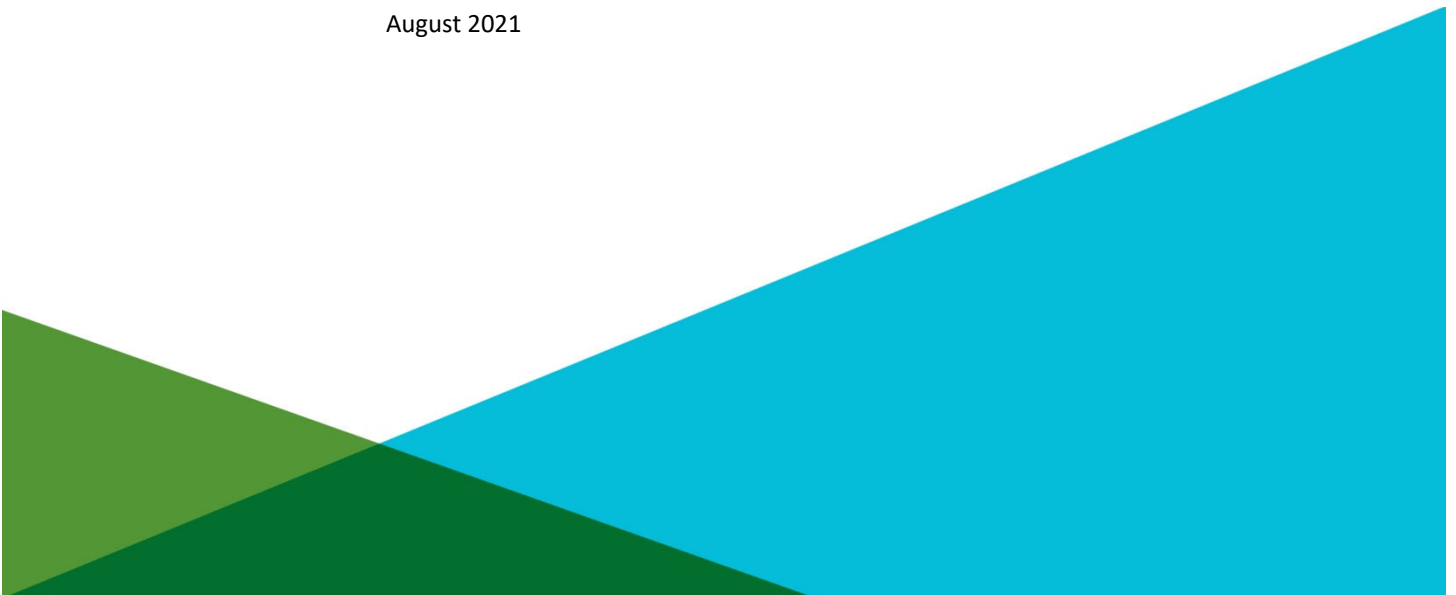


GEOTECHNICAL DESIGN REPORT – BRIDGE CULVERTS
INTERSTATE-395/ROUTE 9 CONNECTOR
MAINEDOT WIN 018915.00
BREWER AND EDDINGTON, MAINE

by Haley & Aldrich, Inc.
Portland, Maine

for Maine Department of Transportation
Augusta, Maine

File No. 132076-007
August 2021





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31 August 2021
File No. 132076-007

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Attention: Laura Krusinski, P.E.
Senior Geotechnical Engineer

Subject: Geotechnical Design Report - Bridge Culverts
Interstate 395/Route 9 Connector
MaineDOT WIN 018915.00
Brewer and Eddington, Maine

Ladies and Gentlemen:

We are pleased to submit herewith our report entitled, "Geotechnical Design Report - Bridge Culverts, Interstate 395/Route 9 Connector, MaineDOT WIN 018915.00, Brewer and Eddington, Maine." This Geotechnical Design Report (GDR) has been prepared in accordance with our proposal, dated 22 January 2021 and executed by your Richard J. Crawford on 5 February 2021, and the provisions of our General Consultant Agreement (GCA) with the Maine Department of Transportation (MaineDOT), No. CT20150706000000000010.

Introduction

This GDR presents the results of preliminary design phase (Phase I) and final design phase (Phase II) subsurface and laboratory testing programs and technical evaluations that were completed by Haley & Aldrich, Inc. (Haley & Aldrich) on behalf of the Maine Department of Transportation (MaineDOT), and provides geotechnical design recommendations for the bridge culverts that are planned for the project (see Figure 1, Project Locus). Please note that the subject project is part of the I-395/Route 9 connector (Connector) project.

HORIZONTAL COORDINATE SYSTEM, ELEVATION DATUM, AND BASELINE STATIONING

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. As-drilled test boring locations were related to station and offset distance/direction relative to the Connector baseline stationing by MaineDOT (Phase I) and Haley & Aldrich (Phase II) (see Table I). The baseline stationing for the project extends from approximately Sta. 24+00 (south; project beginning) to Sta. 343+50 (north; project end).

The project elevation datum and elevations referenced herein are in feet and reference the North American Vertical Datum of 1988 (NAVD 88).

PROJECT LOCATION AND PROPOSED IMPROVEMENTS

Eight bridge culverts are proposed along the Connector alignment, at the approximate locations shown on Figure 1, Project Locus. Three highway culverts are also being proposed along the Connector alignment and will be addressed under separate cover in the overall highway GDR. Based on progress plans provided by MaineDOT on 12 July 2021, the bridge culverts are proposed to be precast concrete box culverts with the following details:

Culvert	Location	Proposed Span (Width) (ft)	Proposed Rise (Height) (ft)	Proposed Length (ft)	Proposed Invert El. (ft)	Existing Ground Surface El. (ft)	Proposed Roadway El. (ft)
Felts Brook	Sta. 55+08	18	12	201	72	80	97
Felts Brook Tributary	Sta. 64+14	23	16	142	77	81	100
Snowmobile 10C	Sta. 77+00	12	14	118	84	86	105
Wildlife 1	Sta. 272+35	12	14	122	179 to 181	181	201
Eaton Brook Tributary	Sta. 273+48	16	8	192	175	178	203
Wildlife 2	Sta. 275+88	12	14	144	180	181	206
Snowmobile 107	Sta. 284+27	12	14	122	194.5 to 195.5	197	216
Wetland	Sta. 289+11	10	8	122	187 to 188	189	209

Preliminary Phase Subsurface Explorations

Haley & Aldrich completed a preliminary design phase (Phase I) subsurface exploration program along the proposed Connector alignment during the period from July through December 2018. A total of 101 test borings were drilled along the proposed alignment, including a minimum of one boring at each of the proposed culvert locations. Please note that only fourteen of the test borings that were drilled closest to the proposed culverts are included in this GDR and are discussed herein.

The test boring locations were laid out in the field by Haley & Aldrich using global positioning system (GPS) survey equipment prior to the start of drilling. Upon completion of drilling, “as-drilled” test boring locations and ground surface elevations at test boring locations were determined in the field by MaineDOT using GPS survey equipment. The “as-drilled” coordinates and station/offset distance and direction relative to the proposed baseline was provided by MaineDOT. The plan location data for the borings are summarized in Table I and the locations are shown graphically on Figures 2, 4, 5, 6, 8 and 9.

The test borings were drilled by New England Boring Contractors of Hermon, Maine using a Mobile Drill B-53 track-mounted drill rig and Northern Test Borings Inc. of Gorham, Maine using a Diedrich D-50 track-mounted drill rig. Test borings were typically advanced to top of or into bedrock, to depths

ranging from approximately 17 to 56 ft below existing ground surface (BGS) using cased-washed drilling methods and a combination of solid-stem augers and 4-in. (HW-size) inside diameter (ID) steel casing.

Soil samples were generally collected at standard, 5-ft intervals, 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. 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 (N_{uncorrected}) 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 drill rig was equipped with a calibrated automatic hammer per MaineDOT requirements. The energy-corrected SPT N-value (N₆₀) is equal to the uncorrected N-value multiplied by the hammer efficiency factor (0.907 or 0.925, as shown on test boring logs) divided by 0.6 (i.e., 60 percent calculated hammer efficiency). Both the raw blow count (uncorrected N-values) and the corrected N-values are shown on the boring logs.

Eight of the Phase I test borings were advanced approximately 5 to 15 ft into bedrock using a 2-in. (NQ-size) ID diamond-tipped core barrel.

A Haley & Aldrich geotechnical engineer monitored the drilling, logged and conducted visual inspection/classification of the soil and rock samples collected, prepared test boring logs documenting the conditions encountered, and confirmed that all drilling and sampling was performed in accordance with MaineDOT requirements. Test boring logs are included in Appendix A.

All soil and bedrock samples were collected and preserved in glass jars and wooden boxes, respectively, and are available for review upon request. The available soil and bedrock samples (i.e., those that were not submitted for laboratory testing) are currently being stored at the Haley & Aldrich laboratory facility in Portland, Maine and the MaineDOT facility in Bangor, Maine.

Observation wells were installed during the Phase I investigation in the completed BB-EEBT2-102, BB-EWC-101 and HB-BE-101 boreholes to provide information on the static groundwater levels. The observation wells consisted of 2-in. ID, machine-slotted PVC pipe and solid PVC riser pipe extending approximately 2 to 3 ft above existing ground surface. The observation wells were outfitted with locking guard pipe surface protection. The observation well installation and groundwater monitoring reports are provided in Appendix B.

Final Design Phase Subsurface Explorations

Haley & Aldrich completed a final design phase (Phase II) subsurface exploration program along the proposed Connector alignment during the period from October 2020 through April 2021. A total of 149 test borings were drilled along the proposed alignment, including additional borings at the proposed culvert locations. Please note that only thirteen of the test borings that were drilled closest to the proposed culverts are included in this GDR and are discussed herein.

The test boring locations were laid out in the field by MaineDOT using global positioning system (GPS) survey equipment prior to the start of drilling. Upon completion of drilling, “as-drilled” test boring locations and ground surface elevations at test boring locations were determined in the field by

MaineDOT using GPS survey equipment. The “as-drilled” coordinates and station/offset distance and direction relative to the proposed baseline was prepared by Haley & Aldrich. The plan location data for the borings are summarized in Table I and the locations are shown graphically on Figures 2, 4, 5, 6, 8 and 9.

The test borings were drilled by New England Boring Contractors of Hermon, Maine using a Mobile Drill B-53 track-mounted drill rig. Test borings were typically advanced to top of or into bedrock, to depths ranging from approximately 8 to 53 ft below existing ground surface (BGS) using cased-washed drilling methods and a combination of solid-stem augers and 4-in. (HW-size) inside diameter (ID) steel casing.

Soil samples were generally collected at standard, 5-ft intervals, 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. 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 (N-uncorrected) 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 drill rig was equipped with a calibrated automatic hammer per MaineDOT requirements. The energy-corrected SPT N-value (N_{60}) is equal to the uncorrected N-value multiplied by the hammer efficiency factor (0.852, as shown on test boring logs) divided by 0.6 (i.e., 60 percent calculated hammer efficiency). Both the raw blow count (uncorrected N-values) and the corrected N-values are shown on the boring logs.

Six of the test borings were advanced approximately 5 to 11 ft into bedrock using a 2-in. (NQ-size) ID diamond-tipped core barrel.

A Haley & Aldrich geotechnical engineer monitored the drilling, logged and conducted visual inspection/classification of the soil and rock samples collected, prepared test boring logs documenting the conditions encountered, and confirmed that all drilling and sampling was performed in accordance with MaineDOT requirements. Test boring logs are included in Appendix A.

All soil and bedrock samples were collected and preserved in glass jars and wooden boxes, respectively, and are available for review upon request. The available soil and bedrock samples (i.e., those that were not submitted for laboratory testing) are currently being stored at the Haley & Aldrich laboratory facility in Portland, Maine and the MaineDOT facility in Bangor, Maine.

No observation wells were installed during the Phase II investigation.

Generalized Subsurface Conditions

The generalized subsurface conditions encountered in the test borings drilled near proposed culvert locations generally consist of the following geologic units presented in order of increasing depth below ground surface: topsoil, marine deposits (clay, silt and sand), glacial till, weathered rock, and bedrock. Refer to Table II for a summary of the soil units and encountered thicknesses at each test boring location. Detailed soil and bedrock descriptions are provided on the test boring logs included Appendix A. Refer to Figures 2, 3, 4, 5, 7, 8 and 9 for a graphical representation of the subsurface conditions present at each bridge culvert.

Please note that the soil descriptions provided on the test boring logs and summarized below do not represent actual field conditions other than at the specific test boring locations. The actual conditions may vary from those described and shown herein and may not become apparent until construction begins.

The subsurface conditions present at each of the eight proposed culvert locations are presented below.

FELTS BROOK CULVERT (STA. 55+08)

Soil Unit	Approximate Range in Encountered Thickness (ft)	Generalized Description (refer to test borings BB-BFB-101, BB-BFB-201, BB-BFB-202, and HB-BE-101)
Topsoil	0 to 1	Soft to medium stiff SILT, contains trace fine sand and organics (<i>encountered in test borings BB-BFB-101 and HB-BE-101</i>).
Marine Deposit	29 to 42	Very soft to medium stiff silty CLAY, trace organics; In-situ vane shear tests were conducted in all borings with measured shear strength ranging from 1,745 psf near the top of the deposit to 310 psf at depth (<i>encountered in each test boring</i>).
Glacial Till	2 to 6	Very dense, fine to coarse GRAVEL, some silt, little fine to coarse sand; medium dense, fine to coarse SAND, some fine to coarse gravel, loosely bonded (<i>encountered in each test boring</i>).
Bedrock		Top of bedrock surface encountered at depths ranging from approximately 31 to 48 ft BGS (El. 32.5 to El. 50.2). Bedrock was cored in BB-BFB-101, BB-BFB-201, and BB-BFB-202. HB-BE-101 was extended 2.5 ft into bedrock with a rollerbit. Bedrock conditions are summarized below.

FELTS BROOK TRIBUTARY CULVERT (STA. 64+14)

Soil Unit	Approximate Range in Encountered Thickness (ft)	Generalized Description (refer to test boring BB-BFB1-201, BB-BFB1-202, BB-BFB1-203, HB-BE-109, and HB-BE-212)
Topsoil	0 to 1.3	Very stiff SILT, trace roots encountered in HB-BE-109; very soft, SILT with organics was encountered in HB-BE-212; soft clayey SILT with organics was encountered in BB-BFB1-201; very soft silty CLAY with organics was observed in BB-BFB1-203 (<i>encountered in all test borings, except BB-BFB1-202</i>).
Marine Deposit	14 to 31	Very soft to stiff silty CLAY, trace roots, trace medium sand; medium stiff to very stiff clayey SILT; very soft SILT was encountered in BB-BFB1-203; In-situ vane shear tests were conducted in test borings HB-BE-212, BB-BFB1-202 and BB-BFB1-203 with measured shear strength ranging from 735 psf near the top of the deposit to 425 psf at depth (<i>encountered in each test boring</i>).
Glacial Till	0.4 to >8	Medium dense to very dense fine SAND with variable amounts of silt, fine to coarse sand, and gravel; very stiff sandy SILT was encountered in BB-BFB1-201; loose to dense fine to coarse GRAVEL was encountered in HB-BE-212, BB-BFB1-202 and BB-BFB1-203 (<i>encountered in each test boring</i>).
Bedrock		Top of bedrock surface encountered at a depth of approximately 23 to 34 ft BGS (El. 46.7 to El. 60.7). Bedrock was cored in all borings except HB-BE-212. Bedrock conditions are summarized below and in Table III.

SNOWMOBILE 10C CULVERT (STA. 77+00)

Soil Unit	Approximate Range in Encountered Thickness (ft)	Generalized Description (refer to test borings BB-BST1-101, BB-BST1-102, BB-BST1-103, and BB-BST1-201)
Topsoil	0.1 to 0.4	Very soft to soft SILT, trace fine sand, organics, and roots; soft clayey SILT with organics was encountered in BB-BST1-201 (<i>encountered in each test boring</i>).
Marine Deposit	18 to 23	Very soft to medium stiff silty CLAY; In-situ vane shear tests were conducted in each boring with measured shear strength ranging from 710 psf to 425 psf (<i>encountered in each test boring</i>).
Glacial Till	9 to 13	Loose to dense fine SAND, variable amounts of medium to coarse sand, trace silt and gravel (<i>encountered in each test boring</i>). Advanced rollerbit through 2-ft boulder in test boring BB-BST1-103.
Weathered Bedrock	1	Probable weathered bedrock based on drilling action (<i>encountered in BB-BST1-102</i>).
Bedrock		Top of bedrock surface encountered at depths ranging from approximately 28 to 35 ft BGS (El. 51.5 to El. 59.2). Bedrock was cored in BB-BST1-101 and BB-BST1-201. Top of bedrock was estimated based on drilling behavior in BB-BST1-102 and BB-BST1-103. Bedrock conditions are summarized below.

WILDLIFE 1, EATON BROOK TRIBUTARY, AND WILDLIFE 2 CULVERTS (STA. 272+35, 273+48, AND 275+88)

Soil Unit	Approximate Range in Encountered Thickness (ft)	Generalized Description (refer to test borings BB-EWC1-101, BB-EEBT2-101, BB-EWC1-201, BB-EWC1-202, BB-EEBT2-102, BB-EEBT2-103, BB-EEBT2-201, BB-EEBT2-202, BB-EWC2-101, BB-EWC2-201, and BB-EWC2-202)
Topsoil	0 to 0.4	Topsoil encountered at ground surface (encountered in test borings BB-EWC1-101, BB-EEBT2-101, BB-EEBT2-102, BB-EWC2-201, and BB-EWC2-202).
Marine Deposit	4 to 11	Stiff to very stiff clayey SILT, variable amounts of fine sand, trace organics; soft to stiff silty CLAY, trace fine sand; loose silty fine SAND, trace organics; One in-situ vane shear test was conducted in boring BB-EEBT2-101 with a measured shear strength of 1,363 psf (encountered in each test boring).
Glacial Till	1 to 47	Very stiff to hard SILT, variable amounts of fine to coarse sand and fine to coarse gravel, trace clay; very dense fine to coarse silty SAND, trace gravel; very stiff silty CLAY, some gravel encountered in BB-EWC2-201 (encountered in each test boring).
Weathered Bedrock	1.3	Probable weathered bedrock based on drilling action (encountered in BB-EWC1-101).
Bedrock		Top of bedrock surface encountered at depths ranging from approximately 11 to 51 ft BGS (El. 130.7 to El. 172.2). Bedrock was cored in borings, BB-EWC1-101, BB-EEBT2-101, and BB-EWC2-101. Borings BB-EEBT2-102, BB-EWC1-201, and BB-EWC1-202 were extended into bedrock with a rollerbit. Bedrock conditions are summarized below.

SNOWMOBILE 107 CULVERT (STA. 284+27)

Soil Unit	Approximate Encountered Thickness (ft)	Generalized Description (refer to test boring BB-EST2-101)
Topsoil	0.1	Topsoil encountered at ground surface.
Glacial Till	10	Very soft to very stiff sandy SILT, little fine gravel, trace organics, loosely to moderately bonded.
Weathered Bedrock	2	Top of weathered bedrock surface encountered at depth of approximately 10 ft BGS (El. 187.5).
Bedrock		Top of bedrock surface encountered at depth of approximately 11.5 ft BGS (El. 186.0). Bedrock was cored in boring BB-EST2-101. Bedrock conditions are summarized below.

WETLAND CULVERT (STA. 289+11)

Soil Unit	Approximate Encountered Thickness (ft)	Generalized Description (refer to test borings BB-EWC-101 and BB-EWC-203)
Topsoil	0.1	Topsoil encountered at ground surface (<i>encountered in each test boring</i>).
Marine Deposit	2.5 to 4	Soft clayey SILT, trace organics encountered in BB-EWC-101; soft silty CLAY (<i>encountered in BB-EWC-203</i>).
Glacial Till	2 to 6	Very stiff gravelly SILT, little fine to coarse sand, well bonded (<i>encountered in each test boring</i>).
Weathered Bedrock	1.5	Very dense weathered bedrock fragments (<i>encountered in BB-EWC-203</i>).
Bedrock		Top of bedrock surface encountered at depths ranging from approximately 8 to 10 ft BGS (El. 181.6 to El. 183.0). Bedrock was cored in boring BB-EWC-101. Bedrock conditions are summarized below.

GROUNDWATER CONDITIONS

Observation wells were installed in boreholes HB-BE-101 (near Felts Brook Culvert), BB-EEBT2-102 (at Eaton Brook Tributary) and BB-EWC-101 (at Wetland Culvert). Measured static groundwater levels in the vicinity of Felts Brook Culvert range from 0.6 to 9.0 ft BGS (El. 73.0 to El. 81.4). Measured static groundwater levels in the vicinity of Eaton Brook Tributary Culvert range from 0.4 above the ground surface to 2.8 ft BGS (El. 178.5 to El. 181.7). Measured static groundwater levels in the vicinity of Wetland Culvert ranges from approximately 0.9 ft BGS to 3.2 ft BGS (El. 188 to El. 190.3). Groundwater measurements were made in the three observation wells between August 2018 and July 2021. Observation well installation and groundwater monitoring reports are provided in Appendix B.

Observation wells were not installed in any of the completed boreholes for culverts proposed at Felts Brook Tributary, Snowmobile 10C, Wildlife 1, Wildlife 2, or Snowmobile 107. As a result, static water levels at these culvert locations were not determined. The following general observations were made relative to groundwater conditions during drilling:

- Felts Brook Tributary Culvert – collected soil samples were visually observed to be “wet” beginning between approximately 0 and 10 ft BGS. Water levels measured in the boreholes upon completion of drilling and sampling ranged between above ground surface at BB-BFB1-201 (where water was observed seeping out of the borehole) and 3.6 ft BGS (El. 80.8).
- Snowmobile 10C Culvert – collected soil samples were visually observed to be “wet” beginning between approximately 0 and 10 ft BGS. Water levels measured in boreholes BB-BST1-103 and BB-BST1-201 upon completion of drilling and sampling ranged between approximately 1.8 and 5.1 ft BGS (El. 80.9 to El. 85.6). Water levels were not recorded during drilling or upon completion in boreholes BB-BST1-101 and BB-BST1-102.
- Wildlife 1 and Wildlife 2 Culverts – collected soil samples were visually observed to be “wet” beginning between approximately 0 and 10 ft BGS. Water levels were not recorded during drilling or upon completion in boreholes BB-EWC1-101, BB-EWC2-101. Water levels measured

in boreholes BB-EWC1-201, BB-EWC1-202, BB-EWC2-201, and BB-EWC2-202 upon completion of drilling and sampling ranged between approximately 1.5 and 6.6 ft BGS (El. 174.5 to El. 179.8).

- Snowmobile 107 Culvert – collected soil samples were visually observed to be “wet” beginning at approximately 0 ft BGS. Water levels measured in the borehole upon completion of drilling and sampling was approximately 2 ft BGS (El. 195.5).

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 test boring drilling means/methods, seasonal variation, local soil conditions, topography and precipitation. Groundwater levels encountered during construction may differ from those observed in the test borings.

BEDROCK CONDITIONS

As stated previously, approximately 5 to 15 ft of bedrock was sampled in test borings drilled in the vicinity of the bridge culverts. The sampled and recovered bedrock generally consisted of the following:

- Felts Brook, Felts Brook Tributary, Snowmobile 10C Culverts - Hard, fresh to slightly weathered, aphanitic to fine-grained SILTSTONE of the Brewer formation. Primary joints dip at low to steep angles and are very close to close. Joints are tight to open, and occasional calcite veins are present (*encountered in test borings BB-BFB-101, BB-BFB-201, BB-BFB-202, BB-BFB1-101, BB-BFB1-201, BB-BFB1-202, BB-BFB1-203, HB-BE-109, and BB-BST1-101, BB-BST1-201*).
- Wildlife 1, Eaton Brook Tributary, Wildlife 2, Snowmobile 107, Wetland Culverts - Hard, fresh to severely weathered, aphanitic to fine-grained PHYLLITE of the Brewer formation. Primary joints dip at low to steep angles and are very close to moderately close. Joints are tight to open, and joint surfaces have some silt coatings, oxidation, and slight pyrite. Variable amounts of calcite/quartz stringers up to ½-in. thickness are present (*encountered in test borings BB-EEBT2-101, BB-EWC1-101, BB-EWC2-101, BB-EST2-101, and BB-EWC-101*).

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 bedrock core run. RQD values for bedrock encountered at the site ranged from 0 to 100 percent indicating very poor to excellent rock quality.

Detailed bedrock core data and descriptions are provided on Table III (for borings located at Felts Brook) and on the logs in Appendix A. In addition, photographs of the recovered bedrock core samples are provided for reference in Appendix A.

Geotechnical Laboratory Testing

A geotechnical laboratory testing program was undertaken on soil samples collected during the Phase I and Phase II subsurface exploration programs to assist in soil classification and determination of engineering soil properties. In general, laboratory testing was performed on disturbed soil samples

collected during SPT sampling and undisturbed soil samples collected during Shelby tube sampling. All laboratory soil testing was performed by Geotesting Express, Inc. in Acton, Massachusetts. Geotechnical laboratory testing was performed in accordance with applicable American Society for Testing Materials (ASTM) testing procedures. Laboratory test results are provided in Appendix C and can be found on the test boring logs in Appendix A. A summary of laboratory test results completed on samples collected from test borings drilled in the vicinity of the bridge culverts is provided below.

Laboratory Test	ASTM Test Designation	Soil Unit	No. of Completed Tests	Range in Test Results ¹
Moisture Content	ASTM D 2216	Marine Deposit	13	29% < WC < 42%
Atterberg Limits	ASTM D 4318	Marine Deposit	13	32 < LL < 45 16 < PL < 24 14 < PI < 21
Consolidated Undrained Triaxial Shear	ASTM D 4767	Marine Deposit	11	368 psf < S _u < 984 psf
Consolidated Undrained Direct Shear	ASTM D 6528	Marine Deposit	2	255 psf < S _u < 444 psf
One Dimensional Consolidation ²	ASTM D 2435 Method B	Marine Deposit	11	1,600 psf < σ _{vm} < 13,000 psf 0.85 < e ₀ < 1.25 0.01 < Cr < 0.05 0.10 < Cc < 0.45 0.007 < RR < 0.025 0.053 < CR < 0.222

Notes:

¹ LL = Liquid Limit; PL = Plastic Limit; WC = Moisture Content; psf = pounds per square ft.

² Consolidation test results are interpretations from laboratory test data.

Geotechnical Design Recommendations

Geotechnical design recommendations for the subject project, as discussed and provided herein, were developed in accordance with the following documents:

- AASHTO Load and Resistance Factor Design (LRFD) Bridge Design Specifications, Ninth Edition, 2020, referred to herein as AASHTO LRFD, and
- MaineDOT Bridge Design Guide (BDG), August 2003, with Interim Revisions through June 2018, referred to herein as Bridge Design Guide.

Engineering calculations that support the recommendations outlined in this report are provided for reference in Appendix D.

BACKGROUND AND SPECIAL EMBANKMENT CONSTRUCTION

Raises-in-grade over compressible, cohesive soils are anticipated in four areas along the proposed Connector alignment. During the final design phase embankment evaluations, we completed extensive global stability and settlement evaluations in these four areas using a stepped approach to determine whether special embankment construction was required to meet minimum factors of safety for temporary and permanent global stability, and post-construction settlement requirements. Based on the results of our evaluations, it was determined that the embankments located in three out of the four areas (i.e., Areas 1, 2 and 4) will require special embankment construction. Felts Brook, Felts Brook Tributary, and Snowmobile 10C Culverts are located within the limit of special embankment construction Area 1. All other bridge culverts are located outside the special embankment construction areas.

As described in the GDR for the Connector roadway entitled “Geotechnical Design Report, Interstate 395/Route 9 Connector Highway, MaineDOT WIN 08915.00, Brewer to Eddington, Maine,” dated September 2021, by Haley & Aldrich, Inc. (herein referred to as Highway GDR) we recommend the following general special embankment construction sequence in Area 1 in areas where culverts are not present:

- Clear and stabilize site.
- Install ground improvement consisting of prefabricated vertical drains (PVDs) and staged preload/surcharge. PVDs should be spaced 5 ft on-center arranged in a triangular pattern.
- Place first stage of embankment fill (common borrow preload/surcharge fill). Height of first stage of fill in single stage embankment area varies based on subsurface conditions, proposed embankment heights, and post construction settlement criteria. The height of the first stage fill relative to the finished roadway grade is shown on Figures 10 through 12.
- After the first stage hold time is complete, place the second stage of embankment fill consisting of lightweight fill (foamed glass aggregate, FGA) in select portions of embankments, as required to meet settlement and global stability criteria. Over-excavation of some of the first stage common borrow embankment fill will be required to install the FGA fill in some areas.

In areas where bridge culverts are present, we recommend the following culvert support/special embankment requirements:

- Felts Brook Culvert – box culvert will be supported on H-piles driven to rock. We anticipate that the piles will be installed after the site has been cleared/stabilized and before PVDs have been installed.
- Felts Brook Tributary Culvert – box culvert will be soil supported after some over-excavation below existing grade (i.e., to El. 76 [varies between approximately 3 to 6 ft] in the area below the embankment; see Figure 11). Full height FGA lightweight fill will be placed adjacent and above box culvert from El. 76 up to pavement subgrade. The over-excavation depth and full-height FGA placement will extend approximately 50 ft upstation and downstation from the edge of the box (i.e., between Sta. 63+50 and Sta. 64+75). The FGA fill thickness then transitions from full height (at Sta. 63+50 and Sta. 64+75) to no FGA downstation (at Sta. 63+20) and upstation

(at Sta. 65+05) as shown on Figure 11. No PVDs are required within the full height lightweight fill section (i.e., between Sta. 63+50 and 64+75).

- Snowmobile 10C Culvert – box culvert will be installed after the first stage preload/surcharge hold period is complete. Second stage FGA fill will be placed above and adjacent to the box so that post-construction settlement criteria of the culvert are met (see Figure 12). Unlike the Felts Brook and Felts Brook Tributary culverts, temporary drainage will not required during construction of the Snowmobile 10C culvert, which allows the culvert to be installed after the first stage preload/surcharge hold period is complete.

Refer to Figures 10 through 12 for special embankment construction plans in the vicinity of these three bridge culverts.

The recommendations below assume this special embankment approach at these three bridge culverts. It is our opinion that remaining five bridge culverts and adjacent embankments can be constructed conventionally using normal weight embankment fill (common borrow), without any special embankment considerations or pile/column support. Refer to the Highway GDR for additional information.

ANTICIPATED SUBGRADE CONDITIONS

Based on the subsurface conditions encountered in the test borings and the design culvert invert elevations provided by MaineDOT, the soil units present at design subgrade level will vary at each culvert location. The design invert elevation, soil unit anticipated to be present at design subgrade level and bedding detail recommendations for each bridge culvert is summarized below and shown graphically on Figures 2, 3, 4, 5, 7, 8 and 9.

Culvert	Approximate Invert Elevation (ft)	Anticipated Soil Unit at Subgrade Level ¹	Bedding Detail ²
Felts Brook	El. 72	marine deposit (soft clay)	NA ³
Felts Brook Tributary	El. 77	marine deposit (soft to stiff clay)	2
Snowmobile 10C	El. 84	marine deposit (soft to medium stiff clay)	2
Wildlife 1	El. 179 to El. 181	marine deposit (medium stiff to very stiff clay or silt)	modified 2
Eaton Brook Tributary	El. 175	marine deposit (soft to stiff clay or silt)	2
Wildlife 2	El. 180	marine deposit (medium stiff to stiff clay or silt)	modified 2
Snowmobile 107	El. 194.5 to El. 195.5	glacial till (very stiff silt)	1
Wetland	El. 187 to El. 188	glacial till (medium stiff silt)	1

Notes:

¹ Refer to the test boring logs in Appendix A for a more detailed description of the soil units that are anticipated to be present at subgrade level.

² See bedding detail descriptions below.

³ The culvert at Felts Brook will be pile-supported. Refer to separate Felts Brook culvert recommendations below for additional information.

Bedding Detail 1: 1-ft thick layer of Granular Borrow, Material for Underwater Backfill (MaineDOT Item 203.25, Granular Borrow). The bedding material should be placed in lifts of 6 to 8 in. loose measure and compacted to at least 95 percent of the AASHTO T-180 maximum dry density.

Bedding Detail 2: 2-ft thick layer of Underdrain Backfill Material, Type C (MaineDOT Pay Item 203.55 Culvert Bedding Stone) that is fully encapsulated in Stabilization/Reinforcement Geotextile (MaineDOT Standard Specification 722.01) with a layer of geogrid at the center. The bedding material should be placed in lifts of 6 to 8 in. loose measure and compacted to at least 95 percent of the AASHTO T-180 maximum dry density.

Modified Bedding Detail 2: 2-ft thick layer of Underdrain Backfill Material, Type C (MaineDOT Pay Item 203.55 Culvert Bedding Stone) that is fully encapsulated in Stabilization/Reinforcement Geotextile (MaineDOT Standard Specification 722.01) *without* a layer of geogrid at the center. The bedding material should be placed in lifts of 6 to 8 in. loose measure and compacted to at least 95 percent of its AASHTO T-180 maximum dry density.

Please note that the actual subgrade conditions may vary from those summarized above and shown on Figures 2, 3, 4, 5, 7, 8 and 9 and may not become apparent until construction begins.

We recommend that all topsoil, organic matter, and other unsuitable material (if present) be over-excavated (removed) from within the zone of influence (ZOI) of culverts prior to subgrade preparation and placement of the bedding material described above. The ZOI is defined as the area below proposed culverts and below imaginary lines that extend 1 ft laterally beyond the edge of the culvert and down on a one horizontal to one vertical (1H:1V) slope to the top of an acceptable bearing layer.

Recommendations regarding subgrade preparation and protection are provided in the Construction Considerations section of this report.

BEARING RESISTANCE

Bearing resistance calculations were completed in accordance with AASHTO LRFD Section 10.6.3.1.2 for each culvert based on the culvert dimensions, the subgrade conditions summarized above, and the subsurface conditions present below the culvert. Recommended bearing resistances for the culverts are as follows:

Culvert	Limit State	Resistance Factor ϕ_b	AASHTO LRFD Reference	Factored Bearing Resistance (ksf)
Felts Brook	Service	1.0	Article 10.6.2.5.1	NA ¹
	Strength	0.45	Table 10.6.3.1.2a	NA ¹
Felts Brook Tributary	Service	1.0	Article 10.6.2.5.1	1.0
	Strength	0.45	Table 10.6.3.1.2a	2.3
Snowmobile 10C	Service	1.0	Article 10.6.2.5.1	1.0
	Strength	0.45	Table 10.6.3.1.2a	2.2
Wildlife 1	Service	1.0	Article 10.6.2.5.1	3.0
	Strength	0.45	Table 10.6.3.1.2a	5.8
Eaton Brook Tributary	Service	1.0	Article 10.6.2.5.1	1.0
	Strength	0.45	Table 10.6.3.1.2a	2.6
Wildlife 2	Service	1.0	Article 10.6.2.5.1	2.0
	Strength	0.45	Table 10.6.3.1.2a	2.6
Snowmobile 107	Service	1.0	Article 10.6.2.5.1	6.0
	Strength	0.45	Table 10.6.3.1.2a	60
Wetland	Service	1.0	Article 10.6.2.5.1	6.0
	Strength	0.45	Table 10.6.3.1.2a	60

Note:

¹The Felts Brook Culvert will be pile-supported. Refer to separate Felts Brook recommendations below for additional information.

Bearing resistance calculations are provided in Appendix D.

SUBGRADE MODULUS

The coefficient of subgrade reaction (k_v) relates foundation contact pressure to immediate (elastic) settlement and is typically used in soil-structure interaction models to determine reinforcing requirements for thickened footings and mat foundations. In general, and as reported by DeSimone and Gould (1972), the design of mat foundations requires estimates not only of differential settlement resulting from long-term consolidation, but also the relatively rapid displacement due to load concentrations on the subgrade surface. This rapid displacement can produce large moments within the mat as compared and often controls mat design. The coefficient of subgrade reaction is dependent on many factors, including the material properties and thickness of subgrade and foundation materials, geometry of the loaded area, and the stiffness and configuration of the structure.

The recommended value of coefficients of subgrade reaction for use in analysis of the culverts bearing on systematically placed and compacted granular borrow overlying undisturbed naturally-deposited subgrade soils varies by culvert location and are summarized in the table below.

Culvert	Approximate Invert Elevation (ft)	Anticipated Soil Unit Below Bedding¹	Modulus of Subgrade Reaction (pci)²
Felts Brook	El. 72	marine deposit (soft clay)	NA ³
Felts Brook Tributary	El. 77	marine deposit (soft to stiff clay)	50
Snowmobile 10C	El. 84	marine deposit (soft to medium stiff clay)	50
Wildlife 1	El. 179 to El. 181	marine deposit (medium stiff to very stiff clay or silt)	150
Eaton Brook Tributary	El. 175	marine deposit (soft to stiff clay or silt)	100
Wildlife 2	El. 180	marine deposit (medium stiff to stiff clay or silt)	150
Snowmobile 107	El. 194.5 To El. 195.5	glacial till (very stiff silt)	250
Wetland	El. 187 to El. 188	glacial till (medium stiff silt)	250

Notes:

¹ Refer to the test boring logs in Appendix A for a more detailed description of the soil units that are anticipated to be present below the proposed bedding layer.

² Based on NAVFAC DM-7.2.

³ The Felts Brook Culvert will be pile-supported.

ELASTIC AND CONSOLIDATION SETTLEMENT

Settlement of the culverts was evaluated using a settlement spreadsheet developed by Haley & Aldrich (Felts Brook Tributary, Snowmobile 10C Culverts) and the software program Settle 3D developed by Rocscience, Inc. (remaining culverts). Progress plans provided by MaineDOT on 12 July 2021 were used to estimate embankment fill loads. The approach used in our settlement analyses is described below and the calculations and supporting documentation are attached.

- Consolidation analysis was used to evaluate settlement of cohesive soils below the water table.
- Elastic theory was used to evaluate settlement of granular and cohesive soils above the water table and granular soils below the water table.
- Project-wide consolidation data was summarized and reviewed to determine consolidation properties of cohesive soils. Refer to Appendix D and the Highway GDR for additional details.

Culvert	Maximum Fill Height (ft)	Estimated Post-Construction Settlement at Center of Embankment/Middle of Culvert (in.)	Estimated Post-Construction Settlement at Edge of Embankment/Ends of Culvert (in.)	Estimated Differential Settlement from Center to Edge (in.)
Felts Brook	17	NA ¹		
Felts Brook Tributary ²	19	1¾ - 2	0 - ¼	1¾
Snowmobile 10C ³	16	1¾ - 2	1¼ - 1½	½
Wildlife 1	22	1½ - 1¾	¾ - 1	¾
Eaton Brook Tributary	24	1½ - 1¾	1 - 1¼	½
Wildlife 2	21	1¾ - 2	1 - 1¼	¾
Snowmobile 107	16	¼ - ½	0 - ¼	¼
Wetland	19	½ - ¾	0 - ¼	½

Notes:

¹ The Felts Brook Culvert will be pile-supported. Refer to separate Felts Brook recommendations below for pile information.

² The embankment at and adjacent to the culvert at Felts Brook Tributary will be constructed with full height FGA lightweight fill to achieve the settlement criteria.

³ The embankment at and adjacent to the culvert at Snowmobile 10C required 5 ft of FGA lightweight fill to achieve the settlement criteria.

As shown in the table above, the anticipated magnitudes of settlement along the length of each culvert will vary depending on location of the culvert to the centerline of the embankment fill. That is, the maximum anticipated settlement will occur at/near the middle of the culvert below the embankment centerline, with lesser settlement amounts occurring at the ends of the culvert near the toe of the embankments. Differential settlement between the center and ends of the culvert range from ¼ to 1½ in. This amount of differential settlement should be evaluated to confirm that each culvert will function properly from a hydraulics and structural standpoint.

The project criterion for post-construction total settlement for bridge box culvert structures as provided by MaineDOT is as follows: maximum of 2 in. in 100 years. The special embankment construction requirements outlined above and shown on Figures 10 through 12 have been developed to meet this post-construction settlement requirement.

Settlement calculations are provided in Appendix D.

DRIVEN PILE RECOMMENDATIONS AT FELTS BROOK

It is our opinion, based on the subsurface soil conditions present at the site, that steel H-piles should be driven through the overburden soils and to/into bedrock to provide the minimum required axial compressive resistance, primarily through end bearing resistance.

Corrosion and Deterioration

The geotechnical engineering design of the proposed piles included consideration of corrosion in accordance with AASHTO LRFD Section 10.7.5. Based on our visual review of the soil samples and our

experience on similar projects with similar soil conditions, it is our opinion that the in-situ soils have low corrosive potential. Therefore, the net factored pile axial compressive pile resistance recommended in the following sections does not include a reduction in pile cross sectional area for steel degradation due to corrosion.

Downdrag

Downdrag occurs due to relative vertical displacement between a pile and the surrounding soil. In accordance with AASHTO LRFD Section 3.11.8, where the relative displacement exceeds 0.4 in., downdrag is likely to be fully developed. For the downdrag evaluations we assumed that pile displacement was zero (i.e., end bearing piles with no elastic pile compression) and that piles will be driven prior to embankment construction. Because of that, a sufficient amount of relative displacement between the pile and surrounding soil (i.e., > 0.4 in.) is anticipated to occur after pile installation such that full downdrag loads on the pile would be mobilized.

Based on the results of the settlement evaluations presented herein, the estimated pile-soil relative displacement exceeded 0.4 in. along the upper approximately 29 ft of the pile located below the proposed culvert and within the compressible marine clay stratum. The α method was used to calculate the downdrag loads in cohesive soil layers, in accordance with AASHTO LRFD recommendations. The calculated factored downdrag load on an HP14x89 steel H-pile is summarized below.

Load Factor	HP14x89 Factored Downdrag Load (kips) ¹
1.40 (cohesive)	77

Note:

¹ The perimeter or "box" area of the H-pile was used to compute the surface area of the pile.

Because the thickness of marine clay varies across the length of the culvert, the factored downdrag load presented above was calculated assuming the greatest marine clay thickness encountered in nearby test borings (i.e., 29 ft below the pile cap in test boring BB-BFB-202). Since the tops of the piles will be located in the marine clay, no additional downdrag contribution will occur above the marine clay stratum.

Structural/Geotechnical Resistance

In accordance with AASHTO LRFD Section 10.7.3, a distinction is made between piles driven to "soft" rock and those that are driven to "hard rock." Based on our experience on similar projects with similar bedrock conditions, we consider the bedrock at the site to be "hard." Therefore, the geotechnical resistance of the piles is controlled by the structural resistance as discussed in AASHTO LRFD Section 10.7.3.2.3. The structural resistance factor (AASHTO LRFD Section 6.5.4.2) for axial resistance of piles in compression and subject to damage due to severe driving ("hard" rock bearing stratum) is 0.5. In addition, resistance factors for Service and Extreme Limit State loading are 1.0. Therefore, the nominal

and factored structural resistances of an HP14x89 steel H-pile at the Service, Strength and Extreme Event Limit States are summarized below.

Steel H-pile Section	Nominal Structural Resistance (kips)	Factored Structural Resistance (kips)		
		Service Limit State ($\phi=1.0$)	Strength Limit State ($\phi=0.5$)	Extreme Limit State ($\phi=1.0$)
HP14x89	1,306	1,306	653	1,306

Drivability Resistance

The engineering design of the proposed piles included consideration of drivability resistance in accordance with AASHTO LRFD Section 10.7.8. The drivability analyses were conducted to determine: 1) if the piles could be impact driven through overburden soils to bedrock; and 2) what nominal resistance could be achieved using hammer sizes typical of local pile driving contractors without damaging or overstressing the piles while keeping the penetration resistance below 15 blows per inch (bpi), which is the upper limit of penetration resistance allowed by MaineDOT.

The drivability evaluations were conducted using the computer program GRL WEAP 2010 developed by GRL Engineers, Inc. and assumed that a Delmag D36-32 single acting diesel hammer with a maximum rated energy equal to 90,560 ft-lbs. will be used to install the piles. The Delmag D36-32 hammer has a ratchet style fuel pump with four settings, which are designed to limit the ram stroke to 5.2 ft (fuel setting 1), 7.0 ft (fuel setting 2), 8.8 ft (fuel setting 3), and 11.4 ft (fuel setting 4; maximum). Drivability evaluations were completed modeling different pile lengths (i.e., “short” piles [24 ft] and “long” piles [40 ft]) based on the variation in the top of bedrock elevation along the length of the culvert and the hammer. For the purposes of our evaluations, we assumed the hammer will be operated at fuel setting 2 (7.0 ft ram stroke). The nominal and factored drivability resistances for an HP14x89 steel H-pile (both short and long piles) is summarized below.

Steel H-pile Section	Drivability Resistance (kips)	
	Nominal	Factored ($\phi_{dyn}=0.65$)
HP14x89	775	503

Our evaluations show that the nominal drivability resistance for an HP14x89 steel H-pile, as summarized above, is controlled by the maximum permissible compressive driving stresses per AASHTO LRFD Section 10.7.8, which is 45 ksi ($0.90F_y$) for 50 ksi steel piles. Maximum driving stresses calculated in our drivability evaluations were approximately 47 ksi for “short piles” and 44 ksi for “long piles”, which are essentially at or slightly higher than the maximum permissible stresses. In our experience however, drivability evaluations completed using GRL WEAP tend to over-predict compressive driving stresses. Because of this, it is our opinion that actual compressive driving stresses measured during test pile installation will be at or slightly lower than the maximum permissible. Predicted penetration resistances for “short” and “long” piles ranged from approximately 12 to 19 blows per inch (bpi), respectively. It is our understanding based on discussions with you, that although the upper limit of penetration allowed

by MaineDOT is 15 bpi, it is not uncommon to install piles to greater penetration resistances (i.e., > 15 bpi) in some instances.

Please note that the drivability resistances summarized above are based on an assumed pile hammer size, hammer energy setting and the assumption that the piles penetrate through the entire soil overburden and end bear in/on bedrock. If the actual, factored axial compressive pile loads vary or if the actual pile-hammer system used to install the piles is different than the assumed system, additional evaluations will be required to determine the nominal and factored drivability resistances that can be achieved at a reasonable penetration resistance without overstressing the piles.

Summary and Recommended Axial Compressive Resistance

The factored axial compressive pile resistance is controlled by the lesser of the Strength Limit State drivability and structural/geotechnical resistances since the piles will be installed using impact hammers and the minimum nominal resistance will be confirmed using dynamic testing. The factored resistances (structural, geotechnical and drivability) are summarized below.

Steel H-pile Section	Factored Structural Resistance (kips)	Factored Drivability Resistance (kips)	Governing Factored Resistance (kips)	Factored Downdrag Load (kips)	Net Factored Resistance (kips)
HP14x89	653	503	503	77	426

As can be seen in the table above, the factored Strength I Limit State axial compressive pile resistance is controlled by the drivability resistance. Therefore, we recommend that a factored Strength I Limit State axial compressive resistance equal to 503 kips be used for design of the culvert using HP14x89 steel H-piles (with net factored resistance of 426 kips for culvert support after downdrag load is accounted for).

We recommend that a minimum of four piles along the length of the culvert be dynamically tested during construction to confirm that the minimum required nominal resistance has been achieved.

We recommend that minimum pile spacing, clearance and embedment (into the pile cap) meet the requirements of AASHTO LRFD Section 10.7.1.2. We also recommend that the pile tips be protected using cast steel driving shoes to prevent damage when driving through the dense glacial till and to/into bedrock.

Estimated Pile Tip Elevations

The subsurface conditions present along the length of the culvert are shown graphically in Figure 3. Specifically, the elevation of the top of rock varies between approximately El. 50 at the north end of the culvert and approximately El. 32 at the south end of the culvert. As discussed previously, the piles are

expected to develop most of their axial compressive resistance through end bearing in/on bedrock. For an estimate of bid quantities, we recommend the following pile tip elevations at each substructure location:

Structure	Pile Location	Proposed Top of Pile Elevation ¹	Approximate Top of Bedrock Elevation ²	Approximate Bottom of Pile Elevation ³	Approximate In-Place Pile Length (ft)	Recommended Delivered Pile Length (ft)
Felts Brook Culvert	north end	68.75	50	49	19.75	25
	center	68.75	39	38	30.75	35
	south end	68.75	32	31	37.75	40

Notes:

¹ Shown on plans provided by MaineDOT on 12 July 2021.

² Taken from nearest test boring and rounded down to the nearest 1 ft.

³ Assumes 1-ft penetration into bedrock.

Please note that the estimated pile lengths summarized above do not account the additional 5 ft of pile required for dynamic testing instrumentation or any additional pile length needed to accommodate the Contractor's leads and pile driving equipment.

Based on the anticipate pile lengths summarized above, we do not anticipate that pile splicing will be required to install the piles.

EMBANKMENTS IN VICINITY OF BRIDGE CULVERTS

As stated above, subsurface soil conditions along the proposed highway alignment in the vicinity of the culverts will affect the planning and design of the construction of the new embankments adjacent to and above the culverts. Global embankment stability and settlement analyses were conducted as part of the highway evaluations in order to assess the feasibility of constructing the highway embankments using normal weight earthfill over the compressible and low strength marine silt/clay soils present at the site. Results of these evaluations are presented in the Highway GDR.

Global Stability

Computer-assisted, two-dimensional global stability evaluations of the embankments in areas where compressible marine clay soils are present were performed as part of the highway evaluations. Three culverts (i.e., Felts Brook, Felts Brook Tributary, and Snowmobile 10C Culverts) are located in the special embankment construction Area 1.

The calculated global stability factors of safety values for the evaluations closest to these three culverts (for permanent conditions) are summarized below. These evaluations assume implementation of the special embankment construction recommendations outlined in the Highway GDR (i.e, PVDs, staged construction and second stage lightweight fill). Evaluations using full height, normal weight fill resulted in factors of safety less than 1.3. Refer to the Highway GDR for additional details and supporting calculations.

Culvert	Culvert Location	Embankment Stability Evaluation Location	Minimum Factor of Safety (per Spencer Method) ¹	
			Static	Pseudo-Static
Felts Book	Sta. 55+08	56+50	1.47	1.19
Felts Brook Tributary	Sta. 64+14	63+00	1.55	1.26
Snowmobile 10C	Sta. 77+00	77+00	1.79	1.52

The minimum required factor of safety (for permanent conditions) as specified by both AASHTO LRFD and the MaineDOT BDG for embankments under static conditions which do not support structures is 1.3. The minimum required factor of safety for embankments subjected to pseudo-static seismic loading is 1.1 (FHWA Geotechnical Engineering Circular No. 3).

As can be seen in the table above, the calculated factors of safety for these sections were acceptable for both the static and pseudo-static evaluations.

A complete discussion of the stability evaluations, and supporting calculations, are provided in the Highway GDR.

Elastic and Consolidation Settlement

The project criteria for post-construction total settlement for bridge culverts, highway embankments, and span bridges as provided by MaineDOT are as follows:

- Bridge Culverts
 - 2 in. in 100 years
- Highway Embankments (criteria applied to embankments adjacent to culverts, except pile-supported Felts Brook)
 - 4 in. from 0 to 20 years
 - 4 in. from 20 years to 75 years
- Within 200 ft of Span Bridges (criteria applied within 200 ft of pile-supported Felts Brook Culvert)
 - 2 in. from 0 to 5 years
 - 2 in. from 5 to 20 years
 - 2 in. from 20 to 75 years

The results of settlement evaluations completed at each culvert are provided above. Three culverts (i.e., Felts Brook, Felts Brook Tributary, and Snowmobile 10C Culverts) are located in the special embankment construction Area 1. In this area, PVDs, staged construction, and lightweight fill was needed to meet the project post-construction settlement criteria.

For a complete discussion of the settlement evaluations and supporting calculations, refer to the Highway GDR.

HYDROSTATIC UPLIFT

The long-term groundwater levels observed at the culverts are typically above the bottom of the culverts, in some cases as much as 10 ft. However, since the culverts are open and will carry water if it rises above the invert elevation, we do not recommend that hydrostatic uplift forces need to be resisted/accounted for in the culvert design.

Construction Considerations

The primary purpose of this section is to comment on geotechnical aspects of proposed construction. This section is written primarily for the individuals having responsibility for preparation of geotechnical related plans and specifications as well as personnel appointed to monitor construction activities. Prospective Contractors should evaluate the potential for construction problems on the basis of their own knowledge and experience in the Brewer-Eddington area, and on the basis of similar projects in other localities, taking into account their proposed construction methods, procedures, equipment and personnel. Please note that the construction considerations provided below relate to the subject project only.

EXCAVATION

Excavation will be required to construct the proposed culverts. Based on existing ground surface elevations, proposed culvert invert elevations, and the anticipated subgrade conditions, excavation depths ranging between approximately 4 and 12 ft BGS will be required to construct the culverts. We anticipate that excavation and over-excavation (where required) of the in-situ soils (primarily marine deposits, glacial till, and topsoil/root mat) can be accomplished using normal earth-excavating equipment. We do not anticipate that bedrock excavation will be required to construct any of the culverts. Please note that the marine deposit soils that will be present at the bottom of the excavations are considered susceptible to disturbance from construction activities especially when the soils are wet or saturated. We anticipate that excavations may be made using sloped, open cut techniques. It also is possible that temporary support of excavation systems (e.g., steel sheeting) may be used by the contractor to control groundwater inflow into the excavation and minimize the scope of the dewatering effort (see below). We recommended that the Contractor be responsible for the design, stability and safety of all excavations in accordance with local, state and federal regulations.

DEWATERING

Based on measurements made in observation wells and water observations during drilling, we anticipate that excavations will typically extend 2 to 5 ft below static groundwater levels. We anticipate that construction dewatering will be needed and can likely be accomplished by using ditches and open pumping from sumps. However, at the Felts Brook Culvert location, the excavation may extend up to 12 ft below static groundwater levels, so more substantial dewatering methods (e.g., well points, gravel packed wells) may be required. We recommend that the Contractor be made responsible for controlling all infiltration from groundwater and surface runoff to permit subgrade preparation, fill placement and construction in-the-dry.

Excavation and control of water should be done by methods that prevent disturbance to subgrade soils (i.e., marine deposits and glacial till soils). Sumps and pumps should be designed with proper filters to control the loss of fine-grained soil.

Dewatering and discharge of dewatering effluent should be performed in accordance with all applicable local, state and federal regulations. Dewatering discharge should be recharged on site if possible. If on-site recharge is not feasible, dewatering discharge will likely need to be directed to the local storm drain system. Sedimentation tanks and other treatment methods may be required for legal disposal of the effluent into the storm drain system.

SUBGRADE PREPARATION

As discussed in previous sections of this report, we anticipate that soils present at the bottom of the excavations will likely consist of marine deposits or glacial till. These soils can easily be disturbed by construction activities if care is not taken in excavating within a few feet of design subgrade levels and in protecting the subgrade surfaces after preparation and prior to backfilling. The following guidelines are recommended to protect subgrade soils beneath the culverts:

- Make final excavations into natural bearing soils using methodical methods and smooth-bladed equipment to limit disturbance. We recommend the use of lightweight tracked grading equipment, such as low ground-pressure bulldozers, within 2 ft of subgrade elevation to the extent possible.
- Prevent water from accumulating on soil surfaces to reduce the possibility of soil disturbance. All filling should be performed in-the-dry. Subgrades that become disturbed due to water infiltration should be re-excavated and stabilized. Subgrade stabilization methods could include placement of a concrete mudmat or additional bedding material that is fully encapsulated in separation geotextile with approval of the Resident and/or Geotechnical Engineer.
- Exposed subgrades should be examined in the field by the Resident and/or Geotechnical Engineer to verify strength and bearing capacity. Excavation may be necessary to remove weak, disturbed or otherwise unacceptable soils.
- All topsoil, organic matter, debris fill, and other unsuitable material be over-excavated (removed) prior to subgrade preparation and placement of fill/backfill.
- Granular subgrade surfaces could be proofrolled with self-propelled, static/vibratory compaction equipment until firm and prior to placement of bedding material if the soil appears dry and no “free” water is observed as determined by the Resident and/or Geotechnical Engineer. To minimize disturbance, we recommend that wet/saturated granular or cohesive soils exposed at subgrade level not be proofrolled.
- Disturbance due to water and adverse weather could be reduced by maintaining excavations at least 12 in. above the final bearing level until immediately before placing fill material. Alternatively, it may be desirable to protect the exposed soil subgrade areas, as soon as possible after acceptance by the Resident and/or Geotechnical Engineer, by placing the culvert and backfill materials.

- Limit equipment traffic across the exposed soil bearing surfaces.
- If disturbance and rutting occur, the disturbed materials should be removed and replaced to the satisfaction of the Resident and/or Geotechnical Engineer.
- We recommend that the Contractor be made responsible for protecting subgrade surfaces. Any damage to the subgrade surface resulting from Contractor means and methods should be repaired to the satisfaction of the Resident and/or Geotechnical Engineer at no additional expense to MaineDOT.

Limitations and Closure

This report is prepared for the exclusive use of MaineDOT 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 Contractors 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.

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


Sincerely yours,
HALEY & ALDRICH, INC.



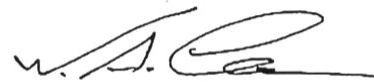
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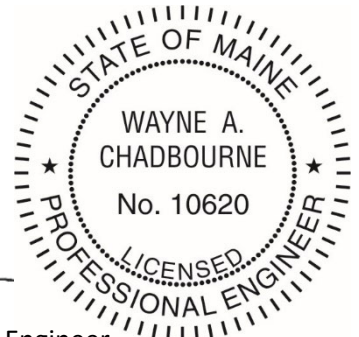
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Enclosures:

- Table I – Subsurface Exploration Location Data
- Table II – Subsurface Exploration Subsurface Data
- Table III - Subsurface Exploration Bedrock Core Data
- Figure 1 – Project Locus
- Figure 2 – Boring Location Plan & Interpretive Subsurface Profile (Felts Brook Culvert)
- Figure 3 – Interpretive Subsurface Cross Section (Felts Brook Culvert)
- Figure 4 – Boring Location Plan & Interpretive Subsurface Profile (Felts Brook Tributary Culvert)
- Figure 5 – Boring Location Plan & Interpretive Subsurface Profile (Snowmobile 10C Culvert)
- Figure 6 – Site and Subsurface Exploration Location Plan (Wildlife 1, Eaton Brook Tributary, Wildlife 2 Culverts)
- Figure 7 – Interpretive Subsurface Cross Section (Wildlife 1, Eaton Brook Tributary, Wildlife 2 Culverts)
- Figure 8 – Boring Location Plan & Interpretive Subsurface Profile (Snowmobile 107 Culvert)
- Figure 9 – Boring Location Plan & Interpretive Subsurface Profile (Wetland Culvert)
- Figure 10 – Special Embankment Construction Plan – Area 1 (Sheet 1 of 3)
- Figure 11 – Special Embankment Construction Plan – Area 1 (Sheet 2 of 3)
- Figure 12 – Special Embankment Construction Plan – Area 1 (Sheet 3 of 3)
- Appendix A – Test Boring Logs and Rock Core Photographs
- Appendix B – Observation Well Installation and Groundwater Monitoring Reports
- Appendix C – Laboratory Test Results
- Appendix D – Geotechnical Calculations

TABLES

TABLE I

Subsurface Exploration Location Data
 Interstate 395/Route 9 Connector
 MaineDOT WIN 018915.00
 Brewer and Eddington, Maine

Haley & Aldrich, Inc. File No.: 132076-007

Culvert Structure	Test Boring No. ¹	Ground Surface Elevation ^{3,4}	Station ⁵	Offset Distance & Direction ⁵	Coordinates ²	
					Northing	Easting
Felts Brook	BB-BFB-101	79.4	54+61.2	2.8 LT	463,901	1,745,761
	BB-BFB-201	80.9	903+99.8	47.8 RT	464,013	1,745,755
	BB-BFB-202	80.5	702+28.8	28.0 RT	463,851	1,745,812
	HB-BE-101	82.0	52+97.4	1.8 LT	463,815	1,745,621
Felts Brook Tributary	BB-BFB1-201	80.7	63+88.2	63.2 LT	464,436	1,746,520
	BB-BFB1-202	80.8	64+27.6	63.1 RT	464,349	1,746,620
	BB-BFB1-203	80.6	64+16.2	0.6 LT	464,397	1,746,577
	HB-BE-109	84.4	62+43.7	1.1 LT	464,308	1,746,429
	HB-BE-212	81.6	65+49.2	2.4 LT	464,469	1,746,689
Snowmobile 10C	BB-BST1-101	86.3	77+48.3	16.1 LT	465,286	1,747,552
	BB-BST1-102	86.7	77+40.7	96.9 LT	465,329	1,747,483
	BB-BST1-103	87.4	77+53.7	96.7 RT	465,223	1,747,646
	BB-BST1-201	86.0	76+98.8	0.4 RT	465,237	1,747,536
Eaton Brook Tributary, Wildlife 1, Wildlife 2	BB-EEBT2-101	179.7	272+98.7	8.6 LT	480,618	1,759,397
	BB-EEBT2-102	181.3	273+34.1	97.9 LT	480,702	1,759,351
	BB-EEBT2-103	179.8	273+23.1	101.1 RT	480,567	1,759,498
	BB-EEBT2-201	179.4	274+26.3	71.0 LT	480,756	1,759,430
	BB-EEBT2-202	179.2	273+57.6	3.8 LT	480,656	1,759,444
	BB-EWC1-101	181.1	272+35.9	3.4 RT	480,562	1,759,367
	BB-EWC1-201	182.9	272+36.2	60.7 LT	480,603	1,759,317
	BB-EWC1-202	181.1	272+35.2	58.8 LT	480,526	1,759,409
	BB-EWC2-101	181.5	275+86.7	12.7 LT	480,842	1,759,580
	BB-EWC2-201	181.4	275+86.6	74.6 LT	480,883	1,759,534
	BB-EWC2-202	180.8	275+88.9	72.1 RT	480,786	1,759,644
Snowmobile 107	BB-EST2-101	197.5	284+04.3	1.3 LT	481,316	1,760,243
Wetland	BB-EWC-101	191.2	289+53.7	7.4 LT	481,488	1,760,765
	BB-EWC-203	189.5	288+99.4	2.8 RT	481,468	1,760,713

Notes:

¹ Test boring locations are shown on Figures 2 through 9 , Boring Location Plans.

² As-drilled coordinates of test borings were determined by MaineDOT using GPS survey equipment, are measured in feet and reference NAD83, Maine 2000 Central Zone coordinate system.

³ Ground surface elevations at test boring locations were determined in the field by MaineDOT using GPS survey equipment.

⁴ Elevations are measured in feet and reference the North American Vertical Datum of 1988 (NAVD 88).

⁵ Station and offset relative to the I-395/Route 9 Connector baseline information determined by MaineDOT and provided to Haley & Aldrich.

	Individual	Date
Prepared By:	EMS	3/11/2020
Checked By:	EAF	4/29/2020
Reviewed By:	WAC	5/4/2020
Updated By:	SSM	2/23/2021
Checked By:	TPJ	7/19/2021
Reviewed By:	EAF	7/19/2021

TABLE II
Subsurface Exploration Subsurface Data
Interstate 395/Route 9 Connector
MaineDOT WIN 018915.00
Brewer and Eddington, Maine

Haley & Aldrich, Inc. File No.: 132076-007

Culvert Structure	Test Boring No. ¹	Ground Surface Elevation (ft) ^{2,3}	Total Exploration Depth (ft)	El. Bottom of Exploration ^{2,3}	Topsoil / Root Mat ⁴			Marine Deposit ⁴			Glacial Till ^{4,6}			Weathered Bedrock ⁴			Bedrock ⁵	
					Depth to Top (ft)	El. of Top (ft)	Thickness (ft)	Depth to Top (ft)	El. of Top (ft)	Thickness (ft)	Depth to Top (ft)	El. of Top (ft)	Thickness (ft)	Depth to Top (ft)	El. of Top (ft)	Thickness (ft)	Depth to Top (ft)	El. of Top (ft)
Felts Brook	BB-BFB-101	79.4	52.0	27.4	0.0	79.4	0.5	0.5	78.9	34.0	34.5	44.9	5.8	NE	NE	NE	40.3	39.1
	BB-BFB-201	80.9	35.6	45.3	NE	NE	NE	0.0	80.9	29.0	29.0	51.9	1.7	NE	NE	NE	30.7	50.2
	BB-BFB-202	80.5	53.5	27.0	NE	NE	NE	0.0	80.5	41.8	41.8	38.7	6.2	NE	NE	NE	48.0	32.5
	HB-BE-101	82.0	45.0	37.0	0.0	82.0	1.0	1.0	81.0	36.0	37.0	45.0	5.6	NE	NE	NE	42.6	39.4
Felts Brook Tributary	BB-BFB1-201	80.7	34.1	46.6	0.0	80.7	0.1	0.1	80.6	15.7	15.8	64.9	7.0	NE	NE	NE	22.8	57.9
	BB-BFB1-202	80.8	45.0	35.8	NE	NE	NE	0.0	80.8	30.5	30.5	50.3	3.6	NE	NE	NE	34.1	46.7
	BB-BFB1-203	80.6	34.8	45.8	0.0	80.6	0.3	0.3	80.3	23.4	23.7	56.9	0.4	NE	NE	NE	24.1	56.5
	HB-BE-109	84.4	36.3	48.1	0.0	84.4	1.3	1.3	83.1	14.2	15.5	68.9	8.2	NE	NE	NE	23.7	60.7
	HB-BE-212	81.6	32.0	49.6	0.0	81.6	0.2	0.2	81.4	23.6	23.8	57.8	>8.2	NE	NE	NE	NE	NE
Snowmobile 10C	BB-BST1-101	86.3	49.4	36.9	0.0	86.3	0.1	0.1	86.2	21.4	21.5	64.8	13.3	NE	NE	NE	34.8	51.5
	BB-BST1-102	86.7	31.0	55.7	0.0	86.7	0.4	0.4	86.3	18.9	19.3	67.4	10.7	30.0	56.7	1.0	31.0	55.7
	BB-BST1-103	87.4	30.2	57.2	0.0	87.4	0.3	0.3	87.1	17.5	17.8	69.6	10.4	NE	NE	NE	28.2	59.2
	BB-BST1-201	86.0	41.5	44.5	0.0	86.0	0.2	0.2	85.8	22.9	23.1	62.9	8.9	NE	NE	NE	32.0	54.0
Eaton Brook Tributary, Wildlife 1, Wildlife 2	BB-EEBT2-101	179.7	32.0	147.7	0.0	179.7	0.2	0.2	179.5	10.5	10.7	169.0	10.7	NE	NE	NE	21.4	158.3
	BB-EEBT2-102	181.3	17.5	163.8	0.0	181.3	0.1	0.1	181.2	12.2	12.3	169.0	4.9	NE	NE	NE	17.2	164.1
	BB-EEBT2-103	179.8	17.0	162.8	NE	NE	NE	0.0	179.8	10.6	10.6	169.2	>6.4	NE	NE	NE	NE	NE
	BB-EEBT2-201	179.4	17.0	162.4	0.0	179.4	0.4	0.4	179.0	7.3	7.7	171.7	>9.3	NE	NE	NE	NE	NE
	BB-EEBT2-202	179.2	20.6	158.6	0.0	179.2	0.1	0.1	179.1	11.0	11.1	168.1	9.5	NE	NE	NE	20.6	158.6
	BB-EWC1-101	181.1	24.0	157.1	0.0	181.1	0.1	0.1	181.0	8.9	9.0	172.1	3.7	12.7	168.4	1.3	14.0	167.1
	BB-EWC1-201	182.9	13.0	169.9	0.0	182.9	0.2	0.2	182.7	9.9	10.1	172.8	0.6	NE	NE	NE	10.7	172.2
	BB-EWC1-202	181.1	15.0	166.1	NE	NE	NE	0.0	181.1	9.1	9.1	172.0	3.7	NE	NE	NE	12.8	168.3
	BB-EWC2-101	181.5	56.4	125.1	NE	NE	NE	0.0	181.5	3.6	3.6	177.9	47.2	NE	NE	NE	50.8	130.7
	BB-EWC2-201	181.4	17.0	164.4	0.0	181.4	0.2	0.2	181.2	6.7	6.9	174.5	>10.1	NE	NE	NE	NE	NE
	BB-EWC2-202	180.8	12.0	168.8	0.0	180.8	0.2	0.2	180.6	5.4	5.6	175.2	>6.4	NE	NE	NE	NE	NE
Snowmobile 107	BB-EST2-101	197.5	21.2	176.3	0.0	197.5	0.1	NE	NE	NE	0.1	197.4	9.9	10.0	187.5	1.5	11.5	186.0
Wetland	BB-EWC-101	191.2	24.2	167.0	0.0	191.2	0.1	0.1	191.1	3.7	3.8	187.4	5.8	NE	NE	NE	9.6	181.6
	BB-EWC-203	189.5	8.2	181.3	0.0	189.5	0.1	0.1	189.4	2.5	2.6	186.9	2.4	5.0	184.5	1.5	6.5	183.0

Notes:

- ¹ Test boring locations are shown on Figures 2 through 9 , Boring Location Plans.
- ² Ground surface elevations at test boring locations were determined in the field by MaineDOT using GPS survey equipment.
- ³ Elevations are measured in feet and reference the North American Vertical Datum of 1988 (NAVD 88).
- ⁴ "NE" indicates stratum was not encountered in test boring.
- ⁵ Top of bedrock in BB-BST1-102, BB-BST1-103, BB-EEBT2-102, BB-EEBT2-103, BB-EEBT2-202, HB-BE-101, EWC1-201, EWC1-202 and EWC-203 is probable based on drilling behavior. Bedrock was not cored.
- ⁶ ">" indicates deposit was not fully penetrated.

	Individual	Date
Prepared By:	EMS	3/11/2020
Checked By:	JMR	3/23/2020
Reviewed By:	EAF	4/29/2020
Updated By:	SSM	2/23/2021
Checked By:	TPJ	7/19/2021
Reviewed By:	EAF	7/19/2021

TABLE III
Subsurface Exploration Bedrock Core Data
Interstate 395/Route 9 Connector
MaineDOT WIN No. 018915.00
Brewer and Eddington, Maine

Haley & Aldrich, Inc. File No.: 132076-007

Test Boring No. ¹	Ground Surface Elevation ² (ft)	Bedrock Core Diameter (in.)	Run				Total Core Recovery ³		Rock Quality Designation ^{4,5}			Physical Rock Parameters		Lithologic, Rock Mass and Discontinuity Description	
			No.	Depth Below Ground Surface (ft)			Total Length (ft)	Recovered Length (ft)	%	Length (ft)	%	Designation	Weathering		Estimated Field Strength
				Top	Bottom	Midpoint									
BB-BFB-101	79.4	NQ (1.875")	R1	42.0	45.0	43.5	3.0	2.3	78%	0.7	22%	Very Poor	Fresh	Hard	Grey, aphanitic, SILTSTONE. Discontinuities dipping at low to steep angles (5 to 85 degrees from horizontal axis), spacing very close to close (<2 in. to 12 in.), discontinuity apertures are tight to open, few calcite veins, highly weathered and fractured zone from 43.5 to 45.0.
			R2	45.0	50.0	47.5	5.0	4.6	92%	3.9	78%	Good	Fresh	Hard	
			R3	50.0	52.0	51.0	2.0	1.8	88%	1.8	88%	Good	Fresh	Hard	
BB-BFB-201	80.9	NQ (1.875")	R1	31.0	35.6	33.3	4.6	4.6	100%	2.1	45%	Poor	Fresh to Slightly	Hard	Grey, aphanitic, SILTSTONE, discontinuities dipping at low to moderate angles (5 to 55 degrees from horizontal axis), spacing very close to close (<2 in. to 12 in.), discontinuity apertures are tight to open, calcite veins, moderately to highly fractured throughout.
BB-BFB-202	80.5	NQ (1.875")	R1	48.5	53.5	51.0	5.0	4.7	93%	2.6	52%	Fair	Fresh to Slightly	Hard	Grey, aphanitic, SILTSTONE, discontinuities dipping at steep angles (55 to 85 degrees from horizontal axis), spacing close to moderately close (2 in. to 3 ft), discontinuity apertures are tight to open. Joint surfaces are rough and planar. Few quartz/calcite veins.

Notes:

¹ Test boring locations are shown on Figures 2 through 9 , Boring Location Plans.

² Ground surface elevations at test boring locations were determined in the field by MaineDOT using GPS survey equipment, are measured in feet and reference the North American Vertical Datum of 1988 (NAVD 88).

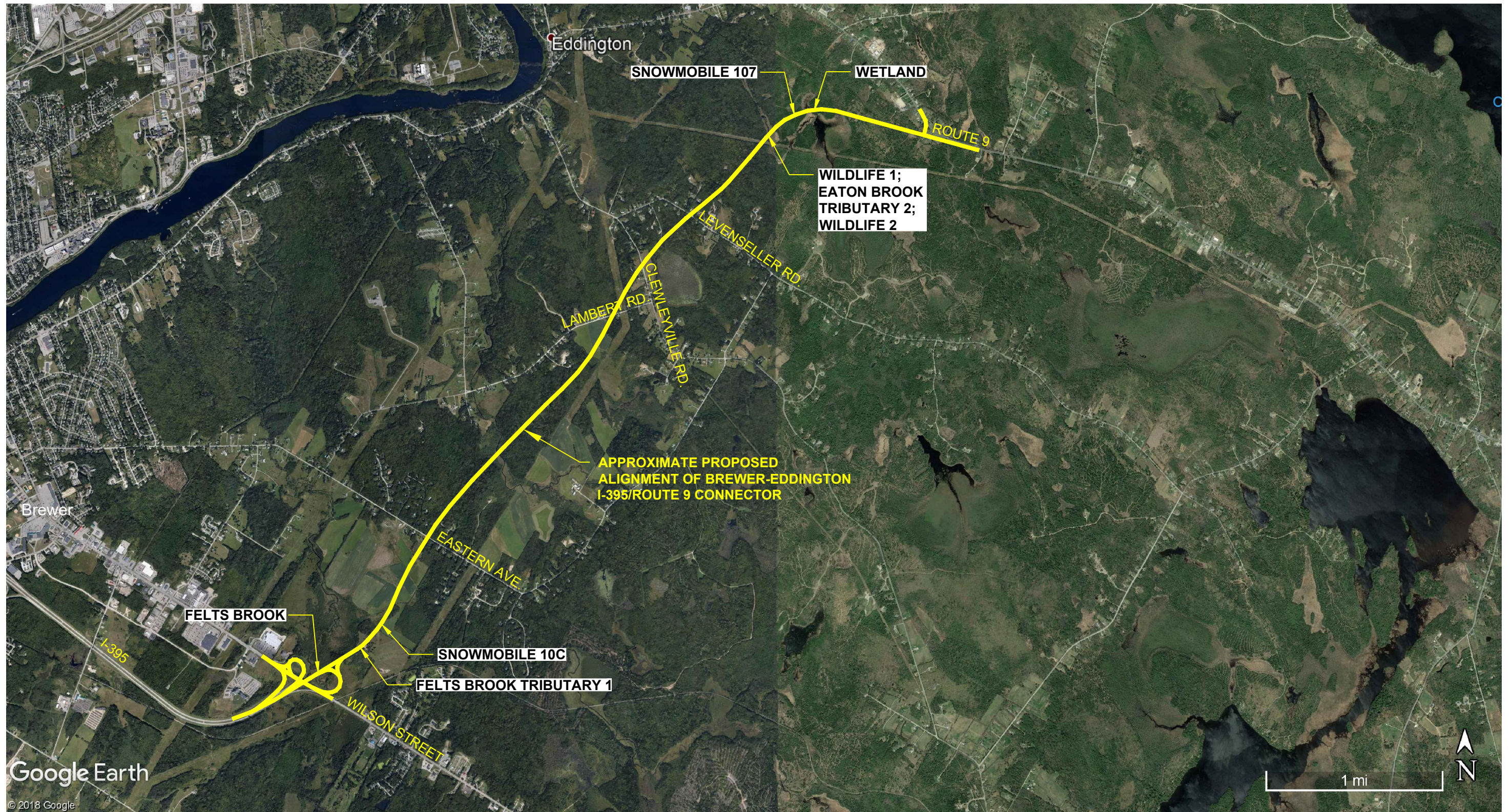
³ TCR = total core recovery. Total core recovery is the length of core recovered divided by the length of the run.

⁴ RQD = rock quality designation. RQD is the total length of intact, full-diameter core pieces recovered with a length greater than or equal to twice the core diameter (i.e., length of at least 4 in.) measured along the core axis. The percent RQD is the total length of RQD measured versus the run length. Note that vertical discontinuities are not included in determination of RQD.

⁵ Designation based on RQD in accordance with MaineDOT Geotechnical Section "Key to Soil and Rock Descriptions and Terms" Field Identification Information.

	Individual	Date
Prepared By:	JAD	9/3/2021
Checked By:	EAF	9/3/2021
Reviewed By:	WAC	9/3/2021

FIGURES



NOTES

1. IMAGE TAKEN FROM GOOGLE EARTH IMAGES, 2018.



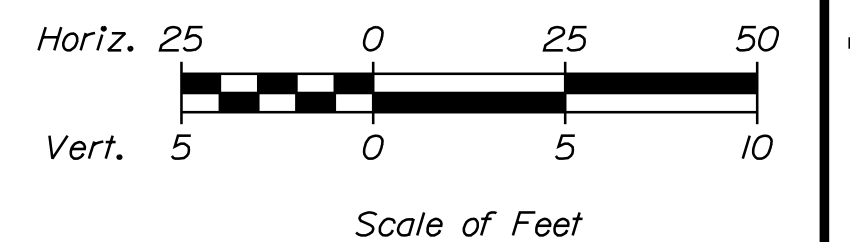
**HALEY
ALDRICH**

BRIDGE CULVERTS
INTERSTATE 395/ROUTE 9 CONNECTOR
MAINEDOT WIN 018915.00
BREWER AND EDDINGTON, MAINE

PROJECT LOCUS

SCALE: AS SHOWN
AUGUST 2021

FIGURE 1



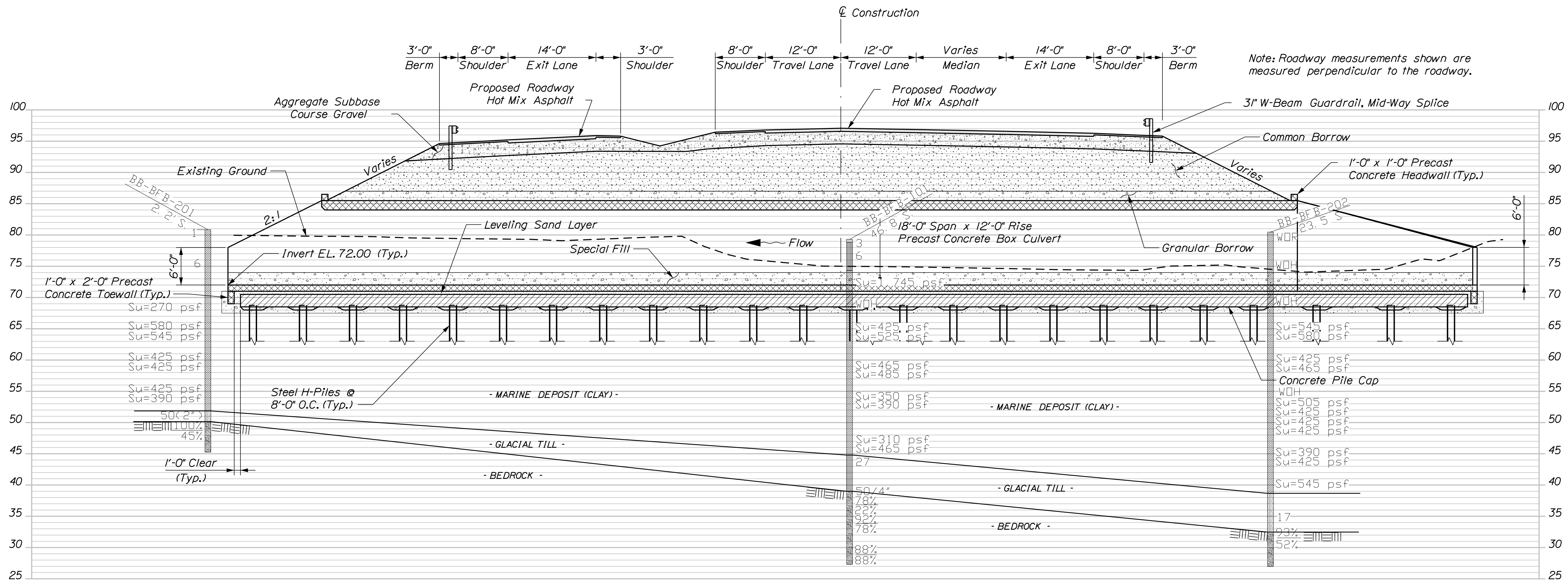
1. EXISTING AND PROPOSED SITE CONDITIONS, THE LOCATION AND ORIENTATION OF EXISTING SITE FEATURES, AND THE PROPOSED STRUCTURES ARE TAKEN FROM ELECTRONIC MICROSTATION FILES PROVIDED BY THE MAINE DEPARTMENT OF TRANSPORTATION.
2. THE PLAN LOCATIONS OF AND GROUND SURFACE ELEVATIONS AT TEST BORINGS SHOWN WERE DETERMINED UPON THE COMPLETION OF DRILLING BY THE MAINE DEPARTMENT OF TRANSPORTATION USING GPS SURVEY EQUIPMENT.
3. BORING OFFSET SHOWN ON THE PROFILE IS BASED ON PROPOSED I-395/ROUTE 9 CONNECTOR BASELINE.
4. THIS GENERALIZED INTERPRETIVE SUBSURFACE PROFILE IS INTENDED TO CONVEY TRENDS IN SUBSURFACE CONDITIONS. THE BOUNDARIES BETWEEN STRATA ARE APPROXIMATE AND IDEALIZED, AND HAVE BEEN DEVELOPED BY INTERPRETATIONS OF WIDELY SPACED EXPLORATIONS AND SAMPLES. ACTUAL SOIL AND ROCK TRANSITIONS MAY VARY AND ARE PROBABLY MORE ERRATIC.
5. ELEVATIONS ARE IN FEET AND REFERENCE THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88).
6. TEST BORINGS WERE MONITORED IN THE FIELD BY HALEY & ALDRICH, INC. GEOLOGIST OR GEOTECHNICAL ENGINEER.
7. REFER TO THE GEOTECHNICAL DESIGN REPORT FOR TEST BORING LOGS, ROCK CORE PHOTOGRAPHS, OBSERVATION WELL INSTALLATION AND GROUNDWATER MONITORING REPORTS, AND PIEZOONE AND SEISMIC PIEZOONE PENETRATION TEST REPORT.

Date:9/3/2021

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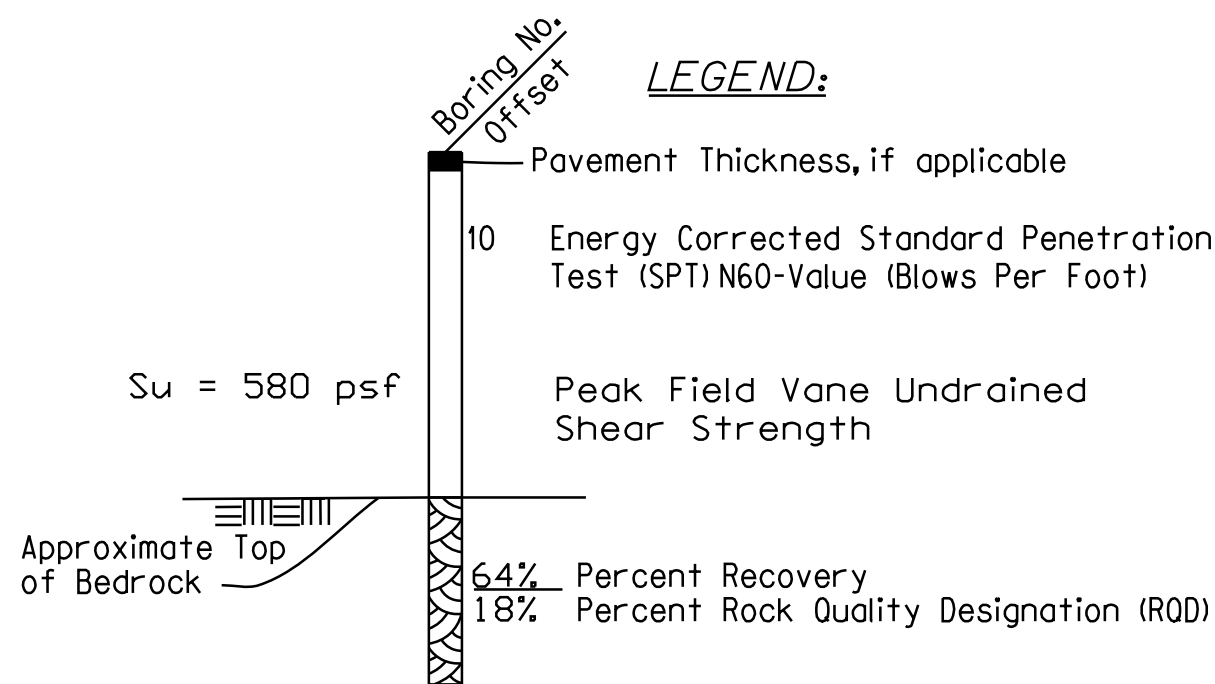
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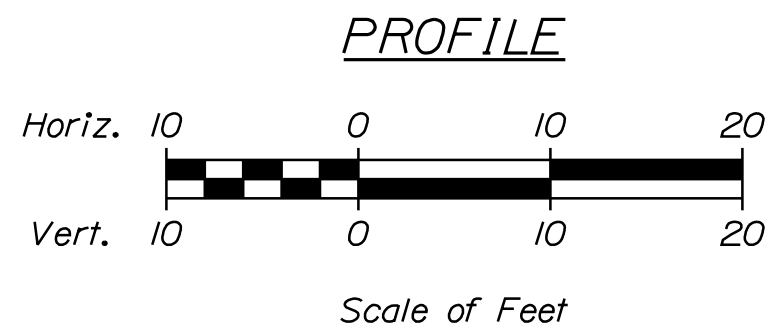
PROPOSED TYPICAL PRECAST CONCRETE BOX LONGITUDINAL SECTION

Section Along \mathcal{C} of Concrete Box at Sta. 55+08 Skewed 5° Ahead on Left



NOTES:

- EXISTING AND PROPOSED SITE CONDITIONS, THE LOCATION AND ORIENTATION OF EXISTING SITE FEATURES, AND THE PROPOSED STRUCTURES ARE TAKEN FROM ELECTRONIC MICROSTATION FILES PROVIDED BY THE MAINE DEPARTMENT OF TRANSPORTATION.
- THE PLAN LOCATIONS OF AND GROUND SURFACE ELEVATIONS AT TEST BORINGS SHOWN WERE DETERMINED UPON THE COMPLETION OF DRILLING BY THE MAINE DEPARTMENT OF TRANSPORTATION USING GPS SURVEY EQUIPMENT.
- BORING OFFSET SHOWN ON THE PROFILE IS BASED ON PROPOSED CULVERT CENTERLINE.
- THIS GENERALIZED INTERPRETIVE SUBSURFACE CROSS SECTION IS INTENDED TO CONVEY TRENDS IN SUBSURFACE CONDITIONS. THE BOUNDARIES BETWEEN STRATA ARE APPROXIMATE AND IDEALIZED, AND HAVE BEEN DEVELOPED BY INTERPRETATIONS OF WIDELY SPACED EXPLORATIONS AND SAMPLES. ACTUAL SOIL AND ROCK TRANSITIONS MAY VARY AND ARE PROBABLY MORE ERRATIC.
- ELEVATIONS ARE IN FEET AND REFERENCE THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88).
- TEST BORINGS WERE MONITORED IN THE FIELD BY HALEY & ALDRICH, INC. GEOLOGIST OR GEOTECHNICAL ENGINEER.
- REFER TO THE GEOTECHNICAL DESIGN REPORT FOR TEST BORING LOGS, ROCK CORE PHOTOGRAPHS, OBSERVATION WELL INSTALLATION AND GROUNDWATER MONITORING REPORTS, AND PIEZOCONE AND SEISMIC PIEZOCONE PENETRATION TEST REPORT.



HALEY
ALDRICH

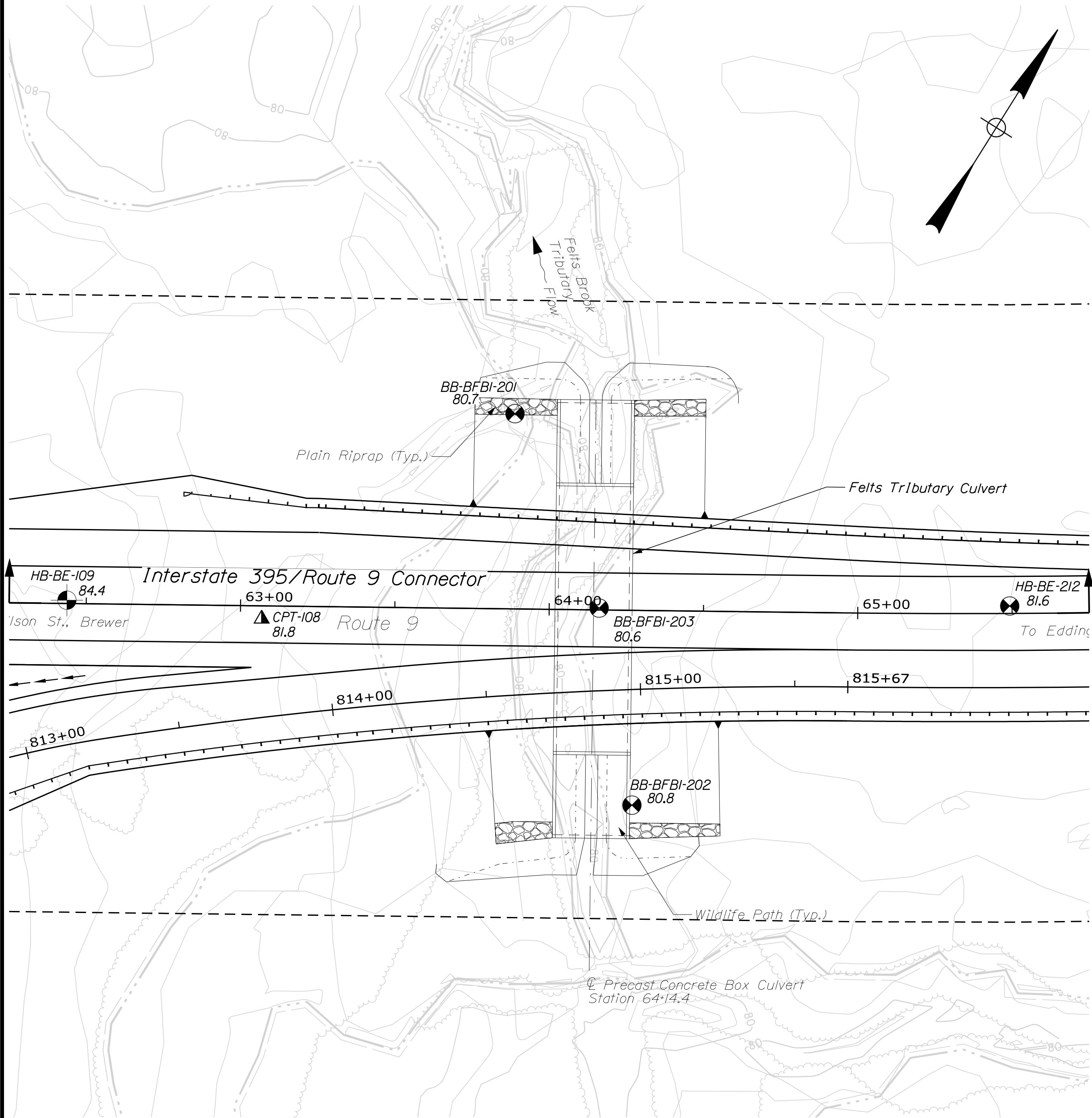
SHEET NUMBER										STATE OF MAINE									
3 OF 12										DEPARTMENT OF TRANSPORTATION									
										1891500									
										WIN									
										018915.00									
BRIDGE NO. 6642										BRIDGE PLANS									

I-395/ROUTE 9 CONNECTOR										PROJ. MANAGER										M. WIGHT										BY										DATE									
FELTS BROOK BRIDGE (55+08) BREWER-EDDINGTON PENOBSCOT COUNTY INTERPRETIVE SUBSURFACE CROSS SECTION										DESIGN-DETAILED										E. FORCE										K. POST										6-18-21									
										CHECKED-REVIEWED										E. FORCE										W. CHABOUBE										8-31-21									
										DESIGN2-DETAILED2										*****										*****										SIGNATURE									
										DESIGN3-DETAILED3										*****										*****										P.E. NUMBER									
										REVISIONS 1										*****										*****										DATE									
REVISIONS 2										*****										*****										DATE																			
REVISIONS 3										*****										*****										DATE																			
REVISIONS 4										*****										*****										DATE																			
FIELD CHANGES										*****										*****										DATE																			

Date:9/3/2021

Username:

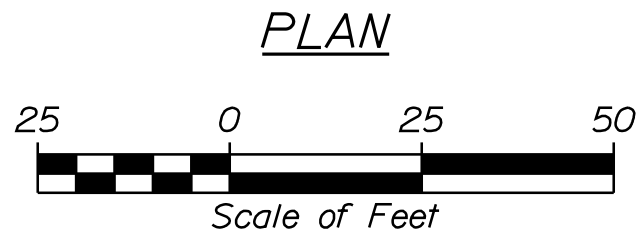
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PLAN LEGEND:

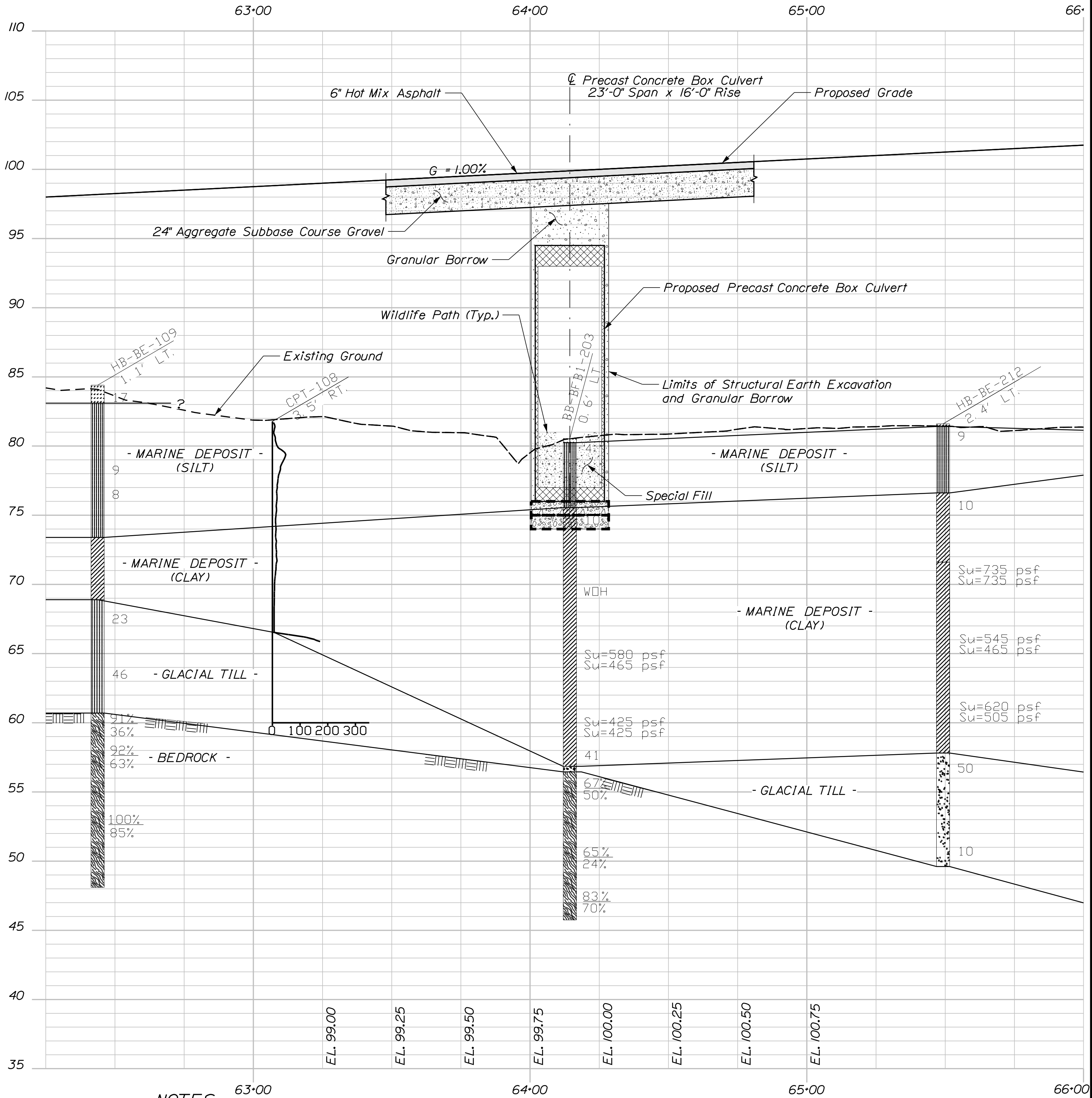
- HB-BE-212
BB-BFBI-202
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- DESIGNATION, AS-DRILLED LOCATION AND GROUND SURFACE ELEVATION OF FINAL DESIGN PHASE (PHASE 1) BRIDGE (BB) OR HIGHWAY (HB) TEST BORING DRILLED BY NEW ENGLAND BORING CONTRACTORS OF HERMAN, MAINE FROM OCTOBER 2020 TO FEBRUARY 2021, AND MAINE DEPARTMENT OF TRANSPORTATION FROM MARCH TO APRIL 2021 UNDER THE DIRECTION OF HALEY & ALDRICH
- BB-BE-109
84.4
- DESIGNATION, AS-DRILLED LOCATION AND GROUND SURFACE ELEVATION OF PRELIMINARY DESIGN PHASE (PHASE 1) BRIDGE (BB) OR HIGHWAY (HB) TEST BORING DRILLED BY NORTHERN TEST BORINGS, INC. OF GORHAM, MAINE FROM JULY TO AUGUST 2018, AND NEW ENGLAND BORING CONTRACTORS OF HERMAN, MAINE FROM OCTOBER TO DECEMBER 2018 UNDER THE DIRECTION OF HALEY & ALDRICH
- CPT-108
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- DESIGNATION, AS-DRILLED LOCATION AND GROUND SURFACE ELEVATION OF PIEZOCONE (CPT) AND SEISMIC PIEZOCONE (SCPT) PENETRATION TEST COMPLETED BY CONETEC, INC. OF WEST BERLIN, NEW JERSEY UNDER THE DIRECTION OF HALEY & ALDRICH IN OCTOBER AND NOVEMBER 2020

DESIGNATION, APPROXIMATE LOCATION, AND ORIENTATION OF CULVERT INTERPRETIVE SUBSURFACE PROFILE (THIS SHEET)



PROFILE LEGEND:

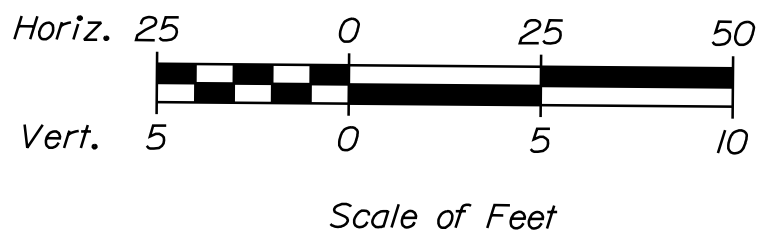
- Boring No. Offset
- Pavement Thickness, if applicable
- 10 Energy Corrected Standard Penetration Test (SPT) N60-Value (Blows Per Foot)
- Peak Field Vane Undrained Shear Strength
- Approximate Top of Bedrock
- 64% Percent Recovery
- 18% Percent Rock Quality Designation (RQD)
- CPT-No. Offset
- Cone Penetration Test (CPT) Designation
- Tip Resistance
- Uncorrected Tip Resistance in Tons per Square Foot (TSF)



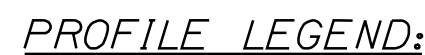
NOTES:

- EXISTING AND PROPOSED SITE CONDITIONS, THE LOCATION AND ORIENTATION OF EXISTING SITE FEATURES, AND THE PROPOSED STRUCTURES ARE TAKEN FROM ELECTRONIC MICROSTATION FILES PROVIDED BY THE MAINE DEPARTMENT OF TRANSPORTATION.
- THE PLAN LOCATIONS OF AND GROUND SURFACE ELEVATIONS AT TEST BORINGS SHOWN WERE DETERMINED UPON THE COMPLETION OF DRILLING BY THE MAINE DEPARTMENT OF TRANSPORTATION USING GPS SURVEY EQUIPMENT.
- BORING OFFSET SHOWN ON THE PROFILE IS BASED ON PROPOSED I-395/ROUTE 9 CONNECTOR BASELINE.
- THIS GENERALIZED INTERPRETIVE SUBSURFACE PROFILE IS INTENDED TO CONVEY TRENDS IN SUBSURFACE CONDITIONS. THE BOUNDARIES BETWEEN STRATA ARE APPROXIMATE AND IDEALIZED, AND HAVE BEEN DEVELOPED BY INTERPRETATIONS OF WIDELY SPACED EXPLORATIONS AND SAMPLES. ACTUAL SOIL AND ROCK TRANSITIONS MAY VARY AND ARE PROBABLY MORE ERRATIC.
- ELEVATIONS ARE IN FEET AND REFERENCE THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88).
- TEST BORINGS WERE MONITORED IN THE FIELD BY HALEY & ALDRICH, INC. GEOLOGIST OR GEOTECHNICAL ENGINEER.
- REFER TO THE GEOTECHNICAL DESIGN REPORT FOR TEST BORING LOGS, ROCK CORE PHOTOGRAPHS, OBSERVATION WELL INSTALLATION AND GROUNDWATER MONITORING REPORTS, AND PIEZOCONE AND SEISMIC PIEZOCONE PENETRATION TEST REPORT.

PROFILE



PROJ. MANAGER	BY	DATE	SIGNATURE	P.E. NUMBER	DATE
DESIGN-DETAILED	K. POST	6-18-21			
CHECKED-REVIEWED	M. CHAMBOURNE	8-31-21			
DESIGNS-DETAILED					
DESIGNS-DETAILED					
REVISIONS 1					
REVISIONS 2					
REVISIONS 3					
REVISIONS 4					
FIELD CHANGES					

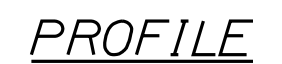
DESIGNATION, APPROXIMATE LOCATION, AND ORIENTATION OF CULVERT
INTERPRETIVE SUBSURFACE PROFILE (THIS SHEET)

PROFILE LEGEND:

The diagram illustrates the correlation between different geotechnical test results. On the left, a vertical borehole log is shown with various data points. On the right, a corresponding CPT log is displayed, showing the relationship between CPT designation and tip resistance. The x-axis at the bottom represents the uncorrected tip resistance in tons per square foot (TSF), ranging from 0 to 300.

Labels and Data Points:

- Boring No. / Offset
- Pavement Thickness, if applicable
- 10 Energy Corrected Standard Penetration Test (SPT) N60-Value (Blows Per Foot)
- $S_u = 560$ psf Peak Field Vane Undrained Shear Strength
- Approximate Top of Bedrock
- 64% Percent Recovery
- 18% Percent Rock Quality Designation (RQD)
- CPT No. / Offset
- Cone Penetration Test (CPT) Designation
- Tip Resistance
- Uncorrected Tip Resistance in Tons per Square Foot (TSF)
- Q (tsf)



Horiz. 25 0 25 50

Vert. 5 0 5 10

Scale of Feet

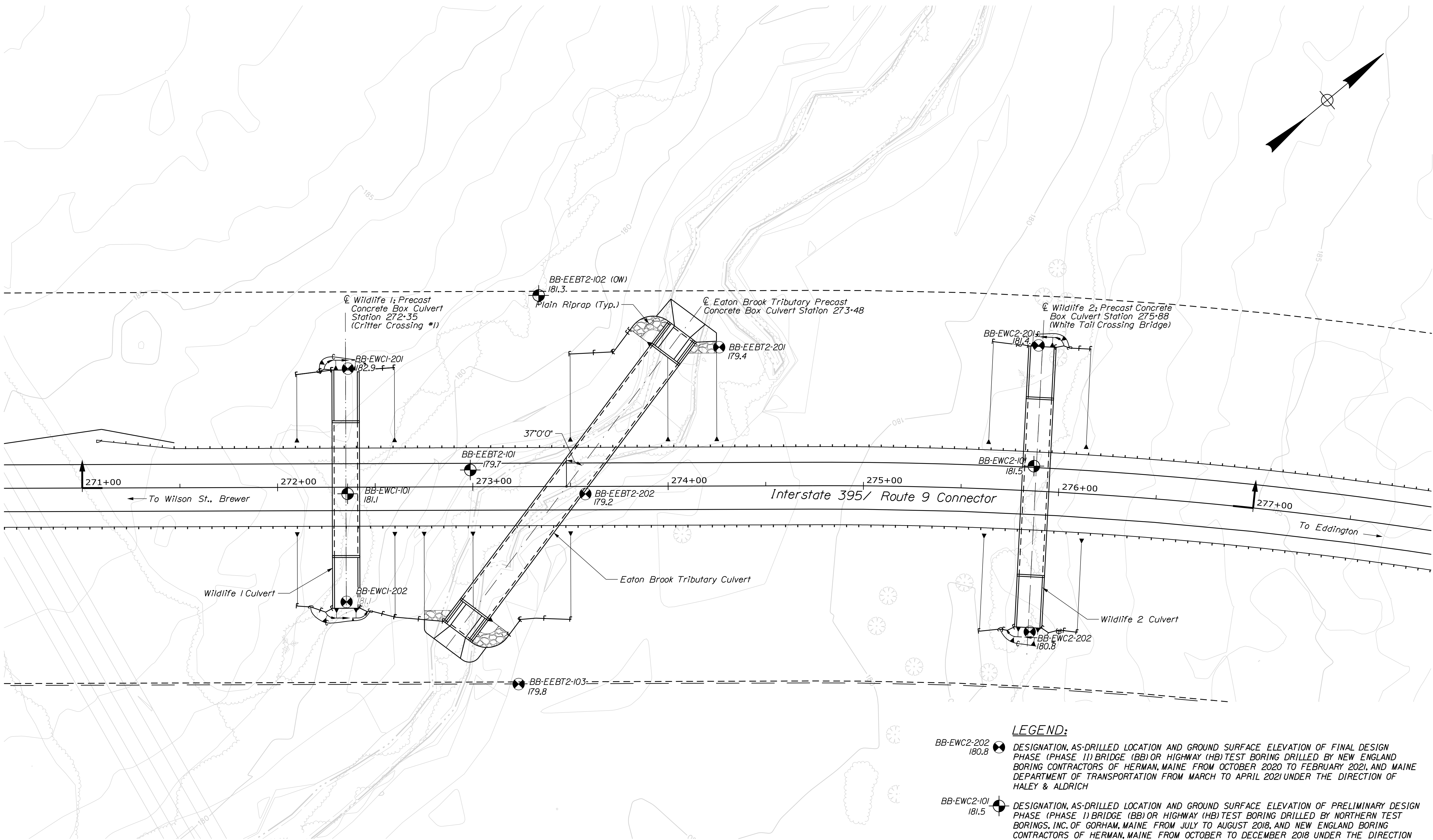
NOTES:

1. EXISTING AND PROPOSED SITE CONDITIONS, THE LOCATION AND ORIENTATION OF EXISTING SITE FEATURES, AND THE PROPOSED STRUCTURES ARE TAKEN FROM ELECTRONIC MICROSTATION FILES PROVIDED BY THE MAINE DEPARTMENT OF TRANSPORTATION.
2. THE PLAN LOCATIONS OF AND GROUND SURFACE ELEVATIONS AT TEST BORINGS SHOWN WERE DETERMINED UPON THE COMPLETION OF DRILLING BY THE MAINE DEPARTMENT OF TRANSPORTATION USING GPS SURVEY EQUIPMENT.
3. BORING OFFSET SHOWN ON THE PROFILE IS BASED ON PROPOSED I-395/ROUTE 9 CONNECTOR BASELINE.
4. THIS GENERALIZED INTERPRETIVE SUBSURFACE PROFILE IS INTENDED TO CONVEY TRENDS IN SUBSURFACE CONDITIONS, THE BOUNDARIES BETWEEN STRATA ARE APPROXIMATE AND IDEALIZED, AND HAVE BEEN DEVELOPED BY INTERPRETATIONS OF WIDELY SPACED EXPLORATIONS AND SAMPLES. ACTUAL SOIL AND ROCK TRANSITIONS MAY VARY AND ARE PROBABLY MORE ERRATIC.
5. ELEVATIONS ARE IN FEET AND REFERENCE THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88).
6. TEST BORINGS WERE MONITORED IN THE FIELD BY HALEY & ALDRICH, INC. GEOLOGIST OR GEOTECHNICAL ENGINEER.
7. REFER TO THE GEOTECHNICAL DESIGN REPORT FOR TEST BORING LOGS, ROCK CORE PHOTOGRAPHS, OBSERVATION WELL INSTALLATION AND GROUNDWATER MONITORING REPORTS, AND PIEZOCONE AND SEISMIC PIEZOCONE PENETRATION TEST REPORT.

Username:

Date:9/3/2021

Filename: ... \108_BR Plan_EatonBrook Group.dgn Division:



NOTES:

- EXISTING AND PROPOSED SITE CONDITIONS, THE LOCATION AND ORIENTATION OF EXISTING SITE FEATURES, AND THE PROPOSED STRUCTURES ARE TAKEN FROM ELECTRONIC MICROSTATION FILES PROVIDED BY THE MAINE DEPARTMENT OF TRANSPORTATION.
- THE PLAN LOCATIONS OF AND GROUND SURFACE ELEVATIONS AT TEST BORINGS SHOWN WERE DETERMINED UPON THE COMPLETION OF DRILLING BY THE MAINE DEPARTMENT OF TRANSPORTATION USING GPS SURVEY EQUIPMENT.
- ELEVATIONS ARE IN FEET AND REFERENCE THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88).
- TEST BORINGS WERE MONITORED IN THE FIELD BY HALEY & ALDRICH, INC. GEOLOGIST OR GEOTECHNICAL ENGINEER.
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LEGEND:

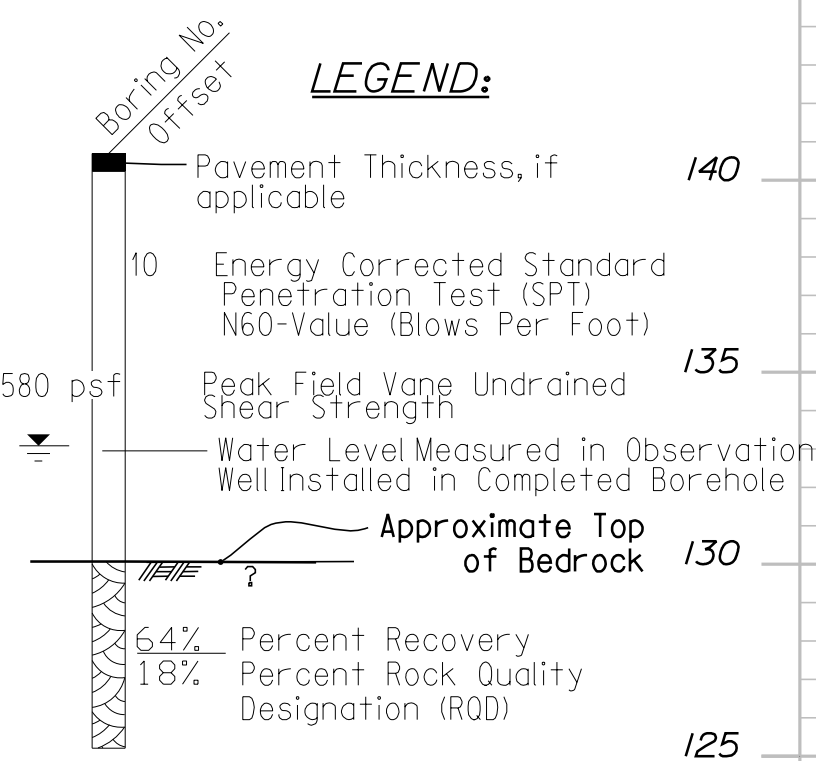
- BB-EWC2-202 180.8 DESIGNATION, AS-DRILLED LOCATION AND GROUND SURFACE ELEVATION OF FINAL DESIGN PHASE (PHASE II) BRIDGE (BB) OR HIGHWAY (HB) TEST BORING DRILLED BY NEW ENGLAND BORING CONTRACTORS OF HERMAN, MAINE FROM OCTOBER 2020 TO FEBRUARY 2021, AND MAINE DEPARTMENT OF TRANSPORTATION FROM MARCH TO APRIL 2021 UNDER THE DIRECTION OF HALEY & ALDRICH
- BB-EWC2-101 181.5 DESIGNATION, AS-DRILLED LOCATION AND GROUND SURFACE ELEVATION OF PRELIMINARY DESIGN PHASE (PHASE I) BRIDGE (BB) OR HIGHWAY (HB) TEST BORING DRILLED BY NORTHERN TEST BORINGS, INC. OF GORHAM, MAINE FROM JULY TO AUGUST 2018, AND NEW ENGLAND BORING CONTRACTORS OF HERMAN, MAINE FROM OCTOBER TO DECEMBER 2018 UNDER THE DIRECTION OF HALEY & ALDRICH
- (OW) DENOTES OBSERVATION WELL INSTALLED IN COMPLETED BOREHOLE
- DESIGNATION, APPROXIMATE LOCATION, AND ORIENTATION OF CULVERT INTERPRETIVE SUBSURFACE PROFILE (SEE FIGURE 7)

PLAN



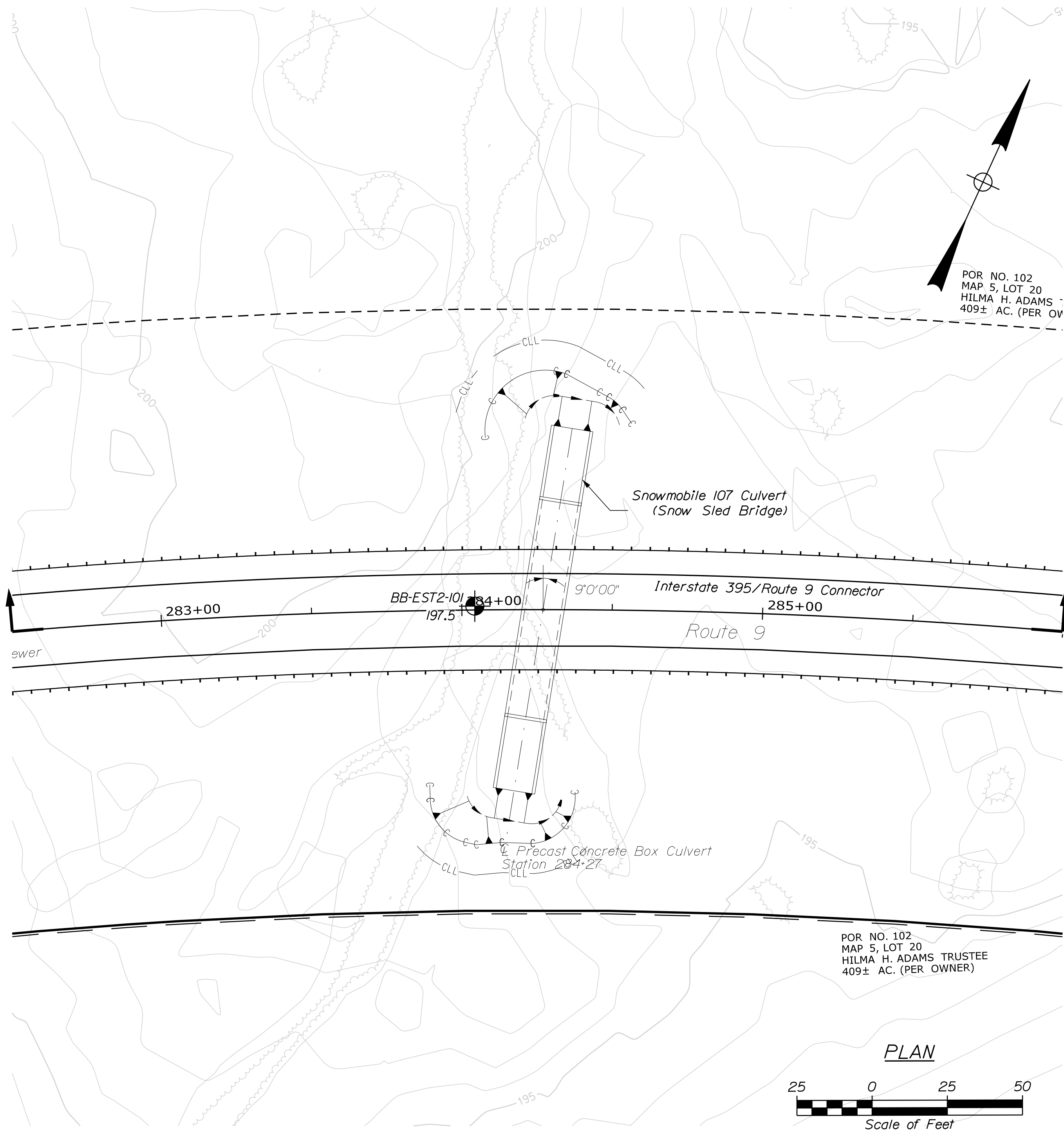
HALEY
ALDRICH

STATE OF MAINE DEPARTMENT OF TRANSPORTATION	1891500	WIN 018915.00 BRIDGE NOS. 6650, 6651, 6652	BRIDGE PLANS
I-395/ROUTE 9 CONNECTOR CULVERTS LOCATED BETWEEN STATION 272+35 AND 275+88 BREWSTER-EDDINGTON PENOBSCOT COUNTY			
SITE AND SUBSURFACE EXPLORATION LOCATION PLAN			
SHEET NUMBER 6 OF 12			



1. EXISTING AND PROPOSED SITE CONDITIONS, THE LOCATION AND ORIENTATION OF EXISTING SITE FEATURES, AND THE PROPOSED
STRUCTURES ARE TAKEN FROM ELECTRONIC MICROSTATION FILES PROVIDED BY THE MAINE DEPARTMENT OF TRANSPORTATION.
2. BORING OFFSET SHOWN ON THE PROFILE IS BASED ON PROPOSED I-395/ROUTE 9 CONNECTOR BASELINE.
3. THIS GENERALIZED INTERPRETIVE SUBSURFACE PROFILE IS INTENDED TO CONVEY TRENDS IN SUBSURFACE CONDITIONS, THE
BOUNDARIES BETWEEN STRATA ARE APPROXIMATE AND IDEALIZED, AND HAVE BEEN DEVELOPED BY INTERPRETATIONS OF WIDELY
SPACED EXPLORATIONS AND SAMPLES. ACTUAL SOIL AND ROCK TRANSITIONS MAY VARY AND ARE PROBABLY MORE ERRATIC.
4. ELEVATIONS ARE IN FEET AND REFERENCE THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88).
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AND GROUNDWATER MONITORING REPORTS, AND PIEZOCONE AND SEISMIC PIEZOCONE PENETRATION TEST REPORT.





PLAN LEGEND:

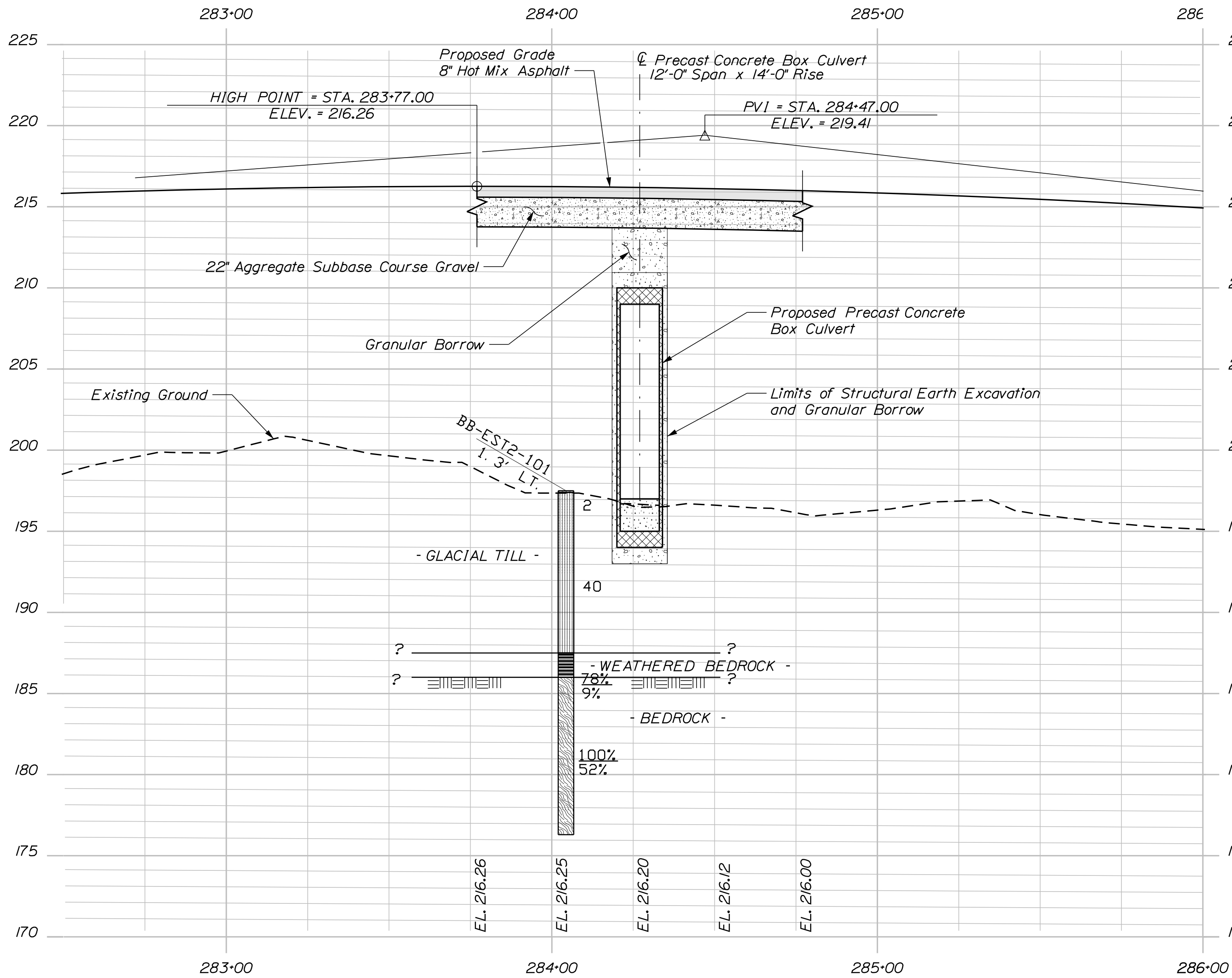
- BB-EST2-101 197.5
- DESIGNATION, GROUND SURFACE ELEVATION AND AS-DRILLED LOCATION OF PRELIMINARY (PHASE I) BRIDGE (BB) TEST BORING DRILLED BY NEW ENGLAND BORING CONTRACTORS AND MONITORED BY HALEY & ALDRICH IN NOVEMBER 2018
- DESIGNATION, APPROXIMATE LOCATION, AND ORIENTATION OF CULVERT INTERPRETIVE SUBSURFACE PROFILE (THIS SHEET)

PLAN

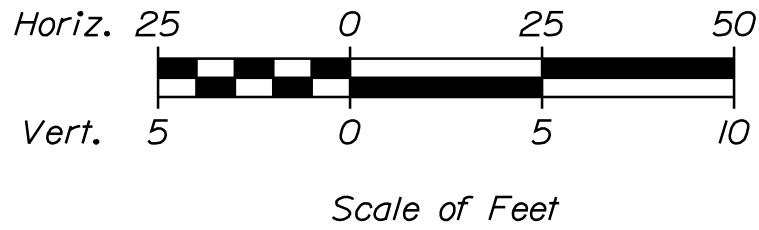


PROFILE LEGEND:

- Boring No. Offset
- Pavement Thickness, if applicable
- 10 Energy Corrected Standard Penetration Test (SPT) N60-Value (Blows Per Foot)
- Approximate Top of Bedrock
- 64% Percent Recovery
- 18% Percent Rock Quality Designation (RQD)



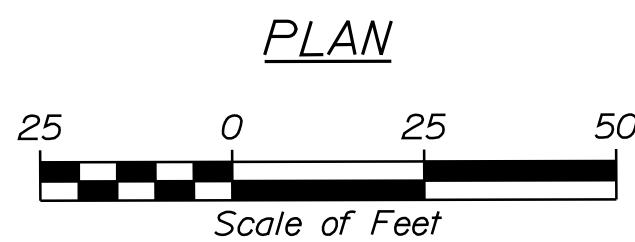
PROFILE



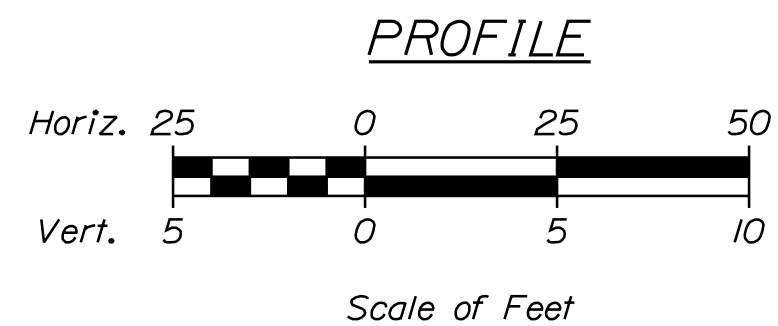
NOTES:

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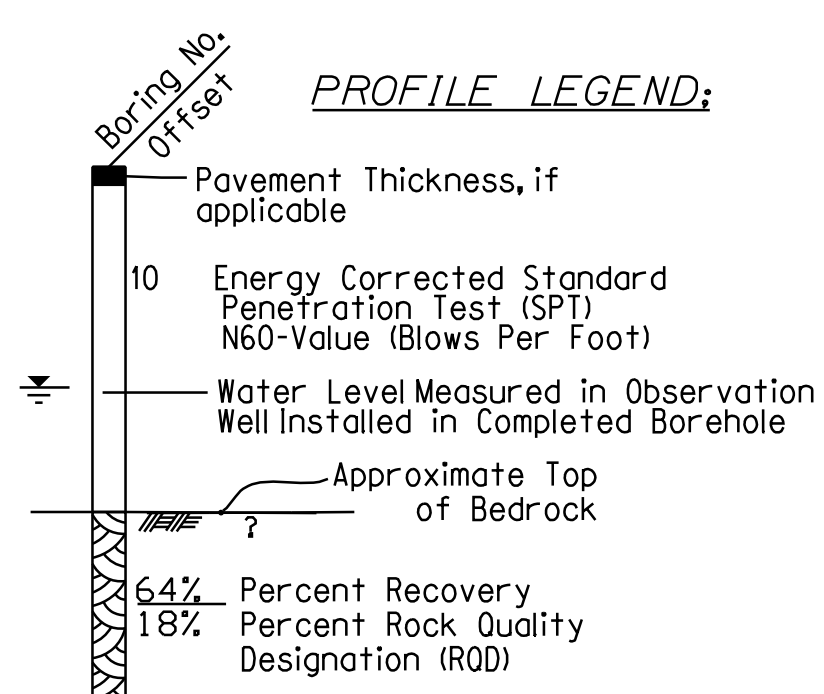
HALEY
ALDRICH

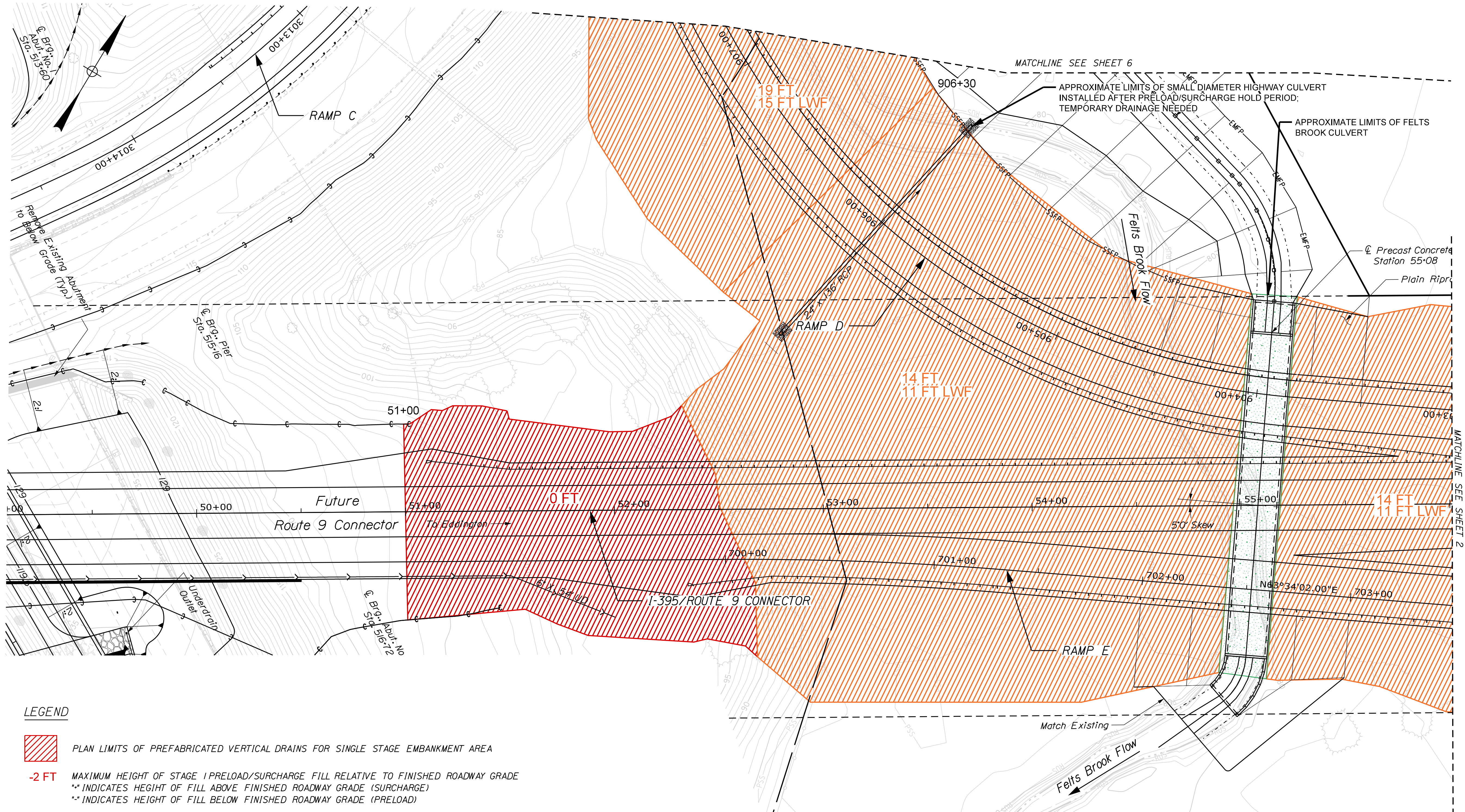


DESIGNATION, APPROXIMATE LOCATION, AND ORIENTATION OF CULVERT
INTERPRETIVE SUBSURFACE PROFILE (THIS SHEET)



1. EXISTING AND PROPOSED SITE CONDITIONS, THE LOCATION AND ORIENTATION OF EXISTING SITE FEATURES, AND THE PROPOSED STRUCTURES ARE TAKEN FROM ELECTRONIC MICROSTATION FILES PROVIDED BY THE MAINE DEPARTMENT OF TRANSPORTATION.
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5. ELEVATIONS ARE IN FEET AND REFERENCE THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88).
6. TEST BORINGS WERE MONITORED IN THE FIELD BY HALEY & ALDRICH, INC. GEOLOGIST OR GEOTECHNICAL ENGINEER.
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LEGEND

PLAN LIMITS OF PREFABRICATED VERTICAL DRAINS FOR SINGLE STAGE EMBANKMENT AREA

-2 FT MAXIMUM HEIGHT OF STAGE I PRELOAD/SURCHARGE FILL RELATIVE TO FINISHED ROADWAY GRADE
** INDICATES HEIGHT OF FILL ABOVE FINISHED ROADWAY GRADE (SURCHARGE)
** INDICATES HEIGHT OF FILL BELOW FINISHED ROADWAY GRADE (PRELOAD)

PLAN LIMITS OF PREFABRICATED VERTICAL DRAINS FOR TWO STAGE EMBANKMENT AREA; FOAM GLASS AGGREGATE (FGA) LIGHTWEIGHT FILL REQUIRED IN THESE AREAS

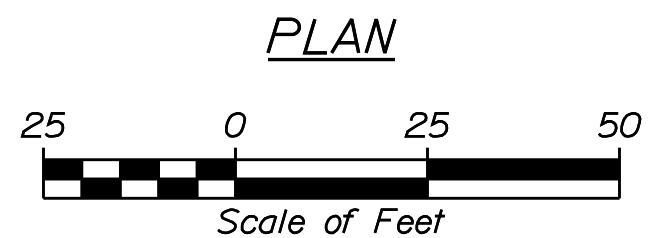
14 FT/-2 FT* MAXIMUM HEIGHT OF STAGE I PRELOAD/SURCHARGE FILL ABOVE EXISTING GROUND SURFACE/
* MAXIMUM HEIGHT OF STAGE I PRELOAD/SURCHARGE FILL RELATIVE TO FINISHED ROADWAY GRADE
3.5 FT LWF THICKNESS OF FGA LIGHTWEIGHT FILL PLACED IN STAGE TWO OF EMBANKMENT CONSTRUCTION

PILE SUPPORTED CULVERT

FULL HEIGHT FGA LIGHTWEIGHT FILL EMBANKMENT SECTION

TRANSITION AREA FROM FULL HEIGHT FGA LIGHTWEIGHT FILL EMBANKMENT SECTION TO NORMAL WEIGHT FILL EMBANKMENT SECTION

- NOTES:**
1. REFER TO SHEET 38 FOR GENERAL SPECIAL EMBANKMENT NOTES AND TYPICAL DETAILS.
 2. REFER TO SHEETS 13 TO 28 FOR SPECIAL EMBANKMENT PROFILES.
 3. REFER TO SHEETS 29 TO 37 FOR SPECIAL EMBANKMENT CROSS SECTIONS.



STATE OF MAINE	
DEPARTMENT OF TRANSPORTATION	
1891500	
WIN	018915.00
HIGHWAY PLANS	

PROJ. MANAGER	BY	DATE	SIGNATURE
DESIGN-DETAILED	E. FORCE	7-15-21	
CHECKED-REVIEWED	K. POST	7-15-21	
DESIGN-DETAILED	W. CHADBOURNE	8-25-21	
DESIGN-DETAILED			
DESIGN-DETAILED			
REVISIONS 1			P.E. NUMBER
REVISIONS 2			
REVISIONS 3			DATE
REVISIONS 4			
FIELD CHANGES			

BREWER TO EDDINGTON	
I-395/ROUTE 9 CONNECTOR	
SPECIAL EMBANKMENT	
CONSTRUCTION PLAN - AREA 1 (1 OF 8)	

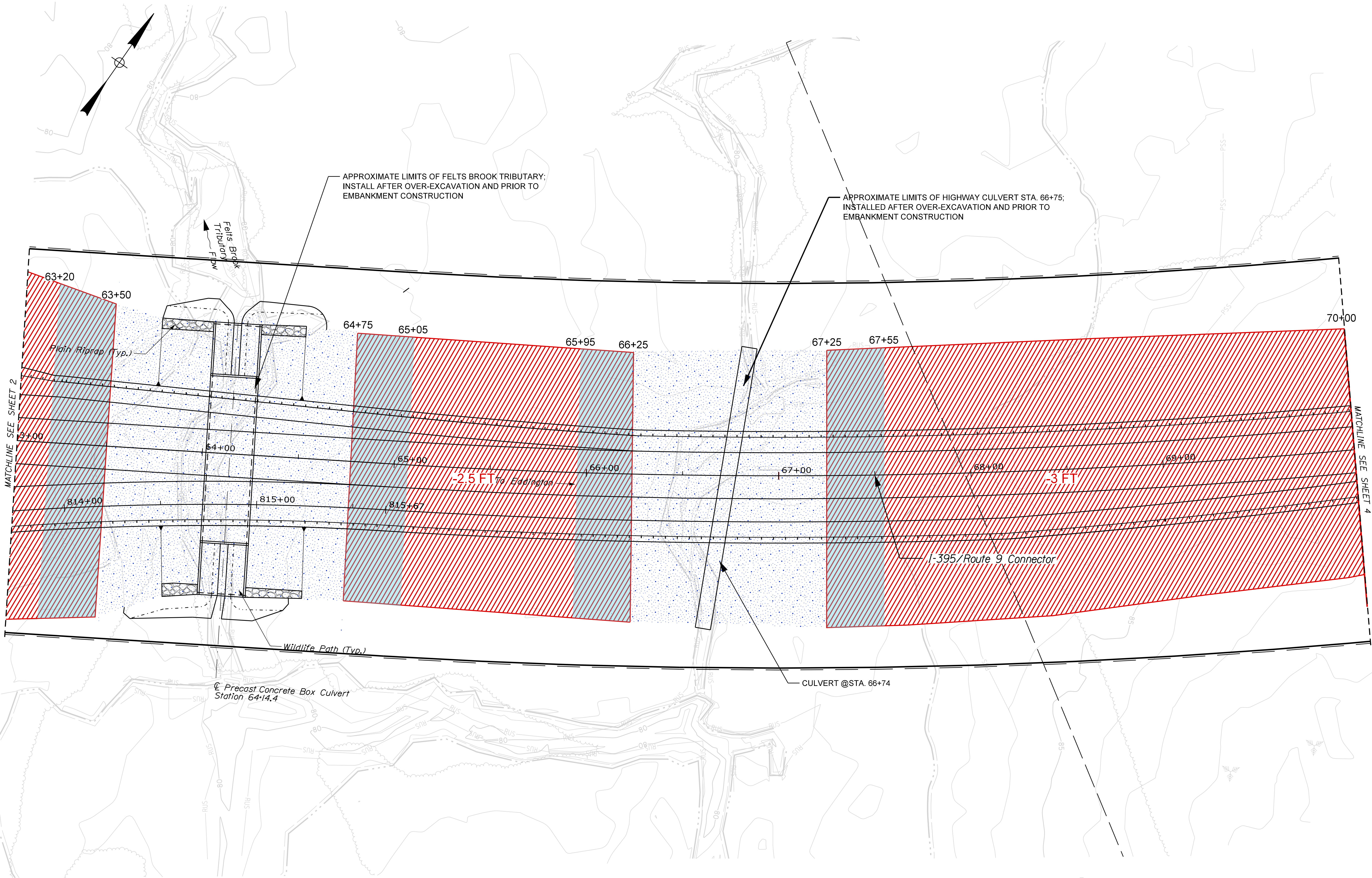
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OF 12	

Date:8/25/2021

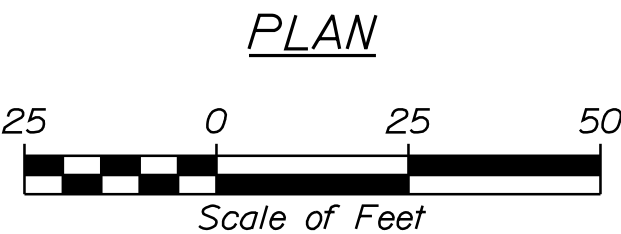
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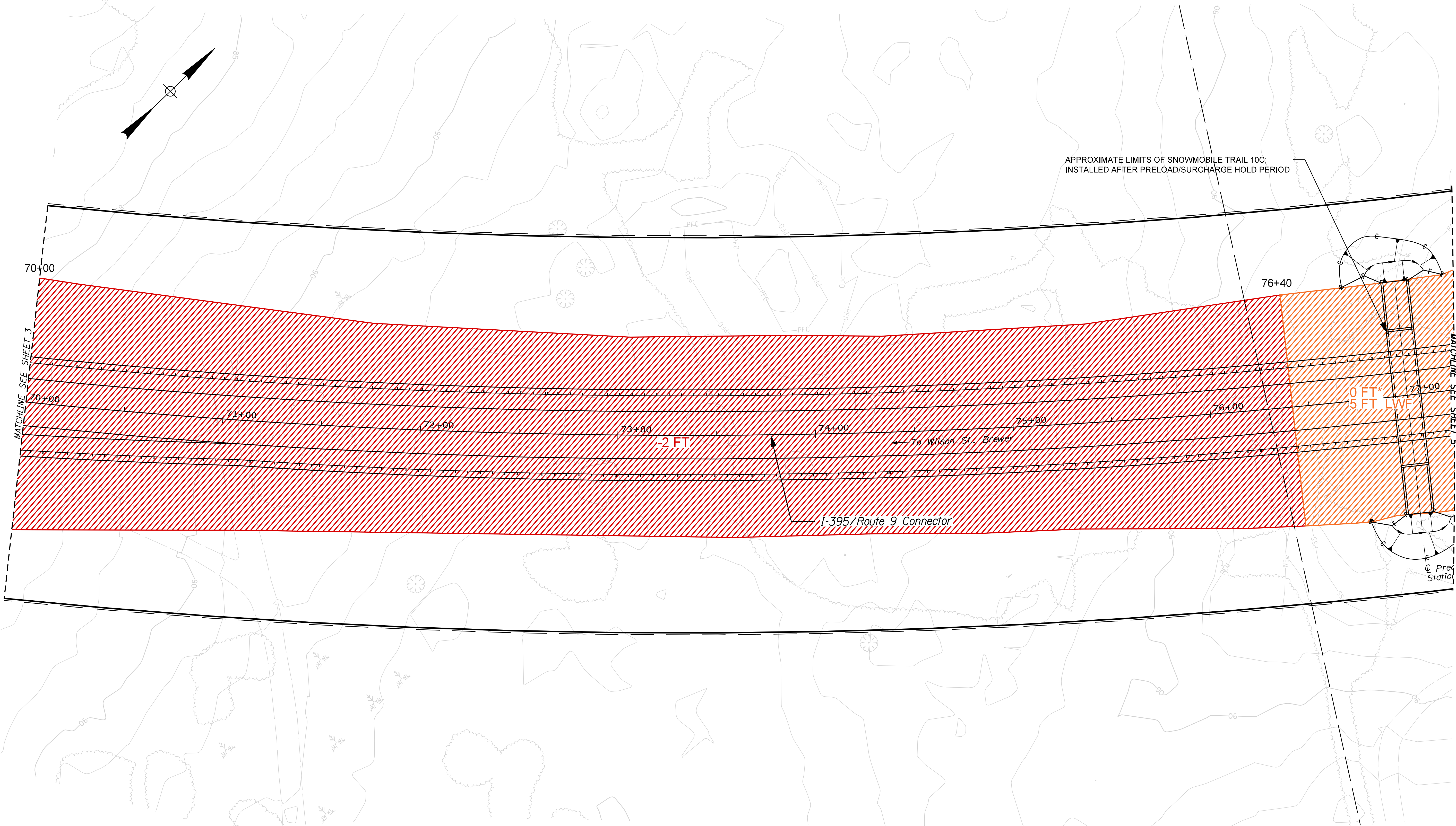


1. REFER TO SHEET 1 FOR LEGEND AND NOTES.

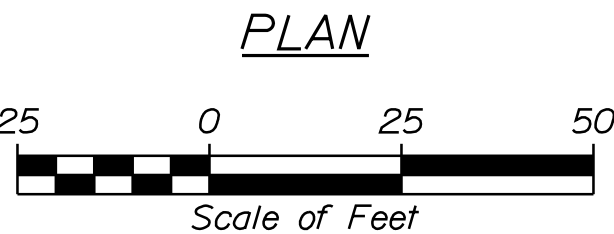


STATE OF MAINE		DEPARTMENT OF TRANSPORTATION	
1891500		WIN	
018915.00		HIGHWAY PLANS	
PROJECT MANAGER		DATE	
DESIGN-DETAILED		7-15-21	
CHECKED-REVIEWED		K. POST	
DESIGN-DETAILED		W. CHADBOURNE	
DESIGN-DETAILED		SIGNATURE	
REVISIONS 1		P.E. NUMBER	
REVISIONS 2		DATE	
REVISIONS 3			
REVISIONS 4			
FIELD CHANGES			
SHEET NUMBER		11	
OF 12			

BREWER TO EDDINGTON
I-395/ROUTE 9 CONNECTOR
SPECIAL EMBANKMENT
CONSTRUCTION PLAN - AREA 1 (3 OF 8)



1. REFER TO SHEET 1 FOR LEGEND AND NOTES.



STATE OF MAINE		DEPARTMENT OF TRANSPORTATION	
1891500		WIN	
018915.00		HIGHWAY PLANS	
BREWER TO EDDINGTON		SHEET NUMBER	
I-395/ROUTE 9 CONNECTOR		12	
SPECIAL EMBANKMENT		OF 12	
CONSTRUCTION PLAN - AREA 1 (4 OF 8)			
PROJ. MANAGER		BY	
DESIGN-DETAILED		DATE	
CHECKED-REVIEWED		K. POST	
DESIGN-DETAILED		W. CHARBONEAU	
DESIGN-DETAILED		SIGNATURE	
REVISIONS 1		P.E. NUMBER	
REVISIONS 2		DATE	
REVISIONS 3			
REVISIONS 4			
FIELD CHANGES			




APPENDIX A

Test Boring Logs and Rock Core Photographs

**Felts Brook
Sta. 55+08**

Maine Department of Transportation Soil/Rock Exploration Log US CUSTOMARY UNITS				Project: Route 9/I-395 Connector Location: Brewer and Eddington, Maine		Boring No.: BB-BFB-101 WIN: 18915.00					
Driller: Northern Test Borings, Inc.		Elevation (ft.): 79.4		Auger ID/OD: --							
Operator: M. Nadeau		Datum: NAVD 88		Sampler: Split-Spoon 1.375 in. ID							
Logged By: N. Klausmeyer		Rig Type: Diedrich D50 Track (Rig #377)		Hammer Wt./Fall: SS-140#/30; HW-140#/20							
Date Start/Finish: 07-17-18/07-18-18		Drilling Method: SSA/HW Drive		Core Barrel: NQ-2.0 in. ID							
Boring Location: Sta. 54+61.2; 2.8 Lt.		Casing ID/OD: HW-4.0 in. ID		Water Level*: Not Measured							
Hammer Efficiency Factor: 0.907		Hammer Type: Automatic <input checked="" type="checkbox"/> Hydraulic <input type="checkbox"/> Rope & Cathead <input type="checkbox"/>									
<div style="display: flex; justify-content: space-between; font-size: 0.8em;"> <div> 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 </div> <div> 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 </div> <div> 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 </div> <div> 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 </div> </div>											
Depth (ft.)	Sample Information							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				Elevation (ft.)
0	1D	24/19	0.0 - 2.0	1/1/1/1	2	3	HW	78.9		Brown, wet, soft, SILT, contains organics -TOPSOIL-(OL) Grey, wet, soft, SILT, trace clay, trace organics -MARINE DEPOSIT-(ML) Grey-brown, damp, medium stiff, Clayey SILT, trace organics -MARINE DEPOSIT-(ML) Grey, moist, Silty CLAY 55x110 mm vane raw torque readings: V1: 450/10 in-lbs Note: Vane refusal at 7.7 ft. Grey, wet, very soft, Silty CLAY -MARINE DEPOSIT-(CL) Grey, wet, Silty CLAY Grey, wet, soft to medium stiff, Silty CLAY -MARINE DEPOSIT-(CL) 55x110 mm vane raw torque readings: V2: 110/10 in-lbs V3: 135/10 in-lbs. Note: Failed tube sample from 16.0 to 18.0 ft, no recovery. Grey, Silty CLAY Grey, wet, soft, Silty CLAY -MARINE DEPOSIT-(CL) 55x110 mm vane raw torque readings: V4: 120/5 in-lbs V5: 125/5 in-lbs	C#IP-1A C#IP-1 CU#1-1 Su=656 psf LL=41 PL=22 PI=19 WC=36.1 C#IP-1B C#IP-1 CU#2-1 Su=714 psf LL=35 PL=20 PI=15 WC=40.4
	2D	24/24	2.0 - 4.0	2/2/2/1	4	6					
5	1U	24/24	5.0 - 7.0								
	V1		7.3 - 7.7	Su=1,745/40 psf							
10	3D	24/24	10.0 - 12.0	WOH/WOH/WOH/ WOH							
	2U	24/20	12.0 - 14.0								
15	4D	24/20	14.0 - 16.0	push thru vane							
	V2		14.6 - 15.0	Su=425/40 psf							
	V3		15.6 - 16.0	Su=525/40 psf							
	MU	24/24	16.0 - 18.0								
	3U	24/24	18.0 - 20.0								
20	5D	24/24	20.0 - 22.0	push thru vane							
	V4		20.6 - 21.0	Su=465/20 psf							
	V5		21.6 - 22.0	Su=485/20 psf							
25											
Remarks: 1. Washed ahead of casing in approximate 5-ft intervals from ground surface. Casing driven (advanced) after washing ahead, casing blows not recorded.											
Stratification lines represent approximate boundaries between soil types; transitions may be gradual.									Page 1 of 3		
* 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.									Boring No.: BB-BFB-101		

Maine Department of Transportation				Project: Route 9/I-395 Connector		Boring No.: BB-BFB-101		
Soil/Rock Exploration Log US CUSTOMARY UNITS				Location: Brewer and Eddington, Maine		WIN: 18915.00		
Driller: Northern Test Borings, Inc.		Elevation (ft.): 79.4		Auger ID/OD: --				
Operator: M. Nadeau		Datum: NAVD 88		Sampler: Split-Spoon 1.375 in. ID				
Logged By: N. Klausmeyer		Rig Type: Diedrich D50 Track (Rig #377)		Hammer Wt./Fall: SS-140#/30; HW-140#				
Date Start/Finish: 07-17-18/07-18-18		Drilling Method: SSA/HW Drive		Core Barrel: NQ-2.0 in. ID				
Boring Location: Sta. 54+61.2; 2.8 Lt.		Casing ID/OD: HW-4.0 in. ID		Water Level*: Not Measured				
Hammer Efficiency Factor: 0.907		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 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							Laboratory Testing Results/AASHTO and Unified Class.
	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (16 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N ₆₀	Casing Blows	
25	6D	24/24	25.0 - 27.0	push thru vane			HW	Grey, wet, soft, Silty CLAY -MARINE DEPOSIT-(CL) 55x110 mm vane raw torque readings: V6: 90/5 in-lbs V7: 100/5 in-lbs Grey, wet, Silty CLAY Grey, wet, soft, Silty CLAY -MARINE DEPOSIT-(CL) 55x110 mm vane raw torque readings: V8: 80/20 in-lbs V9: 120/20 in-lbs Note: Drill action and wash water contents indicate granular material at approximately 34.5 ft. Grey, wet, medium dense, fine SAND, some fine to coarse gravel, little silt, trace medium to coarse sand, loosely bonded -GLACIAL TILL-(SM) Grey to olive-grey, wet, very dense, fine to coarse GRAVEL, some fine to coarse sand, little silt, moderately bonded -GLACIAL TILL-(GP) Top of Bedrock at El. 39.1 ft R1: Grey, aphanitic SILTSTONE. Hard, fresh, joints dipping at moderate to steep angles, very close to close spacing, tight to open, few calcite veins. Rock Quality=Very Poor Recovery=78% -BREWER FORMATION- R1 Core Times (min:sec): 42.0-43.0' (3:25); 43.0-44.0' (4:00); 44.0-45.0' (2:23) Note: Water loss while coring at 44.0 ft depth. R2: Grey, aphanitic SILTSTONE. Hard, fresh, joints dipping at low to moderate angles, foliation dipping at moderate angles, close to moderately close, tight, calcite veins, highly weathered, fractured zone from approximately 43.5 to 45.0 ft. Rock Quality=Good Recovery=92% -BREWER FORMATION-
	V6		25.6 - 26.0	Su=350/20 psf				
	V7		26.6 - 27.0	Su=390/20 psf				
30	4U	24/23	30.0 - 32.0					
	7D	24/2	32.0 - 34.0	push thru vane				
	V8		32.6 - 33.0	Su=310/80 psf				
	V9		33.6 - 34.0	Su=465/80 psf				
35	8D	24/11	35.0 - 37.0	6/9/9/12	18	27		
40	9D	4/4	40.0 - 40.3	50(4")			RC	
	R1	36/28	42.0 - 45.0	RQD = 22%			NQ CORE	
45	R2	60/55	45.0 - 50.0	RQD = 78%				
50								
Remarks: 1. Washed ahead of casing in approximate 5-ft intervals from ground surface. Casing driven (advanced) after washing ahead, casing blows not recorded.								
Stratification lines represent approximate boundaries between soil types; transitions may be gradual.								

Maine Department of Transportation Soil/Rock Exploration Log US CUSTOMARY UNITS				Project: Route 9/I-395 Connector Location: Brewer and Eddington, Maine				Boring No.: BB-BFB-101 WIN: 18915.00																																																																																																																																																											
Driller: Northern Test Borings, Inc.				Elevation (ft.): 79.4				Auger ID/OD: --																																																																																																																																																											
Operator: M. Nadeau				Datum: NAVD 88				Sampler: Split-Spoon 1.375 in. ID																																																																																																																																																											
Logged By: N. Klausmeyer				Rig Type: Diedrich D50 Track (Rig #377)				Hammer Wt./Fall: SS-140#/30; HW-140#/#																																																																																																																																																											
Date Start/Finish: 07-17-18/07-18-18				Drilling Method: SSA/HW Drive				Core Barrel: NQ-2.0 in. ID																																																																																																																																																											
Boring Location: Sta. 54+61.2; 2.8 Lt.				Casing ID/OD: HW-4.0 in. ID				Water Level*: Not Measured																																																																																																																																																											
Hammer Efficiency Factor: 0.907				Hammer Type: Automatic <input checked="" type="checkbox"/> Hydraulic <input type="checkbox"/> Rope & Cathead <input type="checkbox"/>																																																																																																																																																															
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* 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.										Boring No.: BB-BFB-101																																																																																																																																																									

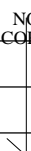

Maine Department of Transportation Soil/Rock Exploration Log US CUSTOMARY UNITS				Project: Route 9/I-395 Connector Location: Brewer and Eddington, Maine				Boring No.: BB-BFB-201 WIN: 18915.00																																																																																																																																																																																																																																																																																																																					
Driller: New England Boring Contractors				Elevation (ft.): 80.9				Auger ID/OD: --																																																																																																																																																																																																																																																																																																																					
Operator: M. Porter				Datum: NAVD 88				Sampler: Split Spoon 1.375 in. ID																																																																																																																																																																																																																																																																																																																					
Logged By: J. Fletcher				Rig Type: Mobile B-53 Track				Hammer Wt./Fall: SS-140#/30; HW-300#/16																																																																																																																																																																																																																																																																																																																					
Date Start/Finish: 11-16-2020/11-16-2020				Drilling Method: SSA/HW Drive				Core Barrel: NQ-2.0 in. ID																																																																																																																																																																																																																																																																																																																					
Boring Location: Sta. 903+99.8, 47.8 RT				Casing ID/OD: HW-4.0 in. ID				Water Level*: 0.0 ft																																																																																																																																																																																																																																																																																																																					
Hammer Efficiency Factor: 0.852				Hammer Type: Automatic <input checked="" type="checkbox"/> Hydraulic <input type="checkbox"/> Rope & Cathead <input type="checkbox"/>																																																																																																																																																																																																																																																																																																																									
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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	24/7	0.0 - 2.0	WOH/WOH/1/3	1	1	SSA			Grey, wet, very soft, Silty CLAY, moderately plastic, organics -MARINE DEPOSIT-(CL)	LL=32 PL=16 PI=16 WC=33.7 CL																																													5	2D	24/22	5.0 - 7.0	3/2/2/2	4	6	20			Grey-brown mottled, wet, medium stiff, Silty CLAY, moderately plastic -MARINE DEPOSIT-(CL)								22											39											53											51				10	1U	24/7	10.0 - 12.0				26											25					3D V1	24/24	12.0 - 14.0	push thru vane Su=270/40 psf			21			Grey, wet, soft, Silty CLAY, moderately to highly plastic -MARINE DEPOSIT-(CL) 55x110 mm vane raw torque readings: V1: 70/10 in-lbs Note: Attempted field vane shear test, no penetration.		MV		13.6 - 14.0				17											14				15	4D V2	24/24	15.0 - 17.0	push thru vane Su=580/60 psf			PUSH			Grey, wet, medium stiff, Silty CLAY, moderately plastic -MARINE DEPOSIT-(CL) 55x110 mm vane raw torque readings: V2: 150/15 in-lbs V3: 140/10 in-lbs		V3		16.6 - 17.0	Su=545/40 psf																																								20	5D V4	24/24	20.0 - 22.0	push thru vane Su=425/60 psf						Grey, wet, soft, Silty CLAY, moderate to low plasticity -MARINE DEPOSIT-(CL) 55x110 mm vane raw torque readings: V4: 110/15 in-lbs V5: 110/20 in-lbs		V5		21.6 - 22.0	Su=425/80 psf																			2U	24/16.8	23.0 - 25.0																			25										
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10	1U	24/7	10.0 - 12.0				26																																																																																																																																																																																																																																																																																																																						
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	3D V1	24/24	12.0 - 14.0	push thru vane Su=270/40 psf			21			Grey, wet, soft, Silty CLAY, moderately to highly plastic -MARINE DEPOSIT-(CL) 55x110 mm vane raw torque readings: V1: 70/10 in-lbs Note: Attempted field vane shear test, no penetration.																																																																																																																																																																																																																																																																																																																			
	MV		13.6 - 14.0				17																																																																																																																																																																																																																																																																																																																						
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15	4D V2	24/24	15.0 - 17.0	push thru vane Su=580/60 psf			PUSH			Grey, wet, medium stiff, Silty CLAY, moderately plastic -MARINE DEPOSIT-(CL) 55x110 mm vane raw torque readings: V2: 150/15 in-lbs V3: 140/10 in-lbs																																																																																																																																																																																																																																																																																																																			
	V3		16.6 - 17.0	Su=545/40 psf																																																																																																																																																																																																																																																																																																																									
20	5D V4	24/24	20.0 - 22.0	push thru vane Su=425/60 psf						Grey, wet, soft, Silty CLAY, moderate to low plasticity -MARINE DEPOSIT-(CL) 55x110 mm vane raw torque readings: V4: 110/15 in-lbs V5: 110/20 in-lbs																																																																																																																																																																																																																																																																																																																			
	V5		21.6 - 22.0	Su=425/80 psf																																																																																																																																																																																																																																																																																																																									
	2U	24/16.8	23.0 - 25.0																																																																																																																																																																																																																																																																																																																										
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Maine Department of Transportation Soil/Rock Exploration Log US CUSTOMARY UNITS				Project: Route 9/I-395 Connector Location: Brewer and Eddington, Maine		Boring No.: BB-BFB-201 WIN: 18915.00				
Driller: New England Boring Contractors			Elevation (ft.): 80.9		Auger ID/OD: --					
Operator: M. Porter			Datum: NAVD 88		Sampler: Split Spoon 1.375 in. ID					
Logged By: J. Fletcher			Rig Type: Mobile B-53 Track		Hammer Wt./Fall: SS-140#/30; HW-300#/#					
Date Start/Finish: 11-16-2020/11-16-2020			Drilling Method: SSA/HW Drive		Core Barrel: NQ-2.0 in. ID					
Boring Location: Sta. 903+99.8, 47.8 RT			Casing ID/OD: HW-4.0 in. ID		Water Level*: 0.0 ft					
Hammer Efficiency Factor: 0.852			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 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							Graphic Log	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.
	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (16 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N ₆₀	Casing Blows			
25	6D	24/24	25.0 - 27.0	push thru vane			11		Grey, wet, soft, Silty CLAY, low plasticity -MARINE DEPOSIT-(CL) 55x110 mm vane raw torque readings: V6: 110/20 in-lbs V7: 100/20 in-lbs Note: Drill action indicates change at 29.0 ft. Grey, wet, very dense, fine to coarse SAND, some gravel, trace silt, loosely bonded -GLACIAL TILL-(SP) Top of Bedrock El. 50.2 R1: Grey, aphanitic, SILTSTONE, hard, fresh to slightly weathered. Joints dipping at low to moderate angles, very close to close spacing, tight to open, rough, planar joints. Secondary steeply dipping joints, moderately close, tight to open. Calcite veins. Moderately to highly fractured throughout. Rock Quality=Poor Recovery=100% -BREWER FORMATION- R1 Core Times (min:sec): 31.0-32.0' (3:43); 32.0-33.0' (3:06); 33.0-34.0' (2:58); 34.0-35.0' (2:33); 35.0-35.6' (0:29) Bottom of Exploration at 35.6 feet below ground surface.	
	V6		25.6 - 26.0	Su=425/80 psf			12			
	V7		26.6 - 27.0	Su=390/80 psf			19			
							79			
							103			
30	7D	8.4/4	30.0 - 30.7	17/50(2")			RC			
	R1	55/55	31.0 - 35.6	RQD = 45%			NQ CORE			
35							45.3			
40										
45										
50										
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: Route 9/I-395 Connector Location: Brewer and Eddington, Maine		Boring No.: BB-BFB-202 WIN: 18915.00				
Driller: New England Boring Contractors		Elevation (ft.): 80.5		Auger ID/OD: --						
Operator: M. Porter		Datum: NAVD 88		Sampler: Split Spoon 1.375 in. ID						
Logged By: J. Fletcher		Rig Type: Mobile B-53 Track		Hammer Wt./Fall: SS-140#/30; HW-300#/16						
Date Start/Finish: 11-9-2020/11-10-2020		Drilling Method: SSA/HW Drive		Core Barrel: NQ-2.0 in. ID						
Boring Location: Sta. 702+28.8, 28.0 RT		Casing ID/OD: HW-4.0 in. ID		Water Level*: 0.1 ft						
Hammer Efficiency Factor: 0.852		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 = Plasticity Limit PI = Plasticity Index G = Grain Size Analysis C = Consolidation Test										
Depth (ft.)	Sample Information							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	24/7	0.0 - 2.0	WOR/WOR/WH/WH			SSA		Brown, wet, very soft, Silty CLAY, low plasticity, organics -MARINE DEPOSIT-(CL)	C#IP-17 CU#17-1 Su=414psf DSS-1 Su=254psf LL=38 PL=19 PI=19 WC=42.9 CL
5	2D	24/24	5.0 - 7.0	WOH/WH/WH/WH			13		Grey, wet, very soft, Silty CLAY, moderate plasticity -MARINE DEPOSIT-(CL)	
10	3D MV	24/24	10.0 - 12.0 10.6 - 11.0	WOH/WH/WH/WH			17		Grey to dark grey, wet, very soft, Silty CLAY, low plasticity -MARINE DEPOSIT-(CL) Note: Attempted field vane shear test, no penetration.	
15	4D V1 V2	24/24	15.0 - 17.0 15.6 - 16.0 16.6 - 17.0	push thru vane Su=545/80 psf Su=580/80 psf			33 27 29		Dark grey to grey, wet, medium stiff, Silty CLAY, low to moderate plasticity -MARINE DEPOSIT-(CL) 55x110 mm vane raw torque readings: V1: 140/20 in-lbs V2: 150/20 in-lbs	
20	5D V3 V4	24/24	20.0 - 22.0 20.6 - 21.0 21.6 - 22.0	push thru vane Su=425/60 psf Su=465/80 psf			29 23 24		Grey to dark grey, wet, soft, Silty CLAY, moderate plasticity -MARINE DEPOSIT-(CL) 55x110 mm vane raw torque readings: V3: 110/15 in-lbs V4: 120/20 in-lbs	
25							22			
Remarks:										
Stratification lines represent approximate boundaries between soil types; transitions may be gradual.										Page 1 of 3
* 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.										Boring No.: BB-BFB-202

Maine Department of Transportation Soil/Rock Exploration Log US CUSTOMARY UNITS				Project: Route 9/I-395 Connector Location: Brewer and Eddington, Maine		Boring No.: BB-BFB-202 WIN: 18915.00				
Driller: New England Boring Contractors			Elevation (ft.): 80.5		Auger ID/OD: --					
Operator: M. Porter			Datum: NAVD 88		Sampler: Split Spoon 1.375 in. ID					
Logged By: J. Fletcher			Rig Type: Mobile B-53 Track		Hammer Wt./Fall: SS-140#/30; HW-300#					
Date Start/Finish: 11-9-2020/11-10-2020			Drilling Method: SSA/HW Drive		Core Barrel: NQ-2.0 in. ID					
Boring Location: Sta. 702+28.8, 28.0 RT			Casing ID/OD: HW-4.0 in. ID		Water Level*: 0.1 ft					
Hammer Efficiency Factor: 0.852			Hammer Type: Automatic <input checked="" type="checkbox"/> Hydraulic <input type="checkbox"/> Rope & Cathead <input type="checkbox"/>							
<div style="display: flex; justify-content: space-between; font-size: 0.8em;"> <div> 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 </div> <div> 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 </div> <div> 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 </div> <div> 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 </div> </div>										
Depth (ft.)	Sample Information							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	2U	24/24	25.0 - 27.0				29		Grey to dark grey, wet, soft to medium stiff, Silty CLAY, moderate plasticity -MARINE DEPOSIT-(CL) 55x110 mm vane raw torque readings: V5: 130/15 in-lbs V6: 110/15 in-lbs	LL=35 PL=20 PI=15 WC=36.0 CL
							25			
	6D	24/24	27.0 - 29.0	WOH/WOH/WOH/			25			
	V5		27.6 - 28.0	Su=505/60 psf			28			
	V6		28.6 - 29.0	Su=425/60 psf			27			
30										
	7D	24/24	30.0 - 32.0	push thru vane			28			
	V7		30.6 - 31.0	Su=425/60 psf			23			
	V8		31.6 - 32.0	Su=425/60 psf			22			
							23			
35							19		Dark grey, wet, soft, Silty CLAY, moderate plasticity -MARINE DEPOSIT-(CL) 55x110 mm vane raw torque readings: V7: 110/15 in-lbs V8: 110/15 in-lbs	
	8D	24/24	35.0 - 37.0	push thru vane			26			
	V9		35.6 - 36.0	Su=390/60 psf			36			
	V10		36.6 - 37.0	Su=425/80 psf			28			
							21			
							13			
40										
	9D	24/24	40.0 - 42.0	push thru vane			19			
	V11		40.6 - 41.0	Su=545/115 psf			19			
	MV		41.6 - 42.0				40			
							44		Grey, wet, medium stiff, Silty CLAY, trace coarse gravel, moderate plasticity -MARINE DEPOSIT-(CL) 55x110 mm vane raw torque readings: V11: 140/30 in-lbs Note: Attempted field vane shear test, refusal.	
							31			
45										
	10D	24/7	45.0 - 47.0	9/5/7/37	12	17	37			
							95			
							278			
	R1	60/56	48.5 - 53.5	RQD = 52%			RC			
							NQ			
							CORE			
50										
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.										

<div>Maine Department of Transportation</div>						Project: Route 9/I-395 Connector							Boring No.: BB-BFB-202																														
Soil/Rock Exploration Log US CUSTOMARY UNITS						Location: Brewer and Eddington, Maine							WIN: 18915.00																														
Driller: New England Boring Contractors						Elevation (ft.): 80.5							Auger ID/OD: --																														
Operator: M. Porter						Datum: NAVD 88							Sampler: Split Spoon 1.375 in. ID																														
Logged By: J. Fletcher						Rig Type: Mobile B-53 Track							Hammer Wt./Fall: SS-140#/30; HW-300#/#																														
Date Start/Finish: 11-9-2020/11-10-2020						Drilling Method: SSA/HW Drive							Core Barrel: NQ-2.0 in. ID																														
Boring Location: Sta. 702+28.8, 28.0 RT						Casing ID/OD: HW-4.0 in. ID							Water Level*: 0.1 ft																														
Hammer Efficiency Factor: 0.852						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											Su = Peak/Remolded Field Vane Undrained Shear Strength (psf) Su(lab) = Lab Vane Undrained Shear Strength (psf) qp = 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											Tv = 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										
<div>Sample Information</div>																																											
Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N60	Casing Blows	Elevation (ft.)	Graphic Log	Visual Description and Remarks											Laboratory Testing Results/AASHTO and Unified Class.																						
50							NO CORE 	27.0		veins (0.25 to 0.75-in. thick). Rock Quality=Fair Recovery=93% -BREWER FORMATION- R1 Core Times (min:sec): 48.5-49.5' (2:47); 49.5-50.5' (2:27); 50.5-51.5' (2:21); 51.5-52.5' (2:11); 52.5-53.5' (3:02)																																	
										Bottom of Exploration at 53.5 feet below ground surface.																																	
55																																											
60																																											
65																																											
70																																											
75																																											
Remarks:																																											
Stratification lines represent approximate boundaries between soil types; transitions may be gradual.																																											
Page 3 of 3																Boring No.: BB-BFB-202																											

Maine Department of Transportation Soil/Rock Exploration Log US CUSTOMARY UNITS				Project: Route 9/I-395 Connector		Boring No.: HB-BE-101				
				Location: Brewer and Eddington, Maine		WIN: 18915.00				
Driller: Northern Test Borings, Inc.		Elevation (ft.): 82.0		Auger ID/OD: --						
Operator: M. Nadeau		Datum: NAVD 88		Sampler: Split-Spoon 1.375 in. ID						
Logged By: N. Klausmeyer		Rig Type: Diedrich D50 Track (Rig #377)		Hammer Wt./Fall: SS-140#/30; HW-140#/20						
Date Start/Finish: 07-16-18/07-16-18		Drilling Method: SSA/HW Drive		Core Barrel: --						
Boring Location: Sta. 52+97.4; 1.8 Lt.		Casing ID/OD: HW-4.0 in. ID		Water Level*: See Remarks						
Hammer Efficiency Factor: 0.907		Hammer Type: Automatic <input checked="" type="checkbox"/> Hydraulic <input type="checkbox"/> Rope & Cathead <input type="checkbox"/>								
<div style="font-size: small;"> 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 S_u(lab) = Lab Vane Undrained Shear Strength (psf) WC = Water Content, percent MD = Unsuccessful Split Spoon Sample Attempt 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 = Plasticity 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 </div>										
Depth (ft.)	Sample Information							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	24/20	0.0 - 2.0	2/2/3/4	5	8	SSA	81.0	Brown, damp, medium stiff, SILT, trace fine sand, trace organics -TOPSOIL-(OL)	C#IP-3 CU#3-1 Su=984 psf LL=45 PL=24 PI-21 WC=35.1
								80.0	Grey-brown, moist, medium stiff, Clayey SILT, trace organics -MARINE DEPOSIT-(ML)	
	2D	24/16	2.0 - 4.0	3/3/5/5	8	12				
									Grey, moist, medium stiff, Silty CLAY, trace organics -MARINE DEPOSIT-(CL)	
5								77.0	Grey, Clayey SILT -MARINE DEPOSIT-(ML)	
	1U	24/19	5.0 - 7.0				HW			
	MV		6.6 - 7.0					75.4	Note: Attempted field vane shear test at 7.0 ft, no penetration. Grey, moist, stiff, Silty CLAY, trace organics -MARINE DEPOSIT-(CL)	
	3D	24/19	7.0 - 9.0	2/3/3/3	6	9				
10										
	4D	24/24	10.0 - 12.0	WOH/WOH/WO1P/2					Grey, wet, very soft, Silty CLAY, trace organics -MARINE DEPOSIT-(CL)	
15	MU	0/0	15.0 - 15.0							
	5D	24/0	15.0 - 17.0	WOH/WOR/WOR/ WOR					Grey, wet, very soft, Silty CLAY -MARINE DEPOSIT-(CL)	
	MU	24/0	17.0 - 19.0							
20										
	6D	24/24	20.0 - 22.0	push thru vane					Grey, wet, very soft, Silty CLAY -MARINE DEPOSIT-(CL)	
	V1		20.6 - 21.0	Su=660/40 psf					55x110 mm vane raw torque readings: V1: 170/10 in-lbs V2: 150/10 in-lbs	
	V2		21.6 - 22.0	Su=580/40 psf						
25	2U	24/23	24.0 - 26.0						Grey, wet, Silty CLAY	
Remarks: 1. Washed ahead of casing in approximate 5-ft intervals below 5 ft. Casing driven (advanced) after washing ahead, casing blows not recorded. 2. Observation well installed in completed borehole. See observation well installation and groundwater monitoring reports for details.										
Stratification lines represent approximate boundaries between soil types; transitions may be gradual.								Page 1 of 2		
* 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.								Boring No.: HB-BE-101		

Maine Department of Transportation Soil/Rock Exploration Log US CUSTOMARY UNITS				Project: Route 9/I-395 Connector Location: Brewer and Eddington, Maine				Boring No.: HB-BE-101 WIN: 18915.00		
Driller: Northern Test Borings, Inc.				Elevation (ft.): 82.0				Auger ID/OD: --		
Operator: M. Nadeau				Datum: NAVD 88				Sampler: Split-Spoon 1.375 in. ID		
Logged By: N. Klausmeyer				Rig Type: Diedrich D50 Track (Rig #377)				Hammer Wt./Fall: SS-140#/30; HW-140#		
Date Start/Finish: 07-16-18/07-16-18				Drilling Method: SSA/HW Drive				Core Barrel: --		
Boring Location: Sta. 52+97.4; 1.8 Lt.				Casing ID/OD: HW-4.0 in. ID				Water Level*: See Remarks		
Hammer Efficiency Factor: 0.907				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 N ₆₀ = SPT N-uncorrected Corrected for Hammer Efficiency N ₆₀ = (Hammer Efficiency Factor/60%)*N-uncorrected T _y = 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							Graphic Log	Visual Description and Remarks	Laboratory Testing Results/AASHTO and Unified Class.
	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (16 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N ₆₀	Casing Blows			
25							HW		Grey, wet, soft to medium stiff, Silty CLAY -MARINE DEPOSIT-(CL) 55x110 mm vane raw torque readings: V3: 165/15 in-lbs V4: 115/10 in-lbs Note: Water loss at approximately 29.0 ft. Grey, wet, very soft, Silty CLAY -MARINE DEPOSIT-(CL) Grey, wet, soft to medium stiff, Silty CLAY -MARINE DEPOSIT-(CL) 55x110 mm vane raw torque readings: V5: 160/30 in-lbs V6: 110/15 in-lbs Grey, Silty CLAY grading to SAND Note: Attempted 55 x 110 mm vane shear test from 37.64 to 38.0 ft, no penetration. Grey, wet, very dense, fine to coarse GRAVEL, some silt, little fine to coarse sand -GLACIAL TILL-(GM) Top of Probable Bedrock at El. 39.4 ft -PROBABLE BEDROCK- Bottom of Exploration at 45.0 feet below ground surface.	
	7D V3	24/24	26.0 - 28.0 26.6 - 27.0	push thru vane Su=640/60 psf						
	V4		27.6 - 28.0	Su=445/40 psf						
30	8D	24/24	30.0 - 32.0	WOR/WOR/WOR/ WOR						
	9D V5	24/24	32.0 - 34.0 32.6 - 33.0	push thru vane Su=620/115 psf						
	V6		33.6 - 34.0	Su=425/60 psf						
35	3U	24/24	35.0 - 37.0							
	MV		37.6 - 38.0							
40	10D	15/10	40.0 - 41.3	7/8/50(3")			RC			
45										
50										

Remarks:
 1. Washed ahead of casing in approximate 5-ft intervals below 5 ft. Casing driven (advanced) after washing ahead, casing blows not recorded.
 2. Observaton well installed in completed borehole. See observation well installation and groundwater monitoring reports for details.

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.

Page 2 of 2
Boring No.: HB-BE-101

Felts Brook Tributary
Sta. 64+14

Maine Department of Transportation Soil/Rock Exploration Log US CUSTOMARY UNITS				Project: Route 9/I-395 Connector Location: Brewer and Eddington, Maine		Boring No.: BB-BFB1-201 WIN: 18915.00	
Driller: New England Boring Contractors		Elevation (ft.): 80.7		Auger ID/OD: --			
Operator: M. Porter		Datum: NAVD 88		Sampler: Split Spoon 1.375 in. ID			
Logged By: J. Fletcher		Rig Type: Mobile B-53 Track		Hammer Wt./Fall: SS-140#/30; HW-300#/16			
Date Start/Finish: 11-18-2020/11-19-2020		Drilling Method: SSA/HW Drive		Core Barrel: NQ-2.0 in. ID			
Boring Location: Sta. 63+88.2, 63.2 LT		Casing ID/OD: HW-4.0 in. ID		Water Level*: Artesian			
Hammer Efficiency Factor: 0.852		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							
Sample Information							
Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N ₆₀	Casing Blows
0	1D	24/12	0.0 - 2.0	WOH/WOH/2/2	2	3	SSA
5	2D MU	24/24	5.0 - 7.0 5.0 - 7.0	WOH/WOH/WOH/ WOH			17 23 31 26 33
10	3D MV	24/24	10.0 - 12.0 10.6 - 11.0	WOH/WOH/WOH/ WOH			35 28 31 26 23
15	4D/A MV	24/15	15.0 - 17.0 15.6 - 16.0	WOH/6/9/12	15	21	41 32 48 47 42
20	5D	24/7	20.0 - 22.0	8/8/12/18	20	28	HW RC
25							
				Elevation (ft.)		Graphic Log	
				Visual Description and Remarks		Laboratory Testing Results/ AASHTO and Unified Class.	
				Brown, moist, very soft, SILT, organics -TOPSOIL-(OL) 0.1-			
				Grey-brown mottled, moist, soft, Silty CLAY, low plasticity -MARINE DEPOSIT-(CL)			
				Grey-brown mottled, moist, very soft, Silty CLAY, moderate plasticity -MARINE DEPOSIT-(CL) Note: Attempted tube sample, no recovery.			
				Grey-brown mottled, wet, very soft, Silty CLAY, moderate plasticity -MARINE DEPOSIT-(CL) Note: Attempted field vane shear test, no penetration.			
				Grey, wet, very soft, Silty CLAY, moderate plasticity -MARINE DEPOSIT-(CL) Note: Attempted field vane shear test, no penetration.			
				Grey, wet, very stiff, fine Sandy SILT, some gravel, trace medium to coarse sand, loosely bonded -GLACIAL TILL-(ML) 15.8-			
				Grey, wet, medium dense, fine to coarse SAND, some silt, some gravel, loosely bonded -GLACIAL TILL-(SM) 20.0-			
				Top of Bedrock El. 57.9 22.8-			
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: Route 9/I-395 Connector Location: Brewer and Eddington, Maine				Boring No.: BB-BFB1-201 WIN: 18915.00																			
Driller: New England Boring Contractors				Elevation (ft.): 80.7				Auger ID/OD: --																			
Operator: M. Porter				Datum: NAVD 88				Sampler: Split Spoon 1.375 in. ID																			
Logged By: J. Fletcher				Rig Type: Mobile B-53 Track				Hammer Wt./Fall: SS-140#/30; HW-300#																			
Date Start/Finish: 11-18-2020/11-19-2020				Drilling Method: SSA/HW Drive				Core Barrel: NQ-2.0 in. ID																			
Boring Location: Sta. 63+88.2, 63.2 LT				Casing ID/OD: HW-4.0 in. ID				Water Level*: Artesian																			
Hammer Efficiency Factor: 0.852				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 N ₆₀ = SPT N-uncorrected Corrected for Hammer Efficiency N ₆₀ = (Hammer Efficiency Factor/60%)*N-uncorrected T _y = 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								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	R1	57.6/55	25.0 - 29.8	RQD = 35%				NO CORE		R1: Grey, aphanitic, SILTSTONE, moderately hard, fresh to slightly weathered. Joints dipping at low to moderate angles, very close to close spacing, tight to open, calcite intrusions. Rock Quality=Poor Recovery=95% -BREWER FORMATION- R1 Core Times (min:sec): 25.0-26.0' (3:36); 26.0-27.0' (3:44); 27.0-28.0' (2:25); 28.0-29.0' (3:58); 29.0-29.8' (4:41)																	
30	R2	51.6/52	29.8 - 34.1	RQD = 46%								R2: Grey, aphanitic, SILTSTONE, moderately hard to hard, fresh to slightly weathered. Joints dipping at low to moderate angles, close to very close spacing, tight to open, calcite veins. Secondary steeply dipping joints, moderate to widely spaced. Rock Quality=Poor Recovery=101% Note: R2 recovery and RQD included portion of R1 not initially recovered. -BREWER FORMATION- R2 Core Times (min:sec): 29.8-30.8' (4:07); 30.8-31.8' (3:05); 31.8-32.8' (2:49); 32.8-34.1' (2:31)															
35														Bottom of Exploration at 34.1 feet below ground surface.													
40																											
45																											
50																											
Remarks:																											
Stratification lines represent approximate boundaries between soil types; transitions may be gradual.										Page 2 of 2 Boring No.: BB-BFB1-201																	

* 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: Route 9/I-395 Connector Location: Brewer and Eddington, Maine		Boring No.: BB-BFB1-202 WIN: 18915.00			
Driller: New England Boring Contractors		Elevation (ft.): 80.8		Auger ID/OD: --					
Operator: M. Porter		Datum: NAVD 88		Sampler: Split Spoon 1.375 in. ID					
Logged By: J. Fletcher		Rig Type: Mobile B-53 Track		Hammer Wt./Fall: SS-140#/30; HW-300#/16					
Date Start/Finish: 10-12-2020/10-13-2020		Drilling Method: SSA/HW Drive		Core Barrel: NQ-2.0 in. ID					
Boring Location: Sta. 64+27.6, 63.1 RT		Casing ID/OD: HW-4.0 in. ID		Water Level*: 0.2 ft					
Hammer Efficiency Factor: 0.852		Hammer Type: Automatic <input checked="" type="checkbox"/> Hydraulic <input type="checkbox"/> Rope & Cathead <input type="checkbox"/>							
<div> <div> 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 </div> <div> 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 </div> <div> 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 </div> <div> 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 </div> </div>									
Depth (ft.)	Sample Information							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	0.0 - 2.0	WOH/WOH/1/2			SSA	<div> Brown-grey, wet, very soft, Silty CLAY, highly plastic, with organics, grass and roots -MARINE DEPOSIT-(CL) </div> <div> Note: Attempted tube sample, no recovery. Brown-grey, wet, stiff, Silty CLAY, trace fine sand, trace organics, low plasticity -MARINE DEPOSIT-(CL) Note: Attempted field vane shear test, no penetration. </div> <div> 55x110 mm vane raw torque readings: V1: 190/15 in-lbs V2: 190/10 in-lbs </div> <div> 55x110 mm vane raw torque readings: V3: 140/20 in-lbs V4: 120/20 in-lbs </div> <div> Grey, wet, soft to medium stiff, Silty CLAY, high plasticity -MARINE DEPOSIT-(CL) </div>	<div> C#IP-2 CU#5-1A Su=486psf DSS-7 Su=443psf LL=36 PL=20 PI=16 WC=35.2 CL </div> <div> C#IP-3 CU#4-1 Su=429psf LL=37 PL=20 PI=17 WC=39.1 CL </div>
5	MU		4.9 - 6.9				✓		
	2D	24/20	5.0 - 7.0	2/2/4/4	6	9	20		
	MV		5.6 - 6.0				28		
							30		
							33		
							24		
10	1U	24/24	10.0 - 12.0				34		
							28		
	V1		12.6 - 13.0	Su=735/60 psf			29		
	V2		13.6 - 14.0	Su=735/40 psf			30		
							28		
15	2U	24/24	15.0 - 17.0				52		
							52		
	V3		17.6 - 18.0	Su=545/80 psf			40		
	V4		18.6 - 19.0	Su=465/80 psf			33		
							32		
20	3D	24/24	20.0 - 22.0	WOR/WOR/WOR/ WOR			48		
							29		
							29		
							24		
25							18		
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.

Page 1 of 2

Boring No.: BB-BFB1-202

Maine Department of Transportation Soil/Rock Exploration Log US CUSTOMARY UNITS				Project: Route 9/I-395 Connector Location: Brewer and Eddington, Maine		Boring No.: BB-BFB1-202 WIN: 18915.00					
Driller: New England Boring Contractors			Elevation (ft.): 80.8		Auger ID/OD: --						
Operator: M. Porter			Datum: NAVD 88		Sampler: Split Spoon 1.375 in. ID						
Logged By: J. Fletcher			Rig Type: Mobile B-53 Track		Hammer Wt./Fall: SS-140#/30; HW-300#/#						
Date Start/Finish: 10-12-2020/10-13-2020			Drilling Method: SSA/HW Drive		Core Barrel: NQ-2.0 in. ID						
Boring Location: Sta. 64+27.6, 63.1 RT			Casing ID/OD: HW-4.0 in. ID		Water Level*: 0.2 ft						
Hammer Efficiency Factor: 0.852			Hammer Type: Automatic <input checked="" type="checkbox"/> Hydraulic <input type="checkbox"/> Rope & Cathead <input type="checkbox"/>								
<div style="display: flex; justify-content: space-between; font-size: 0.8em;"> <div> 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 </div> <div> 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 </div> <div> 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 </div> <div> 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 </div> </div>											
Depth (ft.)	Sample Information							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	4D	24/21	25.0 - 27.0	push thru vane			24		Grey, wet, medium stiff, Silty CLAY, medium plasticity -MARINE DEPOSIT-(CL) 55x110 mm vane raw torque readings: V5: 130/30 in-lbs Note: Attempted field vane shear test, no penetration.		
	V5		25.6 - 26.0	Su=505/115 psf			23				
	MV		26.6 - 27.0				48				
							41				
							24				
30	5D	13.2/9	30.0 - 31.1	11/34/50(1")			HW			50.3	Similar to 4D, except very stiff
											Grey, wet, very dense, fine to coarse GRAVEL, little fine to coarse sand, trace silt, loosely bonded -GLACIAL TILL-(GW)
										46.7	Top of Bedrock El. 46.7
35	R1	60/58	35.0 - 40.0	RQD = 90%			NQ CORE				R1: Grey, aphanitic, SILTSTONE, hard to very hard. Joints dipping at low to moderate angles, joints rough, planar, moderate spacing, tight to open, calcite veins, quartz intrusion at approximately 39.4 ft. Rock Quality=Good Recovery=97% -BREWER FORMATION- R1 Core Times (min:sec): 35.0-36.0' (1:53); 36.0-37.0' (2:57); 37.0-38.0' (2:29); 38.0-39.0' (2:19); 39.0-40.0' (2:36)
40	R2	60/58	40.0 - 45.0	RQD = 83%							R2: Grey, aphanitic, SILTSTONE, hard to very hard, fresh. Primary joints dipping at steep angle, secondary joints dipping at low angles, joints rough, planar, moderate spacing, tight frequent calcite veins. Rock Quality=Good Recovery=97% -BREWER FORMATION- R2 Core Times (min:sec): 40.0-41.0' (2:18); 41.0-42.0' (2:26); 42.0-43.0' (2:25); 43.0-44.0' (2:13); 44.0-45.0' (2:39)
45								35.8	Bottom of Exploration at 45.0 feet below ground surface.		
50											
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.

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Boring No.: BB-BFB1-202

Maine Department of Transportation Soil/Rock Exploration Log US CUSTOMARY UNITS				Project: Route 9/I-395 Connector Location: Brewer and Eddington, Maine		Boring No.: BB-BFB1-203 WIN: 18915.00					
Driller: New England Boring Contractors		Elevation (ft.): 80.6		Auger ID/OD: --							
Operator: M. Porter		Datum: NAVD 88		Sampler: Split Spoon 1.375 in. ID							
Logged By: J. Fletcher		Rig Type: Mobile B-53 Track		Hammer Wt./Fall: SS-140#/30; HW-300#/16							
Date Start/Finish: 10-13-2020/10-14-2020		Drilling Method: SSA/HW Drive		Core Barrel: NQ-2.0 in. ID							
Boring Location: Sta. 64+16.2, 0.6 LT		Casing ID/OD: HW-4.0 in. ID		Water Level*: 0.5 ft							
Hammer Efficiency Factor: 0.852		Hammer Type: Automatic <input checked="" type="checkbox"/> Hydraulic <input type="checkbox"/> Rope & Cathead <input type="checkbox"/>									
<small> 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 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 </small>											
Sample Information											
Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N ₆₀	Casing Blows	Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/AASHTO and Unified Class.
0	1D	24/14	0.0 - 2.0	WOH/WOH/3/3	3	4	SSA	80.3		Dark brown, very soft, SILT with organics -TOPSOIL-(ML) Brown-grey, wet, soft, SILT, little clay, trace organics, slight plasticity -MARINE DEPOSIT (ML) Brown-grey, wet, stiff, Silty CLAY, trace organics, slight plasticity -MARINE DEPOSIT-(CL) Note: Attempted field vane shear test, no penetration. Grey, wet, very soft, Silty CLAY, high plasticity -MARINE DEPOSITS-(CL) Note: Attempted field vane shear test, no penetration. Grey, wet, soft to medium stiff, Silty CLAY, silt seam -MARINE DEPOSIT-(CL) 55x110 mm vane raw torque readings: V1: 150/10 in-lbs V2: 120/10 in-lbs 55x110 mm vane raw torque readings: V3: 110/40 in-lbs V4: 110/30 in-lbs Similar to 4D, except hard Grey, wet, dense, fine to coarse GRAVEL, little silt, trace fine to coarse sand, trace clay, poorly graded, layering, loosely to	
5	2D MV	24/24	5.0 - 7.0 5.6 - 6.0	3/3/4/5	7	10	18	75.6			
							18				
							26				
							35				
							33				
10	3D MV	24/24	10.0 - 12.0 10.6 - 11.0	WOH/WOH/WOH/ WOH			26				
							26				
							43				
							24				
							22				
15	4D V1	24/24	15.0 - 17.0 15.6 - 16.0	push thru vane Su=580/40 psf			37				
	V2		16.6 - 17.0	Su=465/40 psf			31				
							28				
							26				
							23				
20	V3		20.6 - 21.0	Su=425/155 psf			HW				
	V4		21.6 - 22.0	Su=425/115 psf							
	5D/A	24/16	22.0 - 24.0	6/7/22/7	29	41					
25	R1	60/40	24.8 - 29.8	RQD = 50%			RC	56.9 56.5			
Remarks:											
Stratification lines represent approximate boundaries between soil types; transitions may be gradual.										Page 1 of 2 Boring No.: BB-BFB1-203	

[illegible]

Maine Department of Transportation						Project: Route 9/I-395 Connector				Boring No.: HB-BE-109							
Soil/Rock Exploration Log US CUSTOMARY UNITS						Location: Brewer and Eddington, Maine				WIN: 18915.00							
Driller:			New England Boring Contractors			Elevation (ft.):			84.4			Auger ID/OD:			--		
Operator:			M. Porter			Datum:			NAVD 88			Sampler:			Split-Spoon 1.375 in. ID		
Logged By:			H. Hollauer			Rig Type:			Mobile B-53 Track			Hammer Wt./Fall:			SS-140#/30; HW-300#/24		
Date Start/Finish:			10-19-18/10-22-18			Drilling Method:			SSA/HW Drive			Core Barrel:			--		
Boring Location:			Sta. 62+43.7; 1.1 LT			Casing ID/OD:			HW-4.0 in. ID			Water Level*:			3.6 ft BGS		
Hammer Efficiency Factor: 0.925						Hammer Type: Automatic <input checked="" type="checkbox"/> Hydraulic <input type="checkbox"/> Rope & Cathead <input type="checkbox"/>											
<div>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</div> <div>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</div> <div>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</div> <div>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</div>																	
Sample Information																	
Depth (ft.)		Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N ₆₀	Casing Blows	Elevation (ft.)	Graphic Log	Visual Description and Remarks					Laboratory Testing Results/AASHTO and Unified Class.	
0		1D	24/20	0.0 - 2.0	2/4/7/7	11	17	HW	83.1		Light brown, slightly moist, very stiff, SILT, trace roots, non-plastic -TOPSOIL/ROOT MAT-(OL)					1.3	
											Light grey-brown, slightly moist, very stiff, SILT, non-plastic -MARINE DEPOSIT-(ML)						
5		MU 2D	6/0 18/18	5.0 - 5.5 5.5 - 7.0	3/3/3	6	9				Note: Tube advanced from 5 to 5.5 ft to refusal; sample contents placed in jar. Grey-brown mottled, slightly moist, Clayey SILT -MARINE DEPOSIT-(ML) Grey-brown mottled, moist, stiff, Clayey SILT -MARINE DEPOSIT-(ML) Pocket Penetrometer Readings=2.5, 2.0 tsf Grey-brown slightly mottled, moist, medium stiff, Clayey SILT -MARINE DEPOSIT-(ML) Pocket Penetrometer Readings=1.0, 1.0 tsf						
		3D	24/24	7.0 - 9.0	2/2/3/4	5	8										
10		1U	24/20	10.0 - 12.0					73.4		Note: Top of tube similar to above grading to grey, soft, Silty CLAY at bottom.					11.0	
		MU	24/0	12.0 - 14.0							Note: No tube recovery, collected split-spoon sample. Grey, wet, Silty CLAY -MARINE DEPOSIT-(CL)						
		3D	24/24	12.0 - 14.0	Push thru tube						Grey, wet, Silty CLAY -MARINE DEPOSIT-(CL)						
15		2U	18/16	14.0 - 15.5							Note: Attempted vane shear test at 15.5 ft, no penetration, drill action indicates probable top of till at 15.5 ft. Grey, wet, medium dense, fine to coarse SAND, some silt, trace gravel -GLACIAL TILL-(SM)					15.5	
		MV		15.5 - 15.5					68.9								
		4D	24/6	16.0 - 18.0	6/6/9/15	15	23										
20		5D	24/8	20.0 - 22.0	19/18/12/8	30	46				Grey, wet, dense, fine to coarse SAND, some silt, trace gravel -GLACIAL TILL-(SM)						
																	
																	
25		R1	27.6/25	24.0 - 26.3	RQD = 36%			CORE	60.7		Top of Bedrock at El. 60.7 R1: Medium grey, aphanitic SILTSTONE, hard, fresh. Primary					23.7	
Remarks:																	
Stratification lines represent approximate boundaries between soil types; transitions may be gradual.												Page 1 of 2					
* 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.																	
Boring No.: HB-BE-109																	

Maine Department of Transportation								Project: Route 9/I-395 Connector						Boring No.: HB-BE-109																					
Soil/Rock Exploration Log US CUSTOMARY UNITS								Location: Brewer and Eddington, Maine						WIN: 18915.00																					
Driller:				New England Boring Contractors				Elevation (ft.):				84.4				Auger ID/OD:				--															
Operator:				M. Porter				Datum:				NAVD 88				Sampler:				Split-Spoon 1.375 in. ID															
Logged By:				H. Hollauer				Rig Type:				Mobile B-53 Track				Hammer Wt./Fall:				SS-140#/30; HW-300#/#															
Date Start/Finish:				10-19-18/10-22-18				Drilling Method:				SSA/HW Drive				Core Barrel:				--															
Boring Location:				Sta. 62+43.7; 1.1 LT				Casing ID/OD:				HW-4.0 in. ID				Water Level*:				3.6 ft BGS															
Hammer Efficiency Factor: 0.925								Hammer Type:								Automatic <input checked="" type="checkbox"/> Hydraulic <input type="checkbox"/> Rope & Cathead <input type="checkbox"/>																			
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Depth (ft.)		Sample No.		Pen./Rec. (in.)		Sample Depth (ft.)		Blows (/6 in.) Shear Strength (psf) or RQD (%)		N-uncorrected		N60		Casing Blows		Elevation (ft.)		Graphic Log		Visual Description and Remarks														Laboratory Testing Results/ AASHTO and Unified Class.	
25		R2		60/55		26.3 - 31.3		RQD = 63%								NQ CORE				joints dipping at moderate to steep angles, spaced very close to close, smooth, planar to undulating, tight to open, occasional quartz veins parallel to discontinuities. Rock Quality=Poor Recovery=91% R1 Core Times (min:sec): 24.0-25.0' (2:50); 26.0-26.3' (2:30) R2: Same as R1, except joints very close to moderately close. Rock Quality=Fair Recovery=92% R2 Core Times (min:sec): 26.3-27.3' (1:45); 27.3-28.3' (1:38); 28.3-29.3' (1:50); 29.3-30.3' (1:36); 30.3-31.3' (1:46)															
30		R3		60/60		31.3 - 36.3		RQD = 85%												R3: Same as R1, except joints very close to moderately close. Rock Quality=Good Recovery=100% R3 Core Times (min:sec): 31.3-32.3' (2:30); 32.3-33.3' (2:10); 33.3-34.3' (missd); 34.3-35.3' (2:10); 35.3-36.3' (1:40)															
35																48.1				Bottom of Exploration at 36.3 feet below ground surface.															
40																																			
45																																			
50																																			
Remarks:																																			
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Page 2 of 2																																			
Boring No.: HB-BE-109																																			

Maine Department of Transportation				Project: Route 9/I-395 Connector		Boring No.: HB-BE-212					
Soil/Rock Exploration Log US CUSTOMARY UNITS				Location: Brewer and Eddington, Maine		WIN: 18915.00					
Driller: New England Boring Contractors		Elevation (ft.): 81.6		Auger ID/OD: --							
Operator: M. Porter		Datum: NAVD 88		Sampler: Split Spoon 1.375 in. ID							
Logged By: J. Fletcher		Rig Type: Mobile B-53 Track		Hammer Wt./Fall: SS-140#/30; HW-300#/16							
Date Start/Finish: 10-14-2020/10-14-2020		Drilling Method: SSA/HW Drive		Core Barrel: --							
Boring Location: Sta. 65+49.2, 2.4 LT		Casing ID/OD: HW-4.0 in. ID		Water Level*: 1.75 ft							
Hammer Efficiency Factor: 0.852		Hammer Type: Automatic <input checked="" type="checkbox"/> Hydraulic <input type="checkbox"/> Rope & Cathead <input type="checkbox"/>									
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Sample Information											
Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N ₆₀	Casing Blows	Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.
0	1D/A	24/16	0.0 - 2.0	WOH/3/3/4	6	9	SSA	81.4		Dark brown, moist, very soft, SILT, organics -TOPSOIL/ROOTMAT-(OL) Brown-grey mottled, moist, stiff, SILT, trace organics -MARINE DEPOSIT-(ML) Brown-grey mottled, moist, stiff, Silty CLAY, trace organics -MARINE DEPOSIT-(CL) Grey, wet, medium stiff, Silty CLAY -MARINE DEPOSIT-(CL) 55x110 mm vane raw torque readings: V1: 190/40 in-lbs V2: 190/40 in-lbs Similar to 3D, except soft to medium stiff 55x110 mm vane raw torque readings: V3: 140/30 in-lbs V4: 120/20 in-lbs Grey, wet, medium stiff, Silty CLAY -MARINE DEPOSIT-(CL) 55x110 mm vane raw torque readings: V5: 160/30 in-lbs V6: 130/30 in-lbs Note: Strata change at 23.8 ft based on drill action. Grey, wet, dense, Sandy GRAVEL, trace silt, poorly graded, loosely bonded	
5	2D	24/22	5.0 - 7.0	2/3/4/6	7	10	32	76.6			
							31				
							40				
							44				
							45				
10	3D	24/24	10.0 - 12.0	push thru vane			46	71.6			
	V1		10.6 - 11.0	Su=735/155 psf			41				
	V2		11.6 - 12.0	Su=735/155 psf			39				
							40				
							38				
15	4D	24/24	15.0 - 17.0	push thru vane			42				
	V3		15.6 - 16.0	Su=545/115 psf			40				
	V4		16.6 - 17.0	Su=465/80 psf			41				
							46				
							41				
20	5D	24/24	20.0 - 22.0	push thru vane			37				
	V5		20.6 - 21.0	Su=620/115 psf			44				
	V6		21.6 - 22.0	Su=505/115 psf			45				
							48				
25	6D	24/11	24.0 - 26.0	6/18/17/8	35	50	49	57.8			
Remarks:											
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Maine Department of Transportation Soil/Rock Exploration Log US CUSTOMARY UNITS				Project: Route 9/I-395 Connector Location: Brewer and Eddington, Maine				Boring No.: HB-BE-212 WIN: 18915.00																																																																																																																																																																																																																																																																		
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Snowmobile 10C
Sta. 77+00

Maine Department of Transportation Soil/Rock Exploration Log US CUSTOMARY UNITS				Project: Route 9/I-395 Connector		Boring No.: BB-BST1-101				
				Location: Brewer and Eddington, Maine		WIN: 18915.00				
Driller: New England Boring Contractors		Elevation (ft.): 86.3		Auger ID/OD: --						
Operator: M. Porter		Datum: NAVD 88		Sampler: Split-Spoon 1.375 in. ID						
Logged By: H. Hollauer		Rig Type: Mobile B-53 Track		Hammer Wt./Fall: SSA-140#/30; HW-300#/24						
Date Start/Finish: 10-30-18/10-30-18		Drilling Method: SSA/HW Drive		Core Barrel: NQ-2.0 in. ID						
Boring Location: Sta. 77+48.3; 16.1 LT		Casing ID/OD: HW-4.0 in. ID		Water Level*: --						
Hammer Efficiency Factor: 0.925		Hammer Type: Automatic <input checked="" type="checkbox"/> Hydraulic <input type="checkbox"/> Rope & Cathead <input type="checkbox"/>								
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Depth (ft.)	Sample Information							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	0.0 - 2.0	1/1/2/3	3	5	HW	86.2		Brown, wet, medium stiff, SILT, trace fine sand, some organics -TOPSOIL/ROOT MAT-(OL) Grey and brown mottled, wet, medium stiff, Silty CLAY -MARINE DEPOSIT-(CL) Grey and brown slightly mottled, wet, medium stiff, Silty CLAY, becomes softer and grey with depth -MARINE DEPOSIT-(CL) Note: Clay becomes softer with depth based on casing blows and drill action. Grey, wet, Silty CLAY -MARINE DEPOSIT-(CL) Dark grey and black, wet, medium stiff, Silty CLAY -MARINE DEPOSIT-(CL) 65x130 mm vane raw torque readings: V1: 263/38 in-lbs V2: 215/28 in-lbs Dark grey and black, wet, medium stiff, Silty CLAY -MARINE DEPOSIT-(CL) 65x130 mm vane raw torque readings: V3: 235/45 in-lbs V4: 250/40 in-lbs Grey, wet, medium dense, fine SAND, little silt, trace medium to coarse sand, trace gravel -GLACIAL TILL-(SM)
5	2D	24/24	5.0 - 7.0	WOH/1/3/3	4	6				
10	1U	24/23	10.0 - 12.0							
	3D	24/24	12.0 - 14.0	Pushed thru vane						
	V1		12.6 - 13.0	Su=624/91 psf						
	V2		13.6 - 14.0	Su=510/66 psf						
15	U2	24/23	15.0 - 17.0							
	4D	24/24	17.0 - 19.0	Pushed thru vane						
	V3		17.6 - 18.0	Su=555/105 psf						
	V4		18.6 - 19.0	Su=595/95 psf						
20	5D	24/16	20.0 - 22.0	1/2/14/18	16	25				
25								64.8		

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.

Page 1 of 3

Boring No.: BB-BST1-101

Maine Department of Transportation Soil/Rock Exploration Log US CUSTOMARY UNITS				Project: Route 9/I-395 Connector Location: Brewer and Eddington, Maine				Boring No.: BB-BST1-101 WIN: 18915.00			
Driller: New England Boring Contractors				Elevation (ft.): 86.3				Auger ID/OD: --			
Operator: M. Porter				Datum: NAVD 88				Sampler: Split-Spoon 1.375 in. ID			
Logged By: H. Hollauer				Rig Type: Mobile B-53 Track				Hammer Wt./Fall: SSA-140#/30; HW-			
Date Start/Finish: 10-30-18/10-30-18				Drilling Method: SSA/HW Drive				Core Barrel: NQ-2.0 in. ID			
Boring Location: Sta. 77+48.3; 16.1 LT				Casing ID/OD: HW-4.0 in. ID				Water Level*: --			
Hammer Efficiency Factor: 0.925				Hammer Type: Automatic <input checked="" type="checkbox"/> Hydraulic <input type="checkbox"/> Rope & Cathead <input type="checkbox"/>							
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	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N ₆₀	Casing Blows	Elevation (ft.)			
25	6D	24/4	25.0 - 27.0	5/5/5/7	10	15	HW	51.5	34.8	Grey, wet, medium dense, fine SAND, little silt, little fine to coarse gravel, trace medium to coarse sand -GLACIAL TILL-(SM)	
30	7D	24/9	30.0 - 32.0	11/11/12/13	23	35		51.5	34.8	Grey, wet, dense, fine SAND, little silt, trace medium to coarse sand, trace gravel -GLACIAL TILL-(SM)	
35	R1	27.6/27.6	35.0 - 37.3	RQD = 36%			NQ CORE	51.5	34.8	Top of Bedrock at El. 51.5 R1: Core blocked in barrel at 37.3 ft. Recovery=100% R1 Core Times (min:sec): 35.0-36.0' (2:45); 36.0-37.0' (2:06); 37.0-37.3' (0:54) R1,R2: Grey, aphanitic to fine-grained SILTSTONE, hard, fresh to very slightly weathered. Primary joints dipping at moderate to high angles parallel to foliation, very close to close, tight to open. Occasional calcite veins parallel to foliation. Secondary joints are horizontal. Occasional thin quartzite intrusions. Rock Quality=Poor Recovery=86% R2 Core Times (min:sec): 37.3-38.0' (1:02); 38.0-39.0' (2:54); 39.0-40.0' (2:14) R3: Similar to above, except joints very close, few granitic intrusions. Joint surfaces moderately hard at 40.3 to 42.6 ft. Rock Quality=Very Poor Recovery=100% R3 Core Times (min:sec): 40.6-41.6' (3:30); 41.6-42.6' (2:26) R4: Similar joints very close to close, occasional quartz veins parallel to foliation. Rock Quality=Poor Recovery=95% R4 Core Times (min:sec): 42.6-43.6' (3:02); 43.6-44.6' (2:45); 44.6-45.4' (2:35) R5: Similar to above, except numerous fractures, granitic intrusions. Joint surfaces moderately hard at 49.0 to 49.3 ft. Rock Quality=Poor Recovery=100% R5 Core Times (min:sec): 45.4-46.4' (3:10); 46.4-47.4' (3:05); 47.4-48.4' (3:00); 48.4-49.4' (3:00)	
40	R3	24/24	40.6 - 42.6	RQD = 0%				51.5	34.8		
45	R5	48/48	45.4 - 49.4	RQD = 42%				51.5	34.8		
50								36.9	49.4		
Remarks:											
Stratification lines represent approximate boundaries between soil types; transitions may be gradual.											

<div>Maine Department of Transportation</div> <div>Soil/Rock Exploration Log</div> <div>US CUSTOMARY UNITS</div>				<div>Project: Route 9/1-395 Connector</div> <div>Location: Brewer and Eddington, Maine</div>				<div>Boring No.: BB-BST1-101</div> <div>WIN: 18915.00</div>																																																																																																																																																																																																																																															
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Maine Department of Transportation Soil/Rock Exploration Log US CUSTOMARY UNITS				Project: Route 9/I-395 Connector		Boring No.: BB-BST1-102		
				Location: Brewer and Eddington, Maine		WIN: 18915.00		
Driller: New England Boring Contractors		Elevation (ft.): 86.7		Auger ID/OD: --				
Operator: M. Porter		Datum: NAVD 88		Sampler: Split-Spoon 1.375 in. ID				
Logged By: H. Hollauer		Rig Type: Mobile B-53 Track		Hammer Wt./Fall: SS-140#/30; HW-300#/24				
Date Start/Finish: 10-26-18/10-26-18		Drilling Method: SSA/HW Drive		Core Barrel: --				
Boring Location: Sta. 77+40.7; 96.9 LT		Casing ID/OD: HW-4.0 in. ID		Water Level*:				
Hammer Efficiency Factor: 0.925		Hammer Type: Automatic <input checked="" type="checkbox"/> Hydraulic <input type="checkbox"/> Rope & Cathead <input type="checkbox"/>						
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0	1D	24/18	0.0 - 2.0	WOH/2/4/6	6	9	HW	86.3
5	2D	24/18	5.0 - 7.0	WOH/4/3/4	7	11		
10	3D	24/24	10.0 - 12.0	WOH/WOH/WOH/ WOH				
	MV		10.0 - 10.0					
	4D	24/10	12.0 - 14.0	Push thru vane				
	V1		12.6 - 13.0	Su=595/95 psf				
	V2		13.6 - 14.0	Su=630/105 psf				
15								
	5D	24/24	17.0 - 19.0	Push thru vane				
	V3		17.6 - 18.0	Su=710/125 psf				
	V4		18.6 - 19.0					
20	6D	24/10	20.0 - 22.0	17/15/12/10	27	42		67.4
25								

Visual Description and Remarks

Brown, moist, stiff, SILT, trace fine sand, trace organics/roots
-TOPSOIL/ROOT MAT-(OL)

Grey and brown slightly mottled, dry grading to moist, stiff, Silty CLAY, slightly plastic
-MARINE DEPOSIT-(CL)

Grey and brown slightly mottled, dry grading to moist, stiff, Silty CLAY, slightly plastic
-MARINE DEPOSIT-(CL)

Pocket Penetrometer Readings (5.5 ft)=2.5 tsf
Pocket Penetrometer Readings (6.8 ft)=0.5 tsf

Note: Attempted vane at 10.0 ft, no penetration.
Dark grey to black, wet, very soft, CLAY, some silt, highly plastic
-MARINE DEPOSIT-(CL)

Dark grey, wet, medium stiff, CLAY, some silt, highly plastic
-MARINE DEPOSIT-(CL)
65x130 mm vane raw torque readings:
V1: 250/39 in-lbs
V2: 265/45 in-lbs

Dark grey, wet, medium stiff, CLAY, some silt, highly plastic
-MARINE DEPOSIT-(CL)
65x130 mm vane raw torque readings:
V3: 299/52 in-lbs
V4: Vane refusal at 18.8 ft.

Note: Top of glacial till at 19.3 ft based on casing advancement.

Dark grey, wet, dense, fine to coarse SAND, little silt, trace gravel
-GLACIAL TILL-(SM)

Graphic Log

Laboratory Testing Results/ AASHTO and Unified Class.

Remarks:

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Boring No.: BB-BST1-102

Maine Department of Transportation Soil/Rock Exploration Log US CUSTOMARY UNITS				Project: Route 9/I-395 Connector Location: Brewer and Eddington, Maine				Boring No.: BB-BST1-102 WIN: 18915.00																																																																																																																																																																												
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Maine Department of Transportation				Project: Route 9/1-395 Connector		Boring No.: BB-BST1-103				
Soil/Rock Exploration Log US CUSTOMARY UNITS				Location: Brewer and Eddington, Maine		WIN: 18915.00				
Driller: New England Boring Contractors		Elevation (ft.): 87.4		Auger ID/OD: --						
Operator: M. Porter/E. Baron		Datum: NAVD 88		Sampler: Split-Spoon 1.375 in. ID						
Logged By: H. Hollauer		Rig Type: Mobile B-53 Track		Hammer Wt./Fall: SSA-140#/30; HW-300#/20						
Date Start/Finish: 10-29-18/10-29-18		Drilling Method: SSA/HW Drive		Core Barrel: --						
Boring Location: Sta. 77+53.7; 96.7 RT		Casing ID/OD: HW-4.0 in. ID		Water Level*: 1.8 ft						
Hammer Efficiency Factor: 0.925		Hammer Type: Automatic <input checked="" type="checkbox"/> Hydraulic <input type="checkbox"/> Rope & Cathead <input type="checkbox"/>								
<div style="display: flex; justify-content: space-between; font-size: 0.8em;"> <div> <p>Definitions:</p> <p>D = Split Spoon Sample</p> <p>MD = Unsuccessful Split Spoon Sample Attempt</p> <p>U = Thin Wall Tube Sample</p> <p>MU = Unsuccessful Thin Wall Tube Sample Attempt</p> <p>V = Field Vane Shear Test, PP = Pocket Penetrometer</p> <p>MV = Unsuccessful Field Vane Shear Test Attempt</p> </div> <div> <p>R = Rock Core Sample</p> <p>SSA = Solid Stem Auger</p> <p>HSA = Hollow Stem Auger</p> <p>RC = Roller Cone</p> <p>WOH = Weight of 140lb. Hammer</p> <p>WOR/C = Weight of Rods or Casing</p> <p>WO1P = Weight of One Person</p> </div> <div> <p>S_u = Peak/Remolded Field Vane Undrained Shear Strength (psf)</p> <p>S_{u(lab)} = Lab Vane Undrained Shear Strength (psf)</p> <p>q_p = Unconfined Compressive Strength (ksf)</p> <p>N-uncorrected = Raw Field SPT N-value</p> <p>Hammer Efficiency Factor = Rig Specific Annual Calibration Value</p> <p>N₆₀ = SPT N-uncorrected Corrected for Hammer Efficiency</p> <p>N₆₀ = (Hammer Efficiency Factor/60%)*N-uncorrected</p> </div> <div> <p>T_v = Pocket Torvane Shear Strength (psf)</p> <p>WC = Water Content, percent</p> <p>LL = Liquid Limit</p> <p>PL = Plastic Limit</p> <p>PI = Plasticity Index</p> <p>G = Grain Size Analysis</p> <p>C = Consolidation Test</p> </div> </div>										
Depth (ft.)	Sample Information							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	24/20	0.0 - 2.0	WOH/2/3/3	5	8	HW	87.1	<div style="display: flex;"> <div style="width: 20px; height: 100%; background: repeating-linear-gradient(45deg, transparent, transparent 2px, black 2px, black 4px); border: 1px solid black; margin-right: 5px;"></div> <div> <p>Brown, moist, medium stiff, Clayey SILT, trace fine sand, trace organics</p> <p>-TOPSOIL/ROOT MAT-(OL)</p> <hr style="border: 0.3px solid black;"/> <p>Grey-brown mottled, moist, medium stiff, Silty CLAY</p> <p>-MARINE DEPOSIT-(CL)</p> <p>Grey-brown slightly mottled, moist, medium stiff, Silty CLAY</p> <p>-MARINE DEPOSIT-(CL)</p> <p>Grey and black, wet, medium stiff, Silty CLAY</p> <p>-MARINE DEPOSIT-(CL)</p> <p>65x130 mm vane raw torque readings:</p> <p>V1: 285/49 in-lbs</p> <p>V2: 265/40 in-lbs</p> <p>Grey, wet, medium stiff, Silty CLAY</p> <p>-MARINE DEPOSIT-(CL)</p> <p>65x130 mm vane raw torque readings:</p> <p>V3: 265/58 in-lbs</p> <p>V4: 290/50 in-lbs</p> <p>Note: Advanced rollerbit from 17.8 to 19.9 ft through boulder.</p> <p>-BOULDER-</p> <p>Grey, wet, very dense, fine to coarse SAND, little silt, little fine to coarse gravel, well-graded</p> <p>-GLACIAL TILL-(SW-SM)</p> </div> </div>	
5	2D	24/24	5.0 - 7.0	2/2/3/3	5	8				
10	3D	24/24	10.0 - 12.0	Push thru vane						
	V1		10.6 - 11.0	Su=675/117 psf						
	V2		11.6 - 12.0	Su=630/95 psf						
15	4D	24/24	15.0 - 17.0	Push thru vane						
	V3		15.6 - 16.0	Su=630/136 psf						
	V4		16.6 - 17.0	Su=685/120 psf						
20	5D	24/5	20.0 - 22.0	7/14/20/15	34	52				
25										
<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p>Remarks:</p> </div> <div style="width: 50%; text-align: right;"> <p>Stratification lines represent approximate boundaries between soil types; transitions may be gradual.</p> </div> </div>										
								Page 1 of 2 Boring No.: BB-BST1-103		

<div>Maine Department of Transportation</div>							Project: Route 9/I-395 Connector						Boring No.: BB-BST1-103													
Soil/Rock Exploration Log US CUSTOMARY UNITS							Location: Brewer and Eddington, Maine						WIN: 18915.00													
Driller:				New England Boring Contractors				Elevation (ft.)				87.4				Auger ID/OD:				--						
Operator:				M. Porter/E. Baron				Datum:				NAVD 88				Sampler:				Split-Spoon 1.375 in. ID						
Logged By:				H. Hollauer				Rig Type:				Mobile B-53 Track				Hammer Wt./Fall:				SSA-140#/30; HW-						
Date Start/Finish:				10-29-18/10-29-18				Drilling Method:				SSA/HW Drive				Core Barrel:				--						
Boring Location:				Sta. 77+53.7; 96.7 RT				Casing ID/OD:				HW-4.0 in. ID				Water Level*:				1.8 ft						
Hammer Efficiency Factor: 0.925							Hammer Type: Automatic <input checked="" type="checkbox"/> Hydraulic <input type="checkbox"/> Rope & Cathead <input type="checkbox"/>																			
Definitions: D = Split Spoon Sample R = Rock Core Sample S _U = Peak/Remolded Field Vane Undrained Shear Strength (psf) T _V = Pocket Torvane Shear Strength (psf) MD = Unsuccessful Split Spoon Sample Attempt SSA = Solid Stem Auger S _{U(lab)} = Lab Vane Undrained Shear Strength (psf) WC = Water Content, percent U = Thin Wall Tube Sample HSA = Hollow Stem Auger q _p = Unconfined Compressive Strength (ksf) LL = Liquid Limit MU = Unsuccessful Thin Wall Tube Sample Attempt RC = Roller Cone N-uncorrected = Raw Field SPT N-value PL = Plastic Limit V = Field Vane Shear Test, PP = Pocket Penetrometer WOR/C = Weight of 140 lb. Hammer Hammer Efficiency Factor = Rig Specific Annual Calibration Value PI = Plasticity Index MV = Unsuccessful Field Vane Shear Test Attempt WO1P = Weight of One Person N ₆₀ = SPT N-uncorrected Corrected for Hammer Efficiency G = Grain Size Analysis <div>N₆₀ = (Hammer Efficiency Factor/60%)*N-uncorrected</div> C = Consolidation Test																										
Sample Information																										
Depth (ft.)		Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)		Blows ((6 in.) Shear Strength (psf) or RQD (%))		N-uncorrected	N ₆₀	Casing Blows	Elevation (ft.)	Graphic Log	Visual Description and Remarks							Laboratory Testing Results/AASHTO and Unified Class.						
25		6D	24/6	25.0 - 27.0		8/8/7/7		15	23	OPEN			Grey, wet, medium dense, fine SAND, little silt, trace fine to medium sand and gravel, poorly-graded -GLACIAL TILL-(SP-SM)													
														Top of Probable Bedrock at El. 59.2												
30														Bottom of Exploration at 30.2 feet below ground surface.												
35																										


Maine Department of Transportation Soil/Rock Exploration Log US CUSTOMARY UNITS				Project: Route 9/I-395 Connector Location: Brewer and Eddington, Maine		Boring No.: BB-BST1-201 WIN: 18915.00				
Driller: New England Boring Contractors		Elevation (ft.): 86.0		Auger ID/OD: --						
Operator: M. Porter		Datum: NAVD 88		Sampler: Split Spoon 1.375 in. ID						
Logged By: J. Fletcher		Rig Type: Mobile B-53 Track		Hammer Wt./Fall: SS-140#/30; HW-300#/16						
Date Start/Finish: 10-19-2020/10-20-2020		Drilling Method: SSA/HW Drive		Core Barrel: NQ-2.0 in. ID						
Boring Location: Sta. 76+98.8, 0.4 RT		Casing ID/OD: HW-4.0 in. ID		Water Level*: 5.1 ft						
Hammer Efficiency Factor: 0.852		Hammer Type: Automatic <input checked="" type="checkbox"/> Hydraulic <input type="checkbox"/> Rope & Cathead <input type="checkbox"/>								
<div style="font-size: small;"> 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 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 </div>										
Depth (ft.)	Sample Information							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	24/11	0.0 - 2.0	WOH/WOH/WOH/1			SSA	85.8		Brown, moist, very soft, SILT, organics -TOPSOIL(ROOT MAT)-(OL) Grey-brown mottled, moist, very soft, Silty CLAY -MARINE DEPOSIT-(CL) Grey-brown mottled, moist, medium stiff, Silty CLAY, low plasticity -MARINE DEPOSIT-(CL) Grey, wet, soft, Silty CLAY -MARINE DEPOSIT-(CL) 55x110 mm vane raw torque readings: V1: 120/20 in-lbs V2: 110/10 in-lbs 55x110 mm vane raw torque readings: V3: 120/20 in-lbs V4: 160/30 in-lbs Grey, wet, medium stiff, Silty CLAY -MARINE DEPOSIT-(CL) 55x110mm vane raw torque readings: V5: 160/30 in-lbs Note: Attempted field vane shear test, no penetration. Note: Strata change at 23.1 ft based on drill action.
5	2D	24/22	5.0 - 7.0	WOH/WOH/6/3	6	9	15			
							25			
							28			
							23			
							19			
10	3D V1	24/24	10.0 - 12.0 10.6 - 11.0	push thru vane Su=465/80 psf			16			
	V2		11.6 - 12.0	Su=425/40 psf			12			
							12?			
							12			
							10			
15	1U	24/24	15.0 - 17.0				27			
							15			
	V3		17.6 - 18.0	Su=465/80 psf			13			
	V4		18.6 - 19.0	Su=620/115 psf			11			
							10			
20	4D V5	24/24	20.0 - 22.0 20.6 - 21.0	push thru vane Su=620/115 psf			11			
	MV		21.6 - 22.0				14			
							74			
							44			
25							49			
Remarks:										
Stratification lines represent approximate boundaries between soil types; transitions may be gradual.									Page 1 of 2 Boring No.: BB-BST1-201	

Maine Department of Transportation Soil/Rock Exploration Log US CUSTOMARY UNITS				Project: Route 9/I-395 Connector Location: Brewer and Eddington, Maine				Boring No.: BB-BST1-201 WIN: 18915.00							
Driller: New England Boring Contractors				Elevation (ft.): 86.0				Auger ID/OD: --							
Operator: M. Porter				Datum: NAVD 88				Sampler: Split Spoon 1.375 in. ID							
Logged By: J. Fletcher				Rig Type: Mobile B-53 Track				Hammer Wt./Fall: SS-140#/30; HW-300#							
Date Start/Finish: 10-19-2020/10-20-2020				Drilling Method: SSA/HW Drive				Core Barrel: NQ-2.0 in. ID							
Boring Location: Sta. 76+98.8, 0.4 RT				Casing ID/OD: HW-4.0 in. ID				Water Level*: 5.1 ft							
Hammer Efficiency Factor: 0.852				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 N ₆₀ = SPT N-uncorrected Corrected for Hammer Efficiency N ₆₀ = (Hammer Efficiency Factor/60%)*N-uncorrected				T _y = 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 (16 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N ₆₀	Casing Blows								
25	5D	24/6	25.0 - 27.0	6/8/8/7	16	23	41	56.0		Grey, wet, medium dense, Gravelly fine to coarse SAND, little silt, well graded, moderately bonded -GLACIAL TILL-(SW) Grey, wet, very dense, fine SAND, little medium to coarse sand, little silt, trace gravel, poorly graded, moderately bonded -GLACIAL TILL-(SP) Top of Bedrock El. 54.0 R1: Grey, aphanitic, SILTSTONE, hard, slightly to moderately weathered, highly fractured throughout (gravel-sized pieces). Rock Quality=Very Poor Recovery=61% -BREWER FORMATION- R1 Core Times (min:sec): 33.0-34.0' (2:31); 34.0-34.5' (1:59) R2: Grey, aphanitic, SILTSTONE, hard, fresh. Joints dipping at moderate to steep angles, close to moderate spacing, tight, planar, rough, calcite veins. Rock Quality=Fair Recovery=81% -BREWER FORMATION- R2 Core Times (min:sec): 34.5-35.5' (2:03); 35.5-36.5' (2:17); 36.5-37.5' (2:43); 37.5-38.5' (2:22) R3: Grey, aphanitic, SILTSTONE, hard, fresh. Joints dipping at steep angles, moderate spacing, tight, planar, rough, calcite veins. Rock Quality=Excellent Recovery=100% -BREWER FORMATION- R3 Core Times (min:sec): 38.5-39.5' (2:33); 39.5-40.5' (2:32); 40.5-41.5' (2:36) Bottom of Exploration at 41.5 feet below ground surface.					
							27								
							29								
							35								
							53								
30	6D	24/17	30.0 - 32.0	29/51/32/60	83	118	2	54.0							
							21								
							RC								
	R1	18/11	33.0 - 34.5	RQD = 0%			NQ CORE								
	R2	48/39	34.5 - 38.5	RQD = 75%											
35															
	R3	36/36	38.5 - 41.5	RQD = 94%											
40															
45															
50															
Remarks:															
Stratification lines represent approximate boundaries between soil types; transitions may be gradual.										Page 2 of 2 Boring No.: BB-BST1-201					

Eaton Brook Tributary
Sta. 273+48

Wildlife 1
Sta. 272+35

Wildlife 2
Sta. 275+88

Maine Department of Transportation Soil/Rock Exploration Log US CUSTOMARY UNITS				Project: Route 9/I-395 Connector		Boring No.: BB-EEBT2-101				
				Location: Brewer and Eddington, Maine		WIN: 18915.00				
Driller: New England Boring Contractors		Elevation (ft.): 179.7		Auger ID/OD: --						
Operator: E. Baron		Datum: NAVD 88		Sampler: Split-Spoon 1.375 in. ID						
Logged By: N. Klausmeyer		Rig Type: Mobile B-53 Track		Hammer Wt./Fall: SS-140#/30; HW-300#/16						
Date Start/Finish: 12-5-18/12-5-18		Drilling Method: HW Drive		Core Barrel: NQ 2.0 in. ID						
Boring Location: Sta. 272+98.7; 8.6 LT		Casing ID/OD: HW 4.0 in. ID		Water Level*: --						
Hammer Efficiency Factor: 0.925		Hammer Type: Automatic <input checked="" type="checkbox"/> Hydraulic <input type="checkbox"/> Rope & Cathead <input type="checkbox"/>								
<div style="display: flex; justify-content: space-between; font-size: 0.8em;"> <div> 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 </div> <div> 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 </div> <div> 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 </div> <div> 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 </div> </div>										
Depth (ft.)	Sample Information							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	0.0 - 2.0	1/5/5/2	10	15	HW PUSH	179.5	 <p>Note: Frozen soil at ground surface.</p> <p>-TOPSOIL-</p> <p>Grey, wet, medium dense, Silty fine SAND, trace organics</p> <p>-MARINE DEPOSIT-(SM)</p> <p>Note: Auger action indicates clay at 2.2 ft.</p> <p>Grey, wet, Silty CLAY (CL)</p> <p>65 x 130mm vane raw torque readings: V1: 575/100 in-lbs Note: Attempted vane shear test at 8.0 ft, no penetration.</p> <p>Grey, wet, hard, Silty CLAY, trace fine sand</p> <p>-MARINE DEPOSIT-(CL)</p> <p>Grey, wet, hard, SILT, little clay, trace medium to fine sand, trace fine to coarse gravel, well bonded</p> <p>-GLACIAL TILL-(ML)</p> <p>Grey, wet, hard, SILT, little fine to coarse sand, trace fine to coarse gravel, well bonded</p> <p>-GLACIAL TILL-(ML)</p> <p>Grey, wet, very dense, Silty fine to coarse SAND, trace fine to coarse gravel, loosely bonded</p> <p>-GLACIAL TILL-(SM)</p> <p>Top of Bedrock at El. 158.3 Note: Advanced roller bit to 22.0 ft. Begin NQ rock core at 22.0 ft. R1: Grey, aphanitic, PHYLLITE, hard, fresh. Joints dipping at horizontal to moderate angles, very close to close, tight, very slight fine-grained coating on joint surfaces, calcite/quartz</p>	C#IP-10 CU#19-1 Su=369 psf LL=35 PL=18 PI=17 WC=29 CL
								177.5		
5	1U	24/22	5.0 - 7.0				3			
							4			
	V1		7.6 - 8.0	Su=1,363/235 psf			5			
	MV		8.0 - 8.0				5			
							10			
10	2D/A	24/15	10.0 - 12.0	1/10/11/12	21	32	20	169.0		
							41			
							75			
							73			
							93			
15	3D	24/12	15.0 - 17.0	12/15/12/14	27	42	77			
							76			
							59			
							71			
							70			
20	4D	17/4	20.0 - 21.4	8/12/50(5")			113	159.7		
								158.3		
	R1	60/58	22.0 - 27.0	RQD = 97%			121 RC NQ CORE			
25										
Remarks:										
Stratification lines represent approximate boundaries between soil types; transitions may be gradual.								Page 1 of 2		
* 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.								Boring No.: BB-EEBT2-101		

<div>Maine Department of Transportation</div> <div>Soil/Rock Exploration Log</div> <div>US CUSTOMARY UNITS</div>						Project: Route 9/1-395 Connector			Boring No.: BB-EEBT2-101		
						Location: Brewer and Eddington, Maine			WIN: 18915.00		
Driller:			New England Boring Contractors			Elevation (ft.):			179.7		
Operator:			E. Baron			Datum:			NAVD 88		
Logged By:			N. Klausmeyer			Rig Type:			Mobile B-53 Track		
Date Start/Finish:			12-5-18/12-5-18			Drilling Method:			HW Drive		
Boring Location:			Sta. 272+98.7; 8.6 LT			Casing ID/OD:			HW 4.0 in. ID		
Hammer Efficiency Factor: 0.925						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			Su = Peak/Remolded Field Vane Undrained Shear Strength (psf) Su(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					
Sample Information											
Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows ((/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N ₆₀	Casing Blows	Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/AASHTO and Unified Class.
25							NO CORE			stringers up to 1/5 in. thickness throughout core. Rock Quality=Excellent Recovery=97% R1 Core Times (min:sec): 22.0-23.0' (2:13); 23.0-24.0' (1:36); 24.0-25.0' (1:30); 25.0-26.0' (1:25); 26.0-27.0' (1:27) R2: Grey, aphanitic, PHYLLITE, hard, fresh. Joints dipping at low to moderate angles, very close to close, tight, very slight fine-grained coatings on some joint surfaces, some calcite/quartz stringers up to 1/3 in. thickness throughout run. Rock Quality=Fair Recovery=75% R2 Core Times (min:sec): 27.0-28.0' (1:47); 28.0-29.0' (1:29); 29.0-30.0' (1:33); 30.0-31.0' (1:30); 31.0-32.0' (1:46)	
30	R2	60/45	27.0 - 32.0	RQD = 72%				147.7		Bottom of Exploration at 32.0 feet below ground surface.	
35											
40											
45											
50											
Remarks:											
Stratification lines represent approximate boundaries between soil types; transitions may be gradual.										Page 2 of 2	
* 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.										Boring No.: BB-EEBT2-101	

Maine Department of Transportation Soil/Rock Exploration Log US CUSTOMARY UNITS				Project: Route 9/I-395 Connector Location: Brewer and Eddington, Maine		Boring No.: BB-EEBT2-102 WIN: 18915.00	
Driller: New England Boring Contractors		Elevation (ft.): 181.3		Auger ID/OD: --			
Operator: M. Porter		Datum: NAVD 88		Sampler: Split-Spoon 1.375 in. ID			
Logged By: N. Klausmeyer		Rig Type: Mobile B-53 Track		Hammer Wt./Fall: SS-140#/30; HW-300#/16			
Date Start/Finish: 12-3-18/12-3-18		Drilling Method: HW Drive		Core Barrel: --			
Boring Location: Sta. 273+34.1; 97.9 LT		Casing ID/OD: HW 4.0 in. ID		Water Level*: --			
Hammer Efficiency Factor: 0.925		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							
Sample Information							
Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N ₆₀	Casing Blows
0	1D	24/12	0.0 - 2.0	1/4/4/8	8	12	HW PUSH
							4
							5
							4
							4
5	2D	24/24	5.0 - 7.0	3/4/5/5	9	14	19
							23
							26
							29
							48
10	3D	24/18	10.0 - 12.0	1/4/9/13	13	20	35
							66
							113
							137
							157
15	4D	24/10	15.0 - 17.0	7/9/18/23	27	42	RC
							164.1
							163.8
25							

Visual Description and Remarks

Note: Frozen soil at ground surface.
-TOPSOIL-

Grey-brown to yellow-brown, moist, stiff, Clayey SILT, little fine sand, trace organics
-MARINE DEPOSIT-(ML)

Grey-brown to yellow-brown, wet, stiff, Clayey SILT, little fine sand, trace organics
-MARINE DEPOSIT-(ML)

Grey, wet, very stiff, Clayey SILT, trace fine sand
-MARINE DEPOSIT-(ML)

Note: Drill action and wash water contents indicate strata change at 12.3 ft.

Grey, wet, hard, SILT, little fine to coarse sand, trace fine to coarse gravel, well bonded
-GLACIAL TILL-(ML)

Top of Probable Bedrock at El. 164.1
Note: Drill action and wash water contents indicate top of probable bedrock at 17.2 ft. Advanced roller bit to 17.5 ft.
-PROBABLE BEDROCK-

Bottom of Exploration at 17.5 feet below ground surface.

Laboratory Testing Results/ AASHTO and Unified Class.

Remarks:

1. Observation well installed in completed borehole. See Observation Well Installation Report and Groundwater Monitoring Report for details.

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.

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Boring No.: BB-EEBT2-102

Maine Department of Transportation Soil/Rock Exploration Log US CUSTOMARY UNITS				Project: Route 9/I-395 Connector Location: Brewer and Eddington, Maine		Boring No.: BB-EEBT2-103 WIN: 18915.00			
Driller: New England Boring Contractors		Elevation (ft.): 179.8		Auger ID/OD: --					
Operator: M. Porter		Datum: NAVD 88		Sampler: Split-Spoon 1.375 in. ID					
Logged By: N. Klausmeyer		Rig Type: Mobile B-53 Track		Hammer Wt./Fall: SS-140#/30; HW-300#/16					
Date Start/Finish: 11-30-18/11-30-18		Drilling Method: HW Drive		Core Barrel: --					
Boring Location: Sta. 273+23.1; 101.1 RT		Casing ID/OD: HW 4.0 in. ID		Water Level*: --					
Hammer Efficiency Factor: 0.925		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							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	24/11	0.0 - 2.0	WOH/2/2/4	4	6	HW PUSH	Note: Frozen soil at ground surface. Grey to yellow-brown, wet, loose, Silty fine SAND, trace clay, trace organics -MARINE DEPOSIT-(SM)	
							176.9	Note: Encountered clay at 2.9 ft.	
5	1U	24/23	5.0 - 7.0					Grey, wet, Silty CLAY, some fine sand (CL)	
	2D	24/24	7.0 - 9.0	WOH/WOH/2/2	2	3	5		
	MV		7.0 - 7.0				6	Grey, wet, soft, Silty CLAY, trace fine sand, trace fine gravel -MARINE DEPOSIT-(CL) Note: Attempted field vane shear test at 7.0 ft, no penetration.	
							10		
							16		
10	2U	6/5	10.0 - 10.5	9/11/11/15	22	34	OPEN	Note: Tube sample refusal at 10.5 ft. Recovered 5 in. of grey, wet, Clayey fine SAND.	
	3D	24/18	10.5 - 12.5					Grey, wet, hard, SILT, trace fine sand, trace fine gravel, well bonded -GLACIAL TILL-(ML)	
15	4D	24/12	15.0 - 17.0	17/21/21/24	42	65		Grey, wet, hard, SILT, little fine to coarse sand, trace fine to coarse gravel, well bonded -GLACIAL TILL-(ML)	
20									
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.								Page 1 of 1 Boring No.: BB-EEBT2-103	

Maine Department of Transportation Soil/Rock Exploration Log US CUSTOMARY UNITS				Project: Route 9/I-395 Connector Location: Brewer and Eddington, Maine		Boring No.: BB-EEBT2-201 WIN: 18915.00	
Driller: New England Boring Contractors		Elevation (ft.): 179.4		Auger ID/OD: --			
Operator: M. Porter		Datum: NAVD 88		Sampler: Split Spoon 1.375 in. ID			
Logged By: J. Fletcher		Rig Type: Mobile B-53 Track		Hammer Wt./Fall: SS-140#/30; HW-300#/16			
Date Start/Finish: 2-11-2021/2-11-2021		Drilling Method: SSA/HW Drive		Core Barrel: --			
Boring Location: Sta. 274+26.3, 71.0 LT		Casing ID/OD: HW-4.0 in. ID		Water Level*: 4.0 ft			
Hammer Efficiency Factor: 0.852		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/A	24/4	0.0 - 2.0	2/1/1/3	2	3	SSA	179.0		Dark brown, moist, soft, SILT, trace fine sand, trace clay, organics -TOPSOIL-(OL) Grey-brown mottled, moist, soft, Silty CLAY, low plasticity -MARINE DEPOSIT-(CL)	
								173.8			
								171.7			
								164.4			
								162.4			
5	2D	24/24	5.0 - 7.0	3/4/5/15	9	13	14	173.8		Grey, wet, stiff, Clayey SILT, trace gravel -MARINE DEPOSIT-(ML) Grey, wet, very dense, GRAVEL, little silt, trace fine to medium sand, moderately bonded -GLACIAL TILL-(GM) Grey, wet, hard, Gravelly SILT, trace fine to medium sand, moderately bonded -GLACIAL TILL-(ML)	
								171.7			
								164.4			
								162.4			
								162.4			
10	3D	24/8	10.0 - 12.0	28/74/34/19	108	153	OPEN			Grey, wet, very dense, GRAVEL, little silt, trace fine to medium sand, moderately bonded -GLACIAL TILL-(GM) Grey, wet, hard, Gravelly SILT, trace fine to medium sand, moderately bonded -GLACIAL TILL-(ML)	
								164.4			
								162.4			
								162.4			
								162.4			
15	4D	24/16	15.0 - 17.0	22/20/20/21	40	57		164.4		Grey, wet, hard, Gravelly SILT, trace fine to medium sand, moderately bonded -GLACIAL TILL-(ML)	
								162.4			
								162.4			
								162.4			
								162.4			
20										Bottom of Exploration at 17.0 feet below ground surface. No Refusal	
								162.4			
								162.4			
								162.4			
								162.4			
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.

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Boring No.: BB-EEBT2-201

Maine Department of Transportation Soil/Rock Exploration Log US CUSTOMARY UNITS				Project: Route 9/I-395 Connector		Boring No.: BB-EEBT2-202																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
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Driller: New England Boring Contractors		Elevation (ft.): 179.2		Auger ID/OD: --																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
Operator: M. Porter		Datum: NAVD 88		Sampler: Split Spoon 1.375 in. ID																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
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Date Start/Finish: 2-10-2021/2-10-2021		Drilling Method: SSA/HW Drive		Core Barrel: --																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
Boring Location: Sta. 273+57.6, 3.8 LT		Casing ID/OD: HW-4.0 in. ID		Water Level*: 5.3 ft																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
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<div style="display: flex; justify-content: space-between; font-size: 0.8em;"> <div> <p>Definitions:</p> <p>D = Split Spoon Sample</p> <p>MD = Unsuccessful Split Spoon Sample Attempt</p> <p>U = Thin Wall Tube Sample</p> <p>MU = Unsuccessful Thin Wall Tube Sample Attempt</p> <p>V = Field Vane Shear Test, PP = Pocket Penetrometer</p> <p>MV = Unsuccessful Field Vane Shear Test Attempt</p> </div> <div> <p>R = Rock Core Sample</p> <p>SSA = Solid Stem Auger</p> <p>HSA = Hollow Stem Auger</p> <p>RC = Roller Cone</p> <p>WOH = Weight of 140lb. Hammer</p> <p>WOR/C = Weight of Rods or Casing</p> <p>WO1P = Weight of One Person</p> </div> <div> <p>S_u = Peak/Remolded Field Vane Undrained Shear Strength (psf)</p> <p>S_{u(lab)} = Lab Vane Undrained Shear Strength (psf)</p> <p>q_p = Unconfined Compressive Strength (ksf)</p> <p>N-uncorrected = Raw Field SPT N-value</p> <p>Hammer Efficiency Factor = Rig Specific Annual Calibration Value</p> <p>N₆₀ = SPT N-uncorrected Corrected for Hammer Efficiency</p> <p>N₆₀ = (Hammer Efficiency Factor/60%)*N-uncorrected</p> </div> <div> <p>T_v = Pocket Torvane Shear Strength (psf)</p> <p>WC = Water Content, percent</p> <p>LL = Liquid Limit</p> <p>PL = Plastic Limit</p> <p>PI = Plasticity Index</p> <p>G = Grain Size Analysis</p> <p>C = Consolidation Test</p> </div> </div>																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
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* 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.

Page 1 of 1

Boring No.: BB-EEBT2-202

Maine Department of Transportation Soil/Rock Exploration Log US CUSTOMARY UNITS				Project: Route 9/I-395 Connector Location: Brewer and Eddington, Maine				Boring No.: BB-EWC1-101 WIN: 18915.00																																																																																																																																																																																																																																					
Driller: New England Boring Contractors				Elevation (ft.): 181.1				Auger ID/OD: --																																																																																																																																																																																																																																					
Operator: T.Schaffer/E. Baron				Datum: NAVD 88				Sampler: Split-Spoon 1.375 in. ID																																																																																																																																																																																																																																					
Logged By: N. Klausmeyer				Rig Type: Mobile B-53 Track				Hammer Wt./Fall: SS-140#/30; HW-300#/16																																																																																																																																																																																																																																					
Date Start/Finish: 12-4-18/12-5-18				Drilling Method: HW Drive				Core Barrel: NQ 2.0-in. ID																																																																																																																																																																																																																																					
Boring Location: Sta. 272+35.9; 3.4 RT				Casing ID/OD: HW 4.0 in. ID				Water Level*: --																																																																																																																																																																																																																																					
Hammer Efficiency Factor: 0.925				Hammer Type: Automatic <input checked="" type="checkbox"/> Hydraulic <input type="checkbox"/> Rope & Cathead <input type="checkbox"/>																																																																																																																																																																																																																																									
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Light brown to grey-brown, wet, hard, SILT, little fine to coarse sand, trace fine to coarse gravel, trace clay, well bonded -GLACIAL TILL-(ML)</td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>98</td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>RC</td><td>168.4</td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>167.1</td><td>Note: Drill action and wash water contents indicate top of weathered bedrock at 12.7 ft. -PROBABLE WEATHERED BEDROCK-</td></tr><tr><td>15</td><td>R1</td><td>60/53</td><td>14.0 - 19.0</td><td>RQD = 55%</td><td></td><td></td><td>NO CORE</td><td></td><td>Note: Advance rollerbit to 14.0 ft.</td><td>-14.0-</td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>Top of Bedrock at El. 167.1 R1: Grey aphanitic to fine-grained, PHYLLITE. Olive-green calcareous ARENITE from 17.5 to 18.0 ft, hard, fresh to moderately weathered. Joints dipping at horizontal to steep angles, very close to close, tight to open, silt coatings on some joint surfaces, oxidation and slight pyrite on some joint surfaces, frequent calcite/quartz veins up to 1/2 in. thickness throughout run, occasional pitting. Rock Quality=Fair Recovery=88% R1 Core Times (min:sec): 14.0-15.0' (2:49); 15.0-16.0' (9:15); 16.0-17.0' (2:46); 17.0-18.0' (2:32); 18.0-19.0' (2:52) R2: Grey, aphanitic, PHYLLITE, hard, fresh to very slightly weathered. Joints dipping at low angles, close to moderately close, tight, slight pyrite on some joint surfaces. Secondary joints steeply dipping, frequent calcite/quartz stringers up to 1/3 in. thickness throughout run, slight pitting. Rock Quality=Excellent Recovery=100% R2 Core Times (min:sec): 19.0-20.0' (3:15); 20.0-21.0' (2:43); 21.0-22.0' (3:02); 22.0-23.0' (4:17); 23.0-24.0' (4:32)</td><td></td></tr><tr><td>20</td><td>R2</td><td>60/60</td><td>19.0 - 24.0</td><td>RQD = 100%</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>25</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>157.1</td><td></td><td></td></tr></tbody></table>												Depth (ft.)	Sample Information							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	24/11	0.0 - 2.0	1/5/7/19	12	19	HW PUSH	181.0	Note: Frozen soil at ground surface. -TOPSOIL-	-0.1- Grey-brown with some light brown, wet, very stiff, Clayey SILT, trace fine sand, trace organics -MARINE DEPOSIT-(ML)																															5	2D	24/24	5.0 - 7.0	4/8/11/26	19	29	7		Grey-brown with some light brown, wet, very stiff, Clayey SILT, little fine sand, trace organics -MARINE DEPOSIT-(ML)								13										28										45										61	172.1		10	3D	24/8	10.0 - 12.0	49/11/12/17	23	35	35		Note: Drill action and wash water contents indicate increase in granular material at approximately 9.0 ft. Light brown to grey-brown, wet, hard, SILT, little fine to coarse sand, trace fine to coarse gravel, trace clay, well bonded -GLACIAL TILL-(ML)								98										RC	168.4										167.1	Note: Drill action and wash water contents indicate top of weathered bedrock at 12.7 ft. -PROBABLE WEATHERED BEDROCK-	15	R1	60/53	14.0 - 19.0	RQD = 55%			NO CORE		Note: Advance rollerbit to 14.0 ft.	-14.0-										Top of Bedrock at El. 167.1 R1: Grey aphanitic to fine-grained, PHYLLITE. Olive-green calcareous ARENITE from 17.5 to 18.0 ft, hard, fresh to moderately weathered. Joints dipping at horizontal to steep angles, very close to close, tight to open, silt coatings on some joint surfaces, oxidation and slight pyrite on some joint surfaces, frequent calcite/quartz veins up to 1/2 in. thickness throughout run, occasional pitting. 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Maine Department of Transportation						Project: Route 9/I-395 Connector				Boring No.: BB-EWC1-201																																																																																																																																																																																																																												
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Maine Department of Transportation Soil/Rock Exploration Log US CUSTOMARY UNITS				Project: Route 9/I-395 Connector Location: Brewer and Eddington, Maine		Boring No.: BB-EWC1-202 WIN: 18915.00					
Driller: New England Boring Contractors		Elevation (ft.): 181.1		Auger ID/OD: --							
Operator: M. Porter		Datum: NAVD 88		Sampler: Split Spoon 1.375 in. ID							
Logged By: J. Fletcher		Rig Type: Mobile B-53 Track		Hammer Wt./Fall: SS-140#/30; HW-300#/16							
Date Start/Finish: 2-12-2021/2-12-2021		Drilling Method: SSA/HW Drive		Core Barrel: --							
Boring Location: Sta. 272+35.2, 58.8 LT		Casing ID/OD: HW-4.0 in. ID		Water Level*: 6.6 ft							
Hammer Efficiency Factor: 0.852		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											
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0	1D	24/9	0.0 - 2.0	WOH/3/2/4	5	7	SSA			Grey-brown mottled, moist, medium stiff, Silty CLAY, low plasticity -MARINE DEPOSIT-(CL)	
5	2D	24/24	5.0 - 7.0	4/8/11/12	19	27	HW	175.7		Grey, wet, very stiff, Silty CLAY, trace gravel, low plasticity -MARINE DEPOSIT-(CL)	
10	3D	24/12	10.0 - 12.0	16/16/15/15	31	44	RC	172.0		Grey, wet, hard, Clayey SILT, little fine to medium sand, trace gravel, moderately bonded -GLACIAL TILL-(ML) Note: Top of probable bedrock at 12.8 ft based on drill action.	
								168.3		Top of Probable Bedrock at El. 168.3 -PROBABLE BEDROCK-	
15								166.1		Bottom of Exploration at 15.0 feet below ground surface.	
20											
25											
Remarks:											
Stratification lines represent approximate boundaries between soil types; transitions may be gradual.										Page 1 of 1	
* 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.										Boring No.: BB-EWC1-202	

Maine Department of Transportation Soil/Rock Exploration Log US CUSTOMARY UNITS				Project: Route 9/I-395 Connector Location: Brewer and Eddington, Maine		Boring No.: BB-EWC2-101 WIN: 18915.00					
Driller: New England Boring Contractors		Elevation (ft.): 181.5		Auger ID/OD: --							
Operator: B. Enos/M. Porter		Datum: NAVD 88		Sampler: Split-Spoon 1.375 in. ID							
Logged By: N. Klausmeyer		Rig Type: Mobile B-53 Track		Hammer Wt./Fall: SS-140#/30; HW-140#/30							
Date Start/Finish: 11-30-18/12-1-18		Drilling Method: HW Drive		Core Barrel: NQ 2.0-in. ID							
Boring Location: Sta. 275+86.7; 12.7 LT		Casing ID/OD: HW 4.0 in. ID		Water Level*: --							
Hammer Efficiency Factor: 0.925		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	24/15	0.0 - 2.0	2/3/3/4	6	9	HW PUSH	177.9		Grey-brown, wet, stiff, Clayey SILT, trace fine sand, trace organics -MARINE DEPOSIT-(ML) Note: Drill action indicates strata change at 3.6 ft. Light brown, wet, hard, SILT, little fine to coarse sand, trace fine to coarse gravel, well bonded -GLACIAL TILL-(ML) Note: Cobble encountered at approximately 6.8 ft. Light brown, wet, hard, SILT, trace fine sand, trace coarse gravel, well bonded -GLACIAL TILL-(ML) Light brown, wet, hard, SILT, little fine to coarse sand, trace fine to coarse gravel, well bonded -GLACIAL TILL-(ML) Light brown, wet, very stiff, SILT, little fine to coarse sand, trace fine gravel, well bonded -GLACIAL TILL-(ML)	
5	2D	18/8	5.0 - 6.5	12/35/55	90	139	36				
							255				
							10				
							12				
							12				
10	3D	24/13	10.0 - 12.0	14/18/15/28	33	51	15				
							24				
							99				
							83				
							49				
15	4D	24/10	15.0 - 17.0	11/14/14/20	28	43	42				
							41				
							33				
							43				
							37				
20	5D	24/9	20.0 - 22.0	7/7/10/11	17	26	19				
							26				
							28				
							19				
25							32				
Remarks:											
Stratification lines represent approximate boundaries between soil types; transitions may be gradual.										Page 1 of 3	
* 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.										Boring No.: BB-EWC2-101	


Maine Department of Transportation Soil/Rock Exploration Log US CUSTOMARY UNITS				Project: Route 9/I-395 Connector Location: Brewer and Eddington, Maine				Boring No.: BB-EWC2-101 WIN: 18915.00									
Driller: New England Boring Contractors				Elevation (ft.): 181.5				Auger ID/OD: --									
Operator: B. Enos/M. Porter				Datum: NAVD 88				Sampler: Split-Spoon 1.375 in. ID									
Logged By: N. Klausmeyer				Rig Type: Mobile B-53 Track				Hammer Wt./Fall: SS-140#/30; HW-140#/#									
Date Start/Finish: 11-30-18/12-1-18				Drilling Method: HW Drive				Core Barrel: NQ 2.0-in. ID									
Boring Location: Sta. 275+86.7; 12.7 LT				Casing ID/OD: HW 4.0 in. ID				Water Level*: --									
Hammer Efficiency Factor: 0.925				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 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	6D	24/9	25.0 - 27.0	11/12/12/18	24	37	33			Light brown, wet, hard, SILT, little fine to coarse sand, trace fine gravel, well bonded -GLACIAL TILL-(ML)							
							43										
							33										
							80										
							65										
30	7D	24/1	30.0 - 32.0	7/13/17/16	30	46	19						Light brown, wet, hard, SILT, some fine to coarse gravel, little fine to coarse sand -GLACIAL TILL-(ML)				
							30										
							60										
							40										
							47										
35	8D	0/0	35.0 - 35.0	50(0")			293	146.5								Note: Split-spoon refusal at 35.0 ft. Note: Cored through boulder from 35.0 to 36.6 ft.	
							173	144.9									
							197										
							213										
							109										
40	9D	24/14	40.0 - 42.0	12/17/24/28	41	63	42			Grey, wet, hard, SILT, little fine to coarse sand, little fine to coarse gravel, well bonded -GLACIAL TILL-(ML)							
							42										
							67										
							75										
							204										
45	10D	15/15	45.0 - 46.3	36/69/83(3")			129						Grey, wet, hard, SILT, little fine to coarse sand, trace fine gravel, well bonded -GLACIAL TILL-(ML)				
							88										
							67										
							81										
							113										
50																Note: Drill action and wash water contents indicate granular material.	

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.

Page 2 of 3
 Boring No.: BB-EWC2-101

Maine Department of Transportation						Project: Route 9/I-395 Connector						Boring No.: BB-EWC2-101																													
Soil/Rock Exploration Log US CUSTOMARY UNITS						Location: Brewer and Eddington, Maine						WIN: 18915.00																													
Driller: New England Boring Contractors							Elevation (ft.) 181.5							Auger ID/OD: --																											
Operator: B. Enos/M. Porter							Datum: NAVD 88							Sampler: Split-Spoon 1.375 in. ID																											
Logged By: N. Klausmeyer							Rig Type: Mobile B-53 Track							Hammer Wt./Fall: SS-140#/30; HW-140#/#																											
Date Start/Finish: 11-30-18/12-1-18							Drilling Method: HW Drive							Core Barrel: NQ 2.0-in. ID																											
Boring Location: Sta. 275+86.7; 12.7 LT							Casing ID/OD: HW 4.0 in. ID							Water Level*: --																											
Hammer Efficiency Factor: 0.925							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							Su = Peak/Remolded Field Vane Undrained Shear Strength (psf) Su(lab) = Lab Vane Undrained Shear Strength (psf) qp = 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 N60c = (Hammer Efficiency Factor/60%)*N-uncorrected							Ty = 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						
Sample Information																																									
Depth (ft.)		Sample No.		Pen./Rec. (in.)		Sample Depth (ft.)		Blows (/6 in.) Shear Strength (psf) or RQD (%)		N-uncorrected		N60		Casing Blows		Elevation (ft.)		Graphic Log		Visual Description and Remarks												Laboratory Testing Results/ AASHTO and Unified Class.									
50														NQ		130.7				Top of Bedrock at El. 130.7 Note: Drill action and wash water contents indicate top of probable bedrock at 50.8 ft. Advanced roller bit to 51.4 ft. Begin NQ rock core at 51.4 ft. R1: Grey, aphanitic, PHYLLITE, hard, fresh. Joints dipping at low and steep angles, very close to moderately close, tight, slight pyrite on joint surfaces. Calcite/quartz veins up to 2/3 in. thickness throughout run. Rock Quality=Good Recovery=95% R1 Core Times (min:sec): 51.4-52.4' (2:47); 52.4-53.4' (2:13); 53.4-54.4' (2:47); 54.4-55.4' (2:45); 55.4-56.4' (3:23)																					
		R1		60/57		51.4 - 56.4		RQD = 83%						CORE																											
55																125.1																									
60																																									
65																																									
70																																									
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Maine Department of Transportation Soil/Rock Exploration Log US CUSTOMARY UNITS				Project: Route 9/I-395 Connector Location: Brewer and Eddington, Maine				Boring No.: BB-EWC2-201 WIN: 18915.00																																																																																																																																																																																																																																																																															
Driller: New England Boring Contractors				Elevation (ft.): 181.4				Auger ID/OD: --																																																																																																																																																																																																																																																																															
Operator: M. Porter				Datum: NAVD 88				Sampler: Split Spoon 1.375 in. ID																																																																																																																																																																																																																																																																															
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Maine Department of Transportation Soil/Rock Exploration Log US CUSTOMARY UNITS				Project: Route 9/I-395 Connector Location: Brewer and Eddington, Maine		Boring No.: BB-EWC2-202 WIN: 18915.00	
Driller: New England Boring Contractors			Elevation (ft.): 180.8			Auger ID/OD: --	
Operator: M. Porter			Datum: NAVD 88			Sampler: Split Spoon 1.375 in. ID	
Logged By: J. Fletcher			Rig Type: Mobile B-53 Track			Hammer Wt./Fall: SS-140#/30; HW-300#/16	
Date Start/Finish: 2-11-2021/2-11-2021			Drilling Method: SSA/HW Drive			Core Barrel: --	
Boring Location: Sta. 275+88.9, 72.1 RT			Casing ID/OD: HW-4.0 in. ID			Water Level*: 1.5 ft	
Hammer Efficiency Factor: 0.852			Hammer Type: Automatic <input checked="" type="checkbox"/> Hydraulic <input type="checkbox"/> Rope & Cathead <input type="checkbox"/>				
<div style="font-size: 0.8em;"> 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 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 </div>							

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	24/11	0.0 - 2.0	1/3/2/4	5	7	SSA	180.6		Dark brown, moist, medium stiff, SILT, trace fine sand, organics -TOPSOIL-(OL)	
										Grey-brown mottled, moist, medium stiff, Silty CLAY, low plasticity -MARINE DEPOSIT-(CL)	
5	2D/A	24/24	5.0 - 7.0	3/18/24/24	42	60	HW	175.2		Similar to 1D/A above -MARINE DEPOSIT-(CL)	
										Grey, wet, very dense, fine to coarse SAND, some gravel, some silt, loosely bonded -GLACIAL TILL-(SM)	
10	3D	24/12	10.0 - 12.0	25/21/19/26	40	57		170.8		Grey, wet, hard, SILT, little gravel, trace fine sand, moderately bonded -GLACIAL TILL-(ML)	
								168.8		Bottom of Exploration at 12.0 feet below ground surface. No Refusal	
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.

Page 1 of 1

Boring No.: BB-EWC2-202

Snowmobile 107
Sta. 284+27

Maine Department of Transportation Soil/Rock Exploration Log US CUSTOMARY UNITS				Project: Route 9/1-395 Connector Location: Brewer and Eddington, Maine				Boring No.: BB-EST2-101 WIN: 18915.00																																																																																																																																																																																																																																																																																																																																																																					
Driller: New England Boring Contractors				Elevation (ft.): 197.5				Auger ID/OD: --																																																																																																																																																																																																																																																																																																																																																																					
Operator: M. Porter				Datum: NAVD 88				Sampler: Split-Spoon 1.375 in. ID																																																																																																																																																																																																																																																																																																																																																																					
Logged By: N. Klausmeyer				Rig Type: Mobile B-53 Track				Hammer Wt./Fall: SSA-140#/30; HW-140#/30																																																																																																																																																																																																																																																																																																																																																																					
Date Start/Finish: 11-29-18/11-29-18				Drilling Method: SSA/HW Drive				Core Barrel: NQ-2.0 in. ID																																																																																																																																																																																																																																																																																																																																																																					
Boring Location: Sta.284+04.3; 1.3 LT				Casing ID/OD: HW-4.0 in. ID				Water Level*: 2.0 ft																																																																																																																																																																																																																																																																																																																																																																					
Hammer Efficiency Factor: 0.925				Hammer Type: Automatic <input checked="" type="checkbox"/> Hydraulic <input type="checkbox"/> Rope & Cathead <input type="checkbox"/>																																																																																																																																																																																																																																																																																																																																																																									
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Wetland
Sta. 289+11

Maine Department of Transportation Soil/Rock Exploration Log US CUSTOMARY UNITS				Project: Route 9/I-395 Connector Location: Brewer and Eddington, Maine		Boring No.: BB-EWC-101 WIN: 18915.00					
Driller: New England Boring Contractors		Elevation (ft.): 191.2		Auger ID/OD: --							
Operator: M. Porter		Datum: NAVD 88		Sampler: Split-Spoon 1.375 in. ID							
Logged By: N. Klausmeyer		Rig Type: Mobile B-53 Track		Hammer Wt./Fall: SS-140#/30; HW-300#/16							
Date Start/Finish: 11-28-18/11-28-18		Drilling Method: HW Drive		Core Barrel: NQ 2.0-in. ID							
Boring Location: Sta. 289+53.7; 7.4 LT		Casing ID/OD: HW 4.0 in. ID		Water Level*: 0.3 ft							
Hammer Efficiency Factor: 0.925		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							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	24/5	0.0 - 2.0	1/1/2/4	3	5	HW PUSH		Note: Frozen soil at ground surface. -TOPSOIL- Grey-brown to yellow-brown mottled, wet, medium stiff, Clayey SILT, trace organics (wood chips, roots) -MARINE DEPOSIT-(ML)		
									187.4		Note: Drill action indicates granular material at 3.8 ft. Grey-brown, wet, hard, fine to coarse Gravelly SILT, little fine to coarse sand, well bonded -GLACIAL TILL-(ML)
5	2D	24/10	5.0 - 7.0	13/13/14/21	27	42	44				Note: Used 300 lb hammer with 16 in. drop to advance HW casing. Note: Casing refusal at 9.6 ft.
							90				
							185				
							89				
							65				
							RC				
10	R1	60/25	10.0 - 15.0	RQD = 20%			NQ CORE		181.6		Top of Bedrock at El. 181.6 Note: Advanced roller bit to 10 ft. R1: Grey, aphanitic, PHYLLITE, hard, fresh grading to severely weathered. Joints dipping at low to vertical angles, very close to close, tight to open, fine-grained silt coatings and oxidation on some joint surfaces, frequent calcite/quartz veins up to 1/2 in. thickness throughout run. Rock Quality=Very Poor Recovery=42% R1 Core Times (min:sec): 10.0-11.0' (2:01); 11.0-12.0' (1:39); 12.0-13.0' (2:19); 13.0-14.0' (3:06); 14.0-15.0' (2:42)
15	R2	24/24	15.0 - 17.0	RQD = 0%					R2: Grey, aphanitic, PHYLLITE, hard, severely weathered. Joints dipping at low to vertical angles, very close to close, tight to open, fine-grained silt coatings and oxidation on some joint surfaces, some calcite/quartz stringers up to 1/4 in. in thickness throughout run. Rock Quality=Very Poor Recovery=100% R2 Core Times (min:sec): 15.0-16.0' (1:34); 16.0-17.0' (3:06)		
	R3	38.4/38.4	17.0 - 20.2	RQD = 18%					R3: Grey, aphanitic, PHYLLITE, hard, fresh to severely weathered. Joints dipping at low to moderate angles, very close to close, tight to open, some fine-grained coatings and oxidation on some joint surfaces, frequent calcite/quartz stringers up to 1/4 in. thickness throughout run. Rock Quality=Very Poor Recovery=100% R3 Core Times (min:sec): 17.0-18.0' (1:35); 18.0-19.0' (2:48); 19.0-20.0' (1:07); 20.0-20.2' (0:47)		
20	R4	48/45	20.2 - 24.2	RQD = 58%					R4: Grey, aphanitic, PHYLLITE, hard, fresh to moderate weathering. Joints dipping at low to steep angles, very close to close, tight to open, slight fine-grained coatings and slight oxidation on some joint surfaces, frequent calcite/quartz stringers		
25								167.0			
Remarks: 1. Observation well installed in completed borehole. See Observation Well Installation Report and Groundwater Monitoring Report for details.											
Stratification lines represent approximate boundaries between soil types; transitions may be gradual.									Page 1 of 2		
* 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.									Boring No.: BB-EWC-101		

<div>Maine Department of Transportation</div> <div>Soil/Rock Exploration Log US CUSTOMARY UNITS</div>						Project: Route 9/I-395 Connector				Boring No.: BB-EWC-101				
						Location: Brewer and Eddington, Maine				WIN: 18915.00				
Driller: New England Boring Contractors						Elevation (ft.): 191.2				Auger ID/OD: --				
Operator: M. Porter						Datum: NAVD 88				Sampler: Split-Spoon 1.375 in. ID				
Logged By: N. Klausmeyer						Rig Type: Mobile B-53 Track				Hammer Wt./Fall: SS-140#/30; HW-300#				
Date Start/Finish: 11-28-18/11-28-18						Drilling Method: HW Drive				Core Barrel: NQ 2.0-in. ID				
Boring Location: Sta. 289+53.7; 7.4 LT						Casing ID/OD: HW 4.0 in. ID				Water Level*: 0.3 ft				
Hammer Efficiency Factor: 0.925						Hammer Type: Automatic <input checked="" type="checkbox"/> Hydraulic <input type="checkbox"/> Rope & Cathead <input type="checkbox"/>								
Definitions: D = Split Spoon Sample R = Rock Core Sample S _u = Peak/Remolded Field Vane Undrained Shear Strength (psf) T _v = Pocket Torvane Shear Strength (psf) MD = Unsuccessful Split Spoon Sample Attempt SSA = Solid Stem Auger S _{u(lab)} = Lab Vane Undrained Shear Strength (psf) WC = Water Content, percent U = Thin Wall Tube Sample HSA = Hollow Stem Auger q _o = Unconfined Compressive Strength (ksf) LL = Liquid Limit MU = Unsuccessful Thin Wall Tube Sample Attempt RC = Roller Cone N-uncorrected = Raw Field SPT N-value PL = Plastic Limit V = Field Vane Shear Test, PP = Pocket Penetrometer WOH = Weight of 140 lb. Hammer Hammer Efficiency Factor = Rig Specific Annual Calibration Value PI = Plasticity Index MV = Unsuccessful Field Vane Shear Test Attempt WOR/C = Weight of Rods or Casing N ₆₀ = SPT N-uncorrected Corrected for Hammer Efficiency G = Grain Size Analysis WO1P = Weight of One Person N ₆₀ = (Hammer Efficiency Factor/60%)*N-uncorrected C = Consolidation Test														
Sample Information														
Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows ((6 in.) Shear Strength (psf) or RQD (%))	N-uncorrected	N ₆₀	Casing Blows	Elevation (ft.)	Graphic Log	Visual Description and Remarks				Laboratory Testing Results/AASHTO and Unified Class.
25										up to 1/3 in. thickness throughout run. Rock Quality=Fair Recovery 94% R4 Core Times (min:sec); 20.2-21.2' (2:06); 21.2-22.2' (1:43); 22.2-23.2' (1:49); 23.2-24.2' (2:28) <div>Bottom of Exploration at 24.2 feet below ground surface.</div>				
30														
35														
40														
45														
50														
Remarks:														
1. Observation well installed in completed borehole. See Observation Well Installation Report and Groundwater Monitoring Report for details.														
Stratification lines represent approximate boundaries between soil types; transitions may be gradual.										Page 2 of 2				
* 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.														
Boring No.: BB-EWC-101														

Maine Department of Transportation Soil/Rock Exploration Log US CUSTOMARY UNITS				Project: Route 9/I-395 Connector Location: Brewer and Eddington, Maine		Boring No.: BB-EWC-203 WIN: 18915.00					
Driller: New England Boring Contractors		Elevation (ft.): 189.5		Auger ID/OD: --							
Operator: M. Porter		Datum: NAVD 88		Sampler: Split Spoon 1.375 in. ID							
Logged By: J. Fletcher		Rig Type: Mobile B-53 Track		Hammer Wt./Fall: SS-140#/30; HW-300#/16							
Date Start/Finish: 2-10-2021/2-10-2021		Drilling Method: SSA/HW Drive		Core Barrel: --							
Boring Location: Sta. 288+99.4, 2.8 RT		Casing ID/OD: HW-4.0 in. ID		Water Level*: At Ground Surface							
Hammer Efficiency Factor: 0.852		Hammer Type: Automatic <input checked="" type="checkbox"/> Hydraulic <input type="checkbox"/> Rope & Cathead <input type="checkbox"/>									
<div style="font-size: small;"> 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 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 </div>											
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	24/6	0.0 - 2.0	WOH/1/2/4	3	4	SSA	189.4		Dark brown, wet, soft, SILT, trace fine sand, organics -TOPSOIL-(OL) Grey-brown mottled, moist, soft, Silty CLAY, low plasticity -MARINE DEPOSIT-(CL) Note: Drill action indicates change at 2.6 ft. -PROBABLE GLACIAL TILL- Note: Top of probable bedrock at 6.5 ft based on drill action. Grey, wet, very dense, WEATHERED BEDROCK, oxidation. -WEATHERED BEDROCK- Top of Probable Bedrock at El. 183.0 -PROBABLE BEDROCK- Bottom of Exploration at 8.2 feet below ground surface.	
								186.9			
								184.5			
								183.0			
								181.3			
5	2D	14/10	5.0 - 6.2	27/47/50(2")			RC				
10											
20											
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.

Page 1 of 1

Boring No.: BB-EWC-203

ROCK CORE PHOTOGRAPHS
I-395/ROUTE 9 CONNECTOR
MAINEDOT WIN 018915.00
BREWER/EDDINGTON, MAINE



Top Row: BB-BWS-102, Run No. R1 41.0 (left) to 42.3 (middle), Run No. R2 42.3 (middle) to 45.5 (right)
Top Middle Row: BB-BWS-102, Run No. R3 45.5 (left) to 49.8 (middle), Run No. R4 49.8 (middle) to 51.3 (right)
Bottom Middle Row: BB-BFB-101, Run No. R1 42.0 (left) to 45.0 (middle), Run No. R2 45.0 (middle) to 50.0 (right)
Bottom Row: BB-BFB-101, Run No. R2 continued 45.0 (left) to 50.0 (middle), Run No. R3 50.0 (middle) to 52.0 (right)

ROCK CORE PHOTOGRAPHS
I-395/ROUTE 9 CONNECTOR
MAINEDOT WIN 018915.00
BREWER/EDDINGTON, MAINE



Top Row: BB-BST1-101, Run No. R1 35.0 (left) to 37.3 (middle), Run No. R2 37.3 (middle) to 40.6 (right)
Top Middle Row: BB-BST1-101, Run No. R2 continued 37.3 (left) to 40.6 (middle), Run No. R3 40.6 (middle-left) to 42.6 (middle-right), Run No. R4 42.6 (left) to 45.4 (right)
Bottom Middle Row: BB-BST1-101, Run No. R4 continued 42.6 (left) to 45.4 (middle), Run No. R5 45.4 (middle) to 49.4 (right)
Bottom Row: BB-BST1-101, Run No. R5 continued 45.4 (left) to 49.4 (right)

**ROCK CORE PHOTOGRAPHS
I-395/ROUTE 9 CONNECTOR
MAINEDOT WIN 018915.00
BREWER/EDDINGTON, MAINE**



Top Row: BB-EWC1-101, Run No. R1 14.0 (left) to 19.0 (right)
Top Middle Row: BB-EWC1-101, Run No. R2 19.0 (left) to 24.0 (right)
Bottom Middle Row: BB-EEBT2-101, Run No. R1 22.0 (left) to 27.0 (right)
Bottom Row: BB-EEBT2-101, Run No. R2 27.0 (left) to 32.0 (right)

ROCK CORE PHOTOGRAPHS
I-395/ROUTE 9 CONNECTOR
MAINEDOT WIN 018915.00
BREWER/EDDINGTON, MAINE



Top Row: BB-EST2-101, Run No. R1 11.5 (left) to 16.2 (middle), Run No. R2 16.2 (middle) to 21.2 (right)

Top Middle Row: BB-EST2-101 Run No. R2 continued 16.2 (left) to 21.2 (right)

Bottom Row: BB-EWC2-101, Run No. R1 51.4 (left) to 56.4 (right)

ROCK CORE PHOTOGRAPHS
I-395/ROUTE 9 CONNECTOR
MAINEDOT WIN 018915.00
BREWER/EDDINGTON, MAINE



Top Row: HB-BE-152, Run No. R1 20.1 (left) to 24.6 (right)

Top Middle Row: BB-EWC-101, Run No. R1 10.0 (left) to 15.0 (middle), Run No. R2 15.0 (middle) to 17.0 (right)

Bottom Middle Row: BB-EWC-101, Run No. R3 17.0 (left) to 20.2 (right)

Bottom Row: BB-EWC-101, Run No. R4 20.2 (left) to 24.2 (right)

ROCK CORE PHOTOGRAPHS
I-395/ROUTE 9 CONNECTOR
MAINEDOT WIN 018915.00
BREWER/EDDINGTON, MAINE



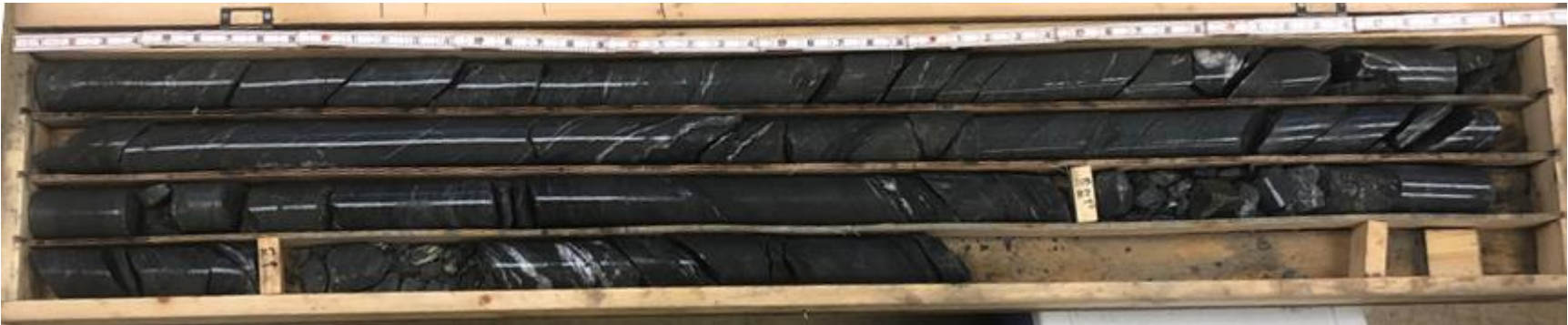
Top Row: HB-BE-109, Run No. R1 24.0 (left) to 26.3 (middle), Run No. R2 26.3 (middle) to 31.3 (right)
Top Middle Row: HB-BE-109, Run No. R2 continued 26.3 (left) to 31.3 (middle), Run No. R3 31.3 (middle) to 36.3 (right)
Bottom Middle Row: HB-BE-109 Run No. R3 continued 31.3 (left) to 36.3 (right)

**ROCK CORE PHOTOGRAPHS
I-395/ROUTE 9 CONNECTOR
MAINEDOT WIN 018915.00
BREWER/EDDINGTON, MAINE**



Top Row: BB-BFB-202, Run No. R1 48.5 (left) to 53.5 (right)
Top Middle Row: BB-BFB-201, Run No. R1 31.0 (left) to 35.6 (right)
Bottom Middle Row: BB-BFB1-201, Run No. R1 25.0 (left) to 29.8 (right)
Bottom Row: BB-BFB1-201, Run No. R2 29.8 (left) to 34.1 (right)

ROCK CORE PHOTOGRAPHS
I-395/ROUTE 9 CONNECTOR
MAINEDOT WIN 018915.00
BREWER/EDDINGTON, MAINE



Top Row: BB-BFB1-202, Run No. R1 35.0 (left) to 40.0 (right)

Top Middle Row: BB-BFB1-202, Run No. R2 40.0 (left) to 45.0 (right)

Bottom Middle Row: BB-BFB1-203, Run No. R1 24.8 (left) to 29.8 (middle), Run No. R2 29.8 (middle) to 33.0 (right)

Bottom Row: BB-BFB1-203, Run No. R2 continued 29.8 (left) to 33.0 (middle), Run No. R3 33.0 (middle) to 34.8 (right)

ROCK CORE PHOTOGRAPHS
I-395/ROUTE 9 CONNECTOR
MAINEDOT WIN 018915.00
BREWER/EDDINGTON, MAINE



Top Row: BB-BFB1-204, Run No. R1 38.8 (left) to 40.8 (middle-left), Run No. R2 40.8 (middle-left) to 44.8 (right)

Top Middle Row: BB-BFB1-204, Run No. R3 44.8 (left) to 47.4 (right)

Bottom Middle Row: BB-BST1-201, Run No. R1 33.0 (left) to 34.5 (middle-left), Run No. R2 34.5 (middle-left) to 38.5 (right)

Bottom Row: BB-BST1-201, Run No. R3 38.5 (left) to 41.5 (right)

APPENDIX B

Observation Well Installation and Groundwater Monitoring Reports

HALEY ALDRICH	OBSERVATION WELL INSTALLATION REPORT		Well No. HB-BE-101(OW)															
			Boring No. HB-BE-101															
PROJECT LOCATION CLIENT CONTRACTOR DRILLER	Route 9/I-395 Connector Brewer, Maine/Eddington, Maine Maine Department of Transportation Northern Test Borings Inc. M. Nadeau		H&A FILE NO. PROJECT MGR. FIELD REP. DATE INSTALLED WATER LEVEL															
		132076-002 B. Steinert N. Klausmeyer 7/7/2018 --																
Ground El. El. Datum	82.0 ft NAVD 88	Location SEE PLAN	<input checked="" type="checkbox"/> Guard Pipe <input type="checkbox"/> Roadway Box															
SOIL/ROCK CONDITIONS Clayey SILT -FILL- 2.0 ft -MARINE DEPOSIT- 37.0 ft -GLACIAL TILL- 42.6 ft -BEDROCK- 12.2 (Bottom of Exploration) (Numbers refer to depth from ground surface in feet)	BOREHOLE BACKFILL -BENTONITE- 1.8 ft -FILTER SAND- 12.2	<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p style="text-align: center;">Type of protective cover Locking Cap</p> <p style="text-align: right;">Height of top of guard pipe above ground surface 2.1 ft</p> <p style="text-align: right;">Height of top of riser pipe above ground surface 1.5 ft</p> <p style="text-align: right;">Type of protective casing: Steel Guard Pipe</p> <p style="text-align: right;">Length 5.0 ft</p> <p style="text-align: right;">Inside Diameter 4.0 in</p> <p style="text-align: right;">Depth of bottom of guard pipe 2.9 ft</p> <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <thead> <tr> <th>Type of Seals</th> <th>Top of Seal (ft)</th> <th>Thickness (ft)</th> </tr> </thead> <tbody> <tr> <td>Concrete</td> <td>--</td> <td>--</td> </tr> <tr> <td>Bentonite Seal</td> <td>0.0</td> <td>1.8</td> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table> <p style="text-align: right;">Type of riser pipe: Sch. 40 PVC</p> <p style="text-align: right;">Inside diameter of riser pipe 2.0 in</p> <p style="text-align: right;">Type of backfill around riser Filter Sand</p> <p style="text-align: right;">Diameter of borehole 4.0 in</p> <p style="text-align: right;">Depth to top of well screen 2.0 ft</p> <p style="text-align: right;">Type of screen Sch. 40 PVC</p> <p style="text-align: right;">Screen gauge or size of openings 0.010 in</p> <p style="text-align: right;">Diameter of screen 2.0 in</p> <p style="text-align: right;">Type of backfill around screen Filter Sand</p> <p style="text-align: right;">Depth of bottom of well screen 12.0 ft</p> <p style="text-align: right;">Bottom of Silt trap 12.2 ft</p> <p style="text-align: right;">Depth of bottom of borehole 12.2 ft</p> </div> <div style="width: 50%; text-align: center;"> <p>L1</p> <p>L2</p> <p>L3</p> </div> </div> <div style="text-align: center; margin-top: 20px;"> <p>(Not to Scale)</p> </div>		Type of Seals	Top of Seal (ft)	Thickness (ft)	Concrete	--	--	Bentonite Seal	0.0	1.8						
Type of Seals	Top of Seal (ft)	Thickness (ft)																
Concrete	--	--																
Bentonite Seal	0.0	1.8																
<div style="display: flex; justify-content: space-around; align-items: center;"> <div>3.5 ft</div> <div>+</div> <div>10.0 ft</div> <div>+</div> <div>0.2 ft</div> <div>=</div> <div>13.7 ft</div> </div> <div style="display: flex; justify-content: space-around; align-items: center; margin-top: 5px;"> <div>Riser Pay Length (L1)</div> <div>Length of screen (L2)</div> <div>Length of silt trap (L3)</div> <div>Pay length</div> </div>																		
COMMENTS:																		

**HB-BE-101**

Page 1 of 1

H&A FILE NO. 132076-002

PROJECT MGR.	B. Steinert
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FIELD REP. N. Klausmeyer

DATE 8/10/2018

ELEVATION OF REFERENCE POINT (ft)	82.0	REFERENCE POINT:	Ground Surface	<input checked="" type="checkbox"/>	PVC	<input type="checkbox"/>	Other	<input type="checkbox"/>
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\\haleyaldrich.com\share\por_common\PROJECTS\132076 - brewer eddington\002 - Exploration + Laboratory Testing Programs\Field\Ground Water Monitoring Reports\Phase1A\HB-BE-101 - Well Monitoring Report.xlsx
Form 2021

	<h2 style="margin: 0;">OBSERVATION WELL INSTALLATION REPORT</h2>		Well No. BB-EEBT2-102(OW)															
			Boring No. BB-EEBT2-102															
PROJECT LOCATION CLIENT CONTRACTOR DRILLER	Route 9/I-395 Connector Brewer, Maine/Eddington, Maine Maine Department of Transportation New England Boring Contractors B. Enos		H&A FILE NO. PROJECT MGR. FIELD REP. DATE INSTALLED WATER LEVEL															
		132076-002 B. Steinert N. Klausmeyer 12/3/2018 1.4 ft (depth below gs)																
Ground El. 181.3 ft El. Datum NAVD 88	Location SEE PLAN	<input checked="" type="checkbox"/> Guard Pipe <input type="checkbox"/> Roadway Box																
SOIL/ROCK CONDITIONS -TOPSOIL- 0.1 ft -MARINE DEPOSIT- 12.3 ft -GLACIAL TILL- 17.2 ft -BEDROCK- 17.5 (Bottom of Exploration) (Numbers refer to depth from ground surface in feet)	BOREHOLE BACKFILL -FILTER SAND- 3.0 ft -BENTONITE- 4.0 ft -FILTER SAND- 17.5	<div style="display: flex; align-items: center;"> <div style="margin-left: 10px;"> <p>Type of protective cover _____ Locking Cap</p> <p>Height of top of guard pipe above ground surface _____ 3.0 ft</p> <p>Height of top of riser pipe above ground surface _____ 3.0 ft</p> <p>Type of protective casing: _____ Steel Guard Pipe</p> <p>Length _____ 5.3 ft</p> <p>Inside Diameter _____ 3.0 in</p> <p>Depth of bottom of guard pipe _____ 2.3 ft</p> <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <thead> <tr> <th>Type of Seals</th> <th>Top of Seal (ft)</th> <th>Thickness (ft)</th> </tr> </thead> <tbody> <tr> <td>Bentonite Seal</td> <td>3.0</td> <td>1.0</td> </tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> </tbody> </table> <p>Type of riser pipe: _____ Sch. 40 PVC</p> <p>Inside diameter of riser pipe _____ 2.0 in</p> <p>Type of backfill around riser _____ Hollister Filter Sand</p> <p>Diameter of borehole _____ 4.0 in</p> <p>Depth to top of well screen _____ 4.8 ft</p> <p>Type of screen _____ Sch. 40 PVC</p> <p>Screen gauge or size of openings _____ 0.010 in</p> <p>Diameter of screen _____ 2.0 in</p> <p>Type of backfill around screen _____ Hollister Filter Sand</p> <p>Depth of bottom of well screen _____ 14.8 ft</p> <p>Bottom of Silt trap _____ 15.0 ft</p> <p>Depth of bottom of borehole _____ 17.5 ft</p> </div> </div>		Type of Seals	Top of Seal (ft)	Thickness (ft)	Bentonite Seal	3.0	1.0									
Type of Seals	Top of Seal (ft)	Thickness (ft)																
Bentonite Seal	3.0	1.0																
<div style="display: flex; justify-content: space-between; align-items: center;"> <div> <p>7.8 ft + 10.0 ft + 0.2 ft = 18.0 ft</p> <p>Riser Pay Length (L1) Length of screen (L2) Length of silt trap (L3) Pay length</p> </div> <div>(Not to Scale)</div> </div>																		
COMMENTS: _____																		

GROUNDWATER MONITORING REPORT

OW/PZ NUMBER

BB-EEBT2-102

Page 1 of 1

PROJECT	Route 9/I-395 Connector
----------------	-------------------------

LOCATION	Brewer, Maine / Eddington, Maine
-----------------	----------------------------------

CLIENT Maine Department of Transportation

CONTRACTOR New England Boring Contractors

H&A FILE NO. 132076-002

PROJECT MGR. B. Steinert

FIELD REP. H. Hollauer/N. Klausmeyer

DATE 4/20/2020

ELEVATION OF REFERENCE POINT (ft)	181.3
-----------------------------------	-------

REFERENCE POINT: Ground Surface ☒ PVC ☐ Other ☐

[illegible]

HALEY ALDRICH	<h2 style="margin: 0;">OBSERVATION WELL INSTALLATION REPORT</h2>		Well No. BB-EWC-101(OW)												
			Boring No. BB-EWC-101												
PROJECT LOCATION CLIENT CONTRACTOR DRILLER	Route 9/I-395 Connector Brewer, Maine/Eddington, Maine Maine Department of Transportation New England Boring Contractors M. Porter		H&A FILE NO. PROJECT MGR. FIELD REP. DATE INSTALLED WATER LEVEL												
		132076-002 B. Steinert H. Hollauer 11/28/2018 0.3 ft. (depth below gs)													
Ground El. <u>191.2</u> ft El. Datum <u>NAVD 88</u>		Location <u>SEE PLAN</u>	<input checked="" type="checkbox"/> Guard Pipe <input type="checkbox"/> Roadway Box												
SOIL/ROCK CONDITIONS -TOPSOIL- 0.1 ft -MARINE DEPOSIT- 3.8 ft -GLACIAL TILL- 9.6 ft -BEDROCK- 24.2 ft (Bottom of Exploration) (Numbers refer to depth from ground surface in feet)	BOREHOLE BACKFILL -FILTER SAND- 2.3 ft -BENTONITE- 3.4 ft -FILTER SAND- 9.5 ft -BENTONITE- 10.0 ft -FILTER SAND- 17.5 ft -BENTONITE- 24.2 ft	<div style="display: flex; align-items: center;"> <div style="margin-left: 20px;"> <p>Type of protective cover: <u>Locking Cap</u></p> <p>Height of top of guard pipe above ground surface: <u>3.3</u> ft</p> <p>Height of top of riser pipe above ground surface: <u>3.2</u> ft</p> <p>Type of protective casing: <u>Steel Guard Pipe</u></p> <p>Length: <u>5.3</u> ft</p> <p>Inside Diameter: <u>3.0</u> in</p> <p>Depth of bottom of guard pipe: <u>2.0</u> ft</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Type of Seals</th> <th>Top of Seal (ft)</th> <th>Thickness (ft)</th> </tr> </thead> <tbody> <tr> <td>Bentonite Seal</td> <td>2.3</td> <td>1.1</td> </tr> <tr> <td>Bentonite Seal</td> <td>9.5</td> <td>0.5</td> </tr> <tr> <td>Bentonite Seal</td> <td>17.5</td> <td>6.7</td> </tr> </tbody> </table> <p>Type of riser pipe: <u>Sch. 40 PVC</u></p> <p>Inside diameter of riser pipe: <u>2.0</u> in</p> <p>Type of backfill around riser: <u>Holliston Filter Sand</u></p> <p>Diameter of borehole: <u>4.0</u> in</p> <p>Depth to top of well screen: <u>4.3</u> ft</p> <p>Type of screen: <u>Sch. 40 PVC</u></p> <p>Screen gauge or size of openings: <u>0.010</u> in</p> <p>Diameter of screen: <u>2.0</u> in</p> <p>Type of backfill around screen: <u>Holliston Filter Sand</u></p> <p>Depth of bottom of well screen: <u>9.3</u> ft</p> <p>Bottom of Silt trap: <u>9.5</u> ft</p> <p>Depth of bottom of borehole: <u>24.2</u> ft</p> </div> </div>		Type of Seals	Top of Seal (ft)	Thickness (ft)	Bentonite Seal	2.3	1.1	Bentonite Seal	9.5	0.5	Bentonite Seal	17.5	6.7
Type of Seals	Top of Seal (ft)	Thickness (ft)													
Bentonite Seal	2.3	1.1													
Bentonite Seal	9.5	0.5													
Bentonite Seal	17.5	6.7													
<div style="display: flex; justify-content: space-between;"> <div> <u>7.5</u> ft + <u>5.0</u> ft + <u>0.2</u> ft = <u>12.7</u> ft Riser Pay Length (L1) Length of screen (L2) Length of silt trap (L3) Pay length </div> <div>(Not to Scale)</div> </div>															
COMMENTS:															



BB-EWC-101

Page 1 of 1

H&A FILE NO. 132076-002

PROJECT MGR.	B. Steinert
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FIELD REP. H. Hollauer/N. Klausmeyer

DATE 12/20/2018

ELEVATION OF REFERENCE POINT (ft)	191.2	REFERENCE POINT:	Ground Surface	<input checked="" type="checkbox"/>	PVC	<input type="checkbox"/>	Other	<input type="checkbox"/>
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\\haleyaldrich.com\share\por_common\PROJECTS\132076 - brewer eddington\002 - Exploration + Laboratory Testing Programs\Field\Ground Water Monitoring Reports\Phase1B\BB-EWC-101- Well Monitoring Report.xlsx
Form 2021

APPENDIX C

Laboratory Test Results



Client:	Haley & Aldrich, Inc.		
Project:	Rt 9/I-395 Connector		
Location:	Brewer and Eddington, ME	Project No:	GTX-308853
Boring ID:	---	Sample Type:	---
Sample ID:	---	Test Date:	10/12/18
Depth :	---	Test Id:	474364
		Tested By:	GA
		Checked By:	emm

Moisture Content of Soil and Rock - ASTM D2216

Boring ID	Sample ID	Depth	Description	Moisture Content, %
HB-BE-101	1U	5-7 ft	Moist, dark gray clay	35.1
HB-BE-102	1U	10-11.3 ft	Moist, dark olive gray clay	27.6
HB-BE-105	1U	10-12 ft	Moist, olive gray clay	30.3
HB-BE-105	2U	14-16 ft	Moist, dark gray clay	36.7
HB-BE-107A	1U	10-12 ft	Wet, dark gray clay	39.3
HB-BE-115	2D	2-4 ft	Moist, brownish yellow silty sand with gravel	4.9
HB-BE-115	3D	5-7 ft	Moist, olive brown silty sand with gravel	6.7
HB-BE-115	6D	14-16 ft	Moist, olive silty sand with gravel	9.7
HB-BE-115	8D	18-19.6 ft	Moist, olive silty sand	11.4

Notes: Temperature of Drying : 110° Celsius



Client:	Haley & Aldrich, Inc.		
Project:	Rt 9/I-395 Connector		
Location:	Brewer and Eddington, ME	Project No:	GTX-308853
Boring ID:	---	Sample Type:	---
Sample ID:	---	Test Date:	10/17/18
Depth :	---	Test Id:	474317
		Tested By:	md
		Checked By:	emm

Moisture Content of Soil and Rock - ASTM D2216

Boring ID	Sample ID	Depth	Description	Moisture Content, %
HB-BE-151	2D	2-3.7 ft	Moist, olive sandy clay	13.7
HB-BE-151	3D	4-6 ft	Moist, olive sandy clay	13.4
HB-BE-151	4D	10-10.9 ft	Moist, olive gray sandy clay	12.4
HB-BE-151	5D	15-16.2 ft	Moist, olive sandy clay	11.3
HB-BE-151	6D+7D+8D	17-21.5 ft	Moist, olive brown gravel with clay and sand	7.9
HB-BFB-101	1U	5-7 ft	Moist, very dark gray clay	36.1
HB-BFB-101	2U	12-14 ft	Wet, very dark greenish gray clay	40.4
HB-BFB-101	4U	30-32 ft	Moist, dark gray clay	35.4

Notes: Temperature of Drying : 110° Celsius

Client:	Haley & Aldrich, Inc.		
Project:	I-395/Rte 9 Connector (Area 1)		
Location:	Brewer-Eddington, ME	Project No:	GTX-312665
Boring ID: ---	Sample Type: ---	Tested By:	md
Sample ID: ---	Test Date: 03/23/21	Checked By:	emm
Depth : ---	Test Id:	611463	

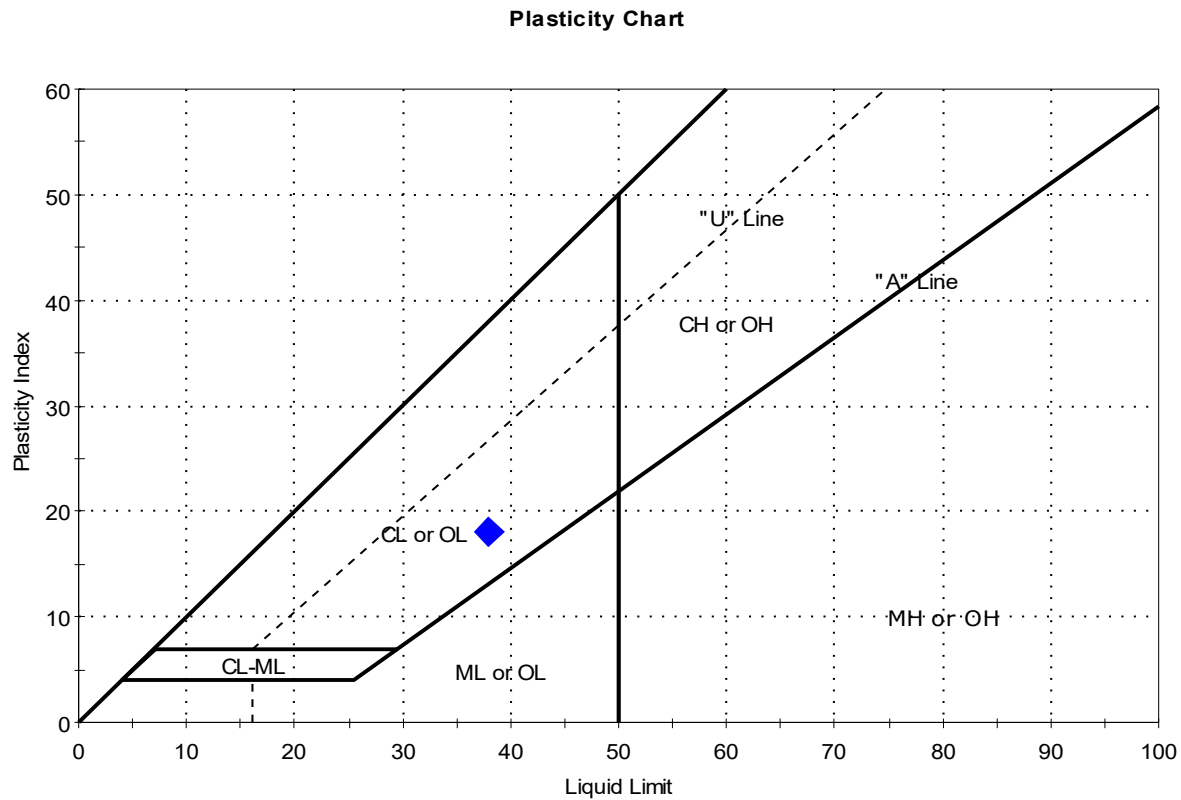
Moisture Content of Soil and Rock - ASTM D2216

Boring ID	Sample ID	Depth	Description	Moisture Content, %
BB-BFB1-202	U1	10-12 ft	Moist, gray clay	35.2
BB-BFB1-202	U2	15-17 ft	Moist, gray clay	38.9
BB-BFB1-204	U1	10-12 ft	Moist, gray clay	35.3
BB-BFB-201	U2	23-25 ft	Moist, gray clay	33.7
BB-BFB-202	U1	18-20 ft	Wet, gray clay	42.0
BB-BFB-202	U2	25-27 ft	Moist, gray clay	36.0
BB-BFB2-201	U1	5-7 ft	Moist, olive gray clay	33.6
BB-BFB2-202	U1	10-12 ft	Moist, gray clay	35.6
BB-BST1-201	U1	15-17 ft	Moist, olive gray	38.0

Notes: Temperature of Drying : 110° Celsius

Client:	Haley & Aldrich, Inc.		
Project:	Rt 9/I-395 Connector		
Location:	Brewer and Eddington, ME	Project No:	GTX-308853
Boring ID:	BB-BFB1-101	Sample Type:	tube
Sample ID:	1U	Test Date:	07/30/19
Depth :	15-16.4 ft	Test Id:	513657
Test Comment:	---		
Visual Description:	Moist, dark 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
◆	1U	BB-BFB1-101	15-16.4 ft	38	38	20	18	1	

Sample Prepared using the WET method

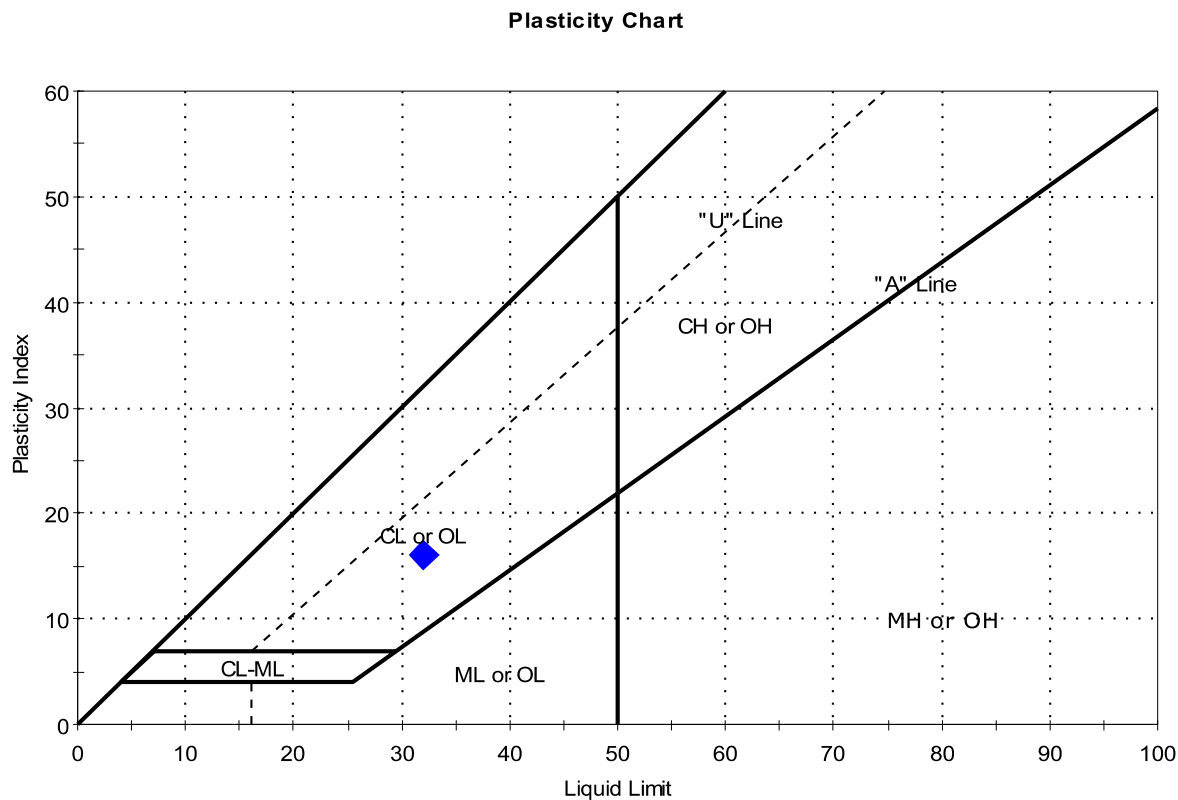
Dry Strength: VERY HIGH

Dilatancy: SLOW

Toughness: LOW

Client:	Haley & Aldrich, Inc.		
Project:	I-395/Rte 9 Connector (Area 1)		
Location:	Brewer-Eddington, ME	Project No:	GTX-312665
Boring ID:	BB-BFB-201	Sample Type:	tube
Sample ID:	U2	Test Date:	03/10/21
Depth :	23-25 ft	Test Id:	611430
Test Comment:	---		
Visual Description:	Moist, 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-BFB-20	23-25 ft	34	32	16	16	1.1	

Sample Prepared using the WET method

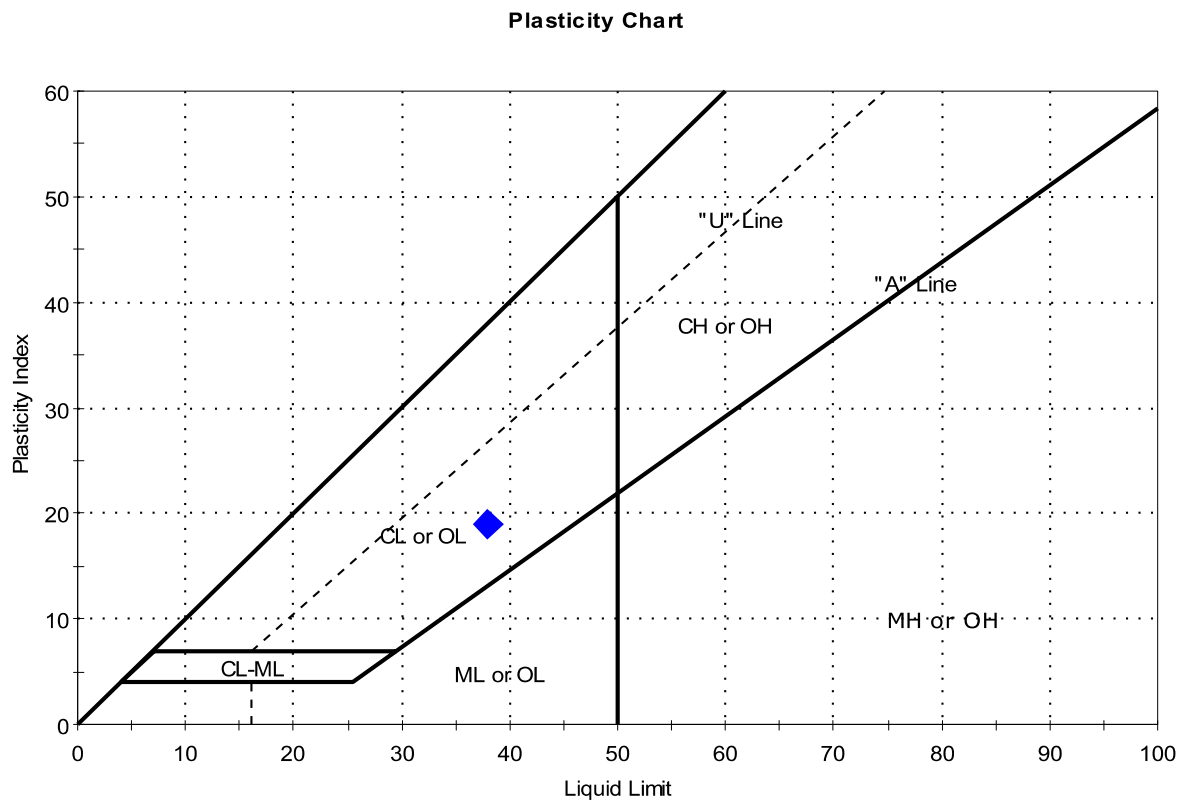
Dry Strength: VERY HIGH

Dilatancy: SLOW

Toughness: LOW

Client:	Haley & Aldrich, Inc.		
Project:	I-395/Rte 9 Connector (Area 1)		
Location:	Brewer-Eddington, ME	Project No:	GTX-312665
Boring ID:	BB-BFB-202	Sample Type:	tube
Sample ID:	U1	Test Date:	03/11/21
Depth :	18-20 ft	Test Id:	611431
Test Comment:	---		
Visual Description:	Moist, 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-BFB-20	18-20 ft	42	38	19	19	1.2	

Sample Prepared using the WET method

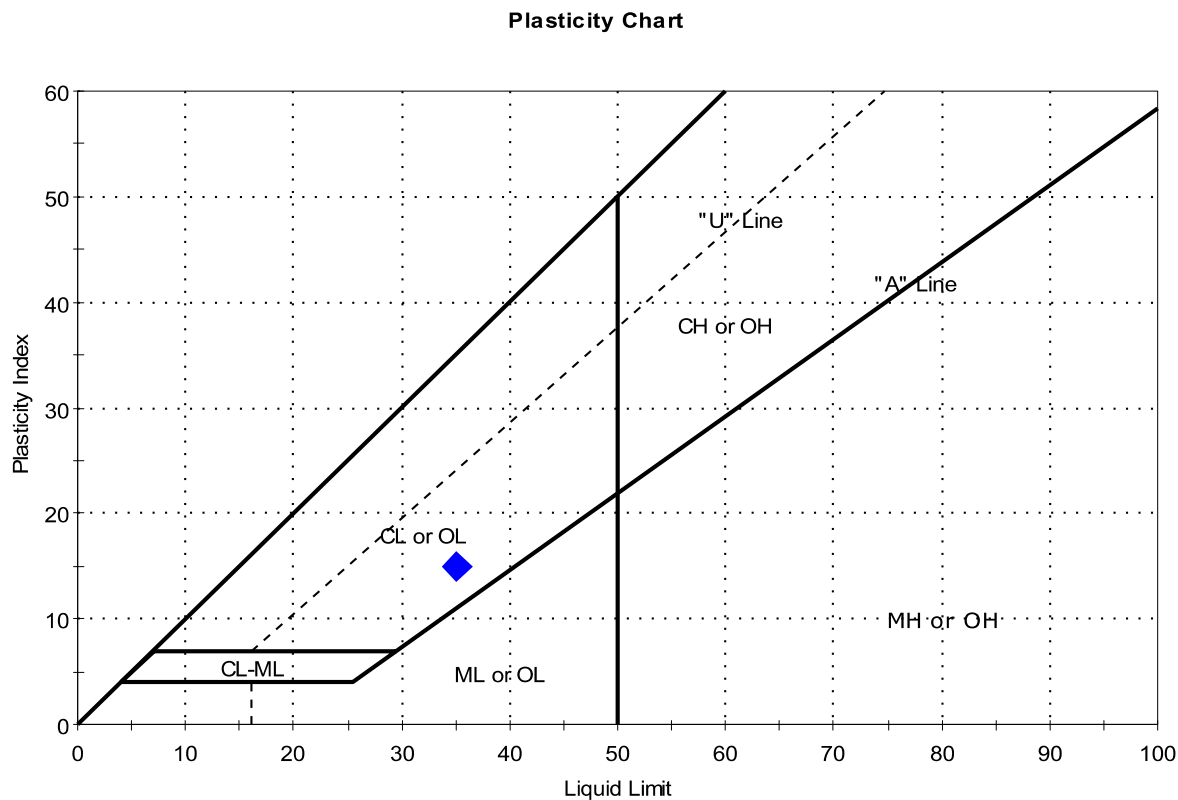
Dry Strength: VERY HIGH

Dilatancy: SLOW

Toughness: LOW

Client:	Haley & Aldrich, Inc.		
Project:	I-395/Rte 9 Connector (Area 1)		
Location:	Brewer-Eddington, ME	Project No:	GTX-312665
Boring ID:	BB-BFB-202	Sample Type:	tube
Sample ID:	U2	Test Date:	03/08/21
Depth :	25-27 ft	Test Id:	611432
Test Comment:	---		
Visual Description:	Moist, 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-BFB-20	25-27 ft	36	35	20	15	1.1	

Sample Prepared using the WET method

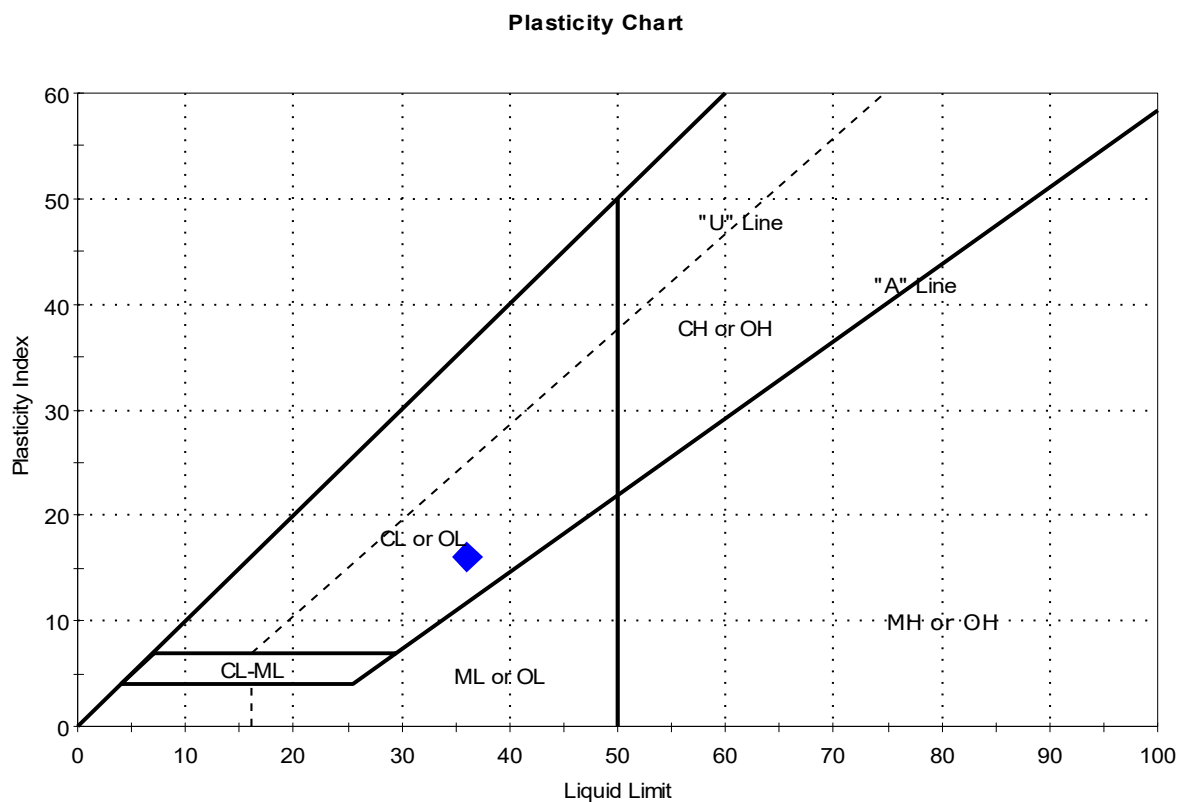
Dry Strength: VERY HIGH

Dilatancy: SLOW

Toughness: LOW

Client:	Haley & Aldrich, Inc.		
Project:	I-395/Rte 9 Connector (Area 1)		
Location:	Brewer-Eddington, ME	Project No:	GTX-312665
Boring ID:	BB-BFB1-202	Sample Type:	tube
Sample ID:	U1	Test Date:	03/05/21
Depth :	10-12 ft	Test Id:	611433
Test Comment:	---		
Visual Description:	Moist, 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	BB-BFB1-202	10-12 ft	35	36	20	16	1	

Sample Prepared using the WET method

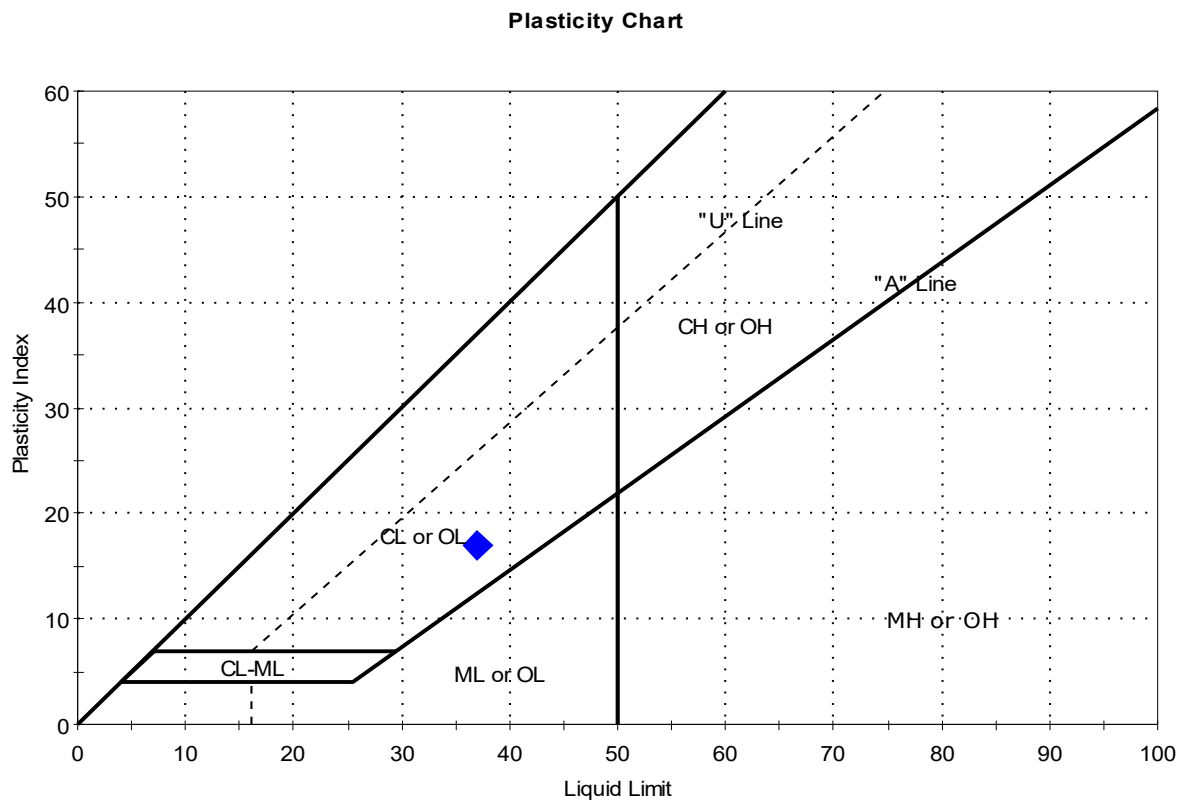
Dry Strength: VERY HIGH

Dilatancy: SLOW

Toughness: LOW

Client:	Haley & Aldrich, Inc.		
Project:	I-395/Rte 9 Connector (Area 1)		
Location:	Brewer-Eddington, ME	Project No:	GTX-312665
Boring ID:	BB-BFB1-202	Sample Type:	tube
Sample ID:	U2	Test Date:	03/09/21
Depth :	15-17 ft	Test Id:	611434
Test Comment:	---		
Visual Description:	Moist, 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	BB-BFB1-202	15-17 ft	39	37	20	17	1.1	

Sample Prepared using the WET method

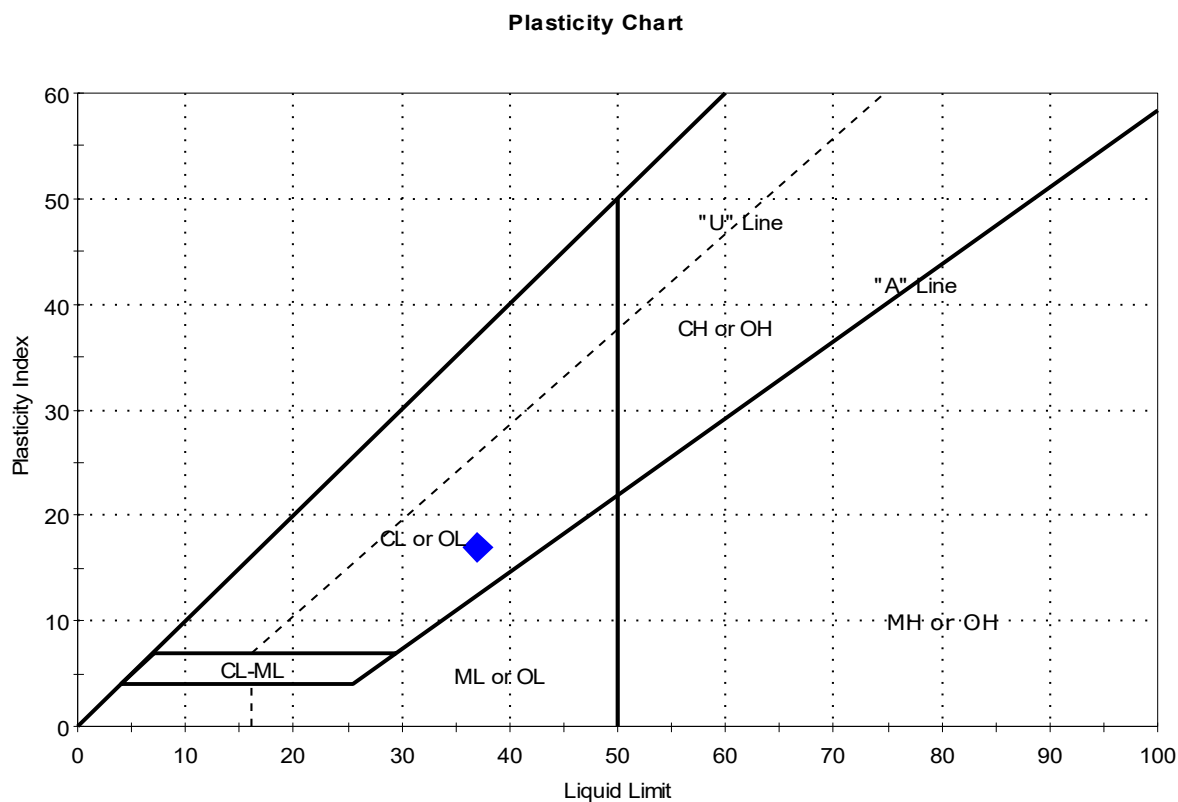
Dry Strength: VERY HIGH

Dilatancy: SLOW

Toughness: LOW

Client:	Haley & Aldrich, Inc.		
Project:	Rt 9/I-395 Connector		
Location:	Brewer and Eddington, ME	Project No:	GTX-308853
Boring ID:	BB-BST1-101	Sample Type:	tube
Sample ID:	1U	Test Date:	07/26/19
Depth :	10-12 ft	Test Id:	513655
Test Comment:	---		
Visual Description:	Moist, dark 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
◆	1U	BB-BST1-101	10-12 ft	34	37	20	17	0.8	

Sample Prepared using the WET method

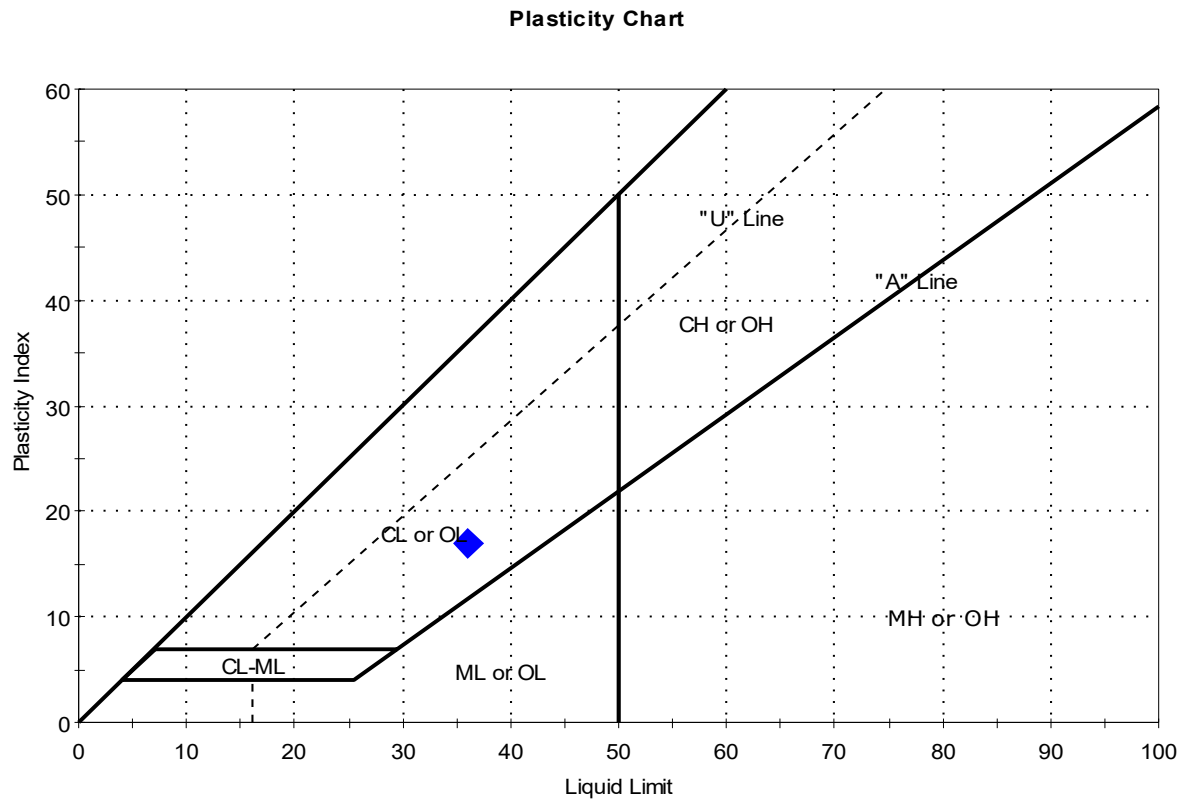
Dry Strength: HIGH

Dilatancy: SLOW

Toughness: LOW

Client:	Haley & Aldrich, Inc.		
Project:	I-395/Rte 9 Connector (Area 1)		
Location:	Brewer-Eddington, ME	Project No:	GTX-312665
Boring ID:	BB-BST1-201	Sample Type:	tube
Sample ID:	U1	Test Date:	03/09/21
Depth :	15-17 ft	Test Id:	611438
Test Comment:	---		
Visual Description:	Moist, olive gray		
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	BB-BST1-201	15-17 ft	38	36	19	17	1.1	

Sample Prepared using the WET method

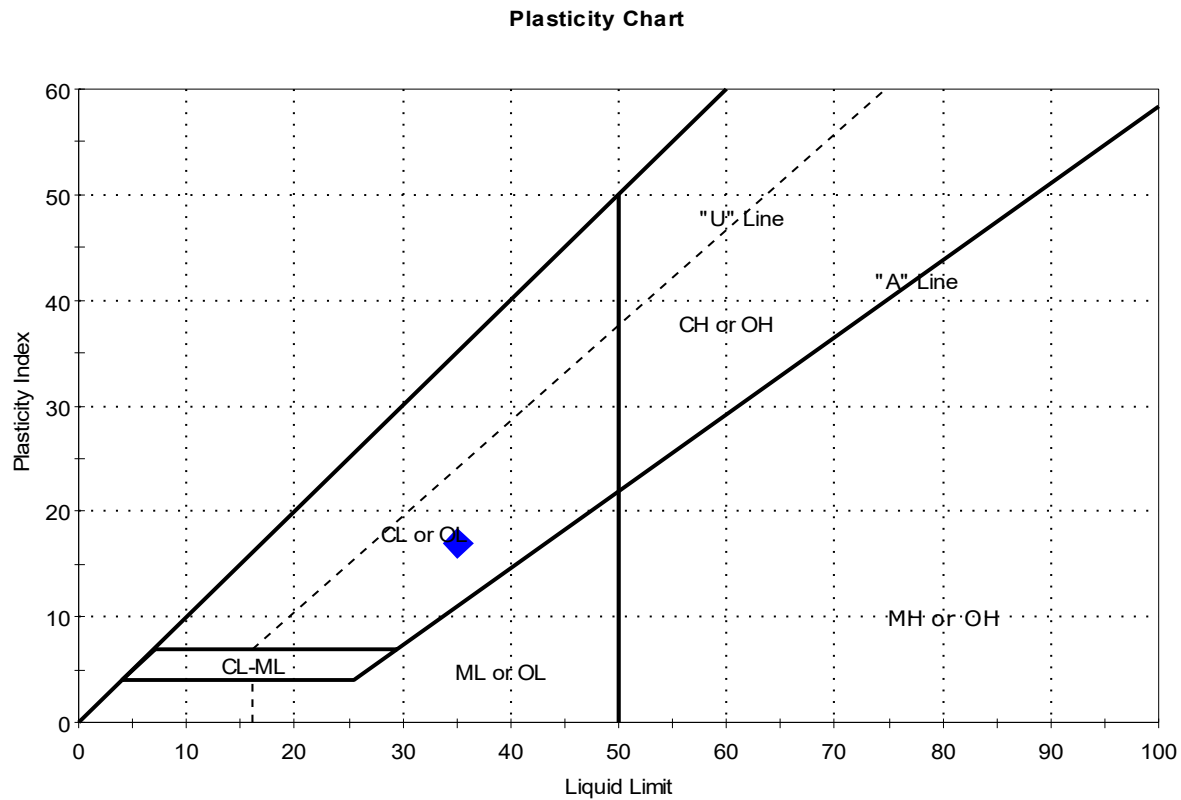
Dry Strength: VERY HIGH

Dilatancy: SLOW

Toughness: LOW

Client:	Haley & Aldrich, Inc.				
Project:	Rt 9/I-395 Connector				
Location:	Brewer and Eddington, ME			Project No:	GTX-308853
Boring ID:	BB-EEBT2-101	Sample Type:	tube	Tested By:	cam
Sample ID:	1U	Test Date:	07/29/19	Checked By:	bfs
Depth :	5-7 ft	Test Id:	513659		
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
◆	1U	-EEBT2-1	5-7 ft	29	35	18	17	0.7	

Sample Prepared using the WET method

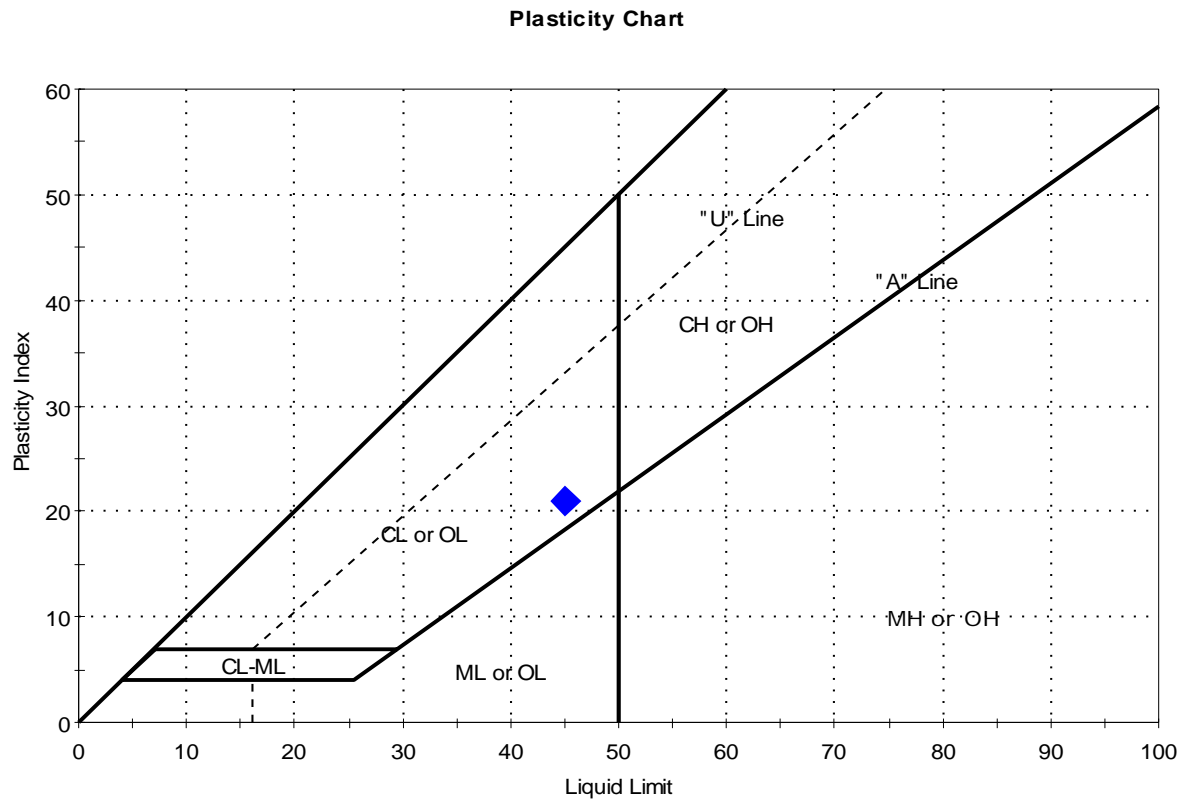
Dry Strength: VERY HIGH

Dilatancy: SLOW

Toughness: LOW

Client:	Haley & Aldrich, Inc.		
Project:	Rt 9/I-395 Connector		
Location:	Brewer and Eddington, ME	Project No:	GTX-308853
Boring ID:	HB-BE-101	Sample Type:	tube
Sample ID:	1U	Test Date:	10/17/18
Depth :	5-7 ft	Test Id:	474306
Test Comment:	---		
Visual Description:	Moist, dark 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
◆	1U	HB-BE-101	5-7 ft	35	45	24	21	0.5	

Sample Prepared using the WET method

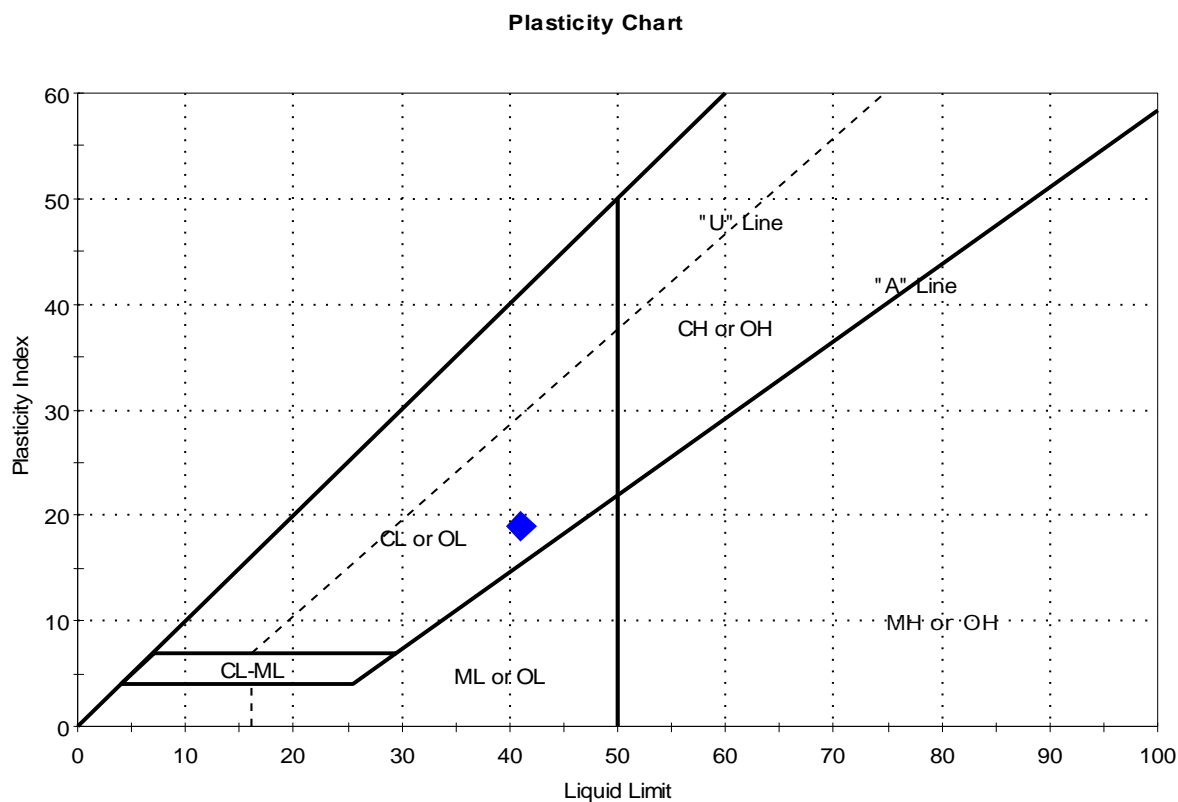
Dry Strength: VERY HIGH

Dilatancy: SLOW

Toughness: LOW

Client:	Haley & Aldrich, Inc.				
Project:	Rt 9/I-395 Connector				
Location:	Brewer and Eddington, ME			Project No:	GTX-308853
Boring ID:	HB-BFB-101	Sample Type:	tube	Tested By:	cam
Sample ID:	1U	Test Date:	10/17/18	Checked By:	emm
Depth :	5-7 ft	Test Id:	474307		
Test Comment:	---				
Visual Description:	Moist, very dark 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
◆	1U	B-BFB-10	5-7 ft	36	41	22	19	0.7	

Sample Prepared using the WET method

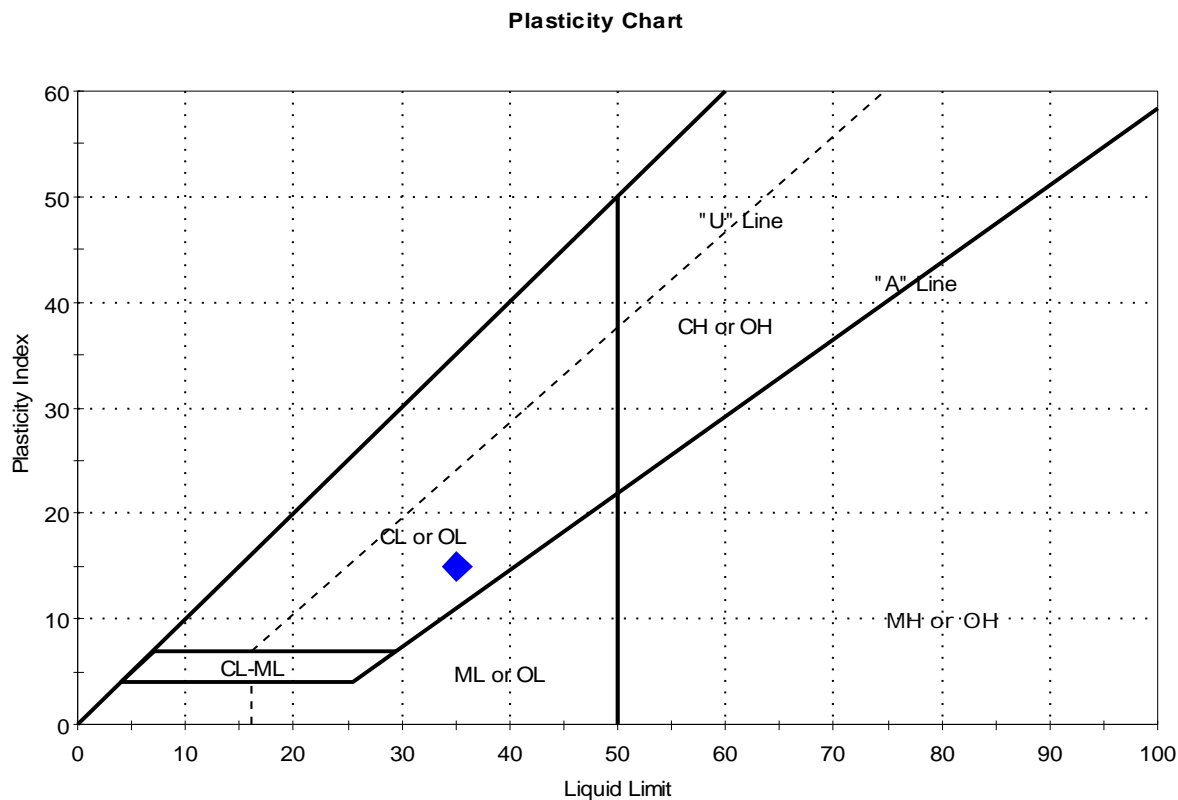
Dry Strength: VERY HIGH

Dilatancy: SLOW

Toughness: LOW

Client:	Haley & Aldrich, Inc.		
Project:	Rt 9/I-395 Connector		
Location:	Brewer and Eddington, ME	Project No:	GTX-308853
Boring ID:	HB-BFB-101	Sample Type:	tube
Sample ID:	2U	Test Date:	10/17/18
Depth :	12-14 ft	Test Id:	474308
Test Comment:	---		
Visual Description:	Wet, very 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
◆	2U	B-BFB-10	12-14 ft	40	35	20	15	1.4	

Sample Prepared using the WET method

Dry Strength: VERY HIGH

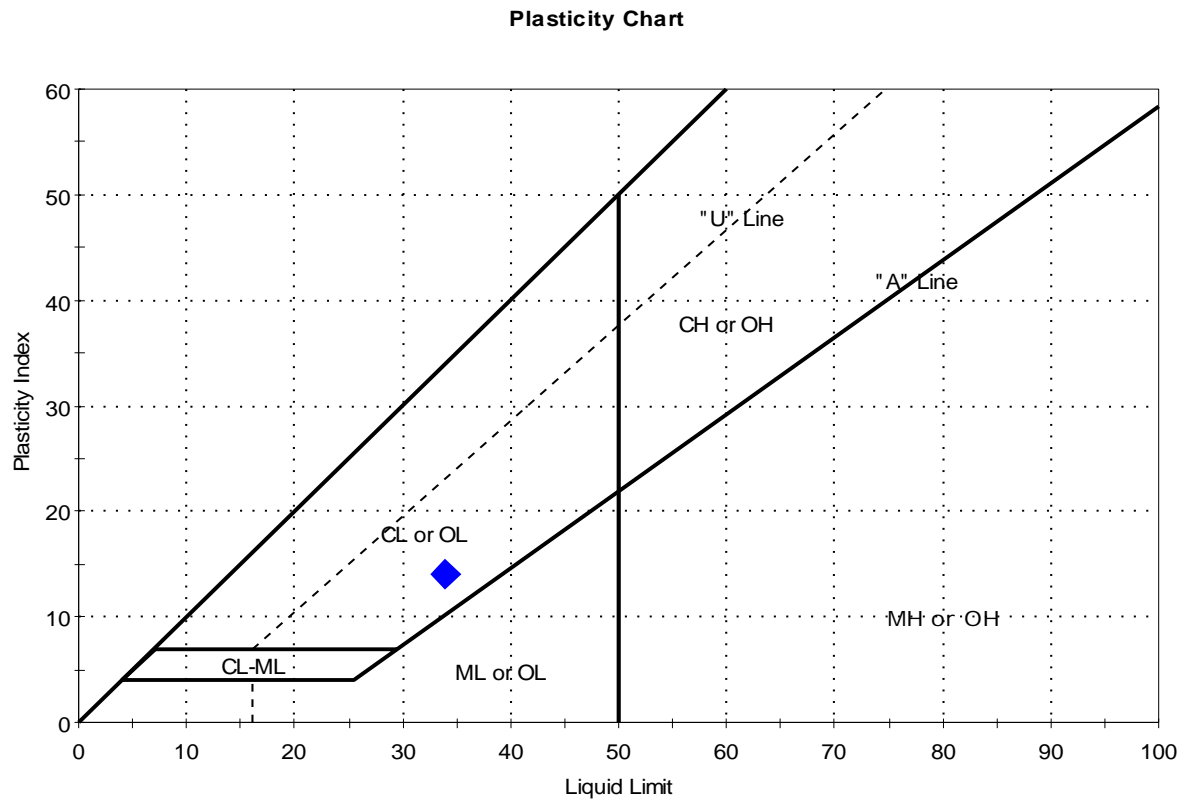
Dilatancy: SLOW

Toughness: LOW



Client:	Haley & Aldrich, Inc.				
Project:	Rt 9/I-395 Connector				
Location:	Brewer and Eddington, ME			Project No:	GTX-308853
Boring ID:	HB-BFB-101	Sample Type:	tube	Tested By:	cam
Sample ID:	4U	Test Date:	10/17/18	Checked By:	emm
Depth :	30-32 ft	Test Id:	474309		
Test Comment:	---				
Visual Description:	Moist, dark 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
◆	4U	B-BFB-10	30-32 ft	35	34	20	14	1.1	

Sample Prepared using the WET method

Dry Strength: VERY HIGH

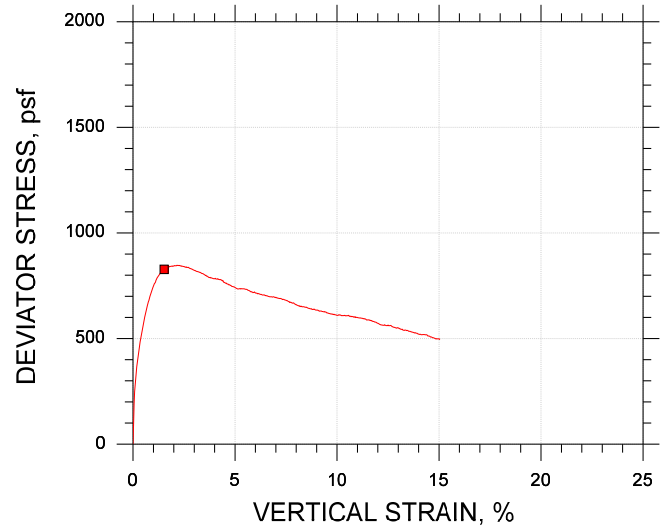
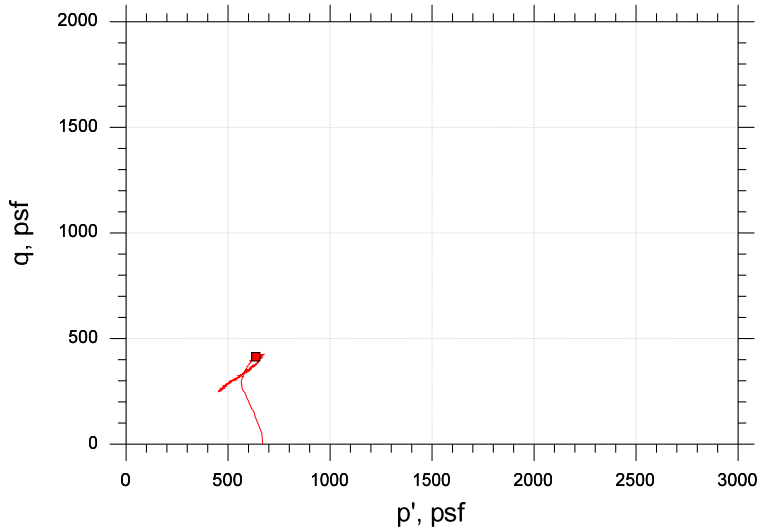
Dilatancy: SLOW


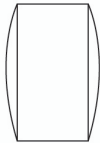
Toughness: LOW



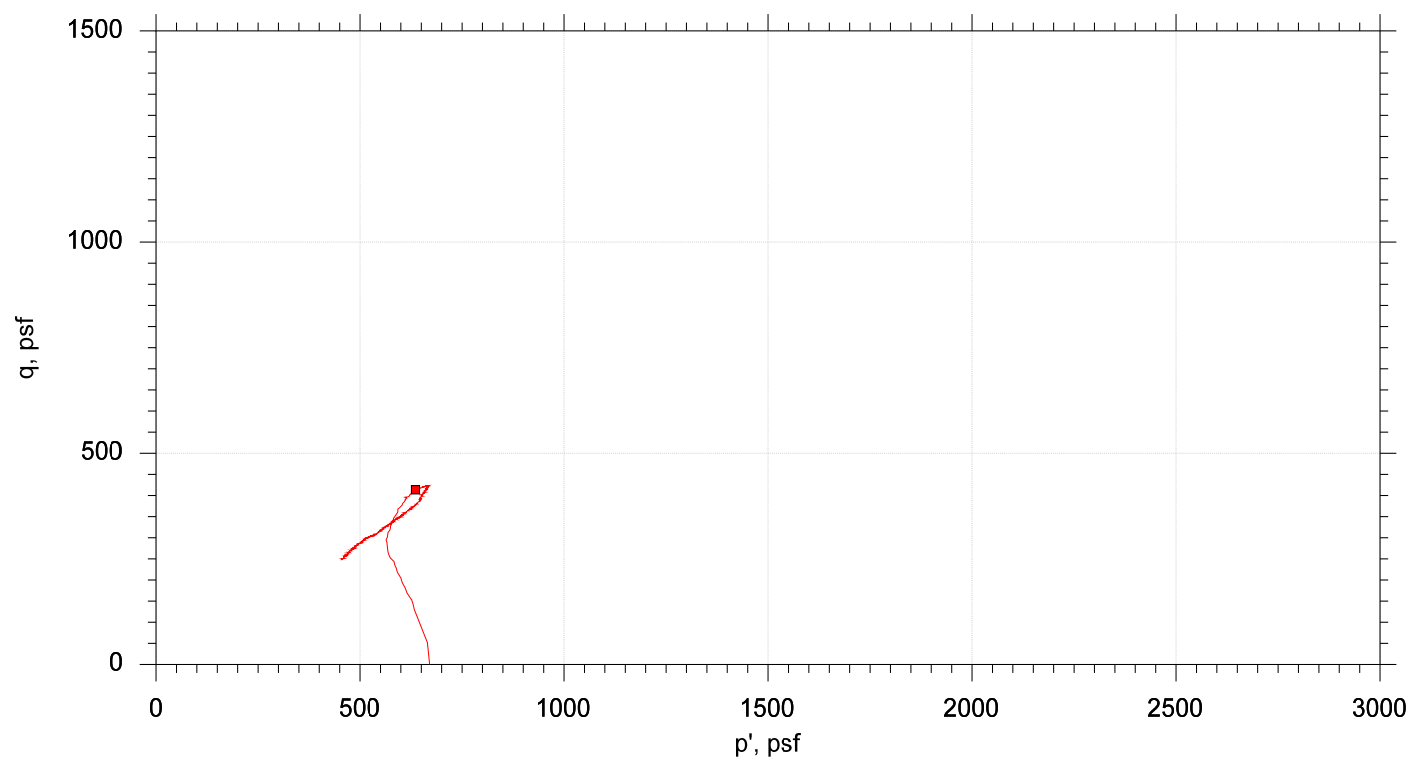
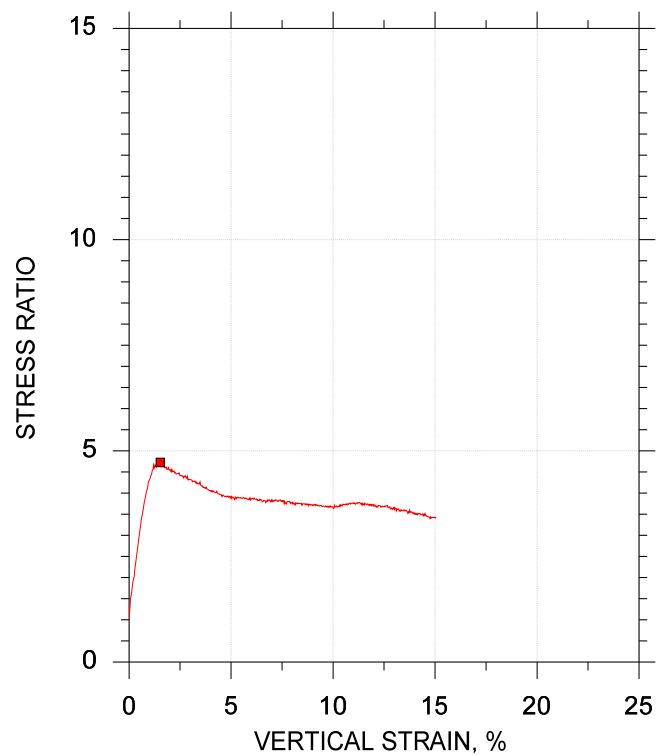
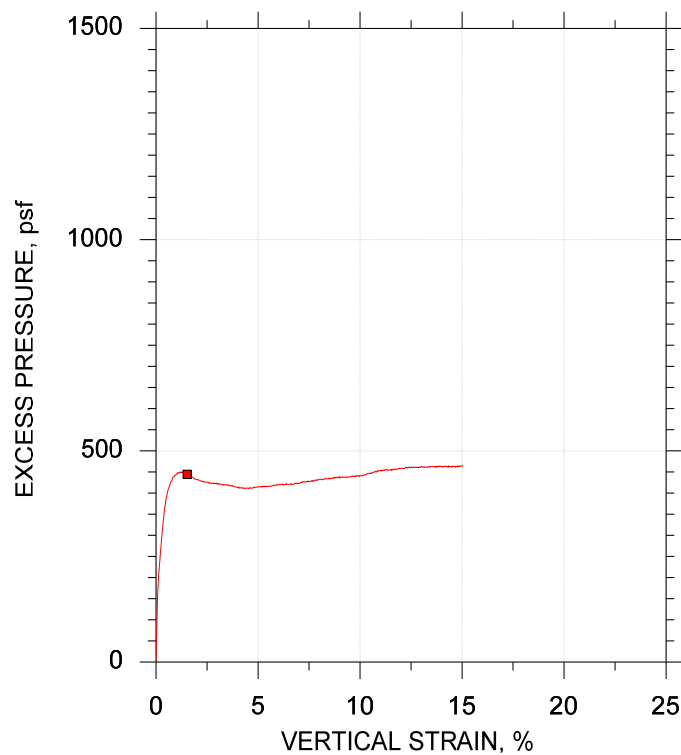
Client: Haley & Aldrich, Inc.	
Project Name: I-395/Rte 9 Connector (Area 1)	
Project Location: Brewer-Eddington, ME Brewer-Eddington, ME	
Project Number: GTX-312665	
Tested By: md	Checked By: mcm
Boring ID: BB-BFB-202	
Preparation: intact	
Description: Wet, gray clay	
Classification: ---	
Group Symbol: ---	
Liquid Limit: 38	Plastic Limit: 19
Plasticity Index: 19	Estimated Specific Gravity: 2.7

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767




Symbol				
Sample ID	U1			
Depth, ft	18-20 ft			
Test Number	CU-17-1			
Initial	Height, in	4.600		
	Diameter, in	2.030		
	Moisture Content (from Cuttings), %	42.9		
	Dry Density, pcf	74.8		
	Saturation (Wet Method), %	92.4		
	Void Ratio	1.25		
Before Shear	Moisture Content, %	45.3		
	Dry Density, pcf	75.8		
	Cross-sectional Area (Method A), in²	3.212		
	Saturation, %	100.0		
	Void Ratio	1.22		
	Back Pressure, psf	2.173e+004		
Vertical Effective Consolidation Stress, psf		667.7		
Horizontal Effective Consolidation Stress, psf		670.1		
Vertical Strain after Consolidation, %		0.2371		
Volumetric Strain after Consolidation, %		0.1463		
Time to 50% Consolidation, min		17.64		
Shear Strength, psf		413.8		
Strain at Failure, %		1.53		
Strain Rate, %/min		0.01600		
Deviator Stress at Failure, psf		827.7		
Effective Minor Principal Stress at Failure, psf		222.1		
Effective Major Principal Stress at Failure, psf		1050.		
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:				
System Y				

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767



	Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
■	U1	CU-17-1	18-20 ft	md	03/09/21	mcm	4/1/21	312665-CU-17-1m.dat

			
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brwre-Eddington, ME	Project No.: GTX-312665
	Boring No.: BB-BFB-202	Sample Type: intact	
	Description: Wet, gray clay		
	Remarks: System Y		



Client: Haley & Aldrich, Inc.

Project Name: Rt 9/I-395 Connector

Project Location: Brewer and Eddington, ME

Project Number: GTX-308853

Tested By: md

Checked By: mcm

Boring ID: HB-BFB1-101

Preparation: Intact

Description: Moist, dark gray clay

Classification: ---

Group Symbol: ---

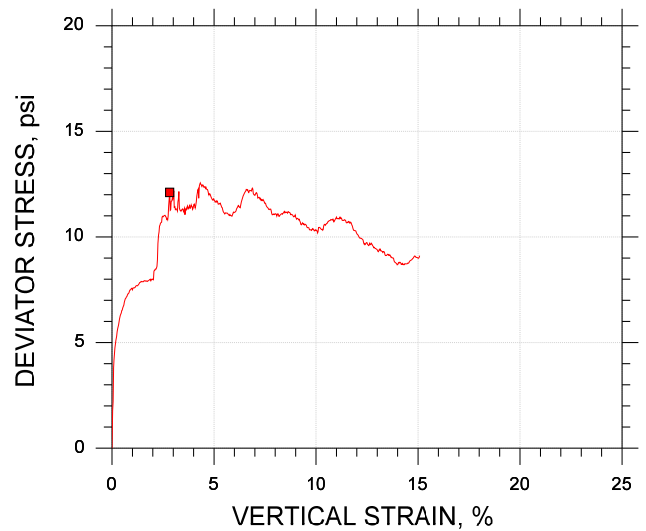
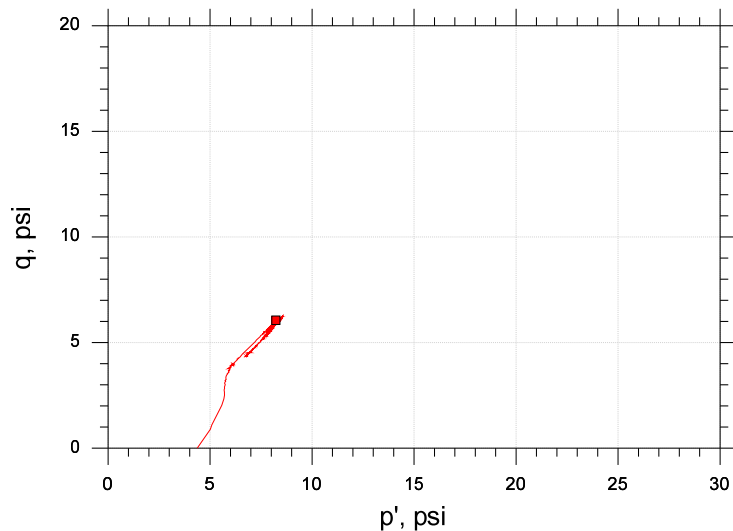
Liquid Limit: 38

Plastic Limit: 20

Plasticity Index: 18

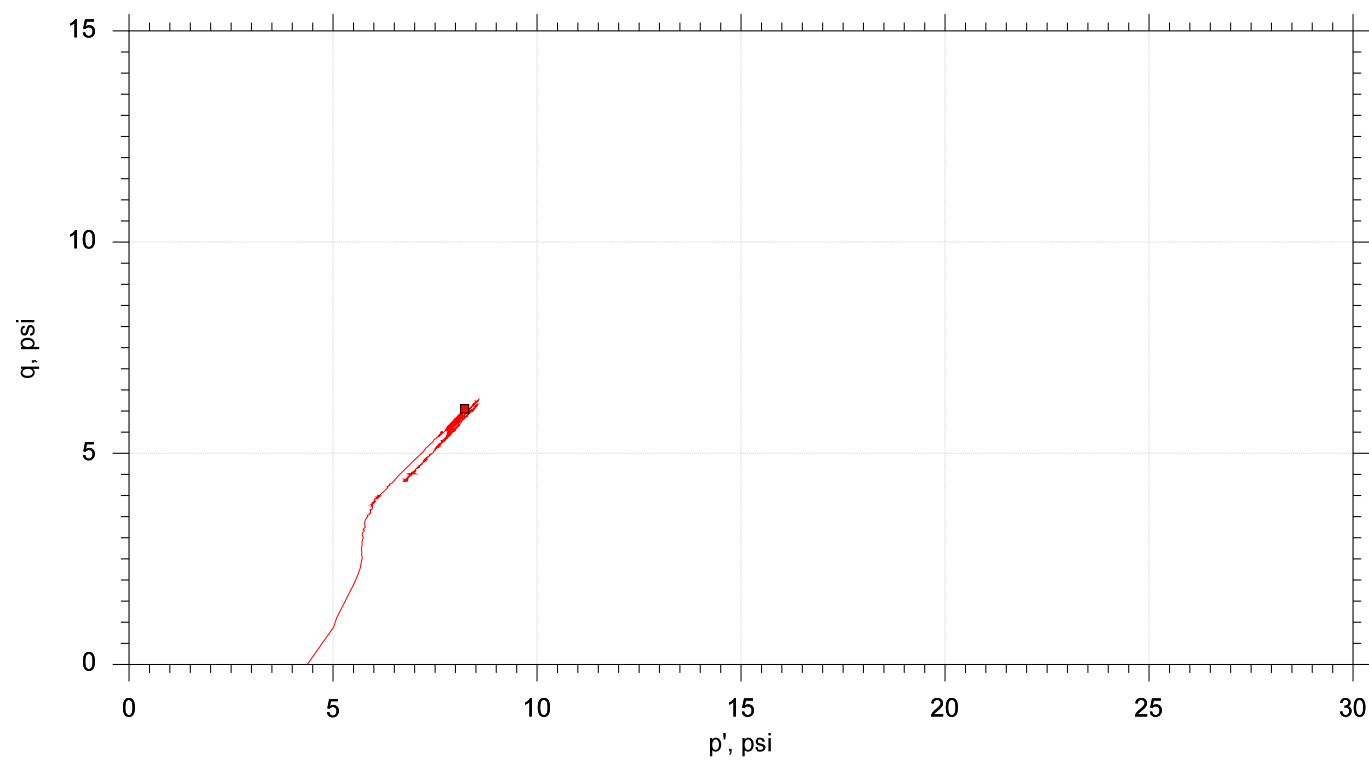
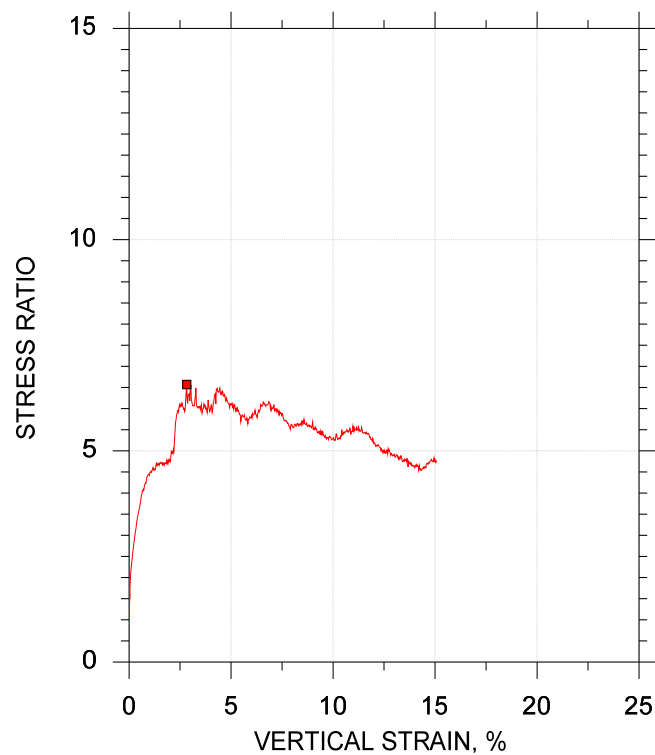
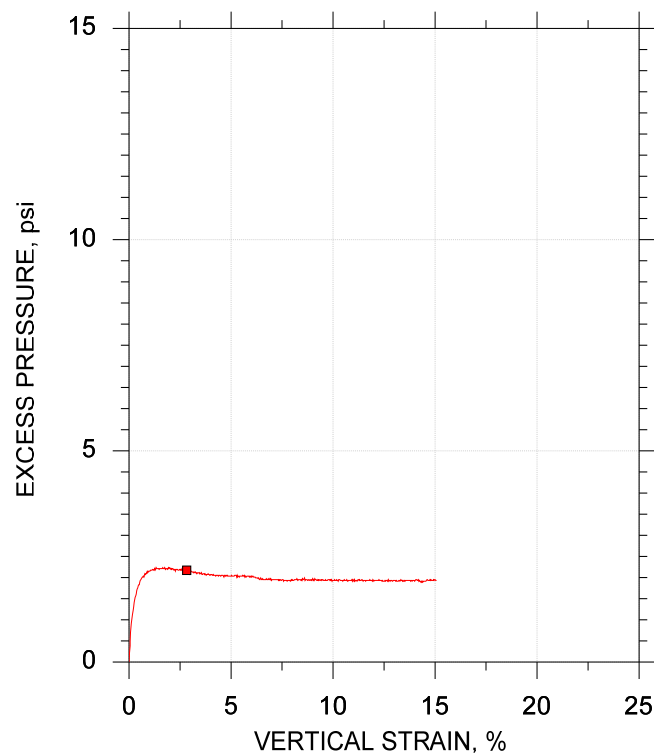
Estimated Specific Gravity: 2.7

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767




Symbol		■		
Sample ID		1U		
Depth, ft		15-16.4 ft		
Test Number		CU-17-1		
Initial	Height, in	4.450		
	Diameter, in	1.950		
	Moisture Content (from Cuttings), %	38.0		
	Dry Density, pcf	82.5		
	Saturation (Wet Method), %	98.2		
	Void Ratio	1.04		
Before Shear	Moisture Content, %	38.5		
	Dry Density, pcf	82.7		
	Cross-sectional Area (Method A), in ²	2.977		
	Saturation, %	100.0		
	Void Ratio	1.04		
	Back Pressure, psi	160.6		
Vertical Effective Consolidation Stress, psi		4.370		
Horizontal Effective Consolidation Stress, psi		4.368		
Vertical Strain after Consolidation, %		0.004397		
Volumetric Strain after Consolidation, %		0.3734		
Time to 50% Consolidation, min		46.24		
Shear Strength, psi		6.054		
Strain at Failure, %		2.83		
Strain Rate, %/min		0.01600		
Deviator Stress at Failure, psi		12.11		
Effective Minor Principal Stress at Failure, psi		2.173		
Effective Major Principal Stress at Failure, psi		14.28		
B-Value		0.96		
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



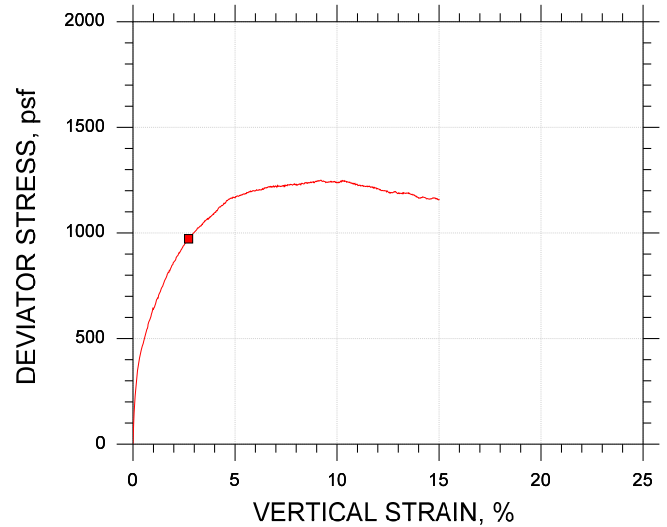
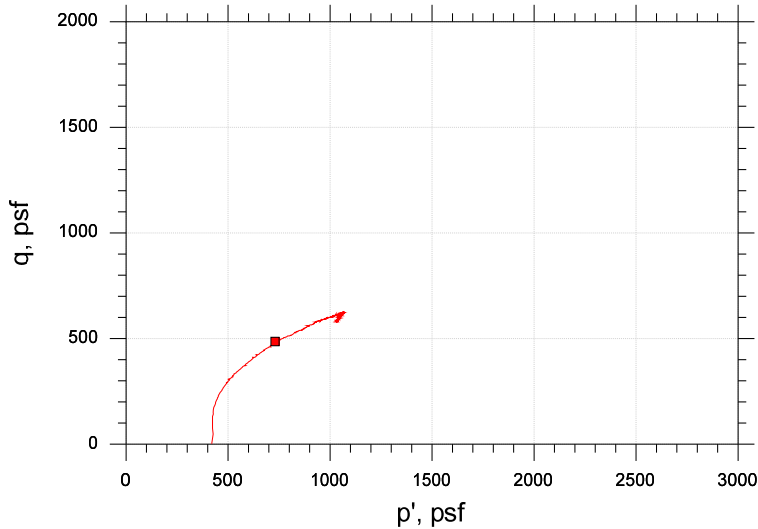
	Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
■	1U	CU-17-1	15-16.4 ft	md	07/24/19	mcm	8/2/19	308853-CU-17-1m.dat

			
	Project: Rt 9/I-395 Connector	Location: Brewer and Eddington, ME	Project No.: GTX-308853
	Boring No.: HB-BFB1-101	Sample Type: Intact	
	Description: Moist, dark gray clay		
	Remarks: System LL		



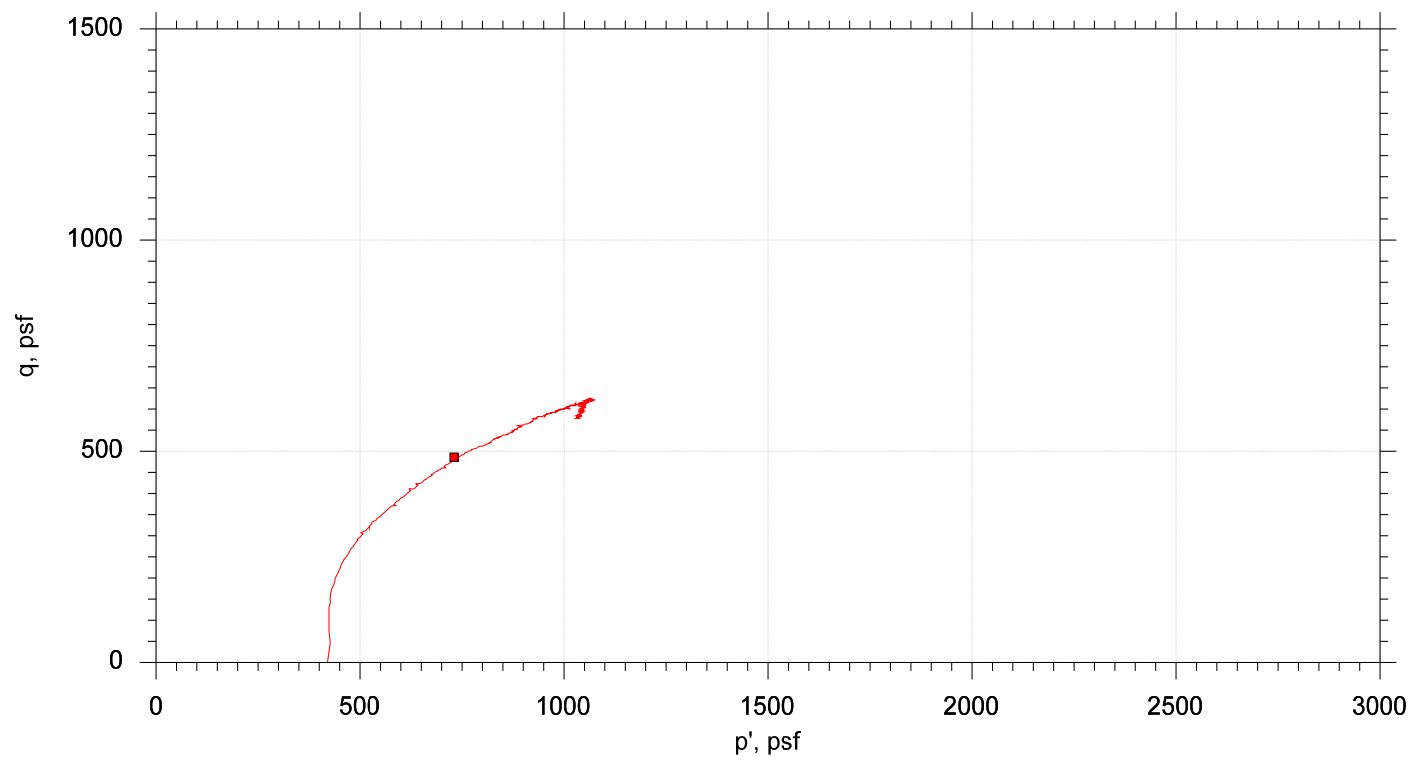
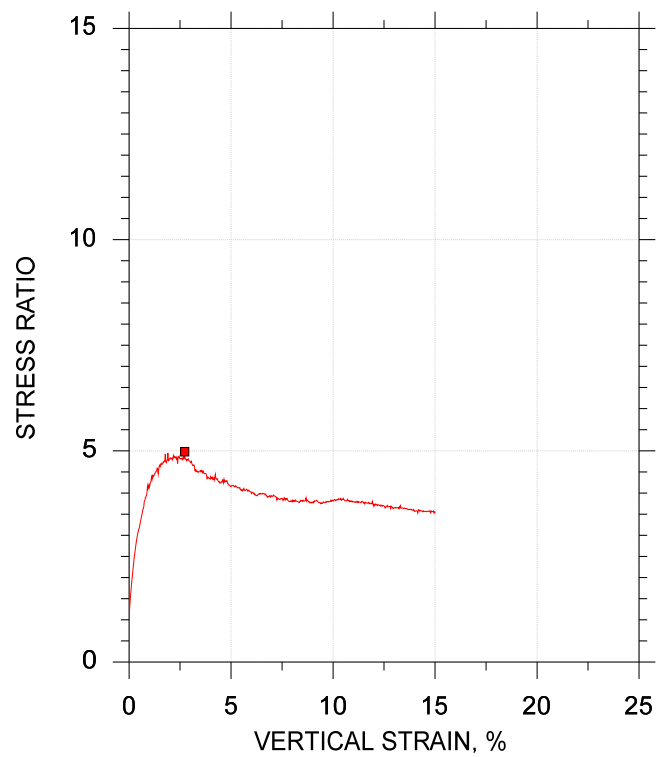
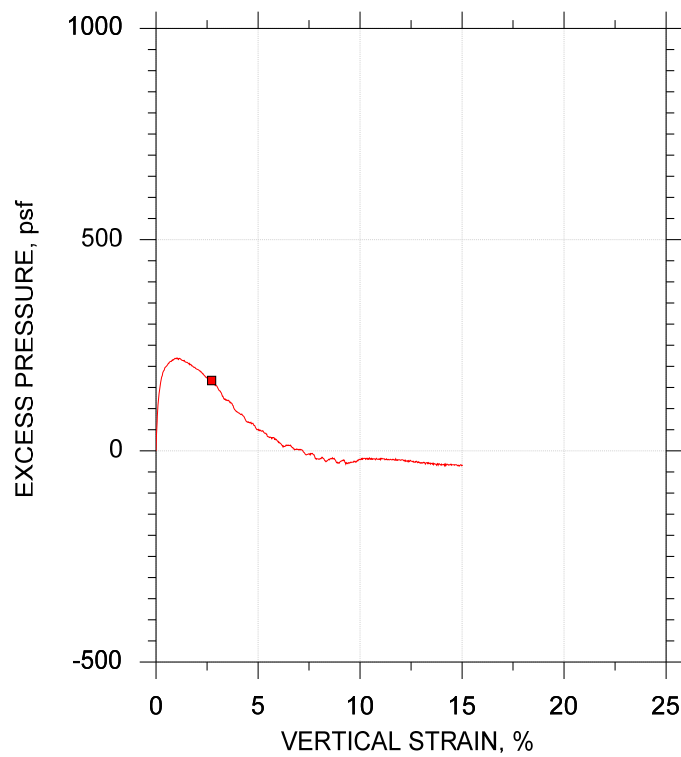
Client: Haley & Aldrich, Inc.	
Project Name: I-395/Rte 9 Connector (Area 1)	
Project Location: Brrewer-Eddington, ME	
Project Number: GTX-312665	
Tested By: trm	Checked By: mcm
Boring ID: BB-BFB1-202	
Preparation: intact	
Description: Moist, gray clay	
Classification: ---	
Group Symbol: ---	
Liquid Limit: ---	Plastic Limit: ---
Plasticity Index: ---	Estimated Specific Gravity: 2.7

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767




Symbol	■			
Sample ID	U1			
Depth, ft	10-12ft			
Test Number	CU-5-1A			
Initial	Height, in	4.450		
	Diameter, in	2.040		
	Moisture Content (from Cuttings), %	32.8		
	Dry Density, pcf	86.2		
	Saturation (Wet Method), %	92.8		
	Void Ratio	0.955		
Before Shear	Moisture Content, %	34.2		
	Dry Density, pcf	87.6		
	Cross-sectional Area (Method A), in ²	3.213		
	Saturation, %	100.0		
	Void Ratio	0.924		
	Back Pressure, psf	2.027e+004		
Vertical Effective Consolidation Stress, psf		421.4		
Horizontal Effective Consolidation Stress, psf		419.0		
Vertical Strain after Consolidation, %		0.006370		
Volumetric Strain after Consolidation, %		1.941		
Time to 50% Consolidation, min		9.000		
Shear Strength, psf		486.2		
Strain at Failure, %		2.73		
Strain Rate, %/min		0.01600		
Deviator Stress at Failure, psf		972.3		
Effective Minor Principal Stress at Failure, psf		244.2		
Effective Major Principal Stress at Failure, psf		1217.		
B-Value		0.94		
Notes: - Before Shear Saturation set to 100% for phase calculation. - Moisture Content determined by ASTM D2216. - 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



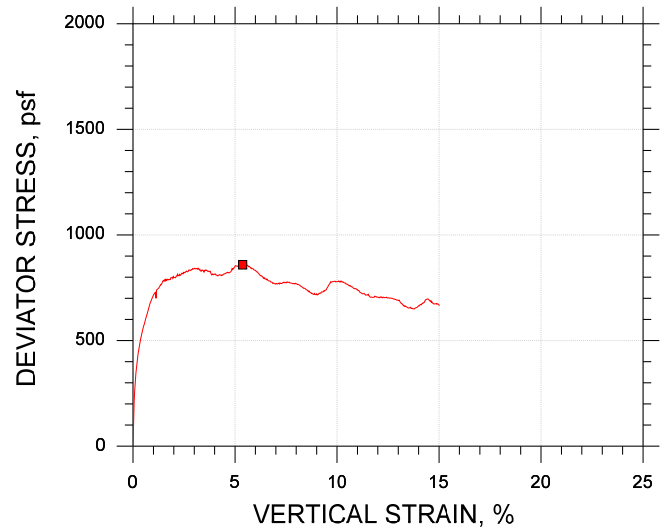
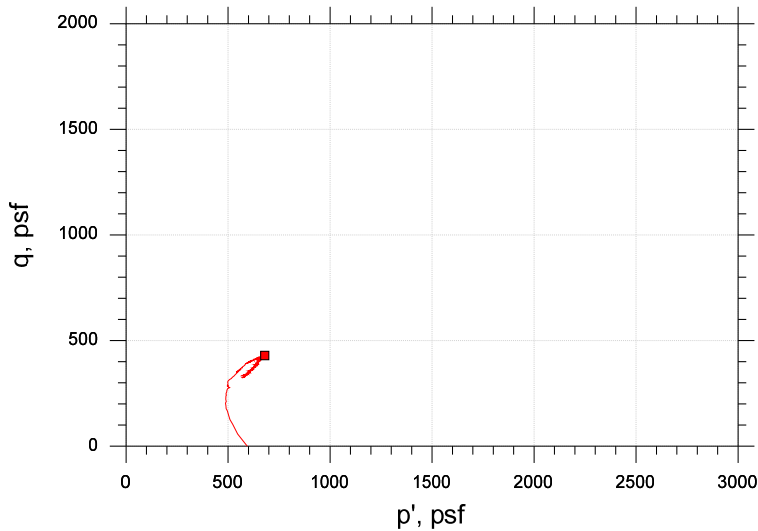
	Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
■	U1	CU-5-1A	10-12ft	trm	4/1/21	mcm	4/9/21	312665-CU-5-1Am.dat

			
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: BB-BFB1-202	Sample Type: intact	
	Description: Moist, gray clay		
	Remarks: System RR		



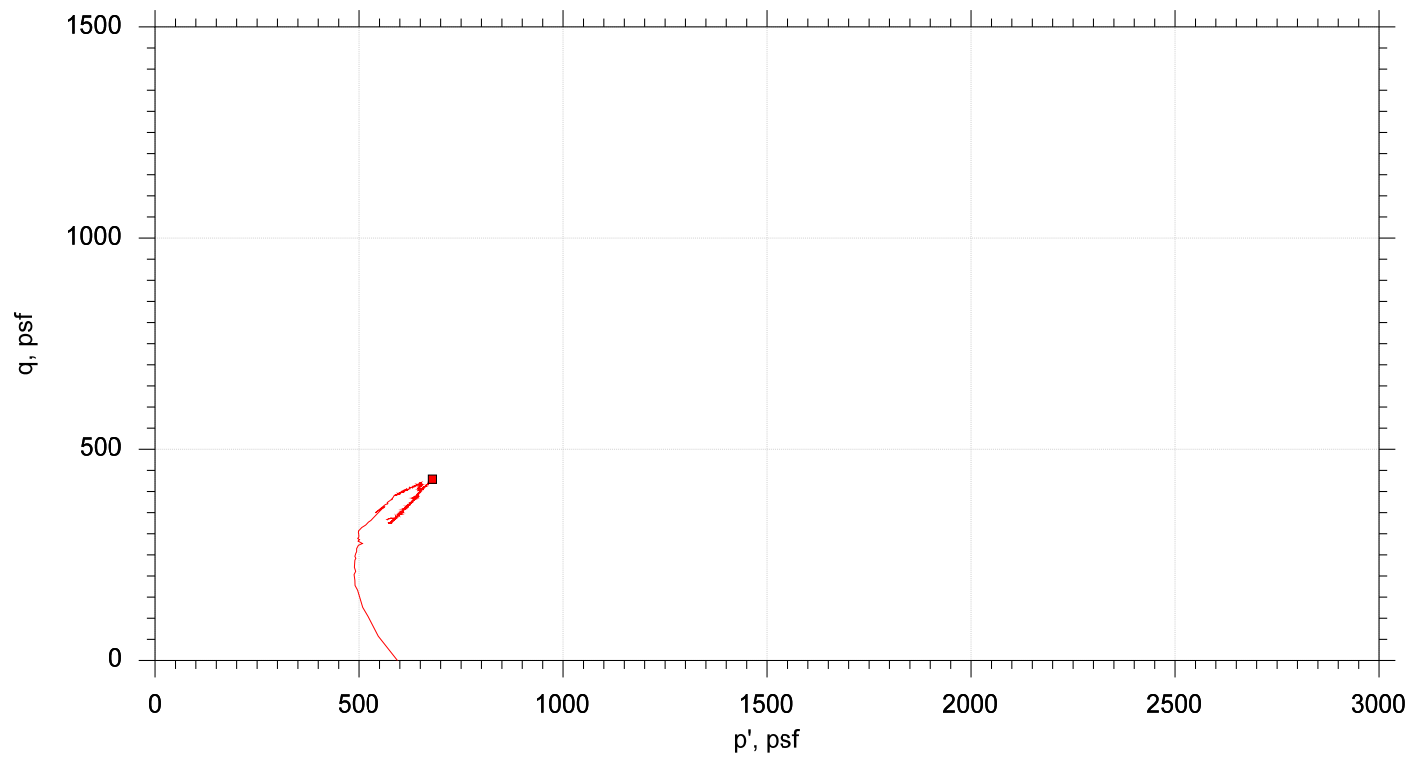
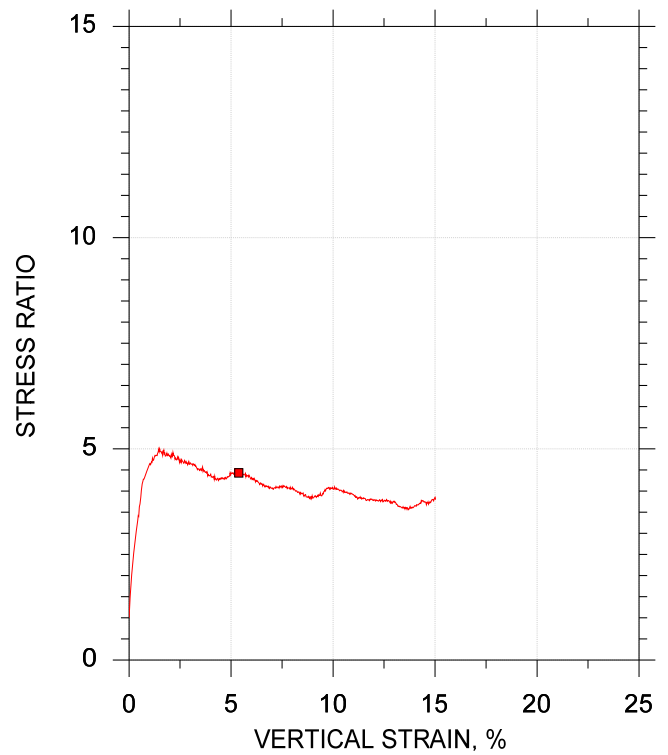
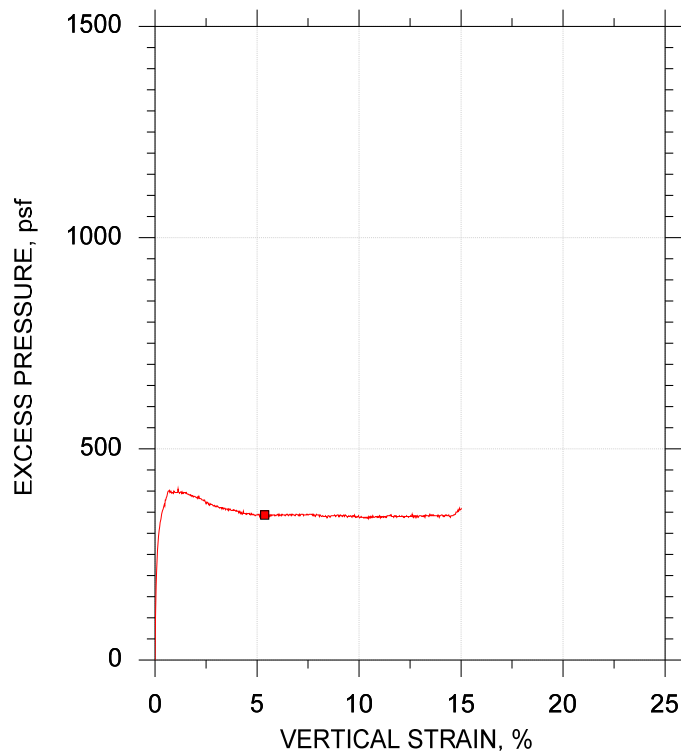
Client: Haley & Aldrich, Inc.	
Project Name: I-395/Rte 9 Connector (Area 1)	
Project Location: Brewer-Eddington, ME	
Project Number: GTX-312665	
Tested By: trm	Checked By: mcm
Boring ID: BB-BFB-1-202	
Preparation: Intact	
Description: Moist, gray clay	
Classification: ---	
Group Symbol: ---	
Liquid Limit: 37	Plastic Limit: 20
Plasticity Index: 17	Estimated Specific Gravity: 2.7

CONSOLIDATED DRAINED TRIAXIAL TEST by ASTM D4767




Symbol		■		
Sample ID		U2		
Depth, ft		15-17 ft		
Test Number		CU-4-1		
Initial	Height, in	4.130		
	Diameter, in	2.030		
	Moisture Content (from Cuttings), %	39.1		
	Dry Density, pcf	79.8		
	Saturation (Wet Method), %	95.0		
	Void Ratio	1.11		
Before Shear	Moisture Content, %	38.4		
	Dry Density, pcf	82.8		
	Cross-sectional Area (Method A), in ²	3.164		
	Saturation, %	100.0		
	Void Ratio	1.04		
	Back Pressure, psf	2.316e+004		
Vertical Effective Consolidation Stress, psf		590.3		
Horizontal Effective Consolidation Stress, psf		593.9		
Vertical Strain after Consolidation, %		0.3365		
Volumetric Strain after Consolidation, %		0.5055		
Time to 50% Consolidation, min		25.00		
Shear Strength, psf		429.4		
Strain at Failure, %		5.38		
Strain Rate, %/min		0.01600		
Deviator Stress at Failure, psf		858.7		
Effective Minor Principal Stress at Failure, psf		250.3		
Effective Major Principal Stress at Failure, psf		1109.		
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 DRAINED TRIAXIAL TEST by ASTM D4767



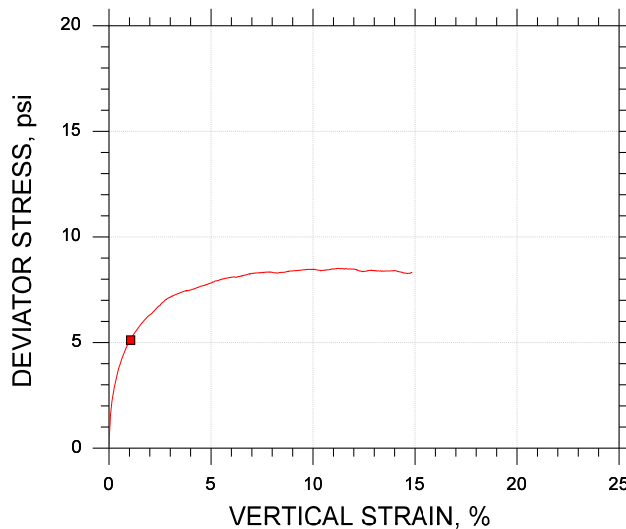
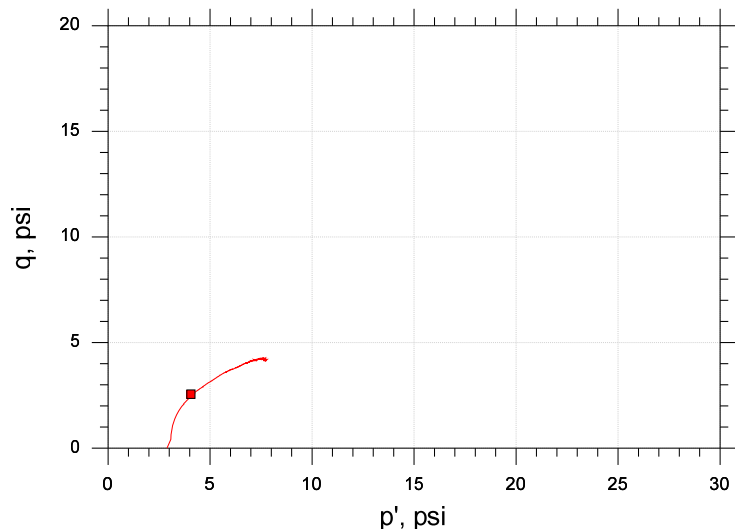
	Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
■	U2	CU-4-1	15-17 ft	trm	2/26/21	mcm	3/16/21	312665-CU-4-1m.dat

			
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: BB-BFB-1-202	Sample Type: Intact	
	Description: Moist, gray clay		
	Remarks: System OO		



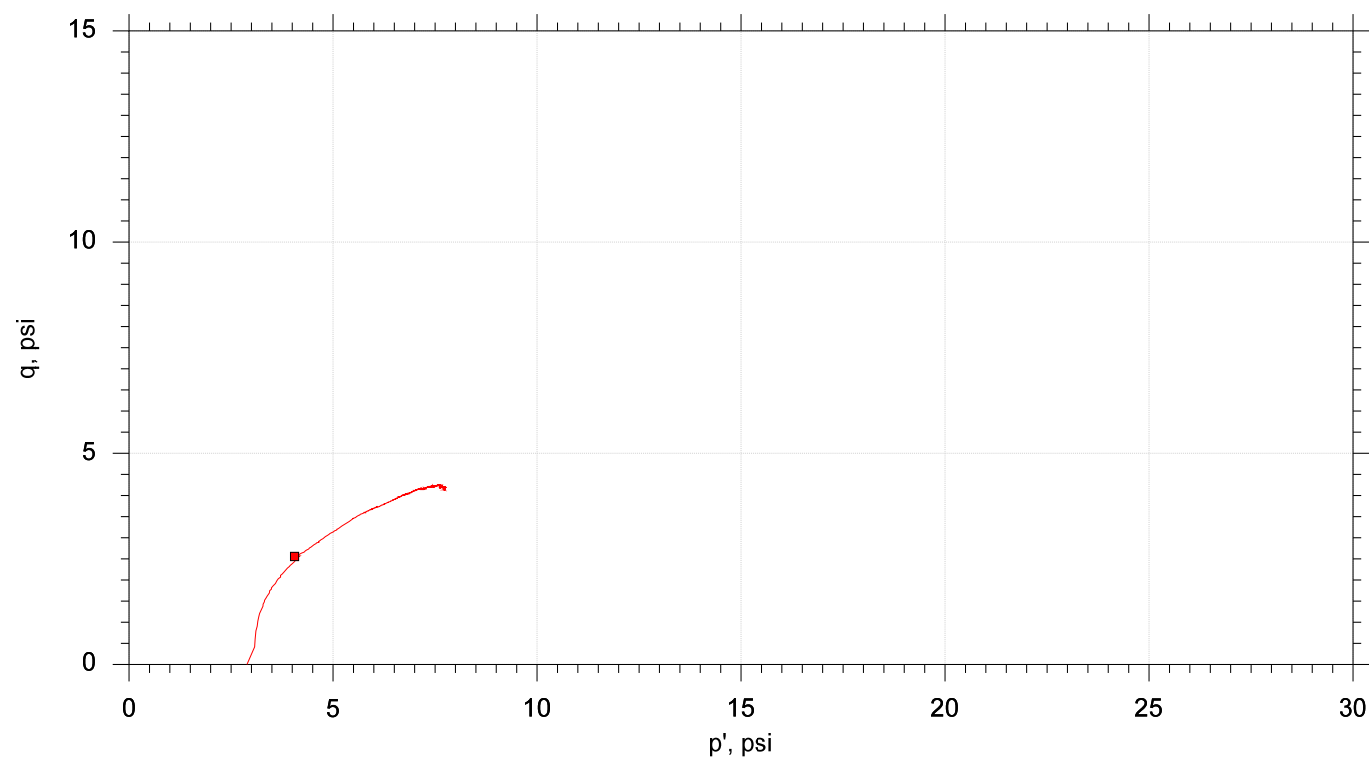
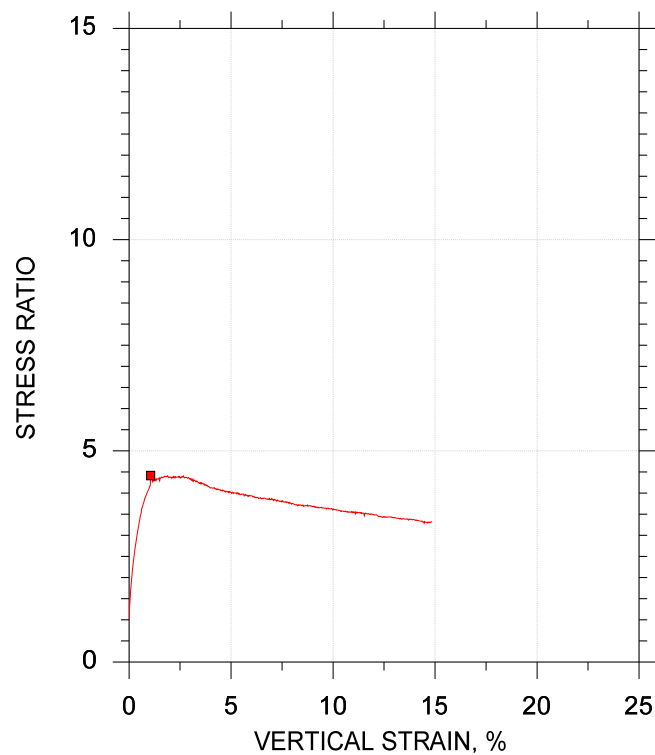
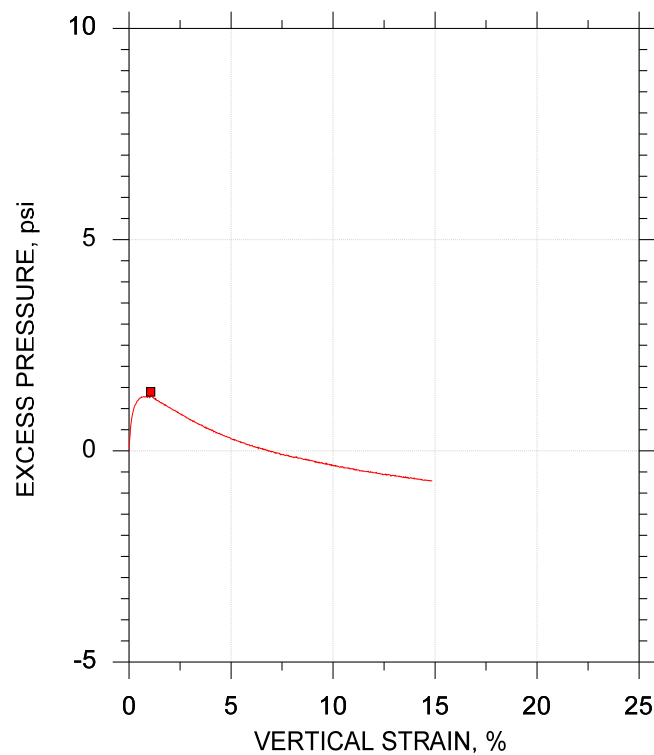
Client: Hakey & Aldrich, Inc.	
Project Name: Rt 9/I-395 Connector	
Project Location: Brewer and Eddington, ME	
Project Number: GTX-308853	
Tested By: trm	Checked By: mcm
Boring ID: BB-BST1-101	
Preparation: Intact	
Description: Moist, dark gray clay	
Classification: ---	
Group Symbol: ---	
Liquid Limit: 37	Plastic Limit: 20
Plasticity Index: 17	Estimated Specific Gravity: 2.7

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767




Symbol		■		
Sample ID		1U		
Depth, ft		10-12 ft		
Test Number		CU-11-1		
Initial	Height, in	4.880		
	Diameter, in	2.040		
	Moisture Content (from Cuttings), %	34.1		
	Dry Density, pcf	87.0		
	Saturation (Wet Method), %	98.3		
	Void Ratio	0.937		
Before Shear	Moisture Content, %	34.9		
	Dry Density, pcf	86.7		
	Cross-sectional Area (Method A), in ²	3.276		
	Saturation, %	100.0		
	Void Ratio	0.943		
	Back Pressure, psi	142.8		
Vertical Effective Consolidation Stress, psi		2.880		
Horizontal Effective Consolidation Stress, psi		2.887		
Vertical Strain after Consolidation, %		0.1294		
Volumetric Strain after Consolidation, %		0.3651		
Time to 50% Consolidation, min		39.69		
Shear Strength, psi		2.559		
Strain at Failure, %		1.06		
Strain Rate, %/min		0.01600		
Deviator Stress at Failure, psi		5.118		
Effective Minor Principal Stress at Failure, psi		1.498		
Effective Major Principal Stress at Failure, psi		6.616		
B-Value		0.96		
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



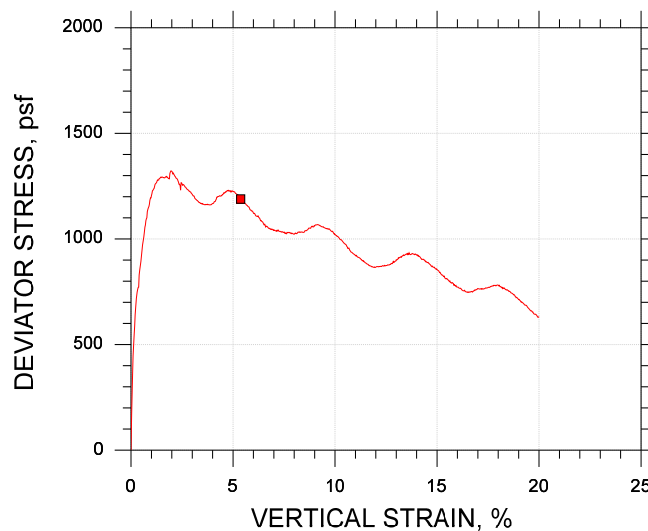
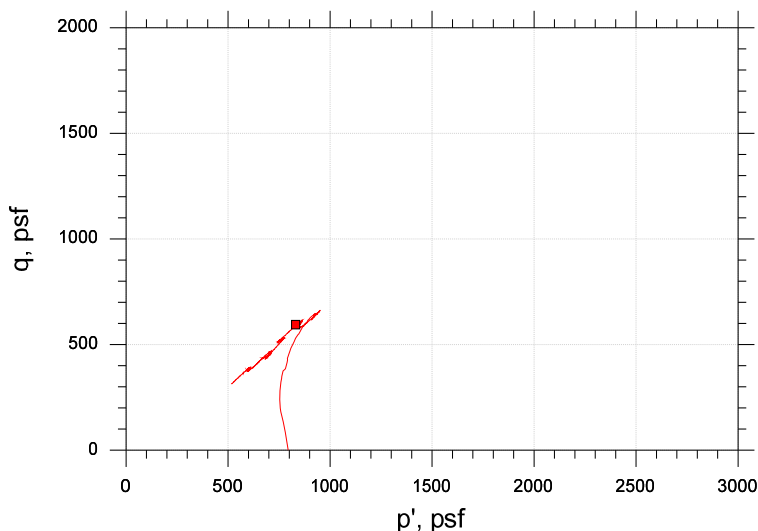
	Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
■	1U	CU-11-1	10-12 ft	trm	7/23/19	mcm	8/2/19	308853-CU-11-1m.dat

			
	Project: Rt 9/I-395 Connector	Location: Brewer and Eddington, ME	Project No.: GTX-308853
	Boring No.: BB-BST1-101	Sample Type: Intact	
	Description: Moist, dark gray clay		
	Remarks: System Q		



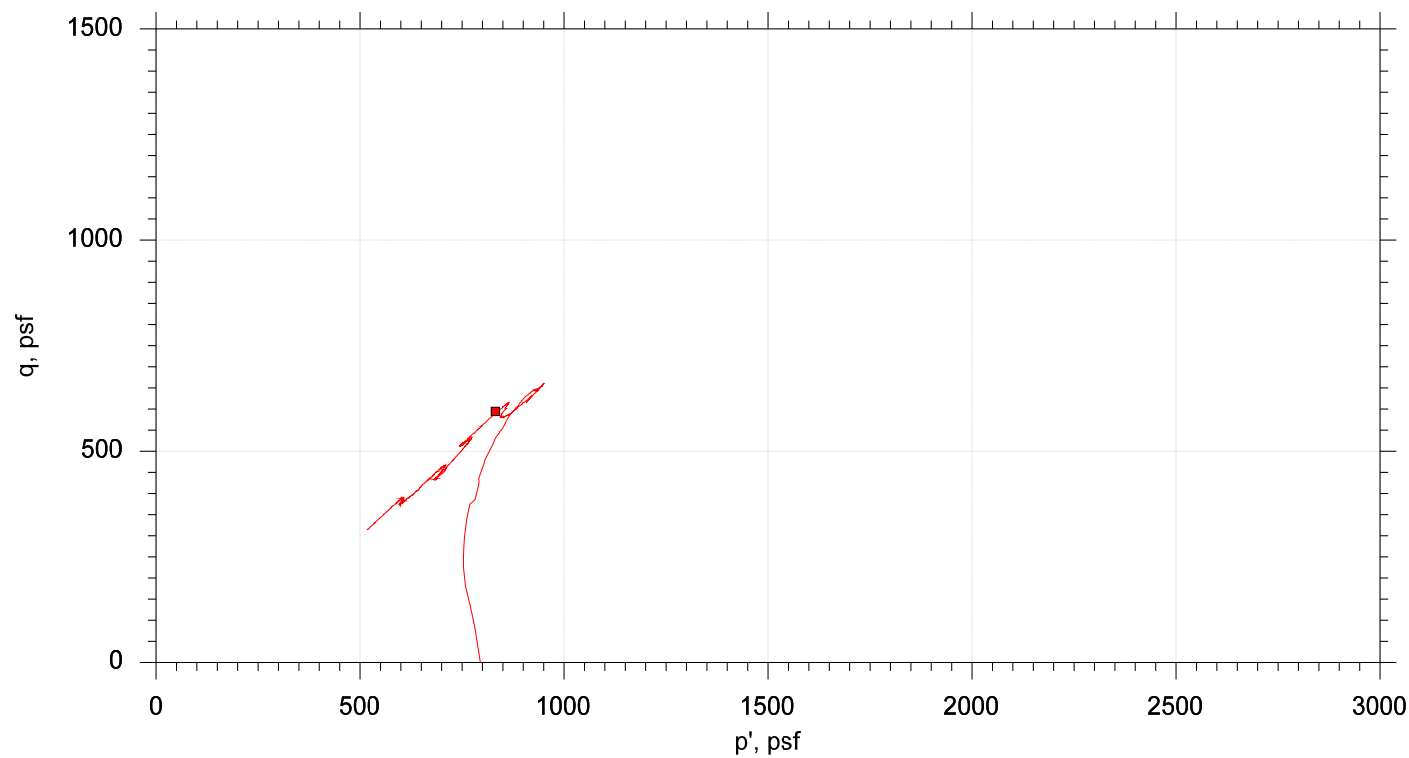
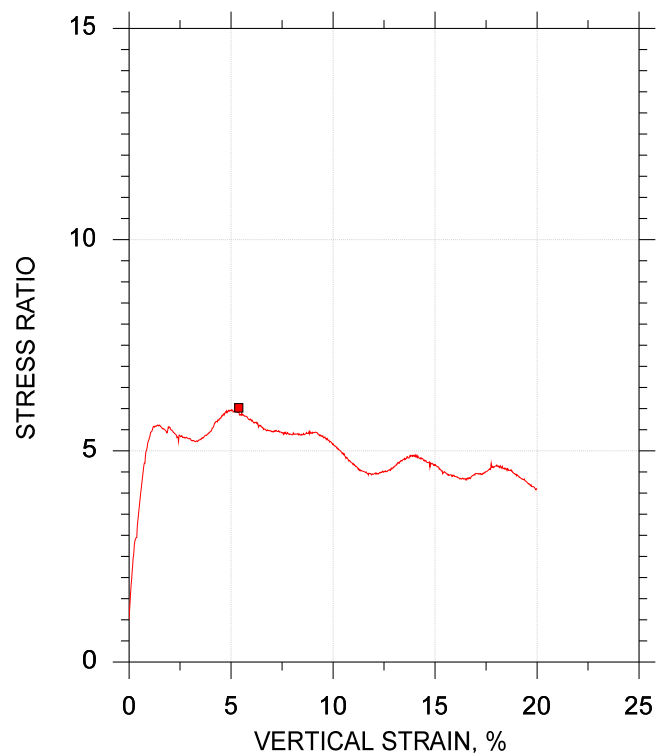
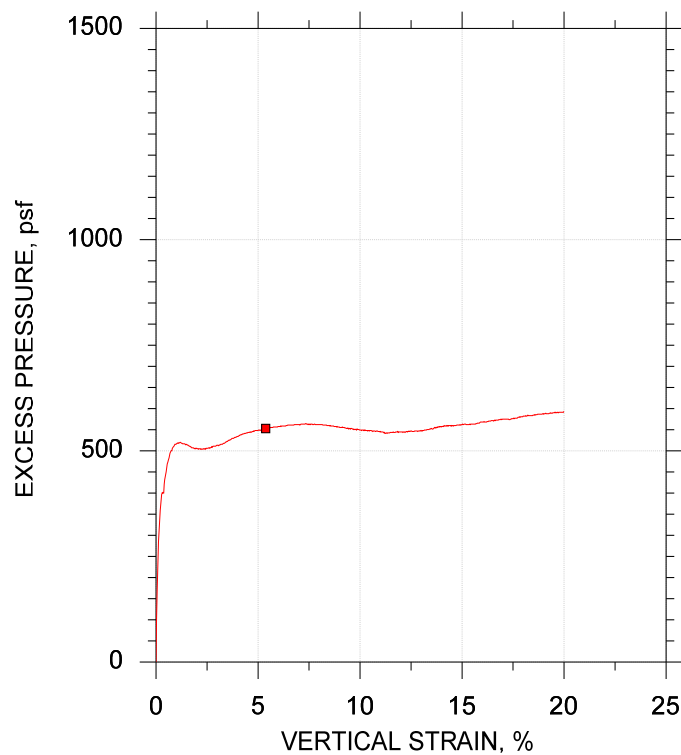
Client: Haley & Aldrich, Inc.	
Project Name: I-395/Rte 9 Connector (Area 1)	
Project Location: Brewer-Eddington, ME.	
Project Number: GTX-312665	
Tested By: trm	Checked By: mcm
Boring ID: BB-BSTI-201	
Preparation: intact	
Description: Moist, olive gray clay	
Classification: ---	
Group Symbol: ---	
Liquid Limit: 36	Plastic Limit: 19
Plasticity Index: 17	Estimated Specific Gravity: 2.7

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767




Symbol		■		
Sample ID		U-1		
Depth, ft		15-17 ft		
Test Number		CU-2-1		
Initial	Height, in	4.510		
	Diameter, in	2.030		
	Moisture Content (from Cuttings), %	37.3		
	Dry Density, pcf	81.6		
	Saturation (Wet Method), %	94.5		
	Void Ratio	1.07		
Before Shear	Moisture Content, %	39.2		
	Dry Density, pcf	81.9		
	Cross-sectional Area (Method A), in ²	3.228		
	Saturation, %	100.0		
	Void Ratio	1.06		
	Back Pressure, psf	2.170e+004		
Vertical Effective Consolidation Stress, psf		794.6		
Horizontal Effective Consolidation Stress, psf		794.6		
Vertical Strain after Consolidation, %		0.02864		
Volumetric Strain after Consolidation, %		0.2779		
Time to 50% Consolidation, min		25.00		
Shear Strength, psf		594.5		
Strain at Failure, %		5.38		
Strain Rate, %/min		0.01600		
Deviator Stress at Failure, psf		1189.		
Effective Minor Principal Stress at Failure, psf		236.9		
Effective Major Principal Stress at Failure, psf		1426.		
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:				
System Y				

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767



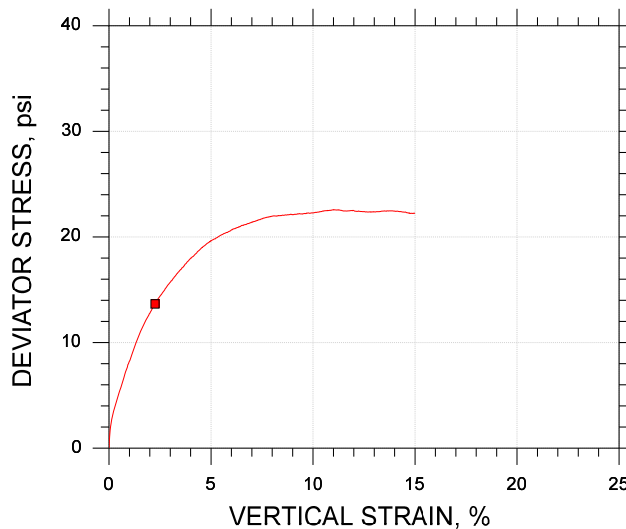
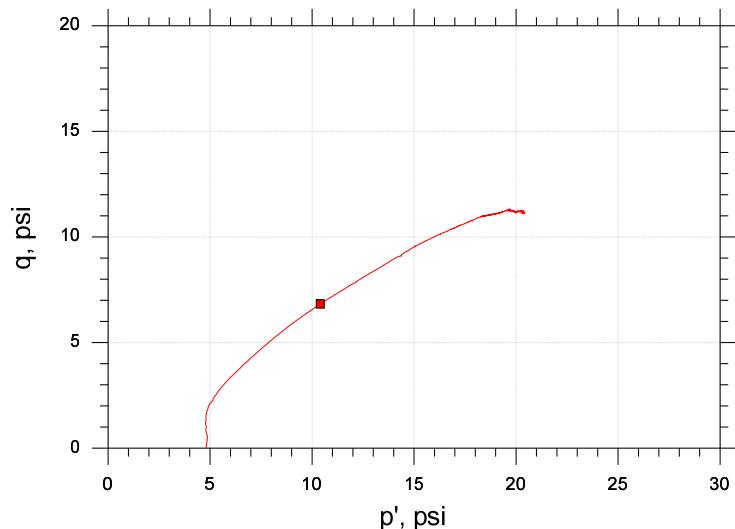
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■	U-1	CU-2-1	15-17 ft	trm	2/26/21	mcm	3/15/21	312665-CU-2-1m.dat

			
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME.	Project No.: GTX-312665
	Boring No.: BB-BSTI-201	Sample Type: intact	
	Description: Moist, olive gray clay		
	Remarks: System Y		



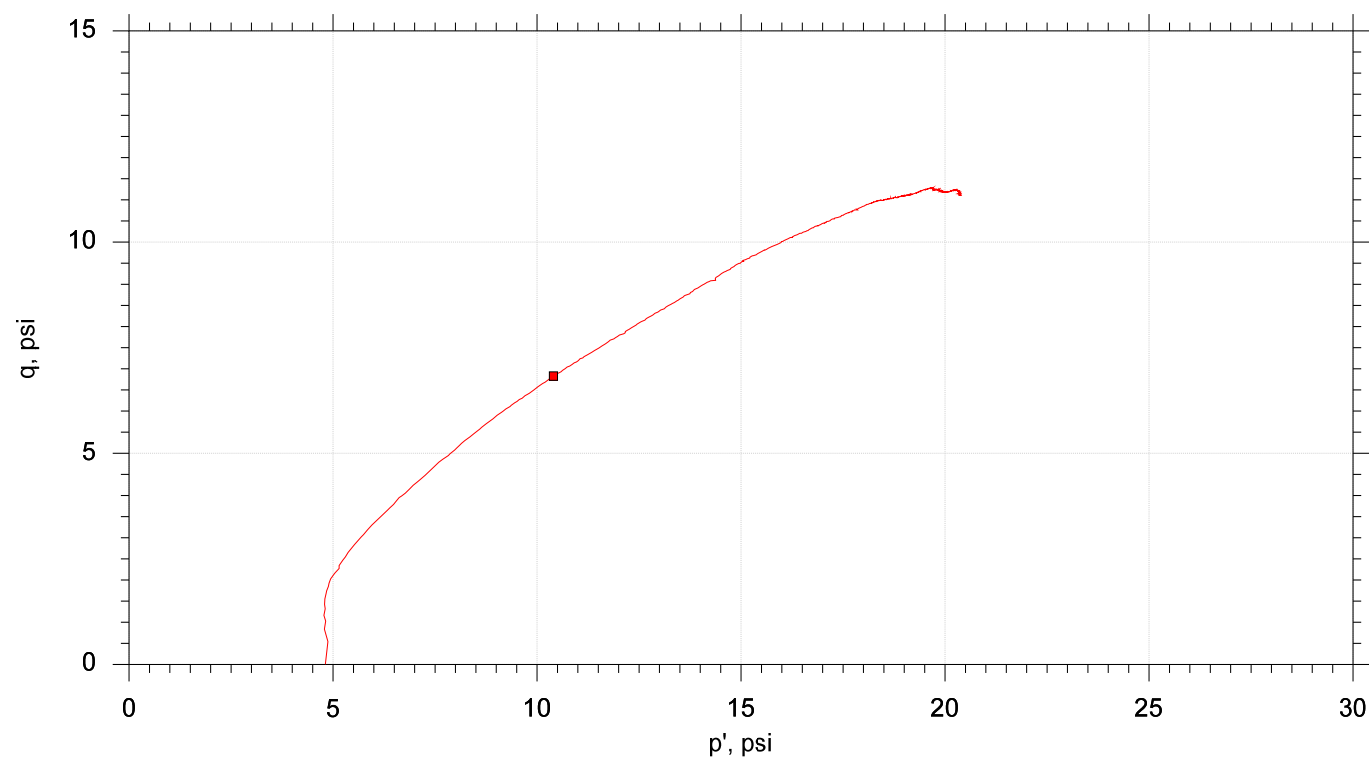
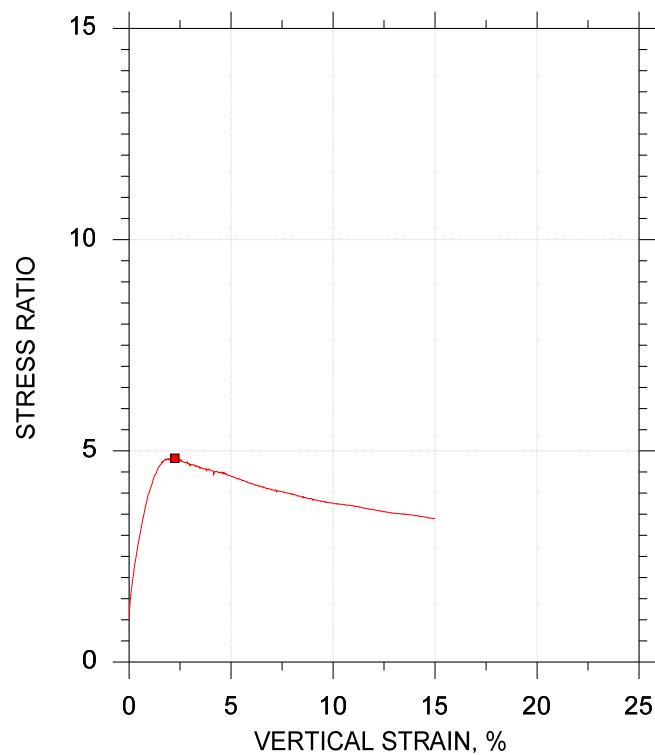
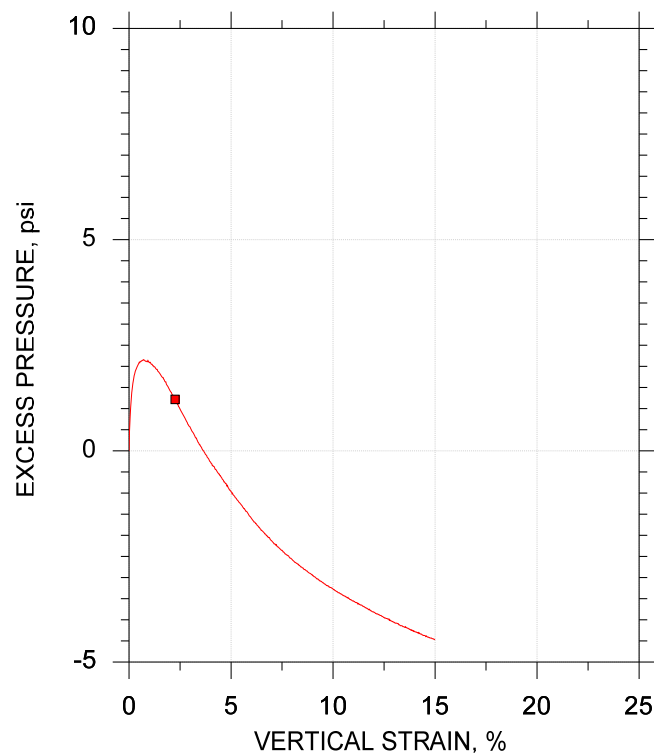
Client: Haley& Aldrich, Inc.	
Project Name: Rt 9/I-395 Connector	
Project Location: Brewer and Eddington, ME	
Project Number: GTX-308553	
Tested By: md/trm	Checked By: mcm
Boring ID: HB-BE-101	
Preparation: intact	
Description: Moist, dark gray clay	
Classification: ---	
Group Symbol: ---	
Liquid Limit: 45	Plastic Limit: 24
Plasticity Index: 21	Estimated Specific Gravity: 2.7

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767




Symbol		■		
Sample ID		1U		
Depth, ft		5-7 ft		
Test Number		CU-3-1		
Initial	Height, in	6.340		
	Diameter, in	2.860		
	Moisture Content (from Cuttings), %	33.0		
	Dry Density, pcf	88.8		
	Saturation (Wet Method), %	99.1		
	Void Ratio	0.899		
Before Shear	Moisture Content, %	32.4		
	Dry Density, pcf	89.9		
	Cross-sectional Area (Method A), in ²	6.372		
	Saturation, %	100.0		
	Void Ratio	0.876		
	Back Pressure, psi	157.0		
Vertical Effective Consolidation Stress, psi		4.805		
Horizontal Effective Consolidation Stress, psi		4.805		
Vertical Strain after Consolidation, %		0.1753		
Volumetric Strain after Consolidation, %		0.4779		
Time to 50% Consolidation, min		4.000		
Shear Strength, psi		6.830		
Strain at Failure, %		2.25		
Strain Rate, %/min		0.01600		
Deviator Stress at Failure, psi		13.66		
Effective Minor Principal Stress at Failure, psi		3.572		
Effective Major Principal Stress at Failure, psi		17.23		
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:				
System F				

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767



	Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
■	1U	CU-3-1	5-7 ft	md/trm	9/27/18	mcm	10/17/18	308853-CU-3-1m.dat

			
	Project: Rt 9/I-395 Connector	Location: Brewer and Eddington, ME	Project No.: GTX-308553
	Boring No.: HB-BE-101	Sample Type: intact	
	Description: Moist, dark gray clay		
	Remarks: System F		



Client: Haley & Aldrich, Inc.

Project Name: Rt 9/I-395 Connector

Project Location: Brewer and Eddington, ME

Project Number: GTX-308853

Tested By: md/trm

Checked By: mcm

Boring ID: ~~HB-BE-101~~ HB-BFB-101

Preparation: intact

Description: Moist, dark gray clay

Classification: ---

Group Symbol: ---

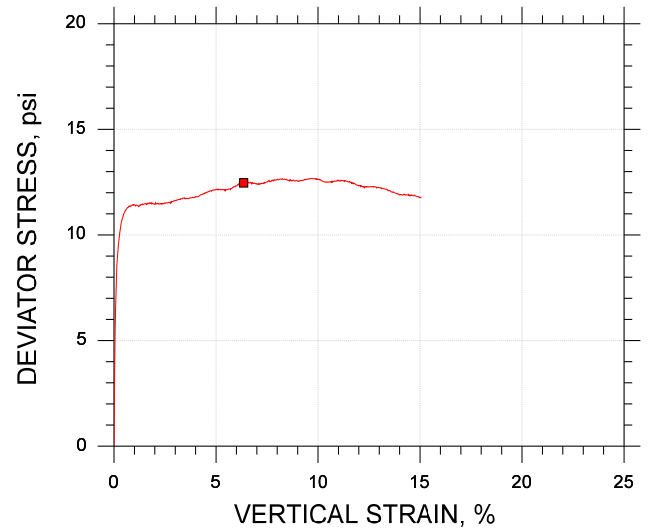
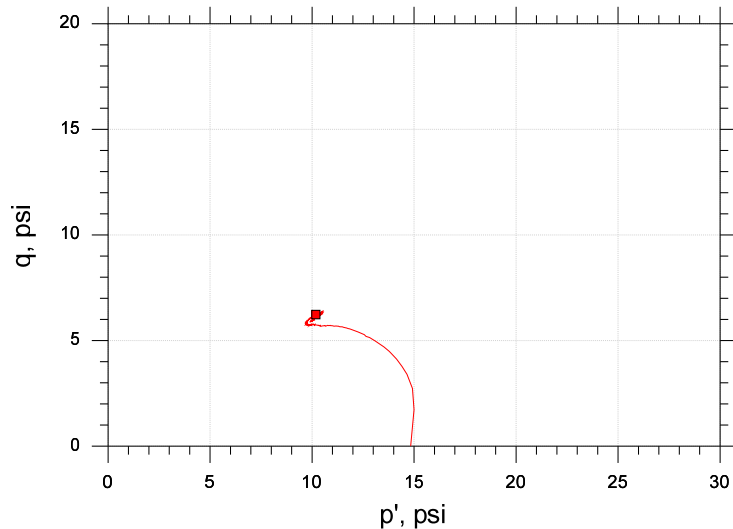
Liquid Limit: 34

Plastic Limit: 20

Plasticity Index: 14

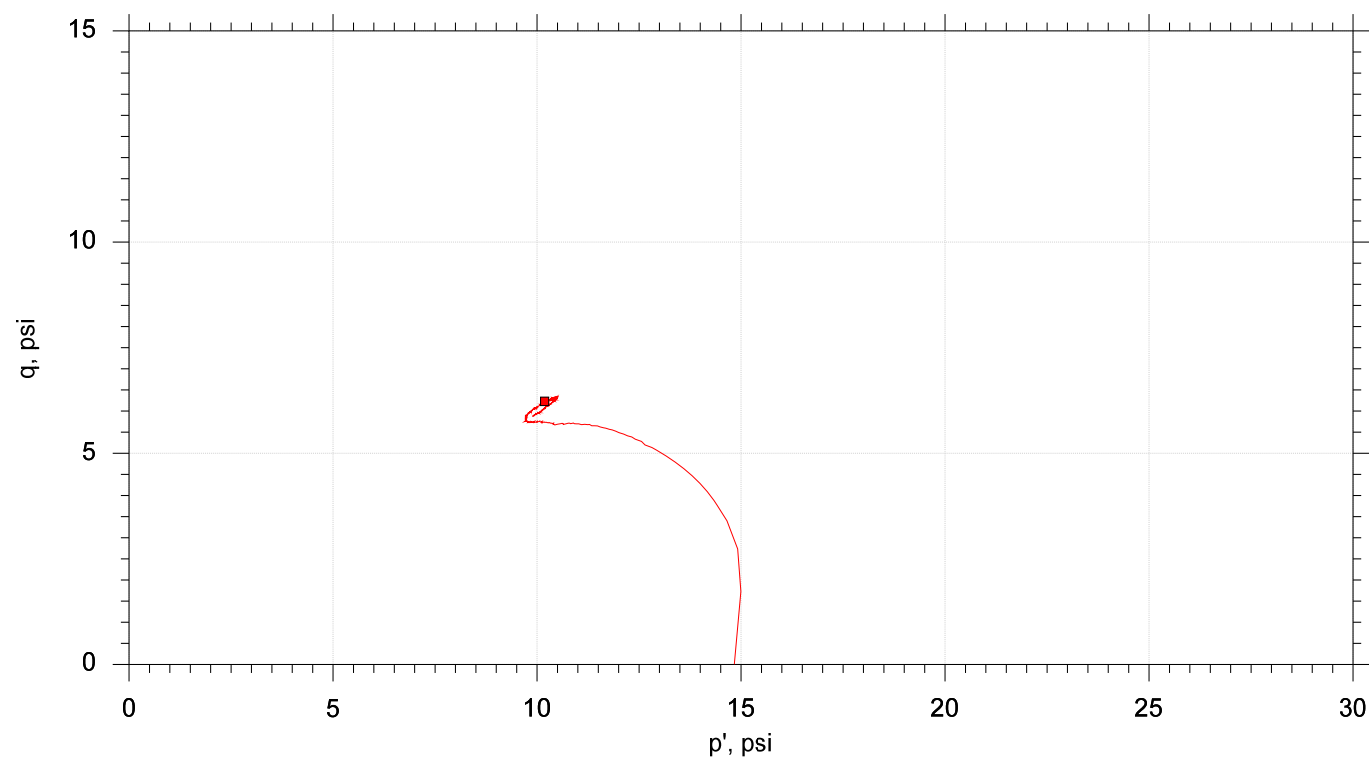
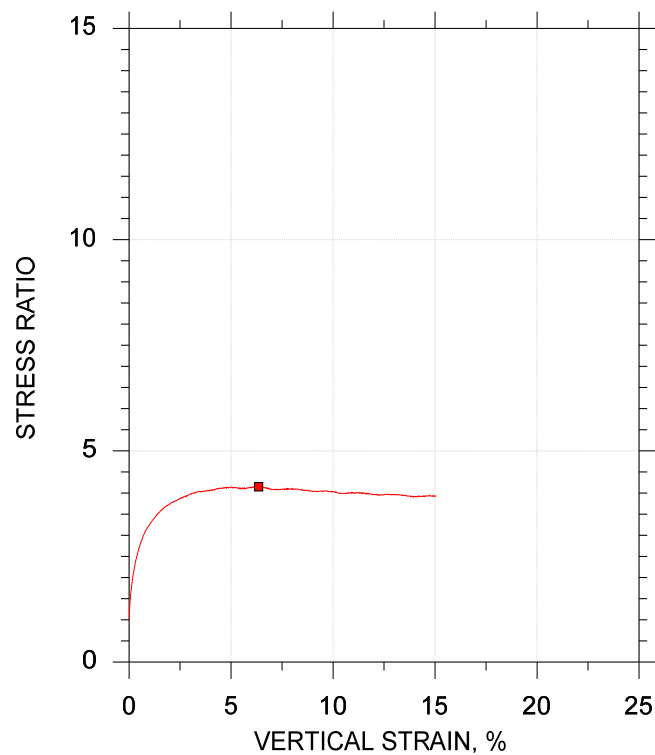
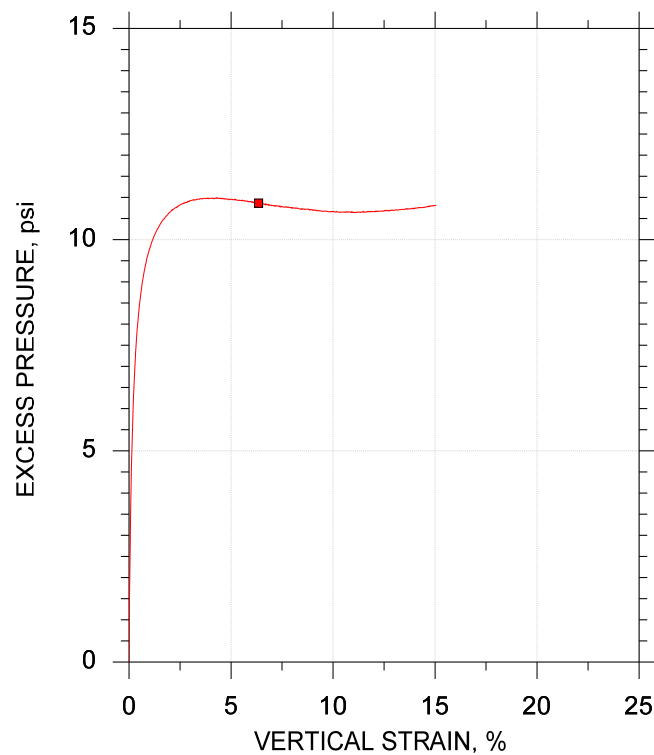
Estimated Specific Gravity: 2.7

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767




Symbol		■		
Sample ID		4U		
Depth, ft		30-32 ft		
Test Number		CU-5-1		
Initial	Height, in	6.000		
	Diameter, in	2.860		
	Moisture Content (from Cuttings), %	34.7		
	Dry Density, pcf	86.8		
	Saturation (Wet Method), %	99.5		
	Void Ratio	0.942		
Before Shear	Moisture Content, %	32.1		
	Dry Density, pcf	90.3		
	Cross-sectional Area (Method A), in ²	6.196		
	Saturation, %	100.0		
	Void Ratio	0.866		
	Back Pressure, psi	167.0		
Vertical Effective Consolidation Stress, psi		14.81		
Horizontal Effective Consolidation Stress, psi		14.83		
Vertical Strain after Consolidation, %		0.4010		
Volumetric Strain after Consolidation, %		4.010		
Time to 50% Consolidation, min		110.3		
Shear Strength, psi		6.232		
Strain at Failure, %		6.35		
Strain Rate, %/min		0.01600		
Deviator Stress at Failure, psi		12.46		
Effective Minor Principal Stress at Failure, psi		3.954		
Effective Major Principal Stress at Failure, psi		16.42		
B-Value		0.91		
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:				
System S				

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767



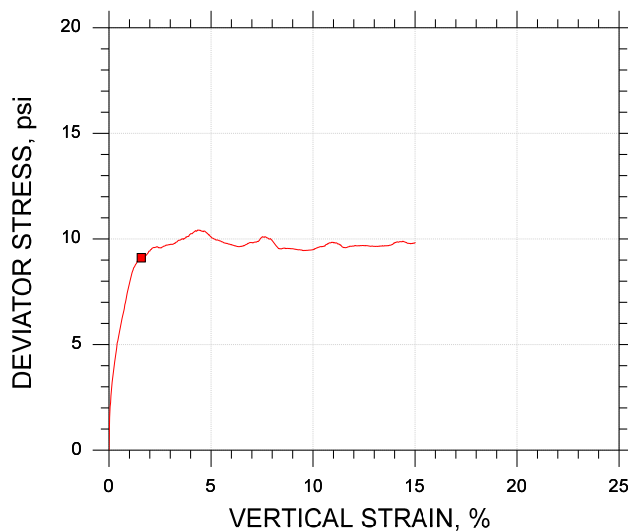
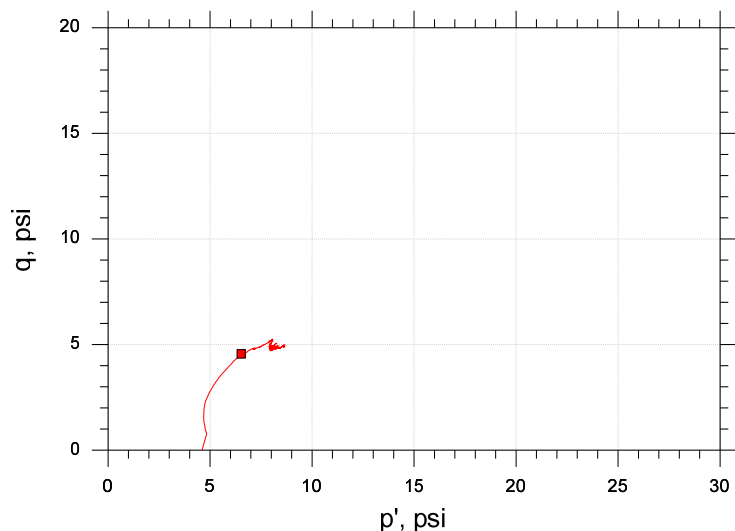
	Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
■	4U	CU-5-1	30-32 ft	md/trm	9/28/2018	mcm	10/17/18	308853-CU-5-1m.dat

			
	Project: Rt 9/I-395 Connector	Location: Brewer and Eddington, ME	Project No.: GTX-308853
	Boring No.: HB-BE-101 HB-BFB-101	Sample Type: intact	
	Description: Moist, dark gray clay		
	Remarks: System S		



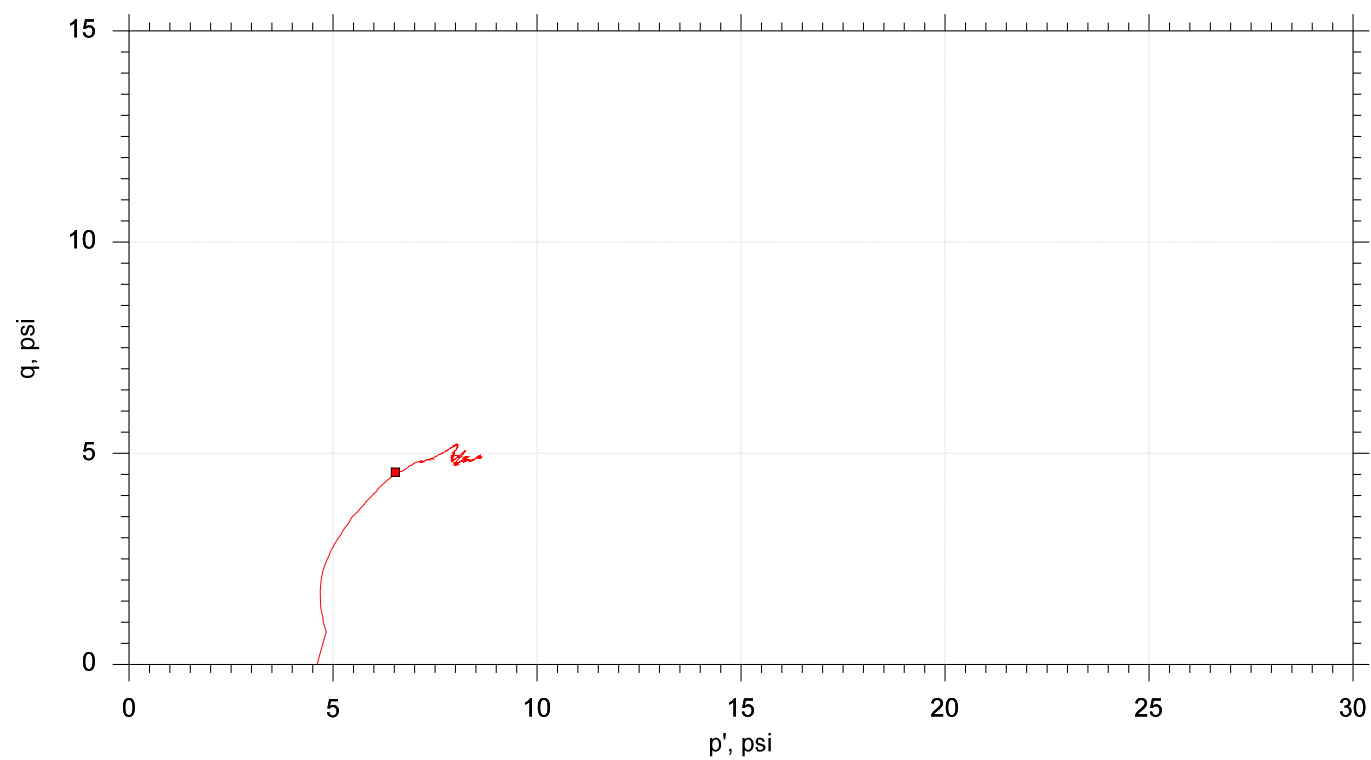
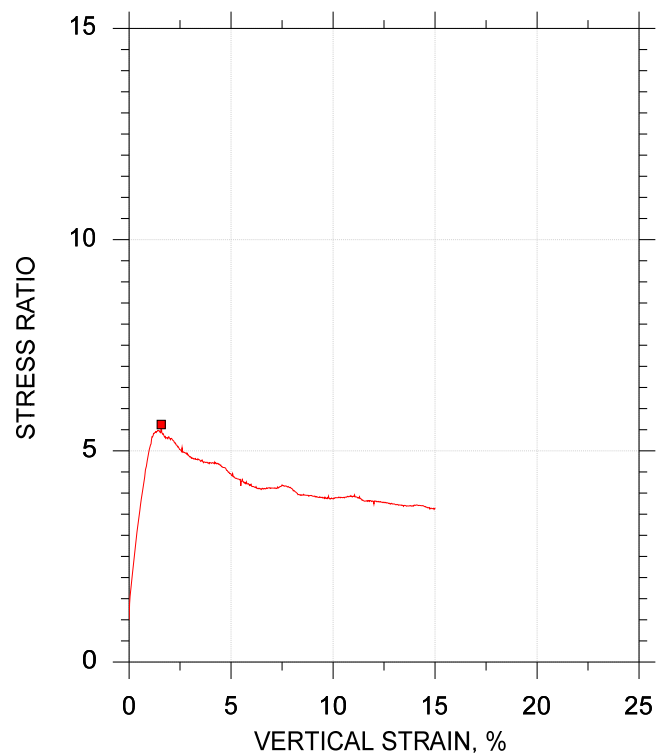
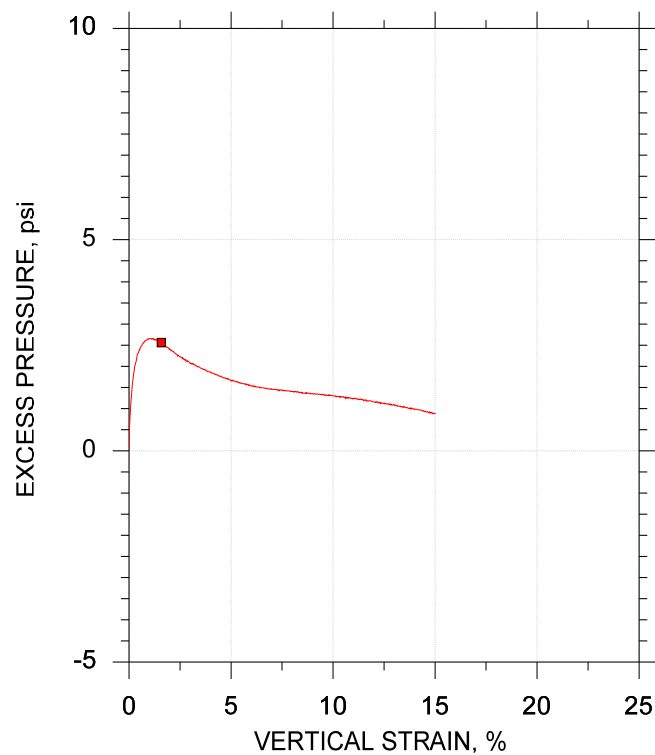
Client: Haley & Aldrich Inc.	
Project Name: Rt 9/ I-395 Connector	
Project Location: Brewer and Eddington, ME	
Project Number: GTX-308853	
Tested By: md/trm	Checked By: mcm
Boring ID: HB-BFB-101	
Preparation: intact	
Description: Moist, very dark gray clay	
Classification: ---	
Group Symbol: ---	
Liquid Limit: 41	Plastic Limit: 22
Plasticity Index: 19	Estimated Specific Gravity: 2.7

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767




Symbol		■		
Sample ID		1U		
Depth, ft		5-7 ft		
Test Number		CU-1-1		
Initial	Height, in	6.110		
	Diameter, in	2.850		
	Moisture Content (from Cuttings), %	36.0		
	Dry Density, pcf	85.4		
	Saturation (Wet Method), %	99.8		
	Void Ratio	0.974		
Before Shear	Moisture Content, %	36.1		
	Dry Density, pcf	85.4		
	Cross-sectional Area (Method A), in ²	6.374		
	Saturation, %	100.0		
	Void Ratio	0.974		
	Back Pressure, psi	147.0		
Vertical Effective Consolidation Stress, psi		4.606		
Horizontal Effective Consolidation Stress, psi		4.607		
Vertical Strain after Consolidation, %		0.04999		
Volumetric Strain after Consolidation, %		0.4042		
Time to 50% Consolidation, min		4.000		
Shear Strength, psi		4.555		
Strain at Failure, %		1.58		
Strain Rate, %/min		0.01600		
Deviator Stress at Failure, psi		9.110		
Effective Minor Principal Stress at Failure, psi		1.970		
Effective Major Principal Stress at Failure, psi		11.08		
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



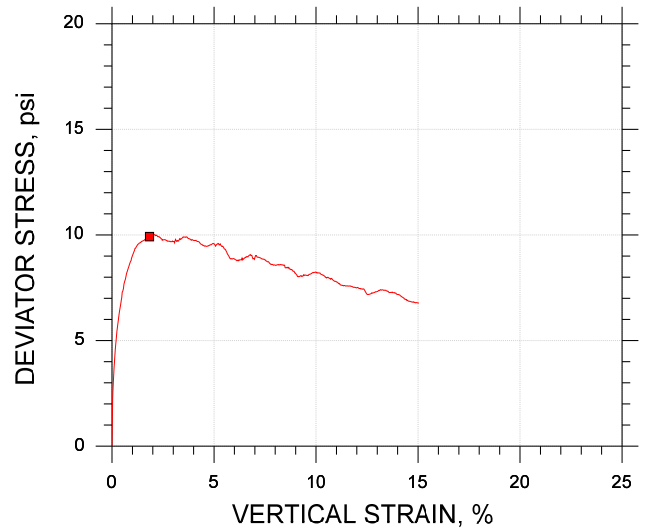
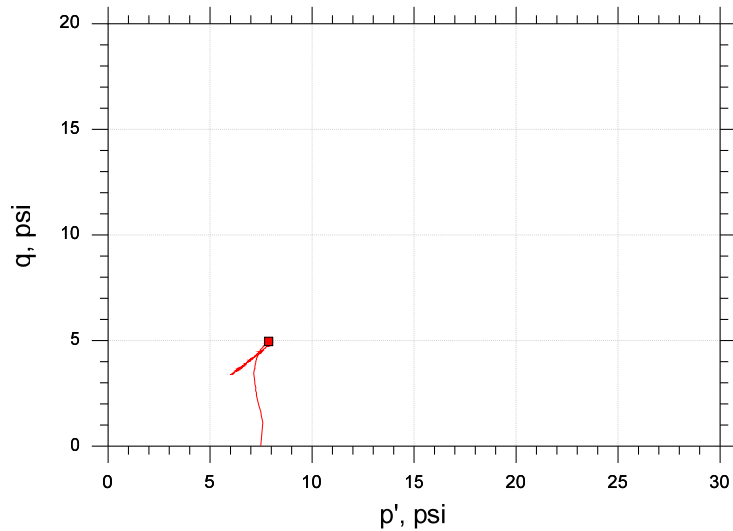
	Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
■	1U	CU-1-1	5-7 ft	md/trm	9/27/18	mcm	10/17/18	308853-CU-1-1m.dat

			
	Project: Rt 9/ I-395 Connector	Location: Brewer and Eddington, ME	Project No.: GTX-308853
	Boring No.: HB-BFB-101	Sample Type: intact	
	Description: Moist, very dark gray clay		
	Remarks: System JJ		



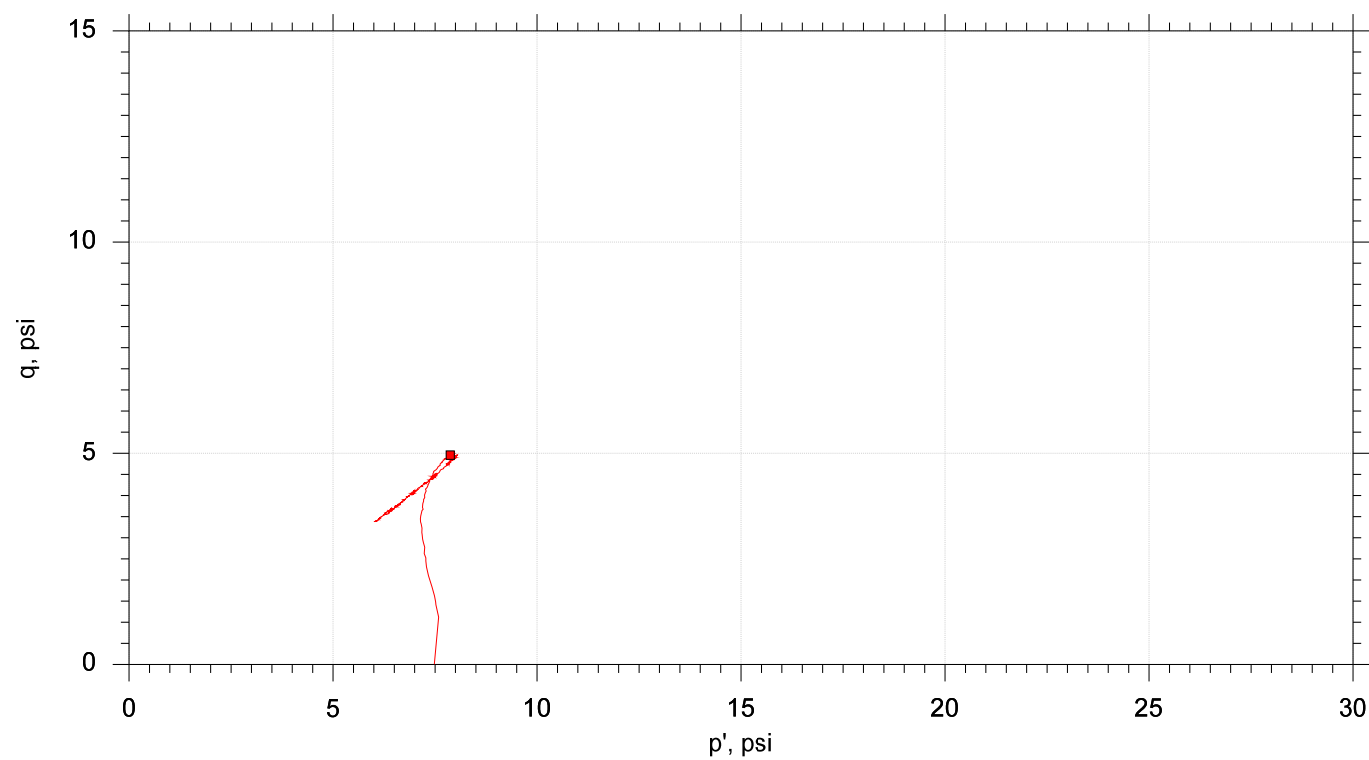
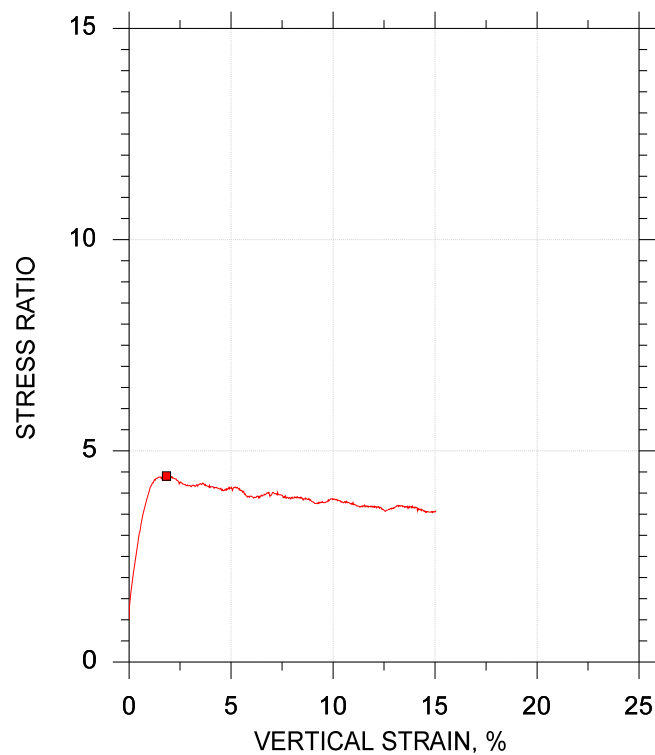
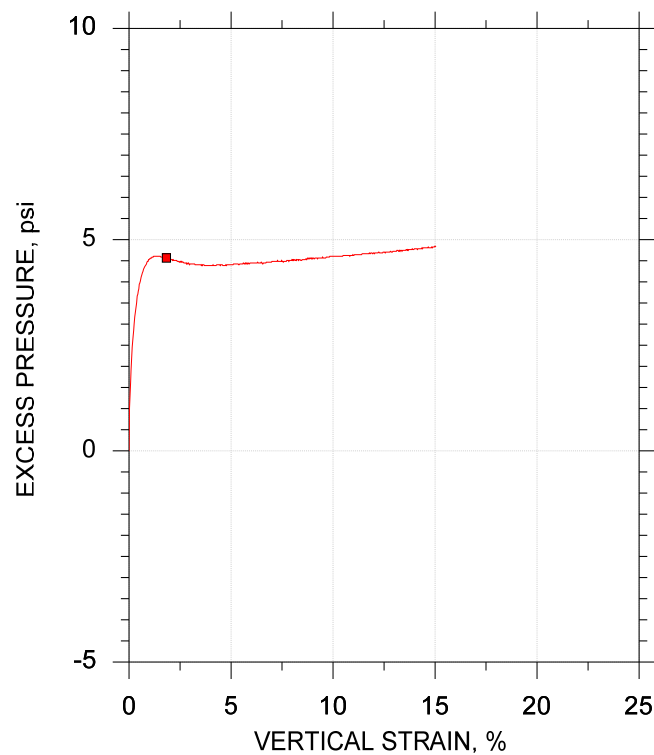
Client: Haley & Aldrich, Inc.	
Project Name: Rt 9/ I-395	
Project Location: Brewer and Eddington, ME	
Project Number: GTX-308853	
Tested By: md/trm	Checked By: mcm
Boring ID: HB-BFB 101	
Preparation: Intact	
Description: Wet, very dark greenish gray clay	
Classification: ---	
Group Symbol: ---	
Liquid Limit: 35	Plastic Limit: 20
Plasticity Index: 15	Estimated Specific Gravity: 2.7

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767




Symbol		■		
Sample ID		2U		
Depth, ft		12-14 ft		
Test Number		CU-2-1		
Initial	Height, in	6.060		
	Diameter, in	2.870		
	Moisture Content (from Cuttings), %	38.7		
	Dry Density, pcf	82.3		
	Saturation (Wet Method), %	99.8		
	Void Ratio	1.05		
Before Shear	Moisture Content, %	37.6		
	Dry Density, pcf	83.7		
	Cross-sectional Area (Method A), in ²	6.393		
	Saturation, %	100.0		
	Void Ratio	1.01		
	Back Pressure, psi	105.0		
Vertical Effective Consolidation Stress, psi		7.462		
Horizontal Effective Consolidation Stress, psi		7.479		
Vertical Strain after Consolidation, %		0.4240		
Volumetric Strain after Consolidation, %		1.534		
Time to 50% Consolidation, min		90.25		
Shear Strength, psi		4.959		
Strain at Failure, %		1.83		
Strain Rate, %/min		0.01600		
Deviator Stress at Failure, psi		9.917		
Effective Minor Principal Stress at Failure, psi		2.912		
Effective Major Principal Stress at Failure, psi		12.83		
B-Value		0.96		
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:				
System X				

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767



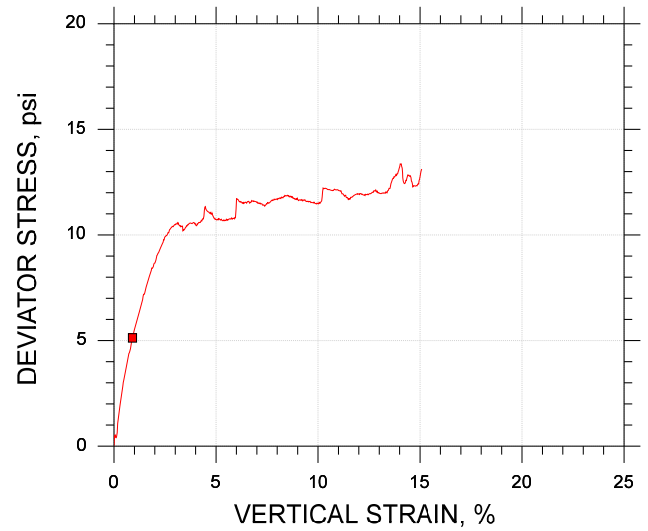
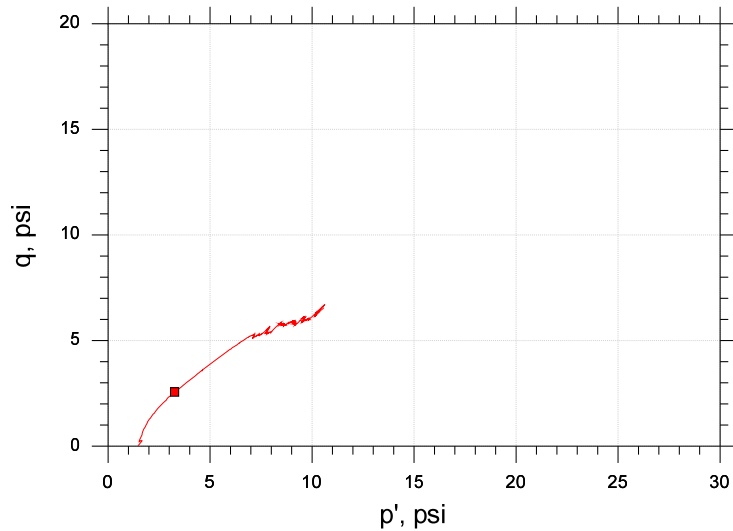
	Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
■	2U	CU-2-1	12-14 ft	md/trm	9/27/18	mcm	10/17/18	308853-CU-2-1m.dat

			
	Project: Rt 9/ I-395	Location: Brewer and Eddington, ME	Project No.: GTX-308853
	Boring No.: HB-BFB 101	Sample Type: Intact	
	Description: Wet, very dark greenish gray clay		
	Remarks: System X		



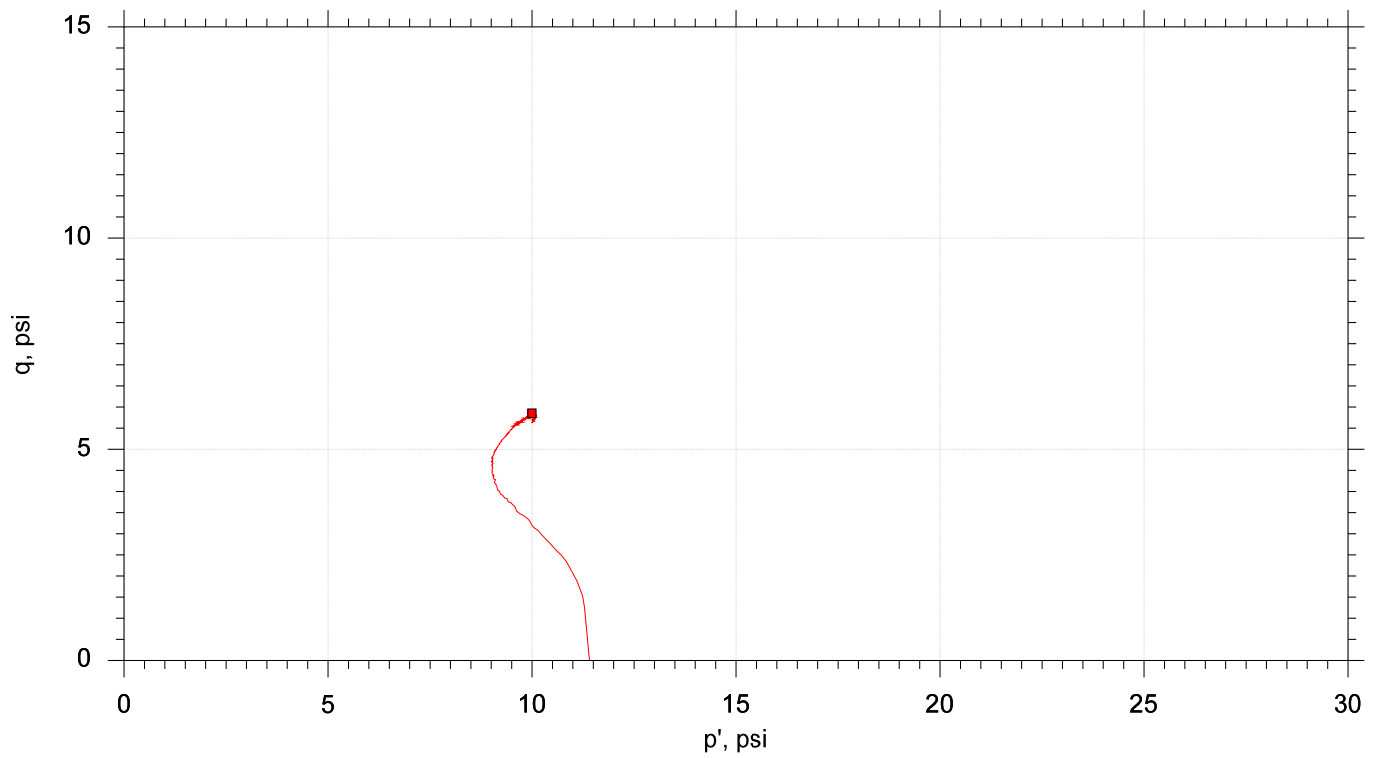
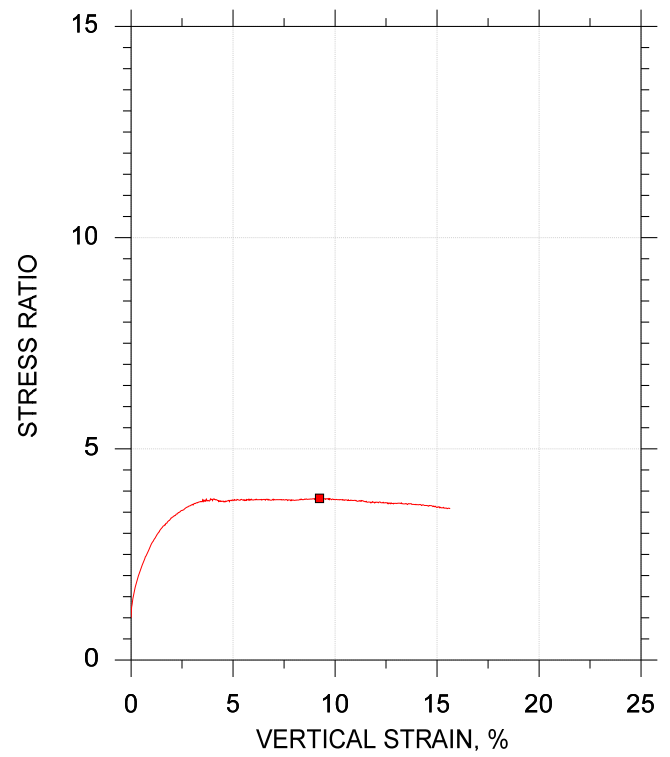
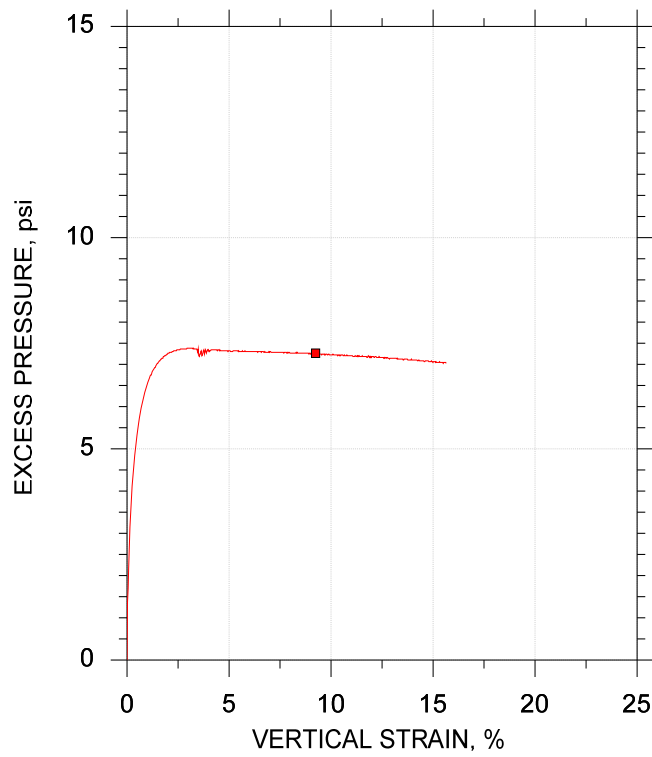
Client: Haley & Aldrich, Inc.	
Project Name: Rt 9/I-395 Connector	
Project Location: Brewer and Eddington, ME	
Project Number: GTX-308853	
Tested By: trm	Checked By: mcm
Boring ID: BB-EEBT2-101	
Preparation: Intact	
Description: Moist, olive gray clay	
Classification: ---	
Group Symbol: ---	
Liquid Limit: 35	Plastic Limit: 18
Plasticity Index: 17	Estimated Specific Gravity: 2.7

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767




Symbol		■		
Sample ID		1U		
Depth, ft		5-7 ft		
Test Number		CU-19-1		
Initial	Height, in	4.800		
	Diameter, in	2.030		
	Moisture Content (from Cuttings), %	29.1		
	Dry Density, pcf	89.3		
	Saturation (Wet Method), %	88.7		
	Void Ratio	0.888		
Before Shear	Moisture Content, %	32.5		
	Dry Density, pcf	89.8		
	Cross-sectional Area (Method A), in ²	3.220		
	Saturation, %	100.0		
	Void Ratio	0.876		
	Back Pressure, psi	72.99		
Vertical Effective Consolidation Stress, psi		1.480		
Horizontal Effective Consolidation Stress, psi		1.459		
Vertical Strain after Consolidation, %		0.0009822		
Volumetric Strain after Consolidation, %		0.3388		
Time to 50% Consolidation, min		0.4900		
Shear Strength, psi		2.562		
Strain at Failure, %		0.901		
Strain Rate, %/min		0.01600		
Deviator Stress at Failure, psi		5.123		
Effective Minor Principal Stress at Failure, psi		0.6961		
Effective Major Principal Stress at Failure, psi		5.819		
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

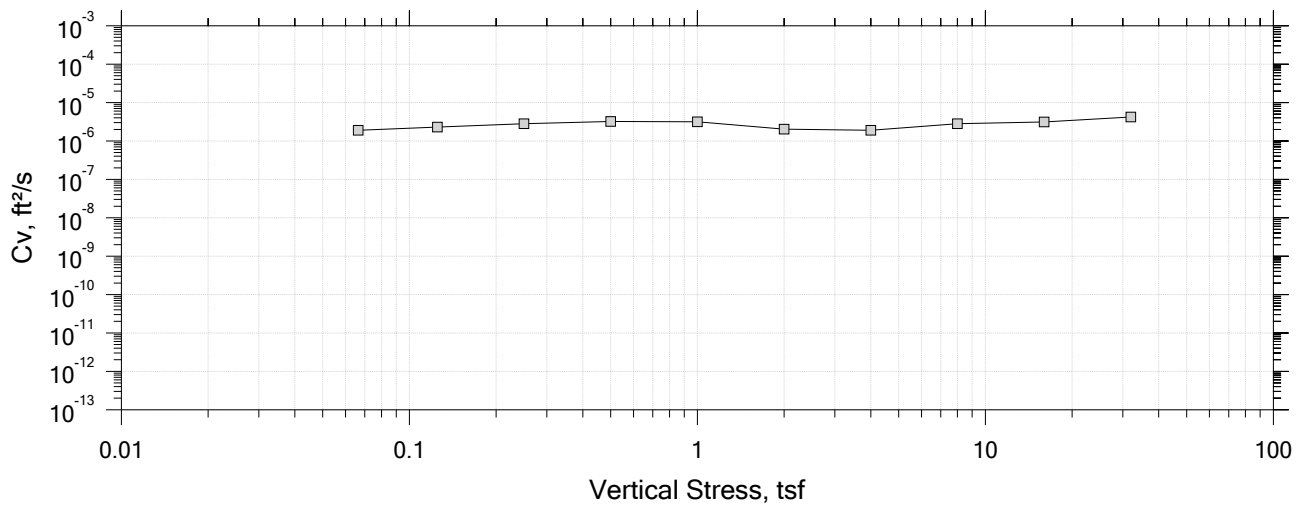
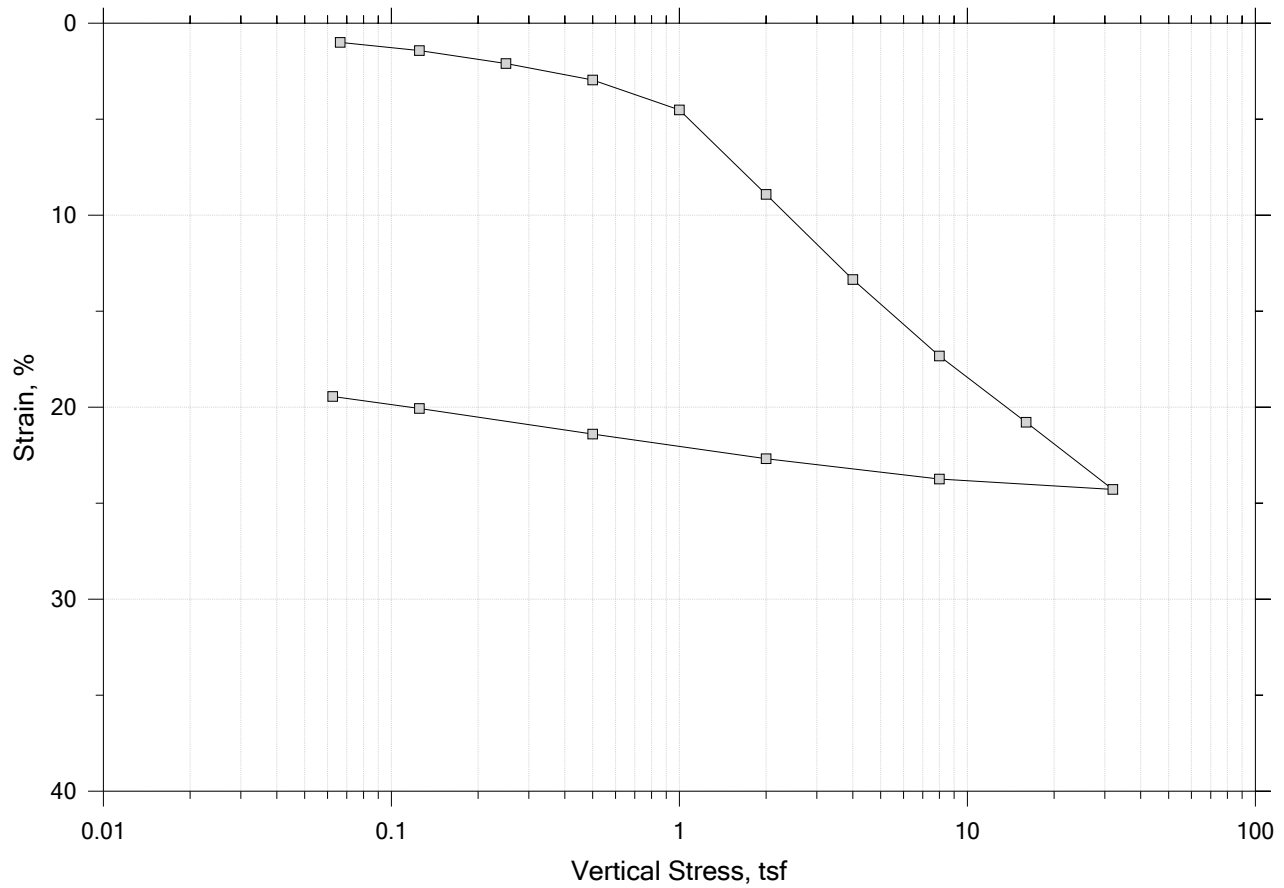



	Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
■	3U	CU-1-1	29-31	md	02/18/20	njh	---	311345-CU-1-1n.dat

			
	Project: Rte-9/I-395 Conn. - Wilson St	Location: Brewer & Eddington, ME	Project No.: GTX-311345
	Boring No.: BB-BWS-301	Sample Type: intact	
	Description: Moist, gray clay		
	Remarks: System RR		

One-Dimensional Consolidation by ASTM D2435 - Method B

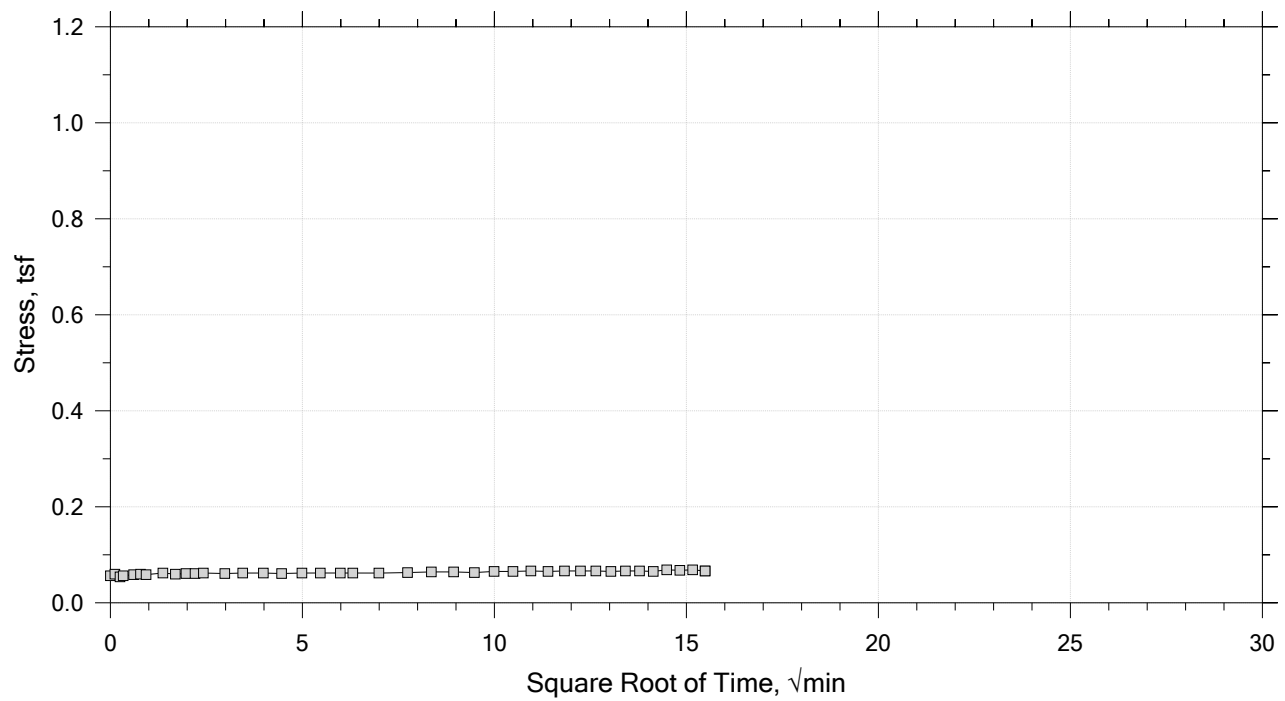
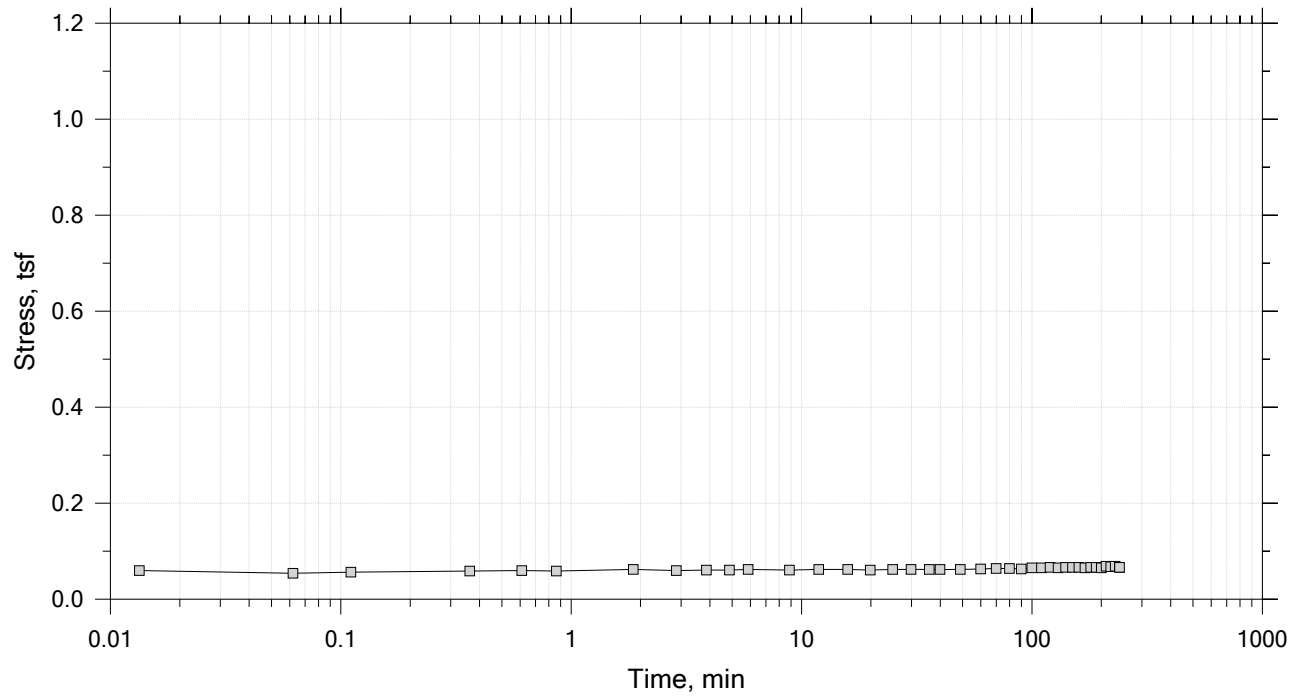
Summary Report




	Project: Rt 9/I-395 Connector	Location: Brewer and Eddington, ME	Project No.: GTX-308853
	Boring No.: BB-BFB1-101	Tested By: trm	Checked By: mcm
	Sample No.: 1U	Test Date: 7/31/19	Depth: 15-16.4 ft
	Test No.: IP-11B	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System S, Swell Pressure = 0.0664 tsf		
	Displacement at End of Increment		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 1 of 15
Constant Volume Step
Stress: 0.0664 tsf



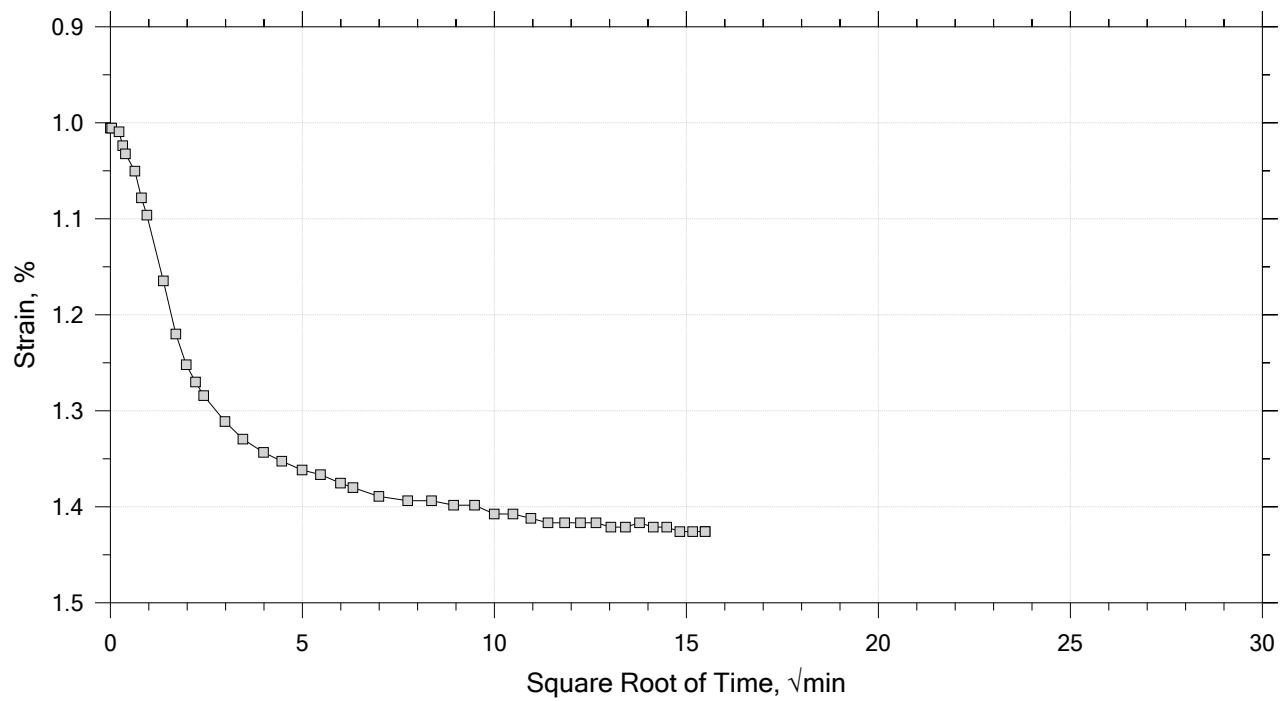
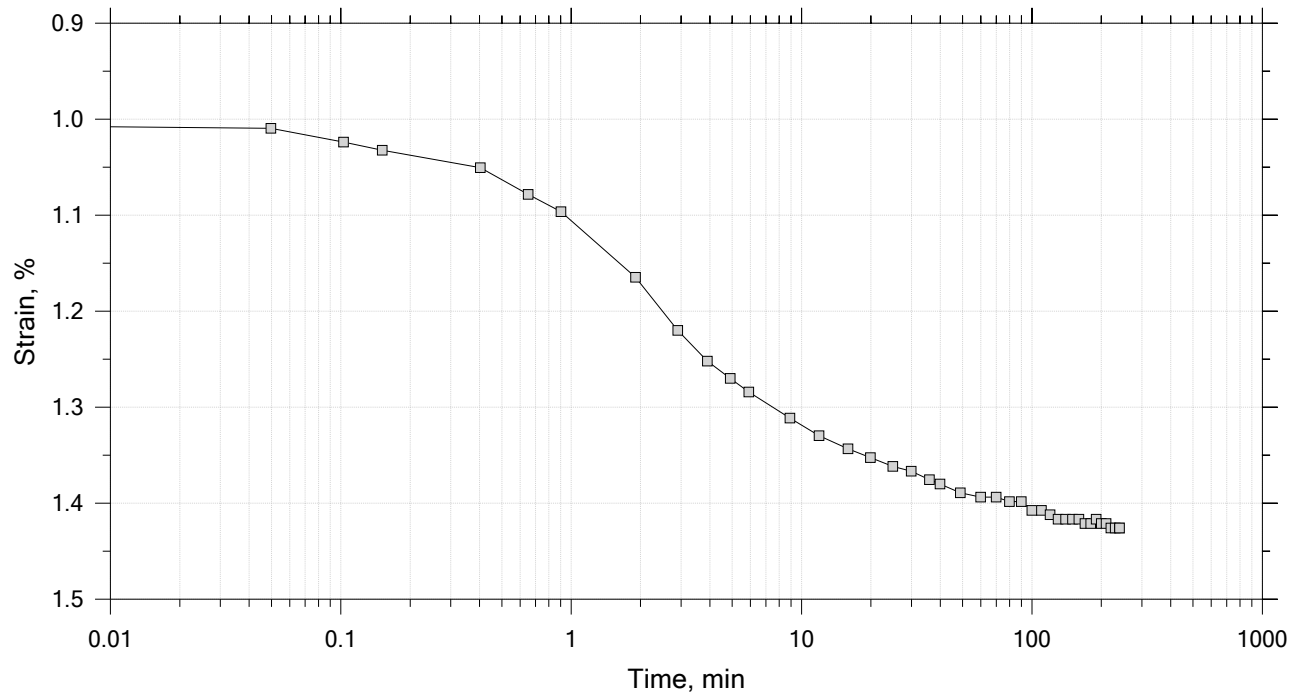
	Project: Rt 9/I-395 Connector	Location: Brewer and Eddington, ME	Project No.: GTX-308853
	Boring No.: BB-BFB1-101	Tested By: trm	Checked By: mcm
	Sample No.: 1U	Test Date: 7/31/19	Depth: 15-16.4 ft
	Test No.: IP-11B	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System S, Swell Pressure = 0.0664 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 2 of 15

Constant Load Step

Stress: 0.125 tsf



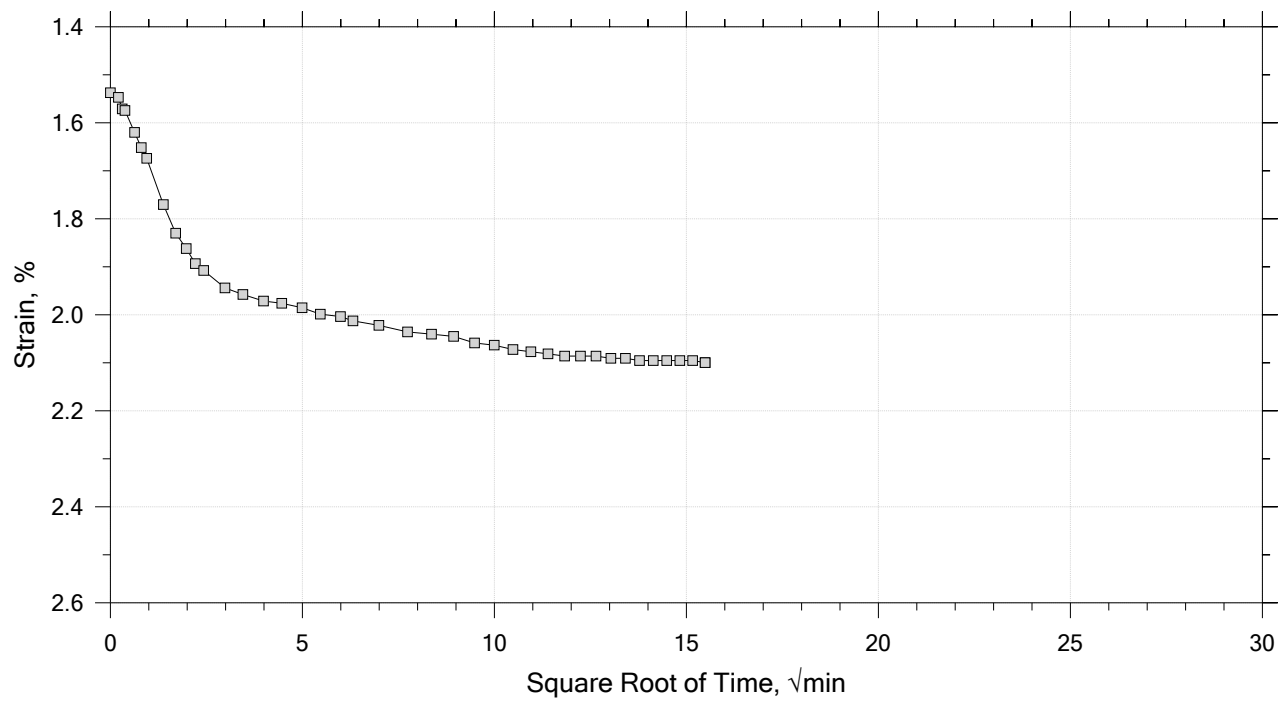
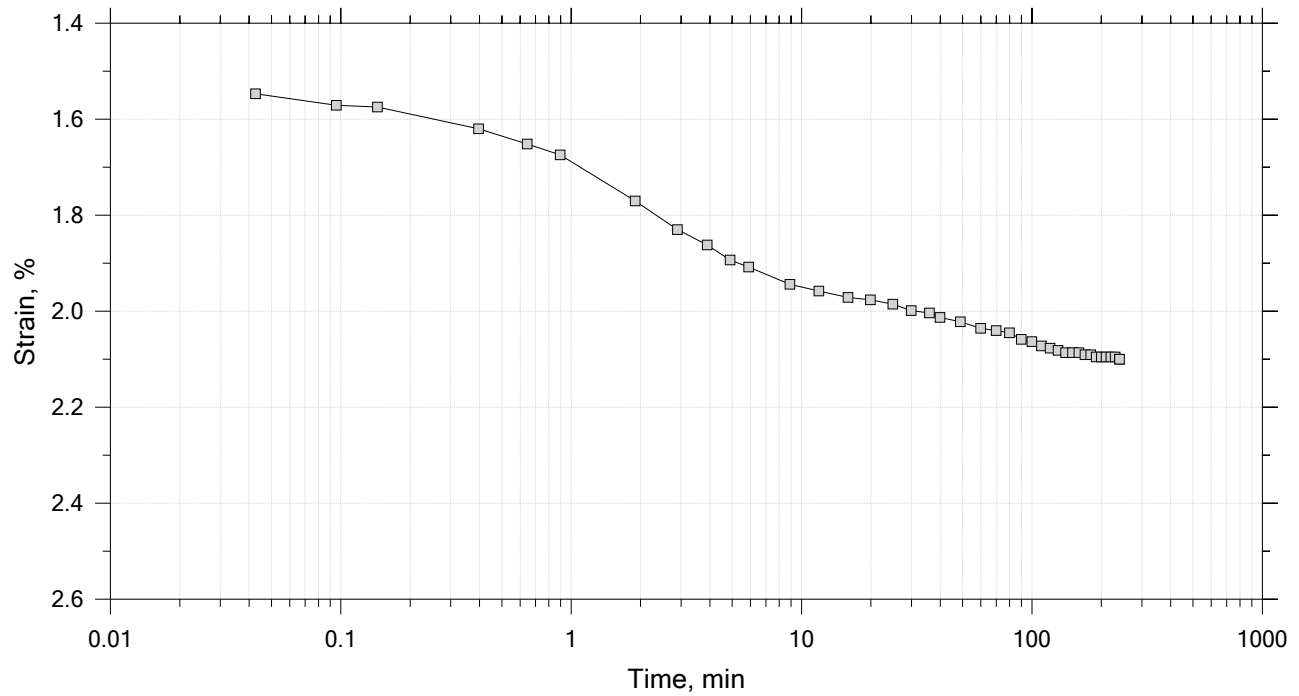
	Project: Rt 9/I-395 Connector	Location: Brewer and Eddington, ME	Project No.: GTX-308853
	Boring No.: BB-BFB1-101	Tested By: trm	Checked By: mcm
	Sample No.: 1U	Test Date: 7/31/19	Depth: 15-16.4 ft
	Test No.: IP-11B	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System S, Swell Pressure = 0.0664 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 3 of 15

Constant Load Step

Stress: 0.25 tsf



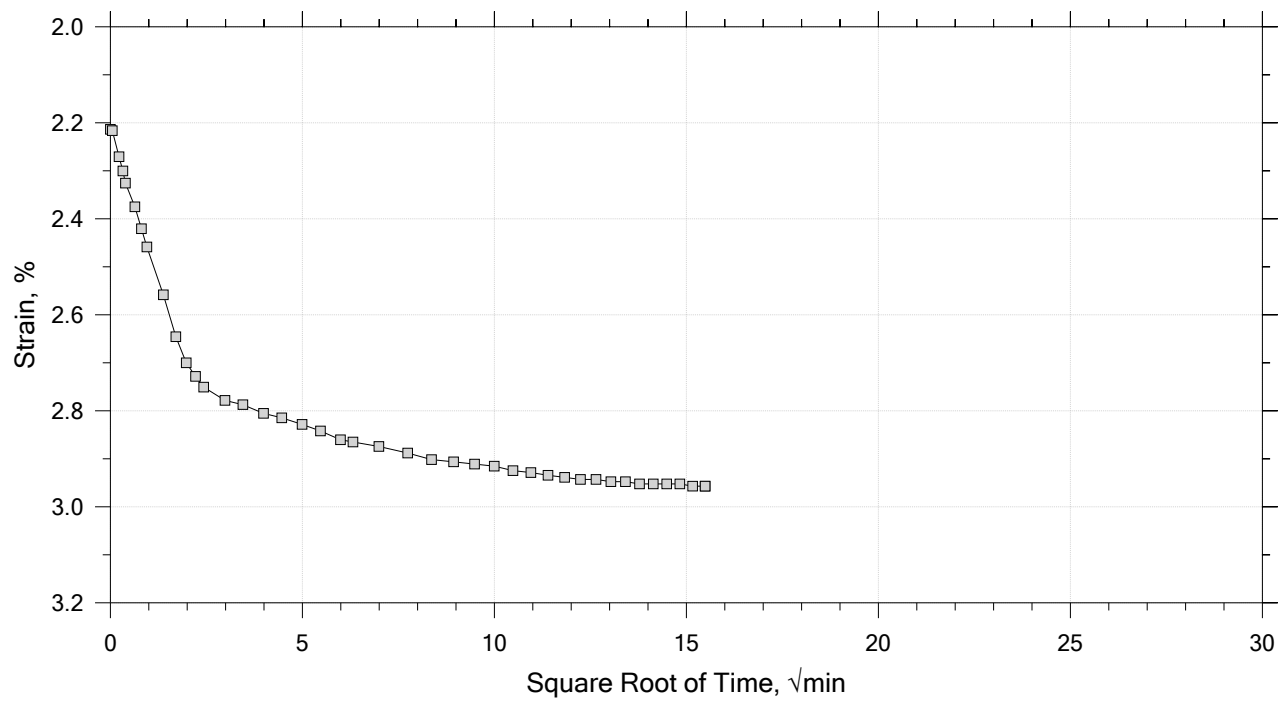
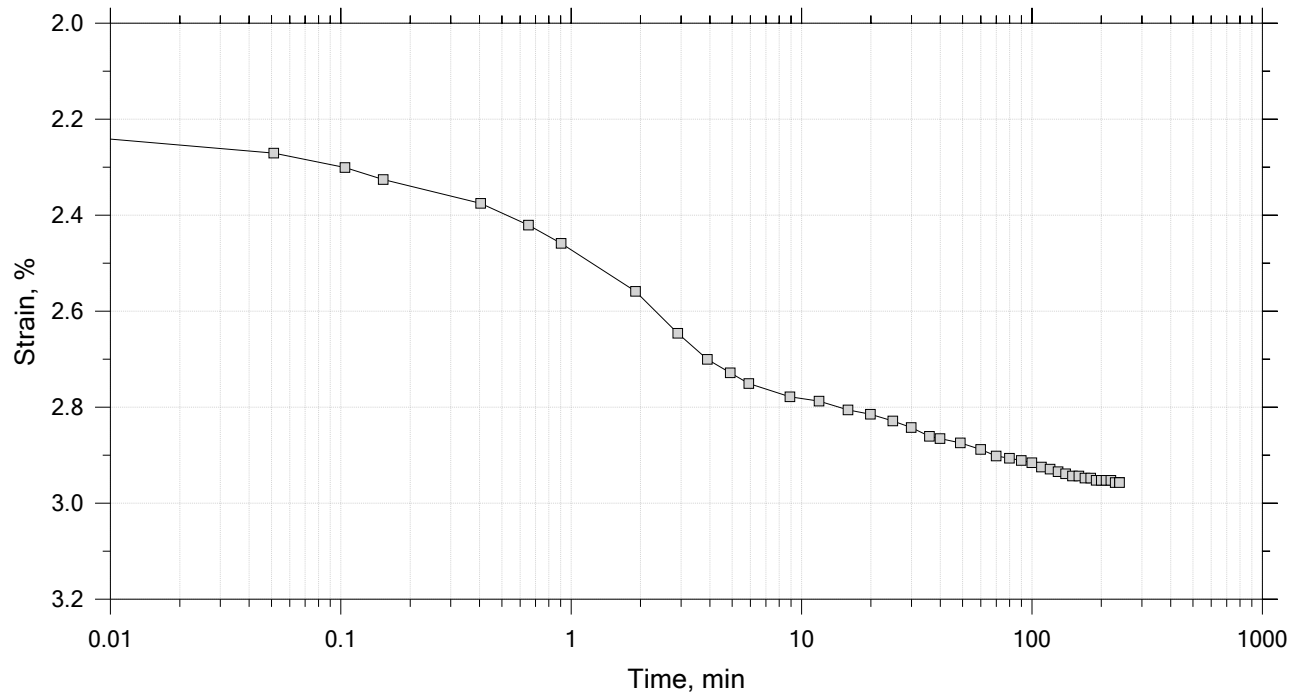
	Project: Rt 9/I-395 Connector	Location: Brewer and Eddington, ME	Project No.: GTX-308853
	Boring No.: BB-BFB1-101	Tested By: trm	Checked By: mcm
	Sample No.: 1U	Test Date: 7/31/19	Depth: 15-16.4 ft
	Test No.: IP-11B	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System S, Swell Pressure = 0.0664 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 4 of 15

Constant Load Step

Stress: 0.5 tsf



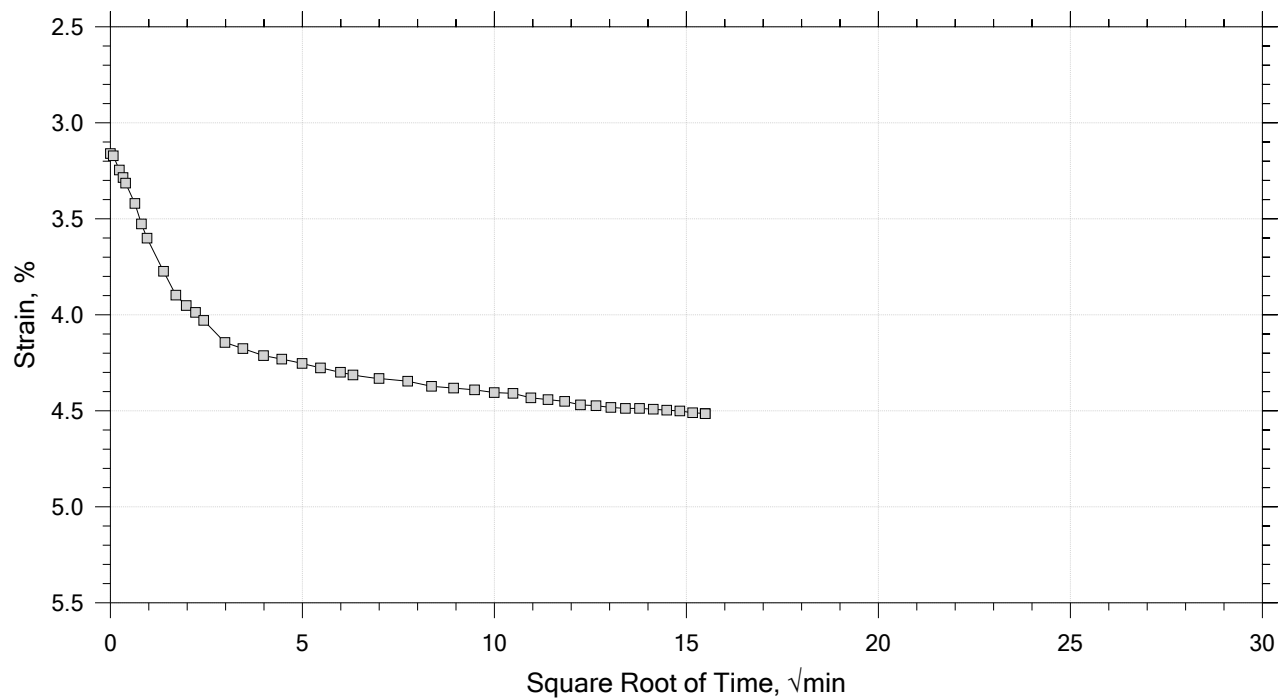
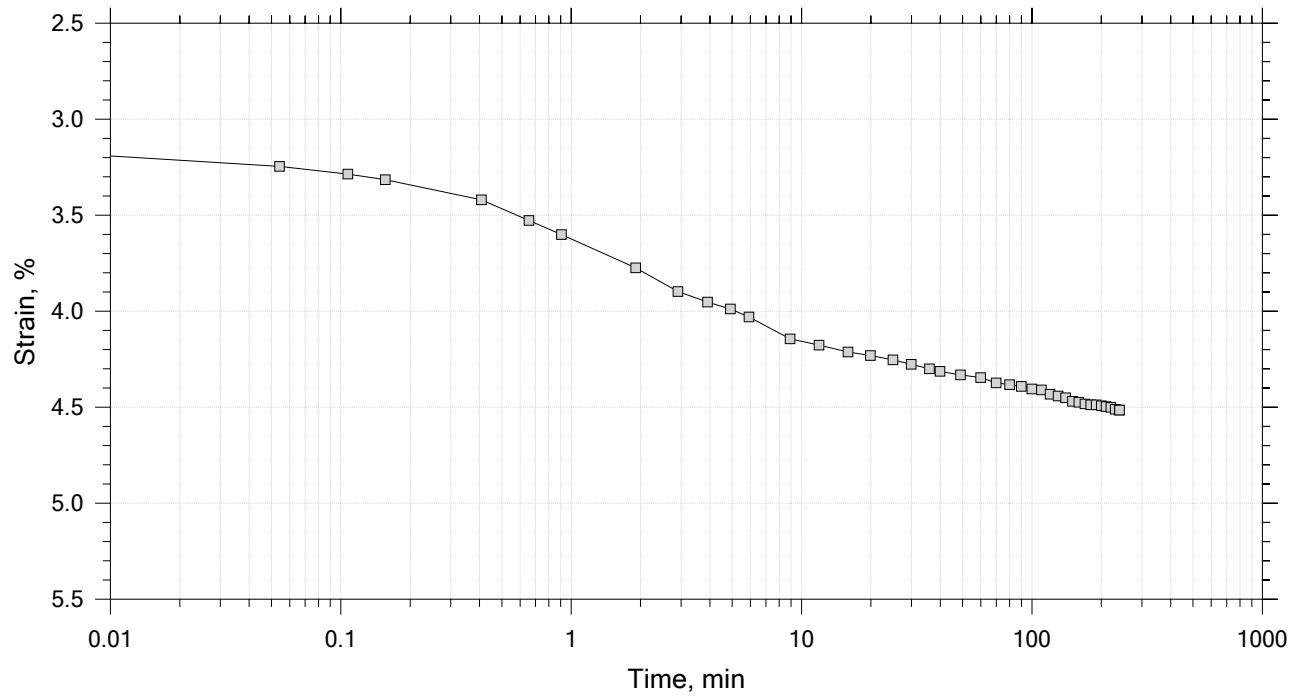
	Project: Rt 9/I-395 Connector	Location: Brewer and Eddington, ME	Project No.: GTX-308853
	Boring No.: BB-BFB1-101	Tested By: trm	Checked By: mcm
	Sample No.: 1U	Test Date: 7/31/19	Depth: 15-16.4 ft
	Test No.: IP-11B	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System S, Swell Pressure = 0.0664 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 5 of 15

Constant Load Step

Stress: 1 tsf



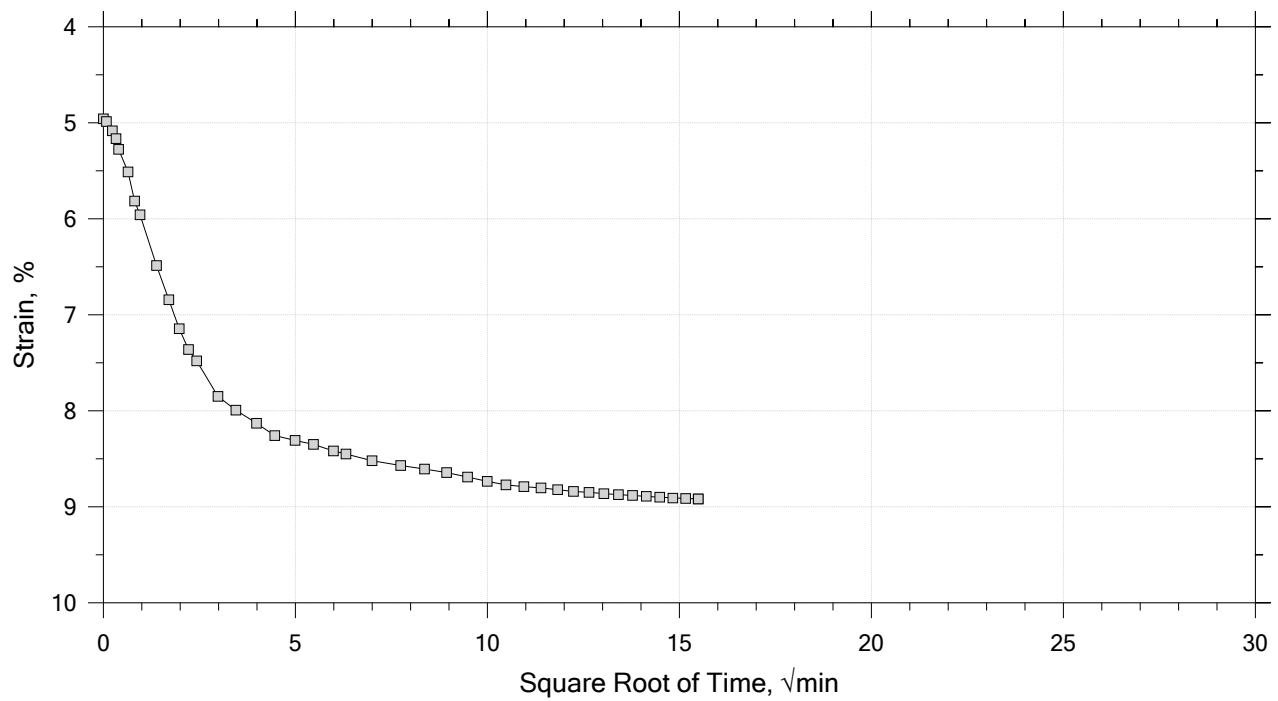
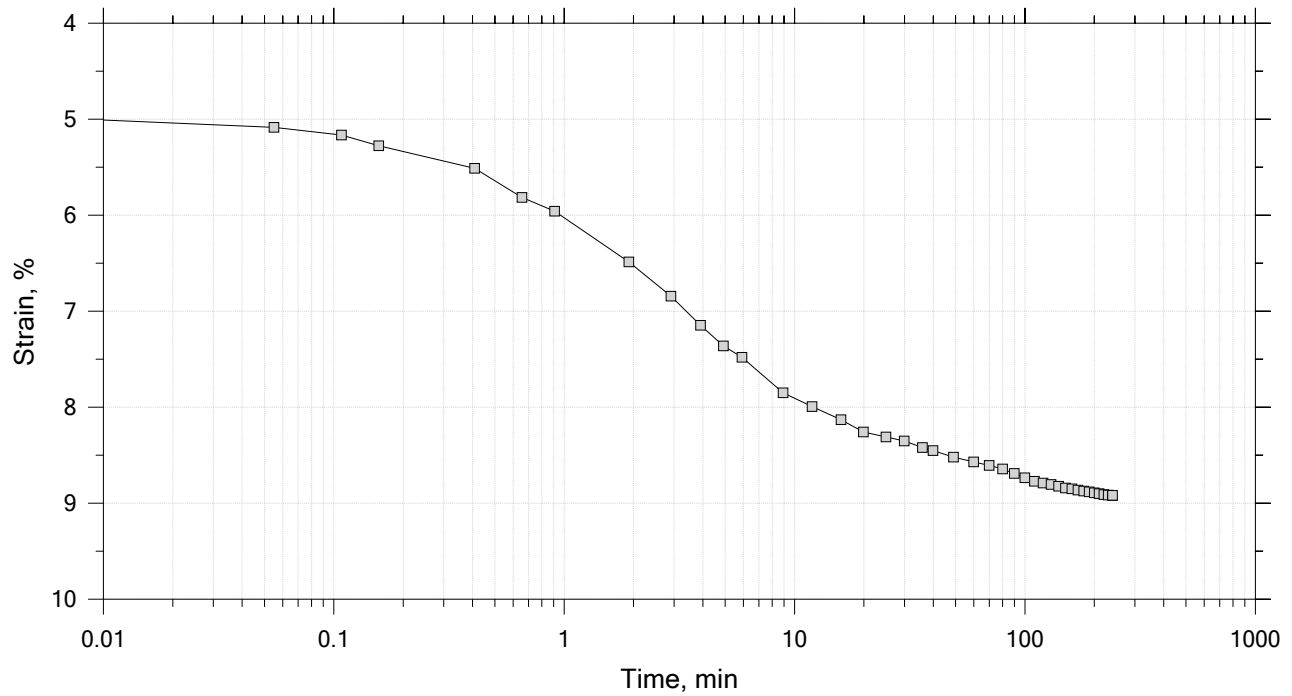
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	Boring No.: BB-BFB1-101	Tested By: trm	Checked By: mcm
	Sample No.: 1U	Test Date: 7/31/19	Depth: 15-16.4 ft
	Test No.: IP-11B	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System S, Swell Pressure = 0.0664 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 6 of 15

Constant Load Step

Stress: 2 tsf



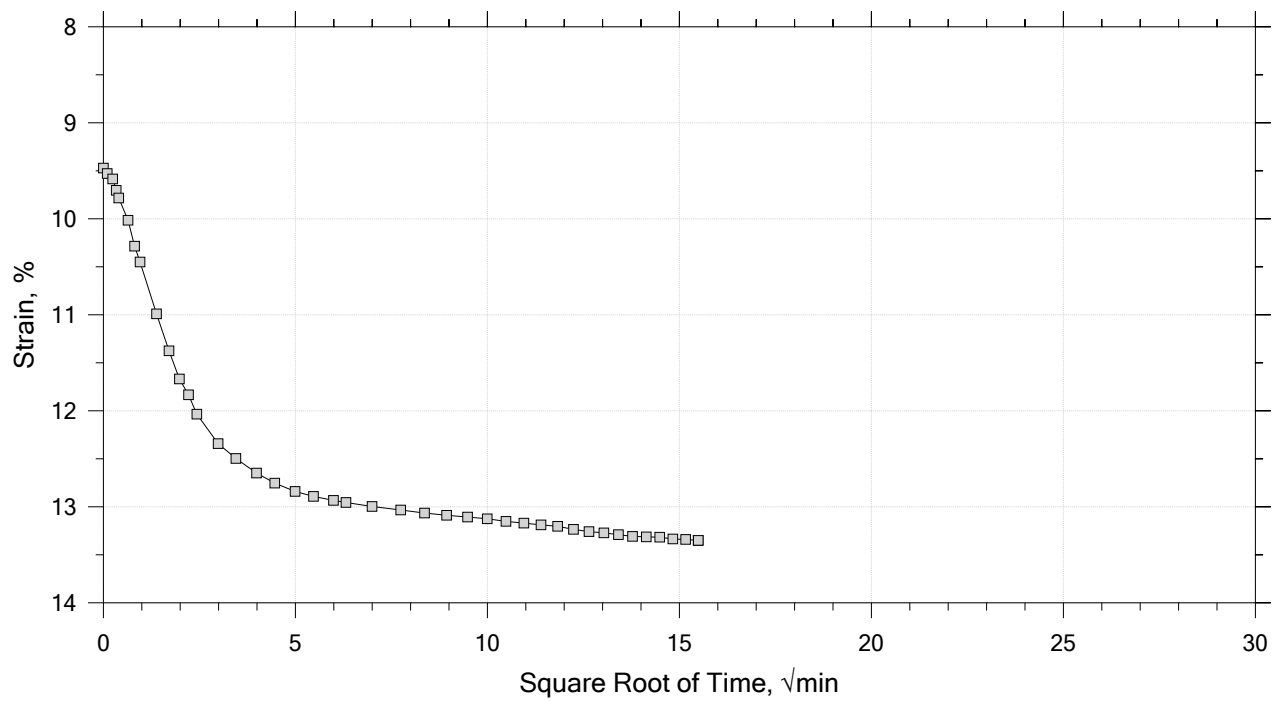
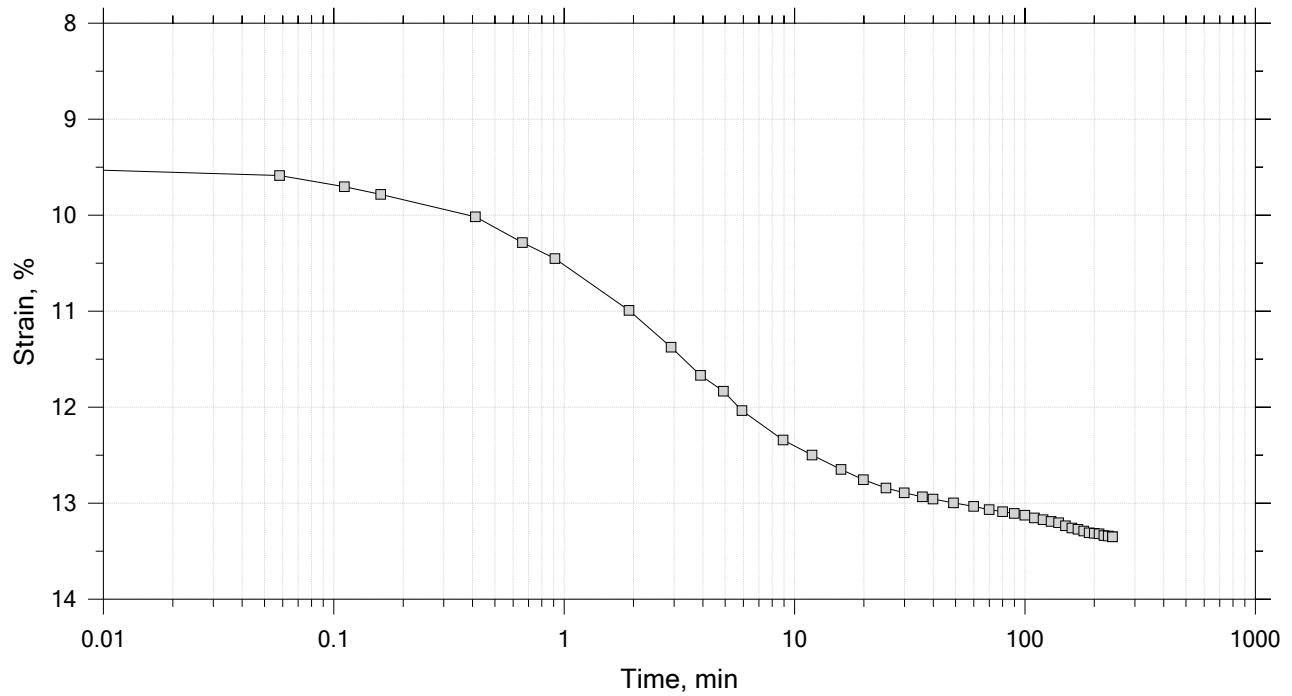
	Project: Rt 9/I-395 Connector	Location: Brewer and Eddington, ME	Project No.: GTX-308853
	Boring No.: BB-BFB1-101	Tested By: trm	Checked By: mcm
	Sample No.: 1U	Test Date: 7/31/19	Depth: 15-16.4 ft
	Test No.: IP-11B	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System S, Swell Pressure = 0.0664 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 7 of 15

Constant Load Step

Stress: 4 tsf



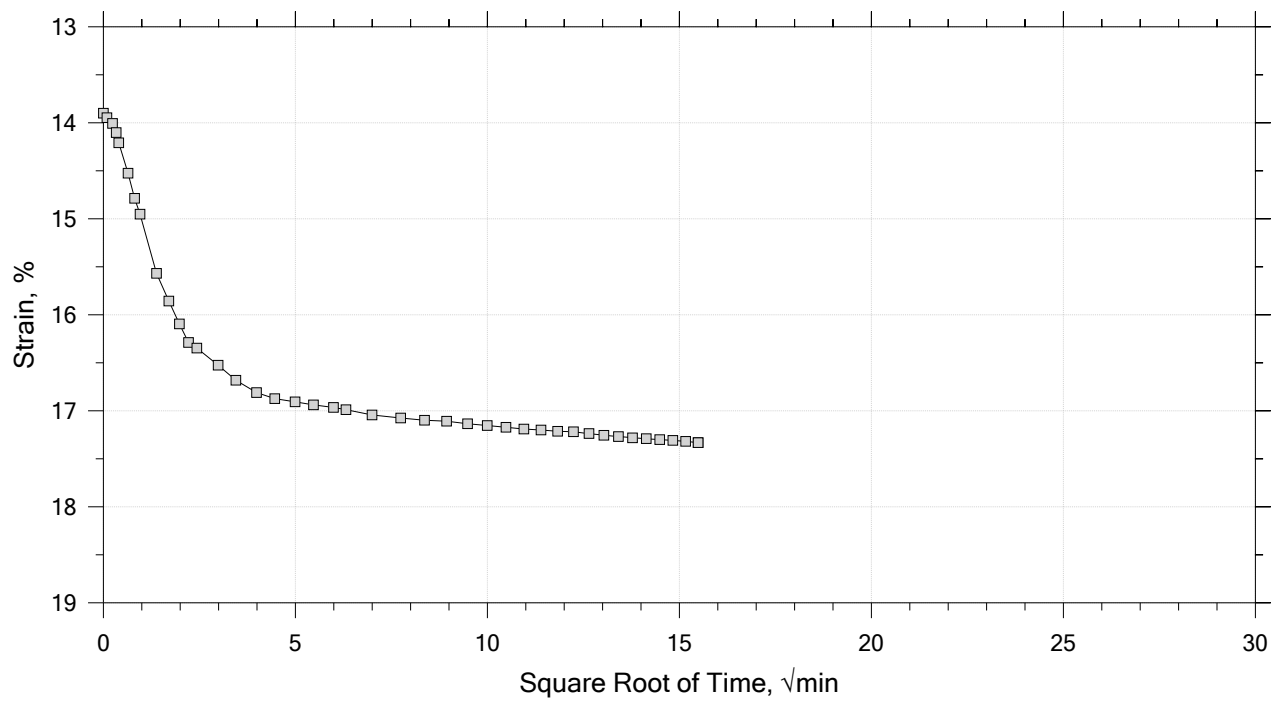
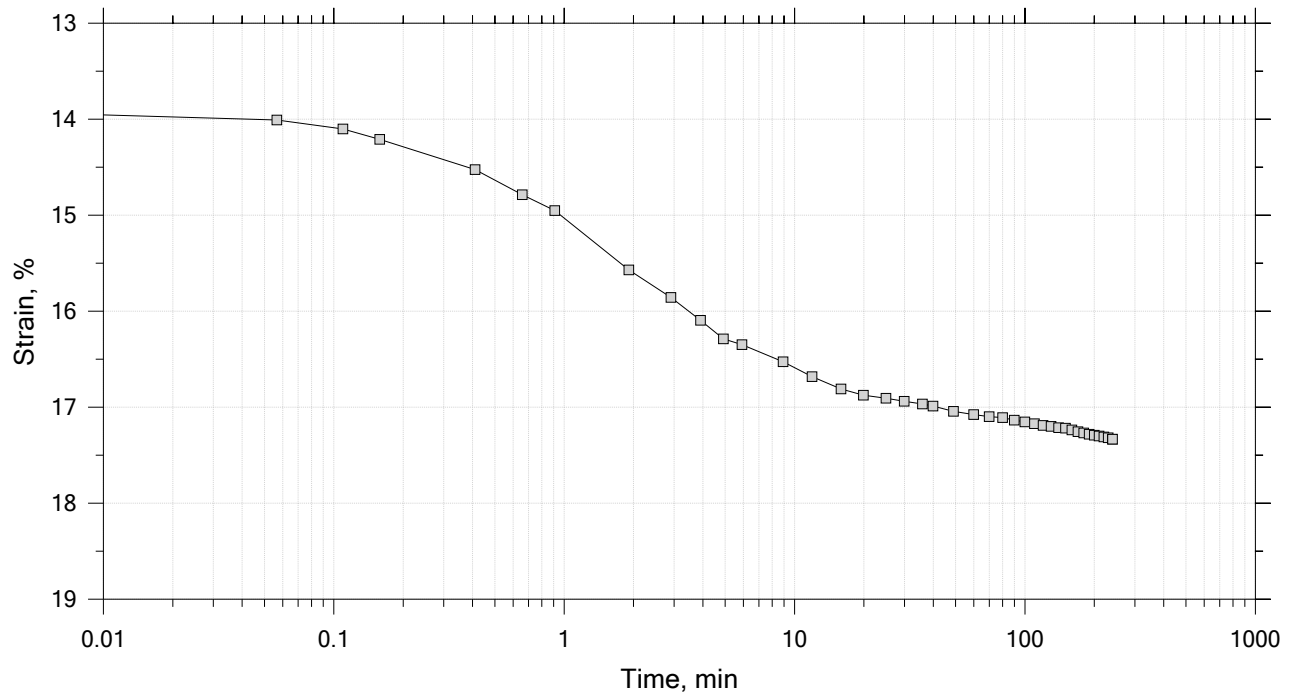
	Project: Rt 9/I-395 Connector	Location: Brewer and Eddington, ME	Project No.: GTX-308853
	Boring No.: BB-BFB1-101	Tested By: trm	Checked By: mcm
	Sample No.: 1U	Test Date: 7/31/19	Depth: 15-16.4 ft
	Test No.: IP-11B	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System S, Swell Pressure = 0.0664 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 8 of 15

Constant Load Step

Stress: 8 tsf



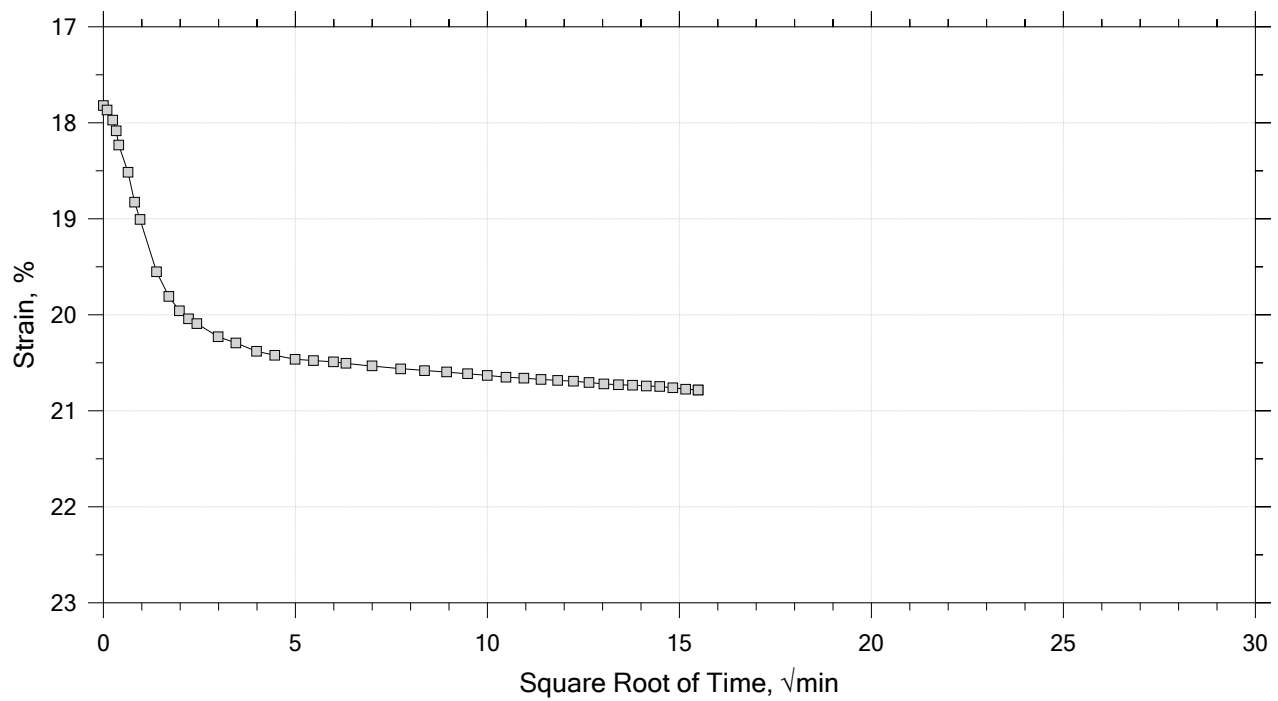
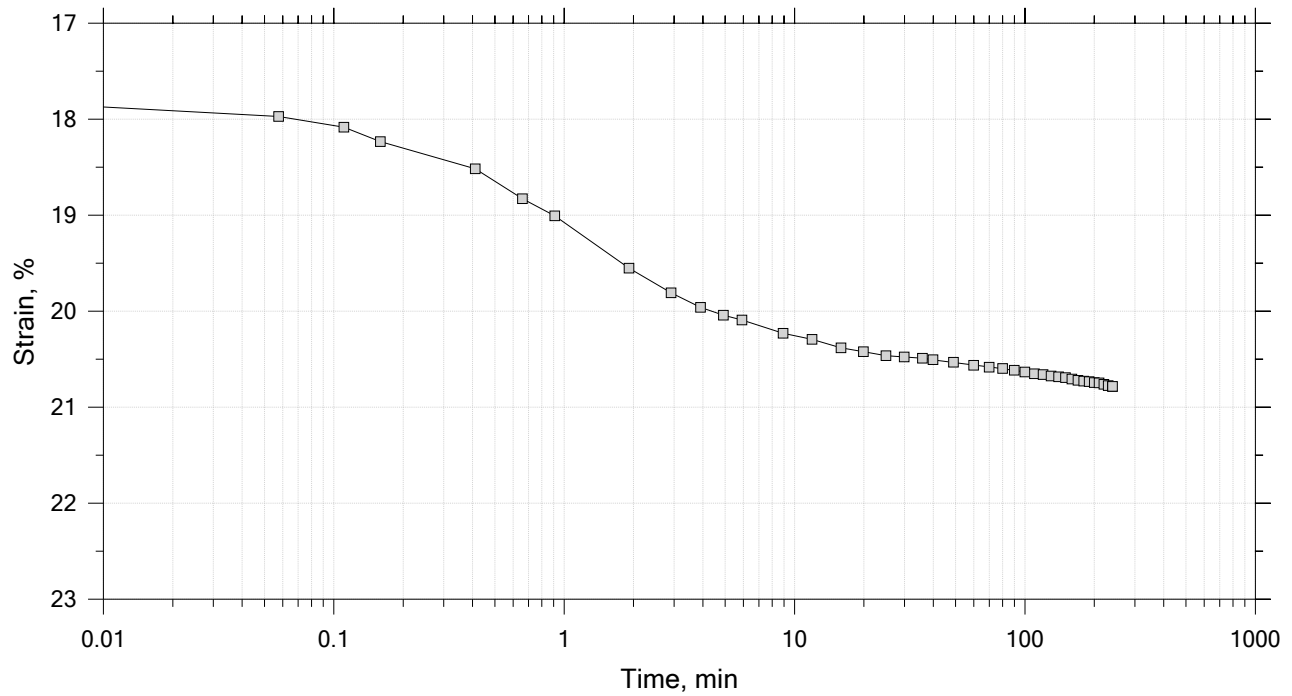
	Project: Rt 9/I-395 Connector	Location: Brewer and Eddington, ME	Project No.: GTX-308853
	Boring No.: BB-BFB1-101	Tested By: trm	Checked By: mcm
	Sample No.: 1U	Test Date: 7/31/19	Depth: 15-16.4 ft
	Test No.: IP-11B	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System S, Swell Pressure = 0.0664 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 9 of 15

Constant Load Step

Stress: 16 tsf



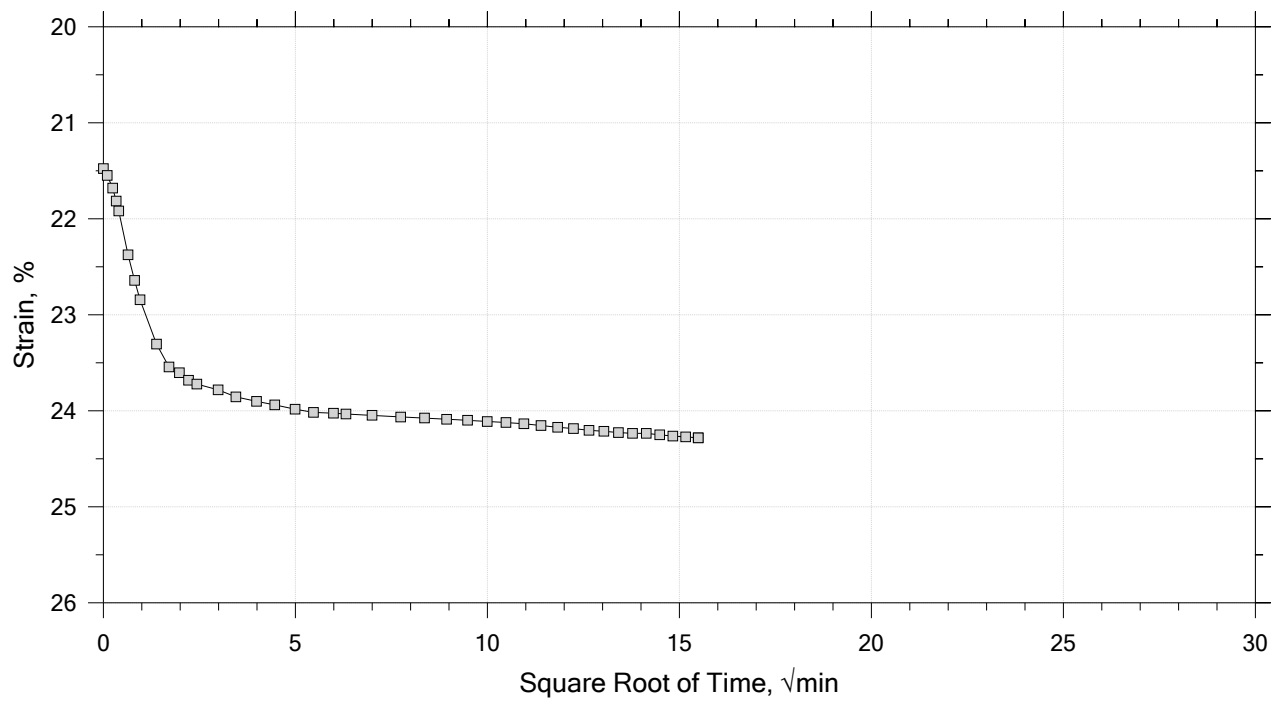
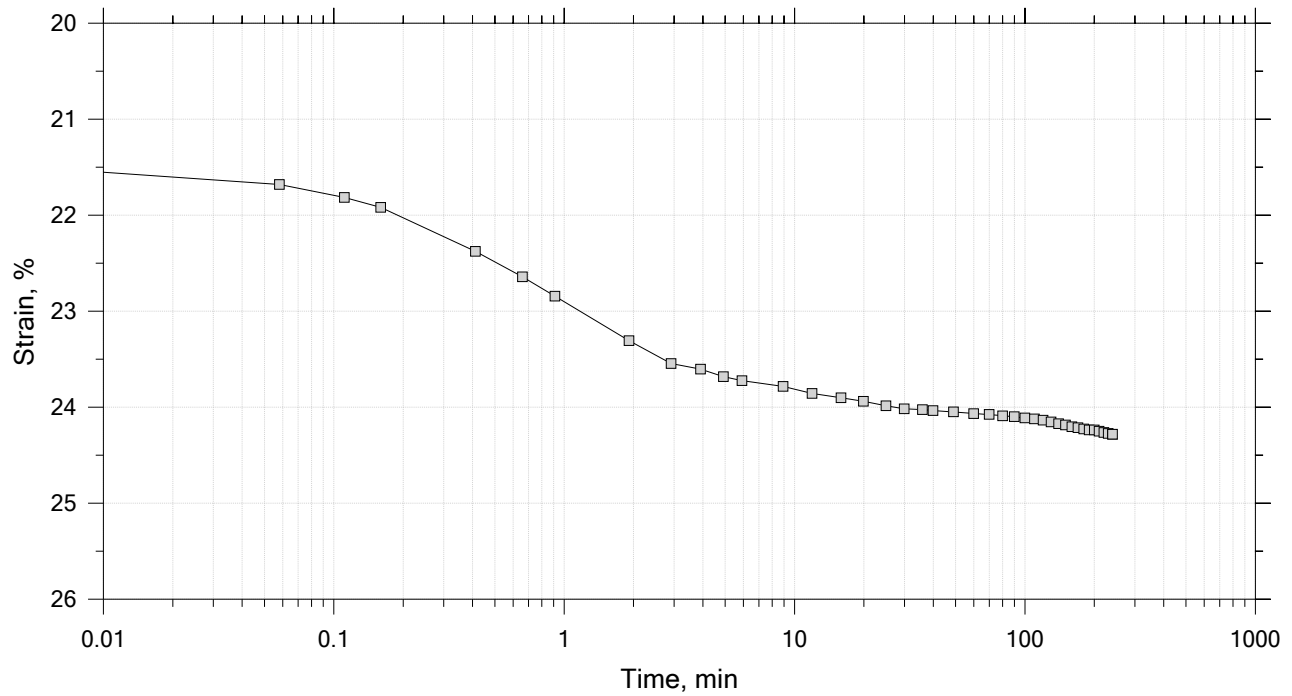
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	Boring No.: BB-BFB1-101	Tested By: trm	Checked By: mcm
	Sample No.: 1U	Test Date: 7/31/19	Depth: 15-16.4 ft
	Test No.: IP-11B	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System S, Swell Pressure = 0.0664 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 10 of 15

Constant Load Step

Stress: 32 tsf



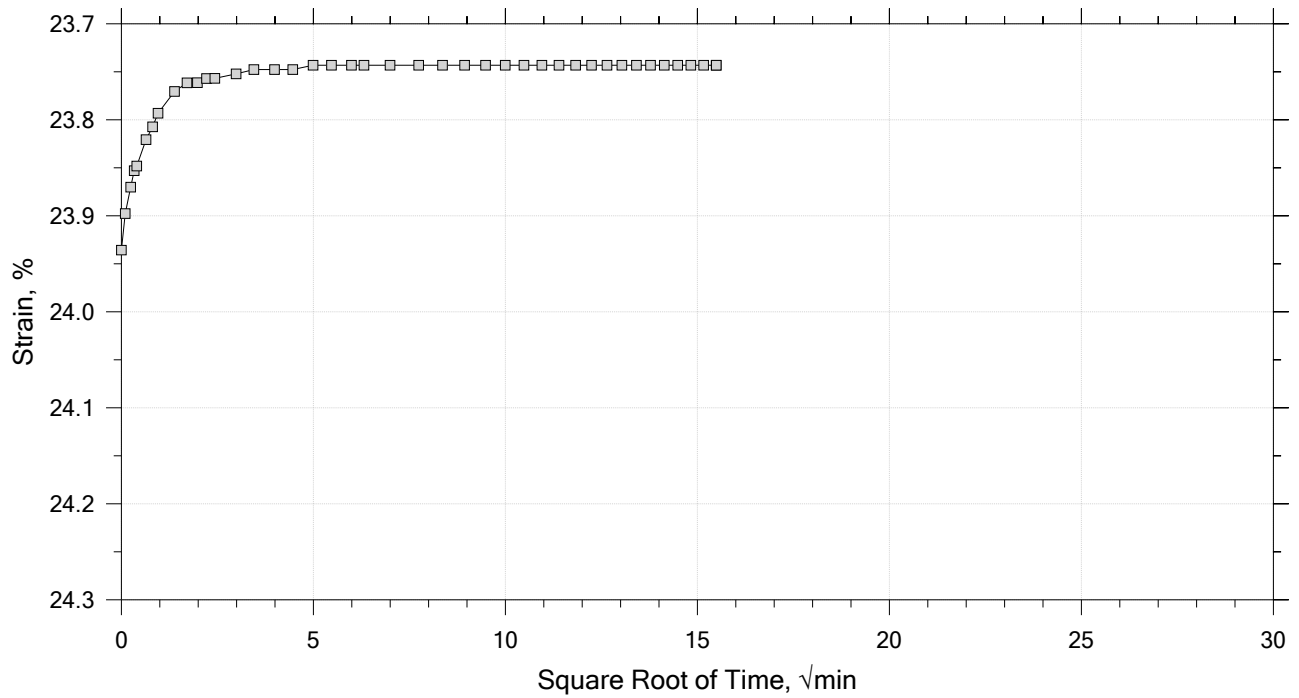
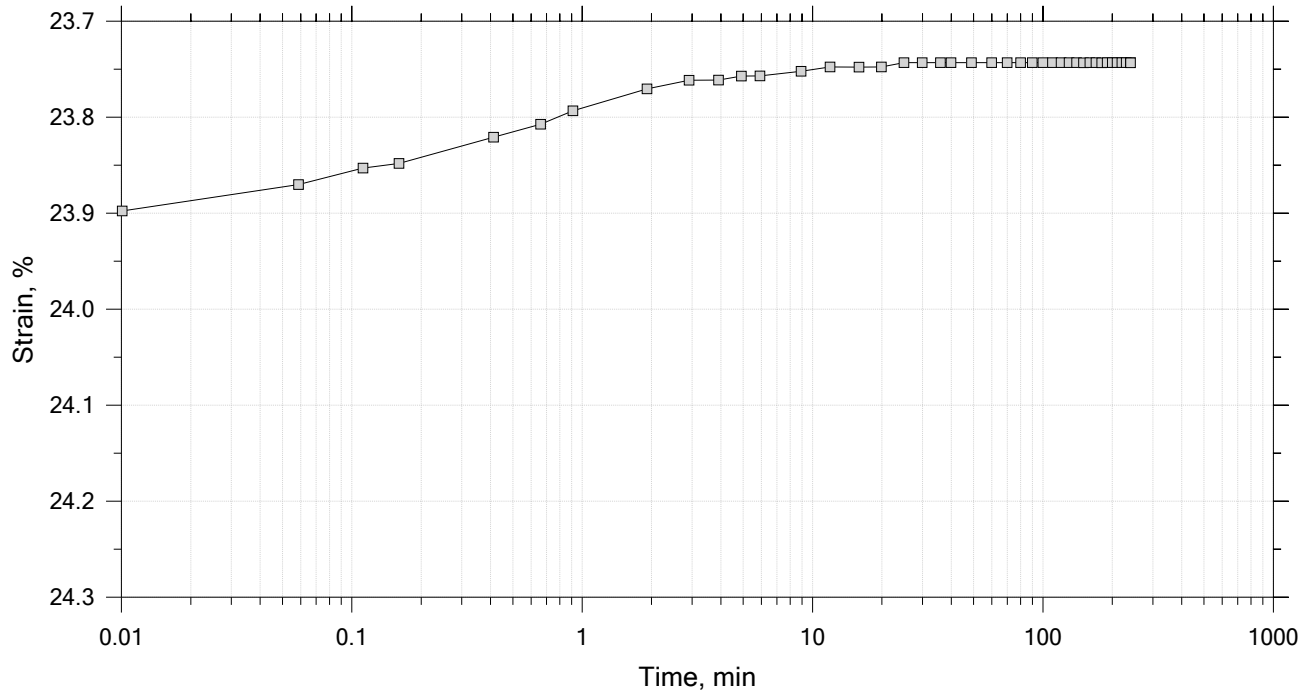
	Project: Rt 9/I-395 Connector	Location: Brewer and Eddington, ME	Project No.: GTX-308853
	Boring No.: BB-BFB1-101	Tested By: trm	Checked By: mcm
	Sample No.: 1U	Test Date: 7/31/19	Depth: 15-16.4 ft
	Test No.: IP-11B	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System S, Swell Pressure = 0.0664 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 11 of 15

Constant Load Step

Stress: 8 tsf



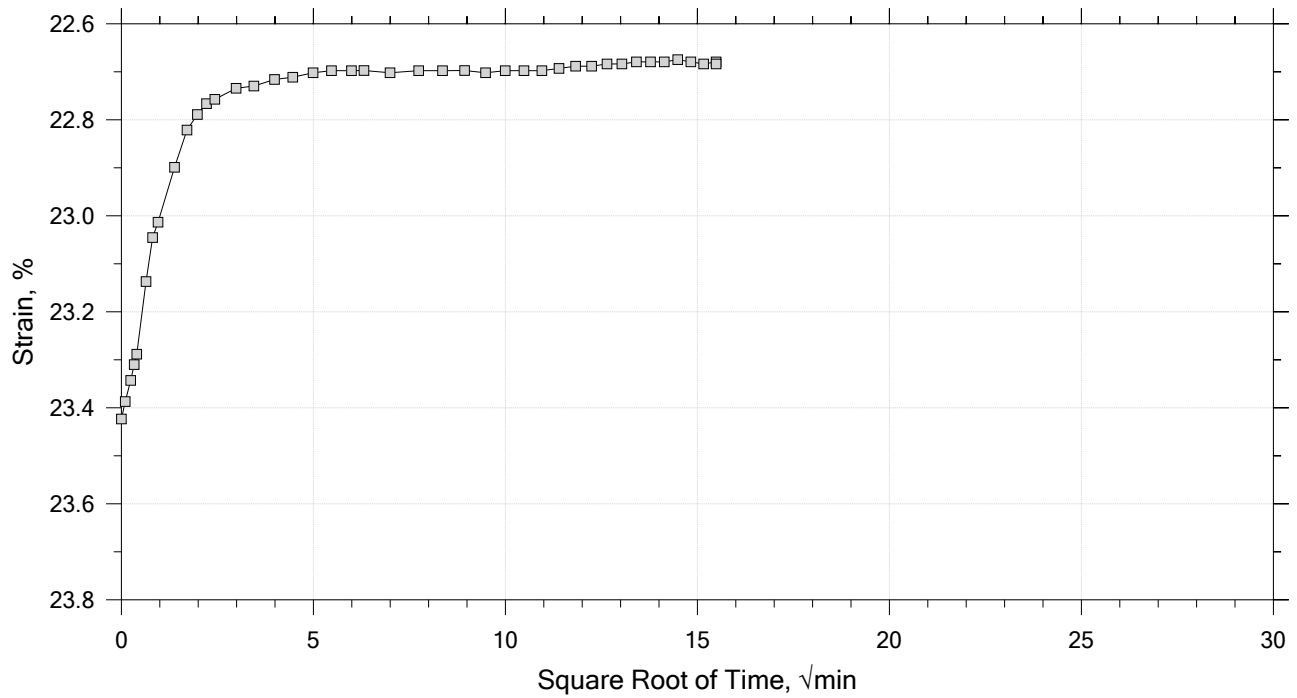
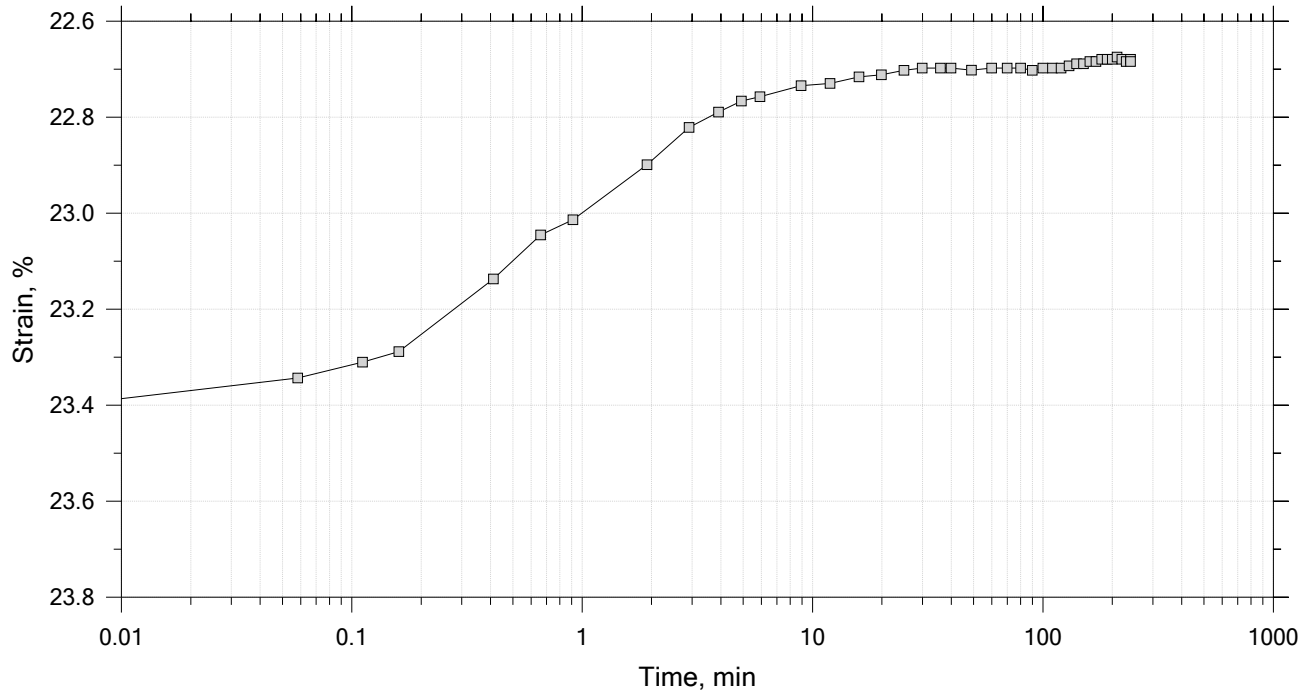
	Project: Rt 9/I-395 Connector	Location: Brewer and Eddington, ME	Project No.: GTX-308853
	Boring No.: BB-BFB1-101	Tested By: trm	Checked By: mcm
	Sample No.: 1U	Test Date: 7/31/19	Depth: 15-16.4 ft
	Test No.: IP-11B	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System S, Swell Pressure = 0.0664 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 12 of 15

Constant Load Step

Stress: 2 tsf



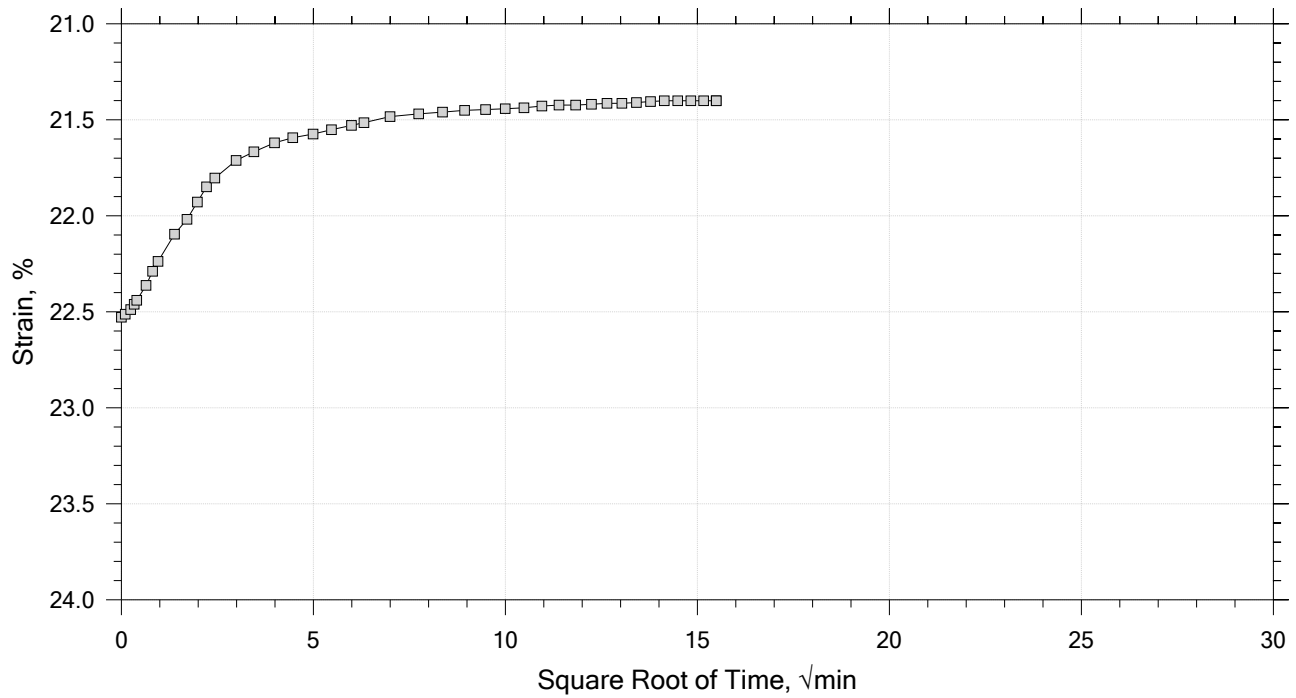
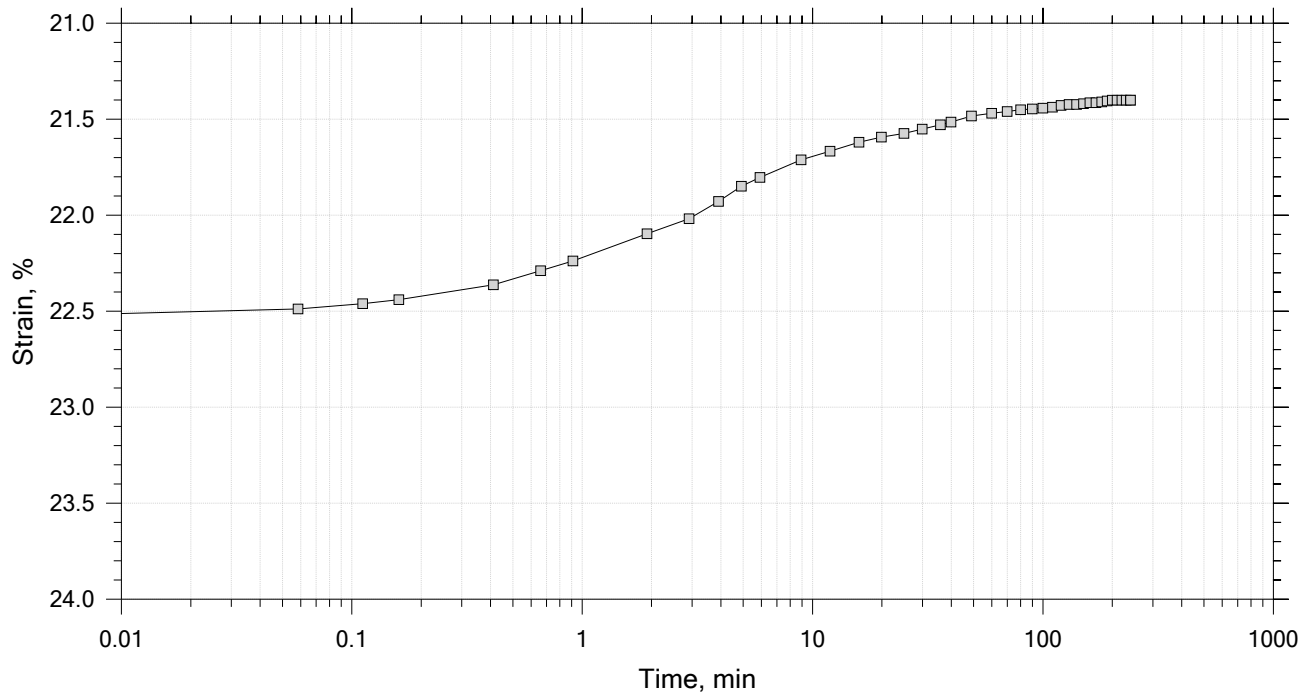
	Project: Rt 9/I-395 Connector	Location: Brewer and Eddington, ME	Project No.: GTX-308853
	Boring No.: BB-BFB1-101	Tested By: trm	Checked By: mcm
	Sample No.: 1U	Test Date: 7/31/19	Depth: 15-16.4 ft
	Test No.: IP-11B	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System S, Swell Pressure = 0.0664 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 13 of 15

Constant Load Step

Stress: 0.5 tsf



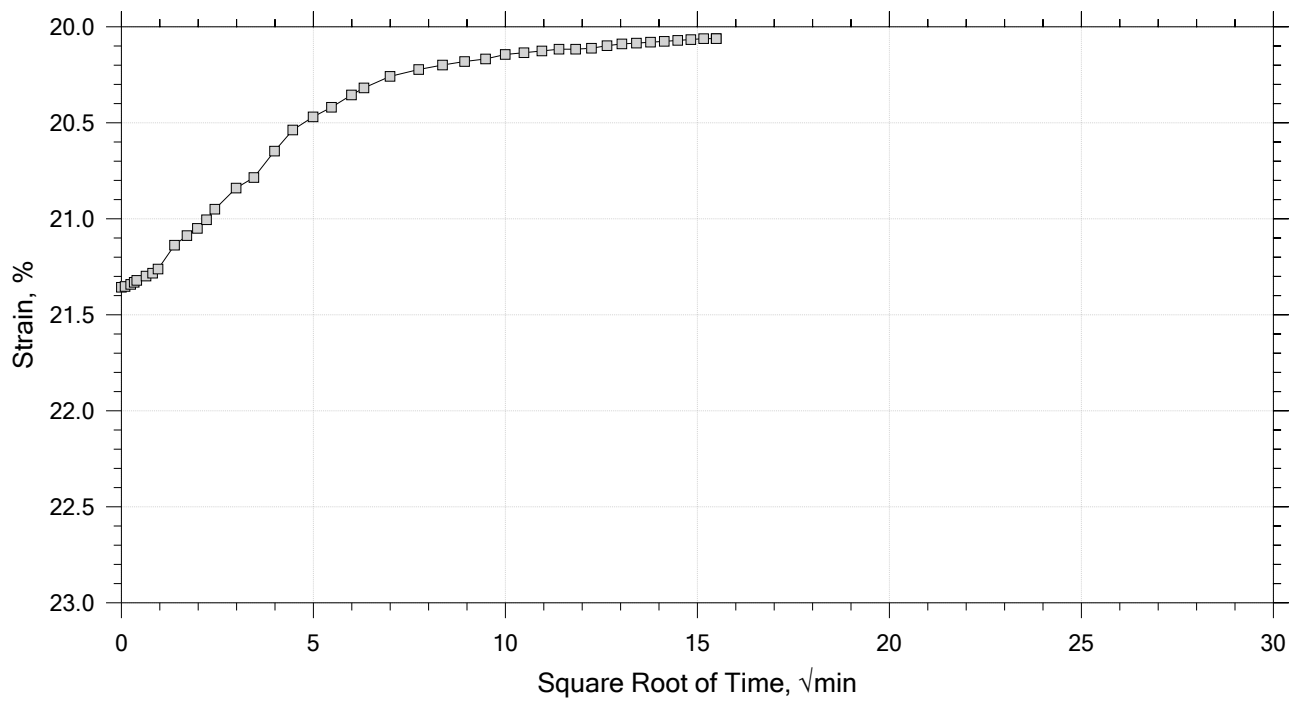
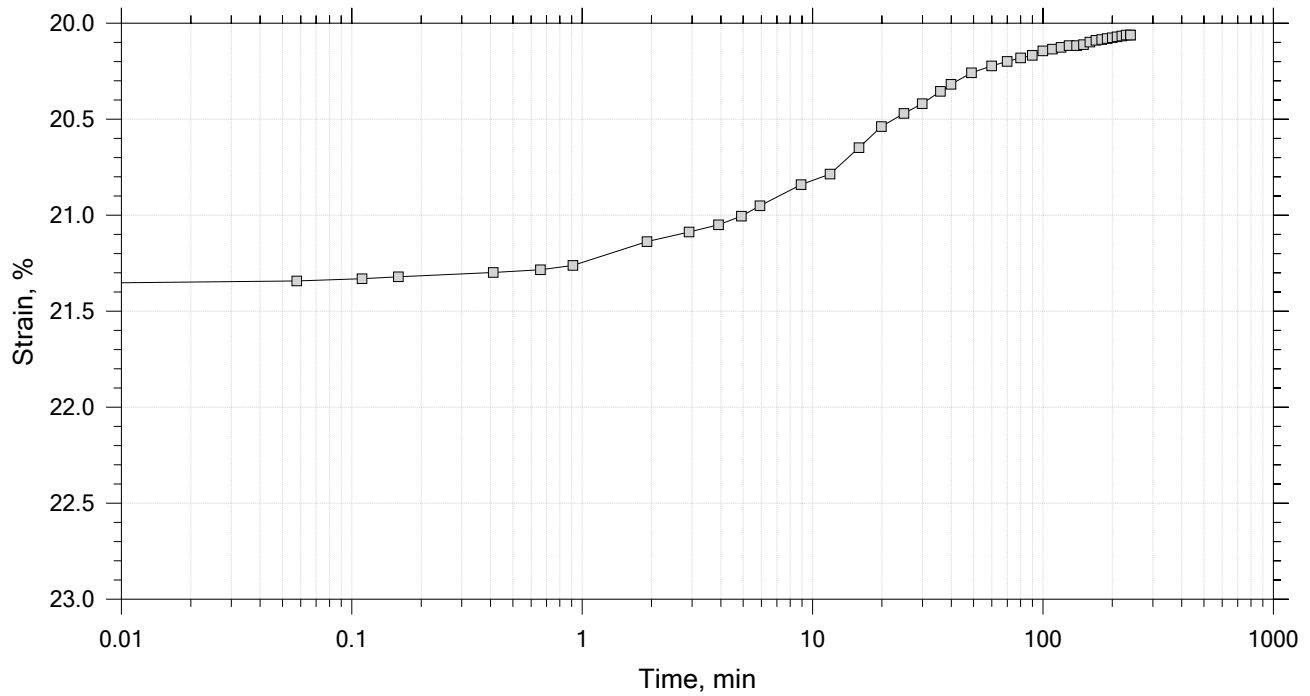
	Project: Rt 9/I-395 Connector	Location: Brewer and Eddington, ME	Project No.: GTX-308853
	Boring No.: BB-BFB1-101	Tested By: trm	Checked By: mcm
	Sample No.: 1U	Test Date: 7/31/19	Depth: 15-16.4 ft
	Test No.: IP-11B	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System S, Swell Pressure = 0.0664 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 14 of 15

Constant Load Step

Stress: 0.125 tsf



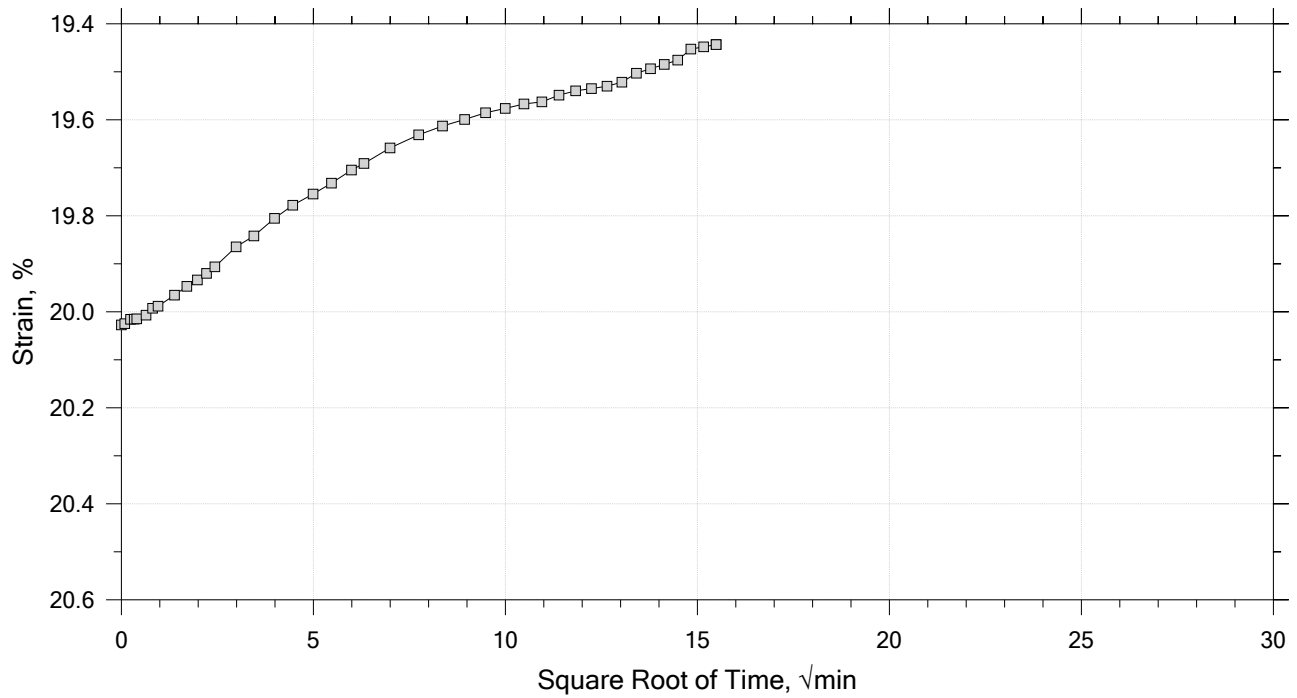
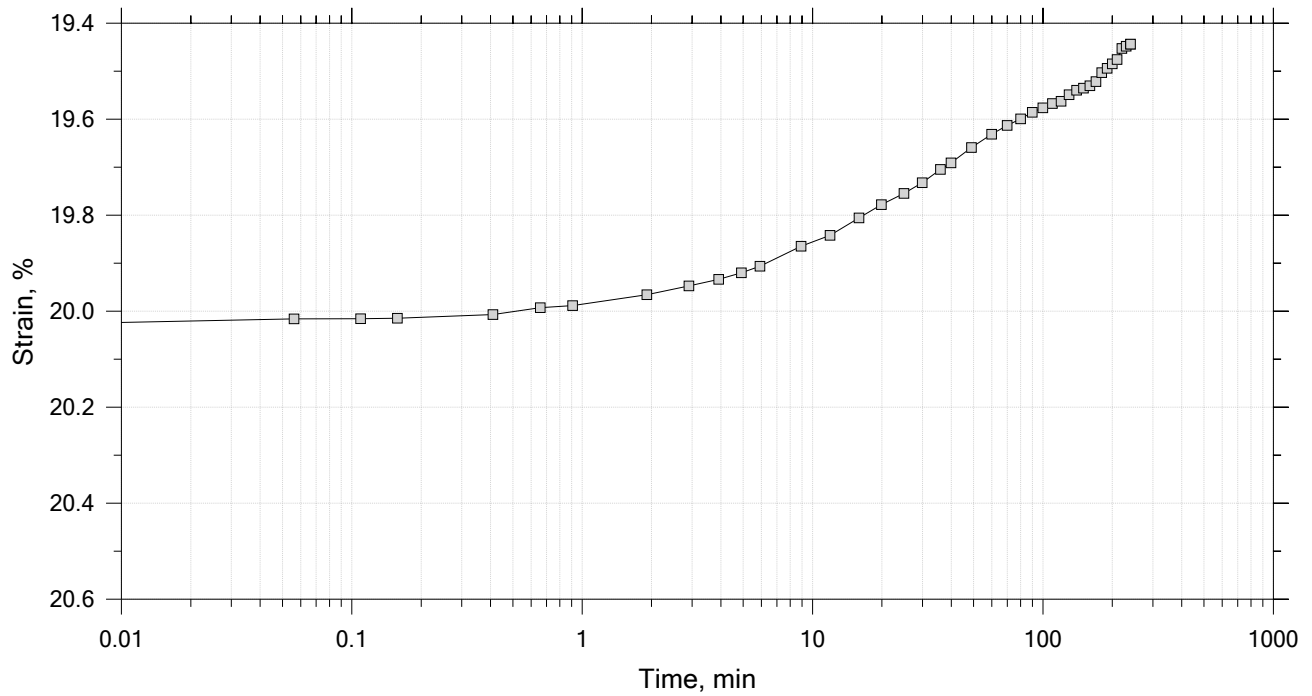
	Project: Rt 9/I-395 Connector	Location: Brewer and Eddington, ME	Project No.: GTX-308853
	Boring No.: BB-BFB1-101	Tested By: trm	Checked By: mcm
	Sample No.: 1U	Test Date: 7/31/19	Depth: 15-16.4 ft
	Test No.: IP-11B	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System S, Swell Pressure = 0.0664 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 15 of 15

Constant Load Step

Stress: 0.0625 tsf




	Project: Rt 9/I-395 Connector	Location: Brewer and Eddington, ME	Project No.: GTX-308853
	Boring No.: BB-BFB1-101	Tested By: trm	Checked By: mcm
	Sample No.: 1U	Test Date: 7/31/19	Depth: 15-16.4 ft
	Test No.: IP-11B	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System S, Swell Pressure = 0.0664 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Specimen Diameter: 2.50 in	Estimated Specific Gravity: 2.78	Liquid Limit: 38
Initial Height: 1.00 in	Initial Void Ratio: 1.1	Plastic Limit: 20
Final Height: 0.81 in	Final Void Ratio: 0.69	Plasticity Index: 18

	Before Test Trimmings	Before Test Specimen	After Test Specimen	After Test Trimmings
Container ID	A2291	RING		B-1837
Mass Container, gm	8.44	108.75	108.75	8.41
Mass Container + Wet Soil, gm	206.5	255.95	241.97	140.28
Mass Container + Dry Soil, gm	153.02	215.51	215.51	114.09
Mass Dry Soil, gm	144.58	106.76	106.76	105.68
Water Content, %	36.99	37.88	24.78	24.78
Void Ratio	---	1.10	0.69	---
Degree of Saturation, %	---	96.06	100.00	---
Dry Unit Weight, pcf	---	82.856	102.85	---


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: Rt 9/I-395 Connector	Location: Brewer and Eddington, ME	Project No.: GTX-308853
	Boring No.: BB-BFB1-101	Tested By: trm	Checked By: mcm
	Sample No.: 1U	Test Date: 7/31/19	Depth: 15-16.4 ft
	Test No.: IP-11B	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System S, Swell Pressure = 0.0664 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Log of Time Coefficients


[illegible]

	Project: Rt 9/I-395 Connector	Location: Brewer and Eddington, ME	Project No.: GTX-308853
	Boring No.: BB-BFB1-101	Tested By: trm	Checked By: mcm
	Sample No.: 1U	Test Date: 7/31/19	Depth: 15-16.4 ft
	Test No.: IP-11B	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System S, Swell Pressure = 0.0664 tsf		
	Displacement at End of Increment		

One-Dimensional Consolidation by ASTM D2435 - Method B

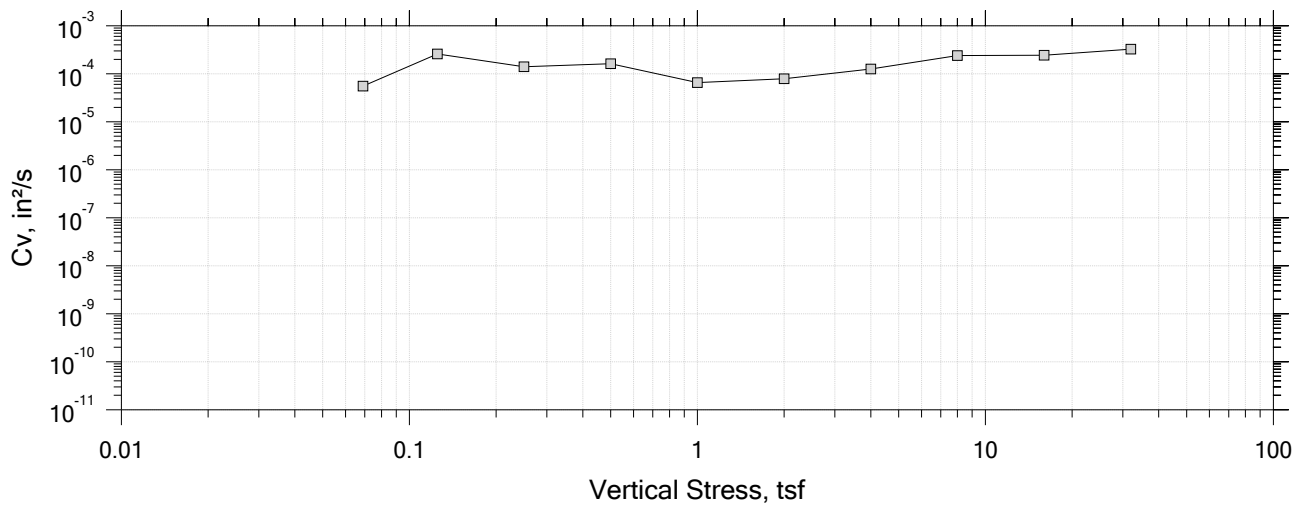
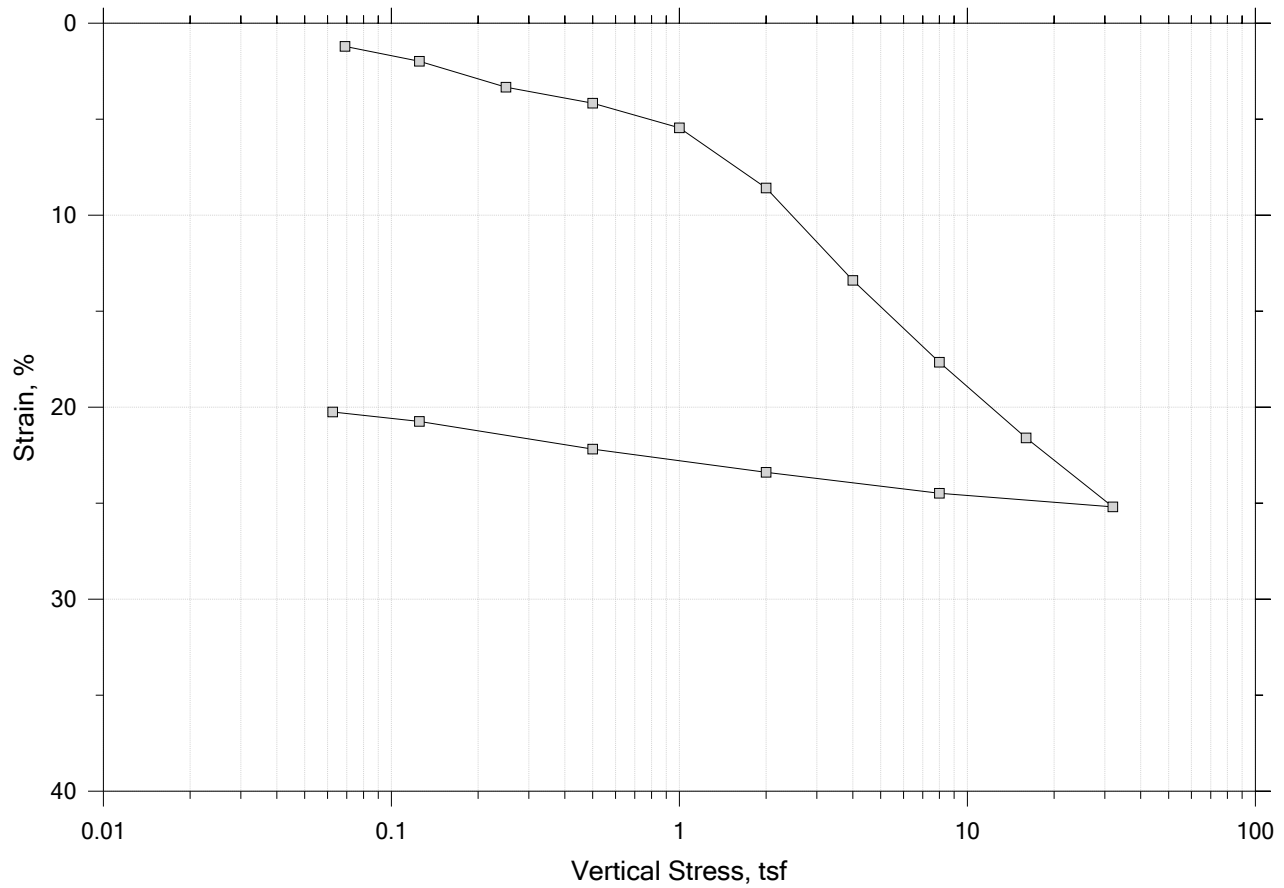
Square Root of Time Coefficients


[illegible]

	Project: Rt 9/I-395 Connector	Location: Brewer and Eddington, ME	Project No.: GTX-308853
	Boring No.: BB-BFB1-101	Tested By: trm	Checked By: mcm
	Sample No.: 1U	Test Date: 7/31/19	Depth: 15-16.4 ft
	Test No.: IP-11B	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System S, Swell Pressure = 0.0664 tsf		
	Displacement at End of Increment		

One-Dimensional Consolidation by ASTM D2435 - Method B

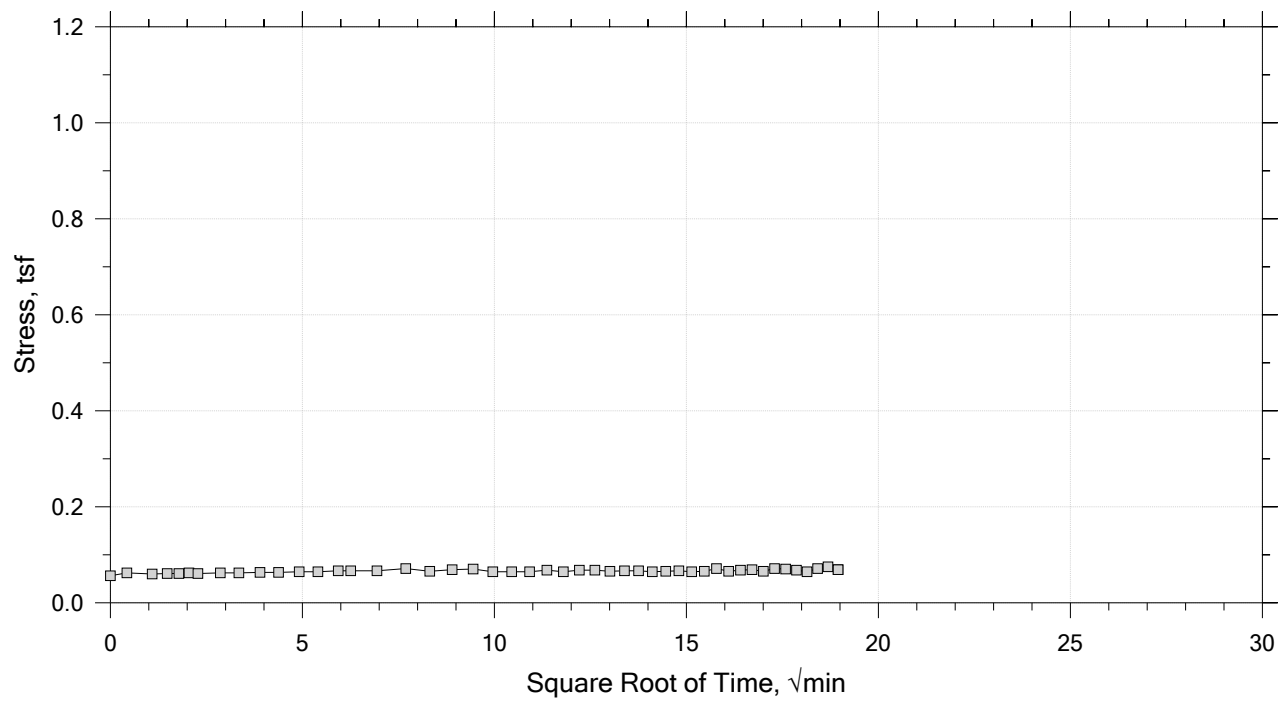
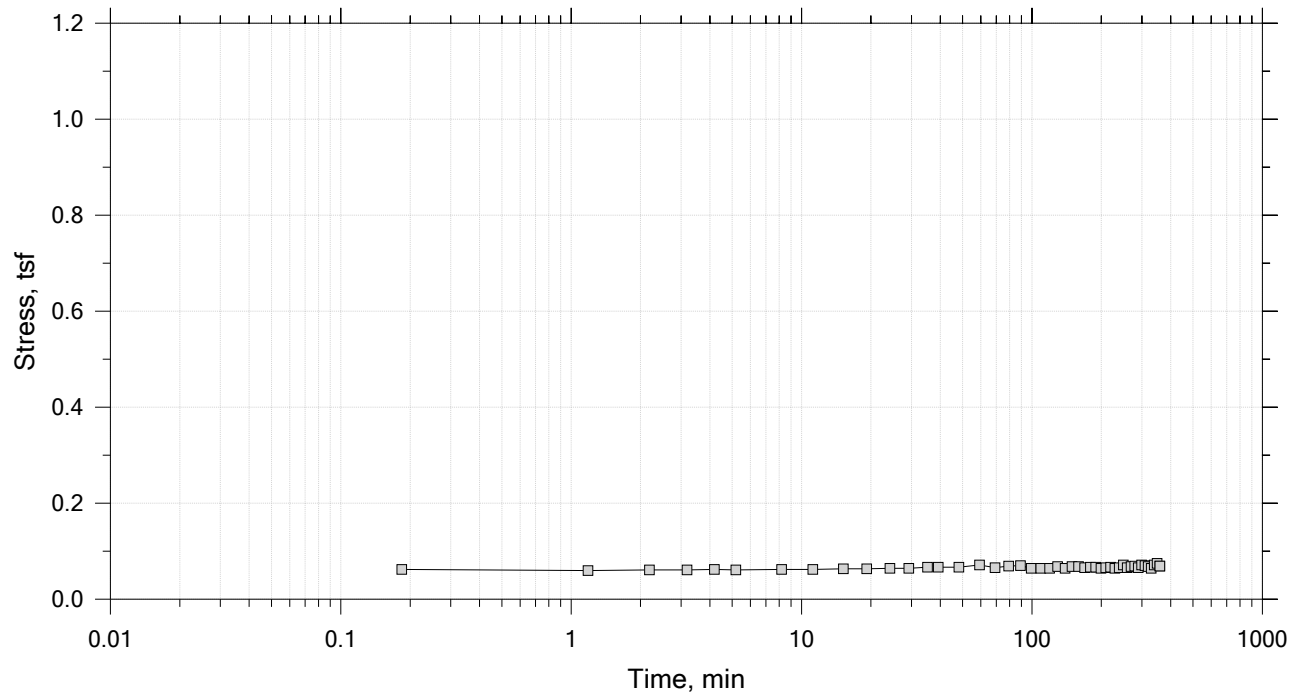
Summary Report




	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: BB-BFB1-202	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 02/23/21	Depth: 10-12 ft
	Test No.: IP-2	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-F, Swell Pressure = 0.069 tsf		
	Displacement at End of Increment		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 1 of 15
Constant Volume Step
Stress: 0.069 tsf



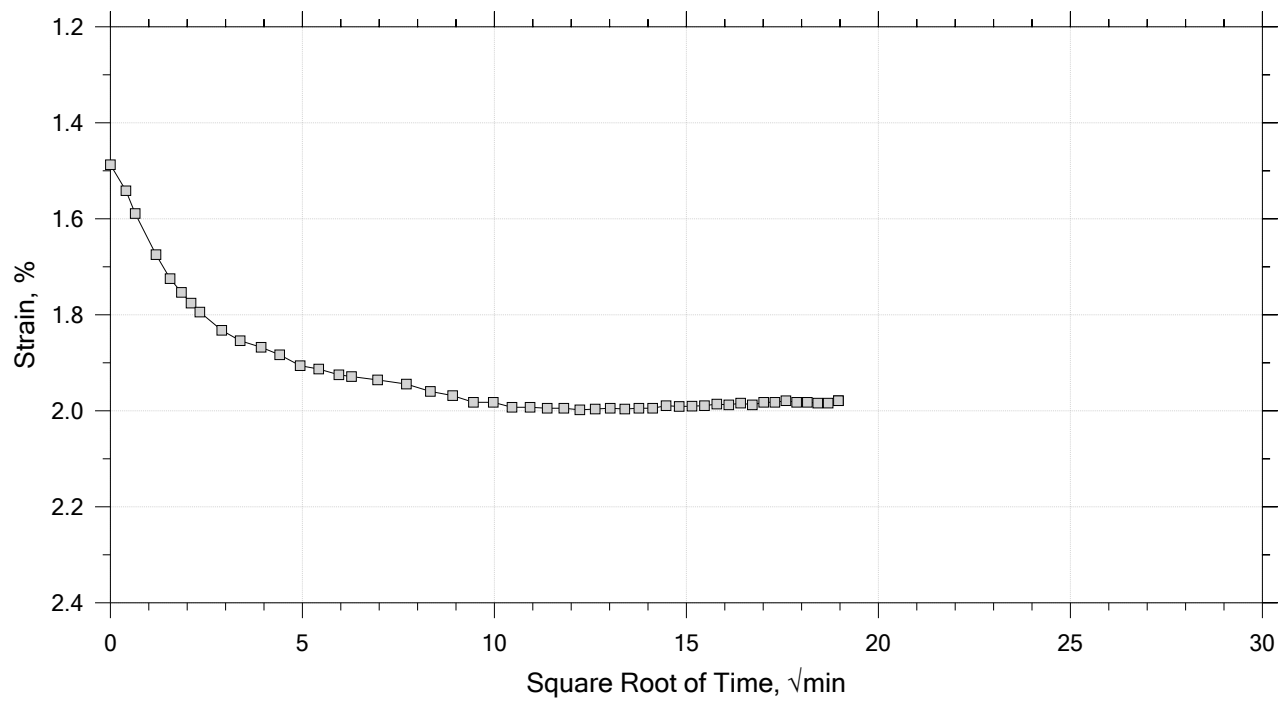
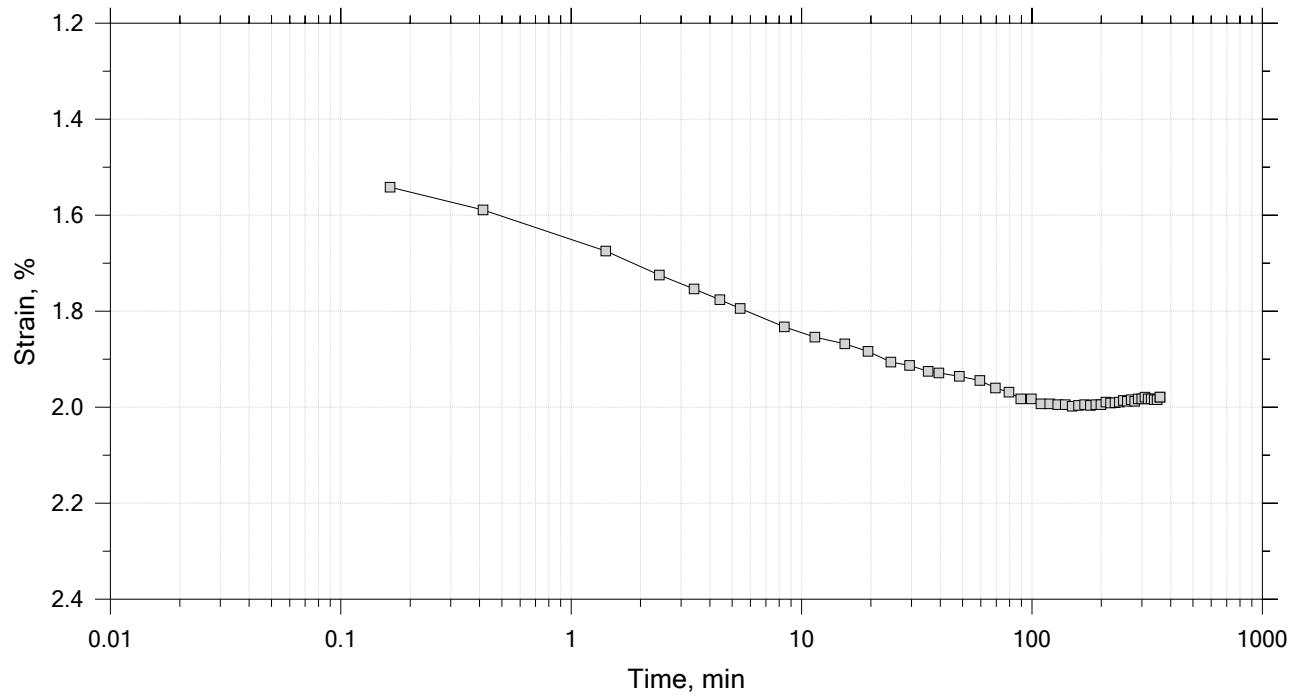
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	Boring No.: BB-BFB1-202	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 02/23/21	Depth: 10-12 ft
	Test No.: IP-2	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-F, Swell Pressure = 0.069 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 2 of 15

Constant Load Step

Stress: 0.125 tsf



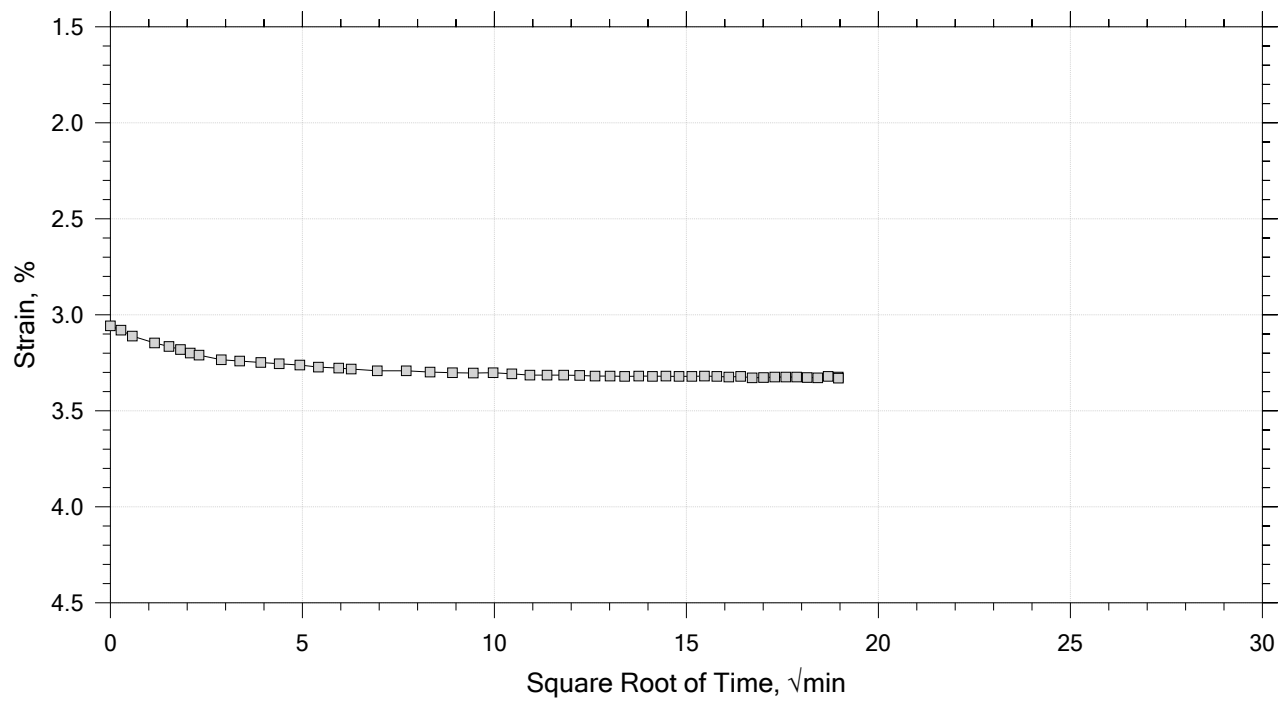
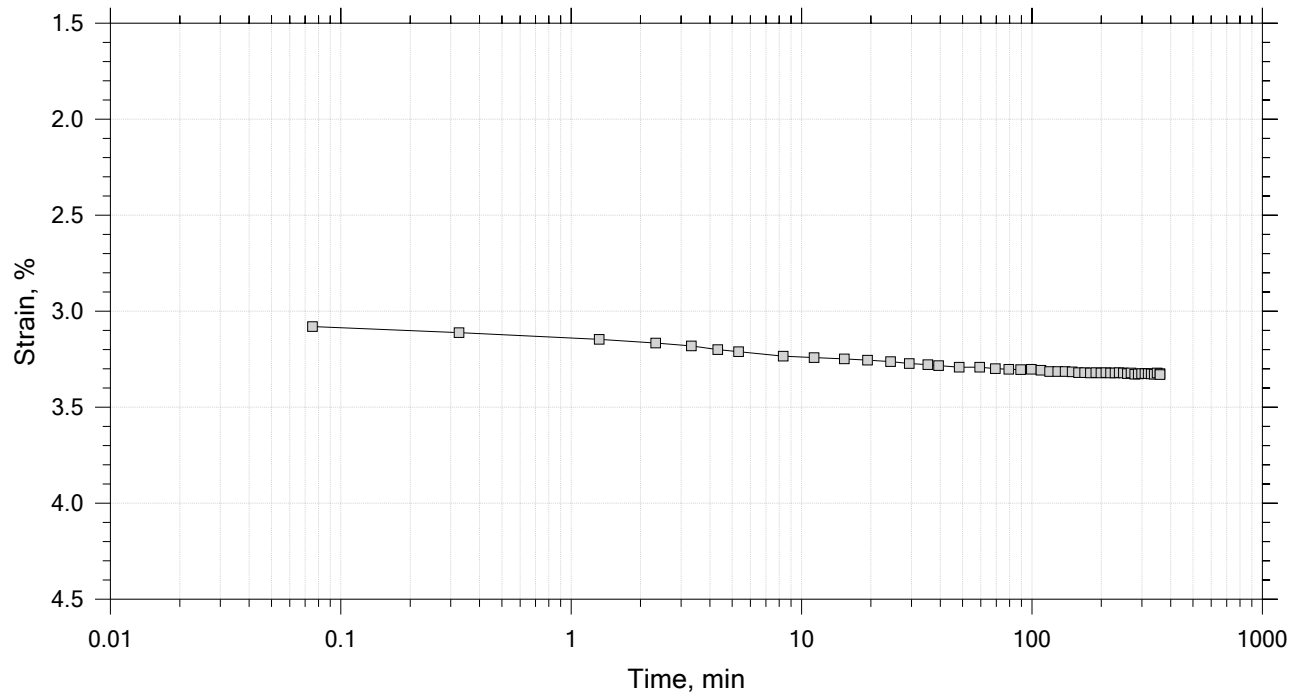
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	Boring No.: BB-BFB1-202	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 02/23/21	Depth: 10-12 ft
	Test No.: IP-2	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-F, Swell Pressure = 0.069 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 3 of 15

Constant Load Step

Stress: 0.25 tsf



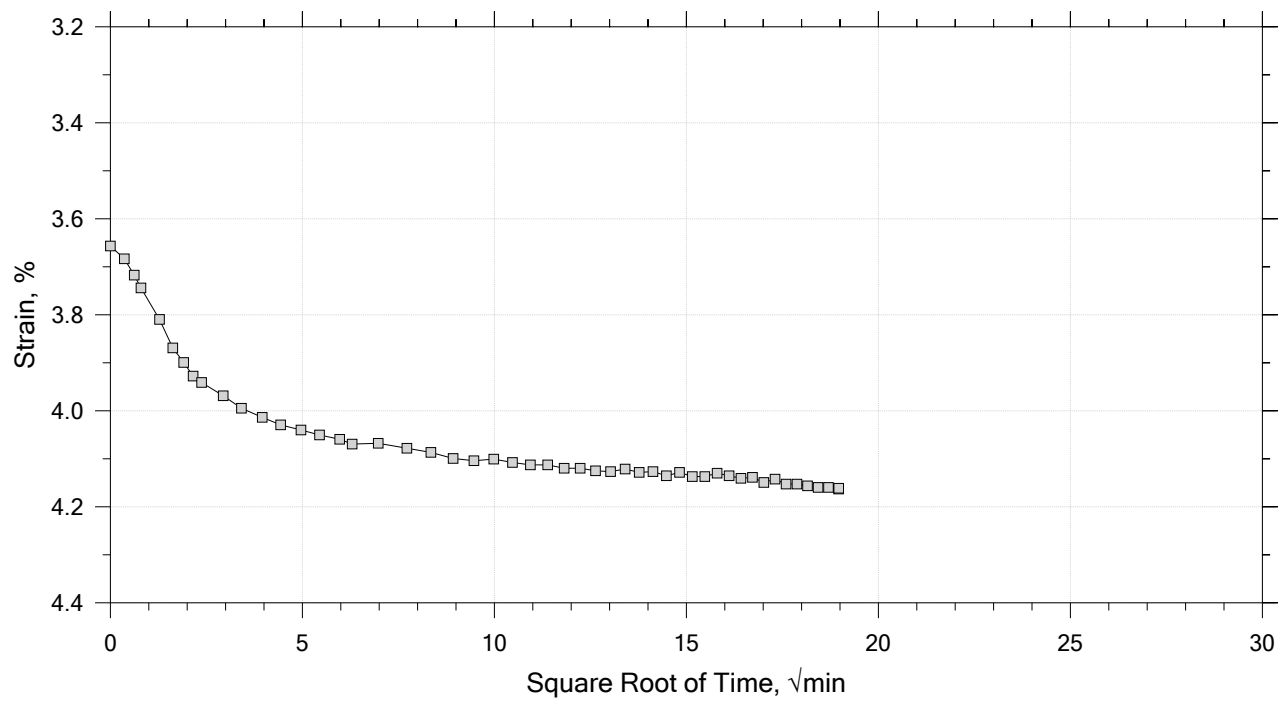
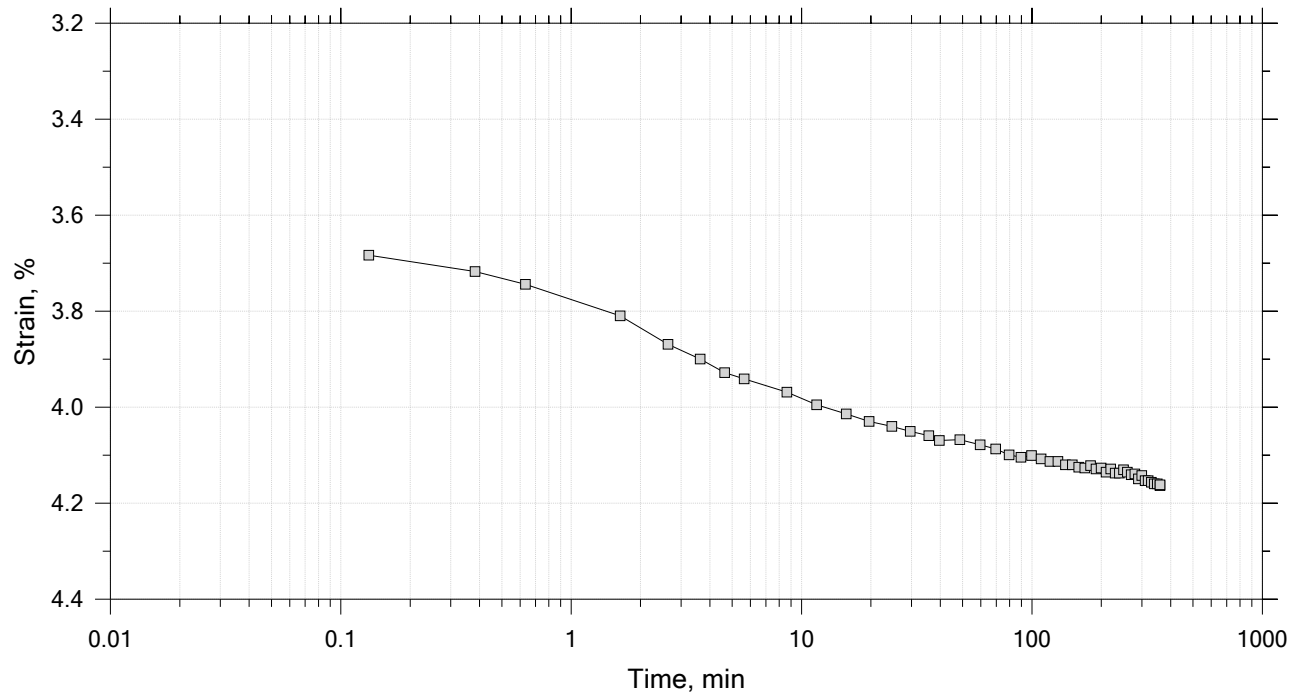
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	Boring No.: BB-BFB1-202	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 02/23/21	Depth: 10-12 ft
	Test No.: IP-2	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-F, Swell Pressure = 0.069 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 4 of 15

Constant Load Step

Stress: 0.5 tsf



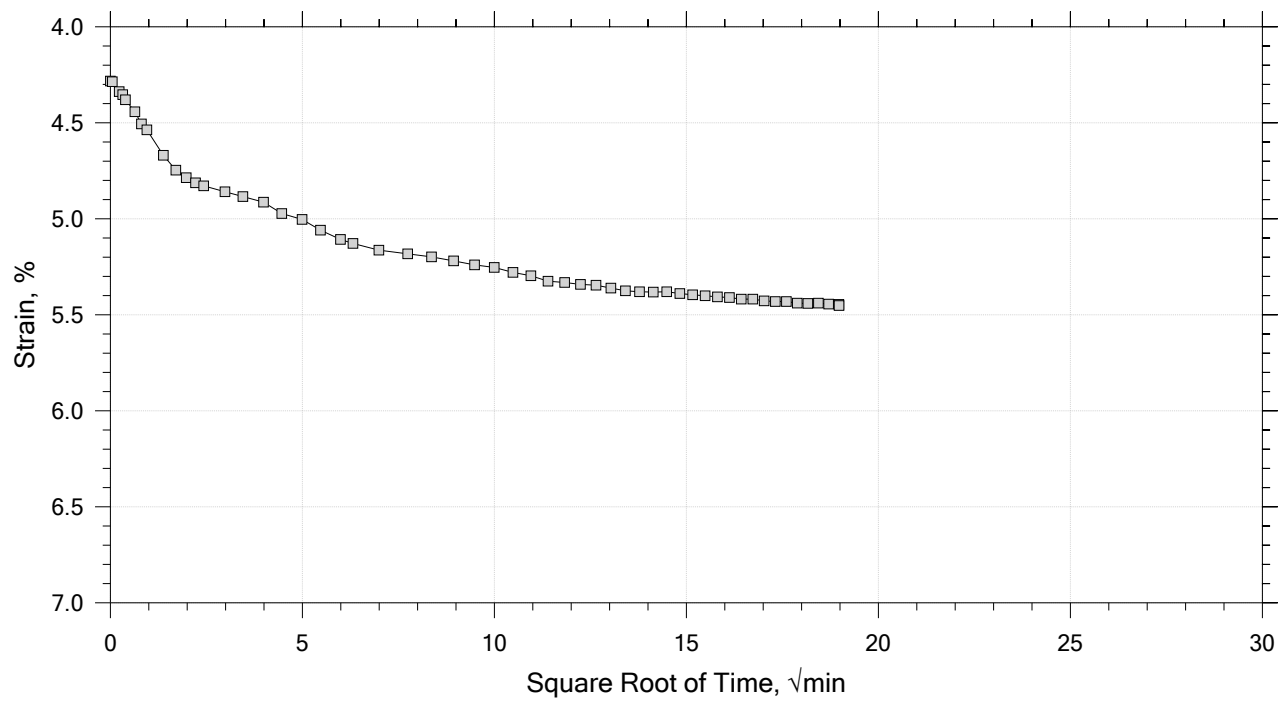
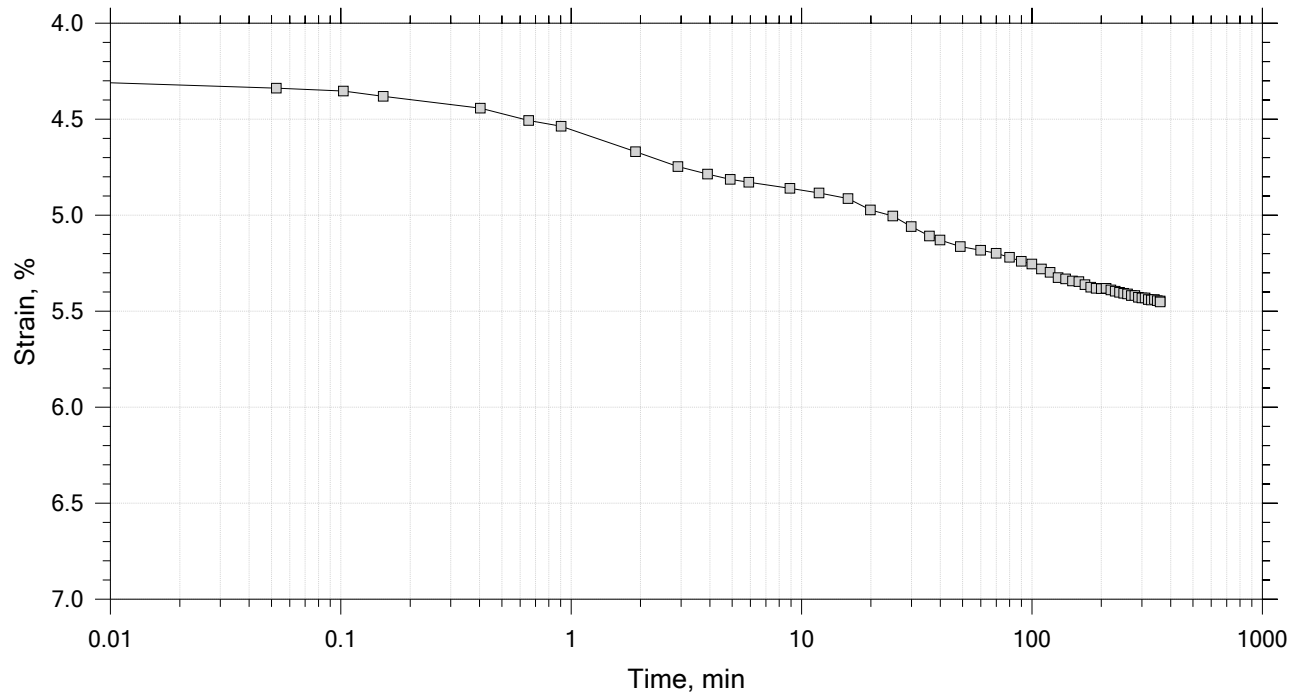
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	Boring No.: BB-BFB1-202	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 02/23/21	Depth: 10-12 ft
	Test No.: IP-2	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-F, Swell Pressure = 0.069 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 5 of 15

Constant Load Step

Stress: 1 tsf



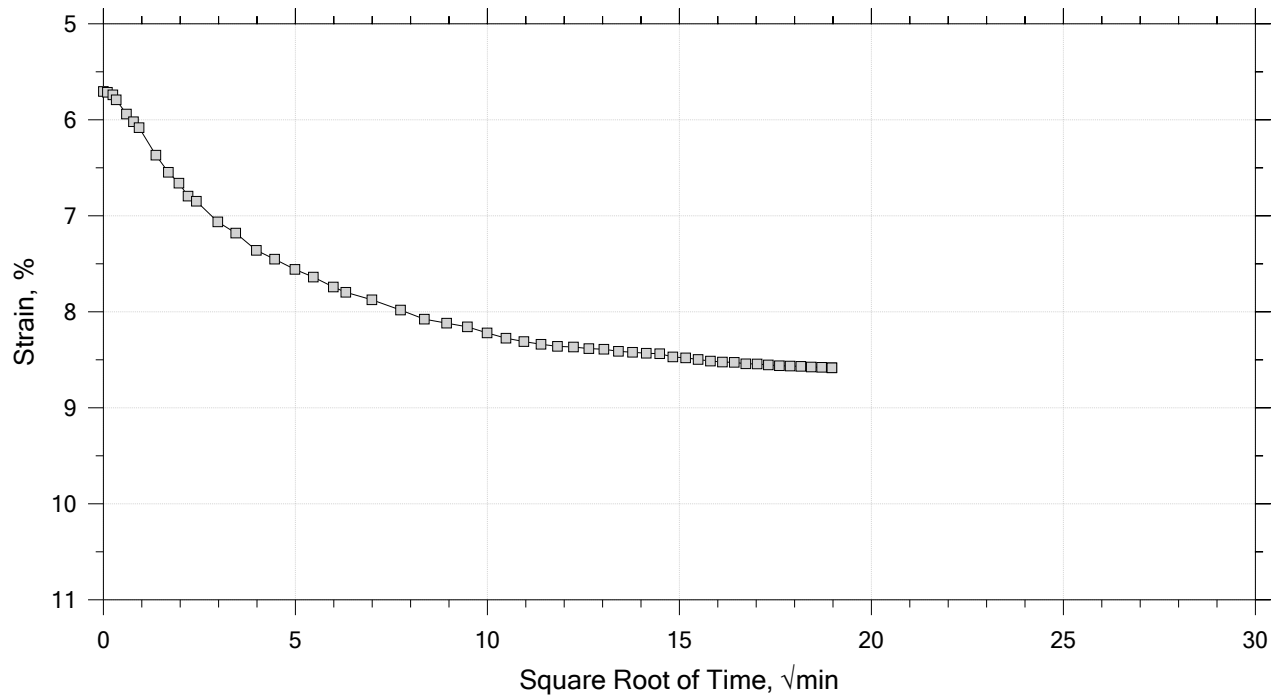
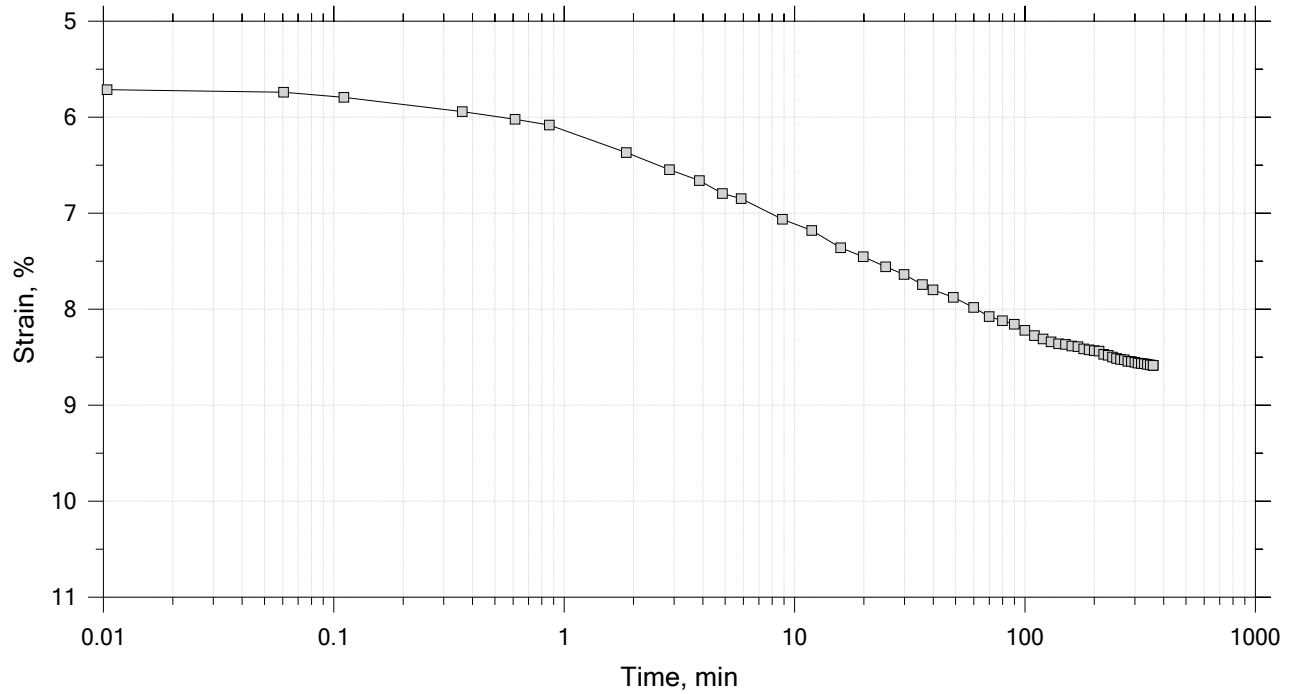
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	Boring No.: BB-BFB1-202	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 02/23/21	Depth: 10-12 ft
	Test No.: IP-2	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-F, Swell Pressure = 0.069 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 6 of 15

Constant Load Step

Stress: 2 tsf



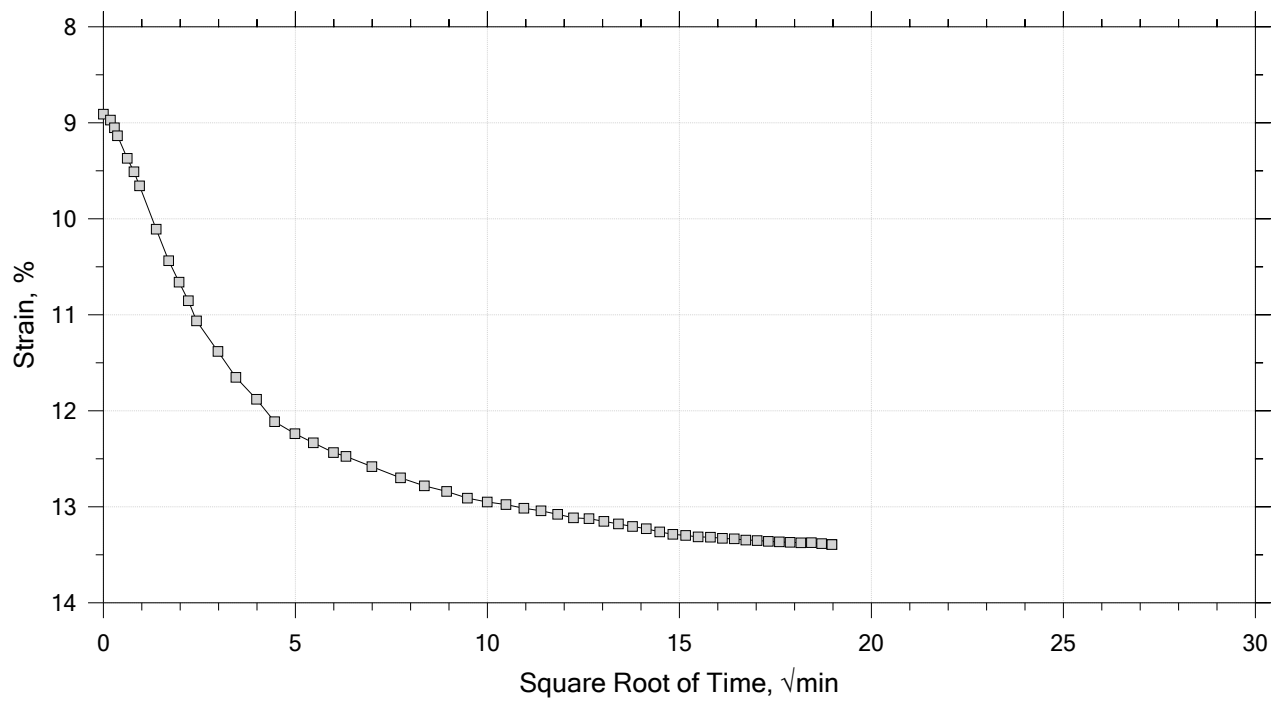
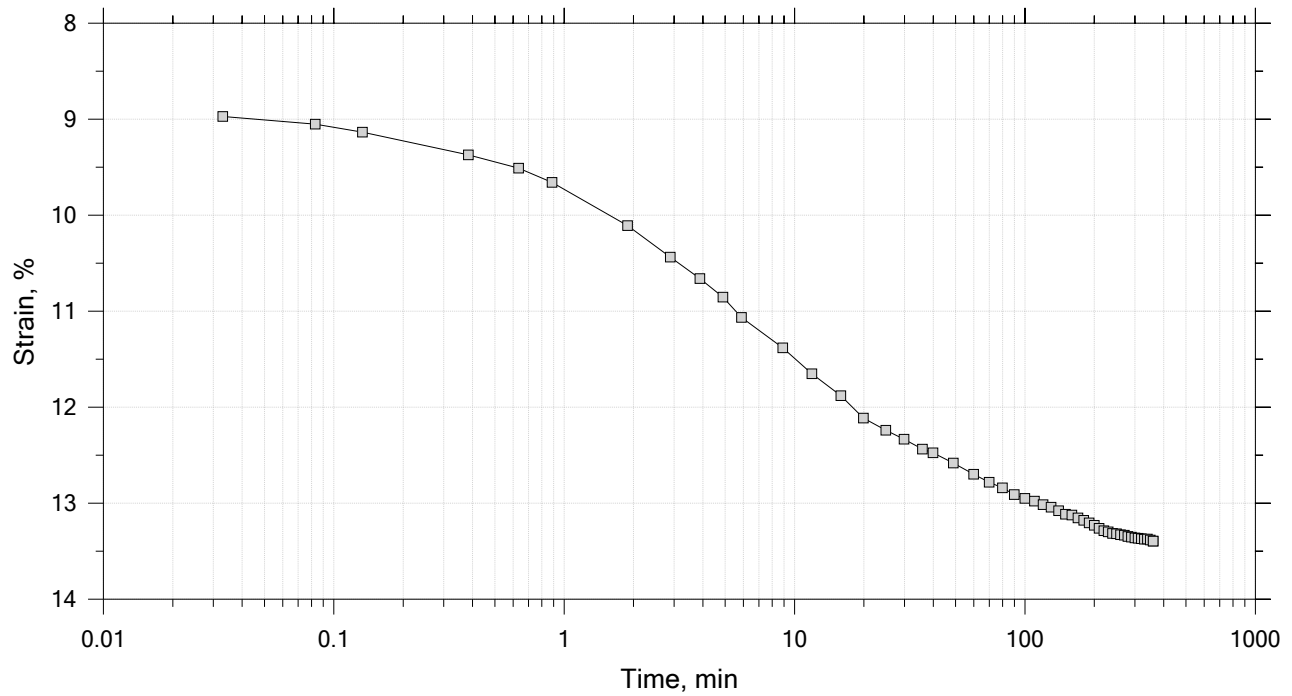
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	Boring No.: BB-BFB1-202	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 02/23/21	Depth: 10-12 ft
	Test No.: IP-2	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-F, Swell Pressure = 0.069 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 7 of 15

Constant Load Step

Stress: 4 tsf



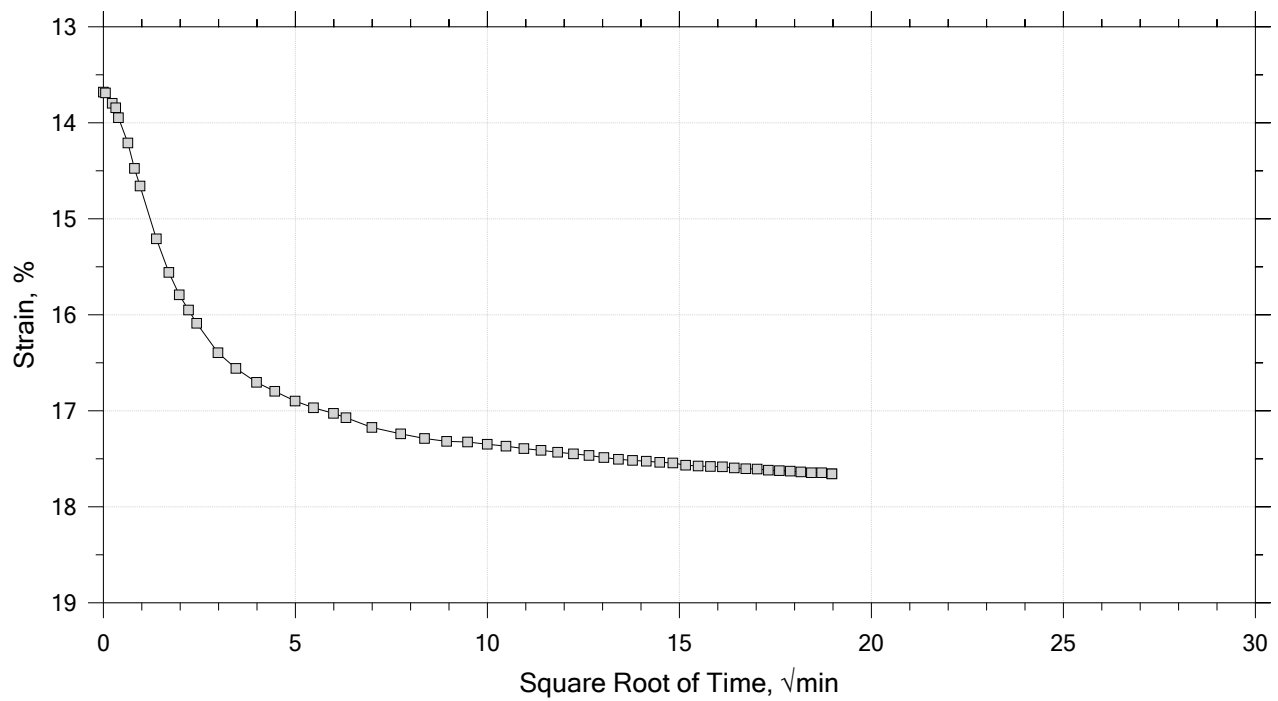
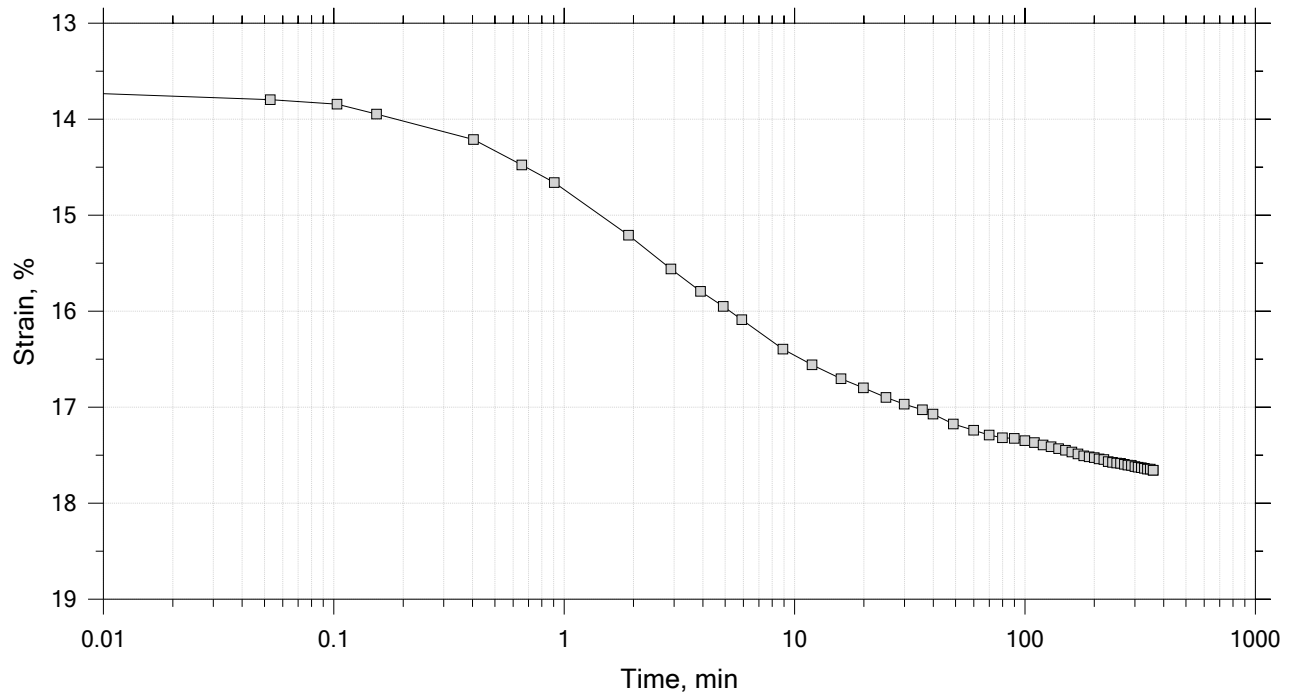
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	Boring No.: BB-BFB1-202	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 02/23/21	Depth: 10-12 ft
	Test No.: IP-2	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-F, Swell Pressure = 0.069 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 8 of 15

Constant Load Step

Stress: 8 tsf



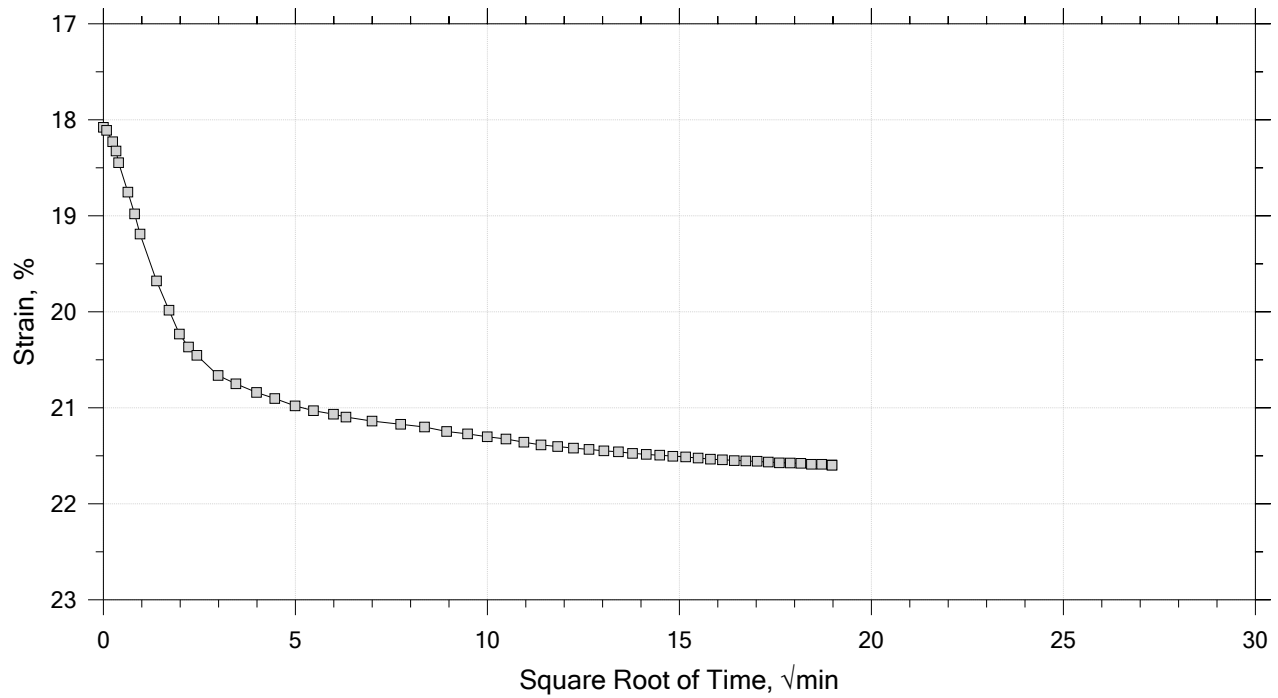
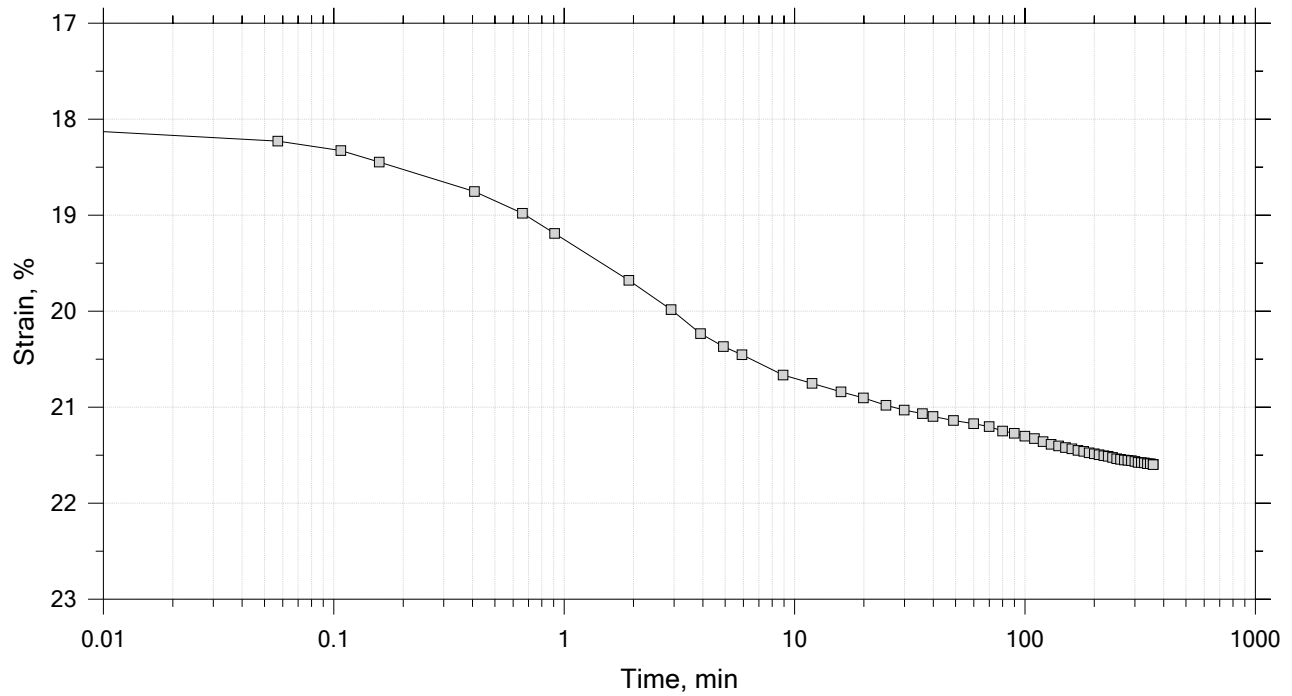
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	Boring No.: BB-BFB1-202	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 02/23/21	Depth: 10-12 ft
	Test No.: IP-2	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-F, Swell Pressure = 0.069 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 9 of 15

Constant Load Step

Stress: 16 tsf



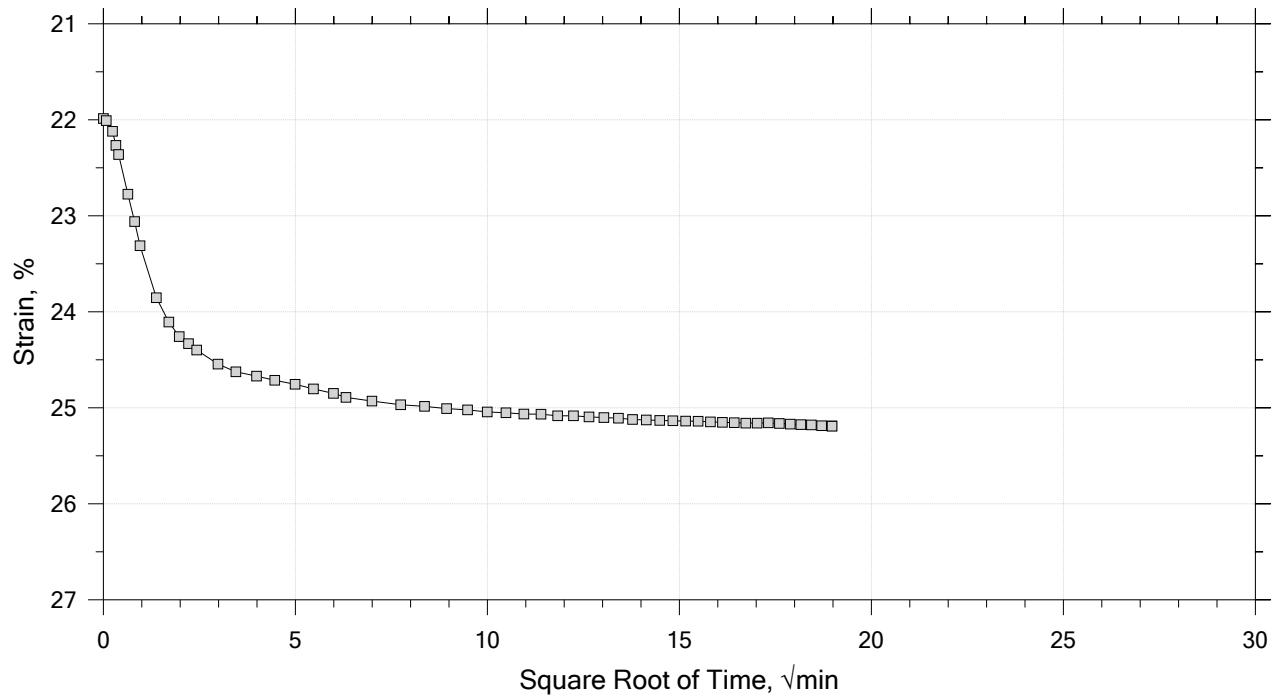
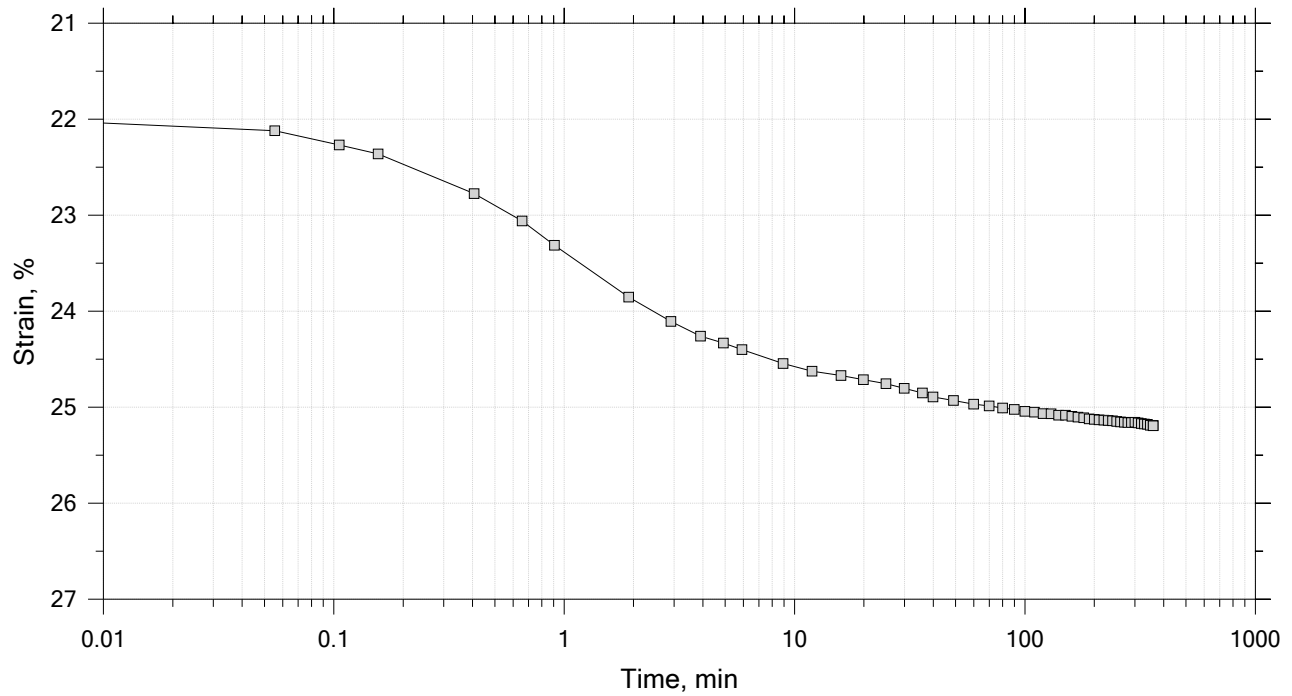
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	Boring No.: BB-BFB1-202	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 02/23/21	Depth: 10-12 ft
	Test No.: IP-2	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-F, Swell Pressure = 0.069 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 10 of 15

Constant Load Step

Stress: 32 tsf



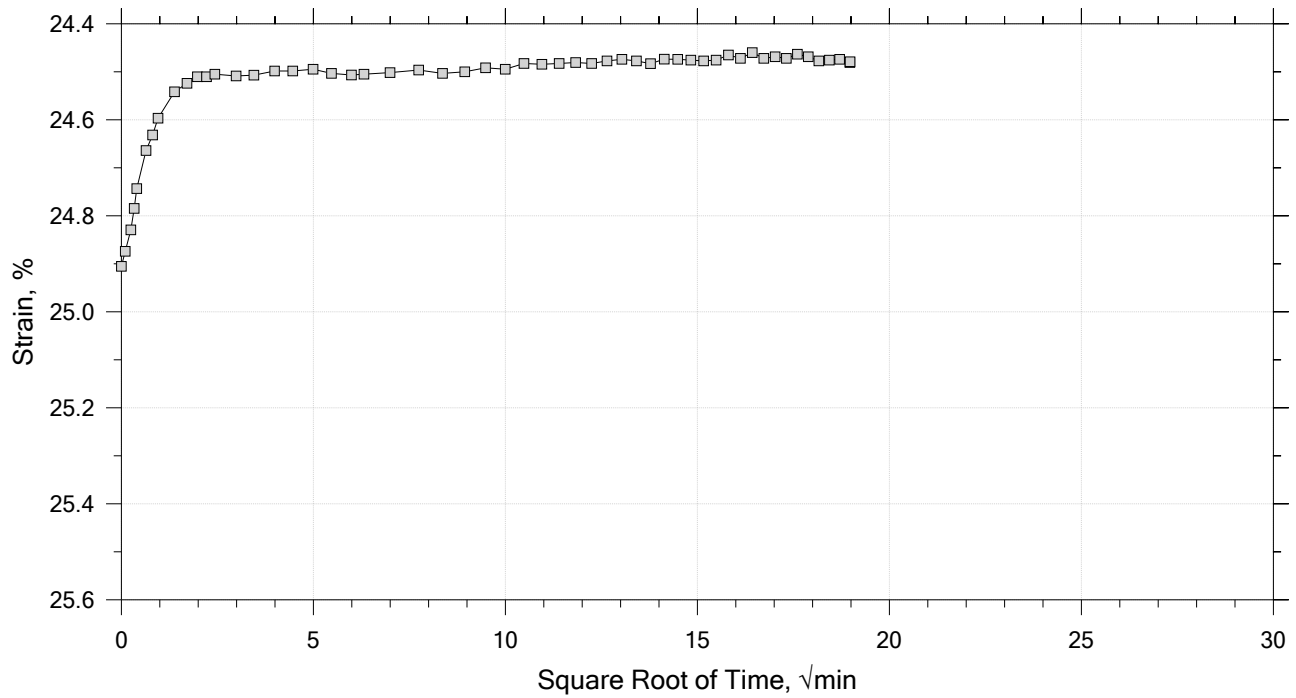
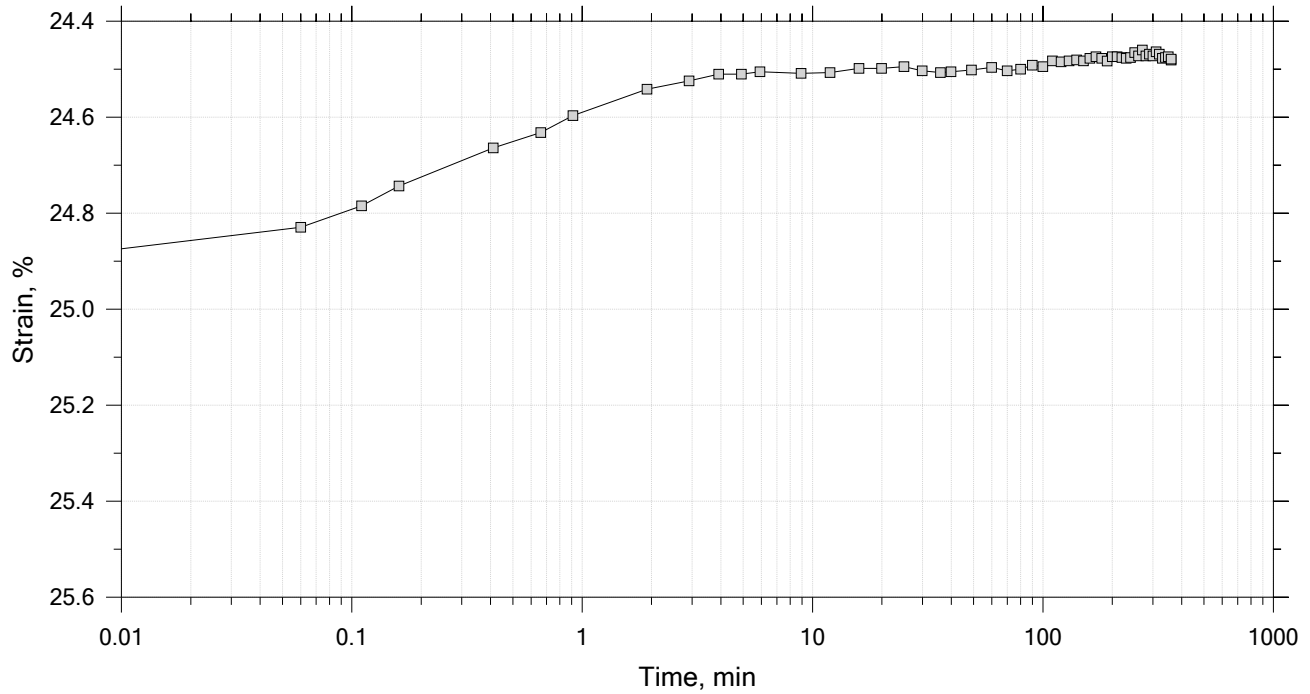
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	Boring No.: BB-BFB1-202	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 02/23/21	Depth: 10-12 ft
	Test No.: IP-2	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-F, Swell Pressure = 0.069 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 11 of 15

Constant Load Step

Stress: 8 tsf



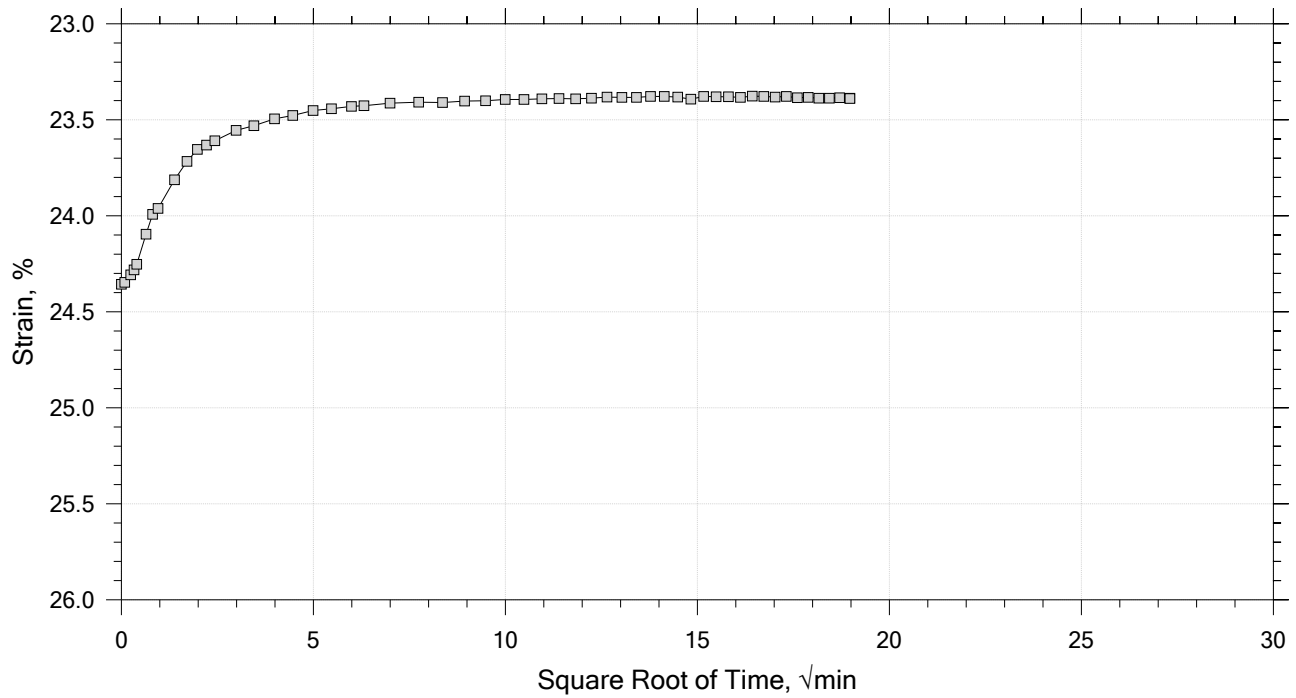
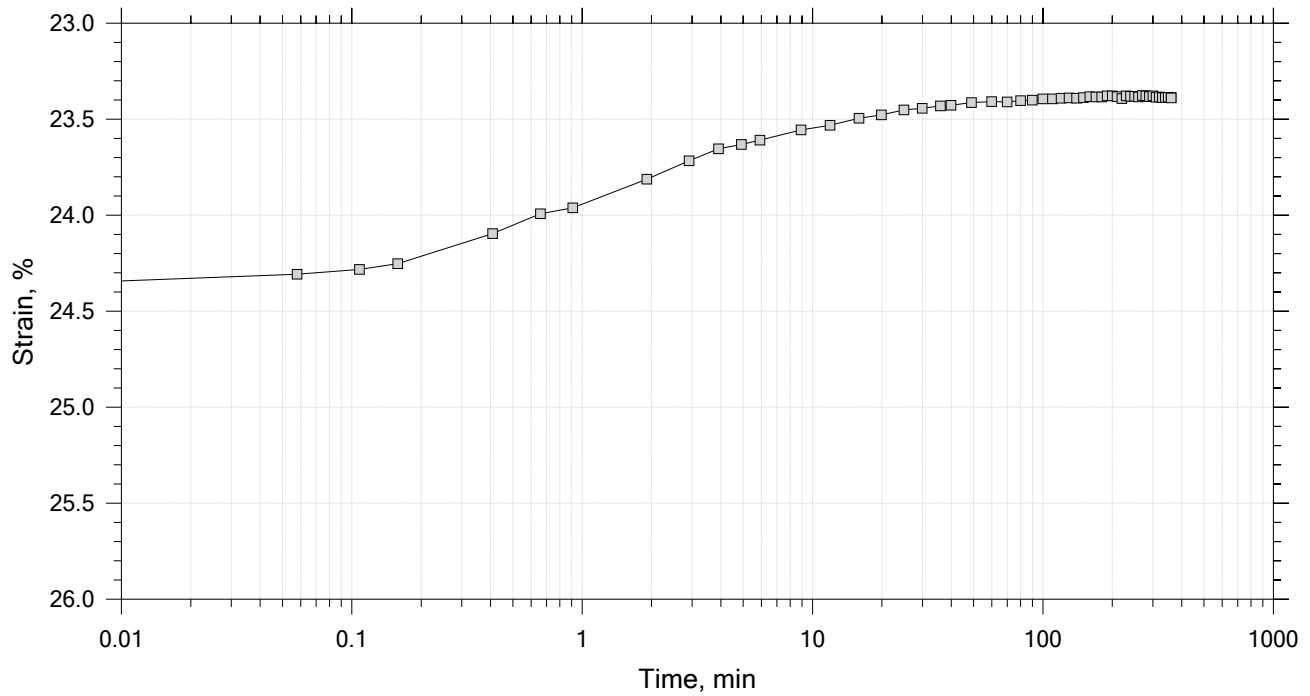
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	Boring No.: BB-BFB1-202	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 02/23/21	Depth: 10-12 ft
	Test No.: IP-2	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-F, Swell Pressure = 0.069 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 12 of 15

Constant Load Step

Stress: 2 tsf



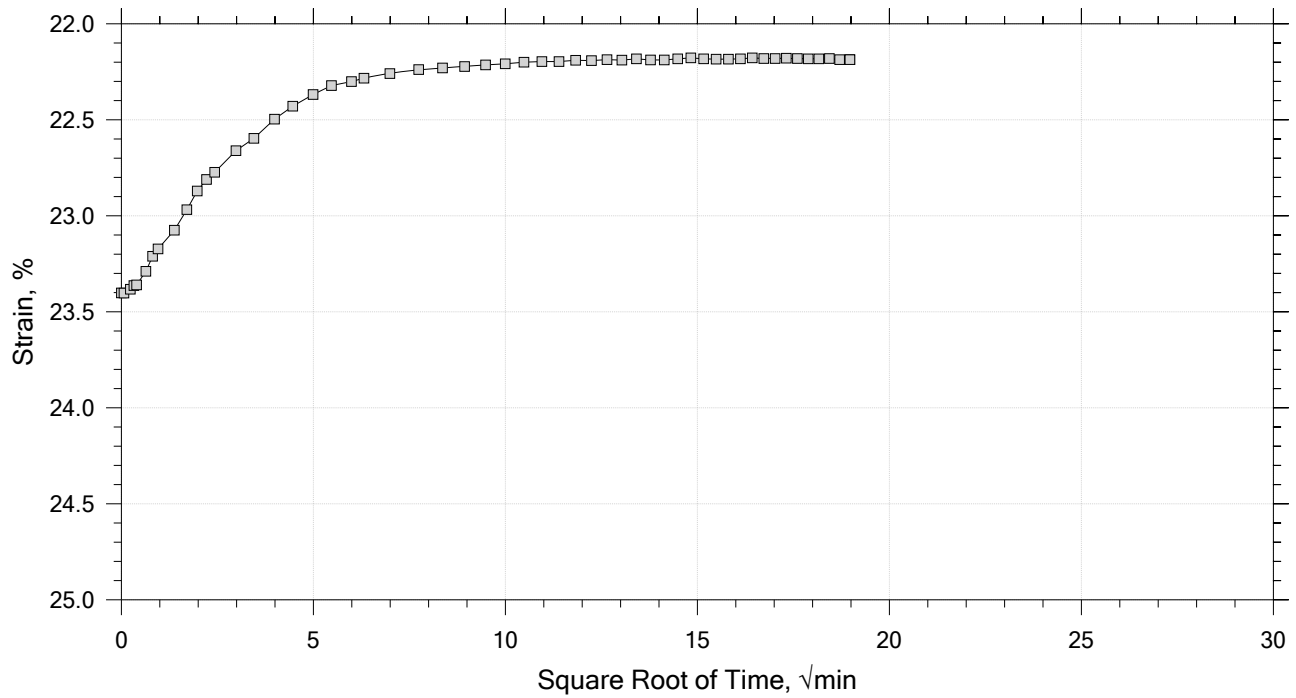
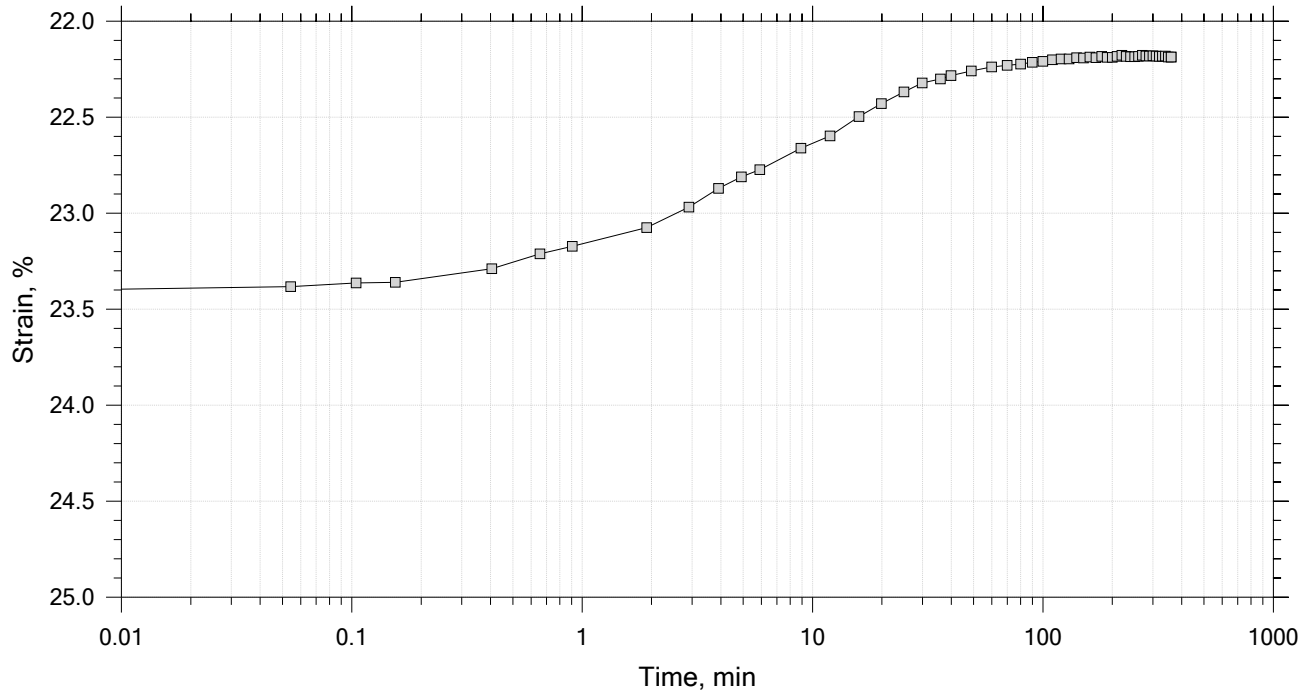
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	Boring No.: BB-BFB1-202	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 02/23/21	Depth: 10-12 ft
	Test No.: IP-2	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-F, Swell Pressure = 0.069 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 13 of 15

Constant Load Step

Stress: 0.5 tsf



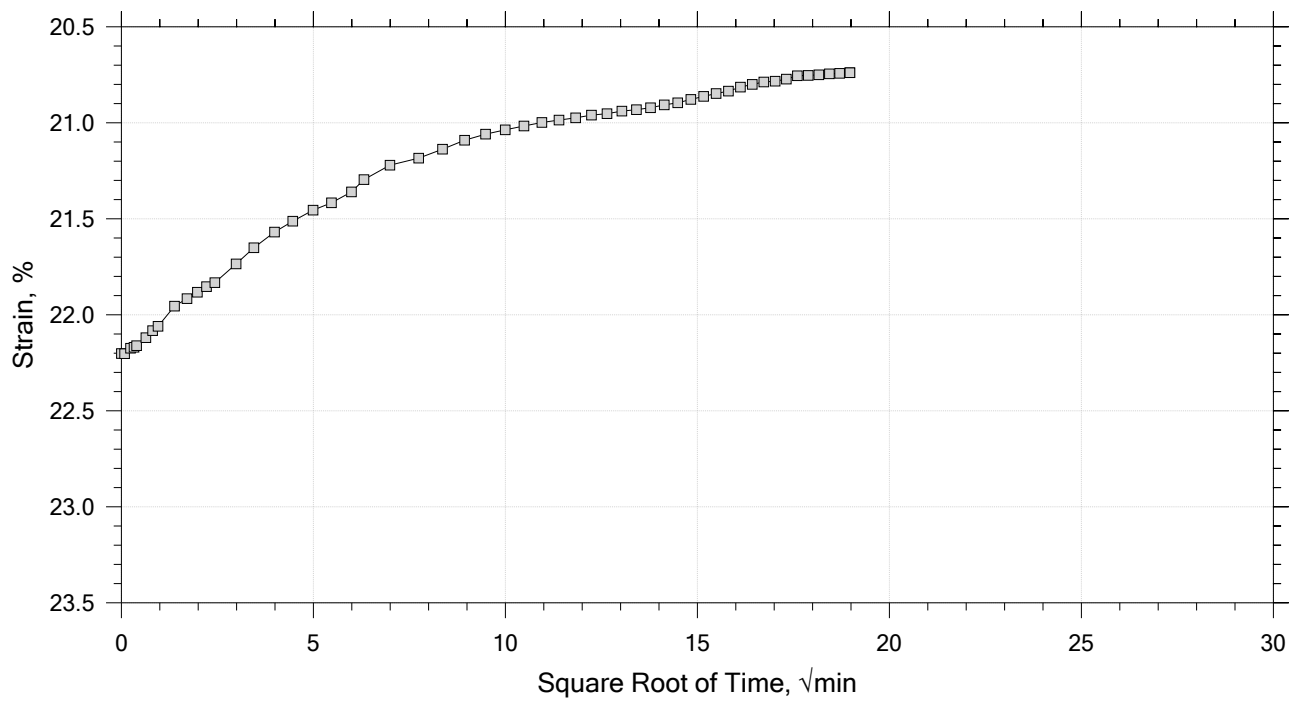
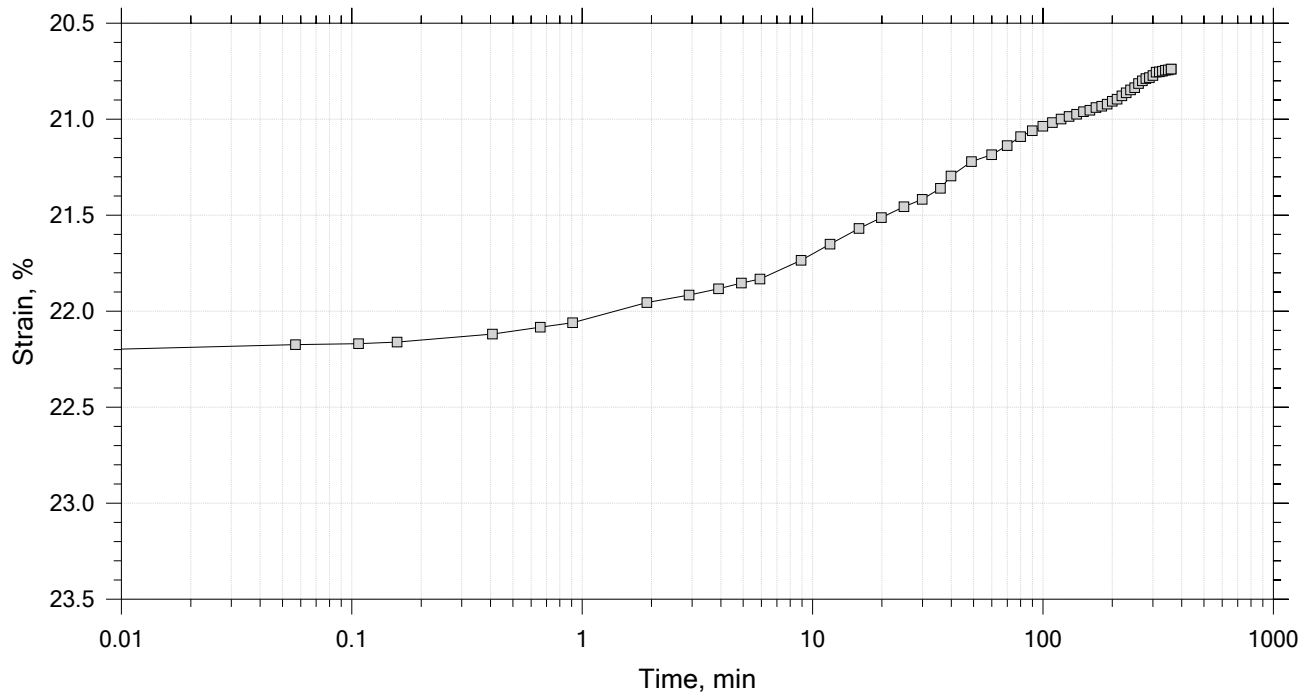
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: BB-BFB1-202	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 02/23/21	Depth: 10-12 ft
	Test No.: IP-2	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-F, Swell Pressure = 0.069 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 14 of 15

Constant Load Step

Stress: 0.125 tsf



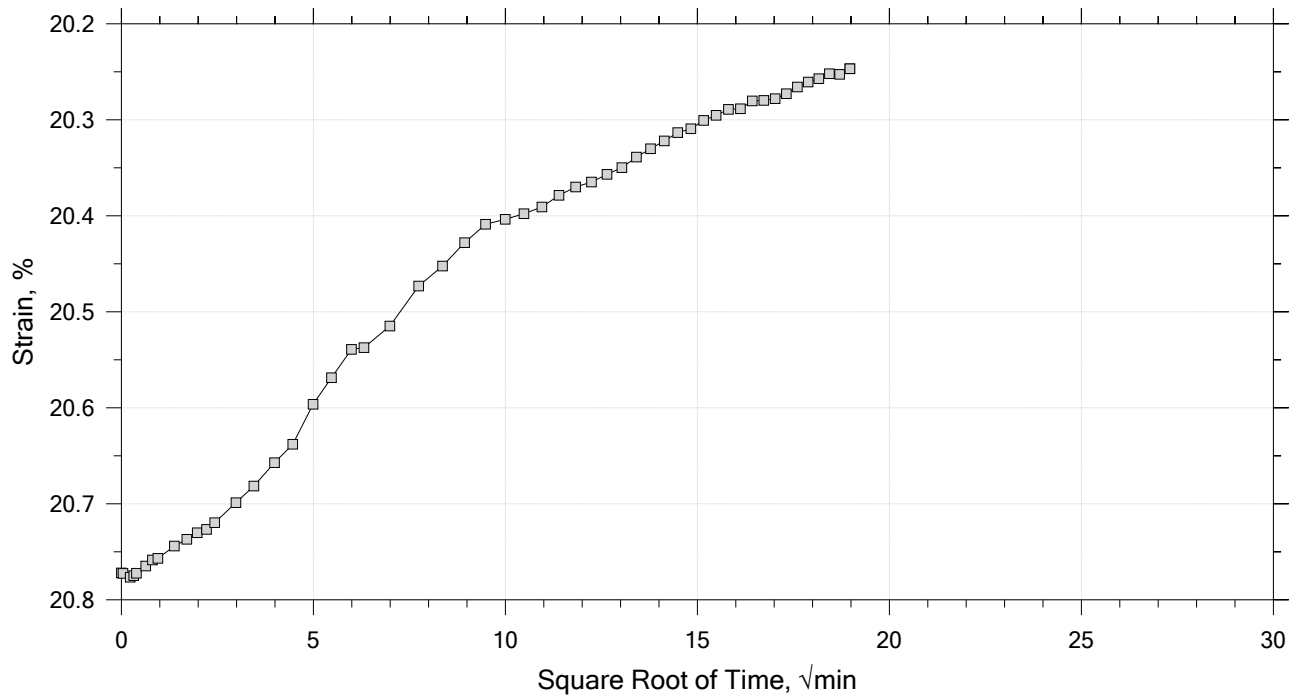
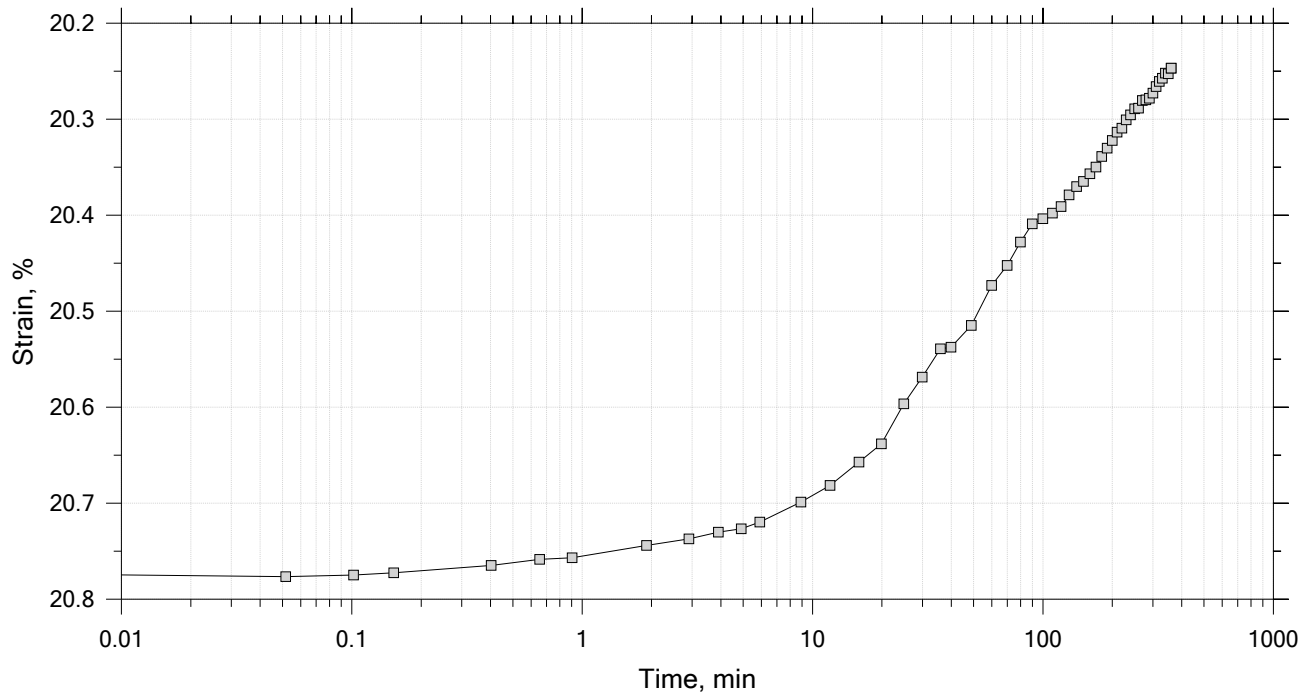
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	Boring No.: BB-BFB1-202	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 02/23/21	Depth: 10-12 ft
	Test No.: IP-2	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-F, Swell Pressure = 0.069 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 15 of 15

Constant Load Step

Stress: 0.0625 tsf




	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: BB-BFB1-202	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 02/23/21	Depth: 10-12 ft
	Test No.: IP-2	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-F, Swell Pressure = 0.069 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Specimen Diameter: 2.50 in	Estimated Specific Gravity: 2.76	Liquid Limit: 36
Initial Height: 1.00 in	Initial Void Ratio: 0.943	Plastic Limit: 20
Final Height: 0.80 in	Final Void Ratio: 0.55	Plasticity Index: 16

	Before Test Trimmings	Before Test Specimen	After Test Specimen	After Test Trimmings
Container ID	D-534	RING		E1334
Mass Container, gm	8.47	110.03	110.03	8.48
Mass Container + Wet Soil, gm	122.26	260.8	247.25	145.43
Mass Container + Dry Soil, gm	95.63	224.5	224.5	122.72
Mass Dry Soil, gm	87.16	114.47	114.47	114.24
Water Content, %	30.55	31.72	19.88	19.88
Void Ratio	---	0.94	0.55	---
Degree of Saturation, %	---	92.99	100.00	---
Dry Unit Weight, pcf	---	88.834	111.39	---


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: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: BB-BFB1-202	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 02/23/21	Depth: 10-12 ft
	Test No.: IP-2	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-F, Swell Pressure = 0.069 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

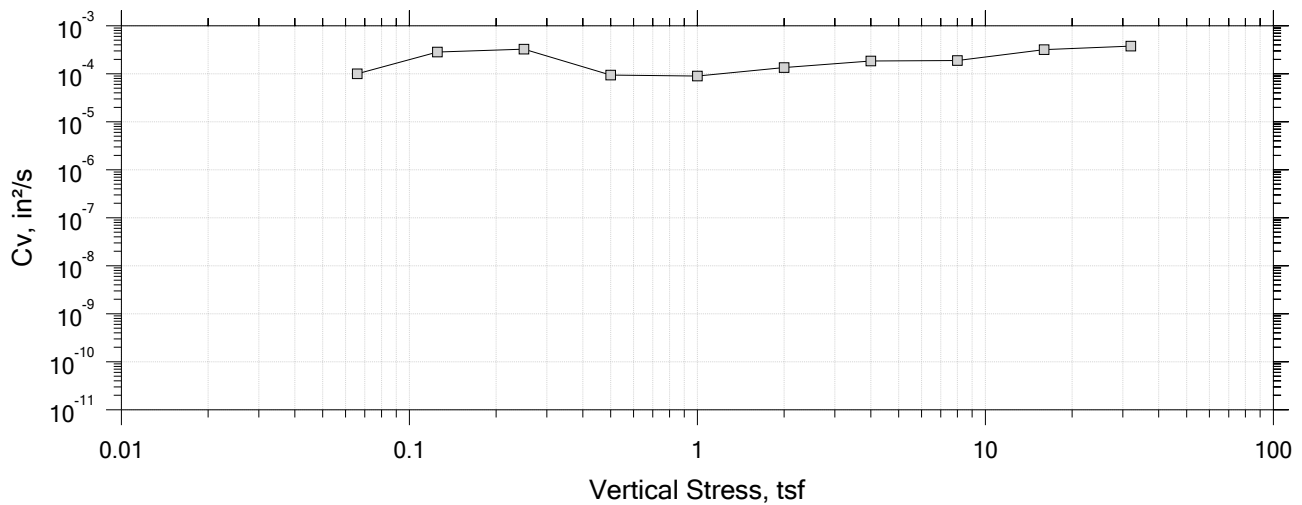
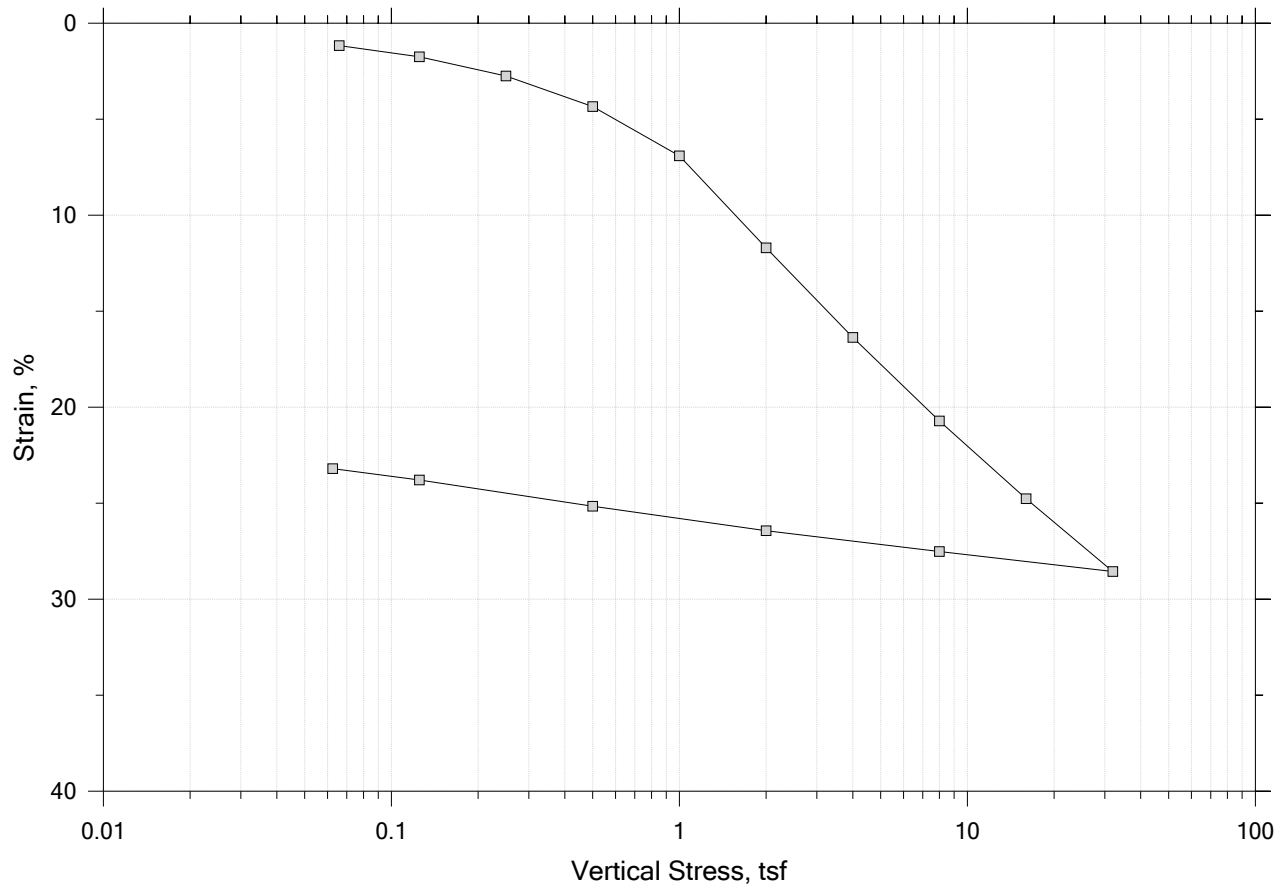
Square Root of Time Coefficients


[illegible]

	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: BB-BFB1-202	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 02/23/21	Depth: 10-12 ft
	Test No.: IP-2	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-F, Swell Pressure = 0.069 tsf		
Displacement at End of Increment			

One-Dimensional Consolidation by ASTM D2435 - Method B

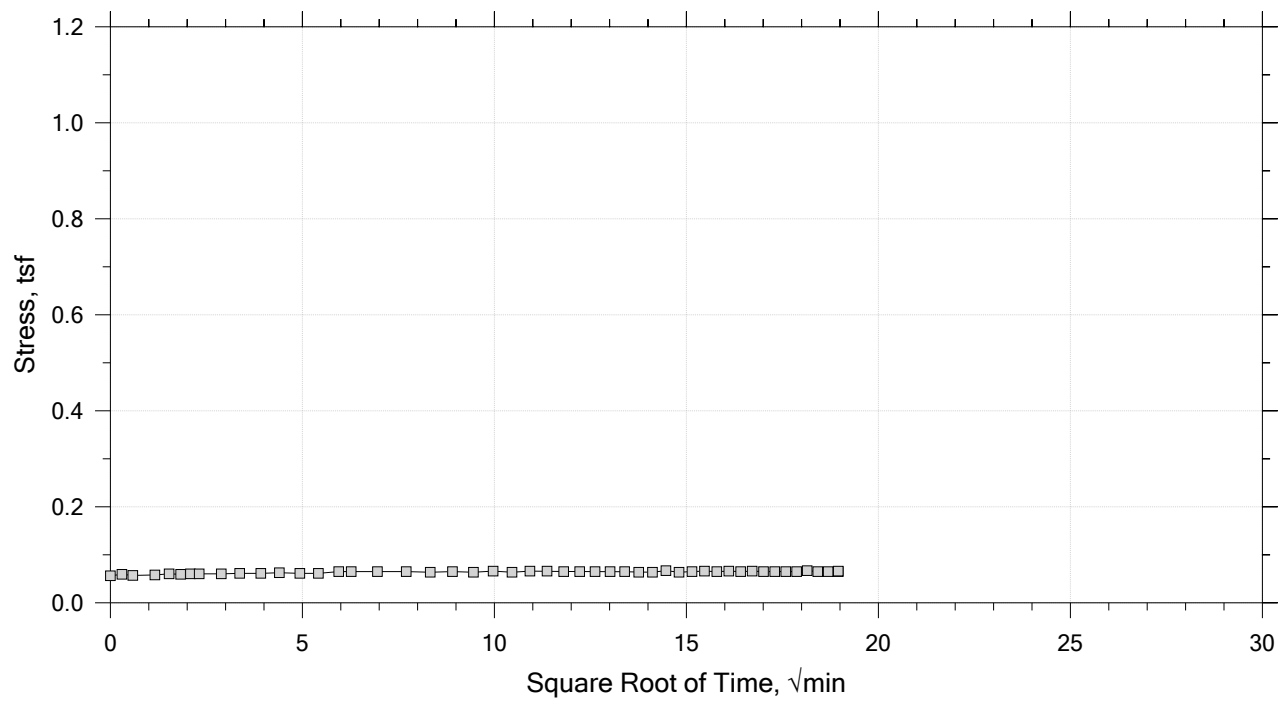
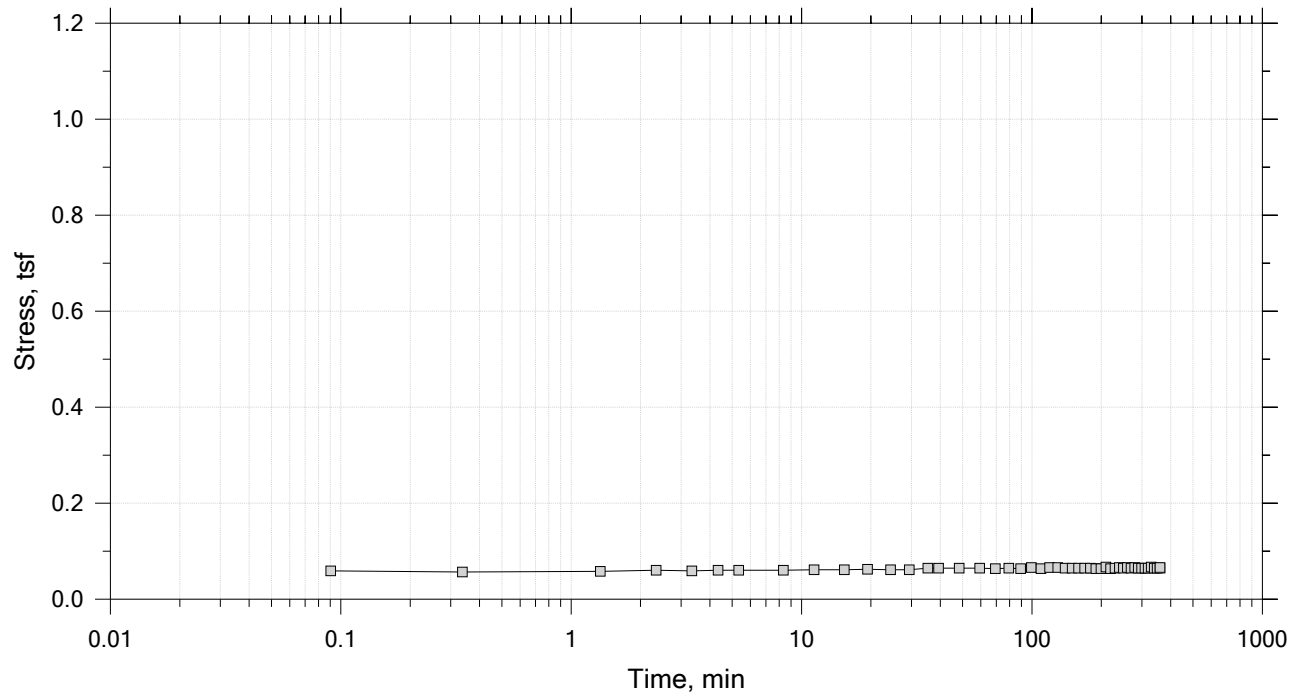
Summary Report




	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: BB-BFB1-202	Tested By: md	Checked By: mcm
	Sample No.: U-2	Test Date: 02/23/21	Depth: 15-17 ft
	Test No.: IP-3	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-C, Swell Pressure = 0.0659 tsf		
	Displacement at End of Increment		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 1 of 15
Constant Volume Step
Stress: 0.0659 tsf



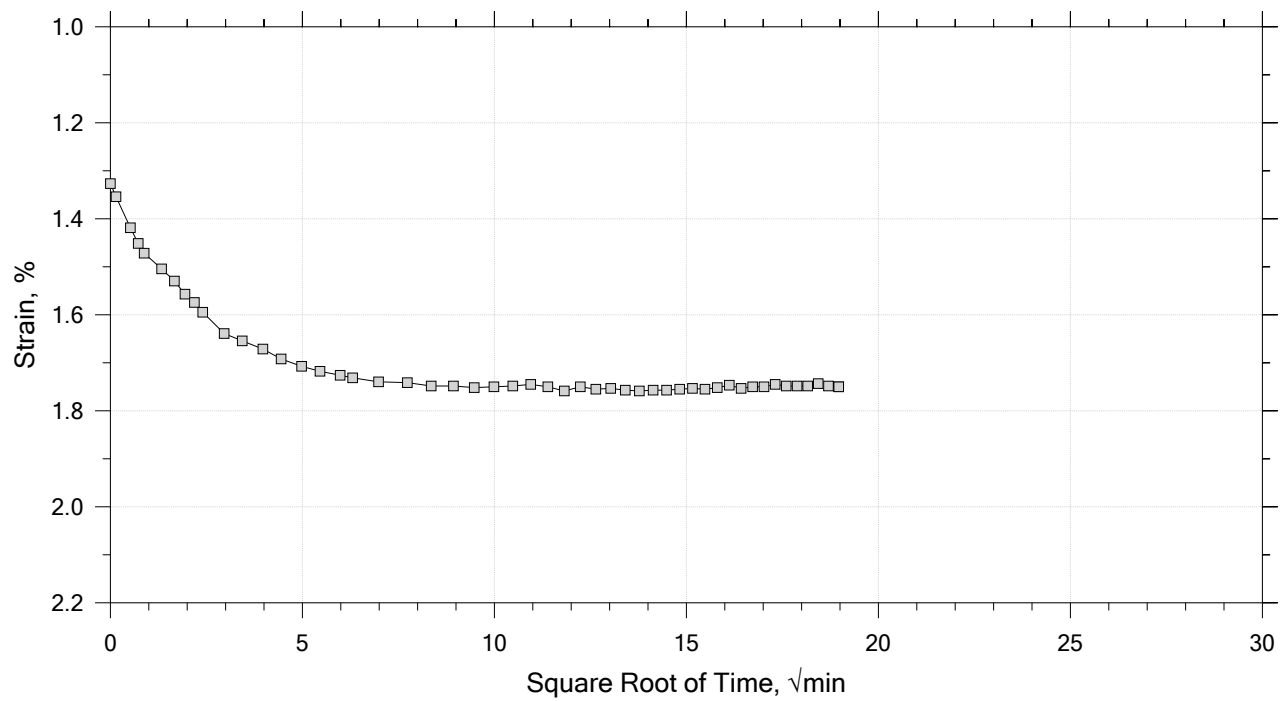
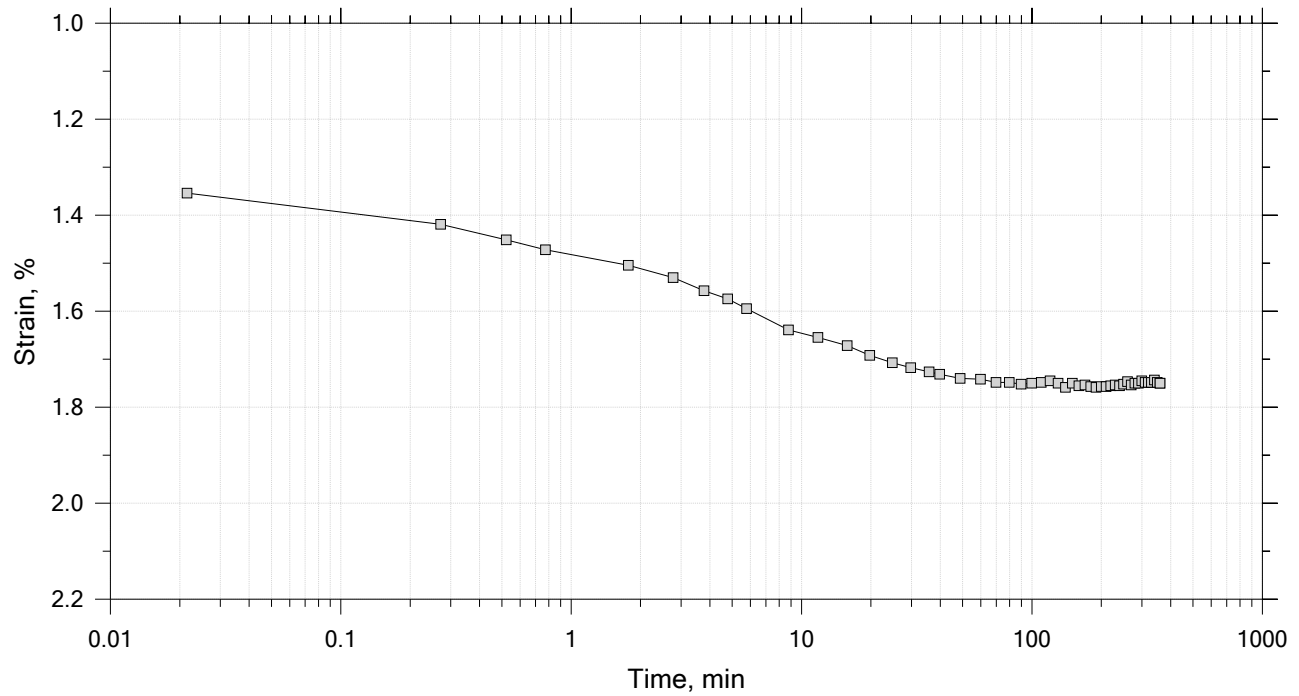
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	Boring No.: BB-BFB1-202	Tested By: md	Checked By: mcm
	Sample No.: U-2	Test Date: 02/23/21	Depth: 15-17 ft
	Test No.: IP-3	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-C, Swell Pressure = 0.0659 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 2 of 15

Constant Load Step

Stress: 0.125 tsf



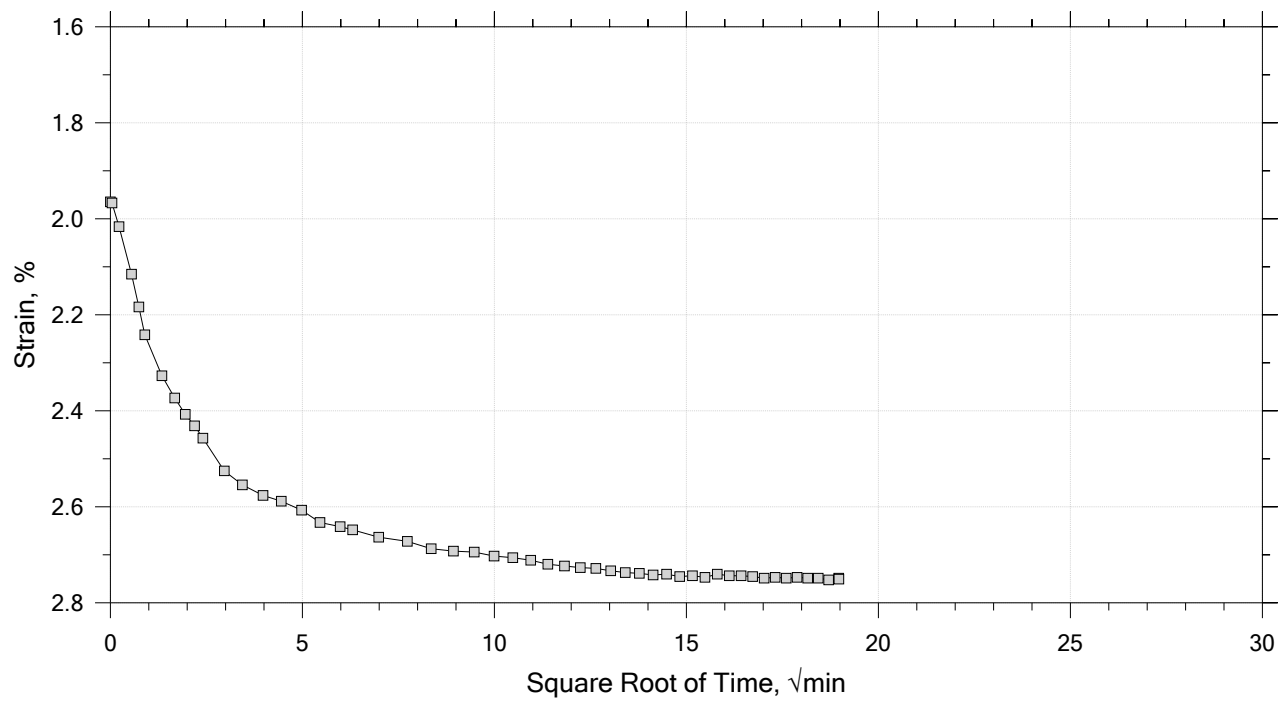
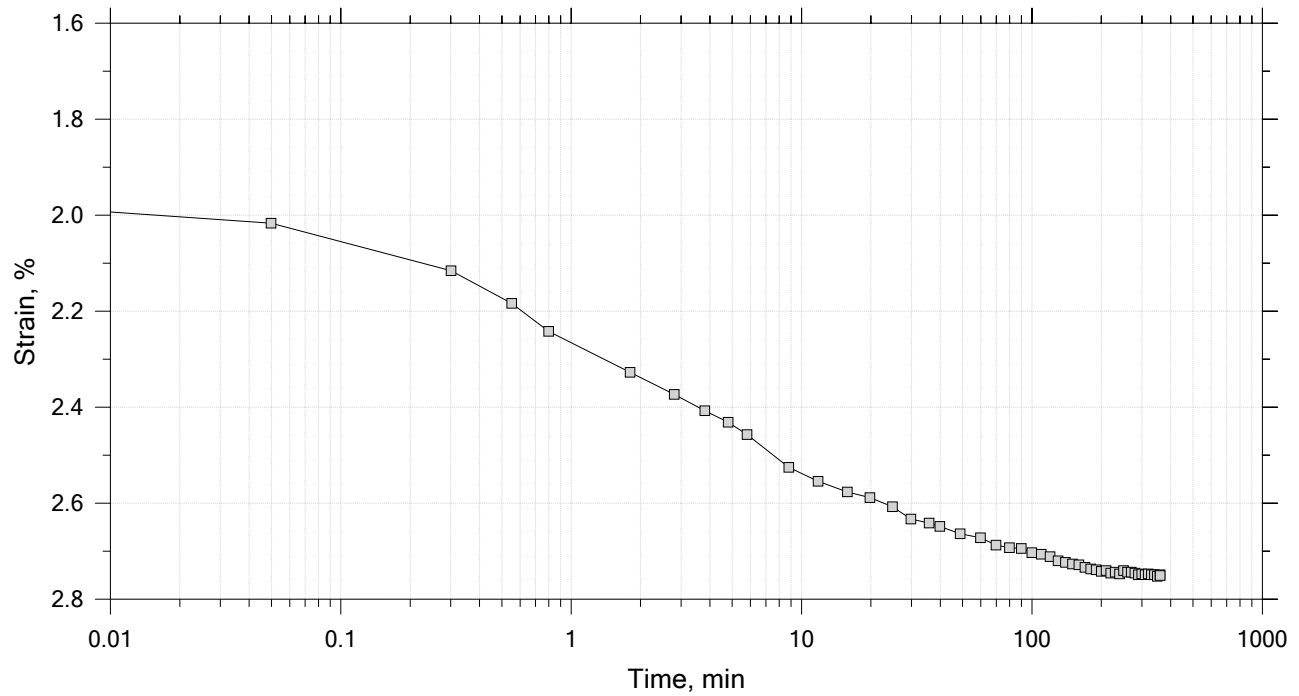
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	Boring No.: BB-BFB1-202	Tested By: md	Checked By: mcm
	Sample No.: U-2	Test Date: 02/23/21	Depth: 15-17 ft
	Test No.: IP-3	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-C, Swell Pressure = 0.0659 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 3 of 15

Constant Load Step

Stress: 0.25 tsf



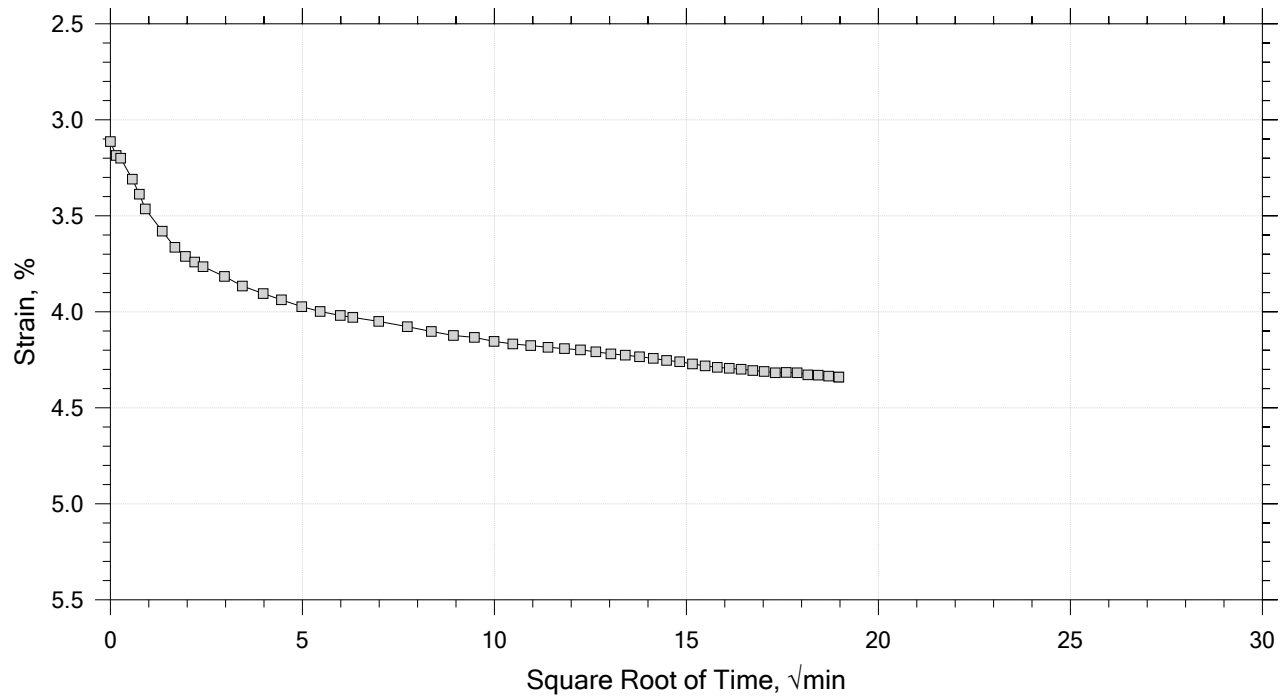
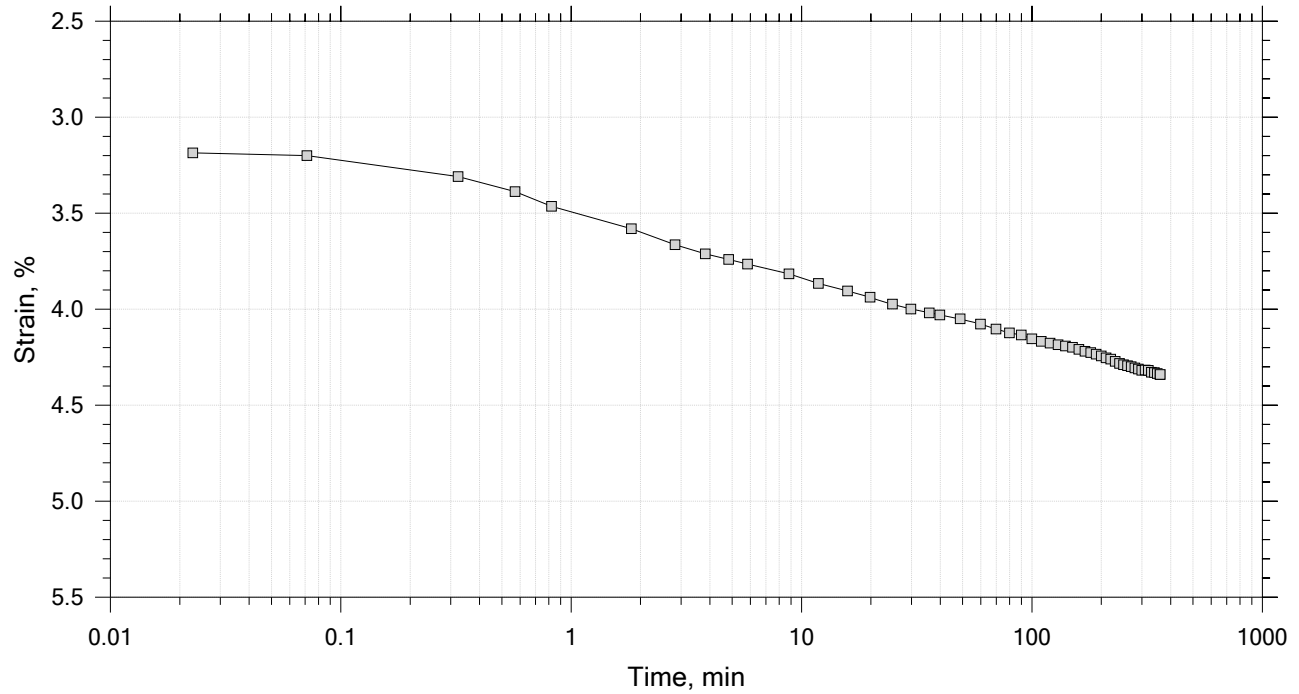
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	Boring No.: BB-BFB1-202	Tested By: md	Checked By: mcm
	Sample No.: U-2	Test Date: 02/23/21	Depth: 15-17 ft
	Test No.: IP-3	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-C, Swell Pressure = 0.0659 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 4 of 15

Constant Load Step

Stress: 0.5 tsf



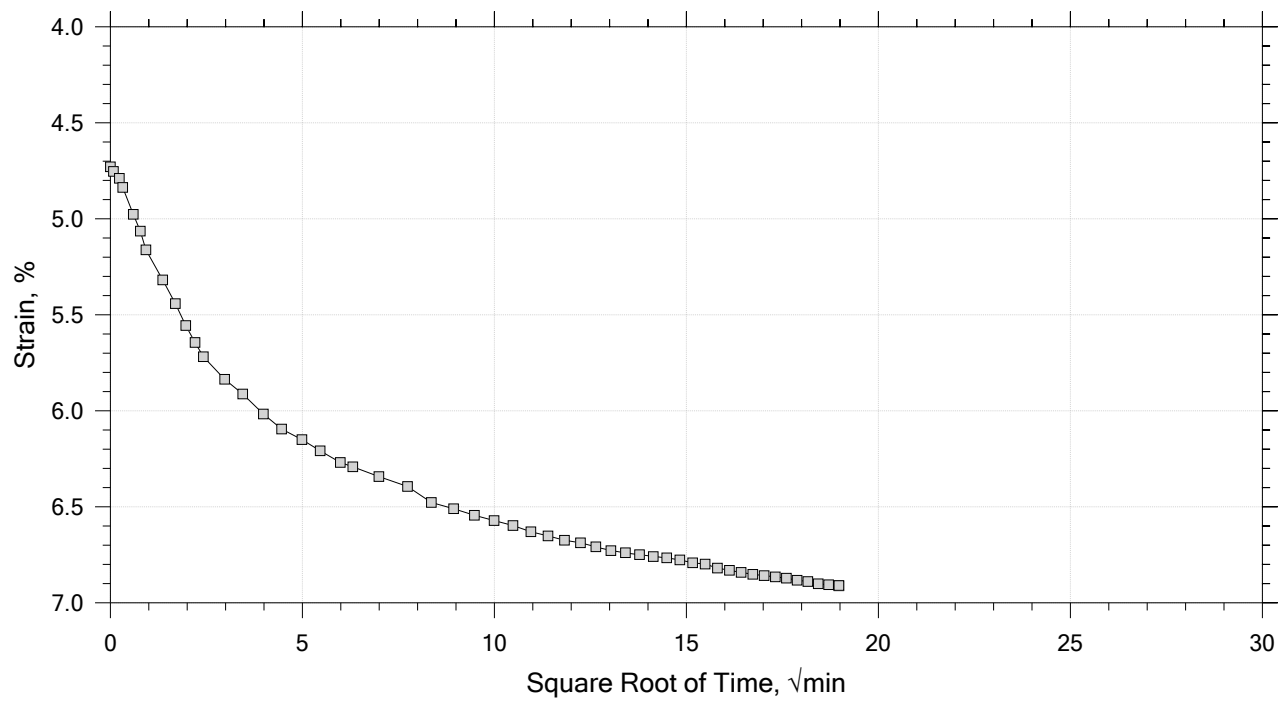
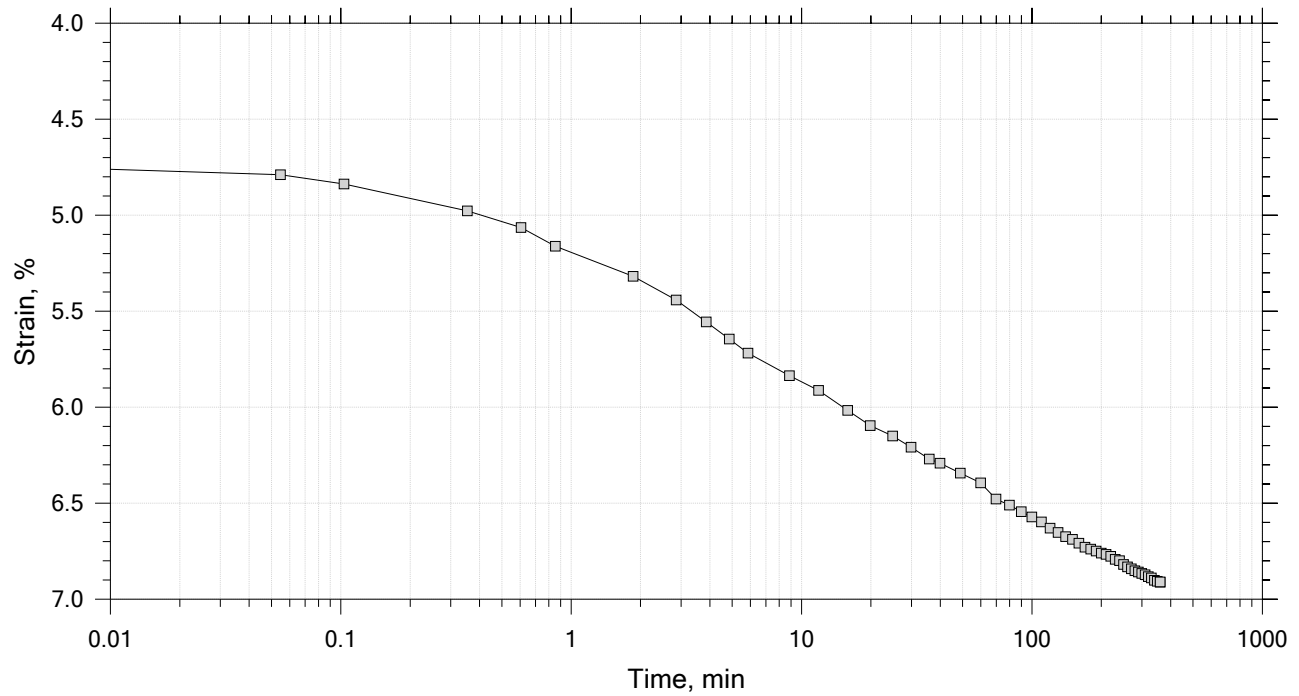
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: BB-BFB1-202	Tested By: md	Checked By: mcm
	Sample No.: U-2	Test Date: 02/23/21	Depth: 15-17 ft
	Test No.: IP-3	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-C, Swell Pressure = 0.0659 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 5 of 15

Constant Load Step

Stress: 1 tsf



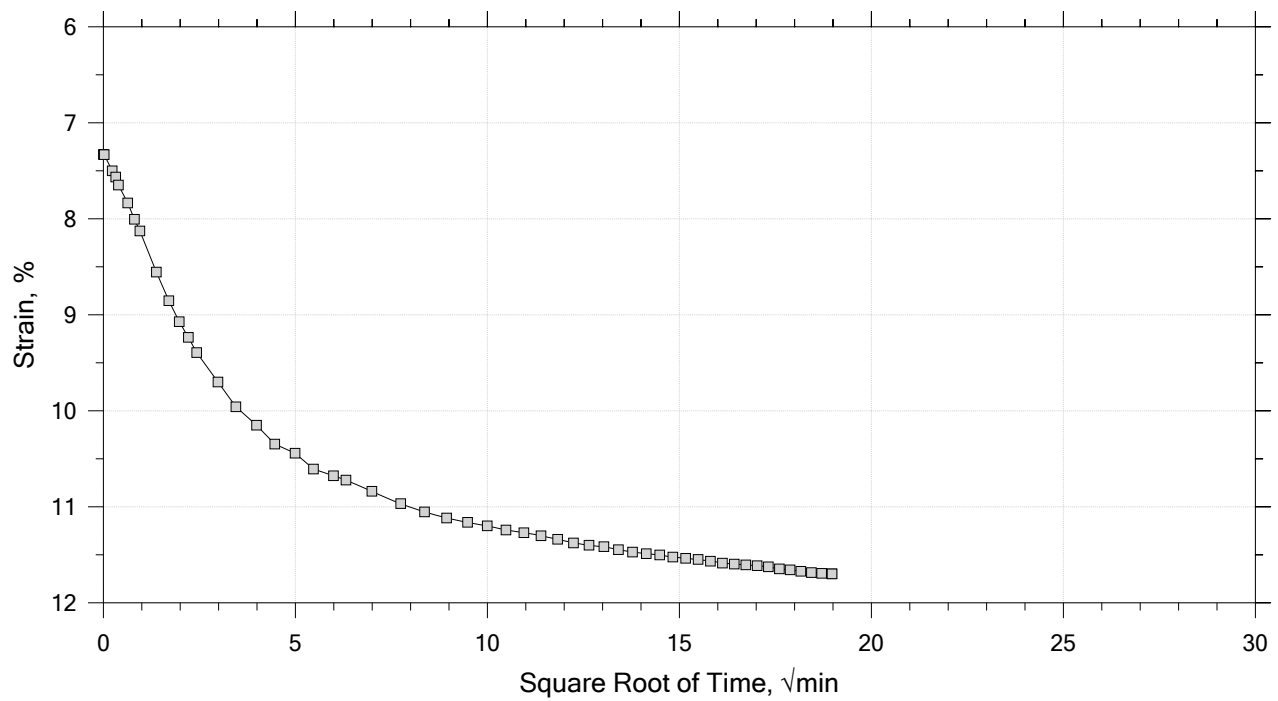
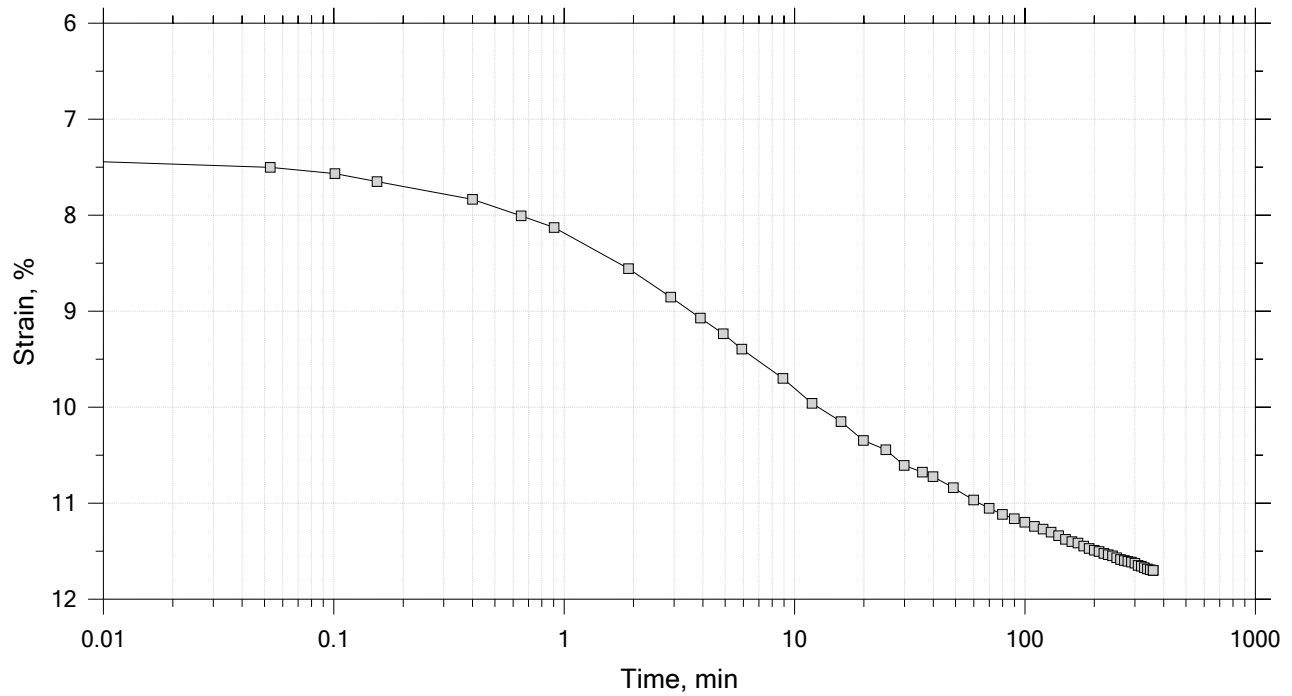
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	Boring No.: BB-BFB1-202	Tested By: md	Checked By: mcm
	Sample No.: U-2	Test Date: 02/23/21	Depth: 15-17 ft
	Test No.: IP-3	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-C, Swell Pressure = 0.0659 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 6 of 15

Constant Load Step

Stress: 2 tsf



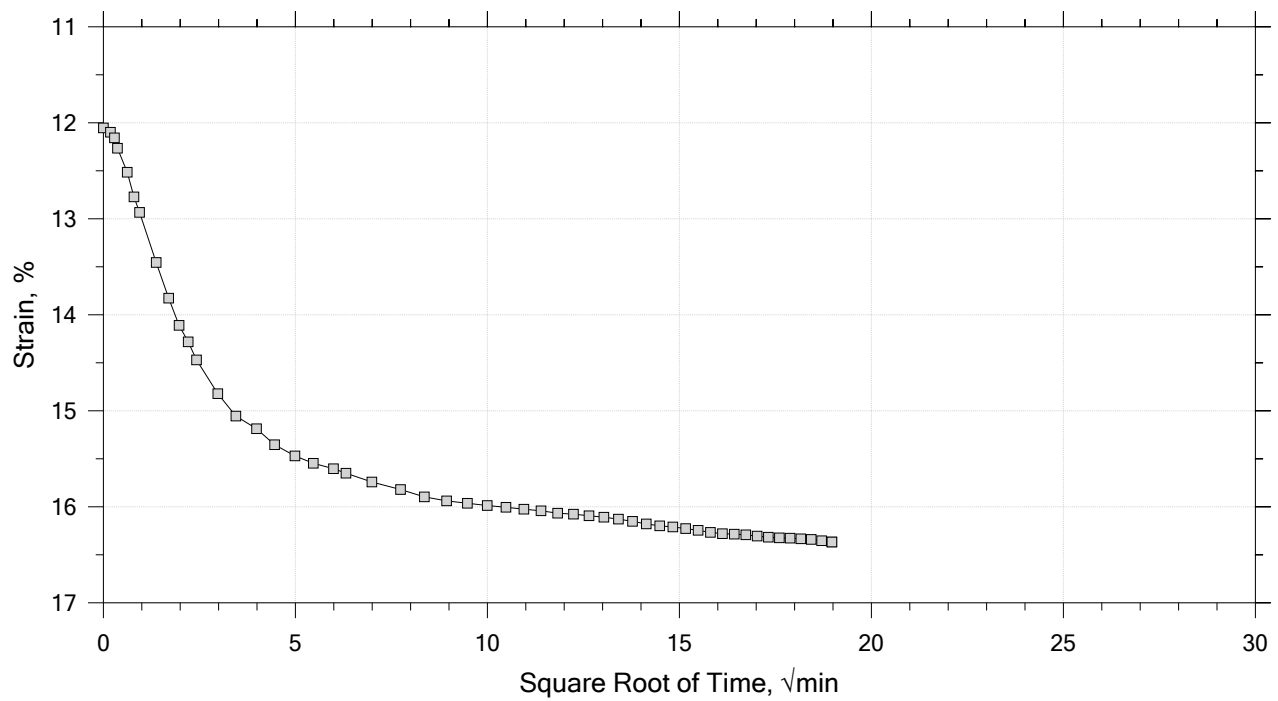
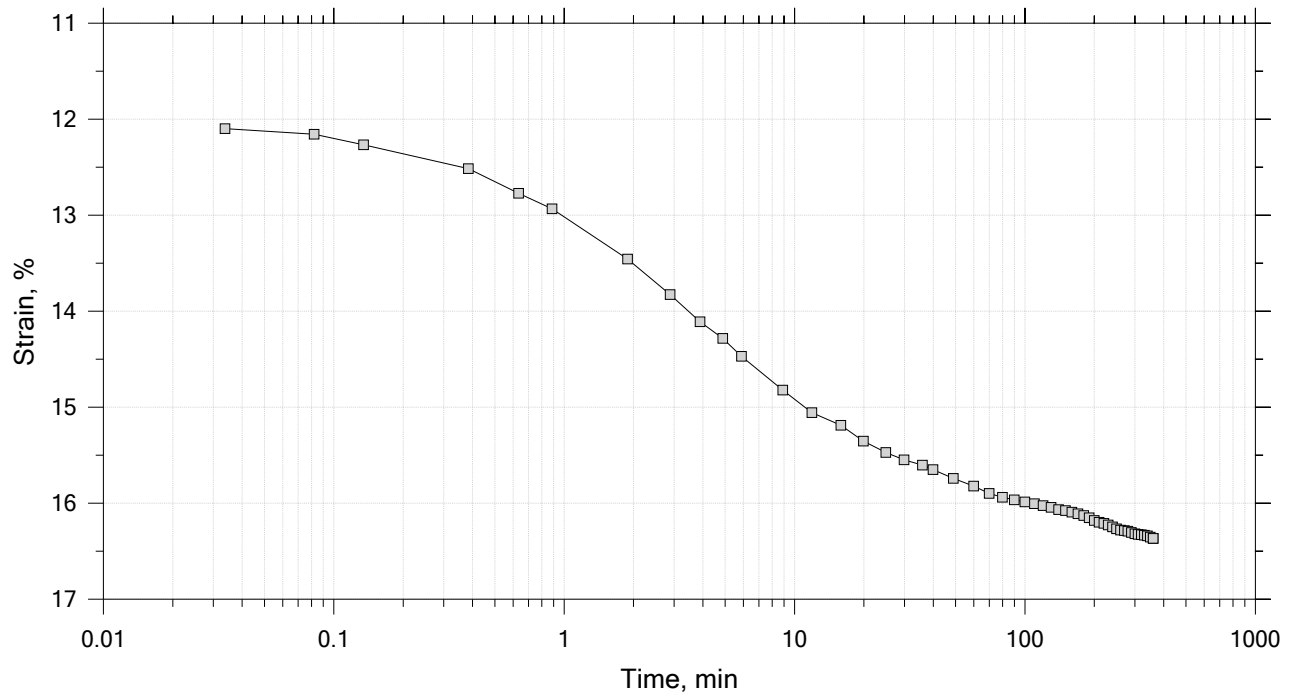
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: BB-BFB1-202	Tested By: md	Checked By: mcm
	Sample No.: U-2	Test Date: 02/23/21	Depth: 15-17 ft
	Test No.: IP-3	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-C, Swell Pressure = 0.0659 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 7 of 15

Constant Load Step

Stress: 4 tsf



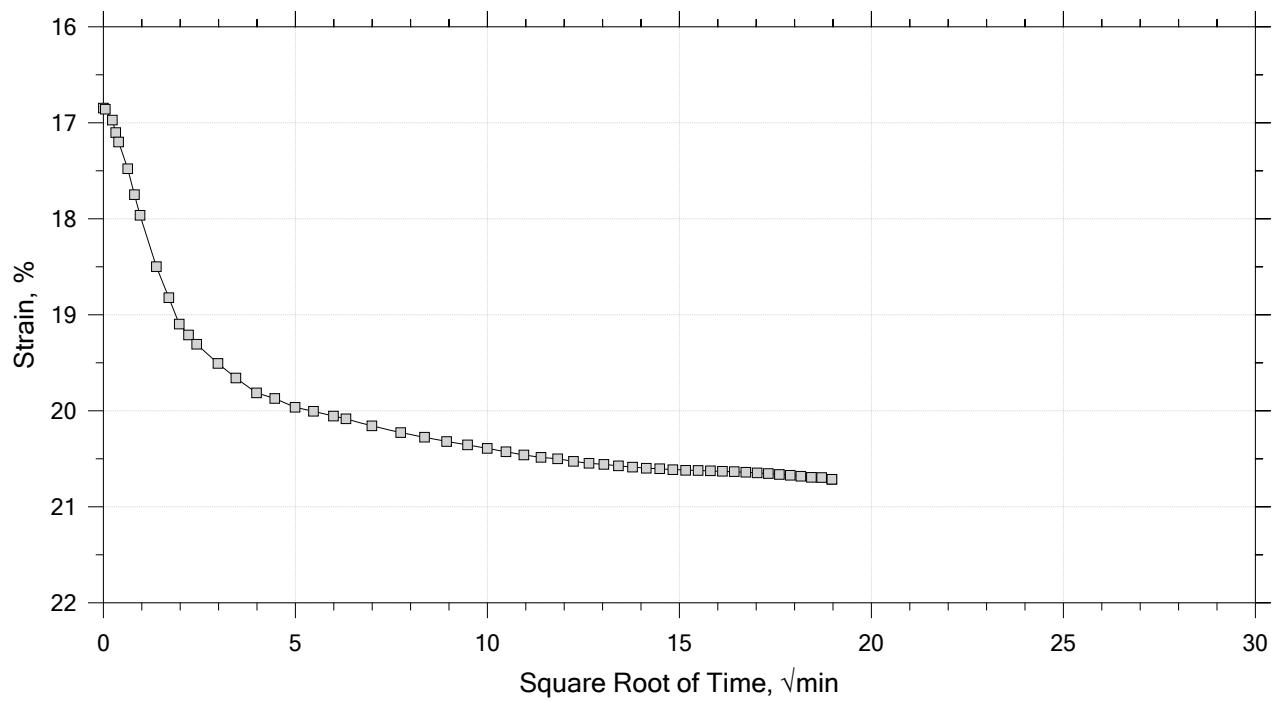
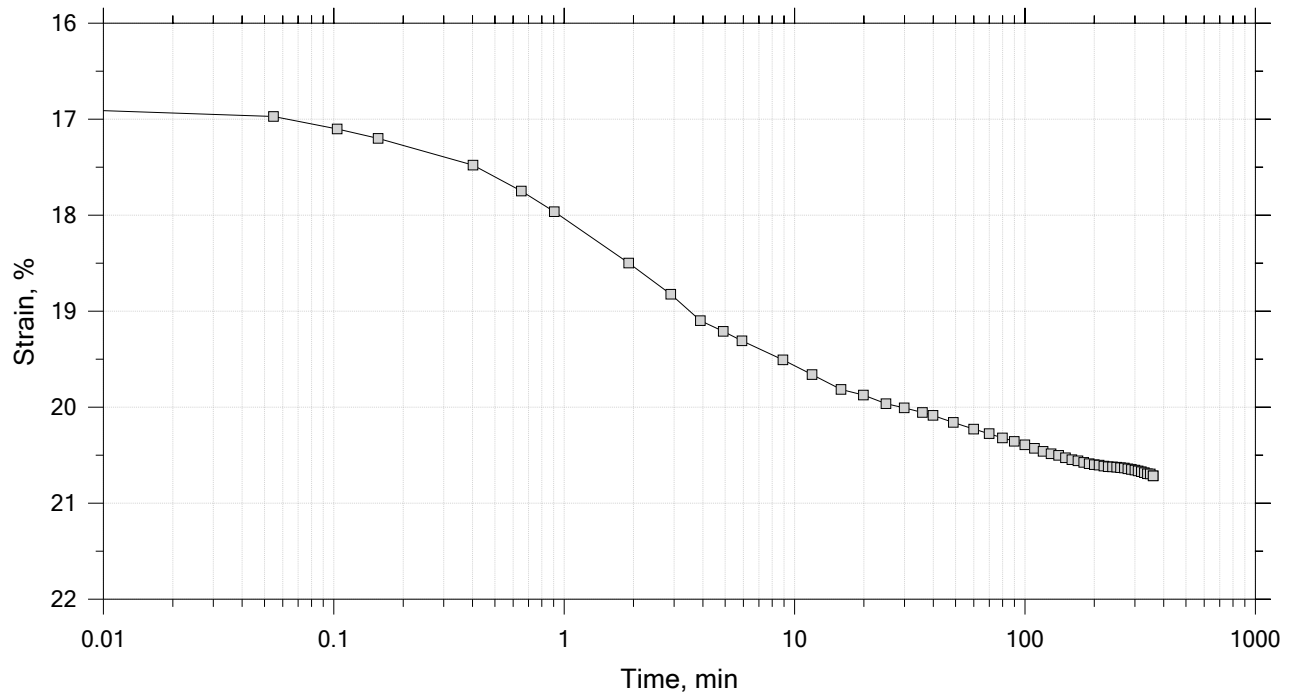
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	Boring No.: BB-BFB1-202	Tested By: md	Checked By: mcm
	Sample No.: U-2	Test Date: 02/23/21	Depth: 15-17 ft
	Test No.: IP-3	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-C, Swell Pressure = 0.0659 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 8 of 15

Constant Load Step

Stress: 8 tsf



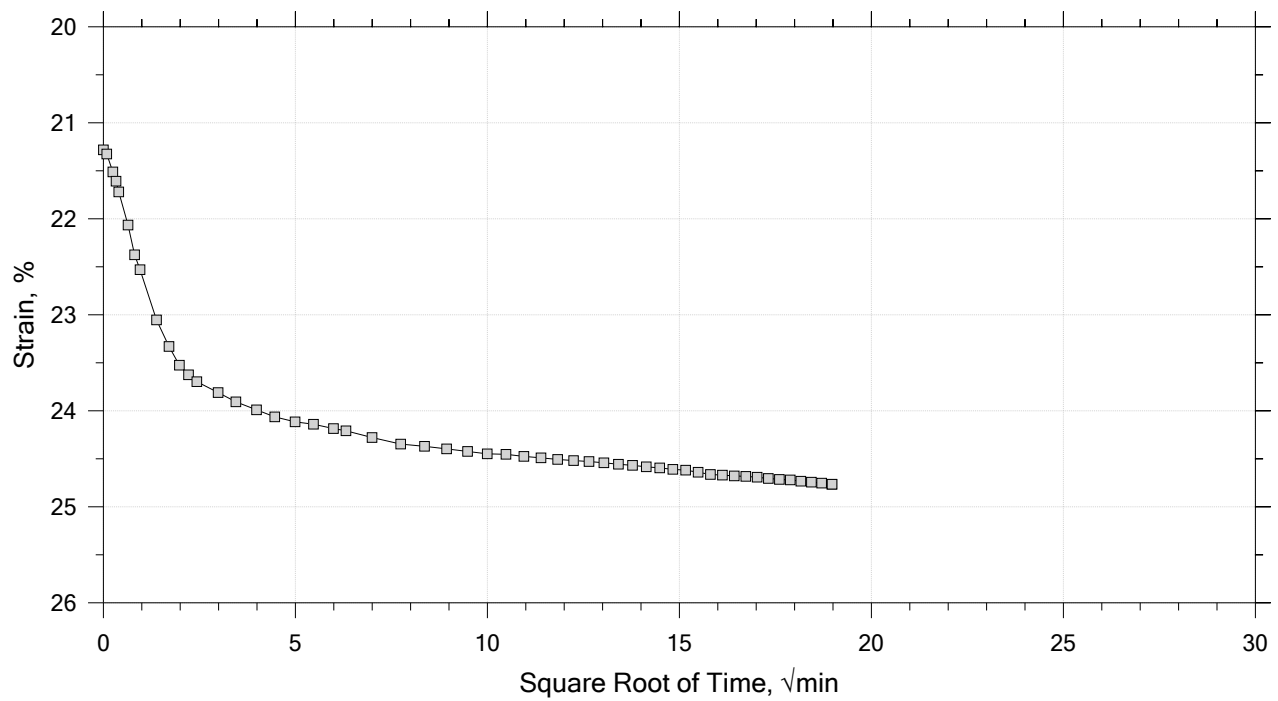
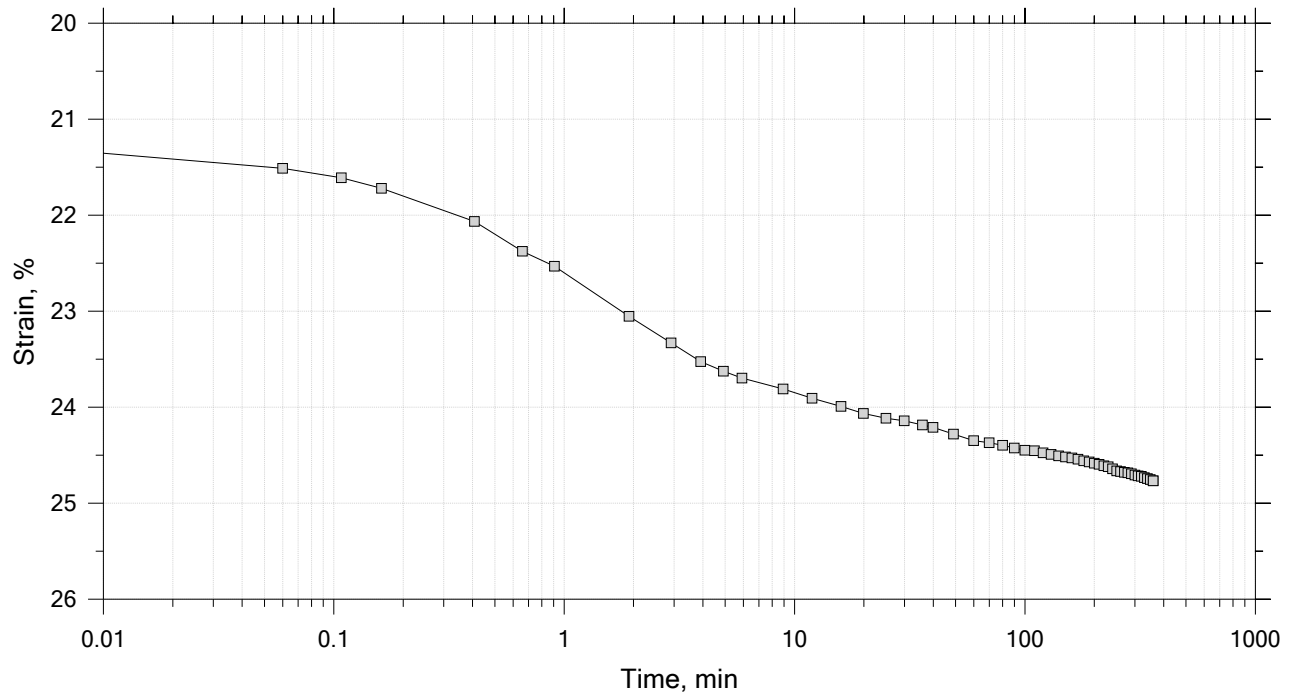
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	Boring No.: BB-BFB1-202	Tested By: md	Checked By: mcm
	Sample No.: U-2	Test Date: 02/23/21	Depth: 15-17 ft
	Test No.: IP-3	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-C, Swell Pressure = 0.0659 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 9 of 15

Constant Load Step

Stress: 16 tsf



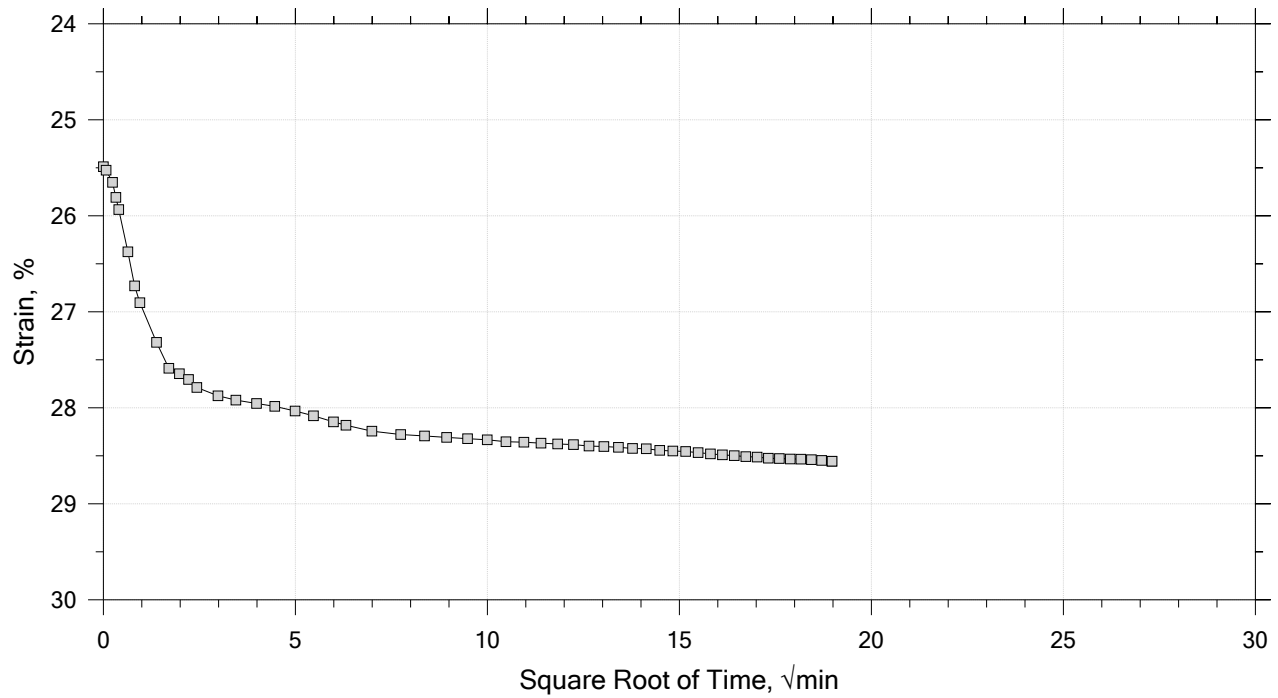
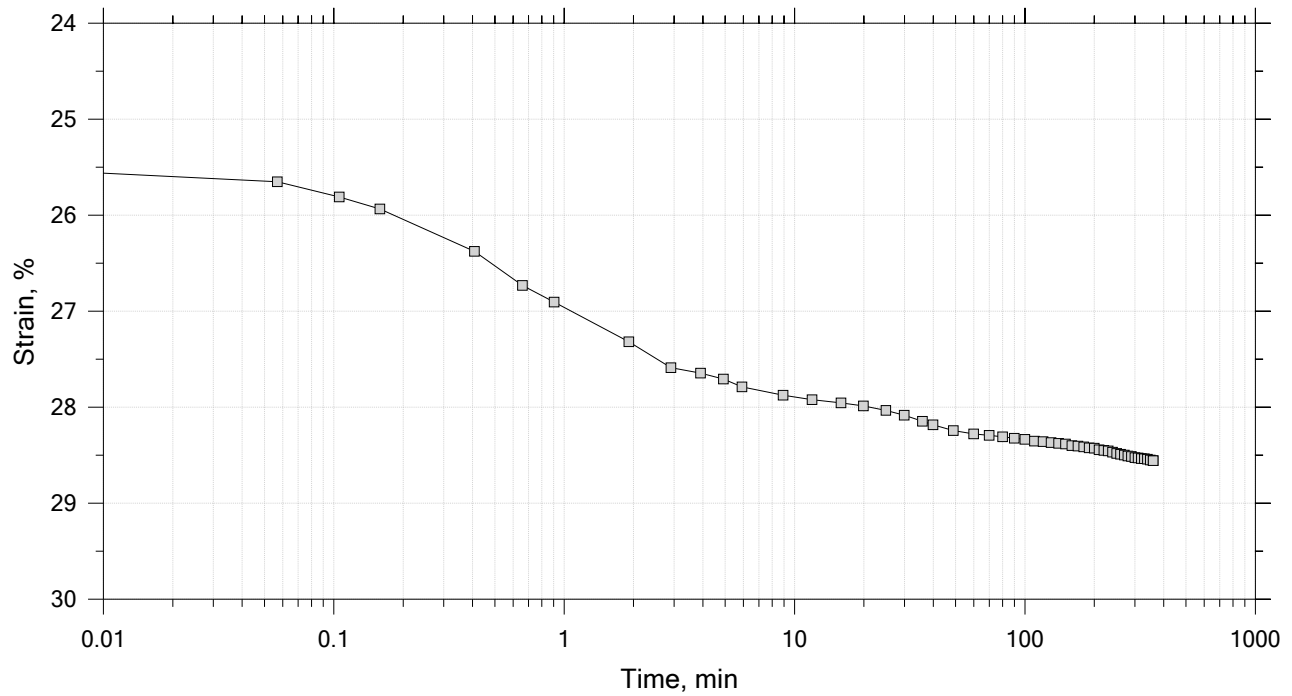
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	Boring No.: BB-BFB1-202	Tested By: md	Checked By: mcm
	Sample No.: U-2	Test Date: 02/23/21	Depth: 15-17 ft
	Test No.: IP-3	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-C, Swell Pressure = 0.0659 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 10 of 15

Constant Load Step

Stress: 32 tsf



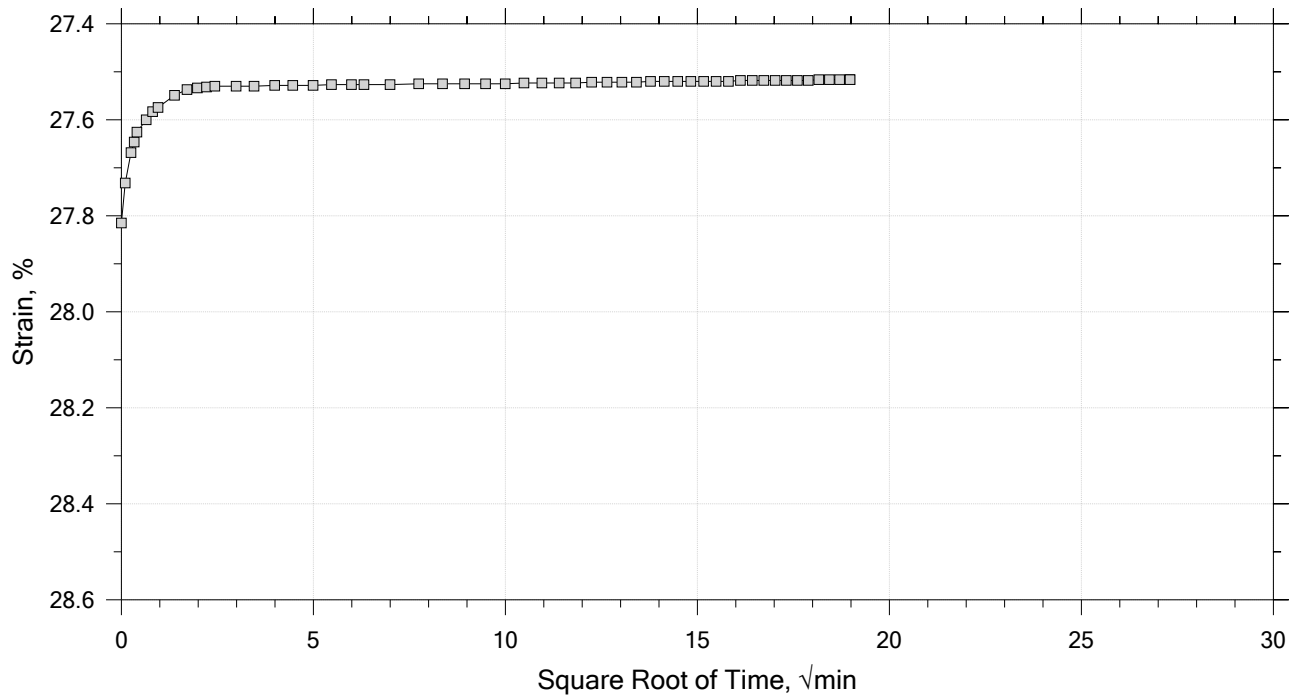
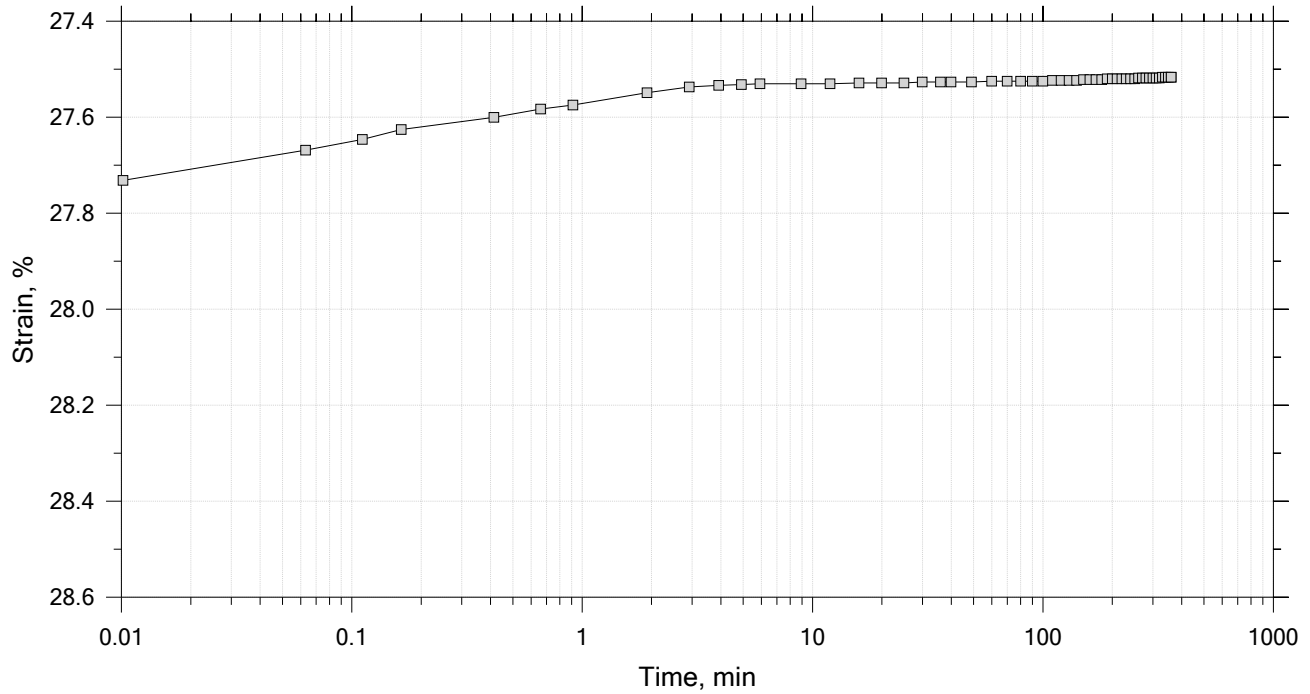
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	Boring No.: BB-BFB1-202	Tested By: md	Checked By: mcm
	Sample No.: U-2	Test Date: 02/23/21	Depth: 15-17 ft
	Test No.: IP-3	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-C, Swell Pressure = 0.0659 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 11 of 15

Constant Load Step

Stress: 8 tsf



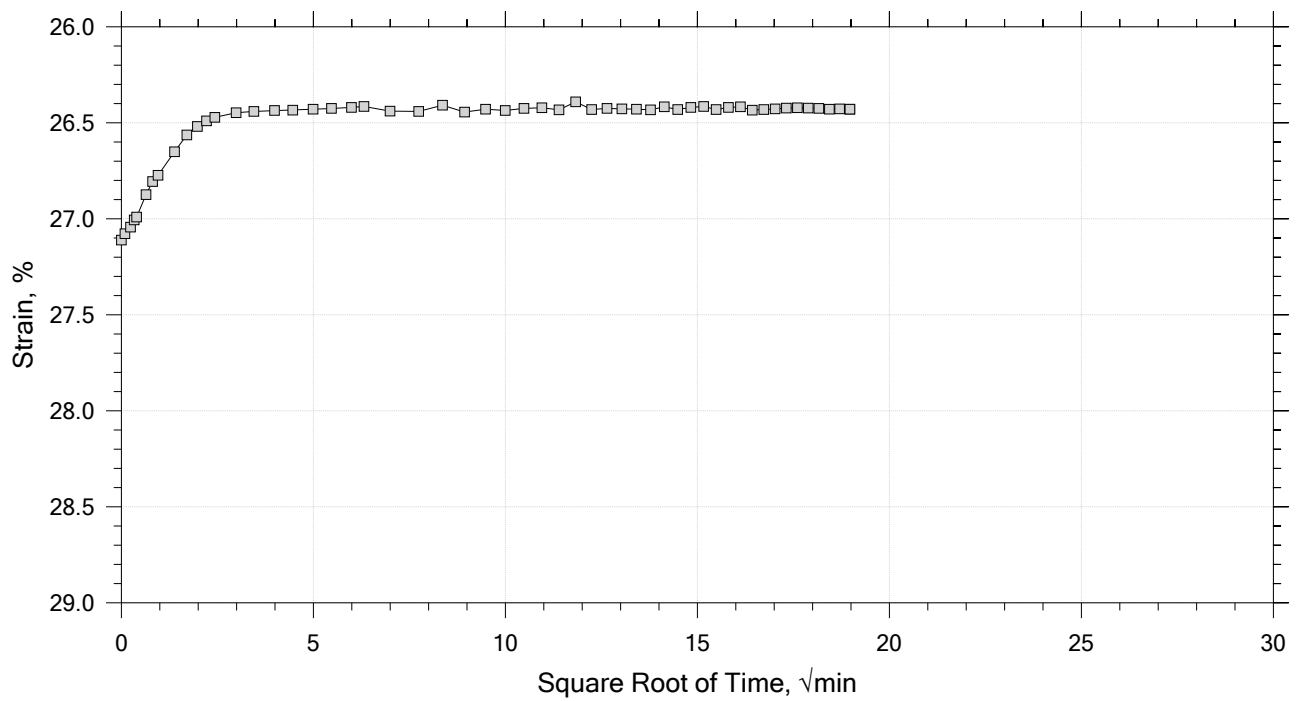
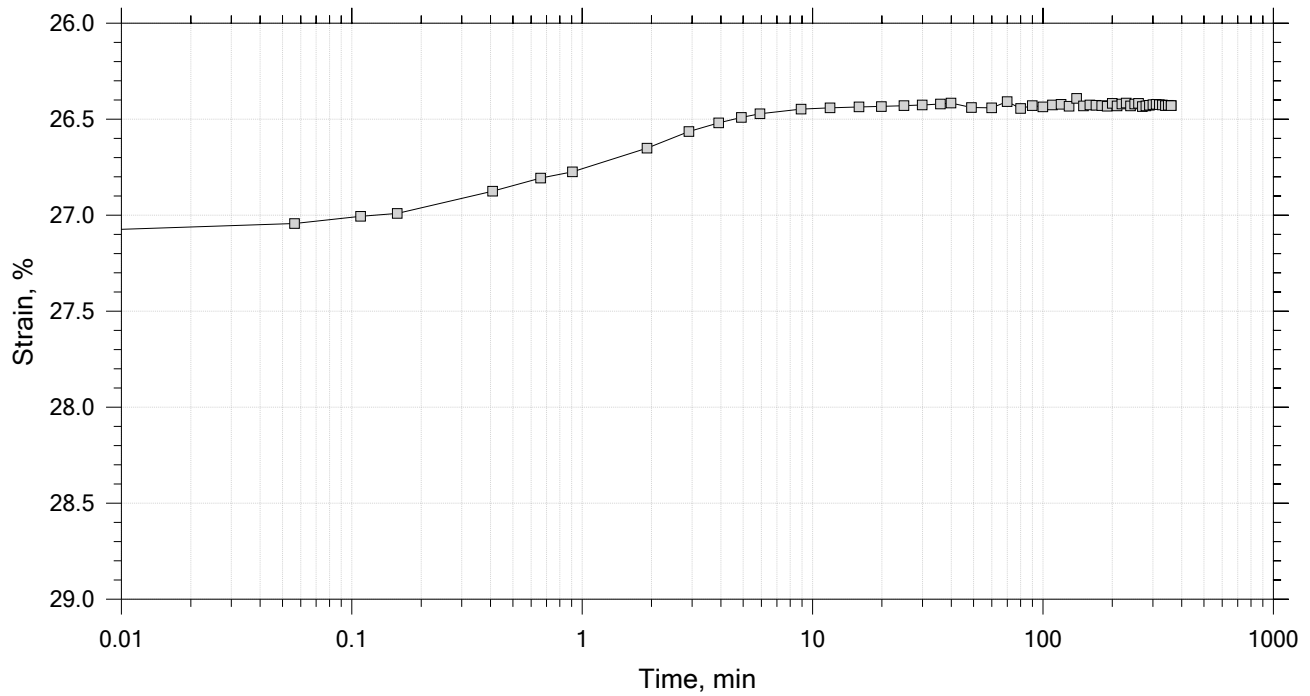
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	Boring No.: BB-BFB1-202	Tested By: md	Checked By: mcm
	Sample No.: U-2	Test Date: 02/23/21	Depth: 15-17 ft
	Test No.: IP-3	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-C, Swell Pressure = 0.0659 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 12 of 15

Constant Load Step

Stress: 2 tsf



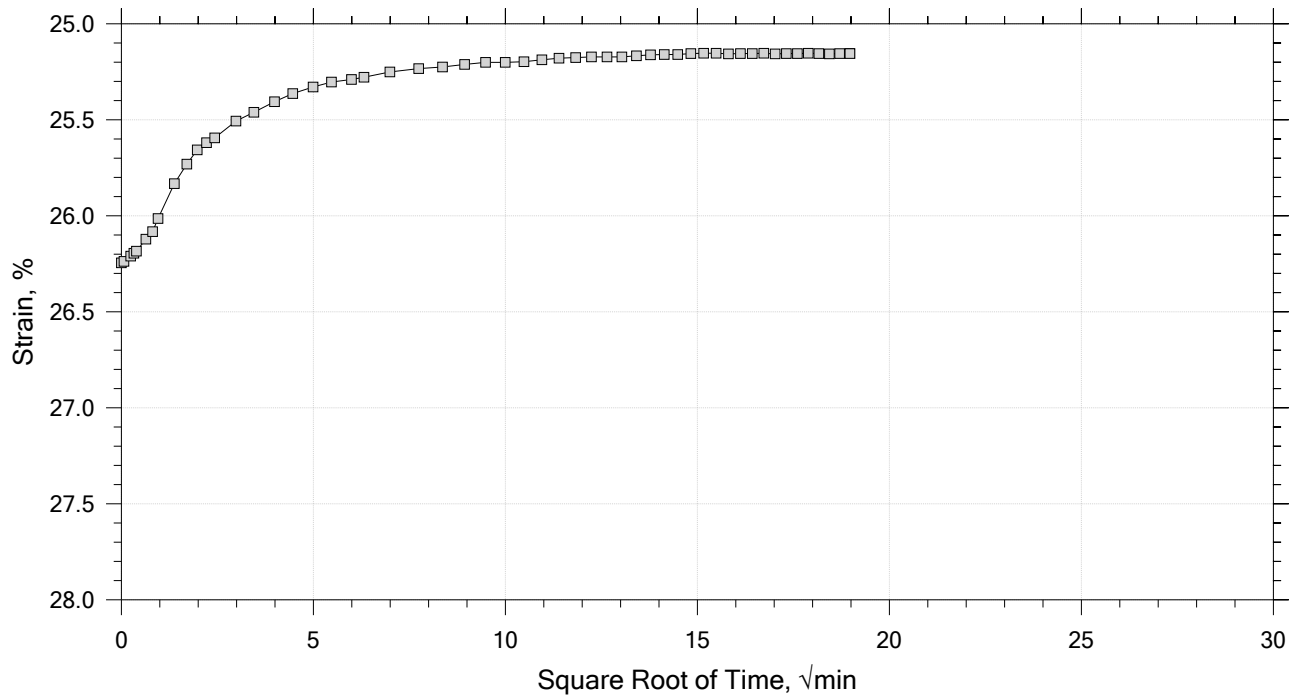
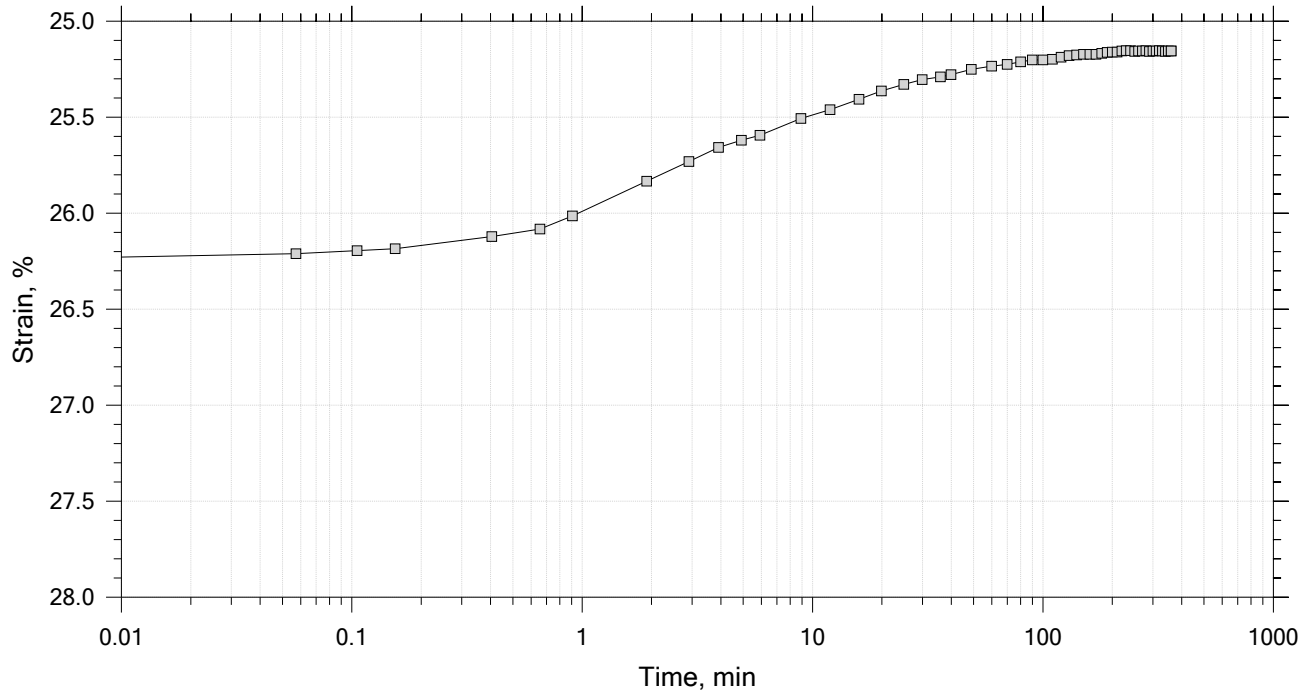
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	Boring No.: BB-BFB1-202	Tested By: md	Checked By: mcm
	Sample No.: U-2	Test Date: 02/23/21	Depth: 15-17 ft
	Test No.: IP-3	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-C, Swell Pressure = 0.0659 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 13 of 15

Constant Load Step

Stress: 0.5 tsf



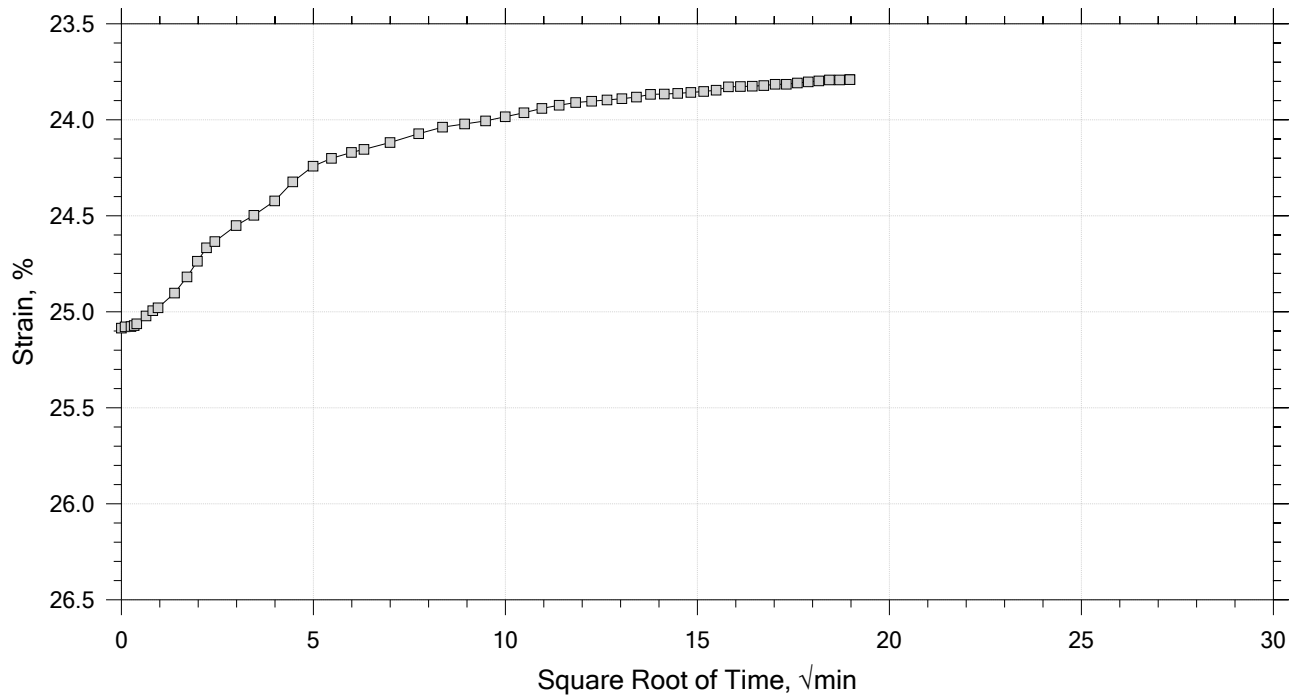
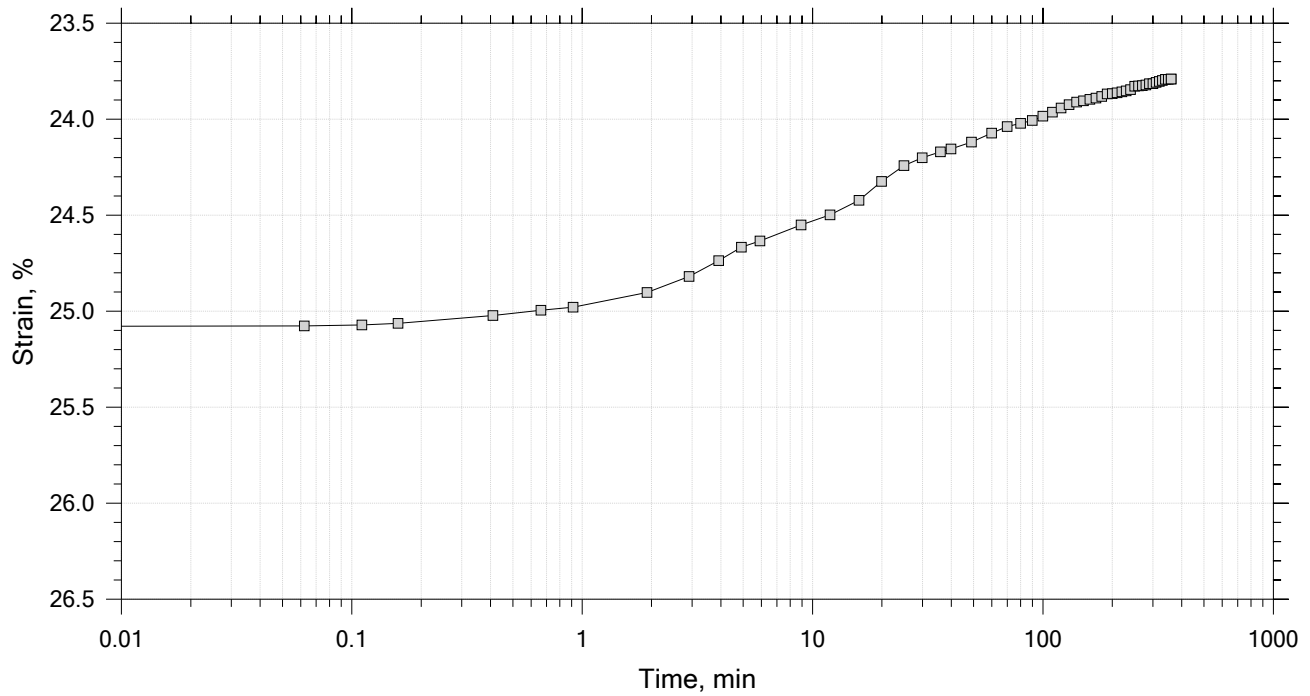
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	Boring No.: BB-BFB1-202	Tested By: md	Checked By: mcm
	Sample No.: U-2	Test Date: 02/23/21	Depth: 15-17 ft
	Test No.: IP-3	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-C, Swell Pressure = 0.0659 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 14 of 15

Constant Load Step

Stress: 0.125 tsf



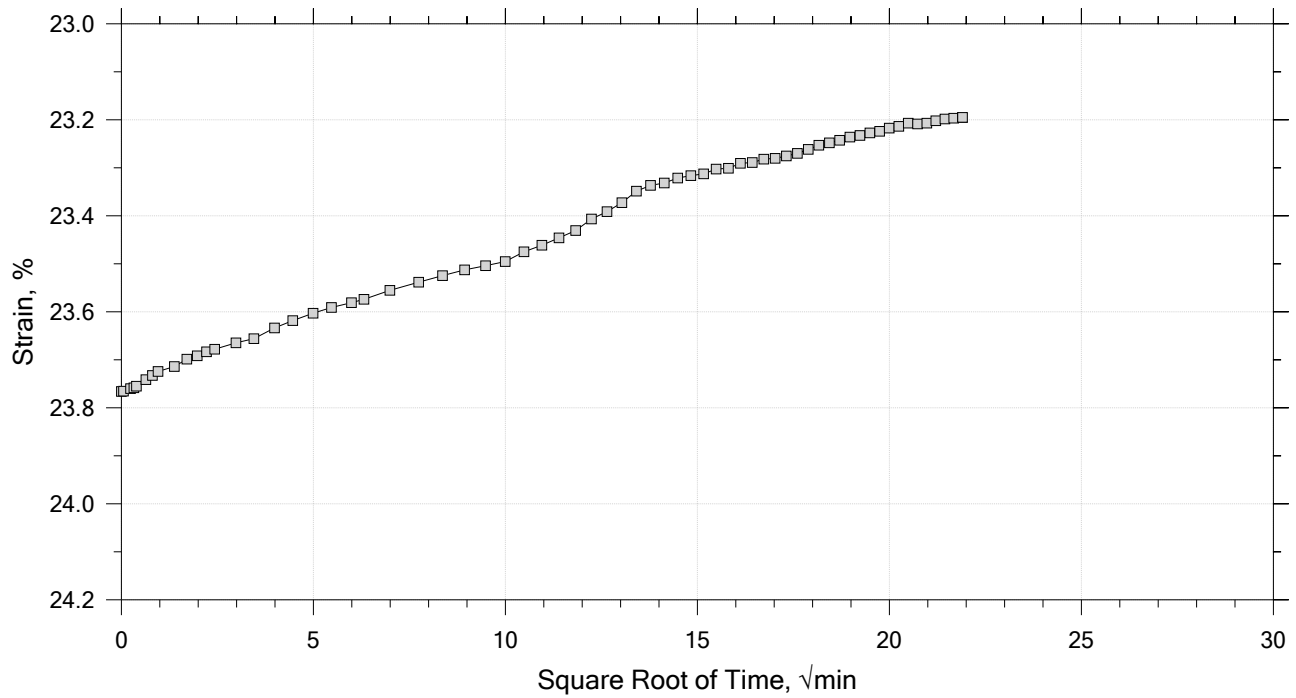
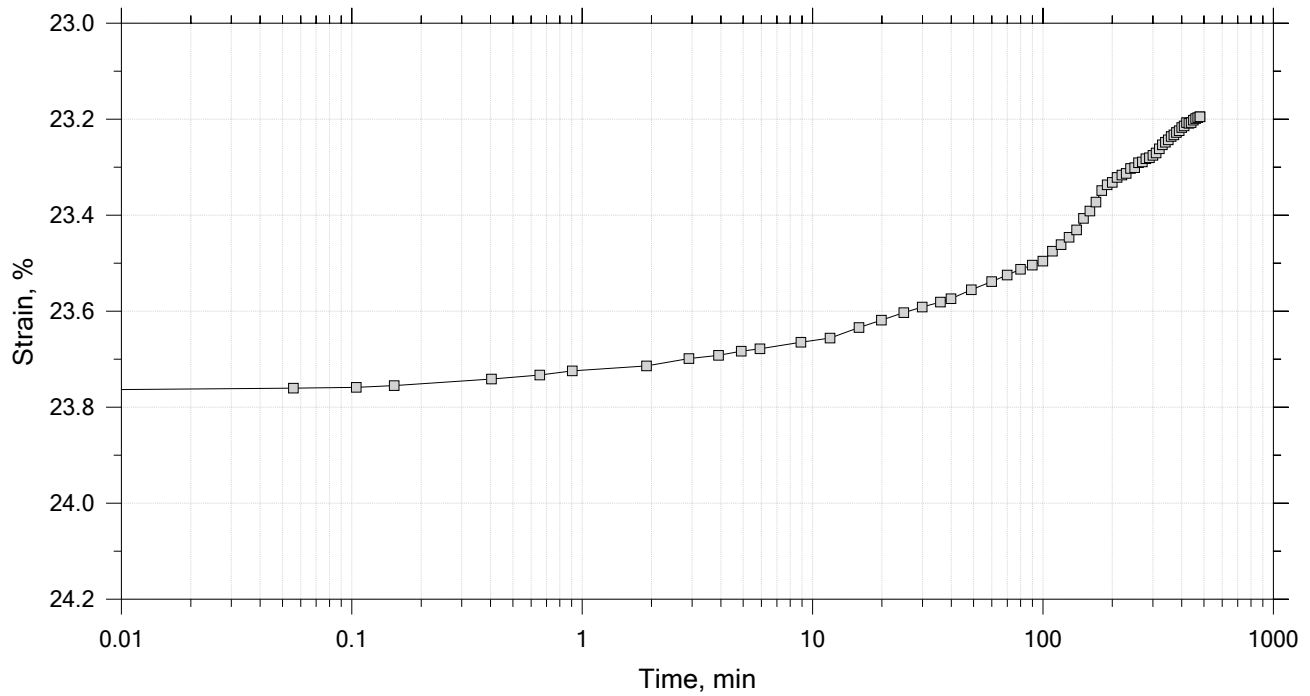
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	Boring No.: BB-BFB1-202	Tested By: md	Checked By: mcm
	Sample No.: U-2	Test Date: 02/23/21	Depth: 15-17 ft
	Test No.: IP-3	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-C, Swell Pressure = 0.0659 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 15 of 15

Constant Load Step

Stress: 0.0625 tsf




	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: BB-BFB1-202	Tested By: md	Checked By: mcm
	Sample No.: U-2	Test Date: 02/23/21	Depth: 15-17 ft
	Test No.: IP-3	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-C, Swell Pressure = 0.0659 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Specimen Diameter: 2.50 in	Estimated Specific Gravity: 2.76	Liquid Limit: 37
Initial Height: 1.00 in	Initial Void Ratio: 1.02	Plastic Limit: 20
Final Height: 0.77 in	Final Void Ratio: 0.551	Plasticity Index: 17

	Before Test Trimmings	Before Test Specimen	After Test Specimen	After Test Trimmings
Container ID	E-0468	RING		E2507
Mass Container, gm	8.27	109.94	109.94	8.18
Mass Container + Wet Soil, gm	84.03	258.8	241.73	139.81
Mass Container + Dry Soil, gm	63.81	219.79	219.79	117.9
Mass Dry Soil, gm	55.54	109.85	109.85	109.72
Water Content, %	36.41	35.51	19.97	19.97
Void Ratio	---	1.02	0.55	---
Degree of Saturation, %	---	96.09	100.00	---
Dry Unit Weight, pcf	---	85.255	111	---


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: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: BB-BFB1-202	Tested By: md	Checked By: mcm
	Sample No.: U-2	Test Date: 02/23/21	Depth: 15-17 ft
	Test No.: IP-3	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-C, Swell Pressure = 0.0659 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

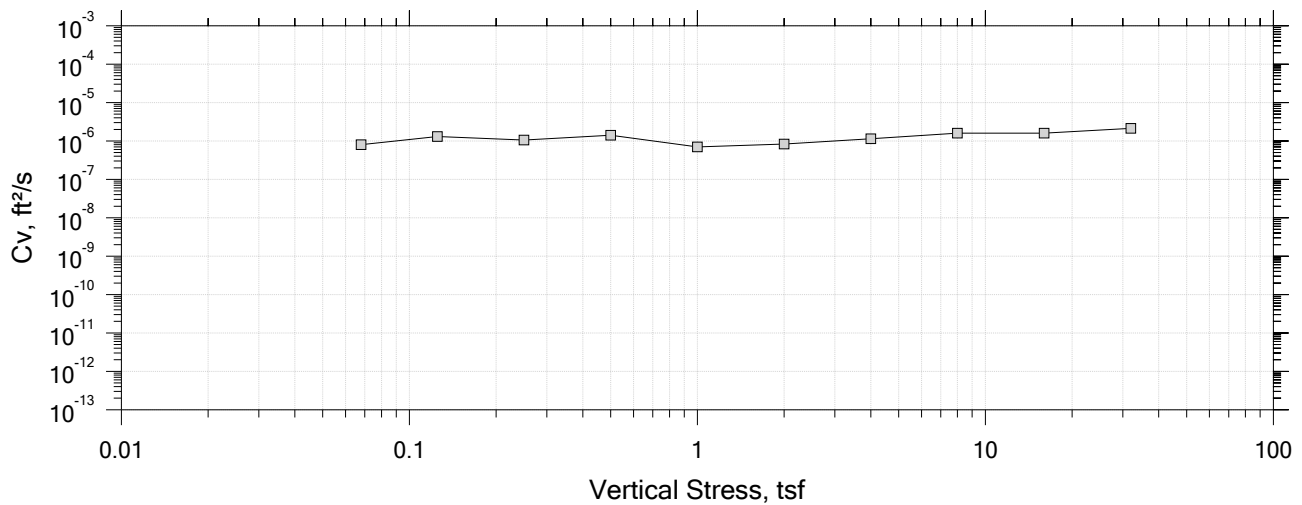
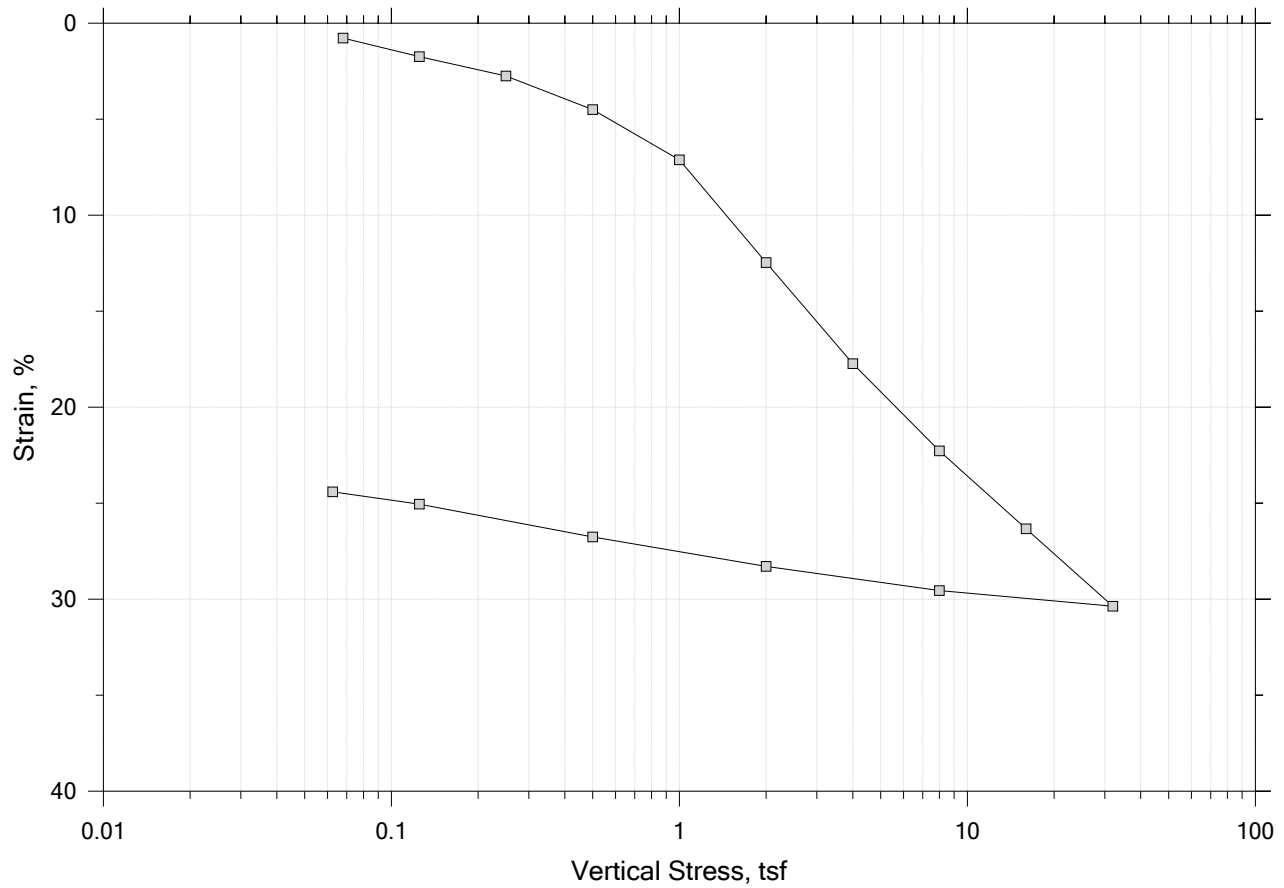
Square Root of Time Coefficients


[illegible]

	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: BB-BFB1-202	Tested By: md	Checked By: mcm
	Sample No.: U-2	Test Date: 02/23/21	Depth: 15-17 ft
	Test No.: IP-3	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIIC-C, Swell Pressure = 0.0659 tsf		
	Displacement at End of Increment		

One-Dimensional Consolidation by ASTM D2435 - Method B

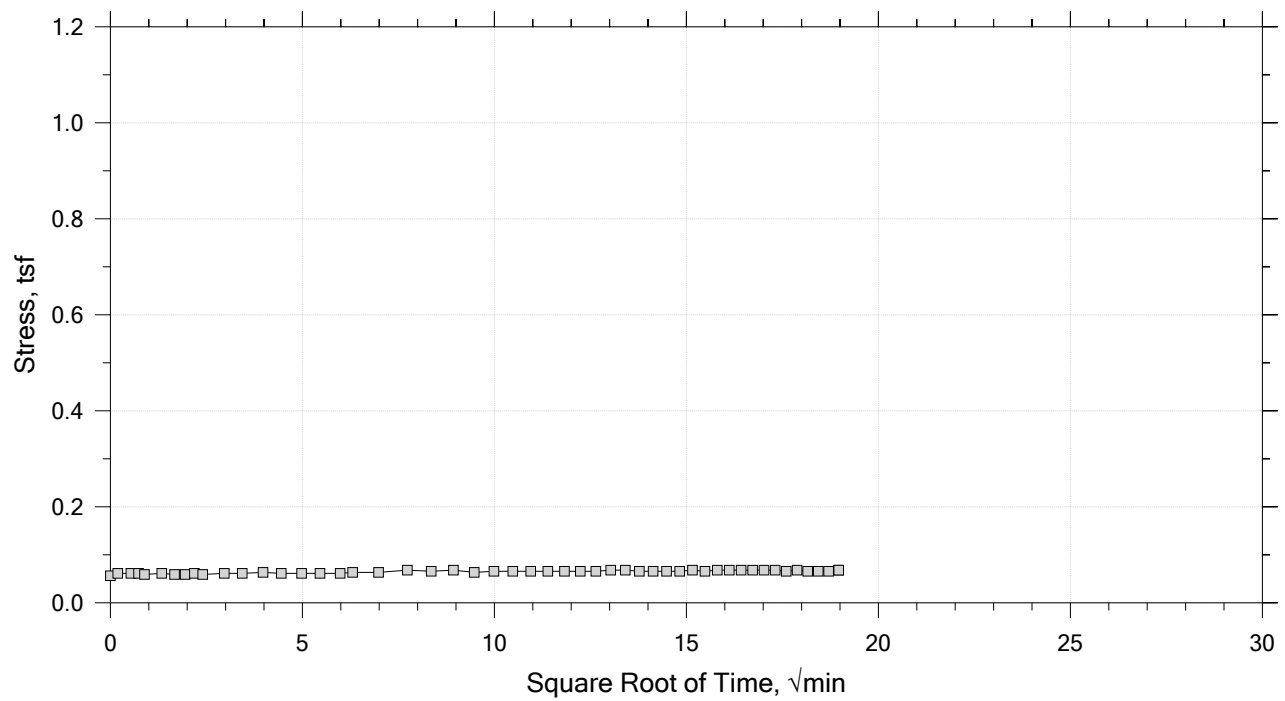
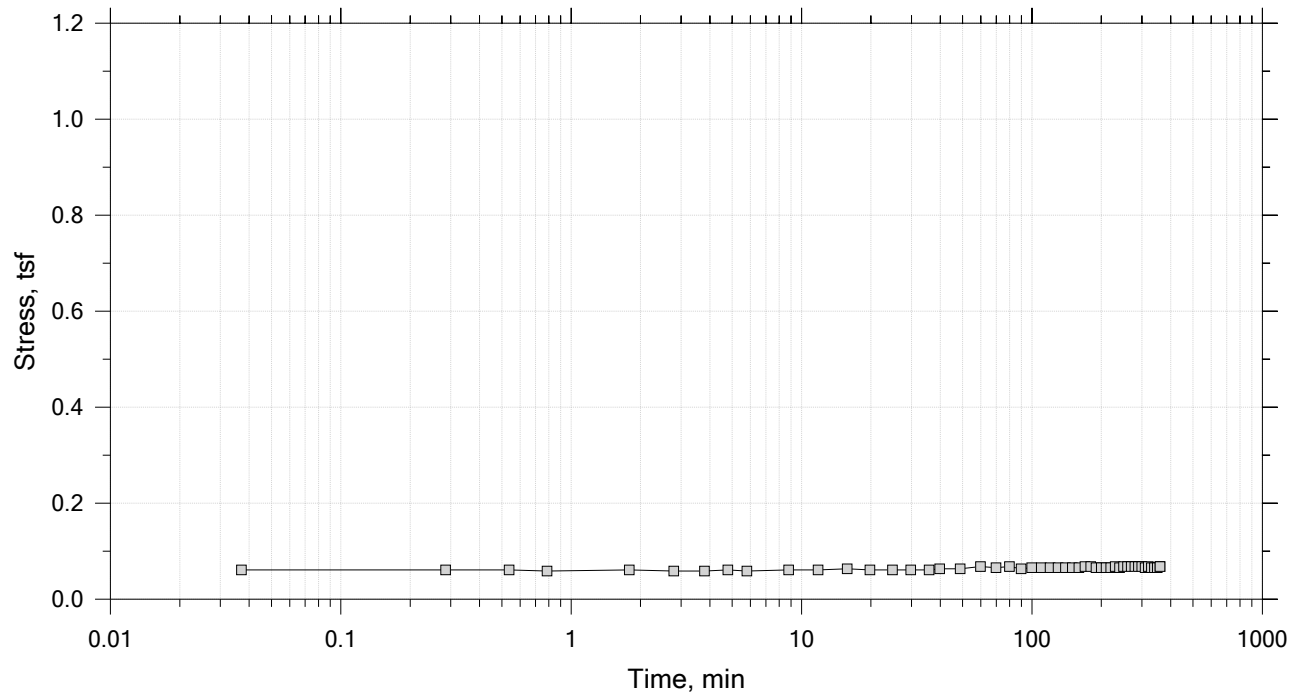
Summary Report




	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: BB-BFB-202	Tested By: md	Checked By: mcm
	Sample No.: U-1	Test Date: 03/05/21	Depth: 18-20
	Test No.: IP-17	Sample Type: Intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System X, Swell Pressure = 0.0679 tsf		
	Displacement at End of Increment		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 1 of 15
Constant Volume Step
Stress: 0.0679 tsf



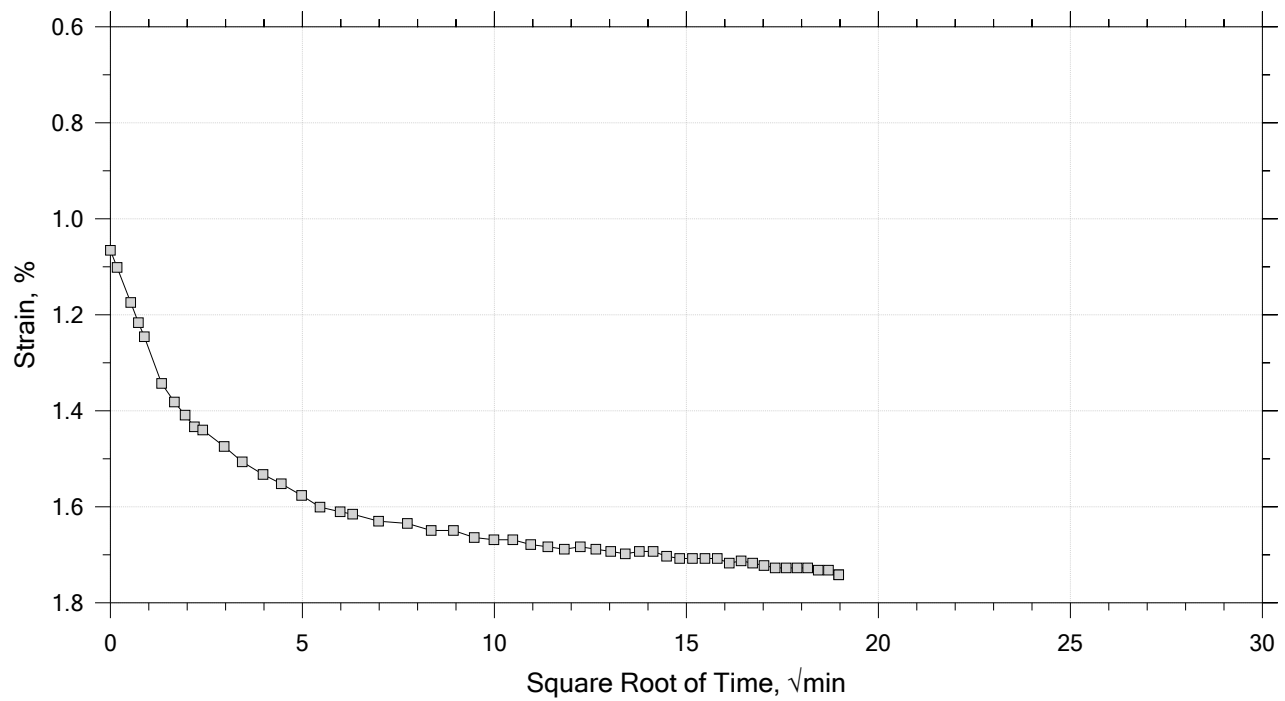
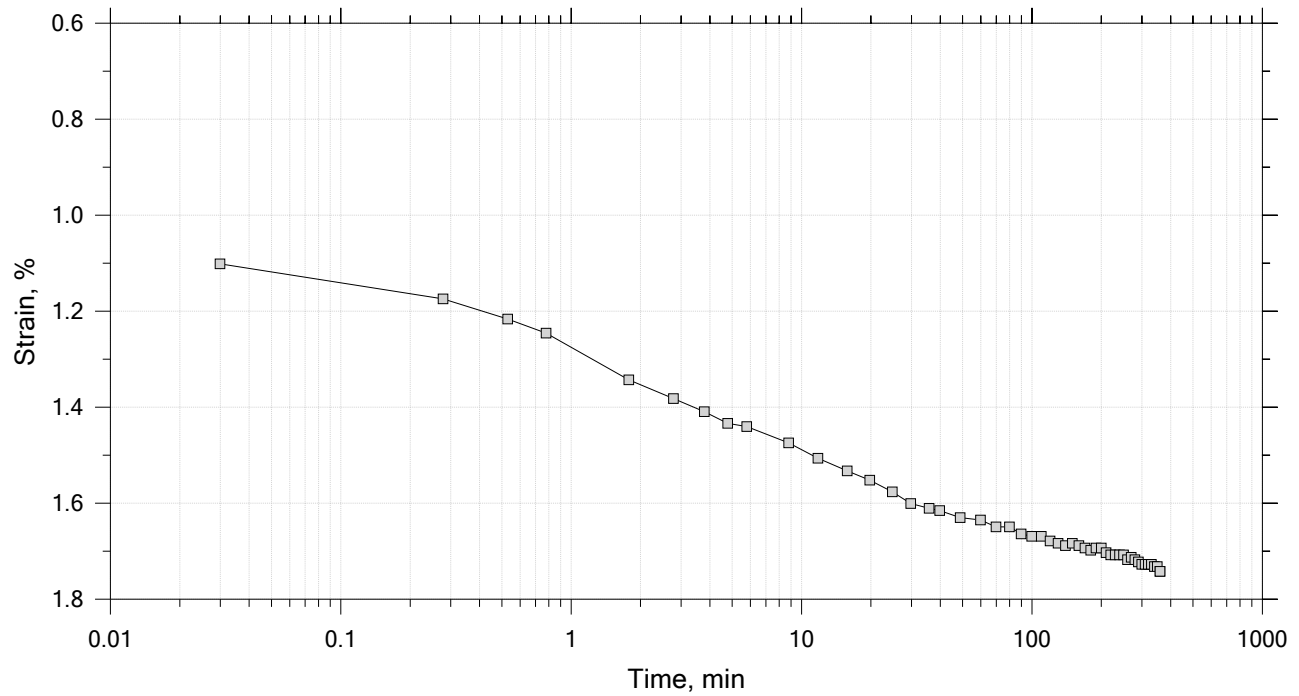
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	Boring No.: BB-BFB-202	Tested By: md	Checked By: mcm
	Sample No.: U-1	Test Date: 03/05/21	Depth: 18-20
	Test No.: IP-17	Sample Type: Intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System X, Swell Pressure = 0.0679 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 2 of 15

Constant Load Step

Stress: 0.125 tsf



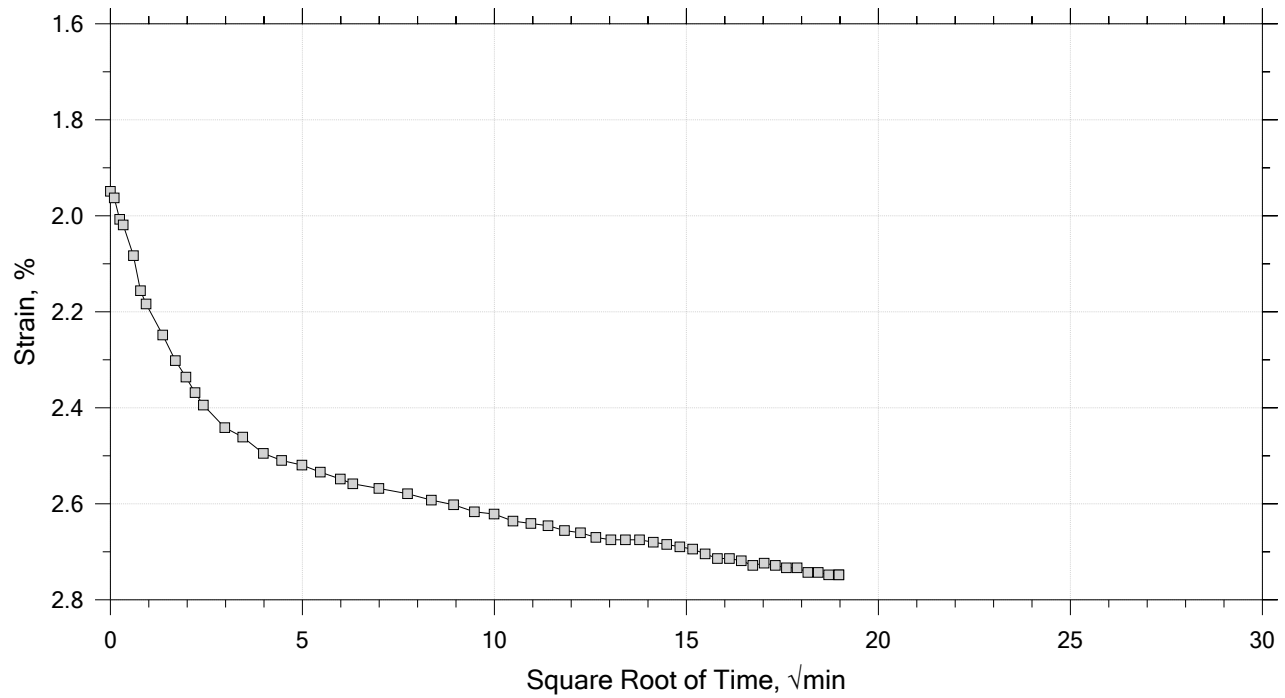
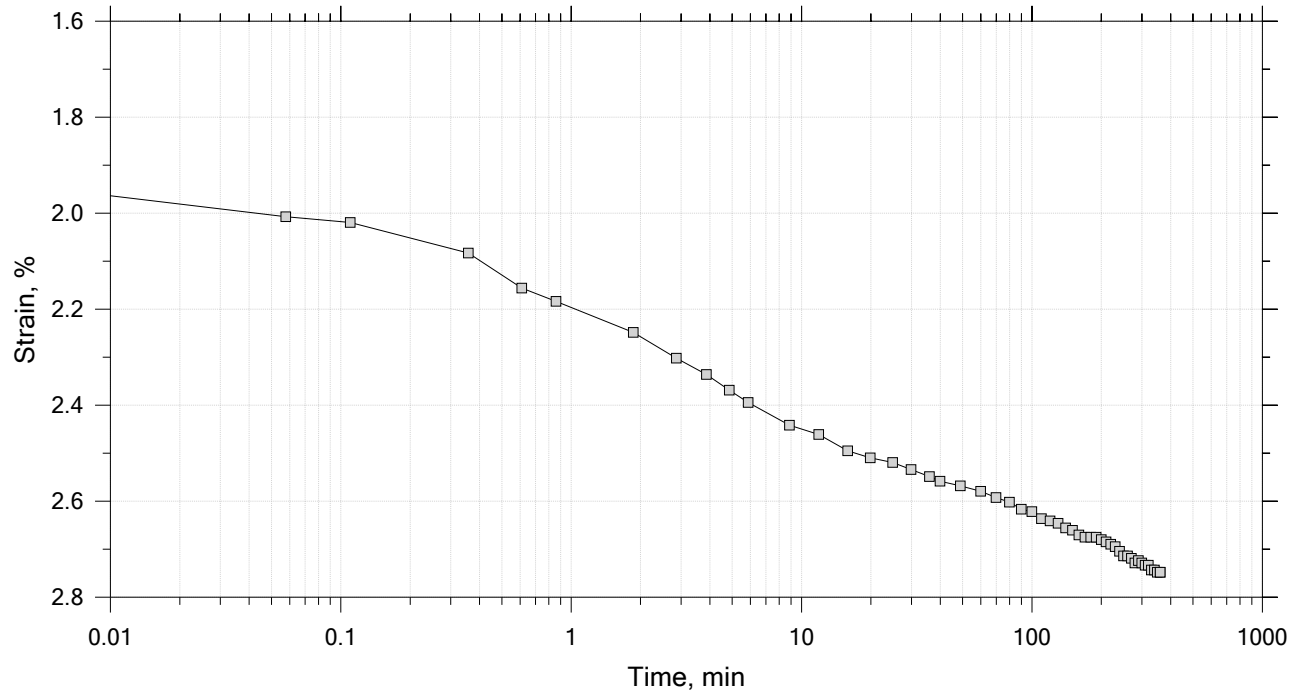
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	Boring No.: BB-BFB-202	Tested By: md	Checked By: mcm
	Sample No.: U-1	Test Date: 03/05/21	Depth: 18-20
	Test No.: IP-17	Sample Type: Intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System X, Swell Pressure = 0.0679 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 3 of 15

Constant Load Step

Stress: 0.25 tsf



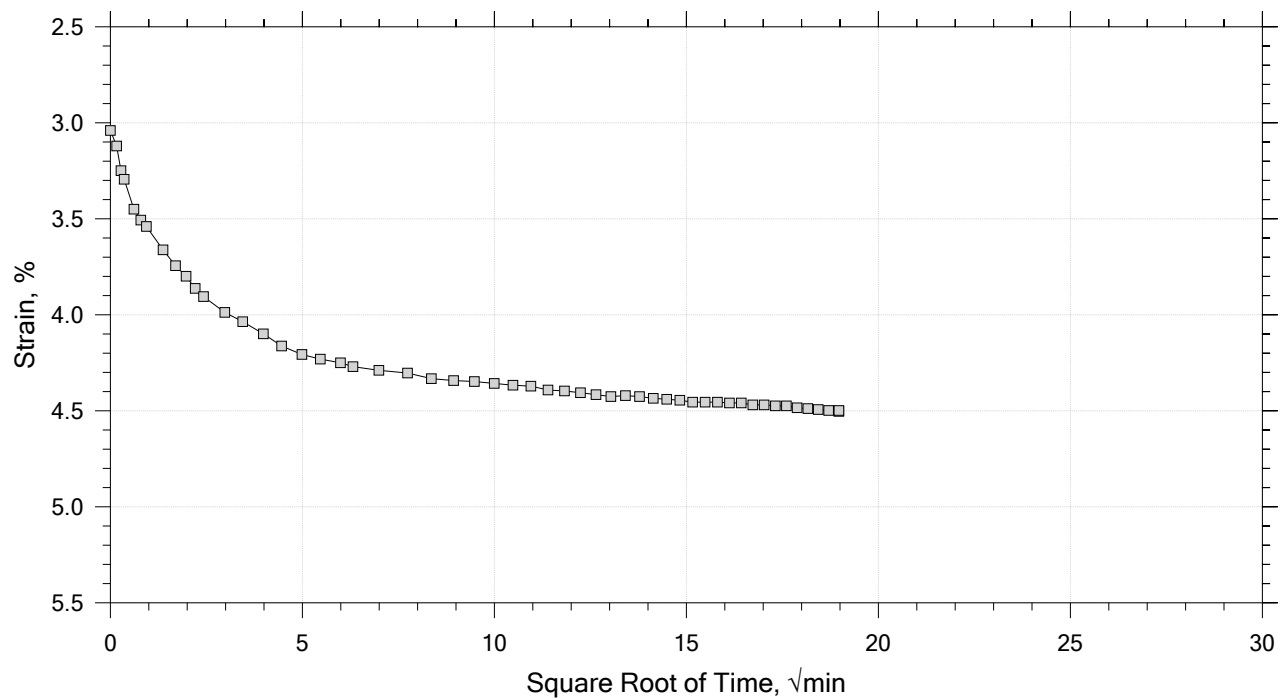
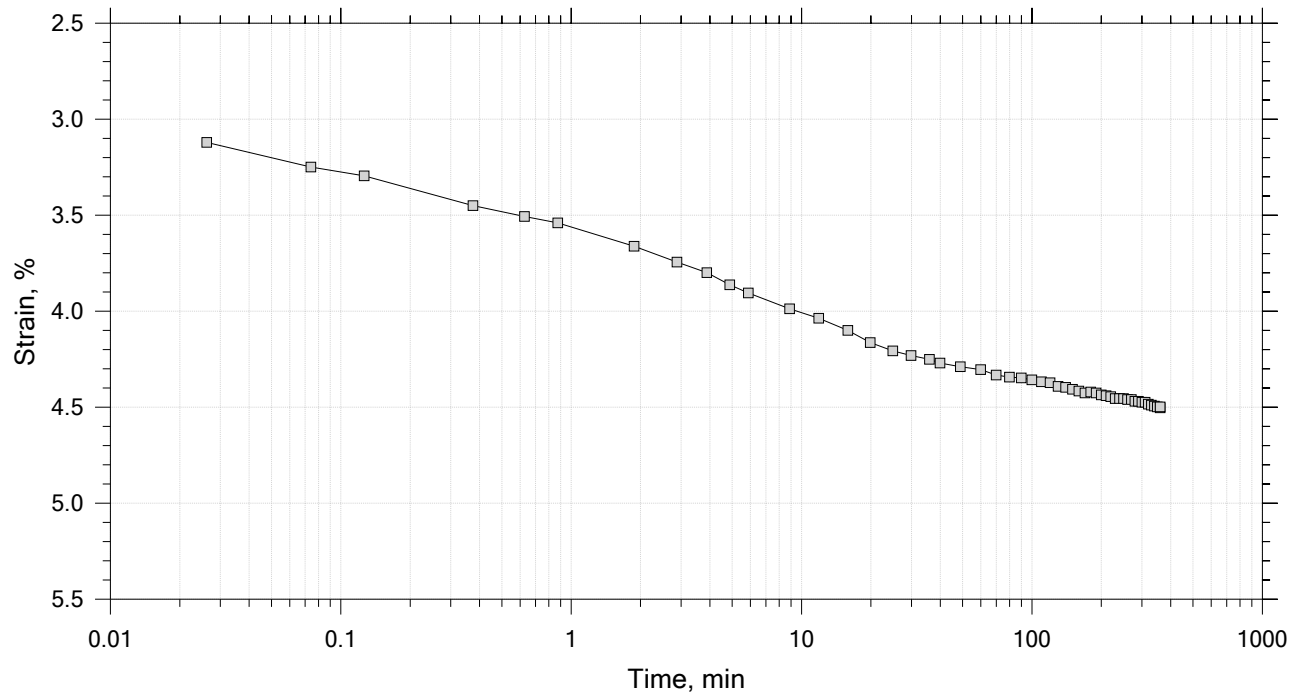
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: BB-BFB-202	Tested By: md	Checked By: mcm
	Sample No.: U-1	Test Date: 03/05/21	Depth: 18-20
	Test No.: IP-17	Sample Type: Intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System X, Swell Pressure = 0.0679 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 4 of 15

Constant Load Step

Stress: 0.5 tsf



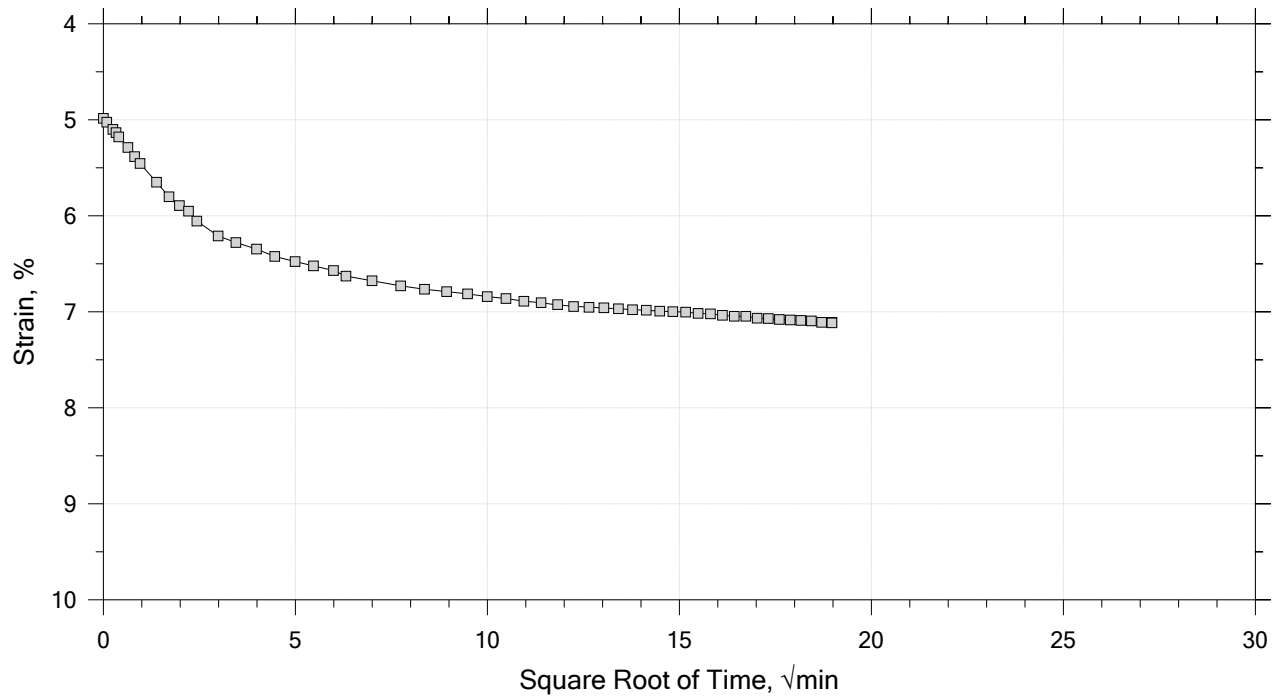
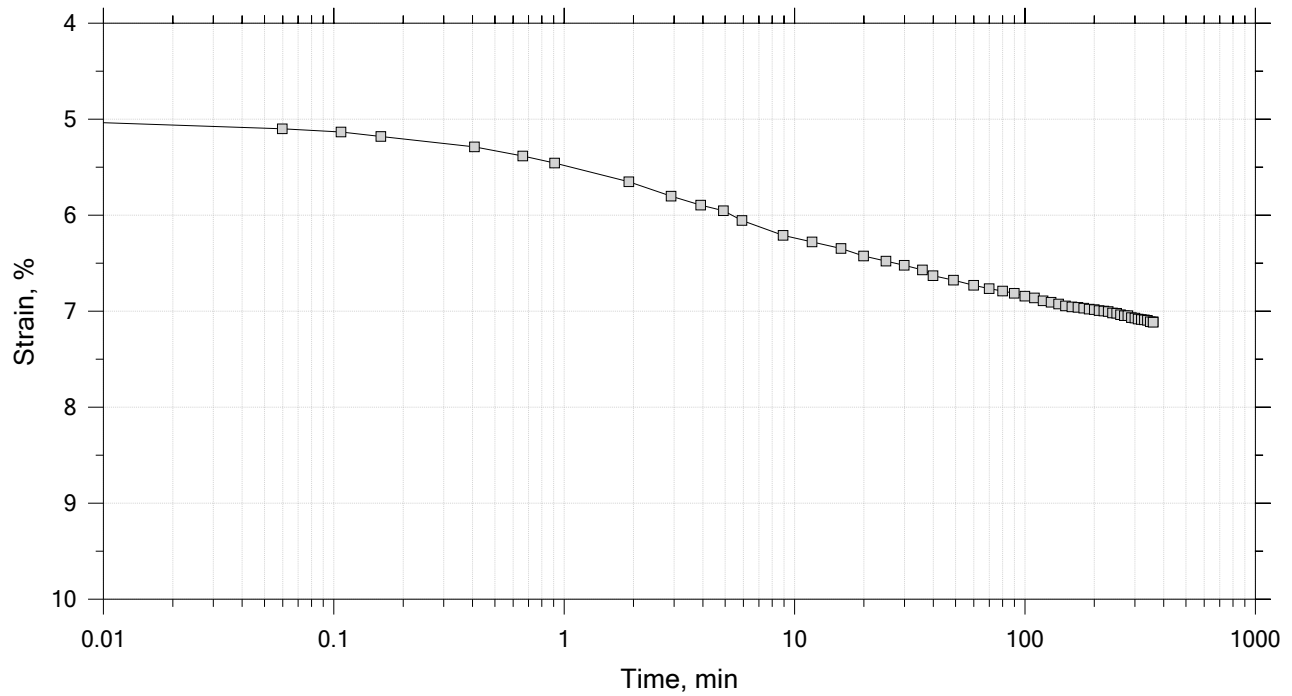
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	Boring No.: BB-BFB-202	Tested By: md	Checked By: mcm
	Sample No.: U-1	Test Date: 03/05/21	Depth: 18-20
	Test No.: IP-17	Sample Type: Intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System X, Swell Pressure = 0.0679 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 5 of 15

Constant Load Step

Stress: 1 tsf



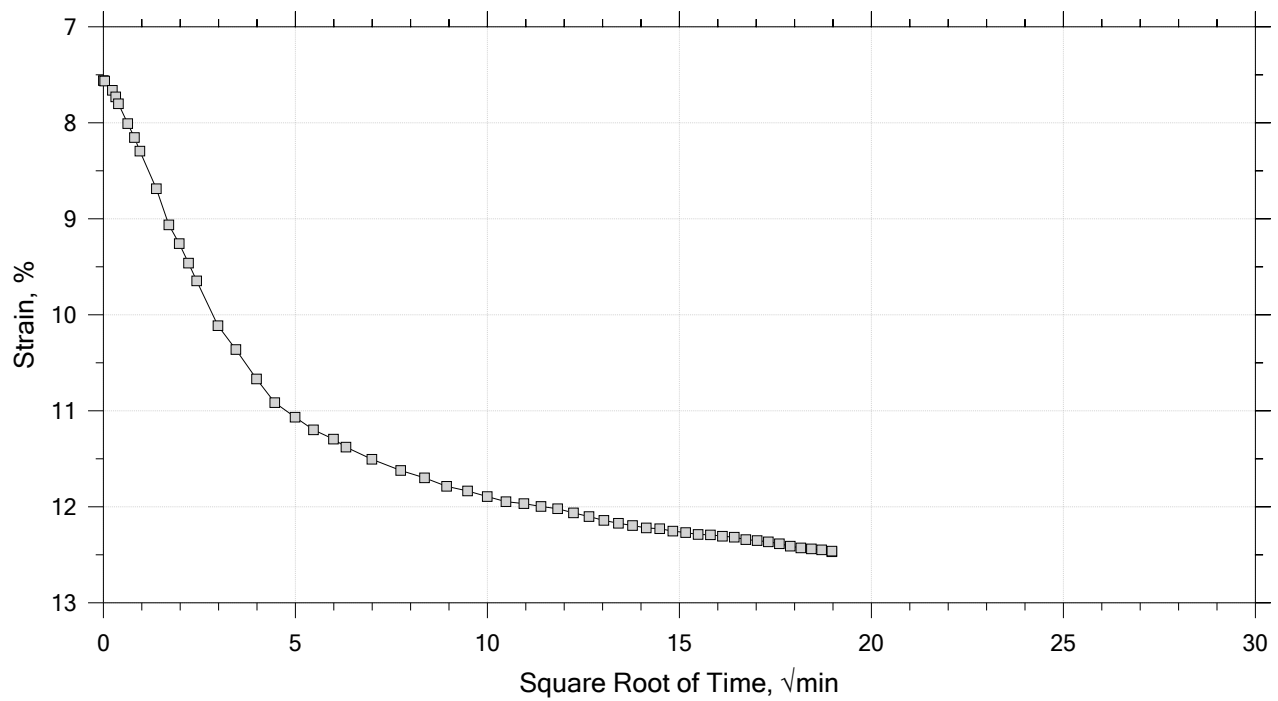
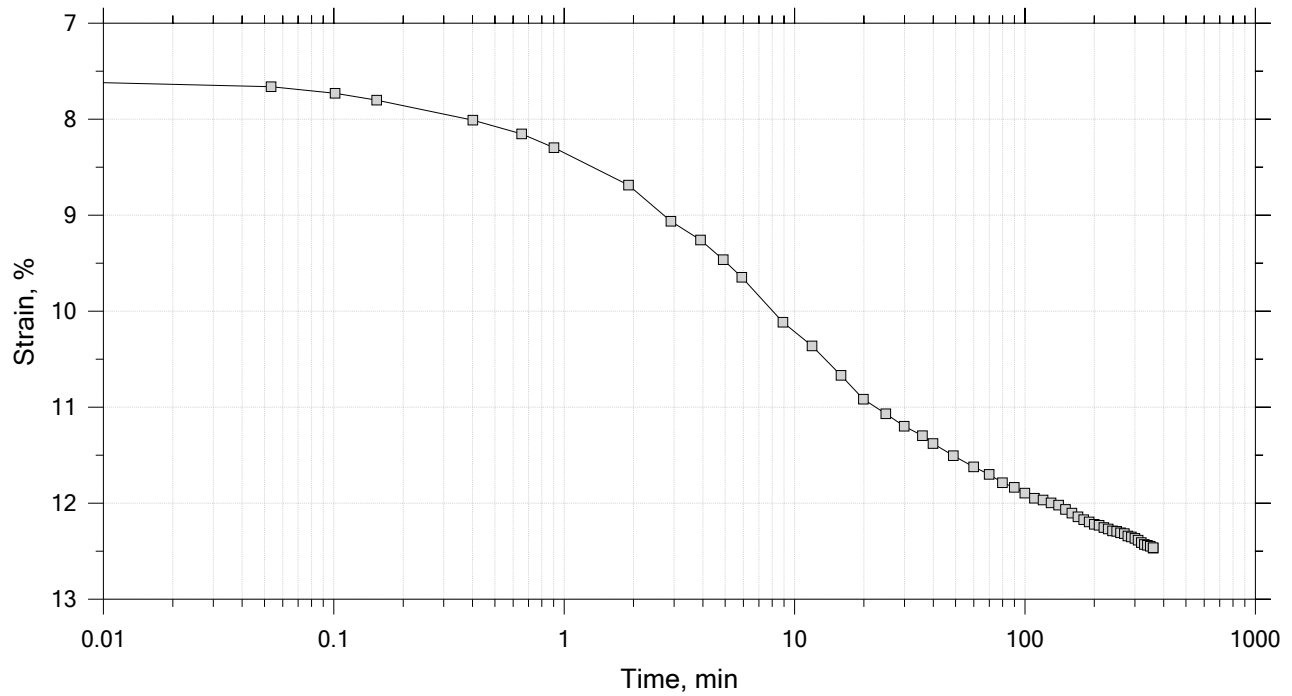
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	Boring No.: BB-BFB-202	Tested By: md	Checked By: mcm
	Sample No.: U-1	Test Date: 03/05/21	Depth: 18-20
	Test No.: IP-17	Sample Type: Intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System X, Swell Pressure = 0.0679 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 6 of 15

Constant Load Step

Stress: 2 tsf



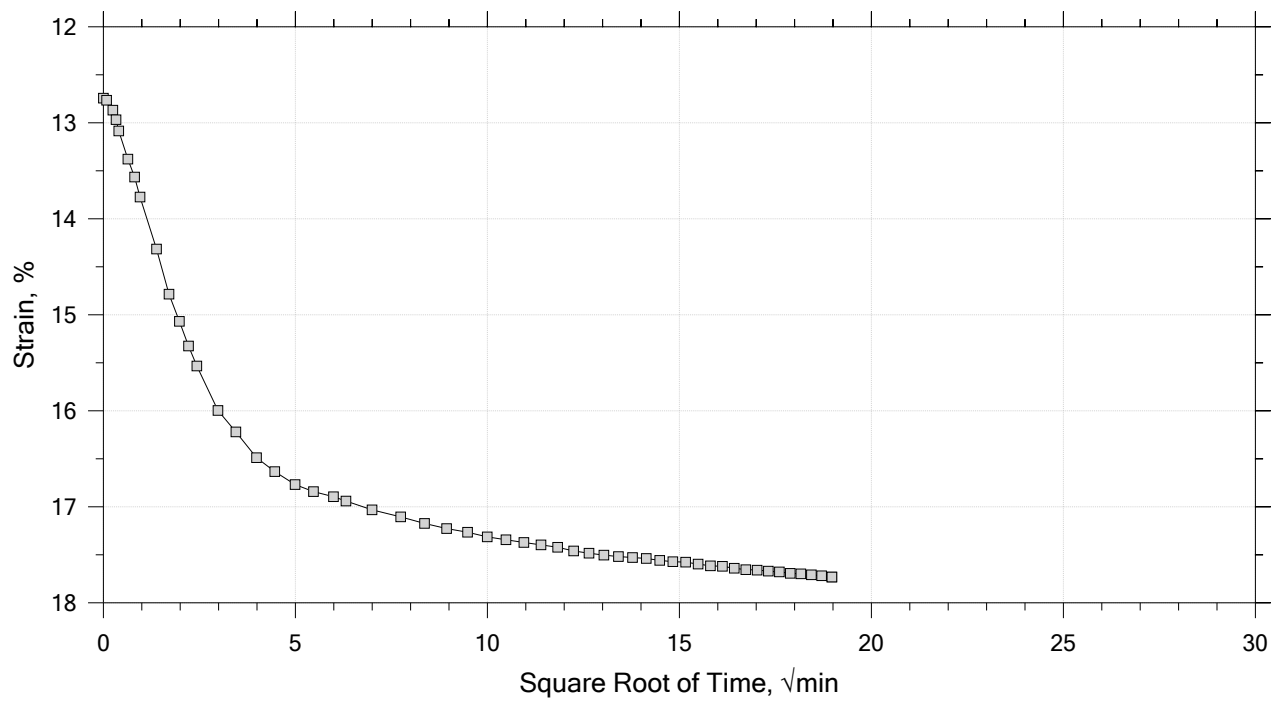
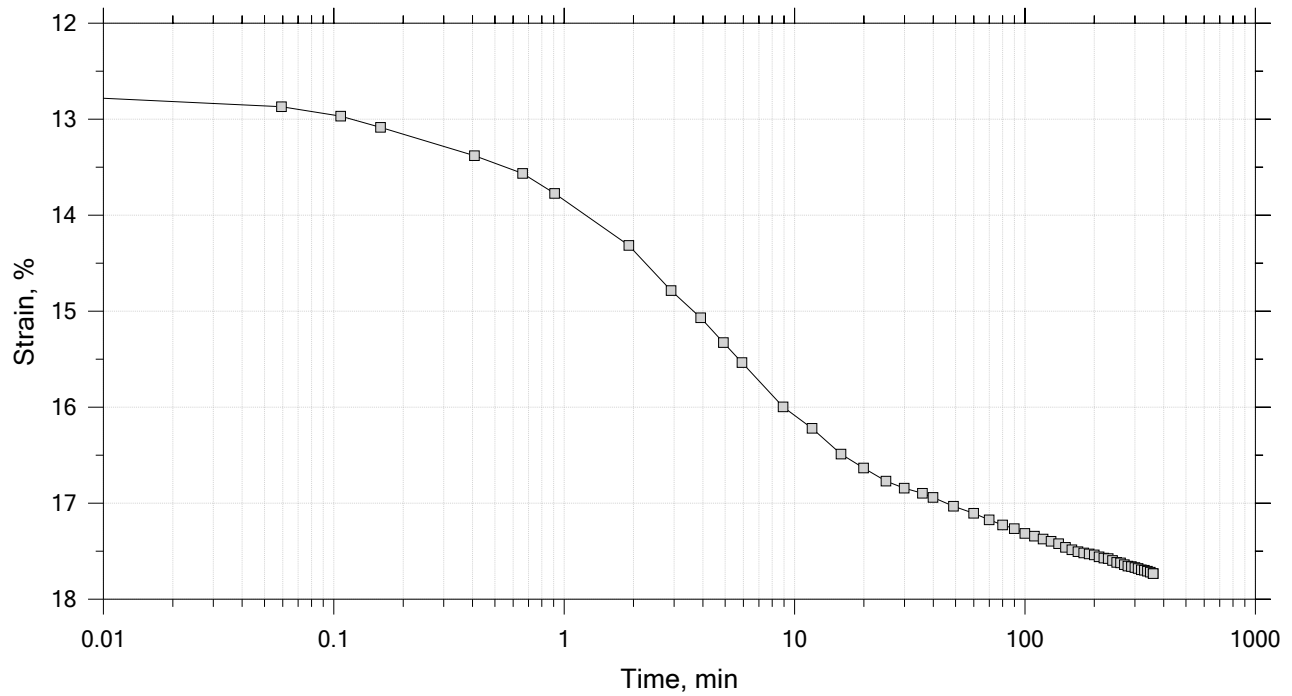
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	Boring No.: BB-BFB-202	Tested By: md	Checked By: mcm
	Sample No.: U-1	Test Date: 03/05/21	Depth: 18-20
	Test No.: IP-17	Sample Type: Intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System X, Swell Pressure = 0.0679 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 7 of 15

Constant Load Step

Stress: 4 tsf



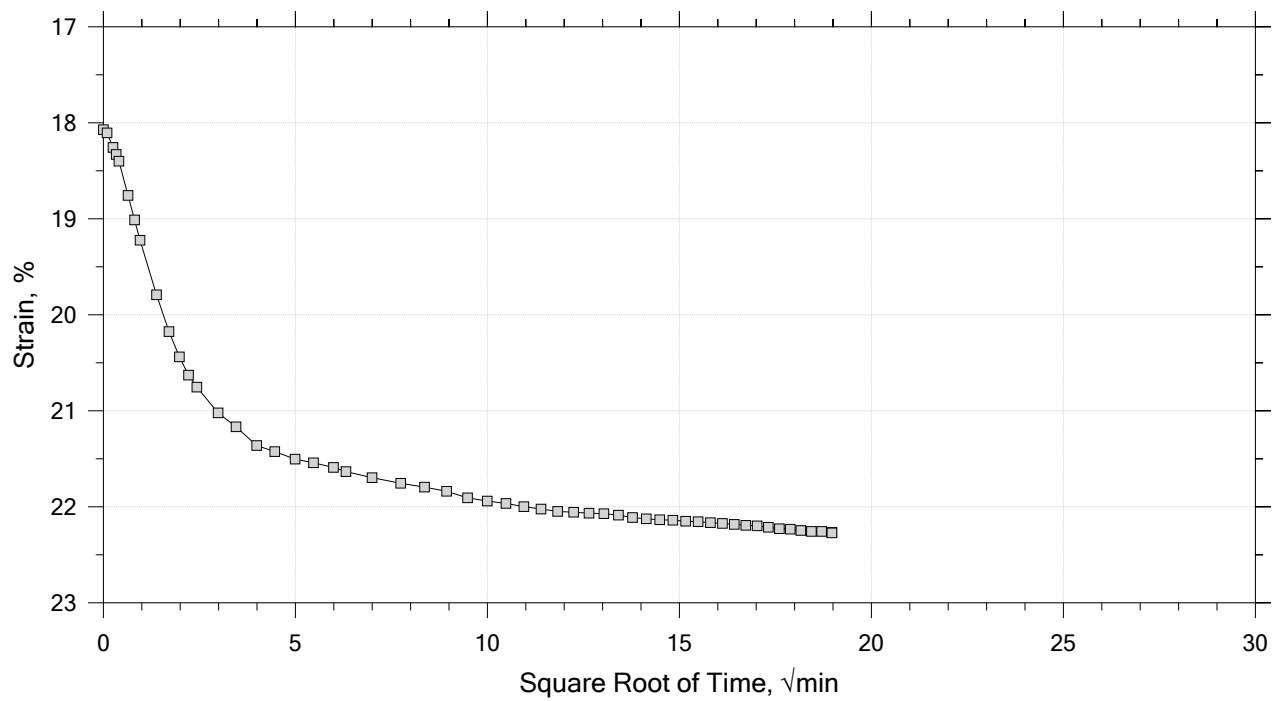
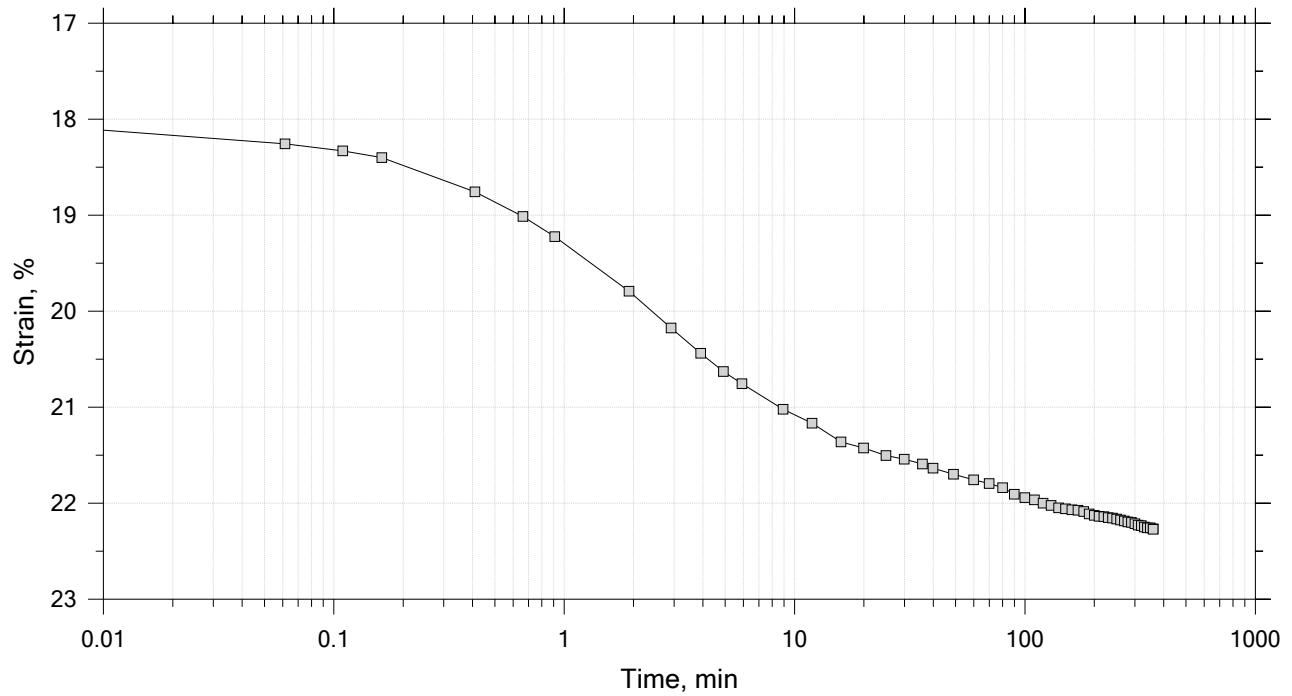
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	Boring No.: BB-BFB-202	Tested By: md	Checked By: mcm
	Sample No.: U-1	Test Date: 03/05/21	Depth: 18-20
	Test No.: IP-17	Sample Type: Intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System X, Swell Pressure = 0.0679 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 8 of 15

Constant Load Step

Stress: 8 tsf



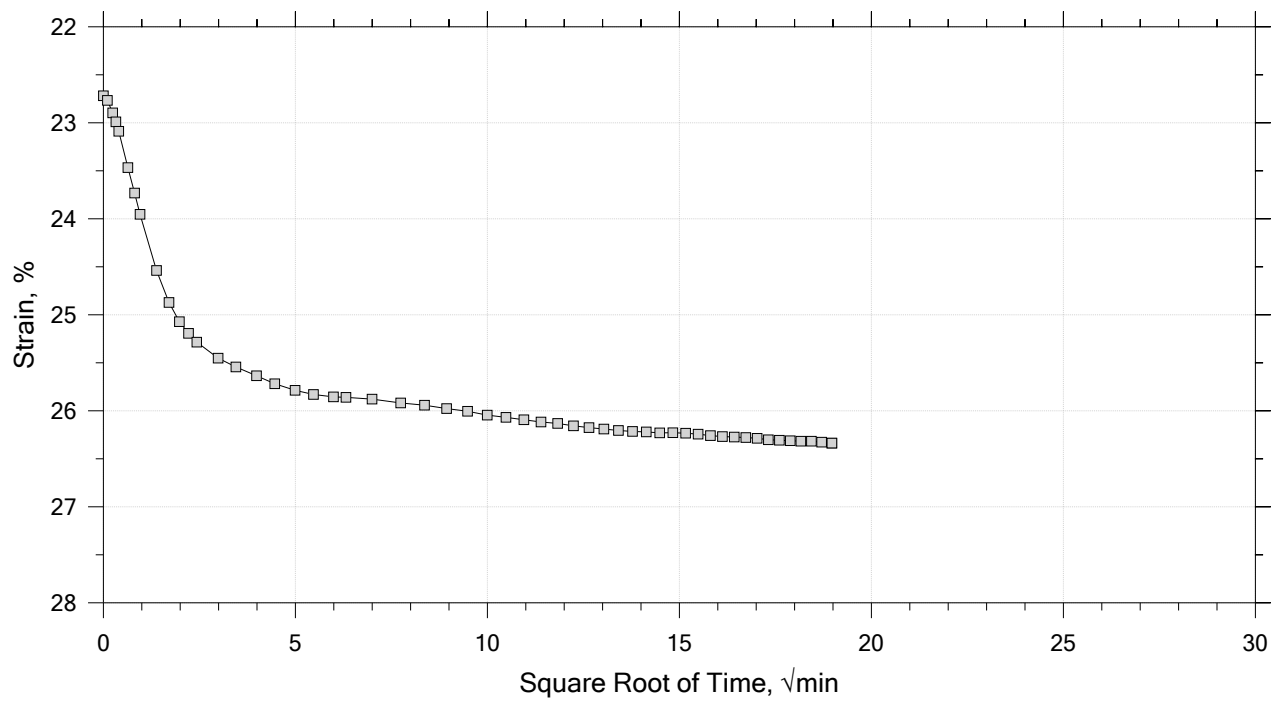
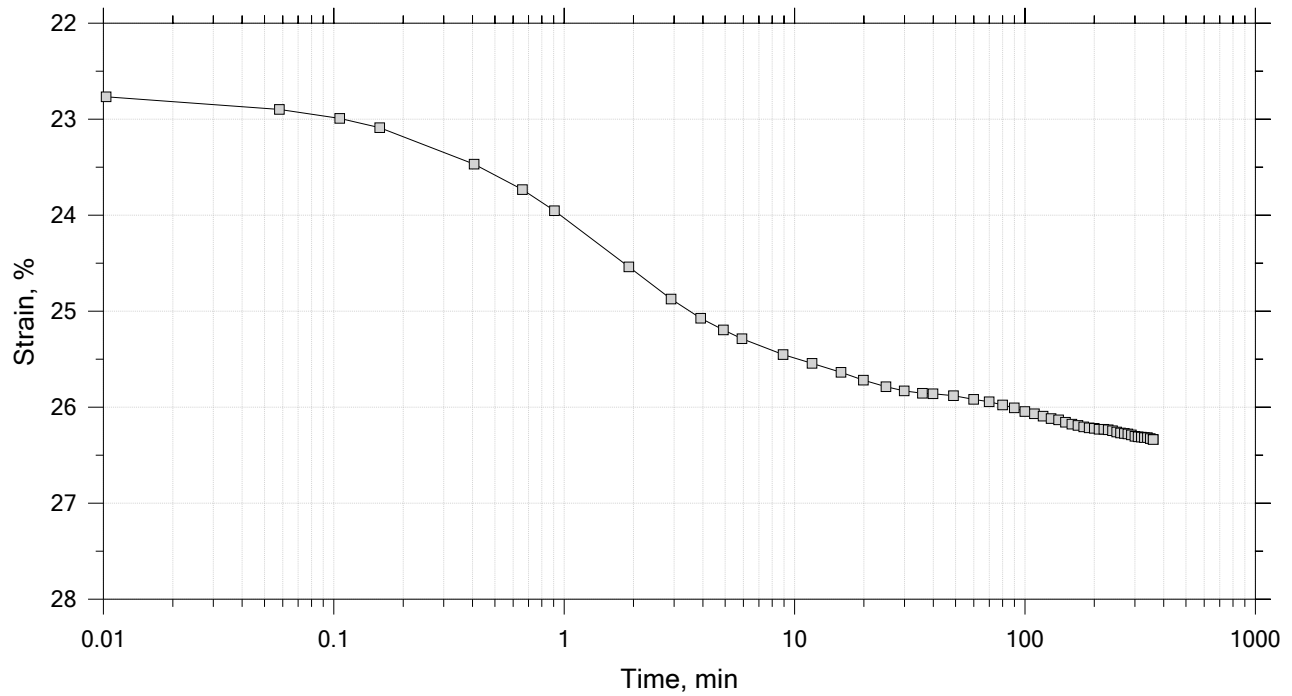
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	Boring No.: BB-BFB-202	Tested By: md	Checked By: mcm
	Sample No.: U-1	Test Date: 03/05/21	Depth: 18-20
	Test No.: IP-17	Sample Type: Intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System X, Swell Pressure = 0.0679 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 9 of 15

Constant Load Step

Stress: 16 tsf



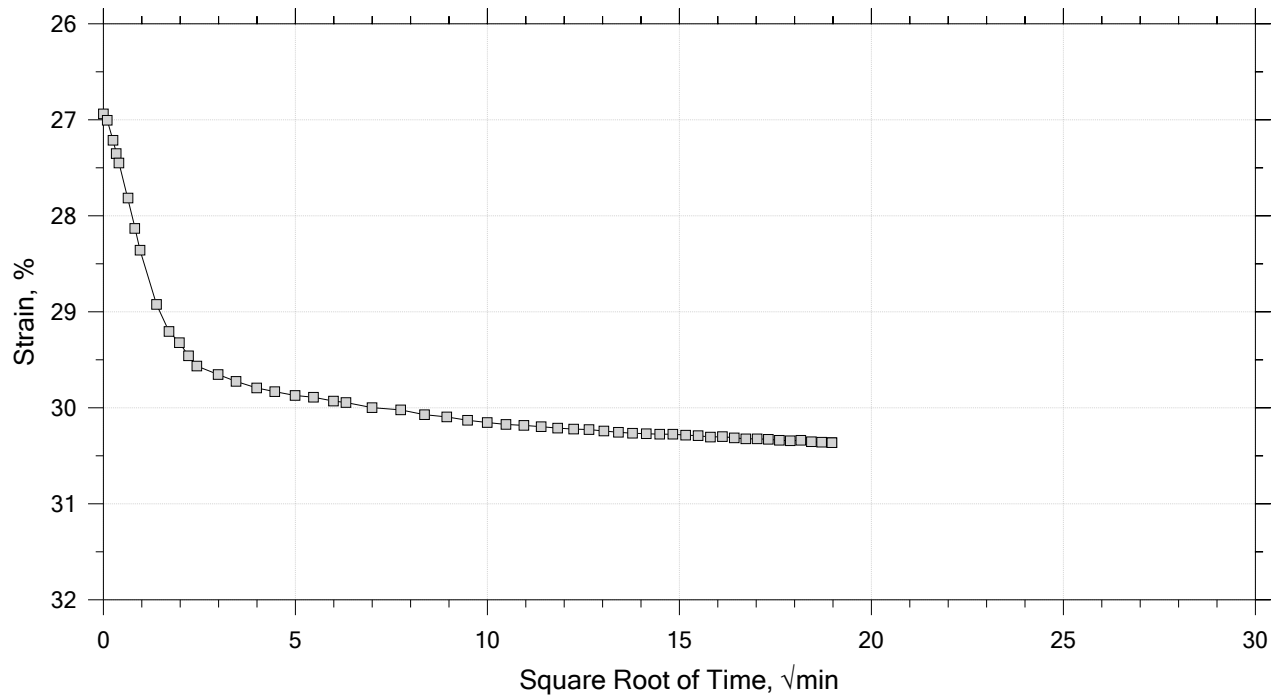
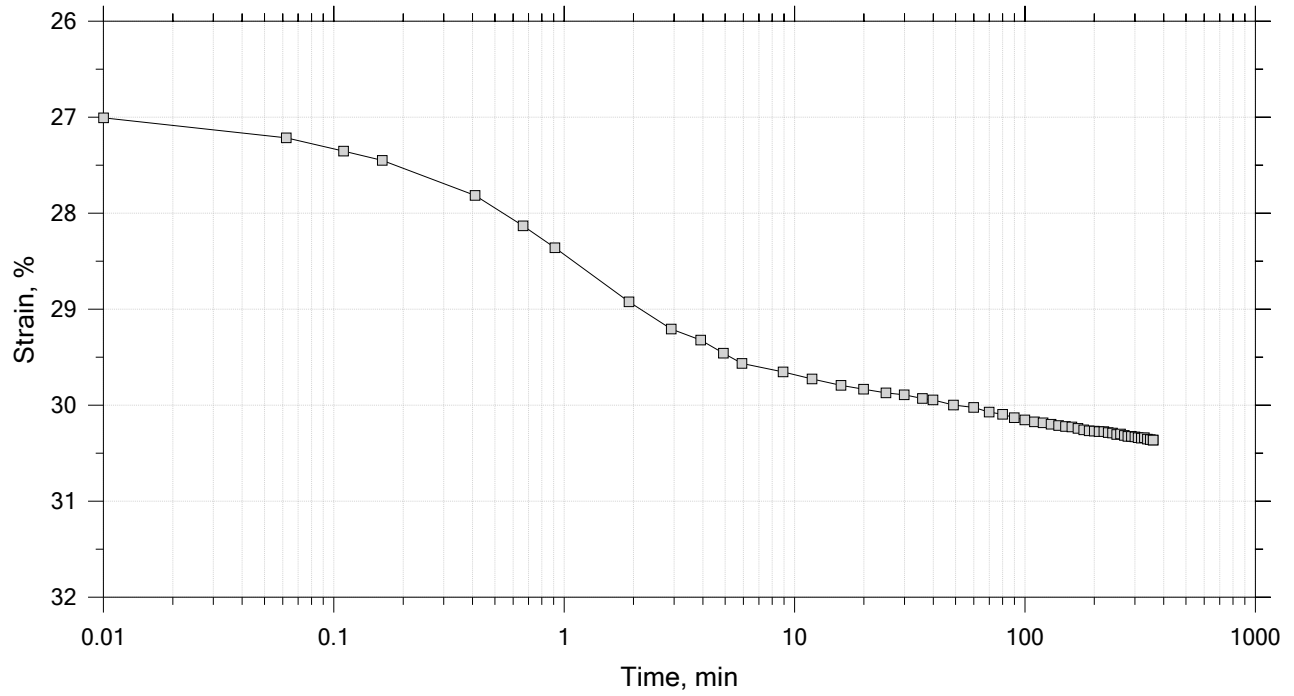
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: BB-BFB-202	Tested By: md	Checked By: mcm
	Sample No.: U-1	Test Date: 03/05/21	Depth: 18-20
	Test No.: IP-17	Sample Type: Intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System X, Swell Pressure = 0.0679 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 10 of 15

Constant Load Step

Stress: 32 tsf



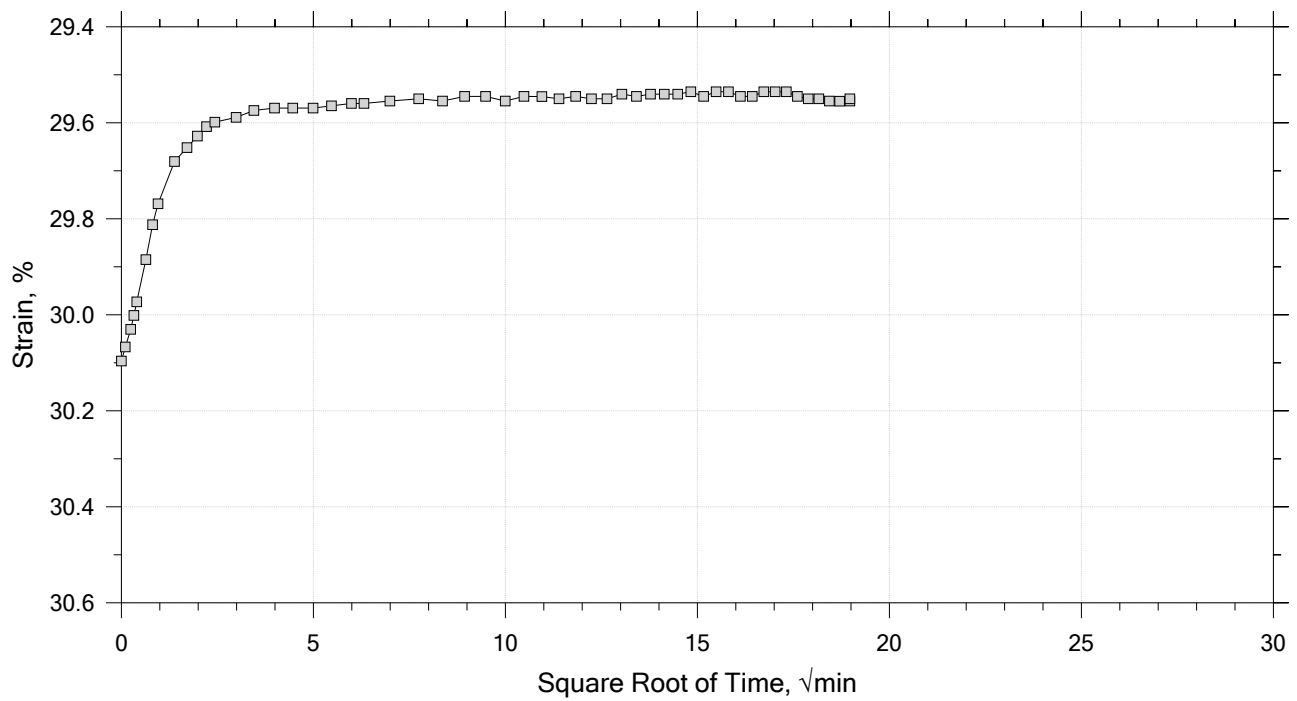
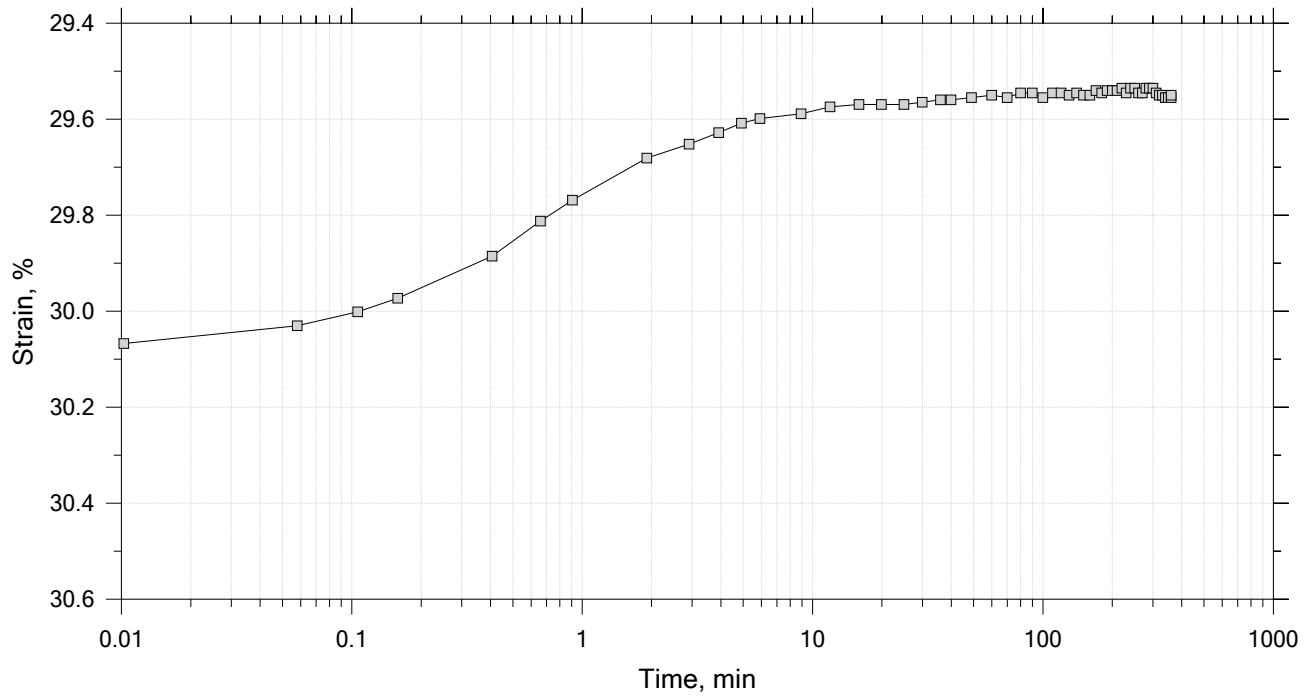
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	Boring No.: BB-BFB-202	Tested By: md	Checked By: mcm
	Sample No.: U-1	Test Date: 03/05/21	Depth: 18-20
	Test No.: IP-17	Sample Type: Intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System X, Swell Pressure = 0.0679 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 11 of 15

Constant Load Step

Stress: 8 tsf



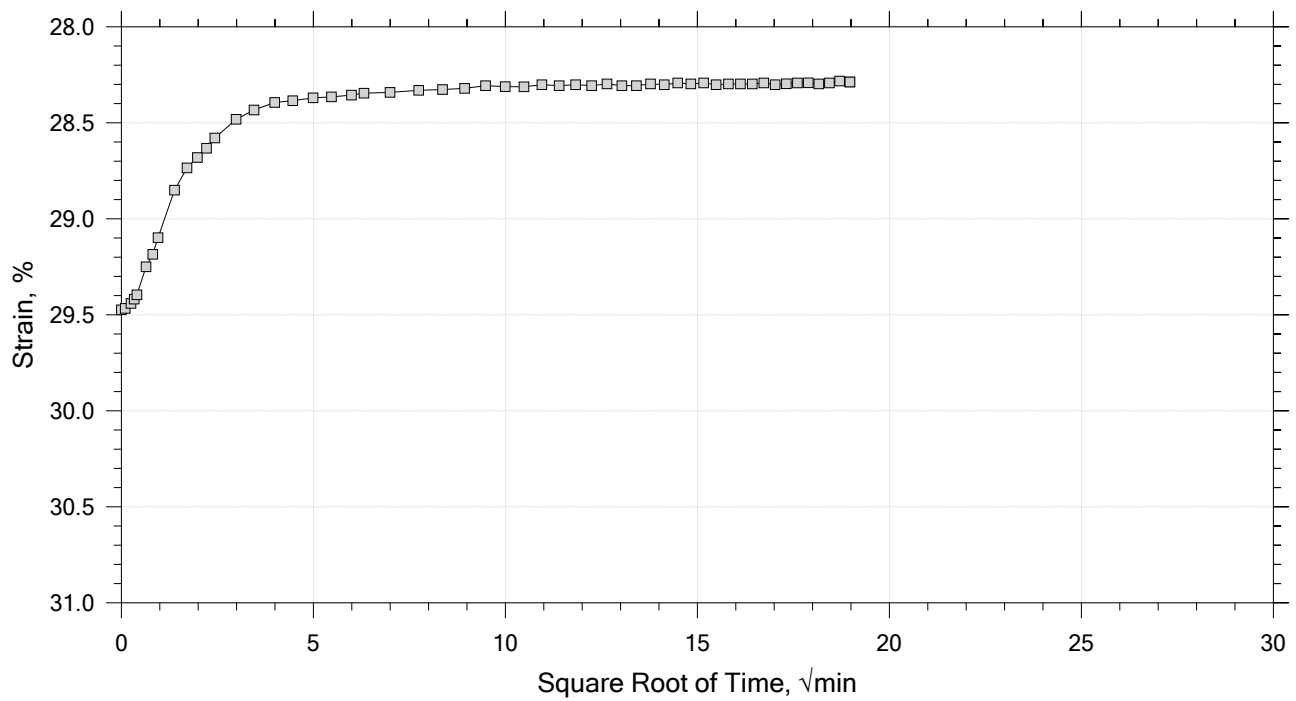
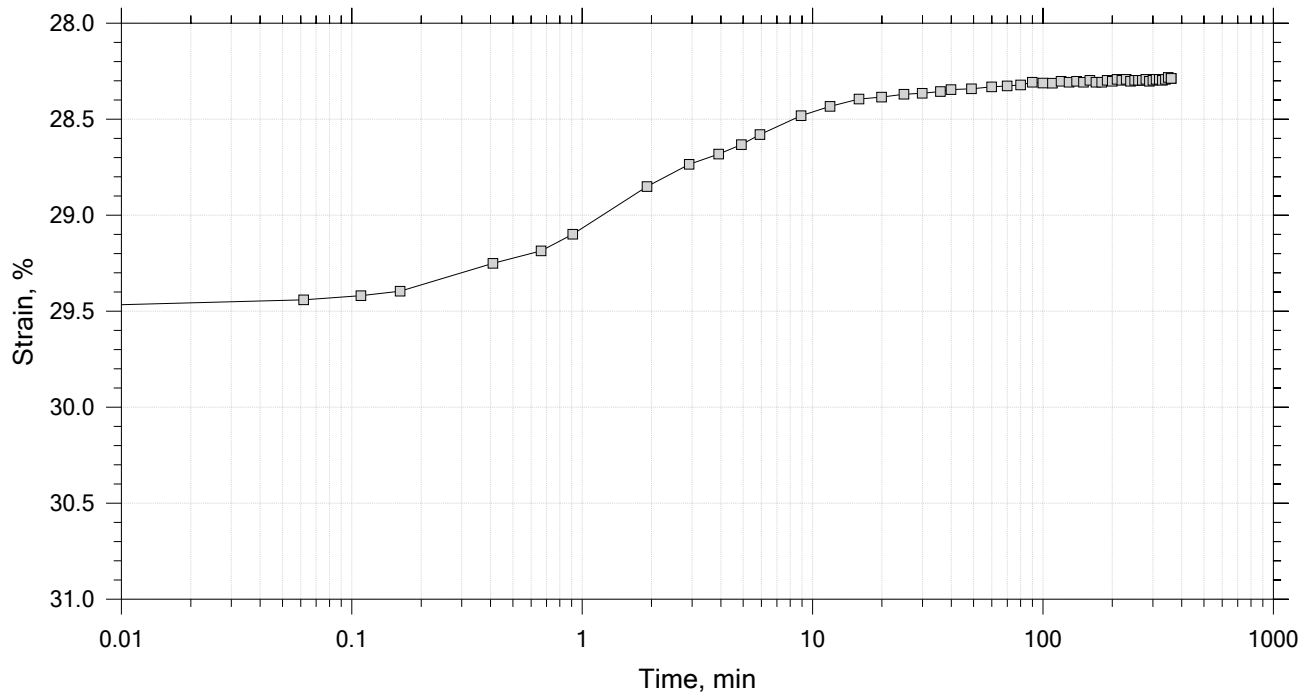
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: BB-BFB-202	Tested By: md	Checked By: mcm
	Sample No.: U-1	Test Date: 03/05/21	Depth: 18-20
	Test No.: IP-17	Sample Type: Intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System X, Swell Pressure = 0.0679 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 12 of 15

Constant Load Step

Stress: 2 tsf



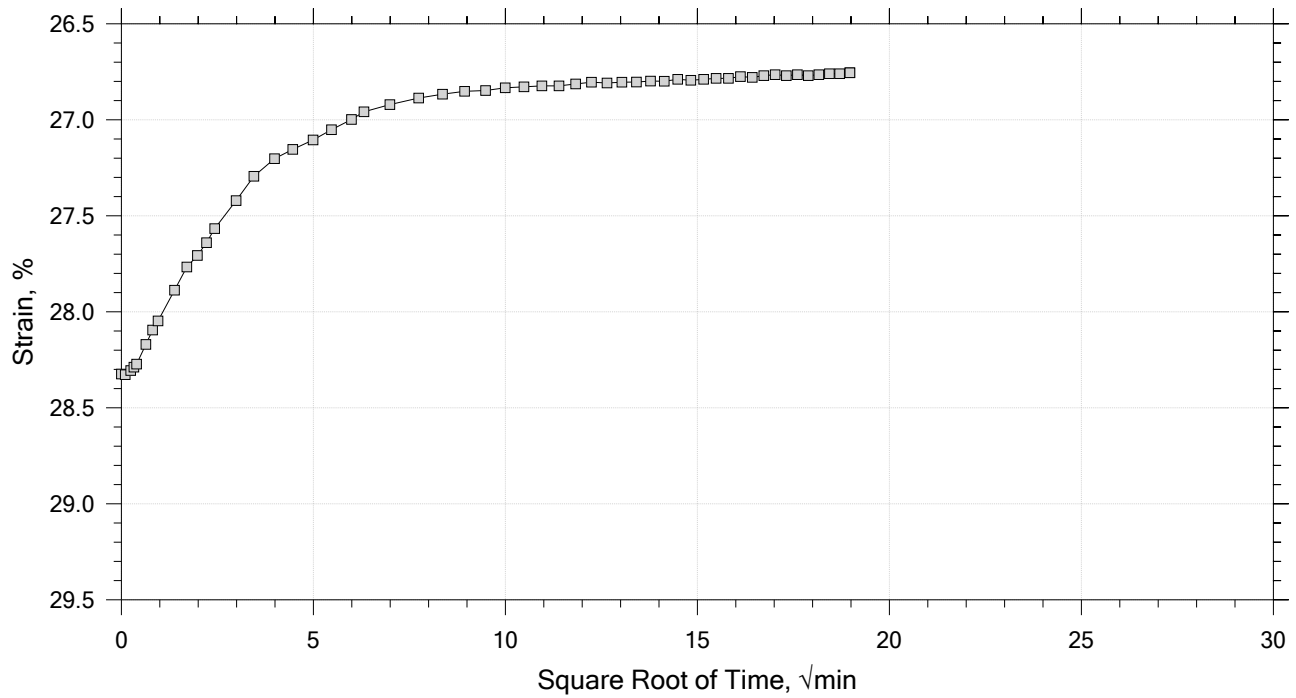
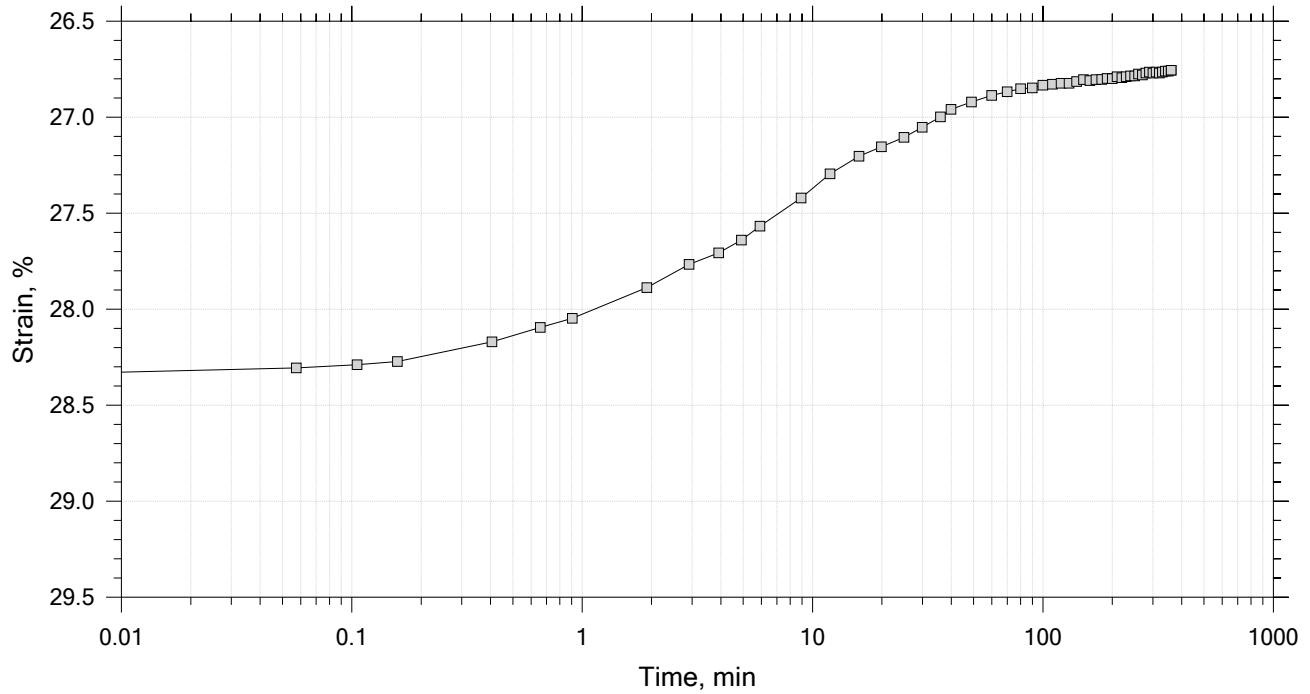
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: BB-BFB-202	Tested By: md	Checked By: mcm
	Sample No.: U-1	Test Date: 03/05/21	Depth: 18-20
	Test No.: IP-17	Sample Type: Intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System X, Swell Pressure = 0.0679 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 13 of 15

Constant Load Step

Stress: 0.5 tsf



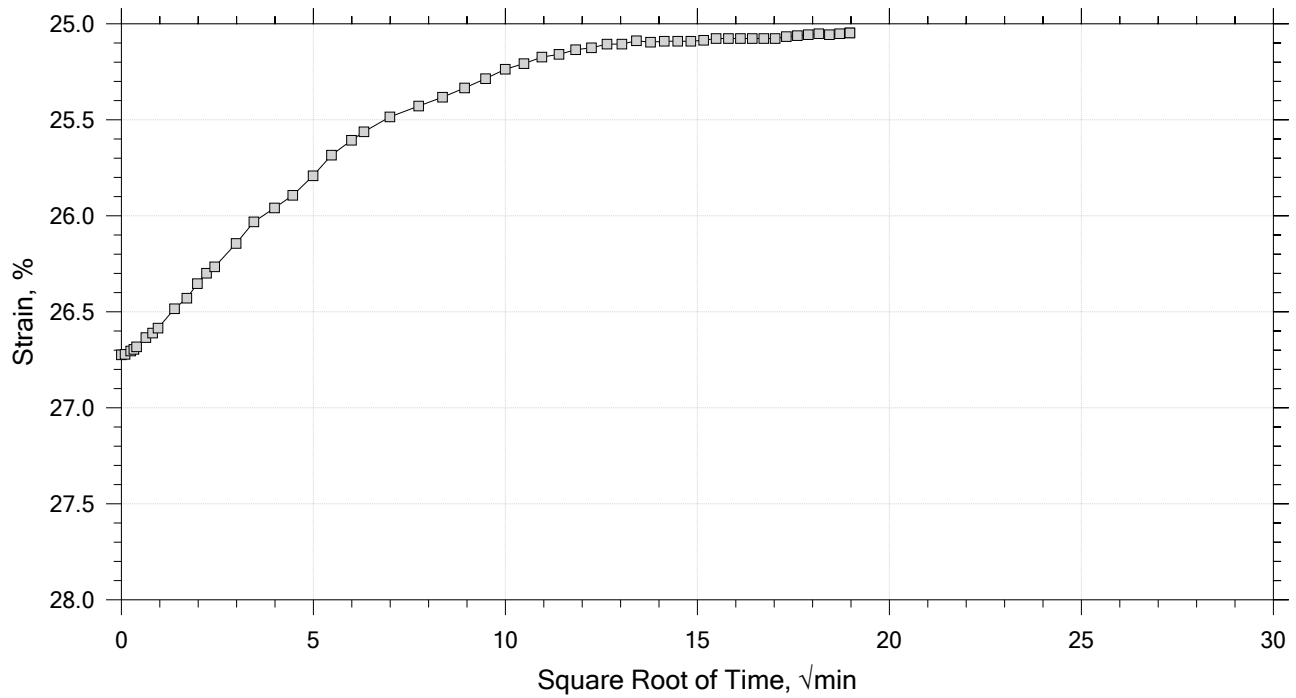
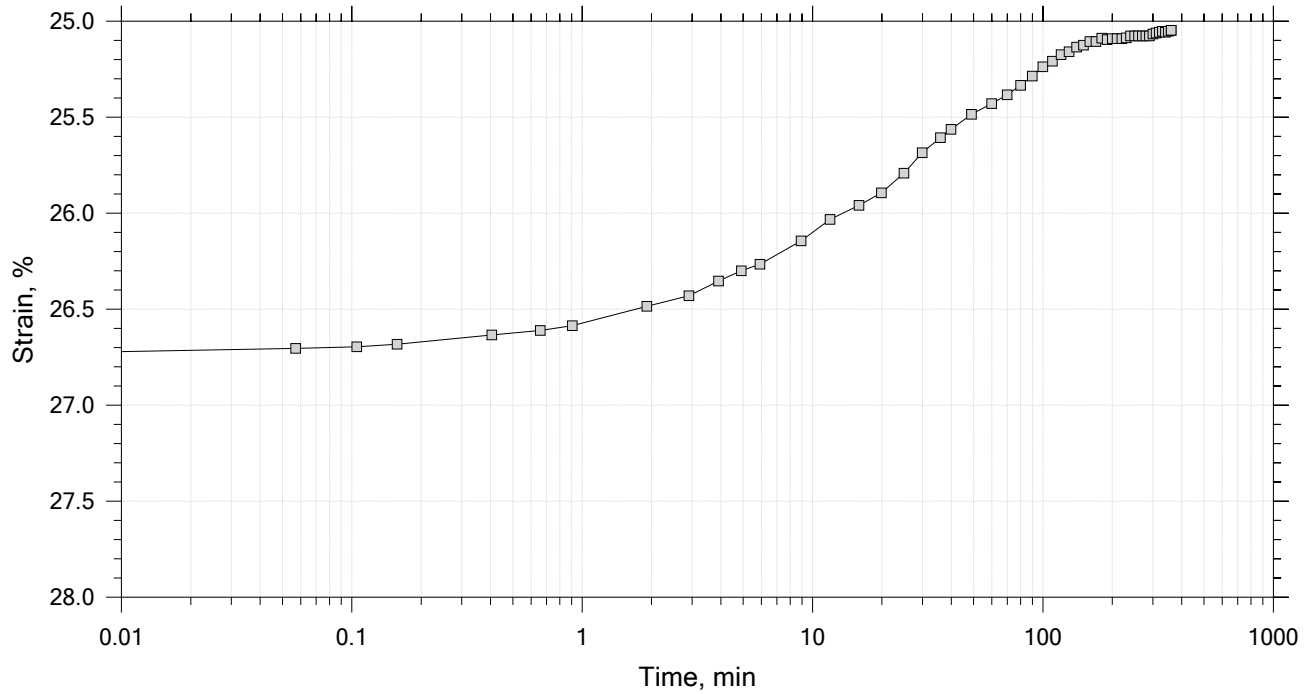
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	Boring No.: BB-BFB-202	Tested By: md	Checked By: mcm
	Sample No.: U-1	Test Date: 03/05/21	Depth: 18-20
	Test No.: IP-17	Sample Type: Intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System X, Swell Pressure = 0.0679 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 14 of 15

Constant Load Step

Stress: 0.125 tsf



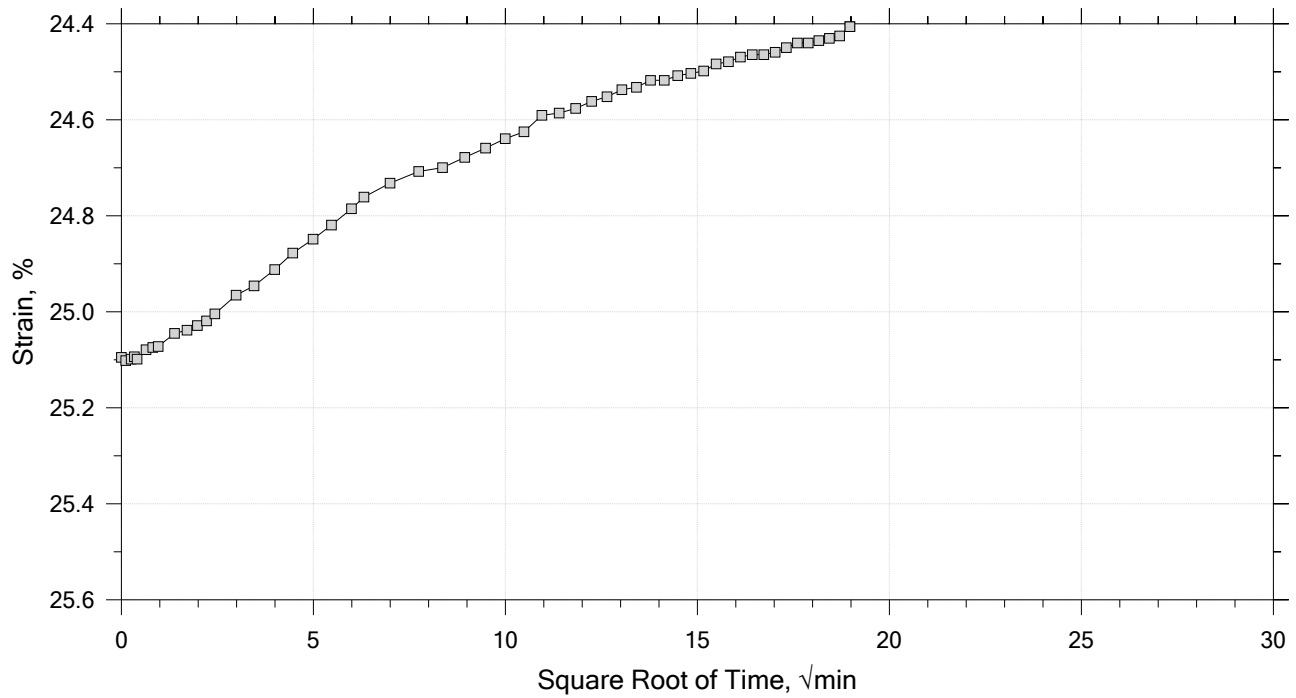
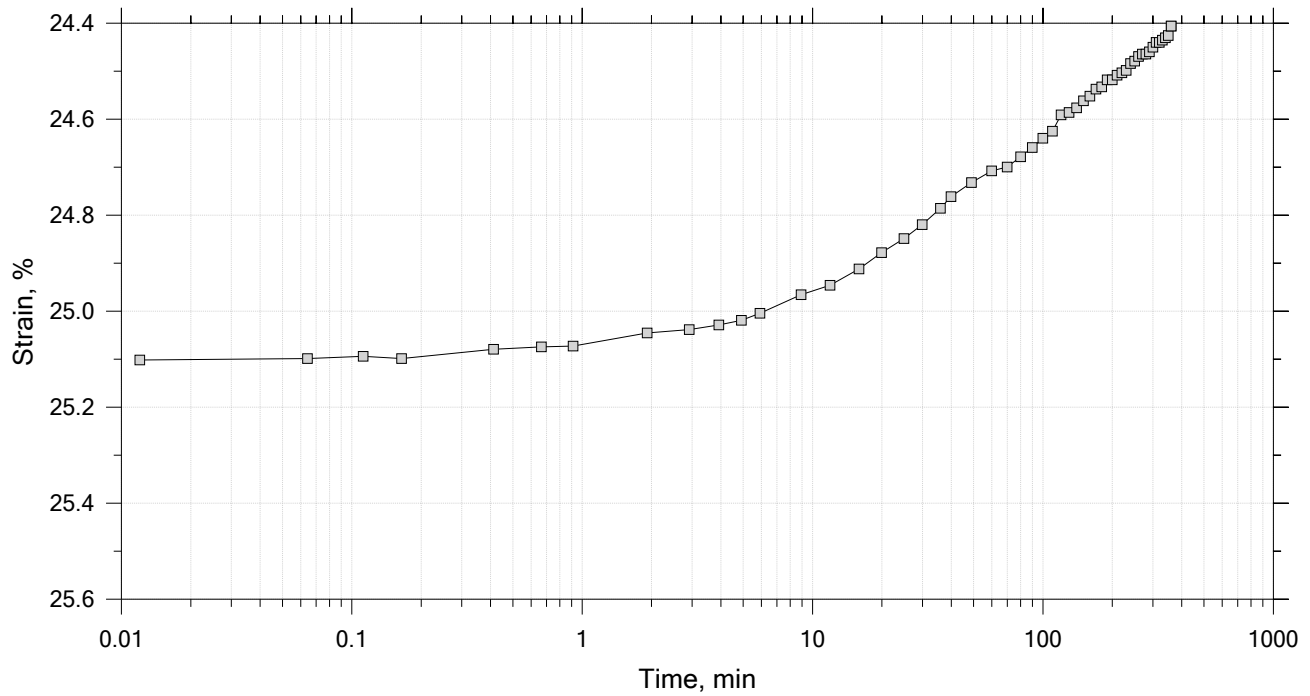
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	Boring No.: BB-BFB-202	Tested By: md	Checked By: mcm
	Sample No.: U-1	Test Date: 03/05/21	Depth: 18-20
	Test No.: IP-17	Sample Type: Intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System X, Swell Pressure = 0.0679 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 15 of 15

Constant Load Step

Stress: 0.0625 tsf




	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: BB-BFB-202	Tested By: md	Checked By: mcm
	Sample No.: U-1	Test Date: 03/05/21	Depth: 18-20
	Test No.: IP-17	Sample Type: Intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System X, Swell Pressure = 0.0679 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Specimen Diameter: 2.50 in	Estimated Specific Gravity: 2.75	Liquid Limit: 38
Initial Height: 1.00 in	Initial Void Ratio: 1.25	Plastic Limit: 19
Final Height: 0.76 in	Final Void Ratio: 0.697	Plasticity Index: 19

	Before Test Trimmings	Before Test Specimen	After Test Specimen	After Test Trimmings
Container ID	B-3093	RING		D2974
Mass Container, gm	8.23	108.75	108.75	8.16
Mass Container + Wet Soil, gm	201.16	250.02	232.09	131.6
Mass Container + Dry Soil, gm	141.71	207.11	207.11	106.6
Mass Dry Soil, gm	133.48	98.36	98.36	98.44
Water Content, %	44.54	43.63	25.40	25.40
Void Ratio	---	1.25	0.70	---
Degree of Saturation, %	---	96.18	100.00	---
Dry Unit Weight, pcf	---	76.336	100.98	---


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: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: BB-BFB-202	Tested By: md	Checked By: mcm
	Sample No.: U-1	Test Date: 03/05/21	Depth: 18-20
	Test No.: IP-17	Sample Type: Intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System X, Swell Pressure = 0.0679 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

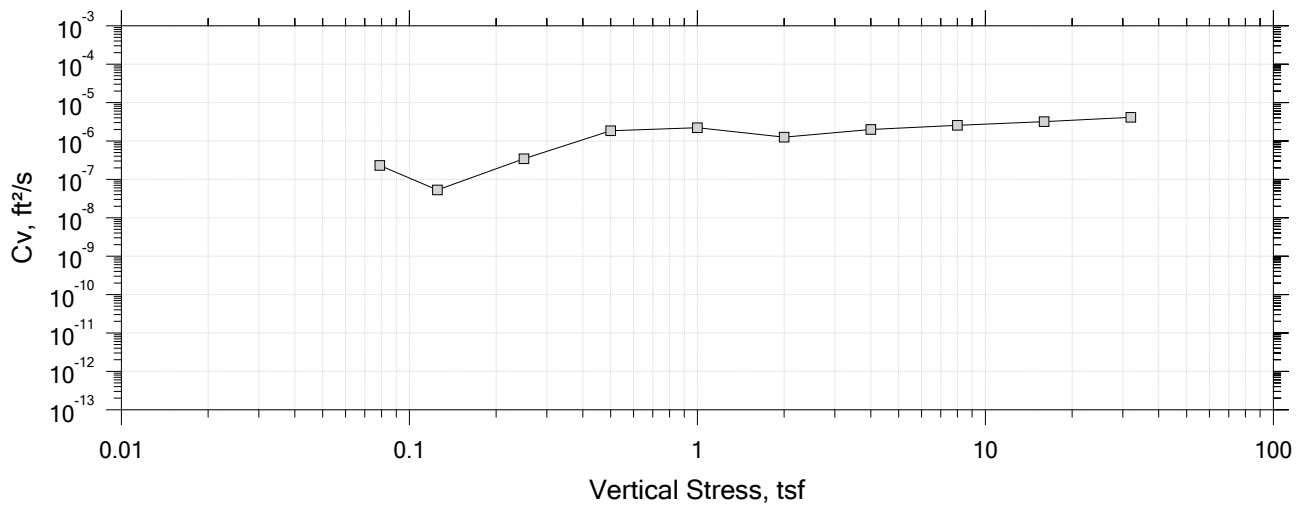
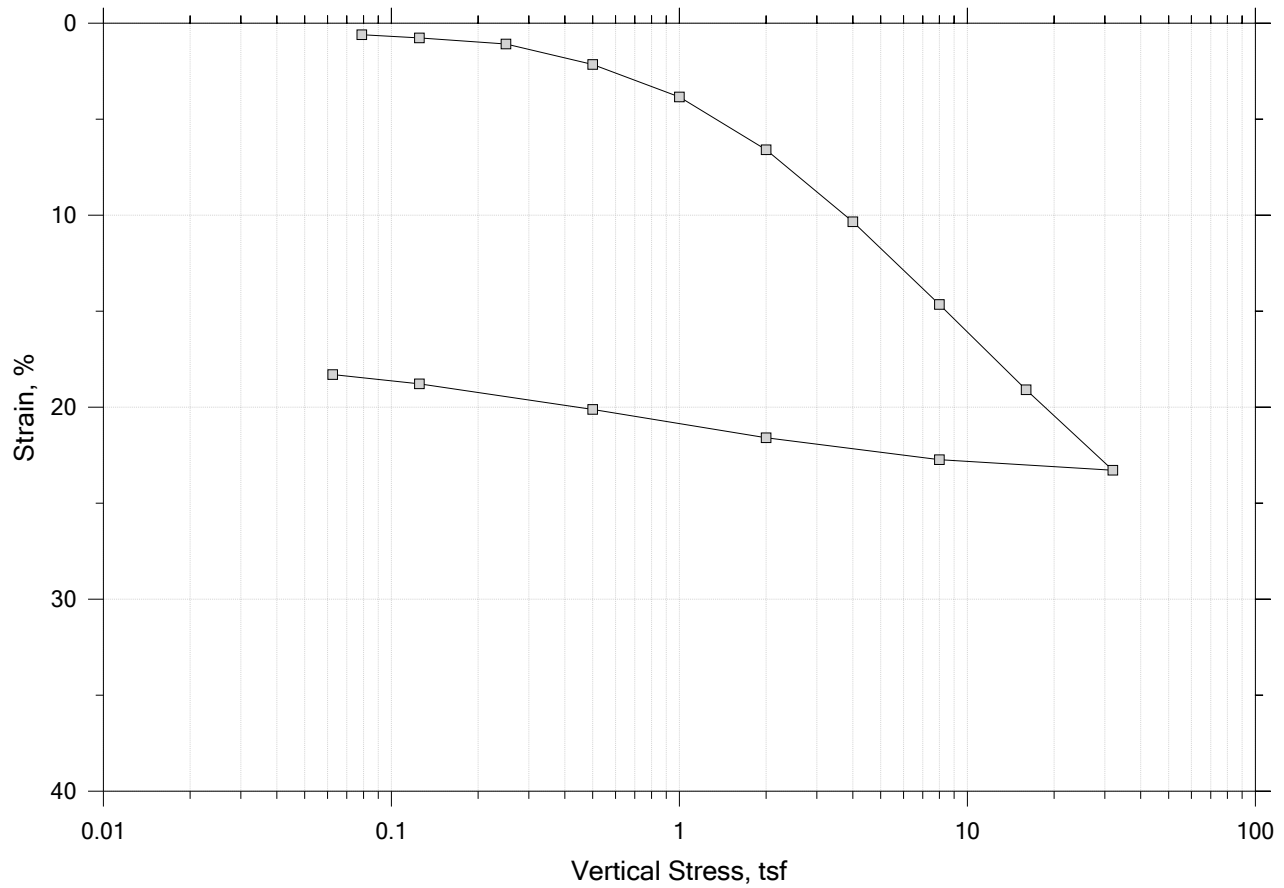
Square Root of Time Coefficients


[illegible]

	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: BB-BFB-202	Tested By: md	Checked By: mcm
	Sample No.: U-1	Test Date: 03/05/21	Depth: 18-20
	Test No.: IP-17	Sample Type: Intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System X, Swell Pressure = 0.0679 tsf		
	Displacement at End of Increment		

One-Dimensional Consolidation by ASTM D2435 - Method B

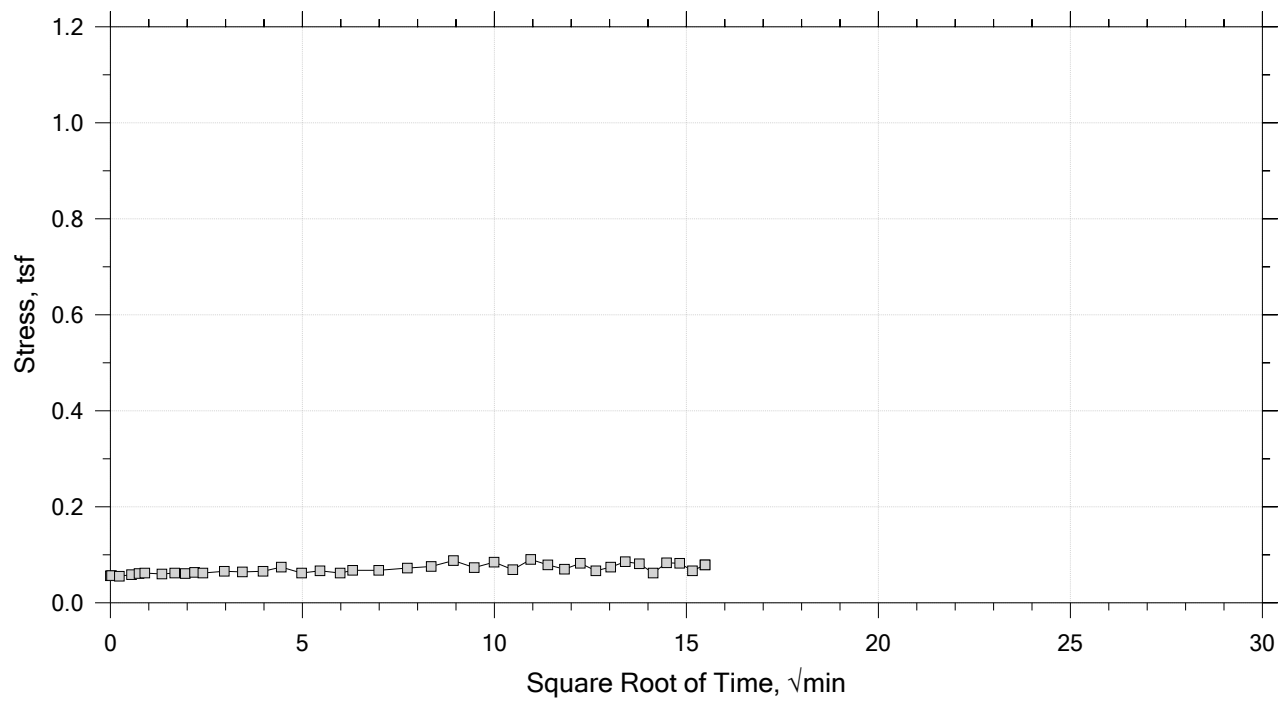
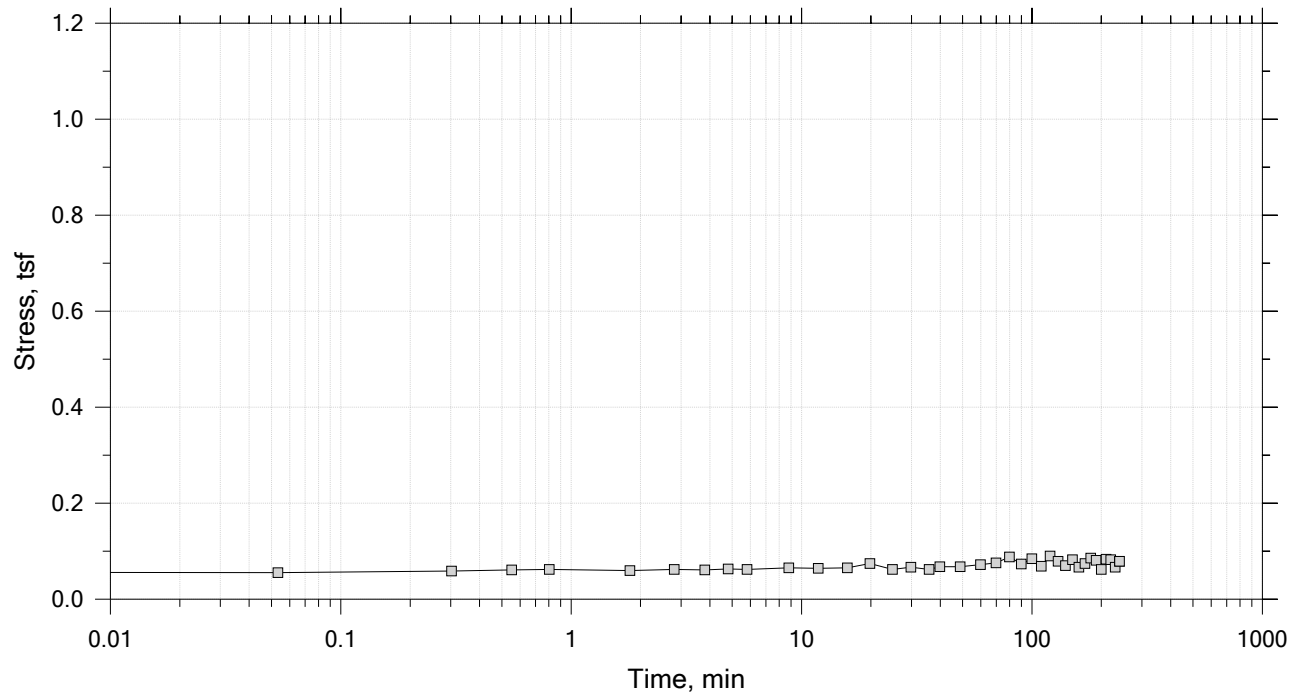
Summary Report




	Project: Rt 9/I-395 Connector	Location: Brewer and Eddington, ME	Project No.: GTX-308853
	Boring No.: BB-BST1-101	Tested By: md	Checked By: mcm
	Sample No.: 1-U	Test Date: 07/22/19	Depth: 10-12 ft
	Test No.: IP-16	Sample Type: Intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System LTIII-B, 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



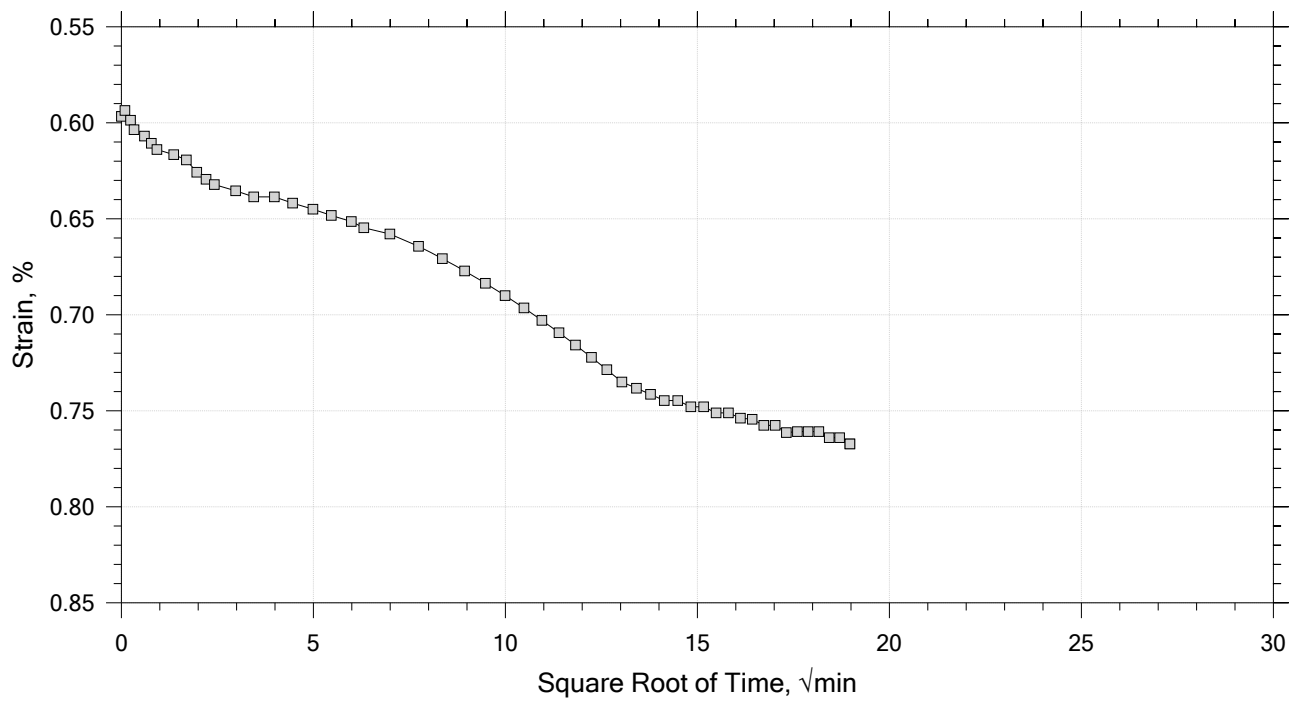
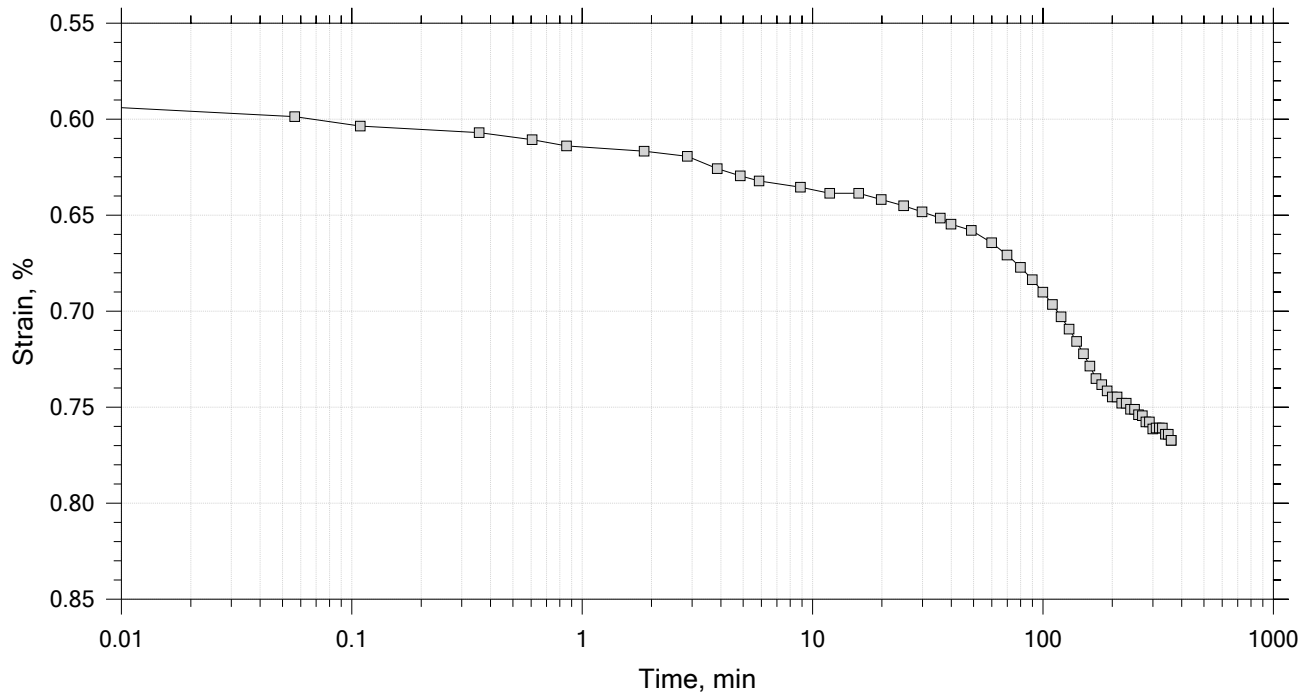
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	Boring No.: BB-BST1-101	Tested By: md	Checked By: mcm
	Sample No.: 1-U	Test Date: 07/22/19	Depth: 10-12 ft
	Test No.: IP-16	Sample Type: Intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System LTIII-B, Swell Pressure = 0.0789 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 2 of 15

Constant Load Step

Stress: 0.125 tsf



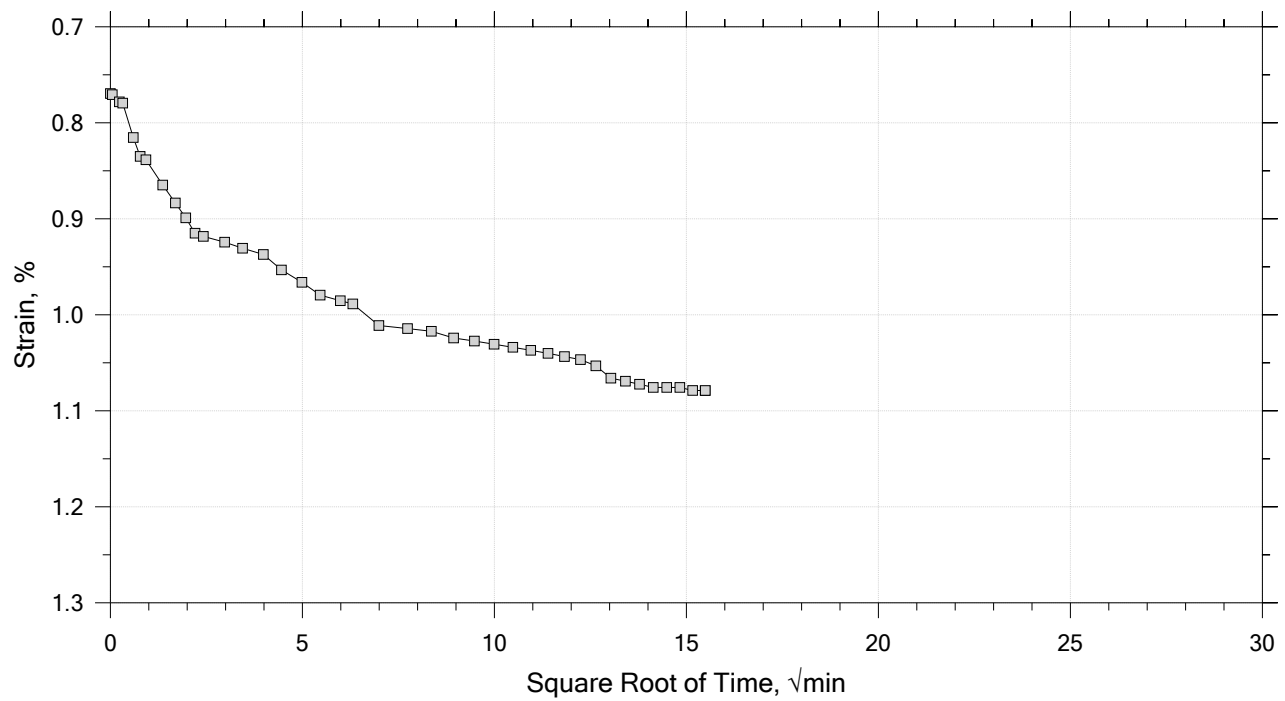
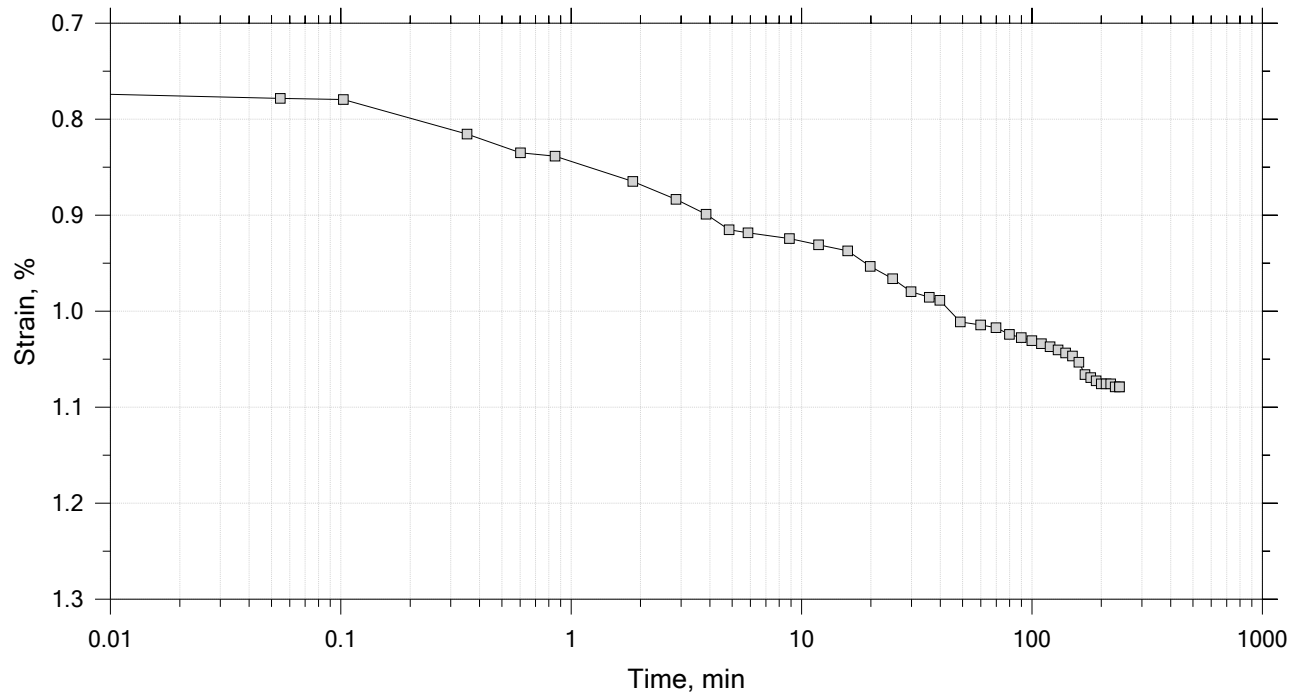
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	Boring No.: BB-BST1-101	Tested By: md	Checked By: mcm
	Sample No.: 1-U	Test Date: 07/22/19	Depth: 10-12 ft
	Test No.: IP-16	Sample Type: Intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System LTIII-B, Swell Pressure = 0.0789 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 3 of 15

Constant Load Step

Stress: 0.25 tsf



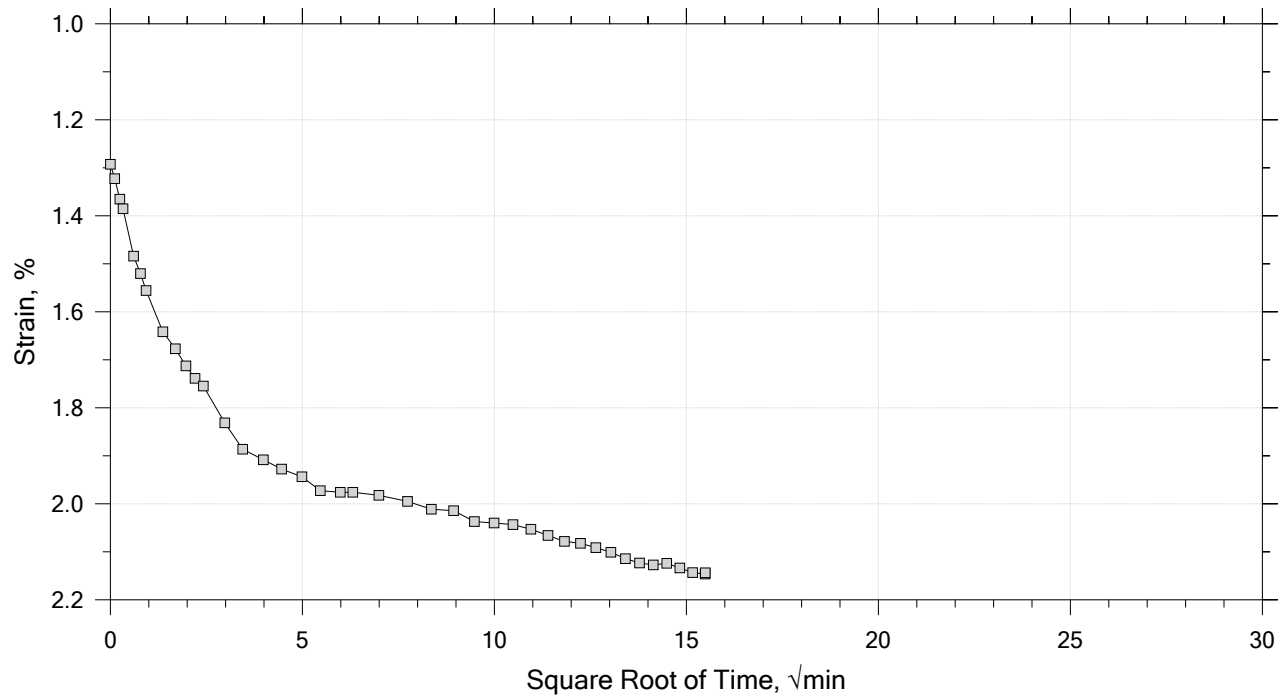
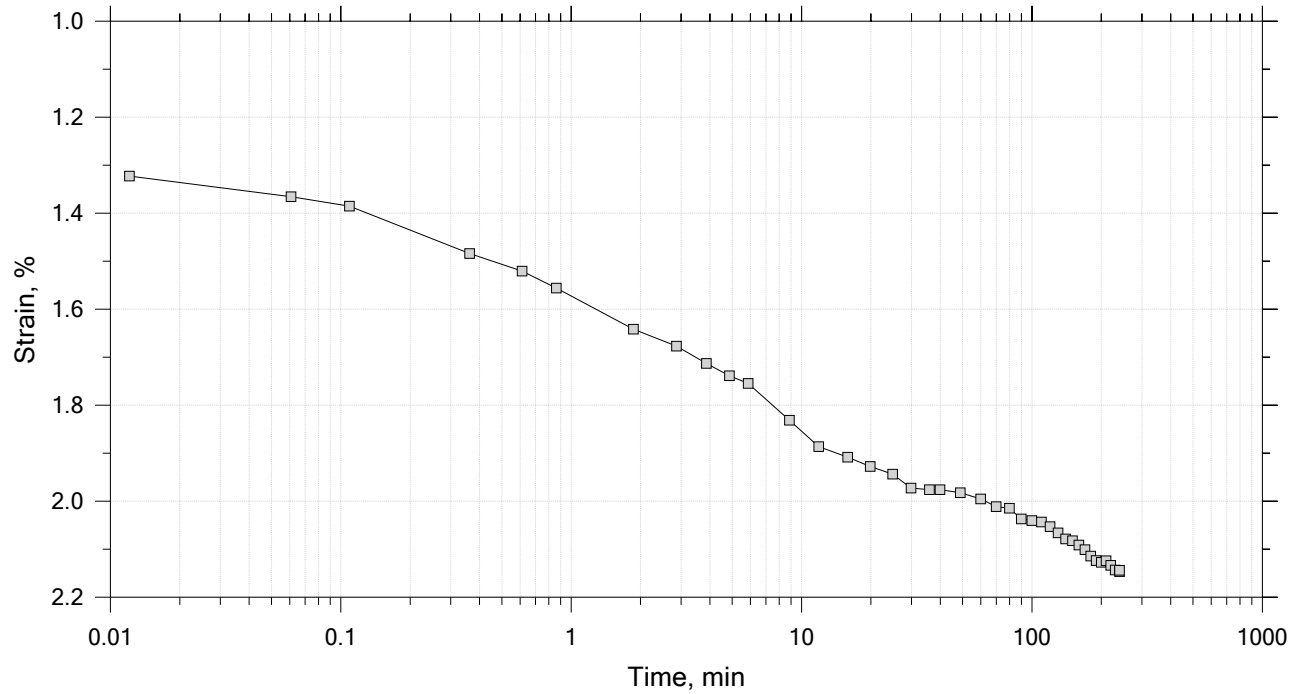
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	Boring No.: BB-BST1-101	Tested By: md	Checked By: mcm
	Sample No.: 1-U	Test Date: 07/22/19	Depth: 10-12 ft
	Test No.: IP-16	Sample Type: Intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System LTIII-B, Swell Pressure = 0.0789 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 4 of 15

Constant Load Step

Stress: 0.5 tsf



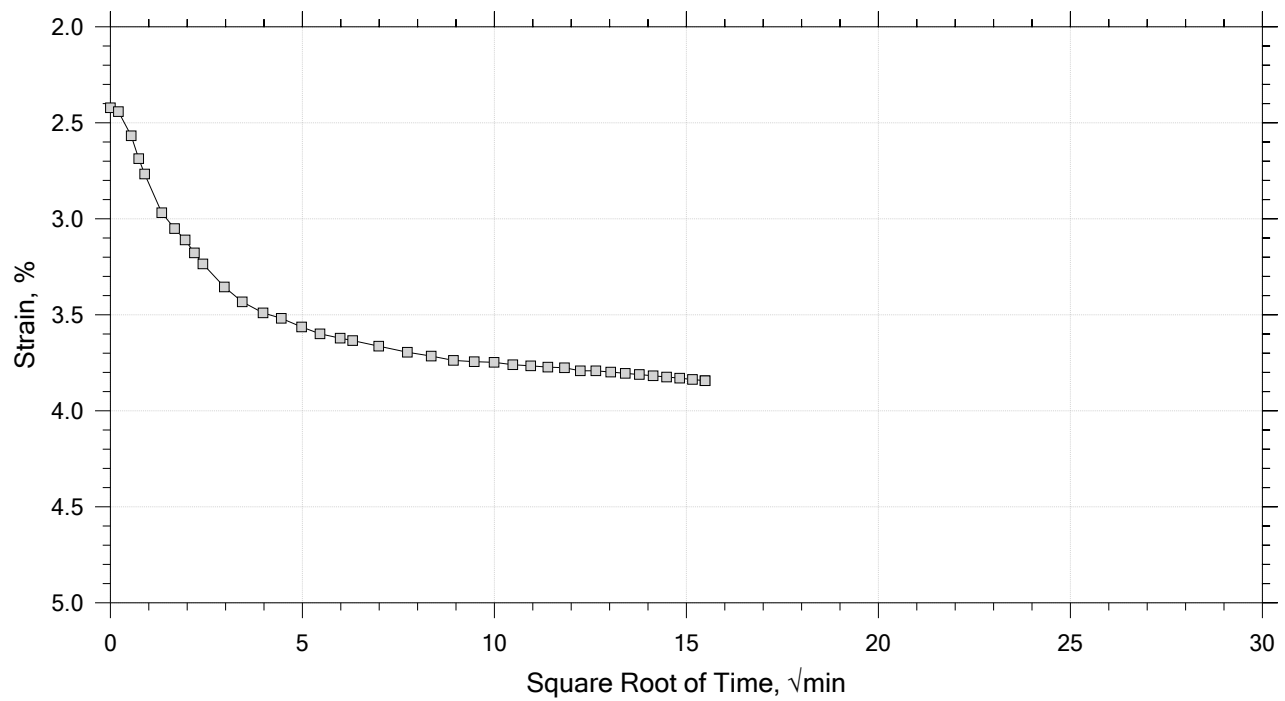
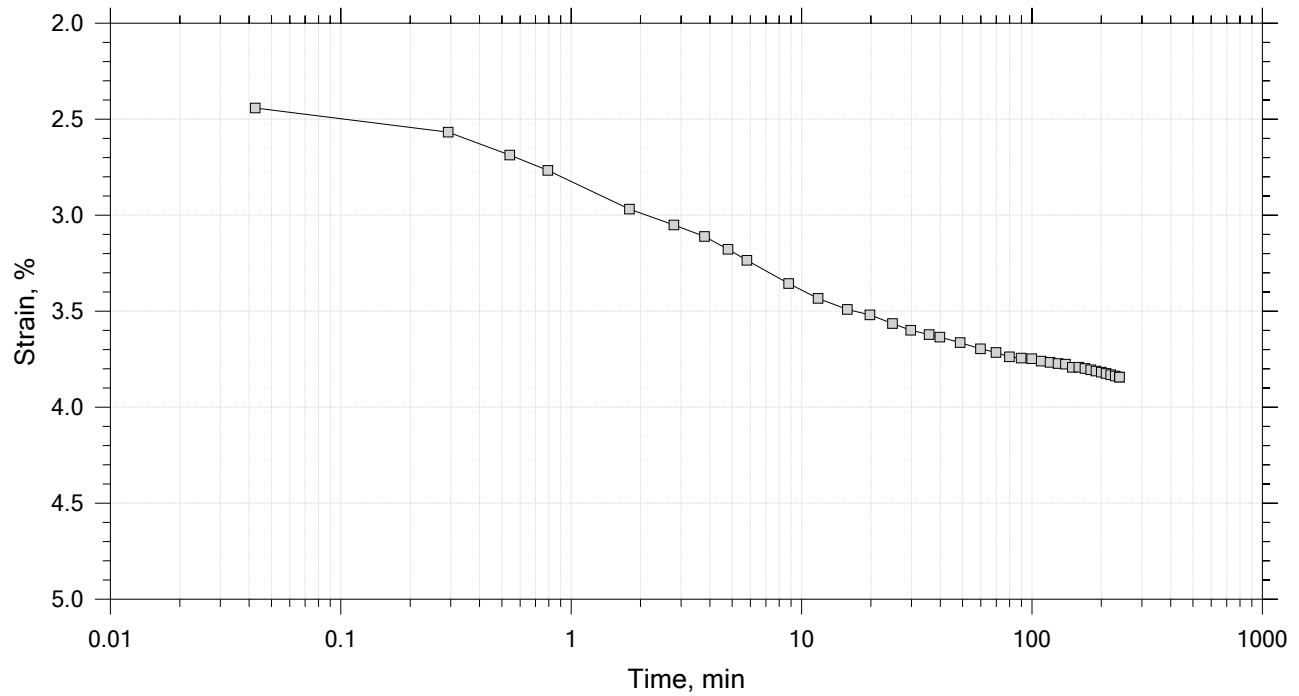
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	Boring No.: BB-BST1-101	Tested By: md	Checked By: mcm
	Sample No.: 1-U	Test Date: 07/22/19	Depth: 10-12 ft
	Test No.: IP-16	Sample Type: Intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System LTIII-B, Swell Pressure = 0.0789 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 5 of 15

Constant Load Step

Stress: 1 tsf



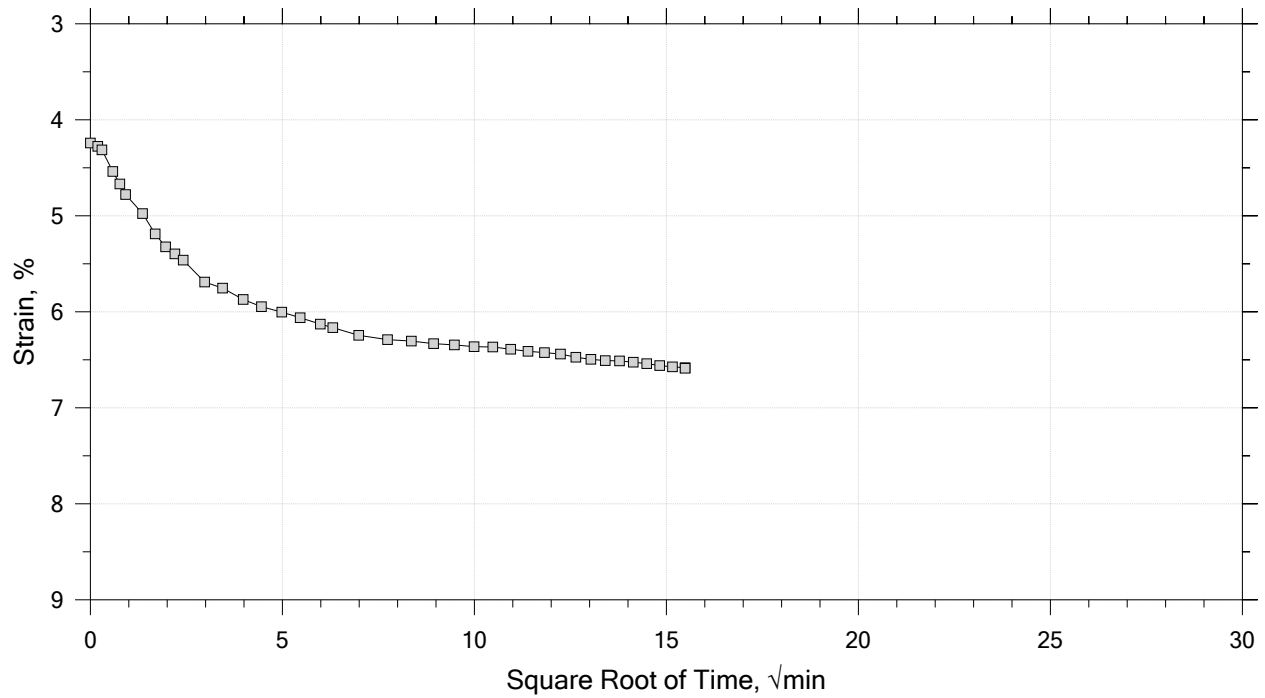
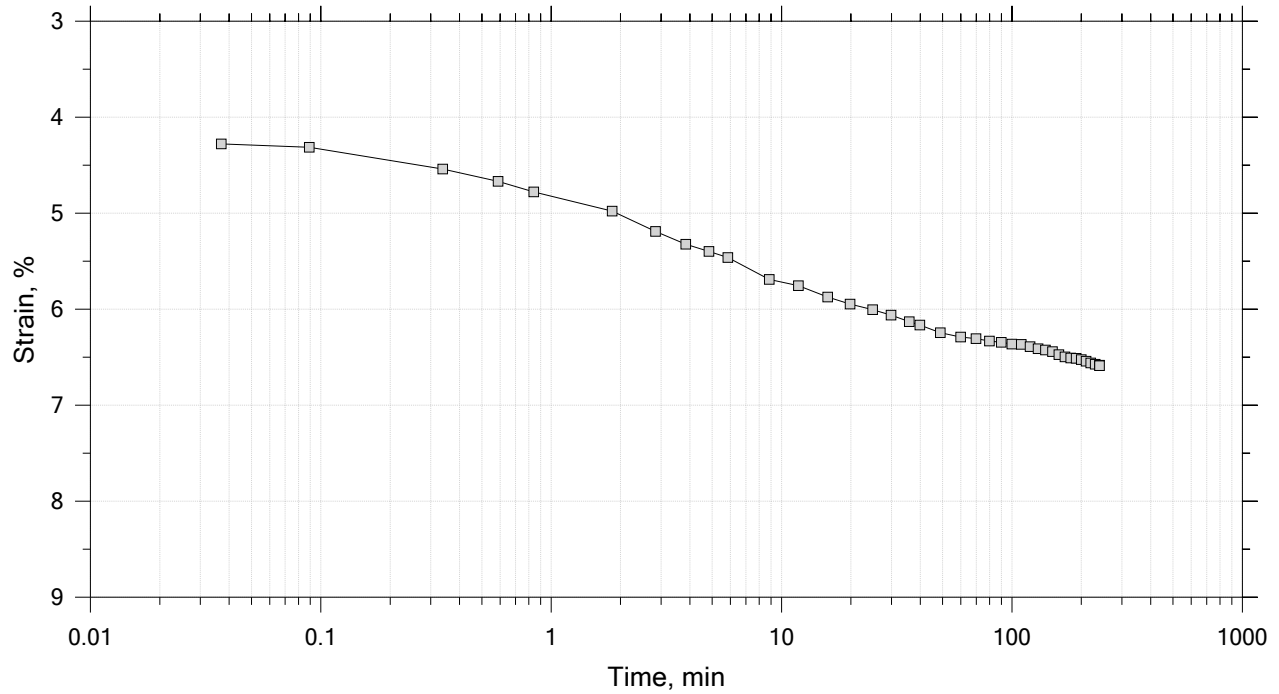
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	Boring No.: BB-BST1-101	Tested By: md	Checked By: mcm
	Sample No.: 1-U	Test Date: 07/22/19	Depth: 10-12 ft
	Test No.: IP-16	Sample Type: Intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System LTIII-B, Swell Pressure = 0.0789 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 6 of 15

Constant Load Step

Stress: 2 tsf



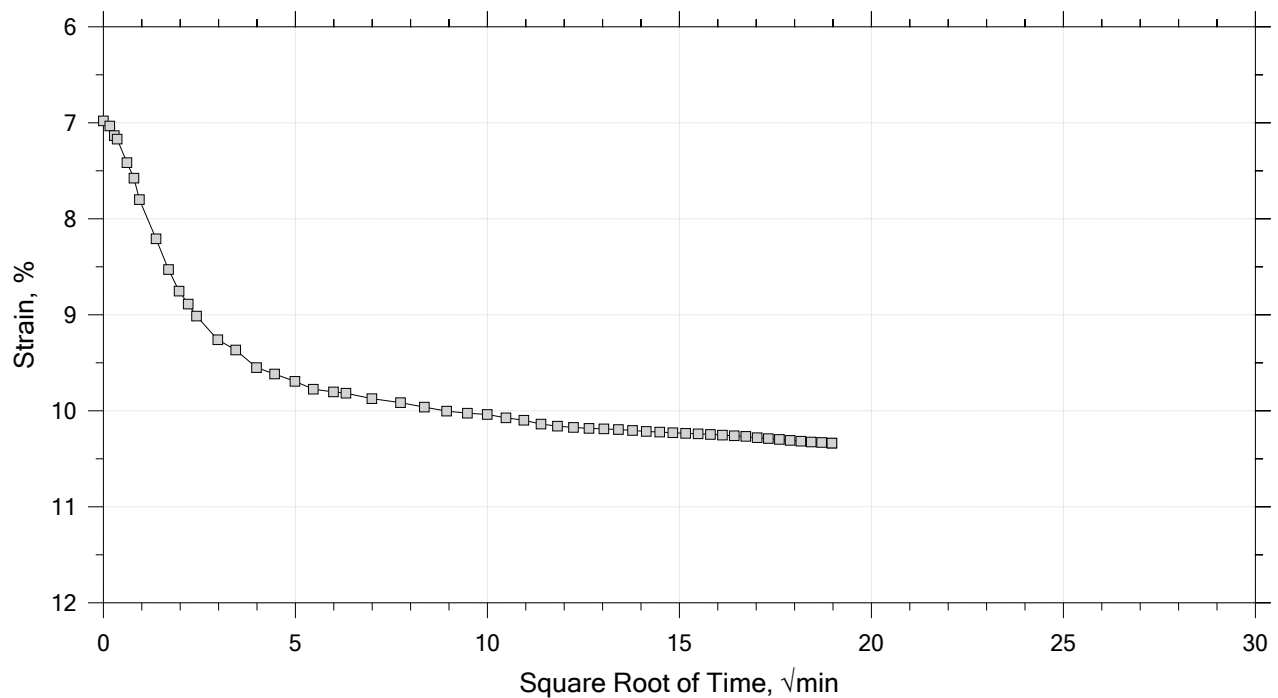
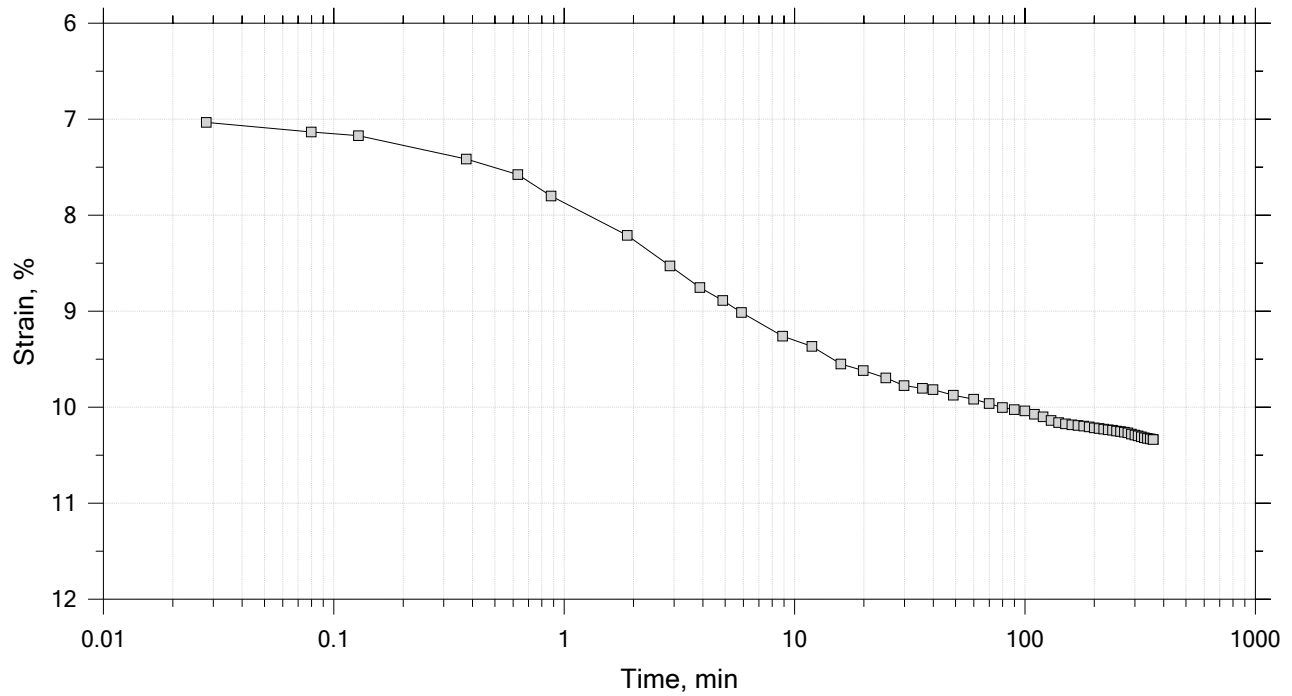
	Project: Rt 9/I-395 Connector	Location: Brewer and Eddington, ME	Project No.: GTX-308853
	Boring No.: BB-BST1-101	Tested By: md	Checked By: mcm
	Sample No.: 1-U	Test Date: 07/22/19	Depth: 10-12 ft
	Test No.: IP-16	Sample Type: Intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System LTIII-B, Swell Pressure = 0.0789 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 7 of 15

Constant Load Step

Stress: 4 tsf



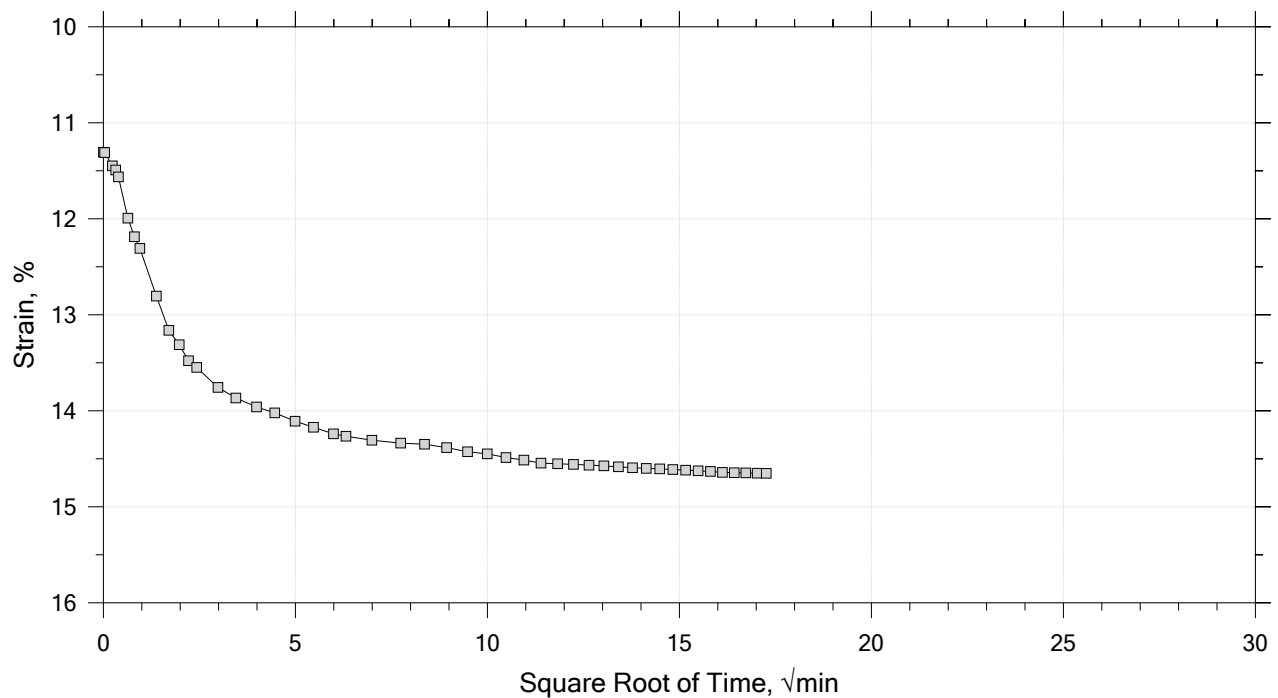
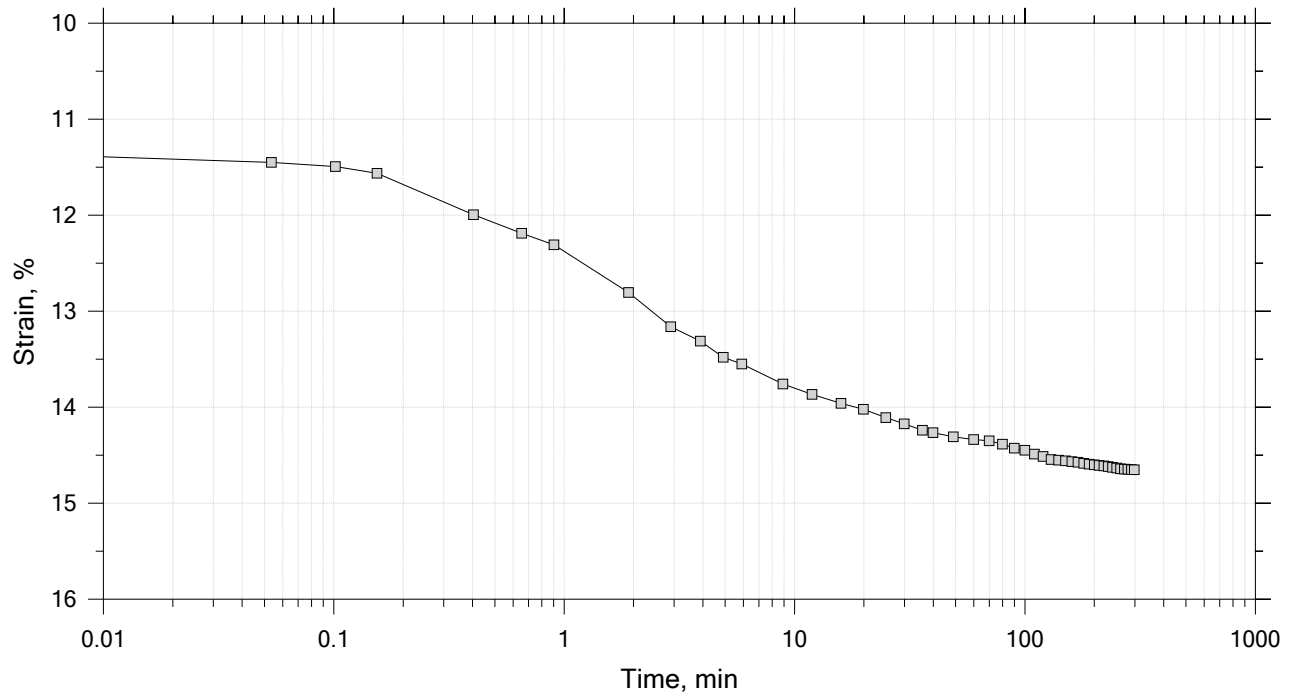
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	Boring No.: BB-BST1-101	Tested By: md	Checked By: mcm
	Sample No.: 1-U	Test Date: 07/22/19	Depth: 10-12 ft
	Test No.: IP-16	Sample Type: Intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System LTIII-B, Swell Pressure = 0.0789 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 8 of 15

Constant Load Step

Stress: 8 tsf



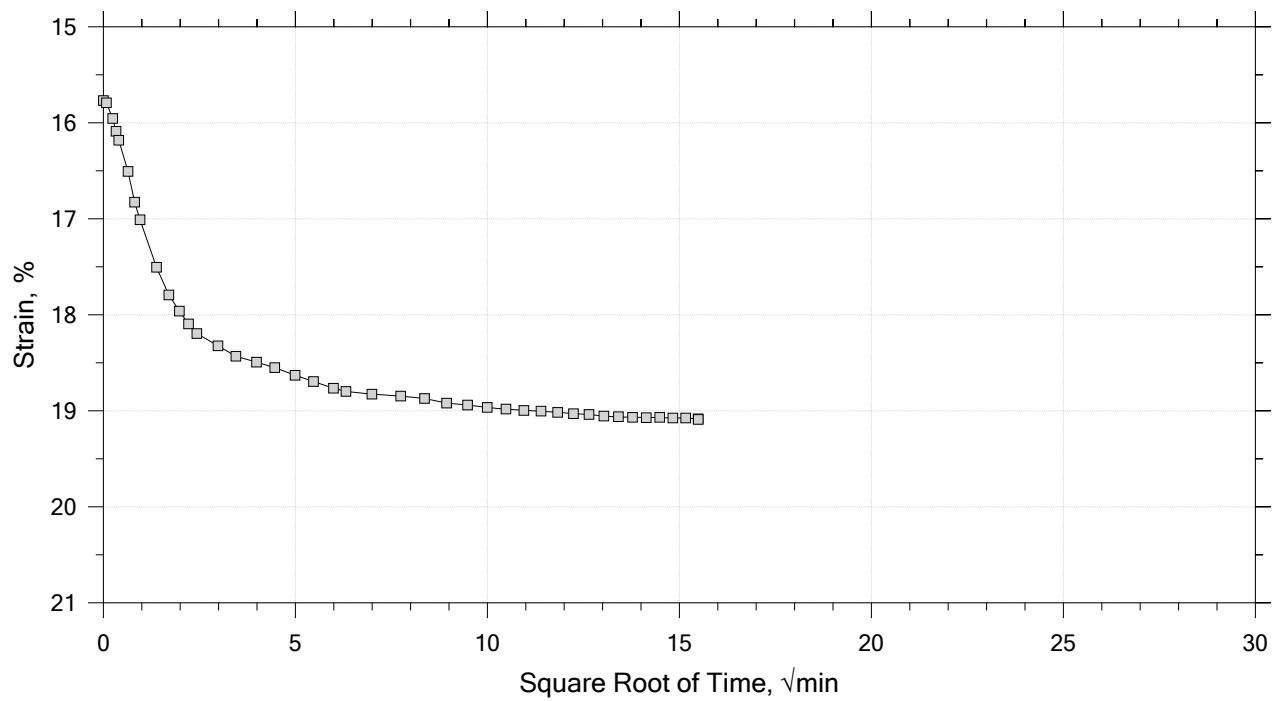
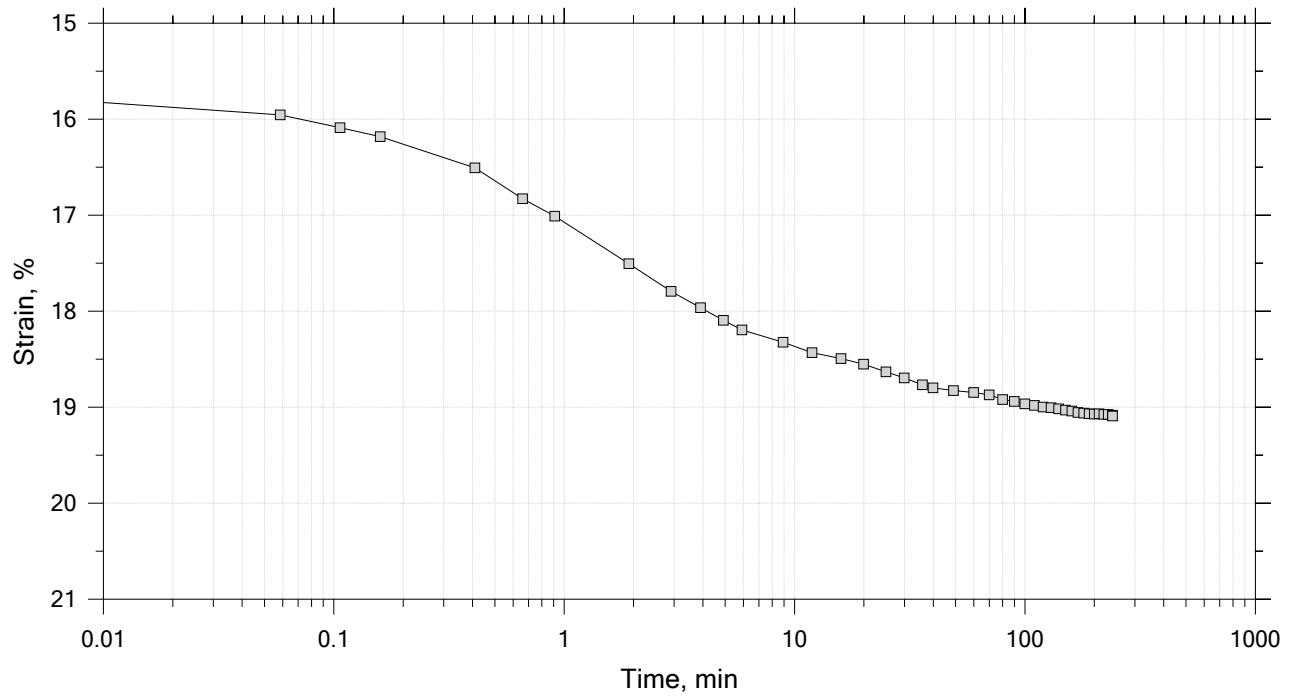
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	Boring No.: BB-BST1-101	Tested By: md	Checked By: mcm
	Sample No.: 1-U	Test Date: 07/22/19	Depth: 10-12 ft
	Test No.: IP-16	Sample Type: Intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System LTIII-B, Swell Pressure = 0.0789 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 9 of 15

Constant Load Step

Stress: 16 tsf



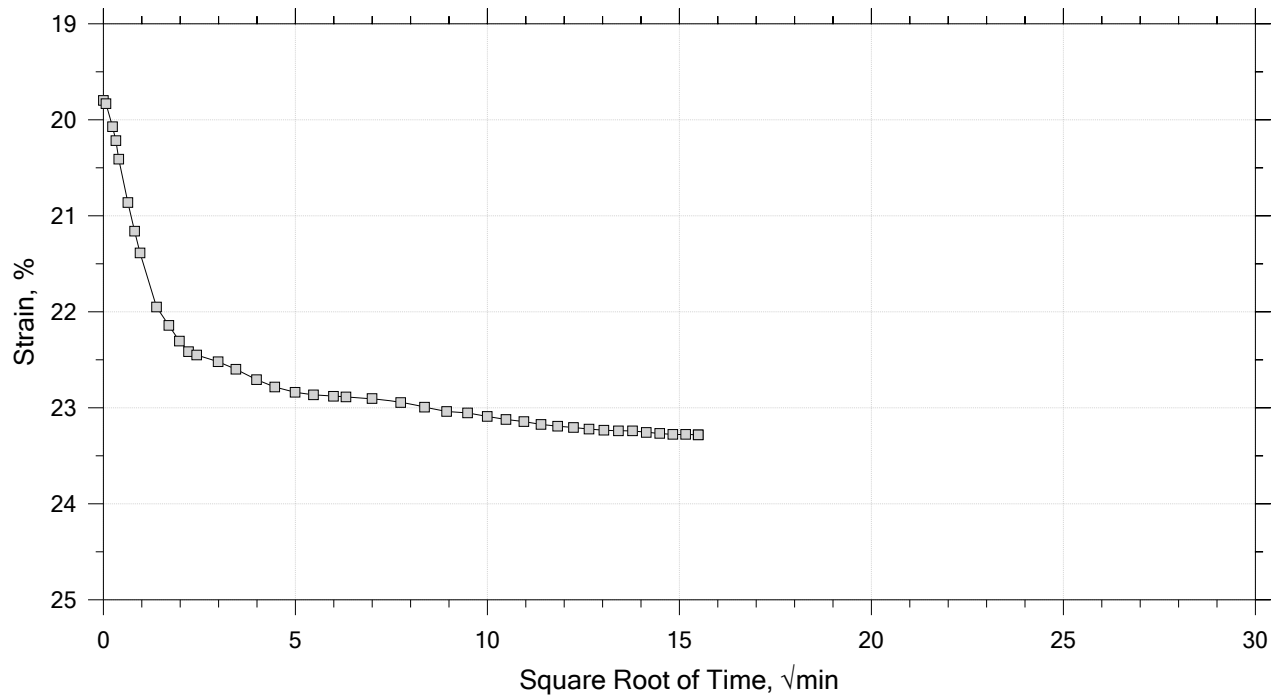
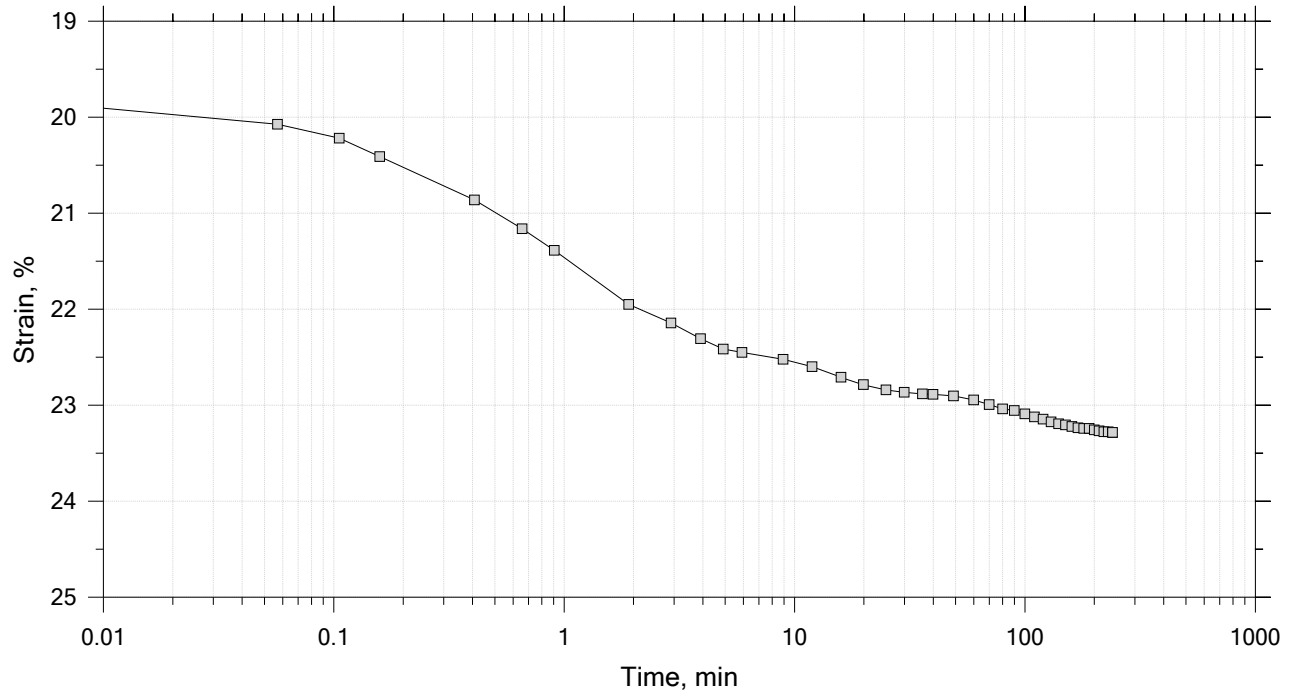
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	Boring No.: BB-BST1-101	Tested By: md	Checked By: mcm
	Sample No.: 1-U	Test Date: 07/22/19	Depth: 10-12 ft
	Test No.: IP-16	Sample Type: Intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System LTIII-B, Swell Pressure = 0.0789 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 10 of 15

Constant Load Step

Stress: 32 tsf



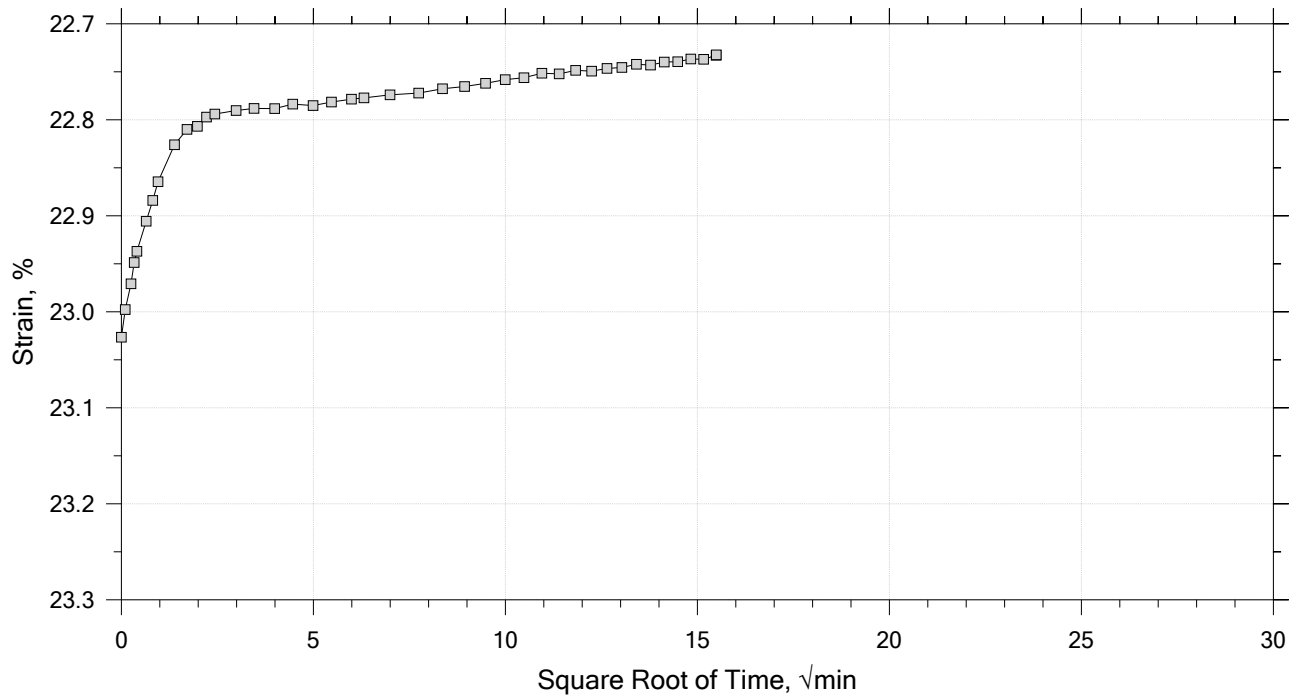
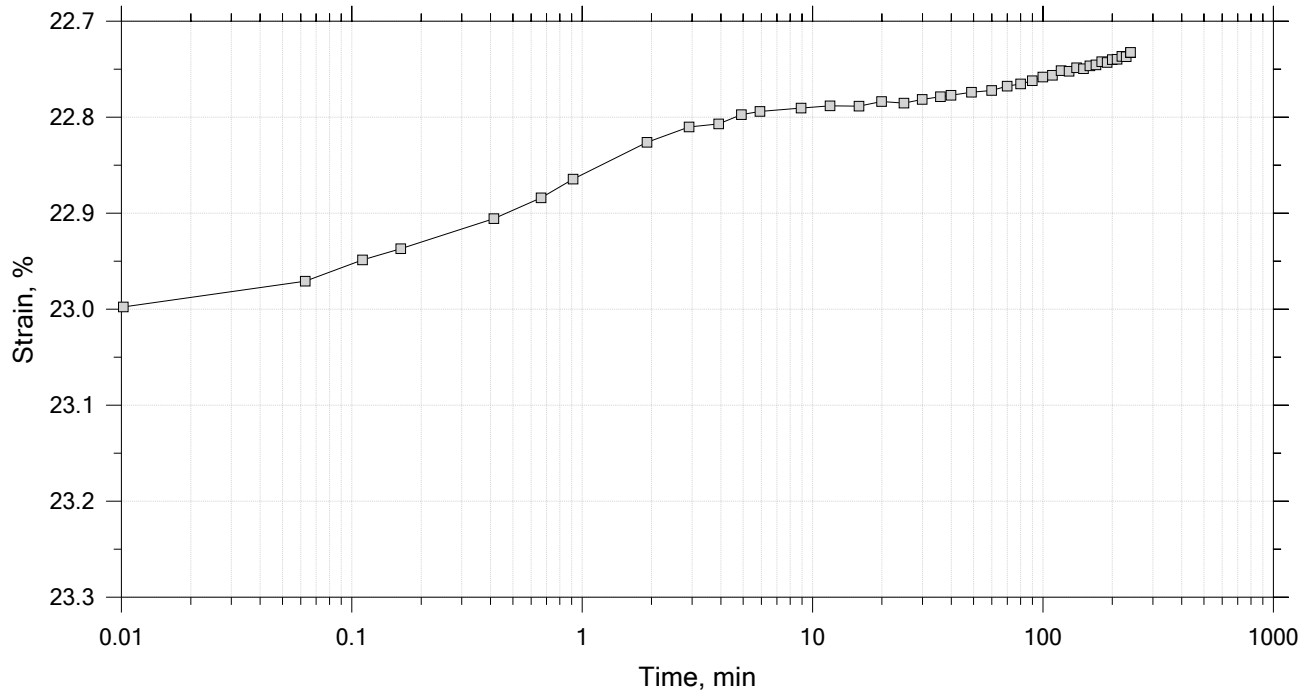
	Project: Rt 9/I-395 Connector	Location: Brewer and Eddington, ME	Project No.: GTX-308853
	Boring No.: BB-BST1-101	Tested By: md	Checked By: mcm
	Sample No.: 1-U	Test Date: 07/22/19	Depth: 10-12 ft
	Test No.: IP-16	Sample Type: Intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System LTIII-B, Swell Pressure = 0.0789 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 11 of 15

Constant Load Step

Stress: 8 tsf



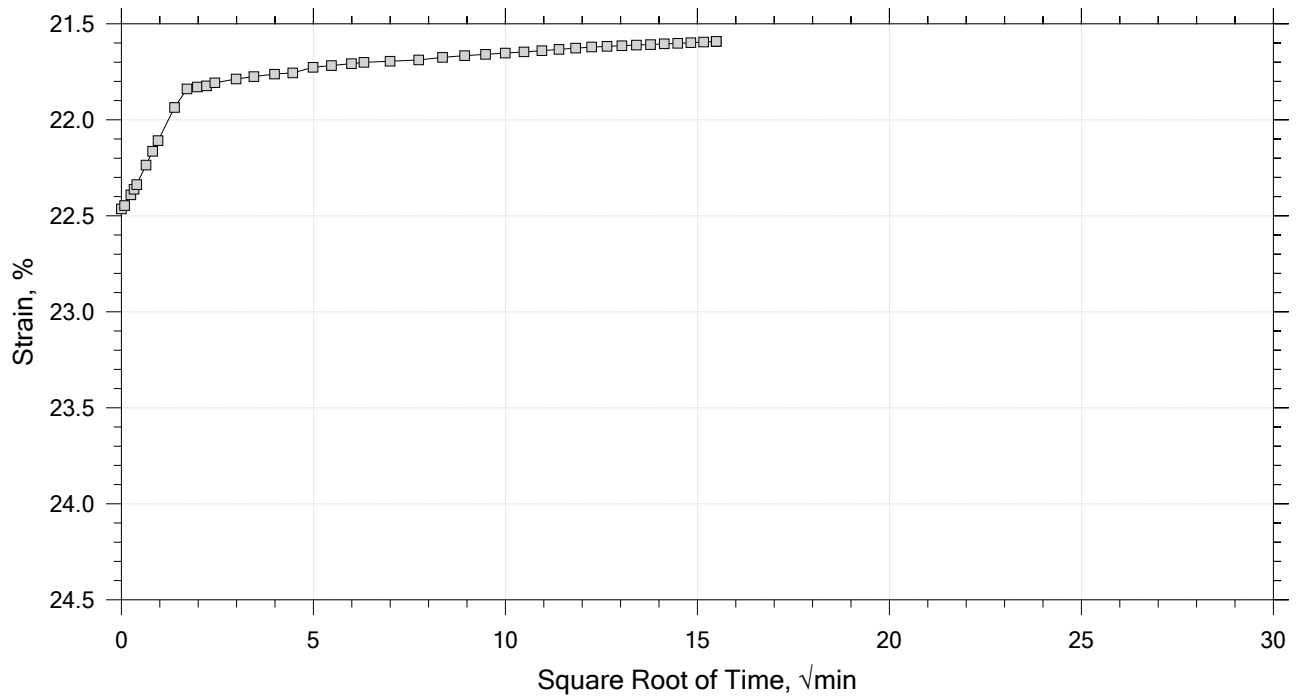
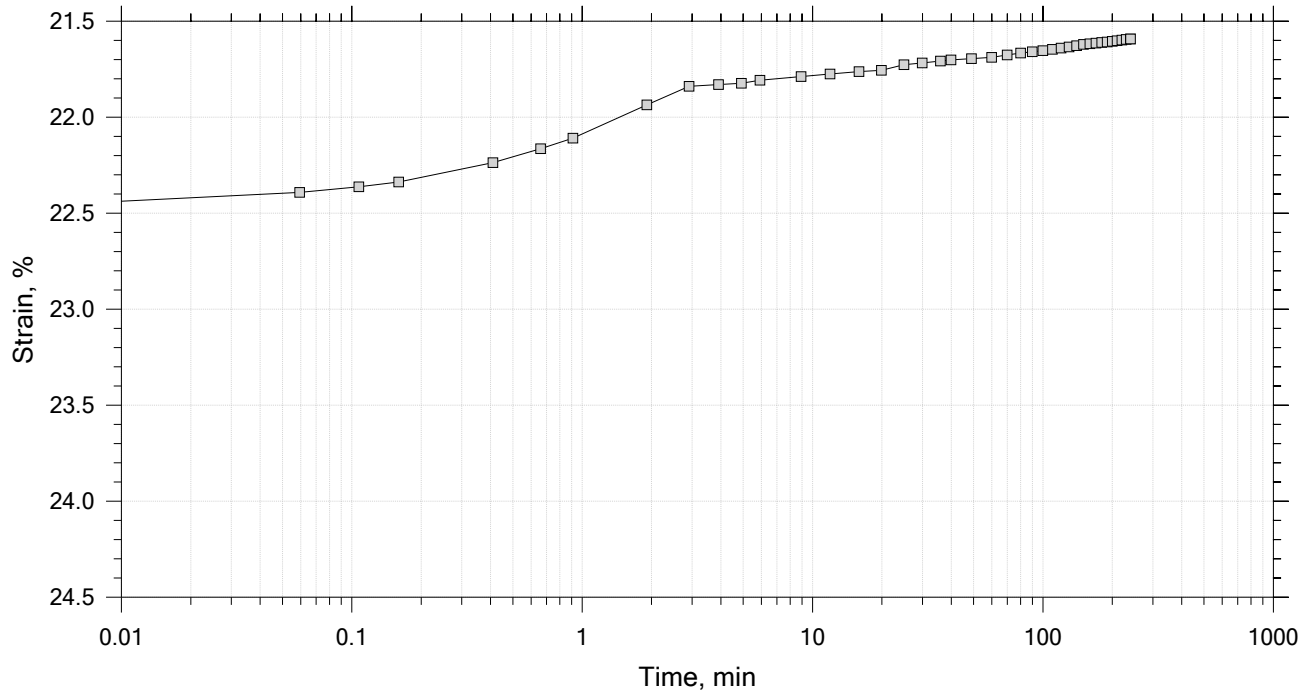
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	Boring No.: BB-BST1-101	Tested By: md	Checked By: mcm
	Sample No.: 1-U	Test Date: 07/22/19	Depth: 10-12 ft
	Test No.: IP-16	Sample Type: Intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System LTIII-B, Swell Pressure = 0.0789 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 12 of 15

Constant Load Step

Stress: 2 tsf



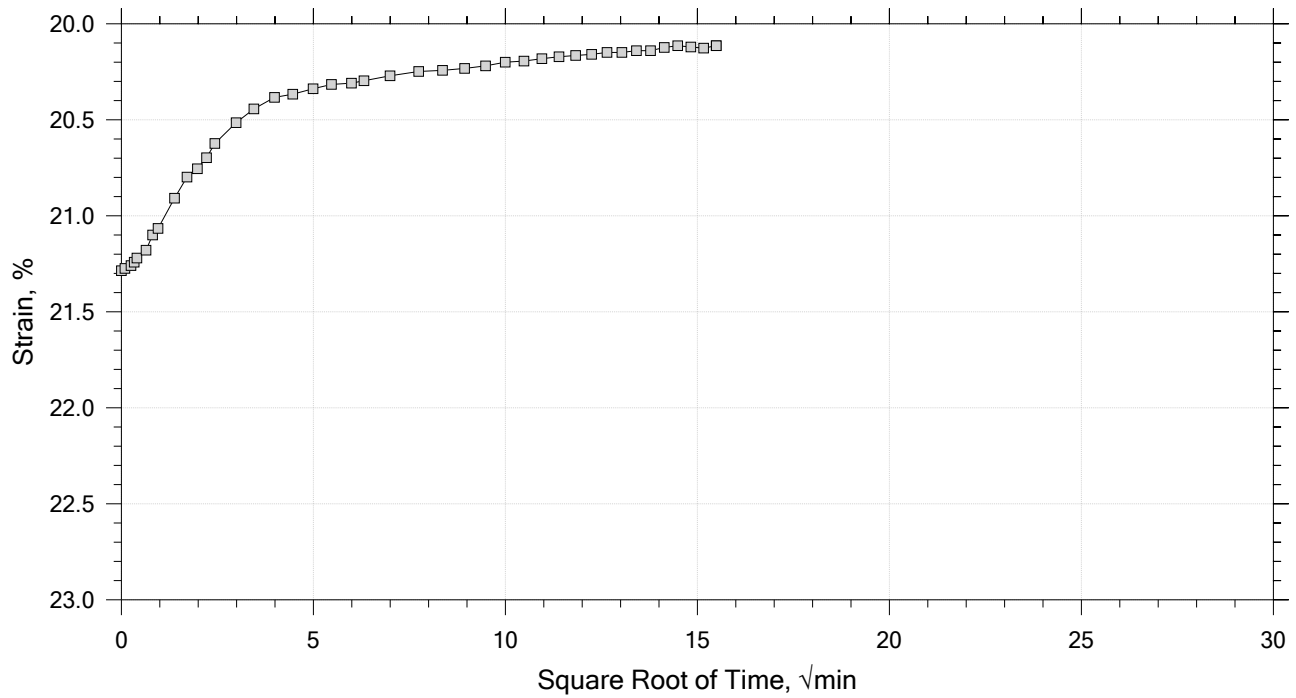
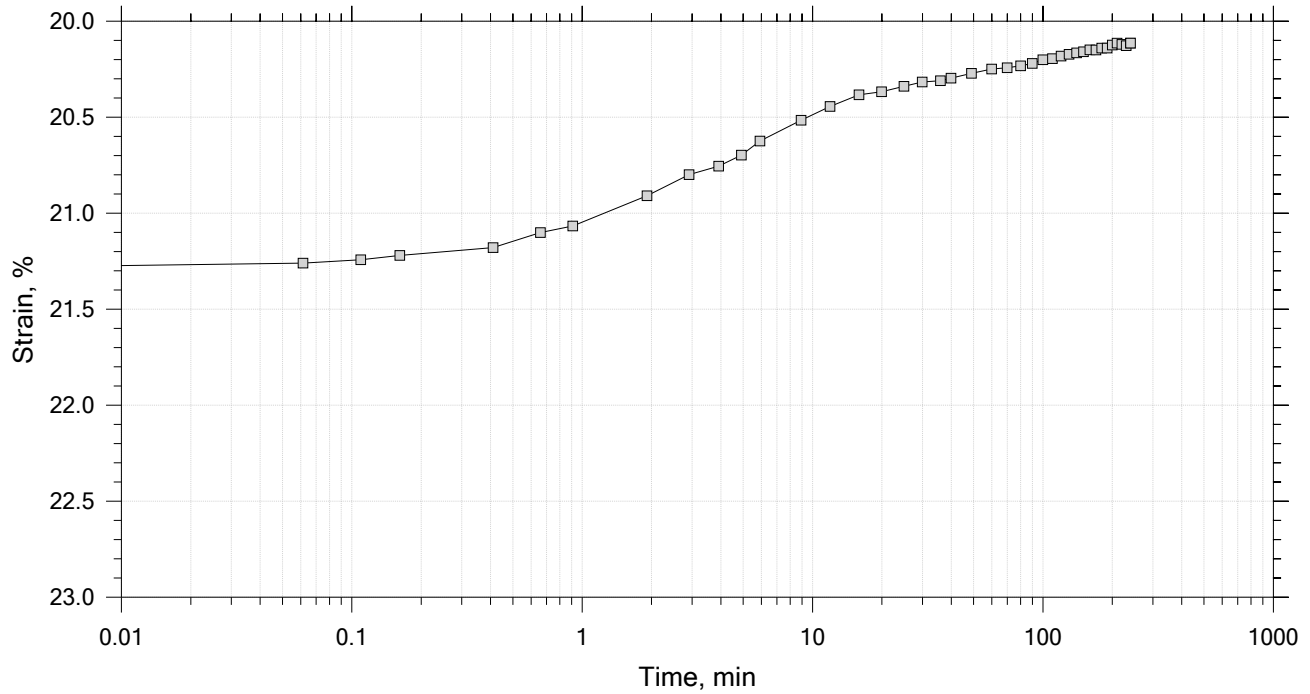
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	Boring No.: BB-BST1-101	Tested By: md	Checked By: mcm
	Sample No.: 1-U	Test Date: 07/22/19	Depth: 10-12 ft
	Test No.: IP-16	Sample Type: Intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System LTIII-B, Swell Pressure = 0.0789 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 13 of 15

Constant Load Step

Stress: 0.5 tsf



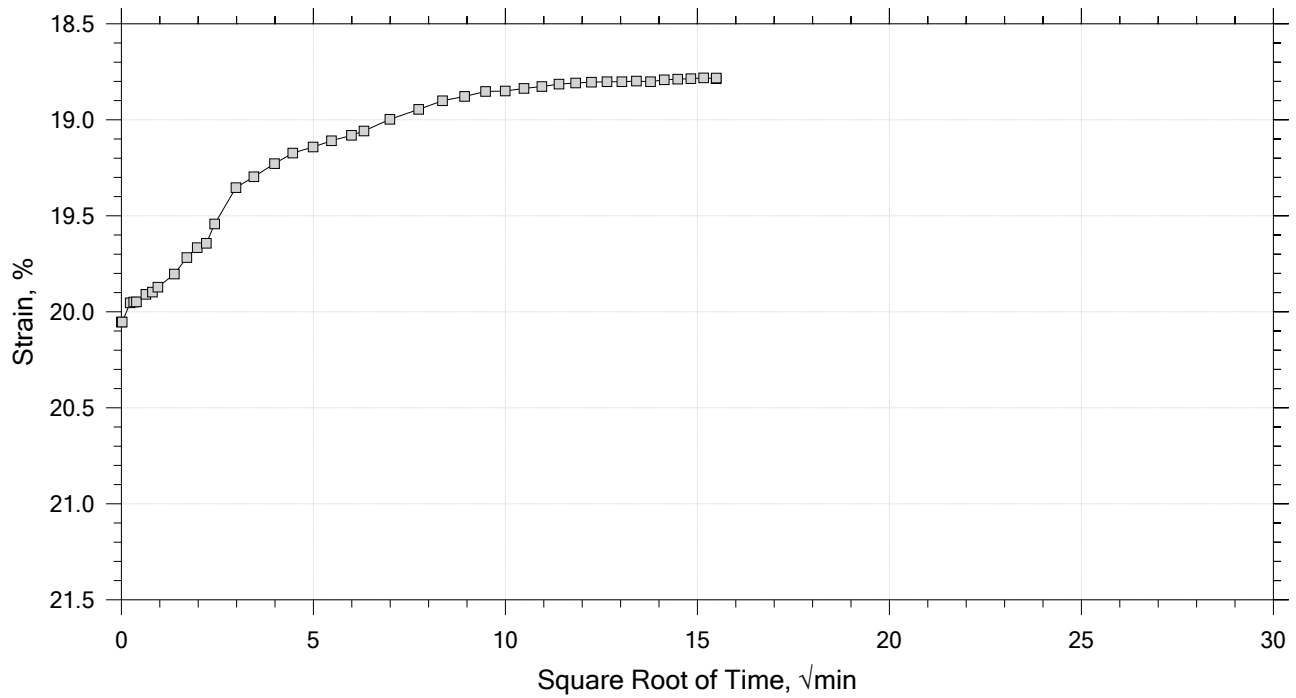
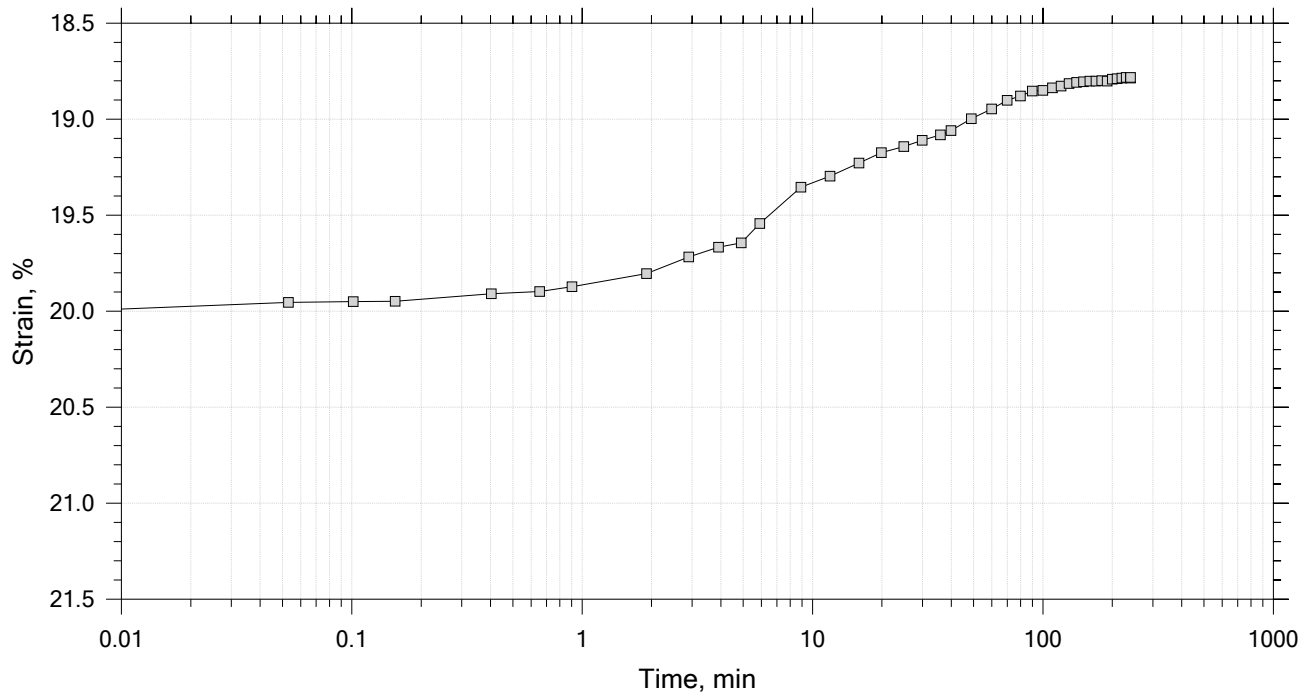
	Project: Rt 9/I-395 Connector	Location: Brewer and Eddington, ME	Project No.: GTX-308853
	Boring No.: BB-BST1-101	Tested By: md	Checked By: mcm
	Sample No.: 1-U	Test Date: 07/22/19	Depth: 10-12 ft
	Test No.: IP-16	Sample Type: Intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System LTIII-B, 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



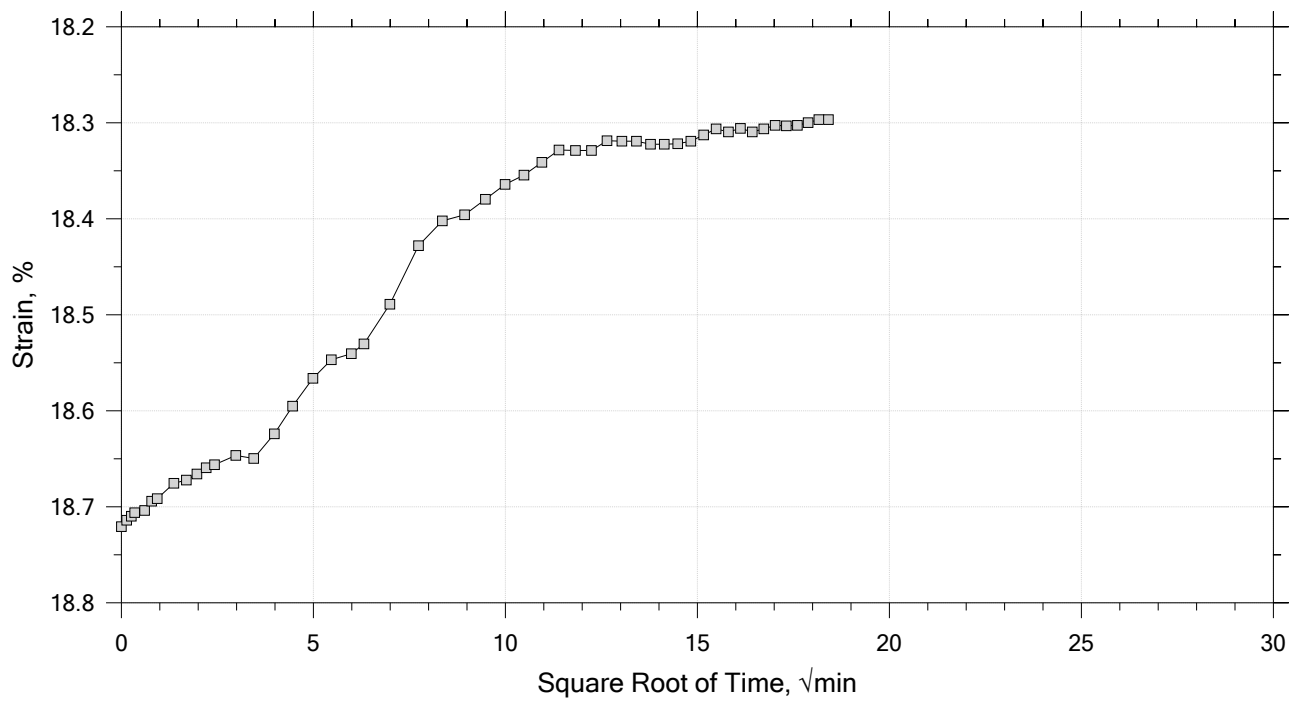
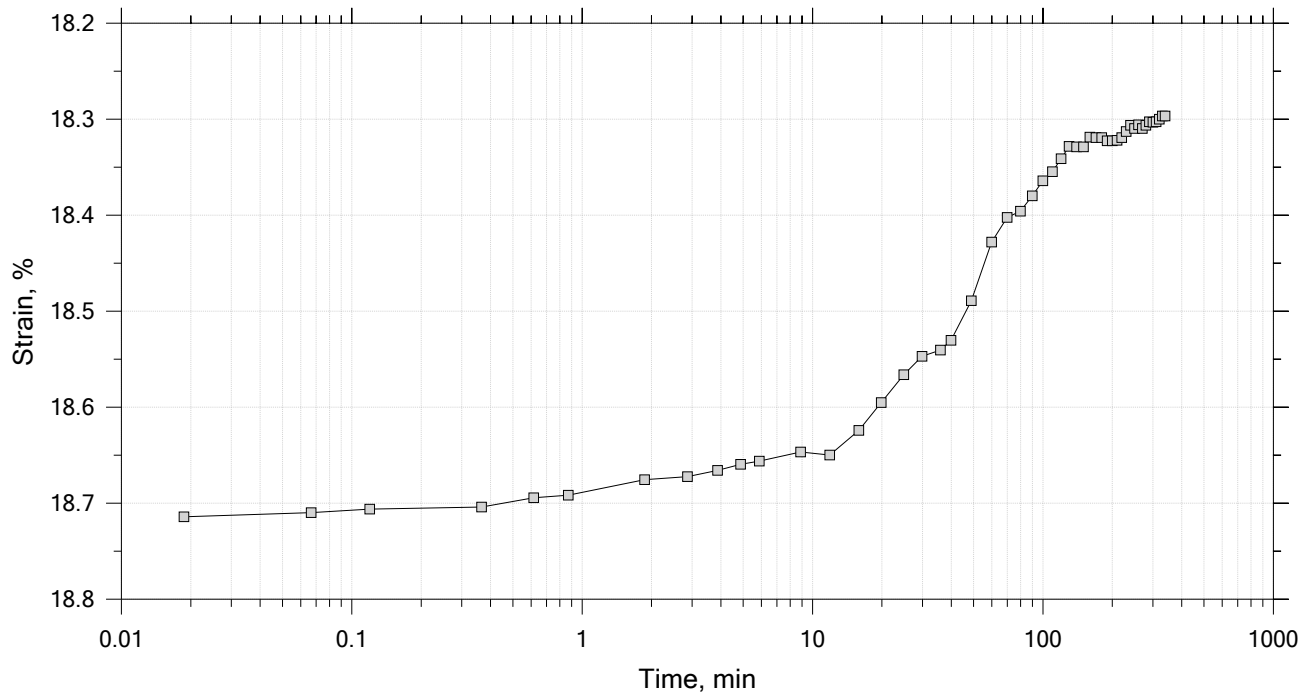
	Project: Rt 9/I-395 Connector	Location: Brewer and Eddington, ME	Project No.: GTX-308853
	Boring No.: BB-BST1-101	Tested By: md	Checked By: mcm
	Sample No.: 1-U	Test Date: 07/22/19	Depth: 10-12 ft
	Test No.: IP-16	Sample Type: Intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System LTIII-B, 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: Rt 9/I-395 Connector	Location: Brewer and Eddington, ME	Project No.: GTX-308853
	Boring No.: BB-BST1-101	Tested By: md	Checked By: mcm
	Sample No.: 1-U	Test Date: 07/22/19	Depth: 10-12 ft
	Test No.: IP-16	Sample Type: Intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System LTIII-B, Swell Pressure = 0.0789 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Specimen Diameter: 2.50 in	Estimated Specific Gravity: 2.76	Liquid Limit: 37
Initial Height: 1.00 in	Initial Void Ratio: 0.933	Plastic Limit: 20
Final Height: 0.82 in	Final Void Ratio: 0.579	Plasticity Index: 17

	Before Test Trimmings	Before Test Specimen	After Test Specimen	After Test Trimmings
Container ID	D-968	RING		A-3022
Mass Container, gm	8.24	109.56	109.56	8.64
Mass Container + Wet Soil, gm	155.83	260.03	248.39	147.12
Mass Container + Dry Soil, gm	118.13	224.29	224.29	123.08
Mass Dry Soil, gm	109.89	114.73	114.73	114.44
Water Content, %	34.31	31.15	21.01	21.01
Void Ratio	---	0.93	0.58	---
Degree of Saturation, %	---	92.07	100.00	---
Dry Unit Weight, pcf	---	89.039	108.98	---


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: Rt 9/I-395 Connector	Location: Brewer and Eddington, ME	Project No.: GTX-308853
	Boring No.: BB-BST1-101	Tested By: md	Checked By: mcm
	Sample No.: 1-U	Test Date: 07/22/19	Depth: 10-12 ft
	Test No.: IP-16	Sample Type: Intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System LTIII-B, Swell Pressure = 0.0789 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Log of Time Coefficients


[illegible]

	Project: Rt 9/I-395 Connector	Location: Brewer and Eddington, ME	Project No.: GTX-308853
	Boring No.: BB-BST1-101	Tested By: md	Checked By: mcm
	Sample No.: 1-U	Test Date: 07/22/19	Depth: 10-12 ft
	Test No.: IP-16	Sample Type: Intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System LTIIB-B, Swell Pressure = 0.0789 tsf		
	Displacement at End of Increment		

One-Dimensional Consolidation by ASTM D2435 - Method B

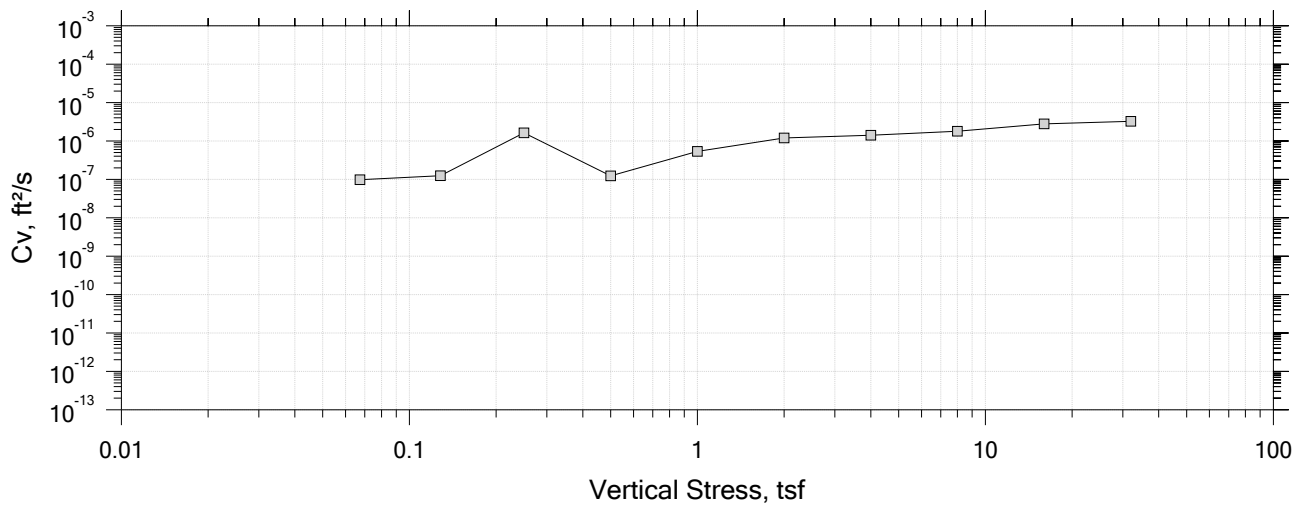
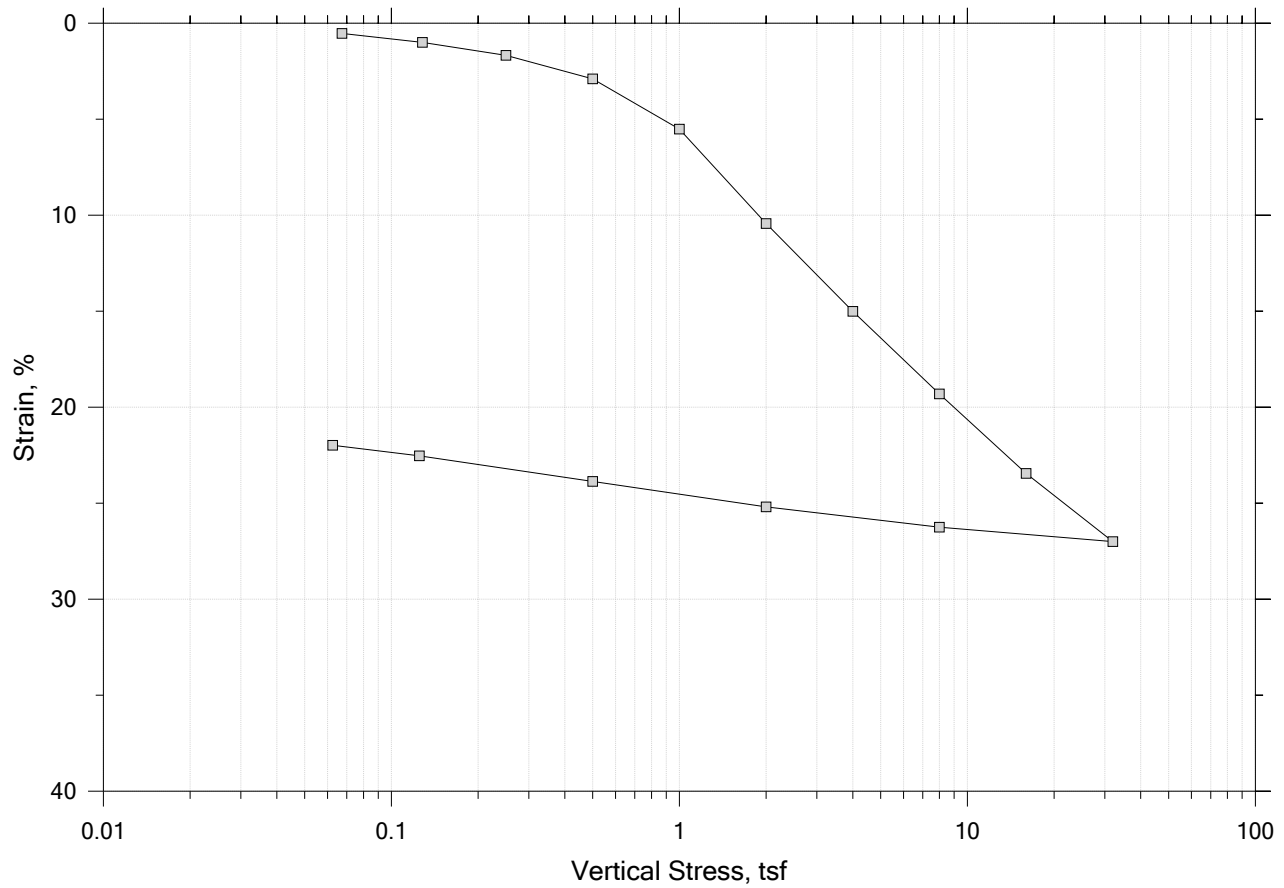
Square Root of Time Coefficients


[illegible]

	Project: Rt 9/I-395 Connector	Location: Brewer and Eddington, ME	Project No.: GTX-308853
	Boring No.: BB-BST1-101	Tested By: md	Checked By: mcm
	Sample No.: 1-U	Test Date: 07/22/19	Depth: 10-12 ft
	Test No.: IP-16	Sample Type: Intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System LTIIB-B, Swell Pressure = 0.0789 tsf		
	Displacement at End of Increment		

One-Dimensional Consolidation by ASTM D2435 - Method B

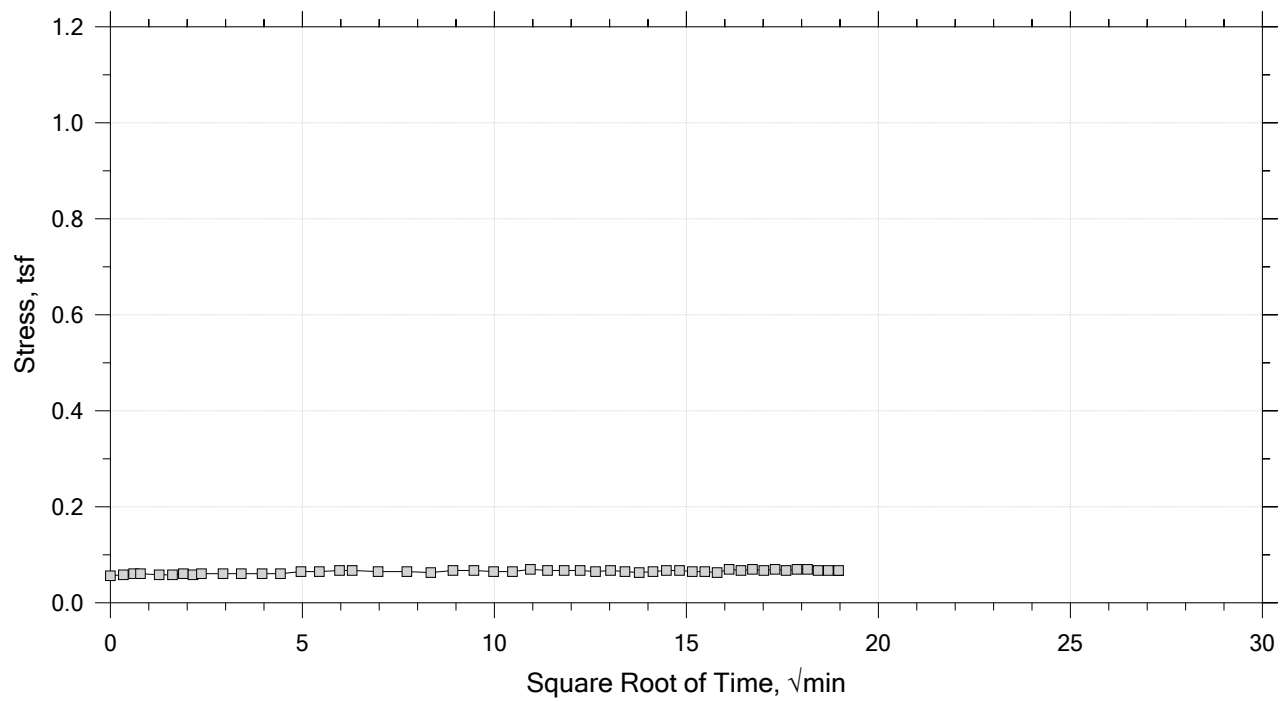
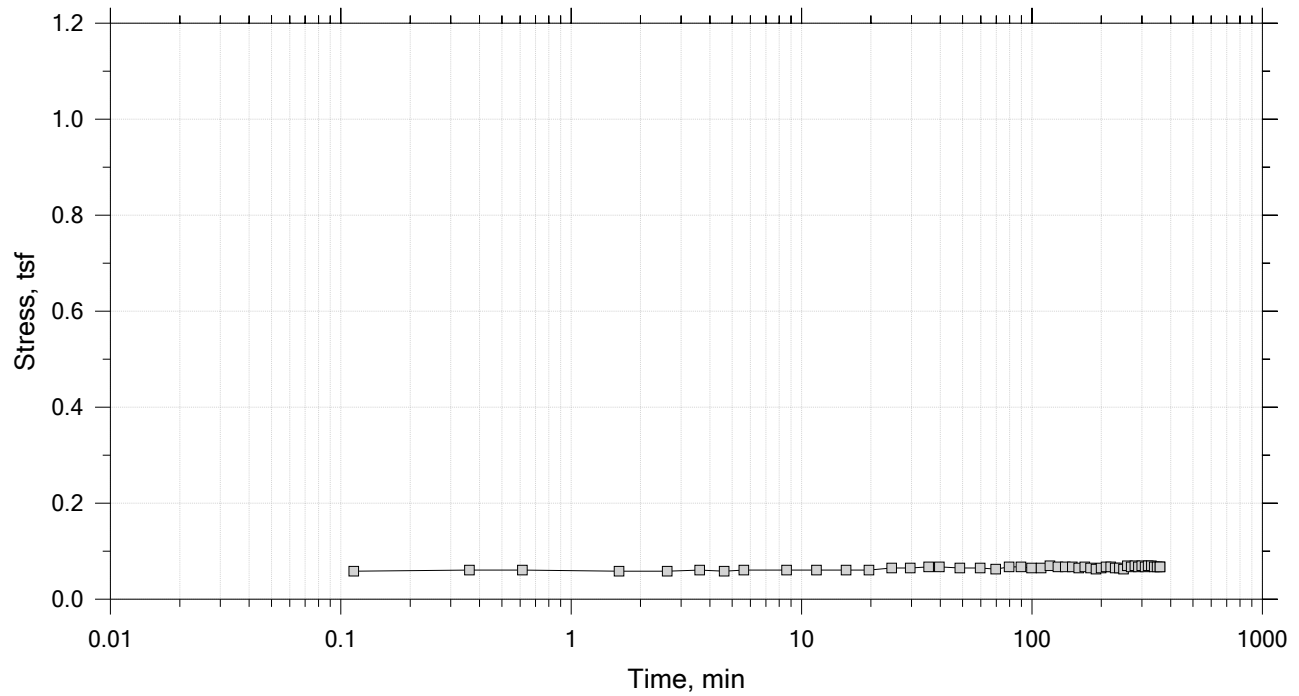
Summary Report




	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: BB-BST1-201	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 03/24/21	Depth: 15-17 ft
	Test No.: IP-7A-	Sample Type: intact	Elevation: ---
	Description: Moist, olive clay		
	Remarks: System X, Swell Pressure = 0.128 tsf		
	Displacement at End of Increment		

One-Dimensional Consolidation by ASTM D2435 - Method B

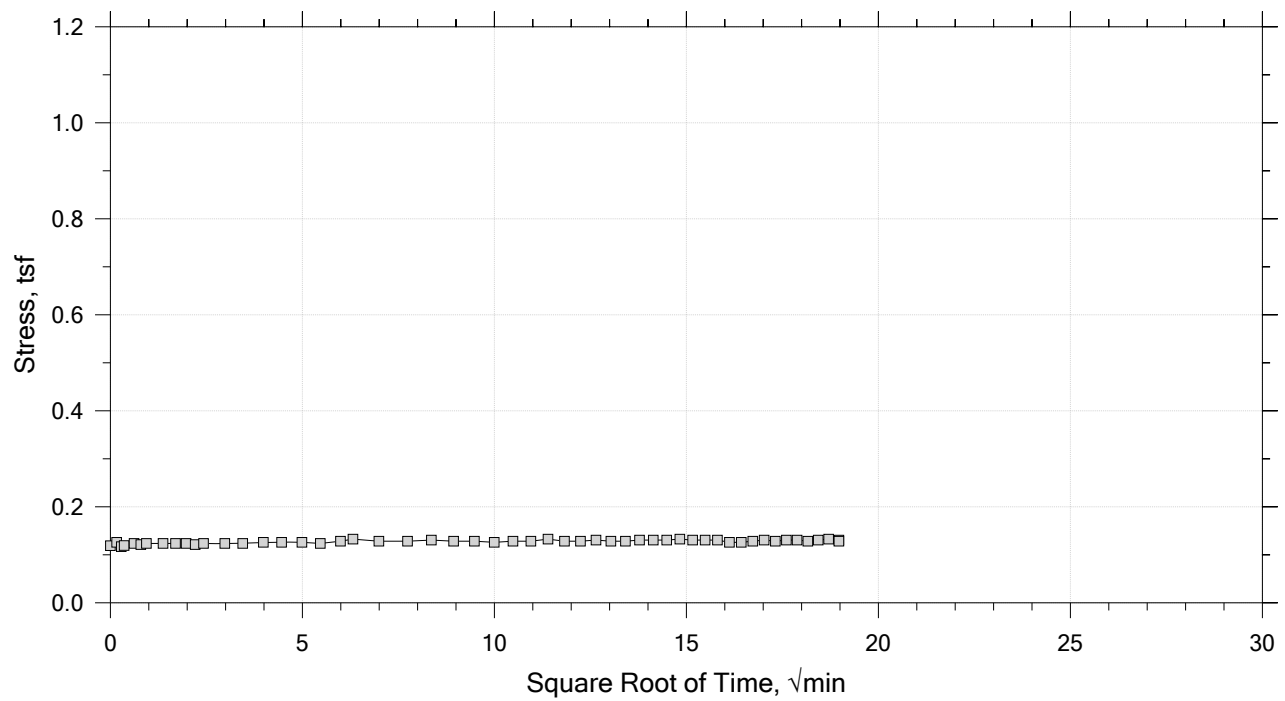
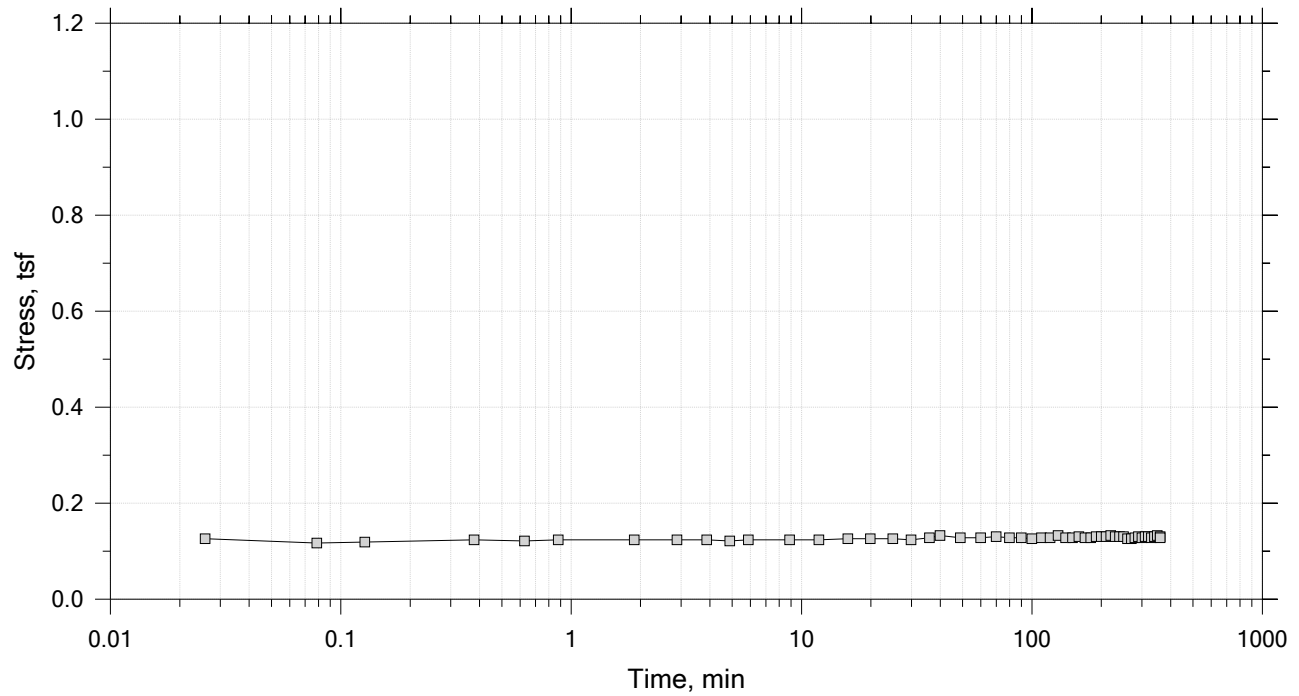
Time Curve 1 of 15
Constant Volume Step
Stress: 0.0673 tsf




	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: BB-BST1-201	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 03/24/21	Depth: 15-17 ft
	Test No.: IP-7A-	Sample Type: intact	Elevation: ---
	Description: Moist, olive clay		
	Remarks: System X, Swell Pressure = 0.128 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 2 of 15
Constant Volume Step
Stress: 0.128 tsf



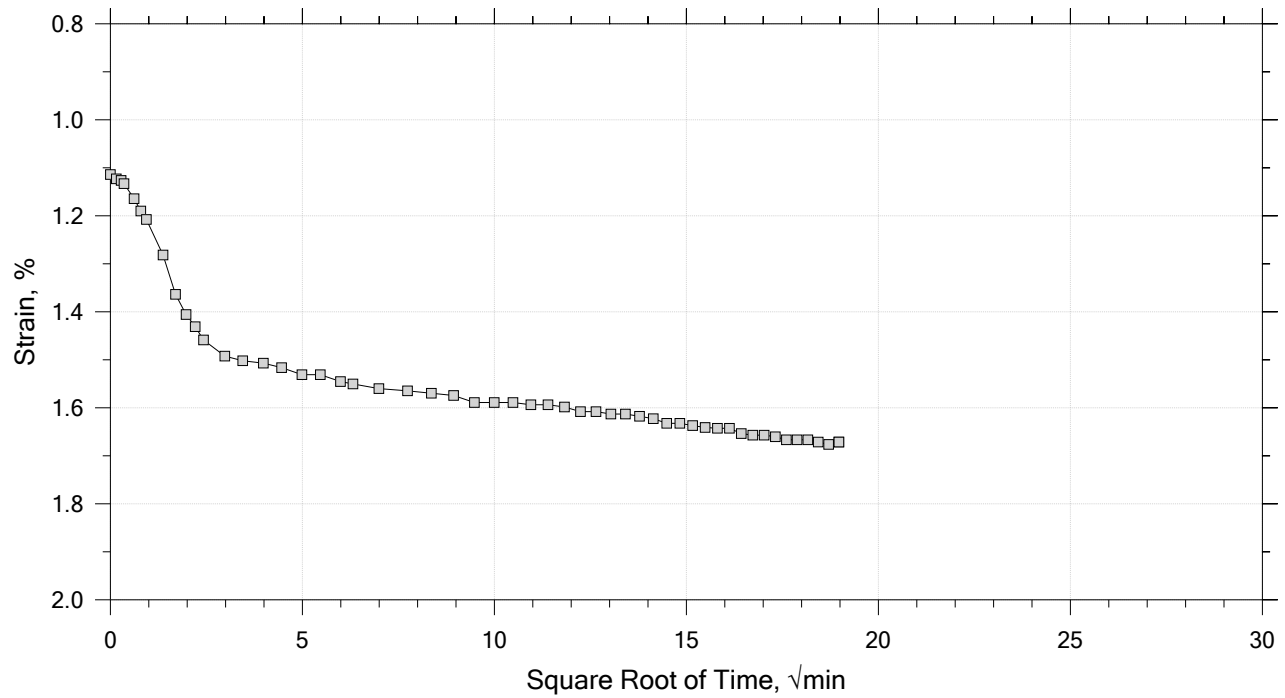
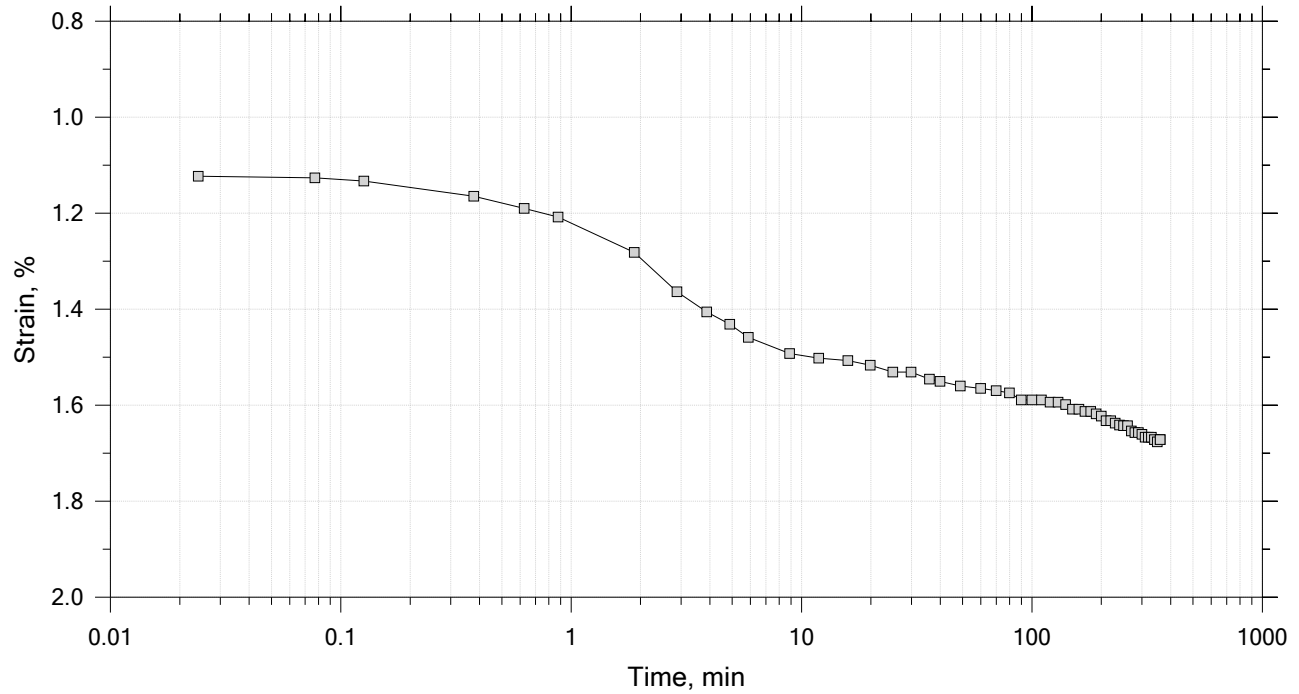
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	Boring No.: BB-BST1-201	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 03/24/21	Depth: 15-17 ft
	Test No.: IP-7A-	Sample Type: intact	Elevation: ---
	Description: Moist, olive clay		
	Remarks: System X, Swell Pressure = 0.128 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 3 of 15

Constant Load Step

Stress: 0.25 tsf



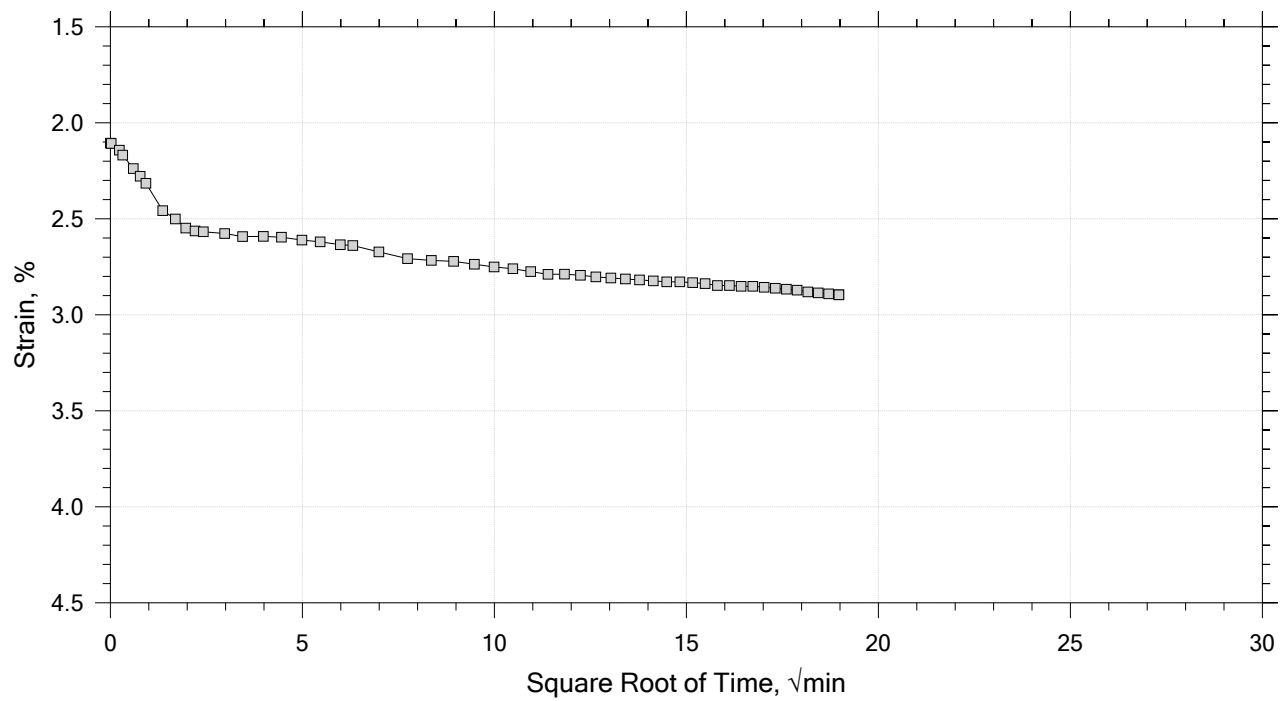
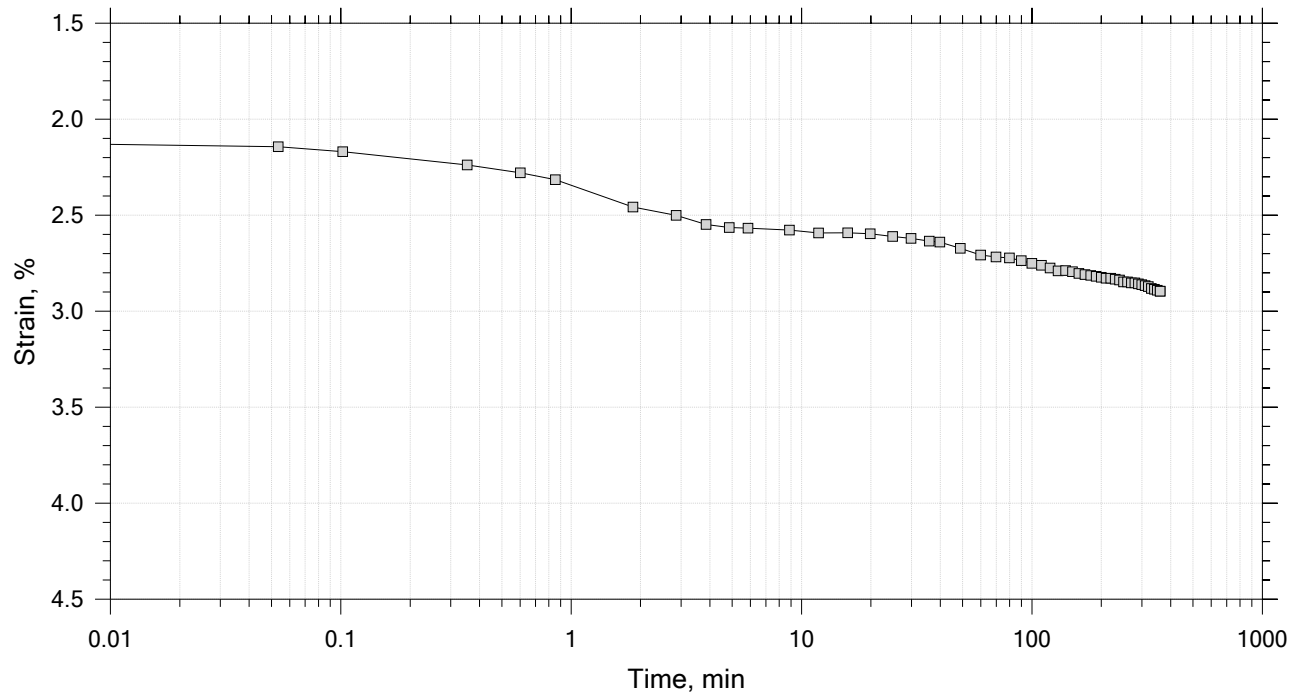
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	Boring No.: BB-BST1-201	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 03/24/21	Depth: 15-17 ft
	Test No.: IP-7A-	Sample Type: intact	Elevation: ---
	Description: Moist, olive clay		
	Remarks: System X, Swell Pressure = 0.128 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 4 of 15

Constant Load Step

Stress: 0.5 tsf



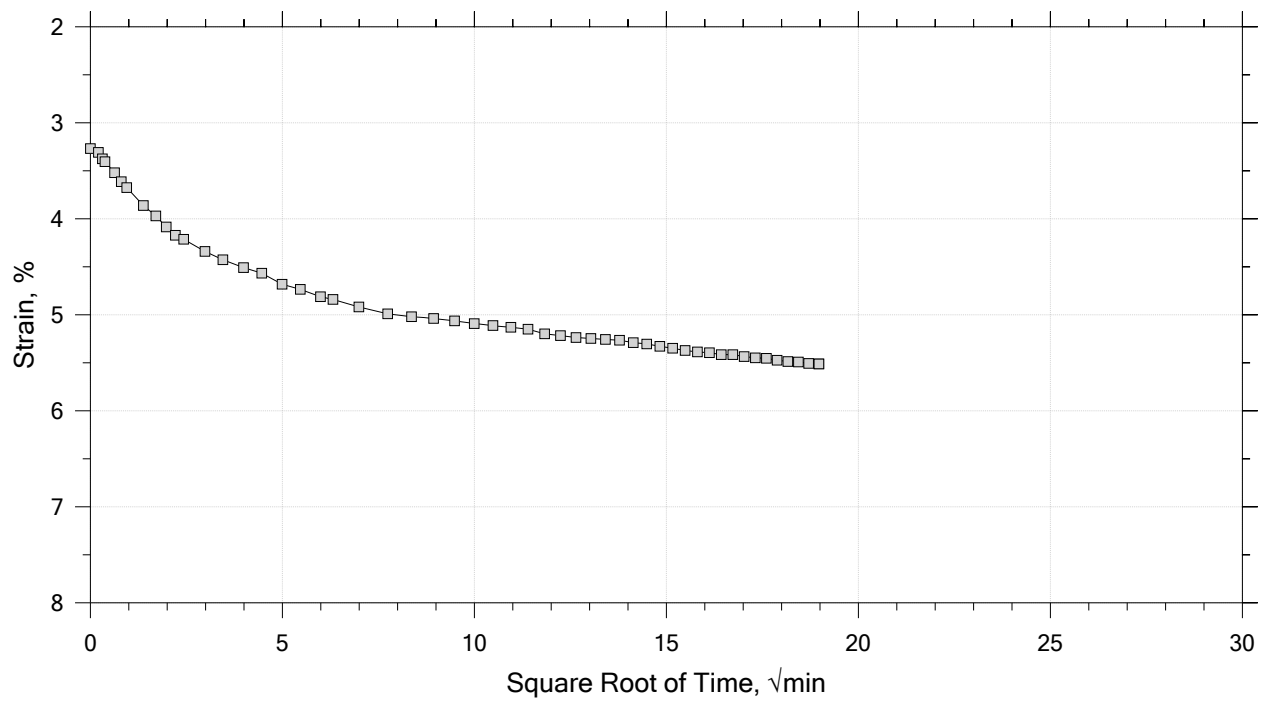
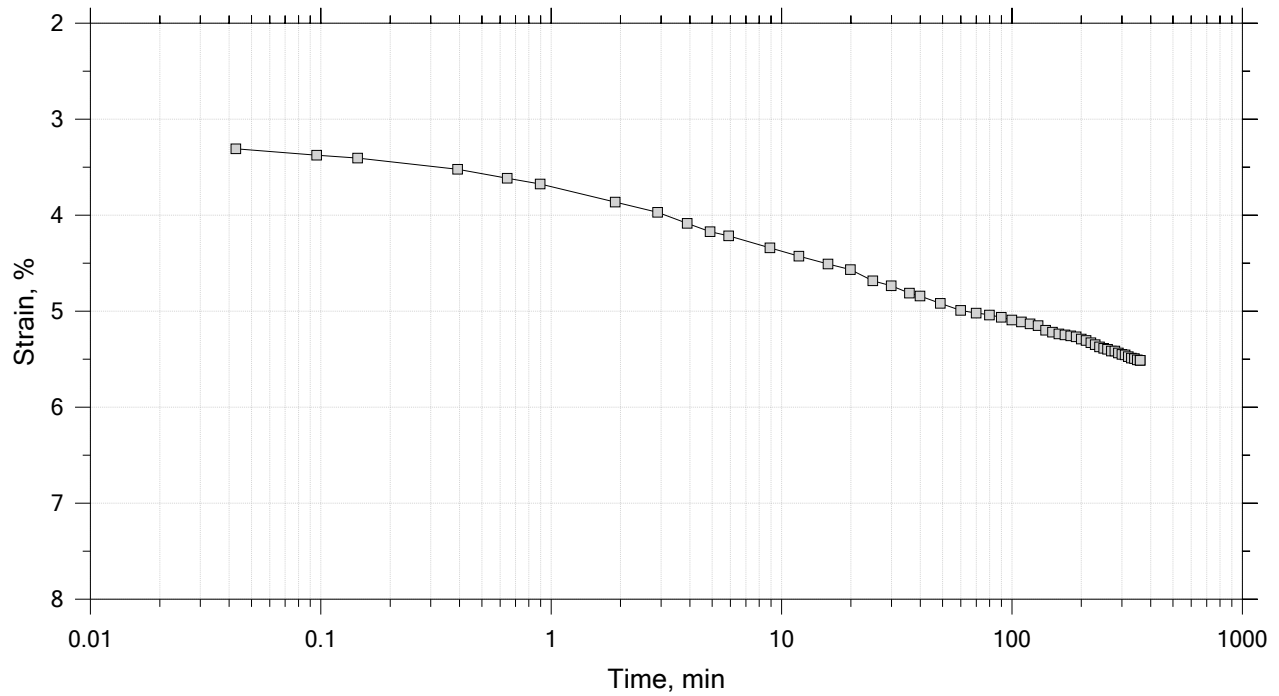
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	Boring No.: BB-BST1-201	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 03/24/21	Depth: 15-17 ft
	Test No.: IP-7A-	Sample Type: intact	Elevation: ---
	Description: Moist, olive clay		
	Remarks: System X, Swell Pressure = 0.128 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 5 of 15

Constant Load Step

Stress: 1 tsf



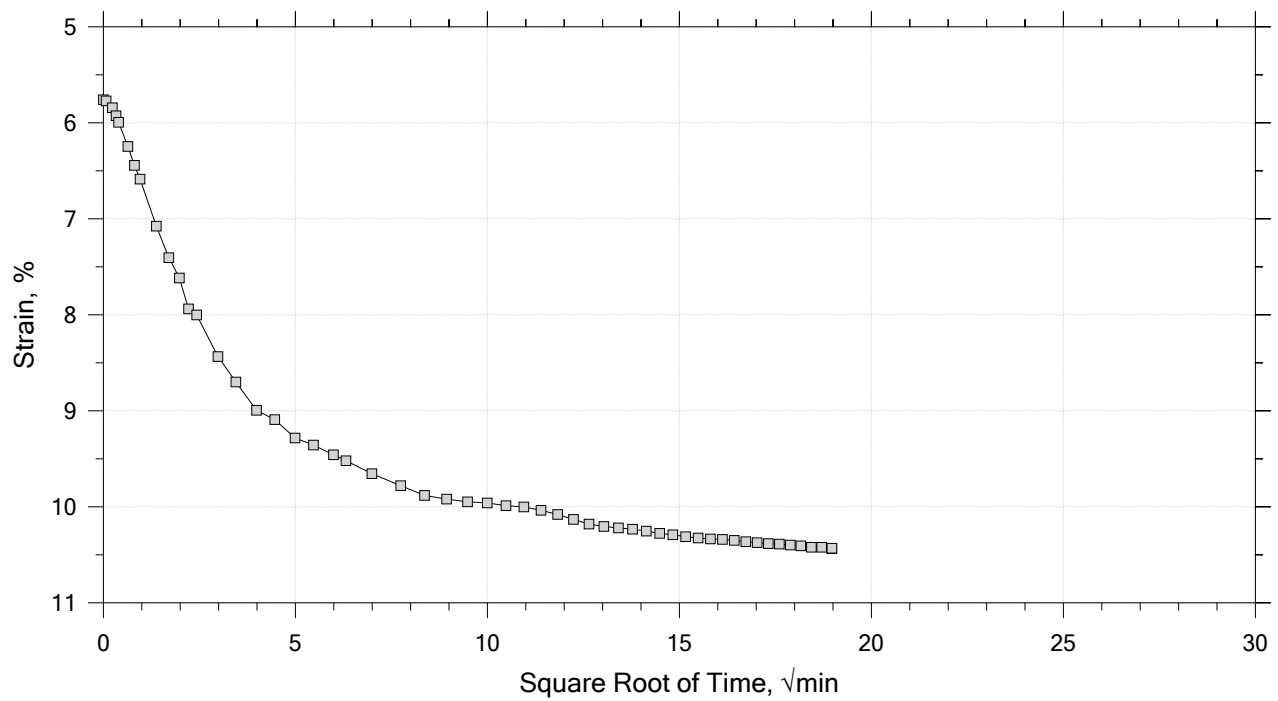
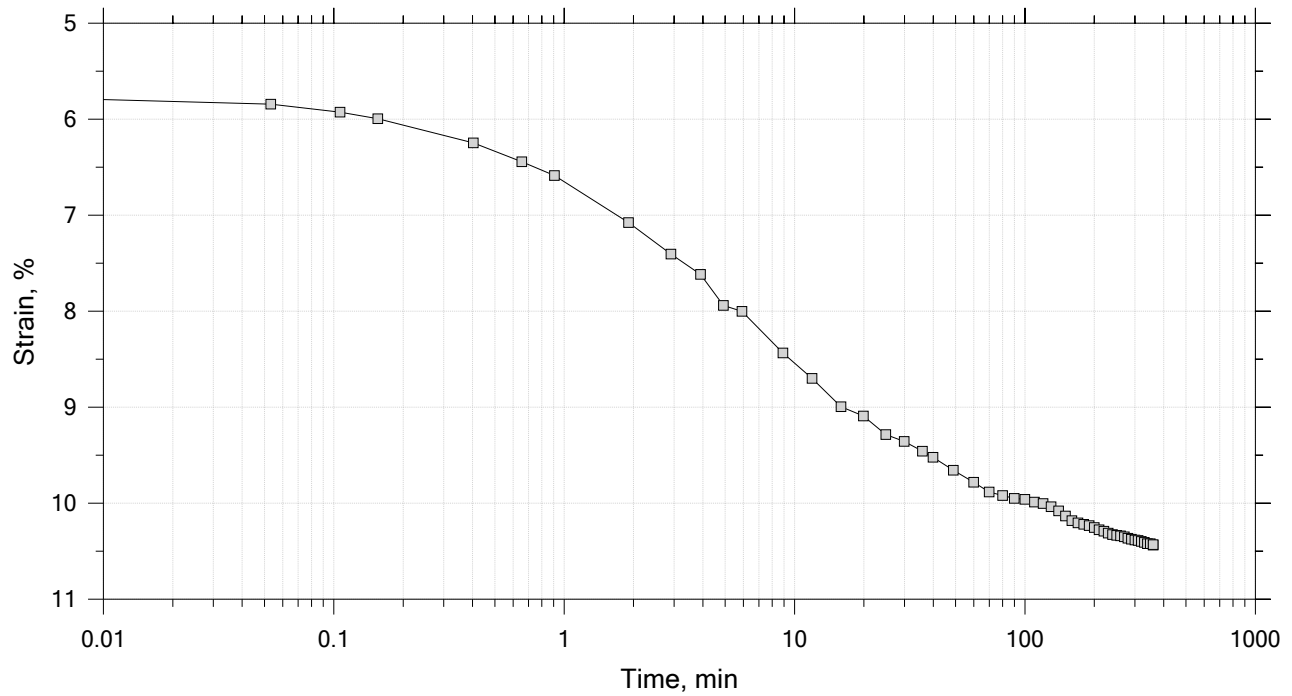
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	Boring No.: BB-BST1-201	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 03/24/21	Depth: 15-17 ft
	Test No.: IP-7A-	Sample Type: intact	Elevation: ---
	Description: Moist, olive clay		
	Remarks: System X, Swell Pressure = 0.128 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 6 of 15

Constant Load Step

Stress: 2 tsf



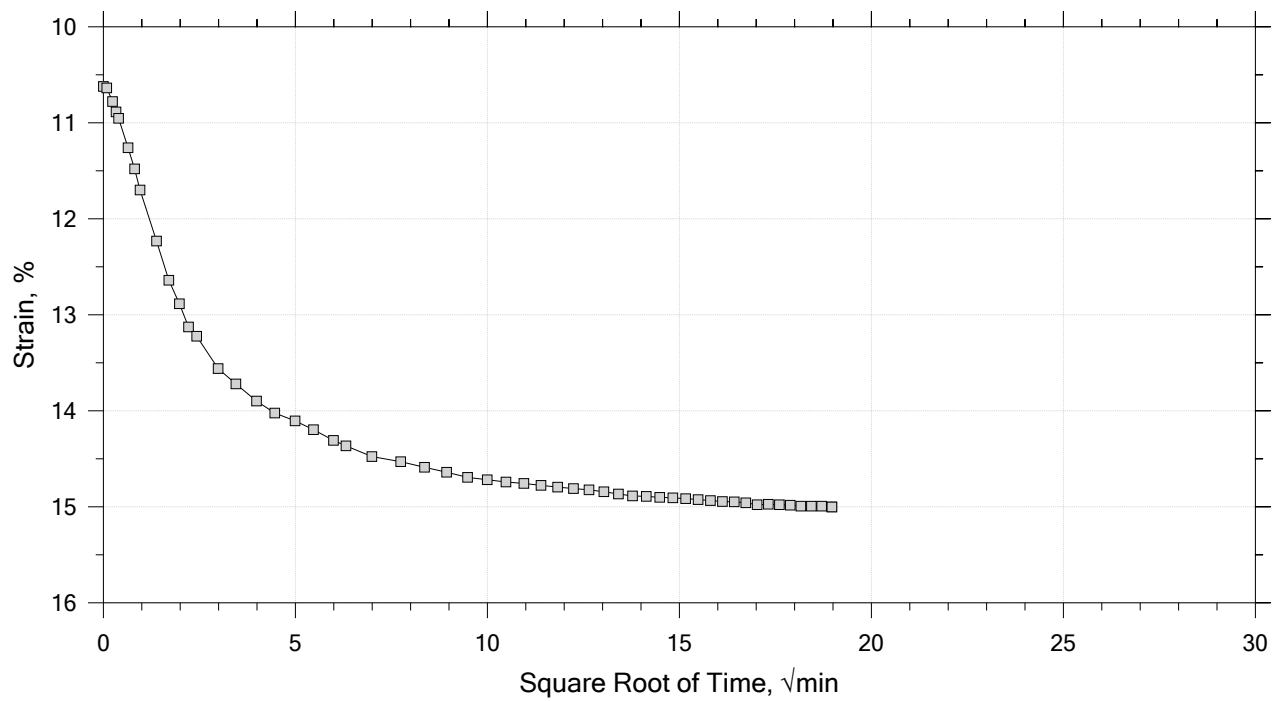
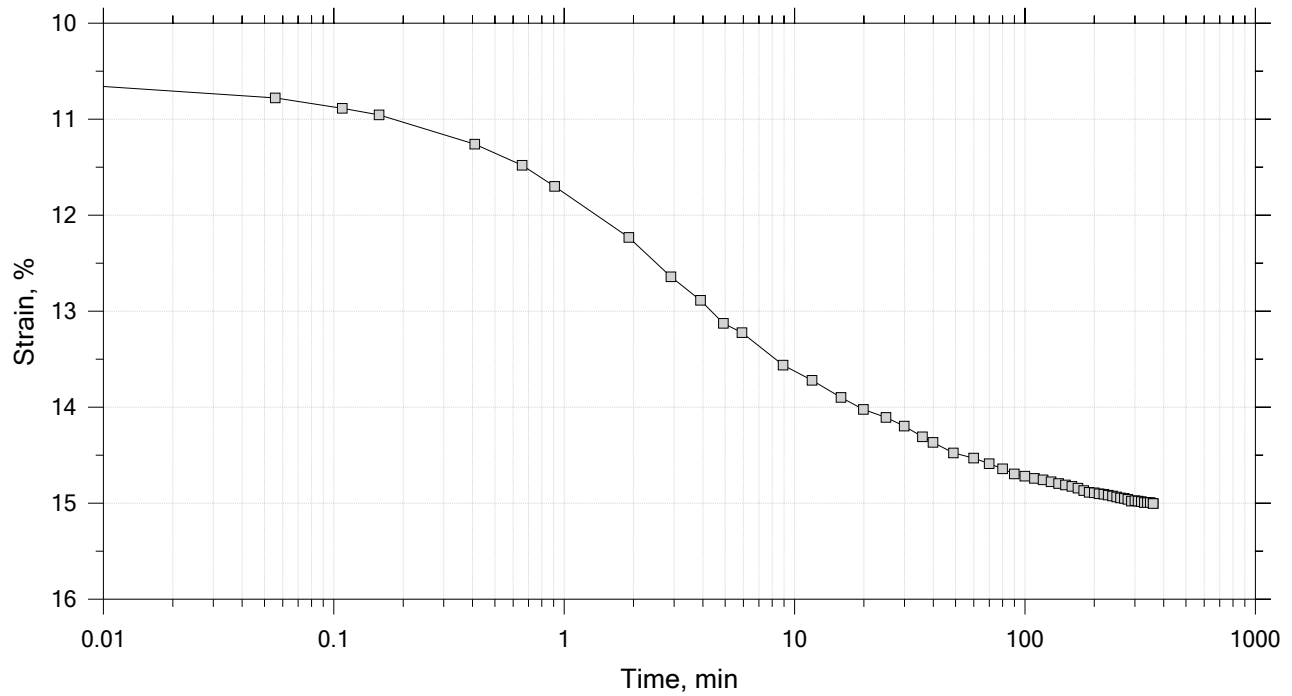
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	Boring No.: BB-BST1-201	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 03/24/21	Depth: 15-17 ft
	Test No.: IP-7A-	Sample Type: intact	Elevation: ---
	Description: Moist, olive clay		
	Remarks: System X, Swell Pressure = 0.128 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 7 of 15

Constant Load Step

Stress: 4 tsf



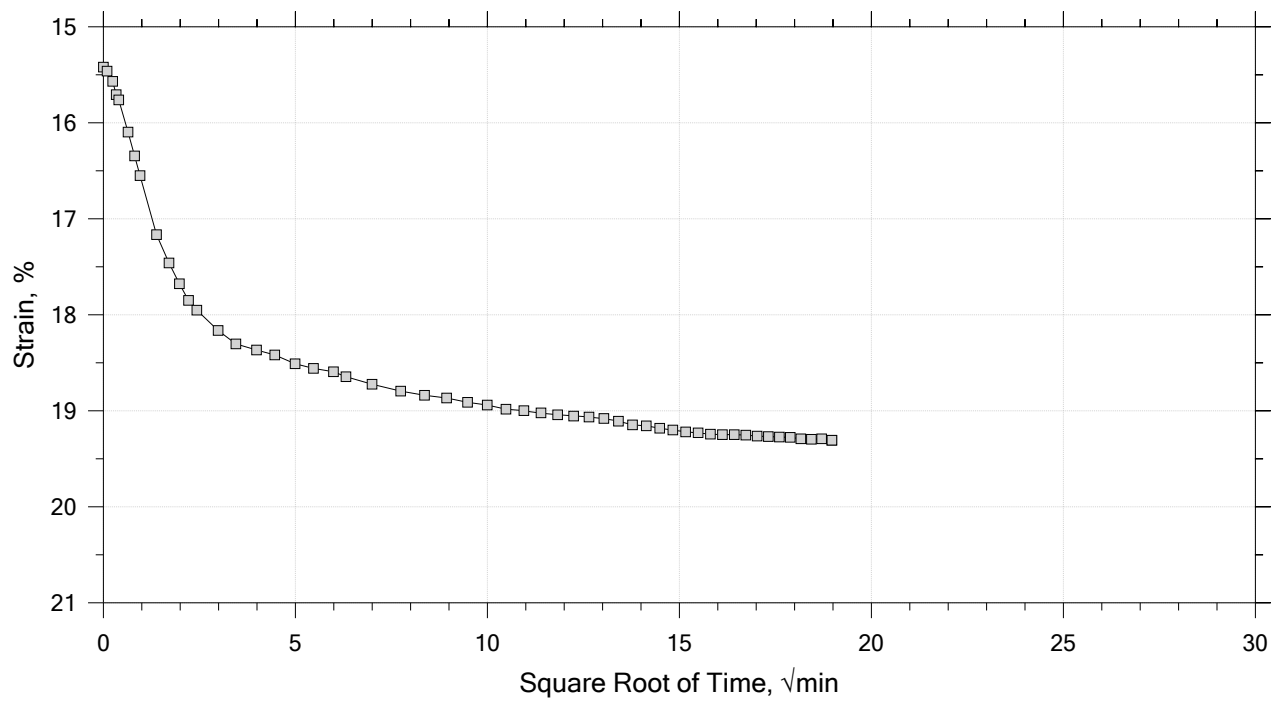
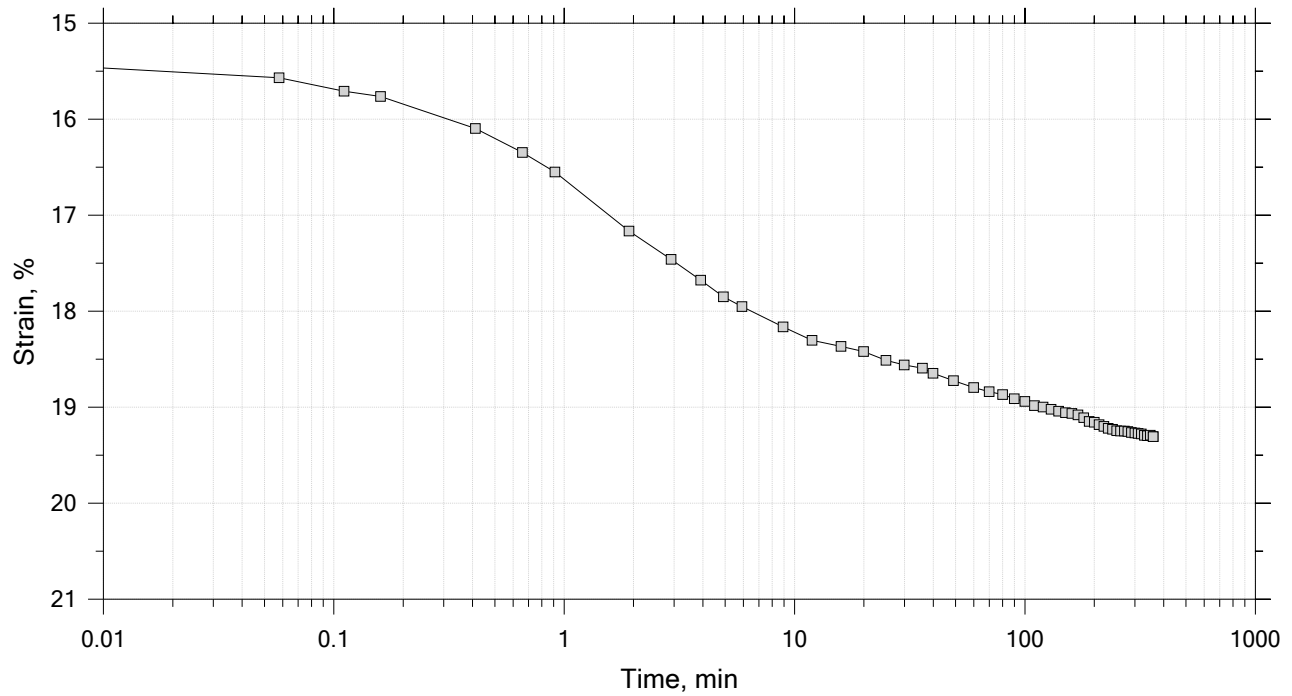
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	Boring No.: BB-BST1-201	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 03/24/21	Depth: 15-17 ft
	Test No.: IP-7A-	Sample Type: intact	Elevation: ---
	Description: Moist, olive clay		
	Remarks: System X, Swell Pressure = 0.128 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 8 of 15

Constant Load Step

Stress: 8 tsf



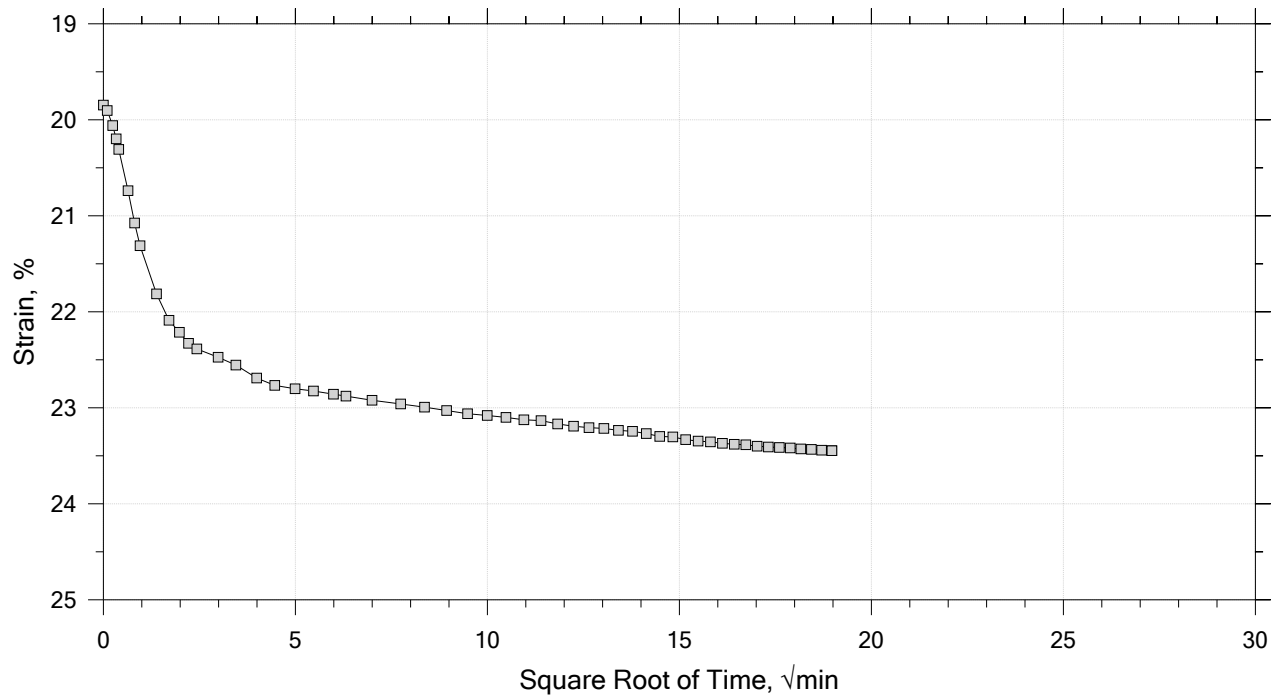
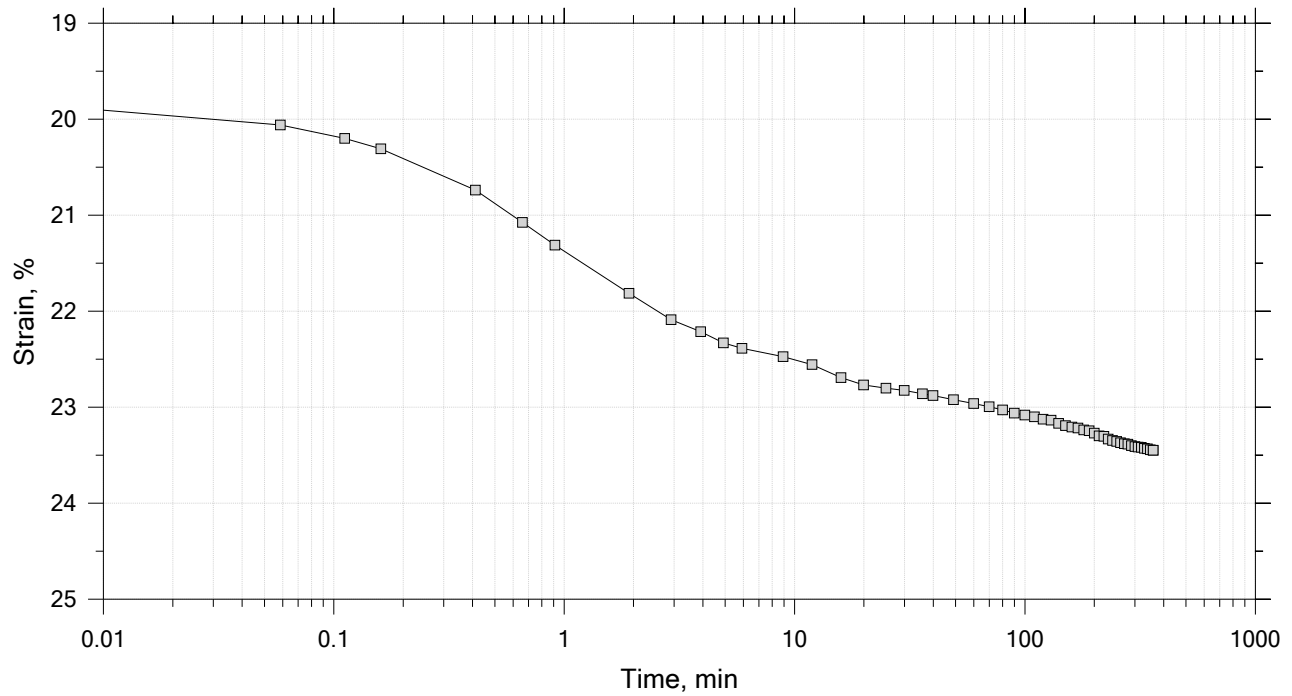
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	Boring No.: BB-BST1-201	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 03/24/21	Depth: 15-17 ft
	Test No.: IP-7A-	Sample Type: intact	Elevation: ---
	Description: Moist, olive clay		
	Remarks: System X, Swell Pressure = 0.128 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 9 of 15

Constant Load Step

Stress: 16 tsf



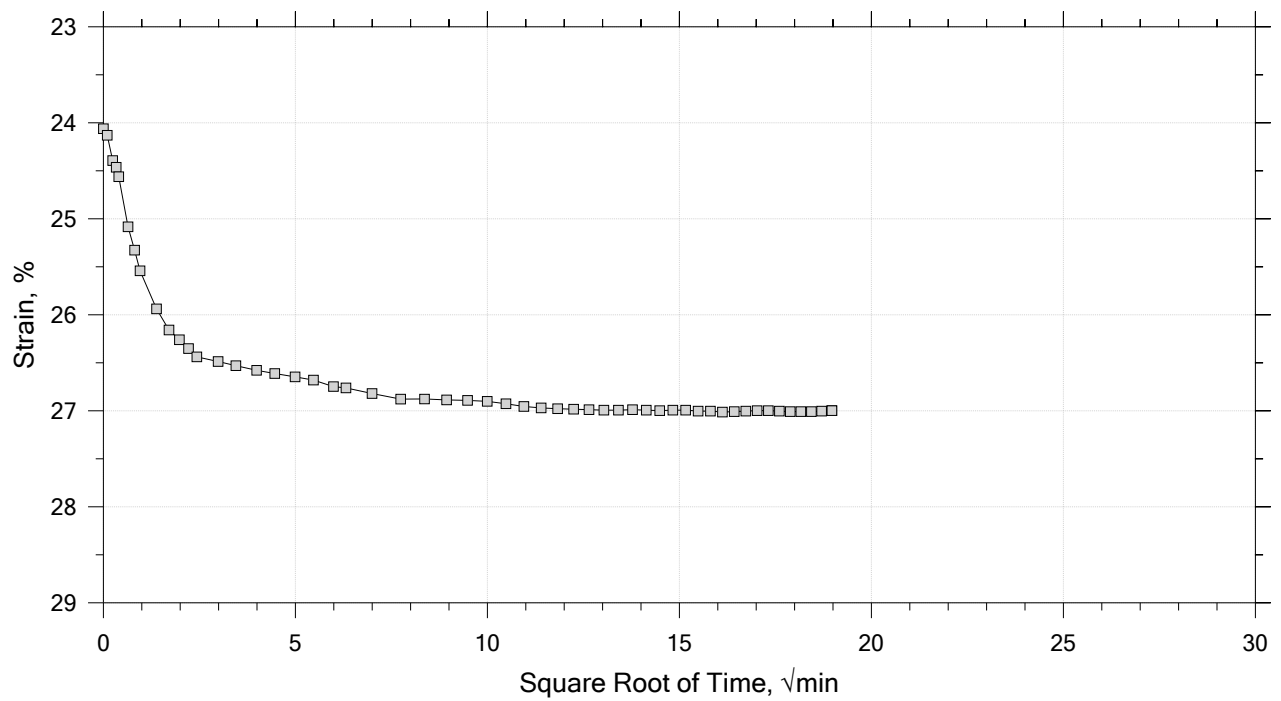
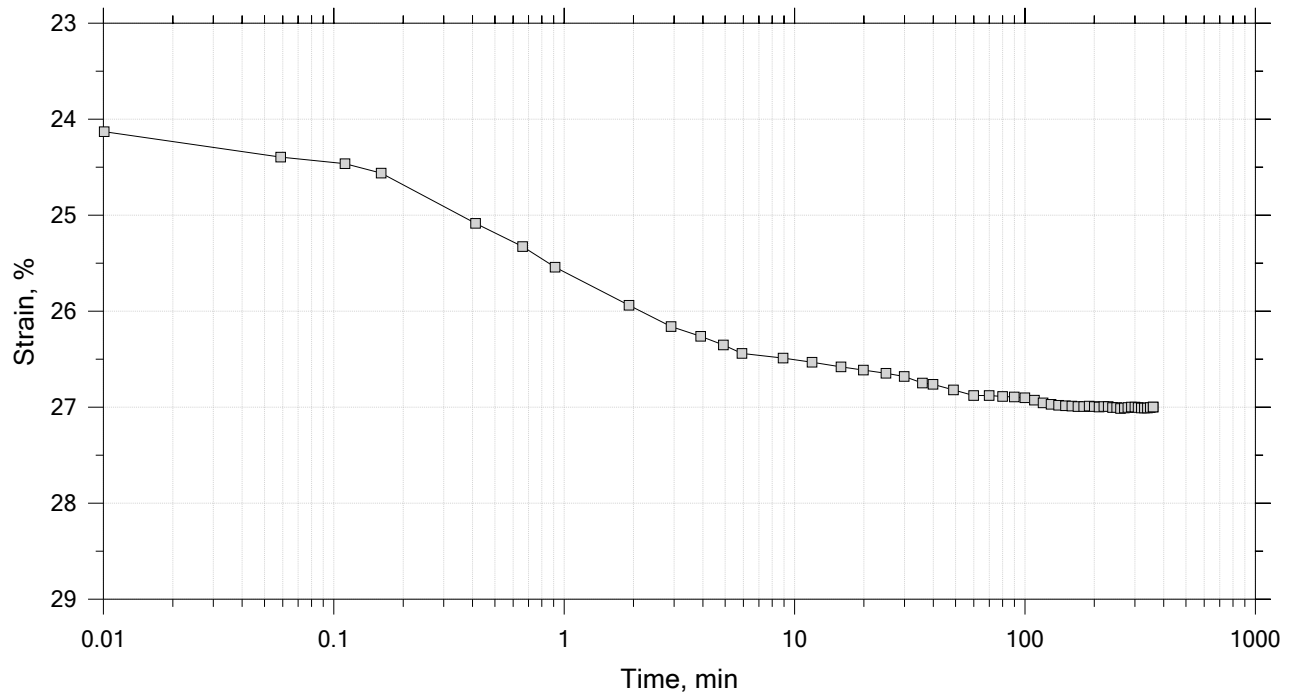
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	Boring No.: BB-BST1-201	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 03/24/21	Depth: 15-17 ft
	Test No.: IP-7A-	Sample Type: intact	Elevation: ---
	Description: Moist, olive clay		
	Remarks: System X, Swell Pressure = 0.128 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 10 of 15

Constant Load Step

Stress: 32 tsf



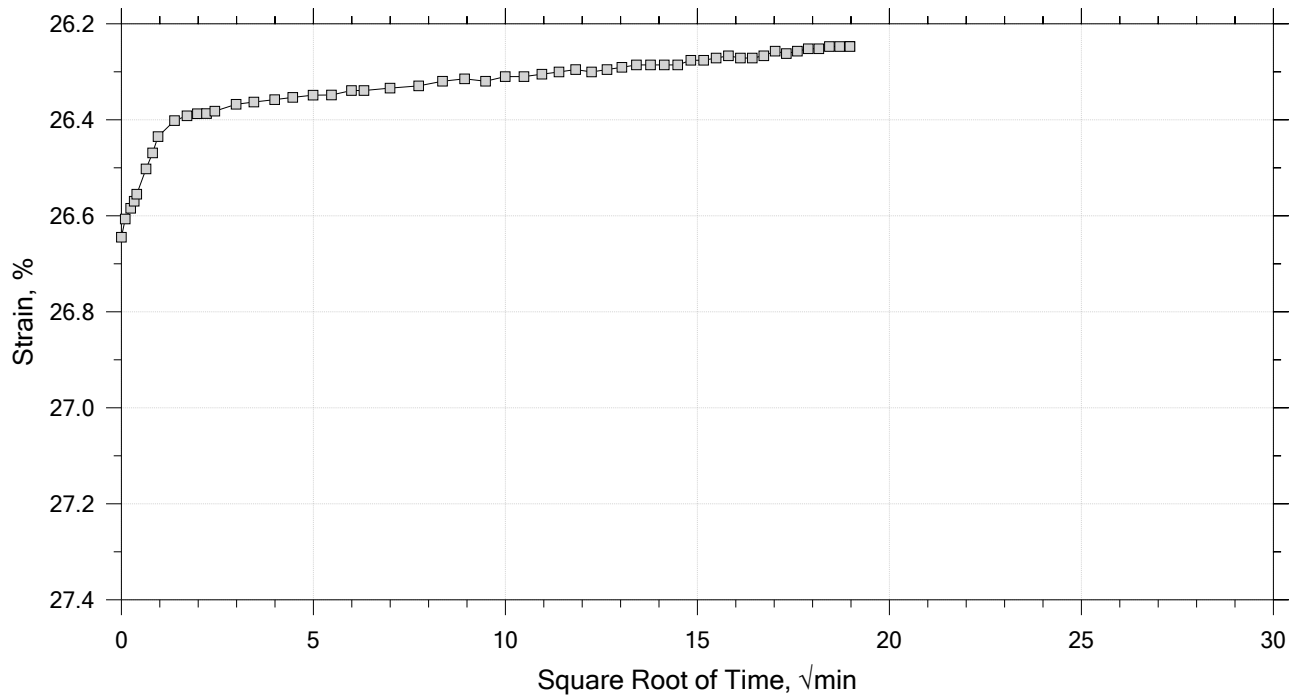
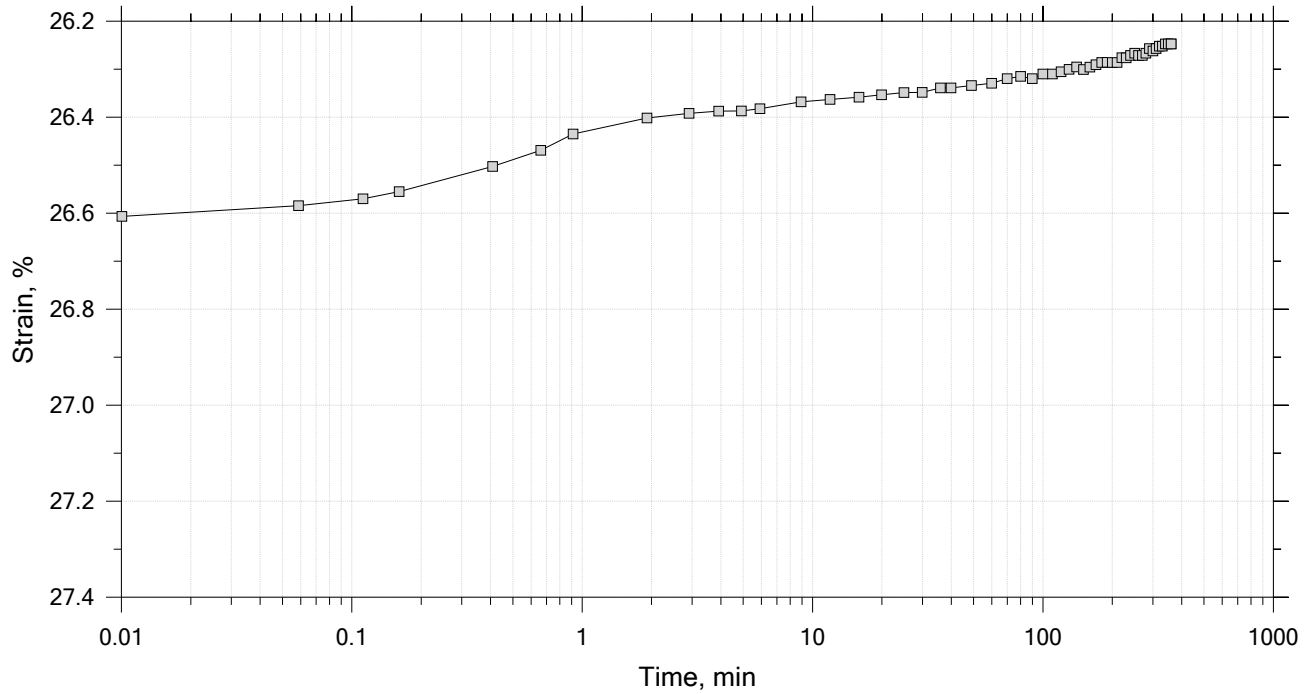
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	Boring No.: BB-BST1-201	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 03/24/21	Depth: 15-17 ft
	Test No.: IP-7A-	Sample Type: intact	Elevation: ---
	Description: Moist, olive clay		
	Remarks: System X, Swell Pressure = 0.128 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 11 of 15

Constant Load Step

Stress: 8 tsf



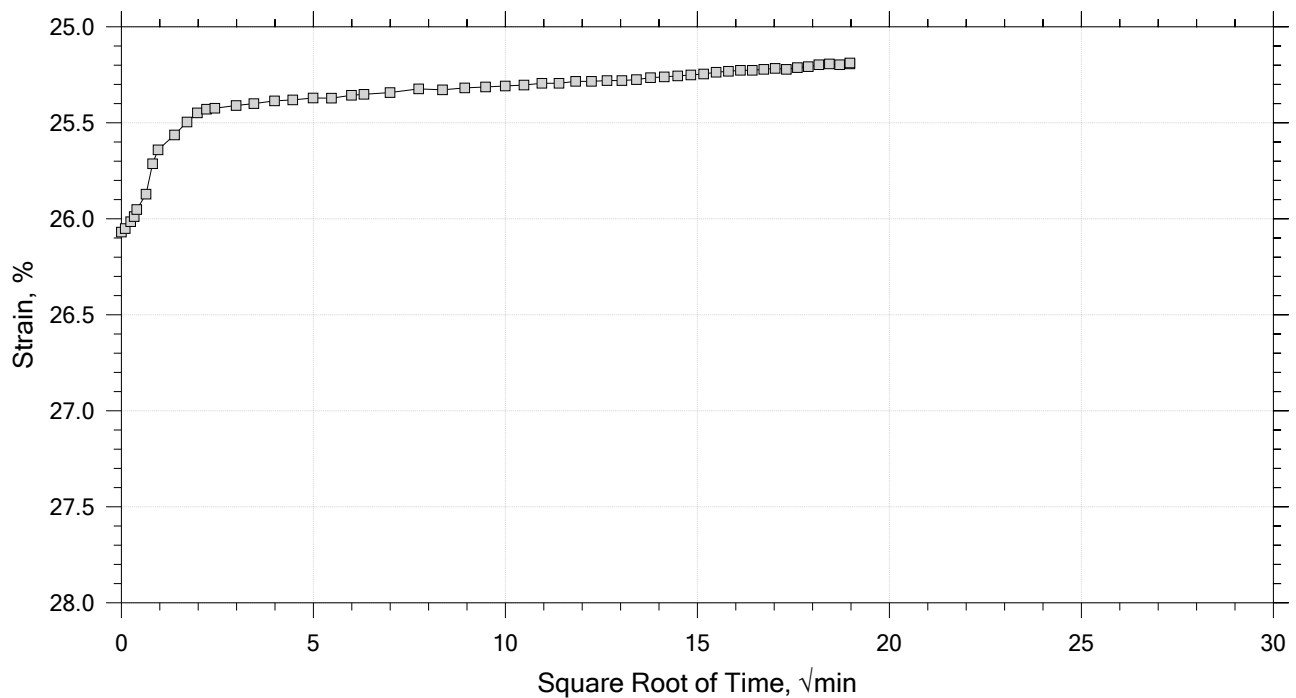
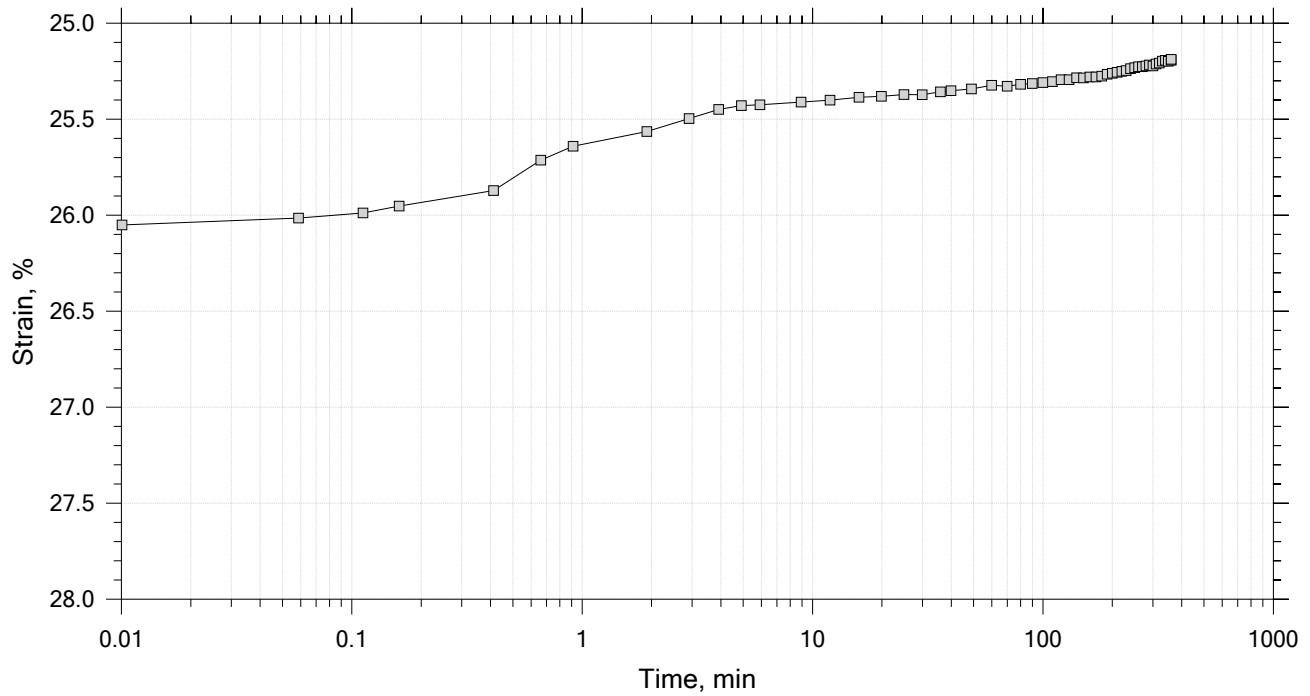
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	Boring No.: BB-BST1-201	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 03/24/21	Depth: 15-17 ft
	Test No.: IP-7A-	Sample Type: intact	Elevation: ---
	Description: Moist, olive clay		
	Remarks: System X, Swell Pressure = 0.128 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 12 of 15

Constant Load Step

Stress: 2 tsf



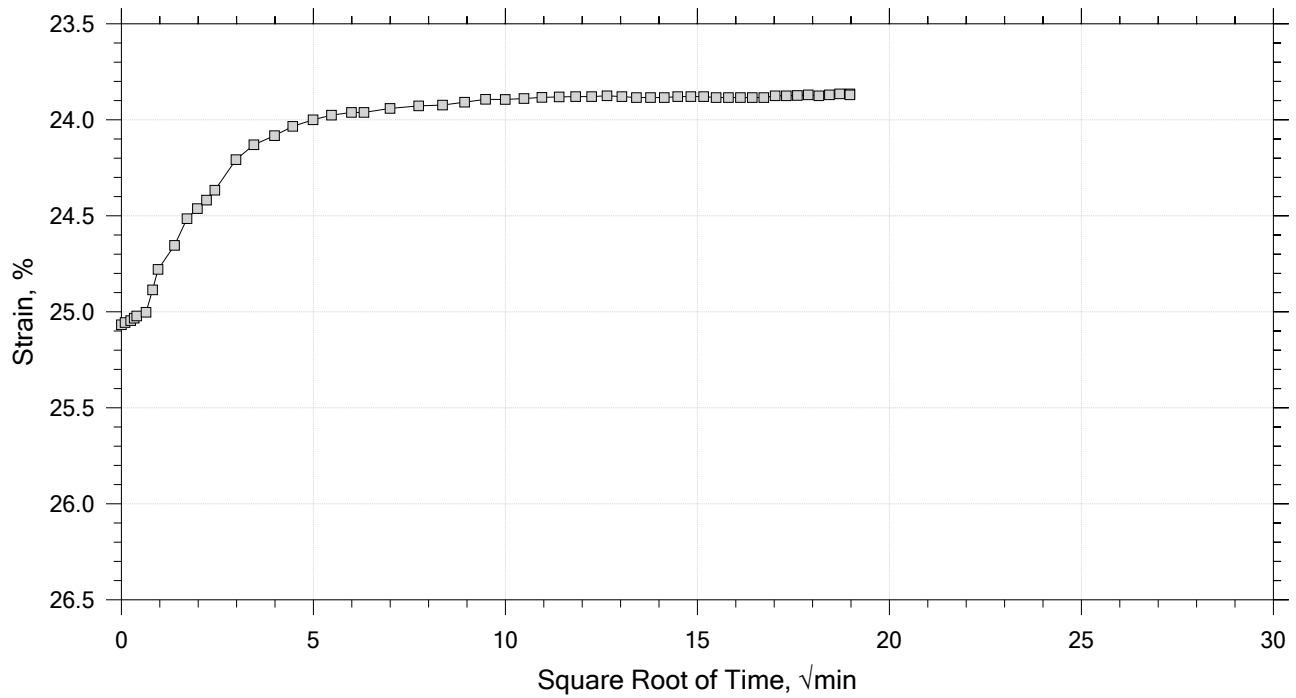
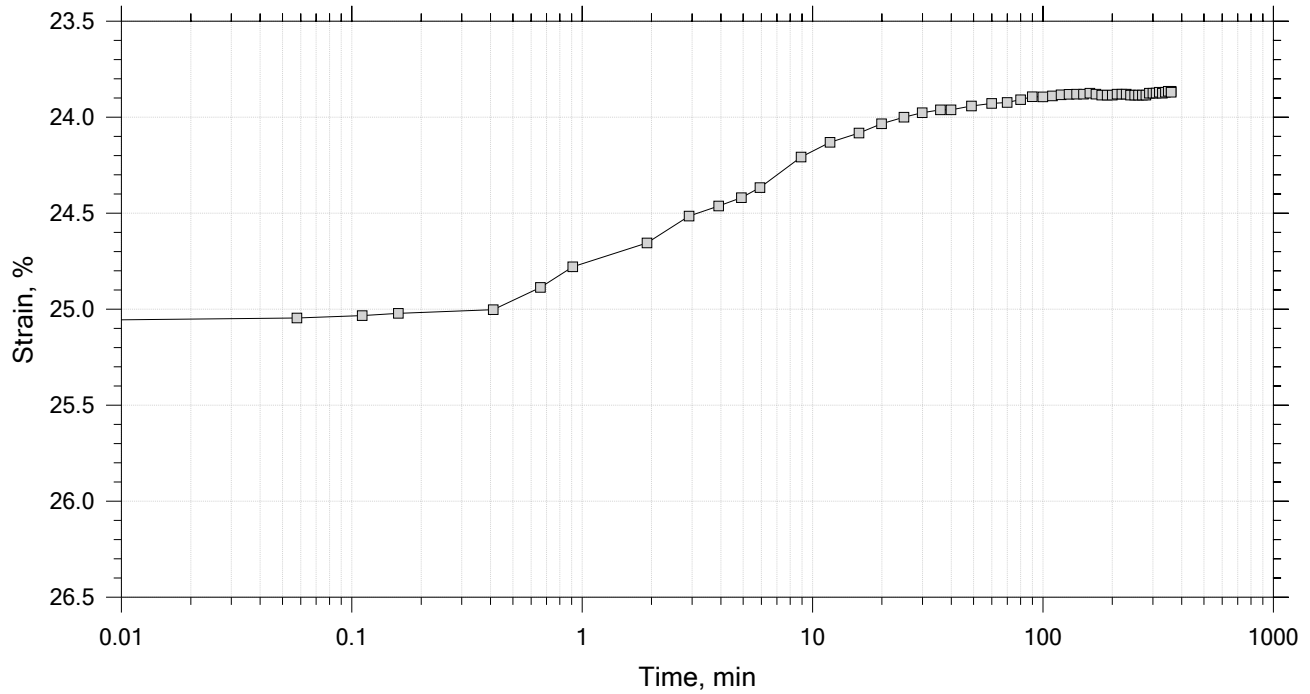
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: BB-BST1-201	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 03/24/21	Depth: 15-17 ft
	Test No.: IP-7A-	Sample Type: intact	Elevation: ---
	Description: Moist, olive clay		
	Remarks: System X, Swell Pressure = 0.128 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 13 of 15

Constant Load Step

Stress: 0.5 tsf



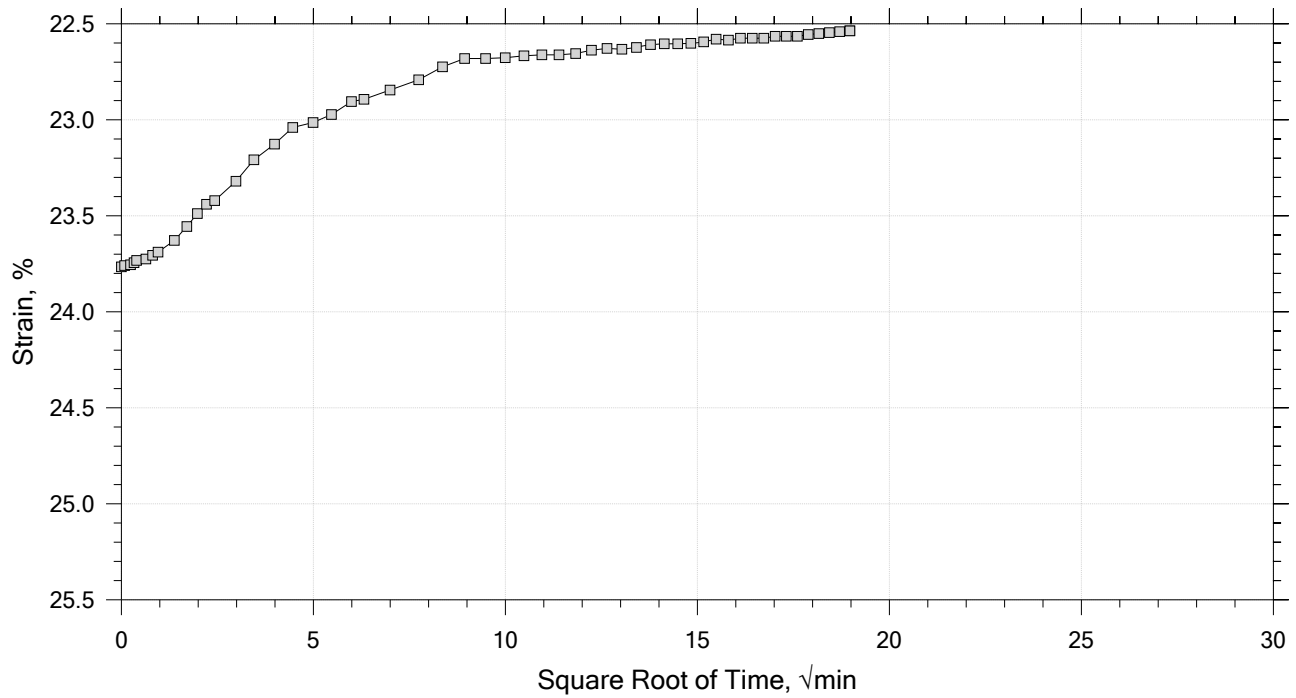
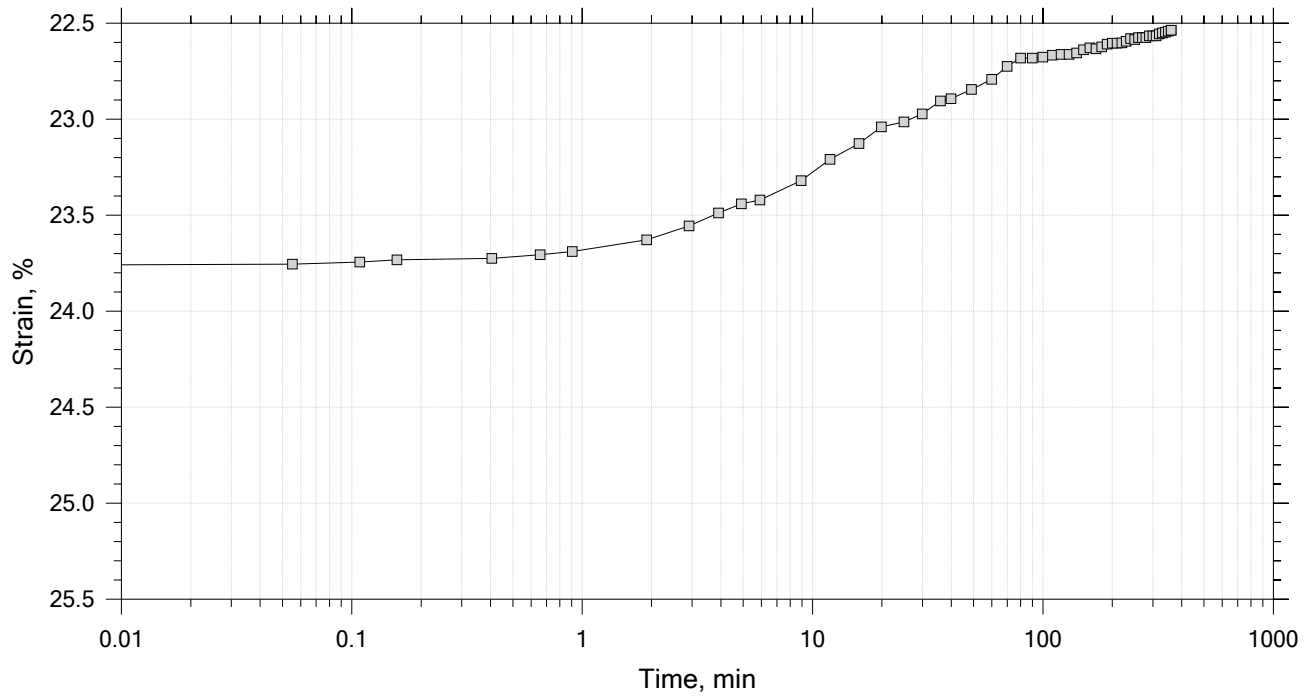
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: BB-BST1-201	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 03/24/21	Depth: 15-17 ft
	Test No.: IP-7A-	Sample Type: intact	Elevation: ---
	Description: Moist, olive clay		
	Remarks: System X, Swell Pressure = 0.128 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 14 of 15

Constant Load Step

Stress: 0.125 tsf



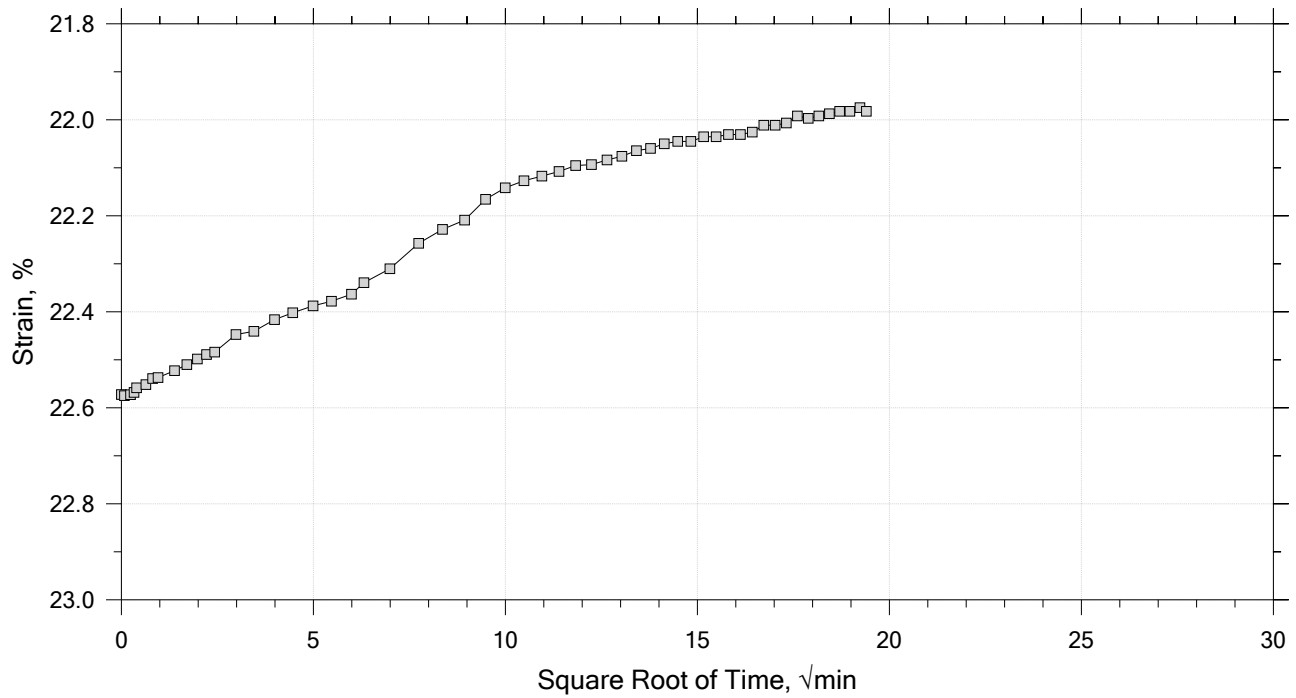
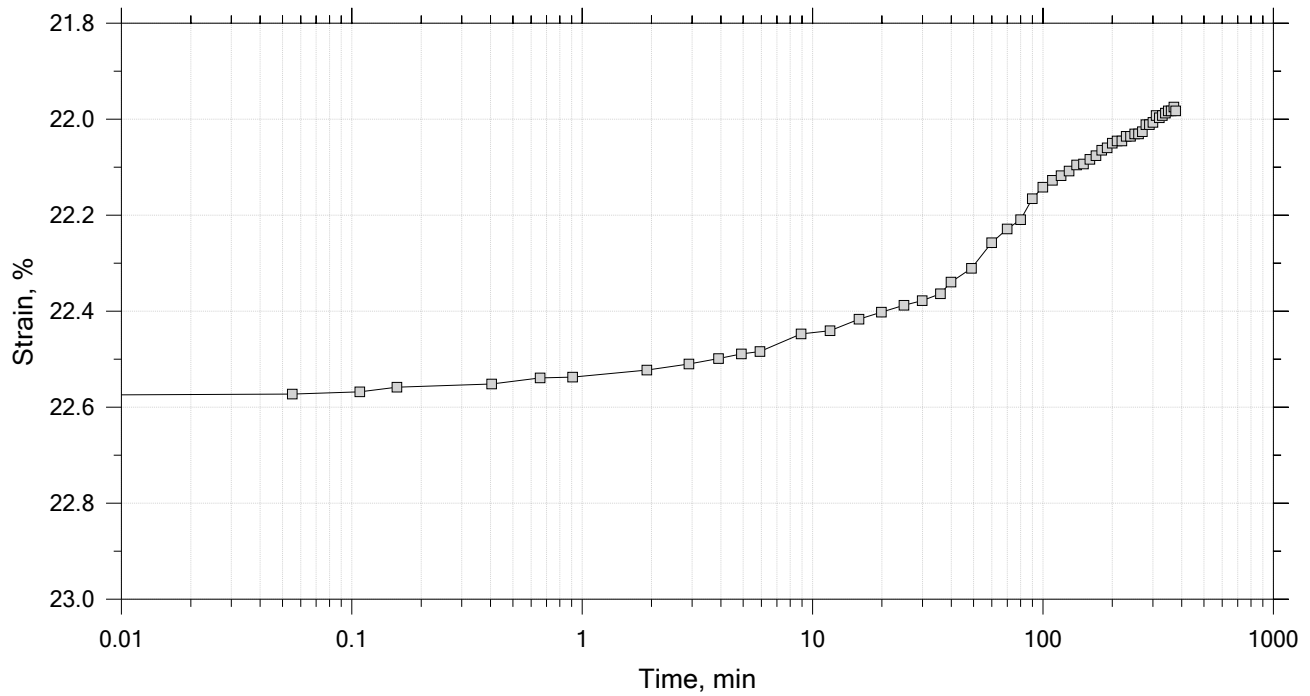
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: BB-BST1-201	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 03/24/21	Depth: 15-17 ft
	Test No.: IP-7A-	Sample Type: intact	Elevation: ---
	Description: Moist, olive clay		
	Remarks: System X, Swell Pressure = 0.128 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 15 of 15

Constant Load Step

Stress: 0.0625 tsf




	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: BB-BST1-201	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 03/24/21	Depth: 15-17 ft
	Test No.: IP-7A-	Sample Type: intact	Elevation: ---
	Description: Moist, olive clay		
	Remarks: System X, Swell Pressure = 0.128 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Specimen Diameter: 2.50 in	Estimated Specific Gravity: 2.75	Liquid Limit: 36
Initial Height: 1.00 in	Initial Void Ratio: 1.02	Plastic Limit: 19
Final Height: 0.79 in	Final Void Ratio: 0.596	Plasticity Index: 17

	Before Test Trimmings	Before Test Specimen	After Test Specimen	After Test Trimmings
Container ID	E-1411	RING		E0995
Mass Container, gm	8.12	110.89	110.89	8.46
Mass Container + Wet Soil, gm	155.63	260.31	244.24	141.54
Mass Container + Dry Soil, gm	115.43	220.51	220.51	117.86
Mass Dry Soil, gm	107.31	109.62	109.62	109.4
Water Content, %	37.46	36.30	21.65	21.65
Void Ratio	---	1.02	0.60	---
Degree of Saturation, %	---	97.98	100.00	---
Dry Unit Weight, pcf	---	85.076	107.69	---


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: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: BB-BST1-201	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 03/24/21	Depth: 15-17 ft
	Test No.: IP-7A-	Sample Type: intact	Elevation: ---
	Description: Moist, olive clay		
	Remarks: System X, Swell Pressure = 0.128 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

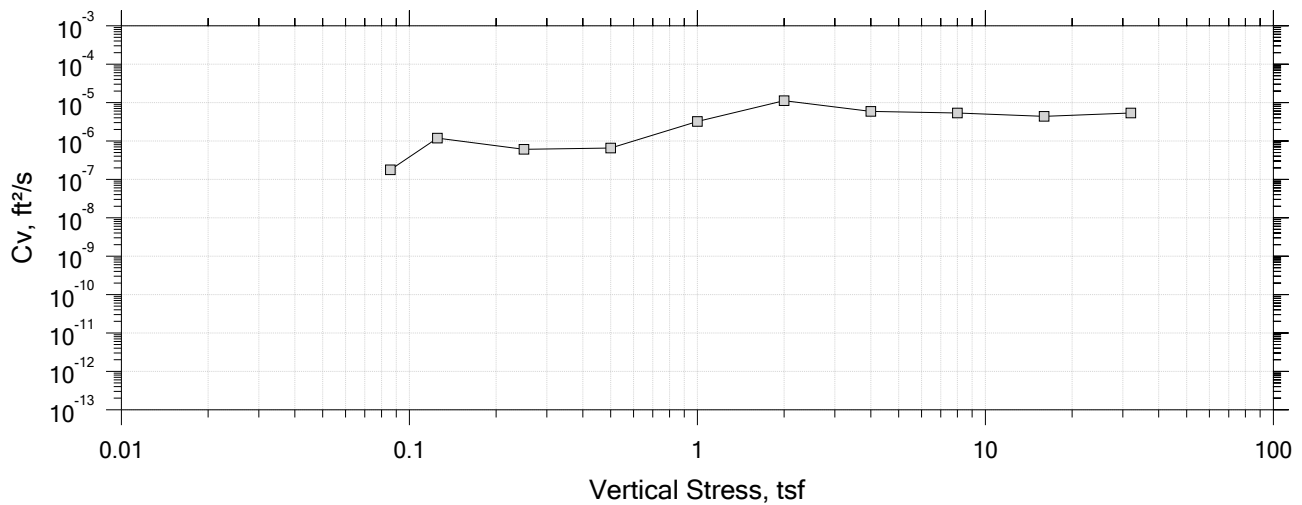
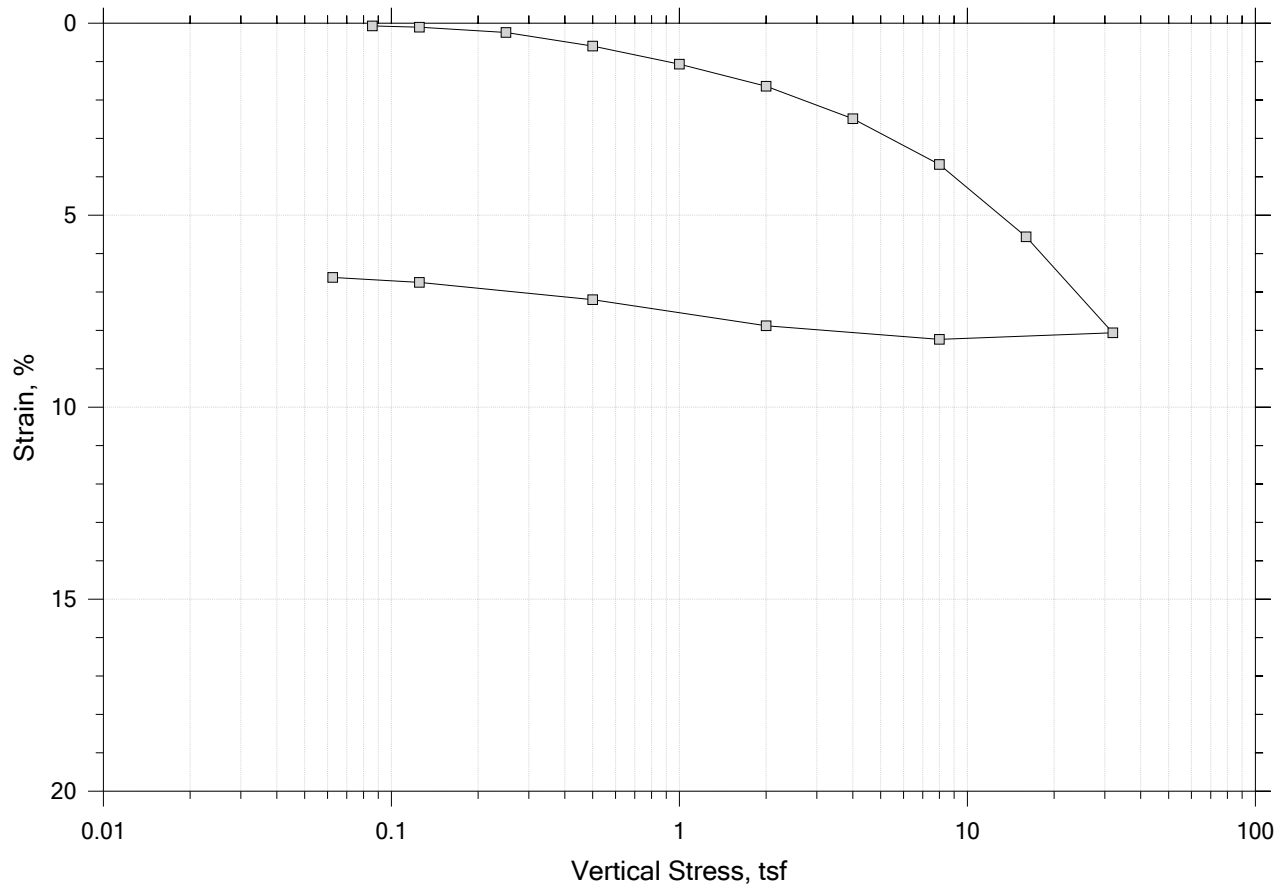
Square Root of Time Coefficients


[illegible]

	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: BB-BST1-201	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 03/24/21	Depth: 15-17 ft
	Test No.: IP-7A-	Sample Type: intact	Elevation: ---
	Description: Moist, olive clay		
	Remarks: System X, Swell Pressure = 0.128 tsf		
	Displacement at End of Increment		

One-Dimensional Consolidation by ASTM D2435 - Method B

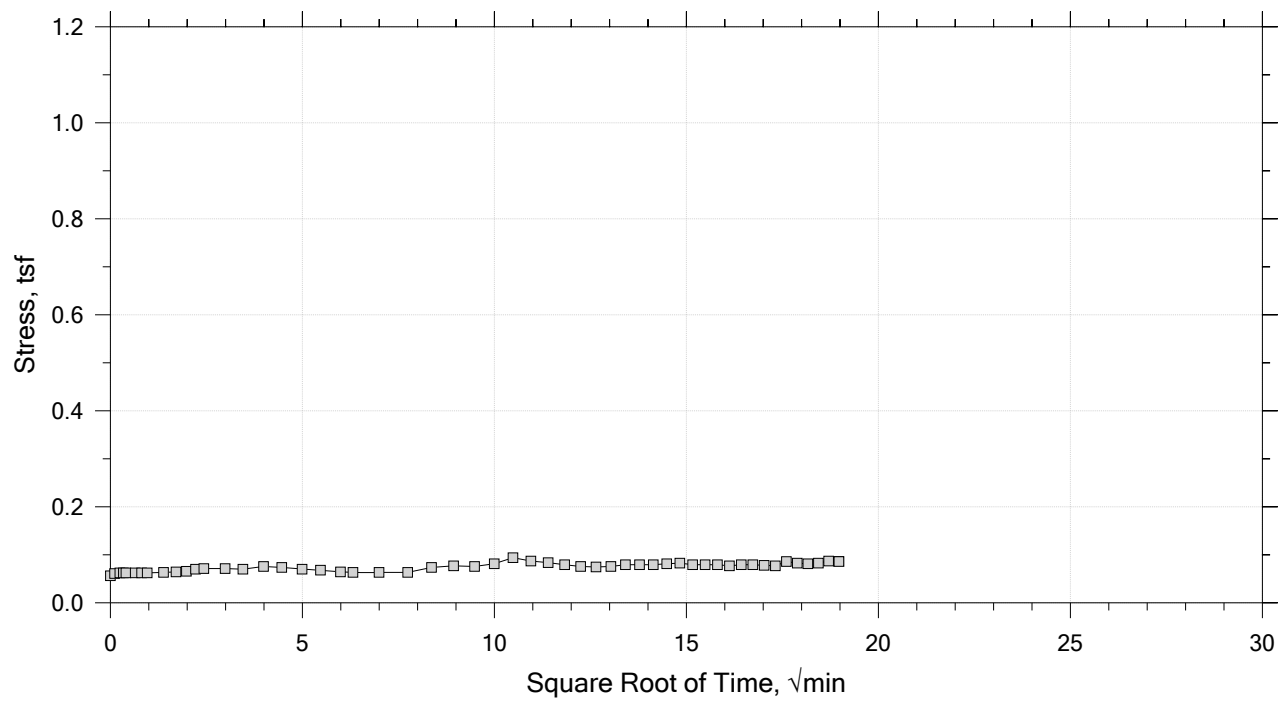
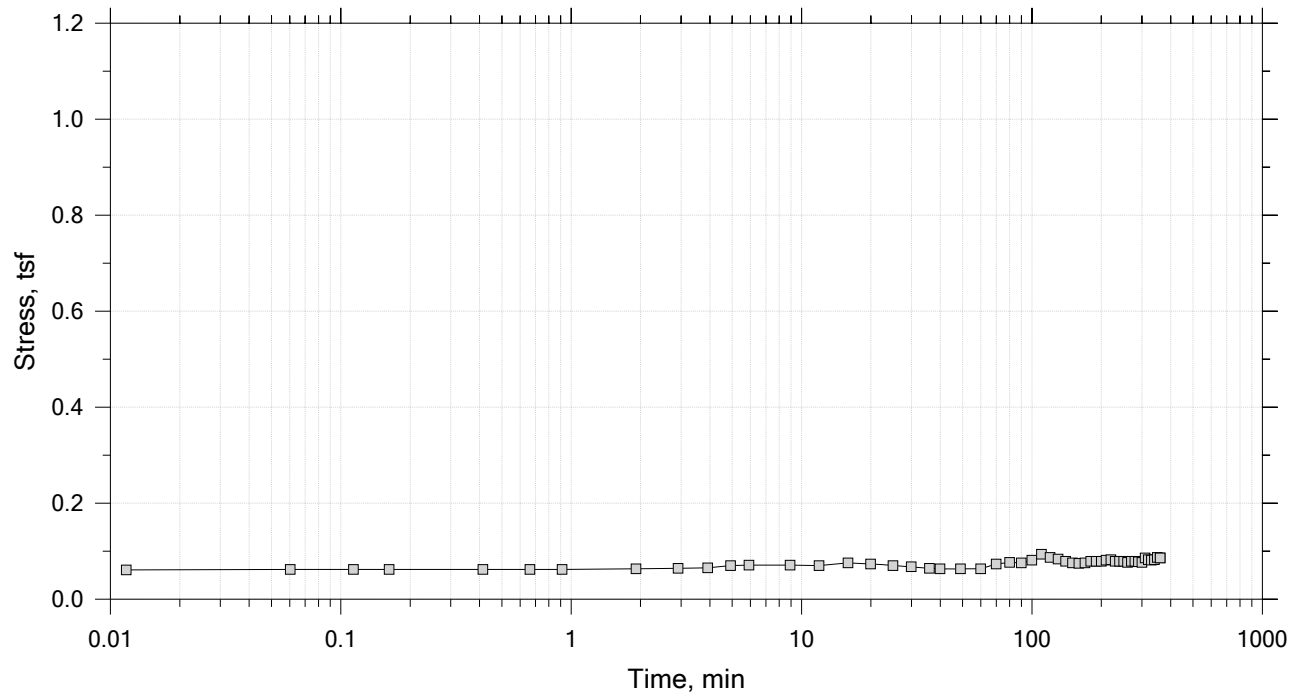
Summary Report




	Project: Rt 9/I-395	Location: Brewer and Eddington, ME	Project No.: GTX-308853
	Boring No.: BB-EEBT2-101	Tested By: md	Checked By: mcm
	Sample No.: 1U	Test Date: 07/13/19	Depth: 5-7 ft
	Test No.: IP-10	Sample Type: intact	Elevation: ---
	Description: Moist, olive gray clay		
	Remarks: System O, Swell Pressure = 0.0859 tsf		
	Displacement at End of Increment		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 1 of 15
Constant Volume Step
Stress: 0.0859 tsf



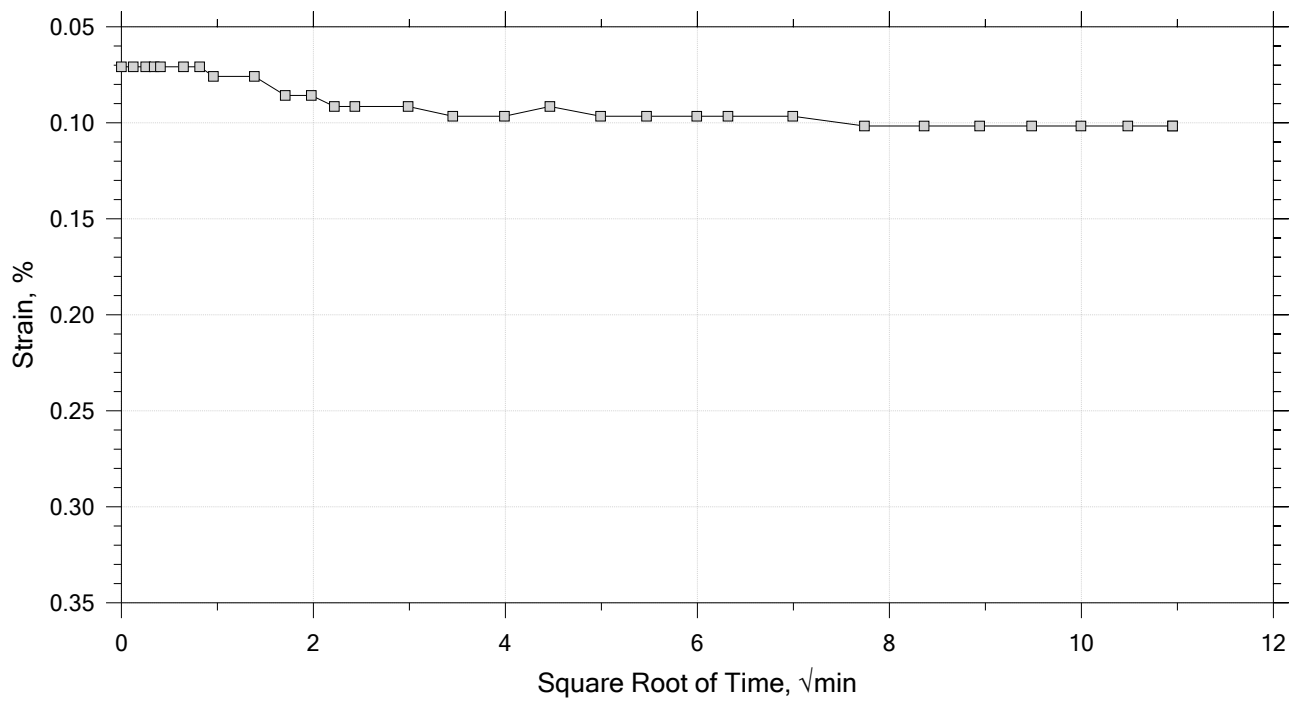
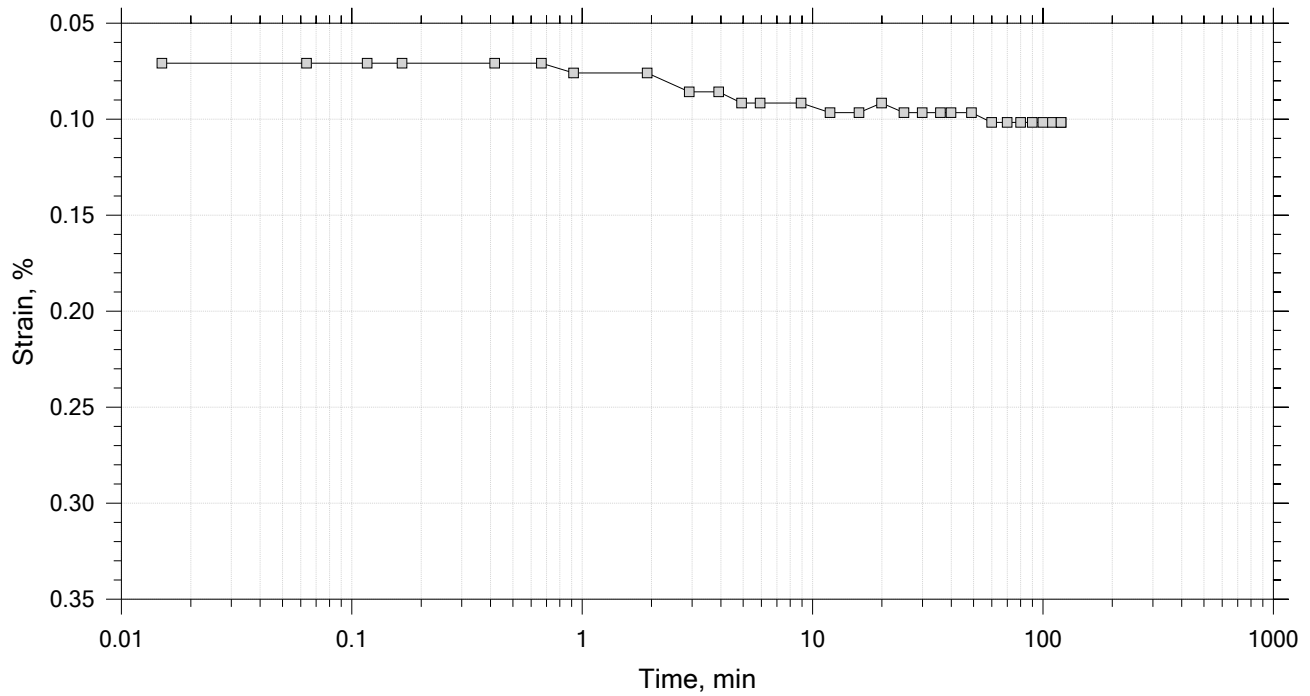
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	Boring No.: BB-EEBT2-101	Tested By: md	Checked By: mcm
	Sample No.: 1U	Test Date: 07/13/19	Depth: 5-7 ft
	Test No.: IP-10	Sample Type: intact	Elevation: ---
	Description: Moist, olive gray clay		
	Remarks: System O, Swell Pressure = 0.0859 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 2 of 15

Constant Load Step

Stress: 0.125 tsf



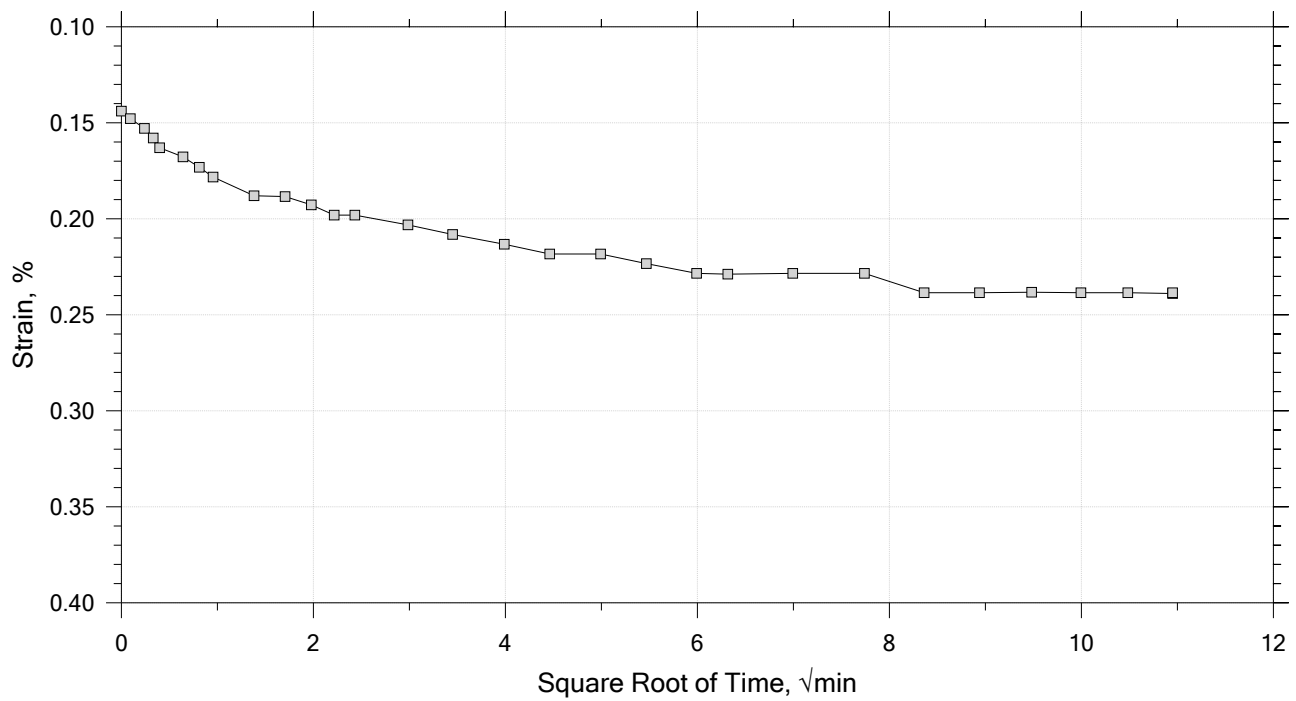
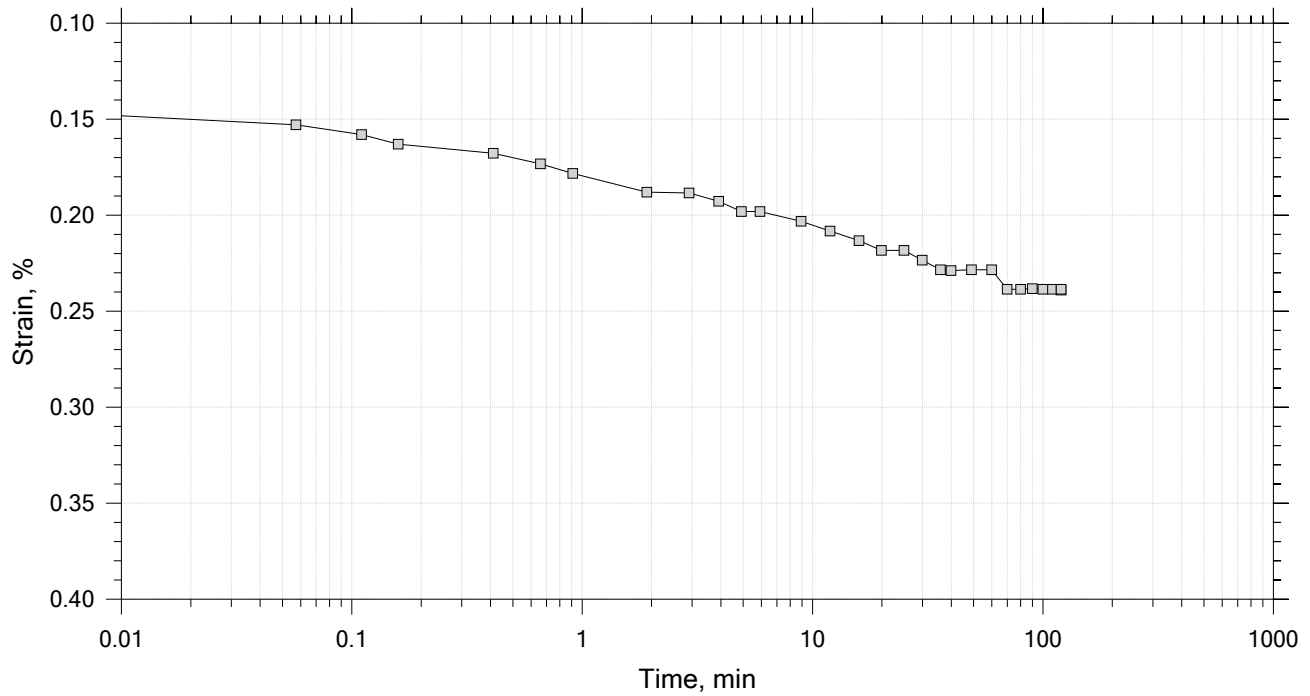
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	Boring No.: BB-EEBT2-101	Tested By: md	Checked By: mcm
	Sample No.: 1U	Test Date: 07/13/19	Depth: 5-7 ft
	Test No.: IP-10	Sample Type: intact	Elevation: ---
	Description: Moist, olive gray clay		
	Remarks: System O, Swell Pressure = 0.0859 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 3 of 15

Constant Load Step

Stress: 0.25 tsf



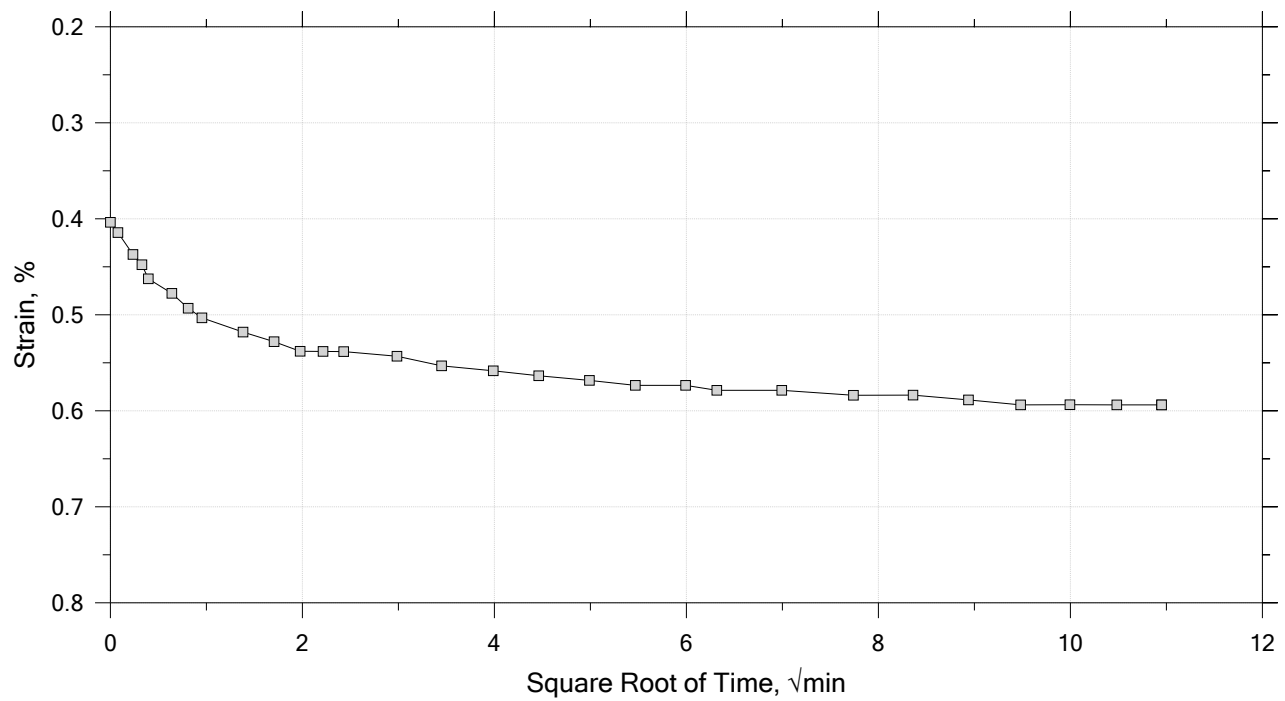
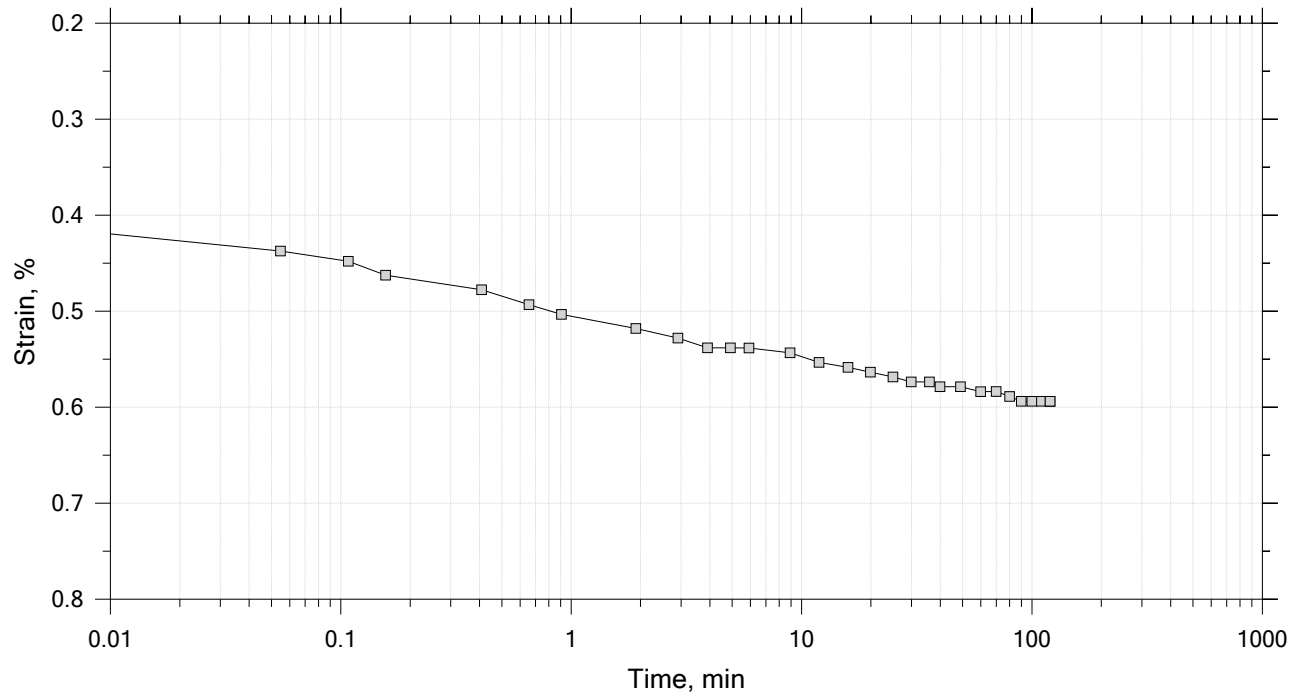
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	Boring No.: BB-EEBT2-101	Tested By: md	Checked By: mcm
	Sample No.: 1U	Test Date: 07/13/19	Depth: 5-7 ft
	Test No.: IP-10	Sample Type: intact	Elevation: ---
	Description: Moist, olive gray clay		
	Remarks: System O, Swell Pressure = 0.0859 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 4 of 15

Constant Load Step

Stress: 0.5 tsf



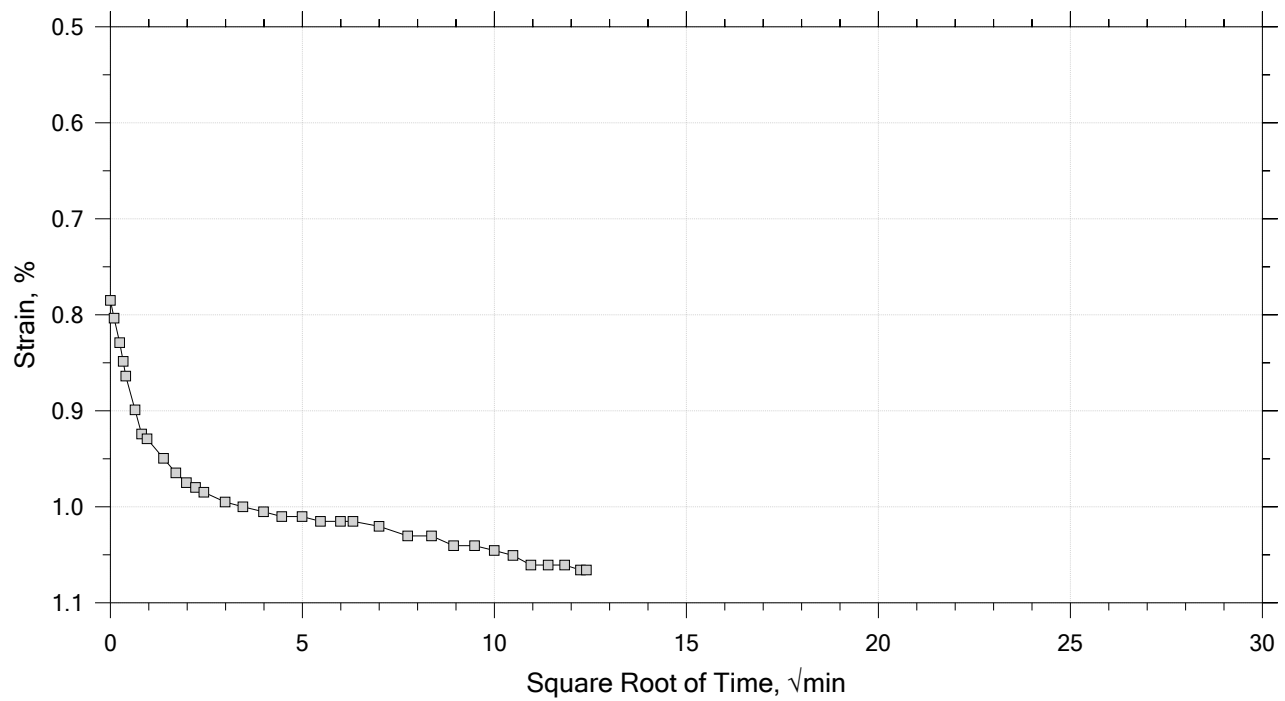
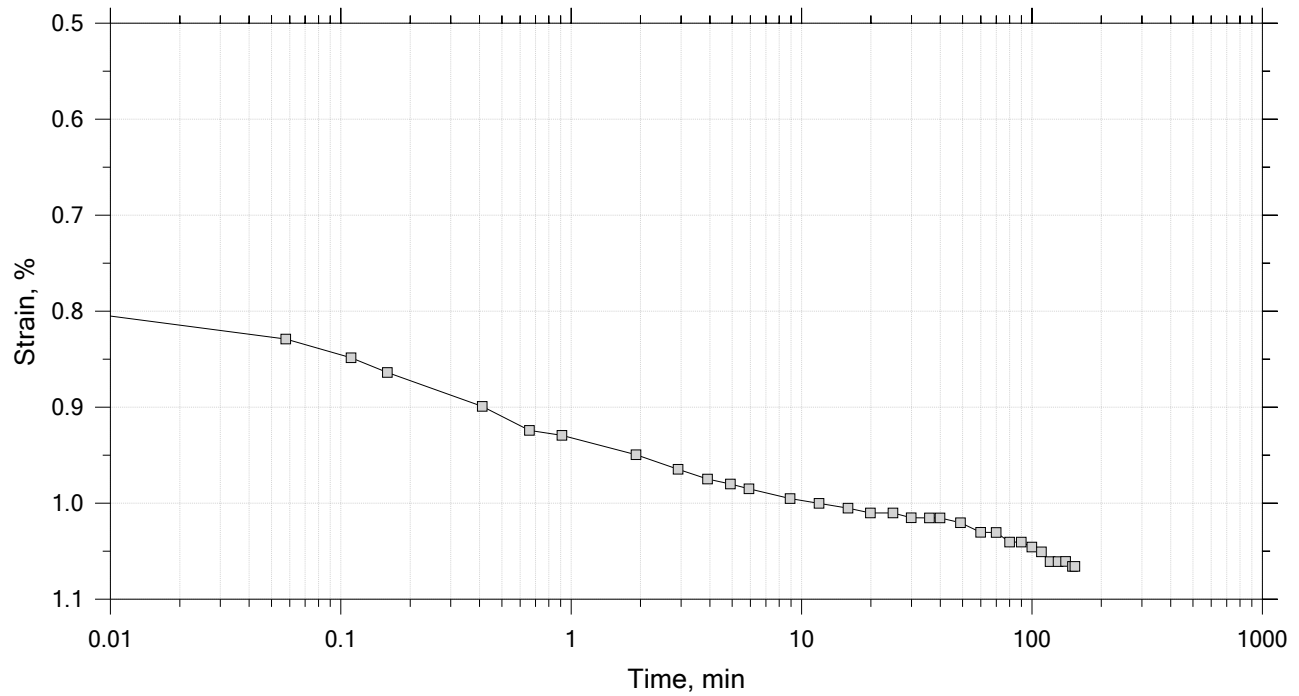
	Project: Rt 9/I-395	Location: Brewer and Eddington, ME	Project No.: GTX-308853
	Boring No.: BB-EEBT2-101	Tested By: md	Checked By: mcm
	Sample No.: 1U	Test Date: 07/13/19	Depth: 5-7 ft
	Test No.: IP-10	Sample Type: intact	Elevation: ---
	Description: Moist, olive gray clay		
	Remarks: System O, Swell Pressure = 0.0859 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 5 of 15

Constant Load Step

Stress: 1 tsf



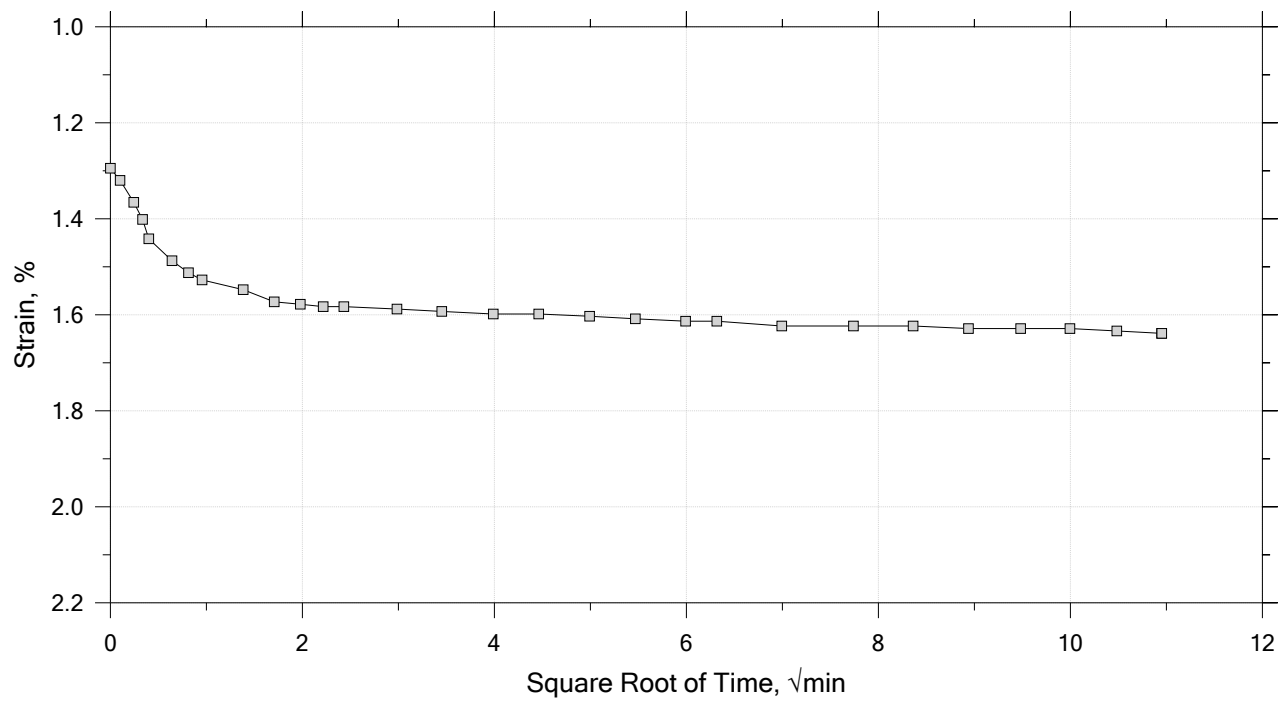
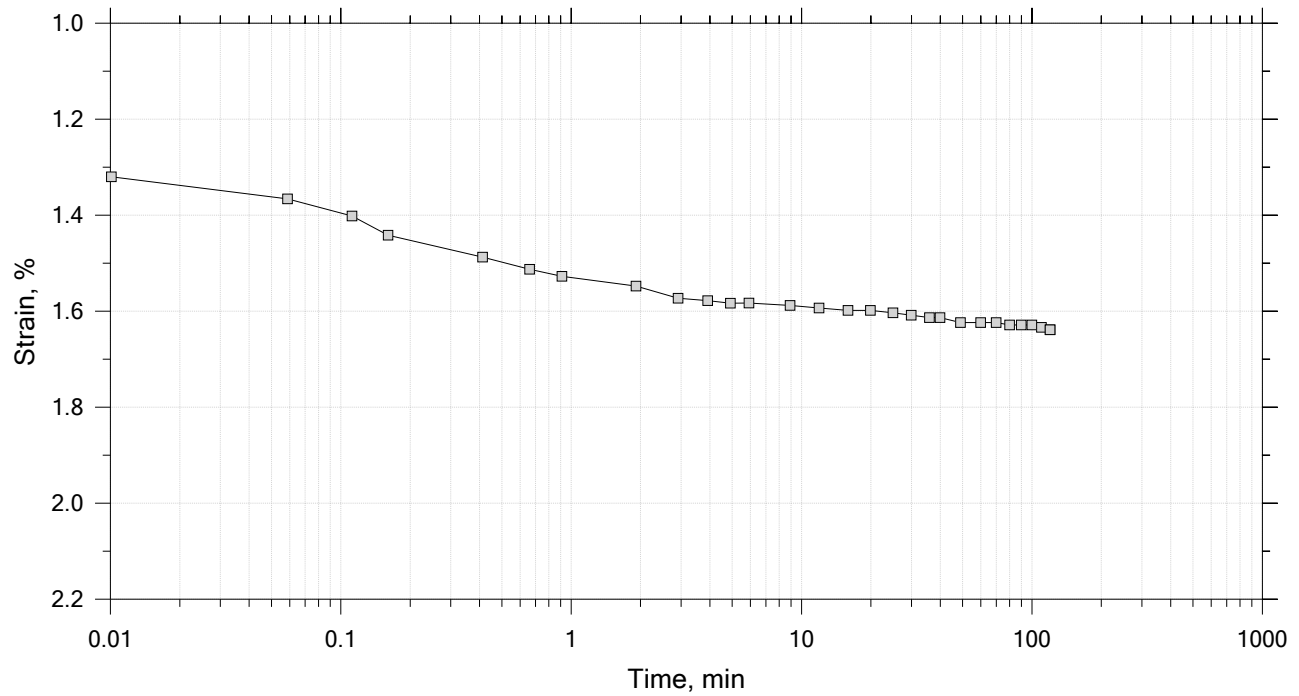
	Project: Rt 9/I-395	Location: Brewer and Eddington, ME	Project No.: GTX-308853
	Boring No.: BB-EEBT2-101	Tested By: md	Checked By: mcm
	Sample No.: 1U	Test Date: 07/13/19	Depth: 5-7 ft
	Test No.: IP-10	Sample Type: intact	Elevation: ---
	Description: Moist, olive gray clay		
	Remarks: System O, Swell Pressure = 0.0859 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 6 of 15

Constant Load Step

Stress: 2 tsf



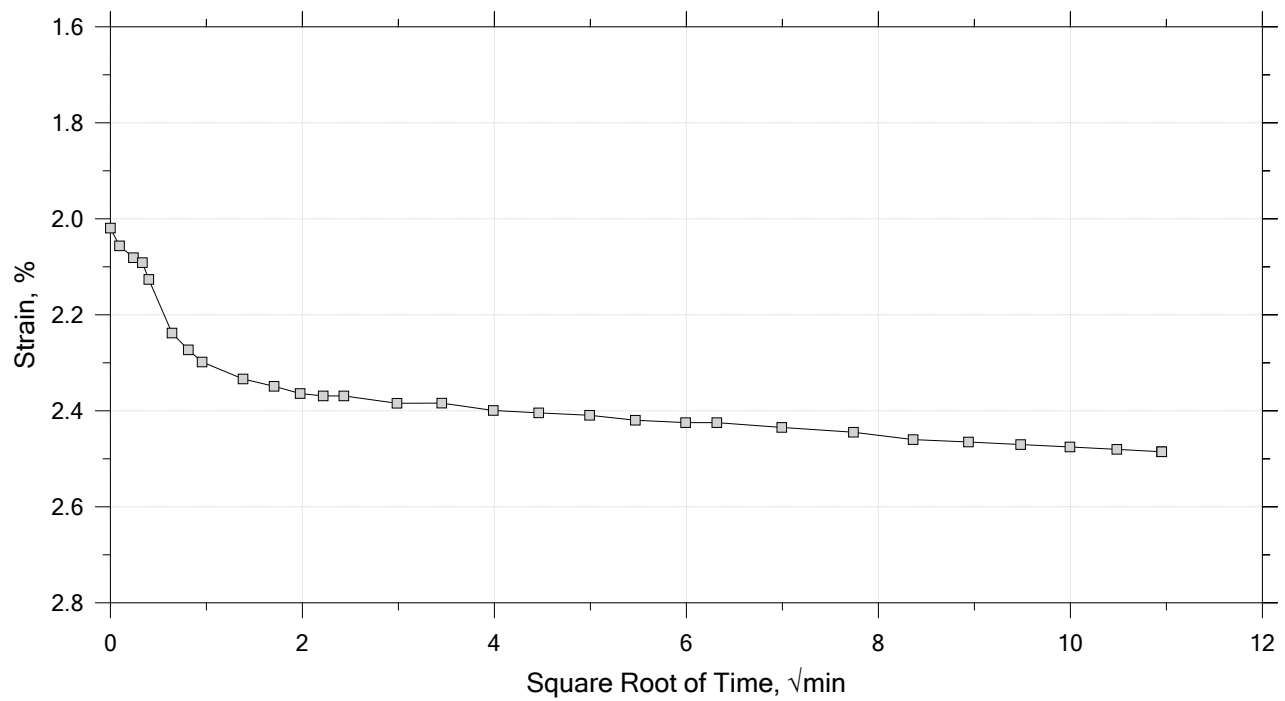
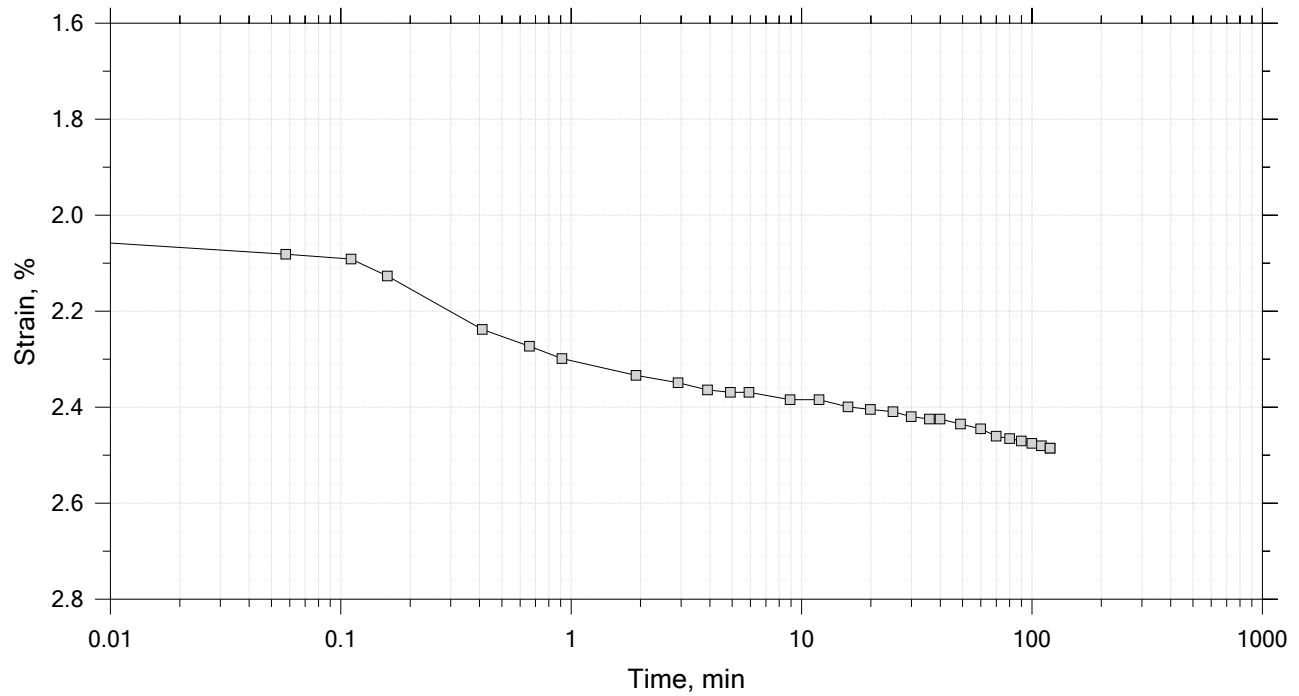
	Project: Rt 9/I-395	Location: Brewer and Eddington, ME	Project No.: GTX-308853
	Boring No.: BB-EEBT2-101	Tested By: md	Checked By: mcm
	Sample No.: 1U	Test Date: 07/13/19	Depth: 5-7 ft
	Test No.: IP-10	Sample Type: intact	Elevation: ---
	Description: Moist, olive gray clay		
	Remarks: System O, Swell Pressure = 0.0859 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 7 of 15

Constant Load Step

Stress: 4 tsf



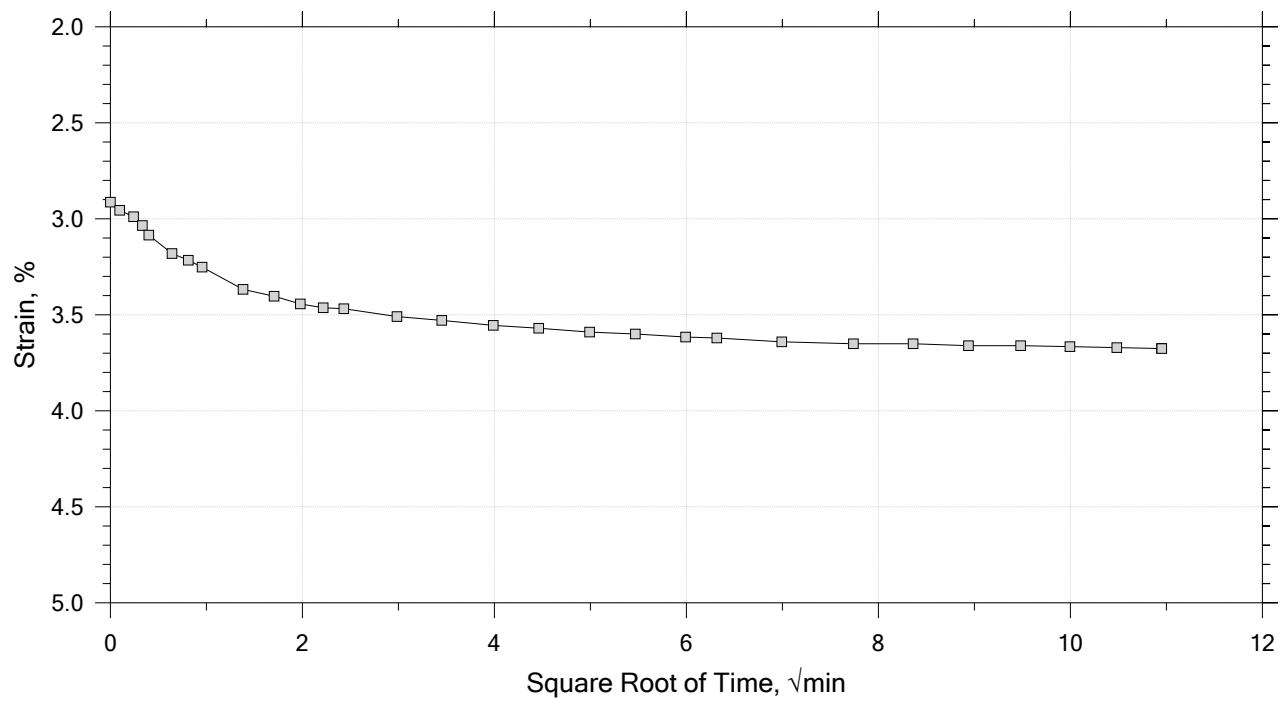
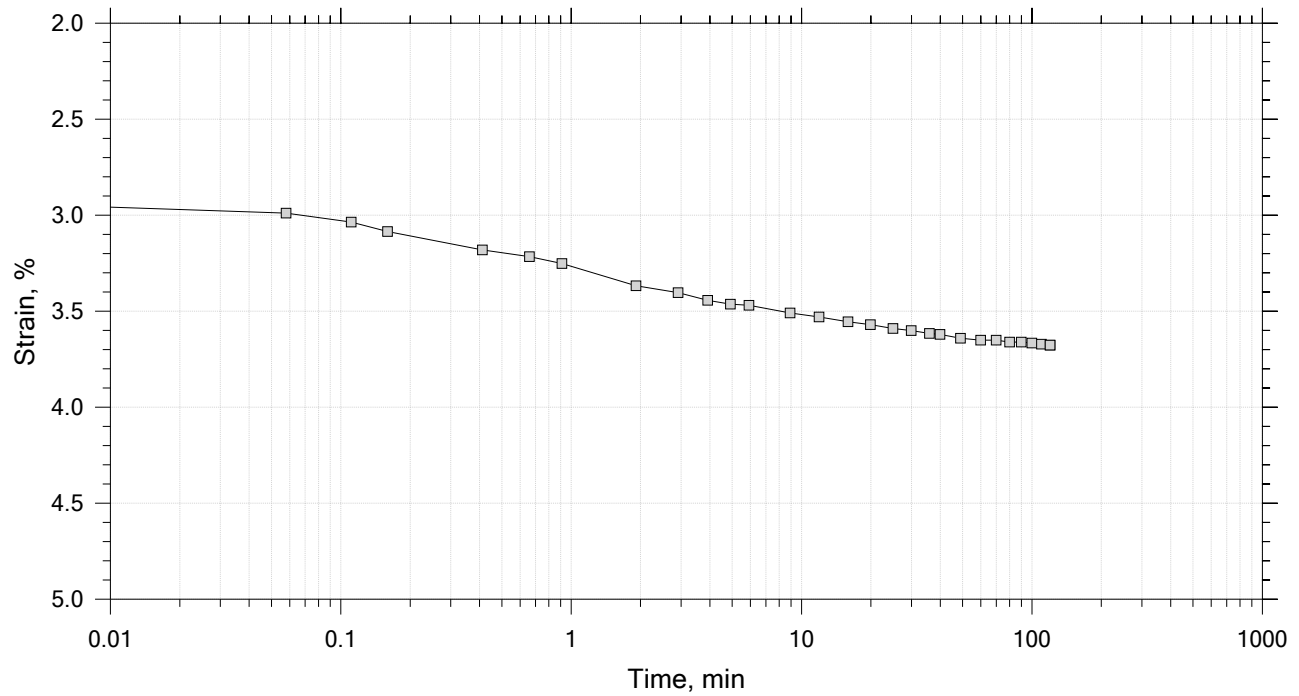
	Project: Rt 9/I-395	Location: Brewer and Eddington, ME	Project No.: GTX-308853
	Boring No.: BB-EEBT2-101	Tested By: md	Checked By: mcm
	Sample No.: 1U	Test Date: 07/13/19	Depth: 5-7 ft
	Test No.: IP-10	Sample Type: intact	Elevation: ---
	Description: Moist, olive gray clay		
	Remarks: System O, Swell Pressure = 0.0859 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 8 of 15

Constant Load Step

Stress: 8 tsf



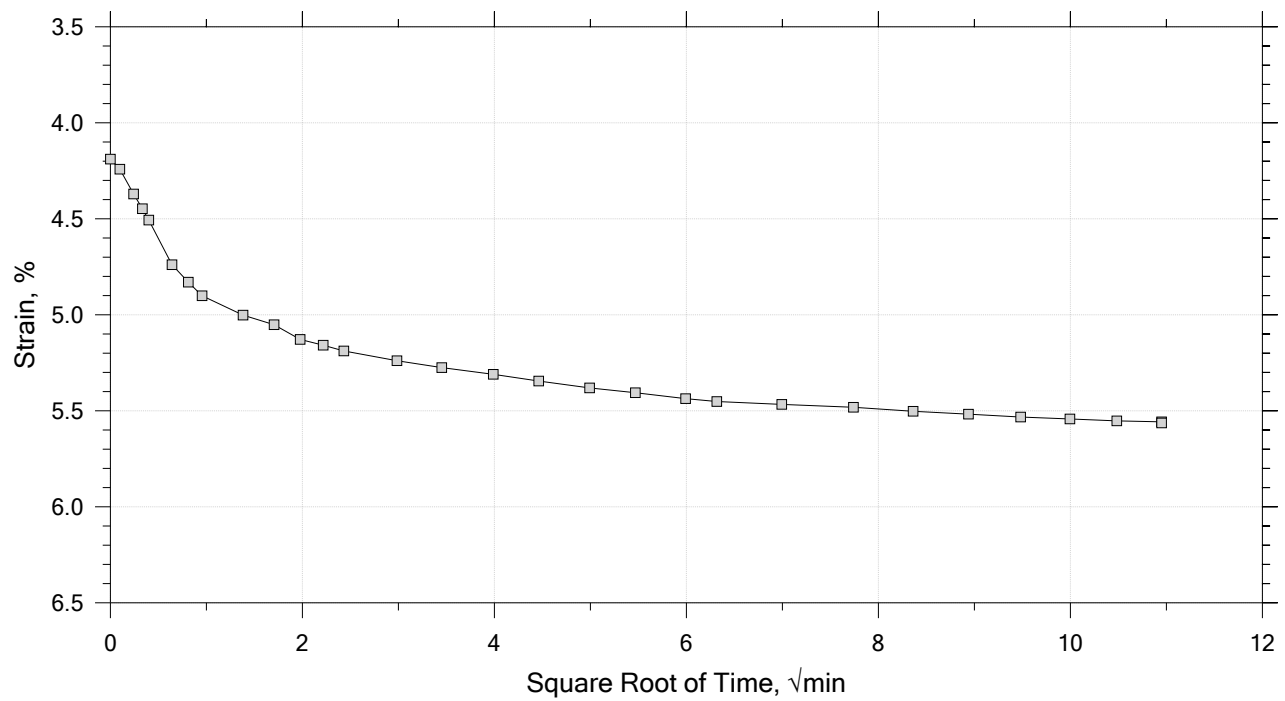
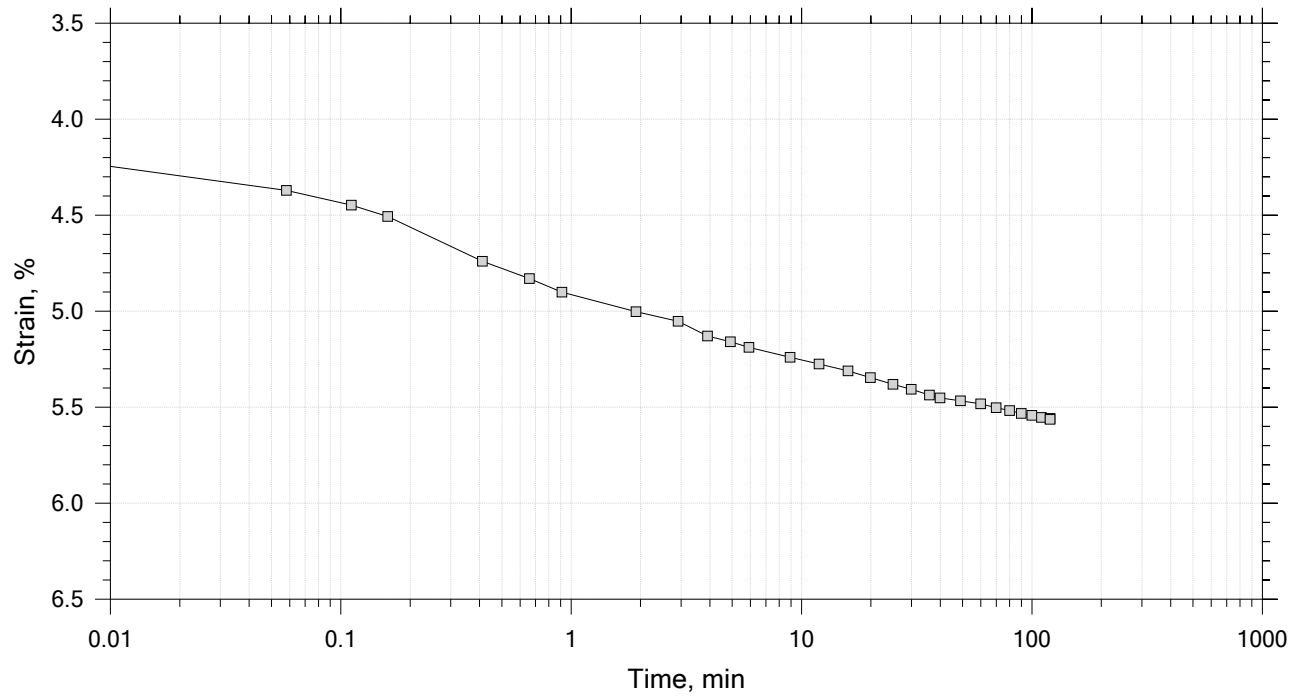
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	Boring No.: BB-EEBT2-101	Tested By: md	Checked By: mcm
	Sample No.: 1U	Test Date: 07/13/19	Depth: 5-7 ft
	Test No.: IP-10	Sample Type: intact	Elevation: ---
	Description: Moist, olive gray clay		
	Remarks: System O, Swell Pressure = 0.0859 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 9 of 15

Constant Load Step

Stress: 16 tsf



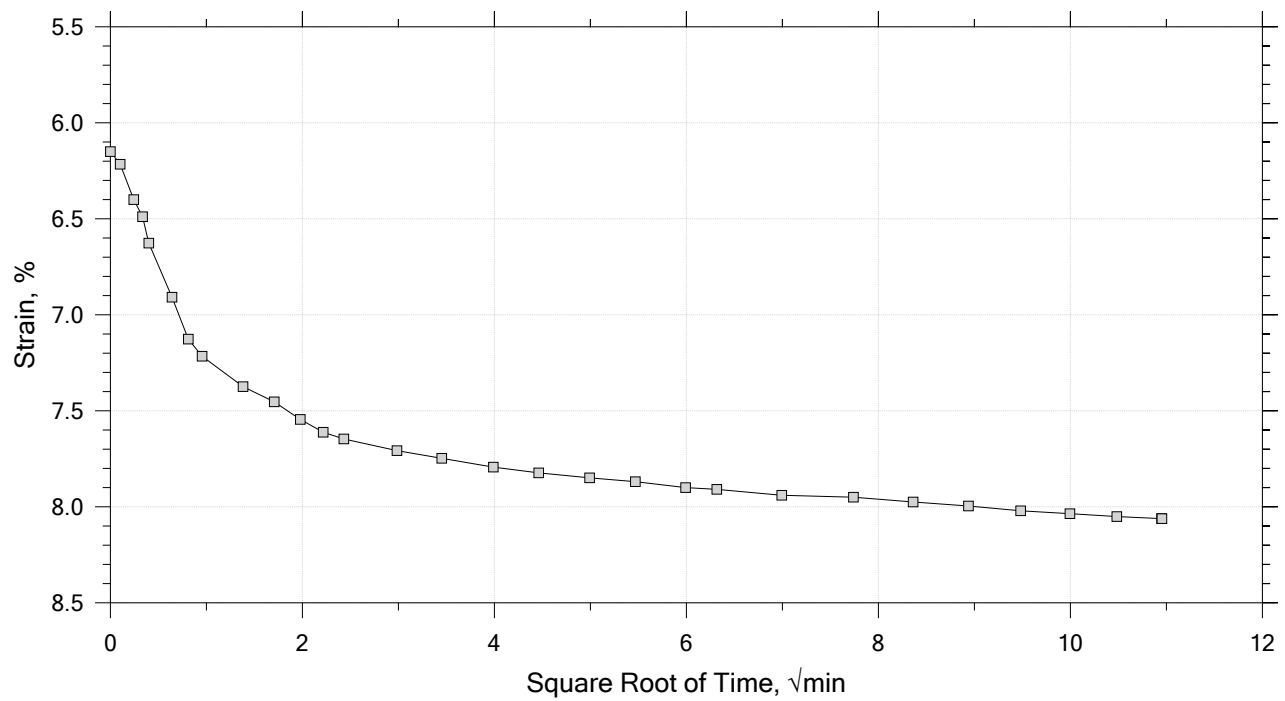
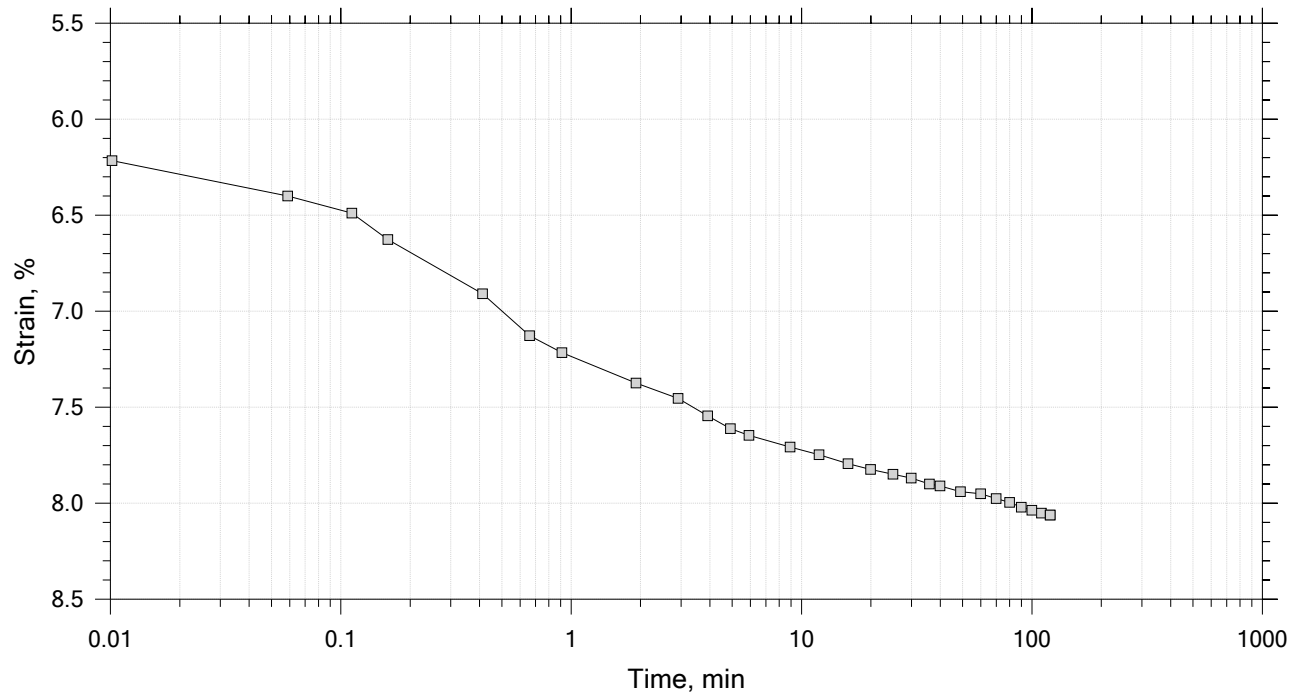
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	Boring No.: BB-EEBT2-101	Tested By: md	Checked By: mcm
	Sample No.: 1U	Test Date: 07/13/19	Depth: 5-7 ft
	Test No.: IP-10	Sample Type: intact	Elevation: ---
	Description: Moist, olive gray clay		
	Remarks: System O, Swell Pressure = 0.0859 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 10 of 15

Constant Load Step

Stress: 32 tsf



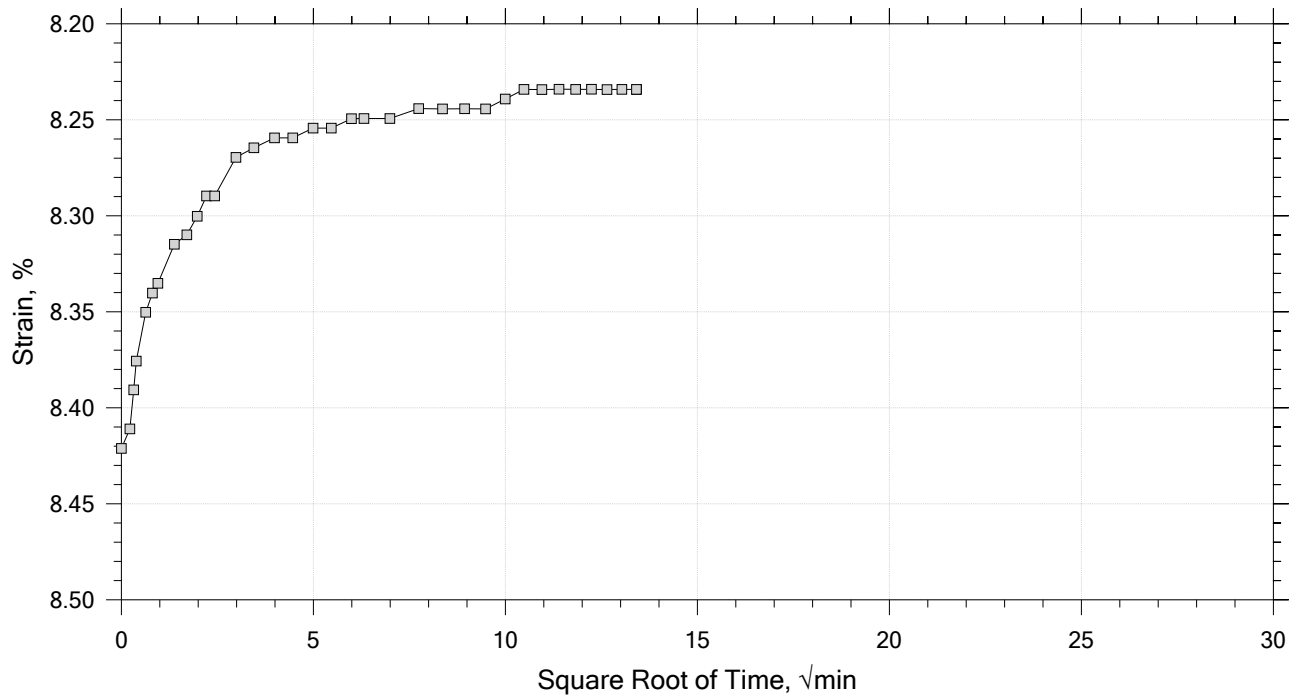
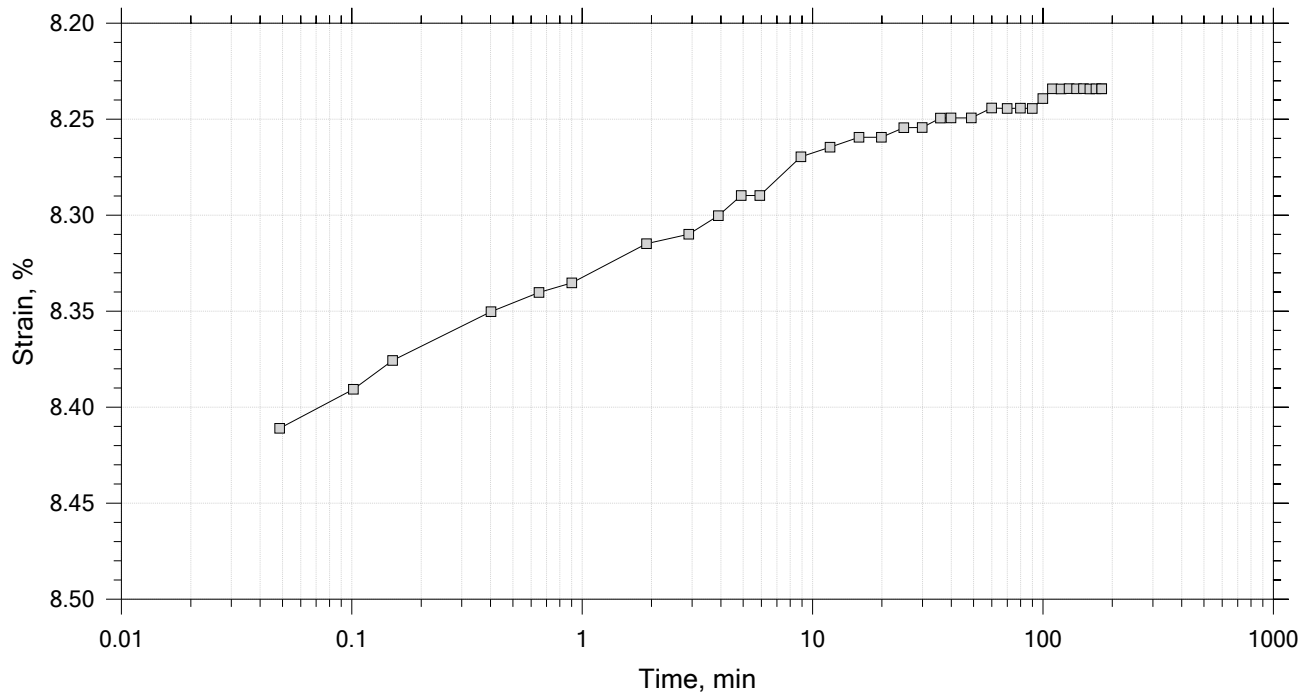
	Project: Rt 9/I-395	Location: Brewer and Eddington, ME	Project No.: GTX-308853
	Boring No.: BB-EEBT2-101	Tested By: md	Checked By: mcm
	Sample No.: 1U	Test Date: 07/13/19	Depth: 5-7 ft
	Test No.: IP-10	Sample Type: intact	Elevation: ---
	Description: Moist, olive gray clay		
	Remarks: System O, Swell Pressure = 0.0859 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 11 of 15

Constant Load Step

Stress: 8 tsf



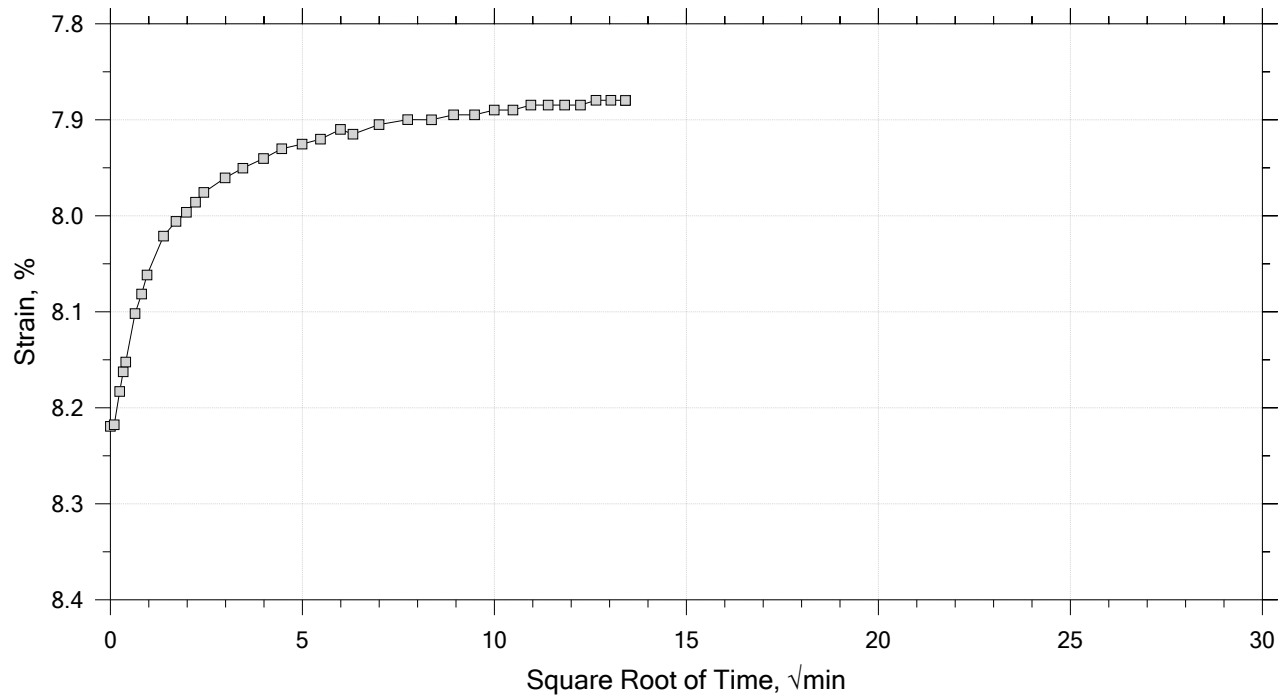
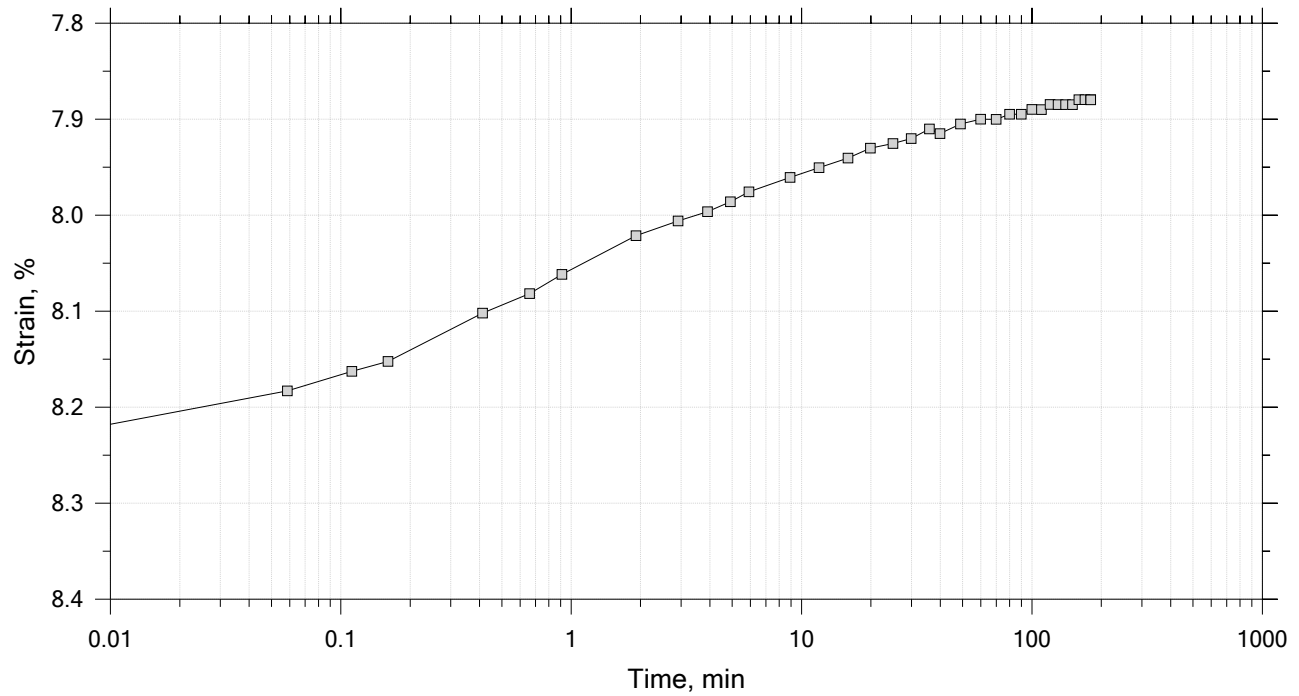
	Project: Rt 9/I-395	Location: Brewer and Eddington, ME	Project No.: GTX-308853
	Boring No.: BB-EEBT2-101	Tested By: md	Checked By: mcm
	Sample No.: 1U	Test Date: 07/13/19	Depth: 5-7 ft
	Test No.: IP-10	Sample Type: intact	Elevation: ---
	Description: Moist, olive gray clay		
	Remarks: System O, Swell Pressure = 0.0859 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 12 of 15

Constant Load Step

Stress: 2 tsf



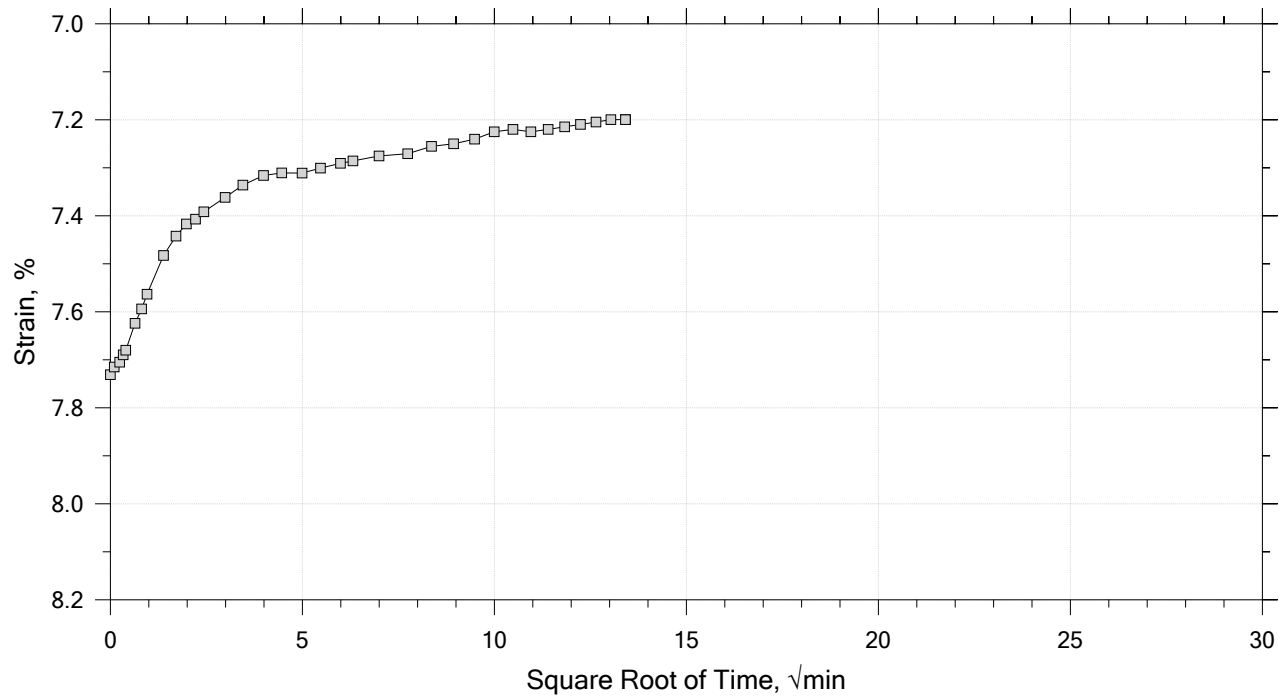
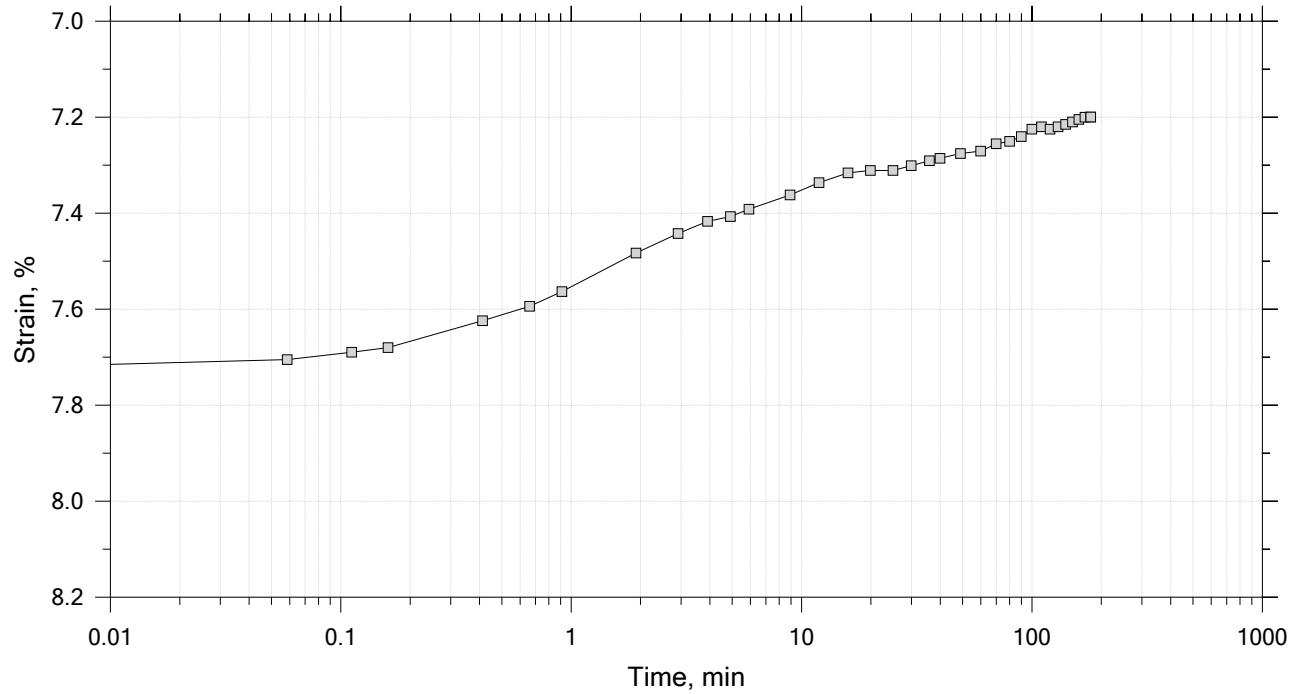
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	Boring No.: BB-EEBT2-101	Tested By: md	Checked By: mcm
	Sample No.: 1U	Test Date: 07/13/19	Depth: 5-7 ft
	Test No.: IP-10	Sample Type: intact	Elevation: ---
	Description: Moist, olive gray clay		
	Remarks: System O, Swell Pressure = 0.0859 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 13 of 15

Constant Load Step

Stress: 0.5 tsf



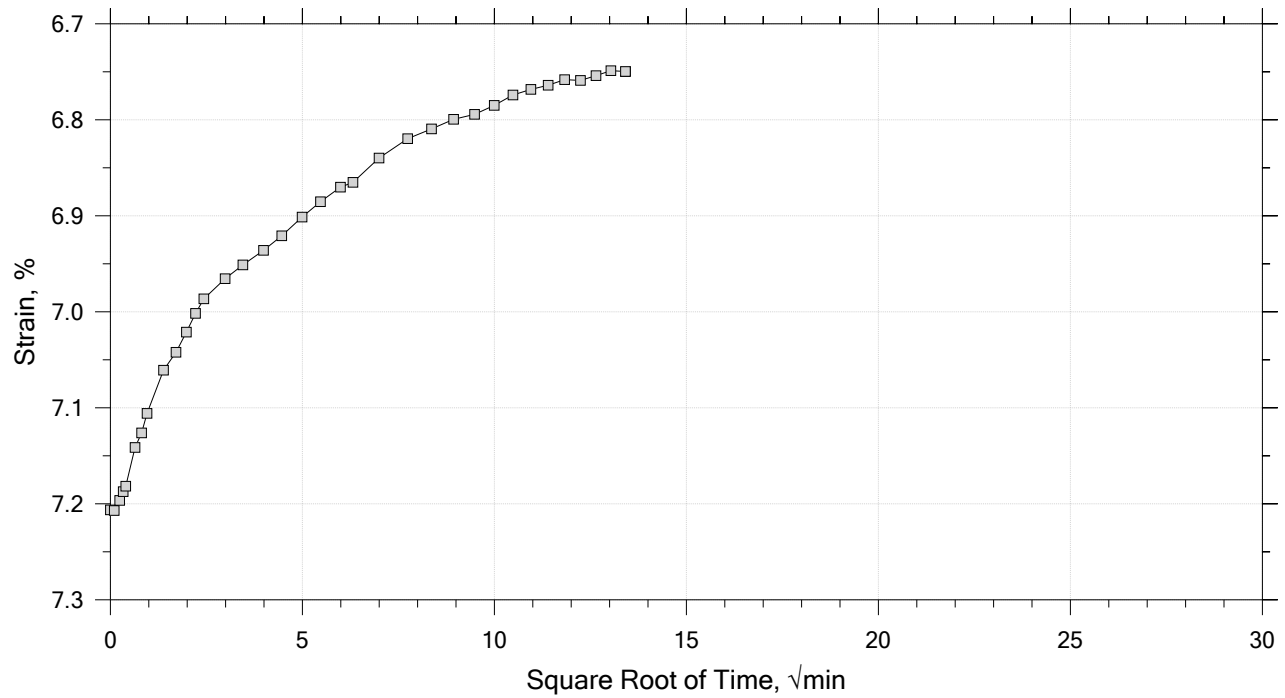
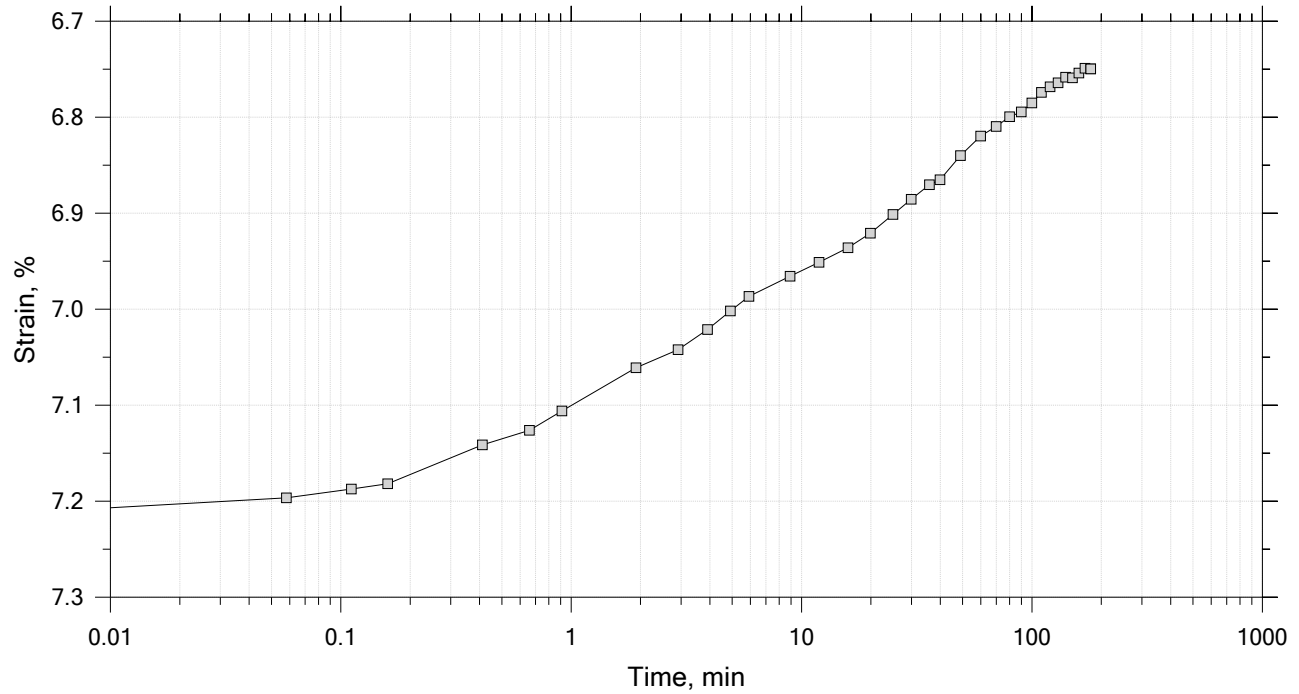
	Project: Rt 9/I-395	Location: Brewer and Eddington, ME	Project No.: GTX-308853
	Boring No.: BB-EEBT2-101	Tested By: md	Checked By: mcm
	Sample No.: 1U	Test Date: 07/13/19	Depth: 5-7 ft
	Test No.: IP-10	Sample Type: intact	Elevation: ---
	Description: Moist, olive gray clay		
	Remarks: System O, Swell Pressure = 0.0859 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 14 of 15

Constant Load Step

Stress: 0.125 tsf



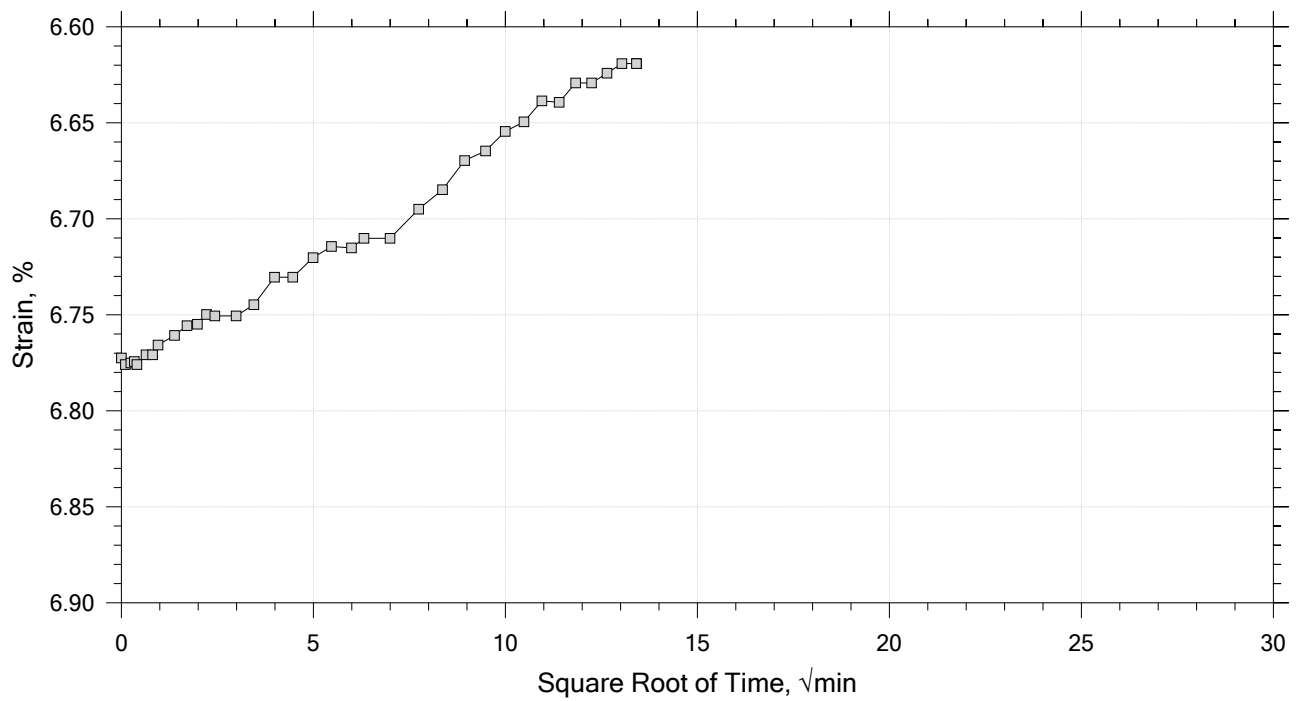
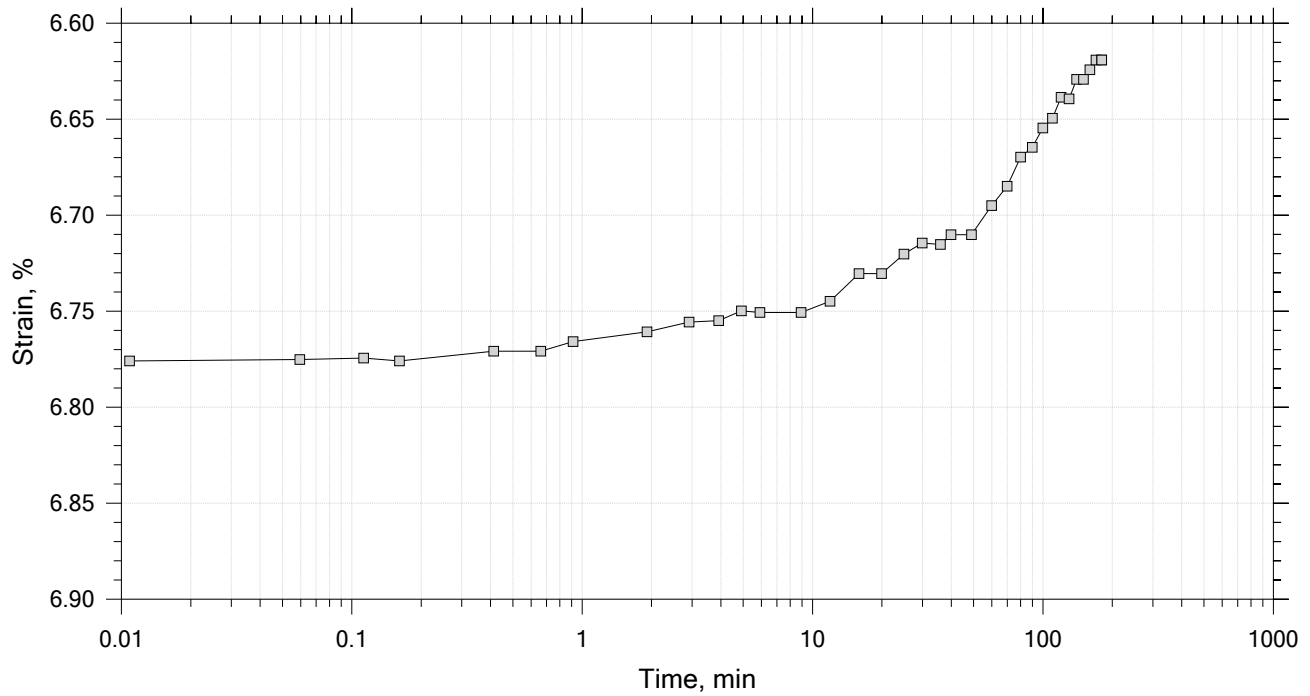
	Project: Rt 9/I-395	Location: Brewer and Eddington, ME	Project No.: GTX-308853
	Boring No.: BB-EEBT2-101	Tested By: md	Checked By: mcm
	Sample No.: 1U	Test Date: 07/13/19	Depth: 5-7 ft
	Test No.: IP-10	Sample Type: intact	Elevation: ---
	Description: Moist, olive gray clay		
	Remarks: System O, Swell Pressure = 0.0859 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 15 of 15

Constant Load Step

Stress: 0.0625 tsf




	Project: Rt 9/I-395	Location: Brewer and Eddington, ME	Project No.: GTX-308853
	Boring No.: BB-EEBT2-101	Tested By: md	Checked By: mcm
	Sample No.: 1U	Test Date: 07/13/19	Depth: 5-7 ft
	Test No.: IP-10	Sample Type: intact	Elevation: ---
	Description: Moist, olive gray clay		
	Remarks: System O, Swell Pressure = 0.0859 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Specimen Diameter: 2.50 in	Estimated Specific Gravity: 2.78	Liquid Limit: 35
Initial Height: 1.00 in	Initial Void Ratio: 0.847	Plastic Limit: 18
Final Height: 0.93 in	Final Void Ratio: 0.725	Plasticity Index: 17

	Before Test Trimmings	Before Test Specimen	After Test Specimen	After Test Trimmings
Container ID	B-722	RING		B-2443
Mass Container, gm	8.67	109.1	109.1	9.1
Mass Container + Wet Soil, gm	143.93	264.35	261.67	161.7
Mass Container + Dry Soil, gm	113.13	230.11	230.11	130.13
Mass Dry Soil, gm	104.46	121.01	121.01	121.03
Water Content, %	29.48	28.30	26.08	26.08
Void Ratio	---	0.85	0.72	---
Degree of Saturation, %	---	92.83	100.00	---
Dry Unit Weight, pcf	---	93.911	100.57	---


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: Rt 9/I-395	Location: Brewer and Eddington, ME	Project No.: GTX-308853
	Boring No.: BB-EEBT2-101	Tested By: md	Checked By: mcm
	Sample No.: 1U	Test Date: 07/13/19	Depth: 5-7 ft
	Test No.: IP-10	Sample Type: intact	Elevation: ---
	Description: Moist, olive gray clay		
	Remarks: System O, Swell Pressure = 0.0859 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Log of Time Coefficients


[illegible]

	Project: Rt 9/I-395	Location: Brewer and Eddington, ME	Project No.: GTX-308853
	Boring No.: BB-EEBT2-101	Tested By: md	Checked By: mcm
	Sample No.: 1U	Test Date: 07/13/19	Depth: 5-7 ft
	Test No.: IP-10	Sample Type: intact	Elevation: ---
	Description: Moist, olive gray clay		
	Remarks: System O, Swell Pressure = 0.0859 tsf		
Displacement at End of Increment			

One-Dimensional Consolidation by ASTM D2435 - Method B

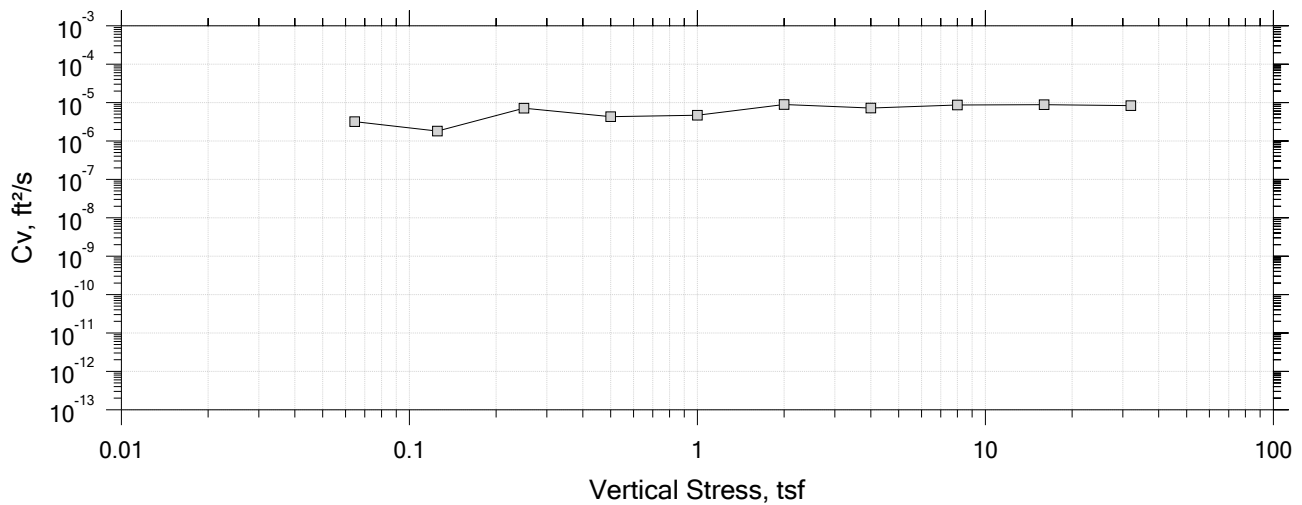
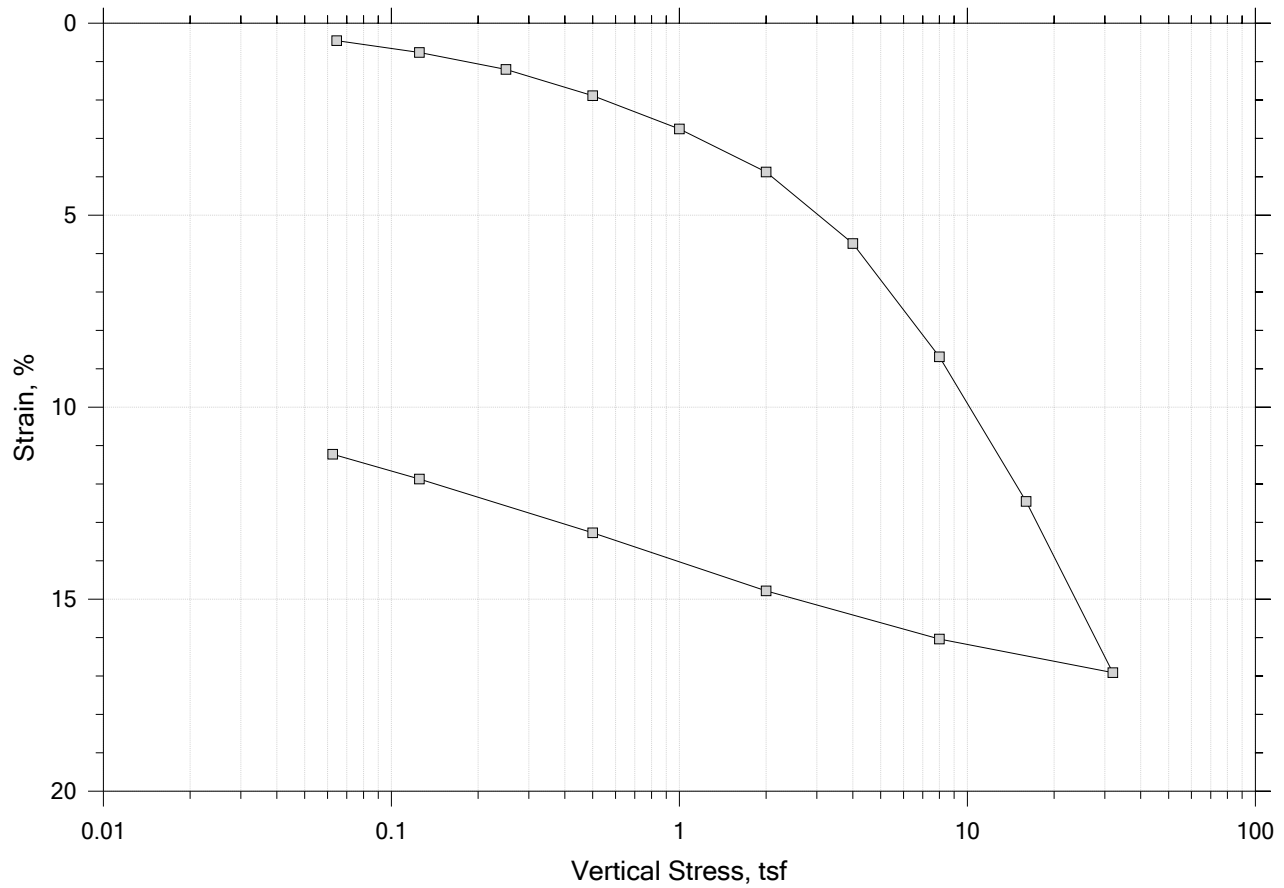
Square Root of Time Coefficients


[illegible]

	Project: Rt 9/I-395	Location: Brewer and Eddington, ME	Project No.: GTX-308853
	Boring No.: BB-EEBT2-101	Tested By: md	Checked By: mcm
	Sample No.: 1U	Test Date: 07/13/19	Depth: 5-7 ft
	Test No.: IP-10	Sample Type: intact	Elevation: ---
	Description: Moist, olive gray clay		
	Remarks: System O, Swell Pressure = 0.0859 tsf		
	Displacement at End of Increment		

One-Dimensional Consolidation by ASTM D2435 - Method B

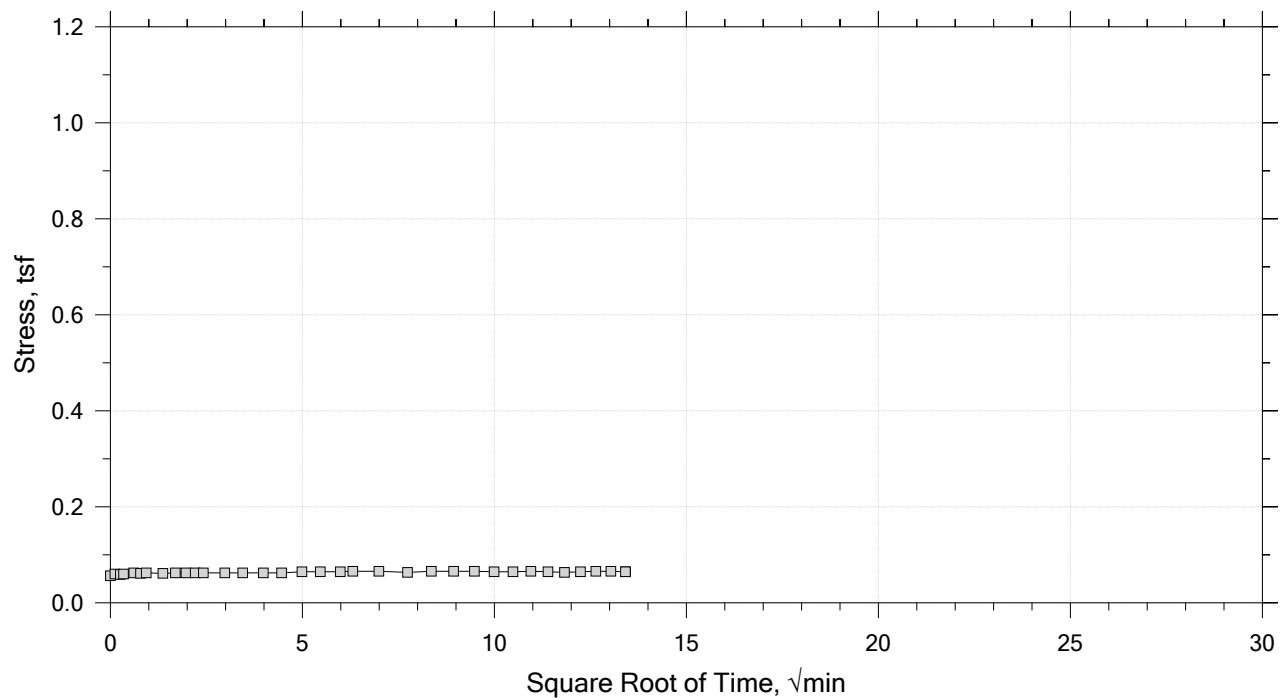
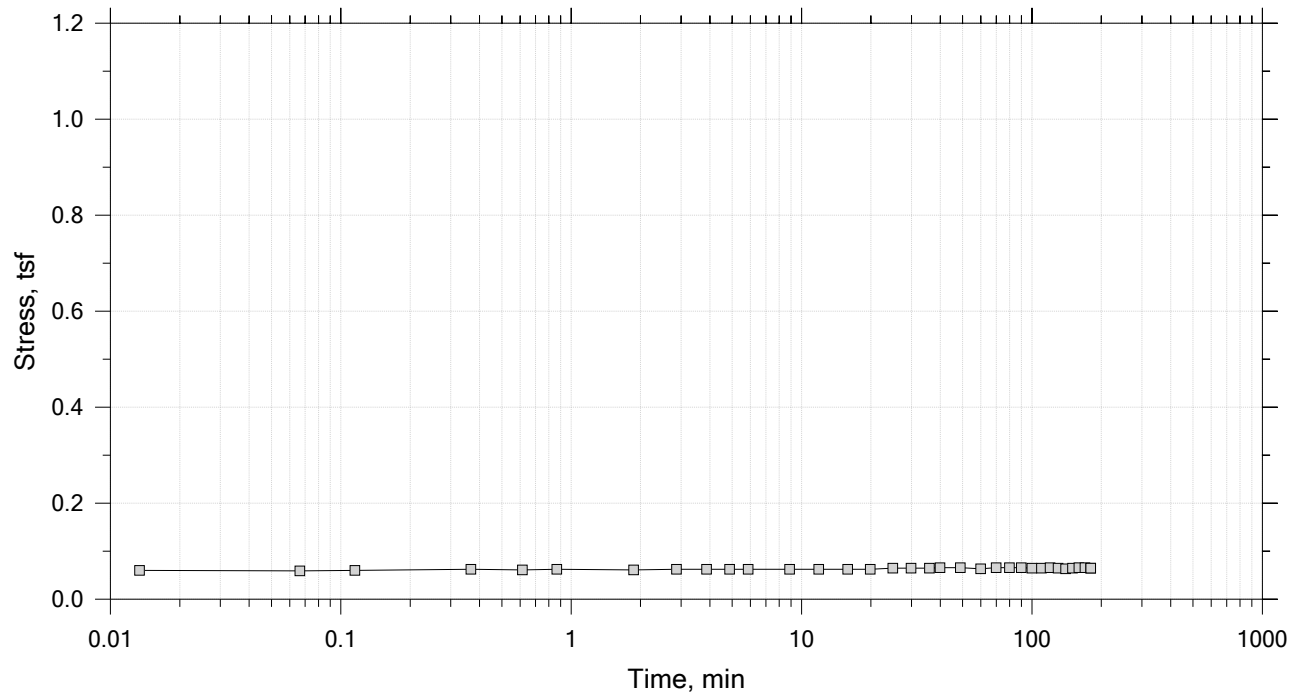
Summary Report




	Project: RT-9/I-395 Connector	Location: Brewer, ME	Project No.: GTX-308853
	Boring No.: HB-BE-101	Tested By: md	Checked By: mcm
	Sample No.: 1U	Test Date: 09/27/18	Depth: 5-7 ft
	Test No.: IP-3	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System W, Swell Pressure = 0.0645 tsf		
	Displacement at End of Increment		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 1 of 15
Constant Volume Step
Stress: 0.0645 tsf



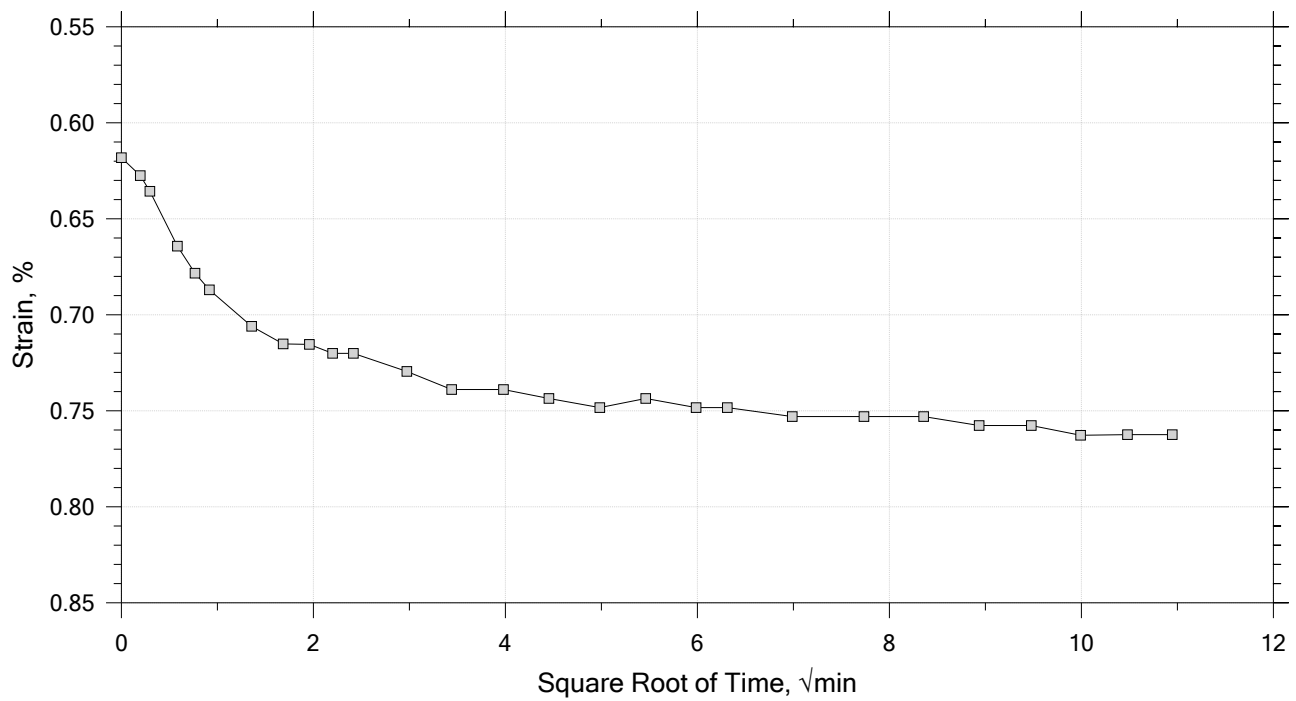
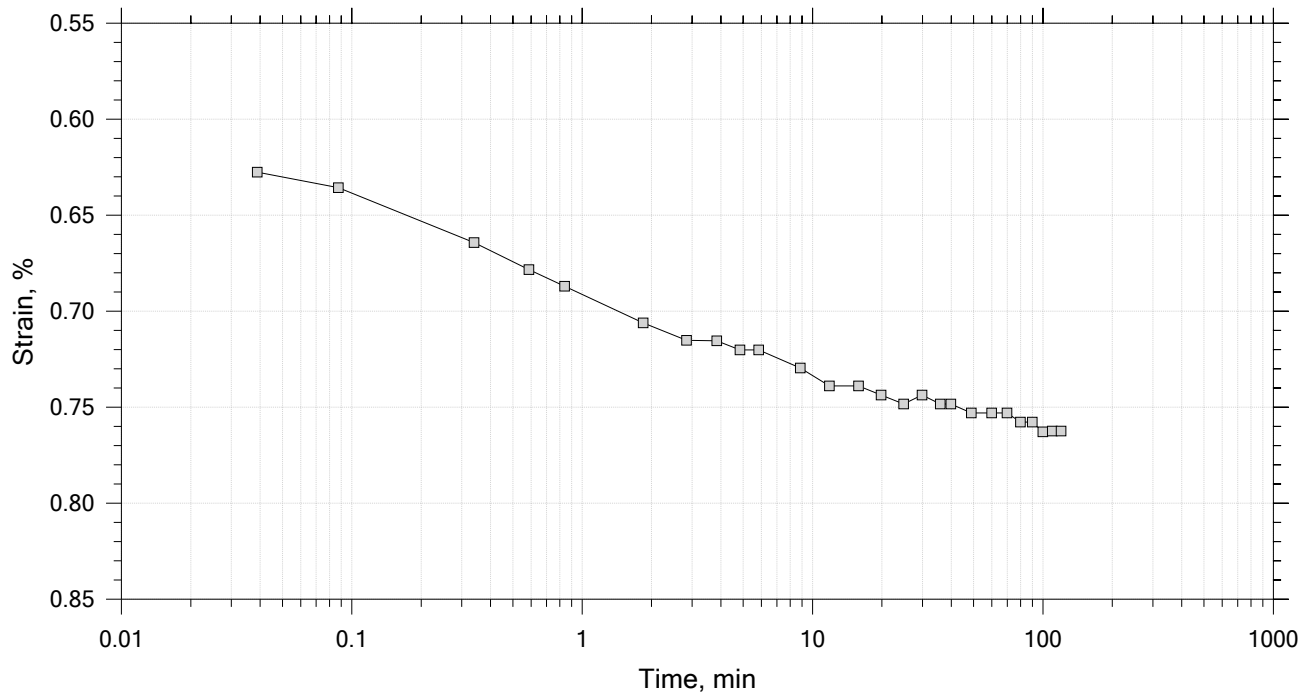
	Project: RT-9/I-395 Connector	Location: Brewer, ME	Project No.: GTX-308853
	Boring No.: HB-BE-101	Tested By: md	Checked By: mcm
	Sample No.: 1U	Test Date: 09/27/18	Depth: 5-7 ft
	Test No.: IP-3	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System W, Swell Pressure = 0.0645 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 2 of 15

Constant Load Step

Stress: 0.125 tsf



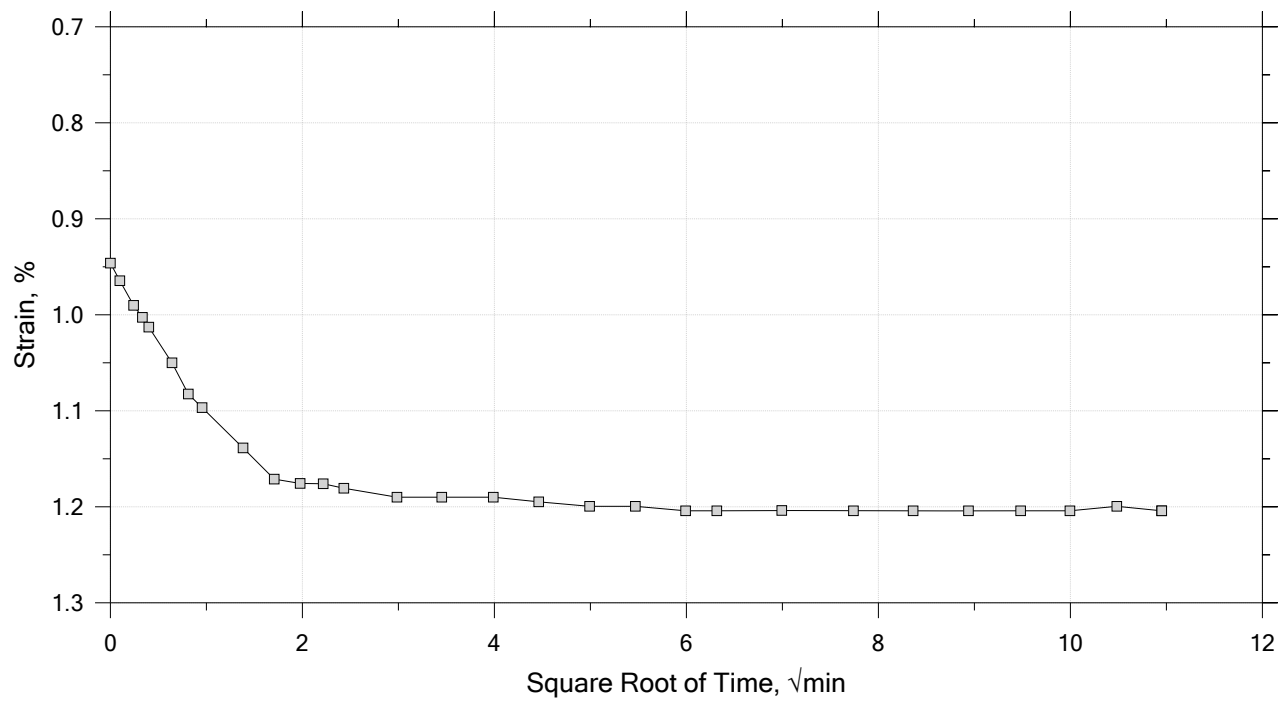
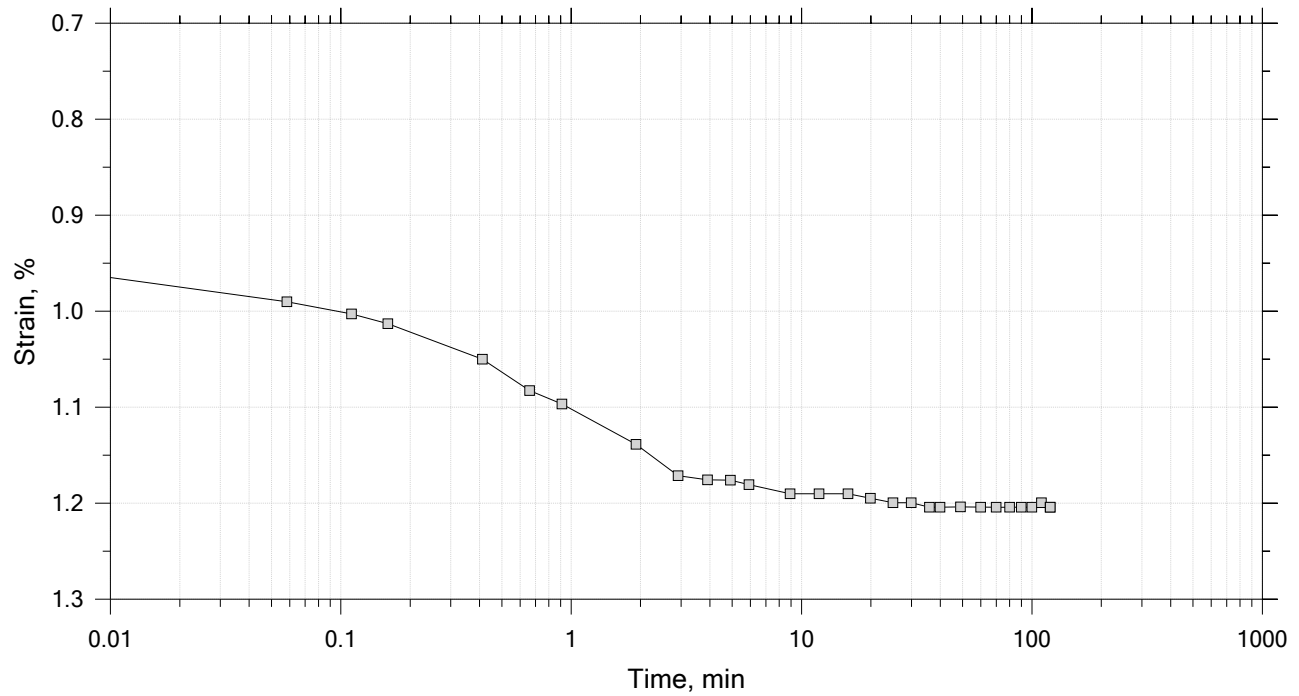
	Project: RT-9/I-395 Connector	Location: Brewer, ME	Project No.: GTX-308853
	Boring No.: HB-BE-101	Tested By: md	Checked By: mcm
	Sample No.: 1U	Test Date: 09/27/18	Depth: 5-7 ft
	Test No.: IP-3	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System W, Swell Pressure = 0.0645 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 3 of 15

Constant Load Step

Stress: 0.25 tsf



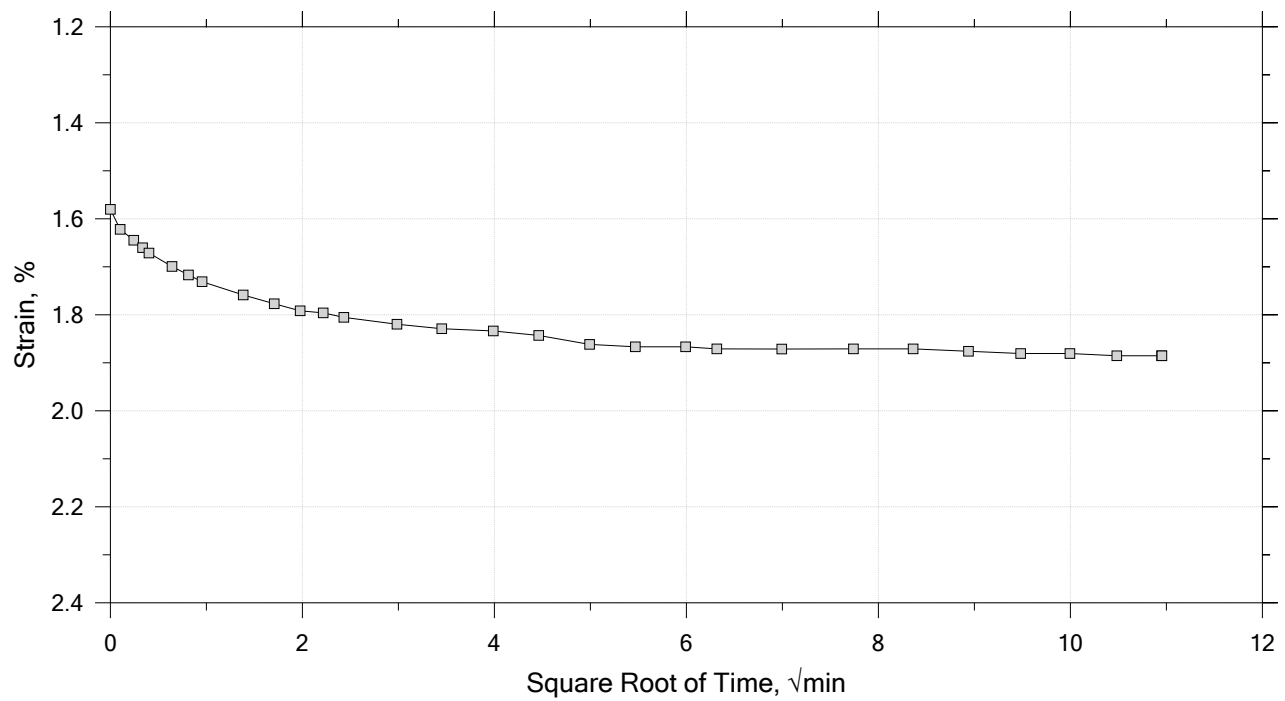
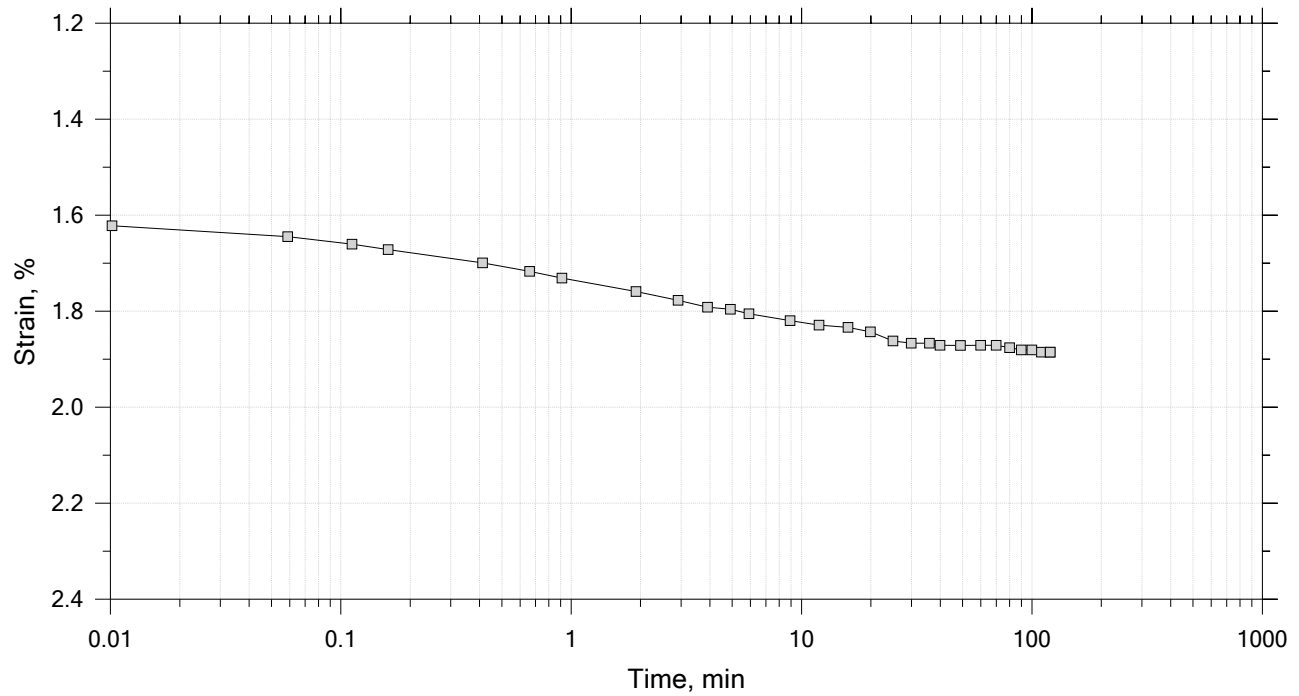
	Project: RT-9/I-395 Connector	Location: Brewer, ME	Project No.: GTX-308853
	Boring No.: HB-BE-101	Tested By: md	Checked By: mcm
	Sample No.: 1U	Test Date: 09/27/18	Depth: 5-7 ft
	Test No.: IP-3	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System W, Swell Pressure = 0.0645 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 4 of 15

Constant Load Step

Stress: 0.5 tsf



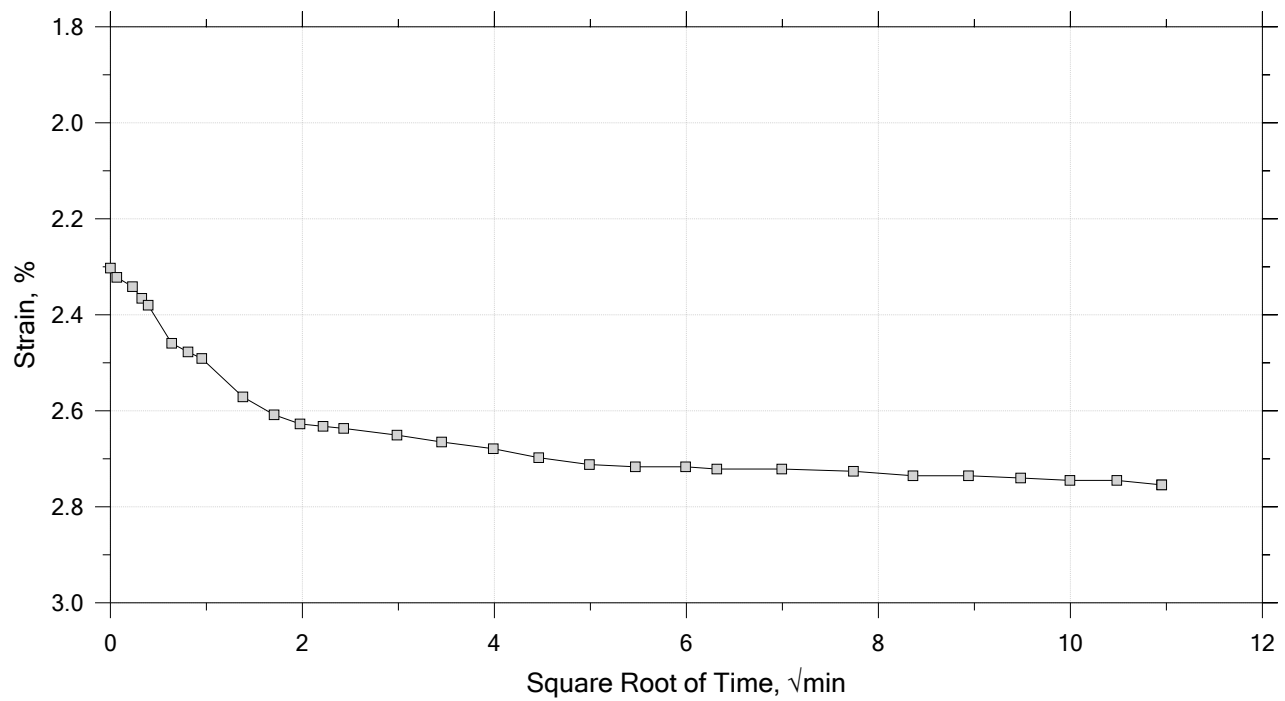
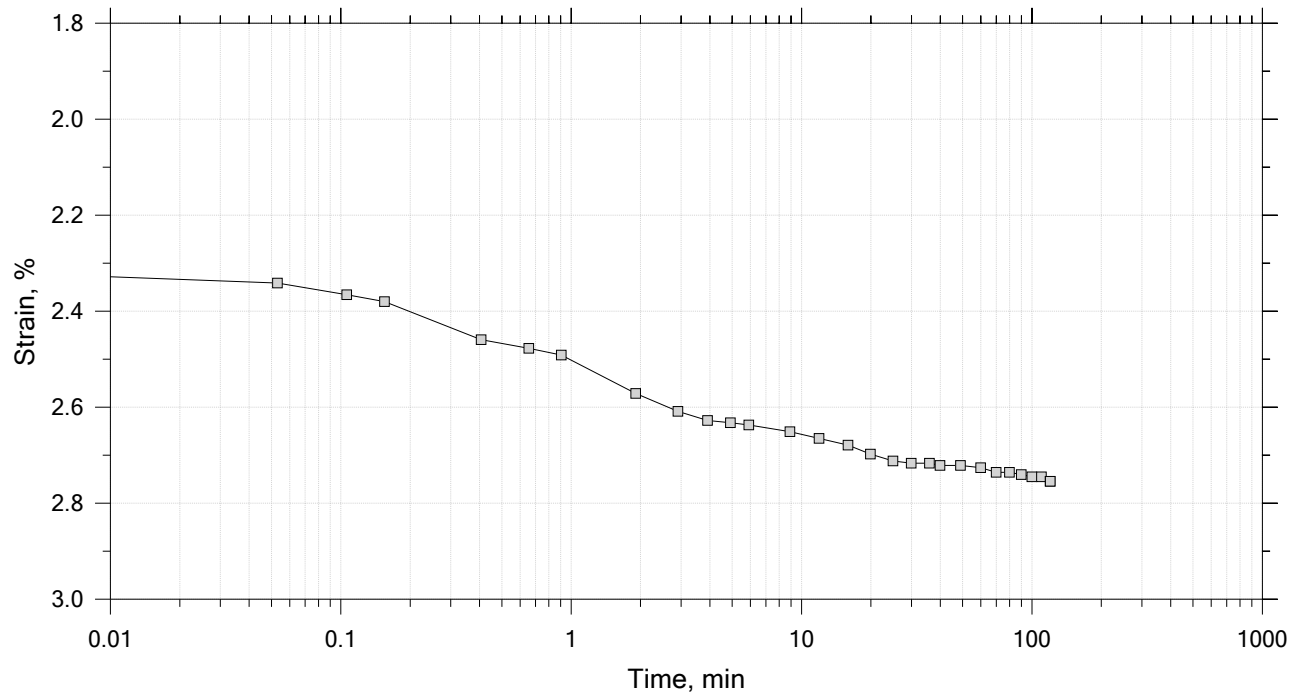
	Project: RT-9/I-395 Connector	Location: Brewer, ME	Project No.: GTX-308853
	Boring No.: HB-BE-101	Tested By: md	Checked By: mcm
	Sample No.: 1U	Test Date: 09/27/18	Depth: 5-7 ft
	Test No.: IP-3	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System W, Swell Pressure = 0.0645 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 5 of 15

Constant Load Step

Stress: 1 tsf



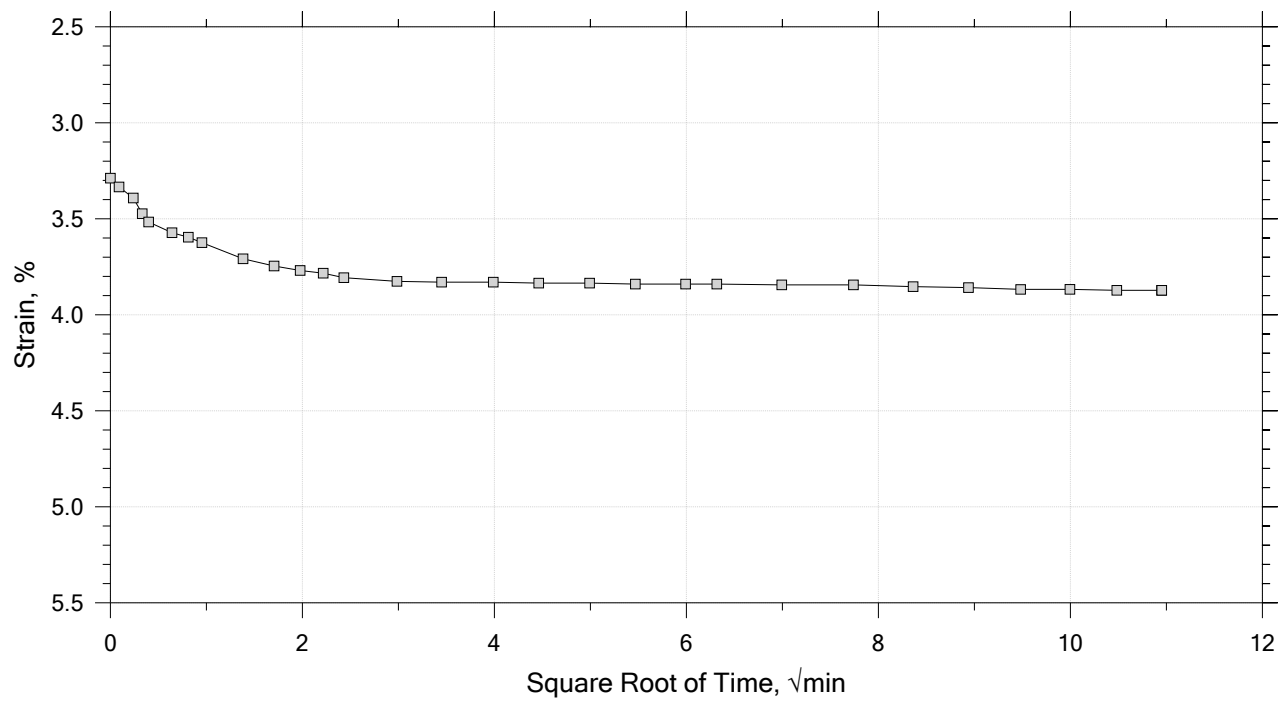
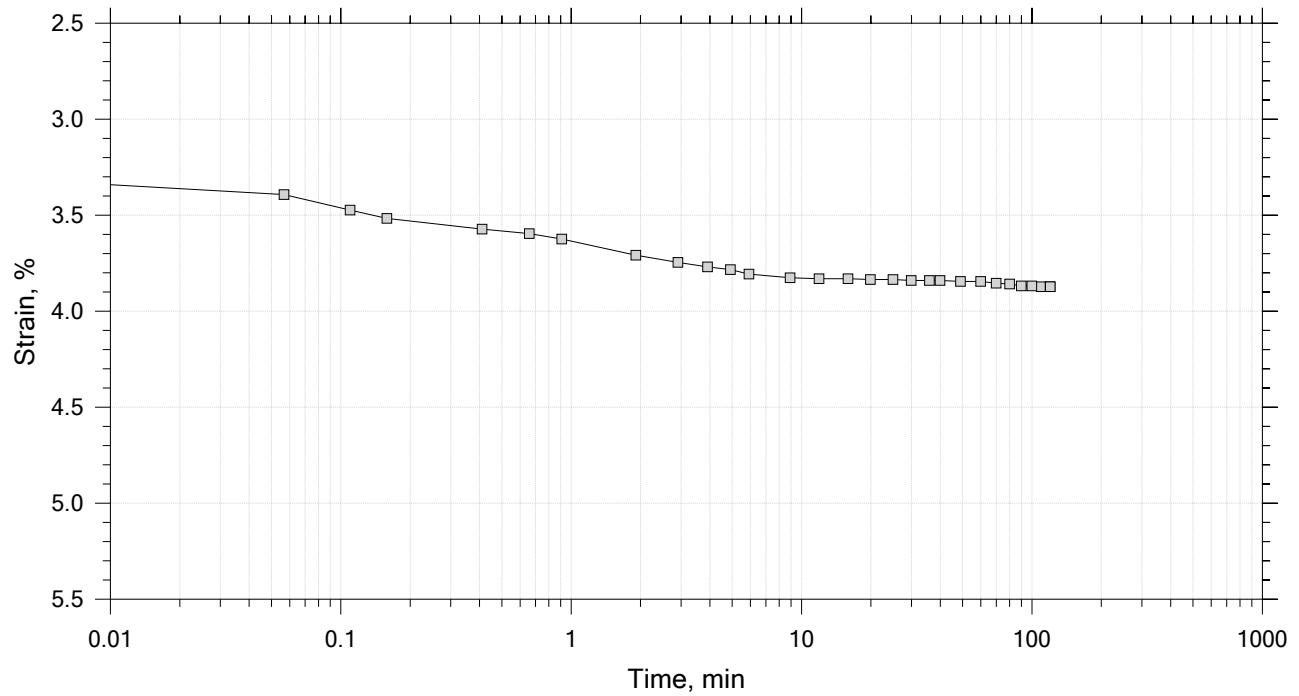
	Project: RT-9/I-395 Connector	Location: Brewer, ME	Project No.: GTX-308853
	Boring No.: HB-BE-101	Tested By: md	Checked By: mcm
	Sample No.: 1U	Test Date: 09/27/18	Depth: 5-7 ft
	Test No.: IP-3	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System W, Swell Pressure = 0.0645 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 6 of 15

Constant Load Step

Stress: 2 tsf



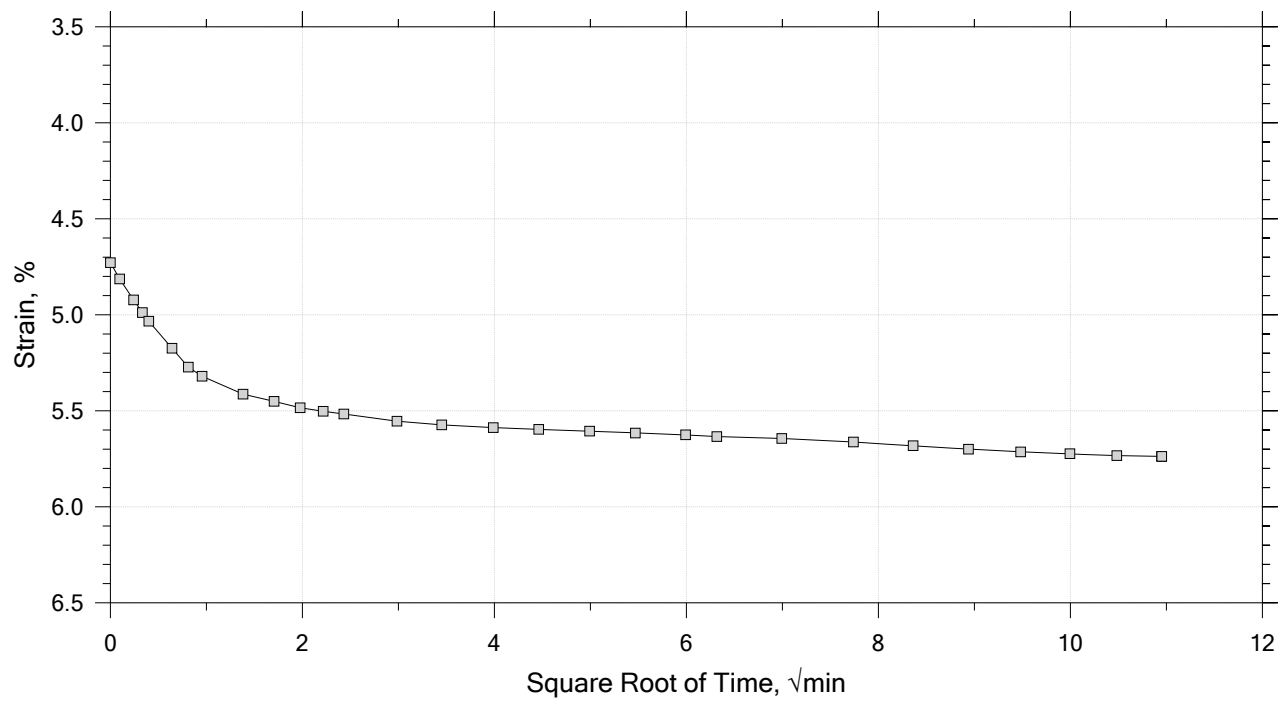
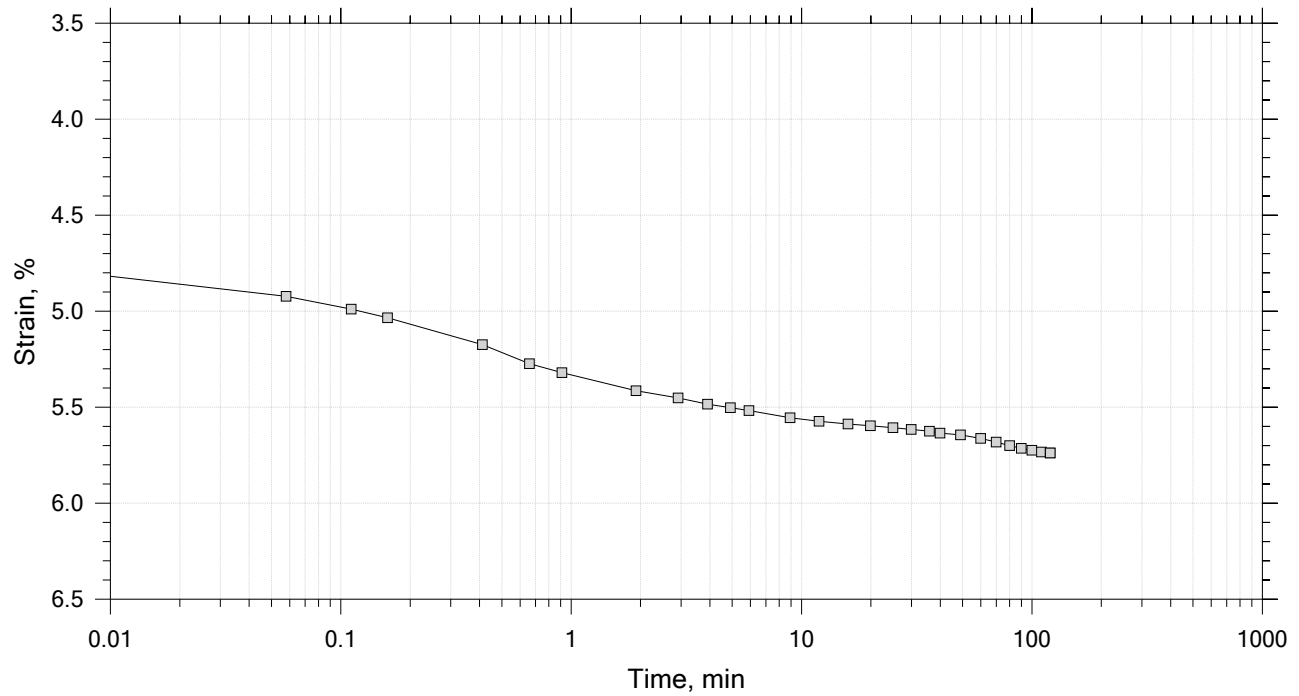
	Project: RT-9/I-395 Connector	Location: Brewer, ME	Project No.: GTX-308853
	Boring No.: HB-BE-101	Tested By: md	Checked By: mcm
	Sample No.: 1U	Test Date: 09/27/18	Depth: 5-7 ft
	Test No.: IP-3	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System W, Swell Pressure = 0.0645 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 7 of 15

Constant Load Step

Stress: 4 tsf



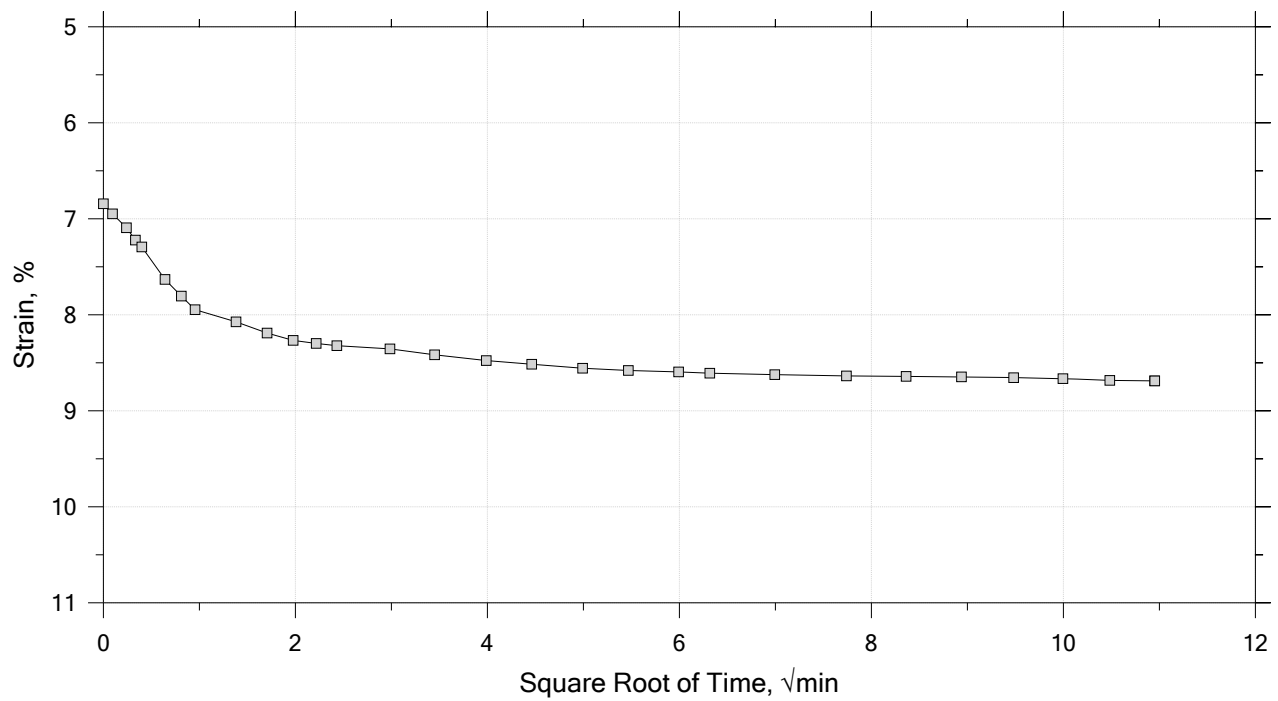
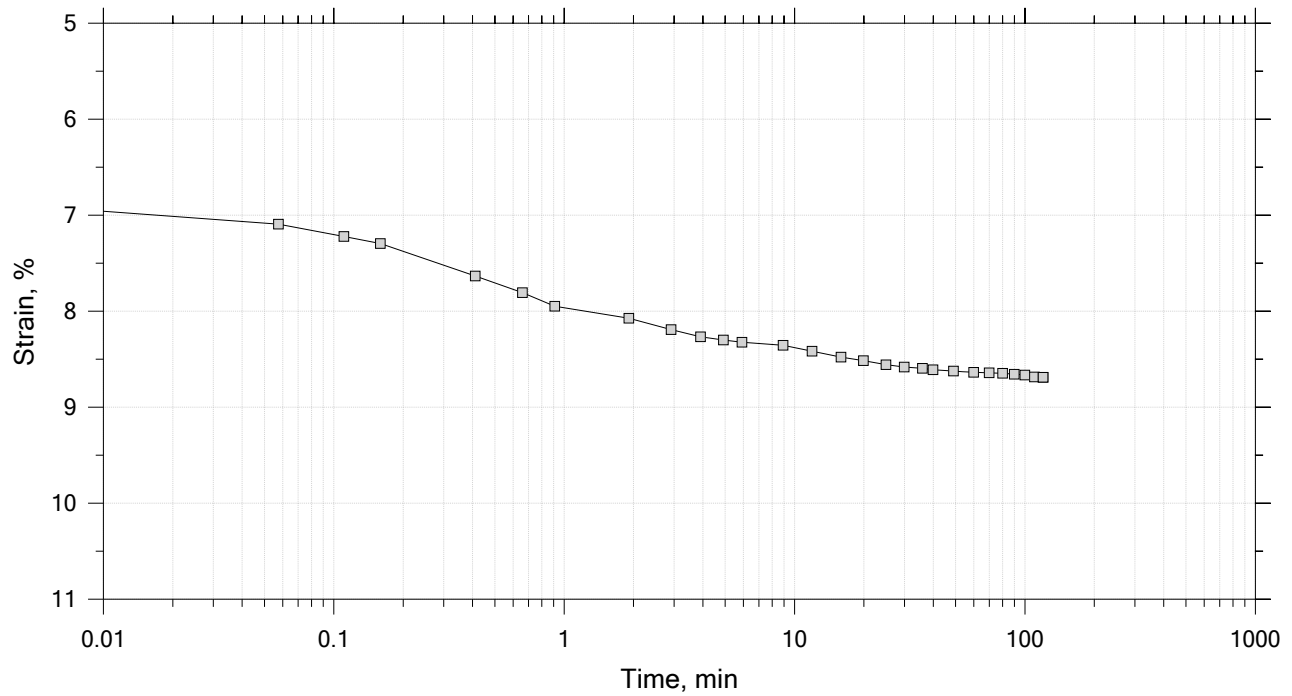
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	Boring No.: HB-BE-101	Tested By: md	Checked By: mcm
	Sample No.: 1U	Test Date: 09/27/18	Depth: 5-7 ft
	Test No.: IP-3	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System W, Swell Pressure = 0.0645 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 8 of 15

Constant Load Step

Stress: 8 tsf



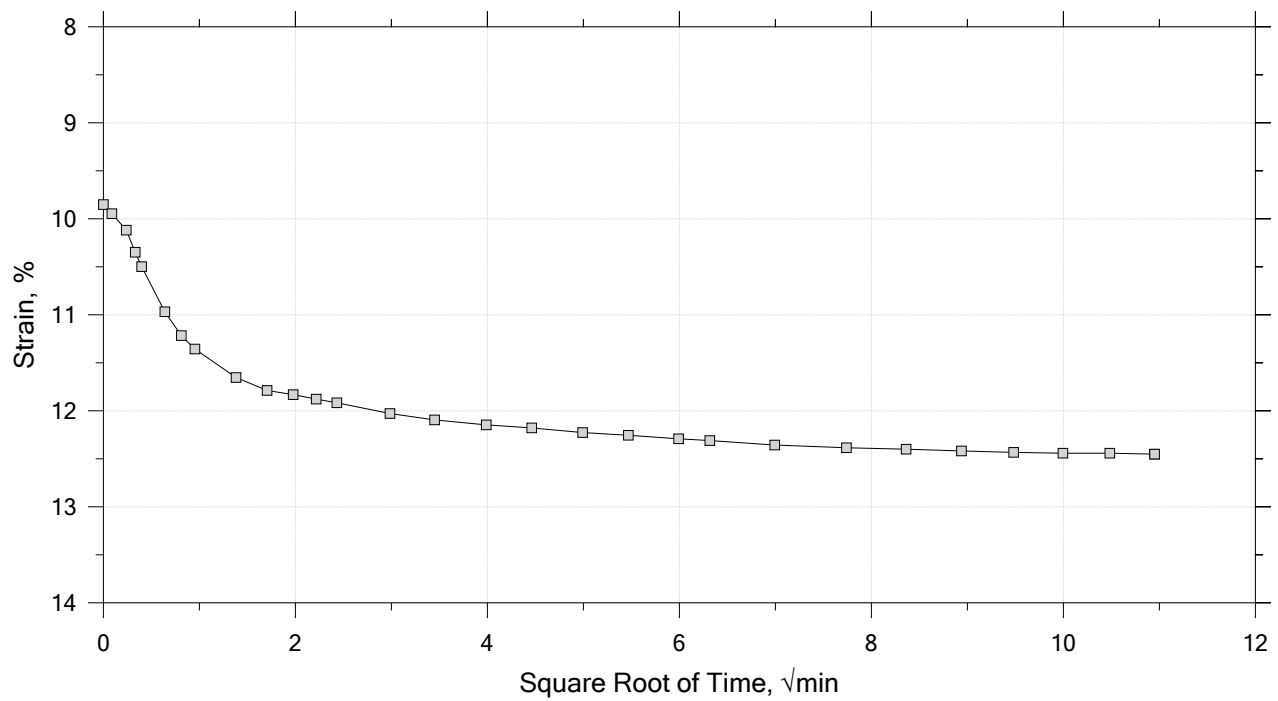
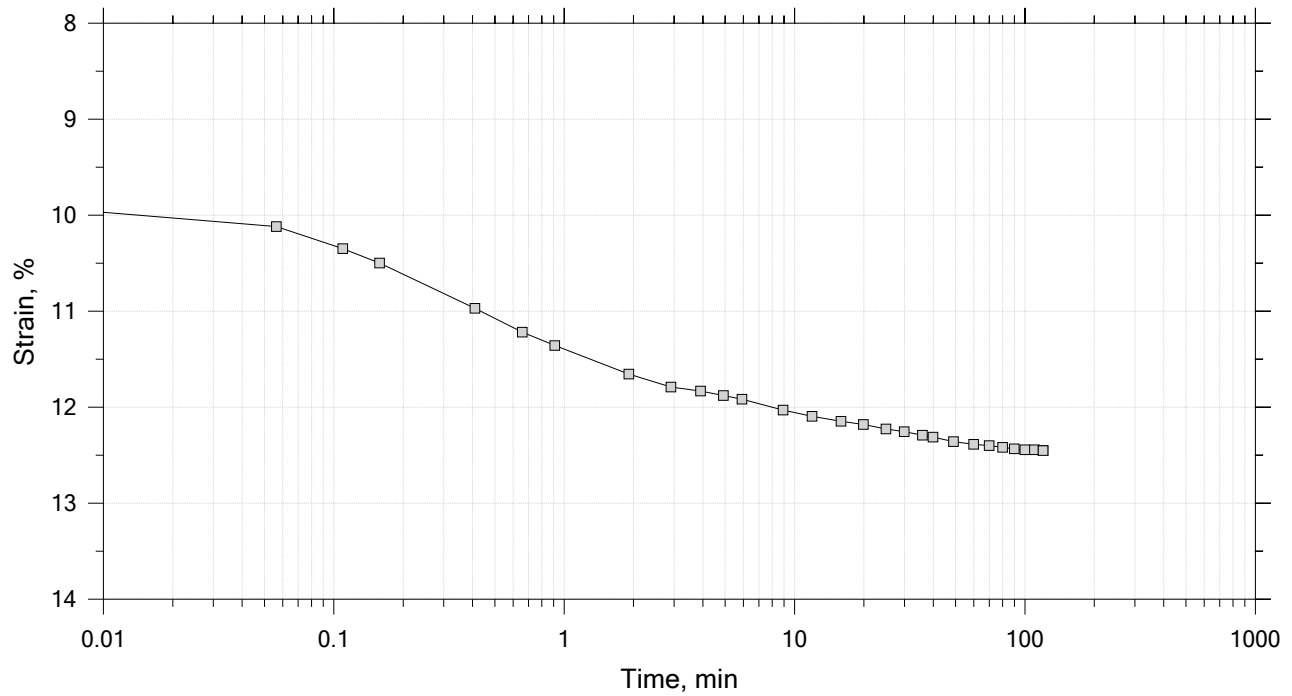
	Project: RT-9/I-395 Connector	Location: Brewer, ME	Project No.: GTX-308853
	Boring No.: HB-BE-101	Tested By: md	Checked By: mcm
	Sample No.: 1U	Test Date: 09/27/18	Depth: 5-7 ft
	Test No.: IP-3	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System W, Swell Pressure = 0.0645 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 9 of 15

Constant Load Step

Stress: 16 tsf



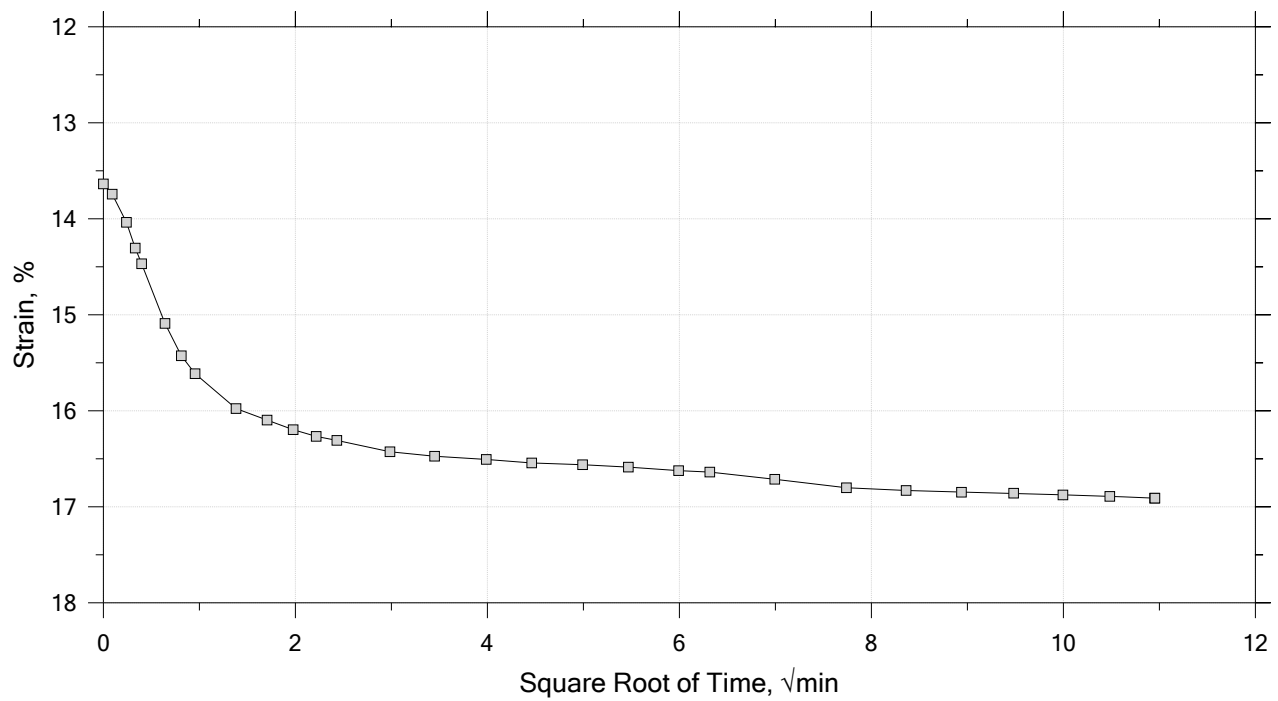
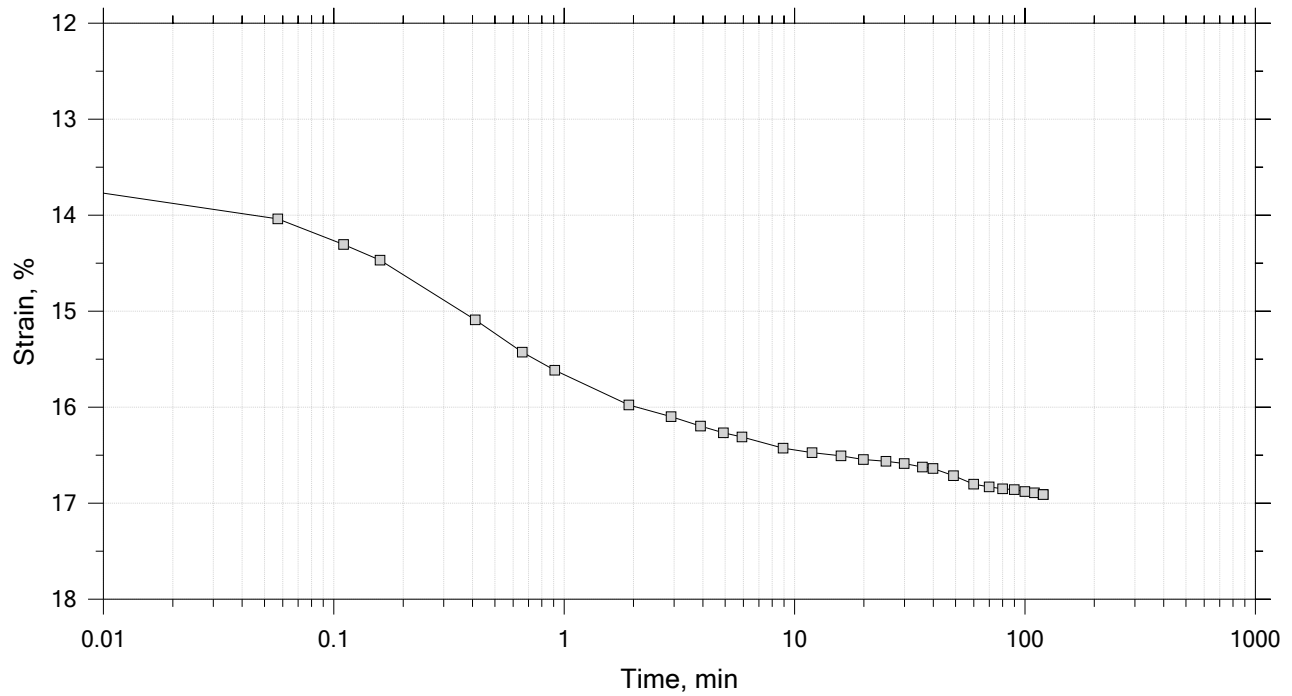
	Project: RT-9/I-395 Connector	Location: Brewer, ME	Project No.: GTX-308853
	Boring No.: HB-BE-101	Tested By: md	Checked By: mcm
	Sample No.: 1U	Test Date: 09/27/18	Depth: 5-7 ft
	Test No.: IP-3	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System W, Swell Pressure = 0.0645 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 10 of 15

Constant Load Step

Stress: 32 tsf



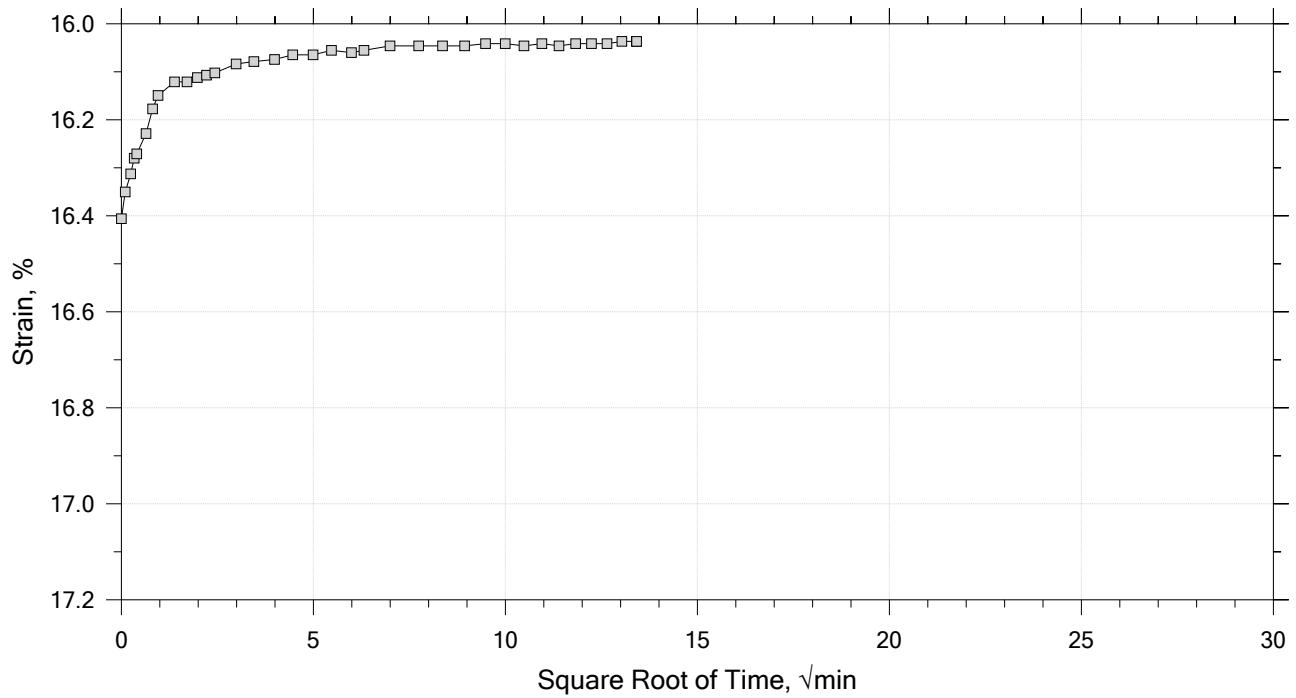
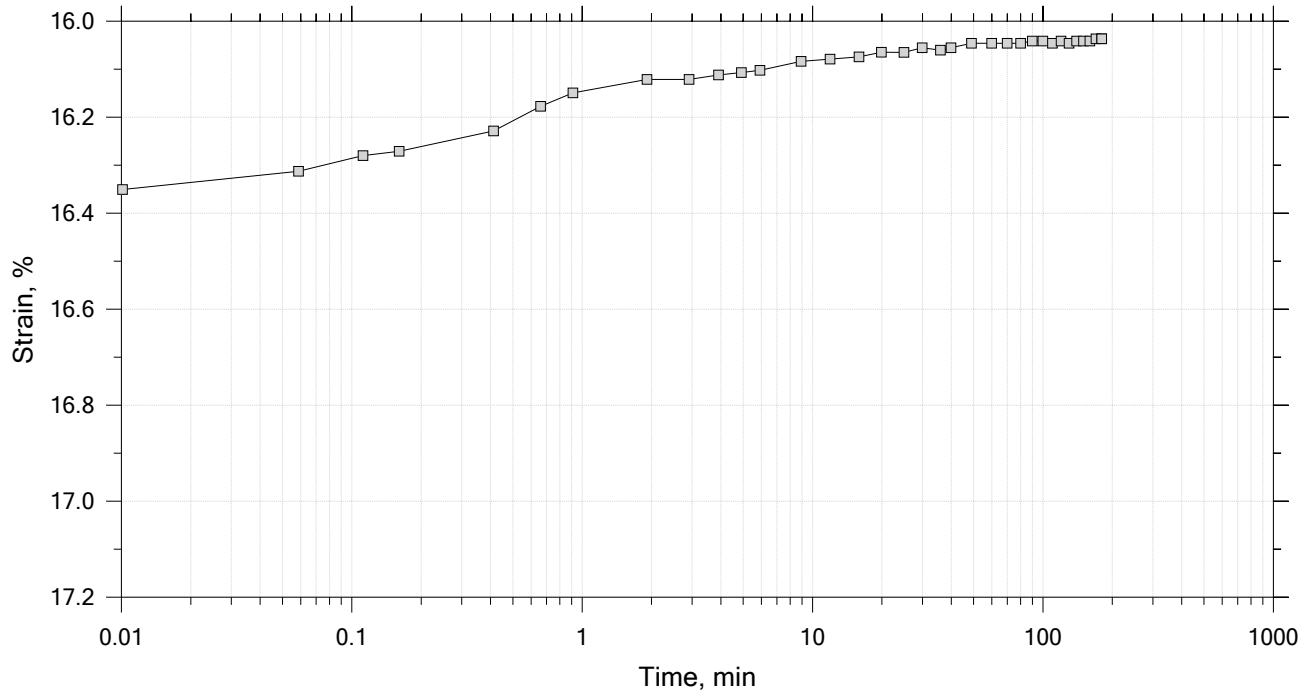
	Project: RT-9/I-395 Connector	Location: Brewer, ME	Project No.: GTX-308853
	Boring No.: HB-BE-101	Tested By: md	Checked By: mcm
	Sample No.: 1U	Test Date: 09/27/18	Depth: 5-7 ft
	Test No.: IP-3	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System W, Swell Pressure = 0.0645 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 11 of 15

Constant Load Step

Stress: 8 tsf



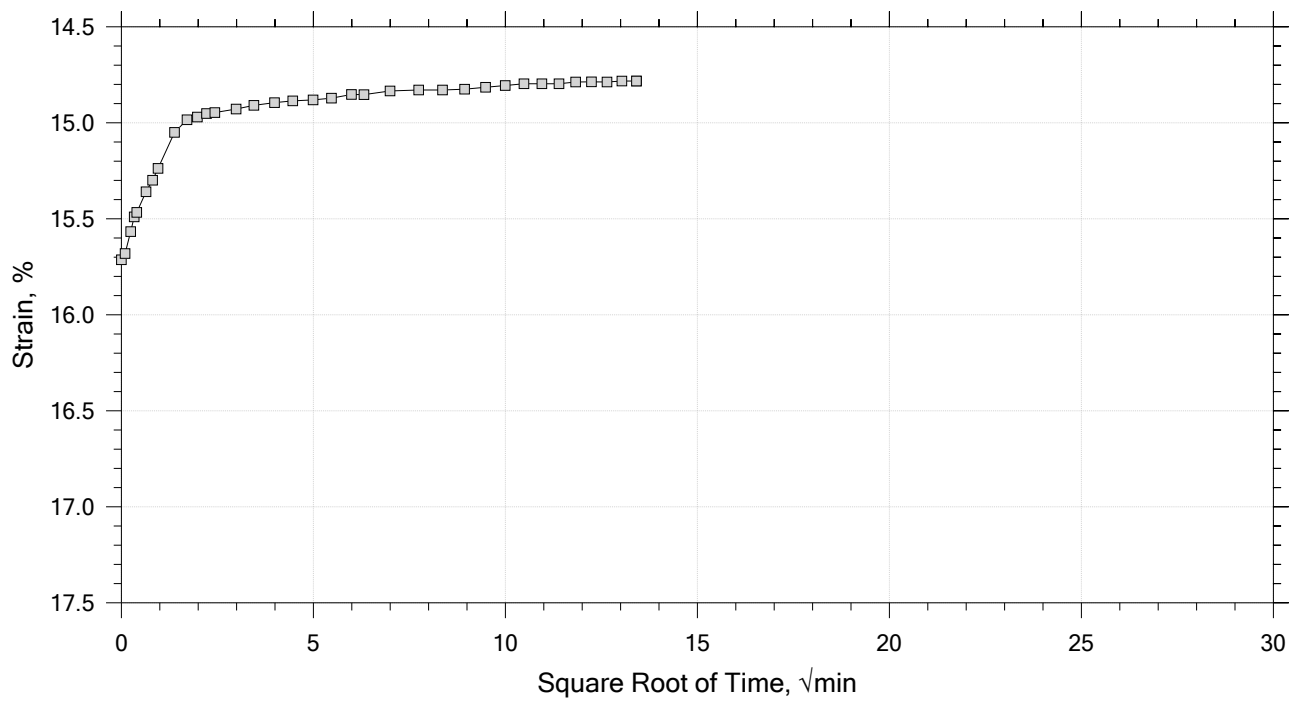
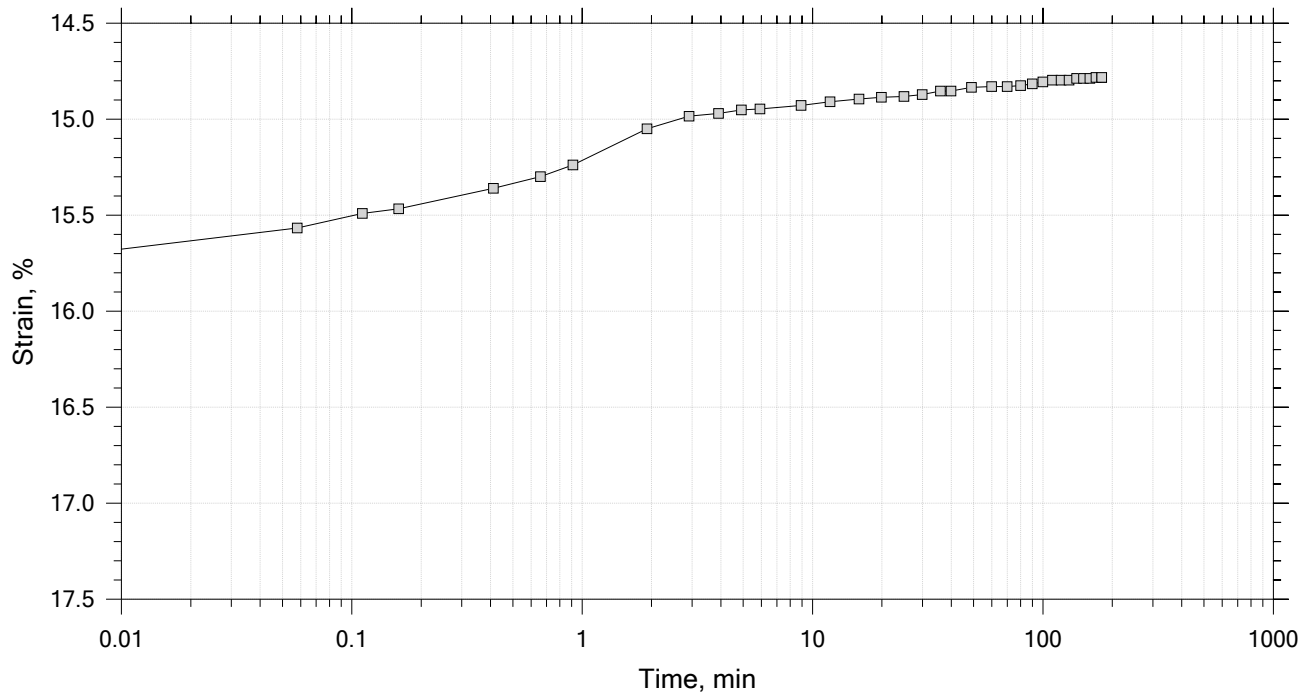
	Project: RT-9/I-395 Connector	Location: Brewer, ME	Project No.: GTX-308853
	Boring No.: HB-BE-101	Tested By: md	Checked By: mcm
	Sample No.: 1U	Test Date: 09/27/18	Depth: 5-7 ft
	Test No.: IP-3	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System W, Swell Pressure = 0.0645 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 12 of 15

Constant Load Step

Stress: 2 tsf



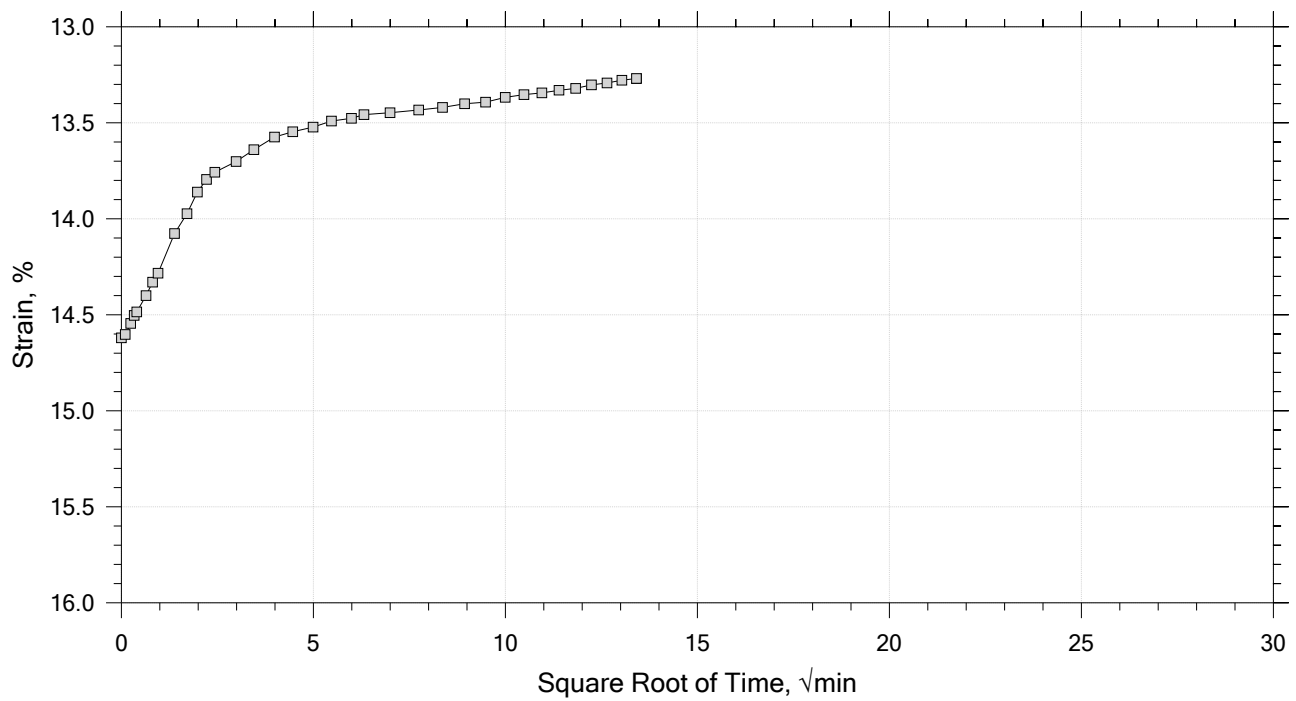
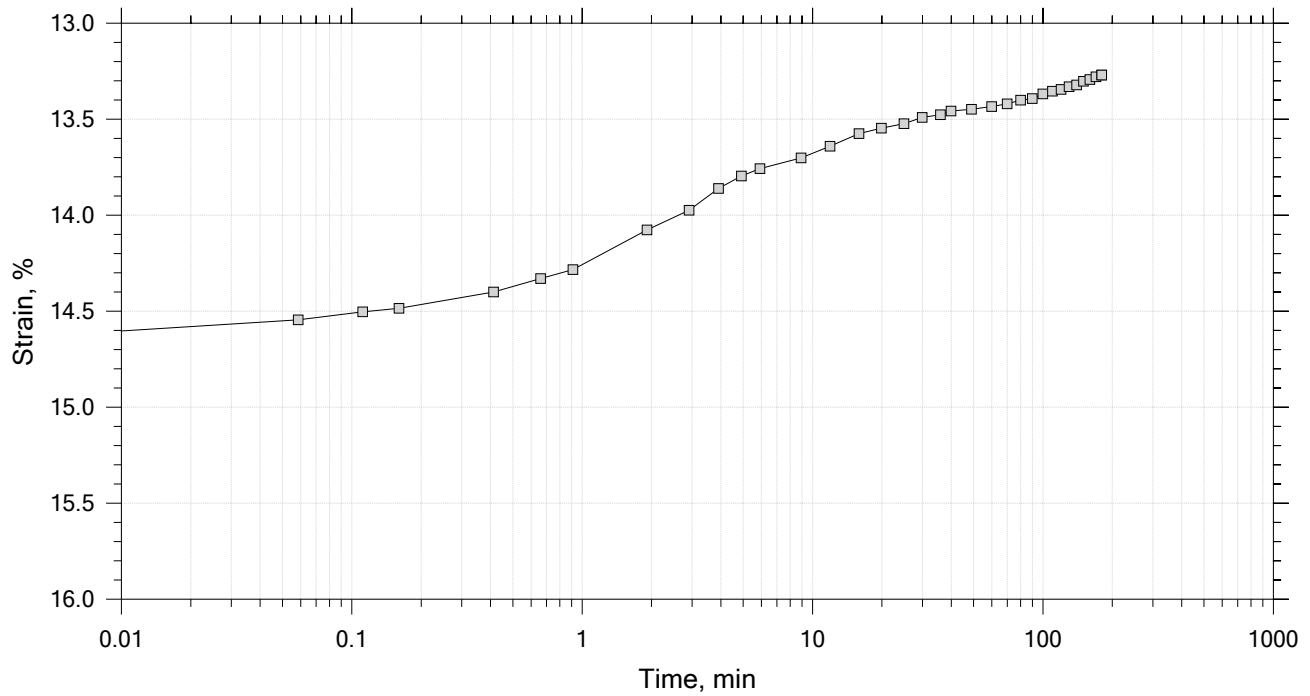
	Project: RT-9/I-395 Connector	Location: Brewer, ME	Project No.: GTX-308853
	Boring No.: HB-BE-101	Tested By: md	Checked By: mcm
	Sample No.: 1U	Test Date: 09/27/18	Depth: 5-7 ft
	Test No.: IP-3	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System W, Swell Pressure = 0.0645 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 13 of 15

Constant Load Step

Stress: 0.5 tsf



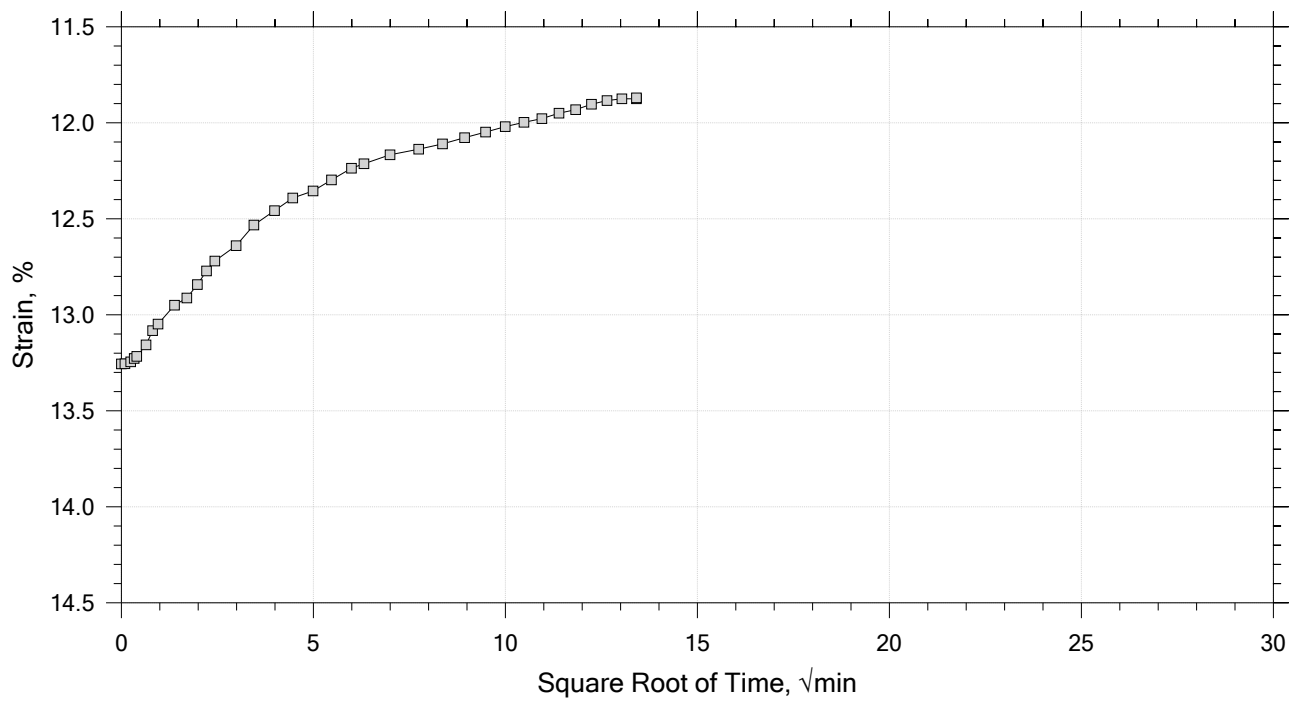
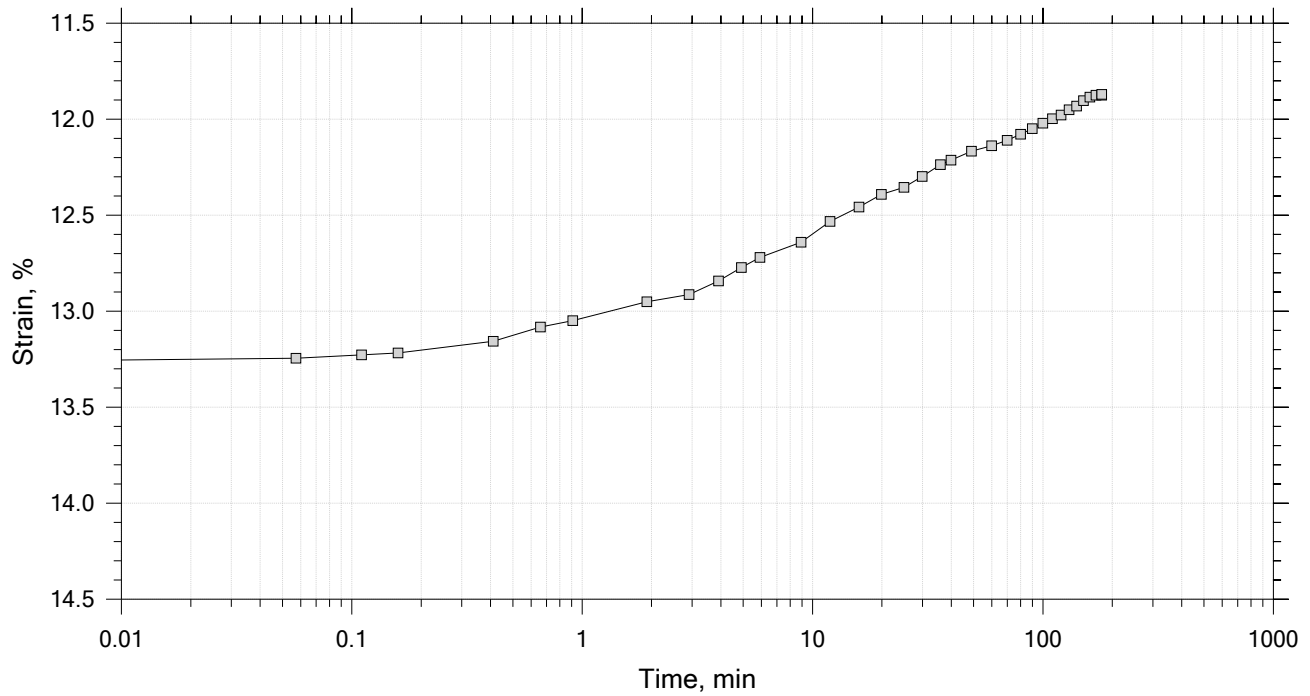
	Project: RT-9/I-395 Connector	Location: Brewer, ME	Project No.: GTX-308853
	Boring No.: HB-BE-101	Tested By: md	Checked By: mcm
	Sample No.: 1U	Test Date: 09/27/18	Depth: 5-7 ft
	Test No.: IP-3	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System W, Swell Pressure = 0.0645 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 14 of 15

Constant Load Step

Stress: 0.125 tsf



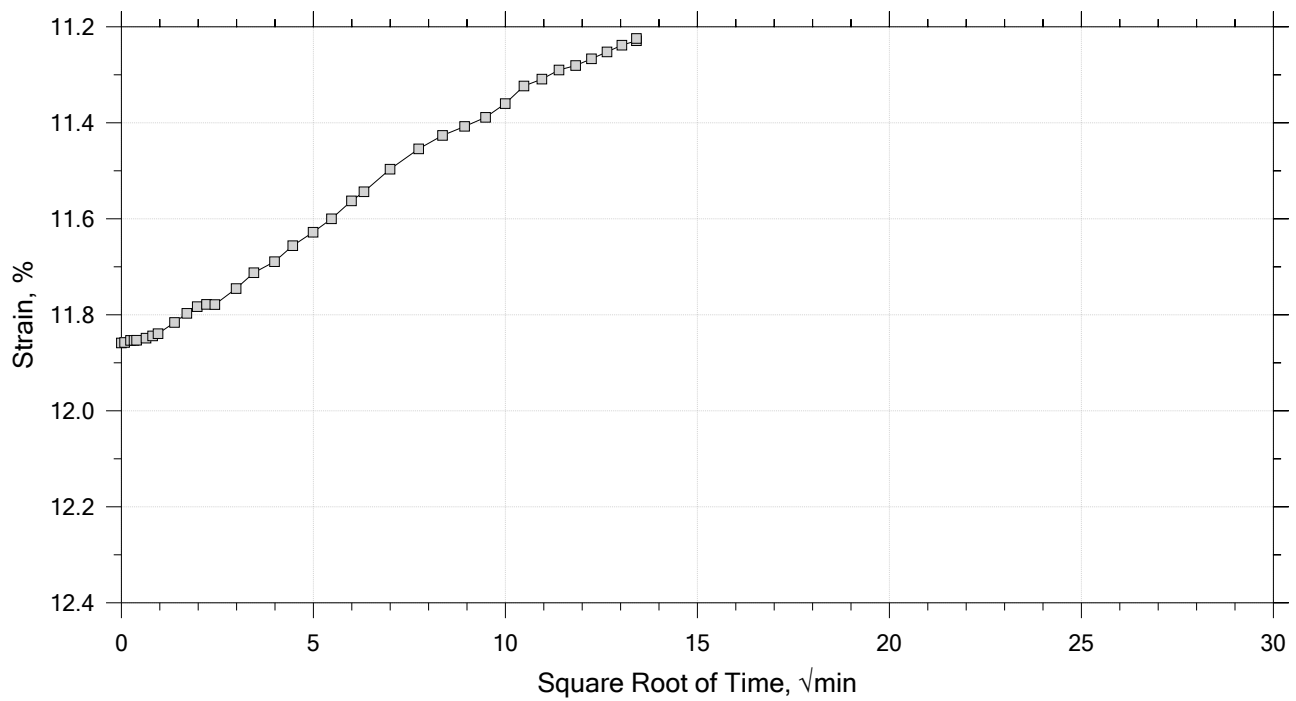
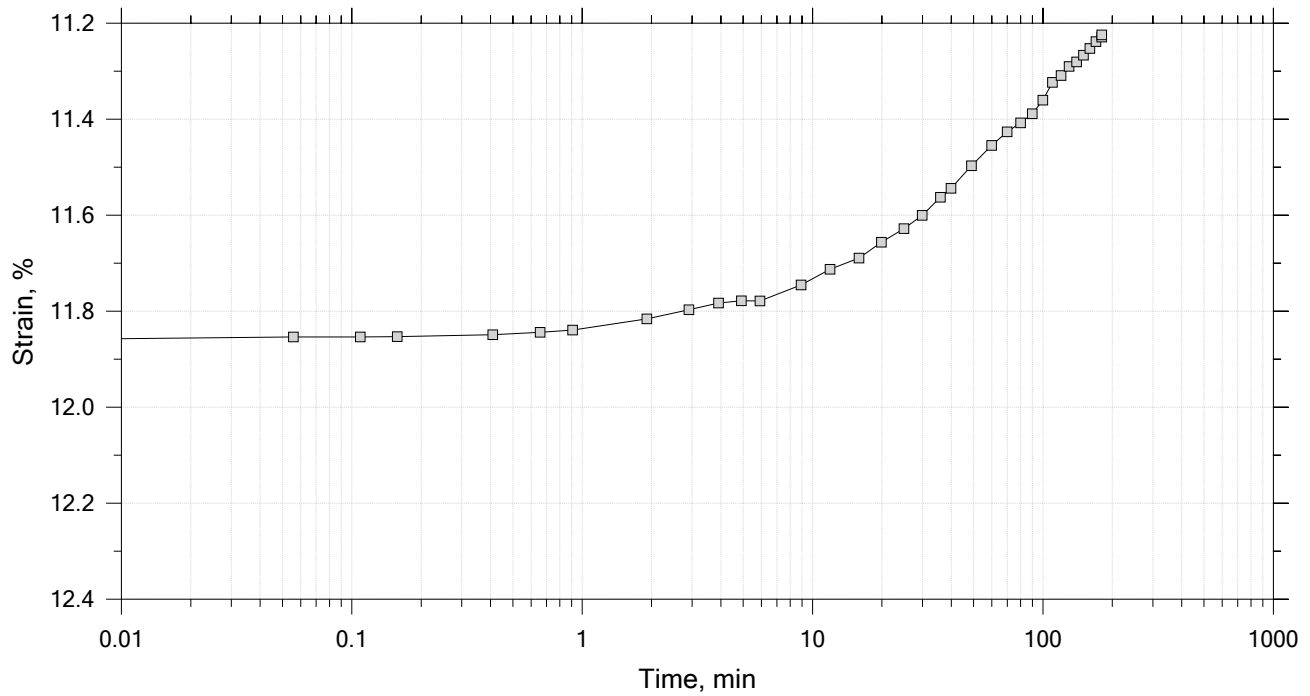
	Project: RT-9/I-395 Connector	Location: Brewer, ME	Project No.: GTX-308853
	Boring No.: HB-BE-101	Tested By: md	Checked By: mcm
	Sample No.: 1U	Test Date: 09/27/18	Depth: 5-7 ft
	Test No.: IP-3	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System W, Swell Pressure = 0.0645 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 15 of 15

Constant Load Step

Stress: 0.0625 tsf




	Project: RT-9/I-395 Connector	Location: Brewer, ME	Project No.: GTX-308853
	Boring No.: HB-BE-101	Tested By: md	Checked By: mcm
	Sample No.: 1U	Test Date: 09/27/18	Depth: 5-7 ft
	Test No.: IP-3	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System W, Swell Pressure = 0.0645 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Specimen Diameter: 2.50 in	Estimated Specific Gravity: 2.75	Liquid Limit: 45
Initial Height: 1.00 in	Initial Void Ratio: 0.998	Plastic Limit: 24
Final Height: 0.92 in	Final Void Ratio: 0.838	Plasticity Index: 21

	Before Test Trimmings	Before Test Specimen	After Test Specimen	After Test Trimmings
Container ID	C-1725	RING		A1264
Mass Container, gm	8.52	108.84	108.84	8.42
Mass Container + Wet Soil, gm	142.75	258.5	253.17	152.55
Mass Container + Dry Soil, gm	107.85	219.43	219.43	118.86
Mass Dry Soil, gm	99.33	110.59	110.59	110.44
Water Content, %	35.14	35.32	30.51	30.51
Void Ratio	---	1.00	0.84	---
Degree of Saturation, %	---	97.25	100.00	---
Dry Unit Weight, pcf	---	85.83	93.293	---


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: RT-9/I-395 Connector	Location: Brewer, ME	Project No.: GTX-308853
	Boring No.: HB-BE-101	Tested By: md	Checked By: mcm
	Sample No.: 1U	Test Date: 09/27/18	Depth: 5-7 ft
	Test No.: IP-3	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System W, Swell Pressure = 0.0645 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Log of Time Coefficients


[illegible]

	Project: RT-9/I-395 Connector	Location: Brewer, ME	Project No.: GTX-308853
	Boring No.: HB-BE-101	Tested By: md	Checked By: mcm
	Sample No.: 1U	Test Date: 09/27/18	Depth: 5-7 ft
	Test No.: IP-3	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System W, Swell Pressure = 0.0645 tsf		
	Displacement at End of Increment		

One-Dimensional Consolidation by ASTM D2435 - Method B

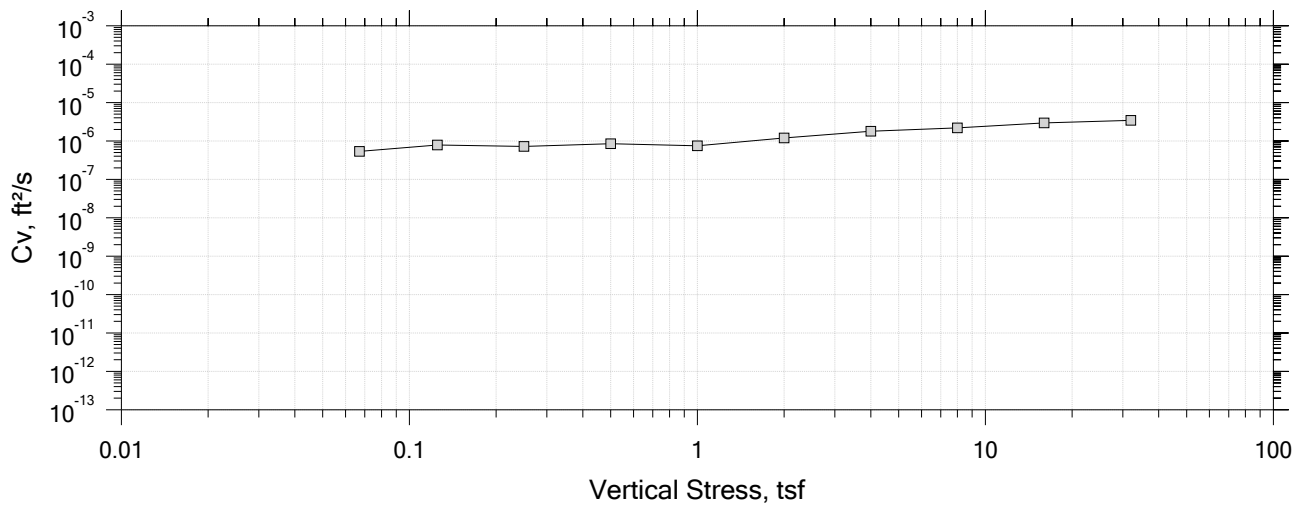
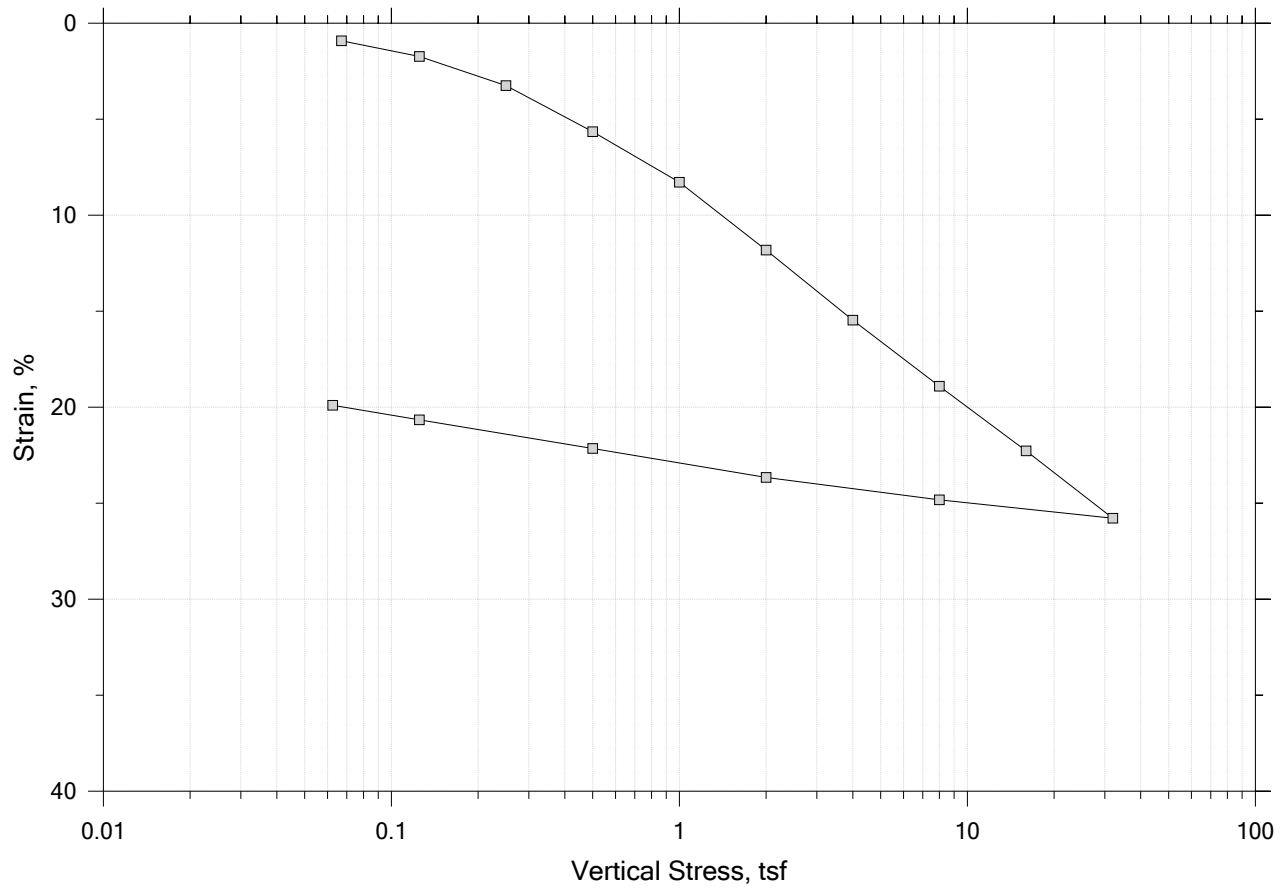
Square Root of Time Coefficients


[illegible]

	Project: RT-9/I-395 Connector	Location: Brewer, ME	Project No.: GTX-308853
	Boring No.: HB-BE-101	Tested By: md	Checked By: mcm
	Sample No.: 1U	Test Date: 09/27/18	Depth: 5-7 ft
	Test No.: IP-3	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System W, Swell Pressure = 0.0645 tsf		
	Displacement at End of Increment		

One-Dimensional Consolidation by ASTM D2435 - Method B

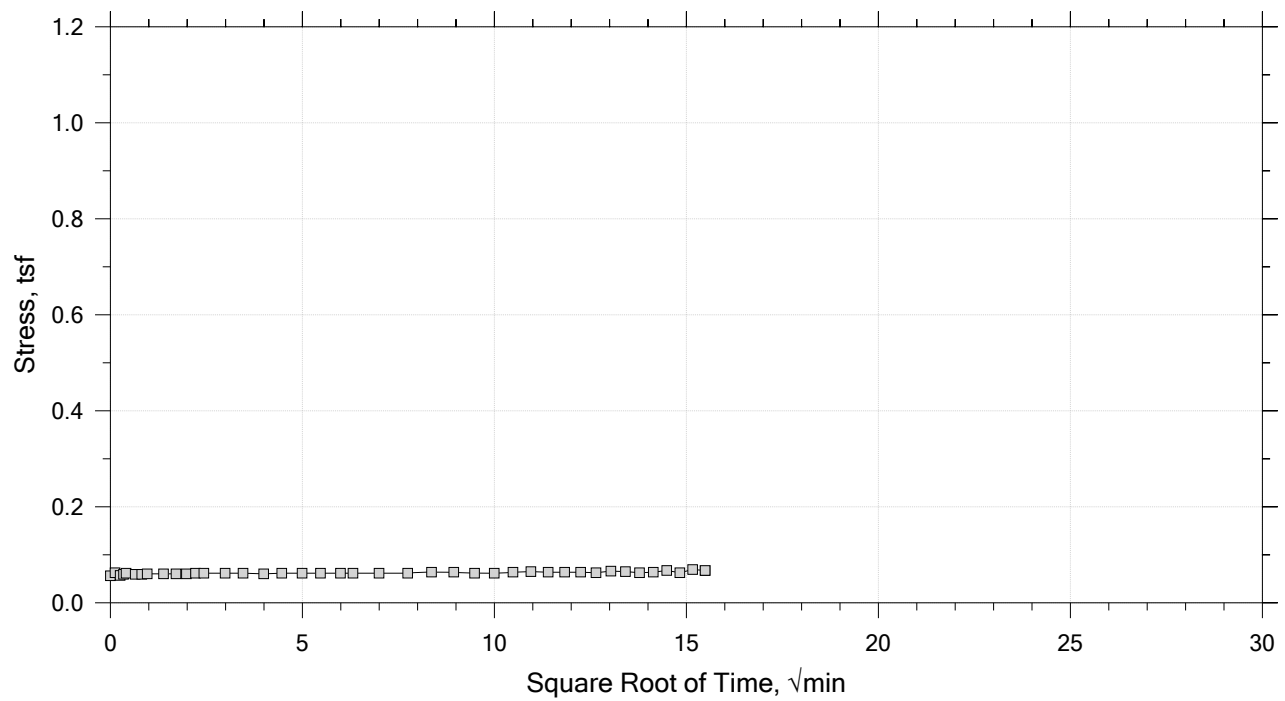
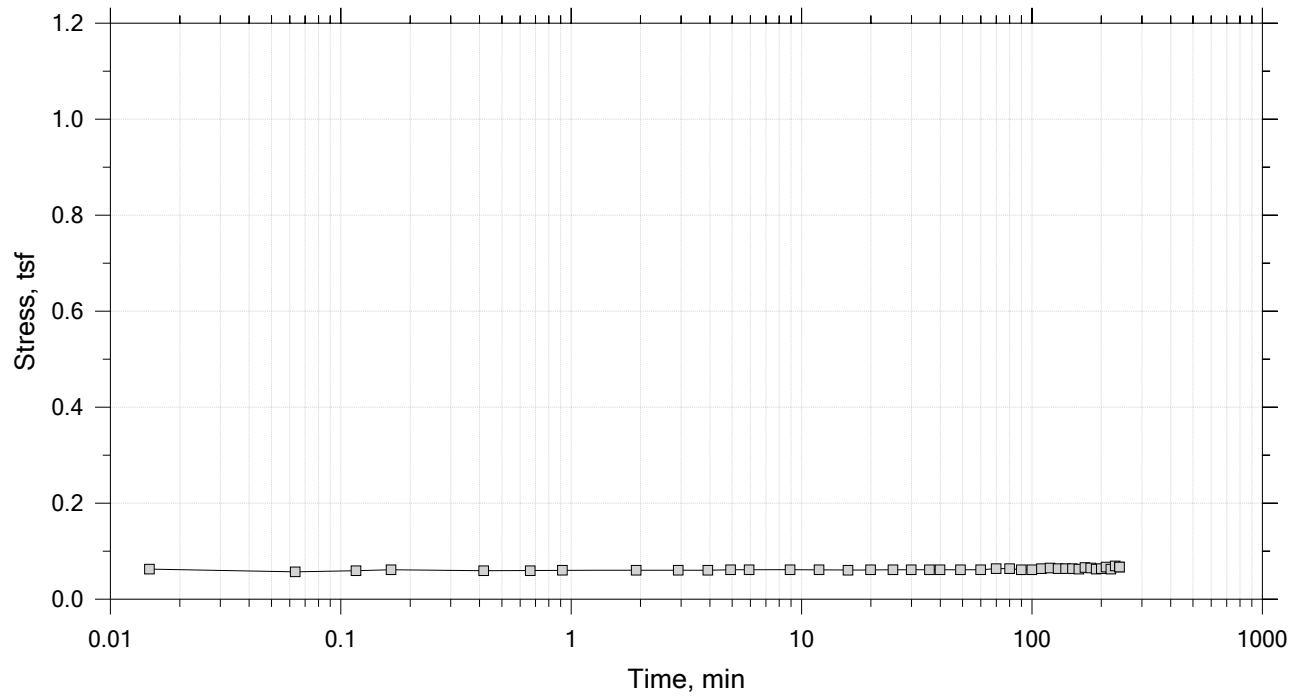
Summary Report




	Project: Rt-9/I-395 Connector	Location: Brewer, ME	Project No.: GTX-308853
	Boring No.: HB-BE-101 HB-BFB-101	Tested By: trm	Checked By: mcm
	Sample No.: 4U	Test Date: 9/28/2018	Depth: 30-32 ft
	Test No.: IP-5	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System Q, Swell Pressure = 0.0671 tsf		
	Displacement at End of Increment		

One-Dimensional Consolidation by ASTM D2435 - Method B

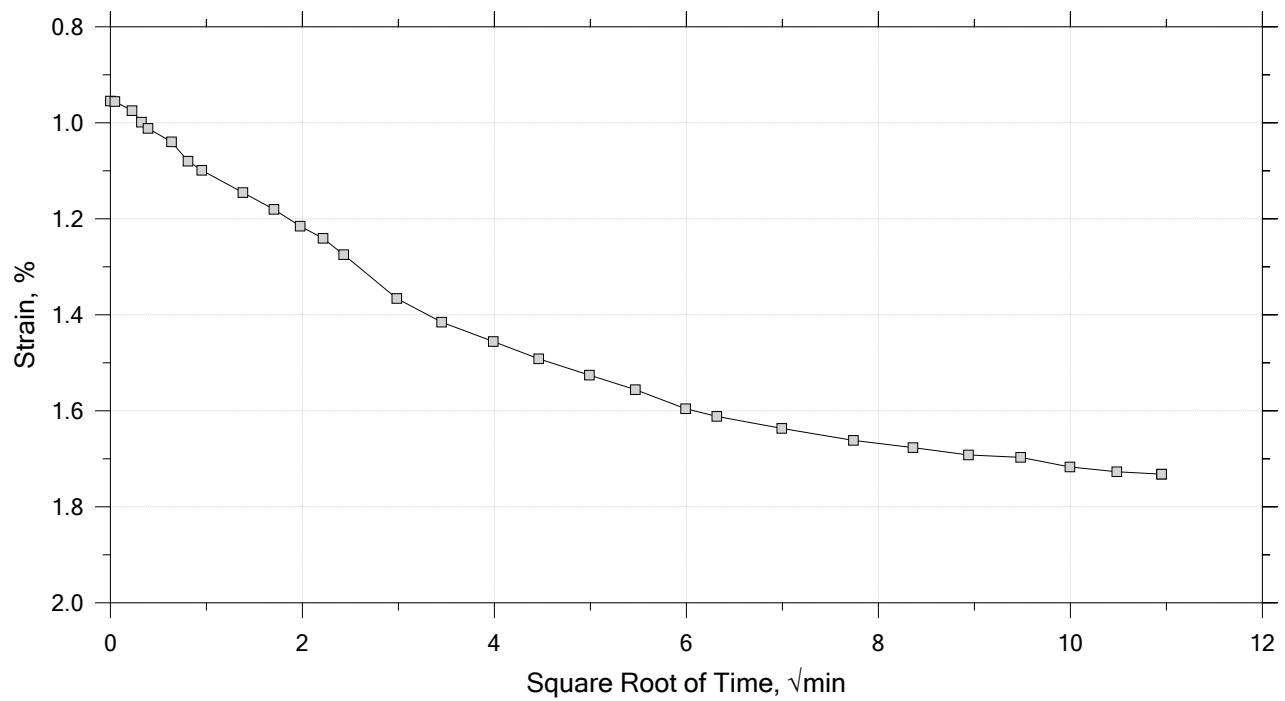
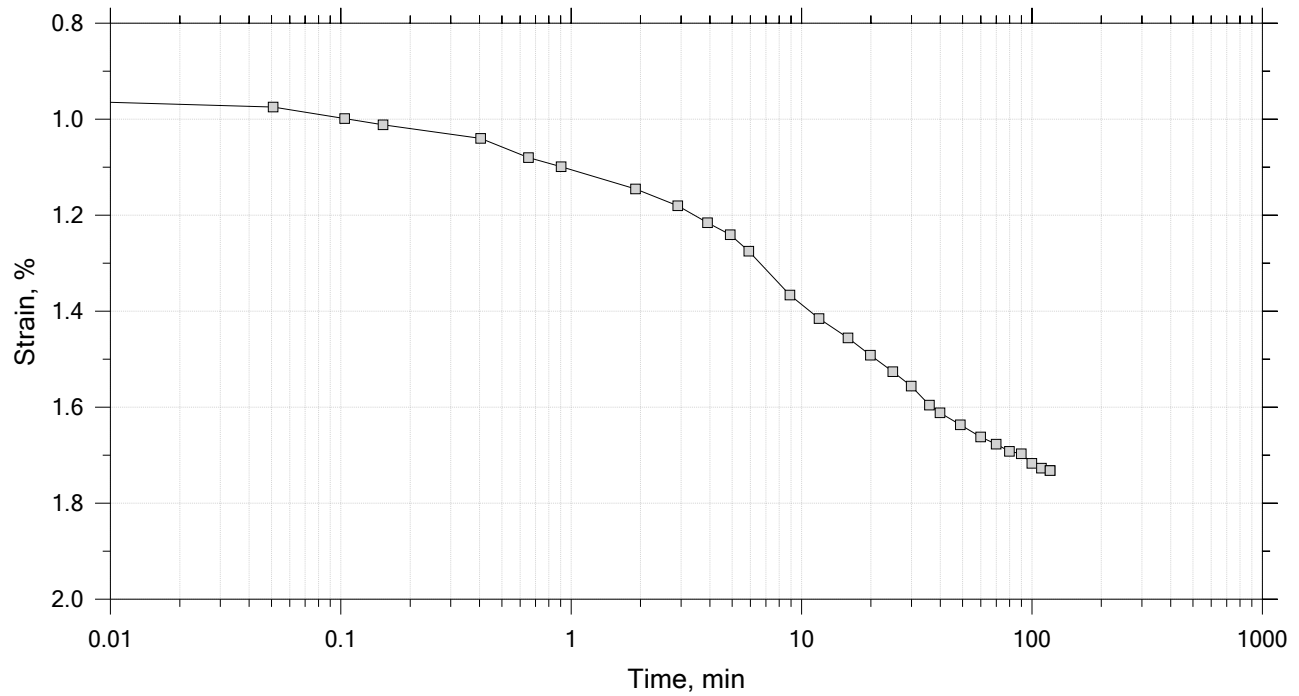
Time Curve 1 of 15
Constant Volume Step
Stress: 0.0671 tsf




	Project: Rt-9/I-395 Connector	Location: Brewer, ME	Project No.: GTX-308853
	Boring No.: HB-BE-101 HB-BFB-101	Tested By: trm	Checked By: mcm
	Sample No.: 4U	Test Date: 9/28/2018	Depth: 30-32 ft
	Test No.: IP-5	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System Q, Swell Pressure = 0.0671 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

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



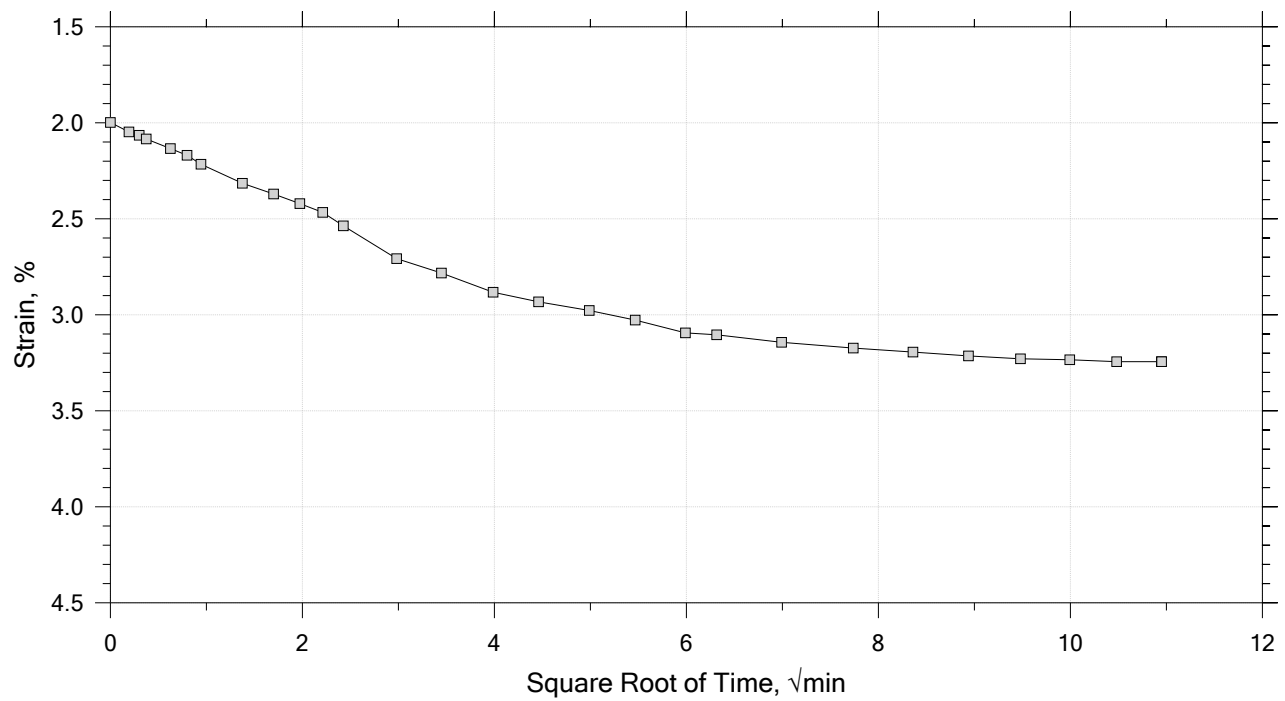
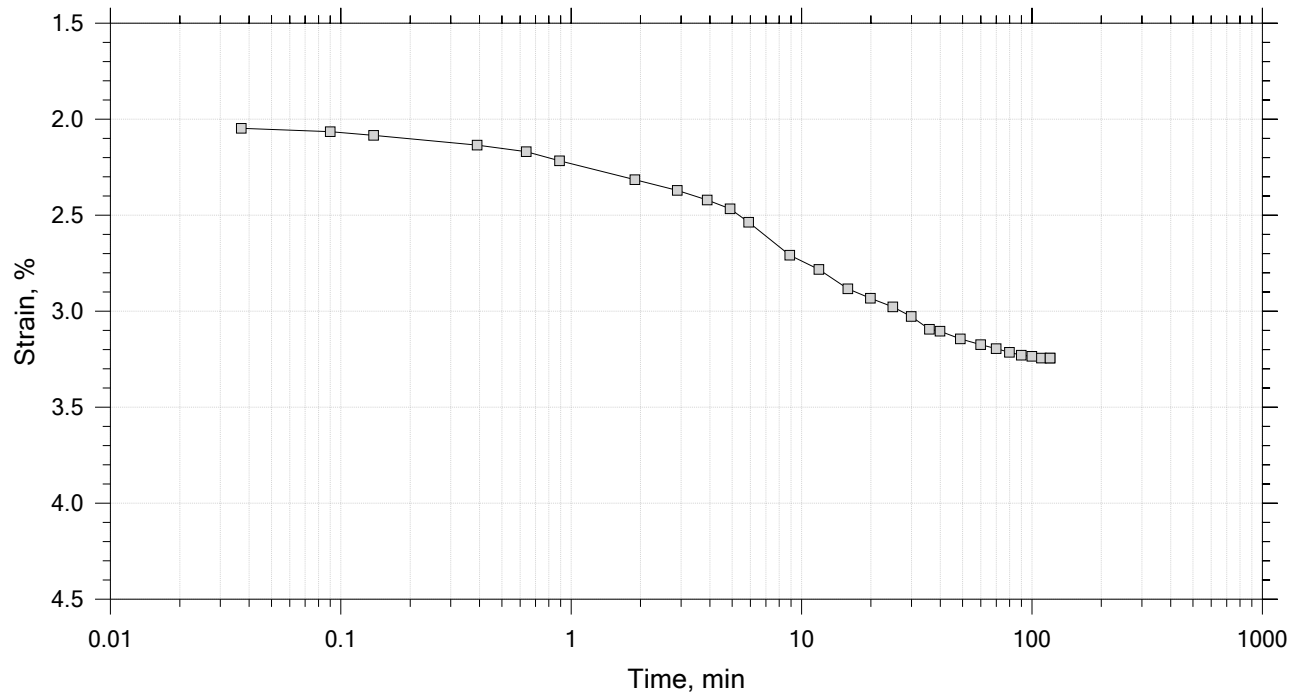
	Project: Rt-9/I-395 Connector	Location: Brewer, ME	Project No.: GTX-308853
	Boring No.: HB-BE-101 HB-BFB-101	Tested By: trm	Checked By: mcm
	Sample No.: 4U	Test Date: 9/28/2018	Depth: 30-32 ft
	Test No.: IP-5	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System Q, Swell Pressure = 0.0671 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 3 of 15

Constant Load Step

Stress: 0.25 tsf



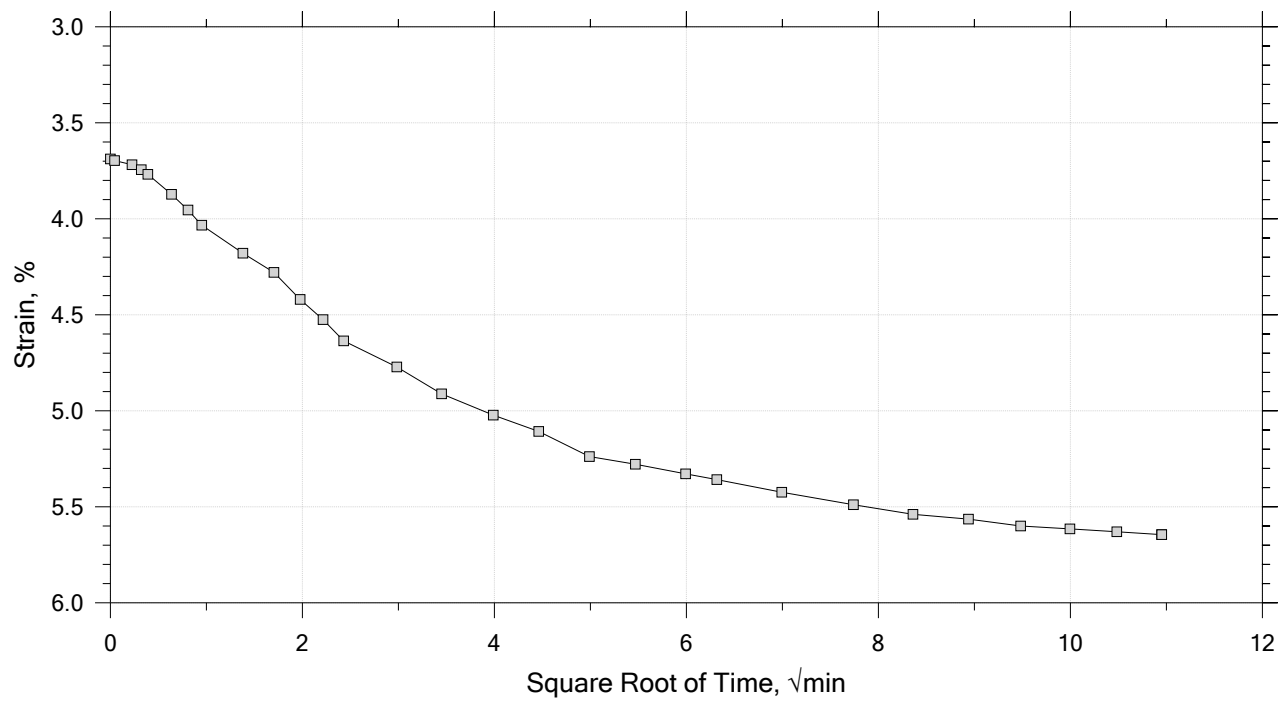
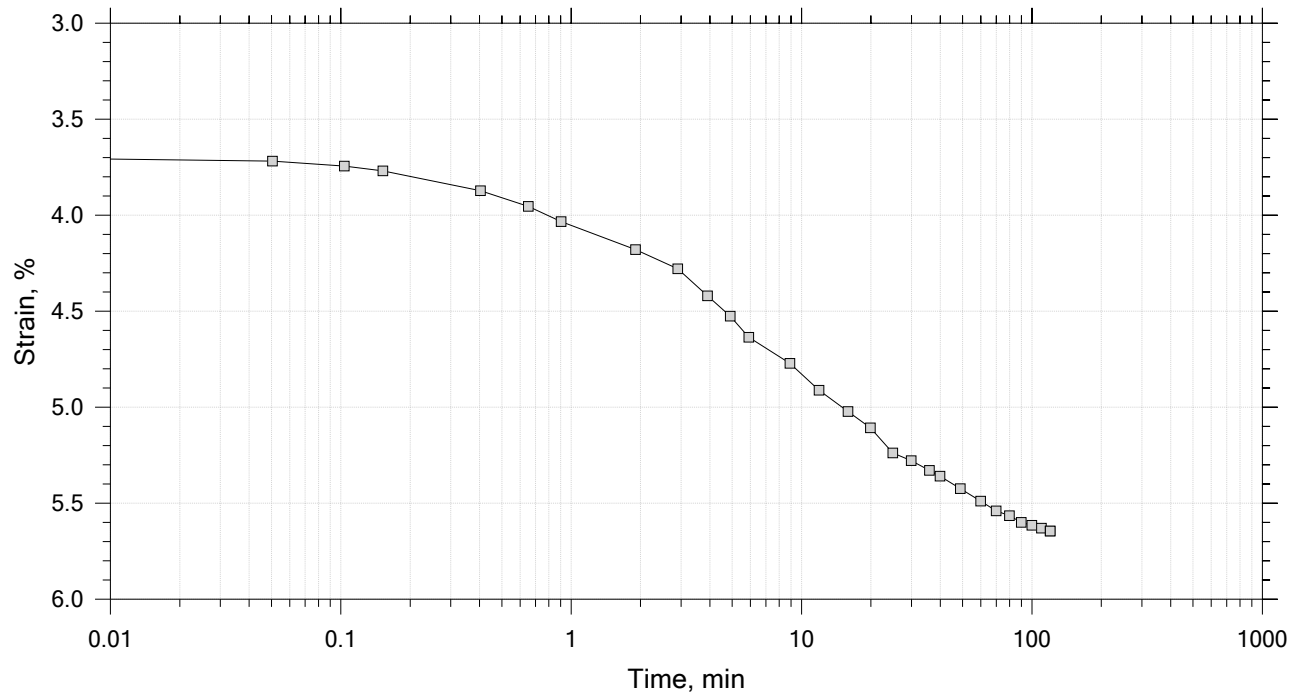
	Project: Rt-9/I-395 Connector	Location: Brewer, ME	Project No.: GTX-308853
	Boring No.: HB-BE-101 HB-BFB-101	Tested By: trm	Checked By: mcm
	Sample No.: 4U	Test Date: 9/28/2018	Depth: 30-32 ft
	Test No.: IP-5	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System Q, Swell Pressure = 0.0671 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 4 of 15

Constant Load Step

Stress: 0.5 tsf



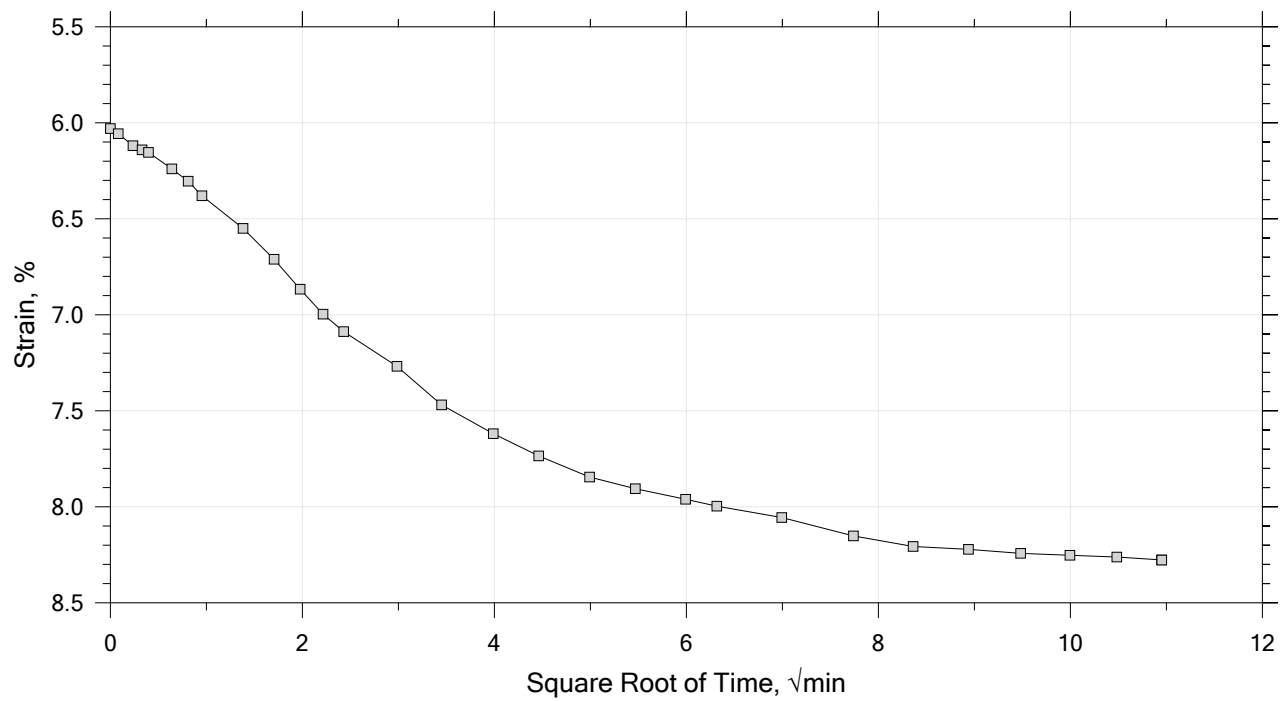
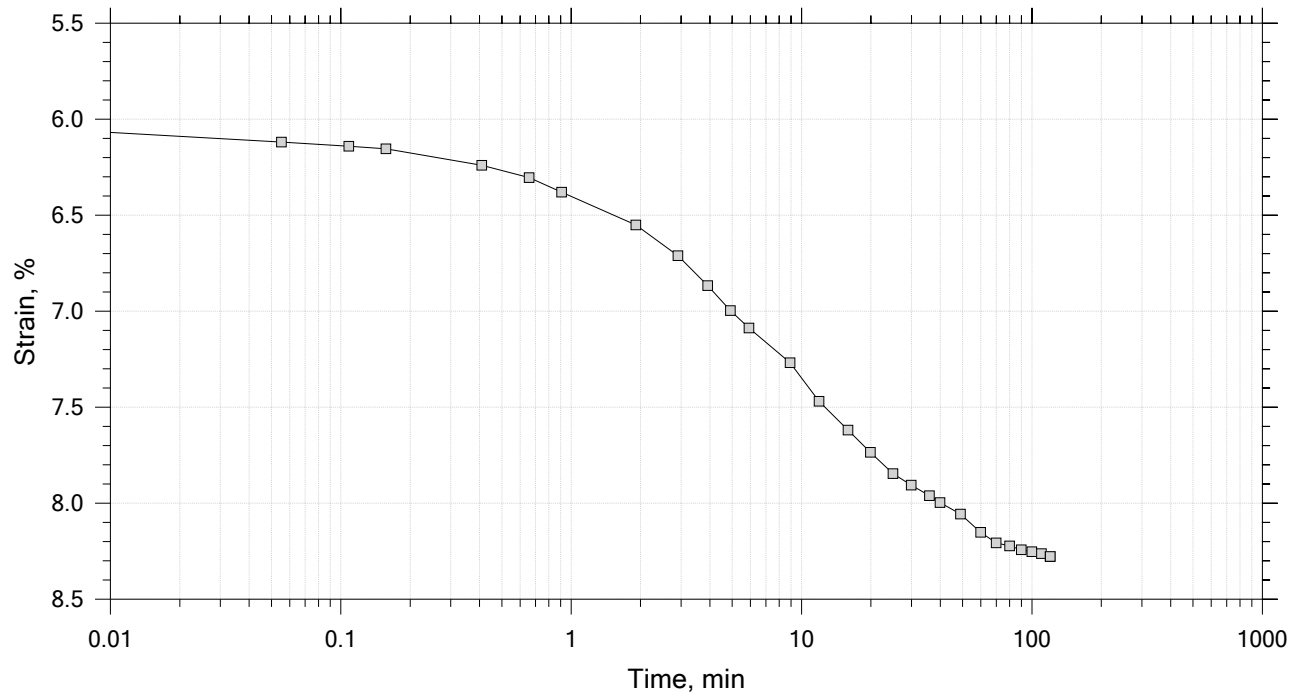
	Project: Rt-9/I-395 Connector	Location: Brewer, ME	Project No.: GTX-308853
	Boring No.: HB-BE-101 HB-BFB-101	Tested By: trm	Checked By: mcm
	Sample No.: 4U	Test Date: 9/28/2018	Depth: 30-32 ft
	Test No.: IP-5	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System Q, Swell Pressure = 0.0671 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 5 of 15

Constant Load Step

Stress: 1 tsf



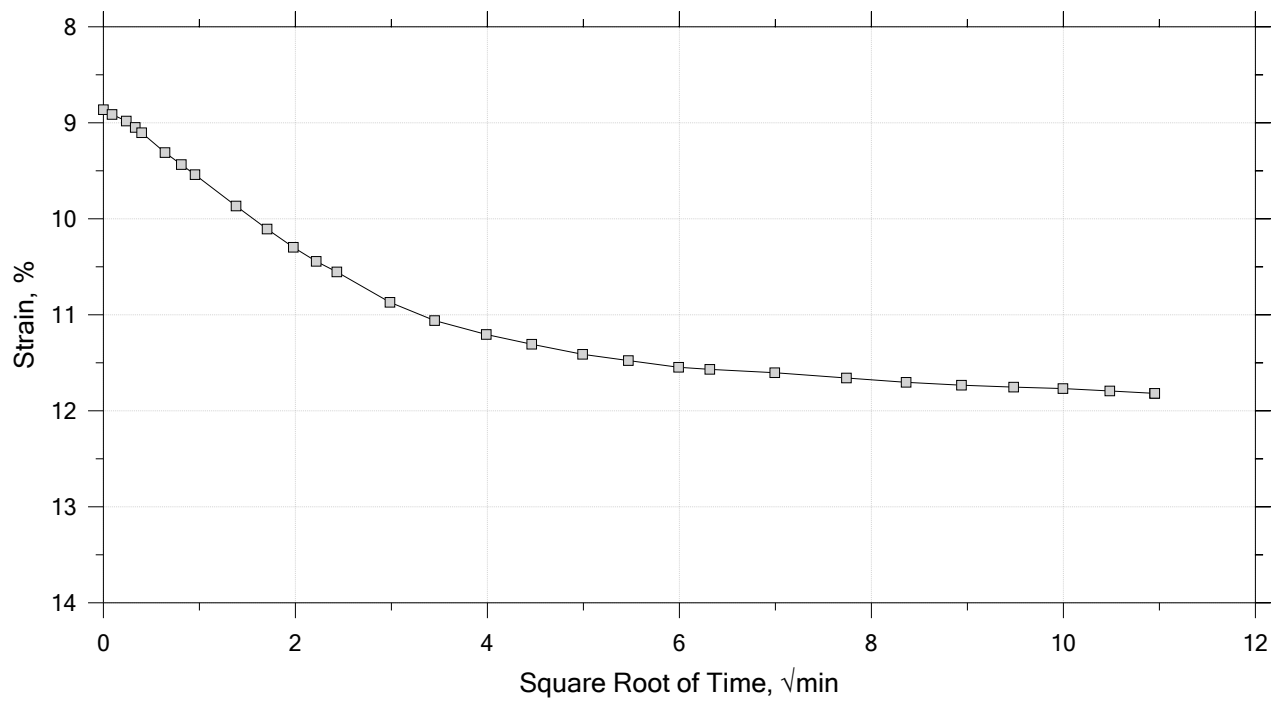
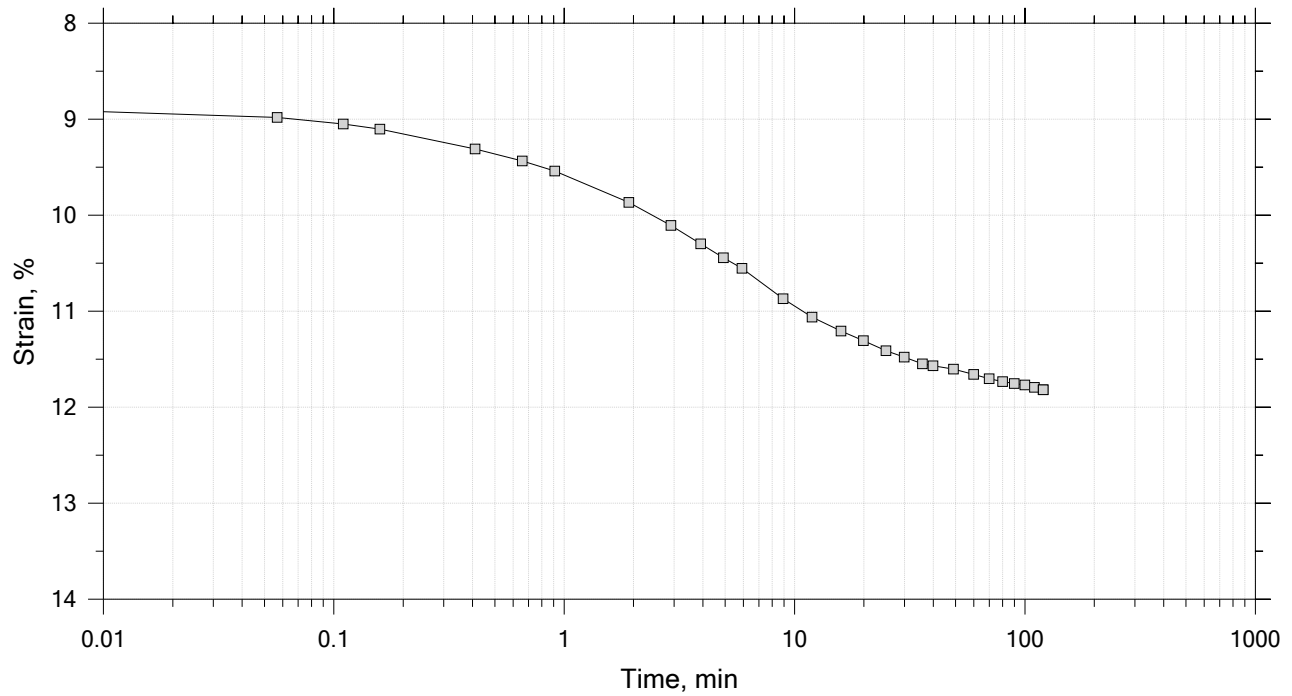
	Project: Rt-9/I-395 Connector	Location: Brewer, ME	Project No.: GTX-308853
	Boring No.: HB-BE-101 HB-BFB-101	Tested By: trm	Checked By: mcm
	Sample No.: 4U	Test Date: 9/28/2018	Depth: 30-32 ft
	Test No.: IP-5	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System Q, Swell Pressure = 0.0671 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 6 of 15

Constant Load Step

Stress: 2 tsf



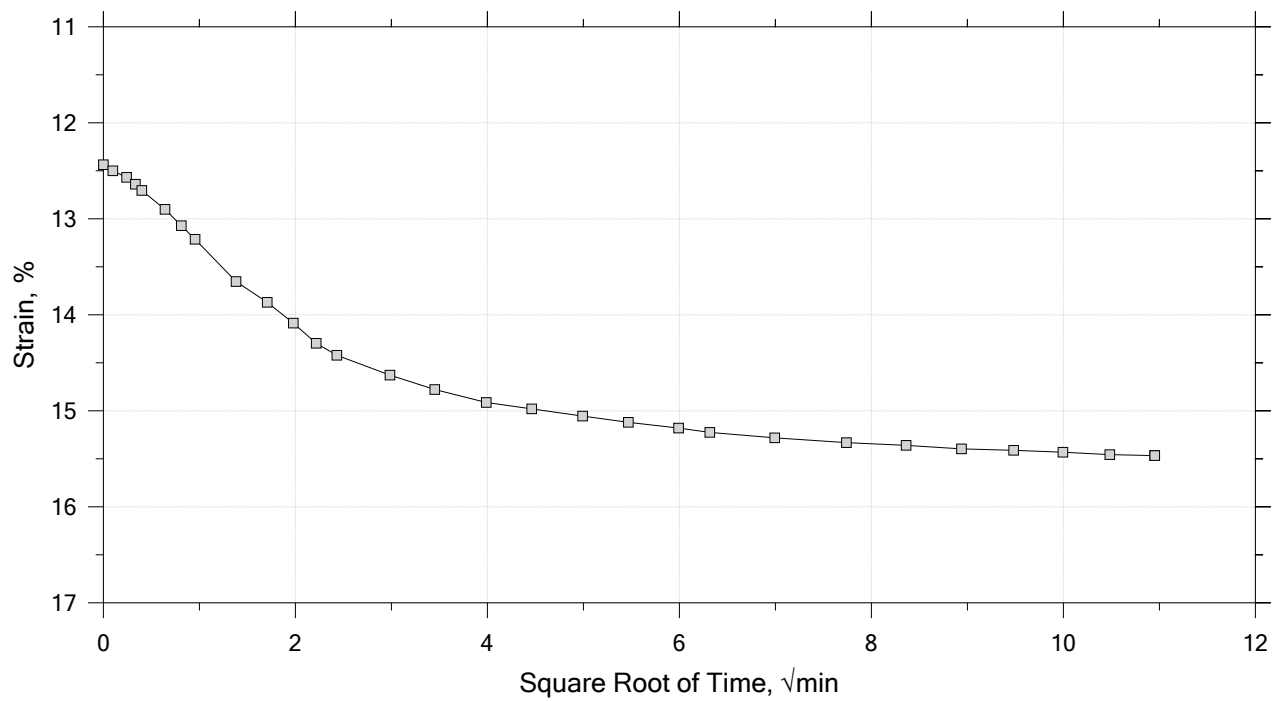
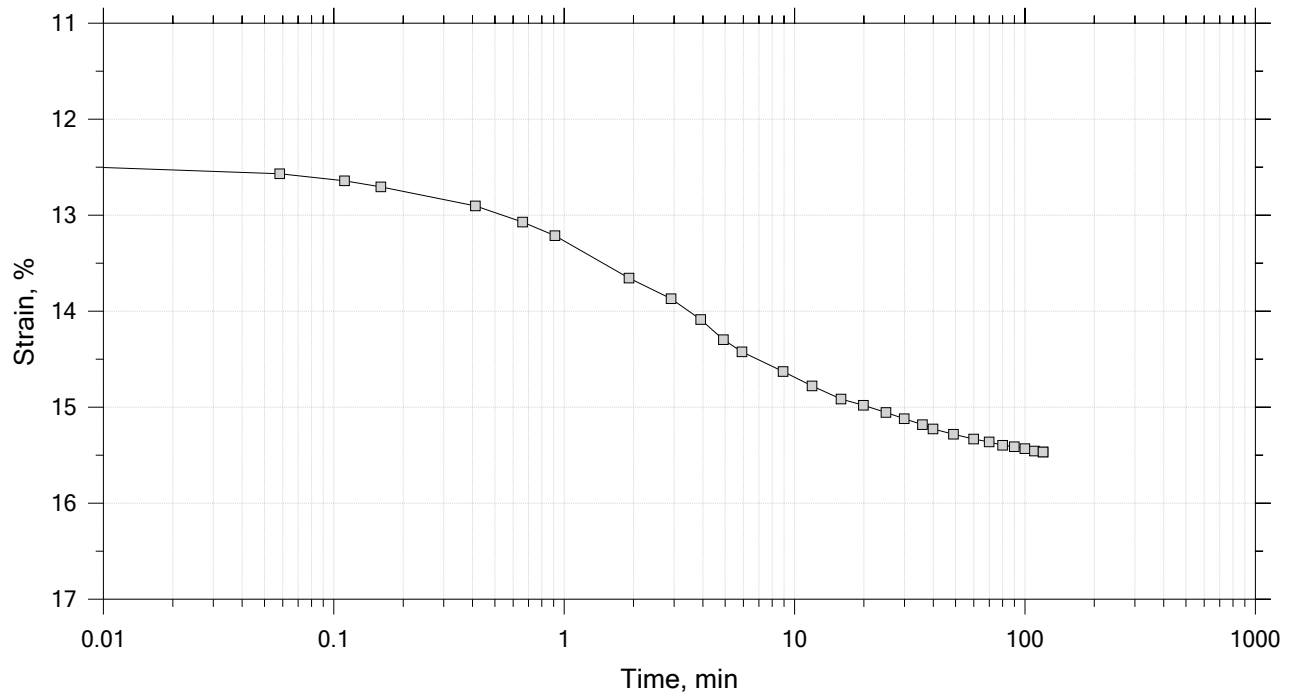
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	Boring No.: HB-BE-101 HB-BFB-101	Tested By: trm	Checked By: mcm
	Sample No.: 4U	Test Date: 9/28/2018	Depth: 30-32 ft
	Test No.: IP-5	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System Q, Swell Pressure = 0.0671 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 7 of 15

Constant Load Step

Stress: 4 tsf



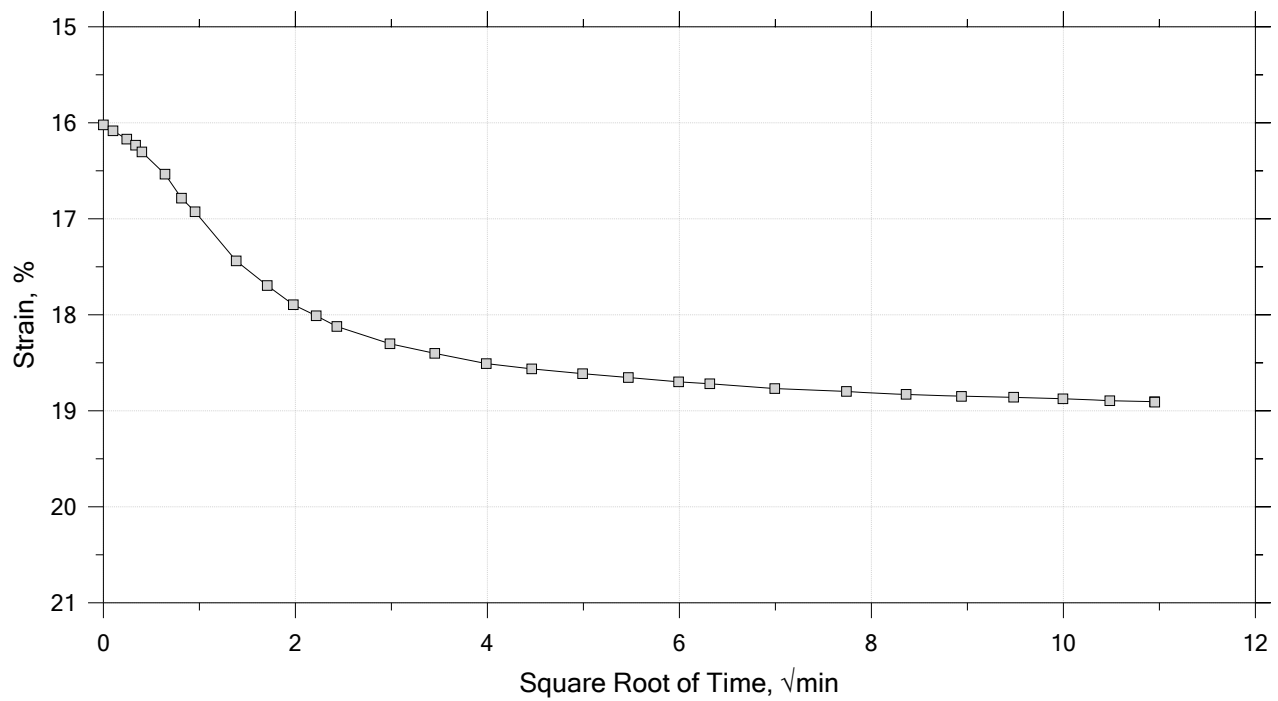
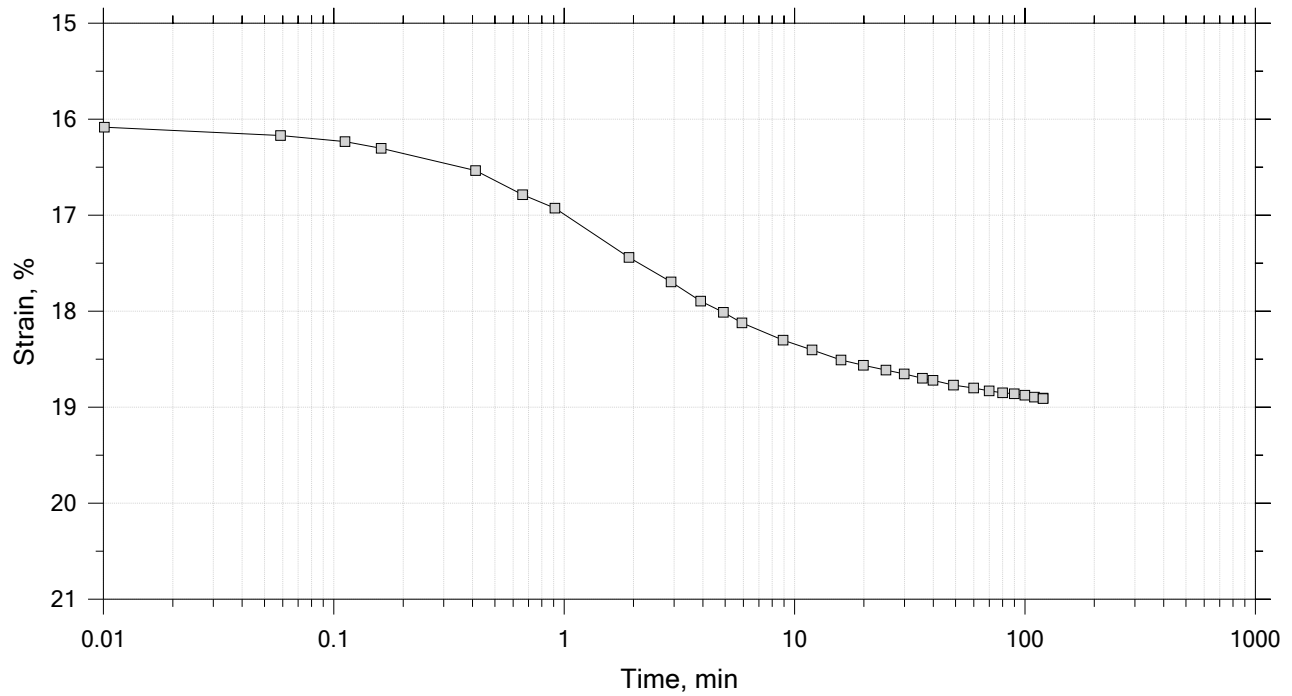
	Project: Rt-9/I-395 Connector	Location: Brewer, ME	Project No.: GTX-308853
	Boring No.: HB-BE-101 HB-BFB-101	Tested By: trm	Checked By: mcm
	Sample No.: 4U	Test Date: 9/28/2018	Depth: 30-32 ft
	Test No.: IP-5	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System Q, Swell Pressure = 0.0671 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 8 of 15

Constant Load Step

Stress: 8 tsf



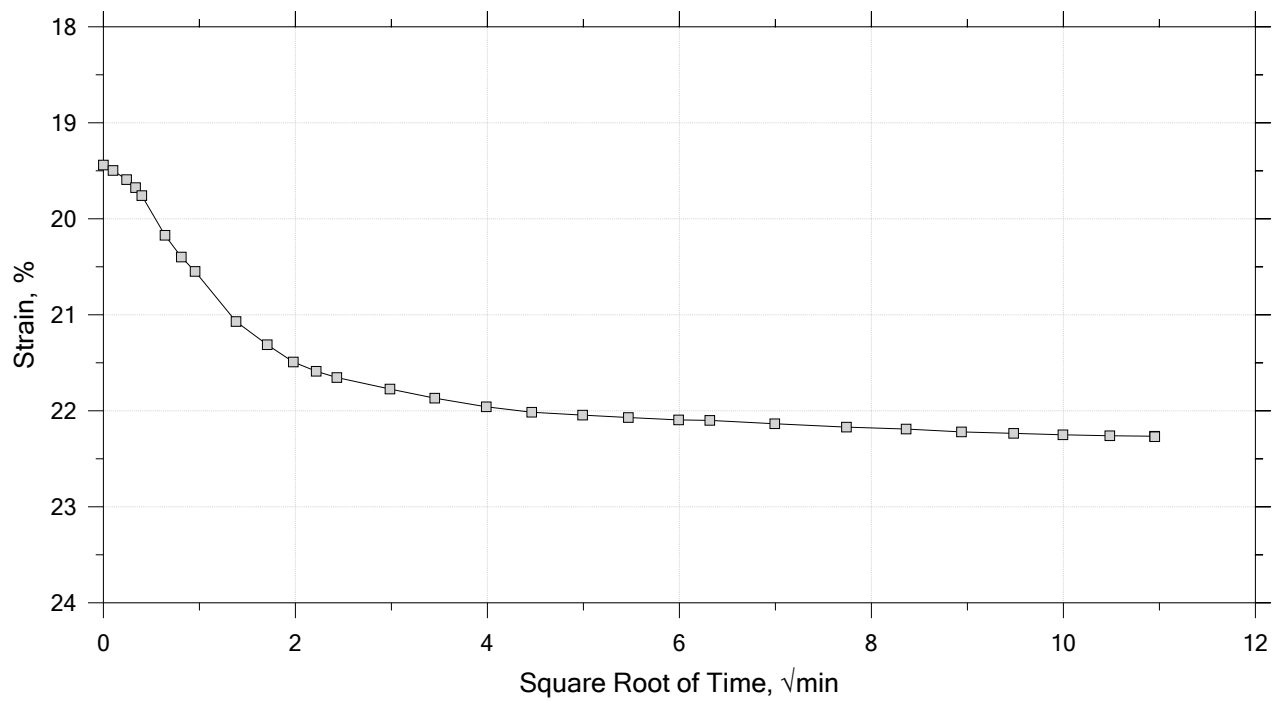
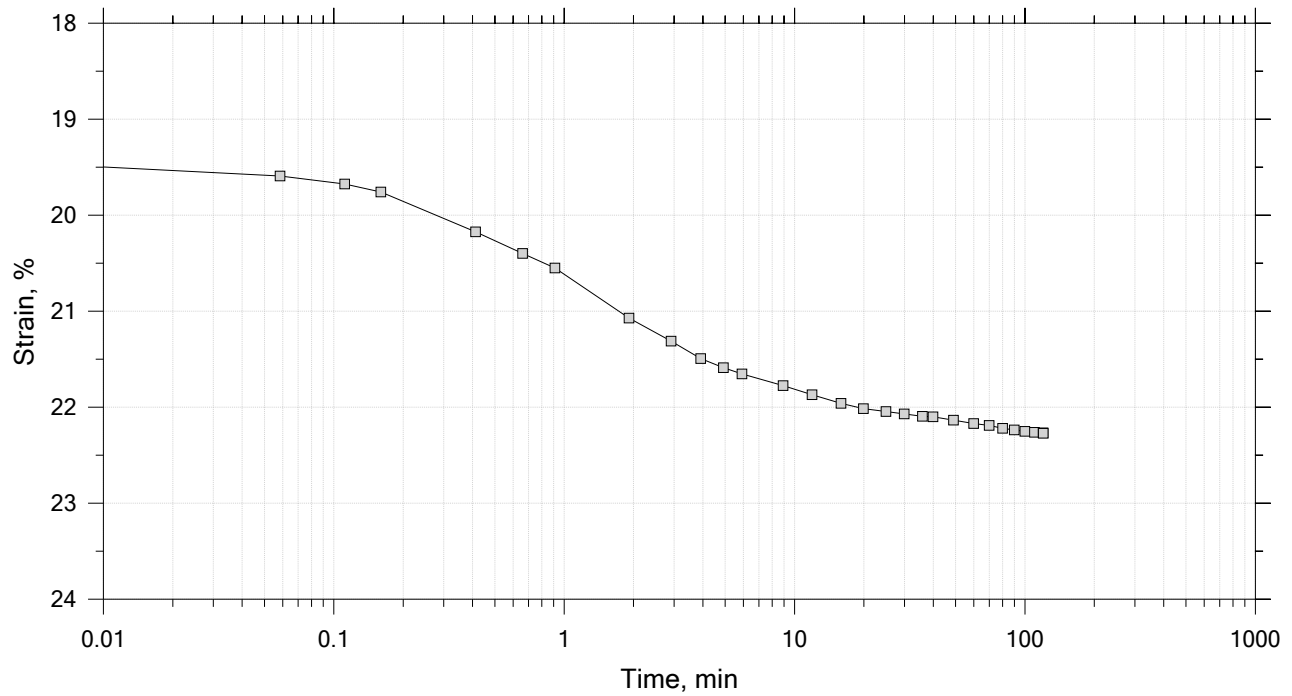
	Project: Rt-9/I-395 Connector	Location: Brewer, ME	Project No.: GTX-308853
	Boring No.: HB-BE-101 HB-BFB-101	Tested By: trm	Checked By: mcm
	Sample No.: 4U	Test Date: 9/28/2018	Depth: 30-32 ft
	Test No.: IP-5	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System Q, Swell Pressure = 0.0671 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 9 of 15

Constant Load Step

Stress: 16 tsf



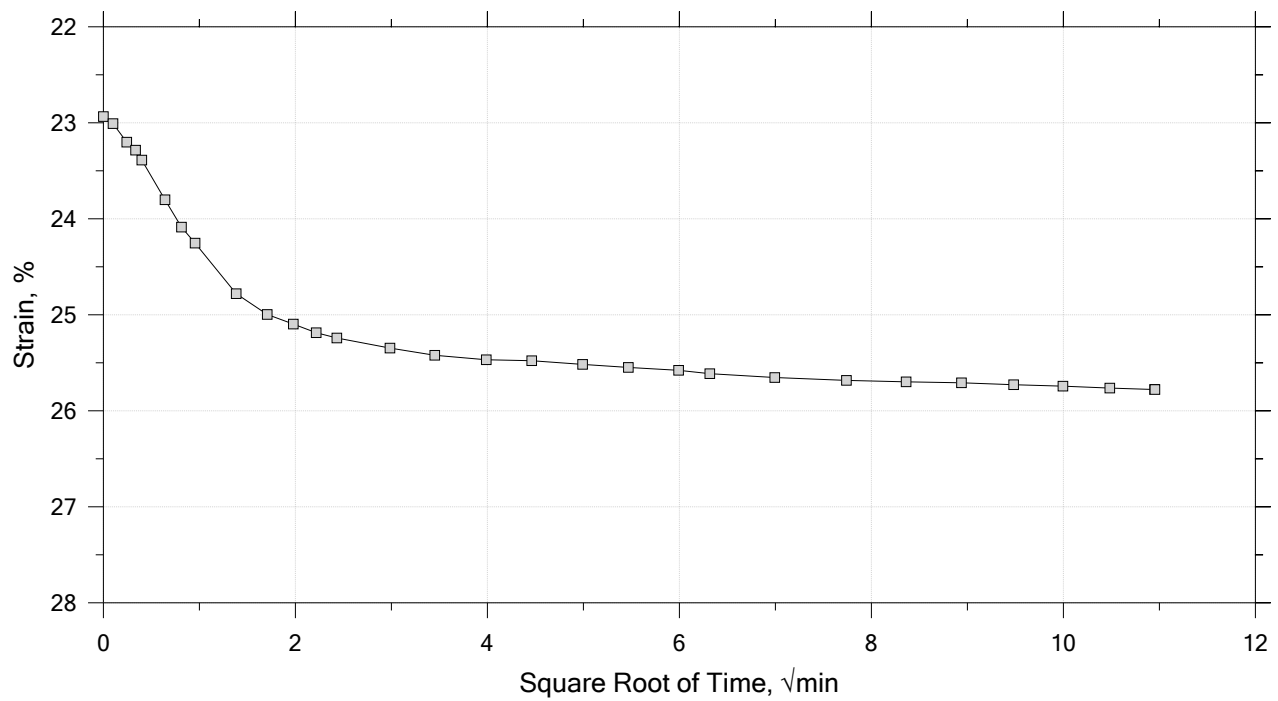
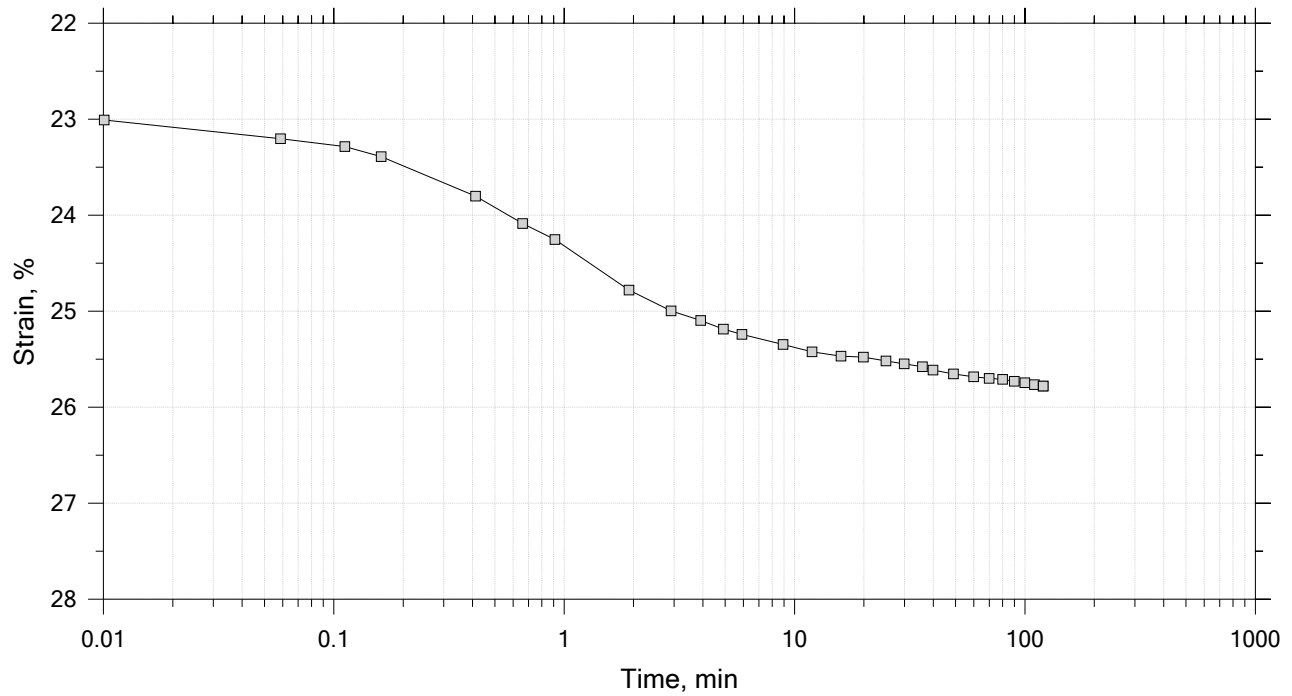
	Project: Rt-9/I-395 Connector	Location: Brewer, ME	Project No.: GTX-308853
	Boring No.: HB-BE-101 HB-BFB-101	Tested By: trm	Checked By: mcm
	Sample No.: 4U	Test Date: 9/28/2018	Depth: 30-32 ft
	Test No.: IP-5	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System Q, Swell Pressure = 0.0671 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 10 of 15

Constant Load Step

Stress: 32 tsf



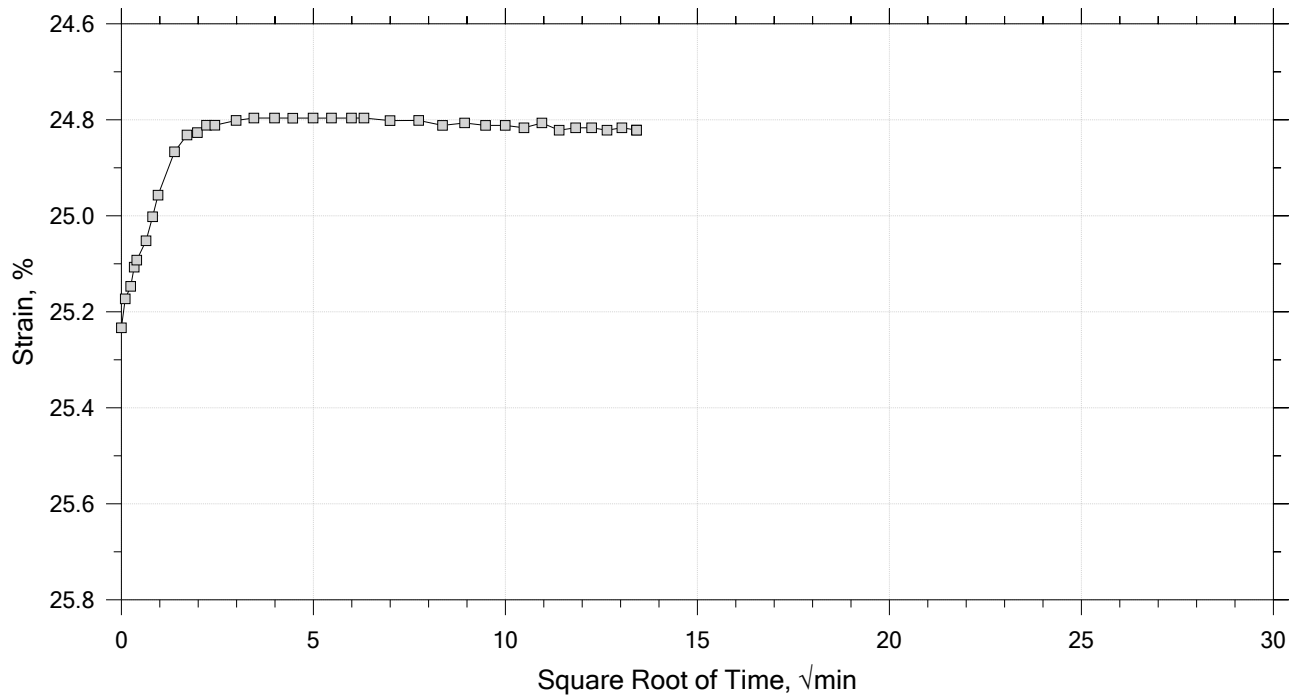
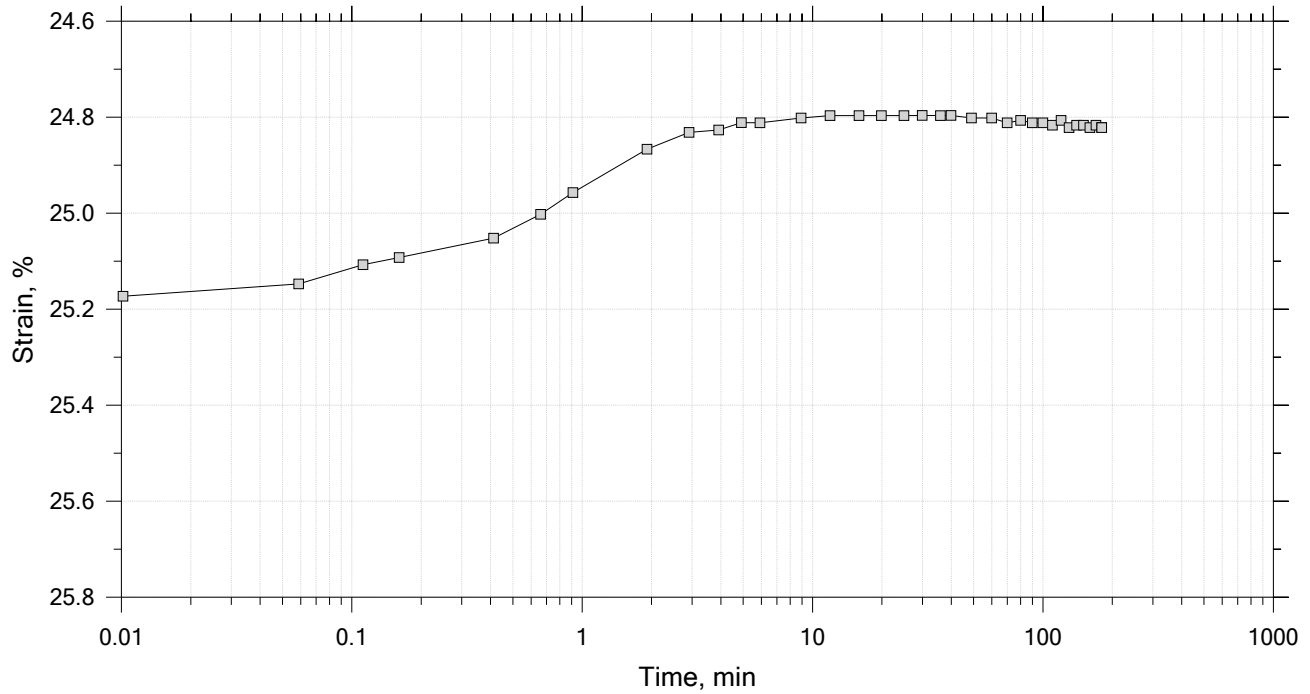
	Project: Rt-9/I-395 Connector	Location: Brewer, ME	Project No.: GTX-308853
	Boring No.: HB-BE-101 HB-BFB-101	Tested By: trm	Checked By: mcm
	Sample No.: 4U	Test Date: 9/28/2018	Depth: 30-32 ft
	Test No.: IP-5	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System Q, Swell Pressure = 0.0671 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 11 of 15

Constant Load Step

Stress: 8 tsf



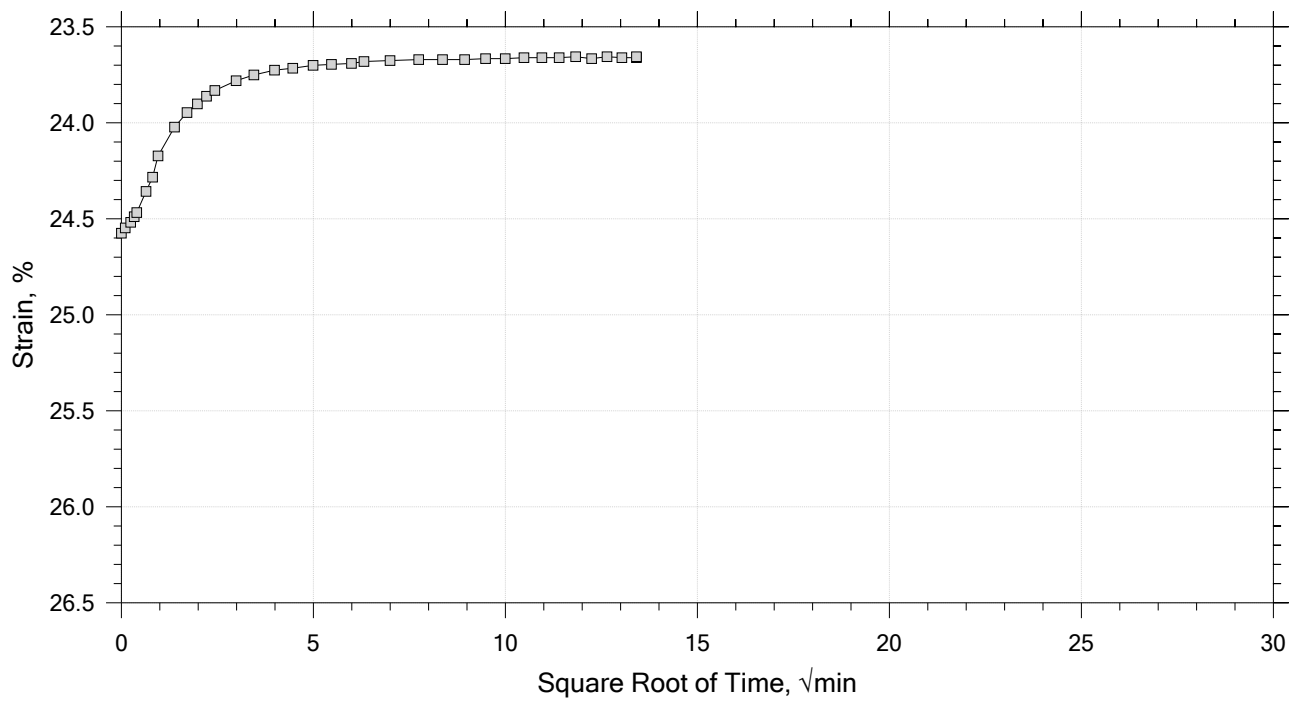
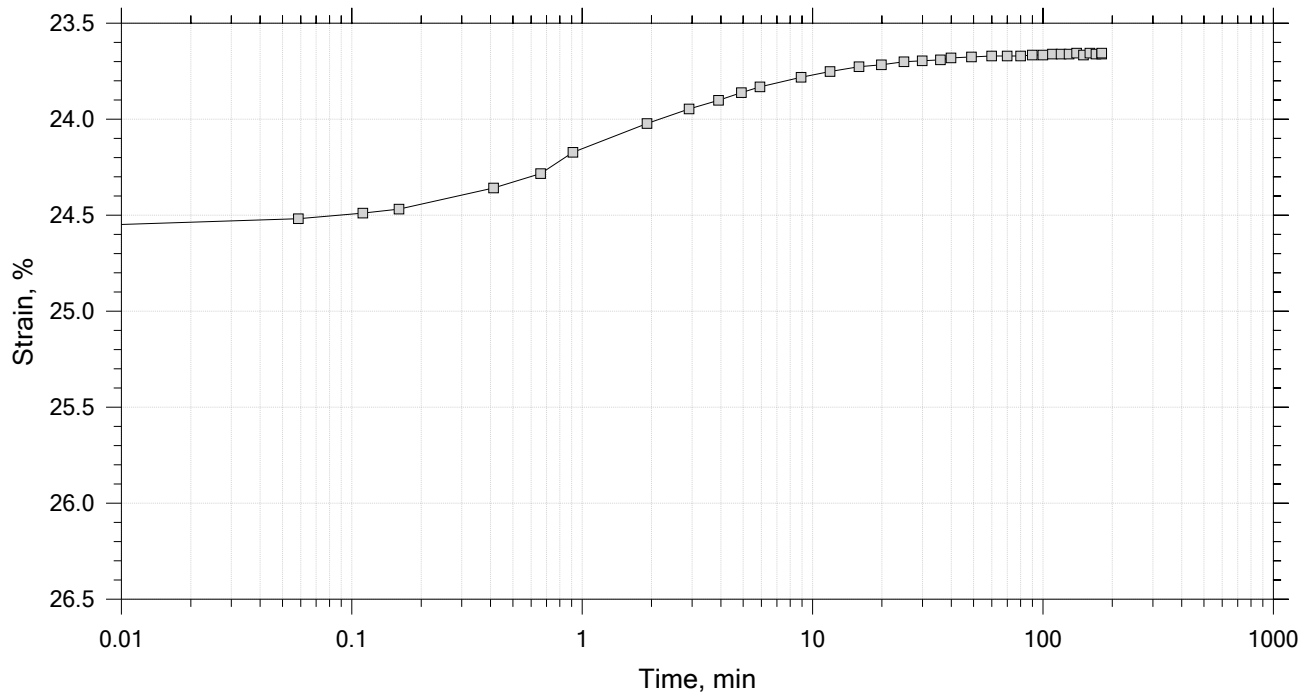
	Project: Rt-9/I-395 Connector	Location: Brewer, ME	Project No.: GTX-308853
	Boring No.: HB-BE-101 HB-BFB-101	Tested By: trm	Checked By: mcm
	Sample No.: 4U	Test Date: 9/28/2018	Depth: 30-32 ft
	Test No.: IP-5	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System Q, Swell Pressure = 0.0671 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 12 of 15

Constant Load Step

Stress: 2 tsf



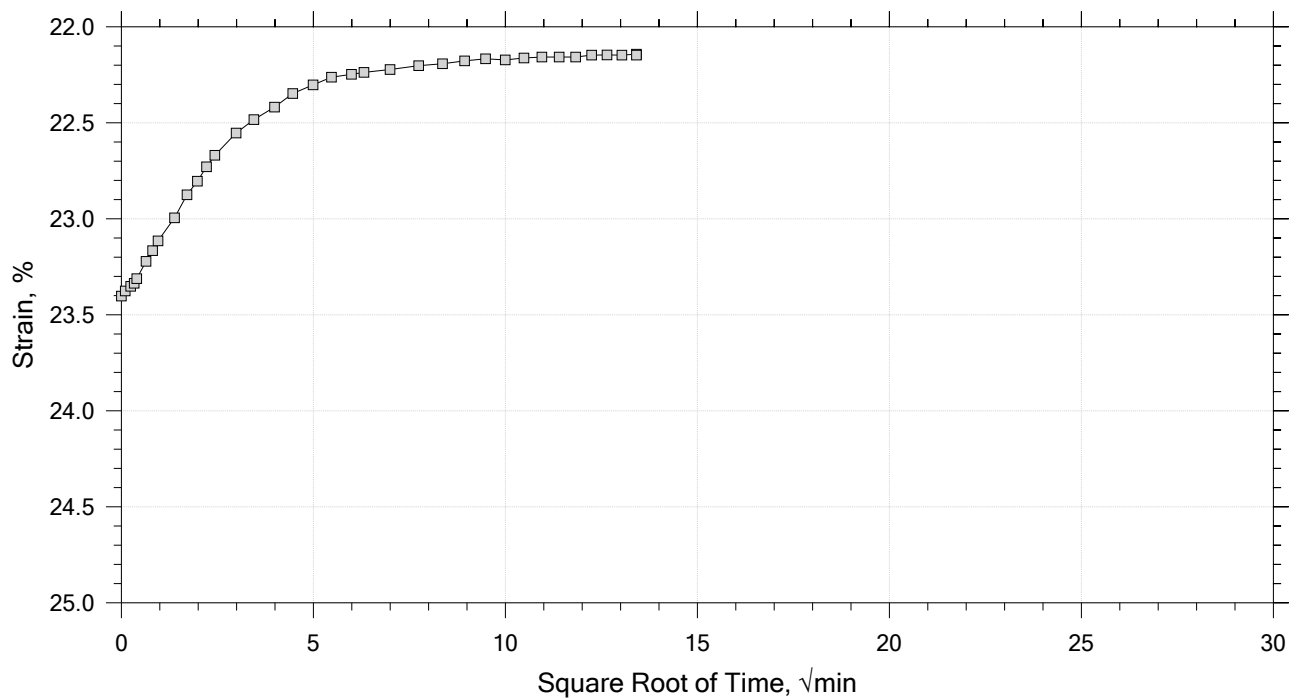
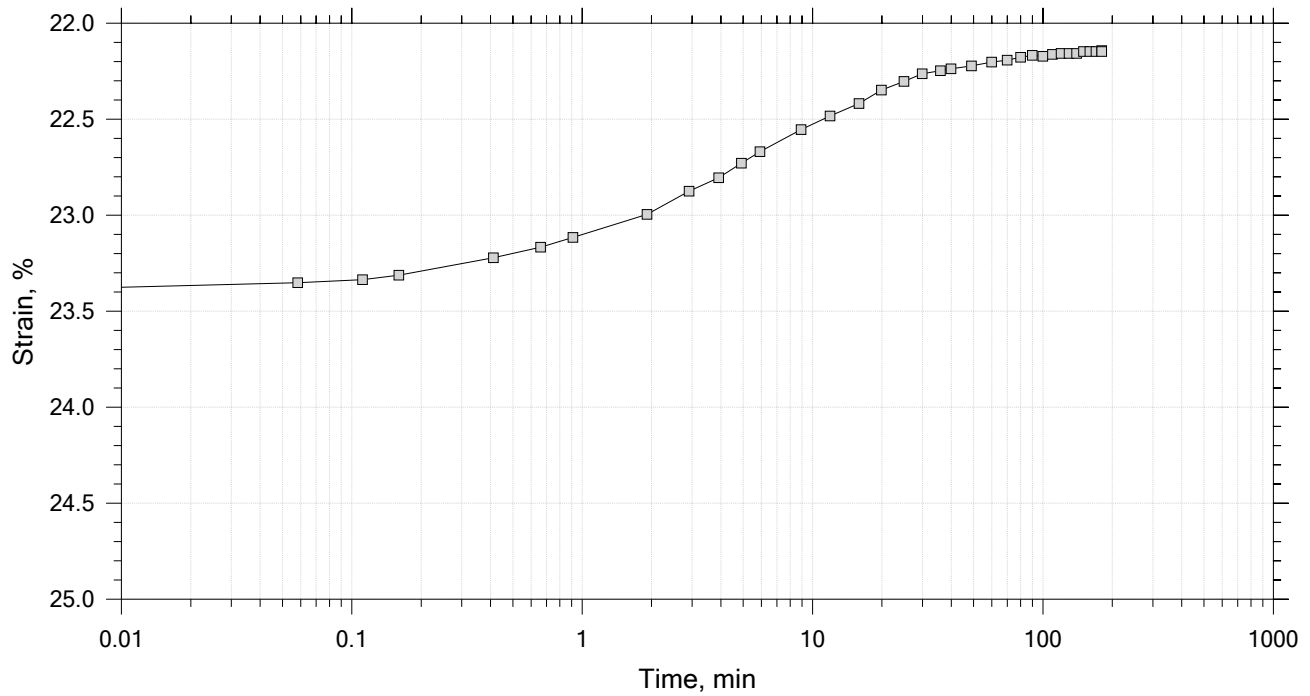
	Project: Rt-9/I-395 Connector	Location: Brewer, ME	Project No.: GTX-308853
	Boring No.: HB-BE-101 HB-BFB-101	Tested By: trm	Checked By: mcm
	Sample No.: 4U	Test Date: 9/28/2018	Depth: 30-32 ft
	Test No.: IP-5	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System Q, Swell Pressure = 0.0671 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 13 of 15

Constant Load Step

Stress: 0.5 tsf



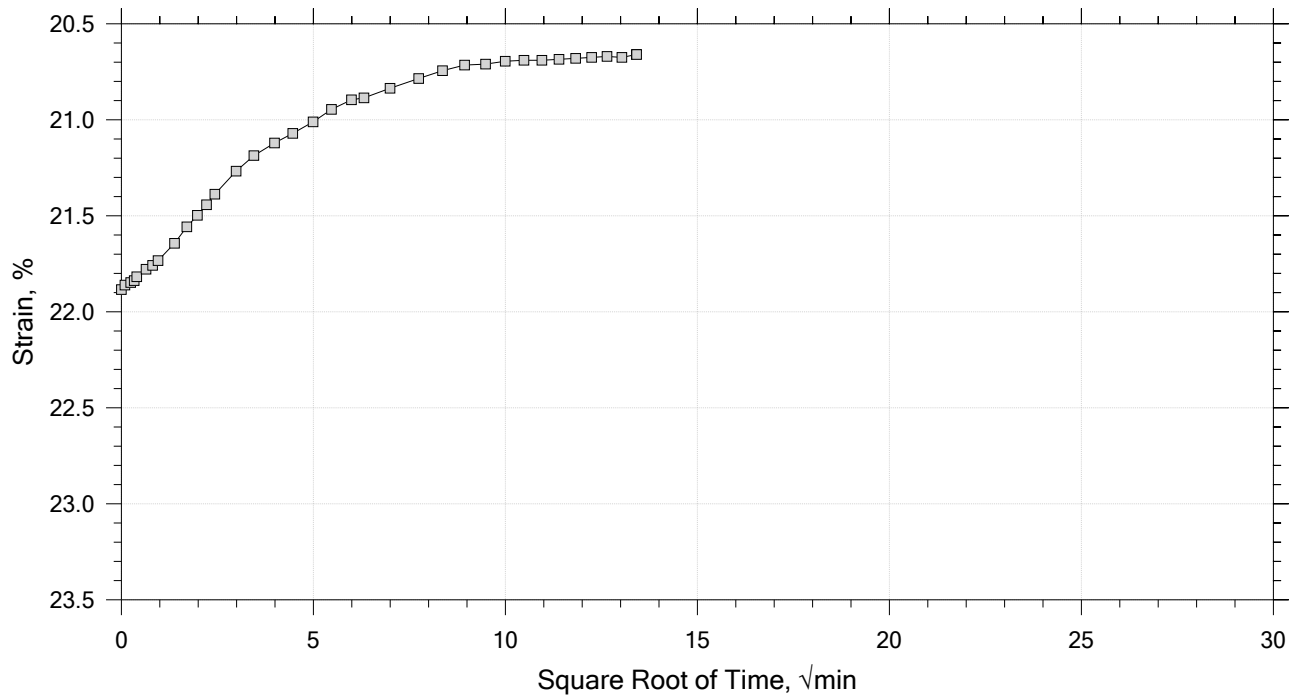
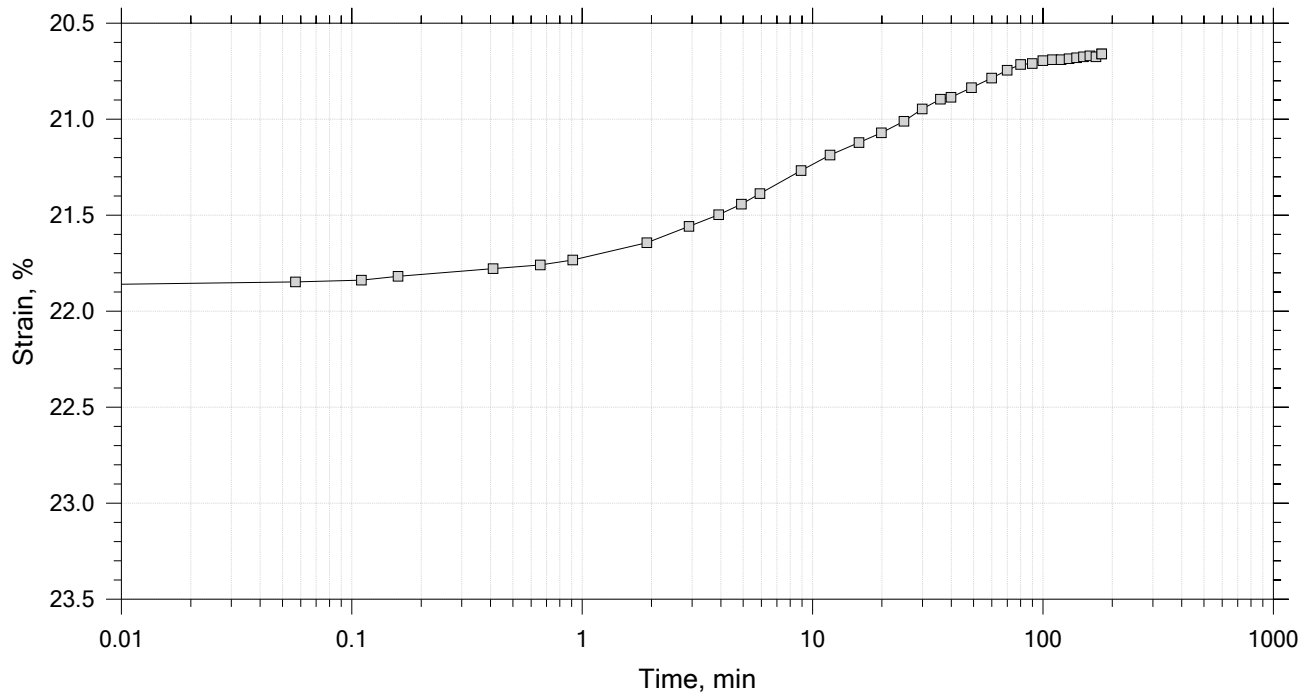
	Project: Rt-9/I-395 Connector	Location: Brewer, ME	Project No.: GTX-308853
	Boring No.: HB-BE-101 HB-BFB-101	Tested By: trm	Checked By: mcm
	Sample No.: 4U	Test Date: 9/28/2018	Depth: 30-32 ft
	Test No.: IP-5	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System Q, Swell Pressure = 0.0671 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 14 of 15

Constant Load Step

Stress: 0.125 tsf



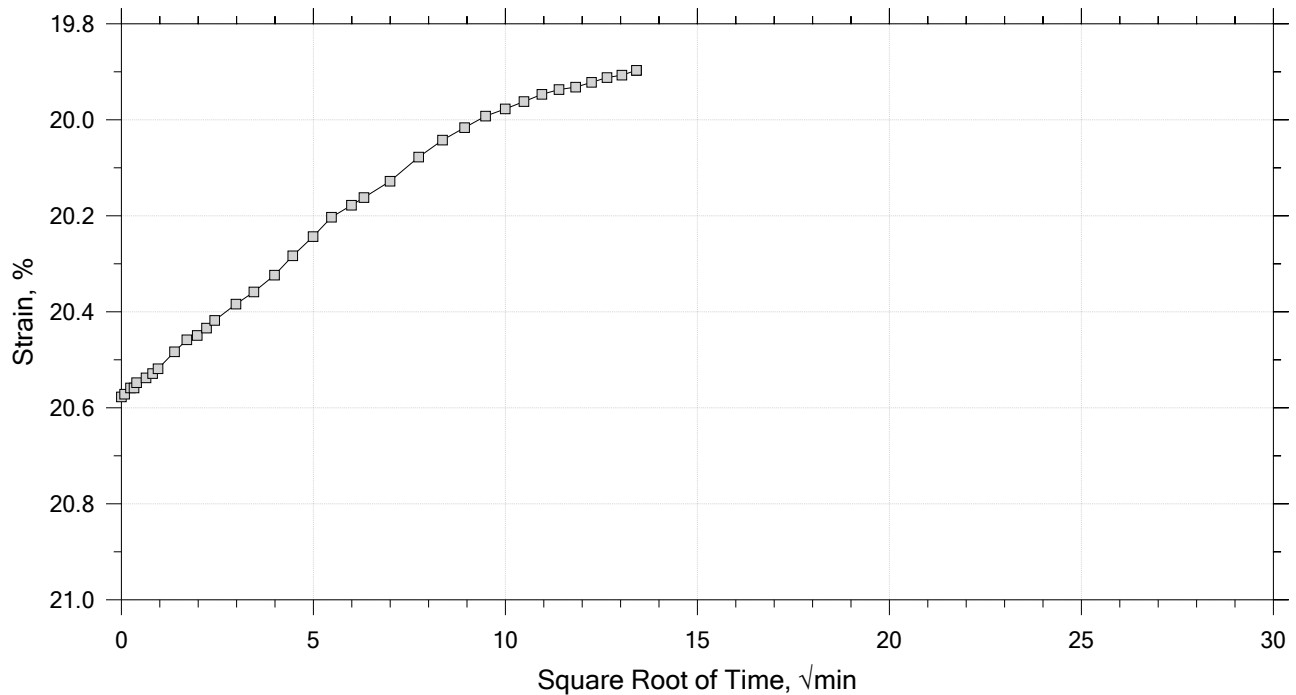
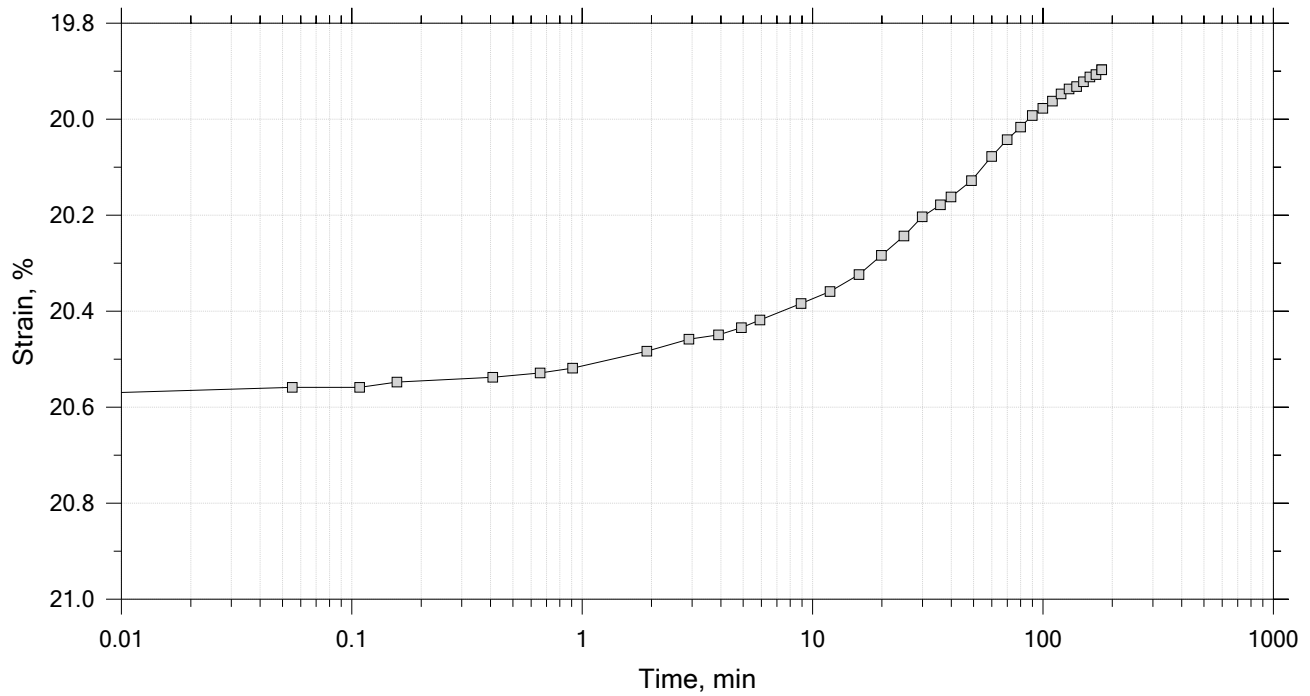
	Project: Rt-9/I-395 Connector	Location: Brewer, ME	Project No.: GTX-308853
	Boring No.: HB-BE-101 HB-BFB-101	Tested By: trm	Checked By: mcm
	Sample No.: 4U	Test Date: 9/28/2018	Depth: 30-32 ft
	Test No.: IP-5	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System Q, Swell Pressure = 0.0671 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 15 of 15

Constant Load Step

Stress: 0.0625 tsf




	Project: Rt-9/I-395 Connector	Location: Brewer, ME	Project No.: GTX-308853
	Boring No.: HB-BE-101 HB-BFB-101	Tested By: trm	Checked By: mcm
	Sample No.: 4U	Test Date: 9/28/2018	Depth: 30-32 ft
	Test No.: IP-5	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System Q, Swell Pressure = 0.0671 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Specimen Diameter: 2.50 in	Estimated Specific Gravity: 2.75	Liquid Limit: 34
Initial Height: 1.00 in	Initial Void Ratio: 0.933	Plastic Limit: 20
Final Height: 0.82 in	Final Void Ratio: 0.585	Plasticity Index: 14

	Before Test Trimmings	Before Test Specimen	After Test Specimen	After Test Trimmings
Container ID	C575	RING		A2478
Mass Container, gm	8.5	111.71	111.71	8
Mass Container + Wet Soil, gm	126.85	263.55	250.61	145.22
Mass Container + Dry Soil, gm	96.91	226.26	226.26	121.16
Mass Dry Soil, gm	88.41	114.55	114.55	113.16
Water Content, %	33.86	32.56	21.26	21.26
Void Ratio	---	0.93	0.59	---
Degree of Saturation, %	---	96.04	100.00	---
Dry Unit Weight, pcf	---	88.897	108.41	---


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: Rt-9/I-395 Connector	Location: Brewer, ME	Project No.: GTX-308853
	Boring No.: HB-BE-101 HB-BFB-101	Tested By: trm	Checked By: mcm
	Sample No.: 4U	Test Date: 9/28/2018	Depth: 30-32 ft
	Test No.: IP-5	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System Q, Swell Pressure = 0.0671 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Log of Time Coefficients


[illegible]

	Project: Rt-9/I-395 Connector	Location: Brewer, ME	Project No.: GTX-308853
	Boring No.: HB-BE-101 HB-BFB-101	Tested By: trm	Checked By: mcm
	Sample No.: 4U	Test Date: 9/28/2018	Depth: 30-32 ft
	Test No.: IP-5	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System Q, Swell Pressure = 0.0671 tsf		
Displacement at End of Increment			

One-Dimensional Consolidation by ASTM D2435 - Method B

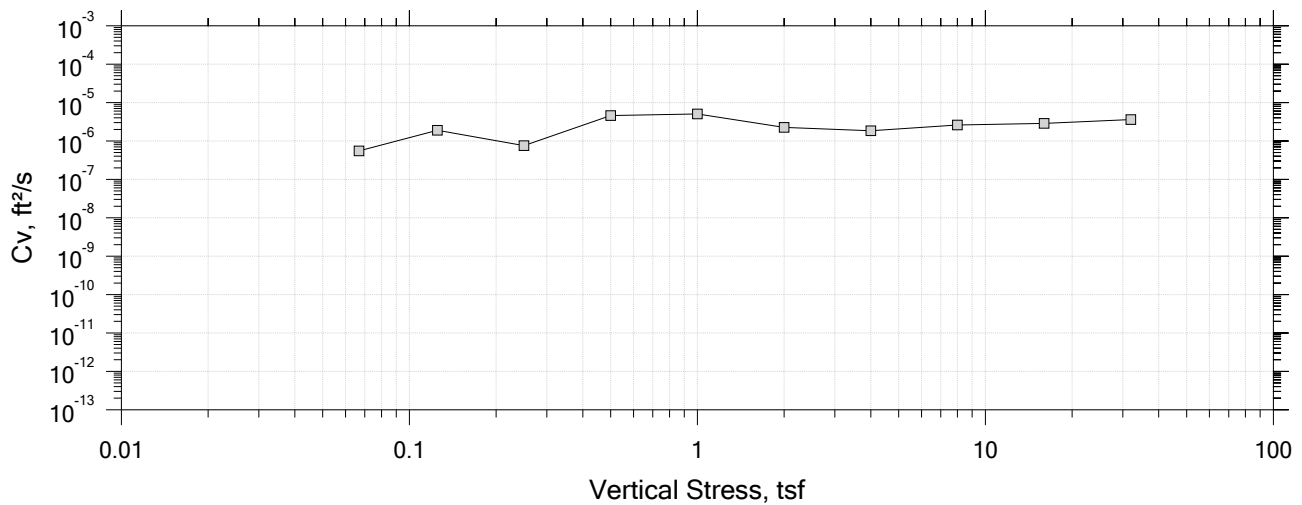
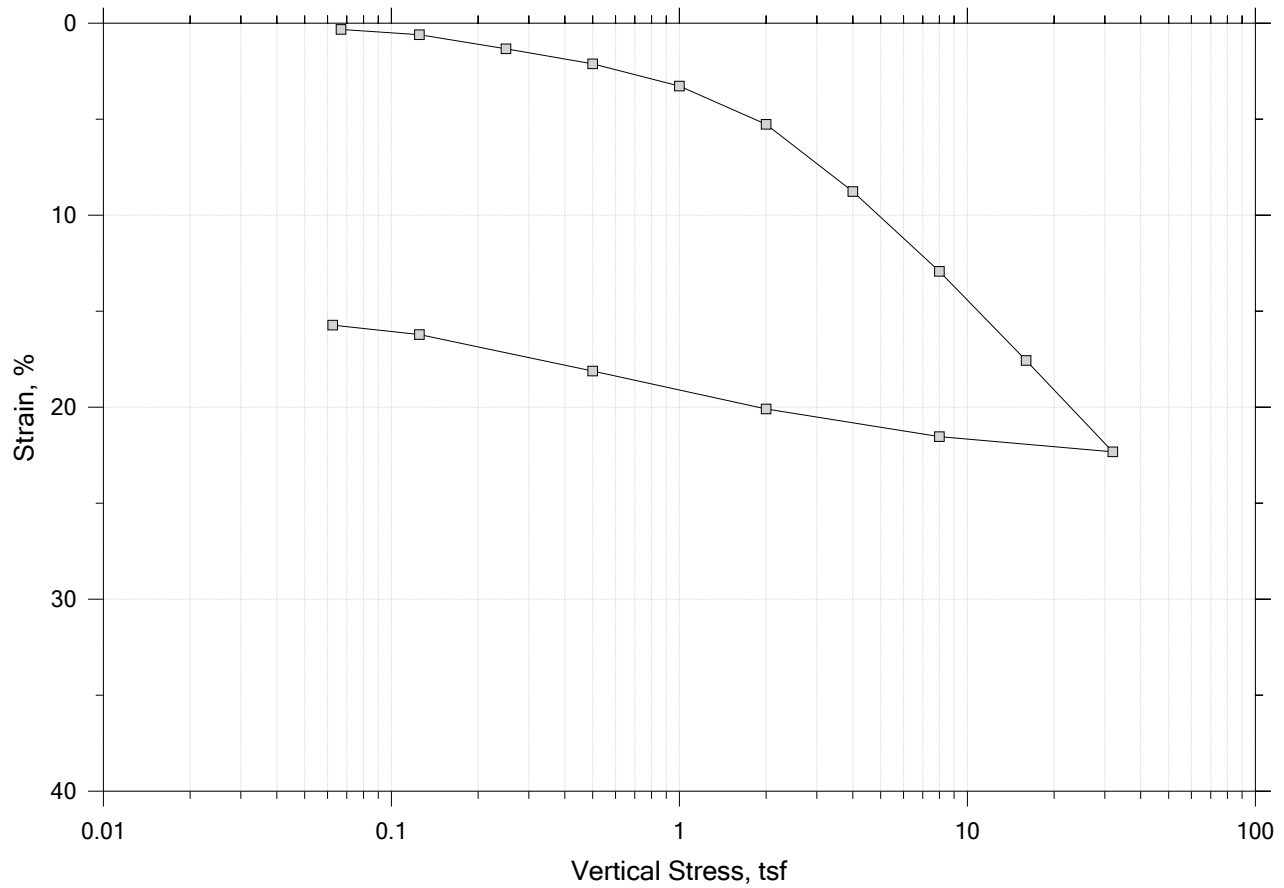
Square Root of Time Coefficients


[illegible]

	Project: Rt-9/I-395 Connector	Location: Brewer, ME	Project No.: GTX-308853
	Boring No.: HB-BE-101 HB-BFB-101	Tested By: trm	Checked By: mcm
	Sample No.: 4U	Test Date: 9/28/2018	Depth: 30-32 ft
	Test No.: IP-5	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System Q, Swell Pressure = 0.0671 tsf		
	Displacement at End of Increment		

One-Dimensional Consolidation by ASTM D2435 - Method B

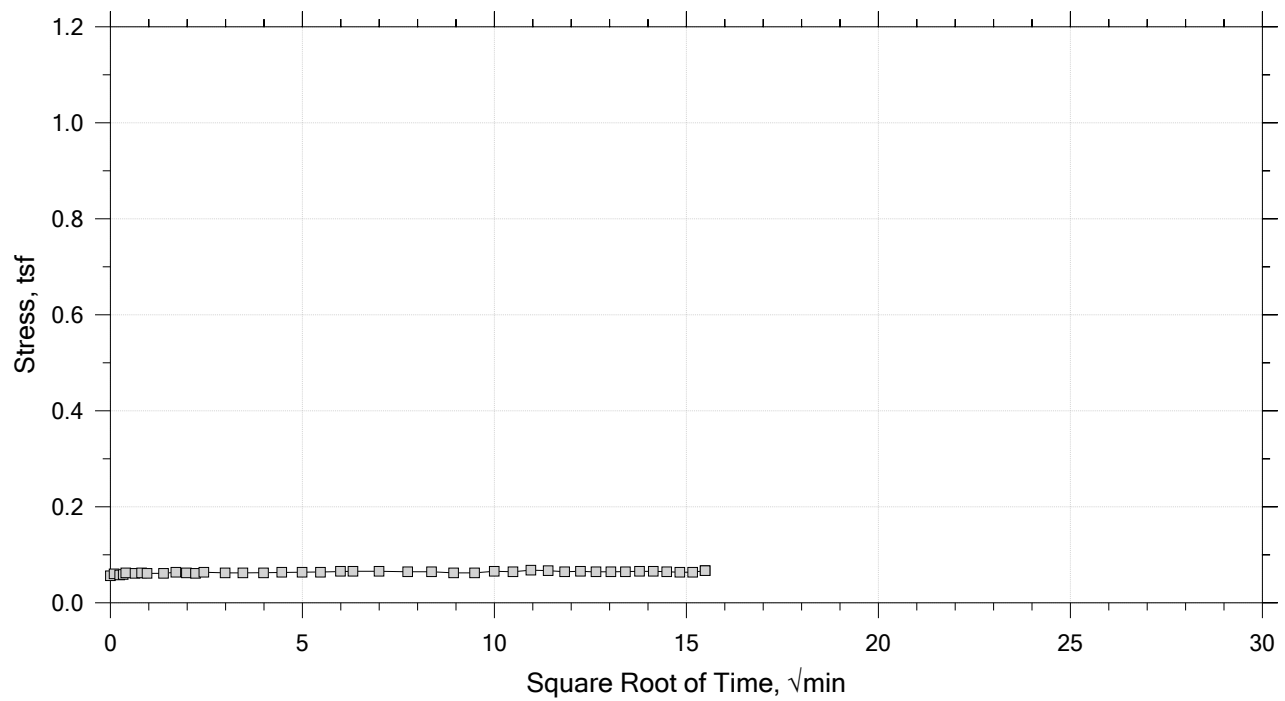
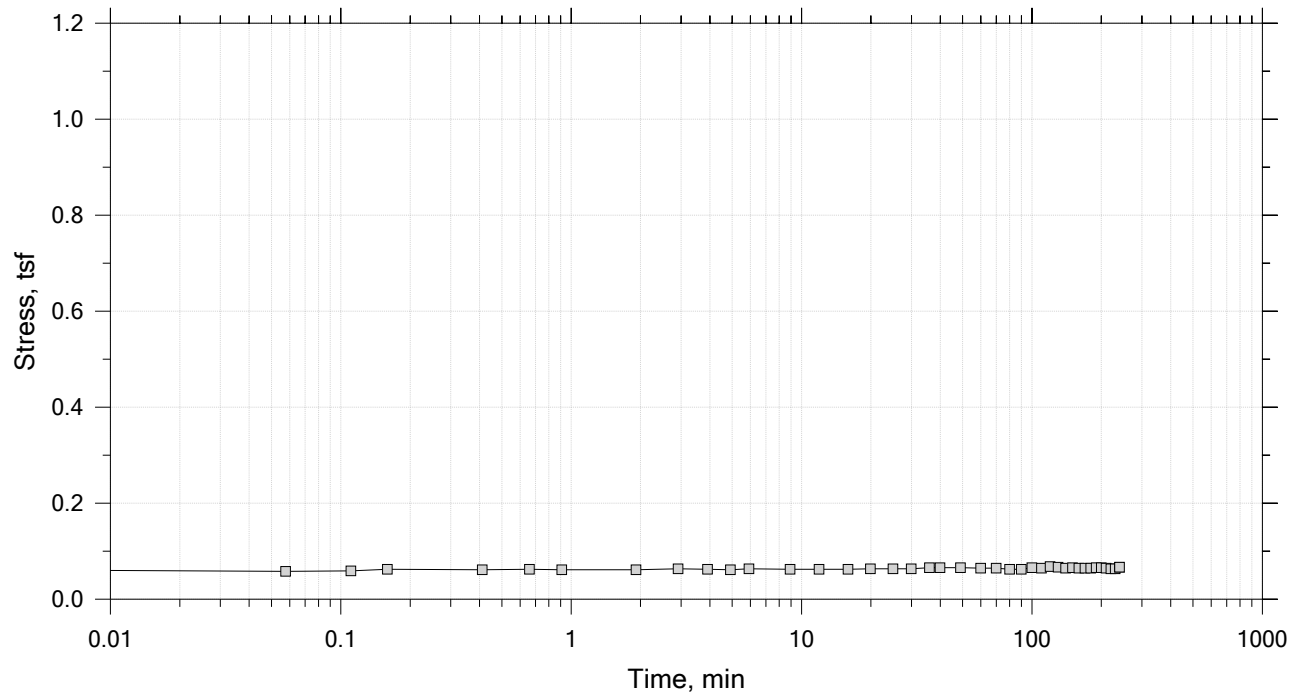
Summary Report




	Project: Rt-9/I-395 Connector	Location: Brewer, ME	Project No.: GTX-308853
	Boring No.: HB BFB-101	Tested By: md/trm	Checked By: mcm
	Sample No.: 1-U	Test Date: 9/27/18	Depth: 5-7
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System E, Swell Pressure = 0.0668 tsf		
	Displacement at End of Increment		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 1 of 15
Constant Volume Step
Stress: 0.0668 tsf



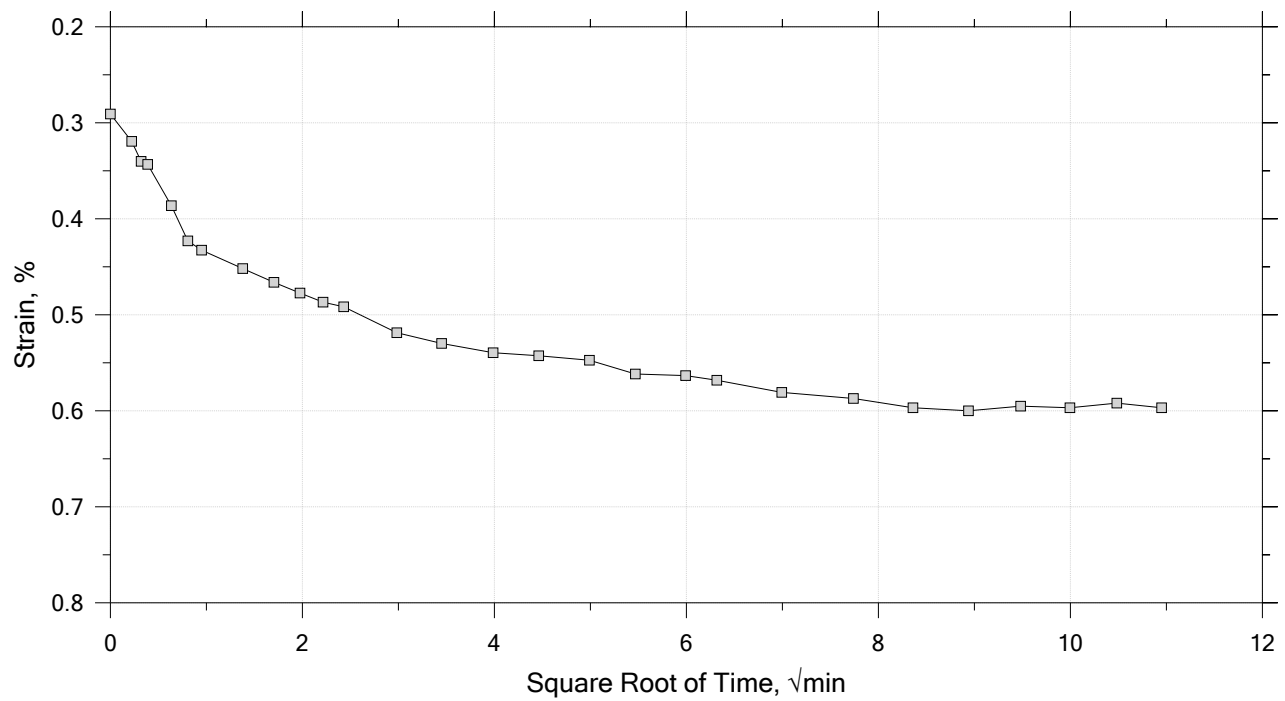
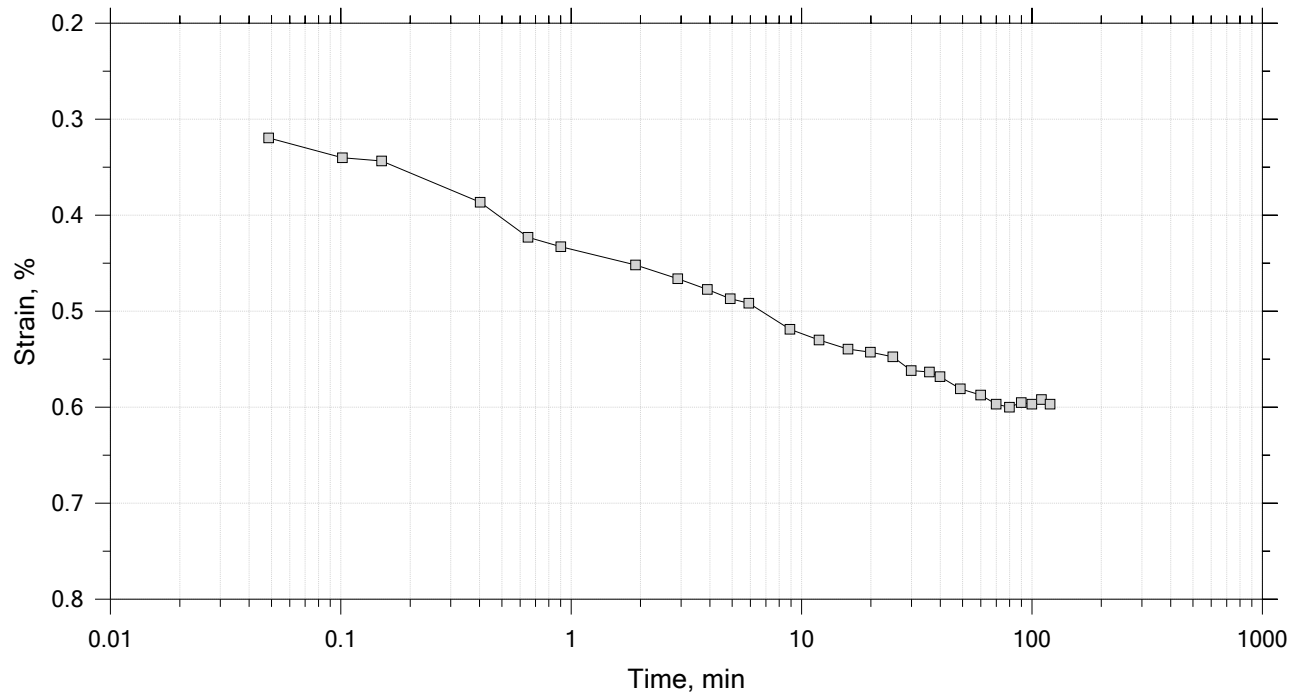
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	Boring No.: HB BFB-101	Tested By: md/trm	Checked By: mcm
	Sample No.: 1-U	Test Date: 9/27/18	Depth: 5-7
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System E, Swell Pressure = 0.0668 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 2 of 15

Constant Load Step

Stress: 0.125 tsf



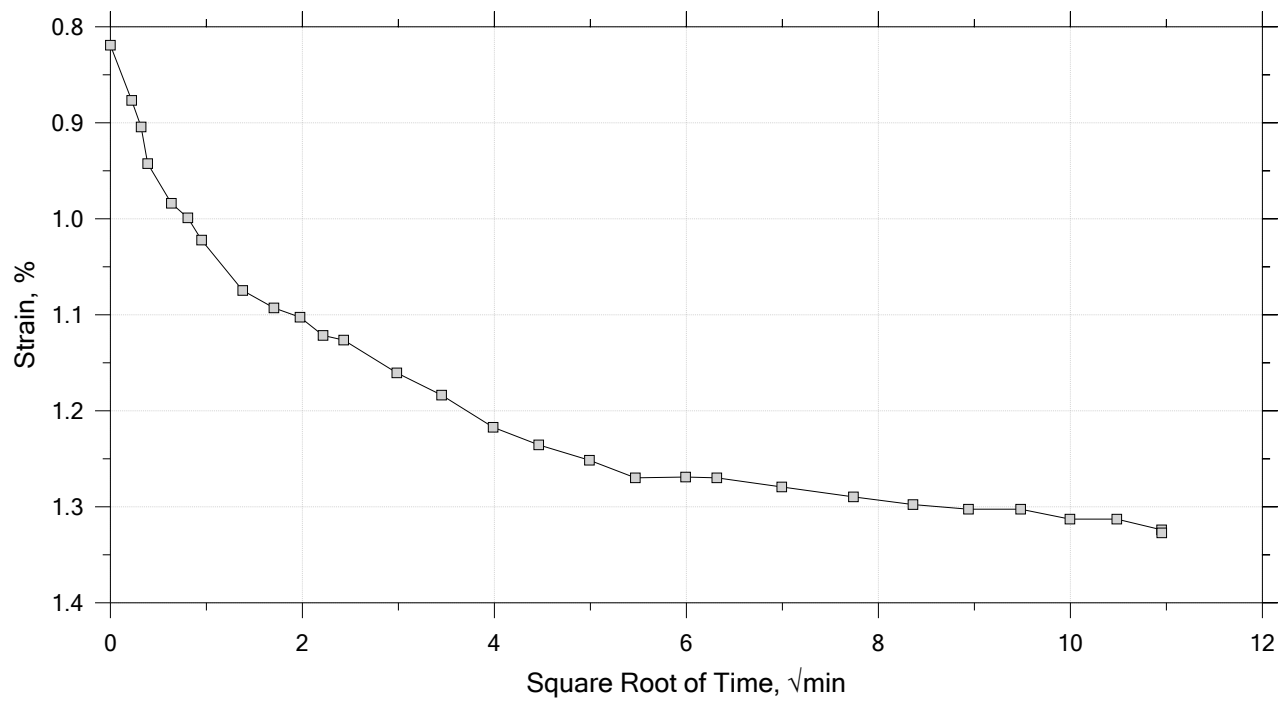
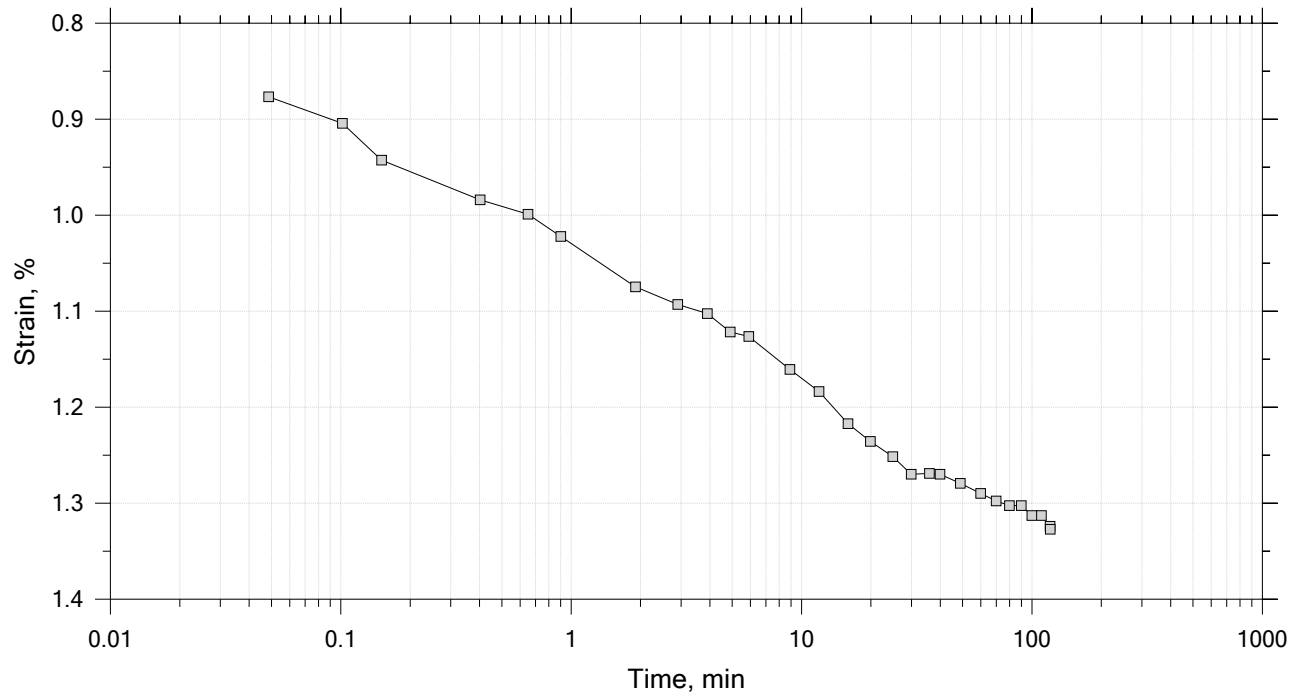
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	Boring No.: HB BFB-101	Tested By: md/trm	Checked By: mcm
	Sample No.: 1-U	Test Date: 9/27/18	Depth: 5-7
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System E, Swell Pressure = 0.0668 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 3 of 15

Constant Load Step

Stress: 0.25 tsf



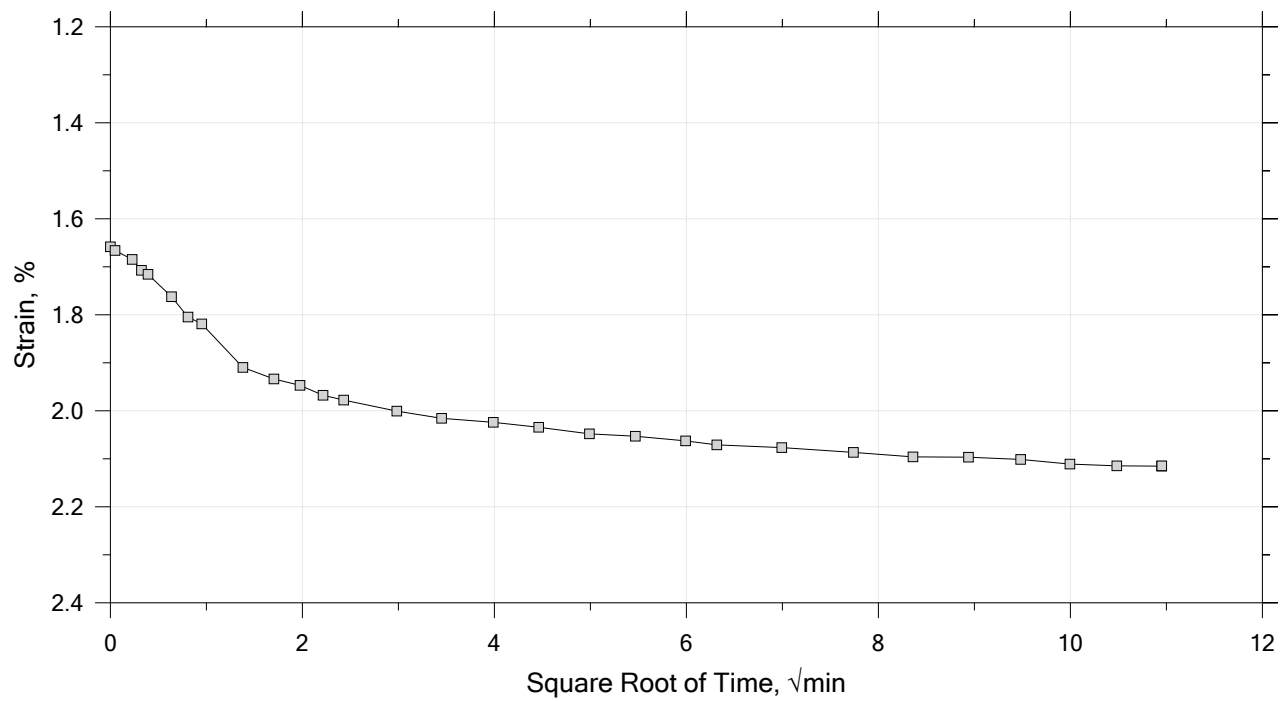
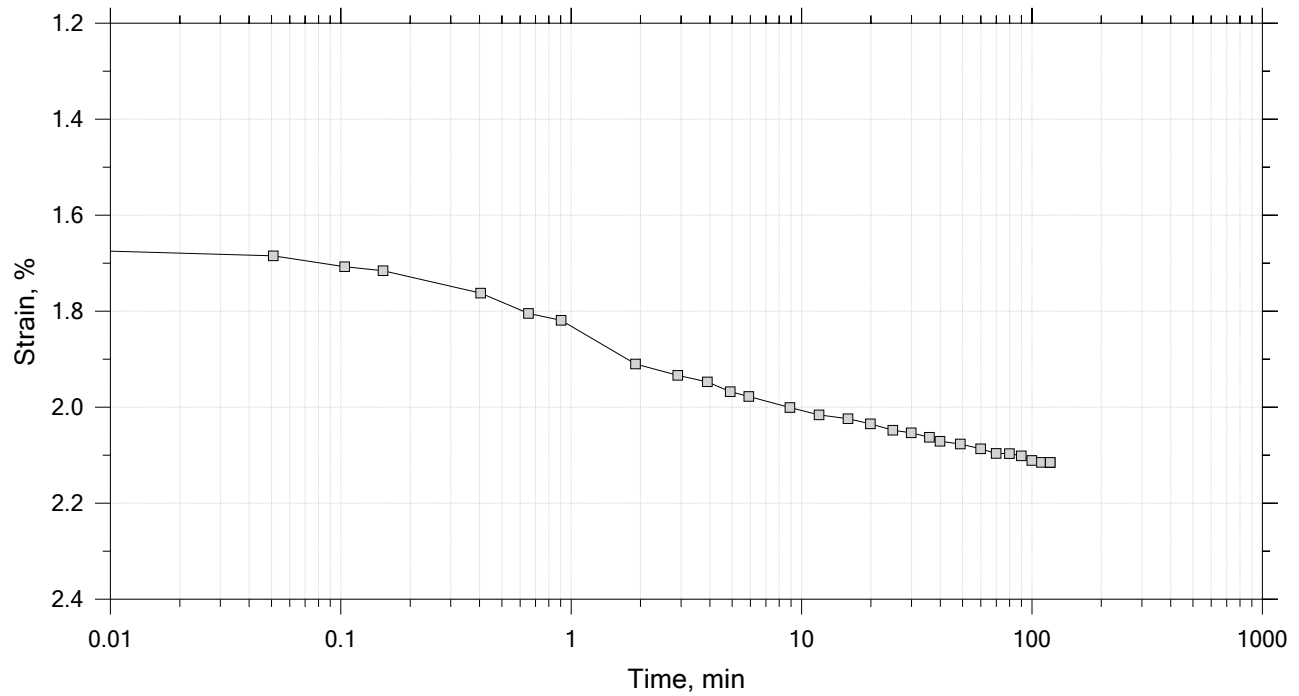
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	Boring No.: HB BFB-101	Tested By: md/trm	Checked By: mcm
	Sample No.: 1-U	Test Date: 9/27/18	Depth: 5-7
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System E, Swell Pressure = 0.0668 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 4 of 15

Constant Load Step

Stress: 0.5 tsf



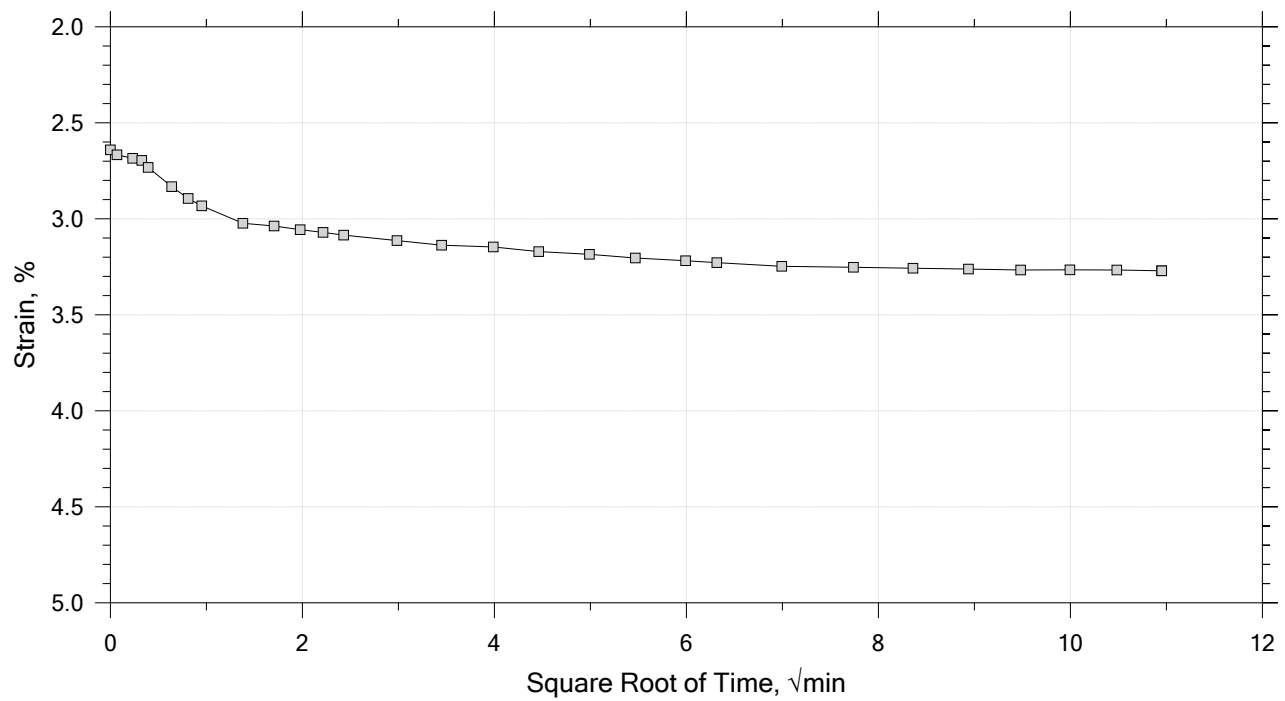
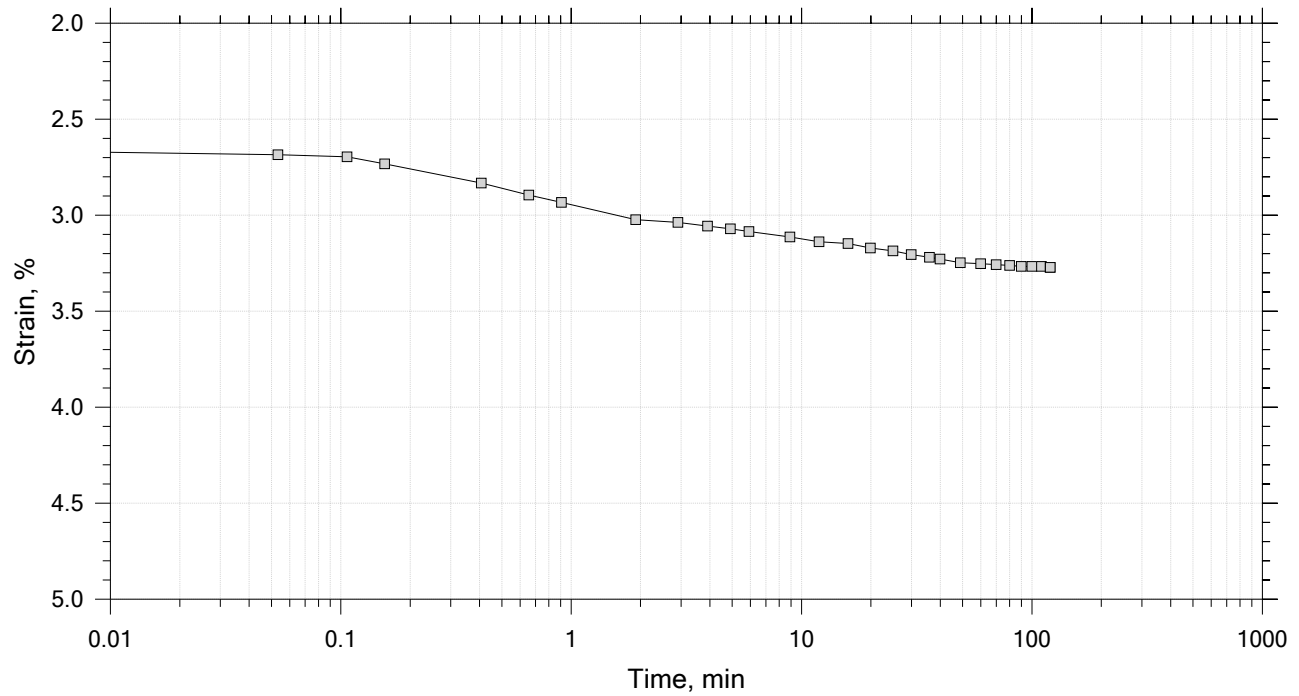
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	Boring No.: HB BFB-101	Tested By: md/trm	Checked By: mcm
	Sample No.: 1-U	Test Date: 9/27/18	Depth: 5-7
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System E, Swell Pressure = 0.0668 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 5 of 15

Constant Load Step

Stress: 1 tsf



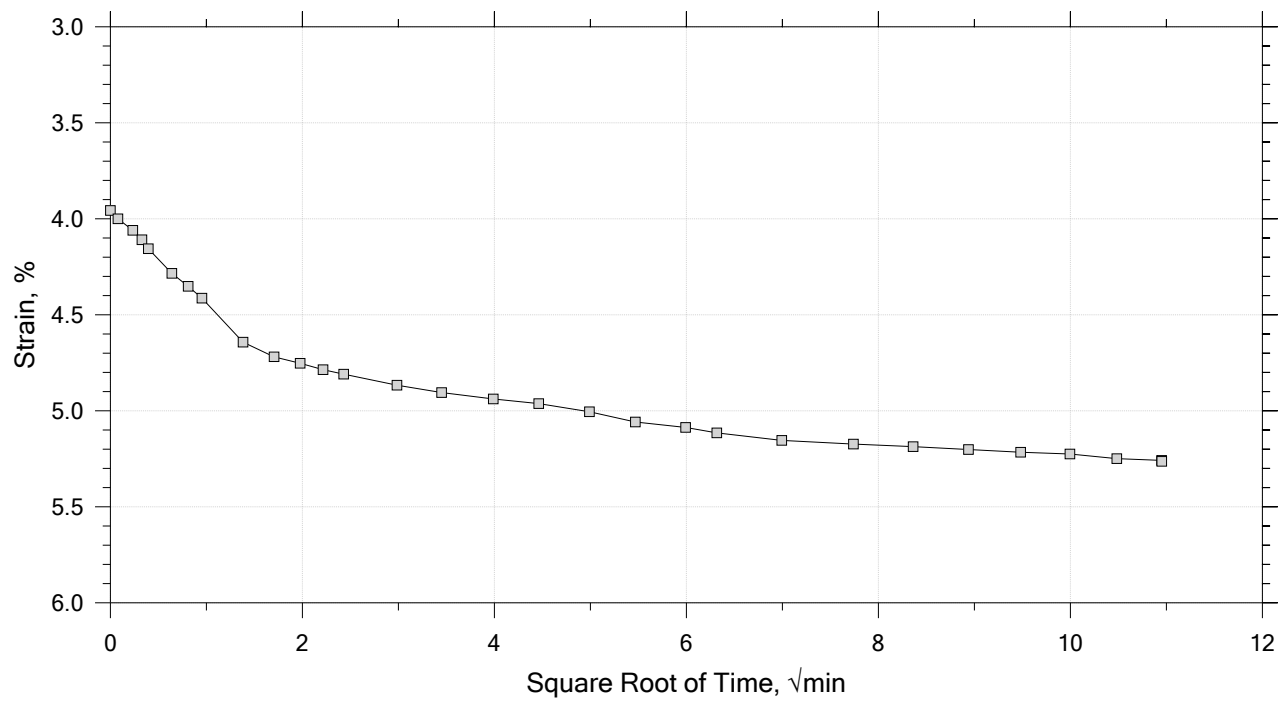
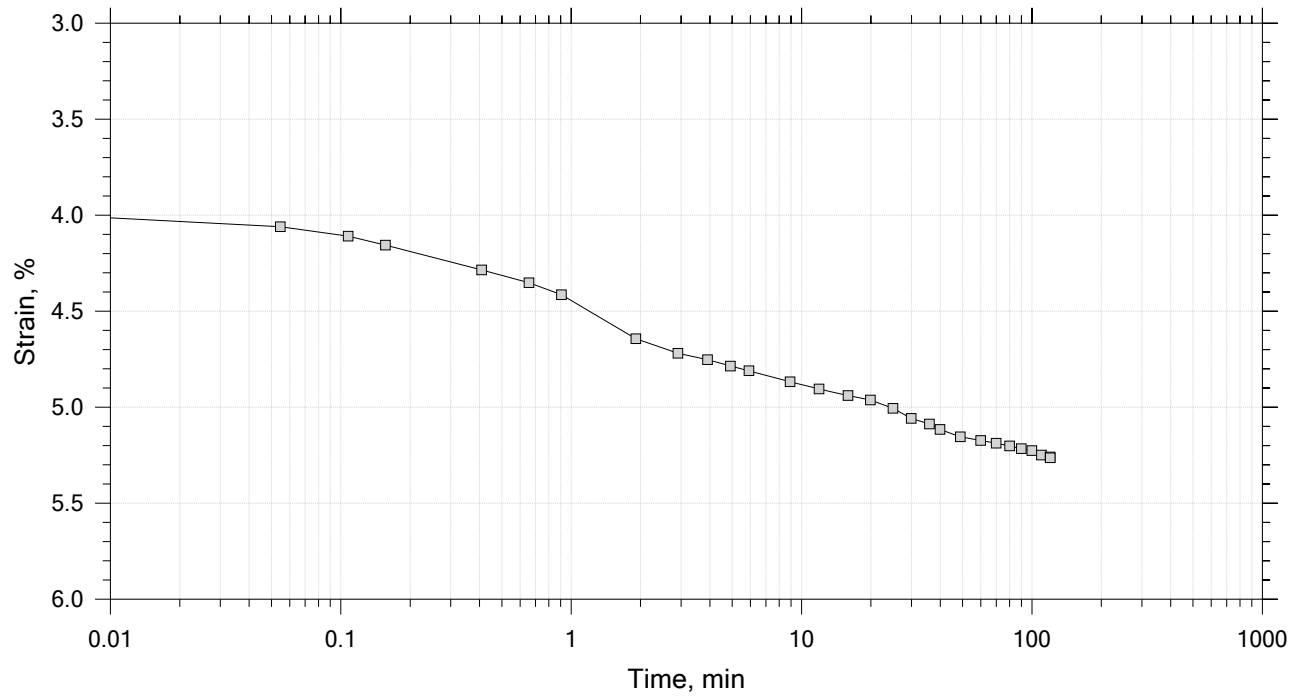
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	Boring No.: HB BFB-101	Tested By: md/trm	Checked By: mcm
	Sample No.: 1-U	Test Date: 9/27/18	Depth: 5-7
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System E, Swell Pressure = 0.0668 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 6 of 15

Constant Load Step

Stress: 2 tsf



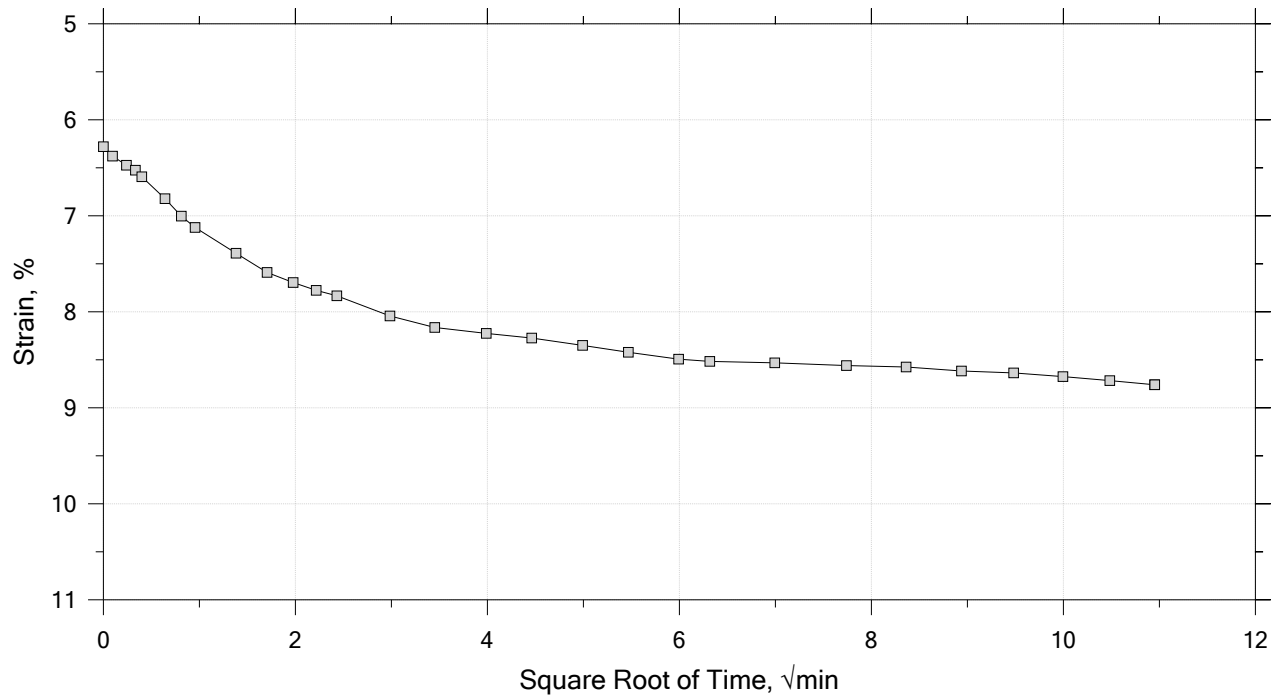
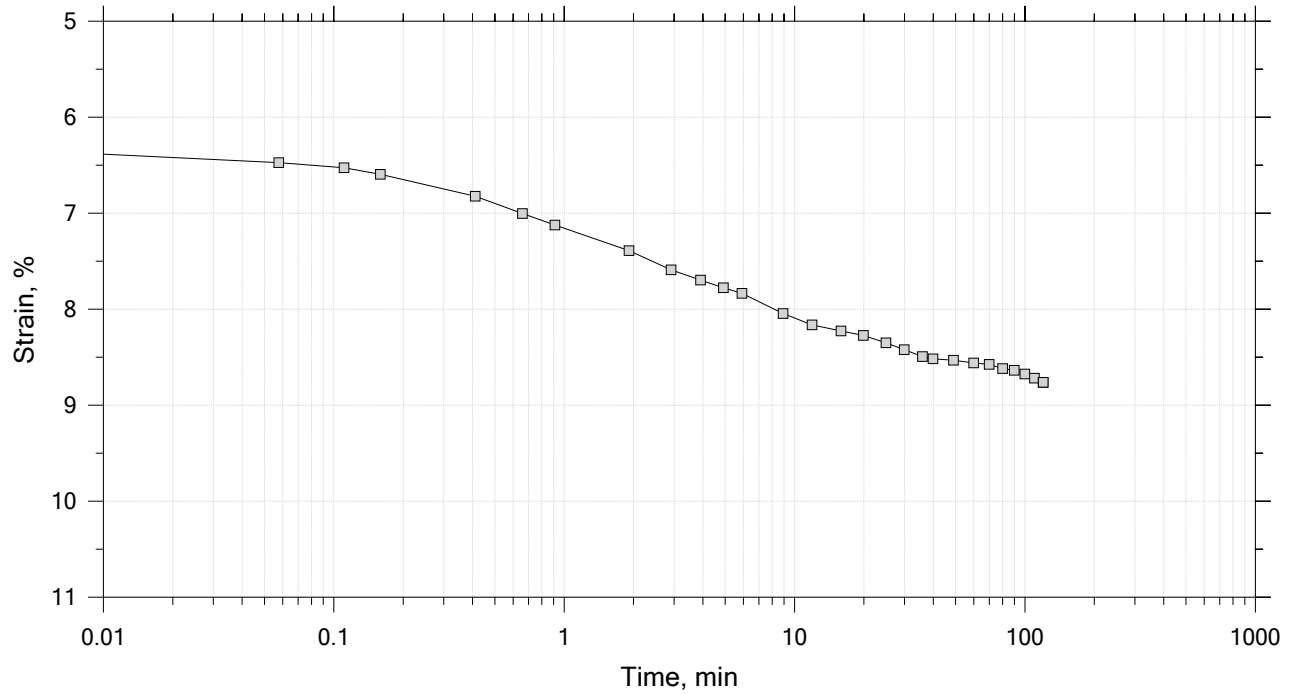
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	Boring No.: HB BFB-101	Tested By: md/trm	Checked By: mcm
	Sample No.: 1-U	Test Date: 9/27/18	Depth: 5-7
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System E, Swell Pressure = 0.0668 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 7 of 15

Constant Load Step

Stress: 4 tsf



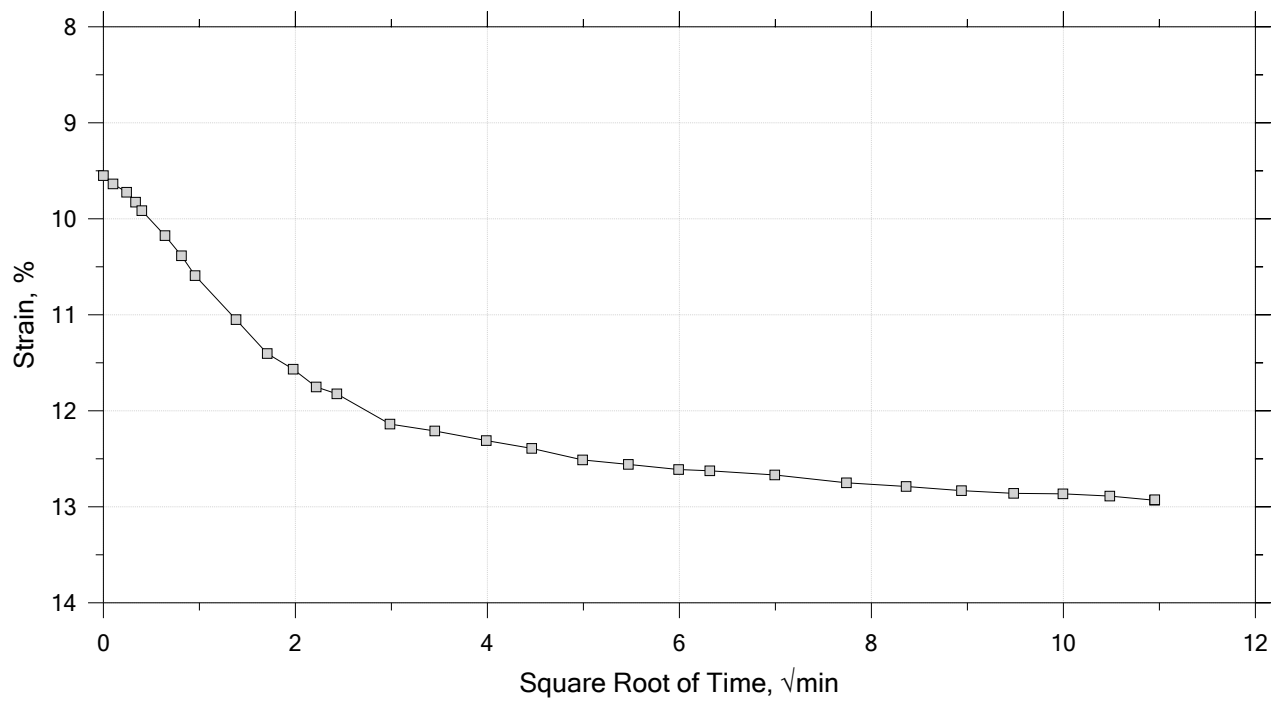
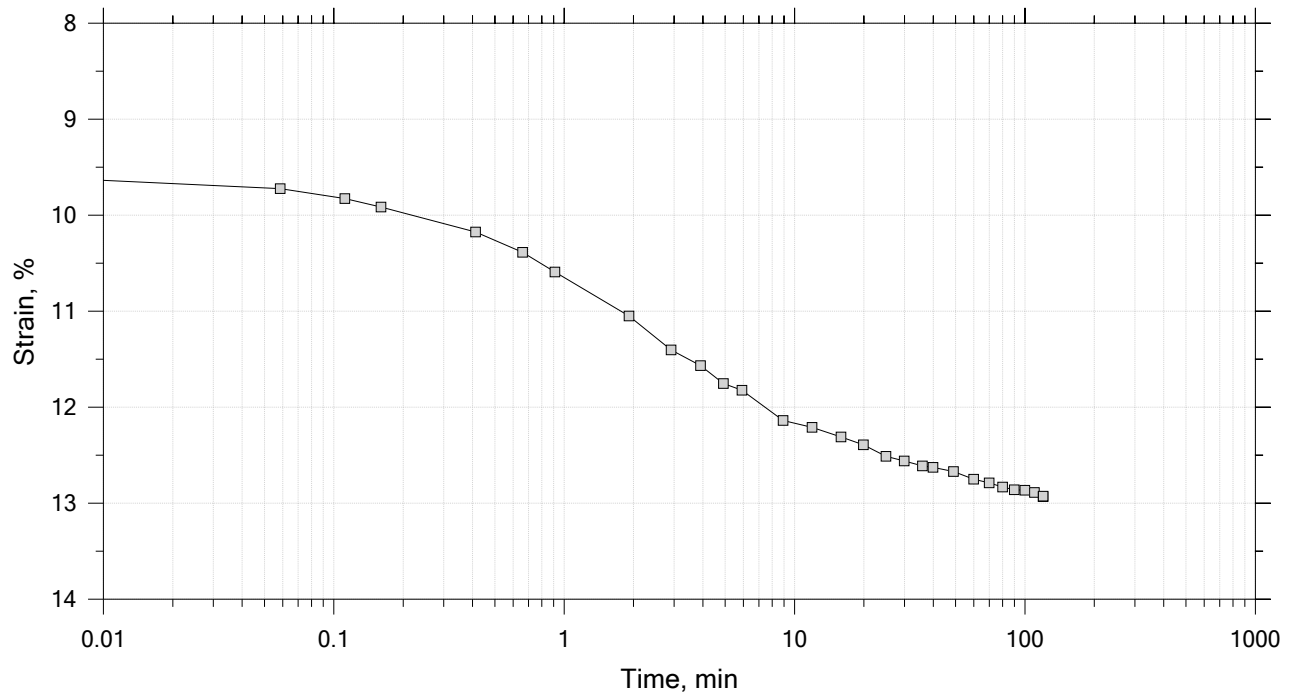
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	Boring No.: HB BFB-101	Tested By: md/trm	Checked By: mcm
	Sample No.: 1-U	Test Date: 9/27/18	Depth: 5-7
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System E, Swell Pressure = 0.0668 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 8 of 15

Constant Load Step

Stress: 8 tsf



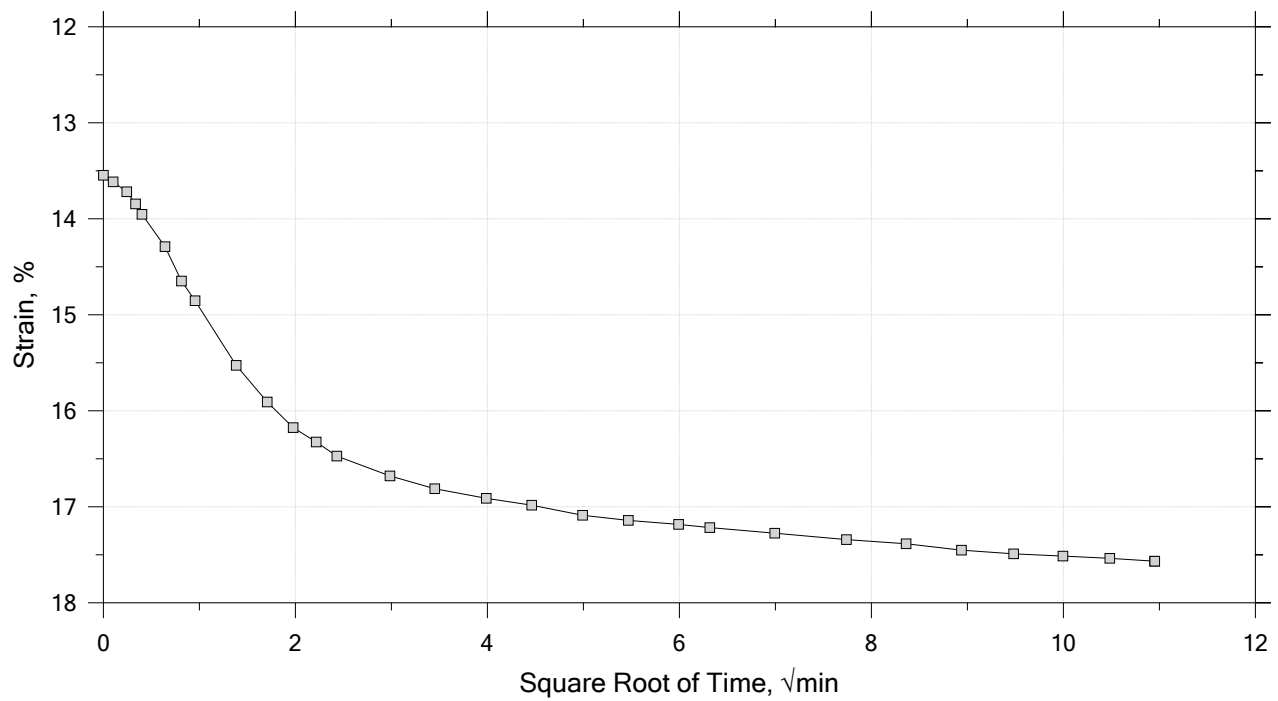
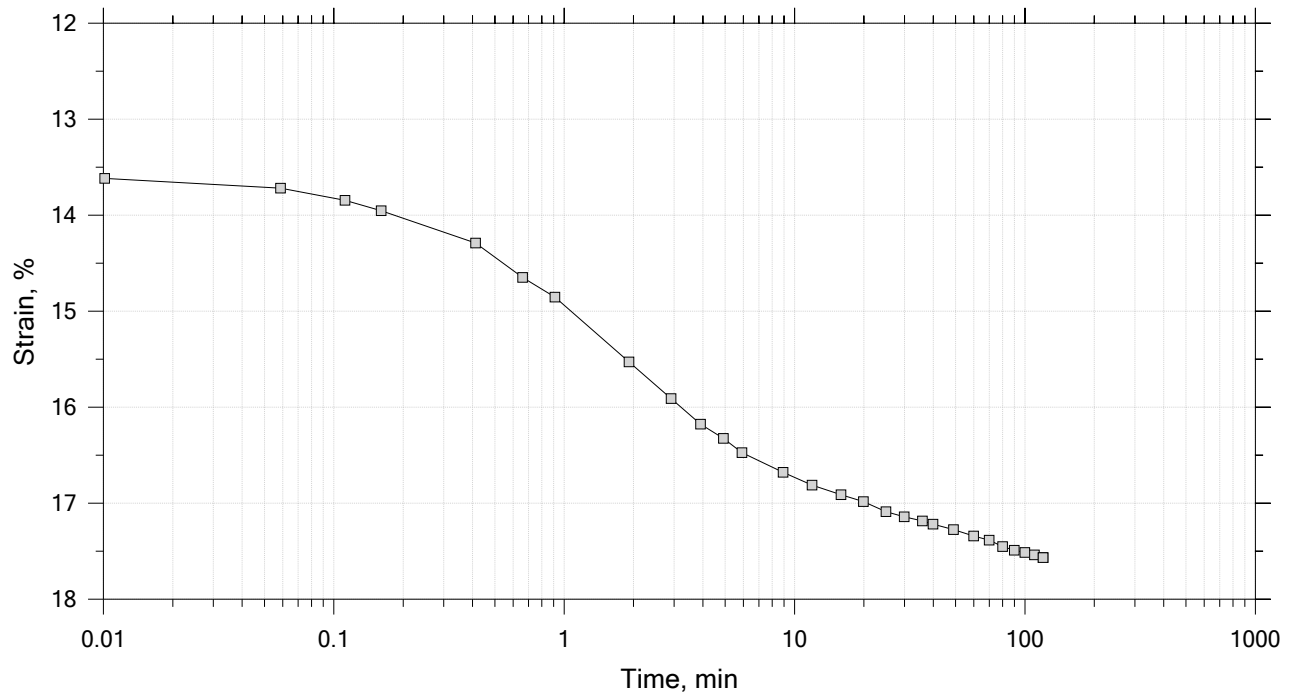
	Project: Rt-9/I-395 Connector	Location: Brewer, ME	Project No.: GTX-308853
	Boring No.: HB BFB-101	Tested By: md/trm	Checked By: mcm
	Sample No.: 1-U	Test Date: 9/27/18	Depth: 5-7
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System E, Swell Pressure = 0.0668 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 9 of 15

Constant Load Step

Stress: 16 tsf



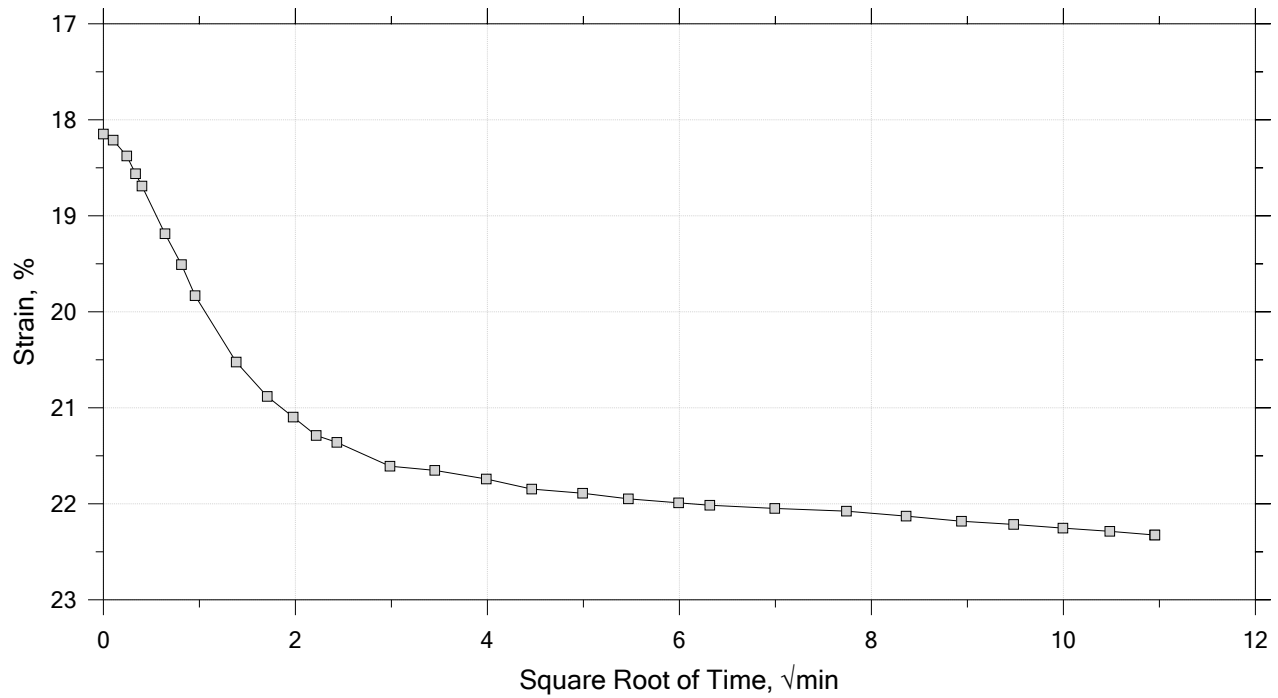
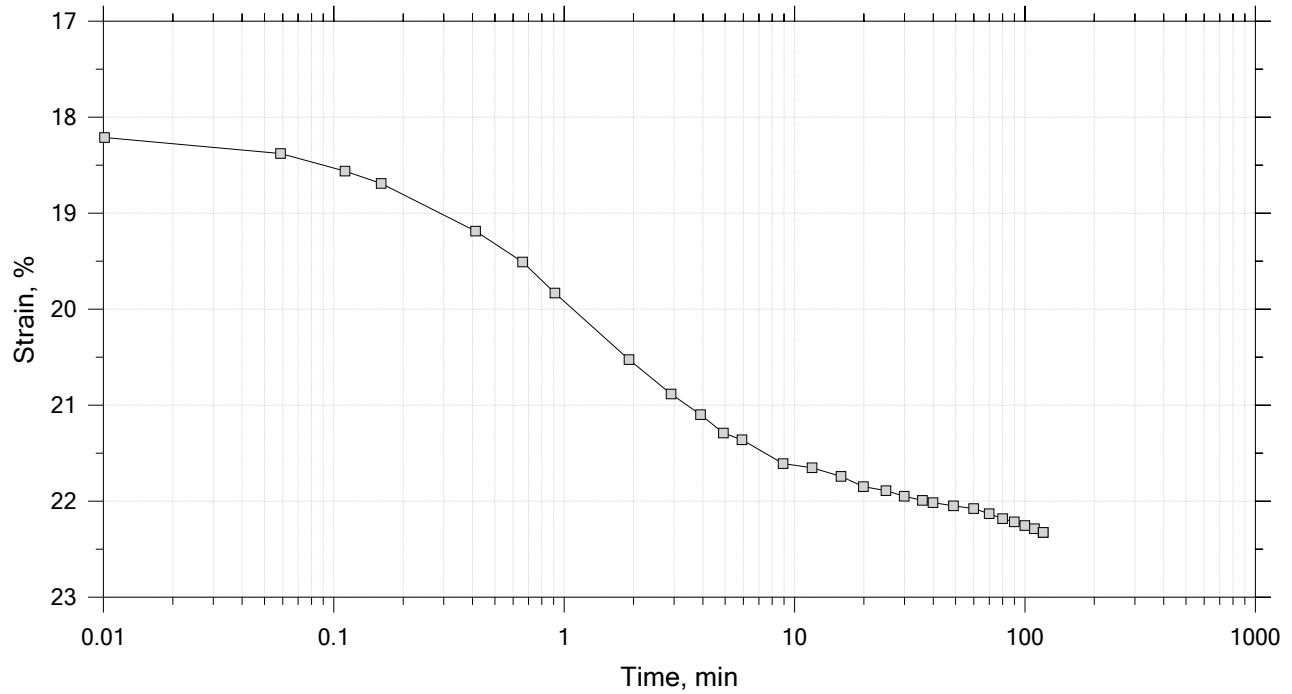
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	Boring No.: HB BFB-101	Tested By: md/trm	Checked By: mcm
	Sample No.: 1-U	Test Date: 9/27/18	Depth: 5-7
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System E, Swell Pressure = 0.0668 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 10 of 15

Constant Load Step

Stress: 32 tsf



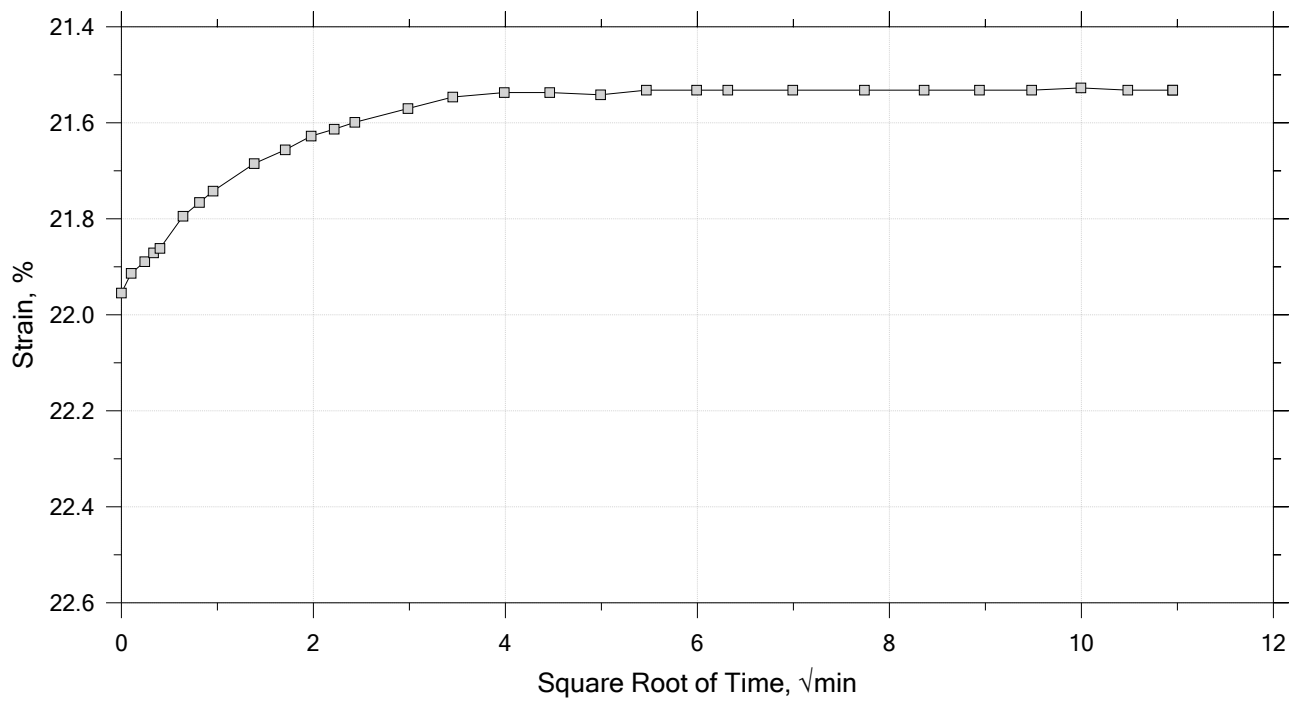
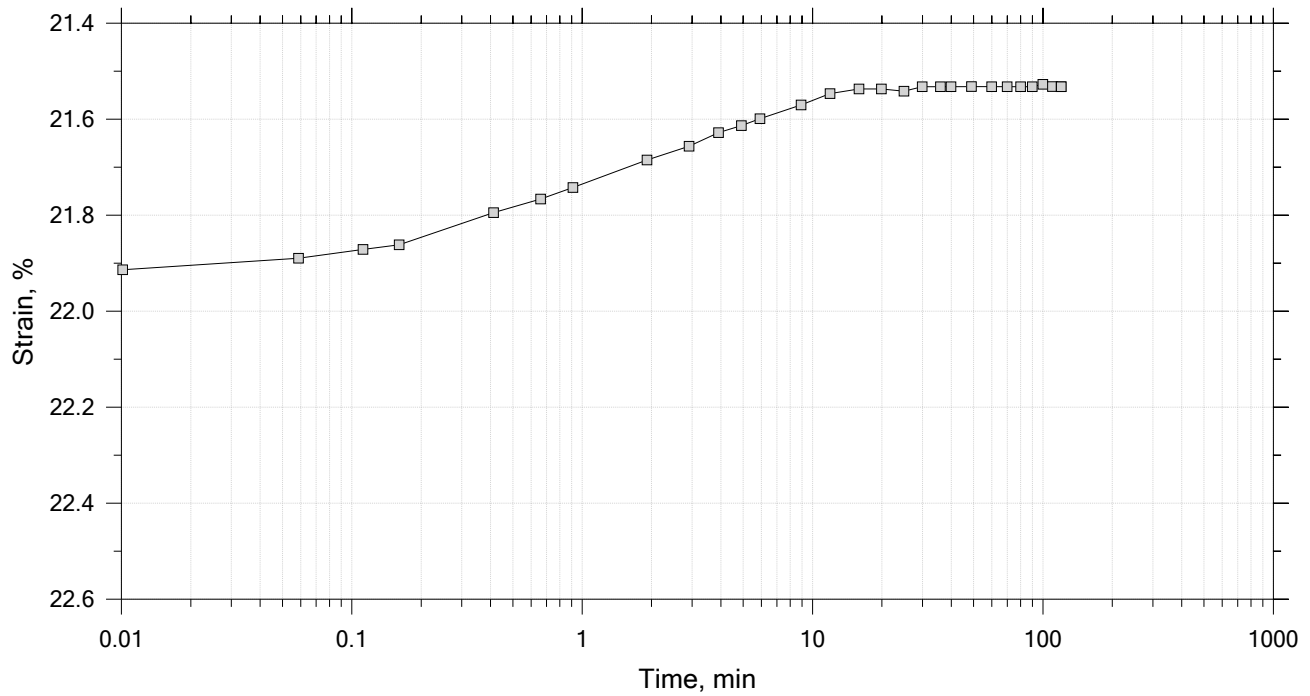
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	Boring No.: HB BFB-101	Tested By: md/trm	Checked By: mcm
	Sample No.: 1-U	Test Date: 9/27/18	Depth: 5-7
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System E, Swell Pressure = 0.0668 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 11 of 15

Constant Load Step

Stress: 8 tsf



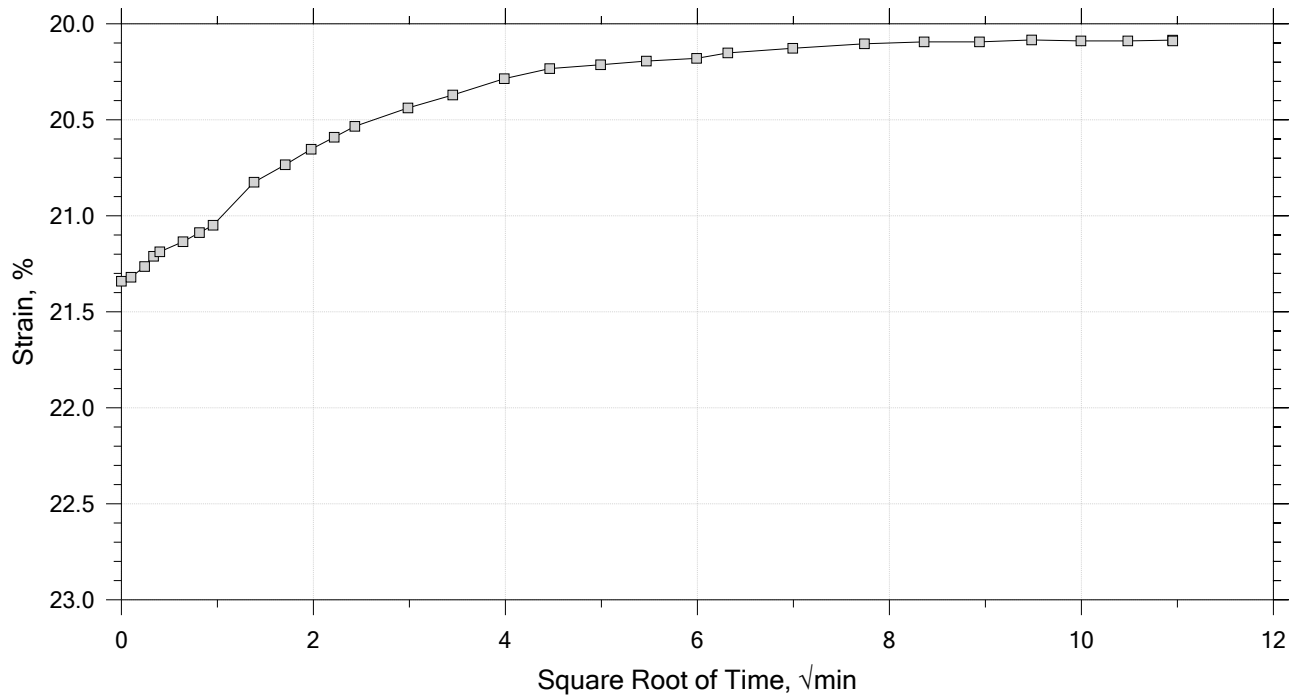
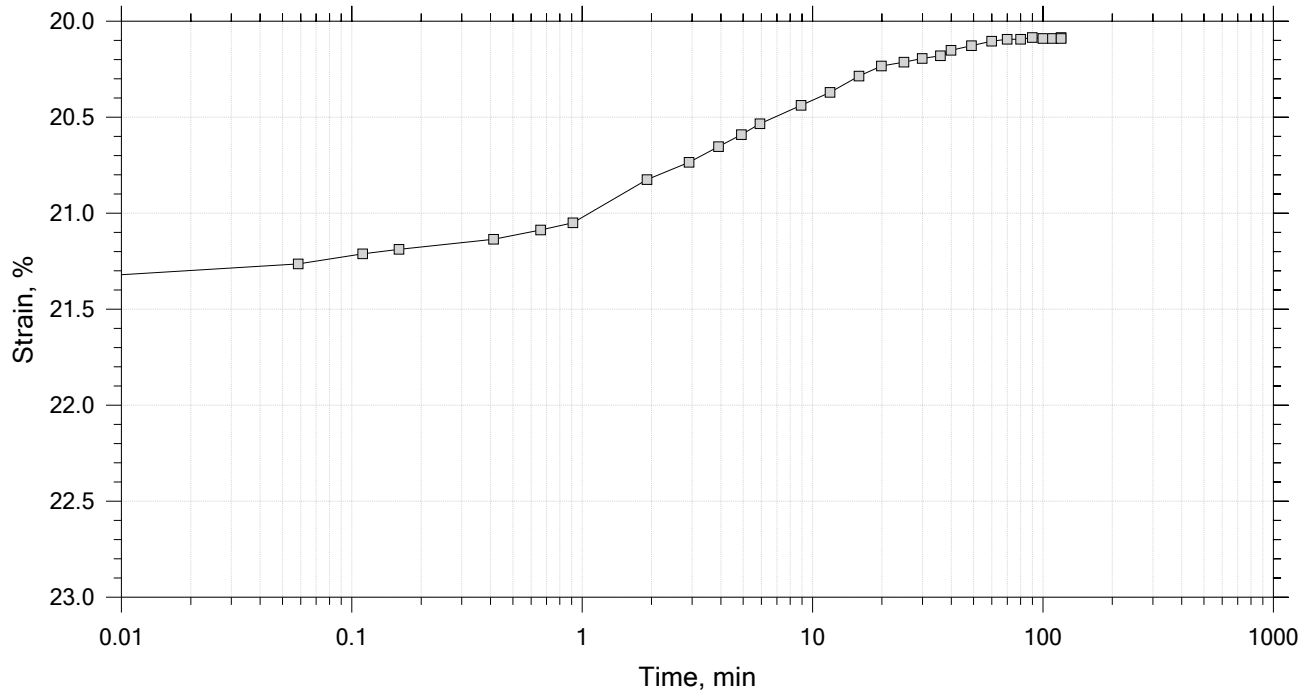
	Project: Rt-9/I-395 Connector	Location: Brewer, ME	Project No.: GTX-308853
	Boring No.: HB BFB-101	Tested By: md/trm	Checked By: mcm
	Sample No.: 1-U	Test Date: 9/27/18	Depth: 5-7
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System E, Swell Pressure = 0.0668 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 12 of 15

Constant Load Step

Stress: 2 tsf



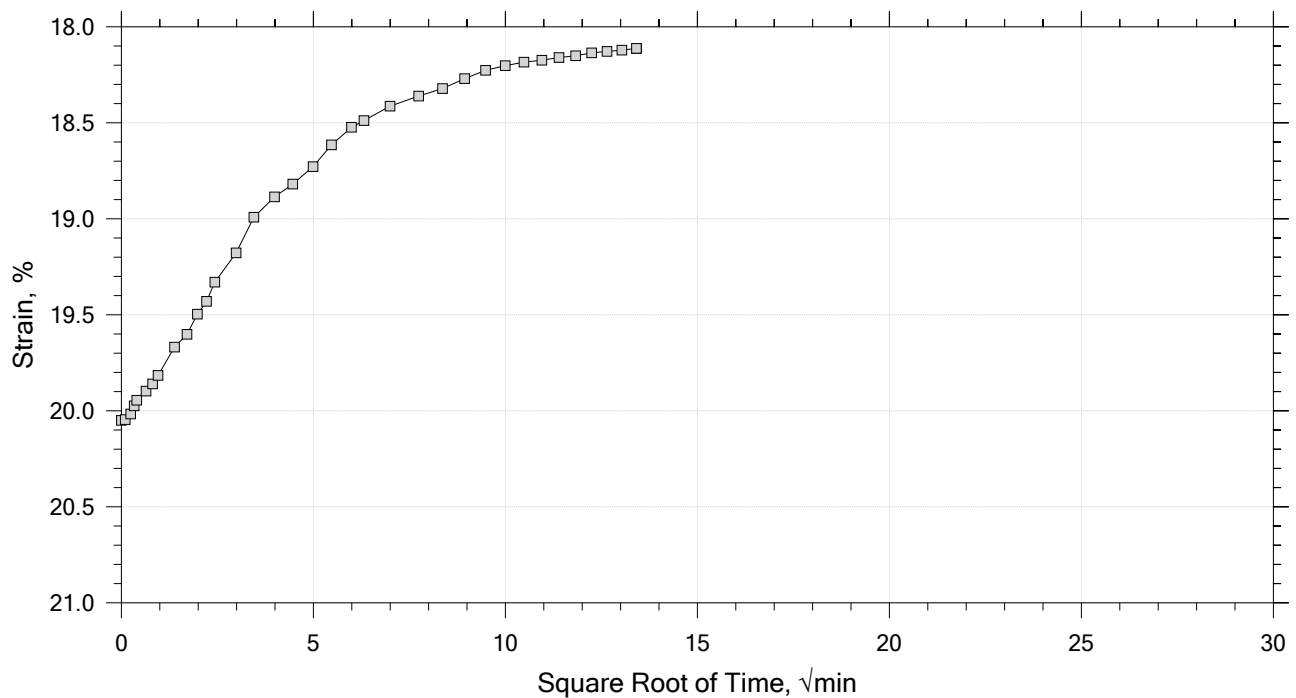
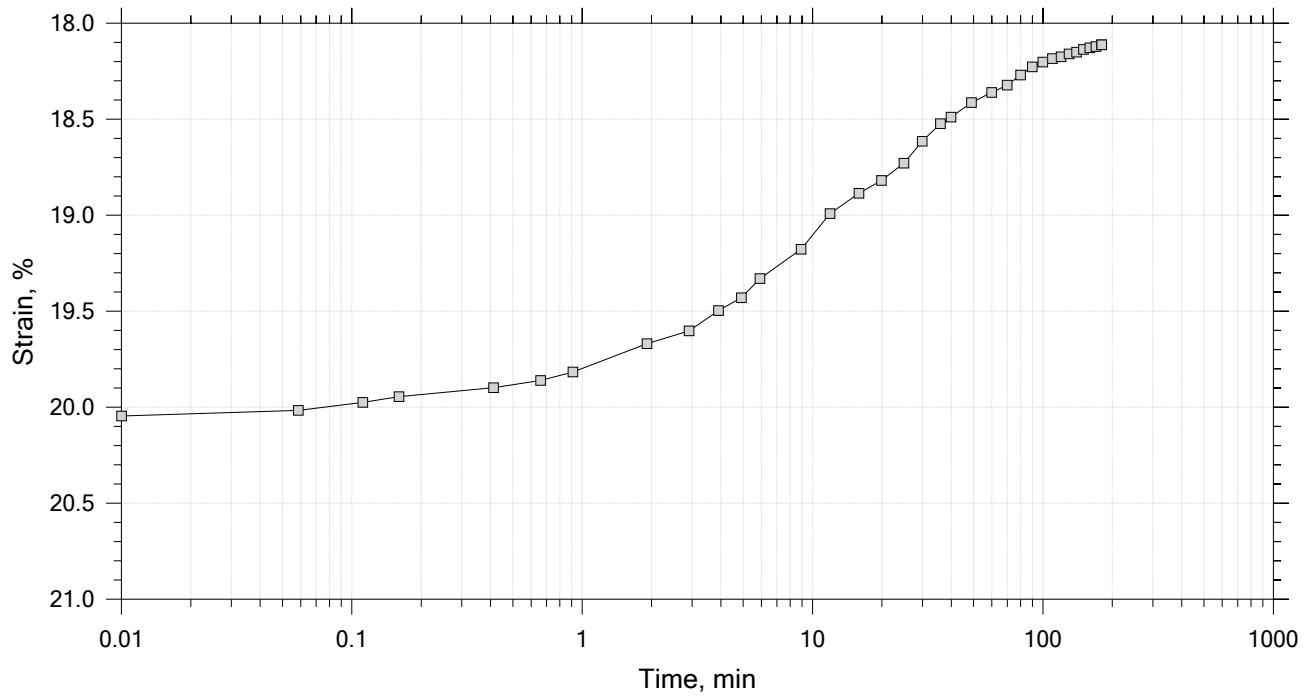
	Project: Rt-9/I-395 Connector	Location: Brewer, ME	Project No.: GTX-308853
	Boring No.: HB BFB-101	Tested By: md/trm	Checked By: mcm
	Sample No.: 1-U	Test Date: 9/27/18	Depth: 5-7
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System E, Swell Pressure = 0.0668 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 13 of 15

Constant Load Step

Stress: 0.5 tsf



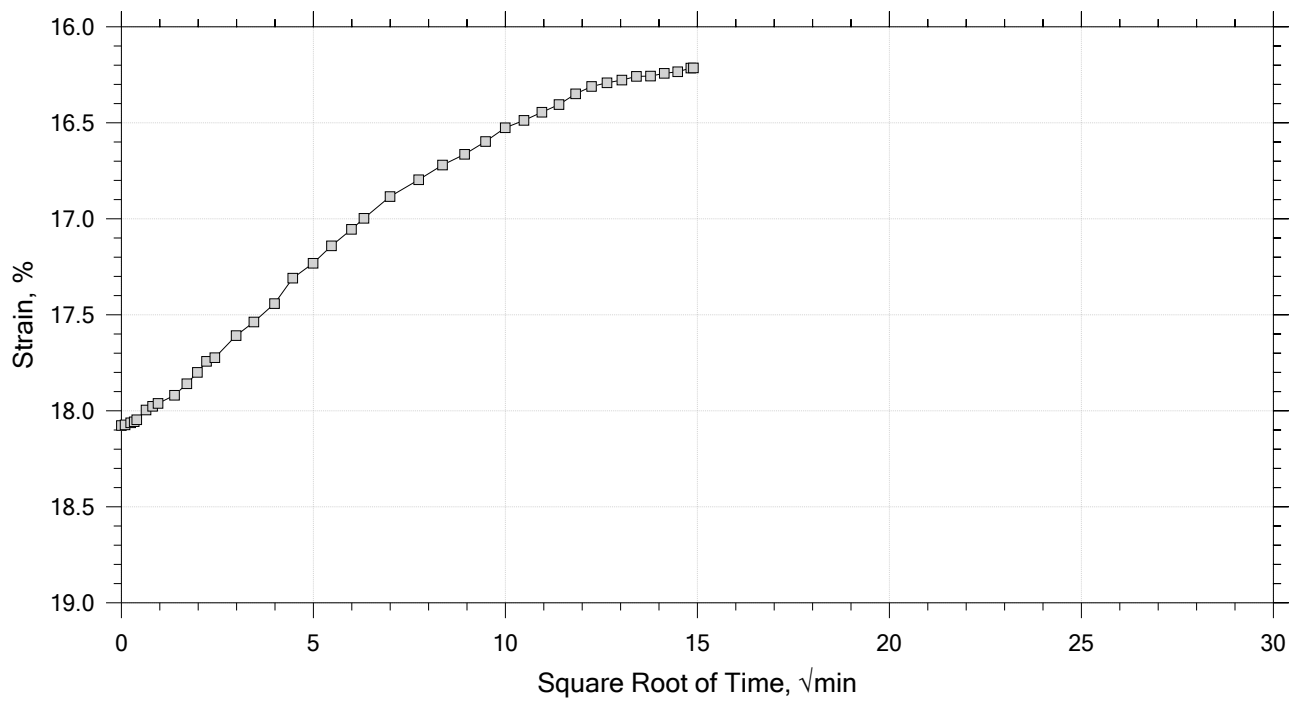
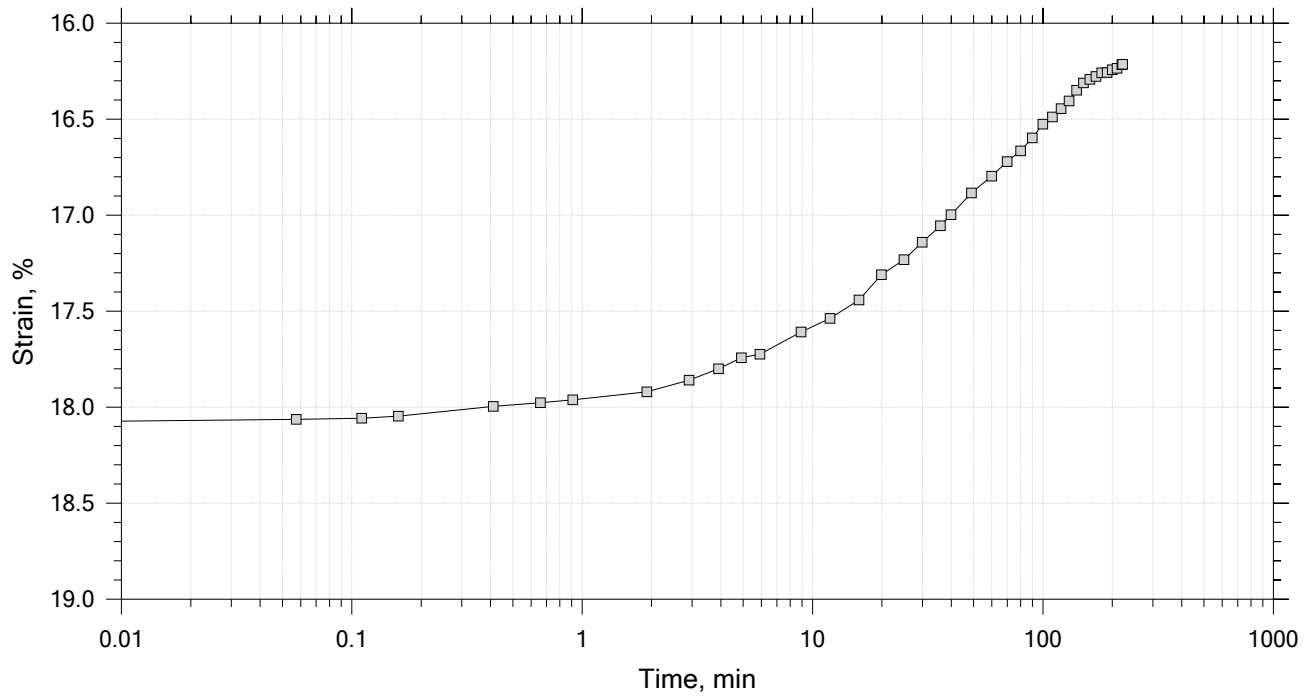
	Project: Rt-9/I-395 Connector	Location: Brewer, ME	Project No.: GTX-308853
	Boring No.: HB BFB-101	Tested By: md/trm	Checked By: mcm
	Sample No.: 1-U	Test Date: 9/27/18	Depth: 5-7
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System E, Swell Pressure = 0.0668 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 14 of 15

Constant Load Step

Stress: 0.125 tsf



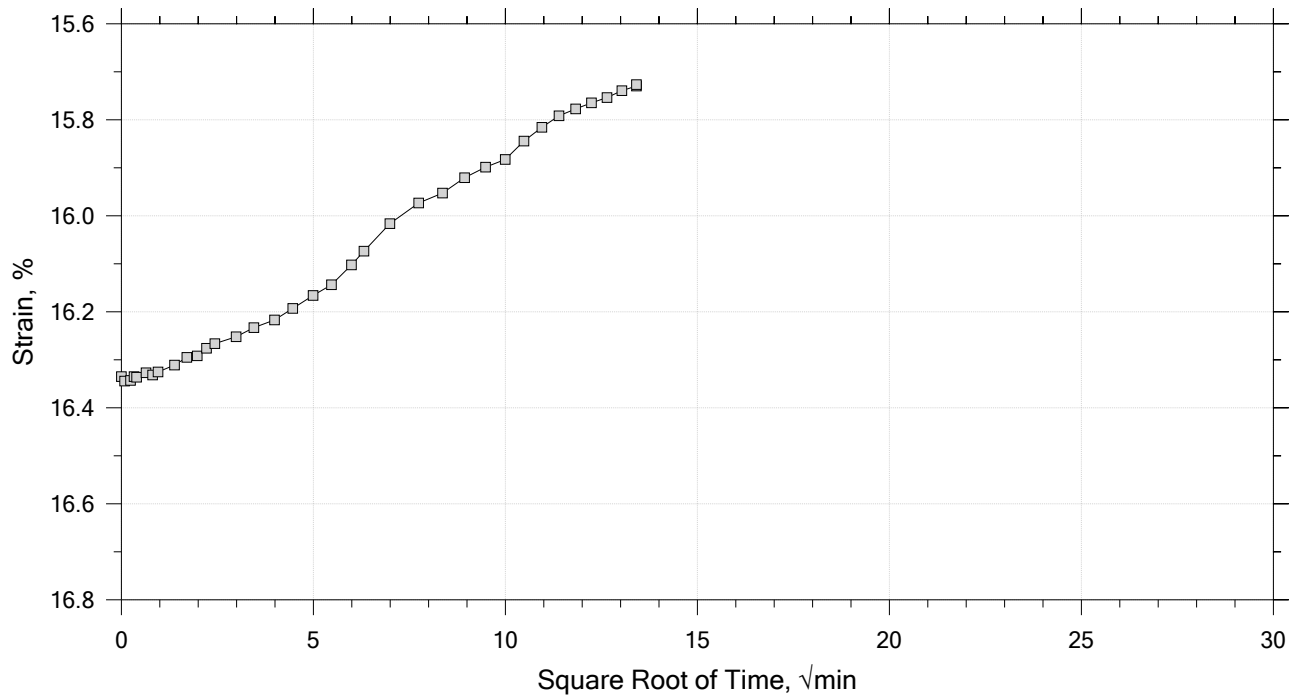
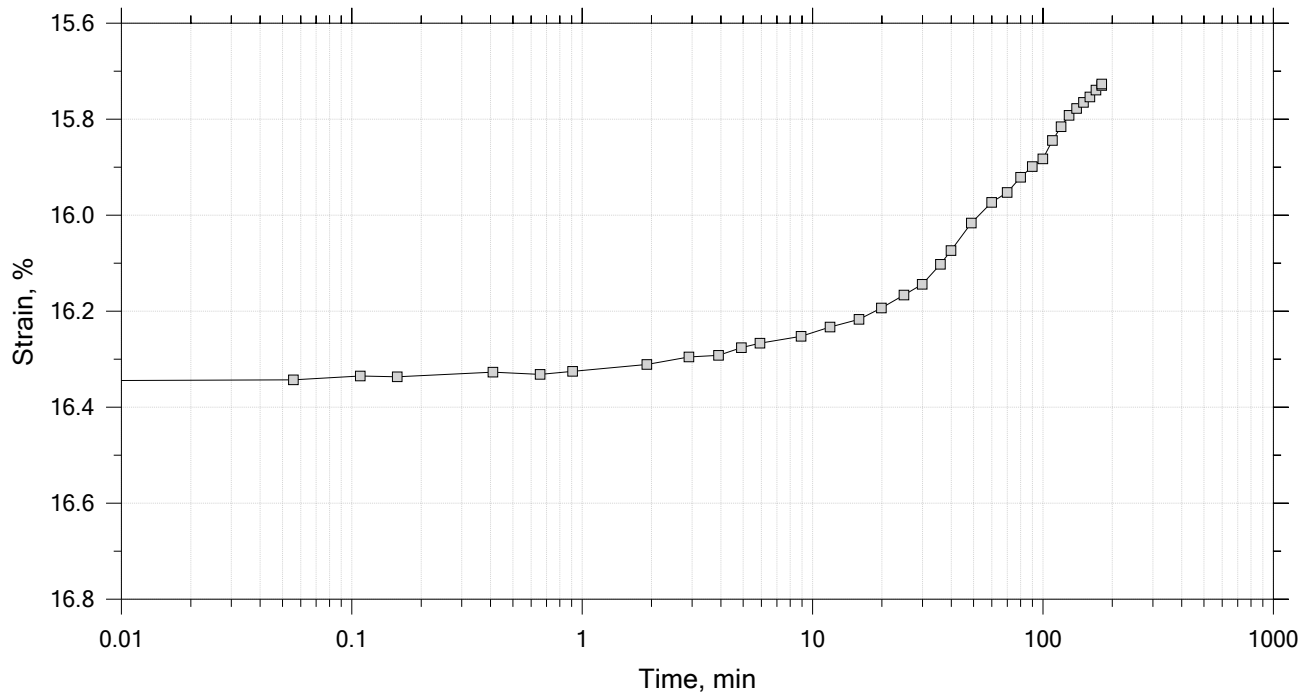
	Project: Rt-9/I-395 Connector	Location: Brewer, ME	Project No.: GTX-308853
	Boring No.: HB BFB-101	Tested By: md/trm	Checked By: mcm
	Sample No.: 1-U	Test Date: 9/27/18	Depth: 5-7
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System E, Swell Pressure = 0.0668 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 15 of 15

Constant Load Step

Stress: 0.0625 tsf




	Project: Rt-9/I-395 Connector	Location: Brewer, ME	Project No.: GTX-308853
	Boring No.: HB BFB-101	Tested By: md/trm	Checked By: mcm
	Sample No.: 1-U	Test Date: 9/27/18	Depth: 5-7
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System E, Swell Pressure = 0.0668 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Specimen Diameter: 2.50 in	Estimated Specific Gravity: 2.77	Liquid Limit: 41
Initial Height: 1.00 in	Initial Void Ratio: 1.14	Plastic Limit: 22
Final Height: 0.84 in	Final Void Ratio: 0.806	Plasticity Index: 19

	Before Test Trimmings	Before Test Specimen	After Test Specimen	After Test Trimmings
Container ID	C110	RING		15910
Mass Container, gm	8.31	109.47	109.47	8.53
Mass Container + Wet Soil, gm	117.88	253.28	243.75	141.37
Mass Container + Dry Soil, gm	88.51	213.51	213.51	111.45
Mass Dry Soil, gm	80.2	104.04	104.04	102.92
Water Content, %	36.62	38.23	29.07	29.07
Void Ratio	---	1.14	0.81	---
Degree of Saturation, %	---	92.73	100.00	---
Dry Unit Weight, pcf	---	80.74	95.808	---


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: Rt-9/I-395 Connector	Location: Brewer, ME	Project No.: GTX-308853
	Boring No.: HB BFB-101	Tested By: md/trm	Checked By: mcm
	Sample No.: 1-U	Test Date: 9/27/18	Depth: 5-7
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System E, Swell Pressure = 0.0668 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Log of Time Coefficients


[illegible]

	Project: Rt-9/I-395 Connector	Location: Brewer, ME	Project No.: GTX-308853
	Boring No.: HB BFB-101	Tested By: md/trm	Checked By: mcm
	Sample No.: 1-U	Test Date: 9/27/18	Depth: 5-7
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System E, Swell Pressure = 0.0668 tsf		
	Displacement at End of Increment		

One-Dimensional Consolidation by ASTM D2435 - Method B

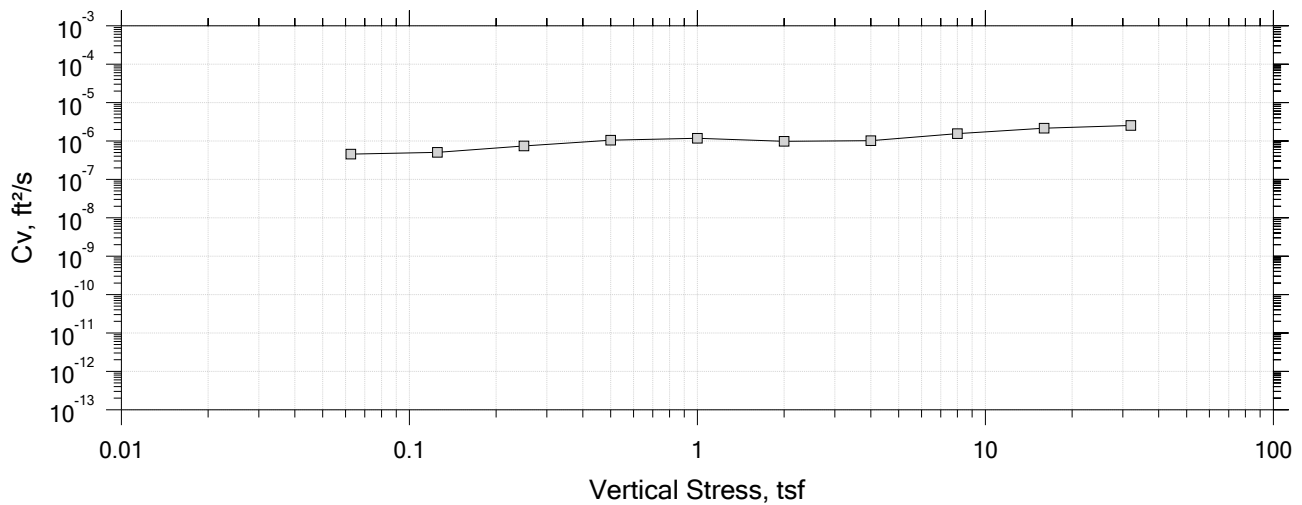
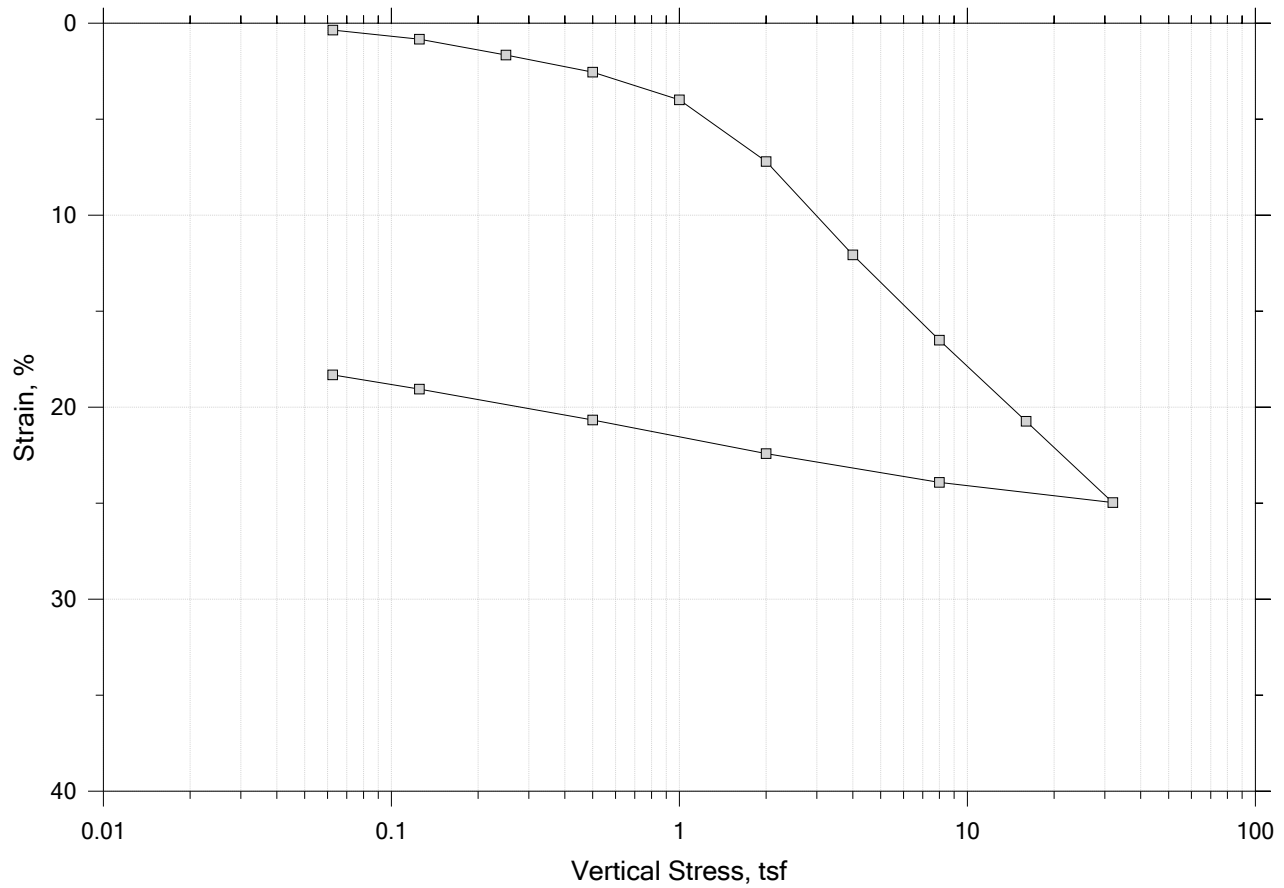
Square Root of Time Coefficients


[illegible]

	Project: Rt-9/I-395 Connector	Location: Brewer, ME	Project No.: GTX-308853
	Boring No.: HB BFB-101	Tested By: md/trm	Checked By: mcm
	Sample No.: 1-U	Test Date: 9/27/18	Depth: 5-7
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System E, Swell Pressure = 0.0668 tsf		
	Displacement at End of Increment		

One-Dimensional Consolidation by ASTM D2435 - Method B

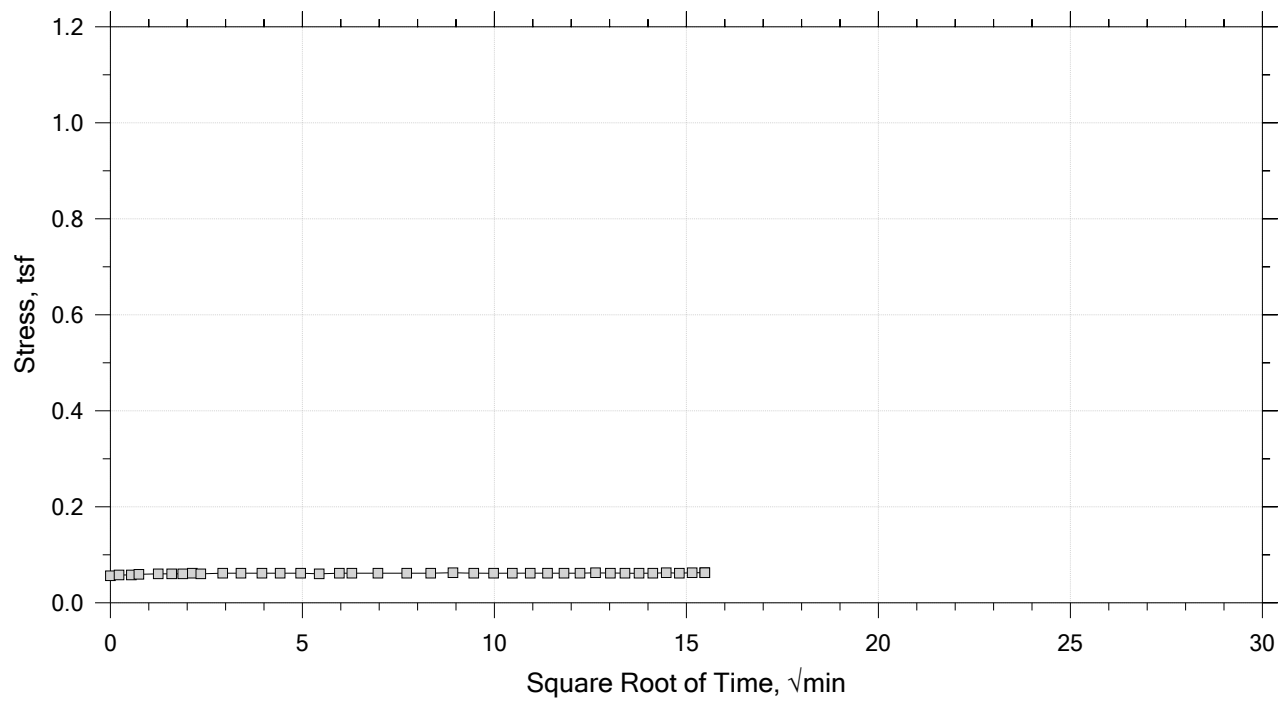
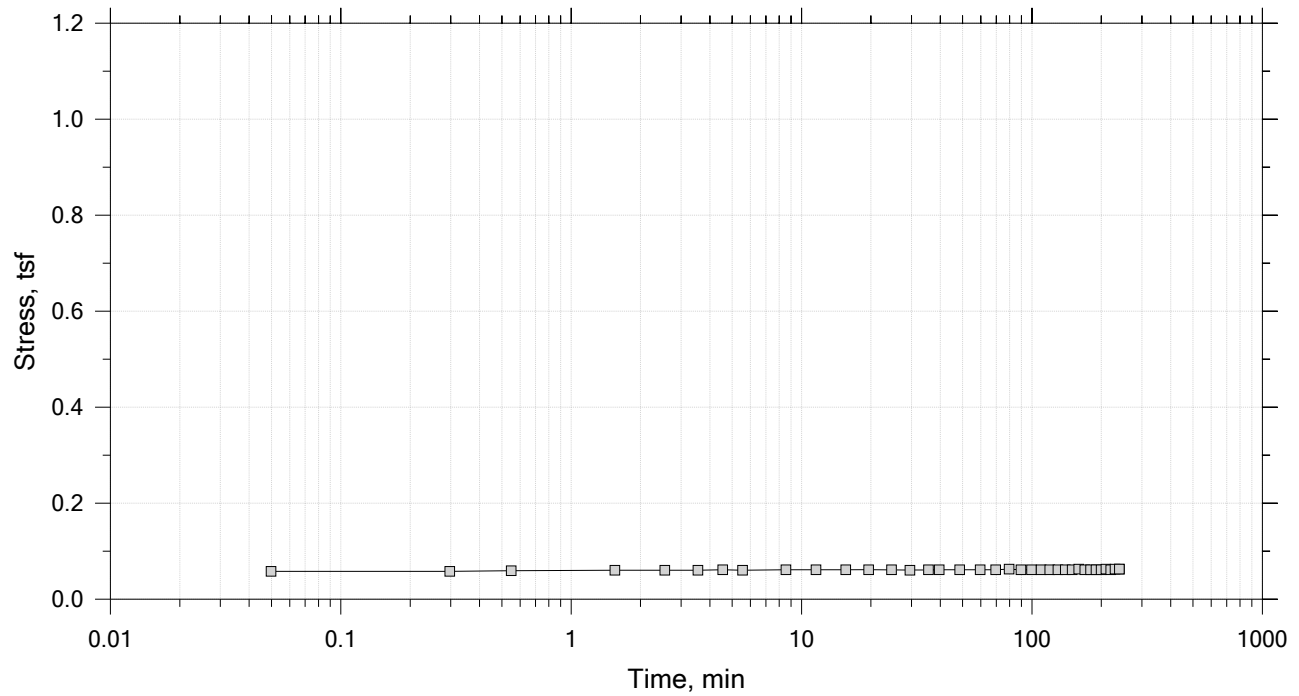
Summary Report




	Project: Rt 9/I-395 Connector	Location: Brewer, ME	Project No.: GTX-308853
	Boring No.: HB- BFB-101	Tested By: md	Checked By: mcm
	Sample No.: 2U	Test Date: 09/26/18	Depth: 12-14 ft
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Wet, very dark greenish gray clay		
	Remarks: System T, Swell Pressure = 0.0626 tsf		
	Displacement at End of Increment		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 1 of 15
Constant Volume Step
Stress: 0.0626 tsf



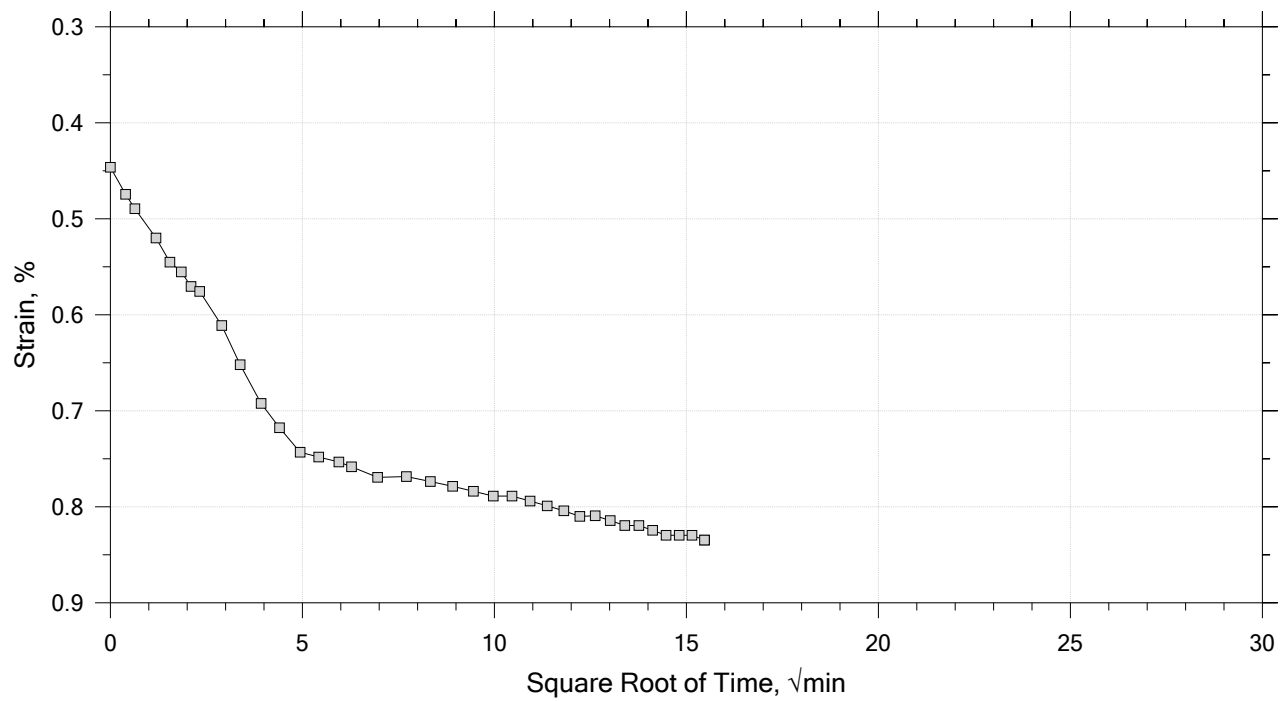
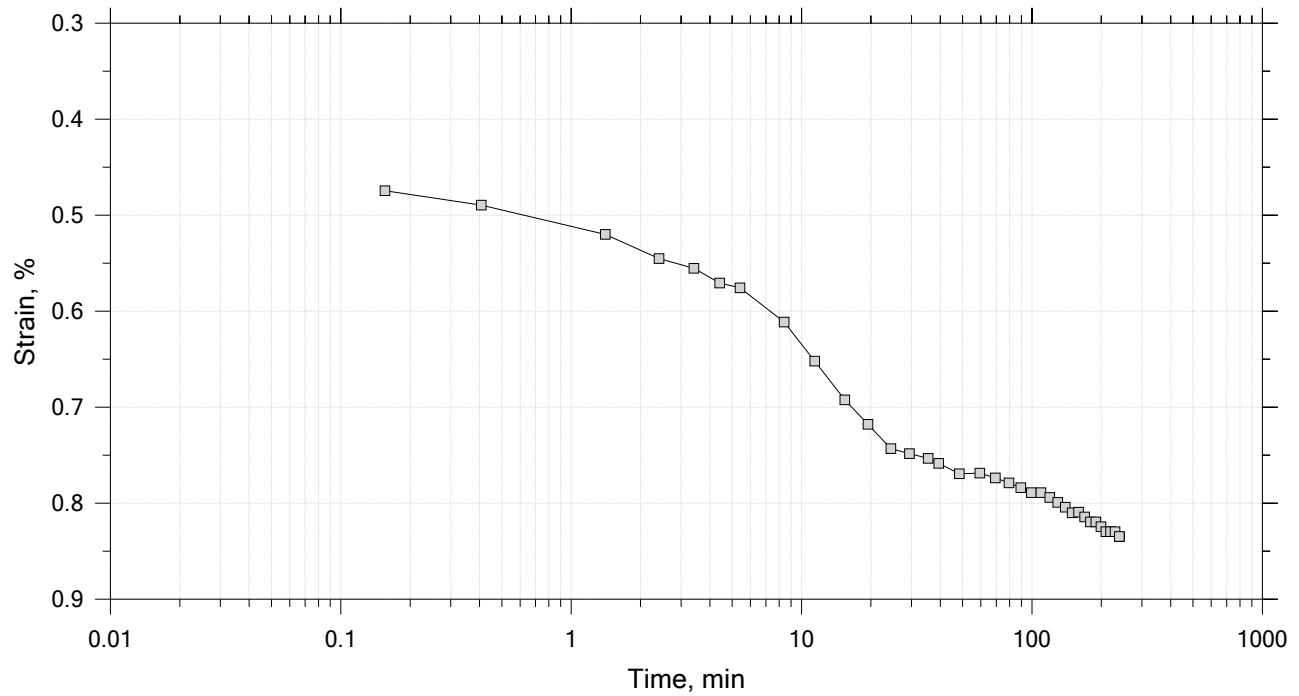
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	Boring No.: HB- BFB-101	Tested By: md	Checked By: mcm
	Sample No.: 2U	Test Date: 09/26/18	Depth: 12-14 ft
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Wet, very dark greenish gray clay		
	Remarks: System T, Swell Pressure = 0.0626 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 2 of 15

Constant Load Step

Stress: 0.125 tsf



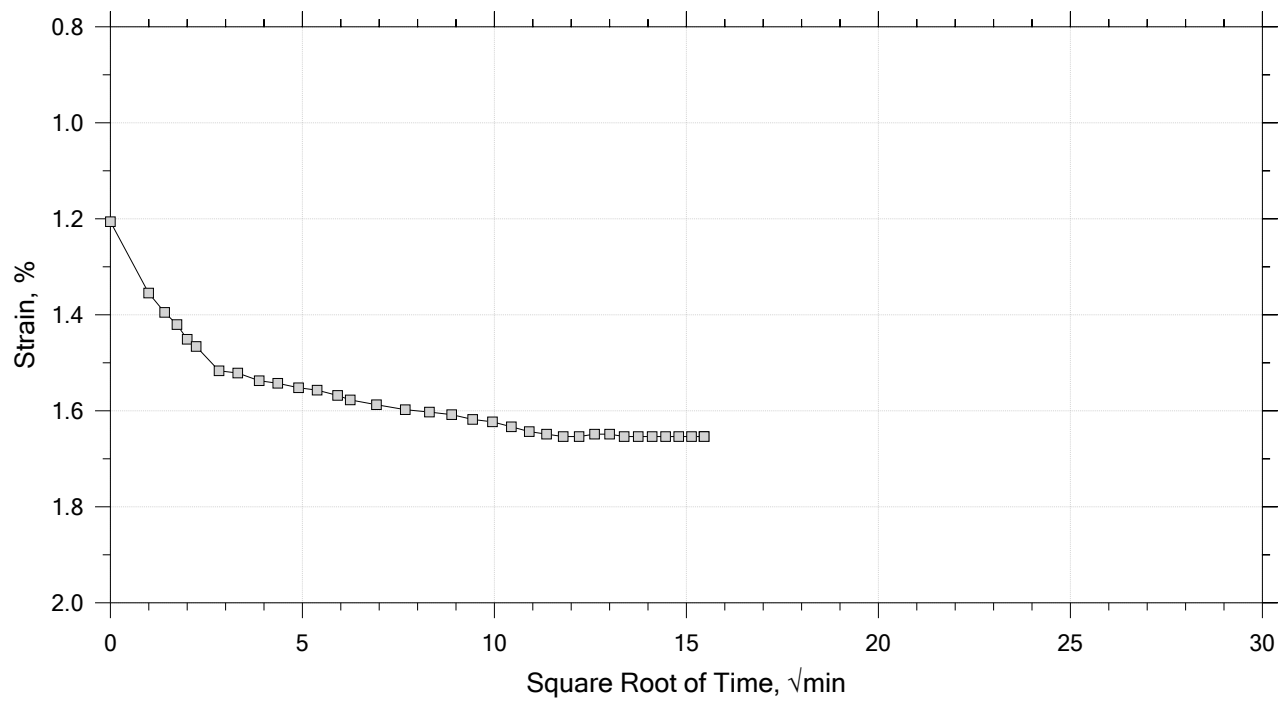
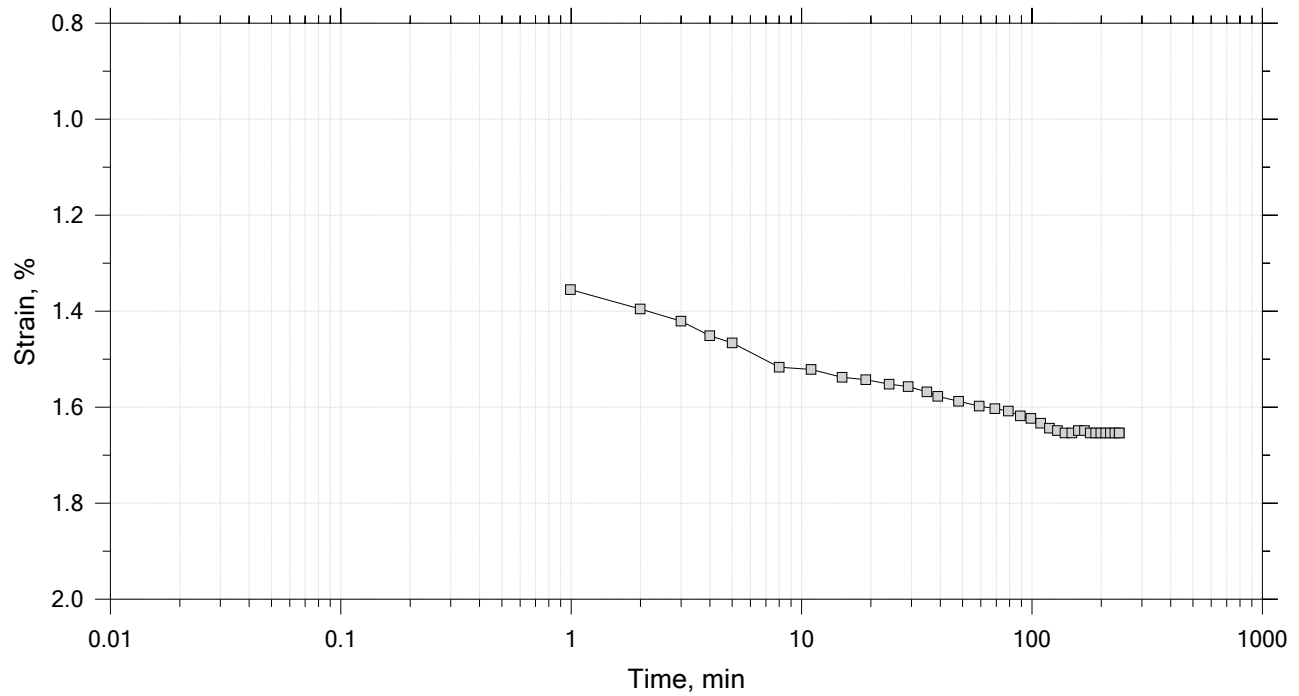
	Project: Rt 9/I-395 Connector	Location: Brewer, ME	Project No.: GTX-308853
	Boring No.: HB- BFB-101	Tested By: md	Checked By: mcm
	Sample No.: 2U	Test Date: 09/26/18	Depth: 12-14 ft
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Wet, very dark greenish gray clay		
	Remarks: System T, Swell Pressure = 0.0626 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 3 of 15

Constant Load Step

Stress: 0.25 tsf



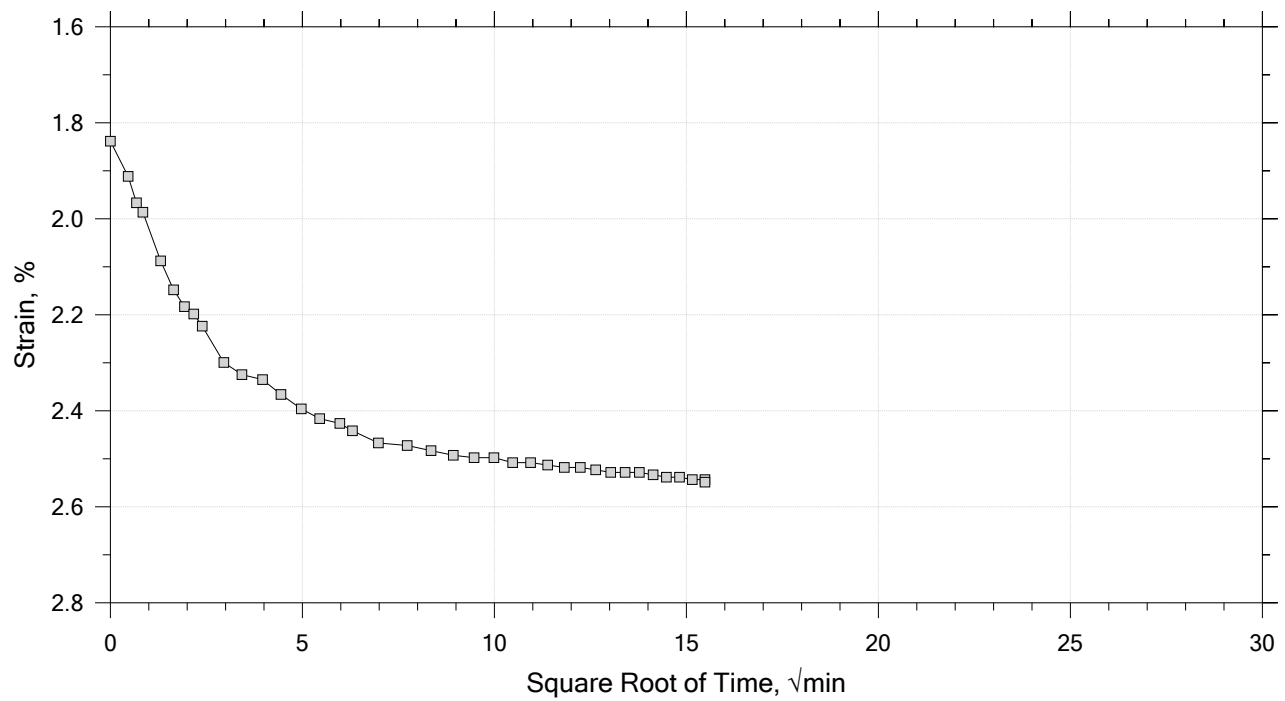
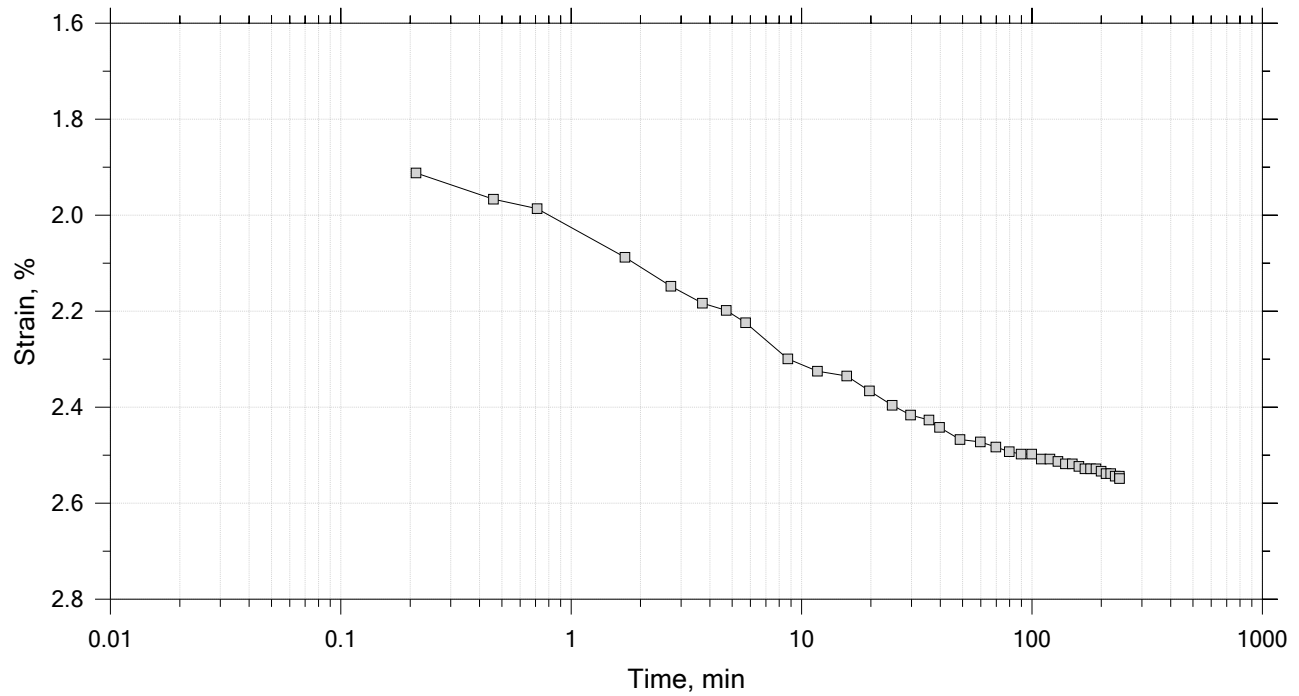
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	Boring No.: HB- BFB-101	Tested By: md	Checked By: mcm
	Sample No.: 2U	Test Date: 09/26/18	Depth: 12-14 ft
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Wet, very dark greenish gray clay		
	Remarks: System T, Swell Pressure = 0.0626 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 4 of 15

Constant Load Step

Stress: 0.5 tsf



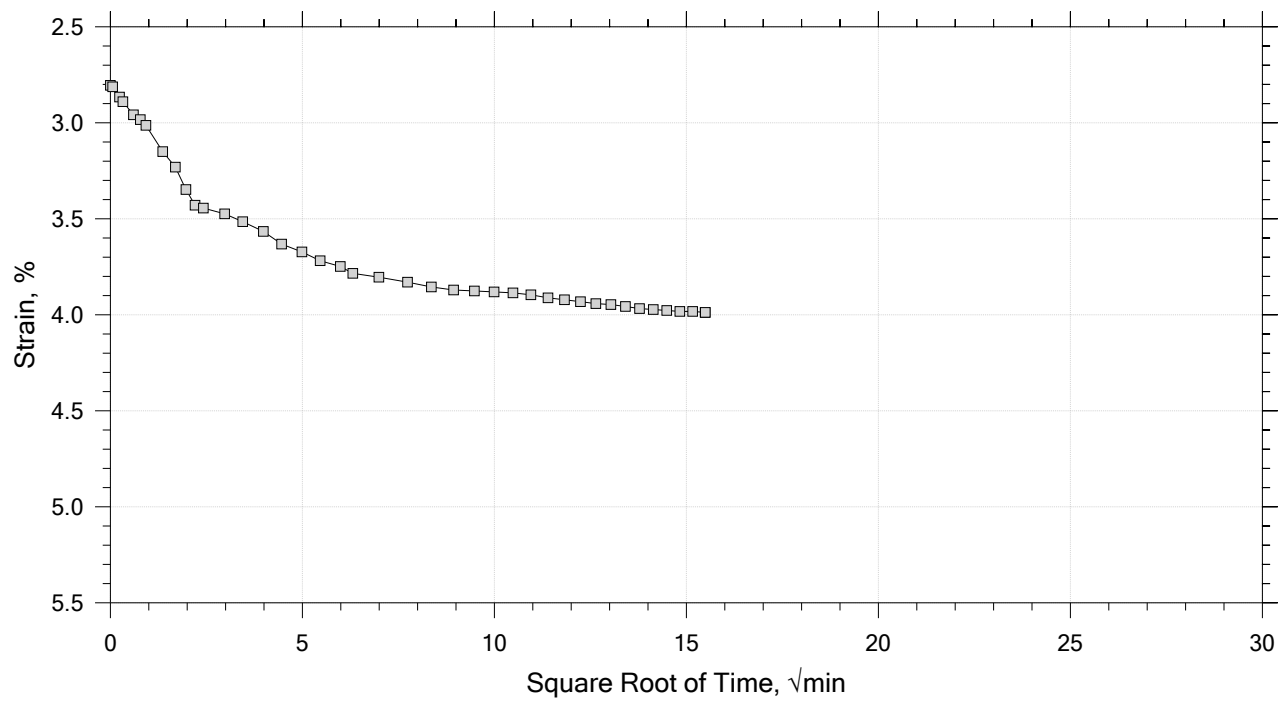
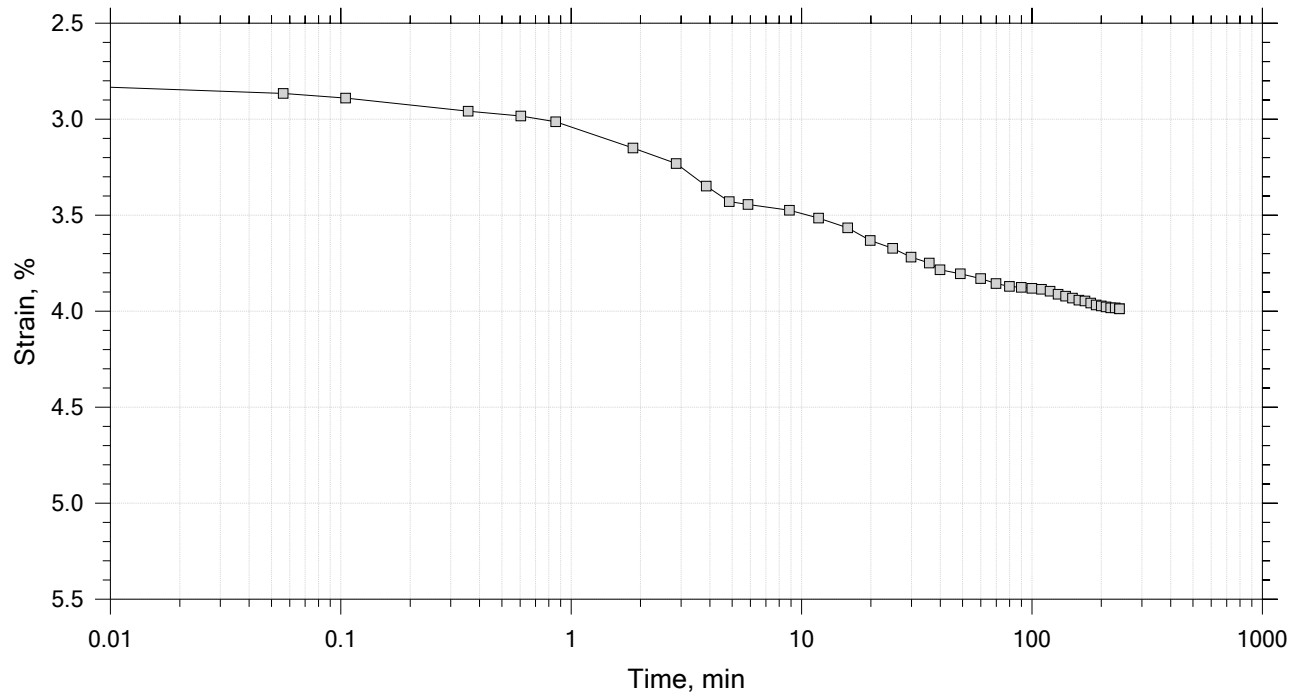
	Project: Rt 9/I-395 Connector	Location: Brewer, ME	Project No.: GTX-308853
	Boring No.: HB- BFB-101	Tested By: md	Checked By: mcm
	Sample No.: 2U	Test Date: 09/26/18	Depth: 12-14 ft
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Wet, very dark greenish gray clay		
	Remarks: System T, Swell Pressure = 0.0626 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 5 of 15

Constant Load Step

Stress: 1 tsf



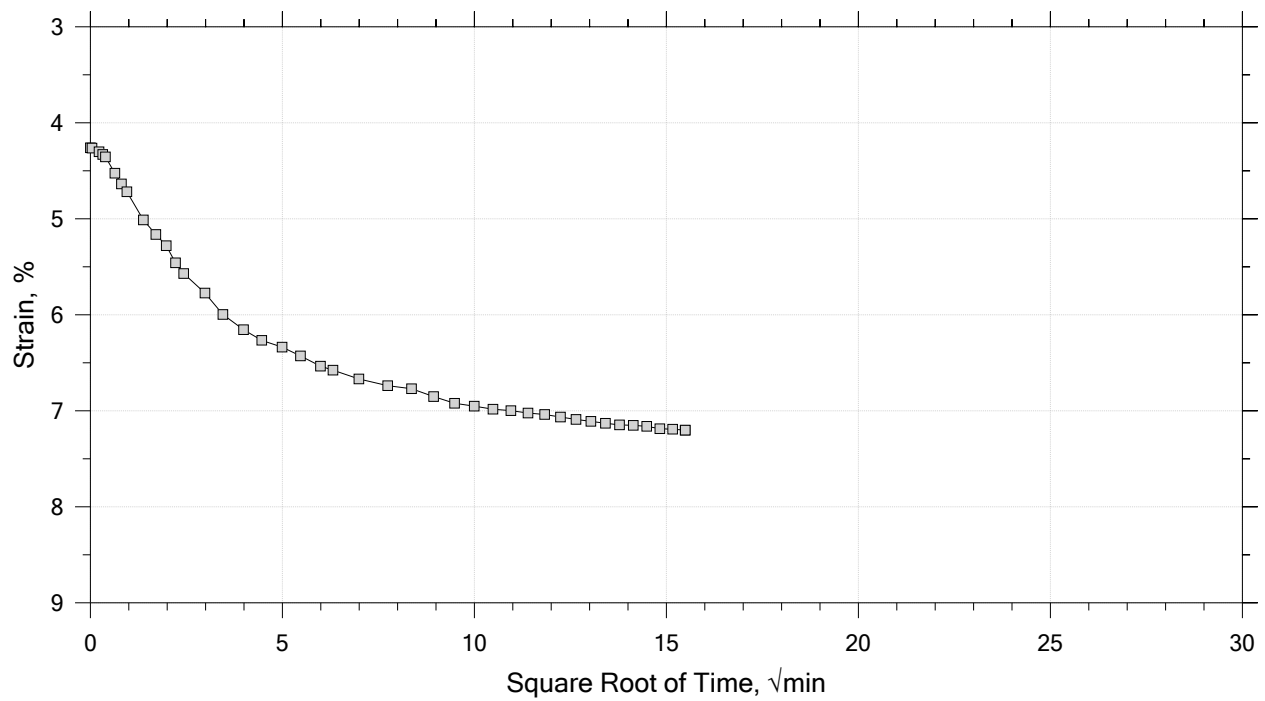
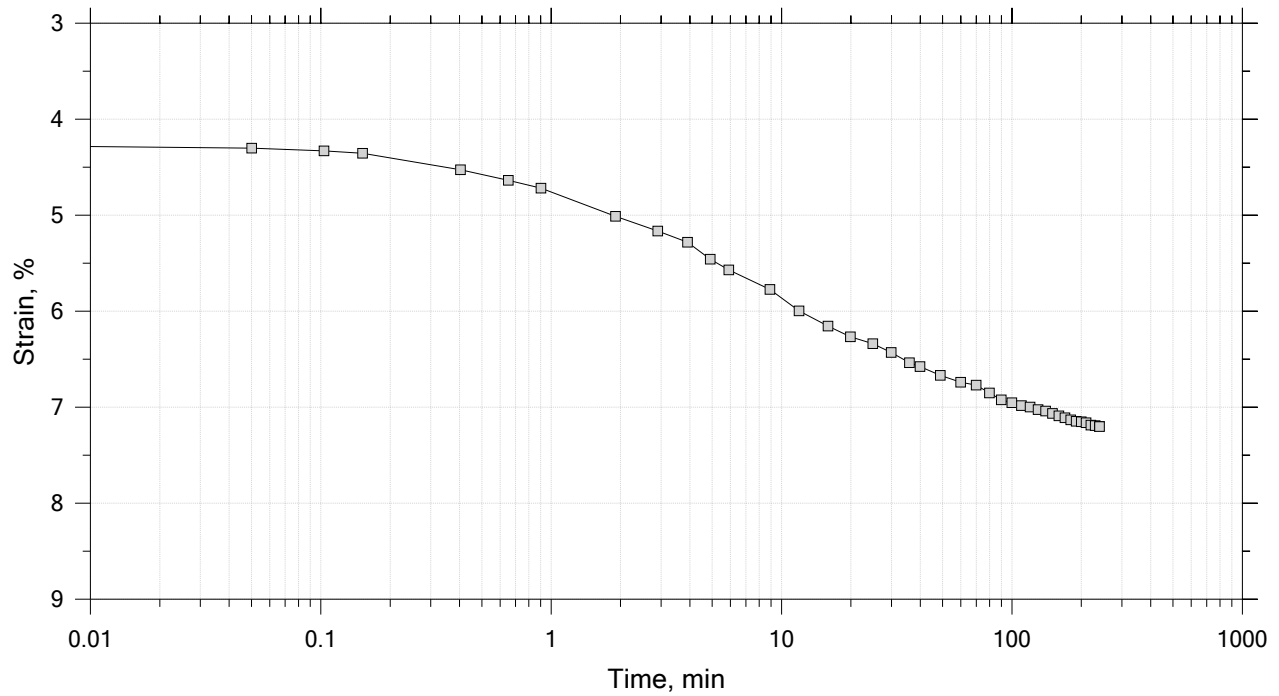
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	Boring No.: HB- BFB-101	Tested By: md	Checked By: mcm
	Sample No.: 2U	Test Date: 09/26/18	Depth: 12-14 ft
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Wet, very dark greenish gray clay		
	Remarks: System T, Swell Pressure = 0.0626 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 6 of 15

Constant Load Step

Stress: 2 tsf



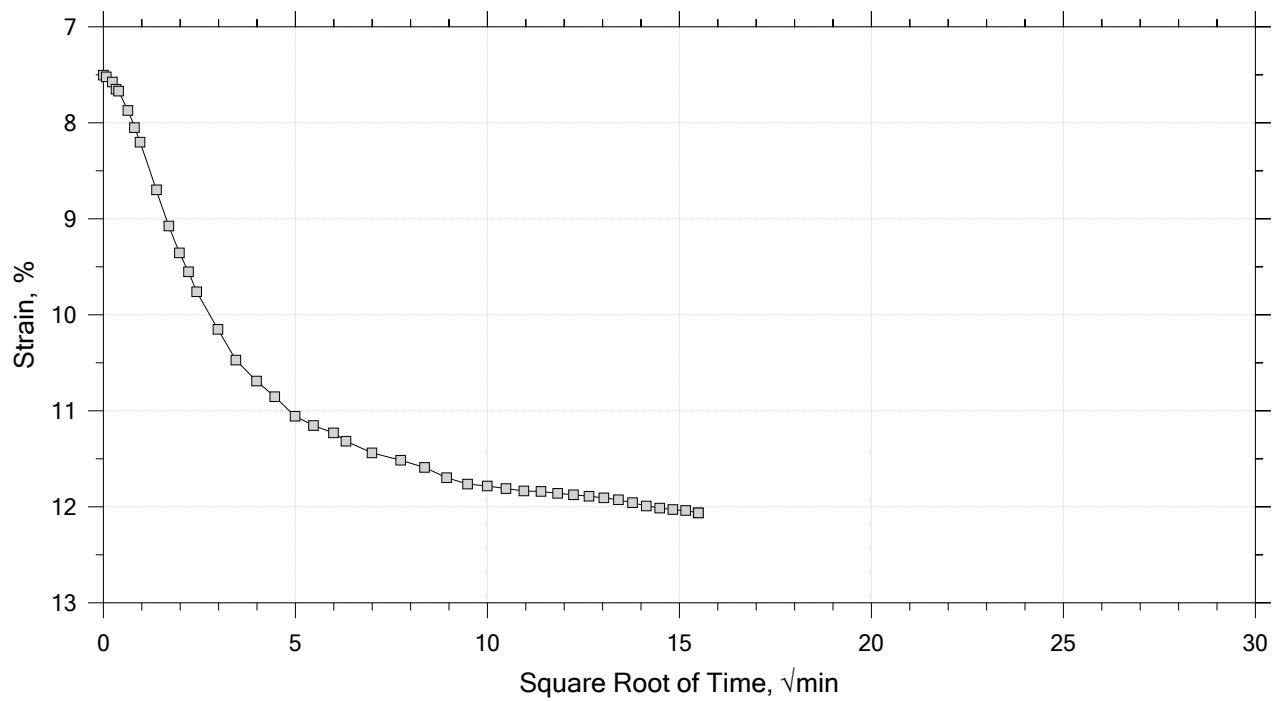
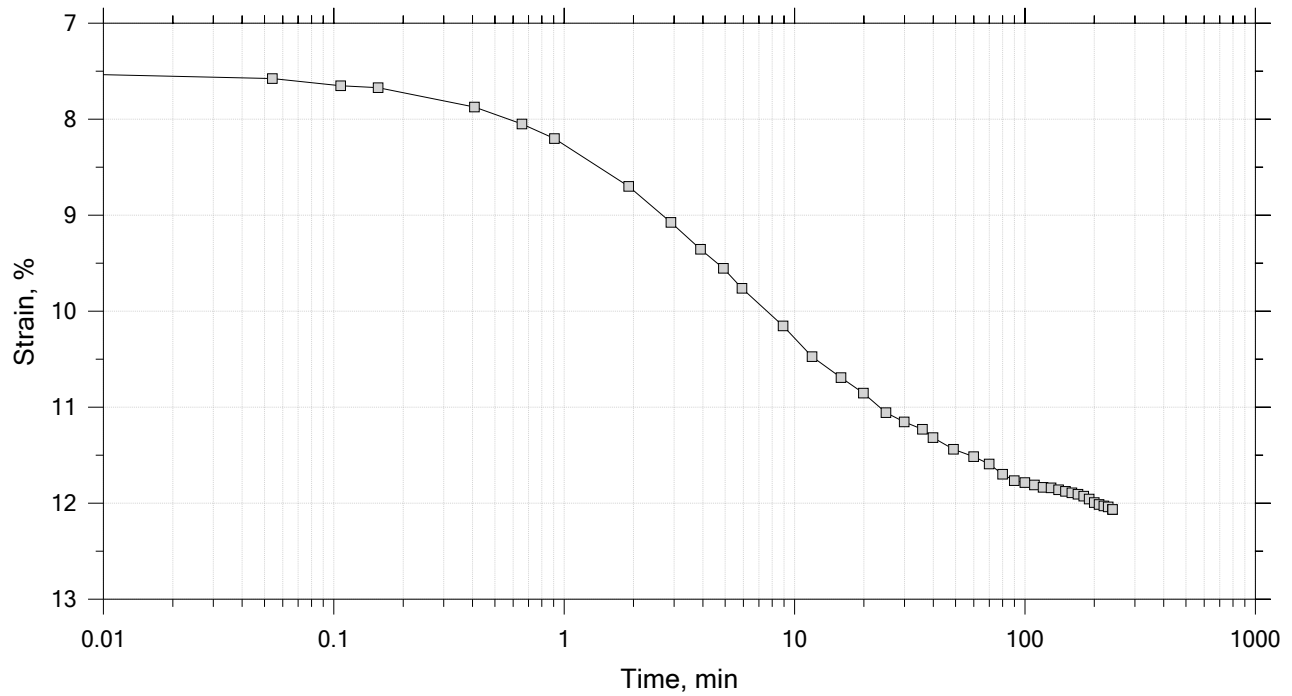
	Project: Rt 9/I-395 Connector	Location: Brewer, ME	Project No.: GTX-308853
	Boring No.: HB- BFB-101	Tested By: md	Checked By: mcm
	Sample No.: 2U	Test Date: 09/26/18	Depth: 12-14 ft
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Wet, very dark greenish gray clay		
	Remarks: System T, Swell Pressure = 0.0626 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 7 of 15

Constant Load Step

Stress: 4 tsf



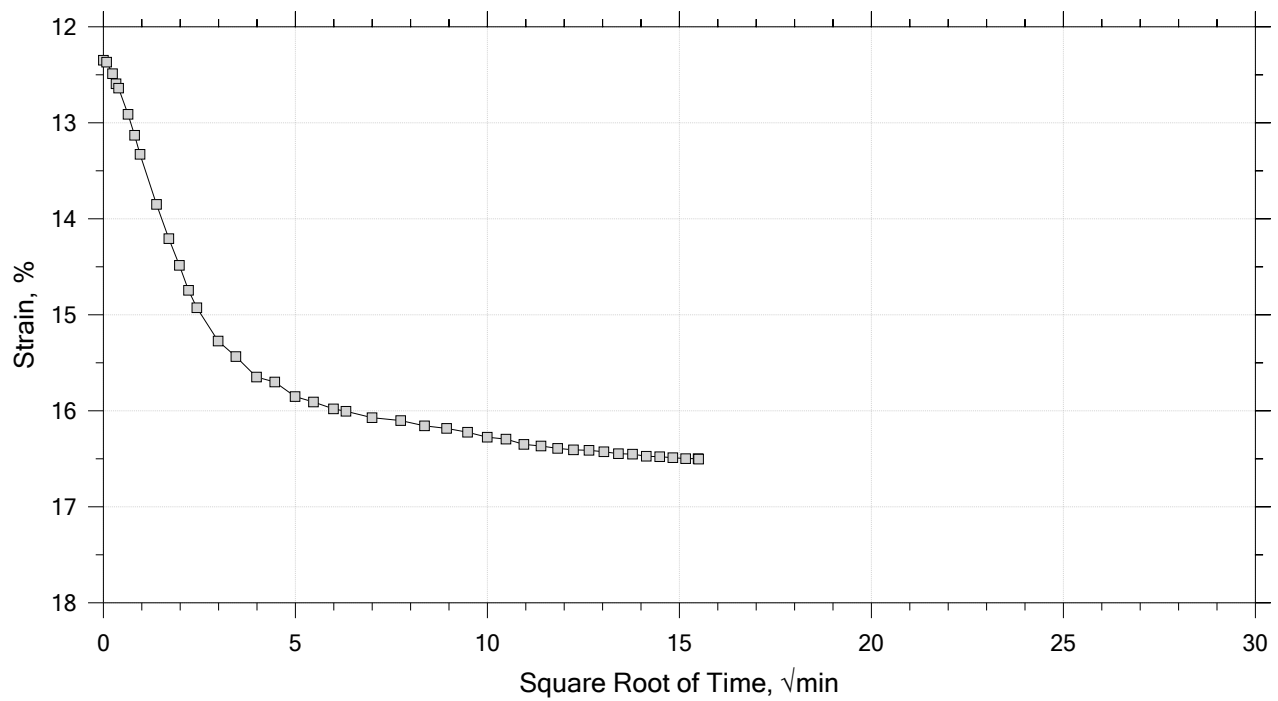
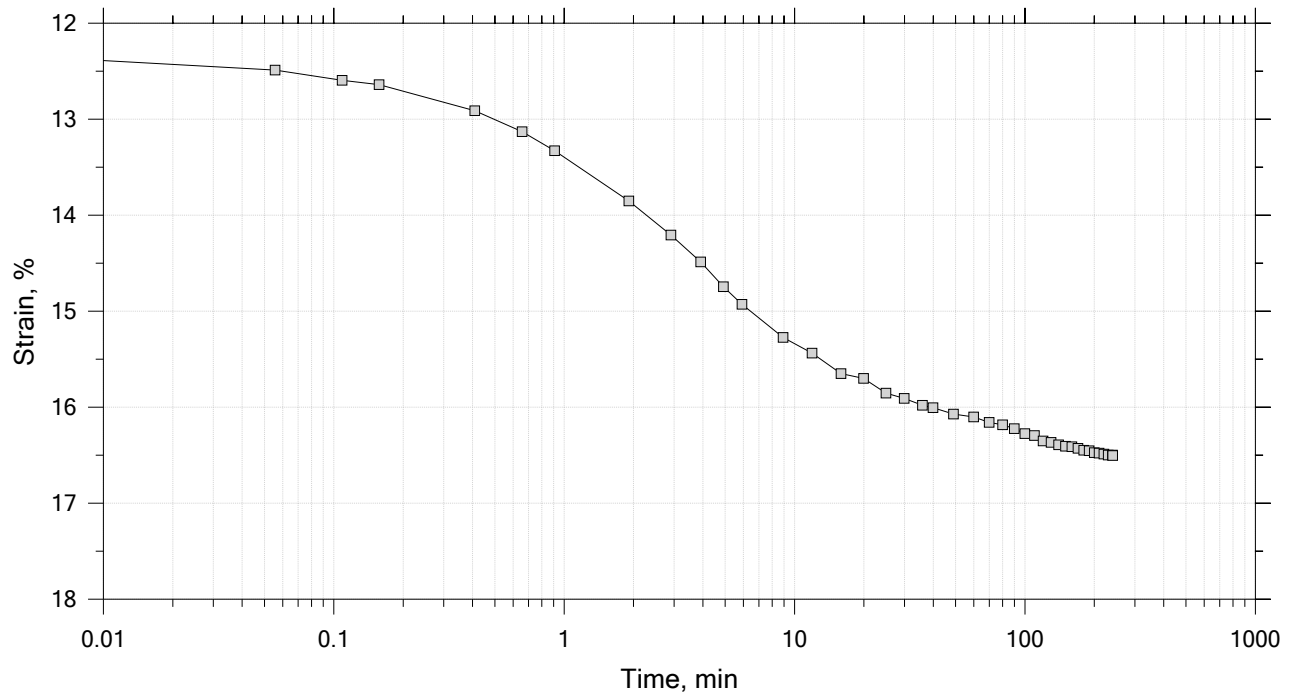
	Project: Rt 9/I-395 Connector	Location: Brewer, ME	Project No.: GTX-308853
	Boring No.: HB- BFB-101	Tested By: md	Checked By: mcm
	Sample No.: 2U	Test Date: 09/26/18	Depth: 12-14 ft
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Wet, very dark greenish gray clay		
	Remarks: System T, Swell Pressure = 0.0626 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 8 of 15

Constant Load Step

Stress: 8 tsf



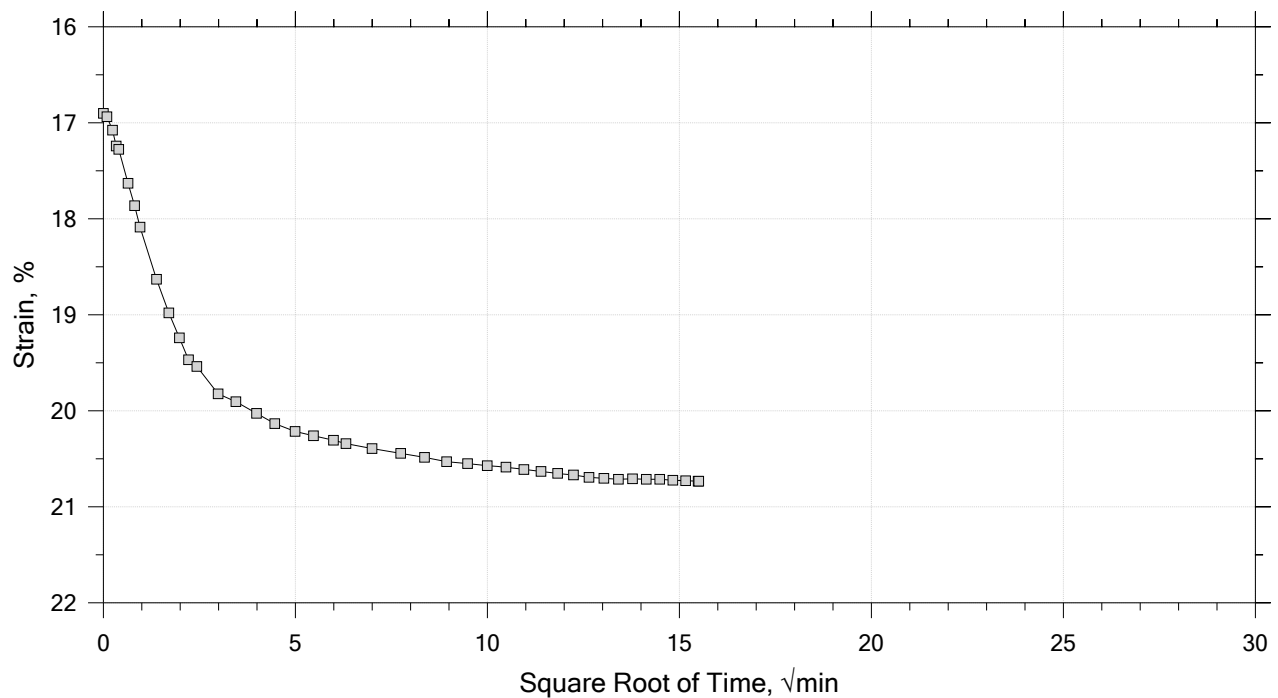
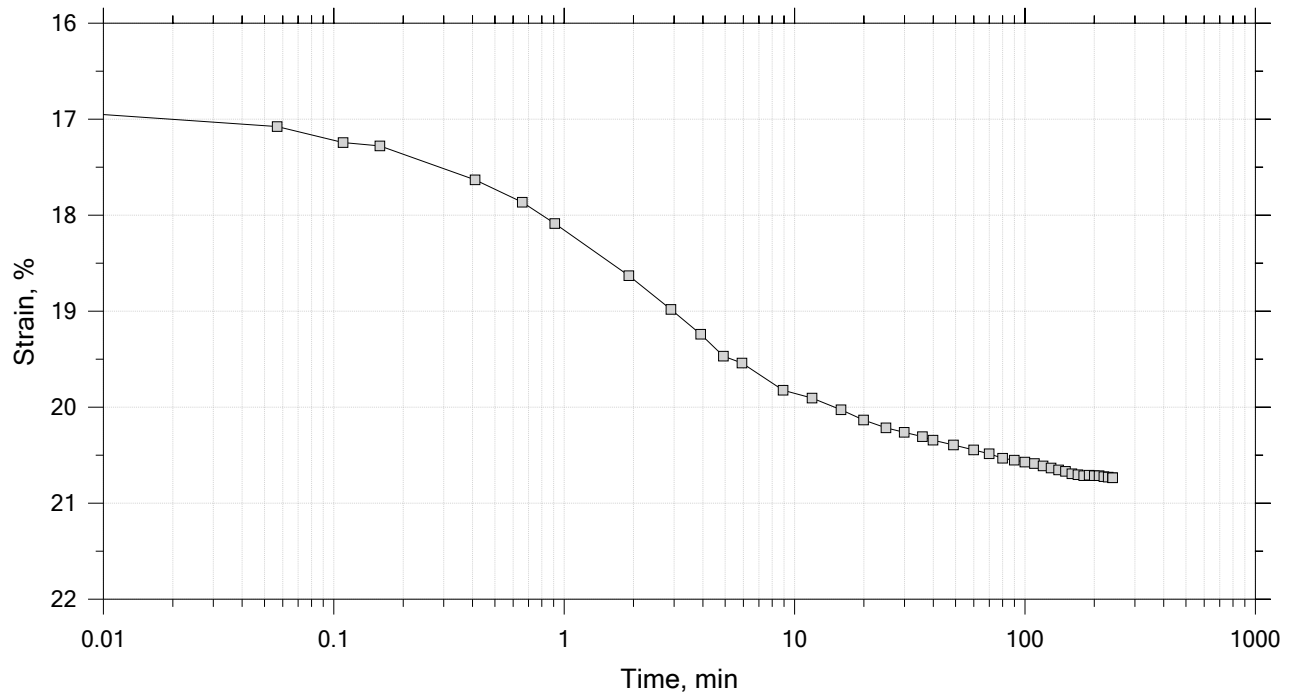
	Project: Rt 9/I-395 Connector	Location: Brewer, ME	Project No.: GTX-308853
	Boring No.: HB- BFB-101	Tested By: md	Checked By: mcm
	Sample No.: 2U	Test Date: 09/26/18	Depth: 12-14 ft
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Wet, very dark greenish gray clay		
	Remarks: System T, Swell Pressure = 0.0626 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 9 of 15

Constant Load Step

Stress: 16 tsf



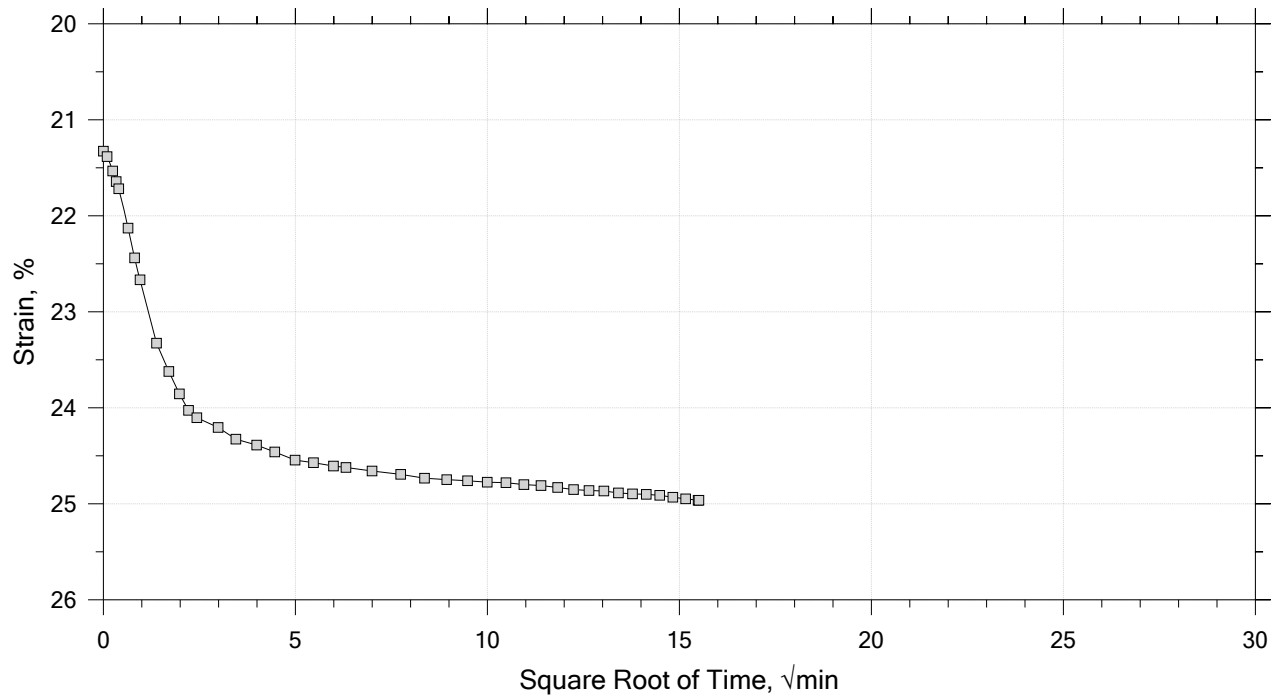
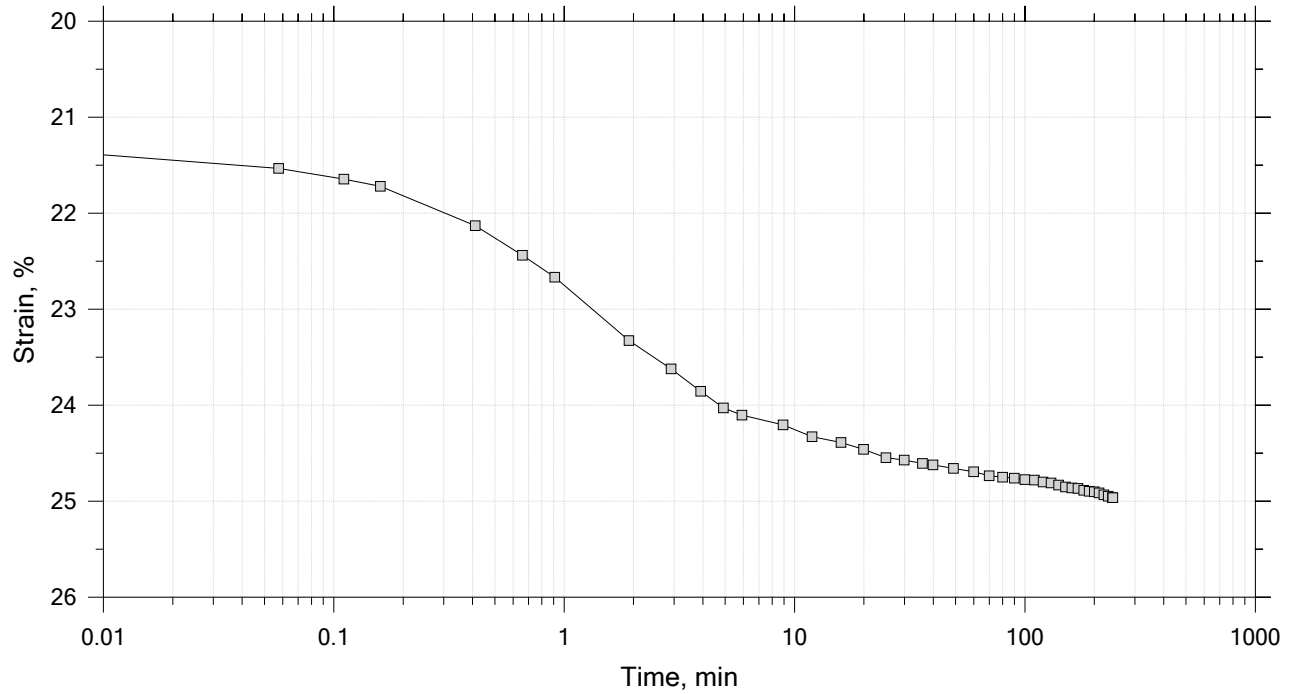
	Project: Rt 9/I-395 Connector	Location: Brewer, ME	Project No.: GTX-308853
	Boring No.: HB- BFB-101	Tested By: md	Checked By: mcm
	Sample No.: 2U	Test Date: 09/26/18	Depth: 12-14 ft
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Wet, very dark greenish gray clay		
	Remarks: System T, Swell Pressure = 0.0626 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 10 of 15

Constant Load Step

Stress: 32 tsf



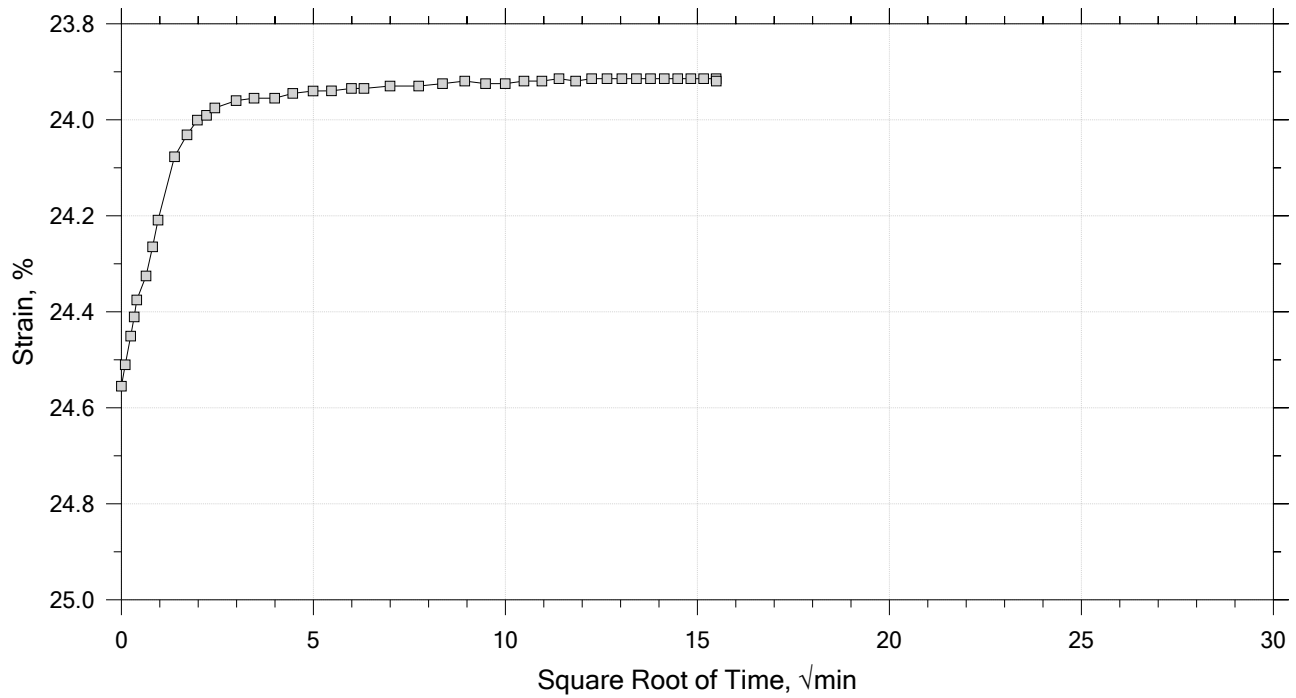
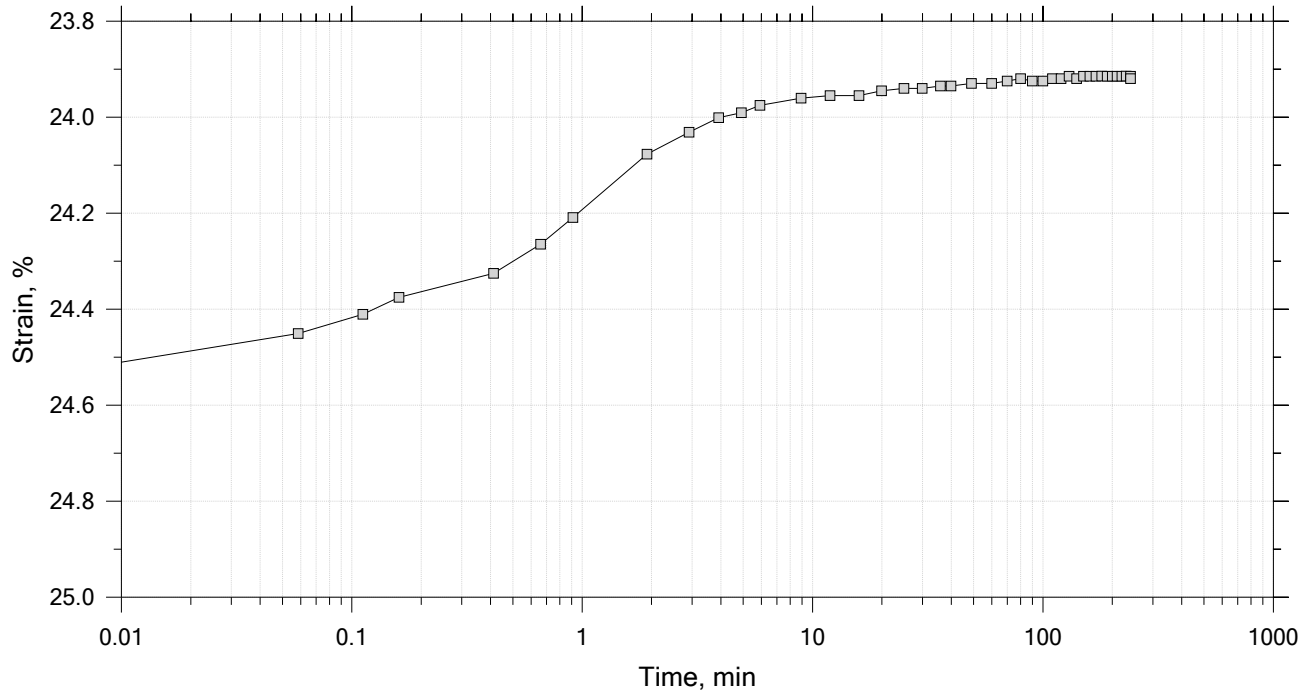
	Project: Rt 9/I-395 Connector	Location: Brewer, ME	Project No.: GTX-308853
	Boring No.: HB- BFB-101	Tested By: md	Checked By: mcm
	Sample No.: 2U	Test Date: 09/26/18	Depth: 12-14 ft
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Wet, very dark greenish gray clay		
	Remarks: System T, Swell Pressure = 0.0626 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 11 of 15

Constant Load Step

Stress: 8 tsf



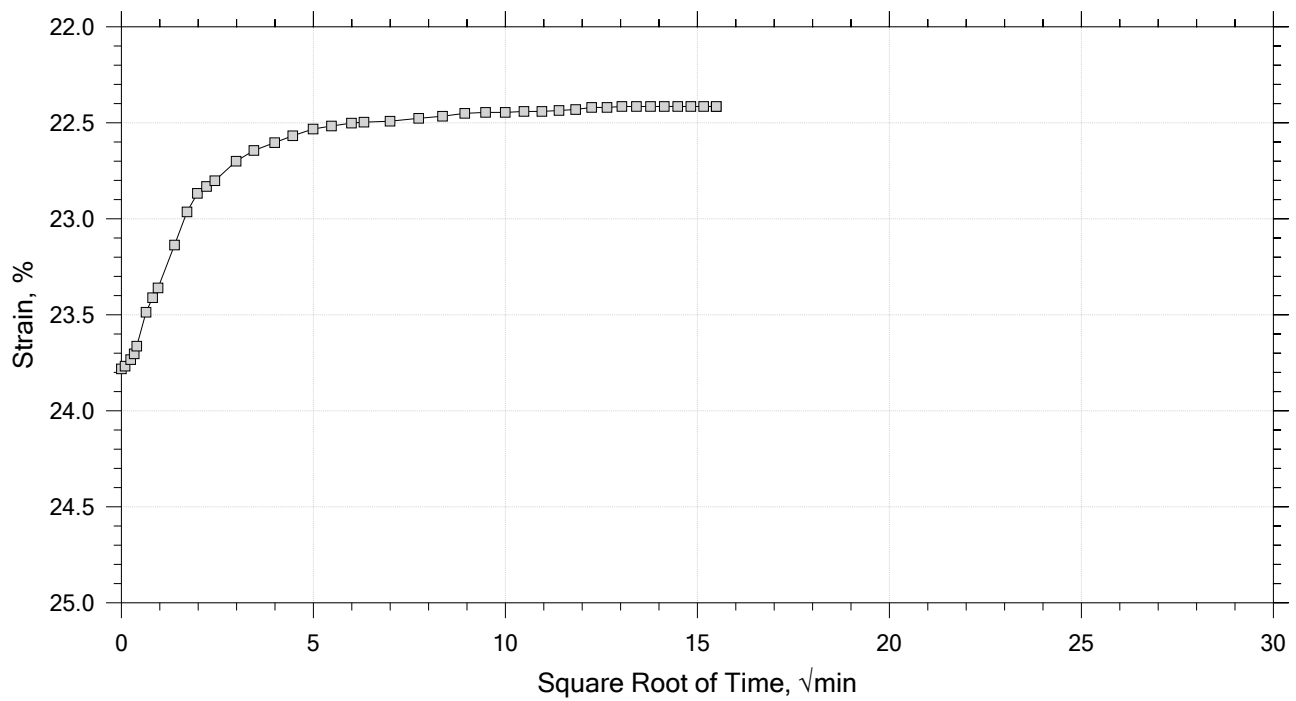
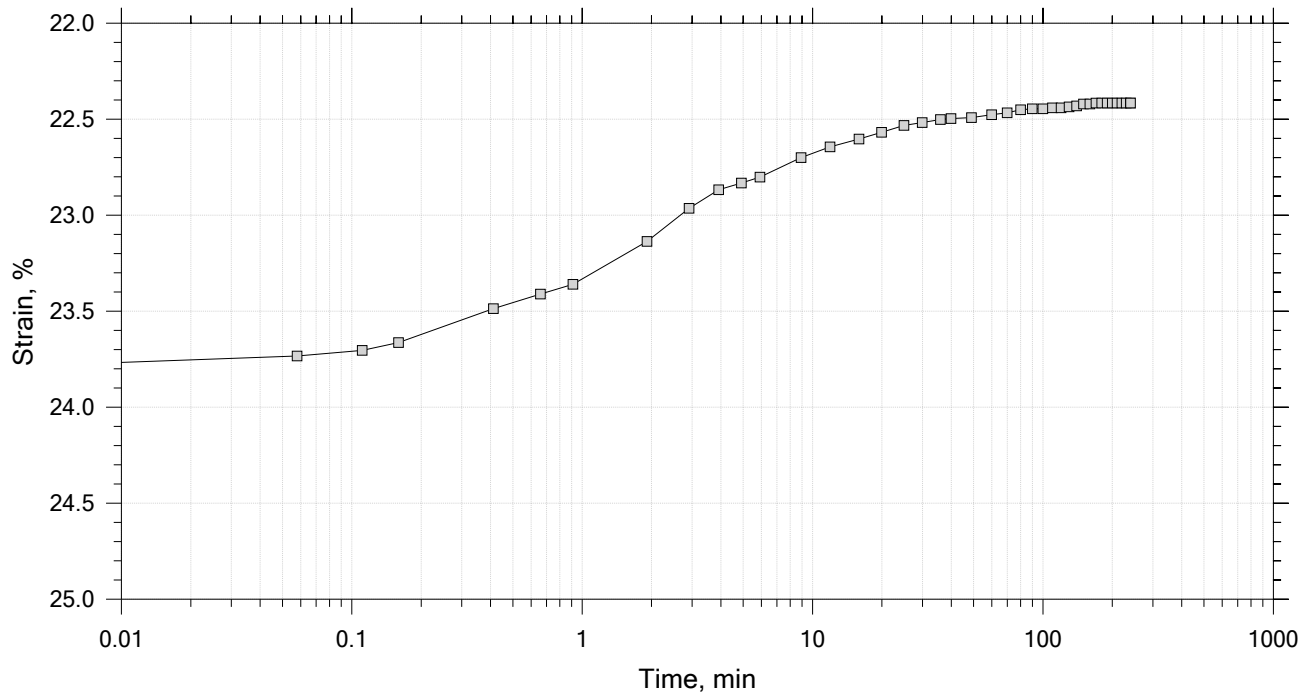
	Project: Rt 9/I-395 Connector	Location: Brewer, ME	Project No.: GTX-308853
	Boring No.: HB- BFB-101	Tested By: md	Checked By: mcm
	Sample No.: 2U	Test Date: 09/26/18	Depth: 12-14 ft
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Wet, very dark greenish gray clay		
	Remarks: System T, Swell Pressure = 0.0626 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 12 of 15

Constant Load Step

Stress: 2 tsf



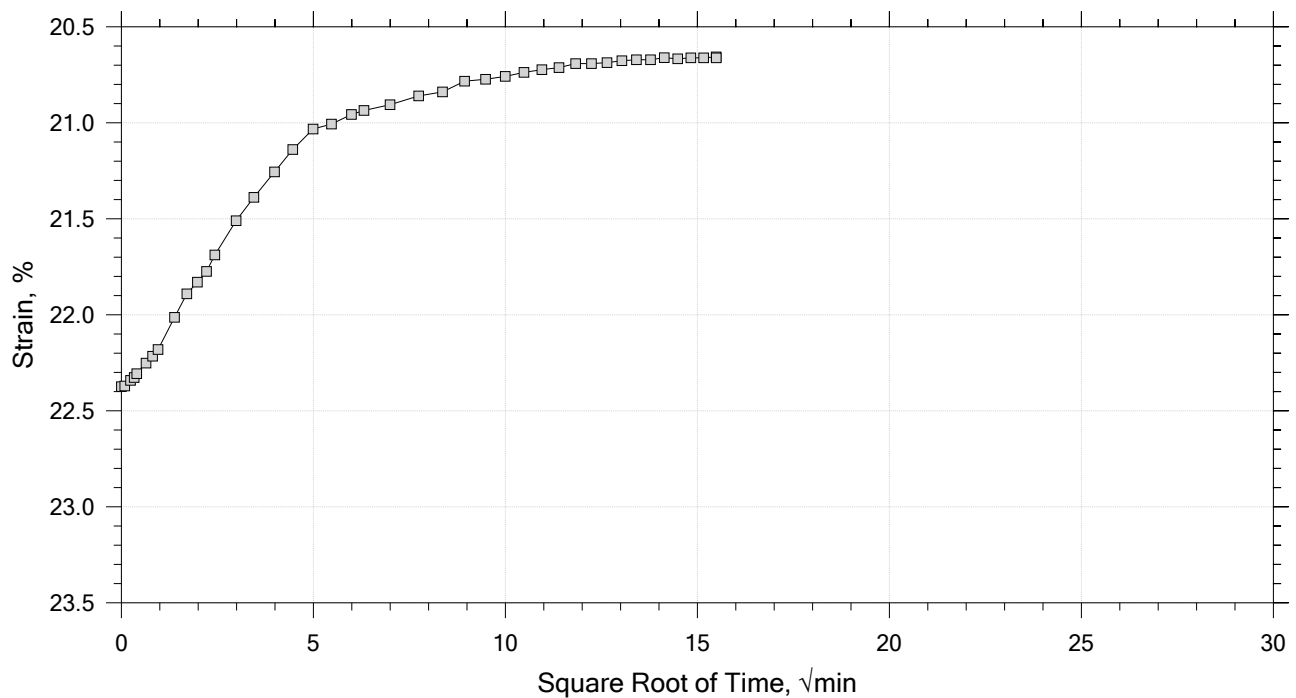
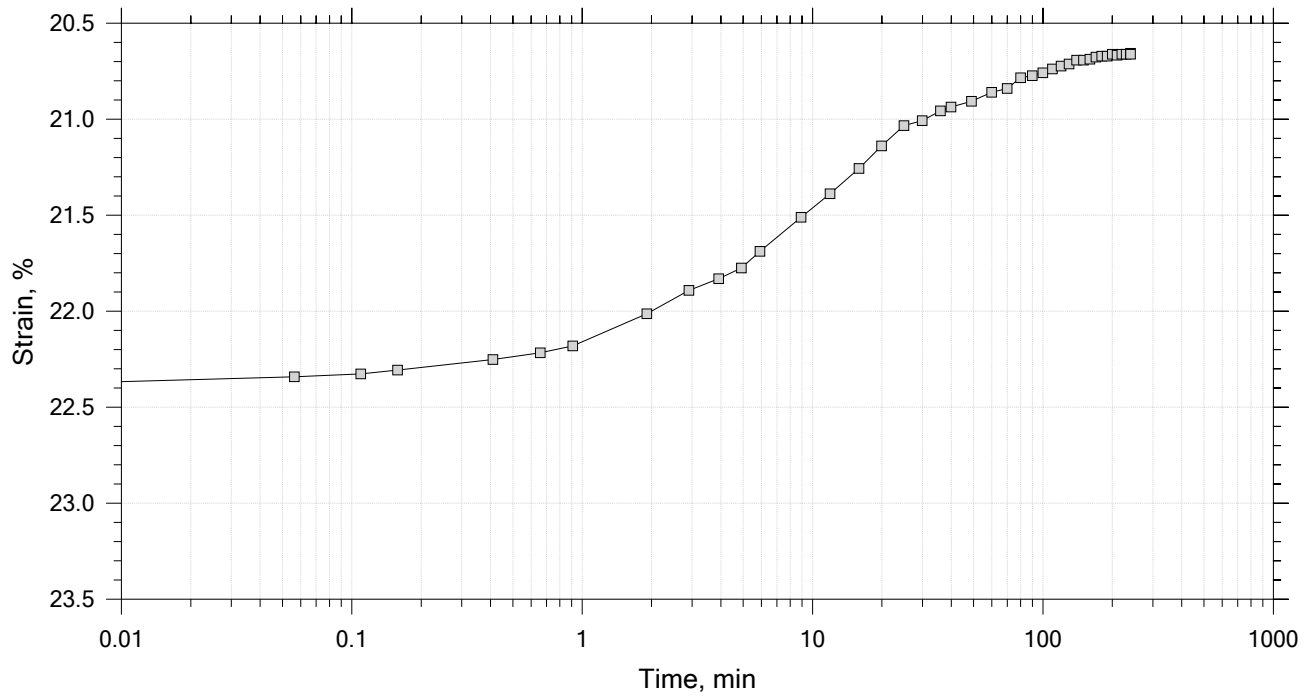
	Project: Rt 9/I-395 Connector	Location: Brewer, ME	Project No.: GTX-308853
	Boring No.: HB- BFB-101	Tested By: md	Checked By: mcm
	Sample No.: 2U	Test Date: 09/26/18	Depth: 12-14 ft
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Wet, very dark greenish gray clay		
	Remarks: System T, Swell Pressure = 0.0626 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 13 of 15

Constant Load Step

Stress: 0.5 tsf



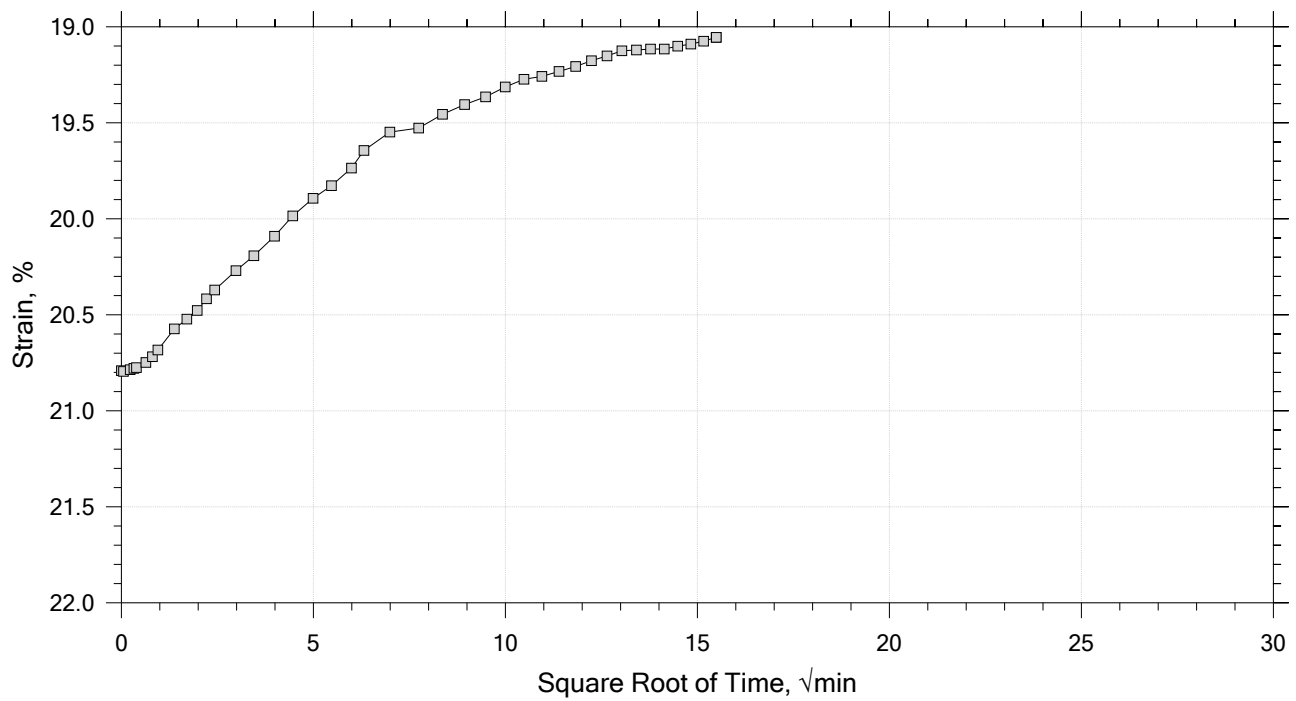
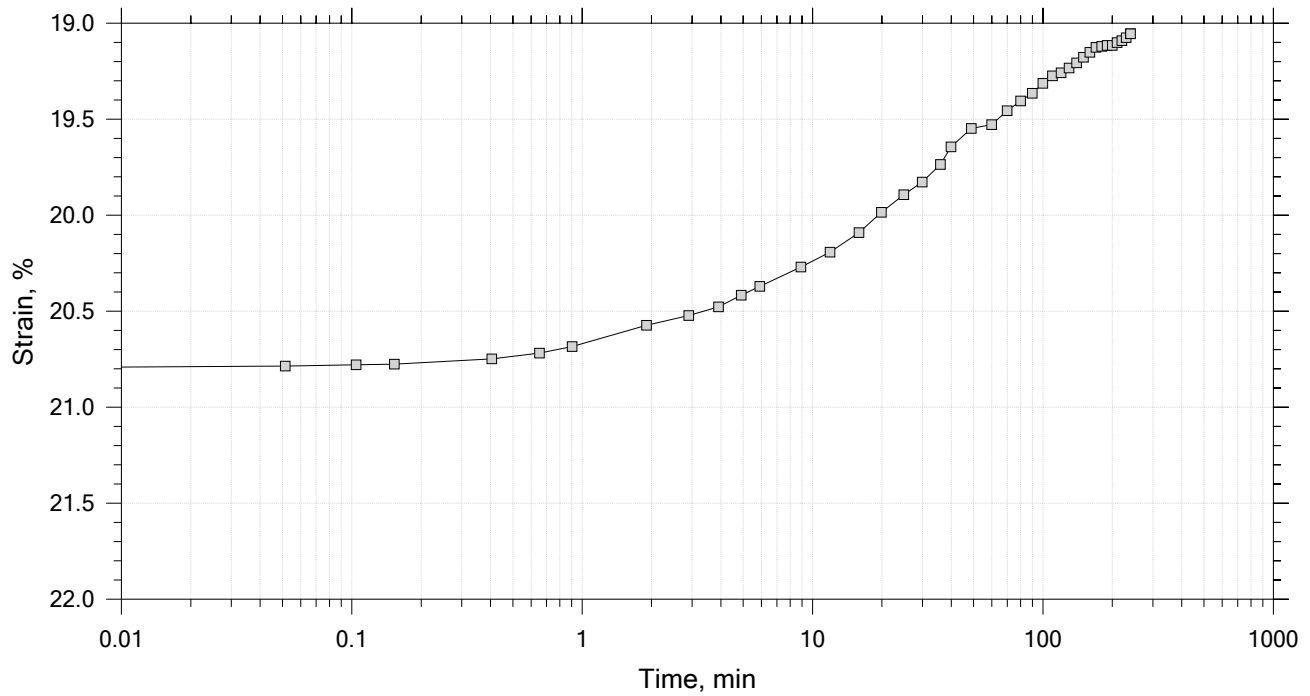
	Project: Rt 9/I-395 Connector	Location: Brewer, ME	Project No.: GTX-308853
	Boring No.: HB- BFB-101	Tested By: md	Checked By: mcm
	Sample No.: 2U	Test Date: 09/26/18	Depth: 12-14 ft
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Wet, very dark greenish gray clay		
	Remarks: System T, Swell Pressure = 0.0626 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 14 of 15

Constant Load Step

Stress: 0.125 tsf



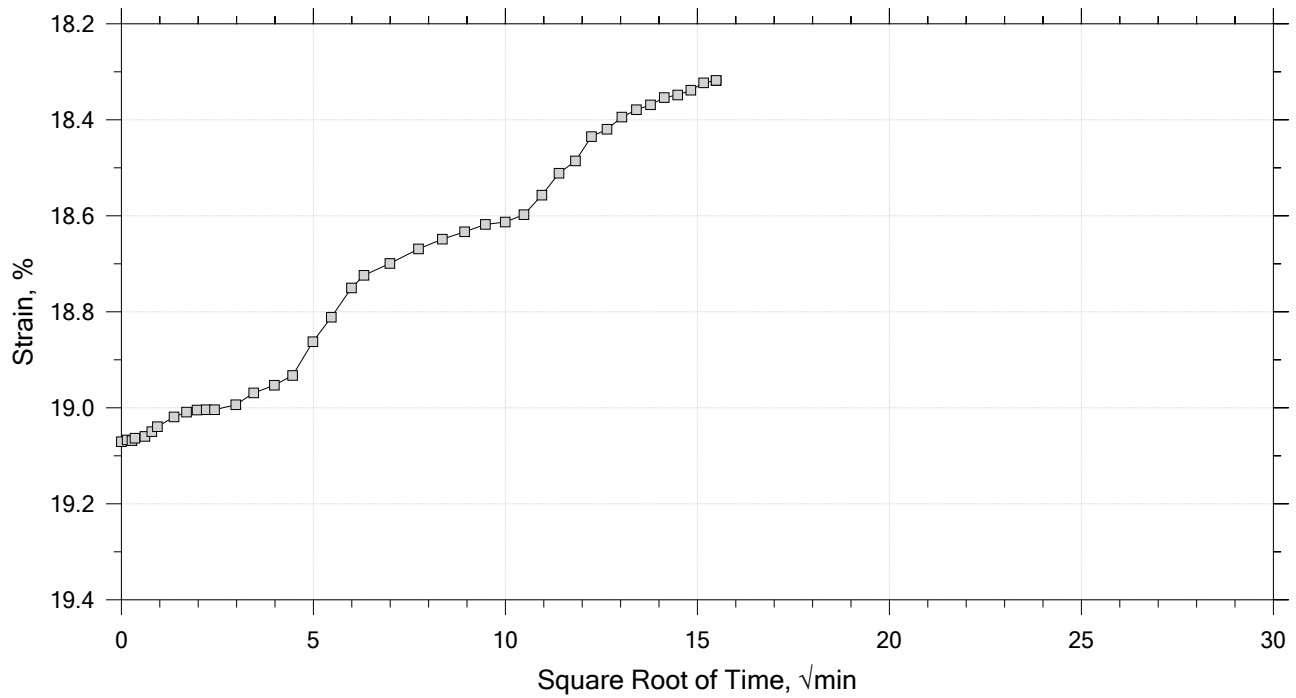
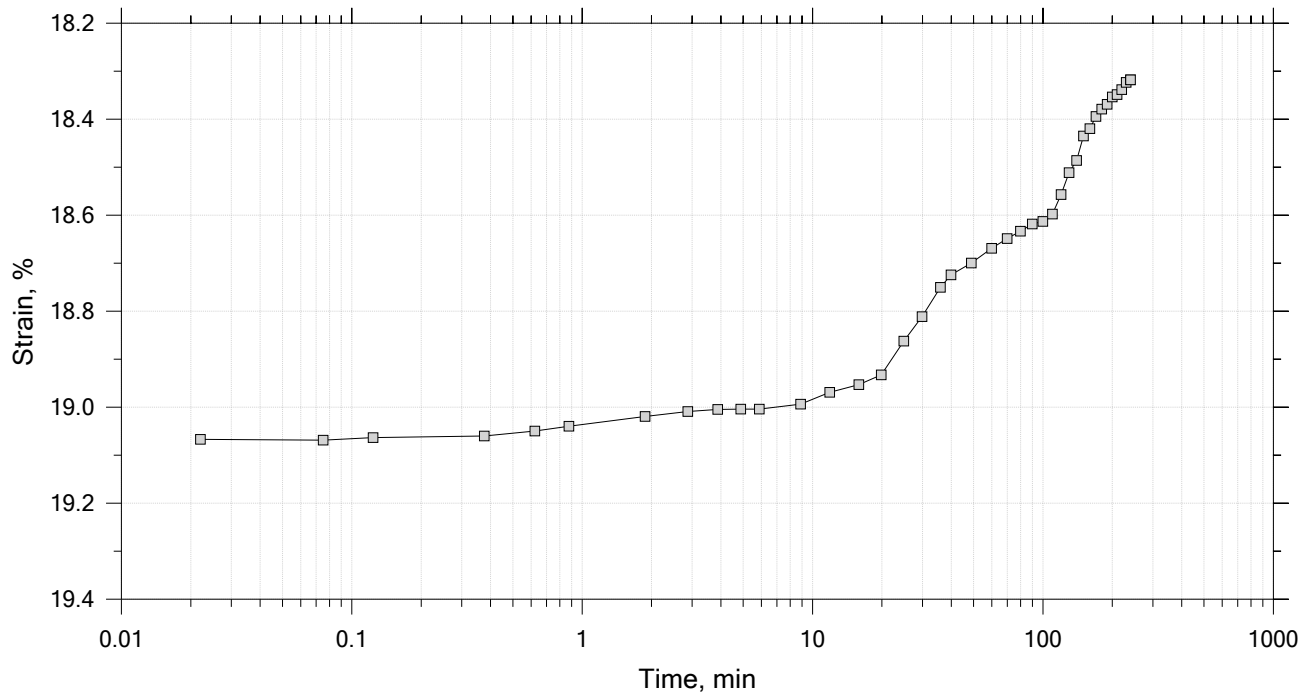
	Project: Rt 9/I-395 Connector	Location: Brewer, ME	Project No.: GTX-308853
	Boring No.: HB- BFB-101	Tested By: md	Checked By: mcm
	Sample No.: 2U	Test Date: 09/26/18	Depth: 12-14 ft
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Wet, very dark greenish gray clay		
	Remarks: System T, Swell Pressure = 0.0626 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 15 of 15

Constant Load Step

Stress: 0.0625 tsf




	Project: Rt 9/I-395 Connector	Location: Brewer, ME	Project No.: GTX-308853
	Boring No.: HB- BFB-101	Tested By: md	Checked By: mcm
	Sample No.: 2U	Test Date: 09/26/18	Depth: 12-14 ft
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Wet, very dark greenish gray clay		
	Remarks: System T, Swell Pressure = 0.0626 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Specimen Diameter: 2.50 in	Estimated Specific Gravity: 2.77	Liquid Limit: 35
Initial Height: 1.00 in	Initial Void Ratio: 1.09	Plastic Limit: 20
Final Height: 0.83 in	Final Void Ratio: 0.737	Plasticity Index: 15

	Before Test Trimmings	Before Test Specimen	After Test Specimen	After Test Trimmings
Container ID	B-2002	RING		D1550
Mass Container, gm	8.26	111.18	111.18	8.32
Mass Container + Wet Soil, gm	149.69	259.44	245.93	142.05
Mass Container + Dry Soil, gm	108.98	217.6	217.6	113.93
Mass Dry Soil, gm	100.72	106.42	106.42	105.61
Water Content, %	40.42	39.32	26.63	26.63
Void Ratio	---	1.09	0.74	---
Degree of Saturation, %	---	99.61	100.00	---
Dry Unit Weight, pcf	---	82.587	99.503	---


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: Rt 9/I-395 Connector	Location: Brewer, ME	Project No.: GTX-308853
	Boring No.: HB- BFB-101	Tested By: md	Checked By: mcm
	Sample No.: 2U	Test Date: 09/26/18	Depth: 12-14 ft
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Wet, very dark greenish gray clay		
	Remarks: System T, Swell Pressure = 0.0626 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Log of Time Coefficients


[illegible]

	Project: Rt 9/I-395 Connector	Location: Brewer, ME	Project No.: GTX-308853
	Boring No.: HB- BFB-101	Tested By: md	Checked By: mcm
	Sample No.: 2U	Test Date: 09/26/18	Depth: 12-14 ft
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Wet, very dark greenish gray clay		
	Remarks: System T, Swell Pressure = 0.0626 tsf		
	Displacement at End of Increment		

One-Dimensional Consolidation by ASTM D2435 - Method B

Square Root of Time Coefficients

[illegible]

	Project: Rt 9/I-395 Connector	Location: Brewer, ME	Project No.: GTX-308853
	Boring No.: HB- BFB-101	Tested By: md	Checked By: mcm
	Sample No.: 2U	Test Date: 09/26/18	Depth: 12-14 ft
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Wet, very dark greenish gray clay		
	Remarks: System T, Swell Pressure = 0.0626 tsf		
	Displacement at End of Increment		



Consolidated Undrained Direct Simple Shear Testing of Cohesive Soils by ASTM D6528

Client: Haley & Aldrich, Inc. GTX#: 312665
Project Name: I-395/Rte 9 Connector (Area 1) Test Date: 3/15/21
Project Location: Brewer-Eddington, ME

Boring ID: BB-BFB1-202
Sample ID: U1
Depth, ft: 10-12

Visual Description: Moist, gray clay

Test Equipment: Top and bottom box (circular) = 2.50 in diameter. Load cells and LVDT's connected to data acquisition system for shear force, normal load, horizontal and vertical displacement; surface area = 4.91 in², soil height = 1 inch. Stacked rings used. Set up included porous stones with pins.

Test Condition: Inundated prior to consolidating to 626.1 psf.

Sample Type and Preparation: Extruded from tube, cut, trimmed and placed into apparatus at as-received density and moisture content.

Parameter	Point 1	Point 2	Point 3	Point 4	Point 5
Test No.	DSS-7				
Initial Moisture Content, %	33.4				
Initial Dry Density, pcf	82.5				
Nominal Rate of Shear Strain, %/hr	5.0				
Maximum Vertical Consolidation Stress, psf	626.1				
Final Moisture Content, %	31.2				
Measured Peak Shear Stress, psf	505.5				
Shear Strain at Peak Shear Stress, %	11.2				
Membrane Correction, psf	62				
Corrected Peak Shear Stress, psf	443.5				
S_u / σ'_{vc}	0.71				

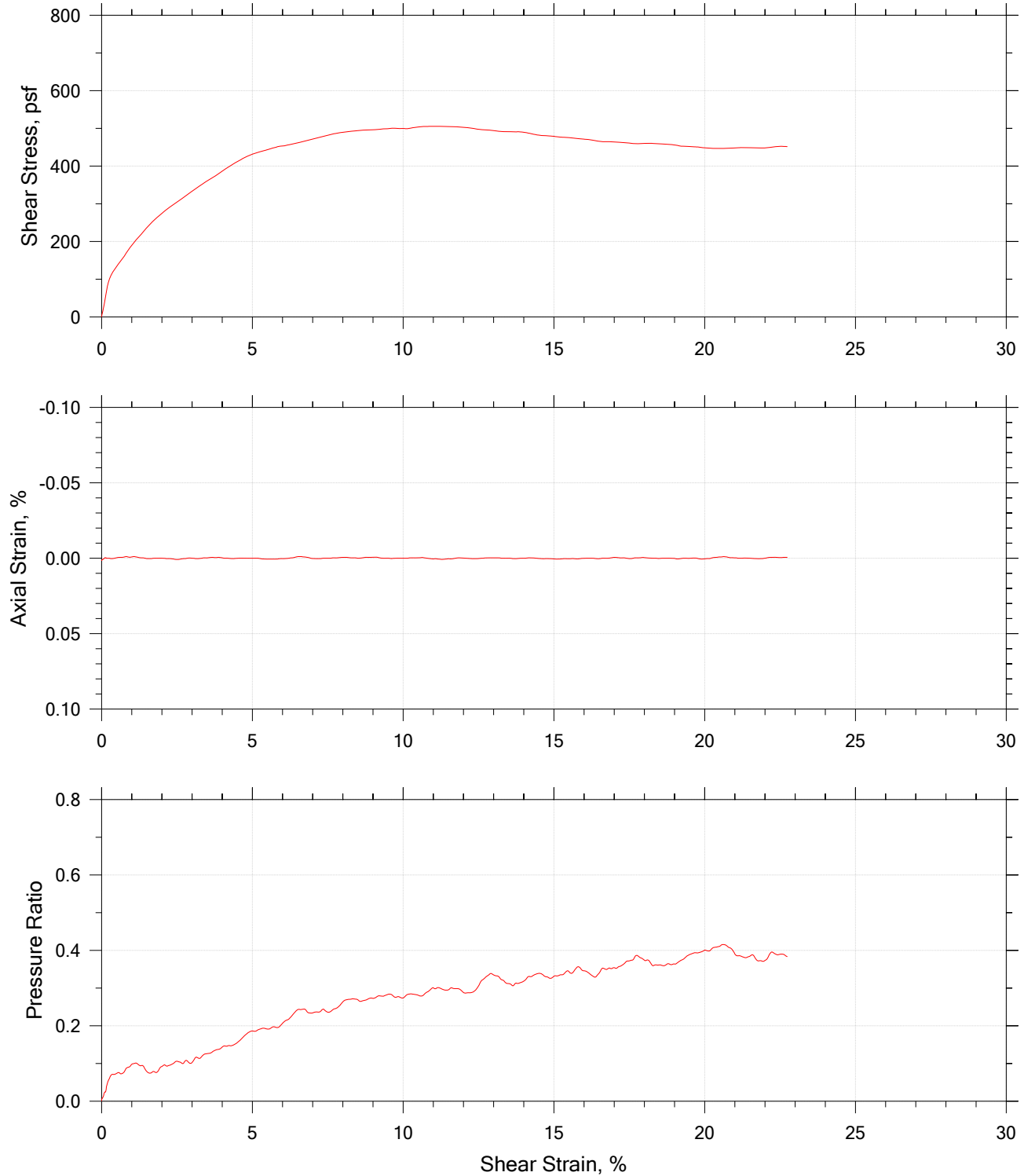
Comments: Failure taken at peak prior to or at 20% strain, per ASTM D6528.


Tested By: md

Checked By: njh

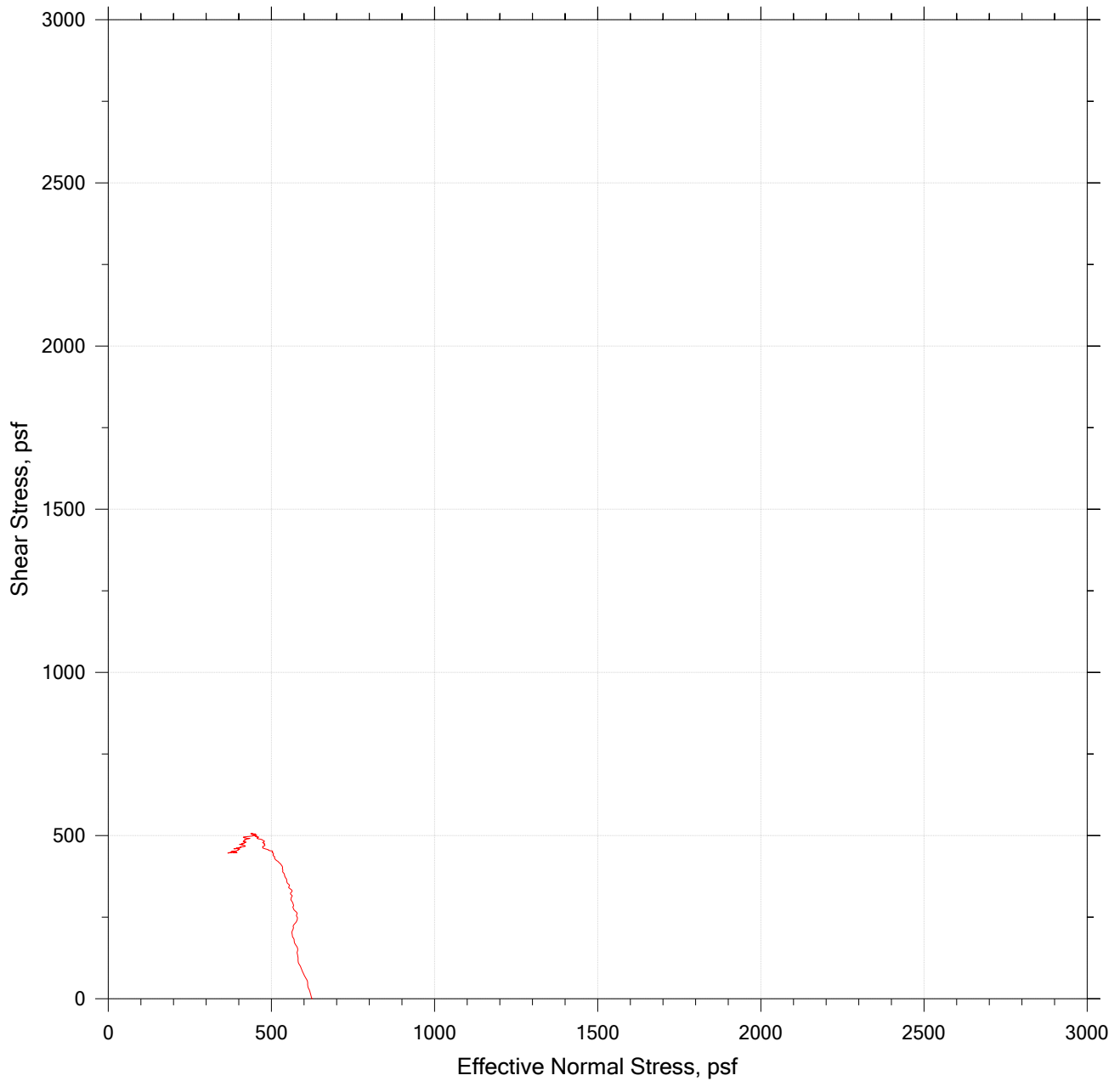
Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.


Direct Simple Shear Test



	Project Name: I-395/Rte 9 Connector	Location: Brewer-Eddington, ME	Project Number: GTX-312665
	Boring Number: BB -BFB1-202	Tester: md	Checker: njh
	Sample Number: U1	Test Date: 03/15/21	Depth: 10-12 ft
	Test Number: DSS-7	Preparation: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System HH		

Direct Simple Shear Test



	Project Name: I-395/Rte 9 Connector	Location: Brewer-Eddington, ME	Project Number: GTX-312665
	Boring Number: BB -BFB1-202	Tester: md	Checker: njh
	Sample Number: U1	Test Date: 03/15/21	Depth: 10-12 ft
	Test Number: DSS-7	Preparation: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System HH		



Consolidated Undrained Direct Simple Shear Testing of Cohesive Soils by ASTM D6528

Client: Haley & Aldrich, Inc. GTX#: 312665
Project Name: I-395/Rte 9 Connector (Area 1) Test Date: 3/5/21
Project Location: Brewer-Eddington, ME

Boring ID: BB-BFB-202
Sample ID: U1
Depth, ft: 18-20

Visual Description: Wet, gray clay

Test Equipment: Top and bottom box (circular) = 2.50 in diameter. Load cells and LVDT's connected to data acquisition system for shear force, normal load, horizontal and vertical displacement; surface area = 4.91 in², soil height = 1 inch. Stacked rings used. Set up included porous stones with pins.

Test Condition: Inundated prior to consolidating to 1,005.6 psf.

Sample Type and Preparation: Extruded from tube, cut, trimmed and placed into apparatus at as-received density and moisture content.

Parameter	Point 1	Point 2	Point 3	Point 4	Point 5
Test No.	DSS-1				
Initial Moisture Content, %	43.4				
Initial Dry Density, pcf	72.8				
Nominal Rate of Shear Strain, %/hr	5.0				
Maximum Vertical Consolidation Stress, psf	1,005.6				
Final Moisture Content, %	41.7				
Measured Peak Shear Stress, psf	307.6				
Shear Strain at Peak Shear Stress, %	17.4				
Membrane Correction, psf	53				
Corrected Peak Shear Stress, psf	254.6				
S_u / σ'_{vc}	0.25				

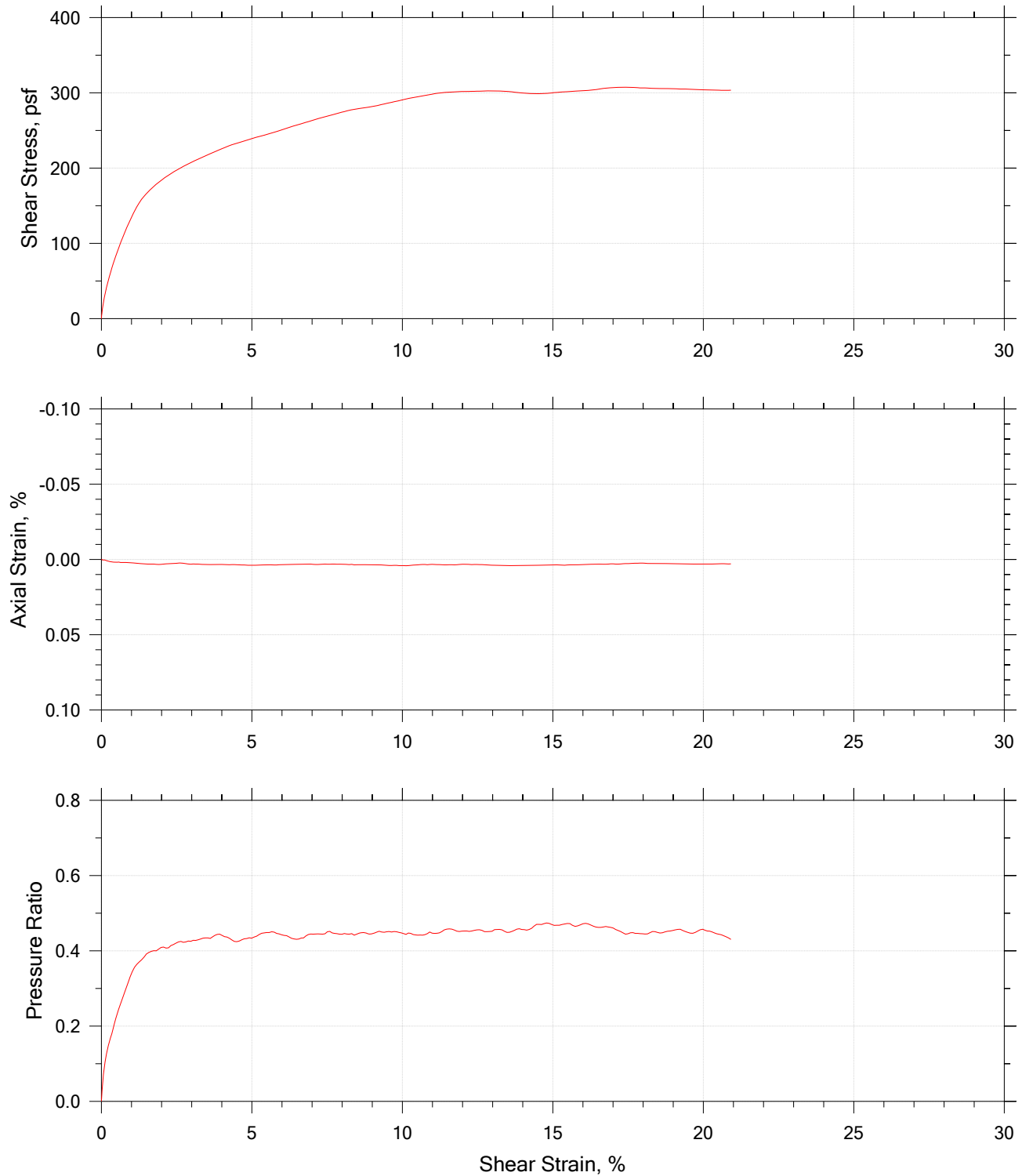
Comments: Failure taken at peak prior to or at 20% strain, per ASTM D6528.


Tested By: md

Checked By: njh

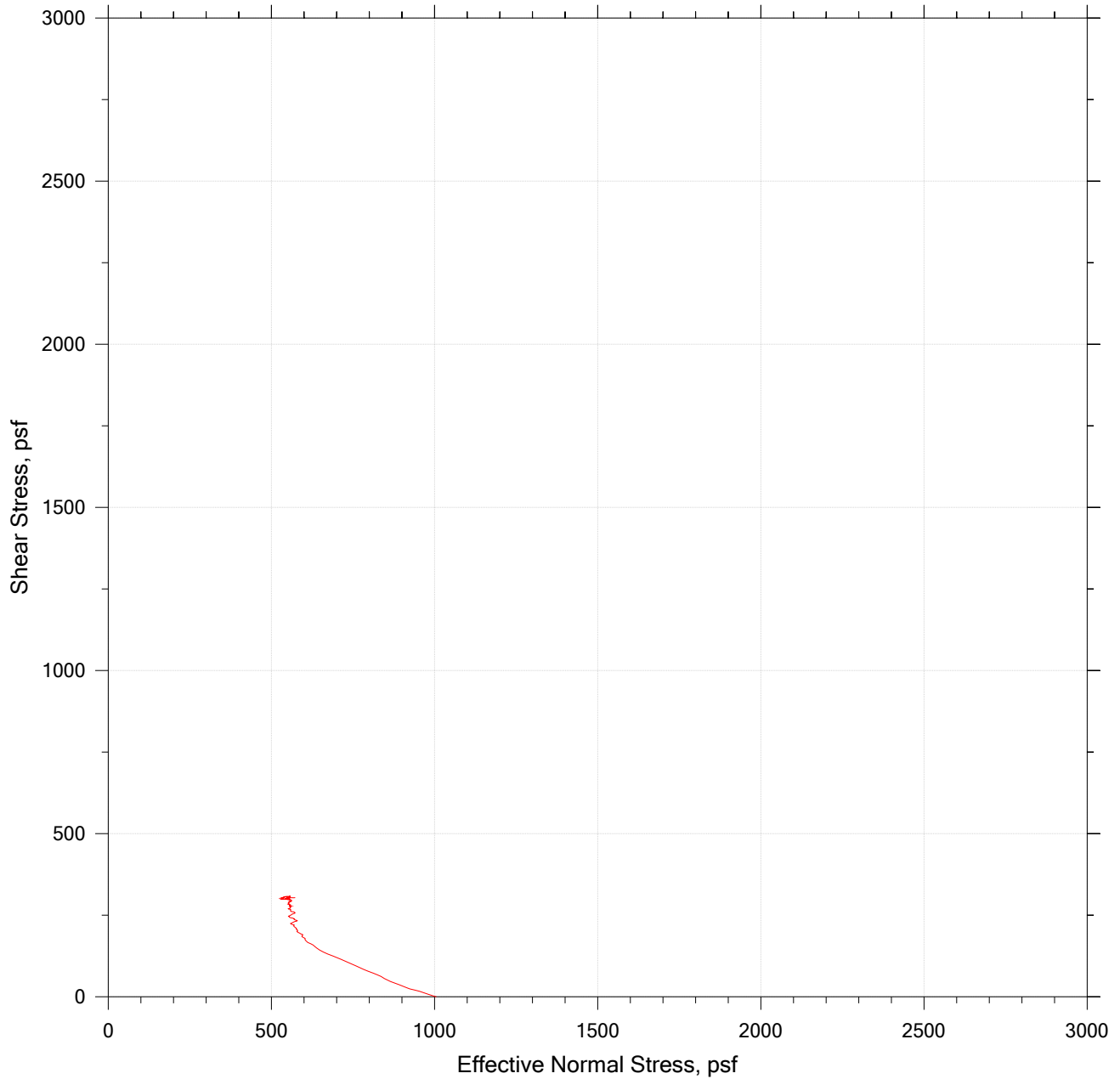
Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.


Direct Simple Shear Test



	Project Name: I-395/Rte 9 Connector	Location: Brewer-Eddington, ME	Project Number: GTX-312665
	Boring Number: BB-BFB-202	Tester: md	Checker: njh
	Sample Number: U1	Test Date: 03/05/21	Depth: 18-20 ft
	Test Number: DSS-1	Preparation: intact	Elevation: ---
	Description: Wet, gray clay		
	Remarks:		

Direct Simple Shear Test



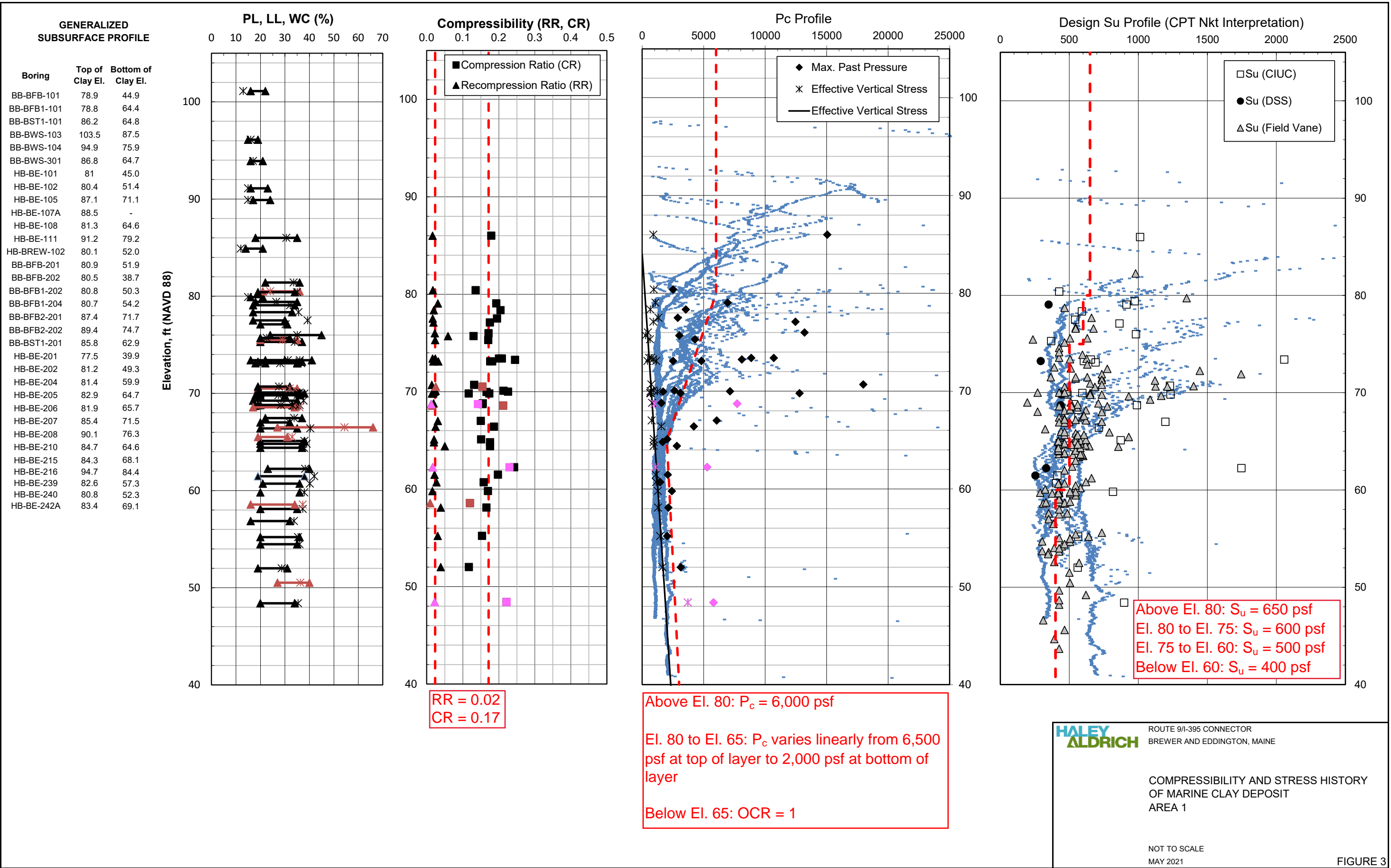
	Project Name: I-395/Rte 9 Connector	Location: Brewer-Eddington, ME	Project Number: GTX-312665
	Boring Number: BB-BFB-202	Tester: md	Checker: njh
	Sample Number: U1	Test Date: 03/05/21	Depth: 18-20 ft
	Test Number: DSS-1	Preparation: intact	Elevation: ---
	Description: Wet, gray clay		
	Remarks:		

APPENDIX D

Geotechnical Calculations

Soil Properties

\\haleyaldrich.com\share\proj_common\PROJECTS\132076 - brewer eddington\007 - Phase II\Soil Properties Summary\2021-0507-HAI-Brewer-Edd-Soil Nkt Adjusted-D11.xlsx\Compressibility Fig AREA 1 Nkt



Bearing Resistance

Client Maine Department of Transportation

Date 19-May-21

Project Route 9 / I-395 Connector

Computed by JAD

Subject Bearing Resistance Calculations - Felts Brook Tributary Sta. 64+14

Checked by EMS

PROBLEM STATEMENT & OBJECTIVE

Calculate the Strength and Service Limit State bearing resistance for the proposed footing.

REFERENCES

1. AASHTO LRFD Bridge Design Specifications, 9th Edition, 2020.

AVAILABLE INFORMATION

1. Plan set titled "Brewer-Eddington, Penobscot County, I-395 - Route 9 Connector, Stream and Snowmobile Crossings", dated September 2020.

ASSUMPTIONS

1. The vertical load eccentricity only applies in one direction (i.e., overturning moment only in one direction). The maximum eccentricity assumed is B/3 based on AASHTO Section 10.6.3.3.
2. Subsurface conditions based on borings BB-BFB1-101, BB-BFB1-201 through BB-BFB1-203
3. Footing will bear on Marine Deposits (soft to medium CLAY).

PROCEDURE FOR STRENGTH LIMIT STATE

AASHTO LRFD Equation 10.6.3.1.2a- Basic Formulation for Nominal Bearing Resistance

$$q_n = cN_{cm} + \gamma D_f N_{qm} C_{wq} + 0.5 \gamma B N_{\gamma m} C_{w\gamma} \quad \text{Equation 10.6.3.1.2a-1}$$

$$N_{cm} = N_c s_c i_c \quad \text{Equation 10.6.3.1.2a-2}$$

$$N_{qm} = N_q s_q d_q i_q \quad \text{Equation 10.6.3.1.2a-3}$$

$$N_{\gamma m} = N_\gamma s_\gamma i_\gamma \quad \text{Equation 10.6.3.1.2a-4}$$

q_n = nominal strength limit state bearing resistance (ksf)

RF = resistance factor from Table 10.5.5.2.2-1

q_R = factored strength limit state bearing resistance (ksf) = RF x q_n

c = cohesion, taken as undrained shear strength (ksf)

N_c = cohesion term (undrained loading) bearing capacity factor as specified in Table 10.6.3.1.2a-1 (dim)

N_q = surcharge (embedment) term (drained or undrained loading) bearing capacity factor as specified in Table 10.6.3.1.2a-1 (dim)

N_γ = unit weight (footing width) term (drained loading) bearing capacity factor as specified in Table 10.6.3.1.2a-1 (dim)

γ = total (moist) unit weight of soil above or below the bearing depth of the footing (kcf)

D_f = footing embedment depth (ft)

D_w = depth of water below ground surface (ft)

B = footing width (ft)

e_B = footing width eccentricity (ft) as specified in Section 10.6.3.3

B' = effective footing width ($B-2e$) (ft)

L = footing length (ft)

e_L = footing length eccentricity (ft) as specified in Section 10.6.3.3

L' = effective footing length ($L-2e$) (ft)

$C_{wq}, C_{w\gamma}$ = correction factors to account for the location of the groundwater table as specified in Table 10.6.3.1.2a-2 (dim)

s_c, s_q, s_γ = footing shape correction factors as specified in Table 10.6.3.1.2a-3 (dim)

d_q = correction factor to account for the shearing resistance along the failure surface passing through cohesionless material above the bearing elevation as specified in Table 10.6.3.1.2a-4 (dim).

i_c, i_q, i_γ = load inclination factors

Client Maine Department of Transportation

Date 19-May-21

Project Route 9 / I-395 Connector

Computed by JAD

Subject Bearing Resistance Calculations - Felts Brook Tributary Sta. 64+14

Checked by EMS

CALCULATION FOR STRENGTH LIMIT STATE

B =	25	ft
$e_B =$	0	ft
B' =	25.0	ft
L =	142	ft
$e_L =$	0	ft
L' =	142	ft
c =	0.45	ksf
$\gamma =$	115	pcf
$\phi =$	0	degrees
D_w	19.8	ft
D_f	26	ft
$N_f = f(\phi)$	1.00	
C_{wq}	0.9	
$C_{w\gamma}$	0.50	
N_c	5.1	
S_c	1.04	
i_c	1	
N_{cm}	5.3	
N_q	1	
S_q	1.00	
d_q	1	
i_q	1	
N_{qm}	1.0	
N_γ	0.0	
S_γ	1.00	
i_γ	1	
$N_{\gamma m}$	0.0	
q_n	5.0	ksf
RF	0.45	
q_R	2.3	ksf

Client Maine Department of Transportation

Project Route 9 / I-395 Connector

Subject Bearing Resistance Calculations - Felts Brook Tributary Sta. 64+14

SERVICE LIMIT STATE BASED ON PRESUMPTIVE BEARING RESISTANCES IN AASHTO LRFD:

10.6.2.5.1—Presumptive Values for Bearing Resistance C10.6.2.5.1

The use of presumptive values shall be based on knowledge of geological conditions at or near the structure site.

Unless more appropriate regional data are available, the presumptive values given in [Table C10.6.2.5.1-1](#) may be used. These bearing resistances are settlement limited, e.g., 1.0 in., and apply only at the service limit state.

Table C10.6.2.5.1-1—Presumptive Bearing Resistance for Spread Footing Foundations at the Service Limit State Modified after U.S. Department of the Navy (1982)

Type of Bearing Material	Consistency in Place	Bearing Resistance (ksf)	
		Ordinary Range	Recommended Value of Use
Massive crystalline igneous and metamorphic rock: granite, diorite, basalt, gneiss, thoroughly cemented conglomerate (sound condition allows minor cracks)	Very hard, sound rock	120–200	160
Foliated metamorphic rock: slate, schist (sound condition allows minor cracks)	Hard sound rock	60–80	70
Sedimentary rock: hard cemented shales, siltstone, sandstone, limestone without cavities	Hard sound rock	30–50	40
Weathered or broken bedrock of any kind, except highly argillaceous rock (shale)	Medium hard rock	16–24	20
Compaction shale or other highly argillaceous rock in sound condition	Medium hard rock	16–24	20
Well-graded mixture of fine- and coarse-grained soil: glacial till, hardpan, boulder clay (GW-GC, GC, SC)	Very dense	16–24	20
Gravel, gravel-sand mixture, boulder-gravel mixtures (GW, GP, SW, SP)	Very dense	12–20	14
	Medium dense to dense	8–14	10
	Loose	4–12	6
Coarse to medium sand, and with little gravel (SW, SP)	Very dense	8–12	8
	Medium dense to dense	4–8	6
	Loose	2–6	3
Fine to medium sand, silty or clayey medium to coarse sand (SW, SM, SC)	Very dense	6–10	6
	Medium dense to dense	4–8	5
	Loose	2–4	3
Fine sand, silty or clayey medium to fine sand (SP, SM, SC)	Very dense	6–10	6
	Medium dense to dense	4–8	5
	Loose	2–4	3
Homogeneous inorganic clay, sandy or silty clay (CL, CH)	Very dense	6–12	8
	Medium dense to dense	2–6	4
	Loose	1–2	1
Inorganic silt, sandy or clayey silt, varved silt-clay-fine sand (ML, MH)	Very stiff to hard	4–8	6
	Medium stiff to stiff	2–6	3
	Soft	1–2	1

$$q_0 = 1 \text{ ksf}$$



CALCULATIONS

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Project	Route 9 / I-395 Connector
Subject	Bearing Resistance Calculations - Felts Brook Tributary Sta. 64+14

CONCLUSIONS AND RECOMMENDATIONS

Strength Limit State

The factored bearing resistance for the strength limit state is 2.3 ksf

Service Limit State

The factored bearing resistance for the service limit state is 1.0 ksf for a 1 in. settlement.

Client Maine Department of Transportation

Date 19-May-21

Project Route 9 / I-395 Connector

Computed by JAD

Subject Bearing Resistance Calculations - Snowmobile 10C Sta. 77+00

Checked by EMS

PROBLEM STATEMENT & OBJECTIVE

Calculate the Strength and Service Limit State bearing resistance for the proposed footing.

REFERENCES

1. AASHTO LRFD Bridge Design Specifications, 9th Edition, 2020.

AVAILABLE INFORMATION

1. Plan set titled "Brewer-Eddington, Penobscot County, I-395 - Route 9 Connector, Stream and Snowmobile Crossings", dated September 2020.

ASSUMPTIONS

1. The vertical load eccentricity only applies in one direction (i.e., overturning moment only in one direction). The maximum eccentricity assumed is B/3 based on AASHTO Section 10.6.3.3.
2. Subsurface conditions based on borings BB-BST1-101, BB-BST1-102, BB-BST1-103, BB-BST1-201
3. Footing will bear on Marine Deposits (soft CLAY).

PROCEDURE FOR STRENGTH LIMIT STATE

AASHTO LRFD Equation 10.6.3.1.2a- Basic Formulation for Nominal Bearing Resistance

$$q_n = cN_{cm} + \gamma D_f N_{qm} C_{wq} + 0.5 \gamma B N_{ym} C_{wy} \quad \text{Equation 10.6.3.1.2a-1}$$

$$N_{cm} = N_c s_c i_c \quad \text{Equation 10.6.3.1.2a-2}$$

$$N_{qm} = N_q s_q d_q i_q \quad \text{Equation 10.6.3.1.2a-3}$$

$$N_{ym} = N_\gamma s_\gamma i_\gamma \quad \text{Equation 10.6.3.1.2a-4}$$

q_n = nominal strength limit state bearing resistance (ksf)

RF = resistance factor from Table 10.5.5.2.2-1

q_R = factored strength limit state bearing resistance (ksf) = RF x q_n

c = cohesion, taken as undrained shear strength (ksf)

N_c = cohesion term (undrained loading) bearing capacity factor as specified in Table 10.6.3.1.2a-1 (dim)

N_q = surcharge (embedment) term (drained or undrained loading) bearing capacity factor as specified in Table 10.6.3.1.2a-1 (dim)

N_γ = unit weight (footing width) term (drained loading) bearing capacity factor as specified in Table 10.6.3.1.2a-1 (dim)

γ = total (moist) unit weight of soil above or below the bearing depth of the footing (kcf)

D_f = footing embedment depth (ft)

D_w = depth of water below ground surface (ft)

B = footing width (ft)

e_B = footing width eccentricity (ft) as specified in Section 10.6.3.3

B' = effective footing width ($B-2e$) (ft)

L = footing length (ft)

e_L = footing length eccentricity (ft) as specified in Section 10.6.3.3

L' = effective footing length ($L-2e$) (ft)

C_{wq}, C_{wy} = correction factors to account for the location of the groundwater table as specified in Table 10.6.3.1.2a-2 (dim)

s_c, s_q, s_γ = footing shape correction factors as specified in Table 10.6.3.1.2a-3 (dim)

d_q = correction factor to account for the shearing resistance along the failure surface passing through cohesionless material above the bearing elevation as specified in Table 10.6.3.1.2a-4 (dim).

i_c, i_q, i_γ = load inclination factors

Client Maine Department of Transportation

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Project Route 9 / I-395 Connector

Computed by JAD

Subject Bearing Resistance Calculations - Snowmobile 10C Sta. 77+00

Checked by EMS

CALCULATION FOR STRENGTH LIMIT STATE

B =	14	ft
e _B =	0	ft
B' =	14.0	ft
L =	115	ft
e _L =	0	ft
L' =	115	ft
c =	0.4	ksf
Y =	115	pcf
φ =	0	degrees
D _w	24	ft
D _f	24	ft
N _f = f(φ)	1.00	
C _{wq}	1.0	
C _{wY}	0.50	
N _c	5.1	
S _c	1.02	
i _c	1	
N _{cm}	5.3	
N _q	1	
S _q	1.00	
d _q	1	
i _q	1	
N _{qm}	1.0	
N _Y	0.0	
S _Y	1.00	
i _Y	1	
N _{Ym}	0.0	
q _n	4.9	ksf
RF	0.45	
q _R	2.2	ksf

Client Maine Department of Transportation

Date 19-May-21

Project Route 9 / I-395 Connector

Computed by JAD

Subject Bearing Resistance Calculations - Snowmobile 10C Sta. 77+00

Checked by EMS

SERVICE LIMIT STATE BASED ON PRESUMPTIVE BEARING RESISTANCES IN AASHTO LRFD:
10.6.2.5.1—Presumptive Values for Bearing Resistance C10.6.2.5.1

The use of presumptive values shall be based on knowledge of geological conditions at or near the structure site.

Unless more appropriate regional data are available, the presumptive values given in Table C10.6.2.5.1-1 may be used. These bearing resistances are settlement limited, e.g., 1.0 in., and apply only at the service limit state.

Table C10.6.2.5.1-1—Presumptive Bearing Resistance for Spread Footing Foundations at the Service Limit State Modified after U.S. Department of the Navy (1982)

Type of Bearing Material	Consistency in Place	Bearing Resistance (ksf)	
		Ordinary Range	Recommended Value of Use
Massive crystalline igneous and metamorphic rock: granite, diorite, basalt, gneiss, thoroughly cemented conglomerate (sound condition allows minor cracks)	Very hard, sound rock	120–200	160
Foliated metamorphic rock: slate, schist (sound condition allows minor cracks)	Hard sound rock	60–80	70
Sedimentary rock: hard cemented shales, siltstone, sandstone, limestone without cavities	Hard sound rock	30–50	40
Weathered or broken bedrock of any kind, except highly argillaceous rock (shale)	Medium hard rock	16–24	20
Compaction shale or other highly argillaceous rock in sound condition	Medium hard rock	16–24	20
Well-graded mixture of fine- and coarse-grained soil: glacial till, hardpan, boulder clay (GW-GC, GC, SC)	Very dense	16–24	20
Gravel, gravel-sand mixture, boulder-gravel mixtures (GW, GP, SW, SP)	Very dense	12–20	14
	Medium dense to dense	8–14	10
	Loose	4–12	6
Coarse to medium sand, and with little gravel (SW, SP)	Very dense	8–12	8
	Medium dense to dense	4–8	6
	Loose	2–6	3
Fine to medium sand, silty or clayey medium to coarse sand (SW, SM, SC)	Very dense	6–10	6
	Medium dense to dense	4–8	5
	Loose	2–4	3
Fine sand, silty or clayey medium to fine sand (SP, SM, SC)	Very dense	6–10	6
	Medium dense to dense	4–8	5
	Loose	2–4	3
Homogeneous inorganic clay, sandy or silty clay (CL, CH)	Very dense	6–12	8
	Medium dense to dense	2–6	4
	Loose	1–2	1
Inorganic silt, sandy or clayey silt, varved silt-clay-fine sand (ML, MH)	Very stiff to hard	4–8	6
	Medium stiff to stiff	2–6	3
	Soft	1–2	1

$$q_0 = 1 \text{ ksf}$$



CALCULATIONS

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CONCLUSIONS AND RECOMMENDATIONS

Strength Limit State

The factored bearing resistance for the strength limit state is 2.2 ksf

Service Limit State

The factored bearing resistance for the service limit state is 1.0 ksf for a 1 in. settlement.

Client Maine Department of Transportation

Date 19-May-21

Project Route 9 / I-395 Connector

Computed by JAD

Subject Bearing Resistance Calculations - Wildlife Crossing 1 Sta. 272+36

Checked by EMS

PROBLEM STATEMENT & OBJECTIVE

Calculate the Strength and Service Limit State bearing resistance for the proposed footing.

REFERENCES

1. AASHTO LRFD Bridge Design Specifications, 9th Edition, 2020.

AVAILABLE INFORMATION

1. Plan set titled "Brewer-Eddington, Penobscot County, I-395 - Route 9 Connector, Stream and Snowmobile Crossings", dated September 2020.

ASSUMPTIONS

1. The vertical load eccentricity only applies in one direction (i.e., overturning moment only in one direction). The maximum eccentricity assumed is B/3 based on AASHTO Section 10.6.3.3.
2. Subsurface conditions based on boring BB-EWC1-101, BB-EWC1-201 and BB-EWC1-202.
3. Footing will bear on Marine Deposits (medium stiff CLAY).

PROCEDURE FOR STRENGTH LIMIT STATE

AASHTO LRFD Equation 10.6.3.1.2a- Basic Formulation for Nominal Bearing Resistance

$$q_n = cN_{cm} + \gamma D_f N_{qm} C_{wq} + 0.5 \gamma B N_{\gamma m} C_{w\gamma} \quad \text{Equation 10.6.3.1.2a-1}$$

$$N_{cm} = N_c s_c i_c \quad \text{Equation 10.6.3.1.2a-2}$$

$$N_{qm} = N_q s_q d_q i_q \quad \text{Equation 10.6.3.1.2a-3}$$

$$N_{\gamma m} = N_\gamma s_\gamma i_\gamma \quad \text{Equation 10.6.3.1.2a-4}$$

q_n = nominal strength limit state bearing resistance (ksf)

RF = resistance factor from Table 10.5.5.2.2-1

q_R = factored strength limit state bearing resistance (ksf) = RF x q_n

c = cohesion, taken as undrained shear strength (ksf)

N_c = cohesion term (undrained loading) bearing capacity factor as specified in Table 10.6.3.1.2a-1 (dim)

N_q = surcharge (embedment) term (drained or undrained loading) bearing capacity factor as specified in Table 10.6.3.1.2a-1 (dim)

N_γ = unit weight (footing width) term (drained loading) bearing capacity factor as specified in Table 10.6.3.1.2a-1 (dim)

γ = total (moist) unit weight of soil above or below the bearing depth of the footing (kcf)

D_f = footing embedment depth (ft)

D_w = depth of water below ground surface (ft)

B = footing width (ft)

e_B = footing width eccentricity (ft) as specified in Section 10.6.3.3

B' = effective footing width ($B-2e$) (ft)

L = footing length (ft)

e_L = footing length eccentricity (ft) as specified in Section 10.6.3.3

L' = effective footing length ($L-2e$) (ft)

$C_{wq}, C_{w\gamma}$ = correction factors to account for the location of the groundwater table as specified in Table 10.6.3.1.2a-2 (dim)

s_c, s_q, s_γ = footing shape correction factors as specified in Table 10.6.3.1.2a-3 (dim)

d_q = correction factor to account for the shearing resistance along the failure surface passing through cohesionless material above the bearing elevation as specified in Table 10.6.3.1.2a-4 (dim).

i_c, i_q, i_γ = load inclination factors

Client Maine Department of Transportation

Date 19-May-21

Project Route 9 / I-395 Connector

Computed by JAD

Subject Bearing Resistance Calculations - Wildlife Crossing 1 Sta. 272+36

Checked by EMS

CALCULATION FOR STRENGTH LIMIT STATE

B =	14	ft
e _B =	0	ft
B' =	14.0	ft
L =	122	ft
e _L =	0	ft
L' =	122	ft
c =	2.0	ksf
γ =	115	pcf
φ =	0	degrees
D _w	20	ft
D _f	23	ft
N _f = f(φ)	1.00	
C _{wq}	0.9	
C _{wγ}	0.50	
N _c	5.1	
S _c	1.02	
i _c	1	
N _{cm}	5.3	
N _q	1	
S _q	1.00	
d _q	1	
i _q	1	
N _{qm}	1.0	
N _γ	0.0	
S _γ	1.00	
i _γ	1	
N _{γm}	0.0	
q _n	13.0	ksf
RF	0.45	
q _R	5.8	ksf

Client Maine Department of Transportation

Date 19-May-21

Project Route 9 / I-395 Connector

Computed by JAD

Subject Bearing Resistance Calculations - Wildlife Crossing 1 Sta. 272+36

Checked by EMS

SERVICE LIMIT STATE BASED ON PRESUMPTIVE BEARING RESISTANCES IN AASHTO LRFD:
10.6.2.5.1—Presumptive Values for Bearing Resistance C10.6.2.5.1

The use of presumptive values shall be based on knowledge of geological conditions at or near the structure site.

Unless more appropriate regional data are available, the presumptive values given in [Table C10.6.2.5.1-1](#) may be used. These bearing resistances are settlement limited, e.g., 1.0 in., and apply only at the service limit state.

Table C10.6.2.5.1-1—Presumptive Bearing Resistance for Spread Footing Foundations at the Service Limit State Modified after U.S. Department of the Navy (1982)

Type of Bearing Material	Consistency in Place	Bearing Resistance (ksf)	
		Ordinary Range	Recommended Value of Use
Massive crystalline igneous and metamorphic rock: granite, diorite, basalt, gneiss, thoroughly cemented conglomerate (sound condition allows minor cracks)	Very hard, sound rock	120–200	160
Foliated metamorphic rock: slate, schist (sound condition allows minor cracks)	Hard sound rock	60–80	70
Sedimentary rock: hard cemented shales, siltstone, sandstone, limestone without cavities	Hard sound rock	30–50	40
Weathered or broken bedrock of any kind, except highly argillaceous rock (shale)	Medium hard rock	16–24	20
Compaction shale or other highly argillaceous rock in sound condition	Medium hard rock	16–24	20
Well-graded mixture of fine- and coarse-grained soil: glacial till, hardpan, boulder clay (GW-GC, GC, SC)	Very dense	16–24	20
Gravel, gravel-sand mixture, boulder-gravel mixtures (GW, GP, SW, SP)	Very dense	12–20	14
	Medium dense to dense	8–14	10
	Loose	4–12	6
Coarse to medium sand, and with little gravel (SW, SP)	Very dense	8–12	8
	Medium dense to dense	4–8	6
	Loose	2–6	3
Fine to medium sand, silty or clayey medium to coarse sand (SW, SM, SC)	Very dense	6–10	6
	Medium dense to dense	4–8	5
	Loose	2–4	3
Fine sand, silty or clayey medium to fine sand (SP, SM, SC)	Very dense	6–10	6
	Medium dense to dense	4–8	5
	Loose	2–4	3
Homogeneous inorganic clay, sandy or silty clay (CL, CH)	Very dense	6–12	8
	Medium dense to dense	2–6	4
	Loose	1–2	1
Inorganic silt, sandy or clayey silt, varved silt-clay-fine sand (ML, MH)	Very stiff to hard	4–8	6
	Medium stiff to stiff	2–6	3
	Soft	1–2	1

$$q_0 = 3 \text{ ksf}$$



CALCULATIONS

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CONCLUSIONS AND RECOMMENDATIONS

Strength Limit State

The factored bearing resistance for the strength limit state is 5.8 ksf

Service Limit State

The factored bearing resistance for the service limit state is 3.0 ksf for a 1 in. settlement.

Client Maine Department of Transportation

Date 19-May-21

Project Route 9 / I-395 Connector

Computed by JAD

Subject Bearing Resistance Calculations - Eaton Brook Tributary Sta. 273+50

Checked by EMS

PROBLEM STATEMENT & OBJECTIVE

Calculate the Strength and Service Limit State bearing resistance for the proposed footing.

REFERENCES

1. AASHTO LRFD Bridge Design Specifications, 9th Edition, 2020.

AVAILABLE INFORMATION

1. Plan set titled "Brewer-Eddington, Penobscot County, I-395 - Route 9 Connector, Stream and Snowmobile Crossings", dated September 2020.

ASSUMPTIONS

1. The vertical load eccentricity only applies in one direction (i.e., overturning moment only in one direction). The maximum eccentricity assumed is B/3 based on AASHTO Section 10.6.3.3.
2. Subsurface conditions based on boring BB-EEBT2-101, BB-EEBT2-201 and BB-EEBT2-202.
3. Footing will bear on Marine Deposits (medium stiff CLAY).

PROCEDURE FOR STRENGTH LIMIT STATE

AASHTO LRFD Equation 10.6.3.1.2a- Basic Formulation for Nominal Bearing Resistance

$$q_n = cN_{cm} + \gamma D_f N_{qm} C_{wq} + 0.5 \gamma B N_{ym} C_{wy} \quad \text{Equation 10.6.3.1.2a-1}$$

$$N_{cm} = N_c s_c i_c \quad \text{Equation 10.6.3.1.2a-2}$$

$$N_{qm} = N_q s_q d_q i_q \quad \text{Equation 10.6.3.1.2a-3}$$

$$N_{ym} = N_\gamma s_\gamma i_\gamma \quad \text{Equation 10.6.3.1.2a-4}$$

q_n = nominal strength limit state bearing resistance (ksf)

RF = resistance factor from Table 10.5.5.2.2-1

q_R = factored strength limit state bearing resistance (ksf) = RF x q_n

c = cohesion, taken as undrained shear strength (ksf)

N_c = cohesion term (undrained loading) bearing capacity factor as specified in Table 10.6.3.1.2a-1 (dim)

N_q = surcharge (embedment) term (drained or undrained loading) bearing capacity factor as specified in Table 10.6.3.1.2a-1 (dim)

N_γ = unit weight (footing width) term (drained loading) bearing capacity factor as specified in Table 10.6.3.1.2a-1 (dim)

γ = total (moist) unit weight of soil above or below the bearing depth of the footing (kcf)

D_f = footing embedment depth (ft)

D_w = depth of water below ground surface (ft)

B = footing width (ft)

e_B = footing width eccentricity (ft) as specified in Section 10.6.3.3

B' = effective footing width ($B-2e$) (ft)

L = footing length (ft)

e_L = footing length eccentricity (ft) as specified in Section 10.6.3.3

L' = effective footing length ($L-2e$) (ft)

C_{wq}, C_{wy} = correction factors to account for the location of the groundwater table as specified in Table 10.6.3.1.2a-2 (dim)

s_c, s_q, s_γ = footing shape correction factors as specified in Table 10.6.3.1.2a-3 (dim)

d_q = correction factor to account for the shearing resistance along the failure surface passing through cohesionless material above the bearing elevation as specified in Table 10.6.3.1.2a-4 (dim).

i_c, i_q, i_γ = load inclination factors

Client Maine Department of Transportation

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Project Route 9 / I-395 Connector

Computed by JAD

Subject Bearing Resistance Calculations - Eaton Brook Tributary Sta. 273+50

Checked by EMS

CALCULATION FOR STRENGTH LIMIT STATE

B =	18	ft
$e_B =$	0	ft
B' =	18.0	ft
L =	192	ft
$e_L =$	0	ft
L' =	192	ft
c =	0.5	ksf
$\gamma =$	115	pcf
$\phi =$	0	degrees
D_w	25	ft
D_f	30	ft
$N_f = f(\phi)$	1.00	
C_{wq}	0.9	
$C_{w\gamma}$	0.50	
N_c	5.1	
S_c	1.02	
i_c	1	
N_{cm}	5.2	
N_q	1	
S_q	1.00	
d_q	1	
i_q	1	
N_{qm}	1.0	
N_γ	0.0	
S_γ	1.00	
i_γ	1	
$N_{\gamma m}$	0.0	
q_n	5.8	ksf
RF	0.45	
q_R	2.6	ksf

Client Maine Department of Transportation

Date 19-May-21

Project Route 9 / I-395 Connector

Computed by JAD

Subject Bearing Resistance Calculations - Eaton Brook Tributary Sta. 273+50

Checked by EMS

SERVICE LIMIT STATE BASED ON PRESUMPTIVE BEARING RESISTANCES IN AASHTO LRFD:
10.6.2.5.1—Presumptive Values for Bearing Resistance C10.6.2.5.1

The use of presumptive values shall be based on knowledge of geological conditions at or near the structure site.

Unless more appropriate regional data are available, the presumptive values given in [Table C10.6.2.5.1-1](#) may be used. These bearing resistances are settlement limited, e.g., 1.0 in., and apply only at the service limit state.

Table C10.6.2.5.1-1—Presumptive Bearing Resistance for Spread Footing Foundations at the Service Limit State Modified after U.S. Department of the Navy (1982)

Type of Bearing Material	Consistency in Place	Bearing Resistance (ksf)	
		Ordinary Range	Recommended Value of Use
Massive crystalline igneous and metamorphic rock: granite, diorite, basalt, gneiss, thoroughly cemented conglomerate (sound condition allows minor cracks)	Very hard, sound rock	120–200	160
Foliated metamorphic rock: slate, schist (sound condition allows minor cracks)	Hard sound rock	60–80	70
Sedimentary rock: hard cemented shales, siltstone, sandstone, limestone without cavities	Hard sound rock	30–50	40
Weathered or broken bedrock of any kind, except highly argillaceous rock (shale)	Medium hard rock	16–24	20
Compaction shale or other highly argillaceous rock in sound condition	Medium hard rock	16–24	20
Well-graded mixture of fine- and coarse-grained soil: glacial till, hardpan, boulder clay (GW-GC, GC, SC)	Very dense	16–24	20
Gravel, gravel-sand mixture, boulder-gravel mixtures (GW, GP, SW, SP)	Very dense	12–20	14
	Medium dense to dense	8–14	10
	Loose	4–12	6
Coarse to medium sand, and with little gravel (SW, SP)	Very dense	8–12	8
	Medium dense to dense	4–8	6
	Loose	2–6	3
Fine to medium sand, silty or clayey medium to coarse sand (SW, SM, SC)	Very dense	6–10	6
	Medium dense to dense	4–8	5
	Loose	2–4	3
Fine sand, silty or clayey medium to fine sand (SP, SM, SC)	Very dense	6–10	6
	Medium dense to dense	4–8	5
	Loose	2–4	3
Homogeneous inorganic clay, sandy or silty clay (CL, CH)	Very dense	6–12	8
	Medium dense to dense	2–6	4
	Loose	1–2	1
Inorganic silt, sandy or clayey silt, varved silt-clay-fine sand (ML, MH)	Very stiff to hard	4–8	6
	Medium stiff to stiff	2–6	3
	Soft	1–2	1

$$q_0 = 1 \text{ ksf}$$



CALCULATIONS

File No.	132076-007
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Date	19-May-21
Computed by	JAD
Checked by	EMS

Client	Maine Department of Transportation
Project	Route 9 / I-395 Connector
Subject	Bearing Resistance Calculations - Eaton Brook Tributary Sta. 273+50

CONCLUSIONS AND RECOMMENDATIONS

Strength Limit State

The factored bearing resistance for the strength limit state is 2.6 ksf

Service Limit State

The factored bearing resistance for the service limit state is 1.0 ksf for a 1 in. settlement.

Client Maine Department of Transportation

Date 19-May-21

Project Route 9 / I-395 Connector

Computed by JAD

Subject Bearing Resistance Calculations - Wildlife 2 Sta. 275+88

Checked by EMS

PROBLEM STATEMENT & OBJECTIVE

Calculate the Strength and Service Limit State bearing resistance for the proposed footing.

REFERENCES

1. AASHTO LRFD Bridge Design Specifications, 9th Edition, 2020.

AVAILABLE INFORMATION

1. Plan set titled "Brewer-Eddington, Penobscot County, I-395 - Route 9 Connector, Stream and Snowmobile Crossings", dated September 2020.

ASSUMPTIONS

1. The vertical load eccentricity only applies in one direction (i.e., overturning moment only in one direction). The maximum eccentricity assumed is B/3 based on AASHTO Section 10.6.3.3.
2. Subsurface conditions based on boring BB-EWC2-101, BB-EWC2-201 and BB-EWC2-202.
3. Footing will bear on Marine Deposits (medium stiff CLAY) and Glacial Till (SILT with trace sand and gravel).

PROCEDURE FOR STRENGTH LIMIT STATE

AASHTO LRFD Equation 10.6.3.1.2a- Basic Formulation for Nominal Bearing Resistance

$$q_n = cN_{cm} + \gamma D_f N_{qm} C_{wq} + 0.5 \gamma B N_{ym} C_{wy} \quad \text{Equation 10.6.3.1.2a-1}$$

$$N_{cm} = N_c s_c i_c \quad \text{Equation 10.6.3.1.2a-2}$$

$$N_{qm} = N_q s_q d_q i_q \quad \text{Equation 10.6.3.1.2a-3}$$

$$N_{ym} = N_\gamma s_\gamma i_\gamma \quad \text{Equation 10.6.3.1.2a-4}$$

q_n = nominal strength limit state bearing resistance (ksf)

RF = resistance factor from Table 10.5.5.2.2-1

q_R = factored strength limit state bearing resistance (ksf) = RF x q_n

c = cohesion, taken as undrained shear strength (ksf)

N_c = cohesion term (undrained loading) bearing capacity factor as specified in Table 10.6.3.1.2a-1 (dim)

N_q = surcharge (embedment) term (drained or undrained loading) bearing capacity factor as specified in Table 10.6.3.1.2a-1 (dim)

N_γ = unit weight (footing width) term (drained loading) bearing capacity factor as specified in Table 10.6.3.1.2a-1 (dim)

γ = total (moist) unit weight of soil above or below the bearing depth of the footing (kcf)

D_f = footing embedment depth (ft)

D_w = depth of water below ground surface (ft)

B = footing width (ft)

e_B = footing width eccentricity (ft) as specified in Section 10.6.3.3

B' = effective footing width ($B-2e$) (ft)

L = footing length (ft)

e_L = footing length eccentricity (ft) as specified in Section 10.6.3.3

L' = effective footing length ($L-2e$) (ft)

C_{wq}, C_{wy} = correction factors to account for the location of the groundwater table as specified in Table 10.6.3.1.2a-2 (dim)

s_c, s_q, s_γ = footing shape correction factors as specified in Table 10.6.3.1.2a-3 (dim)

d_q = correction factor to account for the shearing resistance along the failure surface passing through cohesionless material above the bearing elevation as specified in Table 10.6.3.1.2a-4 (dim).

i_c, i_q, i_γ = load inclination factors

Client Maine Department of Transportation

Date 19-May-21

Project Route 9 / I-395 Connector

Computed by JAD

Subject Bearing Resistance Calculations - Wildlife 2 Sta. 275+88

Checked by EMS

CALCULATION FOR STRENGTH LIMIT STATE

B =	14	ft
e _B =	0	ft
B' =	14.0	ft
L =	144	ft
e _L =	0	ft
L' =	144	ft
c =	0.5	ksf
Y =	115	pcf
φ =	0	degrees
D _w	26	ft
D _f	29	ft
N _f = f(φ)	1.00	
C _{wq}	0.9	
C _{wY}	0.50	
N _c	5.1	
S _c	1.02	
i _c	1	
N _{cm}	5.2	
N _q	1	
S _q	1.00	
d _q	1	
i _q	1	
N _{qm}	1.0	
N _Y	0.0	
S _Y	1.00	
i _Y	1	
N _{Ym}	0.0	
q _n	5.8	ksf
RF	0.45	
q _R	2.6	ksf

Client Maine Department of Transportation

Date 19-May-21

Project Route 9 / I-395 Connector

Computed by JAD

Subject Bearing Resistance Calculations - Wildlife 2 Sta. 275+88

Checked by EMS

SERVICE LIMIT STATE BASED ON PRESUMPTIVE BEARING RESISTANCES IN AASHTO LRFD:*10.6.2.5.1—Presumptive Values for Bearing Resistance C10.6.2.5.1*

The use of presumptive values shall be based on knowledge of geological conditions at or near the structure site.

Unless more appropriate regional data are available, the presumptive values given in Table C10.6.2.5.1-1 may be used. These bearing resistances are settlement limited, e.g., 1.0 in., and apply only at the service limit state.

Table C10.6.2.5.1-1—Presumptive Bearing Resistance for Spread Footing Foundations at the Service Limit State Modified after U.S. Department of the Navy (1982)

Type of Bearing Material	Consistency in Place	Bearing Resistance (ksf)	
		Ordinary Range	Recommended Value of Use
Massive crystalline igneous and metamorphic rock: granite, diorite, basalt, gneiss, thoroughly cemented conglomerate (sound condition allows minor cracks)	Very hard, sound rock	120–200	160
Foliated metamorphic rock: slate, schist (sound condition allows minor cracks)	Hard sound rock	60–80	70
Sedimentary rock: hard cemented shales, siltstone, sandstone, limestone without cavities	Hard sound rock	30–50	40
Weathered or broken bedrock of any kind, except highly argillaceous rock (shale)	Medium hard rock	16–24	20
Compaction shale or other highly argillaceous rock in sound condition	Medium hard rock	16–24	20
Well-graded mixture of fine- and coarse-grained soil: glacial till, hardpan, boulder clay (GW-GC, GC, SC)	Very dense	16–24	20
Gravel, gravel-sand mixture, boulder-gravel mixtures (GW, GP, SW, SP)	Very dense	12–20	14
	Medium dense to dense	8–14	10
	Loose	4–12	6
Coarse to medium sand, and with little gravel (SW, SP)	Very dense	8–12	8
	Medium dense to dense	4–8	6
	Loose	2–6	3
Fine to medium sand, silty or clayey medium to coarse sand (SW, SM, SC)	Very dense	6–10	6
	Medium dense to dense	4–8	5
	Loose	2–4	3
Fine sand, silty or clayey medium to fine sand (SP, SM, SC)	Very dense	6–10	6
	Medium dense to dense	4–8	5
	Loose	2–4	3
Homogeneous inorganic clay, sandy or silty clay (CL, CH)	Very dense	6–12	8
	Medium dense to dense	2–6	4
	Loose	1–2	1
Inorganic silt, sandy or clayey silt, varved silt-clay-fine sand (ML, MH)	Very stiff to hard	4–8	6
	Medium stiff to stiff	2–6	3
	Soft	1–2	1

$$q_0 = 2 \text{ ksf}$$

Client Maine Department of Transportation

Date 19-May-21

Project Route 9 / I-395 Connector

Computed by JAD

Subject Bearing Resistance Calculations - Snowmobile 107 Sta. 284+27

Checked by EMS

PROBLEM STATEMENT & OBJECTIVE

Calculate the Strength and Service Limit State bearing resistance for the proposed footing.

REFERENCES

1. AASHTO LRFD Bridge Design Specifications, 9th Edition, 2020.

AVAILABLE INFORMATION

1. Plan set titled "Brewer-Eddington, Penobscot County, I-395 - Route 9 Connector, Stream and Snowmobile Crossings", dated September 2020.

ASSUMPTIONS

1. The vertical load eccentricity only applies in one direction (i.e., overturning moment only in one direction). The maximum eccentricity assumed is B/3 based on AASHTO Section 10.6.3.3.
2. Subsurface conditions based on boring BB-EST2-101.
3. Footing will bear on Glacial Till (sandy SILT).

PROCEDURE FOR STRENGTH LIMIT STATE

EMS

AASHTO LRFD Equation 10.6.3.1.2a- Basic Formulation for Nominal Bearing Resistance

$$q_n = cN_{cm} + \gamma D_f N_{qm} C_{wq} + 0.5 \gamma B N_{\gamma m} C_{w\gamma} \quad \text{Equation 10.6.3.1.2a-1}$$

$$N_{cm} = N_c s_c i_c \quad \text{Equation 10.6.3.1.2a-2}$$

$$N_{qm} = N_q s_q d_q i_q \quad \text{Equation 10.6.3.1.2a-3}$$

$$N_{\gamma m} = N_\gamma s_\gamma i_\gamma \quad \text{Equation 10.6.3.1.2a-4}$$

q_n = nominal strength limit state bearing resistance (ksf)

RF = resistance factor from Table 10.5.5.2.2-1

q_R = factored strength limit state bearing resistance (ksf) = RF x q_n

c = cohesion, taken as undrained shear strength (ksf)

N_c = cohesion term (undrained loading) bearing capacity factor as specified in Table 10.6.3.1.2a-1 (dim)

N_q = surcharge (embedment) term (drained or undrained loading) bearing capacity factor as specified in Table 10.6.3.1.2a-1 (dim)

N_γ = unit weight (footing width) term (drained loading) bearing capacity factor as specified in Table 10.6.3.1.2a-1 (dim)

γ = total (moist) unit weight of soil above or below the bearing depth of the footing (kcf)

D_f = footing embedment depth (ft)

D_w = depth of water below ground surface (ft)

B = footing width (ft)

e_B = footing width eccentricity (ft) as specified in Section 10.6.3.3

B' = effective footing width ($B-2e$) (ft)

L = footing length (ft)

e_L = footing length eccentricity (ft) as specified in Section 10.6.3.3

L' = effective footing length ($L-2e$) (ft)

$C_{wq}, C_{w\gamma}$ = correction factors to account for the location of the groundwater table as specified in Table 10.6.3.1.2a-2 (dim)

s_c, s_q, s_γ = footing shape correction factors as specified in Table 10.6.3.1.2a-3 (dim)

d_q = correction factor to account for the shearing resistance along the failure surface passing through cohesionless material above the bearing elevation as specified in Table 10.6.3.1.2a-4 (dim).

i_c, i_q, i_γ = load inclination factors

Client Maine Department of Transportation

Date 19-May-21

Project Route 9 / I-395 Connector

Computed by JAD

Subject Bearing Resistance Calculations - Snowmobile 107 Sta. 284+27

Checked by EMS

CALCULATION FOR STRENGTH LIMIT STATE

B =	14	ft
e _B =	0	ft
B' =	14.0	ft
L =	122	ft
e _L =	0	ft
L' =	122	ft
c =	0.0	ksf
γ =	130	pcf
φ =	36	degrees
D _w	21	ft
D _f	23	ft
N _f = f(φ)	3.85	
C _{wq}	1.0	
C _{wγ}	0.50	
N _c	5.1	
S _c	1.84	
i _c	1	
N _{cm}	9.5	
N _q	37.8	
S _q	1.08	
d _q	1	
i _q	1	
N _{qm}	41.0	
N _γ	56.4	
S _γ	0.95	
i _γ	1	
N _{γm}	53.8	
q _n	141.6	ksf
RF	0.45	
q _R	63.7	ksf

Client Maine Department of Transportation

Date 19-May-21

Project Route 9 / I-395 Connector

Computed by JAD

Subject Bearing Resistance Calculations - Snowmobile 107 Sta. 284+27

Checked by EMS

SERVICE LIMIT STATE BASED ON PRESUMPTIVE BEARING RESISTANCES IN AASHTO LRFD:
10.6.2.5.1—Presumptive Values for Bearing Resistance C10.6.2.5.1

The use of presumptive values shall be based on knowledge of geological conditions at or near the structure site.

Unless more appropriate regional data are available, the presumptive values given in [Table C10.6.2.5.1-1](#) may be used. These bearing resistances are settlement limited, e.g., 1.0 in., and apply only at the service limit state.

Table C10.6.2.5.1-1—Presumptive Bearing Resistance for Spread Footing Foundations at the Service Limit State Modified after U.S. Department of the Navy (1982)

Type of Bearing Material	Consistency in Place	Bearing Resistance (ksf)	
		Ordinary Range	Recommended Value of Use
Massive crystalline igneous and metamorphic rock: granite, diorite, basalt, gneiss, thoroughly cemented conglomerate (sound condition allows minor cracks)	Very hard, sound rock	120–200	160
Foliated metamorphic rock: slate, schist (sound condition allows minor cracks)	Hard sound rock	60–80	70
Sedimentary rock: hard cemented shales, siltstone, sandstone, limestone without cavities	Hard sound rock	30–50	40
Weathered or broken bedrock of any kind, except highly argillaceous rock (shale)	Medium hard rock	16–24	20
Compaction shale or other highly argillaceous rock in sound condition	Medium hard rock	16–24	20
Well-graded mixture of fine- and coarse-grained soil: glacial till, hardpan, boulder clay (GW-GC, GC, SC)	Very dense	16–24	20
Gravel, gravel-sand mixture, boulder-gravel mixtures (GW, GP, SW, SP)	Very dense	12–20	14
	Medium dense to dense	8–14	10
	Loose	4–12	6
Coarse to medium sand, and with little gravel (SW, SP)	Very dense	8–12	8
	Medium dense to dense	4–8	6
	Loose	2–6	3
Fine to medium sand, silty or clayey medium to coarse sand (SW, SM, SC)	Very dense	6–10	6
	Medium dense to dense	4–8	5
	Loose	2–4	3
Fine sand, silty or clayey medium to fine sand (SP, SM, SC)	Very dense	6–10	6
	Medium dense to dense	4–8	5
	Loose	2–4	3
Homogeneous inorganic clay, sandy or silty clay (CL, CH)	Very dense	6–12	8
	Medium dense to dense	2–6	4
	Loose	1–2	1
Inorganic silt, sandy or clayey silt, varved silt-clay-fine sand (ML, MH)	Very stiff to hard	4–8	6
	Medium stiff to stiff	2–6	3
	Soft	1–2	1

$$q_0 = 6 \text{ ksf}$$



CALCULATIONS

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Checked by	EMS

Client	Maine Department of Transportation
Project	Route 9 / I-395 Connector
Subject	Bearing Resistance Calculations - Snowmobile 107 Sta. 284+27

CONCLUSIONS AND RECOMMENDATIONS

Strength Limit State

The factored bearing resistance for the strength limit state is 63.7 ksf

Service Limit State

The factored bearing resistance for the service limit state is 6.0 ksf for a 1 in. settlement.

Client Maine Department of Transportation

Date 19-May-21

Project Route 9 / I-395 Connector

Computed by JAD

Subject Bearing Resistance Calculations - Wetland Sta. 289+11

Checked by EMS

PROBLEM STATEMENT & OBJECTIVE

Calculate the Strength and Service Limit State bearing resistance for the proposed footing.

REFERENCES

1. AASHTO LRFD Bridge Design Specifications, 9th Edition, 2020.

AVAILABLE INFORMATION

1. Plan set titled "Brewer-Eddington, Penobscot County, I-395 - Route 9 Connector, Stream and Snowmobile Crossings", dated September 2020.

ASSUMPTIONS

1. The vertical load eccentricity only applies in one direction (i.e., overturning moment only in one direction). The maximum eccentricity assumed is B/3 based on AASHTO Section 10.6.3.3.
2. Subsurface conditions based on boring BB-EWC-101 and BB-EWC-203.
3. Footing will bear on Glacial Till (gravelly SILT).

PROCEDURE FOR STRENGTH LIMIT STATE

AASHTO LRFD Equation 10.6.3.1.2a- Basic Formulation for Nominal Bearing Resistance

$$q_n = cN_{cm} + \gamma D_f N_{qm} C_{wq} + 0.5 \gamma B N_{ym} C_{wy} \quad \text{Equation 10.6.3.1.2a-1}$$

$$N_{cm} = N_c s_c i_c \quad \text{Equation 10.6.3.1.2a-2}$$

$$N_{qm} = N_q s_q d_q i_q \quad \text{Equation 10.6.3.1.2a-3}$$

$$N_{ym} = N_\gamma s_\gamma i_\gamma \quad \text{Equation 10.6.3.1.2a-4}$$

q_n = nominal strength limit state bearing resistance (ksf)

RF = resistance factor from Table 10.5.5.2.2-1

q_R = factored strength limit state bearing resistance (ksf) = RF x q_n

c = cohesion, taken as undrained shear strength (ksf)

N_c = cohesion term (undrained loading) bearing capacity factor as specified in Table 10.6.3.1.2a-1 (dim)

N_q = surcharge (embedment) term (drained or undrained loading) bearing capacity factor as specified in Table 10.6.3.1.2a-1 (dim)

N_γ = unit weight (footing width) term (drained loading) bearing capacity factor as specified in Table 10.6.3.1.2a-1 (dim)

γ = total (moist) unit weight of soil above or below the bearing depth of the footing (kcf)

D_f = footing embedment depth (ft)

D_w = depth of water below ground surface (ft)

B = footing width (ft)

e_B = footing width eccentricity (ft) as specified in Section 10.6.3.3

B' = effective footing width ($B-2e$) (ft)

L = footing length (ft)

e_L = footing length eccentricity (ft) as specified in Section 10.6.3.3

L' = effective footing length ($L-2e$) (ft)

C_{wq}, C_{wy} = correction factors to account for the location of the groundwater table as specified in Table 10.6.3.1.2a-2 (dim)

s_c, s_q, s_γ = footing shape correction factors as specified in Table 10.6.3.1.2a-3 (dim)

d_q = correction factor to account for the shearing resistance along the failure surface passing through cohesionless material above the bearing elevation as specified in Table 10.6.3.1.2a-4 (dim).

i_c, i_q, i_γ = load inclination factors

Client Maine Department of Transportation

Date 19-May-21

Project Route 9 / I-395 Connector

Computed by JAD

Subject Bearing Resistance Calculations - Wetland Sta. 289+11

Checked by EMS

CALCULATION FOR STRENGTH LIMIT STATE

B =	12	ft
e _B =	0	ft
B' =	12.0	ft
L =	122	ft
e _L =	0	ft
L' =	122	ft
c =	0.0	ksf
γ =	130	pcf
φ =	36	degrees
D _w	20	ft
D _f	23	ft
N _f = f(φ)	3.85	
C _{wq}	0.9	
C _{wγ}	0.50	
N _c	5.1	
S _c	1.72	
i _c	1	
N _{cm}	8.9	
N _q	37.8	
S _q	1.07	
d _q	1	
i _q	1	
N _{qm}	40.5	
N _γ	56.4	
S _γ	0.96	
i _γ	1	
N _{γm}	54.2	
q _n	134.3	ksf
RF	0.45	
q _R	60.4	ksf

Client Maine Department of Transportation

Date 19-May-21

Project Route 9 / I-395 Connector

Computed by JAD

Subject Bearing Resistance Calculations - Wetland Sta. 289+11

Checked by EMS

SERVICE LIMIT STATE BASED ON PRESUMPTIVE BEARING RESISTANCES IN AASHTO LRFD:*10.6.2.5.1—Presumptive Values for Bearing Resistance C10.6.2.5.1*

The use of presumptive values shall be based on knowledge of geological conditions at or near the structure site.

Unless more appropriate regional data are available, the presumptive values given in [Table C10.6.2.5.1-1](#) may be used. These bearing resistances are settlement limited, e.g., 1.0 in., and apply only at the service limit state.

Table C10.6.2.5.1-1—Presumptive Bearing Resistance for Spread Footing Foundations at the Service Limit State Modified after U.S. Department of the Navy (1982)

Type of Bearing Material	Consistency in Place	Bearing Resistance (ksf)	
		Ordinary Range	Recommended Value of Use
Massive crystalline igneous and metamorphic rock: granite, diorite, basalt, gneiss, thoroughly cemented conglomerate (sound condition allows minor cracks)	Very hard, sound rock	120–200	160
Foliated metamorphic rock: slate, schist (sound condition allows minor cracks)	Hard sound rock	60–80	70
Sedimentary rock: hard cemented shales, siltstone, sandstone, limestone without cavities	Hard sound rock	30–50	40
Weathered or broken bedrock of any kind, except highly argillaceous rock (shale)	Medium hard rock	16–24	20
Compaction shale or other highly argillaceous rock in sound condition	Medium hard rock	16–24	20
Well-graded mixture of fine- and coarse-grained soil: glacial till, hardpan, boulder clay (GW-GC, GC, SC)	Very dense	16–24	20
Gravel, gravel-sand mixture, boulder-gravel mixtures (GW, GP, SW, SP)	Very dense	12–20	14
	Medium dense to dense	8–14	10
	Loose	4–12	6
Coarse to medium sand, and with little gravel (SW, SP)	Very dense	8–12	8
	Medium dense to dense	4–8	6
	Loose	2–6	3
Fine to medium sand, silty or clayey medium to coarse sand (SW, SM, SC)	Very dense	6–10	6
	Medium dense to dense	4–8	5
	Loose	2–4	3
Fine sand, silty or clayey medium to fine sand (SP, SM, SC)	Very dense	6–10	6
	Medium dense to dense	4–8	5
	Loose	2–4	3
Homogeneous inorganic clay, sandy or silty clay (CL, CH)	Very dense	6–12	8
	Medium dense to dense	2–6	4
	Loose	1–2	1
Inorganic silt, sandy or clayey silt, varved silt-clay-fine sand (ML, MH)	Very stiff to hard	4–8	6
	Medium stiff to stiff	2–6	3
	Soft	1–2	1

$$q_0 = 6 \text{ ksf}$$



CALCULATIONS

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Checked by	EMS

Client	Maine Department of Transportation
Project	Route 9 / I-395 Connector
Subject	Bearing Resistance Calculations - Wetland Sta. 289+11

CONCLUSIONS AND RECOMMENDATIONS


Strength Limit State

The factored bearing resistance for the strength limit state is 60.4 ksf

Service Limit State

The factored bearing resistance for the service limit state is 6.0 ksf for a 1 in. settlement.

Settlement

		CALCULATIONS				File No.:	132076-007																																			
						Sheet:	1 of 8																																			
Client:	Maine Department of Transportation					Date:	06JUL2021																																			
Project:	I-395/Rt. 9 Connector Highway, Brewer-Eddington, ME					Computed by:	JLL																																			
Subject:	Embankment Construction Settlement Evaluations					Checked by:	EMS																																			
<p>PROBLEM STATEMENT & OBJECTIVE Evaluate primary consolidation and secondary settlements in staged construction of embankments to meet post-construction settlement criteria.</p> <p>EXECUTIVE SUMMARY Construction staging, pre-excavation depths, lightweight fill thickness required were calculated based on the settlement criteria. Results are presented in the pages that follow.</p> <p>REFERENCES 1. 9th Edition, AASHTO LRFD Bridge Design Specifications, 2020. 2. Holtz, R.D. & Kovacs, W.D., An Introduction to Geotechnical Engineering.</p> <p>AVAILABLE INFORMATION 1. Subsurface Data: preliminary and final design phase borings. 2. Laboratory consolidation test results for the marine clay (compressibility and stress history/preconsolidation pressure). 3. (CPT soundings were not used to evaluate stress history and compressibility. They were used to calibrate CPT parameters against lab data). 4. Settlement criteria for highway (embankment), bridge, and culvert structures. 5. Maximum stable stage heights also based on global stability evaluations performed by Haley & Aldrich.</p> <p>ASSUMPTIONS 1. Elevations are in feet, NAVD88 Datum. 2. The project was divided into 4 areas with the following compressibility parameters and stress history:</p> <table border="1"> <thead> <tr> <th>Area</th> <th colspan="2">Approx. Stations</th> <th>CR</th> <th>RR</th> <th>C$\alpha$$\epsilon$</th> <th>Preconsolidation Pressure, p'_c Profile/Stress History (psf)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>50+50</td> <td>83+00</td> <td>0.17</td> <td>0.02</td> <td>0.004</td> <td>6000-2000 above El. 65, NC below El. 65</td> </tr> <tr> <td>2</td> <td>137+00</td> <td>143+00</td> <td>0.17</td> <td>0.02</td> <td>0.004</td> <td>3000-900 above El. 60, NC below El. 60</td> </tr> <tr> <td>3</td> <td>159+00</td> <td>170+00</td> <td>0.19</td> <td>0.02</td> <td>0.004</td> <td>9000-2500 above El. 100, 2500-NC below El. 65</td> </tr> <tr> <td>4</td> <td>179+00</td> <td>186+00</td> <td>0.18</td> <td>0.02</td> <td>0.004</td> <td>5000-1000 above El. 84, NC below El. 84</td> </tr> </tbody> </table> <p>Notes: CR = strain-based compressibility for virgin compression, CR=Cc/(1+e0) from lab consolidation test data. RR = strain-based compressibility for recompression, RR=Cr/(1+e0) from lab consolidation test data. C$\alpha$$\epsilon$ = strain-based coefficient of secondary compression, from lab consolidation test data. p'_c = preconsolidation pressure or maximum past pressure, NC - normally-consolidated, OCR=1. Settlement calculated at select stations along alignment using nearest boring soil conditions. Water depth/elevation taken from water level readings at nearest boring, if not available, completely submerged conditions were assumed.</p> <p>3. For areas where prefabricated vertical drains (PVD or wick drains) will be used, separate calculations performed by Haley & Aldrich indicate that 5 ft wick drain spacing and ch/cv=2 reaches 90% average degree of consolidation in 7.4 months. Where secondary clay compression is calculated, end of primary consolidation and start of secondary compression was assumed to start at about 7.4 months.</p> <p>4. For areas where wick drains are NOT used, single drainage conditions are assumed and the secondary compression is assumed to start from the time it takes to 90% average degree of consolidation (t90). This consol. time varies with clay thickness since there are no wick drains. For t90, the dimensionless time factor T=0.848 (uniform stress increase).</p> <p>5. The following post-construction settlement criteria were considered depending on the embankment location: Highway Embankment and Highway Culvert Settlement Criteria: less than or equal to 4 inches in the first 20 yrs. additional settlement less than or equal to 4 inches from 20 yrs. to 75 yrs.</p> <p>Bridge Settlement Criteria: less than or equal to 2 inches in the first 5 yrs. additional settlement less than or equal to 2 inches from 5 yrs. to 20 yrs. additional settlement less than or equal to 2 inches from 20 yrs. to 75 yrs.</p> <p>(Box) Culvert Settlement Criteria: less than or equal to 2 inches in the first 100 yrs.</p> <p>6. Settlement was calculated under the estimated maximum height of embankment at stations analyzed (i.e., where the stress increase is maximum). Stress increase in the clay assumed uniform with depth (i.e., surcharge condition).</p> <p>7. Traffic surcharge was not considered in the settlement evaluations.</p> <p>8. Where lightweight fill (LWF) is required to meet the settlement criteria, LWF assumed total unit weight is 15 pcf.</p> <p>9. Pavement section is assumed to be 3 ft thick with unit weight of 135 pcf.</p>								Area	Approx. Stations		CR	RR	C α ϵ	Preconsolidation Pressure, p' _c Profile/Stress History (psf)	1	50+50	83+00	0.17	0.02	0.004	6000-2000 above El. 65, NC below El. 65	2	137+00	143+00	0.17	0.02	0.004	3000-900 above El. 60, NC below El. 60	3	159+00	170+00	0.19	0.02	0.004	9000-2500 above El. 100, 2500-NC below El. 65	4	179+00	186+00	0.18	0.02	0.004	5000-1000 above El. 84, NC below El. 84
Area	Approx. Stations		CR	RR	C α ϵ	Preconsolidation Pressure, p' _c Profile/Stress History (psf)																																				
1	50+50	83+00	0.17	0.02	0.004	6000-2000 above El. 65, NC below El. 65																																				
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3	159+00	170+00	0.19	0.02	0.004	9000-2500 above El. 100, 2500-NC below El. 65																																				
4	179+00	186+00	0.18	0.02	0.004	5000-1000 above El. 84, NC below El. 84																																				

RESULTS

AREA 1 - Highway Settlement Criteria, Wick Drains Required, LWF may be Required

Station No.	CPT or Boring ID	GS El. (ft)	GW El. (ft)	Clay Thickness (ft)	Full Emb. Ht. (ft)	Stage 1 Emb. Ht. (ft)	Initial Excav. Depth from Ground Surf. (ft)	Required LWF Thickness (ft)	Post-Constr. Settlement 0-20 yrs (in.)	Post-Constr. Settlement 20-75 yrs (in.)
59+00	HB-BE-108	81.8	80.9	17.2	13.2	11.2	-	0	2.0	1.3
59+00	HB-BE-204	81.5	80.4	21.6	12.9	10.9	-	0	3.1	1.6
59+00	HB-BE-205	83.1	80.4	18.4	12.7	10.7	-	0	2.1	1.3
63+00	BB-BFB1-202	80.8	80.6	30.5	16.7	14.7	-	2.25	4.0	2.2
63+00	HB-BE-109	84.4	80.8	15.5	16.7	14.7	-	0	1.6	1.1
65+50	HB-BE-212	81.6	79.85	23.8	19.5	17	-	0	3.9	1.7
68+00	BB-BFB1-101	80.8	80	16.4	21.9	19	-	0	2.3	1.2
82+50	CPT-113	88	88	20	12	10	-	0	2.1	1.5
712+00	HB-BE-105	88.1	83.7	17	21	19	-	0	1.7	1.2
712+00	HB-BE-208	90.1	83	13.8	21	19	-	0	1.4	1.0
712+00	HB-BE-210	84.7	83.4	20.1	21	19	-	0	2.5	1.5
713+50	HB-BE-210	84.7	83.4	20.1	31.3	20	-	3.5	4.0	1.5
907+00	HB-BE-239	82.6	82.6	25.3	33.1	19	-	14	4.0	1.8
907+00	HB-BE-202	81.2	81.2	31.4	33.1	19	-	16.75	4.0	2.3
907+00	HB-BE-203	80.6	80.6	22.8	33.1	19	-	13.25	4.0	1.7

Notes:

Highway Settlement Criteria:

less than or equal to 4 inches in the first 20 yrs.

additional settlement less than or equal to 4 inches from 20 yrs. to 75 yrs.

Wick drains required at these stations due to staged embankment construction (i.e., to reduce consolidation wait time).

Some stations have multiple nearest borings or CPT soundings.

Stage 1 embankment height may be controlled by global stability.

AREA 1 - Bridge Settlement Criteria, Wick Drains Required, LWF may be Required

Station No.	CPT or Boring ID	GS El. (ft)	GW El. (ft)	Clay Thickness (ft)	Full Emb. Ht. (ft)	Stage 1 Emb. Ht. (ft)	Initial Excav. Depth from Ground Surf. (ft)	Required LWF Thickness (ft)	Post-Constr. Settlement 0-5 yrs (in.)	Post-Constr. Settlement 5-20 yrs (in.)	Post-Constr. Settlement 20-75 yrs (in.)
56+50	HB-BE-204	81.5	80.4	30	15.5	17.5	-	0	1.9	0.9	0.8
53+00	HB-BE-101	82	82	37	21.4	14	-	10.75	2.0	1.1	1.0
53+00	BB-BFB-101	79.4	79.4	34.5	21.4	14	-	10.75	1.9	1.0	1.0
53+00	BB-BFB-202	80.5	80.4	41.8	21.4	14	-	11	2.0	1.2	1.2

Notes:

Bridge Settlement Criteria:

less than or equal to 2 inches in the first 5 yrs.

additional settlement less than or equal to 2 inches from 5 yrs. to 20 yrs.

additional settlement less than or equal to 2 inches from 20 yrs. to 75 yrs.

Wick drains required at these stations due to staged embankment construction (i.e., to reduce consolidation wait time).

Some stations have multiple nearest borings or CPT soundings.

Stage 1 embankment height may be controlled by global stability. Some sections may require stage 1 heights greater than final.

Client: Maine Department of Transportation

Computed by: JLL

Checked by: EMS

Sheet: 2 of 8



File No.: 132076-007

Date: 06JUL2021

Project: I-395/Rt. 9 Connector Highway, Brewer-Eddington, ME

Subject: Embankment Construction Settlement Evaluations

RESULTS

AREA 1 - Culvert Settlement Criteria, No Wick Drains, Excavation & LWF Required									Embank. Centerline	Embank. Toe
Station No.	CPT or Boring ID	GS El. (ft)	GW El. (ft)	Clay Thickness (ft)	Full Emb. Ht. (ft)	Stage 1 Emb. Ht. (ft)	Initial Excav. Depth from Ground Surf. (ft)	Required LWF Thickness (ft)	Post-Constr. Settlement 0-100 yrs (in.)	Post-Constr. Settlement 0-100 yrs (in.)
64+00	BB-BFB1-201	80.7	80.7	15.8	19.3	19.3	2.25	18.6	2.0	0.0
64+00	BB-BFB1-202	80.8	80.8	30.5	19.3	19.3	5.75	22.1	2.0	-0.9
64+00	BB-BFB1-203	80.6	80.6	23.7	19.3	19.3	5.25	21.6	2.0	-0.6

Notes:

Culvert Settlement Criteria:

less than or equal to 2 inches in the first 100 yrs.

Required excavation depth is depth of excavation below existing ground surface needed to meet post-construction settlement criteria.

LWF is placed from bottom of excavation to bottom of pavement section, LWF is required to meet post-construction settlement criteria.

Wick drains are not required at these sections.

Some stations have multiple nearest borings or CPT soundings.

Felts Brook Tributary

AREA 1 - Culvert Settlement Criteria, Wick Drains Required, LWF Required									Embank. Centerline	Embank. Toe
Station No.	CPT or Boring ID	GS El. (ft)	GW El. (ft)	Clay Thickness (ft)	Full Emb. Ht. (ft)	Stage 1 Emb. Ht. (ft)	Initial Excav. Depth from Ground Surf. (ft)	Required LWF Thickness (ft)	Post-Constr. Settlement 0-100 yrs (in.)	Post-Constr. Settlement 0-100 yrs (in.)
77+00	BB-BST1-201	86	86	23.1	19.2	19.2	-	5	2.0	1.3

Notes:

Culvert Settlement Criteria:

less than or equal to 2 inches in the first 100 yrs.

Wick drains required at these stations due to staged embankment construction (i.e., to reduce consolidation wait time).

Snowmobile 10C

AREA 1 - Highway Culvert Settlement Criteria, No Wick Drains, Excavation & LWF Requirements									Embank. Centerline	Embank. Centerline	Embank. Toe	Embank. Toe
Station No.	CPT or Boring ID	GS El. (ft)	GW El. (ft)	Clay Thickness (ft)	Full Emb. Ht. (ft)	Stage 1 Emb. Ht. (ft)	Initial Excav. Depth from Ground Surf. (ft)	Required LWF Thickness (ft)	Post-Constr. Settlement 0-20 yrs (in.)	Post-Constr. Settlement 20-75 yrs (in.)	Post-Constr. Settlement 0-20 yrs (in.)	Post-Constr. Settlement 20-75 yrs (in.)
66+75	BB-BFB1-101	80.8	80.8	20	21.5	21.5	0.75	19.3	4.0	0.5	0.1	0.5
66+75	HB-BE-213	81.1	81.1	21.7	21.5	21.5	1.4	19.9	4.0	0.6	-0.4	0.6
66+75	HB-BE-214	82.3	82.3	11.3	21.5	21.5	0	18.5	2.3	0.3	0.6	0.3
66+75	HB-BE-204	81	81	26.8	21.5	21.5	3	21.5	4.0	0.7	-1.1	0.7
84+50	BB-BFB2-201	87.4	87.4	15.7	11	11	0	0.0	2.4	0.4	0.9	0.4
84+50	BB-BFB2-101	89.1	89.1	20	11	11	0	0.0	2.5	0.6	0.9	0.6
84+50	BB-BFB2-202	89.4	89.4	14.7	11	11	0	0.0	2.3	0.4	0.9	0.4

Notes:

Highway Settlement Criteria:

less than or equal to 4 inches in the first 20 yrs.

additional settlement less than or equal to 4 inches from 20 yrs. to 75 yrs.

Required excavation depth is depth of excavation below existing ground surface needed to meet post-construction settlement criteria.

LWF is placed from bottom of excavation to bottom of pavement section, LWF is required to meet post-construction settlement criteria.

Wick drains are not required at these sections.

Some stations have multiple nearest borings or CPT soundings.

RESULTS

EMBANKMENT AREA 1 - Highway Settlement Criteria, Wick Drains Required

Station No.	CPT or Boring ID	ASSUMED GS El. (ft)	GW El. (ft)	Clay Thickness (ft)	Full Emb. Ht. (ft)	Stage 1 Emb. Ht. (ft)	Initial Excav. Depth from Ground Surf. (ft)	Required LWF Thickness (ft)	Post-Constr. Settlement 0-20 yrs (in.)	Post-Constr. Settlement 20-75 yrs (in.)
52+00	HB-BE-201	98	98	26	8	8	-	0	2.4	0.7
52+00	HB-BE-202	98	98	31.4	8	8	-	0	2.9	0.9
52+00	HB-BE-328	98	97.3	17	8	8	-	0	1.4	0.5
717+50	HB-BE-241	100	81.4	15	15	15	-	0	1.3	0.4
801+00	BB-BWS-301	100	88.5	22.1	15.5	13.5	-	0	2.5	0.6
801+00	HB-BE-242	100	83.5	13.9	15.5	13.5	-	0	1.4	0.4
801+00	HB-BE-242A	100	83.4	14.3	15.5	13.5	-	0	1.5	0.4
801+00	HB-BE-243	100	83.1	25	15.5	13.5	-	0	2.4	0.7
908+50	HB-BE-239	115	76	25.3	11.5	11.5	-	0	2.3	0.7
908+50	HB-BE-202	115	81.2	31.4	11.5	11.5	-	0	2.9	0.9
908+50	HB-BE-203	115	80.6	22.8	11.5	11.5	-	0	2.1	0.6

Notes:

Highway Settlement Criteria:

less than or equal to 4 inches in the first 20 yrs.

additional settlement less than or equal to 4 inches from 20 yrs. to 75 yrs.

Wick drains required at these stations due to staged embankment construction (i.e., to reduce consolidation wait time).

Some stations have multiple nearest borings or CPT soundings.

Stage 1 embankment height may be controlled by global stability.

Ground surface at these stations were taken from the contour plans of ground surface elevation, the nearest CPT or boring ground surface is likely different from the assumed value.

Client: Maine Department of Transportation

Computed by: JLL

Checked by: EMS

Sheet: 4 of 8



File No.: 132076-007

Date: 06JUL2021

Project: I-395/Rt. 9 Connector Highway, Brewer-Eddington, ME

Subject: Embankment Construction Settlement Evaluations

RESULTS

AREA 2 - Highway Settlement Criteria, Wick Drains Required

Station No.	CPT or Boring ID	GS El. (ft)	GW El. (ft)	Clay Thickness (ft)	Full Emb. Ht. (ft)	Stage 1 Emb. Ht. (ft)	Initial Excav. Depth from Ground Surf. (ft)	Required LWF Thickness (ft)	Post-Constr. Settlement 0-20 yrs (in.)	Post-Constr. Settlement 20-75 yrs (in.)
140+00	BB-BEB-202	74.5	74.5	18.2	18	15	-	-	3.8	0.5
143+00	CPT-116	75	75	16.7	10.1	10.1	-	-	1.7	0.5

Notes:

Highway Settlement Criteria:

- less than or equal to 4 inches in the first 20 yrs.
- additional settlement less than or equal to 4 inches from 20 yrs. to 75 yrs.

Wick drains required at these stations due to staged embankment construction (i.e., to reduce consolidation wait time).

Stage 1 embankment height may be controlled by global stability.

AREA 2 - Highway Settlement Criteria, No Wick Drains

Station No.	CPT or Boring ID	GS El. (ft)	GW El. (ft)	Clay Thickness (ft)	Full Emb. Ht. (ft)	Stage 1 Emb. Ht. (ft)	Initial Excav. Depth from Ground Surf. (ft)	Required LWF Thickness (ft)	Post-Constr. Settlement 0-20 yrs (in.)	Post-Constr. Settlement 20-75 yrs (in.)
138+00	CPT-115	85	85	15.3	10.4	10.4	-	-	3.3	0.4
144+00	-	83	83	10.7	6.2	6.2			2.3	0.3

Notes:

Highway Settlement Criteria:

- less than or equal to 4 inches in the first 20 yrs.
- additional settlement less than or equal to 4 inches from 20 yrs. to 75 yrs.

Wick drains are not required at these sections.

Client: Maine Department of Transportation

Computed by: JLL

Checked by: EMS

Sheet: 5 of 8



File No.: 132076-007

Date: 06JUL2021

Project: I-395/Rt. 9 Connector Highway, Brewer-Eddington, ME

Subject: Embankment Construction Settlement Evaluations

RESULTS

AREA 2 - Bridge Settlement Criteria, Wick Drains Required, LWF may be Required

Station No.	CPT or Boring ID	GS El. (ft)	GW El. (ft)	Clay Thickness (ft)	Full Emb. Ht. (ft)	Stage 1 Emb. Ht. (ft)	Initial Excav. Depth from Ground Surf. (ft)	Required LWF Thickness (ft)	Post-Constr. Settlement 0-5 yrs (in.)	Post-Constr. Settlement 5-20 yrs (in.)	Post-Constr. Settlement 20-75 yrs (in.)
140+00	BB-BEB-202	74.5	74.5	18.2	18	15	-	5	1.2	0.5	0.5
142+00	HB-BE-222	76.5	76.5	19.7	14	14	-	4	0.2	0.6	0.5
143+00	CPT-116	75	75	16.7	10.1	10.1	-	0	1.4	0.5	0.5

Notes:

Bridge Settlement Criteria:

- less than or equal to 2 inches in the first 5 yrs.
- additional settlement less than or equal to 2 inches from 5 yrs. to 20 yrs.
- additional settlement less than or equal to 2 inches from 20 yrs. to 75 yrs.

Wick drains required at these stations due to staged embankment construction (i.e., to reduce consolidation wait time).

Stage 1 embankment height may be controlled by global stability.

Client: Maine Department of Transportation

Computed by: JLL

Checked by: EMS

Sheet: 6 of 8



File No.: 132076-007

Date: 06JUL2021

Project: I-395/Rt. 9 Connector Highway, Brewer-Eddington, ME

Subject: Embankment Construction Settlement Evaluations

RESULTS

AREA 3 - Highway and Highway Culvert Settlement Criteria, No Wick Drains

Station No.	CPT or Boring ID	GS El. (ft)	GW El. (ft)	Clay Thickness (ft)	Full Emb. Ht. (ft)	Stage 1 Emb. Ht. (ft)	Initial Excav. Depth from Ground Surf. (ft)	Required LWF Thickness (ft)	Post-Constr. Settlement 0-20 yrs (in.)	Post-Constr. Settlement 20-75 yrs (in.)
166+00	HB-BE-223A	109	108.9	15.7	17.4	17.4	-	-	4.5	0.4
167+50	HB-BE-223A	109	109	11.6	20.4	20.4	-	-	4.1	0.3

Notes:

(see note below)

Highway and Highway Culver Settlement Criteria:

- less than or equal to 4 inches in the first 20 yrs.
- additional settlement less than or equal to 4 inches from 20 yrs. to 75 yrs.

The estimated post-construction settlement from 0-20 yrs. exceeds 4 inches (4.1 to 4.5 inches), MainedOT finds this acceptable for these locations (discussion with MaineDOT in May 2021).

Conventional construction can be used here.

Wick drains are not required at these sections.

Client: Maine Department of Transportation

Computed by: JLL

Checked by: EMS

Sheet: 7 of 8



File No.: 132076-007

Date: 06JUL2021

Project: I-395/Rt. 9 Connector Highway, Brewer-Eddington, ME

Subject: Embankment Construction Settlement Evaluations

RESULTS

AREA 4 - Highway Settlement Criteria, Wick Drains Required, LWF may be Required

Station No.	CPT or Boring ID	GS El. (ft)	GW El. (ft)	Clay Thickness (ft)	Full Emb. Ht. (ft)	Stage 1 Emb. Ht. (ft)	Initial Excav. Depth from Ground Surf. (ft)	Required LWF Thickness (ft)	Post-Constr. Settlement 0-20 yrs (in.)	Post-Constr. Settlement 20-75 yrs (in.)
180+50	HB-BE-135	93	93	28.3	30	12.5	-	20.5	4.0	2.1
182+00	HB-BE-138	94.2	94.2	11	25.1	19	-	4	2.1	0.8
185+00	HB-BE-138	96	96	12	17	15	-	0	1.8	0.9
181+50		93.5	93.5	19	26	12.5	-	13.5	4.0	1.4
183+50	CPT-124	96	96	12	18	16	-	0	1.8	0.9

Notes:

Highway Settlement Criteria:

less than or equal to 4 inches in the first 20 yrs.

additional settlement less than or equal to 4 inches from 20 yrs. to 75 yrs.

Wick drains required at these stations due to staged embankment construction (i.e., to reduce consolidation wait time).

Some stations have multiple nearest borings or CPT soundings.

Stage 1 embankment height may be controlled by global stability.

AREA 4 - Highway Settlement Criteria, No Wick Drains

Station No.	CPT or Boring ID	GS El. (ft)	GW El. (ft)	Clay Thickness (ft)	Full Emb. Ht. (ft)	Stage 1 Emb. Ht. (ft)	Initial Excav. Depth from Ground Surf. (ft)	Required LWF Thickness (ft)	Post-Constr. Settlement 0-20 yrs (in.)	Post-Constr. Settlement 20-75 yrs (in.)
187+00	-	100	100	10.3	13.7	13.7	-	-	3.0	0.3
186+00	-	97	97	11.15	16.3	16.3	-	-	3.6	0.3

Notes:

Highway Settlement Criteria:

less than or equal to 4 inches in the first 20 yrs.

additional settlement less than or equal to 4 inches from 20 yrs. to 75 yrs.

Wick drains are not required at these sections.

Client: Maine Department of Transportation

Computed by: JLL

Checked by: EMS

Sheet: 8 of 8



File No.: 132076-007

Date: 06JUL2021

Project: I-395/Rt. 9 Connector Highway, Brewer-Eddington, ME

Subject: Embankment Construction Settlement Evaluations

Client:	Maine Department of Transportation
Project:	Route 9 / I-395 Connector
Subject:	Bridge Culvert Settlement

PROBLEM STATEMENT & OBJECTIVE

Calculate the settlement for the five proposed bridge culverts along proposed Route 9 / I-395 Connector.

REFERENCES

1. Settle3D version 4.0 by RocScience.

AVAILABLE INFORMATION

1. Current boring logs as noted below.
2. Plan set titled, "Brewer-Eddington I-395/Route 9 Connector, Cross Sections," by MaineDOT dated 3 March 2021.
3. Plan set titled, "Brewer-Eddington I-395/Route 9 Connector" by MaineDOT dated 5 March 2021.

ASSUMPTIONS

1. Borings used to determine soil profiles and groundwater depths vary and are noted below.
2. New fill is modeled to extend 250 ft from either side of the proposed culvert, and have a length equal to the culvert length.
3. Fill height varies and is noted below.
4. New fill unit weight is assumed to be 125 pcf.
5. Existing soil unit weight is assumed to be 115 pcf in the Marine Deposit and 130 psf in the Glacial Till.
6. Elastic soil moduli estimated after AASHTO 2004 with 2006 interims.
7. Consolidation properties based on laboratory testing performed on borings drilled in the vicinity of the proposed culverts, and on past experience with Marine Deposit clay properties.
8. Settlement was analyzed using the Westergaard stress computation method.

SOIL PROFILES AND PROPERTIES (not to scale)

1. Wildlife 1, Sta. 272+36

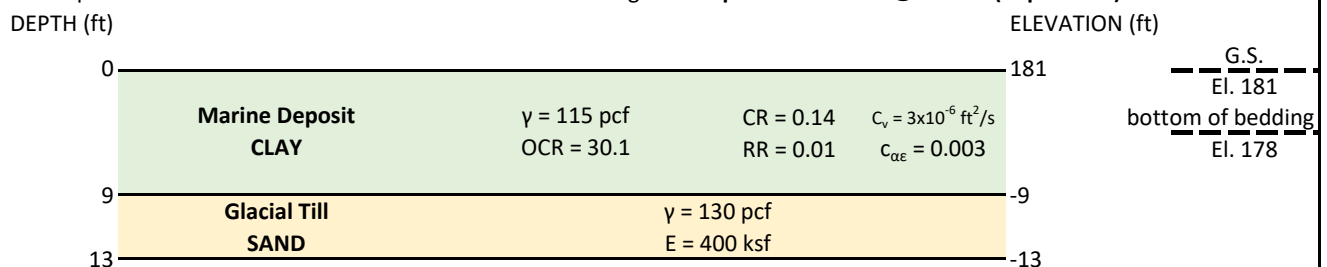
Based on boring BB-EWC1-101, BB-EWC1-201, BB-EWC1-202

Assumed fill height = 20 ft → $\gamma = 2.500$ ksf

Depth to groundwater table = 0 ft (assume water at ground surface based on BB-EWC1-101)

Ground surface at proposed culvert = El. 181

Proposed culvert invert = El. 180 - 1ft concrete - 1ft bedding → **compute settlement @ El. 178 (depth = 3ft)**



Client: Maine Department of Transportation

Date: 14-Jun-2021

Project: Route 9 / I-395 Connector

Computed by: JAD

Subject: Bridge Culvert Settlement

Checked by: EMS

SOIL PROFILES AND PROPERTIES (not to scale), continued

2.. Eaton Brook Tributary, Sta. 273+50

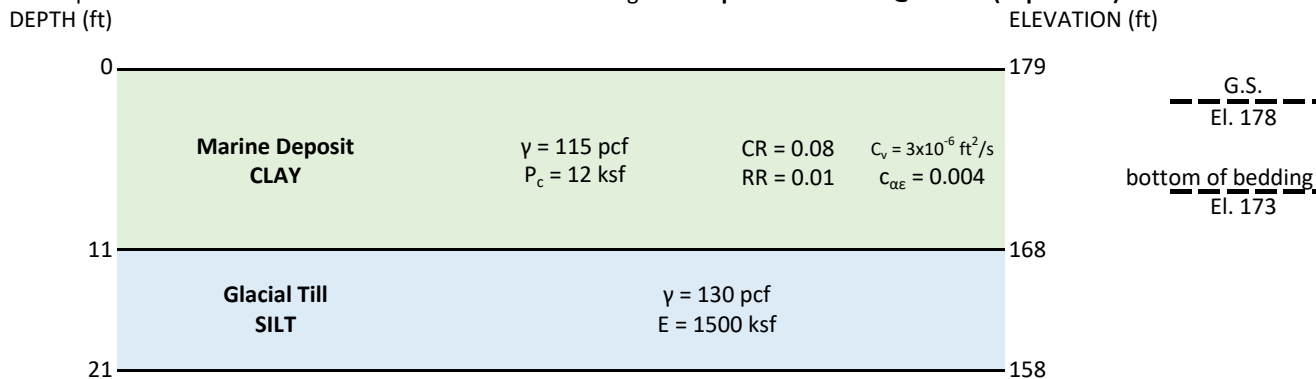
Based on boring BB-EEBT2-101, BB-EEBT2-201, BB-EEBT2-202

Assumed fill height = 25 ft → $\gamma = 3.125$ ksf

Depth to groundwater table = 0 ft (assume water at ground surface based on BB-EEBT2-202)

Ground surface at proposed culvert = El. 178

Proposed culvert invert = El. 175 - 1ft concrete - 1ft bedding → **compute settlement @ El. 173 (depth = 5ft)**



3. Wildlife 2, Sta. 275+88

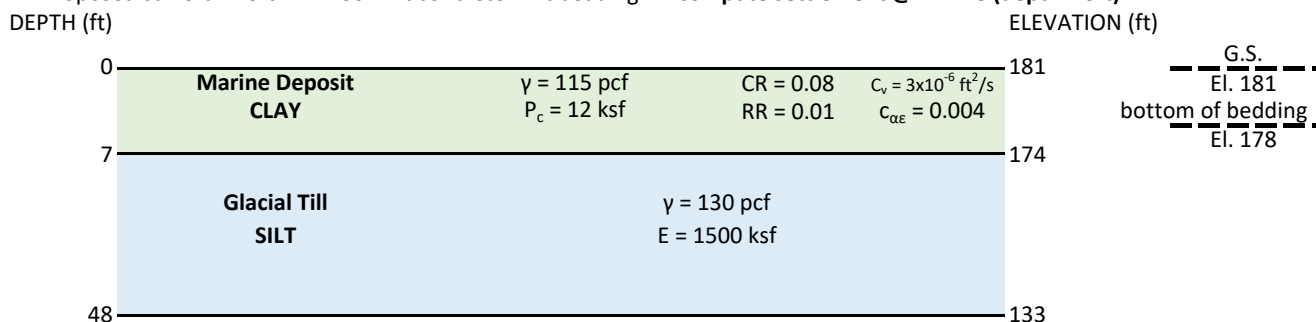
Based on boring BB-EWC2-101, BB-EWC2-201, BB-EWC2-202

Assumed fill height = 26 ft → $\gamma = 3.250$ ksf

Depth to groundwater table = 0 ft (assume water at ground surface based on BB-EWC2-101)

Ground surface at proposed culvert = El. 181

Proposed culvert invert = El. 180 - 1ft concrete - 1ft bedding → **compute settlement @ El. 178 (depth = 3ft)**



4. Snowmobile 107, Sta. 284+27

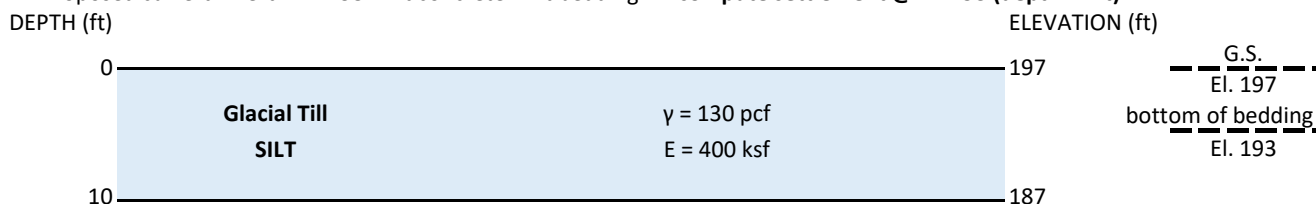
Based on boring BB-EST2-101

Assumed fill height = 20 ft → $\gamma = 2.500$ ksf

Depth to groundwater table = 0 ft (assume water at ground surface based on BB-EST2-101)

Ground surface at proposed culvert = El. 197

Proposed culvert invert = El. 195 - 1ft concrete - 1ft bedding → **compute settlement @ El. 193 (depth = 4ft)**



Client: Maine Department of Transportation

Date: 14-Jun-2021

Project: Route 9 / I-395 Connector

Computed by: JAD

Subject: Bridge Culvert Settlement

Checked by: EMS

SOIL PROFILES AND PROPERTIES (not to scale), continued

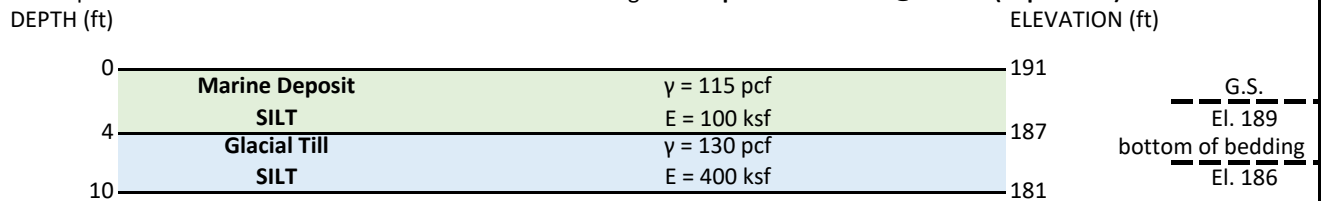
5. Wetland, Sta. 289+11

Based on boring BB-EWC-101, BB-EWC-203

Assumed fill height = 20 ft → $\gamma = 2.500$ ksf

Depth to groundwater table = 0 ft (assume water at ground surface based on BB-EWC-101)

Ground surface at proposed culvert = El. 189

Proposed culvert invert = El. 188 - 1ft concrete - 1ft bedding --> **compute settlement @ El. 186 (depth = 3ft)**

SUMMARY OF RESULTS

Culvert	Station	Time to 95% Consol. (months)	Estimated Settlement at Center of Embankment / Middle of Culvert			
			Elastic Settlement (in.)	Primary Consolidation Settlement (in.)	Secondary Consolidation Settlement (in.)	Total Settlement (in.)
Wildlife 1	272+35	1.5	0.3	0.7	0.6	1.5
Eaton Brook Tributary	273+50	2.5	0.2	0.7	0.7	1.6
Wildlife 2	275+88	1	0.7	0.5	0.6	1.8
Snowmobile 107	284+27	-	0.4	0.0	0.0	0.4
Wetland	289+11	-	0.7	0.0	0.0	0.7

Culvert	Station	Time to 95% Consol. (months)	Estimated Settlement at Edge of Embankment / Ends of Culvert			
			Elastic Settlement (in.)	Primary Consolidation Settlement (in.)	Secondary Consolidation Settlement (in.)	Total Settlement (in.)
Wildlife 1	272+35	1.5	0.1	0.2	0.6	0.9
Eaton Brook Tributary	273+50	2.5	0.0	0.2	0.7	1.0
Wildlife 2	275+88	1	0.2	0.2	0.6	1.0
Snowmobile 107	284+27	-	0.1	0.0	0.0	0.1
Wetland	289+11	-	0.1	0.0	0.0	0.1

Sta. 272+36

Settle3 Analysis Information

I-395 Rout 9 Connector - WIN 18915.00

Project Settings

Document Name	2021-0610-Sta 272+36 Wildlife 1-D2.s3z
Project Title	I-395 Rout 9 Connector - WIN 18915.00
Analysis	Sta 272+35 Settlement
Author	JAD
Company	Haley & Aldrich, Inc
Date Created	3/3/2020, 10:33:21 AM
Stress Computation Method	Westergaard
Time-dependent Consolidation Analysis	
Time Units	months
Permeability Units	feet/second
Minimum settlement ratio for subgrade modulus	0.9
Use average properties to calculate layered stresses	
Improve consolidation accuracy	
Ignore negative effective stresses in settlement calculations	

Stage Settings

Stage #	Name	Time [months]
1	Initial	0
2	95% Consolidation	1
3	20 Years	240
4	75 Years	900
5	100 Years	1200

Results

Time taken to compute: 3.70238 seconds

Stage: Initial = 0 mon

Data Type	Minimum	Maximum
Total Settlement [in]	0	0.248141
Total Consolidation Settlement [in]	0	0
Virgin Consolidation Settlement [in]	0	0
Recompression Consolidation Settlement [in]	0	0
Immediate Settlement [in]	0	0.248141
Secondary Settlement [in]	0	0
Loading Stress ZZ [ksf]	-0.000195982	2.50001
Loading Stress XX [ksf]	-0.000254497	0.624999
Loading Stress YY [ksf]	-0.000254497	0.624999
Effective Stress ZZ [ksf]	0	0.7438
Effective Stress XX [ksf]	-5.42619e-05	1.23564
Effective Stress YY [ksf]	-5.42619e-05	1.23564
Total Stress ZZ [ksf]	-3.35784e-05	3.54805
Total Stress XX [ksf]	-9.10165e-06	4.03988
Total Stress YY [ksf]	-9.10165e-06	4.03988
Modulus of Subgrade Reaction (Total) [ksf/ft]	-19.3936	7377.51
Modulus of Subgrade Reaction (Immediate) [ksf/ft]	-19.3936	7377.51
Modulus of Subgrade Reaction (Consolidation) [ksf/ft]	0	0
Total Strain	0	0.00535845
Pore Water Pressure [ksf]	-3.35784e-05	2.80425
Excess Pore Water Pressure [ksf]	-0.000195982	2.50001
Degree of Consolidation [%]	0	0
Pre-consolidation Stress [ksf]	0.00712467	14.2351
Over-consolidation Ratio	2.1	30.1
Void Ratio	0	0.85
Permeability [ft/s]	0	3.43858e-06
Coefficient of Consolidation [ft ² /s]	0	3e-06
Hydroconsolidation Settlement [in]	0	0
Average Degree of Consolidation [%]	0	45
Undrained Shear Strength	0	0

Stage: 95% Consolidation = 1 mon

Data Type	Minimum	Maximum
Total Settlement [in]	-0.000614344	2.4791
Total Consolidation Settlement [in]	-0.000693264	2.23096
Virgin Consolidation Settlement [in]	0	1.1234
Recompression Consolidation Settlement [in]	-0.000693264	1.10756
Immediate Settlement [in]	0	0.248141
Secondary Settlement [in]	0	0
Loading Stress ZZ [ksf]	-0.000195982	2.50001
Loading Stress XX [ksf]	-0.000254497	0.624999
Loading Stress YY [ksf]	-0.000254497	0.624999
Effective Stress ZZ [ksf]	0	2.73685
Effective Stress XX [ksf]	-9.10165e-06	3.22868
Effective Stress YY [ksf]	-9.10165e-06	3.22868
Total Stress ZZ [ksf]	0	3.54805
Total Stress XX [ksf]	-9.10165e-06	4.03988
Total Stress YY [ksf]	-9.10165e-06	4.03988
Modulus of Subgrade Reaction (Total) [ksf/ft]	-0.00326297	13.3747
Modulus of Subgrade Reaction (Immediate) [ksf/ft]	-19.3936	7377.51
Modulus of Subgrade Reaction (Consolidation) [ksf/ft]	-0.00387781	14.799
Total Strain	-1.64168e-05	0.371112
Pore Water Pressure [ksf]	0	1.06418
Excess Pore Water Pressure [ksf]	0	0.689625
Degree of Consolidation [%]	0	100
Pre-consolidation Stress [ksf]	0.00712467	14.2351
Over-consolidation Ratio	1	30.214
Void Ratio	0	0.85003
Permeability [ft/s]	0	4.81402e-05
Coefficient of Consolidation [ft ² /s]	0	3e-06
Hydroconsolidation Settlement [in]	0	0
Average Degree of Consolidation [%]	0	84.8953
Undrained Shear Strength	0	0.356526

Stage: 20 Years = 240 mon

Data Type	Minimum	Maximum
Total Settlement [in]	0	3.26163
Total Consolidation Settlement [in]	-1.72105e-05	2.30448
Virgin Consolidation Settlement [in]	0	1.12646
Recompression Consolidation Settlement [in]	-1.72105e-05	1.17802
Immediate Settlement [in]	0	0.248141
Secondary Settlement [in]	0	0.709011
Loading Stress ZZ [ksf]	-0.000195982	2.50001
Loading Stress XX [ksf]	-0.000254497	0.624999
Loading Stress YY [ksf]	-0.000254497	0.624999
Effective Stress ZZ [ksf]	0	2.73685
Effective Stress XX [ksf]	-9.10165e-06	3.22868
Effective Stress YY [ksf]	-9.10165e-06	3.22868
Total Stress ZZ [ksf]	0	3.54805
Total Stress XX [ksf]	-9.10165e-06	4.03988
Total Stress YY [ksf]	-9.10165e-06	4.03988
Modulus of Subgrade Reaction (Total) [ksf/ft]	-0.000447474	10.3068
Modulus of Subgrade Reaction (Immediate) [ksf/ft]	-19.3936	7377.51
Modulus of Subgrade Reaction (Consolidation) [ksf/ft]	-0.00313813	14.2799
Total Strain	-3.59755e-06	0.378229
Pore Water Pressure [ksf]	0	0.8112
Excess Pore Water Pressure [ksf]	-5.66449e-07	4.85926e-07
Degree of Consolidation [%]	0	100
Pre-consolidation Stress [ksf]	0.00712467	14.2351
Over-consolidation Ratio	1	30.1249
Void Ratio	0	0.850007
Permeability [ft/s]	0	4.81402e-05
Coefficient of Consolidation [ft ² /s]	0	3e-06
Hydroconsolidation Settlement [in]	0	0
Average Degree of Consolidation [%]	0	100
Undrained Shear Strength	0	0.356526

Stage: 75 Years = 900 mon

Data Type	Minimum	Maximum
Total Settlement [in]	0	3.44762
Total Consolidation Settlement [in]	-1.72105e-05	2.30448
Virgin Consolidation Settlement [in]	0	1.12646
Recompression Consolidation Settlement [in]	-1.72105e-05	1.17802
Immediate Settlement [in]	0	0.248141
Secondary Settlement [in]	0	0.894997
Loading Stress ZZ [ksf]	-0.000195982	2.50001
Loading Stress XX [ksf]	-0.000254497	0.624999
Loading Stress YY [ksf]	-0.000254497	0.624999
Effective Stress ZZ [ksf]	0	2.73685
Effective Stress XX [ksf]	-9.10165e-06	3.22868
Effective Stress YY [ksf]	-9.10165e-06	3.22868
Total Stress ZZ [ksf]	0	3.54805
Total Stress XX [ksf]	-9.10165e-06	4.03988
Total Stress YY [ksf]	-9.10165e-06	4.03988
Modulus of Subgrade Reaction (Total) [ksf/ft]	-0.000370874	9.6902
Modulus of Subgrade Reaction (Immediate) [ksf/ft]	-19.3936	7377.51
Modulus of Subgrade Reaction (Consolidation) [ksf/ft]	-0.00313813	14.2799
Total Strain	-3.59755e-06	0.379952
Pore Water Pressure [ksf]	0	0.8112
Excess Pore Water Pressure [ksf]	-5.65308e-07	4.84928e-07
Degree of Consolidation [%]	0	100
Pre-consolidation Stress [ksf]	0.00712467	14.2351
Over-consolidation Ratio	1	30.1249
Void Ratio	0	0.850007
Permeability [ft/s]	0	4.81402e-05
Coefficient of Consolidation [ft ² /s]	0	3e-06
Hydroconsolidation Settlement [in]	0	0
Average Degree of Consolidation [%]	0	100
Undrained Shear Strength	0	0.356526

Stage: 100 Years = 1200 mon

Data Type	Minimum	Maximum
Total Settlement [in]	0	3.4881
Total Consolidation Settlement [in]	-1.72105e-05	2.30448
Virgin Consolidation Settlement [in]	0	1.12646
Recompression Consolidation Settlement [in]	-1.72105e-05	1.17802
Immediate Settlement [in]	0	0.248141
Secondary Settlement [in]	0	0.935477
Loading Stress ZZ [ksf]	-0.000195982	2.50001
Loading Stress XX [ksf]	-0.000254497	0.624999
Loading Stress YY [ksf]	-0.000254497	0.624999
Effective Stress ZZ [ksf]	0	2.73685
Effective Stress XX [ksf]	-9.10165e-06	3.22868
Effective Stress YY [ksf]	-9.10165e-06	3.22868
Total Stress ZZ [ksf]	0	3.54805
Total Stress XX [ksf]	-9.10165e-06	4.03988
Total Stress YY [ksf]	-9.10165e-06	4.03988
Modulus of Subgrade Reaction (Total) [ksf/ft]	-0.000357552	9.56564
Modulus of Subgrade Reaction (Immediate) [ksf/ft]	-19.3936	7377.51
Modulus of Subgrade Reaction (Consolidation) [ksf/ft]	-0.00313813	14.2799
Total Strain	-3.59755e-06	0.380326
Pore Water Pressure [ksf]	0	0.8112
Excess Pore Water Pressure [ksf]	-4.84831e-07	5.65197e-07
Degree of Consolidation [%]	0	100
Pre-consolidation Stress [ksf]	0.00712467	14.2351
Over-consolidation Ratio	1	30.1249
Void Ratio	0	0.850007
Permeability [ft/s]	0	4.81402e-05
Coefficient of Consolidation [ft ² /s]	0	3e-06
Hydroconsolidation Settlement [in]	0	0
Average Degree of Consolidation [%]	0	100
Undrained Shear Strength	0	0.356526

Loads

1. Fill Load: "Fill Load 2"

Label	Fill Load 2
Load Type	Flexible
Area of Load	19000 ft2

Advanced Staging

Stage	Load Factor	Depth [ft]
Initial = 0 mon	1	-0
95% Consolidation = 1 mon	1	-0
20 Years = 240 mon	1	-0
75 Years = 900 mon	1	-0
100 Years = 1200 mon	1	-0

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
-250	-23	2.5
-250	-61	0
250	-61	0
250	-23	2.5

2. Fill Load: "Fill Load 3"

Label	Fill Load 3
Load Type	Flexible
Area of Load	19000 ft2

Advanced Staging

Stage	Load Factor	Depth [ft]
Initial = 0 mon	1	-0
95% Consolidation = 1 mon	1	-0
20 Years = 240 mon	1	-0
75 Years = 900 mon	1	-0
100 Years = 1200 mon	1	-0

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
-250	23	2.5
250	23	2.5
250	61	0
-250	61	0

3. Fill Load: "Fill Load 1"

Label	Fill Load 1
Load Type	Flexible
Area of Load	23000 ft2
Load	2.5 ksf

Advanced Staging

Stage	Load Factor	Depth [ft]
Initial = 0 mon	1	-0
95% Consolidation = 1 mon	1	-0
20 Years = 240 mon	1	-0
75 Years = 900 mon	1	-0
100 Years = 1200 mon	1	-0

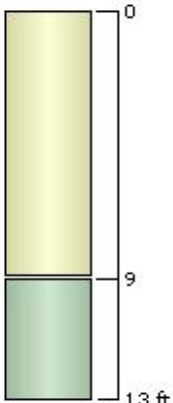
Coordinates

X [ft]	Y [ft]
-250	23
-250	-23
250	-23
250	23



Soil Layers

Ground Surface Drained: Yes

Layer #	Type	Thickness [ft]	Depth [ft]	Drained at Bottom
1	MARINE DEPOSIT CLAY	9	0	Yes
2	GLACIAL TILL SILT	4	9	No



Soil Properties

Property	MARINE DEPOSIT CLAY	GLACIAL TILL SILT
Color		
Unit Weight [kips/ft3]	0.115	0.13
Saturated Unit Weight [kips/ft3]	0.115	0.13
K0	1	1
Immediate Settlement	Disabled	Enabled
Es [ksf]	-	400
E _{sur} [ksf]	-	400
Primary Consolidation	Enabled	Disabled
Material Type	Non-Linear	
C _{ce}	0.14	-
C _{re}	0.01	-
e ₀	0.85	-
OCR	30.1	-
C _v [ft2/s]	3e-06	-
C _{vr} [ft2/s]	3e-06	-
B-bar	1	-
Secondary Consolidation	Standard	Disabled
C _{ae}	0.003	-
C _{are}	0.003	-
Undrained Su A [kips/ft2]	0	0
Undrained Su S	0.2	0.2
Undrained Su m	0.8	0.8
Piezo Line ID	1	1

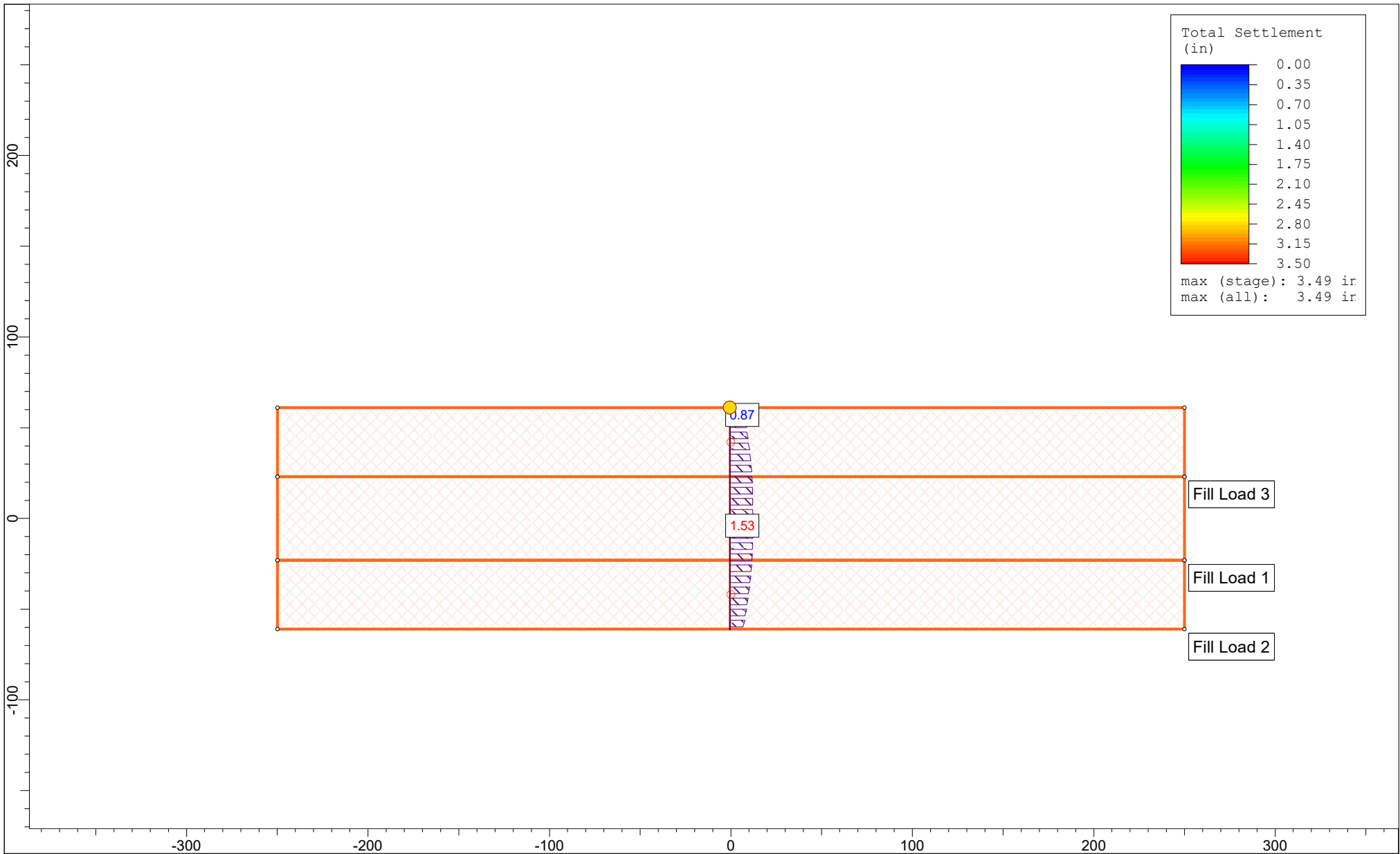
Groundwater

Groundwater method
Water Unit Weight

Piezometric Lines
0.0624 kips/ft³

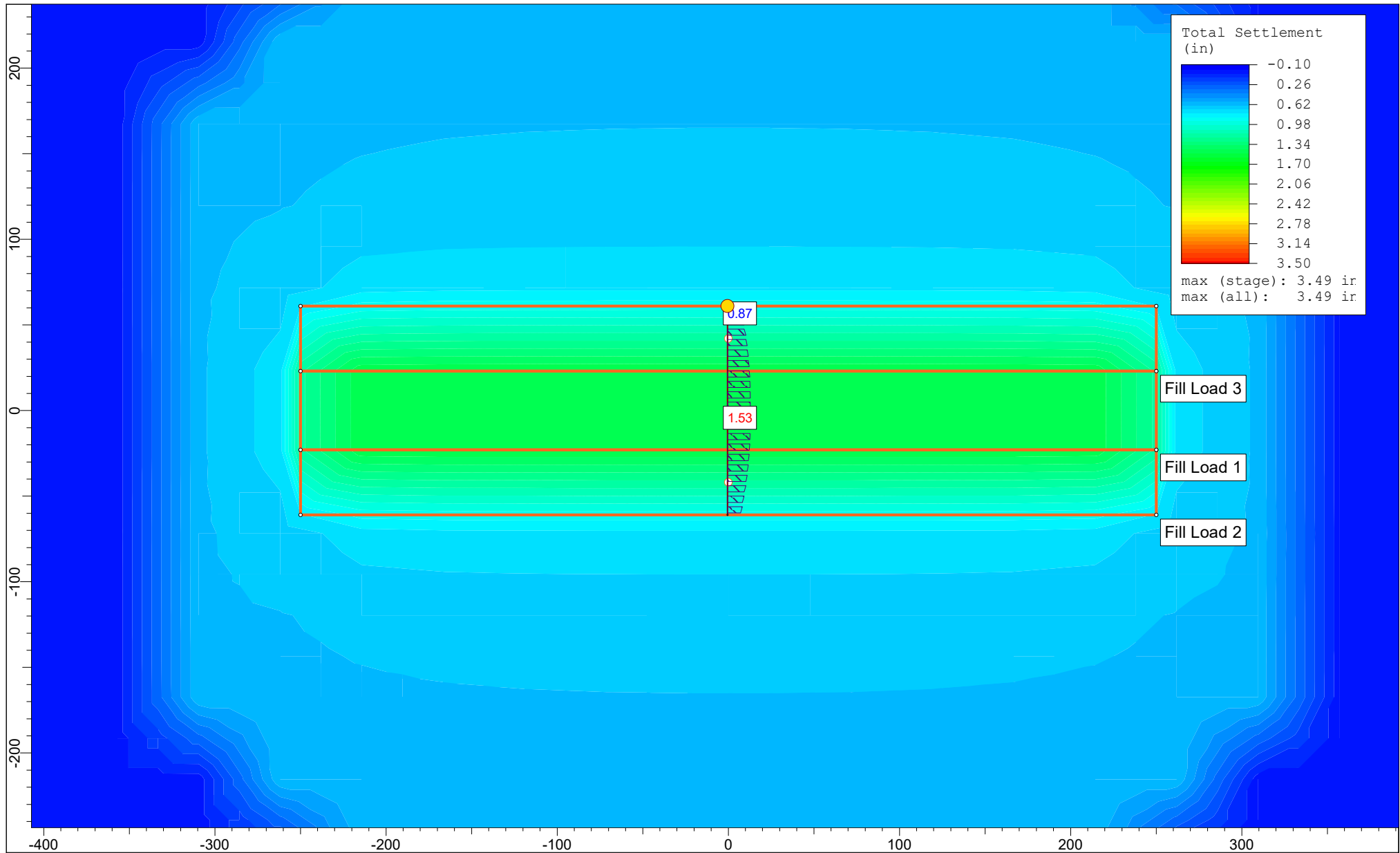
Piezometric Line Entities

ID	Depth (ft)
1	0 ft



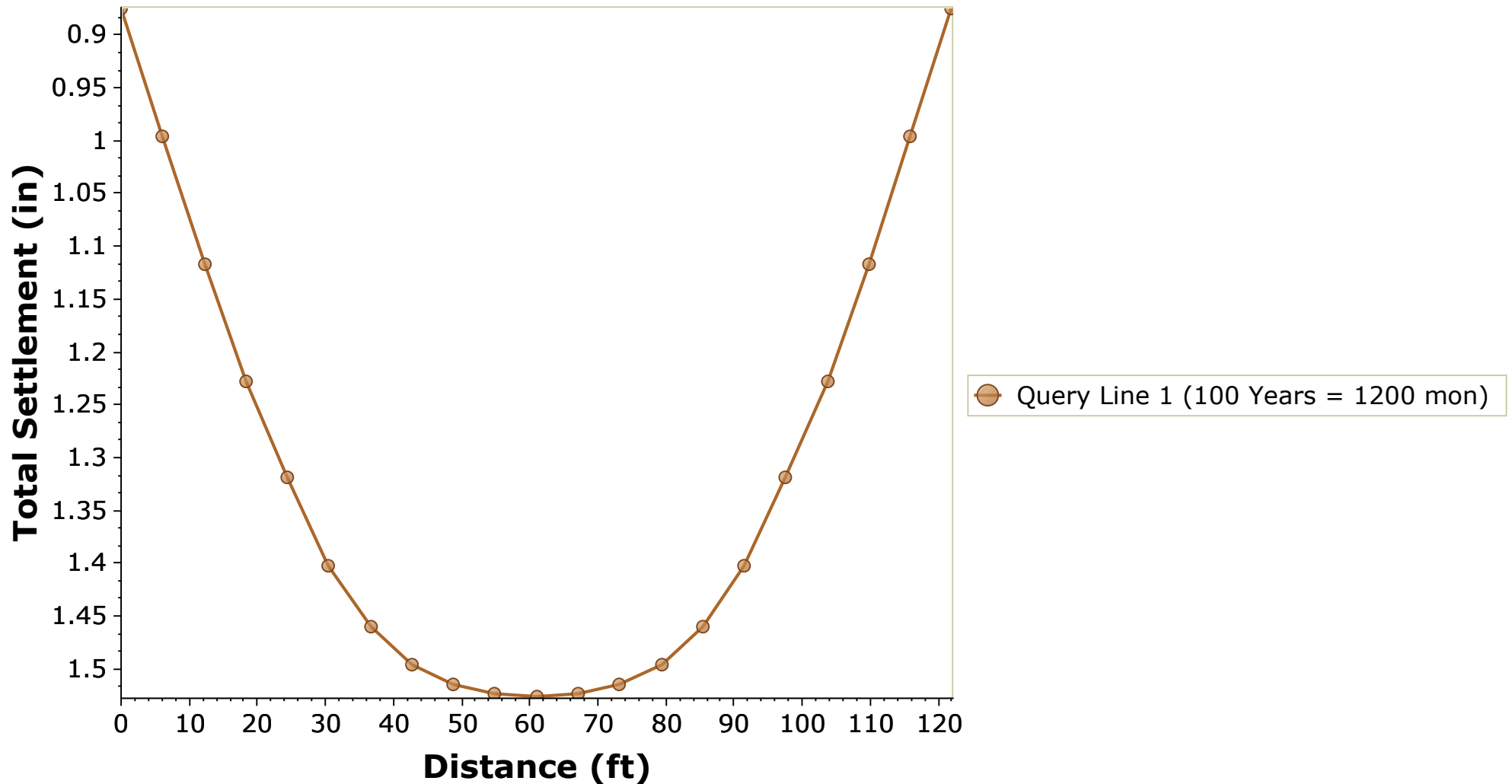
SETTLE3 5.011

Project		I-395 Rout 9 Connector - WIN 18915.00	
Analysis Description		Sta 272+35 Settlement	
Drawn By		JAD	Company Haley & Aldrich, Inc
Date		3/3/2020, 10:33:21 AM	File Name 2021-0610-Sta 272+36 Wildlife 1-D2.s3z



Project	I-395 Rout 9 Connector - WIN 18915.00		
Analysis Description	Sta 272+35 Settlement		
Drawn By	JAD	Company	Haley & Aldrich, Inc
Date	3/3/2020, 10:33:21 AM	File Name	2021-0610-Sta 272+36 Wildlife 1-D2.s3z

Distance vs. Total Settlement



Reference Stage: None
Total Settlement at Depth = 3 ft



Project		I-395 Rout 9 Connector - WIN 18915.00	
Analysis Description		Sta 272+35 Settlement	
Drawn By		JAD	Company Haley & Aldrich, Inc
Date		3/3/2020, 10:33:21 AM	File Name 2021-0610-Sta 272+36 Wildlife 1-D2.s3z

Sta. 273+36

Settle3 Analysis Information

I-395/Rout 9 Connector - WIN 18915.00

Project Settings

Document Name	2021-0610-Sta 273+36 Eaton Brook Trib-D2.s3z
Project Title	I-395/Rout 9 Connector - WIN 18915.00
Analysis	Sta 273+36 Settlement
Author	JAD
Company	Haley & Aldrich, Inc.
Date Created	3/3/2020, 10:33:21 AM
Stress Computation Method	Westergaard
Time-dependent Consolidation Analysis	
Time Units	months
Permeability Units	feet/second
Minimum settlement ratio for subgrade modulus	0.9
Use average properties to calculate layered stresses	
Improve consolidation accuracy	
Ignore negative effective stresses in settlement calculations	

Stage Settings

Stage #	Name	Time [months]
1	Initial	0
2	95% Consolidation	2
3	20 Years	240
4	75 Years	900
5	100 Years	1200

Results

Time taken to compute: 2.33605 seconds

Stage: Initial = 0 mon

Data Type	Minimum	Maximum
Total Settlement [in]	0	0.202571
Total Consolidation Settlement [in]	0	0
Virgin Consolidation Settlement [in]	0	0
Recompression Consolidation Settlement [in]	0	0
Immediate Settlement [in]	0	0.202571
Secondary Settlement [in]	0	0
Loading Stress ZZ [ksf]	-5.88749e-05	3.125
Loading Stress XX [ksf]	-5.11833e-05	0.781249
Loading Stress YY [ksf]	-5.11833e-05	0.781249
Effective Stress ZZ [ksf]	0	1.2546
Effective Stress XX [ksf]	-5.11833e-05	1.78111
Effective Stress YY [ksf]	-5.11833e-05	1.78111
Total Stress ZZ [ksf]	-5.88749e-05	4.92621
Total Stress XX [ksf]	-5.88479e-05	5.45272
Total Stress YY [ksf]	-5.88479e-05	5.45272
Modulus of Subgrade Reaction (Total) [ksf/ft]	-0.0762061	202.763
Modulus of Subgrade Reaction (Immediate) [ksf/ft]	-0.0762061	202.763
Modulus of Subgrade Reaction (Consolidation) [ksf/ft]	0	0
Total Strain	0	0.00180568
Pore Water Pressure [ksf]	-5.88749e-05	3.67161
Excess Pore Water Pressure [ksf]	-5.88749e-05	3.125
Degree of Consolidation [%]	0	0
Pre-consolidation Stress [ksf]	0.580121	12
Over-consolidation Ratio	1	20739.7
Void Ratio	-7.16495e-16	1.16201e-16
Permeability [ft/s]	0	1.40669e-06
Coefficient of Consolidation [ft ² /s]	0	3e-06
Hydroconsolidation Settlement [in]	0	0
Average Degree of Consolidation [%]	0	0.2
Undrained Shear Strength	-2.77556e-17	2.77556e-17

Stage: 95% Consolidation = 2 mon

Data Type	Minimum	Maximum
Total Settlement [in]	0	1.68251
Total Consolidation Settlement [in]	0	1.47994
Virgin Consolidation Settlement [in]	0	0
Recompression Consolidation Settlement [in]	0	1.47994
Immediate Settlement [in]	0	0.202571
Secondary Settlement [in]	0	0
Loading Stress ZZ [ksf]	-5.88749e-05	3.125
Loading Stress XX [ksf]	-5.11833e-05	0.781249
Loading Stress YY [ksf]	-5.11833e-05	0.781249
Effective Stress ZZ [ksf]	0	3.61581
Effective Stress XX [ksf]	-5.88479e-05	4.14232
Effective Stress YY [ksf]	-5.88479e-05	4.14232
Total Stress ZZ [ksf]	0	4.92621
Total Stress XX [ksf]	-5.88479e-05	5.45272
Total Stress YY [ksf]	-5.88479e-05	5.45272
Modulus of Subgrade Reaction (Total) [ksf/ft]	-0.00933656	24.9321
Modulus of Subgrade Reaction (Immediate) [ksf/ft]	-0.0762061	202.763
Modulus of Subgrade Reaction (Consolidation) [ksf/ft]	-0.0106402	26.9625
Total Strain	4.12574e-07	0.0373249
Pore Water Pressure [ksf]	0	1.3104
Excess Pore Water Pressure [ksf]	0	0.642965
Degree of Consolidation [%]	0	99.9678
Pre-consolidation Stress [ksf]	0.581287	12
Over-consolidation Ratio	1	20731.7
Void Ratio	-0.0373249	0
Permeability [ft/s]	0	1.40669e-06
Coefficient of Consolidation [ft ² /s]	0	3e-06
Hydroconsolidation Settlement [in]	0	0
Average Degree of Consolidation [%]	0	88.0499
Undrained Shear Strength	0	0.324555

Stage: 20 Years = 240 mon

Data Type	Minimum	Maximum
Total Settlement [in]	0	2.752
Total Consolidation Settlement [in]	0	1.54912
Virgin Consolidation Settlement [in]	0	0
Recompression Consolidation Settlement [in]	0	1.54912
Immediate Settlement [in]	0	0.202571
Secondary Settlement [in]	0	1.004
Loading Stress ZZ [ksf]	-5.88749e-05	3.125
Loading Stress XX [ksf]	-5.11833e-05	0.781249
Loading Stress YY [ksf]	-5.11833e-05	0.781249
Effective Stress ZZ [ksf]	0	3.61581
Effective Stress XX [ksf]	-5.88479e-05	4.14232
Effective Stress YY [ksf]	-5.88479e-05	4.14232
Total Stress ZZ [ksf]	0	4.92621
Total Stress XX [ksf]	-5.88479e-05	5.45272
Total Stress YY [ksf]	-5.88479e-05	5.45272
Modulus of Subgrade Reaction (Total) [ksf/ft]	-0.000650496	14.7851
Modulus of Subgrade Reaction (Immediate) [ksf/ft]	-0.0762061	202.763
Modulus of Subgrade Reaction (Consolidation) [ksf/ft]	-0.00935797	25.6766
Total Strain	7.77038e-07	0.0456017
Pore Water Pressure [ksf]	0	1.3104
Excess Pore Water Pressure [ksf]	-1.7562e-17	1.55593e-17
Degree of Consolidation [%]	0	100
Pre-consolidation Stress [ksf]	0.581287	12
Over-consolidation Ratio	1	20731.7
Void Ratio	-0.0456017	0
Permeability [ft/s]	0	1.40669e-06
Coefficient of Consolidation [ft ² /s]	0	3e-06
Hydroconsolidation Settlement [in]	0	0
Average Degree of Consolidation [%]	0	100
Undrained Shear Strength	0	0.324555

Stage: 75 Years = 900 mon

Data Type	Minimum	Maximum
Total Settlement [in]	0	3.05509
Total Consolidation Settlement [in]	0	1.54912
Virgin Consolidation Settlement [in]	0	0
Recompression Consolidation Settlement [in]	0	1.54912
Immediate Settlement [in]	0	0.202571
Secondary Settlement [in]	0	1.30709
Loading Stress ZZ [ksf]	-5.88749e-05	3.125
Loading Stress XX [ksf]	-5.11833e-05	0.781249
Loading Stress YY [ksf]	-5.11833e-05	0.781249
Effective Stress ZZ [ksf]	0	3.61581
Effective Stress XX [ksf]	-5.88479e-05	4.14232
Effective Stress YY [ksf]	-5.88479e-05	4.14232
Total Stress ZZ [ksf]	0	4.92621
Total Stress XX [ksf]	-5.88479e-05	5.45272
Total Stress YY [ksf]	-5.88479e-05	5.45272
Modulus of Subgrade Reaction (Total) [ksf/ft]	-0.000508572	13.2545
Modulus of Subgrade Reaction (Immediate) [ksf/ft]	-0.0762061	202.763
Modulus of Subgrade Reaction (Consolidation) [ksf/ft]	-0.00935797	25.6766
Total Strain	7.77038e-07	0.0478978
Pore Water Pressure [ksf]	0	1.3104
Excess Pore Water Pressure [ksf]	-1.55579e-17	1.74559e-17
Degree of Consolidation [%]	0	100
Pre-consolidation Stress [ksf]	0.581287	12
Over-consolidation Ratio	1	20731.7
Void Ratio	-0.0478978	0
Permeability [ft/s]	0	1.40669e-06
Coefficient of Consolidation [ft ² /s]	0	3e-06
Hydroconsolidation Settlement [in]	0	0
Average Degree of Consolidation [%]	0	100
Undrained Shear Strength	0	0.324555

Stage: 100 Years = 1200 mon

Data Type		Minimum	Maximum
Total Settlement [in]	0		3.12105
Total Consolidation Settlement [in]	0		1.54912
Virgin Consolidation Settlement [in]	0		0
Recompression Consolidation Settlement [in]	0		1.54912
Immediate Settlement [in]	0		0.202571
Secondary Settlement [in]	0		1.37305
Loading Stress ZZ [ksf]	-5.88749e-05		3.125
Loading Stress XX [ksf]	-5.11833e-05		0.781249
Loading Stress YY [ksf]	-5.11833e-05		0.781249
Effective Stress ZZ [ksf]	0		3.61581
Effective Stress XX [ksf]	-5.88479e-05		4.14232
Effective Stress YY [ksf]	-5.88479e-05		4.14232
Total Stress ZZ [ksf]	0		4.92621
Total Stress XX [ksf]	-5.88479e-05		5.45272
Total Stress YY [ksf]	-5.88479e-05		5.45272
Modulus of Subgrade Reaction (Total) [ksf/ft]	-0.000485517		12.9632
Modulus of Subgrade Reaction (Immediate) [ksf/ft]	-0.0762061		202.763
Modulus of Subgrade Reaction (Consolidation) [ksf/ft]	-0.00935797		25.6766
Total Strain	7.77038e-07		0.0483976
Pore Water Pressure [ksf]	0		1.3104
Excess Pore Water Pressure [ksf]	-1.74424e-17		1.55577e-17
Degree of Consolidation [%]	0		100
Pre-consolidation Stress [ksf]	0.581287		12
Over-consolidation Ratio	1		20731.7
Void Ratio	-0.0483976		0
Permeability [ft/s]	0		1.40669e-06
Coefficient of Consolidation [ft^2/s]	0		3e-06
Hydroconsolidation Settlement [in]	0		0
Average Degree of Consolidation [%]	0		100
Undrained Shear Strength	0		0.324555

Loads

1. Fill Load: "Fill Load 2"

Label	Fill Load 2
Load Type	Flexible
Area of Load	36500 ft2
Depth	-0 ft
Installation Stage	Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
-250	-23	3.125
-250	-96	0
250	-96	0
250	-23	3.125

2. Fill Load: "Fill Load 3"

Label	Fill Load 3
Load Type	Flexible
Area of Load	36500 ft2
Depth	-0 ft
Installation Stage	Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
250	23	3.125
250	96	0
-250	96	0
-250	23	3.125

3. Fill Load: "Fill Load 1"

Label	Fill Load 1
Load Type	Flexible
Area of Load	23000 ft2
Load	3.125 ksf
Depth	-0 ft
Installation Stage	Initial = 0 mon

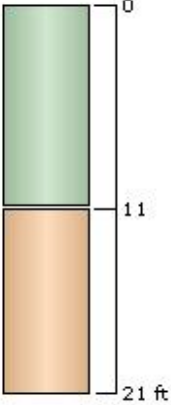
Coordinates

X [ft]	Y [ft]
-250	23
-250	-23
250	-23
250	23



Soil Layers

Ground Surface Drained: Yes

Layer #	Type	Thickness [ft]	Depth [ft]	Drained at Bottom
1	MARINE DEPOSIT CLAY	11	0	Yes
2	GLACIAL TILL SILT	10	11	No



Soil Properties

Property	MARINE DEPOSIT CLAY	GLACIAL TILL SILT
Color		
Unit Weight [kips/ft ³]	0.115	0.13
Saturated Unit Weight [kips/ft ³]	0.115	0.13
K0	1	1
Immediate Settlement	Disabled	Enabled
Es [ksf]	-	1500
E _{sur} [ksf]	-	300
Primary Consolidation	Enabled	Disabled
Material Type	Non-Linear	
C _{ce}	0.08	-
C _{re}	0.01	-
e ₀	0	-
P _c [ksf]	12	-
C _v [ft ² /s]	3e-06	-
C _{vr} [ft ² /s]	3e-06	-
B-bar	1	-
Secondary Consolidation	Standard	Disabled
C _{ae}	0.004	-
C _{are}	0.004	-
Undrained Su A [kips/ft ²]	0	0
Undrained Su S	0.2	0.2
Undrained Su m	0.8	0.8
Piezo Line ID	1	1

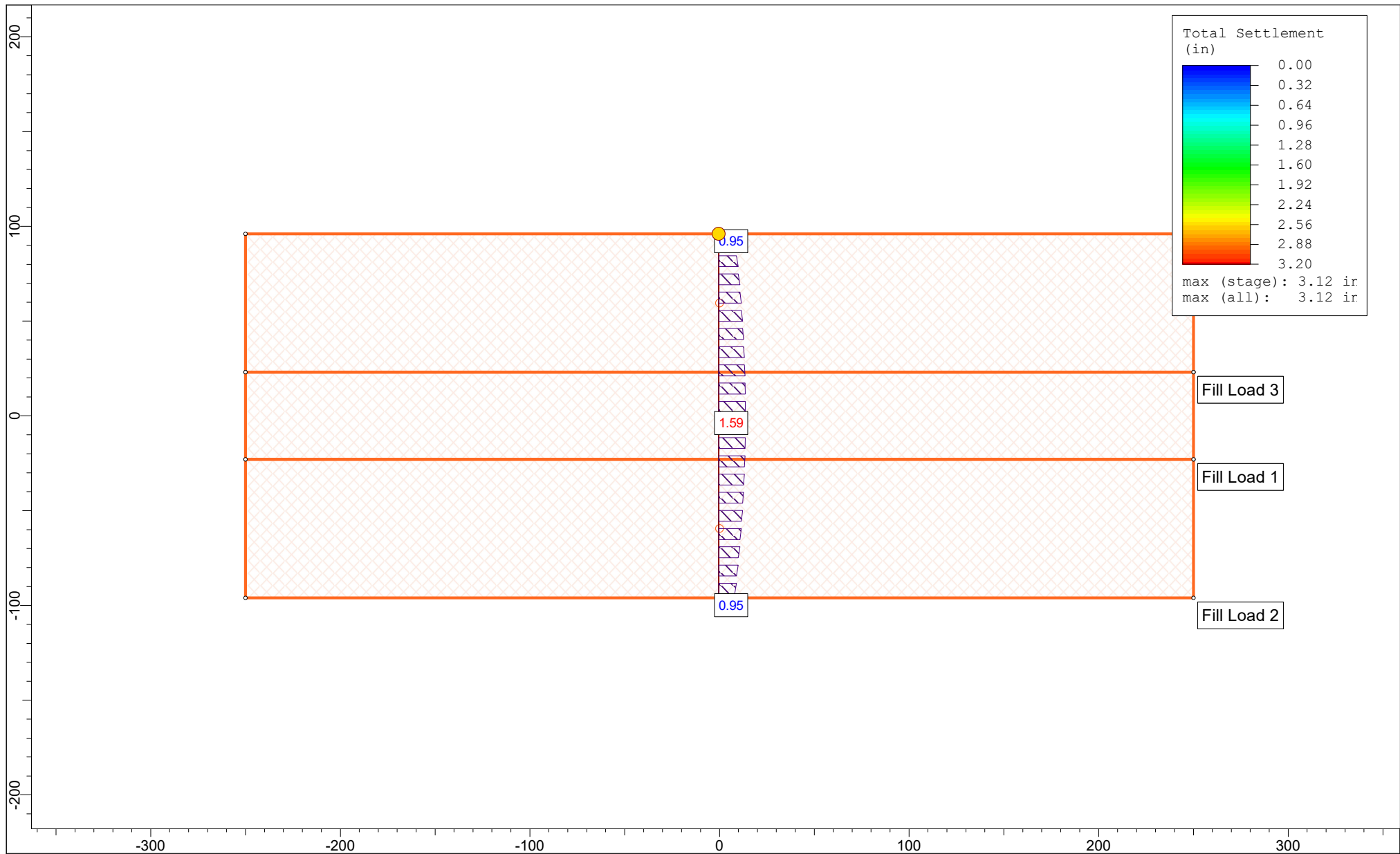
Groundwater

Groundwater method
Water Unit Weight

Piezometric Lines
0.0624 kips/ft³

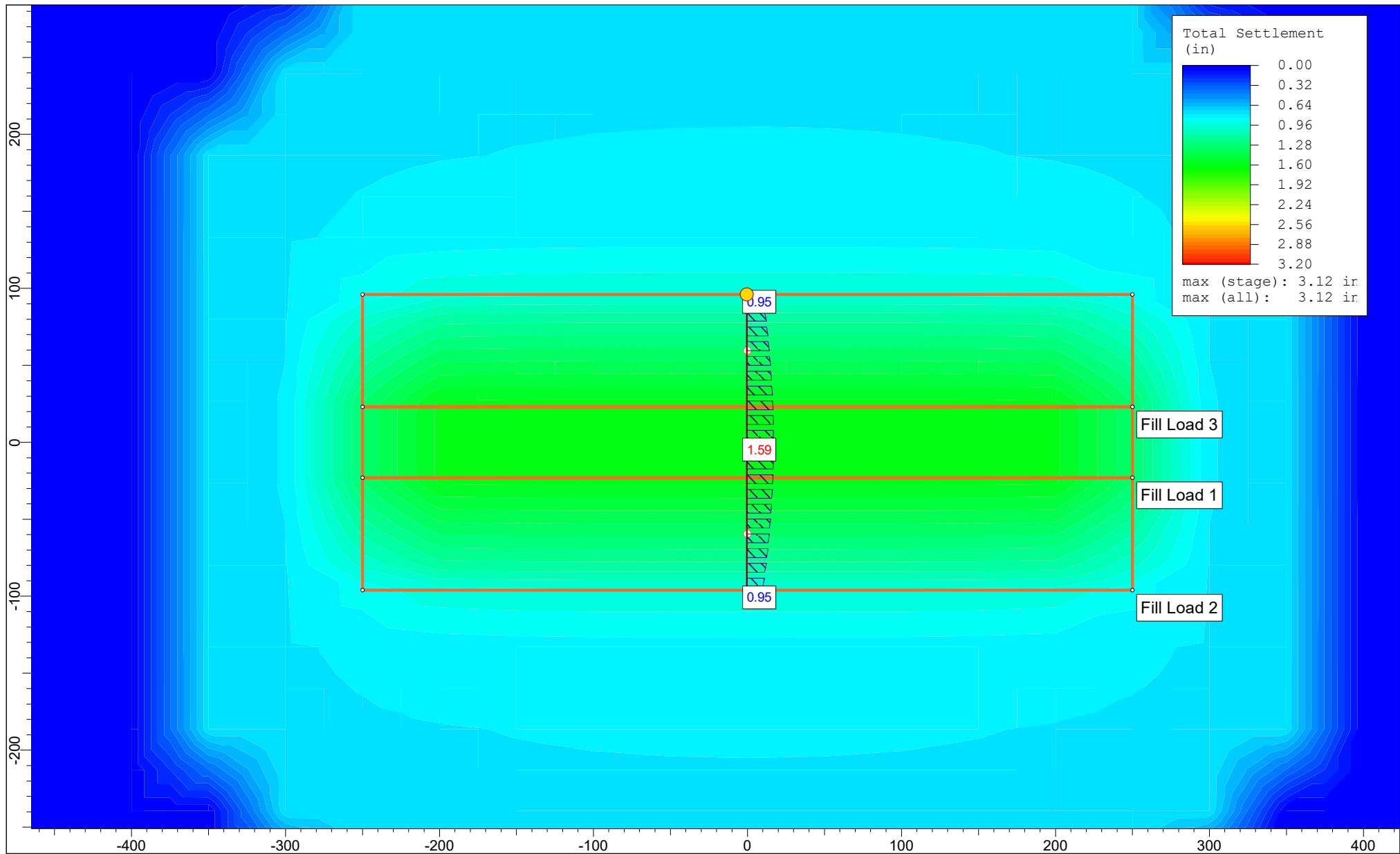
Piezometric Line Entities

ID	Depth (ft)
1	0 ft



SETTLE3 5.011

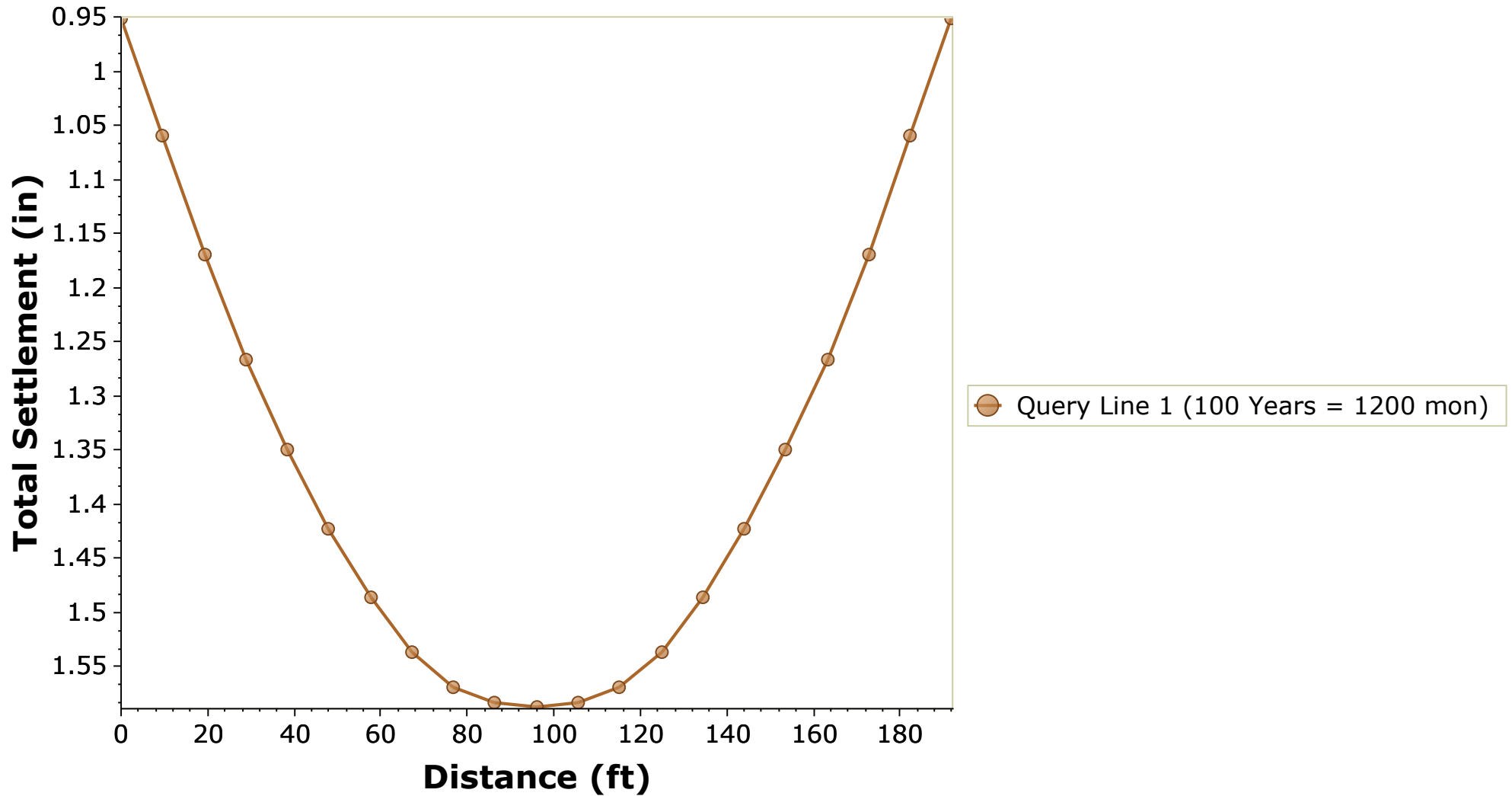
Project		I-395/Rout 9 Connector - WIN 18915.00	
Analysis Description		Sta 273+36 Settlement	
Drawn By		JAD	Company Haley & Aldrich, Inc.
Date		3/3/2020, 10:33:21 AM	File Name 2021-0610-Sta 273+36 Eaton Brook Trib-D2.s3z



SETTLE3 S.011

Project	I-395/Rout 9 Connector - WIN 18915.00		
Analysis Description	Sta 273+36 Settlement		
Drawn By	JAD	Company	Haley & Aldrich, Inc.
Date	3/3/2020, 10:33:21 AM	File Name	2021-0610-Sta 273+36 Eaton Brook Trib-D2.s3z

Distance vs. Total Settlement



Reference Stage: None
Total Settlement at Depth = 5 ft



Project		I-395/Rout 9 Connector - WIN 18915.00	
Analysis Description		Sta 273+36 Settlement	
Drawn By		JAD	Company Haley & Aldrich, Inc.
Date		3/3/2020, 10:33:21 AM	File Name 2021-0610-Sta 273+36 Eaton Brook Trib-D2.s3z

Sta. 275+89

Settle3 Analysis Information

I-395/Rout 9 Connector - WIN 18915.00

Project Settings

Document Name	2021-0610-Sta 275+89 Wildlife 2-D2.s3z
Project Title	I-395/Rout 9 Connector - WIN 18915.00
Analysis	Sta 275+89 Settlement
Author	JAD
Company	Haley & Aldrich, Inc.
Date Created	3/3/2020, 10:33:21 AM
Stress Computation Method	Westergaard
Time-dependent Consolidation Analysis	
Time Units	months
Permeability Units	feet/second
Minimum settlement ratio for subgrade modulus	0.9
Use average properties to calculate layered stresses	
Improve consolidation accuracy	
Ignore negative effective stresses in settlement calculations	

Stage Settings

Stage #	Name	Time [months]
1	Initial	0
2	95% Consol	1
3	20 Years	240
4	75 Years	900
5	100 Years	1200

Results

Time taken to compute: 2.31447 seconds

Stage: Initial = 0 mon

Data Type	Minimum	Maximum
Total Settlement [in]	0	0.696748
Total Consolidation Settlement [in]	0	0
Virgin Consolidation Settlement [in]	0	0
Recompression Consolidation Settlement [in]	0	0
Immediate Settlement [in]	0	0.696748
Secondary Settlement [in]	0	0
Loading Stress ZZ [ksf]	-0.000734275	3.27184
Loading Stress XX [ksf]	-0.000171489	0.81257
Loading Stress YY [ksf]	-0.000171489	0.81257
Effective Stress ZZ [ksf]	0	3.1398
Effective Stress XX [ksf]	-8.39268e-05	3.48047
Effective Stress YY [ksf]	-8.39268e-05	3.48047
Total Stress ZZ [ksf]	-0.000734275	7.62757
Total Stress XX [ksf]	-0.000734169	7.96825
Total Stress YY [ksf]	-0.000734169	7.96825
Modulus of Subgrade Reaction (Total) [ksf/ft]	-1.84576	203.245
Modulus of Subgrade Reaction (Immediate) [ksf/ft]	-1.84576	203.245
Modulus of Subgrade Reaction (Consolidation) [ksf/ft]	0	0
Total Strain	-8.30951e-09	0.00194684
Pore Water Pressure [ksf]	-0.000734275	4.48777
Excess Pore Water Pressure [ksf]	-0.000734275	3.27184
Degree of Consolidation [%]	0	0
Pre-consolidation Stress [ksf]	0.370972	12
Over-consolidation Ratio	1	3259.1
Void Ratio	0	1.03
Permeability [ft/s]	0	2.21052e-07
Coefficient of Consolidation [ft ² /s]	0	3e-06
Hydroconsolidation Settlement [in]	0	0
Average Degree of Consolidation [%]	0	73
Undrained Shear Strength	-5.55112e-17	5.55112e-17

Stage: 95% Consol = 1 mon

Data Type	Minimum	Maximum
Total Settlement [in]	0	1.81631
Total Consolidation Settlement [in]	-0.000143222	1.11956
Virgin Consolidation Settlement [in]	0	0
Recompression Consolidation Settlement [in]	-0.000143222	1.11956
Immediate Settlement [in]	0	0.696748
Secondary Settlement [in]	0	0
Loading Stress ZZ [ksf]	-0.000734275	3.27184
Loading Stress XX [ksf]	-0.000171489	0.81257
Loading Stress YY [ksf]	-0.000171489	0.81257
Effective Stress ZZ [ksf]	0	4.63237
Effective Stress XX [ksf]	-0.000734169	4.97305
Effective Stress YY [ksf]	-0.000734169	4.97305
Total Stress ZZ [ksf]	0	7.62757
Total Stress XX [ksf]	-0.000734169	7.96825
Total Stress YY [ksf]	-0.000734169	7.96825
Modulus of Subgrade Reaction (Total) [ksf/ft]	-0.0248126	24.2403
Modulus of Subgrade Reaction (Immediate) [ksf/ft]	-1.84576	203.245
Modulus of Subgrade Reaction (Consolidation) [ksf/ft]	-0.0448724	39.0236
Total Strain	-4.05439e-06	0.0294815
Pore Water Pressure [ksf]	0	2.9952
Excess Pore Water Pressure [ksf]	0	0.503941
Degree of Consolidation [%]	0	100
Pre-consolidation Stress [ksf]	0.370972	12
Over-consolidation Ratio	1	3254.43
Void Ratio	0	1.03001
Permeability [ft/s]	0	2.21052e-07
Coefficient of Consolidation [ft ² /s]	0	3e-06
Hydroconsolidation Settlement [in]	0	0
Average Degree of Consolidation [%]	0	91.2736
Undrained Shear Strength	-1.91751e-06	0.389706

Stage: 20 Years = 240 mon

Data Type	Minimum	Maximum
Total Settlement [in]	0	2.5989
Total Consolidation Settlement [in]	-5.86684e-05	1.15247
Virgin Consolidation Settlement [in]	0	0
Recompression Consolidation Settlement [in]	-5.86684e-05	1.15247
Immediate Settlement [in]	0	0.696748
Secondary Settlement [in]	0	0.752117
Loading Stress ZZ [ksf]	-0.000734275	3.27184
Loading Stress XX [ksf]	-0.000171489	0.81257
Loading Stress YY [ksf]	-0.000171489	0.81257
Effective Stress ZZ [ksf]	0	4.63237
Effective Stress XX [ksf]	-0.000734169	4.97305
Effective Stress YY [ksf]	-0.000734169	4.97305
Total Stress ZZ [ksf]	0	7.62757
Total Stress XX [ksf]	-0.000734169	7.96825
Total Stress YY [ksf]	-0.000734169	7.96825
Modulus of Subgrade Reaction (Total) [ksf/ft]	-0.00784839	16.501
Modulus of Subgrade Reaction (Immediate) [ksf/ft]	-1.84576	203.245
Modulus of Subgrade Reaction (Consolidation) [ksf/ft]	-0.0415484	37.7687
Total Strain	-1.44404e-06	0.0389637
Pore Water Pressure [ksf]	0	2.9952
Excess Pore Water Pressure [ksf]	-2.37396e-21	2.43882e-21
Degree of Consolidation [%]	0	100
Pre-consolidation Stress [ksf]	0.370972	12
Over-consolidation Ratio	1	3254.39
Void Ratio	0	1.03
Permeability [ft/s]	0	2.21052e-07
Coefficient of Consolidation [ft ² /s]	0	3e-06
Hydroconsolidation Settlement [in]	0	0
Average Degree of Consolidation [%]	0	100
Undrained Shear Strength	-1.91751e-06	0.389706

Stage: 75 Years = 900 mon

Data Type	Minimum	Maximum
Total Settlement [in]	0	2.79177
Total Consolidation Settlement [in]	-5.86684e-05	1.15247
Virgin Consolidation Settlement [in]	0	0
Recompression Consolidation Settlement [in]	-5.86684e-05	1.15247
Immediate Settlement [in]	0	0.696748
Secondary Settlement [in]	0	0.944992
Loading Stress ZZ [ksf]	-0.000734275	3.27184
Loading Stress XX [ksf]	-0.000171489	0.81257
Loading Stress YY [ksf]	-0.000171489	0.81257
Effective Stress ZZ [ksf]	0	4.63237
Effective Stress XX [ksf]	-0.000734169	4.97305
Effective Stress YY [ksf]	-0.000734169	4.97305
Total Stress ZZ [ksf]	0	7.62757
Total Stress XX [ksf]	-0.000734169	7.96825
Total Stress YY [ksf]	-0.000734169	7.96825
Modulus of Subgrade Reaction (Total) [ksf/ft]	-0.00669774	15.2963
Modulus of Subgrade Reaction (Immediate) [ksf/ft]	-1.84576	203.245
Modulus of Subgrade Reaction (Consolidation) [ksf/ft]	-0.0415484	37.7687
Total Strain	-1.44404e-06	0.0412598
Pore Water Pressure [ksf]	0	2.9952
Excess Pore Water Pressure [ksf]	-2.28667e-21	2.22585e-21
Degree of Consolidation [%]	0	100
Pre-consolidation Stress [ksf]	0.370972	12
Over-consolidation Ratio	1	3254.39
Void Ratio	0	1.03
Permeability [ft/s]	0	2.21052e-07
Coefficient of Consolidation [ft ² /s]	0	3e-06
Hydroconsolidation Settlement [in]	0	0
Average Degree of Consolidation [%]	0	100
Undrained Shear Strength	-1.91751e-06	0.389706

Stage: 100 Years = 1200 mon

Data Type	Minimum	Maximum
Total Settlement [in]	0	2.83375
Total Consolidation Settlement [in]	-5.86684e-05	1.15247
Virgin Consolidation Settlement [in]	0	0
Recompression Consolidation Settlement [in]	-5.86684e-05	1.15247
Immediate Settlement [in]	0	0.696748
Secondary Settlement [in]	0	0.986971
Loading Stress ZZ [ksf]	-0.000734275	3.27184
Loading Stress XX [ksf]	-0.000171489	0.81257
Loading Stress YY [ksf]	-0.000171489	0.81257
Effective Stress ZZ [ksf]	0	4.63237
Effective Stress XX [ksf]	-0.000734169	4.97305
Effective Stress YY [ksf]	-0.000734169	4.97305
Total Stress ZZ [ksf]	0	7.62757
Total Stress XX [ksf]	-0.000734169	7.96825
Total Stress YY [ksf]	-0.000734169	7.96825
Modulus of Subgrade Reaction (Total) [ksf/ft]	-0.00649062	15.057
Modulus of Subgrade Reaction (Immediate) [ksf/ft]	-1.84576	203.245
Modulus of Subgrade Reaction (Consolidation) [ksf/ft]	-0.0415484	37.7687
Total Strain	-1.44404e-06	0.0417596
Pore Water Pressure [ksf]	0	2.9952
Excess Pore Water Pressure [ksf]	-2.27043e-21	2.21004e-21
Degree of Consolidation [%]	0	100
Pre-consolidation Stress [ksf]	0.370972	12
Over-consolidation Ratio	1	3254.39
Void Ratio	0	1.03
Permeability [ft/s]	0	2.21052e-07
Coefficient of Consolidation [ft ² /s]	0	3e-06
Hydroconsolidation Settlement [in]	0	0
Average Degree of Consolidation [%]	0	100
Undrained Shear Strength	-1.91751e-06	0.389706

Loads

1. Fill Load: "Fill Load 2"

Label	Fill Load 2
Load Type	Flexible
Area of Load	24500 ft2
Depth	-0 ft
Installation Stage	Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
-250	-23	3.25
-250	-72	0
250	-72	0
250	-23	3.25

2. Fill Load: "Fill Load 3"

Label	Fill Load 3
Load Type	Flexible
Area of Load	24500 ft2
Depth	-0 ft
Installation Stage	Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
250	23	2.625
250	72	0
-250	72	0
-250	23	3.25

3. Fill Load: "Fill Load 1"

Label	Fill Load 1
Load Type	Flexible
Area of Load	23000 ft2
Load	3.25 ksf
Depth	-0 ft
Installation Stage	Initial = 0 mon

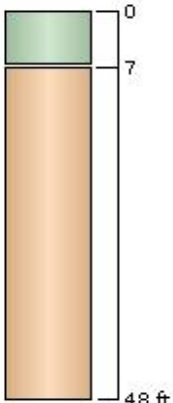
Coordinates

X [ft]	Y [ft]
-250	23
-250	-23
250	-23
250	23



Soil Layers

Ground Surface Drained: Yes

Layer #	Type	Thickness [ft]	Depth [ft]	Drained at Bottom
1	MARINE DEPOSIT CLAY	7	0	Yes
2	GLACIAL TILL SILT	41	7	No



Soil Properties

Property	MARINE DEPOSIT CLAY	GLACIAL TILL SILT
Color		
Unit Weight [kips/ft3]	0.115	0.13
Saturated Unit Weight [kips/ft3]	0.115	0.13
K0	1	1
Immediate Settlement	Disabled	Enabled
Es [ksf]	-	1500
E _{sur} [ksf]	-	1500
Primary Consolidation	Enabled	Disabled
Material Type	Non-Linear	
C _{ce}	0.08	-
C _{re}	0.01	-
e ₀	1.03	-
P _c [ksf]	12	-
C _v [ft2/s]	3e-06	-
C _{vr} [ft2/s]	3e-06	-
B-bar	1	-
Secondary Consolidation	Standard	Disabled
C _{ae}	0.004	-
C _{are}	0.004	-
Undrained Su A [kips/ft2]	0	0
Undrained Su S	0.2	0.2
Undrained Su m	0.8	0.8
Piezo Line ID	1	1

Groundwater

Groundwater method

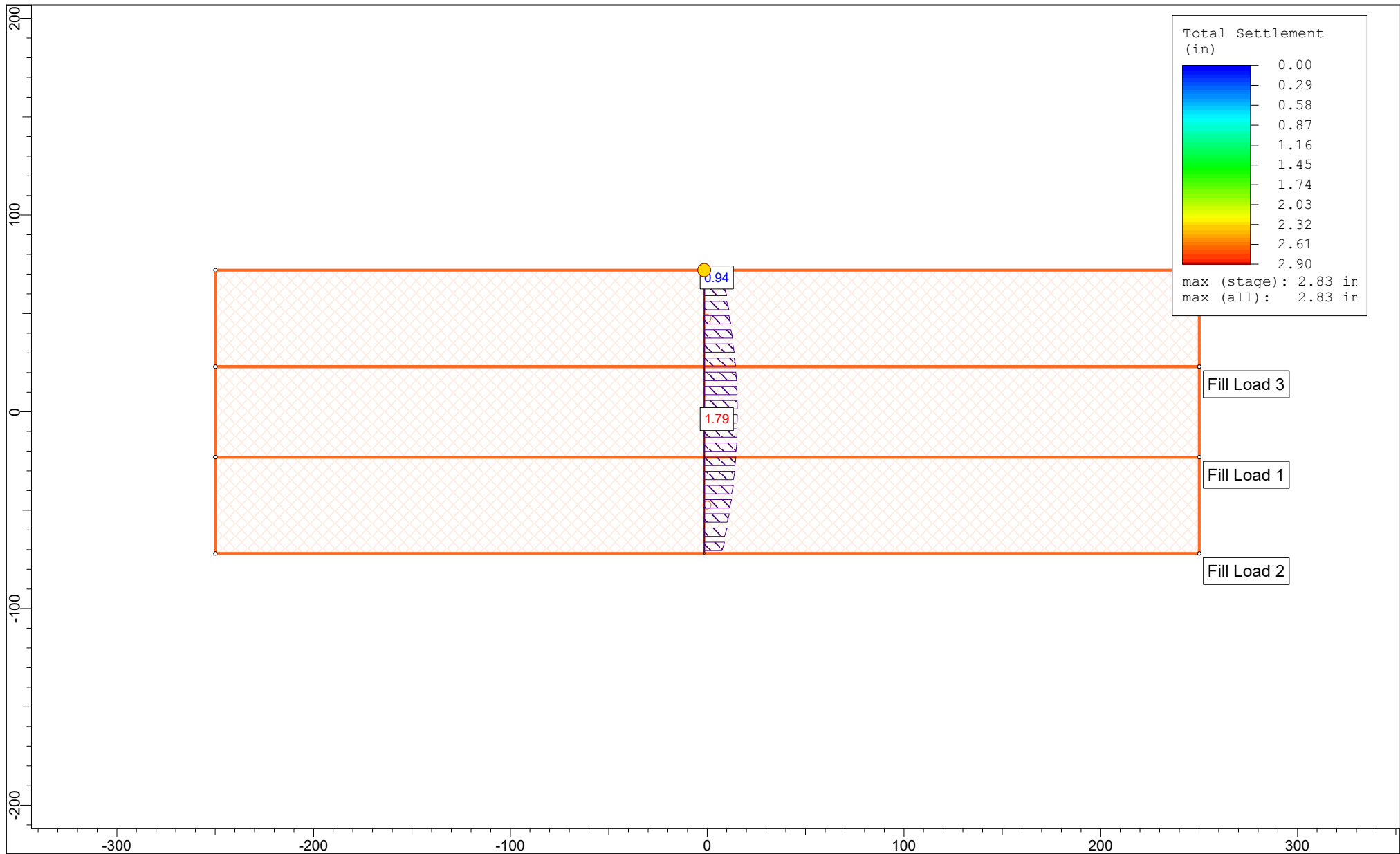
Piezometric Lines

Water Unit Weight

0.0624 kips/ft³

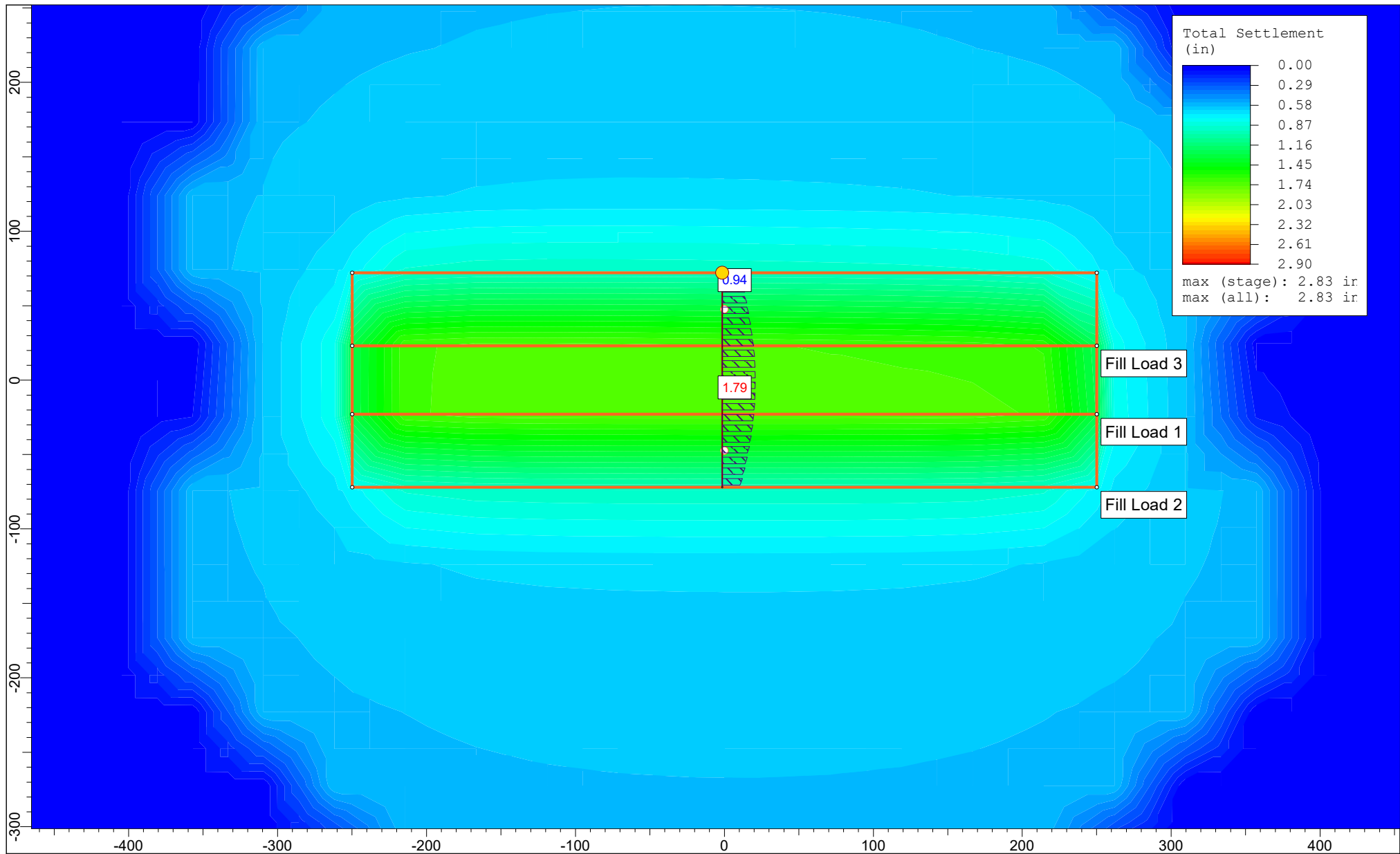
Piezometric Line Entities

ID	Depth (ft)
1	0 ft



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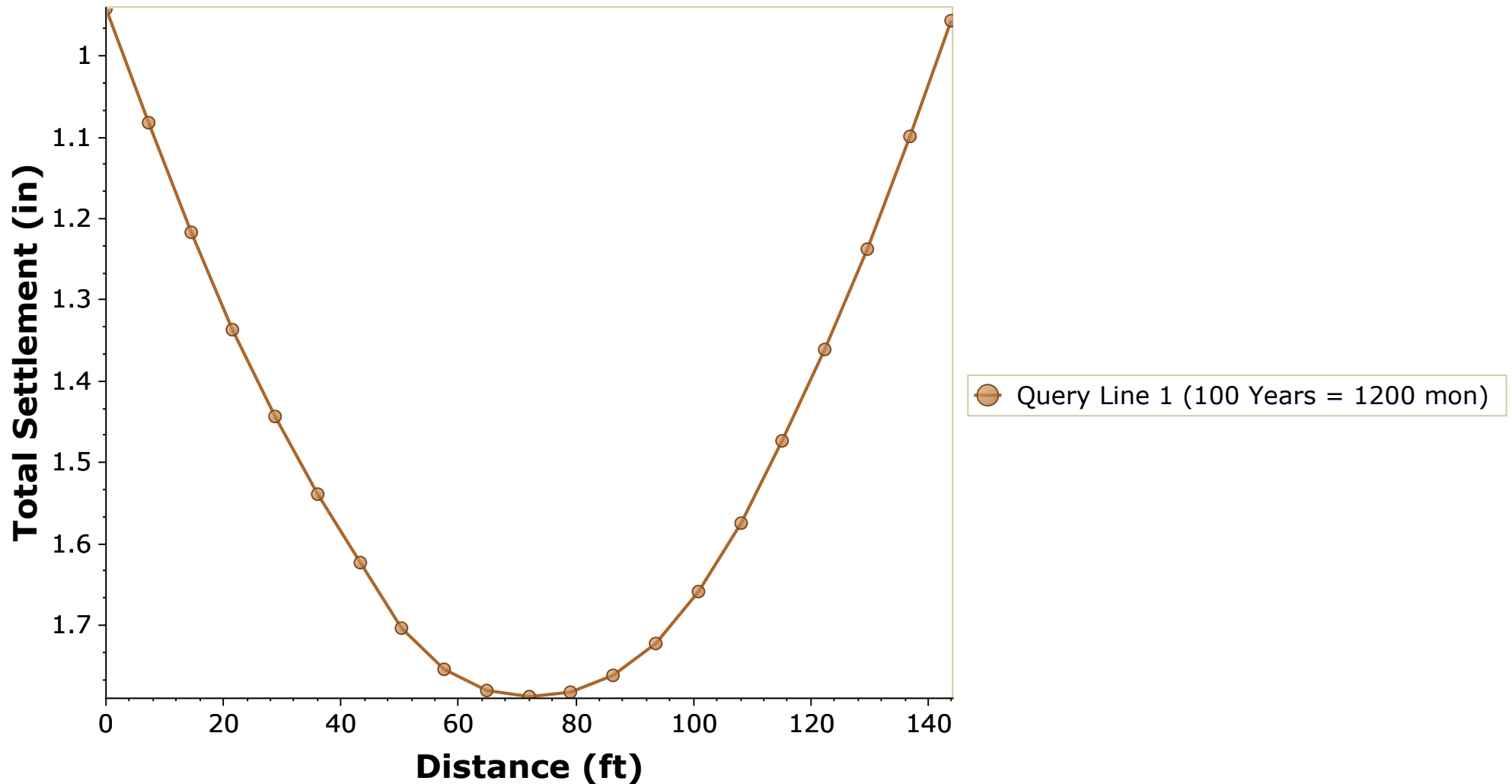
Project	I-395/Rout 9 Connector - WIN 18915.00		
Analysis Description	Sta 275+89 Settlement		
Drawn By	JAD	Company	Haley & Aldrich, Inc.
Date	3/3/2020, 10:33:21 AM	File Name	2021-0610-Sta 275+89 Wildlife 2-D2.s3z



SETTLE3 S.011

Project	I-395/Rout 9 Connector - WIN 18915.00		
Analysis Description	Sta 275+89 Settlement		
Drawn By	JAD	Company	Haley & Aldrich, Inc.
Date	3/3/2020, 10:33:21 AM	File Name	2021-0610-Sta 275+89 Wildlife 2-D2.s3z

Distance vs. Total Settlement



Reference Stage: None
Total Settlement at Depth = 3 ft



Project		I-395/Rout 9 Connector - WIN 18915.00	
Analysis Description		Sta 275+89 Settlement	
Drawn By		JAD	Company Haley & Aldrich, Inc.
Date		3/3/2020, 10:33:21 AM	File Name 2021-0610-Sta 275+89 Wildlife 2-D2.s3z

Sta. 284+06

Settle3 Analysis Information

I-395/Rout 9 Connector - WIN 18915.00

Project Settings

Document Name	2021-0610-Sta 284+06 Snowmobile 107-D2.s3z
Project Title	I-395/Rout 9 Connector - WIN 18915.00
Analysis	Sta 284+06 Settlement
Author	JAD
Company	Haley & Aldrich.com
Date Created	3/3/2020, 10:33:21 AM
Stress Computation Method	Westergaard
Time-dependent Consolidation Analysis	
Time Units	months
Permeability Units	feet/second
Minimum settlement ratio for subgrade modulus	0.9
Use average properties to calculate layered stresses	
Improve consolidation accuracy	
Ignore negative effective stresses in settlement calculations	

Stage Settings

	Stage #	Name	Time [months]
1		Initial	0
2		20 Years	240
3		75 Years	900
4		100 Years	1200

Results

Time taken to compute: 0.882644 seconds

Stage: Initial = 0 mon

Data Type	Minimum	Maximum
Total Settlement [in]	0	0.724811
Total Consolidation Settlement [in]	0	0
Virgin Consolidation Settlement [in]	0	0
Recompression Consolidation Settlement [in]	0	0
Immediate Settlement [in]	0	0.724811
Secondary Settlement [in]	0	0
Loading Stress ZZ [ksf]	-0.000205781	2.62501
Loading Stress XX [ksf]	-0.000266385	0.656249
Loading Stress YY [ksf]	-0.000266385	0.656249
Effective Stress ZZ [ksf]	-3.52573e-05	2.88671
Effective Stress XX [ksf]	-5.69383e-05	1.22307
Effective Stress YY [ksf]	-5.69383e-05	1.22307
Total Stress ZZ [ksf]	-3.52573e-05	3.51071
Total Stress XX [ksf]	-5.69383e-05	1.84707
Total Stress YY [ksf]	-5.69383e-05	1.84707
Modulus of Subgrade Reaction (Total) [ksf/ft]	-0.0180095	395.116
Modulus of Subgrade Reaction (Immediate) [ksf/ft]	-0.0180095	395.116
Modulus of Subgrade Reaction (Consolidation) [ksf/ft]	0	0
Total Strain	-4.57305e-07	0.00656197
Pore Water Pressure [ksf]	0	0.624
Excess Pore Water Pressure [ksf]	0	0
Degree of Consolidation [%]	0	0
Pre-consolidation Stress [ksf]	0.000338342	2.88658
Over-consolidation Ratio	1	1.00068
Void Ratio	0	0
Permeability [ft/s]	0	0
Coefficient of Consolidation [ft ² /s]	0	0
Hydroconsolidation Settlement [in]	0	0
Average Degree of Consolidation [%]	0	0
Undrained Shear Strength	-5.48948e-06	0.0455458

Stage: 20 Years = 240 mon

Data Type	Minimum	Maximum
Total Settlement [in]	0	0.724811
Total Consolidation Settlement [in]	0	0
Virgin Consolidation Settlement [in]	0	0
Recompression Consolidation Settlement [in]	0	0
Immediate Settlement [in]	0	0.724811
Secondary Settlement [in]	0	0
Loading Stress ZZ [ksf]	-0.000205781	2.62501
Loading Stress XX [ksf]	-0.000266385	0.656249
Loading Stress YY [ksf]	-0.000266385	0.656249
Effective Stress ZZ [ksf]	-3.52573e-05	2.88671
Effective Stress XX [ksf]	-5.69383e-05	1.22307
Effective Stress YY [ksf]	-5.69383e-05	1.22307
Total Stress ZZ [ksf]	-3.52573e-05	3.51071
Total Stress XX [ksf]	-5.69383e-05	1.84707
Total Stress YY [ksf]	-5.69383e-05	1.84707
Modulus of Subgrade Reaction (Total) [ksf/ft]	-0.0180095	395.116
Modulus of Subgrade Reaction (Immediate) [ksf/ft]	-0.0180095	395.116
Modulus of Subgrade Reaction (Consolidation) [ksf/ft]	0	0
Total Strain	-4.57305e-07	0.00656197
Pore Water Pressure [ksf]	0	0.624
Excess Pore Water Pressure [ksf]	0	0
Degree of Consolidation [%]	0	0
Pre-consolidation Stress [ksf]	0.000338342	2.88658
Over-consolidation Ratio	1	1.00068
Void Ratio	0	0
Permeability [ft/s]	0	0
Coefficient of Consolidation [ft ² /s]	0	0
Hydroconsolidation Settlement [in]	0	0
Average Degree of Consolidation [%]	0	0
Undrained Shear Strength	-5.48948e-06	0.0455458

Stage: 75 Years = 900 mon

Data Type	Minimum	Maximum
Total Settlement [in]	0	0.724811
Total Consolidation Settlement [in]	0	0
Virgin Consolidation Settlement [in]	0	0
Recompression Consolidation Settlement [in]	0	0
Immediate Settlement [in]	0	0.724811
Secondary Settlement [in]	0	0
Loading Stress ZZ [ksf]	-0.000205781	2.62501
Loading Stress XX [ksf]	-0.000266385	0.656249
Loading Stress YY [ksf]	-0.000266385	0.656249
Effective Stress ZZ [ksf]	-3.52573e-05	2.88671
Effective Stress XX [ksf]	-5.69383e-05	1.22307
Effective Stress YY [ksf]	-5.69383e-05	1.22307
Total Stress ZZ [ksf]	-3.52573e-05	3.51071
Total Stress XX [ksf]	-5.69383e-05	1.84707
Total Stress YY [ksf]	-5.69383e-05	1.84707
Modulus of Subgrade Reaction (Total) [ksf/ft]	-0.0180095	395.116
Modulus of Subgrade Reaction (Immediate) [ksf/ft]	-0.0180095	395.116
Modulus of Subgrade Reaction (Consolidation) [ksf/ft]	0	0
Total Strain	-4.57305e-07	0.00656197
Pore Water Pressure [ksf]	0	0.624
Excess Pore Water Pressure [ksf]	0	0
Degree of Consolidation [%]	0	0
Pre-consolidation Stress [ksf]	0.000338342	2.88658
Over-consolidation Ratio	1	1.00068
Void Ratio	0	0
Permeability [ft/s]	0	0
Coefficient of Consolidation [ft ² /s]	0	0
Hydroconsolidation Settlement [in]	0	0
Average Degree of Consolidation [%]	0	0
Undrained Shear Strength	-5.48948e-06	0.0455458

Stage: 100 Years = 1200 mon

Data Type	Minimum	Maximum
Total Settlement [in]	0	0.724811
Total Consolidation Settlement [in]	0	0
Virgin Consolidation Settlement [in]	0	0
Recompression Consolidation Settlement [in]	0	0
Immediate Settlement [in]	0	0.724811
Secondary Settlement [in]	0	0
Loading Stress ZZ [ksf]	-0.000205781	2.62501
Loading Stress XX [ksf]	-0.000266385	0.656249
Loading Stress YY [ksf]	-0.000266385	0.656249
Effective Stress ZZ [ksf]	-3.52573e-05	2.88671
Effective Stress XX [ksf]	-5.69383e-05	1.22307
Effective Stress YY [ksf]	-5.69383e-05	1.22307
Total Stress ZZ [ksf]	-3.52573e-05	3.51071
Total Stress XX [ksf]	-5.69383e-05	1.84707
Total Stress YY [ksf]	-5.69383e-05	1.84707
Modulus of Subgrade Reaction (Total) [ksf/ft]	-0.0180095	395.116
Modulus of Subgrade Reaction (Immediate) [ksf/ft]	-0.0180095	395.116
Modulus of Subgrade Reaction (Consolidation) [ksf/ft]	0	0
Total Strain	-4.57305e-07	0.00656197
Pore Water Pressure [ksf]	0	0.624
Excess Pore Water Pressure [ksf]	0	0
Degree of Consolidation [%]	0	0
Pre-consolidation Stress [ksf]	0.000338342	2.88658
Over-consolidation Ratio	1	1.00068
Void Ratio	0	0
Permeability [ft/s]	0	0
Coefficient of Consolidation [ft ² /s]	0	0
Hydroconsolidation Settlement [in]	0	0
Average Degree of Consolidation [%]	0	0
Undrained Shear Strength	-5.48948e-06	0.0455458

Loads

1. Fill Load: "Fill Load 2"

Label	Fill Load 2
Load Type	Flexible
Area of Load	19000 ft2
Depth	-0 ft
Installation Stage	Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
-250	-23	2.625
-250	-61	0
250	-61	0
250	-23	2.625

2. Fill Load: "Fill Load 2"

Label	Fill Load 2
Load Type	Flexible
Area of Load	19000 ft2
Depth	-0 ft
Installation Stage	Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
-250	61	0
-250	23	2.625
250	23	2.625
250	61	0

3. Fill Load: "Fill Load 1"

Label	Fill Load 1
Load Type	Flexible
Area of Load	23000 ft2
Load	2.625 ksf
Depth	-0 ft
Installation Stage	Initial = 0 mon

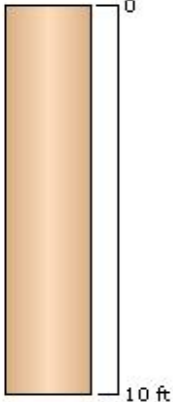
Coordinates

X [ft]	Y [ft]
-250	23
-250	-23
250	-23
250	23


Soil Layers

Ground Surface Drained: Yes

Layer #	Type	Thickness [ft]	Depth [ft]	Drained at Bottom
1	GLACIAL TILL SILT	10	0	No



Soil Properties

Property	GLACIAL TILL SILT
Color	
Unit Weight [kips/ft3]	0.13
Saturated Unit Weight [kips/ft3]	0.13
K0	1
Immediate Settlement	Enabled
Es [ksf]	400
E _{sur} [ksf]	400
B-bar	-
Undrained Su A [kips/ft2]	0
Undrained Su S	0.2
Undrained Su m	0.8
Piezo Line ID	1

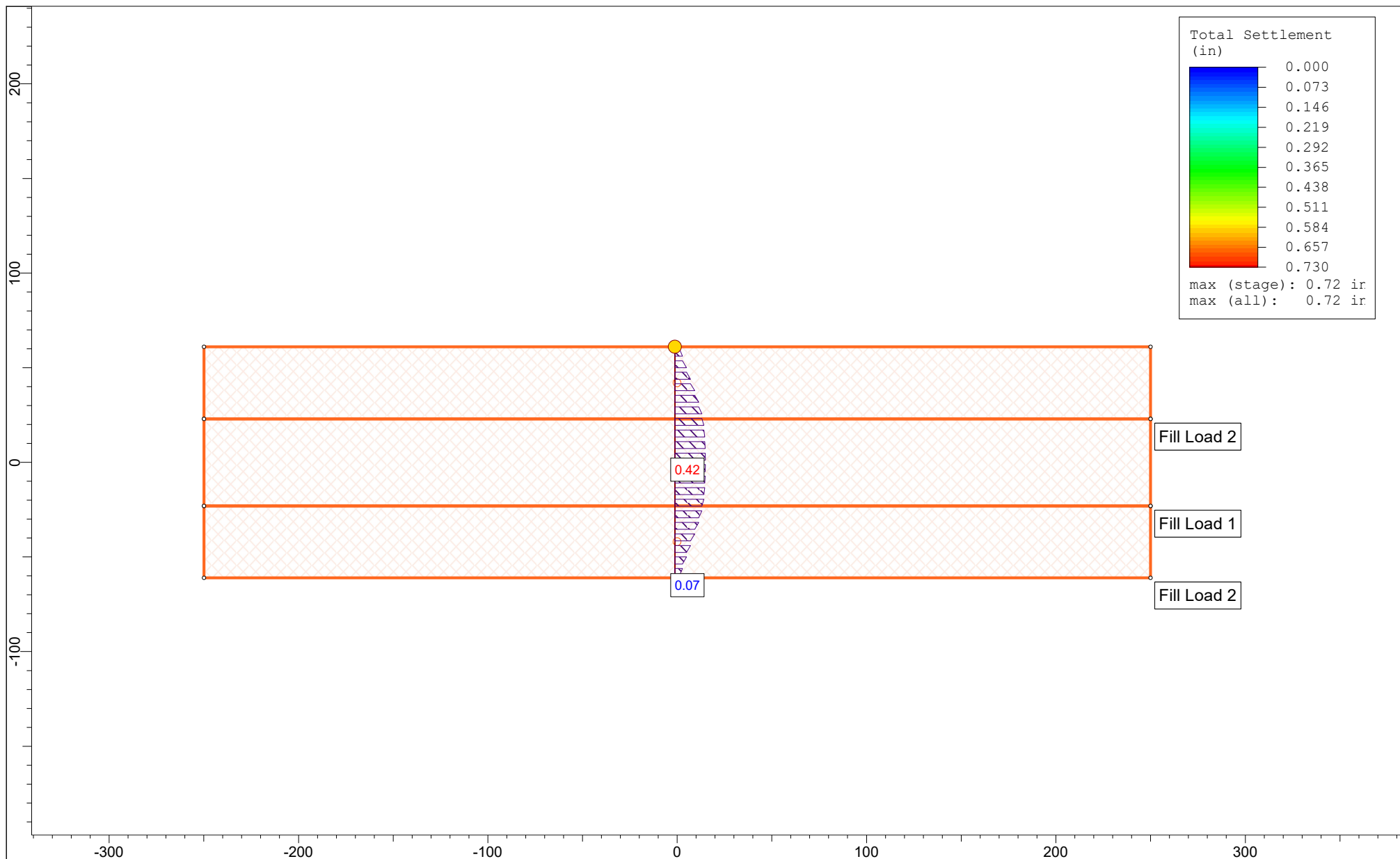
Groundwater

Groundwater method
Water Unit Weight

Piezometric Lines
0.0624 kips/ft³

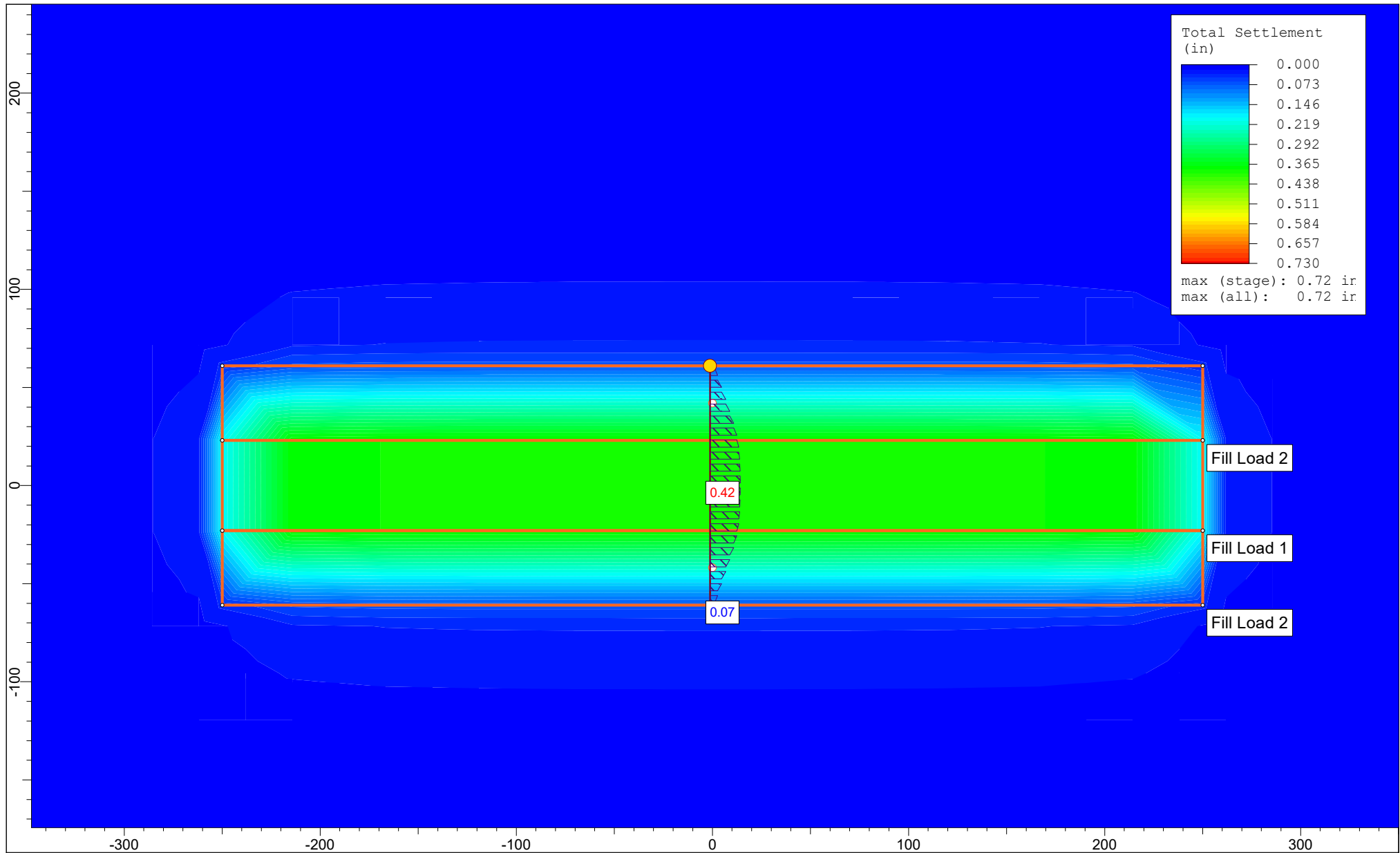
Piezometric Line Entities

ID	Depth (ft)
1	0 ft



SETTLE3 5.011

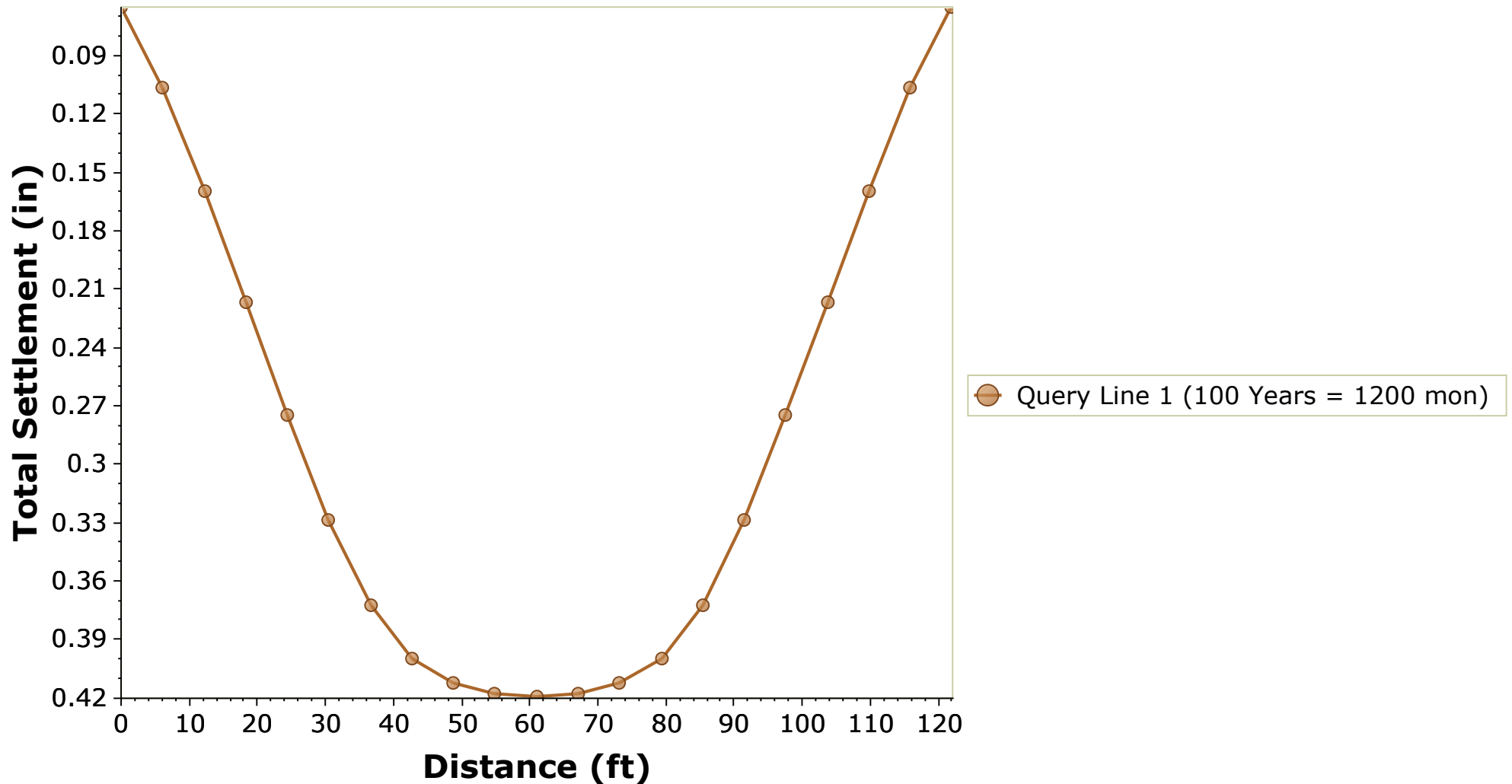
Project	I-395/Rout 9 Connector - WIN 18915.00		
Analysis Description	Sta 284+06 Settlement		
Drawn By	JAD	Company	Haley & Aldrich.com
Date	3/3/2020, 10:33:21 AM	File Name	2021-0610-Sta 284+06 Snowmobile 107-D2.s3z



SETTLE3 5.011

Project	I-395/Rout 9 Connector - WIN 18915.00		
Analysis Description	Sta 284+06 Settlement		
Drawn By	JAD	Company	Haley & Aldrich.com
Date	3/3/2020, 10:33:21 AM	File Name	2021-0610-Sta 284+06 Snowmobile 107-D2.s3z

Distance vs. Total Settlement



Reference Stage: None
Total Settlement at Depth = 4 ft



Project		I-395/Rout 9 Connector - WIN 18915.00	
Analysis Description		Sta 284+06 Settlement	
Drawn By		JAD	Company Haley & Aldrich.com
Date		3/3/2020, 10:33:21 AM	File Name 2021-0610-Sta 284+06 Snowmobile 107-D2.s3z

Sta. 289+11

Settle3 Analysis Information

I-395/Rout 9 Connector - WIN 18915.00

Project Settings

Document Name	2021-0610-Sta 289+11 Wetland-D2.s3z
Project Title	I-395/Rout 9 Connector - WIN 18915.00
Analysis	Sta 289+11 Settlement
Author	JAD
Company	Haley & Aldrich, Inc.
Date Created	3/3/2020, 10:33:21 AM
Stress Computation Method	Westergaard
Time-dependent Consolidation Analysis	
Time Units	months
Permeability Units	feet/second
Minimum settlement ratio for subgrade modulus	0.9
Use average properties to calculate layered stresses	
Improve consolidation accuracy	
Ignore negative effective stresses in settlement calculations	

Stage Settings

	Stage #	Name	Time [months]
1		Initial	0
2		20 Years	240
3		75 Years	900
4		100 Years	1200

Results

Time taken to compute: 1.02438 seconds

Stage: Initial = 0 mon

Data Type	Minimum	Maximum
Total Settlement [in]	0	1.56143
Total Consolidation Settlement [in]	0	0
Virgin Consolidation Settlement [in]	0	0
Recompression Consolidation Settlement [in]	0	0
Immediate Settlement [in]	0	1.56143
Secondary Settlement [in]	0	0
Loading Stress ZZ [ksf]	-0.000200335	2.50001
Loading Stress XX [ksf]	-0.000260064	0.624999
Loading Stress YY [ksf]	-0.000260064	0.624999
Effective Stress ZZ [ksf]	-3.35784e-05	2.72144
Effective Stress XX [ksf]	-5.424e-05	1.13702
Effective Stress YY [ksf]	-5.424e-05	1.13702
Total Stress ZZ [ksf]	-3.35784e-05	3.34544
Total Stress XX [ksf]	-5.424e-05	1.76102
Total Stress YY [ksf]	-5.424e-05	1.76102
Modulus of Subgrade Reaction (Total) [ksf/ft]	-0.0121582	102.953
Modulus of Subgrade Reaction (Immediate) [ksf/ft]	-0.0121582	102.953
Modulus of Subgrade Reaction (Consolidation) [ksf/ft]	0	0
Total Strain	-1.7382e-06	0.0249984
Pore Water Pressure [ksf]	0	0.624
Excess Pore Water Pressure [ksf]	0	0
Degree of Consolidation [%]	0	0
Pre-consolidation Stress [ksf]	0.00044184	2.72127
Over-consolidation Ratio	1	2.10174
Void Ratio	0	0
Permeability [ft/s]	0	0
Coefficient of Consolidation [ft ² /s]	0	0
Hydroconsolidation Settlement [in]	0	0
Average Degree of Consolidation [%]	0	0
Undrained Shear Strength	-6.49155e-06	0.0492439

Stage: 20 Years = 240 mon

Data Type	Minimum	Maximum
Total Settlement [in]	0	1.56143
Total Consolidation Settlement [in]	0	0
Virgin Consolidation Settlement [in]	0	0
Recompression Consolidation Settlement [in]	0	0
Immediate Settlement [in]	0	1.56143
Secondary Settlement [in]	0	0
Loading Stress ZZ [ksf]	-0.000200335	2.50001
Loading Stress XX [ksf]	-0.000260064	0.624999
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Modulus of Subgrade Reaction (Total) [ksf/ft]	-0.0121582	102.953
Modulus of Subgrade Reaction (Immediate) [ksf/ft]	-0.0121582	102.953
Modulus of Subgrade Reaction (Consolidation) [ksf/ft]	0	0
Total Strain	-1.7382e-06	0.0249984
Pore Water Pressure [ksf]	0	0.624
Excess Pore Water Pressure [ksf]	0	0
Degree of Consolidation [%]	0	0
Pre-consolidation Stress [ksf]	0.00044184	2.72127
Over-consolidation Ratio	1	2.10174
Void Ratio	0	0
Permeability [ft/s]	0	0
Coefficient of Consolidation [ft ² /s]	0	0
Hydroconsolidation Settlement [in]	0	0
Average Degree of Consolidation [%]	0	0
Undrained Shear Strength	-6.49155e-06	0.0492439

Stage: 75 Years = 900 mon

Data Type	Minimum	Maximum
Total Settlement [in]	0	1.56143
Total Consolidation Settlement [in]	0	0
Virgin Consolidation Settlement [in]	0	0
Recompression Consolidation Settlement [in]	0	0
Immediate Settlement [in]	0	1.56143
Secondary Settlement [in]	0	0
Loading Stress ZZ [ksf]	-0.000200335	2.50001
Loading Stress XX [ksf]	-0.000260064	0.624999
Loading Stress YY [ksf]	-0.000260064	0.624999
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Modulus of Subgrade Reaction (Total) [ksf/ft]	-0.0121582	102.953
Modulus of Subgrade Reaction (Immediate) [ksf/ft]	-0.0121582	102.953
Modulus of Subgrade Reaction (Consolidation) [ksf/ft]	0	0
Total Strain	-1.7382e-06	0.0249984
Pore Water Pressure [ksf]	0	0.624
Excess Pore Water Pressure [ksf]	0	0
Degree of Consolidation [%]	0	0
Pre-consolidation Stress [ksf]	0.00044184	2.72127
Over-consolidation Ratio	1	2.10174
Void Ratio	0	0
Permeability [ft/s]	0	0
Coefficient of Consolidation [ft ² /s]	0	0
Hydroconsolidation Settlement [in]	0	0
Average Degree of Consolidation [%]	0	0
Undrained Shear Strength	-6.49155e-06	0.0492439

Stage: 100 Years = 1200 mon

Data Type	Minimum	Maximum
Total Settlement [in]	0	1.56143
Total Consolidation Settlement [in]	0	0
Virgin Consolidation Settlement [in]	0	0
Recompression Consolidation Settlement [in]	0	0
Immediate Settlement [in]	0	1.56143
Secondary Settlement [in]	0	0
Loading Stress ZZ [ksf]	-0.000200335	2.50001
Loading Stress XX [ksf]	-0.000260064	0.624999
Loading Stress YY [ksf]	-0.000260064	0.624999
Effective Stress ZZ [ksf]	-3.35784e-05	2.72144
Effective Stress XX [ksf]	-5.424e-05	1.13702
Effective Stress YY [ksf]	-5.424e-05	1.13702
Total Stress ZZ [ksf]	-3.35784e-05	3.34544
Total Stress XX [ksf]	-5.424e-05	1.76102
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Modulus of Subgrade Reaction (Total) [ksf/ft]	-0.0121582	102.953
Modulus of Subgrade Reaction (Immediate) [ksf/ft]	-0.0121582	102.953
Modulus of Subgrade Reaction (Consolidation) [ksf/ft]	0	0
Total Strain	-1.7382e-06	0.0249984
Pore Water Pressure [ksf]	0	0.624
Excess Pore Water Pressure [ksf]	0	0
Degree of Consolidation [%]	0	0
Pre-consolidation Stress [ksf]	0.00044184	2.72127
Over-consolidation Ratio	1	2.10174
Void Ratio	0	0
Permeability [ft/s]	0	0
Coefficient of Consolidation [ft ² /s]	0	0
Hydroconsolidation Settlement [in]	0	0
Average Degree of Consolidation [%]	0	0
Undrained Shear Strength	-6.49155e-06	0.0492439

Loads

1. Fill Load: "Fill Load 2"

Label	Fill Load 2
Load Type	Flexible
Area of Load	19000 ft2
Depth	-0 ft
Installation Stage	Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
-250	-23	2.5
-250	-61	0
250	-61	0
250	-23	2.5

2. Fill Load: "Fill Load 2"

Label	Fill Load 2
Load Type	Flexible
Area of Load	19000 ft2
Depth	-0 ft
Installation Stage	Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
-250	61	0
-250	23	2.5
250	23	2.5
250	61	0

3. Fill Load: "Fill Load 1"

Label	Fill Load 1
Load Type	Flexible
Area of Load	23000 ft2
Load	2.5 ksf
Depth	-0 ft
Installation Stage	Initial = 0 mon

Coordinates

X [ft]	Y [ft]
-250	23
-250	-23
250	-23
250	23



Soil Layers

Ground Surface Drained: Yes

Layer #	Type	Thickness [ft]	Depth [ft]	Drained at Bottom
1	MARINE DEPOSIT SILT	4	0	Yes
2	GLACIAL TILL SILT	6	4	No



Soil Properties

Property	MARINE DEPOSIT SILT	GLACIAL TILL SILT
Color		
Unit Weight [kips/ft3]	0.115	0.13
Saturated Unit Weight [kips/ft3]	0.115	0.13
K0	1	1
Immediate Settlement	Enabled	Enabled
Es [ksf]	100	400
E _{sur} [ksf]	100	400
B-bar	-	-
Undrained Su A [kips/ft2]	0	0
Undrained Su S	0.2	0.2
Undrained Su m	0.8	0.8
Piezo Line ID	1	1

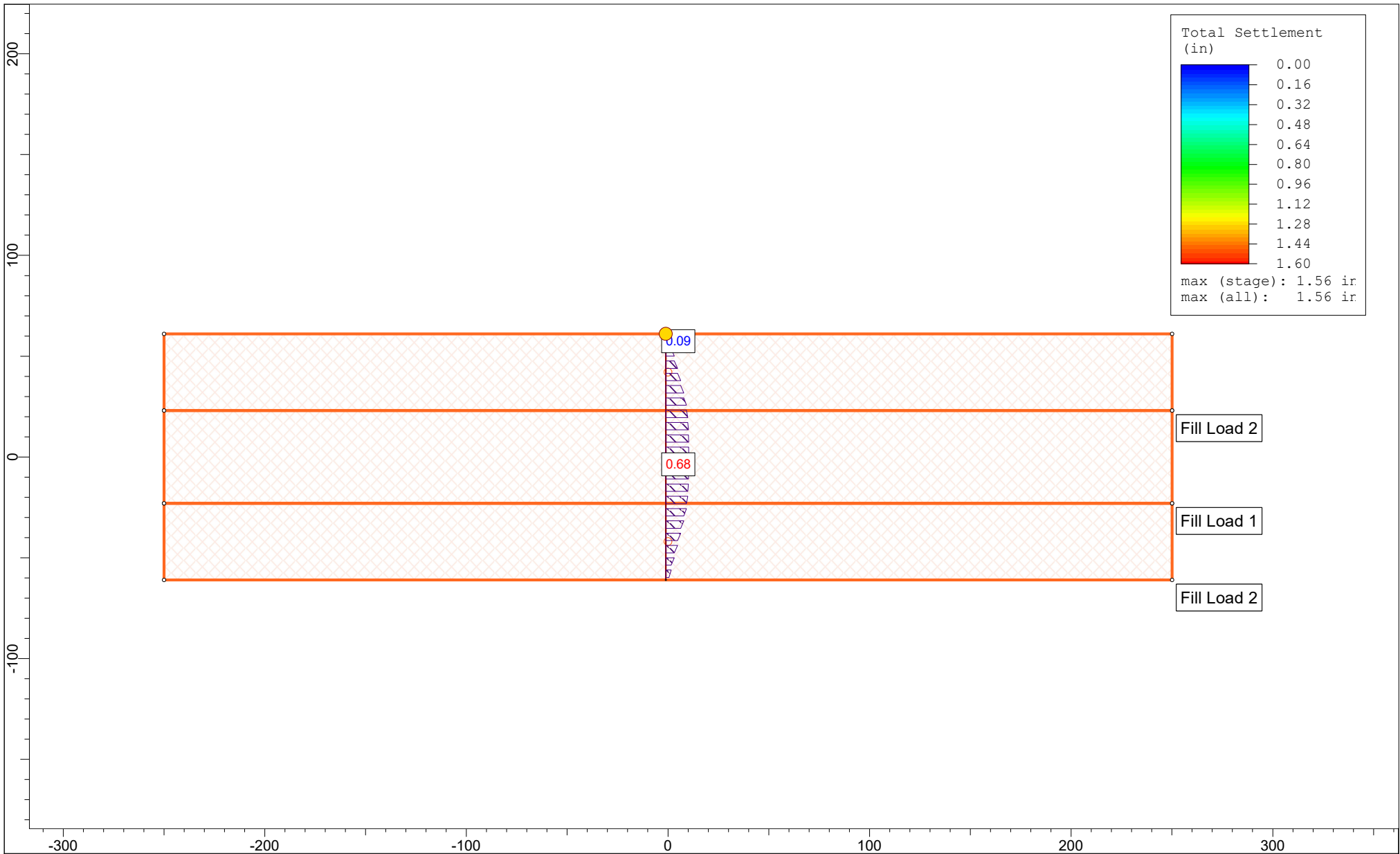
Groundwater


Groundwater method
Water Unit Weight

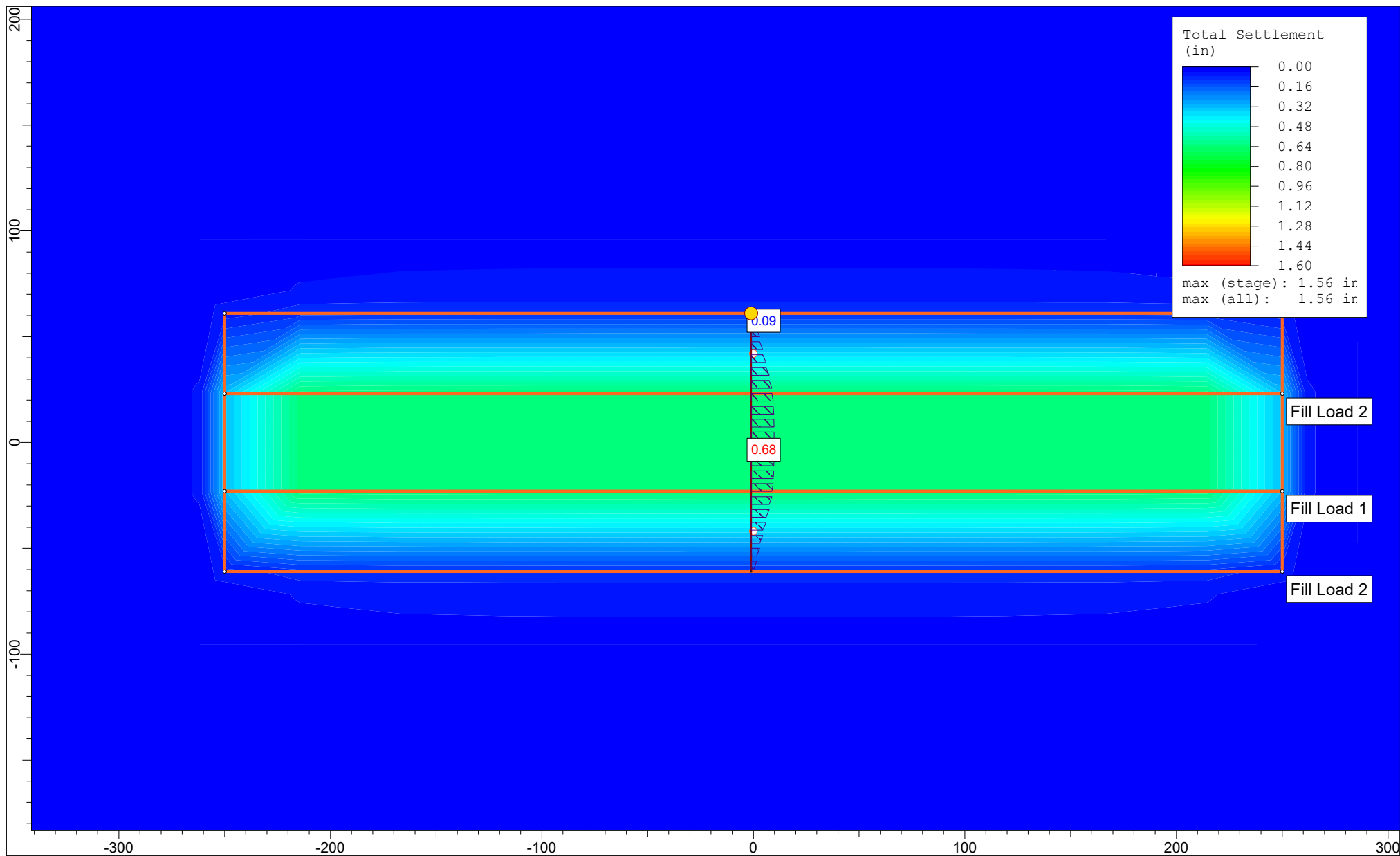
Piezometric Lines
0.0624 kips/ft³

Piezometric Line Entities

ID	Depth (ft)
1	0 ft



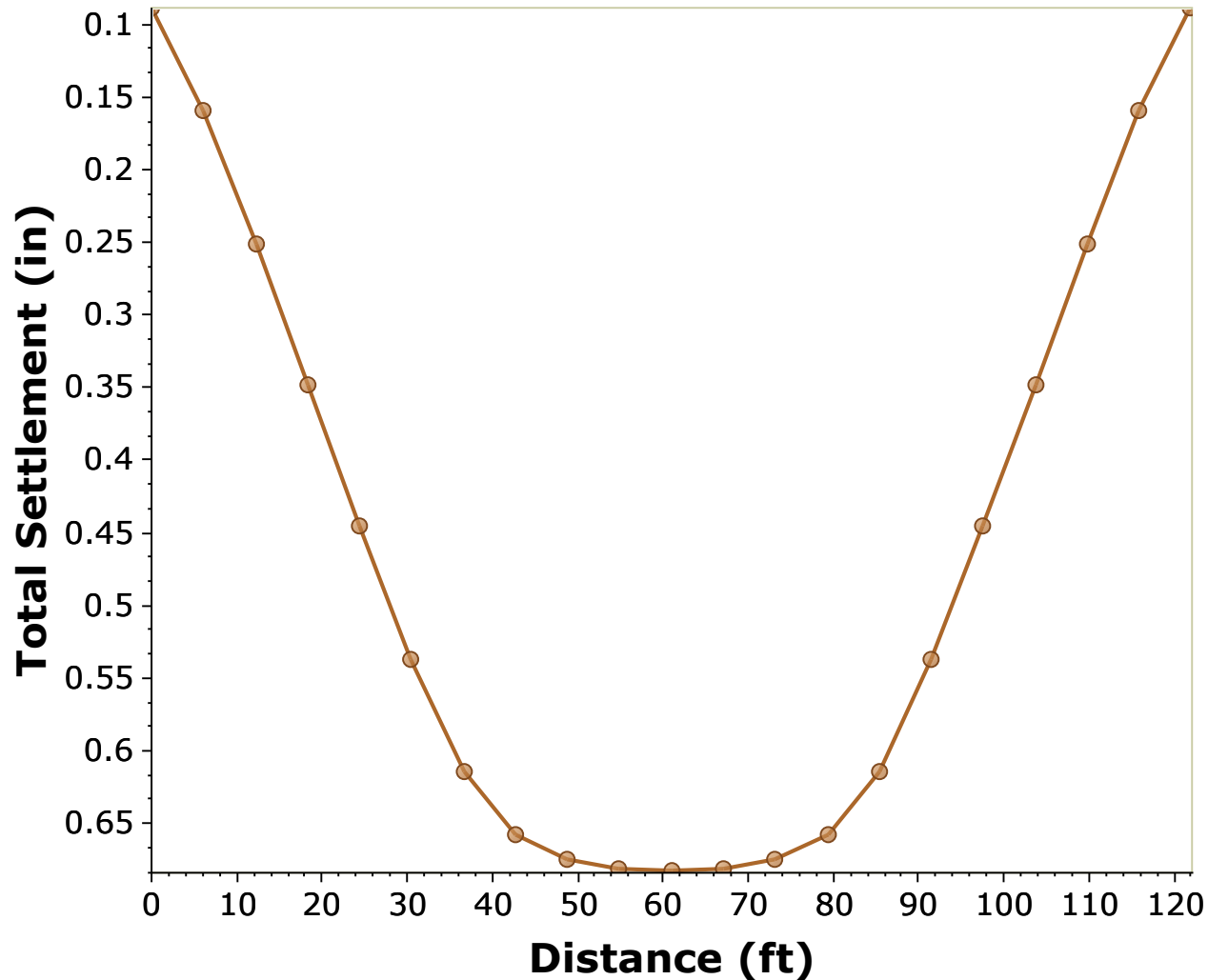
	Project		I-395/Rout 9 Connector - WIN 18915.00	
	Analysis Description		Sta 289+11 Settlement	
	Drawn By	JAD	Company	Haley & Aldrich, Inc.
	Date	3/3/2020, 10:33:21 AM	File Name	2021-0610-Sta 289+11 Wetland-D2.s3z



SETTLE3 S.011

Project	I-395/Rout 9 Connector - WIN 18915.00		
Analysis Description	Sta 289+11 Settlement		
Drawn By	JAD	Company	Haley & Aldrich, Inc.
Date	3/3/2020, 10:33:21 AM	File Name	2021-0610-Sta 289+11 Wetland-D2.s3z

Distance vs. Total Settlement



Query Line 1 (100 Years = 1200 mon)

Reference Stage: None
Total Settlement at Depth = 3 ft



SETTLE3 S.011

Project		I-395/Rout 9 Connector - WIN 18915.00	
Analysis Description		Sta 289+11 Settlement	
Drawn By		JAD	Company Haley & Aldrich, Inc.
Date		3/3/2020, 10:33:21 AM	File Name 2021-0610-Sta 289+11 Wetland-D2.s3z

Felts Brook Piles

PROBLEM STATEMENT & OBJECTIVE

Estimate the downdrag load per pile due to the additional fill placement for the embankment around the culvert piles.

REFERENCES

- 1. American Institute of Steel Construction (AISC) Manual, 13th Edition, 2005.
- 2. AASHTO LRFD Bridge Design Specifications, 9th Edition, 2020.

ASSUMPTIONS

- 1. The soil profile is based on boring **BB-BFB-202**.
- 2. The bottom of the culvert pile cap is at approximately El. 68.
- 3. The Alpha method for cohesive soils were used for the geotechnical axial resistance based on AASHTO guidance.
- 4. Downdrag is considered for the entire length of the pile embedded in Marine Clay

PROCEDURE

- 1. Using the nominal unit side resistances calculated in the pile axial resistance calculations, calculate the unfactored downdrag load on the pile.
*Based on Equation 10.7.3.8.6a-4, AASHTO ($R_s = q_s A_s$):

$DD = H * P * q_s$ where H = height of downdrag zone, P = pile perimeter, q_s = nominal pile axial side resistance

- 2. Calculate the factored downdrag load based on a load factor of 1.4 (AASHTO Table 3.4.1-2)

SUMMARY OF PILE PROPERTIES

Location	Top of Pile Elevation	Estimated Pile Tip Elevation	Pile Length, L (ft)	Steel H-Pile Size	Pile Section Area, A (in ²)	Pile Box Perimeter (ft)	Pile Elastic Modulus, E (ksi)
Felt Brook Culvert	68.3	40.0	28.3	HP 14x89	26.1	4.75	29,000

Cohesive Soils

10.7.3.8.6b - α method

$q_s = \alpha S_u$ 10.7.3.8.6b-1

where

S_u = undrained shear strength
 α = adhesion factor applied to S_u

Marine Clay Top El.	Marine Clay Bottom El.	Marine Clay Thickness (ft)	S_u (ksf)	α	Unit Side Resistance (k/ft)	Nominal Downdrag (kip)	Factored Downdrag (kip)
69	40	29.0	0.4	1.0	1.9	55	77

PROBLEM STATEMENT AND OBJECTIVE

Calculate the structural axial compressive pile resistances for the Felts Brook culvert.

ASSUMPTIONS

- 1 HP14x89 pile section considered for the structural evaluations.
- 2 A pile yield stress of 50 ksi was considered for the structural resistance evaluations.
- 3 The pile axial structural resistance was evaluated assuming a full steel H pile section (no corrosion).
- 4 The pile unbraced length is 0 ft for the structural axial resistance calculations.
- 5 This calculation only addresses axial resistance, if the piles are subjected to lateral loads, the structural resistance under combined axial load and flexure should also be evaluated by others.

STRUCTURAL RESISTANCE - AASHTO LRFD

6.9.2 - Compressive Resistance

6.9.2.1 - Axial Compression

The factored resistance of components in compression, Pr, shall be taken as

Pr = φcPn

Pn = nominal compressive resistance as specified in Article 6.9.4 or 6.9.5 as applicable.

φc = resistance factor for compression as specified in Article 6.5.4.2

6.9.4 - Noncomposite Members

6.9.4.1 - Nominal Compressive Resistance

If $\frac{Pe}{Po} \geq 0.44$, then $Pn = Po * (0.658^{\frac{Po}{Pe}})$ 6.9.4.1.1-1

If $\frac{Pe}{Po} < 0.44$, then $Pn = 0.877Pe$ 6.9.4.1.1-2

where

Ag = gross cross-sectional area of the member

Fy = specified minimum yield strength

Pe = elastic critical buckling resistance determined as specified in Article 6.9.4.1.2 for flexural buckling, and as specified in Article 6.9.4.1.3 for torsional buckling or flexural-torisonal buckling as applicable

Po = nominal yield resistance = FyAg

6.9.4.1.2 - Elastic Flexural Buckling Resistance

The elastic critical buckling resistance, Pe, based on flexural buckling shall be taken as

$Pe = \frac{\pi^2 E}{(\frac{Kl}{rs})^2} Ag$ 6.9.4.1.2-1

where

Ag = gross cross-sectional area of the member

K = effective length factor in the plane of buckling determined as specified in Article 4.6.2.5

l = unbraced length in the plane of buckling

rs = radius of gyration about the axis normal to the plane of buckling

STRUCTURAL AXIAL RESISTANCE CALCULATIONS

Pile Section	Gross Section Area Ag (in²)	Corrosion Allowance (in)	Effective Gross Area Aeff (in²)	Effective Length Factor K	Unbraced Length l (ft)	Yield Stress fy (ksi)	Elastic Modulus E (ksi)	Radius of Gyration rweak (in)	Po (kips)	Pe (kips)	Pe/Po	Pn (kips)	φ (Strength Limit State)	φPn (kips)
HP 14x89	26.1	0	26.1	2.0	0	50	29000	3.53	1305	1.6E+15	1.2E+12	1305	0.5	653

Client: Maine Department of Transportation

Computed by: BWC

Checked by: BCS

Sheet: 1 of 1



File No.: 132076-007

Date: 4-Jun-2021

Project: Interstate 395/Route 9 Connector

Subject: Felt's Brook Culvert Axial Compressive Structural Pile Resistance

Client: Maine Department of Transportation

Project: I-95 - Route 9 Connector - WIN No. 18915.00

Subject: GRL WEAP Pile Driving Analyses

Computed by: BWC

Checked by: BCS

PROBLEM STATEMENT & OBJECTIVE

Perform impact hammer drivability analyses of a HP14x89 piles. Calculate penetration resistances and driving stresses for two cases: (1) short pile (24ft) and (2) long pile (41ft).

EXECUTIVE SUMMARY

A Delmag D36-32 diesel impact driving hammer driving a short and long pile steel pile to rock can achieve the target nominal capacity of 775 kips without overstressing the pile.

REFERENCES

1. AASHTO LRFD Bridge Design Specifications, 2017.
2. Maine DOT standard specifications.
3. AISC Steel design manual.
4. GRL WEAP 2010 software manual.

AVAILABLE INFORMATION

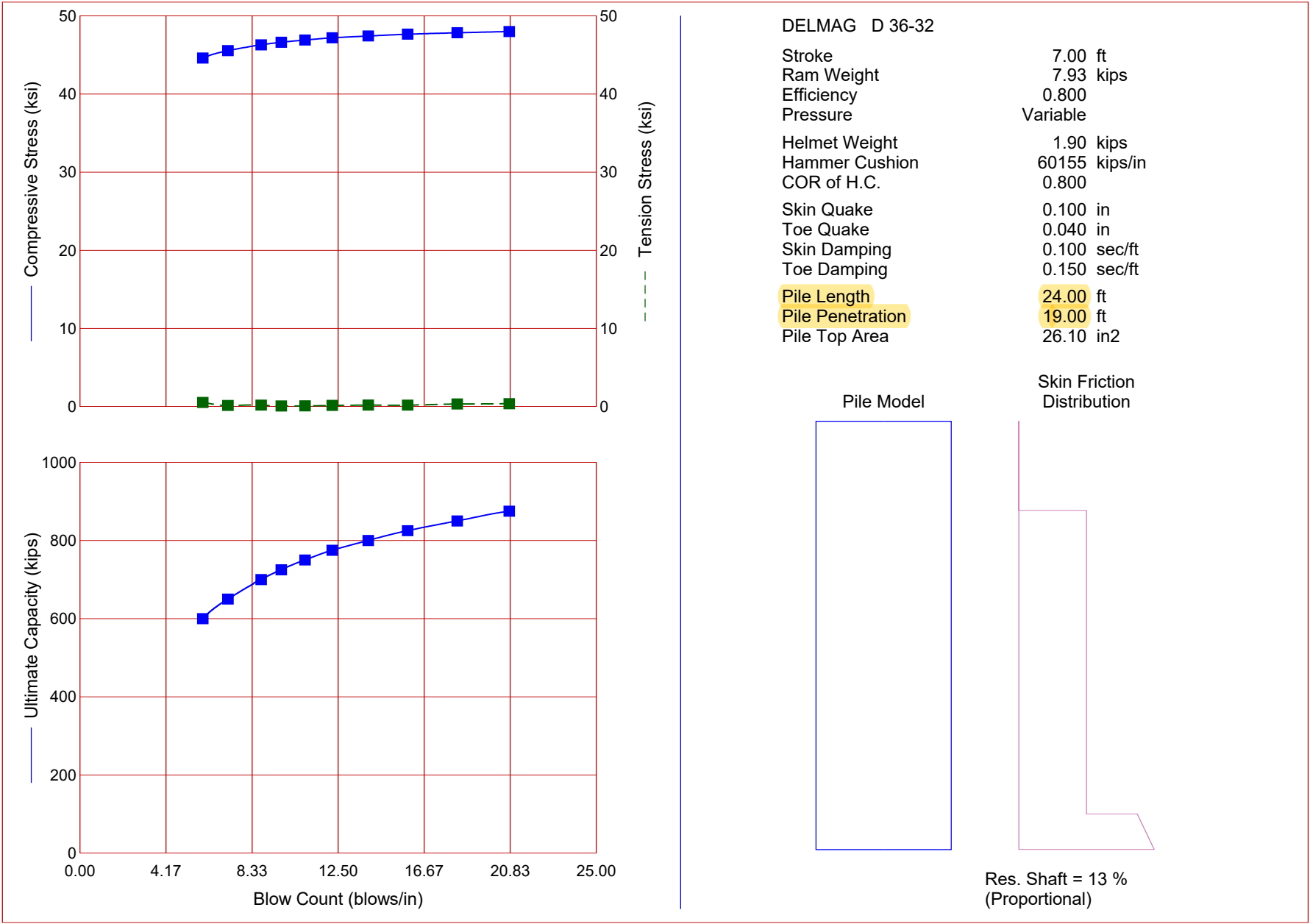
1. Recent boring logs: BB-BFB-201, BB-BFB-101, and BB-BFB-202

ASSUMPTIONS

1. Elevation Units and Datum: feet, North American Vertical Datum of 1988 (NAVD88).
2. Soil conditions are based on the borings indicated above.
3. Piles will be driven to top of rock. One pile section was analyzed (HP14x89)
4. Top of pile elevation is El. 68.25
5. Top of rock varies between approximately El. 50 (north; BB-BFB-201), El. 40 (center; BB-BFB-101) and El. 33 (south; BB-BFB-202).
6. Groundwater assumed at existing ground surface.
7. Pile embedment is based on estimated depth from ground surface to top of rock at each location.
Pile length is based on pile embedment plus 5 ft.
8. Strength Limit State maximum pile load at abutments based on calculated factored axial geotechnical resistance.
9. Factored resistances are based on the factored geotechnical resistance (from H&A).
10. Nominal resistance (set as the target ultimate resistance in WEAP) is taken as the factored resistance divided by 0.65 (resistance factor for CAPWAP dynamic testing).
11. Shaft (skin) quake and damping values used are the suggested values in WEAP.
Toe (end) quake and damping values used are suggested values in WEAP. The smaller quake value represents the condition where the pile tip reaches rock.
12. Acceptable penetration resistance according to MEDOT standard specifications.
13. Limit pile compressive stress is assumed to be $0.9f_y$ or 45 ksi for $f_y=50$ ksi steel.

CALCULATIONS AND RESULTS

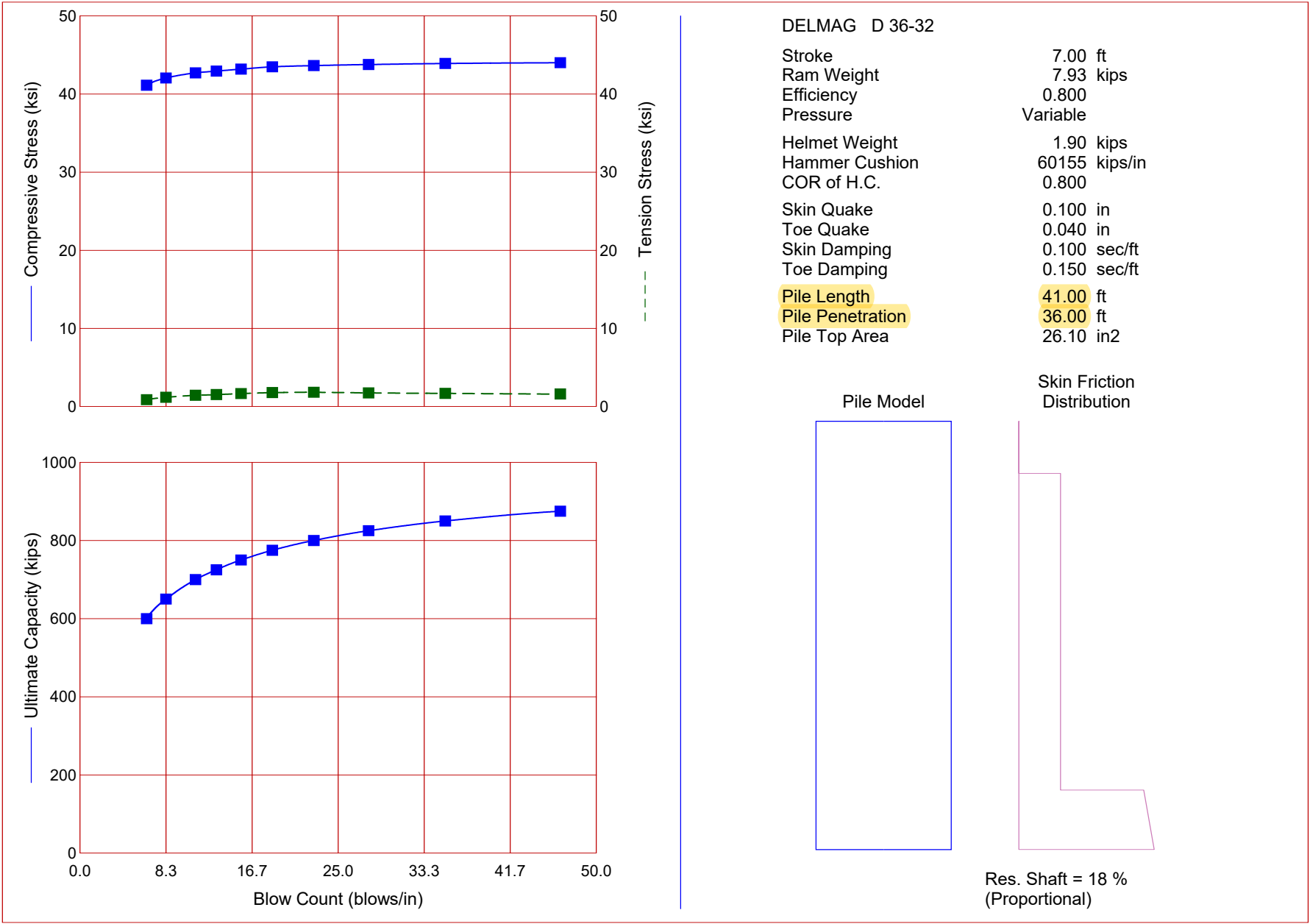
Pile	Pile Size	Hammer Fuel Setting	Stroke	Driving Stress	BPI	Nominal Resistance	Factored Resistance
			(ft)	(ksi)		(kips)	(kips)
Short	HP14x89	2	7	47	12	775	504
Long				44	19	775	504



Haley & Aldrich Inc
HP14x89

11-Mar-2021
GRLWEAP Version 2010

Ultimate Capacity kips	Maximum Compression Stress ksi	Maximum Tension Stress ksi	Blow Count blows/in	Stroke ft	Energy kips-ft
600.0	44.60	0.53	6.0	7.00	22.42
650.0	45.54	0.14	7.2	7.00	21.90
700.0	46.29	0.19	8.8	7.00	21.39
725.0	46.62	0.08	9.8	7.00	21.20
750.0	46.90	0.09	10.9	7.00	21.00
775.0	47.19	0.15	12.2	7.00	20.84
800.0	47.42	0.20	14.0	7.00	20.59
825.0	47.65	0.19	15.9	7.00	20.46
850.0	47.83	0.33	18.3	7.00	20.27
875.0	47.98	0.37	20.8	7.00	20.17



Haley & Aldrich Inc
HP14x89

11-Mar-2021
GRLWEAP Version 2010

Ultimate Capacity kips	Maximum Compression Stress ksi	Maximum Tension Stress ksi	Blow Count blows/in	Stroke ft	Energy kips-ft
600.0	41.11	0.88	6.5	7.00	25.22
650.0	42.04	1.19	8.3	7.00	24.89
700.0	42.70	1.45	11.2	7.00	24.52
725.0	42.93	1.53	13.2	7.00	24.27
750.0	43.18	1.66	15.6	7.00	24.25
775.0	43.48	1.79	18.6	7.00	24.27
800.0	43.64	1.84	22.6	7.00	24.21
825.0	43.77	1.76	28.0	7.00	24.16
850.0	43.91	1.69	35.4	7.00	24.13
875.0	44.01	1.61	46.5	7.00	24.09