2019	Drilling Method: HW Drive	Core Barrel: --
Boring Location: N460380; E1695889	Casing ID/OD: HW-3.0 in. ID	Water Level*: 0.5 ft
Hammer Efficiency Factor: 0.7122	Hammer Type: Automatic <input checked="" type="checkbox"/> Hydraulic <input type="checkbox"/> Rope & Cathead <input type="checkbox"/>	

Definitions:
 D = Split Spoon Sample
 MD = Unsuccessful Split Spoon Sample Attempt
 U = Thin Wall Tube Sample
 MU = Unsuccessful Thin Wall Tube Sample Attempt
 V = Field Vane Shear Test, PP = Pocket Penetrometer
 MV = Unsuccessful Field Vane Shear Test Attempt
 R = Rock Core Sample
 SSA = Solid Stem Auger
 HSA = Hollow Stem Auger
 RC = Roller Cone
 WOH = Weight of 140 lb. Hammer
 WOR/C = Weight of Rods or Casing
 WO1P = Weight of One Person
 S_u = Peak/Remolded Field Vane Undrained Shear Strength (psf)
 S_{u(lab)} = Lab Vane Undrained Shear Strength (psf)
 q_u = Unconfined Compressive Strength (ksf)
 N-uncorrected = Raw Field SPT N-value
 Hammer Efficiency Factor = Rig Specific Annual Calibration Value
 N₆₀ = SPT N-uncorrected Corrected for Hammer Efficiency
 N₆₀ = (Hammer Efficiency Factor/60%)*N-uncorrected
 T_v = Pocket Torvane Shear Strength (psf)
 WC = Water Content, percent
 LL = Liquid Limit
 PL = Plastic Limit
 PI = Plasticity Index
 G = Grain Size Analysis
 C = Consolidation Test

Depth (ft.)	Sample Information							Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/AASHTO and Unified Class.						
	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows/(6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N ₆₀	Casing Blows										
25	1D V1 V2	24/24	25.00 - 27.00 25.57 - 26.00 26.57 - 27.00	WOR/WOR/WOR/ WOR Su=405/70 psf Su=310/85 psf			Open	100.7		Olive-grey, wet, soft, silty CLAY, contains black organic streaks and shells -MARINE DEPOSIT-(CL) 65x130 mm vane raw torque readings: V1: 170/30 in.-lbs V2: 130/35 in.-lbs	25.0						
30	2D V3 V4	24/24	30.00 - 32.00 30.57 - 31.00 31.57 - 32.00	WOR/WOR/WOR/ WOR Su=310/95 psf Su=330/105 psf									Olive-grey, wet, soft, silty CLAY, contains black organic streaks and shells -MARINE DEPOSIT-(CL) 65x130 mm vane raw torque readings: V3: 130/40 in.-lbs V4: 140/45 in.-lbs	34.5			
35	3D	24/8	35.00 - 37.00	4/6/3/6	9	11		91.2								Note: Strata change at 34.5 ft based on drill action. Olive-grey, wet, loose, clayey SAND, little gravel, weakly bonded -GLACIAL TILL-(SC)	37.0
40								88.7									
45																	
50																	

Remarks:

Maine Department of Transportation Soil/Rock Exploration Log US CUSTOMARY UNITS				Project: Souadabscook Stream Center Bridges Location: Hampden, Maine				Boring No.: BB-HSS-208 WIN: 21728.00/21728.10							
Driller: New England Boring Contractors		Elevation (ft.): 125.3		Auger ID/OD: --		Operator: M. Porter		Datum: NAVD 88		Sampler: Split Spoon Sampler-1.375 in.					
Logged By: N. Klausmeyer		Rig Type: Track-Mounted Mobile B53		Hammer Wt./Fall: SS-140#/30;HW-300#/16		Date Start/Finish: 4-18-2019/4-19-2019		Drilling Method: HW Drive		Core Barrel: NQ-2.0 in. ID					
Boring Location: N460393; E1696353		Casing ID/OD: HW-4.0 in. ID		Water Level*: 1.0 ft		Hammer Efficiency Factor: 0.7122		Hammer Type: Automatic <input checked="" type="checkbox"/> Hydraulic <input type="checkbox"/> Rope & Cathead <input type="checkbox"/>							
Definitions: D = Split Spoon Sample MD = Unsuccessful Split Spoon Sample Attempt U = Thin Wall Tube Sample MU = Unsuccessful Thin Wall Tube Sample Attempt V = Field Vane Shear Test, PP = Pocket Penetrometer MV = Unsuccessful Field Vane Shear Test Attempt				R = Rock Core Sample SSA = Solid Stem Auger HSA = Hollow Stem Auger RC = Roller Cone WOH = Weight of 140lb. Hammer WOR/C = Weight of Rods or Casing WO1P = Weight of One Person				S _u = Peak/Remolded Field Vane Undrained Shear Strength (psf) S _u (lab) = Lab Vane Undrained Shear Strength (psf) q _p = Unconfined Compressive Strength (ksf) N-uncorrected = Raw Field SPT N-value Hammer Efficiency Factor = Rig Specific Annual Calibration Value N ₆₀ = SPT N-uncorrected Corrected for Hammer Efficiency N ₆₀ = (Hammer Efficiency Factor/60%)*N-uncorrected				T _v = Pocket Torvane Shear Strength (psf) WC = Water Content, percent LL = Liquid Limit PL = Plastic Limit PI = Plasticity Index G = Grain Size Analysis C = Consolidation Test			
Depth (ft.)	Sample Information								Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/AASHTO and Unified Class.			
	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or ROD (%)	N-uncorrected	N ₆₀	Casing Blows								
0	1D/A	24/11	0.00 - 2.00	3/2/2/7	4	5	Push	124.8		Brown, wet, soft, fine to coarse sandy SILT, trace fine gravel, contains organics -TOPSOIL-(OL/OH)	G#502197 A-4 SM				
	2D	24/3	2.00 - 4.00	5/2/3/3	5	6				Brown, wet, loose, fine to coarse SAND, some silt, little fine to coarse gravel -FILL-(SM) Light brown, wet, loose, fine to coarse SAND, some silt, little fine to coarse gravel -FILL-(SM)					
5	3D	24/11	4.00 - 6.00	3/5/4/3	9	11	✓			Light brown, wet, loose, silty fine to coarse SAND, some fine to coarse gravel -FILL-(SM)					
	4D	24/8	6.00 - 8.00	7/5/7/5	12	14	13			Light brown, wet, medium dense, fine to coarse SAND, little fine to coarse gravel, little silt, well-graded -FILL-(SW-SM)					
	5D	24/5	8.00 - 10.00	5/4/4/5	8	9	11			Light brown, wet, loose, fine to coarse SAND, some fine to coarse gravel, little silt, well-graded -FILL-(SW-SM)					
10	6D	24/6	10.00 - 12.00	3/1/2/2	3	4	Push			Light brown, wet, very loose, fine to coarse SAND, some fine to coarse gravel, little silt, well-graded -FILL-(SW-SM)					
	7D	24/2	12.00 - 14.00	7/3/3/3	6	7	14			Light brown, wet, loose, fine to coarse SAND, some fine to coarse gravel, little silt, well-graded -FILL-(SW-SM)					
	8D	24/5	14.00 - 16.00	6/4/4/2	8	9	Push			Light brown, wet, loose, fine to coarse SAND, little fine to coarse gravel, trace silt, well-graded -FILL-(SW)					
15	9D	24/8	16.00 - 18.00	1/WOH/WOH/WOH			Push	109.3		Note: Drill wash color change from light brown to dark brown at approximately 16.0 ft. Dark brown, wet, very soft, PEAT, little fine sand, organic odor -ORGANIC DEPOSIT-(OL)					
	10D	24/24	18.00 - 20.00	WOH/WOH/WOH/WOH				107.3		Note: Drill wash color change from brown to grey at approximately 18.0 ft. Grey-brown mottled with occasional black streaks, wet, very soft, silty CLAY, trace fine gravel, trace fine sand, trace organics -MARINE DEPOSIT-(CL)					
20	11D	24/12	20.00 - 22.00	WOH/WOH/WOH/WOH						Note: Attempt Shelby tube sample at 20.0 ft, refusal. Olive-grey, wet, very soft, silty CLAY, trace fine sand -MARINE DEPOSIT-(CL)					
	12D	24/13	22.00 - 24.00	5/4/5/14	9	11				Olive-grey, wet, stiff, silty CLAY, little fine sand, trace medium sand and fine gravel, occasional 1-in. concretions -MARINE DEPOSIT-(CL)					
25	13D	24/7	24.00 - 26.00	7/8/9/6	17	20		101.8		Olive-grey, medium dense, sandy GRAVEL, little clay -GLACIAL TILL-(GM)					

Remarks:

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

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

Maine Department of Transportation Soil/Rock Exploration Log US CUSTOMARY UNITS		Project: Souadabscook Stream Center Bridges	Boring No.: BB-HSS-209
		Location: Hampden, Maine	WIN: 21728.00/21728.10
Driller: New England Boring Contractors	Elevation (ft.): 125.8	Auger ID/OD: --	
Operator: T. Schaffer	Datum: NAVD 88	Sampler: Split Spoon Sampler-1.375 in.	
Logged By: N. Klausmeyer	Rig Type: Track-Mounted Mobile B53	Hammer Wt./Fall: SS-140#/30;HW-300#/16	
Date Start/Finish: 4-11-2019/4-15-2019	Drilling Method: HW Drive	Core Barrel: NQ-2.0 in. ID	
Boring Location: N460396; E1696491	Casing ID/OD: HW-4.0 in. ID	Water Level*: 5.9 ft	

Hammer Efficiency Factor: 0.7122	Hammer Type: Automatic <input checked="" type="checkbox"/> Hydraulic <input type="checkbox"/> Rope & Cathead <input type="checkbox"/>
Definitions: D = Split Spoon Sample MD = Unsuccessful Split Spoon Sample Attempt U = Thin Wall Tube Sample MU = Unsuccessful Thin Wall Tube Sample Attempt V = Field Vane Shear Test, PP = Pocket Penetrometer MV = Unsuccessful Field Vane Shear Test Attempt	R = Rock Core Sample SSA = Solid Stem Auger HSA = Hollow Stem Auger RC = Roller Cone WOH = Weight of 140lb. Hammer WOR/C = Weight of Rods or Casing WO1P = Weight of One Person
S_u = Peak/Remolded Field Vane Undrained Shear Strength (psf) $S_{u(lab)}$ = Lab Vane Undrained Shear Strength (psf) q_p = Unconfined Compressive Strength (ksf) N-uncorrected = Raw Field SPT N-value Hammer Efficiency Factor = Rig Specific Annual Calibration Value N_{60} = SPT N-uncorrected Corrected for Hammer Efficiency N_{60} = (Hammer Efficiency Factor/60%)*N-uncorrected	T_v = Pocket Torvane Shear Strength (psf) WC = Water Content, percent LL = Liquid Limit PL = Plastic Limit PI = Plasticity Index G = Grain Size Analysis C = Consolidation Test

Depth (ft.)	Sample Information								Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/AASHTO and Unified Class.
	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N ₆₀	Casing Blows					
0	1D	24/13	0.00 - 2.00	4/6/6/7	12	14	Push			Note: Frozen soil at ground surface. Brown, moist, medium dense, silty fine to coarse SAND, little fine to coarse gravel, trace organics, well-graded -FILL-(SM)		
	2D	24/9	2.00 - 4.00	7/13/20/31	33	39				Brown, moist, dense, silty fine to coarse SAND, little fine to coarse gravel, trace organics FILL-(SM)		
5	3D	24/7	4.00 - 6.00	5/4/2/2	6	7				Brown, wet, loose, silty fine to coarse SAND, trace fine to coarse gravel, trace organics, well-graded -FILL-(SM)		
	4D	24/14	7.00 - 9.00	2/4/4/4	8	9			118.8	Note: Water encountered at 5.9 ft. Note: Drill wash color change from brown to grey at approximately 6.5 ft.		
10	U1	24/20	9.00 - 11.00						116.8	Olive-grey to grey, wet, medium stiff silty CLAY, trace fine sand, trace organics, layered -MARINE DEPOSIT-(CL)	G#502192 WC=351% LL=495 PL=356 PI=139 OH	
	5D	24/9	11.00 - 13.00	WOH/WOH/2/4	2	2				Olive-grey, wet, stiff, silty CLAY, trace fine sand, trace organics, layered -MARINE DEPOSIT-(CL)		
15	6D V1 MV	24/24	13.00 - 15.00 13.64 - 14.00 14.00 - 14.00	WOH/WOH/2/2 Su=1,475/350 psf	2	2			114.8	Grey, wet, stiff, silty CLAY, trace organics -MARINE DEPOSIT-(CL) 55x110 mm vane raw torque readings: V1: 380/90 in.-lbs Note: Attempted vane shear test, vane refusal at 14.0 ft.		
	7D	24/24	15.00 - 17.00	WOH/WOH/4/4	4	5				Grey, wet, stiff, silty CLAY, trace fine sand, trace organics -MARINE DEPOSIT-(CL)		
	U2	24/12	17.00 - 19.00							U2: Grey, wet, silty CLAY	G#502193 WC=29% LL=30, PL=13 PI=17 CL	
20	8D	24/24	19.00 - 21.00	WOH/WOH/WOH/WOH						Grey, wet, very soft, silty CLAY, trace organics, occasional black streaking -MARINE DEPOSIT-(CL)		
	9D	24/18	21.00 - 23.00	WOR/WOR/WOR/WOR						Grey with occasional black streaking, wet, very soft, silty CLAY, trace fine sand, trace organics -MARINE DEPOSIT-(CL)		
	MU	24/0	21.00 - 23.00							MU: Grey, wet, silty CLAY with organics		
	10D	24/24	23.00 - 25.00	WOR/WOR/WOR/WOR						Grey with occasional black streaking, wet, very soft, silty CLAY, trace fine sand, trace organics -MARINE DEPOSIT-(CL)		
	MU	24/0	23.00 - 25.00							Grey with occasional black streaking, wet, very soft, silty CLAY, trace fine sand, trace organics -MARINE DEPOSIT-(CL)		
25	11D	24/24	25.00 - 27.00	WOR/WOR/WOR/WOR								

Remarks:

Maine Department of Transportation Soil/Rock Exploration Log US CUSTOMARY UNITS		Project: Souadabscook Stream Center Bridges	Boring No.: BB-HSS-210
		Location: Hampden, Maine	WIN: 21728.00/21728.10
Driller: New England Boring Contractors	Elevation (ft.): 124.6	Auger ID/OD: --	
Operator: T. Schaffer	Datum: NAVD 88	Sampler: Split Spoon Sampler-1.375 in.	
Logged By: N. Klausmeyer	Rig Type: Track-Mounted Mobile B53	Hammer Wt./Fall: SS-140#/30;HW-300#/16	
Date Start/Finish: 4-15-2019/4-15-2019	Drilling Method: HW Drive	Core Barrel: NQ-2.0 in. ID	
Boring Location: N460481; E1696946	Casing ID/OD: HW-4.0 in. ID	Water Level*: 0.4 ft	

Hammer Efficiency Factor: 0.7122	Hammer Type: Automatic <input checked="" type="checkbox"/> Hydraulic <input type="checkbox"/> Rope & Cathead <input type="checkbox"/>
Definitions: D = Split Spoon Sample MD = Unsuccessful Split Spoon Sample Attempt U = Thin Wall Tube Sample MU = Unsuccessful Thin Wall Tube Sample Attempt V = Field Vane Shear Test, PP = Pocket Penetrometer MV = Unsuccessful Field Vane Shear Test Attempt	R = Rock Core Sample SSA = Solid Stem Auger HSA = Hollow Stem Auger RC = Roller Cone WOH = Weight of 140lb. Hammer WOR/C = Weight of Rods or Casing WO1P = Weight of One Person
S_u = Peak/Remolded Field Vane Undrained Shear Strength (psf) $S_{u(lab)}$ = Lab Vane Undrained Shear Strength (psf) q_u = Unconfined Compressive Strength (ksf) N-uncorrected = Raw Field SPT N-value Hammer Efficiency Factor = Rig Specific Annual Calibration Value N_{60} = SPT N-uncorrected Corrected for Hammer Efficiency N_{60} = (Hammer Efficiency Factor/60%)*N-uncorrected	T_v = Pocket Torvane Shear Strength (psf) WC = Water Content, percent LL = Liquid Limit PL = Plastic Limit PI = Plasticity Index G = Grain Size Analysis C = Consolidation Test

Depth (ft.)	Sample Information								Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/AASHTO and Unified Class.
	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or ROD (%)	N-uncorrected	N ₆₀	Casing Blows					
0	1D	24/7	0.00 - 2.00	5/2/1/2	3	4	Push	124.1		Brown, wet, stiff, fine to coarse sandy SILT, trace fine gravel, trace organics -FILL-(ML)		
	2D	24/15	2.00 - 4.00	2/3/2/2	5	6				Grey to light brown, mottled, wet, soft, silty CLAY, trace fine sand, trace organics -MARINE DEPOSIT-(CL)		
5	3D	24/14	4.00 - 6.00	1/2/2/2	4	5		120.7		Grey, wet, soft, silty CLAY, little organics, trace fine sand -MARINE DEPOSIT-(CL)		
	4D	24/17	6.00 - 8.00	WOH/WOH/WOH/WOH				117.9		Grey-brown, wet, soft, clayey SILT, some organics, noticeable layering, slight organic odor -MARINE DEPOSIT-(ML)	G#502200 WC=425% OC=60.9%	
	5D	24/13	8.00 - 10.00	WOH/WOH/WOH/WOH				116.6		Brown, wet, very soft, PEAT, organic odor -ORGANIC DEPOSIT-(OL)		
10	6D	24/24	10.00 - 12.00	WOH/WOH/WOH/WOH						Grey with one 4-in. thick layer of light brown, wet, very soft, silty CLAY, some organics, organic odor from approximately 8.8 to 9.1 ft -MARINE DEPOSIT-(CL)	G#502194 WC=29% LL=29, PL=18 PI=11 CL	
	7D	24/24	12.00 - 14.00	WOH/2/2/2	4	5				Grey, wet, soft, silty CLAY, trace fine sand -MARINE DEPOSIT-(CL)		
15	8D	24/24	14.00 - 16.00	2/1/WOH/1	1	1				Grey, wet, very soft, silty CLAY, trace fine sand, trace organics, slight organic odor -MARINE DEPOSIT-(CL)		
	9D	24/24	16.00 - 18.00	3/1/1/2	2	2				Grey with occasional black streaking, wet, soft, silty CLAY, trace fine sand, trace organics -MARINE DEPOSIT-(CL)		
	10D	24/24	18.00 - 20.00	1/WOH/WOH/WOH						Grey with occasional black streaking, wet, very soft, silty CLAY, trace fine sand, trace organics -MARINE DEPOSIT-(CL)		
20	11D	24/0	20.00 - 22.00	4/5/4/3	9	11				No Recovery		
	12D	24/24	22.00 - 24.00	WOH/WOH/WOH/WOH						Grey, wet, very soft, silty CLAY -MARINE DEPOSIT-(CL)		
25	13D	24/12	24.00 - 26.00	WOH/WOH/4/11	4	5				Grey, wet, very soft, silty CLAY -MARINE DEPOSIT-(CL)		

Remarks:
OC = Organic Content

Maine Department of Transportation Soil/Rock Exploration Log US CUSTOMARY UNITS	Project: Souadabscook Stream Center Bridges Location: Hampden, Maine	Boring No.: BB-HSS-210 WIN: 21728.00/21728.10
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Driller: New England Boring Contractors	Elevation (ft.): 124.6	Auger ID/OD: --
Operator: T. Schaffer	Datum: NAVD 88	Sampler: Split Spoon Sampler-1.375 in.
Logged By: N. Klausmeyer	Rig Type: Track-Mounted Mobile B53	Hammer Wt./Fall: SS-140#/30;HW-300#/16
Date Start/Finish: 4-15-2019/4-15-2019	Drilling Method: HW Drive	Core Barrel: NQ-2.0 in. ID
Boring Location: N460481; E1696946	Casing ID/OD: HW-4.0 in. ID	Water Level*: 0.4 ft

Hammer Efficiency Factor: 0.7122 **Hammer Type:** Automatic Hydraulic Rope & Cathead

Definitions: R = Rock Core Sample S_u = Peak/Remolded Field Vane Undrained Shear Strength (psf) T_v = Pocket Torvane Shear Strength (psf)
 D = Split Spoon Sample SSA = Solid Stem Auger S_{u(lab)} = Lab Vane Undrained Shear Strength (psf) W_C = Water Content, percent
 MD = Unsuccessful Split Spoon Sample Attempt HSA = Hollow Stem Auger q_u = Unconfined Compressive Strength (ksf) LL = Liquid Limit
 U = Thin Wall Tube Sample RC = Roller Cone N-uncorrected = Raw Field SPT N-value PL = Plastic Limit
 MU = Unsuccessful Thin Wall Tube Sample Attempt WOH = Weight of 140 lb. Hammer Hammer Efficiency Factor = Rig Specific Annual Calibration Value PI = Plasticity Index
 V = Field Vane Shear Test, PP = Pocket Penetrometer WOR/C = Weight of Rods or Casing N₆₀ = SPT N-uncorrected Corrected for Hammer Efficiency G = Grain Size Analysis
 MV = Unsuccessful Field Vane Shear Test Attempt WO1P = Weight of One Person N₆₀ = (Hammer Efficiency Factor/60%)*N-uncorrected C = Consolidation Test

Depth (ft.)	Sample Information							Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/AASHTO and Unified Class.
	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows / (6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N ₆₀	Casing Blows				
25								99.6		Note: Drill action and wash indicate granular material at 25.0 ft. Grey, wet, very dense, fine to coarse GRAVEL, some fine to coarse sand, trace silt, well bonded -GLACIAL TILL-(GW) Note: Split-Spoon Refusal at 26.8 ft.	25.0 G#502199 A-1-a(1) GM 26.8
	14D	9.6/6	26.00 - 26.80	8/50(3.0")				97.8			
										Bottom of Exploration at 26.8 feet below ground surface. Note: Split-spoon refusal at 26.8 ft.	
30											
35											
40											
45											
50											

Remarks:
OC = Organic Content

Souadabscook Stream East

Maine Department of Transportation Soil/Rock Exploration Log US CUSTOMARY UNITS				Project: Souadabscook Stream East Bridges				Boring No.: BB-HSS-211							
				Location: Hampden, Maine				WIN: 21729.00/21729.10							
Driller: New England Boring Contractors				Elevation (ft.): 130.0				Auger ID/OD: --							
Operator: T. Schaffer				Datum: NAVD 88				Sampler: Split-Spoon-1.375 in. ID							
Logged By: N. Klausmeyer				Rig Type: Track-Mounted Mobile B53				Hammer Wt./Fall: SS-140#/30;HW-300#/16							
Date Start/Finish: 4-9-2019/4-9-2019				Drilling Method: HW Drive				Core Barrel: --							
Boring Location: N461140; E1699666				Casing ID/OD: HW-4.0 in. ID				Water Level*: 4.3 ft							
Hammer Efficiency Factor: 0.7122				Hammer Type: Automatic <input checked="" type="checkbox"/> Hydraulic <input type="checkbox"/> Rope & Cathead <input type="checkbox"/>											
Definitions: D = Split Spoon Sample MD = Unsuccessful Split Spoon Sample Attempt U = Thin Wall Tube Sample MU = Unsuccessful Thin Wall Tube Sample Attempt V = Field Vane Shear Test, PP = Pocket Penetrometer MV = Unsuccessful Field Vane Shear Test Attempt				R = Rock Core Sample SSA = Solid Stem Auger HSA = Hollow Stem Auger RC = Roller Cone WOH = Weight of 140lb. Hammer WOR/C = Weight of Rods or Casing WO1P = Weight of One Person				S_u = Peak/Remolded Field Vane Undrained Shear Strength (psf) $S_{u(lab)}$ = Lab Vane Undrained Shear Strength (psf) q_u = Unconfined Compressive Strength (ksf) N-uncorrected = Raw Field SPT N-value Hammer Efficiency Factor = Rig Specific Annual Calibration Value N_{60} = SPT N-uncorrected Corrected for Hammer Efficiency N_{60} = (Hammer Efficiency Factor/60%)*N-uncorrected				T_v = Pocket Torvane Shear Strength (psf) WC = Water Content, percent LL = Liquid Limit PL = Plastic Limit PI = Plasticity Index G = Grain Size Analysis C = Consolidation Test			
Depth (ft.)	Sample Information								Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/AASHTO and Unified Class.			
	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N ₆₀	Casing Blows								
	0	1D	24/17	0.00 - 2.00	3/1/2/3	3	4	Push						Brown to grey-brown, mottled, wet, soft, clayey SILT, trace fine sand, trace organics -MARINE DEPOSIT-(ML)	
		2D	24/21	2.00 - 4.00	4/6/7/10	13	15							Light brown to grey-brown, mottled, moist, stiff, clayey SILT, trace fine sand, trace organics -MARINE DEPOSIT-(ML)	
	5	3D	24/24	4.00 - 6.00	4/6/7/13	13	15							Light brown to grey-brown, mottled, moist, stiff, clayey SILT, trace fine sand, trace organics -MARINE DEPOSIT-(ML)	
		4D	24/24	6.00 - 8.00	6/8/14/20	22	26							Light brown to grey-brown, mottled, moist, very stiff, clayey SILT, trace fine sand, trace organics -MARINE DEPOSIT-(ML)	
		5D	24/8	8.00 - 10.00	20/15/16/18	31	37	75					122.2	Brown, wet, fine to coarse SAND, some silt and fine to coarse gravel, moderately bonded -WEATHERED BEDROCK-(SM)	G#502208 A-2-4 SM
	10	6D	6/3	10.00 - 10.50	80(6.0")								119.5	Brown to red-brown, wet, fine to coarse GRAVEL, some fine to coarse sand, some silt, moderately to loosely bonded -WEATHERED BEDROCK-(GM)	
								118.5	Brown and grey, wet, fine to coarse GRAVEL, little fine to coarse sand, little silt, well bonded -WEATHERED BEDROCK-(GW)						
									Note: Drill action indicates top of probable bedrock at 10.5 ft. Advanced roller bit to 11.5 ft. Collected drill cuttings (rock chips) from 10.6 to 11.5 ft.						
									Bottom of Exploration at 11.5 feet below ground surface.						

Remarks:

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

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

Maine Department of Transportation Soil/Rock Exploration Log US CUSTOMARY UNITS		Project: Souadabscook Stream East Bridges	Boring No.: BB-HSS-212
		Location: Hampden, Maine	WIN: 21729.00/21729.10
Driller: New England Boring Contractors	Elevation (ft.): 128.4	Auger ID/OD: --	
Operator: T. Schaffer	Datum: NAVD 88	Sampler: Split-Spoon-1.375 in. ID	
Logged By: N. Klausmeyer	Rig Type: Track-Mounted Mobile B53	Hammer Wt./Fall: SS-140#/30;HW-300#/16	
Date Start/Finish: 4-5-2019/4-5-2019	Drilling Method: HW Drive	Core Barrel: --	
Boring Location: N461212; E1699952	Casing ID/OD: HW-4.0 in. ID	Water Level*: At Ground Surface	

Hammer Efficiency Factor: 0.7122	Hammer Type: Automatic <input checked="" type="checkbox"/> Hydraulic <input type="checkbox"/> Rope & Cathead <input type="checkbox"/>
Definitions: D = Split Spoon Sample MD = Unsuccessful Split Spoon Sample Attempt U = Thin Wall Tube Sample MU = Unsuccessful Thin Wall Tube Sample Attempt V = Field Vane Shear Test, PP = Pocket Penetrometer MV = Unsuccessful Field Vane Shear Test Attempt	R = Rock Core Sample SSA = Solid Stem Auger HSA = Hollow Stem Auger RC = Roller Cone WOH = Weight of 140lb. Hammer WOR/C = Weight of Rods or Casing WO1P = Weight of One Person
S_u = Peak/Remolded Field Vane Undrained Shear Strength (psf) $S_u(lab)$ = Lab Vane Undrained Shear Strength (psf) q_u = Unconfined Compressive Strength (ksf) N-uncorrected = Raw Field SPT N-value Hammer Efficiency Factor = Rig Specific Annual Calibration Value N_{60} = SPT N-uncorrected Corrected for Hammer Efficiency $N_{60} = (Hammer\ Efficiency\ Factor/60\%)*N-uncorrected$	T_v = Pocket Torvane Shear Strength (psf) WC = Water Content, percent LL = Liquid Limit PL = Plastic Limit PI = Plasticity Index G = Grain Size Analysis C = Consolidation Test

Depth (ft.)	Sample Information								Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/AASHTO and Unified Class.
	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in. Shear Strength (psf) or RQD (%))	N-uncorrected	N ₆₀	Casing Blows					
0										Note: Frozen ground surface. Advanced auger from 0.0 to 1.0 ft to penetrate frozen ground and underlying roots.		
	1D	24/9	1.00 - 3.00	4/5/7/6	12	14			127.4	-TOPSOIL-		
									125.4	Grey-brown to red-brown and light brown, wet, stiff, SILT, little fine to coarse gravel, little fine to coarse sand -MARINE DEPOSIT-(ML)	G#502209 A-4 ML	
	2D	19.2/14	3.00 - 4.60	13/27/21/50(1")	48	57			123.8	Brown to grey and red-brown, wet grading to dry, dense, fine to coarse GRAVEL, some silt, moderately bonded -WEATHERED BEDROCK-(GM)		
5									121.9	Note: Drill action and wash water indicate top of bedrock at 4.6 ft. Advanced roller bit to 6.5 ft, collected drill cuttings sample (rock chips).		
										Bottom of Exploration at 6.5 feet below ground surface.		
10												
15												
20												
25												

Remarks:

Maine Department of Transportation Soil/Rock Exploration Log US CUSTOMARY UNITS				Project: Souadabscook Stream East Bridges Location: Hampden, Maine				Boring No.: BB-HSS-213 WIN: 21729.00/21729.10							
Driller: New England Boring Contractors				Elevation (ft.): 124.5				Auger ID/OD: --							
Operator: T. Schaffer				Datum: NAVD 88				Sampler: Split-Spoon-1.375 in. ID							
Logged By: N. Klausmeyer				Rig Type: Track-Mounted Mobile B53				Hammer Wt./Fall: SS-140#/30;HW-300#/16							
Date Start/Finish: 4-4-2019/4-5-2019				Drilling Method: HW Drive				Core Barrel: NQ-2.0 in. ID							
Boring Location: N461265; E1700223				Casing ID/OD: HW-4.0 in. ID				Water Level*: 0.3 ft							
Hammer Efficiency Factor: 0.7122				Hammer Type: Automatic <input checked="" type="checkbox"/> Hydraulic <input type="checkbox"/> Rope & Cathead <input type="checkbox"/>											
Definitions: D = Split Spoon Sample MD = Unsuccessful Split Spoon Sample Attempt U = Thin Wall Tube Sample MU = Unsuccessful Thin Wall Tube Sample Attempt V = Field Vane Shear Test, PP = Pocket Penetrometer MV = Unsuccessful Field Vane Shear Test Attempt				R = Rock Core Sample SSA = Solid Stem Auger HSA = Hollow Stem Auger RC = Roller Cone WOH = Weight of 140lb. Hammer WOR/C = Weight of Rods or Casing WO1P = Weight of One Person				S _u = Peak/Remolded Field Vane Undrained Shear Strength (psf) S _u (lab) = Lab Vane Undrained Shear Strength (psf) q _p = Unconfined Compressive Strength (ksf) N-uncorrected = Raw Field SPT N-value Hammer Efficiency Factor = Rig Specific Annual Calibration Value N ₆₀ = SPT N-uncorrected Corrected for Hammer Efficiency N ₆₀ = (Hammer Efficiency Factor/60%)*N-uncorrected				T _v = Pocket Torvane Shear Strength (psf) WC = Water Content, percent LL = Liquid Limit PL = Plastic Limit PI = Plasticity Index G = Grain Size Analysis C = Consolidation Test			
Depth (ft.)	Sample Information								Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/AASHTO and Unified Class.			
	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N ₆₀	Casing Blows								
0	1D	24/17	0.00 - 2.00	3/7/8/7	15	18	Push			Note: Moved boring 5.0 ft south of staked location due to water level above ground surface.					
	2D	24/17	2.00 - 4.00	6/8/10/12	18	21				Brown to grey-brown, mottled, moist, stiff, SILT, some fine to coarse sand, trace fine to coarse gravel, trace organics (roots) -MARINE DEPOSIT-(ML) Grey-brown with layers of red-brown, mottled, damp, very stiff, SILT, trace fine sand, trace organics -MARINE DEPOSIT-(ML)					
5	3D	24/24	4.00 - 6.00	3/3/4/5	7	8				Grey-brown with layers of light brown, mottled, moist, medium stiff, SILT, trace fine sand, trace organics -MARINE DEPOSIT-(ML)					
	4D	24/24	6.00 - 8.00	3/4/5/7	9	11				Grey-brown with layers of light-brown, mottled, moist, stiff, SILT, trace fine sand, trace organics -MARINE DEPOSIT-(ML)					
	5D	24/24	8.00 - 10.00	2/2/2/1	4	5		116.4		Grey-brown grading to grey, wet, soft, silty CLAY, trace organics -MARINE DEPOSIT-(CL)					
10	1U	24/14	10.00 - 12.00												
	MV		12.00 - 12.00												
	6D	24/14	12.00 - 14.00	15/19/16/18	35	42	16	112.2		Note: Attempted vane shear test, zero penetration due to stiff soil at 12.0 ft.					
15															
	7D	20,4/14	17.00 - 18.70	19/18/44/50(2.0)	62	74	52	107.5		Grey, wet, very dense, fine to coarse GRAVEL, little silt, moderately bonded -WEATHERED ROCK-(GM)					
20	R1	60/36	19.40 - 24.40	RQD = 8%				105.7		Top of Probable Bedrock at El. 105.7 Note: Advanced roller bit to 19.4 ft. Begin NQ rock core at 19.4 ft. R1: Grey to olive-grey, aphanitic, PHYLLITE, hard to soft, fresh to slightly weathered with severely weathered zone from approximately 21.0 to 23.0 ft. Joints dipping moderate to steep, very close to close, planar, smooth to rough, open, one near-vertical, undulating joint, rough, open. Quartz intrusion at approximately 23.8 ft. Rock Mass Quality=Very Poor Recovery=60% R1 Core Times (min:sec): 19.4-20.4' (1:39); 20.4-21.4' (2:04); 21.4-22.4' (5:09); 22.4-23.4' (3:08); 23.4-24.4' (3:03)					
25	R2	42/38	24.40 - 27.90	RQD = 45%						R2: White with some grey/olive-grey beginning at approximately					

G#502210
A-1-b
SM

Remarks:

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

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

Maine Department of Transportation Soil/Rock Exploration Log US CUSTOMARY UNITS	Project: Souadabscook Stream East Bridges	Boring No.: BB-HSS-213
	Location: Hampden, Maine	WIN: 21729.00/21729.10

Driller: New England Boring Contractors	Elevation (ft.): 124.5	Auger ID/OD: --
Operator: T. Schaffer	Datum: NAVD 88	Sampler: Split-Spoon-1.375 in. ID
Logged By: N. Klausmeyer	Rig Type: Track-Mounted Mobile B53	Hammer Wt./Fall: SS-140#/30;HW-300#/16
Date Start/Finish: 4-4-2019/4-5-2019	Drilling Method: HW Drive	Core Barrel: NQ-2.0 in. ID
Boring Location: N461265; E1700223	Casing ID/OD: HW-4.0 in. ID	Water Level*: 0.3 ft

Hammer Efficiency Factor: 0.7122	Hammer Type: Automatic <input checked="" type="checkbox"/> Hydraulic <input type="checkbox"/> Rope & Cathead <input type="checkbox"/>
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Definitions: R = Rock Core Sample S_u = Peak/Remolded Field Vane Undrained Shear Strength (psf) T_v = Pocket Torvane Shear Strength (psf)
 D = Split Spoon Sample SSA = Solid Stem Auger S_u(lab) = Lab Vane Undrained Shear Strength (psf) WC = Water Content, percent
 MD = Unsuccessful Split Spoon Sample Attempt HSA = Hollow Stem Auger q_u = Unconfined Compressive Strength (ksf) LL = Liquid Limit
 U = Thin Wall Tube Sample RC = Roller Cone N-uncorrected = Raw Field SPT N-value PL = Plastic Limit
 MU = Unsuccessful Thin Wall Tube Sample Attempt WOH = Weight of 140 lb. Hammer Hammer Efficiency Factor = Rig Specific Annual Calibration Value PI = Plasticity Index
 V = Field Vane Shear Test, PP = Pocket Penetrometer N₆₀ = SPT N-uncorrected Corrected for Hammer Efficiency G = Grain Size Analysis
 MV = Unsuccessful Field Vane Shear Test Attempt WOTP = Weight of One Person N₆₀ = (Hammer Efficiency Factor/60%)*N-uncorrected C = Consolidation Test

Depth (ft.)	Sample Information							Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/AASHTO and Unified Class.
	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows/(6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N ₆₀	Casing Blows				
25											
	R3	54/48	27.90 - 32.40	RQD = 56%				96.9		27.6 ft, fine to coarse-grained grading to aphanitic beginning at approximately 27.6 ft, QUARTZITE, hard to soft, fresh to severely weathered. Joints dipping at low to steep angles, smooth to rough, close, tight to open, some phyllite zones found throughout core. Rock Mass Quality=Poor Recovery=90% R2 Core Times (min:sec): 24.4-25.4' (3:00); 25.4-26.4' (2:20); 26.4-27.4' (2:20); 27.4-27.9' (3:41)	
										-----27.6 R3: White to grey to olive-grey, aphanitic to coarse-grained, QUARTZITE, hard, fresh to slightly weathered. Joints dipping at low to steep angles, smooth to rough, close, tight to open, intermittent phyllite throughout core. Rock Mass Quality=Fair Recovery=89% R3 Core Times (min:sec): 27.9-28.9' (4:40); 28.9-29.9' (4:13); 29.9-30.9' (3:57); 30.9-31.9' (5:01); 31.1-32.4' (2:37)	
								92.1		-----32.4 Bottom of Exploration at 32.4 feet below ground surface.	
30											
35											
40											
45											
50											

Remarks:

Maine Department of Transportation Soil/Rock Exploration Log US CUSTOMARY UNITS	Project: Souadabscook Stream East Bridges	Boring No.: BB-HSS-214
	Location: Hampden, Maine	WIN: 21729.00/21729.10

Driller: New England Boring Contractors	Elevation (ft.): 124.4	Auger ID/OD: --
Operator: T. Schaffer	Datum: NAVD 88	Sampler: Split-Spoon-1.375 in. ID
Logged By: N. Klausmeyer	Rig Type: Track-Mounted Mobile B53	Hammer Wt./Fall: SS-140#/30;HW-300#/16
Date Start/Finish: 4-2-2019/4-2-2019	Drilling Method: HW Drive	Core Barrel: NQ-2.0 in. ID
Boring Location: N461299; E1700433	Casing ID/OD: HW-4.0 in. ID	Water Level*: 0.3 ft

Hammer Efficiency Factor: 0.7122	Hammer Type: Automatic <input checked="" type="checkbox"/> Hydraulic <input type="checkbox"/> Rope & Cathead <input type="checkbox"/>
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Definitions:
 D = Split Spoon Sample
 MD = Unsuccessful Split Spoon Sample Attempt
 U = Thin Wall Tube Sample
 MU = Unsuccessful Thin Wall Tube Sample Attempt
 V = Field Vane Shear Test, PP = Pocket Penetrometer
 MV = Unsuccessful Field Vane Shear Test Attempt
 R = Rock Core Sample
 SSA = Solid Stem Auger
 HSA = Hollow Stem Auger
 RC = Roller Cone
 WOH = Weight of 140 lb. Hammer
 WOR/C = Weight of Rods or Casing
 WO1P = Weight of One Person
 S_u = Peak/Remolded Field Vane Undrained Shear Strength (psf)
 S_u(lab) = Lab Vane Undrained Shear Strength (psf)
 q_u = Unconfined Compressive Strength (ksf)
 N-uncorrected = Raw Field SPT N-value
 Hammer Efficiency Factor = Rig Specific Annual Calibration Value
 N₆₀ = SPT N-uncorrected Corrected for Hammer Efficiency
 N₆₀ = (Hammer Efficiency Factor/60%)*N-uncorrected
 T_v = Pocket Torvane Shear Strength (psf)
 WC = Water Content, percent
 LL = Liquid Limit
 PL = Plastic Limit
 PI = Plasticity Index
 G = Grain Size Analysis
 C = Consolidation Test

Depth (ft.)	Sample Information							Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/AASHTO and Unified Class.
	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows/(6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N ₆₀	Casing Blows				
25								95.4		smooth, slight fine-grained infilling, slight pyrite observed on joint surfaces, slight staining on joint surfaces. Frequent quartz/calcite veins up to 0.25 in. thick. Rock Mass Quality=Fair Recovery=97% R2 Core Times (min:sec): 24.0-25.0' (1:17); 25.0-26.0' (1:18); 26.0-27.0' (1:00); 27.0-28.0' (1:24); 28.0-29.0' (1:38)	
30										Bottom of Exploration at 29.0 feet below ground surface.	
35											
40											
45											
50											

Remarks:

Driller: New England Boring Contractors	Elevation (ft.): 125.6	Auger ID/OD: --
Operator: T. Schaffer	Datum: NAVD 88	Sampler: Split-Spoon-1.375 in. ID
Logged By: N. Klausmeyer	Rig Type: Track-Mounted Mobile B53	Hammer Wt./Fall: SS-140#/30;HW-300#/16
Date Start/Finish: 4-1-2019/4-2-2019	Drilling Method: HW Drive	Core Barrel: --
Boring Location: N461379; E1700712	Casing ID/OD: HW-4.0 in. ID	Water Level*: 5.3 ft

Hammer Efficiency Factor: 0.7122 Hammer Type: Automatic Hydraulic Rope & Cathead

Definitions: R = Rock Core Sample S_u = Peak/Remolded Field Vane Undrained Shear Strength (psf) T_v = Pocket Torvane Shear Strength (psf)
D = Split Spoon Sample SSA = Solid Stem Auger S_{u(lab)} = Lab Vane Undrained Shear Strength (psf) WC = Water Content, percent
MD = Unsuccessful Split Spoon Sample Attempt HSA = Hollow Stem Auger q_p = Unconfined Compressive Strength (ksf) LL = Liquid Limit
U = Thin Wall Tube Sample RC = Roller Cone N-uncorrected = Raw Field SPT N-value PL = Plastic Limit
MU = Unsuccessful Thin Wall Tube Sample Attempt WOH = Weight of 140lb. Hammer Hammer Efficiency Factor = Rig Specific Annual Calibration Value PI = Plasticity Index
V = Field Vane Shear Test, PP = Pocket Penetrometer WOR/C = Weight of Rods or Casing N₆₀ = SPT N-uncorrected Corrected for Hammer Efficiency G = Grain Size Analysis
MV = Unsuccessful Field Vane Shear Test Attempt WO1P = Weight of One Person N₆₀ = (Hammer Efficiency Factor/60%)*N-uncorrected C = Consolidation Test

Depth (ft.)	Sample Information								Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/AASHTO and Unified Class.
	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N ₆₀	Casing Blows					
0	1D	24/14	0.00 - 2.00	3/3/2/3	5	6	Push	125.3		Note: Frozen ground surface. -TOPSOIL-		
	2D	24/20	2.00 - 4.00	6/8/9/12	17	20				Dark brown grading to grey-brown, wet, medium stiff, SILT, little fine to medium sand, trace gravel, contains organics, moderately bonded -GLACIAL TILL-(ML)		
5	3D	24/16	4.00 - 6.00	10/13/27/23	40	47				Grey-brown to light brown, wet grading to moist, very stiff, SILT, little fine to coarse sand and gravel, trace organics, well bonded -GLACIAL TILL-(ML)		
	4D	24/12	6.00 - 8.00	18/19/15/18	34	40	↘	119.6		Grey-brown to light brown and red-brown, moist, hard, SILT, some gravel, little fine to coarse sand, well bonded -GLACIAL TILL-(ML)		
										Brown to grey-brown and red-brown, moist, dense, fine to coarse SAND, some silt, some fine to coarse gravel, well bonded -GLACIAL TILL-(SM)	G#502212 A-2-4 SM	
10			10.00 - 12.00	Cuttings Sample				116.0		Note: Drill action and wash water indicate bedrock at 9.6 ft. Advanced roller bit to 12.0 ft.		
										Note: Collected sample of rock chips from drill wash from 10.0 to 12.0 ft.		
								113.6		Bottom of Exploration at 12.0 feet below ground surface.		

Remarks:

Maine Department of Transportation Soil/Rock Exploration Log US CUSTOMARY UNITS				Project: Souadabscook Stream East Bridges Location: Hampden, Maine				Boring No.: BB-HSS-216 WIN: 21729.00/21729.10							
Driller: New England Boring Contractors				Elevation (ft.): 126.1				Auger ID/OD: --							
Operator: T. Schaffer				Datum: NAVD 88				Sampler: Split-Spoon-1.375 in. ID							
Logged By: N. Klausmeyer				Rig Type: Track-Mounted Mobile B53				Hammer Wt./Fall: SS-140#/30;HW-300#/16							
Date Start/Finish: 4-1-2019/4-1-2019				Drilling Method: HW Drive				Core Barrel: --							
Boring Location: N461468; E1701000				Casing ID/OD: HW-4.0 in. ID				Water Level*: At Ground Surface							
Hammer Efficiency Factor: 0.7122				Hammer Type: Automatic <input checked="" type="checkbox"/> Hydraulic <input type="checkbox"/> Rope & Cathead <input type="checkbox"/>											
Definitions: D = Split Spoon Sample MD = Unsuccessful Split Spoon Sample Attempt U = Thin Wall Tube Sample MU = Unsuccessful Thin Wall Tube Sample Attempt V = Field Vane Shear Test, PP = Pocket Penetrometer MV = Unsuccessful Field Vane Shear Test Attempt				R = Rock Core Sample SSA = Solid Stem Auger HSA = Hollow Stem Auger RC = Roller Cone WOH = Weight of 140lb. Hammer WOR/C = Weight of Rods or Casing WO1P = Weight of One Person				S _u = Peak/Remolded Field Vane Undrained Shear Strength (psf) S _u (lab) = Lab Vane Undrained Shear Strength (psf) q _p = Unconfined Compressive Strength (ksf) N-uncorrected = Raw Field SPT N-value Hammer Efficiency Factor = Rig Specific Annual Calibration Value N ₆₀ = SPT N-uncorrected Corrected for Hammer Efficiency N ₆₀ = (Hammer Efficiency Factor/60%)*N-uncorrected				T _v = Pocket Torvane Shear Strength (psf) WC = Water Content, percent LL = Liquid Limit PL = Plastic Limit PI = Plasticity Index G = Grain Size Analysis C = Consolidation Test			
Depth (ft.)	Sample Information							Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/AASHTO and Unified Class.				
	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N ₆₀	Casing Blows								
0	1D	24/14	0.00 - 2.00	1/2/5/8	7	8	Push	125.9		Note: Frozen soil at ground surface. -TOPSOIL-					
	2D	24/22	2.00 - 4.00	8/9/8/11	17	20				Grey-brown to light brown, mottled, wet grading to moist, medium stiff, SILT, little fine to medium sand, trace organics -FILL-(ML) Grey-brown to light brown, mottled, moist, very stiff, SILT, little fine to medium sand, trace organics -FILL-(ML)					
5	3D	24/7	5.00 - 7.00	20/35/30/21	65	77	32	122.1		Note: Drill action and wash water indicate granular material at 4.0 ft, advanced roller bit to 5.0 ft. Grey-brown to red-brown, moist, very dense, fine to coarse GRAVEL, little silt, little fine to coarse sand, well bonded -GLACIAL TILL-(ML)					
10	4D	24/6	10.00 - 12.00	15/14/16/22	30	36	68			Grey-brown, moist, very stiff, SILT, little fine to coarse sand and gravel, well bonded -GLACIAL TILL-(ML)					
15	5D	24/8	14.00 - 16.00	12/20/17/22	37	44	52			Grey-brown, wet, hard, SILT, some fine to coarse sand and gravel, well bonded -GLACIAL TILL-(ML)					
20	6D	24/12	19.00 - 21.00	10/13/8/28	21	25		105.1		Grey-brown, wet, ver stiff, SILT, some fine to coarse sand and gravel, well bonded -GLACIAL TILL-(ML)	G#502213 A-4 ML				
										Bottom of Exploration at 21.0 feet below ground surface.					
25															

Remarks:

Stratification lines represent approximate boundaries between soil types; transitions may be gradual.
 * Water level readings have been made at times and under conditions stated. Groundwater fluctuations may occur due to conditions other than those present at the time measurements were made.

Emerson Mill Road/B&A Railroad

Driller: New England Boring Contractors	Elevation (ft.): 138.1	Auger ID/OD: --
Operator: M. Porter	Datum: NAVD 88	Sampler: Split-Spoon-1.375 in. ID
Logged By: N. Klausmeyer	Rig Type: Track-Mounted Mobile B53	Hammer Wt./Fall: SS-140#/30;HW-300#/16
Date Start/Finish: 4-24-2019/4-24-2019	Drilling Method: HW Drive	Core Barrel: --
Boring Location: N463132; E1706504	Casing ID/OD: HW-4.0 in. ID	Water Level*: 5.4 ft

Hammer Efficiency Factor: 0.7122 **Hammer Type:** Automatic Hydraulic Rope & Cathead
 Definitions: R = Rock Core Sample S_u = Peak/Remolded Field Vane Undrained Shear Strength (psf) T_v = Pocket Torvane Shear Strength (psf)
 D = Split Spoon Sample SSA = Solid Stem Auger S_{u(lab)} = Lab Vane Undrained Shear Strength (psf) WC = Water Content, percent
 MD = Unsuccessful Split Spoon Sample Attempt HSA = Hollow Stem Auger q_p = Unconfined Compressive Strength (ksf) LL = Liquid Limit
 U = Thin Wall Tube Sample RC = Roller Cone N-uncorrected = Raw Field SPT N-value PL = Plastic Limit
 MU = Unsuccessful Thin Wall Tube Sample Attempt WOH = Weight of 140lb. Hammer Hammer Efficiency Factor = Rig Specific Annual Calibration Value PI = Plasticity Index
 V = Field Vane Shear Test, PP = Pocket Penetrometer WOR/C = Weight of Rods or Casing N₆₀ = SPT N-uncorrected Corrected for Hammer Efficiency G = Grain Size Analysis
 MV = Unsuccessful Field Vane Shear Test Attempt WO1P = Weight of One Person N₆₀ = (Hammer Efficiency Factor/60%)*N-uncorrected C = Consolidation Test

Depth (ft.)	Sample Information							Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/AASHTO and Unified Class.
	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N ₆₀	Casing Blows				
0	1D	24/6	0.00 - 2.00	WOH/4/1/3	5	6	Push	138.0		G#505099 A-4 SM	
								137.5			
	2D	24/20	2.00 - 4.00	3/6/10/12	16	19					
5	3D	24/20	4.00 - 6.00	6/7/9/12	16	19	∇				
								70			
								91			
								100			
								99			
								80			
10	4D	24/24	10.00 - 12.00	WOH/WOH/1/2	1	1	Open				
								124.9			
								123.5			
15								122.1			
								119.5			
20	5D	19.2/9	17.00 - 18.60	12/10/8/50(1")	18	21	∇	118.1			
25											

Remarks:

Maine Department of Transportation Soil/Rock Exploration Log US CUSTOMARY UNITS		Project: Souadabscook Stream Emerson Mill Rd/ B&A Railroad Bridges Location: Hampden, Maine	Boring No.: BB-HSS-218 WIN: 21673.00/21673.10
Driller: New England Boring Contractors	Elevation (ft.): 139.6	Auger ID/OD: --	
Operator: M. Porter	Datum: NAVD 88	Sampler: Split-Spoon-1.375 in. ID	
Logged By: K. Russ	Rig Type: Track-Mounted Mobile M1	Hammer Wt./Fall: SS-140#/30;HW/NW-300#/16	
Date Start/Finish: 5-2-2019/5-3-2019	Drilling Method: HW/NW Drive	Core Barrel: NQ-2.0 in. ID	
Boring Location: N463267; 1706794	Casing ID/OD: HW-4.0 in. ID; NW-3.0 in. ID	Water Level*: 4.5 ft.	

Hammer Efficiency Factor: 0.6	Hammer Type: Automatic <input type="checkbox"/> Hydraulic <input type="checkbox"/> Rope & Cathead <input checked="" type="checkbox"/>
Definitions: D = Split Spoon Sample MD = Unsuccessful Split Spoon Sample Attempt U = Thin Wall Tube Sample MU = Unsuccessful Thin Wall Tube Sample Attempt V = Field Vane Shear Test, PP = Pocket Penetrometer MV = Unsuccessful Field Vane Shear Test Attempt	R = Rock Core Sample SSA = Solid Stem Auger HSA = Hollow Stem Auger RC = Roller Cone WOH = Weight of 140lb. Hammer WOR/C = Weight of Rods or Casing WO1P = Weight of One Person
S_u = Peak/Remolded Field Vane Undrained Shear Strength (psf) $S_{u(lab)}$ = Lab Vane Undrained Shear Strength (psf) q_p = Unconfined Compressive Strength (ksf) N-uncorrected = Raw Field SPT N-value Hammer Efficiency Factor = Rig Specific Annual Calibration Value N_{60} = SPT N-uncorrected Corrected for Hammer Efficiency N_{60} = (Hammer Efficiency Factor/60%)*N-uncorrected	T_v = Pocket Torvane Shear Strength (psf) WC = Water Content, percent LL = Liquid Limit PL = Plastic Limit PI = Plasticity Index G = Grain Size Analysis C = Consolidation Test

Depth (ft.)	Sample Information							Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/AASHTO and Unified Class.
	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N ₆₀	Casing Blows				
0	1D	24/15	0.00 - 2.00	1/1/3/4	4	4	Push	137.1	Brown, moist, very loose, silty SAND, little gravel -FILL-(SM)		
	2D/A	24/20	2.00 - 4.00	4/11/10/10	21	21		137.1	Brown, moist, very loose, silty SAND, little gravel -FILL-(SM)		
5	3D	24/24	4.00 - 6.00	12/13/17/19	30	30		131.8	Olive-brown, dry to moist, very stiff, silty CLAY, trace fine sand -MARINE DEPOSIT-(CL) Olive-brown, moist to wet, very stiff, silty CLAY, trace fine sand -MARINE DEPOSIT-(CL)		
								129.6	Note: Drill action indicates gravel at 7.8 ft.		
10	4D/A	24/19	10.00 - 12.00	3/4/14/19	18	18	1	128.6	Olive-brown, wet, loose, clayey SAND -GLACIAL TILL-(SC)		
							2	126.8	Olive-brown, wet, dense, silty GRAVEL, some fine to coarse sand, weakly bonded to moderately bonded, occasional 1-in. thick clayey fine sand partings -GLACIAL TILL-(GM)	G#505100 A-2-4 GM	
							20		Note: Advanced roller bit to 14.6 ft, drive NW to 14.6 ft, begin R1 at 14.6 ft. -GLACIAL TILL/COBBLES/COARSE GRAVEL- 5D: Recovery consists of rock chips R1: Recovered cobbles and coarse gravel. R1 Core Times (min:sec): 14.6-15.6' (3:39); 15.6-15.9' (2:42)		
15	R1	15.6/10	14.60 - 15.90				17/5"	123.7	Top of Bedrock at El. 123.7 R2: Greenish-grey, fine-grained, QUARTZITE, hard, slightly weathered. Joints dipping at low to steep angles, close to moderately close, open. Single 0.25-in. thick quartz vein from 16.2 to 17.2 ft, contains frequent 0.125-in. thick vugs throughout intrusion. Rock Mass Quality=Poor Recovery=81% R2 Core Times (min:sec): Not Recorded		
	R2	37.2/30	15.90 - 19.00	RQD = 43%				120.6	R3: Grey, aphanitic to fine-grained, PHYLLITE, hard, fresh. Single joint at top of run dipping moderately, moderately spaced, open. Occasional <0.125-in. thick quartz stringers throughout core stem. Rock Mass Quality=Good Recovery=90% R3 Core Times (min:sec): Not Recorded. R4: Grey, aphanitic to fine-grained, PHYLLITE, hard, fresh. Joints dipping at low angles, close to moderately close, open, slightly		
20	R3	31.2/28	19.00 - 21.60	RQD = 90%							
	R4	60/55	21.60 - 26.60	RQD = 90%							
25											

Remarks:

Maine Department of Transportation Soil/Rock Exploration Log US CUSTOMARY UNITS	Project: Souadabscook Stream Emerson Mill Rd/ B&A Railroad Bridges Location: Hampden, Maine	Boring No.: BB-HSS-218 WIN: 21673.00/21673.10
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Driller: New England Boring Contractors	Elevation (ft.): 139.6	Auger ID/OD: --
Operator: M. Porter	Datum: NAVD 88	Sampler: Split-Spoon-1.375 in. ID
Logged By: K. Russ	Rig Type: Track-Mounted Mobile M1	Hammer Wt./Fall: SS-140#/30;HW/NW-300#/16
Date Start/Finish: 5-2-2019/5-3-2019	Drilling Method: HW/NW Drive	Core Barrel: NQ-2.0 in. ID
Boring Location: N463267; 1706794	Casing ID/OD: HW-4.0 in. ID; NW-3.0 in. ID	Water Level*: 4.5 ft.

Hammer Efficiency Factor: 0.6 **Hammer Type:** Automatic Hydraulic Rope & Cathead

Definitions: R = Rock Core Sample S_u = Peak/Remolded Field Vane Undrained Shear Strength (psf) T_v = Pocket Torvane Shear Strength (psf)
 D = Split Spoon Sample SSA = Solid Stem Auger S_{u(lab)} = Lab Vane Undrained Shear Strength (psf) WC = Water Content, percent
 MD = Unsuccessful Split Spoon Sample Attempt HSA = Hollow Stem Auger q_u = Unconfined Compressive Strength (ksf) LL = Liquid Limit
 U = Thin Wall Tube Sample RC = Roller Cone N-uncorrected = Raw Field SPT N-value PL = Plastic Limit
 MU = Unsuccessful Thin Wall Tube Sample Attempt WOH = Weight of 140 lb. Hammer Hammer Efficiency Factor = Rig Specific Annual Calibration Value PI = Plasticity Index
 V = Field Vane Shear Test, PP = Pocket Penetrometer WOR/C = Weight of Rods or Casing N₆₀ = SPT N-uncorrected Corrected for Hammer Efficiency G = Grain Size Analysis
 MV = Unsuccessful Field Vane Shear Test Attempt WO1P = Weight of One Person N₆₀ = (Hammer Efficiency Factor/60%)*N-uncorrected C = Consolidation Test

Depth (ft.)	Sample Information							Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/AASHTO and Unified Class.
	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows / (6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N ₆₀	Casing Blows				
25								113.0		weathered joints. Occasional 0.0625 to 0.25-in. thick quartz stringers and veins. Rock Mass Quality=Excellent Recovery=92% R4 Core Times (min:sec): Not Recorded.	
										Bottom of Exploration at 26.6 feet below ground surface.	
30											
35											
40											
45											
50											

Remarks:

Maine Department of Transportation Soil/Rock Exploration Log US CUSTOMARY UNITS				Project: Souadabscook Stream Emerson Mill Rd/ B&A Railroad Bridges Location: Hampden, Maine		Boring No.: BB-HSS-219					
Driller: New England Boring Contractors				Elevation (ft.): 139.1		Auger ID/OD: --					
Operator: M. Porter				Datum: NAVD 88		Sampler: Split-Spoon-1.375 in. ID					
Logged By: N. Klausmeyer				Rig Type: Track-Mounted Mobile M1		Hammer Wt./Fall: SS-140#/30;HW-300#/16					
Date Start/Finish: 4-29-2019/4-30-2019				Drilling Method: HW/NW Drive		Core Barrel: NQ-2.0 in. ID					
Boring Location: N463326; E1706946				Casing ID/OD: HW-4.0 in. ID		Water Level*: 4.3 ft					
Hammer Efficiency Factor: 0.6				Hammer Type: Automatic <input type="checkbox"/> Hydraulic <input type="checkbox"/> Rope & Cathead <input checked="" type="checkbox"/>							
Definitions:		R = Rock Core Sample		S _u = Peak/Remolded Field Vane Undrained Shear Strength (psf)		T _v = Pocket Torvane Shear Strength (psf)					
D = Split Spoon Sample		SSA = Solid Stem Auger		S _u (lab) = Lab Vane Undrained Shear Strength (psf)		WC = Water Content, percent					
MD = Unsuccessful Split Spoon Sample Attempt		HSA = Hollow Stem Auger		q _p = Unconfined Compressive Strength (ksf)		LL = Liquid Limit					
U = Thin Wall Tube Sample		RC = Roller Cone		N-uncorrected = Raw Field SPT N-value		PL = Plastic Limit					
MU = Unsuccessful Thin Wall Tube Sample Attempt		WOH = Weight of 140lb. Hammer		Hammer Efficiency Factor = Rig Specific Annual Calibration Value		PI = Plasticity Index					
V = Field Vane Shear Test, PP = Pocket Penetrometer		WOR/C = Weight of Rods or Casing		N ₆₀ = SPT N-uncorrected Corrected for Hammer Efficiency		G = Grain Size Analysis					
MV = Unsuccessful Field Vane Shear Test Attempt		WO1P = Weight of One Person		N ₆₀ = (Hammer Efficiency Factor/60%)*N-uncorrected		C = Consolidation Test					
Depth (ft.)	Sample Information							Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/AASHTO and Unified Class.
	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N ₆₀	Casing Blows				
0	1D/A	24/15	0.00 - 2.00	1/2/3/6	5	5	Push	138.8	-TOPSOIL-	-0.3	
								137.4	Brown, moist, very loose, silty SAND, little gravel, contains roots	-1.7	
	2D	24/22	2.00 - 4.00	4/10/8/8	18	18			Olive-brown, mottled, moist, medium stiff, silty CLAY, trace fine sand		
									-MARINE DEPOSIT-(CL)		
									Olive-brown, mottled, moist, very stiff, silty CLAY, trace fine sand		
	3D	24/20	4.00 - 6.00	14/15/18/15	33	33	24		-MARINE DEPOSIT-(CL)		
							Open		Olive-brown, mottled, moist, hard, silty CLAY, trace fine sand		
									-MARINE DEPOSIT-(CL)		
	4D	24/24	6.00 - 8.00	14/18/21/28	39	39			Olive-brown, mottled, moist, hard, silty CLAY, trace fine sand		
									-MARINE DEPOSIT-(CL)		
									Note: Based on drill action, encountered Glacial Till at 9.8 ft.		
10	5D	24/1	10.00 - 12.00	9/21/50(0")	71+	71	1	129.3	5D: Recovered 1-in. of gravel	-9.8	
								128.1	-GLACIAL TILL-	-11.0	
								127.3	-COBBLE-	-11.8	
								125.7	-GLACIAL TILL-	-13.4	
									Note: Advanced roller bit to 14.0 ft, drive NW casing to 14.0 ft. Cored through boulder from 14.0 to 18.7 ft, recovered 36 in.)		
									-BOULDER-		
								122.1		-17.0	
	6D	18/10	18.80 - 20.30	31/27/50(5")	77+	77		118.9	Olive-brown, wet, very dense, fine to coarse GRAVEL, some fine to coarse sand, little silt, well-graded, well bonded, contains bedrock fragments.	-20.2	G#505101 A-1-b GW-GM
									-GLACIAL TILL-(GW-GM)		
									Bottom of Exploration at 20.2 feet below ground surface.		
									Note: Boring abandoned, drill rig moved 4.5 ft N due to bent casing, obstructions and water loss. See Boring Log BB-HSS-219A for details.		

Remarks:

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

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

Maine Department of Transportation Soil/Rock Exploration Log US CUSTOMARY UNITS		Project: Souadabscook Stream Emerson Mill Rd/ B&A Railroad Bridges Location: Hampden, Maine	Boring No.: BB-HSS-219A WIN: 21673.00/21673.10
Driller: New England Boring Contractors	Elevation (ft.): 138.9	Auger ID/OD: --	
Operator: M. Porter	Datum: NAVD 88	Sampler: Split-Spoon-1.375 in. ID	
Logged By: K. Russ	Rig Type: Track-Mounted Mobile M1	Hammer Wt./Fall: SS-140#/30;HW/NW-300#/16	
Date Start/Finish: 4-30-2019/5-1-2019	Drilling Method: HW/NW Drive	Core Barrel: NQ-2.0 in. ID	
Boring Location: N463329; E1706950	Casing ID/OD: HW-4.0 in. ID; NW-3.0 in. ID	Water Level*: 4.3 ft	

Hammer Efficiency Factor: 0.6	Hammer Type: Automatic <input type="checkbox"/> Hydraulic <input type="checkbox"/> Rope & Cathead <input checked="" type="checkbox"/>		
Definitions: D = Split Spoon Sample MD = Unsuccessful Split Spoon Sample Attempt U = Thin Wall Tube Sample MU = Unsuccessful Thin Wall Tube Sample Attempt V = Field Vane Shear Test, PP = Pocket Penetrometer MV = Unsuccessful Field Vane Shear Test Attempt	R = Rock Core Sample SSA = Solid Stem Auger HSA = Hollow Stem Auger RC = Roller Cone WOH = Weight of 140lb. Hammer WOR/C = Weight of Rods or Casing WO1P = Weight of One Person	S _u = Peak/Remolded Field Vane Undrained Shear Strength (psf) S _u (lab) = Lab Vane Undrained Shear Strength (psf) q _p = Unconfined Compressive Strength (ksf) N-uncorrected = Raw Field SPT N-value Hammer Efficiency Factor = Rig Specific Annual Calibration Value N ₆₀ = SPT N-uncorrected Corrected for Hammer Efficiency N ₆₀ = (Hammer Efficiency Factor/60%)*N-uncorrected	T _v = Pocket Torvane Shear Strength (psf) WC = Water Content, percent LL = Liquid Limit PL = Plastic Limit PI = Plasticity Index G = Grain Size Analysis C = Consolidation Test

Depth (ft.)	Sample Information								Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/AASHTO and Unified Class.
	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N ₆₀	Casing Blows					
0									138.8	-TOPSOIL-		
										-FILL-		
									136.9	Note: Strata breaks indicated are based on observations of drill behavior and drill cuttings. See Boring BB-HSS-219 for additional overburden details from 0 to 20.0 ft.		
5										-MARINE DEPOSIT-		
									128.1	-COBBLE-		
									127.3	-GLACIAL TILL/COBBLES-		
										Note: HW roller bit; drill action indicates frequent coarse gravel and cobbles to 20.0 ft.		
20	MD	0/0	20.00 - 20.00	50(0")					118.9	No Recovery, split spoon refusal Note: Clean out borehole to 20.0 ft, begin R1 at 20.0 ft. R1: Recovered two cobbles and coarse gravel pieces. Note: Drill action indicates soil between cobbles/gravel. Spin NW casing to 23.0 ft. Recovery=65%		
	R1	33.6/22	20.00 - 22.80						115.9	R1 Core Times (min:sec): 20.0-21.0' (4:13); 21.0-22.0' (3:38); 22.0-22.8' (6:40); 22.8-23.8' (4:41)		
25	R2	25.2/22	24.20 - 26.30	RQD = 48%						Top of Bedrock at El. 115.9		

Remarks:

Maine Department of Transportation Soil/Rock Exploration Log US CUSTOMARY UNITS				Project: Souadabscook Stream Emerson Mill Rd/ B&A Railroad Bridges Location: Hampden, Maine				Boring No.: BB-HSS-220 WIN: 21673.00/21673.10							
Driller: New England Boring Contractors				Elevation (ft.): 136.5				Auger ID/OD: --							
Operator: M. Porter				Datum: NAVD 88				Sampler: Split-Spoon-1.375 in. ID							
Logged By: N. Klausmeyer				Rig Type: Track-Mounted Mobile M1				Hammer Wt./Fall: SS-140#/30;NW-300#/16							
Date Start/Finish: 4-29-2019/4-29-2019				Drilling Method: NW Drive				Core Barrel: NQ-2.0 in. ID							
Boring Location: N463386; E1707096				Casing ID/OD: NW-3.0 in. ID				Water Level*: 4.3 ft							
Hammer Efficiency Factor: 0.6				Hammer Type: Automatic <input type="checkbox"/> Hydraulic <input type="checkbox"/> Rope & Cathead <input checked="" type="checkbox"/>											
Definitions: D = Split Spoon Sample MD = Unsuccessful Split Spoon Sample Attempt U = Thin Wall Tube Sample MU = Unsuccessful Thin Wall Tube Sample Attempt V = Field Vane Shear Test, PP = Pocket Penetrometer MV = Unsuccessful Field Vane Shear Test Attempt				R = Rock Core Sample SSA = Solid Stem Auger HSA = Hollow Stem Auger RC = Roller Cone WOH = Weight of 140lb. Hammer WOR/C = Weight of Rods or Casing WO1P = Weight of One Person				S _u = Peak/Remolded Field Vane Undrained Shear Strength (psf) S _u (lab) = Lab Vane Undrained Shear Strength (psf) q _p = Unconfined Compressive Strength (ksf) N-uncorrected = Raw Field SPT N-value Hammer Efficiency Factor = Rig Specific Annual Calibration Value N ₆₀ = SPT N-uncorrected Corrected for Hammer Efficiency N ₆₀ = (Hammer Efficiency Factor/60%)*N-uncorrected				T _v = Pocket Torvane Shear Strength (psf) WC = Water Content, percent LL = Liquid Limit PL = Plastic Limit PI = Plasticity Index G = Grain Size Analysis C = Consolidation Test			
Depth (ft.)	Sample Information							Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/AASHTO and Unified Class.				
	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or ROD (%)	N-uncorrected	N ₆₀	Casing Blows								
0	1D	24/11	0.00 - 2.00	1/1/3/3	4	4	Push	136.3	TOPSOIL-						
									Brown, wet, vry loose, silty SAND, little gravel						
	2D	24/15	2.00 - 4.00	5/2/1/1	3	3	8	134.5	-FILL-(SM)						
									Brown, wet, soft, SILT, some fine to coarse sand, trace gravel,						
									-FILL-(ML)		G#505102 A-4 ML				
	3D/A	24/19	4.00 - 6.00	4/4/7/10	11	11	12	132.5							
									Brown, wet, loose, silty SAND, little gravel						
5								131.7	-FILL-(SM)						
	4D	24/18	6.00 - 8.00	12/12/12/9	24	24	53		Olive-brown, mottled, moist, very stiff, silty CLAY, trace fine sand						
									-MARINE DEPOSIT-(CL)						
									Olive-brown, mottled, moist, very stiff, silty CLAY, trace fine sand						
									-MARINE DEPOSIT-(CL)						
	MV		10.00 - 10.00												
10	5D	24/10	10.00 - 12.00	5/7/5/8	12	12	Open		Note: Attempted field vane shear test; FV refusal at 10.0 ft.						
									Olive-brown, moist, stiff, silty CLAY, rock in spoon tip						
									-MARINE DEPOSIT-(CL)						
	MV		15.00 - 15.00												
15	6D	24/14	15.00 - 17.00	3/5/5/5	10	10			Note: Attempted field vane shear test; FV refusal at 15.0 ft.						
									Olive-brown to olive-grey, wet, stiff, silty CLAY, trace fine sand,						
									trace coarse gravel, rock in spoon tip						
									-MARINE DEPOSIT-(CL)						
	V1		20.00 - 20.30	Su>1940 psf					Note: Vane refusal at 20.3 ft.						
20	7D	24/24	20.00 - 22.00	1/4/3/4	7	7		116.2	55x110 mm vane raw torque readings:						
									V1: >500 in.-lbs						
									Olive-grey, wet, medium stiff, fine sandy CLAY, frequent 0.25 to 1.5-						
									in. thick fine sand partings						
									-MARINE DEPOSIT-(CL)						
									Note: Top of Glacial Till at 22.5 ft, based on drill action.						
25															

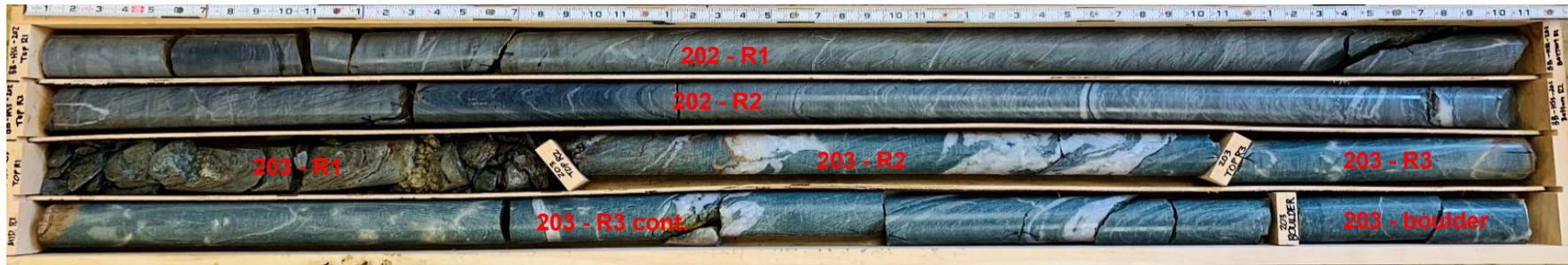
Remarks:

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

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

APPENDIX B

Rock Core Photographs



BORING ID	CORE ID	CORE RUN DEPTH (FT)	CORE RUN EL. ^{NOTE 1}	RECOVERY		RQD ^{NOTE 2}	
				IN.	%	IN.	%
BB-HSS-202	R1	38.2 to 43.2	87.9 to 82.9	60.0	100	53.5	89
BB-HSS-202	R2	43.2 to 48.2	82.9 to 77.9	60.0	100	56.0	93
BB-HSS-203	R1	34.2 to 37.2	92.1 to 89.1	20.0	56	0.0	0
BB-HSS-203	R2	37.2 to 39.2	89.1 to 87.1	26.0	100+	26.0	100+
BB-HSS-203	R3	39.2 to 44.2	87.1 to 82.1	60.0	100	58.0	97
BB-HSS-203	Boulder	28.7 to 30.2	97.6 to 96.1	Boulder	Boulder	Boulder	Boulder

NOTES:

1. ELEVATIONS ARE MEASURED IN FEET AND REFERENCE THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88).
2. "RQD" INDICATES ROCK QUALITY DESIGNATION (PERCENT OF ROCK PIECES RECOVERED EQUAL TO OR GREATER THAN 4 IN. IN LENGTH).



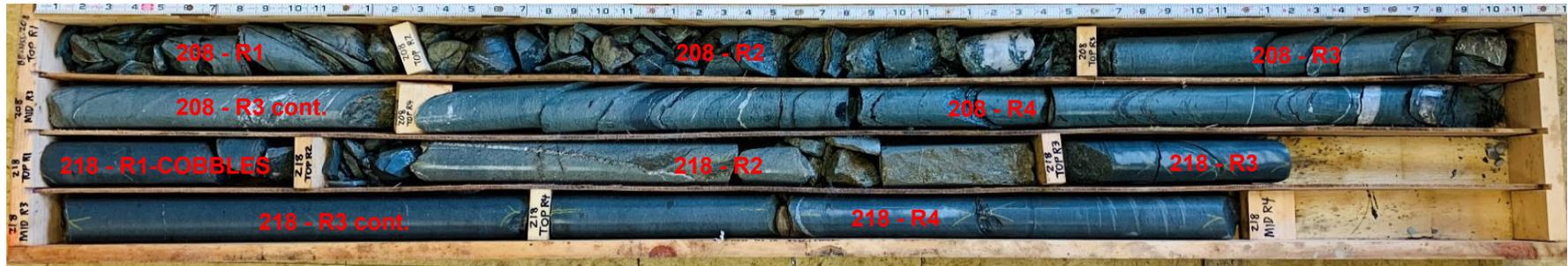
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**PHOTOGRAPH OF
BEDROCK CORE
BORINGS: BB-HSS-202 & BB-HSS-203**

FILE NO. 129380-002/003/004/005

June 2019



BORING ID	CORE ID	CORE RUN DEPTH (FT)	CORE RUN EL. ^{NOTE 1}	RECOVERY		RQD ^{NOTE 2}	
				IN.	%	IN.	%
BB-HSS-208	R1	28.0 to 30.3	97.3 to 95.0	14	51	0	0
BB-HSS-208	R2	30.3 to 32.1	95.0 to 93.2	27	100+	0	0
BB-HSS-208	R3	32.1 to 35.5	93.2 to 89.8	31	76	27	66
BB-HSS-208	R4	35.5 to 39.0	89.8 to 86.3	41	98	41	98
BB-HSS-218	R1	14.6 to 15.9	125.0 to 123.7	COBBLES	COBBLES	COBBLES	COBBLES
BB-HSS-218	R2	15.9 to 19.0	123.7 to 120.6	30	81	16	43
BB-HSS-218	R3	19.0 to 21.6	120.6 to 118.0	28	90	28	90
BB-HSS-218	R4	21.6 to 26.2	118.0 to 113.4	55	92	54	90

NOTES:

1. ELEVATIONS ARE MEASURED IN FEET AND REFERENCE THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88).
2. "RQD" INDICATES ROCK QUALITY DESIGNATION (PERCENT OF ROCK PIECES RECOVERED EQUAL TO OR GREATER THAN 4 IN. IN LENGTH).



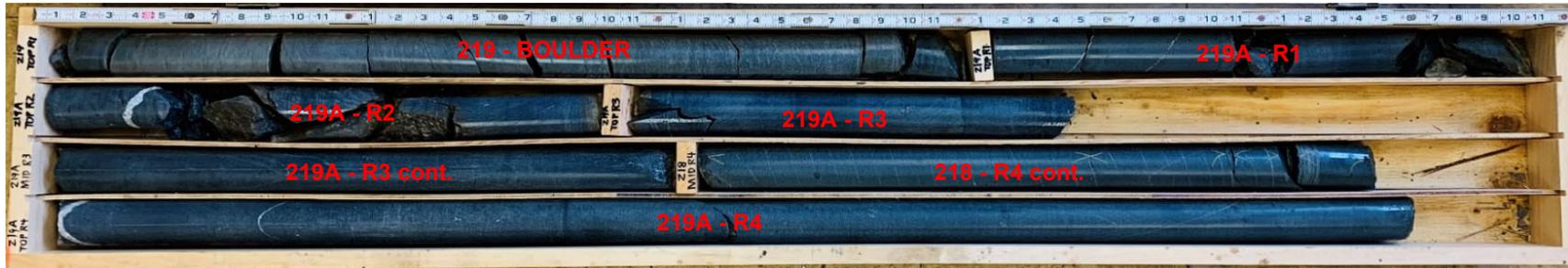
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**PHOTOGRAPH OF
BEDROCK CORE
BORINGS: BB-HSS-208 & BB-HSS-218**

FILE NO. 129380-002/003/004/005

June 2019



BORING ID	CORE ID	CORE RUN DEPTH (FT)	CORE RUN EL. NOTE 1	RECOVERY		RQD ^{NOTE 2}	
				IN.	%	IN.	%
BB-HSS-219	Boulder	14.0 to 18.7	125.1 to 120.4	BOULDER	BOULDER	BOULDER	BOULDER
BB-HSS-219A	R1	20.0 to 22.8	118.9 to 116.1	COBBLES	COBBLES	COBBLES	COBBLES
BB-HSS-219A	R2	24.2 to 26.3	114.7 to 112.6	22.0	87	12.0	48
BB-HSS-219A	R3	26.3 to 29.8	112.6 to 109.1	42.0	100	42.0	100
BB-HSS-218	R4 cont.	21.6 to 26.2	118.0 to 113.4	55.0	92	54.0	90
BB-HSS-219A	R4	29.8 to 34.3	109.1 to 104.6	54.0	100	54.0	100

NOTES:

1. ELEVATIONS ARE MEASURED IN FEET AND REFERENCE THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88).
2. "RQD" INDICATES ROCK QUALITY DESIGNATION (PERCENT OF ROCK PIECES RECOVERED EQUAL TO OR GREATER THAN 4 IN. IN LENGTH).



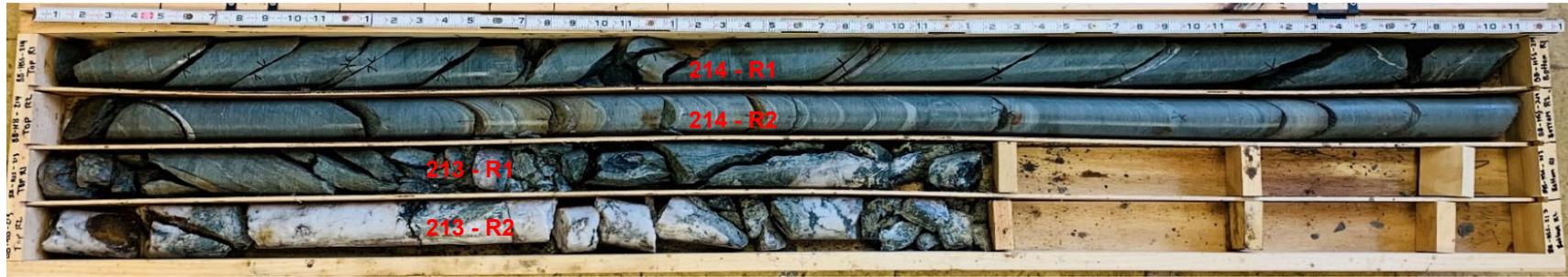
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**PHOTOGRAPH OF
BEDROCK CORE
BORINGS: BB-HSS-219, BB-HSS-219A
& BB-HSS-218 (CONT.)**

FILE NO. 129380-002/003/004/005

June 2019



BORING ID	CORE ID	CORE RUN DEPTH (FT)	CORE RUN EL. ^{NOTE 1}	RECOVERY		RQD ^{NOTE 2}	
				IN.	%	IN.	%
BB-HSS-214	R1	19.0 to 24.0	105.4 to 100.4	60.0	100	38.4	64
BB-HSS-214	R2	24.0 to 29.0	100.4 to 95.4	58.0	97	38.4	64
BB-HSS-213	R1	19.4 to 24.4	105.1 to 100.1	36.0	60	5.0	8
BB-HSS-213	R2	24.4 to 27.9	100.1 to 96.6	38.0	90	19.0	45

NOTES:

1. ELEVATIONS ARE MEASURED IN FEET AND REFERENCE THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88).
2. "RQD" INDICATES ROCK QUALITY DESIGNATION (PERCENT OF ROCK PIECES RECOVERED EQUAL TO OR GREATER THAN 4 IN. IN LENGTH).



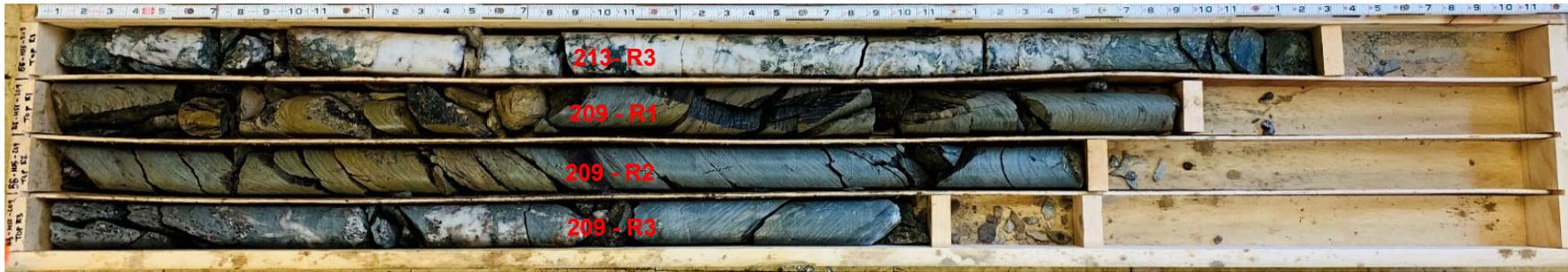
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**PHOTOGRAPH OF
BEDROCK CORE
BORINGS: BB-HSS-214 & BB-HSS-213**

FILE NO. 129380-002/003/004/005

June 2019



BORING ID	CORE ID	CORE RUN DEPTH (FT)	CORE RUN EL. ^{NOTE 1}	RECOVERY		RQD ^{NOTE 2}	
				IN.	%	IN.	%
BB-HSS-213	R3	27.9 to 32.4	96.6 to 92.1	48.0	89	30.5	56
BB-HSS-209	R1	44.0 to 49.0	81.8 to 76.8	44.0	73	9.5	16
BB-HSS-209	R2	49.0 to 53.5	76.8 to 72.3	39.0	72	4.5	8
BB-HSS-209	R3	53.5 to 56.5	72.3 to 69.3	33.0	92	23.5	65

NOTES:

1. ELEVATIONS ARE MEASURED IN FEET AND REFERENCE THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88).
2. "RQD" INDICATES ROCK QUALITY DESIGNATION (PERCENT OF ROCK PIECES RECOVERED EQUAL TO OR GREATER THAN 4 IN. IN LENGTH).



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**PHOTOGRAPH OF
BEDROCK CORE
BORINGS: BB-HSS-213 (CONT.)
& BB-HSS-209**

FILE NO. 129380-002/003/004/005

June 2019

APPENDIX C

Laboratory Test Results

Souadabscook Stream West



Client:	Haley & Aldrich, Inc.				
Project:	Souadabscook West; Bridge Nos.1433 and 5951				
Location:	Hampden, Maine	Project No:	GTX-309946		
Boring ID:	---	Sample Type:	---	Tested By:	cam
Sample ID:	---	Test Date:	05/10/19	Checked By:	bfs
Depth :	---	Test Id:	502188		

Moisture, Ash, and Organic Matter - ASTM D2974

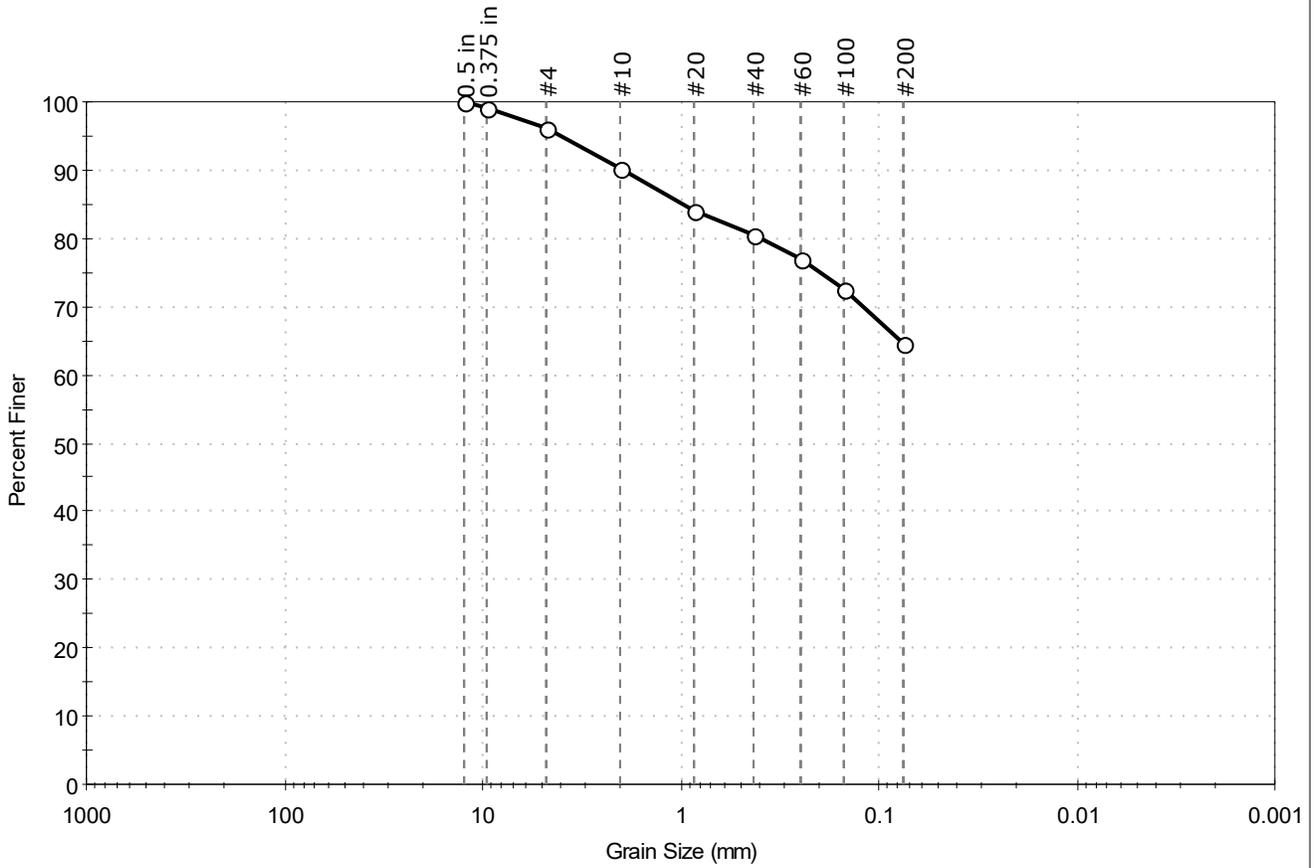
Boring ID	Sample ID	Depth	Description	Moisture Content,%	Ash Content,%	Organic Matter,%
BB-HSS-202	4DA	7-8 ft	Moist, very dark gray silt with organics	316	43.0	57.0
BB-HSS-203	4DA	7.5-8 ft	Moist, very dark brown sand with gravel and organics	213	55.4	44.6

Notes: Moisture content determined by Method A and reported as a percentage of oven-dried mass; dried to a constant mass at temperature of 105° C
Ash content and organic matter determined by Method C; dried to constant mass at temperature 440° C



Client:	Haley & Aldrich, Inc.		
Project:	Souadabscook West; Bridge Nos.1433 and 5951		
Location:	Hampden, Maine	Project No:	GTX-309946
Boring ID:	BB-HSS-201	Sample Type:	jar
Sample ID:	4D	Test Date:	05/15/19
Depth :	6-8 ft	Test Id:	502182
Test Comment:	---		
Visual Description:	Moist, dark gray sandy silt		
Sample Comment:	---		

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	3.9	31.5	64.6

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
0.5 in	12.50	100		
0.375 in	9.50	99		
#4	4.75	96		
#10	2.00	90		
#20	0.85	84		
#40	0.42	81		
#60	0.25	77		
#100	0.15	73		
#200	0.075	65		

<u>Coefficients</u>	
D ₈₅ = 0.9651 mm	D ₃₀ = N/A
D ₆₀ = N/A	D ₁₅ = N/A
D ₅₀ = N/A	D ₁₀ = N/A
C _u = N/A	C _c = N/A

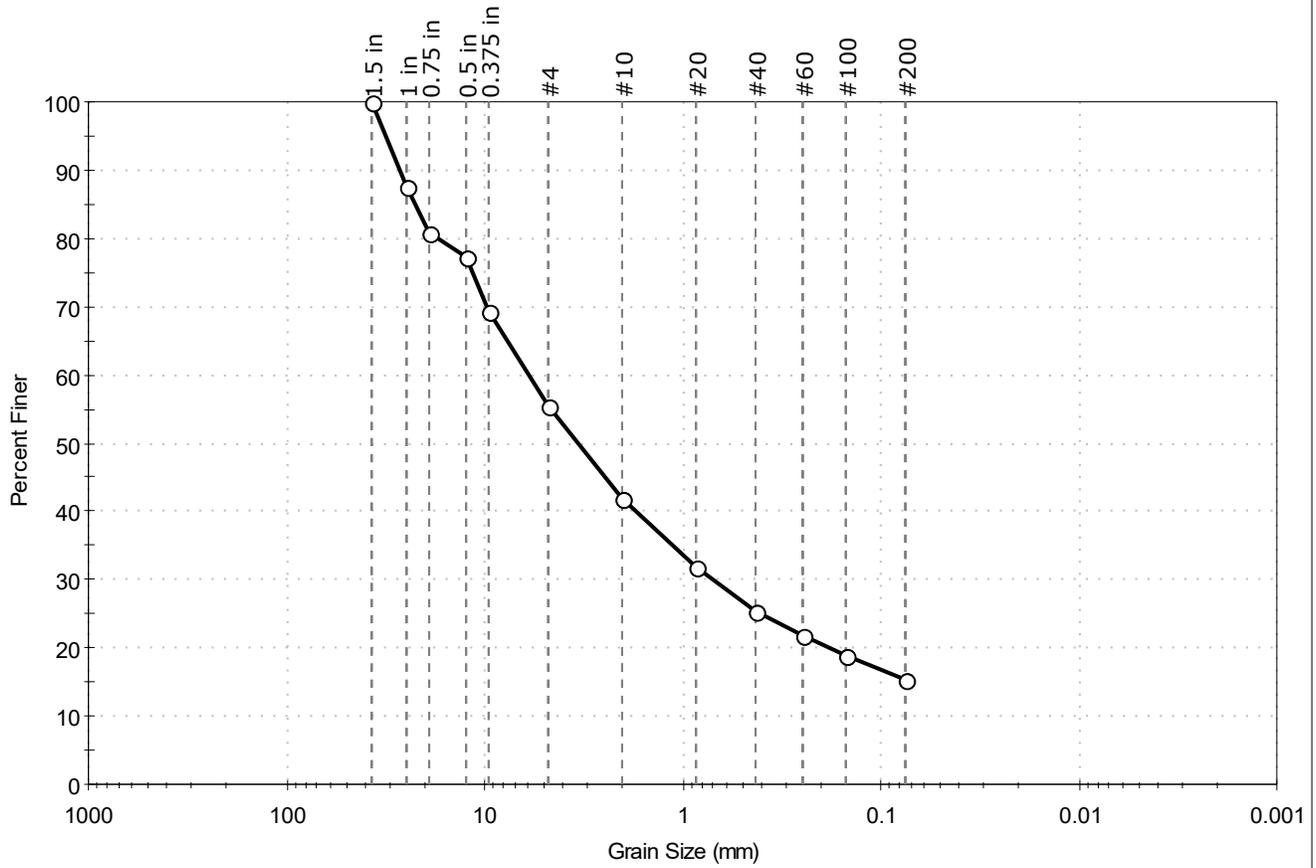
<u>Classification</u>	
ASTM	N/A
AASHTO	Silty Soils (A-4 (0))

<u>Sample/Test Description</u>
Sand/Gravel Particle Shape : ANGULAR
Sand/Gravel Hardness : HARD



Client:	Haley & Aldrich, Inc.		
Project:	Souadabscook West; Bridge Nos.1433 and 5951		
Location:	Hampden, Maine	Project No:	GTX-309946
Boring ID:	BB-HSS-202	Sample Type:	jar
Sample ID:	2D	Test Date:	05/15/19
Depth :	2-4 ft	Test Id:	502183
Test Comment:	---		
Visual Description:	Moist, olive brown silty gravel with sand		
Sample Comment:	---		

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	44.6	39.9	15.5

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
1.5 in	37.50	100		
1 in	25.00	88		
0.75 in	19.00	81		
0.5 in	12.50	77		
0.375 in	9.50	69		
#4	4.75	55		
#10	2.00	42		
#20	0.85	32		
#40	0.42	25		
#60	0.25	22		
#100	0.15	19		
#200	0.075	15		

<u>Coefficients</u>	
D ₈₅ = 22.4988 mm	D ₃₀ = 0.7001 mm
D ₆₀ = 5.9734 mm	D ₁₅ = N/A
D ₅₀ = 3.3747 mm	D ₁₀ = N/A
C _u = N/A	C _c = N/A

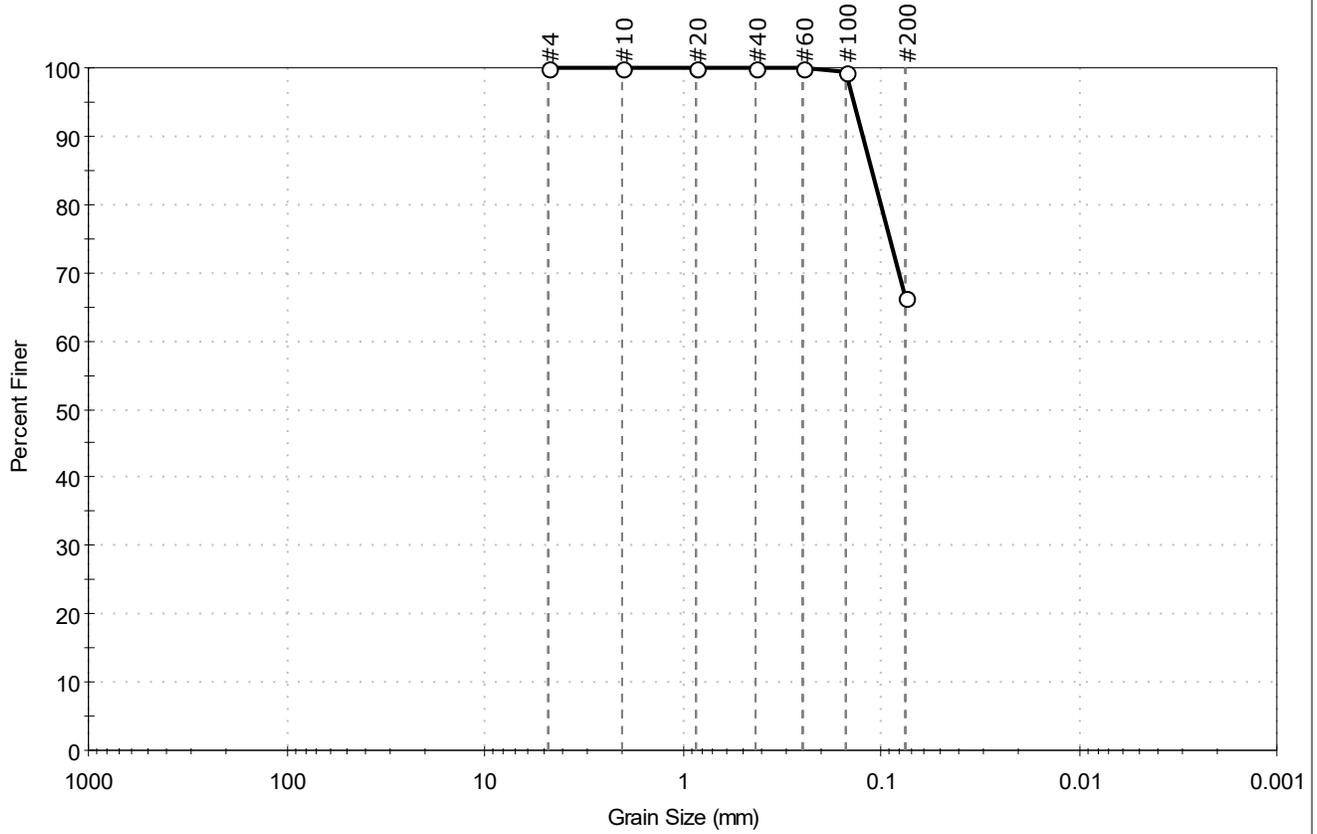
<u>Classification</u>	
ASTM	N/A
AASHTO	Stone Fragments, Gravel and Sand (A-1-b (0))

<u>Sample/Test Description</u>
Sand/Gravel Particle Shape : ANGULAR
Sand/Gravel Hardness : HARD



Client: Haley & Aldrich, Inc.	Project: Souadabscook West; Bridge Nos.1433 and 5951	Location: Hampden, Maine	Project No: GTX-309946
Boring ID: BB-HSS-203	Sample Type: jar	Tested By: ckg	Checked By: bfs
Sample ID: 10D	Test Date: 05/16/19	Test Id: 502184	
Depth : 20-22 ft			
Test Comment: ---			
Visual Description: Moist, dark greenish gray sandy silt			
Sample Comment: ---			

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	0.0	33.5	66.5

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	100		
#60	0.25	100		
#100	0.15	99		
#200	0.075	66		

<u>Coefficients</u>	
D ₈₅ = 0.1109 mm	D ₃₀ = N/A
D ₆₀ = N/A	D ₁₅ = N/A
D ₅₀ = N/A	D ₁₀ = N/A
C _u = N/A	C _c = N/A

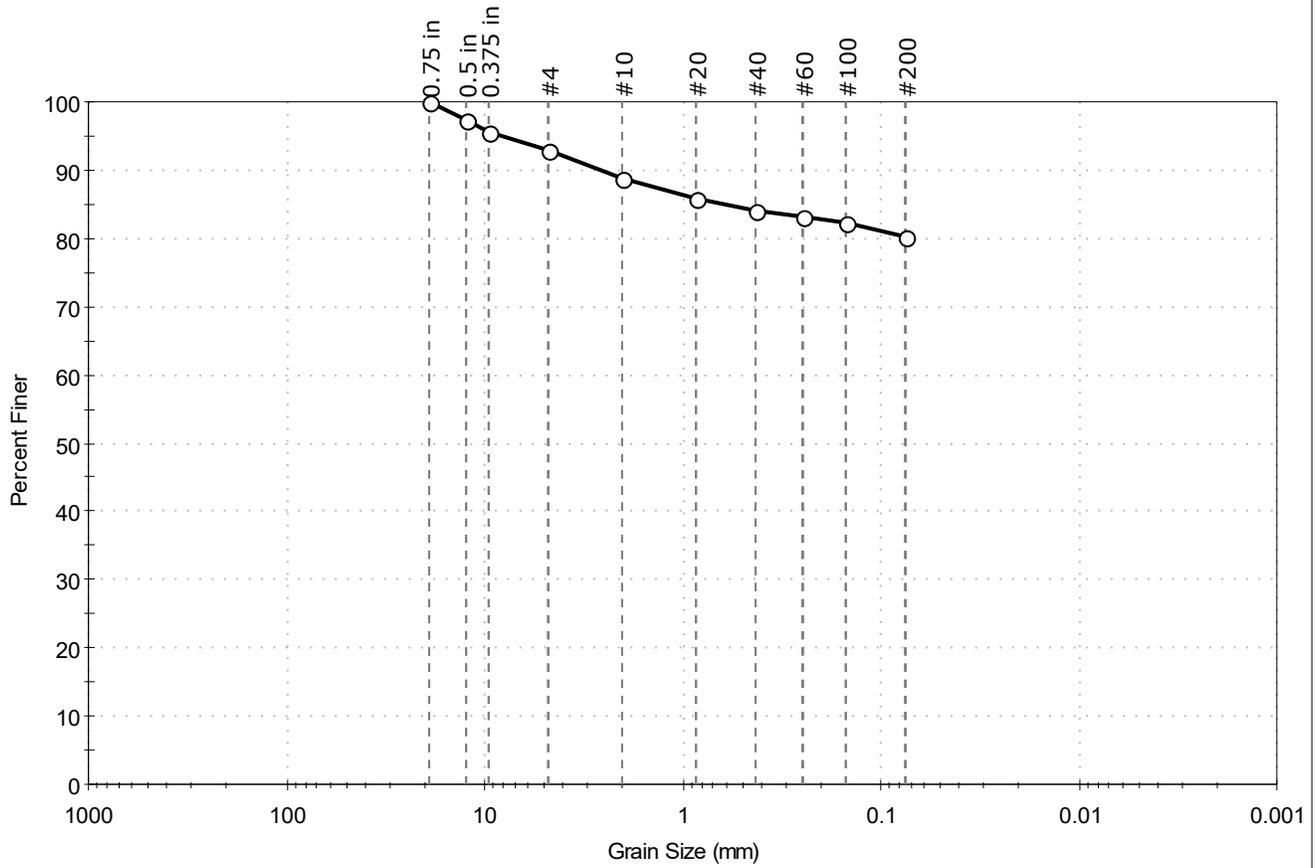
<u>Classification</u>	
ASTM	N/A
AASHTO	Silty Soils (A-4 (0))

<u>Sample/Test Description</u>
Sand/Gravel Particle Shape : ---
Sand/Gravel Hardness : ---



Client:	Haley & Aldrich, Inc.		
Project:	Souadabscook West; Bridge Nos.1433 and 5951		
Location:	Hampden, Maine	Project No:	GTX-309946
Boring ID:	BB-HSS-204	Sample Type:	jar
Sample ID:	5D	Test Date:	05/16/19
Depth :	9.5-10.5 ft	Test Id:	502185
Test Comment:	---		
Visual Description:	Moist, dark greenish gray silt with sand		
Sample Comment:	---		

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	7.2	12.6	80.2

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
0.75 in	19.00	100		
0.5 in	12.50	97		
0.375 in	9.50	96		
#4	4.75	93		
#10	2.00	89		
#20	0.85	86		
#40	0.42	84		
#60	0.25	83		
#100	0.15	82		
#200	0.075	80		

<u>Coefficients</u>	
D ₈₅ = 0.5924 mm	D ₃₀ = N/A
D ₆₀ = N/A	D ₁₅ = N/A
D ₅₀ = N/A	D ₁₀ = N/A
C _u = N/A	C _c = N/A

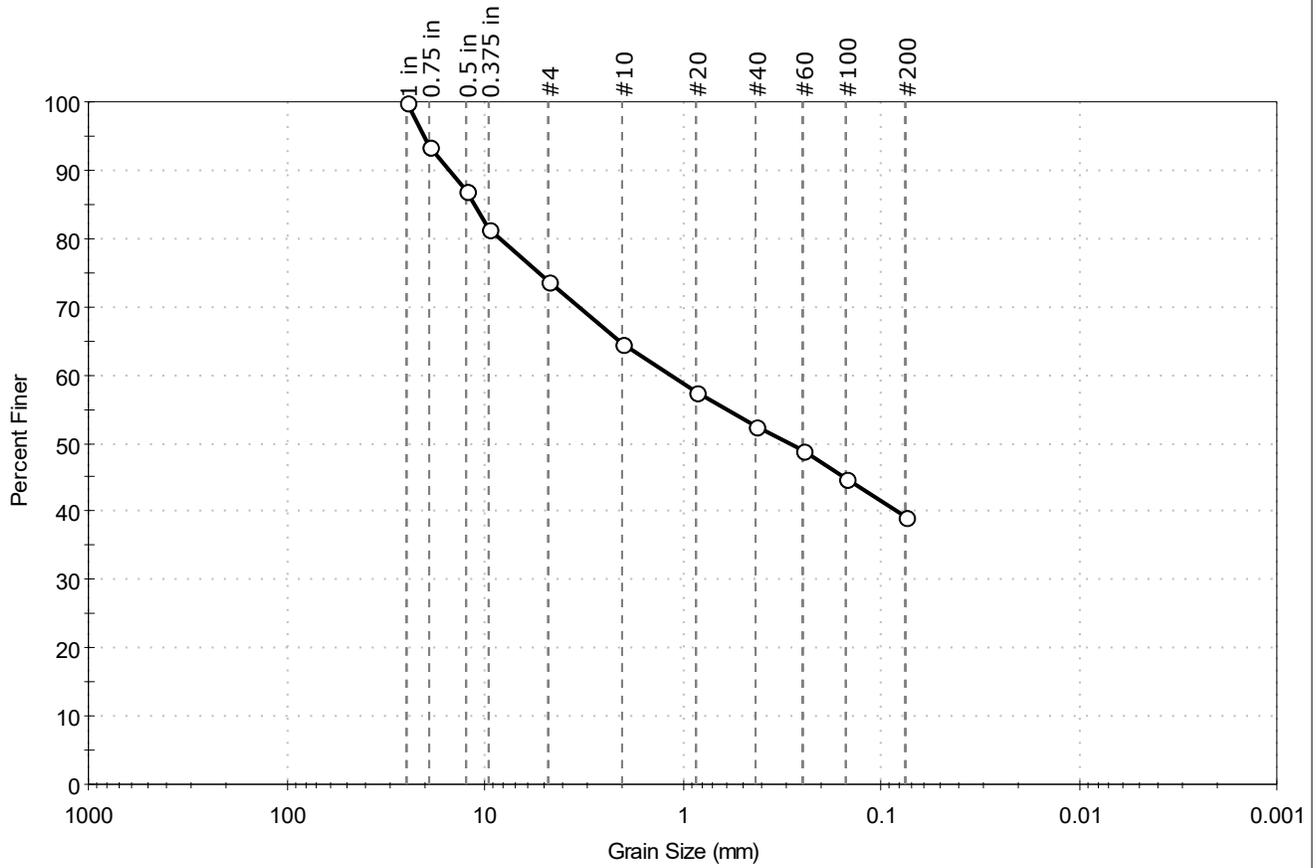
<u>Classification</u>	
ASTM	N/A
AASHTO	Silty Soils (A-4 (0))

<u>Sample/Test Description</u>
Sand/Gravel Particle Shape : ANGULAR
Sand/Gravel Hardness : HARD



Client:	Haley & Aldrich, Inc.		
Project:	Souadabscook West; Bridge Nos.1433 and 5951		
Location:	Hampden, Maine	Project No:	GTX-309946
Boring ID:	BB-HSS-205	Sample Type:	jar
Sample ID:	6D	Test Date:	05/16/19
Depth :	15-17 ft	Test Id:	502186
Test Comment:	---		
Visual Description:	Moist, olive silty sand with gravel		
Sample Comment:	---		

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	26.2	34.7	39.1

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
1 in	25.00	100		
0.75 in	19.00	94		
0.5 in	12.50	87		
0.375 in	9.50	82		
#4	4.75	74		
#10	2.00	65		
#20	0.85	57		
#40	0.42	53		
#60	0.25	49		
#100	0.15	45		
#200	0.075	39		

<u>Coefficients</u>	
D ₈₅ = 11.2719 mm	D ₃₀ = N/A
D ₆₀ = 1.1462 mm	D ₁₅ = N/A
D ₅₀ = 0.2879 mm	D ₁₀ = N/A
C _u = N/A	C _c = N/A

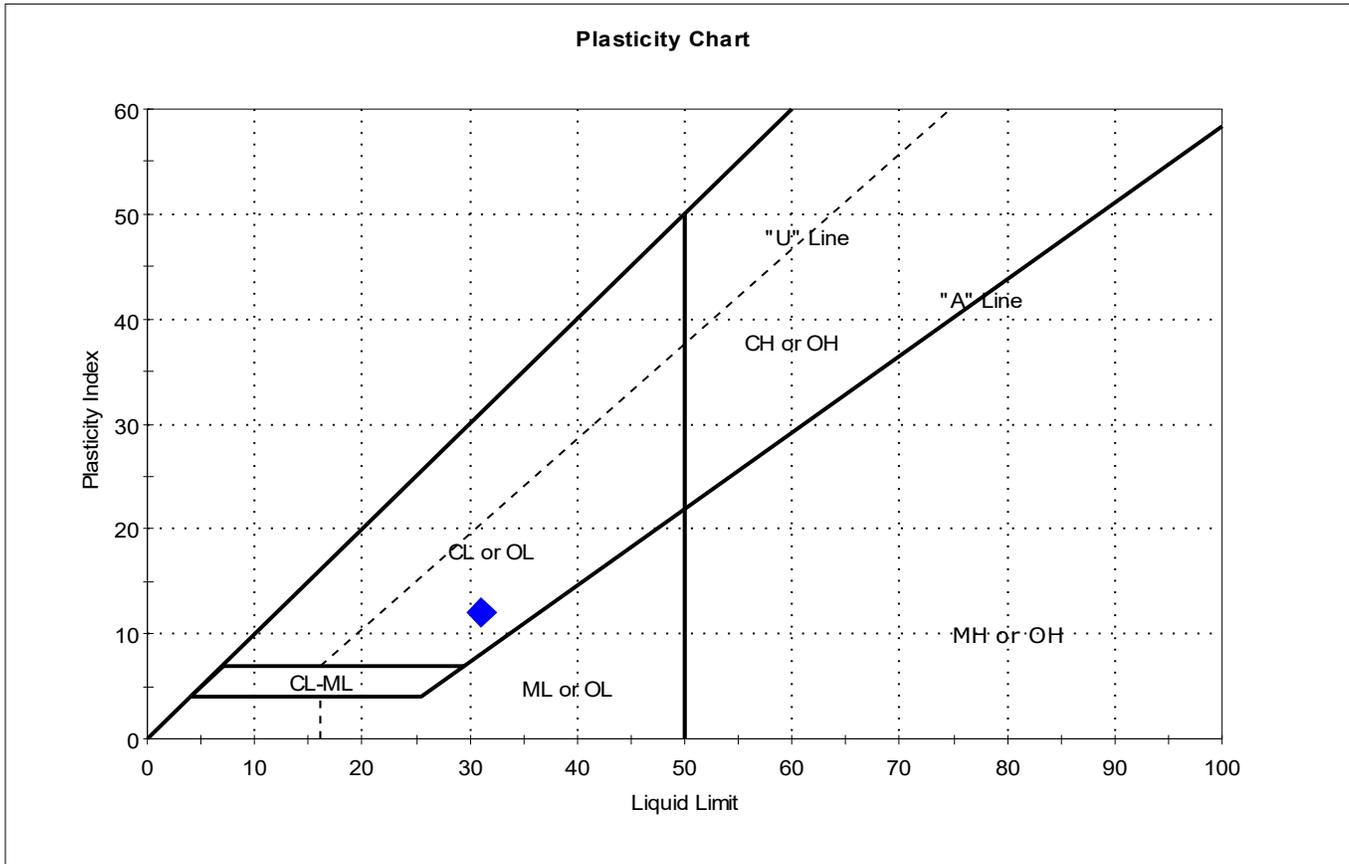
<u>Classification</u>	
ASTM	N/A
AASHTO	Silty Soils (A-4 (0))

<u>Sample/Test Description</u>
Sand/Gravel Particle Shape : ANGULAR
Sand/Gravel Hardness : HARD



Client:	Haley & Aldrich, Inc.		
Project:	Souadabscook West; Bridge Nos.1433 and 5951		
Location:	Hampden, Maine	Project No:	GTX-309946
Boring ID:	BB-HSS-201	Sample Type:	jar
Sample ID:	9D	Test Date:	05/15/19
Depth :	20-22 ft	Test Id:	502179
Test Comment:	---		
Visual Description:	Moist, olive clay		
Sample Comment:	---		

Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content, %	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
◆	9D	B-HSS-20	20-22 ft	32	31	19	12	1.1	

Sample Prepared using the WET method

Dry Strength: VERY HIGH

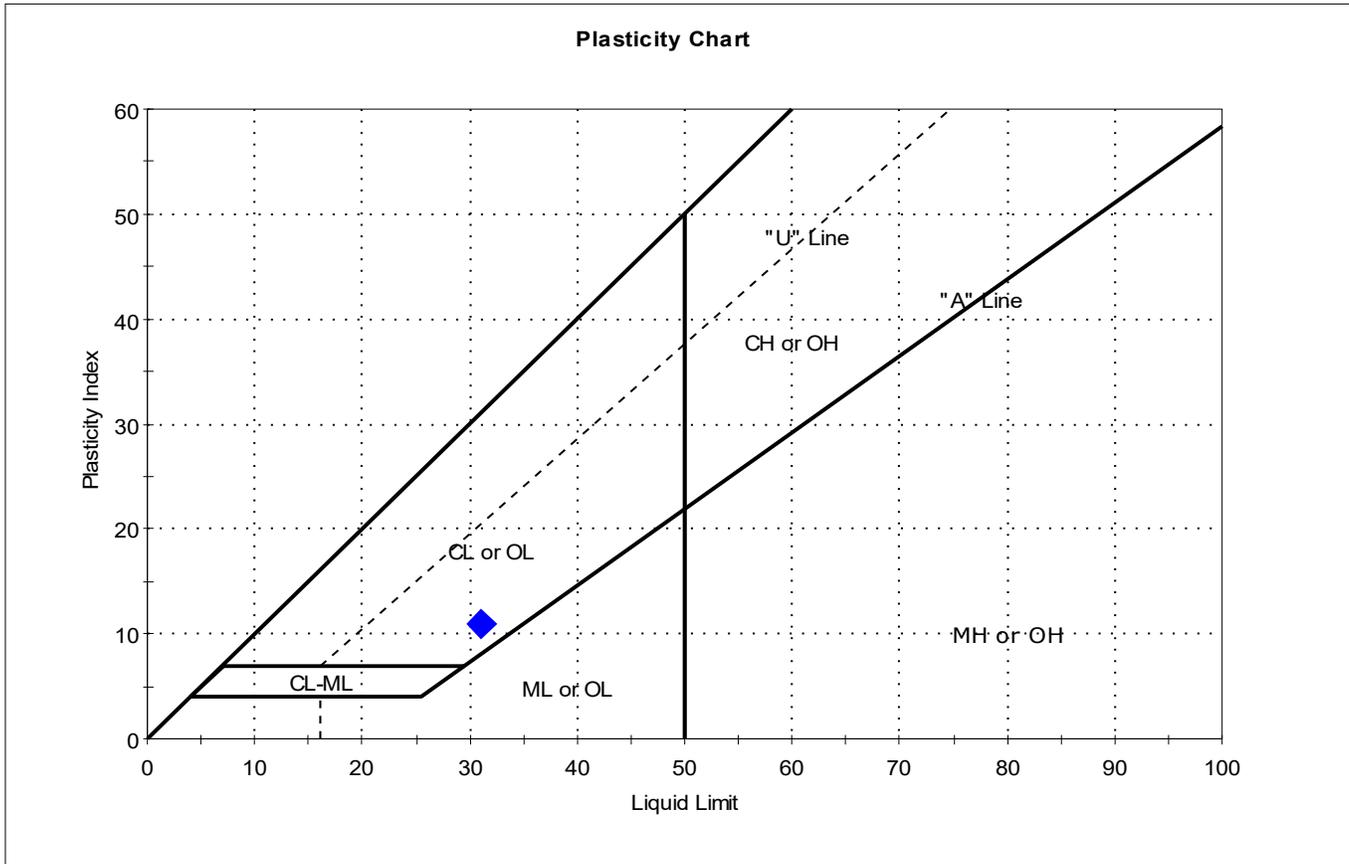
Dilatancy: SLOW

Toughness: LOW



Client:	Haley & Aldrich, Inc.		
Project:	Souadabscook West; Bridge Nos.1433 and 5951		
Location:	Hampden, Maine	Project No:	GTX-309946
Boring ID:	BB-HSS-202	Sample Type:	tube
Sample ID:	U1	Test Date:	05/15/19
Depth :	17-19 ft	Test Id:	502178
Test Comment:	---		
Visual Description:	Moist, dark greenish gray clay		
Sample Comment:	---		

Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content, %	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
◆	U1	B-HSS-20	17-19 ft	32	31	20	11	1.1	

Sample Prepared using the WET method

Dry Strength: VERY HIGH

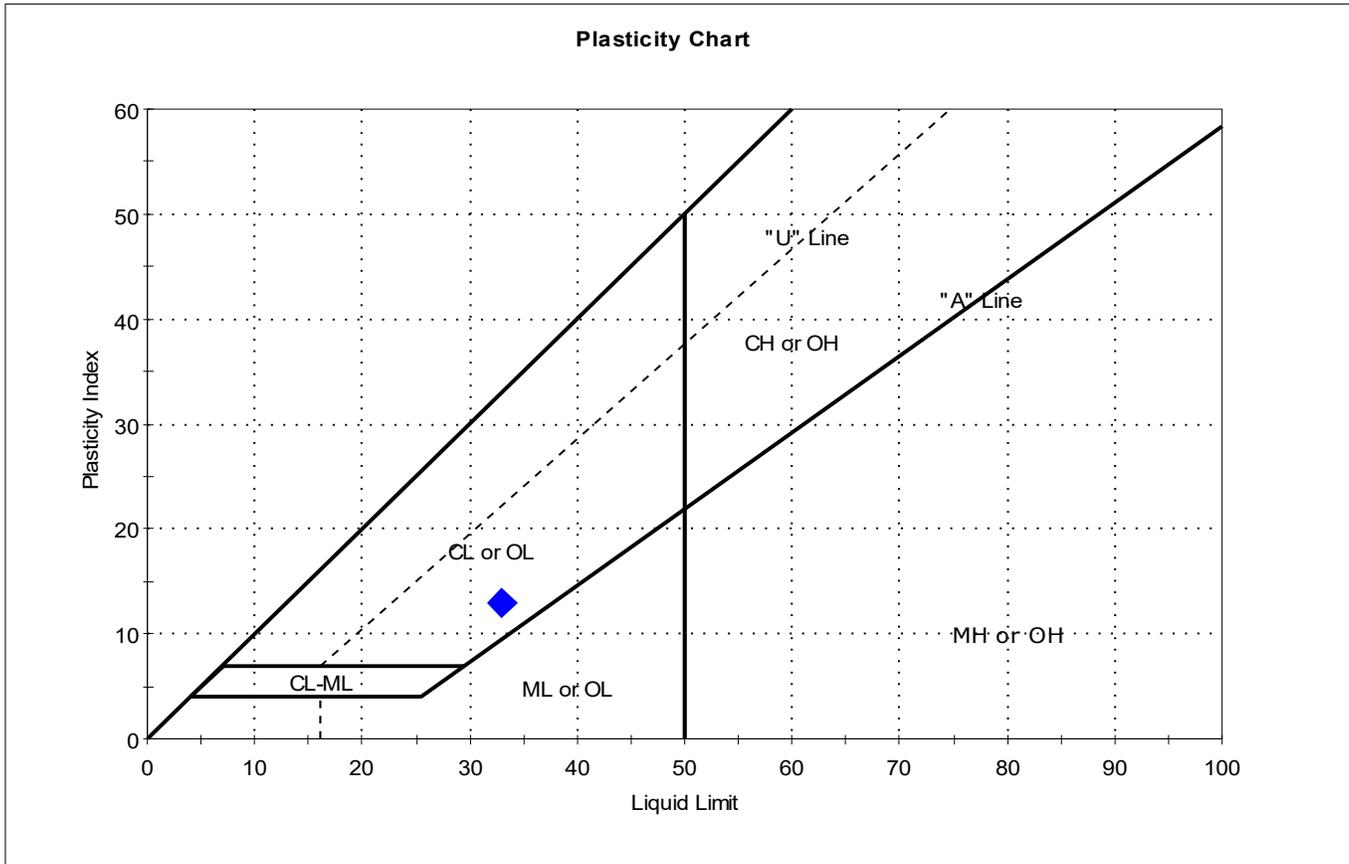
Dilatancy: SLOW

Toughness: LOW



Client:	Haley & Aldrich, Inc.		
Project:	Souadabscook West; Bridge Nos.1433 and 5951		
Location:	Hampden, Maine	Project No:	GTX-309946
Boring ID:	BB-HSS-203	Sample Type:	jar
Sample ID:	8D	Test Date:	05/15/19
Depth :	14-16 ft	Test Id:	502180
Test Comment:	---		
Visual Description:	Moist, greenish gray clay		
Sample Comment:	---		

Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content, %	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
◆	8D	B-HSS-20	14-16 ft	28	33	20	13	0.6	

Sample Prepared using the WET method

Dry Strength: VERY HIGH

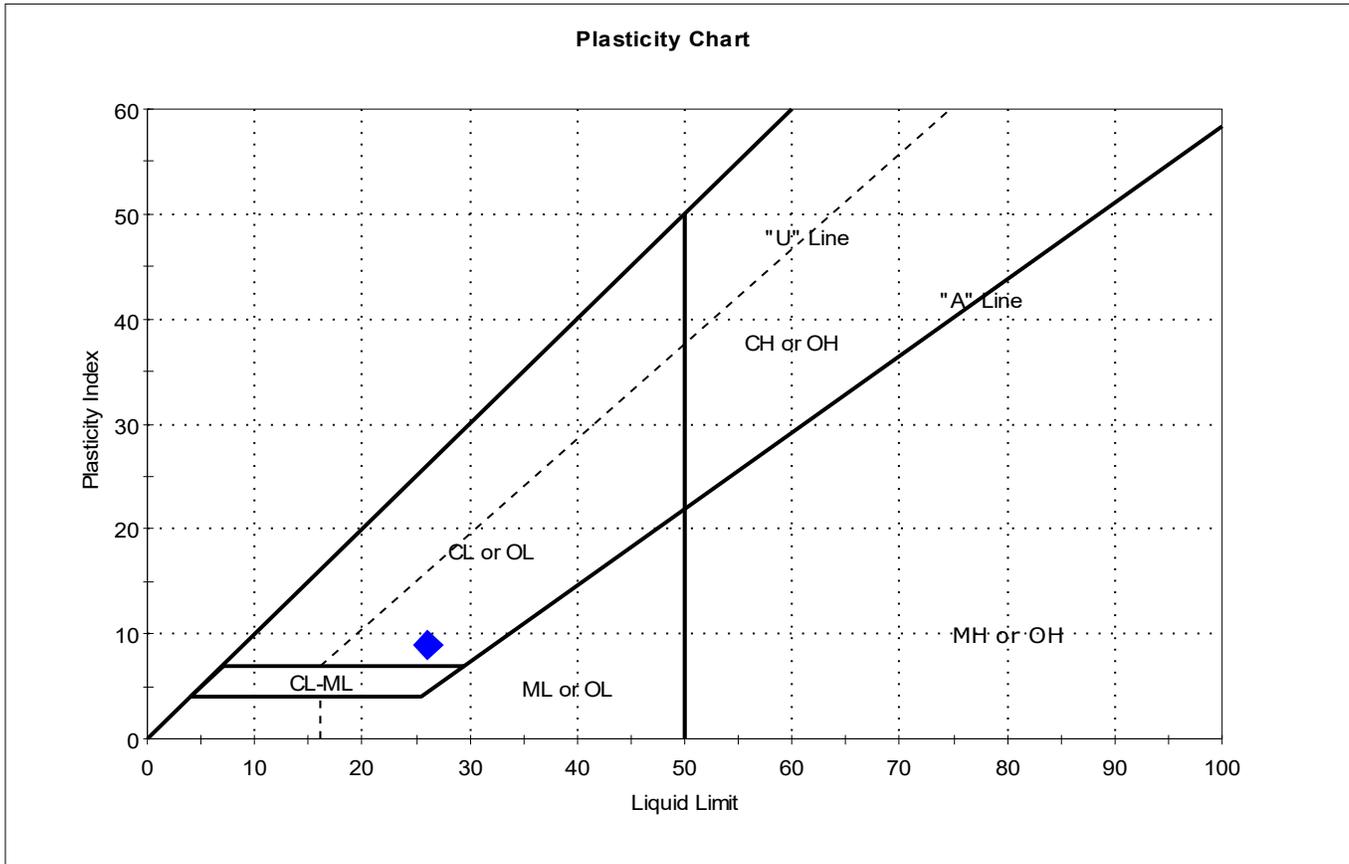
Dilatancy: SLOW

Toughness: LOW



Client:	Haley & Aldrich, Inc.		
Project:	Souadabscook West; Bridge Nos.1433 and 5951		
Location:	Hampden, Maine	Project No:	GTX-309946
Boring ID:	BB-HSS-204	Sample Type:	jar
Sample ID:	5DA	Test Date:	05/15/19
Depth :	10.5-11.5 ft	Test Id:	502181
Test Comment:	---		
Visual Description:	Moist, dark bluish gray clay		
Sample Comment:	---		

Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content, %	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
◆	5DA	B-HSS-204	10.5-11.5 ft	28	26	17	9	1.2	

Sample Prepared using the WET method

Dry Strength: VERY HIGH

Dilatancy: SLOW

Toughness: LOW



Client: Haley & Aldrich, Inc.

Project Name: Souadabscook West Bridges

Project Location: Hampden, ME

Project Number: GTX-309946

Tested By: md/trm

Checked By: njh

Boring ID: BB-HSS-202

Preparation: Intact

Description: Moist, dark greenish gray clay

Classification: ---

Group Symbol: ---

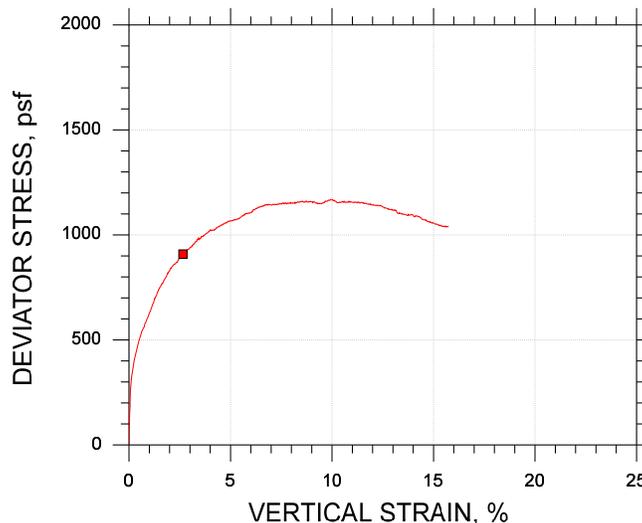
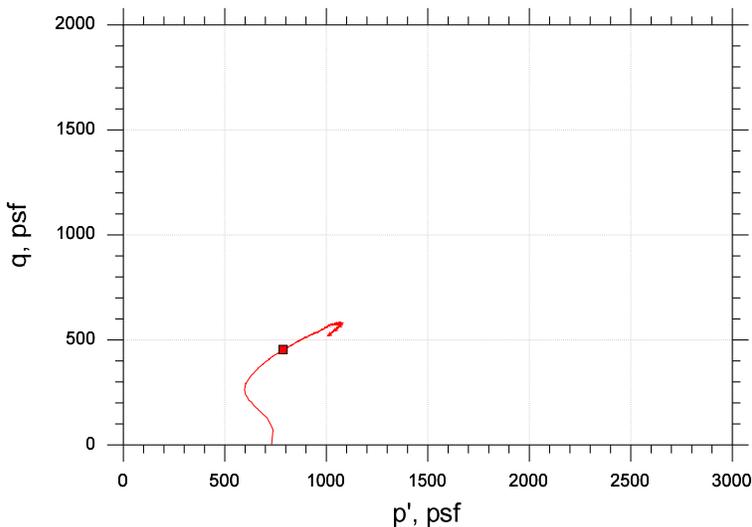
Liquid Limit: 31

Plastic Limit: 20

Plasticity Index: 11

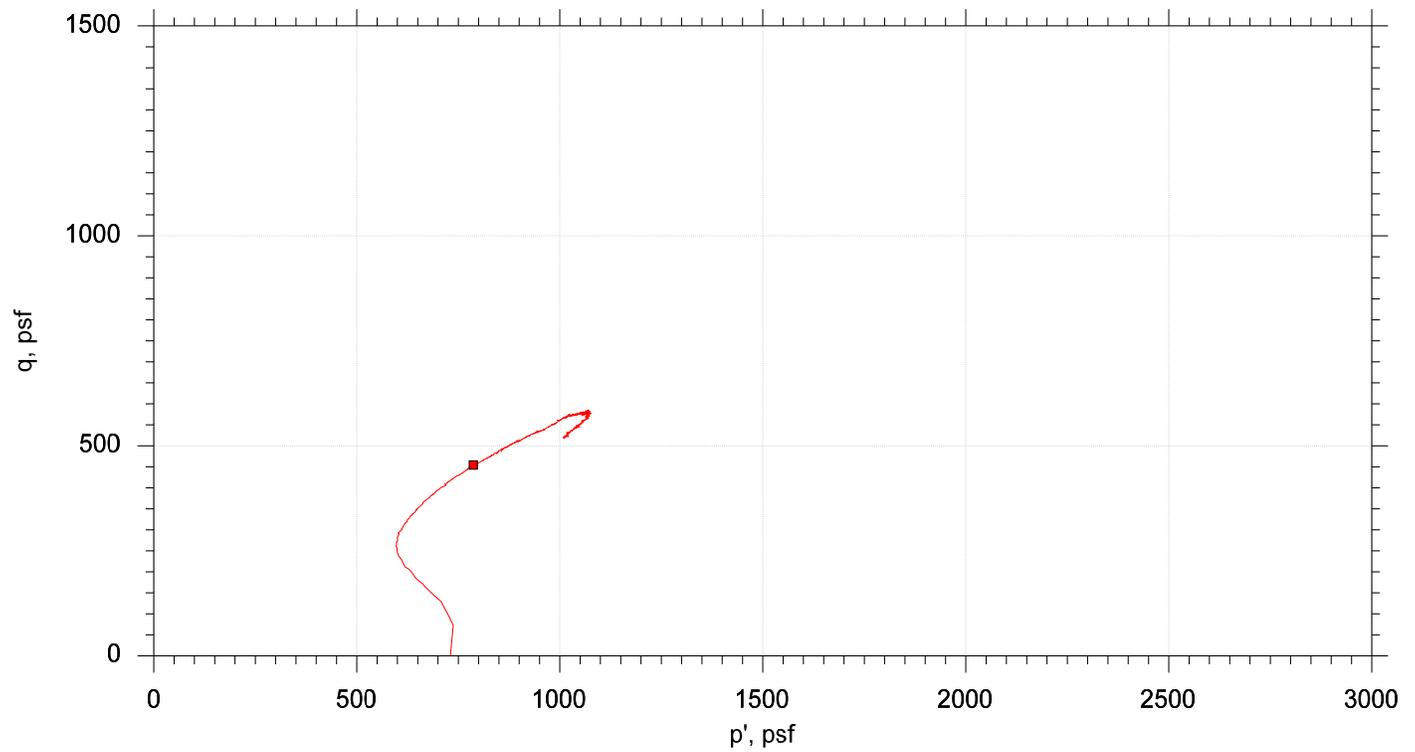
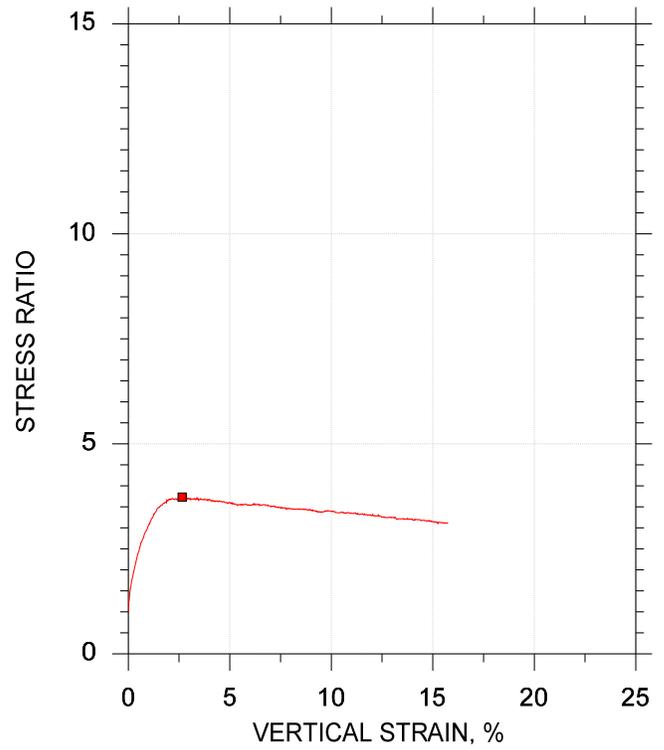
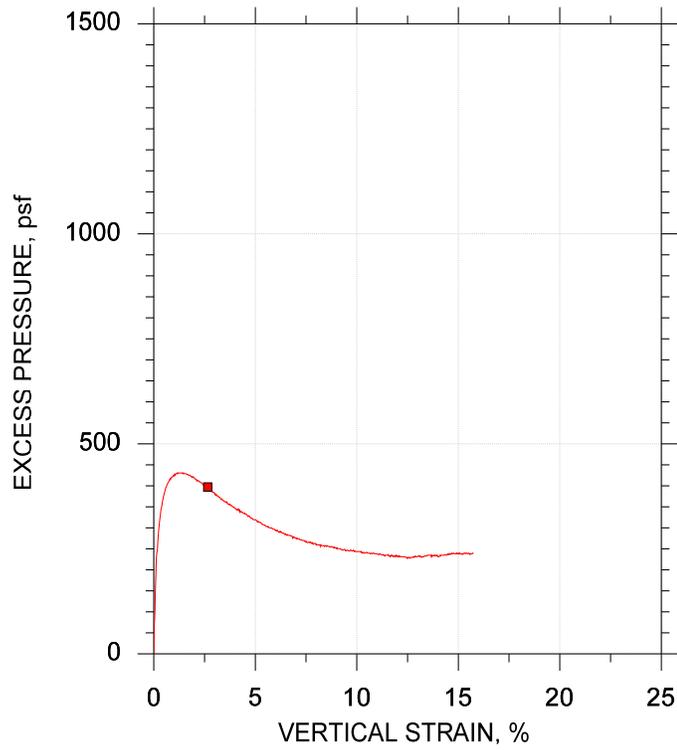
Estimated Specific Gravity: 2.7

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767



Symbol	■		
Sample ID	U1		
Depth, ft	17-19		
Test Number	CU-1-1		
Initial	Height, in	4.800	
	Diameter, in	2.040	
	Moisture Content (from Cuttings), %	32.1	
	Dry Density, pcf	89.1	
	Saturation (Wet Method), %	97.1	
	Void Ratio	0.892	
Before Shear	Moisture Content, %	32.0	
	Dry Density, pcf	90.4	
	Cross-sectional Area (Method A), in ²	3.240	
	Saturation, %	100.0	
	Void Ratio	0.864	
	Back Pressure, psf	2.515e+004	
Vertical Effective Consolidation Stress, psf	727.8		
Horizontal Effective Consolidation Stress, psf	729.8		
Vertical Strain after Consolidation, %	0.2699		
Volumetric Strain after Consolidation, %	0.4687		
Time to 50% Consolidation, min	31.40		
Shear Strength, psf	454.4		
Strain at Failure, %	2.65		
Strain Rate, %/min	0.01600		
Deviator Stress at Failure, psf	908.8		
Effective Minor Principal Stress at Failure, psf	332.5		
Effective Major Principal Stress at Failure, psf	1241.		
B-Value	0.95		
Notes:			
- Before Shear Saturation set to 100% for phase calculation.			
- Moisture Content determined by ASTM D2216.			
- Atterberg Limits determined by ASTM D4318.			
- Deviator Stress includes membrane correction.			
- Values for c and φ determined from best-fit straight line for the specific test conditions. Actual strength parameters may vary and should be determined by an engineer for site conditions.			
Remarks:			

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767

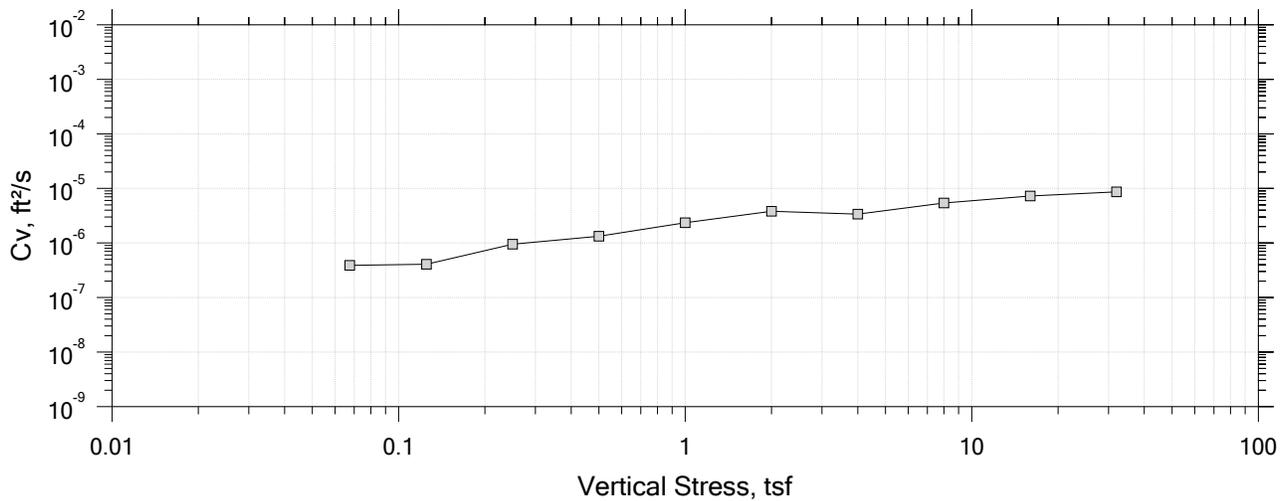
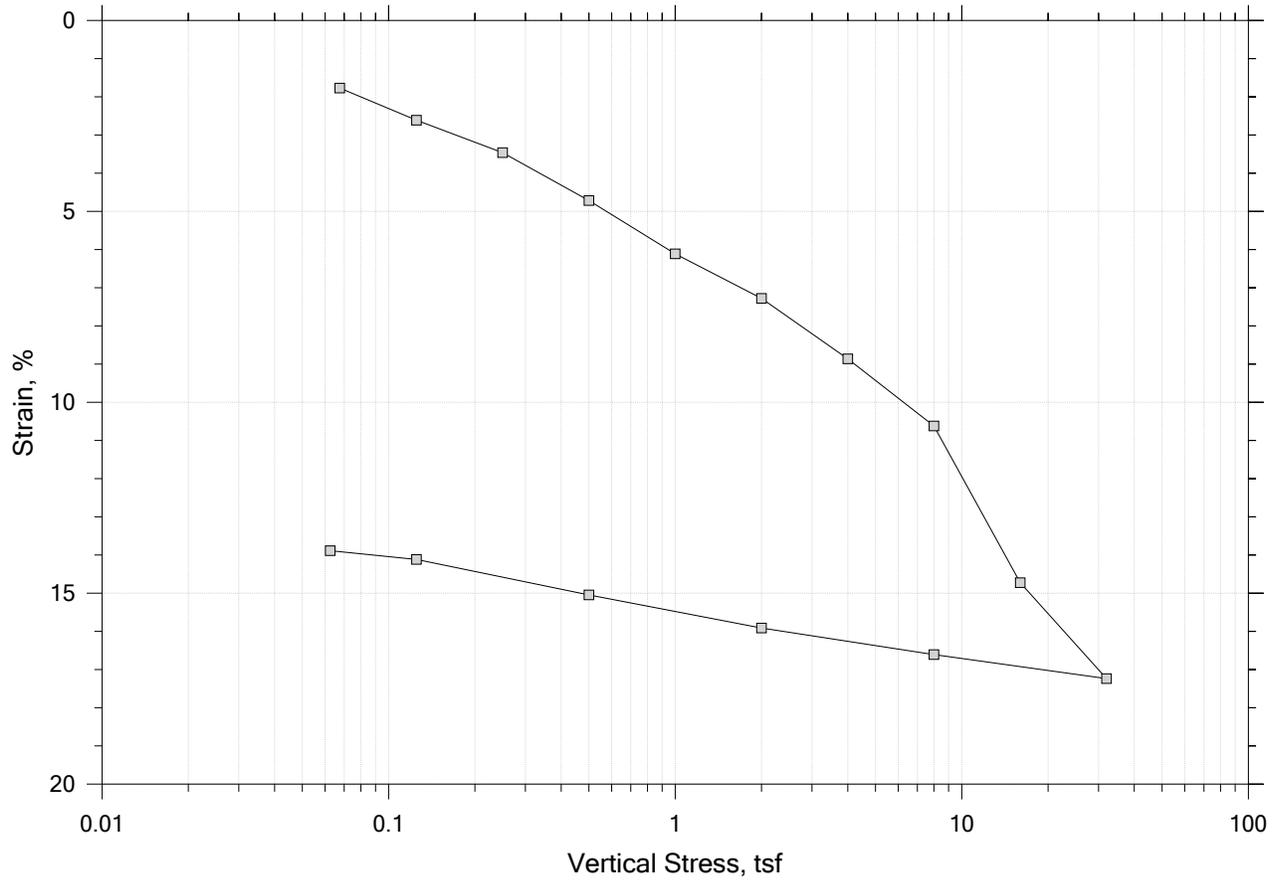


	Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
■	U1	CU-1-1	17-19	md/trm	5/8/19	njh	5/17/19	309946-CU-1-1n.dat

	Project: Souadabscook West Bridges		Location: Hampden, ME		Project No.: GTX-309946	
	Boring No.: BB-HSS-202		Sample Type: Intact			
	Description: Moist, dark greenish gray clay					
	Remarks: System PP					

One-Dimensional Consolidation by ASTM D2435 - Method B

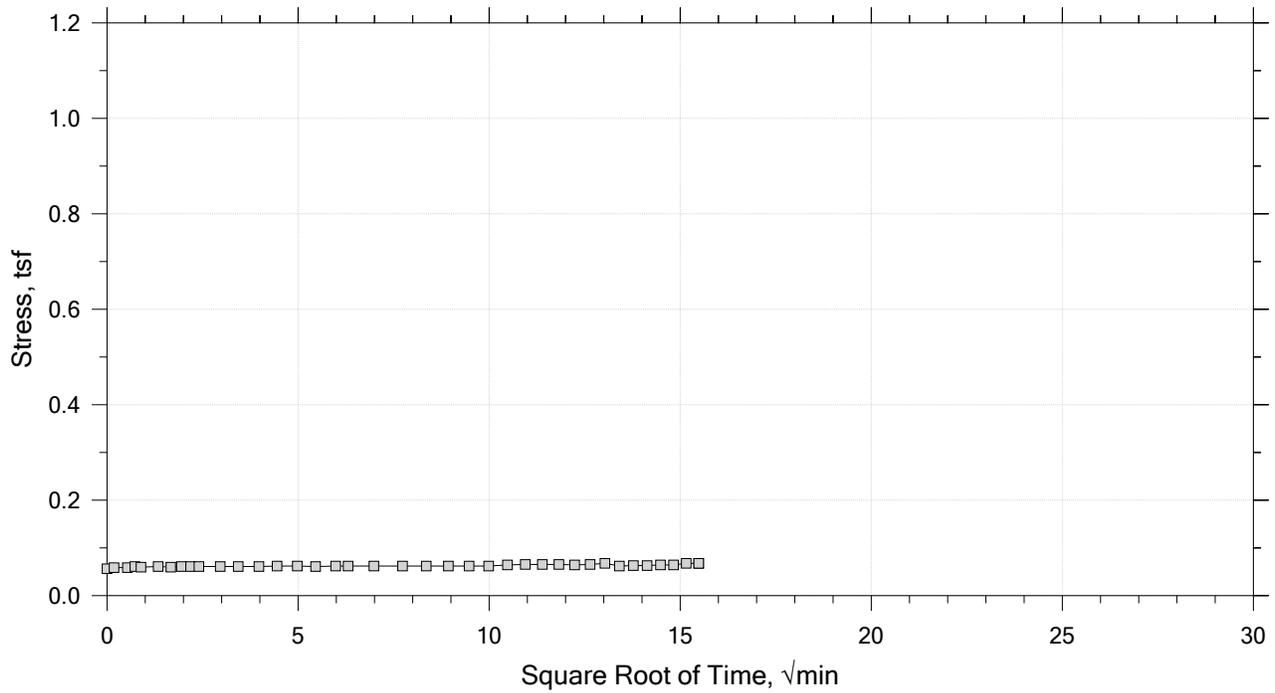
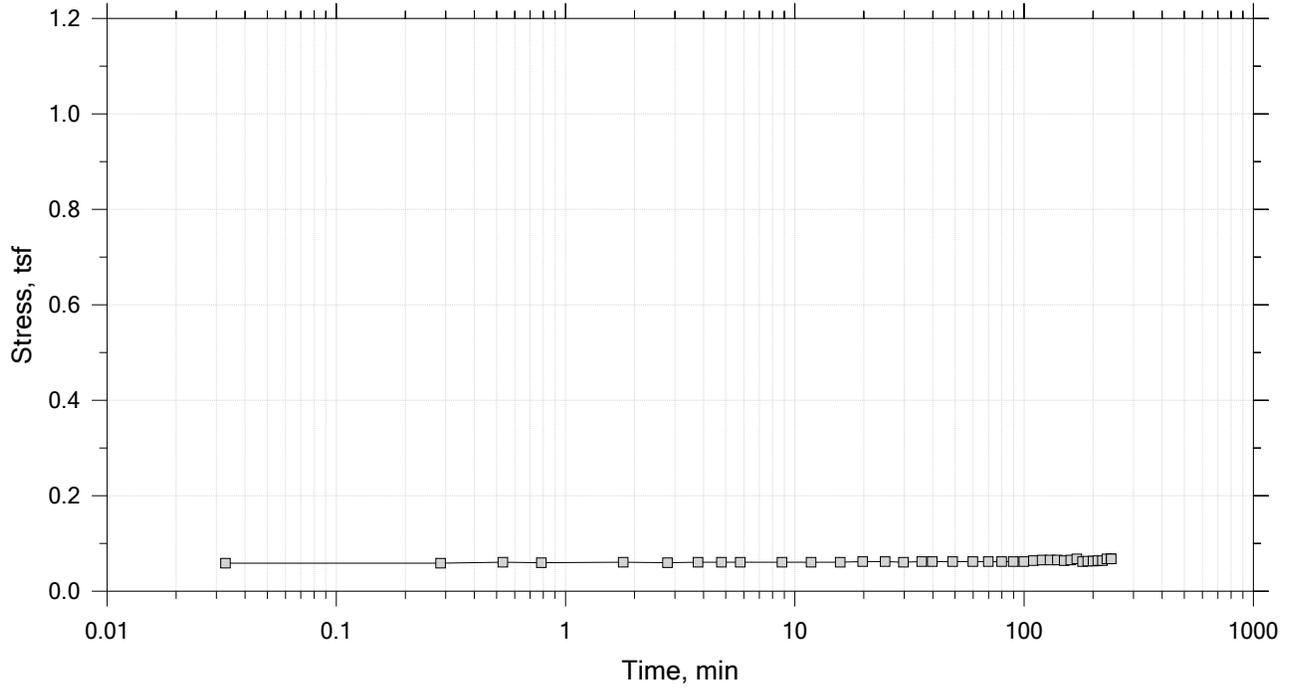
Summary Report



	Project: Souadabscook West Bridges	Location: Hampden, ME	Project No.: GTX-309946
	Boring No.: BB-HSS-202	Tested By: trm	Checked By: njh
	Sample No.: U1	Test Date: 5/3/19	Depth: 17-19 ft
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, dark greenish gray clay		
	Remarks: System Y, Swell Pressure = 0.0675 tsf		
	Displacement at End of Increment		

One-Dimensional Consolidation by ASTM D2435 - Method B

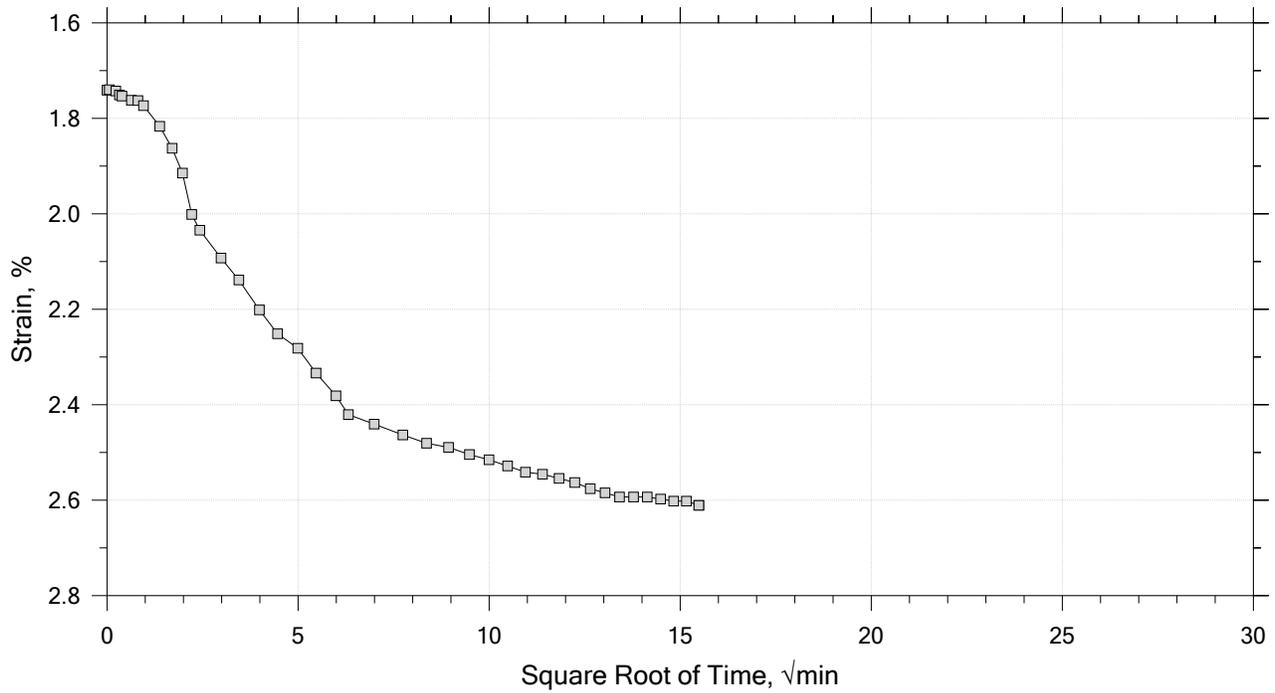
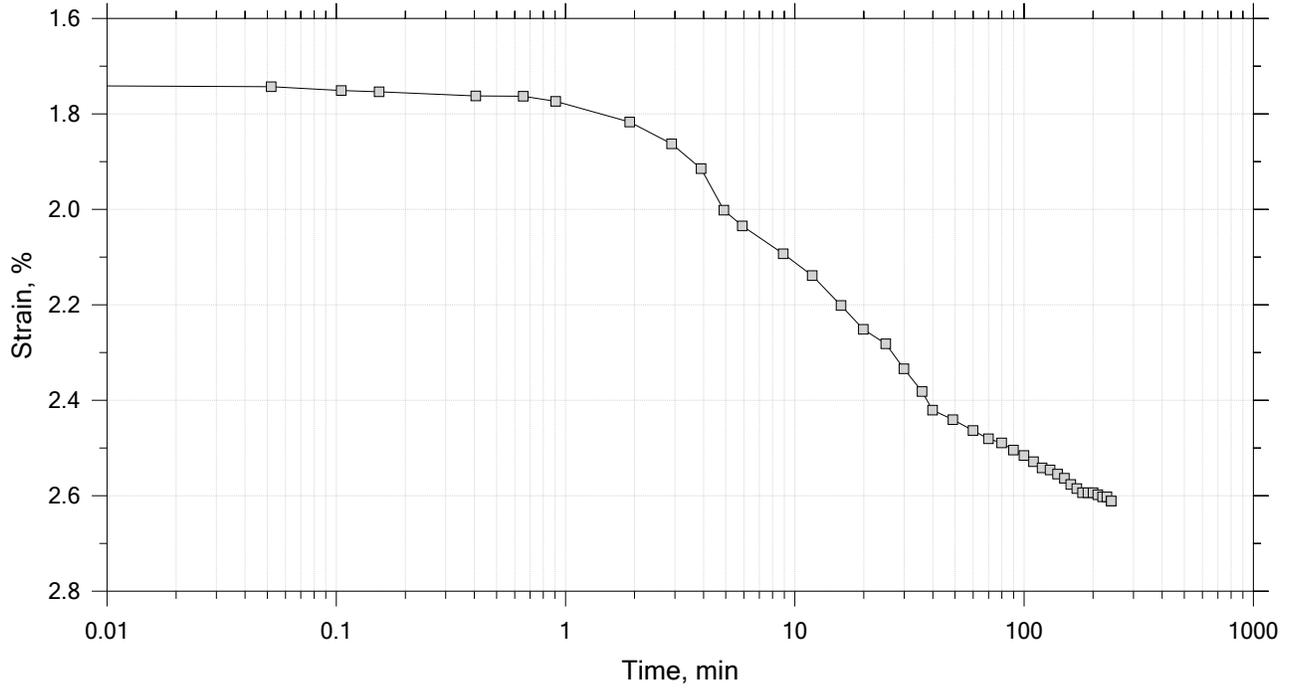
Time Curve 1 of 15
 Constant Volume Step
 Stress: 0.0675 tsf



	Project: Souadabscook West Bridges	Location: Hampden, ME	Project No.: GTX-309946
	Boring No.: BB-HSS-202	Tested By: trm	Checked By: njh
	Sample No.: U1	Test Date: 5/3/19	Depth: 17-19 ft
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, dark greenish gray clay		
	Remarks: System Y, Swell Pressure = 0.0675 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

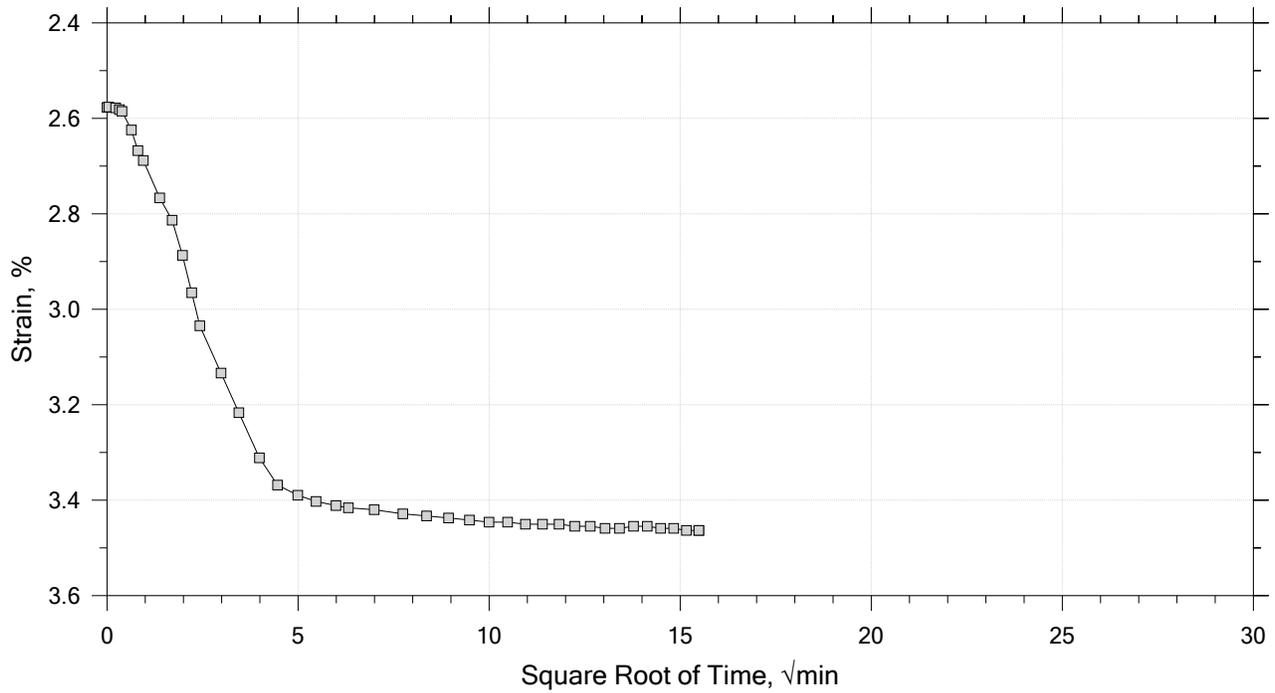
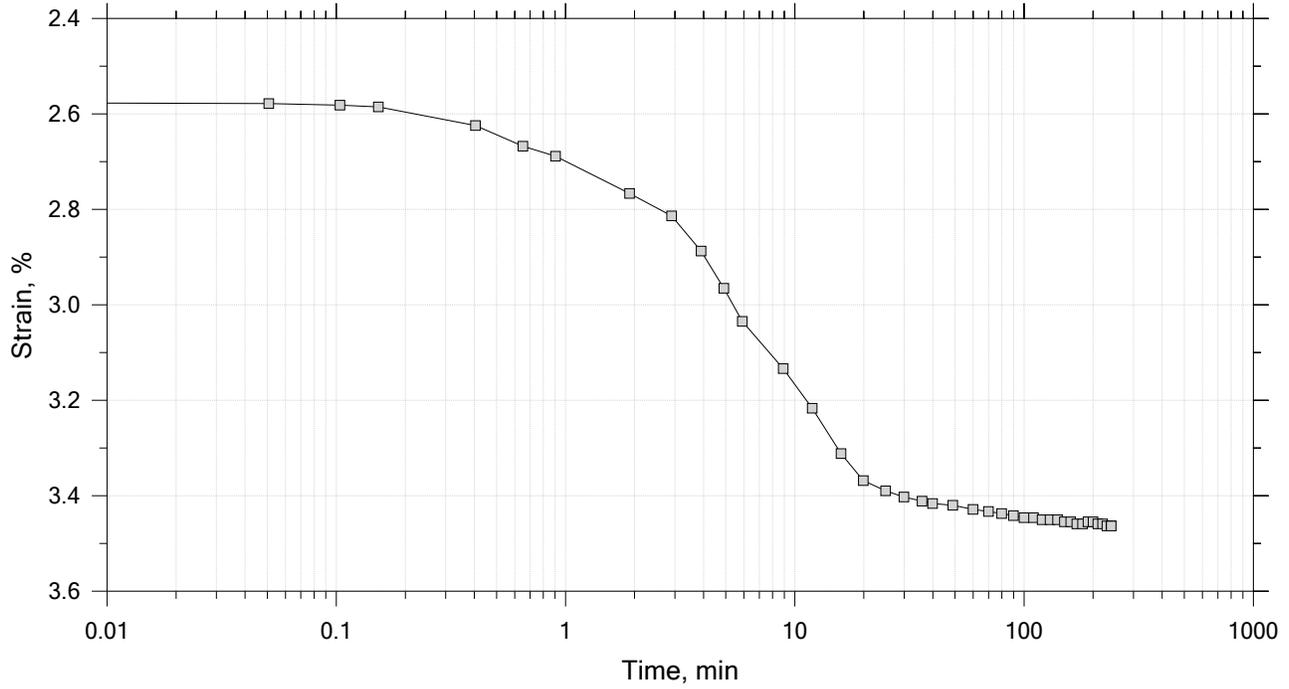
Time Curve 2 of 15
 Constant Load Step
 Stress: 0.125 tsf



	Project: Souadabscook West Bridges	Location: Hampden, ME	Project No.: GTX-309946
	Boring No.: BB-HSS-202	Tested By: trm	Checked By: njh
	Sample No.: U1	Test Date: 5/3/19	Depth: 17-19 ft
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, dark greenish gray clay		
	Remarks: System Y, Swell Pressure = 0.0675 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

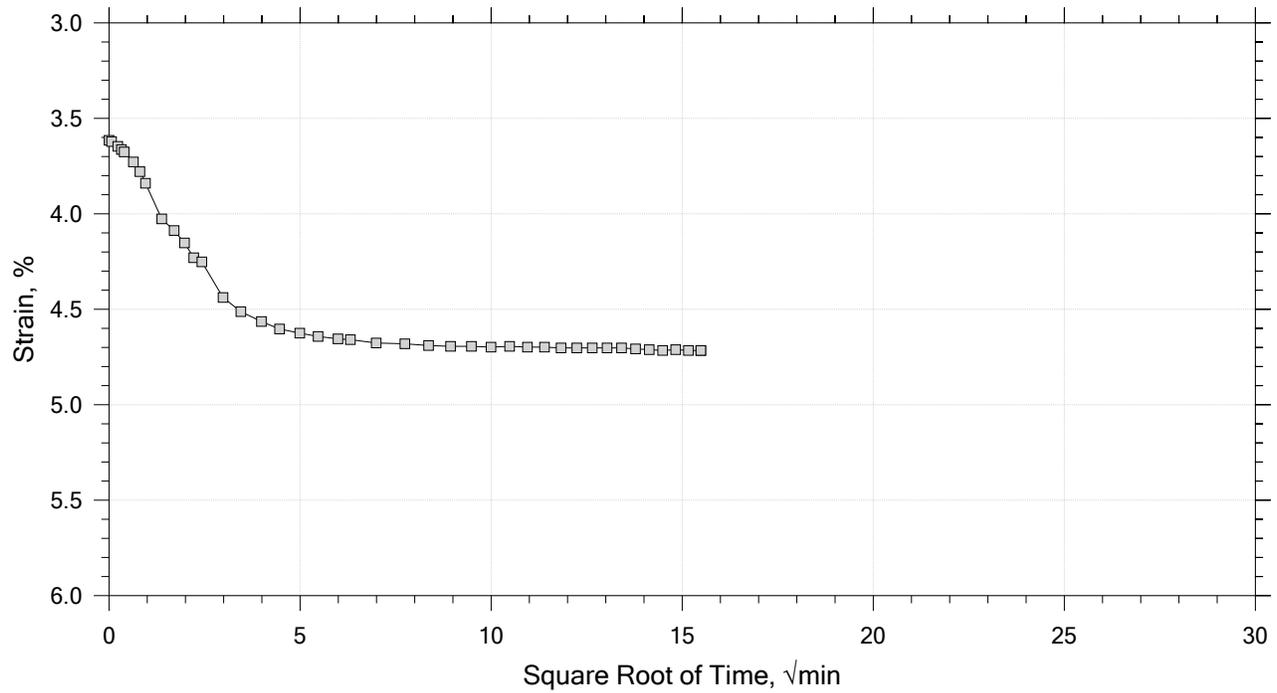
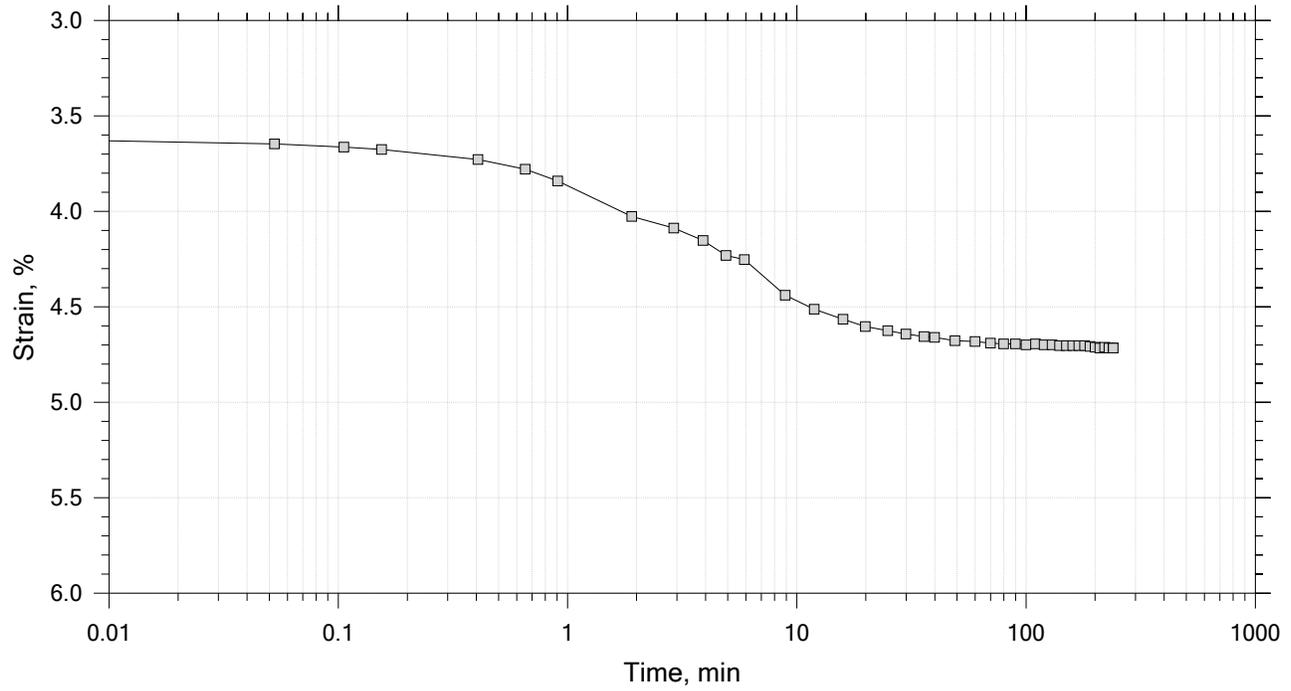
Time Curve 3 of 15
 Constant Load Step
 Stress: 0.25 tsf



	Project: Souadabscook West Bridges	Location: Hampden, ME	Project No.: GTX-309946
	Boring No.: BB-HSS-202	Tested By: trm	Checked By: njh
	Sample No.: U1	Test Date: 5/3/19	Depth: 17-19 ft
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, dark greenish gray clay		
	Remarks: System Y, Swell Pressure = 0.0675 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

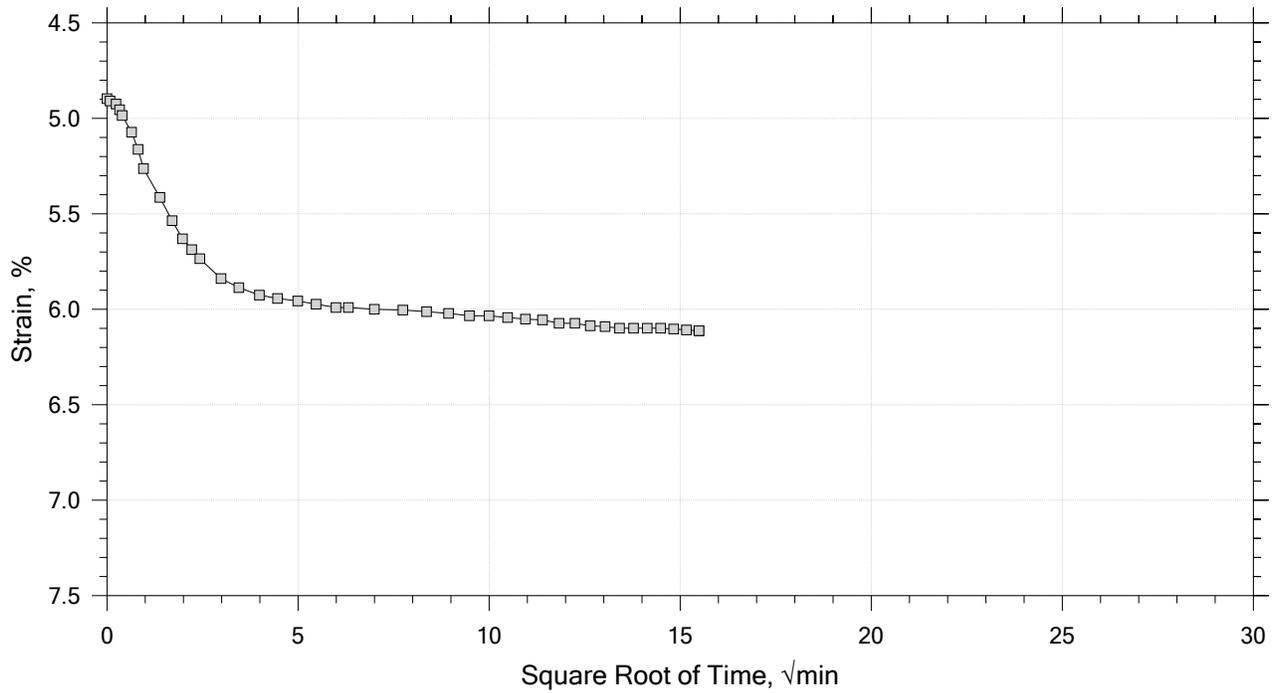
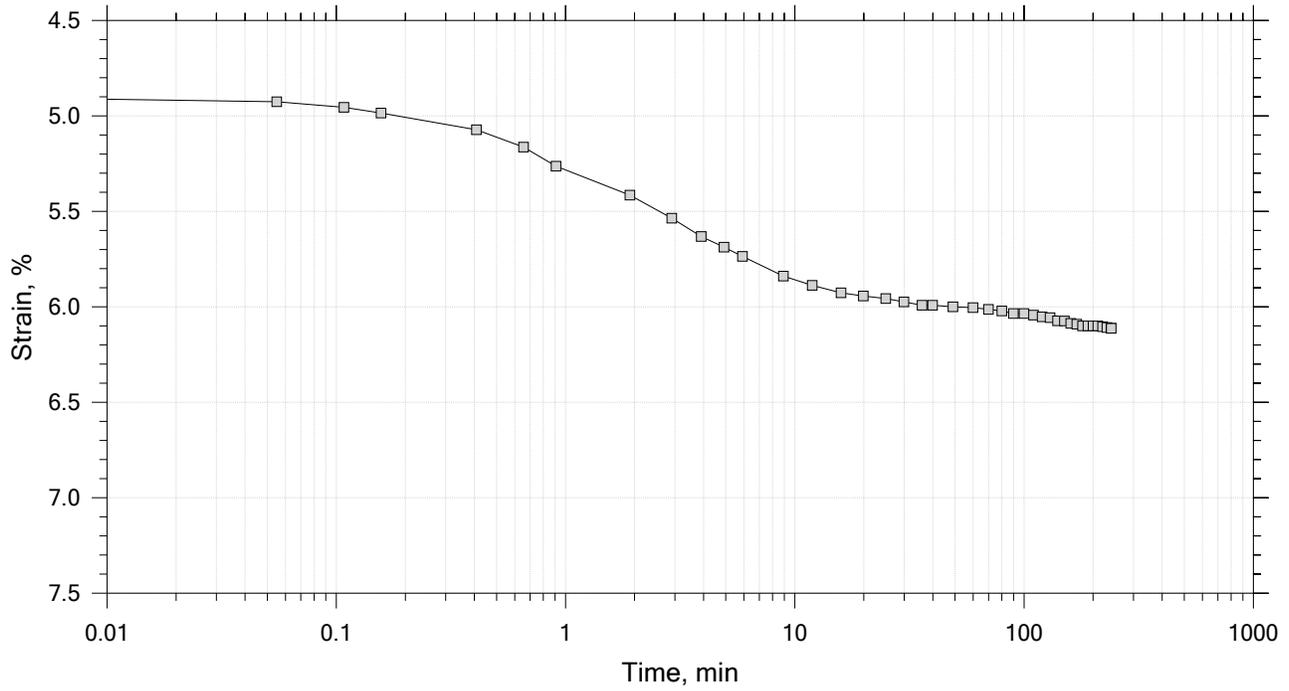
Time Curve 4 of 15
Constant Load Step
Stress: 0.5 tsf



	Project: Souadabscook West Bridges	Location: Hampden, ME	Project No.: GTX-309946
	Boring No.: BB-HSS-202	Tested By: trm	Checked By: njh
	Sample No.: U1	Test Date: 5/3/19	Depth: 17-19 ft
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, dark greenish gray clay		
	Remarks: System Y, Swell Pressure = 0.0675 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

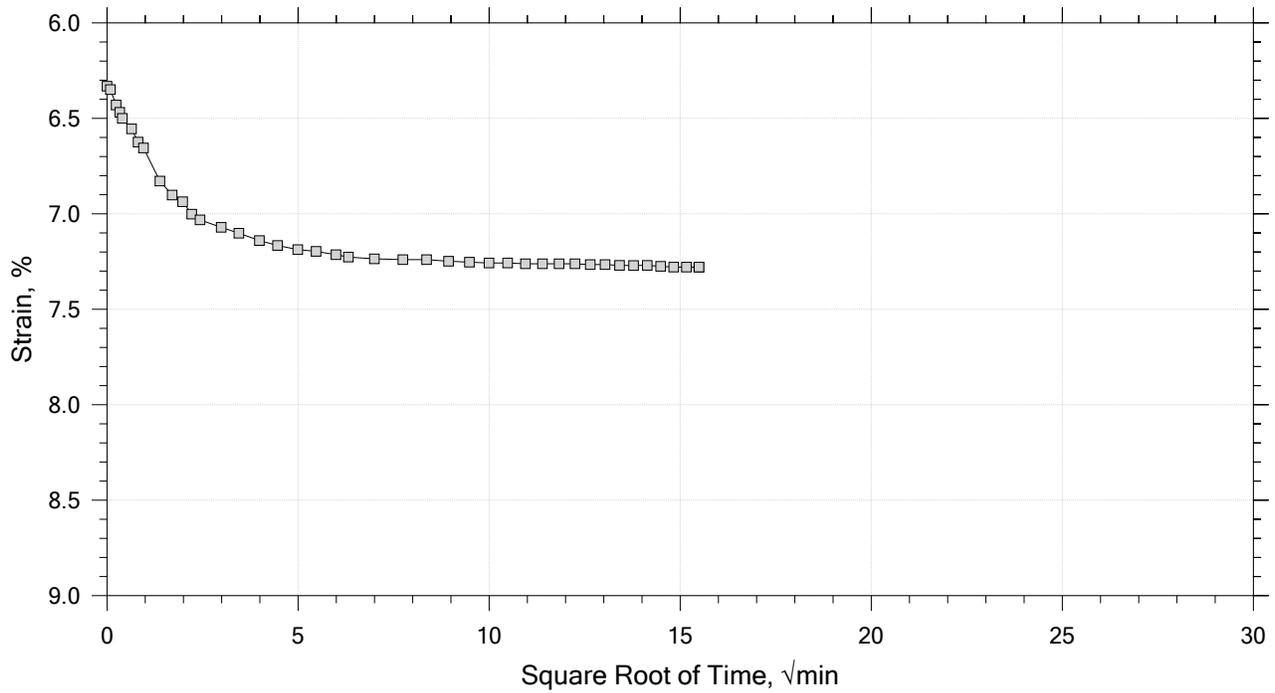
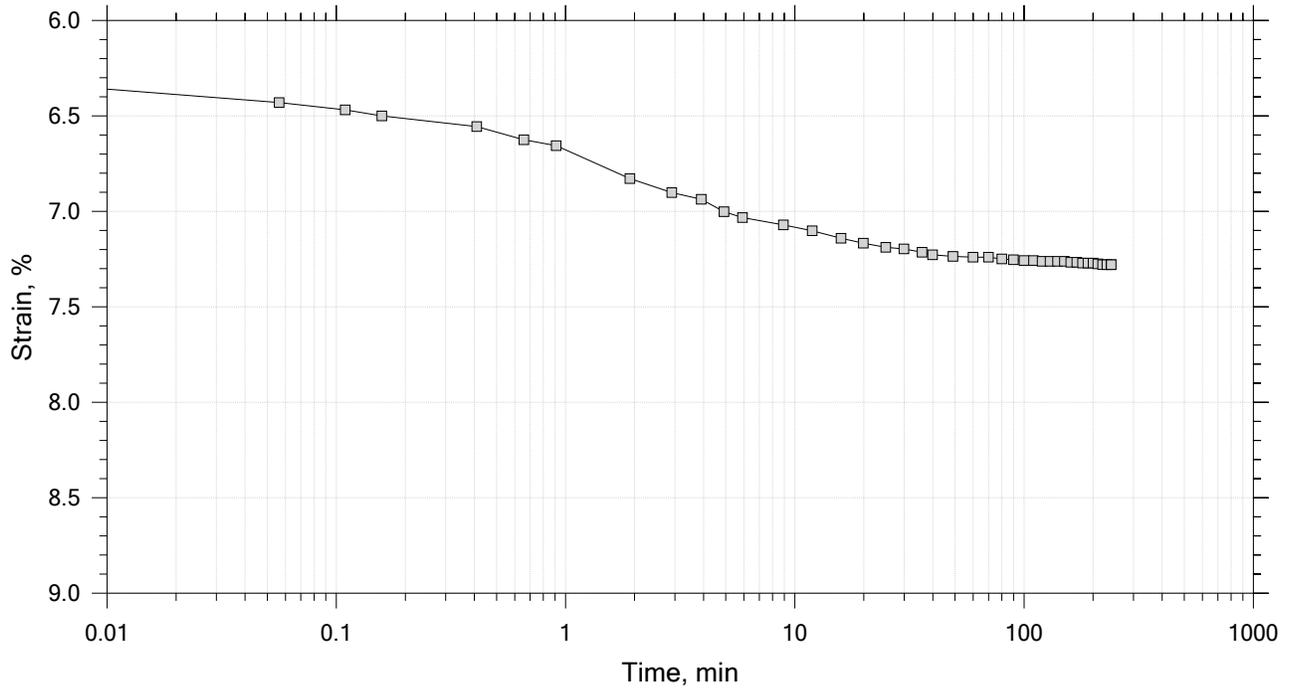
Time Curve 5 of 15
 Constant Load Step
 Stress: 1 tsf



	Project: Souadabscook West Bridges	Location: Hampden, ME	Project No.: GTX-309946
	Boring No.: BB-HSS-202	Tested By: trm	Checked By: njh
	Sample No.: U1	Test Date: 5/3/19	Depth: 17-19 ft
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, dark greenish gray clay		
	Remarks: System Y, Swell Pressure = 0.0675 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 6 of 15
Constant Load Step
Stress: 2 tsf



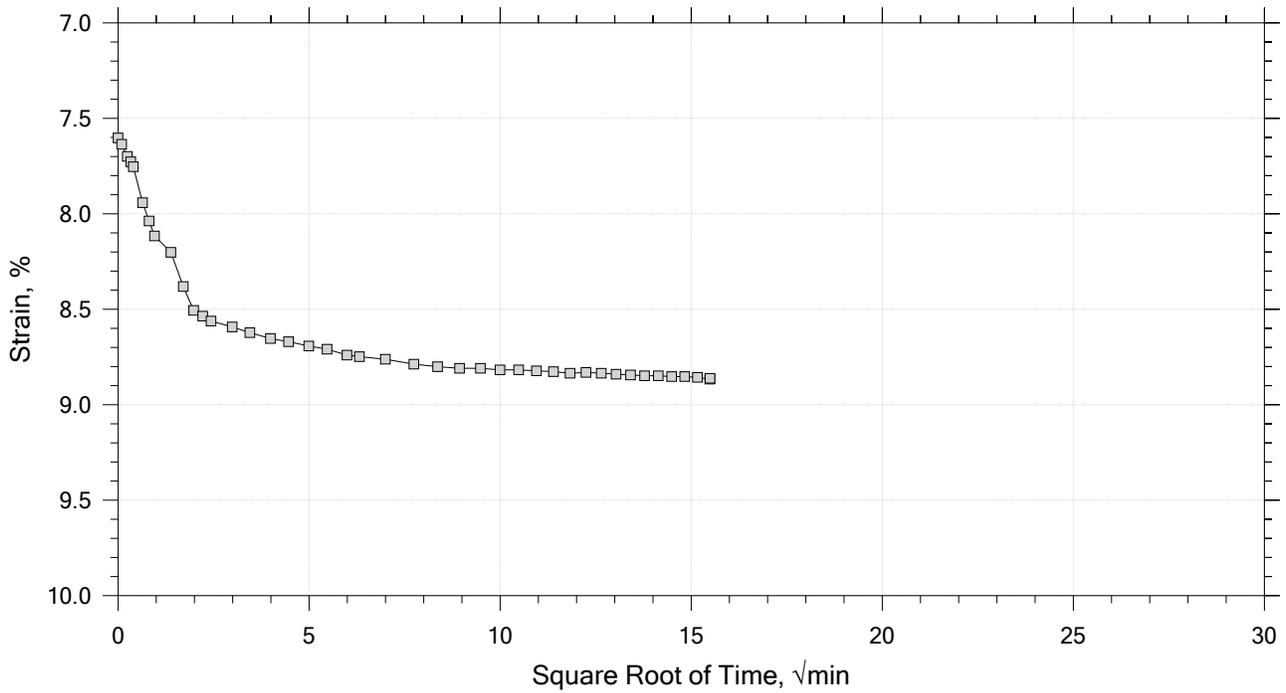
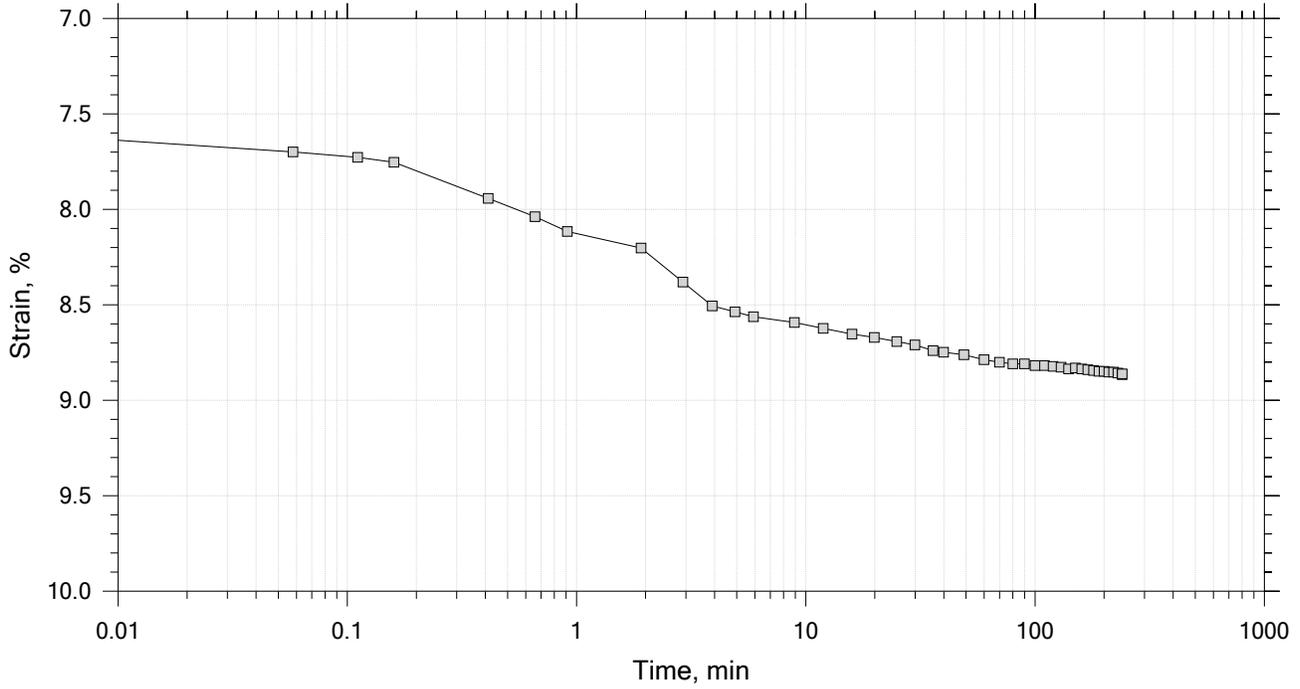
	Project: Souadabscook West Bridges	Location: Hampden, ME	Project No.: GTX-309946
	Boring No.: BB-HSS-202	Tested By: trm	Checked By: njh
	Sample No.: U1	Test Date: 5/3/19	Depth: 17-19 ft
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, dark greenish gray clay		
	Remarks: System Y, Swell Pressure = 0.0675 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 7 of 15

Constant Load Step

Stress: 4 tsf



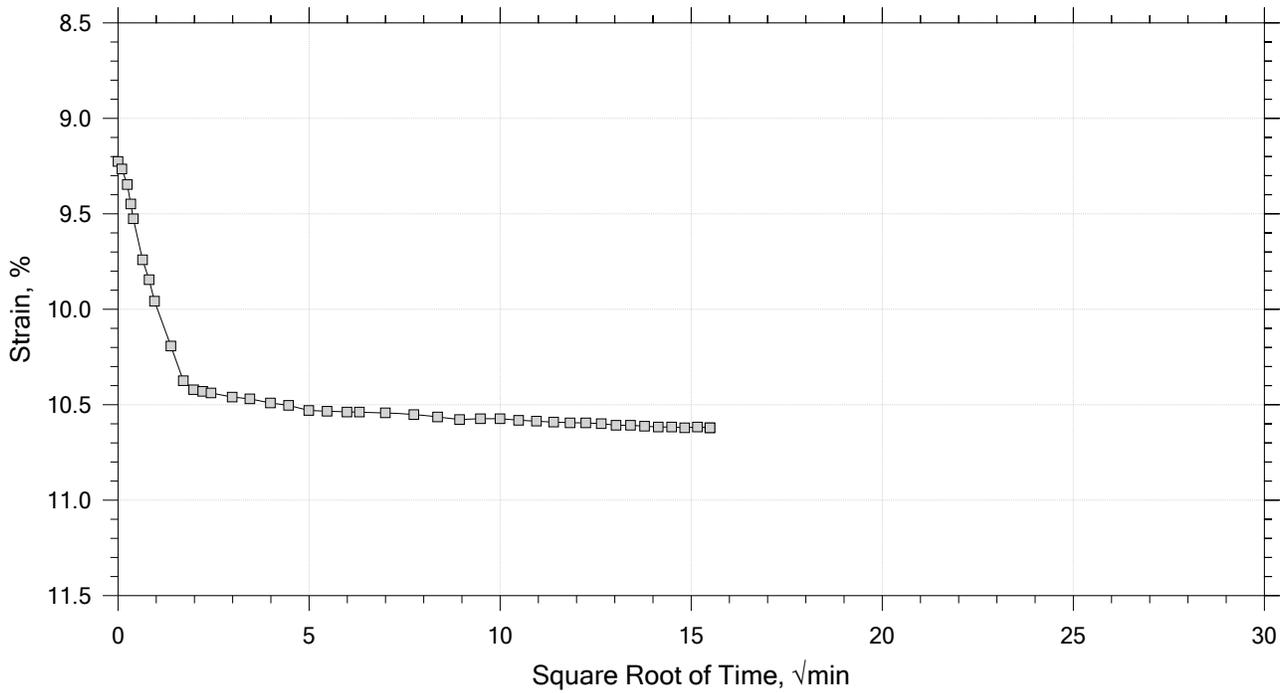
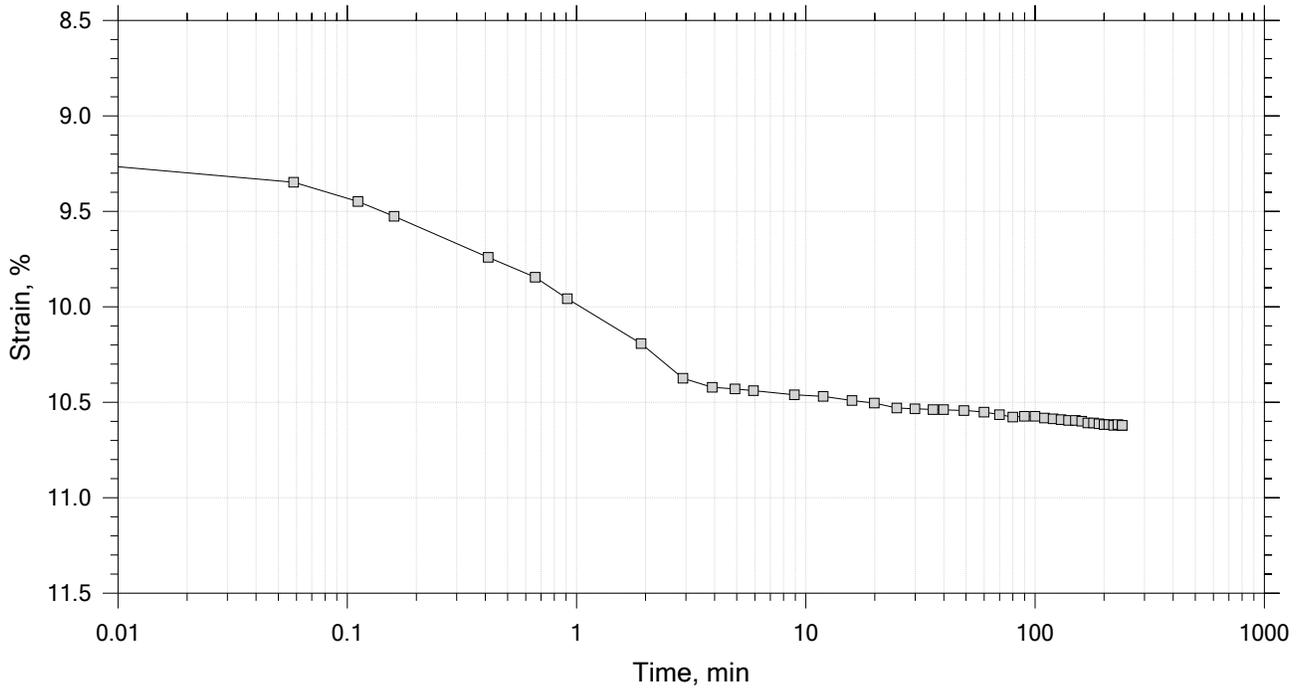
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	Boring No.: BB-HSS-202	Tested By: trm	Checked By: njh
	Sample No.: U1	Test Date: 5/3/19	Depth: 17-19 ft
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, dark greenish gray clay		
	Remarks: System Y, Swell Pressure = 0.0675 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 8 of 15

Constant Load Step

Stress: 8 tsf



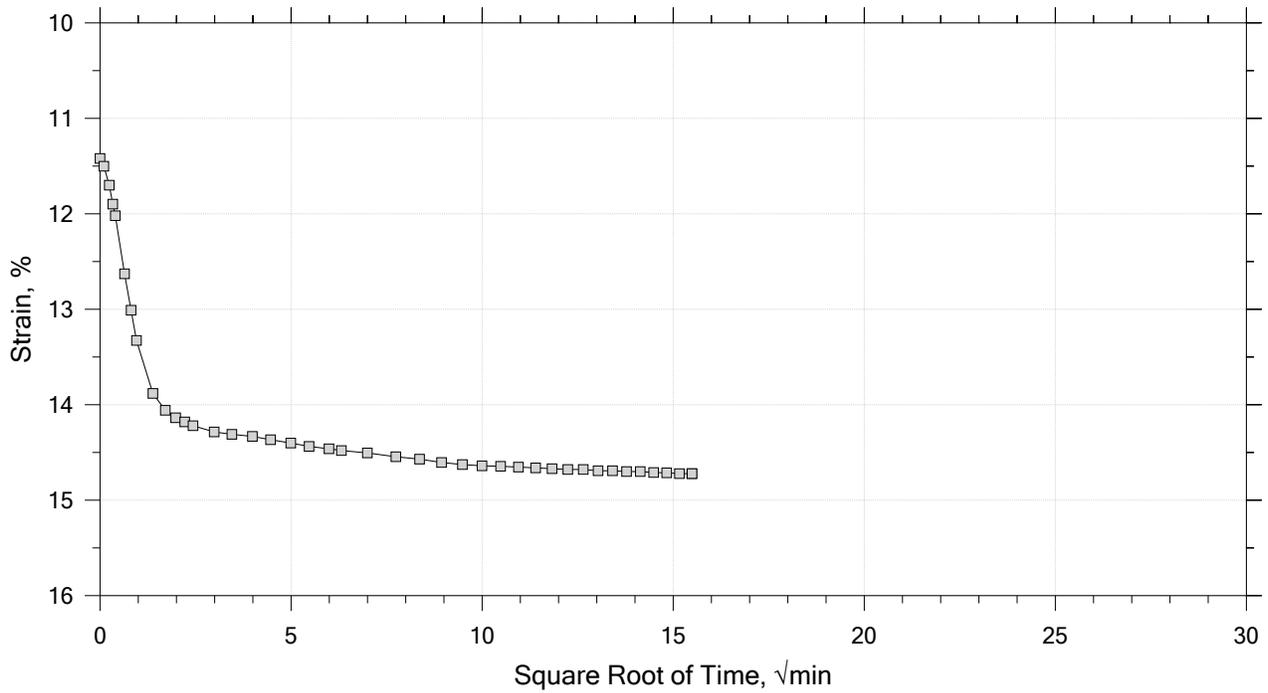
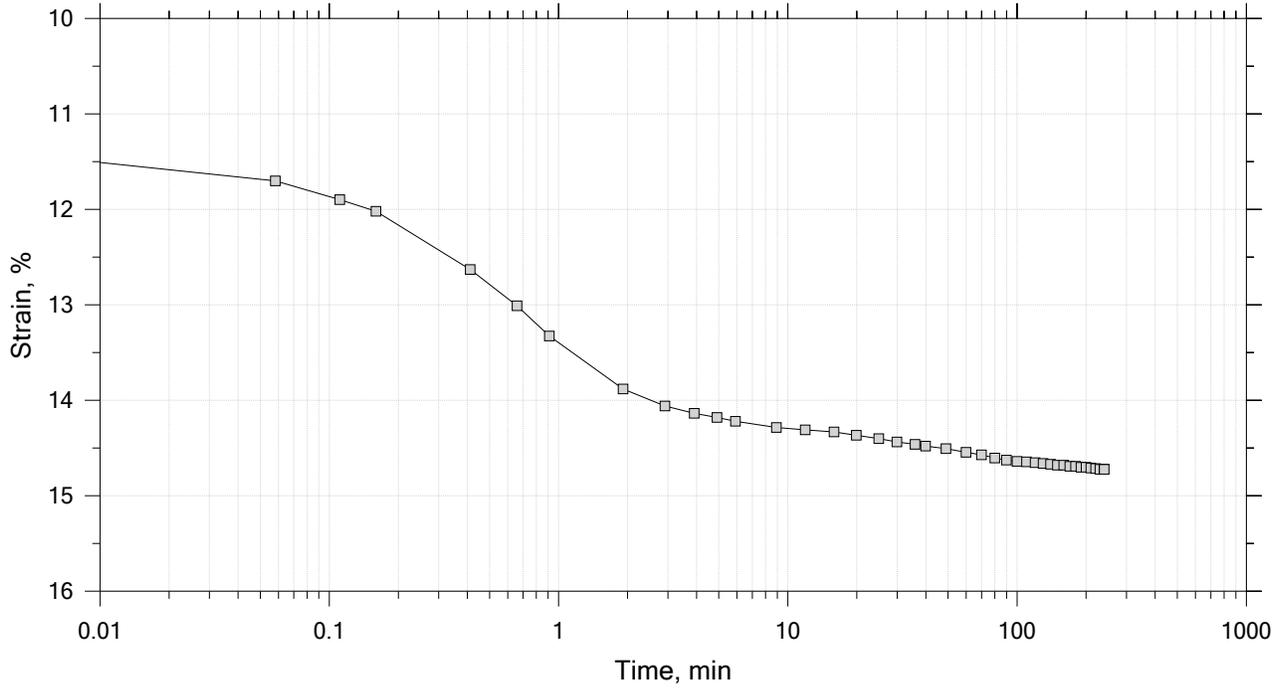
	Project: Souadabscook West Bridges	Location: Hampden, ME	Project No.: GTX-309946
	Boring No.: BB-HSS-202	Tested By: trm	Checked By: njh
	Sample No.: U1	Test Date: 5/3/19	Depth: 17-19 ft
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, dark greenish gray clay		
	Remarks: System Y, Swell Pressure = 0.0675 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 9 of 15

Constant Load Step

Stress: 16 tsf



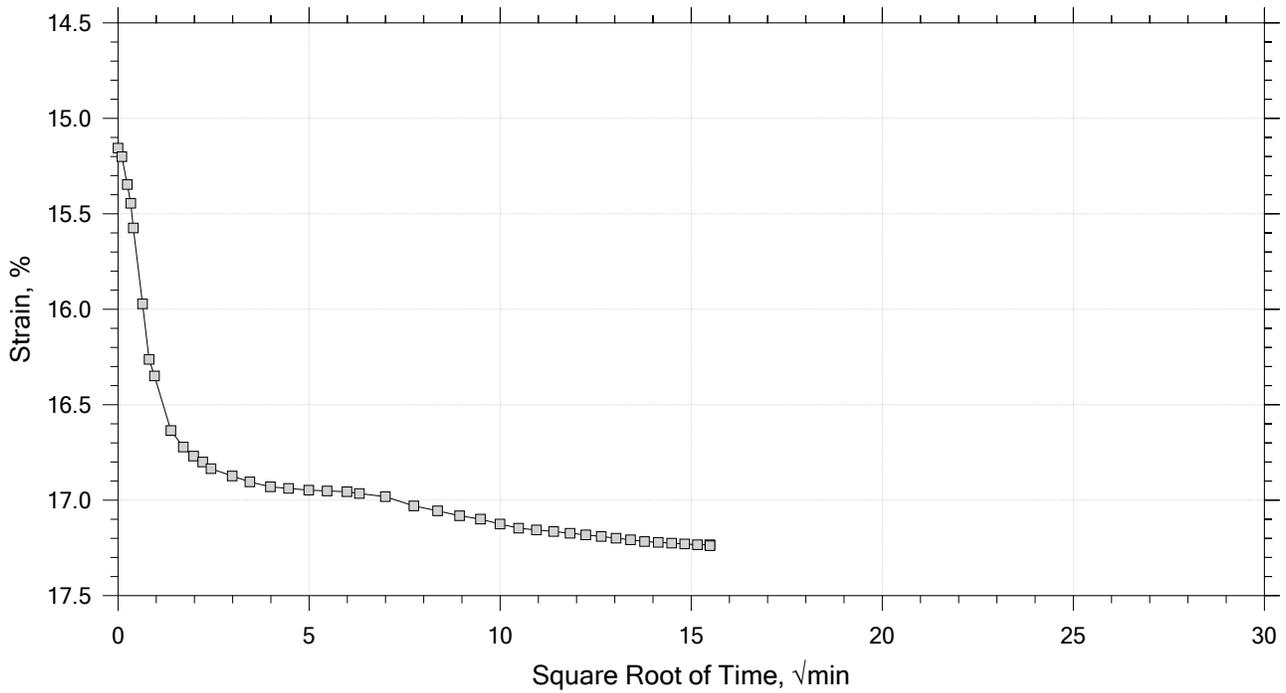
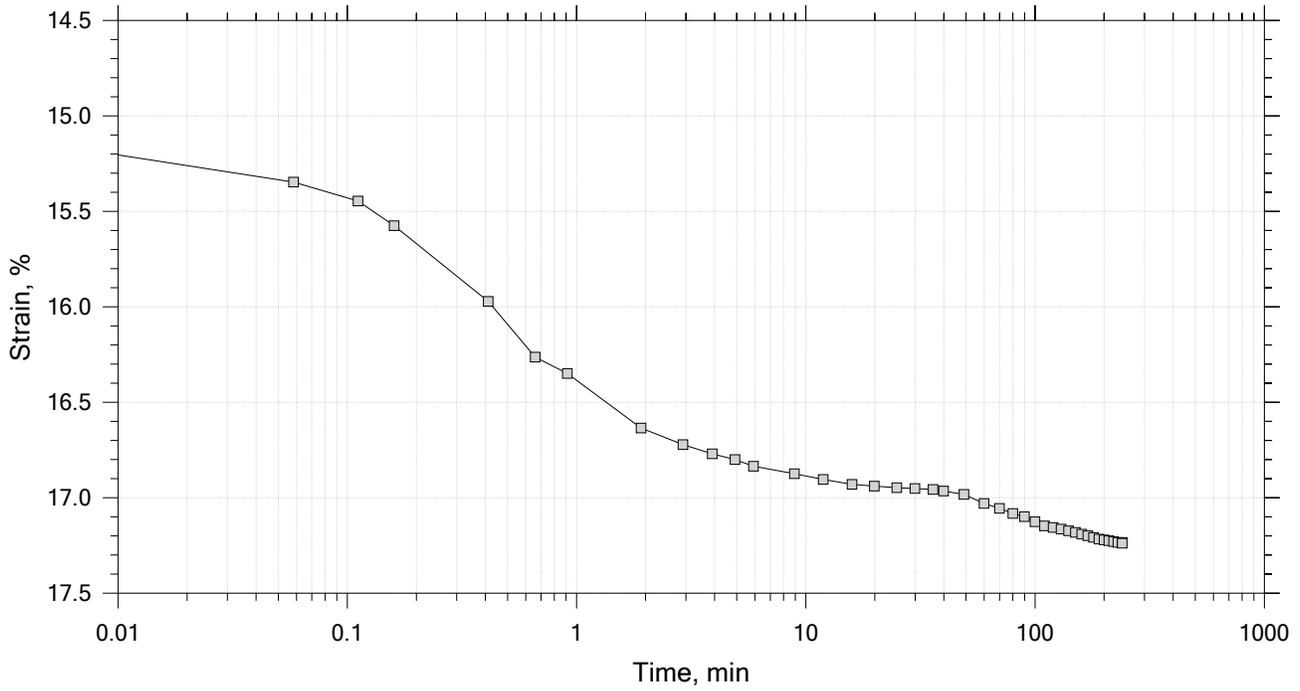
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	Boring No.: BB-HSS-202	Tested By: trm	Checked By: njh
	Sample No.: U1	Test Date: 5/3/19	Depth: 17-19 ft
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, dark greenish gray clay		
	Remarks: System Y, Swell Pressure = 0.0675 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 10 of 15

Constant Load Step

Stress: 32 tsf



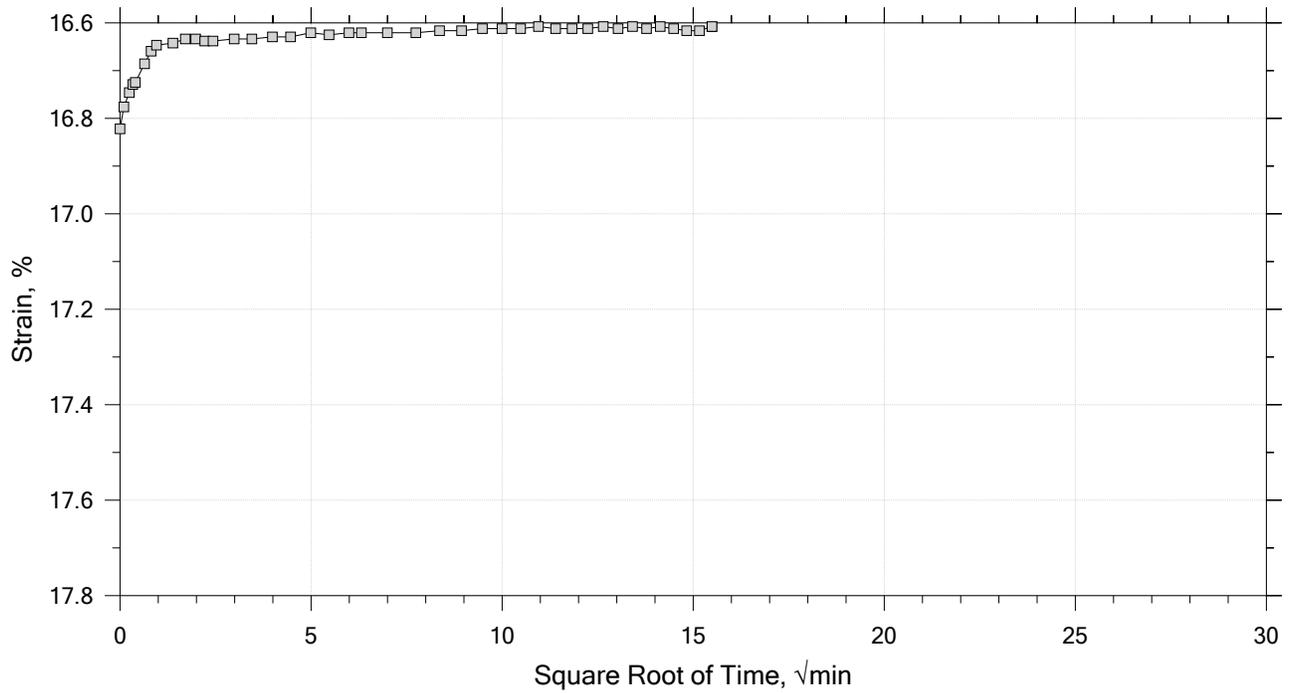
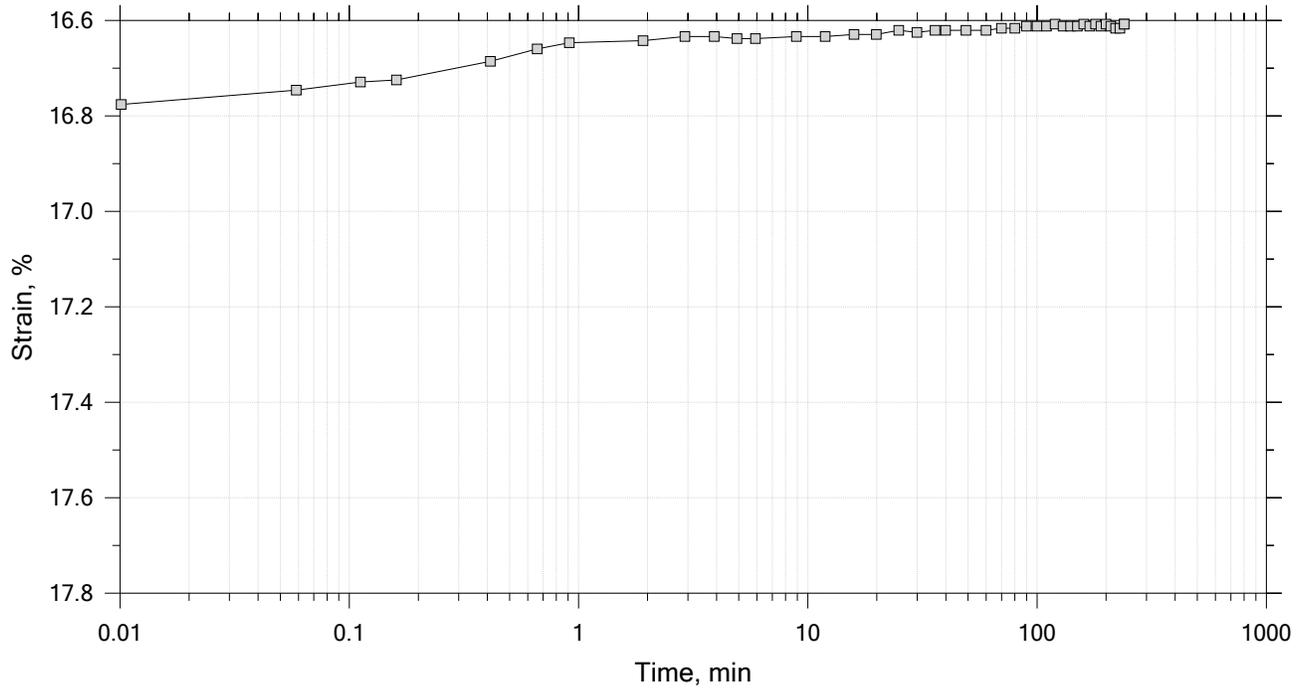
	Project: Souadabscook West Bridges	Location: Hampden, ME	Project No.: GTX-309946
	Boring No.: BB-HSS-202	Tested By: trm	Checked By: njh
	Sample No.: U1	Test Date: 5/3/19	Depth: 17-19 ft
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, dark greenish gray clay		
	Remarks: System Y, Swell Pressure = 0.0675 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 11 of 15

Constant Load Step

Stress: 8 tsf



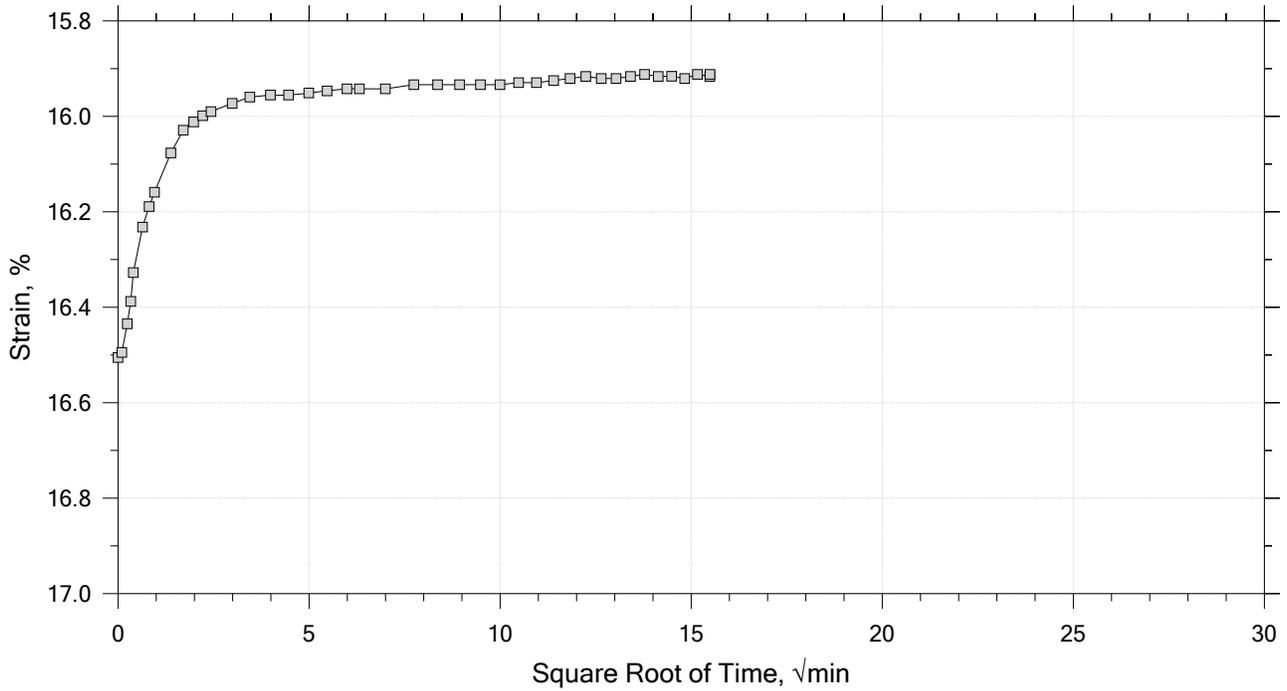
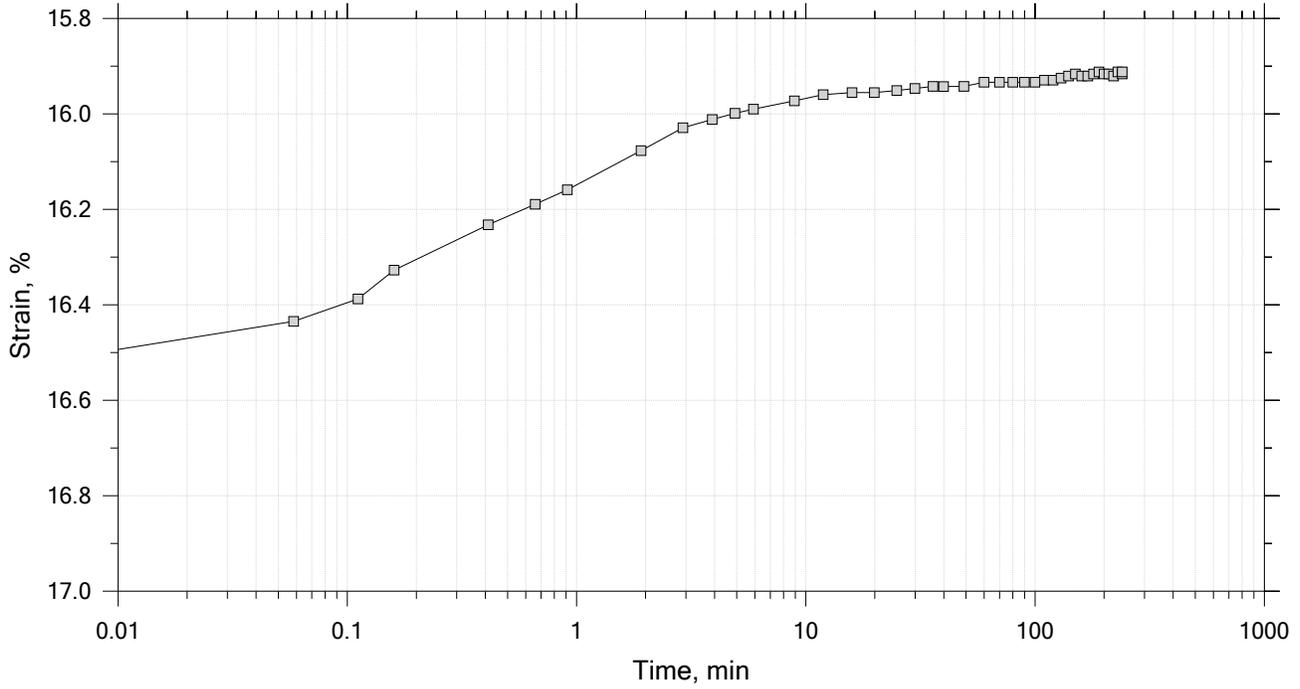
	Project: Souadabscook West Bridges	Location: Hampden, ME	Project No.: GTX-309946
	Boring No.: BB-HSS-202	Tested By: trm	Checked By: njh
	Sample No.: U1	Test Date: 5/3/19	Depth: 17-19 ft
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, dark greenish gray clay		
	Remarks: System Y, Swell Pressure = 0.0675 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 12 of 15

Constant Load Step

Stress: 2 tsf



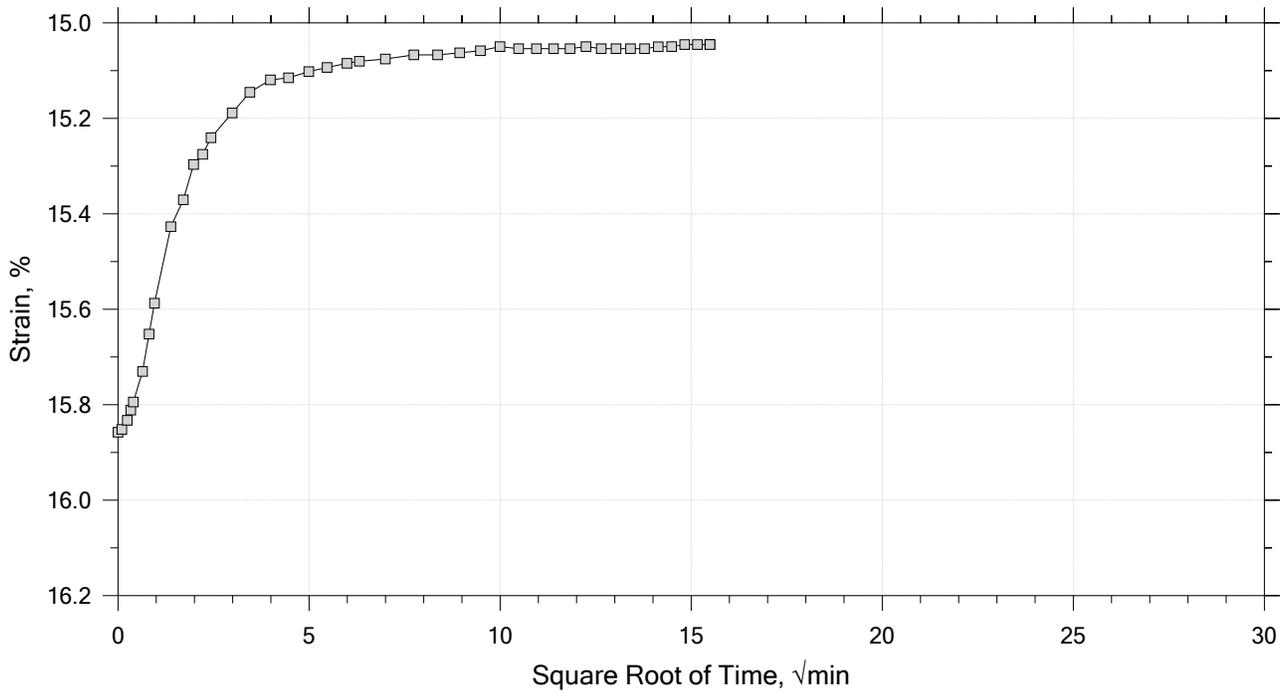
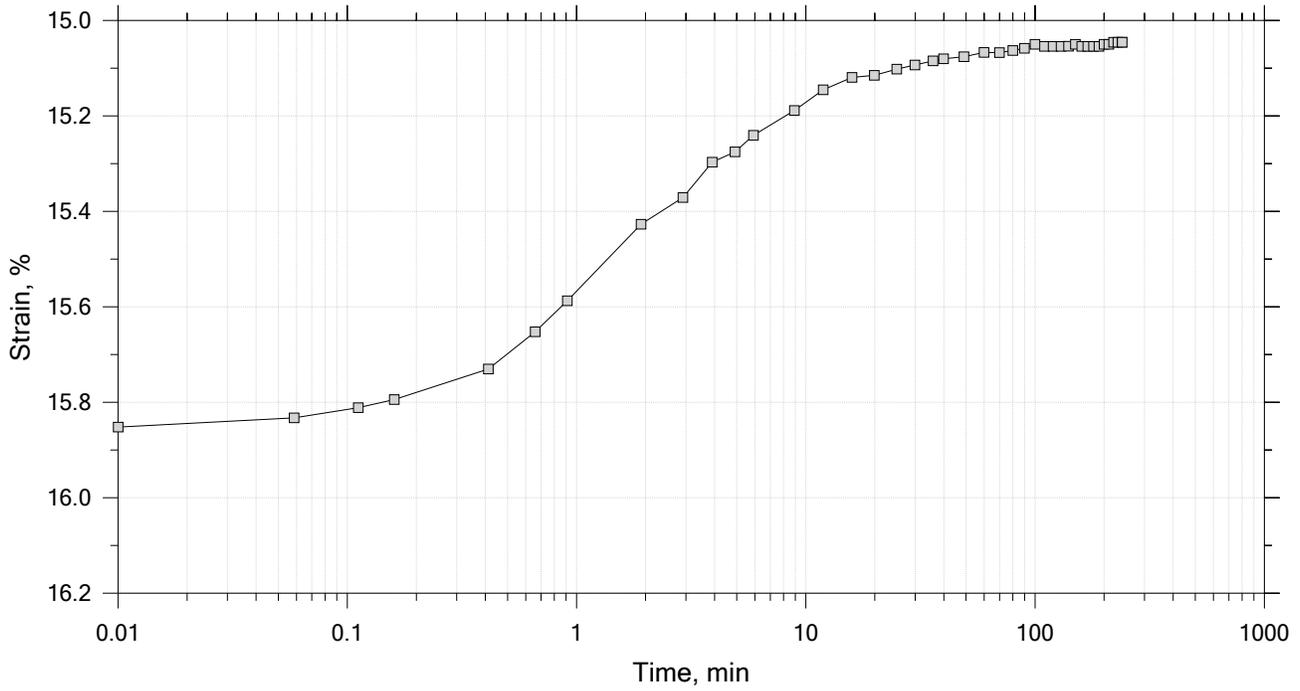
	Project: Souadabscook West Bridges	Location: Hampden, ME	Project No.: GTX-309946
	Boring No.: BB-HSS-202	Tested By: trm	Checked By: njh
	Sample No.: U1	Test Date: 5/3/19	Depth: 17-19 ft
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, dark greenish gray clay		
	Remarks: System Y, Swell Pressure = 0.0675 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 13 of 15

Constant Load Step

Stress: 0.5 tsf



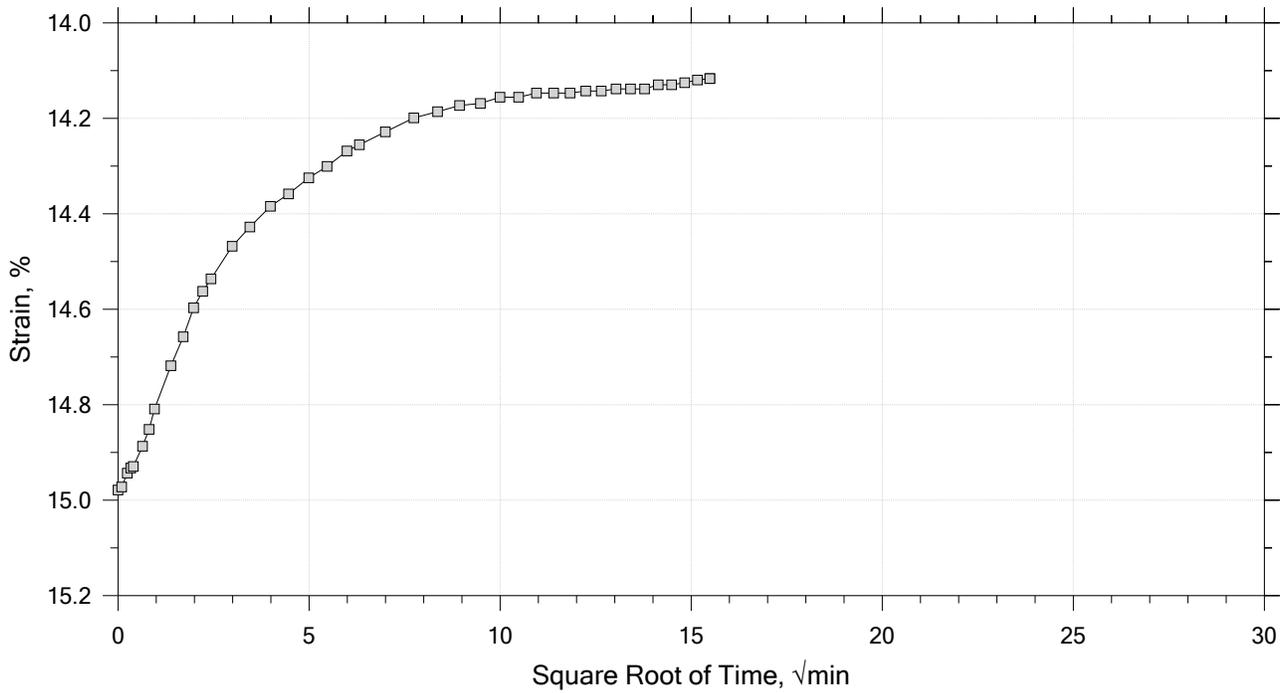
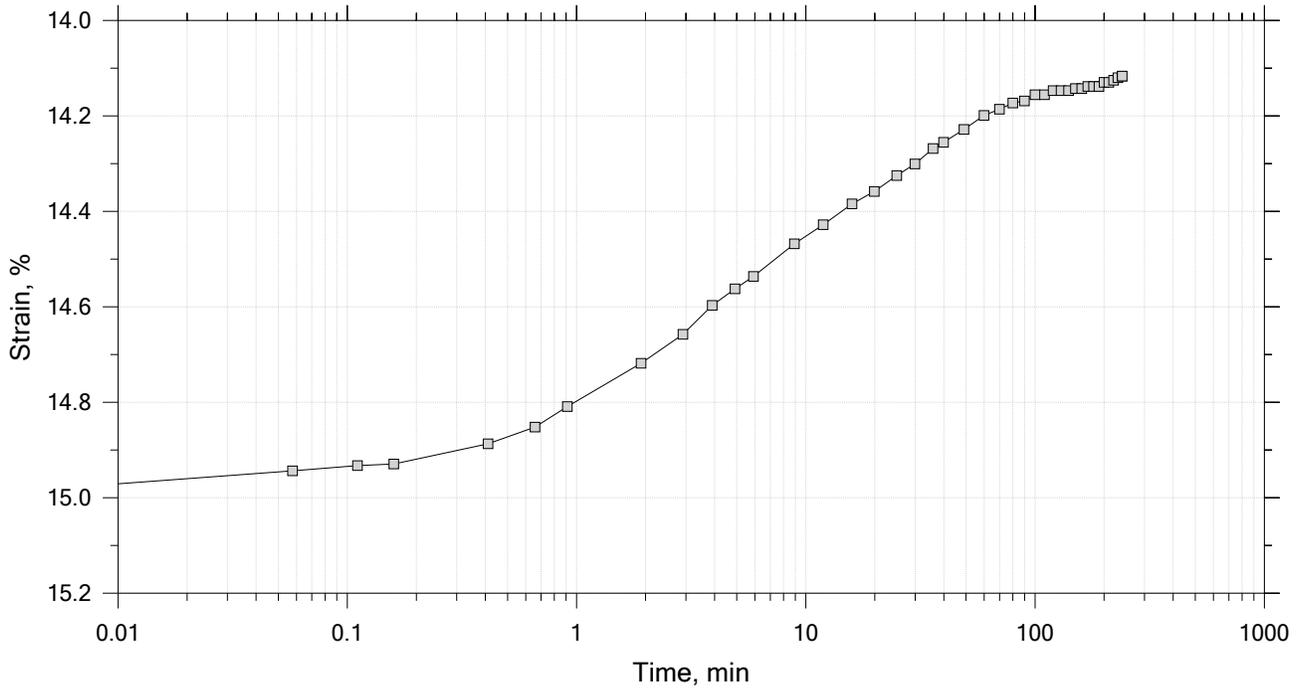
	Project: Souadabscook West Bridges	Location: Hampden, ME	Project No.: GTX-309946
	Boring No.: BB-HSS-202	Tested By: trm	Checked By: njh
	Sample No.: U1	Test Date: 5/3/19	Depth: 17-19 ft
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, dark greenish gray clay		
	Remarks: System Y, Swell Pressure = 0.0675 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 14 of 15

Constant Load Step

Stress: 0.125 tsf



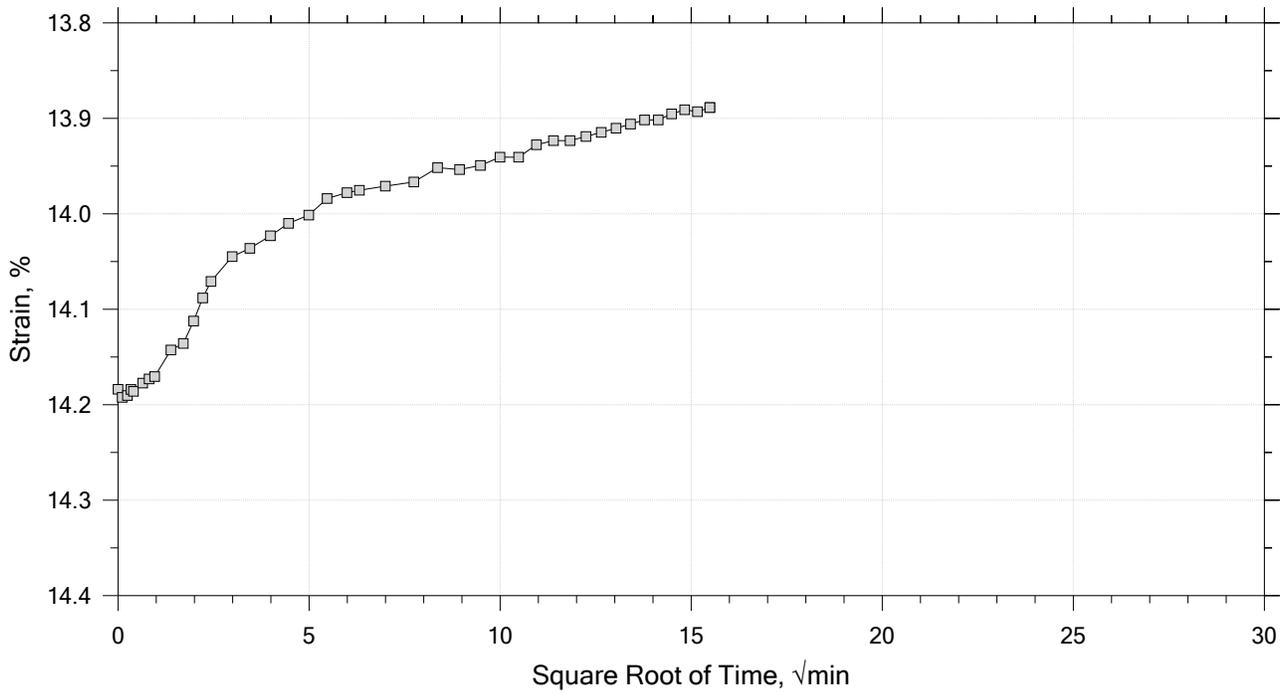
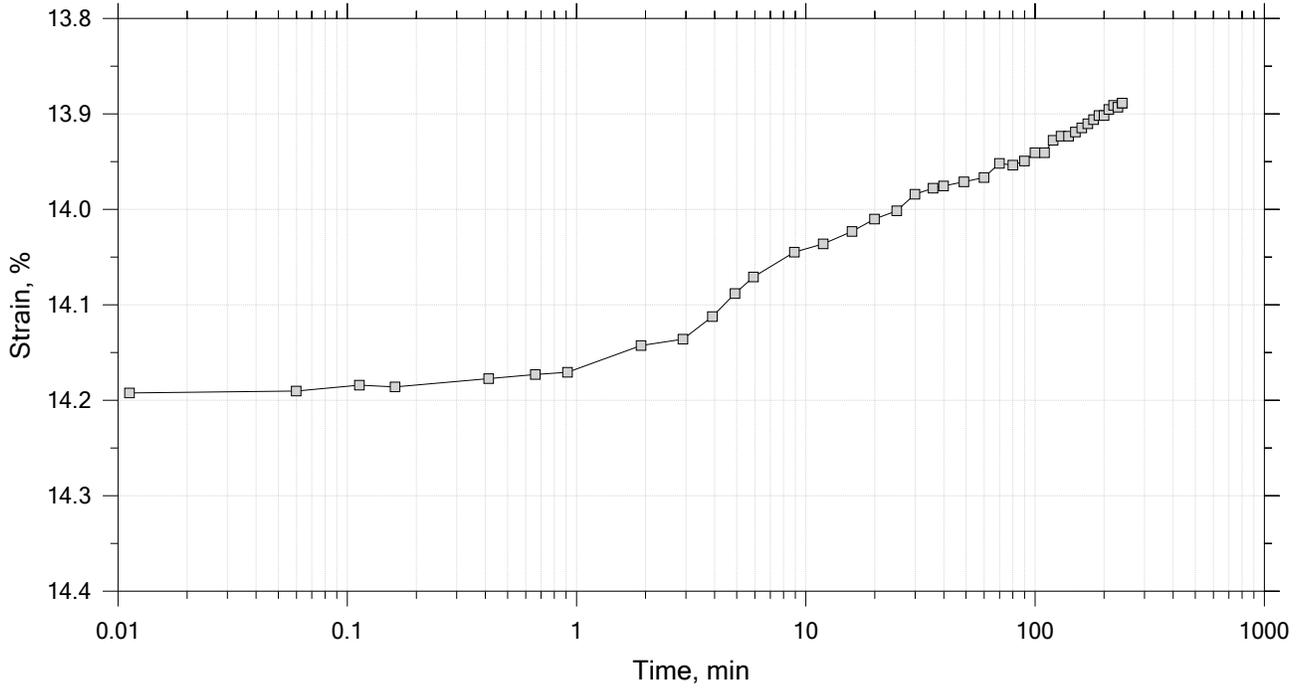
	Project: Souadabscook West Bridges	Location: Hampden, ME	Project No.: GTX-309946
	Boring No.: BB-HSS-202	Tested By: trm	Checked By: njh
	Sample No.: U1	Test Date: 5/3/19	Depth: 17-19 ft
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, dark greenish gray clay		
	Remarks: System Y, Swell Pressure = 0.0675 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 15 of 15

Constant Load Step

Stress: 0.0625 tsf



	Project: Souadabscook West Bridges	Location: Hampden, ME	Project No.: GTX-309946
	Boring No.: BB-HSS-202	Tested By: trm	Checked By: njh
	Sample No.: U1	Test Date: 5/3/19	Depth: 17-19 ft
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, dark greenish gray clay		
	Remarks: System Y, Swell Pressure = 0.0675 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Specimen Diameter: 2.50 in	Estimated Specific Gravity: 2.75	Liquid Limit: 31
Initial Height: 1.00 in	Initial Void Ratio: 0.714	Plastic Limit: 20
Final Height: 0.88 in	Final Void Ratio: 0.508	Plasticity Index: 11

	Before Test Trimmings	Before Test Specimen	After Test Specimen	After Test Trimmings
Container ID	B2327	RING		B-2271
Mass Container, gm	8.99	108	108	8.32
Mass Container + Wet Soil, gm	200.76	269.8	260.77	158.3
Mass Container + Dry Soil, gm	157.73	236.92	236.92	134.89
Mass Dry Soil, gm	148.74	128.92	128.92	126.57
Water Content, %	28.93	25.50	18.50	18.50
Void Ratio	---	0.71	0.51	---
Degree of Saturation, %	---	98.14	100.00	---
Dry Unit Weight, pcf	---	100.06	113.7	---

Note: Specific Gravity and Void Ratios are calculated assuming the degree of saturation equals 100% at the end of the test. Therefore, values may not represent actual values for the specimen.

	Project: Souadabscook West Bridges	Location: Hampden, ME	Project No.: GTX-309946
	Boring No.: BB-HSS-202	Tested By: trm	Checked By: njh
	Sample No.: U1	Test Date: 5/3/19	Depth: 17-19 ft
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, dark greenish gray clay		
	Remarks: System Y, Swell Pressure = 0.0675 tsf		

Souadabscook Stream Center



Client:	Haley & Aldrich, Inc.				
Project:	Souadabscook Center; Bridge Nos. 1432 and 5950				
Location:	Hampden, Maine	Project No:	GTX-309947		
Boring ID:	---	Sample Type:	---	Tested By:	cam
Sample ID:	---	Test Date:	05/09/19	Checked By:	bfs
Depth :	---	Test Id:	502200		

Moisture, Ash, and Organic Matter - ASTM D2974

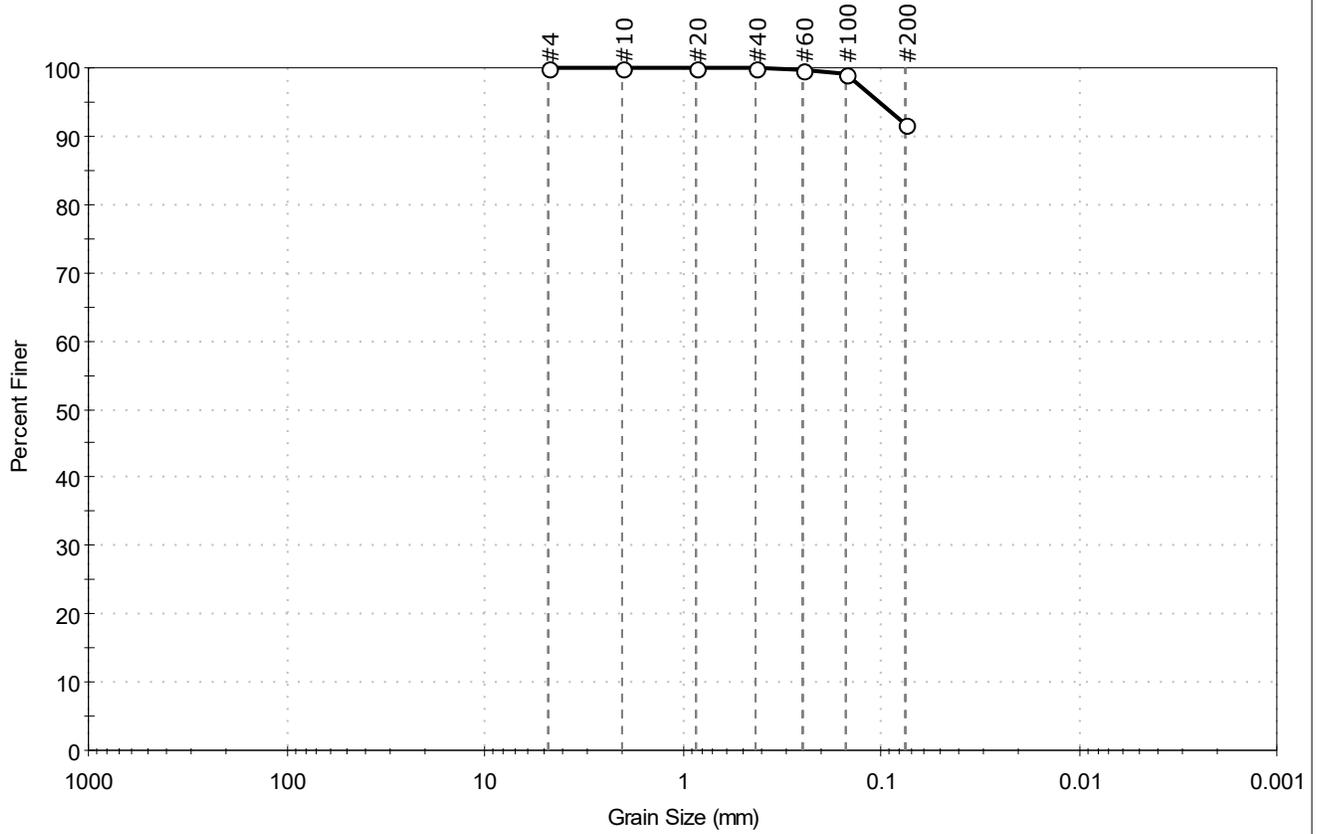
Boring ID	Sample ID	Depth	Description	Moisture Content,%	Ash Content,%	Organic Matter,%
BB-HSS-207	5D	8-10 ft	Moist, very dark brown silty sand with gravel and organics	411	38.9	61.1
BB-HSS-210	4D-B	6.7-8 ft	Moist, very dark brown sand with gravel and organics	425	39.1	60.9

Notes: Moisture content determined by Method A and reported as a percentage of oven-dried mass; dried to a constant mass at temperature of 105° C
Ash content and organic matter determined by Method C; dried to constant mass at temperature 440° C



Client:	Haley & Aldrich, Inc.		
Project:	Souadabscook Center; Bridge Nos. 1432 and 5950		
Location:	Hampden, Maine	Project No:	GTX-309947
Boring ID:	BB-HSS-206	Sample Type:	jar
Sample ID:	4D	Test Date:	05/15/19
Depth :	10-12 ft	Test Id:	502195
Test Comment:	---		
Visual Description:	Moist, olive brown silt		
Sample Comment:	---		

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	0.0	8.2	91.8

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	100		
#60	0.25	100		
#100	0.15	99		
#200	0.075	92		

<u>Coefficients</u>	
D ₈₅ = N/A	D ₃₀ = N/A
D ₆₀ = N/A	D ₁₅ = N/A
D ₅₀ = N/A	D ₁₀ = N/A
C _u = N/A	C _c = N/A

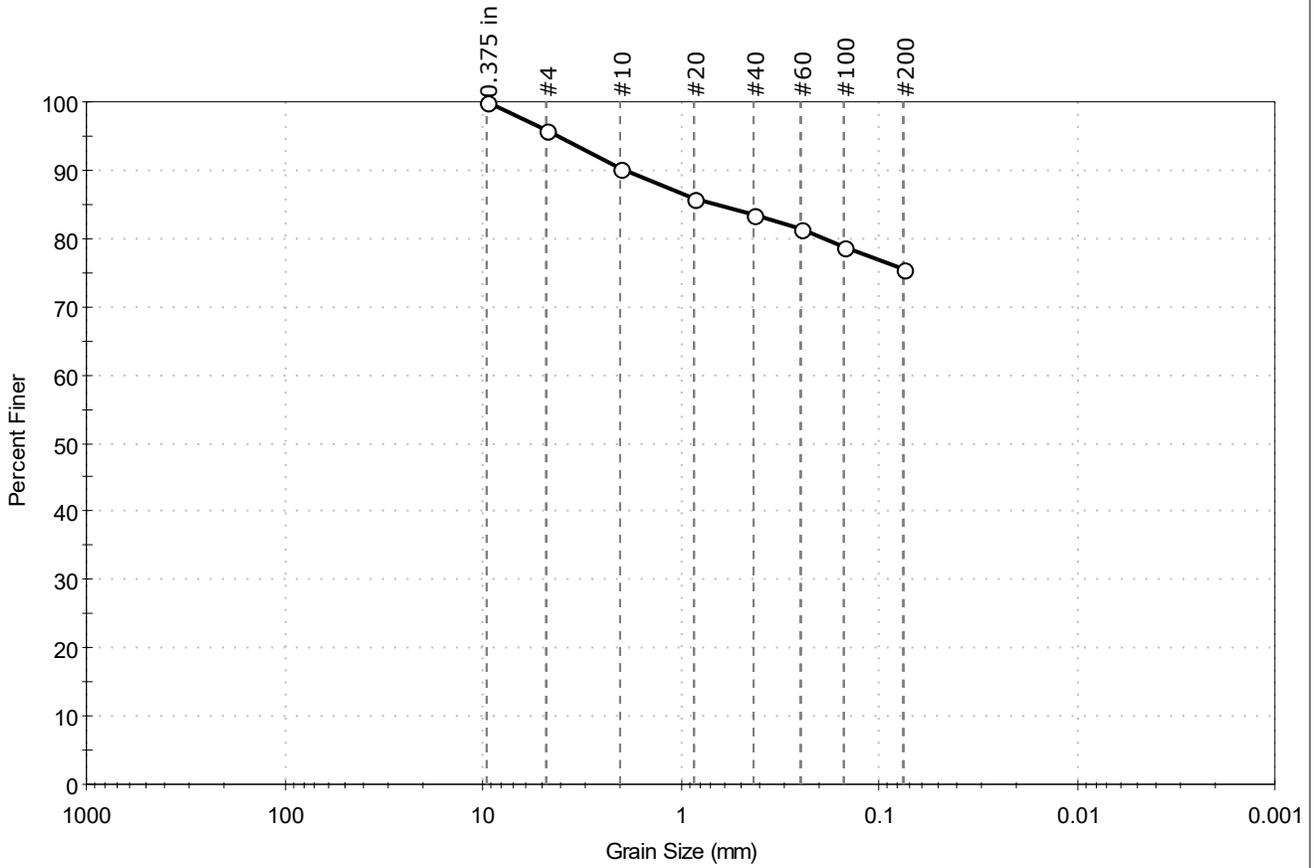
<u>Classification</u>	
ASTM	N/A
AASHTO	Silty Soils (A-4 (0))

<u>Sample/Test Description</u>
Sand/Gravel Particle Shape : ---
Sand/Gravel Hardness : ---



Client:	Haley & Aldrich, Inc.		
Project:	Souadabscook Center; Bridge Nos. 1432 and 5950		
Location:	Hampden, Maine	Project No:	GTX-309947
Boring ID:	BB-HSS-207	Sample Type:	jar
Sample ID:	1D	Test Date:	05/15/19
Depth :	0-2 ft	Test Id:	502196
Test Comment:	---		
Visual Description:	Moist, greenish gray silt with sand		
Sample Comment:	---		

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	4.2	20.2	75.6

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
0.375 in	9.50	100		
#4	4.75	96		
#10	2.00	90		
#20	0.85	86		
#40	0.42	84		
#60	0.25	81		
#100	0.15	79		
#200	0.075	76		

<u>Coefficients</u>	
D ₈₅ = 0.6441 mm	D ₃₀ = N/A
D ₆₀ = N/A	D ₁₅ = N/A
D ₅₀ = N/A	D ₁₀ = N/A
C _u = N/A	C _c = N/A

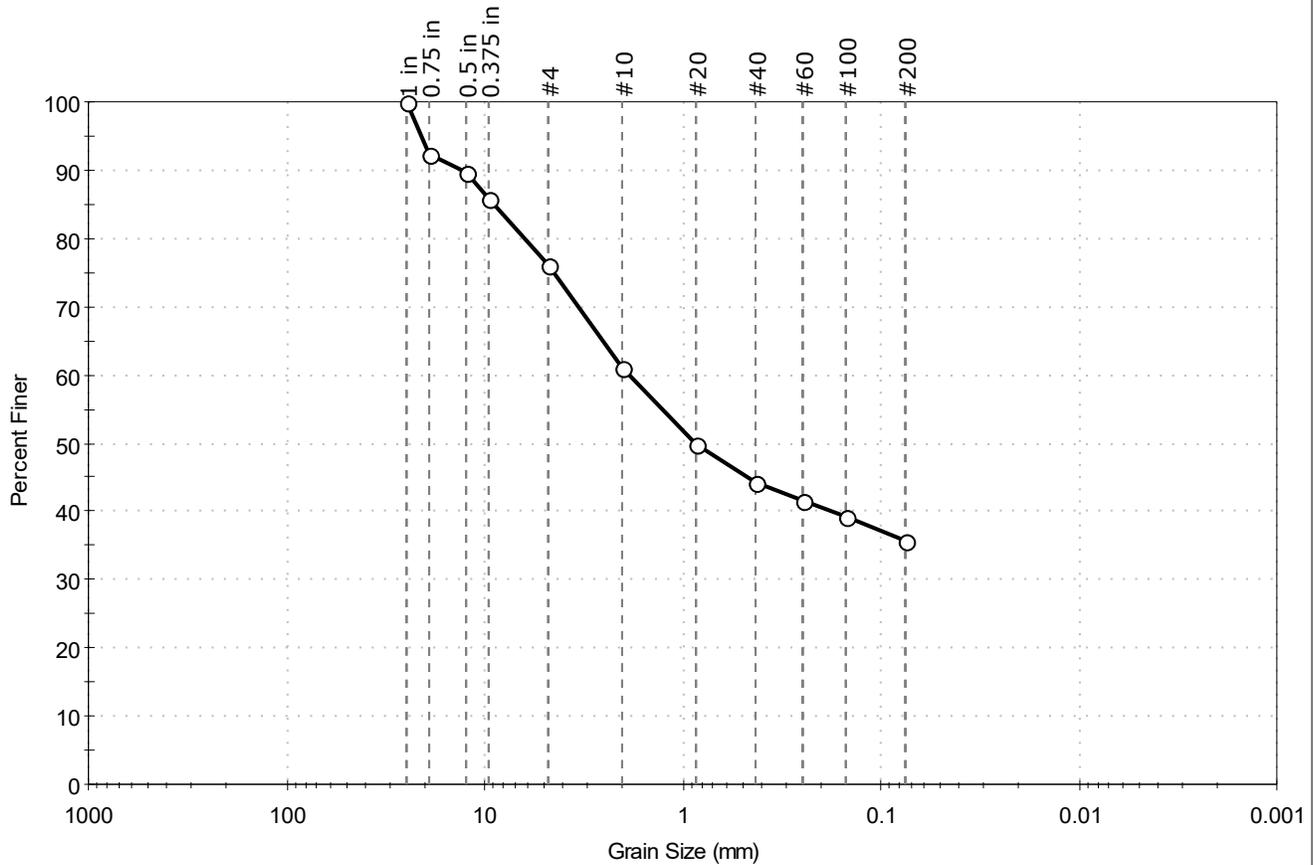
<u>Classification</u>	
ASTM	N/A
AASHTO	Silty Soils (A-4 (0))

<u>Sample/Test Description</u>
Sand/Gravel Particle Shape : ANGULAR
Sand/Gravel Hardness : HARD



Client:	Haley & Aldrich, Inc.		
Project:	Souadabscook Center; Bridge Nos. 1432 and 5950		
Location:	Hampden, Maine	Project No:	GTX-309947
Boring ID:	BB-HSS-208	Sample Type:	jar
Sample ID:	3D	Test Date:	05/15/19
Depth :	4-6 ft	Test Id:	502197
Test Comment:	---		
Visual Description:	Moist, olive brown silty sand with gravel		
Sample Comment:	---		

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	23.9	40.5	35.6

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
1 in	25.00	100		
0.75 in	19.00	92		
0.5 in	12.50	90		
0.375 in	9.50	86		
#4	4.75	76		
#10	2.00	61		
#20	0.85	50		
#40	0.42	44		
#60	0.25	41		
#100	0.15	39		
#200	0.075	36		

<u>Coefficients</u>	
D ₈₅ = 8.9016 mm	D ₃₀ = N/A
D ₆₀ = 1.8382 mm	D ₁₅ = N/A
D ₅₀ = 0.8664 mm	D ₁₀ = N/A
C _u = N/A	C _c = N/A

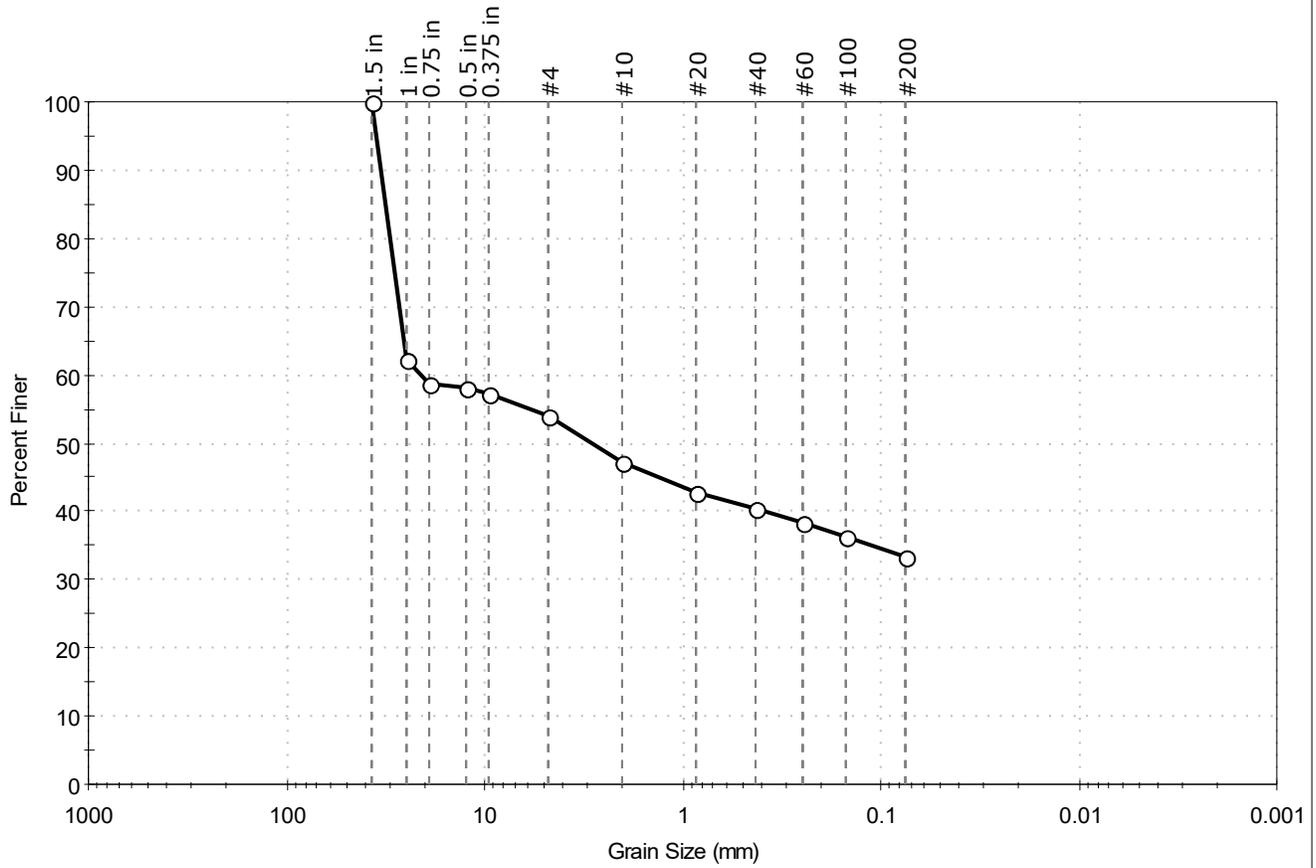
<u>Classification</u>	
ASTM	N/A
AASHTO	Silty Soils (A-4 (0))

<u>Sample/Test Description</u>
Sand/Gravel Particle Shape : ANGULAR
Sand/Gravel Hardness : HARD



Client: Haley & Aldrich, Inc.
 Project: Souadabscook Center; Bridge Nos. 1432 and 5950
 Location: Hampden, Maine
 Project No: GTX-309947
 Boring ID: BB-HSS-209
 Sample Type: jar
 Tested By: ckg
 Sample ID: 17D
 Test Date: 05/15/19
 Checked By: bfs
 Depth: 40-42 ft
 Test Id: 502198
 Test Comment: ---
 Visual Description: Moist, olive yellow silty gravel with sand
 Sample Comment: ---

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	46.0	20.7	33.3

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
1.5 in	37.50	100		
1 in	25.00	62		
0.75 in	19.00	59		
0.5 in	12.50	58		
0.375 in	9.50	57		
#4	4.75	54		
#10	2.00	47		
#20	0.85	43		
#40	0.42	40		
#60	0.25	38		
#100	0.15	36		
#200	0.075	33		

Coefficients

D ₈₅ = 31.9145 mm	D ₃₀ = N/A
D ₆₀ = 20.9451 mm	D ₁₅ = N/A
D ₅₀ = 2.8244 mm	D ₁₀ = N/A
C _u = N/A	C _c = N/A

Classification

ASTM N/A

AASHTO Silty Gravel and Sand (A-2-4 (0))

Sample/Test Description

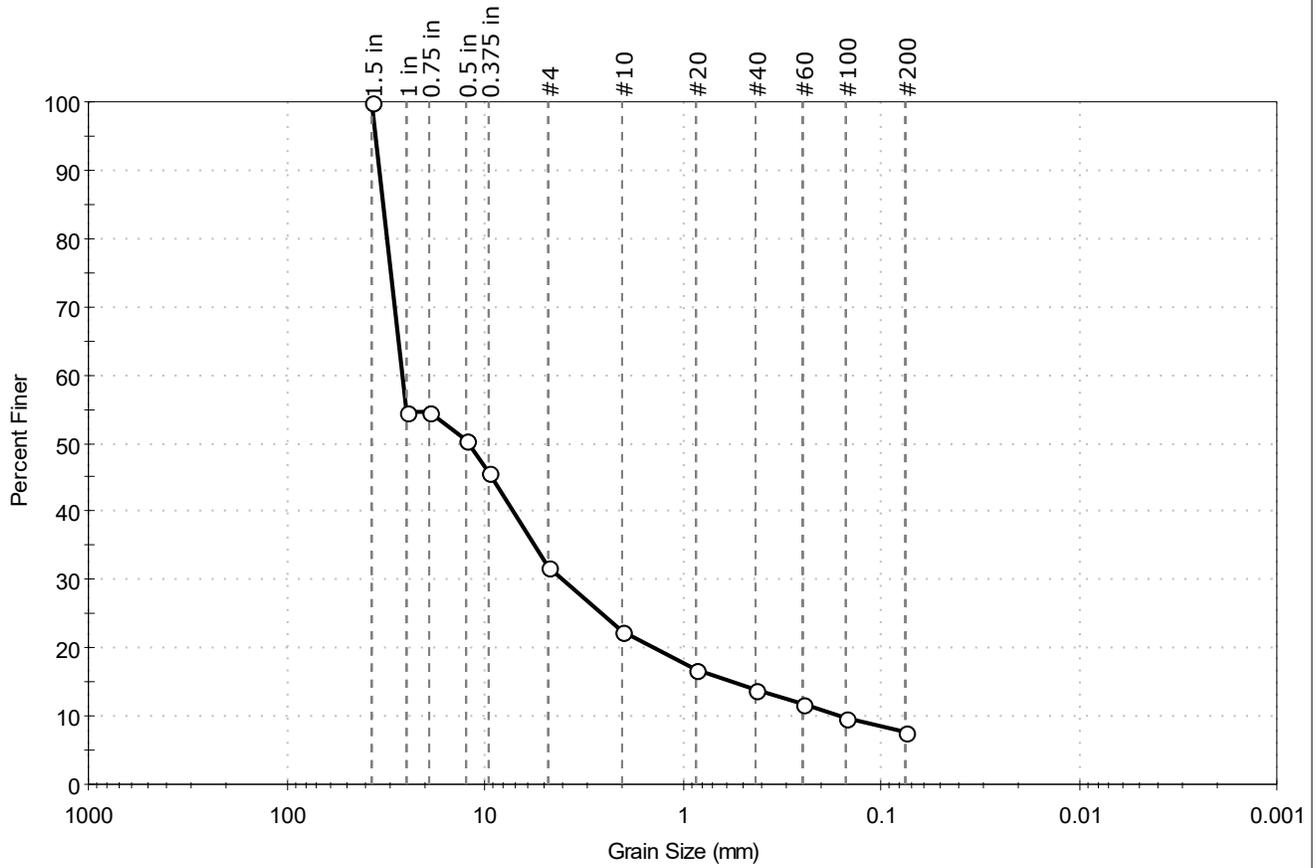
Sand/Gravel Particle Shape : ANGULAR

Sand/Gravel Hardness : HARD



Client:	Haley & Aldrich, Inc.		
Project:	Souadabscook Center; Bridge Nos. 1432 and 5950		
Location:	Hampden, Maine	Project No:	GTX-309947
Boring ID:	BB-HSS-210	Sample Type:	jar
Sample ID:	14D	Test Date:	05/15/19
Depth :	26-26.8 ft	Test Id:	502199
Test Comment:	---		
Visual Description:	Moist, very dark greenish gray gravel with silt and sand		
Sample Comment:	---		

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	68.1	24.2	7.7

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
1.5 in	37.50	100		
1 in	25.00	55		
0.75 in	19.00	55		
0.5 in	12.50	50		
0.375 in	9.50	46		
#4	4.75	32		
#10	2.00	23		
#20	0.85	17		
#40	0.42	14		
#60	0.25	12		
#100	0.15	10		
#200	0.075	7.7		

<u>Coefficients</u>	
D ₈₅ = 32.7869 mm	D ₃₀ = 3.9781 mm
D ₆₀ = 26.2108 mm	D ₁₅ = 0.5654 mm
D ₅₀ = 12.1851 mm	D ₁₀ = 0.1556 mm
C _u = 168.450	C _c = 3.880

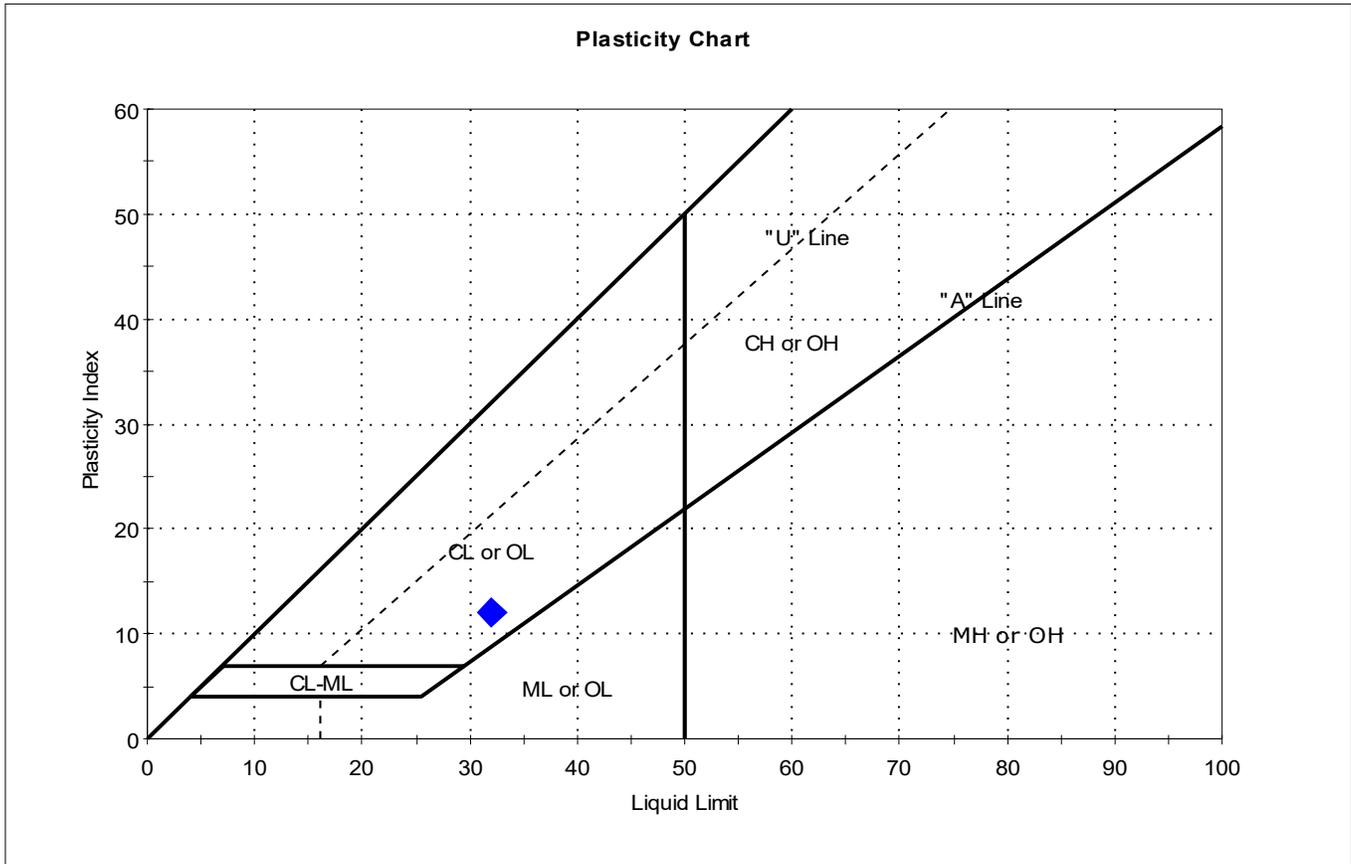
<u>Classification</u>	
ASTM	N/A
AASHTO	Stone Fragments, Gravel and Sand (A-1-a (1))

<u>Sample/Test Description</u>
Sand/Gravel Particle Shape : ANGULAR
Sand/Gravel Hardness : HARD



Client:	Haley & Aldrich, Inc.		
Project:	Souadabscook Center; Bridge Nos. 1432 and 5950		
Location:	Hampden, Maine	Project No:	GTX-309947
Boring ID:	BB-HSS-207	Sample Type:	tube
Sample ID:	U1	Test Date:	05/16/19
Depth :	20-22 ft	Test Id:	502191
Test Comment:	---		
Visual Description:	Wet, olive gray clay		
Sample Comment:	---		

Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content, %	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
◆	U1	B-HSS-20	20-22 ft	37	32	20	12	1.4	

Sample Prepared using the WET method

Dry Strength: VERY HIGH

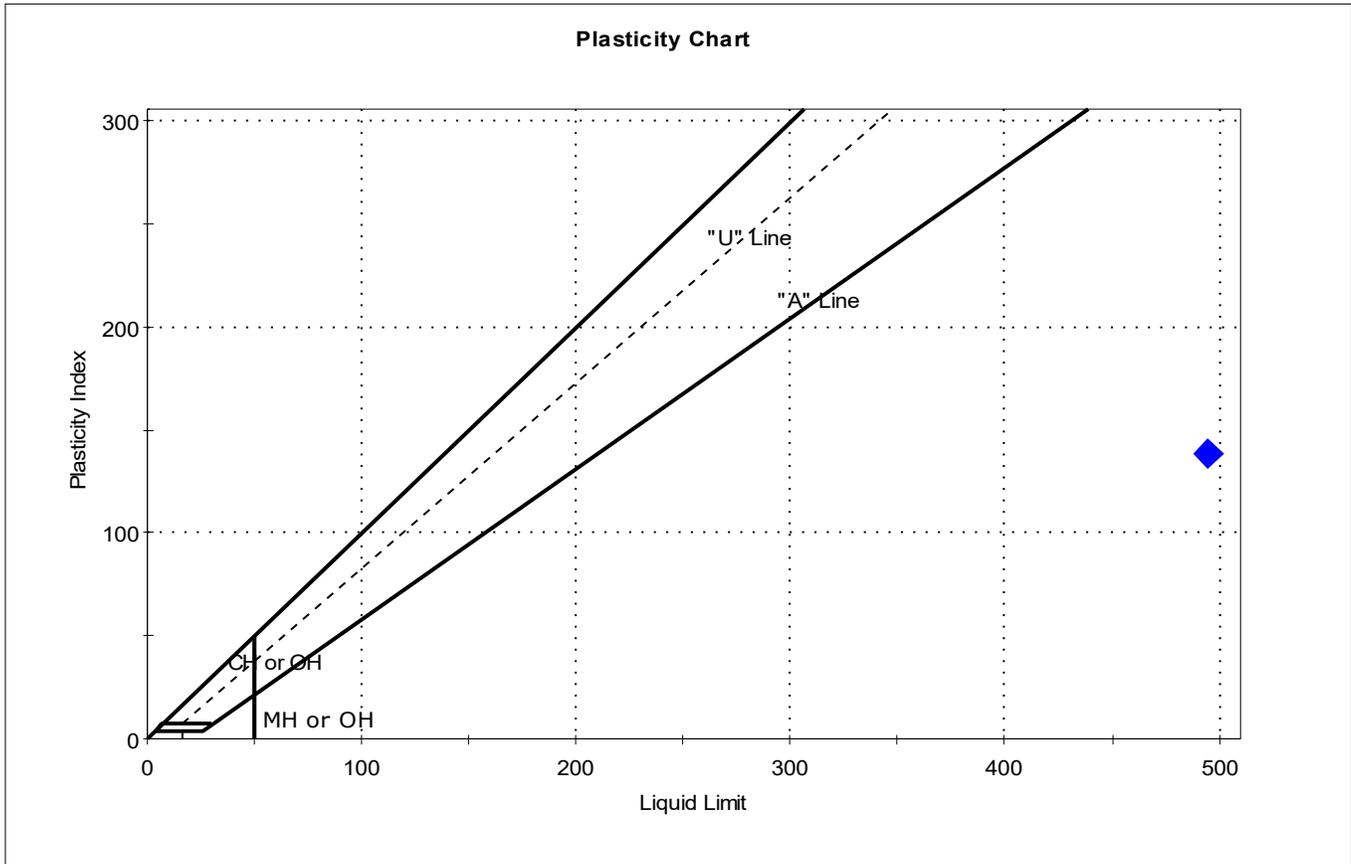
Dilatancy: SLOW

Toughness: LOW



Client:	Haley & Aldrich, Inc.		
Project:	Souadabscook Center; Bridge Nos. 1432 and 5950		
Location:	Hampden, Maine	Project No:	GTX-309947
Boring ID:	BB-HSS-209	Sample Type:	tube
Sample ID:	U1	Test Date:	05/16/19
Depth :	9-11 ft	Checked By:	bfs
		Test Id:	502192
Test Comment:	---		
Visual Description:	Moist, gray silt		
Sample Comment:	---		

Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content, %	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
◆	U1	B-HSS-20	9-11 ft	351	495	356	139	0	

Sample Prepared using the WET method

Dry Strength: HIGH

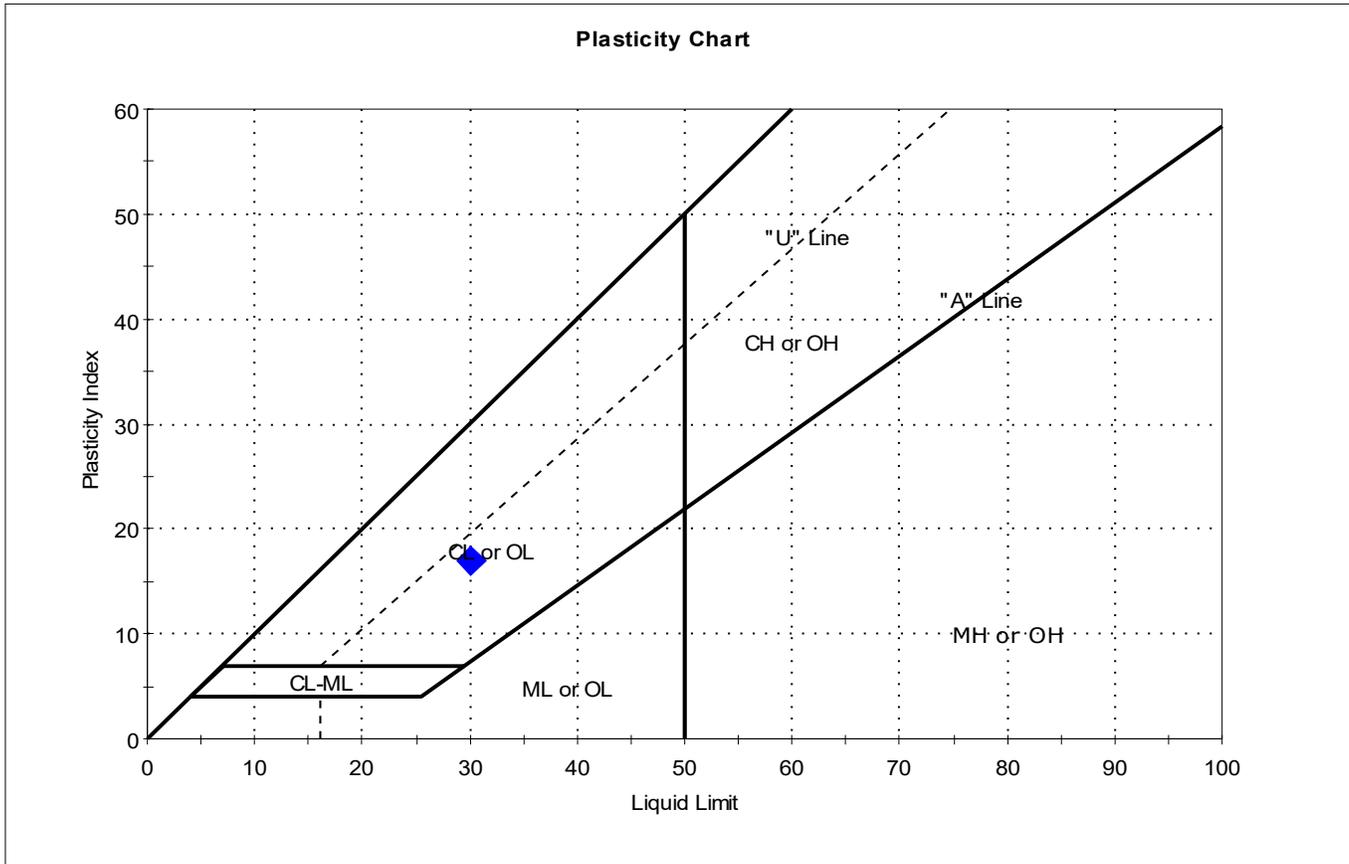
Dilatancy: SLOW

Toughness: LOW



Client:	Haley & Aldrich, Inc.		
Project:	Souadabscook Center; Bridge Nos. 1432 and 5950		
Location:	Hampden, Maine	Project No:	GTX-309947
Boring ID:	BB-HSS-209	Sample Type:	tube
Sample ID:	U2	Test Date:	05/15/19
Depth :	17-19 ft	Test Id:	502193
Test Comment:	---		
Visual Description:	Moist, dark greenish gray clay		
Sample Comment:	---		

Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content, %	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
◆	U2	B-HSS-20	17-19 ft	29	30	13	17	0.9	

Sample Prepared using the WET method

Dry Strength: VERY HIGH

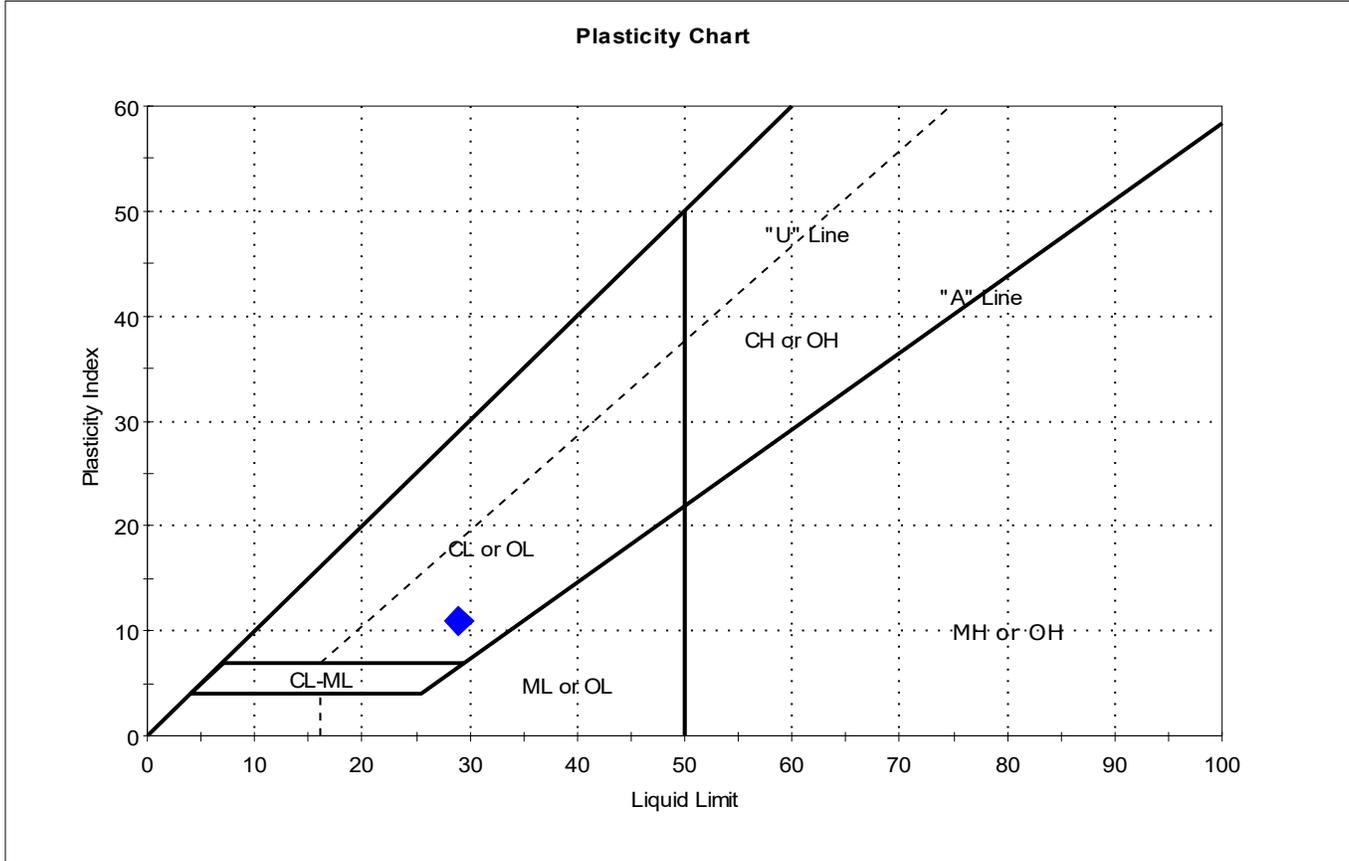
Dilatancy: SLOW

Toughness: LOW



Client:	Haley & Aldrich, Inc.		
Project:	Souadabscook Center; Bridge Nos. 1432 and 5950		
Location:	Hampden, Maine	Project No:	GTX-309947
Boring ID:	BB-HSS-210	Sample Type:	jar
Sample ID:	6D	Test Date:	05/15/19
Depth:	10-12 ft	Test Id:	502194
Test Comment:	---		
Visual Description:	Moist, olive gray clay		
Sample Comment:	---		

Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content, %	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
◆	6D	B-HSS-21	10-12 ft	29	29	18	11	1	

Sample Prepared using the WET method

Dry Strength: VERY HIGH

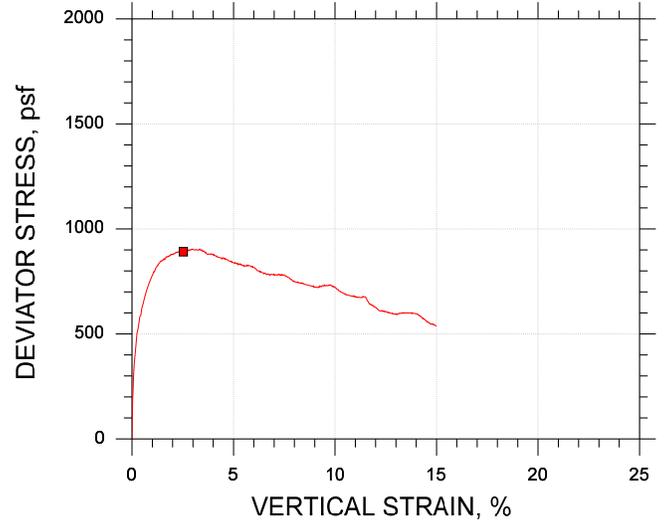
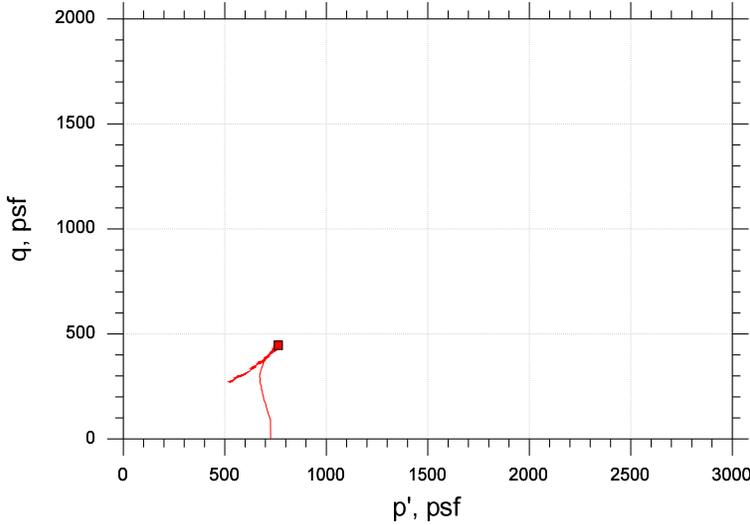
Dilatancy: SLOW

Toughness: LOW



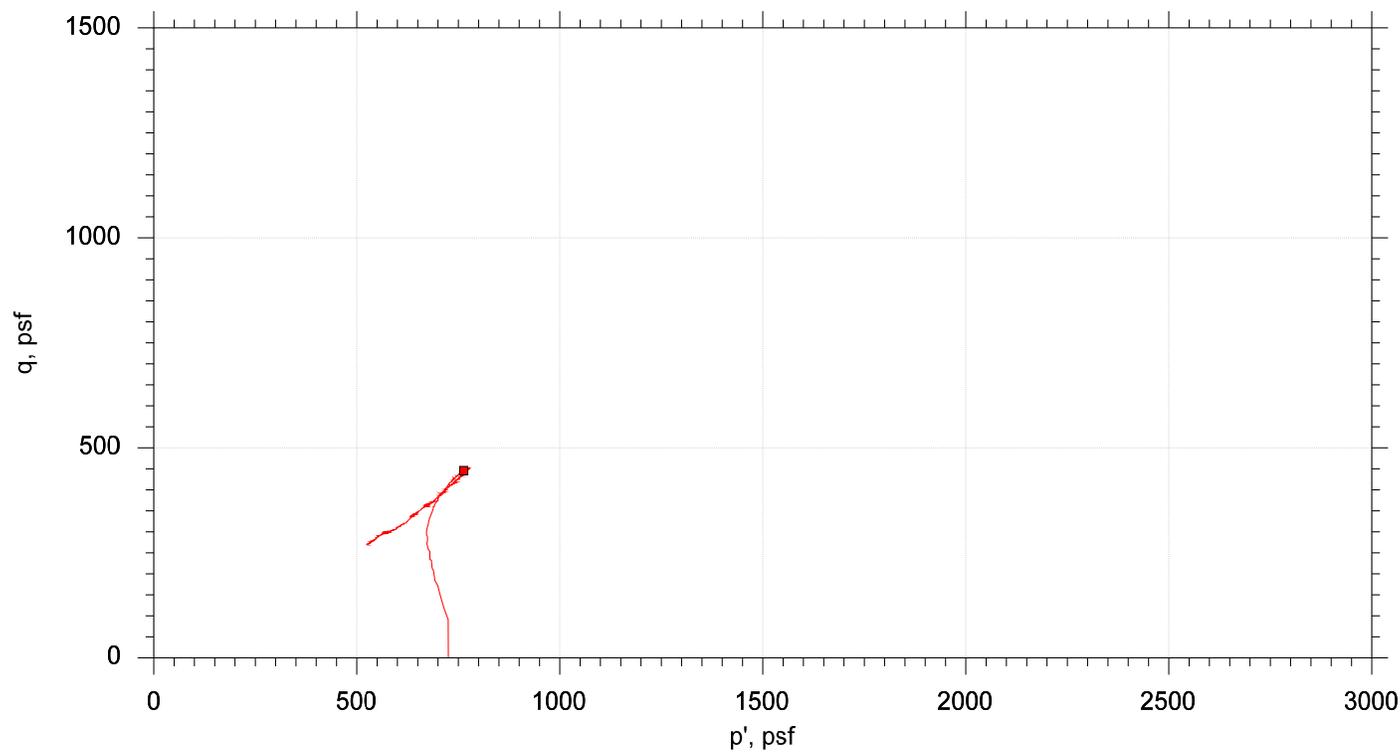
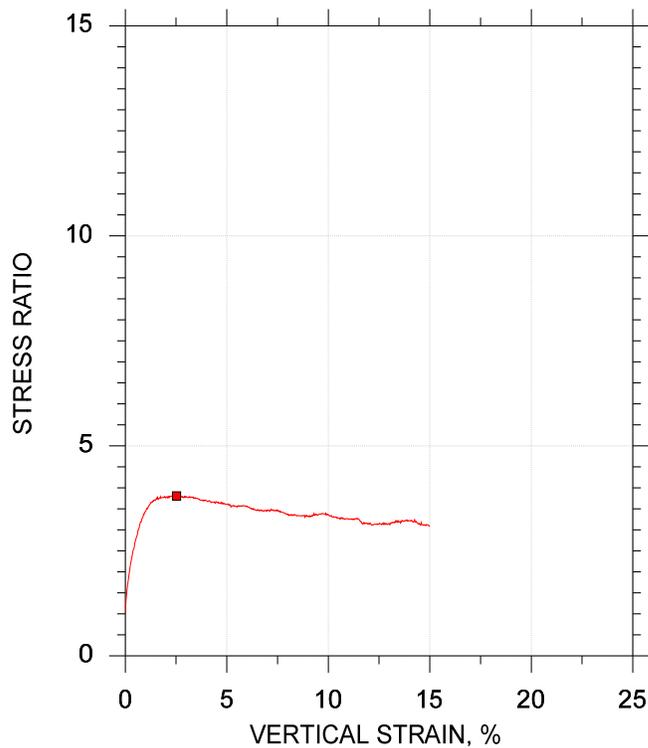
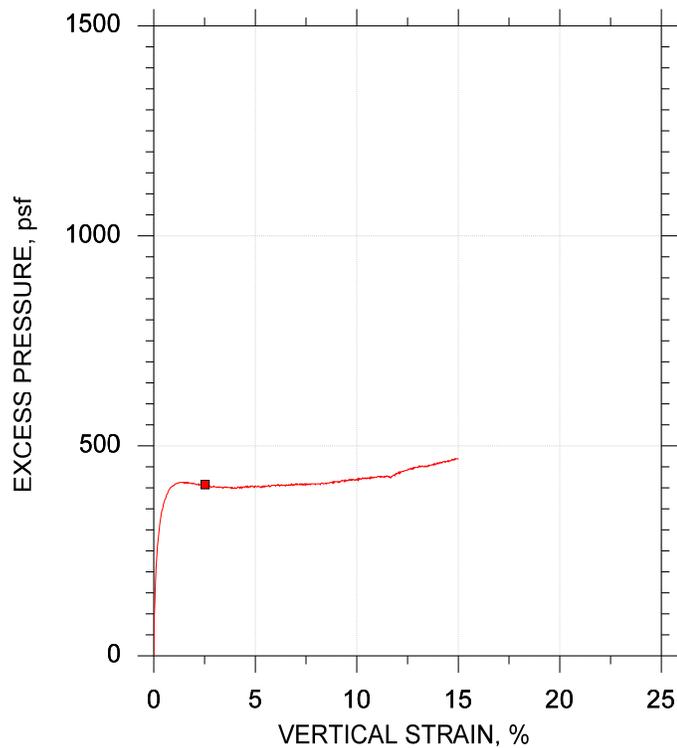
Client: Haley & Aldrich, Inc.	
Project Name: Souadabscook Center Bridges	
Project Location: Hampden, ME	
Project Number: GTX-309947	
Tested By: md/trm	Checked By: njh
Boring ID: BB-HSS-207	
Preparation: Intact	
Description: Wet, olive gray clay	
Classification: ---	
Group Symbol: ---	
Liquid Limit: 32	Plastic Limit: 20
Plasticity Index: 12	Estimated Specific Gravity: 2.7

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767



Symbol	■		
Sample ID	U1		
Depth, ft	20-22		
Test Number	CU-4-1		
Initial	Height, in	4.750	
	Diameter, in	2.000	
	Moisture Content (from Cuttings), %	35.8	
	Dry Density, pcf	85.6	
	Saturation (Wet Method), %	99.9	
	Void Ratio	0.969	
Before Shear	Moisture Content, %	34.6	
	Dry Density, pcf	87.2	
	Cross-sectional Area (Method A), in ²	3.107	
	Saturation, %	100.0	
	Void Ratio	0.933	
	Back Pressure, psf	2.747e+004	
Vertical Effective Consolidation Stress, psf	724.1		
Horizontal Effective Consolidation Stress, psf	723.8		
Vertical Strain after Consolidation, %	0.2332		
Volumetric Strain after Consolidation, %	0.3937		
Time to 50% Consolidation, min	27.00		
Shear Strength, psf	445.7		
Strain at Failure, %	2.53		
Strain Rate, %/min	0.01600		
Deviator Stress at Failure, psf	891.4		
Effective Minor Principal Stress at Failure, psf	317.7		
Effective Major Principal Stress at Failure, psf	1209.		
B-Value	0.95		
Notes:			
Remarks:			

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767



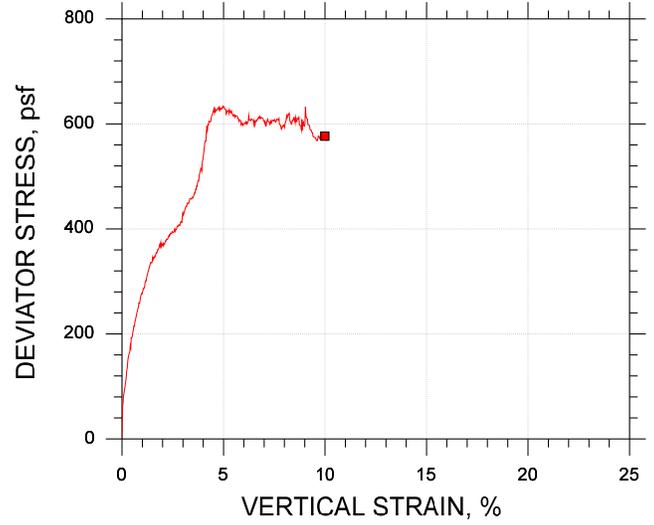
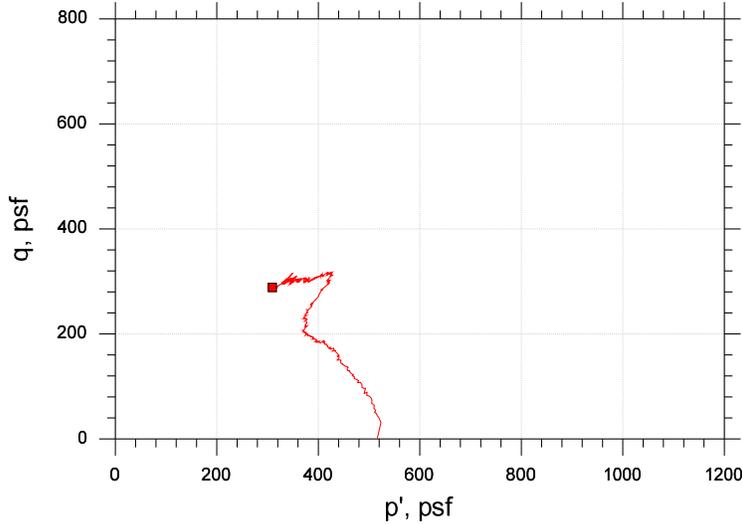
	Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
■	U1	CU-4-1	20-22	md/trm	5/10/19	njh	5/17/19	309947-CU-4-1n.dat

	Project: Souadabscook Center Bridges		Location: Hampden, ME		Project No.: GTX-309947	
	Boring No.: BB-HSS-207		Sample Type: Intact			
	Description: Wet, olive gray clay					
	Remarks: System PP					



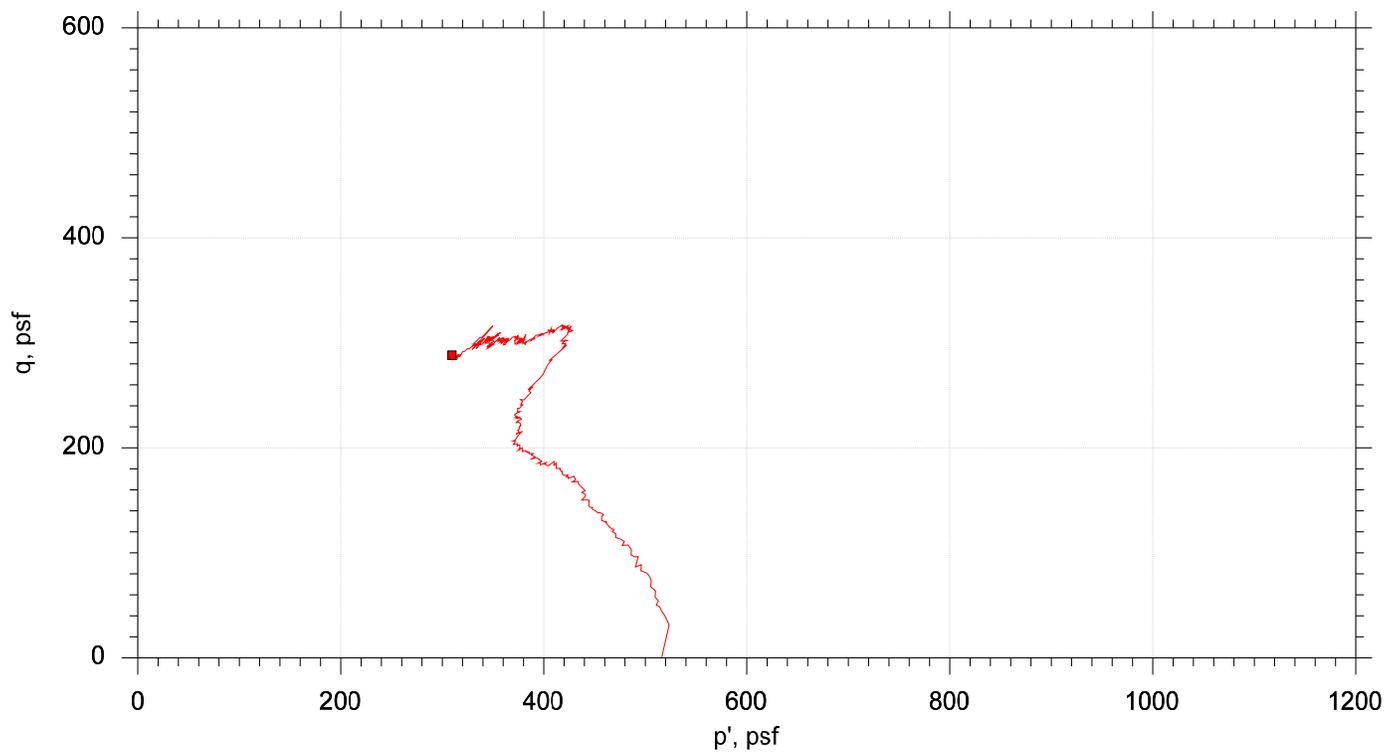
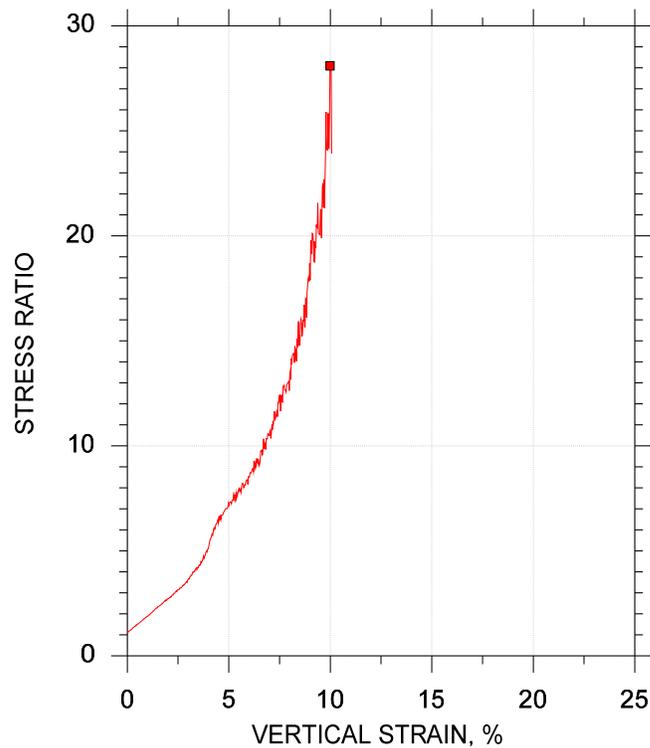
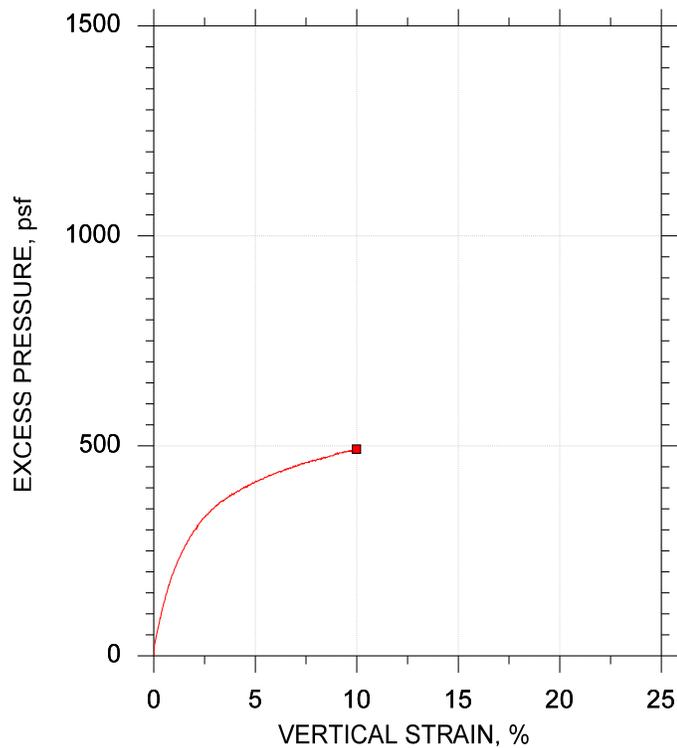
Client: Haley & Aldrich, Inc.	
Project Name: Souadabscook Center Bridges	
Project Location: Hampden, ME	
Project Number: GTX-309947	
Tested By: md/trm	Checked By: njh
Boring ID: BB-HSS-209	
Preparation: intact	
Description: Moist, gray silt	
Classification: ---	
Group Symbol: ---	
Liquid Limit: 495	Plastic Limit: 356
Plasticity Index: 139	Estimated Specific Gravity: 2.2

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767



Symbol	■		
Sample ID	U1		
Depth, ft	9-11		
Test Number	CU-3-1		
Initial	Height, in	4.400	
	Diameter, in	1.930	
	Moisture Content (from Cuttings), %	432.5	
	Dry Density, pcf	12.4	
	Saturation (Wet Method), %	94.1	
	Void Ratio	10.1	
Before Shear	Moisture Content, %	403.5	
	Dry Density, pcf	13.9	
	Cross-sectional Area (Method A), in ²	2.784	
	Saturation, %	100.0	
	Void Ratio	8.88	
	Back Pressure, psf	8640.	
Vertical Effective Consolidation Stress, psf	456.4		
Horizontal Effective Consolidation Stress, psf	515.3		
Vertical Strain after Consolidation, %	4.838		
Volumetric Strain after Consolidation, %	5.852		
Time to 50% Consolidation, min	23.00		
Shear Strength, psf	288.3		
Strain at Failure, %	9.99		
Strain Rate, %/min	0.008000		
Deviator Stress at Failure, psf	576.6		
Effective Minor Principal Stress at Failure, psf	21.28		
Effective Major Principal Stress at Failure, psf	597.9		
B-Value	0.95		
Notes:			
<ul style="list-style-type: none"> - Before Shear Saturation set to 100% for phase calculation. - Moisture Content determined by ASTM D2216. - Atterberg Limits determined by ASTM D4318. - Deviator Stress includes membrane correction. - Values for c and φ determined from best-fit straight line for the specific test conditions. Actual strength parameters may vary and should be determined by an engineer for site conditions. 			
Remarks:			

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767



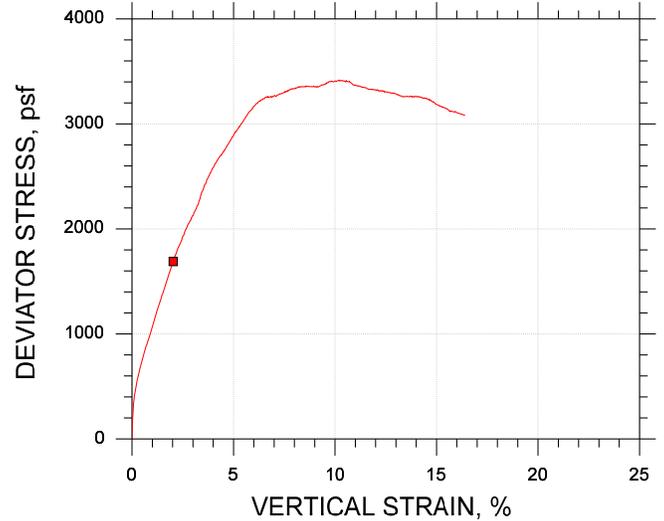
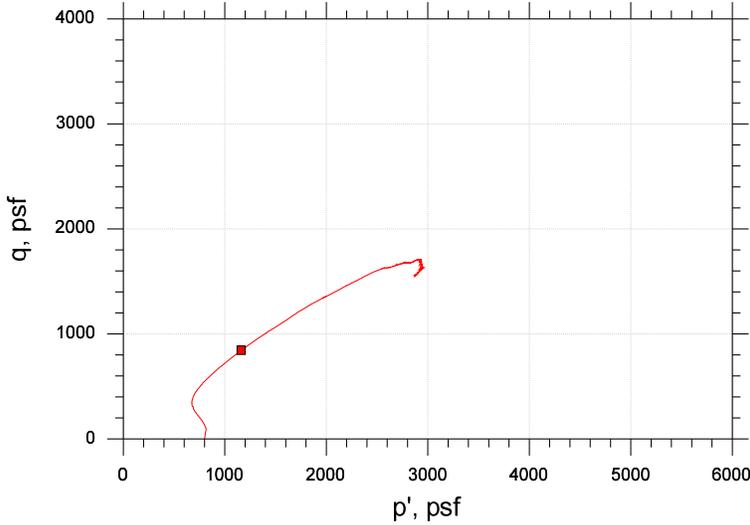
Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
■ U1	CU-3-1	9-11	md/trm	5/10/19	njh	5/17/19	309947-CU-3-1n.dat

	Project: Souadabscook Center Bridges	Location: Hampden, ME	Project No.: GTX-309947
	Boring No.: BB-HSS-209	Sample Type: intact	
	Description: Moist, gray silt		
	Remarks: System OO		



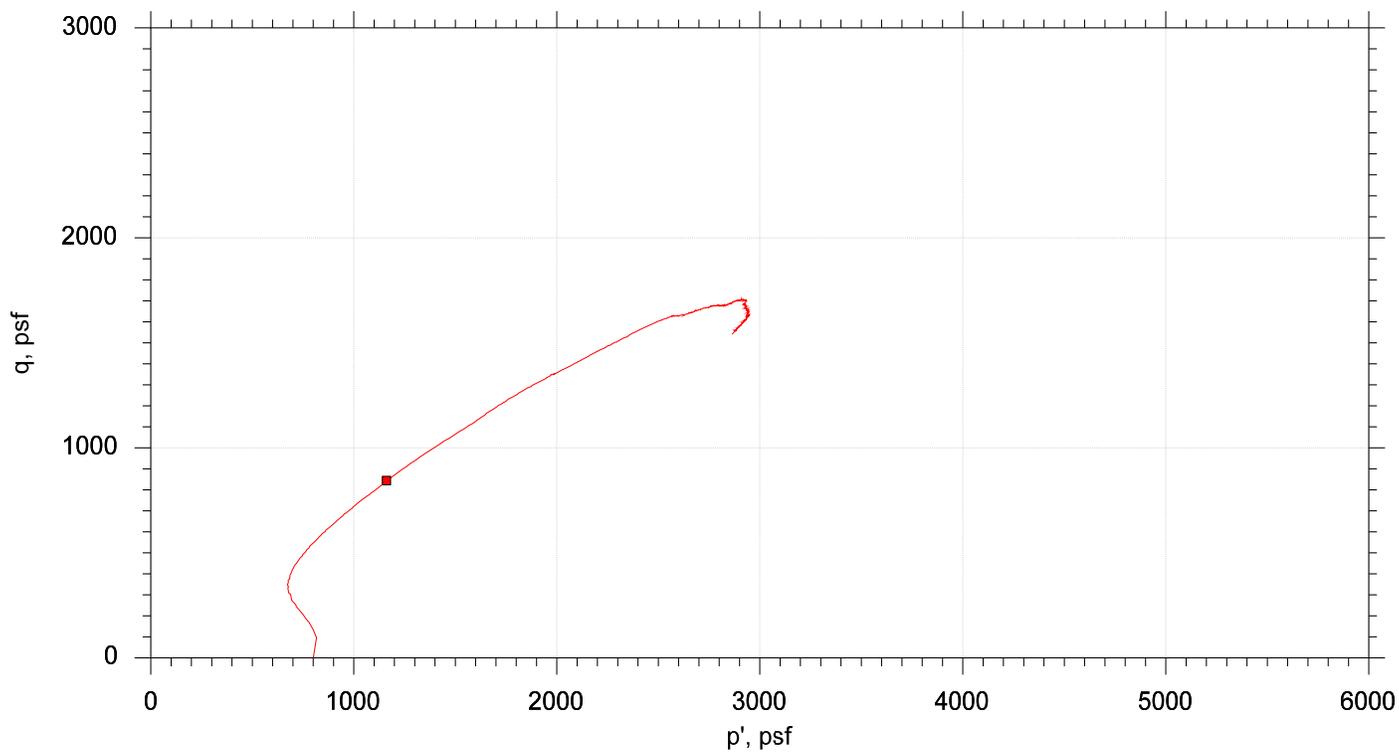
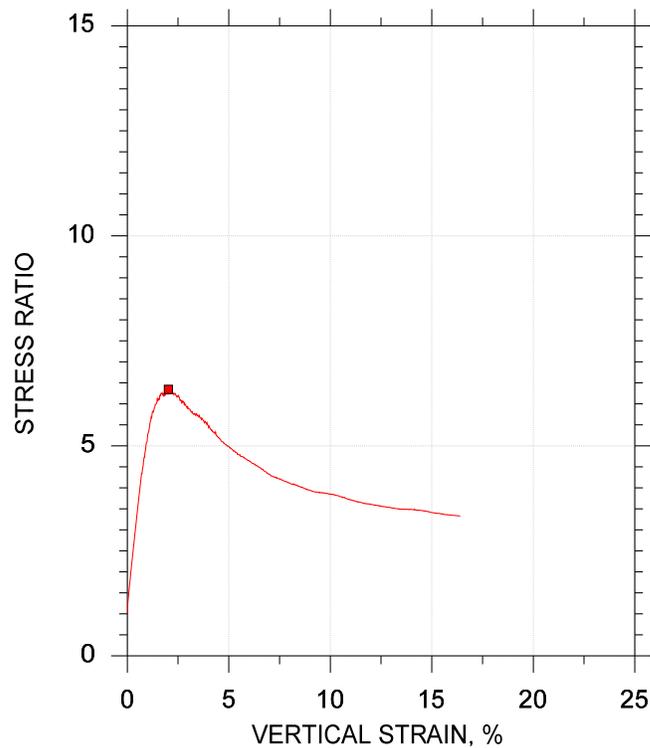
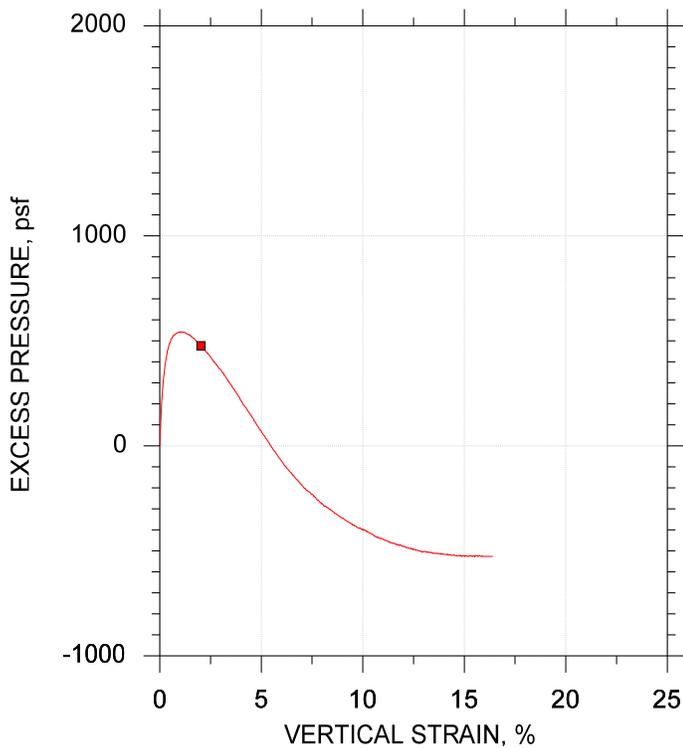
Client: Haley & Aldrich, Inc.	
Project Name: Souadabscook Center Bridges	
Project Location: Hampden, ME	
Project Number: GTX-309947	
Tested By: md/trm	Checked By: njh
Boring ID: BB-HSS-209	
Preparation: intact	
Description: Moist, dark greenish gray clay	
Classification: ---	
Group Symbol: ---	
Liquid Limit: 30	Plastic Limit: 13
Plasticity Index: 17	Estimated Specific Gravity: 2.7

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767



Symbol	■		
Sample ID	U2		
Depth, ft	17-19		
Test Number	CU-2-1		
Initial	Height, in	4.770	
	Diameter, in	2.030	
	Moisture Content (from Cuttings), %	26.8	
	Dry Density, pcf	97.7	
	Saturation (Wet Method), %	99.9	
	Void Ratio	0.724	
Before Shear	Moisture Content, %	26.0	
	Dry Density, pcf	99.0	
	Cross-sectional Area (Method A), in ²	3.212	
	Saturation, %	100.0	
	Void Ratio	0.703	
	Back Pressure, psf	2.510e+004	
Vertical Effective Consolidation Stress, psf	800.9		
Horizontal Effective Consolidation Stress, psf	799.5		
Vertical Strain after Consolidation, %	0.1328		
Volumetric Strain after Consolidation, %	0.1853		
Time to 50% Consolidation, min	14.40		
Shear Strength, psf	844.9		
Strain at Failure, %	2.03		
Strain Rate, %/min	0.01600		
Deviator Stress at Failure, psf	1690.		
Effective Minor Principal Stress at Failure, psf	316.1		
Effective Major Principal Stress at Failure, psf	2006.		
B-Value	0.95		
Notes:			
<ul style="list-style-type: none"> - Before Shear Saturation set to 100% for phase calculation. - Moisture Content determined by ASTM D2216. - Atterberg Limits determined by ASTM D4318. - Deviator Stress includes membrane correction. - Values for c and φ determined from best-fit straight line for the specific test conditions. Actual strength parameters may vary and should be determined by an engineer for site conditions. 			
Remarks:			

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767

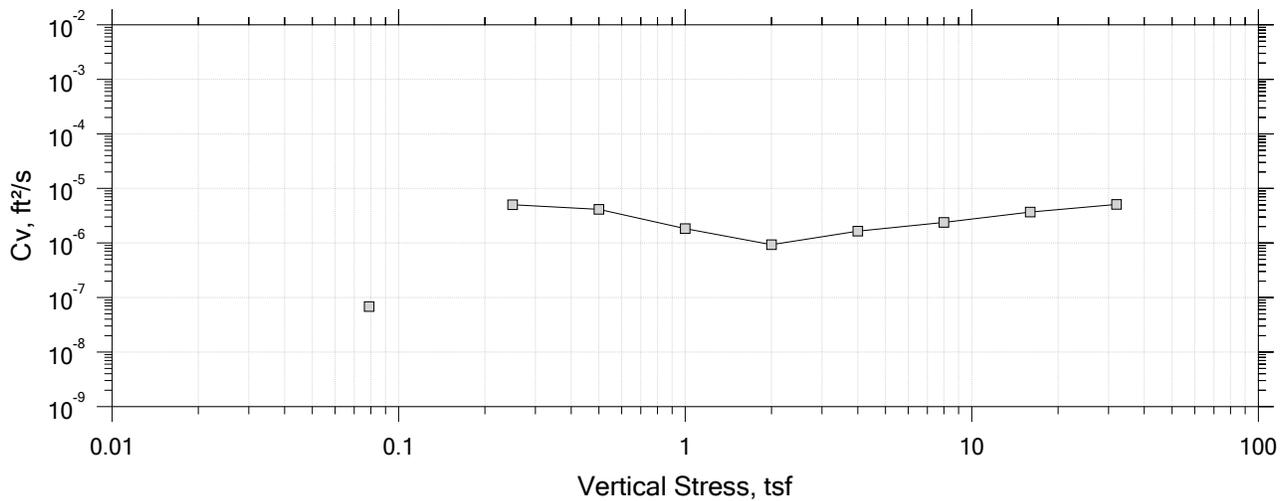
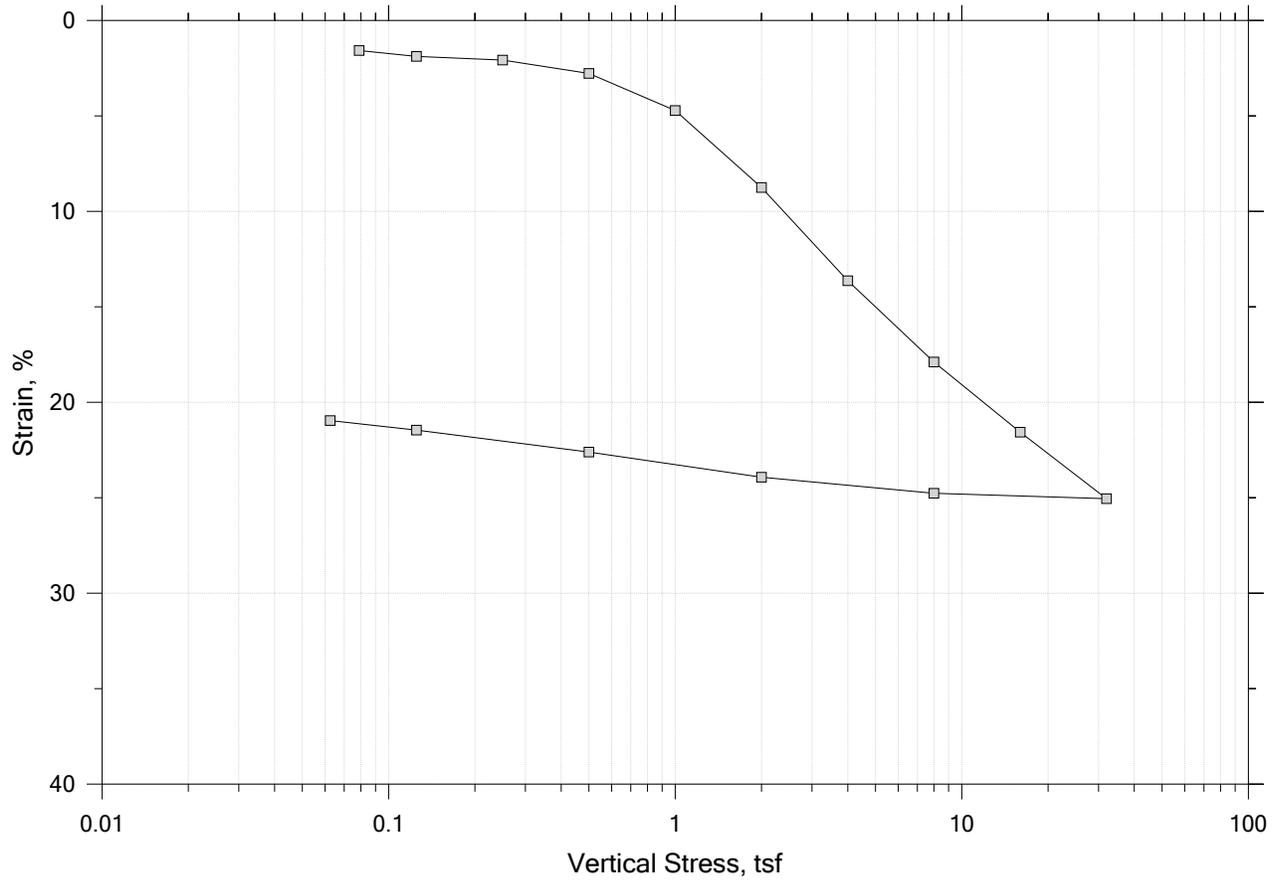


	Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
■	U2	CU-2-1	17-19	md/trm	5/8/19	njh	5/17/19	309947-CU-2-1n.dat

	Project: Souadabscook Center Bridges		Location: Hampden, ME		Project No.: GTX-309947	
	Boring No.: BB-HSS-209		Sample Type: intact			
	Description: Moist, dark greenish gray clay					
	Remarks: System OO					

One-Dimensional Consolidation by ASTM D2435 - Method B

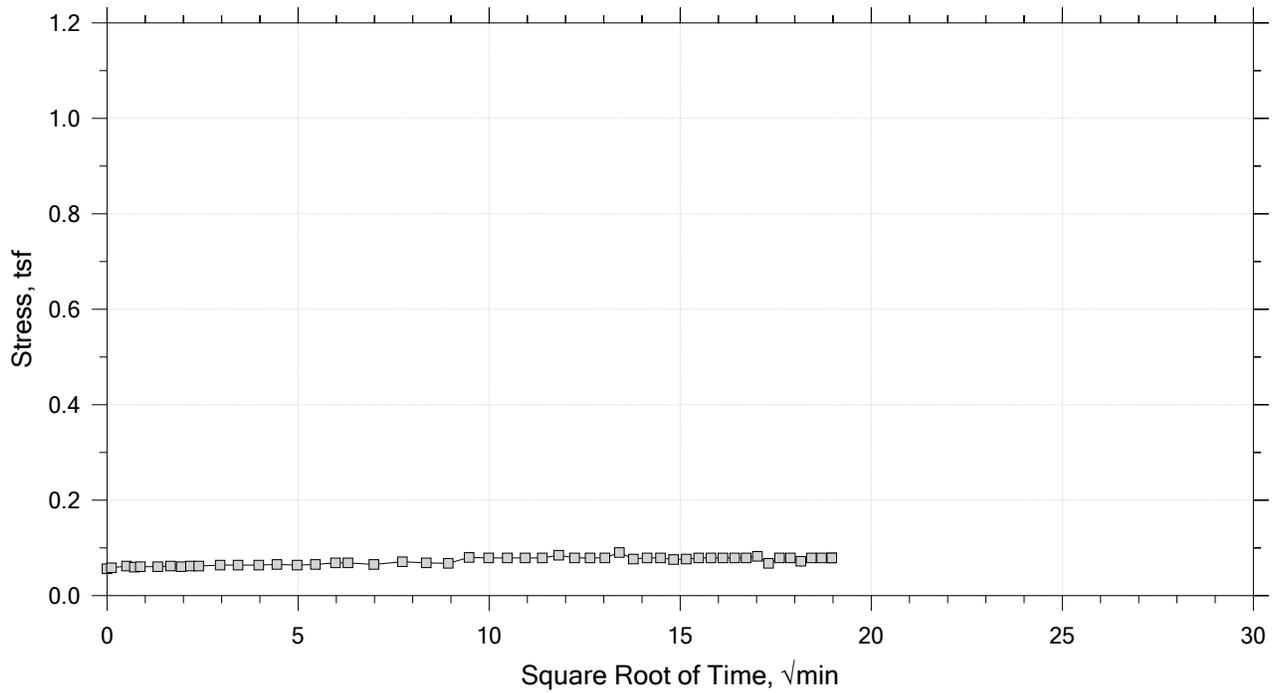
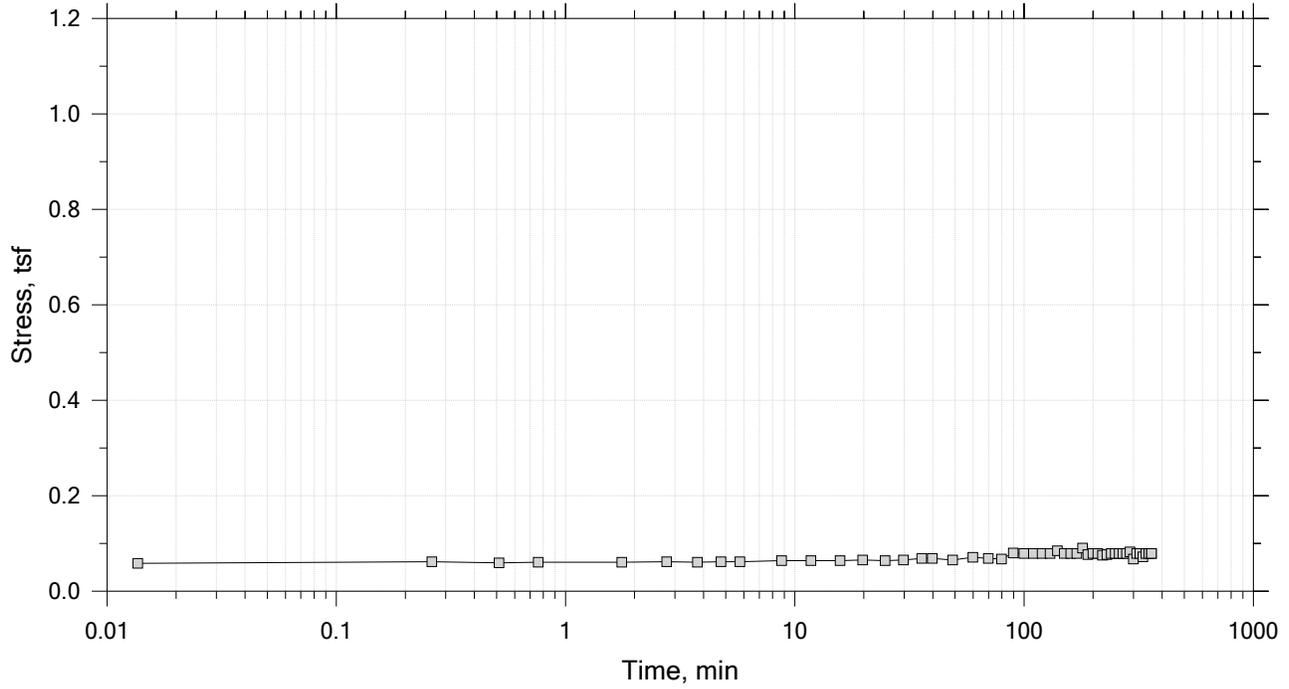
Summary Report



	Project: Souadabscook Center Bridges	Location: Hampden, ME	Project No.: GTX-309947
	Boring No.: BB-HSS-207	Tested By: trm	Checked By: njh
	Sample No.: U1	Test Date: 5/3/19	Depth: 20-22 ft
	Test No.: IP-2	Sample Type: intact	Elevation: ---
	Description: Wet, olive gray clay		
	Remarks: System LTIll-A, Swell Pressure = 0.0789 tsf		
	Displacement at End of Increment		

One-Dimensional Consolidation by ASTM D2435 - Method B

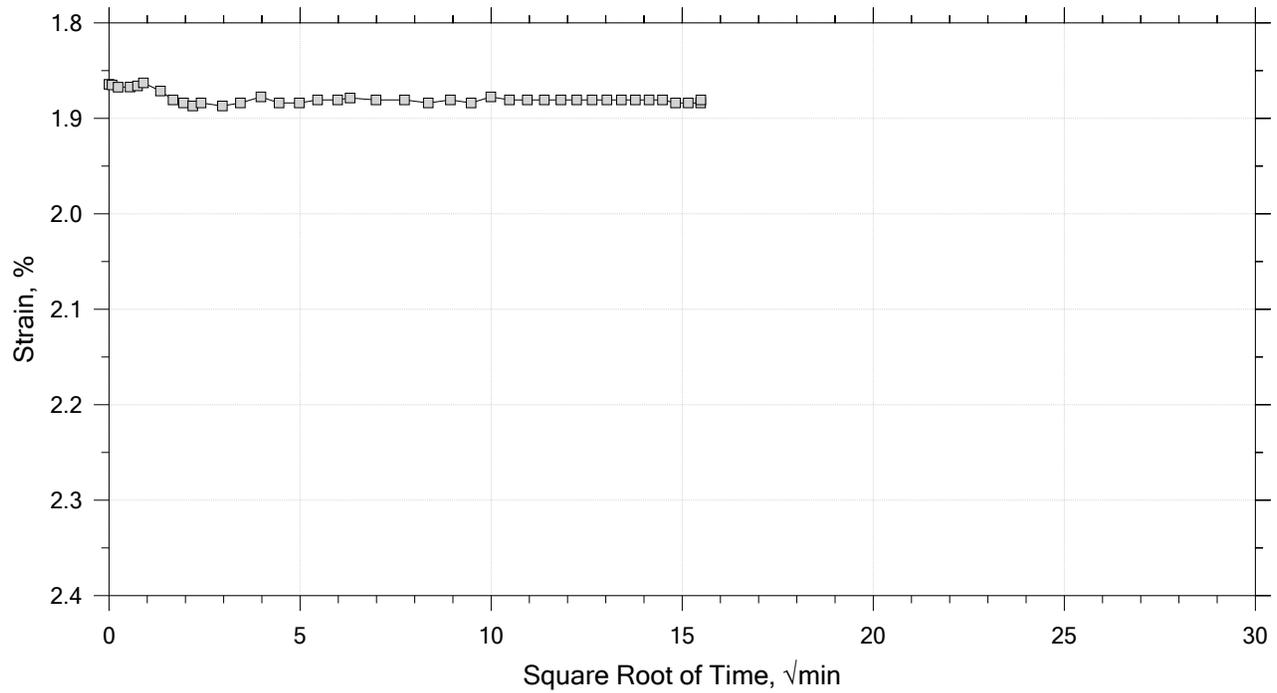
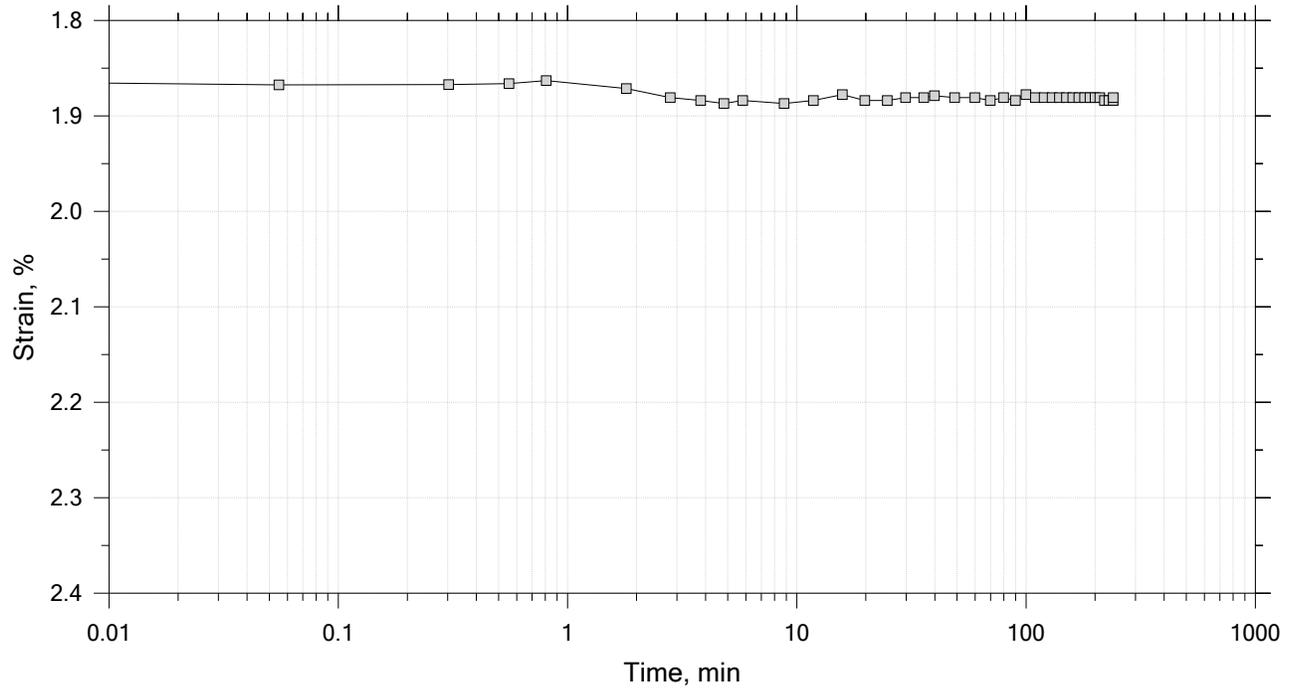
Time Curve 1 of 15
 Constant Volume Step
 Stress: 0.0789 tsf



	Project: Souadabscook Center Bridges	Location: Hampden, ME	Project No.: GTX-309947
	Boring No.: BB-HSS-207	Tested By: trm	Checked By: njh
	Sample No.: U1	Test Date: 5/3/19	Depth: 20-22 ft
	Test No.: IP-2	Sample Type: intact	Elevation: ---
	Description: Wet, olive gray clay		
	Remarks: System LTIII-A, Swell Pressure = 0.0789 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

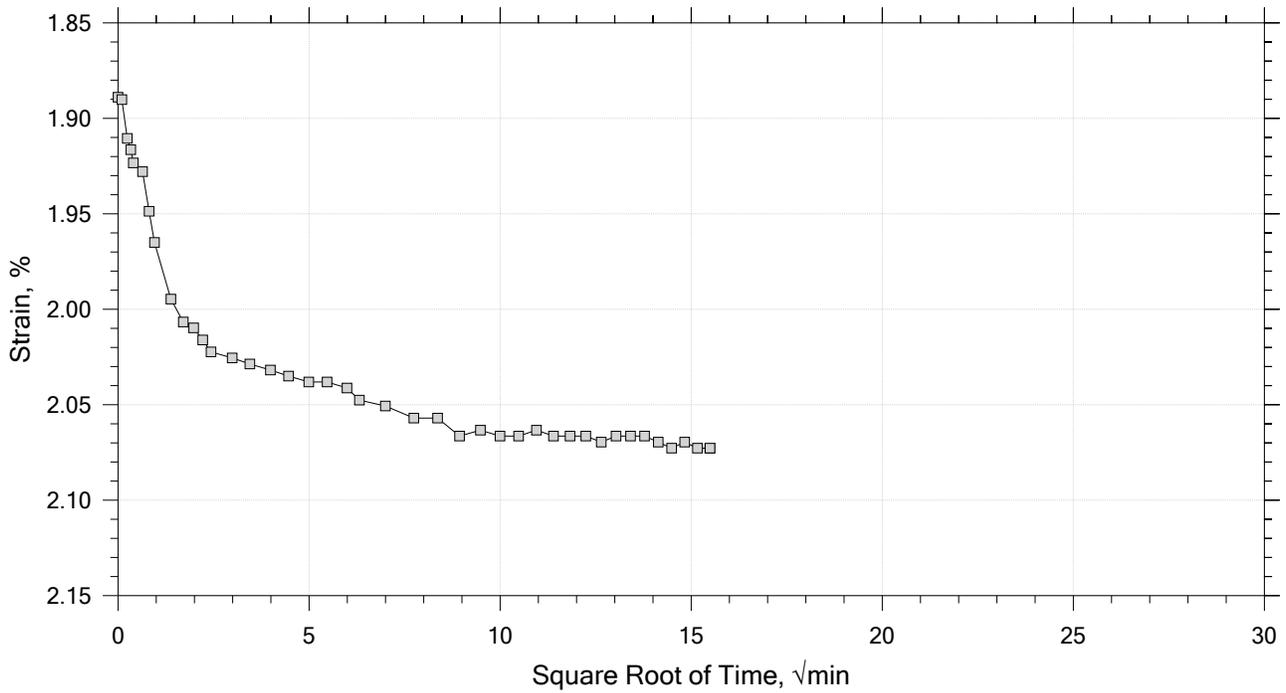
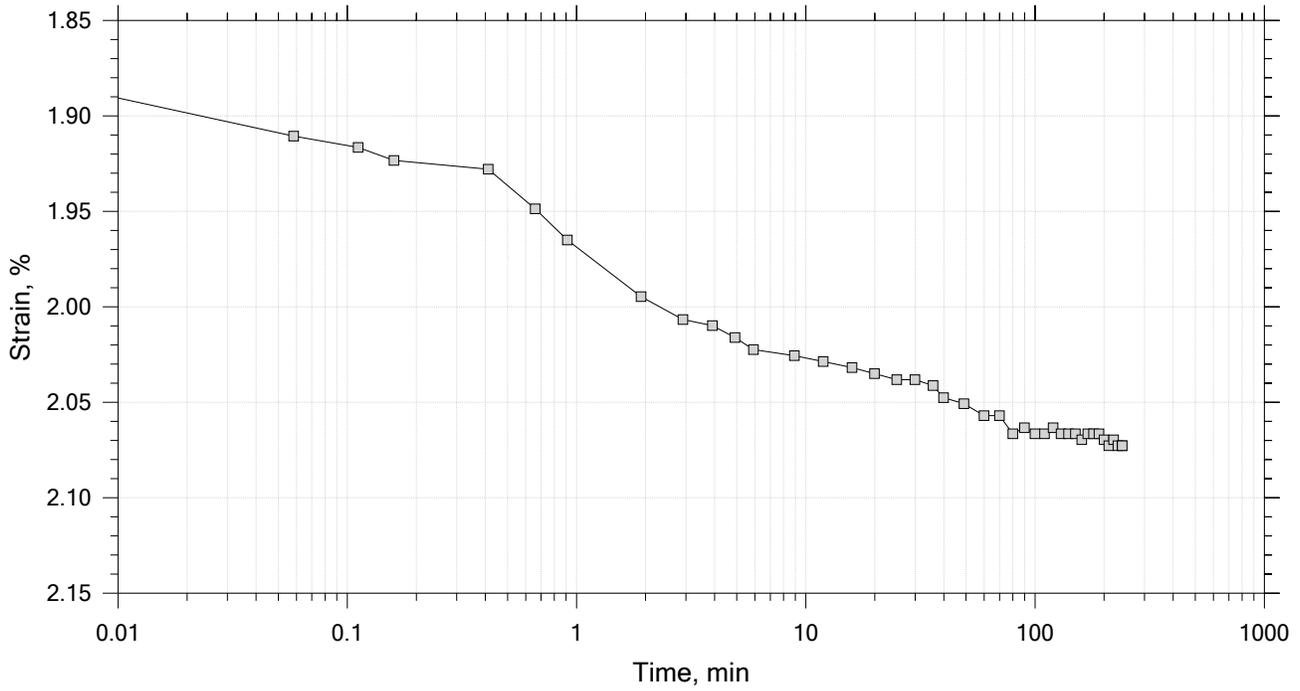
Time Curve 2 of 15
 Constant Load Step
 Stress: 0.125 tsf



	Project: Souadabscook Center Bridges	Location: Hampden, ME	Project No.: GTX-309947
	Boring No.: BB-HSS-207	Tested By: trm	Checked By: njh
	Sample No.: U1	Test Date: 5/3/19	Depth: 20-22 ft
	Test No.: IP-2	Sample Type: intact	Elevation: ---
	Description: Wet, olive gray clay		
	Remarks: System LTIII-A, Swell Pressure = 0.0789 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

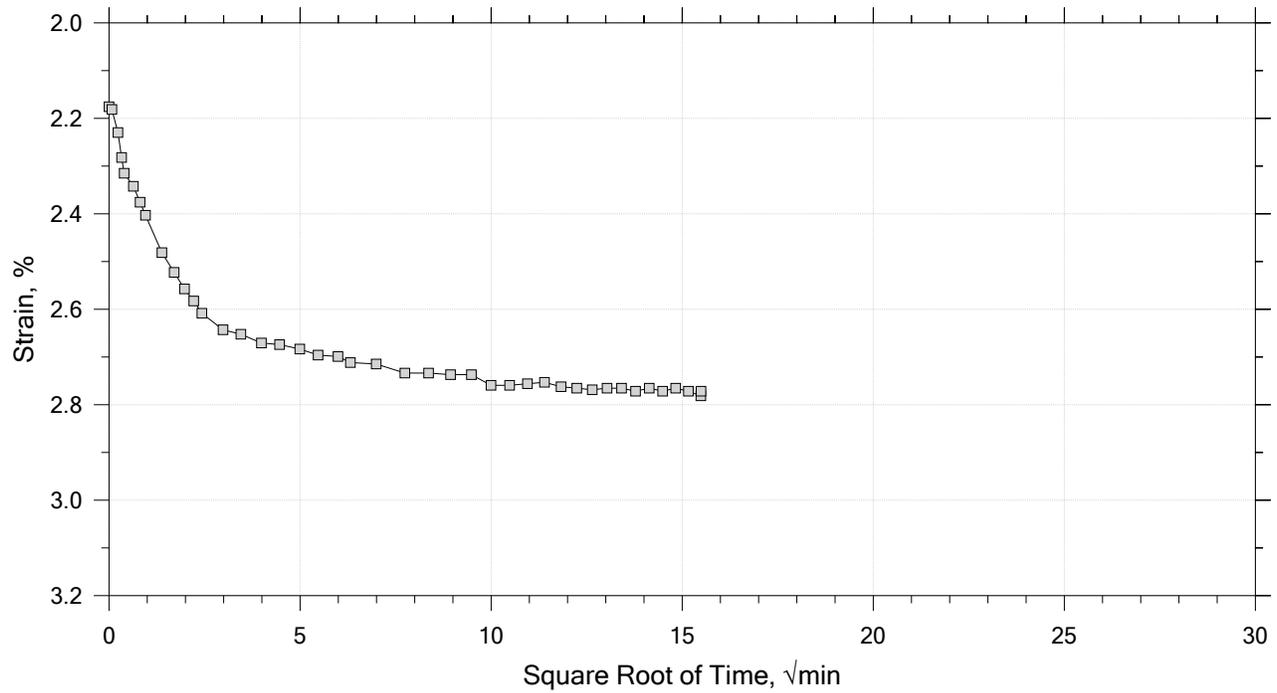
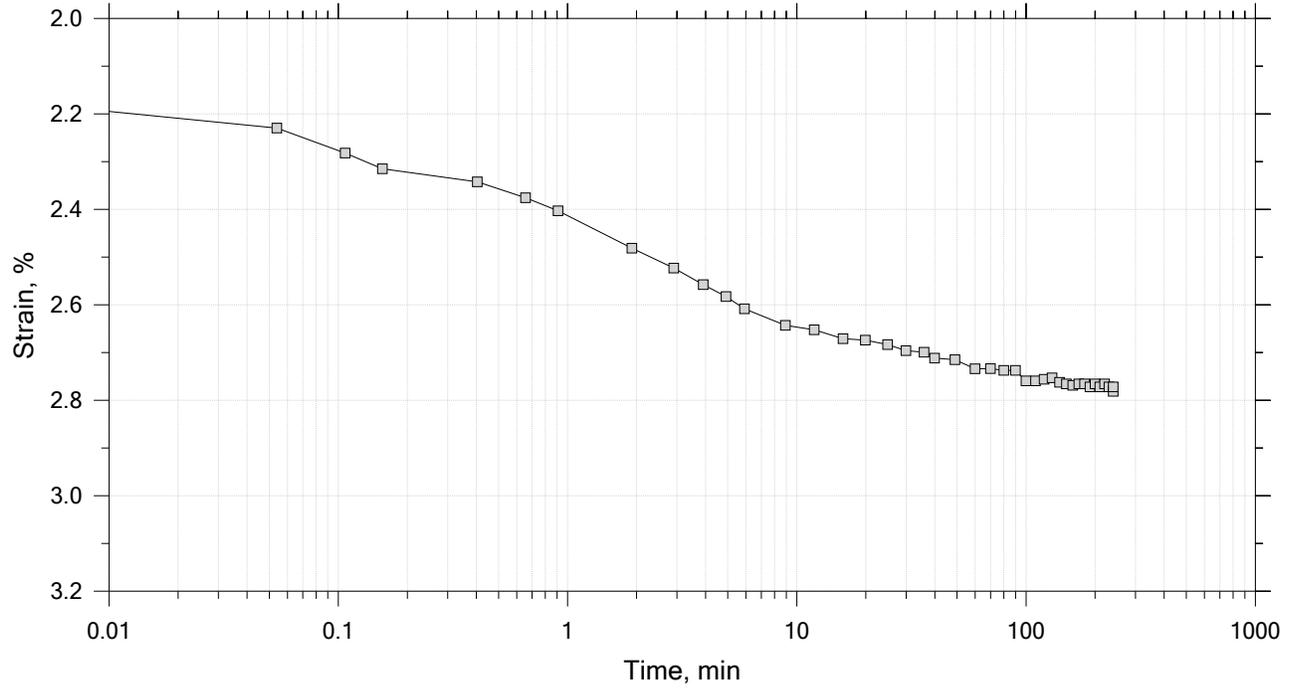
Time Curve 3 of 15
 Constant Load Step
 Stress: 0.25 tsf



	Project: Souadabscook Center Bridges	Location: Hampden, ME	Project No.: GTX-309947
	Boring No.: BB-HSS-207	Tested By: trm	Checked By: njh
	Sample No.: U1	Test Date: 5/3/19	Depth: 20-22 ft
	Test No.: IP-2	Sample Type: intact	Elevation: ---
	Description: Wet, olive gray clay		
	Remarks: System LTIII-A, Swell Pressure = 0.0789 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 4 of 15
 Constant Load Step
 Stress: 0.5 tsf



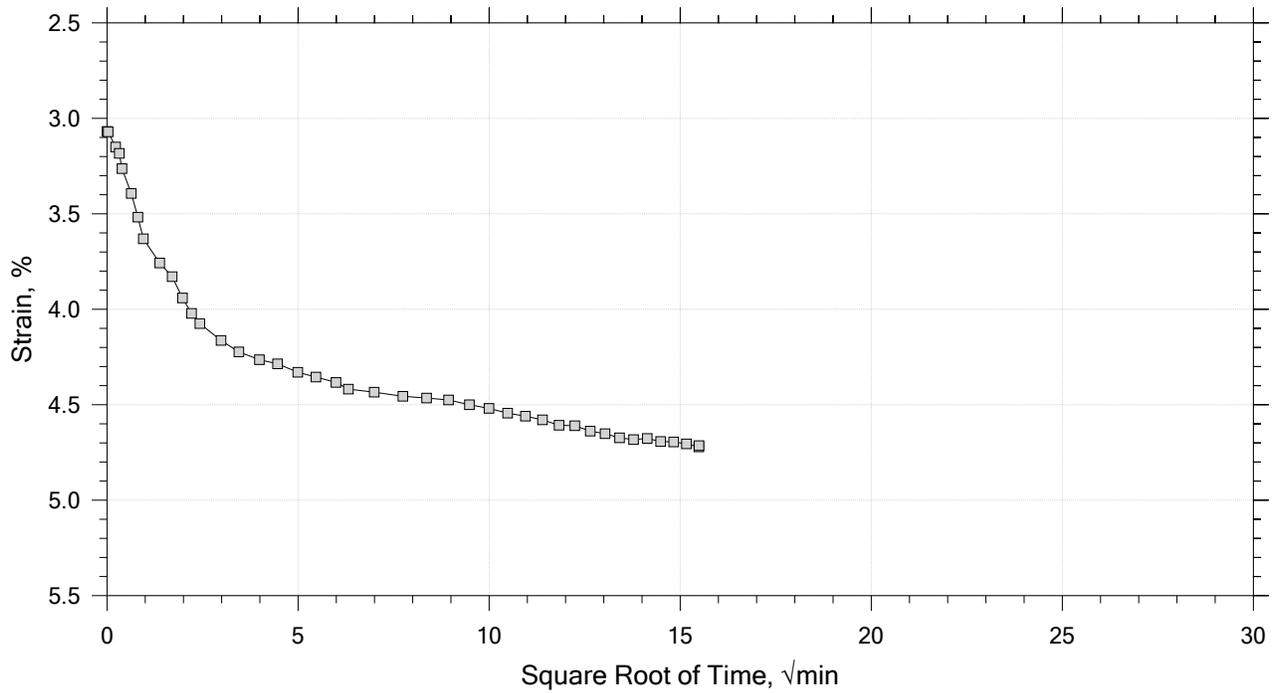
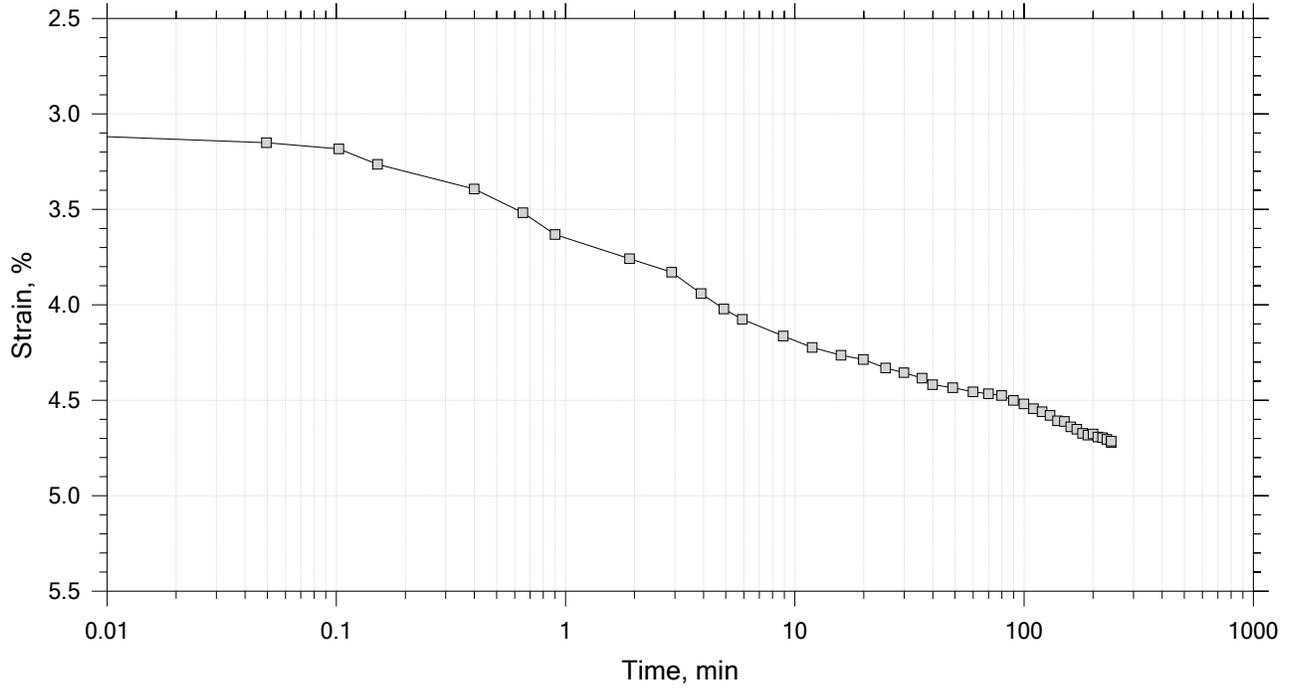
	Project: Souadabscook Center Bridges	Location: Hampden, ME	Project No.: GTX-309947
	Boring No.: BB-HSS-207	Tested By: trm	Checked By: njh
	Sample No.: U1	Test Date: 5/3/19	Depth: 20-22 ft
	Test No.: IP-2	Sample Type: intact	Elevation: ---
	Description: Wet, olive gray clay		
	Remarks: System LTIII-A, Swell Pressure = 0.0789 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 5 of 15

Constant Load Step

Stress: 1 tsf



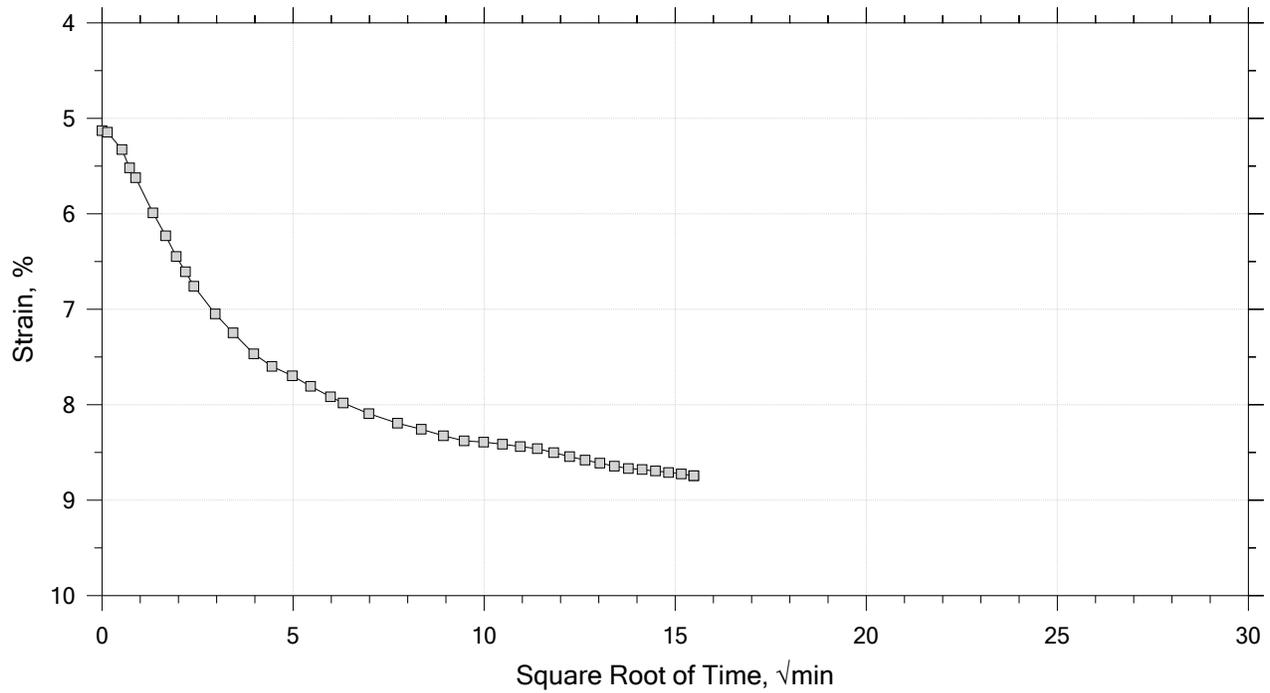
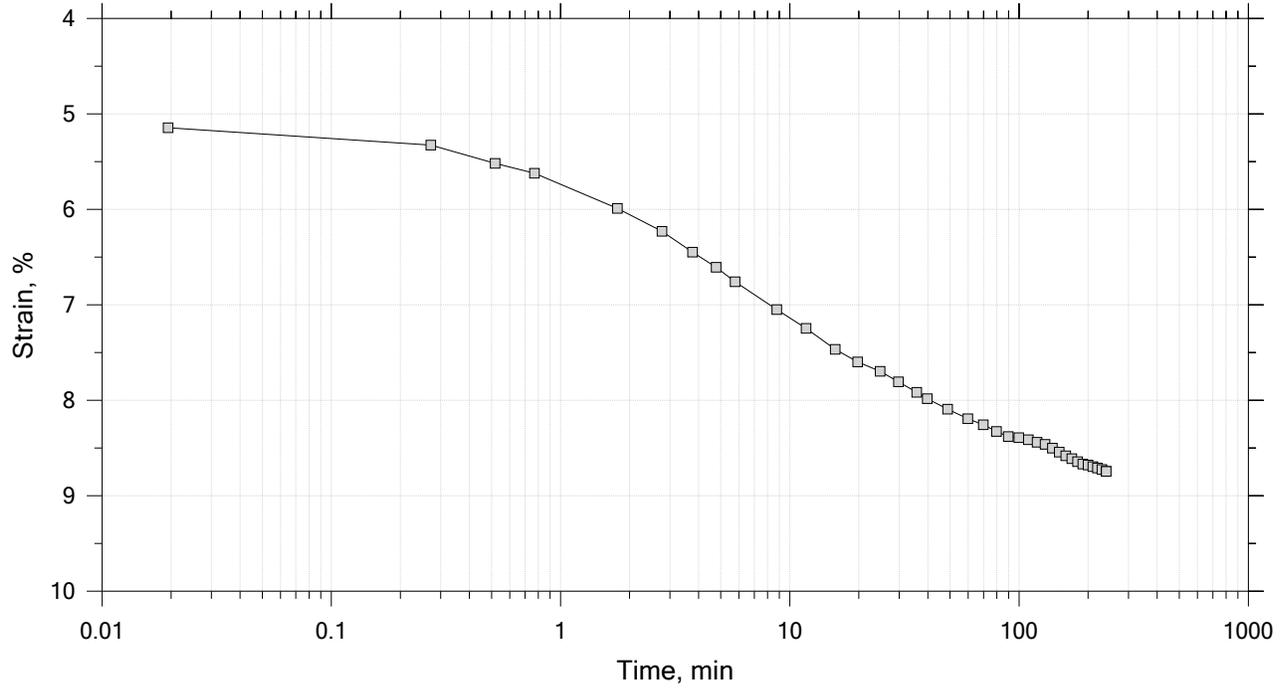
	Project: Souadabscook Center Bridges	Location: Hampden, ME	Project No.: GTX-309947
	Boring No.: BB-HSS-207	Tested By: trm	Checked By: njh
	Sample No.: U1	Test Date: 5/3/19	Depth: 20-22 ft
	Test No.: IP-2	Sample Type: intact	Elevation: ---
	Description: Wet, olive gray clay		
	Remarks: System LTIII-A, Swell Pressure = 0.0789 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 6 of 15

Constant Load Step

Stress: 2 tsf



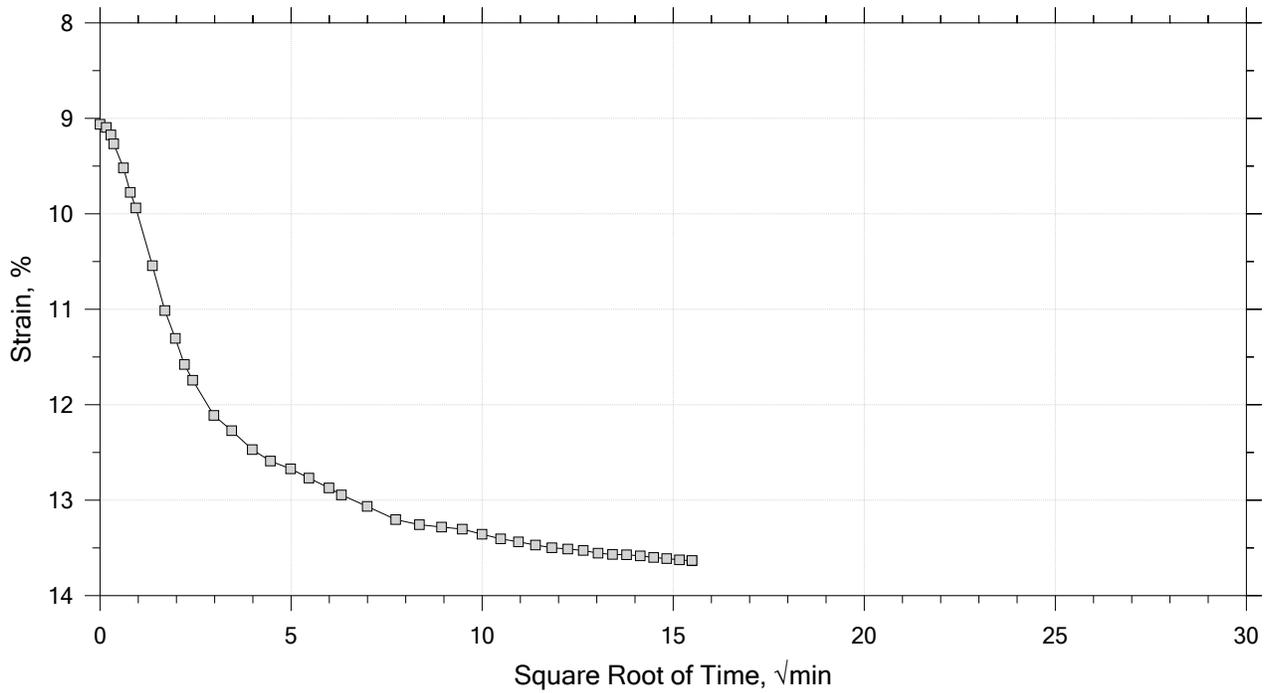
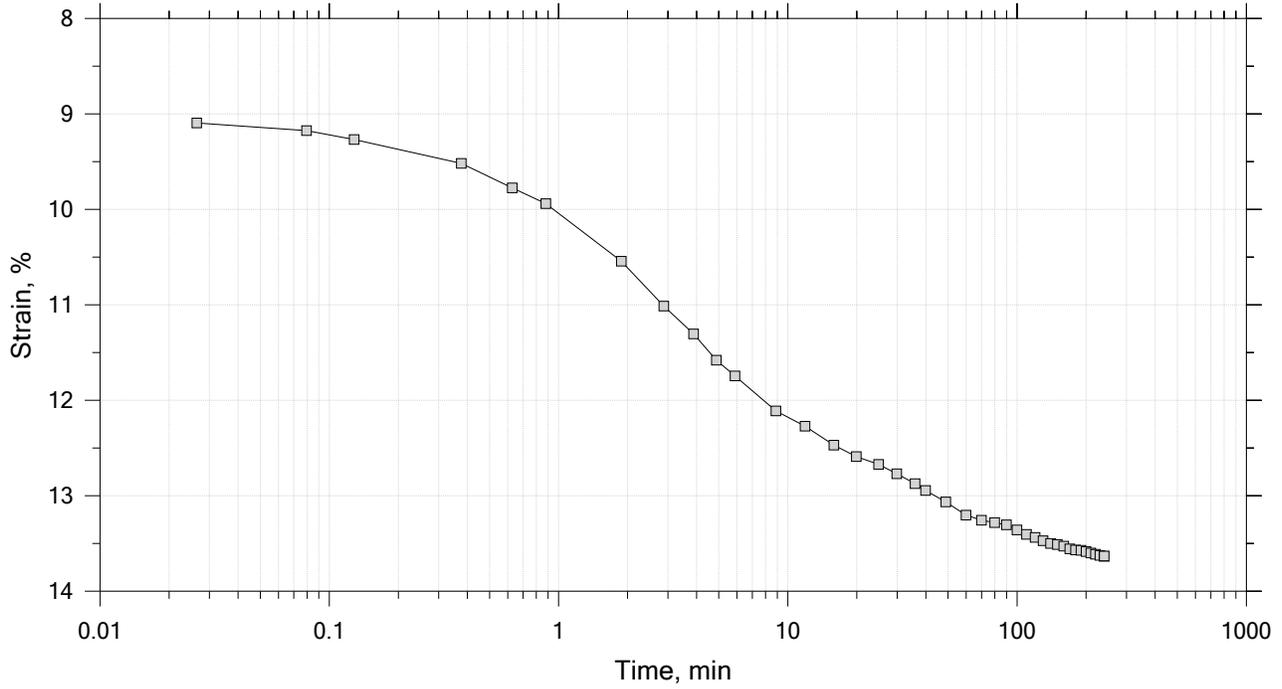
	Project: Souadabscook Center Bridges	Location: Hampden, ME	Project No.: GTX-309947
	Boring No.: BB-HSS-207	Tested By: trm	Checked By: njh
	Sample No.: U1	Test Date: 5/3/19	Depth: 20-22 ft
	Test No.: IP-2	Sample Type: intact	Elevation: ---
	Description: Wet, olive gray clay		
	Remarks: System LTIII-A, Swell Pressure = 0.0789 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 7 of 15

Constant Load Step

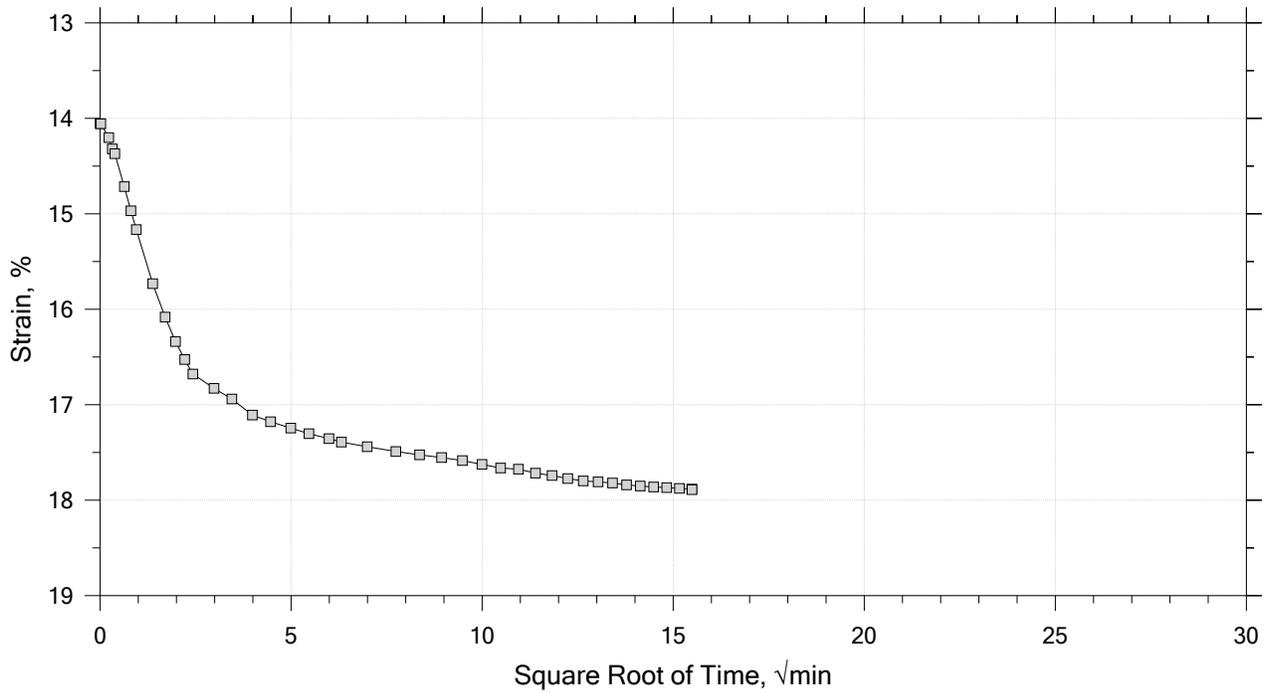
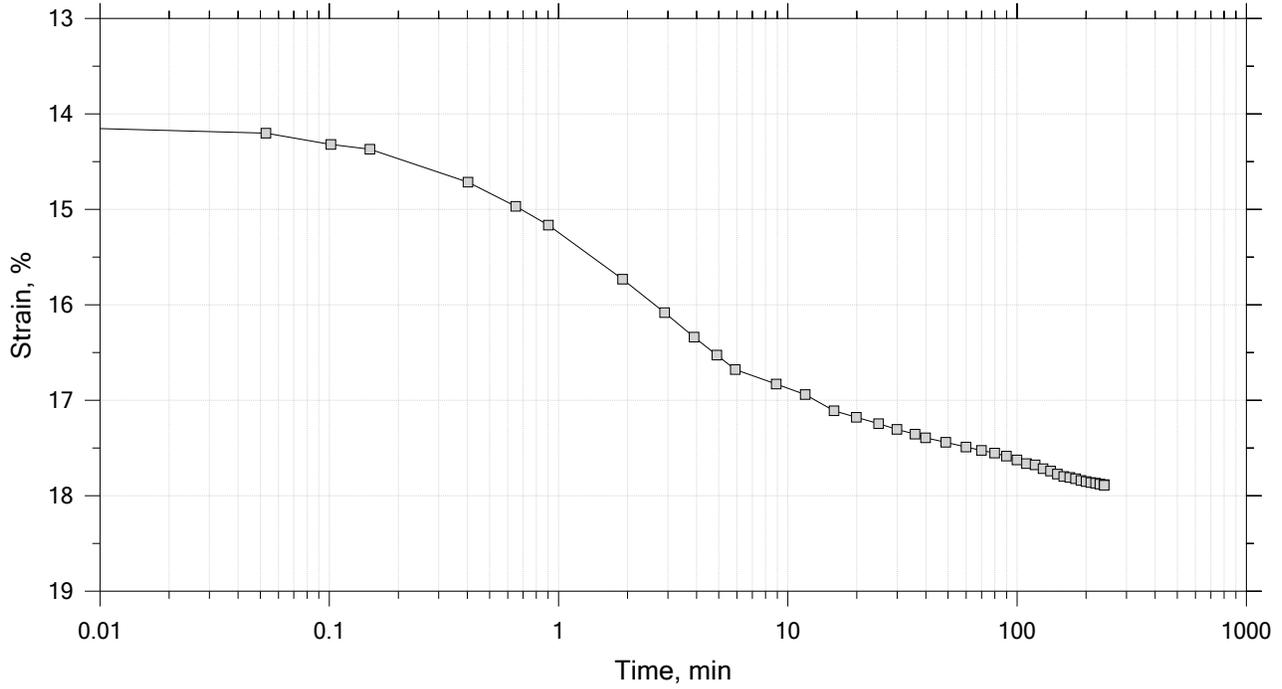
Stress: 4 tsf



	Project: Souadabscook Center Bridges	Location: Hampden, ME	Project No.: GTX-309947
	Boring No.: BB-HSS-207	Tested By: trm	Checked By: njh
	Sample No.: U1	Test Date: 5/3/19	Depth: 20-22 ft
	Test No.: IP-2	Sample Type: intact	Elevation: ---
	Description: Wet, olive gray clay		
	Remarks: System LTIII-A, Swell Pressure = 0.0789 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

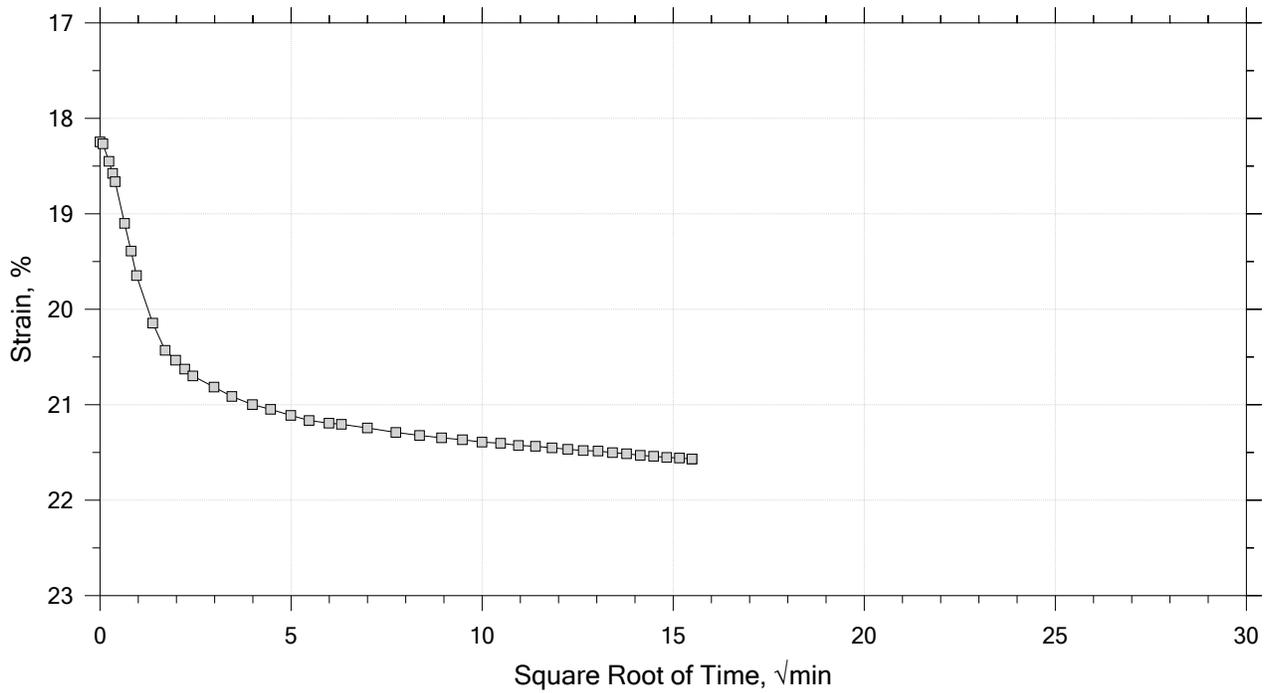
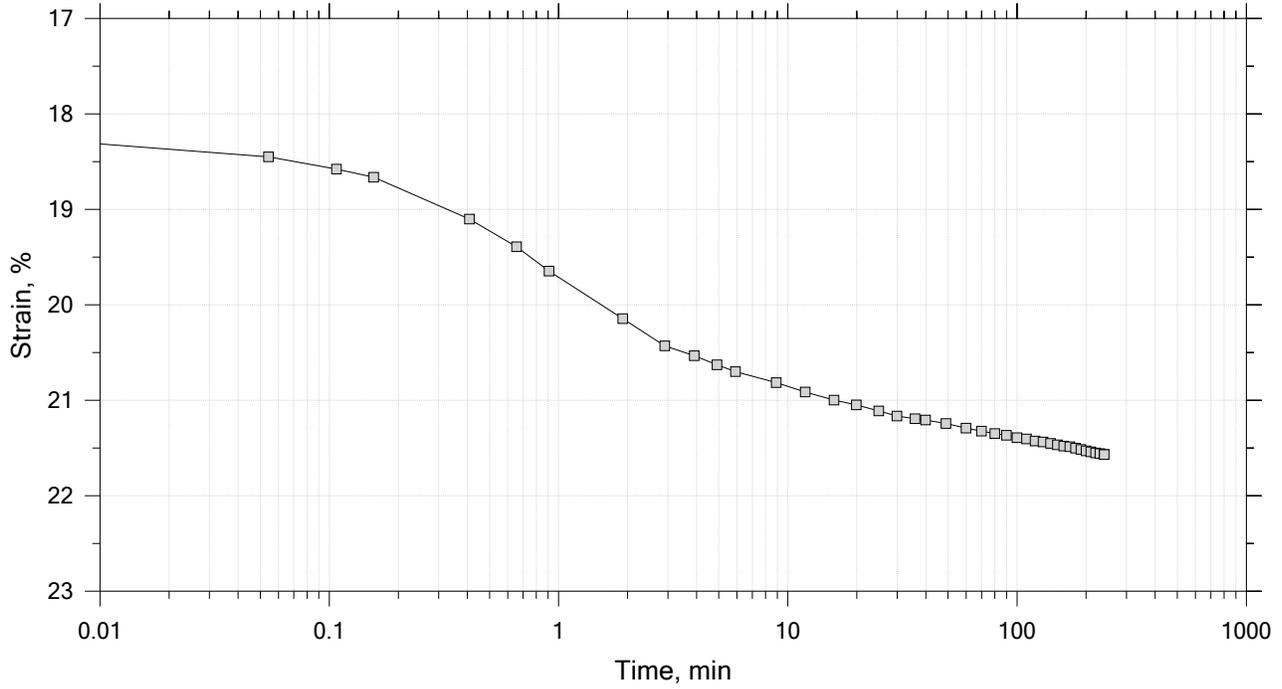
Time Curve 8 of 15
 Constant Load Step
 Stress: 8 tsf



	Project: Souadabscook Center Bridges	Location: Hampden, ME	Project No.: GTX-309947
	Boring No.: BB-HSS-207	Tested By: trm	Checked By: njh
	Sample No.: U1	Test Date: 5/3/19	Depth: 20-22 ft
	Test No.: IP-2	Sample Type: intact	Elevation: ---
	Description: Wet, olive gray clay		
	Remarks: System LTIII-A, Swell Pressure = 0.0789 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 9 of 15
 Constant Load Step
 Stress: 16 tsf



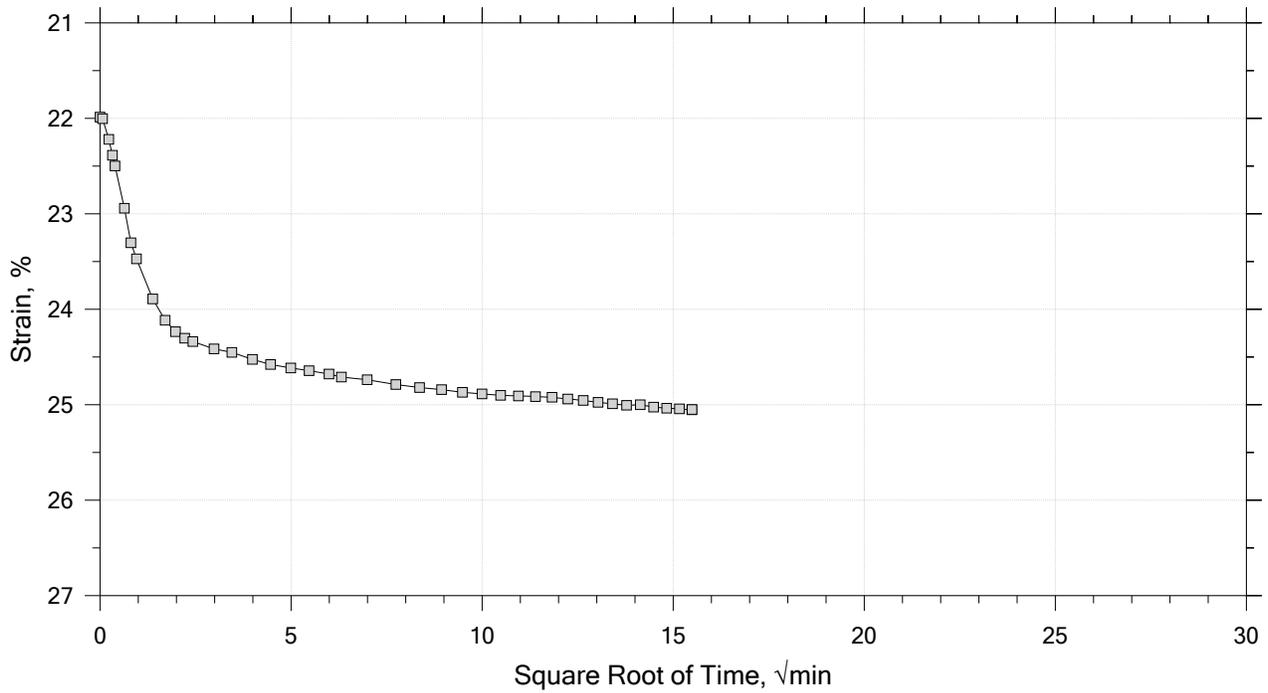
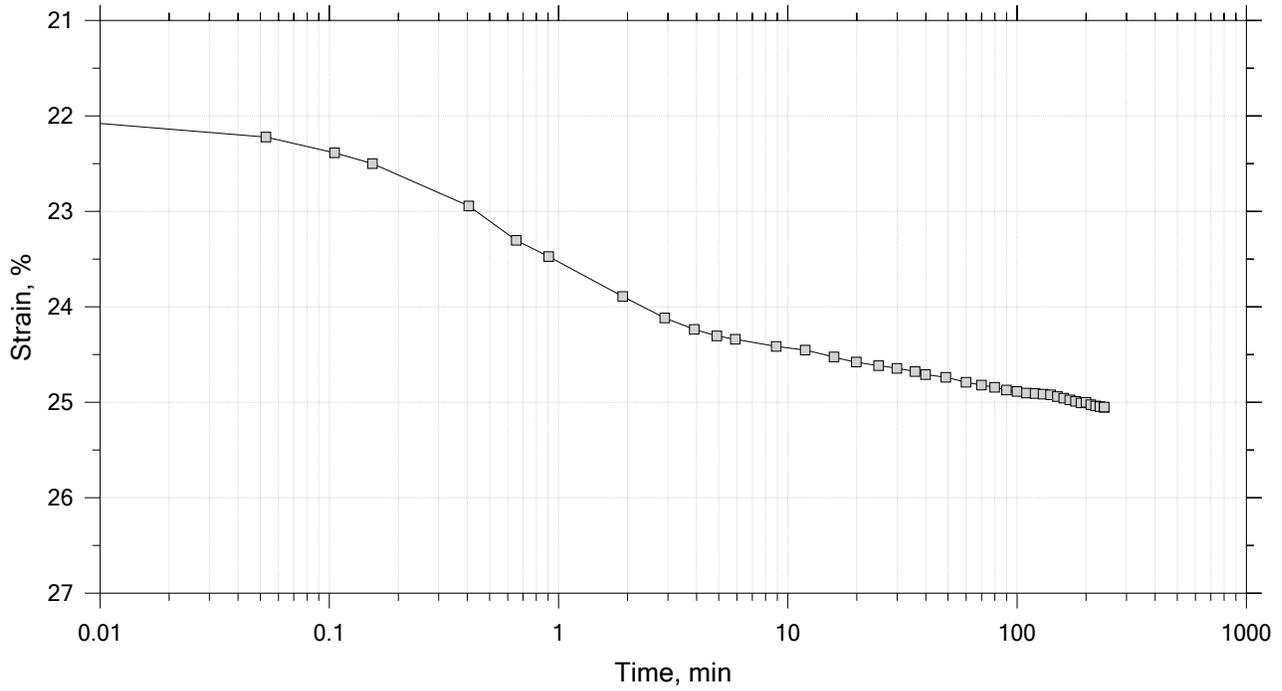
	Project: Souadabscook Center Bridges	Location: Hampden, ME	Project No.: GTX-309947
	Boring No.: BB-HSS-207	Tested By: trm	Checked By: njh
	Sample No.: U1	Test Date: 5/3/19	Depth: 20-22 ft
	Test No.: IP-2	Sample Type: intact	Elevation: ---
	Description: Wet, olive gray clay		
	Remarks: System LTIII-A, Swell Pressure = 0.0789 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 10 of 15

Constant Load Step

Stress: 32 tsf



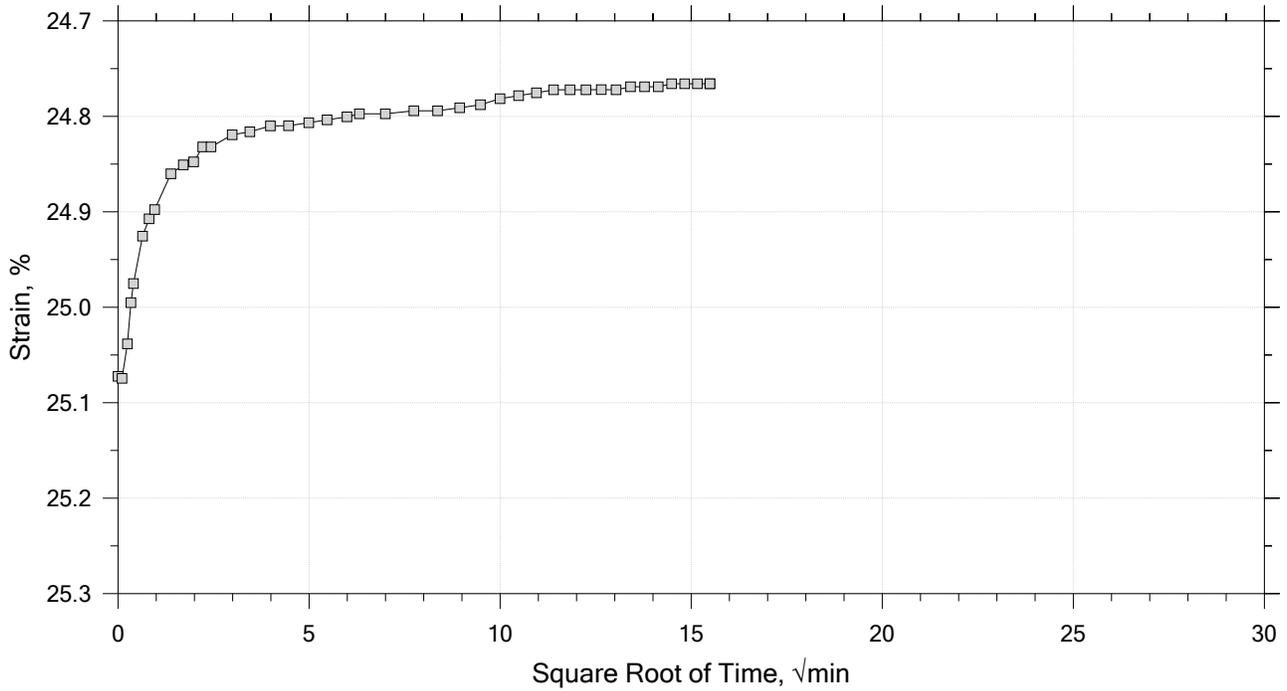
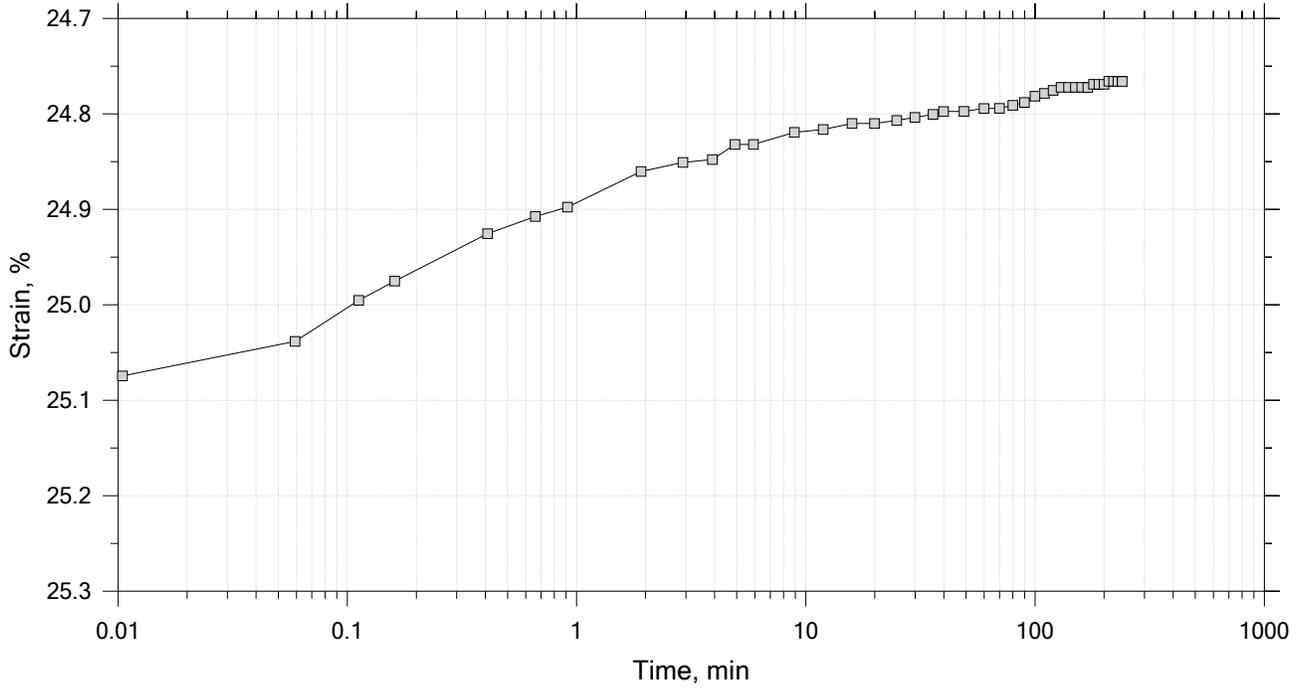
	Project: Souadabscook Center Bridges	Location: Hampden, ME	Project No.: GTX-309947
	Boring No.: BB-HSS-207	Tested By: trm	Checked By: njh
	Sample No.: U1	Test Date: 5/3/19	Depth: 20-22 ft
	Test No.: IP-2	Sample Type: intact	Elevation: ---
	Description: Wet, olive gray clay		
	Remarks: System LTIII-A, Swell Pressure = 0.0789 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 11 of 15

Constant Load Step

Stress: 8 tsf



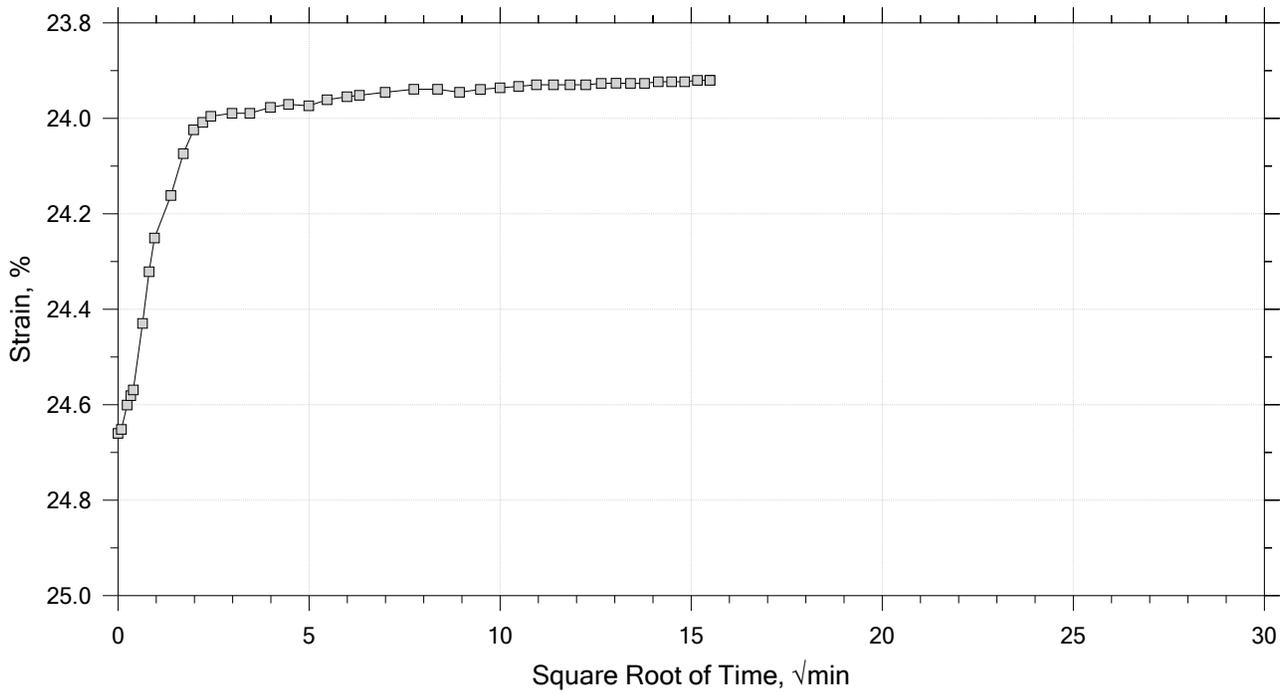
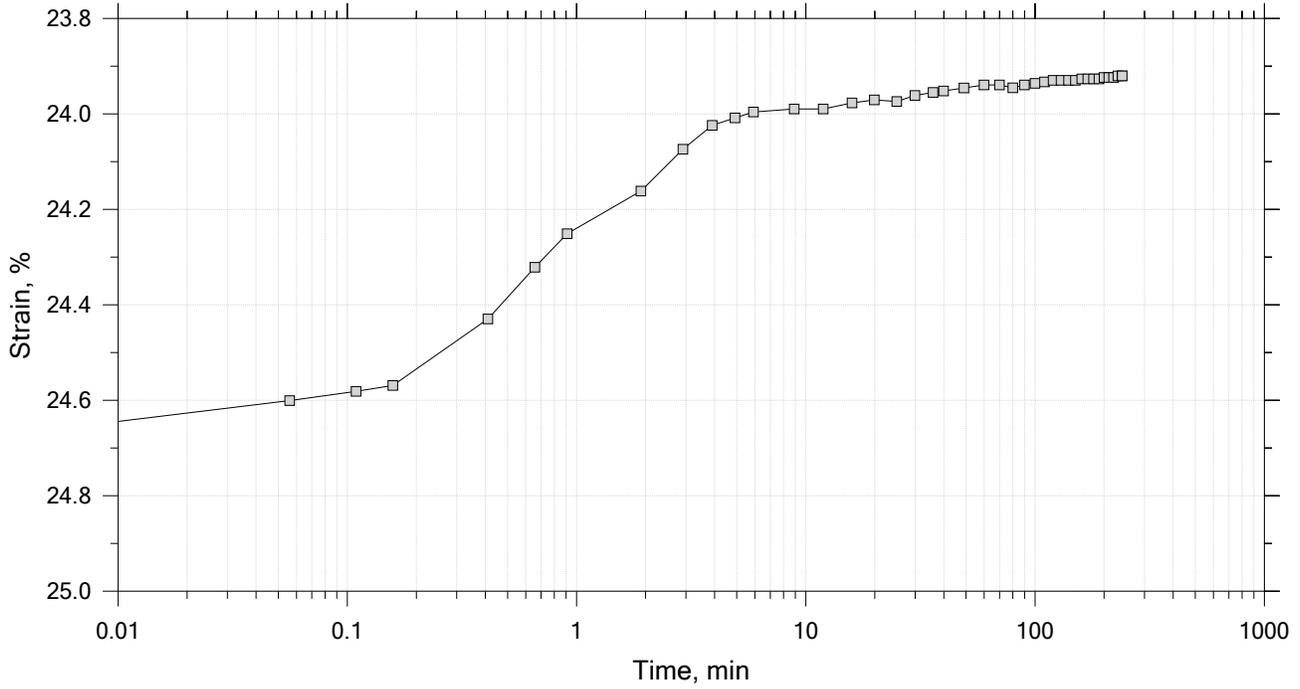
	Project: Souadabscook Center Bridges	Location: Hampden, ME	Project No.: GTX-309947
	Boring No.: BB-HSS-207	Tested By: trm	Checked By: njh
	Sample No.: U1	Test Date: 5/3/19	Depth: 20-22 ft
	Test No.: IP-2	Sample Type: intact	Elevation: ---
	Description: Wet, olive gray clay		
	Remarks: System LTIII-A, Swell Pressure = 0.0789 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 12 of 15

Constant Load Step

Stress: 2 tsf



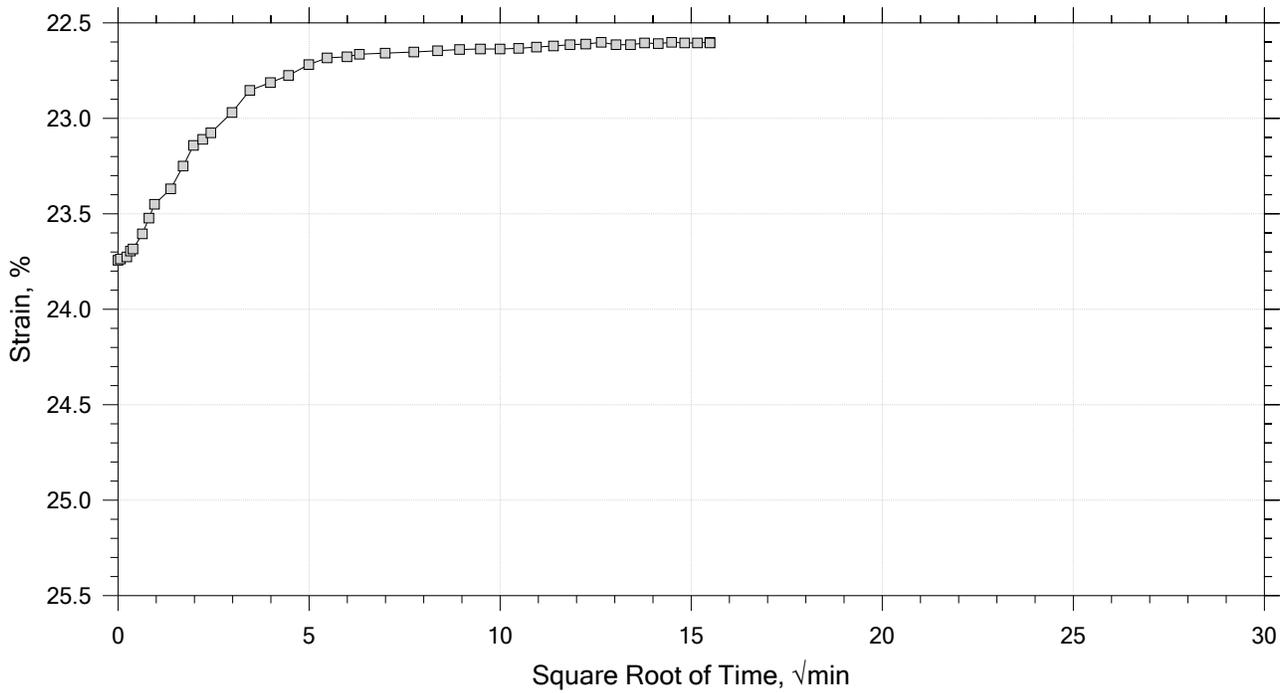
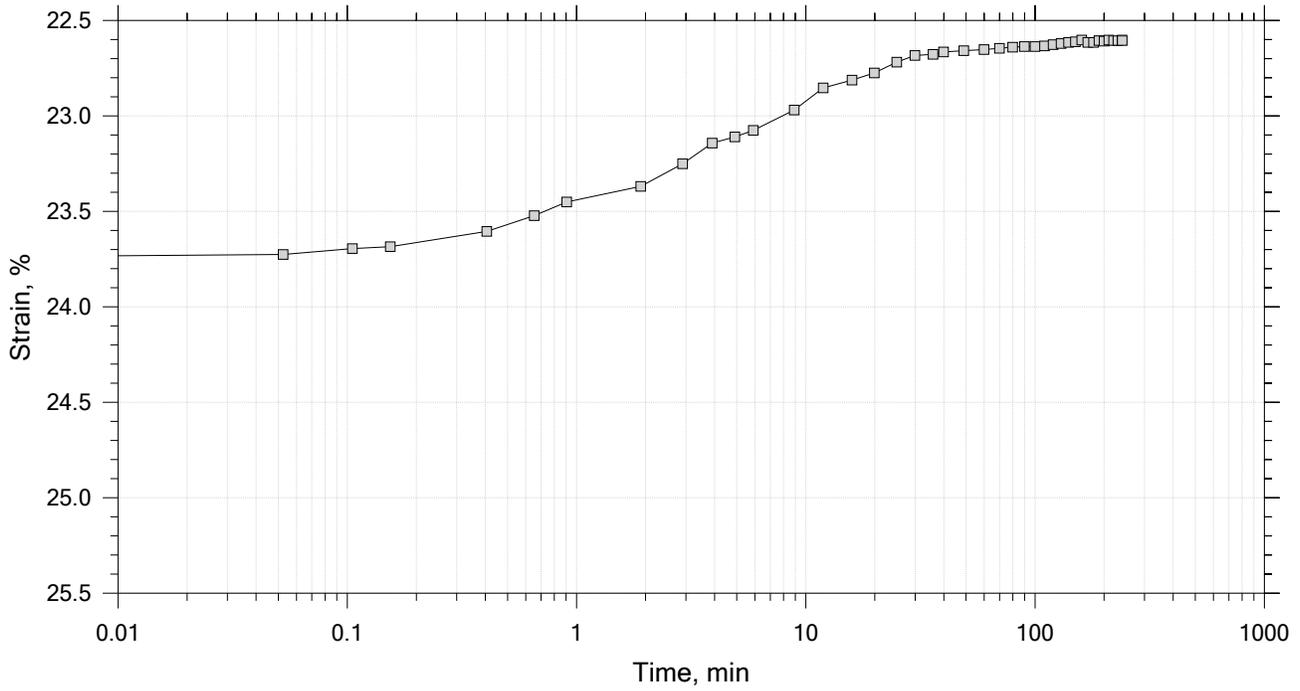
	Project: Souadabscook Center Bridges	Location: Hampden, ME	Project No.: GTX-309947
	Boring No.: BB-HSS-207	Tested By: trm	Checked By: njh
	Sample No.: U1	Test Date: 5/3/19	Depth: 20-22 ft
	Test No.: IP-2	Sample Type: intact	Elevation: ---
	Description: Wet, olive gray clay		
	Remarks: System LTIII-A, Swell Pressure = 0.0789 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 13 of 15

Constant Load Step

Stress: 0.5 tsf



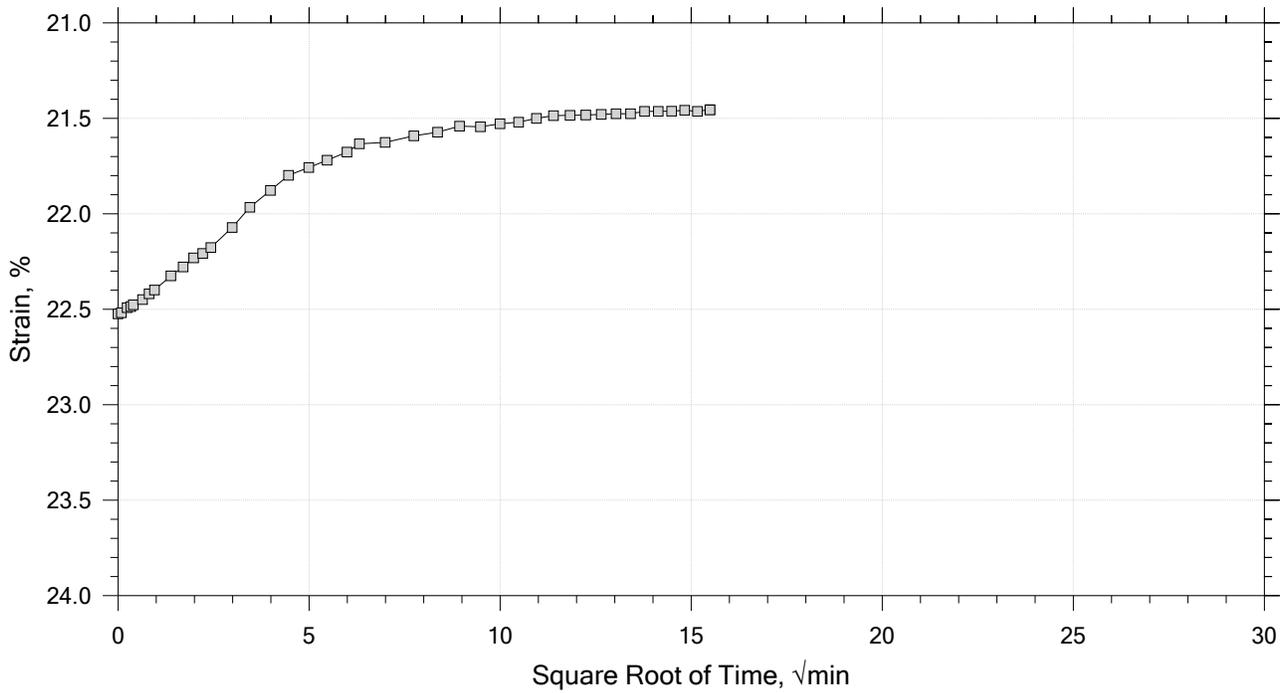
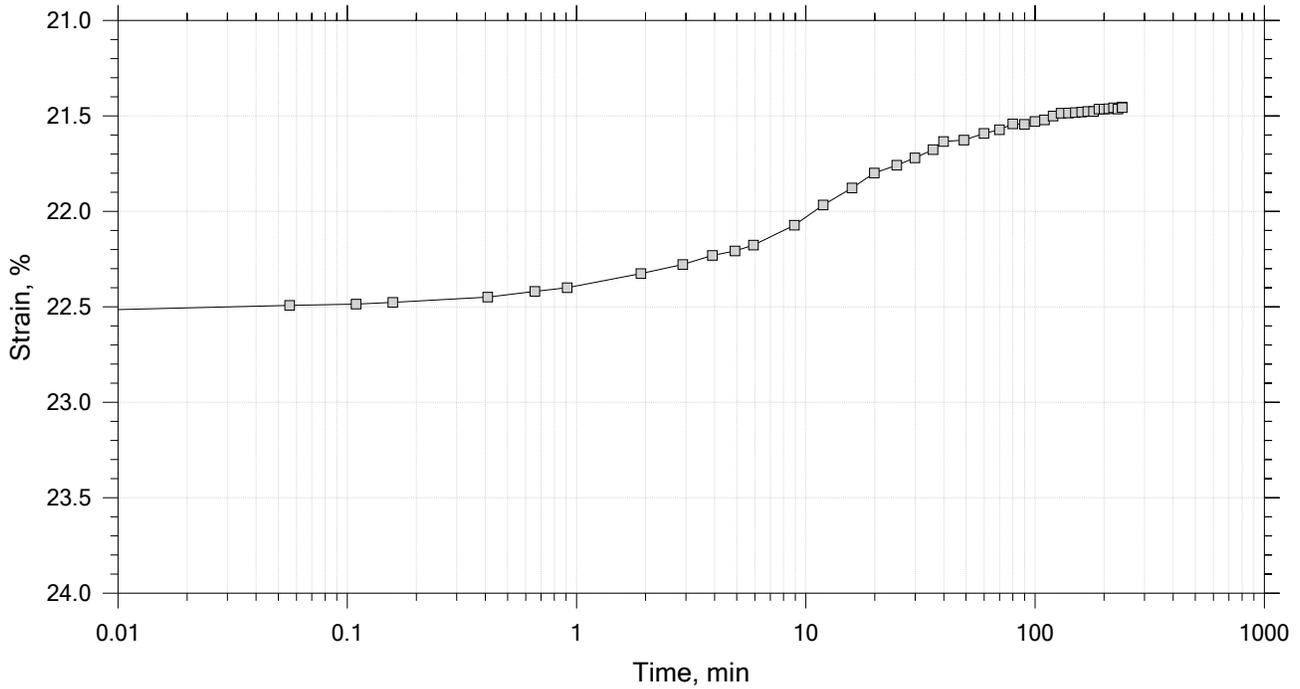
	Project: Souadabscook Center Bridges	Location: Hampden, ME	Project No.: GTX-309947
	Boring No.: BB-HSS-207	Tested By: trm	Checked By: njh
	Sample No.: U1	Test Date: 5/3/19	Depth: 20-22 ft
	Test No.: IP-2	Sample Type: intact	Elevation: ---
	Description: Wet, olive gray clay		
	Remarks: System LTIII-A, Swell Pressure = 0.0789 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 14 of 15

Constant Load Step

Stress: 0.125 tsf



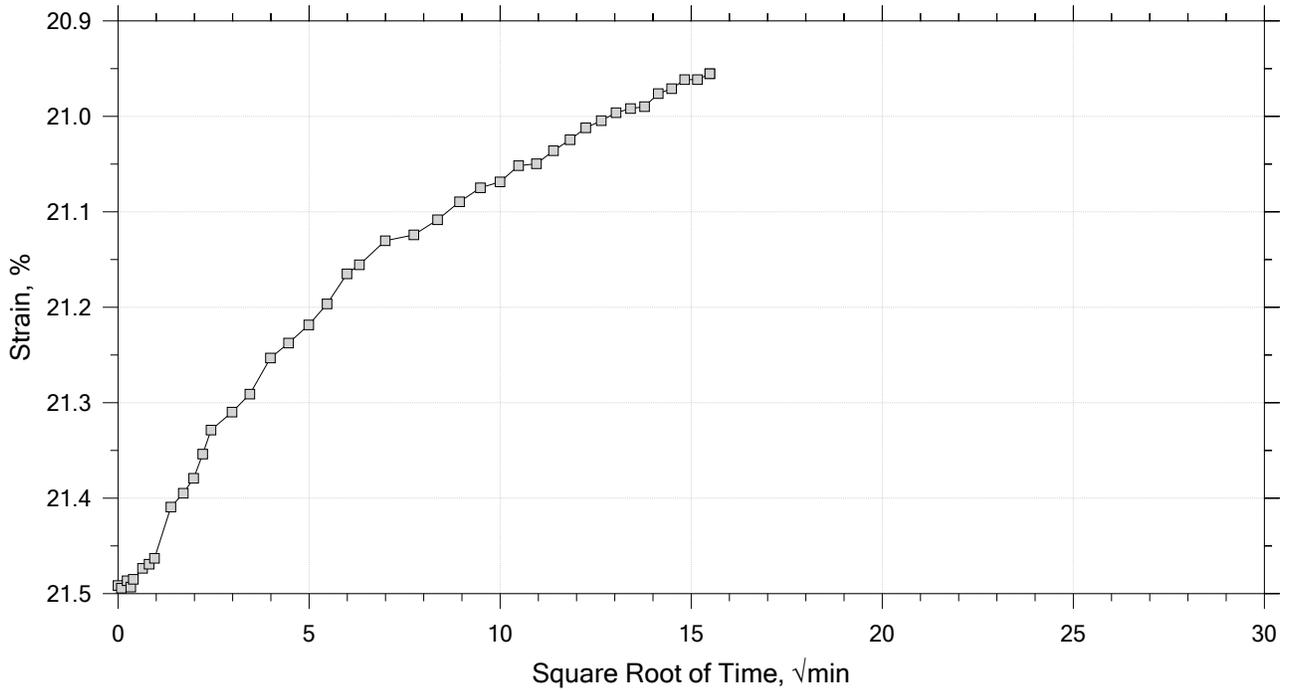
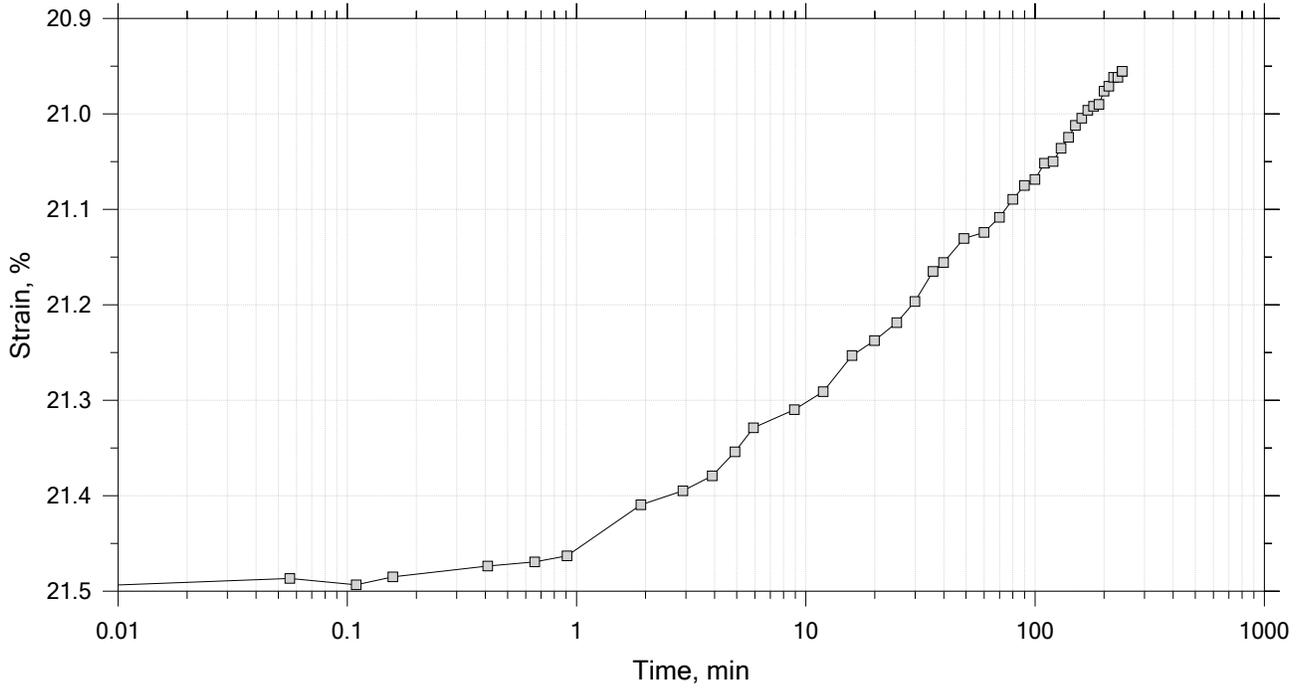
	Project: Souadabscook Center Bridges	Location: Hampden, ME	Project No.: GTX-309947
	Boring No.: BB-HSS-207	Tested By: trm	Checked By: njh
	Sample No.: U1	Test Date: 5/3/19	Depth: 20-22 ft
	Test No.: IP-2	Sample Type: intact	Elevation: ---
	Description: Wet, olive gray clay		
	Remarks: System LTIII-A, Swell Pressure = 0.0789 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 15 of 15

Constant Load Step

Stress: 0.0625 tsf



	Project: Souadabscook Center Bridges	Location: Hampden, ME	Project No.: GTX-309947
	Boring No.: BB-HSS-207	Tested By: trm	Checked By: njh
	Sample No.: U1	Test Date: 5/3/19	Depth: 20-22 ft
	Test No.: IP-2	Sample Type: intact	Elevation: ---
	Description: Wet, olive gray clay		
	Remarks: System LTIII-A, Swell Pressure = 0.0789 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Specimen Diameter: 2.50 in	Estimated Specific Gravity: 2.72	Liquid Limit: 32
Initial Height: 1.00 in	Initial Void Ratio: 1	Plastic Limit: 20
Final Height: 0.80 in	Final Void Ratio: 0.604	Plasticity Index: 12

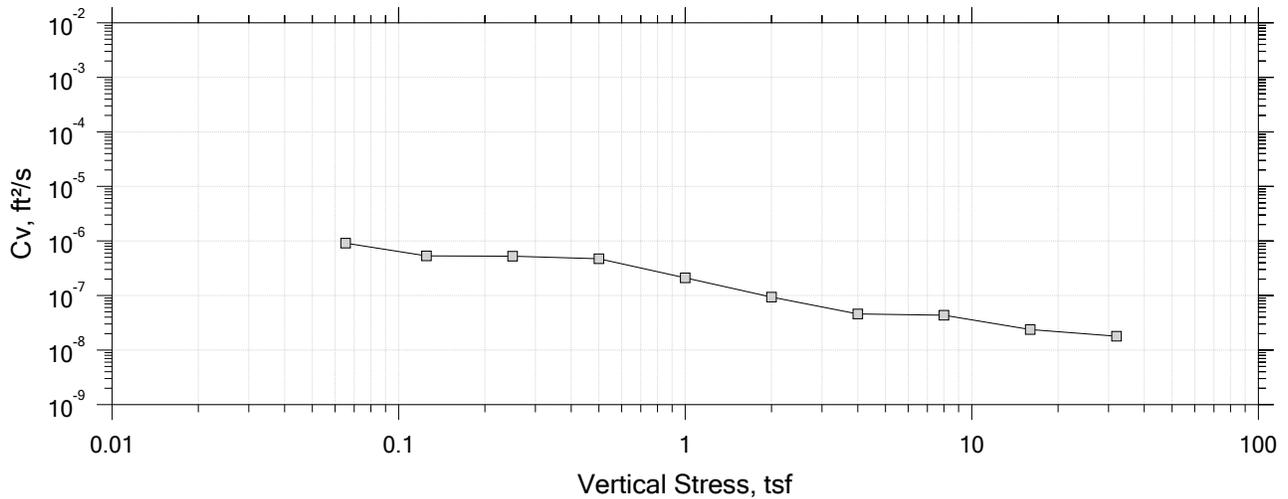
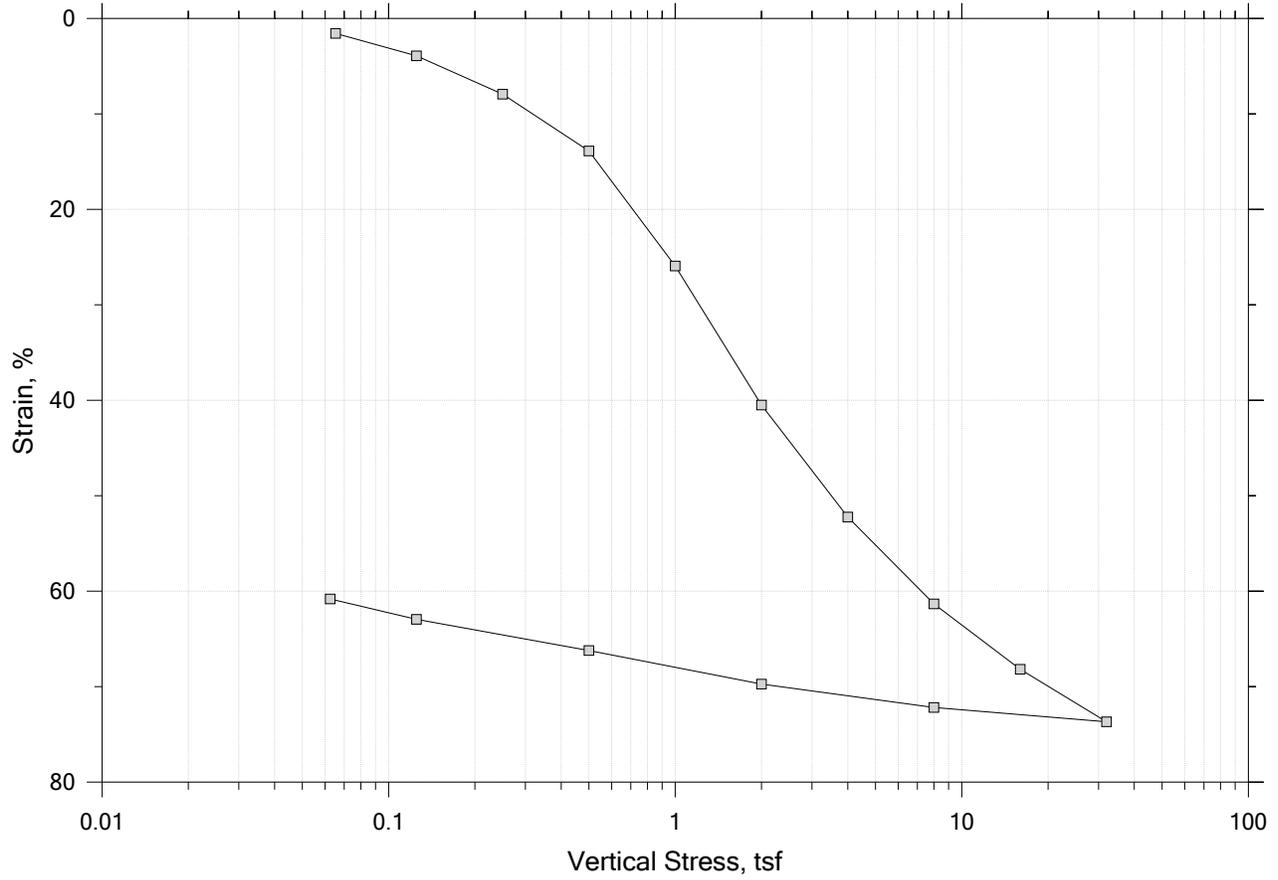
	Before Test Trimmings	Before Test Specimen	After Test Specimen	After Test Trimmings
Container ID	B2192	RING		A-2929
Mass Container, gm	8.38	110.52	110.52	8.65
Mass Container + Wet Soil, gm	182.85	259.43	243.71	141.66
Mass Container + Dry Soil, gm	135.41	219.49	219.49	117.47
Mass Dry Soil, gm	127.03	108.97	108.97	108.82
Water Content, %	37.35	36.66	22.23	22.23
Void Ratio	---	1.00	0.60	---
Degree of Saturation, %	---	99.09	100.00	---
Dry Unit Weight, pcf	---	84.568	105.71	---

Note: Specific Gravity and Void Ratios are calculated assuming the degree of saturation equals 100% at the end of the test. Therefore, values may not represent actual values for the specimen.

	Project: Souadabscook Center Bridges	Location: Hampden, ME	Project No.: GTX-309947
	Boring No.: BB-HSS-207	Tested By: trm	Checked By: njh
	Sample No.: U1	Test Date: 5/3/19	Depth: 20-22 ft
	Test No.: IP-2	Sample Type: intact	Elevation: ---
	Description: Wet, olive gray clay		
	Remarks: System LTIII-A, Swell Pressure = 0.0789 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

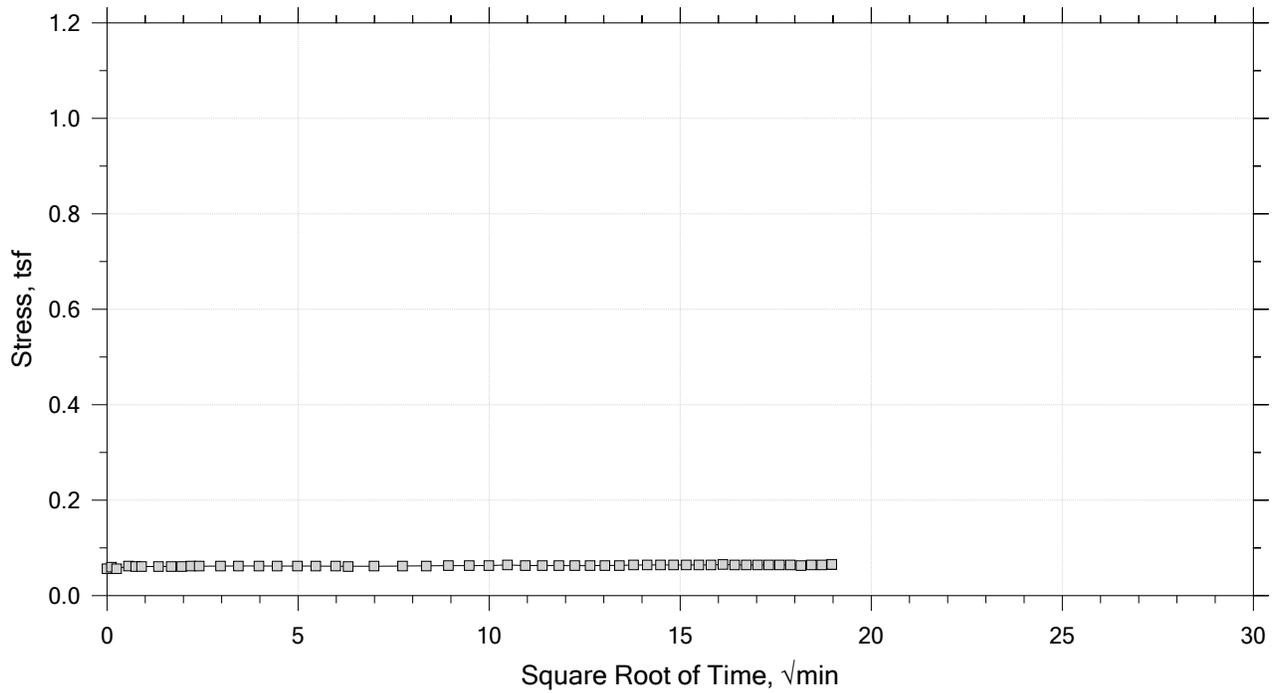
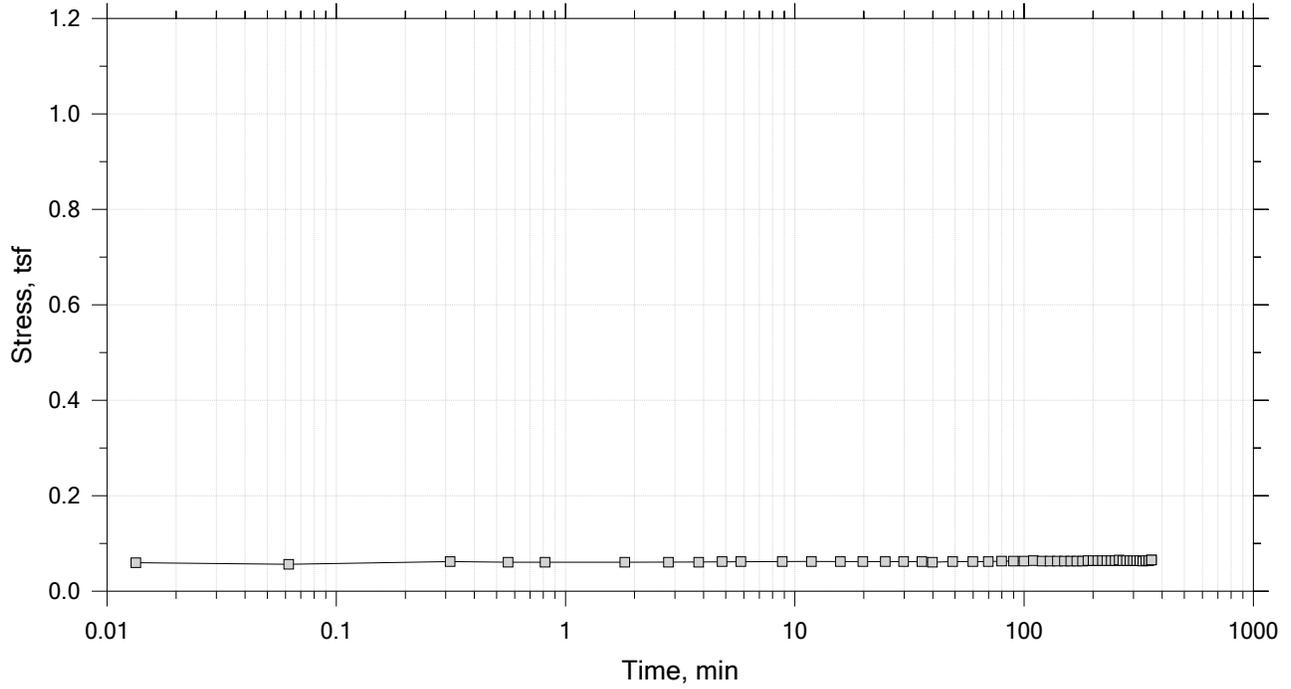
Summary Report



	Project: Souadabscook Center Bridges	Location: Hampden, ME	Project No.: GTX-309947
	Boring No.: BB-HSS-209	Tested By: trm	Checked By: njh
	Sample No.: U1	Test Date: 5/3/19	Depth: 9-11 ft
	Test No.: IP-4	Sample Type: intact	Elevation: ---
	Description: Moist, gray silt		
	Remarks: System S, Swell Pressure = 0.0653 tsf		
	Displacement at End of Increment		

One-Dimensional Consolidation by ASTM D2435 - Method B

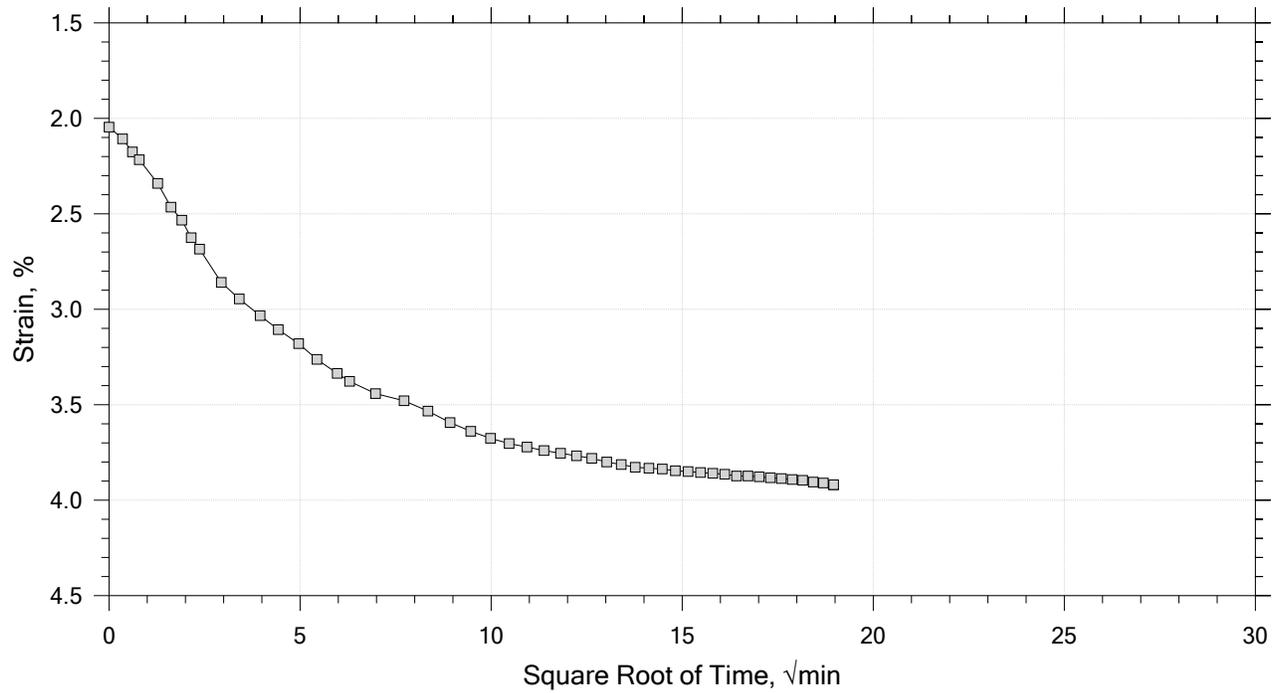
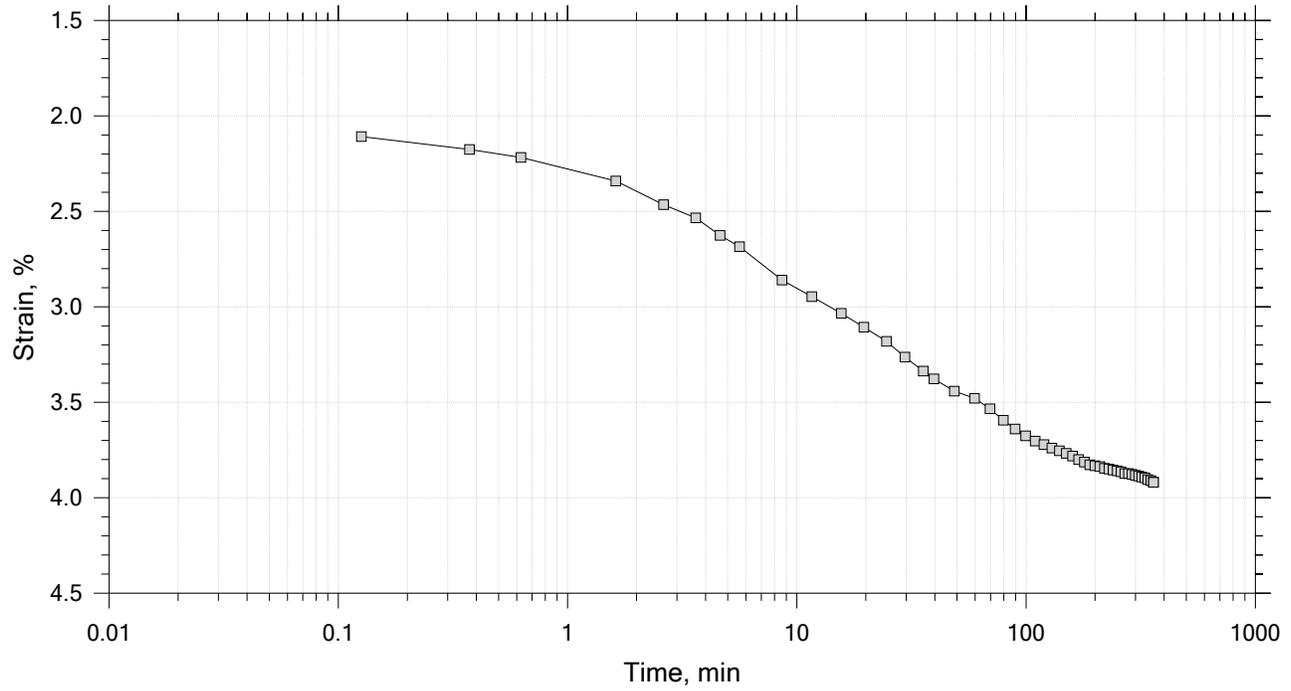
Time Curve 1 of 15
 Constant Volume Step
 Stress: 0.0653 tsf



	Project: Souadabscook Center Bridges	Location: Hampden, ME	Project No.: GTX-309947
	Boring No.: BB-HSS-209	Tested By: trm	Checked By: njh
	Sample No.: U1	Test Date: 5/3/19	Depth: 9-11 ft
	Test No.: IP-4	Sample Type: intact	Elevation: ---
	Description: Moist, gray silt		
	Remarks: System S, Swell Pressure = 0.0653 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 2 of 15
 Constant Load Step
 Stress: 0.125 tsf



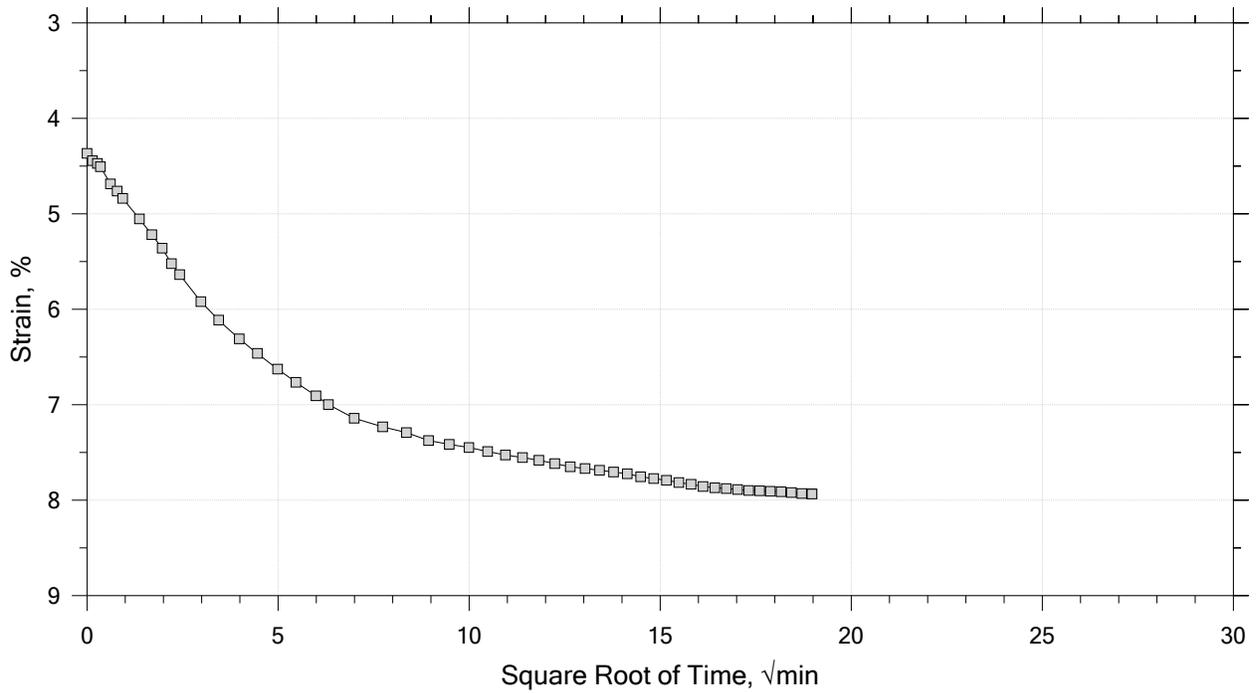
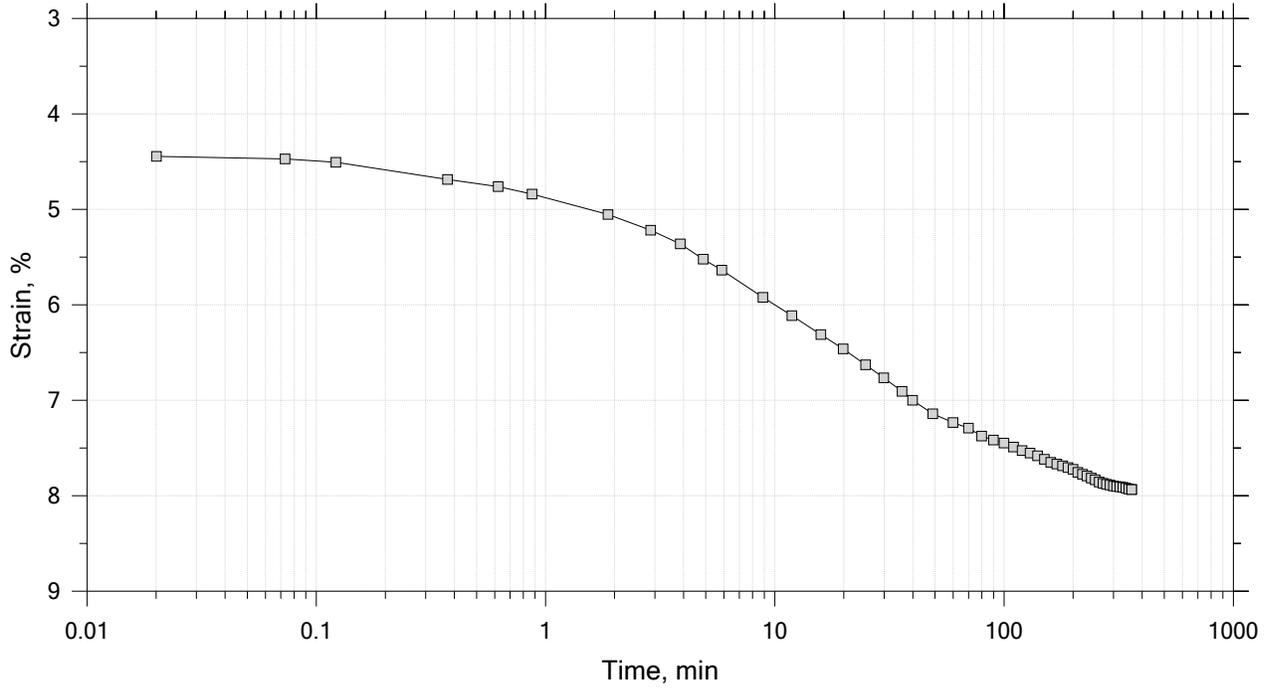
	Project: Souadabscook Center Bridges	Location: Hampden, ME	Project No.: GTX-309947
	Boring No.: BB-HSS-209	Tested By: trm	Checked By: njh
	Sample No.: U1	Test Date: 5/3/19	Depth: 9-11 ft
	Test No.: IP-4	Sample Type: intact	Elevation: ---
	Description: Moist, gray silt		
	Remarks: System S, Swell Pressure = 0.0653 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 3 of 15

Constant Load Step

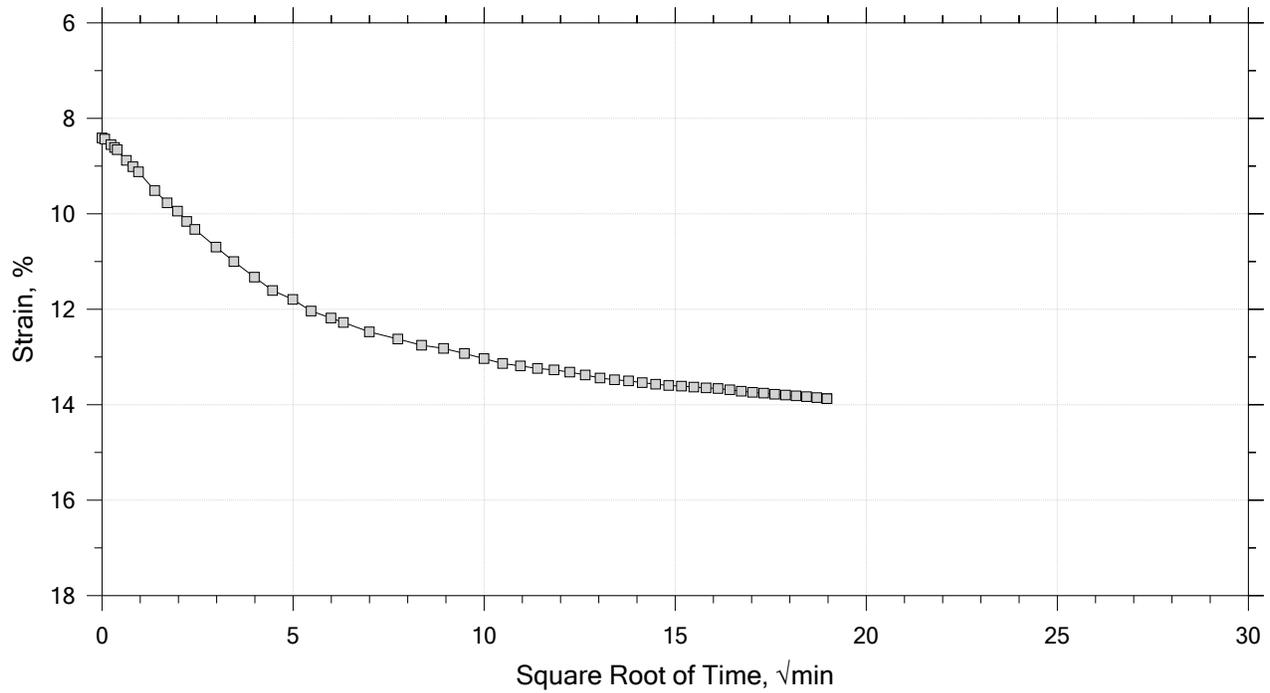
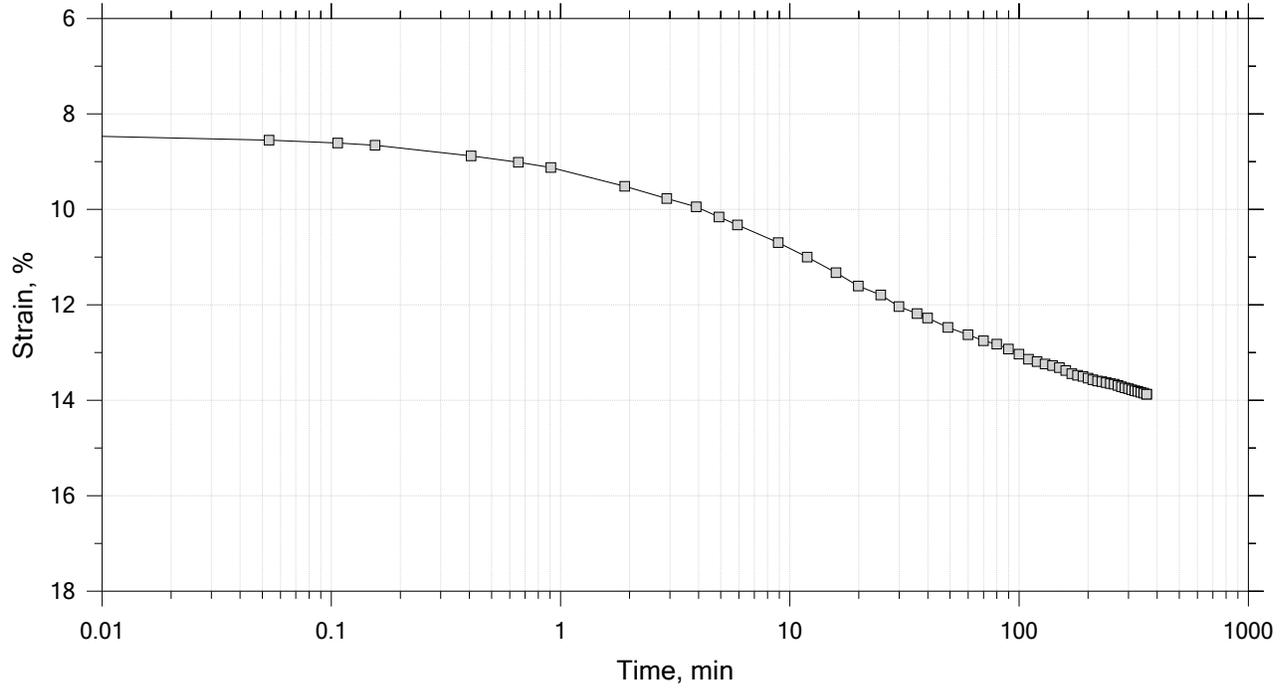
Stress: 0.25 tsf



	Project: Souadabscook Center Bridges	Location: Hampden, ME	Project No.: GTX-309947
	Boring No.: BB-HSS-209	Tested By: trm	Checked By: njh
	Sample No.: U1	Test Date: 5/3/19	Depth: 9-11 ft
	Test No.: IP-4	Sample Type: intact	Elevation: ---
	Description: Moist, gray silt		
	Remarks: System S, Swell Pressure = 0.0653 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

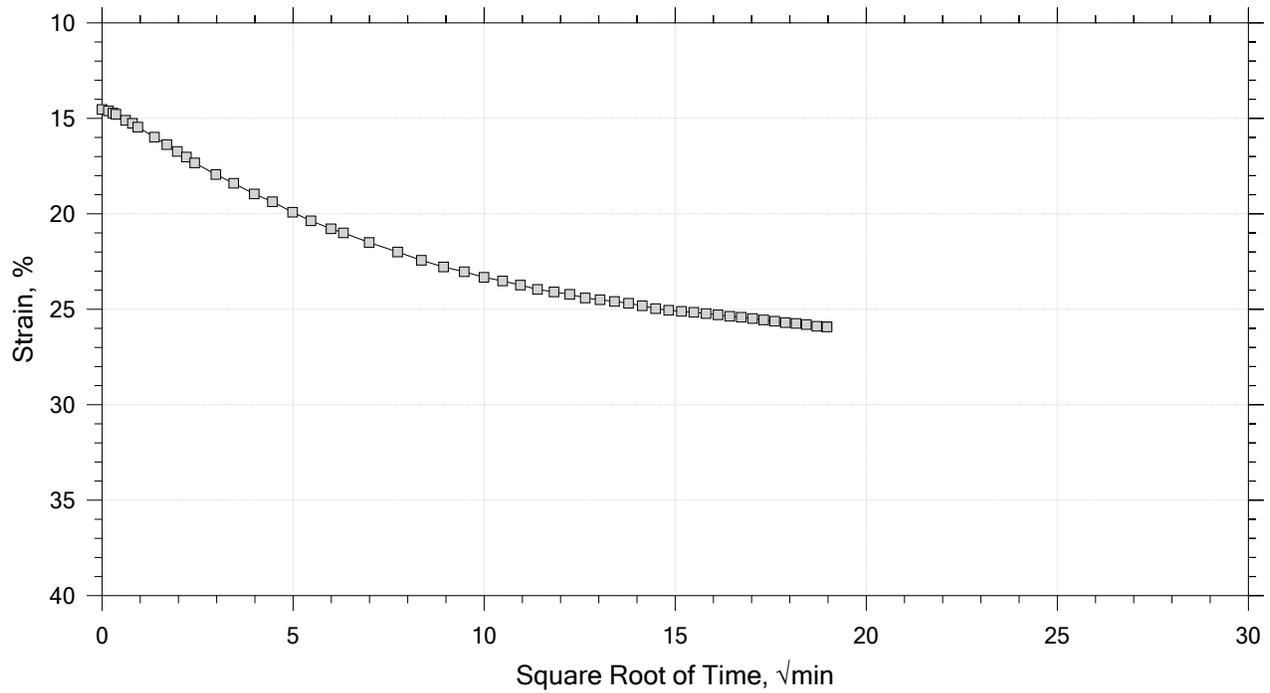
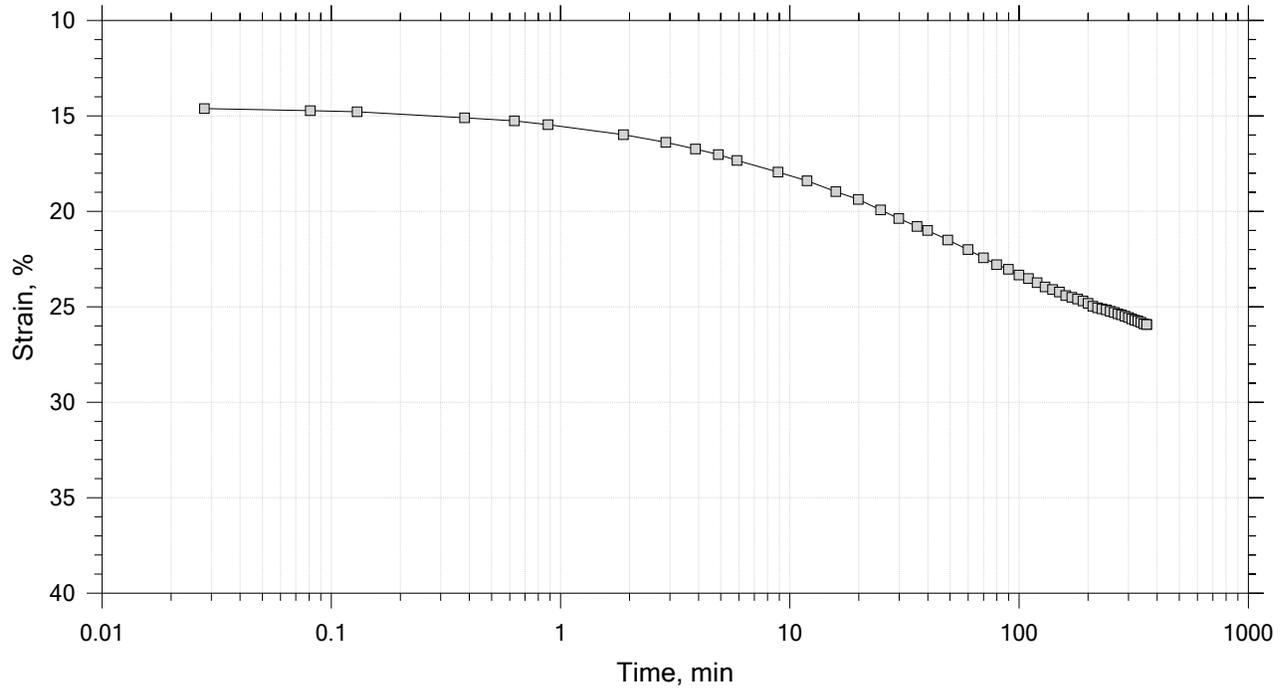
Time Curve 4 of 15
 Constant Load Step
 Stress: 0.5 tsf



	Project: Souadabscook Center Bridges	Location: Hampden, ME	Project No.: GTX-309947
	Boring No.: BB-HSS-209	Tested By: trm	Checked By: njh
	Sample No.: U1	Test Date: 5/3/19	Depth: 9-11 ft
	Test No.: IP-4	Sample Type: intact	Elevation: ---
	Description: Moist, gray silt		
	Remarks: System S, Swell Pressure = 0.0653 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 5 of 15
 Constant Load Step
 Stress: 1 tsf



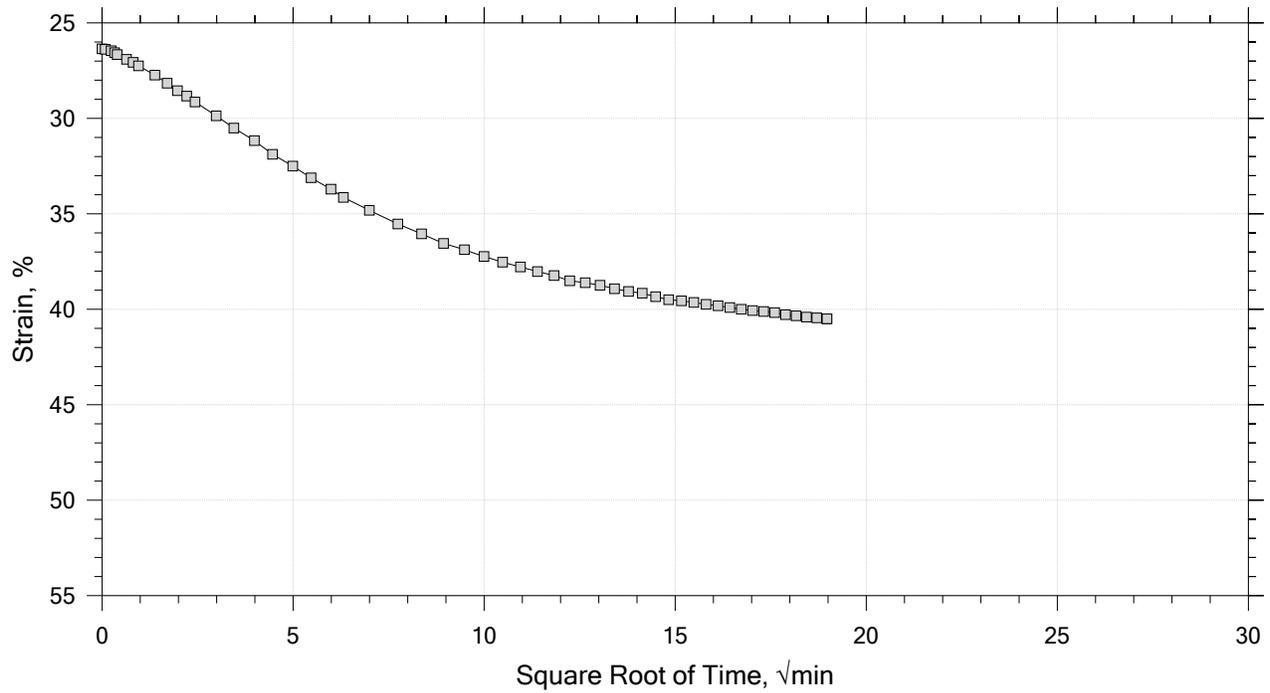
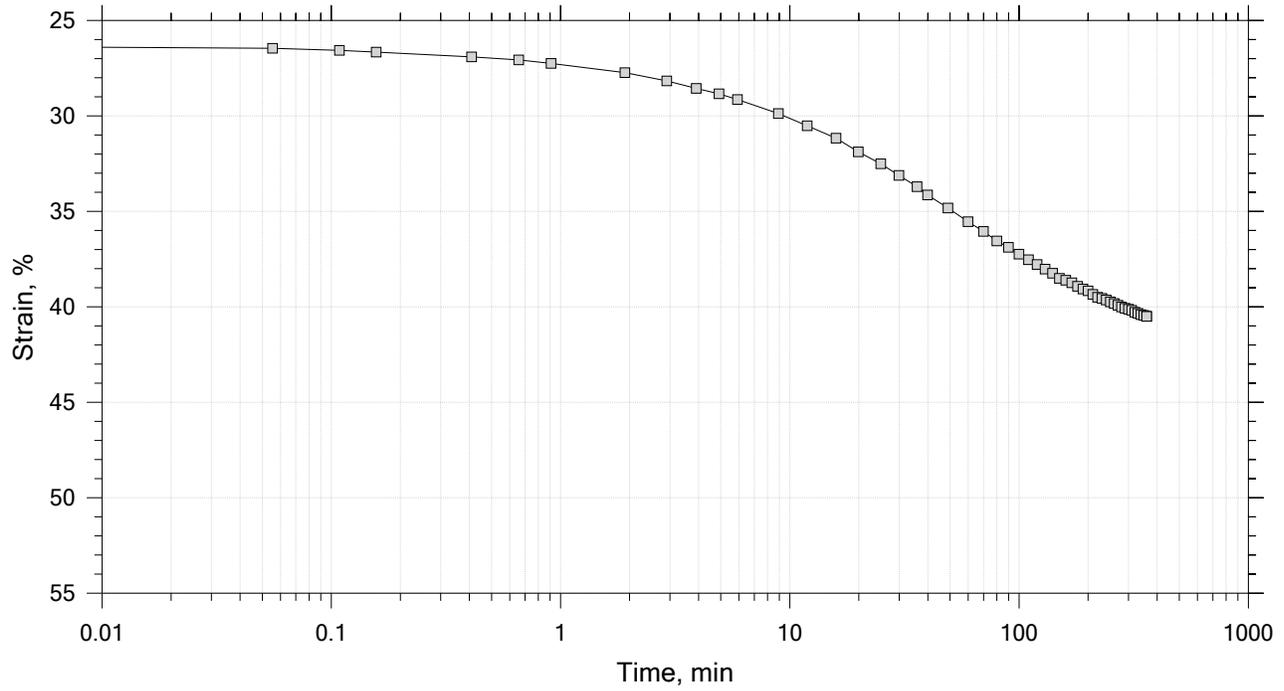
	Project: Souadabscook Center Bridges	Location: Hampden, ME	Project No.: GTX-309947
	Boring No.: BB-HSS-209	Tested By: trm	Checked By: njh
	Sample No.: U1	Test Date: 5/3/19	Depth: 9-11 ft
	Test No.: IP-4	Sample Type: intact	Elevation: ---
	Description: Moist, gray silt		
	Remarks: System S, Swell Pressure = 0.0653 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 6 of 15

Constant Load Step

Stress: 2 tsf



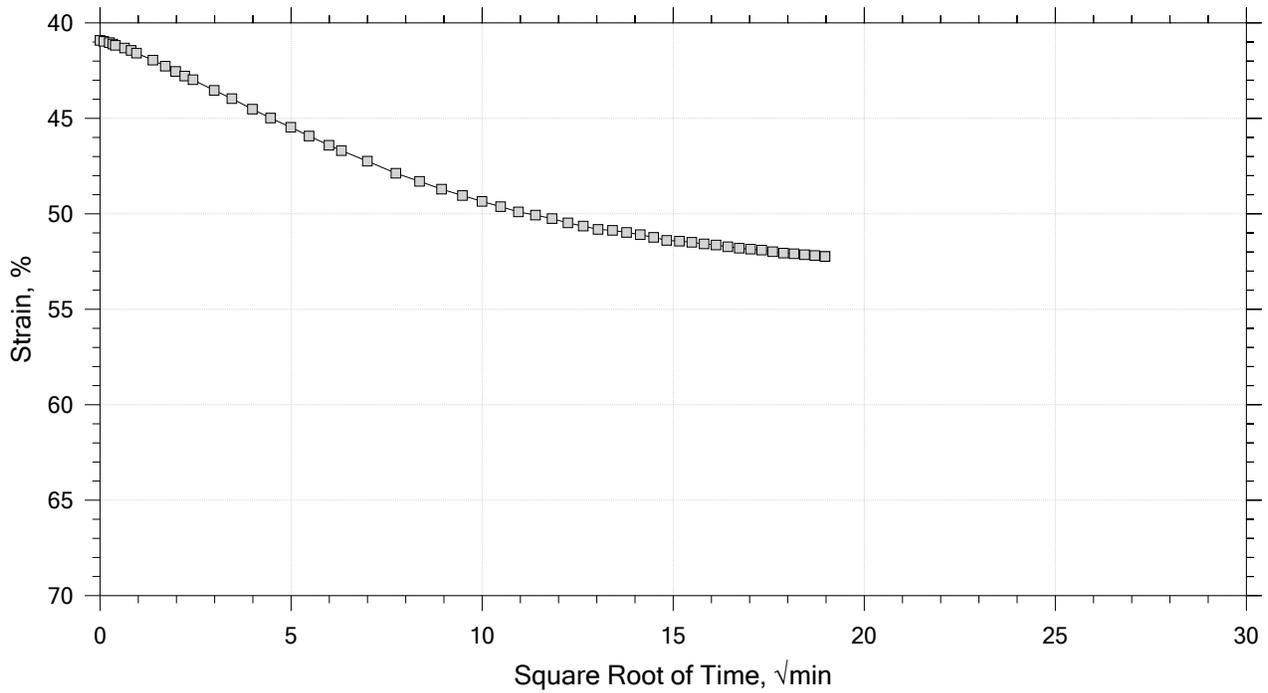
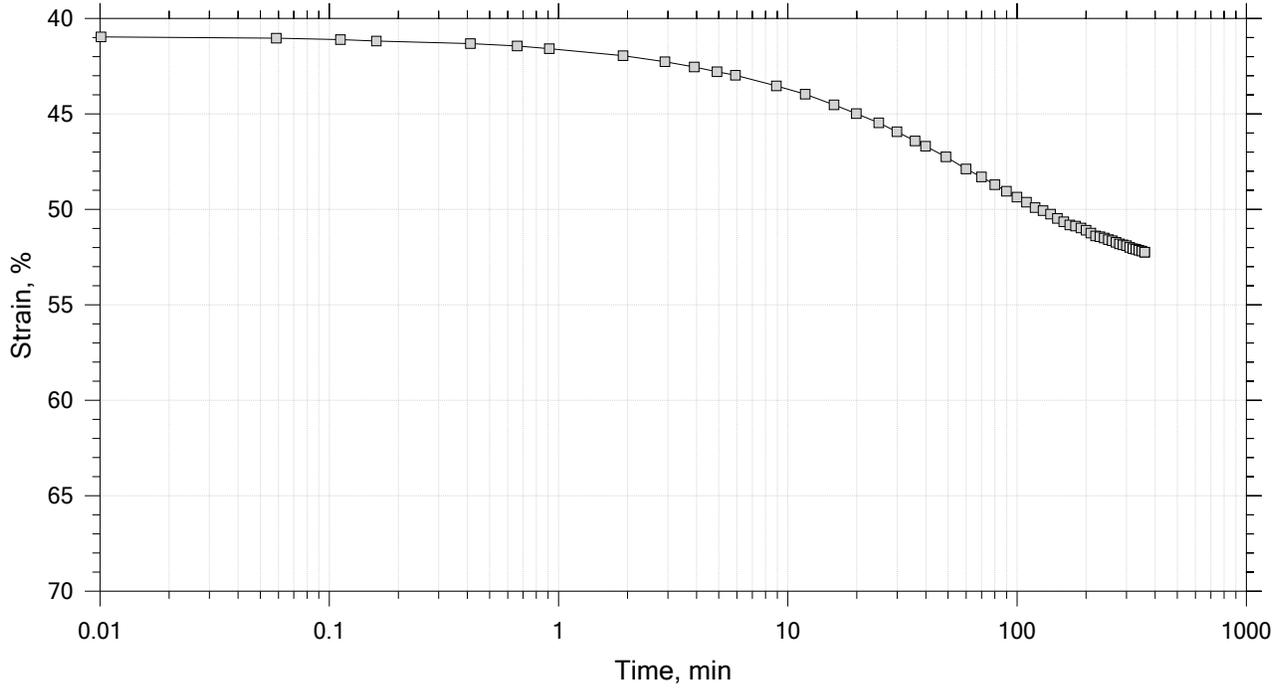
	Project: Souadabscook Center Bridges	Location: Hampden, ME	Project No.: GTX-309947
	Boring No.: BB-HSS-209	Tested By: trm	Checked By: njh
	Sample No.: U1	Test Date: 5/3/19	Depth: 9-11 ft
	Test No.: IP-4	Sample Type: intact	Elevation: ---
	Description: Moist, gray silt		
	Remarks: System S, Swell Pressure = 0.0653 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 7 of 15

Constant Load Step

Stress: 4 tsf



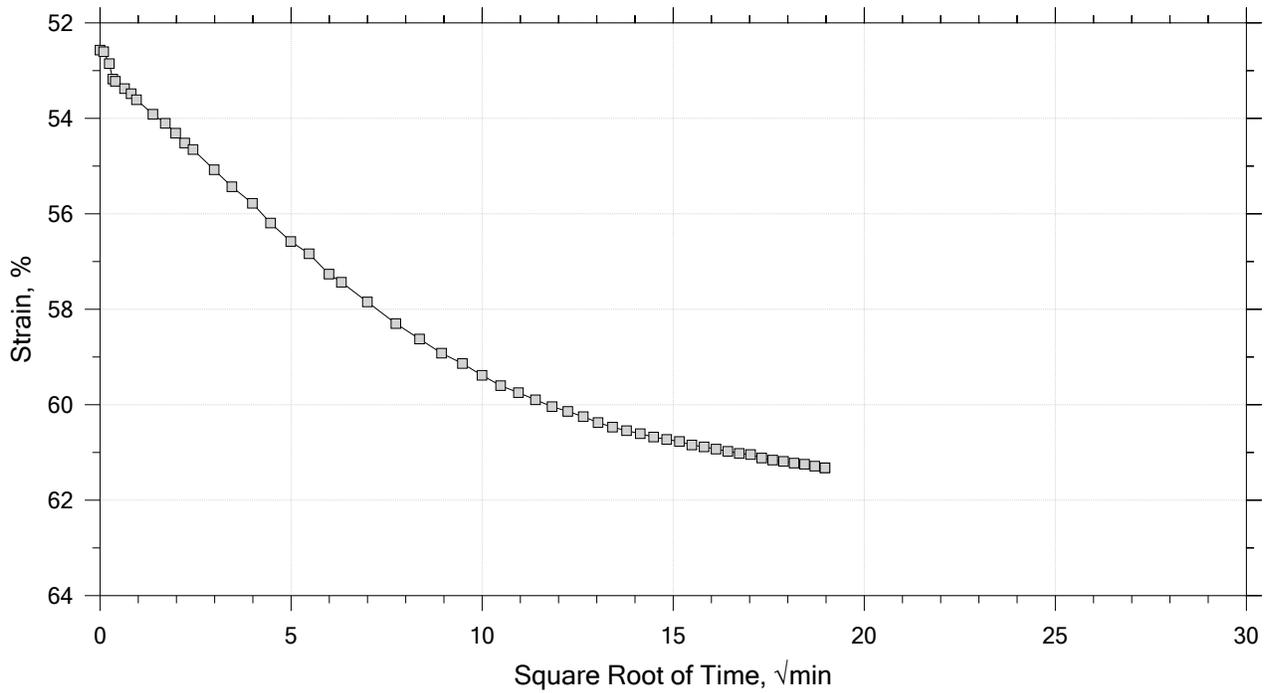
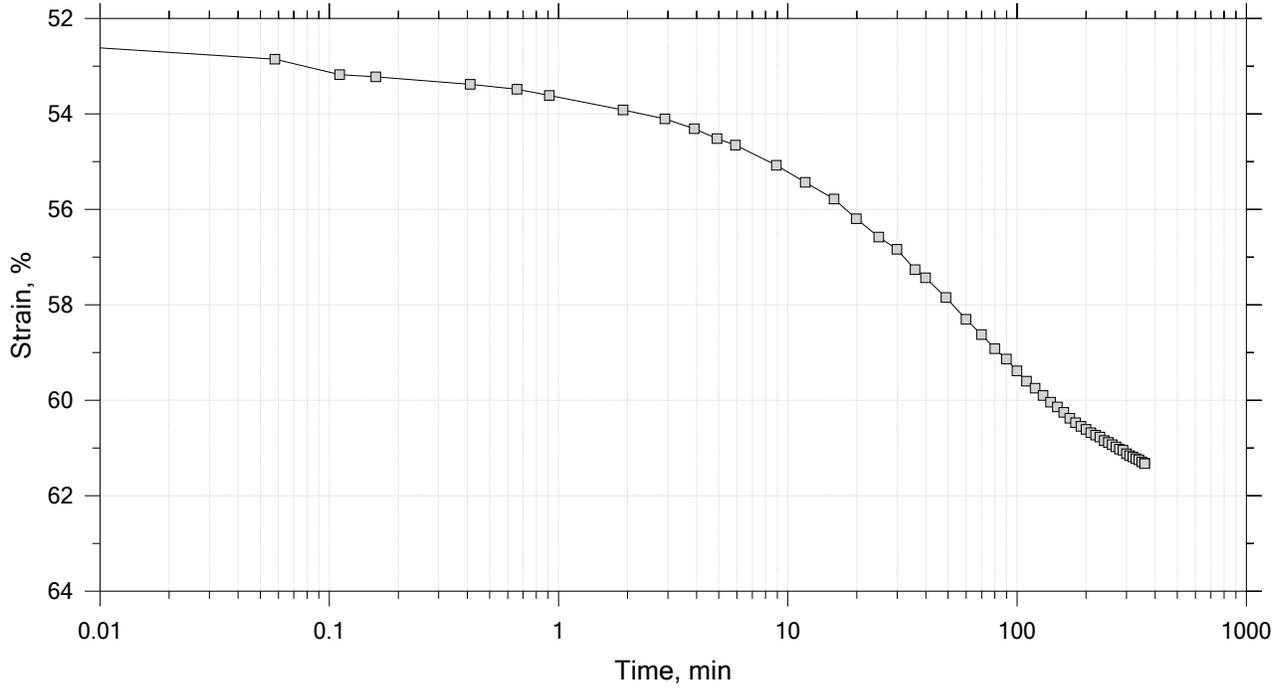
	Project: Souadabscook Center Bridges	Location: Hampden, ME	Project No.: GTX-309947
	Boring No.: BB-HSS-209	Tested By: trm	Checked By: njh
	Sample No.: U1	Test Date: 5/3/19	Depth: 9-11 ft
	Test No.: IP-4	Sample Type: intact	Elevation: ---
	Description: Moist, gray silt		
	Remarks: System S, Swell Pressure = 0.0653 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 8 of 15

Constant Load Step

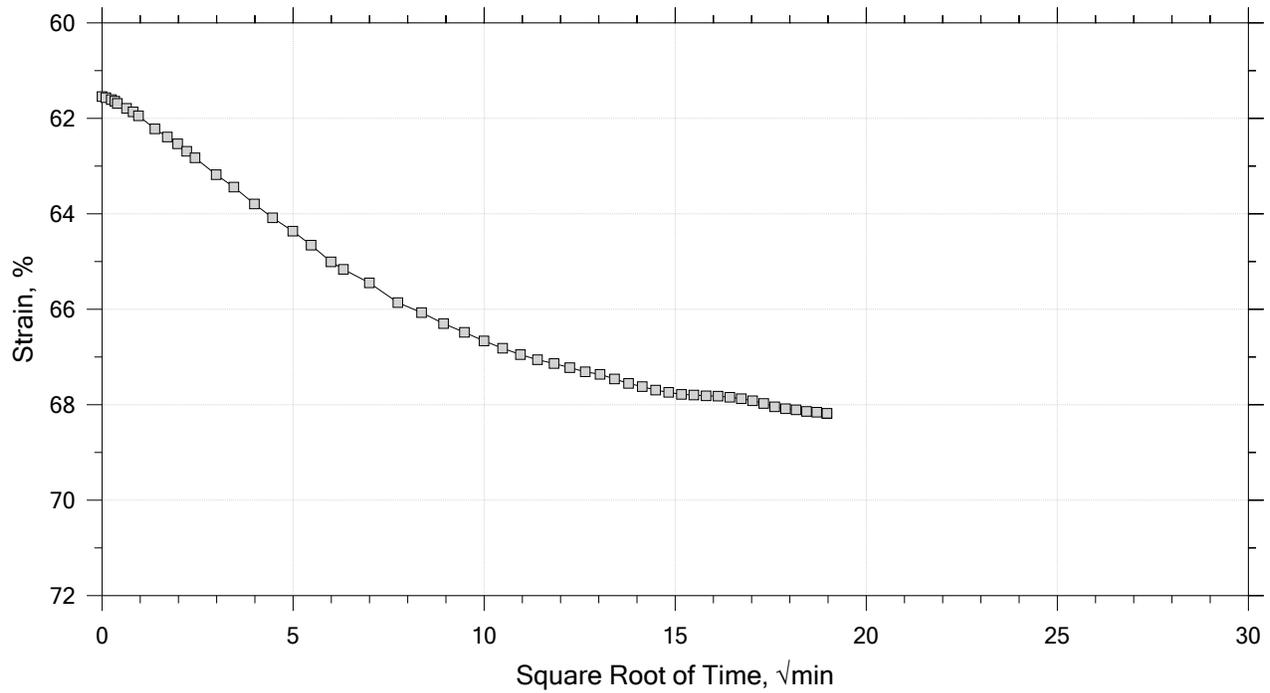
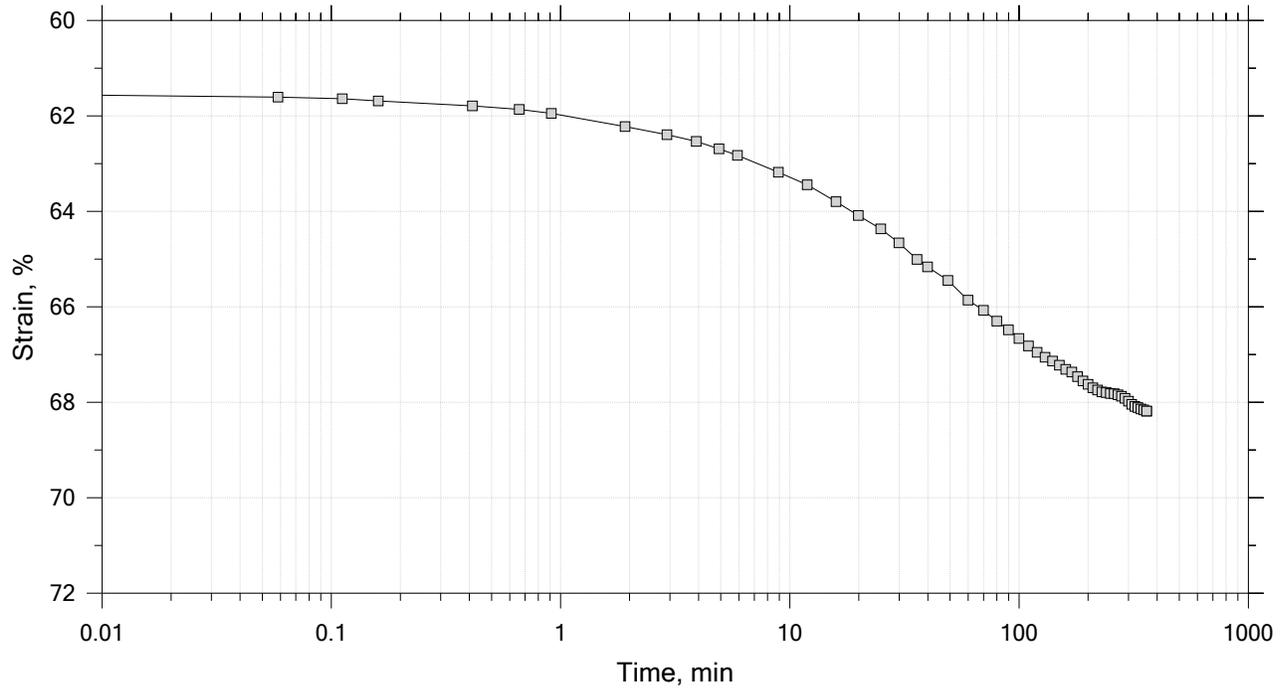
Stress: 8 tsf



	Project: Souadabscook Center Bridges	Location: Hampden, ME	Project No.: GTX-309947
	Boring No.: BB-HSS-209	Tested By: trm	Checked By: njh
	Sample No.: U1	Test Date: 5/3/19	Depth: 9-11 ft
	Test No.: IP-4	Sample Type: intact	Elevation: ---
	Description: Moist, gray silt		
	Remarks: System S, Swell Pressure = 0.0653 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 9 of 15
 Constant Load Step
 Stress: 16 tsf



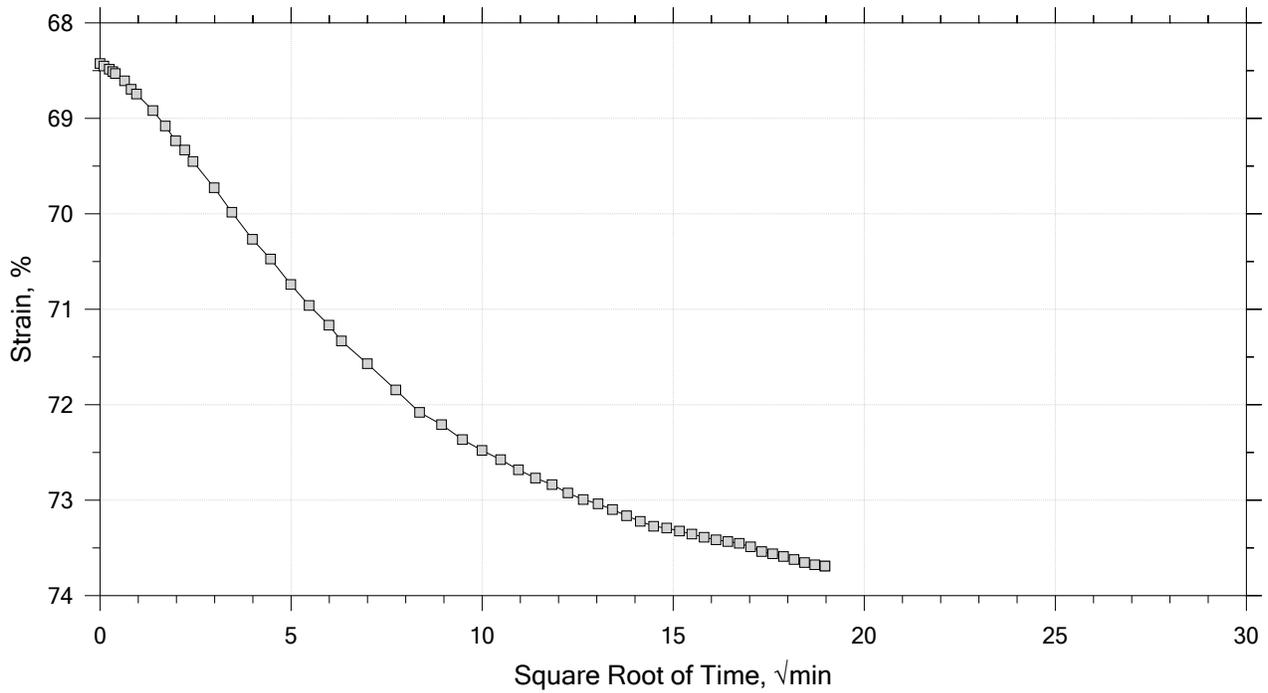
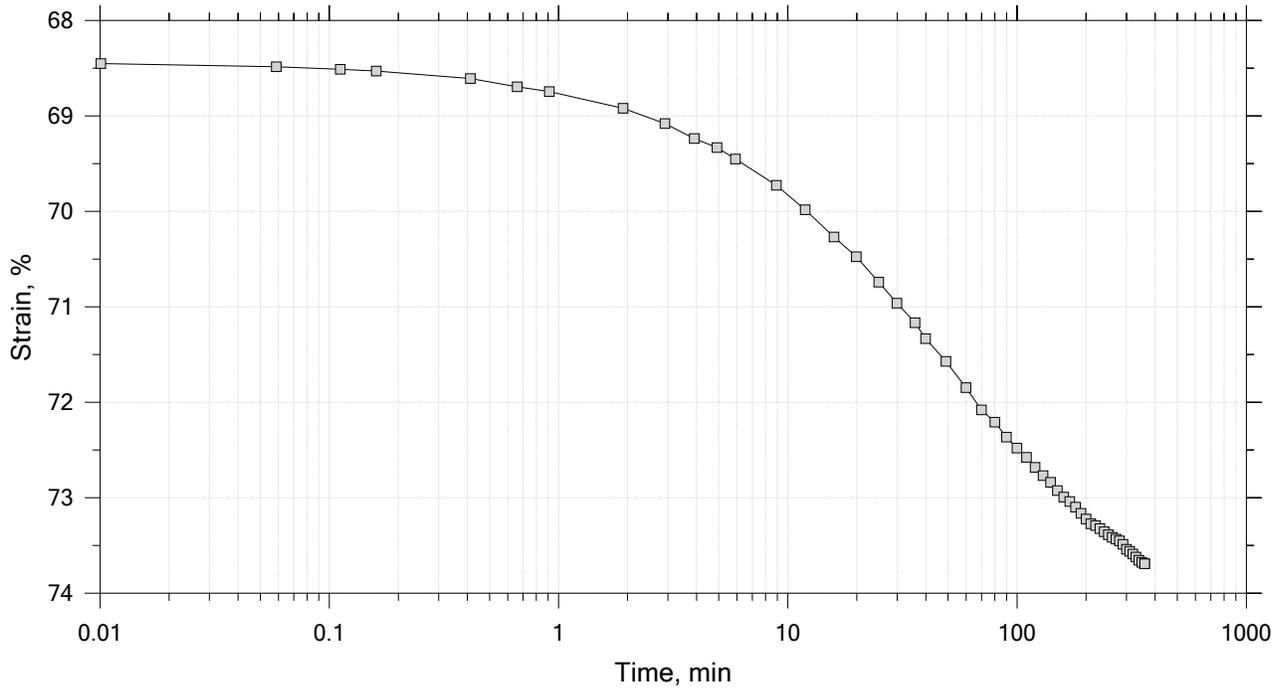
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	Boring No.: BB-HSS-209	Tested By: trm	Checked By: njh
	Sample No.: U1	Test Date: 5/3/19	Depth: 9-11 ft
	Test No.: IP-4	Sample Type: intact	Elevation: ---
	Description: Moist, gray silt		
	Remarks: System S, Swell Pressure = 0.0653 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 10 of 15

Constant Load Step

Stress: 32 tsf



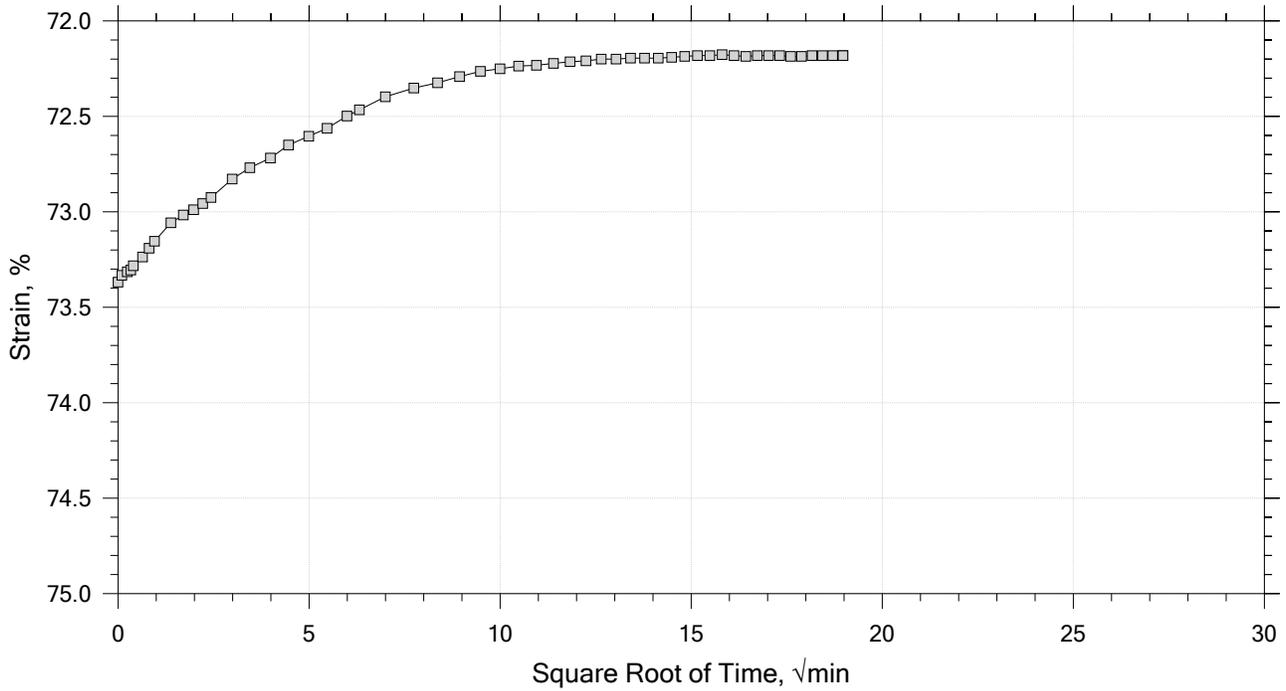
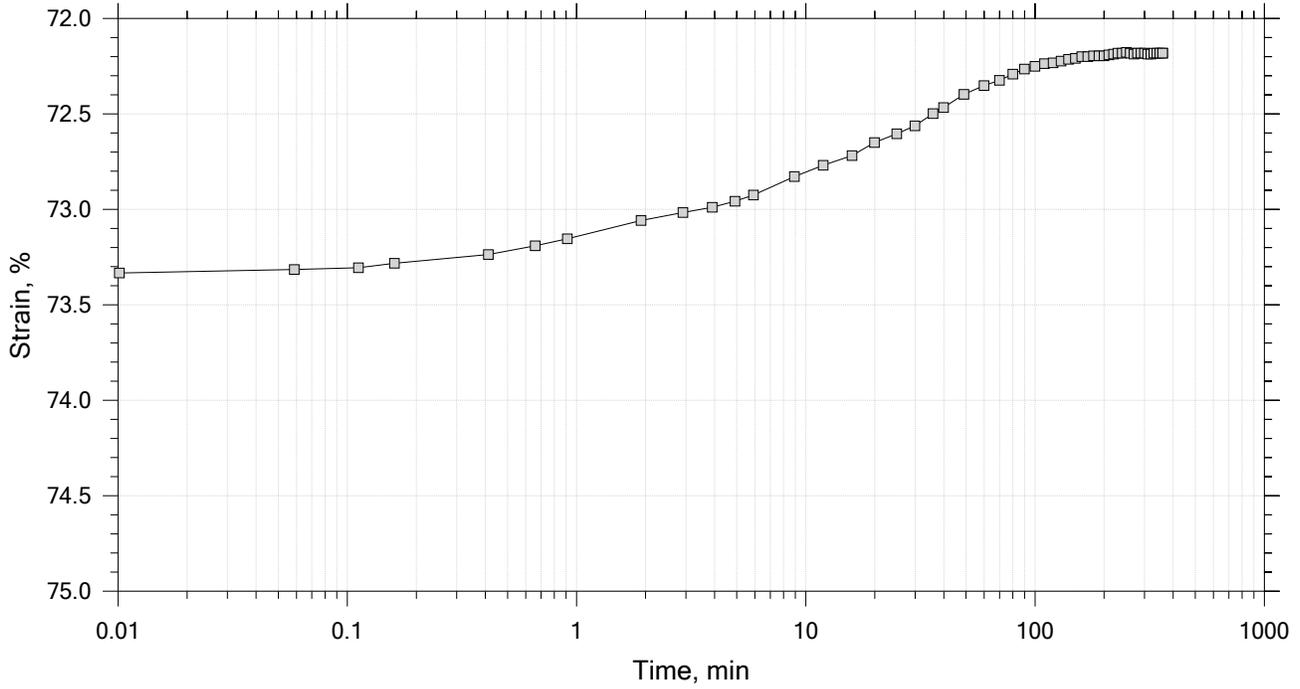
	Project: Souadabscook Center Bridges	Location: Hampden, ME	Project No.: GTX-309947
	Boring No.: BB-HSS-209	Tested By: trm	Checked By: njh
	Sample No.: U1	Test Date: 5/3/19	Depth: 9-11 ft
	Test No.: IP-4	Sample Type: intact	Elevation: ---
	Description: Moist, gray silt		
	Remarks: System S, Swell Pressure = 0.0653 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 11 of 15

Constant Load Step

Stress: 8 tsf



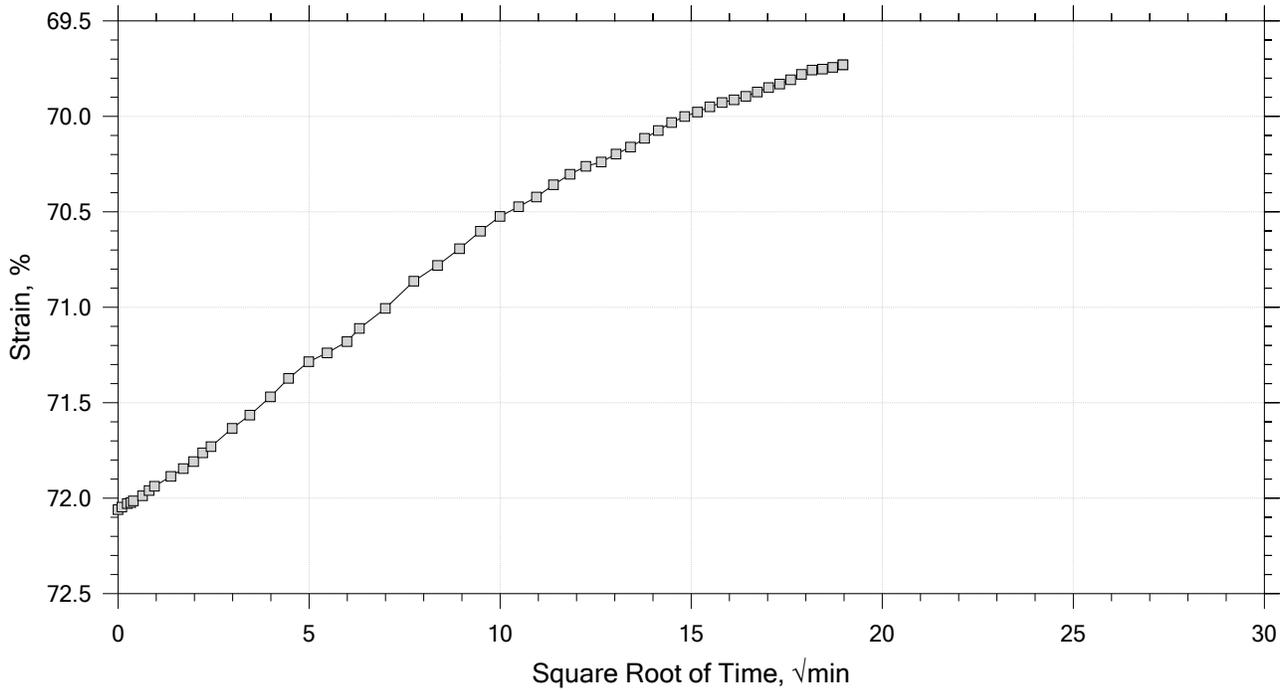
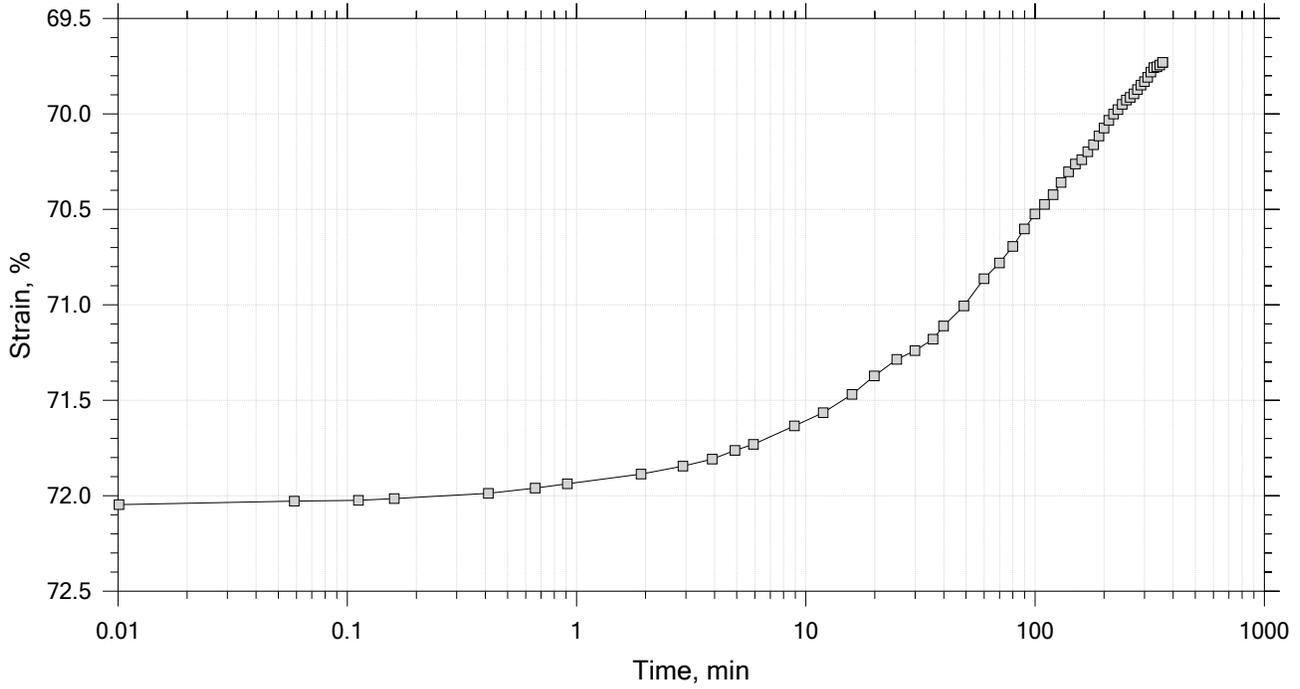
	Project: Souadabscook Center Bridges	Location: Hampden, ME	Project No.: GTX-309947
	Boring No.: BB-HSS-209	Tested By: trm	Checked By: njh
	Sample No.: U1	Test Date: 5/3/19	Depth: 9-11 ft
	Test No.: IP-4	Sample Type: intact	Elevation: ---
	Description: Moist, gray silt		
	Remarks: System S, Swell Pressure = 0.0653 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 12 of 15

Constant Load Step

Stress: 2 tsf



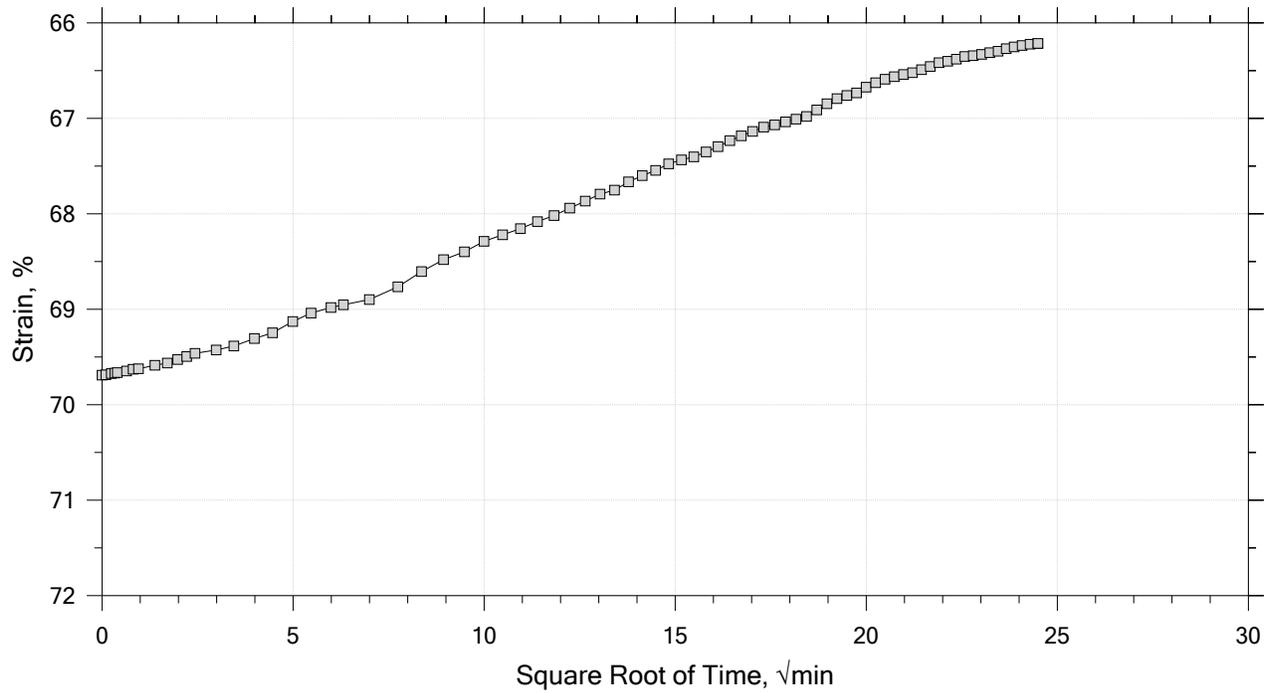
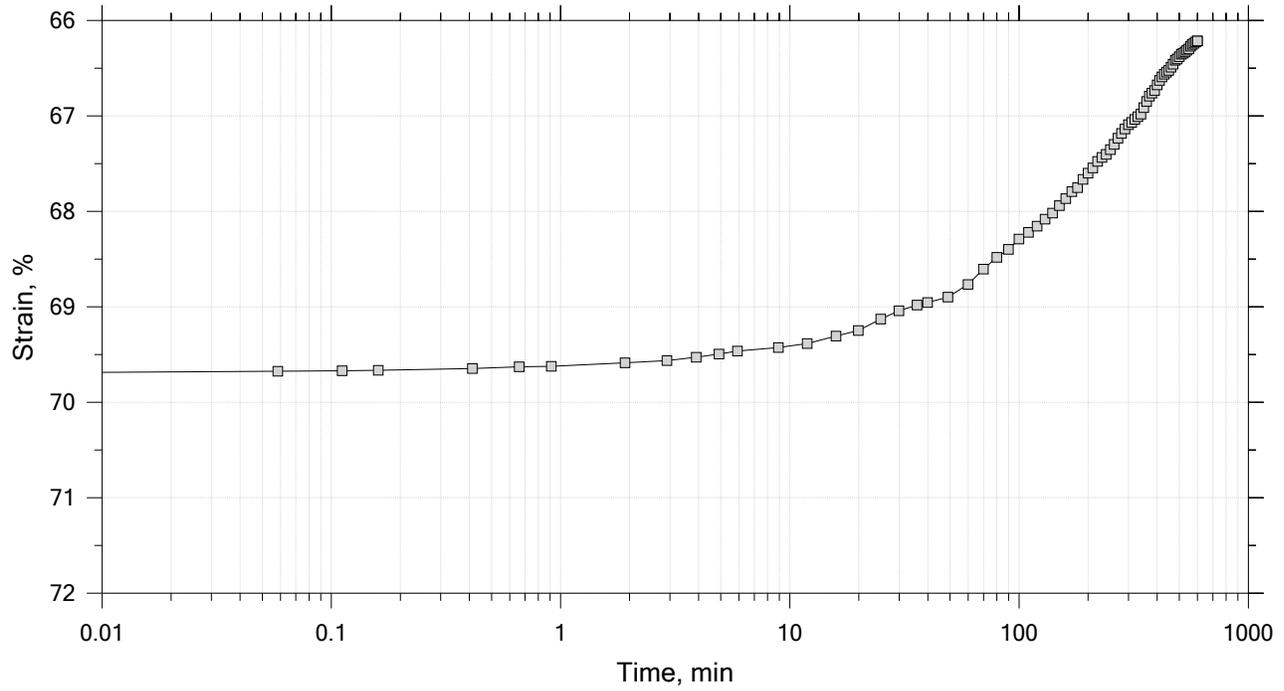
	Project: Souadabscook Center Bridges	Location: Hampden, ME	Project No.: GTX-309947
	Boring No.: BB-HSS-209	Tested By: trm	Checked By: njh
	Sample No.: U1	Test Date: 5/3/19	Depth: 9-11 ft
	Test No.: IP-4	Sample Type: intact	Elevation: ---
	Description: Moist, gray silt		
	Remarks: System S, Swell Pressure = 0.0653 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 13 of 15

Constant Load Step

Stress: 0.5 tsf



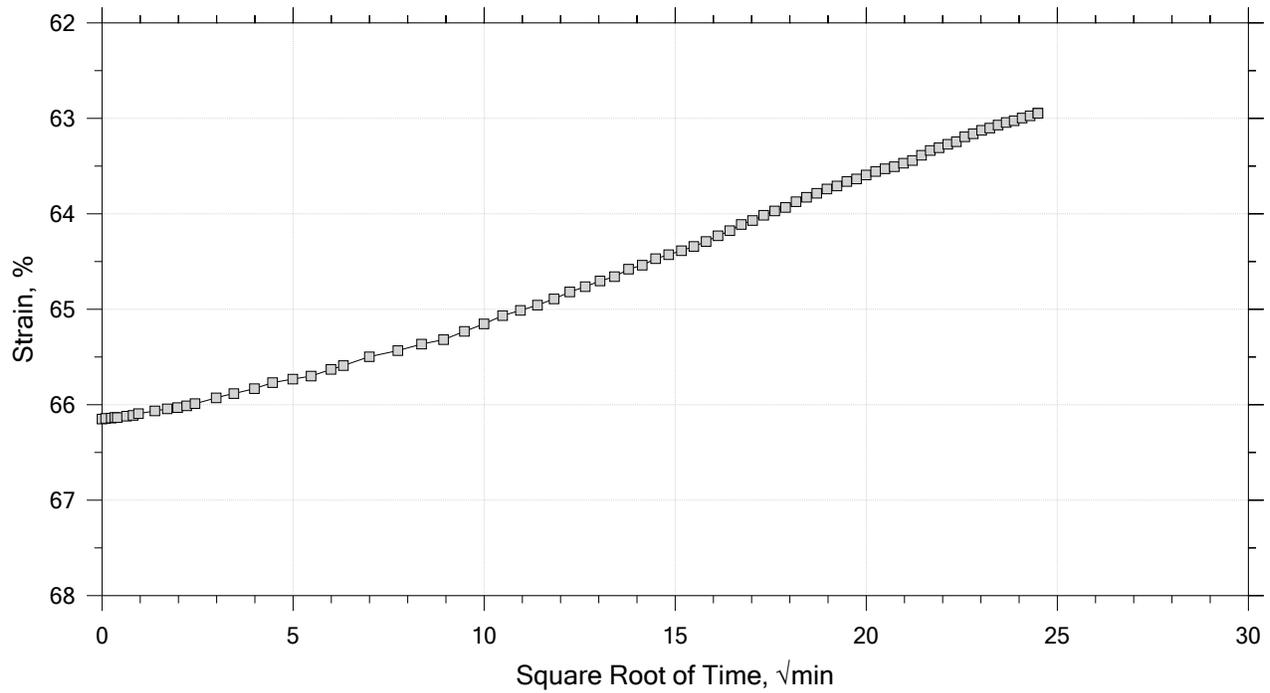
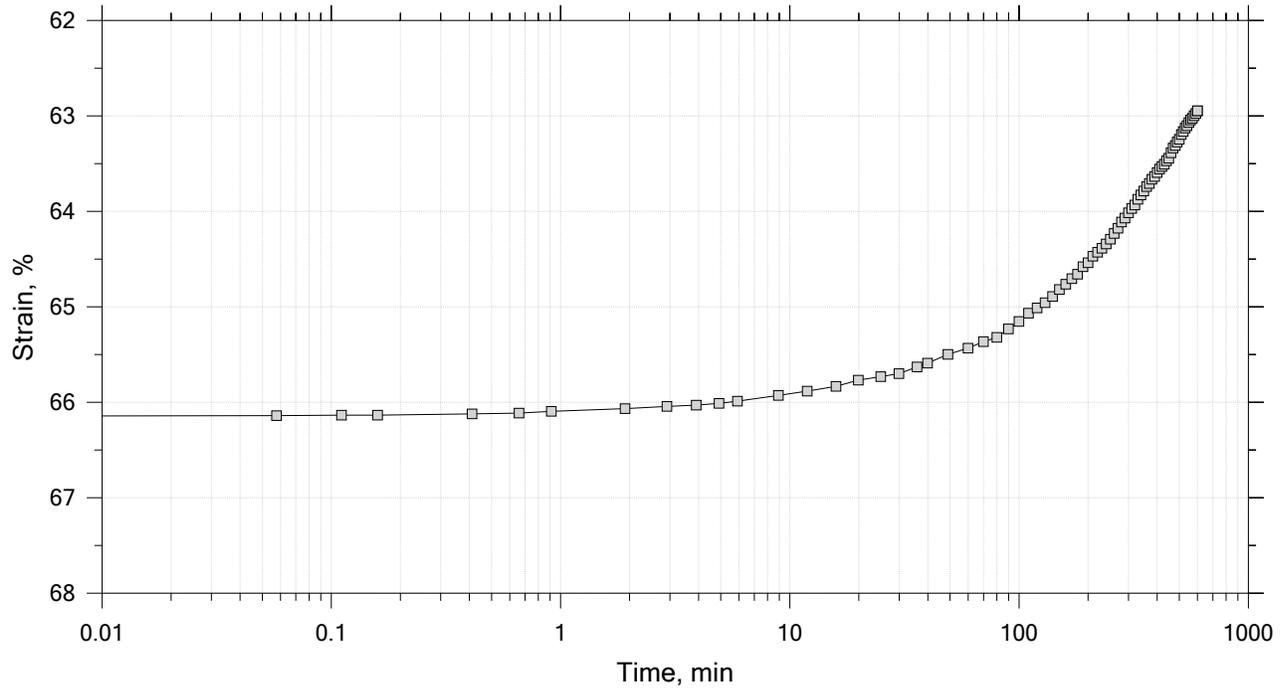
	Project: Souadabscook Center Bridges	Location: Hampden, ME	Project No.: GTX-309947
	Boring No.: BB-HSS-209	Tested By: trm	Checked By: njh
	Sample No.: U1	Test Date: 5/3/19	Depth: 9-11 ft
	Test No.: IP-4	Sample Type: intact	Elevation: ---
	Description: Moist, gray silt		
	Remarks: System S, Swell Pressure = 0.0653 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 14 of 15

Constant Load Step

Stress: 0.125 tsf



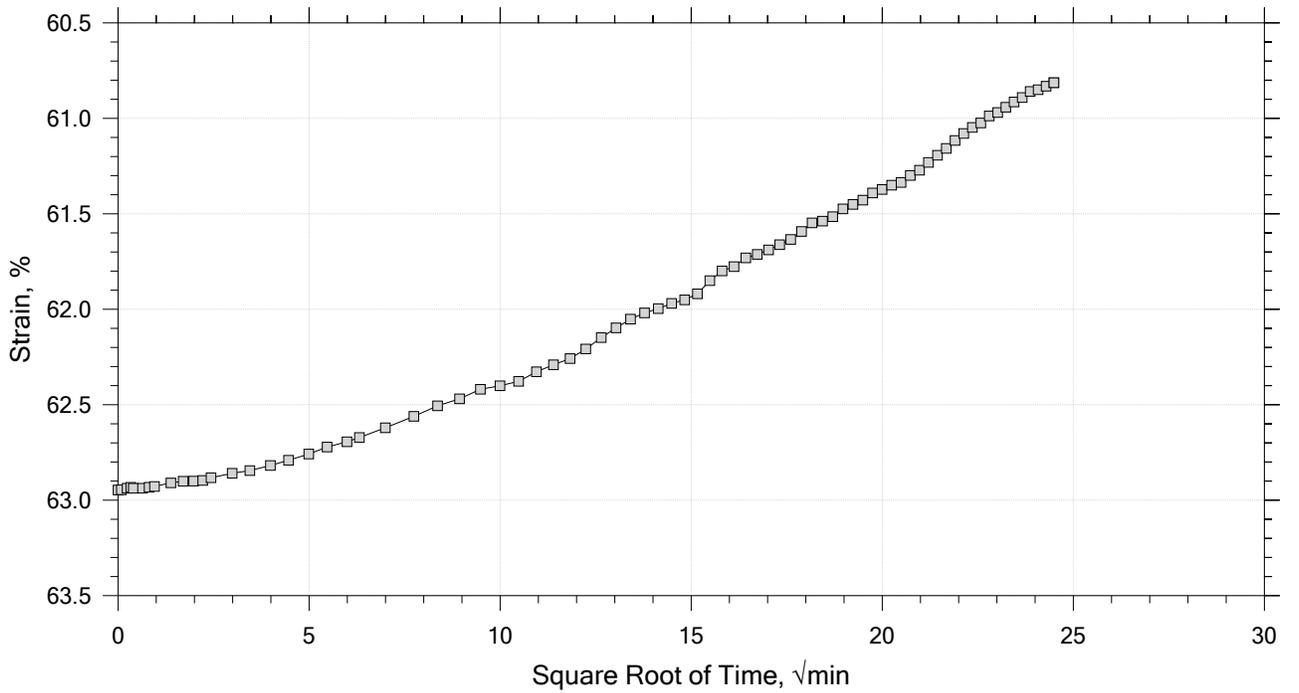
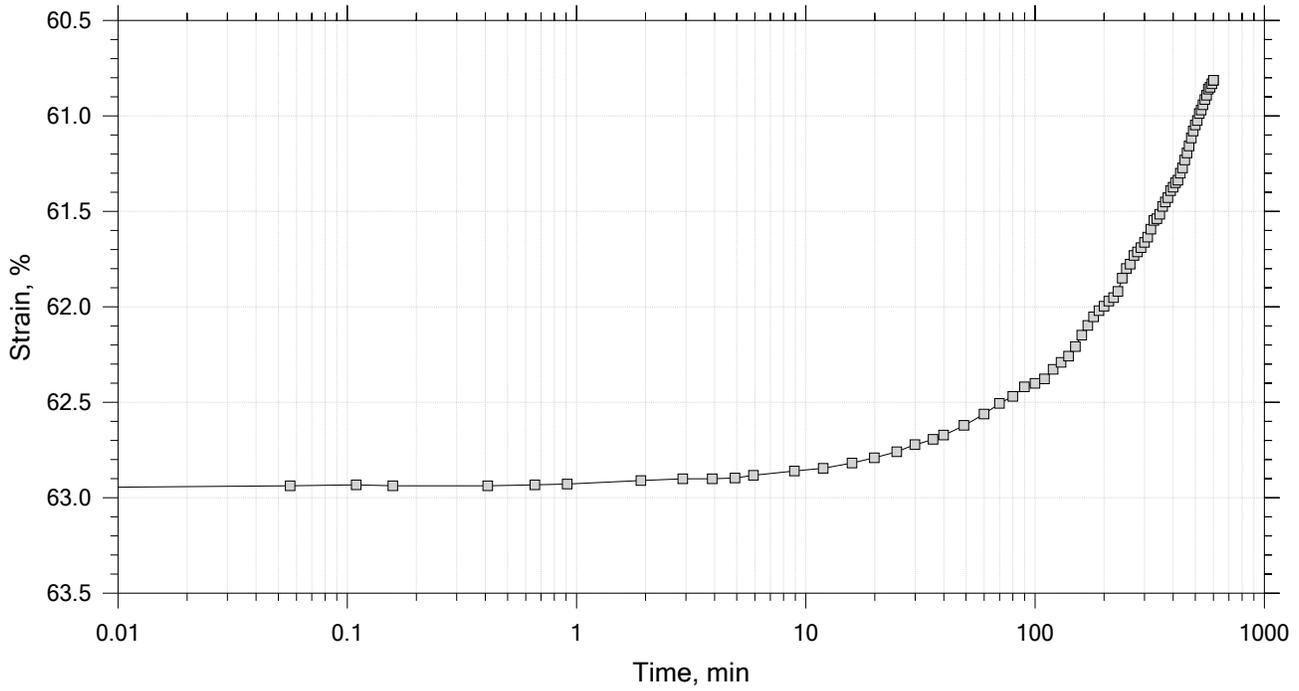
	Project: Souadabscook Center Bridges	Location: Hampden, ME	Project No.: GTX-309947
	Boring No.: BB-HSS-209	Tested By: trm	Checked By: njh
	Sample No.: U1	Test Date: 5/3/19	Depth: 9-11 ft
	Test No.: IP-4	Sample Type: intact	Elevation: ---
	Description: Moist, gray silt		
	Remarks: System S, Swell Pressure = 0.0653 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 15 of 15

Constant Load Step

Stress: 0.0625 tsf



	Project: Souadabscook Center Bridges	Location: Hampden, ME	Project No.: GTX-309947
	Boring No.: BB-HSS-209	Tested By: trm	Checked By: njh
	Sample No.: U1	Test Date: 5/3/19	Depth: 9-11 ft
	Test No.: IP-4	Sample Type: intact	Elevation: ---
	Description: Moist, gray silt		
	Remarks: System S, Swell Pressure = 0.0653 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Specimen Diameter: 2.50 in	Estimated Specific Gravity: 2.14	Liquid Limit: 495
Initial Height: 1.00 in	Initial Void Ratio: 8.2	Plastic Limit: 356
Final Height: 0.40 in	Final Void Ratio: 2.68	Plasticity Index: 139

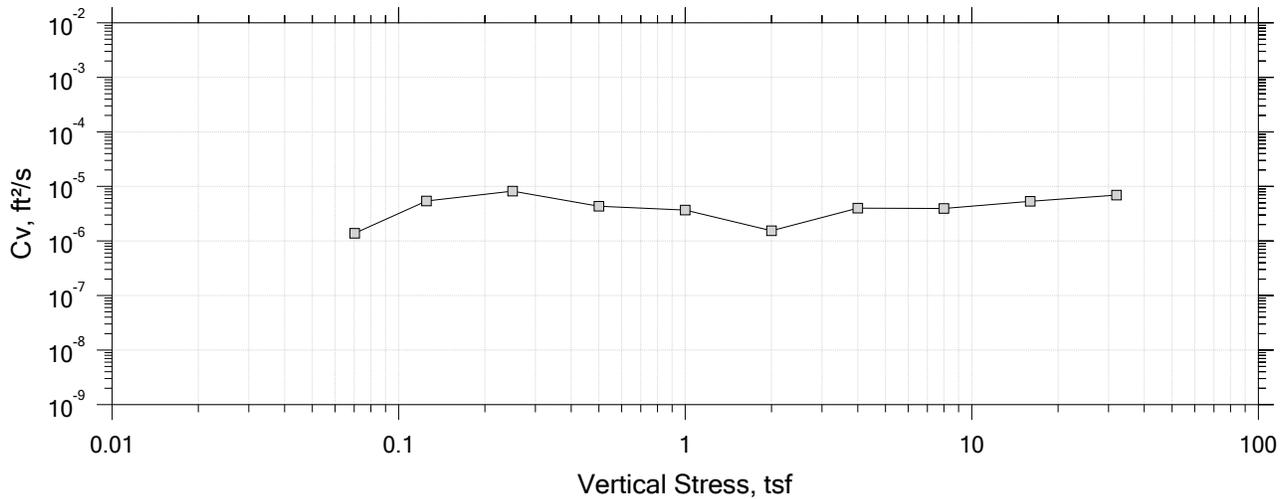
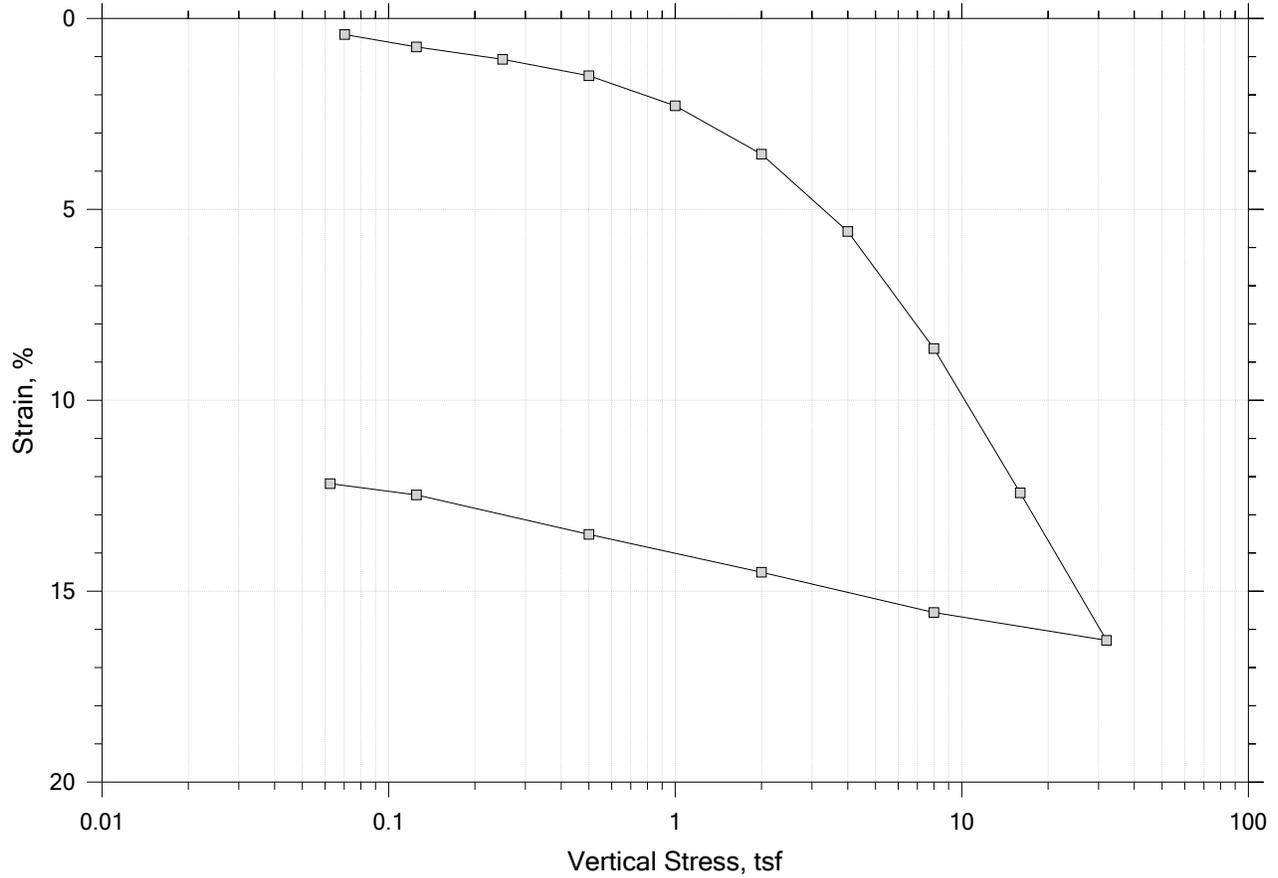
	Before Test Trimmings	Before Test Specimen	After Test Specimen	After Test Trimmings
Container ID	C2790	RING		D2643
Mass Container, gm	8.99	108.98	108.98	8.31
Mass Container + Wet Soil, gm	34.12	197.31	151.12	52.45
Mass Container + Dry Soil, gm	14.56	127.69	127.69	27.91
Mass Dry Soil, gm	5.57	18.712	18.712	19.6
Water Content, %	351.17	372.05	125.20	125.20
Void Ratio	---	8.20	2.68	---
Degree of Saturation, %	---	97.11	100.00	---
Dry Unit Weight, pcf	---	14.522	36.305	---

Note: Specific Gravity and Void Ratios are calculated assuming the degree of saturation equals 100% at the end of the test. Therefore, values may not represent actual values for the specimen.

	Project: Souadabscook Center Bridges	Location: Hampden, ME	Project No.: GTX-309947
	Boring No.: BB-HSS-209	Tested By: trm	Checked By: njh
	Sample No.: U1	Test Date: 5/3/19	Depth: 9-11 ft
	Test No.: IP-4	Sample Type: intact	Elevation: ---
	Description: Moist, gray silt		
	Remarks: System S, Swell Pressure = 0.0653 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

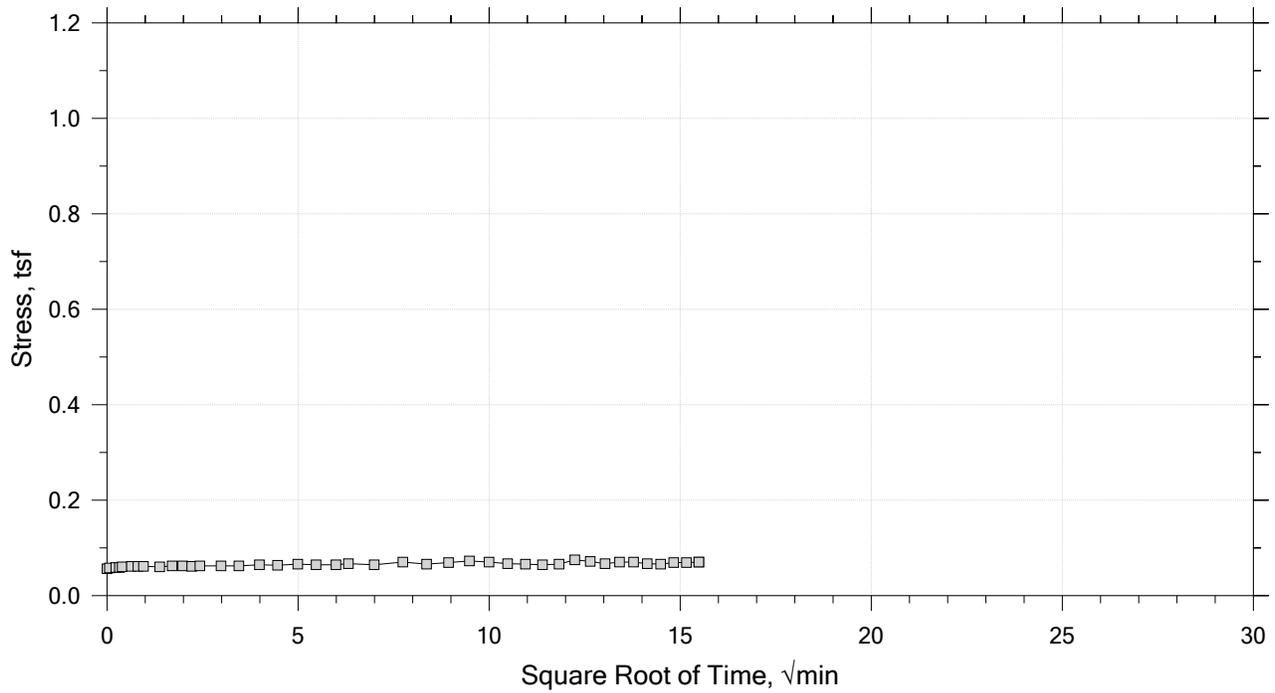
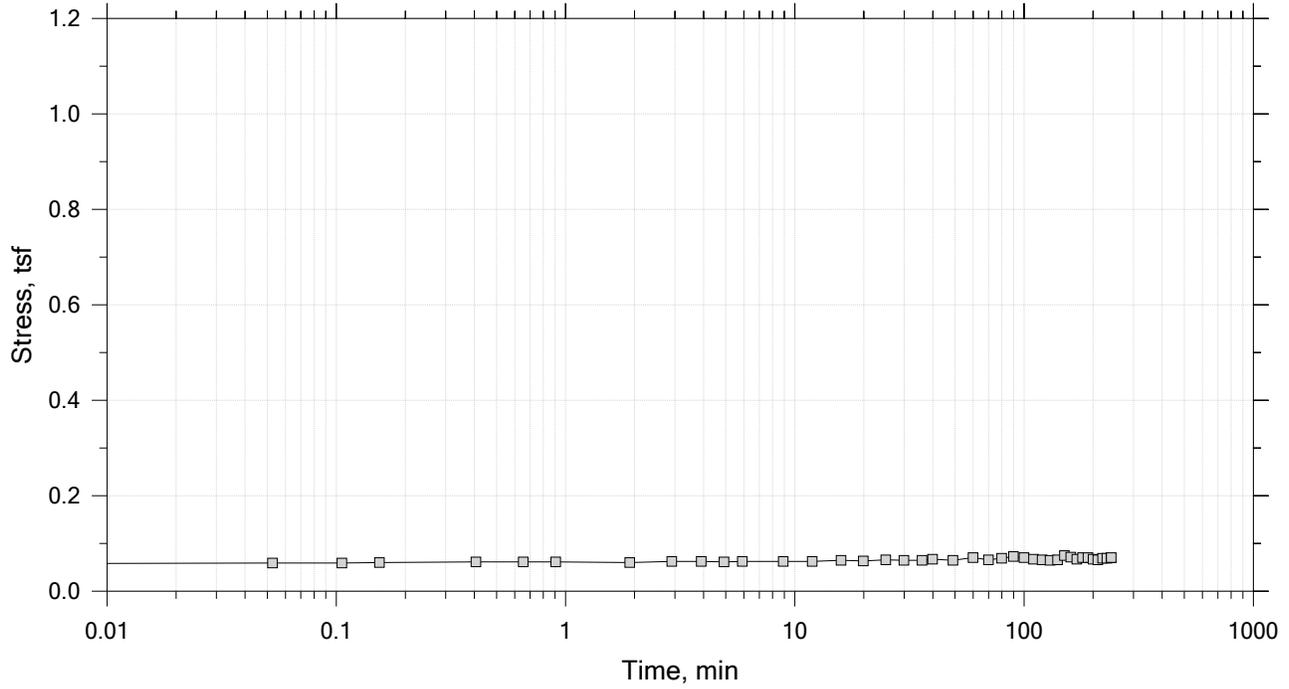
Summary Report



	Project: Souadabscook Center Bridges	Location: Hampden, ME	Project No.: GTX-309947
	Boring No.: BB-HSS-209	Tested By: trm	Checked By: njh
	Sample No.: U2	Test Date: 5/3/19	Depth: 17-19 ft
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, dark greenish gray clay		
	Remarks: System V, Swell Pressure = 0.0703 tsf		
	Displacement at End of Increment		

One-Dimensional Consolidation by ASTM D2435 - Method B

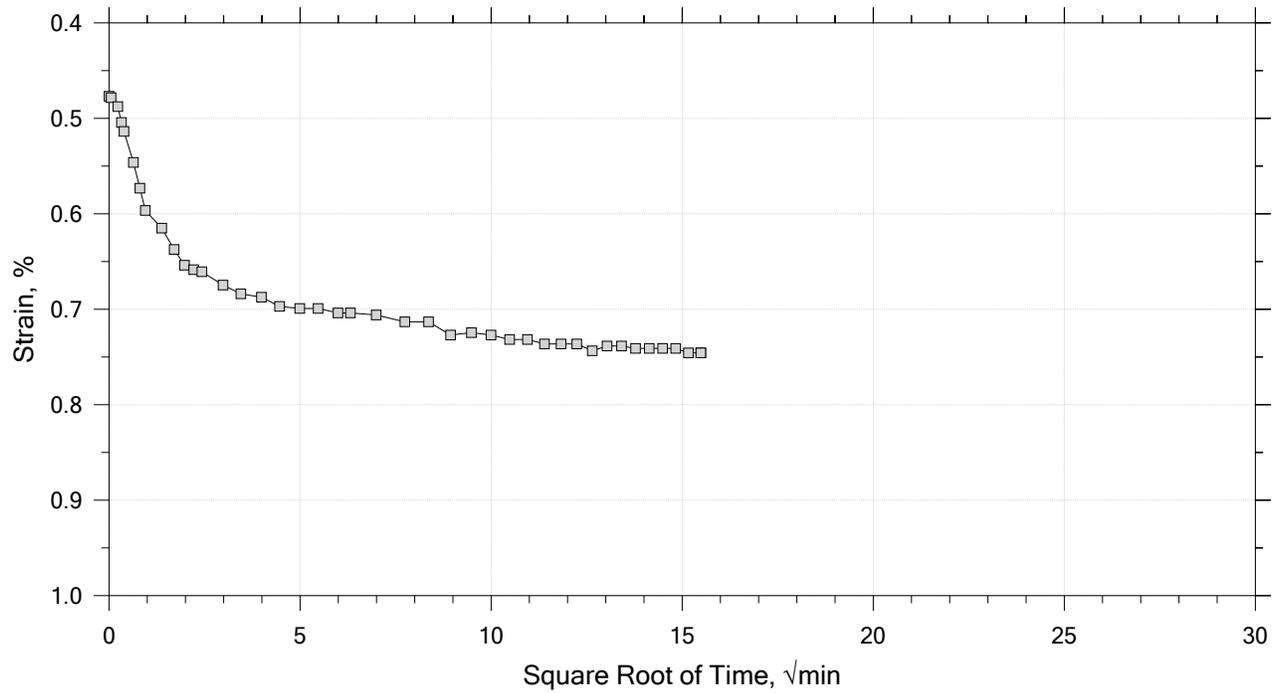
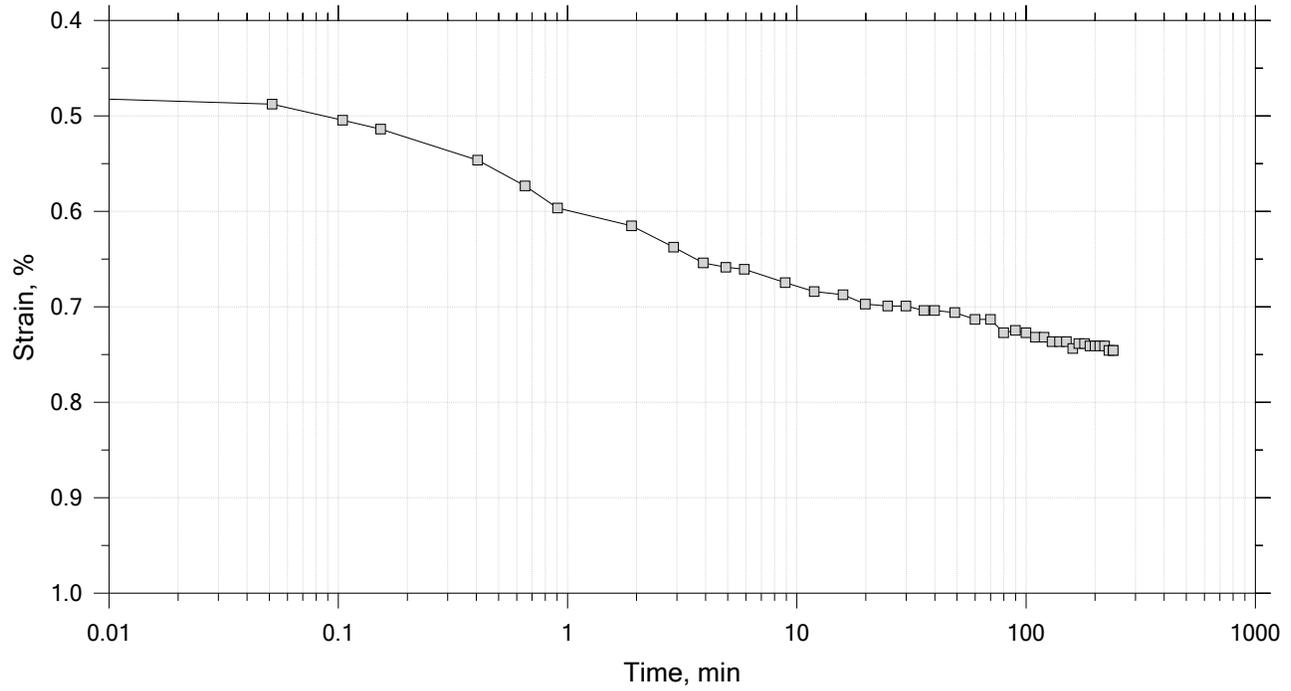
Time Curve 1 of 15
 Constant Volume Step
 Stress: 0.0703 tsf



	Project: Souadabscook Center Bridges	Location: Hampden, ME	Project No.: GTX-309947
	Boring No.: BB-HSS-209	Tested By: trm	Checked By: njh
	Sample No.: U2	Test Date: 5/3/19	Depth: 17-19 ft
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, dark greenish gray clay		
	Remarks: System V, Swell Pressure = 0.0703 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

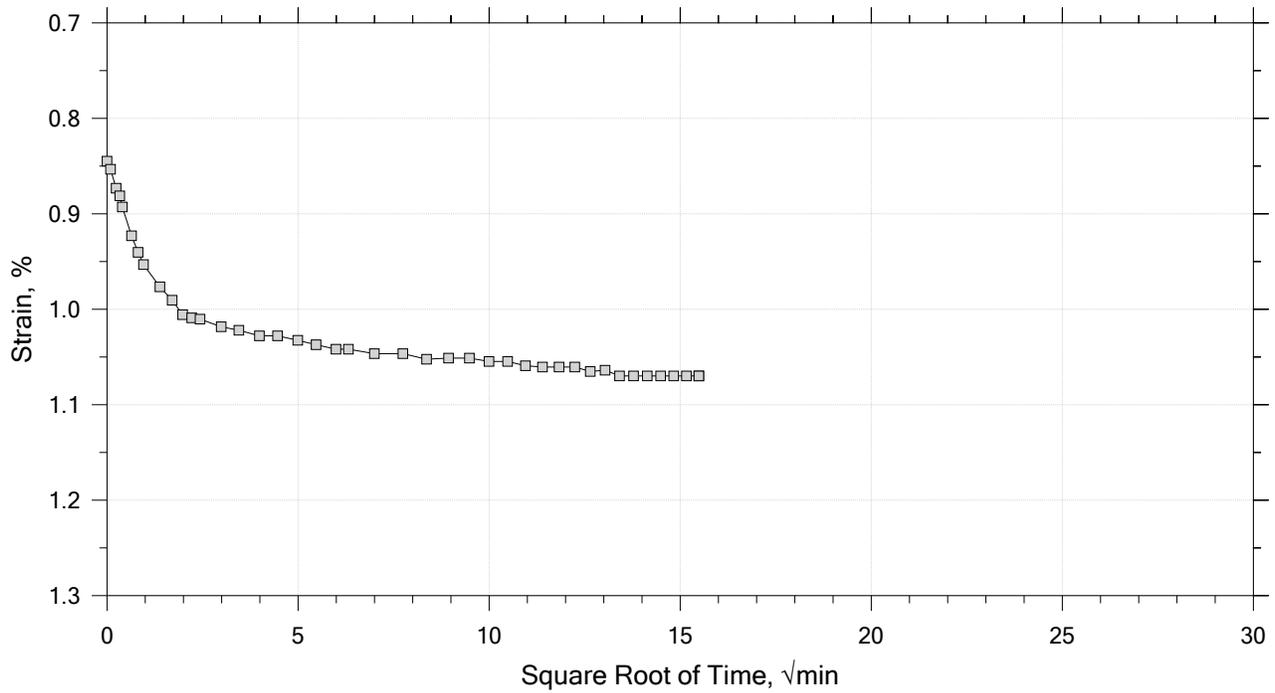
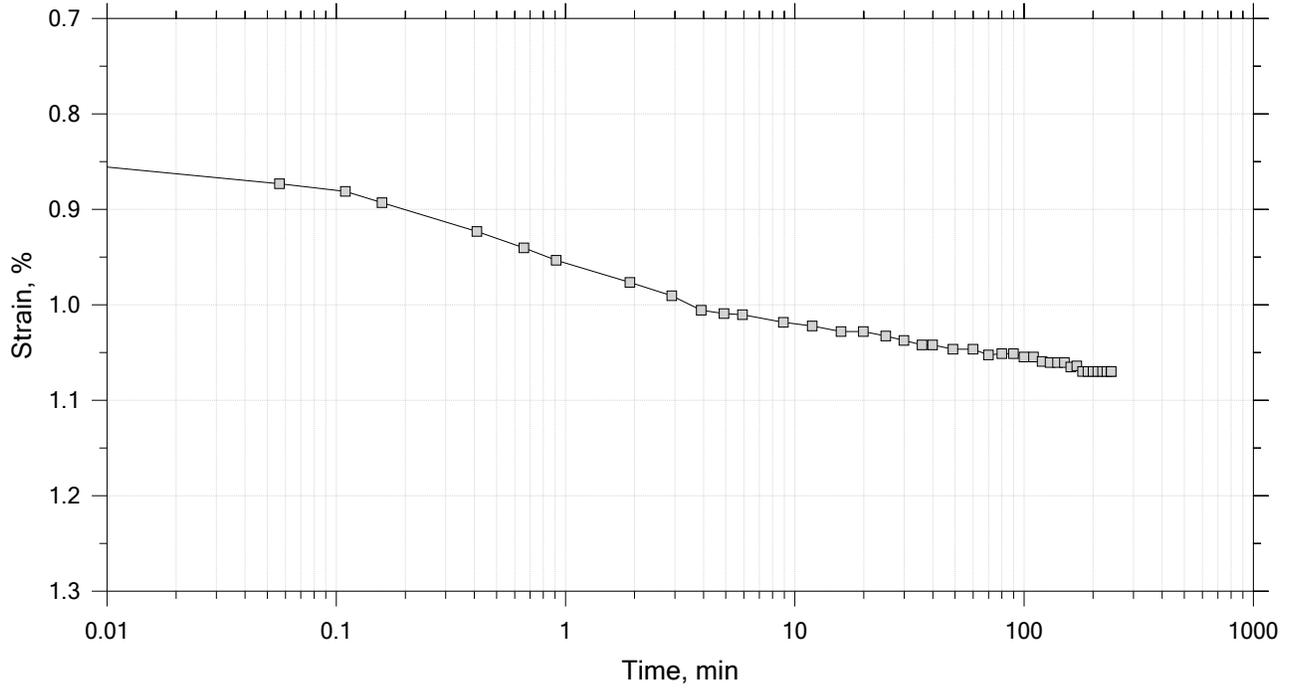
Time Curve 2 of 15
 Constant Load Step
 Stress: 0.125 tsf



	Project: Souadabscook Center Bridges	Location: Hampden, ME	Project No.: GTX-309947
	Boring No.: BB-HSS-209	Tested By: trm	Checked By: njh
	Sample No.: U2	Test Date: 5/3/19	Depth: 17-19 ft
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, dark greenish gray clay		
	Remarks: System V, Swell Pressure = 0.0703 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

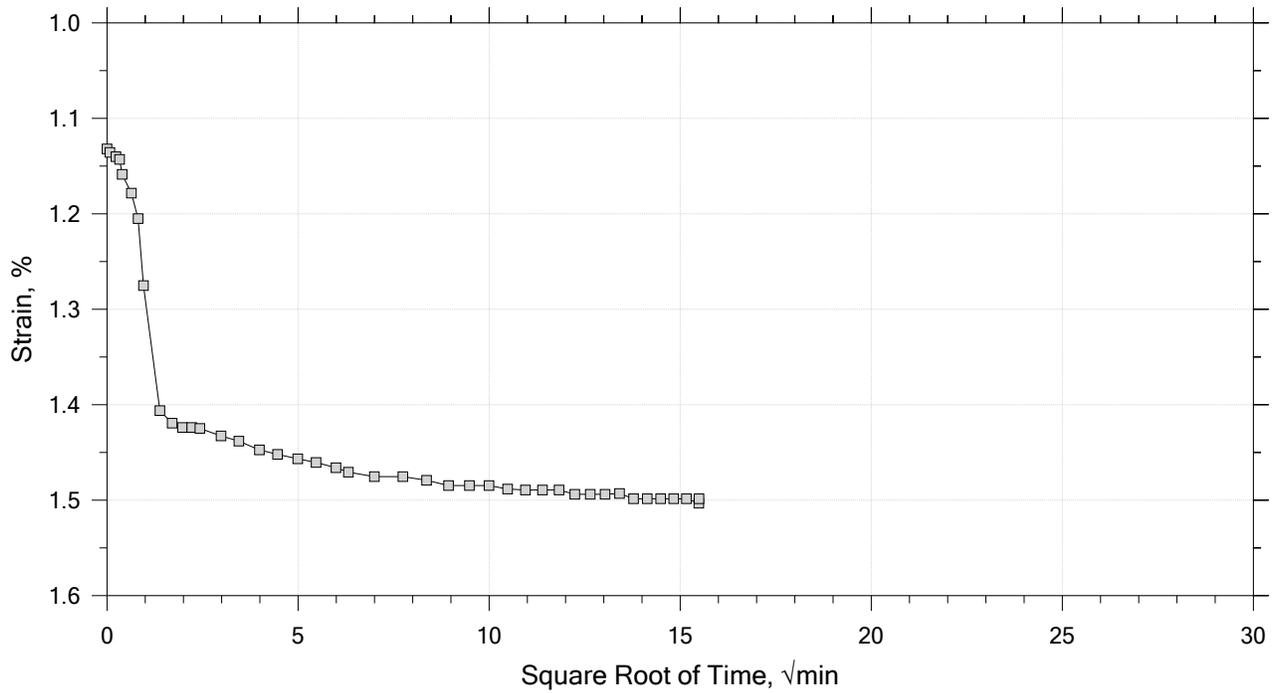
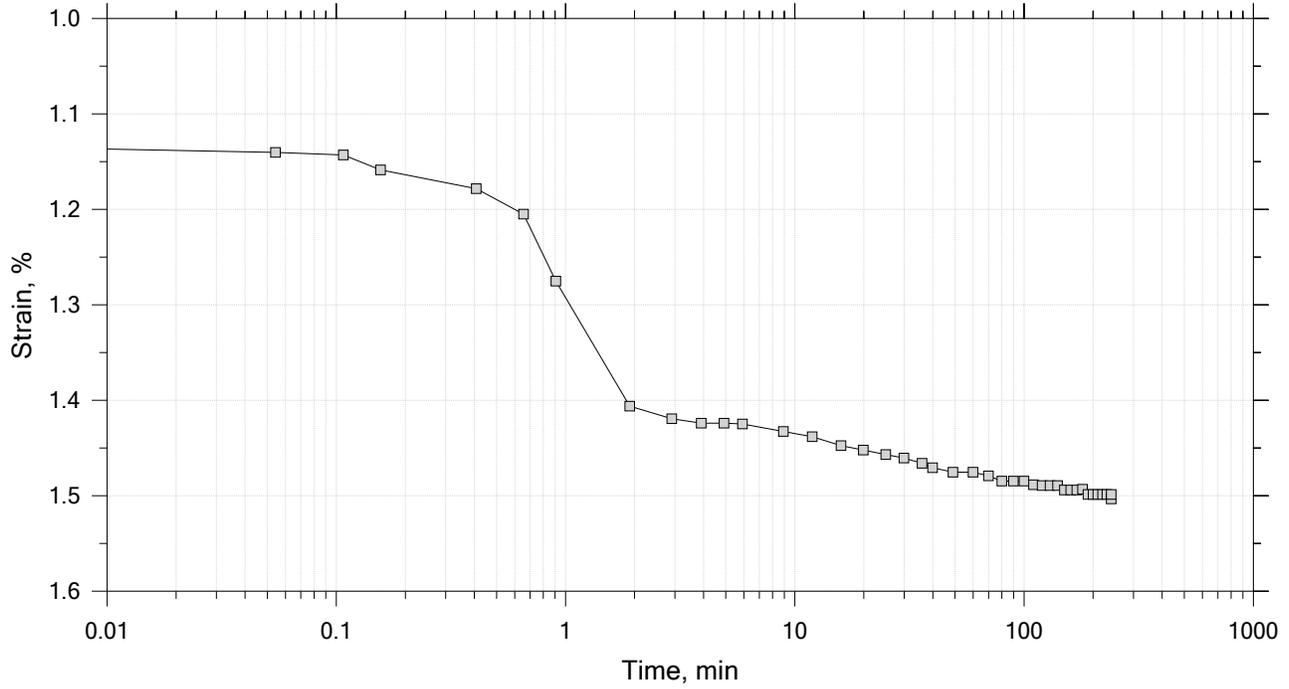
Time Curve 3 of 15
 Constant Load Step
 Stress: 0.25 tsf



	Project: Souadabscook Center Bridges	Location: Hampden, ME	Project No.: GTX-309947
	Boring No.: BB-HSS-209	Tested By: trm	Checked By: njh
	Sample No.: U2	Test Date: 5/3/19	Depth: 17-19 ft
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, dark greenish gray clay		
	Remarks: System V, Swell Pressure = 0.0703 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

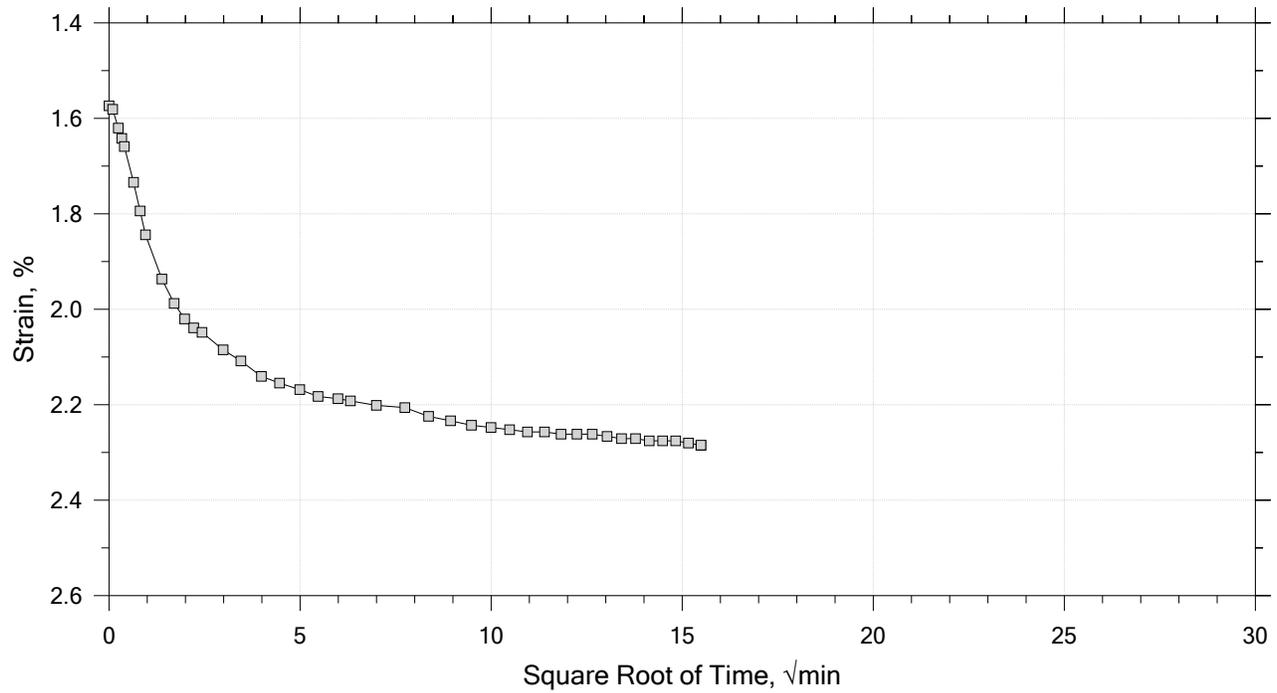
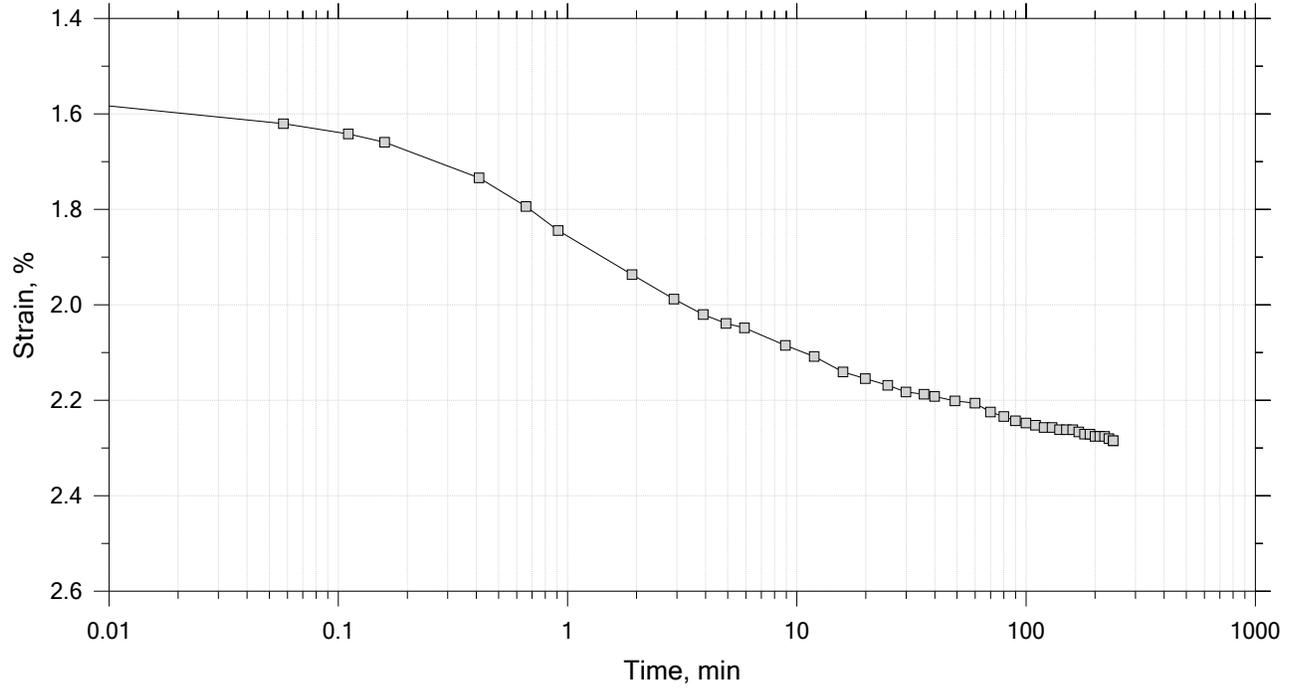
Time Curve 4 of 15
 Constant Load Step
 Stress: 0.5 tsf



	Project: Souadabscook Center Bridges	Location: Hampden, ME	Project No.: GTX-309947
	Boring No.: BB-HSS-209	Tested By: trm	Checked By: njh
	Sample No.: U2	Test Date: 5/3/19	Depth: 17-19 ft
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, dark greenish gray clay		
	Remarks: System V, Swell Pressure = 0.0703 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

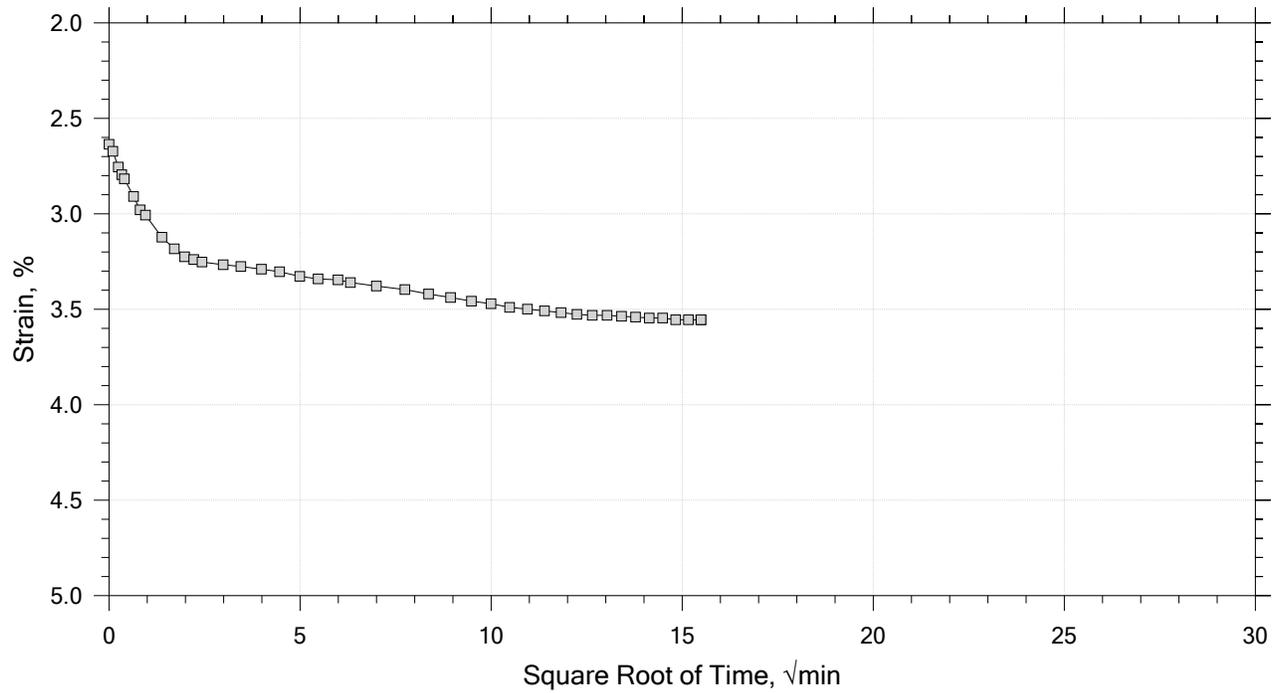
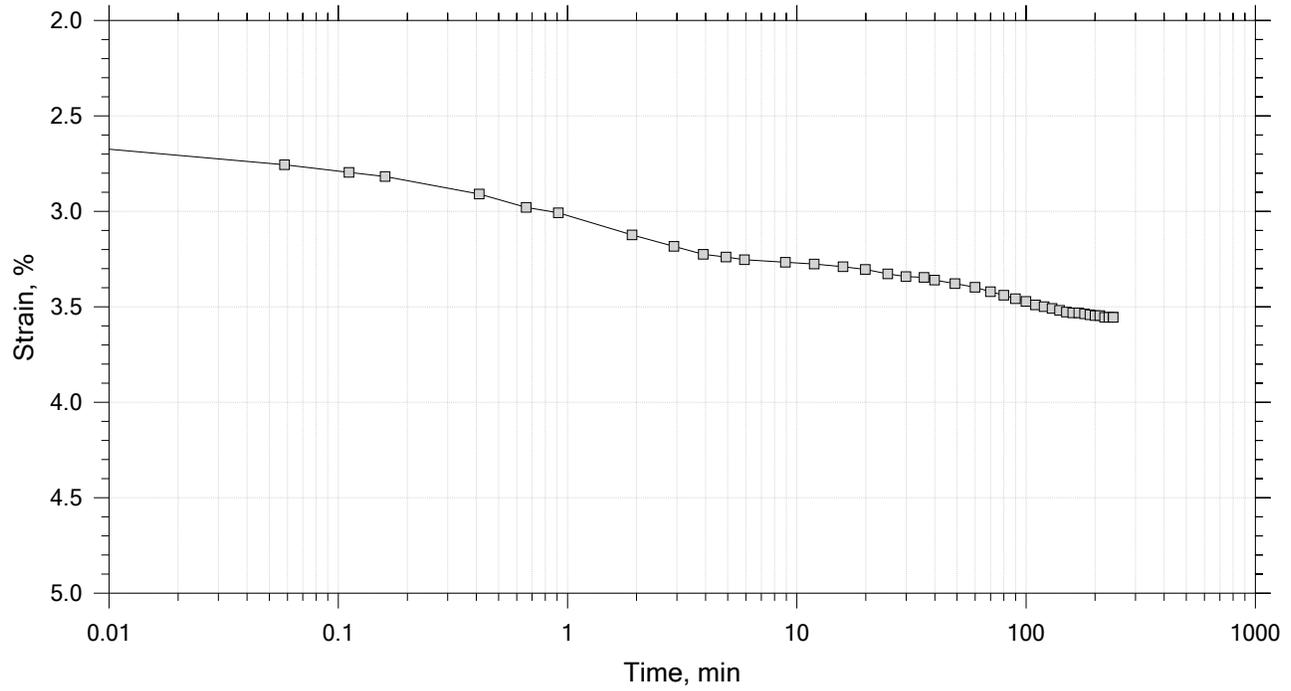
Time Curve 5 of 15
 Constant Load Step
 Stress: 1 tsf



	Project: Souadabscook Center Bridges	Location: Hampden, ME	Project No.: GTX-309947
	Boring No.: BB-HSS-209	Tested By: trm	Checked By: njh
	Sample No.: U2	Test Date: 5/3/19	Depth: 17-19 ft
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, dark greenish gray clay		
	Remarks: System V, Swell Pressure = 0.0703 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 6 of 15
 Constant Load Step
 Stress: 2 tsf



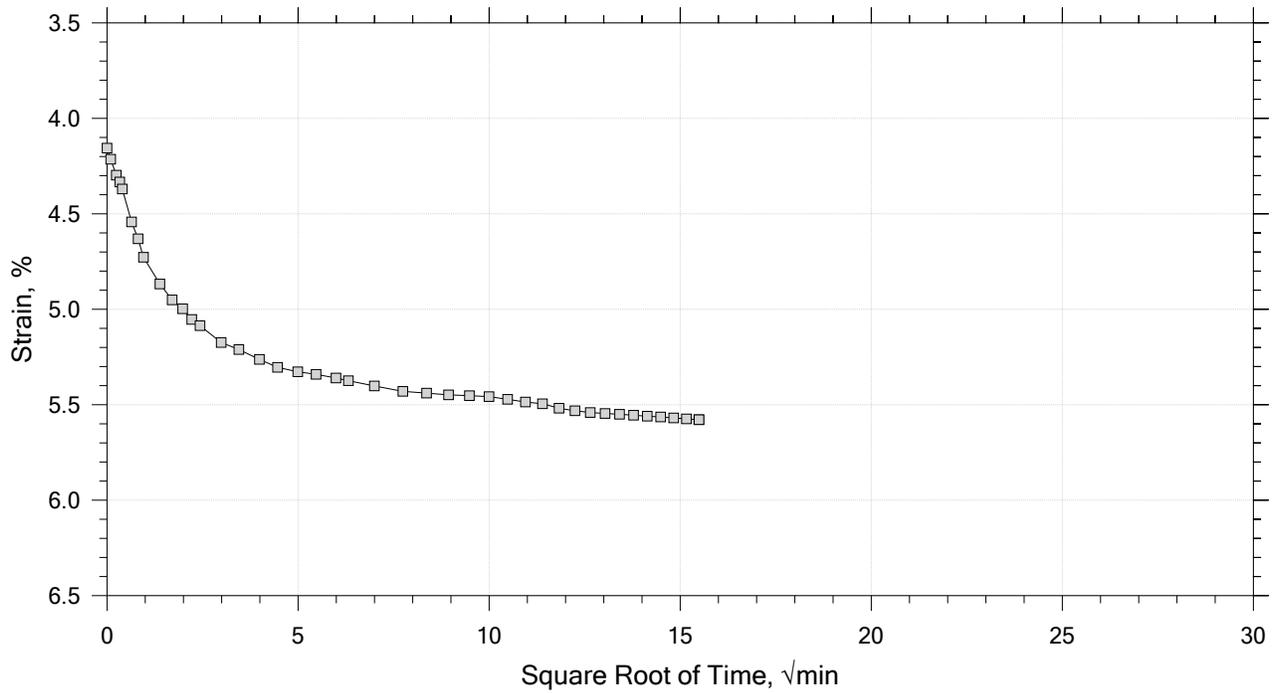
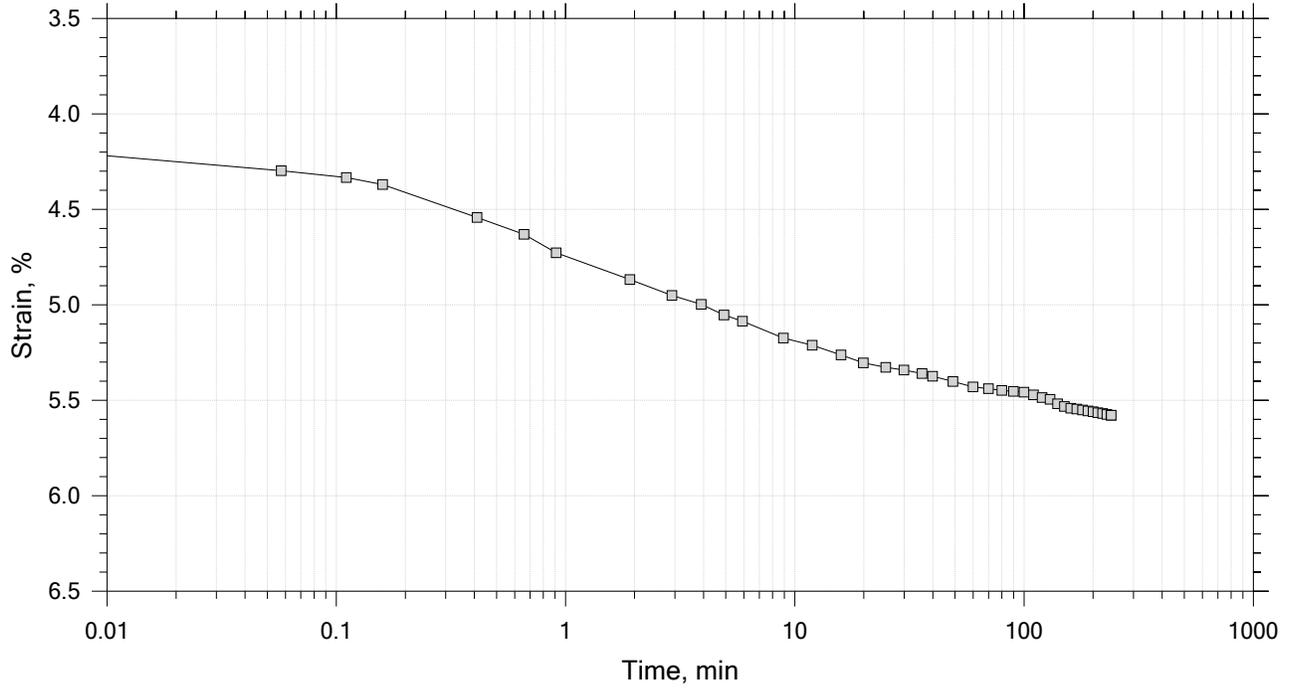
	Project: Souadabscook Center Bridges	Location: Hampden, ME	Project No.: GTX-309947
	Boring No.: BB-HSS-209	Tested By: trm	Checked By: njh
	Sample No.: U2	Test Date: 5/3/19	Depth: 17-19 ft
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, dark greenish gray clay		
	Remarks: System V, Swell Pressure = 0.0703 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 7 of 15

Constant Load Step

Stress: 4 tsf



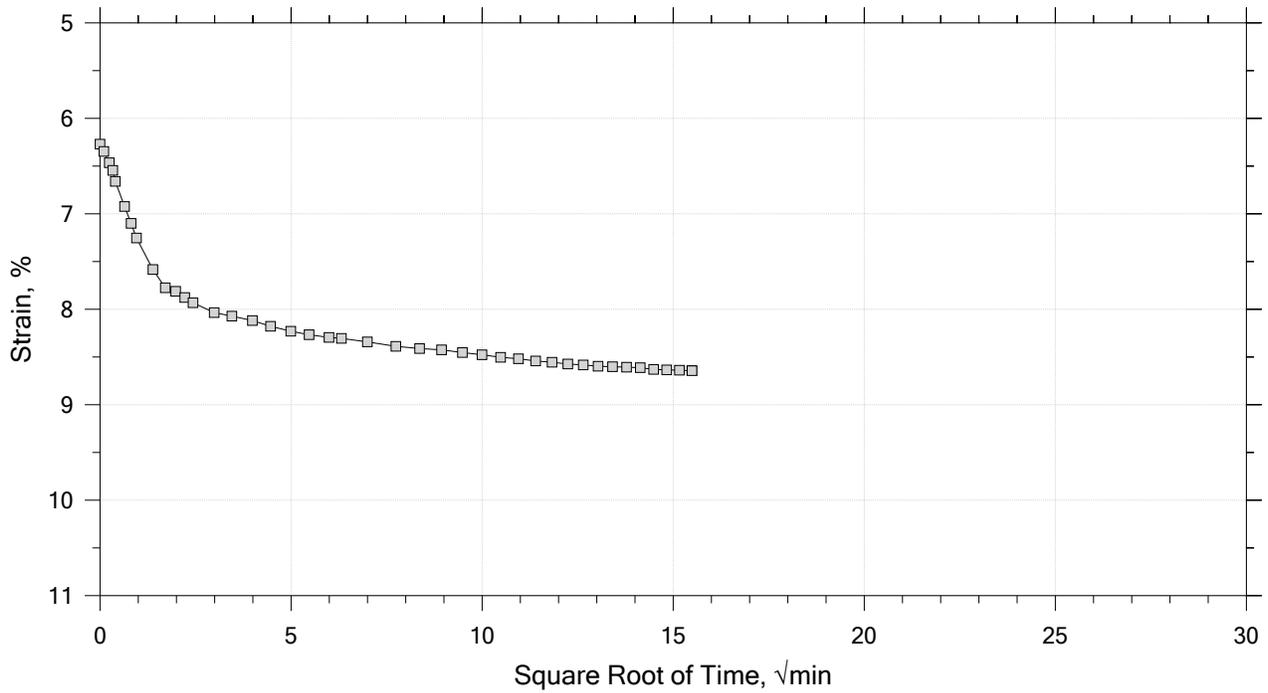
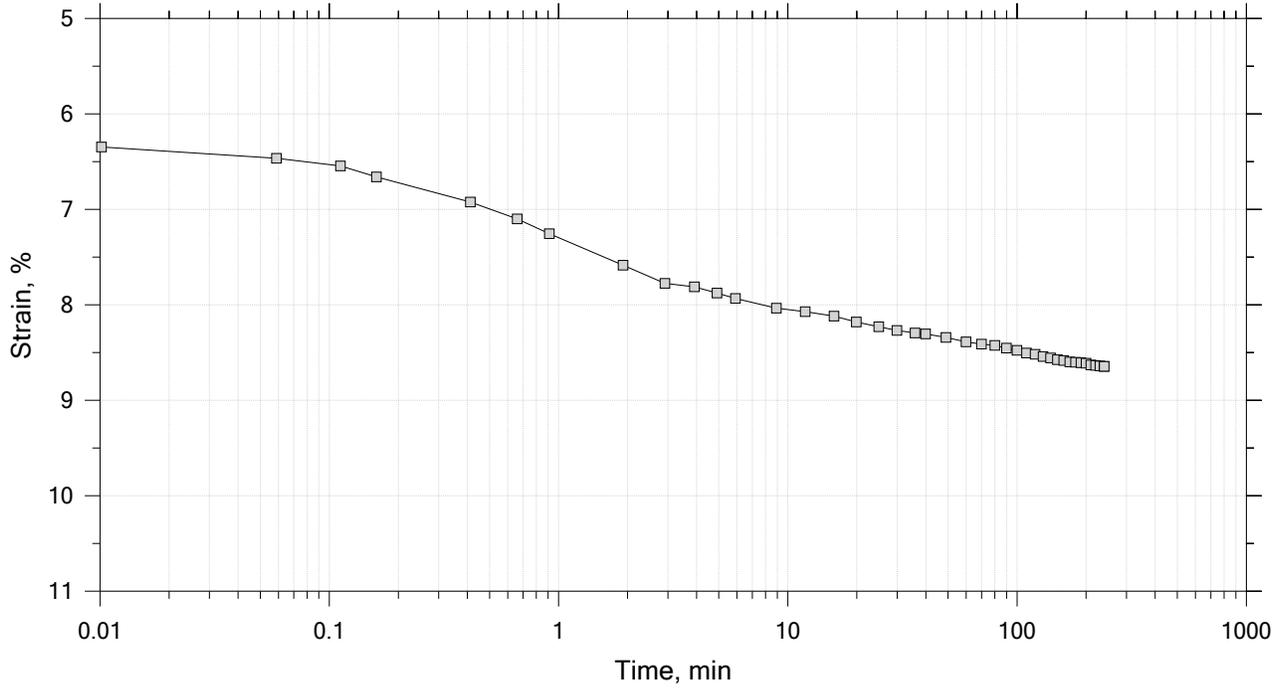
	Project: Souadabscook Center Bridges	Location: Hampden, ME	Project No.: GTX-309947
	Boring No.: BB-HSS-209	Tested By: trm	Checked By: njh
	Sample No.: U2	Test Date: 5/3/19	Depth: 17-19 ft
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, dark greenish gray clay		
	Remarks: System V, Swell Pressure = 0.0703 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 8 of 15

Constant Load Step

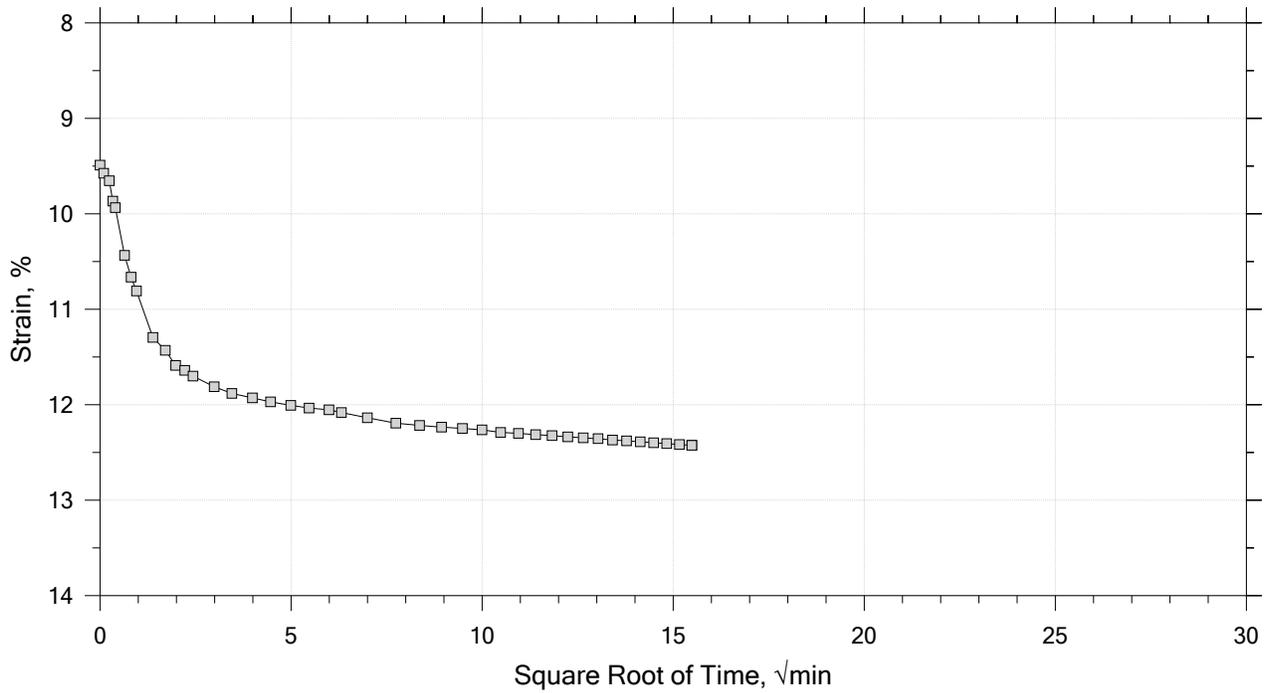
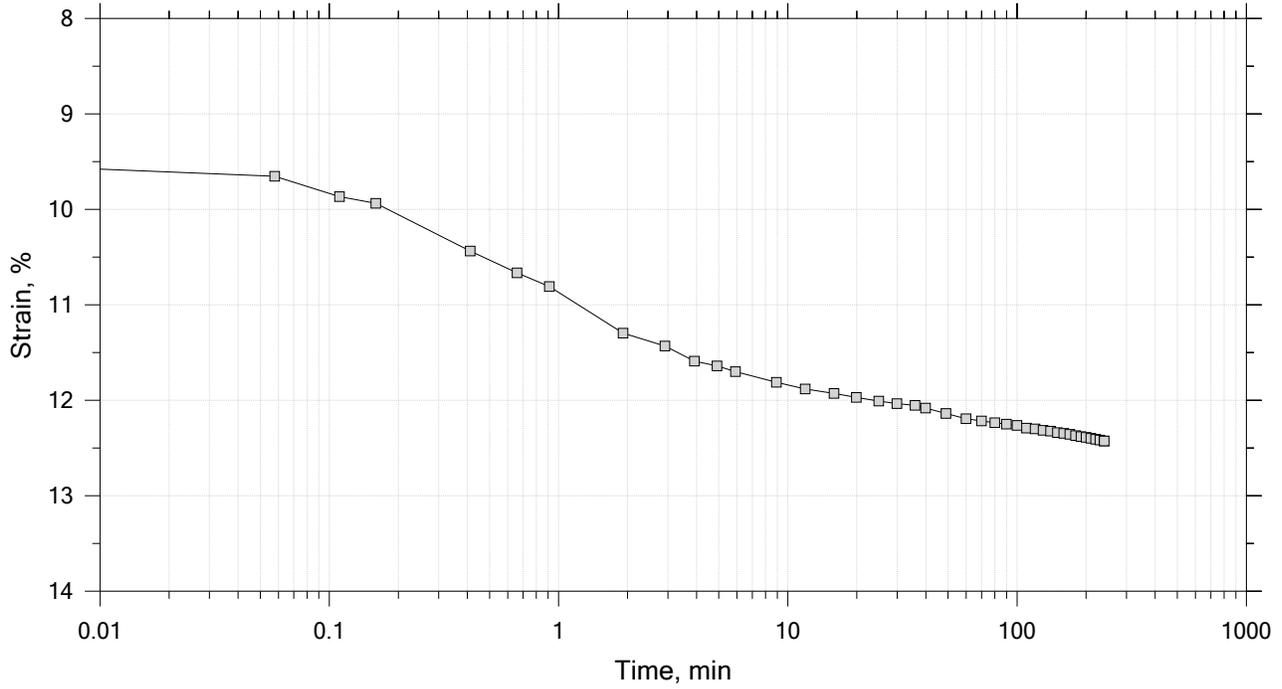
Stress: 8 tsf



	Project: Souadabscook Center Bridges	Location: Hampden, ME	Project No.: GTX-309947
	Boring No.: BB-HSS-209	Tested By: trm	Checked By: njh
	Sample No.: U2	Test Date: 5/3/19	Depth: 17-19 ft
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, dark greenish gray clay		
	Remarks: System V, Swell Pressure = 0.0703 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 9 of 15
 Constant Load Step
 Stress: 16 tsf



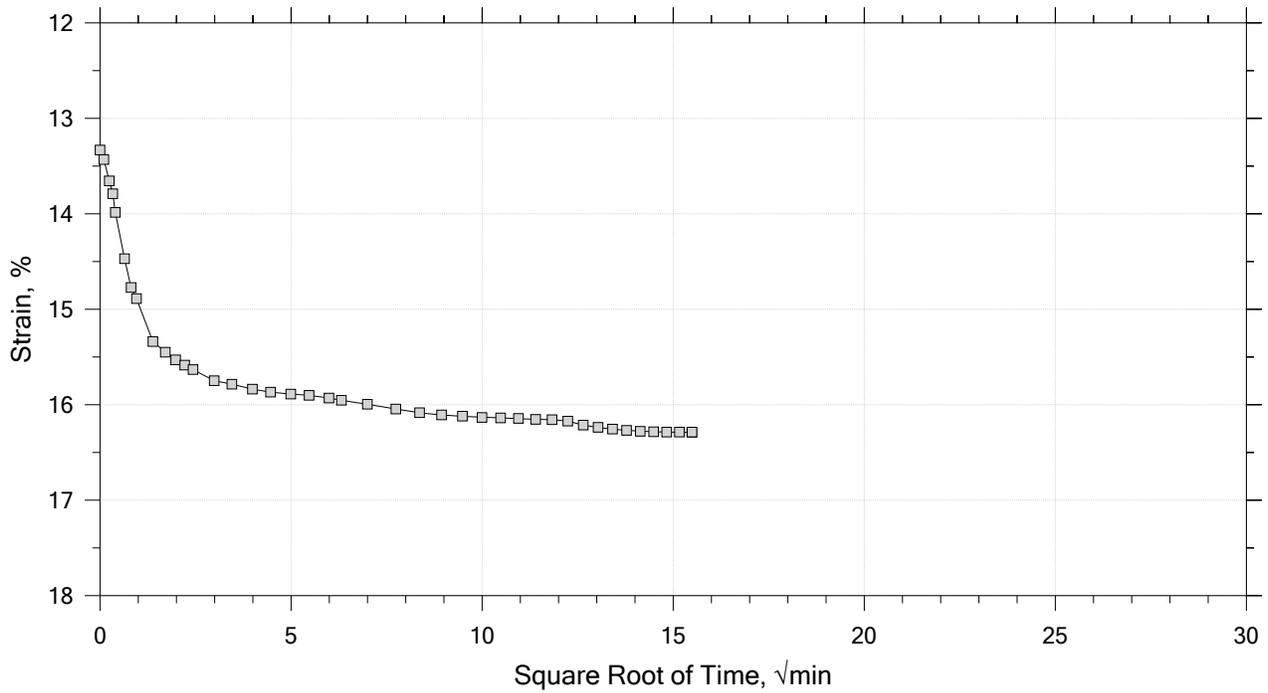
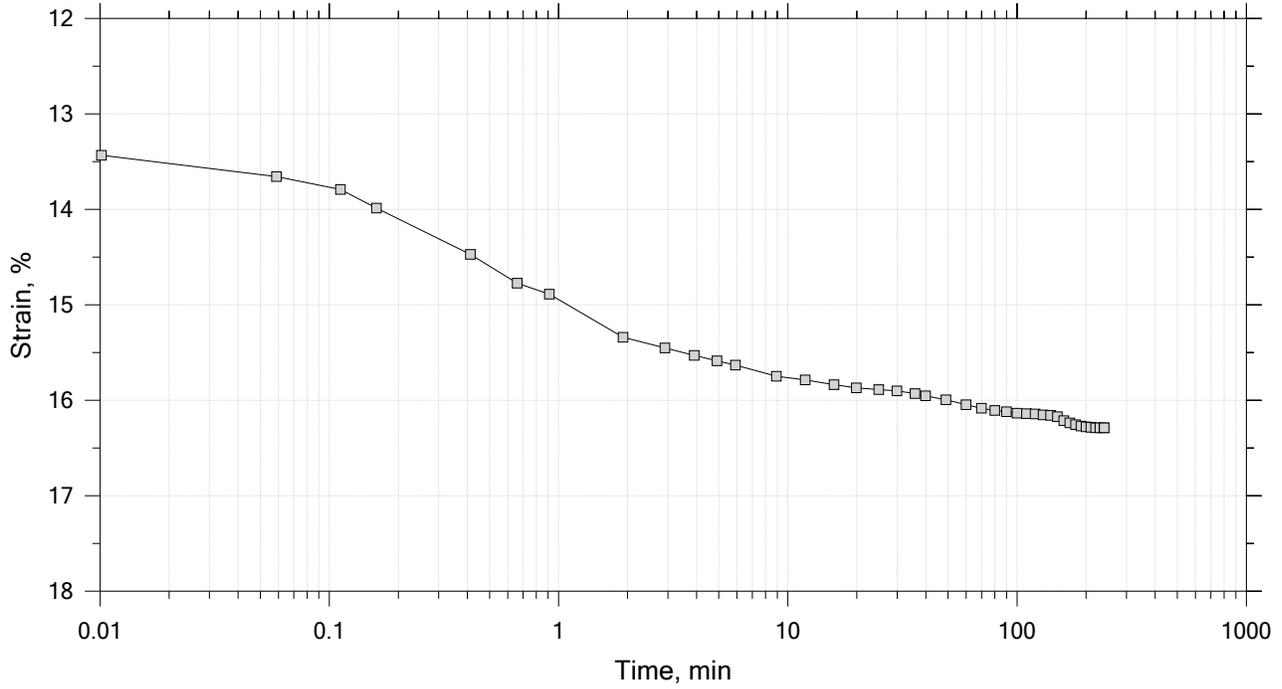
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	Boring No.: BB-HSS-209	Tested By: trm	Checked By: njh
	Sample No.: U2	Test Date: 5/3/19	Depth: 17-19 ft
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, dark greenish gray clay		
	Remarks: System V, Swell Pressure = 0.0703 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 10 of 15

Constant Load Step

Stress: 32 tsf



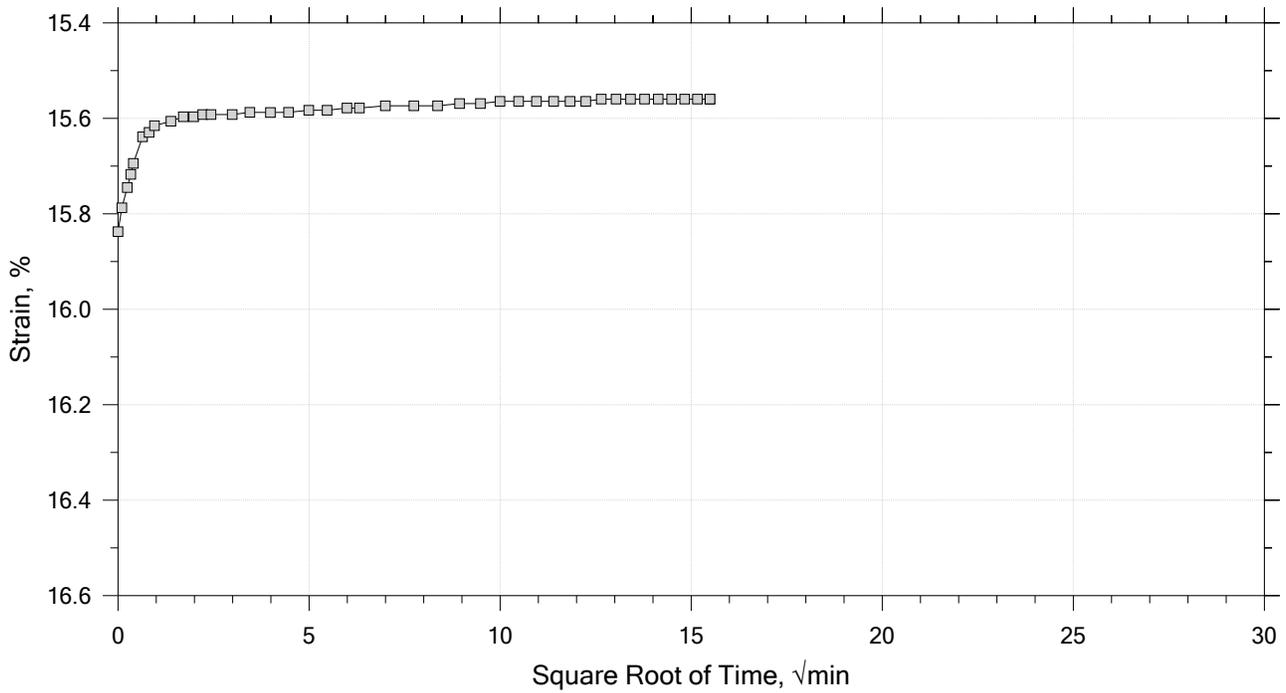
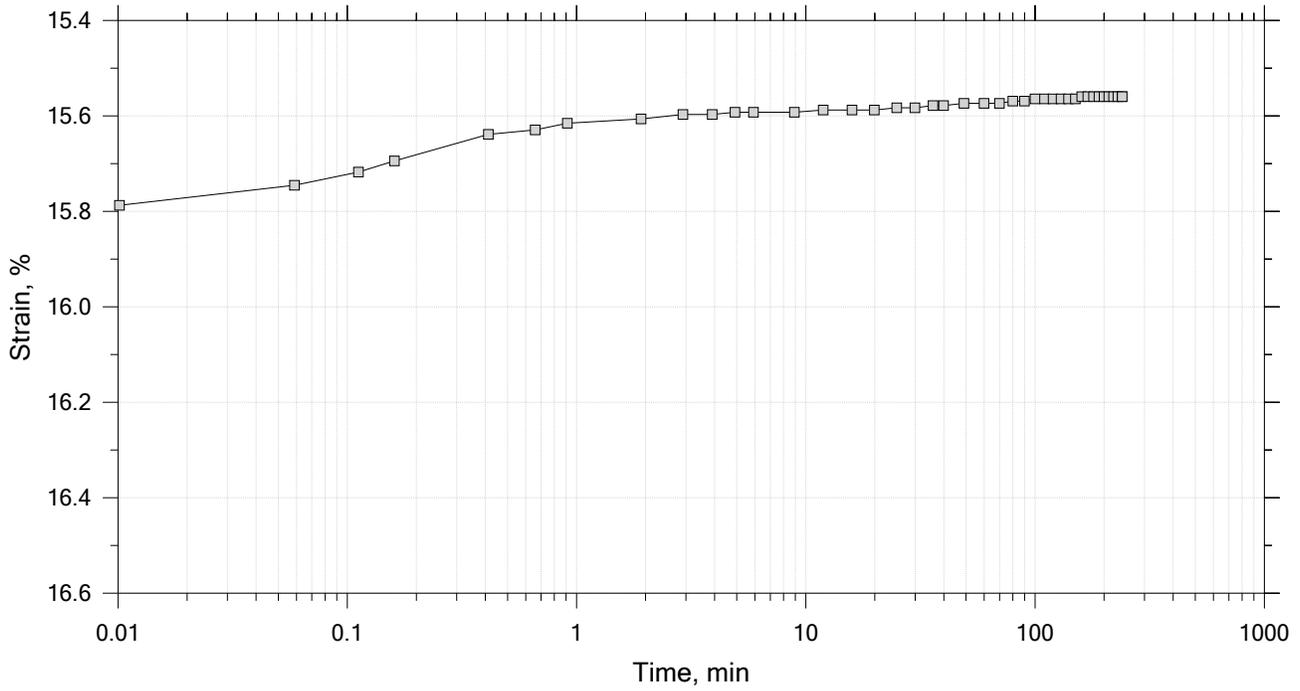
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	Boring No.: BB-HSS-209	Tested By: trm	Checked By: njh
	Sample No.: U2	Test Date: 5/3/19	Depth: 17-19 ft
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, dark greenish gray clay		
	Remarks: System V, Swell Pressure = 0.0703 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 11 of 15

Constant Load Step

Stress: 8 tsf



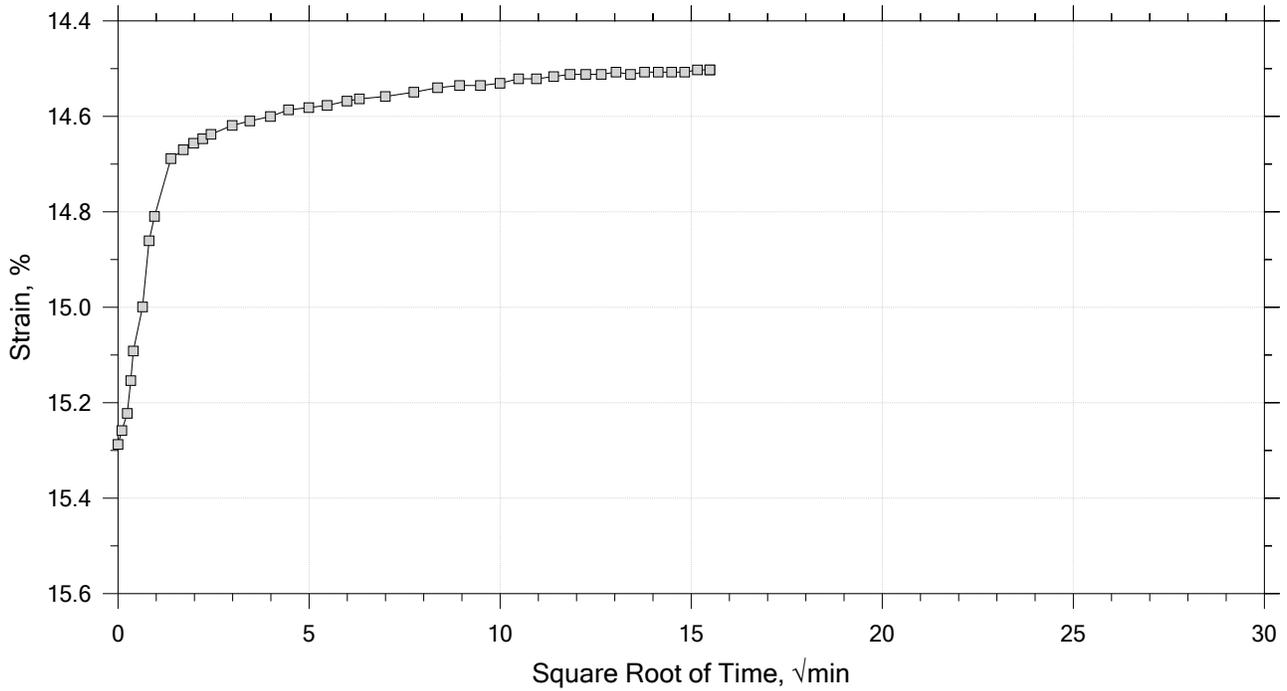
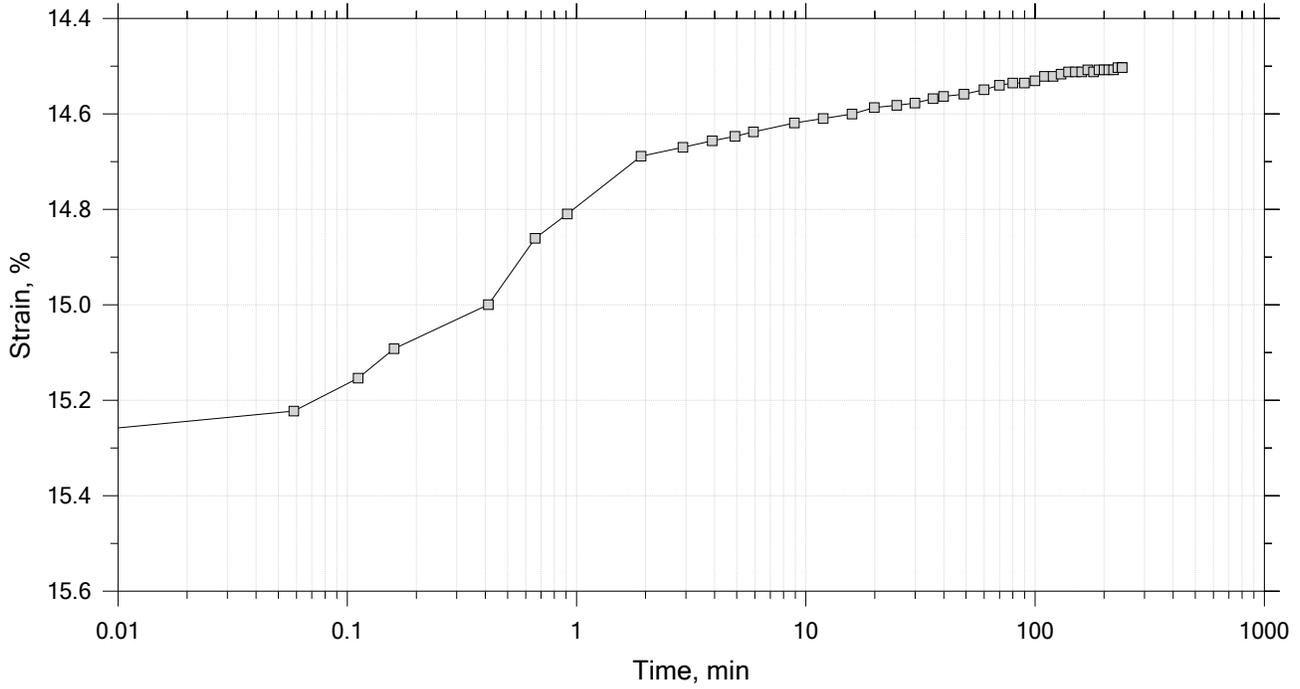
	Project: Souadabscook Center Bridges	Location: Hampden, ME	Project No.: GTX-309947
	Boring No.: BB-HSS-209	Tested By: trm	Checked By: njh
	Sample No.: U2	Test Date: 5/3/19	Depth: 17-19 ft
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, dark greenish gray clay		
	Remarks: System V, Swell Pressure = 0.0703 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 12 of 15

Constant Load Step

Stress: 2 tsf



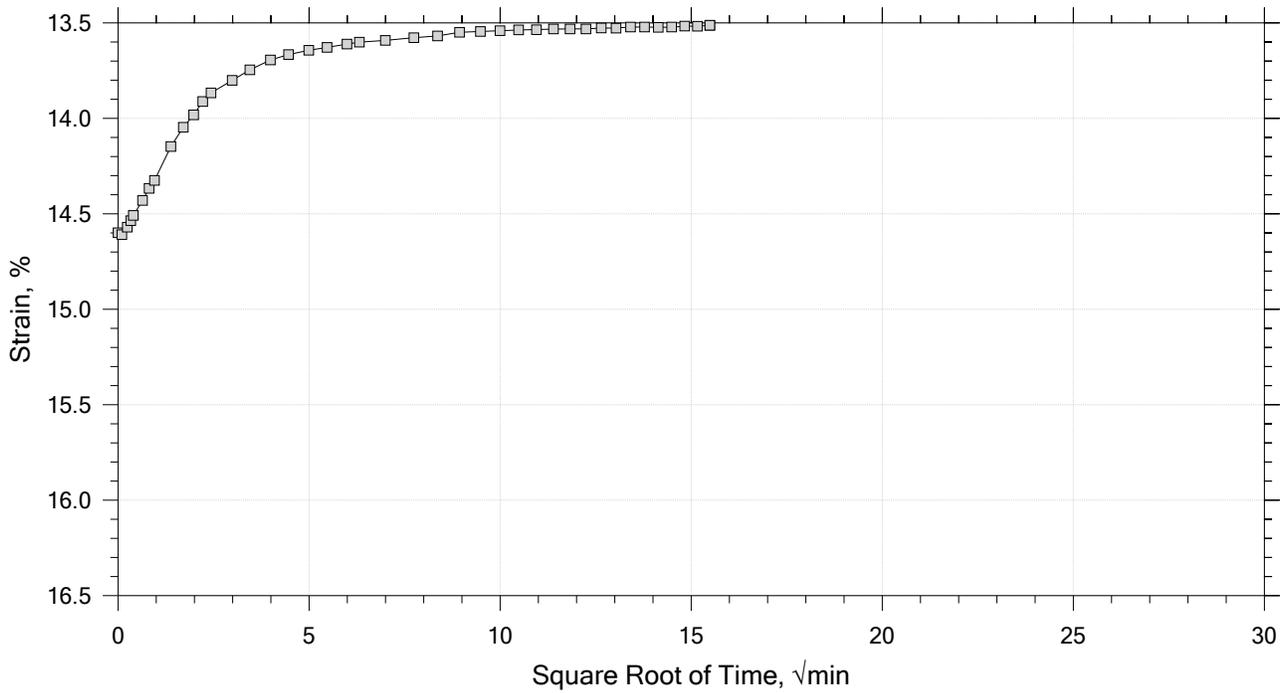
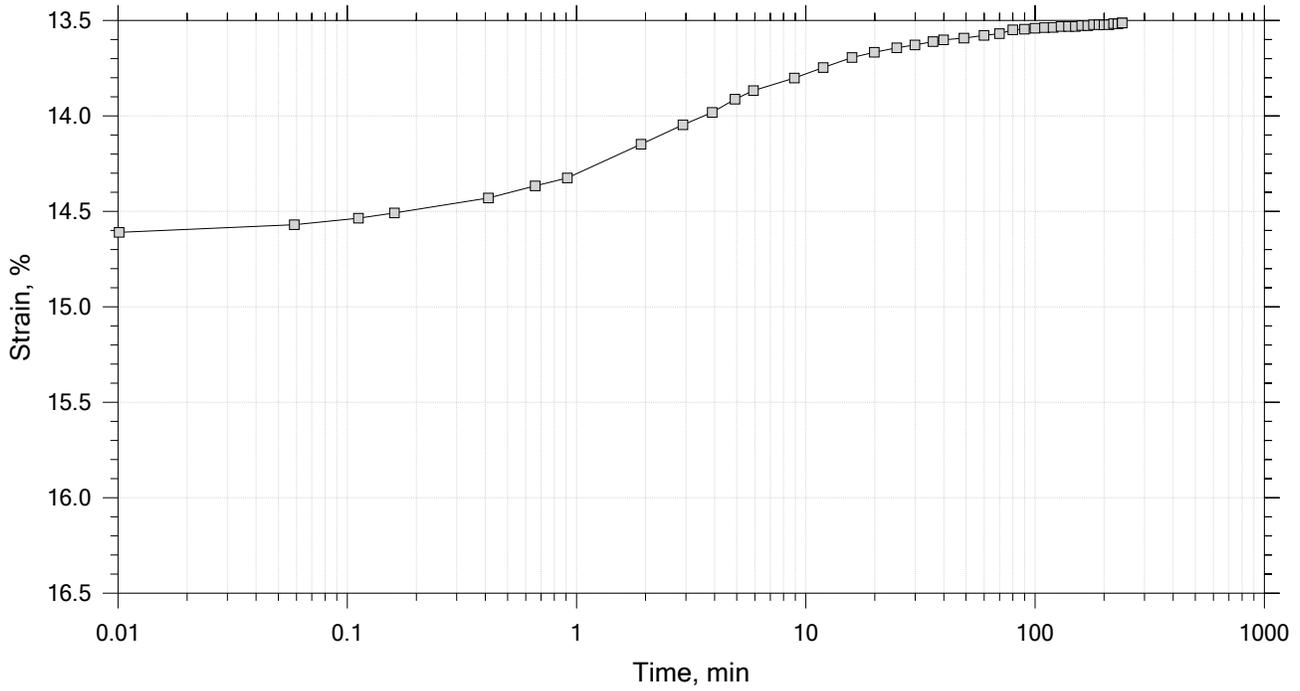
	Project: Souadabscook Center Bridges	Location: Hampden, ME	Project No.: GTX-309947
	Boring No.: BB-HSS-209	Tested By: trm	Checked By: njh
	Sample No.: U2	Test Date: 5/3/19	Depth: 17-19 ft
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, dark greenish gray clay		
	Remarks: System V, Swell Pressure = 0.0703 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 13 of 15

Constant Load Step

Stress: 0.5 tsf



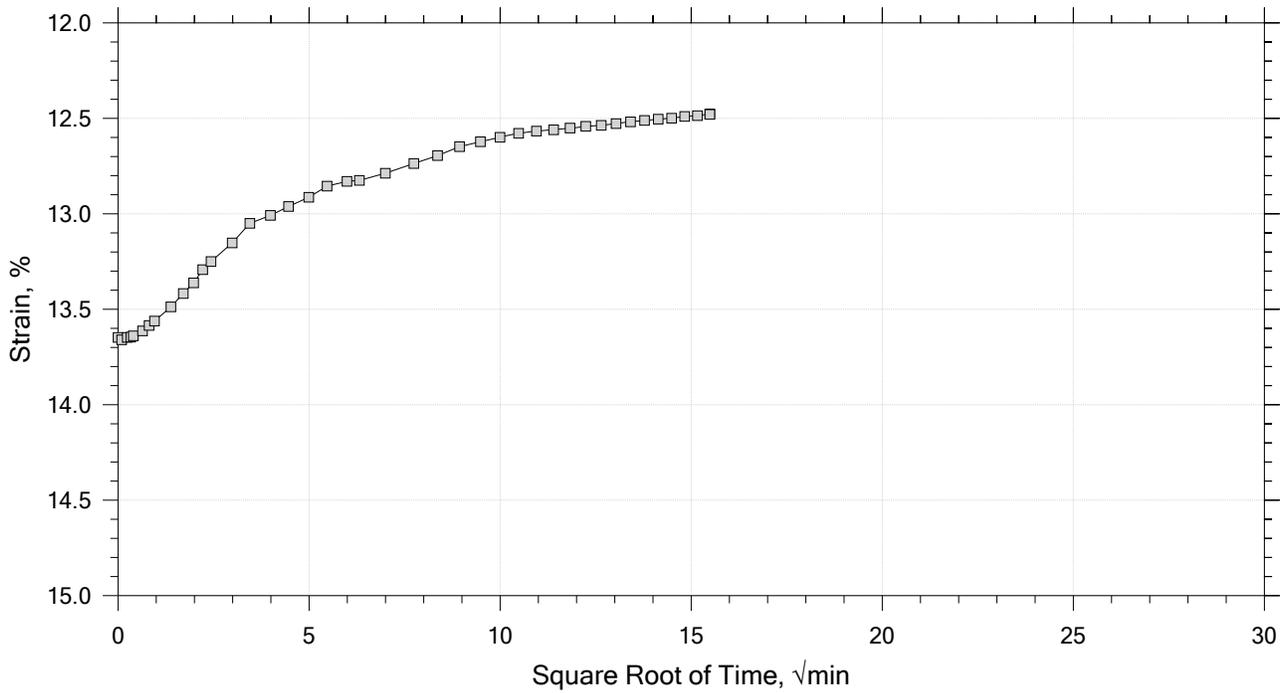
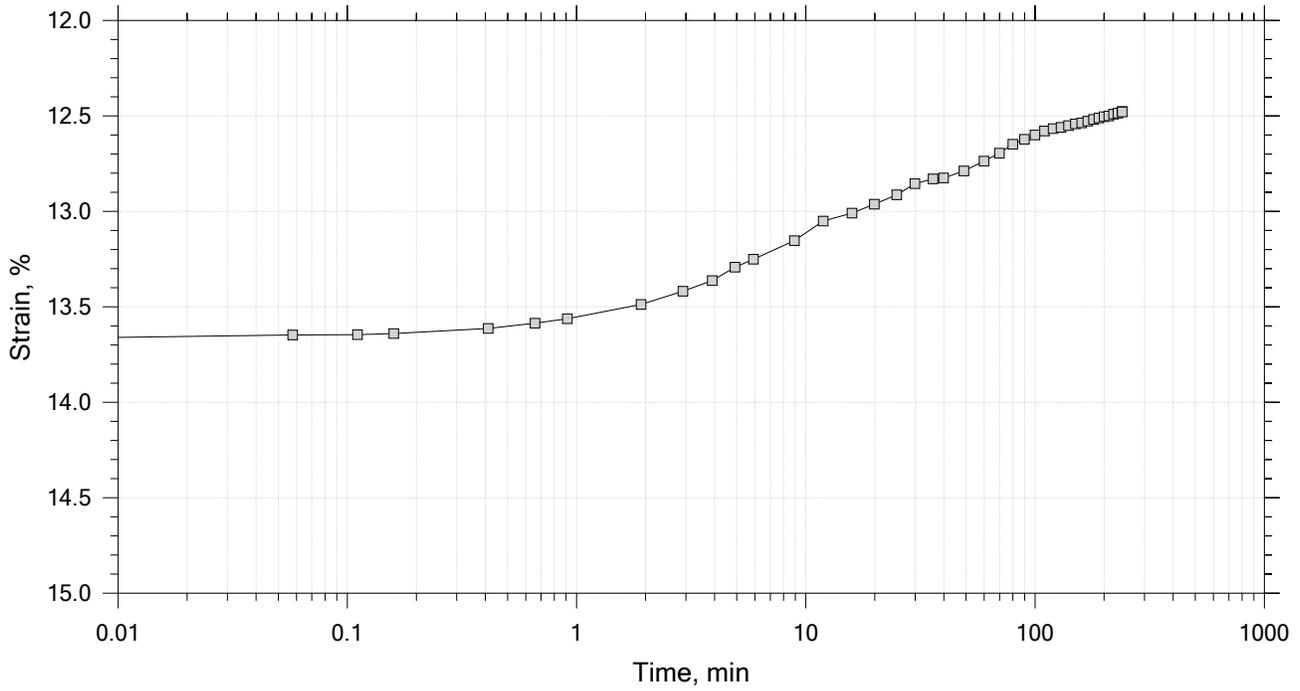
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	Boring No.: BB-HSS-209	Tested By: trm	Checked By: njh
	Sample No.: U2	Test Date: 5/3/19	Depth: 17-19 ft
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, dark greenish gray clay		
	Remarks: System V, Swell Pressure = 0.0703 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 14 of 15

Constant Load Step

Stress: 0.125 tsf



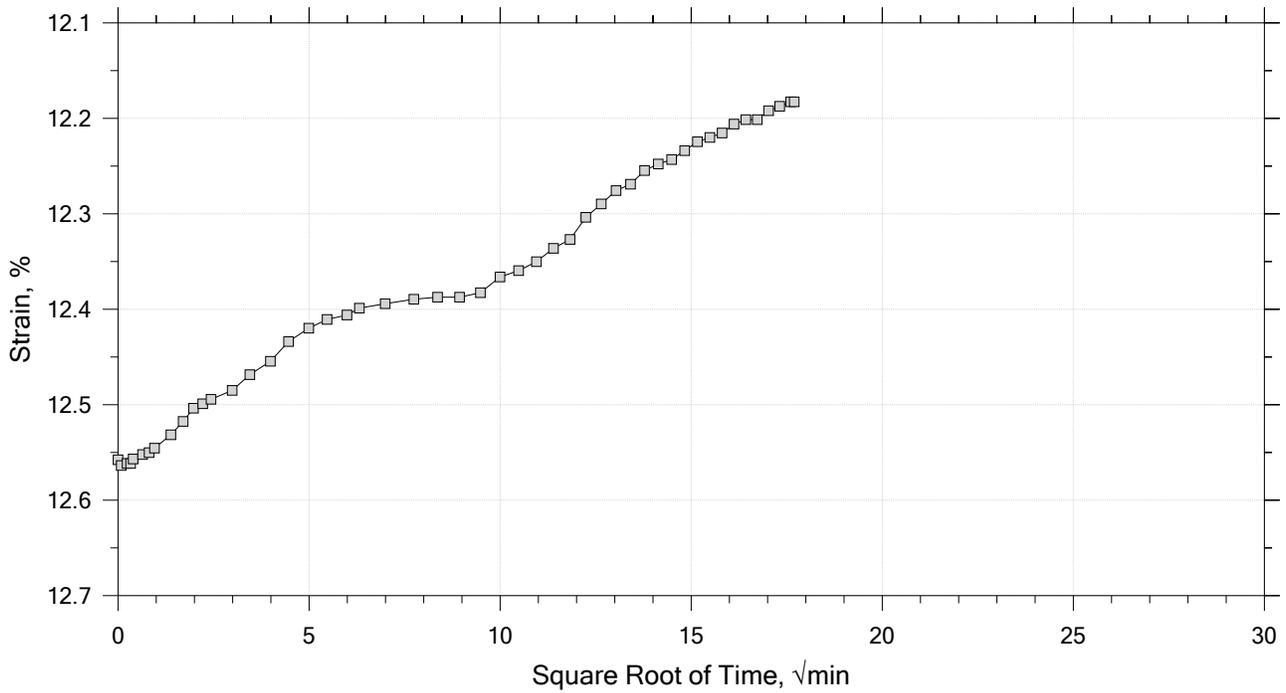
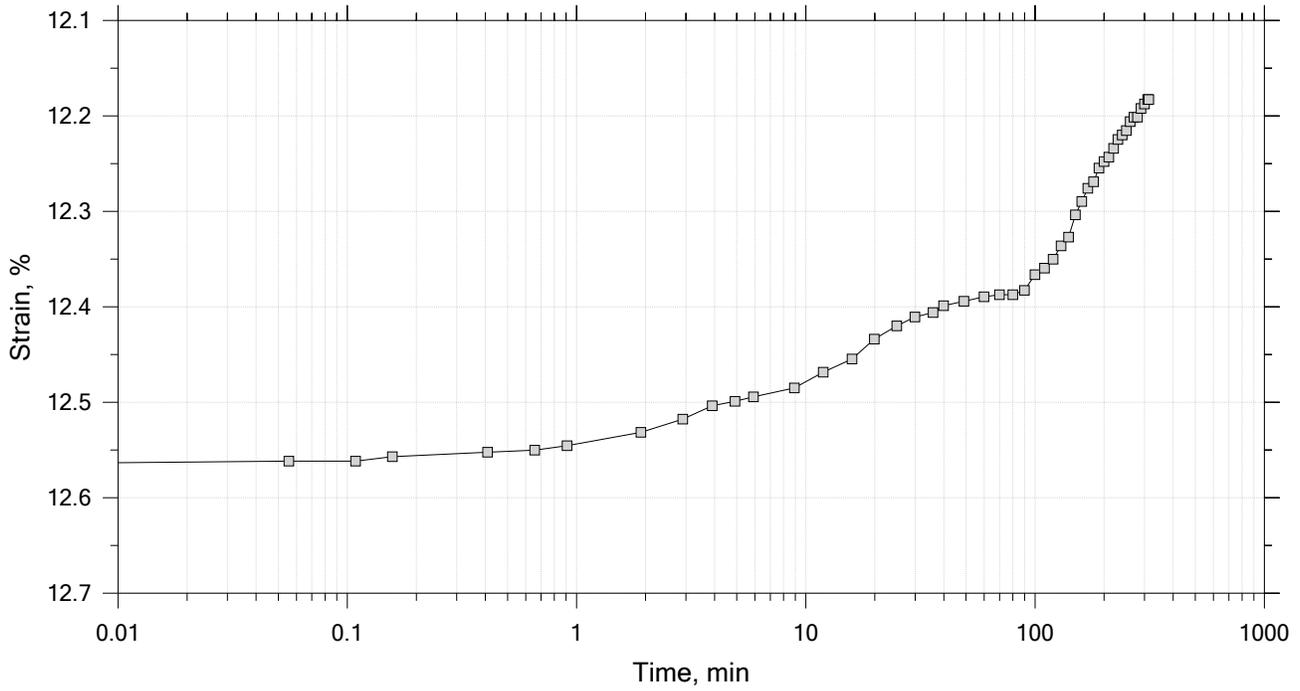
	Project: Souadabscook Center Bridges	Location: Hampden, ME	Project No.: GTX-309947
	Boring No.: BB-HSS-209	Tested By: trm	Checked By: njh
	Sample No.: U2	Test Date: 5/3/19	Depth: 17-19 ft
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, dark greenish gray clay		
	Remarks: System V, Swell Pressure = 0.0703 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 15 of 15

Constant Load Step

Stress: 0.0625 tsf



	Project: Souadabscook Center Bridges	Location: Hampden, ME	Project No.: GTX-309947
	Boring No.: BB-HSS-209	Tested By: trm	Checked By: njh
	Sample No.: U2	Test Date: 5/3/19	Depth: 17-19 ft
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, dark greenish gray clay		
	Remarks: System V, Swell Pressure = 0.0703 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Specimen Diameter: 2.50 in	Estimated Specific Gravity: 2.72	Liquid Limit: 30
Initial Height: 1.00 in	Initial Void Ratio: 0.833	Plastic Limit: 13
Final Height: 0.87 in	Final Void Ratio: 0.595	Plasticity Index: 17

	Before Test Trimmings	Before Test Specimen	After Test Specimen	After Test Trimmings
Container ID	A1128	RING		C-2789
Mass Container, gm	8.34	109.56	109.56	8.98
Mass Container + Wet Soil, gm	164.89	265.12	254.85	156.41
Mass Container + Dry Soil, gm	129.69	228.74	228.74	129.92
Mass Dry Soil, gm	121.35	119.18	119.18	120.94
Water Content, %	29.01	30.52	21.90	21.90
Void Ratio	---	0.83	0.59	---
Degree of Saturation, %	---	99.49	100.00	---
Dry Unit Weight, pcf	---	92.497	106.32	---

Note: Specific Gravity and Void Ratios are calculated assuming the degree of saturation equals 100% at the end of the test. Therefore, values may not represent actual values for the specimen.

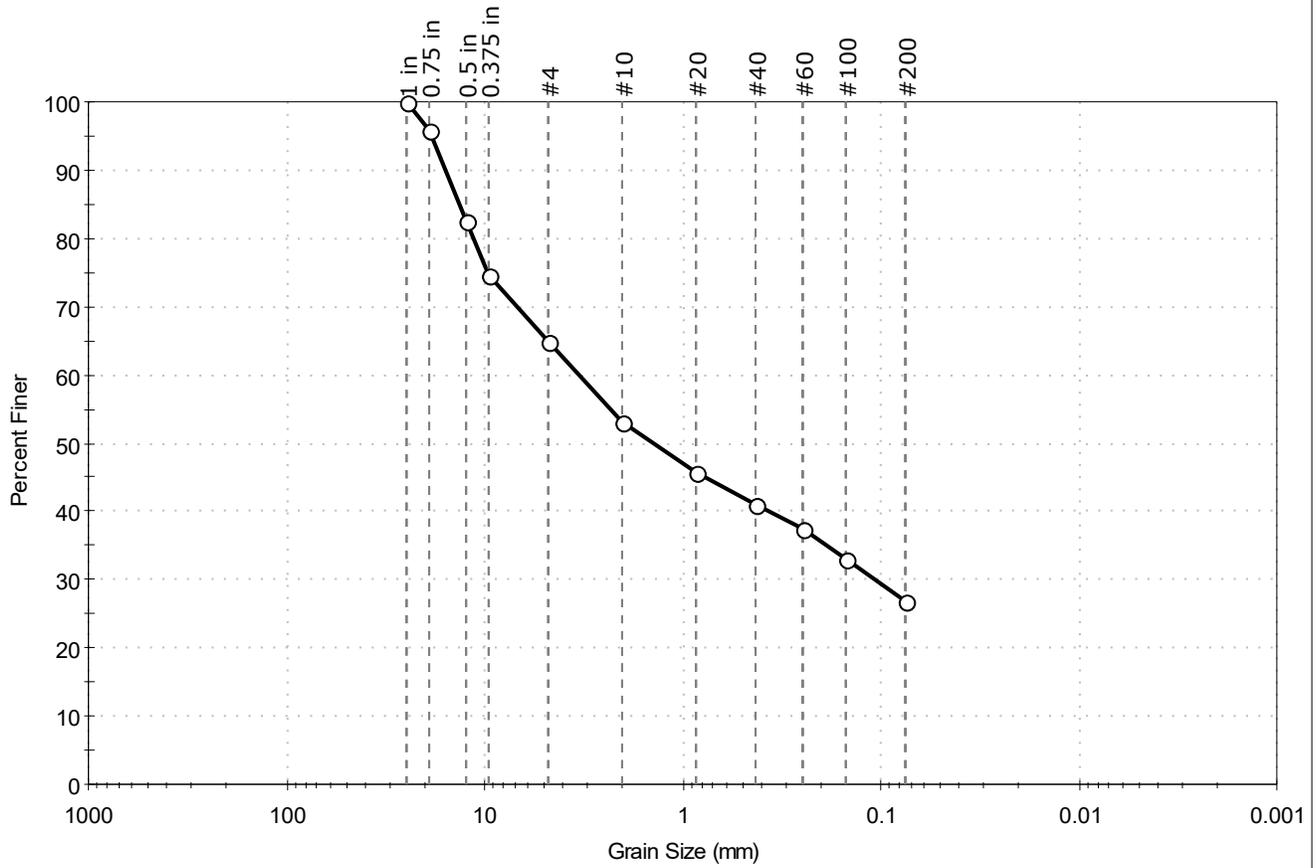
	Project: Souadabscook Center Bridges	Location: Hampden, ME	Project No.: GTX-309947
	Boring No.: BB-HSS-209	Tested By: trm	Checked By: njh
	Sample No.: U2	Test Date: 5/3/19	Depth: 17-19 ft
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, dark greenish gray clay		
	Remarks: System V, Swell Pressure = 0.0703 tsf		

Souadabscook Stream East



Client:	Haley & Aldrich, Inc.		
Project:	Souadabscook East; Bridge Nos. 1431 and 5949		
Location:	Hampden, Maine	Project No:	GTX-309948
Boring ID:	BB-HSS-211	Sample Type:	jar
Sample ID:	5D	Test Date:	05/15/19
Depth :	8-10 ft	Test Id:	502208
Test Comment:	---		
Visual Description:	Moist, olive clayey sand with gravel		
Sample Comment:	---		

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	35.0	38.1	26.9

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
1 in	25.00	100		
0.75 in	19.00	96		
0.5 in	12.50	83		
0.375 in	9.50	74		
#4	4.75	65		
#10	2.00	53		
#20	0.85	46		
#40	0.42	41		
#60	0.25	37		
#100	0.15	33		
#200	0.075	27		

<u>Coefficients</u>	
D ₈₅ = 13.4995 mm	D ₃₀ = 0.1062 mm
D ₆₀ = 3.3154 mm	D ₁₅ = N/A
D ₅₀ = 1.4125 mm	D ₁₀ = N/A
C _u = N/A	C _c = N/A

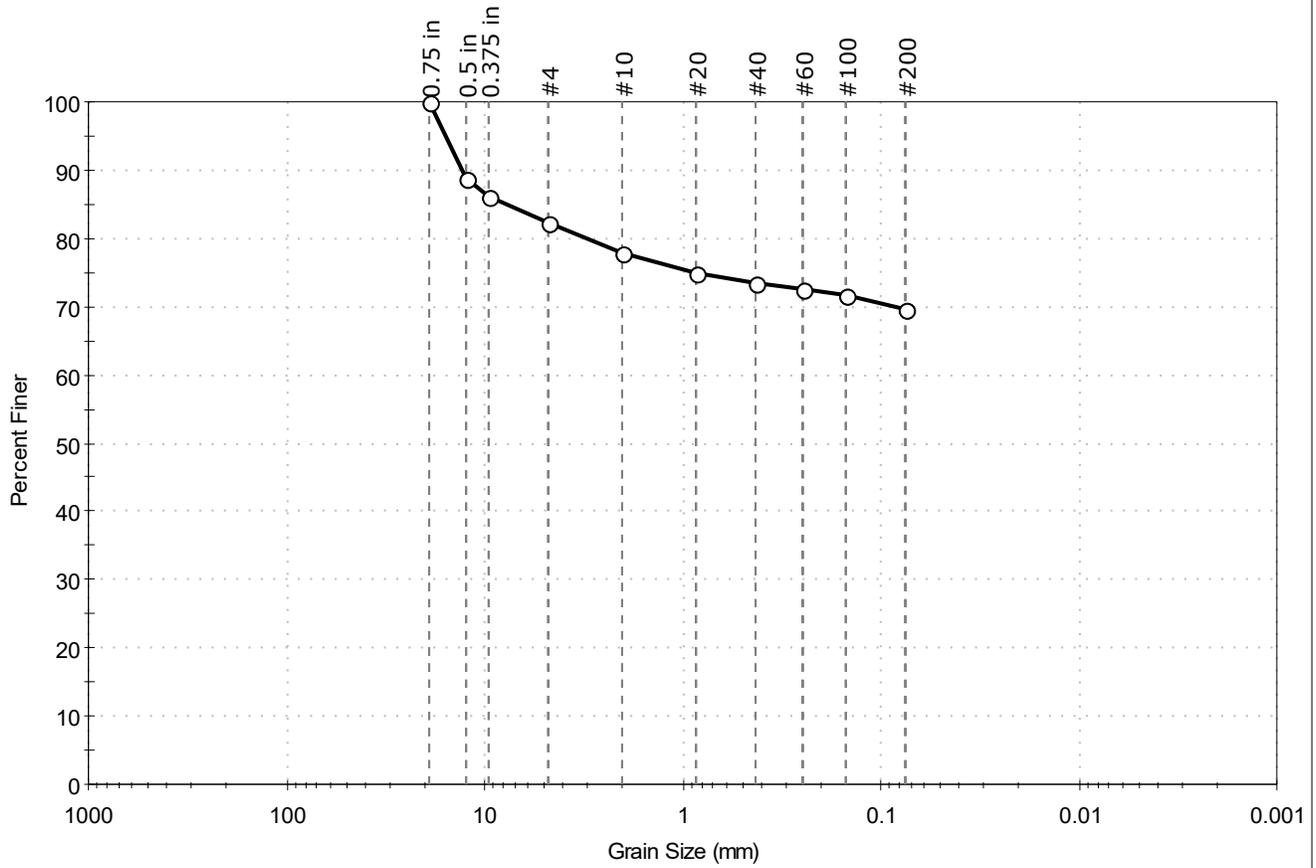
<u>Classification</u>	
ASTM	N/A
AASHTO	Silty Gravel and Sand (A-2-4 (0))

<u>Sample/Test Description</u>
Sand/Gravel Particle Shape : ANGULAR
Sand/Gravel Hardness : HARD



Client: Haley & Aldrich, Inc.
 Project: Souadabscook East; Bridge Nos. 1431 and 5949
 Location: Hampden, Maine
 Project No: GTX-309948
 Boring ID: BB-HSS-212
 Sample Type: jar
 Tested By: ckg
 Sample ID: 1D
 Test Date: 05/15/19
 Checked By: bfs
 Depth: 1-3 ft
 Test Id: 502209
 Test Comment: ---
 Visual Description: Moist, olive sandy clay
 Sample Comment: ---

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	17.7	12.8	69.5

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
0.75 in	19.00	100		
0.5 in	12.50	89		
0.375 in	9.50	86		
#4	4.75	82		
#10	2.00	78		
#20	0.85	75		
#40	0.42	74		
#60	0.25	73		
#100	0.15	72		
#200	0.075	70		

<u>Coefficients</u>	
D ₈₅ = 7.7363 mm	D ₃₀ = N/A
D ₆₀ = N/A	D ₁₅ = N/A
D ₅₀ = N/A	D ₁₀ = N/A
C _u = N/A	C _c = N/A

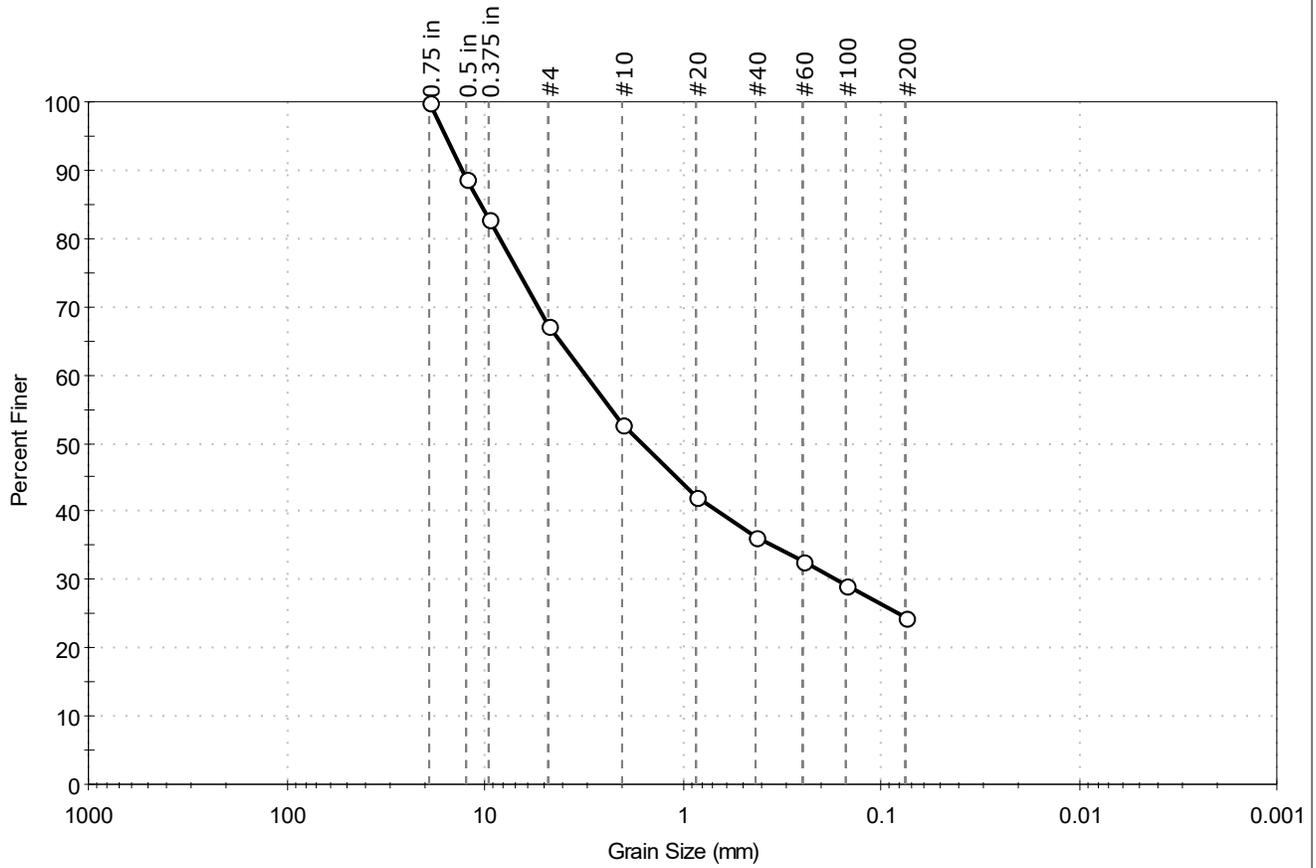
<u>Classification</u>	
ASTM	N/A
AASHTO	Silty Soils (A-4 (0))

<u>Sample/Test Description</u>
Sand/Gravel Particle Shape : ANGULAR
Sand/Gravel Hardness : HARD



Client: Haley & Aldrich, Inc.
 Project: Souadabscook East; Bridge Nos. 1431 and 5949
 Location: Hampden, Maine
 Project No: GTX-309948
 Boring ID: BB-HSS-213
 Sample Type: jar
 Tested By: ckg
 Sample ID: 6D
 Test Date: 05/15/19
 Checked By: bfs
 Depth : 12-14 ft
 Test Id: 502210
 Test Comment: ---
 Visual Description: Moist, olive silty sand with gravel
 Sample Comment: ---

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	32.9	42.6	24.5

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
0.75 in	19.00	100		
0.5 in	12.50	89		
0.375 in	9.50	83		
#4	4.75	67		
#10	2.00	53		
#20	0.85	42		
#40	0.42	36		
#60	0.25	33		
#100	0.15	29		
#200	0.075	24		

Coefficients	
D ₈₅ = 10.5146 mm	D ₃₀ = 0.1701 mm
D ₆₀ = 3.0874 mm	D ₁₅ = N/A
D ₅₀ = 1.5938 mm	D ₁₀ = N/A
C _u = N/A	C _c = N/A

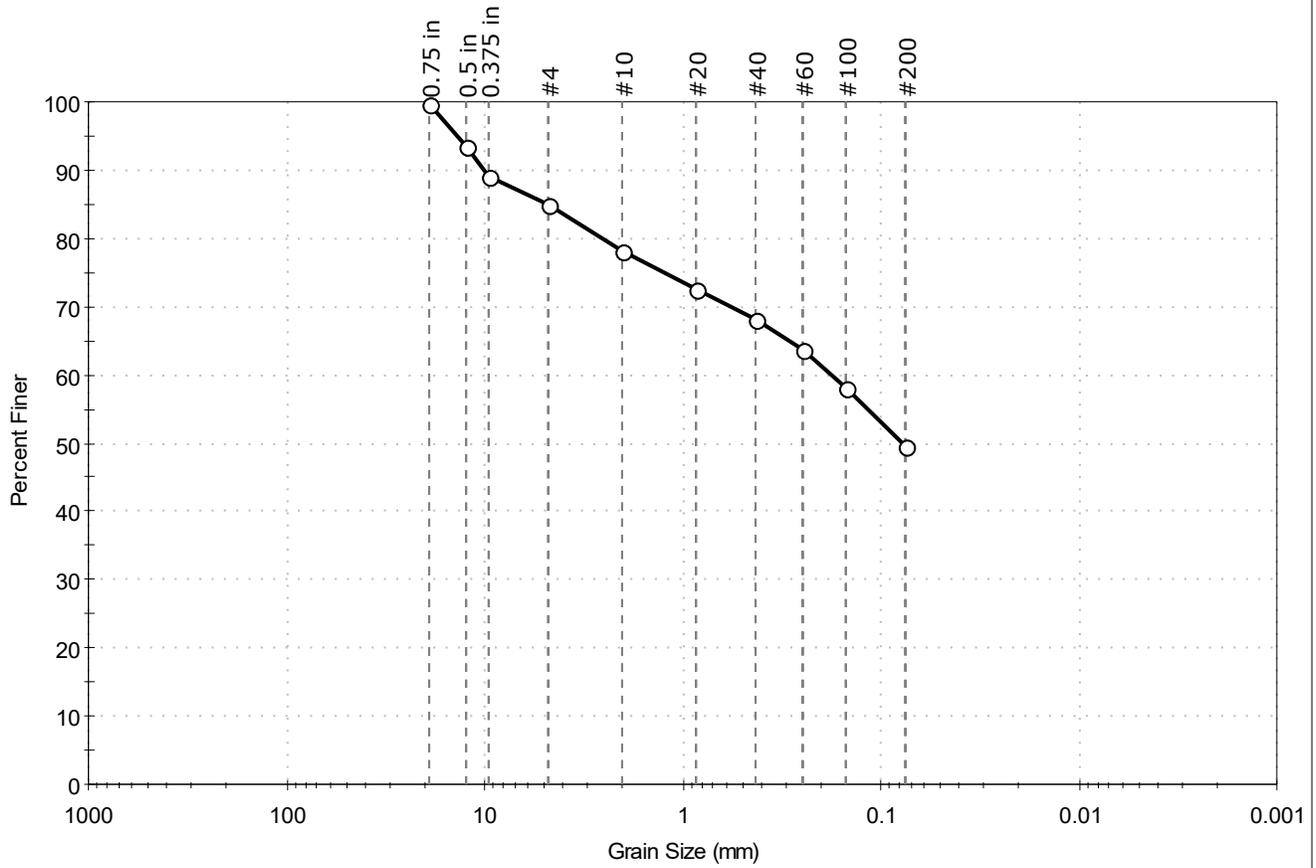
Classification	
ASTM	N/A
AASHTO	Stone Fragments, Gravel and Sand (A-1-b (0))

Sample/Test Description
Sand/Gravel Particle Shape : ANGULAR
Sand/Gravel Hardness : HARD



Client:	Haley & Aldrich, Inc.		
Project:	Souadabscook East; Bridge Nos. 1431 and 5949		
Location:	Hampden, Maine	Project No:	GTX-309948
Boring ID:	BB-HSS-214	Sample Type:	jar
Sample ID:	2D	Test Date:	05/15/19
Depth :	3-5 ft	Test Id:	502211
Test Comment:	---		
Visual Description:	Moist, olive brown silty sand with gravel		
Sample Comment:	---		

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	15.2	35.3	49.5

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
0.75 in	19.00	100		
0.5 in	12.50	93		
0.375 in	9.50	89		
#4	4.75	85		
#10	2.00	78		
#20	0.85	72		
#40	0.42	68		
#60	0.25	64		
#100	0.15	58		
#200	0.075	50		

<u>Coefficients</u>	
D ₈₅ = 4.8778 mm	D ₃₀ = N/A
D ₆₀ = 0.1797 mm	D ₁₅ = N/A
D ₅₀ = 0.0777 mm	D ₁₀ = N/A
C _u = N/A	C _c = N/A

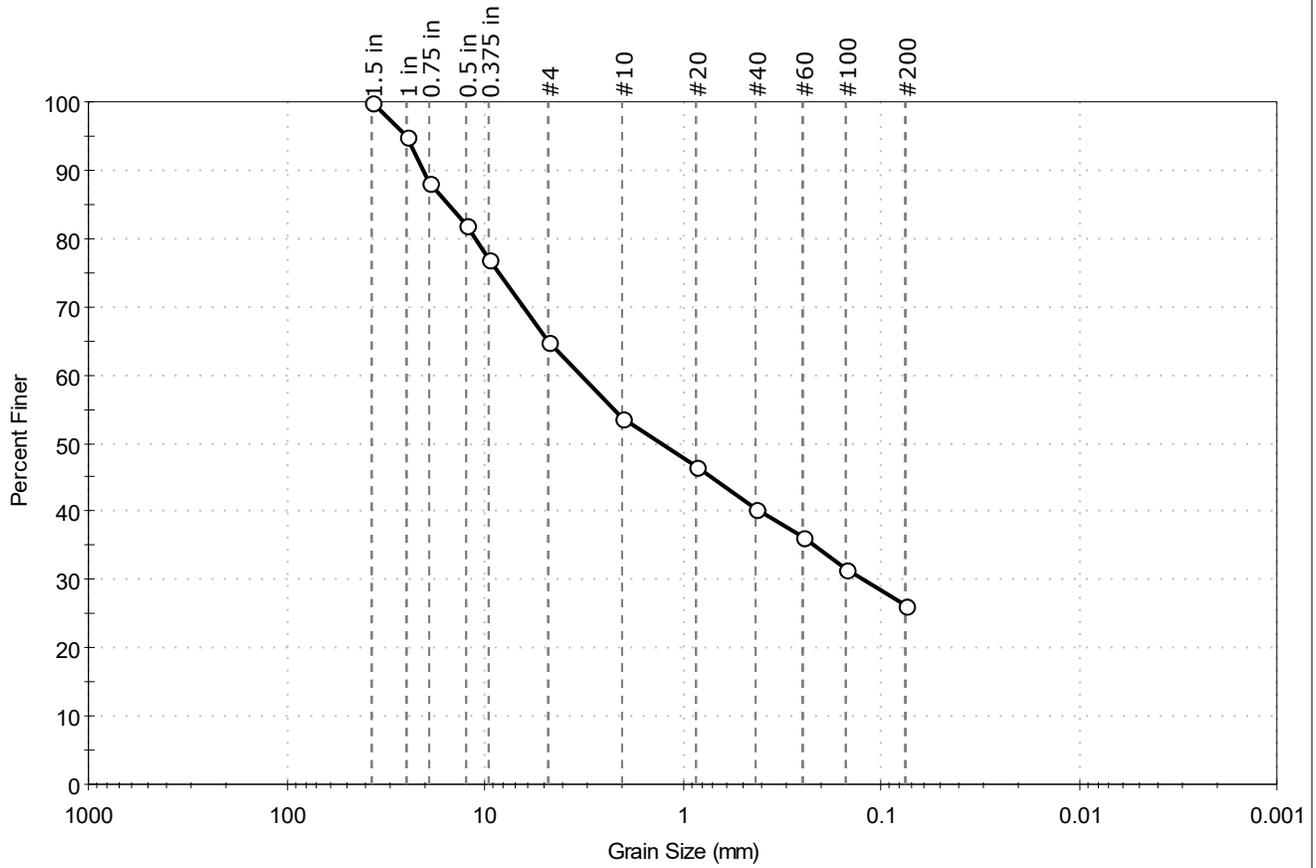
<u>Classification</u>	
ASTM	N/A
AASHTO	Silty Soils (A-4 (0))

<u>Sample/Test Description</u>
Sand/Gravel Particle Shape : ANGULAR
Sand/Gravel Hardness : HARD



Client:	Haley & Aldrich, Inc.		
Project:	Souadabscook East; Bridge Nos. 1431 and 5949		
Location:	Hampden, Maine	Project No:	GTX-309948
Boring ID:	BB-HSS-215	Sample Type:	jar
Sample ID:	4D	Test Date:	05/15/19
Depth :	6-8 ft	Checked By:	bfs
		Test Id:	502212
Test Comment:	---		
Visual Description:	Moist, dark greenish gray silty sand with gravel		
Sample Comment:	---		

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	35.0	38.8	26.2

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
1.5 in	37.50	100		
1 in	25.00	95		
0.75 in	19.00	88		
0.5 in	12.50	82		
0.375 in	9.50	77		
#4	4.75	65		
#10	2.00	54		
#20	0.85	47		
#40	0.42	40		
#60	0.25	36		
#100	0.15	32		
#200	0.075	26		

<u>Coefficients</u>	
D ₈₅ = 15.2929 mm	D ₃₀ = 0.1213 mm
D ₆₀ = 3.2392 mm	D ₁₅ = N/A
D ₅₀ = 1.2709 mm	D ₁₀ = N/A
C _u = N/A	C _c = N/A

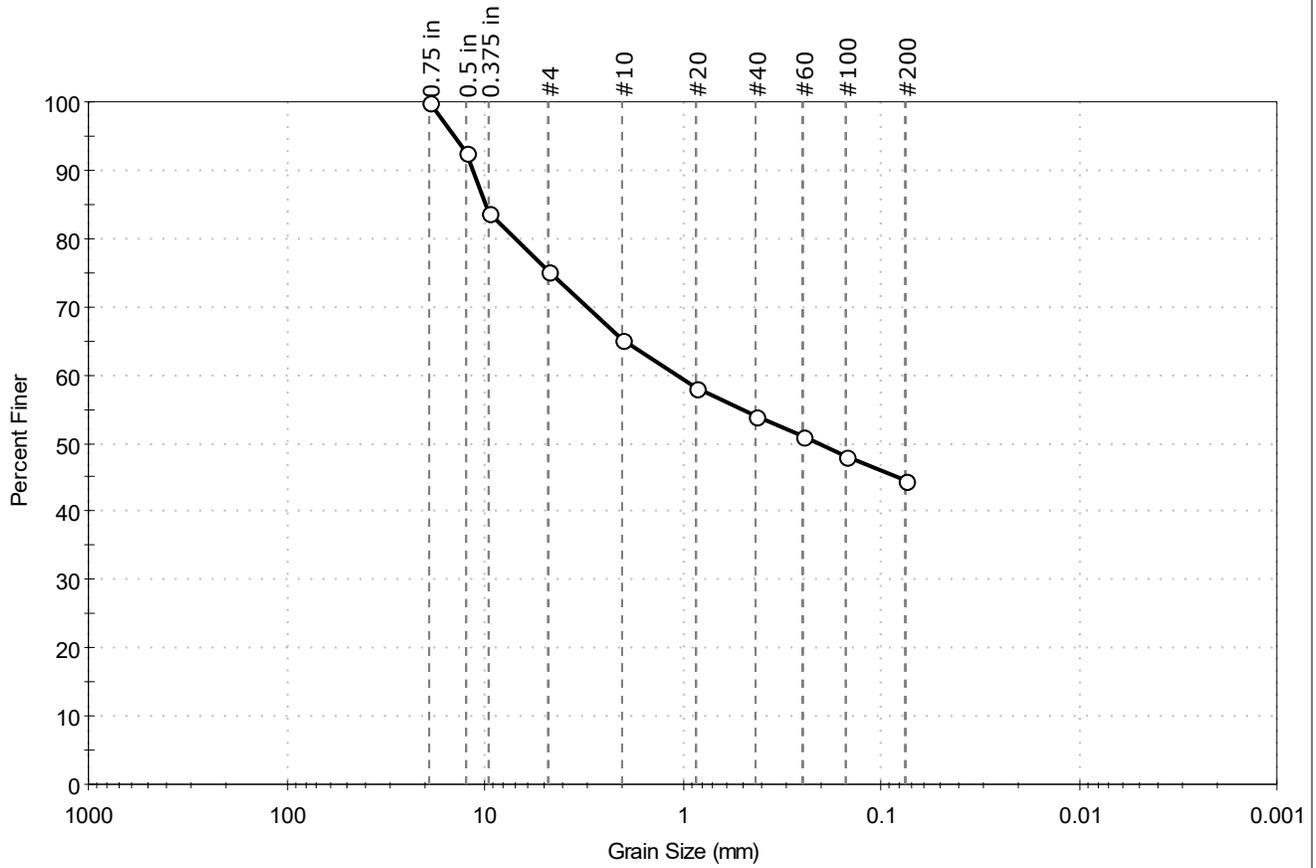
<u>Classification</u>	
ASTM	N/A
AASHTO	Silty Gravel and Sand (A-2-4 (0))

<u>Sample/Test Description</u>
Sand/Gravel Particle Shape : ANGULAR
Sand/Gravel Hardness : HARD



Client:	Haley & Aldrich, Inc.		
Project:	Souadabscook East; Bridge Nos. 1431 and 5949		
Location:	Hampden, Maine	Project No:	GTX-309948
Boring ID:	BB-HSS-216	Sample Type:	jar
Sample ID:	6D	Test Date:	05/15/19
Depth :	19-21 ft	Test Id:	502213
Test Comment:	---		
Visual Description:	Moist, greenish gray silty clayey sand with gravel		
Sample Comment:	---		

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	24.7	30.9	44.4

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
0.75 in	19.00	100		
0.5 in	12.50	93		
0.375 in	9.50	84		
#4	4.75	75		
#10	2.00	65		
#20	0.85	58		
#40	0.42	54		
#60	0.25	51		
#100	0.15	48		
#200	0.075	44		

<u>Coefficients</u>	
D ₈₅ = 9.8565 mm	D ₃₀ = N/A
D ₆₀ = 1.0576 mm	D ₁₅ = N/A
D ₅₀ = 0.2092 mm	D ₁₀ = N/A
C _u = N/A	C _c = N/A

<u>Classification</u>	
ASTM	N/A
AASHTO	Silty Soils (A-4 (0))

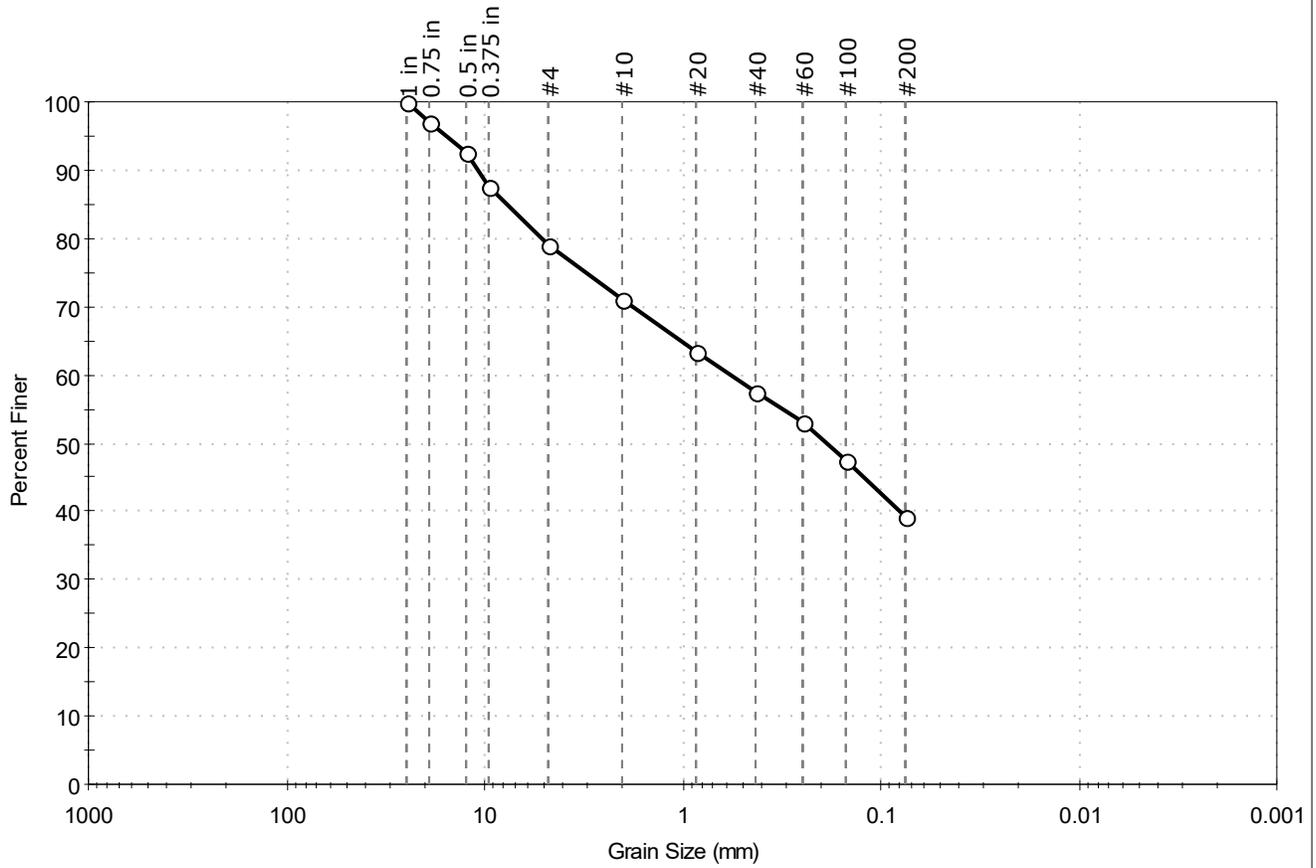
<u>Sample/Test Description</u>
Sand/Gravel Particle Shape : ANGULAR
Sand/Gravel Hardness : HARD

Emerson Mill Road/B&A Railroad



Client: Haley & Aldrich, Inc.	Project No: GTX-310015
Project: Emerson Mill Bridge, 1430 & 5969	
Location: Hampden, ME	
Boring ID: BB-HSS-217	Sample Type: jar
Sample ID: 5D	Test Date: 05/23/19
Depth: 17.0-18.6 ft	Test Id: 505099
Test Comment: ---	Tested By: ckg
Visual Description: Moist, olive silty sand with gravel	Checked By: jsc
Sample Comment: ---	

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	21.0	39.8	39.2

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
1 in	25.00	100		
0.75 in	19.00	97		
0.5 in	12.50	92		
0.375 in	9.50	88		
#4	4.75	79		
#10	2.00	71		
#20	0.85	63		
#40	0.42	58		
#60	0.25	53		
#100	0.15	47		
#200	0.075	39		

<u>Coefficients</u>	
D ₈₅ = 7.7235 mm	D ₃₀ = N/A
D ₆₀ = 0.5668 mm	D ₁₅ = N/A
D ₅₀ = 0.1908 mm	D ₁₀ = N/A
C _u = N/A	C _c = N/A

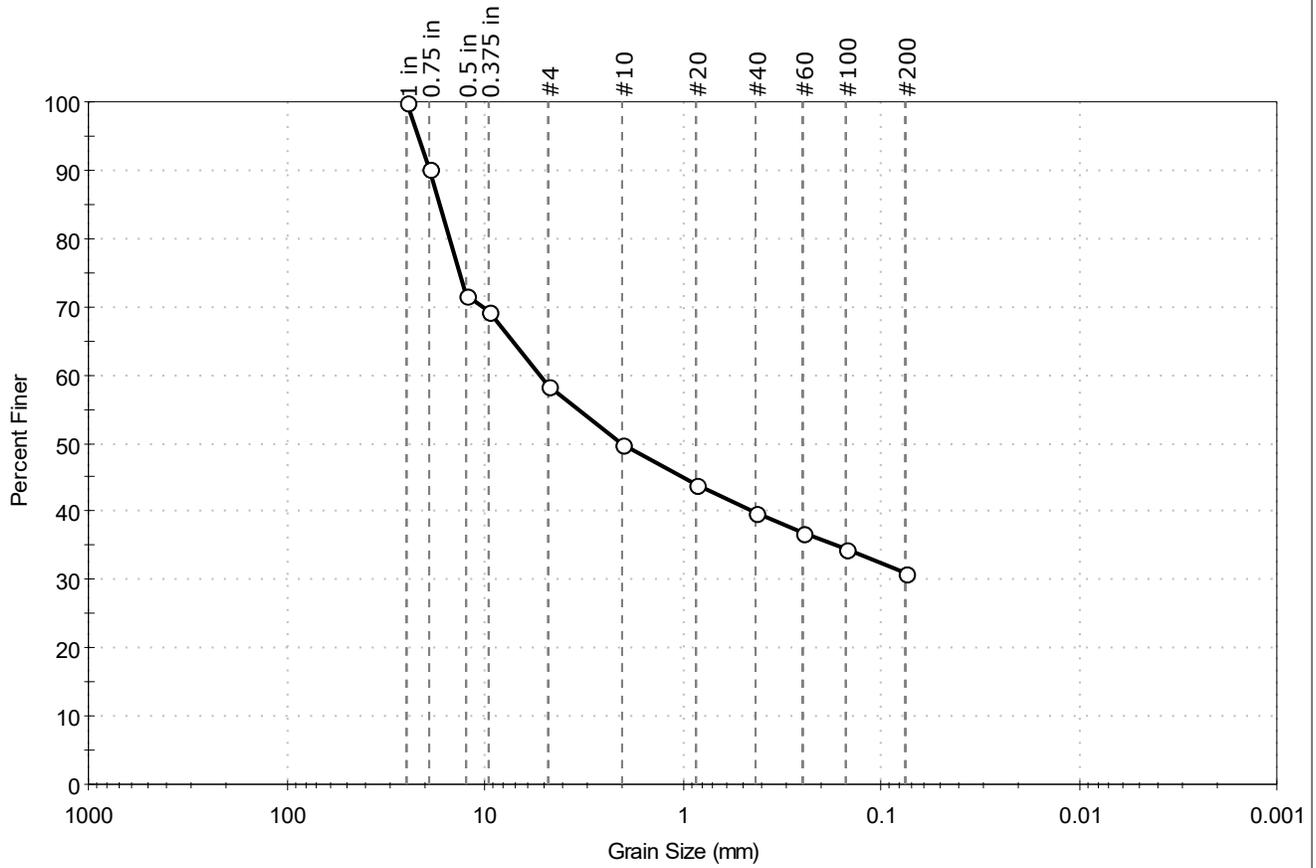
<u>Classification</u>	
ASTM	N/A
AASHTO	Silty Soils (A-4 (0))

<u>Sample/Test Description</u>
Sand/Gravel Particle Shape : ANGULAR
Sand/Gravel Hardness : HARD



Client: Haley & Aldrich, Inc.	Project: Emerson Mill Bridge, 1430 & 5969	Location: Hampden, ME	Project No: GTX-310015
Boring ID: BB-HSS-218	Sample Type: jar	Tested By: ckg	Checked By: jsc
Sample ID: 4DA	Test Date: 05/23/19	Test Id: 505100	
Depth: 11.0-12.0 ft			
Test Comment: ---			
Visual Description: Moist, olive brown silty gravel with sand			
Sample Comment: ---			

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	41.5	27.6	30.9

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
1 in	25.00	100		
0.75 in	19.00	90		
0.5 in	12.50	72		
0.375 in	9.50	69		
#4	4.75	58		
#10	2.00	50		
#20	0.85	44		
#40	0.42	40		
#60	0.25	37		
#100	0.15	34		
#200	0.075	31		

<u>Coefficients</u>	
D ₈₅ = 16.9214 mm	D ₃₀ = N/A
D ₆₀ = 5.2273 mm	D ₁₅ = N/A
D ₅₀ = 2.0275 mm	D ₁₀ = N/A
C _u = N/A	C _c = N/A

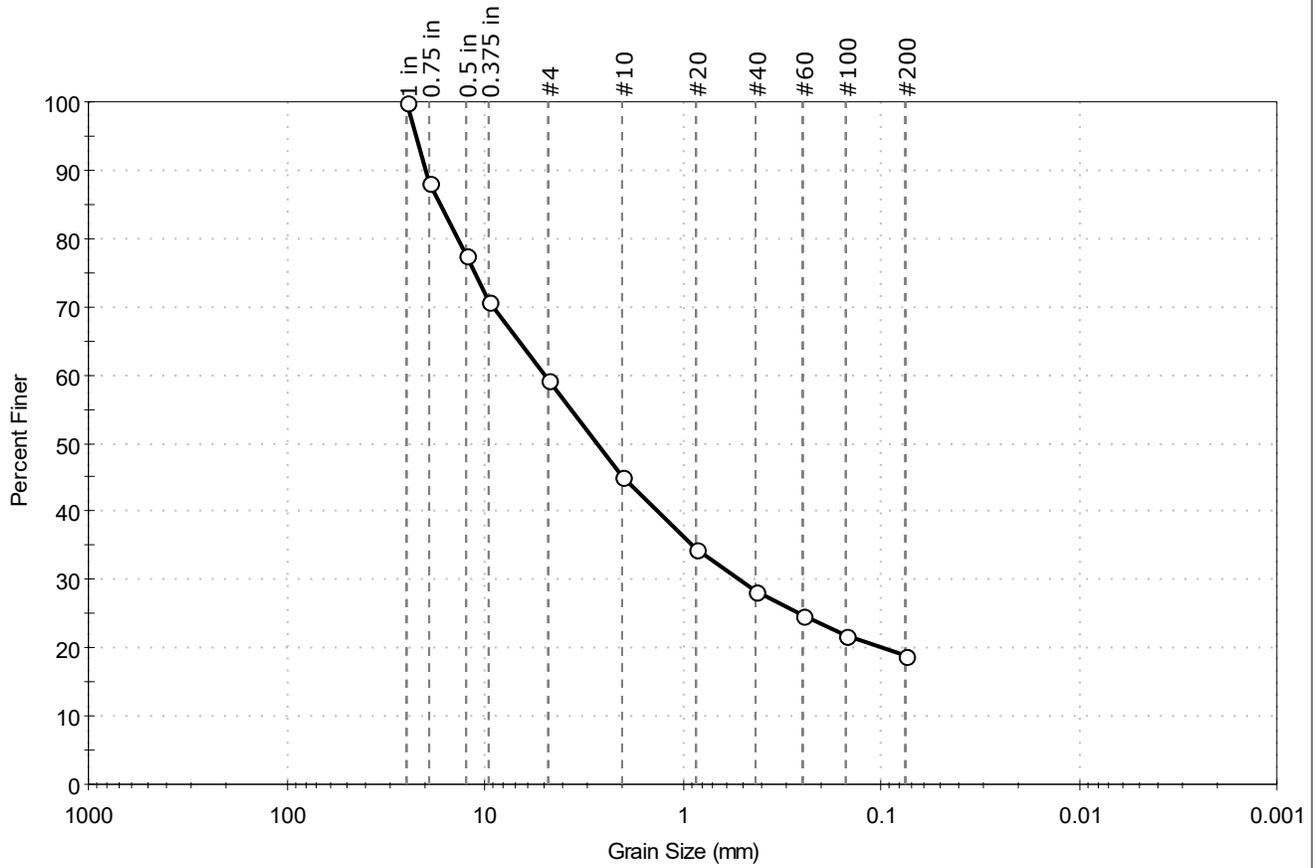
<u>Classification</u>	
ASTM	N/A
AASHTO	Silty Gravel and Sand (A-2-4 (0))

<u>Sample/Test Description</u>
Sand/Gravel Particle Shape : ANGULAR
Sand/Gravel Hardness : HARD



Client: Haley & Aldrich, Inc.	Project No: GTX-310015
Project: Emerson Mill Bridge, 1430 & 5969	
Location: Hampden, ME	
Boring ID: BB-HSS-219	Sample Type: jar
Sample ID: 6D	Test Date: 05/23/19
Depth: 18.7-20.2 ft	Test Id: 505101
Test Comment: ---	Tested By: ckg
Visual Description: Moist, olive brown silty gravel with sand	Checked By: jsc
Sample Comment: ---	

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	40.6	40.4	19.0

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
1 in	25.00	100		
0.75 in	19.00	88		
0.5 in	12.50	78		
0.375 in	9.50	71		
#4	4.75	59		
#10	2.00	45		
#20	0.85	35		
#40	0.42	28		
#60	0.25	25		
#100	0.15	22		
#200	0.075	19		

<u>Coefficients</u>	
D ₈₅ = 16.7228 mm	D ₃₀ = 0.5080 mm
D ₆₀ = 4.9208 mm	D ₁₅ = N/A
D ₅₀ = 2.6979 mm	D ₁₀ = N/A
C _u = N/A	C _c = N/A

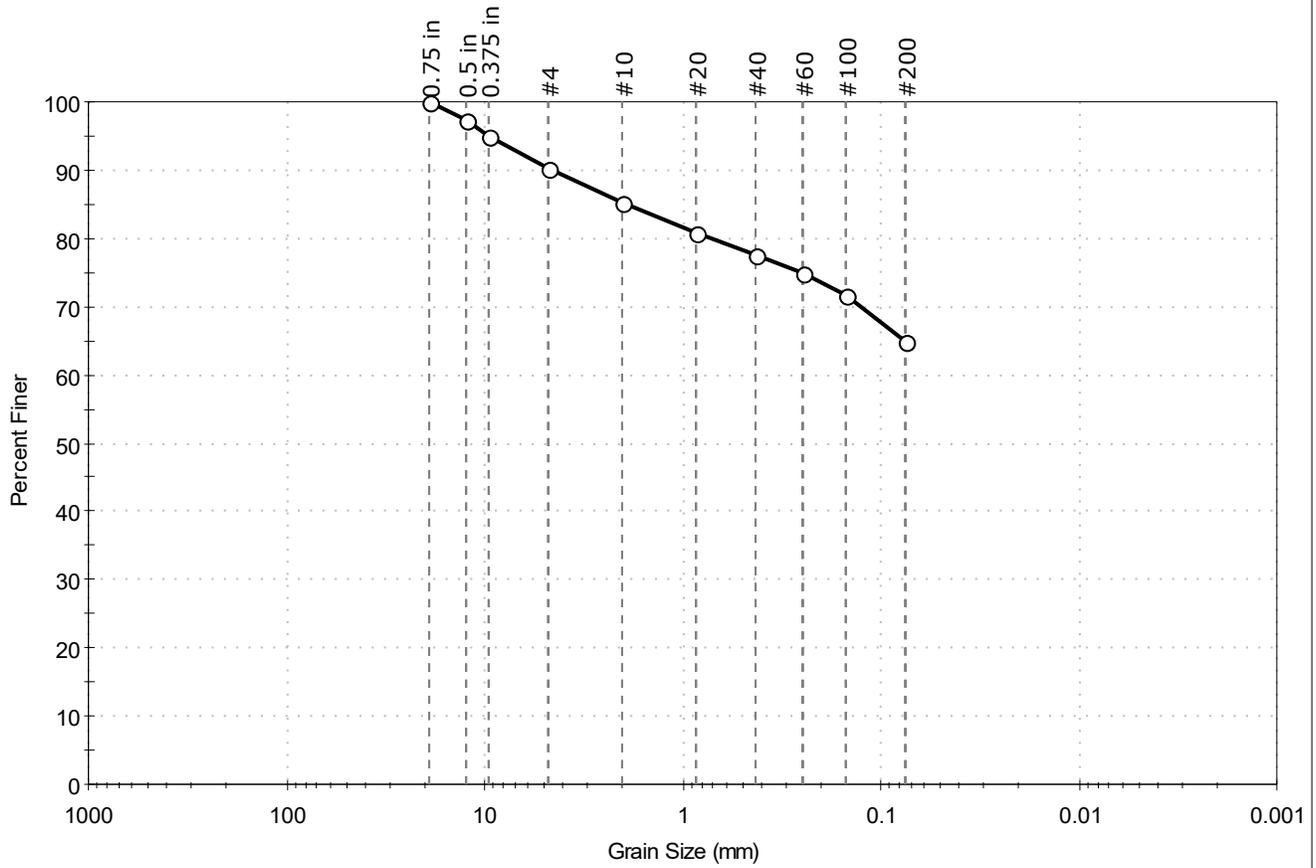
<u>Classification</u>	
ASTM	N/A
AASHTO	Stone Fragments, Gravel and Sand (A-1-b (0))

Sample/Test Description
 Sand/Gravel Particle Shape : ANGULAR
 Sand/Gravel Hardness : HARD



Client: Haley & Aldrich, Inc.
 Project: Emerson Mill Bridge, 1430 & 5969
 Location: Hampden, ME
 Project No: GTX-310015
 Boring ID: BB-HSS-220
 Sample Type: jar
 Tested By: ckg
 Sample ID: 2D
 Test Date: 05/23/19
 Checked By: jsc
 Depth: 2.0-4.0 ft
 Test Id: 505102
 Test Comment: ---
 Visual Description: Moist, olive brown sandy silt
 Sample Comment: ---

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	9.8	25.3	64.9

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
0.75 in	19.00	100		
0.5 in	12.50	97		
0.375 in	9.50	95		
#4	4.75	90		
#10	2.00	85		
#20	0.85	81		
#40	0.42	78		
#60	0.25	75		
#100	0.15	72		
#200	0.075	65		

Coefficients	
D ₈₅ = 1.8824 mm	D ₃₀ = N/A
D ₆₀ = N/A	D ₁₅ = N/A
D ₅₀ = N/A	D ₁₀ = N/A
C _u = N/A	C _c = N/A

Classification	
ASTM	N/A
AASHTO	Silty Soils (A-4 (0))

Sample/Test Description