INTERSTATE 295 OVER VERANDA STREET BRIDGE REPLACEMENT

WIN 21745.00

City of Portland
Cumberland County
Maine

GEOTECHNICAL DESIGN REPORT

APRIL 2, 2020

PREPARED FOR

Maine Department of Transportation
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Augusta, Maine 04333

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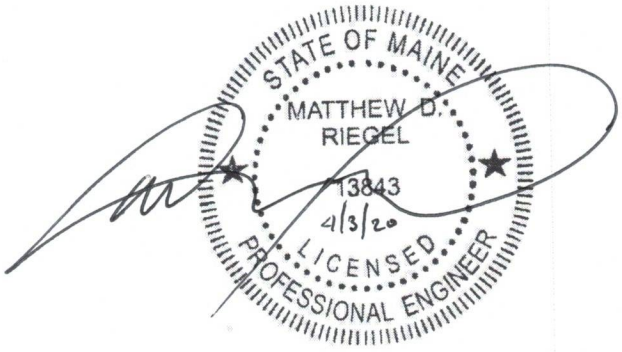
HNTB

INTERSTATE 295 #5933
OVER VERANDA STREET

Portland, Maine

Geotechnical Design Report
April 2, 2020



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1.0 PROJECT DESCRIPTION AND SCOPE

1.1 Project Background

The following summarizes the geotechnical investigation and design completed by HNTB for the replacement of the Interstate 295 over Veranda Street/Route 1 Bridge in Portland, Maine. The existing three-span structure carries Interstate 295 (I-295), a divided roadway with two travel lanes in each direction, over Veranda Street. The existing bridge is approximately 197 feet-long with supports skewed at roughly 30-degrees to the interstate centerline. A project location plan is included in **Figure 1**.

The structure will be replaced along the existing interstate alignment with a new shortened and widened bridge consisting of a single 71-foot span supported by semi-integral abutments. The proposed structure will provide two travel lanes in each direction, feature improved shoulder widths, and provide sufficient bridge width to accommodate two lanes of traffic in each direction during future repair activities. Veranda Street, together with the adjacent intersections on either side of the interstate, will be reconfigured and rerouted under the new span.

Included in the proposed improvements, the existing approach embankments will be widened slightly to match the new bridge width. Additionally, the southerly two spans of the existing bridge will be filled. Embankment with side slopes of 2H:1V will used where possible.

To minimize traffic impacts to I-295, the bridge will be replaced using Accelerated Bridge Construction (ABC) techniques. Specifically, a lateral slide approach will be used. The process will include constructing portions of the new substructure and embankment beneath the existing bridge while it remains in-service. Simultaneously, the new superstructure will be constructed adjacent to the existing bridge on falsework. During a weekend closure of I-295 and Veranda Street the existing structure will be demolished, the new superstructure will be slid laterally onto the prebuilt substructure, and the extended approach embankments will be completed and paved. Following completion of this work the roadways will be reopened, the falsework will be removed, and the reconstruction of Veranda Street will be completed.

1.2 Scope of Services

HNTB has performed the following scope of services in support of this design:

- Reviewed historical geotechnical data for the project site.
- Implemented a subsurface investigation and laboratory testing program to gather additional information where needed.
- Analyzed the resulting data collected to identify subsurface conditions that impact the design and construction of the project.
- Prepared geologic subsurface profiles summarizing geotechnical data from the borings and laboratory testing.
- Established geotechnical engineering design parameters based on the available borings and in-situ testing.

- Performed a conceptual alternatives assessment.
- Conducted geotechnical analyses, including global stability and settlement assessments for embankment construction.
- Prepared design of lightweight embankment solution.
- Performed analysis and provided recommendations for driven pile and micropile foundations.

1.3 Survey Control

All horizontal locations reported herein are based on the North American Datum of 1983 (NAD 83), Maine 2000 West Zone. The project elevation datum and elevations referenced are in feet and reference the North American Vertical Datum of 1988 (NAVD 88). Boring locations were field located with elevations estimated based on topographic survey data.

2.0 GEOLOGY AND SITE CONDITIONS

2.1 Site Geology

The existing geologic mapping utilized for this assessment includes the Portland West quadrangle bedrock and surficial geology mapping prepared by the Maine Geological Survey (MGS). Excerpts from this mapping are included in **Figure 2** and **Figure 3**, respectively. MGS surficial geology mapping identifies soil overburden in the area of the project as the Presumpscot Formation, said to consist of silt, clay, and minor sand deposited on the sea floor during the late-glacial marine submergence. Bedrock geology mapping shows the site is within the Eliot Formation, consisting of fine-grained medium-gray quartz-plagioclase-biotite phyllite.

2.2 Existing Site Conditions

At the bridge location, the I-295 roadway is generally oriented in a north/south direction and elevated relative to the surrounding terrain area on an embankment. The Interstate is carried over Veranda Street on a three-span bridge supported by full-height concrete cantilever abutments and two multi-column piers. Span lengths from south to north are approximately 47 feet, 55 feet, and 95 feet, and average structure width is approximately 68 feet. Abutment and pier foundations consist of both vertical and longitudinally battered 12BP53 steel H-piles. The existing bridge is skewed, located on a horizontal curve, and superelevated at 8%. The top of roadway elevation varies from approximate elevation 32 to 38 feet.

Veranda Street is a two-lane roadway and is oriented in a southwest-northeast direction. The northbound travel lane passes beneath the south bridge span (Span 1) and the southbound lane passes beneath the north span (Span 3). The center bridge span is located over a wide grassed median. Beyond the limits of the highway embankments the existing terrain is generally level with ground surface with elevations ranging between 10 and 15 feet.

3.0 SUBSURFACE EXPLORATIONS

3.1 General

Preliminary and final design phase subsurface investigations were performed by New England Boring Contractors of Derry, NH under the supervision of Schonewald Engineering Associates on behalf of HNTB. The borings were advanced by cased wash boring methods, using 4.0-inch (HW-size) and 3.0-inch (NW-size) inside diameter steel casing. Standard Penetration Testing (SPT) was performed by driving a 1-3/8 inch ID split spoon sampler with a 140-pound hammer dropped 30 inches to obtain samples at 5 foot intervals. Each sample was removed from the sampler in the field, examined, and classified in accordance with the Burmister Soil Identification System.

The number of hammer blows required to advance the sampler through each 6-inch interval using the hammer was recorded and is provided on each boring log. The uncorrected SPT N-value is defined as the total number of blows required to advance the sampler through the second and third six-inch interval of any given 24-inch sampling interval. All SPT N-values discussed in this report have been corrected to reflect a hammer efficiency of 60 percent unless noted otherwise. Where Presumpscot Formation cohesive soils were encountered, SPT sampling was supplemented with in-situ vane shear testing to provide an estimate of undisturbed and remolded shear strength.

Based on the data collected, and available geotechnical borings and reports relating to construction of the existing bridge, a soil profile was prepared, and a geotechnical assessment completed to determine design parameters for foundation and embankment analysis and to develop recommendations for the proposed structure and embankments. A boring location plan is included as **Figure 4**. Details regarding each phase of subsurface investigation are presented below in the following sections.

3.2 Preliminary Design Phase Geotechnical Subsurface Exploration

The preliminary phase subsurface exploration program consisted of two series of three (3) soil borings each. The initial 100-series borings were performed between July 19th and July 27th, 2018. Due to access issues during the initial series of borings, a second round of borings numbered as the 200-series were performed between September 11th and October 23rd, 2018. Boring BB-PVS-101 was drilled to the west side of the proposed south approach embankment, between existing bridge piers 1 and 2. Borings BB-PVS-105 and BB-PVS-201 were drilled along the proposed south abutment at its east and west ends, respectively, just north of existing bridge pier 2. Borings BB-PVS-202 and BB-PVS-203 were drilled along the proposed north abutment at its west and east ends, respectively, just south of the existing bridge north abutment. Boring BB-PVS-106 was drilled east of the proposed south abutment at the east end of the proposed temporary falsework. All borings were observed and logged by a representative from Schonewald Engineering Associates.

The preliminary subsurface investigation borings were advanced to depths ranging from 72.5 to 172.0 feet below ground surface (BGS). Standard Penetration Testing (SPT) was performed with a 140-pound automatic hammer dropped 30 inches. The 100-series borings were advanced from an all-terrain mounted Mobile B-53 drill rig utilizing a rope and cathead. Boring BB-PVS-201 was advanced from an all-terrain mounted Mobile B-53 drill rig utilizing an automatic hammer with a tested hammer efficiency factor of

0.712. Borings BB-PVS-202 and BB-PVS-203 were advanced from a truck-mounted Mobile B-53 drill rig utilizing an automatic hammer with a measured hammer efficiency factor of 0.937.

Boring BB-PVS-101 was advanced to top of rock, as indicated by roller bit refusal. Approximately 10 to 32.5 feet of bedrock was cored in each of the three remaining borings using a 2.0-inch ID NQ-2 size core barrel. The recovery and rock quality designation (RQD) of each core was recorded and is included on the borings logs. Rock core photographs for the preliminary phase subsurface investigation are presented in **Appendix A1**.

The as-drilled boring locations for the final phase investigation are summarized below in Table 3.2. Details of the sampling methods used, field data obtained, and descriptions of the soil, bedrock and groundwater conditions encountered are presented on the boring logs provided in **Appendix A1**.

Table 3.2: Summary of Preliminary Phase Subsurface Exploration

Boring No.	Northing	Easting	Ground Surface Elevation	Depth of Boring (feet)	Location/Purpose
BB-PVS-101	310,609	1,016,701	10.8	83.4	South Approach, West Side
BB-PVS-105	310,724	1,016,766	9.8	108.7	South Abutment, East Side
BB-PVS-106	310,802	1,016,850	9.3	72.5	South Abutment Falsework
BB-PVS-201	310,638	1,016,696	11.0	136.0	South Abutment, West Side
BB-PVS-202	310,708	1,016,681	13.8	172.0	North Abutment, West Side
BB-PVS-203	310,775	1,016,750	13.3	132.8	North Abutment, East Side

3.3 Final Design Phase Geotechnical Subsurface Exploration

A final design phase subsurface exploration program consisting of four (4) soil borings was performed between July 16th and July 18th, 2019. Final design phase borings are numbered in the 300-series, beginning with Boring BB-PVS-301. Boring BB-PVS-301was drilled adjacent to the existing south abutment, east wingwall for design of the proposed south approach fill. Boring BB-PVS-302 was drilled along the proposed temporary falsework east of the proposed south abutment. Boring BB-PVS-303 and BB-PVS-304 were drilled along the proposed temporary falsework east of the proposed north abutment. All borings were observed and logged by a representative from Schonewald Engineering Associates.

The final subsurface investigation borings were advanced to depths ranging from 41.6 to 128.2 feet below ground surface (BGS). Borings were advanced from an all-terrain mounted Mobile B-53 drill rig. Standard Penetration Testing (SPT) was performed with a 140-pound automatic hammer dropped 30 inches with a measured hammer efficiency factor of 0.82.

Boring BB-PVS-301 was advanced to top of rock, as indicated by roller bit refusal. Approximately 5 feet of bedrock was cored in each of the three remaining borings using a 2.0-inch ID NQ-2 size core barrel. The recovery and rock quality designation (RQD) of each core was recorded and is included on the borings logs. Rock core photographs for the final phase subsurface investigation are presented in **Appendix A2**.

The as-drilled boring locations for the final phase investigation are summarized below in Table 3.3. Details of the sampling methods used, field data obtained, and descriptions of the soil, bedrock and groundwater conditions encountered are presented on the boring logs provided in **Appendix A2**.

Table 3.3: Summary of Final Design Subsurface Investigation

Boring No.	Northing	Easting	Ground Surface Elevation	Depth of Boring (feet)	Location/Purpose
BB-PVS-301	310,603	1,016,795	15.1	41.6	South Approach, East Side
BB-PVS-302	310,718	1,016,824	13.7	54.4	South Abutment Falsework
BB-PVS-303	310,873	1,016,831	12.0	91.8	North Abutment Falsework
BB-PVS-304	310,852	1,016,768	14.4	128.2	North Abutment Falsework

4.0 LABORATORY TEST RESULTS

Upon completion of each subsurface investigation program, a laboratory testing program was performed to verify the visual-manual field classifications and to aid in determination of the engineering soil properties. Laboratory testing was performed by GeoTesting Express, Inc. of Acton, Massachusetts.

4.1 Soil Testing

Laboratory soil testing consisted of four (4) tests for natural moisture content, three (3) standard grain size analyses with natural water content, four (4) grain size analyses with hydrometer and natural water content, two (2) tests for fines content, forty two (42) tests for Atterberg limits. The soil testing was performed in accordance with the following ASTM Standards:

Moisture Content	
Grain Size Analysis	ASTM D6913
Percent Passing No. 200 Sieve	ASTM D1140
Atterberg Limits	ASTM D4318
One-Dimensional Consolidation	ASTM D2435

The laboratory soil testing results are included in **Appendix A1** for preliminary phase exploration borings and **Appendix A2** for final design phase borings.

4.2 Rock Testing

Laboratory rock testing consisted of twelve (12) unconfined compressive strength tests. Intact rock core specimens were tested for compressive strength and elastic modulus in accordance with ASTM D7012. A summary of the laboratory tests is presented in Table 4.2, and the complete laboratory results are presented in **Appendix A1** for preliminary phase exploration borings and **Appendix A2** for final design phase borings.

Table 4.2: Summary of Rock Test Results

Boring No.	Sample No.	Depth (ft)	Total Unit Weight (pcf)	Unconfined Compressive Strength (psi)	Axial Strain at Failure (%)	Estimated Elastic Modulus (psi)
BB-PVS-105	R3	89.3 – 89.9	168	844	0.13	$0.65x10^6$
BB-PVS-105	R5	98.9 – 99.4	166	4548	0.06	$7.58x10^6$
BB-PVS-106	R1	62.9 – 63.3	167	2861	0.16	$1.79x10^6$
BB-PVS-201	R2	108.6 – 109.1	169	4858	0.37	$1.31x10^6$
BB-PVS-201	R4	120.9 – 121.6	170	6460	0.32	$2.02x10^6$
BB-PVS-201	R6	128.2 – 129.1	188	6267	0.14	$4.48x10^6$
BB-PVS-202	R1	151.4 – 151.9	163	6087	0.25	$2.43x10^6$
BB-PVS-202	R2	153.5 – 154.0	164	8805	---	---
BB-PVS-202	R3	157.2 – 157.6	160	6213	0.46	$1.35x10^6$
BB-PVS-203	R1	111.1 – 111.8	166	15122	---	---
BB-PVS-203	R2	116.4 – 116.8	166	8958	0.21	$4.27x10^6$
BB-PVS-203	R4	125.0 – 125.5	166	11645	0.19	6.1310^6

4.3 Corrosion Tests

Select soil samples were tested for pH and minimum laboratory resistivity by GeoTesting Express, Inc. of Acton, Massachusetts for determination of site subsurface corrosion potential. Due to low resistivity results on one of two tested samples, material from the lower resistivity sample was sent to TEi-Testing Services LLC of Salt Lake City, Utah for additional sulfate content and chloride content testing. The corrosively testing was performed in accordance with the following Standards:

pH	AASHTO T289
Sulfates	AASHTO T290
Chlorides	AASHTO T291
Minimum Laboratory Resistivity	AASHTO T288

A summary of the laboratory corrosion tests is presented in Table 4.3, the complete laboratory results are presented in **Appendix A1** for preliminary phase exploration borings and **Appendix A2** for final design phase borings.

Table 4.3: Summary of Corrosion Test Results

Boring No.	Sample No.	Depth (ft)	pH	Resistivity (ohm-cm)	Sulfate (ppm)	Chloride (ppm)
BB-PVS-105	1D	0 – 2	6.81	2,169	---	---
BB-PVS-105	2D	4 – 6	6.71	918	22	136

5.0 SUBSURFACE CONDITIONS

5.1 Generalized Subsurface Stratification

A thorough review of the boring logs and laboratory test results was conducted to establish the general stratigraphy of the site. The purpose of "stratifying" a site is to group similar soil materials that have the same geologic origin. Stratification not only aids in visualizing the subsurface conditions, but also facilitates computations since the soil material throughout a particular stratum usually exhibits similar engineering characteristics, e.g., strength and compressibility. Contemporary data was supplemented where possible with historic subsurface investigation data, including a series of ten soil borings conducted in 1957 by Haley & Aldrich (H&A) for design of the existing bridge and embankments, borings V-1 thru V-10. This historic boring data is included for reference in **Appendix C**.

It should be noted that the strata boundaries shown on the logs have been inferred using available subsurface data. The interpretation of soil and groundwater conditions at the project site are based on information obtained at the boring locations only. This information has been used as the basis for the conclusions and recommendations contained in this report. Significant variations at areas not explored by the project borings may require reevaluation of the findings and conclusions contained herein if found during construction.

Based on the available subsurface data, the following general subsurface strata were identified:

- Fill: The bridge site is overlain with up to 15 feet of loose to medium dense granular fill consisting of varying portions of sand, gravel, and fines. In some instances, the fines were identified to be non-plastic, while in other instances they were reported to have high plasticity based on field classifications.

- Marine Silt & Clay: Beneath the fill, a Marine Silt and Clay stratum was encountered generally consisting of olive brown to gray, slightly mottled silt and clay, clay and silt, silty clay, and clayey silt with pockets, partings, and inclusions of silty fine sand. This stratum was observed to have a thickness ranging from approximately 10 feet at the existing south abutment to greater than 60 feet at the northern project limits. The stratum ranged from soft to stiff, and was generally medium stiff. Approximately 2.5 to 8.5 feet of medium stiff to stiff "crust" was encountered at the top of the layer.

- Marine Sand: A layer of generally medium dense Marine Sand was encountered below the marine silt and clay stratum on borings V-3, V-5, V-6, V-10, BB-PVS-101, BB-PVS-105, BB-PVS-106, BB-PVS-201, BB-PVS-202, BB-PVS-302, BB-PVS-303, and BB-PVS-304 with a thickness ranging from approximately 4.5 feet to 20 feet. The stratum consists of brown and tan fine to coarse sand with some gravel and silt.

- Glacial Till: A generally dense to very dense Glacial Till layer followed the marine sand stratum in all borings except for V-9 and BB-PVS-302 consisting of brown fine to coarse sand and gravel with trace to some silt. This stratum had a thickness ranging from approximately 4.5 feet to 65 feet, increasing in thickness from south to north.

- **Phyllite Bedrock:** Bedrock was encountered in all borings except for borings V-3, V-5, V-6, V-7, and V-10. The bedrock at this site slopes down steeply from the southeast corner of the site to the northwest and was encountered as shallow as 40 feet below ground surface and as deep as 140 feet. Bedrock encountered at the site generally consists of hard slightly to moderately weathered, aphanitic to fine grained, light green gray Phyllite bedrock. Rock Quality Designation (RQD) values ranged from 7 to 87 percent and averaged approximately 57 percent.

Interpretive subsurface profiles were prepared along the I-295 centerline and along the centerline of each proposed abutment, and are included for reference in **Figures 5 and 6**.

Based on a review of boring data and as-built drawings, the pile foundations of the existing bridge abutments and piers are anticipated to rely primarily on end bearing below the Presumpscot clay, in the glacial till or at top of rock.

5.2 Groundwater

Groundwater depth was measured where possible at the time of drilling based on sample moisture and downhole measurements. The depth of drilling at the time of groundwater measurement was noted on the boring logs. A summary of the groundwater observations made during drilling are provided below in Table 5.2.

Table 5.2: Groundwater Observations

Boring No.	Ground Surface Elevation	Observed Groundwater Depth (feet)	Observed Groundwater Elevation (feet)
BB-PVS-101	10.8	>6'	<4.8
BB-PVS-105	9.8	>6'	<3.8
BB-PVS-106	9.3	>6'	<3.8
BB-PVS-201	11.0	1.2	9.8
BB-PVS-202	13.8	7.5	6.3
BB-PVS-203	13.3	7.3	6.0
BB-PVS-301	15.1	11	4.1
BB-PVS-302	13.7	9	4.7
BB-PVS-303	12.0	8.4	3.6
BB-PVS-304	14.4	5.5	8.9

Considering the above field observation and normal water levels in the adjacent waterway, the project design has been based on a groundwater elevation of 5 feet. Isolated perched groundwater may be encountered at higher elevations throughout the site.

It should be noted that the site may be prone to flooding in the case of an extreme storm event. A maximum floodwater elevation of 12 feet was considered for extreme cases.

6.0 DESIGN OF BRIDGE FOUNDATIONS

6.1 General Design Considerations

Geotechnical design recommendations for the abutment foundations and wingwalls associated with the Interstate 295 over Veranda Street Bridge Replacement project are discussed in the following sections. Recommendations have been developed in accordance with the AASHTO LRFD Bridge Design Specifications (AASHTO LRFD), Eighth Edition and the 2003 MaineDOT Bridge Design Guide (BDG) with June 2018 updates.

6.1.1 Bridge Substructure Geometry

The proposed substructure configuration consists of full height fixed-expansion abutments supported on vertical concrete stem walls and cast-in-place concrete footings. The bearings and girders sit on stepped pedestals at the top of the stem wall to match the 8% cross-slope. The stem walls will be horizontally jointed in order to provide a level sliding surface while accommodating the superelevation of the bridge. The upper portion of the stem wall will be slid in with the superstructure and the lower portion will be constructed in-place on deep foundations prior to demolition of the existing structure. The stem wall joint will be detailed to provide full fixity between the upper and lower stem wall segments in the permanent, post-slide condition.

6.1.2 Assessment of Corrosion Potential

Based on laboratory test results, one resistivity value was reported as less than 2,000 ohms-cm, and as such the foundation design has been conservatively based on a moderately aggressive corrosive subsurface environment. Corrosion rates as provided in FHWA Manual NHI-05-042, "Design and Construction of Driven Pile Foundations" as well as local project experience are used as a guideline for this project. Specifically, the exterior steel surface thickness has been reduced by 0.1 inches sacrificial steel thickness around the pile perimeter, based on a corrosion rate of 0.001 inches per year for a design life of 100 years, to account for corrosion.

6.1.3 Frost Protection

The minimum depth of embedment for walls or other subgrade structures was evaluated in accordance with Section 5.2.1 of the BDG and AASHTO LRFD Articles 10.6.1.2 and 11.10.2.2. Based on a design freezing index equal to 1,250 freezing degree days, we recommend that the footings and walls bear a minimum of 5.2 feet below the lowest adjacent ground surface exposed to freezing.

6.2 Foundation Type Selection

Due to the soft clay and silt material at shallow depth, a deep foundation system is required to carry the structure loads through the weak upper soils to underlying glacial till and bedrock. To avoid impermissible closures of I-295 travel lanes, the proposed abutments will be constructed primarily beneath the existing bridge, which requires that the foundations either be constructed outside the footprint of the existing bridge or by employing low overhead clearance methods underneath the bridge.

During the conceptual design phase two alternative foundation systems were evaluated: first an offset drilled

shaft foundation concept which minimized construction under the existing bridge, and second a low overhead clearance drilled micropile option which could be constructed along the full length of proposed abutment beneath the bridge. The results of the alternatives analysis showed that the offset drilled shaft option was deficient in terms of efficiency, constructability and staging, and the foundation system consisting of low-overhead-clearance drilled micropiles was advanced.

During the final design phase, the foundations were initially analyzed using 9.625 inch diameter micropiles. The results of the initial analysis showed that some piles at the east ends of the proposed abutments were overstressed due to the superelevation of the bridge and higher resulting overturning moments as well as unfavorable load distribution amongst the limited pile configuration due to the presence of the existing piles. To mitigate the overstress of the piles, two options were advanced to final design. The first option (Option A) is a micropile-only option which utilizes a larger, 10.75 inch diameter micropile which can better accommodate the structure loads. The second option (Option B) is a combined 9.625 inch diameter micropile and H-pile option, with micropiles installed under the existing bridge and the stiffer H-piles being driven on the east and west ends of the abutments outside the footprint of the existing bridge. The stiffer H-piles serve to adequately handle the higher structural demand while simultaneously redistributing some load away from the adjacent micropiles, which enables the use of the smaller 9.625 inch diameter micropiles beneath the existing bridge. In order to maintain the 9.625 inch maximum micropile size, to minimize micropile quantities, and to take advantage of driven pile equipment expected to be on-site for Contractor's temporary works, Option B has been selected as the preferred option with a combined micropile and H-Pile foundation system.

6.3 Foundation Design Approach

6.3.1 Design Methodology

The analysis of micropile and H-pile foundations was performed in accordance with AASHTO LRFD Section 10. Pile groups were analyzed using the computer program FB-Multipier version 5.5 by the BSI, a PY-based lateral analysis software that accounts for pile and footing stiffness and group efficiencies. Strength-I, Strength-IV and Service-I load components for braking, centrifugal force, temperature, and combined minimum and maximum vertical load were determined at the bearing/girder elevation for the entire abutment length. Two critical load cases were analyzed for each abutment: one scenario assuming half of the bridge is loaded with vehicles breaking in the travel direction away from the abutment, and second assuming all travel lanes loaded with vehicles breaking in the travel direction away from the abutment, with the appropriate multiple-presence factors applied to each case. Scenarios with vehicles breaking in the travel direction towards the abutments were not considered as the lateral force will engage the passive soil resistance of the abutment backfill and will not be transferred to the piles. Structural loads were combined with backfill pressure loading into Service-I, Strength-I Max, Strength-I Min, Strength-IV Max, and Strength-IV Min load combinations by the geotechnical engineer for foundation analysis. The pile designs accounted for geofoam or lightweight concrete backfill and therefore assumed only limited locked-in hydrostatic lightweight concrete backfill pressure and zero live load surcharge pressure are applied to the substructure below the backwall level. Superstructure and backfill pressure loads were divided into separate nodes below each girder location to accurately model load distribution. These loads were transposed to the mid-elevation of pile cap, assuming a varying moment arm from the bearing/girder elevation. Wingwalls were analyzed in separate models; due to the lightweight concrete backfill, the wingwall foundations will only experience limited locked-in hydrostatic backfill pressure and the vertical

weight of the wingwall.

Maximum pile Strength-condition axial and bending forces, as well as Service-condition foundation displacements and rotations, were extracted from the FB-Multipier analysis output for evaluation. Single-pile Strength-condition loads were compared to calculated factored structural resistances for a single pile, including a check of combined axial compression and bending. Combined stress analysis of micropile casing assumed a section modulus reduction equivalent to ½ of the casing wall thickness to account for weaknesses at threaded casing joints. Micropile bond lengths were evaluated based on factored compression and tension loading. Service-condition deflections and rotations of the pile cap were extrapolated up to the bearing/girder elevation to estimate Service-state structure deflections, and the foundations were optimized to limit these deflections to under 1 inch at the bearing elevation.

Both foundation design options were developed in accordance with AASHTO LRFD and the MaineDOT Bridge Design Guide.

6.3.2 Subsurface Material Properties

Geotechnical design parameters for soil and rock were developed for each stratum based on material descriptions, standard published correlations, and engineering judgment. A summary of soil and rock design properties at the proposed bridge abutments and approaches, as interpreted from available borings and laboratory testing, are presented in Table 6.3.2 below.

Table 6.3.2: Engineering Properties of Soil and Rock

Layer	$\overline{N1_{60}}$ (bpf)	γ (pcf)	ϕ' (deg.)	S_u (psf)	k_{aw} (pci)	k_{bw} (pci)	G (ksi)	E (ksi)
1 – Fill	7	110	32	---	90	50	0.97	2.43
2 – Marine Silt & Clay – Crust	4	115	33*	500	---	---	0.69	1.67
3 – Marine Silt & Clay	3	115	34*	500-1500	---	---	0.69	1.67
4a – Marine Sand (Loose)	3	105	30	---	45	30	0.69	1.74
4b – Marine Sand (Med. To Dense)	14	115	34	---	115	60	1.46	3.68
5 – Glacial Till	26	120	36	---	170	70	2.01	5.38
6 – Phyllite Bedrock	---	170	25	--	---	---	520	1250

Where:
- $\overline{N_{60}}$= Average SPT-N value of stratum, corrected for hammer efficiency, in blows per foot.
- $\overline{N1_{60}}$= Average SPT-N value of stratum, corrected for hammer efficiency and effective overburden pressure, in blows per foot.
- γ= Total unit weight of soil, based on grain size and relative density per Bowles 4th Edition, Table 3-4 and FB-MultiPier Soil Parameter Tables.
- φ = Internal friction angle of soil, per multiple SPT-N value correlations. *Drained friction angle for clays calculated per FHWA GEC No. 5, Figure 74. Values increased by 3 degrees due to overconsolidation.
- S_u= Undrained shear strength of soil, per plasticity correlations and in-situ vane shear testing.
- k= Subgrade modulus, based on FB-MultiPier Help Manual and NAVFAC DM7.01 as presented in the FB-MultiPier Soil Parameter Table. AW above water, BW below water.
- G= Shear modulus, taken as $E/[2(1+\mu)]$ per Bowles 5th Edition, pg. 121, equation (a).
- E= Elastic modulus, based on grain size and relative density as presented in AASHTO LRFD 8th Ed. Table C10.4.6.3-1. Used for elastic settlement of cohesionless soils.

For the phyllite bedrock, unconfined compression test results indicated strengths and elastic parameters which ranged significantly, both above and below typical reference values. From examination of the test

specimens it appears that the lower-bound values were likely the result of failures upon preferential failure surfaces and foliation planes. For the selected foundation types, the design sensitivity to variations within the ranges observed will be minimal, therefore lower-bound typical values were assigned to this layer per "AASHTO Standard Specifications for Highway Bridges", 17th Edition, section 4.4.8. A design unconfined compression strength of intact rock of 3.5 ksi is recommended. Additional rock property recommendations specifically applicable to axial analysis are provided in subsequent sections below.

6.3.3 Lateral Earth Pressure

Because of the full abutment height and required precision of the proposed superstructure slide-in, it is imperative to limit lateral deflection of the abutments. Analysis of the bridge approach embankments as discussed in Section 7 has indicated that lightweight fill materials including Geofoam and lightweight foam concrete are required to mitigate downdrag on existing pier foundations and excessive post-construction settlements. In order to limit the pressure on the abutment walls during construction, lightweight foam concrete fill will also be used as backfill immediately behind the proposed abutments and wingwalls in lieu of traditional borrow material. The lightweight foam concrete will be poured in limited lift heights in order to reduce locked-in lateral pressure on the wall. Once cured, this material will also prevent lateral live load surcharge pressures from transferring to the abutments and wingwalls in their finished conditions.

6.3.4 Design Loads & Pile Geometry

An FB-Multipier model was prepared for each abutment and the critical wingwall section, assuming a 3-foot-thick pile cap with bottom of cap at elevation 7.6 and 8.3 feet for Abutment 1 and Abutment 2, respectively. Subsurface conditions were modeled based on the greatest depth of bedrock at each abutment. The combined controlling resultant loading for both abutments is summarized in Table 6.3.4 below for reference.

Table 6.3.4: Combined Foundation Design Loads

Structure	Load Case	FX (kips)	FY (kips)	FZ (kips)	MX (k-ft)	MY (k-ft)	MZ (k-ft)
Abutment 1	Service-I	128	261	4056	3591	-2959	0
	Strength-I Max	172	306	5524	3715	-3908	0
	Strength-I Min	172	238	4234	3301	-3908	0
	Strength-IV Max	21	239	4952	2124	-508	0
	Strength-IV Min	21	172	6928	1709	-508	0
Abutment 2	Service-I	128	297	3839	4213	-2771	0
	Strength-I Max	172	374	5253	5000	-3656	0
	Strength-I Min	172	312	4039	4655	-3656	0
	Strength-IV Max	21	220	4626	1861	-477	0
	Strength-IV Min	21	159	2773	1516	-477	0

Where: X=Perpendicular to Abutment, Y=Parallel to Abutment, Z=Vertical
Moments given about axis, following right-hand rule.

Abutment pile geometry was generally controlled by the configuration of existing abutment battered piles, with two rows of proposed vertical micropiles centered between existing H-piles. Existing drawings indicate H-piles at the existing south abutment are clustered below each existing column, therefore the proposed Abutment 1 piles are positioned between columns to avoid conflict. Existing H-piles at the north abutment

are generally spaced at 4'-5 ½" on-center. Therefore, proposed Abutment 2 piles are generally spaced in increments of 4'-5 ½" to fit between existing. The wingwalls are also to be supported on two rows of piles, with pile spacing generally ranging between 13 feet and 16 feet on-center.

6.4 Foundation Recommendations

Based on the aforementioned criteria and analyses, the recommended foundation includes a combination of micropiles and H-piles at each abutment. Abutment 1 consists of two rows of piles, with the piles spaced longitudinally along the abutment between the clusters of existing H-piles. For each row of piles, the outer two piles to each side of abutment are to be H-piles, with six micropiles between (for a total of eight H-piles and 12 micropiles per abutment). Abutment 2 consists of two rows of piles, with the piles spaced longitudinally along the abutment between the existing H-piles. For each row of piles, the outer two piles to each side of the abutment are to be H-piles, with five micropiles between (for a total of eight H-piles and 10 micropiles per abutment). The wingwalls contain an additional combined 10 H-piles per abutment, for a total of 20 wingwall H-piles.

The pile rows are spaced 6 foot on-center, with an assumed overhang of 18 inches from centerline of piles to edge of footing for a footing width of 9 feet. The abutment stem is assumed to be offset one foot behind the centerline of footing to reduce overturning and rotation from backfill pressure. The proposed micropiles consist of a 9.625" OD x 0.545" wall thickness, 80 ksi (API 5CT, N80) outer casing down to top of rock, filled with 5,000 psi Portland cement grout, and having a single central No. 18 ASTM A615 Grade 75 continuously threaded central reinforcing bar running the full length of the pile. The proposed H-piles consist of HP 14x89 piles with a minimum yield strength of 50 ksi (ASTM A572 Grade 50). A summary of the FB-Multipier group model analysis of the piles is presented in Table 6.4A. Foundation Layout plans for Abutment 1 and Abutment 2 are included as **Figure 9** and **Figure 10**. Micropile details are included as **Figure 11**.

Micropiles shall continue uncased below top of rock in order to establish a grout-to-bedrock bond zone. A presumptive ultimate grout-to-ground bond strength of 20 ksf is recommended for the phyllite bedrock and shall be confirmed by a verification load tests on two sacrificial micropiles. Applying a Strength-state resistance factor of 0.70 for axial geotechnical resistance and assuming a bond zone diameter of 8.3 inches, an estimated micropile bond zone length of 10 to 11 feet is required in sound rock. Micropile axial resistances and estimated micropile quantities are summarized in Table 6.4B.

Table 6.4A: FB-Multipier Analysis Summary

Structure	Pile Type	Limit State	Maximum Factored Axial Compression Load (kips)	Maximum Moment (kip.ft)	Maximum Deflection (in)		D/C
					At Pile Cap	At Bearing Elevation	
Abutment 1 (South)	9.625" OD Micropile	Service-I	219	33	0.2	*	-
		Strength-I	281	48	0.3	*	0.71
		Strength-IV	271	31	0.1	*	-
	HP 14x89	Service-I	332	86	0.2	0.4	-
		Strength-I	420	134	0.3	0.4	0.74

Structure	Pile Type	Limit State	Maximum Factored Axial Compression Load (kips)	Maximum Moment (kip.ft)	Maximum Deflection (in)		D/C
					At Pile Cap	At Bearing Elevation	
		Strength-IV	390	104	0.1	0.5	-
Abutment 2 (North)	9.625" OD Micropile	Service-I	245	32	0.2	*	-
		Strength-I	311	52	0.4	*	0.77
		Strength-IV	287	31	0.1	*	-
	HP 14x89	Service-I	358	100	0.3	0.6	-
		Strength-I	462439	161	0.5	0.75	0.73
		Strength-IV	399	111	0.1	0.5	-

*The maximum deflection and rotation of the pile cap occurs at the east end of the abutments where the H-piles are located.

Table 6.4B: Micropile Axial Resistance & Estimated Quantities

Structure	Axial Geotechnical Capacity per Pile (kips)		Average Top of Rock Elev. (ft)	Average Est. Tip Elev. (feet)	Pile Cutoff Elev. (feet)	Average Micropile Length (feet)	Number of Micropiles	Estimated Micropile Length per Abutment (ft)
	Nominal	Factored						
Abutment 1	429	300	-81.5	-92.5	9.11	101.61	12	1219.32
Abutment 2	445	311	-113	-125	9.83	134.83	10	1348.3

This estimate is for design-phase purposes only. Final axial design of micropiles shall be performed by the micropile specialty contractor during construction, based on verification load test results and selected means and methods. This capacity value is utilized for sizing of the micropile array. Individual micropile bond zones may be optimized separately by the specialty contractor.

The HP 14x89 piles will be driven to capacity by refusal in the dense glacial till or the top of competent bedrock. In order to ensure that the required pile capacity was available and achievable based on the criteria stipulated in the Specifications using pile driving equipment typical to MaineDOT projects, axial capacity and drivability analyses were performed at the northbound side of Abutment 1 (shallowest conditions) and the southbound side of Abutment 2 (deepest conditions). Axial analysis was performed using computer program APile version 2019.9.3 by Ensoft to estimate the distribution of side friction and end bearing along the pile length. Based on this distribution, drivability analysis was performed using computer program GRL WEAP version 2010-8. Analysis was performed to ensure that capacity could be achieved with an end of drive blow count between 3 and 15 blows per foot using a range of pile hammers utilized on past MaineDOT projects with driving stresses remaining below 45 ksi. This assessment indicated that capacity should be achieved likely near the top of glacial till while meeting the above criteria using a range of hammers ranging beyond a Delmag D25-32 and a Delmag D36-32. Capacity was cumulative, with higher-capacity layers, refusal conditions, or overstress expected above the bearing layer. It should be noted that the above analysis is for design purposes only and should not be utilized by the contractor for pile hammer selection in lieu of their own analysis. Final selection of appropriate driving equipment should be based on the contractor's own assessment of the project site and WEAP analysis, as required by the Specifications.

Based on the above axial and drivability analysis the H-piles are assumed to be structurally controlled. For analysis and estimating, the H-piles are assumed to extend to the top of rock. H-pile axial resistances and estimated pile quantities are summarized in Table 6.4C below. Capacities are analyzed by applying a Strength-state resistance factor of 0.65 for axial geotechnical resistance.

Table 6.4C: HP 14x89 Axial Resistance & Estimated Pile Quantities

Structure	Axial Geotechnical Resistance per Pile(1) (kips)		Average Top of Rock Elev. (ft)	Pile Cutoff Elev. (feet)	Estimated Pile Length(2) (feet)	No. of Piles(3)	Est. Length per Foundation (ft)
	Nominal	Factored					
Abut. 1 SB Side	647	420	-93	9.11	107	10	1070
Abut. 1 NB Side	647	420	-69	9.11	83	8	664
Abut. 2 SB Side	711	462	-133	9.83	148	6	888
Abut. 2 NB Side	711	462	-96	9.83	111	11	1221

(1) Capacity checked using corroded cross-sectional area

(2) An additional 5 feet of pile is added to the total pile length to conservatively account for pile top damage during driving

(3) Includes wingwall piles

6.5 Global Stability at Bridge Abutments

In analyzing global stability, limit equilibrium analyses were performed at both Abutment 1 (south abutment) and Abutment 2 (north abutment) using the Slope/W module of GeoStudio 2019, distributed by Geo-Slope International Ltd. Subsurface conditions for global stability analysis were selected based on conditions at the nearest abutment borings and stability was evaluated along the center of a section cut along the Interstate 295 baseline. Spencer's method of analysis has been used to perform all global stability analyses and satisfies both force and moment equilibrium which meets the requirements prescribed by AASHTO LRFD Article C11.6.2.2 for slope stability analysis. Results of the analysis were assessed using non-optimized failure surfaces, the preliminary results of which have been provided herein. Global stability analysis was performed for long term and short term loading conditions using estimated drained and undrained soil strength design parameters as specified in Table 6.3.2.

Global stability analysis was performed in the Service-I loading condition. AASHTO LRFD requires a resistance factor of 0.65 to be satisfied for global stability, which approximately equates to a 1.5 factor of safety. Preliminary results from the abutment stability analysis are summarized in Table 6.5.

Table 6.5: Global Stability Results for Proposed Abutments

Location	Minimum Factor of Safety	
	Drained	Undrained
South Abutment	4.95	2.49
North Abutment	2.69	1.46

The above factors of safety do not account for any shear contribution from deep foundation elements. While the factor of safety for the north abutment undrained condition is slightly short of the target value of 1.5, all global stability failure surfaces must pass through multiple rows of existing and proposed piles. Based on this point, both proposed abutments are considered acceptable.

7.0 DESIGN OF APPROACH EMBANKMENTS

7.1 General Design Considerations

As discussed above, the proposed structure length is significantly shorter than the existing. The new bridge will fit entirely within the existing northernmost span and require the construction of a new embankment under existing Spans 1 and 2. The new embankment will extend approximately 114 feet north of the existing south abutment, and approximately 14 feet south of the existing north abutment. The roadway will also be widened beyond the existing structure limits, from a current out-to-out width of 68 feet to a proposed width of 88 feet between guardrails.

7.2 Settlement Assessment

7.2.1 Basis of Settlement Assessment

As indicated in previous sections, subgrade conditions along the approaches consist of loose fill overlying soft to medium stiff marine clay and silt. The clay and silt layer also varies in thickness from south to north and is approximately 10 feet thick at the existing south abutment, up to 53 feet at the proposed south abutment and 60 feet thick at the existing north abutment. The clay is considerably overconsolidated, but still prone to settlement related to recompression and secondary compression.

Due to the accelerated bridge replacement schedule, the existing bridge will need to be demolished and the approach fill and pavement construction will be completed over the course of a weekend roadway closure. With proposed embankment heights of up to 25 feet, these embankments cannot be realistically constructed from existing grade in this shortened window. Therefore, constructing as much of the proposed embankments as possible under and around the existing structure prior to the roadway closure is required. The existing foundations include vertical and battered piles. Therefore, settlement must be minimized prior to demolition to avoid downdrag loading and excessive bending stresses in the existing piling.

The shortened construction window also limits the magnitude of tolerable post-construction settlement. Traffic will be restored to I-295 only hours after completion of fill placement, and before post construction settlement has occurred. The proposed abutments will be supported on deep foundations and the existing pile-supported foundations will remain in place. Neither the proposed nor the existing substructures will settle with the embankment, resulting in hard points and differential settlement of the interstate roadway. To minimize the potential for rideability issues the design team evaluated options that limited settlement between scheduled roadway resurfacings to one inch or less. For design purposes the final surface lift of I-295 pavement is assumed to be placed at end of construction, an estimated six months after the lateral slide is complete. The first resurfacing of the roadway is assumed to occur 10 years post-construction.

7.2.2 Settlement Assessment Alternatives

Embankment settlement analysis was initially considered using normal-weight fill, but the results indicated total settlement values exceeding 6 inches. Settlement of this magnitude could potentially induce significant downdrag and bending on existing piles if occurring pre-demolition, and would exceed rideability requirements post-construction. Considering the anticipated settlement magnitudes, traditional embankment construction was deemed inadequate for schedule and performance, and alternatives were considered.

The following alternatives were qualitatively considered for constructing the proposed approach embankments within required tolerances.

- Option 1, Load Reduction/Compensation: Settlement magnitude and duration may be reduced by limiting the vertical stress applied at the base of embankment through use of lightweight fill materials. Settlement may be further reduced through "compensation" – over-excavating normal weight material from below the existing ground surface and replacing it with lightweight fill. Compensation may be either partial compensation to reduce total settlement to within tolerable levels, or total compensation to result in a "net-zero" bearing pressure and negligible embankment settlement. These methods have commonly been employed on Maine transportation projects to address settlement and slope stability issues, typically using expanded polystyrene (EPS) Geofoam block fill with total unit weights less than 3 pounds per cubic foot. Additional lightweight materials considered include expanded shale, foamed glass aggregate, and foamed concrete. These materials are significantly heavier than EPS Geofoam and would not sufficiently provide the lightweight solution required, but may be useful for placing fill around pier locations and other less settlement-prone areas to simplify construction of Geofoam. Given the prior success, local experience, and predictable results of this approach, load reduction and compensation using lightweight fill has been considered as a preferred option.

- Option 2, Ground Improvement: The second option considered to mitigate settlement issues was to reduce settlement by strengthening the existing soil. By increasing the strength and reducing the compressibility of in-situ soil by means of deep soil mixing, overall settlement may be reduced. Using drilling equipment, soils are mixed with cement or other stabilizing agents in powder or slurry form. While these methods have the potential to significantly decrease settlement and allow for normal-weight fill placement, deep soil mixing is costly and specialized. Mixing is generally required throughout the entire loaded footprint. Installation is also limited at the project site by overhead clearance limitations under the existing bridge, and by the presence of battered piles which must be preserved in-place. Given these concerns, deep soil mixing was not considered a viable alternative.

- Option 3: Settlement Acceleration: A third option considered by the project team was to accelerate primary settlement through the installation of prefabricated vertical drains, or wick drains. These drains consist of plastic cores wrapped in geotextile filter fabric, which are inserted vertically into the ground from existing ground surface to bottom of cohesive layer using a mandrel. Drains are installed in a square or triangular grid, at spacing of several feet between drains, prior to application of embankment load. In cohesive soils experiencing primary consolidation after placement of embankment load or preload, the drains provide a significantly shortened drainage path for excess pore water pressure, thereby accelerating primary settlement.

  While wick drains would not reduce settlement magnitude, it was theorized that drains could be utilized in tandem with a partial lightweight embankment to minimize Geofoam quantities and reduce or eliminate compensation needs. Settlement induced by normal-weight fill placed during the I-295 outage could be accelerated to occur mainly prior to final surfacing. Some monitoring and interim pavement repair may be required during the 6 months from completion of embankment construction to final surfacing, but repair and wick drain costs may be offset by

Geofoam quantity savings. Upon further analysis, however, it was determined that soils are sufficiently overconsolidated such that embankment construction would only result in recompression settlement and would not induce virgin compression. Wick drains are of minimal value in accelerating recompression of overconsolidated soils, and for secondary compression. Therefore, this option was not advanced further.

- Option 4, Column-Supported Embankment: Instead of improving the clay layer, reducing embankment weight, or accelerating settlement, a fourth option included transferring the applied load below the compressible clay and silt altogether using a column supported embankment. By installing driven piles, stone columns, rammed aggregate piers, or other rigid inclusions coupled with a geogrid-reinforced load transfer platform, the load of a normal-weight embankment could be transferred almost entirely to underlying dense granular materials with reduced settlement potential.

  As with deep soil mixing, installation of rigid inclusions would require drilling or driving below the existing structure in low overhead clearance conditions, but at significantly fewer locations since load could be carried between rigid inclusions by the load transfer platform. Installation could still be achievable using segmental or telescoping drilling equipment, or by driving piles in short segments with frequent splicing. Rigid inclusions would also have to be carefully located and installed to avoid existing foundation piling. Due to these limitations and risks a column supported embankment is not currently proposed as the option of choice.

Based on a qualitative assessment of the above, Option 1 was advanced into final design and the proposed embankment construction and staging was analyzed assuming the use of EPS Geofoam fill to reduce load and provide compensation for the new embankment. The required grades of EPS Geofoam were determined based on the proposed loading and performance requirements, as discussed in the following sections.

7.2.3 Lightweight Embankment Design Approach

For design of the proposed embankments, settlement was analyzed at the proposed south approach. This area represents the most significant volume of fill to be placed measuring approximately 114 linear feet along I-295 baseline, 94 feet wide between tops of slope, roughly 25 feet high, and with 2:1 side slopes. A similar cross-section is proposed at the north approach, but for a much shorter length of approximately 14 feet (between the existing and proposed abutment). Roadway widening of the north approach, accompanied by additional material being placed to expand the 2:1 side slopes, continues for about 85 feet beyond the existing abutment. Elastic, primary, and secondary settlement were evaluated utilizing the software Settle3D, by Rocscience. This software models the subsurface conditions and proposed embankment loading three dimensionally with consideration given to the abutment/embankment skew as well as changes in the existing ground surface elevation and stratification.

Settlement was assessed with long-term performance of the embankment and pavement performance in mind. Final surfacing of the length of I-295 impacted by the project has been proposed to occur about six months after the initial embankment and roadway construction, during which time the contractor will work on other locations across the project. This wait period has been considered in the embankment design as a reset point for pavement performance, increasing overall settlement tolerance. The next pavement

resurfacing is assumed to occur ten years post-construction.

Settlement was assessed for net pressure scenarios along the south embankment and the Geofoam extents were designed to provide those pressures. The expansion of the north approach embankment incorporates Geofoam to satisfy the established net pressure criteria. Primary consolidation and secondary settlement along the roadway was controlled to less than one inch over the first six months before the repaving, and less than an additional one inch over the following ten years when maintenance paving is scheduled. Net stress allowances were relaxed along the side slopes to allow a reduction in Geofoam in the slopes, while ensuring the stresses imposed did not cause excessive settlement to the roadway.

The required grade of EPS Geofoam fill was selected for each typical configuration/loading condition as required to limit strain under combined dead load plus live load and to minimize long-term creep. The strain of EPS Geofoam varies non-linearly with stress, and compression to higher strain levels typically results in increased creep potential and possible failure under sustained loading. Industry standards typically limit Service-case loading of EPS Geofoam to the compressive strength of the foam at 1% strain. If loading is kept to within this level the material should be able to endure long-term loading with negligible creep. EPS Geofoam grades and corresponding densities and minimum compressive strength data are specified in ASTM D6817. Design of EPS Geofoam for the I-295 over Veranda Street approach embankments under typical proposed approach pavement and side slopes considered EPS22 with a density of 1.35 pcf and minimum compressive resistance of 1051 psf at 1% strain. The area immediately under the south approach slab sleeper slab, subject to higher concentrated loading from the approach slab, considered EPS39 with a density of 2.40 pcf and a minimum compressive resistance of 2160 psf at 1% strain.

7.2.4 Subsurface Material Properties

Settlement of granular soils was estimated based on the subsurface material properties indicated above in Section 6.3.2. For assessment of time-dependent compression of the Marine Silt & Clay strata, the properties listed in Table 7.2.4 were used based upon consolidation test results and experience with Presumpscot Formation soils. Limited consolidation testing was performed on the Marine Silt & Clay Crust, but as the Crust is generally composed of the same materials having gone through desiccation cycles, and the properties determined for the underlying Marine Silt & Clay are deemed appropriate though slightly conservative.

Table 7.2.4: Settlement Properties of Marine Silt & Clay

$C_{\varepsilon c}$	$C_{\varepsilon r}$	C_v (ft^2/day)	σ_p' (ksf)	$C_{\alpha\varepsilon}$
0.2	0.014	0.2	3.8	0.003

Where: $C_{\varepsilon c}$ = Compression ratio, based upon consolidation test results.

$C_{\varepsilon r}$ = Recompression ratio, based upon consolidation test results.

C_v = Coefficient of consolidation, based on consolidation test results and past project experience.

σ_p' = Maximum past pressure (preconsolidation stress), based upon consolidation test results.

$C_{\alpha\varepsilon}$ = Modified secondary compression index (strain rate), based upon consolidation test results.

7.2.5 Lightweight Embankment Recommendations

The acceptable pressure scheme for controlling roadway settlements was determined from the settlement model based on the above criteria. This pressure scheme and approximate net fill height after excavation and replacement with lightweight fill is summarized below:

1) Between Embankment Crests: A net pressure increase of 520 psf, equivalent to approximately 5 feet of net added embankment fill;
2) Embankment Crest Outward to 15 feet Beyond Crest: A net pressure increase of 780 psf, equivalent to approximately 7 feet of net added embankment fill;
3) Areas Greater Than 15 feet Beyond Embankment Crest: A net pressure increase of 1040 psf, equivalent to approximately 9.5 feet of net added embankment fill.

The settlements estimated at representative locations within the south embankment based on the maximum net pressure increases indicated above are presented below in Exhibit 7.2.5. These values are partitioned into two ranges, first based on the initial 6 months of settlement anticipated to occur prior to final surfacing, and next based on the 10 years immediately following final surfacing up until estimated first resurfacing. As indicated below, roadway pavement does not exceed 1-inch relative settlement between initial and final surfacing, or between final surfacing and estimated first resurfacing, with a total cumulative settlement of approximately 1.25 inches at the time of 10-year resurfacing. Settlement is estimated to taper off after this period, with a maximum estimated 75-year total settlement of approximately 2.3 inches within pavement limits. Note that these settlements include elastic, primary, and secondary settlement of subgrade measured at base of embankment, and do not include elastic compression of new embankment fill or EPS Geofoam.

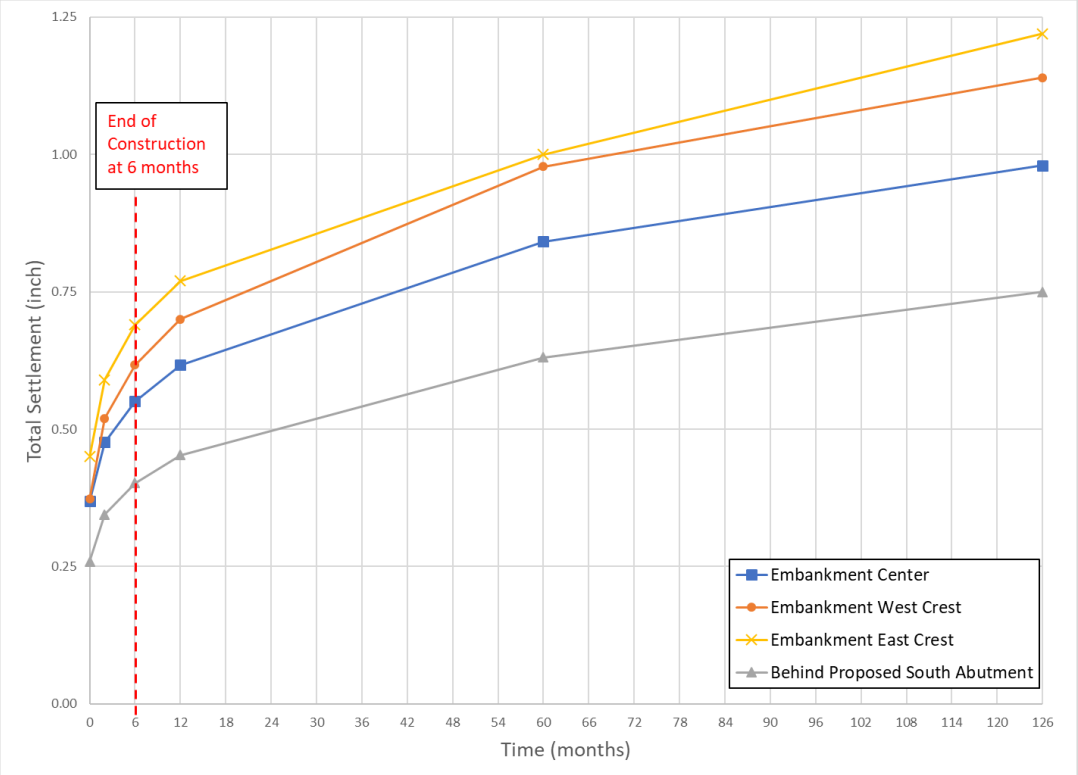

Exhibit 7.2.5: South Approach Estimated Subgrade Settlement vs. Time, With Compensation

Lightweight embankment material is expected to compress elastically under final embankment loading, however this elastic compression is expected to occur rapidly during construction and should be of minimal consequence to the finished roadway. As indicated above in Section 7.2.3, for Geofoam fill, the maximum allowable vertical strain under Service-condition dead and live load should be limited to 1% to adhere to industry standard design procedures. This represents a maximum elastic compression of approximately 3.1 inches for the estimated upper-bound Geofoam thickness of 26 feet.

In lieu of the reinforced concrete distribution slab typically installed atop Geofoam embankments in the region, a minimum two-foot-thick unreinforced lightweight foam concrete distribution slab is proposed. Foam concrete is self-leveling, and can be placed under the existing I-295 structure with minimal overhead clearance. This permits Geofoam to be installed to a higher top elevation just two feet below the bottom of existing bridge girders prior to the existing bridge demolition. The use of lightweight concrete as a distribution slab minimizes the excavation and replacement needed to offset the weight of common borrow and pavement materials.

For EPS22 under paved areas, including a uniform live load surcharge of 240 psf (2 foot of fill) plus 2-foot-thick, 42 pcf lightweight concrete distribution slab and allowing for up to 12 inches of 140 pcf bituminous wearing surface allows for an average of 4.9 feet of additional normal-weight (120 pcf) backfill, leveling sand, and subbase. This equates to a maximum total of approximately 7.9 feet of combined backfill, distribution slab, leveling sand and pavement above top of EPS22 geofoam. Outside of paved areas, where live loading is not applied and distribution slab is not included, backfill height above top of EPS22 geofoam may be increased to as high as 8.75 feet. For EPS39 located below the proposed South Abutment sleeper slab, the maximum bearing pressure at top of Geofoam including approach slab loading, sleeper slab loading, and soil load is computed as approximately 2020 psf, falling within the allowable compression capacity of 2160 psf.

7.3 Global Stability Assessment

Per the above sections, the proposed I-295 embankment to be constructed between the existing south and north bridge abutments will consist primarily of EPS22 and EPS39 lightweight fill. Combined with compensation, the applied pressure at the base of proposed embankment within these limits is negligible. Lightweight fill will extend down the 2:1 embankment slopes, and global stability within these limits is not a concern.

North and south of the crossing and EPS22/EPS39 lightweight fill limits, the existing roadway approach embankments are being widened as the roadway transitions onto the new bridge. These embankments are constructed from normal-weight fill, and additional material is required on the left and right (west and east) transverse slopes to accommodate the widening. Typical sections within these limits were analyzed to determine the global stability factor of safety in the proposed condition.

In analyzing global stability, limit equilibrium analyses were performed along the existing north and south bridge approaches using the Slope/W module of GeoStudio 2019, distributed by Geo-Slope International Ltd. Subsurface conditions for global stability analysis were selected based on conditions at the nearest borings and stability was evaluated along a section cut perpendicular to the Interstate 295 baseline. Spencer's method of analysis has been used to perform all global stability analyses and satisfies both force and moment equilibrium which meets the requirements prescribed by AASHTO LRFD Article C11.6.2.2

for slope stability analysis. Results of the analysis were assessed using non-optimized failure surfaces. Global stability analysis was performed for long term and short term loading conditions using estimated drained and undrained soil strength design parameters as specified in Table 6.3.2.

Global stability analysis was performed in the Service-I loading condition. AASHTO LRFD requires a resistance factor of 0.75 to be satisfied for global stability, which approximately equates to a 1.3 factor of safety. Analysis results are summarized below in **Table 7.3**.

Analysis indicated that the proposed modifications to the existing approach embankments generally result in an acceptable global stability factor of safety, with one exception. The proposed embankment configuration along the east slope immediately behind the existing north abutment at Station 39+92, near the end of existing northeast wingwall, results in a factor of safety of only 1.21 when constructed utilizing standard embankment fill. To address this inadequacy, the EPS22 Geofoam fill already proposed to mitigate settlement between the existing and proposed northeast wingwalls will be extended slightly to the north to approximately Station 40+00 to balance the weight of added fill at the widened embankment. With this proposed compensation, the global stability factor of safety in this section is estimated to increase to 1.31.

Table 7.3: Global Stability Results for Approach Embankments

Analyzed Cross-Section Station	Bridge Approach	Minimum Factor of Safety, East Slope		Minimum Factor of Safety, West Slope	
		Drained	Undrained	Drained	Undrained
37+00	South	1.43	1.30	1.62	1.41
37+50	South	1.48	1.39	3.10	2.10
39+92	North	1.82	1.31*	1.65	1.65
40+08	North	1.45	1.31	1.52	1.52
40+16	North	1.53	1.35	1.61	1.53

*Condition required additional EPS22 geofoam to meet factor of safety requirements.

8.0 SEISMIC DESIGN RECOMMENDATIONS

8.1 Site Evaluation

Based on the corrected SPT blow count for granular soils obtained from the test borings, the site is considered a Site Class "E" in accordance with AASHTO LRFD Table 3.10.3.1-1. **Table 8.1** provides the seismic design parameters developed in accordance with AASHTO LRFD.

Table 8.1: Seismic Design Parameters

Parameter	Design Value	AASHTO LRFD Reference
Site Class	E	Table 3.10.3.1-1
Peak Ground Acceleration (PGA)	0.085	Figure 3.10.2.1-1
F_{PGA} (0.0 second period)	2.5	Table 3.10.3.2-1
F_a	2.5	Table 3.10.3.2-2
F_v	3.5	Table 3.10.3.2-3
Acceleration Coefficient (As)	0.2125	Figure 3.10.4.1-1
S_{DS} (0.2 second period)	0.4250	Figure 3.10.4.1-1
S_{D1} (1.0 second period)	0.1505	Figure 3.10.4.1-1

Parameter	Design Value	AASHTO LRFD Reference
Seismic Zone	2	Table 3.10.6-1

Single span bridges need not be analyzed for seismic loads, regardless of their operational classification and geometry as specified in both MaineDOT BDG Section 5.2.5 and AASHTO LRFD Article 4.7.4. However, the minimum requirements, as specified in AASHTO LRFD Articles 4.7.4.4 and 3.10.9 regarding superstructure connections and minimum support length requirements shall still apply.

8.2 Liquefaction Screening

As part of the seismic assessment, a determination of the liquefaction hazards present at the project site was conducted. Liquefaction is a phenomenon whereby a soil substantially loses strength in response to an applied cyclic stress, typically associated with earthquake loading. This temporary loss of soil strength causes the soil to behave like a liquid, impacting bearing capacity and lateral stiffness. Liquefaction induced ground movement can cause serious damage to structures. Damage may occur during the earthquake itself, or continue to occur or be initiated subsequent to the earthquake in situations where the static factor of safety against lateral movement is reduced to less than unity. Two types of post-liquefaction deformations are possible:

1. Horizontal shear deformation arising from the large shearing strains occurring in zones where the earthquake has induced initial liquefaction.

2. Settlements arising from volume changes that occur on reconsolidation accompanying dissipation of the large excess pore pressures in liquefied zones.

   In general, strata meeting the following criteria are typically not susceptible to liquefaction and can be eliminated from the screening:

   - Soil with fines content (percent passing through No. 200 sieve) more than 35 percent
   - Soils classified as Marine and Lacustrine Silt and Clay
   - Layers with SPT-N values greater than 30 blows per foot
   - Unsaturated soils above the groundwater table

The conditions at the project site satisfy the above screening criteria and are not susceptible to liquefaction.

9.0 Traffic Signal Foundation Recommendations

Proposed reconfigurations of the roadway geometry within the project limits require the construction of new traffic signals at the south bond (SB) on ramp and north bound (NB) off ramp of I-295 at Veranda Street. Geotechnical and foundation recommendations for the proposed signals were prepared by Schonewald Engineering Associates. These recommendations are summarized in a memorandum, included for reference in **Appendix B**.

10.0 CONSTRUCTION CONSIDERATIONS

10.1 Micropile Construction and Testing Considerations

A minimum of one verification load test per abutment will be required on a sacrificial micropile prior to construction of production micropiles to verify design grout-to-bedrock bond strength and to demonstrate the sufficiency of the chosen installation methods. Verification tests may be conducted using either compression or tension methods. A tension test is preferred, as it requires less time and set up and allows for end bearing to be omitted from the load test results without the need for additional instrumentation.

Construction-phase proof testing is necessary on a minimum of 5% of production micropiles or one micropile per substructure, whichever is greater.

Micropiles will be installed in low overhead clearance conditions, which may require specialty equipment, shortened drill rods, and/or shortened casing segments. Micropiles are also located in the vicinity of existing battered H-piles which must remain in service during construction. While every effort will be made to locate micropiles away from existing battered piles, the Contractor should be aware that existing pile conflicts may be encountered and should provide a plan to quickly identify potential conflicts during drilling and minimize damage to the existing H-piles. Where conflicting H-piles are encountered, it will likely be necessary to offset and redrill micropiles to avoid the conflicts.

The API N-80 pipe typically used in micropile construction is mill secondary, or oil industry reject pipe. Mill secondary pipe is rejected for oil industry use because of stringent tolerances, although it is a high-quality pipe suitable for structural applications. Where "Buy America" requirements associated with federally funded projects are imposed, the use of mill seconds is limited, as mill certification of rejected pipe is not provided and therefore country of origin cannot be adequately documented. This makes it necessary for the Contractor to purchase more expensive "Prime Pipe" in order to receive mill certification. Alternatively, if permitted by the Owner and governing regulations, it may be possible for the Contractor to satisfy "Buy America" requirements without a mill certification if a letter can be provided from the casing supplier certifying that the casing is domestically produced.

10.2 Dynamic Pile Load Testing Program

When driven piles are installed for the proposed abutments, wave equation analyses should be performed by the contractor to verify that the proposed pile hammer is adequate to drive the piles to the required nominal resistances without subjecting the pile to stresses greater than 45 ksi. A separate wave equation analysis should be provided at each Northbound and Southbound end of each Abutment, for a total of four (4) analyses. The first pile driven at each Northbound and Southbound end of each abutment should be dynamically tested to confirm nominal pile resistance and develop a driving criterion for the remainder of the piles. The pile driving acceptance criteria should prevent pile damage and be structured so that the end of initial drive penetration resistance is between 3 and 15 blows per inch over the final 6 inches of driving. If the pile penetration is less than 0.5 inches over 10 consecutive blows, the driving may be terminated.

Relaxation may occur when piles are driven to and tip on poor quality bedrock resulting in a loss of pile resistance over time. Minimum 24 hour pile restrikes should be conducted on all test piles in order to ensure

the required nominal pile resistance has been achieved and verify that pile relaxation has not occurred. Additional, dynamic pile tests may be required if pile behavior varies significantly between adjacent piles.

10.3 Temporary Falsework Foundation Considerations

As indicated above, the proposed bridge superstructure will be constructed adjacent to the final bridge location on temporary falsework and ultimately slid onto the proposed substructure following demolition of the existing bridge. The falsework will be constructed to the east side of the existing bridge. Due to the presence of compressible soils and tight deflection requirements for the slide system, deep foundations are required.

The design and layout of the temporary falsework and slide system is contingent on the Contractor's means and methods and, therefore, is the responsibility of the Contractor. However, for proof of concept, preliminary layout, and cost estimating, the falsework is assumed to consist of temporary H-pile foundations driven to refusal in the glacial till material below the marine silt and clay. As piles can be driven to refusal, the H-pile axial resistance is assumed to be structurally controlled.

Final design of the temporary falsework and associated foundations shall be performed by the Contractor's engineer. Shop drawings and details, including structural and geotechnical design calculations, shall be signed and sealed by a Professional Engineer licensed in the state of Maine, and shall be submitted to the Engineer for review and approval. Foundation design, quality control, and testing shall be in accordance with the requirements of the AASHTO Guide Design Specifications for Bridge Temporary Works, 2nd Edition, including all current interim revisions at the time of contract. Pile geotechnical capacity shall be based on the Contractor's proposed quality control methods and associated Strength-state geotechnical resistance factors.

10.4 Lightweight Embankment Construction Considerations

Geofoam should be constructed atop a pad of leveling sand with a minimum thickness of six inches to ensure proper alignment and to provide an even bearing surface. As Expanded Polystyrene (EPS) Geofoam is susceptible to damage from contact with petroleum, all Geofoam must be encapsulated in an impervious geomembrane to prevent loss of embankment in the event of a petroleum spill. Leveling sand should be placed between the geofoam and the impervious geomembrane to pitch the geomembrane a minimum of 0.5% towards the edge of the embankment and promote drainage.

Typically, Geofoam embankment construction projects completed in Maine include the use of a minimum 4-inch-thick unreinforced or lightly reinforced concrete distribution slab. Due to the tight overhead clearance under the existing structure the construction and finishing of a traditional cast-in-place concrete distribution slab will be difficult. As the proposed staging provides a finished roadway surface consistently greater than 5 feet above top of Geofoam it does not need to be considered in the pavement design and differential icing concerns are eliminated. Therefore, the distribution slab will only serve to protect the Geofoam during existing structure demolition and the placement of fill during Stage 2.

In lieu of a traditional distribution slab, HNTB recommends protecting the Geofoam through the placement of a minimum 2-foot-thick mat of lightweight concrete fill. This high-slump self-leveling material can be placed under the existing structure without the need for significant screening or finishing efforts. If

uncracked or lightly reinforced, a thickness of 2 feet is expected to provide adequate distribution for construction loads generated by bulldozers, vibratory compactors, and tracked or wheeled excavator loadings.

The placement of Geofoam tightly around existing pier columns requires precision cutting and shaping which may leave voids and is likely unnecessary as the existing pile supported piers are not anticipated to be susceptible to settlement. Therefore, in lieu of Geofoam, Stage 1 backfill within the footprint of the existing pier foundations, between existing Pier 2 and the proposed south abutment, and between the existing and proposed north abutments, may be performed using the same lightweight concrete fill as proposed above for the protection of the top of Geofoam. The lightweight concrete should be placed in maximum 3-foot fluid lifts to avoid excess locked-in hydrostatic pressures on the surrounding Geofoam and proposed abutment stem wall.

With the normal groundwater elevation estimated at elevation 5 feet, all Geofoam will be placed above the groundwater table. However, during extreme storm events, floodwaters may reach an elevation of 12 feet, resulting in up to six feet of buoyant force. In finished condition, all portions of embankment will have sufficient normal weight soil cover to ballast the foam embankment against buoyancy forces. During construction, it will be the responsibility of the Contractor to ensure that all placed foam is adequately ballasted to resist buoyancy from groundwater rise and storm events.

10.5 Slide-Phase Embankment Construction Considerations

Embankment construction prior to the I-295 bridge slide outage shall be limited to installation and encapsulation of proposed EPS22 and EPS39 Geofoam fill, placement of common borrow material along side slopes only, and placement of lightweight concrete fill up to the top of distribution slab. Construction of the proposed embankment above the top of distribution slab must occur during the I-295 bridge slide outage utilizing standard-weight fill. Due to time constraints and the large quantity of material to be placed during the outage weekend, adequate placement and testing of traditional common borrow or granular borrow material may prove difficult. Difficulties could result in inadequate compaction or placement delays.

In lieu of placing common borrow or granular borrow during the slide period, substituting ¾-inch crushed stone may offer several benefits. First, the crushed stone is typically higher friction and of lighter unit weight. For stockpiling pre-outage, this material should safely stack steeper and higher, and should result in less total settlement. Second, traditional density control methods are unnecessary and ineffective with ¾-inch crushed stone. Rather than compacting traditionally, this type of material instead experiences more of a reorganization and optimization of particle configuration which requires less energy and moisture control. Compaction procedures for the selected placement and compaction equipment could be established pre-slide on a test strip with proof rolling in order to establish the required equipment settings and number of passes. During the outage this would eliminate the need for in-situ density testing or strict moisture control, and keep work moving forward uninterrupted.

Due to the open gradation of the ¾-inch stone, a separation material is required between the stone and subbase to prevent migration of fines into the stone's void space. A layer of filter fabric should be placed over the top of compacted stone prior to placement of roadway subbase. At filter fabric joints, the fabric should be placed with a minimum one-foot overlap. Where common borrow is to be placed around or

encapsulating the crushed stone along side slopes, weep holes should be included in the side slopes at the approximate bottom of crushed stone elevation to permit free drainage of the crushed stone and avoid pooling of runoff within the embankment.

11.0 LIMITATIONS OF REPORT

The conclusions and recommendations contained in this report are based upon the subsurface data obtained during this investigation and on details stated in this report. The validity of the conclusions and recommendations contained in this report are necessarily limited by, among other things, the scope of field investigation and by the number of borings. Therefore, given the nature of this subsurface study, there is a possibility that actual conditions encountered will differ from those discussed in this report. Should conditions arise which differ from those described in this report, HNTB should be notified immediately and provided with all information when available regarding subsurface conditions.

As part of the geotechnical recommendations presented in this report, HNTB makes no warranty as to the absence or presence of any environmental hazard or waste present on any property evaluated hereunder and all reports generated here to are qualified as being based upon existing data reasonably available to HNTB and not subject to independent verification. HNTB is not responsible for any latent defects that could not be reasonably discovered during the performance of its services and makes no legal representations whatsoever concerning any matter, including but not limited to, the ownership of any property or the interpretation of any law. These limitations form a material part of this report and are considered incorporated by reference therein. No warranty for the contents of this report, neither expressed nor implied, is made except that professional services were performed in accordance with generally accepted principles and practices.

12.0 REFERENCES

1. AASHTO. "LRFD Bridge Design Specifications". 8th Edition, 2017.
2. AASHTO. "Standard Specifications for Highway Bridges". 17th Edition, 2002.
3. Bowles, Joseph E. Foundation Analysis and Design. 5th Edition. McGraw-Hill, 1996.
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5. FHWA. "Evaluation of Soil and Rock Properties". Geotechnical Engineering Circular No. 5, FHWA-IF-02-034, 2002.
6. FHWA. "Micropile Design and Construction Reference Manual". FHWA NHI-05-039, 2005.
7. MaineDOT, "Bridge Design Guide". Maine Department of Transportation, Prepared by Guertin Elkerton & Associates, August 2003 with 2018 updates.
8. Naval Facilities Engineering Command. Design Manual 7.02, Foundations & Earth Structures. United States Navy. Alexandria: 1986.

Figures

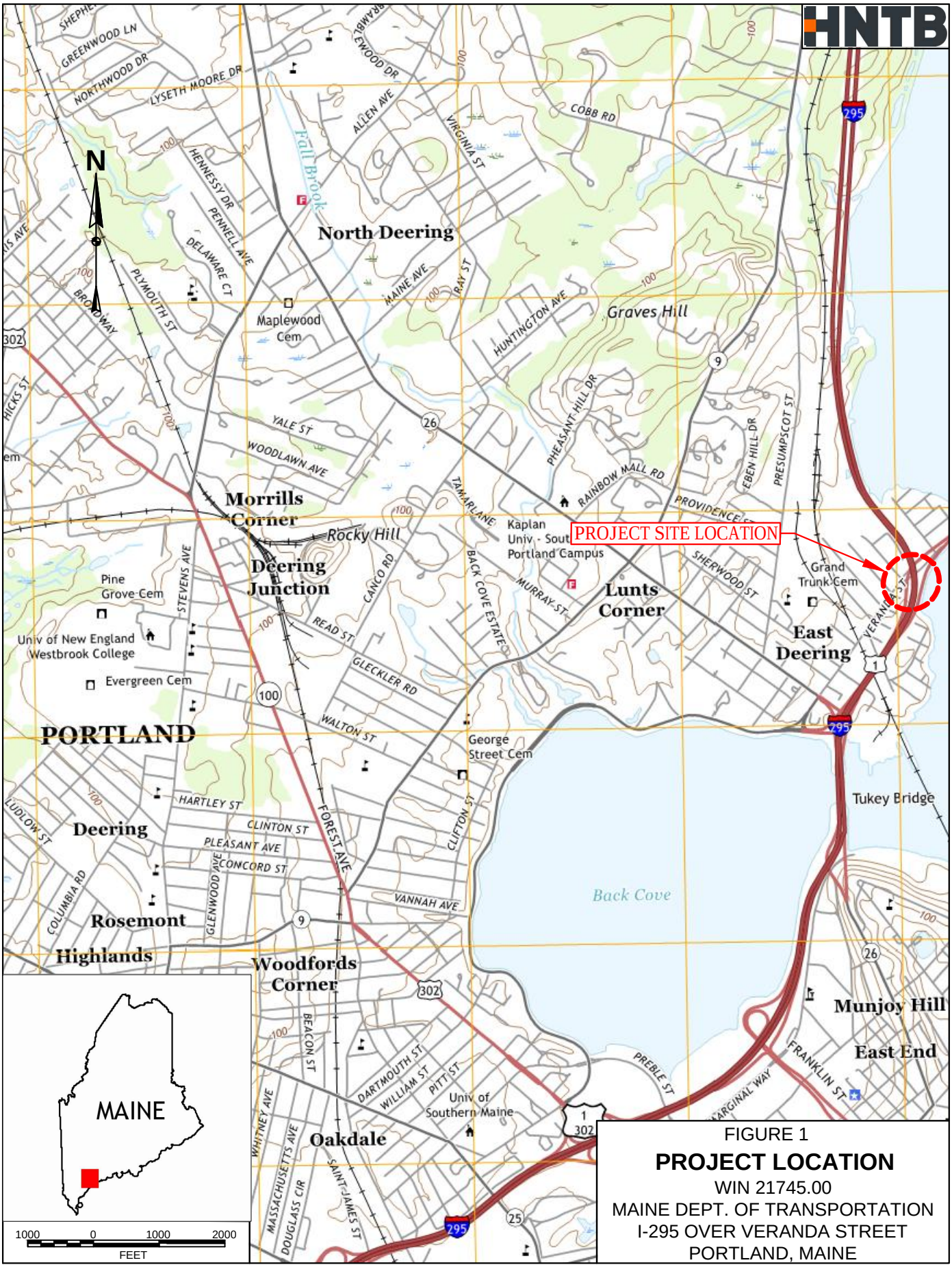


FIGURE 1

PROJECT LOCATION

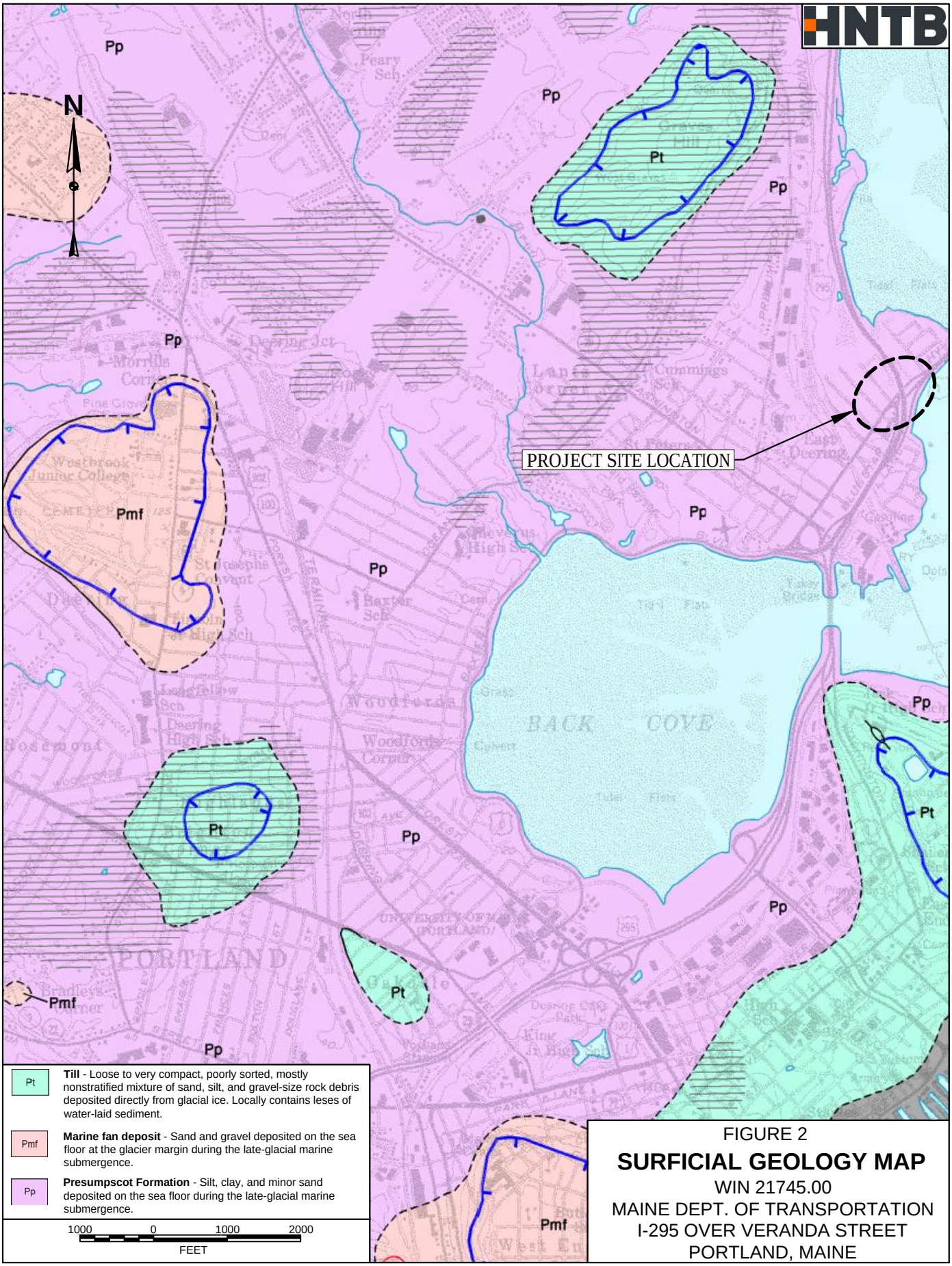
WIN 21745.00

MAINE DEPT. OF TRANSPORTATION

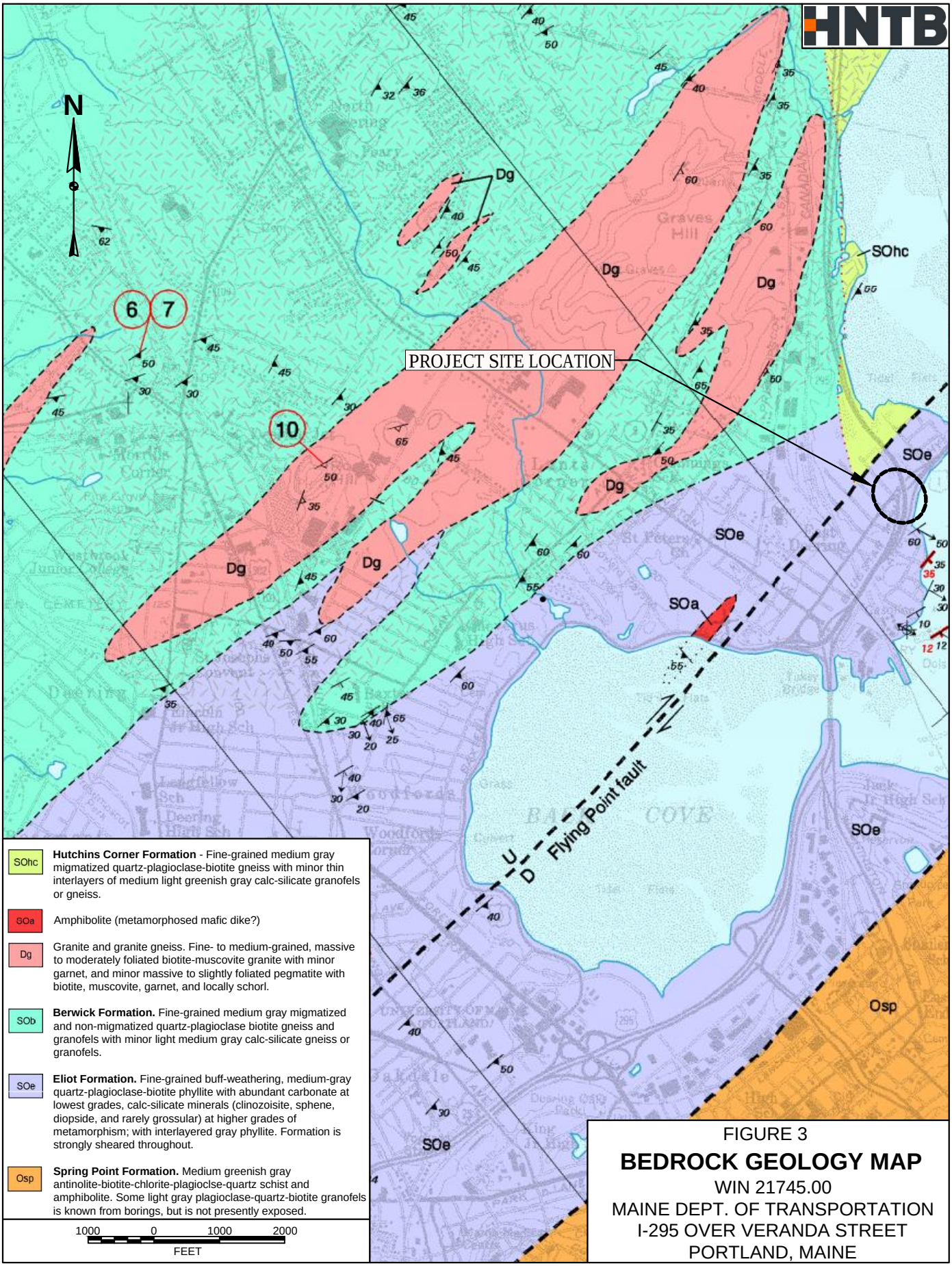
I-295 OVER VERANDA STREET

PORTLAND, MAINE

Basemap: U.S.G.S. Portland West, Maine Quadrangle, US Topo, 2018.



Basemap: USGS Surficial Geologic Map of The Portland West Quadrangle, Maine, 2008.



Basemap: Maine Geological Survey, Map of the Portland West Quadrangle, Portland, Maine, 2003.

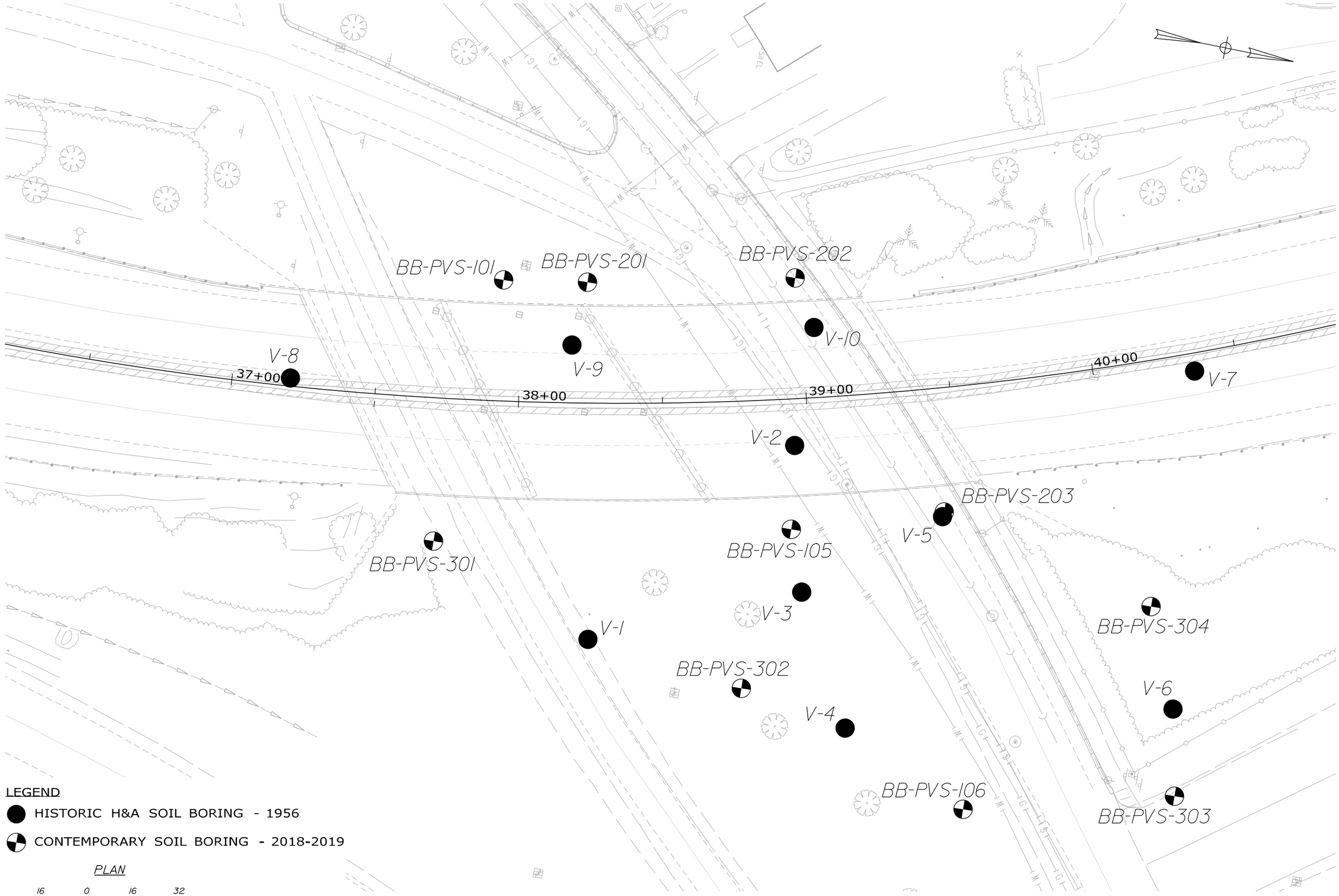


FIGURE 4 - BORING LOCATION PLAN

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

WIN 021745.00

BRIDGE PLANS

BRIDGE NO. 5933

FOR REFERENCE ONLY

	DATE	BY
PROJ. MANAGER		
DESIGN-DETAILED		
CHECKED-REVIEWED		
DESIGN2-DETAILED2		
DESIGN3-DETAILED3		
REVISIONS 1		
REVISIONS 2		
REVISIONS 3		
REVISIONS 4		
FIELD CHANGES		

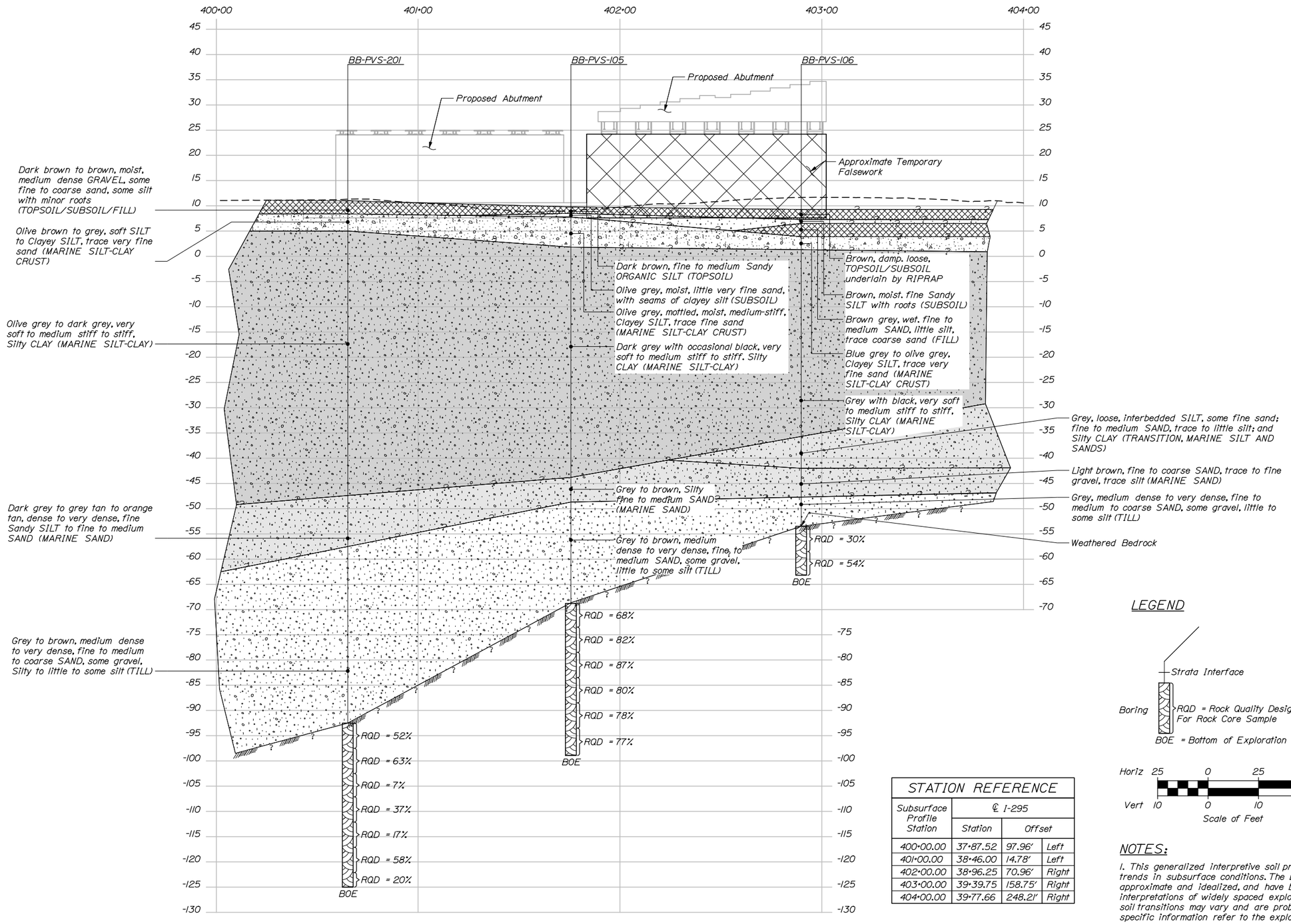
VERANDA STREET OVERPASS
VERANDA STREET
PORTLAND CUMBERLAND COUNTY

BORING LOCATION PLAN

SHEET NUMBER

HNTB

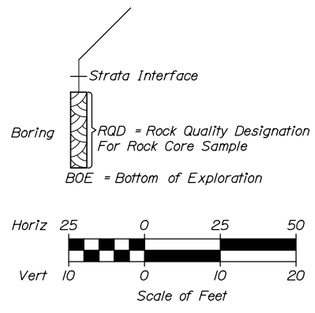
Filename: Boring Location Plan.dgn Division: Username: Date:10/13/2019



PROFILE
(Along ℄ Abut. 1), Looking Upstation I-295

STATION REFERENCE			
Subsurface Profile Station	℄ I-295		
	Station	Offset	
400+00.00	37+87.52	97.96′	Left
401+00.00	38+46.00	14.78′	Left
402+00.00	38+96.25	70.96′	Right
403+00.00	39+39.75	158.75′	Right
404+00.00	39+77.66	248.21′	Right

LEGEND



NOTES:

1. This generalized interpretive soil 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 transitions may vary and are probably more erratic. For more specific information refer to the exploration logs.

2. Abutment linework shown screened for clarity.

FIGURE 5 - SUBSURFACE CROSS-SECTION, ABUTMENT 1

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION
NHPP-2174(500)
WIN 021745.00
BRIDGE NO.5933
BRIDGE PLANS

FOR REFERENCE ONLY

	D. EATON	DATE
PROJ. MANAGER		
DESIGN-DETAILED	HJW	2\20
CHECKED-REVIEWED	KEB	2\20
DESIGN2-DETAILED2		
DESIGN3-DETAILED3		
REVISIONS 1	PEB	JMB
REVISIONS 2		
REVISIONS 3		
REVISIONS 4		
FIELD CHANGES		

INTERSTATE 295 OVER
VERANDA STREET
PORTLAND CUMBERLAND COUNTY

INTERPRETIVE SUBSURFACE PROFILE ALONG ABUT. 1

SHEET NUMBER

HNTB

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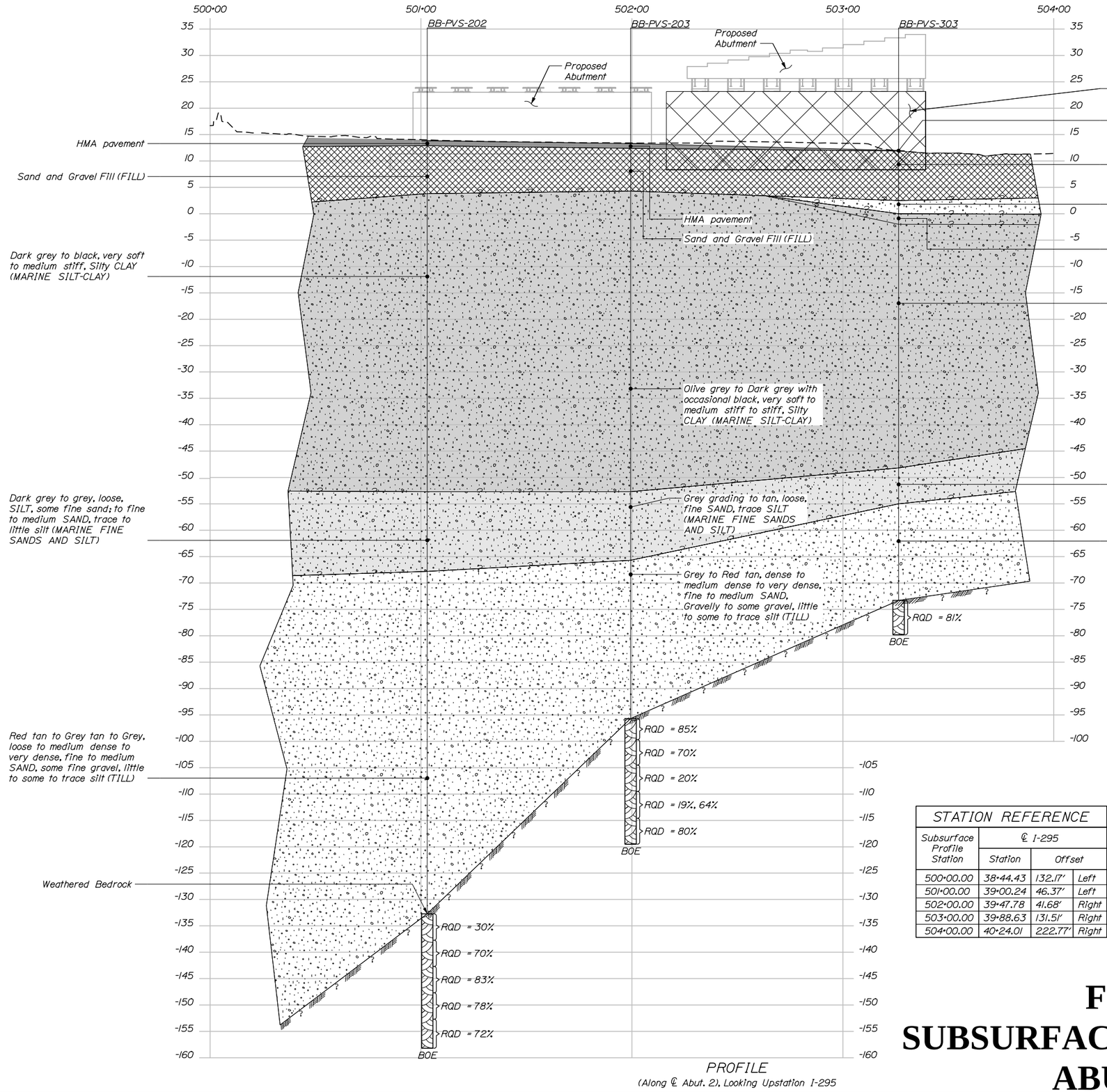

STATION REFERENCE

Subsurface Profile Station	℄ I-295		
	Station	Offset	
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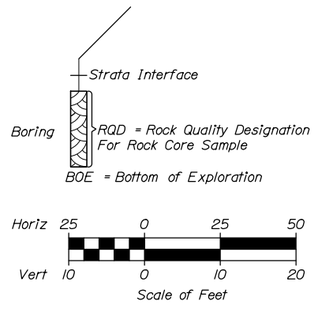
501+00.00	39+00.24	46.37'	Left
502+00.00	39+47.78	41.68'	Right
503+00.00	39+88.63	131.51'	Right
504+00.00	40+24.01	222.77'	Right

LEGEND



NOTES:

1. This generalized interpretive soil 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 transitions may vary and are probably more erratic. For more specific information refer to the exploration logs.

2. Abutment linework shown screened for clarity.

FIGURE 6
SUBSURFACE CROSS-SECTION
ABUTMENT 2

HNTB

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

NHPP-2174(500)

WIN 021745.00

BRIDGE PLANS

BRIDGE NO.5933

FOR REFERENCE ONLY

	BY	DATE
PROJ. MANAGER	D. EATON	
DESIGN-DETAILED	PEB	2\20
CHECKED-REVIEWED	HJW	2\20
DESIGN2-DETAILED2	KEB	
DESIGN3-DETAILED3	JMB	
REVISIONS 1		
REVISIONS 2		
REVISIONS 3		
REVISIONS 4		
FIELD CHANGES		

INTERSTATE 295 OVER
VERANDA STREET
PORTLAND CUMBERLAND COUNTY

INTERPRETIVE SUBSURFACE PROFILE ALONG ABUT. 2

SHEET NUMBER

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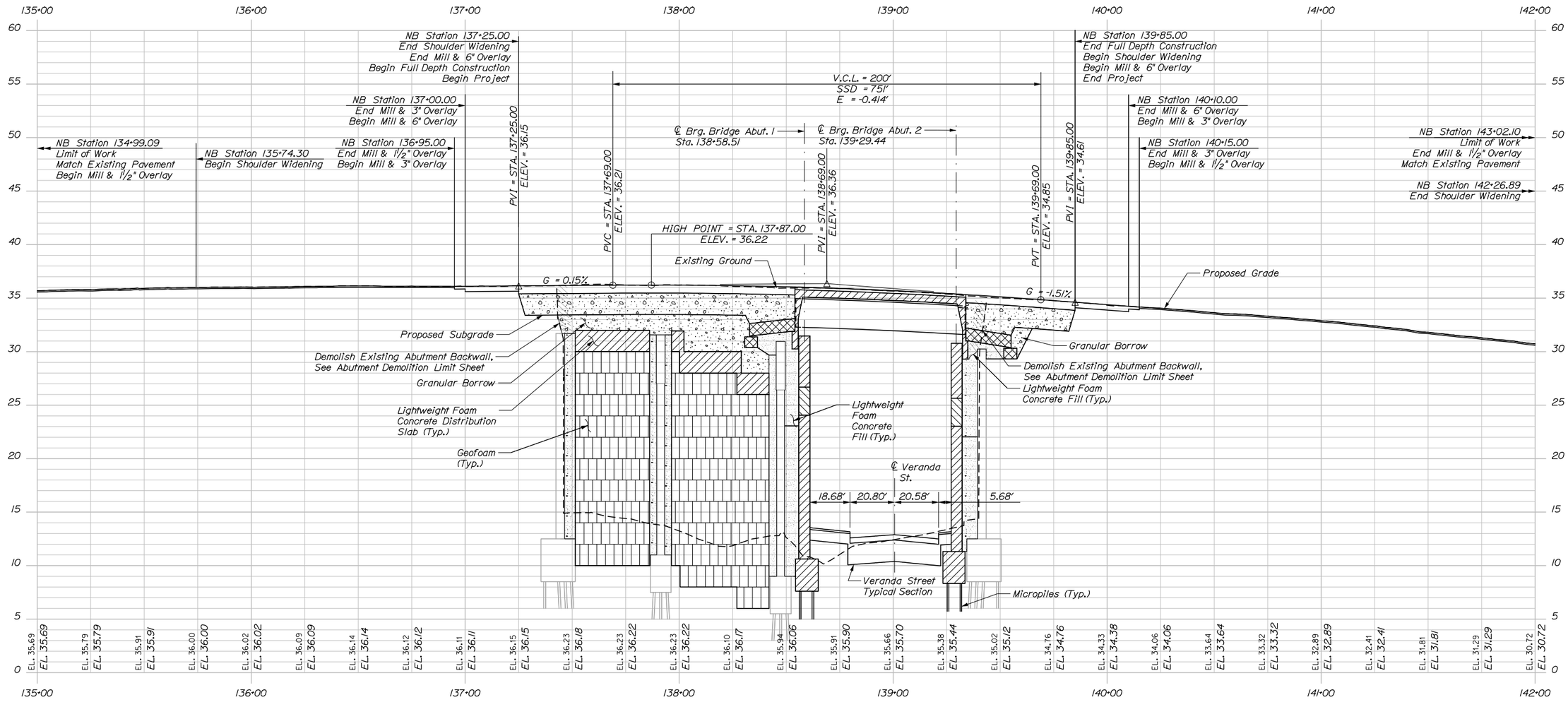

FIGURE 7 - LIGHTWEIGHT EMBANKMENT CONCEPT

NB PROFILE

Horiz. 25 0 25 50

Vert. 5 0 5 10

Scale of Feet

HNTB

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

NHPP-2174(500)

WIN
021745.00

BRIDGE NO.5933

BRIDGE PLANS

FOR REFERENCE ONLY

PROJ. MANAGER	D. EATON	BY	DATE
DESIGN-DETAILED	EDD	CDH	2\20
CHECKED-REVIEWED	RWH	LZD	2\20
DESIGN2-DETAILED2			
DESIGN3-DETAILED3			
REVISIONS 1			
REVISIONS 2			
REVISIONS 3			
REVISIONS 4			
FIELD CHANGES			

INTERSTATE 295 OVER
VERANDA STREET
CUMBERLAND COUNTY
PORTLAND

PROFILE
I-295 NORTHBOUND

SHEET NUMBER

Username:
Division:
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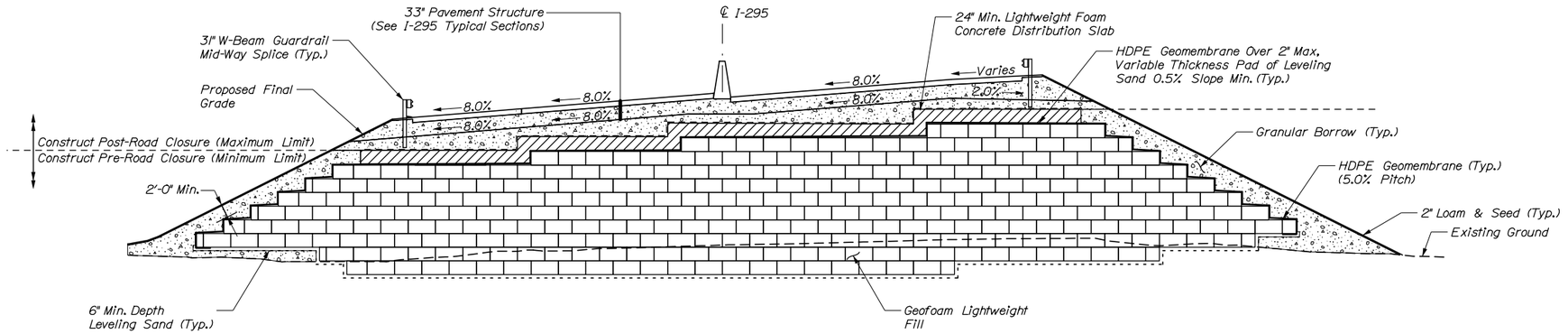
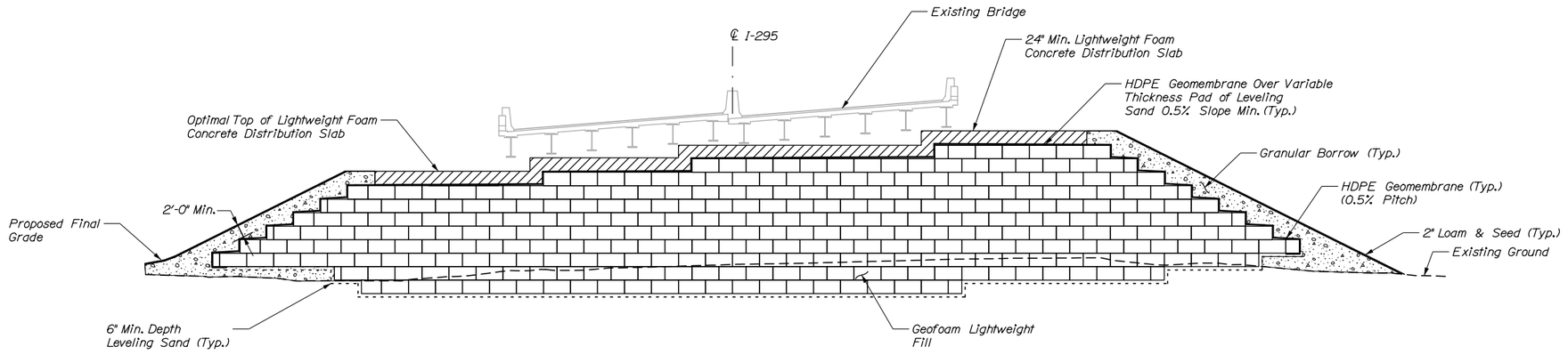


GEOFOAM TYPICAL SECTION - FINAL



GEOFOAM TYPICAL SECTION - PRE-CLOSURE

NOTES:
1. The Contractor shall be permitted to place a thicker layer of lightweight foam concrete distribution slab during the pre-road closure period to minimize fill placement during the road closure. The top of the lightweight foam concrete distribution slab shall not extend beyond the bottom of the existing bridge girders. Care shall be taken to prohibit adhesion between the foam concrete and the existing bridge girders.

FIGURE 8 - COMPENSATION CONCEPT CROSS-SECTIONS

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

NHPP-2174(500)

WIN
021745.00

BRIDGE NO.5933

BRIDGE PLANS

FOR REFERENCE ONLY

PROJ. MANAGER	D. EATON		
DESIGN-DETAILED	EDD	CDH	2\20
CHECKED-REVIEWED	RWH	LZD	2\20
DESIGN2-DETAILED2			
DESIGN3-DETAILED3			
REVISIONS 1			
REVISIONS 2			
REVISIONS 3			
REVISIONS 4			
FIELD CHANGES			

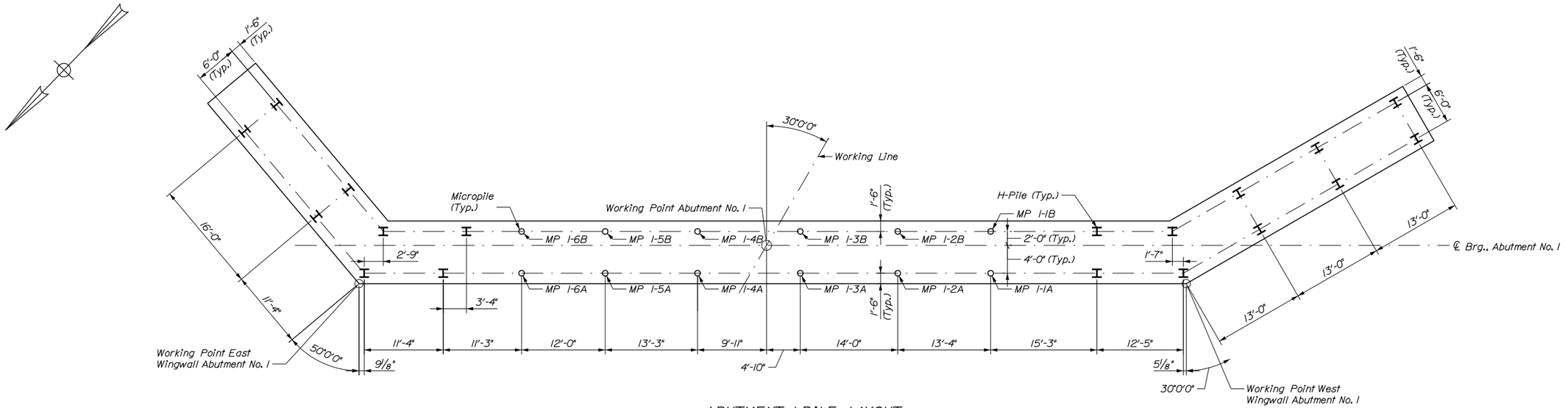
INTERSTATE 295 OVER
VERANDA STREET
PORTLAND CUMBERLAND COUNTY

TYPICAL SECTION
GEOFOAM

SHEET NUMBER

HNTB

Filename: 043_Geofoam Typical.dgn Division: Username: Date:3/3/2020



ABUTMENT 1 PILE LAYOUT

H-PILE NOTES:

1. The maximum axial factored pile load is ~~393~~ 420 kips for Abutment 1 and 462 kips for Abutment 2 (Strength I Load Combination).

2. H-pile material shall be ASTM A572, Grade 50.

3. Estimate of H-piles Required, assuming driven to rock (includes 5 ft per pile as contingency):

   Abutment No. 1, Southbound: 10 - HP 14x89 @ 107 ft
   Abutment No. 1, Northbound: 8 - HP 14x89 @ 83 ft
   Abutment No. 2, Southbound: 6 - HP 14x89 @ 148 ft
   Abutment No. 2, Northbound: 11 - HP 14x89 @ 111 ft

4. All H-piles shall be equipped with a pile tip in accordance with Standard Specification Section 501.048, Prefabricated Pile Tips.

5. Install H-piles to achieve a nominal geotechnical compressive resistance of ~~605~~ 647 kips for Abutment 1 and 711 kips for Abutment 2.

6. H-piles shall not be out of position shown be more than 2 inches in any direction. If the proposed H-pile conflicts with an existing pile the Contractor shall immediately notify the Resident before adjusting pile location.

7. The Contractor shall perform and submit four (4) wave equation analyses for driven H-piles, two at each abutment (one Northbound and one Southbound), for review and acceptance by the Resident. The maximum allowable driving stress is 0.90 times Fy. The submittal analyses shall include the proposed stopping criteria based on the wave equation analysis and the proposed driving system.

8. The Contractor shall perform four (4) dynamic load tests with 24-hour restrikes, one at each Northbound and Southbound end of Abutments, to confirm the nominal resistance of the H-piles. The required nominal resistance for the pile is the factored axial H-pile load divided by a resistance factor of 0.65 per LRFD Specifications. The dynamic tests shall be performed on the first production H-pile driven at each Northbound and Southbound end of Abutments.

9. For more information and notes on micropiles, see "Micropile Details" Sheet.

FIGURE 9 - FOUNDATION LAYOUT, ABUTMENT 1

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

NHPP-2174(500)

WIN 021745.00

BRIDGE NO.5933 — BRIDGE PLANS

FOR REFERENCE ONLY

PROJ. MANAGER	D. EATON		
DESIGN-DETAILED	HJW	ERB	2\20
CHECKED-REVIEWED	NMW	TRC	2\20
DESIGN2-DETAILED2			
DESIGN3-DETAILED3			
REVISIONS 1			
REVISIONS 2			
REVISIONS 3			
REVISIONS 4			
FIELD CHANGES			

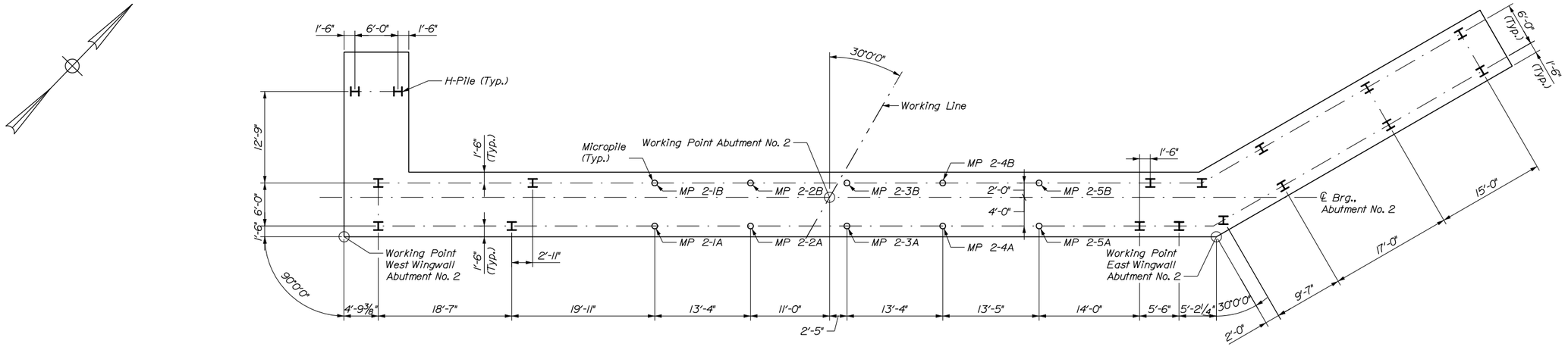
INTERSTATE 295 OVER
VERANDA STREET
CUMBERLAND COUNTY
PORTLAND

ABUTMENT 1
PILE LAYOUT

SHEET NUMBER

HNTB

Filename: 176_Abutment 1 Pile Layout.dgn Division: Username: Date:3/3/2020



ABUTMENT 2 PILE LAYOUT

NOTES:

1. For H-pile notes, see "Abutment I Pile Layout" Sheet.

2. For more information and notes on micropiles, see "Micropile Details" Sheet.

FIGURE 10 - FOUNDATION LAYOUT, ABUTMENT 2

HNTB

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

NHPP-2174(500)

WIN 021745.00

BRIDGE NO.5933

BRIDGE PLANS

FOR REFERENCE ONLY

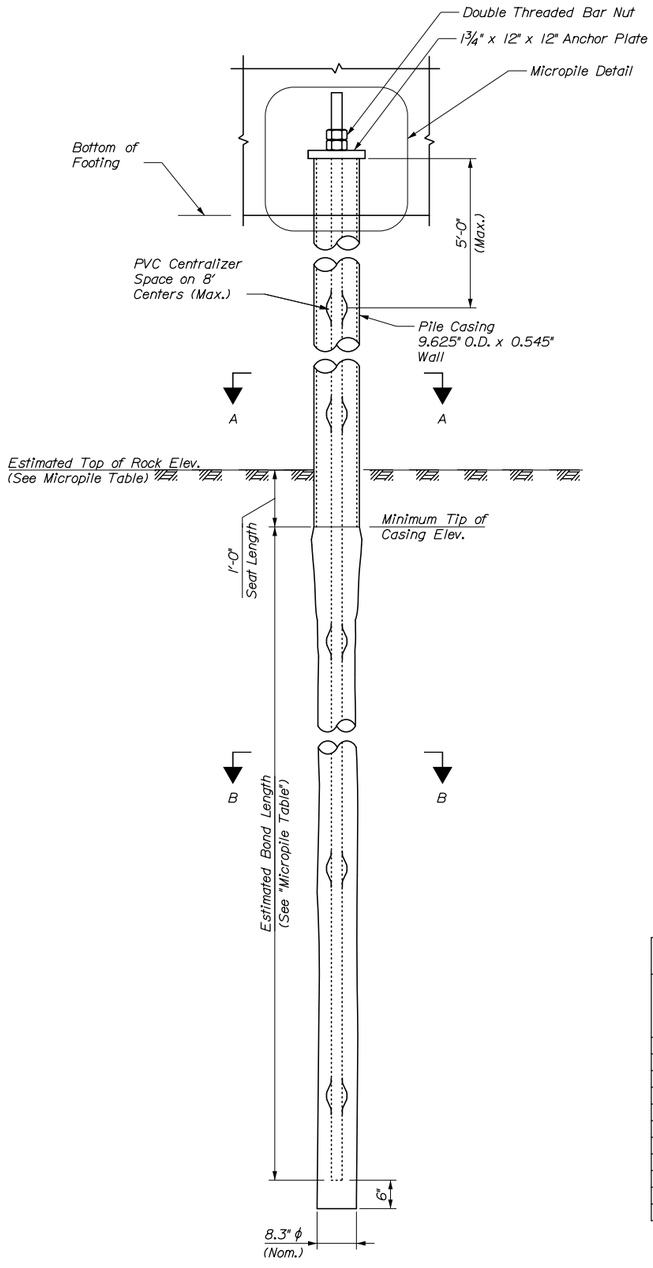
PROJ. MANAGER	D. EATON	BY	DATE
DESIGN-DETAILED	HJW	ERB	2\20
CHECKED-REVIEWED	TJP	TRC	2\20
DESIGN2-DETAILED2			
DESIGN3-DETAILED3			
REVISIONS 1			
REVISIONS 2			
REVISIONS 3			
REVISIONS 4			
FIELD CHANGES			

INTERSTATE 295 OVER
VERANDA STREET
CUMBERLAND COUNTY
PORTLAND

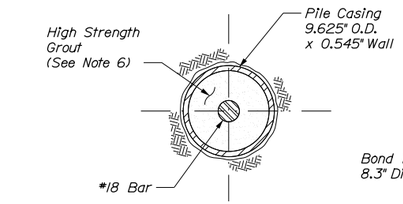
ABUTMENT 2
PILE LAYOUT

SHEET NUMBER

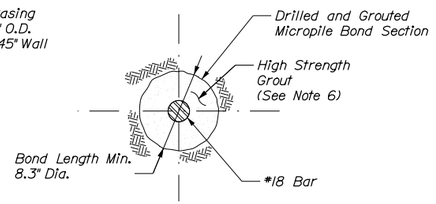
Filename: 183_Abutment 2 Pile Layout.dgn Division: Username: Date:3/3/2020



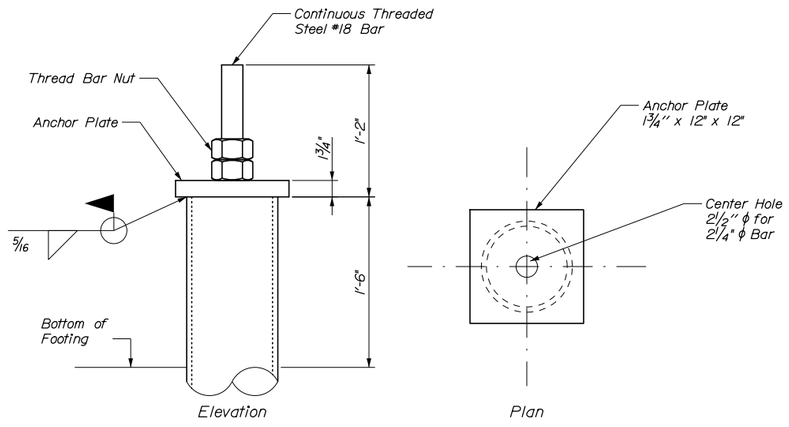
TYPICAL MICROPILE ELEVATION



SECTION A-A
(Cased Zone)



SECTION B-B
(Bond Zone in Bedrock)



MICROPILE DETAIL

MICROPILE TABLE								
Abutment	Micropiles	Required Nominal Resistance		Factored Design Load (FDL)		Bottom of Footing Elevation	Estimated Top of Rock Elevation	Estimated Bond Zone Length (ft.)
		Compression	Tension	Compression	Tension			
1	MP 1-1A, 1-1B	429 kips	0 kips	300 kips	0 kips	761	-89	10.0
1	MP 1-2A, 1-2B	429 kips	0 kips	300 kips	0 kips	761	-86	10.0
1	MP 1-3A, 1-3B	429 kips	0 kips	300 kips	0 kips	761	-83	10.0
1	MP 1-4A, 1-4B	429 kips	0 kips	300 kips	0 kips	761	-80	10.0
1	MP 1-5A, 1-5B	429 kips	0 kips	300 kips	0 kips	761	-77	10.0
1	MP 1-6A, 1-6B	429 kips	0 kips	300 kips	0 kips	761	-74	10.0
2	MP 2-1A, 2-1B	445 kips	0 kips	311 kips	0 kips	8.33	-123	11.0
2	MP 2-2A, 2-2B	445 kips	0 kips	311 kips	0 kips	8.33	-118	11.0
2	MP 2-3A, 2-3B	445 kips	0 kips	311 kips	0 kips	8.33	-113	11.0
2	MP 2-4A, 2-4B	445 kips	0 kips	311 kips	0 kips	8.33	-108	11.0
2	MP 2-5A, 2-5B	445 kips	0 kips	311 kips	0 kips	8.33	-103	11.0

NOTES:

1. Construct micropiles in accordance with Special Provision Section 501, Micropiles.

2. Bedrock bond zone lengths shall be confirmed by Contractor verification load tests on test piles in accordance with Special Provision Section 501, Micropiles.

3. Casing shall be API 5CT N80 pipe with a minimum yield strength of 80 ksi as approved by the Engineer.

4. Reinforcing bar shall be #18 Threaded Bar in accordance with ASTM A615 Grade 75. Reinforcing bars shall be galvanized in accordance with ASTM A153.

5. Anchor plate shall meet requirements of ASTM A709 Grade 50 and shall be galvanized per ASTM A123.

6. Grout shall have minimum 28 day compressive strength of 5,000 psi.

7. Micropile casing, threaded bar, anchor plates, and high strength grout shall be included in the unit bid price for Item 501.222, Micropiles.

8. Micropiles shall not be installed closer than 10 feet from an adjacent micropile, which has been grouted for a period of less than 24 hours.

9. If a micropile cannot be installed in the location indicated on the plans due to a conflict with existing piles, abandon the current micropile and offset a lateral distance determined by the Resident to avoid the current conflict. Payment for the abandoned micropile will be made under Item 501.2221 - Abandoned Micropile.

FIGURE 11 - MICROPILE DETAILS

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION
NHPP-2174(500)
WIN 021745.00
BRIDGE NO.5933
BRIDGE PLANS

FOR REFERENCE ONLY

PROJ. MANAGER	D. EATON		
DESIGN-DETAILED	HJW	ERB	2\20
CHECKED-REVIEWED	NMW	TRC	2\20
DESIGN2-DETAILED2			
DESIGN3-DETAILED3			
REVISIONS 1			
REVISIONS 2			
REVISIONS 3			
REVISIONS 4			
FIELD CHANGES			

INTERSTATE 295 OVER VERANDA STREET
PORTLAND CUMBERLAND COUNTY

MICROPILE DETAILS

SHEET NUMBER

HNTB

Username: Date:3/3/2020
Division:
Filename: 175_Micropile Details.dgn

Appendix A

Field and Laboratory Data Reports
(By Schonewald Engineering Associates)

Appendix A1: Preliminary Geotechnical Program

Appendix A2: Final Design Geotechnical Program

Appendix A1

Field and Laboratory Data Report, Preliminary Geotechnical Program

(By Schonewald Engineering Associates)

SCHONEWALD
ENGINEERING
ASSOCIATES, INC.
■ www.SchonewaldEngineering.com ■

FIELD AND LABORATORY DATA REPORT
PRELIMINARY GEOTECHNICAL PROGRAM
BRIDGE #5933
I-295 OVER VERANDA STREET
PORTLAND, MAINE

PREPARED FOR:

HNTB Corporation
Westbrook, Maine

PREPARED BY:

Isabel V. (Be) Schonewald, P.E.
Schonewald Engineering Associates, Inc. (SchonewaldEA)
129 Middle Road
Cumberland, Maine 04021
Be@SchonewaldEngineering.com

June 2019

SchonewaldEA Project No. 18-007

SCHONEWALD ENGINEERING ASSOCIATES, INC.
■ www.SchonewaldEngineering.com ■

FIELD AND LABORATORY DATA REPORT
PRELIMINARY GEOTECHNICAL PROGRAM
BRIDGE #5933
I-295 OVER VERANDA STREET
PORTLAND, MAINE

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RESULTS OF LABORATORY TESTS ON SOIL SAMPLES – PHASE 2 (BB-PVS-105 (corrosion), -202, AND -203)	**220-340**
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FIELD SUBSURFACE EXPLORATION LOCATION SKETCH

BB-PVS-202

BB-PVS-203

BB-PVS-105

BB-PVS-106

BB-PVS-201

BB-PVS-101

FIELD SUBSURFACE EXPLORATION LOCATION SKETCH

SCALE: 1" =25'

LOGS OF SUBSURFACE EXPLORATIONS

Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: Bridge #5933
I-295 over Veranda Street
Location: Portland, ME

Boring No.: BB-PVS-101

WIN: 21745.00

Driller:	New England Boring Contractors	**Elevation (ft.)**	10.8 ft	**Auger ID/OD:**	SSA (--/4.5")
Operator:	Schaefer / Titus	**Datum:**	NAVD88	**Sampler:**	standard split-spoon
Logged By:	Schonewald	**Rig Type:**	Mobile Drill B-53 ATV	**Hammer Wt./Fall:**	140 lbs / 30 inches
Date Start/Finish:	7/26/18; 1205-7/27/18; 1510	**Drilling Method:**	cased wash boring	**Core Barrel:**	n/a
Boring Location:	N 310609.0, E 1016701.2	**Casing ID/OD:**	HW (4/4.5") NW (3/3.5")	**Water Level*:**	below 6 ft BGS
Hammer Efficiency Factor: 0.60		**Hammer Type:**	Automatic ☐ Hydraulic ☐ Rope & Cathead ☒		

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

Depth (ft.)	Sample Information: Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N_{60}	Casing Blows	Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.
0							SSA	10.1		ASPHALT 0.7	
	1D	24/19	2.0 - 4.0	2-3-4-5	7	7				Olive brown, moist, medium stiff, Silt- Clay Fill (FILL)	
	2D	24/22	4.0 - 6.0	2-2-3-4	5	5				Olive brown, moist, medium stiff, Silt- Clay Fill (FILL)	
5	3D	24/19	6.0 - 8.0	2-3-3-4	6	6	PUSH HW			Olive brown, moist, medium stiff, Silt- Clay Fill (FILL)	
								3.4		7.4	
	4D	24/21	8.0 - 10.0	1-2-3-3	5	5				(3D cont'd): Possible transition to native MARINE SILT-CLAY CRUST at 7.4 ft. Olive brown, slightly mottled, medium stiff, Clayey SILT, with few pockets, partings, and inclusions of silty fine sand. (MARINE SILT-CLAY CRUST)	
10	5D	24/21	10.0 - 12.0	1-2-2-3	4	4				Soft, olive brown, slightly mottled, Clayey SILT grading to olive grey, Clayey SILT. (MARINE SILT-CLAY CRUST)	
								-1.2		12.0	
15	6D	24/24	15.0 - 17.0	WOH/18"-2	--					Dark olive grey with black, very soft, Silty CLAY. (MARINE SILT-CLAY)	
20	7D	24/10	20.0 - 22.0	push thru vane						Dark grey, medium stiff, Silty CLAY. (MARINE SILT-CLAY)	GTX#473553 WC=50% LL=45 PL=22 PI=23
	V1		20.6 - 21.0	Su=647/112 psf						V1: 14.5 / 2.5 ft-lbs (55 mm x 110 mm vane raw torque readings)	
	V2		21.6 - 22.0	Su=915/156 psf						V2: 20.5 / 3.5 ft-lbs (55 mm x 110 mm vane raw torque readings)	
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.

Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

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WO1P = Weight of One Person
S_u = Peak/Remolded Field Vane Undrained Shear Strength (psf)
$S_{u(lab)}$ = Lab Vane Undrained Shear Strength (psf)
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N_{60} = (Hammer Efficiency Factor/60%)*N-uncorrected
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WC = Water Content, percent
LL = Liquid Limit
PL = Plastic Limit
PI = Plasticity Index
G = Grain Size Analysis
C = Consolidation Test

Depth (ft.)	Sample Information: Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N_{60}	Casing Blows	Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.
25	U1	12/12	25.0 - 26.0	HYD PUSH						Sampler not extend past 26 ft; saved sample.	
	8D	24/24	26.0 - 28.0	WOH/12"-1-2	1	1				Dark grey with occasional black, Silty CLAY. (MARINE SILT-CLAY) Sandy gravel observed in top of sample.	
30	9D	24/24	30.0 - 32.0	push thru vane						Dark grey with occasional black, medium stiff to stiff, Silty CLAY. (MARINE SILT-CLAY)	
	~~V3~~		~~30.6 - 31.0~~	~~Su=1,027/179 psf~~						V3: 23 / 4 ft-lbs (55 mm x 110 mm vane raw torque readings)	
	V4		31.6 - 32.0	Su=982/179 psf						V4: 22 / 4 ft-lbs (55 mm x 110 mm vane raw torque readings)	
35	U2	24/24	35.0 - 37.0	HYD PUSH						Dark grey with black, Silty CLAY; bottom of sample blocky break, gritty. (MARINE SILT-CLAY)	GTX#IP-6 CONSOL (Cv, Cα) GTX#473547 WC=39% LL=40 PL=20 PI=20
40	10D	24/24	40.0 - 42.0	push thru vane						Dark grey with black, stiff, Silty CLAY, trace very fine Sand. (MARINE SILT-CLAY)	
	~~V5~~		~~40.6 - 41.0~~	~~Su=1,139/179 psf~~						V5: 25.5 / 4 ft-lbs (55 mm x 110 mm vane raw torque readings)	
	V6		41.6 - 42.0	Su=1,362/268 psf						V6: 30.5 / 6 ft-lbs (55 mm x 110 mm vane raw torque readings)	
45	11D	24/24	45.0 - 47.0	push thru vane						Dark grey with occasional black, stiff, Silty CLAY. (MARINE SILT-CLAY)	
	~~V7~~		~~45.6 - 46.0~~	~~Su=1,340/223 psf~~						V7: 30 / 5 ft-lbs (55 mm x 110 mm vane raw torque readings)	
	V8		46.6 - 47.0	Su=1,362/246 psf						V8: 30.5 / 5.5 ft-lbs (55 mm x 110 mm vane raw torque readings)	
50											

Remarks:

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

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Maine Department of Transportation

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WC = Water Content, percent
LL = Liquid Limit
PL = Plastic Limit
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G = Grain Size Analysis
C = Consolidation Test

Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N_{60}	Casing Blows	Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.
50	12D	24/24	50.0 - 52.0	push thru vane						Dark grey with occasional black, Silty CLAY with three 1-inch seams fine sandy silt in lower part of the sample. (MARINE SILT-CLAY)	
	~~V9~~		~~50.6 - 51.0~~	~~Su=1,496/290 psf~~						V9: 33.5 / 6.5 ft-lbs (55 mm x 110 mm vane raw torque readings)	
	V10		51.6 - 52.0	Su=1,496/223 psf						V10: 33.5 / 5 ft-lbs (55 mm x 110 mm vane raw torque readings)	
							--	-41.4		52.2	
							78				
							90				
55	13D	24/15	55.0 - 57.0	18-17-16-14	33	33	98			Brown, dense, fine to medium SAND, little to some silt; silt content varies in layers. (MARINE SAND)	
							92				
							85				
							102	-47.7		58.5	
							135				
60	14D	24/11	60.0 - 62.0	20-28-16-14	44	44	RC			Grey, dense, fine to medium SAND, some silt, some fine gravel, trace coarse sand. (TILL)	
65											
70											
75											

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-PVS-101

WIN: 21745.00

Driller:	New England Boring Contractors	**Elevation (ft.)**	10.8 ft	**Auger ID/OD:**	SSA (--/4.5")
Operator:	Schaefer / Titus	**Datum:**	NAVD88	**Sampler:**	standard split-spoon
Logged By:	Schonewald	**Rig Type:**	Mobile Drill B-53 ATV	**Hammer Wt./Fall:**	140 lbs / 30 inches
Date Start/Finish:	7/26/18; 1205-7/27/18; 1510	**Drilling Method:**	cased wash boring	**Core Barrel:**	n/a
Boring Location:	N 310609.0, E 1016701.2	**Casing ID/OD:**	HW (4/4.5") NW (3/3.5")	**Water Level*:**	below 6 ft BGS
Hammer Efficiency Factor:	0.60	**Hammer Type:**	Automatic ☐ Hydraulic ☐ Rope & Cathead ☒		

Definitions:
D = Split Spoon Sample
MD = Unsuccessful Split Spoon Sample Attempt
U = Thin Wall Tube Sample
MU = Unsuccessful Thin Wall Tube Sample Attempt
V = Field Vane Shear Test, PP = Pocket Penetrometer
MV = Unsuccessful Field Vane Shear Test Attempt
R = Rock Core Sample
SSA = Solid Stem Auger
HSA = Hollow Stem Auger
RC = Roller Cone
WOH = Weight of 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: 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.
75											
80											
								-72.6		83.4 **Bottom of Exploration at 83.4 feet below ground surface.** Roller cone refusal.	
85											
90											
95											
100											

Remarks:

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

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Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: Bridge #5933
I-295 over Veranda Street
Location: Portland, ME

Boring No.: BB-PVS-105

WIN: 21745.00

Driller:	New England Boring Contractors	**Elevation (ft.)**	9.8 ft	**Auger ID/OD:**	SSA (--/4.5")
Operator:	Schaefer / Titus	**Datum:**	NAVD88	**Sampler:**	standard split-spoon
Logged By:	Schonewald	**Rig Type:**	Mobile Drill B-53 ATV	**Hammer Wt./Fall:**	140 lbs / 30 inches
Date Start/Finish:	7/19/18; 1015-7/24/18; 1405	**Drilling Method:**	cased wash boring	**Core Barrel:**	NQ2 (wireline)
Boring Location:	N 310724.1, E 1016766.4	**Casing ID/OD:**	HW (4/4.5") NW (3/3.5")	**Water Level*:**	below 6 ft BGS
Hammer Efficiency Factor: 0.60		**Hammer Type:**	Automatic ☐ Hydraulic ☐ Rope & Cathead ☒		

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C = Consolidation Test

Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N_{60}	Casing Blows	Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.
0	1D	24/17	0.0 - 2.0	1-1-2-4	3	3	SSA			Dark brown, fine to medium Sandy ORGANIC SILT (TOPSOIL); changing at 1.3 ft to:	
								8.5		1.3	GTX#-n/a
								7.8		(1D) Olive grey, moist, SILT, little very fine sand, with 2 seams clayey silt. (SUBSOIL)	Resistivity, pH
	2D	24/21	2.0 - 4.0	2-2-3-2	5	5				2.0 Olive grey, mottled, moist, medium stiff, Clayey SILT, trace fine sand as partings and one 1-inch seam olive grey, silty fine sand. (MARINE SILT-CLAY CRUST)	
	3D	24/16	4.0 - 6.0	1-1-1/12"	2	2				Olive grey, slightly mottled to 5 ft, moist, soft, Clayey SILT grading to Silty CLAY with occasional partings silty fine sand. (MARINE SILT-CLAY CRUST)	GTX#-n/a Resistivity, pH Sulfates, Chlorides
5	4D	24/24	6.0 - 8.0	WOH/18"-1	--		PUSH HW			Olive grey, wet (saturated), very soft, Silty CLAY, trace very fine sand, with few pockets of olive brown, fine sandy silt. (MARINE SILT-CLAY)	
								1.8		8.0	
	5D	24/24	8.0 - 10.0	WOH/24"	--					Dark grey with occasional black, very soft, Silty CLAY. (MARINE SILT-CLAY)	
10	6D	24/24	10.0 - 12.0	WOH/18"-1	--					Dark grey with occasional black, very soft, Silty CLAY. (MARINE SILT-CLAY)	
15	7D	24/24	15.0 - 17.0	push thru vane						Dark grey with occasional black, medium stiff, Silty CLAY. (MARINE SILT-CLAY)	GTX#473554 WC=43% LL=48 PL=23 PI=25
	V1		15.6 - 16.0	Su= 714/ 124 psf						V1: 26 / 4.5 ft-lbs (65 mm x 130 mm vane raw torque readings)	
	V2		16.6 - 17.0	Su= 700/ 110 psf						V2: 25.5 / 4 ft-lbs (65 mm x 130 mm vane raw torque readings)	
20	MU	24/0	20.0 - 22.0	HYD PUSH						Collect split-spoon sample from 20 to 22 ft: Dark grey with occasional black, Silty CLAY; sandy partings not observed. (MARINE SILT-CLAY)	
25											

Remarks:

Moved approximately 10 ft south of plan location to avoid water main.

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Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: Bridge #5933
I-295 over Veranda Street
Location: Portland, ME

Boring No.: BB-PVS-105

WIN: 21745.00

Driller:	New England Boring Contractors	**Elevation (ft.)**	9.8 ft	**Auger ID/OD:**	SSA (--/4.5")
Operator:	Schaefer / Titus	**Datum:**	NAVD88	**Sampler:**	standard split-spoon
Logged By:	Schonewald	**Rig Type:**	Mobile Drill B-53 ATV	**Hammer Wt./Fall:**	140 lbs / 30 inches
Date Start/Finish:	7/19/18; 1015-7/24/18; 1405	**Drilling Method:**	cased wash boring	**Core Barrel:**	NQ2 (wireline)
Boring Location:	N 310724.1, E 1016766.4	**Casing ID/OD:**	HW (4/4.5") NW (3/3.5")	**Water Level*:**	below 6 ft BGS
Hammer Efficiency Factor: 0.60		**Hammer Type:**	Automatic ☐ Hydraulic ☐ Rope & Cathead ☒		

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SSA = Solid Stem Auger
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WOH = Weight of 140 lb. Hammer
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S_u = Peak/Remolded Field Vane Undrained Shear Strength (psf)
$S_{u(lab)}$ = Lab Vane Undrained Shear Strength (psf)
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N-uncorrected = Raw Field SPT N-value
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WC = Water Content, percent
LL = Liquid Limit
PL = Plastic Limit
PI = Plasticity Index
G = Grain Size Analysis
C = Consolidation Test

Depth (ft.)	Sample Information: Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N_{60}	Casing Blows	Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.
25	U1	24/24	25.0 - 27.0	HYD PUSH						Dark grey, Silty CLAY. (MARINE SILT- CLAY)	GTX#IP-5 CONSOL (Cv, Cα) GTX#473548 WC=41% LL=41 PL=25 PI=16
30	8D	24/24	30.0 - 32.0	push thru vane						Dark grey, medium stiff to stiff, Silty CLAY. (MARINE SILT-CLAY)	
	V3		30.6 - 31.0	Su= 934/ 206 psf						V3: 34 / 7.5 ft-lbs (65 mm x 130 mm vane raw torque readings)	
	V4		31.6 - 32.0	Su=1,044/192 psf						V4: 38 / 7 ft-lbs (65 mm x 130 mm vane raw torque readings)	
35	U2	24/24	35.0 - 37.0	HYD PUSH						Dark grey, Silty CLAY. (MARINE SILT-CLAY)	
40	9D	24/24	40.0 - 42.0	push thru vane						Dark grey with black, stiff, Silty CLAY. (MARINE SILT-CLAY)	
	V5		40.6 - 41.0	Su=1,167/192 psf						V5: 42.5 / 7 ft-lbs (65 mm x 130 mm vane raw torque readings)	
	V6		41.6 - 42.0	Su=1,140/137 psf						V6: 41.5 / 5 ft-lbs (65 mm x 130 mm vane raw torque readings)	
45	U3	24/22	45.0 - 47.0	HYD PUSH						Dark grey, Silty CLAY, trace very fine sand (possibly shell fragments). (MARINE SILT-CLAY)	
50											

Remarks:

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Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: Bridge #5933
I-295 over Veranda Street
Location: Portland, ME

Boring No.: BB-PVS-105

WIN: 21745.00

Driller:	New England Boring Contractors	**Elevation (ft.)**	9.8 ft	**Auger ID/OD:**	SSA (--/4.5")
Operator:	Schaefer / Titus	**Datum:**	NAVD88	**Sampler:**	standard split-spoon
Logged By:	Schonewald	**Rig Type:**	Mobile Drill B-53 ATV	**Hammer Wt./Fall:**	140 lbs / 30 inches
Date Start/Finish:	7/19/18; 1015-7/24/18; 1405	**Drilling Method:**	cased wash boring	**Core Barrel:**	NQ2 (wireline)
Boring Location:	N 310724.1, E 1016766.4	**Casing ID/OD:**	HW (4/4.5") NW (3/3.5")	**Water Level*:**	below 6 ft BGS
Hammer Efficiency Factor:	0.60	**Hammer Type:**	Automatic ☐ Hydraulic ☐ Rope & Cathead ☒		

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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
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Depth (ft.)	Sample Information: Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N_{60}	Casing Blows	Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.
50	10D	24/24	50.0 - 52.0	push thru vane						Dark grey with black, stiff, Silty CLAY, trace very fine sand, with two partings and one 1/8-inch seam fine sandy silt. (MARINE SILT-CLAY)	
	~~V7~~		~~50.6 - 51.0~~	~~Su=1,563/313 psf~~						V7: 35 / 7 ft-lbs (55 mm x 110 mm vane raw torque readings)	
	MV		51.0 - 51.0							Unable to push past 51.0 ft.	
								-44.2		54.0	
							58				
55	11D	24/16	55.0 - 57.0	5-7-14-21	21	21	RC			Grey, Silty fine SAND grading to fine to medium SAND, little silt; changing at 56 ft to Brown, fine to medium SAND, trace to little silt. (MARINE SAND)	
								-48.7		58.5	
60	12D	24/11	60.0 - 62.0	12-28-28-18	56	56				Brown, very dense, fine to medium SAND, some gravel, little to some silt, trace coarse sand. (TILL) 60.5 ft: Telescope NW (3-inch) casing.	
65	13D	24/8	65.0 - 67.0	7-41-19-19	60	60				Tan with 2-inch layer rust, very dense, fine to coarse SAND, little to some silt, little gravel. Dark grey, Silty fine to medium SAND in tip of spoon. (TILL) (blowing sands; controlled with head of water)	
70	14D	24/11	70.0 - 72.0	13-14-10-7	24	24	18			Grey, medium dense, fine to medium SAND, some silt, little fine gravel, trace coarse sand. (TILL)	
							25				
							28				
							65				
75							58				

Remarks:

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Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: Bridge #5933
I-295 over Veranda Street
Location: Portland, ME

Boring No.: BB-PVS-105

WIN: 21745.00

Driller:	New England Boring Contractors	**Elevation (ft.)**	9.8 ft	**Auger ID/OD:**	SSA (--/4.5")
Operator:	Schaefer / Titus	**Datum:**	NAVD88	**Sampler:**	standard split-spoon
Logged By:	Schonewald	**Rig Type:**	Mobile Drill B-53 ATV	**Hammer Wt./Fall:**	140 lbs / 30 inches
Date Start/Finish:	7/19/18; 1015-7/24/18; 1405	**Drilling Method:**	cased wash boring	**Core Barrel:**	NQ2 (wireline)
Boring Location:	N 310724.1, E 1016766.4	**Casing ID/OD:**	HW (4/4.5") NW (3/3.5")	**Water Level*:**	below 6 ft BGS
Hammer Efficiency Factor:	0.60	**Hammer Type:**	Automatic ☐ Hydraulic ☐ Rope & Cathead ☒		

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WC = Water Content, percent
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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.
75	15D	24/12	75.0 - 77.0	47-18-19-20	37	37	64			Grey, dense, fine to medium SAND, some silt, little to some fine gravel, trace coarse sand. (TILL)	
							62				
							72				
							65/7"	-68.8		78.6	
	R1	56/56	79.0 - 83.7	RQD: 38" = 68% sample 79.5-79.9			NQ2			Top of Bedrock at Elev. -68.8 ft. R1: Bedrock: Medium grey, aphanitic to fine grained, PHYLLITE, with remnant bedding visible (varies from high to low angle; occasionally highly undulating), occasional healed fractures, and numerous calcsilicate veins (typically cross-bedding and cross-healed fractures), hard, typically fresh. Low-angle and moderately dipping, close to moderately spaced breaks; undulating, rough, shiny, fresh to discolored, and open, with occasional mud infilling. (ELIOT FORMATION) Core times: 2:35/ 2:00/ 2:15/ 2:30/ - min:sec/ft ROCK QUALITY = FAIR	GTX# n/a qp=-- broke before loaded
80											
	R2	60/60	83.7 - 88.7	RQD: 49" = 82%						R2: Similar to R1. 3:10/ 2:15/ 2:05/ 1:55/ 2:10 min:sec/ft ROCK QUALITY = GOOD	
85											
	R3	60/60	88.7 - 93.7	RQD: 52" = 87%						R3: Similar to R1. Core times: 3:45/ 2:35/ 2:10/ 1:50/ 2:15 min:sec/ft ROCK QUALITY = GOOD	
				sample 89.3-89.9							GTX# n/a qp=121 ksf
90											
	R4	60/60	93.7 - 98.7	RQD: 48" = 80%						R4: Similar to R1. Core times: 2:20/ 2:05/ 2:10/ 1:55/ 2:15 min:sec/ft ROCK QUALITY = GOOD	
95											
	R5	60/60	98.7 - 103.7	RQD: 47" = 78%						R5: Similar to R1. Core times: 2:40/ 2:20/ 2:30/ 2:20/ 2:00 min:sec/ft ROCK QUALITY = GOOD	
				sample 98.9-99.4							GTX# n/a qp=655 ksf
100											

Remarks:

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Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: Bridge #5933
I-295 over Veranda Street
Location: Portland, ME

Boring No.: BB-PVS-105

WIN: 21745.00

Driller:	New England Boring Contractors	**Elevation (ft.)**	9.8 ft	**Auger ID/OD:**	SSA (--/4.5")
Operator:	Schaefer / Titus	**Datum:**	NAVD88	**Sampler:**	standard split-spoon
Logged By:	Schonewald	**Rig Type:**	Mobile Drill B-53 ATV	**Hammer Wt./Fall:**	140 lbs / 30 inches
Date Start/Finish:	7/19/18; 1015-7/24/18; 1405	**Drilling Method:**	cased wash boring	**Core Barrel:**	NQ2 (wireline)
Boring Location:	N 310724.1, E 1016766.4	**Casing ID/OD:**	HW (4/4.5") NW (3/3.5")	**Water Level*:**	below 6 ft BGS
Hammer Efficiency Factor: 0.60		**Hammer Type:**	Automatic ☐ Hydraulic ☐ Rope & Cathead ☒		

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Depth (ft.)	Sample Information: Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N_{60}	Casing Blows	Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.
100											
	R6	60/60	103.7 - 108.7	RQD: 46" = 77%						R6: Similar to R1. Core times: 2:05/ 1:55/ 1:55/ 2:10/ 2:10 min:sec/ft ROCK QUALITY = GOOD	
105											
								-98.9		108.7 **Bottom of Exploration at 108.7 feet below ground surface.**	
110											
115											
120											
125											

Remarks:

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Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: Bridge #5933
I-295 over Veranda Street
Location: Portland, ME

Boring No.: BB-PVS-106

WIN: 21745.00

Driller:	New England Boring Contractors	**Elevation (ft.)**	9.3 ft	**Auger ID/OD:**	SSA (--/4.5")
Operator:	Schaefer / Titus	**Datum:**	NAVD88	**Sampler:**	standard split-spoon
Logged By:	Schonewald	**Rig Type:**	Mobile Drill B-53 ATV	**Hammer Wt./Fall:**	140 lbs / 30 inches
Date Start/Finish:	7/24/18; 1430-7/26/18; 1050	**Drilling Method:**	cased wash boring	**Core Barrel:**	NQ2 (wireline)
Boring Location:	N 310801.8, E 1016850.0	**Casing ID/OD:**	HW (4/4.5") NW (3/3.5")	**Water Level*:**	below 6 ft BGS
Hammer Efficiency Factor: 0.60		**Hammer Type:**	Automatic ☐ Hydraulic ☐ Rope & Cathead ☒		

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N-uncorrected = Raw Field SPT N-value
Hammer Efficiency Factor = Rig Specific Annual Calibration Value
N_{60} = SPT N-uncorrected Corrected for Hammer Efficiency
N_{60} = (Hammer Efficiency Factor/60%)*N-uncorrected
T_v = Pocket Torvane Shear Strength (psf)
WC = Water Content, percent
LL = Liquid Limit
PL = Plastic Limit
PI = Plasticity Index
G = Grain Size Analysis
C = Consolidation Test

Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N_{60}	Casing Blows	Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.
0	1D	24/10	0.0 - 2.0	1-3-3-16	6	6	SSA			Brown, damp, loose, TOPSOIL/SUBSOIL underlain by RIPRAP.	
								7.3		2.0	
	2D	24/14	2.0 - 4.0	1-1-1-2	2	2		6.5		Brown, moist, fine Sandy SILT with roots (SUBSOIL); changing at 2.8 ft to:	
										2.8	
	3D	24/15	4.0 - 6.0	2-2-1-1	3	3				(2D) Brown grey, wet, fine to medium SAND, little silt, trace coarse sand. (FILL) Brown, wet, fine to medium SAND, trace to little silt, trace coarse sand (FILL); changing at 5.4 ft to:	
5								3.9		5.4	
	4D	24/12	6.0 - 8.0	1-1-1-2	2	2	PUSH HW			(3D) Blue grey, Clayey SILT, trace very fine sand. (MARINE SILT-CLAY CRUST) Olive grey, soft, slightly mottled, Clayey SILT. (MARINE SILT-CLAY CRUST)	
								1.3		8.0	
	5D	24/24	8.0 - 10.0	WOH/18"-2	--					Olive grey, very soft, Silty CLAY, trace very fine Sand as partings. (MARINE SILT-CLAY)	
10	6D	24/24	10.0 - 12.0	WOH/18"-2	--					Olive grey grading to grey with occasional black, very soft, Silty CLAY. (MARINE SILT-CLAY)	
15	7D	24/24	15.0 - 17.0	WOH/18"-2	--					Grey with occasional black, very soft, Silty CLAY. (MARINE SILT-CLAY)	
20	8D	24/24	20.0 - 22.0	push thru vane						Grey with occasional black, medium stiff to stiff, Silty CLAY. (MARINE SILT-CLAY)	
	V1		20.6 - 21.0	Su=804/156 psf						V1: 18 / 3.5 ft-lbs (55 mm x 110 mm vane raw torque readings)	
	V2		21.6 - 22.0	Su=1,027/223 psf						V2: 23 / 5 ft-lbs (55 mm x 110 mm vane raw torque readings)	
25											

Remarks:

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

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Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: Bridge #5933
I-295 over Veranda Street
Location: Portland, ME

Boring No.: BB-PVS-106

WIN: 21745.00

Driller:	New England Boring Contractors	**Elevation (ft.)**	9.3 ft	**Auger ID/OD:**	SSA (--/4.5")
Operator:	Schaefer / Titus	**Datum:**	NAVD88	**Sampler:**	standard split-spoon
Logged By:	Schonewald	**Rig Type:**	Mobile Drill B-53 ATV	**Hammer Wt./Fall:**	140 lbs / 30 inches
Date Start/Finish:	7/24/18; 1430-7/26/18; 1050	**Drilling Method:**	cased wash boring	**Core Barrel:**	NQ2 (wireline)
Boring Location:	N 310801.8, E 1016850.0	**Casing ID/OD:**	HW (4/4.5") NW (3/3.5")	**Water Level*:**	below 6 ft BGS
Hammer Efficiency Factor: 0.60		**Hammer Type:**	Automatic ☐ Hydraulic ☐ Rope & Cathead ☒		

Definitions:
D = Split Spoon Sample
MD = Unsuccessful Split Spoon Sample Attempt
U = Thin Wall Tube Sample
MU = Unsuccessful Thin Wall Tube Sample Attempt
V = Field Vane Shear Test, PP = Pocket Penetrometer
MV = Unsuccessful Field Vane Shear Test Attempt
R = Rock Core Sample
SSA = Solid Stem Auger
HSA = Hollow Stem Auger
RC = Roller Cone
WOH = Weight of 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: 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	U1	24/24	25.0 - 27.0	HYD PUSH						Grey with black, Silty CLAY. (MARINE SILT-CLAY)	
30	9D	24/24	30.0 - 32.0	push thru vane						Dark grey with black, stiff, Silty CLAY. (MARINE SILT-CLAY)	
	~~V3~~		~~30.6 - 31.0~~	~~Su=1,206/223 psf~~						V3: 27 / 5 ft-lbs (55 mm x 110 mm vane raw torque readings)	
	V4		31.6 - 32.0	Su=1,206/223 psf						V4: 27 / 5 ft-lbs (55 mm x 110 mm vane raw torque readings)	
35	10D	24/24	35.0 - 37.0	push thru vane						Dark grey with occasional black, stiff, Silty CLAY; possible shell fragments. (MARINE SILT-CLAY)	
	~~V5~~		~~35.6 - 36.0~~	~~Su=1,250/201 psf~~						V5: 28 / 4.5 ft-lbs (55 mm x 110 mm vane raw torque readings)	
	V6		36.6 - 37.0	Su=1,116/179 psf						V6: 25 / 4 ft-lbs (55 mm x 110 mm vane raw torque readings)	
40	11D	24/24	40.0 - 42.0	push thru vane						Grey with occasional black, stiff, Silty CLAY. (MARINE SILT-CLAY)	
	~~V7~~		~~40.6 - 41.0~~	~~Su=1,340/268 psf~~						V7: 30 / 6 ft-lbs (55 mm x 110 mm vane raw torque readings)	
	V8		41.6 - 42.0	Su=1,429/268 psf						V8: 32 / 6 ft-lbs (55 mm x 110 mm vane raw torque readings)	
45	12D	24/22	45.0 - 47.0	7-3-5-15	8	8	60	-35.7		44.7 ft: More difficult to push casing.	
							58			45.0 — Grey, loose, interbedded SILT, some fine sand; fine to medium SAND, trace to little silt; and Silty CLAY. (INTERBEDDED MARINE SILT AND SANDS (TRANSITION))	
							67				
							65				
50							65				

Remarks:

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Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: Bridge #5933
I-295 over Veranda Street
Location: Portland, ME

Boring No.: BB-PVS-106

WIN: 21745.00

Driller:	New England Boring Contractors	**Elevation (ft.)**	9.3 ft	**Auger ID/OD:**	SSA (--/4.5")
Operator:	Schaefer / Titus	**Datum:**	NAVD88	**Sampler:**	standard split-spoon
Logged By:	Schonewald	**Rig Type:**	Mobile Drill B-53 ATV	**Hammer Wt./Fall:**	140 lbs / 30 inches
Date Start/Finish:	7/24/18; 1430-7/26/18; 1050	**Drilling Method:**	cased wash boring	**Core Barrel:**	NQ2 (wireline)
Boring Location:	N 310801.8, E 1016850.0	**Casing ID/OD:**	HW (4/4.5") NW (3/3.5")	**Water Level*:**	below 6 ft BGS
Hammer Efficiency Factor:	0.60	**Hammer Type:**	Automatic ☐ Hydraulic ☐ Rope & Cathead ☒		

Definitions:
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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 No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N_{60}	Casing Blows	Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.
50	13D	24/14	50.0 - 52.0	9-12-13-24	25	25	15			Grey grading to rust, fine to medium SAND, little to some silt; changing at 51.3 ft to:	
							27	-42.0		50.5 ft: Telescope NW (3-inch) casing.	
							55			51.3 — (13D) Light brown, fine to coarse SAND, trace to little fine gravel, trace silt. (MARINE SAND)	
							60				
							48				
55							RC			55 ft: Casing refusal; roller cone ahead; break through at 57 ft.	
							RC				
								-47.7		57.0	
	14D	24/8	57.0 - 59.0	7-8-6-8	14	14	27			Grey, medium dense, fine to coarse SAND, some fine gravel, little to some silt. (TILL)	
							15				
							18				
60	15D	24/11	60.0 - 62.0	19-8-7-9	15	15	RC			Grey, medium dense, fine to medium SAND, some fine gravel, little to some silt, trace coarse sand. (TILL)	
	R1	60/60	62.8 - 67.8	RQD: 21" = 30%			NQ2	-53.2		62.5	
								-53.5		62.5 ft: Possible weathered rock.	
				sample 62.9-63.3						62.8 — Top of Bedrock at Elev. -62.8 ft.	GTX# n/a qp=412 ksf
										R1: Bedrock: Grey, aphanitic to fine grained, PHYLLITE, with remnant bedding visible (undulating, typically moderately dipping), occasional healed fractures, and numerous calcsilicate veins, hard, typically fresh. Moderately dipping, typically close breaks; undulating, rough, shiny, fresh to discolored, and open. Highly fractured 64.8 to 65.3 ft.	
65										(ELIOT FORMATION)	
										Core times: 3:10/ 2:25/ 2:10/ 1:55/ 2:25	
										ROCK QUALITY = POOR	
	R2	56/55	67.8 - 72.5	RQD: 30" = 54%						R2: Similar to R1. Open fracture 68.8 to 69.0 ft.	
										Core times: 3:35/ 3:05/ 2:15/ 2:00/ -	
										ROCK QUALITY = FAIR	
70											
								-63.2		72.5	
										Bottom of Exploration at 72.5 feet below ground surface.	
75											

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Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: Bridge #5933
I-295 over Veranda Street
Location: Portland, ME

Boring No.: BB-PVS-201

WIN: 21745.00

Driller:	New England Boring Contractors	**Elevation (ft.)**	11.0 ft	**Auger ID/OD:**	SSA (--/4.5")
Operator:	Schaefer / Titus	**Datum:**	NAVD88	**Sampler:**	standard split-spoon
Logged By:	Schonewald	**Rig Type:**	Mobile Drill B-53 ATV (NEBC #D-19)	**Hammer Wt./Fall:**	140 lbs / 30 inches
Date Start/Finish:	9/11/18; 1005 - 9/14/18; 1330	**Drilling Method:**	cased wash boring	**Core Barrel:**	NQ2 (wireline)
Boring Location:	N 310637.7, E 1016696.2	**Casing ID/OD:**	HW (4/4.5") NW (3/3.5")	**Water Level*:**	1.2 ft (open)
Hammer Efficiency Factor: 0.712		**Hammer Type:**	Automatic ☒ Hydraulic ☐ Rope & Cathead ☐		

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

Depth (ft.)	Sample Information: Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N_{60}	Casing Blows	Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.
0	1D	24/7	0.0 - 2.0	3-5-6-4	11	13	SSA			Dark brown grading to brown, moist, medium dense, GRAVEL, some fine to coarse sand, some silt with minor roots. (TOPSOIL/SUBSOIL/ FILL)	
	2D	24/18	2.0 - 4.0	WOH-3-8-5	11	13		8.4		Upper 2 inches of sample: Brown, wet, fine to coarse SAND, trace Silt. (FILL) Changing at 2.6 ft to:	
										2.6	
	3D	24/21	4.0 - 6.0	WOH-2-2-1	4	5	PUSH HW			(2D) Olive brown, SILT, some clay, trace to little fine sand with highly mottled fine sandy zone from 3.0 to 3.4 ft; grading to Clayey SILT, trace very fine sand at 3.5 ft. (MARINE SILT-CLAY CRUST) Olive brown grading to grey, soft, Clayey SILT, trace very fine sand with layers of fine sandy silt. (MARINE SILT- CLAY CRUST)	
5								5.0		6.0	
	4D	24/12	6.0 - 8.0	WOR/12"-WOH/12"	--					Olive grey, very soft, Silty CLAY, trace very fine sand. (MARINE SILT-CLAY)	GTX#473561 HYDROMETER A-7-6(23) CL -#200=99.5%
	5D	24/24	8.0 - 10.0	WOR/12"-WOH/12"	--					Dark olive grey with occasional black, very soft, Silty CLAY. (MARINE SILT-CLAY)	GTX#473555 WC=48% LL=42 PL=21 PI=21
10	6D	24/24	10.0 - 12.0	WOR-WOH/18"	--					Dark olive grey with occasional black, very soft, Silty CLAY, trace very fine sand. (MARINE SILT-CLAY)	GTX#473562 HYDROMETER A-7-6(25) CL -#200=99.4%
											GTX#473556 WC=41% LL=44 PL=21 PI=23
15	7D	24/20	15.0 - 17.0	push thru vane						Dark grey with black, medium stiff, Silty CLAY. (MARINE SILT-CLAY)	GTX#473557 WC=45% LL=47 PL=23 PI=24
	V1		15.6 - 16.0	Su=581/67 psf						V1: 13 / 1.5 ft-lbs (55 mm x 110 mm vane raw torque readings)	
	V2		16.6 - 17.0	Su=625/89 psf						V2: 14 / 2 ft-lbs (55 mm x 110 mm vane raw torque readings)	
20	8D	24/24	20.0 - 22.0	push thru vane						Dark grey with occasional black, medium stiff, Silty CLAY. (MARINE SILT-CLAY)	GTX#473558 WC=45% LL=43 PL=22 PI=21
	V3		20.6 - 21.0	Su=893/112 psf						V3: 20 / 2.5 ft-lbs (55 mm x 110 mm vane raw torque readings)	
	V4		21.6 - 22.0	Su=670/89 psf						V4: 15 / 2 ft-lbs (55 mm x 110 mm vane raw torque readings)	
25											

Remarks:

NEBC Rig #D-19 automatic hammer calibrated on 7/3/2018.

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Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: Bridge #5933
I-295 over Veranda Street
Location: Portland, ME

Boring No.: BB-PVS-201

WIN: 21745.00

Driller:	New England Boring Contractors	**Elevation (ft.)**	11.0 ft	**Auger ID/OD:**	SSA (--/4.5")
Operator:	Schaefer / Titus	**Datum:**	NAVD88	**Sampler:**	standard split-spoon
Logged By:	Schonewald	**Rig Type:**	Mobile Drill B-53 ATV (NEBC #D-19)	**Hammer Wt./Fall:**	140 lbs / 30 inches
Date Start/Finish:	9/11/18; 1005 - 9/14/18; 1330	**Drilling Method:**	cased wash boring	**Core Barrel:**	NQ2 (wireline)
Boring Location:	N 310637.7, E 1016696.2	**Casing ID/OD:**	HW (4/4.5") NW (3/3.5")	**Water Level*:**	1.2 ft (open)
Hammer Efficiency Factor:	0.712	**Hammer Type:**	Automatic ☒ Hydraulic ☐ Rope & Cathead ☐		

Definitions:
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MD = Unsuccessful Split Spoon Sample Attempt
U = Thin Wall Tube Sample
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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: 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	U1	24/23	25.0 - 27.0	HYD PUSH						Dark grey, Silty CLAY. (MARINE SILT-CLAY)	GTX#IP-1 CONSOL (Cv, Cα) GTX#473549 WC=44% LL=43 PL=25 PI=18
30	9D	24/24	30.0 - 32.0	push thru vane						Dark grey, medium stiff to stiff, Silty CLAY. (MARINE SILT-CLAY)	GTX#473559 WC=44% LL=45 PL=23 PI=22
	~~V5~~		~~30.6 - 31.0~~	~~Su=804/112 psf~~						V5: 18 / 2.5 ft-lbs (55 mm x 110 mm vane raw torque readings)	
	V6		31.6 - 32.0	Su=1,005/179 psf						V6: 22.5 / 4 ft-lbs (55 mm x 110 mm vane raw torque readings)	
35	U2	24/24	35.0 - 37.0	HYD PUSH						Dark grey, Silty CLAY. (MARINE SILT- CLAY)	GTX#IP-2 CONSOL (Cv, Cα) GTX#473550 WC=41% LL=42 PL=25 PI=17
40	10D	24/24	40.0 - 42.0	push thru vane						Dark grey with black, medium stiff, Silty CLAY with few shell fragments. (MARINE SILT-CLAY)	GTX#473560 WC=38% LL=38 PL=18 PI=20
	~~V7~~		~~40.6 - 41.0~~	~~Su=737/45 psf~~						V7: 16.5 / 1 ft-lbs (55 mm x 110 mm vane raw torque readings)	
	V8		41.6 - 42.0	Su=804/67 psf						V8: 18 / 1.5 ft-lbs (55 mm x 110 mm vane raw torque readings)	
45	U3	24/24	45.0 - 47.0	HYD PUSH						Dark grey with black, Silty CLAY. (MARINE SILT-CLAY)	GTX#IP-3 CONSOL (Cv, Cα) GTX#473551 WC=39% LL=41 PL=23 PI=18
50											

Remarks:

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Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: Bridge #5933
I-295 over Veranda Street
Location: Portland, ME

Boring No.: BB-PVS-201

WIN: 21745.00

Driller:	New England Boring Contractors	**Elevation (ft.)**	11.0 ft	**Auger ID/OD:**	SSA (--/4.5")
Operator:	Schaefer / Titus	**Datum:**	NAVD88	**Sampler:**	standard split-spoon
Logged By:	Schonewald	**Rig Type:**	Mobile Drill B-53 ATV (NEBC #D-19)	**Hammer Wt./Fall:**	140 lbs / 30 inches
Date Start/Finish:	9/11/18; 1005 - 9/14/18; 1330	**Drilling Method:**	cased wash boring	**Core Barrel:**	NQ2 (wireline)
Boring Location:	N 310637.7, E 1016696.2	**Casing ID/OD:**	HW (4/4.5") NW (3/3.5")	**Water Level*:**	1.2 ft (open)
Hammer Efficiency Factor: 0.712		**Hammer Type:**	Automatic ☒ Hydraulic ☐ Rope & Cathead ☐		

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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.
50	11D	24/24	50.0 - 52.0	push thru vane						Dark grey with occasional black, medium stiff to stiff, Silty CLAY. (MARINE SILT-CLAY)	
	~~V9~~		~~50.6 - 51.0~~	~~Su=982/134 psf~~						V9: 22 / 3 ft-lbs (55 mm x 110 mm vane raw torque readings)	
	V10		51.6 - 52.0	Su=1,116/134 psf						V10: 25 / 3 ft-lbs (55 mm x 110 mm vane raw torque readings)	
55	U4	24/23	55.0 - 57.0	HYD PUSH				-47.4		Dark grey, Silty CLAY. (MARINE SILT-CLAY)	GTX#IP-4 CONSOL (Cv, Cα) GTX#473552 WC=34% LL=38 PL=20 PI=18
							56			58.4 ft: Unable to push HW casing past 58.4 ft; likely stratum change.	
60	12D	24/21	60.0 - 62.0	7-11-20-24	31	37	54			Dark grey, dense, fine Sandy SILT, grading to fine SAND, some silt. (MARINE FINE SANDS AND SILT)	
							49				
							50				
							50				
							62				
65	13D	22/10	65.5 - 67.3	20-33-38-50/4"	71	84	RC			Grey tan grading to orange tan, very dense, fine to medium SAND, little silt, trace coarse sand. (MARINE FINE SANDS AND SILT)	
								-57.5		68.5	
70	14D	24/13	70.0 - 72.0	31-28-25-21	53	63				Grey, very dense, fine to coarse SAND, some silt, little fine gravel. (TILL) 70.5 ft: Telescope NW (3-inch) casing.	
75	15D	24/12	74.0 - 76.0	25-31-48-66	79	94	20			Grey, very dense, fine to medium SAND, some silt, little fine gravel, trace coarse sand. (TILL)	

Remarks:

NEBC Rig #D-19 automatic hammer calibrated on 7/3/2018.

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Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: Bridge #5933
I-295 over Veranda Street
Location: Portland, ME

Boring No.: BB-PVS-201

WIN: 21745.00

Driller:	New England Boring Contractors	**Elevation (ft.)**	11.0 ft	**Auger ID/OD:**	SSA (--/4.5")
Operator:	Schaefer / Titus	**Datum:**	NAVD88	**Sampler:**	standard split-spoon
Logged By:	Schonewald	**Rig Type:**	Mobile Drill B-53 ATV (NEBC #D-19)	**Hammer Wt./Fall:**	140 lbs / 30 inches
Date Start/Finish:	9/11/18; 1005 - 9/14/18; 1330	**Drilling Method:**	cased wash boring	**Core Barrel:**	NQ2 (wireline)
Boring Location:	N 310637.7, E 1016696.2	**Casing ID/OD:**	HW (4/4.5") NW (3/3.5")	**Water Level*:**	1.2 ft (open)
Hammer Efficiency Factor:	0.712	**Hammer Type:**	Automatic ☒ Hydraulic ☐ Rope & Cathead ☐		

Definitions:
D = Split Spoon Sample
MD = Unsuccessful Split Spoon Sample Attempt
U = Thin Wall Tube Sample
MU = Unsuccessful Thin Wall Tube Sample Attempt
V = Field Vane Shear Test, PP = Pocket Penetrometer
MV = Unsuccessful Field Vane Shear Test Attempt
R = Rock Core Sample
SSA = Solid Stem Auger
HSA = Hollow Stem Auger
RC = Roller Cone
WOH = Weight of 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: 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.
75							27				
							56				
							54				
							49				
	16D	24/14	79.0 - 81.0	14-14-26-23	40	47	26			Grey, dense, Silty fine to medium SAND, some gravel, trace coarse sand. (TILL)	
80							43				
							82				
							84				
							63				
							--			84.2 ft: Roller cone refusal; telescope NW casing.	
85							31			84.4 ft: NW casing refusal; commence coring; pop through boulder at 85.4 ft.	
							42				
							37				
							64				
	17D	24/21	89.0 - 91.0	39-45-39-36	84	100	59			Grey, very dense, Silty fine to coarse SAND, some fine gravel. (TILL)	
90							69				
							89				
							92				
							90				
							RC				
95											
100	18D	24/24	99.5 - 101.5	WOH/12"-10-8	10	12	12			Grey, medium dense, fine to medium Sandy SILT, some gravel, trace	

Remarks:

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Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: Bridge #5933
I-295 over Veranda Street
Location: Portland, ME

Boring No.: BB-PVS-201

WIN: 21745.00

Driller:	New England Boring Contractors	**Elevation (ft.)**	11.0 ft	**Auger ID/OD:**	SSA (--/4.5")
Operator:	Schaefer / Titus	**Datum:**	NAVD88	**Sampler:**	standard split-spoon
Logged By:	Schonewald	**Rig Type:**	Mobile Drill B-53 ATV (NEBC #D-19)	**Hammer Wt./Fall:**	140 lbs / 30 inches
Date Start/Finish:	9/11/18; 1005 - 9/14/18; 1330	**Drilling Method:**	cased wash boring	**Core Barrel:**	NQ2 (wireline)
Boring Location:	N 310637.7, E 1016696.2	**Casing ID/OD:**	HW (4/4.5") NW (3/3.5")	**Water Level*:**	1.2 ft (open)
Hammer Efficiency Factor:	0.712	**Hammer Type:**	Automatic ☒ Hydraulic ☐ Rope & Cathead ☐		

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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.
100							15			coarse sand; apparent plasticity. (TILL)	
							14				
							21				
	R1	60/56	103.5 - 108.5	RQD: 31"=52%			NQ2	-92.5		103.3 ft: Roller cone refusal; drive NW casing to 103.5 ft.	
										103.5	
										Top of Bedrock at Elev. -92.5 ft. R1: Bedrock: Light green grey, aphanitic to fine grained, PHYLLITE with highly undulating, typically low angle remnant bedding; appears as though calcsilicate veins have weathered, hard, slightly to moderately weathered. Typically low angle, close, breaks; undulating, rough, typically discolored to decomposed, and open with mud infilling; shiny. Highly fractured (very close spacing) from 104.3 to 104.9 and 106.8 to 107.6 ft. (ELIOT FORMATION) Core times: 2:35/ 1:55/ 1:40/ 1:40/ 1:45 min:sec/ft ROCK QUALITY = FAIR	
105											
	R2	60/58	108.5 - 113.5	RQD: 38"=63% smpl 108.6-109.1						R2 (108.5-111.5 ft): Similar to R1, except typically fresh with occasional high angle calcsilicate veins; close to moderately spaced breaks, fresh to discolored.	GTX# n/a qp=700 ksf
110											
										R2A (111.5 to 113.5): Similar to R1, except less visible bedding and more high angle calcsilicate veins; very close to close breaks Core times (R2 and R2A): 1:40/ 1:35/ 1:40/ 1:35/ 1:35 min:sec/ft ROCK QUALITY = FAIR	
	R3	55/51	113.5 - 118.1	RQD: 4"=7%						R3: Similar to R2A, except low to high angle breaks. Core times: 1:40/ 2:15/ 2:55/ 2:10/ -- min:sec/ft ROCK QUALITY = VERY POOR	
115											
	R4	60/54	118.1 - 123.1	RQD: 22"=37%						R4 (118.1-120.4 ft): Similar to R2A, except low to high angle breaks. (Appears that most material lost in this zone (open and/or decomposed fractures)).	
120											
				smpl 120.9-121.6						R4A (120.4-123.1 ft): Similar to R2A, except significant calcsilicate veins (some weathered); close to moderately spaced, typically low angle breaks. Core times (R4 and R4A): 1:25/ 3:05/ 2:40/ 2:15/ 2:45 min:sec/ft ROCK QUALITY = POOR	GTX# n/a qp=930 ksf
	R5	60/60	123.1 - 128.1	RQD: 10"=17%						R5: Similar to R4A. Highly fractured and decomposed from 123.3 to 124.6 ft; near vertical break along significant calcsilicate vein from 124.6 to 126.9 ft. Core times: 1:40/ 1:30/ 1:35/ 1:55/ 2:40 min:sec/ft	
125											

Remarks:

NEBC Rig #D-19 automatic hammer calibrated on 7/3/2018.

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Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: Bridge #5933
I-295 over Veranda Street
Location: Portland, ME

Boring No.: BB-PVS-201

WIN: 21745.00

Driller:	New England Boring Contractors	**Elevation (ft.)**	11.0 ft	**Auger ID/OD:**	SSA (--/4.5")
Operator:	Schaefer / Titus	**Datum:**	NAVD88	**Sampler:**	standard split-spoon
Logged By:	Schonewald	**Rig Type:**	Mobile Drill B-53 ATV (NEBC #D-19)	**Hammer Wt./Fall:**	140 lbs / 30 inches
Date Start/Finish:	9/11/18; 1005 - 9/14/18; 1330	**Drilling Method:**	cased wash boring	**Core Barrel:**	NQ2 (wireline)
Boring Location:	N 310637.7, E 1016696.2	**Casing ID/OD:**	HW (4/4.5") NW (3/3.5")	**Water Level*:**	1.2 ft (open)
Hammer Efficiency Factor:	0.712	**Hammer Type:**	Automatic ☒ Hydraulic ☐ Rope & Cathead ☐		

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Depth (ft.)	Sample Information: Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N_{60}	Casing Blows	Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.
125										ROCK QUALITY = VERY POOR	
	R6	60/60	128.1 - 133.1	RQD: 35"=58% ~~smpl 128.2-129.1~~						R6: Similar to R4A. Start of near vertical fracture along calcsilicate vein at 132.5 ft. Core times: 1:55/ 1:40/ 2:00/ 1:45/ 1:30 min:sec/ft ROCK QUALITY = FAIR	GTX# n/a qp=903 ksf
130											
	R7	35/35	133.1 - 136.0	RQD: 7"=20%						R7: Similar to R4A, except very close breaks from 133.1 to 134.0 and 135.0 to 135.5 ft. Core times: 1:55/ 1:20/ -- min:sec/ft ROCK QUALITY = VERY POOR	
135								-125.0		136.0 **Bottom of Exploration at 136.0 feet below ground surface.**	
140											
145											
150											

Remarks:

NEBC Rig #D-19 automatic hammer calibrated on 7/3/2018.

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Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: Bridge #5933
I-295 over Veranda Street
Location: Portland, ME

Boring No.: BB-PVS-202

WIN: 21745.00

Driller:	New England Boring Contractors	**Elevation (ft.)**	13.8 ft	**Auger ID/OD:**	n/a (vac excavation to 7.5 ft)
Operator:	Schaefer / Titus	**Datum:**	NAVD88	**Sampler:**	standard split-spoon
Logged By:	Schonewald	**Rig Type:**	Mobile Drill B-53 truck (NEBC #B-24)	**Hammer Wt./Fall:**	140 lbs / 30 inches
Date Start/Finish:	10/11/18; 1155 - 10/23/18; 1500	**Drilling Method:**	cased wash boring	**Core Barrel:**	NQ2 (wireline)
Boring Location:	N 310708.2, E 1016680.5	**Casing ID/OD:**	HW (4/4.5") NW (3/3.5")	**Water Level*:**	7.5 ft (open)
Hammer Efficiency Factor: 0.937		**Hammer Type:**	Automatic ☒ Hydraulic ☐ Rope & Cathead ☐		

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$S_{u(lab)}$ = Lab Vane Undrained Shear Strength (psf)
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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
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C = Consolidation Test

Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N_{60}	Casing Blows	Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.
0							VAC	12.9		0.9 ft HMA	
										0.9 0.9 to 7.5 ft: Sand and Gravel Fill throughout vacuum excavation depth. (FILL)	
5							--				
							--				
10							--	3.8		10.0	
							PUSH HW				
15	1D	24/24	15.0 - 17.0	WOR-WOH/18"	--					Dark grey black, very soft, Silty CLAY. (MARINE SILT-CLAY)	GTX#489632 WC=47% LL=47 PL=24 PI=23
20	2D	24/24	20.0 - 22.0	push thru vane						Dark grey black, medium stiff, Silty CLAY. (MARINE SILT-CLAY)	GTX#489633 WC=44% LL=48 PL=24 PI=24
	V1		20.6 - 21.0	Su=737/89 psf						V1: 16.5 / 2 ft-lbs (55 mm x 110 mm vane raw torque readings)	
	V2		21.6 - 22.0	Su=737/89 psf						V2: 16.5 / 2 ft-lbs (55 mm x 110 mm vane raw torque readings)	
25											

Remarks:

NEBC Rig #B-24 automatic hammer calibrated on 7/3/2018.
Successfully vacuum excavate to 7.5 ft BGS; terminated at observed groundwater.

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Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: Bridge #5933
I-295 over Veranda Street
Location: Portland, ME

Boring No.: BB-PVS-202

WIN: 21745.00

Driller:	New England Boring Contractors	**Elevation (ft.)**	13.8 ft	**Auger ID/OD:**	n/a (vac excavation to 7.5 ft)
Operator:	Schaefer / Titus	**Datum:**	NAVD88	**Sampler:**	standard split-spoon
Logged By:	Schonewald	**Rig Type:**	Mobile Drill B-53 truck (NEBC #B-24)	**Hammer Wt./Fall:**	140 lbs / 30 inches
Date Start/Finish:	10/11/18; 1155 - 10/23/18; 1500	**Drilling Method:**	cased wash boring	**Core Barrel:**	NQ2 (wireline)
Boring Location:	N 310708.2, E 1016680.5	**Casing ID/OD:**	HW (4/4.5") NW (3/3.5")	**Water Level*:**	7.5 ft (open)
Hammer Efficiency Factor:	0.937	**Hammer Type:**	Automatic ☒ Hydraulic ☐ Rope & Cathead ☐		

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Depth (ft.)	Sample Information: Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N_{60}	Casing Blows	Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.
25	3D	24/17	25.0 - 27.0	push thru vane						Dark grey with occasional black, medium stiff, Silty CLAY. (MARINE SILT-CLAY)	GTX#489634
	~~V3~~		~~25.6 - 26.0~~	~~Su=759/112 psf~~						V3: 17 / 2.5 ft-lbs (55 mm x 110 mm vane raw torque readings)	WC=43%
	V4		26.6 - 27.0	Su=714/112 psf						V4: 16 / 2.5 ft-lbs (55 mm x 110 mm vane raw torque readings)	LL=43
											PL=23
											PI=20
30	MU	24/6	30.0 - 32.0	HYD PUSH						MU: Sample extruded and jarred. Dark grey with occasional black, Silty CLAY. (MARINE SILT-CLAY)	
	U1	24/11	33.0 - 35.0	HYD PUSH						Dark grey, Silty CLAY. (MARINE SILT- CLAY)	GTX#IP-9 CONSOL (Cv, Cα)
35	4D	24/22	35.0 - 37.0	push thru vane						Dark grey, medium stiff, Silty CLAY. (MARINE SILT-CLAY)	GTX#489628
	~~V5~~		~~35.6 - 36.0~~	~~Su=938/112 psf~~						V5: 21 / 2.5 ft-lbs (55 mm x 110 mm vane raw torque readings)	WC=42%
	V6		36.6 - 37.0	Su=826/89 psf						V6: 18.5 / 2 ft-lbs (55 mm x 110 mm vane raw torque readings)	LL=41
											PL=25
										37.7 ft: Casing fetches-up; shell fragments in wash water; possible ancient clam bed.	PI=16
							46				
							47				
40	5D	24/24	40.0 - 42.0	push thru vane			PUSH			Dark grey, medium stiff, Silty CLAY; minor shell fragments. (MARINE SILT-CLAY)	GTX#489635
	~~V7~~		~~40.6 - 41.0~~	~~Su=826/67 psf~~			HW			V7: 18.5 / 1.5 ft-lbs (55 mm x 110 mm vane raw torque readings); gritty layers noted.	WC=41%
	V8		41.6 - 42.0	Su=893/67 psf						V8: 20 / 1.5 ft-lbs (55 mm x 110 mm vane raw torque readings)	LL=40
											PL=24
											PI=16
45	U2	24/24	45.0 - 47.0	HYD PUSH						Dark grey black, Silty CLAY with shell fragments. (MARINE SILT-CLAY)	
50											

Remarks:

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Successfully vacuum excavate to 7.5 ft BGS; terminated at observed groundwater.

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Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: Bridge #5933
I-295 over Veranda Street
Location: Portland, ME

Boring No.: BB-PVS-202

WIN: 21745.00

Driller:	New England Boring Contractors	**Elevation (ft.)**	13.8 ft	**Auger ID/OD:**	n/a (vac excavation to 7.5 ft)
Operator:	Schaefer / Titus	**Datum:**	NAVD88	**Sampler:**	standard split-spoon
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G = Grain Size Analysis
C = Consolidation Test

Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N_{60}	Casing Blows	Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.
50	6D	24/24	50.0 - 52.0	push thru vane						Dark grey black, medium stiff to stiff, Silty CLAY. (MARINE SILT-CLAY)	
	~~V9~~		~~50.6 - 51.0~~	~~Su=1,094/22 psf~~						V9: 24.5 / 0.5 ft-lbs (55 mm x 110 mm vane raw torque readings)	
	V10		51.6 - 52.0	Su=915/22 psf						V10: 20.5 / 0.5 ft-lbs (55 mm x 110 mm vane raw torque readings)	
55	7D	24/24	55.0 - 57.0	push thru vane						Dark grey, medium stiff, Silty CLAY. (MARINE SILT-CLAY)	
	~~V11~~		~~55.6 - 56.0~~	~~Su=843/45 psf~~						V11: 19 / 1 ft-lbs (55 mm x 110 mm vane raw torque readings)	
	V12		56.6 - 57.0	Su=871/45 psf						V12: 19.5 / 1 ft-lbs (55 mm x 110 mm vane raw torque readings)	
60	8D	24/24	60.0 - 62.0	push thru vane						Dark grey, medium stiff to stiff, Silty CLAY. (MARINE SILT-CLAY)	
	~~V13~~		~~60.6 - 61.0~~	~~Su=982/89 psf~~						V13: 22 / 2 ft-lbs (55 mm x 110 mm vane raw torque readings)	
	V14		61.6 - 62.0	Su=1,027/89 psf						V14: 23 / 2 ft-lbs (55 mm x 110 mm vane raw torque readings)	
							61			62.0 ft: Casing fetches-up.	
							59				
							57				
65	9D	24/24	65.0 - 67.0	(VANE/18")-WOR			34			Dark grey black, stiff, Silty CLAY with occasional fine sandy silt seams and one concretion; changing at 66.5 ft to:	
	~~V15~~		~~65.6 - 66.0~~	~~Su=1,429/134 psf~~						V15: Tu=32 / Tr=3 ft-lbs (55 mm x 110 mm vane raw torque readings)	
	MV						50	-52.7		MV: Unable to push past 66.3 ft.	
							48			66.5 (9D) Dark grey, SILT, some fine sand. (MARINE FINE SANDS AND SILT)	
							45				
							45				
70	10D	24/11	70.0 - 72.0	2-3-4-4	7	11	36			Grey, loose, fine to medium SAND, with varying amounts of silt (trace to some). (MARINE FINE SANDS AND SILT)	
							48				
							47				
							51				
75							43				

Remarks:

NEBC Rig #B-24 automatic hammer calibrated on 7/3/2018.
Successfully vacuum excavate to 7.5 ft BGS; terminated at observed groundwater.

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

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Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: Bridge #5933
I-295 over Veranda Street
Location: Portland, ME

Boring No.: BB-PVS-202

WIN: 21745.00

Driller:	New England Boring Contractors	**Elevation (ft.)**	13.8 ft	**Auger ID/OD:**	n/a (vac excavation to 7.5 ft)
Operator:	Schaefer / Titus	**Datum:**	NAVD88	**Sampler:**	standard split-spoon
Logged By:	Schonewald	**Rig Type:**	Mobile Drill B-53 truck (NEBC #B-24)	**Hammer Wt./Fall:**	140 lbs / 30 inches
Date Start/Finish:	10/11/18; 1155 - 10/23/18; 1500	**Drilling Method:**	cased wash boring	**Core Barrel:**	NQ2 (wireline)
Boring Location:	N 310708.2, E 1016680.5	**Casing ID/OD:**	HW (4/4.5") NW (3/3.5")	**Water Level*:**	7.5 ft (open)
Hammer Efficiency Factor:	0.937	**Hammer Type:**	Automatic ☒ Hydraulic ☐ Rope & Cathead ☐		

Definitions:
D = Split Spoon Sample
MD = Unsuccessful Split Spoon Sample Attempt
U = Thin Wall Tube Sample
MU = Unsuccessful Thin Wall Tube Sample Attempt
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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 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.
75	11D	24/18	75.0 - 77.0	3-3-3-3	6	9	47			Grey, loose, fine to medium SAND, trace to little silt. (MARINE FINE SANDS AND SILT)	
							48				
							48				
							60				
							62				
80	12D	24/12	80.0 - 82.0	4-9-23-26	32	50	51			Grey tan, fine to medium SAND, trace to little silt. (MARINE FINE SANDS AND SILT) Changing at 81.6 ft to:	
							131	-67.8		81.6	
							157			(12D) Red tan, fine to medium SAND, some fine gravel, little to some silt, trace coarse sand. (TILL)	
							161				
							158				
85							RC			85.5 ft: Telescope NW (3-inch) casing.	
	13D	24/13	86.0 - 88.0	8-6-7-9	13	20	RC			Grey tan, medium dense, fine to medium SAND, little to some silt, trace fine gravel, trace coarse sand with one 1/2- inch seam rust fine sand, trace silt and zones of fine to medium sand, trace to little silt. (TILL)	GTX#489646 GRAIN SIZE A-2-4(0) SM -#200=19.7%
90	14D	24/11	90.0 - 92.0	19-34-37-18	71	111	48			Tan grey, very dense, Gravelly fine to coarse SAND, little silt. (TILL)	
							57				
							54				
							52				
							120				
95	15D	3/3	95.0 - 95.3	50/3"	--		RC			Grey, fine to medium SAND, some silt, some fine gravel, trace coarse sand. (TILL)	
100											

Remarks:

NEBC Rig #B-24 automatic hammer calibrated on 7/3/2018.
Successfully vacuum excavate to 7.5 ft BGS; terminated at observed groundwater.

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

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Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: Bridge #5933
I-295 over Veranda Street
Location: Portland, ME

Boring No.: BB-PVS-202

WIN: 21745.00

Driller:	New England Boring Contractors	**Elevation (ft.)**	13.8 ft	**Auger ID/OD:**	n/a (vac excavation to 7.5 ft)
Operator:	Schaefer / Titus	**Datum:**	NAVD88	**Sampler:**	standard split-spoon
Logged By:	Schonewald	**Rig Type:**	Mobile Drill B-53 truck (NEBC #B-24)	**Hammer Wt./Fall:**	140 lbs / 30 inches
Date Start/Finish:	10/11/18; 1155 - 10/23/18; 1500	**Drilling Method:**	cased wash boring	**Core Barrel:**	NQ2 (wireline)
Boring Location:	N 310708.2, E 1016680.5	**Casing ID/OD:**	HW (4/4.5") NW (3/3.5")	**Water Level*:**	7.5 ft (open)
Hammer Efficiency Factor:	0.937	**Hammer Type:**	Automatic ☒ Hydraulic ☐ Rope & Cathead ☐		

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

Depth (ft.)	Sample Information: Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N_{60}	Casing Blows	Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.
100	16D	24/15	100.0 - 102.0	41-45-51-62	96	150	54			Grey, very dense, Gravelly fine to coarse SAND, some silt. (TILL)	
							57				
							114			102.5 to 145.5 ft: Loosely nested cobbles and boulders.	
							92				
							RC				
105							RC				
	17D	24/13	106.0 - 108.0	26-27-23-20	50	78	40			Grey, dense, fine to medium SAND, some gravel, some silt, trace coarse sand. (TILL)	
							44				
							68				
							RC				
110							38				
							44				
							RC				
							RC				
							RC				
115	18D	24/22	115.0 - 117.0	2-3-4-8	7	11	PUSH			Grey, loose, Silty fine to medium SAND, little fine gravel (rounded), trace coarse sand. (TILL)	GTX#489647 GRAIN SIZE A-4(0) SM -#200=43.2%
							RC				
							RC				
							RC				
120							14				
							21				
							22				
							22				
125							26				

Remarks:

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Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: Bridge #5933
I-295 over Veranda Street
Location: Portland, ME

Boring No.: BB-PVS-202

WIN: 21745.00

Driller:	New England Boring Contractors	**Elevation (ft.)**	13.8 ft	**Auger ID/OD:**	n/a (vac excavation to 7.5 ft)
Operator:	Schaefer / Titus	**Datum:**	NAVD88	**Sampler:**	standard split-spoon
Logged By:	Schonewald	**Rig Type:**	Mobile Drill B-53 truck (NEBC #B-24)	**Hammer Wt./Fall:**	140 lbs / 30 inches
Date Start/Finish:	10/11/18; 1155 - 10/23/18; 1500	**Drilling Method:**	cased wash boring	**Core Barrel:**	NQ2 (wireline)
Boring Location:	N 310708.2, E 1016680.5	**Casing ID/OD:**	HW (4/4.5") NW (3/3.5")	**Water Level*:**	7.5 ft (open)
Hammer Efficiency Factor:	0.937	**Hammer Type:**	Automatic ☒ Hydraulic ☐ Rope & Cathead ☐		

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Depth (ft.)	Sample Information: Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N_{60}	Casing Blows	Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.
125							RC			Cobble/boulder at 125.6 ft.	
							RC				
							RC			Cobble/boulder at 127.5 ft.	
							RC			Cobble/boulder at 128.5 ft.	
							RC				
130	19D	24/18	130.0 - 132.0	17-21-24-33	45	70	RC			Grey, dense, Silty fine to medium SAND, little to some gravel (rounded), trace coarse sand. (TILL)	
135											
140	20D	24/24	140.0 - 142.0	14-9-12-7	21	33				Grey, dense, fine to medium Sandy SILT, little gravel (rounded), trace coarse sand; apparent plasticity. (TILL)	
145								-131.7		145.5	
								-132.7		146.5	
	R1	60/60	147.0 - 152.0	RQD: 18"=30%			NQ2			Top of Bedrock at Elev. -132.7 ft. R1: Medium grey, aphanitic to fine grained, PHYLLITE with low angle relic bedding, numerous weathered calcsilicate veins, and cracks; hard, slightly weathered. Low angle, very close to close breaks; undulating, rough, typically discolored to decomposed, and open with mud infilling. (ELIOT FORMATION)	
150											

Remarks:

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Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: Bridge #5933
I-295 over Veranda Street
Location: Portland, ME

Boring No.: BB-PVS-202

WIN: 21745.00

Driller:	New England Boring Contractors	**Elevation (ft.)**	13.8 ft	**Auger ID/OD:**	n/a (vac excavation to 7.5 ft)
Operator:	Schaefer / Titus	**Datum:**	NAVD88	**Sampler:**	standard split-spoon
Logged By:	Schonewald	**Rig Type:**	Mobile Drill B-53 truck (NEBC #B-24)	**Hammer Wt./Fall:**	140 lbs / 30 inches
Date Start/Finish:	10/11/18; 1155 - 10/23/18; 1500	**Drilling Method:**	cased wash boring	**Core Barrel:**	NQ2 (wireline)
Boring Location:	N 310708.2, E 1016680.5	**Casing ID/OD:**	HW (4/4.5") NW (3/3.5")	**Water Level*:**	7.5 ft (open)
Hammer Efficiency Factor:	0.937	**Hammer Type:**	Automatic ☒ Hydraulic ☐ Rope & Cathead ☐		

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N-uncorrected = Raw Field SPT N-value
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N_{60} = SPT N-uncorrected Corrected for Hammer Efficiency
N_{60} = (Hammer Efficiency Factor/60%)*N-uncorrected
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Depth (ft.)	Sample Information: Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N_{60}	Casing Blows	Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.
150										Core times: 2:45/ 2:25/ 2:45/ 2:05/ 2:00 min:sec/ft. ROCK QUALITY = POOR	
				smpl 151.4-151.9							
	R2	60/60	152.0 - 157.0	RQD: 42"=70%						R2: Medium grey grading to brownish grey, aphanitic to fine grained, PHYLLITE with highly undulating, typically moderately dipping relic bedding and numerous fresh, cross bedding calcsilicate veins; hard, fresh. Low angle to moderately dipping, close to moderately spaced, breaks; undulating, rough, typically fresh, and open with mud infilling typical; shiny. (ELIOT FORMATION) Core times: 2:25/ 1:50/ 2:00/ 2:05/ 1:45 min:sec/ft. ROCK QUALITY = FAIR	GTX# n/a qp=877 ksf
				smpl 153.5-154.0							GTX# n/a qp=1,269 ksf
155											
	R3	60/60	157.0 - 162.0	RQD: 50"=83% smpl 157.2-157.6						R3: Similar to R2, except brownish-grey and moderately spaced breaks. Core times: 2:00/ 1:40/ 1:25/ 1:30/ 1:25 min:sec/ft. ROCK QUALITY = GOOD	GTX# n/a qp=894 ksf
160											
	R4	60/60	162.0 - 167.0	RQD: 47"=78%						R4: Similar to R3. Core times: 2:40/ 1:55/ 1:45/ 2:00/ 2:15 min:sec/ft. ROCK QUALITY = GOOD	
165											
	R5	60/59	167.0 - 172.0	RQD: 43"=72%						R5: Similar to R3, except grading to m. grey. Open fracture with mud infilling at 168.1 ft. Core times: 2:30/ 2:15/ 1:30/ 1:50/ 1:30 min:sec/ft. ROCK QUALITY = FAIR	
170								-158.2		172.0 **Bottom of Exploration at 172.0 feet below ground surface.**	
175											

Remarks:

NEBC Rig #B-24 automatic hammer calibrated on 7/3/2018.
Successfully vacuum excavate to 7.5 ft BGS; terminated at observed groundwater.

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Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: Bridge #5933
I-295 over Veranda Street
Location: Portland, ME

Boring No.: BB-PVS-203

WIN: 21745.00

Driller:	New England Boring Contractors	**Elevation (ft.)**	13.3 ft	**Auger ID/OD:**	n/a (vac excavation to 7.5 ft)
Operator:	Schaefer / Titus	**Datum:**	NAVD88	**Sampler:**	standard split-spoon
Logged By:	Schonewald	**Rig Type:**	Mobile Drill B-53 truck (NEBC #B-24)	**Hammer Wt./Fall:**	140 lbs / 30 inches
Date Start/Finish:	10/3/18; 0810 - 10/11/18; 1145	**Drilling Method:**	cased wash boring	**Core Barrel:**	NQ2 (wireline)
Boring Location:	N 310775.0, E 1016750.0	**Casing ID/OD:**	HW (4/4.5") NW (3/3.5")	**Water Level*:**	7.3 ft (open)
Hammer Efficiency Factor: 0.937		**Hammer Type:**	Automatic ☒ Hydraulic ☐ Rope & Cathead ☐		

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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)
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T_v = Pocket Torvane Shear Strength (psf)
WC = Water Content, percent
LL = Liquid Limit
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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							VAC	12.4		0.9 ft HMA (0.9)	
										0.9 to 7.5 ft: vacuum excavation; predominately sand and gravel fill.	
5							--				
							--				
							PUSH	4.3		(9.0)	
10	1D	24/16	10.0 - 12.0	WOH/24"	--					Olive grey with occasional black, very soft, Silty CLAY. (MARINE SILT-CLAY)	GTX#489636 WC=44% LL=40 PL=20 PI=20
15	2D	24/24	15.0 - 17.0	WOH/24"	--					Olive grey black, very soft, Silty CLAY. (MARINE SILT-CLAY)	GTX#489637 WC=44% LL=45 PL=25 PI=20
20	3D	24/24	20.0 - 22.0	push thru vane						Olive grey black, medium stiff, Silty CLAY. (MARINE SILT-CLAY)	
	V1		20.6 - 21.0	Su=915/156 psf						V1: 20.5 / 3.5 ft-lbs (55 mm x 110 mm vane raw torque readings)	
	V2		21.6 - 22.0	Su=781/134 psf						V2: 15 / 3 ft-lbs (55 mm x 110 mm vane raw torque readings)	
25											

Remarks:

NEBC Rig #B-24 automatic hammer calibrated on 7/3/2018.
Crown of corrugated metal pipe encountered at approximately 6 ft BGS in first vacuum excavation; move approximately 1.5 ft westerly and retry. Successfully vacuum excavate to 7.5 ft BGS; terminated at observed groundwater.

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Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: Bridge #5933
I-295 over Veranda Street
Location: Portland, ME

Boring No.: BB-PVS-203

WIN: 21745.00

Driller:	New England Boring Contractors	**Elevation (ft.)**	13.3 ft	**Auger ID/OD:**	n/a (vac excavation to 7.5 ft)
Operator:	Schaefer / Titus	**Datum:**	NAVD88	**Sampler:**	standard split-spoon
Logged By:	Schonewald	**Rig Type:**	Mobile Drill B-53 truck (NEBC #B-24)	**Hammer Wt./Fall:**	140 lbs / 30 inches
Date Start/Finish:	10/3/18; 0810 - 10/11/18; 1145	**Drilling Method:**	cased wash boring	**Core Barrel:**	NQ2 (wireline)
Boring Location:	N 310775.0, E 1016750.0	**Casing ID/OD:**	HW (4/4.5") NW (3/3.5")	**Water Level*:**	7.3 ft (open)
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N-uncorrected = Raw Field SPT N-value
Hammer Efficiency Factor = Rig Specific Annual Calibration Value
N_{60} = SPT N-uncorrected Corrected for Hammer Efficiency
N_{60} = (Hammer Efficiency Factor/60%)*N-uncorrected
T_v = Pocket Torvane Shear Strength (psf)
WC = Water Content, percent
LL = Liquid Limit
PL = Plastic Limit
PI = Plasticity Index
G = Grain Size Analysis
C = Consolidation Test

Depth (ft.)	Sample Information: Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N_{60}	Casing Blows	Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.
25	U1	24/19	25.0 - 27.0	HYD PUSH						Dark grey, Silty CLAY. (MARINE SILT-CLAY)	GTX#IP-10 CONSOL (Cv, Cα) GTX#489629 WC=38% LL=42 PL=24 PI=18
30	4D	24/24	30.0 - 32.0	push thru vane						Dark grey black, medium stiff, Silty CLAY. (MARINE SILT-CLAY)	
	~~V3~~		~~30.6 - 31.0~~	~~Su=915/112 psf~~						V3: 20.5 / 2.5 ft-lbs (55 mm x 110 mm vane raw torque readings)	
	V4		31.6 - 32.0	Su=982/112 psf						V4: 22 / 2.5 ft-lbs (55 mm x 110 mm vane raw torque readings)	
35	5D	24/24	35.0 - 37.0	push thru vane						Dark grey, medium stiff, Silty CLAY. (MARINE SILT-CLAY)	
	~~V5~~		~~35.6 - 36.0~~	~~Su=893/134 psf~~						V5: 20 / 3 ft-lbs (55 mm x 110 mm vane raw torque readings)	
	V6		36.6 - 37.0	Su=960/134 psf						V6: 21.5 / 3 ft-lbs (55 mm x 110 mm vane raw torque readings)	
40	U2	24/16	40.0 - 42.0	HYD PUSH						Dark grey, Silty CLAY. (MARINE SILT-CLAY)	GTX#IP-7 CONSOL (Cv, Cα) GTX#489630 WC=39% LL=40 PL=24 PI=16
45	6D	24/24	45.0 - 47.0	push thru vane						Dark grey black, medium stiff, Silty CLAY, with nodules throughout and occasional shell fragments. (MARINE SILT-CLAY)	
	~~V7~~		~~45.6 - 46.0~~	~~Su=759/45 psf~~						V7: 17 / 1 ft-lbs (55 mm x 110 mm vane raw torque readings)	
	V8		46.6 - 47.0	Su=737/22 psf						V8: 16.5 / 0.5 ft-lbs (55 mm x 110 mm vane raw torque readings)	
50											

Remarks:

NEBC Rig #B-24 automatic hammer calibrated on 7/3/2018.
Crown of corrugated metal pipe encountered at approximately 6 ft BGS in first vacuum excavation; move approximately 1.5 ft westerly and retry. Successfully vacuum excavate to 7.5 ft BGS; terminated at observed groundwater.

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Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: Bridge #5933
I-295 over Veranda Street
Location: Portland, ME

Boring No.: BB-PVS-203

WIN: 21745.00

Driller:	New England Boring Contractors	**Elevation (ft.)**	13.3 ft	**Auger ID/OD:**	n/a (vac excavation to 7.5 ft)
Operator:	Schaefer / Titus	**Datum:**	NAVD88	**Sampler:**	standard split-spoon
Logged By:	Schonewald	**Rig Type:**	Mobile Drill B-53 truck (NEBC #B-24)	**Hammer Wt./Fall:**	140 lbs / 30 inches
Date Start/Finish:	10/3/18; 0810 - 10/11/18; 1145	**Drilling Method:**	cased wash boring	**Core Barrel:**	NQ2 (wireline)
Boring Location:	N 310775.0, E 1016750.0	**Casing ID/OD:**	HW (4/4.5") NW (3/3.5")	**Water Level*:**	7.3 ft (open)
Hammer Efficiency Factor:	0.937	**Hammer Type:**	Automatic ☒ Hydraulic ☐ Rope & Cathead ☐		

Definitions:
D = Split Spoon Sample
MD = Unsuccessful Split Spoon Sample Attempt
U = Thin Wall Tube Sample
MU = Unsuccessful Thin Wall Tube Sample Attempt
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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 No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N_{60}	Casing Blows	Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.
50	U3	24/24	50.0 - 52.0	HYD PUSH						Dark grey black, Silty CLAY. (MARINE SILT-CLAY)	GTX#IP-8 CONSOL (Cv, Cα) GTX#489631 WC=37% LL=37 PL=22 PI=15
55	7D	24/24	55.0 - 57.0	push thru vane						Dark grey black, medium stiff, Silty CLAY. (MARINE SILT-CLAY)	
	~~V9~~		~~55.6 - 56.0~~	~~Su=915/89 psf~~						V9: 20.5 / 2 ft-lbs (55 mm x 110 mm vane raw torque readings)	
	V10		56.6 - 57.0	Su=848/67 psf						V10: 19 / 1.5 ft-lbs (55 mm x 110 mm vane raw torque readings)	
60	8D	24/24	60.0 - 62.0	push thru vane						Dark grey black, medium stiff to stiff, Silty CLAY with one 1-inch layer silty fine sand.	
	~~V11~~		~~60.6 - 61.0~~	~~Su=982/89 psf~~						V11: 22 / 2 ft-lbs (55 mm x 110 mm vane raw torque readings)	
	V12		61.6 - 62.0	Su=1,183/156 psf						V12: 26.5 / 3.5 ft-lbs (55 mm x 110 mm vane raw torque readings)	
65	9D	24/24	65.0 - 67.0	(VANE/12")-6-3			--			Dark grey, Silty CLAY; changing at 66.1 ft to:	
	~~V13~~		~~65.6 - 66.0~~	~~Su=1,340/313 psf~~				-52.7		V13: 30 / 7 ft-lbs (55 mm x 110 mm vane raw torque readings)	
	MV						82			66.0 MV: Unable to push past 66.0 ft. (9D) Grey, SILT, some fine sand grading to Silty fine SAND. (MARINE FINE SANDS AND SILT)	
							63				
							62				
							68				
70	10D	24/9	70.0 - 72.0	5-4-2-2	6	9	71			Grey, loose, fine SAND, trace to little silt. (MARINE FINE SANDS AND SILT)	
							65				
							66				
							72				
75							75				

Remarks:

NEBC Rig #B-24 automatic hammer calibrated on 7/3/2018.
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Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: Bridge #5933
I-295 over Veranda Street
Location: Portland, ME

Boring No.: BB-PVS-203

WIN: 21745.00

Driller:	New England Boring Contractors	**Elevation (ft.)**	13.3 ft	**Auger ID/OD:**	n/a (vac excavation to 7.5 ft)
Operator:	Schaefer / Titus	**Datum:**	NAVD88	**Sampler:**	standard split-spoon
Logged By:	Schonewald	**Rig Type:**	Mobile Drill B-53 truck (NEBC #B-24)	**Hammer Wt./Fall:**	140 lbs / 30 inches
Date Start/Finish:	10/3/18; 0810 - 10/11/18; 1145	**Drilling Method:**	cased wash boring	**Core Barrel:**	NQ2 (wireline)
Boring Location:	N 310775.0, E 1016750.0	**Casing ID/OD:**	HW (4/4.5") NW (3/3.5")	**Water Level*:**	7.3 ft (open)
Hammer Efficiency Factor:	0.937	**Hammer Type:**	Automatic ☒ Hydraulic ☐ Rope & Cathead ☐		

Definitions:
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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
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Depth (ft.)	Sample Information: Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N_{60}	Casing Blows	Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.
75	11D	24/8	75.0 - 77.0	HAMMER ERROR	--		--			Grey grading to tan, fine SAND, trace silt. (MARINE FINE SANDS AND SILT)	
							66				
							58				
							115				
							RC	-65.7		79.0	
80	MD	4/0	80.0 - 80.3	90/4"	--		RC			80.5 ft: Telescope NW (3-inch) casing.	
	12D	24/8	81.0 - 83.0	30-27-23-34	50	78	--			Grey to grey tan, dense, Gravelly fine to coarse SAND, little silt. (TILL)	
							--				
							28				
							37				
85	13D	24/10	85.0 - 87.0	14-7-10-10	17	27	7			Tan to red tan, medium dense, fine to medium SAND, little to some gravel, little silt, trace coarse sand. (TILL) Changing at 86.4 ft to:	
							9			(13D) Grey, fine to medium SAND, some silt, little to some fine gravel, trace coarse sand. (TILL)	
							21				
							31				
							19				
90	14D	24/11	90.0 - 92.0	6-7-7-11	14	22	15			Grey, medium dense, fine to medium SAND, little to some fine gravel, little to some silt, trace coarse sand. (TILL)	
							10				
							19				
							30				
							62				
95	15D	24/14	95.0 - 97.0	20-22-24-19	46	72	--			Grey, dense, fine to medium SAND, little to some fine gravel, little to some silt, trace coarse sand. (TILL)	
							--				
							--				
							--				
100							--				

Remarks:

NEBC Rig #B-24 automatic hammer calibrated on 7/3/2018.
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Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: Bridge #5933
I-295 over Veranda Street
Location: Portland, ME

Boring No.: BB-PVS-203

WIN: 21745.00

Driller:	New England Boring Contractors	**Elevation (ft.)**	13.3 ft	**Auger ID/OD:**	n/a (vac excavation to 7.5 ft)
Operator:	Schaefer / Titus	**Datum:**	NAVD88	**Sampler:**	standard split-spoon
Logged By:	Schonewald	**Rig Type:**	Mobile Drill B-53 truck (NEBC #B-24)	**Hammer Wt./Fall:**	140 lbs / 30 inches
Date Start/Finish:	10/3/18; 0810 - 10/11/18; 1145	**Drilling Method:**	cased wash boring	**Core Barrel:**	NQ2 (wireline)
Boring Location:	N 310775.0, E 1016750.0	**Casing ID/OD:**	HW (4/4.5") NW (3/3.5")	**Water Level*:**	7.3 ft (open)
Hammer Efficiency Factor:	0.937	**Hammer Type:**	Automatic ☒ Hydraulic ☐ Rope & Cathead ☐		

Definitions:
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WOR/C = Weight of Rods or Casing
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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.
100	16D	24/13	100.0 - 102.0	22-27-22-18	49	77	--			Grey, dense, fine to medium SAND, some silt, some gravel, trace coarse sand. (TILL)	
							19				
							30				
							84				
							129				
105	17D	24/13	105.0 - 107.0	65-35-32-45	67	105	RC			Grey, very dense, fine to medium SAND, some silt, little to some gravel, trace coarse sand. (TILL)	
								-95.7		109.0	
	R1	48/48	109.0 - 113.0	RQD: 41"=85%			NQ2			Top of Bedrock at Elev. -95.7 ft. R1: Medium grey, aphanitic to fine grained, PHYLLITE with low angle relic bedding and occasional thin, cross-bedding calcsilicate veins; hard, fresh. Low angle, close breaks; undulating, rough, typically fresh, and open with mud infilling typical; shiny. (ELIOT FORMATION) Core times: 2:25/ 3:30/ 2:45/ 1:55 min:sec/ft. ROCK QUALITY = GOOD	
110											
				smpl 111.1-111.8							GTX# n/a qp=2,177 ksf
	R2	57/57	113.0 - 117.8	RQD: 40"=70%						R2: Medium grey, aphanitic to fine grained, PHYLLITE with moderately dipping and high angle relic bedding, numerous calcsilicate veins (thicker veins typically weathered), and occasional high angle cracks; hard, typically fresh. Moderately dipping, close breaks; undulating, rough, typically fresh, and open with mud infilling typical; shiny. (ELIOT FORMATION) Core times: 1:55/ 2:05/ 1:50/ 2:00/ -- min:sec/ft. ROCK QUALITY = FAIR	
115											
				smpl 116.4-116.8							GTX# n/a qp=1,290 ksf
	R3	60/48	117.8 - 122.8	RQD: 12"=20%						R3: Similar to R2, except typically slightly to highly weathered. Where slightly weathered: close, low angle breaks. One 1-inch wide, mud infilled break at 123.3 ft. Highly weathered and fractured below 124.9 ft. Core times: 2:05/ 1:55/ 2:10/ 2:40/ 3:10 min:sec/ft. ROCK QUALITY = VERY POOR	
120											
	R4	21/18	122.8 - 124.6	RQD: 4"=19%						R4 (122.8 to 124.6 ft): Similar rock to R3; moderately weathered and highly fractured. ROCK QUALITY = VERY POOR	
	R4A	39/39	124.6 - 127.9	RQD: 25"=64%						R4A (124.6 to 127.8 ft): Similar to R2.	
125											

Remarks:

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Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: Bridge #5933
I-295 over Veranda Street
Location: Portland, ME

Boring No.: BB-PVS-203

WIN: 21745.00

Driller:	New England Boring Contractors	**Elevation (ft.)**	13.3 ft	**Auger ID/OD:**	n/a (vac excavation to 7.5 ft)
Operator:	Schaefer / Titus	**Datum:**	NAVD88	**Sampler:**	standard split-spoon
Logged By:	Schonewald	**Rig Type:**	Mobile Drill B-53 truck (NEBC #B-24)	**Hammer Wt./Fall:**	140 lbs / 30 inches
Date Start/Finish:	10/3/18; 0810 - 10/11/18; 1145	**Drilling Method:**	cased wash boring	**Core Barrel:**	NQ2 (wireline)
Boring Location:	N 310775.0, E 1016750.0	**Casing ID/OD:**	HW (4/4.5") NW (3/3.5")	**Water Level*:**	7.3 ft (open)
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Depth (ft.)	Sample Information: Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N_{60}	Casing Blows	Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.
125				smpl 125.0-125.5						ROCK QUALITY = FAIR R4 AND R4A core times: 2:30/ 2:45/ 1:45/ 1:35/ 1:40 min:sec/ft.	GTX# n/a qp=1,678 ksf
	R5	60/60	127.8 - 132.8	RQD: 48"=80%						R5: Similar to R2; notable fracture from 130.1 to 130.2 ft. Core times: 1:35/ 1:35/ 1:30/ 1:30/ 2:05 min:sec/ft. ROCK QUALITY = GOOD	
130											
								-119.5		132.8 **Bottom of Exploration at 132.8 feet below ground surface.**	
135											
140											
145											
150											

Remarks:

NEBC Rig #B-24 automatic hammer calibrated on 7/3/2018.
Crown of corrugated metal pipe encountered at approximately 6 ft BGS in first vacuum excavation; move approximately 1.5 ft westerly and retry. Successfully vacuum excavate to 7.5 ft BGS; terminated at observed groundwater.

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PHOTOGRAPHS OF ROCK CORE OBTAINED IN SUBSURFACE EXPLORATIONS

Photo 1: Core box containing dried rock core from test boring BB-PVS-105; left side of core box (top portion of cores). Slots from top to bottom:
1) BB-PVS-105, R1;
2) BB-PVS-105, R2;
3) BB-PVS-105, R2 and R3;
4) BB-PVS-105, R3.

Photo 2: Core box containing dried rock core from test boring BB-PVS-105; right side of core box (bottom portion of cores). Slots from top to bottom:
1) BB-PVS-105, R1;
2) BB-PVS-105, R2;
3) BB-PVS-105, R3;
4) Empty.

SCHONEWALD ENGINEERING ASSOCIATES, INC.

ROCK CORE PHOTOGRAPHS
BRIDGE #5933
I-295 OVER VERANDA STREET
PORTLAND, MAINE
MAINEDOT WIN 21745.00

Sheet No.:

1 of 9

Photo 3: Core box containing dried rock core from test boring BB-PVS-105; left side of core box (top portion of cores). Slots from top to bottom:
1) BB-PVS-105, R4;
2) BB-PVS-105, R5;
3) BB-PVS-105, R6;
4) Empty.

Photo 4: Core box containing dried rock core from test boring BB-PVS-105; right side of core box (bottom portion of cores). Slots from top to bottom:
1) BB-PVS-105, R4;
2) BB-PVS-105, R5;
3) BB-PVS-105, R6;
4) Empty.

SCHONEWALD ENGINEERING ASSOCIATES, INC.

ROCK CORE PHOTOGRAPHS
BRIDGE #5933
I-295 OVER VERANDA STREET
PORTLAND, MAINE
MAINEDOT WIN 21745.00

Sheet No.:

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Photo 5: Core box containing dried rock core from test boring BB-PVS-106; left side of core box (top portion of cores). Slots from top to bottom:
1) BB-PVS-106, R1;
2) BB-PVS-106, R2;
3) Empty;
4) Empty.

Photo 6: Core box containing dried rock core from test boring BB-PVS-106; right side of core box (bottom portion of cores). Slots from top to bottom:
1) BB-PVS-106, R1;
2) BB-PVS-106, R2;
3) Empty;
4) Empty.

SCHONEWALD ENGINEERING ASSOCIATES, INC.

ROCK CORE PHOTOGRAPHS
BRIDGE #5933
I-295 OVER VERANDA STREET
PORTLAND, MAINE
MAINEDOT WIN 21745.00

Sheet No.:

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Photo 7: Core box containing dried rock core from test boring BB-PVS-201; left side of core box (top portion of cores). Slots from top to bottom:
1) BB-PVS-201, R1;
2) BB-PVS-201, R2;
3) BB-PVS-201, R3;
4) BB-PVS-201, R4.

Photo 8: Core box containing dried rock core from test boring BB-PVS-201; right side of core box (bottom portion of cores). Slots from top to bottom:
1) BB-PVS-201, R1;
2) BB-PVS-201, R2;
3) BB-PVS-201, R3;
4) BB-PVS-201, R4.

SCHONEWALD ENGINEERING ASSOCIATES, INC.

ROCK CORE PHOTOGRAPHS
BRIDGE #5933
I-295 OVER VERANDA STREET
PORTLAND, MAINE
MAINEDOT WIN 21745.00

Sheet No.:

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Photo 9: Core box containing dried rock core from test boring BB-PVS-201; left side of core box (top portion of cores). Slots from top to bottom:
1) BB-PVS-201, R5;
2) BB-PVS-201, R6;
3) BB-PVS-201, R7;
4) Empty.

Photo 10: Core box containing dried rock core from test boring BB-PVS-201; right side of core box (bottom portion of cores). Slots from top to bottom:
1) BB-PVS-201, R5;
2) BB-PVS-201, R6;
3) BB-PVS-201, R7;
4) Empty.

SCHONEWALD ENGINEERING ASSOCIATES, INC.

ROCK CORE PHOTOGRAPHS
BRIDGE #5933
I-295 OVER VERANDA STREET
PORTLAND, MAINE
MAINEDOT WIN 21745.00

Sheet No.:

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Photo 11: Core box containing dried rock core from test boring BB-PVS-202; left side of core box (top portion of cores). Slots from top to bottom:
1) BB-PVS-202, R1;
2) BB-PVS-202, R2;
3) BB-PVS-202, R3;
4) Empty.

Photo 12: Core box containing dried rock core from test boring BB-PVS-202; right side of core box (bottom portion of cores). Slots from top to bottom:
1) BB-PVS-202, R1;
2) BB-PVS-202, R2;
3) BB-PVS-202, R3;
4) Empty.

SCHONEWALD ENGINEERING ASSOCIATES, INC.

ROCK CORE PHOTOGRAPHS
BRIDGE #5933
I-295 OVER VERANDA STREET
PORTLAND, MAINE
MAINEDOT WIN 21745.00

Sheet No.:

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Photo 13: Core box containing dried rock core from test boring BB-PVS-202; left side of core box (top portion of cores). Slots from top to bottom:
1) BB-PVS-202, R4;
2) BB-PVS-202, R5;
3) Empty;
4) Empty.

Photo 14: Core box containing dried rock core from test boring BB-PVS-202; right side of core box (bottom portion of cores). Slots from top to bottom:
1) BB-PVS-202, R4;
2) BB-PVS-202, R5;
3) Empty;
4) Empty.

SCHONEWALD ENGINEERING ASSOCIATES, INC.

ROCK CORE PHOTOGRAPHS
BRIDGE #5933
I-295 OVER VERANDA STREET
PORTLAND, MAINE
MAINEDOT WIN 21745.00

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Photo 15: Core box containing dried rock core from test boring BB-PVS-203; left side of core box (top portion of cores). Slots from top to bottom:
1) BB-PVS-203, R1;
2) BB-PVS-203, R2;
3) BB-PVS-203, R3;
4) Empty.

Photo 16: Core box containing dried rock core from test boring BB-PVS-203; right side of core box (bottom portion of cores). Slots from top to bottom:
1) BB-PVS-203, R1 and R2;
2) BB-PVS-203, R2;
3) BB-PVS-203, R3;
4) Empty.

SCHONEWALD ENGINEERING ASSOCIATES, INC.

ROCK CORE PHOTOGRAPHS
BRIDGE #5933
I-295 OVER VERANDA STREET
PORTLAND, MAINE
MAINEDOT WIN 21745.00

Sheet No.:

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Photo 17: Core box containing dried rock core from test boring BB-PVS-203; left side of core box (top portion of cores). Slots from top to bottom:
1) BB-PVS-203, R4;
2) BB-PVS-203, R5;
3) Empty;
4) Empty.

Photo 18: Core box containing dried rock core from test boring BB-PVS-203; right side of core box (bottom portion of cores). Slots from top to bottom:
1) BB-PVS-203, R4;
2) BB-PVS-203, R5;
3) Empty;
4) Empty.

SCHONEWALD ENGINEERING ASSOCIATES, INC.

ROCK CORE PHOTOGRAPHS
BRIDGE #5933
I-295 OVER VERANDA STREET
PORTLAND, MAINE
MAINEDOT WIN 21745.00

Sheet No.:

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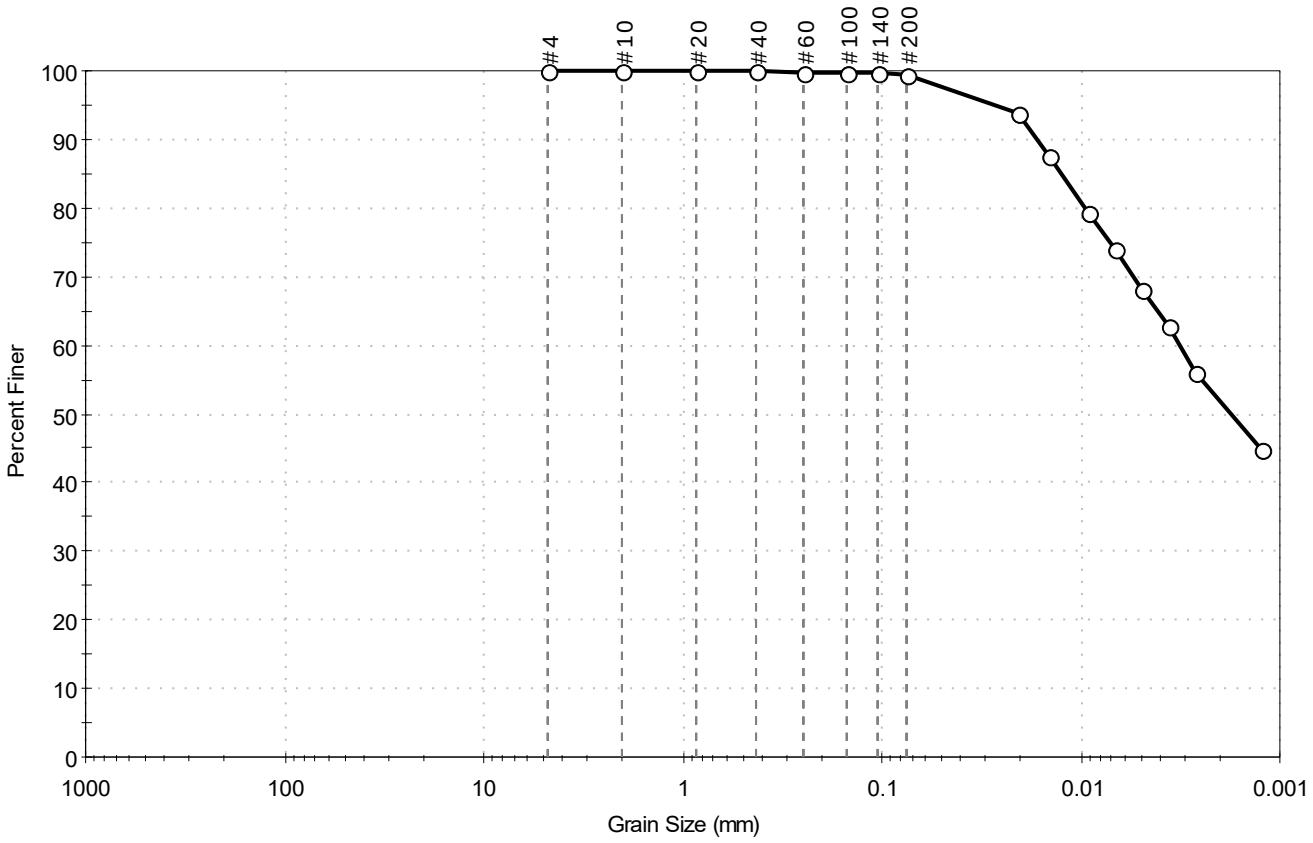
**RESULTS OF LABORATORY TESTS ON SOIL SAMPLES –
PHASE 1 (BB-PVS-101, -105, -106, AND -201)**

TABULATION OF PHASE 1 SOIL TESTING (GTX PROJECT NO. 308805) (listed in order of test report presentation)				
Boring No.	**Sample No.**	**Sample Depth (ft., BGS)**	**GTX TEST ID / NO.**	**Tests Completed**
BB-PVS-201	4D	6-8	473561	grain size with hydrometer
BB-PVS-201	6D	10-12	473562	grain size with hydrometer
BB-PVS-101	7D	20-22	473553	Atterberg Limits
BB-PVS-101	U2	35-37	473547	Atterberg Limits
BB-PVS-105	7D	15-17	473554	Atterberg Limits
BB-PVS-105	U1	25-27	473548	Atterberg Limits
BB-PVS-201	4D	6-8	473555	Atterberg Limits
BB-PVS-201	6D	10-12	473556	Atterberg Limits
BB-PVS-201	7D	15-17	473557	Atterberg Limits
BB-PVS-201	8D	20-22	473558	Atterberg Limits
BB-PVS-201	U1	25-27	473549	Atterberg Limits
BB-PVS-201	9D	30-32	473559	Atterberg Limits
BB-PVS-201	U2	35-37	473550	Atterberg Limits
BB-PVS-201	10D	40-42	473560	Atterberg Limits
BB-PVS-201	U3	45-47	473551	Atterberg Limits
BB-PVS-201	U4	55-57	473552	Atterberg Limits
BB-PVS-101	U2	35-37	IP-6	1D consolidation
BB-PVS-105	U1	25-27	IP-5	1D consolidation
BB-PVS-201	U1	25-27	IP-1	1D consolidation
BB-PVS-201	U2	35-37	IP-2	1D consolidation
BB-PVS-201	U3	45-47	IP-3	1D consolidation
BB-PVS-201	U4	55-57	IP-4	1D consolidation

Client:	Schonewald Engineering Associates, Inc.				
Project:	I-295 over Veranda St (MeDOT WIN21745.00)				
Location:	Portland, ME			Project No:	GTX-308805
Boring ID:	BB-PVS-201	Sample Type:	jar	Tested By:	GA
Sample ID:	4D	Test Date:	10/02/18	Checked By:	emm
Depth :	6-8 ft	Test Id:	473561		
Test Comment:	---				
Visual Description:	Wet, dark gray clay				
Sample Comment:	---				

Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	0.0	0.5	99.5

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	100		
#60	0.25	100		
#100	0.15	100		
#140	0.11	100		
#200	0.075	100		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
---	0.0205	94		
---	0.0144	88		
---	0.0091	79		
---	0.0067	74		
---	0.0049	68		
---	0.0036	63		
---	0.0027	56		
---	0.0012	45		

Coefficients

D_{85} = 0.0124 mm D_{30} = N/A

D_{60} = 0.0032 mm D_{15} = N/A

D_{50} = 0.0018 mm D_{10} = N/A

C_u = N/A C_c = N/A

Classification

ASTM Lean CLAY (CL)

AASHTO Clayey Soils (A-7-6 (23))

Sample / Test Description

Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness : ---

Dispersion Device : Apparatus A - Mech Mixer

Dispersion Period : 1 minute

Est. Specific Gravity : 2.65

Separation of Sample: #200 Sieve

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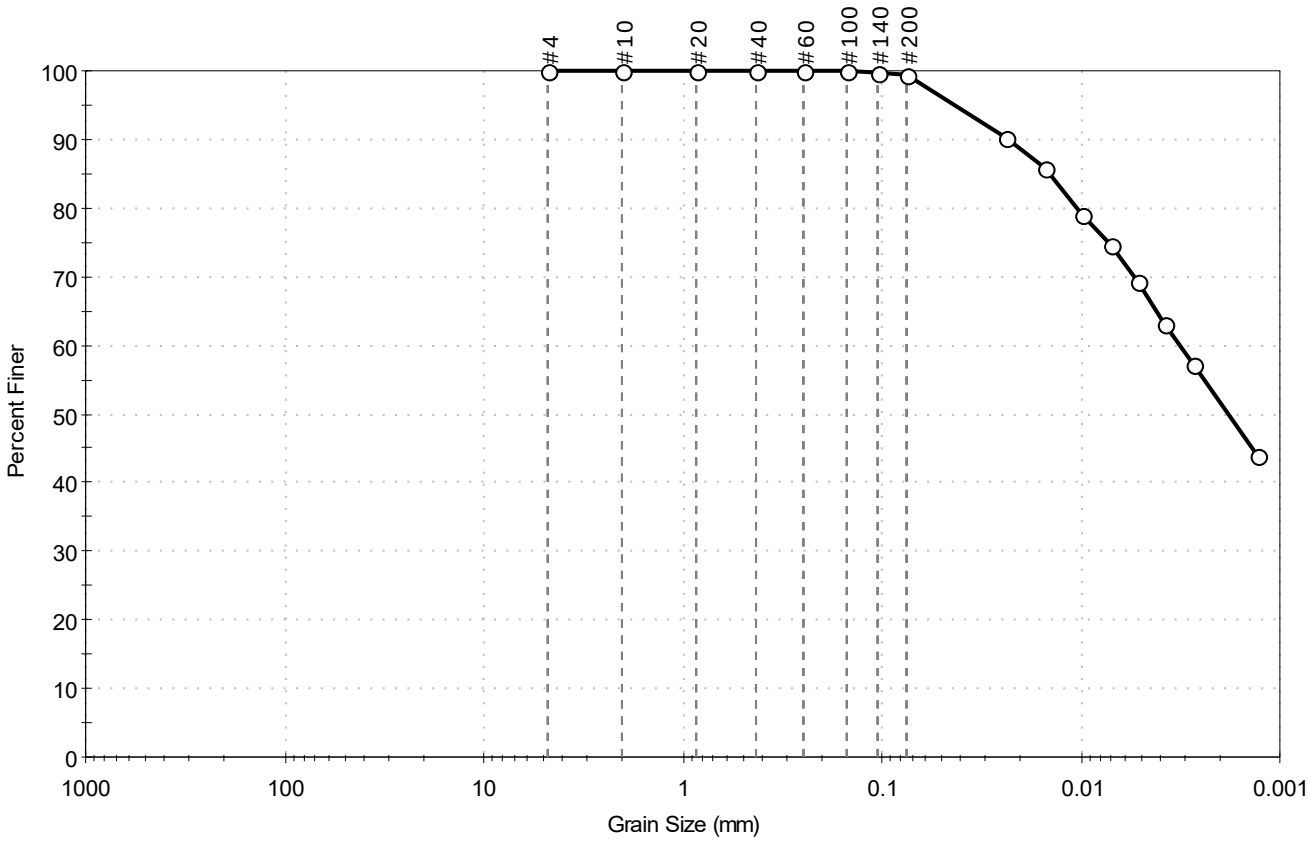
Client:	Schonewald Engineering Associates, Inc.				
Project:	I-295 over Veranda St (MeDOT WIN21745.00)				
Location:	Portland, ME			Project No:	GTX-308805
Boring ID:	BB-PVS-201	Sample Type:	jar	Tested By:	GA
Sample ID:	6D	Test Date:	10/02/18	Checked By:	emm
Depth :	10-12 ft	Test Id:	473562		
Test Comment:	---				
Visual Description:	Moist, dark gray clay				
Sample Comment:	---				

Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	0.0	0.6	99.4

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	100		
#60	0.25	100		
#100	0.15	100		
#140	0.11	100		
#200	0.075	99		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
---	0.0241	90		
---	0.0153	86		
---	0.0099	79		
---	0.0071	75		
---	0.0052	69		
---	0.0038	63		
---	0.0028	57		
---	0.0013	44		

Coefficients

D_{85} = 0.0144 mm	D_{30} = N/A
D_{60} = 0.0032 mm	D_{15} = N/A
D_{50} = 0.0018 mm	D_{10} = N/A
C_u = N/A	C_c = N/A

Classification

ASTM Lean CLAY (CL)

AASHTO Clayey Soils (A-7-6 (25))

Sample / Test Description

Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness : ---

Dispersion Device : Apparatus A - Mech Mixer

Dispersion Period : 1 minute

Est. Specific Gravity : 2.65

Separation of Sample: #200 Sieve

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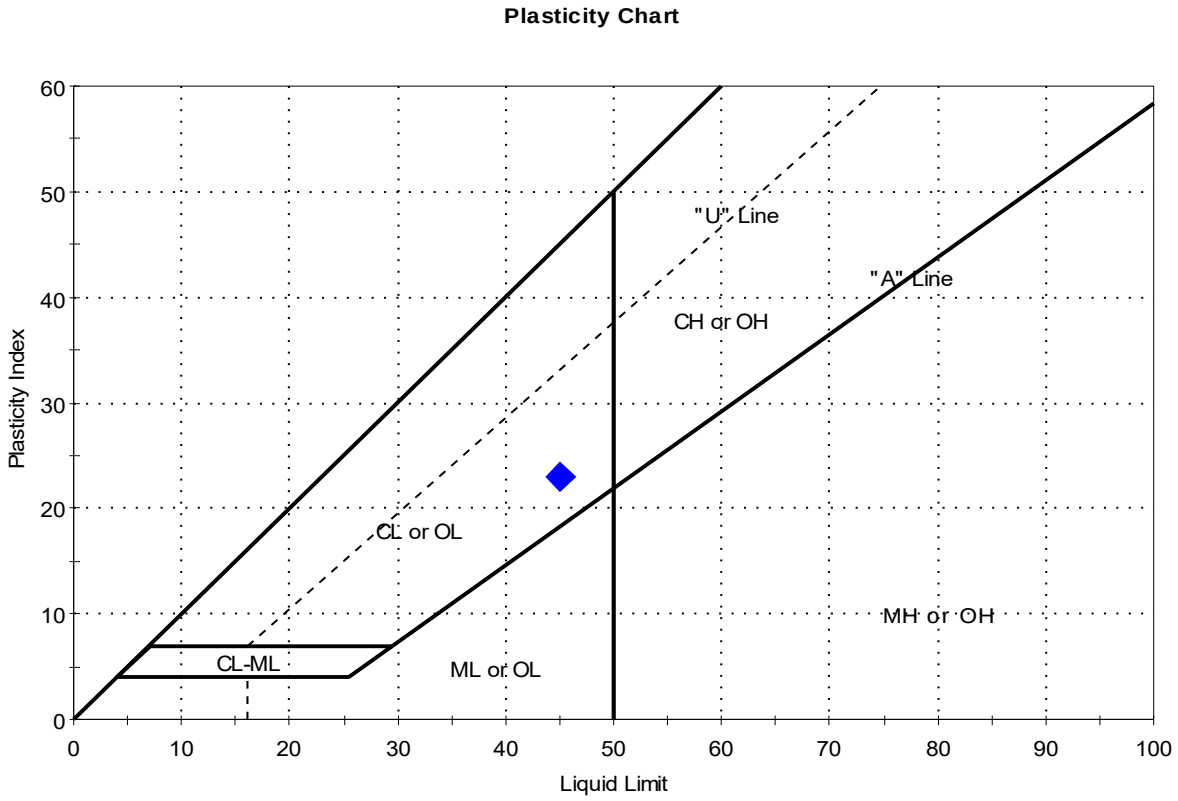
Client:	Schonewald Engineering Associates, Inc.				
Project:	I-295 over Veranda St (MeDOT WIN21745.00)				
Location:	Portland, ME			Project No:	GTX-308805
Boring ID:	BB-PVS-101	Sample Type:	jar	Tested By:	GA
Sample ID:	7D	Test Date:	10/03/18	Checked By:	emm
Depth :	20-22 ft	Test Id:	473553		
Test Comment:	---				
Visual Description:	Wet, 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
◆	7D	B-PVS-10	20-22 ft	50	45	22	23	1.2	

Sample Prepared using the WET method

Dry Strength: HIGH

Dilatancy: NONE

Toughness: MEDIUM

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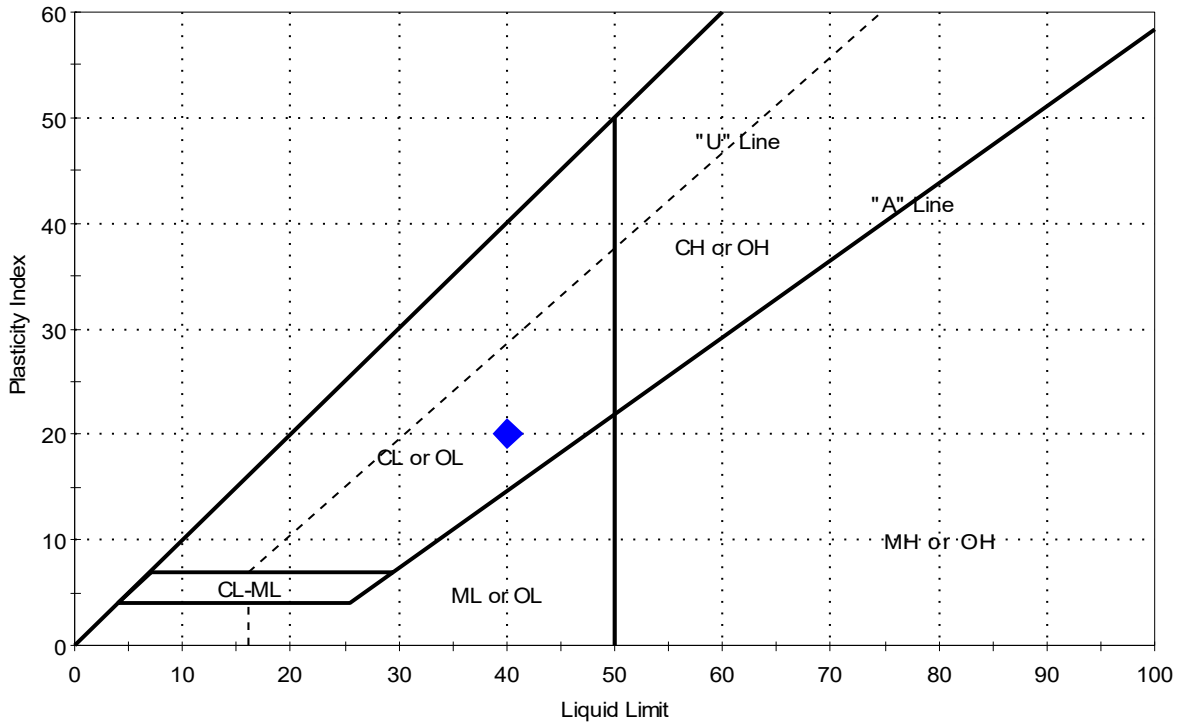
Client:	Schonewald Engineering Associates, Inc.				
Project:	I-295 over Veranda St (MeDOT WIN21745.00)				
Location:	Portland, ME			Project No:	GTX-308805
Boring ID:	BB-PVS-101	Sample Type:	tube	Tested By:	cam
Sample ID:	U2	Test Date:	10/04/18	Checked By:	emm
Depth :	35-37 ft	Test Id:	473547		
Test Comment:	---				
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
◆	U2	B-PVS-10	35-37 ft	39	40	20	20	1	

Sample Prepared using the WET method

Dry Strength: VERY HIGH

Dilatancy: SLOW

Toughness: LOW

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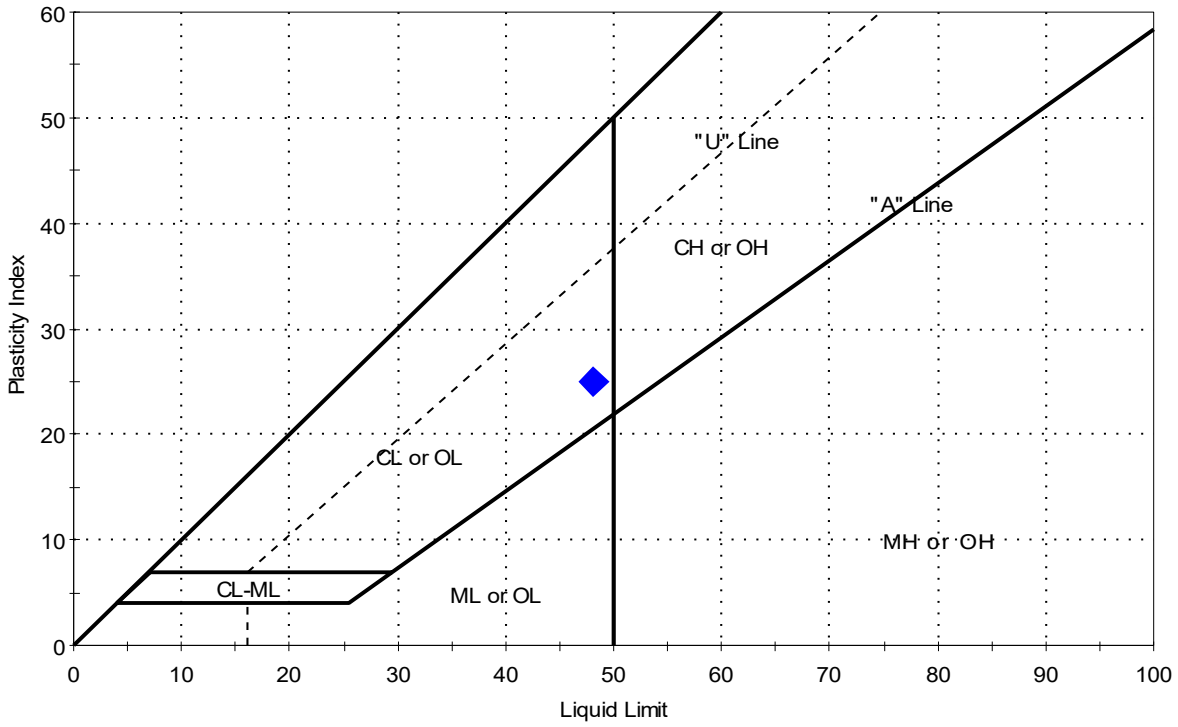
Client:	Schonewald Engineering Associates, Inc.				
Project:	I-295 over Veranda St (MeDOT WIN21745.00)				
Location:	Portland, ME			Project No:	GTX-308805
Boring ID:	BB-PVS-105	Sample Type:	jar	Tested By:	GA
Sample ID:	7D	Test Date:	10/03/18	Checked By:	emm
Depth :	15-17 ft	Test Id:	473554		
Test Comment:	---				
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
◆	7D	B-PVS-10	15-17 ft	43	48	23	25	0.8	

Sample Prepared using the WET method

Dry Strength: HIGH

Dilatancy: NONE

Toughness: MEDIUM

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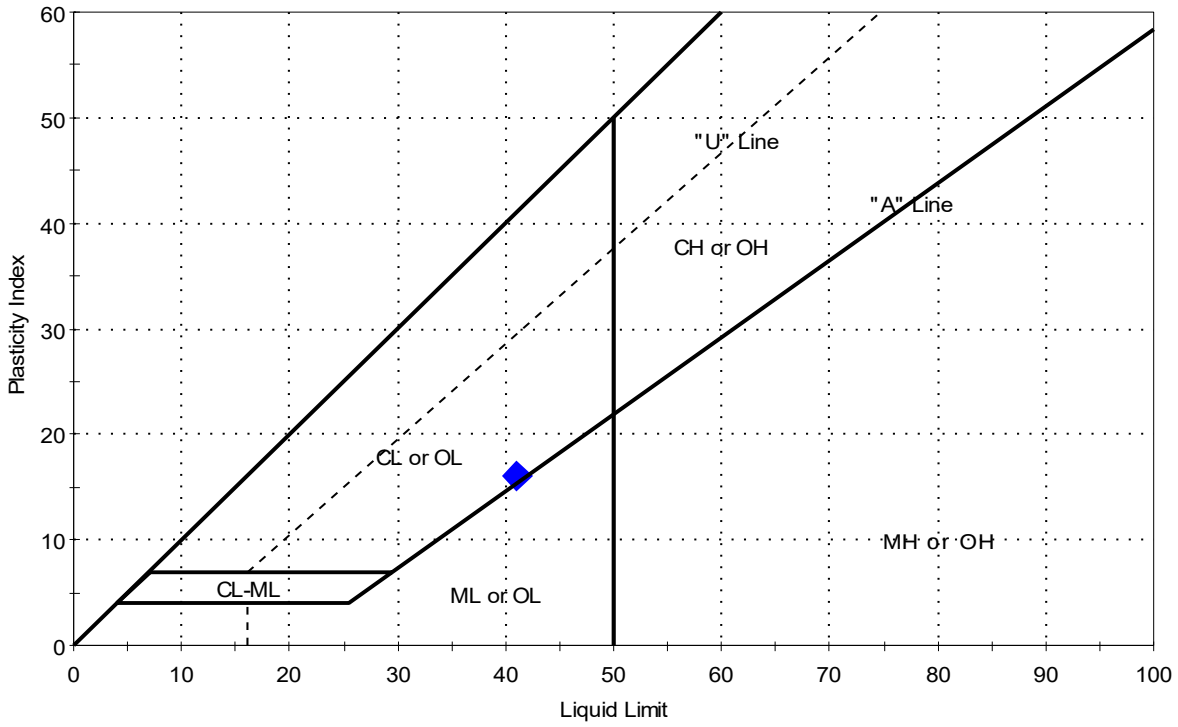
Client:	Schonewald Engineering Associates, Inc.				
Project:	I-295 over Veranda St (MeDOT WIN21745.00)				
Location:	Portland, ME			Project No:	GTX-308805
Boring ID:	BB-PVS-105	Sample Type:	tube	Tested By:	cam
Sample ID:	U1	Test Date:	10/04/18	Checked By:	emm
Depth :	25-27 ft	Test Id:	473548		
Test Comment:	---				
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
◆	U1	B-PVS-10	25-27 ft	41	41	25	16	1	

Sample Prepared using the WET method

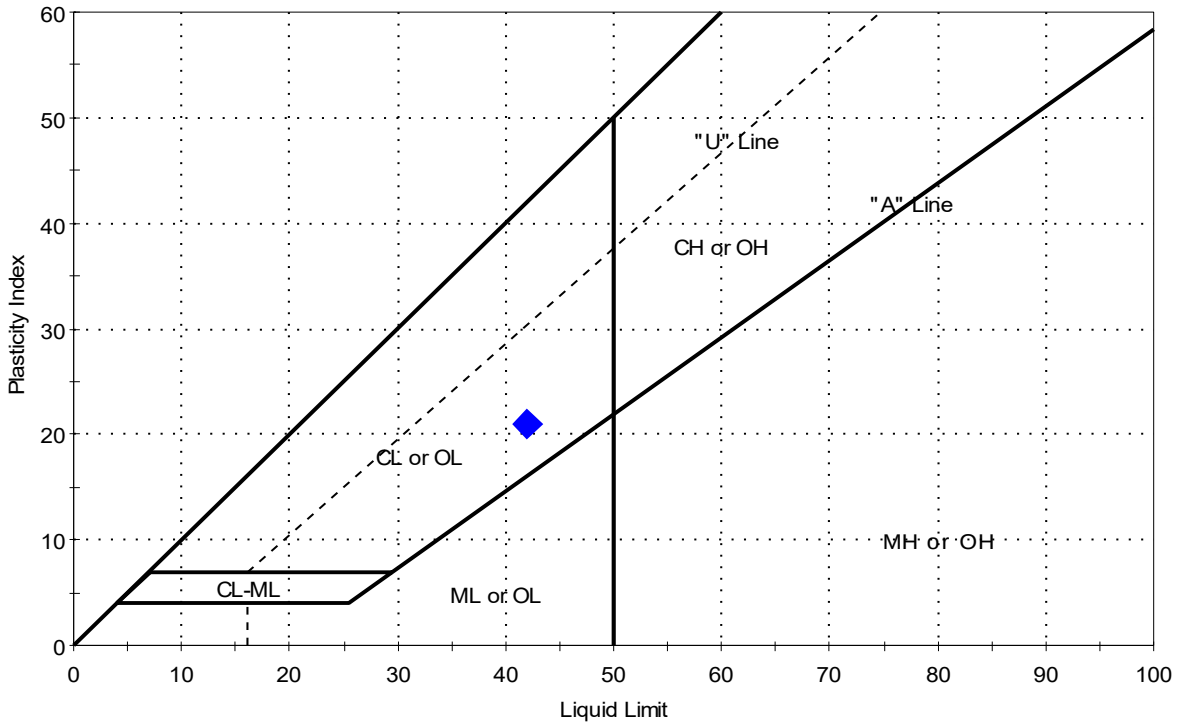
Dry Strength: VERY HIGH

Dilatancy: SLOW

Toughness: LOW

Client:	Schonewald Engineering Associates, Inc.				
Project:	I-295 over Veranda St (MeDOT WIN21745.00)				
Location:	Portland, ME			Project No:	GTX-308805
Boring ID:	BB-PVS-201	Sample Type:	jar	Tested By:	GA
Sample ID:	4D	Test Date:	10/03/18	Checked By:	emm
Depth :	6-8 ft	Test Id:	473555		
Test Comment:	---				
Visual Description:	Wet, 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
◆	4D	B-PVS-20	6-8 ft	48	42	21	21	1.3	Lean CLAY (CL)

Sample Prepared using the WET method
0% Retained on #40 Sieve
Dry Strength: MEDIUM
Dilatancy: NONE
Toughness: HIGH

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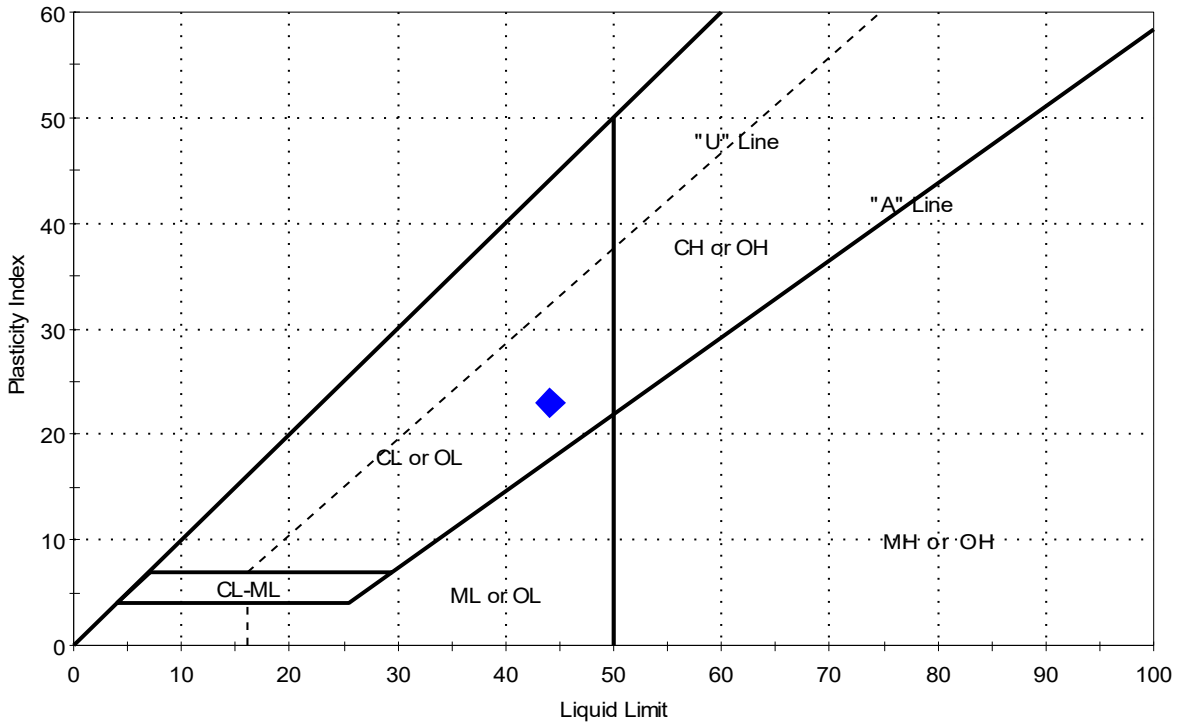
Client:	Schonewald Engineering Associates, Inc.				
Project:	I-295 over Veranda St (MeDOT WIN21745.00)				
Location:	Portland, ME			Project No:	GTX-308805
Boring ID:	BB-PVS-201	Sample Type:	jar	Tested By:	GA
Sample ID:	6D	Test Date:	10/03/18	Checked By:	emm
Depth :	10-12 ft	Test Id:	473556		
Test Comment:	---				
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
◆	6D	B-PVS-20	10-12 ft	41	44	21	23	0.9	Lean CLAY (CL)

Sample Prepared using the WET method

0% Retained on #40 Sieve

Dry Strength: HIGH

Dilatancy: NONE

Toughness: MEDIUM

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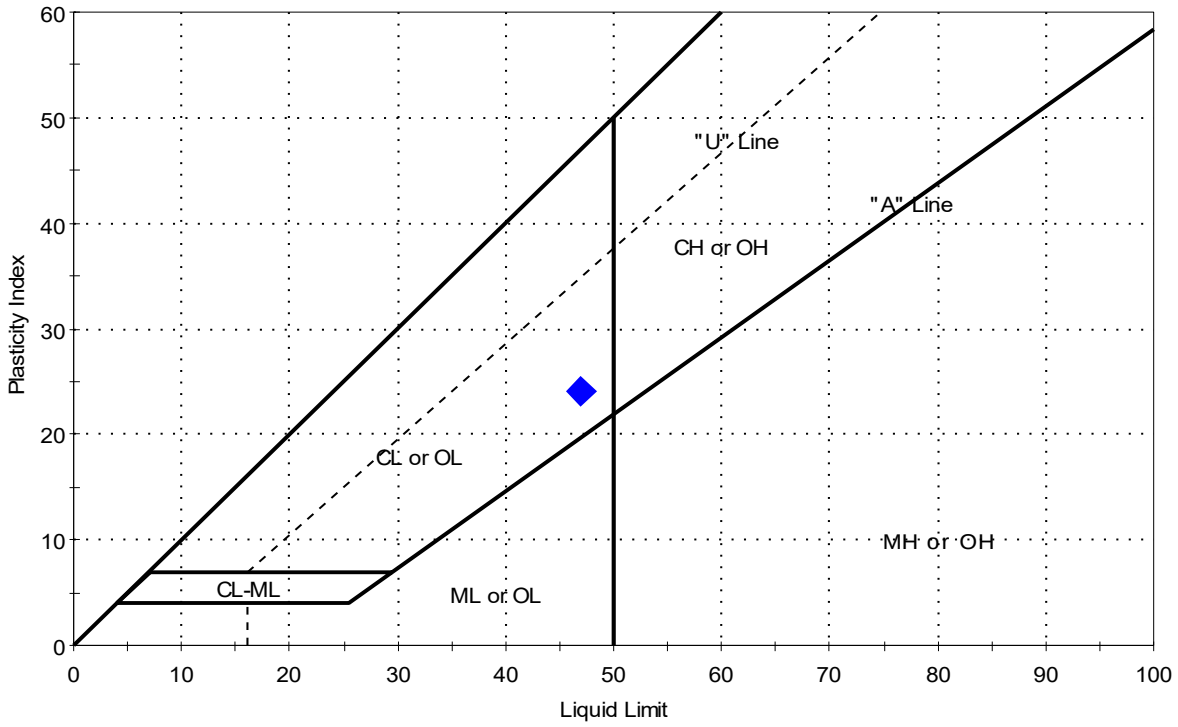
Client:	Schonewald Engineering Associates, Inc.				
Project:	I-295 over Veranda St (MeDOT WIN21745.00)				
Location:	Portland, ME			Project No:	GTX-308805
Boring ID:	BB-PVS-201	Sample Type:	jar	Tested By:	GA
Sample ID:	7D	Test Date:	10/03/18	Checked By:	emm
Depth :	15-17 ft	Test Id:	473557		
Test Comment:	---				
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
◆	7D	B-PVS-20	15-17 ft	45	47	23	24	0.9	

Sample Prepared using the WET method

Dry Strength: HIGH

Dilatancy: NONE

Toughness: MEDIUM

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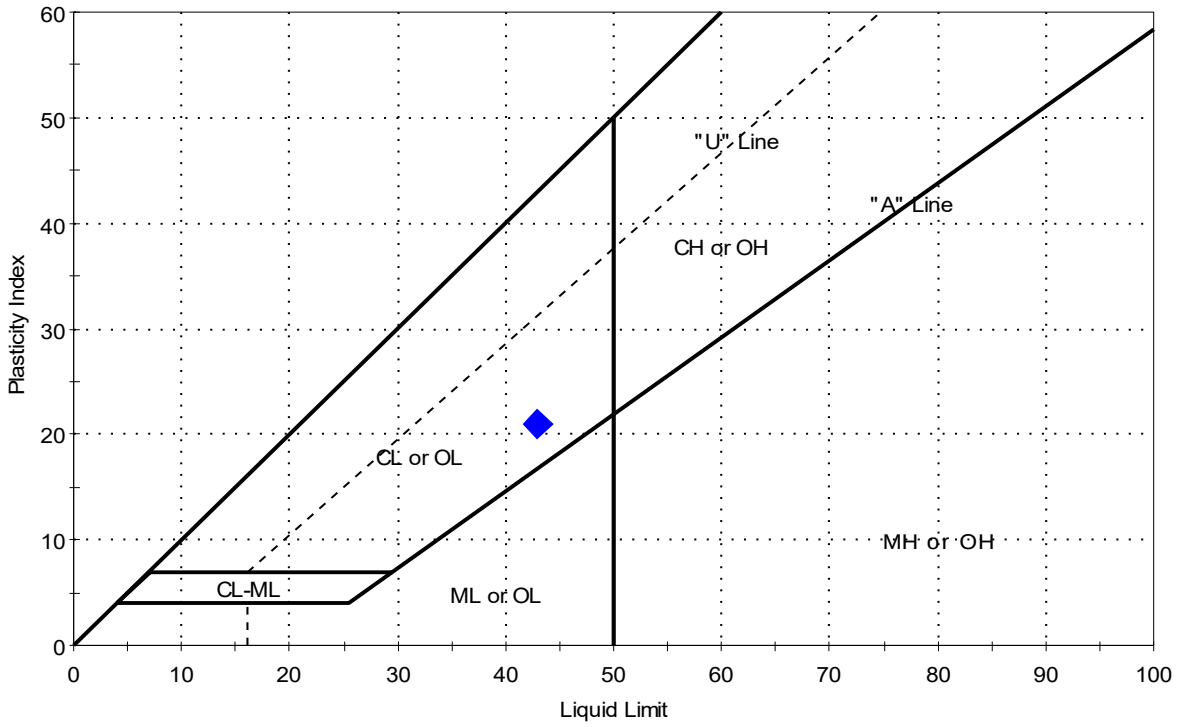
Client:	Schonewald Engineering Associates, Inc.				
Project:	I-295 over Veranda St (MeDOT WIN21745.00)				
Location:	Portland, ME			Project No:	GTX-308805
Boring ID:	BB-PVS-201	Sample Type:	jar	Tested By:	GA
Sample ID:	8D	Test Date:	10/03/18	Checked By:	emm
Depth :	20-22 ft	Test Id:	473558		
Test Comment:	---				
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
◆	8D	B-PVS-20	20-22 ft	45	43	22	21	1.1	

Sample Prepared using the WET method

Dry Strength: HIGH

Dilatancy: NONE

Toughness: MEDIUM

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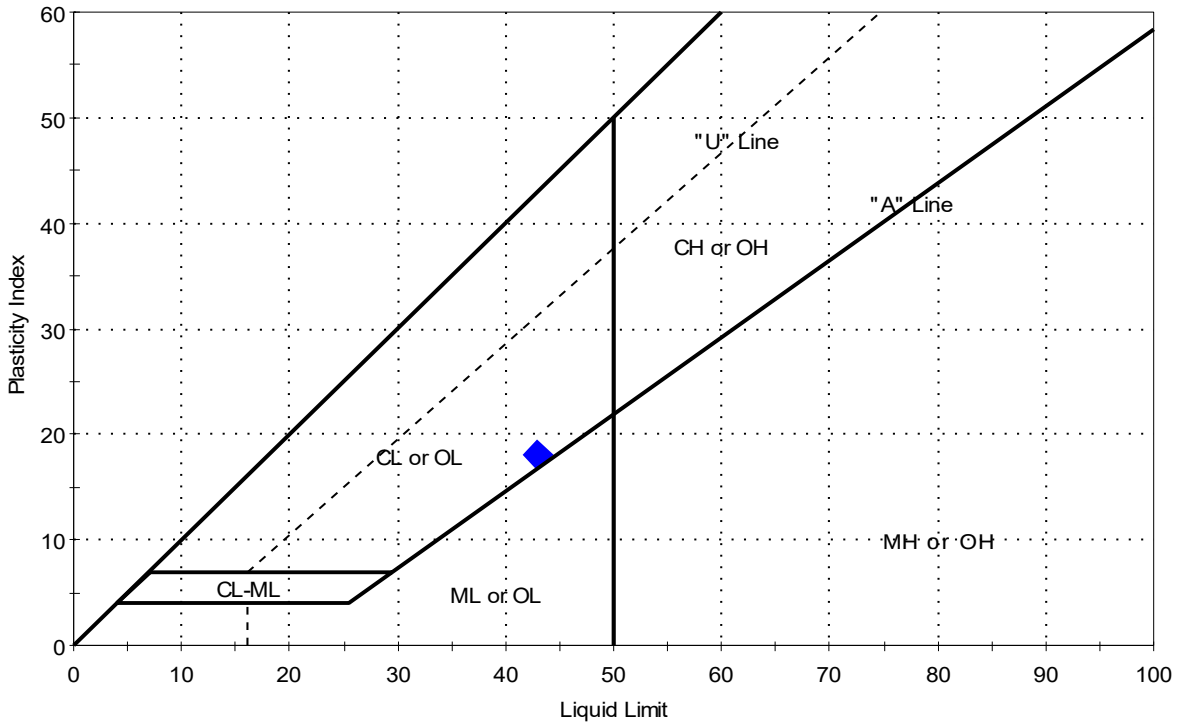
Client:	Schonewald Engineering Associates, Inc.				
Project:	I-295 over Veranda St (MeDOT WIN21745.00)				
Location:	Portland, ME			Project No:	GTX-308805
Boring ID:	BB-PVS-201	Sample Type:	tube	Tested By:	cam
Sample ID:	U1	Test Date:	09/27/18	Checked By:	emm
Depth :	25-27 ft	Test Id:	473549		
Test Comment:	---				
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
◆	U1	B-PVS-20	25-27 ft	44	43	25	18	1	

Sample Prepared using the WET method

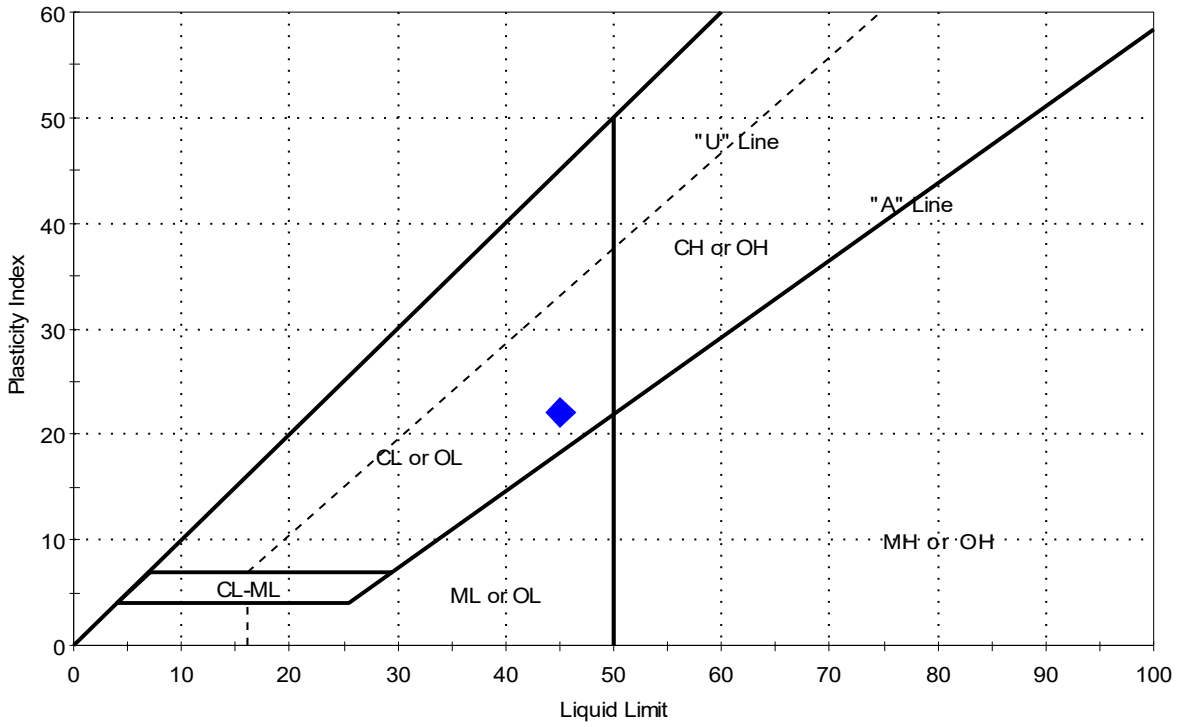
Dry Strength: VERY HIGH

Dilatancy: SLOW

Toughness: LOW

Client:	Schonewald Engineering Associates, Inc.				
Project:	I-295 over Veranda St (MeDOT WIN21745.00)				
Location:	Portland, ME			Project No:	GTX-308805
Boring ID:	BB-PVS-201	Sample Type:	jar	Tested By:	GA
Sample ID:	9D	Test Date:	10/03/18	Checked By:	emm
Depth :	30-32 ft	Test Id:	473559		
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
◆	9D	B-PVS-20	30-32 ft	44	45	23	22	1	

Sample Prepared using the WET method

Dry Strength: HIGH

Dilatancy: NONE

Toughness: MEDIUM

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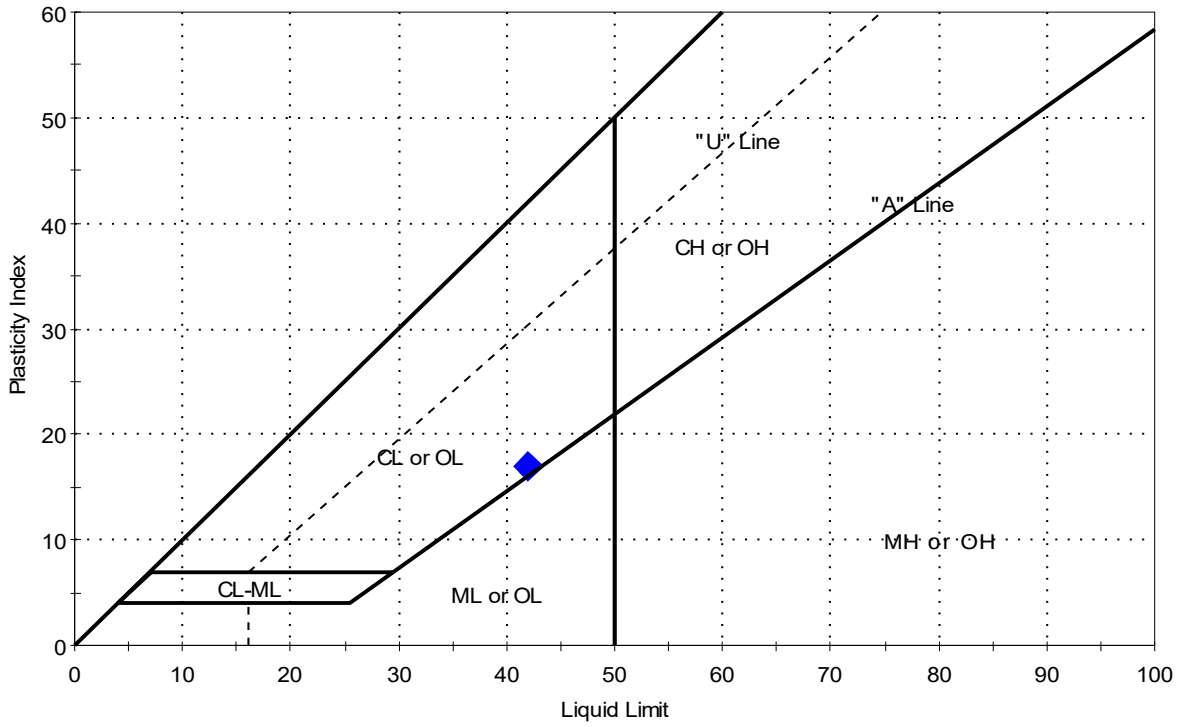
Client:	Schonewald Engineering Associates, Inc.				
Project:	I-295 over Veranda St (MeDOT WIN21745.00)				
Location:	Portland, ME			Project No:	GTX-308805
Boring ID:	BB-PVS-201	Sample Type:	tube	Tested By:	cam
Sample ID:	U2	Test Date:	10/04/18	Checked By:	emm
Depth :	35-37 ft	Test Id:	473550		
Test Comment:	---				
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
◆	U2	B-PVS-20	35-37 ft	41	42	25	17	1	

Sample Prepared using the WET method

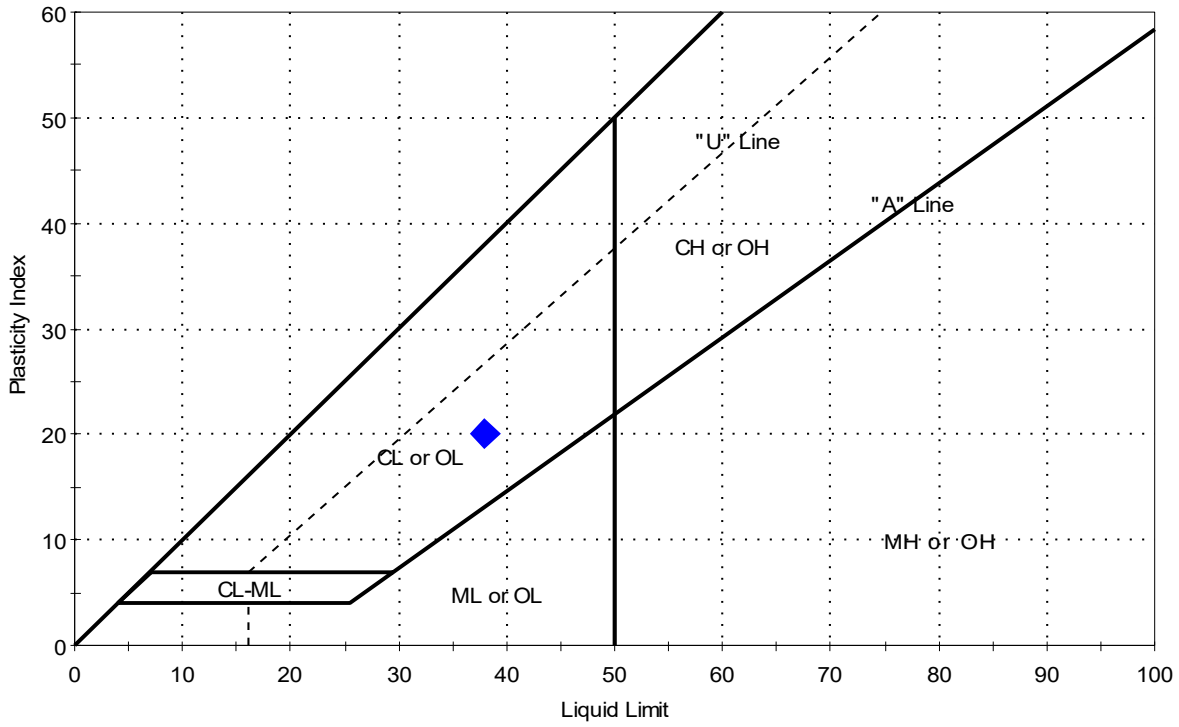
Dry Strength: VERY HIGH

Dilatancy: SLOW

Toughness: LOW

Client:	Schonewald Engineering Associates, Inc.				
Project:	I-295 over Veranda St (MeDOT WIN21745.00)				
Location:	Portland, ME			Project No:	GTX-308805
Boring ID:	BB-PVS-201	Sample Type:	jar	Tested By:	GA
Sample ID:	10D	Test Date:	10/03/18	Checked By:	emm
Depth :	40-42 ft	Test Id:	473560		
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
◆	10D	B-PVS-20	40-42 ft	38	38	18	20	1	

Sample Prepared using the WET method

Dry Strength: HIGH

Dilatancy: NONE

Toughness: MEDIUM

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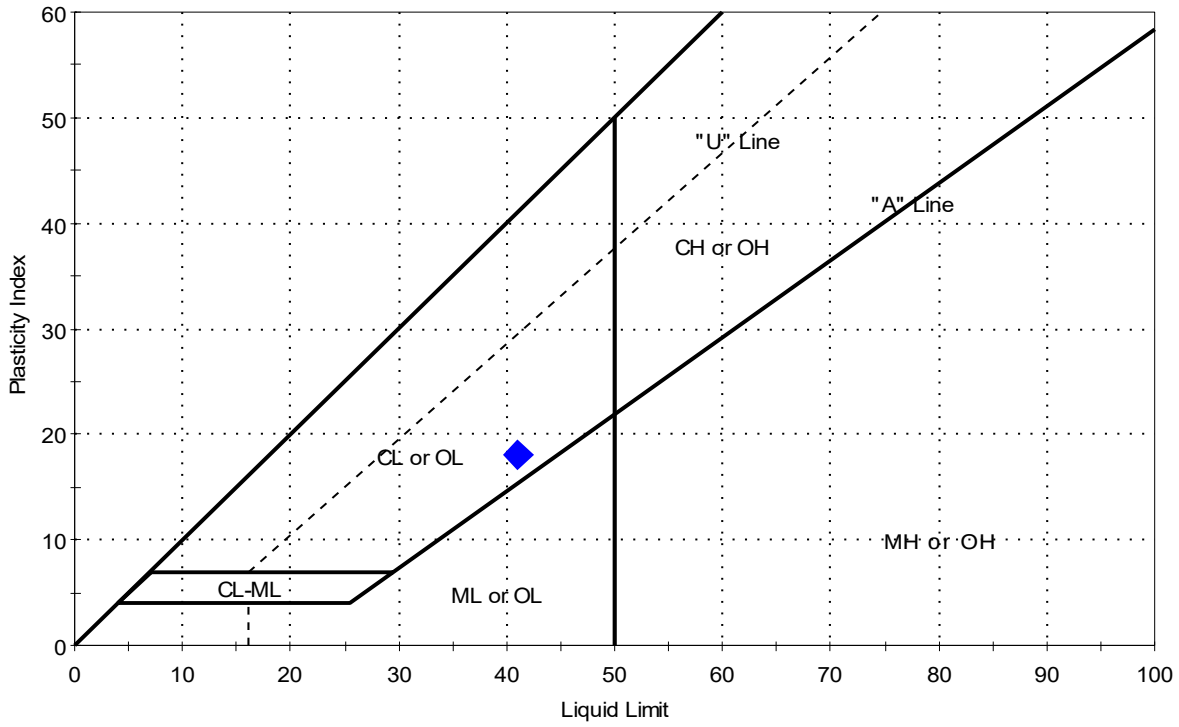
Client:	Schonewald Engineering Associates, Inc.				
Project:	I-295 over Veranda St (MeDOT WIN21745.00)				
Location:	Portland, ME			Project No:	GTX-308805
Boring ID:	BB-PVS-201	Sample Type:	tube	Tested By:	cam
Sample ID:	U3	Test Date:	09/27/18	Checked By:	emm
Depth :	45-47 ft	Test Id:	473551		
Test Comment:	---				
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
◆	U3	B-PVS-20	45-47 ft	39	41	23	18	0.9	

Sample Prepared using the WET method

Dry Strength: VERY HIGH

Dilatancy: SLOW

Toughness: LOW

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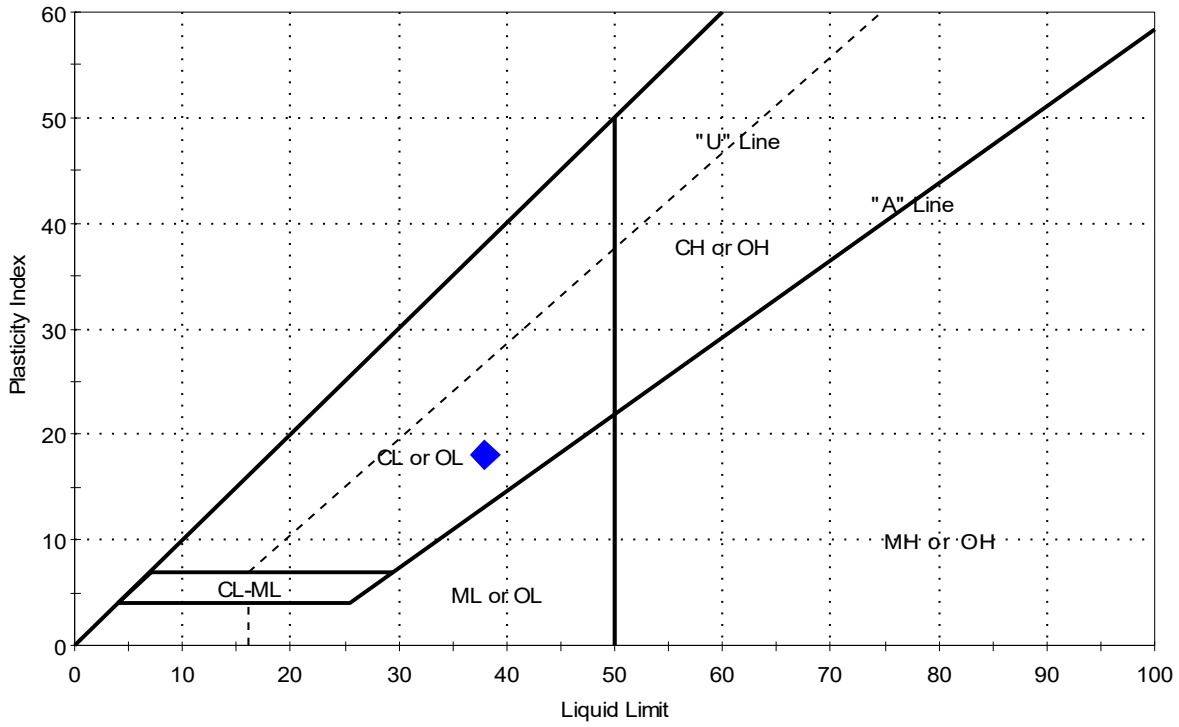
Client:	Schonewald Engineering Associates, Inc.				
Project:	I-295 over Veranda St (MeDOT WIN21745.00)				
Location:	Portland, ME			Project No:	GTX-308805
Boring ID:	BB-PVS-201	Sample Type:	tube	Tested By:	cam
Sample ID:	U4	Test Date:	09/28/18	Checked By:	emm
Depth :	55-57 ft	Test Id:	473552		
Test Comment:	---				
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
◆	U4	B-PVS-20	55-57 ft	34	38	20	18	0.8	

Sample Prepared using the WET method

Dry Strength: VERY HIGH

Dilatancy: SLOW

Toughness: LOW

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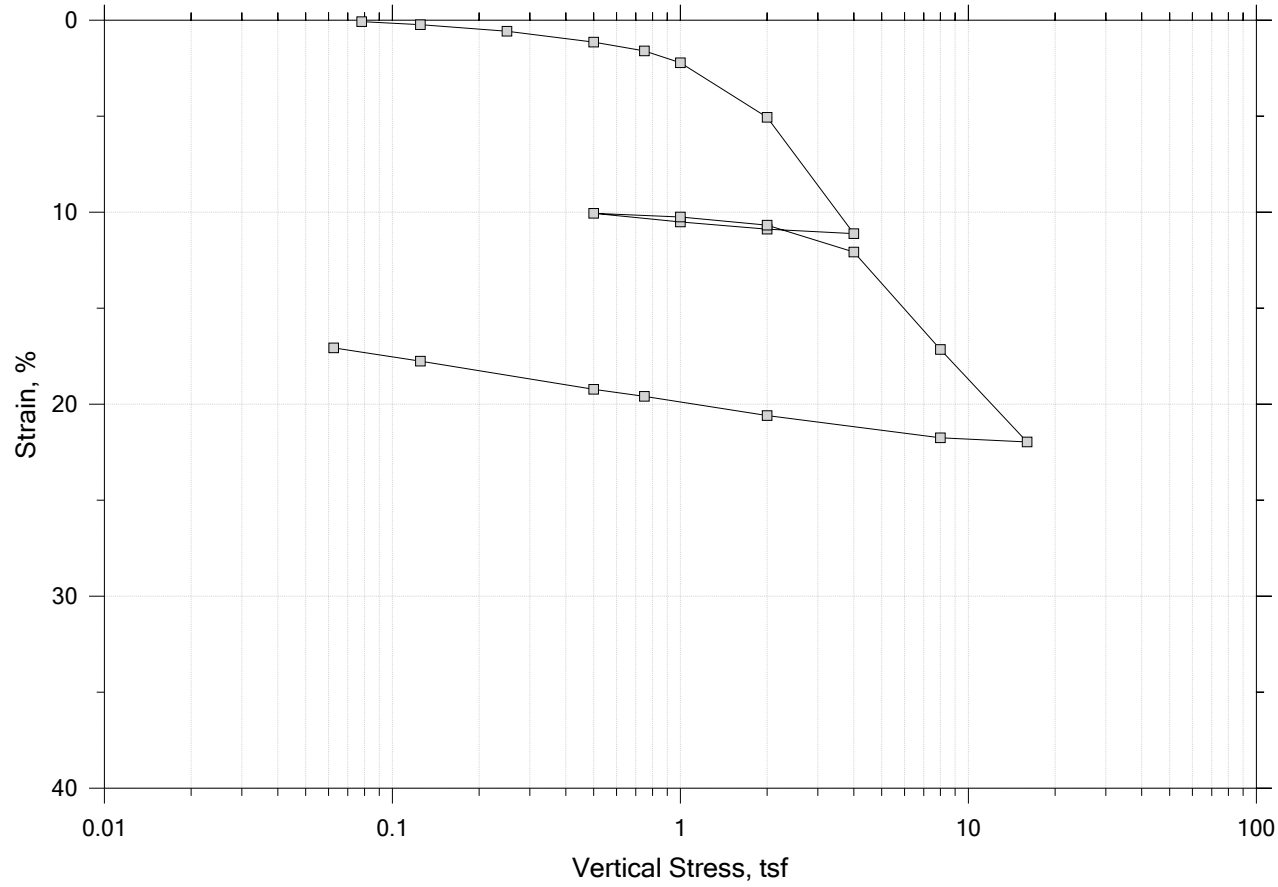
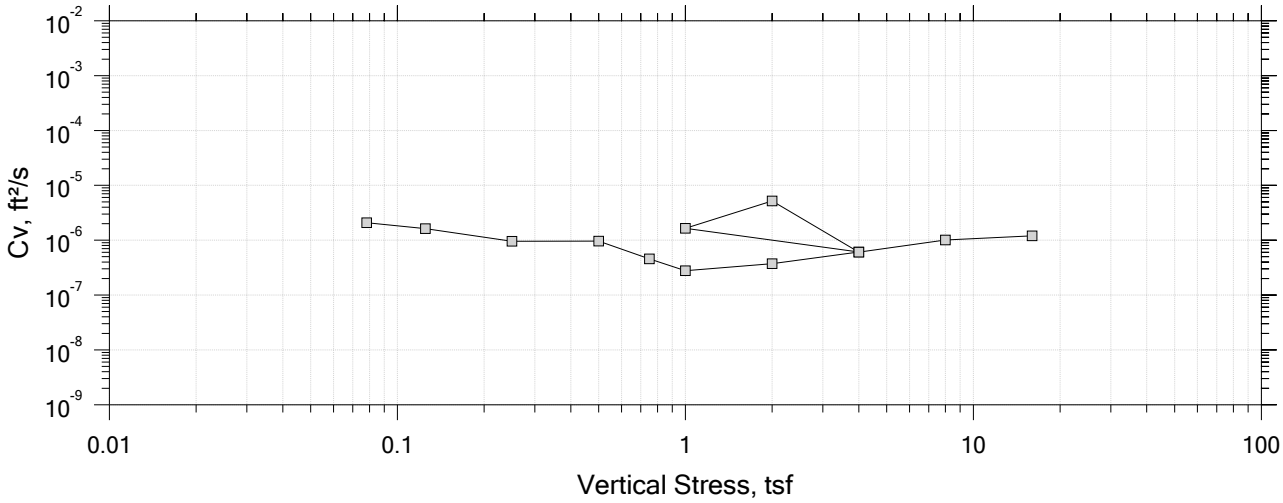
One-Dimensional Consolidation by ASTM D2435 - Method B

Summary Report





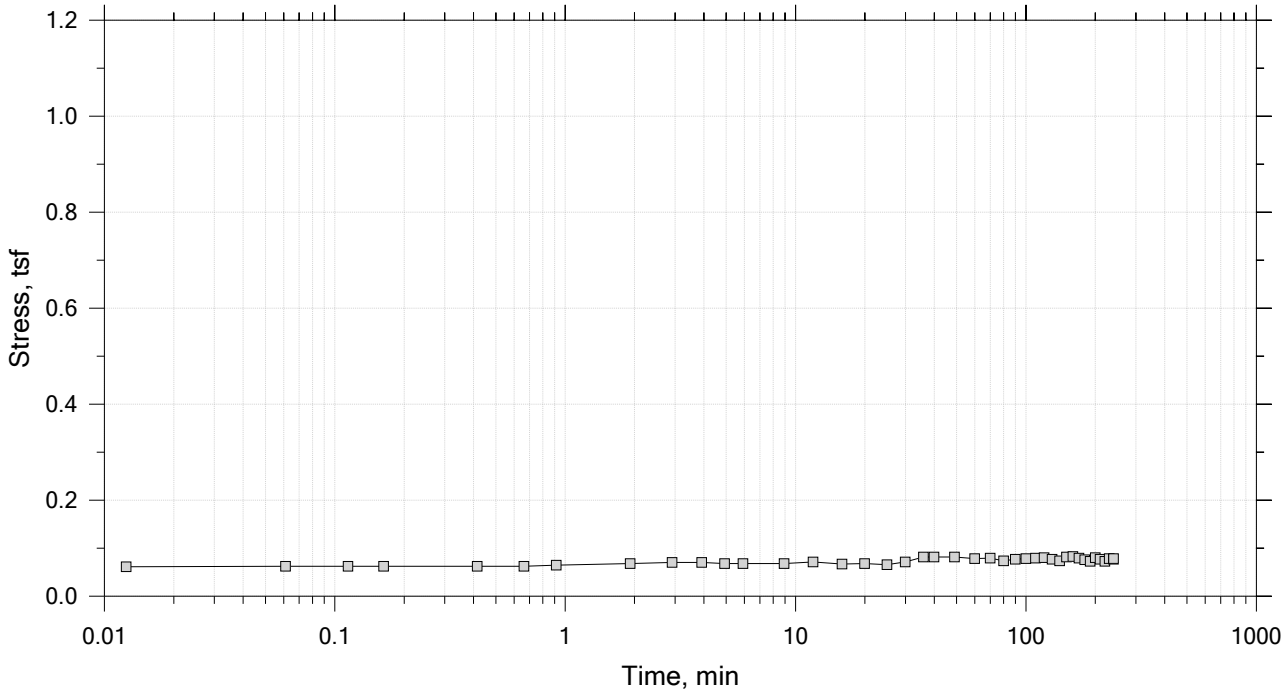
GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-101	Tested By: md	Checked By: njh
	Sample No.: U2	Test Date: 09/24/18	Depth: 35-37 ft
	Test No.: IP-6	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System K, Swell Pressure = 0.0782 tsf		
	Displacement at End of Increment		

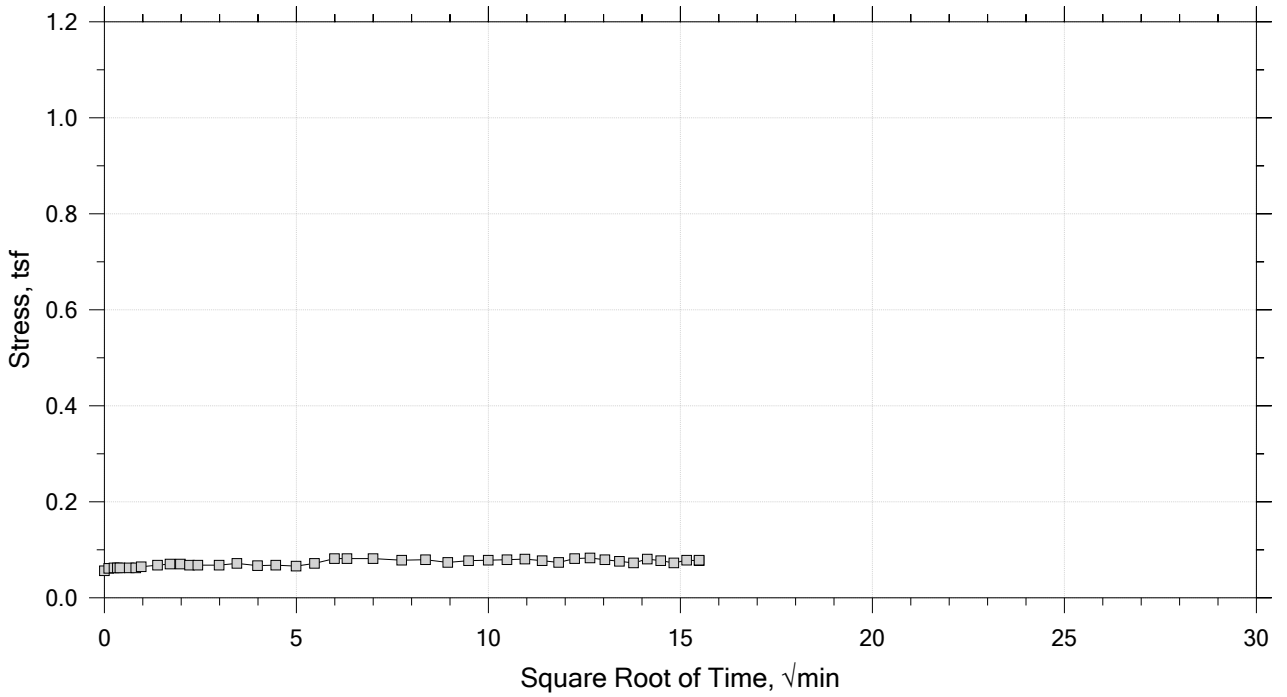
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 1 of 22

Constant Volume Step

Stress: 0.0782 tsf





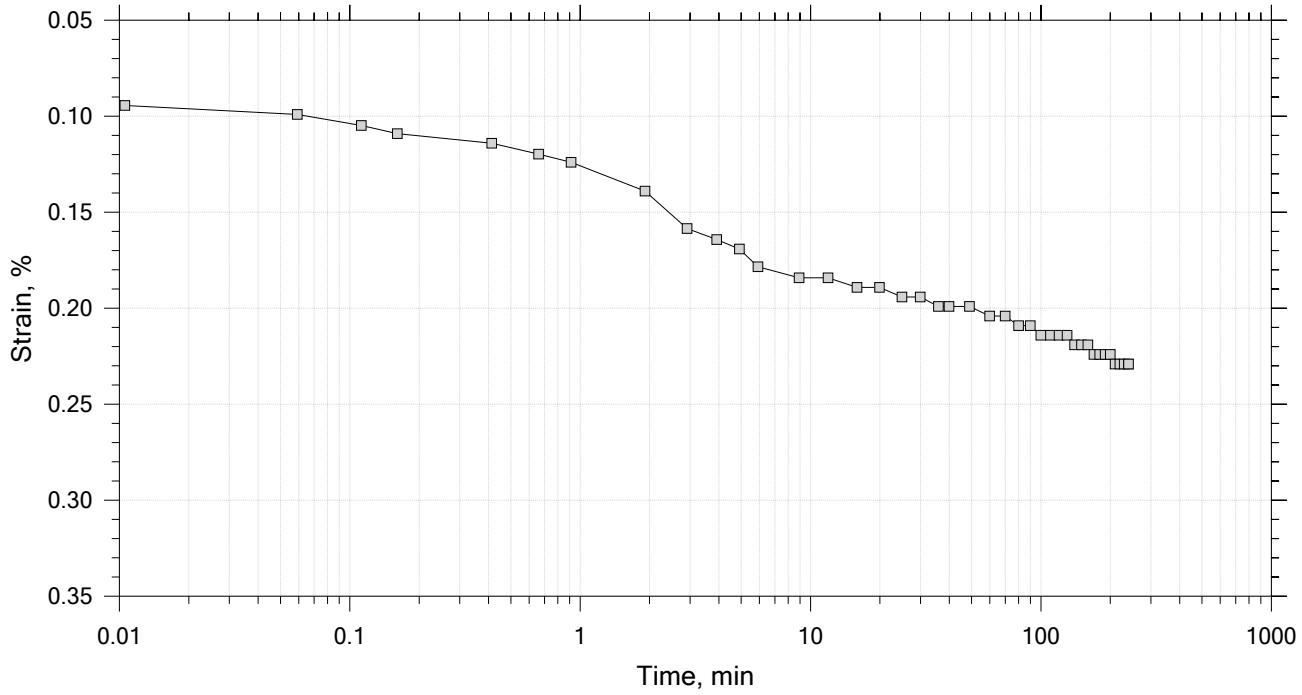
GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-101	Tested By: md	Checked By: njh
	Sample No.: U2	Test Date: 09/24/18	Depth: 35-37 ft
	Test No.: IP-6	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System K, Swell Pressure = 0.0782 tsf		

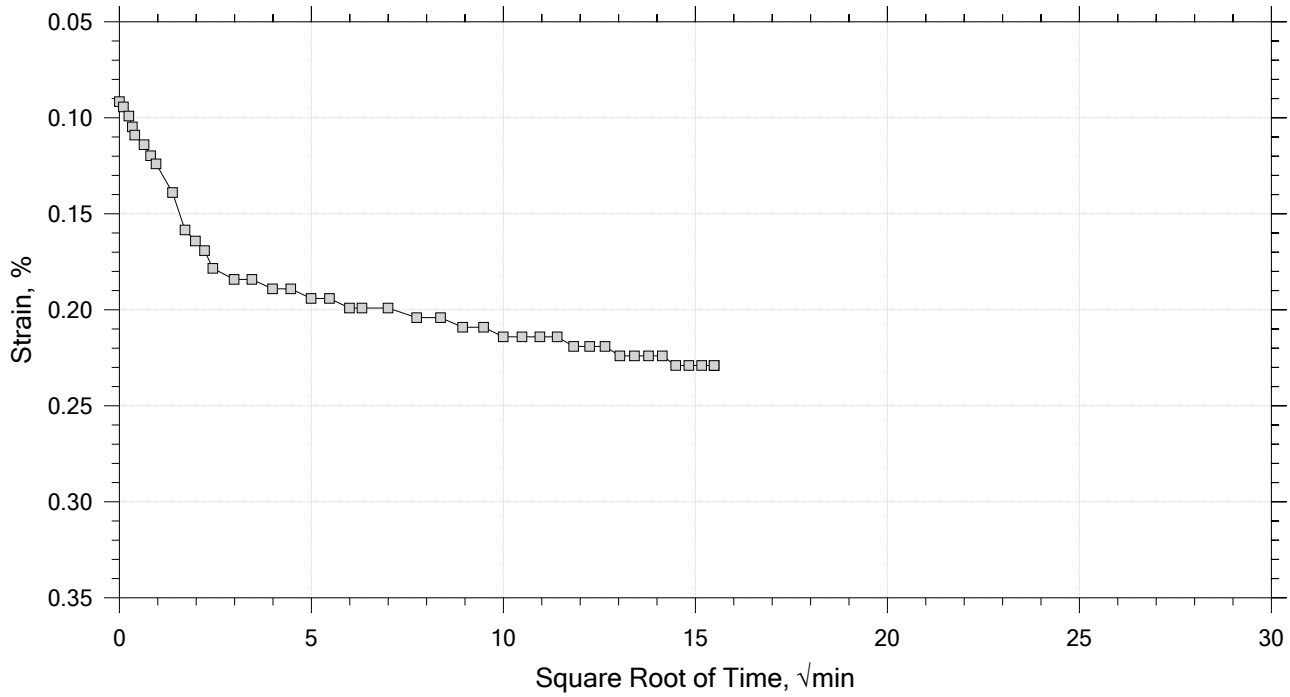
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 2 of 22

Constant Load Step

Stress: 0.125 tsf





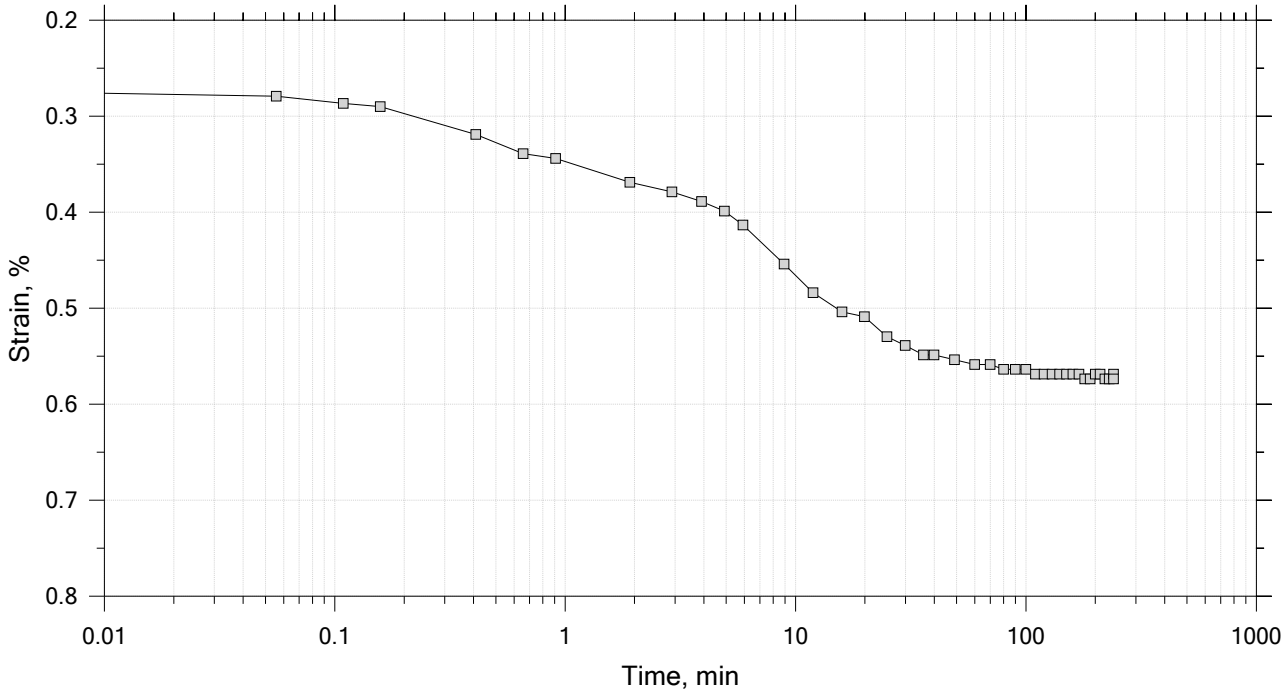
Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
Boring No.: BB-PVS-101	Tested By: md	Checked By: njh
Sample No.: U2	Test Date: 09/24/18	Depth: 35-37 ft
Test No.: IP-6	Sample Type: intact	Elevation: ---
Description: Moist, dark gray clay		
Remarks: System K, Swell Pressure = 0.0782 tsf		

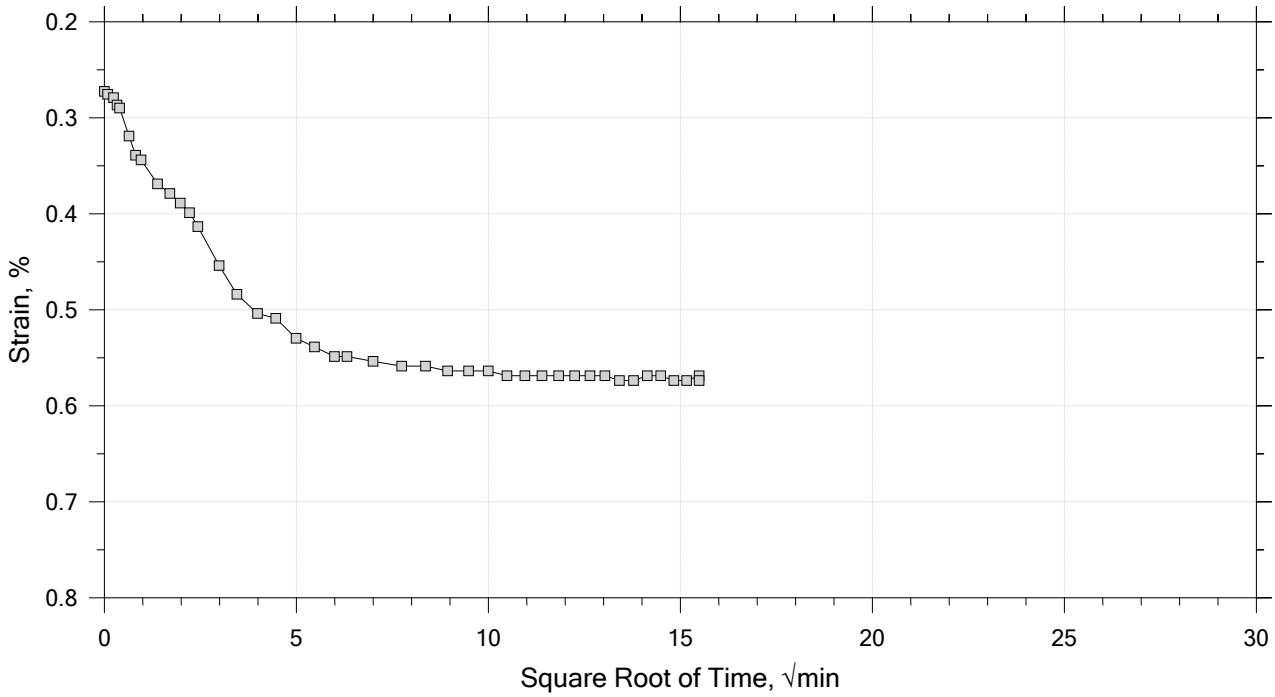
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 3 of 22

Constant Load Step

Stress: 0.25 tsf





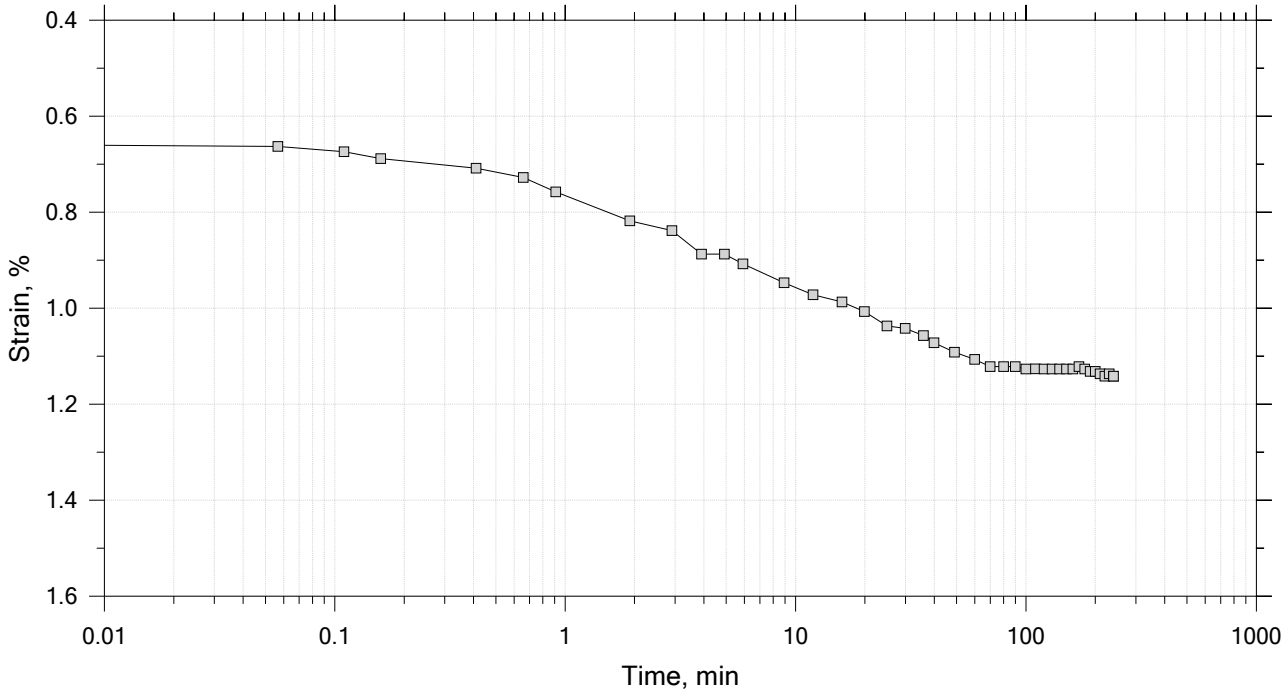
GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-101	Tested By: md	Checked By: njh
	Sample No.: U2	Test Date: 09/24/18	Depth: 35-37 ft
	Test No.: IP-6	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System K, Swell Pressure = 0.0782 tsf		

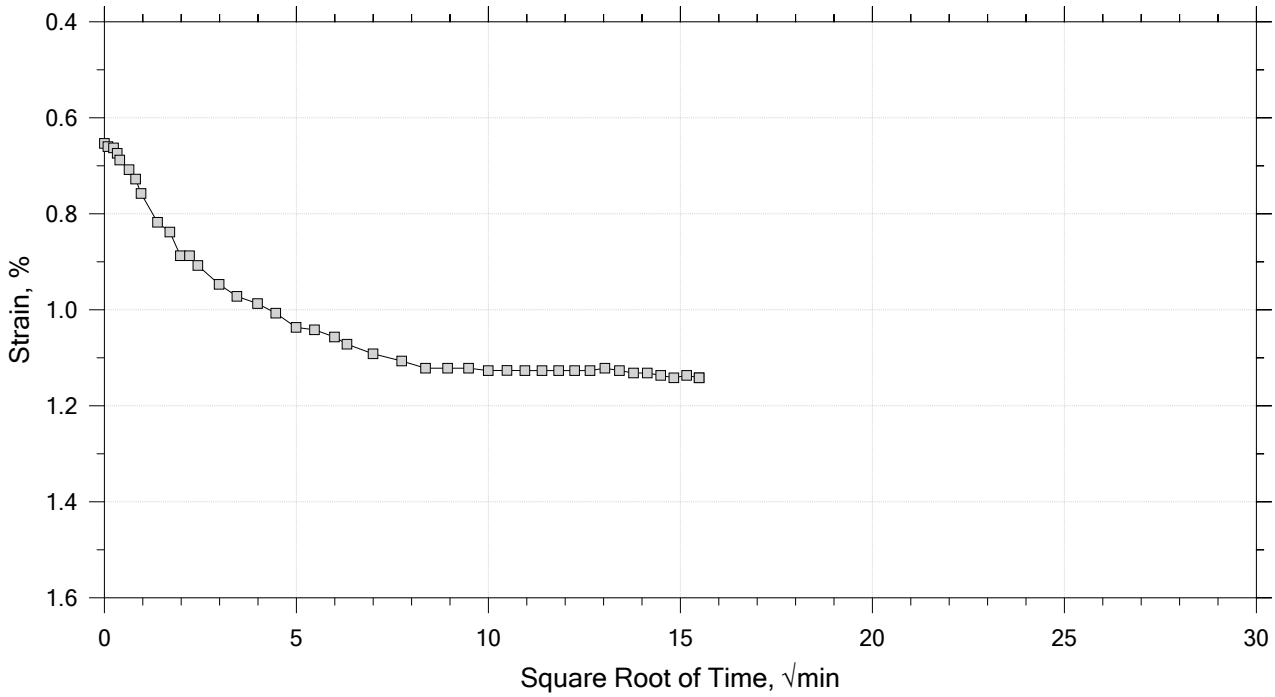
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 4 of 22

Constant Load Step

Stress: 0.5 tsf





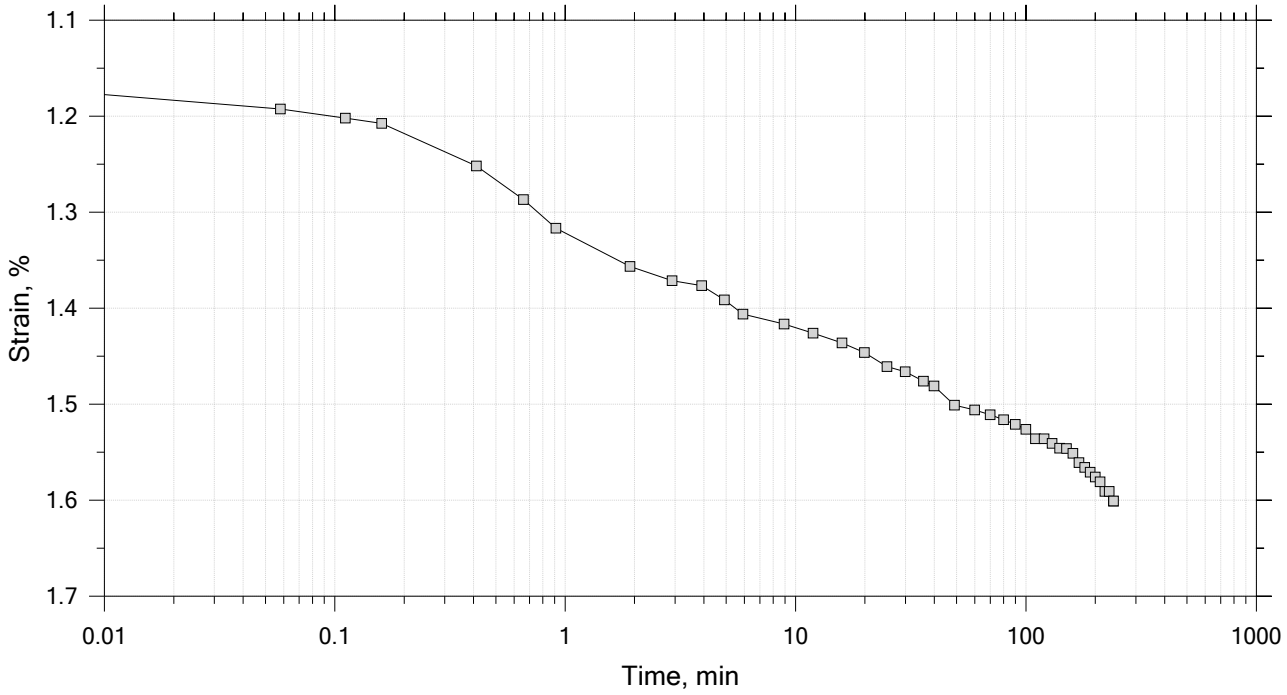
GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-101	Tested By: md	Checked By: njh
	Sample No.: U2	Test Date: 09/24/18	Depth: 35-37 ft
	Test No.: IP-6	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System K, Swell Pressure = 0.0782 tsf		

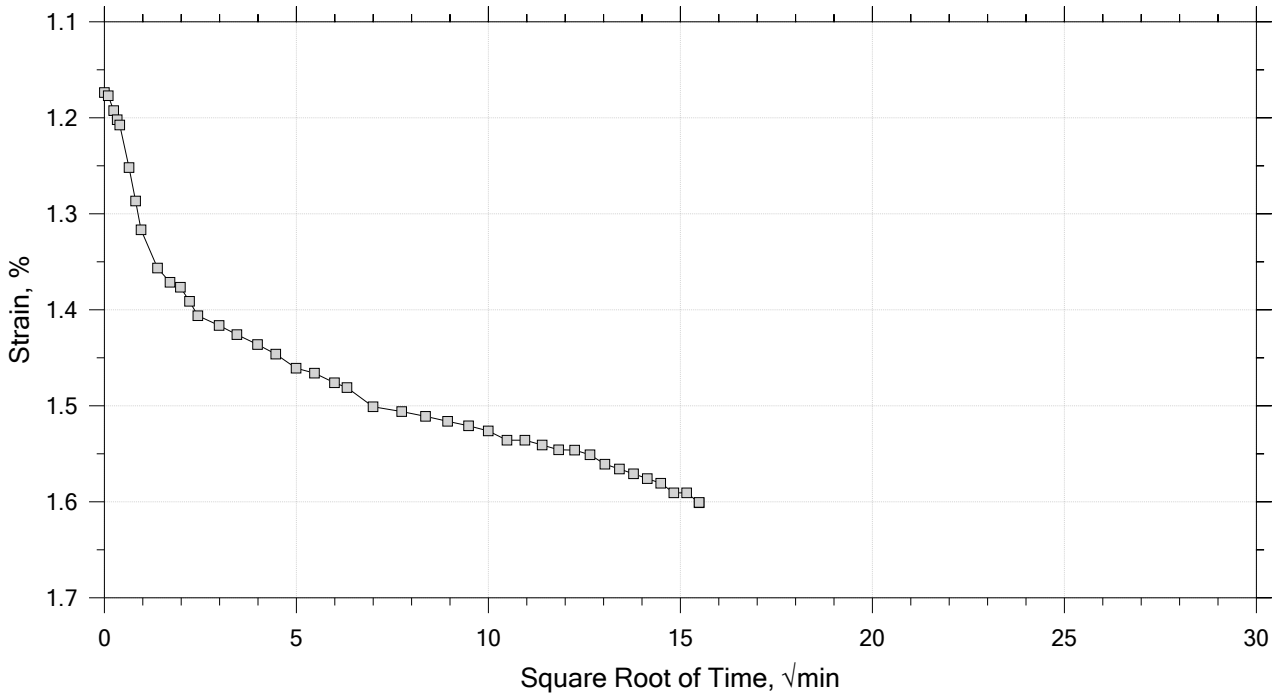
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 5 of 22

Constant Load Step

Stress: 0.75 tsf





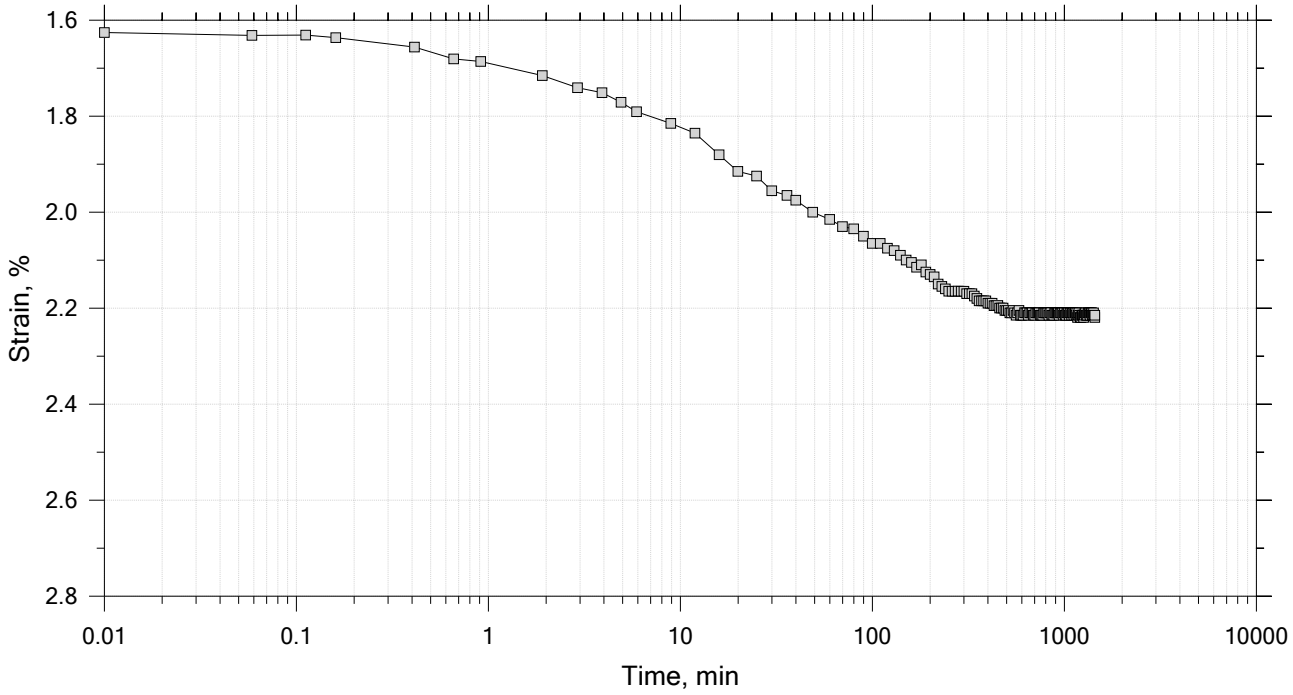
GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-101	Tested By: md	Checked By: njh
	Sample No.: U2	Test Date: 09/24/18	Depth: 35-37 ft
	Test No.: IP-6	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System K, Swell Pressure = 0.0782 tsf		

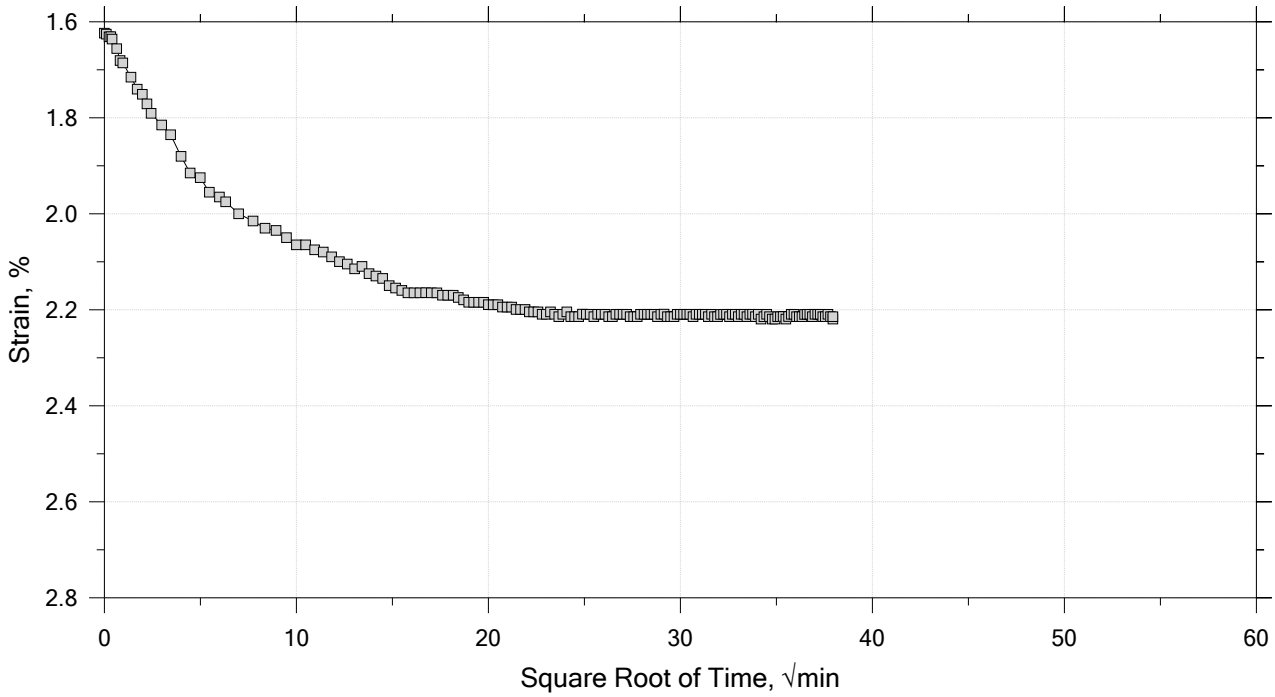
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 6 of 22

Constant Load Step

Stress: 1 tsf





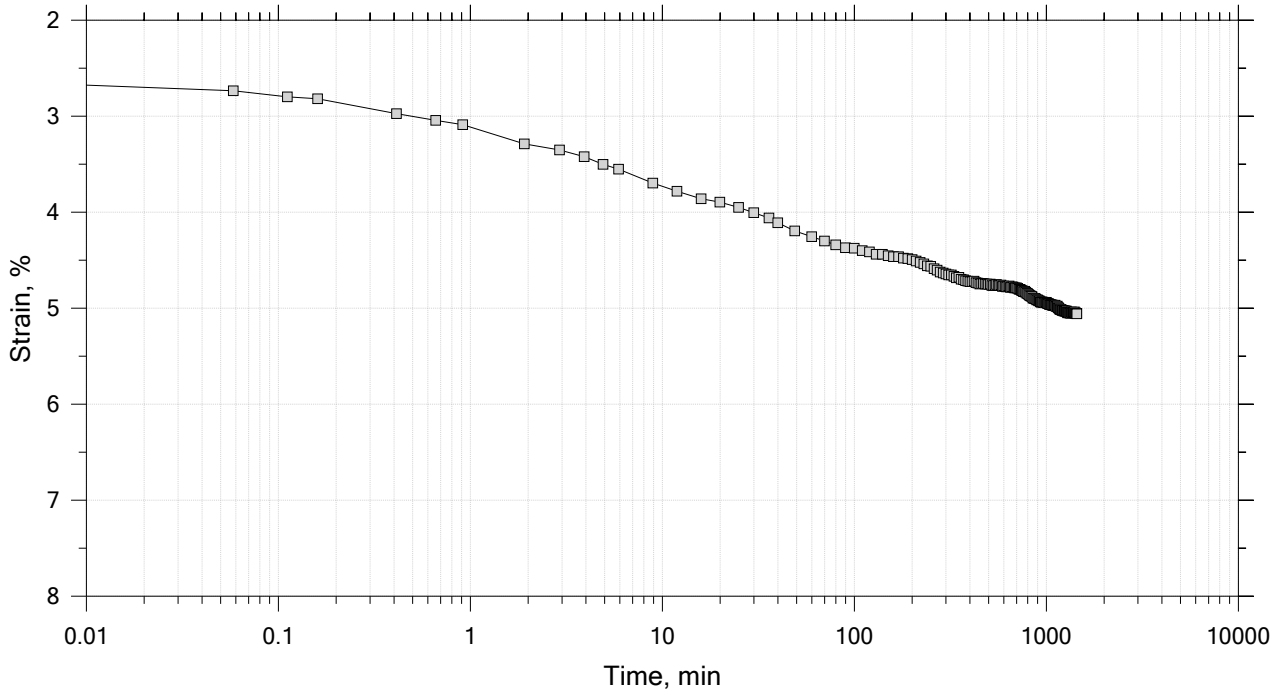
GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-101	Tested By: md	Checked By: njh
	Sample No.: U2	Test Date: 09/24/18	Depth: 35-37 ft
	Test No.: IP-6	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System K, Swell Pressure = 0.0782 tsf		

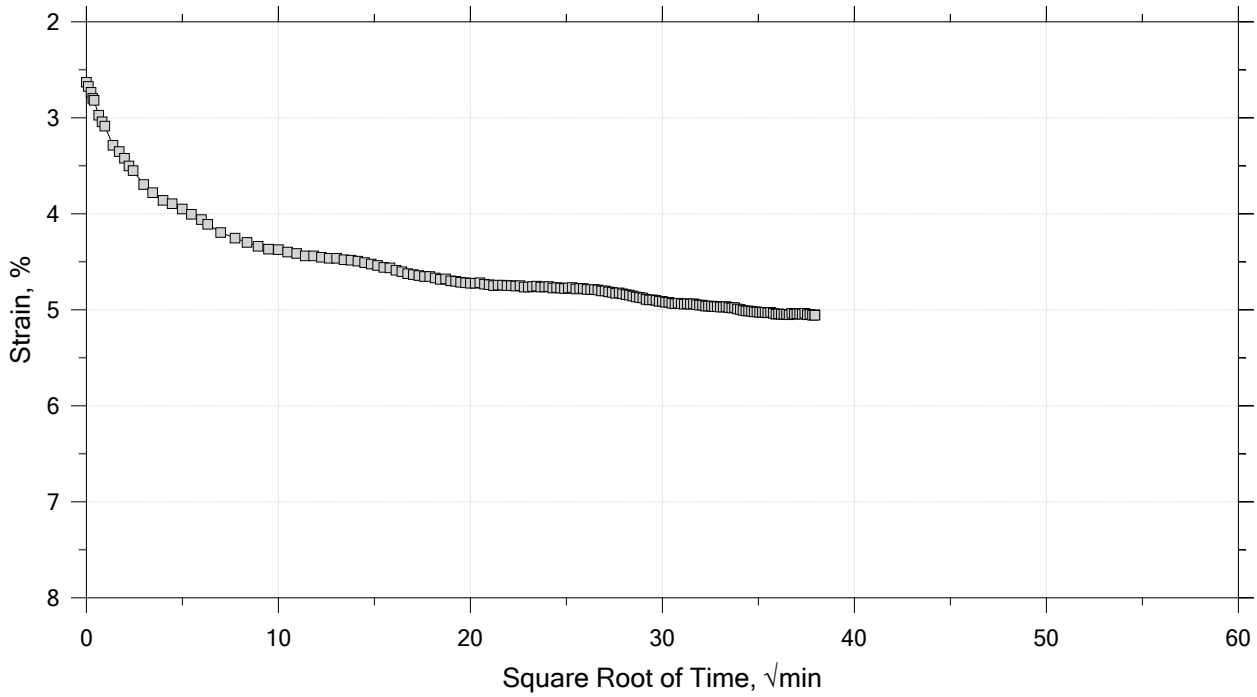
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 7 of 22

Constant Load Step

Stress: 2 tsf





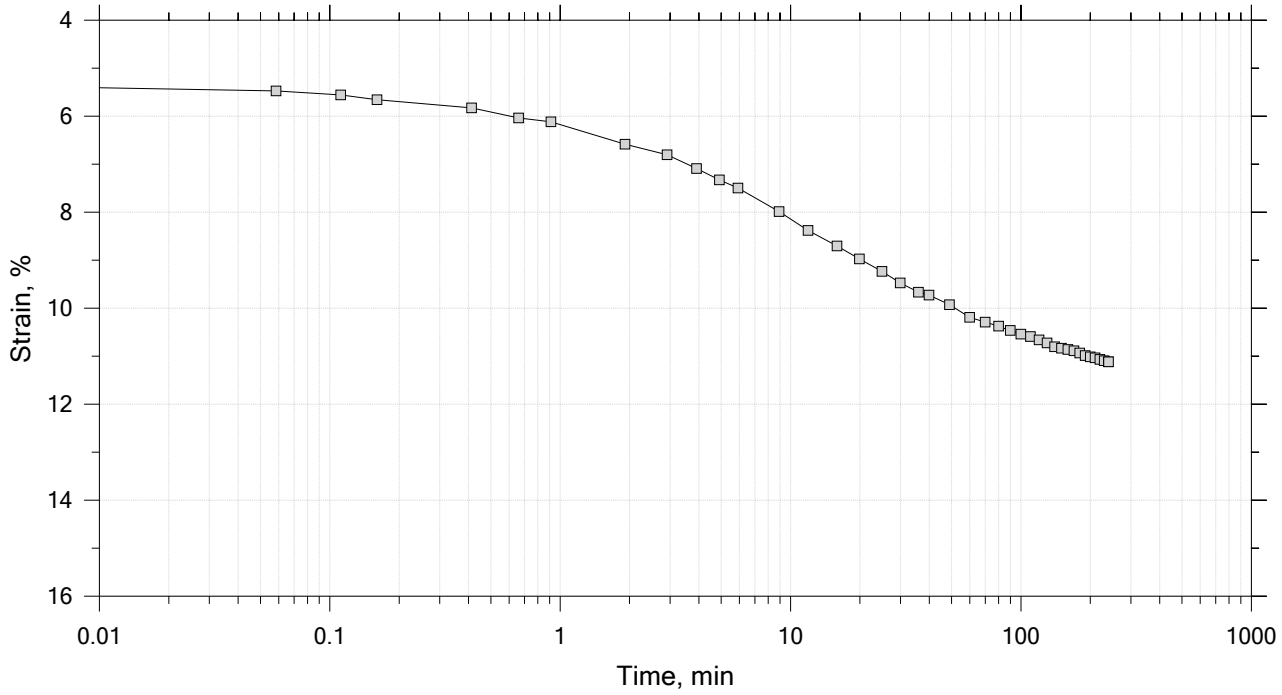
GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-101	Tested By: md	Checked By: njh
	Sample No.: U2	Test Date: 09/24/18	Depth: 35-37 ft
	Test No.: IP-6	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System K, Swell Pressure = 0.0782 tsf		

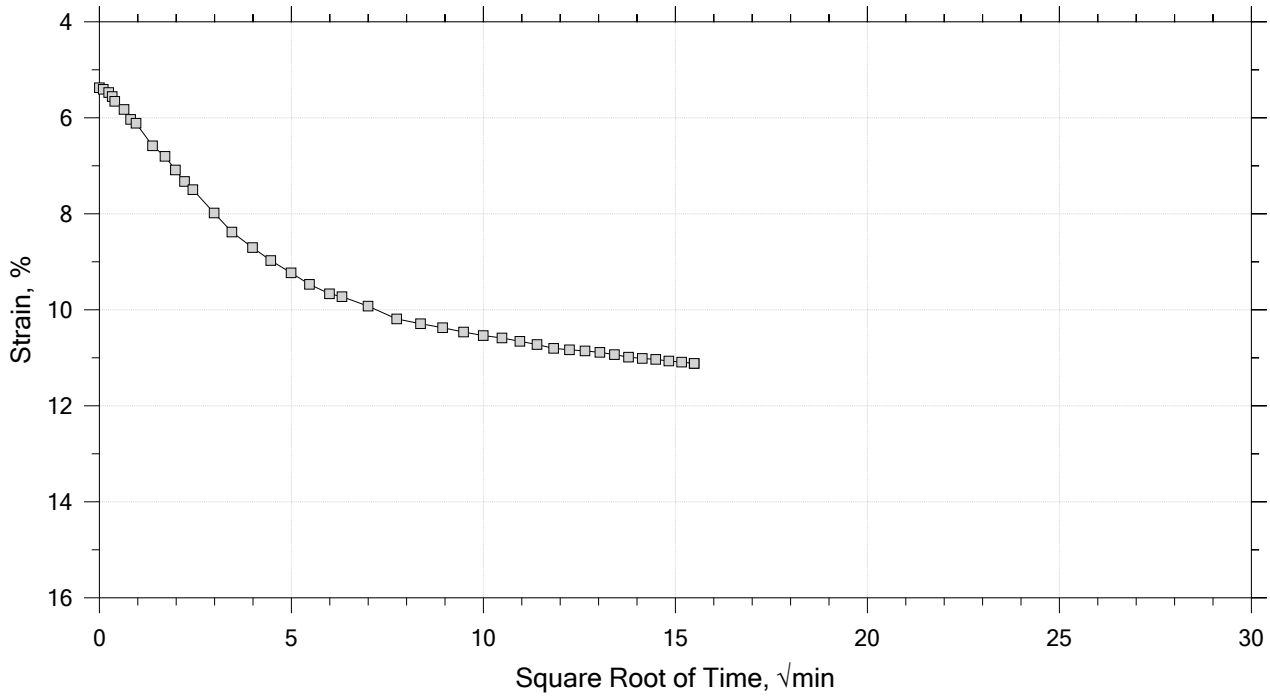
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 8 of 22

Constant Load Step

Stress: 4 tsf





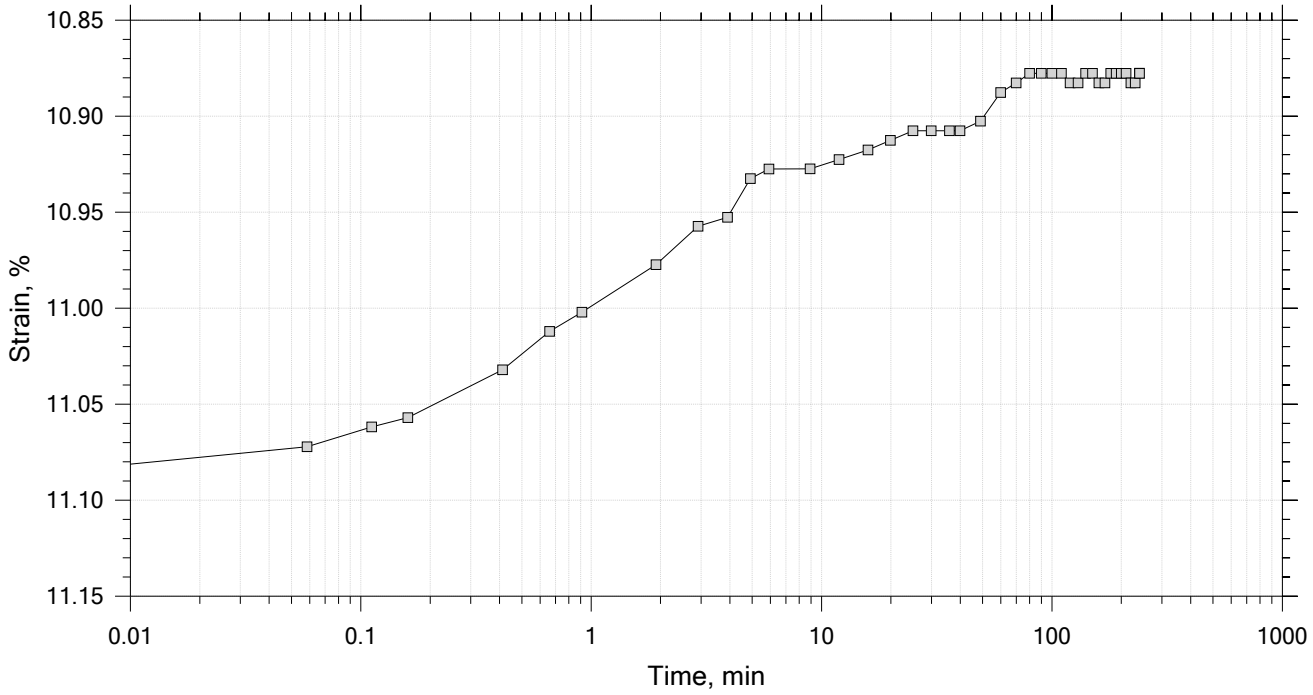
GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-101	Tested By: md	Checked By: njh
	Sample No.: U2	Test Date: 09/24/18	Depth: 35-37 ft
	Test No.: IP-6	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System K, Swell Pressure = 0.0782 tsf		

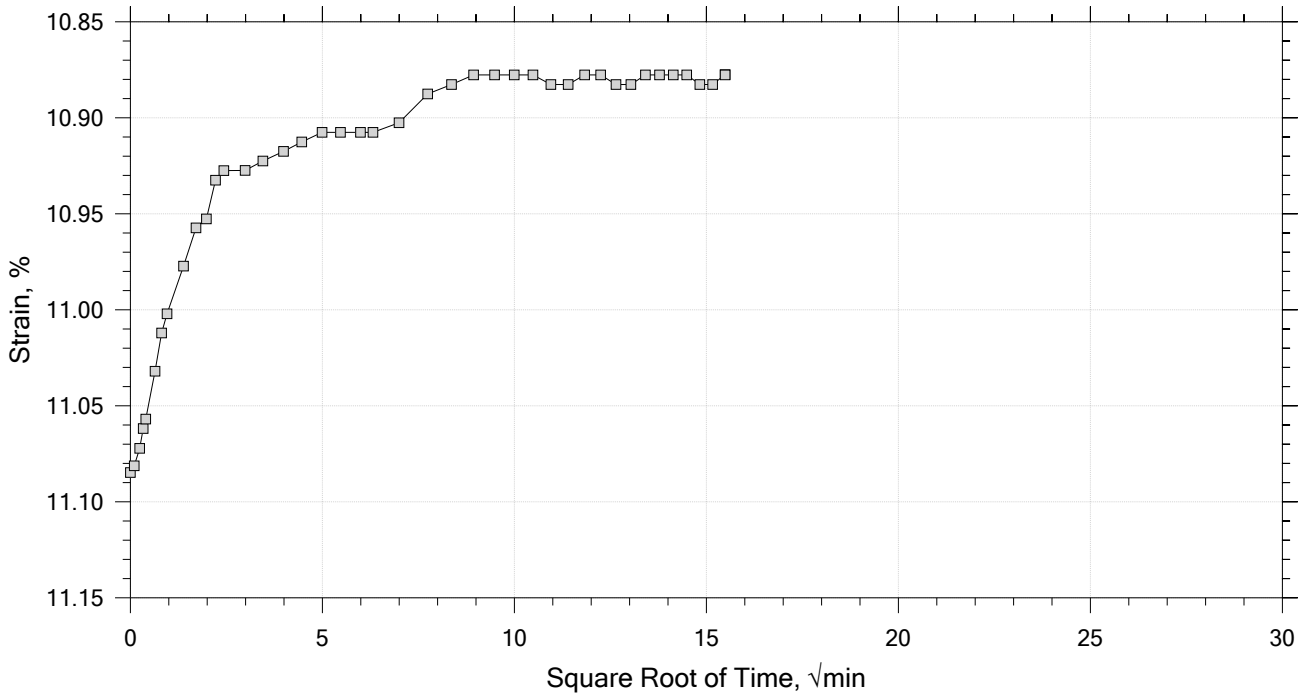
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 9 of 22

Constant Load Step

Stress: 2 tsf

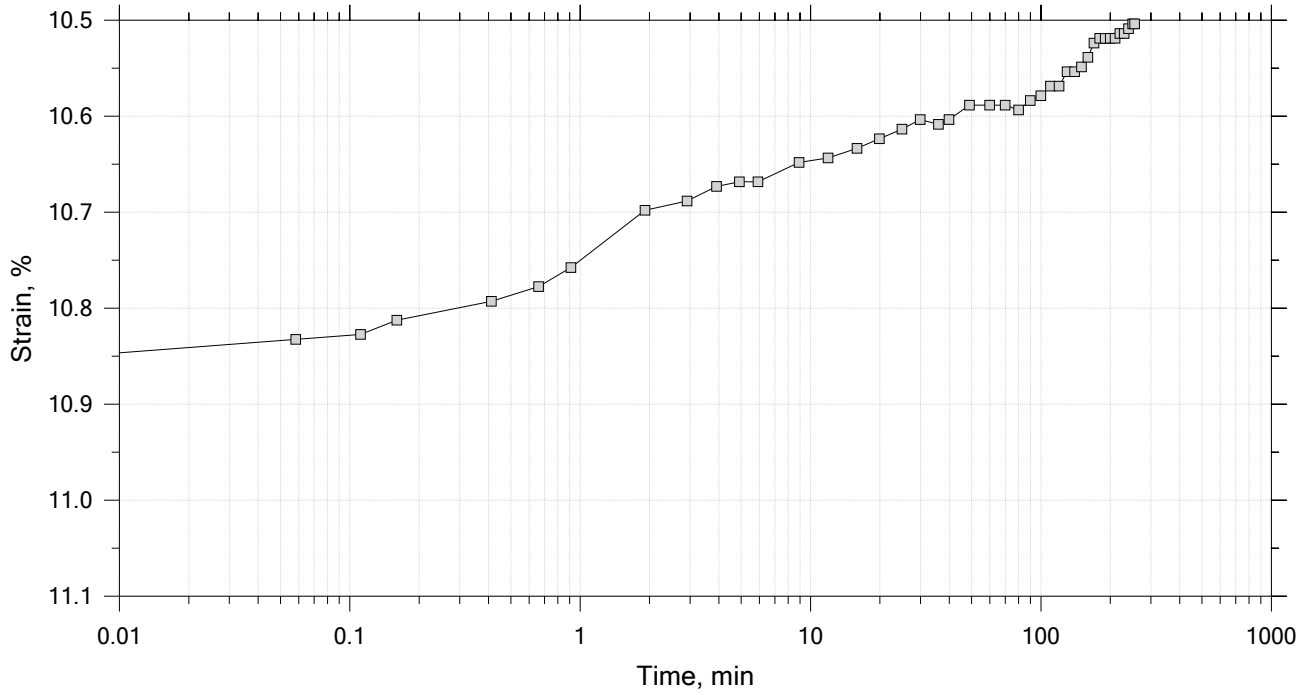


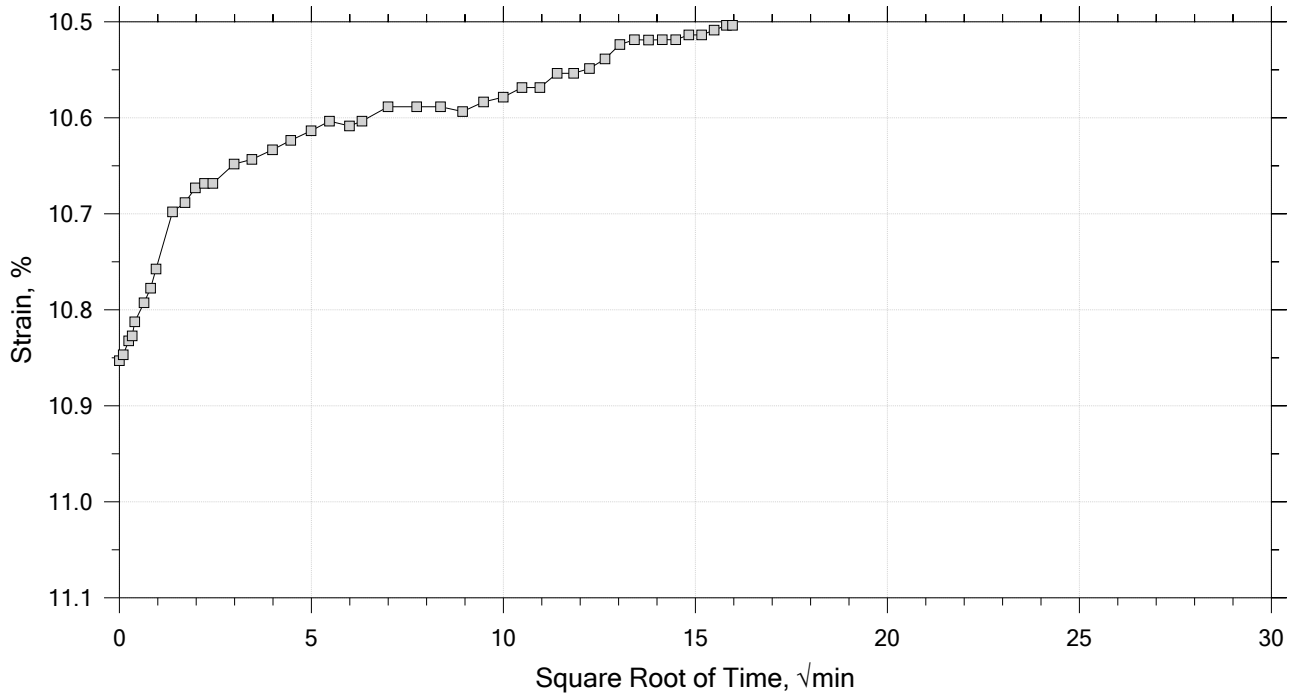


Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
Boring No.: BB-PVS-101	Tested By: md	Checked By: njh
Sample No.: U2	Test Date: 09/24/18	Depth: 35-37 ft
Test No.: IP-6	Sample Type: intact	Elevation: ---
Description: Moist, dark gray clay		
Remarks: System K, Swell Pressure = 0.0782 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 10 of 22
Constant Load Step
Stress: 1 tsf

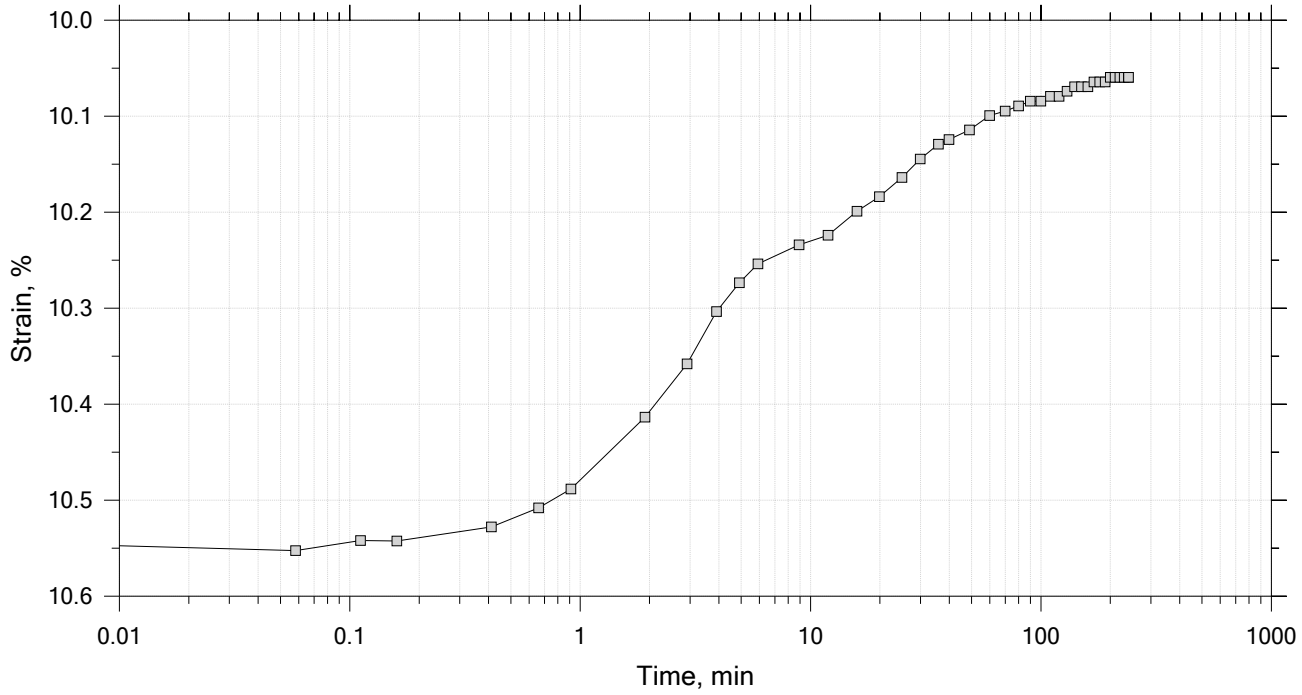


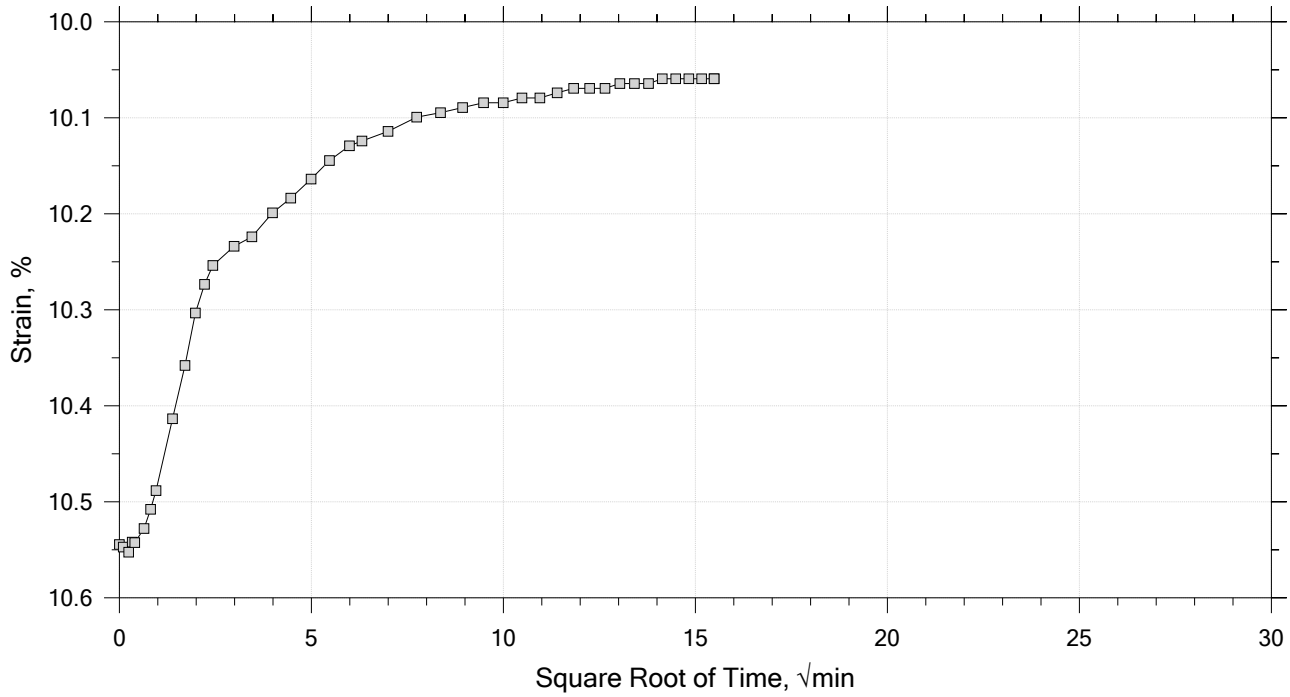


GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-101	Tested By: md	Checked By: njh
	Sample No.: U2	Test Date: 09/24/18	Depth: 35-37 ft
	Test No.: IP-6	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System K, Swell Pressure = 0.0782 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 11 of 22
Constant Load Step
Stress: 0.5 tsf





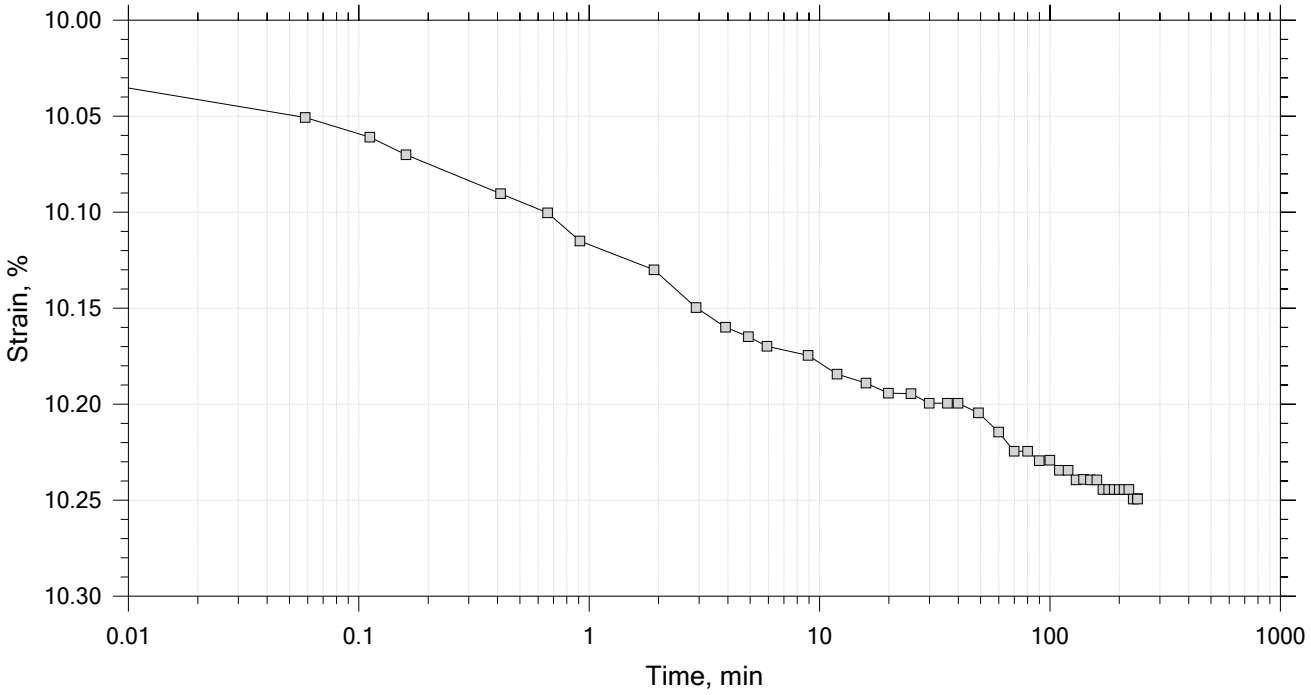
GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-101	Tested By: md	Checked By: njh
	Sample No.: U2	Test Date: 09/24/18	Depth: 35-37 ft
	Test No.: IP-6	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System K, Swell Pressure = 0.0782 tsf		

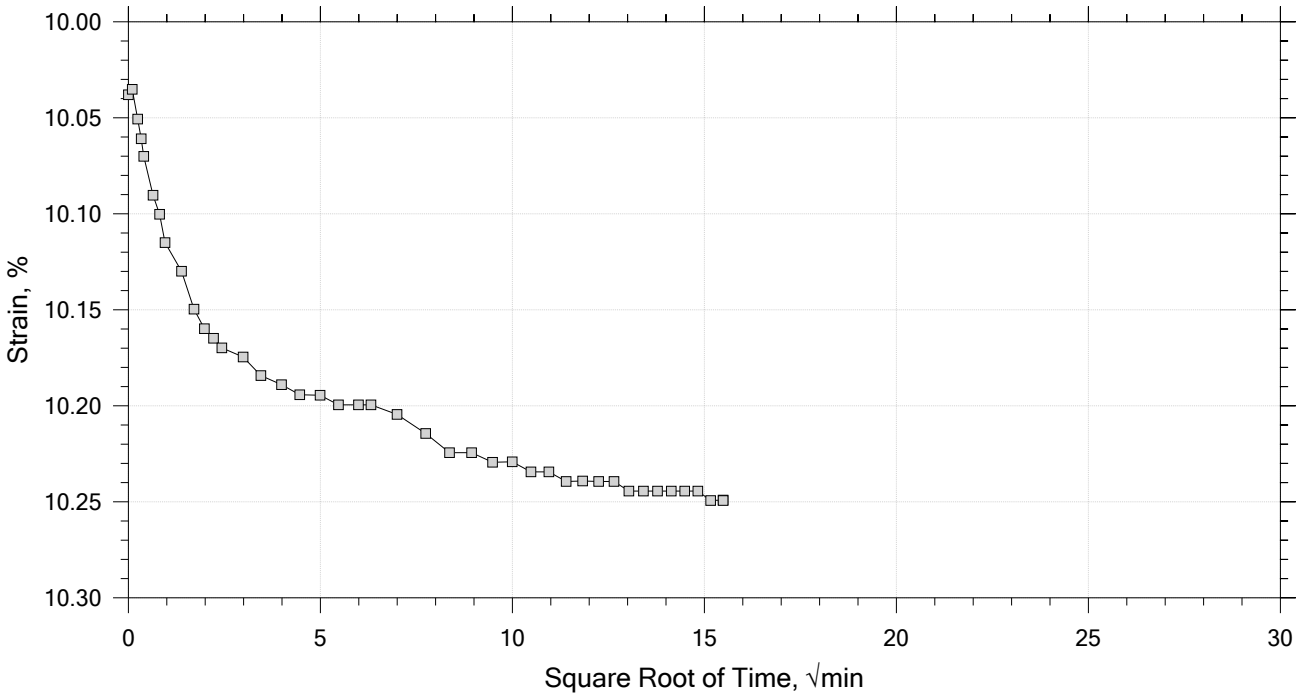
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 12 of 22

Constant Load Step

Stress: 1 tsf

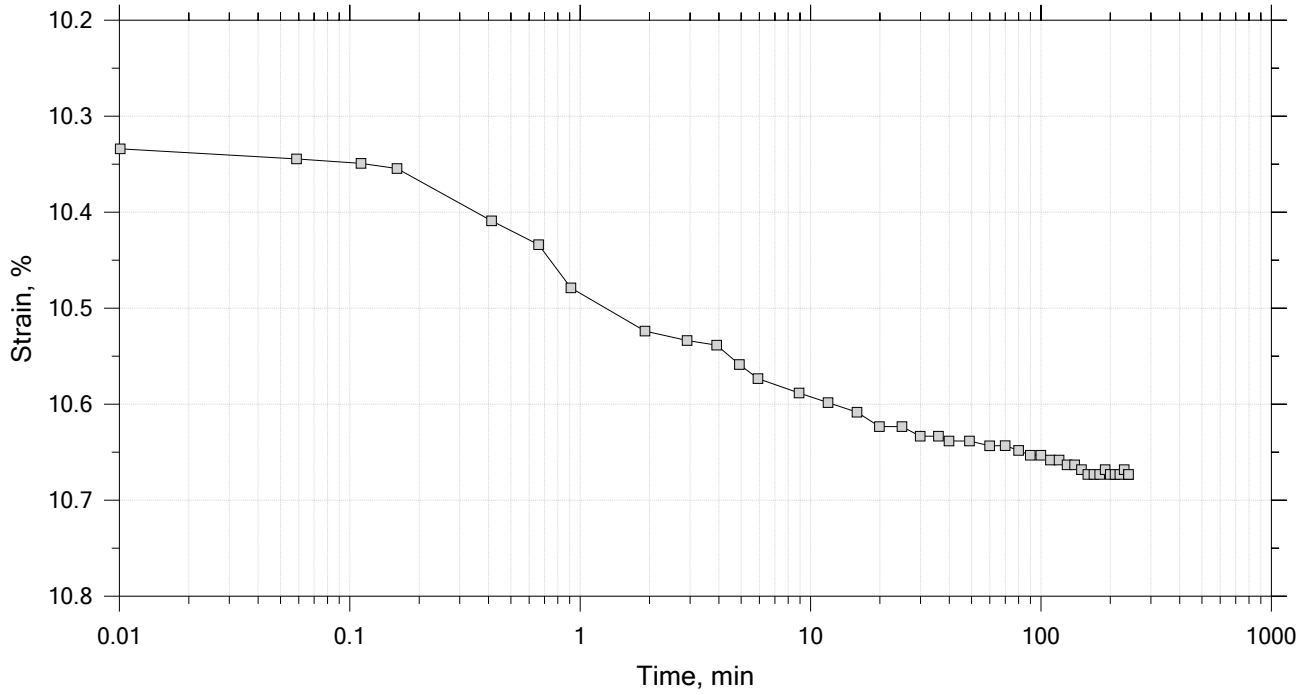


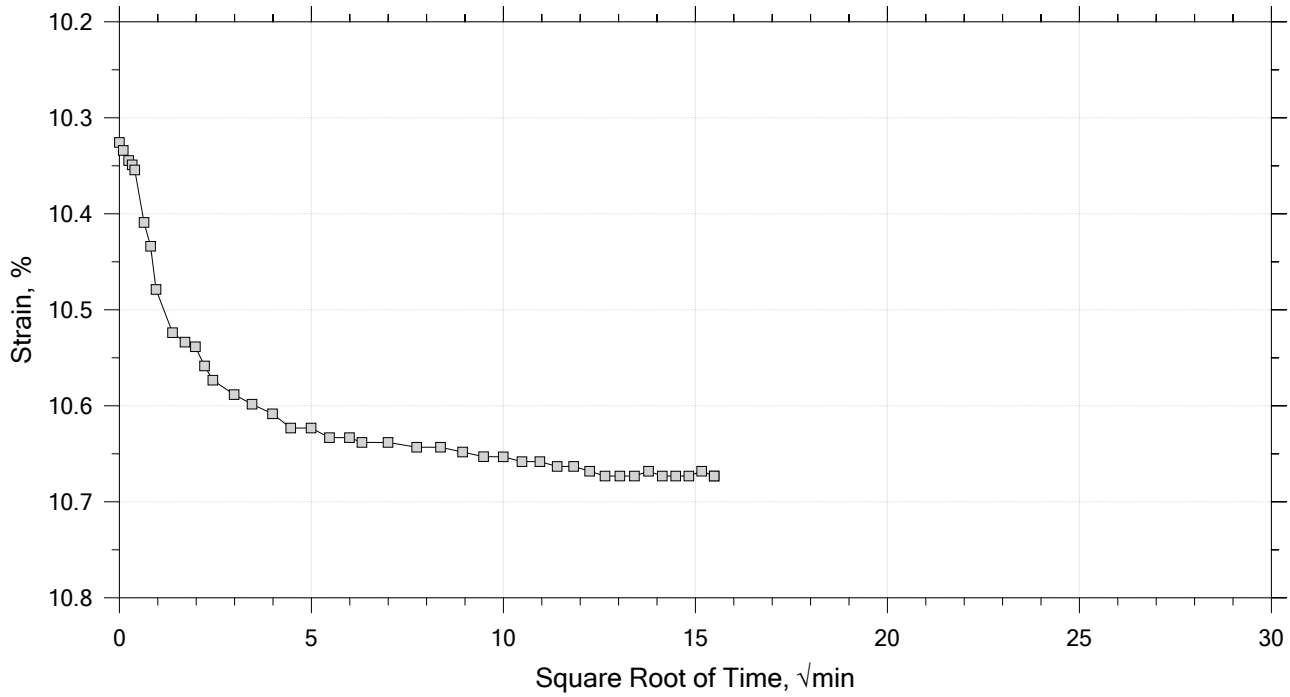


GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-101	Tested By: md	Checked By: njh
	Sample No.: U2	Test Date: 09/24/18	Depth: 35-37 ft
	Test No.: IP-6	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System K, Swell Pressure = 0.0782 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 13 of 22
Constant Load Step
Stress: 2 tsf

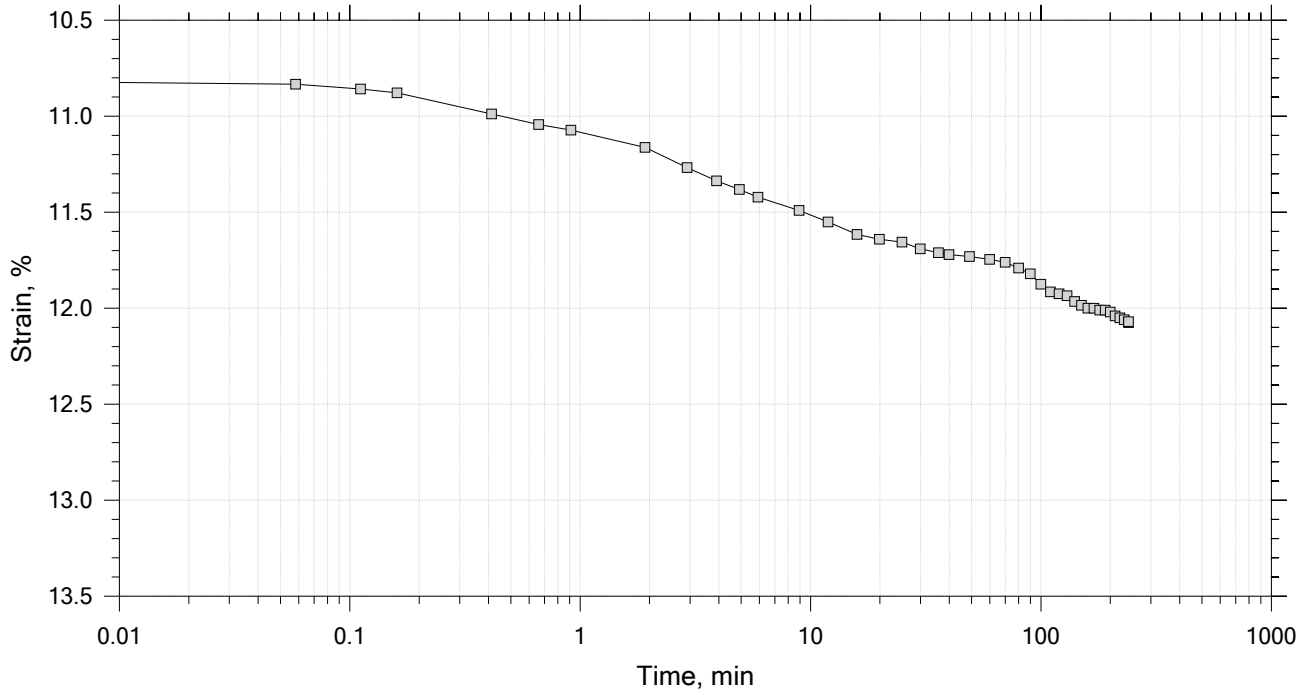


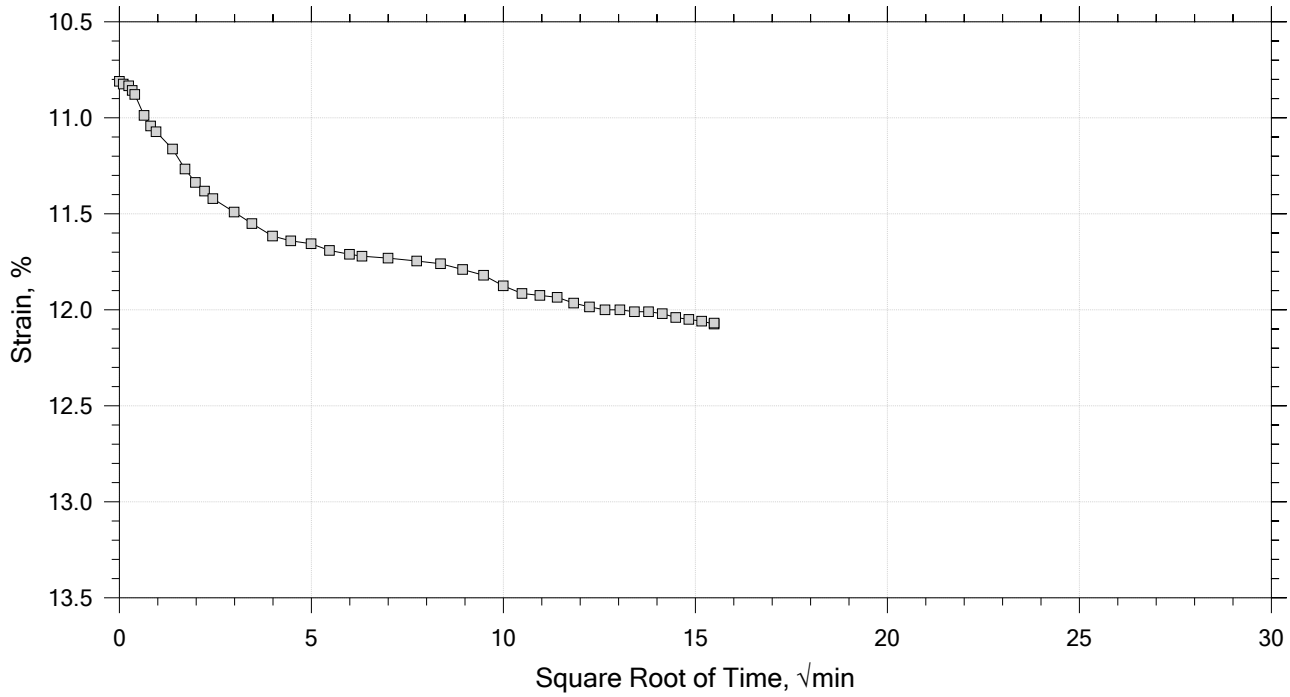


GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-101	Tested By: md	Checked By: njh
	Sample No.: U2	Test Date: 09/24/18	Depth: 35-37 ft
	Test No.: IP-6	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System K, Swell Pressure = 0.0782 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 14 of 22
Constant Load Step
Stress: 4 tsf

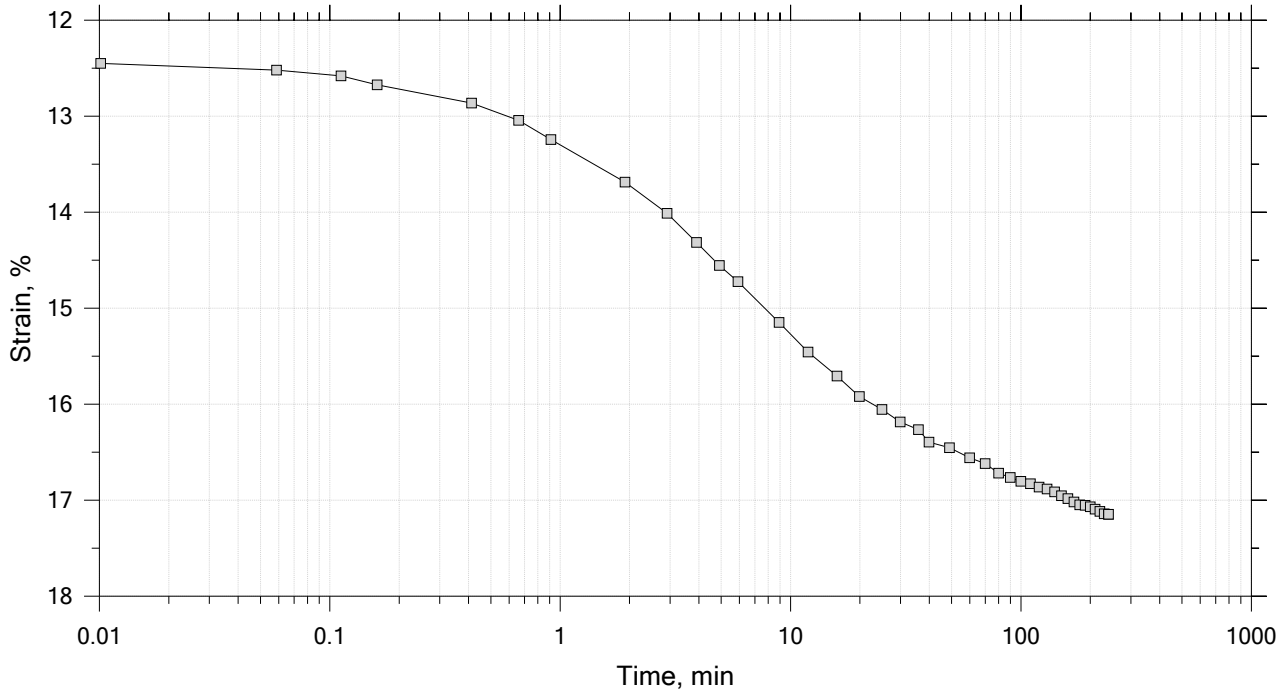


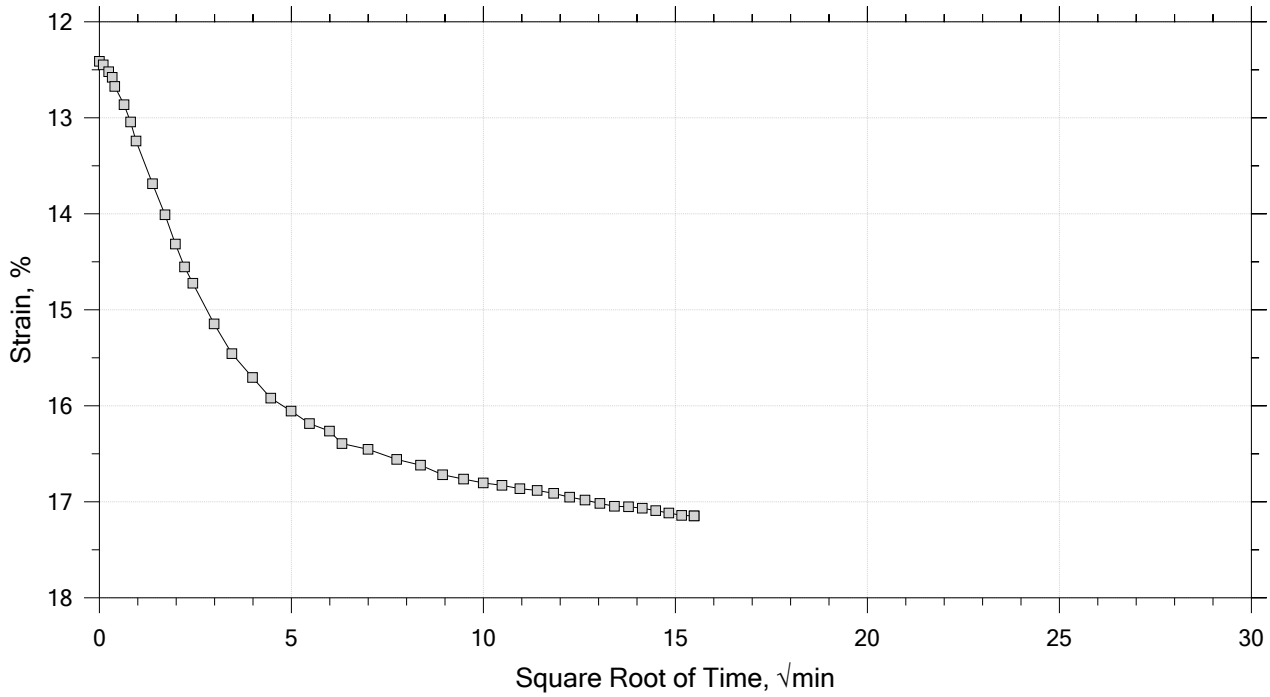


GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-101	Tested By: md	Checked By: njh
	Sample No.: U2	Test Date: 09/24/18	Depth: 35-37 ft
	Test No.: IP-6	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System K, Swell Pressure = 0.0782 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 15 of 22
Constant Load Step
Stress: 8 tsf

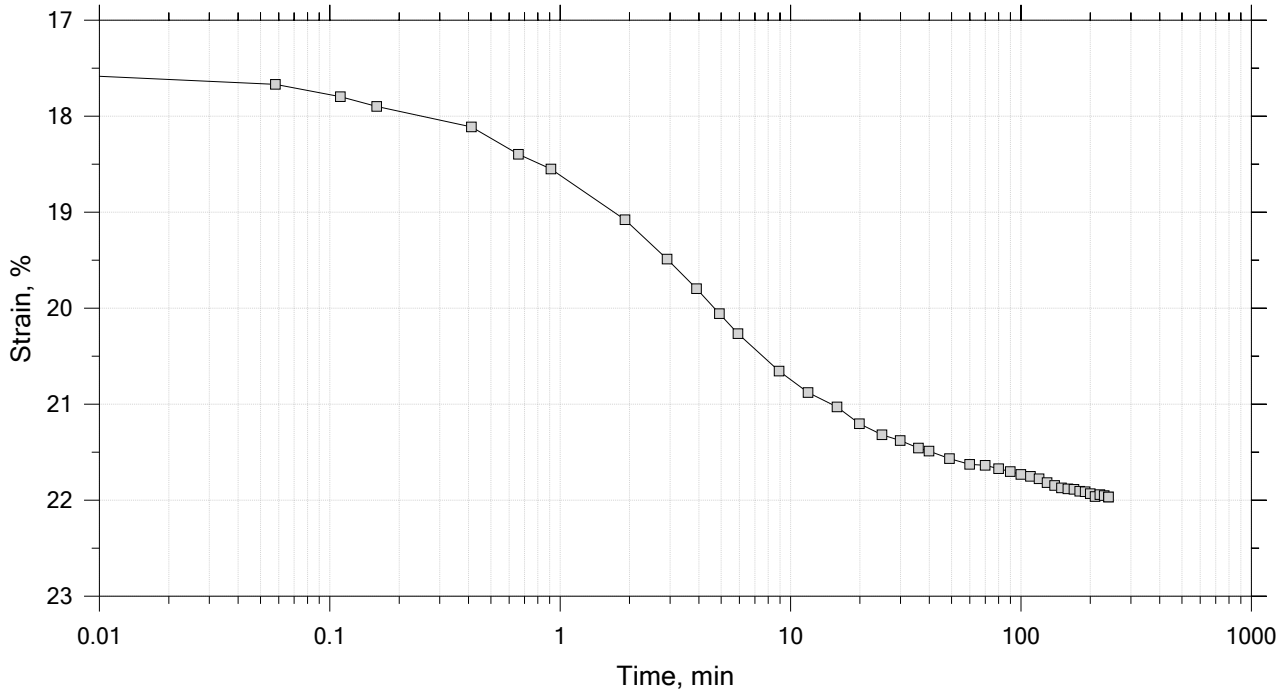


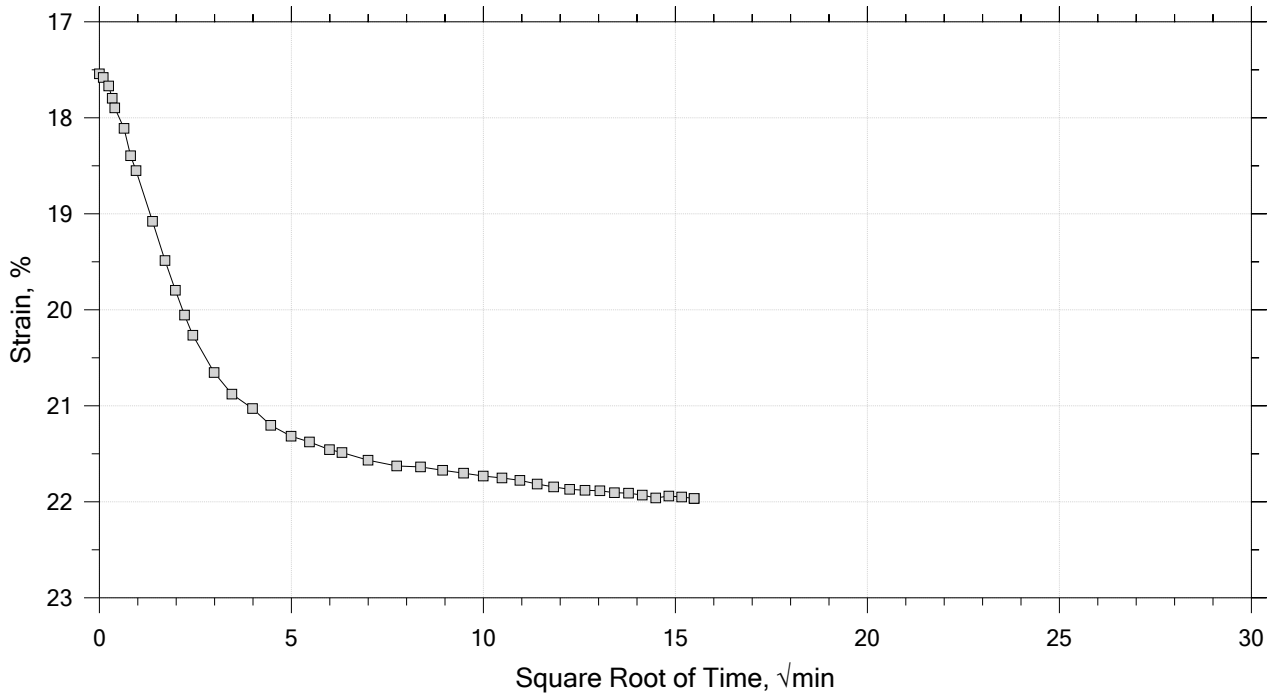


GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-101	Tested By: md	Checked By: njh
	Sample No.: U2	Test Date: 09/24/18	Depth: 35-37 ft
	Test No.: IP-6	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System K, Swell Pressure = 0.0782 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 16 of 22
Constant Load Step
Stress: 16 tsf

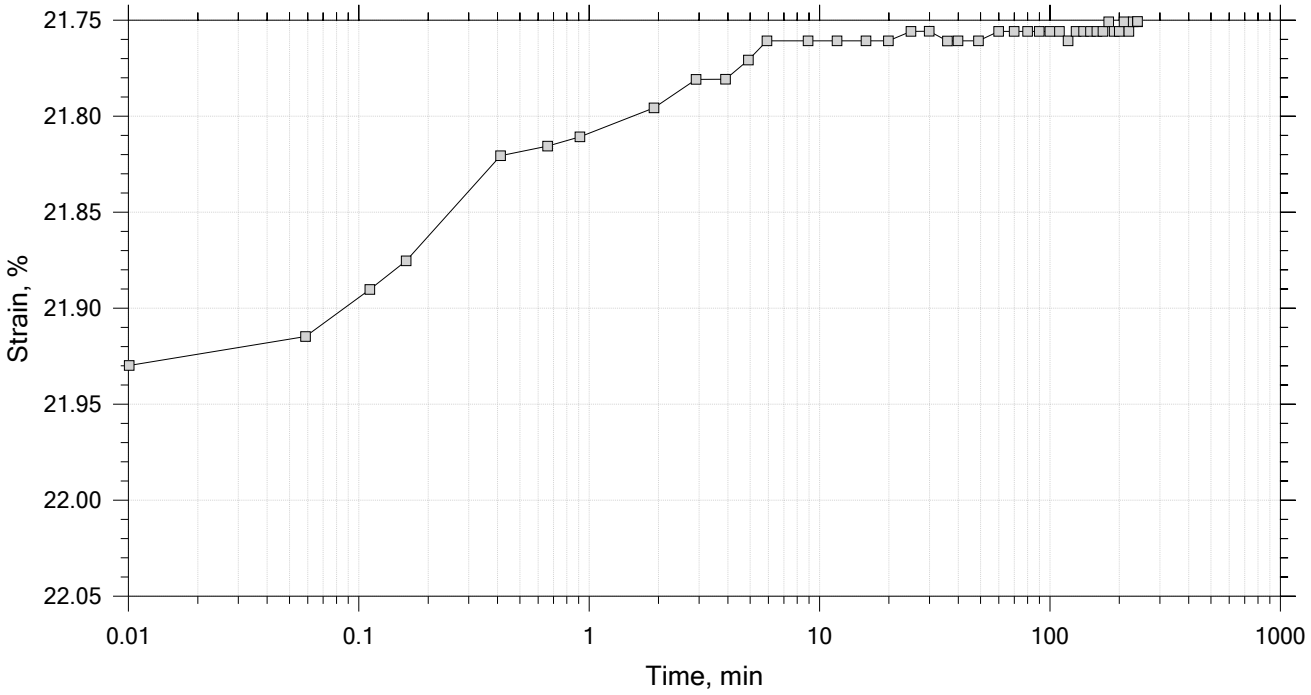


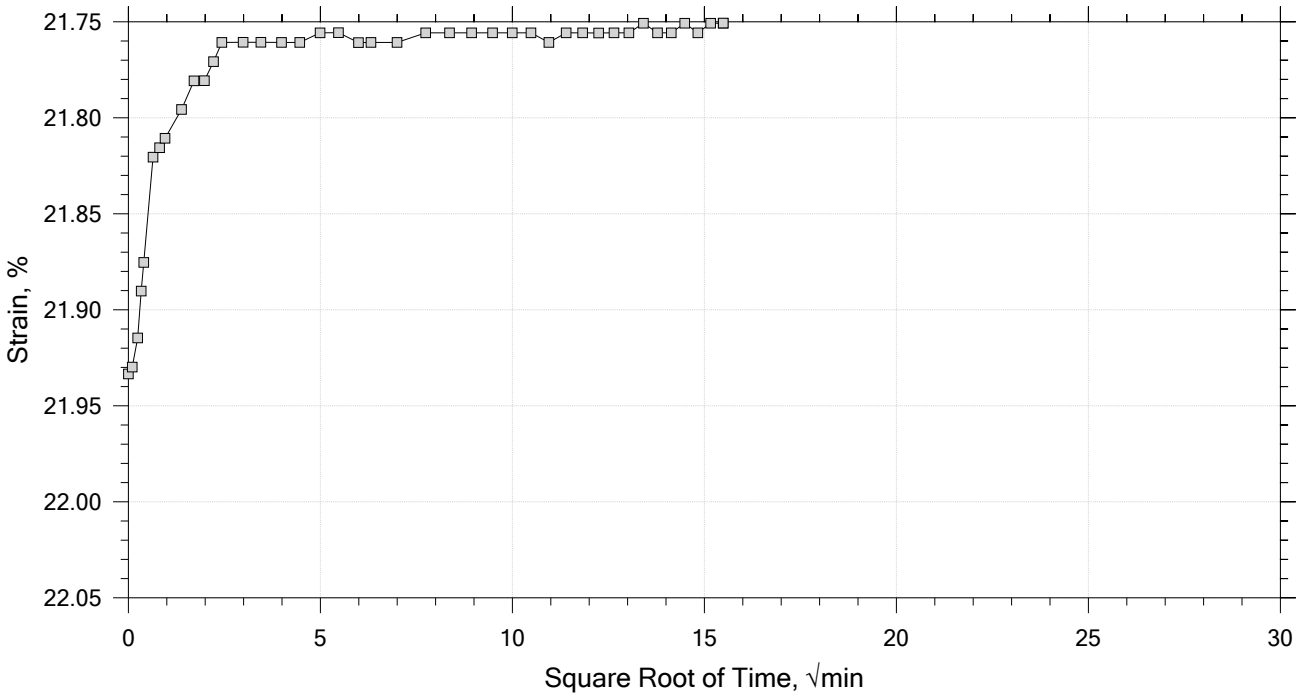


GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-101	Tested By: md	Checked By: njh
	Sample No.: U2	Test Date: 09/24/18	Depth: 35-37 ft
	Test No.: IP-6	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System K, Swell Pressure = 0.0782 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 17 of 22
Constant Load Step
Stress: 8 tsf

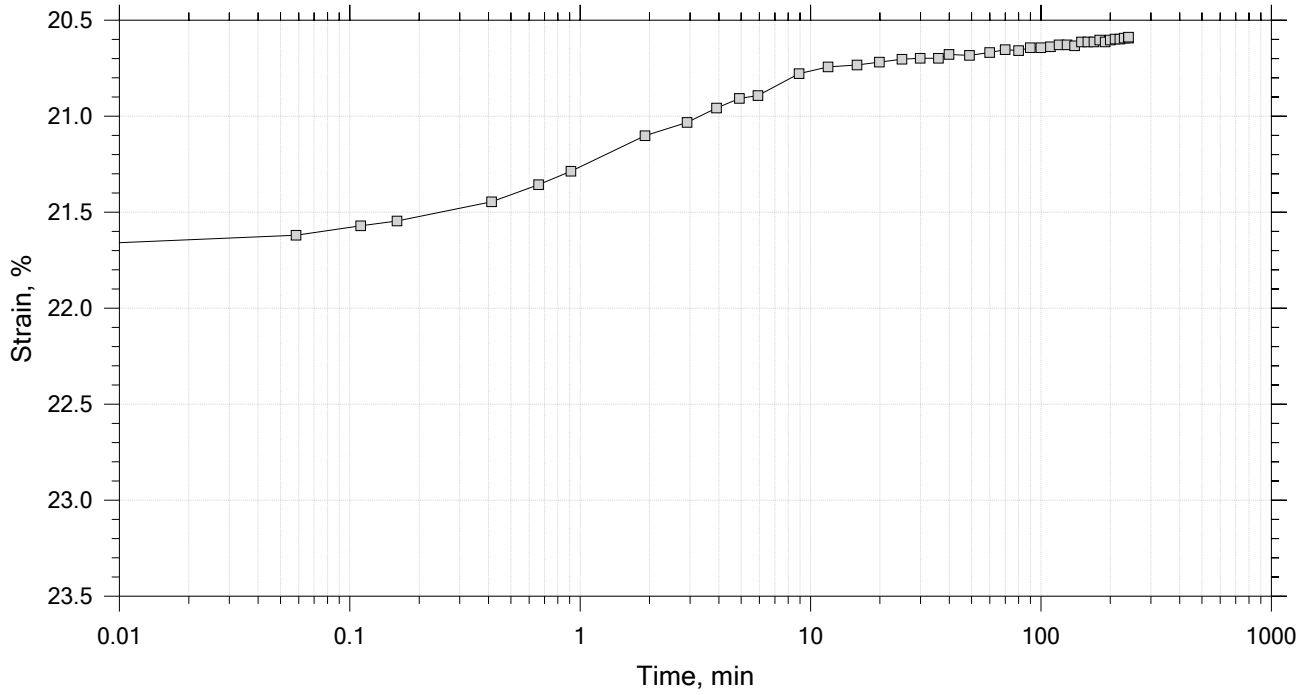


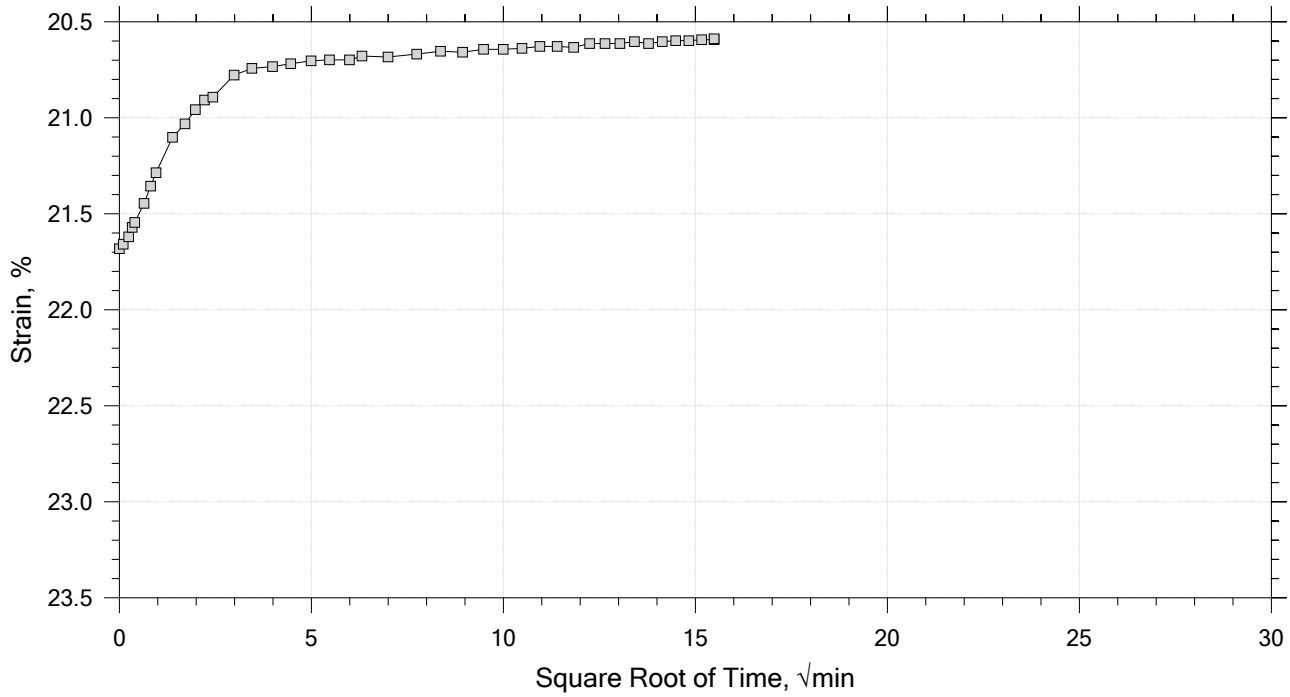


GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-101	Tested By: md	Checked By: njh
	Sample No.: U2	Test Date: 09/24/18	Depth: 35-37 ft
	Test No.: IP-6	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System K, Swell Pressure = 0.0782 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 18 of 22
Constant Load Step
Stress: 2 tsf

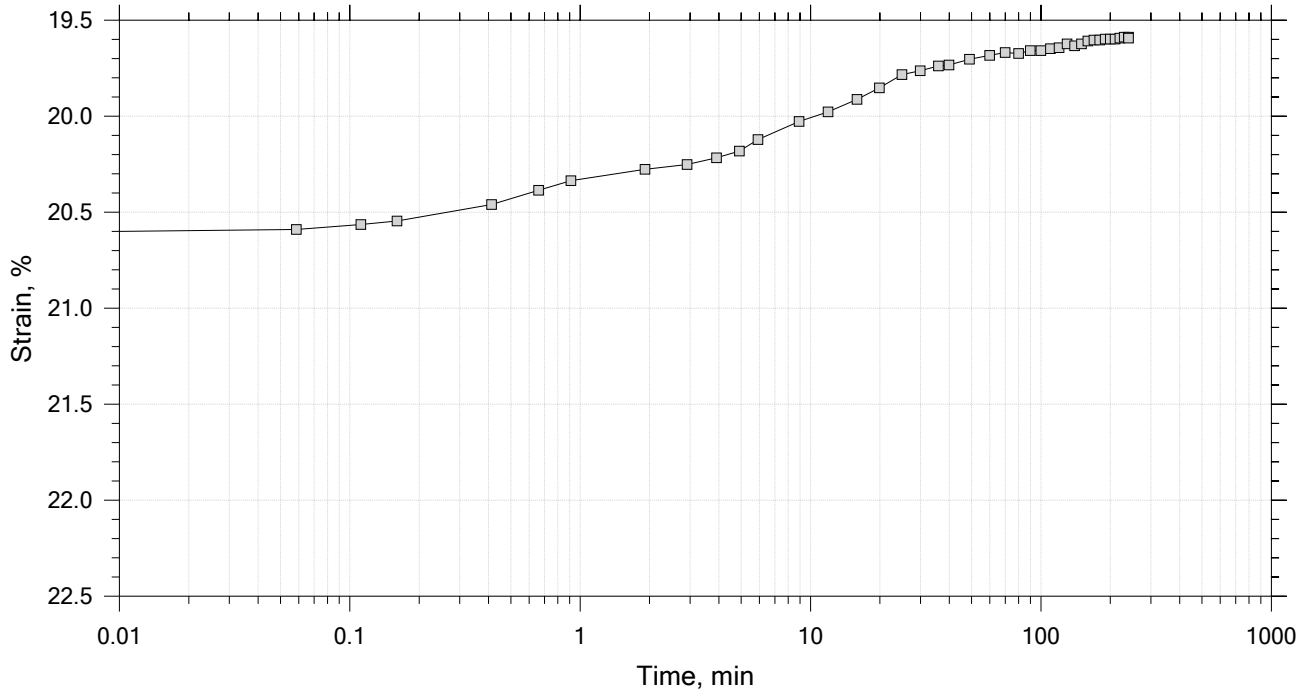


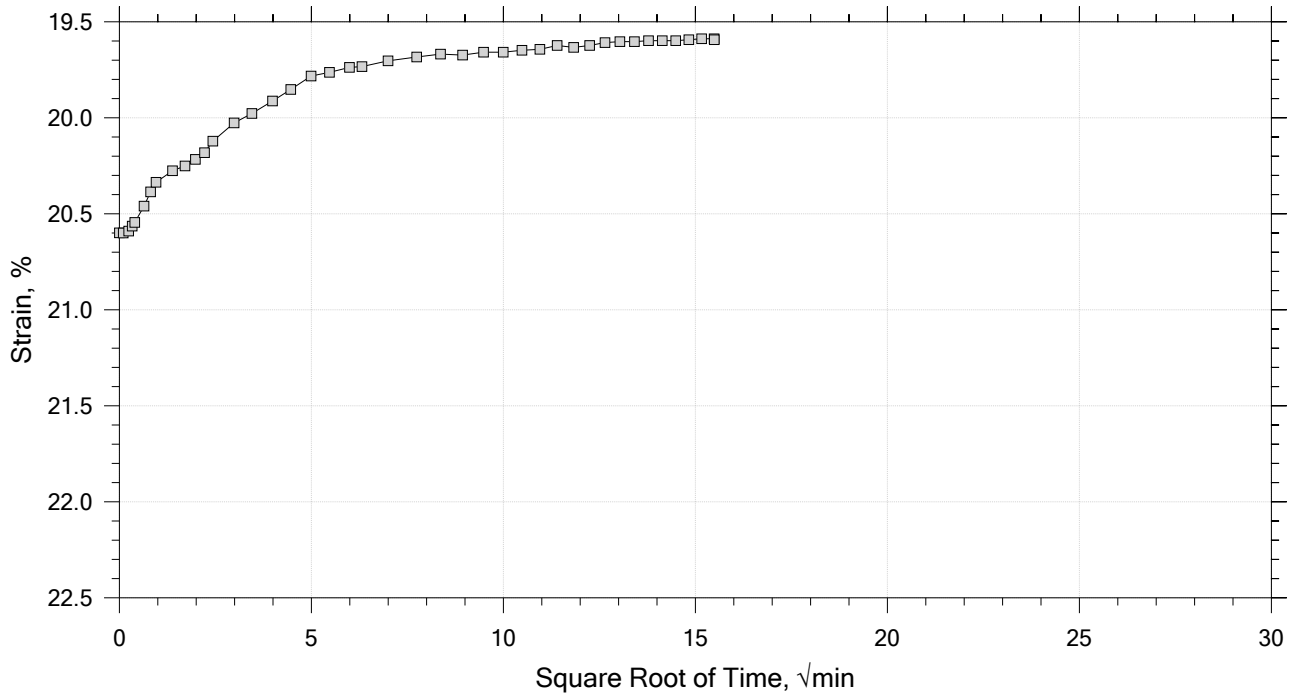


GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-101	Tested By: md	Checked By: njh
	Sample No.: U2	Test Date: 09/24/18	Depth: 35-37 ft
	Test No.: IP-6	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System K, Swell Pressure = 0.0782 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 19 of 22
Constant Load Step
Stress: 0.75 tsf

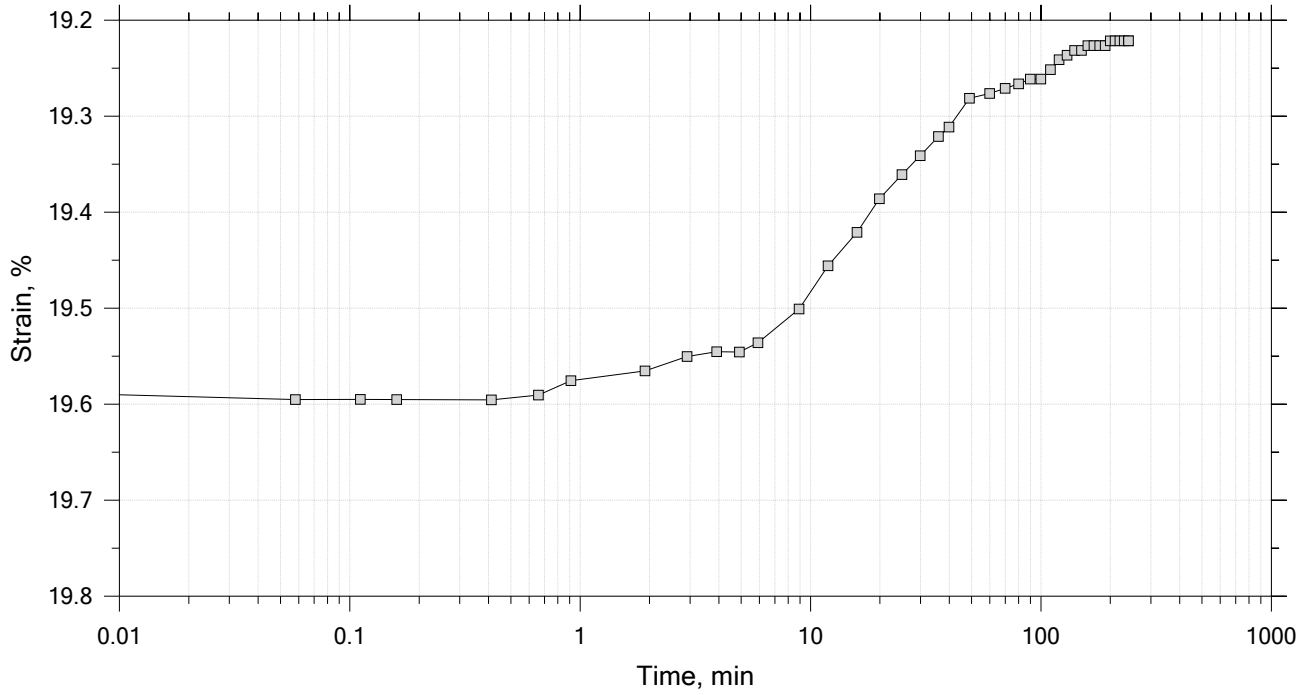


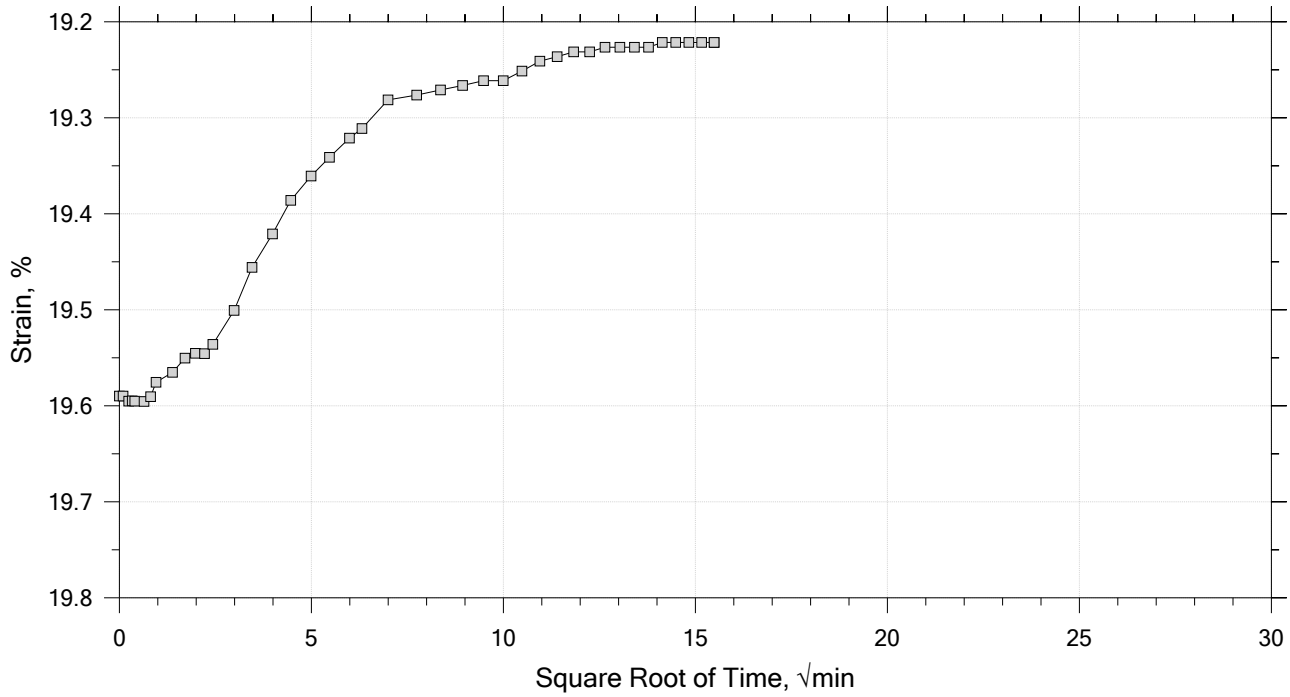


Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
Boring No.: BB-PVS-101	Tested By: md	Checked By: njh
Sample No.: U2	Test Date: 09/24/18	Depth: 35-37 ft
Test No.: IP-6	Sample Type: intact	Elevation: ---
Description: Moist, dark gray clay		
Remarks: System K, Swell Pressure = 0.0782 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 20 of 22
Constant Load Step
Stress: 0.5 tsf

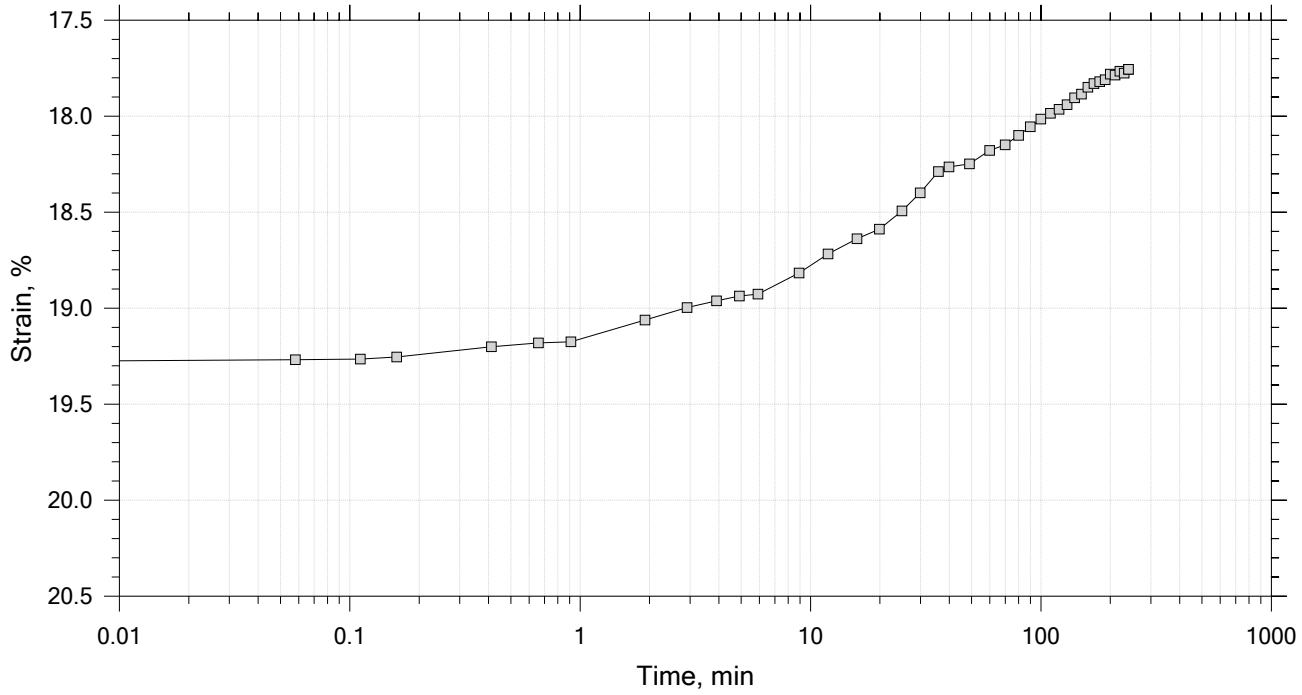


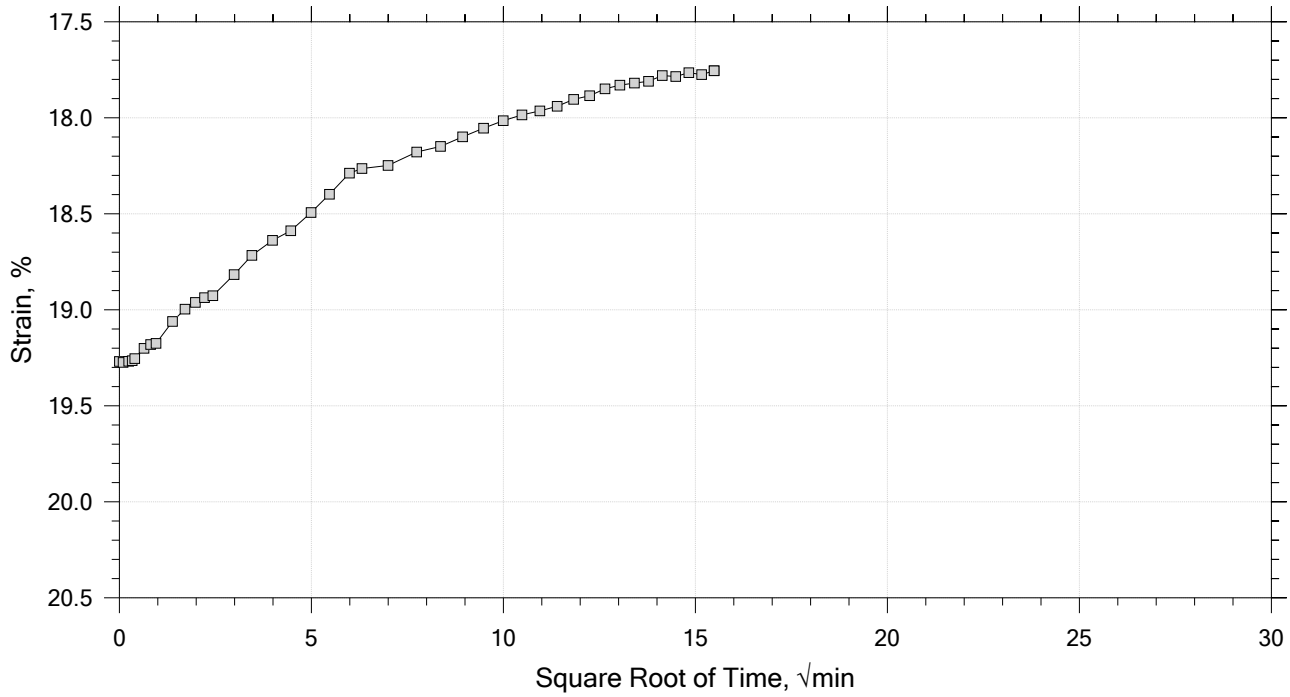


Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
Boring No.: BB-PVS-101	Tested By: md	Checked By: njh
Sample No.: U2	Test Date: 09/24/18	Depth: 35-37 ft
Test No.: IP-6	Sample Type: intact	Elevation: ---
Description: Moist, dark gray clay		
Remarks: System K, Swell Pressure = 0.0782 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 21 of 22
Constant Load Step
Stress: 0.125 tsf

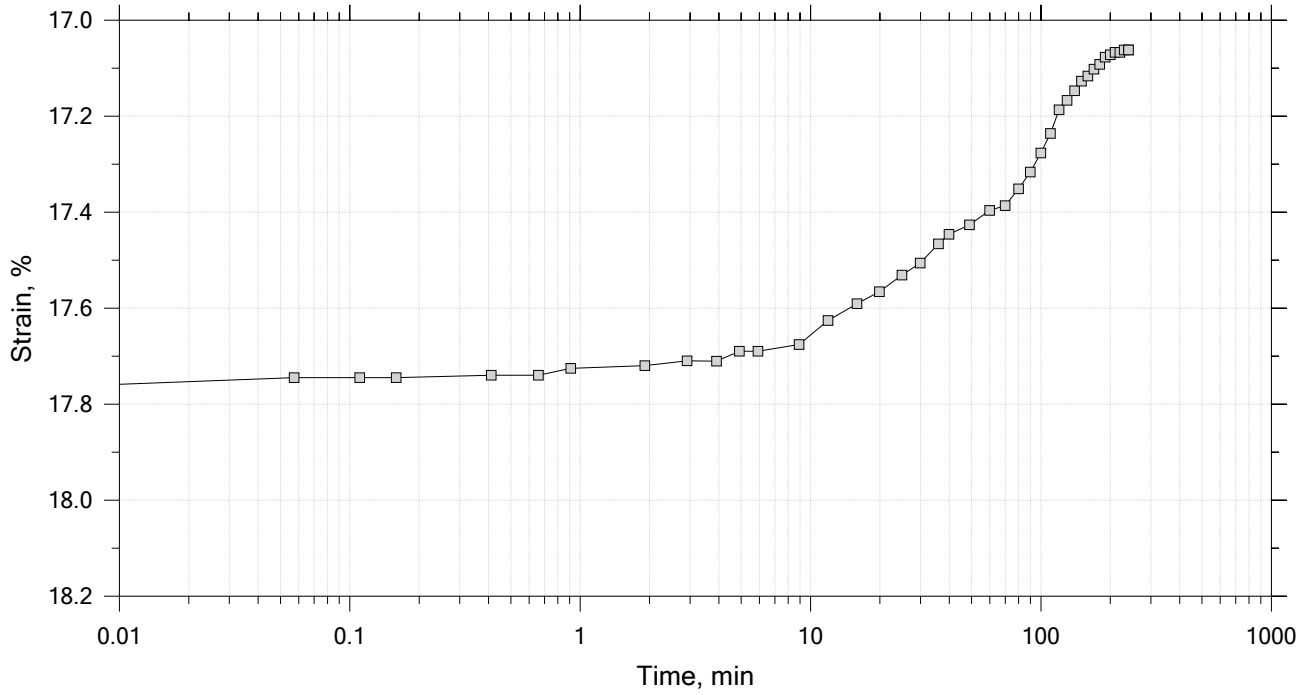


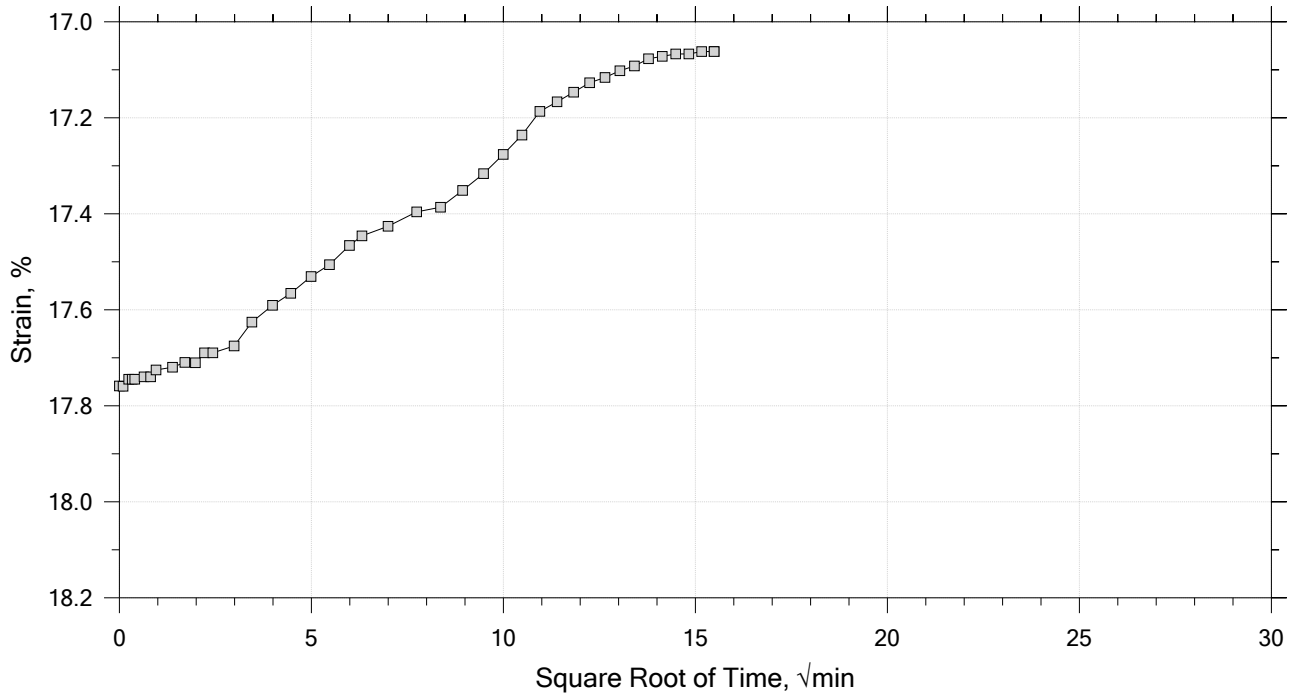


GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-101	Tested By: md	Checked By: njh
	Sample No.: U2	Test Date: 09/24/18	Depth: 35-37 ft
	Test No.: IP-6	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System K, Swell Pressure = 0.0782 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 22 of 22
Constant Load Step
Stress: 0.0625 tsf





GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-101	Tested By: md	Checked By: njh
	Sample No.: U2	Test Date: 09/24/18	Depth: 35-37 ft
	Test No.: IP-6	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System K, Swell Pressure = 0.0782 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Specimen Diameter: 2.50 in	Estimated Specific Gravity: 2.75	Liquid Limit: 40
Initial Height: 1.00 in	Initial Void Ratio: 1.08	Plastic Limit: 20
Final Height: 0.86 in	Final Void Ratio: 0.793	Plasticity Index: 20

	Before Test Trimmings	Before Test Specimen	After Test Specimen	After Test Trimmings
Container ID	D-1245	RING		C590
Mass Container, gm	8.68	108.94	108.94	8.9
Mass Container + Wet Soil, gm	140.35	256.86	245.62	144.76
Mass Container + Dry Soil, gm	103.11	215.03	215.03	114.35
Mass Dry Soil, gm	94.43	106.09	106.09	105.45
Water Content, %	39.44	39.43	28.84	28.84
Void Ratio	---	1.08	0.79	---
Degree of Saturation, %	---	99.95	100.00	---
Dry Unit Weight, pcf	---	82.332	95.735	---

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.

GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-101	Tested By: md	Checked By: njh
	Sample No.: U2	Test Date: 09/24/18	Depth: 35-37 ft
	Test No.: IP-6	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System K, Swell Pressure = 0.0782 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Log of Time Coefficients

Step	Applied Stress tsf	Final Displacement in	Void Ratio	Strain at End %	Log T50 min	Cv ft²/s	Mv 1/tsf	k ft/day	Ca %
1	0.0782	0.0007215	1.08	0.0722	0.000	0.00e+00	9.22e-03	0.00e+00	0.00e+00
2	0.125	0.002290	1.08	0.229	0.000	0.00e+00	3.36e-02	0.00e+00	0.00e+00
3	0.250	0.005736	1.07	0.574	6.604	8.56e-07	2.76e-02	6.37e-05	0.00e+00
4	0.500	0.01142	1.06	1.14	0.000	0.00e+00	2.27e-02	0.00e+00	0.00e+00
5	0.750	0.01601	1.05	1.60	0.000	0.00e+00	1.84e-02	0.00e+00	0.00e+00
6	1.00	0.02214	1.04	2.21	0.000	0.00e+00	2.45e-02	0.00e+00	0.00e+00
7	2.00	0.05057	0.979	5.06	0.000	0.00e+00	2.84e-02	0.00e+00	0.00e+00
8	4.00	0.1112	0.853	11.1	8.681	5.55e-07	3.03e-02	4.53e-05	0.00e+00
9	2.00	0.1088	0.858	10.9	0.000	0.00e+00	1.20e-03	0.00e+00	0.00e+00
10	1.00	0.1050	0.866	10.5	0.000	0.00e+00	3.74e-03	0.00e+00	0.00e+00
11	0.500	0.1006	0.875	10.1	3.010	1.52e-06	8.89e-03	3.65e-05	0.00e+00
12	1.00	0.1025	0.871	10.2	0.000	0.00e+00	3.80e-03	0.00e+00	0.00e+00
13	2.00	0.1067	0.862	10.7	0.000	0.00e+00	4.24e-03	0.00e+00	0.00e+00
14	4.00	0.1207	0.833	12.1	0.000	0.00e+00	6.98e-03	0.00e+00	0.00e+00
15	8.00	0.1715	0.727	17.1	4.147	1.00e-06	1.27e-02	3.43e-05	0.00e+00
16	16.0	0.2197	0.627	22.0	2.939	1.26e-06	6.02e-03	2.04e-05	0.00e+00
17	8.00	0.2175	0.631	21.8	0.000	0.00e+00	2.69e-04	0.00e+00	0.00e+00
18	2.00	0.2059	0.656	20.6	1.527	2.32e-06	1.94e-03	1.21e-05	0.00e+00
19	0.750	0.1959	0.676	19.6	6.252	5.82e-07	7.96e-03	1.25e-05	0.00e+00
20	0.500	0.1922	0.684	19.2	15.225	2.43e-07	1.49e-02	9.76e-06	0.00e+00
21	0.125	0.1776	0.715	17.8	20.791	1.82e-07	3.91e-02	1.92e-05	0.00e+00
22	0.0625	0.1706	0.729	17.1	0.000	0.00e+00	1.11e-01	0.00e+00	0.00e+00

GeoTesting EXPRESS

Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
Boring No.: BB-PVS-101	Tested By: md	Checked By: njh
Sample No.: U2	Test Date: 09/24/18	Depth: 35-37 ft
Test No.: IP-6	Sample Type: intact	Elevation: ---
Description: Moist, dark gray clay		
Remarks: System K, Swell Pressure = 0.0782 tsf		
Displacement at End of Increment		

One-Dimensional Consolidation by ASTM D2435 - Method B

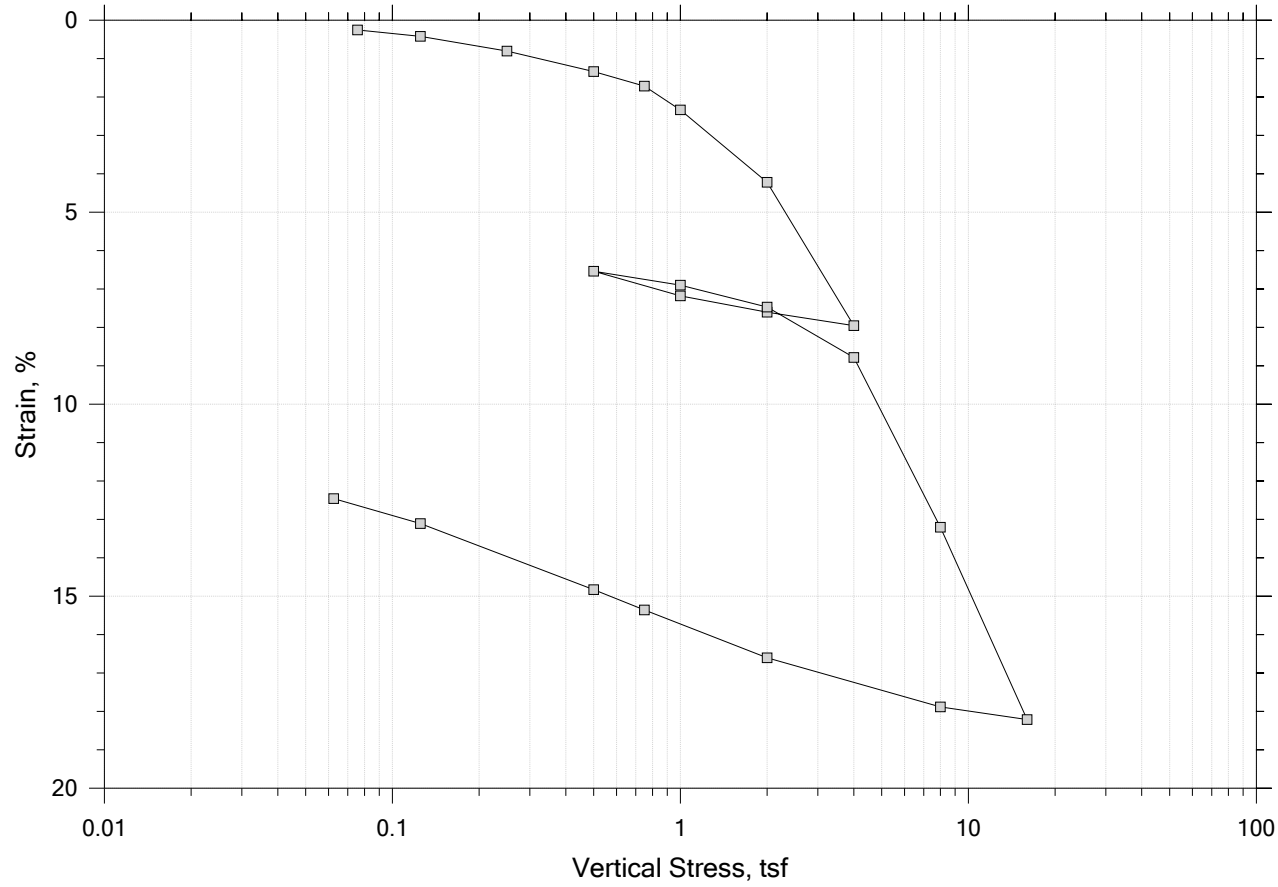
Square Root of Time Coefficients

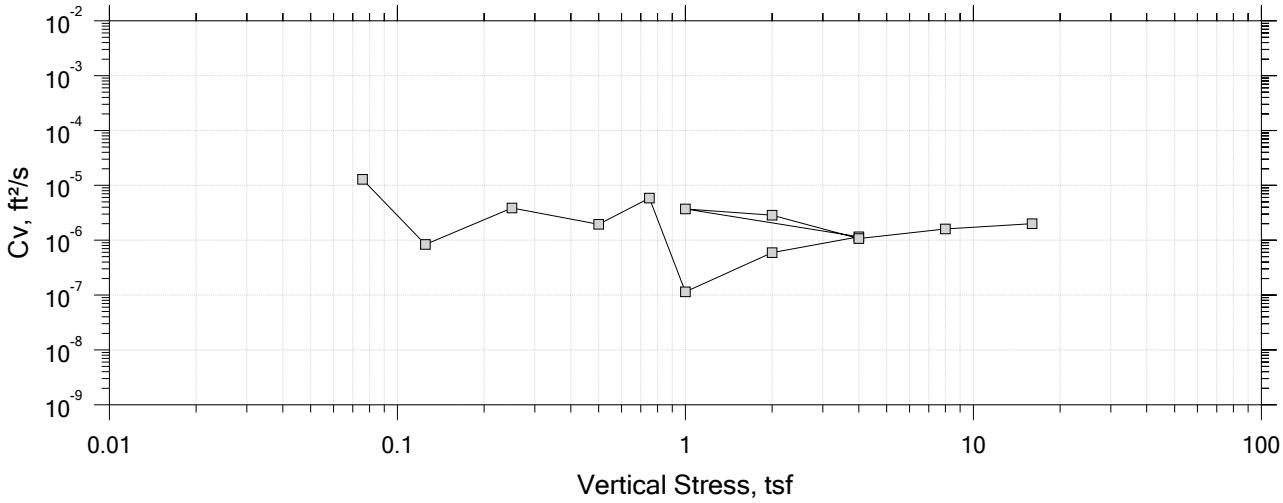
Step	Applied Stress tsf	Final Displacement in	Void Ratio	Strain at End %	Sq.Rt. T90 min	Cv ft²/s	Mv 1/tsf	k ft/day
1	0.0782	0.0007215	1.08	0.0722	8.677	2.83e-06	9.22e-03	7.03e-05
2	0.125	0.002290	1.08	0.229	15.909	1.54e-06	3.36e-02	1.39e-04
3	0.250	0.005736	1.07	0.574	18.317	1.33e-06	2.76e-02	9.88e-05
4	0.500	0.01142	1.06	1.14	27.168	8.88e-07	2.27e-02	5.44e-05
5	0.750	0.01601	1.05	1.60	54.543	4.38e-07	1.84e-02	2.17e-05
6	1.00	0.02214	1.04	2.21	161.828	1.46e-07	2.45e-02	9.66e-06
7	2.00	0.05057	0.979	5.06	129.912	1.75e-07	2.84e-02	1.34e-05
8	4.00	0.1112	0.853	11.1	31.297	6.62e-07	3.03e-02	5.41e-05
9	2.00	0.1088	0.858	10.9	6.281	3.09e-06	1.20e-03	1.00e-05
10	1.00	0.1050	0.866	10.5	230.143	8.50e-08	3.74e-03	8.57e-07
11	0.500	0.1006	0.875	10.1	19.151	1.03e-06	8.89e-03	2.47e-05
12	1.00	0.1025	0.871	10.2	14.294	1.39e-06	3.80e-03	1.42e-05
13	2.00	0.1067	0.862	10.7	6.335	3.11e-06	4.24e-03	3.55e-05
14	4.00	0.1207	0.833	12.1	34.052	5.66e-07	6.98e-03	1.07e-05
15	8.00	0.1715	0.727	17.1	19.106	9.36e-07	1.27e-02	3.21e-05
16	16.0	0.2197	0.627	22.0	14.836	1.07e-06	6.02e-03	1.74e-05
17	8.00	0.2175	0.631	21.8	1.643	9.12e-06	2.69e-04	6.62e-06
18	2.00	0.2059	0.656	20.6	6.326	2.41e-06	1.94e-03	1.26e-05
19	0.750	0.1959	0.676	19.6	20.437	7.67e-07	7.96e-03	1.65e-05
20	0.500	0.1922	0.684	19.2	74.631	2.14e-07	1.49e-02	8.57e-06
21	0.125	0.1776	0.715	17.8	70.172	2.32e-07	3.91e-02	2.45e-05
22	0.0625	0.1706	0.729	17.1	188.488	8.88e-08	1.11e-01	2.66e-05

GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-101	Tested By: md	Checked By: njh
	Sample No.: U2	Test Date: 09/24/18	Depth: 35-37 ft
	Test No.: IP-6	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System K, Swell Pressure = 0.0782 tsf		
	Displacement at End of Increment		

One-Dimensional Consolidation by ASTM D2435 - Method B

Summary Report

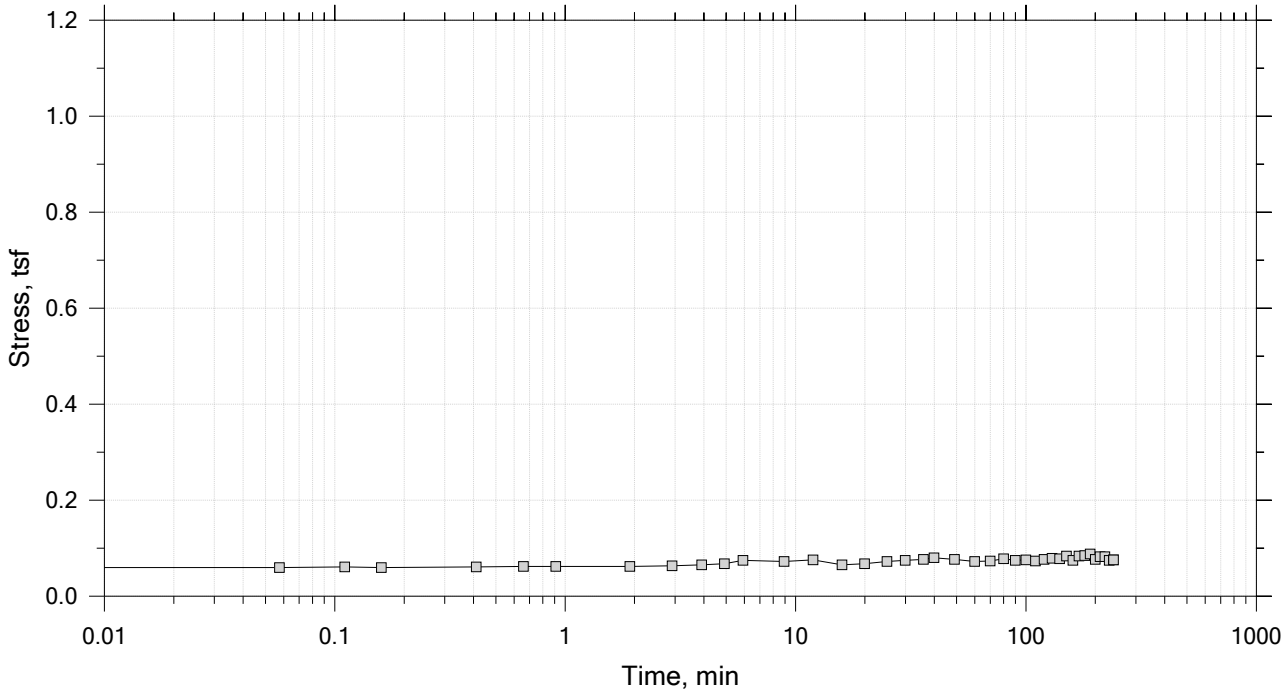


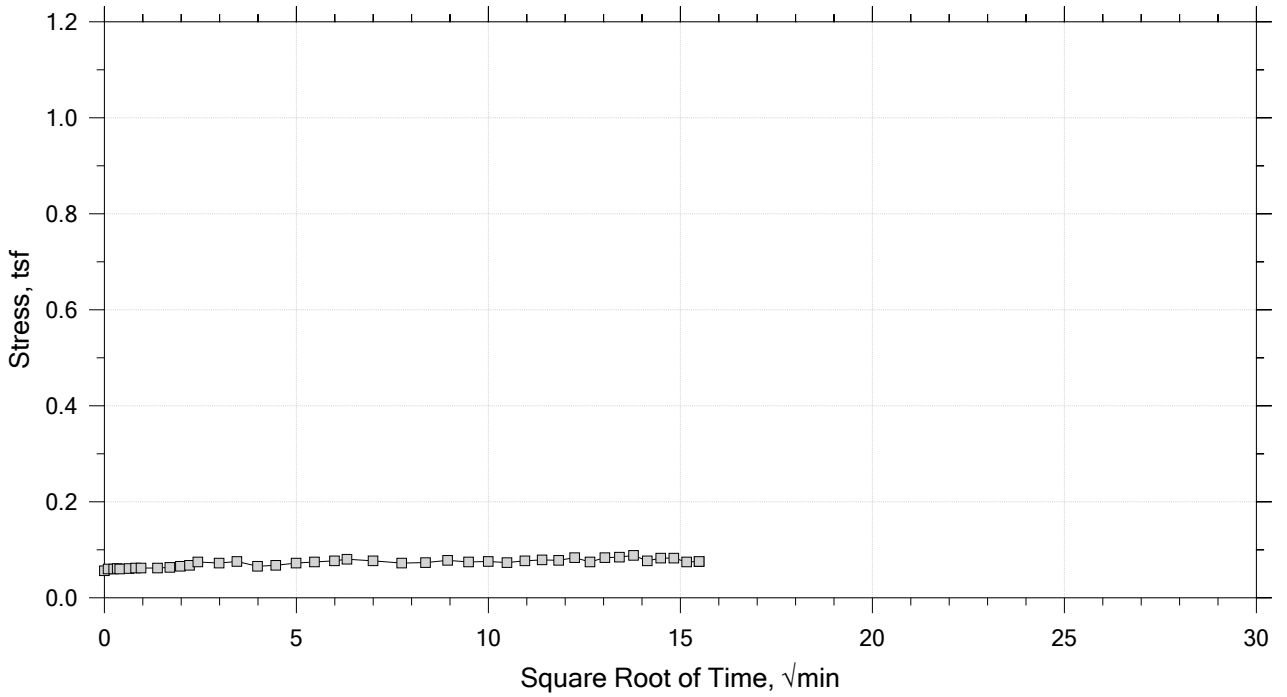


GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-105	Tested By: md	Checked By: njh
	Sample No.: U1	Test Date: 09/24/18	Depth: 25-27 ft
	Test No.: IP-5	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System O, Swell Pressure = 0.0757 tsf		
	Displacement at End of Increment		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 1 of 22
Constant Volume Step
Stress: 0.0757 tsf





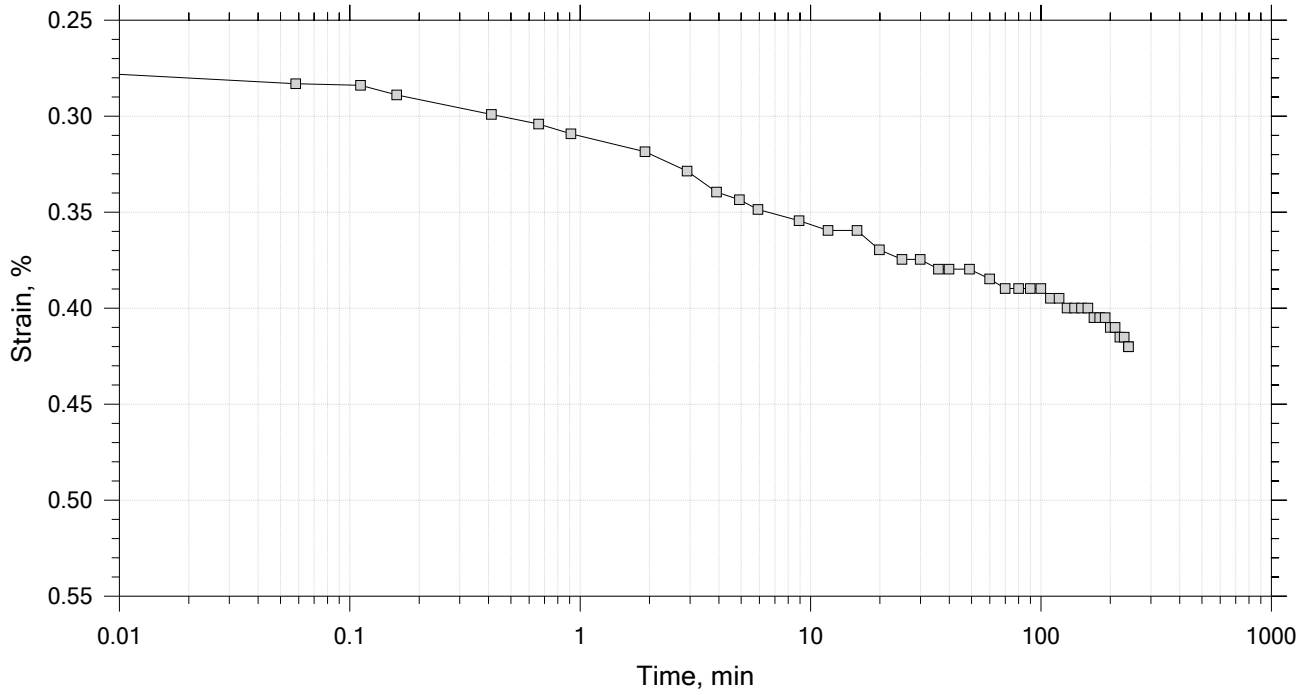
GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-105	Tested By: md	Checked By: njh
	Sample No.: U1	Test Date: 09/24/18	Depth: 25-27 ft
	Test No.: IP-5	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System O, Swell Pressure = 0.0757 tsf		

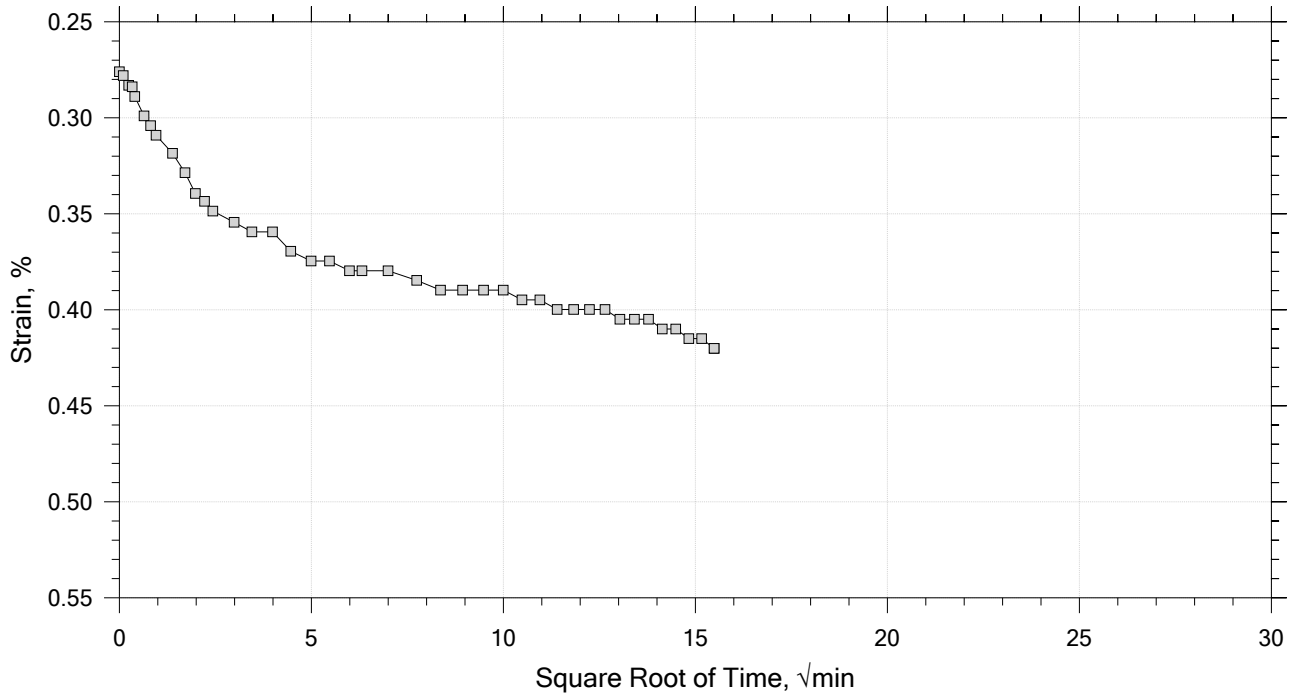
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 2 of 22

Constant Load Step

Stress: 0.125 tsf





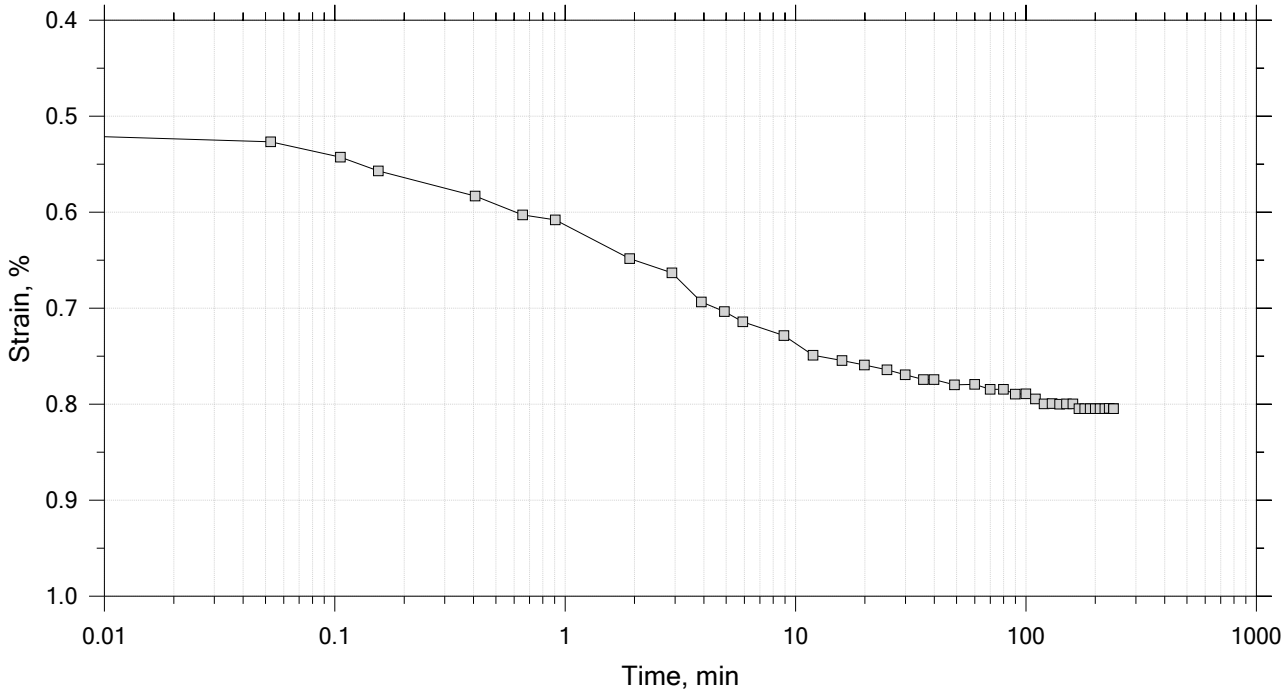
GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-105	Tested By: md	Checked By: njh
	Sample No.: U1	Test Date: 09/24/18	Depth: 25-27 ft
	Test No.: IP-5	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System O, Swell Pressure = 0.0757 tsf		

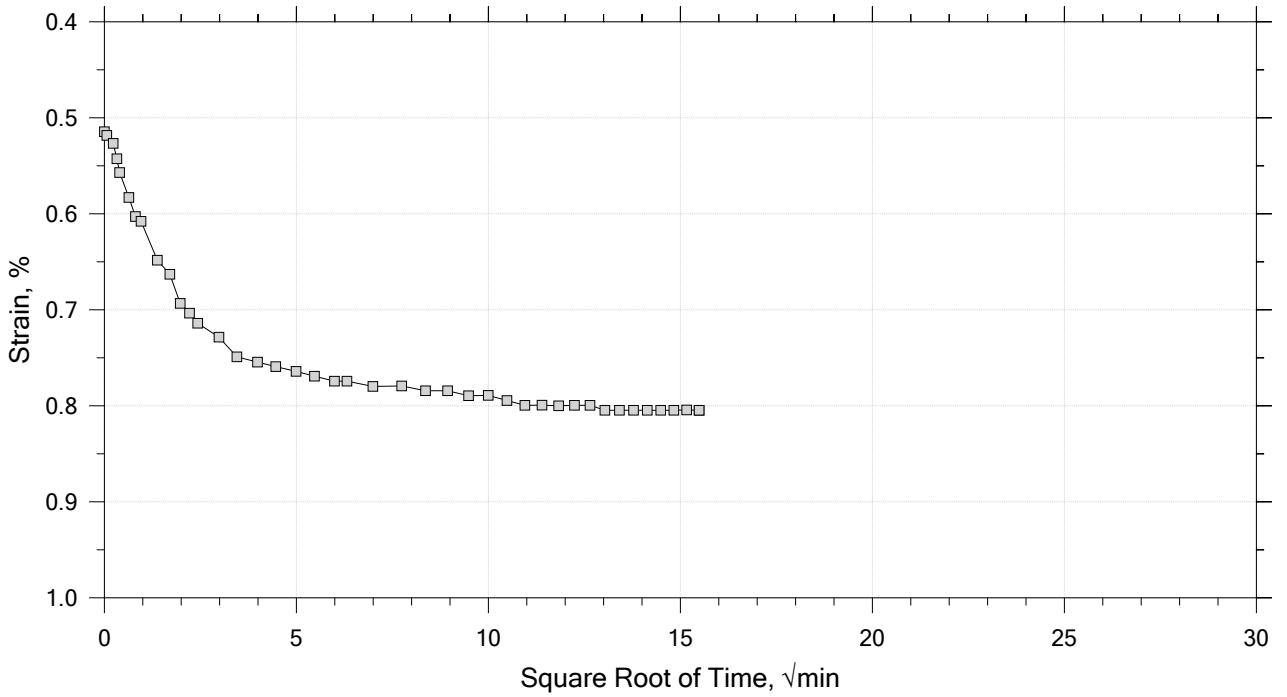
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 3 of 22

Constant Load Step

Stress: 0.25 tsf





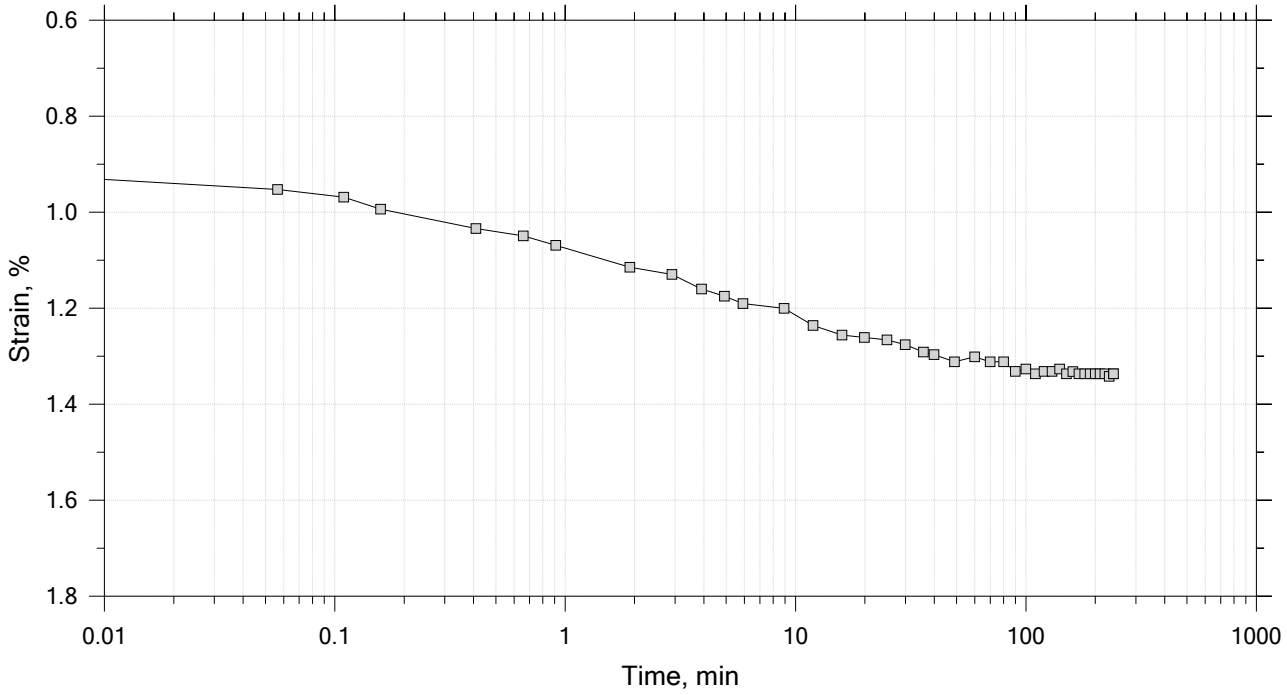
GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-105	Tested By: md	Checked By: njh
	Sample No.: U1	Test Date: 09/24/18	Depth: 25-27 ft
	Test No.: IP-5	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System O, Swell Pressure = 0.0757 tsf		

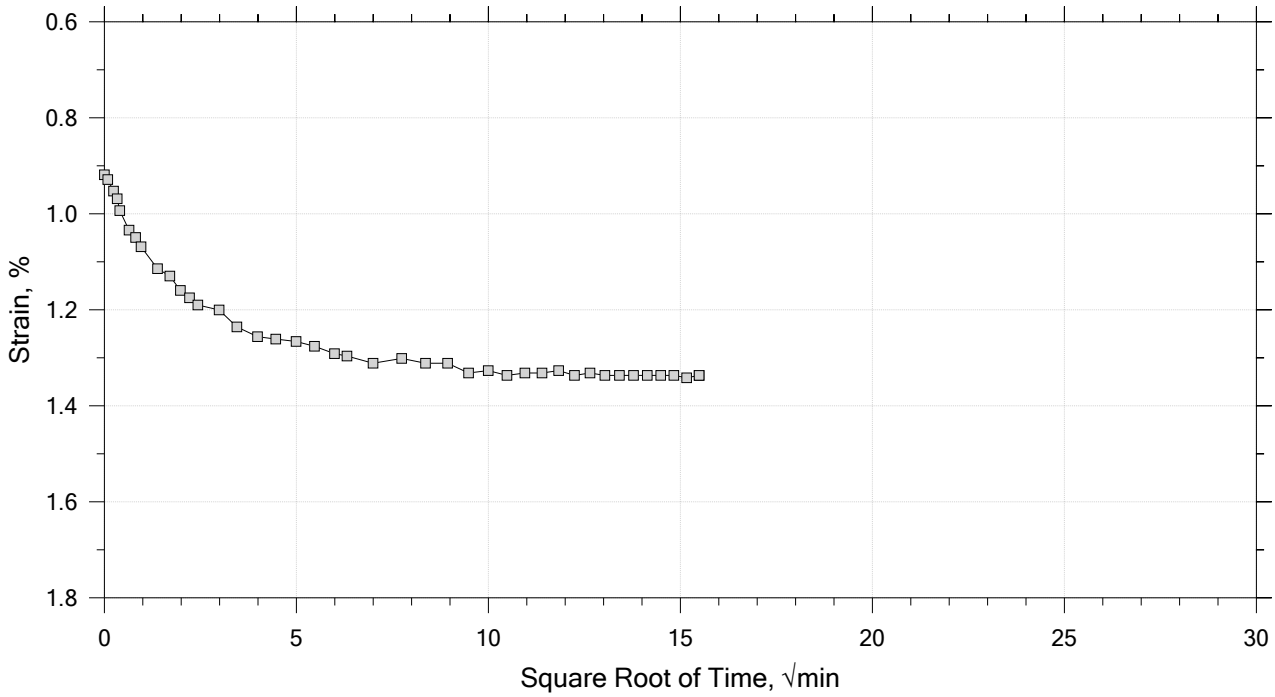
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 4 of 22

Constant Load Step

Stress: 0.5 tsf





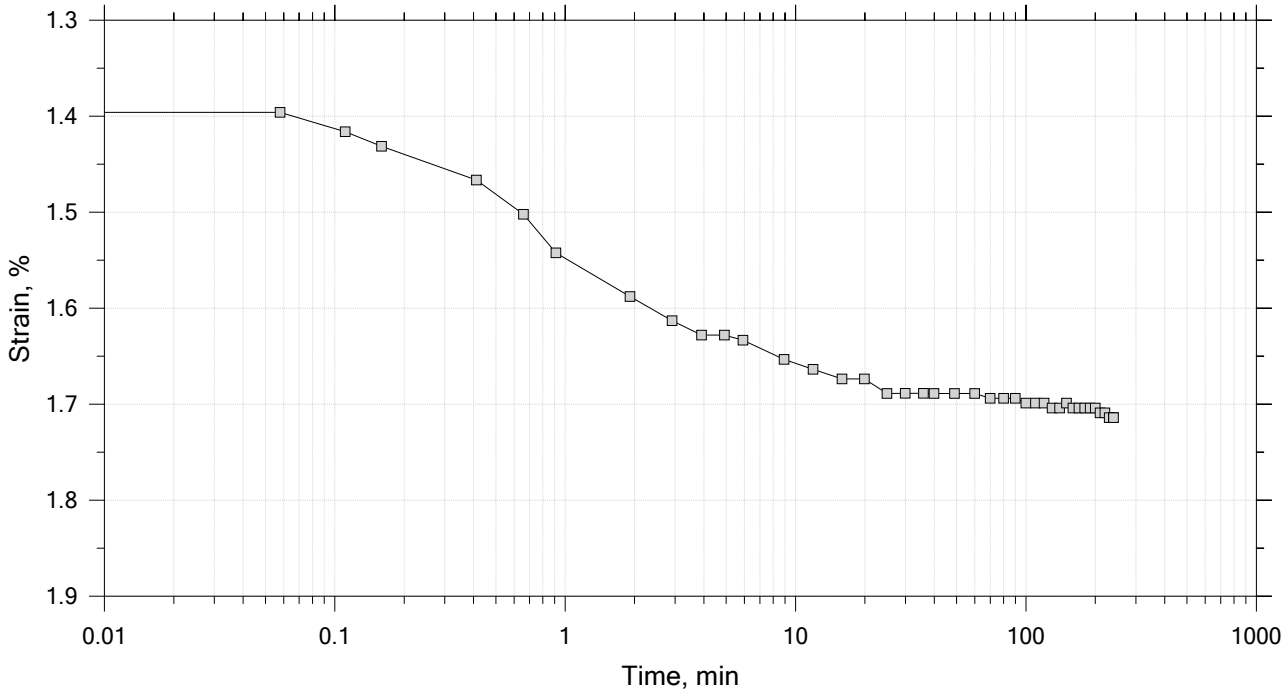
GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-105	Tested By: md	Checked By: njh
	Sample No.: U1	Test Date: 09/24/18	Depth: 25-27 ft
	Test No.: IP-5	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System O, Swell Pressure = 0.0757 tsf		

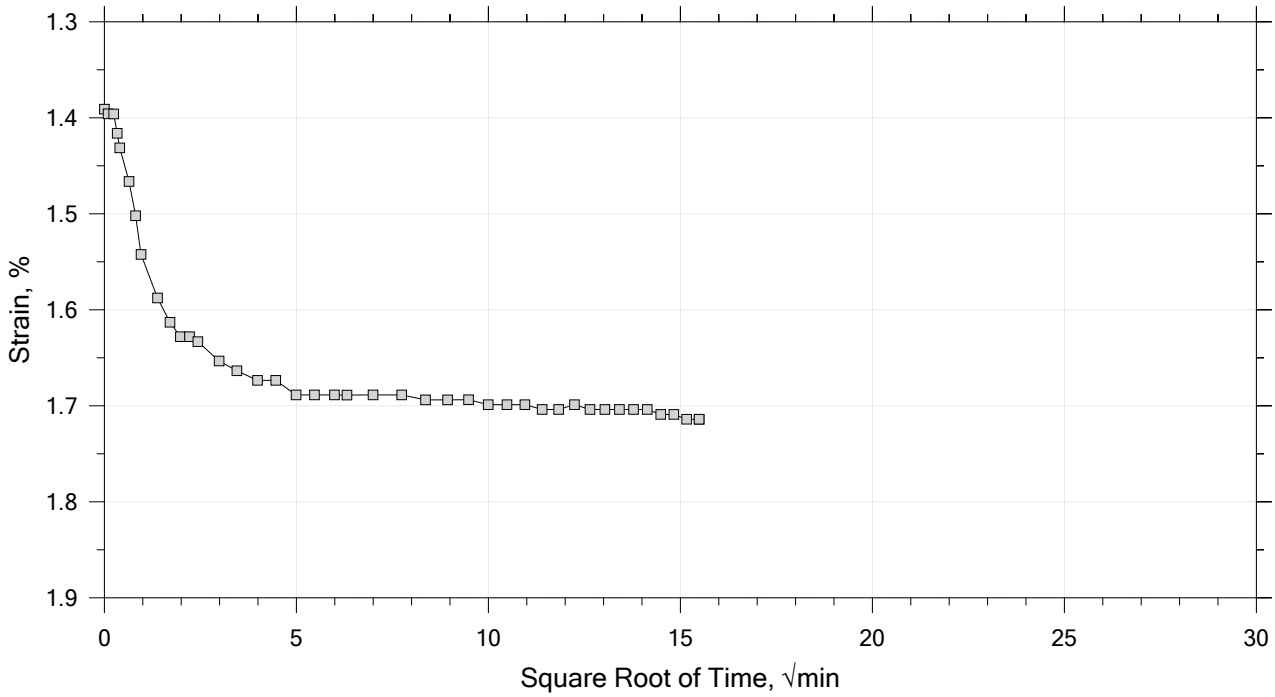
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 5 of 22

Constant Load Step

Stress: 0.75 tsf





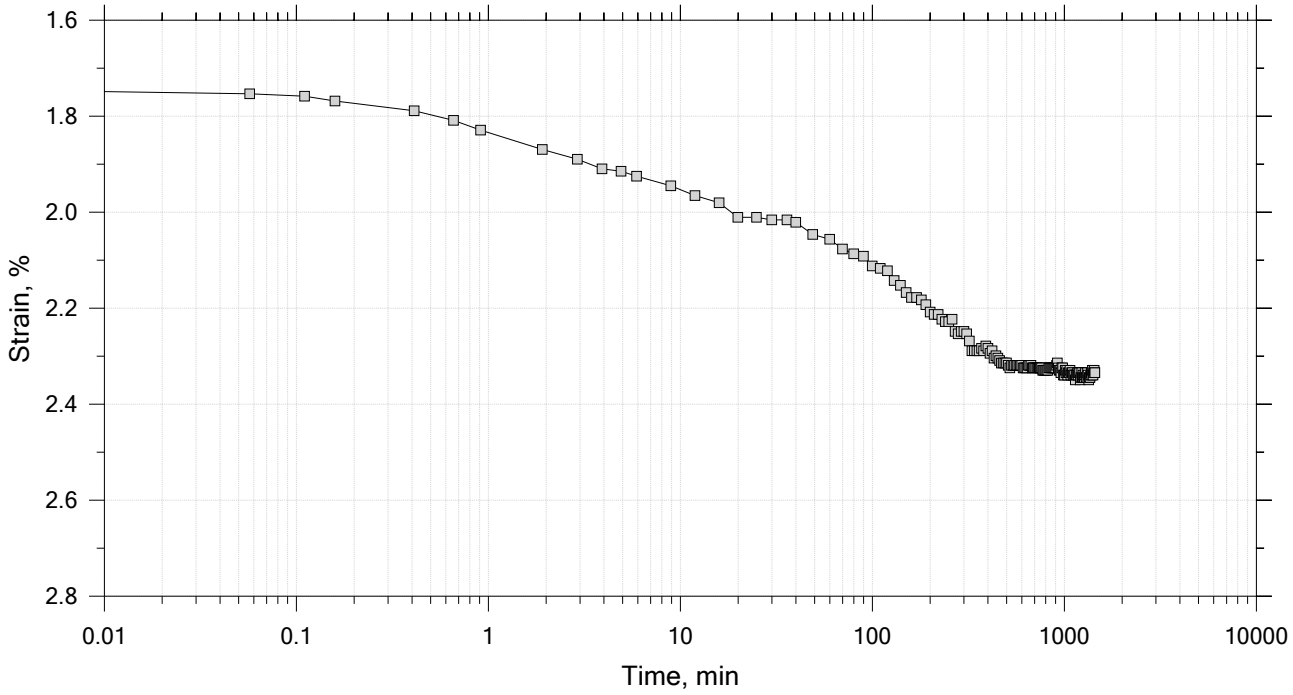
GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-105	Tested By: md	Checked By: njh
	Sample No.: U1	Test Date: 09/24/18	Depth: 25-27 ft
	Test No.: IP-5	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System O, Swell Pressure = 0.0757 tsf		

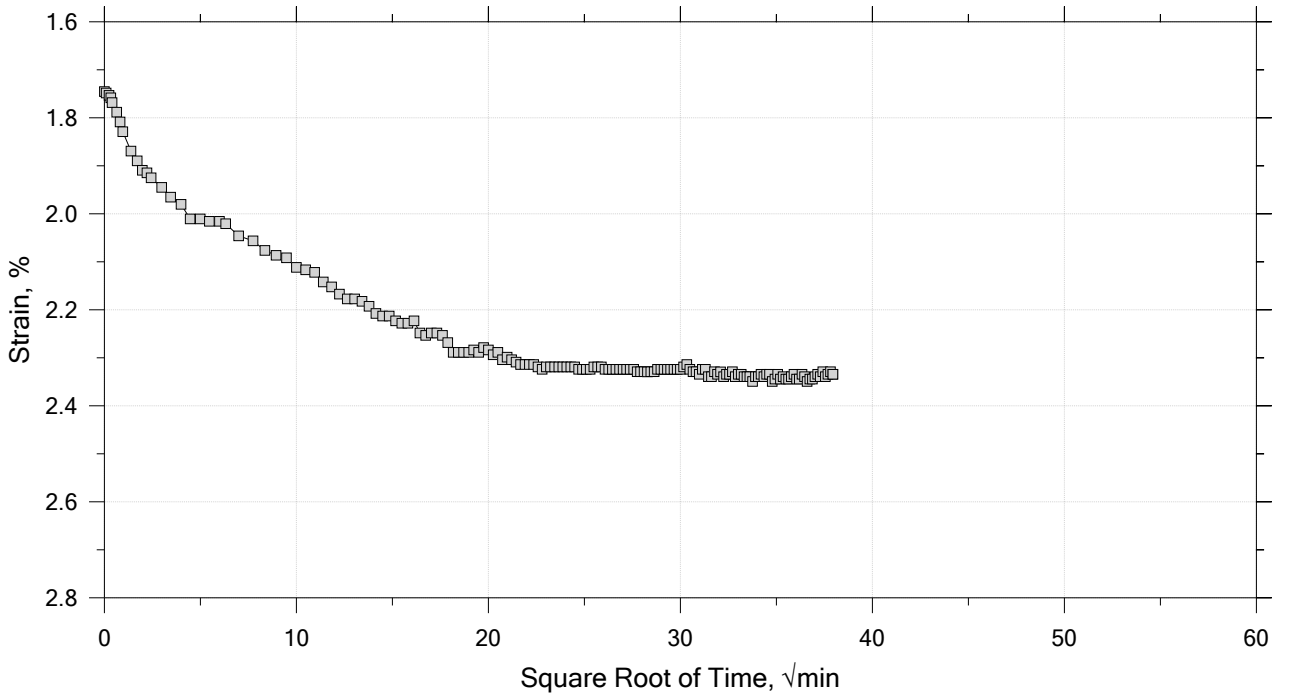
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 6 of 22

Constant Load Step

Stress: 1 tsf





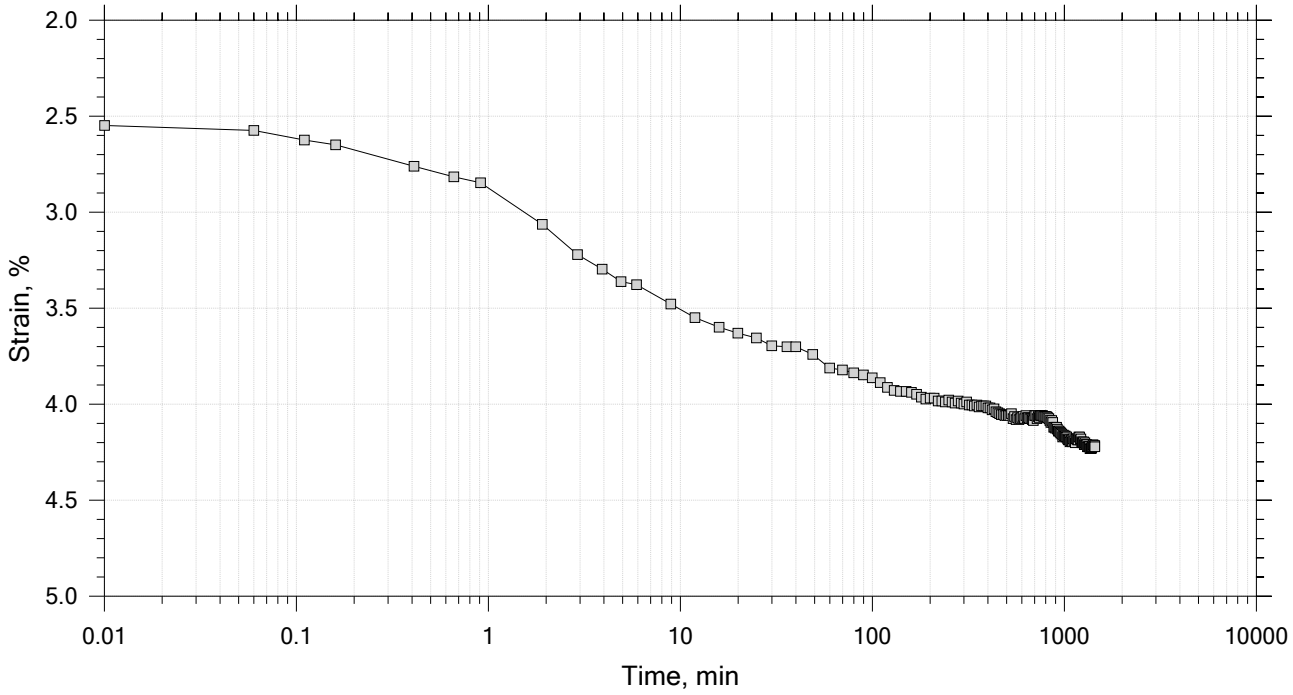
GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-105	Tested By: md	Checked By: njh
	Sample No.: U1	Test Date: 09/24/18	Depth: 25-27 ft
	Test No.: IP-5	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System O, Swell Pressure = 0.0757 tsf		

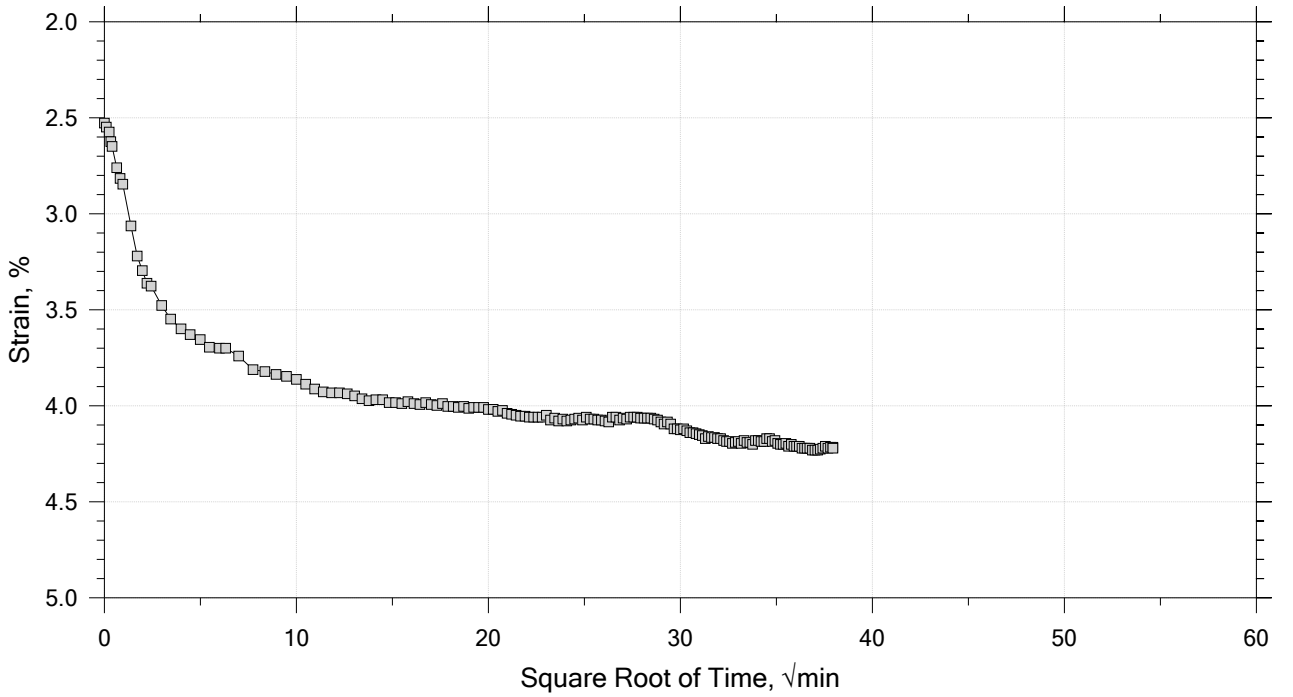
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 7 of 22

Constant Load Step

Stress: 2 tsf





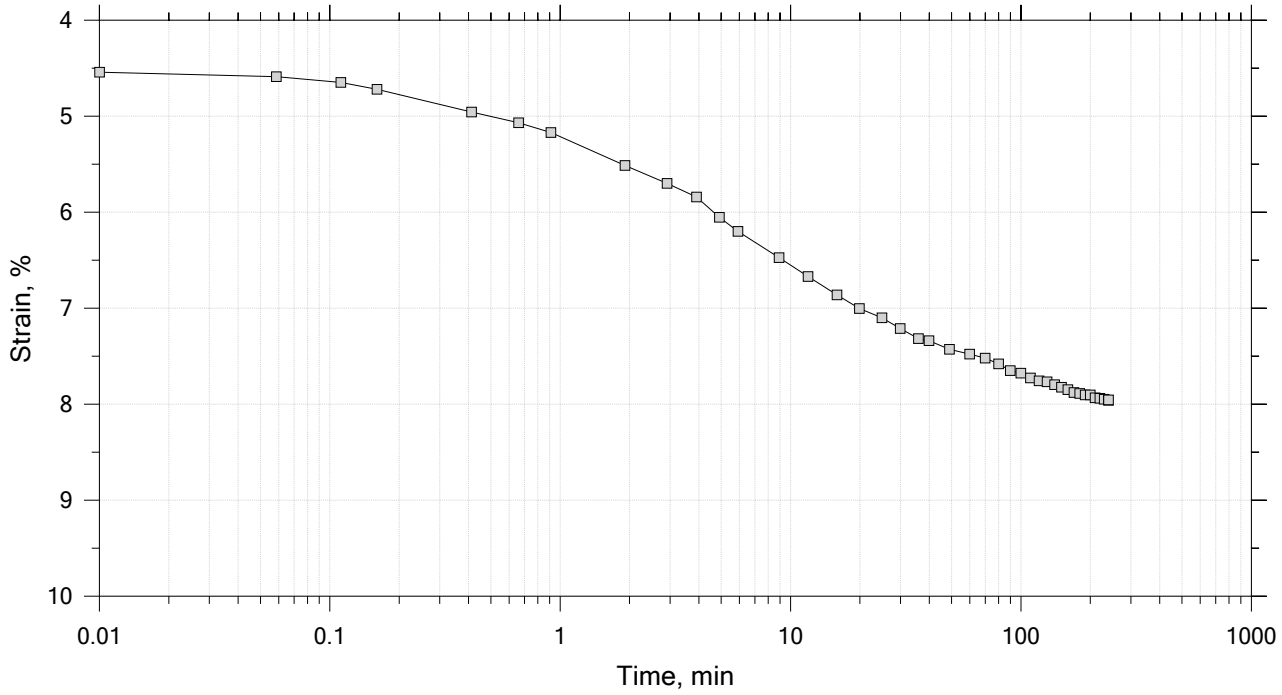
GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-105	Tested By: md	Checked By: njh
	Sample No.: U1	Test Date: 09/24/18	Depth: 25-27 ft
	Test No.: IP-5	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System O, Swell Pressure = 0.0757 tsf		

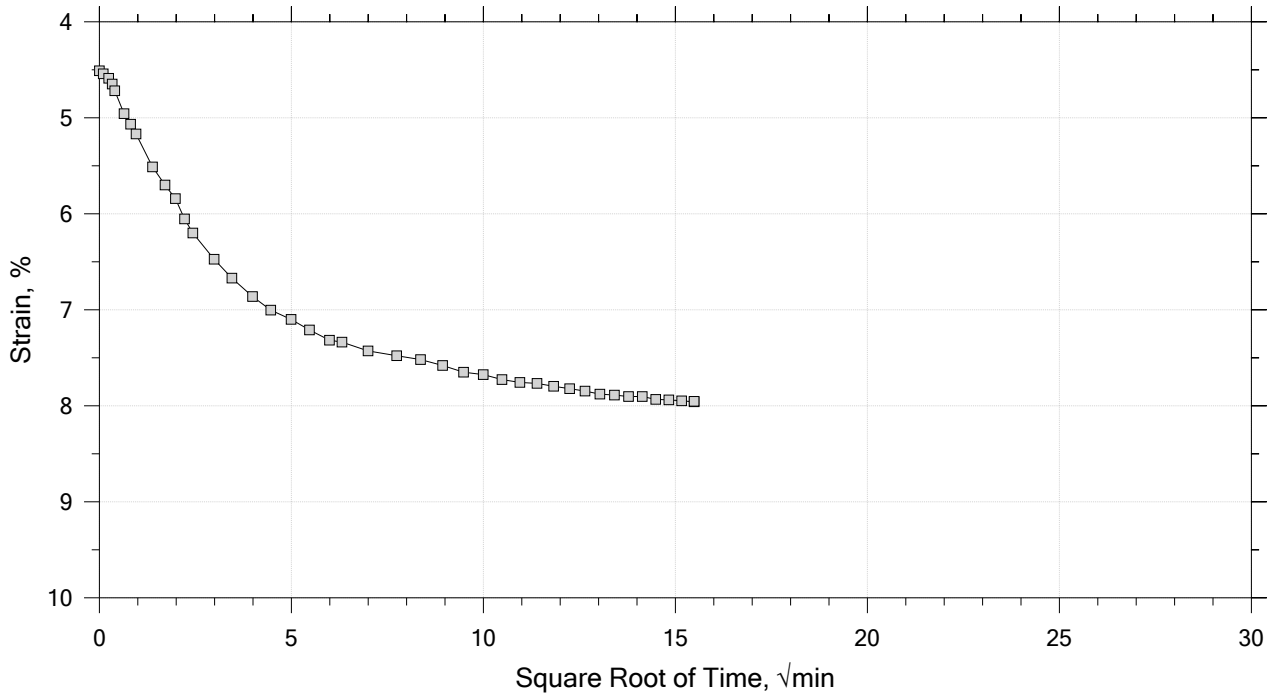
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 8 of 22

Constant Load Step

Stress: 4 tsf





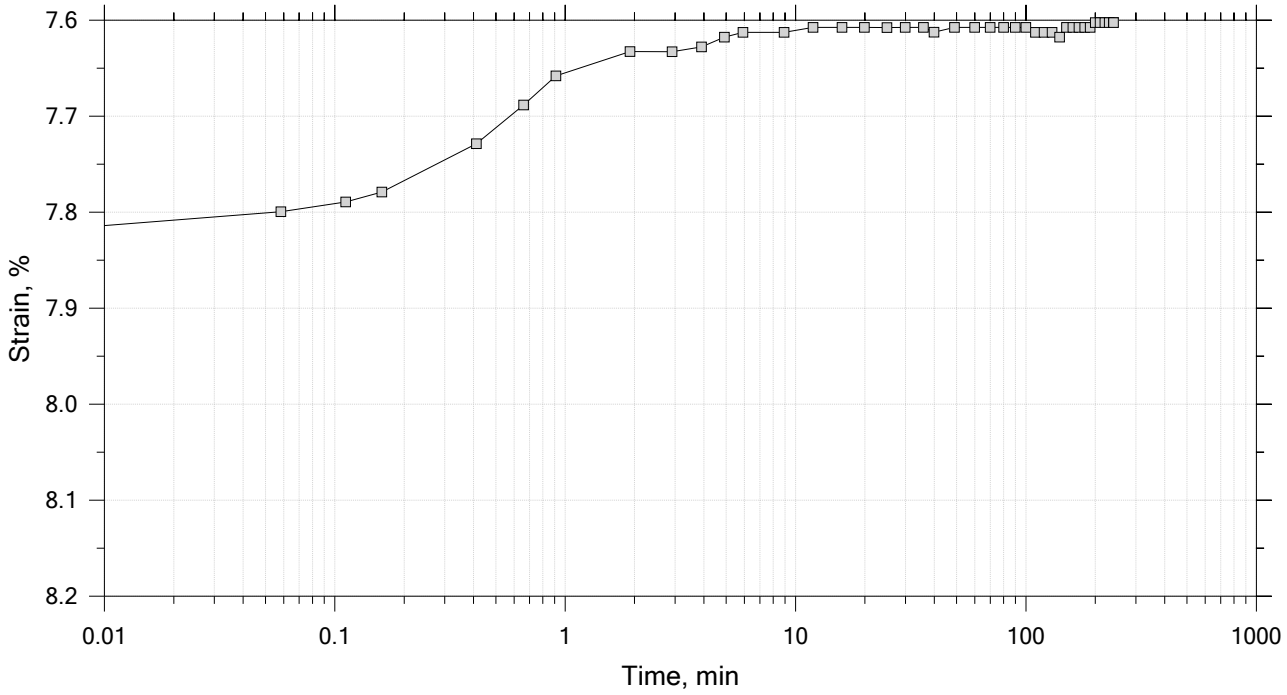
GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-105	Tested By: md	Checked By: njh
	Sample No.: U1	Test Date: 09/24/18	Depth: 25-27 ft
	Test No.: IP-5	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System O, Swell Pressure = 0.0757 tsf		

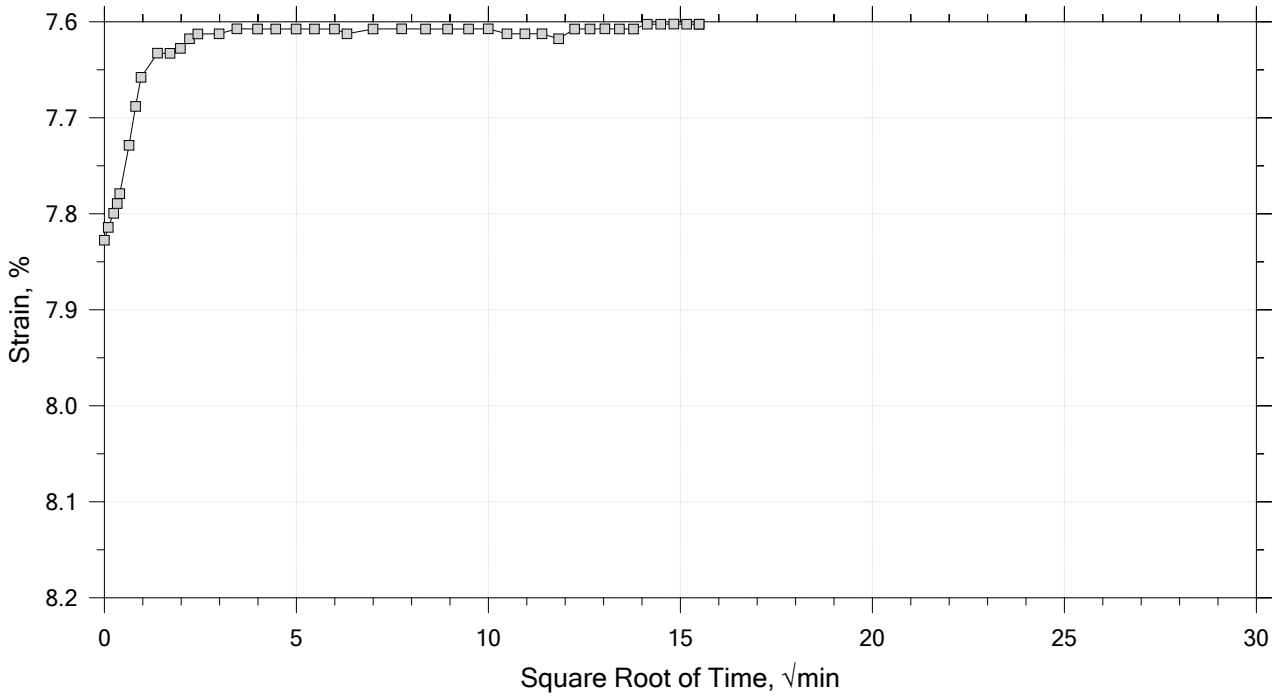
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 9 of 22

Constant Load Step

Stress: 2 tsf





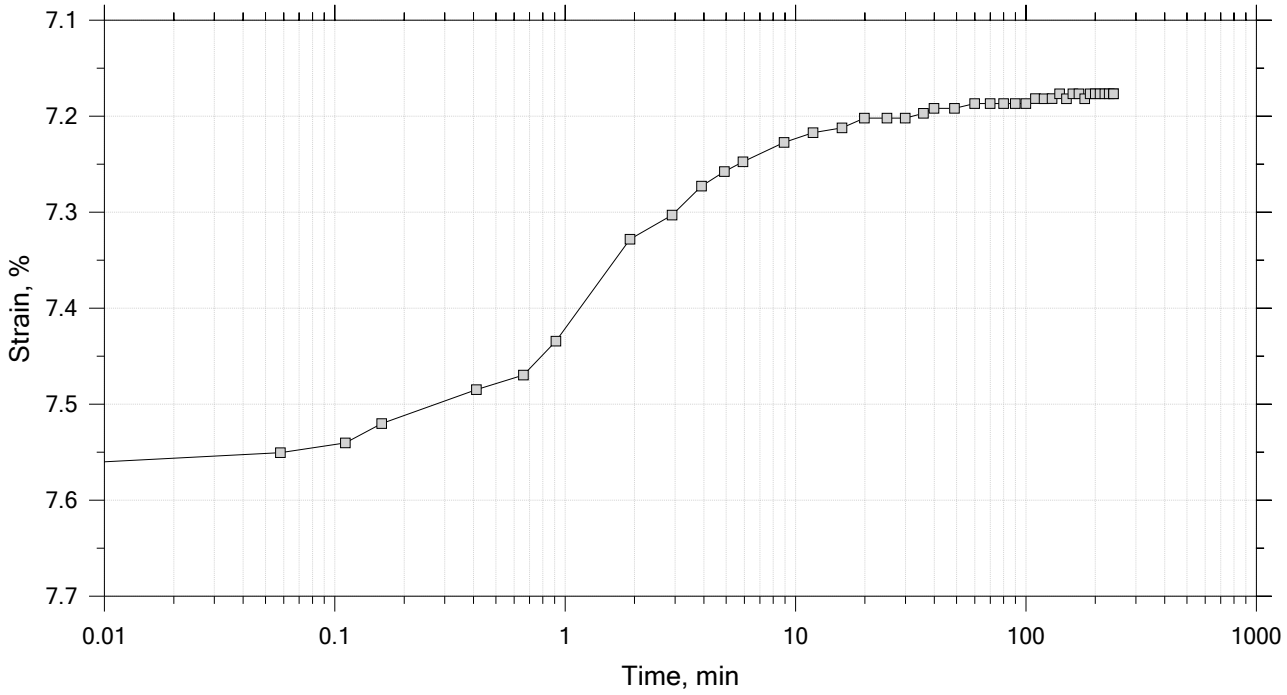
GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-105	Tested By: md	Checked By: njh
	Sample No.: U1	Test Date: 09/24/18	Depth: 25-27 ft
	Test No.: IP-5	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System O, Swell Pressure = 0.0757 tsf		

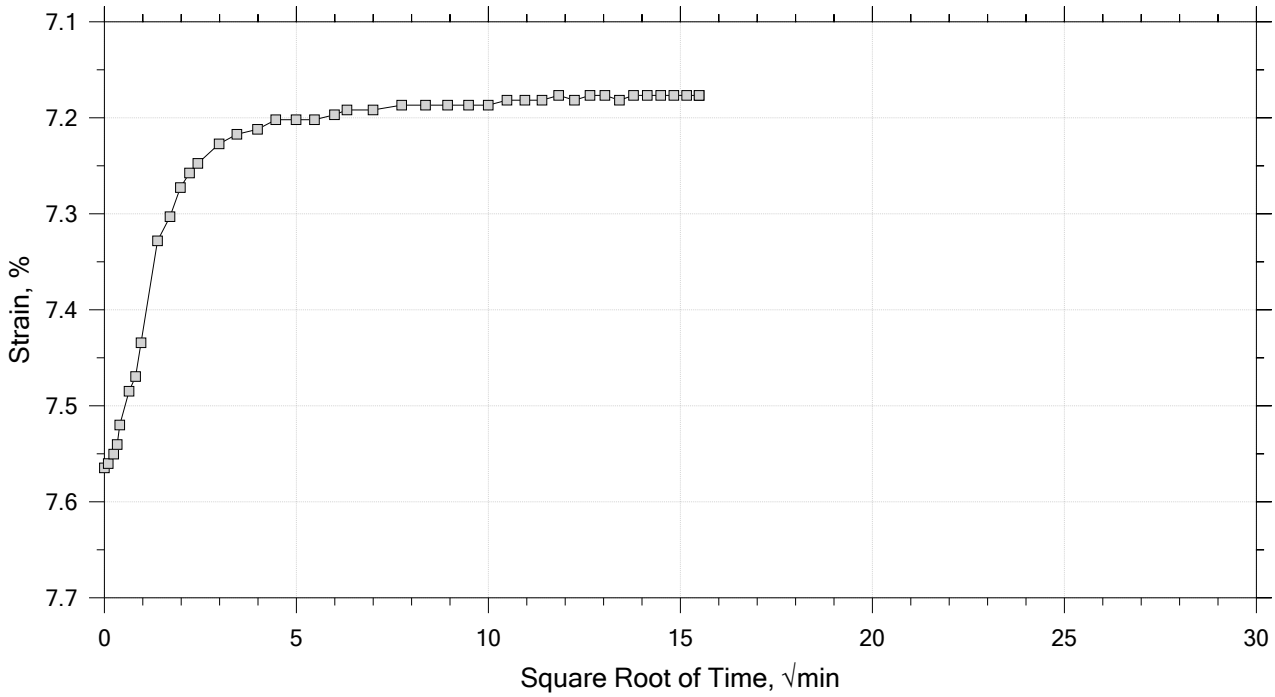
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 10 of 22

Constant Load Step

Stress: 1 tsf

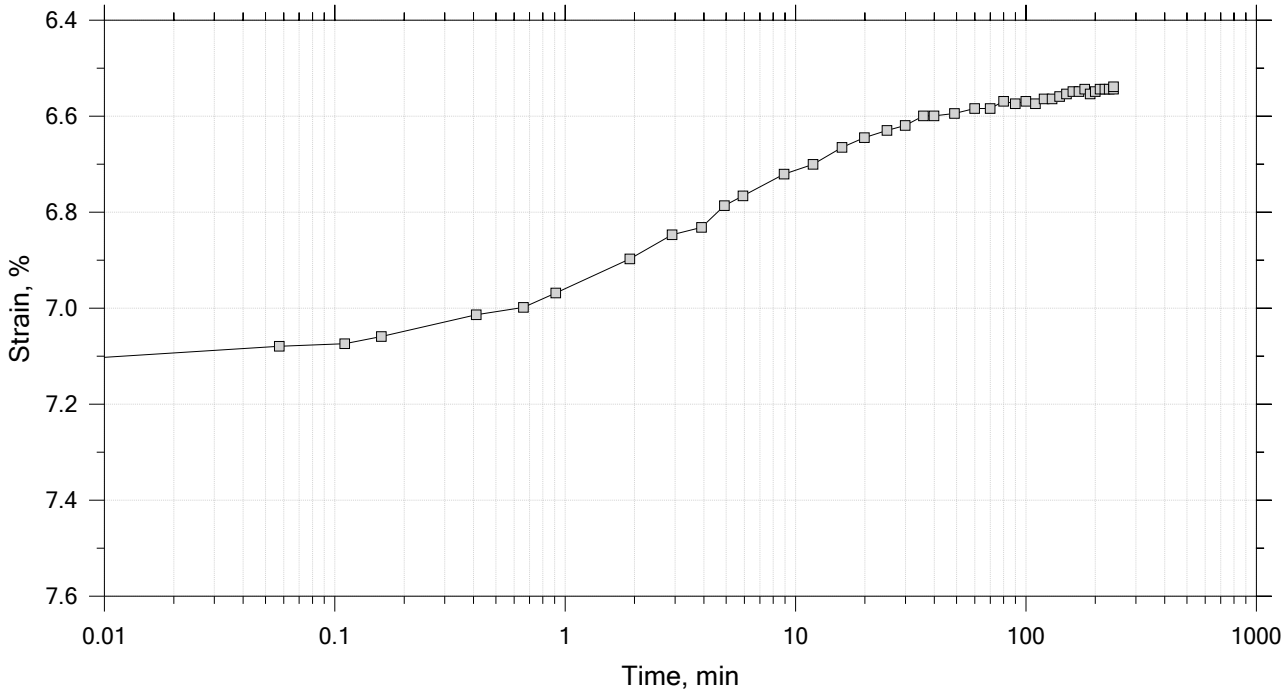


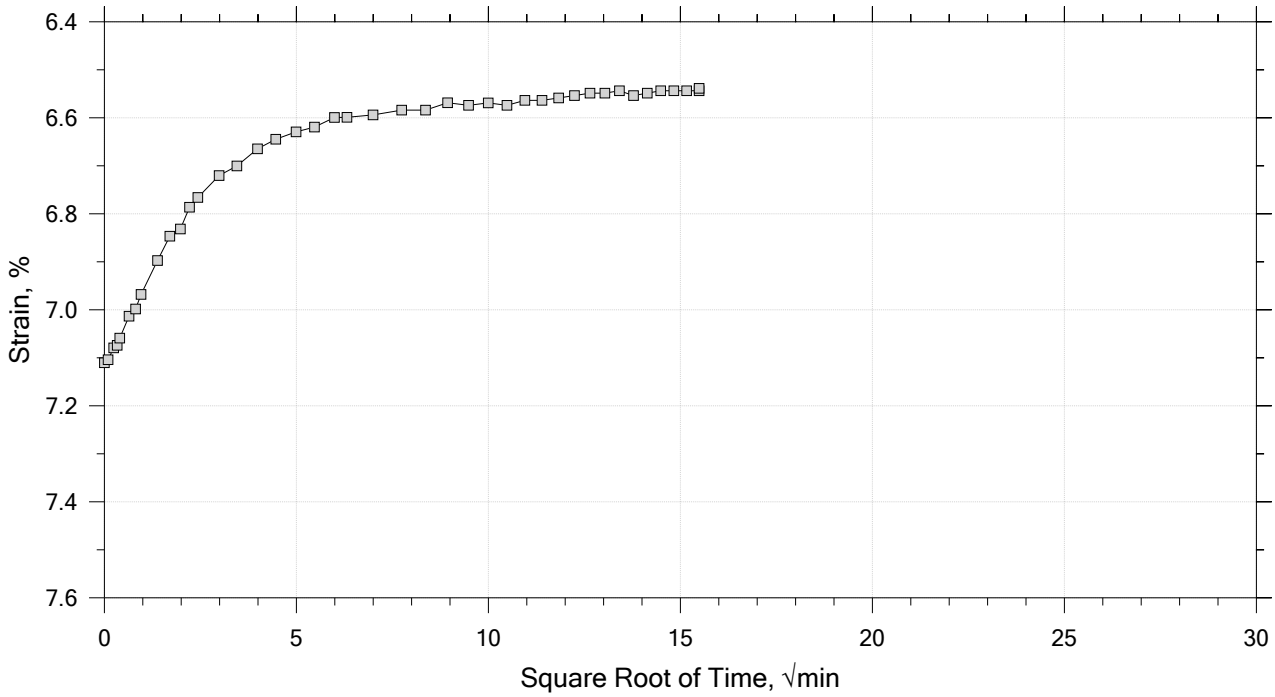


GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-105	Tested By: md	Checked By: njh
	Sample No.: U1	Test Date: 09/24/18	Depth: 25-27 ft
	Test No.: IP-5	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System O, Swell Pressure = 0.0757 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 11 of 22
Constant Load Step
Stress: 0.5 tsf





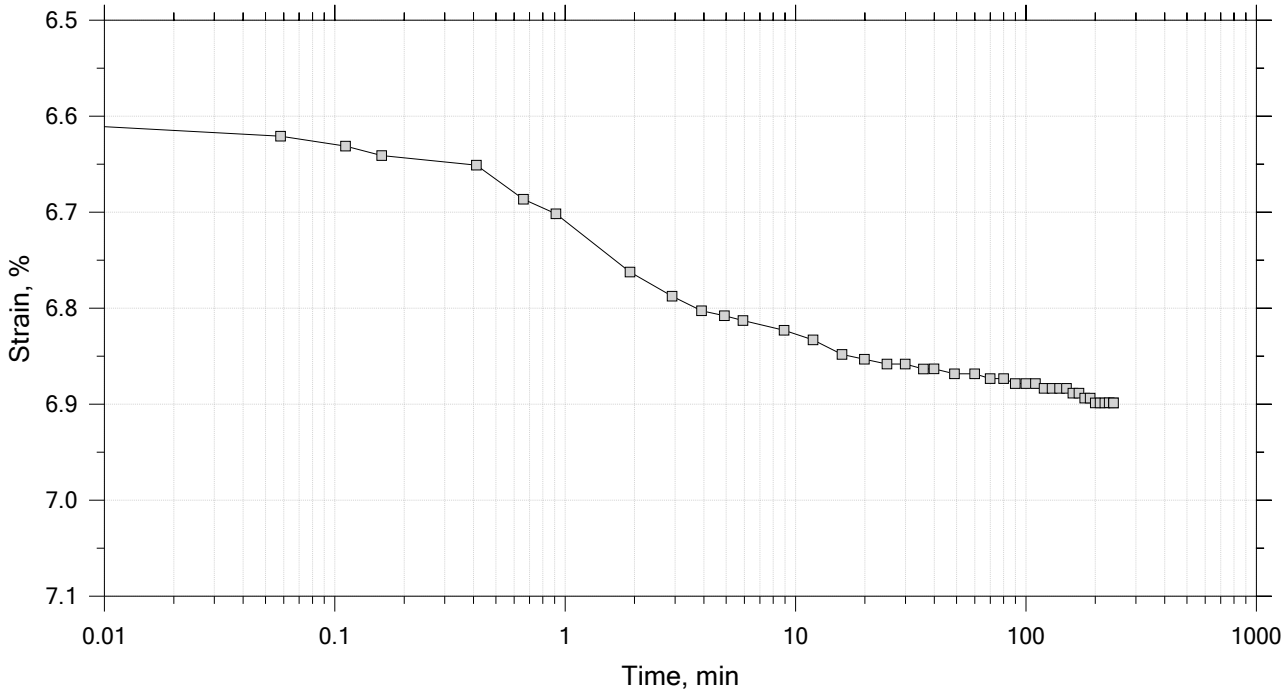
GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-105	Tested By: md	Checked By: njh
	Sample No.: U1	Test Date: 09/24/18	Depth: 25-27 ft
	Test No.: IP-5	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System O, Swell Pressure = 0.0757 tsf		

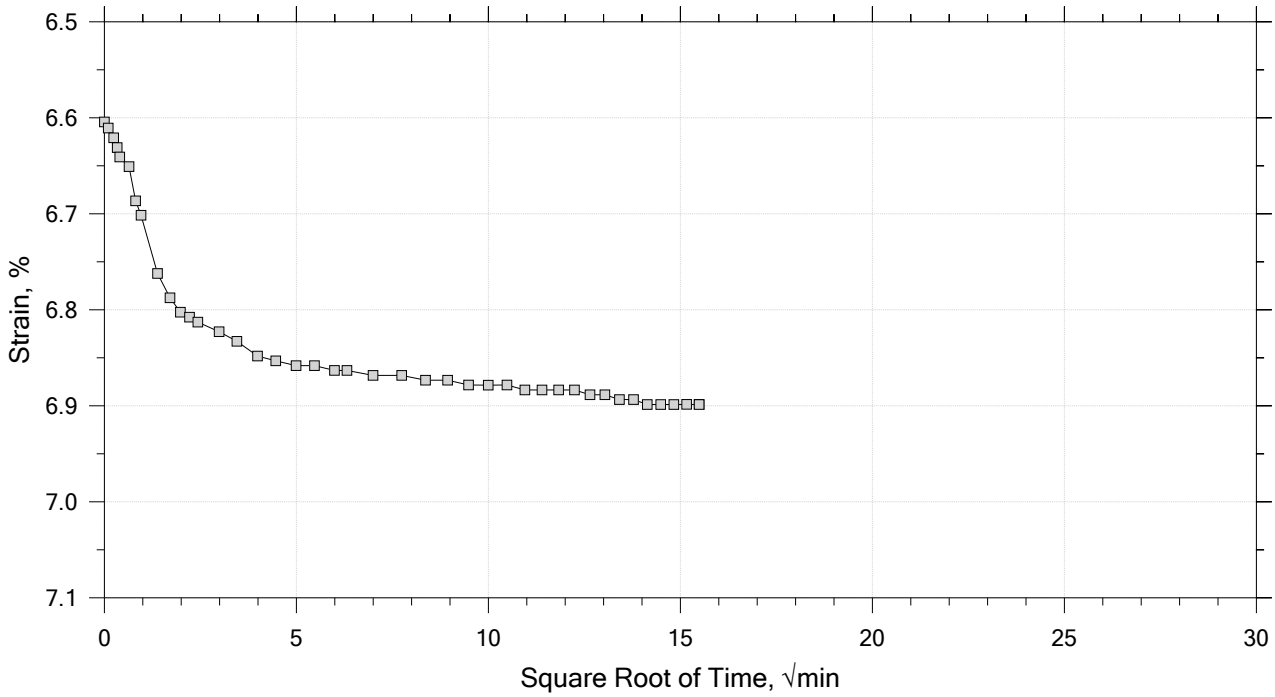
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 12 of 22

Constant Load Step

Stress: 1 tsf

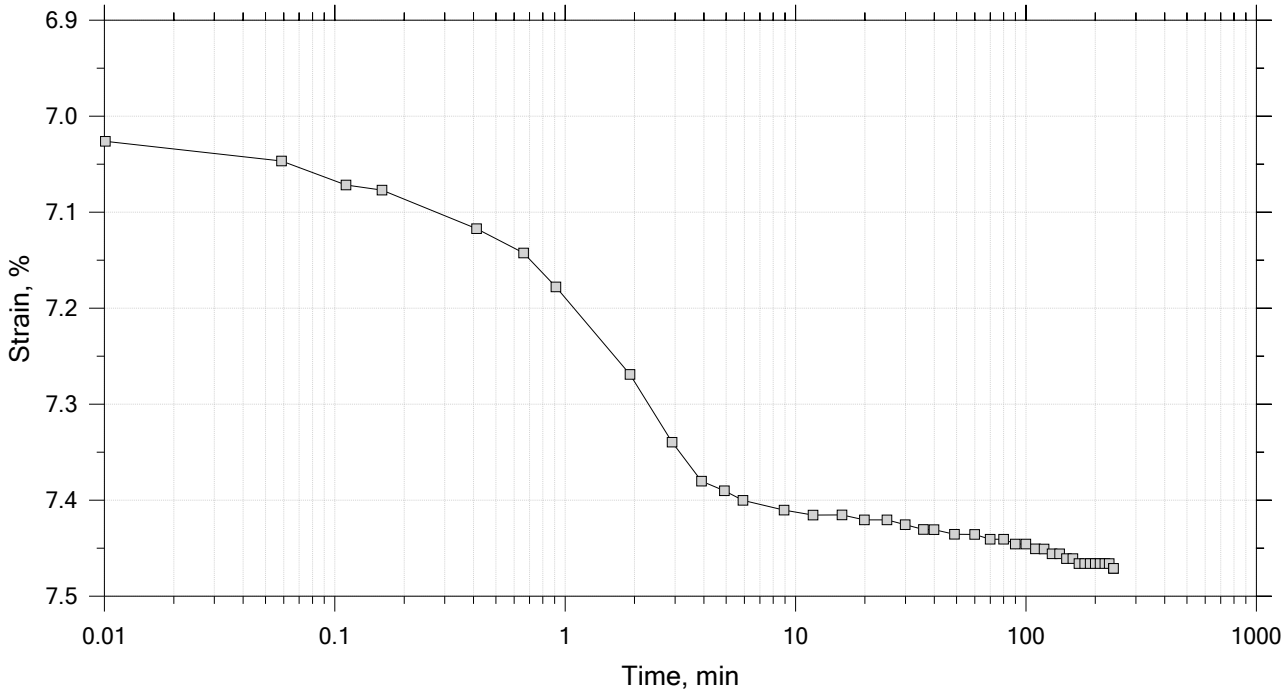


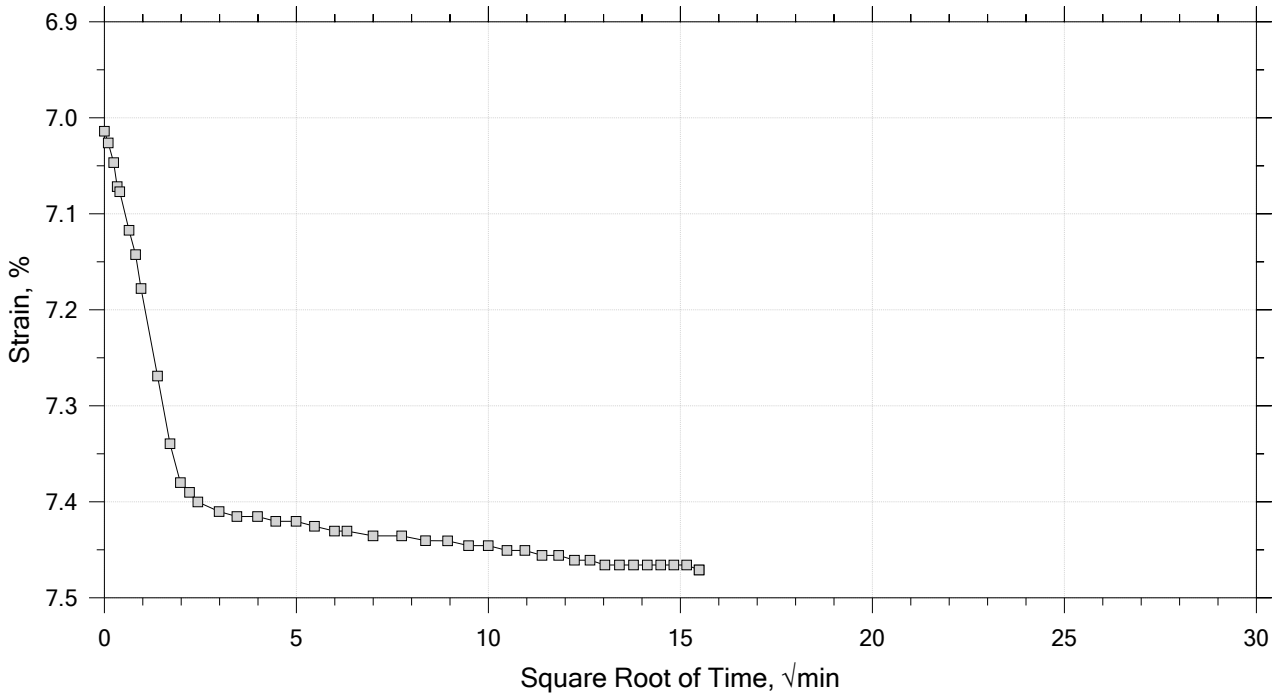


GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-105	Tested By: md	Checked By: njh
	Sample No.: U1	Test Date: 09/24/18	Depth: 25-27 ft
	Test No.: IP-5	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System O, Swell Pressure = 0.0757 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 13 of 22
Constant Load Step
Stress: 2 tsf





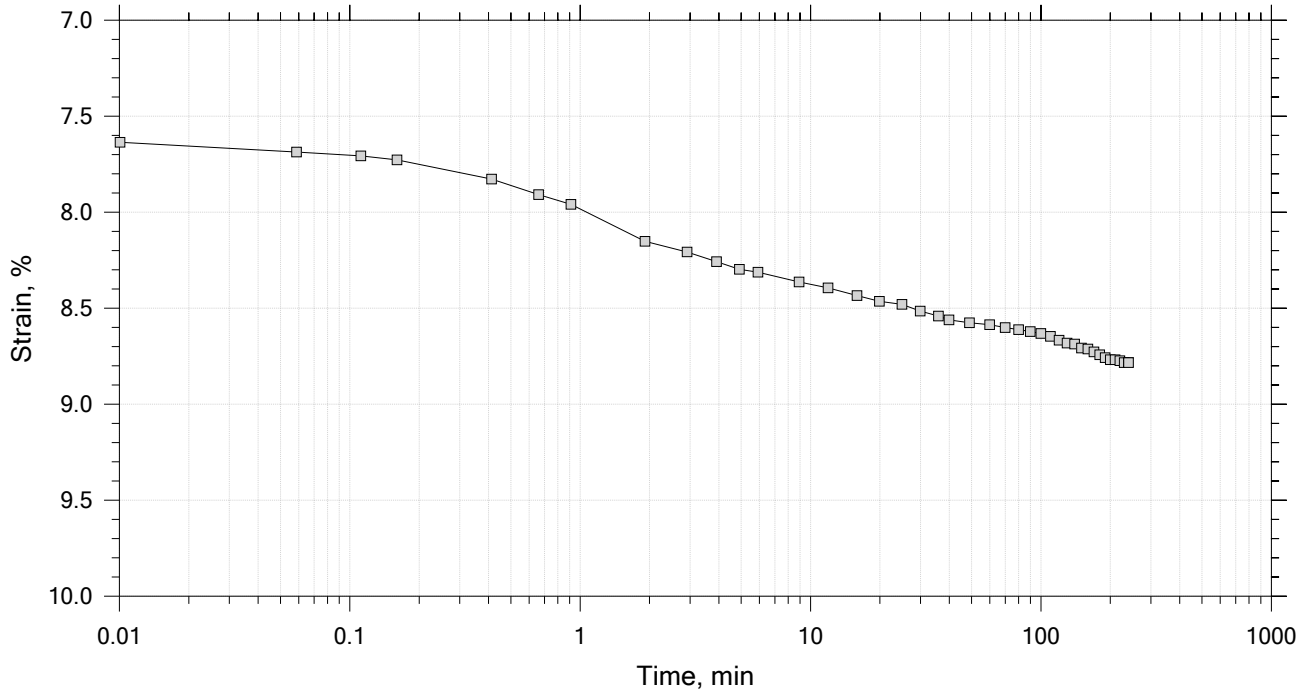
GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-105	Tested By: md	Checked By: njh
	Sample No.: U1	Test Date: 09/24/18	Depth: 25-27 ft
	Test No.: IP-5	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System O, Swell Pressure = 0.0757 tsf		

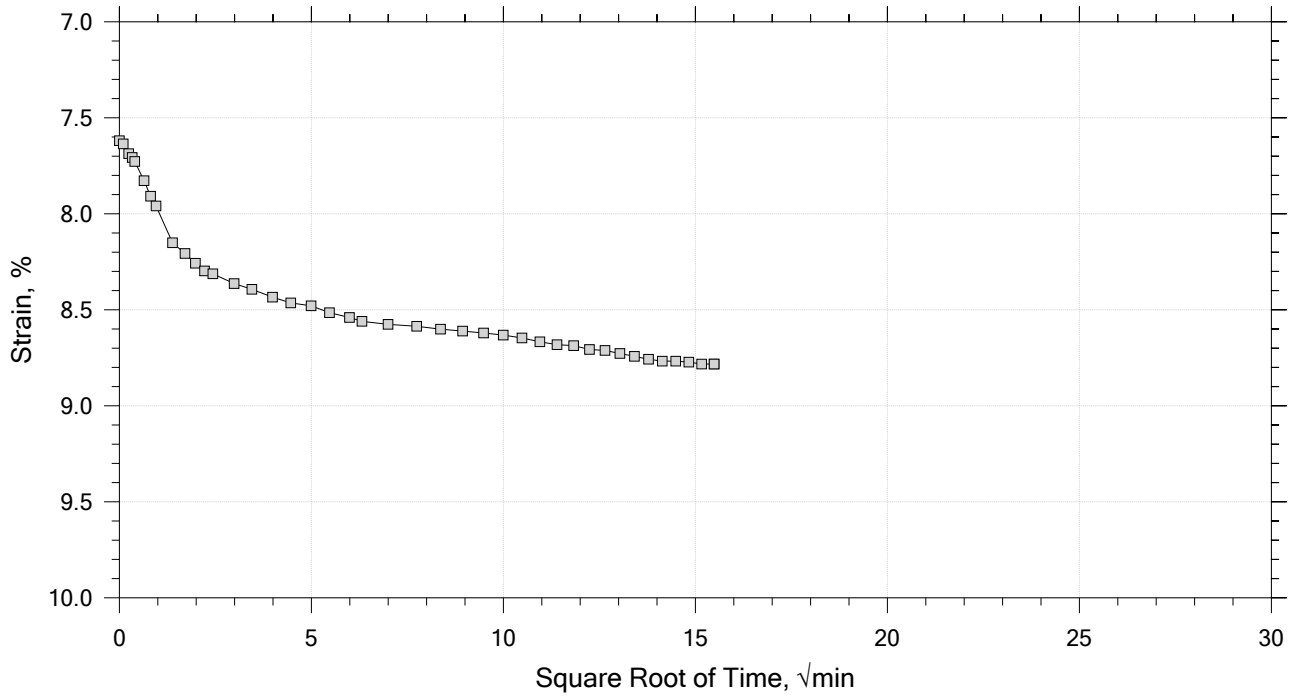
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 14 of 22

Constant Load Step

Stress: 4 tsf

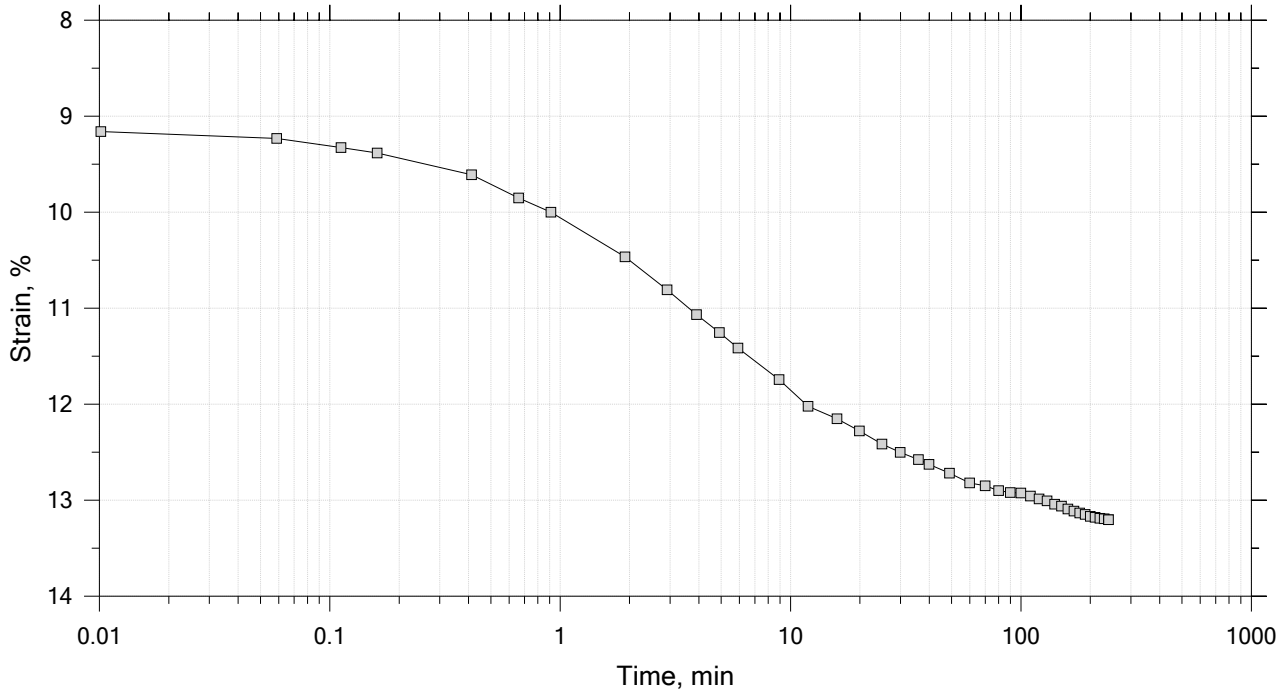


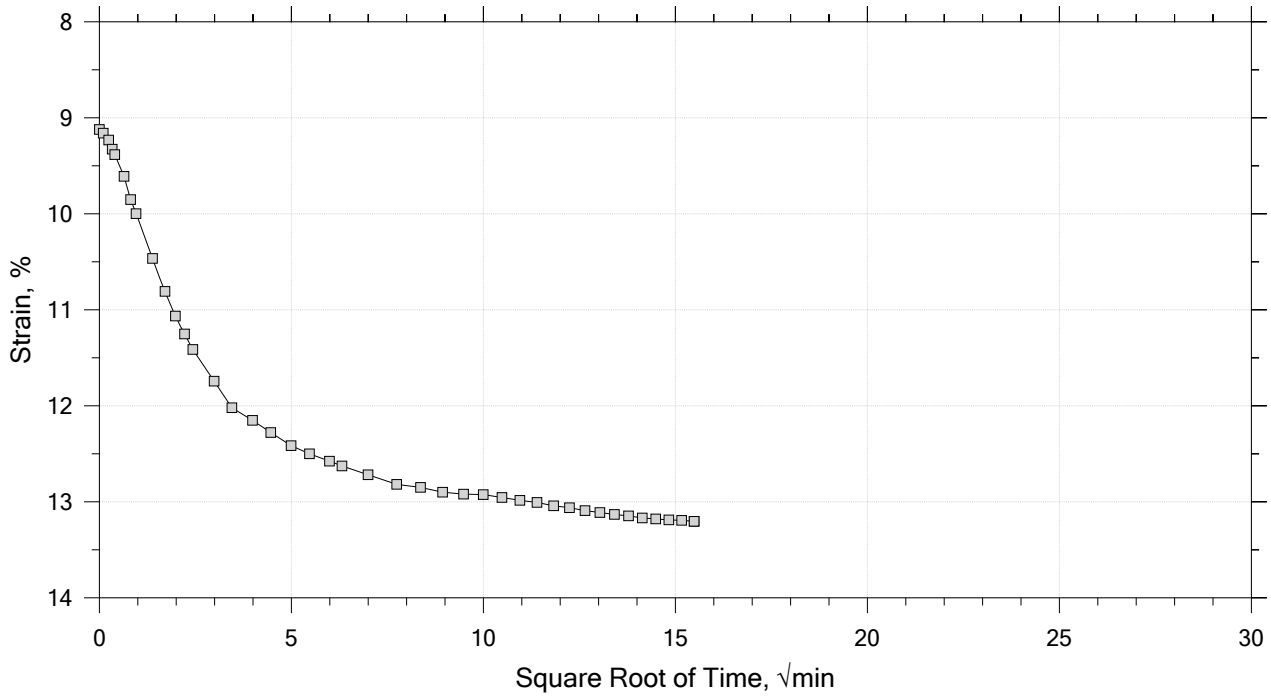


Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
Boring No.: BB-PVS-105	Tested By: md	Checked By: njh
Sample No.: U1	Test Date: 09/24/18	Depth: 25-27 ft
Test No.: IP-5	Sample Type: intact	Elevation: ---
Description: Moist, dark gray clay		
Remarks: System O, Swell Pressure = 0.0757 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 15 of 22
Constant Load Step
Stress: 8 tsf

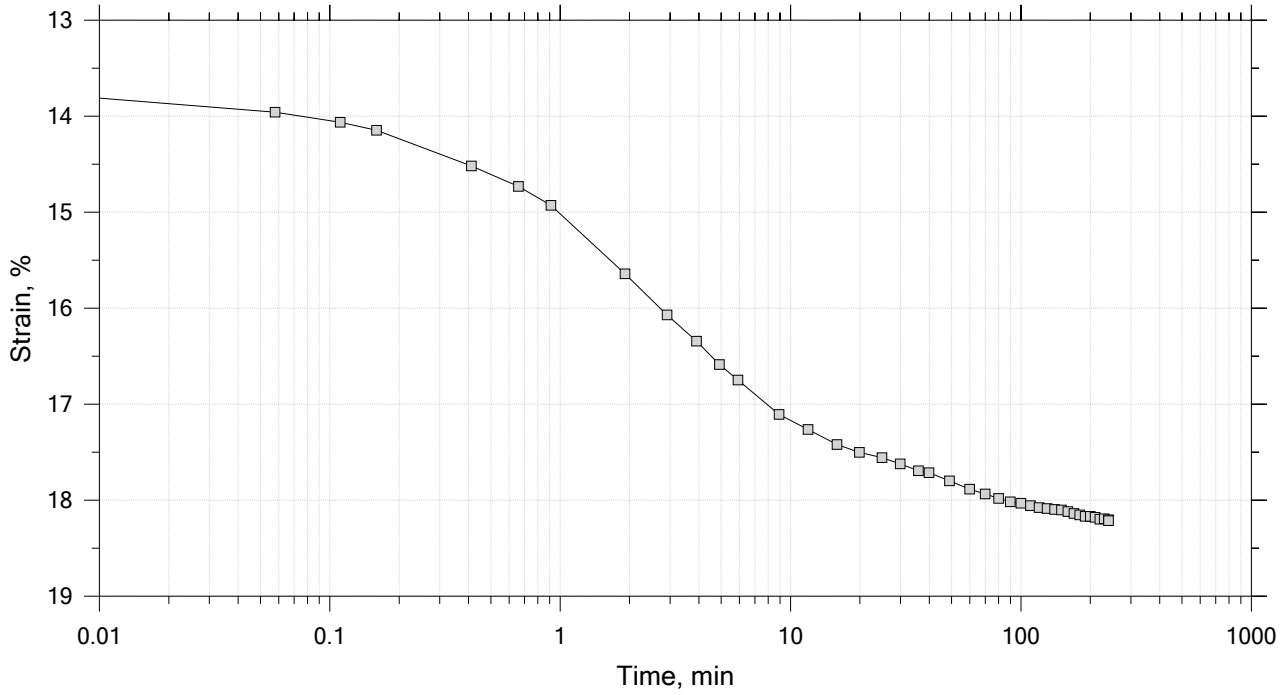


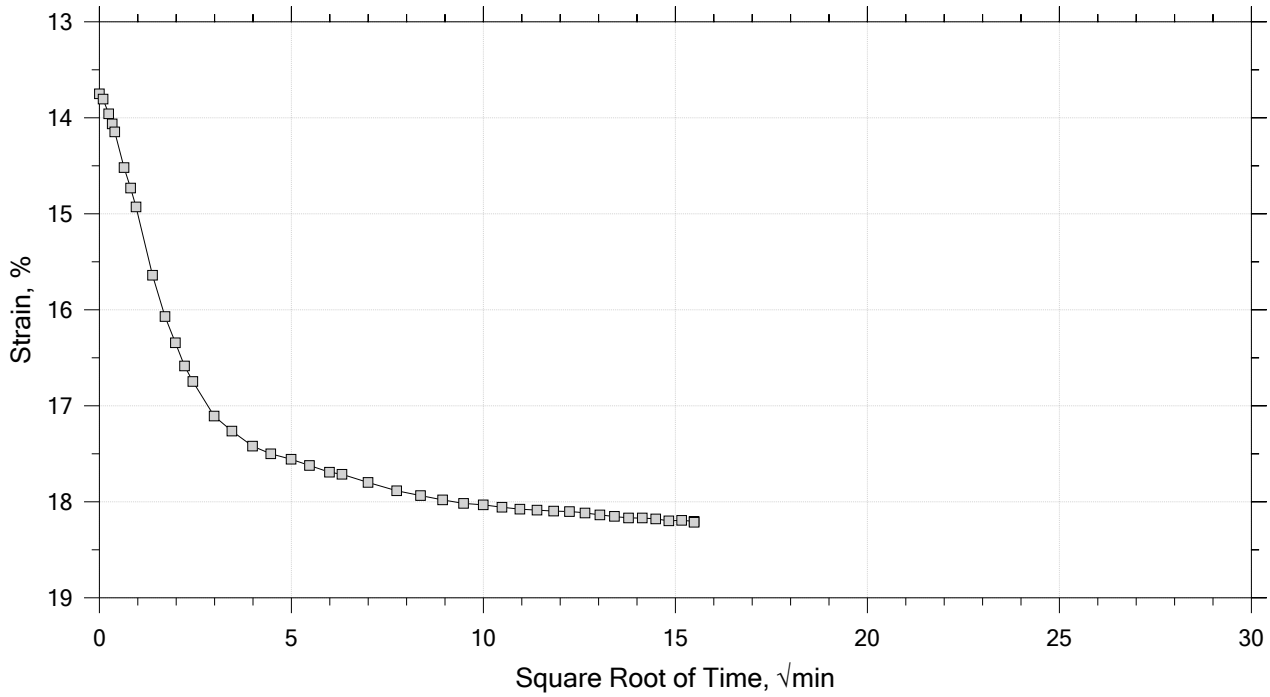


GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-105	Tested By: md	Checked By: njh
	Sample No.: U1	Test Date: 09/24/18	Depth: 25-27 ft
	Test No.: IP-5	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System O, Swell Pressure = 0.0757 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 16 of 22
Constant Load Step
Stress: 16 tsf





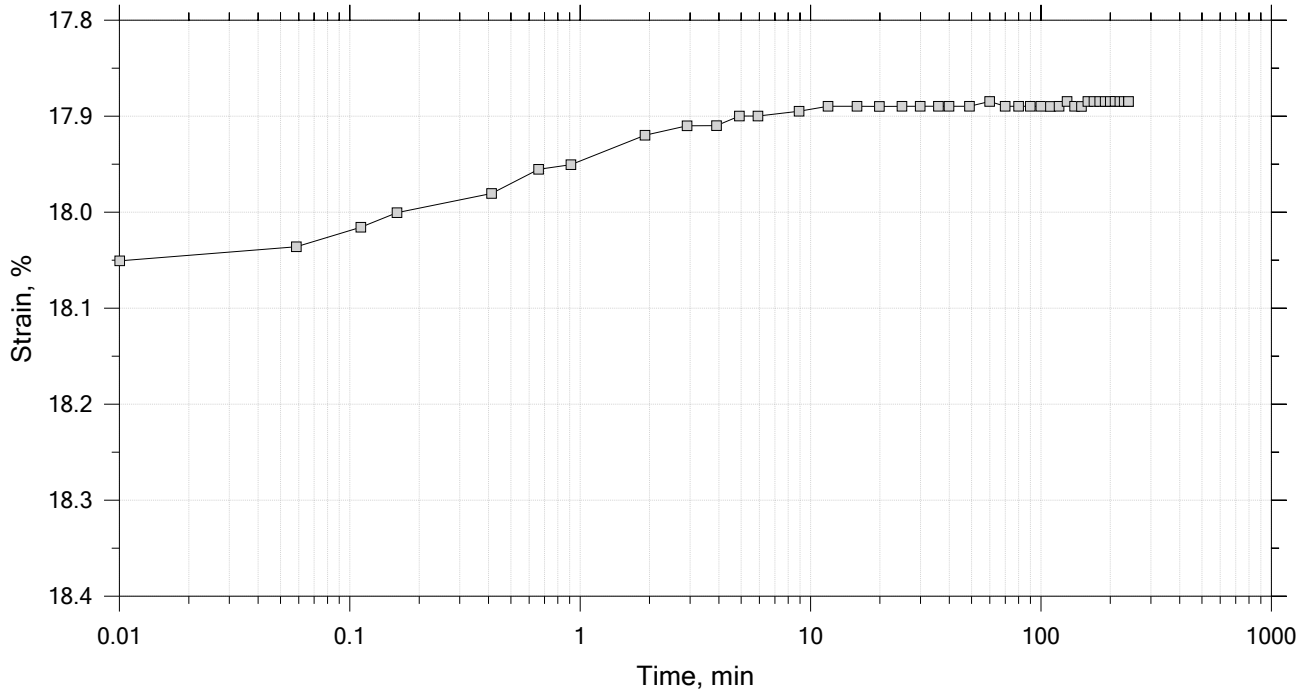
GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-105	Tested By: md	Checked By: njh
	Sample No.: U1	Test Date: 09/24/18	Depth: 25-27 ft
	Test No.: IP-5	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System O, Swell Pressure = 0.0757 tsf		

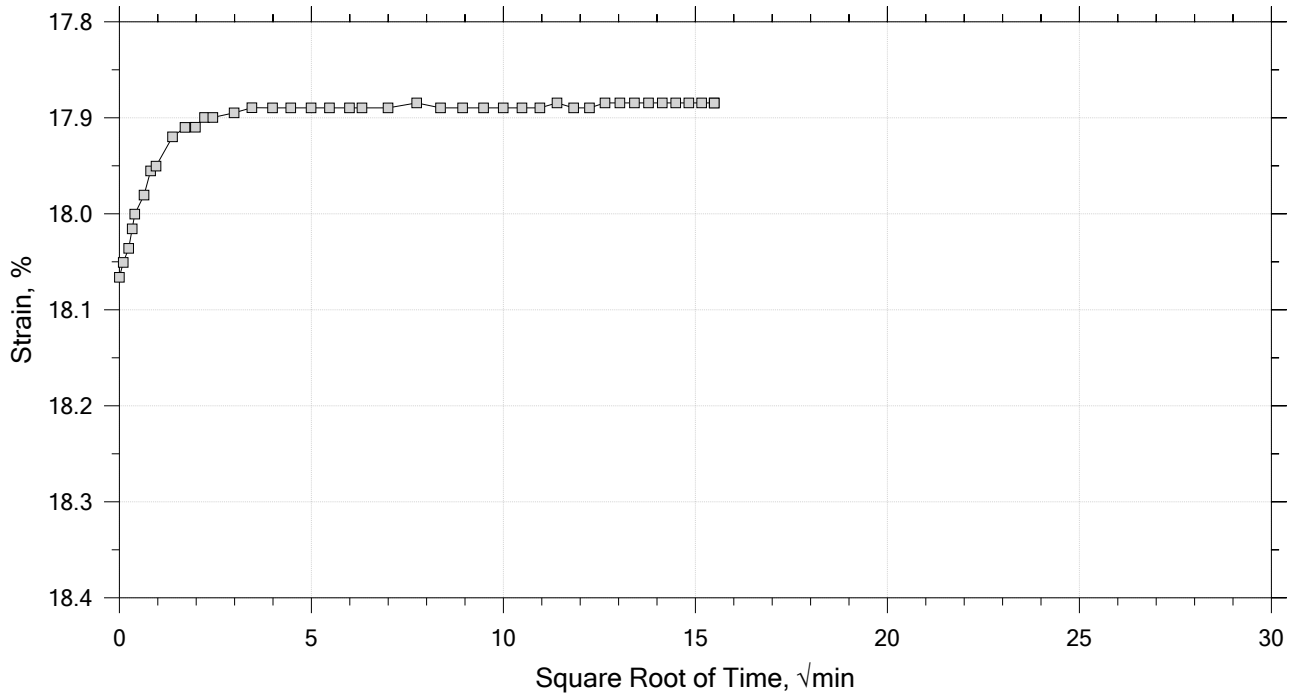
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 17 of 22

Constant Load Step

Stress: 8 tsf

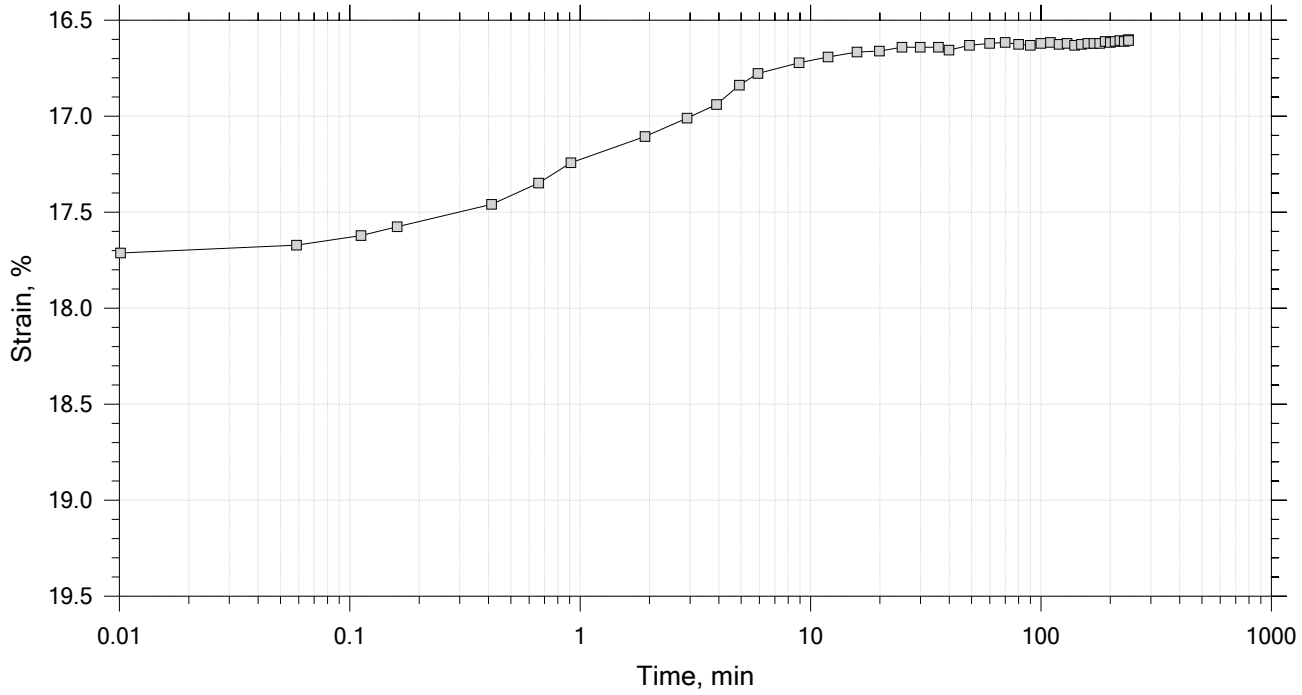


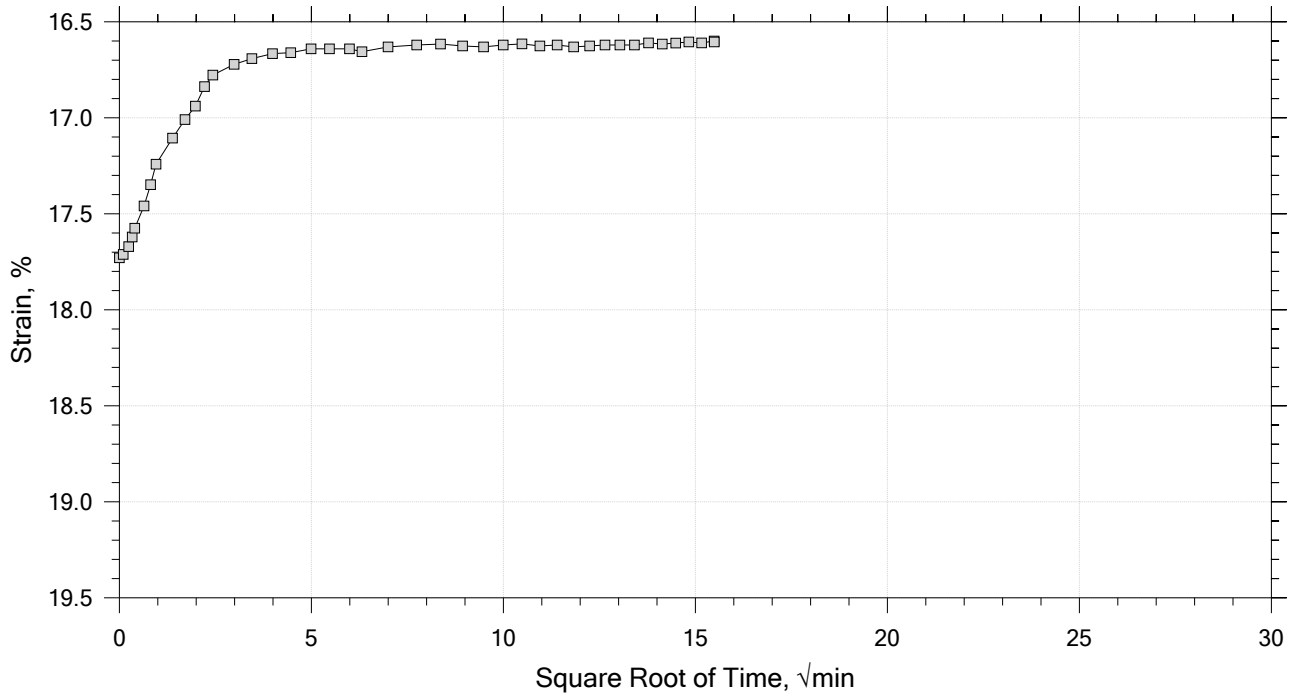


Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
Boring No.: BB-PVS-105	Tested By: md	Checked By: njh
Sample No.: U1	Test Date: 09/24/18	Depth: 25-27 ft
Test No.: IP-5	Sample Type: intact	Elevation: ---
Description: Moist, dark gray clay		
Remarks: System O, Swell Pressure = 0.0757 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 18 of 22
Constant Load Step
Stress: 2 tsf

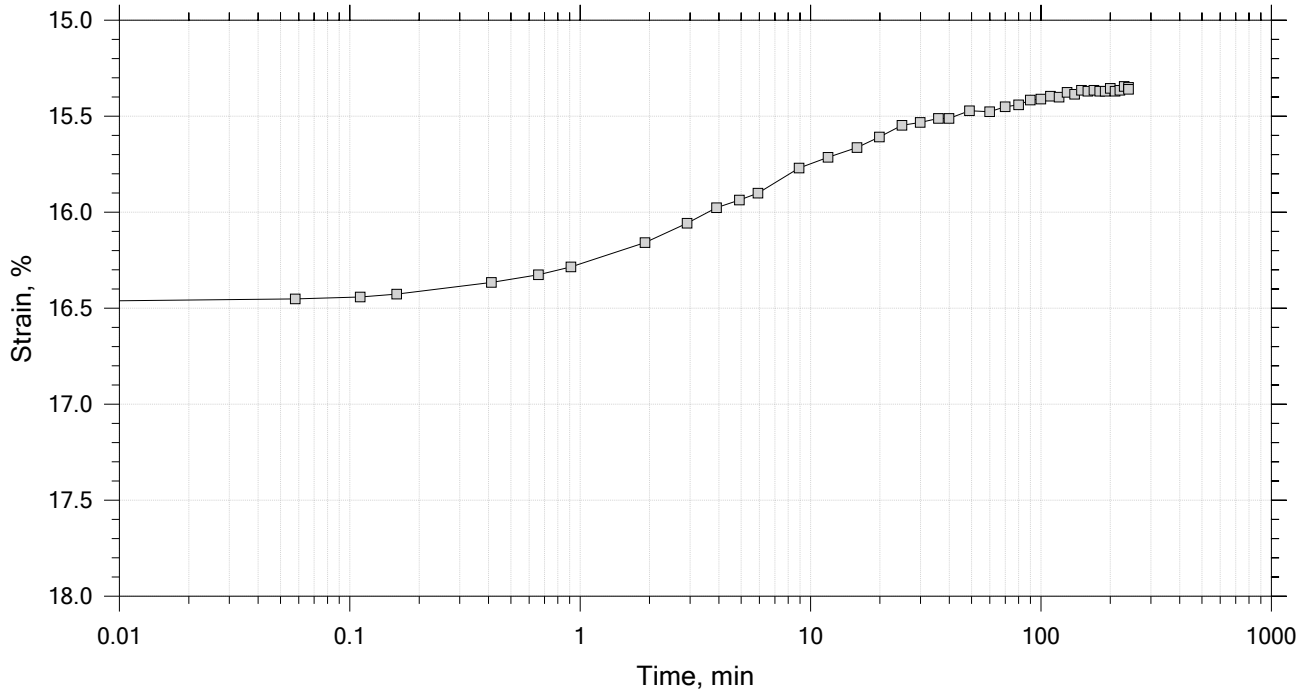


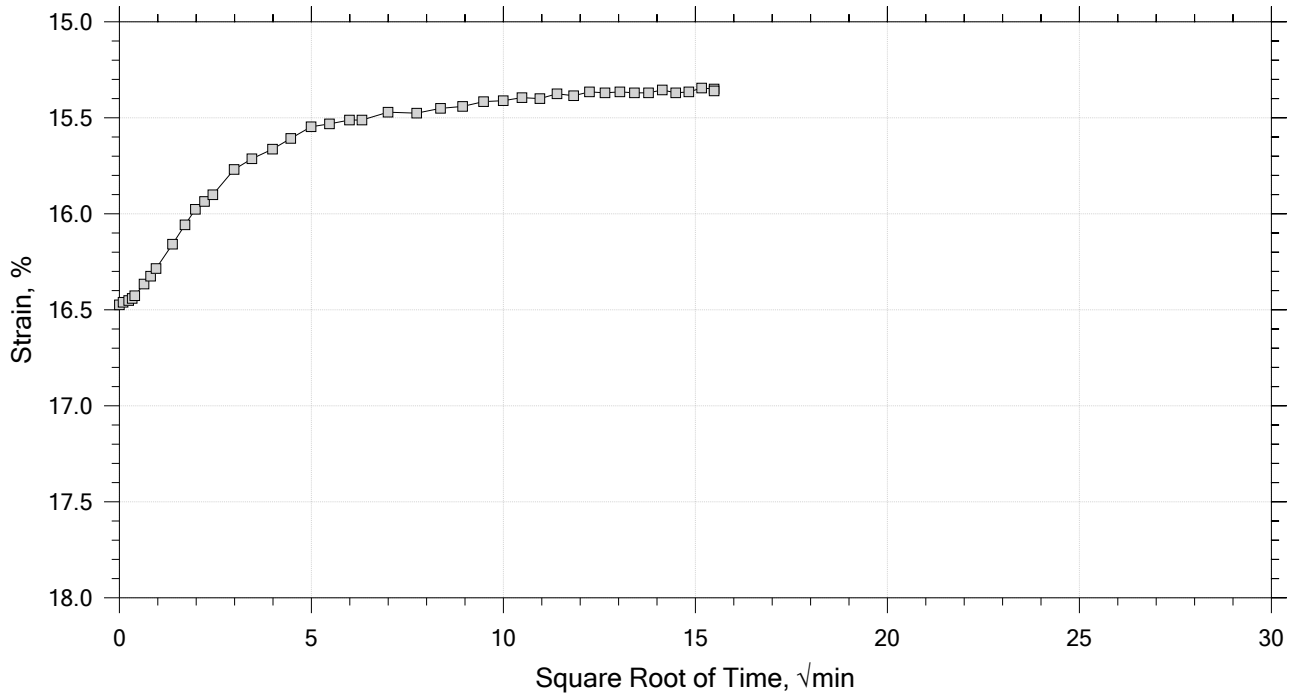


GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-105	Tested By: md	Checked By: njh
	Sample No.: U1	Test Date: 09/24/18	Depth: 25-27 ft
	Test No.: IP-5	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System O, Swell Pressure = 0.0757 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 19 of 22
Constant Load Step
Stress: 0.75 tsf

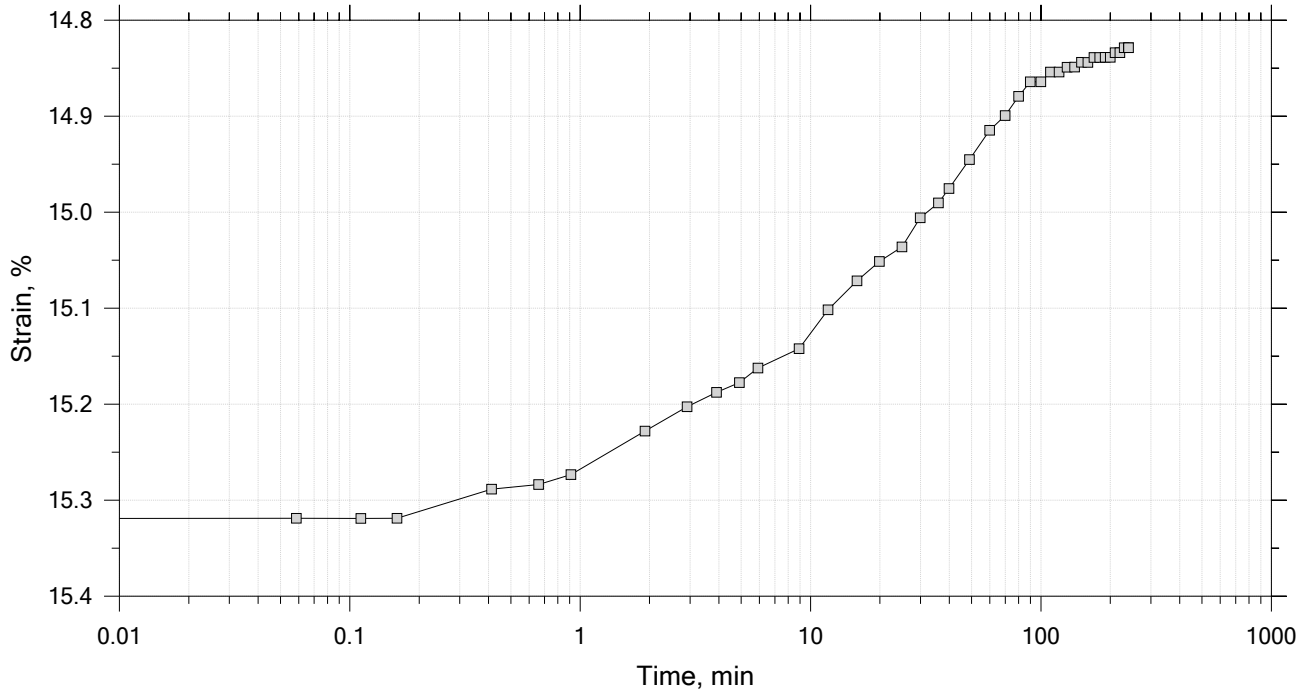


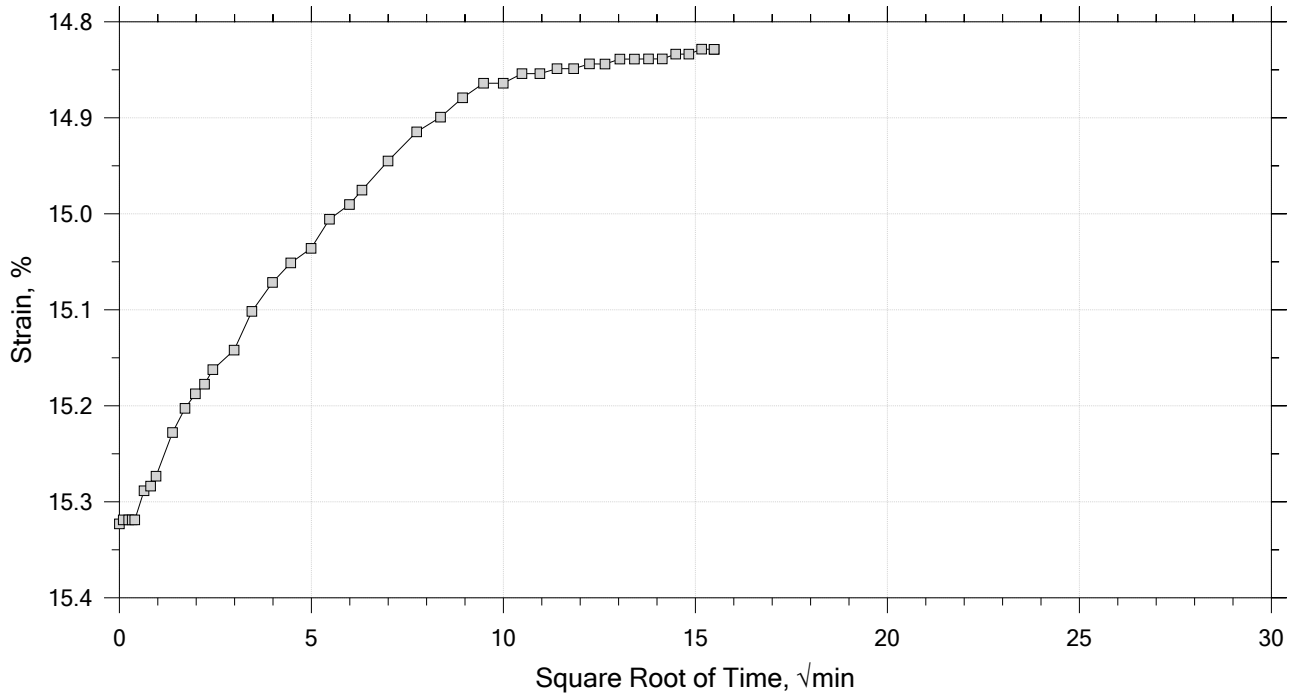


Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
Boring No.: BB-PVS-105	Tested By: md	Checked By: njh
Sample No.: U1	Test Date: 09/24/18	Depth: 25-27 ft
Test No.: IP-5	Sample Type: intact	Elevation: ---
Description: Moist, dark gray clay		
Remarks: System O, Swell Pressure = 0.0757 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 20 of 22
Constant Load Step
Stress: 0.5 tsf

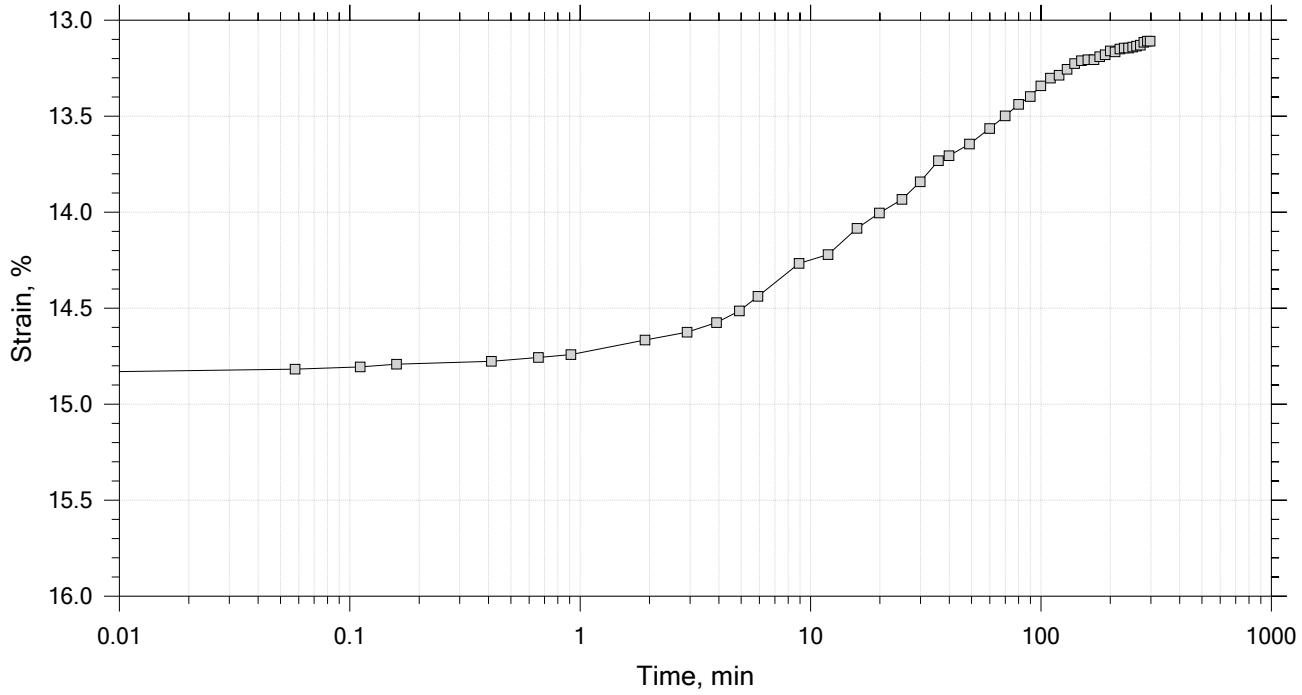


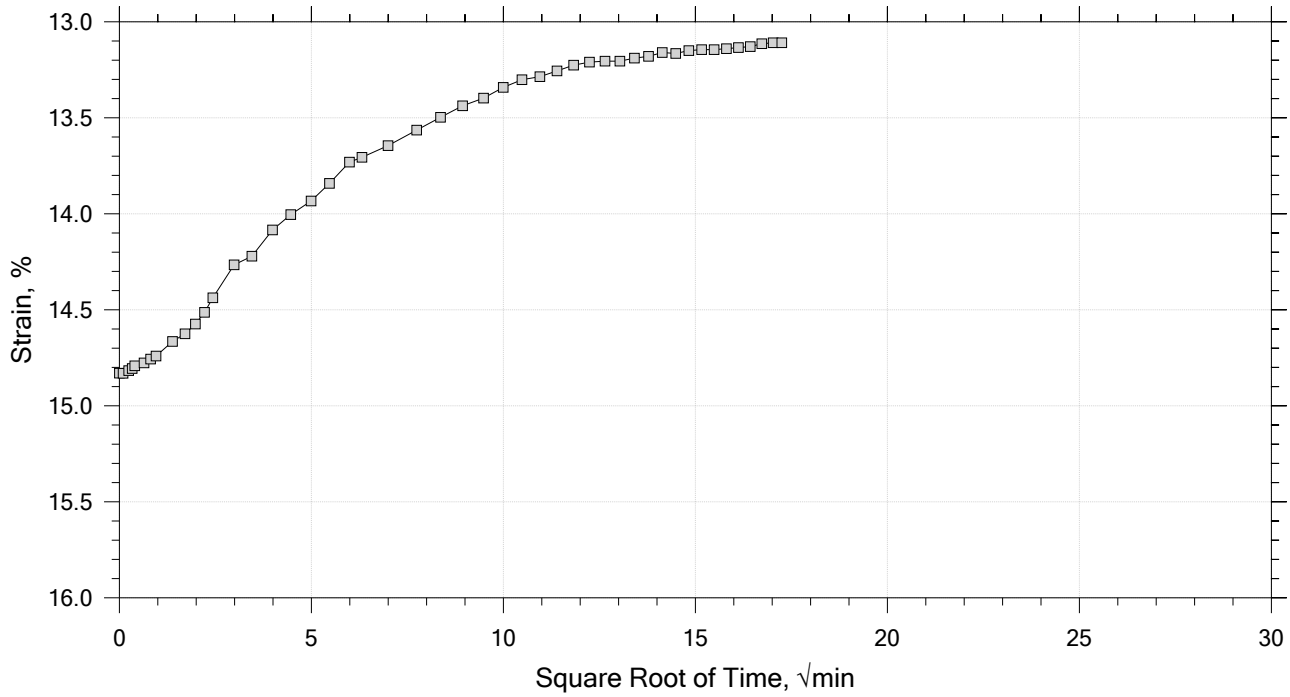


Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
Boring No.: BB-PVS-105	Tested By: md	Checked By: njh
Sample No.: U1	Test Date: 09/24/18	Depth: 25-27 ft
Test No.: IP-5	Sample Type: intact	Elevation: ---
Description: Moist, dark gray clay		
Remarks: System O, Swell Pressure = 0.0757 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 21 of 22
Constant Load Step
Stress: 0.125 tsf

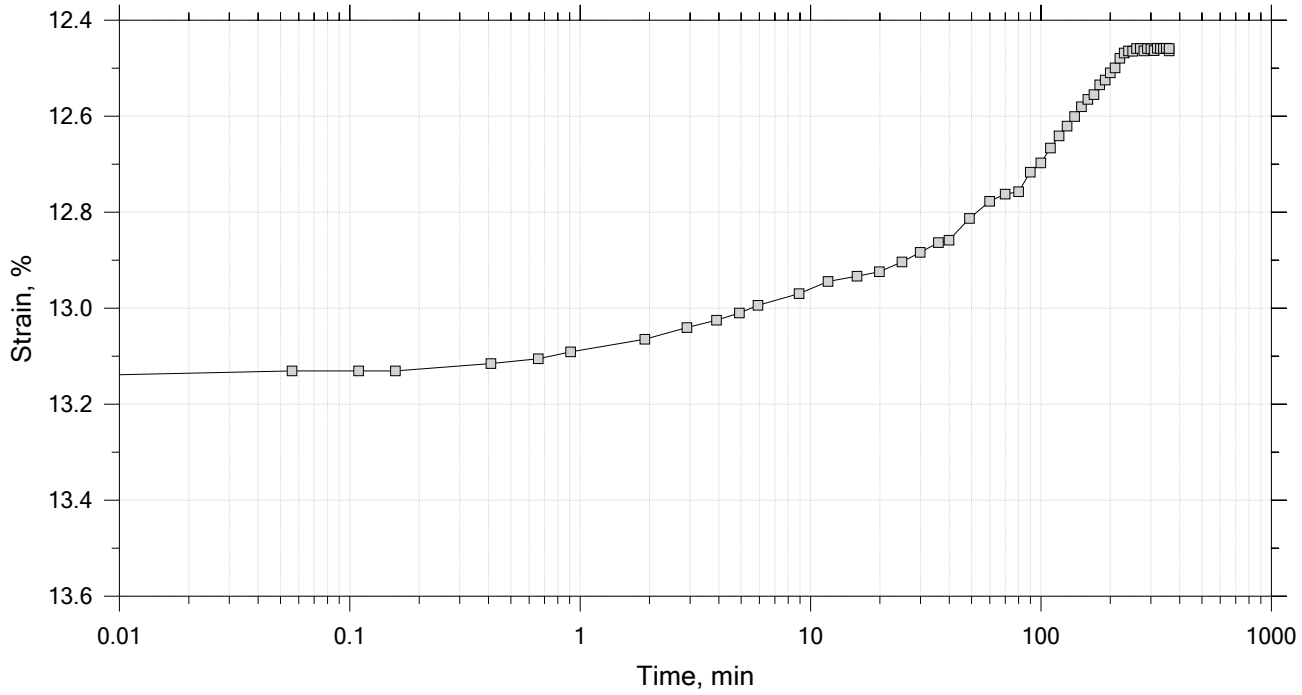


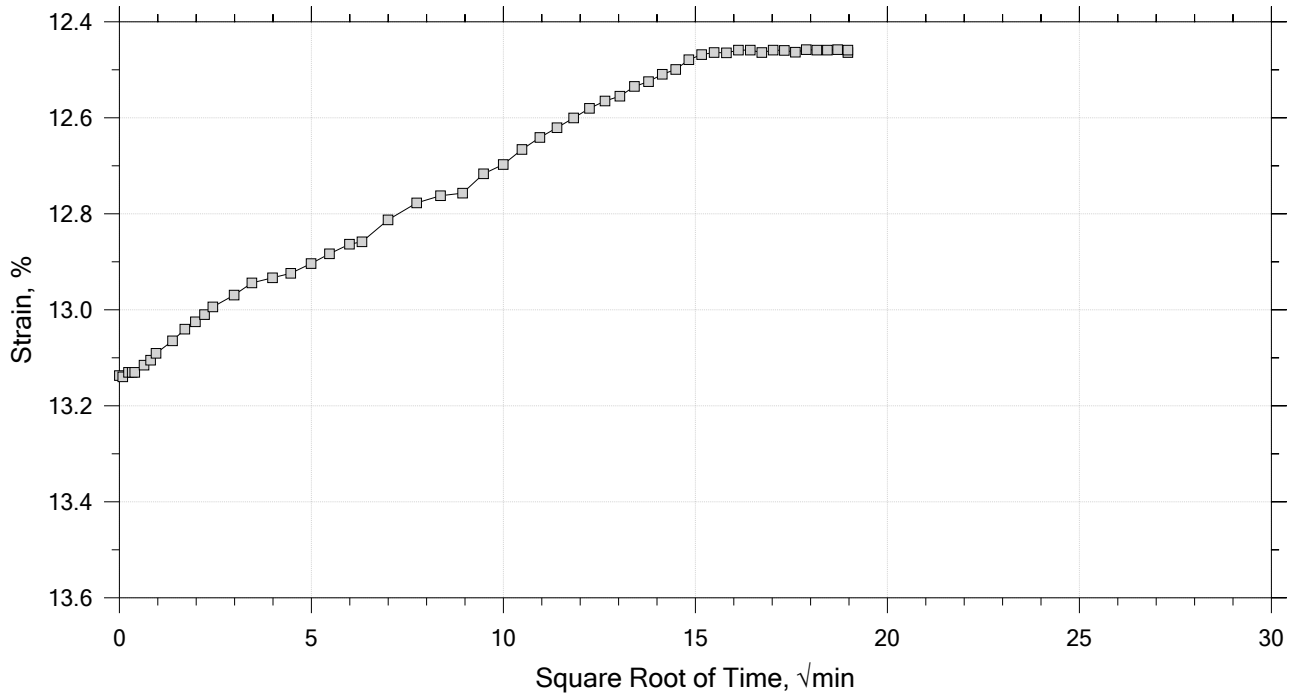


Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
Boring No.: BB-PVS-105	Tested By: md	Checked By: njh
Sample No.: U1	Test Date: 09/24/18	Depth: 25-27 ft
Test No.: IP-5	Sample Type: intact	Elevation: ---
Description: Moist, dark gray clay		
Remarks: System O, Swell Pressure = 0.0757 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 22 of 22
Constant Load Step
Stress: 0.0625 tsf





Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
Boring No.: BB-PVS-105	Tested By: md	Checked By: njh
Sample No.: U1	Test Date: 09/24/18	Depth: 25-27 ft
Test No.: IP-5	Sample Type: intact	Elevation: ---
Description: Moist, dark gray clay		
Remarks: System O, Swell Pressure = 0.0757 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Specimen Diameter: 2.50 in	Estimated Specific Gravity: 2.74	Liquid Limit: 41
Initial Height: 1.00 in	Initial Void Ratio: 1.06	Plastic Limit: 25
Final Height: 0.90 in	Final Void Ratio: 0.857	Plasticity Index: 16

	Before Test Trimmings	Before Test Specimen	After Test Specimen	After Test Trimmings
Container ID	B-2013	RING		B2085
Mass Container, gm	8.32	110.51	110.51	8.45
Mass Container + Wet Soil, gm	154.88	258.44	250.93	146.92
Mass Container + Dry Soil, gm	112.49	217.53	217.53	113.98
Mass Dry Soil, gm	104.17	107.02	107.02	105.53
Water Content, %	40.69	38.23	31.21	31.21
Void Ratio	---	1.06	0.86	---
Degree of Saturation, %	---	98.71	100.00	---
Dry Unit Weight, pcf	---	83.053	92.282	---

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.

GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-105	Tested By: md	Checked By: njh
	Sample No.: U1	Test Date: 09/24/18	Depth: 25-27 ft
	Test No.: IP-5	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System O, Swell Pressure = 0.0757 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Log of Time Coefficients

Step	Applied Stress tsf	Final Displacement in	Void Ratio	Strain at End %	Log T50 min	Cv ft²/s	Mv 1/tsf	k ft/day	Ca %
1	0.0757	0.002511	1.06	0.251	0.000	0.00e+00	3.32e-02	0.00e+00	0.00e+00
2	0.125	0.004201	1.05	0.420	0.000	0.00e+00	3.43e-02	0.00e+00	0.00e+00
3	0.250	0.008047	1.05	0.805	0.000	0.00e+00	3.08e-02	0.00e+00	0.00e+00
4	0.500	0.01337	1.04	1.34	2.402	2.32e-06	2.13e-02	1.33e-04	0.00e+00
5	0.750	0.01714	1.03	1.71	1.049	5.27e-06	1.51e-02	2.14e-04	0.00e+00
6	1.00	0.02334	1.01	2.33	0.000	0.00e+00	2.48e-02	0.00e+00	0.00e+00
7	2.00	0.04221	0.976	4.22	0.000	0.00e+00	1.89e-02	0.00e+00	0.00e+00
8	4.00	0.07954	0.899	7.95	4.260	1.18e-06	1.87e-02	5.94e-05	0.00e+00
9	2.00	0.07602	0.906	7.60	0.000	0.00e+00	1.76e-03	0.00e+00	0.00e+00
10	1.00	0.07177	0.915	7.18	1.364	3.58e-06	4.26e-03	4.12e-05	0.00e+00
11	0.500	0.06539	0.928	6.54	2.549	1.94e-06	1.28e-02	6.68e-05	0.00e+00
12	1.00	0.06899	0.921	6.90	1.404	3.53e-06	7.20e-03	6.86e-05	0.00e+00
13	2.00	0.07471	0.909	7.47	1.638	3.00e-06	5.72e-03	4.63e-05	0.00e+00
14	4.00	0.08783	0.882	8.78	0.000	0.00e+00	6.56e-03	0.00e+00	0.00e+00
15	8.00	0.1320	0.791	13.2	2.777	1.63e-06	1.11e-02	4.85e-05	0.00e+00
16	16.0	0.1821	0.687	18.2	1.865	2.17e-06	6.26e-03	3.67e-05	0.00e+00
17	8.00	0.1788	0.694	17.9	0.000	0.00e+00	4.11e-04	0.00e+00	0.00e+00
18	2.00	0.1661	0.720	16.6	0.000	0.00e+00	2.13e-03	0.00e+00	0.00e+00
19	0.750	0.1536	0.746	15.4	4.124	9.76e-07	9.96e-03	2.62e-05	0.00e+00
20	0.500	0.1483	0.757	14.8	0.000	0.00e+00	2.13e-02	0.00e+00	0.00e+00
21	0.125	0.1311	0.793	13.1	14.614	2.89e-07	4.58e-02	3.57e-05	0.00e+00
22	0.0625	0.1246	0.806	12.5	0.000	0.00e+00	1.04e-01	0.00e+00	0.00e+00

GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-105	Tested By: md	Checked By: njh
	Sample No.: U1	Test Date: 09/24/18	Depth: 25-27 ft
	Test No.: IP-5	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System O, Swell Pressure = 0.0757 tsf		
	Displacement at End of Increment		

One-Dimensional Consolidation by ASTM D2435 - Method B

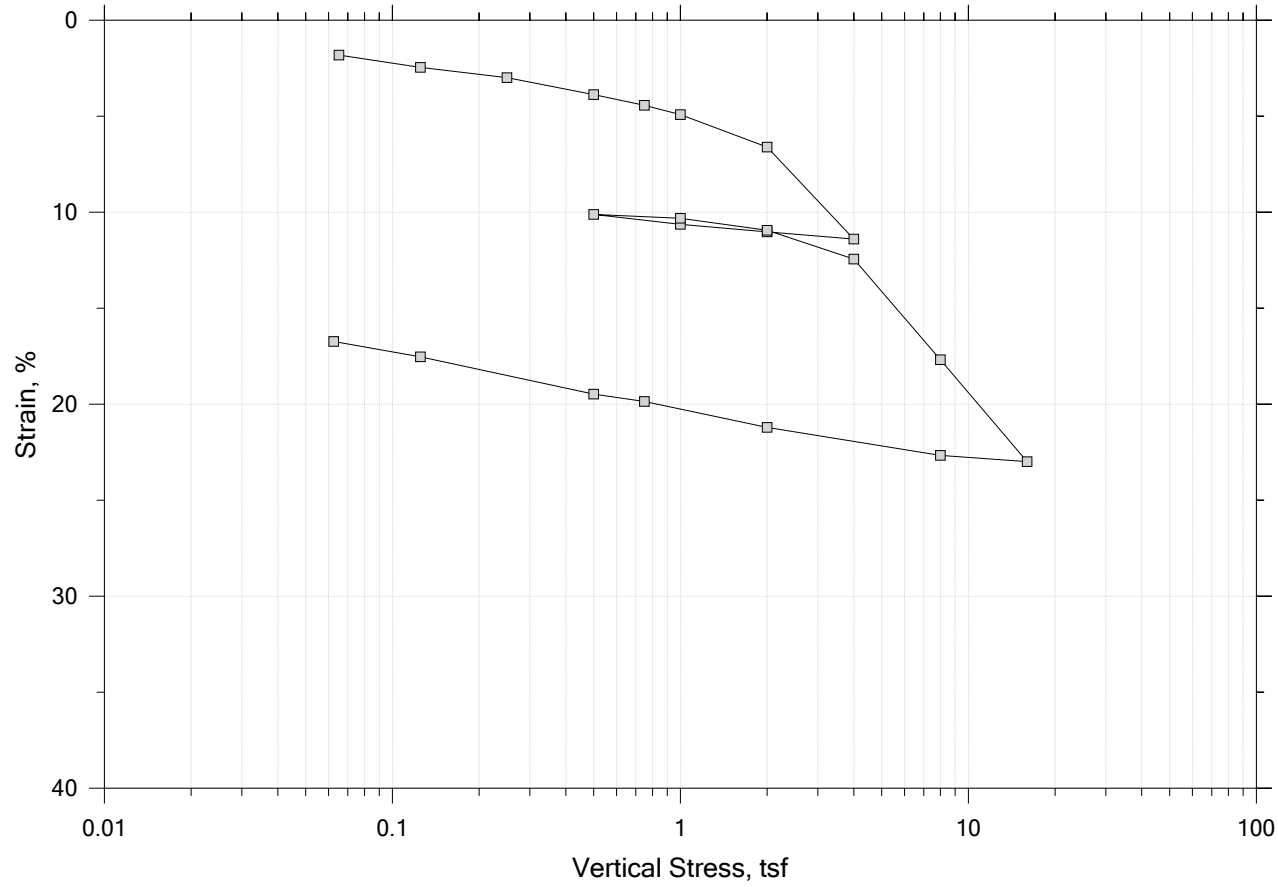
Square Root of Time Coefficients

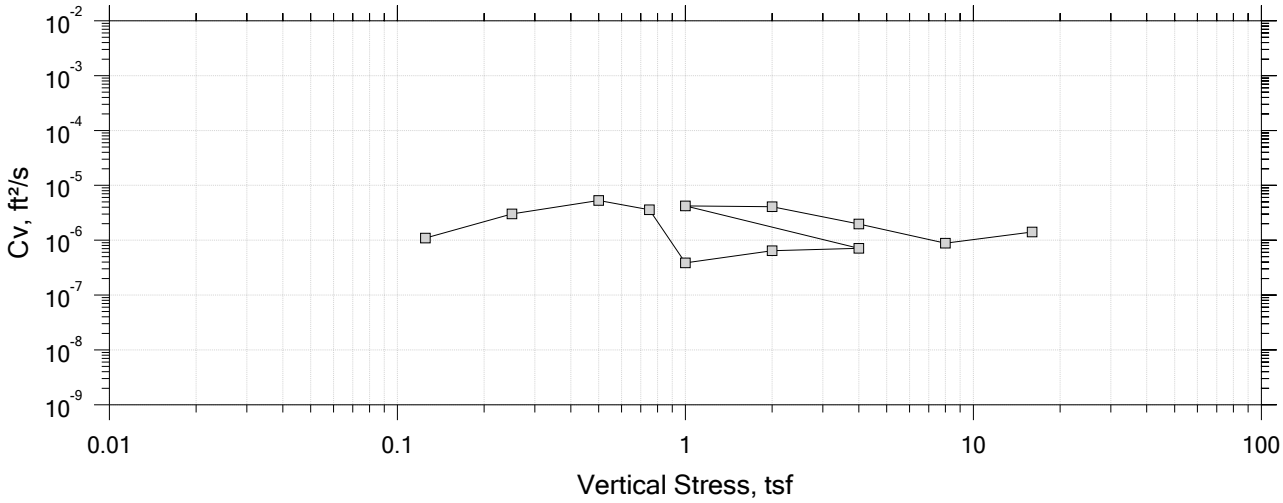
Step	Applied Stress tsf	Final Displacement in	Void Ratio	Strain at End %	Sq.Rt. T90 min	Cv ft²/s	Mv 1/tsf	k ft/day
1	0.0757	0.002511	1.06	0.251	1.909	1.28e-05	3.32e-02	1.15e-03
2	0.125	0.004201	1.05	0.420	35.909	6.79e-07	3.43e-02	6.27e-05
3	0.250	0.008047	1.05	0.805	6.734	3.60e-06	3.08e-02	2.99e-04
4	0.500	0.01337	1.04	1.34	15.607	1.54e-06	2.13e-02	8.83e-05
5	0.750	0.01714	1.03	1.71	5.154	4.62e-06	1.51e-02	1.88e-04
6	1.00	0.02334	1.01	2.33	239.910	9.82e-08	2.48e-02	6.57e-06
7	2.00	0.04221	0.976	4.22	135.325	1.70e-07	1.89e-02	8.63e-06
8	4.00	0.07954	0.899	7.95	19.863	1.09e-06	1.87e-02	5.48e-05
9	2.00	0.07602	0.906	7.60	3.639	5.73e-06	1.76e-03	2.72e-05
10	1.00	0.07177	0.915	7.18	9.047	2.33e-06	4.26e-03	2.67e-05
11	0.500	0.06539	0.928	6.54	11.631	1.83e-06	1.28e-02	6.30e-05
12	1.00	0.06899	0.921	6.90	6.508	3.28e-06	7.20e-03	6.37e-05
13	2.00	0.07471	0.909	7.47	8.453	2.50e-06	5.72e-03	3.86e-05
14	4.00	0.08783	0.882	8.78	22.981	9.01e-07	6.56e-03	1.59e-05
15	8.00	0.1320	0.791	13.2	13.536	1.44e-06	1.11e-02	4.28e-05
16	16.0	0.1821	0.687	18.2	10.813	1.61e-06	6.26e-03	2.72e-05
17	8.00	0.1788	0.694	17.9	3.130	5.26e-06	4.11e-04	5.84e-06
18	2.00	0.1661	0.720	16.6	7.649	2.20e-06	2.13e-03	1.26e-05
19	0.750	0.1536	0.746	15.4	25.326	6.84e-07	9.96e-03	1.84e-05
20	0.500	0.1483	0.757	14.8	59.117	2.99e-07	2.13e-02	1.72e-05
21	0.125	0.1311	0.793	13.1	79.324	2.29e-07	4.58e-02	2.83e-05
22	0.0625	0.1246	0.806	12.5	258.345	7.22e-08	1.04e-01	2.03e-05

GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-105	Tested By: md	Checked By: njh
	Sample No.: U1	Test Date: 09/24/18	Depth: 25-27 ft
	Test No.: IP-5	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System O, Swell Pressure = 0.0757 tsf		
	Displacement at End of Increment		

One-Dimensional Consolidation by ASTM D2435 - Method B

Summary Report





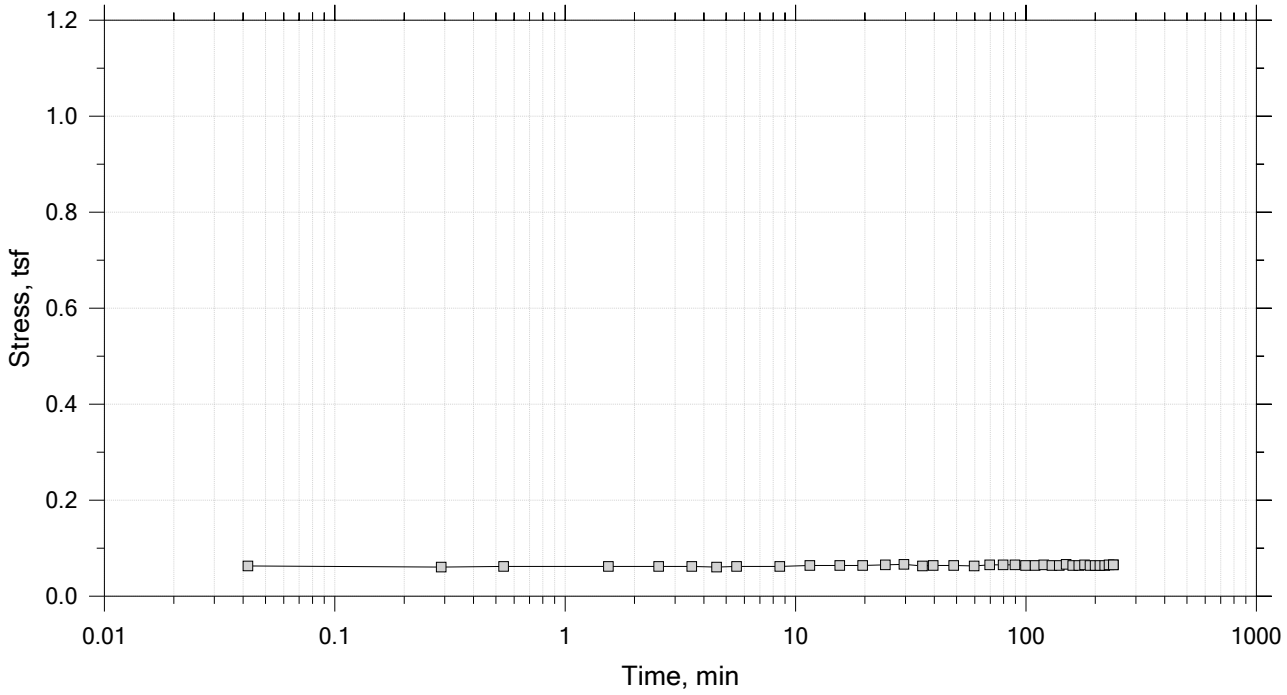
GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-201	Tested By: md	Checked By: njh
	Sample No.: U1	Test Date: 09/20/18	Depth: 25-27 ft
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, olive gray clay		
	Remarks: System S, Swell Pressure = 0.0652 tsf		
	Displacement at End of Increment		

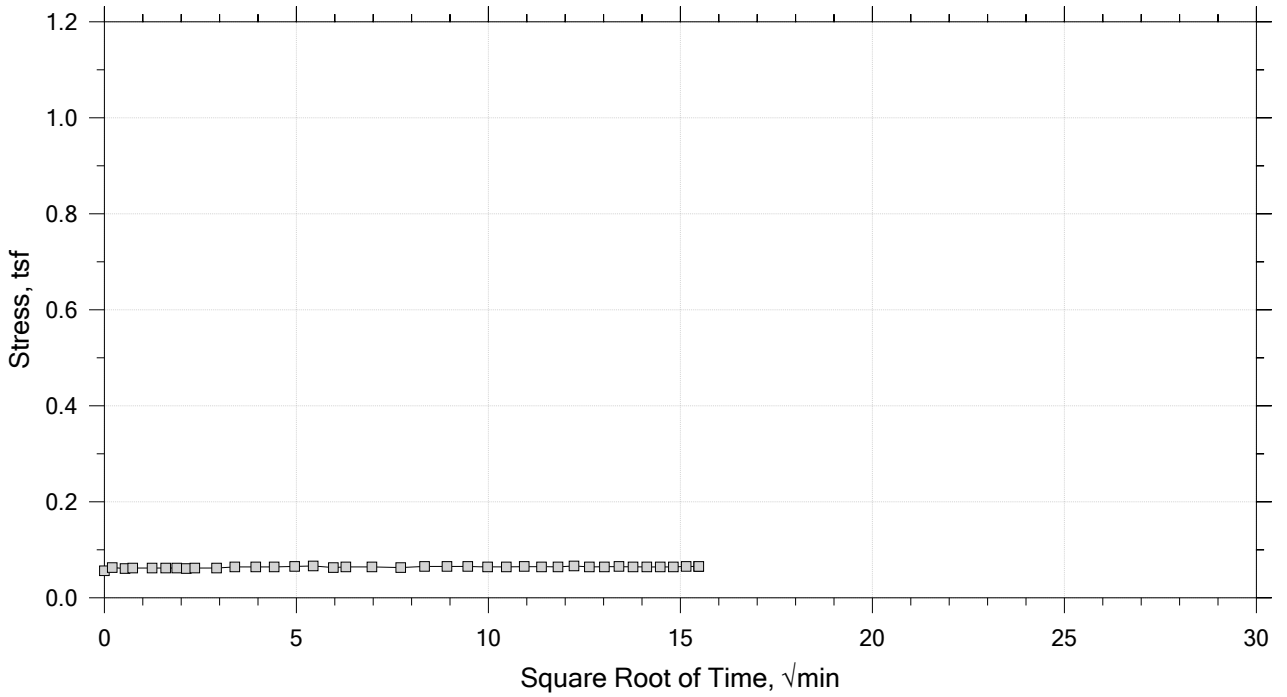
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 1 of 22

Constant Volume Step

Stress: 0.0652 tsf





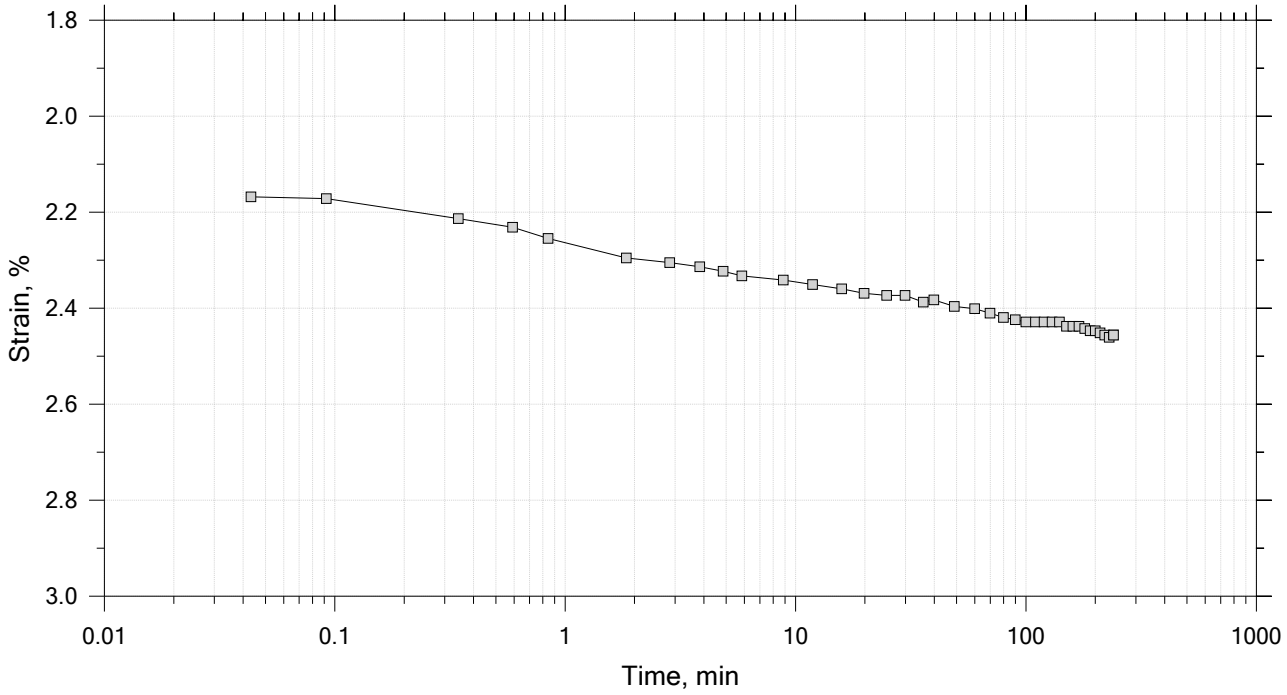
GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-201	Tested By: md	Checked By: njh
	Sample No.: U1	Test Date: 09/20/18	Depth: 25-27 ft
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, olive gray clay		
	Remarks: System S, Swell Pressure = 0.0652 tsf		

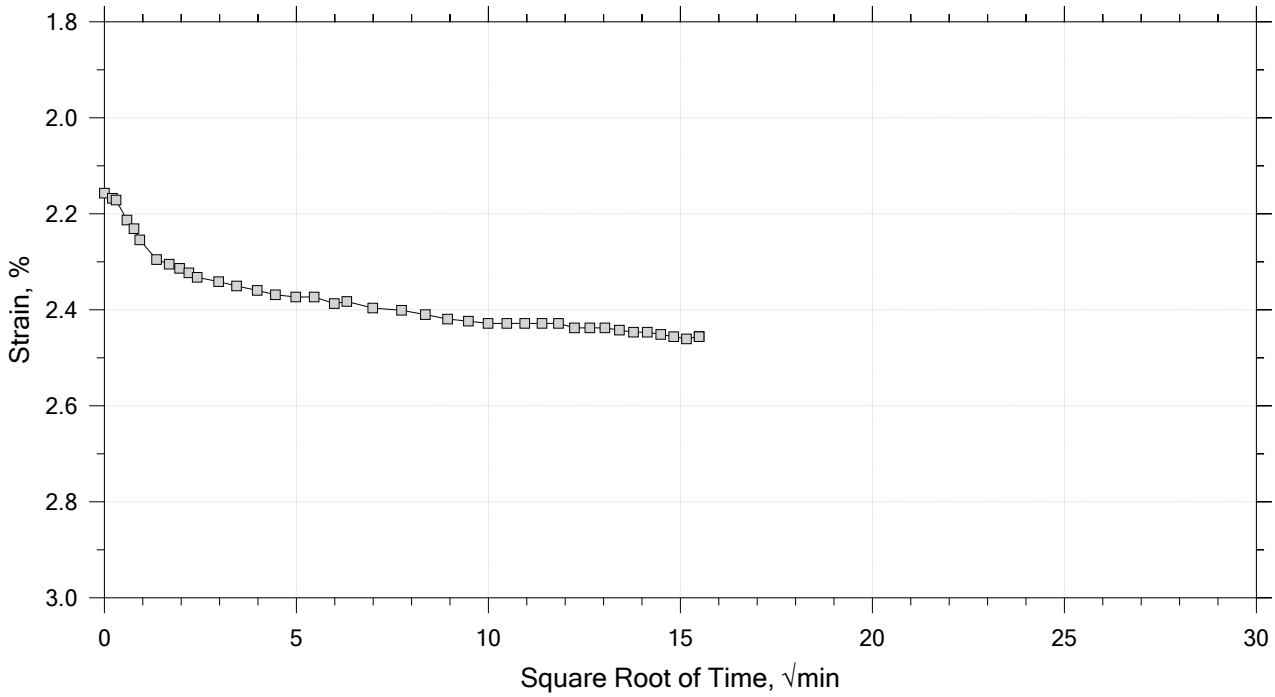
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 2 of 22

Constant Load Step

Stress: 0.125 tsf





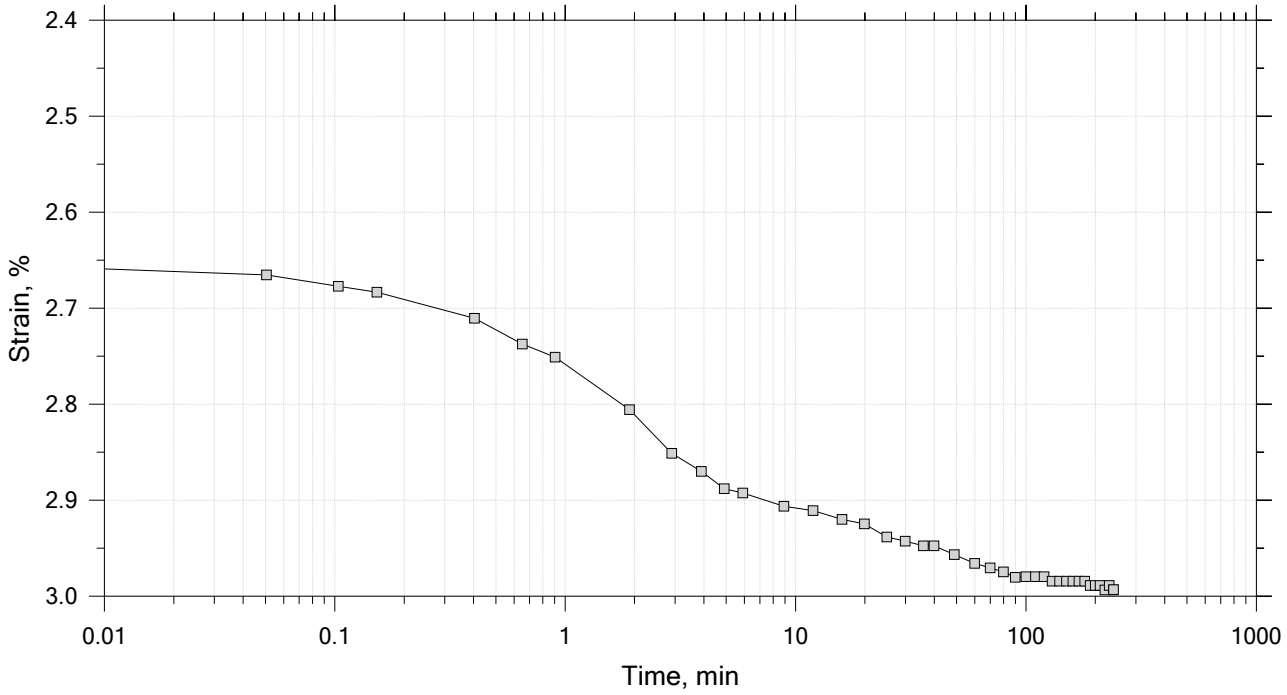
Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
Boring No.: BB-PVS-201	Tested By: md	Checked By: njh
Sample No.: U1	Test Date: 09/20/18	Depth: 25-27 ft
Test No.: IP-1	Sample Type: intact	Elevation: ---
Description: Moist, olive gray clay		
Remarks: System S, Swell Pressure = 0.0652 tsf		

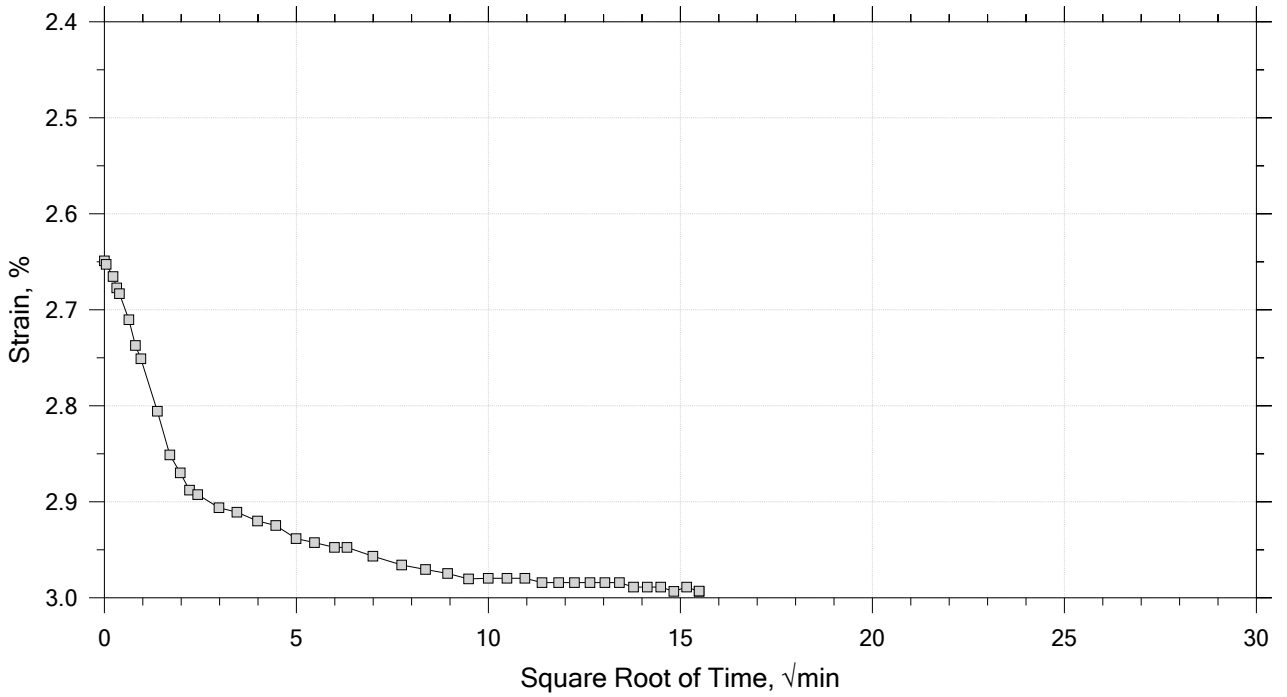
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 3 of 22

Constant Load Step

Stress: 0.25 tsf





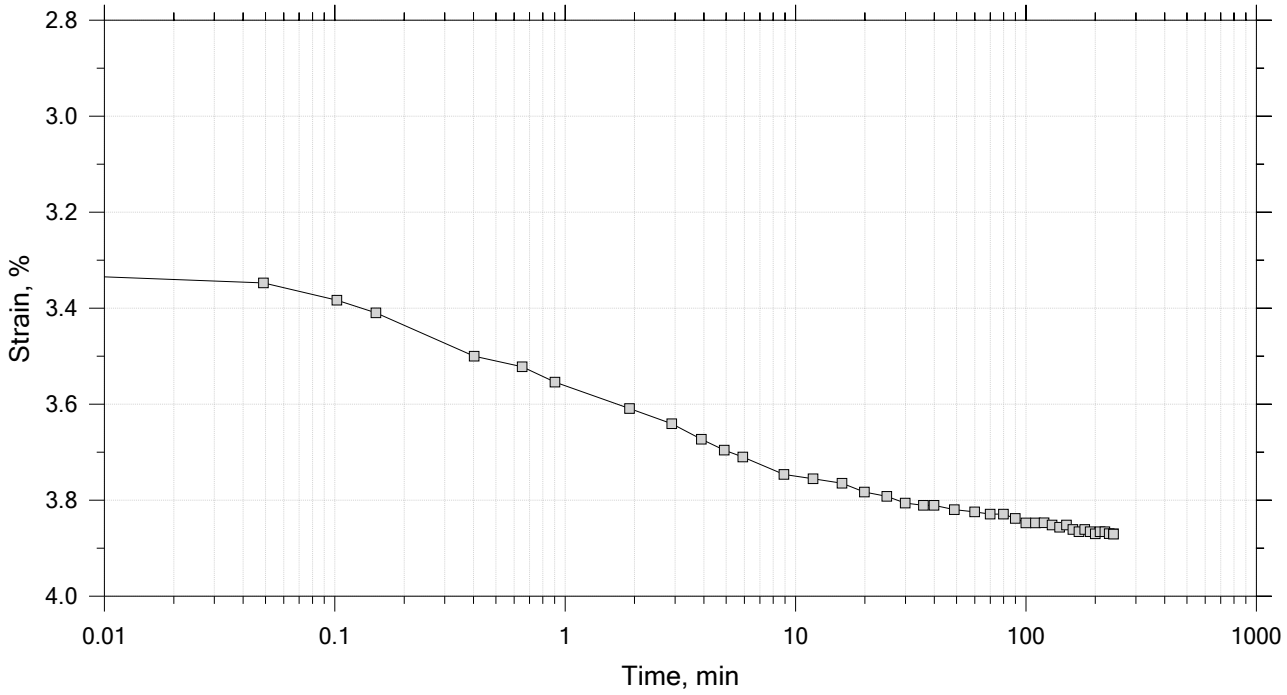
GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-201	Tested By: md	Checked By: njh
	Sample No.: U1	Test Date: 09/20/18	Depth: 25-27 ft
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, olive gray clay		
	Remarks: System S, Swell Pressure = 0.0652 tsf		

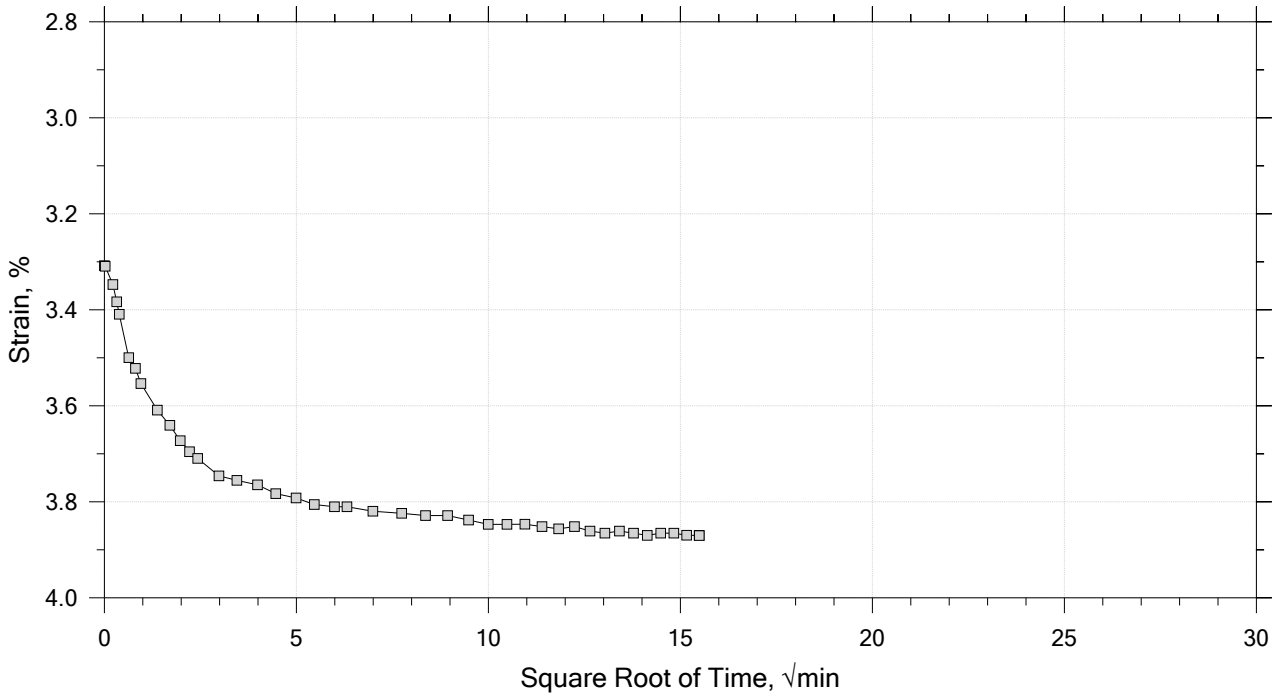
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 4 of 22

Constant Load Step

Stress: 0.5 tsf





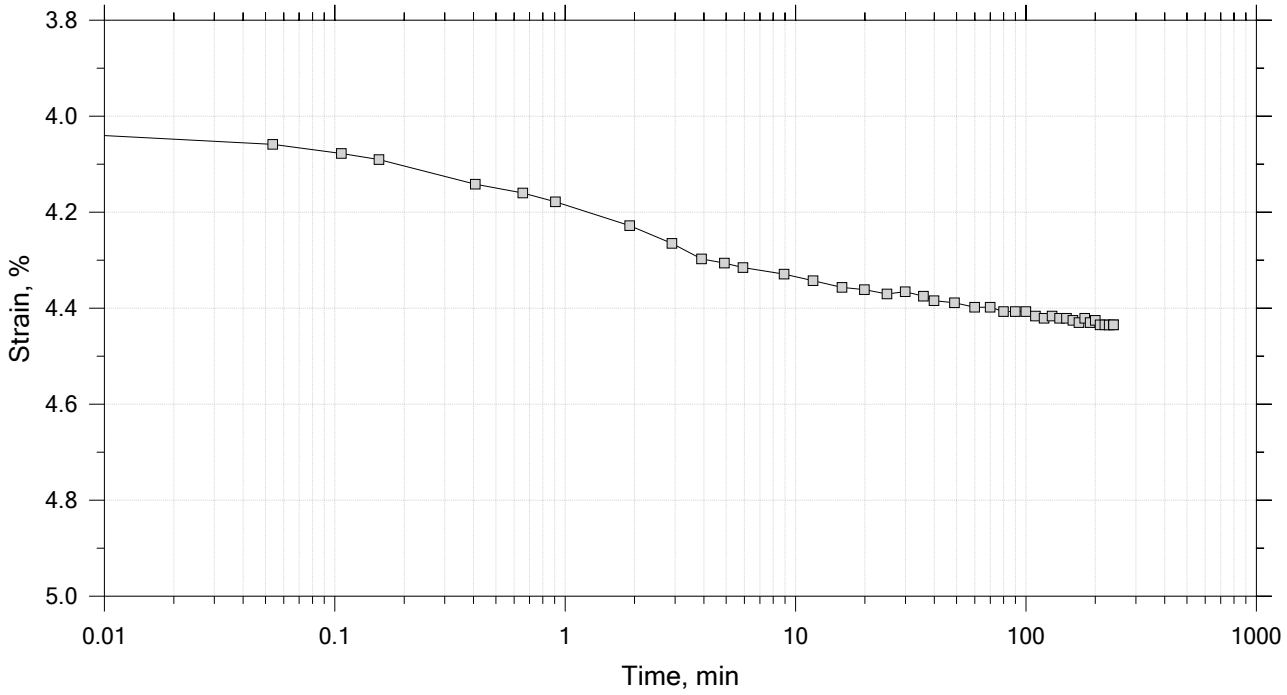
Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
Boring No.: BB-PVS-201	Tested By: md	Checked By: njh
Sample No.: U1	Test Date: 09/20/18	Depth: 25-27 ft
Test No.: IP-1	Sample Type: intact	Elevation: ---
Description: Moist, olive gray clay		
Remarks: System S, Swell Pressure = 0.0652 tsf		

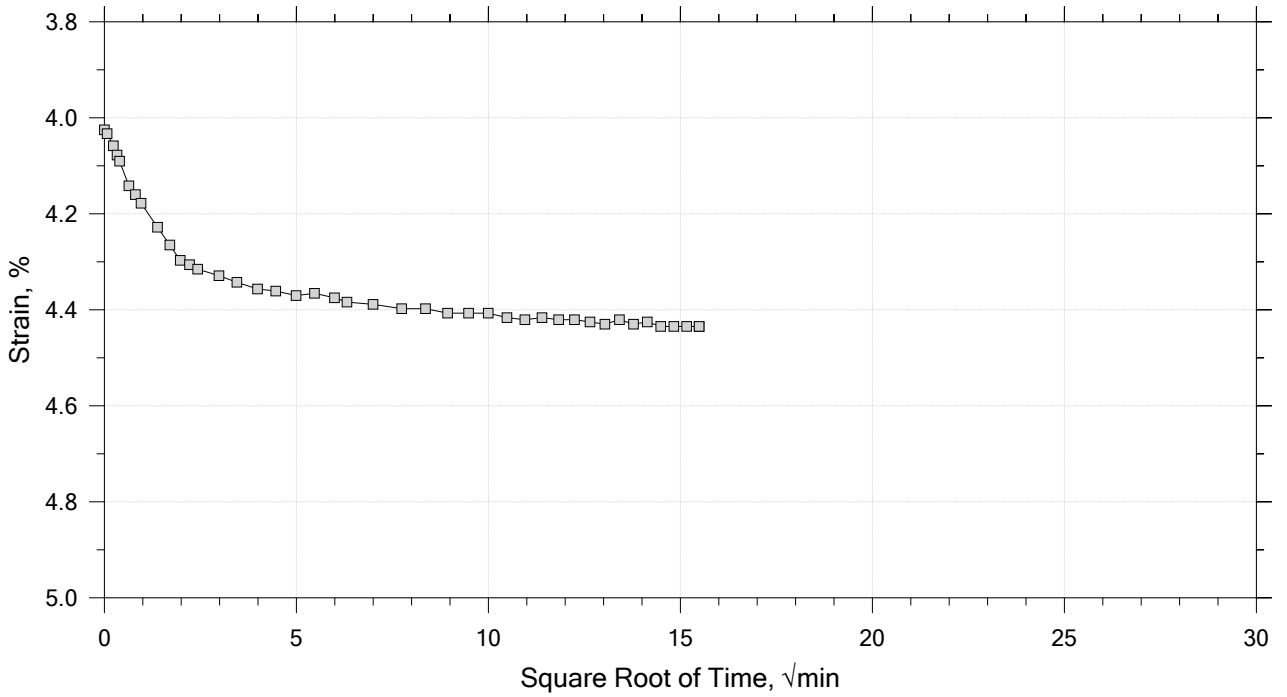
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 5 of 22

Constant Load Step

Stress: 0.75 tsf





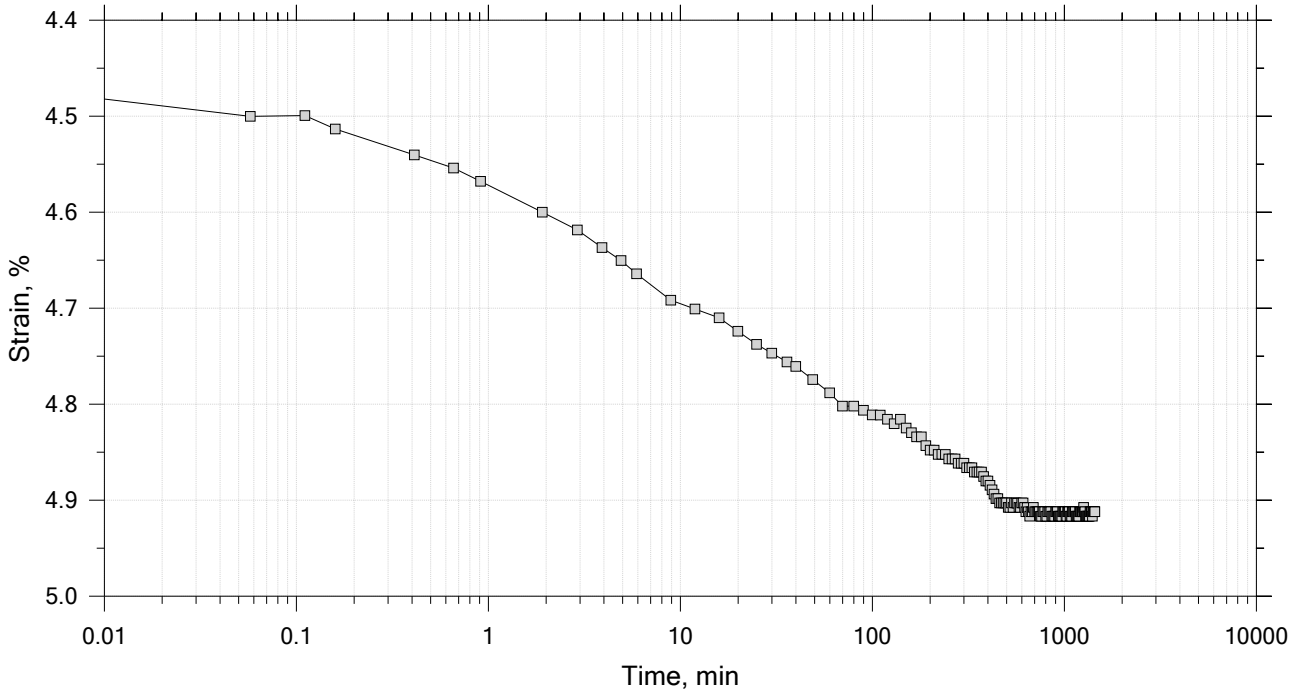
Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
Boring No.: BB-PVS-201	Tested By: md	Checked By: njh
Sample No.: U1	Test Date: 09/20/18	Depth: 25-27 ft
Test No.: IP-1	Sample Type: intact	Elevation: ---
Description: Moist, olive gray clay		
Remarks: System S, Swell Pressure = 0.0652 tsf		

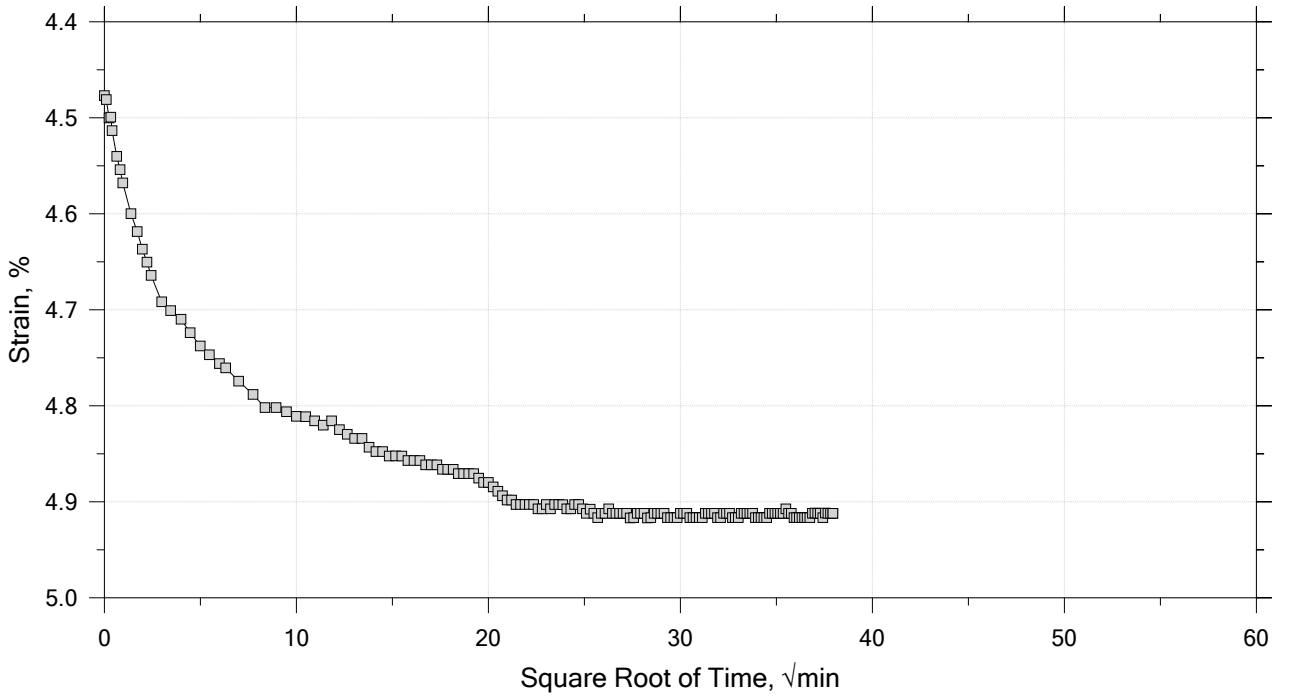
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 6 of 22

Constant Load Step

Stress: 1 tsf





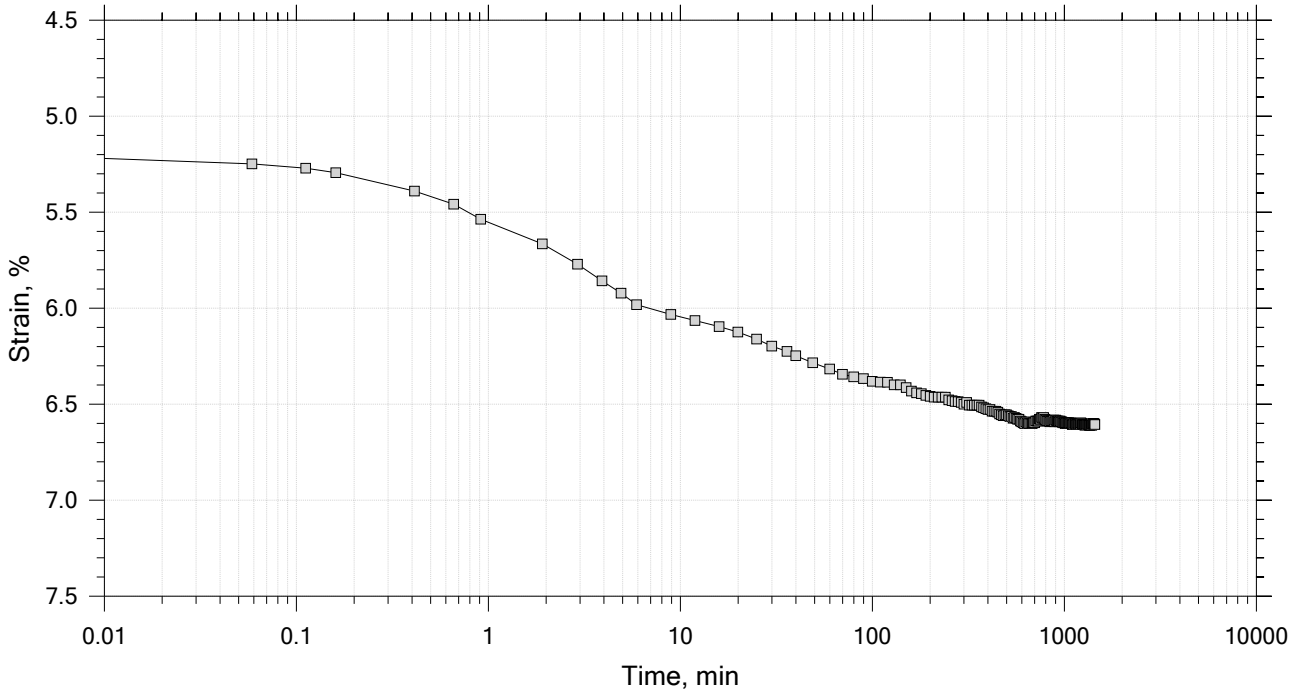
GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-201	Tested By: md	Checked By: njh
	Sample No.: U1	Test Date: 09/20/18	Depth: 25-27 ft
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, olive gray clay		
	Remarks: System S, Swell Pressure = 0.0652 tsf		

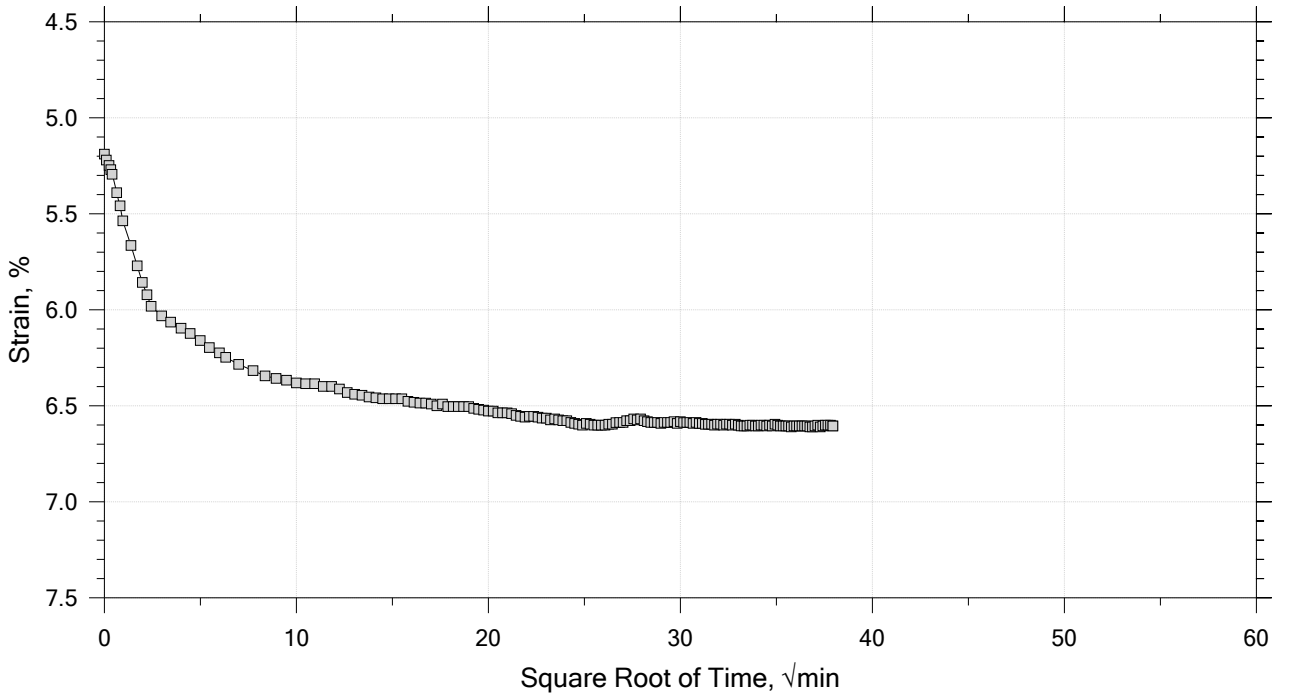
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 7 of 22

Constant Load Step

Stress: 2 tsf





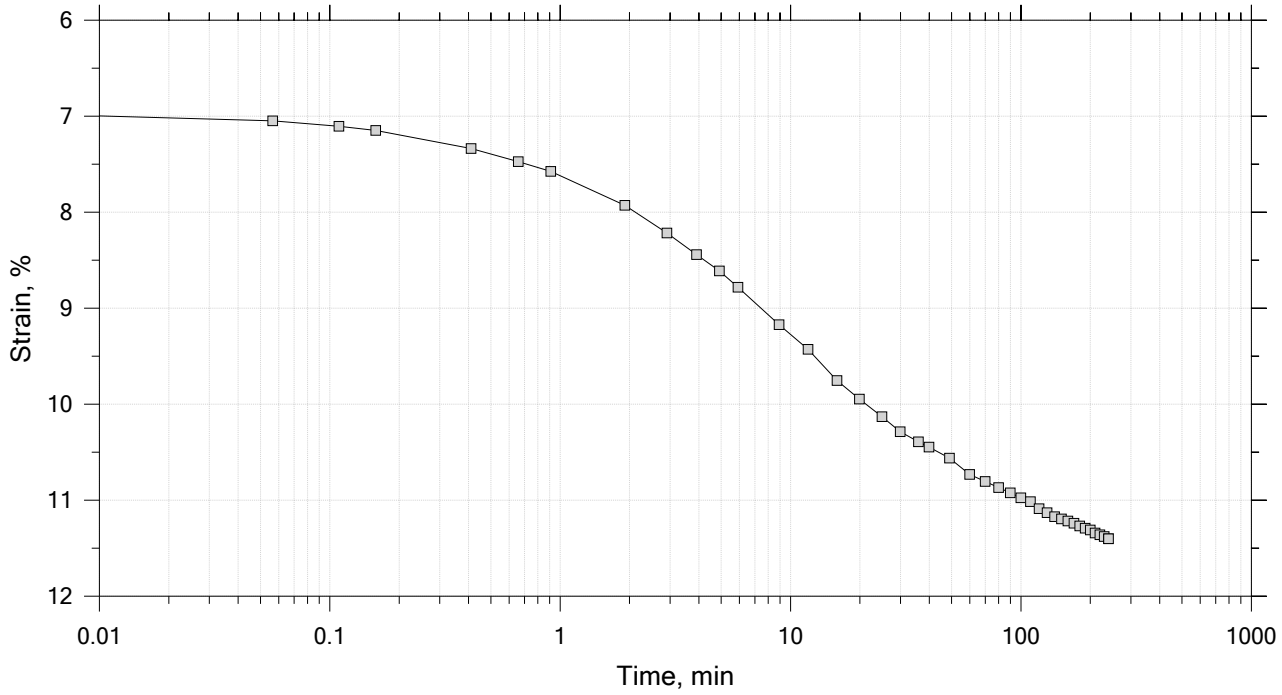
Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
Boring No.: BB-PVS-201	Tested By: md	Checked By: njh
Sample No.: U1	Test Date: 09/20/18	Depth: 25-27 ft
Test No.: IP-1	Sample Type: intact	Elevation: ---
Description: Moist, olive gray clay		
Remarks: System S, Swell Pressure = 0.0652 tsf		

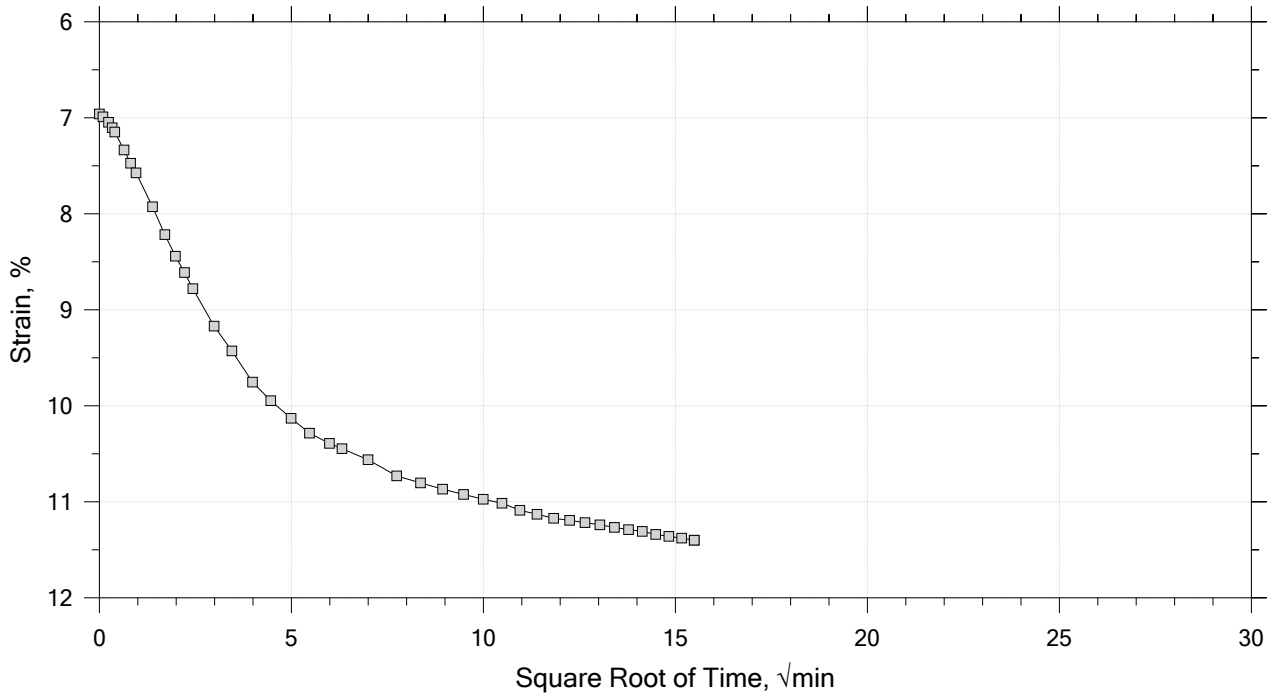
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 8 of 22

Constant Load Step

Stress: 4 tsf





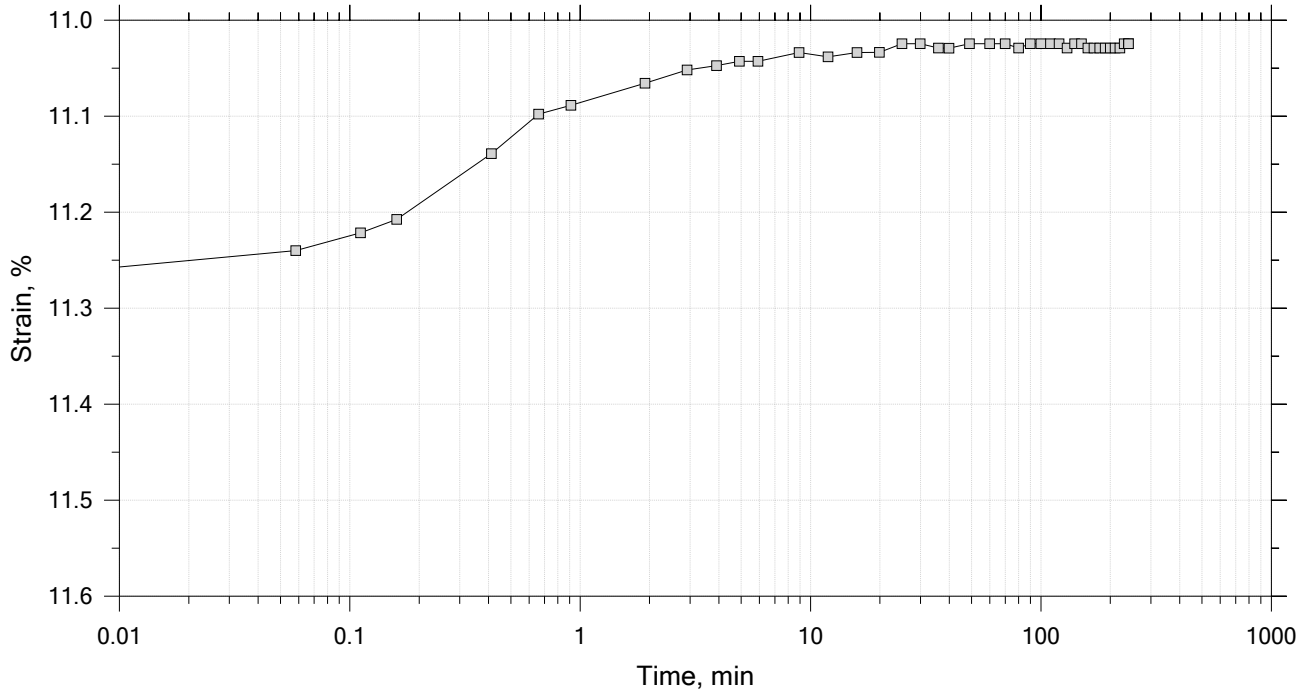
GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-201	Tested By: md	Checked By: njh
	Sample No.: U1	Test Date: 09/20/18	Depth: 25-27 ft
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, olive gray clay		
	Remarks: System S, Swell Pressure = 0.0652 tsf		

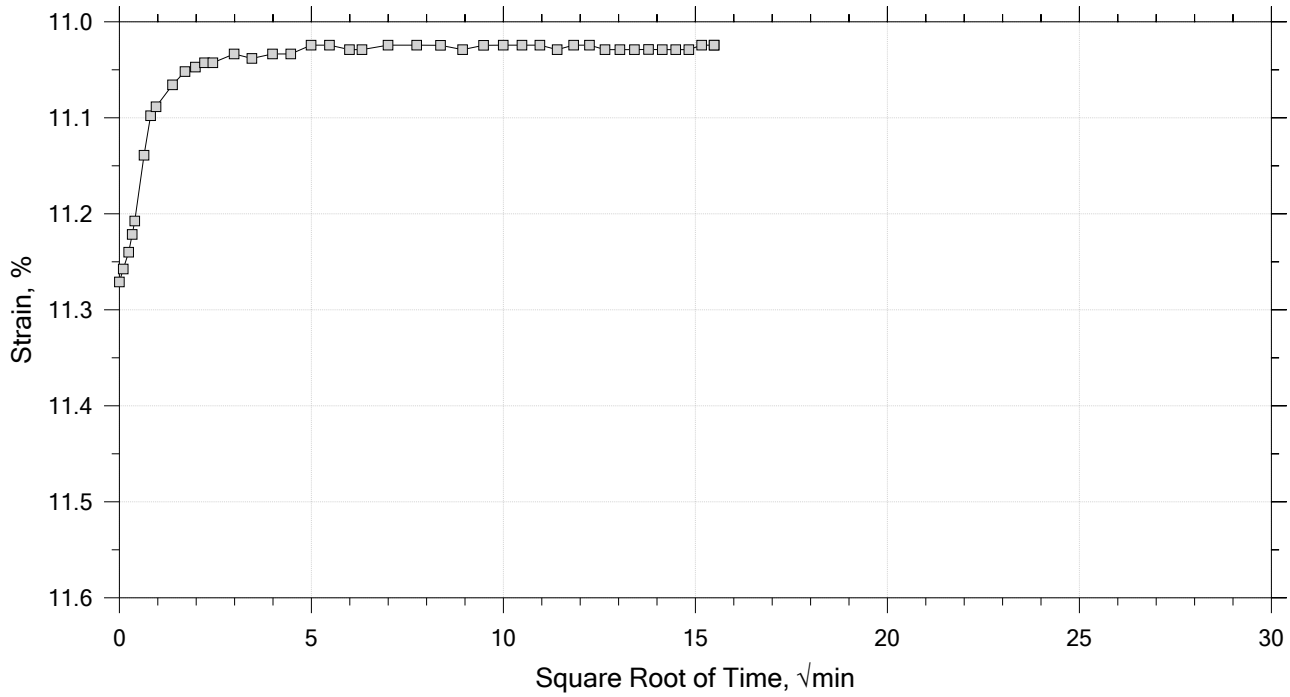
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 9 of 22

Constant Load Step

Stress: 2 tsf

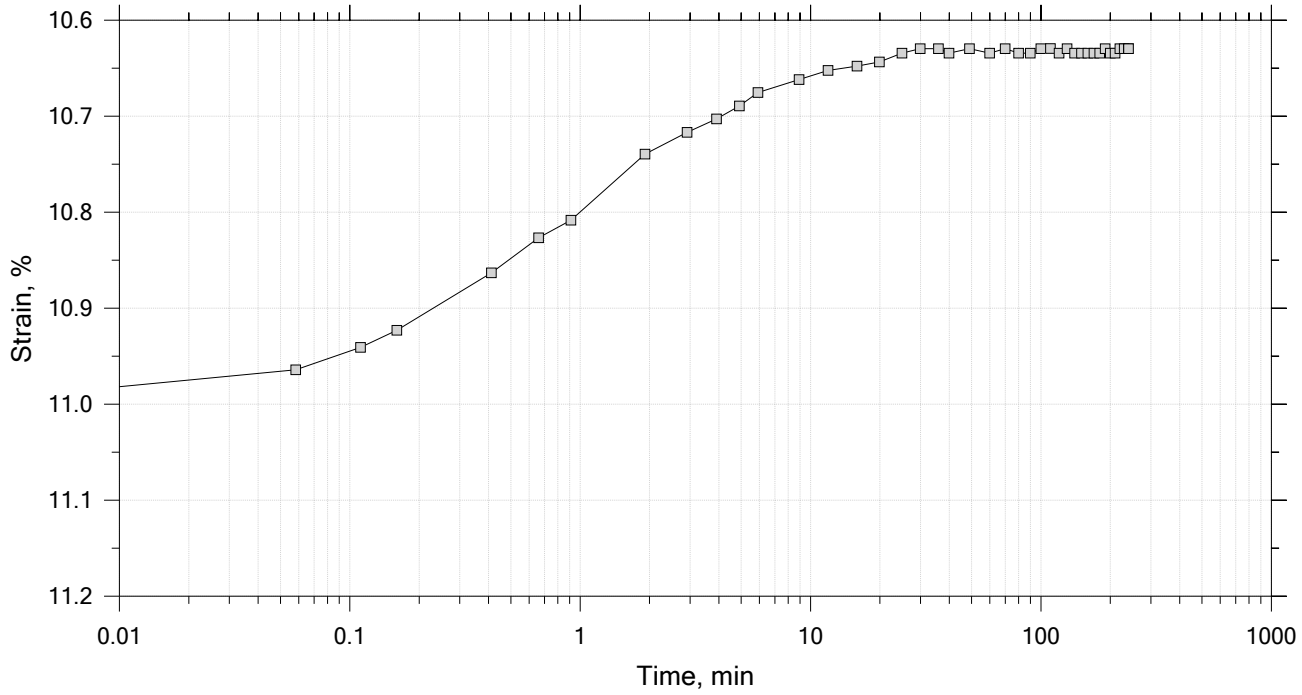


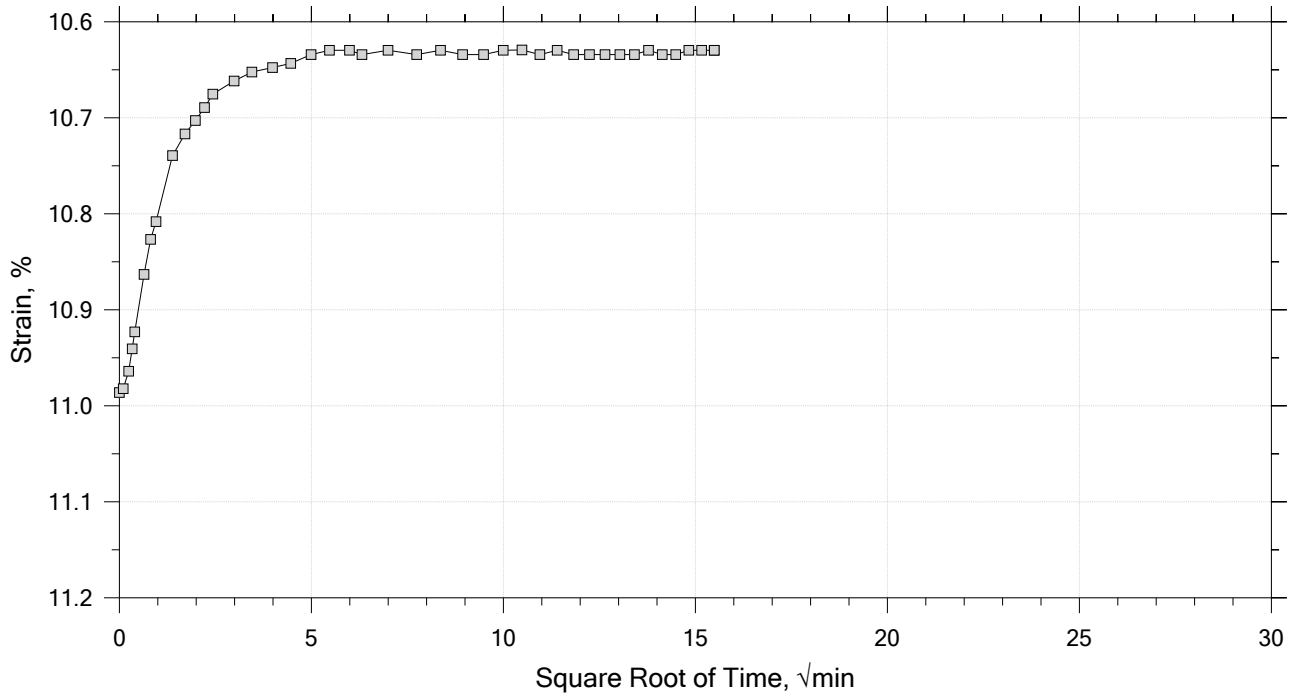


GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-201	Tested By: md	Checked By: njh
	Sample No.: U1	Test Date: 09/20/18	Depth: 25-27 ft
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, olive gray clay		
	Remarks: System S, Swell Pressure = 0.0652 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 10 of 22
Constant Load Step
Stress: 1 tsf

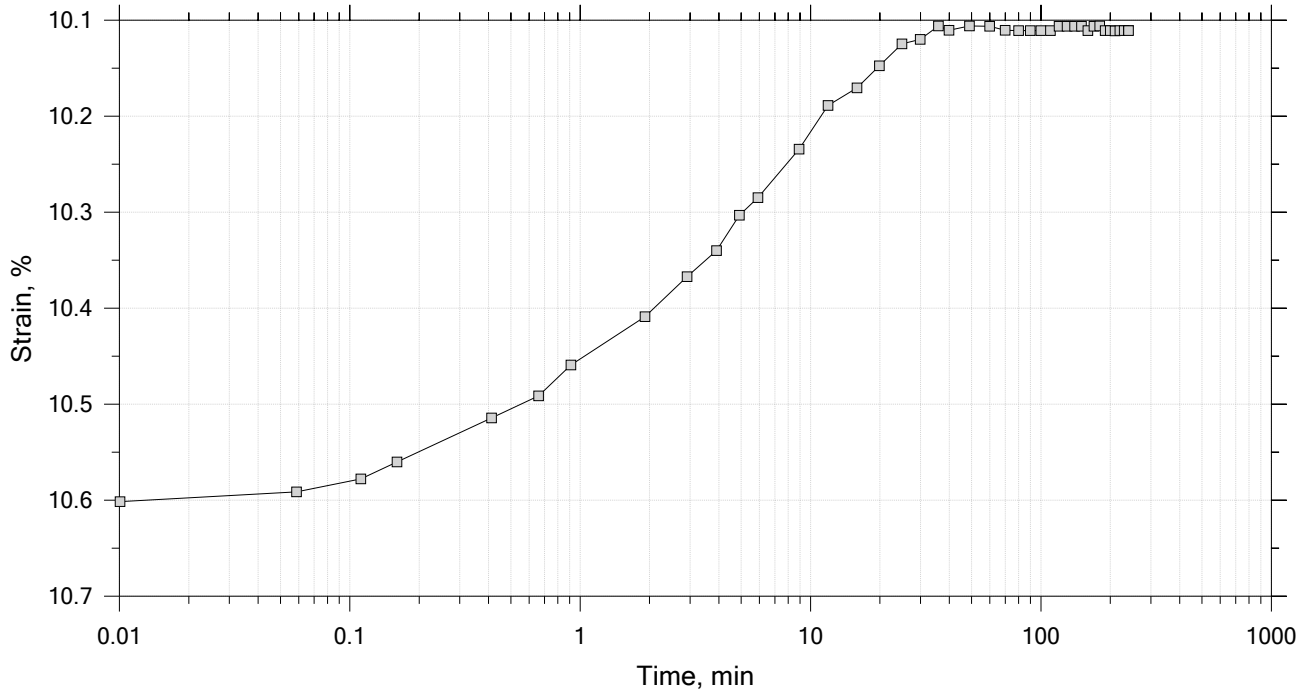


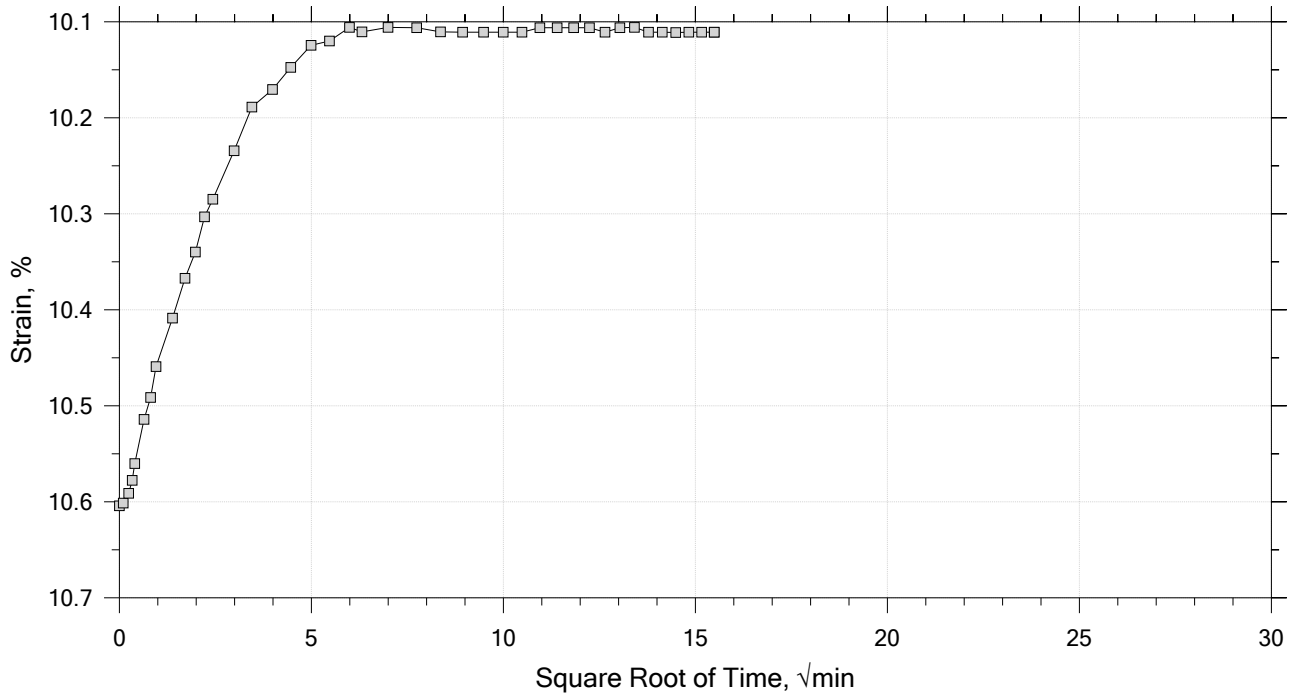


GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-201	Tested By: md	Checked By: njh
	Sample No.: U1	Test Date: 09/20/18	Depth: 25-27 ft
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, olive gray clay		
	Remarks: System S, Swell Pressure = 0.0652 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 11 of 22
Constant Load Step
Stress: 0.5 tsf





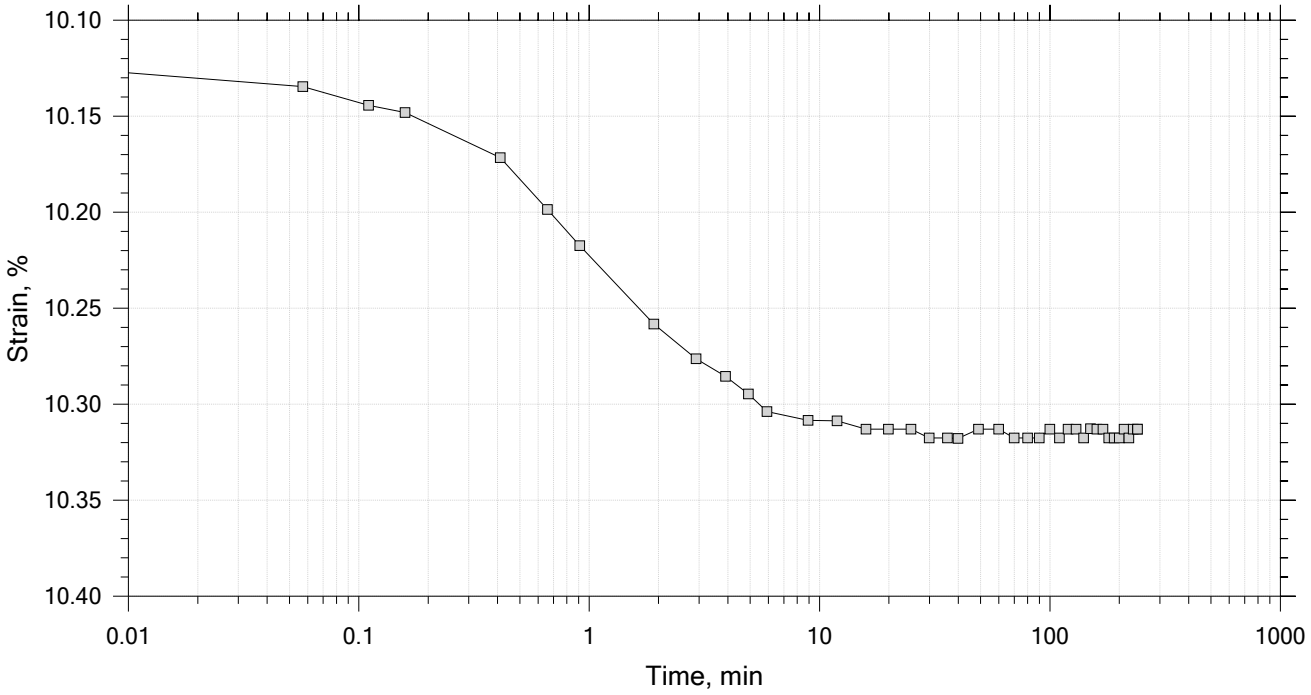
Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
Boring No.: BB-PVS-201	Tested By: md	Checked By: njh
Sample No.: U1	Test Date: 09/20/18	Depth: 25-27 ft
Test No.: IP-1	Sample Type: intact	Elevation: ---
Description: Moist, olive gray clay		
Remarks: System S, Swell Pressure = 0.0652 tsf		

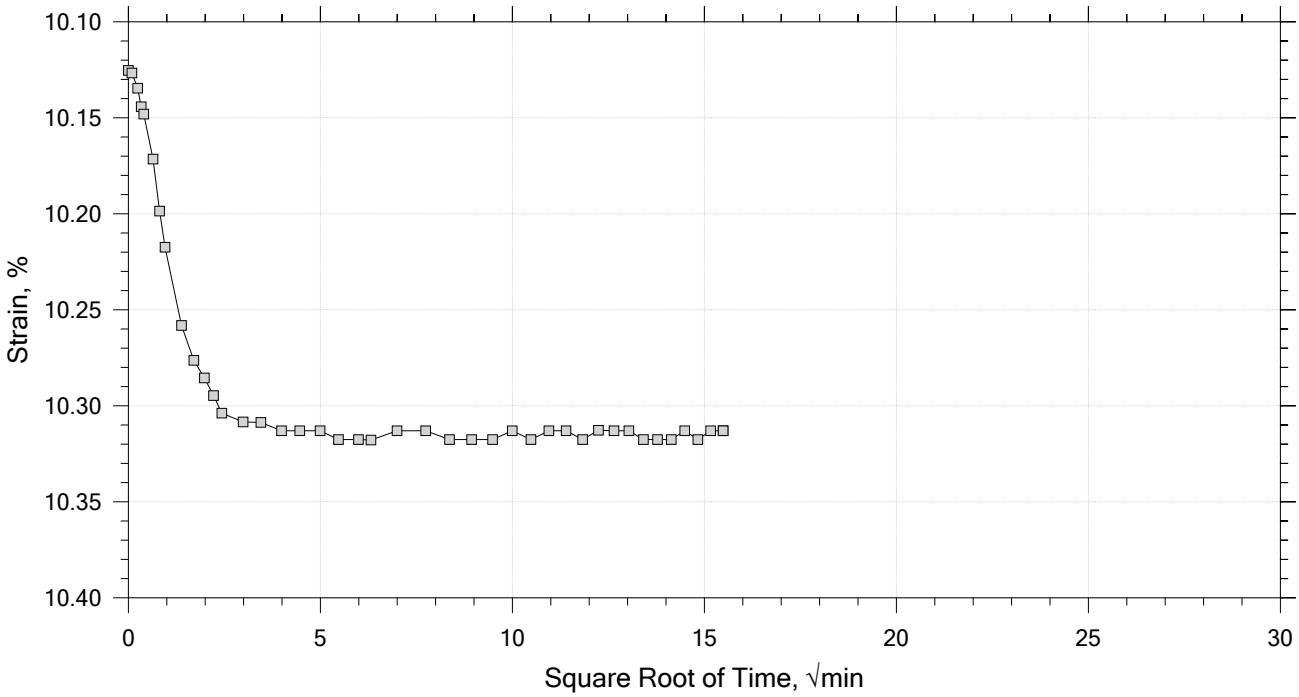
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 12 of 22

Constant Load Step

Stress: 1 tsf

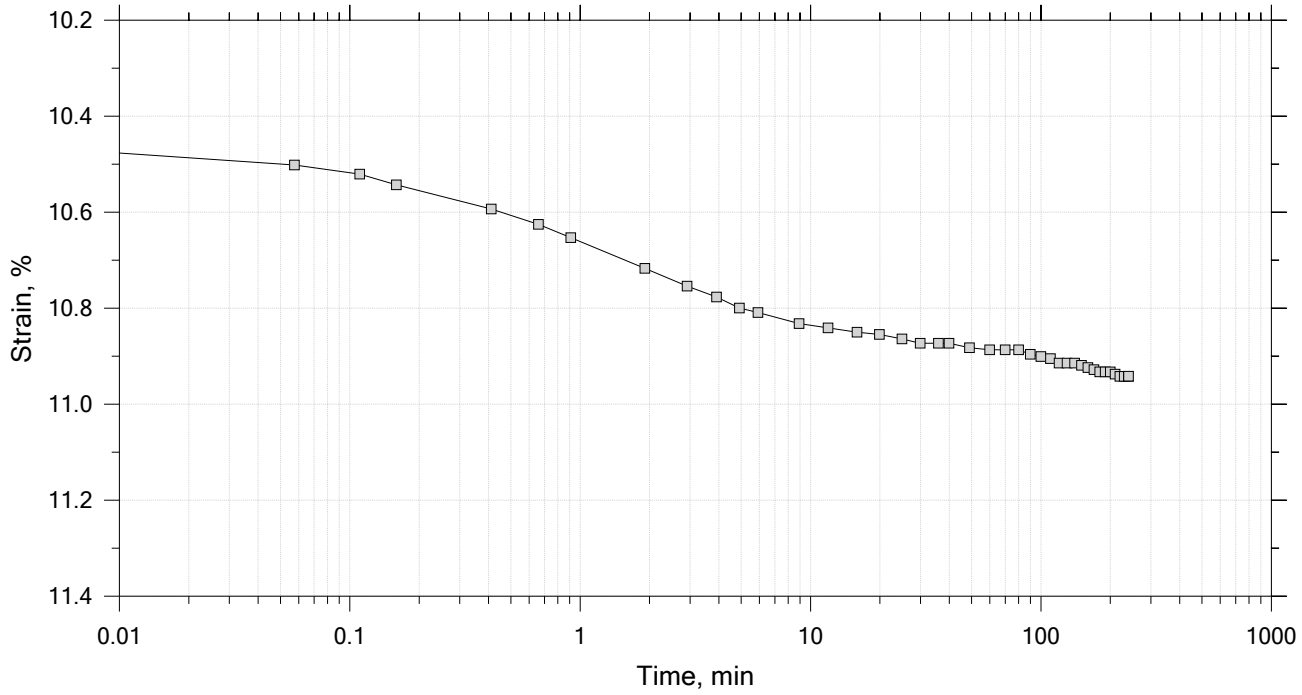


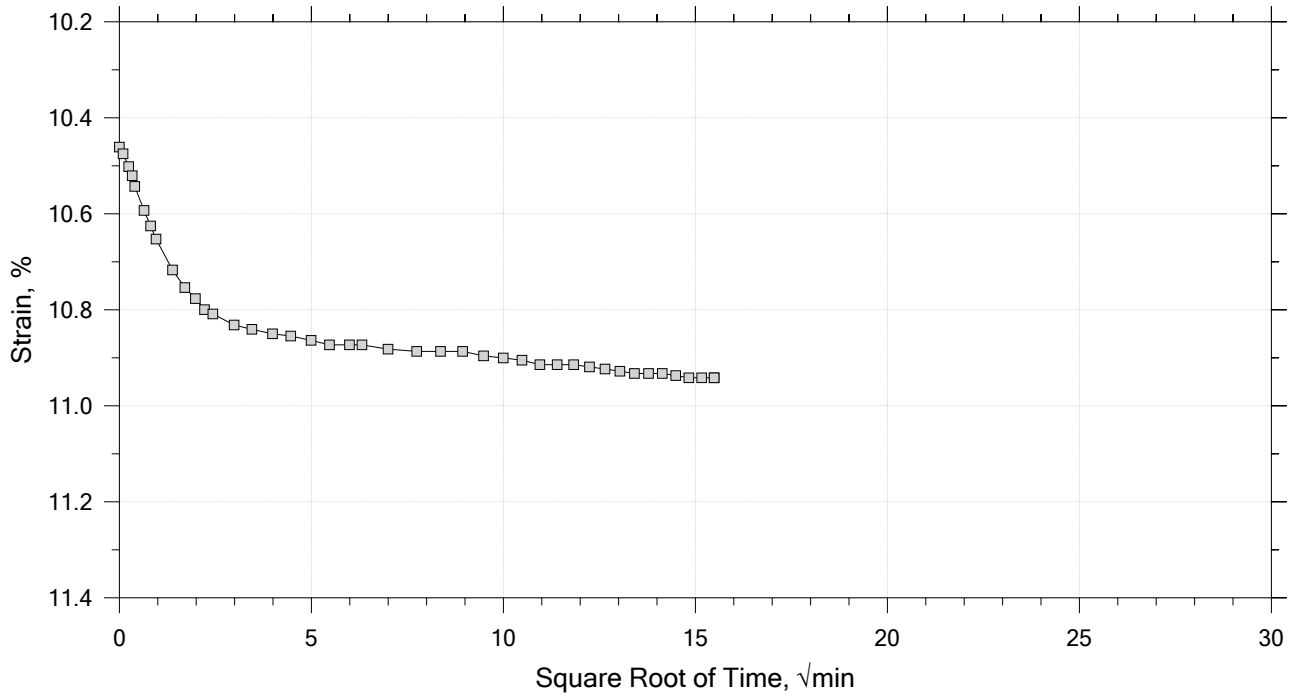


GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-201	Tested By: md	Checked By: njh
	Sample No.: U1	Test Date: 09/20/18	Depth: 25-27 ft
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, olive gray clay		
	Remarks: System S, Swell Pressure = 0.0652 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 13 of 22
Constant Load Step
Stress: 2 tsf

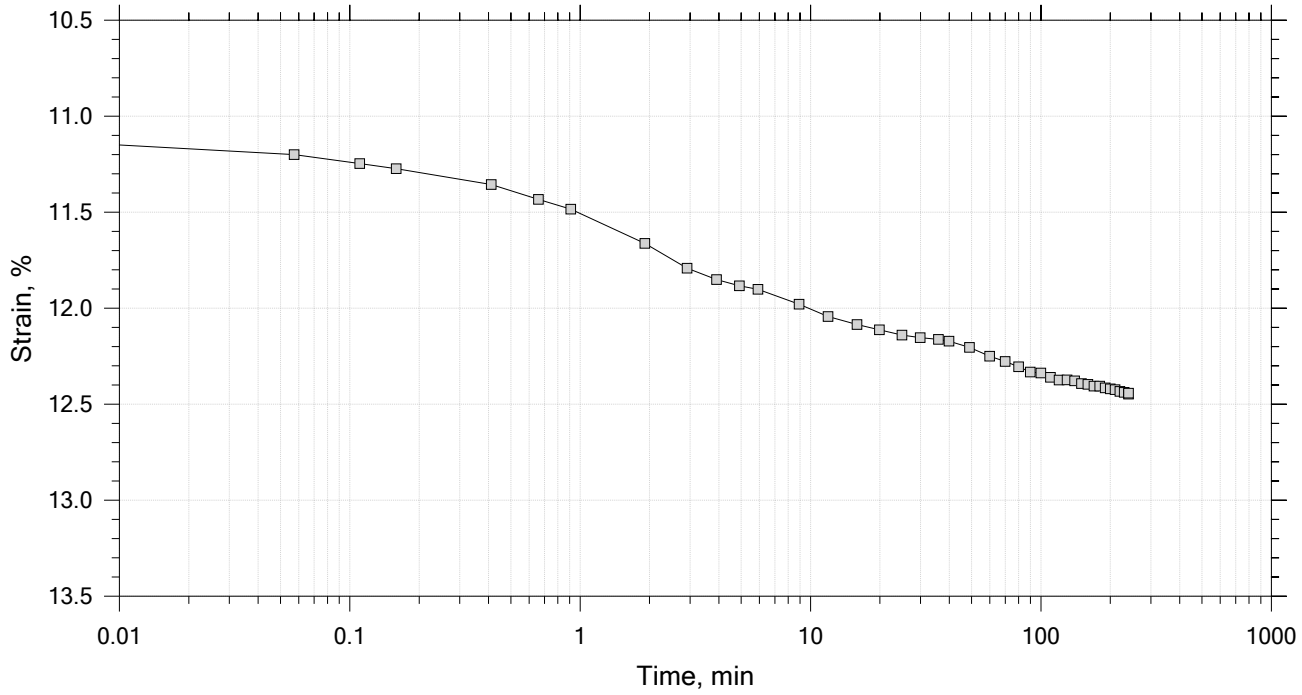


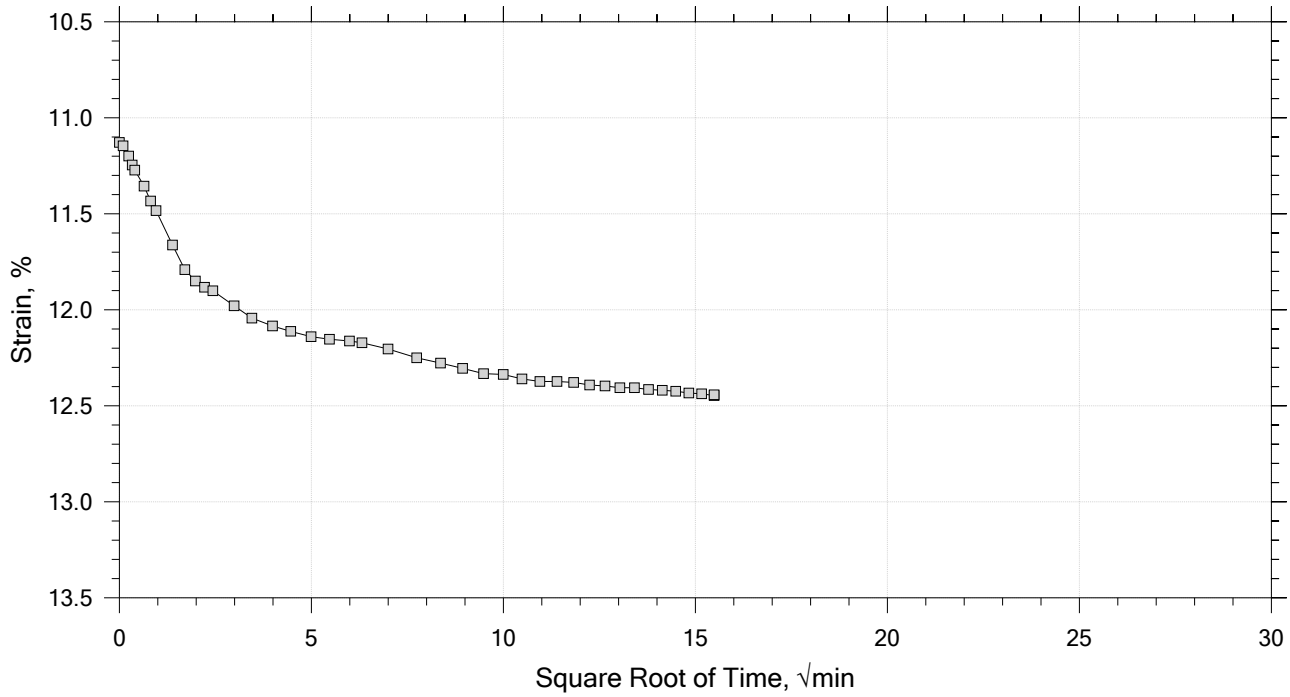


GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-201	Tested By: md	Checked By: njh
	Sample No.: U1	Test Date: 09/20/18	Depth: 25-27 ft
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, olive gray clay		
	Remarks: System S, Swell Pressure = 0.0652 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 14 of 22
Constant Load Step
Stress: 4 tsf

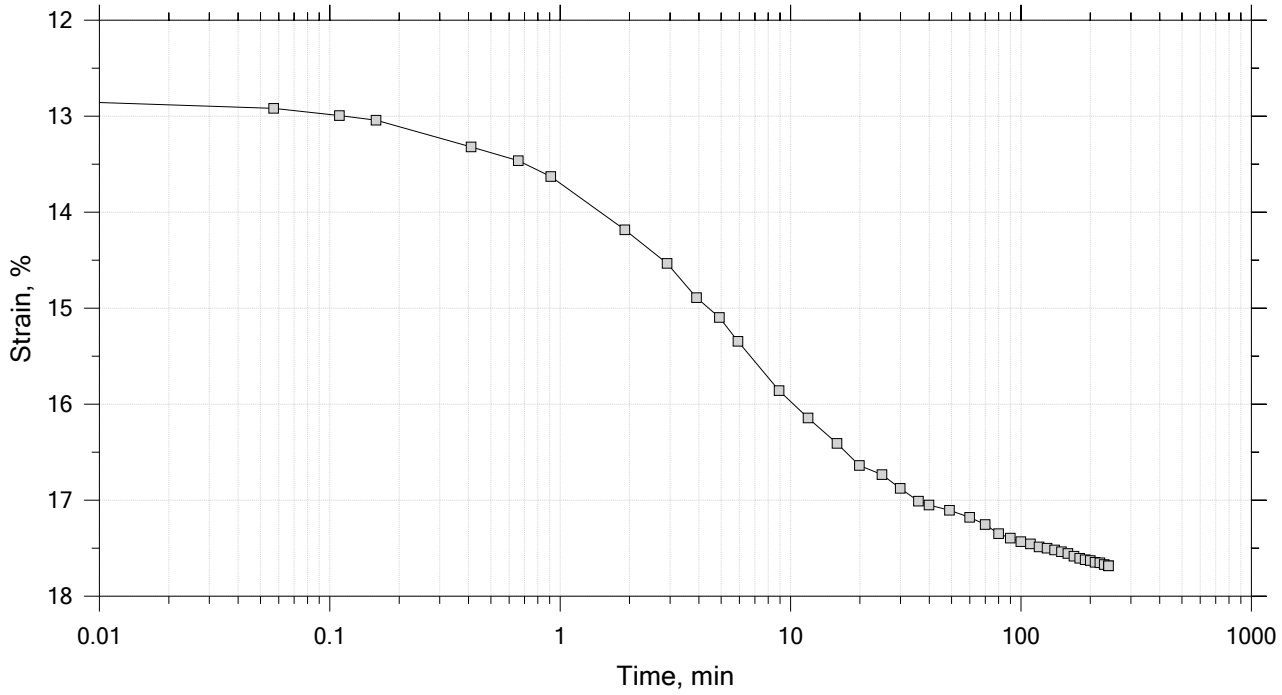


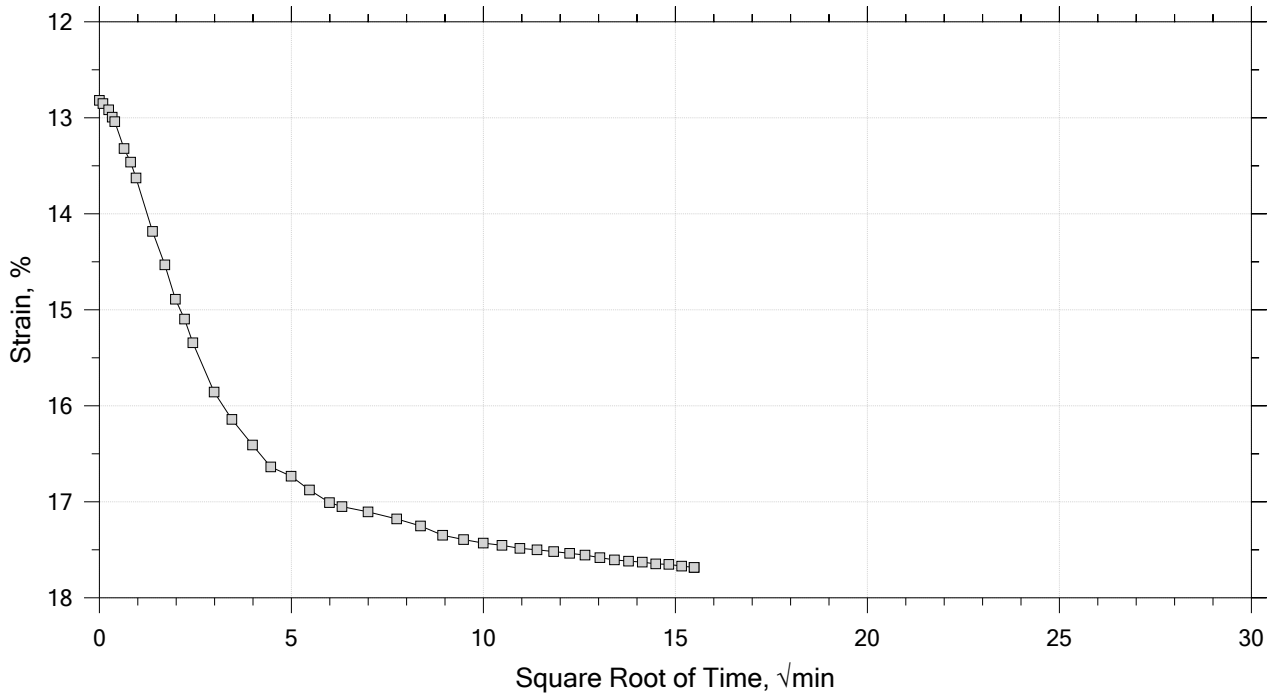


GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-201	Tested By: md	Checked By: njh
	Sample No.: U1	Test Date: 09/20/18	Depth: 25-27 ft
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, olive gray clay		
	Remarks: System S, Swell Pressure = 0.0652 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 15 of 22
Constant Load Step
Stress: 8 tsf

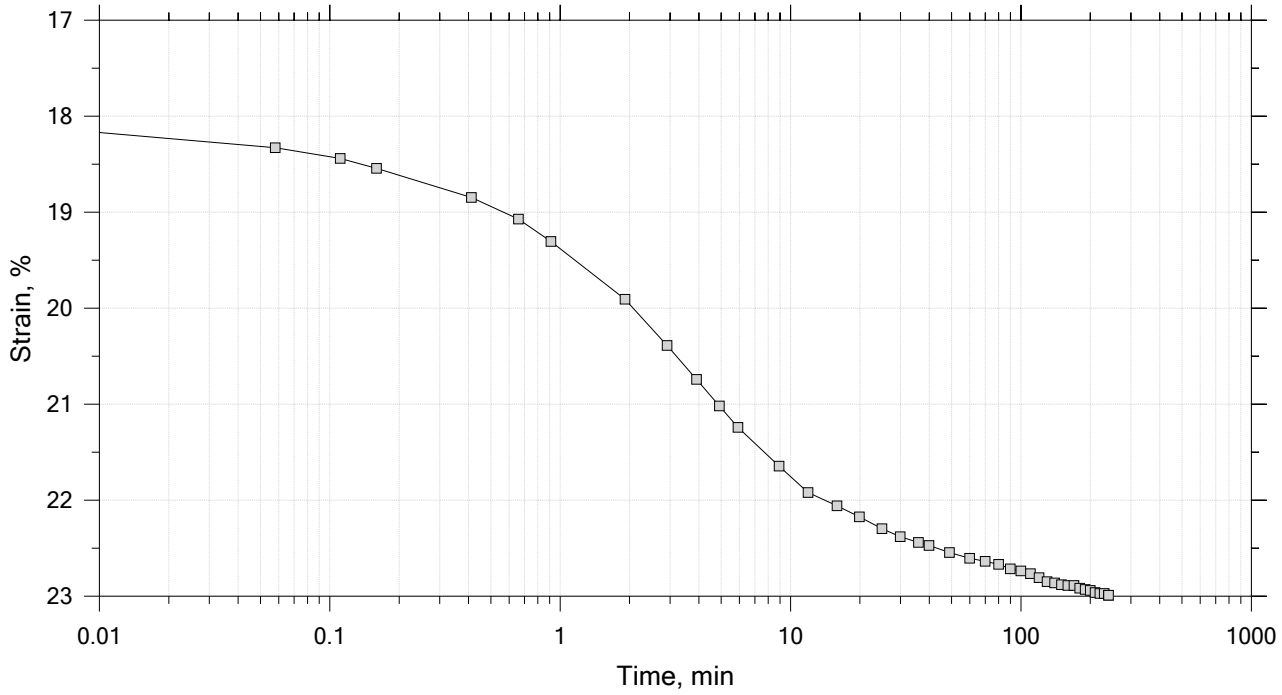


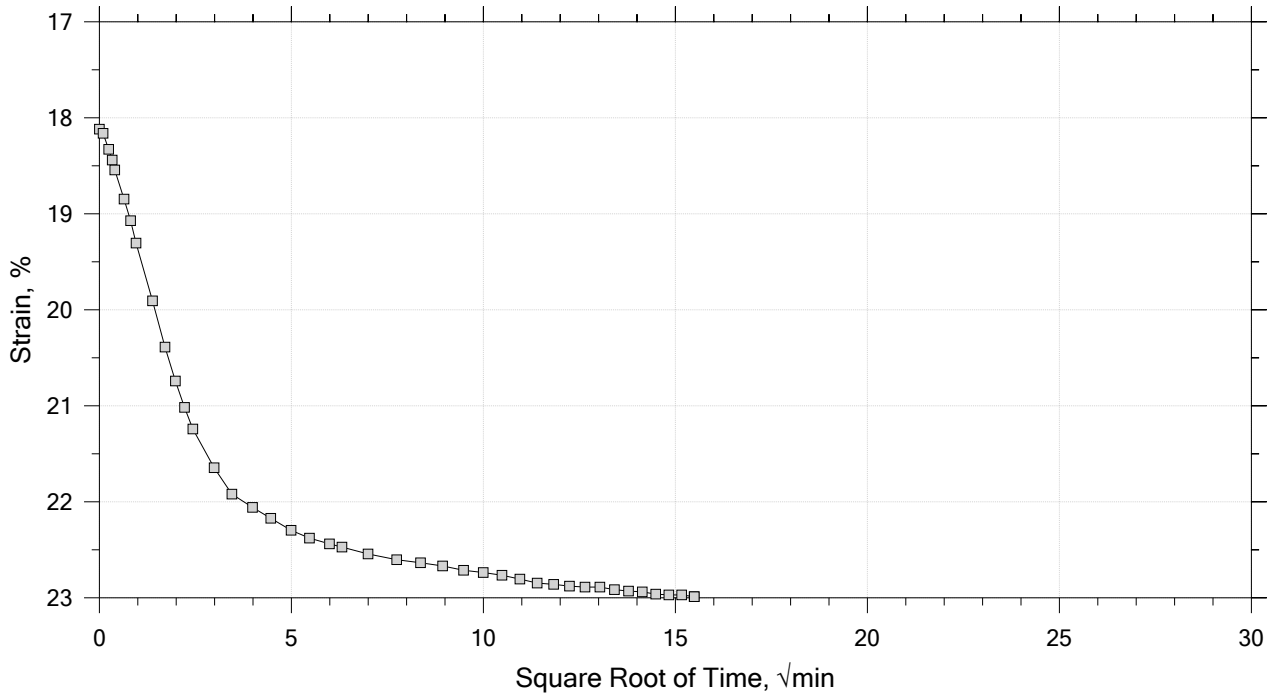


GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-201	Tested By: md	Checked By: njh
	Sample No.: U1	Test Date: 09/20/18	Depth: 25-27 ft
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, olive gray clay		
	Remarks: System S, Swell Pressure = 0.0652 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 16 of 22
Constant Load Step
Stress: 16 tsf





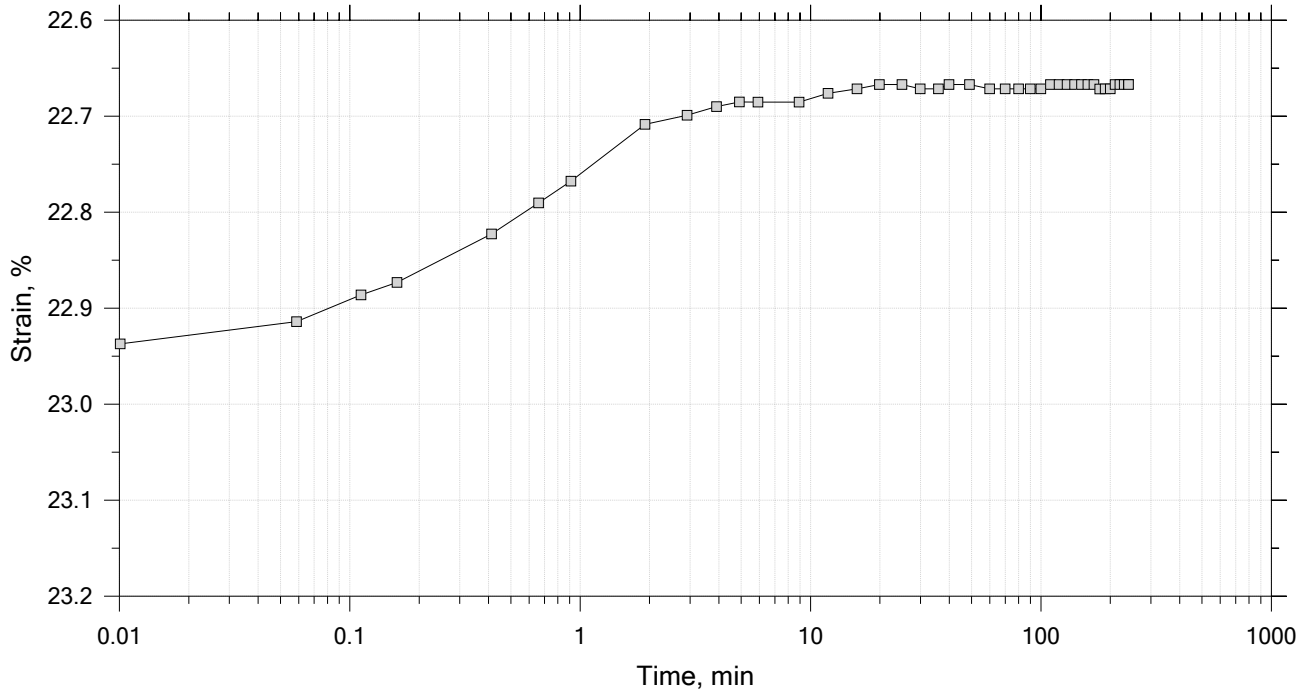
GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-201	Tested By: md	Checked By: njh
	Sample No.: U1	Test Date: 09/20/18	Depth: 25-27 ft
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, olive gray clay		
	Remarks: System S, Swell Pressure = 0.0652 tsf		

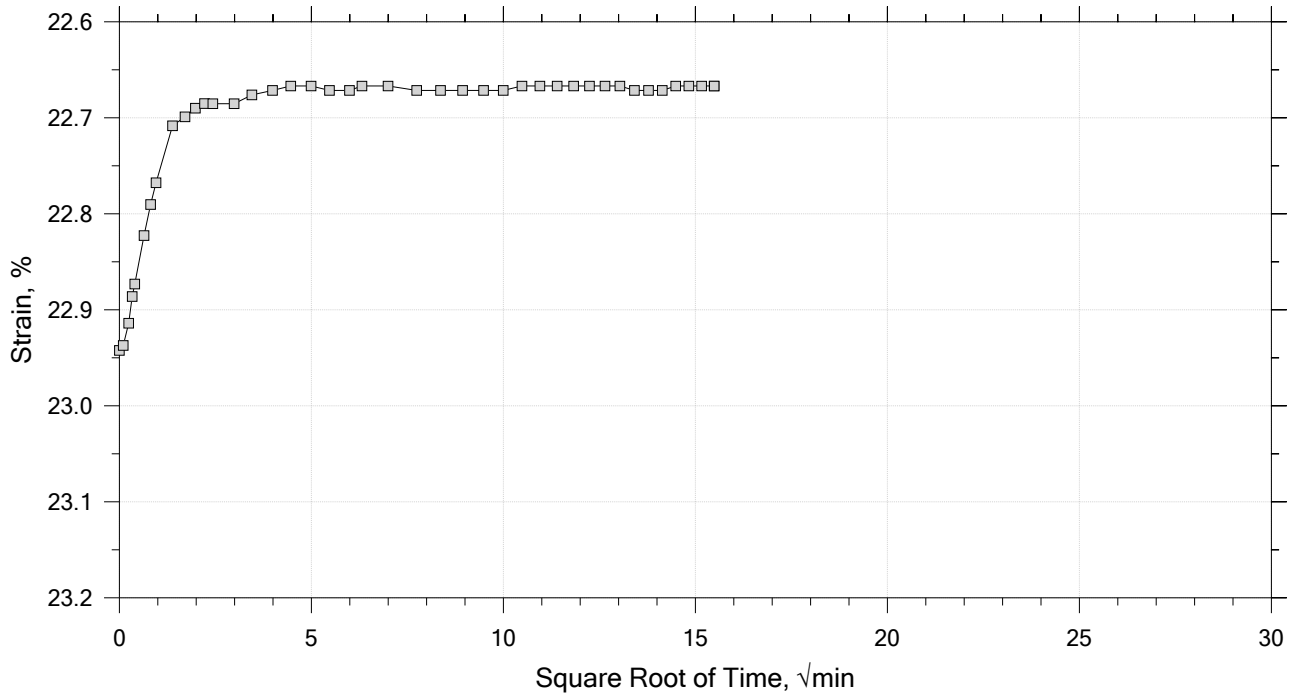
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 17 of 22

Constant Load Step

Stress: 8 tsf

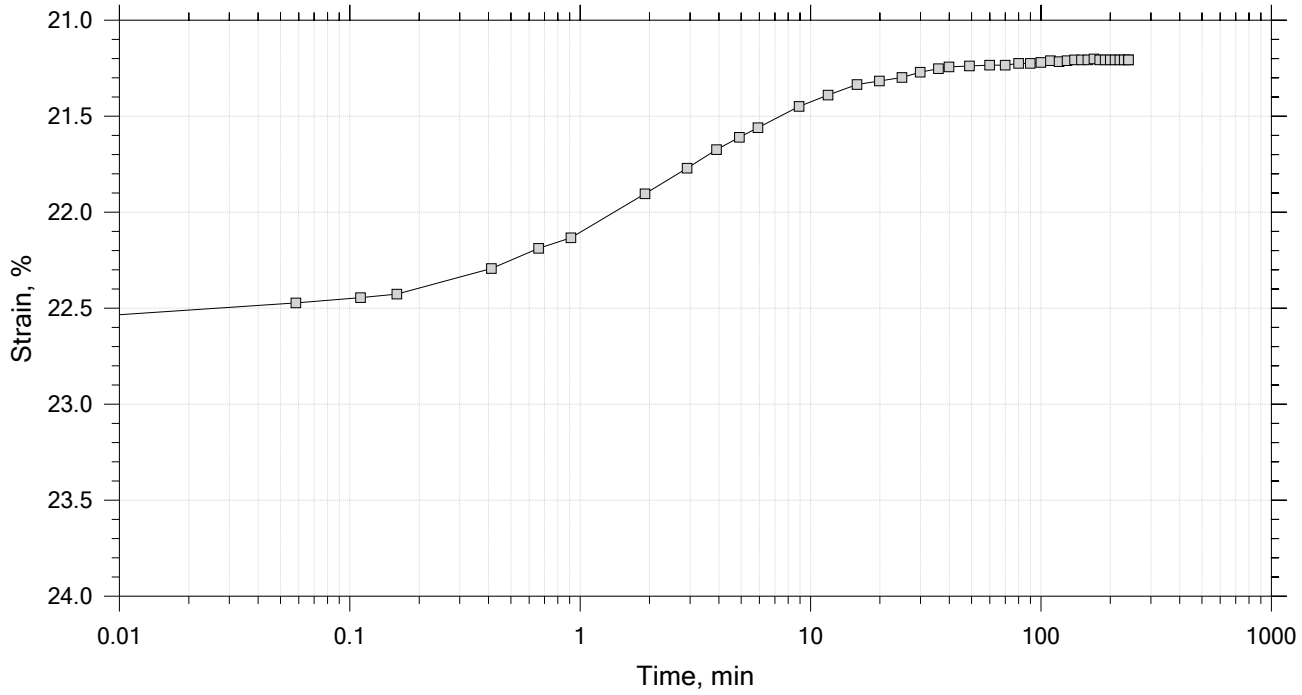


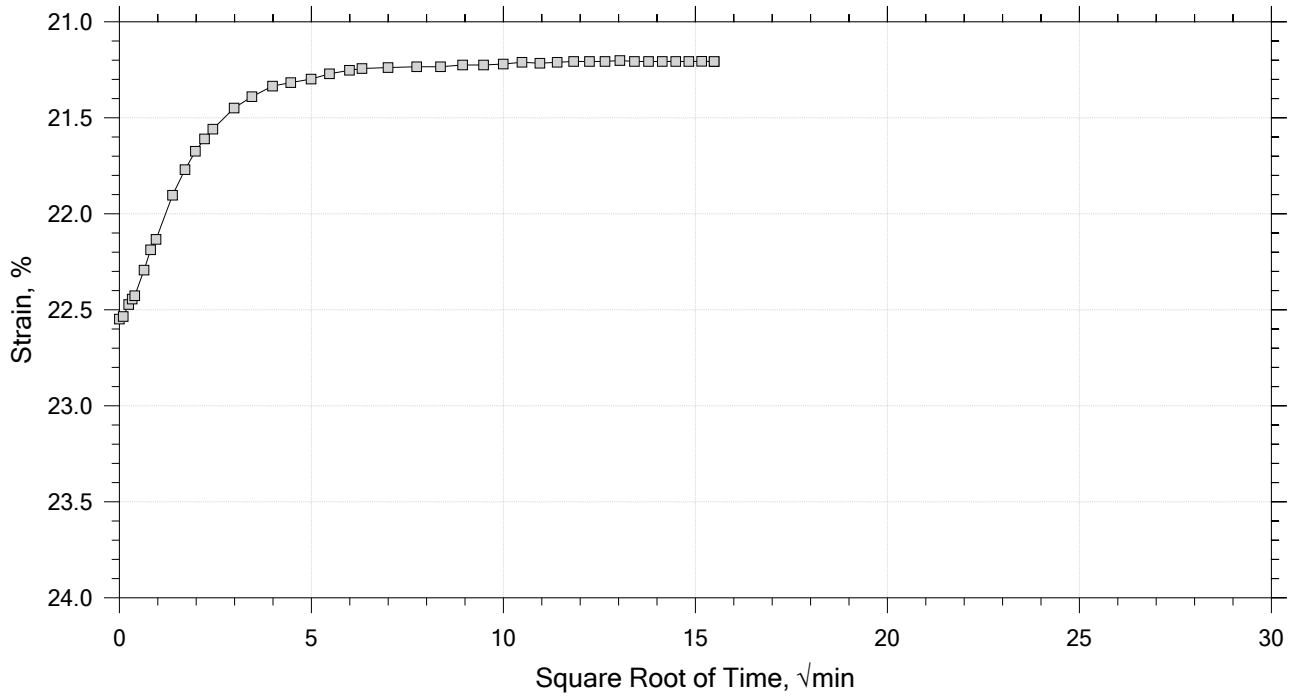


GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-201	Tested By: md	Checked By: njh
	Sample No.: U1	Test Date: 09/20/18	Depth: 25-27 ft
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, olive gray clay		
	Remarks: System S, Swell Pressure = 0.0652 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 18 of 22
Constant Load Step
Stress: 2 tsf

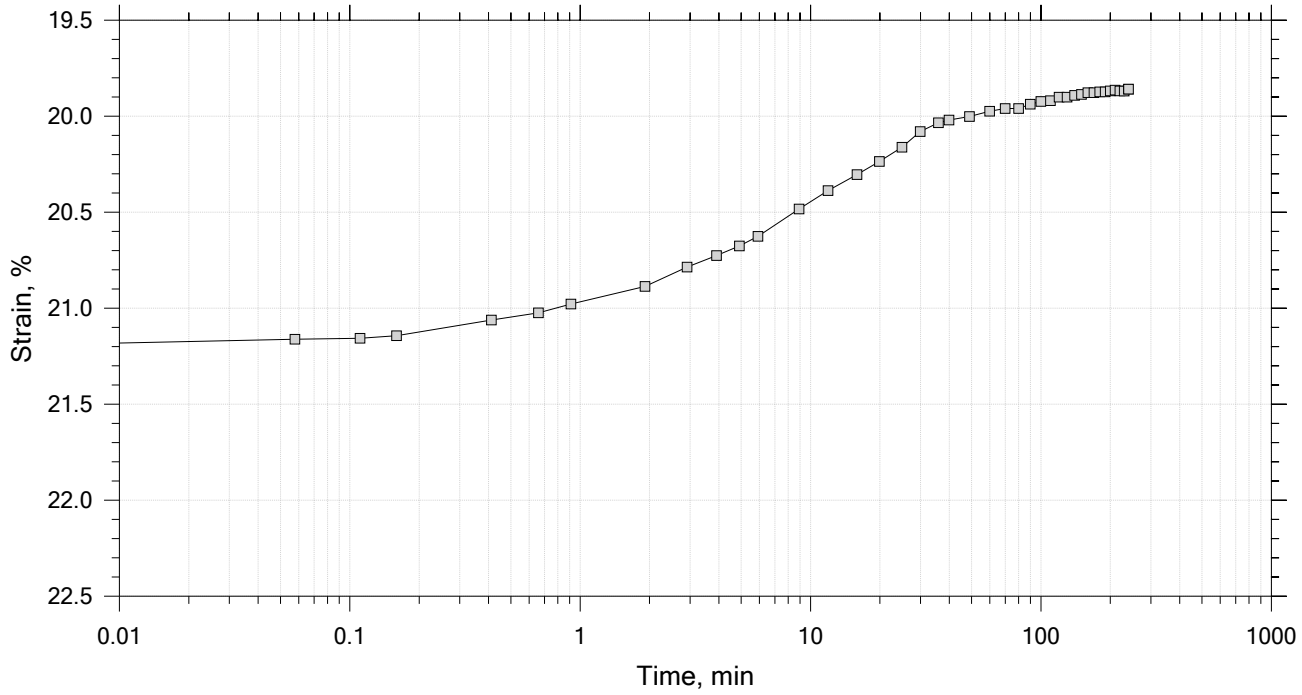


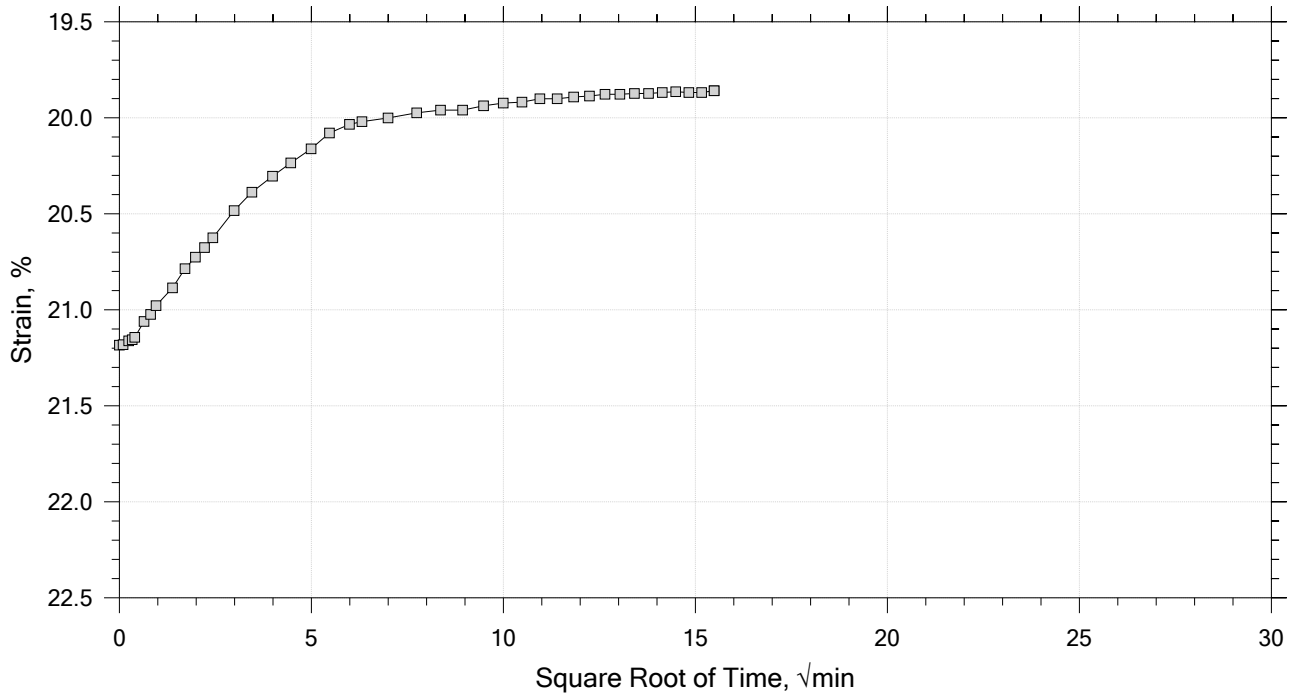


GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-201	Tested By: md	Checked By: njh
	Sample No.: U1	Test Date: 09/20/18	Depth: 25-27 ft
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, olive gray clay		
	Remarks: System S, Swell Pressure = 0.0652 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 19 of 22
Constant Load Step
Stress: 0.75 tsf

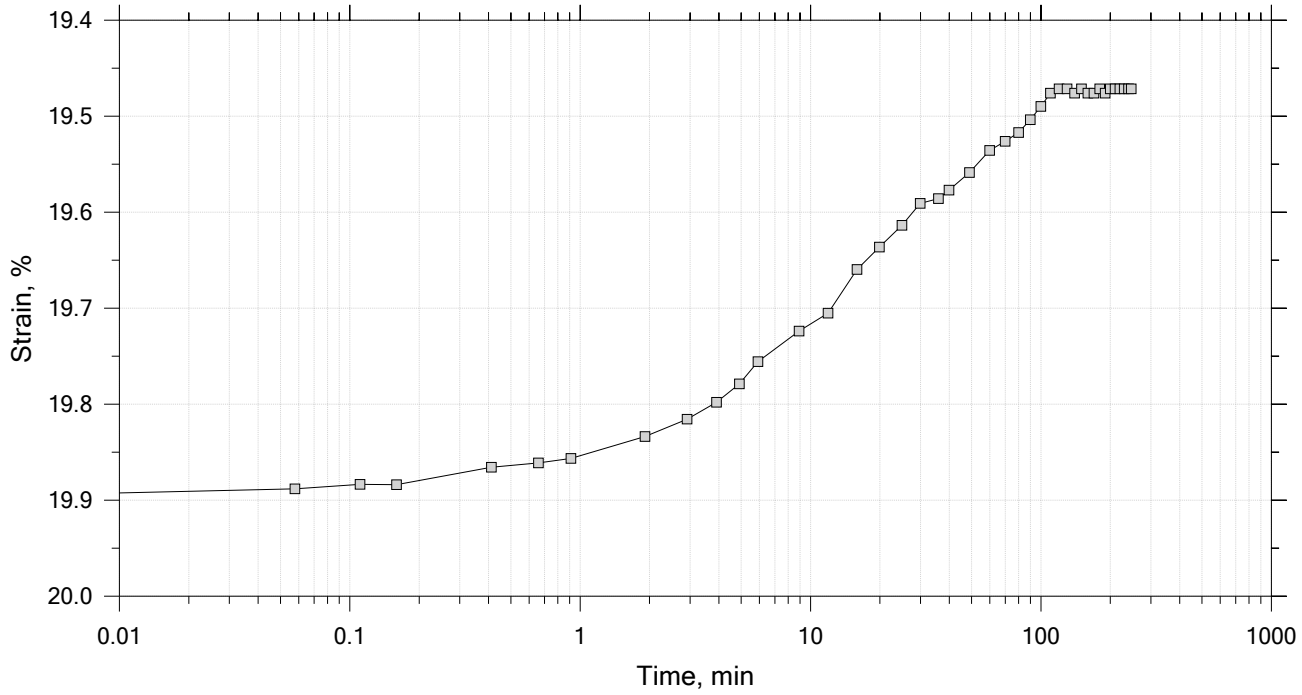


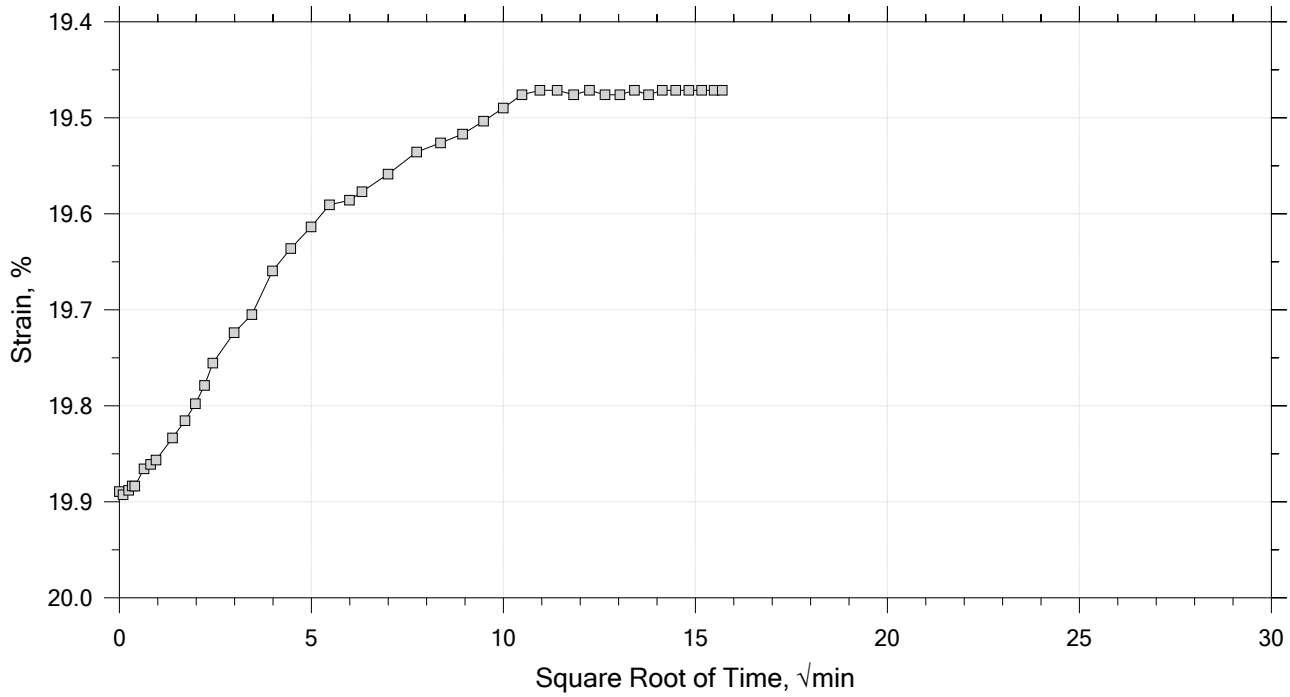


Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
Boring No.: BB-PVS-201	Tested By: md	Checked By: njh
Sample No.: U1	Test Date: 09/20/18	Depth: 25-27 ft
Test No.: IP-1	Sample Type: intact	Elevation: ---
Description: Moist, olive gray clay		
Remarks: System S, Swell Pressure = 0.0652 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 20 of 22
Constant Load Step
Stress: 0.5 tsf

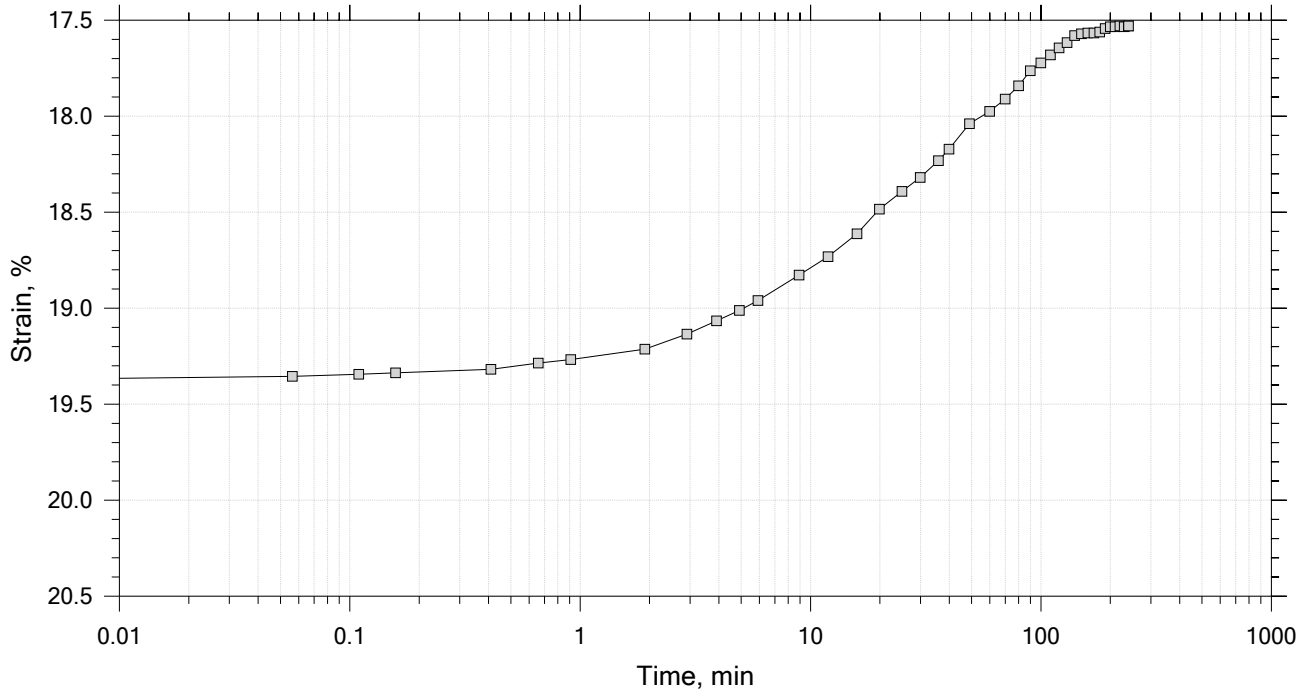


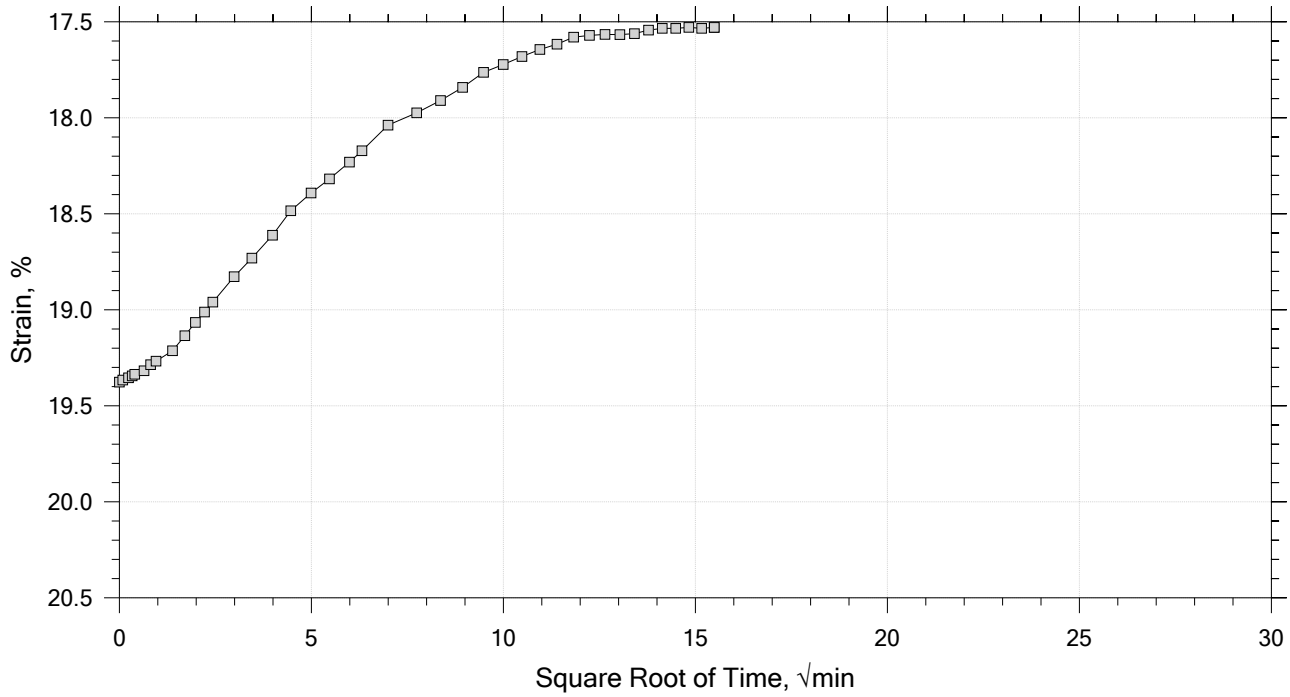


GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-201	Tested By: md	Checked By: njh
	Sample No.: U1	Test Date: 09/20/18	Depth: 25-27 ft
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, olive gray clay		
	Remarks: System S, Swell Pressure = 0.0652 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 21 of 22
Constant Load Step
Stress: 0.125 tsf

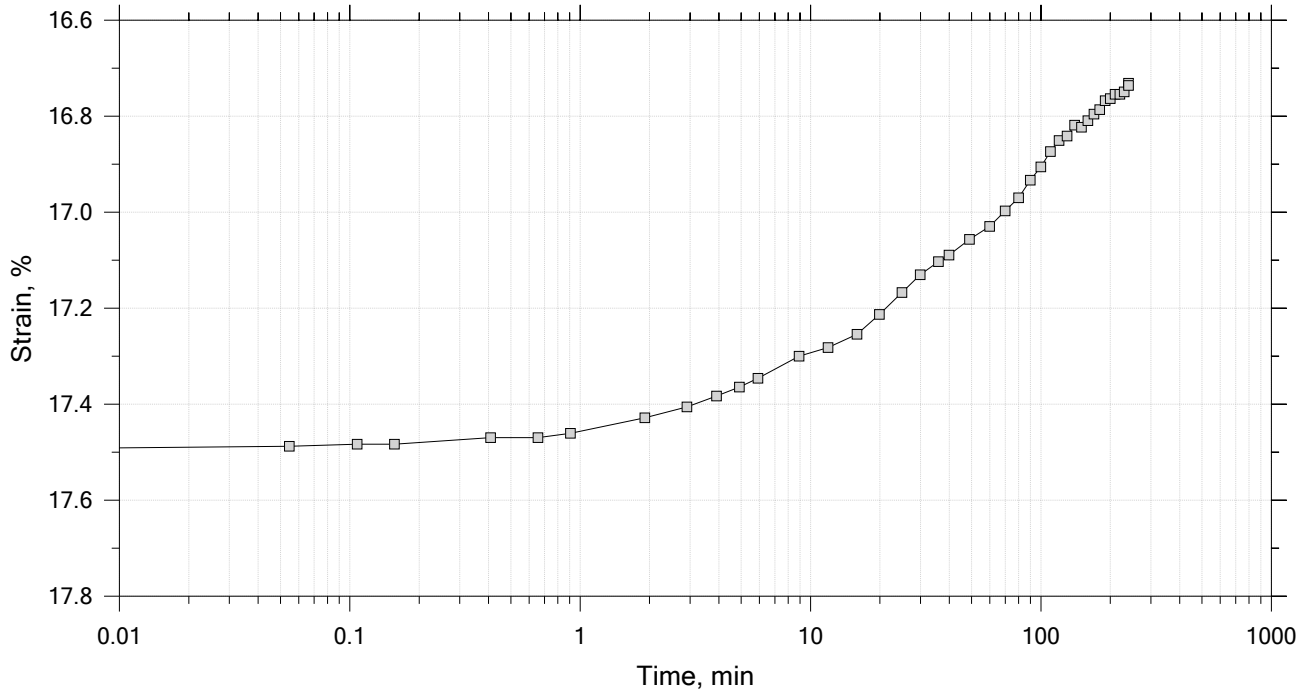


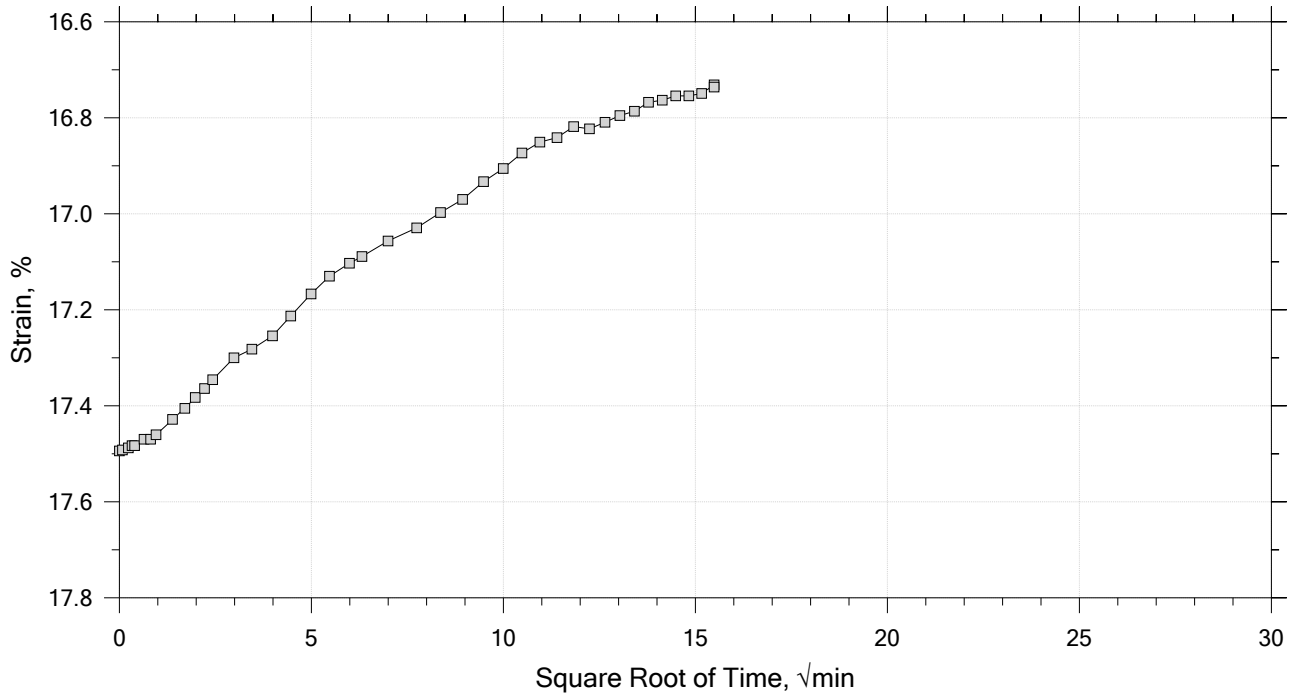


GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-201	Tested By: md	Checked By: njh
	Sample No.: U1	Test Date: 09/20/18	Depth: 25-27 ft
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, olive gray clay		
	Remarks: System S, Swell Pressure = 0.0652 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 22 of 22
Constant Load Step
Stress: 0.0625 tsf





Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
Boring No.: BB-PVS-201	Tested By: md	Checked By: njh
Sample No.: U1	Test Date: 09/20/18	Depth: 25-27 ft
Test No.: IP-1	Sample Type: intact	Elevation: ---
Description: Moist, olive gray clay		
Remarks: System S, Swell Pressure = 0.0652 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Specimen Diameter: 2.50 in	Estimated Specific Gravity: 2.76	Liquid Limit: 43
Initial Height: 1.00 in	Initial Void Ratio: 1.23	Plastic Limit: 25
Final Height: 0.88 in	Final Void Ratio: 0.958	Plasticity Index: 18

	Before Test Trimmings	Before Test Specimen	After Test Specimen	After Test Trimmings
Container ID	A-1437	RING		C-989
Mass Container, gm	8.43	110.01	110.01	8.58
Mass Container + Wet Soil, gm	154.57	253.82	244.45	141.82
Mass Container + Dry Soil, gm	110.18	209.81	209.81	107.49
Mass Dry Soil, gm	101.75	99.801	99.801	98.91
Water Content, %	43.63	44.10	34.71	34.71
Void Ratio	---	1.23	0.96	---
Degree of Saturation, %	---	99.36	100.00	---
Dry Unit Weight, pcf	---	77.454	88.016	---

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.

GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-201	Tested By: md	Checked By: njh
	Sample No.: U1	Test Date: 09/20/18	Depth: 25-27 ft
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, olive gray clay		
	Remarks: System S, Swell Pressure = 0.0652 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Log of Time Coefficients

Step	Applied Stress tsf	Final Displacement in	Void Ratio	Strain at End %	Log T50 min	Cv ft²/s	Mv 1/tsf	k ft/day	Ca %
1	0.0652	0.01818	1.18	1.82	0.000	0.00e+00	2.79e-01	0.00e+00	0.00e+00
2	0.125	0.02456	1.17	2.46	0.000	0.00e+00	1.07e-01	0.00e+00	0.00e+00
3	0.250	0.02993	1.16	2.99	1.633	3.30e-06	4.30e-02	3.83e-04	0.00e+00
4	0.500	0.03870	1.14	3.87	1.106	4.81e-06	3.51e-02	4.55e-04	0.00e+00
5	0.750	0.04435	1.13	4.43	1.733	3.02e-06	2.26e-02	1.84e-04	0.00e+00
6	1.00	0.04912	1.12	4.91	0.000	0.00e+00	1.91e-02	0.00e+00	0.00e+00
7	2.00	0.06606	1.08	6.61	0.000	0.00e+00	1.69e-02	0.00e+00	0.00e+00
8	4.00	0.1140	0.972	11.4	7.165	6.59e-07	2.40e-02	4.26e-05	0.00e+00
9	2.00	0.1102	0.980	11.0	0.000	0.00e+00	1.88e-03	0.00e+00	0.00e+00
10	1.00	0.1063	0.989	10.6	0.000	0.00e+00	3.95e-03	0.00e+00	0.00e+00
11	0.500	0.1011	1.00	10.1	0.000	0.00e+00	1.04e-02	0.00e+00	0.00e+00
12	1.00	0.1031	0.996	10.3	0.000	0.00e+00	4.04e-03	0.00e+00	0.00e+00
13	2.00	0.1094	0.982	10.9	1.164	3.91e-06	6.29e-03	6.63e-05	0.00e+00
14	4.00	0.1244	0.948	12.4	1.807	2.46e-06	7.50e-03	4.98e-05	0.00e+00
15	8.00	0.1768	0.832	17.7	4.409	9.33e-07	1.31e-02	3.30e-05	0.00e+00
16	16.0	0.2299	0.714	23.0	2.472	1.46e-06	6.63e-03	2.62e-05	0.00e+00
17	8.00	0.2267	0.721	22.7	0.000	0.00e+00	4.03e-04	0.00e+00	0.00e+00
18	2.00	0.2121	0.753	21.2	0.000	0.00e+00	2.43e-03	0.00e+00	0.00e+00
19	0.750	0.1986	0.783	19.9	8.345	4.31e-07	1.08e-02	1.25e-05	0.00e+00
20	0.500	0.1947	0.792	19.5	0.000	0.00e+00	1.55e-02	0.00e+00	0.00e+00
21	0.125	0.1753	0.835	17.5	0.000	0.00e+00	5.18e-02	0.00e+00	0.00e+00
22	0.0625	0.1674	0.853	16.7	0.000	0.00e+00	1.27e-01	0.00e+00	0.00e+00

GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-201	Tested By: md	Checked By: njh
	Sample No.: U1	Test Date: 09/20/18	Depth: 25-27 ft
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, olive gray clay		
	Remarks: System S, Swell Pressure = 0.0652 tsf		
	Displacement at End of Increment		

One-Dimensional Consolidation by ASTM D2435 - Method B

Square Root of Time Coefficients

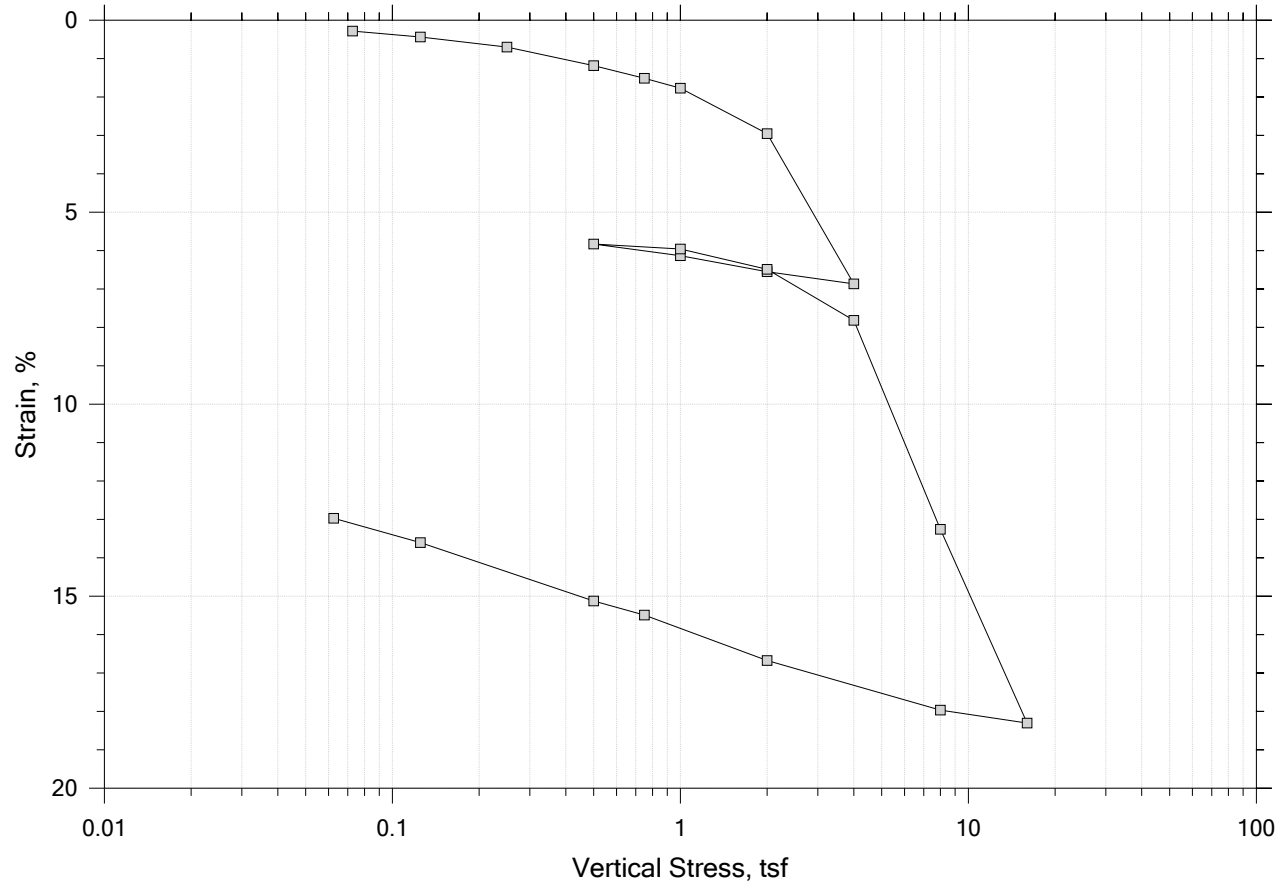
Step	Applied Stress tsf	Final Displacement in	Void Ratio	Strain at End %	Sq.Rt. T90 min	Cv ft²/s	Mv 1/tsf	k ft/day
1	0.0652	0.01818	1.18	1.82	0.000	0.00e+00	2.79e-01	0.00e+00
2	0.125	0.02456	1.17	2.46	22.972	1.02e-06	1.07e-01	2.95e-04
3	0.250	0.02993	1.16	2.99	9.105	2.55e-06	4.30e-02	2.95e-04
4	0.500	0.03870	1.14	3.87	5.422	4.22e-06	3.51e-02	3.99e-04
5	0.750	0.04435	1.13	4.43	5.525	4.08e-06	2.26e-02	2.48e-04
6	1.00	0.04912	1.12	4.91	125.286	1.78e-07	1.91e-02	9.17e-06
7	2.00	0.06606	1.08	6.61	128.596	1.69e-07	1.69e-02	7.74e-06
8	4.00	0.1140	0.972	11.4	27.645	7.35e-07	2.40e-02	4.75e-05
9	2.00	0.1102	0.980	11.0	2.793	6.92e-06	1.88e-03	3.52e-05
10	1.00	0.1063	0.989	10.6	4.529	4.31e-06	3.95e-03	4.59e-05
11	0.500	0.1011	1.00	10.1	13.481	1.46e-06	1.04e-02	4.09e-05
12	1.00	0.1031	0.996	10.3	6.125	3.23e-06	4.04e-03	3.52e-05
13	2.00	0.1094	0.982	10.9	5.491	3.57e-06	6.29e-03	6.05e-05
14	4.00	0.1244	0.948	12.4	14.677	1.30e-06	7.50e-03	2.64e-05
15	8.00	0.1768	0.832	17.7	22.307	7.94e-07	1.31e-02	2.80e-05
16	16.0	0.2299	0.714	23.0	12.253	1.27e-06	6.63e-03	2.27e-05
17	8.00	0.2267	0.721	22.7	3.144	4.65e-06	4.03e-04	5.06e-06
18	2.00	0.2121	0.753	21.2	8.606	1.74e-06	2.43e-03	1.14e-05
19	0.750	0.1986	0.783	19.9	32.642	4.75e-07	1.08e-02	1.38e-05
20	0.500	0.1947	0.792	19.5	55.258	2.87e-07	1.55e-02	1.20e-05
21	0.125	0.1753	0.835	17.5	97.200	1.68e-07	5.18e-02	2.34e-05
22	0.0625	0.1674	0.853	16.7	170.872	9.86e-08	1.27e-01	3.38e-05

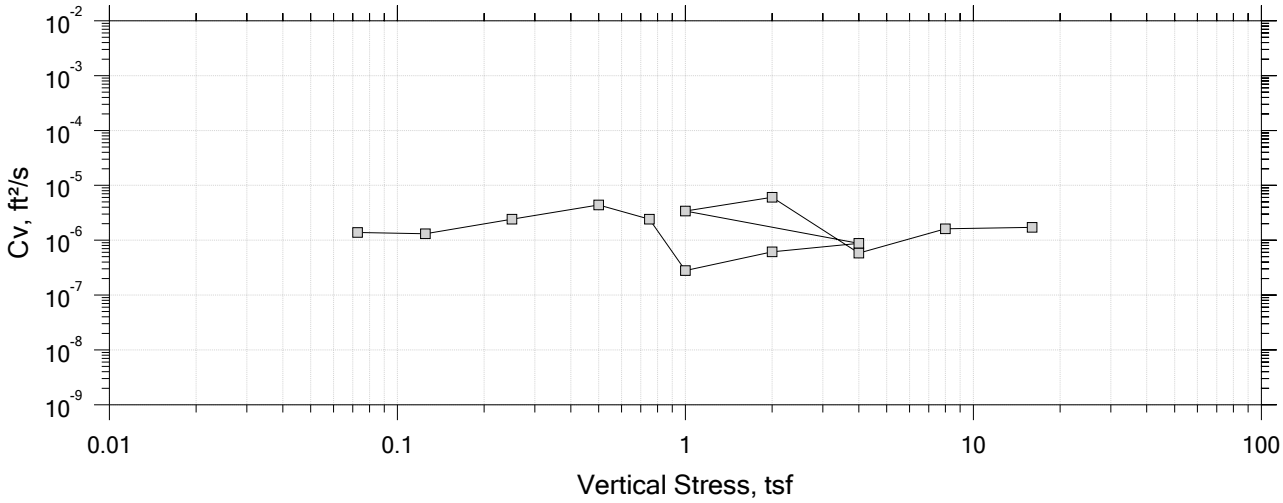
GeoTesting EXPRESS

Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
Boring No.: BB-PVS-201	Tested By: md	Checked By: njh
Sample No.: U1	Test Date: 09/20/18	Depth: 25-27 ft
Test No.: IP-1	Sample Type: intact	Elevation: ---
Description: Moist, olive gray clay		
Remarks: System S, Swell Pressure = 0.0652 tsf		
Displacement at End of Increment		

One-Dimensional Consolidation by ASTM D2435 - Method B

Summary Report





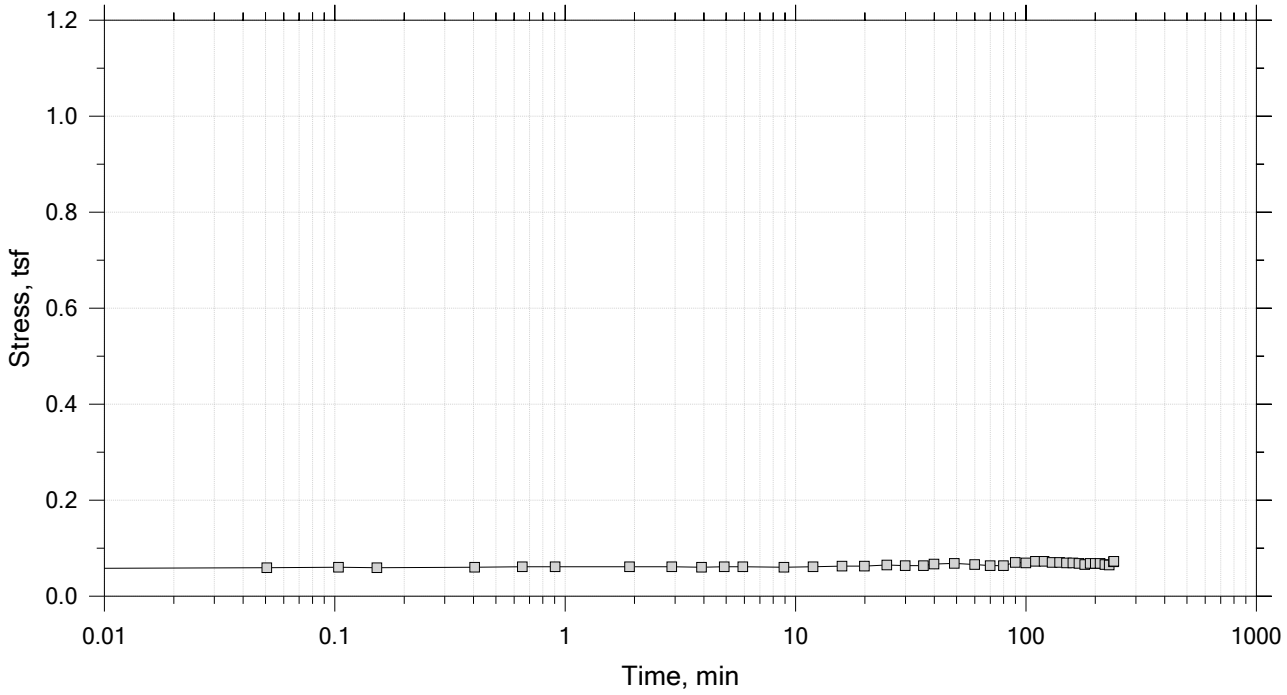
GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-201	Tested By: md	Checked By: njh
	Sample No.: U2	Test Date: 09/20/18	Depth: 35-37 ft
	Test No.: IP-2	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System II, Swell Pressure = 0.0727 tsf		
	Displacement at End of Increment		

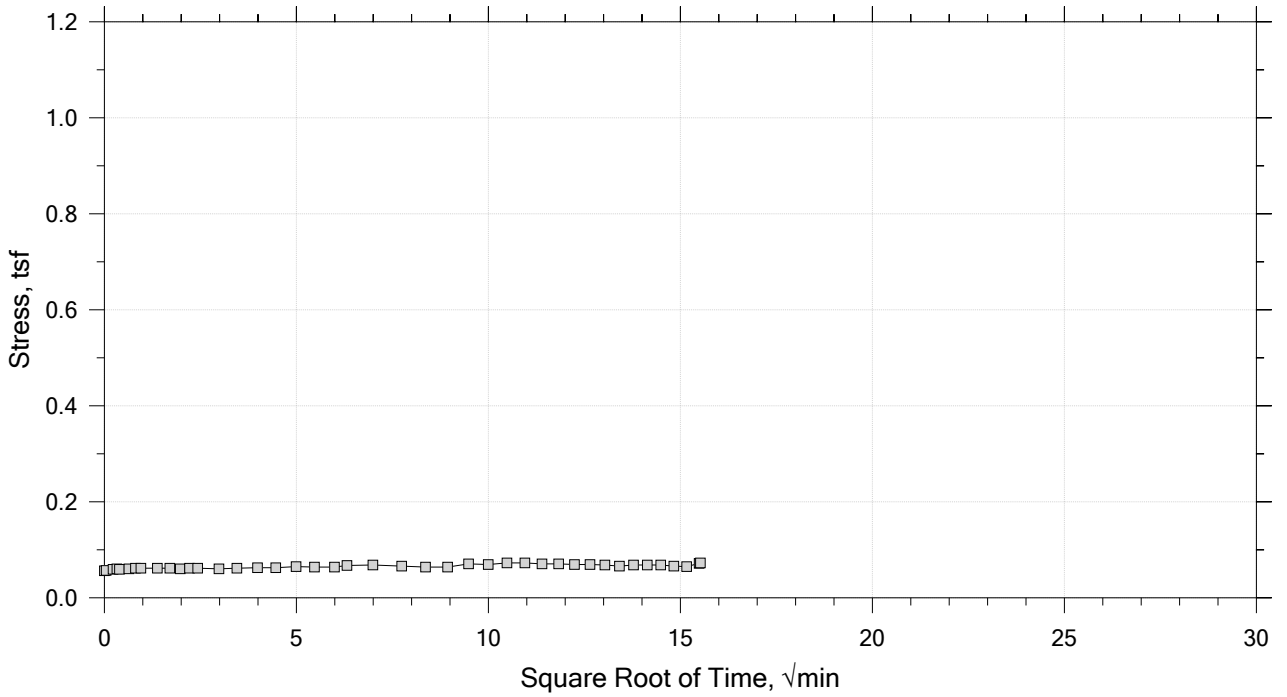
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 1 of 22

Constant Volume Step

Stress: 0.0727 tsf





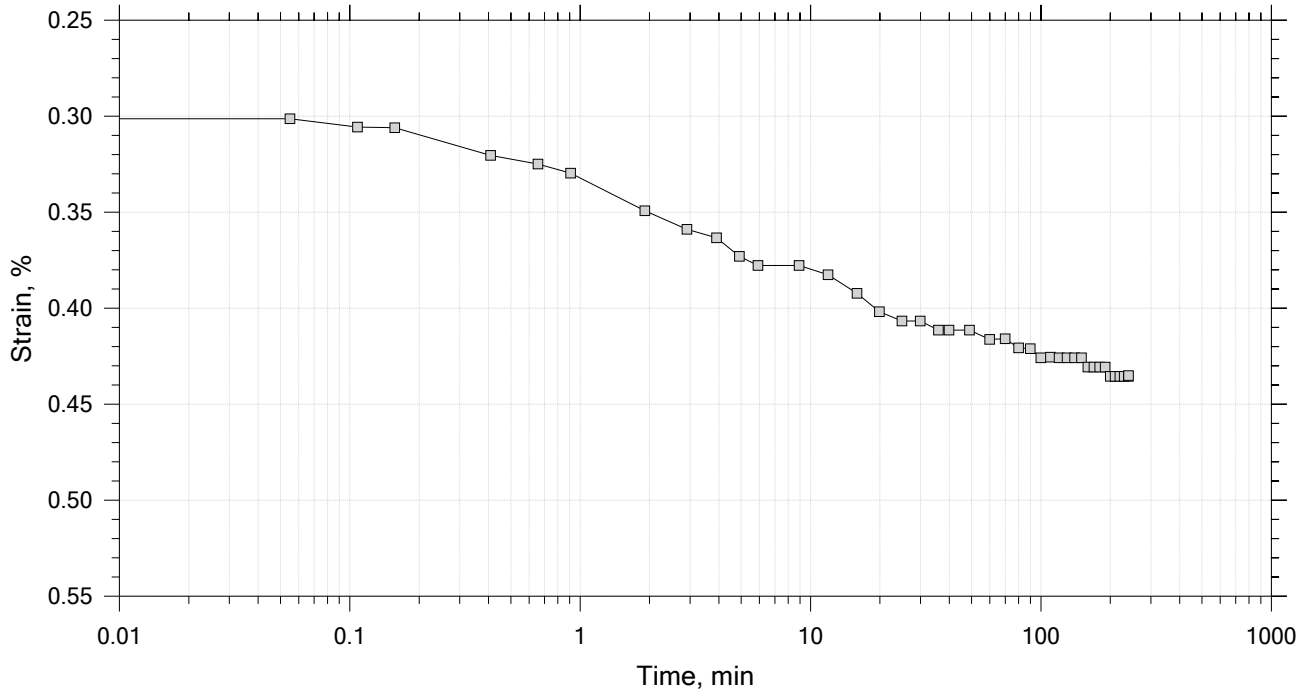
GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-201	Tested By: md	Checked By: njh
	Sample No.: U2	Test Date: 09/20/18	Depth: 35-37 ft
	Test No.: IP-2	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System II, Swell Pressure = 0.0727 tsf		

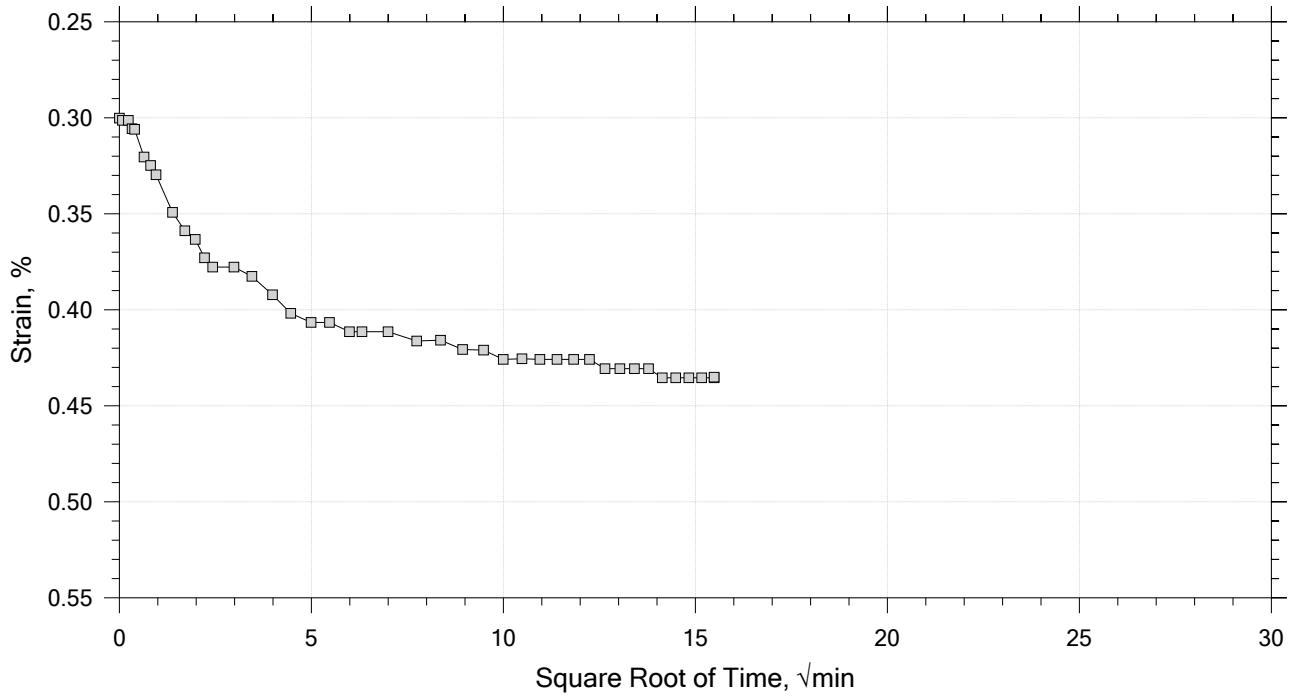
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 2 of 22

Constant Load Step

Stress: 0.125 tsf





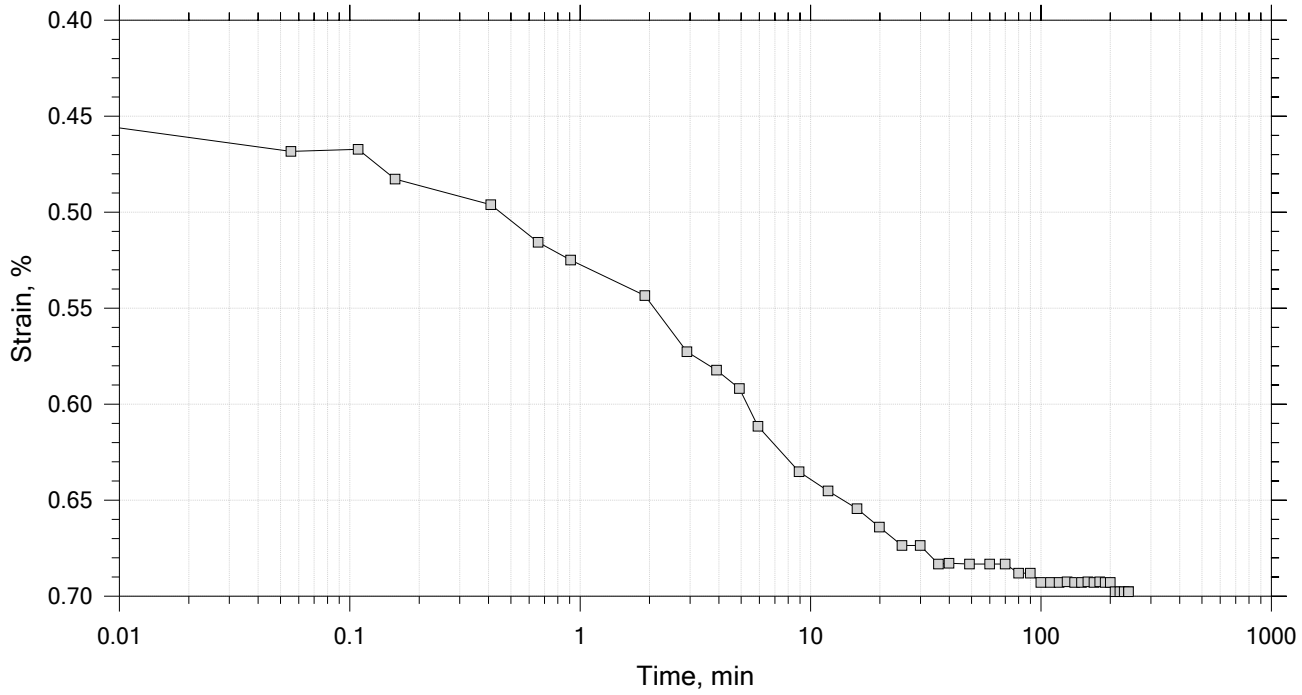
GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-201	Tested By: md	Checked By: njh
	Sample No.: U2	Test Date: 09/20/18	Depth: 35-37 ft
	Test No.: IP-2	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System II, Swell Pressure = 0.0727 tsf		

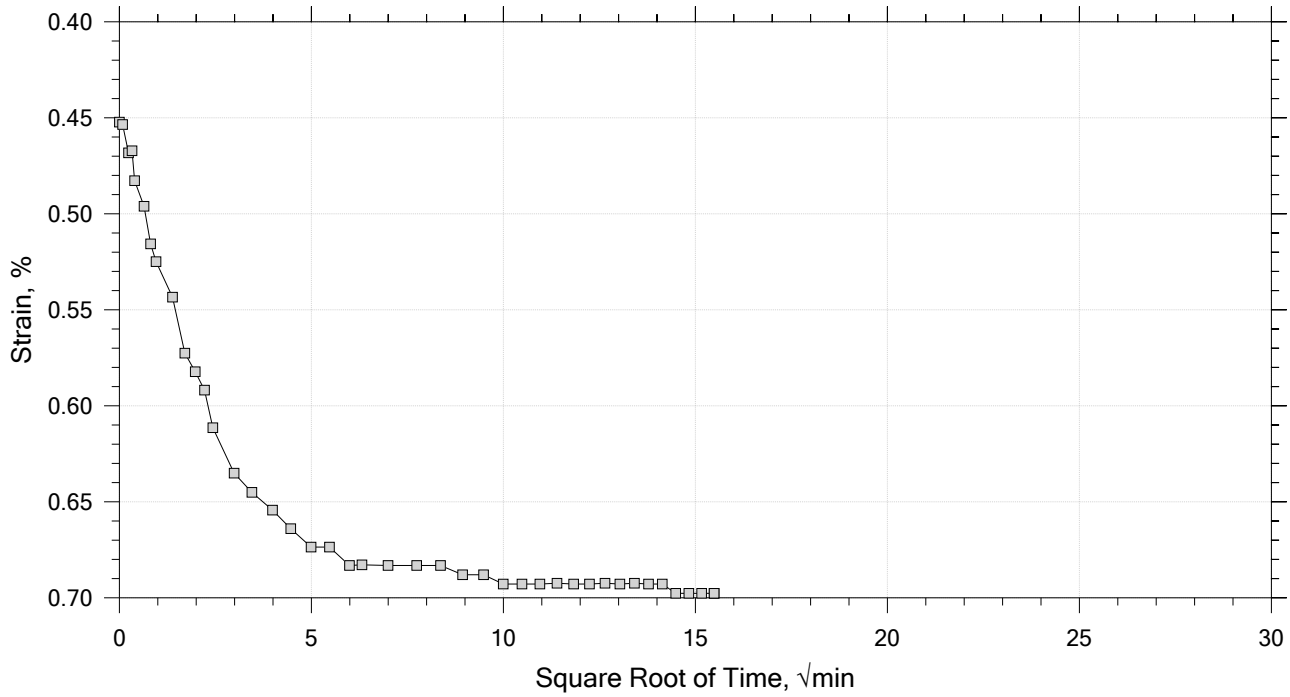
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 3 of 22

Constant Load Step

Stress: 0.25 tsf





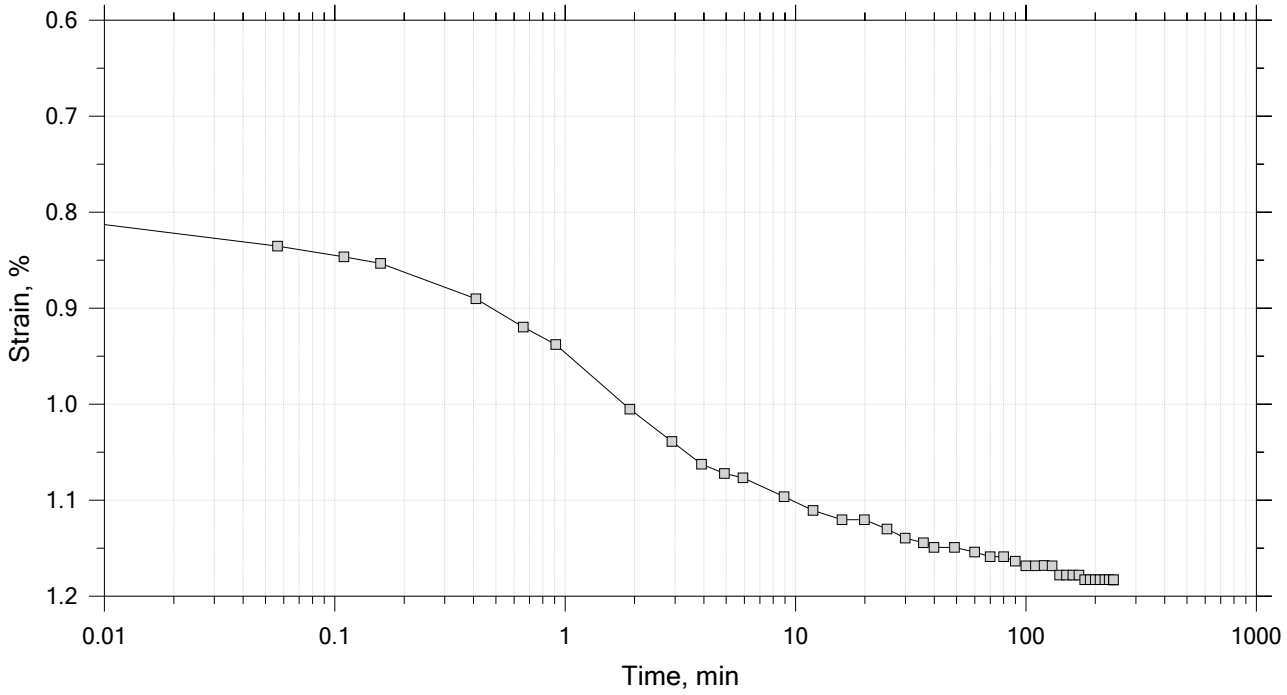
GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-201	Tested By: md	Checked By: njh
	Sample No.: U2	Test Date: 09/20/18	Depth: 35-37 ft
	Test No.: IP-2	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System II, Swell Pressure = 0.0727 tsf		

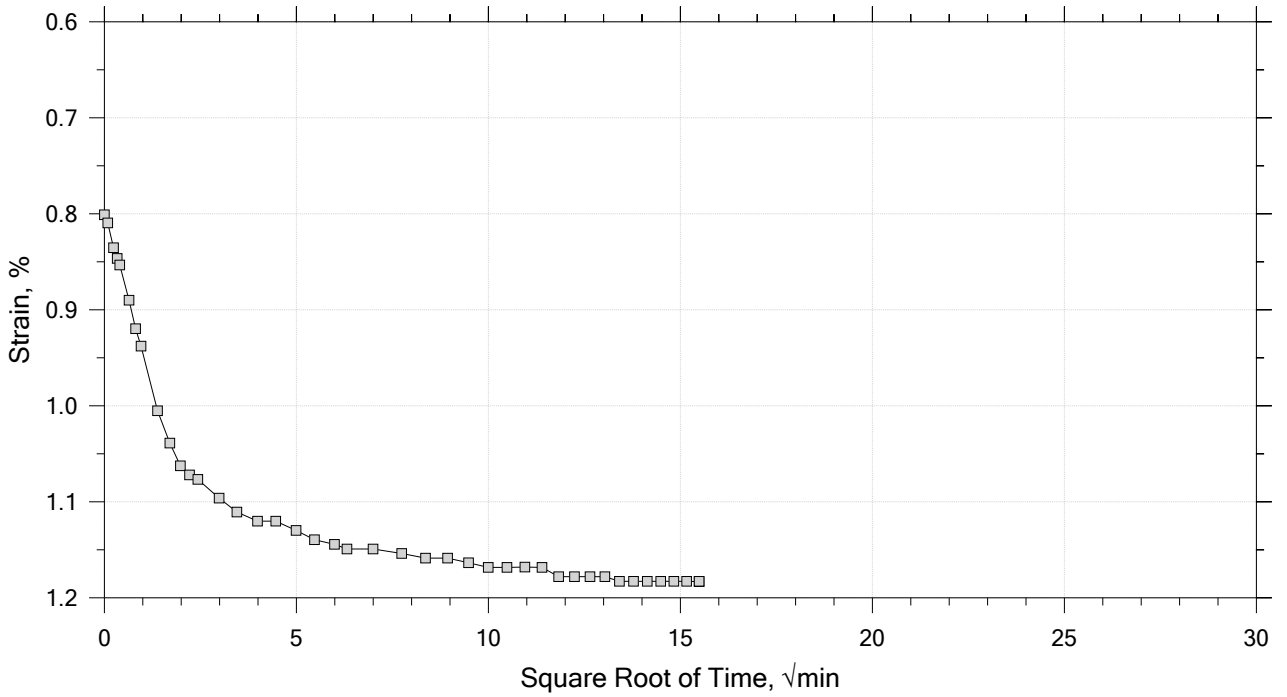
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 4 of 22

Constant Load Step

Stress: 0.5 tsf





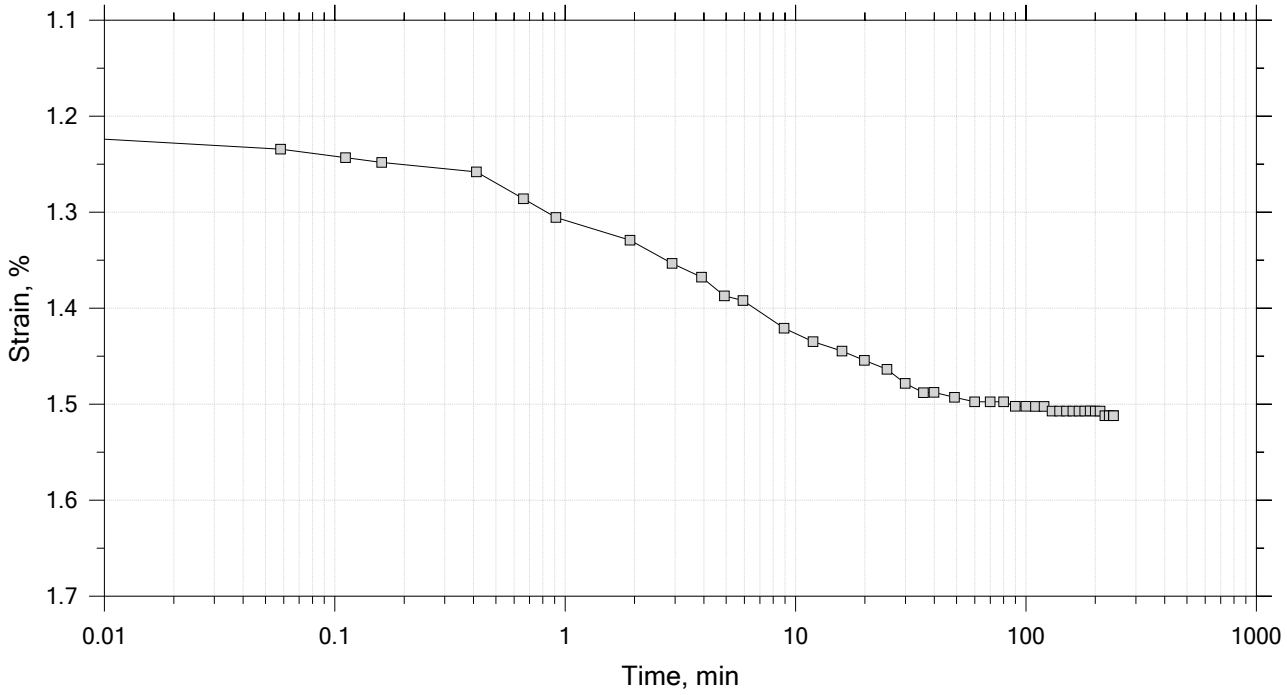
GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-201	Tested By: md	Checked By: njh
	Sample No.: U2	Test Date: 09/20/18	Depth: 35-37 ft
	Test No.: IP-2	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System II, Swell Pressure = 0.0727 tsf		

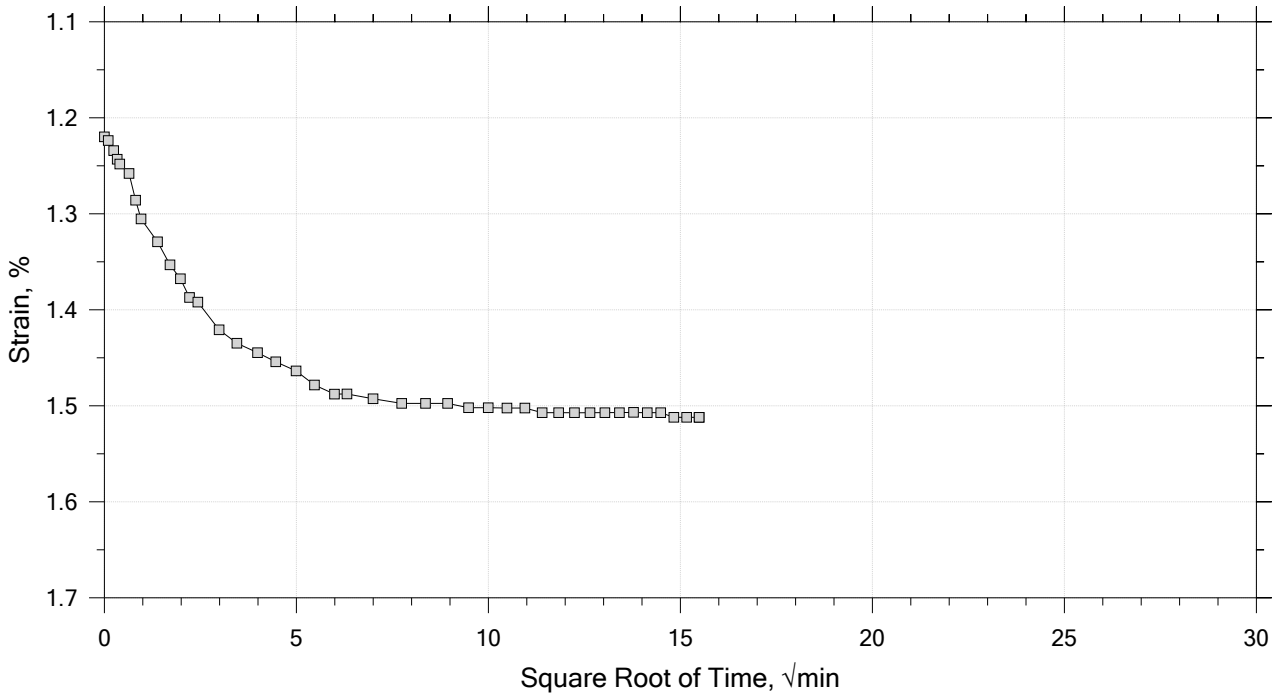
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 5 of 22

Constant Load Step

Stress: 0.75 tsf





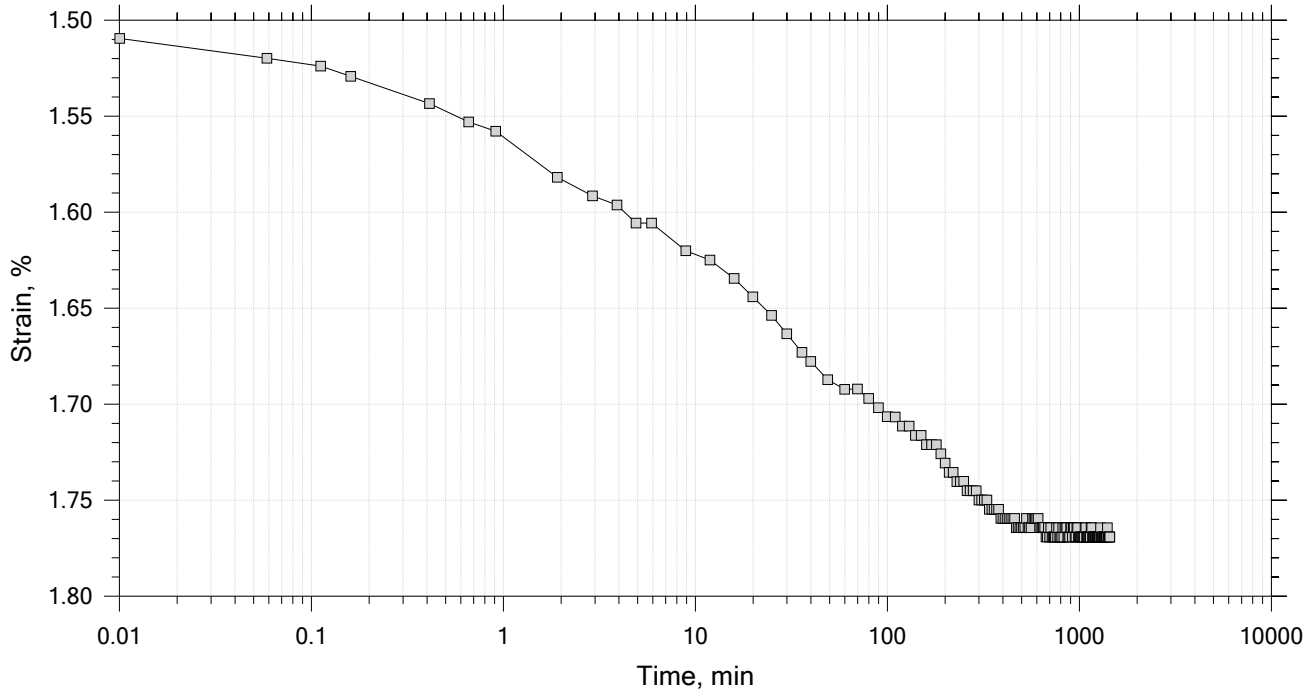
GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-201	Tested By: md	Checked By: njh
	Sample No.: U2	Test Date: 09/20/18	Depth: 35-37 ft
	Test No.: IP-2	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System II, Swell Pressure = 0.0727 tsf		

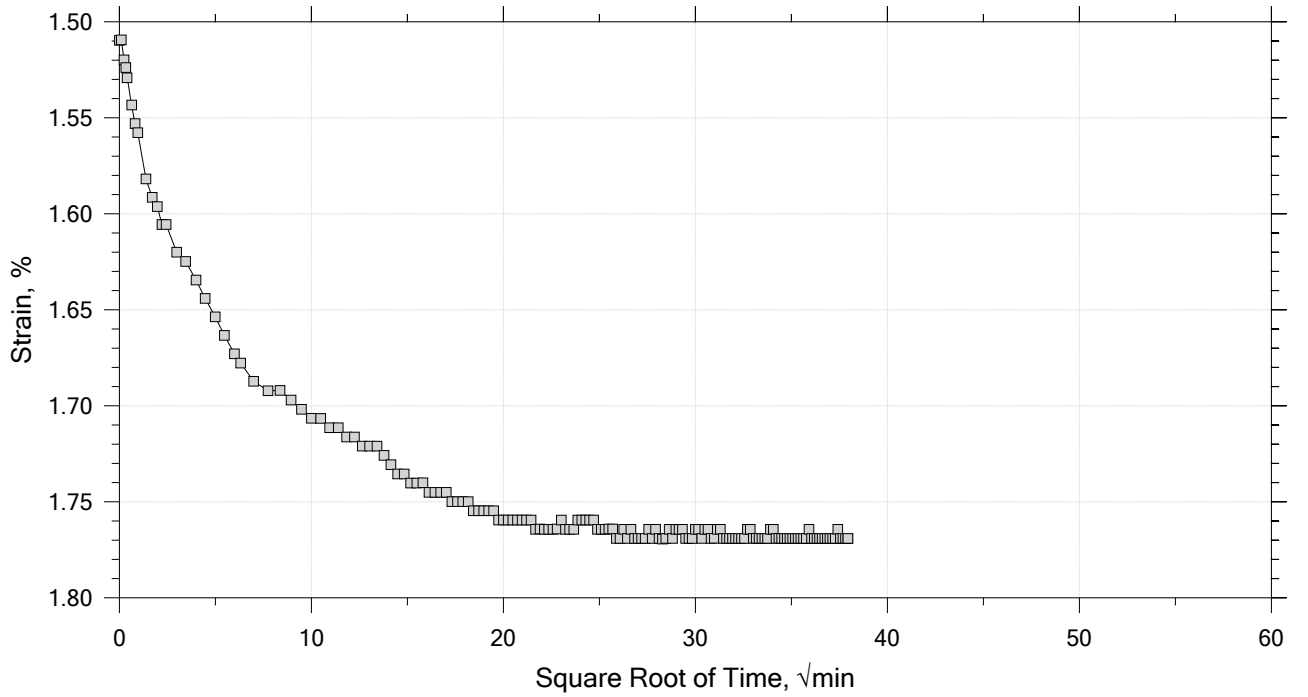
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 6 of 22

Constant Load Step

Stress: 1 tsf





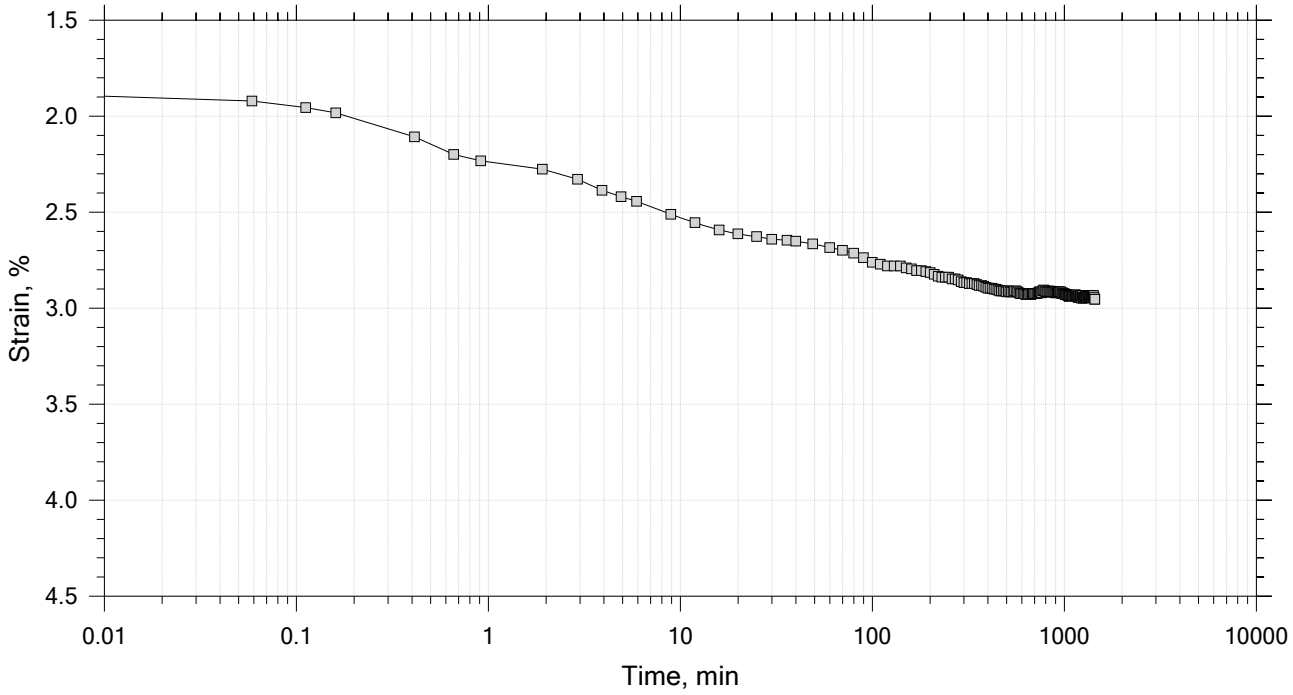
GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-201	Tested By: md	Checked By: njh
	Sample No.: U2	Test Date: 09/20/18	Depth: 35-37 ft
	Test No.: IP-2	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System II, Swell Pressure = 0.0727 tsf		

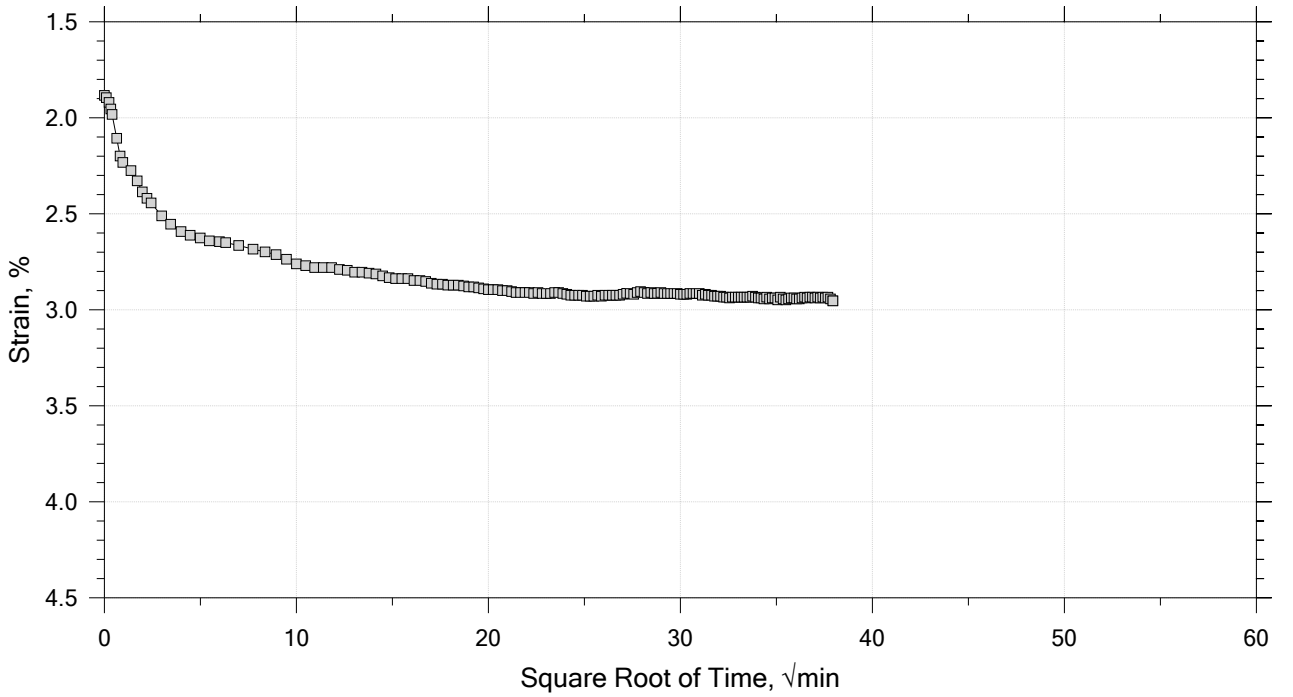
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 7 of 22

Constant Load Step

Stress: 2 tsf





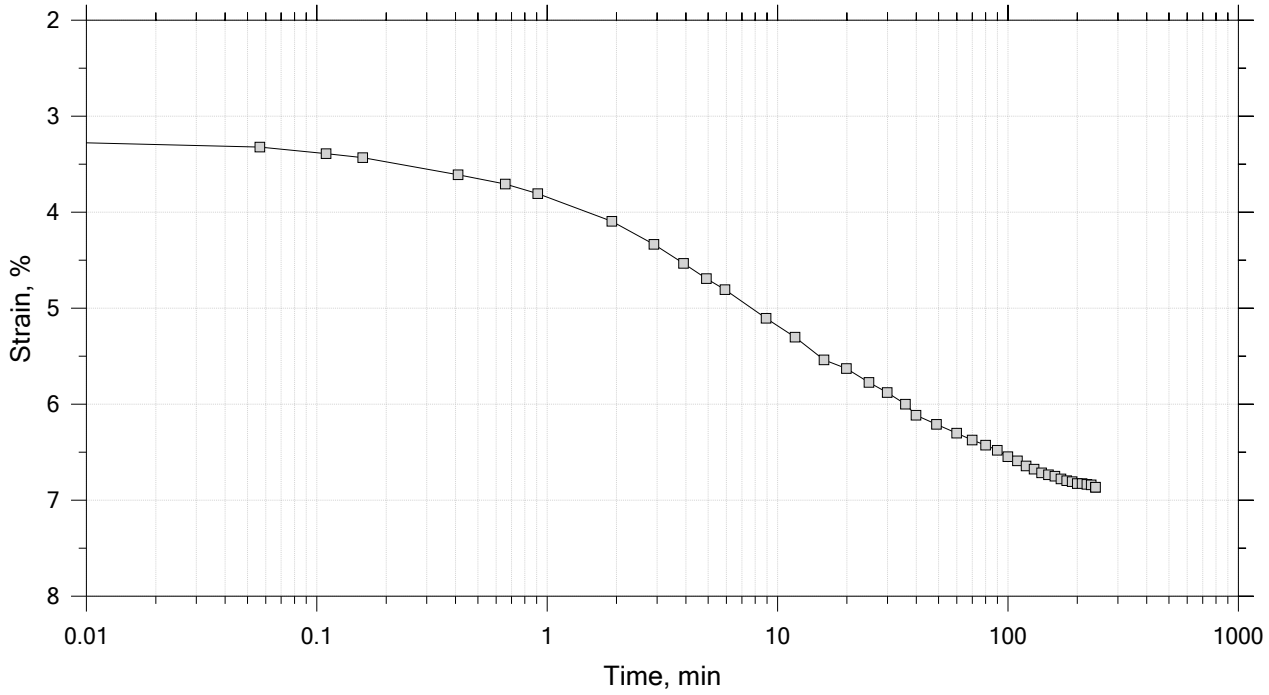
GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-201	Tested By: md	Checked By: njh
	Sample No.: U2	Test Date: 09/20/18	Depth: 35-37 ft
	Test No.: IP-2	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System II, Swell Pressure = 0.0727 tsf		

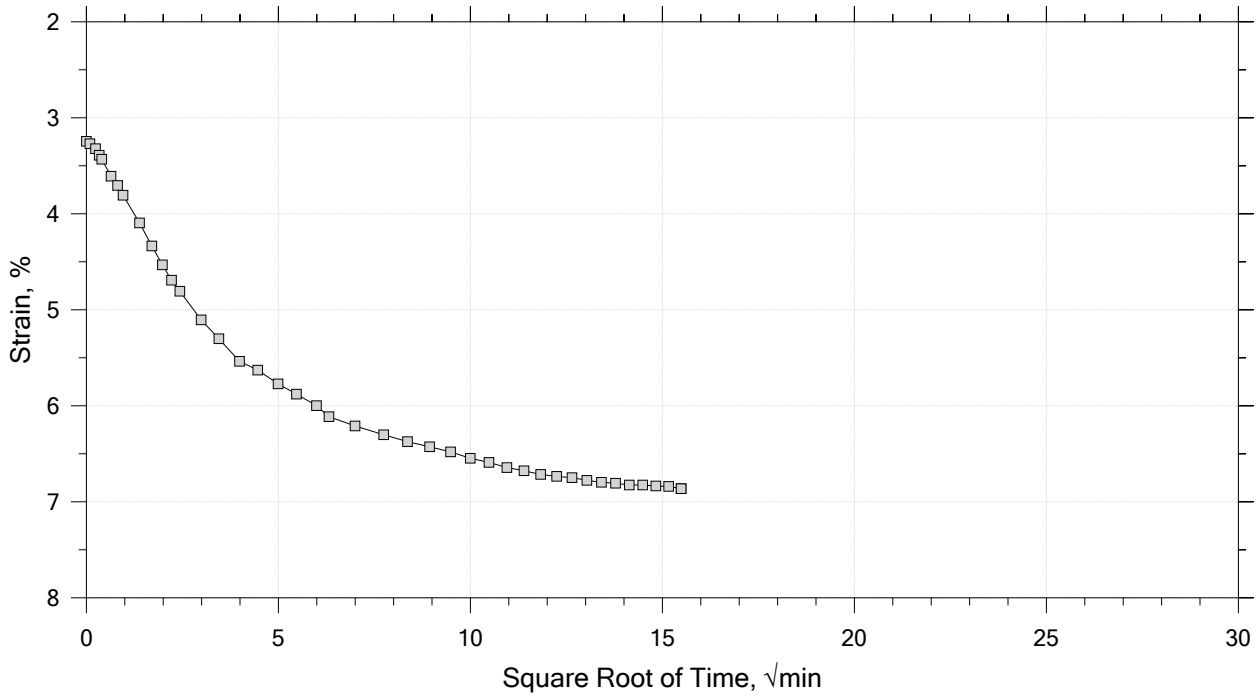
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 8 of 22

Constant Load Step

Stress: 4 tsf





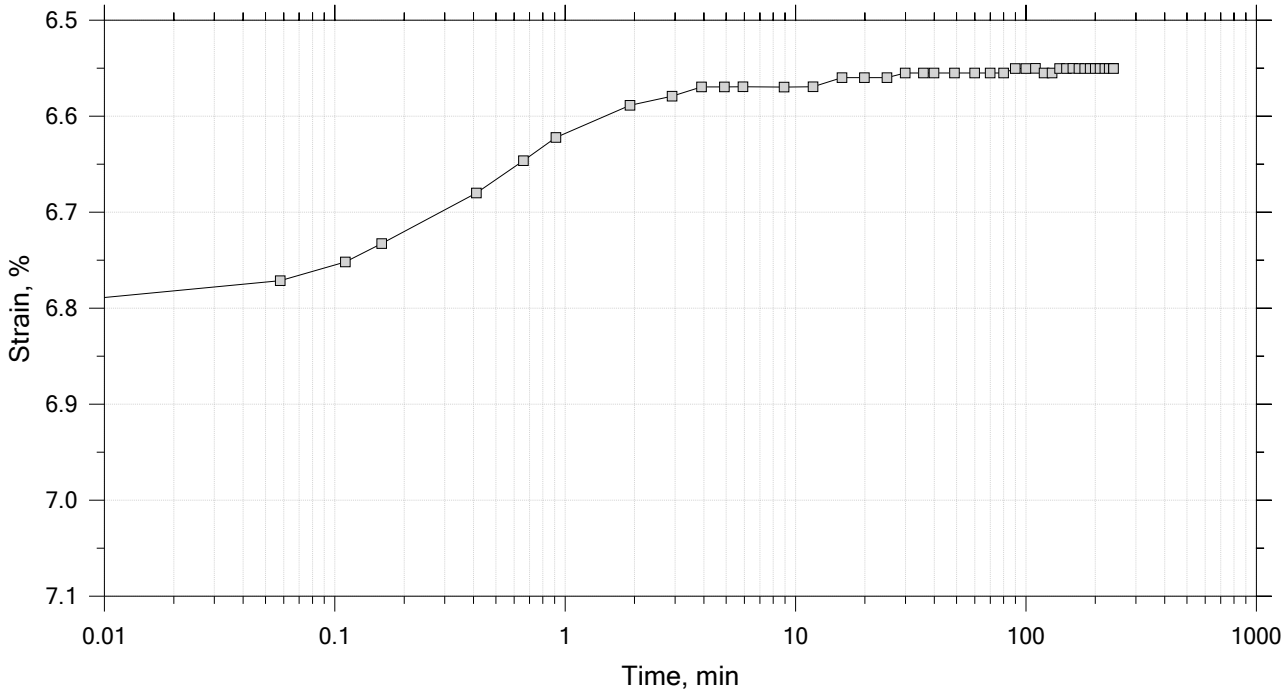
GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-201	Tested By: md	Checked By: njh
	Sample No.: U2	Test Date: 09/20/18	Depth: 35-37 ft
	Test No.: IP-2	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System II, Swell Pressure = 0.0727 tsf		

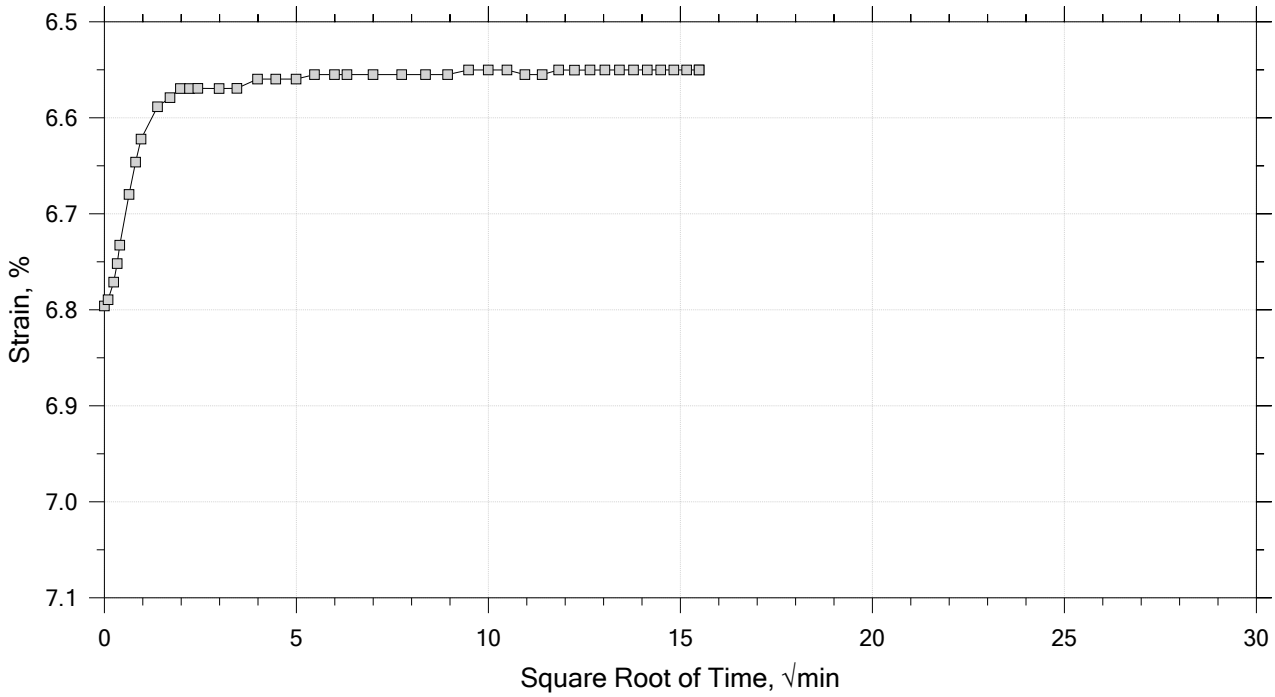
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 9 of 22

Constant Load Step

Stress: 2 tsf

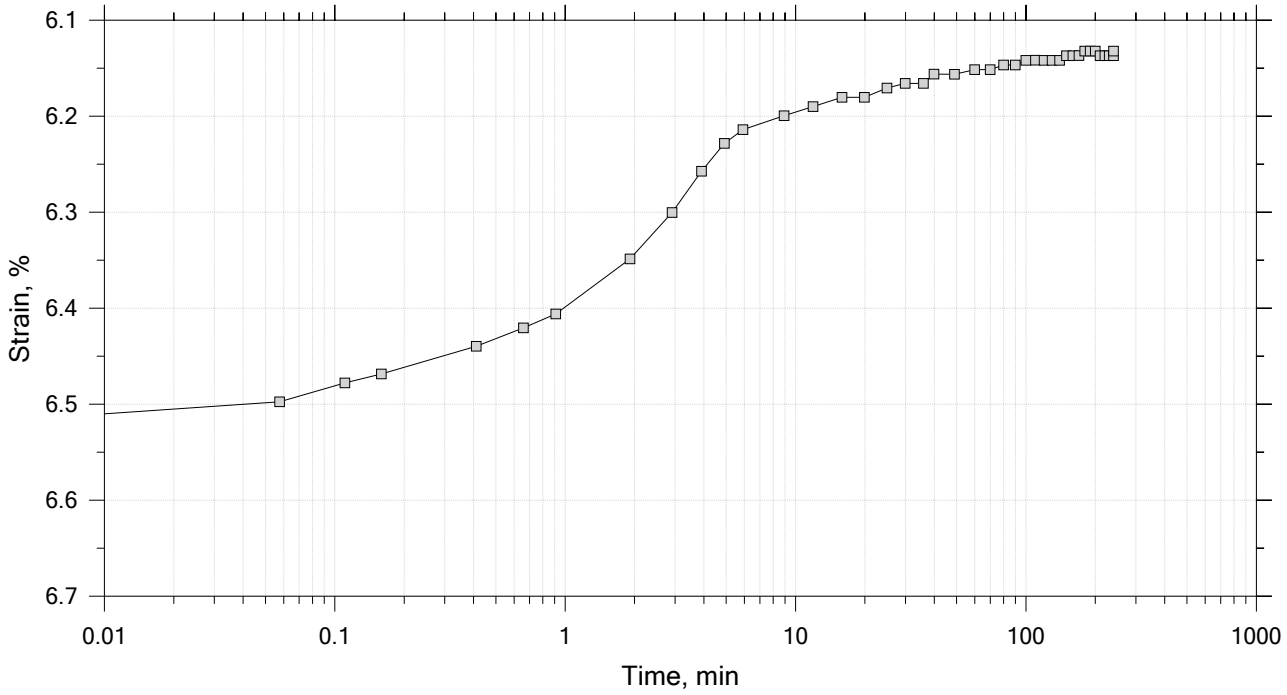


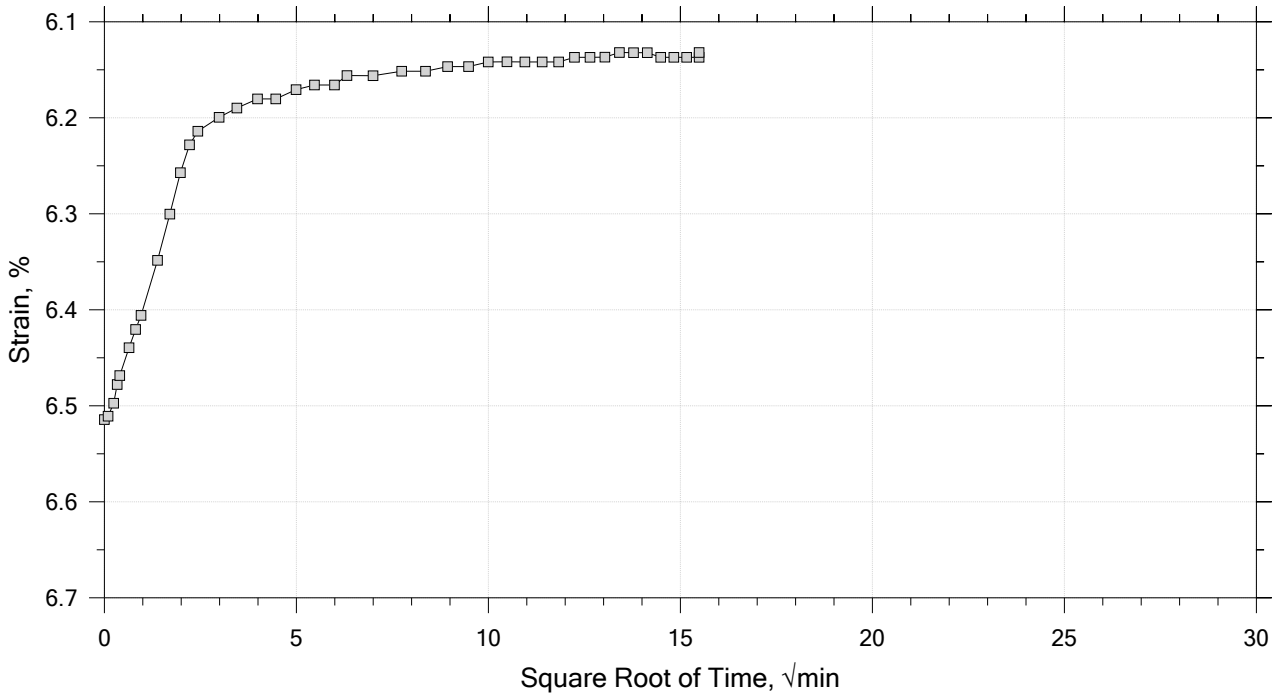


GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-201	Tested By: md	Checked By: njh
	Sample No.: U2	Test Date: 09/20/18	Depth: 35-37 ft
	Test No.: IP-2	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System II, Swell Pressure = 0.0727 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 10 of 22
Constant Load Step
Stress: 1 tsf

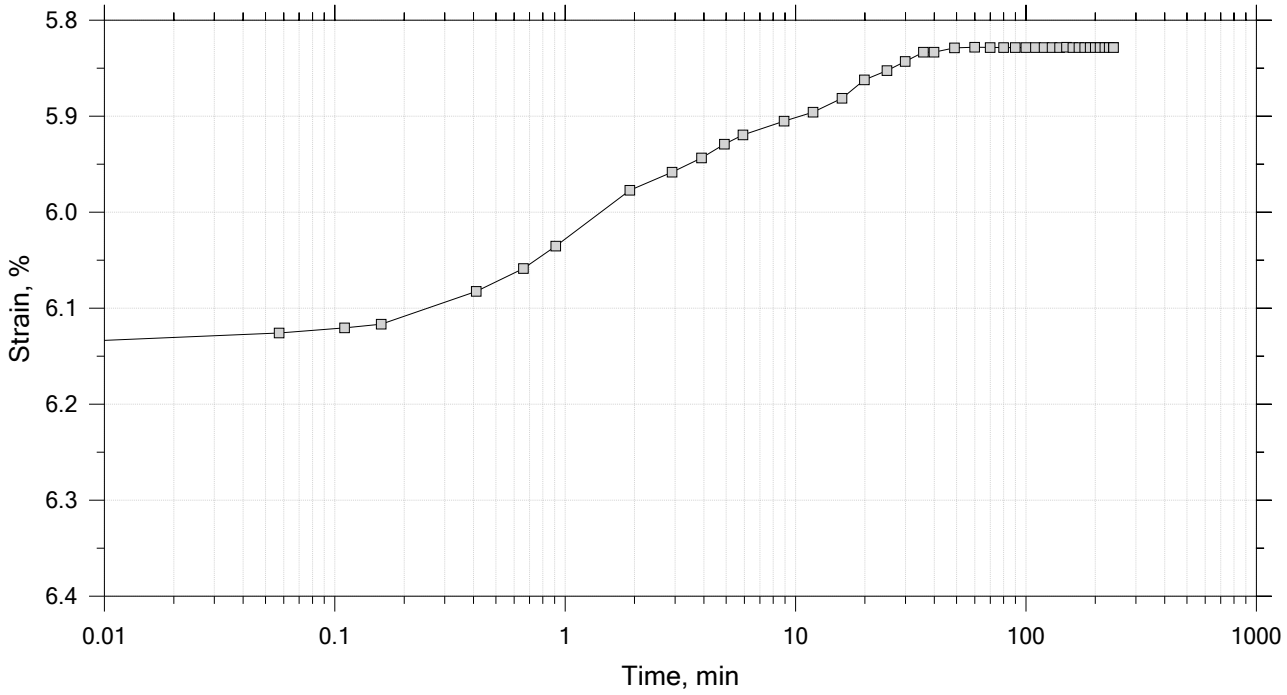


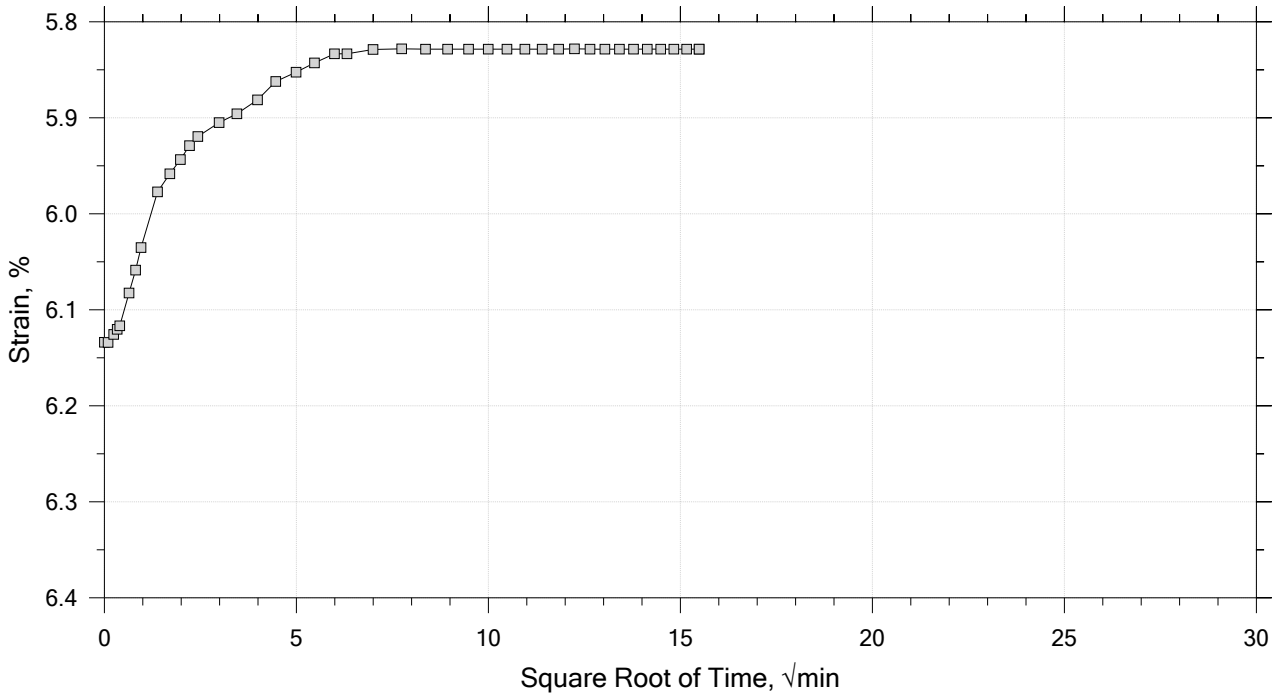


GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-201	Tested By: md	Checked By: njh
	Sample No.: U2	Test Date: 09/20/18	Depth: 35-37 ft
	Test No.: IP-2	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System II, Swell Pressure = 0.0727 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 11 of 22
Constant Load Step
Stress: 0.5 tsf





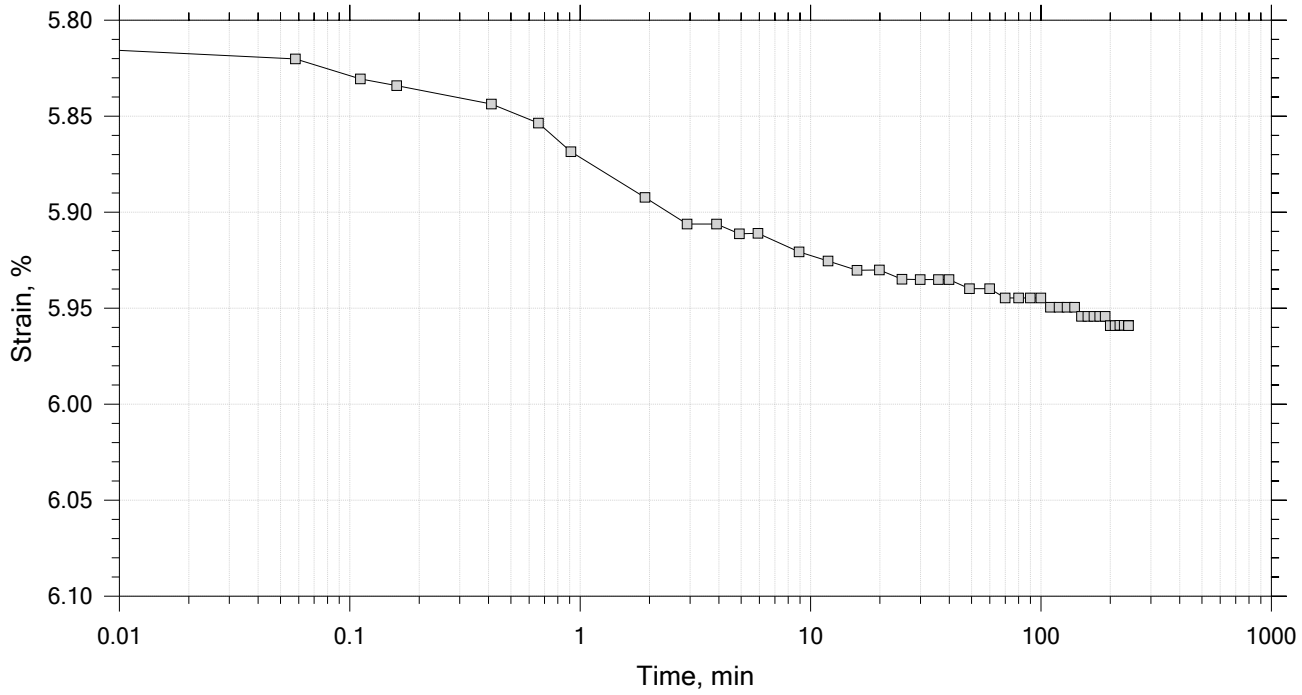
Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
Boring No.: BB-PVS-201	Tested By: md	Checked By: njh
Sample No.: U2	Test Date: 09/20/18	Depth: 35-37 ft
Test No.: IP-2	Sample Type: intact	Elevation: ---
Description: Moist, dark gray clay		
Remarks: System II, Swell Pressure = 0.0727 tsf		

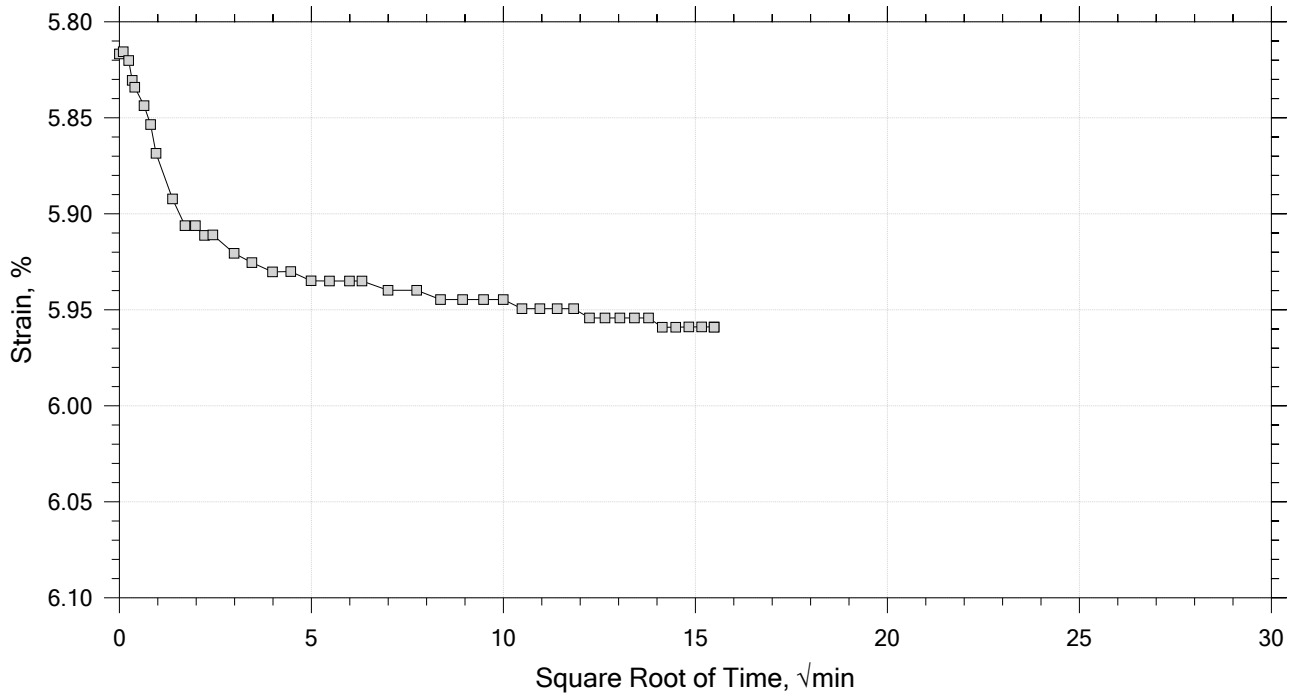
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 12 of 22

Constant Load Step

Stress: 1 tsf

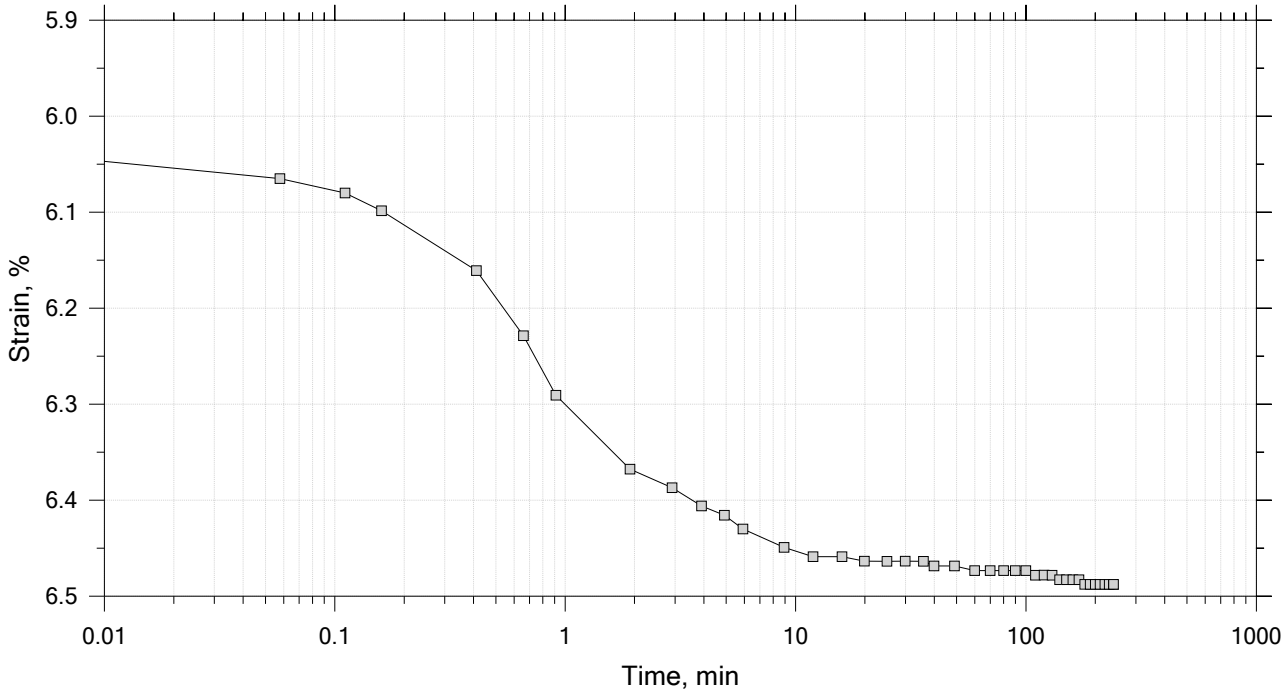


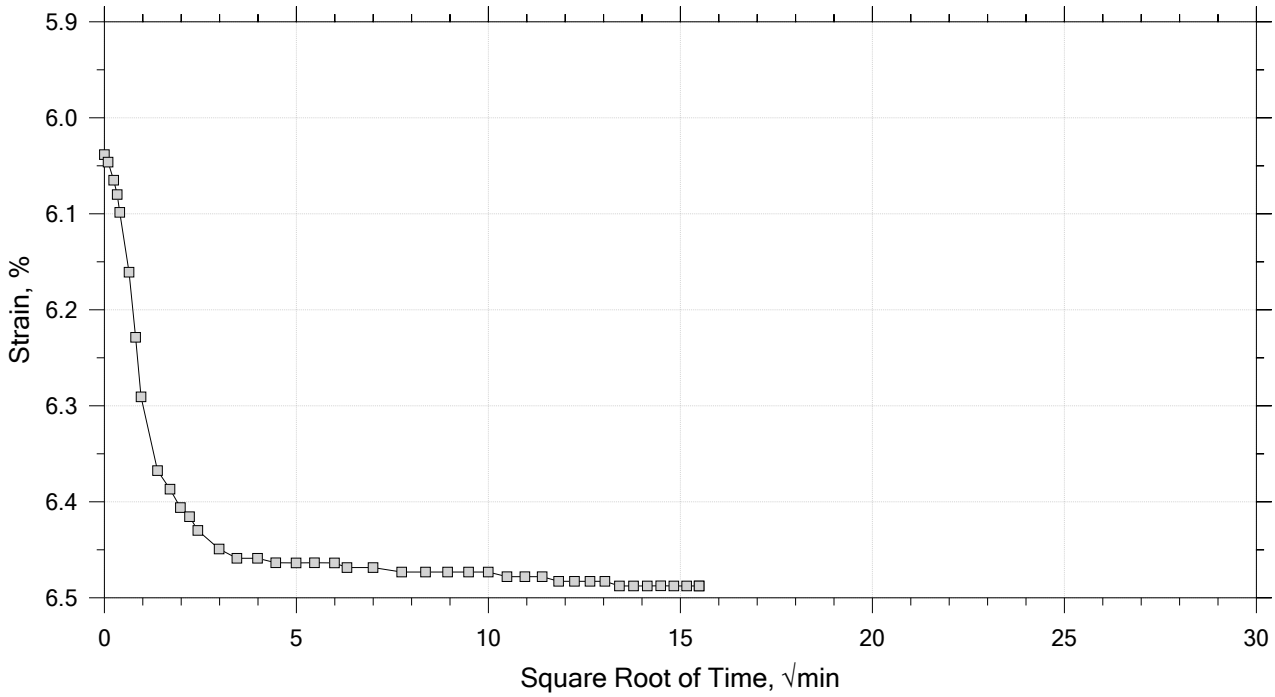


GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-201	Tested By: md	Checked By: njh
	Sample No.: U2	Test Date: 09/20/18	Depth: 35-37 ft
	Test No.: IP-2	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System II, Swell Pressure = 0.0727 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 13 of 22
Constant Load Step
Stress: 2 tsf





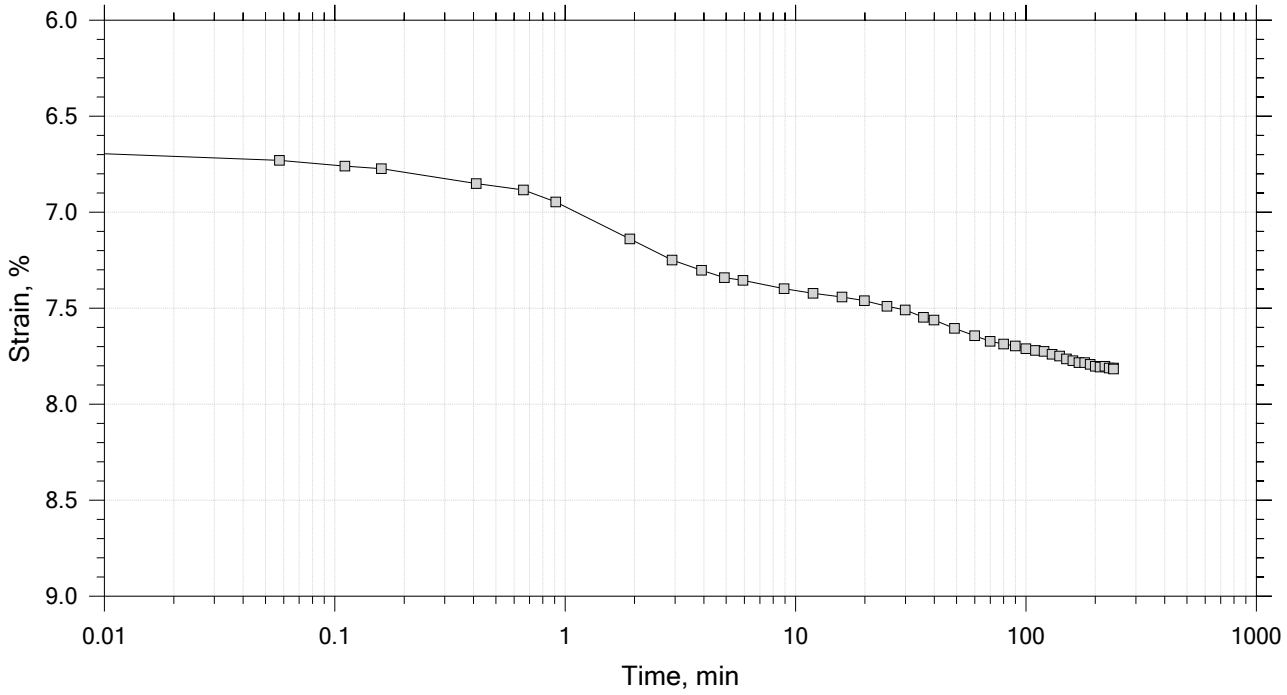
Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
Boring No.: BB-PVS-201	Tested By: md	Checked By: njh
Sample No.: U2	Test Date: 09/20/18	Depth: 35-37 ft
Test No.: IP-2	Sample Type: intact	Elevation: ---
Description: Moist, dark gray clay		
Remarks: System II, Swell Pressure = 0.0727 tsf		

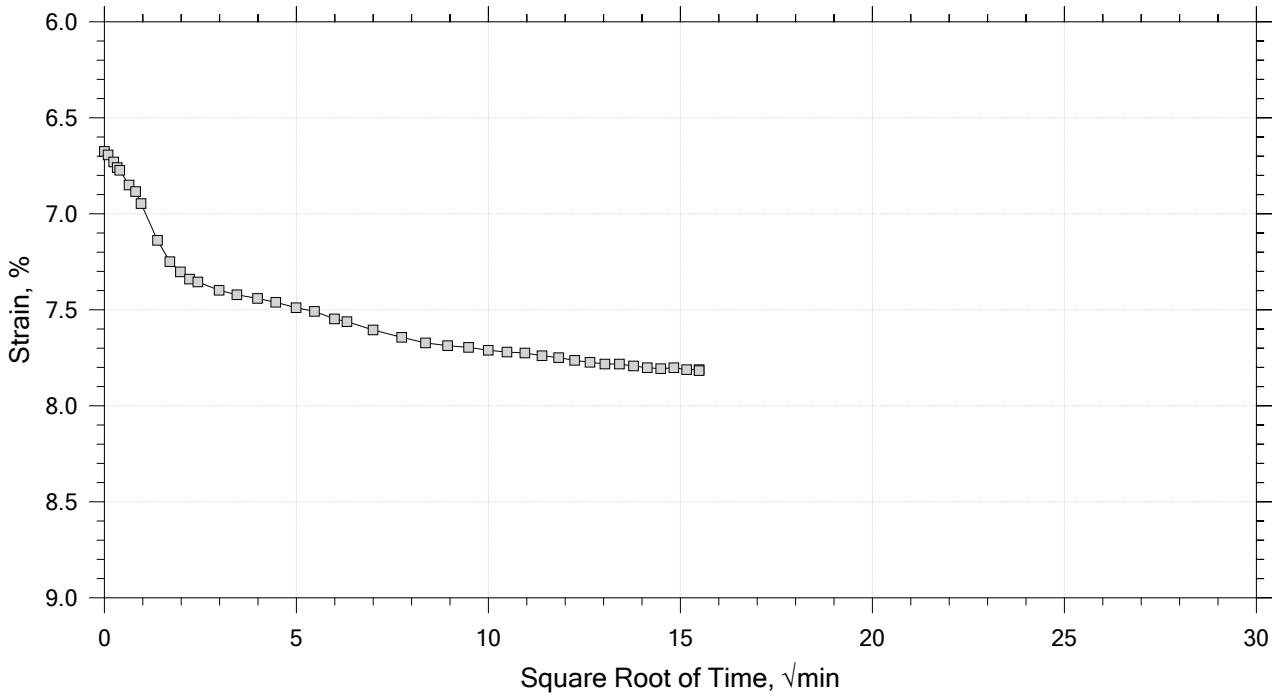
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 14 of 22

Constant Load Step

Stress: 4 tsf

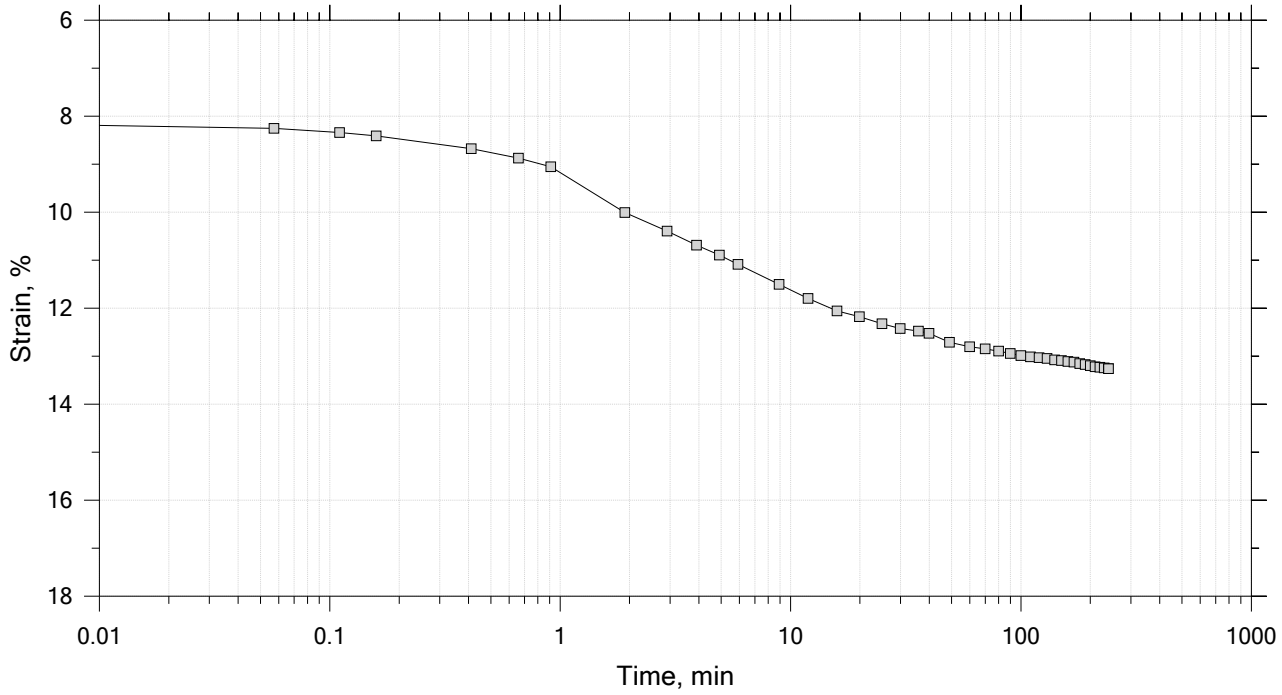


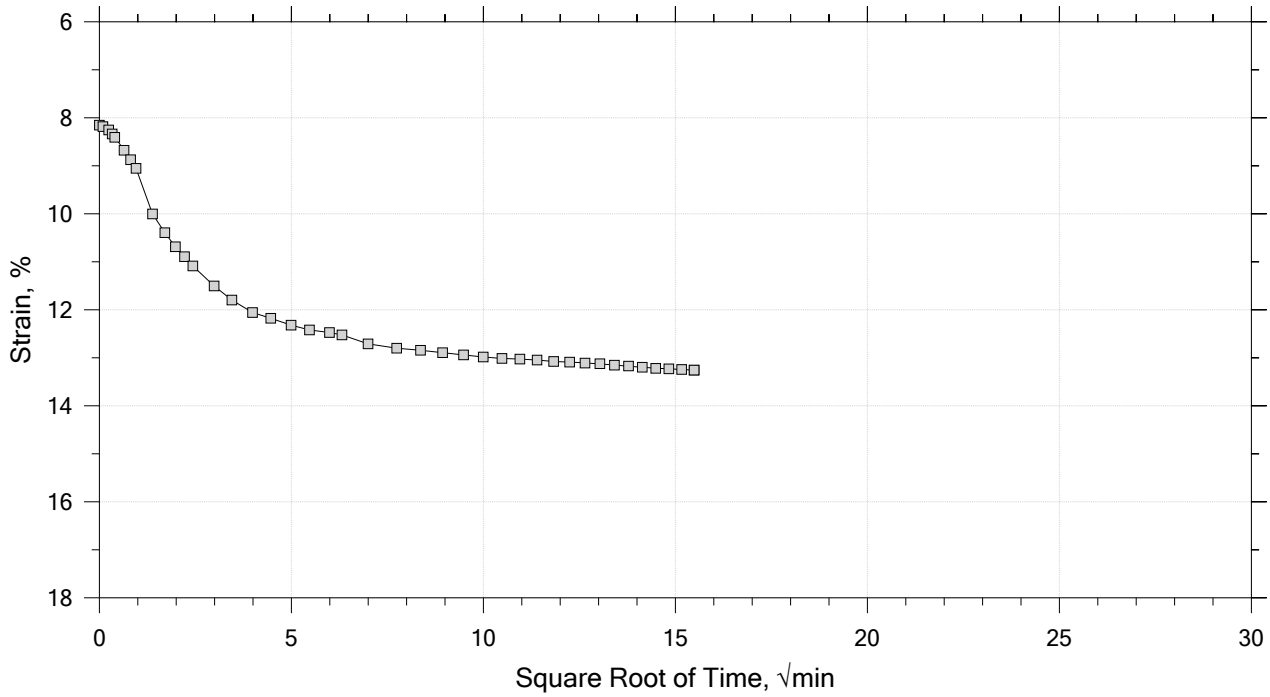


GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-201	Tested By: md	Checked By: njh
	Sample No.: U2	Test Date: 09/20/18	Depth: 35-37 ft
	Test No.: IP-2	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System II, Swell Pressure = 0.0727 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 15 of 22
Constant Load Step
Stress: 8 tsf

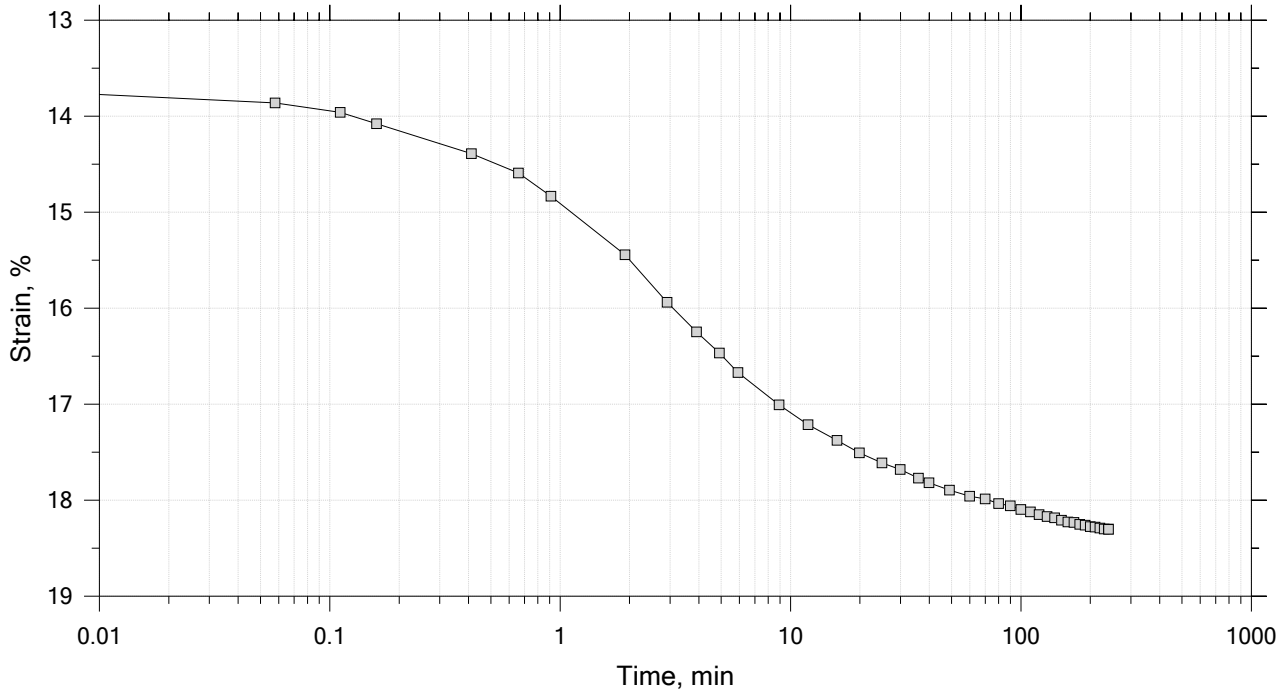


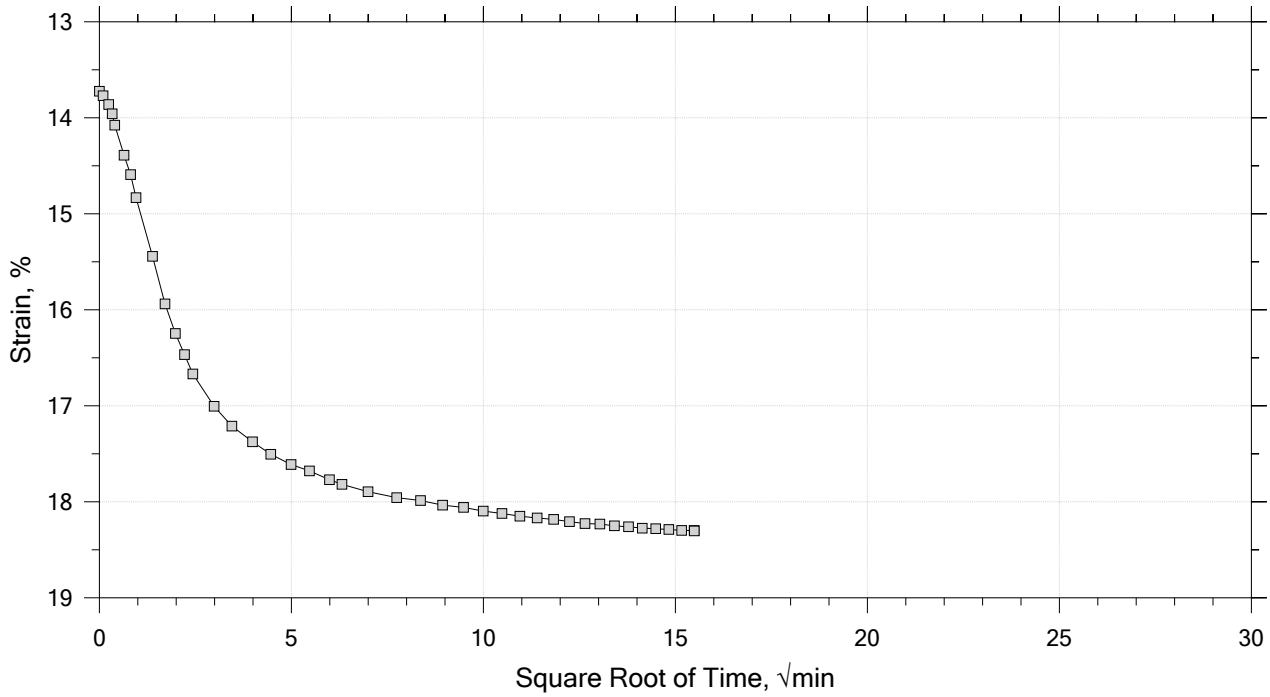


GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-201	Tested By: md	Checked By: njh
	Sample No.: U2	Test Date: 09/20/18	Depth: 35-37 ft
	Test No.: IP-2	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System II, Swell Pressure = 0.0727 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 16 of 22
Constant Load Step
Stress: 16 tsf





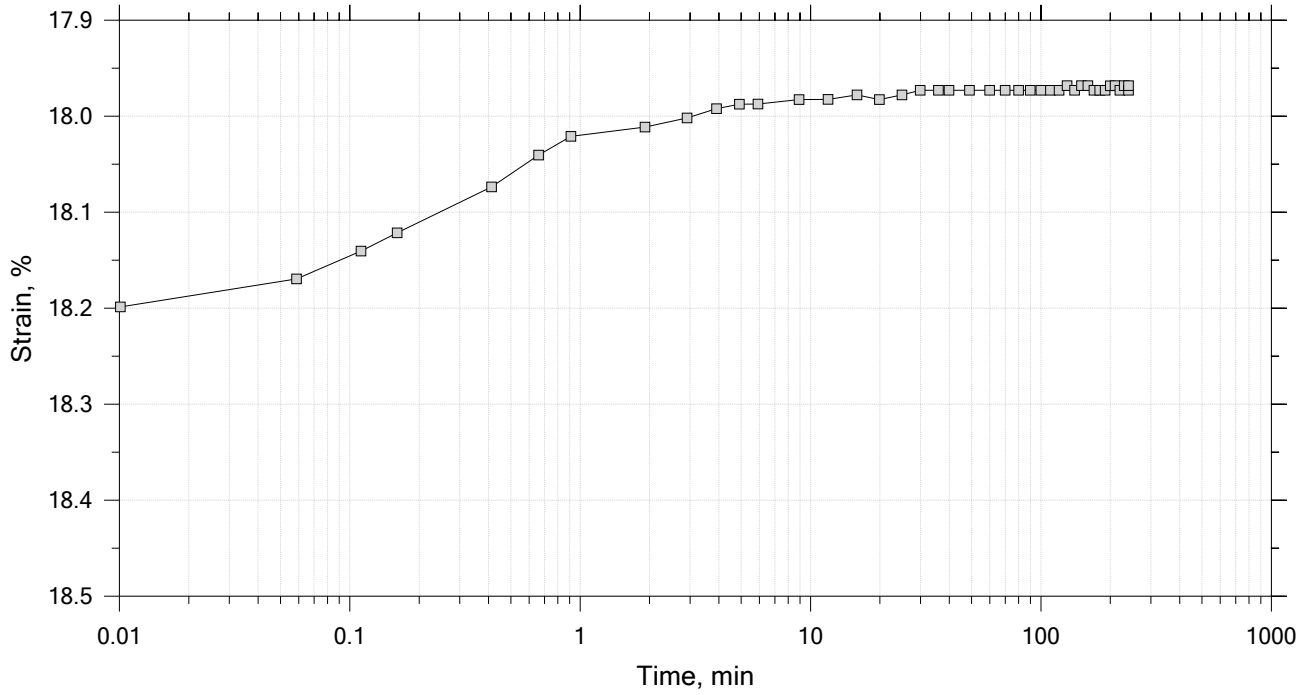
GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-201	Tested By: md	Checked By: njh
	Sample No.: U2	Test Date: 09/20/18	Depth: 35-37 ft
	Test No.: IP-2	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System II, Swell Pressure = 0.0727 tsf		

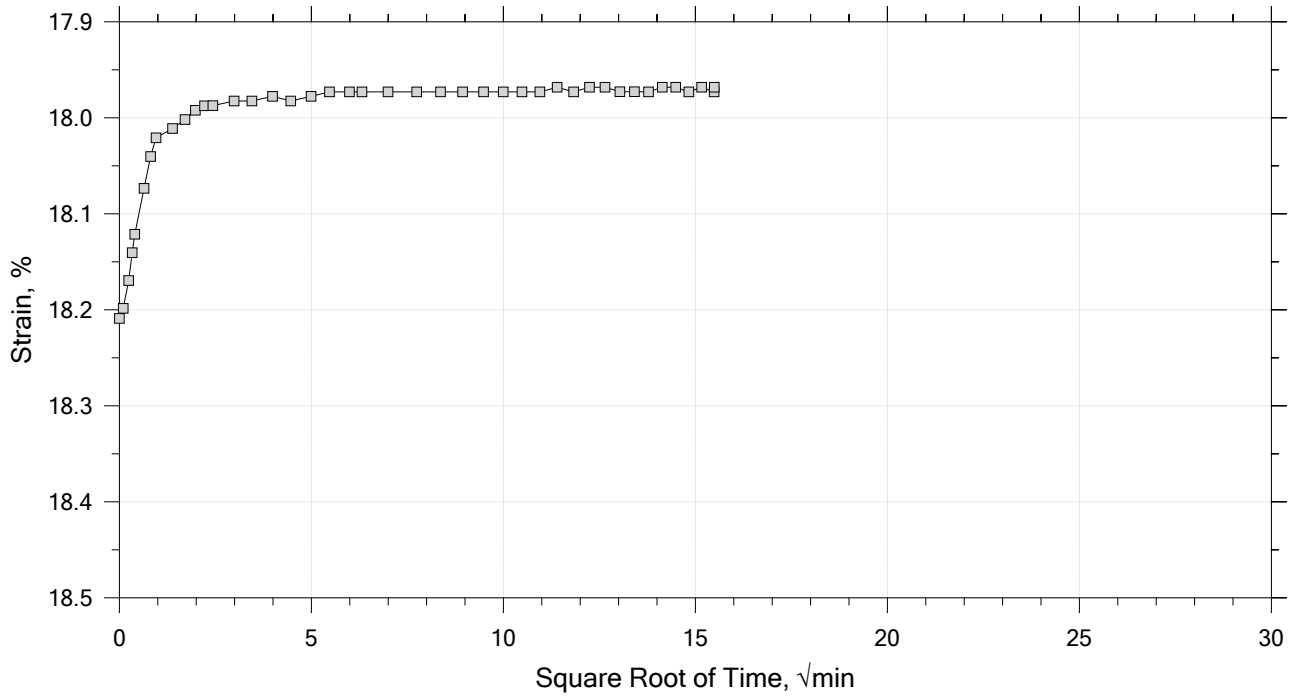
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 17 of 22

Constant Load Step

Stress: 8 tsf

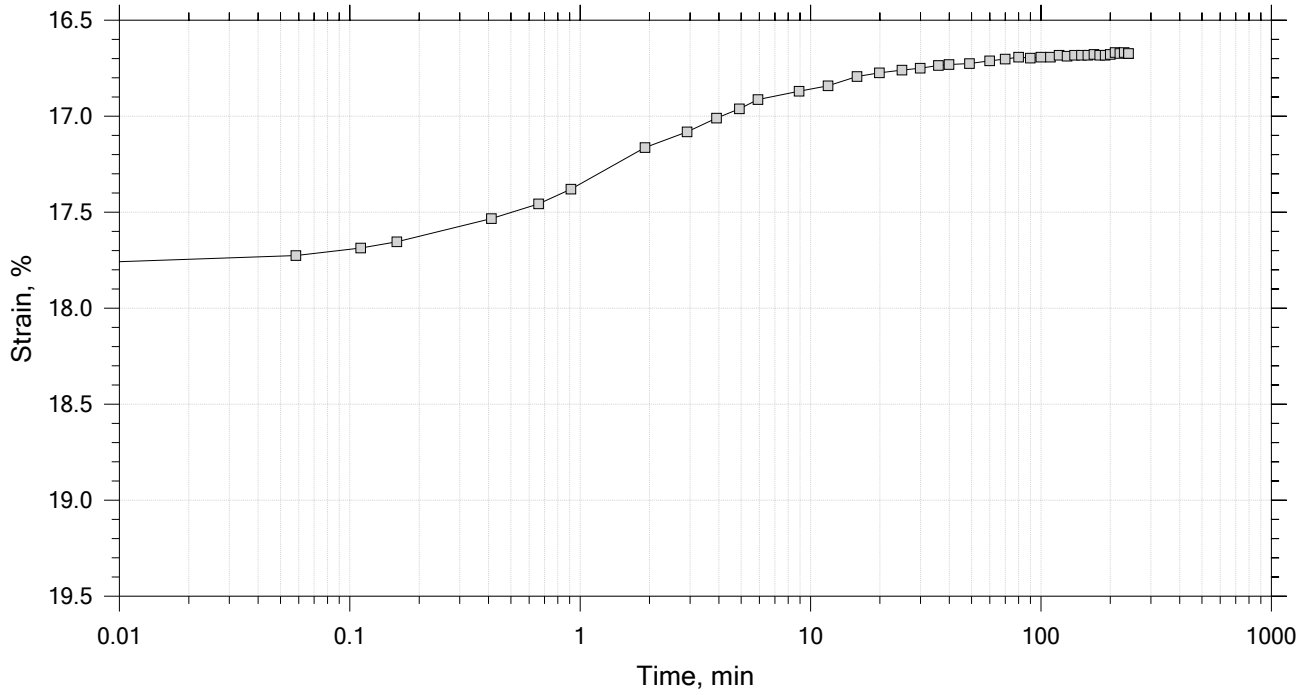


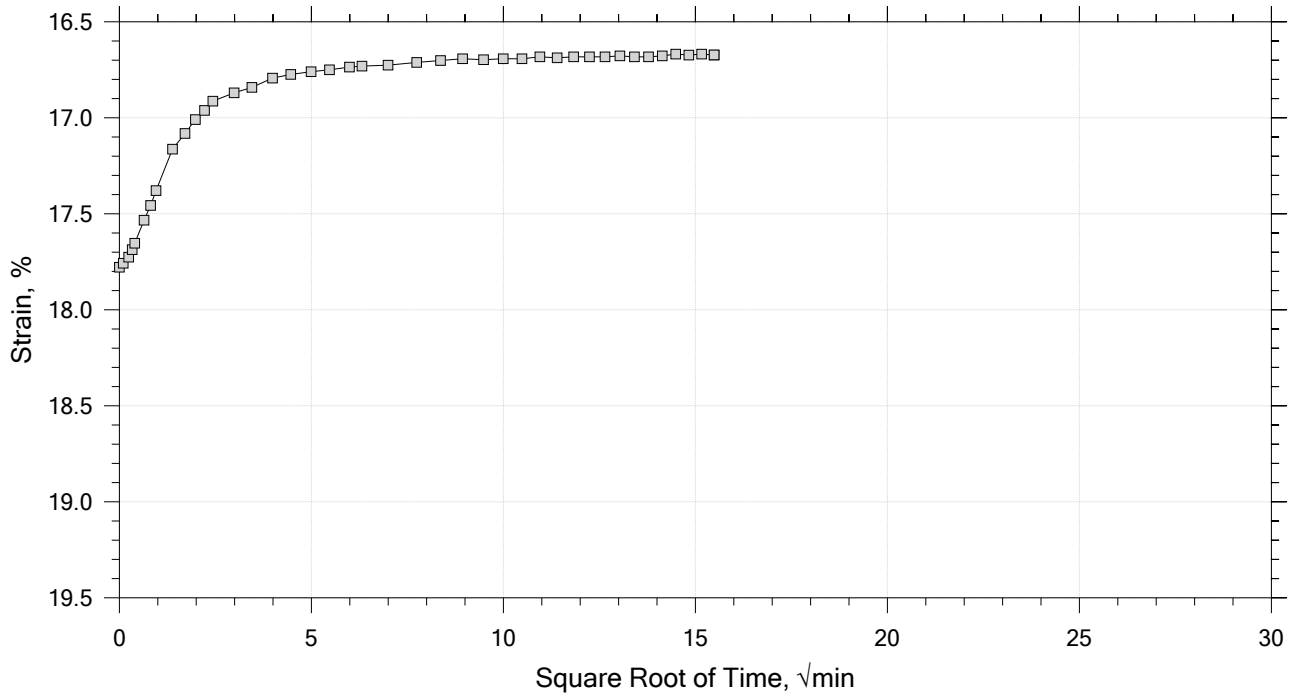


GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-201	Tested By: md	Checked By: njh
	Sample No.: U2	Test Date: 09/20/18	Depth: 35-37 ft
	Test No.: IP-2	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System II, Swell Pressure = 0.0727 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 18 of 22
Constant Load Step
Stress: 2 tsf

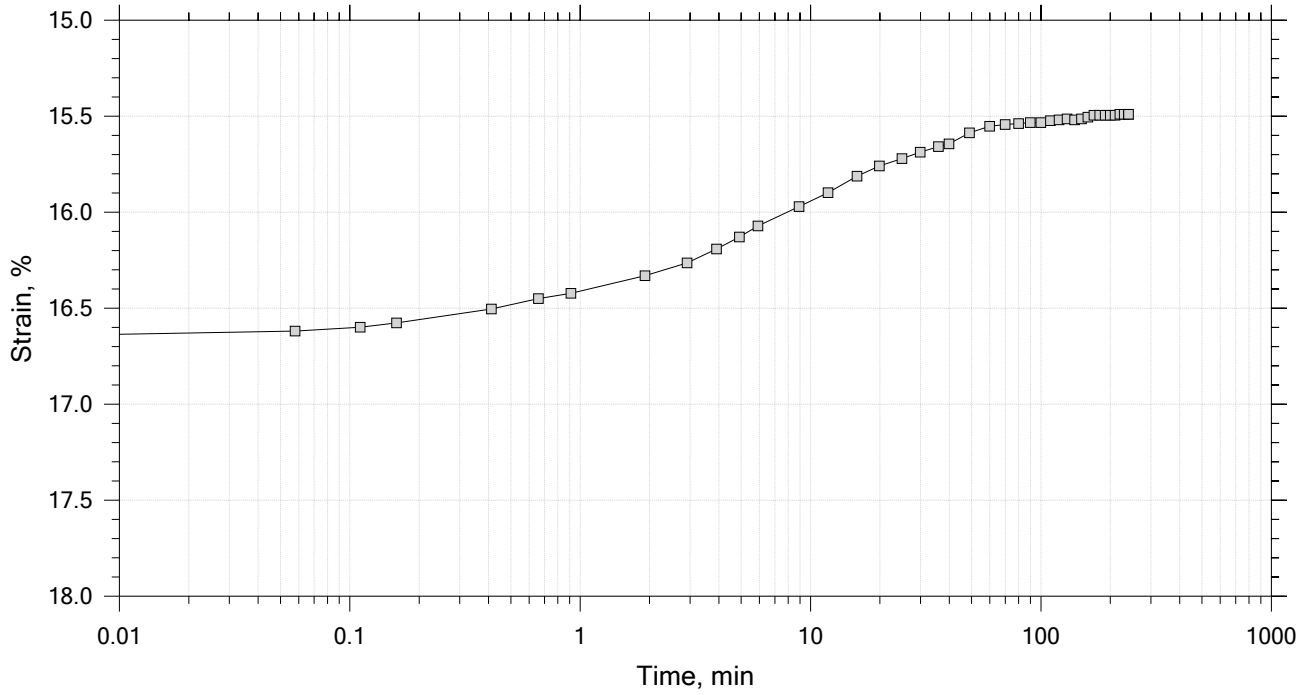


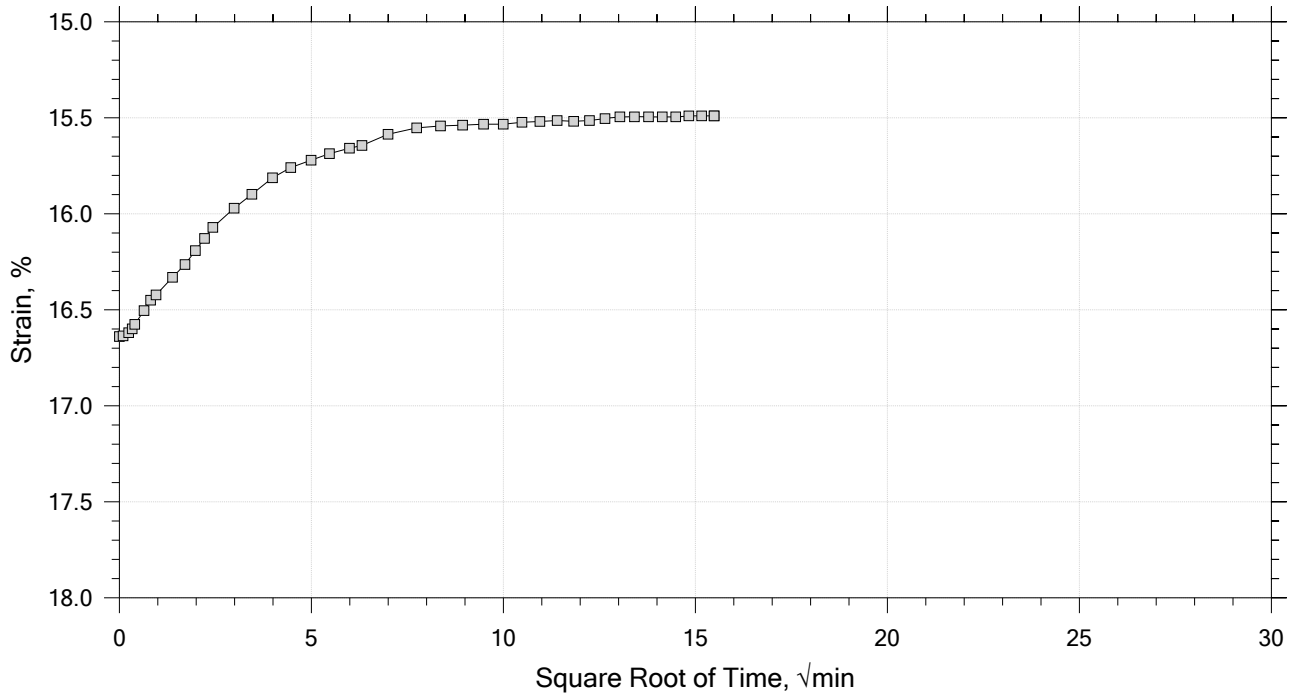


GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-201	Tested By: md	Checked By: njh
	Sample No.: U2	Test Date: 09/20/18	Depth: 35-37 ft
	Test No.: IP-2	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System II, Swell Pressure = 0.0727 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 19 of 22
Constant Load Step
Stress: 0.75 tsf

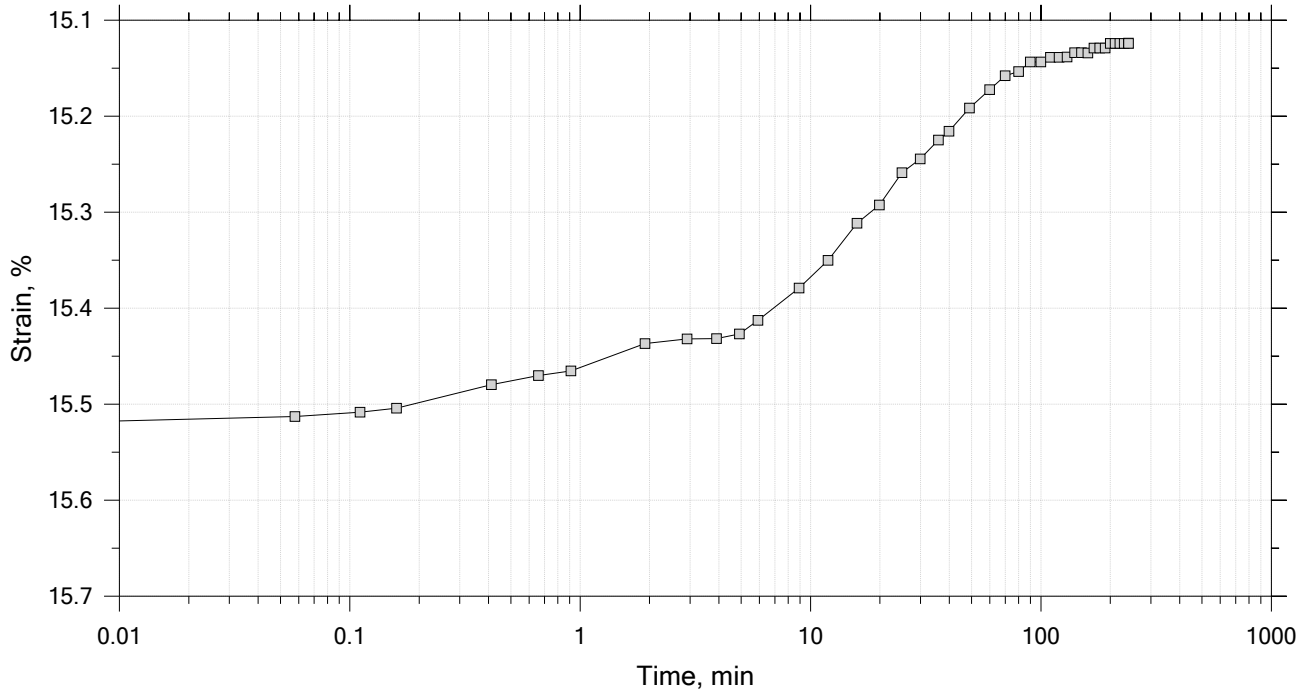


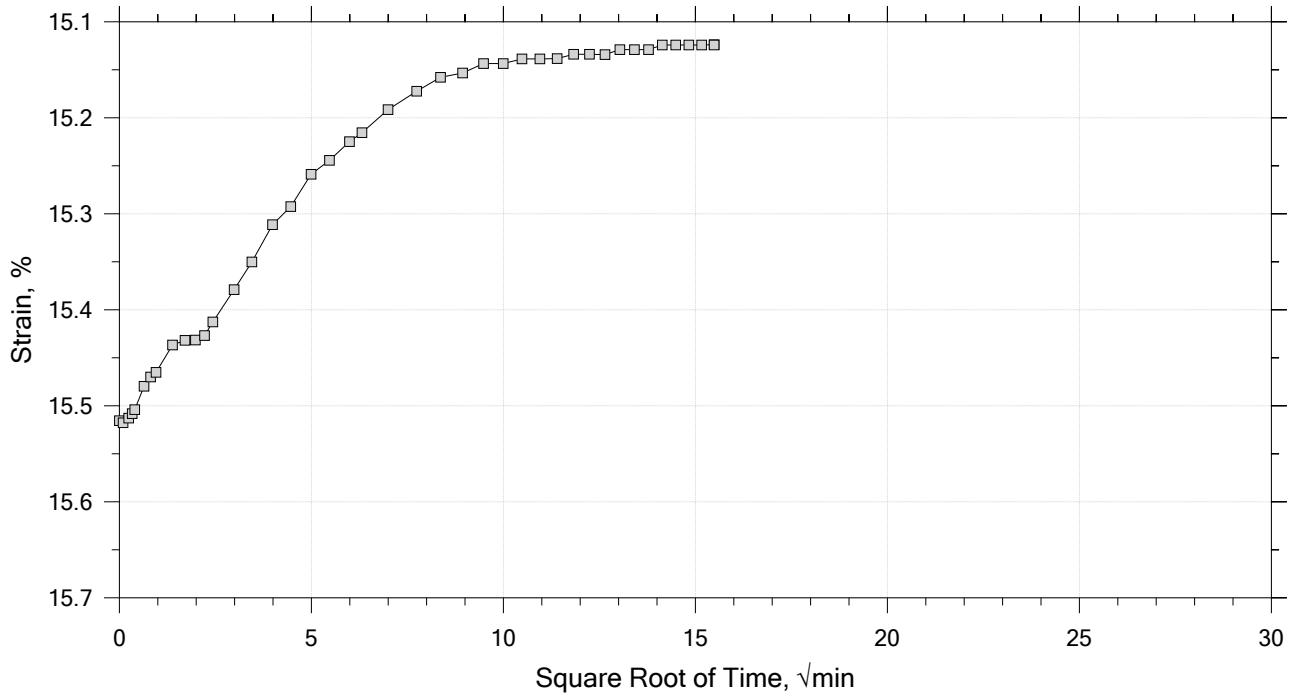


Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
Boring No.: BB-PVS-201	Tested By: md	Checked By: njh
Sample No.: U2	Test Date: 09/20/18	Depth: 35-37 ft
Test No.: IP-2	Sample Type: intact	Elevation: ---
Description: Moist, dark gray clay		
Remarks: System II, Swell Pressure = 0.0727 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 20 of 22
Constant Load Step
Stress: 0.5 tsf

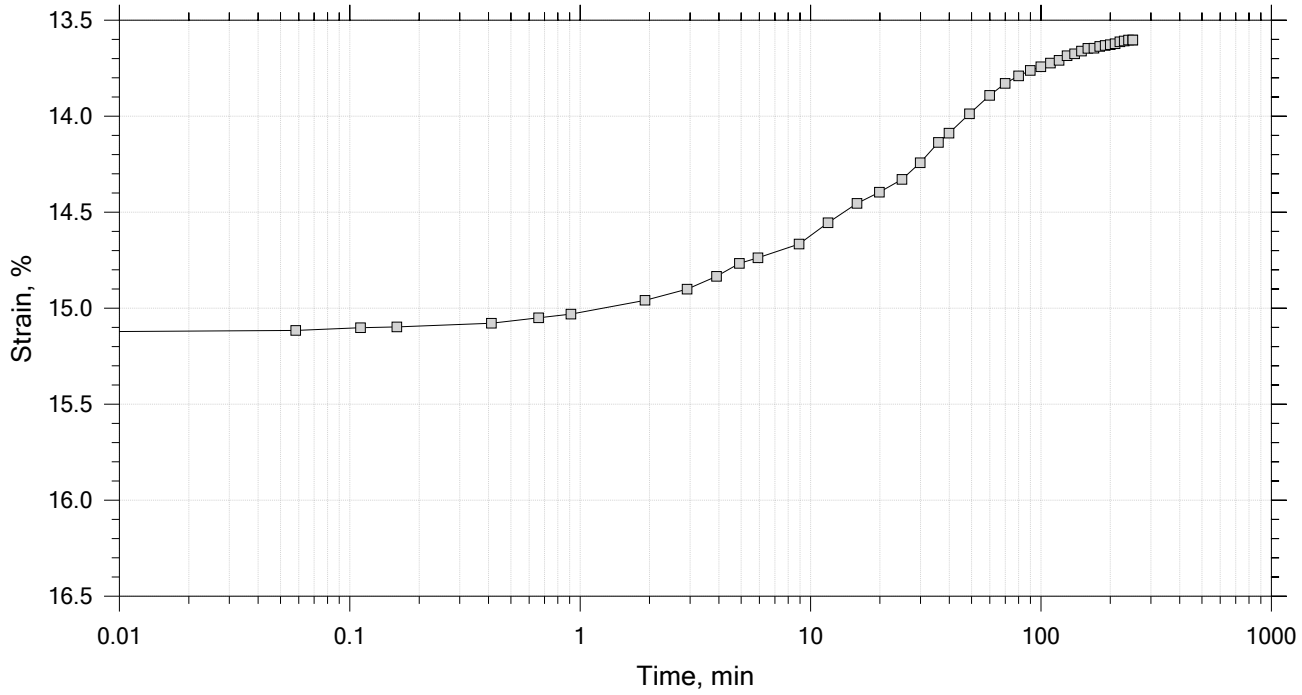


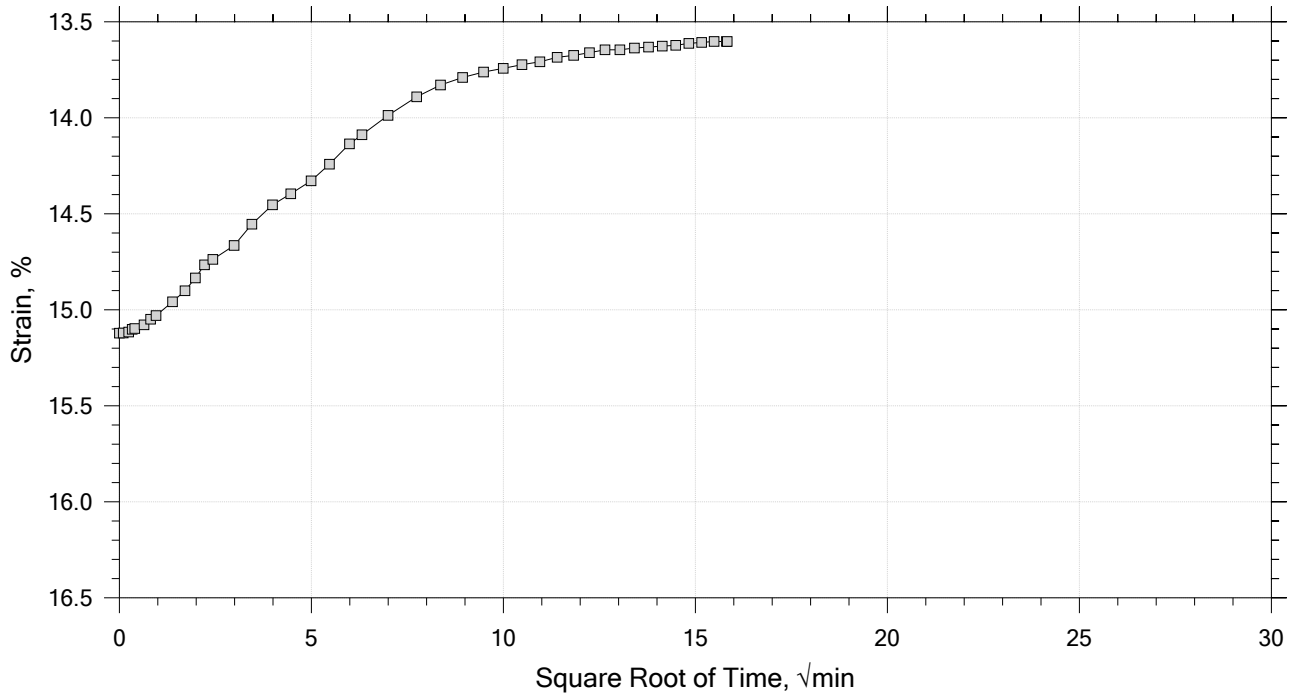


Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
Boring No.: BB-PVS-201	Tested By: md	Checked By: njh
Sample No.: U2	Test Date: 09/20/18	Depth: 35-37 ft
Test No.: IP-2	Sample Type: intact	Elevation: ---
Description: Moist, dark gray clay		
Remarks: System II, Swell Pressure = 0.0727 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 21 of 22
Constant Load Step
Stress: 0.125 tsf

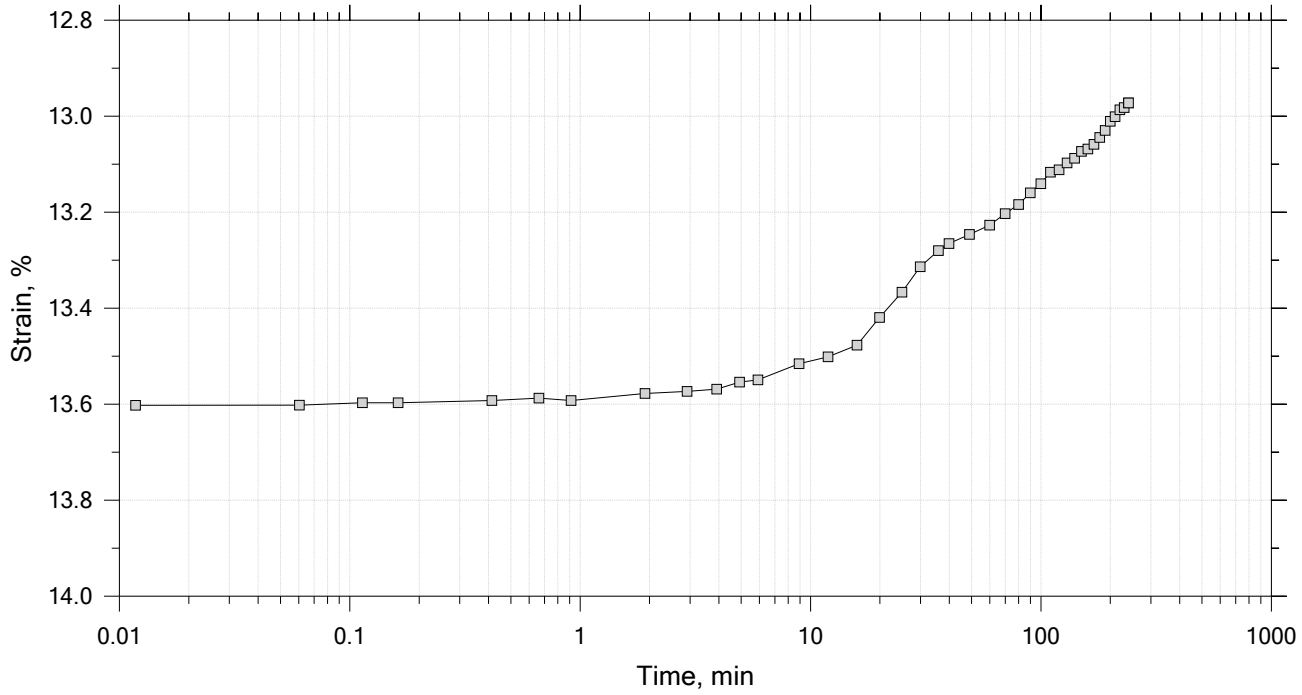


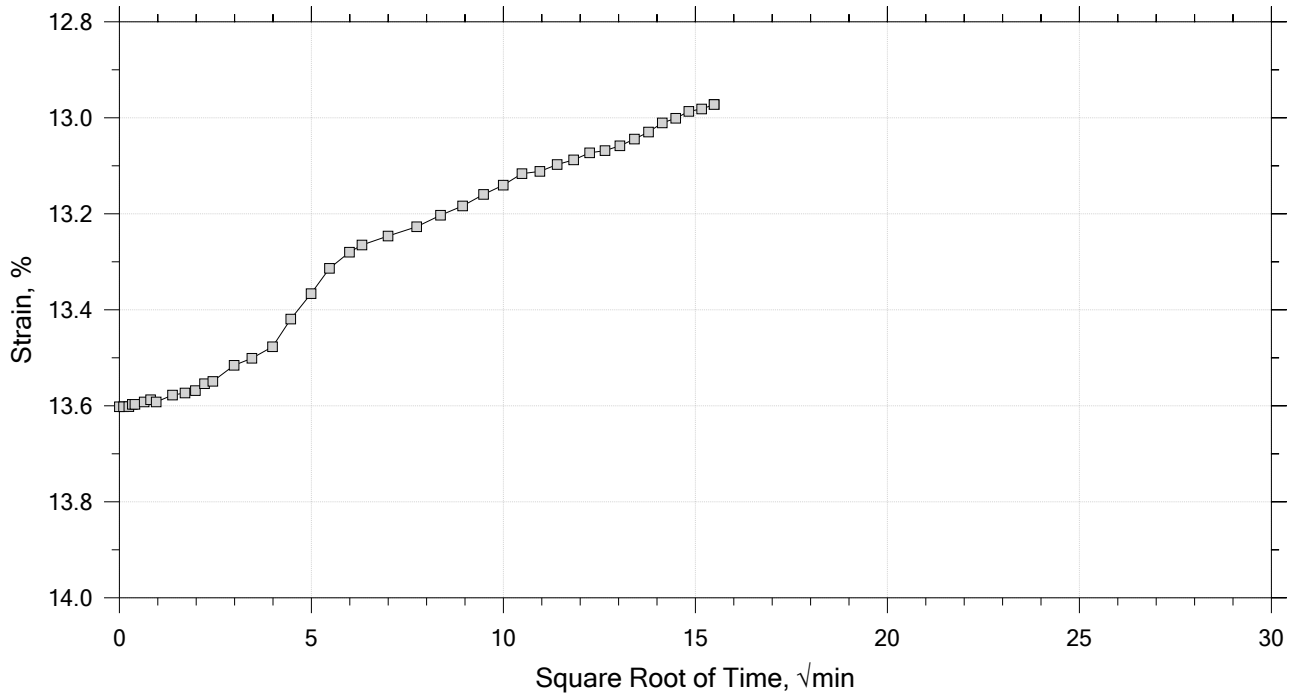


Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
Boring No.: BB-PVS-201	Tested By: md	Checked By: njh
Sample No.: U2	Test Date: 09/20/18	Depth: 35-37 ft
Test No.: IP-2	Sample Type: intact	Elevation: ---
Description: Moist, dark gray clay		
Remarks: System II, Swell Pressure = 0.0727 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 22 of 22
Constant Load Step
Stress: 0.0625 tsf





Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
Boring No.: BB-PVS-201	Tested By: md	Checked By: njh
Sample No.: U2	Test Date: 09/20/18	Depth: 35-37 ft
Test No.: IP-2	Sample Type: intact	Elevation: ---
Description: Moist, dark gray clay		
Remarks: System II, Swell Pressure = 0.0727 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Specimen Diameter: 2.50 in	Estimated Specific Gravity: 2.76	Liquid Limit: 42
Initial Height: 1.00 in	Initial Void Ratio: 1.13	Plastic Limit: 25
Final Height: 0.88 in	Final Void Ratio: 0.873	Plasticity Index: 17

	Before Test Trimmings	Before Test Specimen	After Test Specimen	After Test Trimmings
Container ID	A-2340	RING		A-2471
Mass Container, gm	8.08	109.1	109.1	8.5
Mass Container + Wet Soil, gm	154.72	256.05	246.49	146.05
Mass Container + Dry Soil, gm	111.94	213.49	213.49	113.01
Mass Dry Soil, gm	103.86	104.39	104.39	104.51
Water Content, %	41.19	40.77	31.61	31.61
Void Ratio	---	1.13	0.87	---
Degree of Saturation, %	---	99.78	100.00	---
Dry Unit Weight, pcf	---	81.014	92.061	---

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.

GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-201	Tested By: md	Checked By: njh
	Sample No.: U2	Test Date: 09/20/18	Depth: 35-37 ft
	Test No.: IP-2	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System II, Swell Pressure = 0.0727 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Log of Time Coefficients

Step	Applied Stress tsf	Final Displacement in	Void Ratio	Strain at End %	Log T50 min	Cv ft²/s	Mv 1/tsf	k ft/day	Ca %
1	0.0727	0.002833	1.12	0.283	0.000	0.00e+00	3.90e-02	0.00e+00	0.00e+00
2	0.125	0.004351	1.12	0.435	0.000	0.00e+00	2.90e-02	0.00e+00	0.00e+00
3	0.250	0.006977	1.11	0.698	0.000	0.00e+00	2.10e-02	0.00e+00	0.00e+00
4	0.500	0.01183	1.10	1.18	1.344	4.16e-06	1.94e-02	2.18e-04	0.00e+00
5	0.750	0.01512	1.10	1.51	0.000	0.00e+00	1.32e-02	0.00e+00	0.00e+00
6	1.00	0.01769	1.09	1.77	0.000	0.00e+00	1.03e-02	0.00e+00	0.00e+00
7	2.00	0.02953	1.07	2.95	0.000	0.00e+00	1.18e-02	0.00e+00	0.00e+00
8	4.00	0.06864	0.983	6.86	5.153	1.00e-06	1.96e-02	5.27e-05	0.00e+00
9	2.00	0.06550	0.989	6.55	0.000	0.00e+00	1.57e-03	0.00e+00	0.00e+00
10	1.00	0.06132	0.998	6.13	0.000	0.00e+00	4.18e-03	0.00e+00	0.00e+00
11	0.500	0.05828	1.00	5.83	0.000	0.00e+00	6.07e-03	0.00e+00	0.00e+00
12	1.00	0.05959	1.00	5.96	1.316	3.84e-06	2.61e-03	2.70e-05	0.00e+00
13	2.00	0.06488	0.991	6.49	0.843	5.95e-06	5.29e-03	8.48e-05	0.00e+00
14	4.00	0.07817	0.962	7.82	1.834	2.68e-06	6.64e-03	4.80e-05	0.00e+00
15	8.00	0.1326	0.847	13.3	2.509	1.82e-06	1.36e-02	6.67e-05	0.00e+00
16	16.0	0.1830	0.739	18.3	2.368	1.71e-06	6.31e-03	2.90e-05	0.00e+00
17	8.00	0.1797	0.746	18.0	0.000	0.00e+00	4.20e-04	0.00e+00	0.00e+00
18	2.00	0.1667	0.774	16.7	1.305	2.99e-06	2.16e-03	1.74e-05	0.00e+00
19	0.750	0.1549	0.799	15.5	4.371	9.18e-07	9.46e-03	2.34e-05	0.00e+00
20	0.500	0.1512	0.807	15.1	13.561	3.02e-07	1.46e-02	1.19e-05	0.00e+00
21	0.125	0.1360	0.839	13.6	0.000	0.00e+00	4.06e-02	0.00e+00	0.00e+00
22	0.0625	0.1297	0.853	13.0	0.000	0.00e+00	1.01e-01	0.00e+00	0.00e+00

GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-201	Tested By: md	Checked By: njh
	Sample No.: U2	Test Date: 09/20/18	Depth: 35-37 ft
	Test No.: IP-2	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System II, Swell Pressure = 0.0727 tsf		
	Displacement at End of Increment		

One-Dimensional Consolidation by ASTM D2435 - Method B

Square Root of Time Coefficients

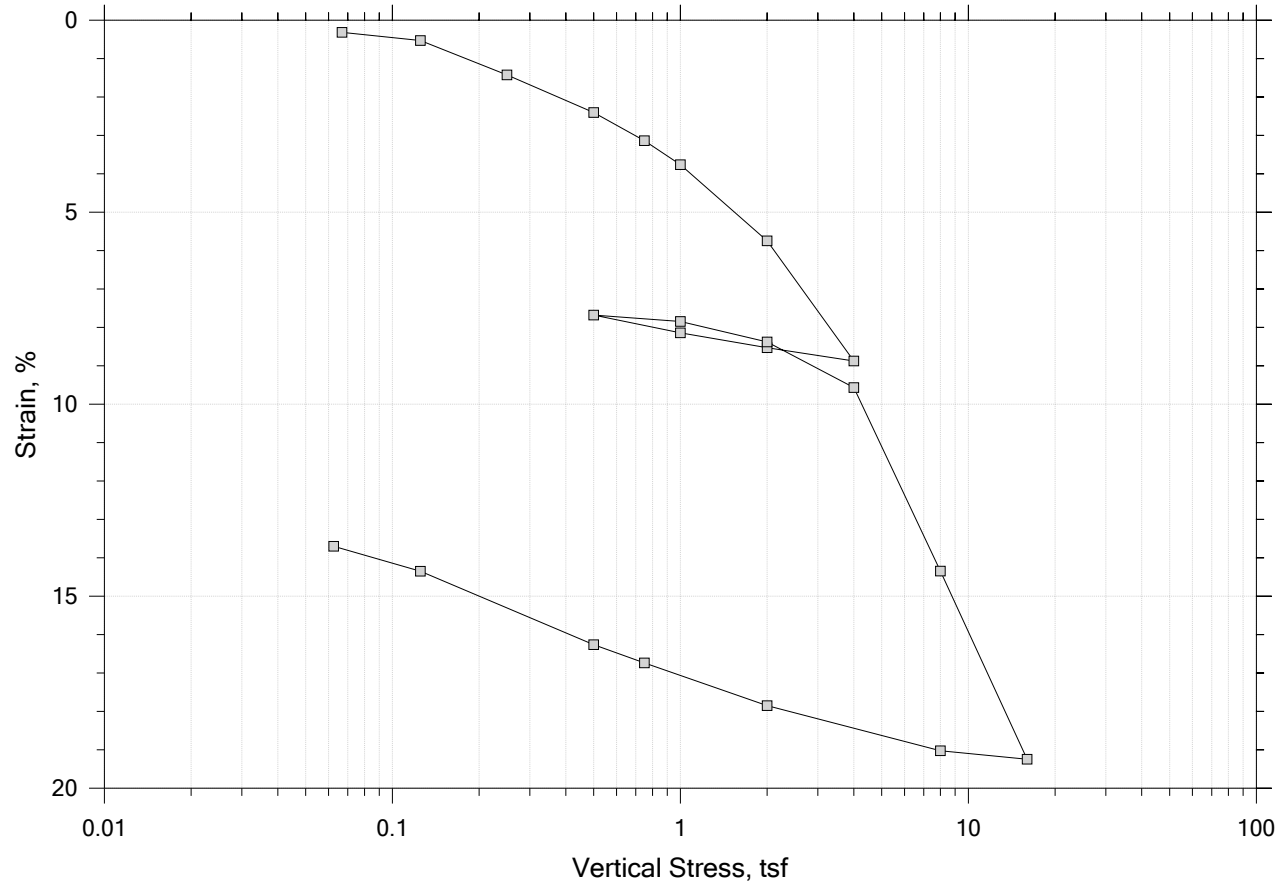
Step	Applied Stress tsf	Final Displacement in	Void Ratio	Strain at End %	Sq.Rt. T90 min	Cv ft²/s	Mv 1/tsf	k ft/day
1	0.0727	0.002833	1.12	0.283	15.901	1.54e-06	3.90e-02	1.62e-04
2	0.125	0.004351	1.12	0.435	22.939	1.06e-06	2.90e-02	8.31e-05
3	0.250	0.006977	1.11	0.698	9.924	2.44e-06	2.10e-02	1.38e-04
4	0.500	0.01183	1.10	1.18	5.796	4.15e-06	1.94e-02	2.17e-04
5	0.750	0.01512	1.10	1.51	10.619	2.25e-06	1.32e-02	7.99e-05
6	1.00	0.01769	1.09	1.77	139.911	1.70e-07	1.03e-02	4.71e-06
7	2.00	0.02953	1.07	2.95	119.910	1.95e-07	1.18e-02	6.23e-06
8	4.00	0.06864	0.983	6.86	30.415	7.29e-07	1.96e-02	3.85e-05
9	2.00	0.06550	0.989	6.55	2.925	7.30e-06	1.57e-03	3.09e-05
10	1.00	0.06132	0.998	6.13	9.538	2.26e-06	4.18e-03	2.54e-05
11	0.500	0.05828	1.00	5.83	7.286	2.98e-06	6.07e-03	4.87e-05
12	1.00	0.05959	1.00	5.96	9.552	2.28e-06	2.61e-03	1.60e-05
13	2.00	0.06488	0.991	6.49	5.250	4.11e-06	5.29e-03	5.86e-05
14	4.00	0.07817	0.962	7.82	63.375	3.34e-07	6.64e-03	5.98e-06
15	8.00	0.1326	0.847	13.3	16.018	1.23e-06	1.36e-02	4.50e-05
16	16.0	0.1830	0.739	18.3	11.151	1.56e-06	6.31e-03	2.65e-05
17	8.00	0.1797	0.746	18.0	1.731	9.50e-06	4.20e-04	1.08e-05
18	2.00	0.1667	0.774	16.7	7.382	2.27e-06	2.16e-03	1.32e-05
19	0.750	0.1549	0.799	15.5	21.731	7.95e-07	9.46e-03	2.03e-05
20	0.500	0.1512	0.807	15.1	70.337	2.50e-07	1.46e-02	9.87e-06
21	0.125	0.1360	0.839	13.6	94.509	1.90e-07	4.06e-02	2.08e-05
22	0.0625	0.1297	0.853	13.0	218.577	8.44e-08	1.01e-01	2.30e-05

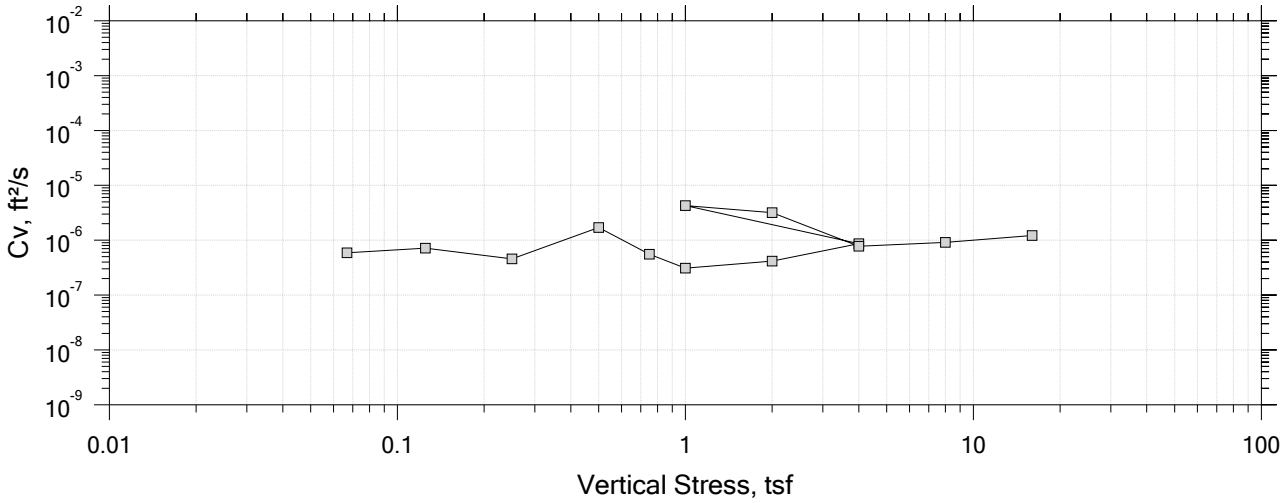
GeoTesting EXPRESS

Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
Boring No.: BB-PVS-201	Tested By: md	Checked By: njh
Sample No.: U2	Test Date: 09/20/18	Depth: 35-37 ft
Test No.: IP-2	Sample Type: intact	Elevation: ---
Description: Moist, dark gray clay		
Remarks: System II, Swell Pressure = 0.0727 tsf		
Displacement at End of Increment		

One-Dimensional Consolidation by ASTM D2435 - Method B

Summary Report





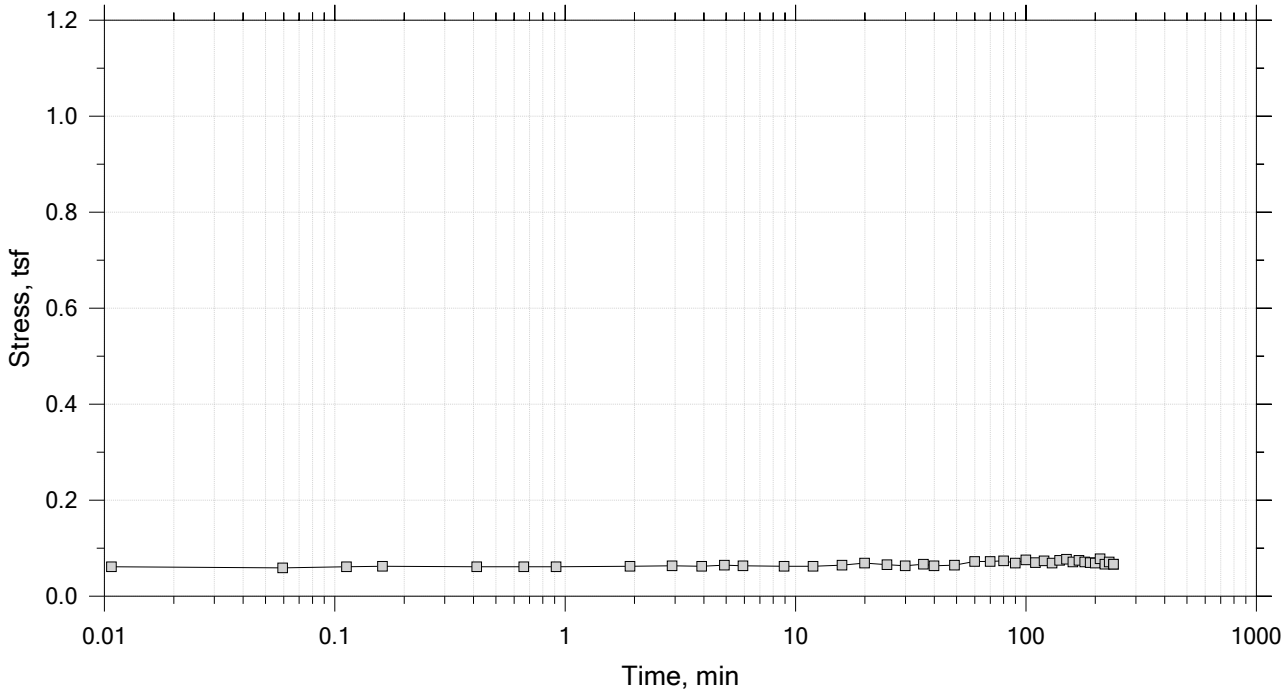
GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-201	Tested By: md	Checked By: njh
	Sample No.: U3	Test Date: 09/21/18	Depth: 45-47 ft
	Test No.: IP-3	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System E, Swell Pressure = 0.0668 tsf		
	Displacement at End of Increment		

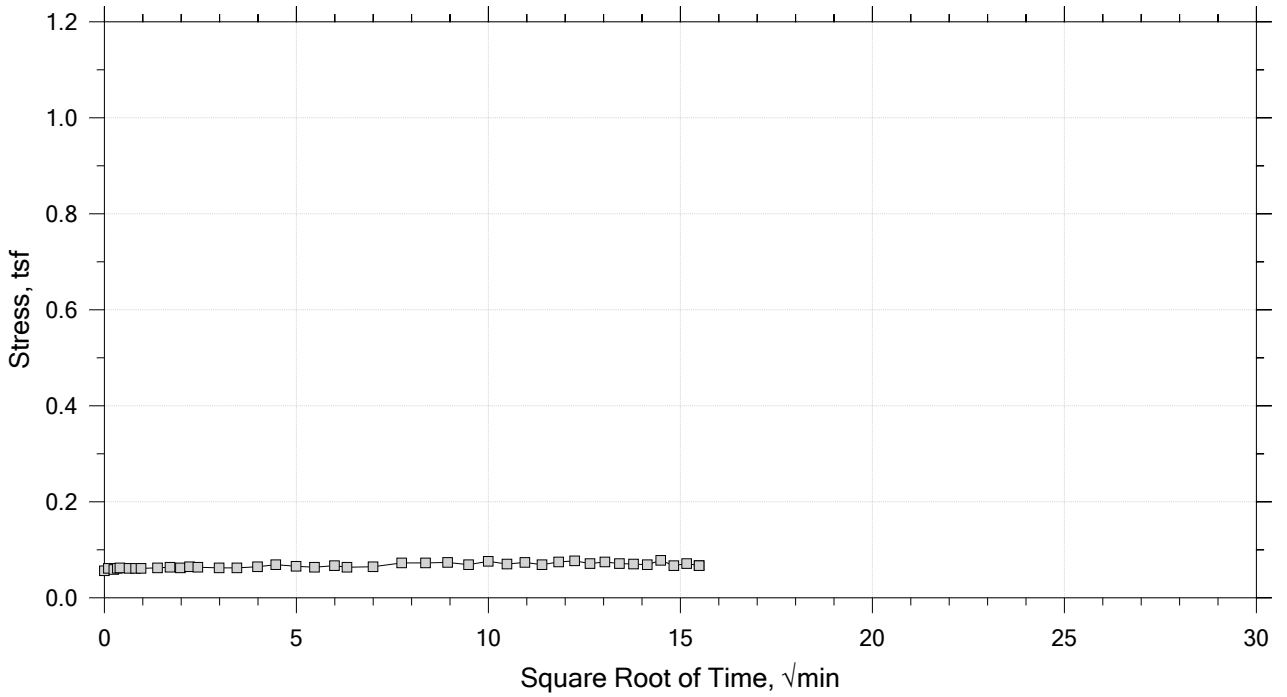
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 1 of 22

Constant Volume Step

Stress: 0.0668 tsf





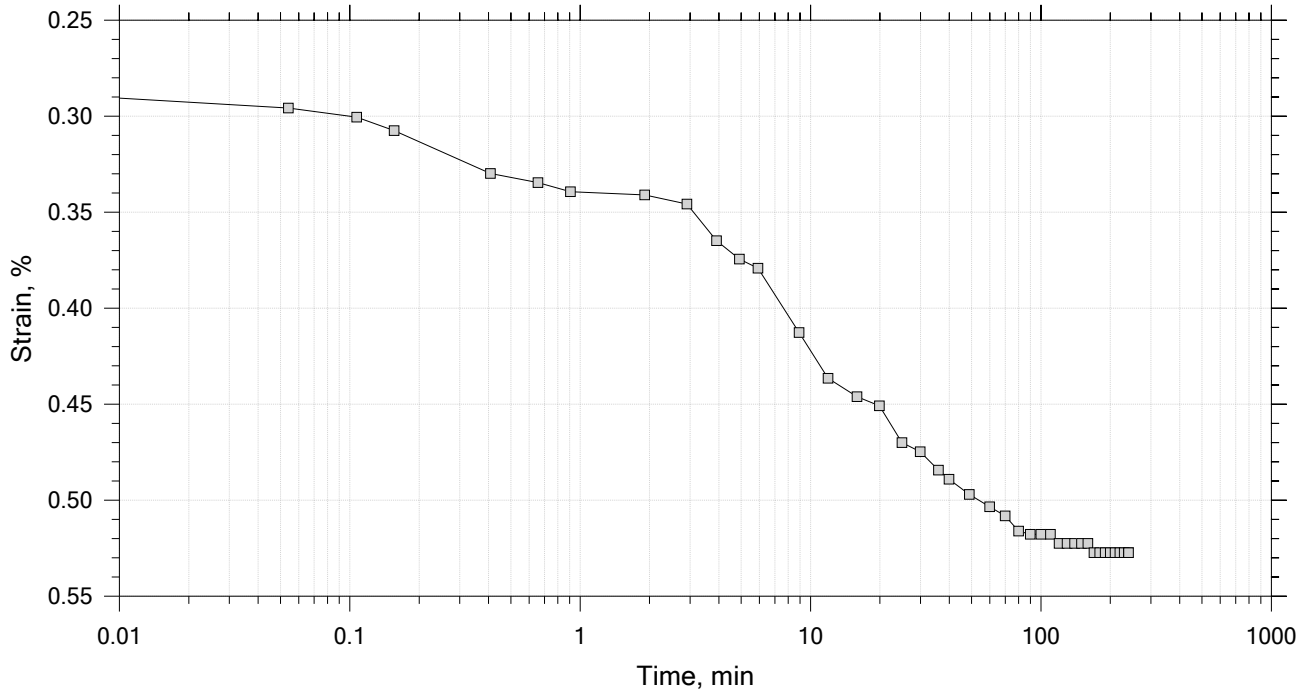
GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-201	Tested By: md	Checked By: njh
	Sample No.: U3	Test Date: 09/21/18	Depth: 45-47 ft
	Test No.: IP-3	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System E, Swell Pressure = 0.0668 tsf		

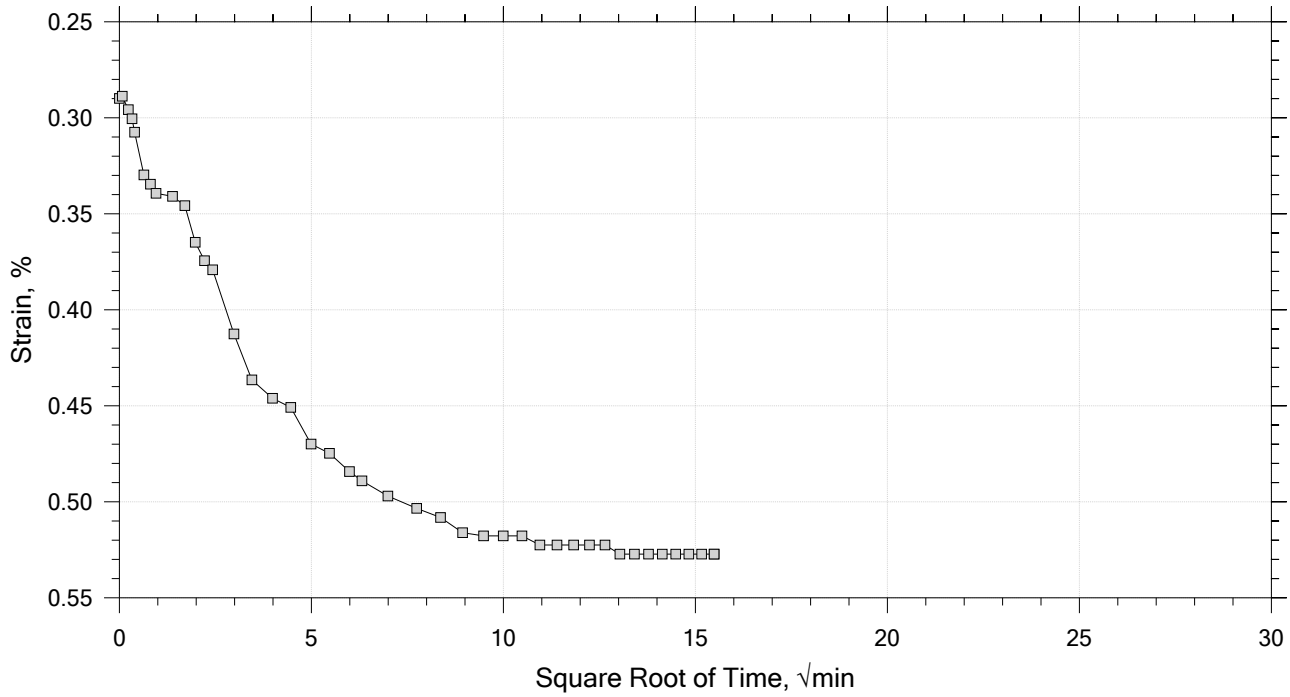
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 2 of 22

Constant Load Step

Stress: 0.125 tsf





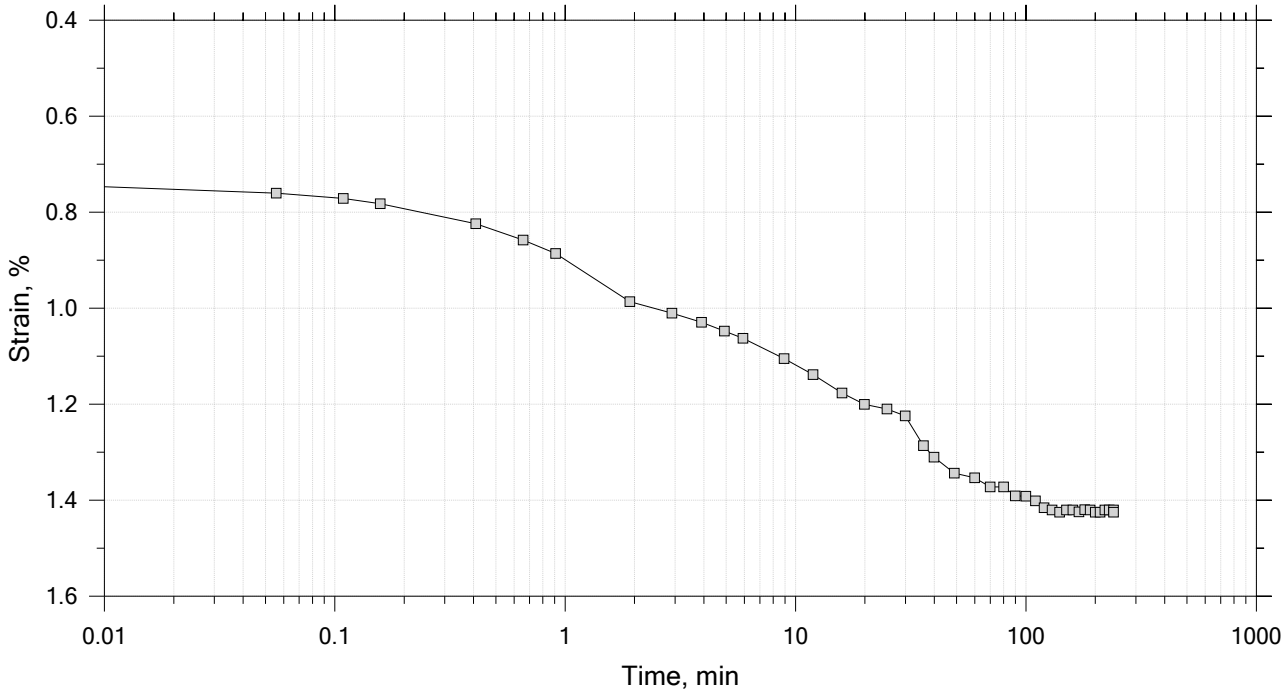
GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-201	Tested By: md	Checked By: njh
	Sample No.: U3	Test Date: 09/21/18	Depth: 45-47 ft
	Test No.: IP-3	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System E, Swell Pressure = 0.0668 tsf		

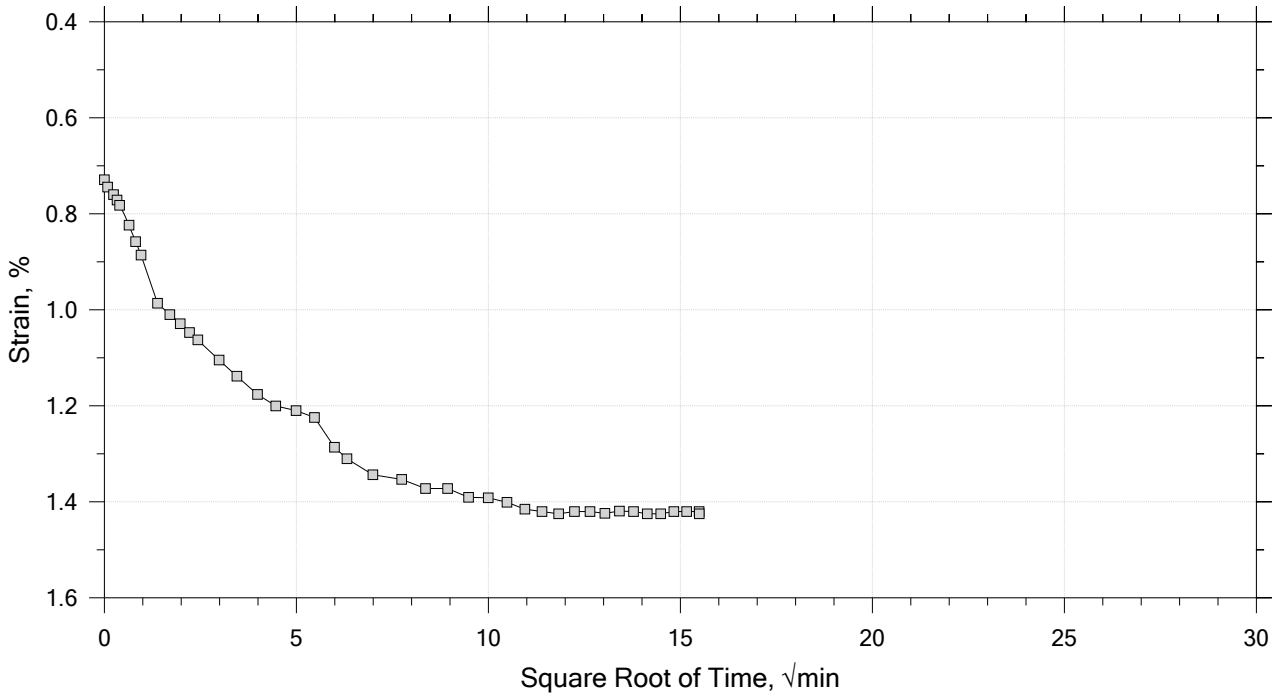
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 3 of 22

Constant Load Step

Stress: 0.25 tsf





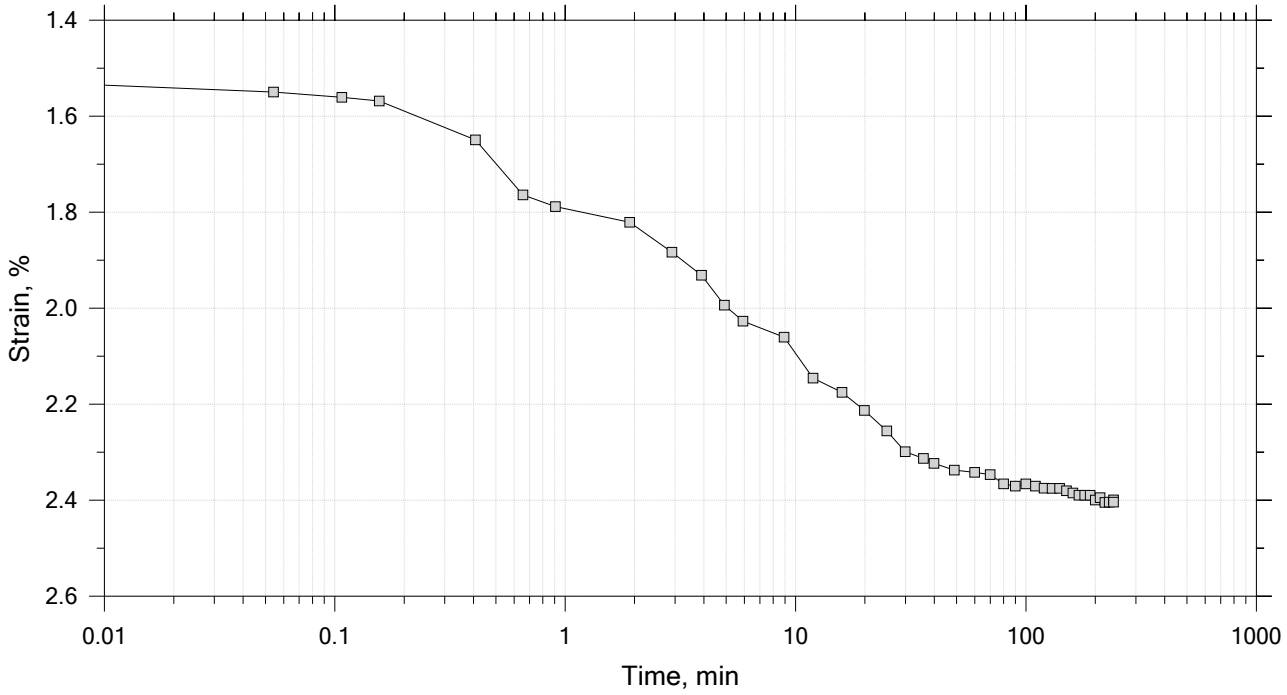
GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-201	Tested By: md	Checked By: njh
	Sample No.: U3	Test Date: 09/21/18	Depth: 45-47 ft
	Test No.: IP-3	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System E, Swell Pressure = 0.0668 tsf		

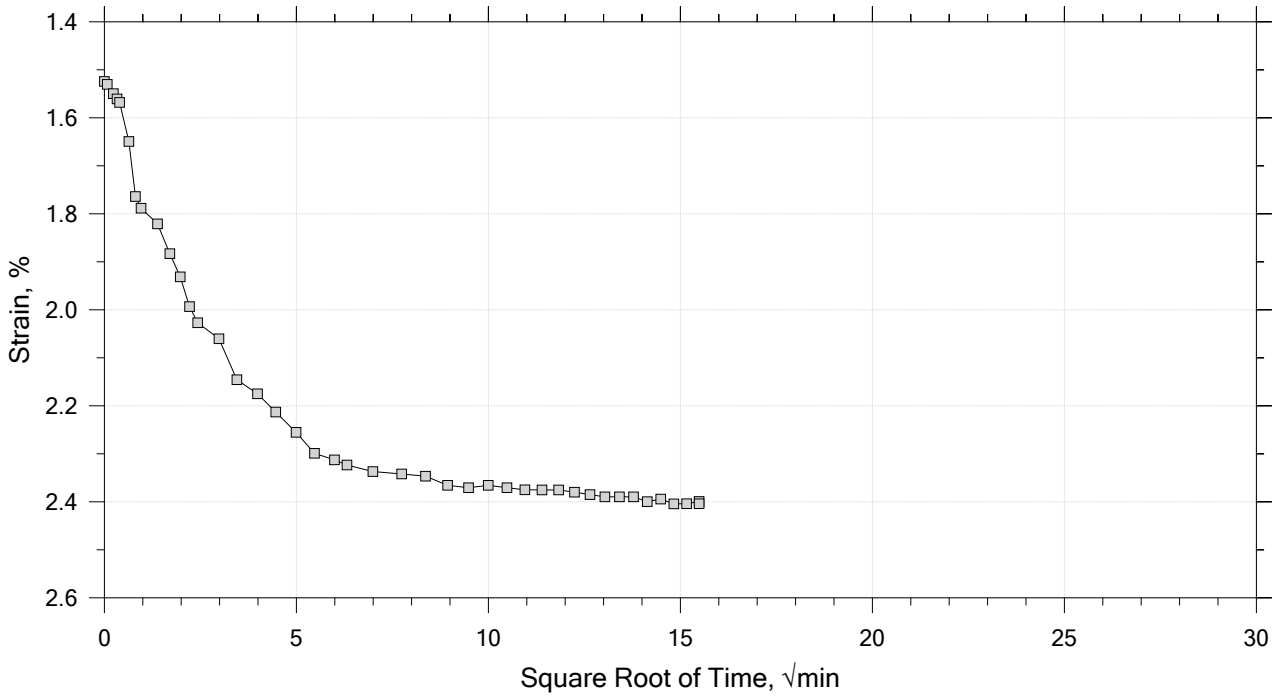
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 4 of 22

Constant Load Step

Stress: 0.5 tsf





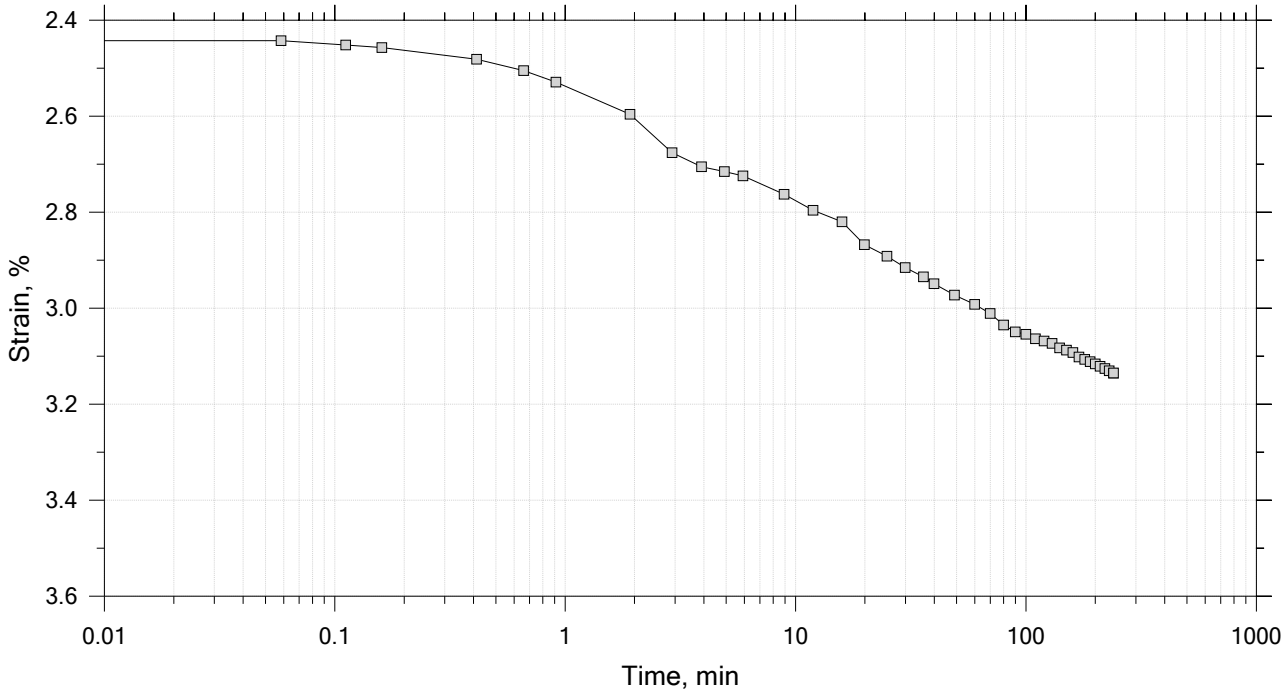
GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-201	Tested By: md	Checked By: njh
	Sample No.: U3	Test Date: 09/21/18	Depth: 45-47 ft
	Test No.: IP-3	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System E, Swell Pressure = 0.0668 tsf		

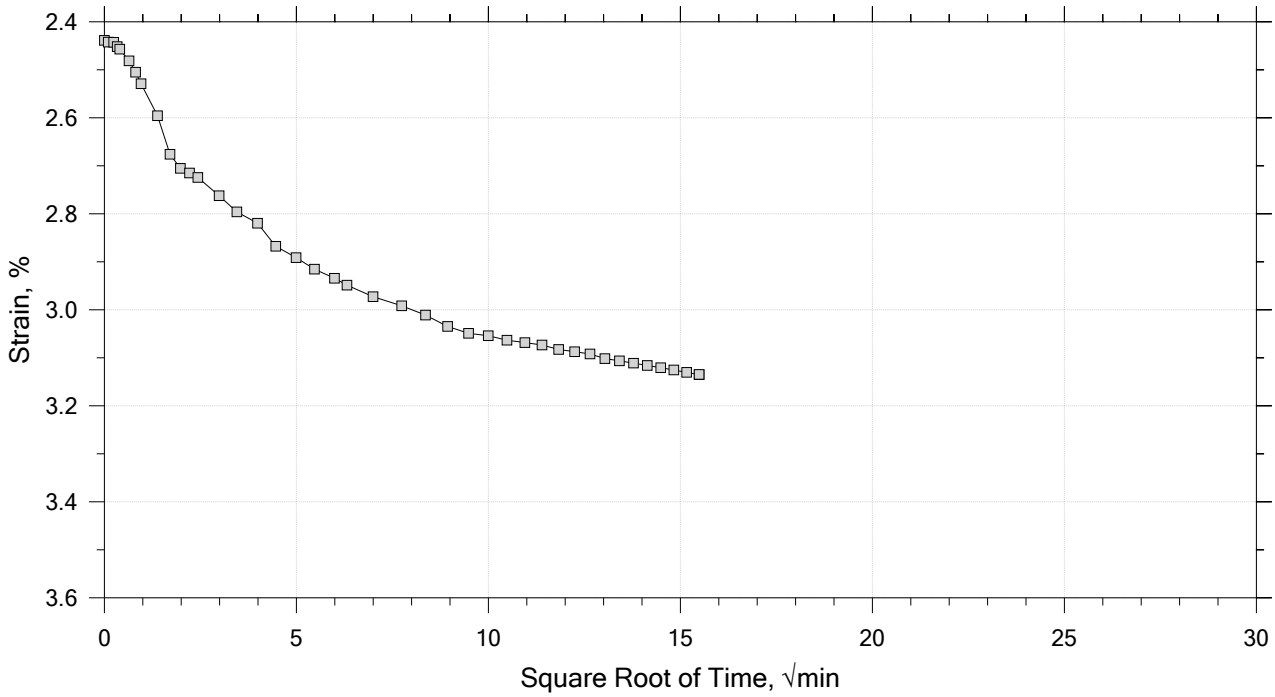
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 5 of 22

Constant Load Step

Stress: 0.75 tsf





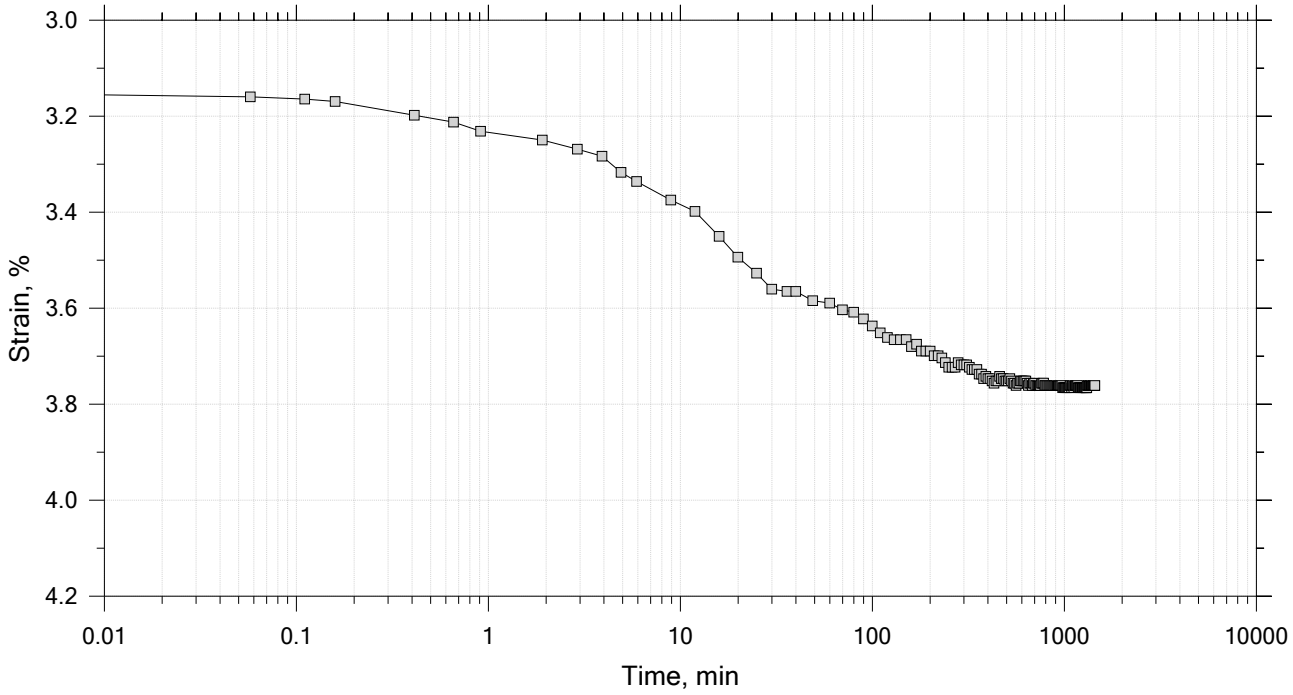
GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-201	Tested By: md	Checked By: njh
	Sample No.: U3	Test Date: 09/21/18	Depth: 45-47 ft
	Test No.: IP-3	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System E, Swell Pressure = 0.0668 tsf		

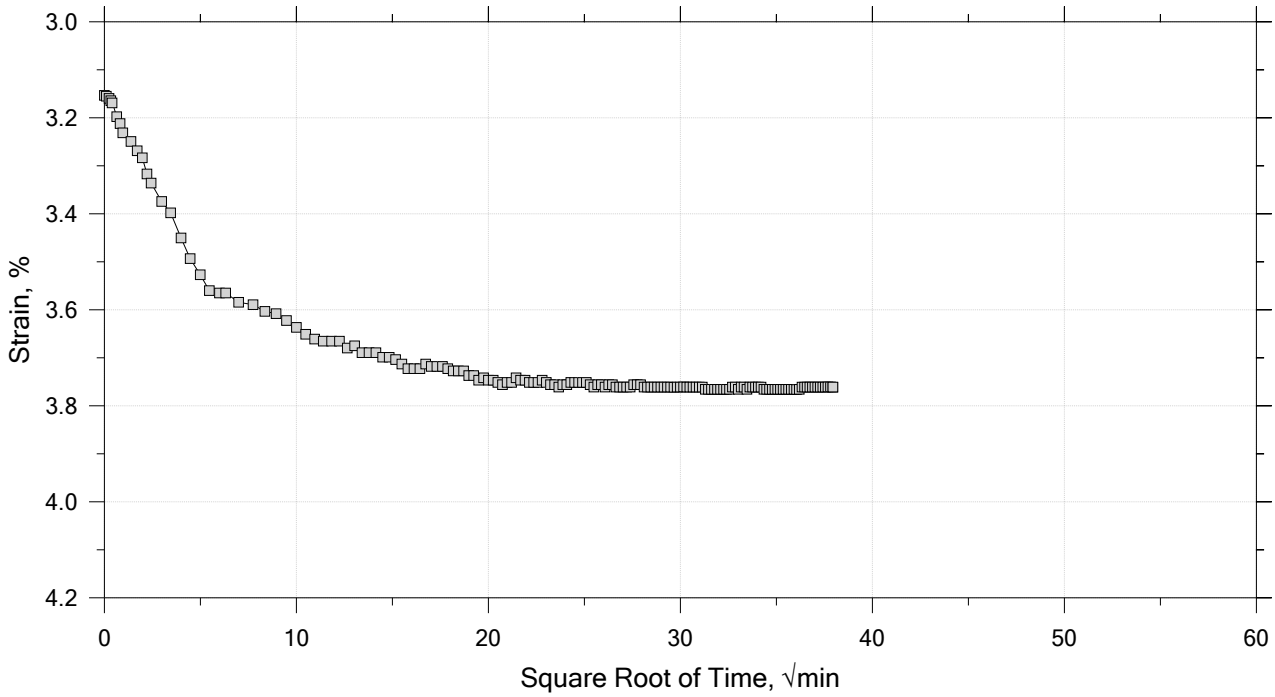
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 6 of 22

Constant Load Step

Stress: 1 tsf

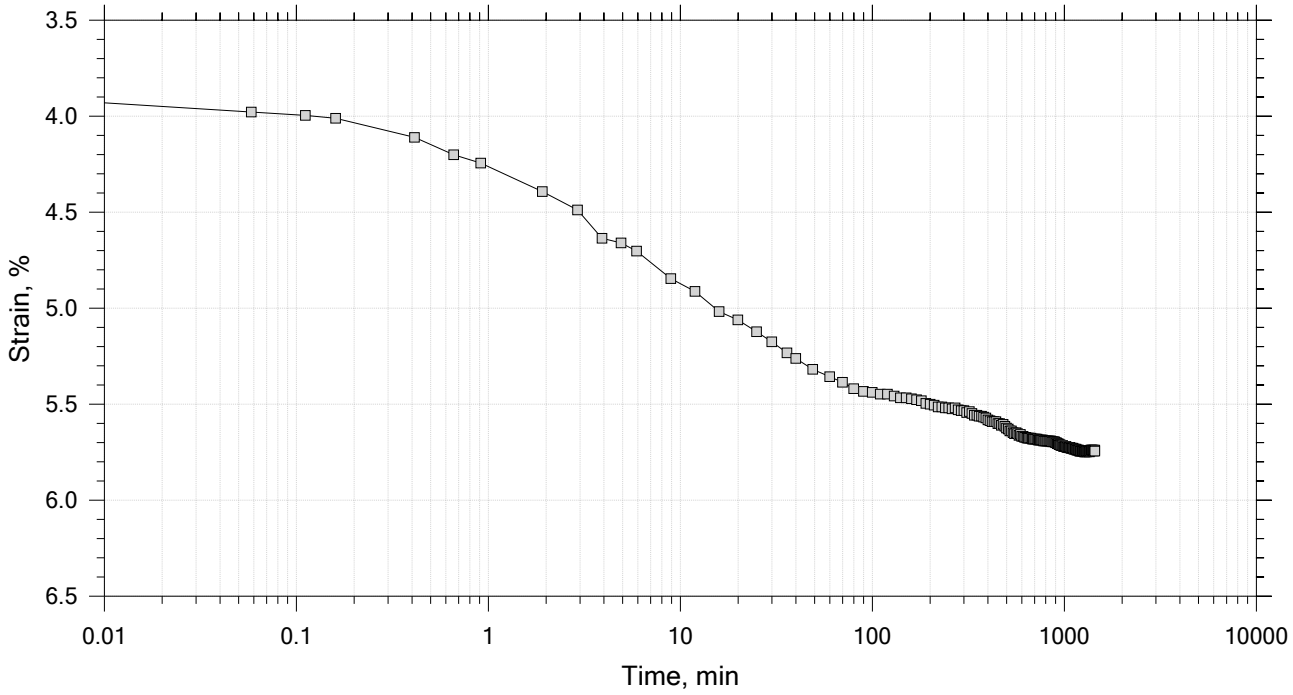


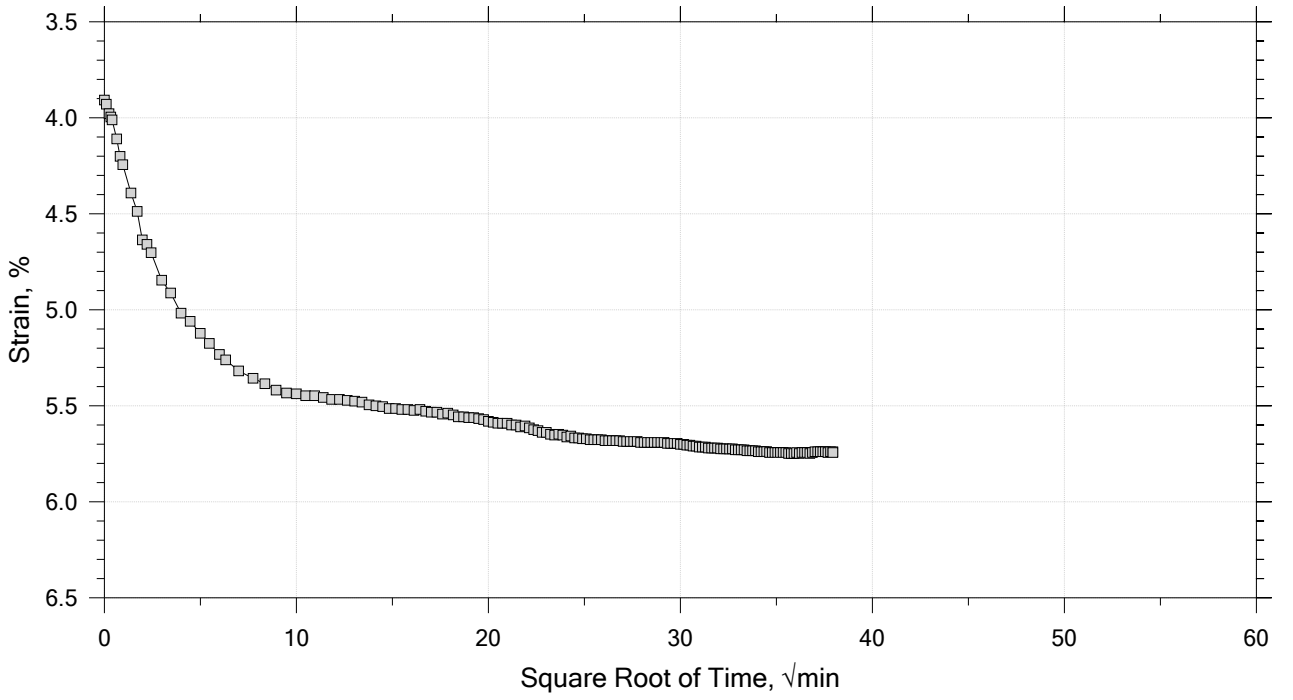


GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-201	Tested By: md	Checked By: njh
	Sample No.: U3	Test Date: 09/21/18	Depth: 45-47 ft
	Test No.: IP-3	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System E, Swell Pressure = 0.0668 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 7 of 22
Constant Load Step
Stress: 2 tsf





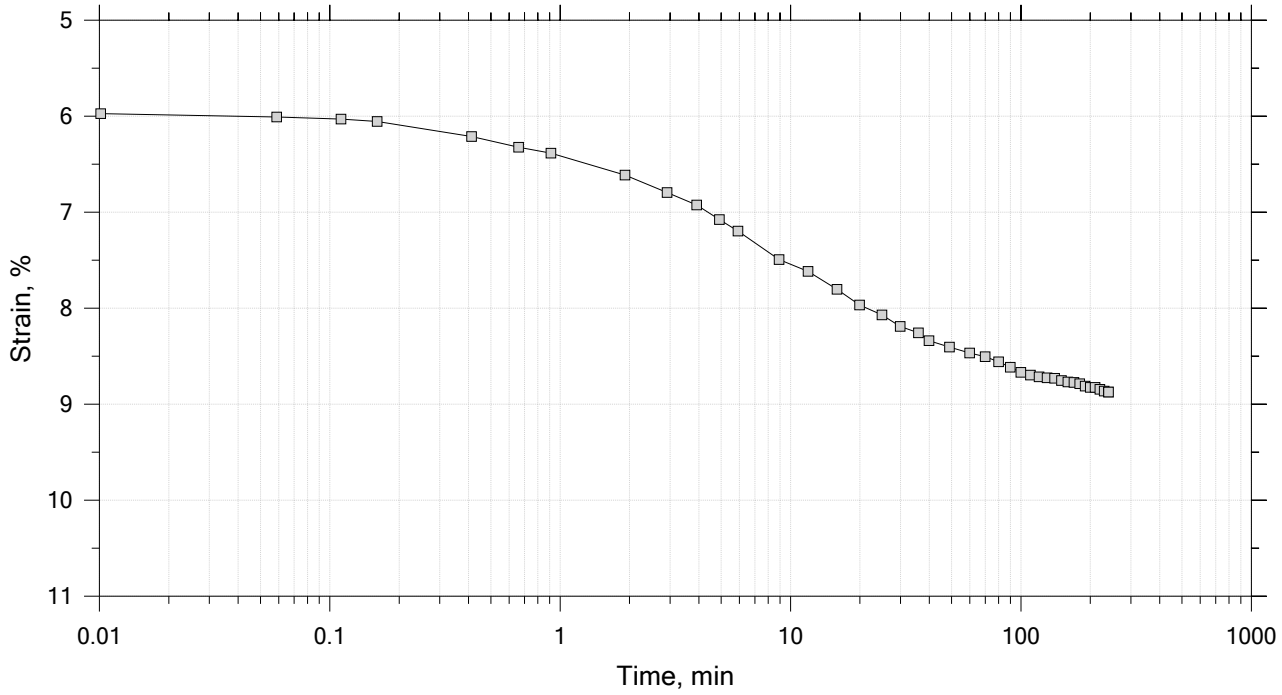
GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-201	Tested By: md	Checked By: njh
	Sample No.: U3	Test Date: 09/21/18	Depth: 45-47 ft
	Test No.: IP-3	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System E, Swell Pressure = 0.0668 tsf		

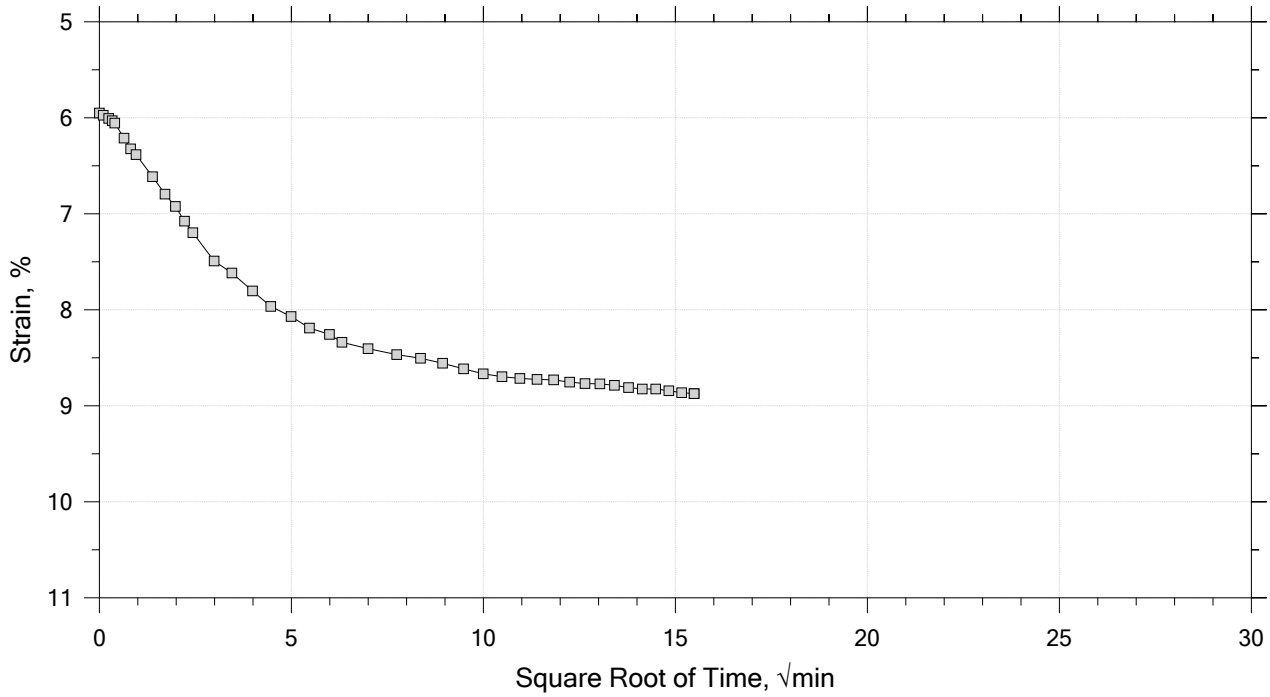
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 8 of 22

Constant Load Step

Stress: 4 tsf





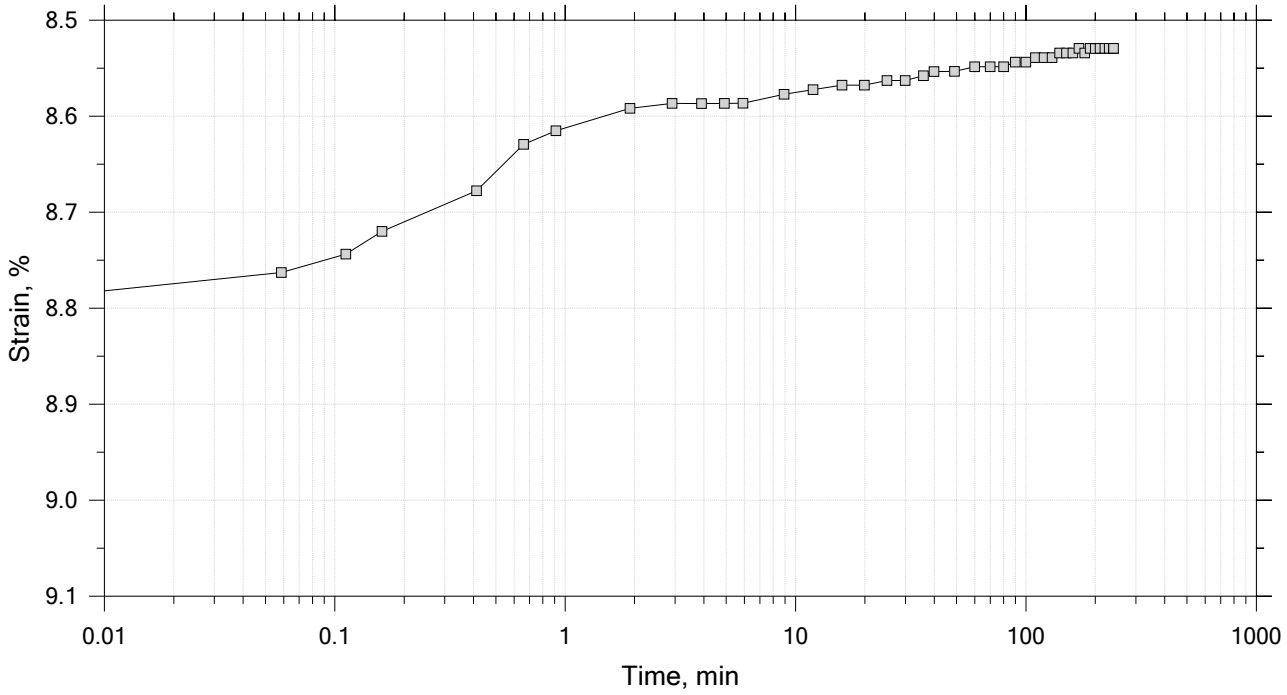
GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-201	Tested By: md	Checked By: njh
	Sample No.: U3	Test Date: 09/21/18	Depth: 45-47 ft
	Test No.: IP-3	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System E, Swell Pressure = 0.0668 tsf		

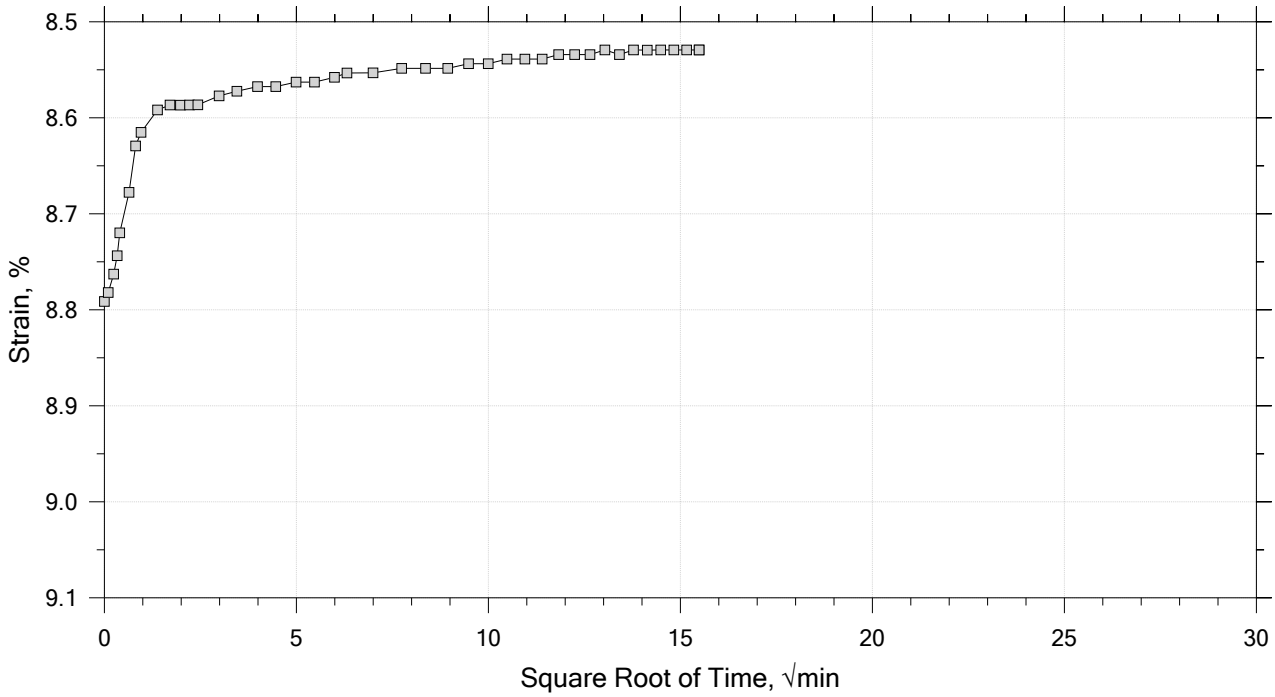
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 9 of 22

Constant Load Step

Stress: 2 tsf

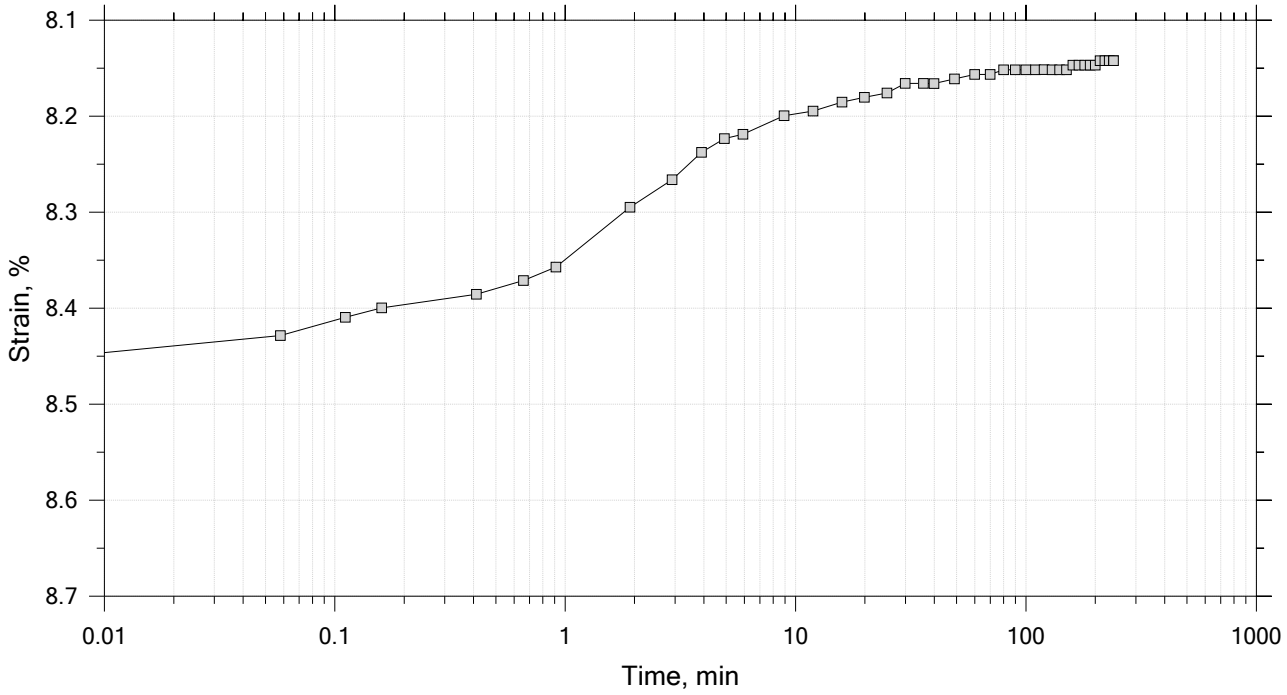


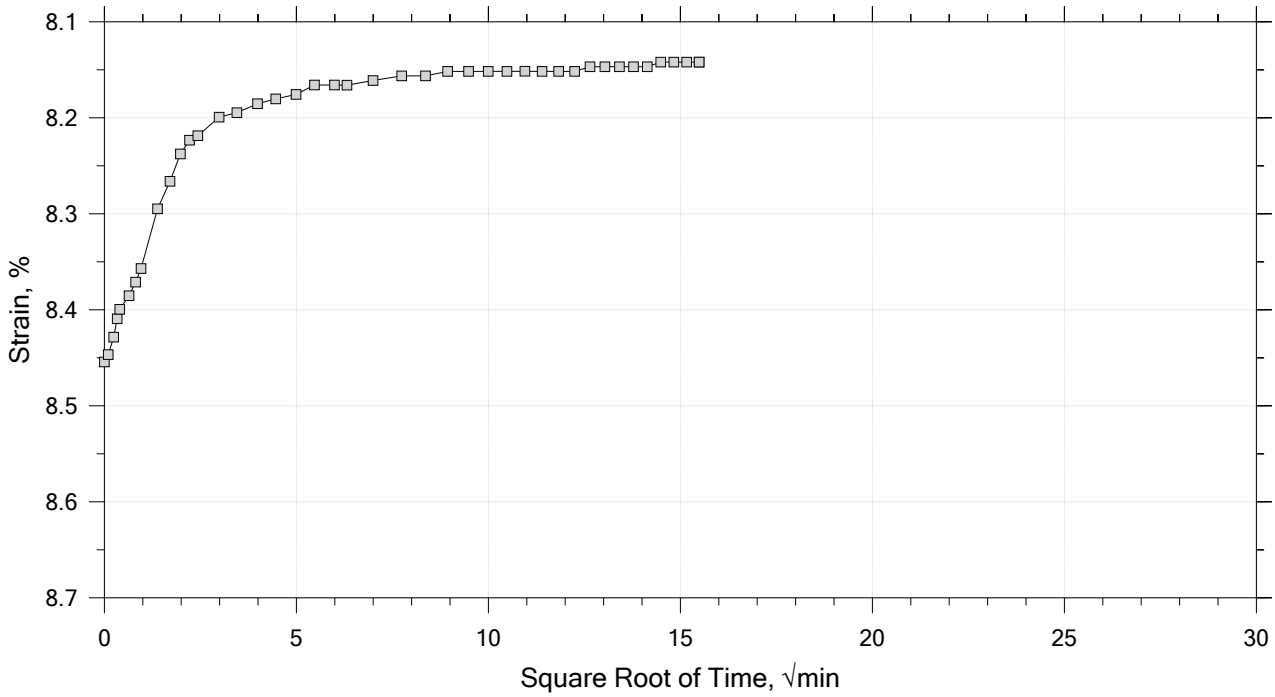


GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-201	Tested By: md	Checked By: njh
	Sample No.: U3	Test Date: 09/21/18	Depth: 45-47 ft
	Test No.: IP-3	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System E, Swell Pressure = 0.0668 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 10 of 22
Constant Load Step
Stress: 1 tsf

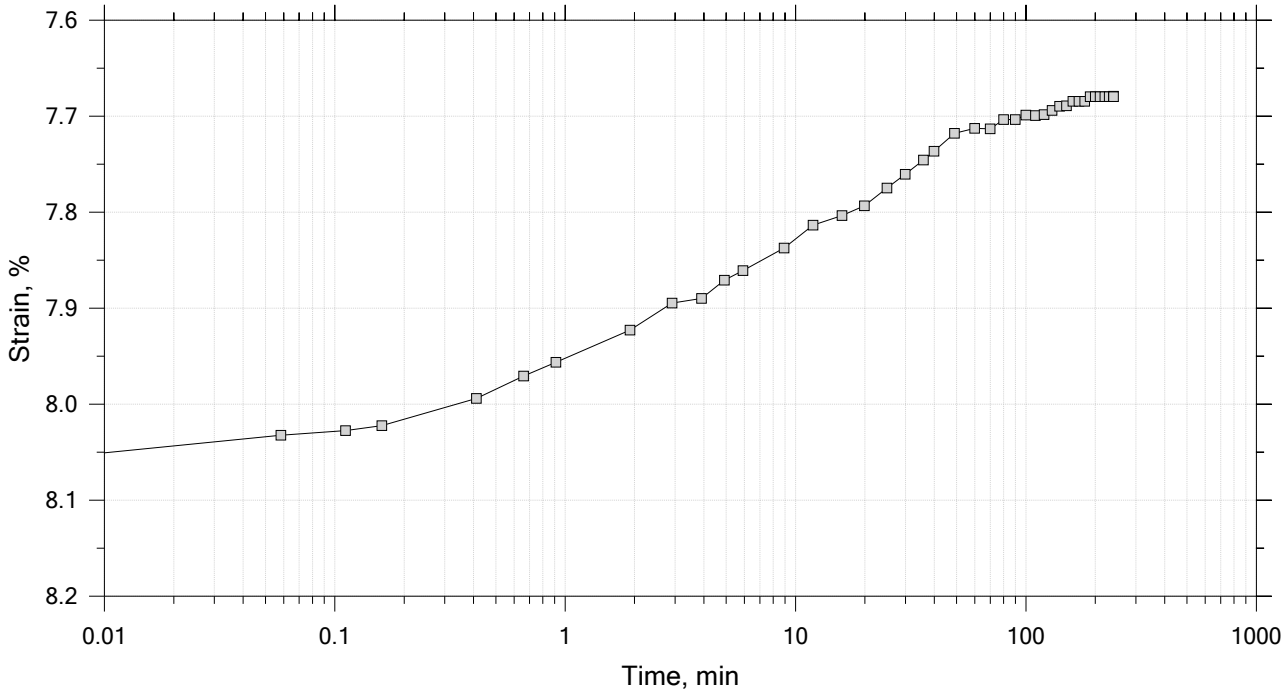


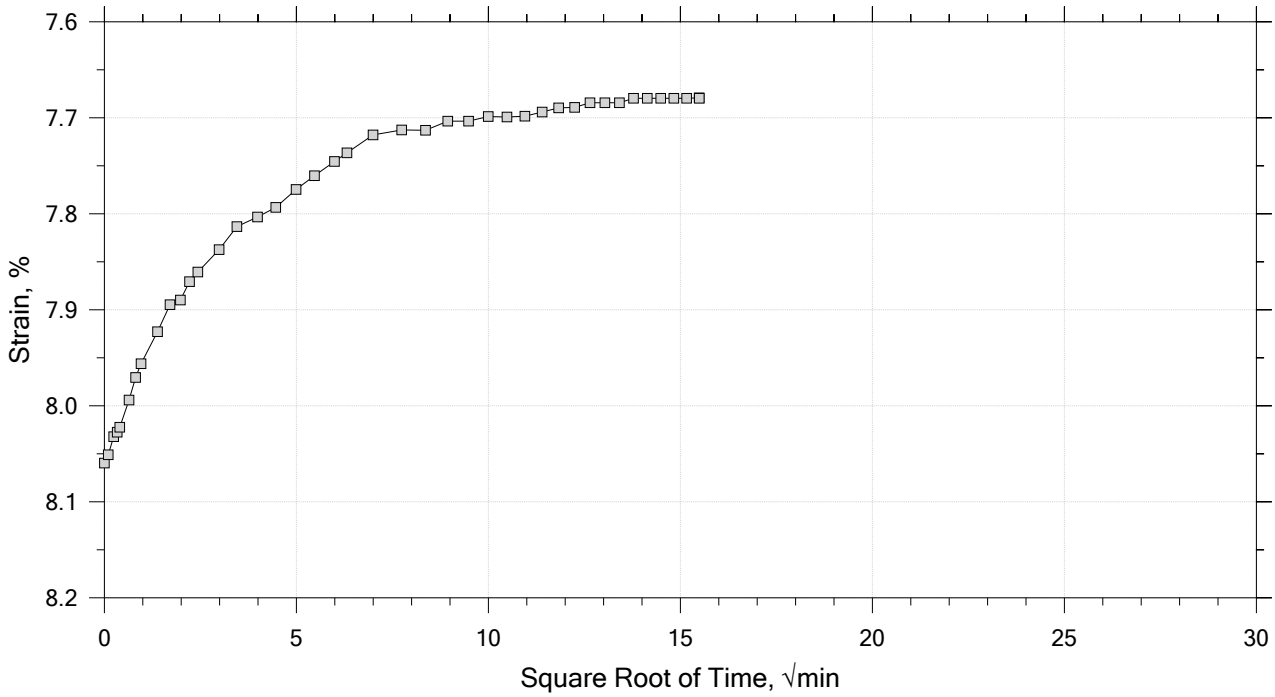


GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-201	Tested By: md	Checked By: njh
	Sample No.: U3	Test Date: 09/21/18	Depth: 45-47 ft
	Test No.: IP-3	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System E, Swell Pressure = 0.0668 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 11 of 22
Constant Load Step
Stress: 0.5 tsf





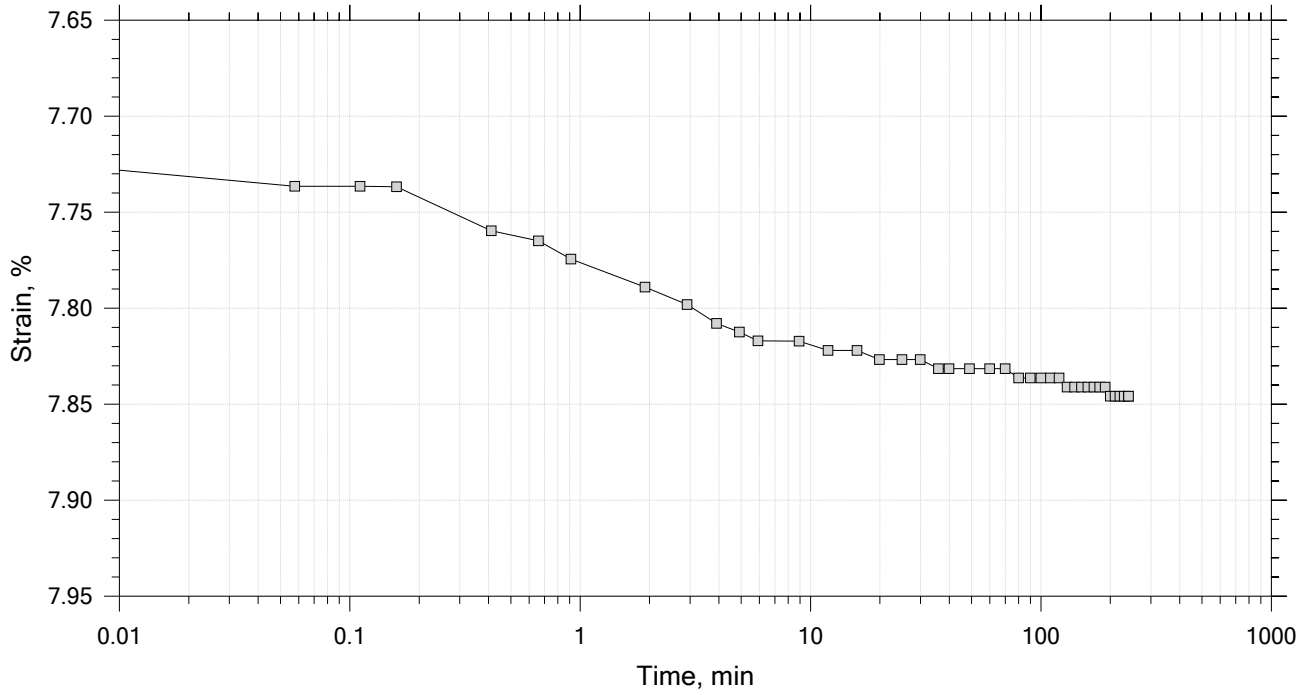
GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-201	Tested By: md	Checked By: njh
	Sample No.: U3	Test Date: 09/21/18	Depth: 45-47 ft
	Test No.: IP-3	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System E, Swell Pressure = 0.0668 tsf		

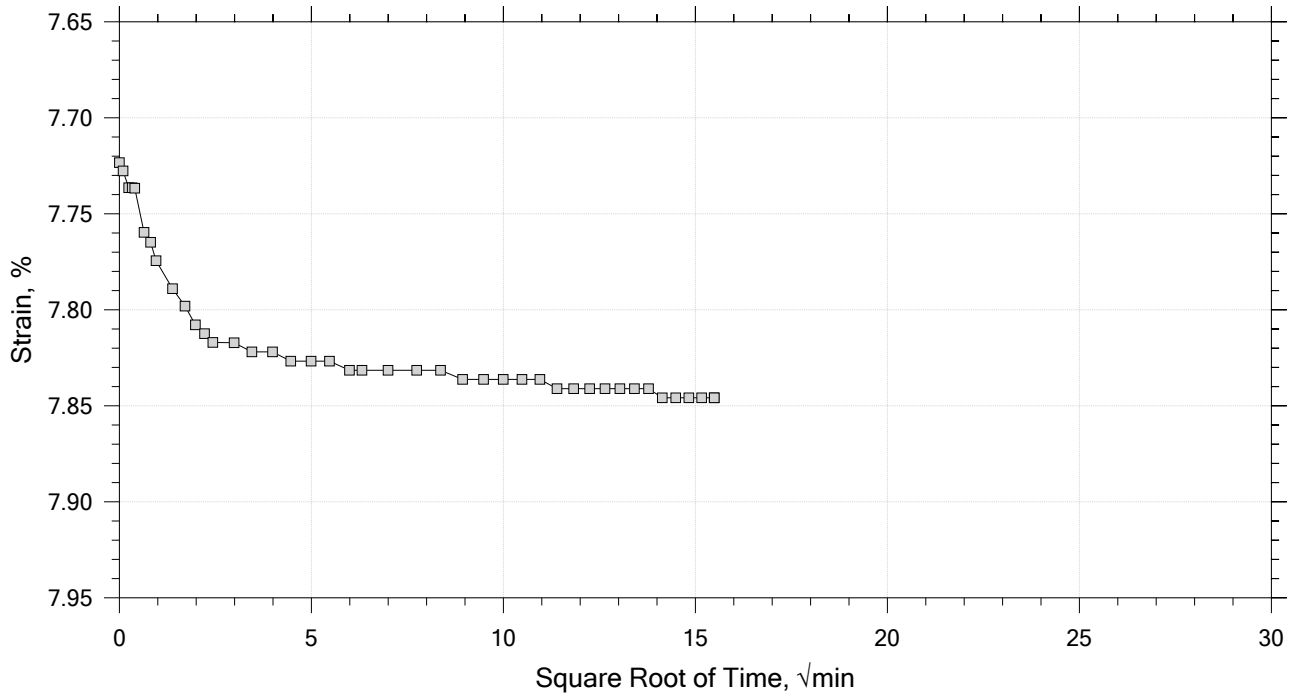
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 12 of 22

Constant Load Step

Stress: 1 tsf

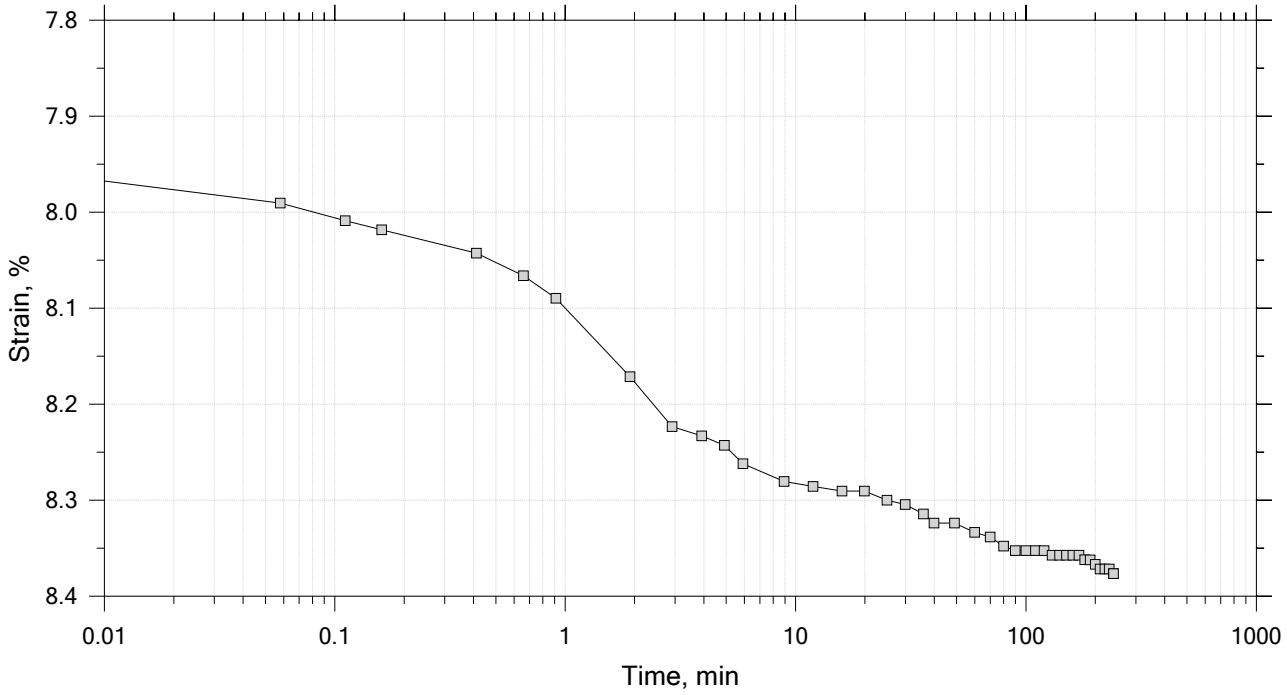


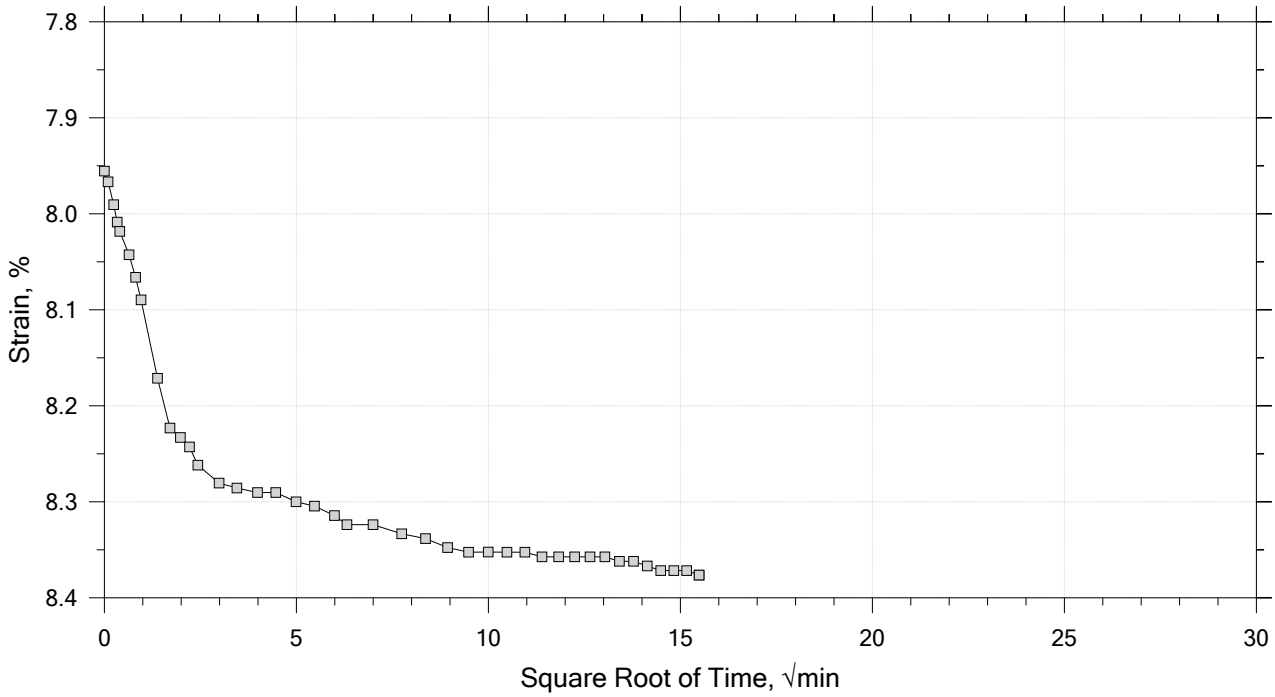


GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-201	Tested By: md	Checked By: njh
	Sample No.: U3	Test Date: 09/21/18	Depth: 45-47 ft
	Test No.: IP-3	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System E, Swell Pressure = 0.0668 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 13 of 22
Constant Load Step
Stress: 2 tsf

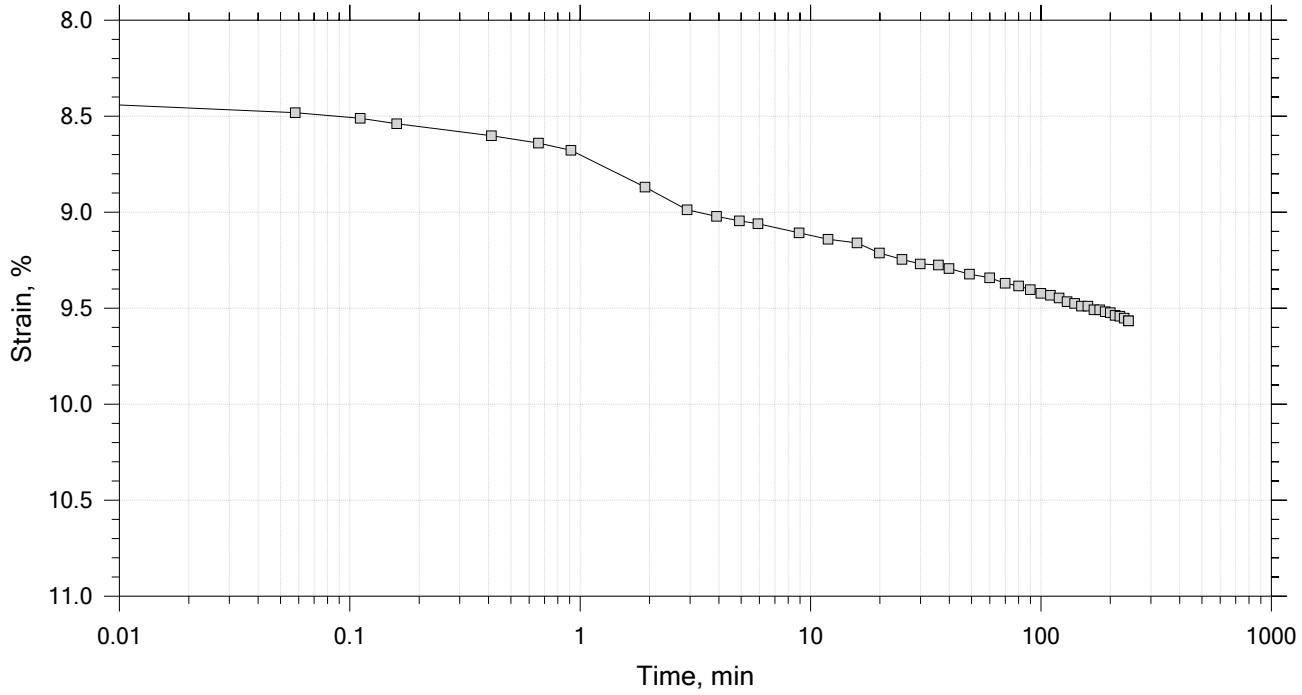


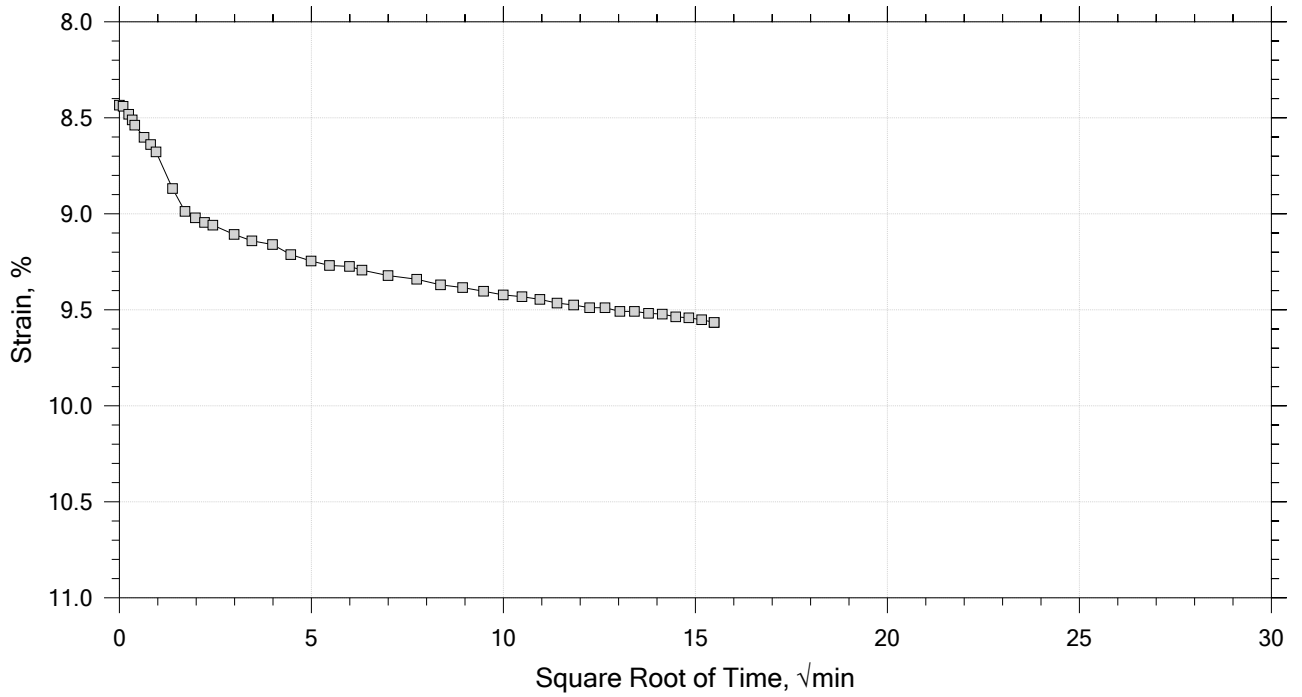


GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-201	Tested By: md	Checked By: njh
	Sample No.: U3	Test Date: 09/21/18	Depth: 45-47 ft
	Test No.: IP-3	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System E, Swell Pressure = 0.0668 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 14 of 22
Constant Load Step
Stress: 4 tsf

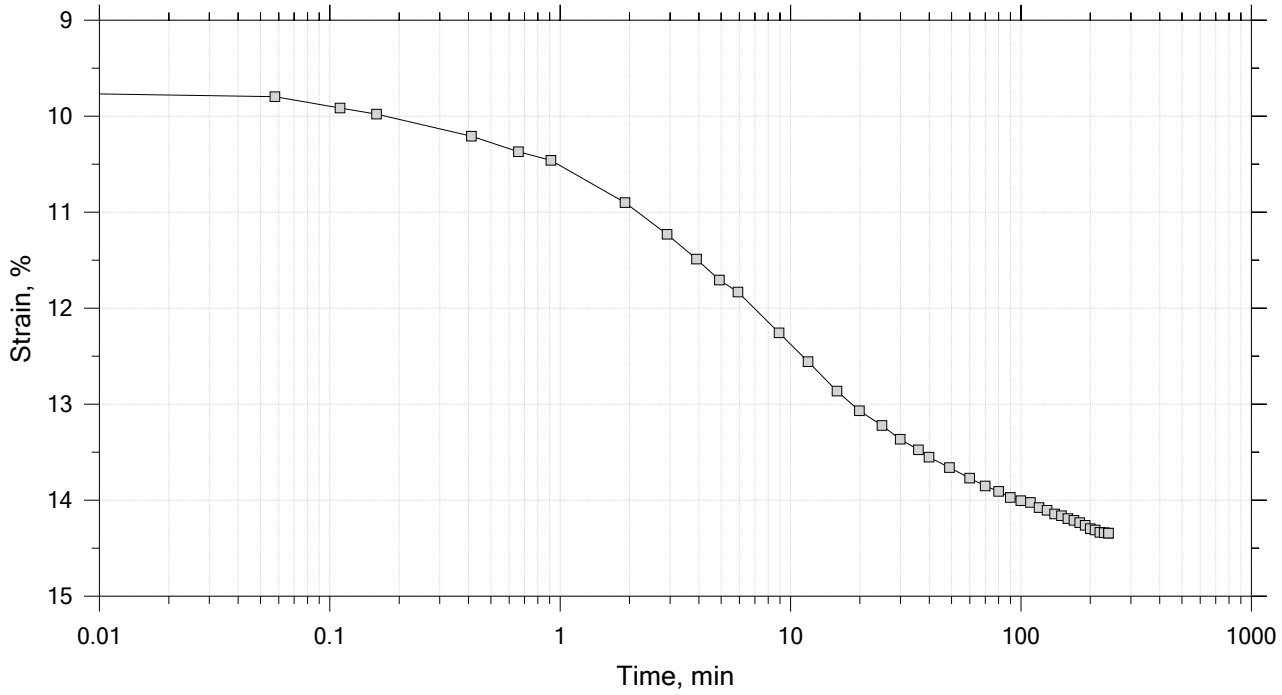


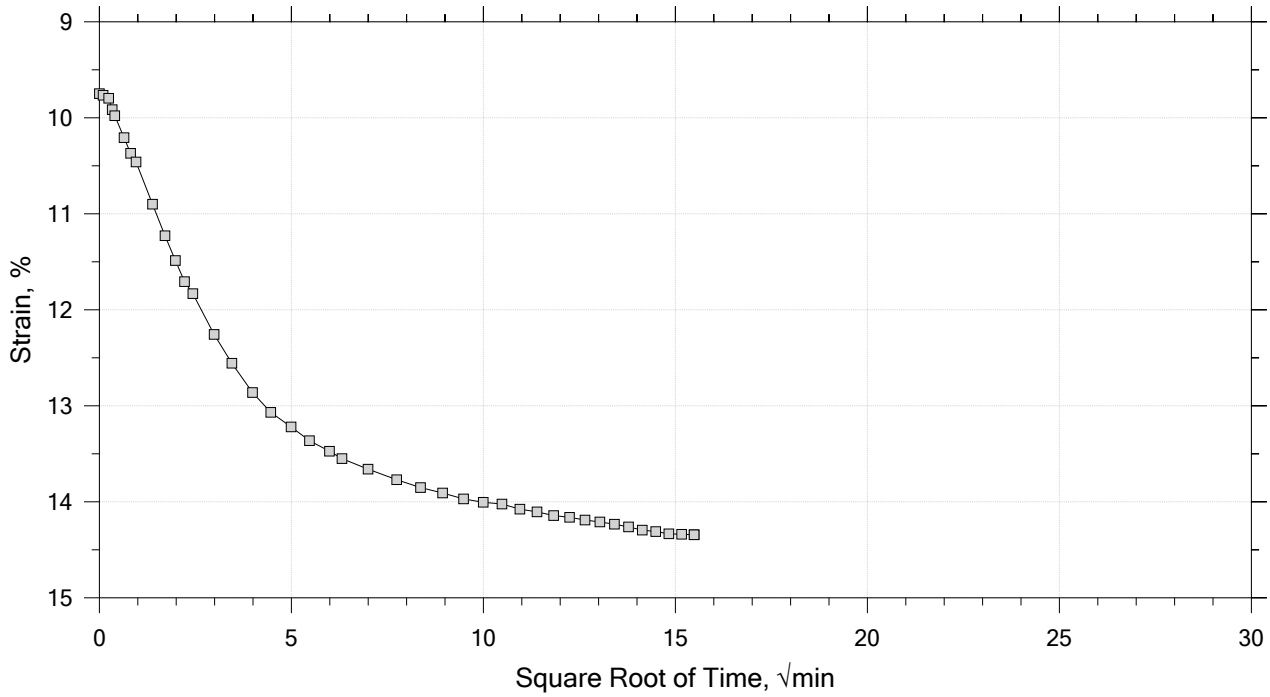


Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
Boring No.: BB-PVS-201	Tested By: md	Checked By: njh
Sample No.: U3	Test Date: 09/21/18	Depth: 45-47 ft
Test No.: IP-3	Sample Type: intact	Elevation: ---
Description: Moist, dark gray clay		
Remarks: System E, Swell Pressure = 0.0668 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 15 of 22
Constant Load Step
Stress: 8 tsf

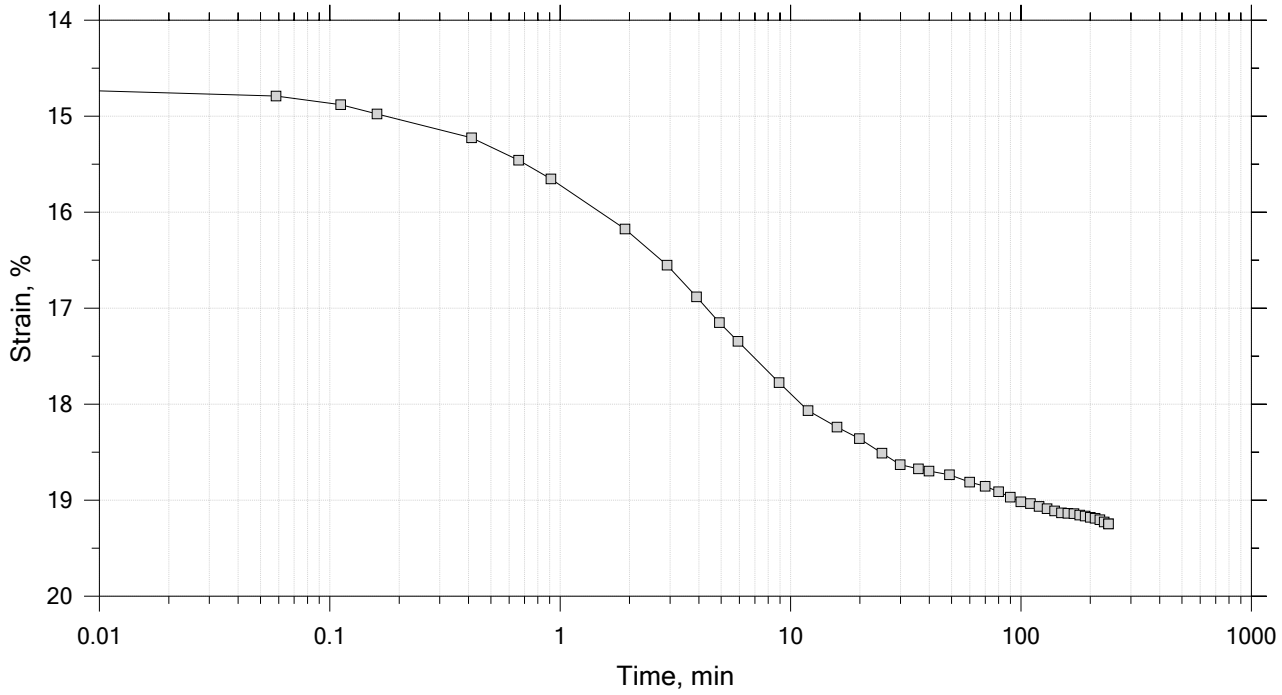


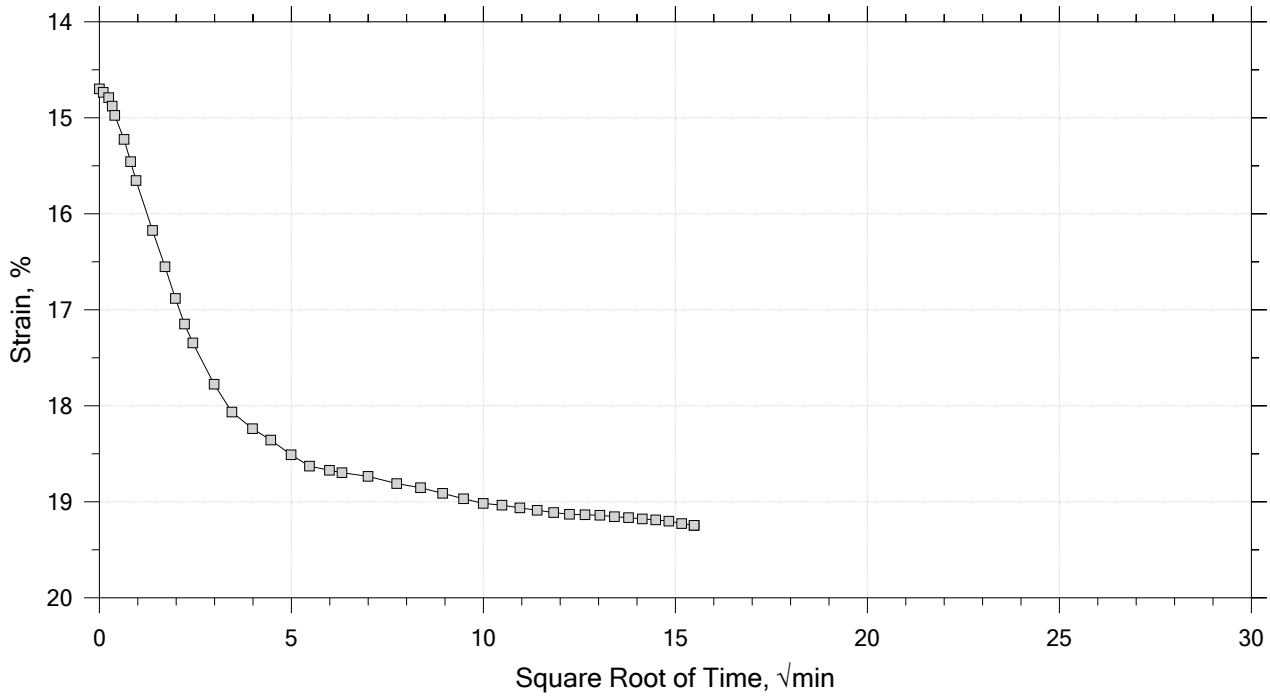


GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-201	Tested By: md	Checked By: njh
	Sample No.: U3	Test Date: 09/21/18	Depth: 45-47 ft
	Test No.: IP-3	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System E, Swell Pressure = 0.0668 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 16 of 22
Constant Load Step
Stress: 16 tsf

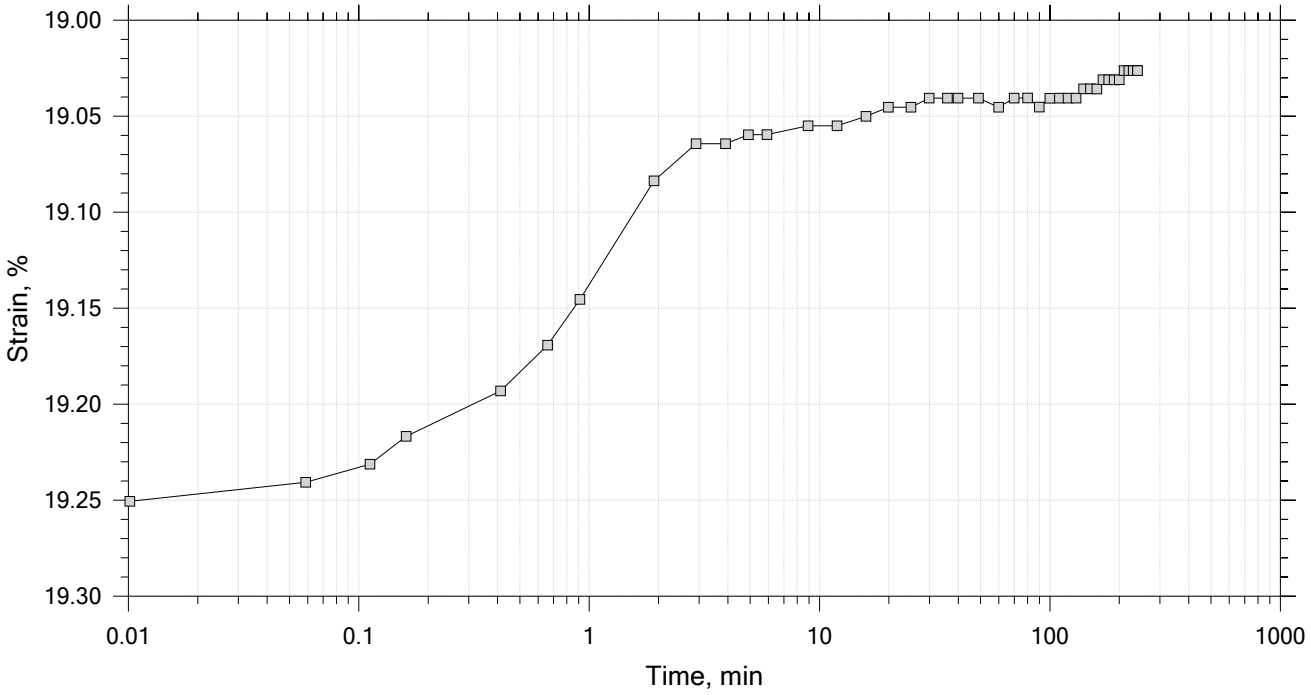


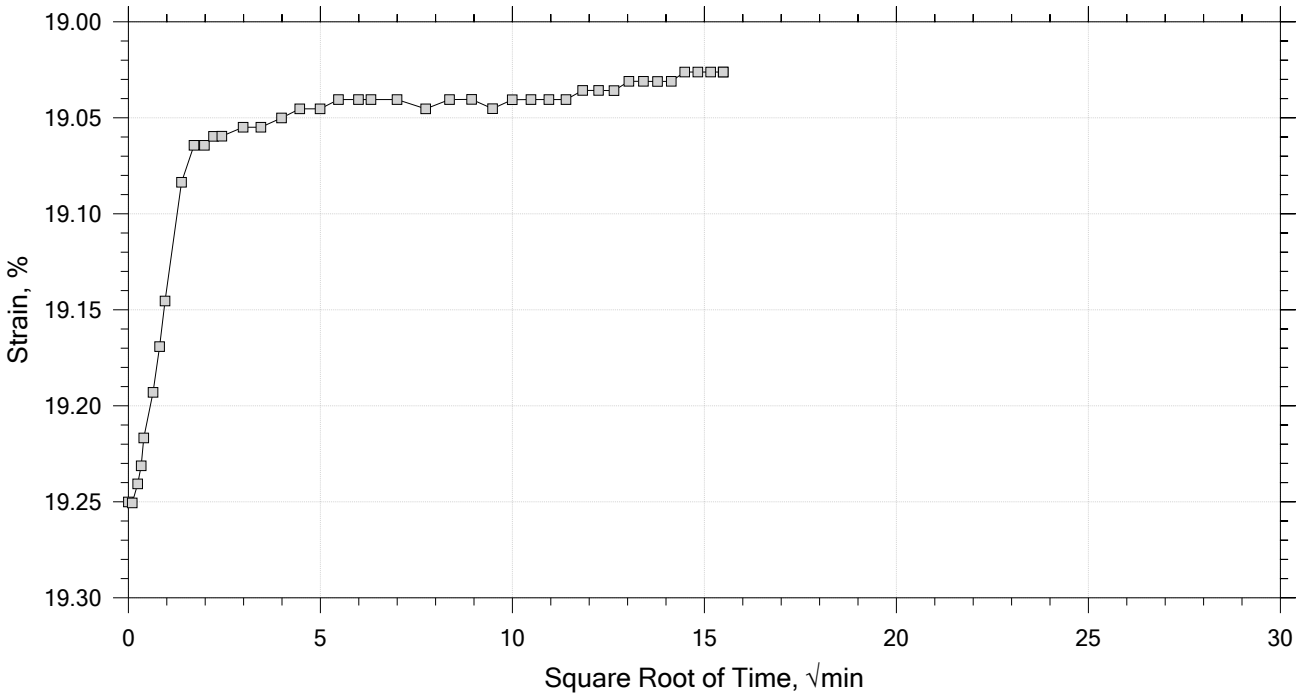


GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-201	Tested By: md	Checked By: njh
	Sample No.: U3	Test Date: 09/21/18	Depth: 45-47 ft
	Test No.: IP-3	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System E, Swell Pressure = 0.0668 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 17 of 22
Constant Load Step
Stress: 8 tsf





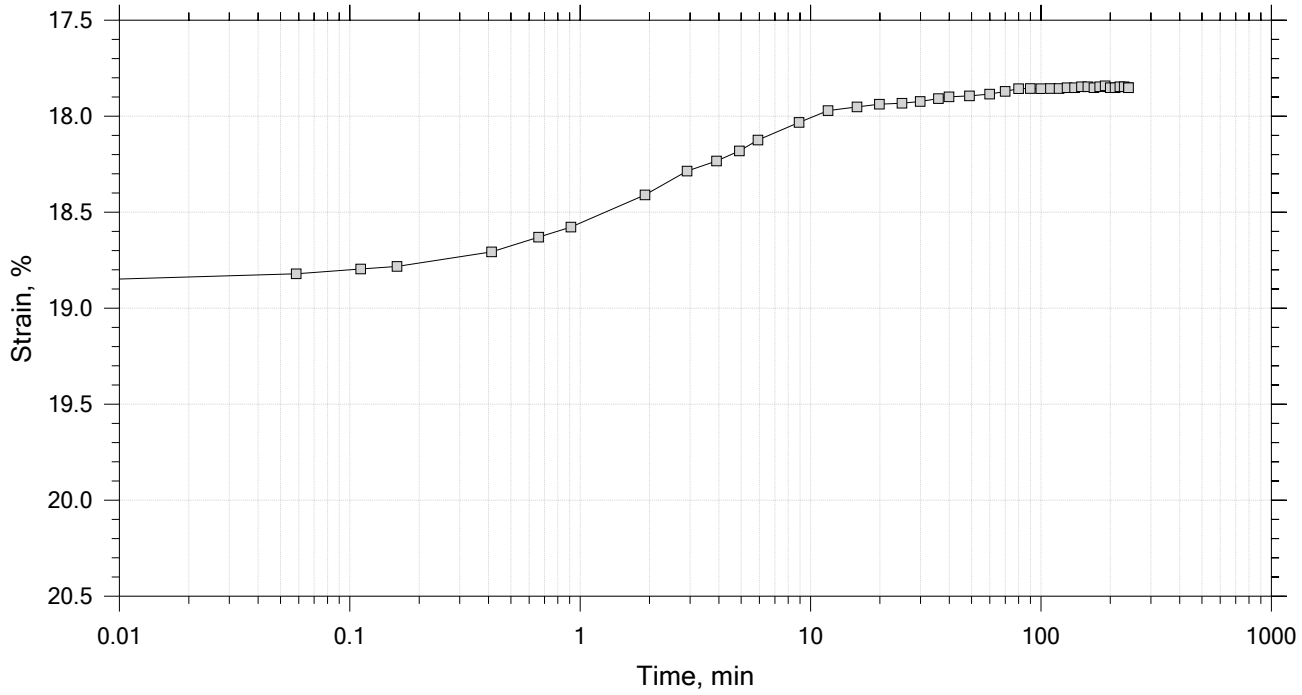
GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-201	Tested By: md	Checked By: njh
	Sample No.: U3	Test Date: 09/21/18	Depth: 45-47 ft
	Test No.: IP-3	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System E, Swell Pressure = 0.0668 tsf		

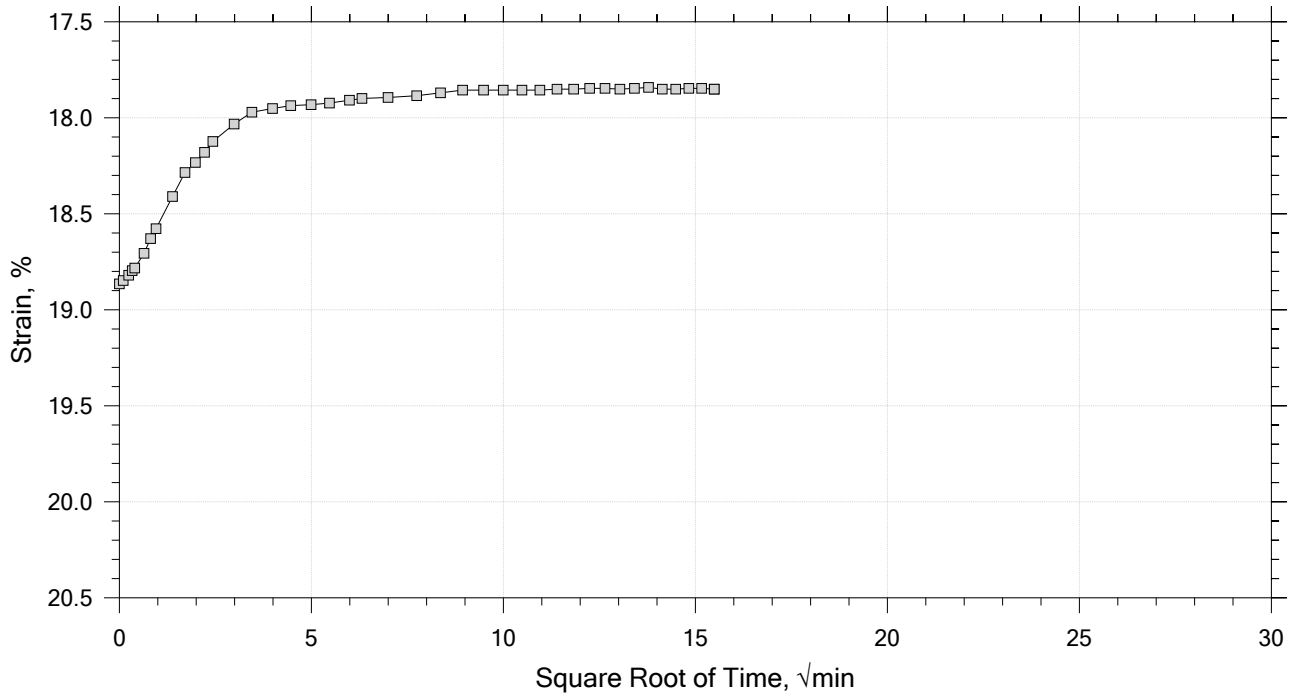
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 18 of 22

Constant Load Step

Stress: 2 tsf

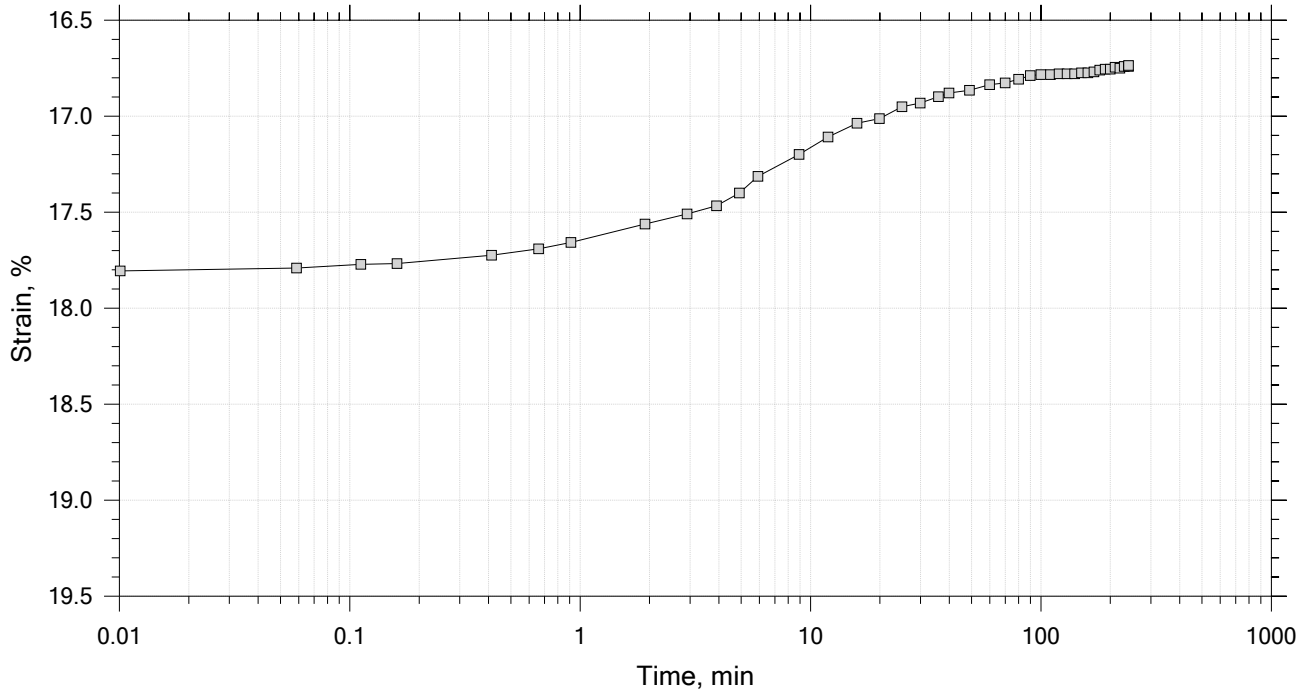


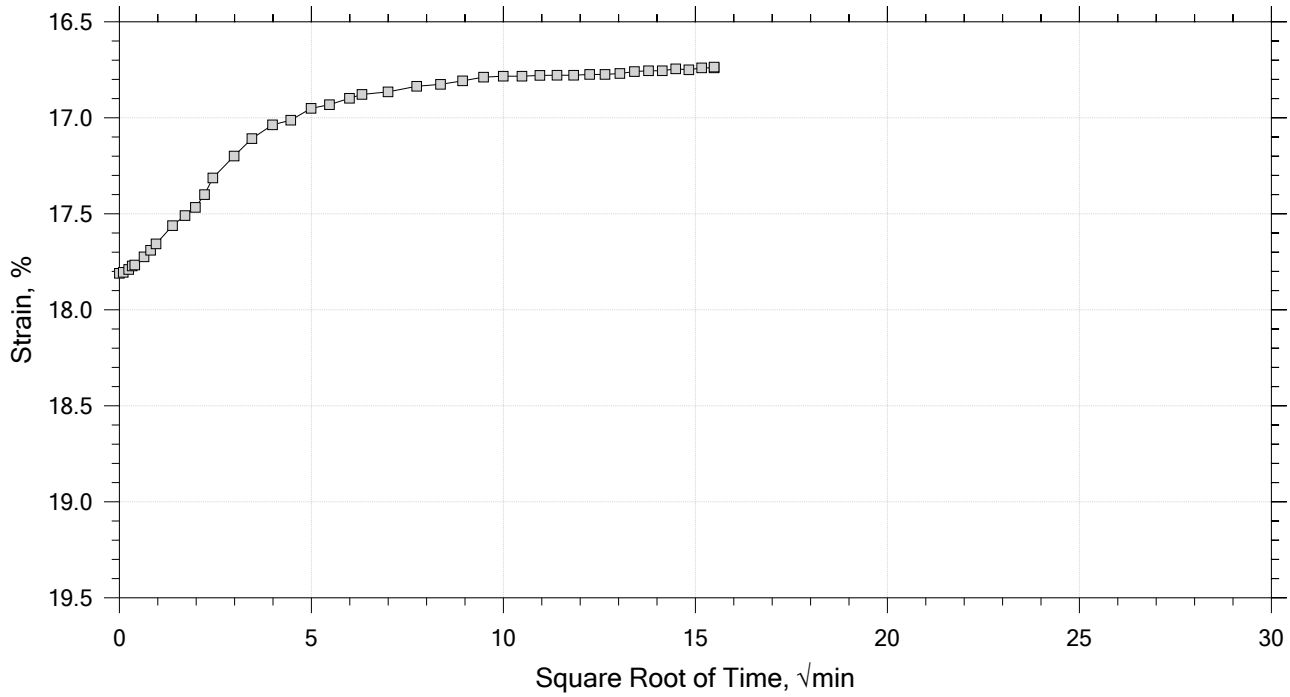


GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-201	Tested By: md	Checked By: njh
	Sample No.: U3	Test Date: 09/21/18	Depth: 45-47 ft
	Test No.: IP-3	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System E, Swell Pressure = 0.0668 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 19 of 22
Constant Load Step
Stress: 0.75 tsf

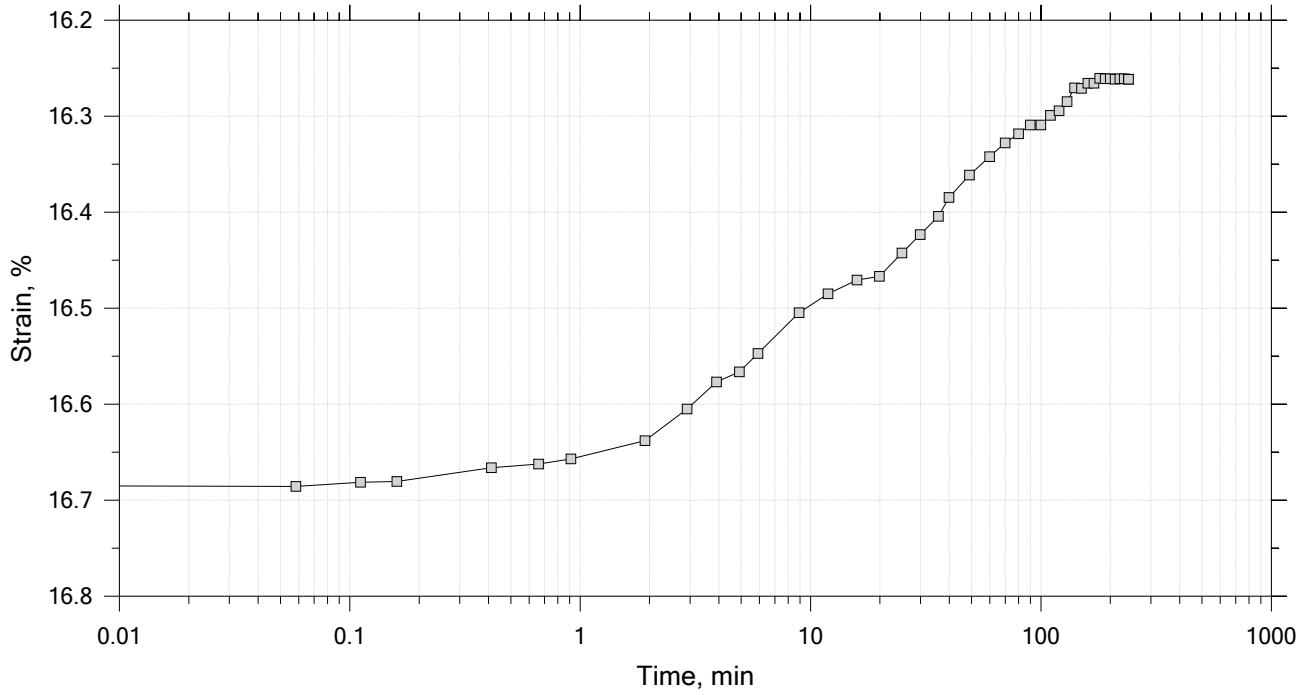


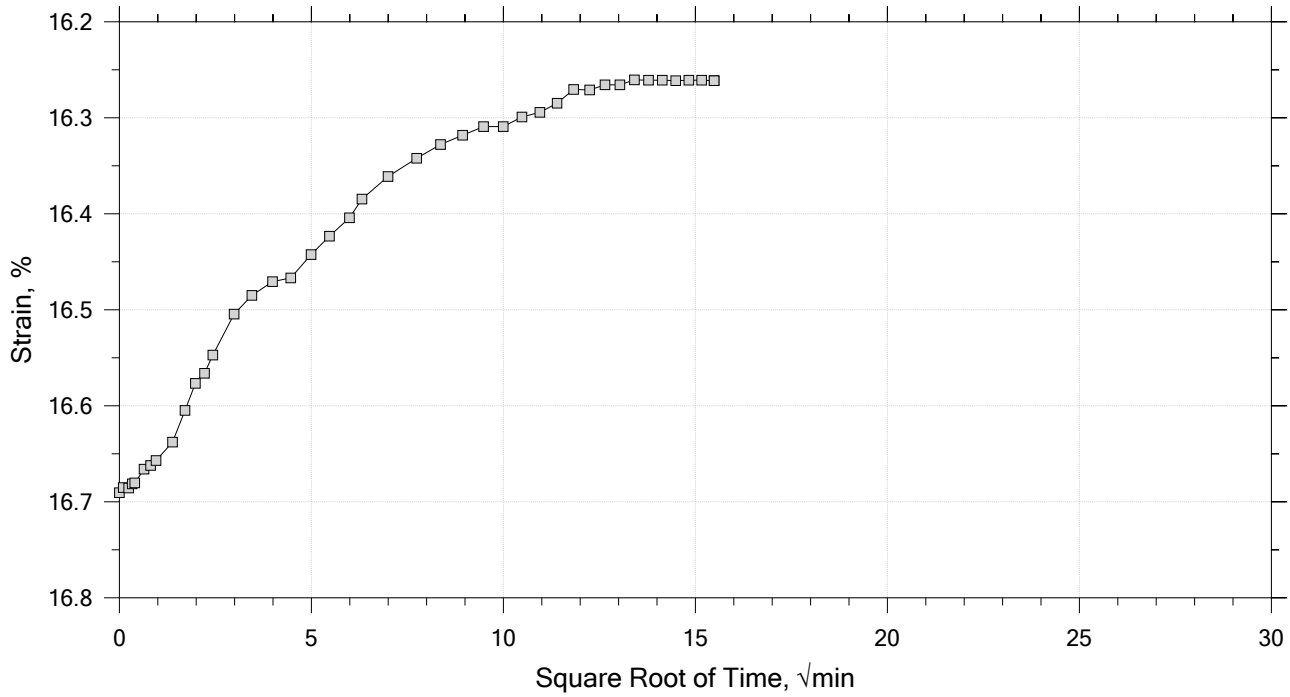


GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-201	Tested By: md	Checked By: njh
	Sample No.: U3	Test Date: 09/21/18	Depth: 45-47 ft
	Test No.: IP-3	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System E, Swell Pressure = 0.0668 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 20 of 22
Constant Load Step
Stress: 0.5 tsf

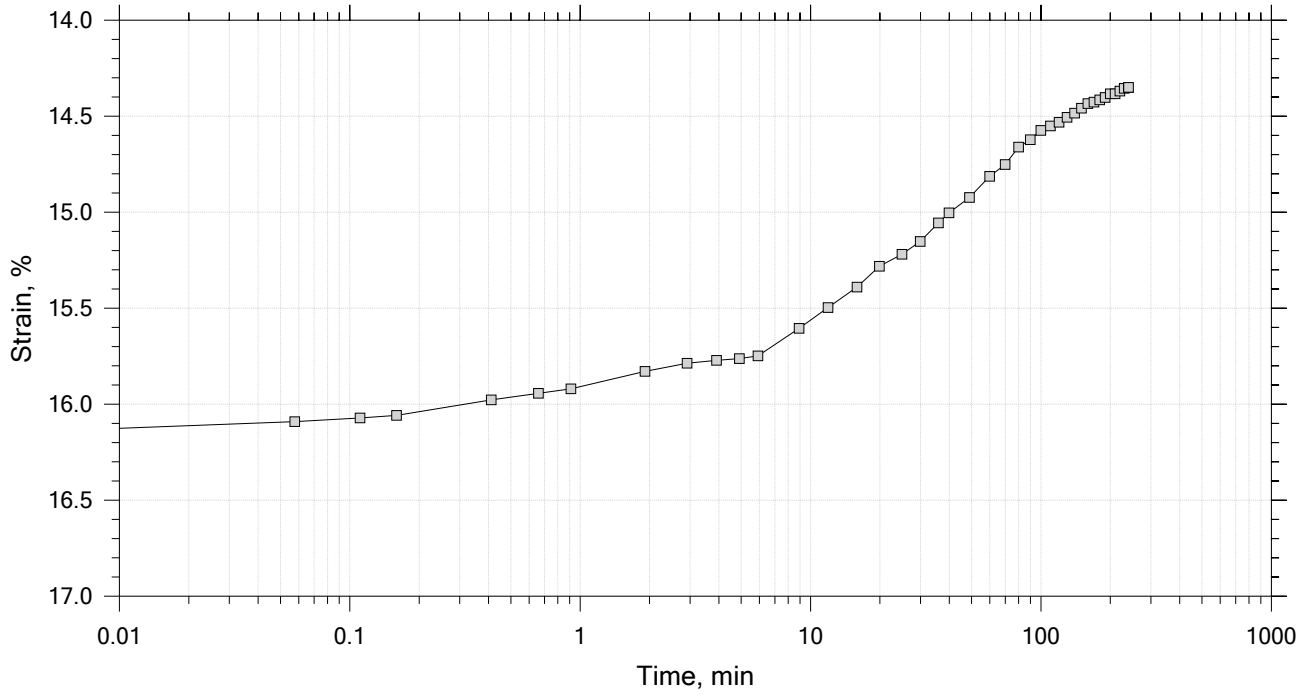


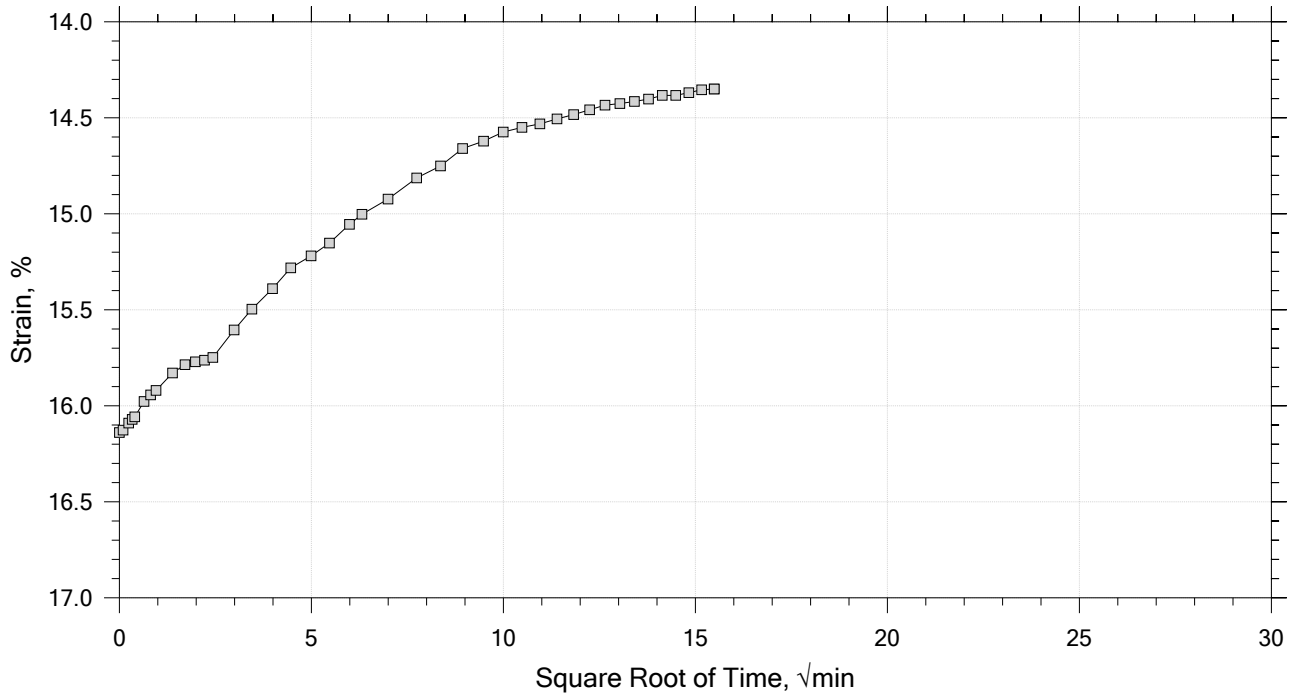


Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
Boring No.: BB-PVS-201	Tested By: md	Checked By: njh
Sample No.: U3	Test Date: 09/21/18	Depth: 45-47 ft
Test No.: IP-3	Sample Type: intact	Elevation: ---
Description: Moist, dark gray clay		
Remarks: System E, Swell Pressure = 0.0668 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 21 of 22
Constant Load Step
Stress: 0.125 tsf

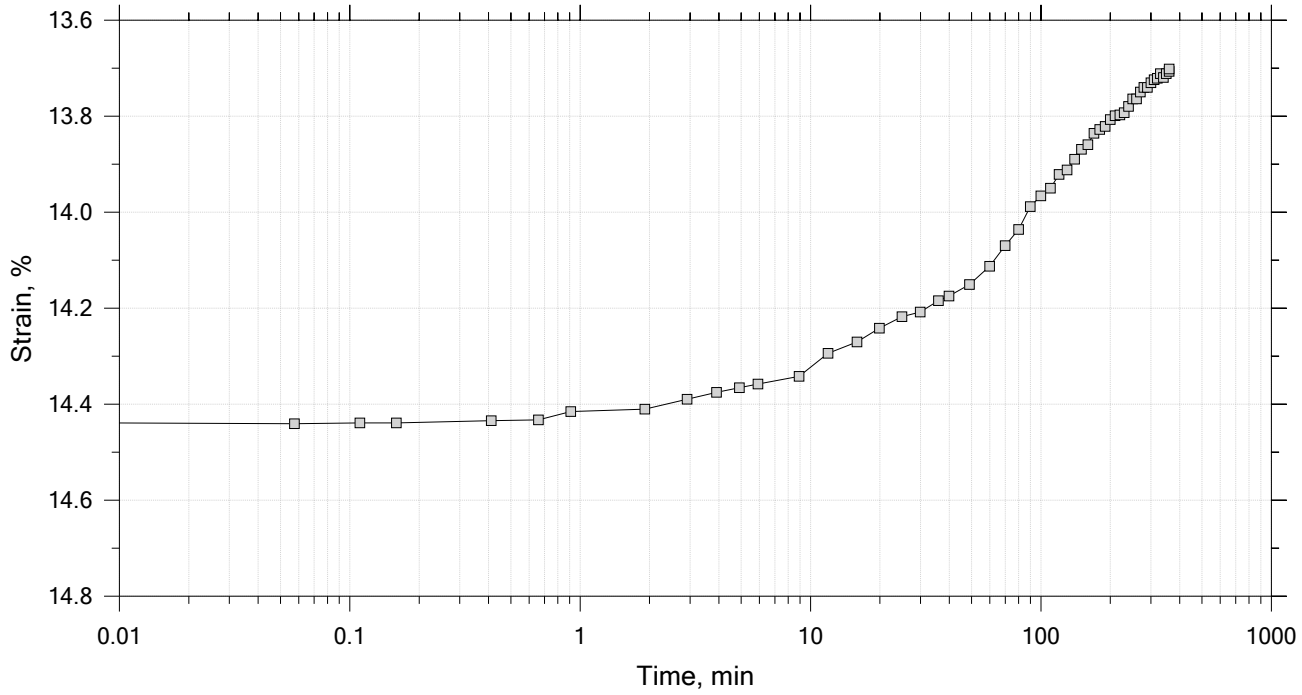


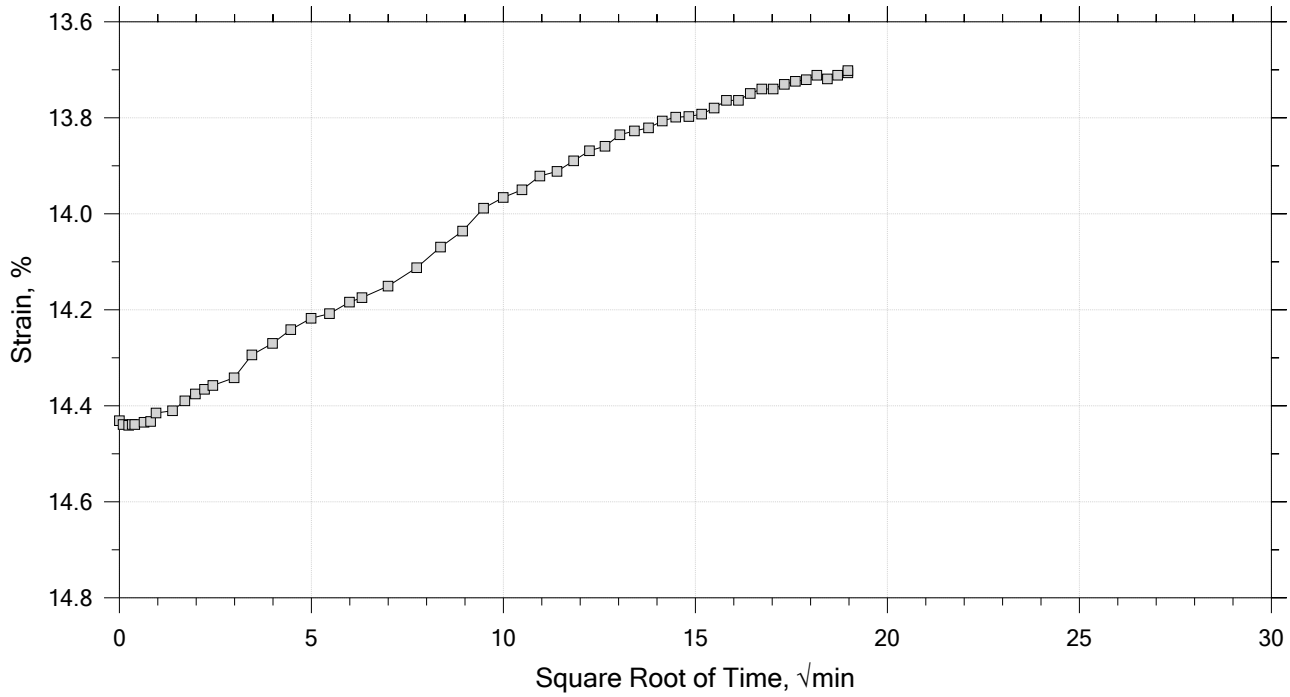


Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
Boring No.: BB-PVS-201	Tested By: md	Checked By: njh
Sample No.: U3	Test Date: 09/21/18	Depth: 45-47 ft
Test No.: IP-3	Sample Type: intact	Elevation: ---
Description: Moist, dark gray clay		
Remarks: System E, Swell Pressure = 0.0668 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 22 of 22
Constant Load Step
Stress: 0.0625 tsf





GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-201	Tested By: md	Checked By: njh
	Sample No.: U3	Test Date: 09/21/18	Depth: 45-47 ft
	Test No.: IP-3	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: 1.07	Plastic Limit: 23
Final Height: 0.86 in	Final Void Ratio: 0.779	Plasticity Index: 18

	Before Test Trimmings	Before Test Specimen	After Test Specimen	After Test Trimmings
Container ID	A-2281	RING		B2073
Mass Container, gm	8.67	110.89	110.89	8.36
Mass Container + Wet Soil, gm	247.92	259.99	248.95	146.87
Mass Container + Dry Soil, gm	180.2	218.65	218.65	116.47
Mass Dry Soil, gm	171.53	107.76	107.76	108.11
Water Content, %	39.48	38.36	28.12	28.12
Void Ratio	---	1.07	0.78	---
Degree of Saturation, %	---	99.47	100.00	---
Dry Unit Weight, pcf	---	83.63	97.244	---

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.

GeoTesting EXPRESS

Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
Boring No.: BB-PVS-201	Tested By: md	Checked By: njh
Sample No.: U3	Test Date: 09/21/18	Depth: 45-47 ft
Test No.: IP-3	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

Step	Applied Stress tsf	Final Displacement in	Void Ratio	Strain at End %	Log T50 min	Cv ft²/s	Mv 1/tsf	k ft/day	Ca %
1	0.0668	0.003150	1.06	0.315	0.000	0.00e+00	4.71e-02	0.00e+00	0.00e+00
2	0.125	0.005273	1.06	0.527	0.000	0.00e+00	3.65e-02	0.00e+00	0.00e+00
3	0.250	0.01425	1.04	1.43	0.000	0.00e+00	7.18e-02	0.00e+00	0.00e+00
4	0.500	0.02404	1.02	2.40	0.000	0.00e+00	3.92e-02	0.00e+00	0.00e+00
5	0.750	0.03135	1.00	3.13	10.395	5.18e-07	2.92e-02	4.09e-05	0.00e+00
6	1.00	0.03761	0.991	3.76	0.000	0.00e+00	2.50e-02	0.00e+00	0.00e+00
7	2.00	0.05744	0.950	5.74	0.000	0.00e+00	1.98e-02	0.00e+00	0.00e+00
8	4.00	0.08873	0.885	8.87	5.476	8.94e-07	1.56e-02	3.77e-05	0.00e+00
9	2.00	0.08529	0.893	8.53	0.431	1.10e-05	1.72e-03	5.10e-05	0.00e+00
10	1.00	0.08142	0.901	8.14	1.852	2.59e-06	3.87e-03	2.70e-05	0.00e+00
11	0.500	0.07680	0.910	7.68	0.000	0.00e+00	9.25e-03	0.00e+00	0.00e+00
12	1.00	0.07846	0.907	7.85	1.089	4.45e-06	3.32e-03	3.99e-05	0.00e+00
13	2.00	0.08376	0.896	8.38	1.574	3.06e-06	5.31e-03	4.38e-05	0.00e+00
14	4.00	0.09566	0.871	9.57	0.000	0.00e+00	5.95e-03	0.00e+00	0.00e+00
15	8.00	0.1434	0.772	14.3	4.148	1.07e-06	1.19e-02	3.43e-05	0.00e+00
16	16.0	0.1925	0.671	19.2	3.036	1.30e-06	6.13e-03	2.15e-05	0.00e+00
17	8.00	0.1903	0.675	19.0	0.000	0.00e+00	2.75e-04	0.00e+00	0.00e+00
18	2.00	0.1785	0.700	17.9	0.000	0.00e+00	1.96e-03	0.00e+00	0.00e+00
19	0.750	0.1674	0.723	16.7	5.210	7.48e-07	8.92e-03	1.80e-05	0.00e+00
20	0.500	0.1626	0.733	16.3	16.034	2.48e-07	1.90e-02	1.27e-05	0.00e+00
21	0.125	0.1435	0.772	14.3	0.000	0.00e+00	5.10e-02	0.00e+00	0.00e+00
22	0.0625	0.1370	0.786	13.7	65.007	6.48e-08	1.04e-01	1.81e-05	0.00e+00

GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-201	Tested By: md	Checked By: njh
	Sample No.: U3	Test Date: 09/21/18	Depth: 45-47 ft
	Test No.: IP-3	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

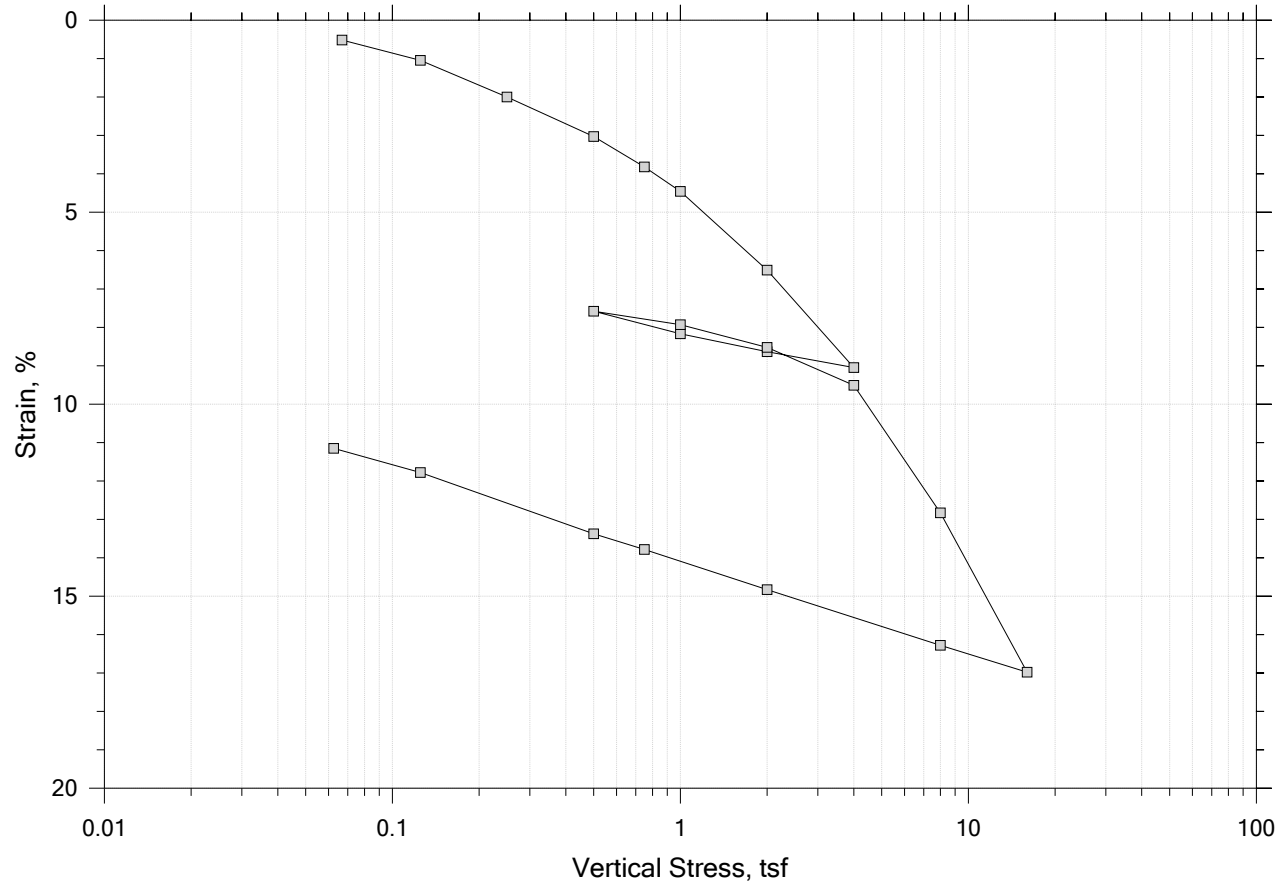
Step	Applied Stress tsf	Final Displacement in	Void Ratio	Strain at End %	Sq.Rt. T90 min	Cv ft²/s	Mv 1/tsf	k ft/day
1	0.0668	0.003150	1.06	0.315	127.844	1.91e-07	4.71e-02	2.43e-05
2	0.125	0.005273	1.06	0.527	35.972	6.76e-07	3.65e-02	6.66e-05
3	0.250	0.01425	1.04	1.43	52.581	4.58e-07	7.18e-02	8.86e-05
4	0.500	0.02404	1.02	2.40	13.012	1.81e-06	3.92e-02	1.92e-04
5	0.750	0.03135	1.00	3.13	39.429	5.88e-07	2.92e-02	4.64e-05
6	1.00	0.03761	0.991	3.76	129.753	1.76e-07	2.50e-02	1.19e-05
7	2.00	0.05744	0.950	5.74	130.565	1.70e-07	1.98e-02	9.12e-06
8	4.00	0.08873	0.885	8.87	27.244	7.74e-07	1.56e-02	3.27e-05
9	2.00	0.08529	0.893	8.53	2.727	7.50e-06	1.72e-03	3.48e-05
10	1.00	0.08142	0.901	8.14	9.463	2.18e-06	3.87e-03	2.28e-05
11	0.500	0.07680	0.910	7.68	28.420	7.32e-07	9.25e-03	1.83e-05
12	1.00	0.07846	0.907	7.85	6.445	3.24e-06	3.32e-03	2.90e-05
13	2.00	0.08376	0.896	8.38	7.189	2.88e-06	5.31e-03	4.12e-05
14	4.00	0.09566	0.871	9.57	30.253	6.72e-07	5.95e-03	1.08e-05
15	8.00	0.1434	0.772	14.3	25.188	7.55e-07	1.19e-02	2.43e-05
16	16.0	0.1925	0.671	19.2	15.781	1.08e-06	6.13e-03	1.78e-05
17	8.00	0.1903	0.675	19.0	5.067	3.17e-06	2.75e-04	2.35e-06
18	2.00	0.1785	0.700	17.9	11.970	1.36e-06	1.96e-03	7.20e-06
19	0.750	0.1674	0.723	16.7	31.380	5.35e-07	8.92e-03	1.29e-05
20	0.500	0.1626	0.733	16.3	50.900	3.36e-07	1.90e-02	1.72e-05
21	0.125	0.1435	0.772	14.3	100.189	1.76e-07	5.10e-02	2.42e-05
22	0.0625	0.1370	0.786	13.7	319.278	5.68e-08	1.04e-01	1.59e-05

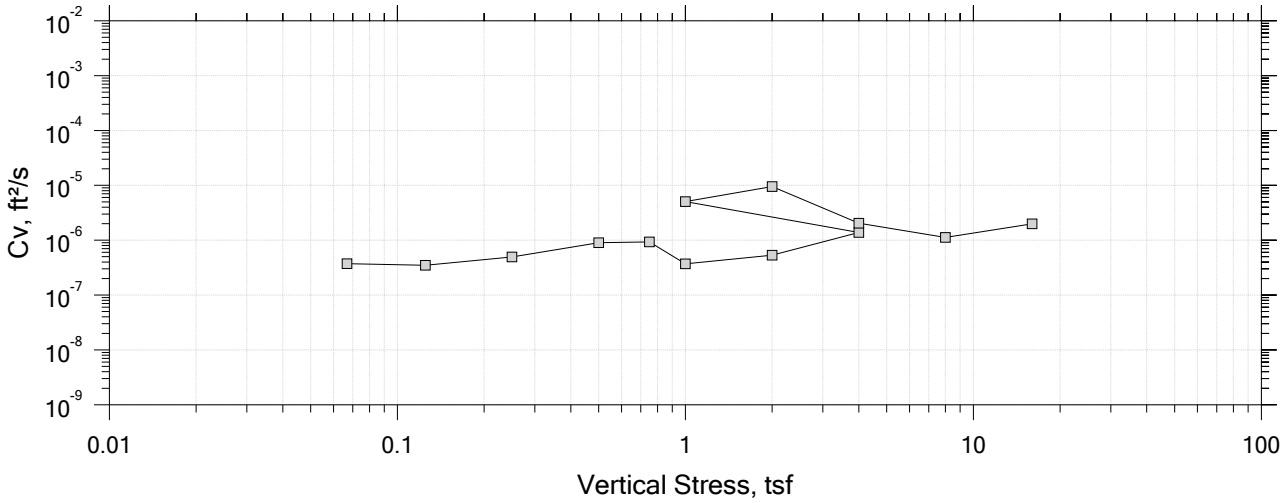
GeoTesting EXPRESS

Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
Boring No.: BB-PVS-201	Tested By: md	Checked By: njh
Sample No.: U3	Test Date: 09/21/18	Depth: 45-47 ft
Test No.: IP-3	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

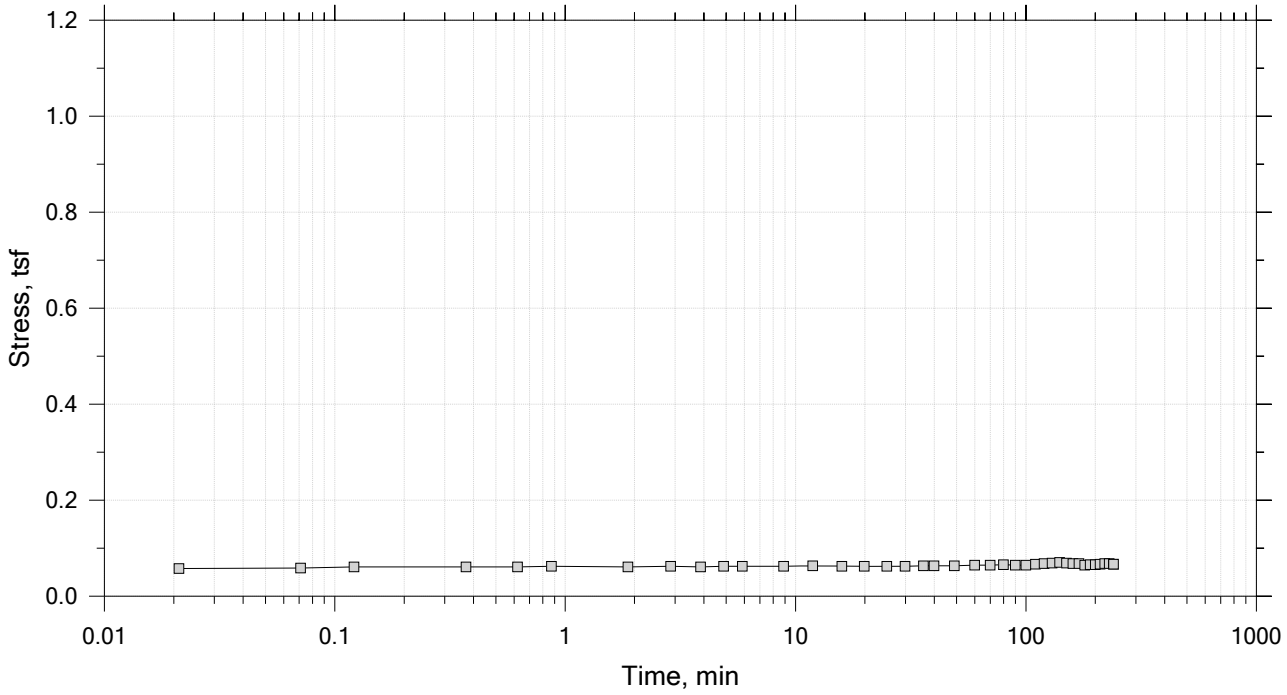


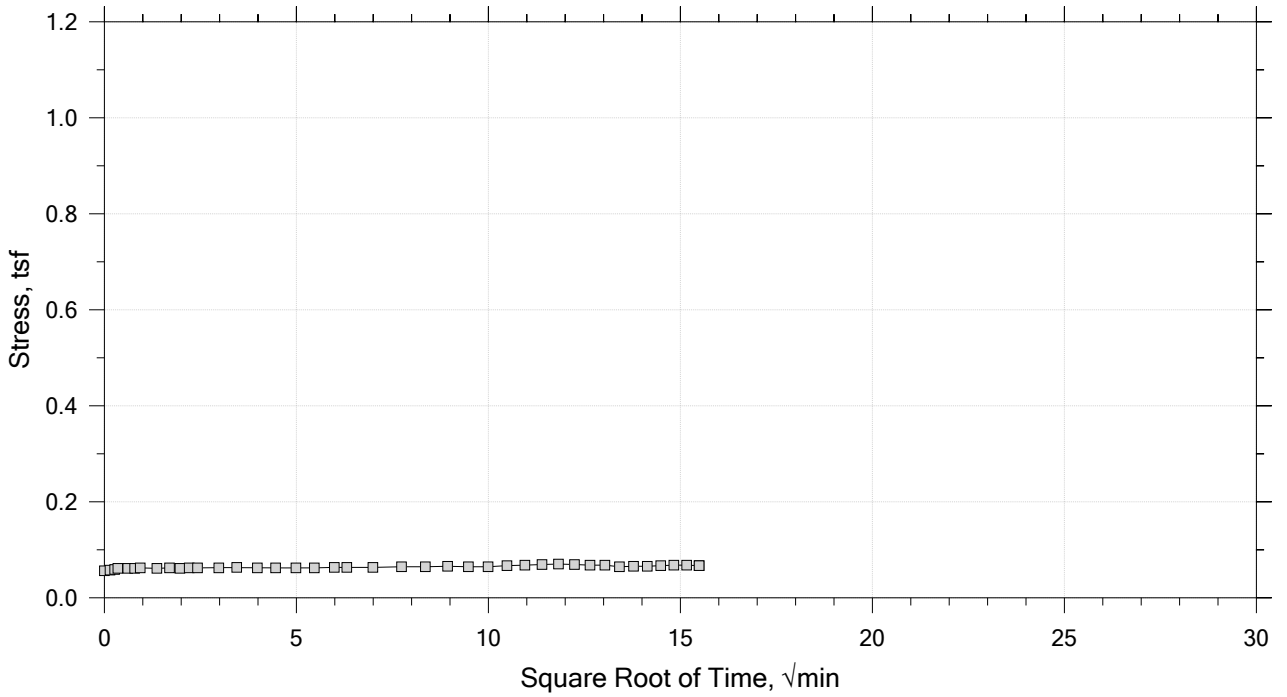


GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-201	Tested By: md	Checked By: njh
	Sample No.: U4	Test Date: 09/21/18	Depth: 55-57 ft
	Test No.: IP-4	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System JJ, Swell Pressure = 0.0668 tsf		
	Displacement at End of Increment		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 1 of 22
Constant Volume Step
Stress: 0.0668 tsf





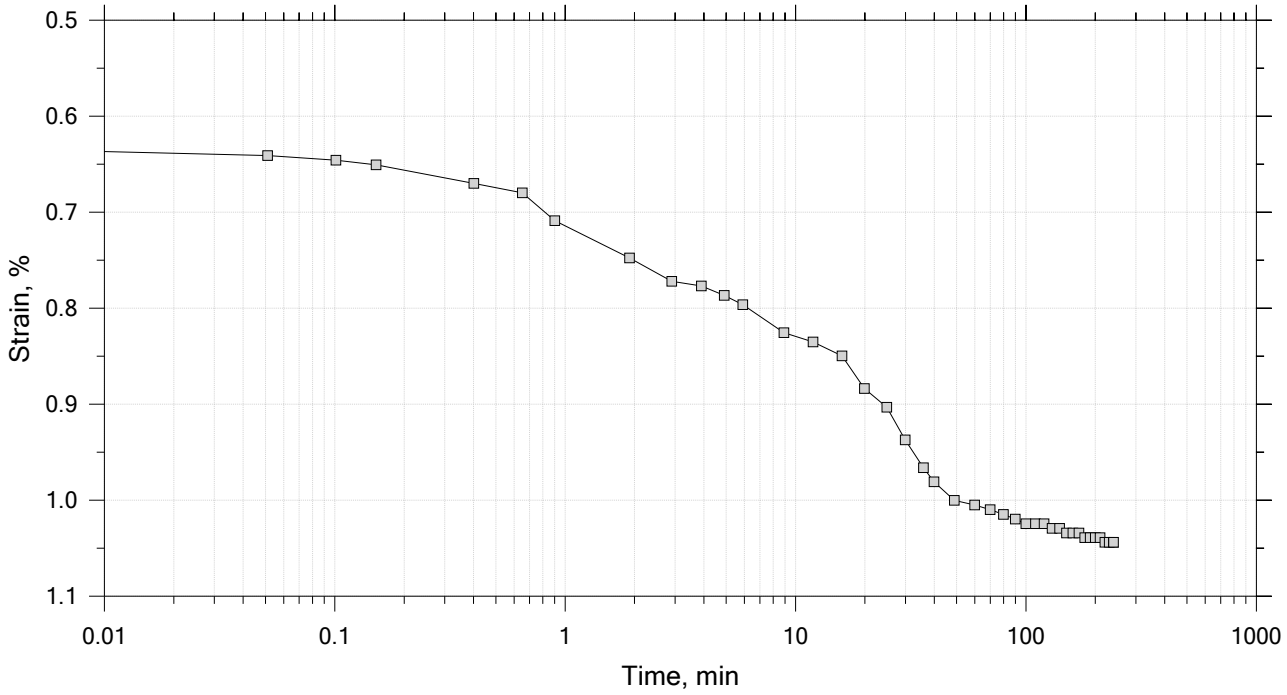
GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-201	Tested By: md	Checked By: njh
	Sample No.: U4	Test Date: 09/21/18	Depth: 55-57 ft
	Test No.: IP-4	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System JJ, Swell Pressure = 0.0668 tsf		

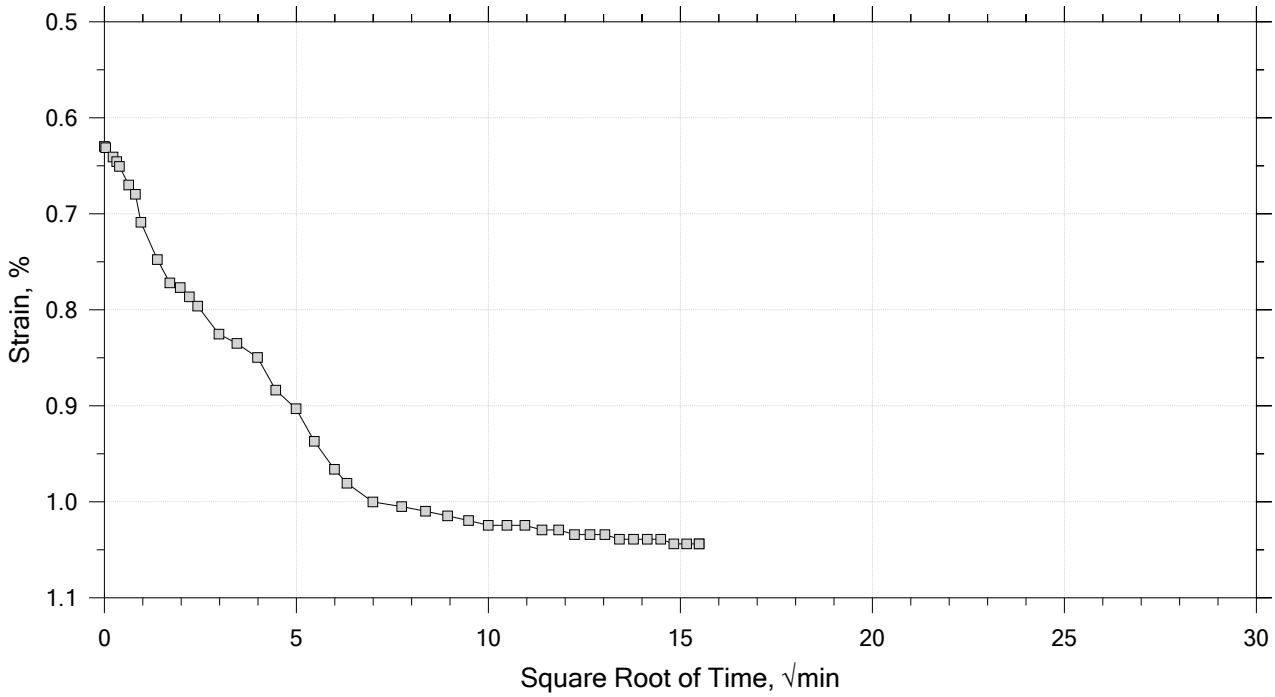
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 2 of 22

Constant Load Step

Stress: 0.125 tsf





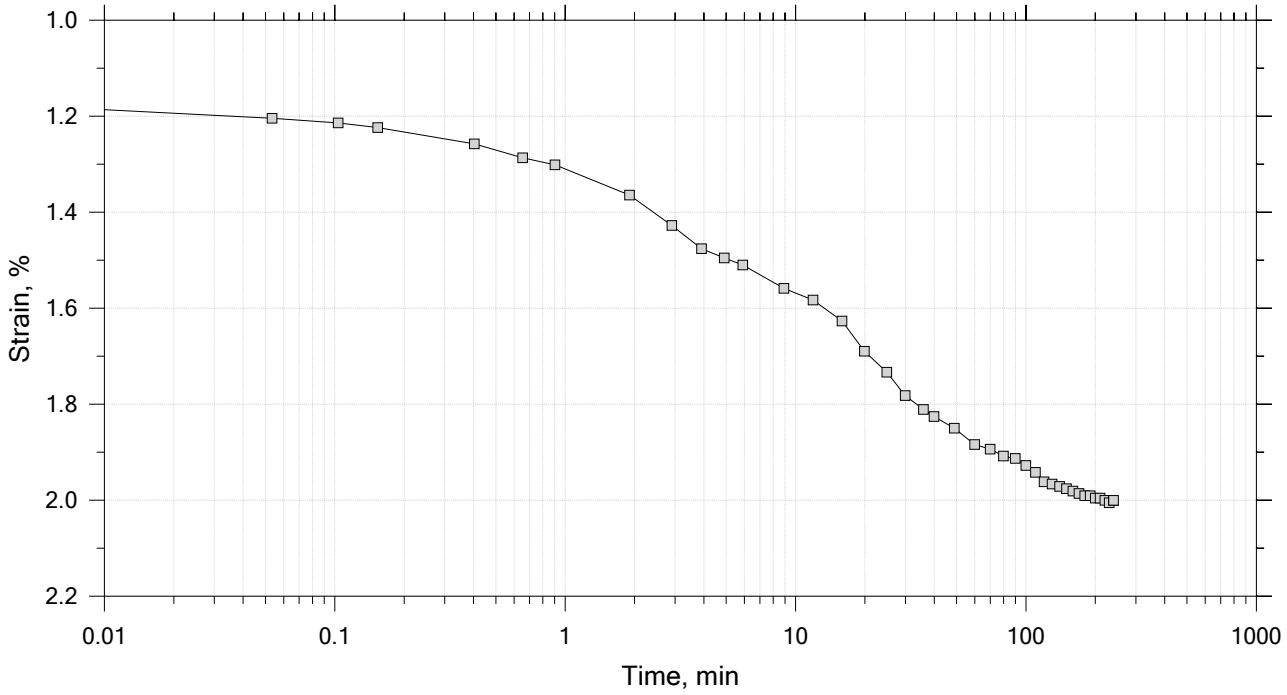
GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-201	Tested By: md	Checked By: njh
	Sample No.: U4	Test Date: 09/21/18	Depth: 55-57 ft
	Test No.: IP-4	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System JJ, Swell Pressure = 0.0668 tsf		

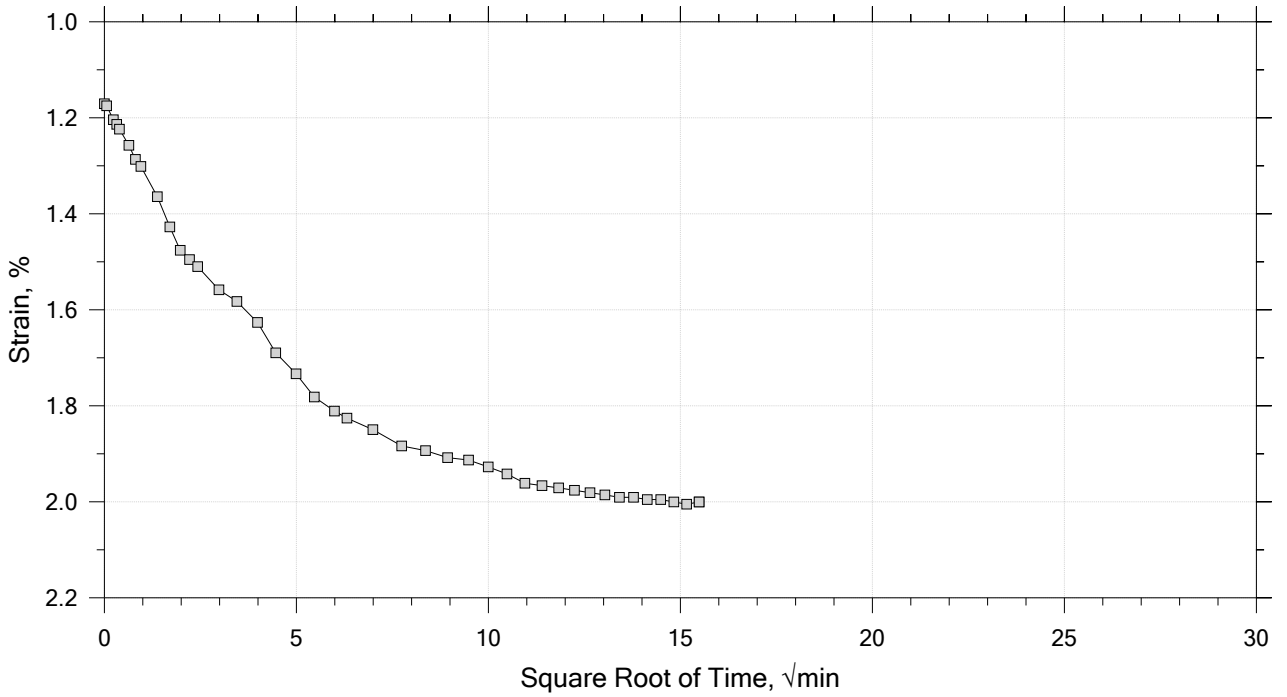
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 3 of 22

Constant Load Step

Stress: 0.25 tsf

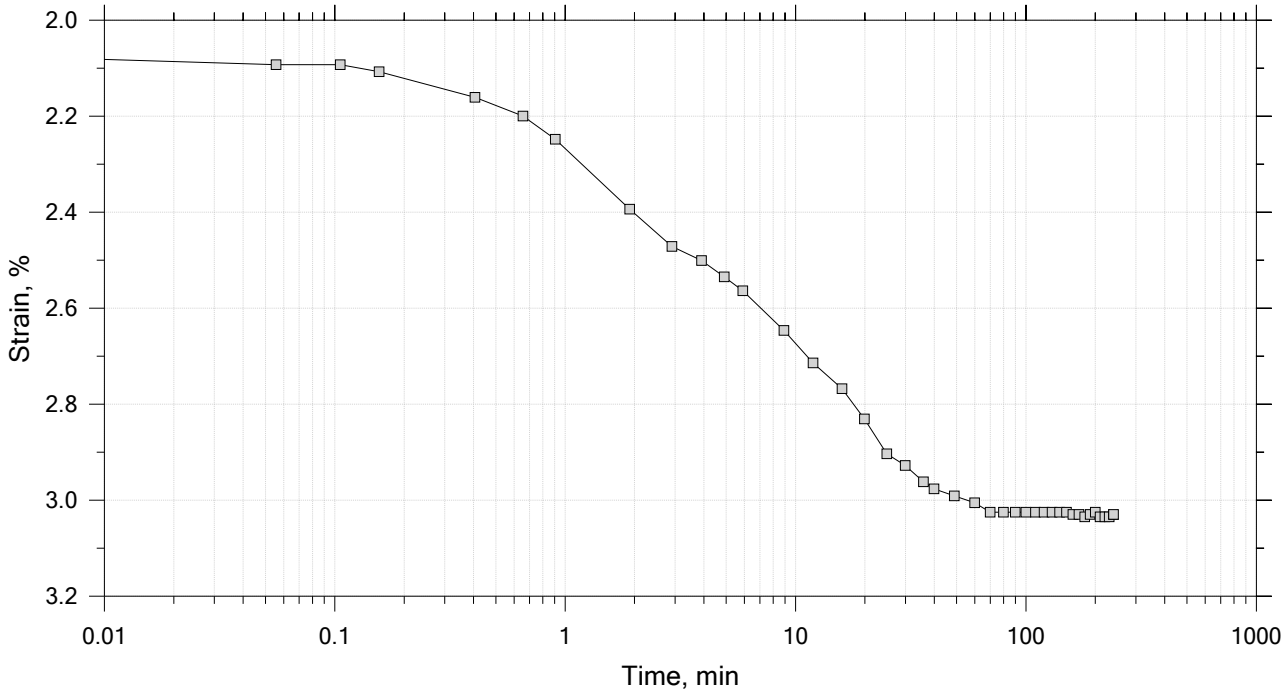


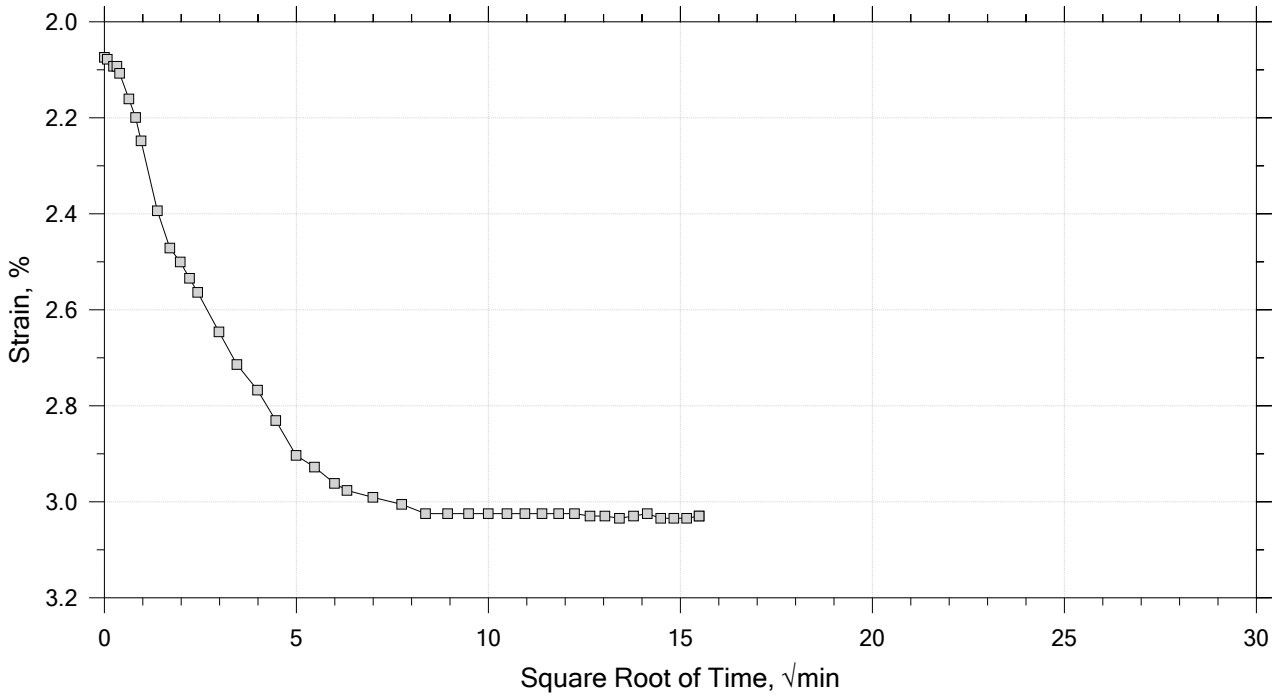


GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-201	Tested By: md	Checked By: njh
	Sample No.: U4	Test Date: 09/21/18	Depth: 55-57 ft
	Test No.: IP-4	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System JJ, Swell Pressure = 0.0668 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 4 of 22
Constant Load Step
Stress: 0.5 tsf

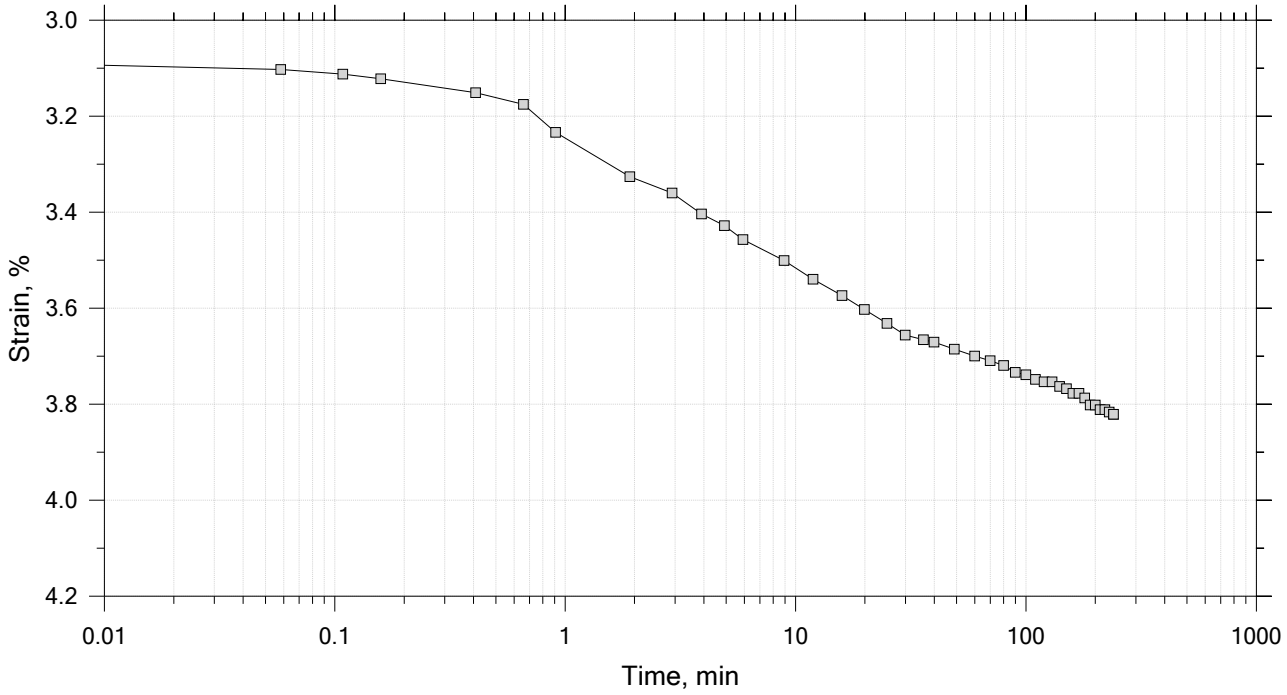


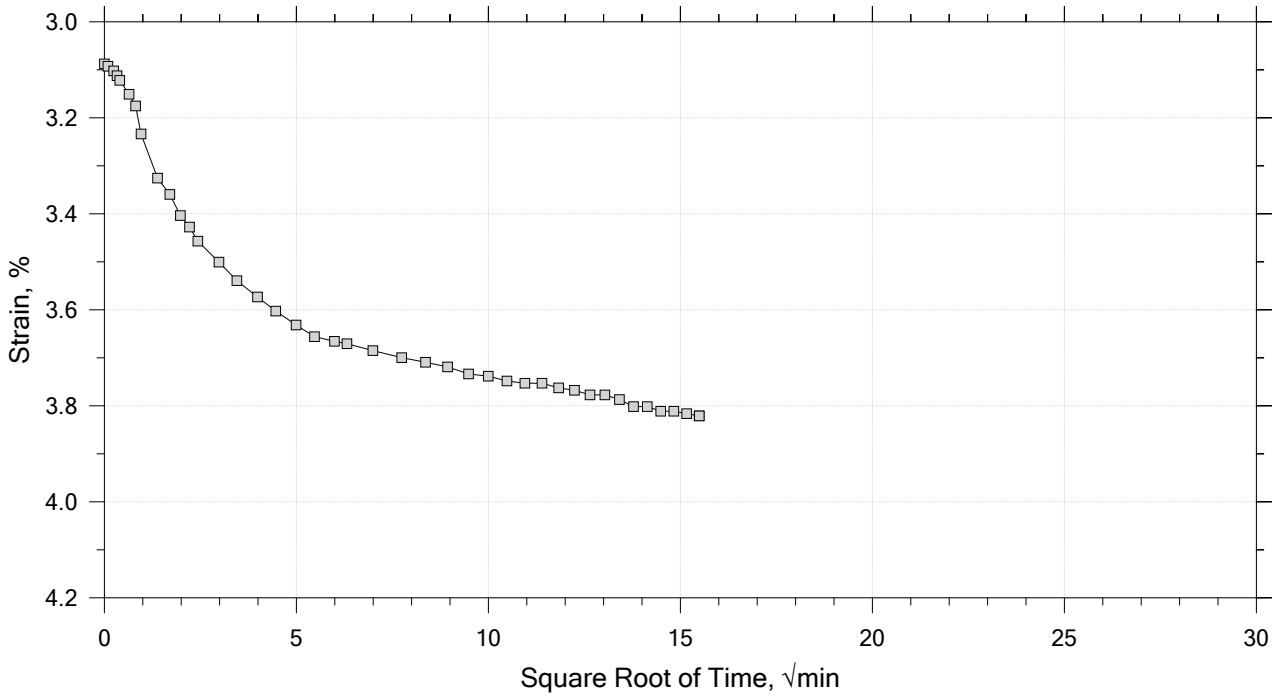


GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-201	Tested By: md	Checked By: njh
	Sample No.: U4	Test Date: 09/21/18	Depth: 55-57 ft
	Test No.: IP-4	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System JJ, Swell Pressure = 0.0668 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 5 of 22
Constant Load Step
Stress: 0.75 tsf





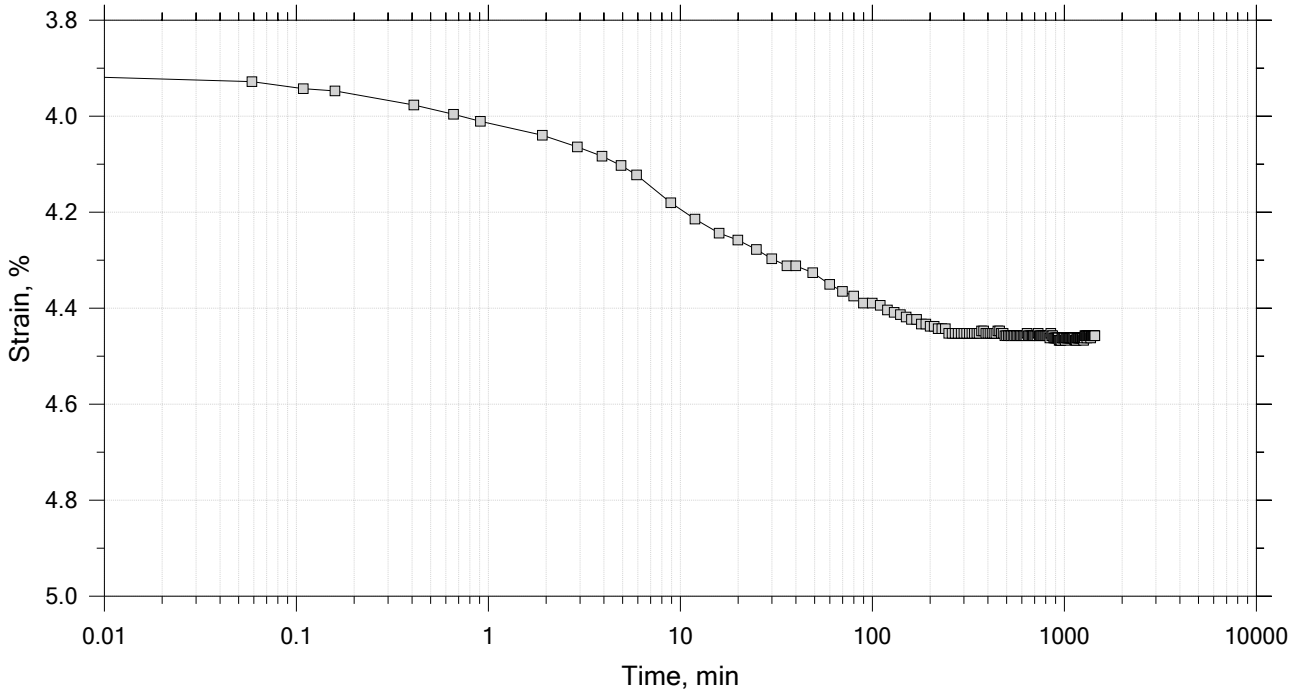
Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
Boring No.: BB-PVS-201	Tested By: md	Checked By: njh
Sample No.: U4	Test Date: 09/21/18	Depth: 55-57 ft
Test No.: IP-4	Sample Type: intact	Elevation: ---
Description: Moist, dark gray clay		
Remarks: System JJ, Swell Pressure = 0.0668 tsf		

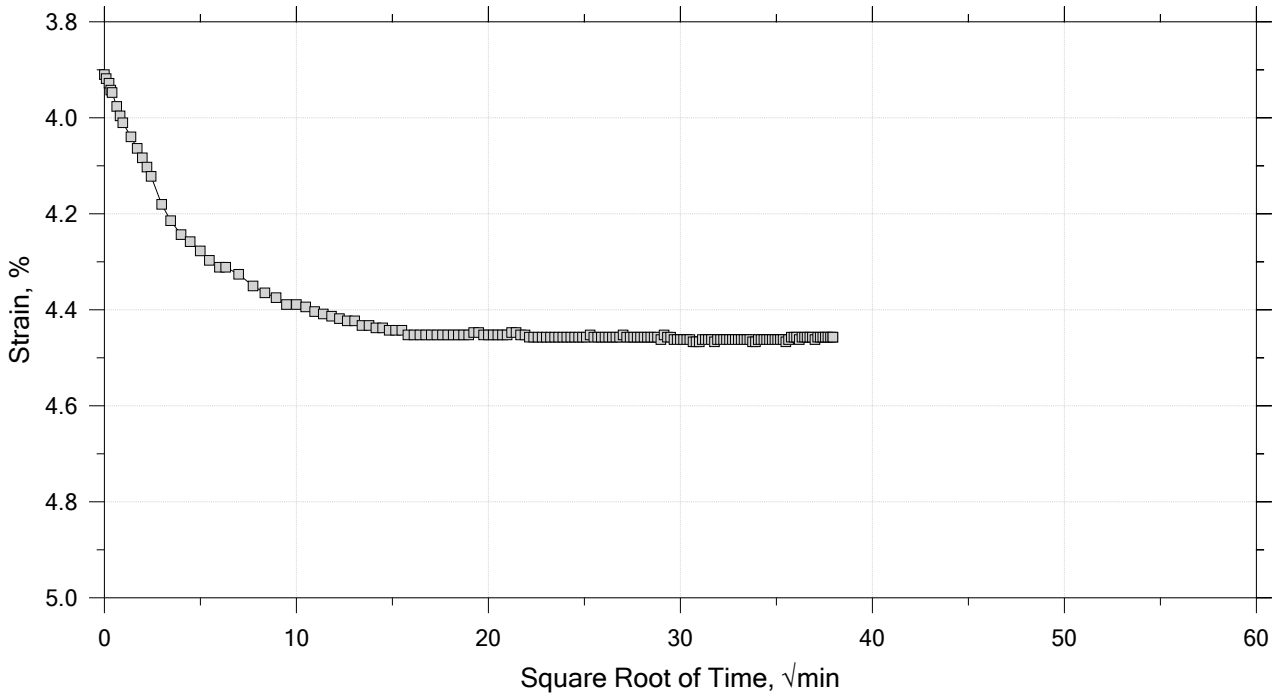
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 6 of 22

Constant Load Step

Stress: 1 tsf





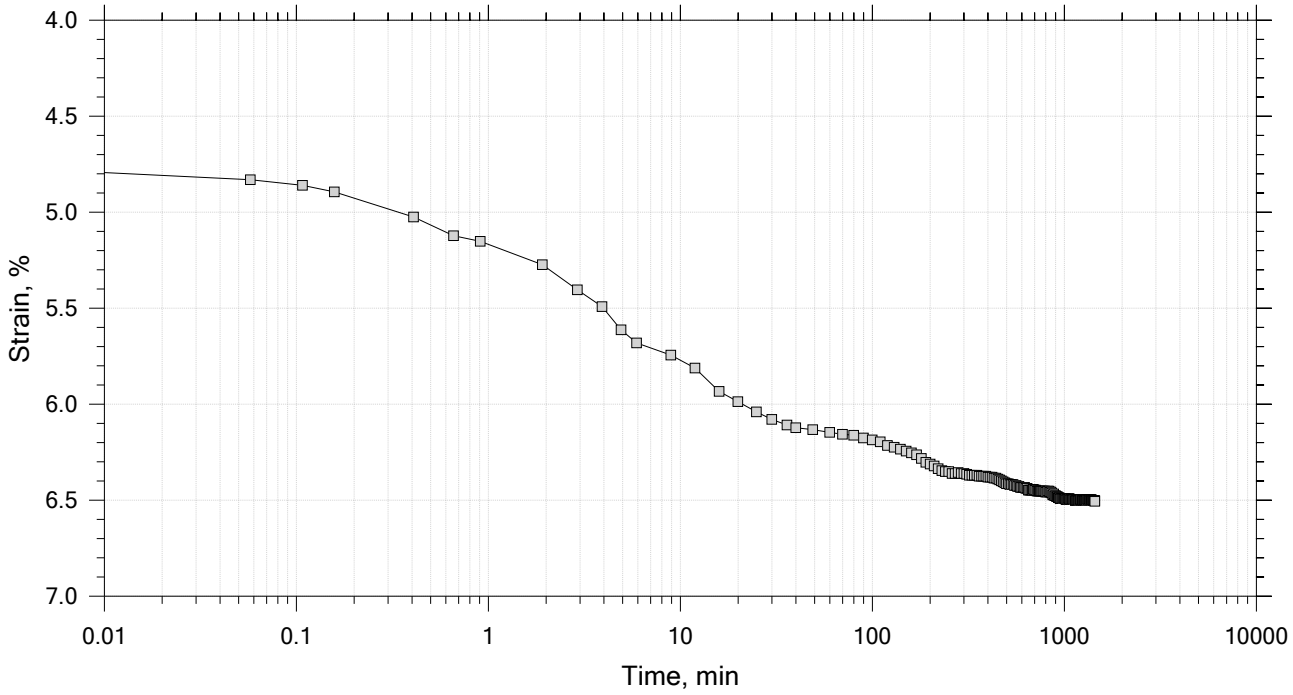
Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
Boring No.: BB-PVS-201	Tested By: md	Checked By: njh
Sample No.: U4	Test Date: 09/21/18	Depth: 55-57 ft
Test No.: IP-4	Sample Type: intact	Elevation: ---
Description: Moist, dark gray clay		
Remarks: System JJ, Swell Pressure = 0.0668 tsf		

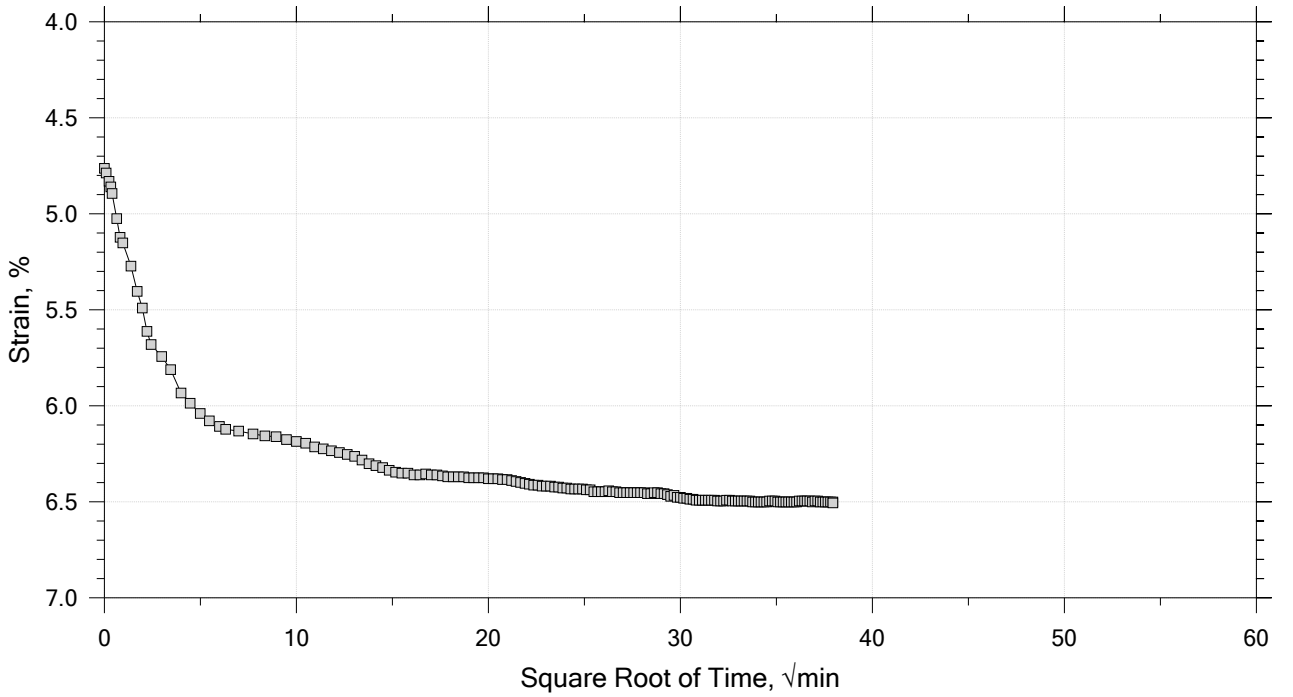
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 7 of 22

Constant Load Step

Stress: 2 tsf





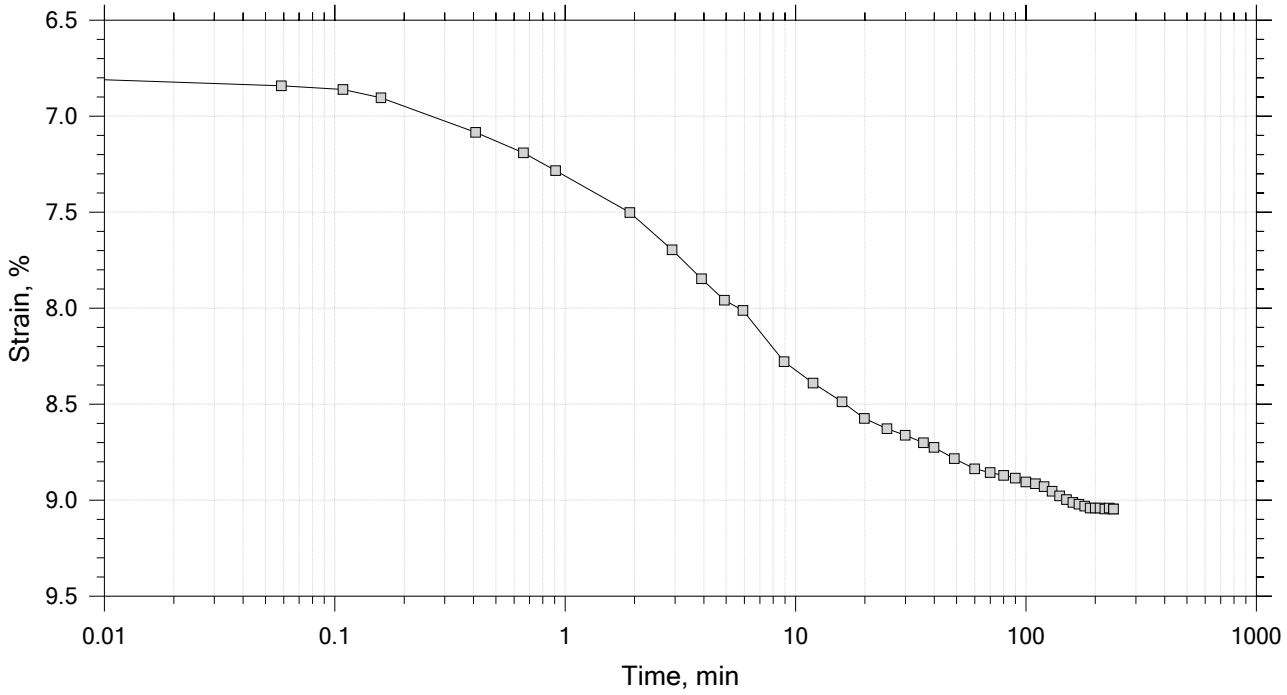
GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-201	Tested By: md	Checked By: njh
	Sample No.: U4	Test Date: 09/21/18	Depth: 55-57 ft
	Test No.: IP-4	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System JJ, Swell Pressure = 0.0668 tsf		

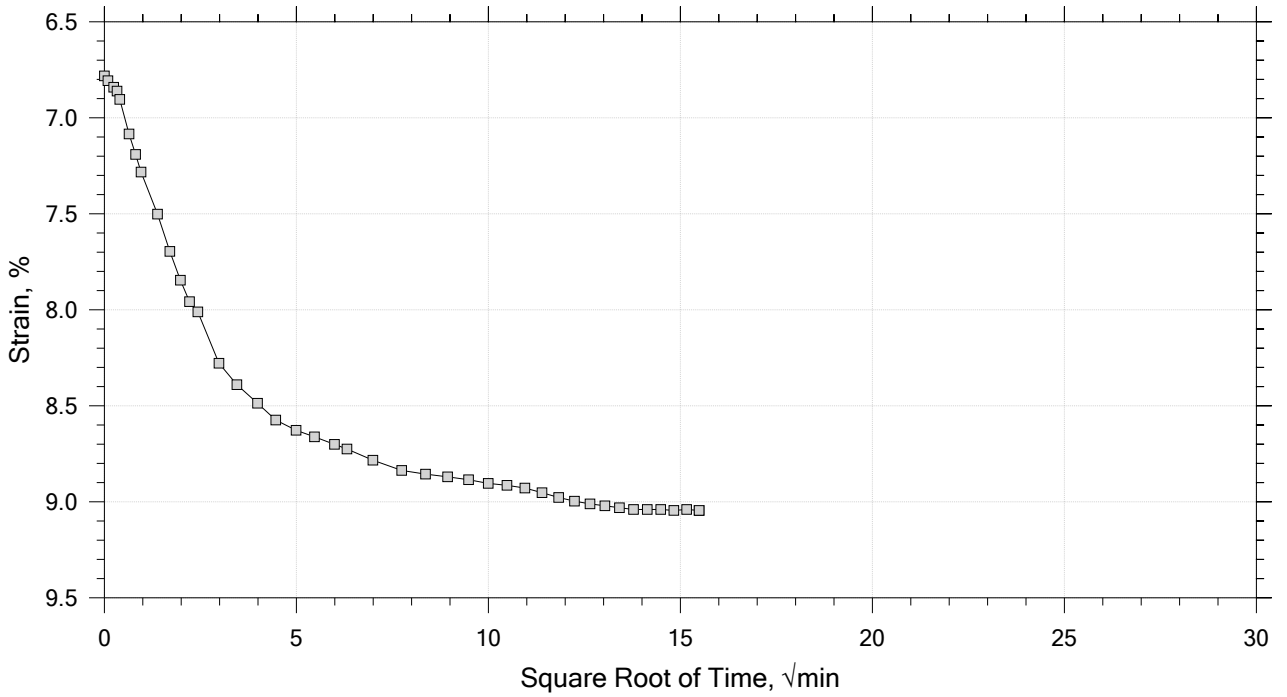
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 8 of 22

Constant Load Step

Stress: 4 tsf





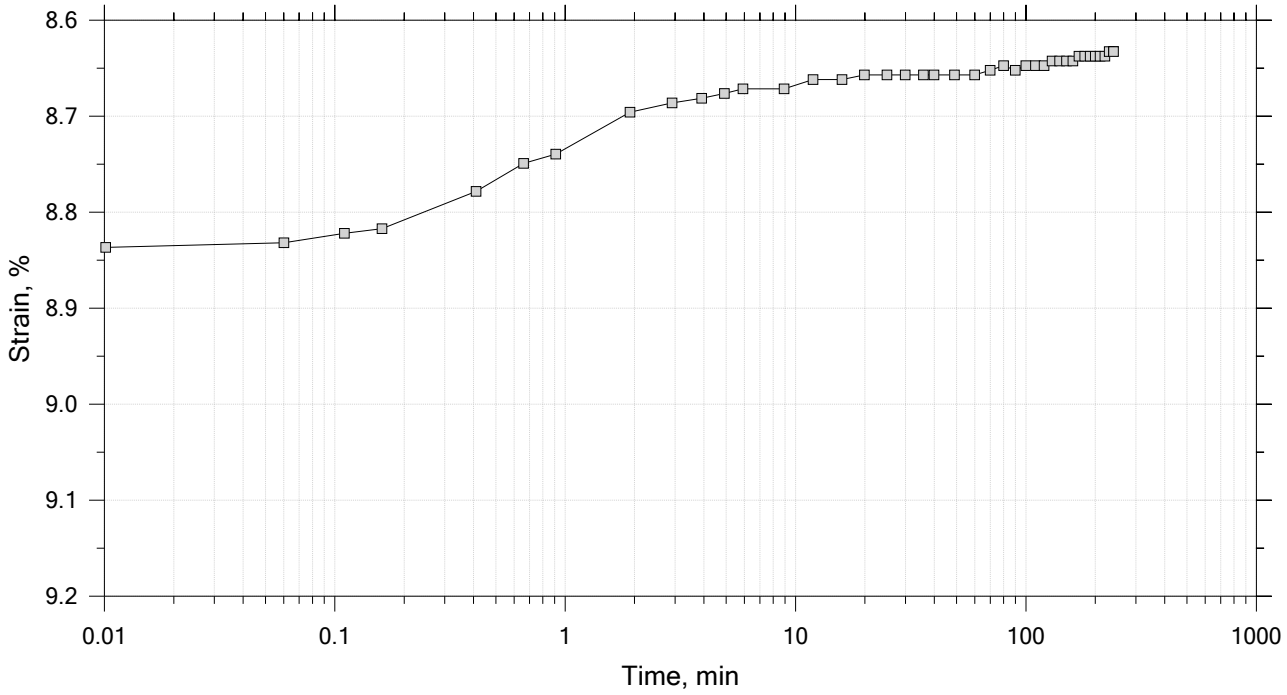
GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-201	Tested By: md	Checked By: njh
	Sample No.: U4	Test Date: 09/21/18	Depth: 55-57 ft
	Test No.: IP-4	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System JJ, Swell Pressure = 0.0668 tsf		

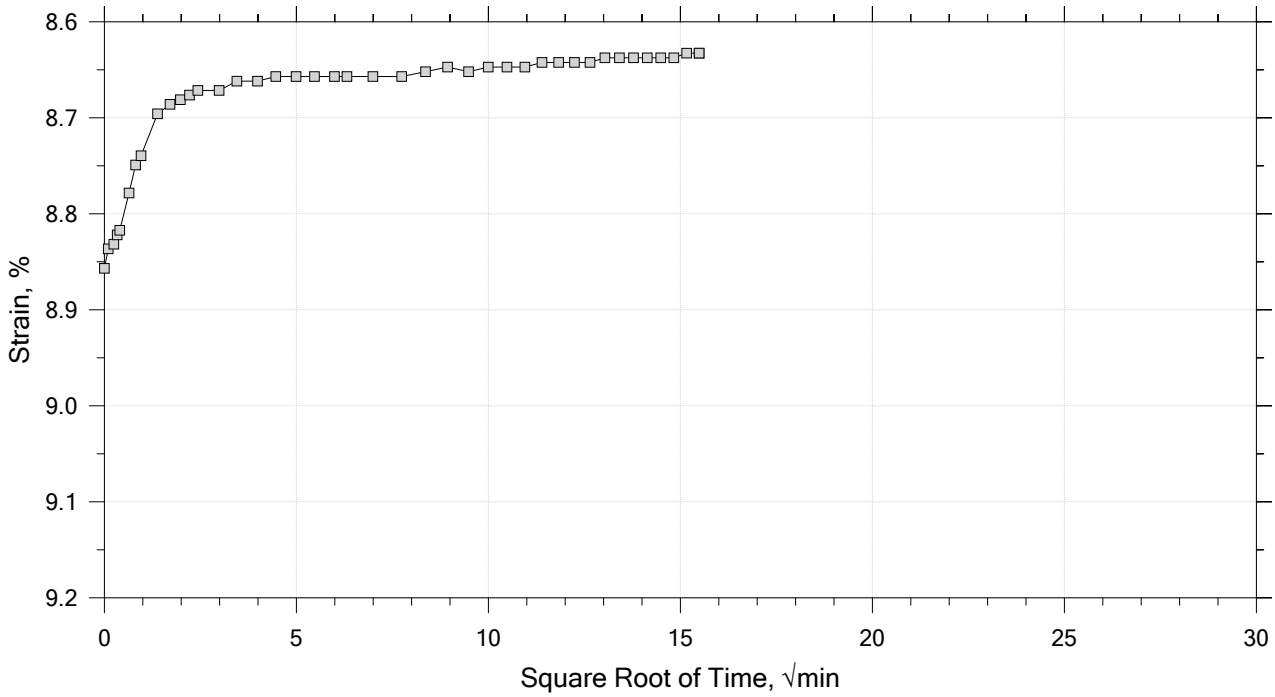
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 9 of 22

Constant Load Step

Stress: 2 tsf

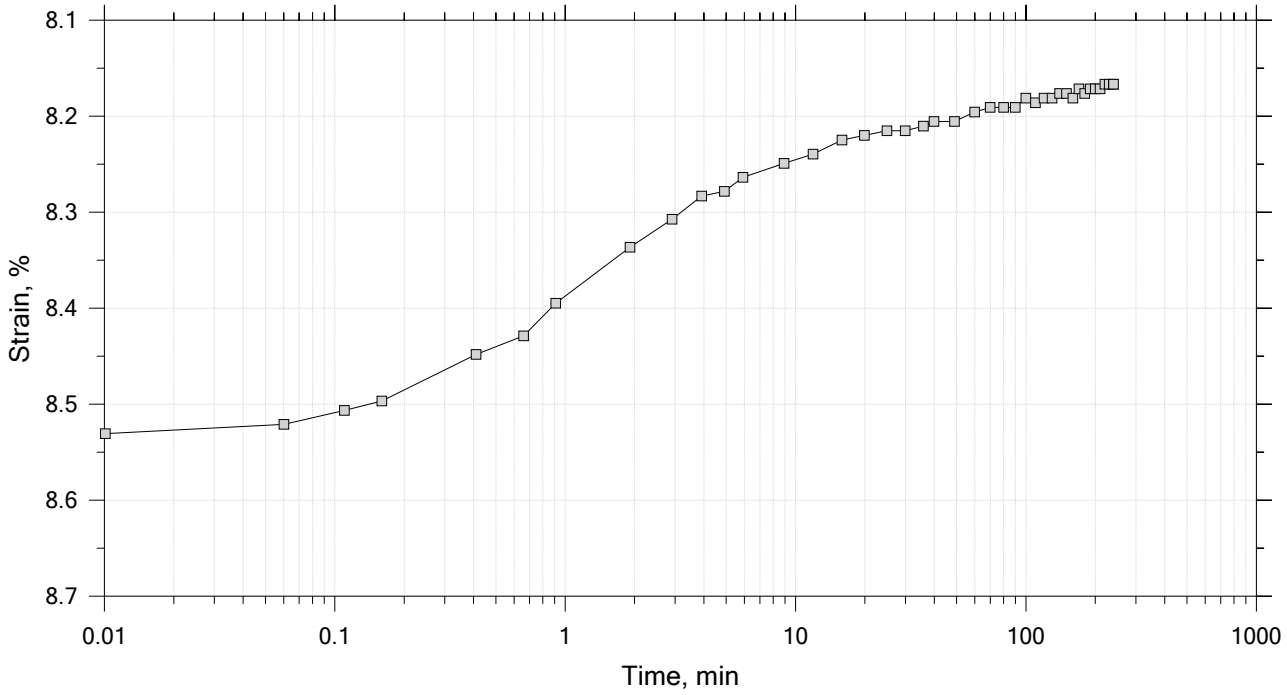


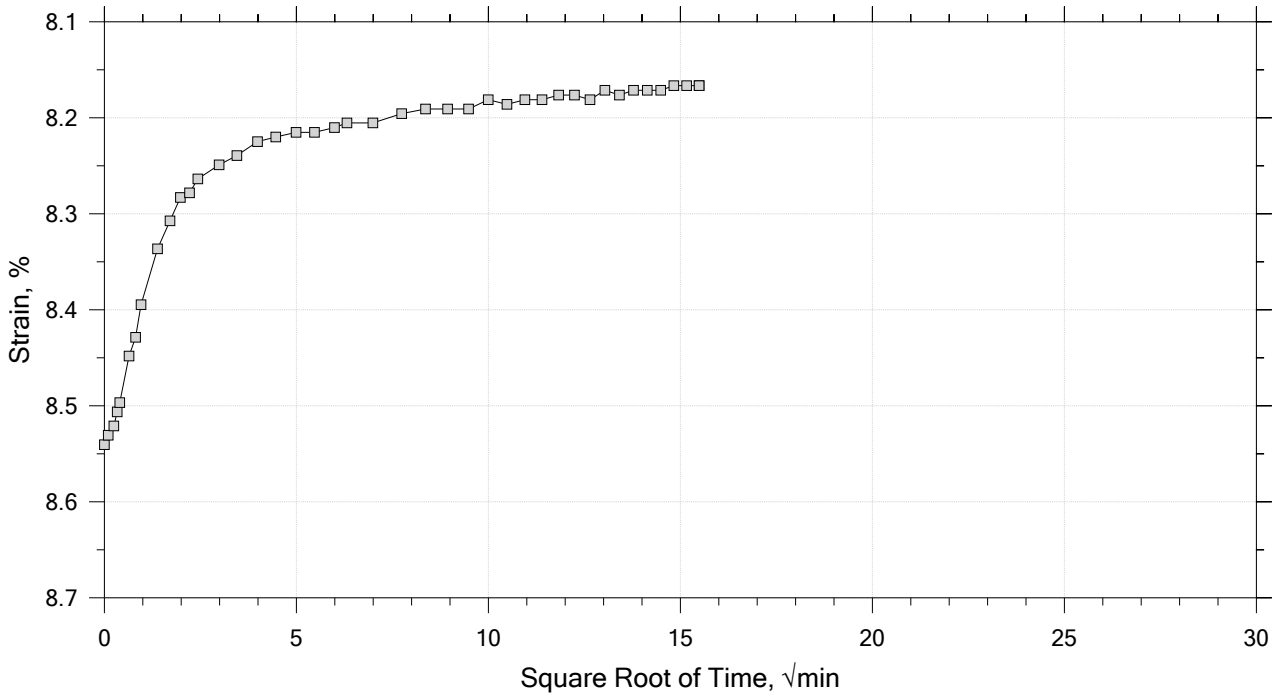


GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-201	Tested By: md	Checked By: njh
	Sample No.: U4	Test Date: 09/21/18	Depth: 55-57 ft
	Test No.: IP-4	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System JJ, Swell Pressure = 0.0668 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 10 of 22
Constant Load Step
Stress: 1 tsf

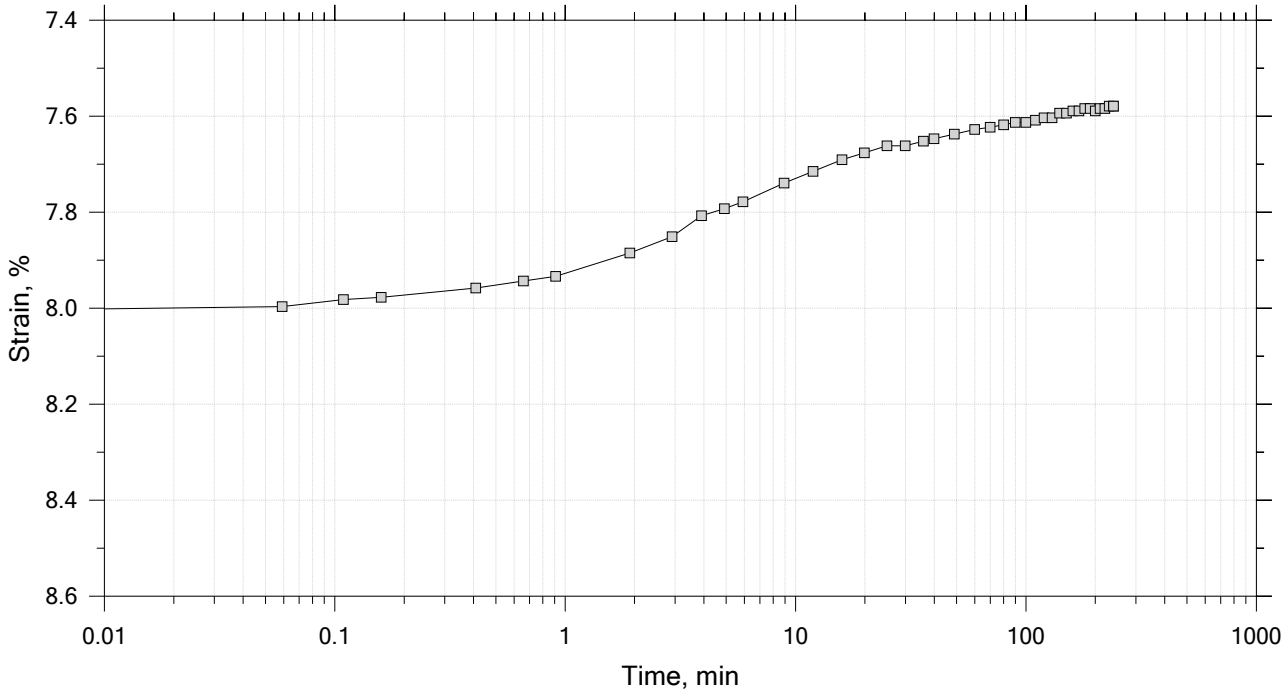


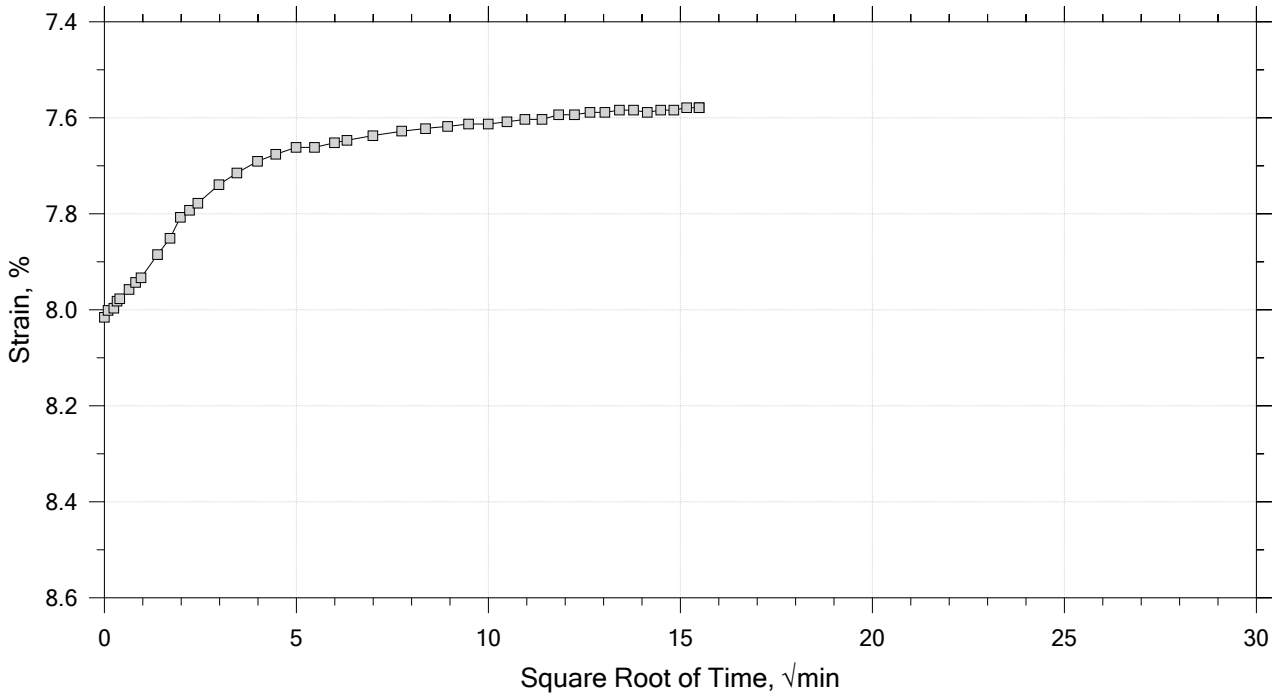


GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-201	Tested By: md	Checked By: njh
	Sample No.: U4	Test Date: 09/21/18	Depth: 55-57 ft
	Test No.: IP-4	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System JJ, Swell Pressure = 0.0668 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 11 of 22
Constant Load Step
Stress: 0.5 tsf





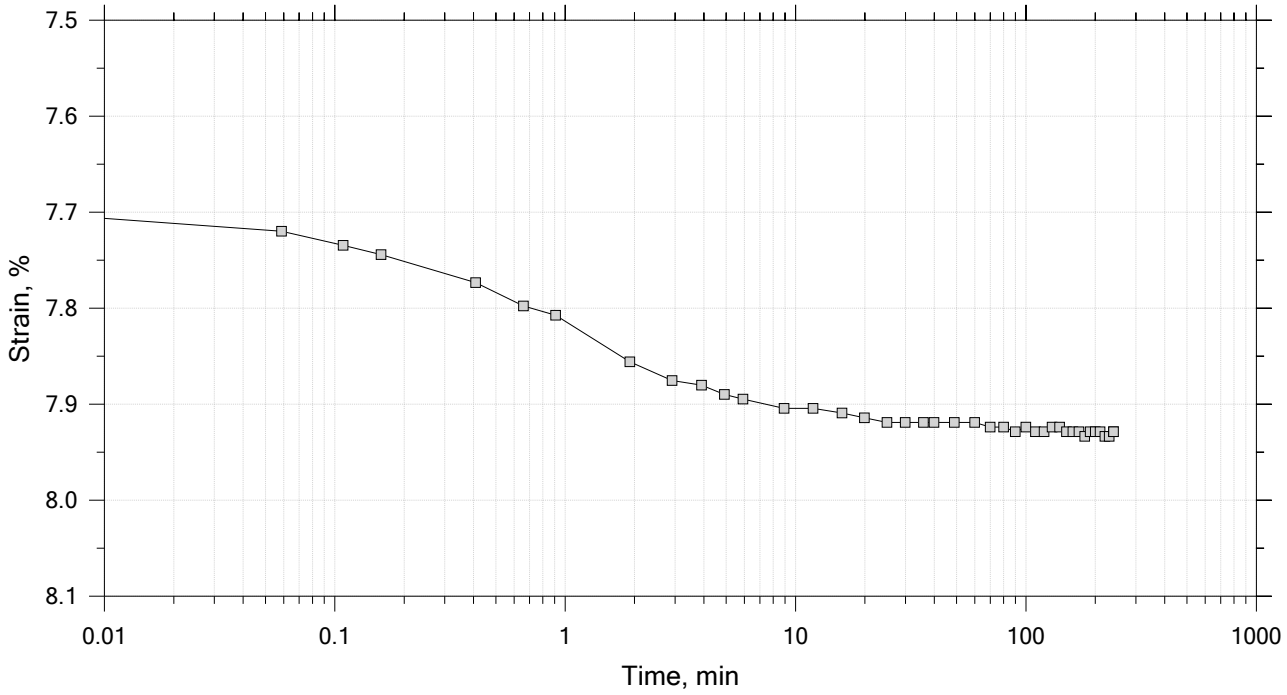
GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-201	Tested By: md	Checked By: njh
	Sample No.: U4	Test Date: 09/21/18	Depth: 55-57 ft
	Test No.: IP-4	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System JJ, Swell Pressure = 0.0668 tsf		

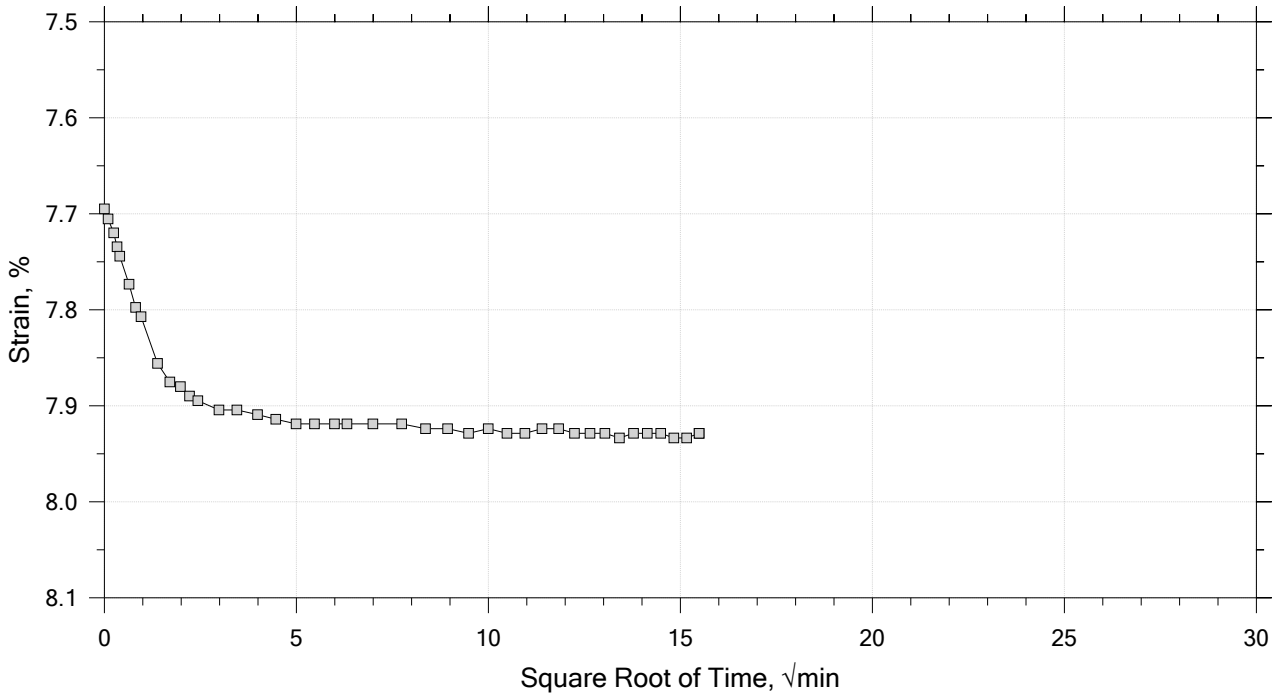
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 12 of 22

Constant Load Step

Stress: 1 tsf

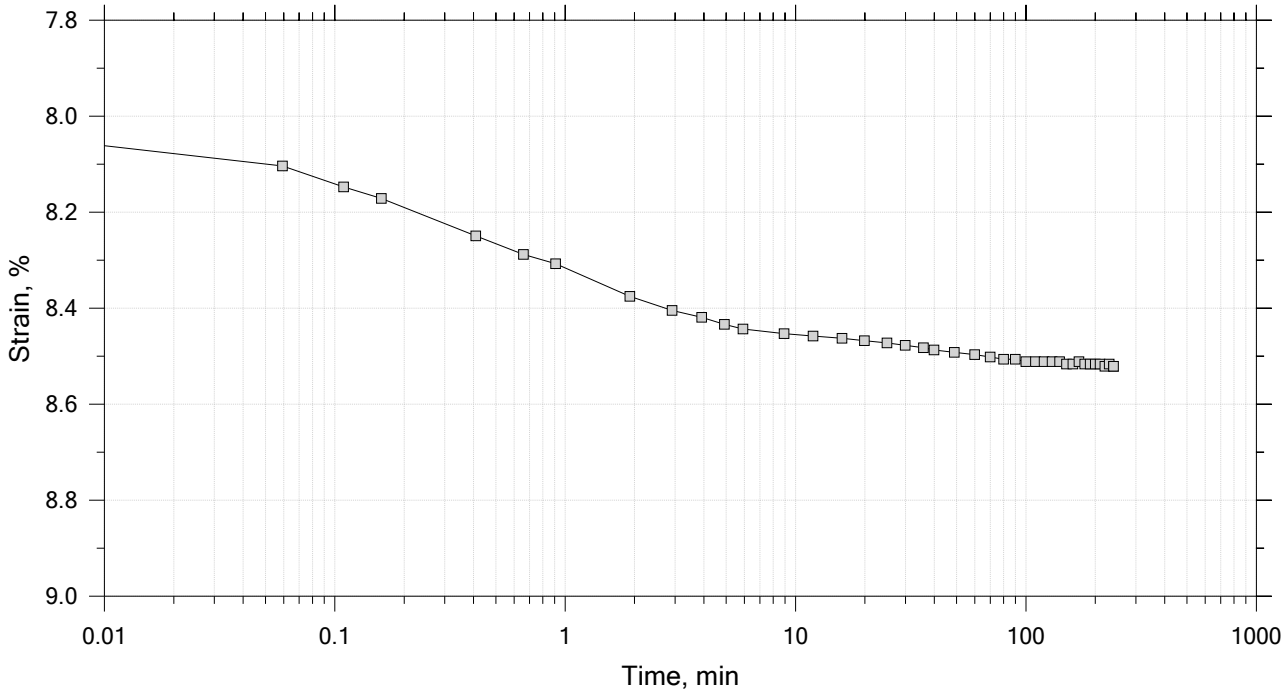


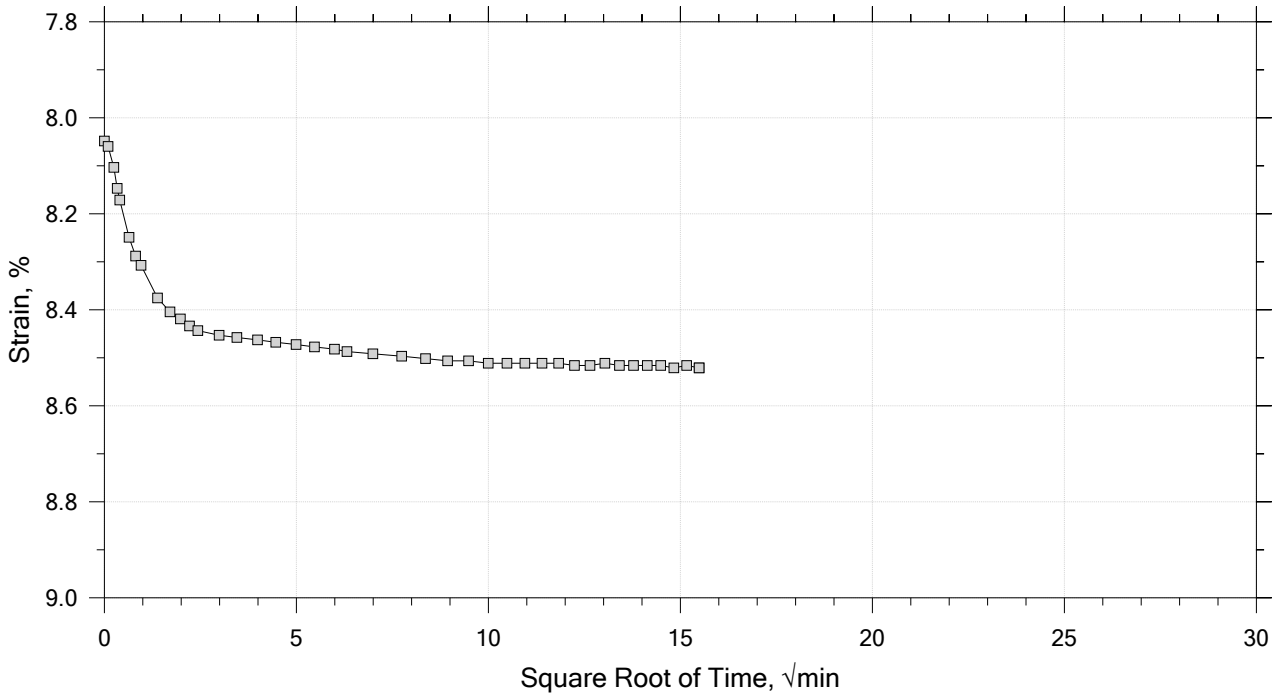


GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-201	Tested By: md	Checked By: njh
	Sample No.: U4	Test Date: 09/21/18	Depth: 55-57 ft
	Test No.: IP-4	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System JJ, Swell Pressure = 0.0668 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 13 of 22
Constant Load Step
Stress: 2 tsf

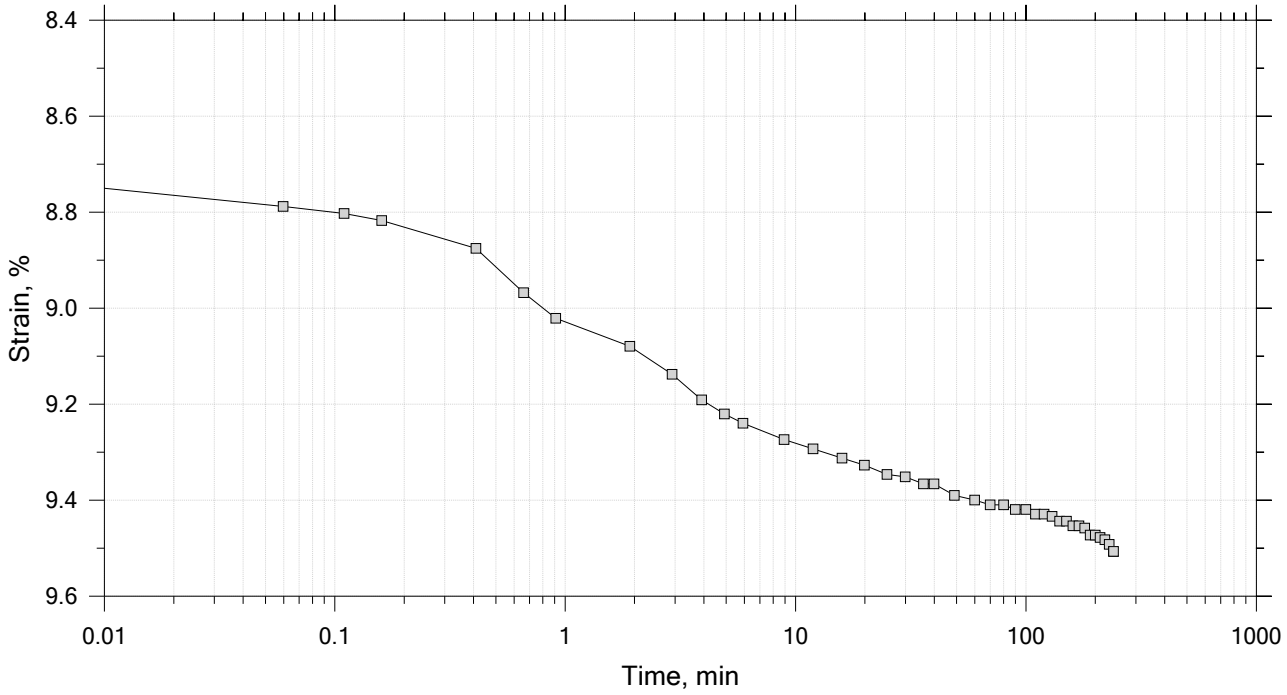


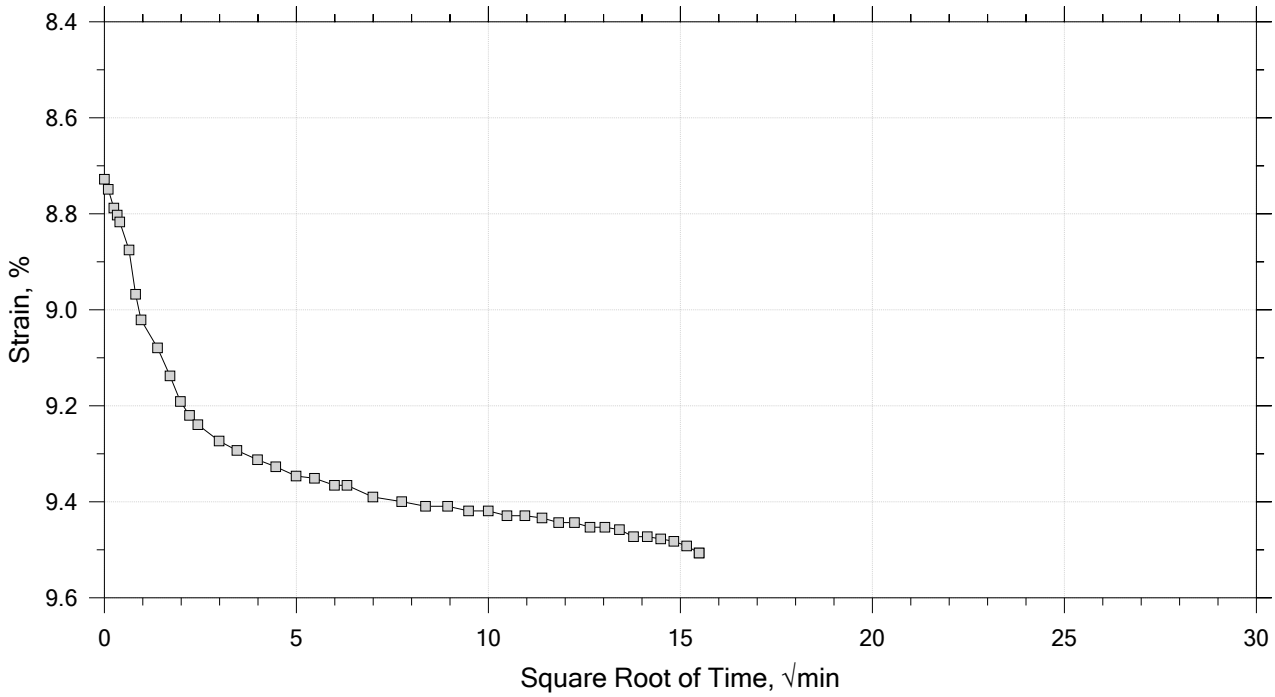


GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-201	Tested By: md	Checked By: njh
	Sample No.: U4	Test Date: 09/21/18	Depth: 55-57 ft
	Test No.: IP-4	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System JJ, Swell Pressure = 0.0668 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 14 of 22
Constant Load Step
Stress: 4 tsf

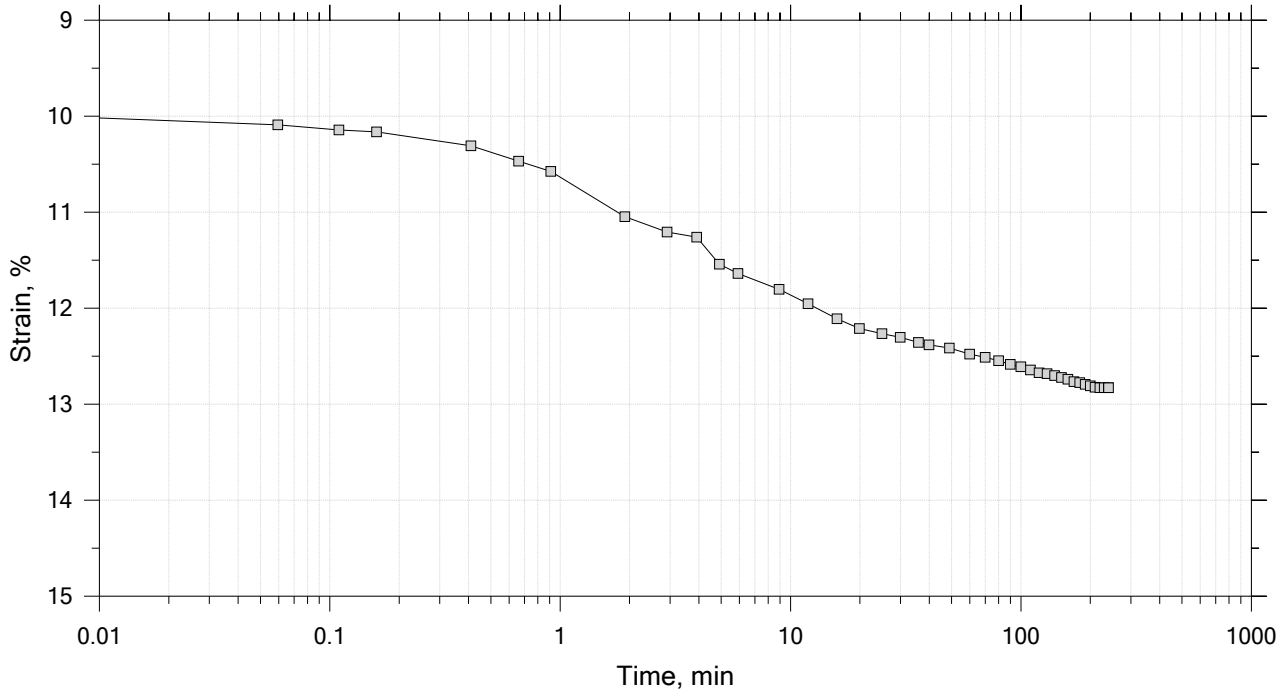


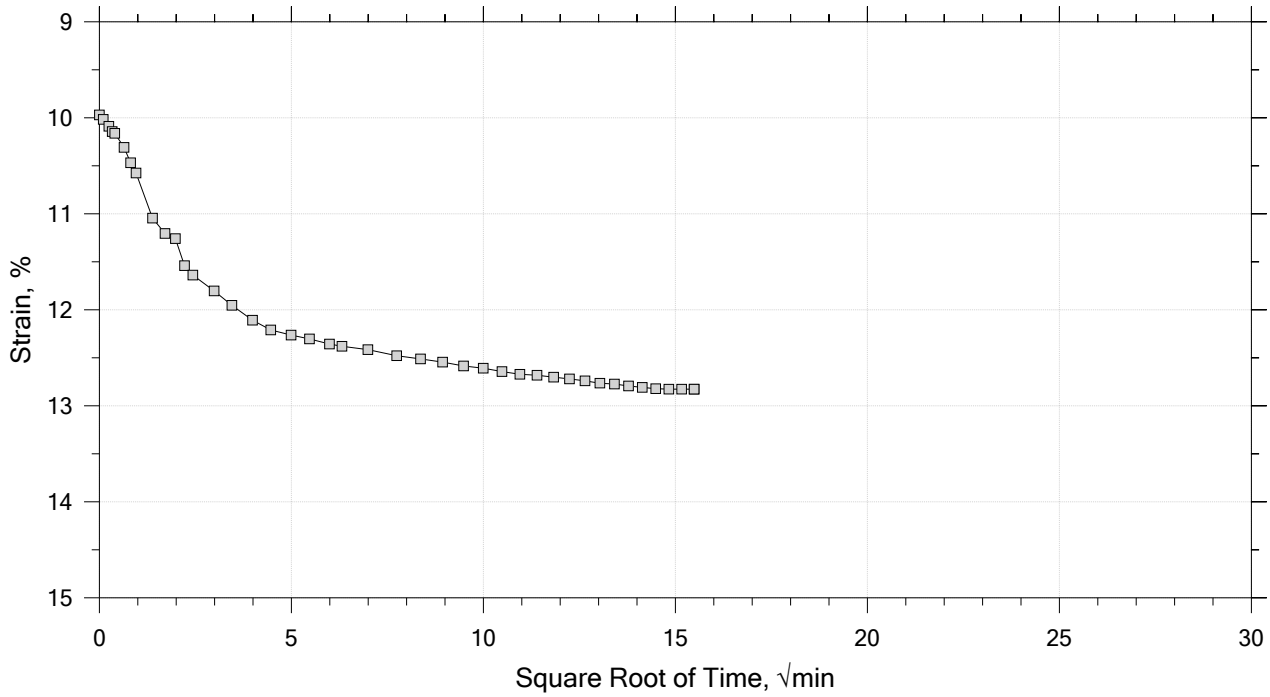


GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-201	Tested By: md	Checked By: njh
	Sample No.: U4	Test Date: 09/21/18	Depth: 55-57 ft
	Test No.: IP-4	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System JJ, Swell Pressure = 0.0668 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 15 of 22
Constant Load Step
Stress: 8 tsf

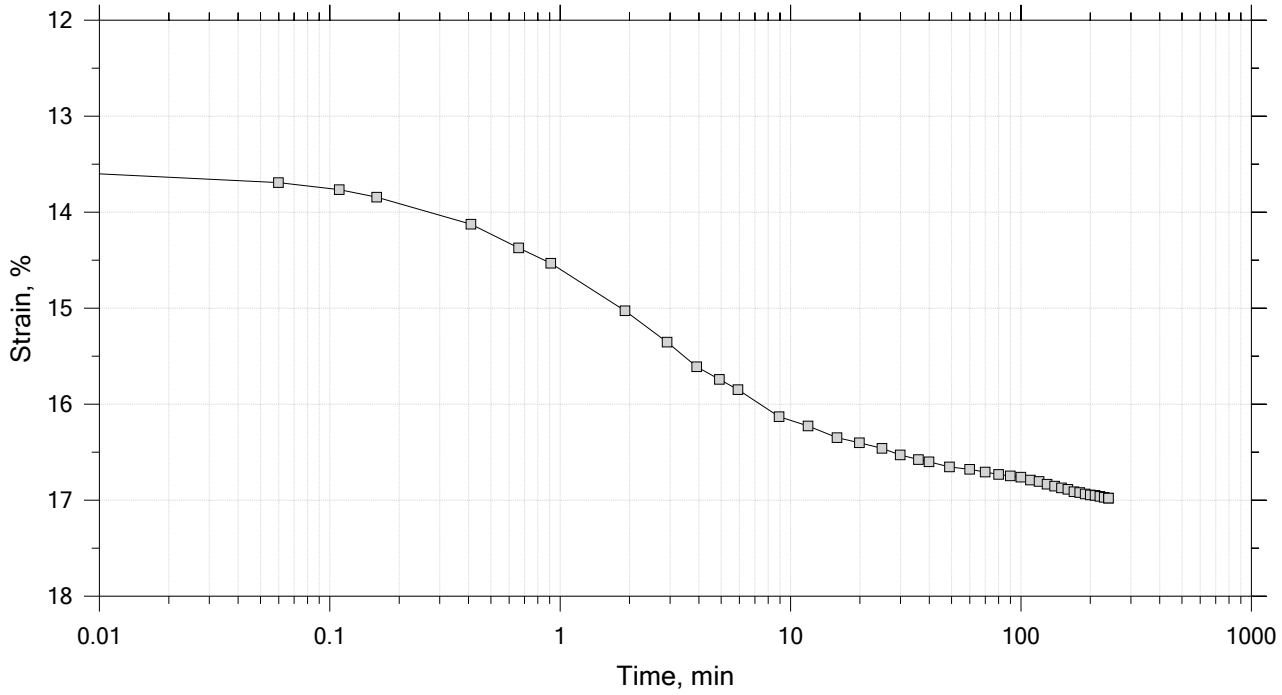


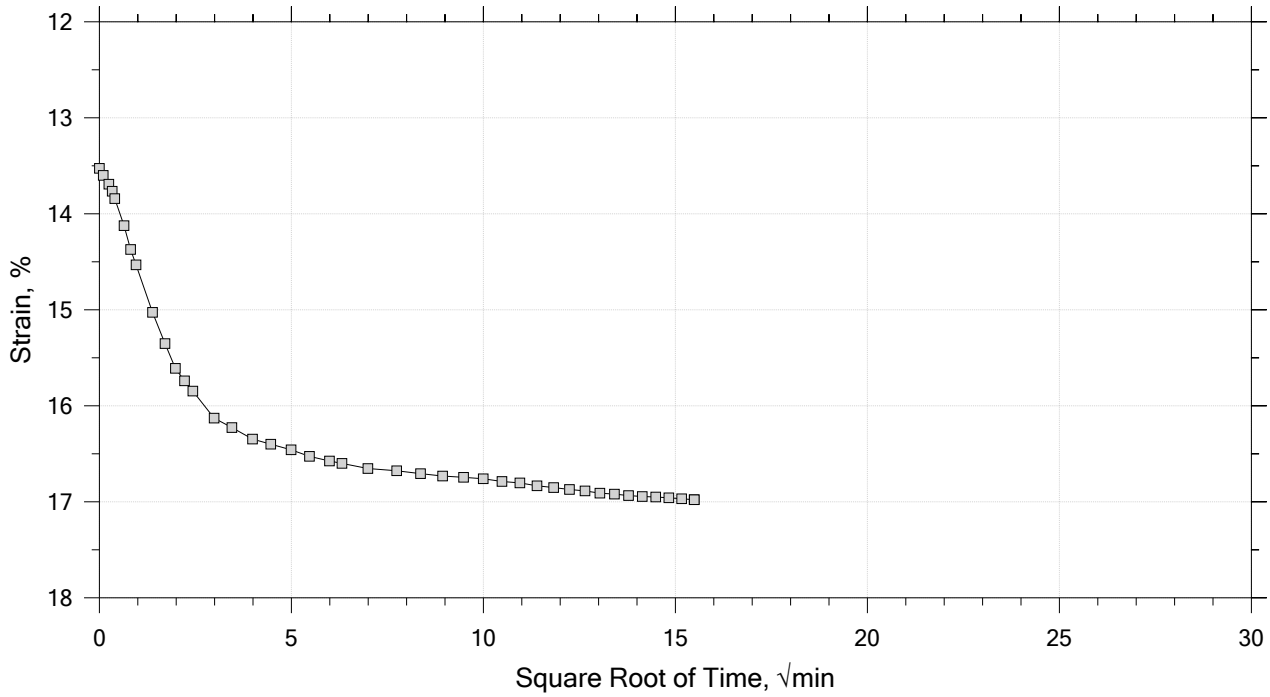


GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-201	Tested By: md	Checked By: njh
	Sample No.: U4	Test Date: 09/21/18	Depth: 55-57 ft
	Test No.: IP-4	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System JJ, Swell Pressure = 0.0668 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 16 of 22
Constant Load Step
Stress: 16 tsf

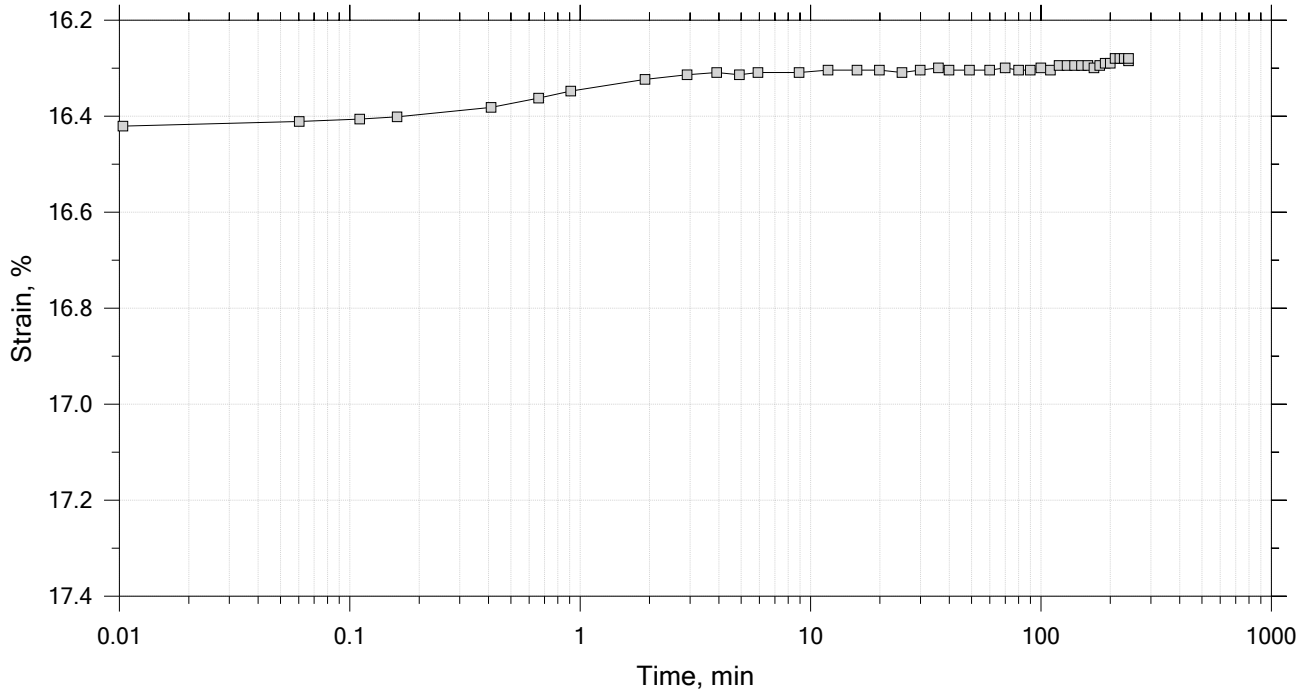


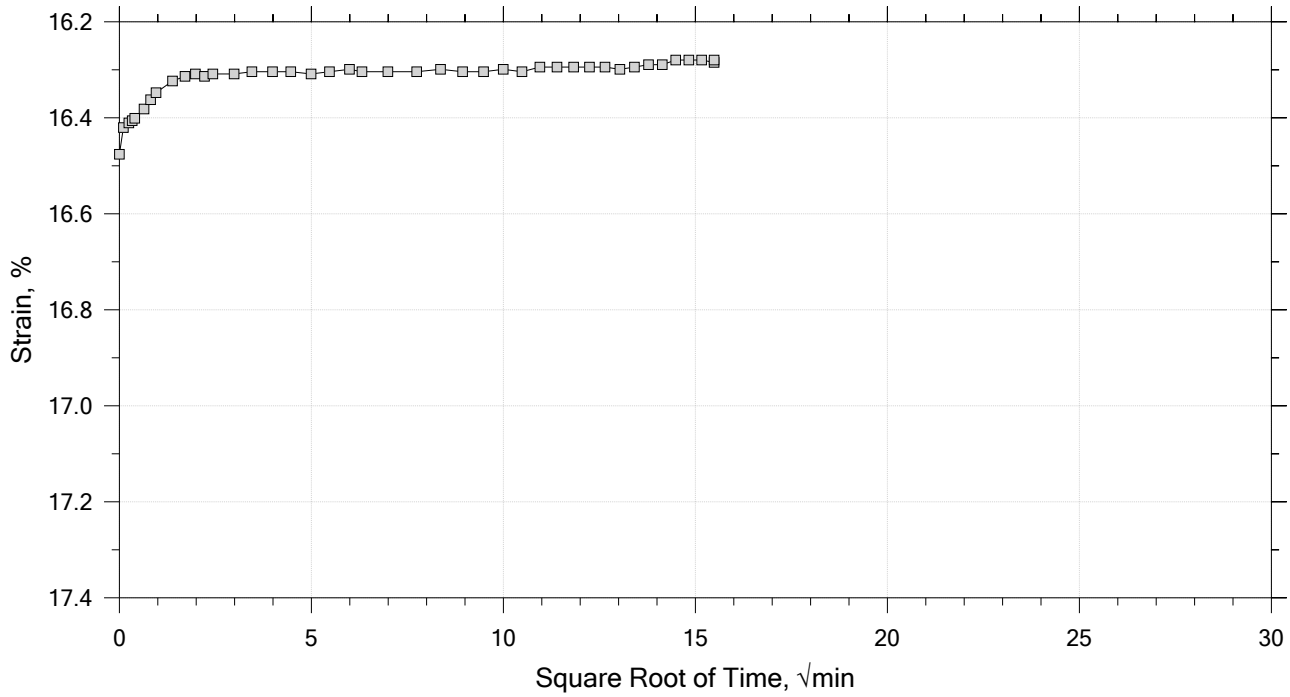


GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-201	Tested By: md	Checked By: njh
	Sample No.: U4	Test Date: 09/21/18	Depth: 55-57 ft
	Test No.: IP-4	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System JJ, Swell Pressure = 0.0668 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 17 of 22
Constant Load Step
Stress: 8 tsf

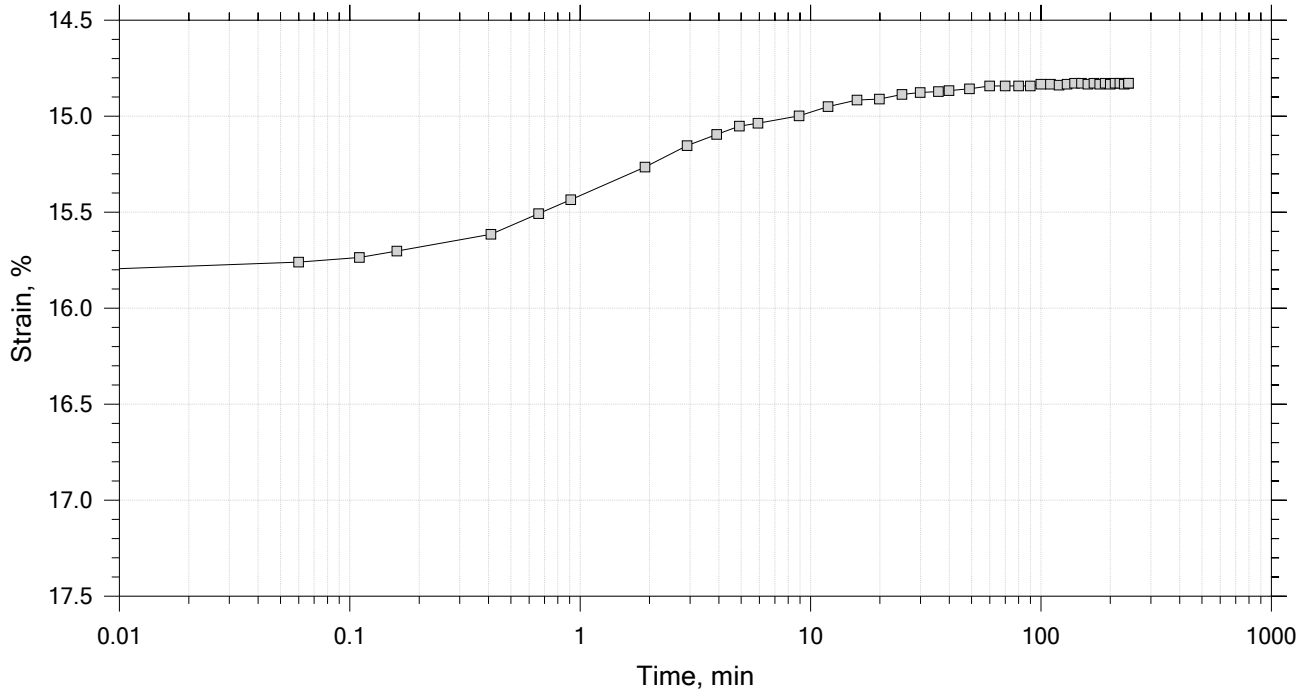


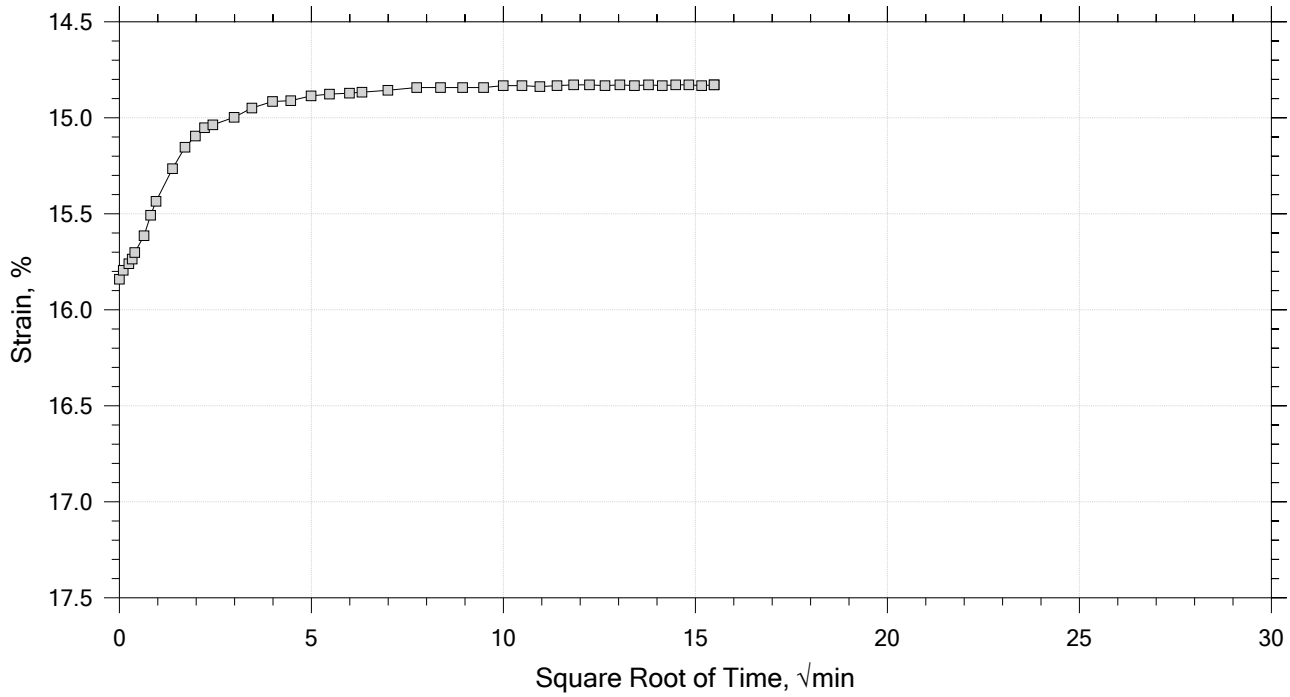


GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-201	Tested By: md	Checked By: njh
	Sample No.: U4	Test Date: 09/21/18	Depth: 55-57 ft
	Test No.: IP-4	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System JJ, Swell Pressure = 0.0668 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 18 of 22
Constant Load Step
Stress: 2 tsf

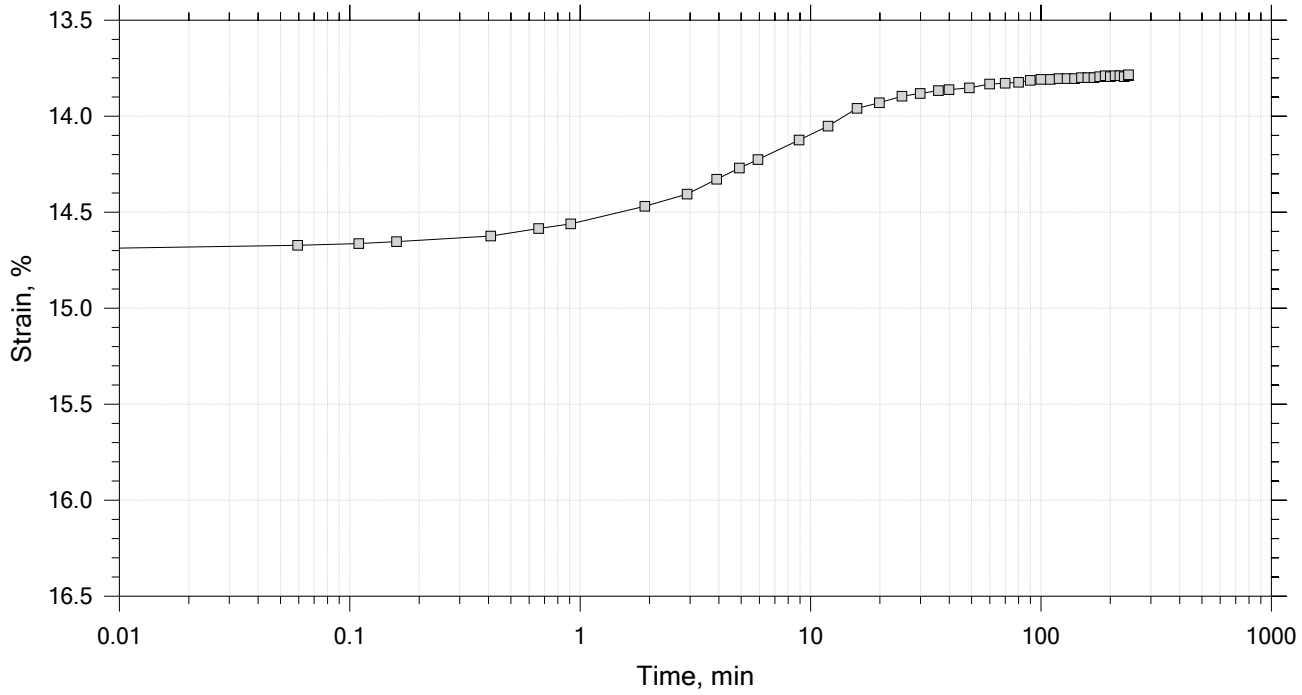


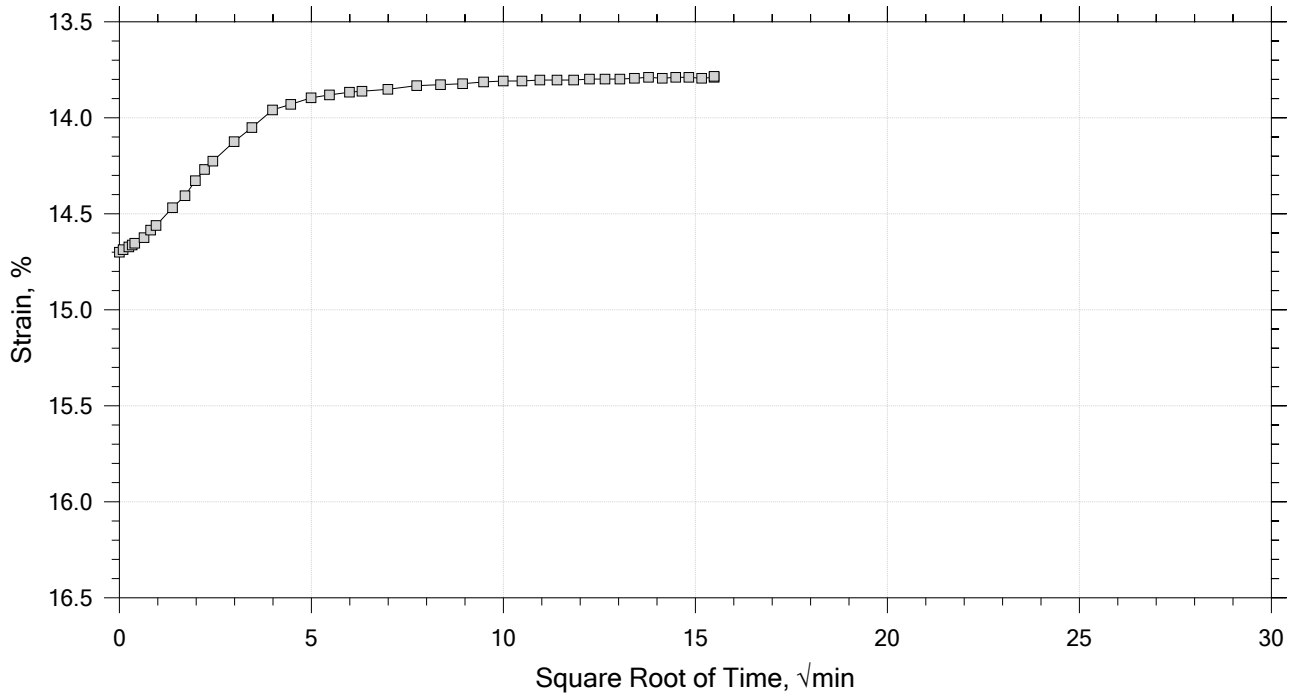


Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
Boring No.: BB-PVS-201	Tested By: md	Checked By: njh
Sample No.: U4	Test Date: 09/21/18	Depth: 55-57 ft
Test No.: IP-4	Sample Type: intact	Elevation: ---
Description: Moist, dark gray clay		
Remarks: System JJ, Swell Pressure = 0.0668 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 19 of 22
Constant Load Step
Stress: 0.75 tsf

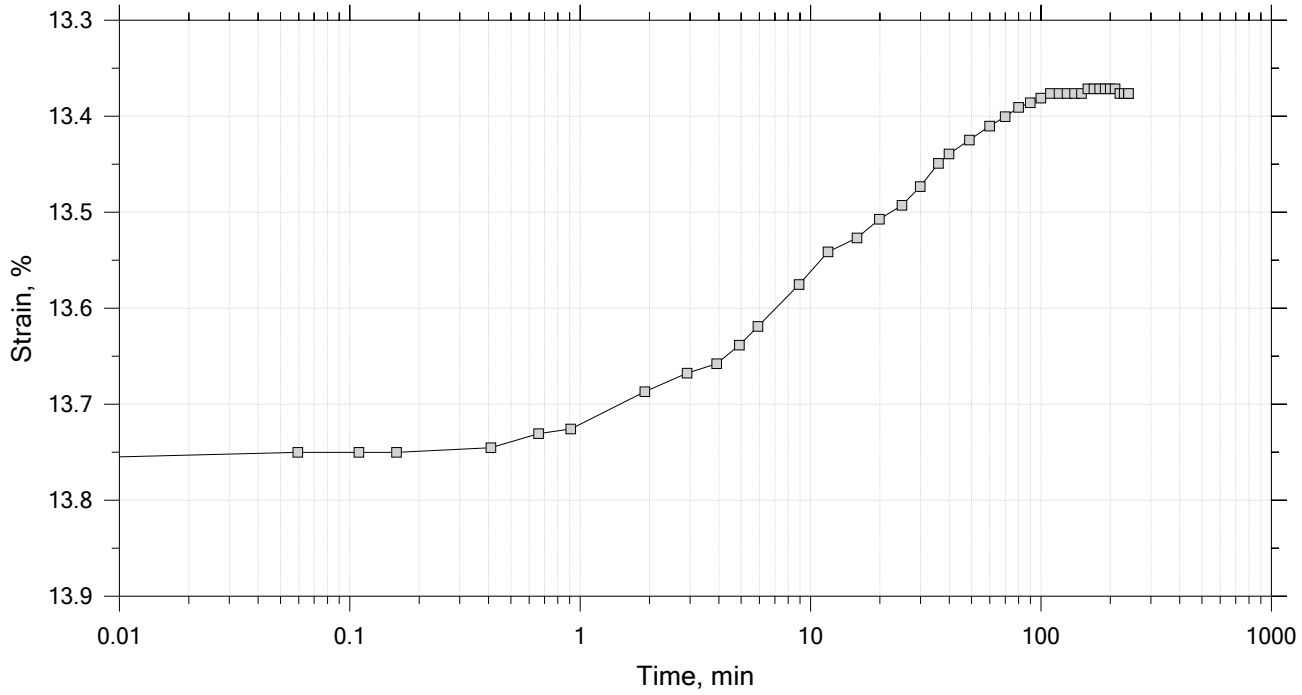


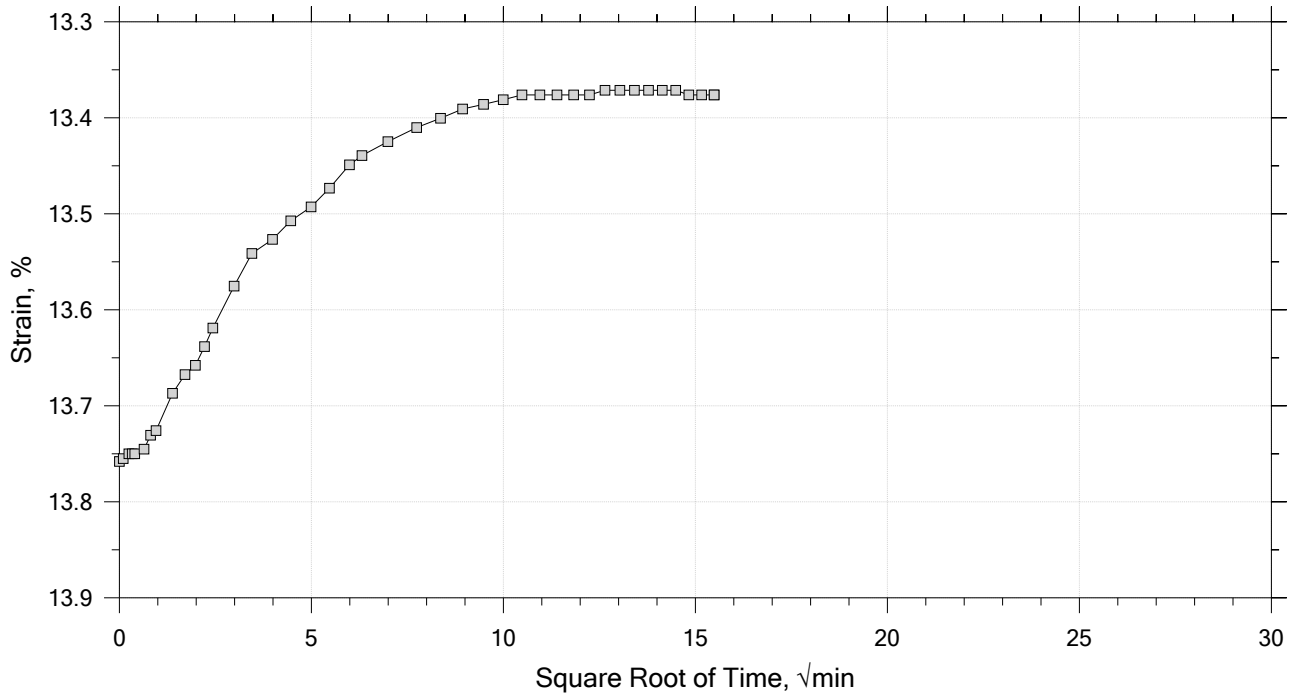


GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-201	Tested By: md	Checked By: njh
	Sample No.: U4	Test Date: 09/21/18	Depth: 55-57 ft
	Test No.: IP-4	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System JJ, Swell Pressure = 0.0668 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 20 of 22
Constant Load Step
Stress: 0.5 tsf

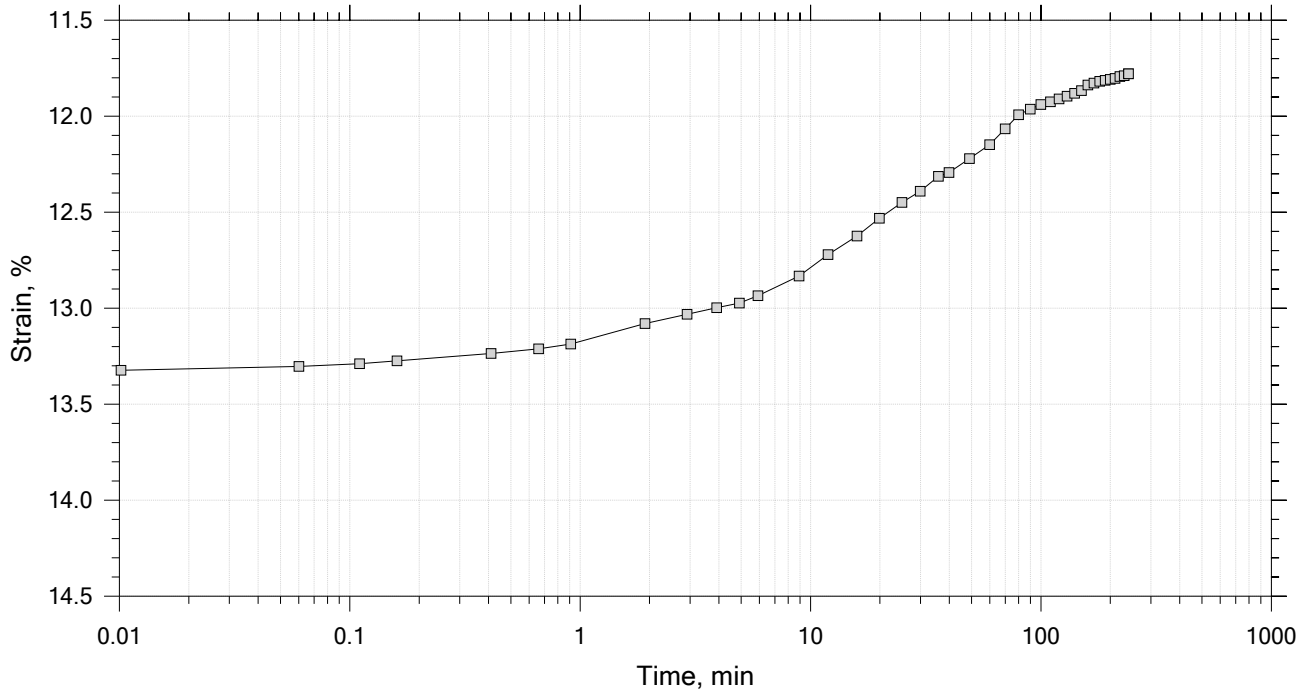


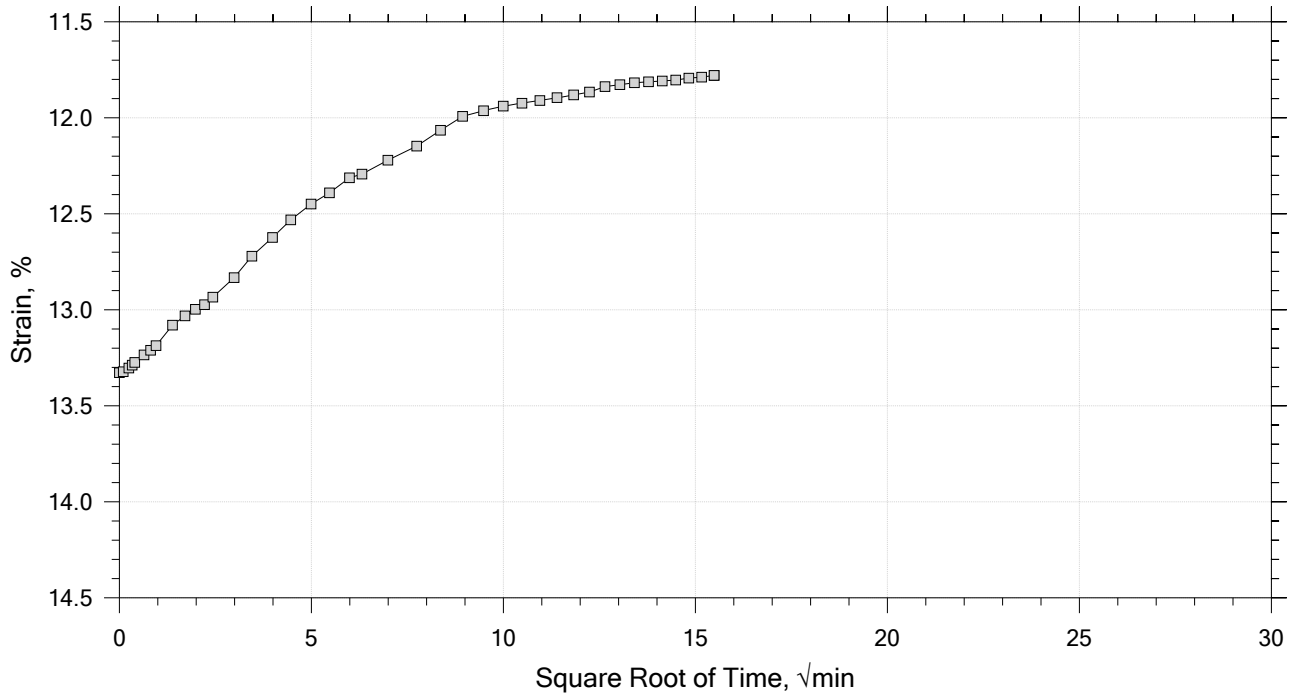


GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-201	Tested By: md	Checked By: njh
	Sample No.: U4	Test Date: 09/21/18	Depth: 55-57 ft
	Test No.: IP-4	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System JJ, Swell Pressure = 0.0668 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 21 of 22
Constant Load Step
Stress: 0.125 tsf

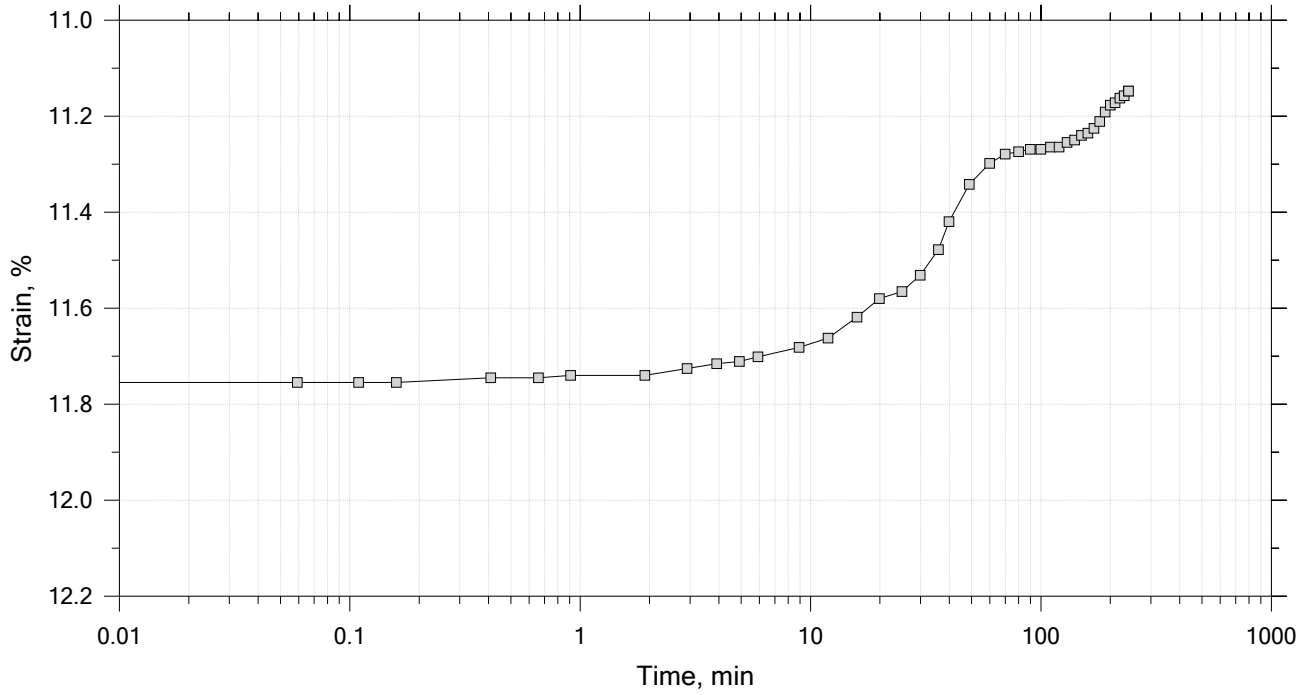


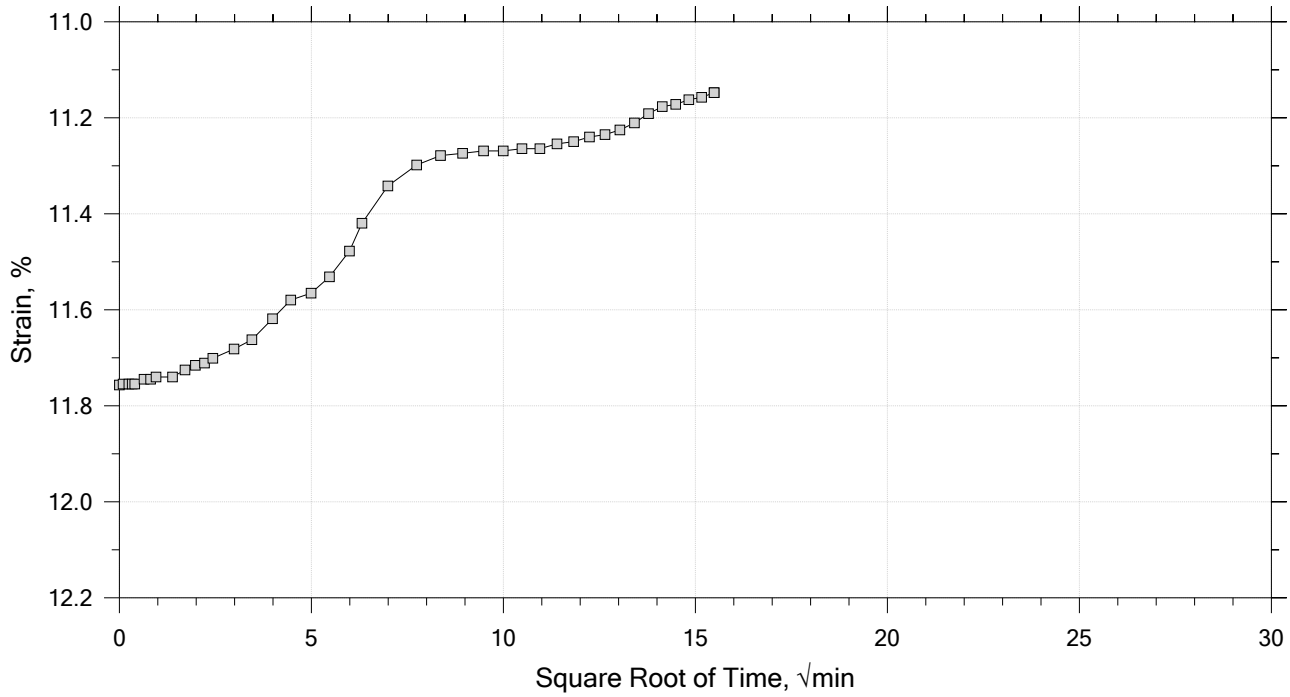


GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-201	Tested By: md	Checked By: njh
	Sample No.: U4	Test Date: 09/21/18	Depth: 55-57 ft
	Test No.: IP-4	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System JJ, Swell Pressure = 0.0668 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 22 of 22
Constant Load Step
Stress: 0.0625 tsf





GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-201	Tested By: md	Checked By: njh
	Sample No.: U4	Test Date: 09/21/18	Depth: 55-57 ft
	Test No.: IP-4	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System JJ, Swell Pressure = 0.0668 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Specimen Diameter: 2.50 in	Estimated Specific Gravity: 2.76	Liquid Limit: 38
Initial Height: 1.00 in	Initial Void Ratio: 0.908	Plastic Limit: 20
Final Height: 0.88 in	Final Void Ratio: 0.679	Plasticity Index: 18

	Before Test Trimmings	Before Test Specimen	After Test Specimen	After Test Trimmings
Container ID	C-296	RING		C1098
Mass Container, gm	8.56	108.9	108.9	8.6
Mass Container + Wet Soil, gm	232.29	263.42	253.82	155.34
Mass Container + Dry Soil, gm	175.77	225.2	225.2	126.36
Mass Dry Soil, gm	167.21	116.3	116.3	117.76
Water Content, %	33.80	32.86	24.61	24.61
Void Ratio	---	0.91	0.68	---
Degree of Saturation, %	---	99.86	100.00	---
Dry Unit Weight, pcf	---	90.258	102.57	---

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.

GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-201	Tested By: md	Checked By: njh
	Sample No.: U4	Test Date: 09/21/18	Depth: 55-57 ft
	Test No.: IP-4	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System JJ, Swell Pressure = 0.0668 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Log of Time Coefficients

Step	Applied Stress tsf	Final Displacement in	Void Ratio	Strain at End %	Log T50 min	Cv ft²/s	Mv 1/tsf	k ft/day	Ca %
1	0.0668	0.005147	0.898	0.515	0.000	0.00e+00	7.70e-02	0.00e+00	0.00e+00
2	0.125	0.01044	0.888	1.04	0.000	0.00e+00	9.10e-02	0.00e+00	0.00e+00
3	0.250	0.02000	0.870	2.00	14.110	3.92e-07	7.65e-02	8.08e-05	0.00e+00
4	0.500	0.03030	0.850	3.03	0.000	0.00e+00	4.12e-02	0.00e+00	0.00e+00
5	0.750	0.03821	0.835	3.82	0.000	0.00e+00	3.17e-02	0.00e+00	0.00e+00
6	1.00	0.04457	0.823	4.46	0.000	0.00e+00	2.54e-02	0.00e+00	0.00e+00
7	2.00	0.06506	0.784	6.51	0.000	0.00e+00	2.05e-02	0.00e+00	0.00e+00
8	4.00	0.09045	0.735	9.05	4.003	1.21e-06	1.27e-02	4.15e-05	0.00e+00
9	2.00	0.08633	0.743	8.63	0.965	4.91e-06	2.06e-03	2.73e-05	0.00e+00
10	1.00	0.08167	0.752	8.17	1.229	3.89e-06	4.66e-03	4.89e-05	0.00e+00
11	0.500	0.07579	0.763	7.58	3.730	1.30e-06	1.17e-02	4.11e-05	0.00e+00
12	1.00	0.07929	0.756	7.93	0.000	0.00e+00	6.99e-03	0.00e+00	0.00e+00
13	2.00	0.08521	0.745	8.52	0.637	7.54e-06	5.92e-03	1.20e-04	0.00e+00
14	4.00	0.09507	0.726	9.51	0.000	0.00e+00	4.93e-03	0.00e+00	0.00e+00
15	8.00	0.1283	0.663	12.8	4.016	1.12e-06	8.30e-03	2.51e-05	0.00e+00
16	16.0	0.1698	0.584	17.0	1.930	2.14e-06	5.19e-03	2.99e-05	0.00e+00
17	8.00	0.1628	0.597	16.3	0.000	0.00e+00	8.74e-04	0.00e+00	0.00e+00
18	2.00	0.1483	0.625	14.8	0.000	0.00e+00	2.42e-03	0.00e+00	0.00e+00
19	0.750	0.1378	0.645	13.8	4.625	9.05e-07	8.35e-03	2.04e-05	0.00e+00
20	0.500	0.1338	0.652	13.4	0.000	0.00e+00	1.63e-02	0.00e+00	0.00e+00
21	0.125	0.1178	0.683	11.8	0.000	0.00e+00	4.26e-02	0.00e+00	0.00e+00
22	0.0625	0.1115	0.695	11.1	37.100	1.20e-07	1.01e-01	3.28e-05	0.00e+00

GeoTesting EXPRESS

Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
Boring No.: BB-PVS-201	Tested By: md	Checked By: njh
Sample No.: U4	Test Date: 09/21/18	Depth: 55-57 ft
Test No.: IP-4	Sample Type: intact	Elevation: ---
Description: Moist, dark gray clay		
Remarks: System JJ, Swell Pressure = 0.0668 tsf		
Displacement at End of Increment		

One-Dimensional Consolidation by ASTM D2435 - Method B

Square Root of Time Coefficients

Step	Applied Stress tsf	Final Displacement in	Void Ratio	Strain at End %	Sq.Rt. T90 min	Cv ft²/s	Mv 1/tsf	k ft/day
1	0.0668	0.005147	0.898	0.515	65.858	3.71e-07	7.70e-02	7.70e-05
2	0.125	0.01044	0.888	1.04	63.840	3.78e-07	9.10e-02	9.28e-05
3	0.250	0.02000	0.870	2.00	35.616	6.68e-07	7.65e-02	1.38e-04
4	0.500	0.03030	0.850	3.03	26.240	8.89e-07	4.12e-02	9.87e-05
5	0.750	0.03821	0.835	3.82	27.827	8.22e-07	3.17e-02	7.02e-05
6	1.00	0.04457	0.823	4.46	143.158	1.58e-07	2.54e-02	1.08e-05
7	2.00	0.06506	0.784	6.51	123.974	1.77e-07	2.05e-02	9.77e-06
8	4.00	0.09045	0.735	9.05	13.839	1.51e-06	1.27e-02	5.16e-05
9	2.00	0.08633	0.743	8.63	5.158	3.95e-06	2.06e-03	2.20e-05
10	1.00	0.08167	0.752	8.17	6.152	3.35e-06	4.66e-03	4.21e-05
11	0.500	0.07579	0.763	7.58	16.765	1.24e-06	1.17e-02	3.94e-05
12	1.00	0.07929	0.756	7.93	4.663	4.48e-06	6.99e-03	8.44e-05
13	2.00	0.08521	0.745	8.52	2.214	9.34e-06	5.92e-03	1.49e-04
14	4.00	0.09507	0.726	9.51	10.291	1.97e-06	4.93e-03	2.62e-05
15	8.00	0.1283	0.663	12.8	16.774	1.15e-06	8.30e-03	2.58e-05
16	16.0	0.1698	0.584	17.0	10.662	1.67e-06	5.19e-03	2.33e-05
17	8.00	0.1628	0.597	16.3	3.682	4.63e-06	8.74e-04	1.09e-05
18	2.00	0.1483	0.625	14.8	6.822	2.56e-06	2.42e-03	1.67e-05
19	0.750	0.1378	0.645	13.8	26.313	6.85e-07	8.35e-03	1.54e-05
20	0.500	0.1338	0.652	13.4	44.323	4.13e-07	1.63e-02	1.82e-05
21	0.125	0.1178	0.683	11.8	86.693	2.16e-07	4.26e-02	2.48e-05
22	0.0625	0.1115	0.695	11.1	109.905	1.75e-07	1.01e-01	4.77e-05

GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-201	Tested By: md	Checked By: njh
	Sample No.: U4	Test Date: 09/21/18	Depth: 55-57 ft
	Test No.: IP-4	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System JJ, Swell Pressure = 0.0668 tsf		
	Displacement at End of Increment		

SCHONEWALD
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RESULTS OF LABORATORY TESTS ON SOIL SAMPLES –
PHASE 2 (BB-PVS-105 (corrosion), -202, AND -203)

TABULATION OF PHASE 2 SOIL TESTING (GTX PROJECT NO. 308805) (listed in order of test report presentation)				
Boring No.	**Sample No.**	**Sample Depth (ft., BGS)**	**GTX TEST ID / NO.**	**Tests Completed**
BB-PVS-105	1D	0-2	not assigned (used boring ID-sample ID)	Corrosivity Test Series (Resistivity and pH only)
BB-PVS-105	3D	4-6	not assigned (used boring ID-sample ID)	Corrosivity Test Series (Resistivity, pH, Sulfates, Chlorides)
BB-PVS-202	13D	86-88	489646	Grain Size
BB-PVS-202	18D	115-117	489647	Grain Size
BB-PVS-202	1D	15-17	489632	Atterberg Limits
BB-PVS-202	2D	20-22	489633	Atterberg Limits
BB-PVS-202	3D	25-27	489634	Atterberg Limits
BB-PVS-202	U1	33-35	489628	Atterberg Limits
BB-PVS-202	5D	40-42	489635	Atterberg Limits
BB-PVS-203	1D	10-12	489636	Atterberg Limits
BB-PVS-203	2D	15-17	489637	Atterberg Limits
BB-PVS-203	U1	25-27	489629	Atterberg Limits
BB-PVS-203	U2	40-42	489630	Atterberg Limits
BB-PVS-203	U3	50-52	489631	Atterberg Limits
BB-PVS-202	U1	33-35	IP-9	1D consolidation
BB-PVS-203	U1	25-27	IP-10	1D consolidation
BB-PVS-203	U2	40-42	IP-7	1D consolidation
BB-PVS-203	U3	50-52	IP-8	1D consolidation

Client:	Schonewald Engineering Associates, Inc.
Project Name:	I-295 over Veranda St (MeDOT WIN21745.00)
Project Location:	Portland, ME
GTX #:	308805
Test Date:	01/22/19
Tested By:	njf
Checked By:	emm

Minimum Laboratory Soil Resistivity by AASHTO T 288

Boring ID	Sample ID	Depth, ft.	Sample Description	Minimum Soil Resistivity, ohm-cm
BB-PVS-105	1D	0-2	Moist, grayish brown clay	2,169
BB-PVS-105	3D	4-6	Moist, olive gray clay	918

Comments: Test Equipment: Nilsson Model 400 Soil Resistance Meter, MC Miller Soil Box
Test conducted in standard laboratory atmosphere: 68-73 F

Client:	Schonewald Engineering Associates, Inc.
Project Name:	I-295 over Veranda St (MeDOT WIN 21745.00)
Project Location:	Portland, ME
GTX #:	308805
Test Date:	01/22/19
Tested By:	njf
Checked By:	emm

pH by AASHTO T 289

Boring ID	Sample ID	Depth, ft	Description	pH
BB-PVS-105	1D	0-2	Moist, grayish brown clay	6.81
BB-PVS-105	3D	4-6	Moist, olive gray clay	6.71

Notes:

PO Box 572455 / Salt Lake City UT 84157-2455 / USA
TEL +1 801 262 2448 · FAX +1 801 262 9870 · www.TEi-TS.com

GEOTESTING EXPRESS INCORPORATED
125 NAGOG PARK
ACTON MA 01720-3451
USA

Analysis No.	TS-A1907781
Report Date	22 January 2019
Date Sampled	16 January 2019
Date Received	18 January 2019
Where Sampled	Acton, MA USA
Sampled By	Client

This is to attest that we have examined: Soil for Project Name: I-295 Veranda Street; Site Location: Portland, ME; Job Number: GTX-308805

When examined to the applicable requirements of:

AASHTO T-291-13	"Standard Method of Test for Determining Water-Soluble Chloride Ion Content in Soil" Method B
AASHTO T-290-16	"Standard Method of Test for Determining Water-Soluble Sulfate Ion Content in Soil"

Results:

AASHTO T-291 – Chloride Method B

Sample		Results		Detection Limit
		ppm (mg/kg)	%[1]	
BB-PVS-105		136.	0.0136	10.
3D	4 – 6'			

NOTE: [1]Percent by weight as received

AASHTO T-290 - Sulfate (soluble)

Sample		Results		Detection Limit
		ppm (mg/kg)	%[1]	
BB-PVS-105		22.	0.0022	10.
3D	4 – 6'			

NOTE: [1]Percent by weight as received

END OF ANALYSIS

USEPA Laboratory ID UT00930

Merrill Gee P.E. – Engineer in Charge

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GeoTesting EXPRESS

Client:	Schonewald Engineering Associates, Inc.				
Project:	I-295 over Veranda St (MeDOT WIN21745.00)				
Location:	Portland, ME			Project No:	GTX-308805
Boring ID:	---	Sample Type:	---	Tested By:	ckg
Sample ID:	---	Test Date:	01/29/19	Checked By:	emm
Depth :	---	Test Id:	489649		

Moisture Content of Soil and Rock - ASTM D2216

Boring ID	Sample ID	Depth	Description	Moisture Content,%
BB-PVS-105	1D	0-2 ft	Moist, grayish brown clay	26.7
BB-PVS-105	3D	4-6 ft	Moist, olive gray clay	37.3

Notes: Temperature of Drying : 110º Celsius

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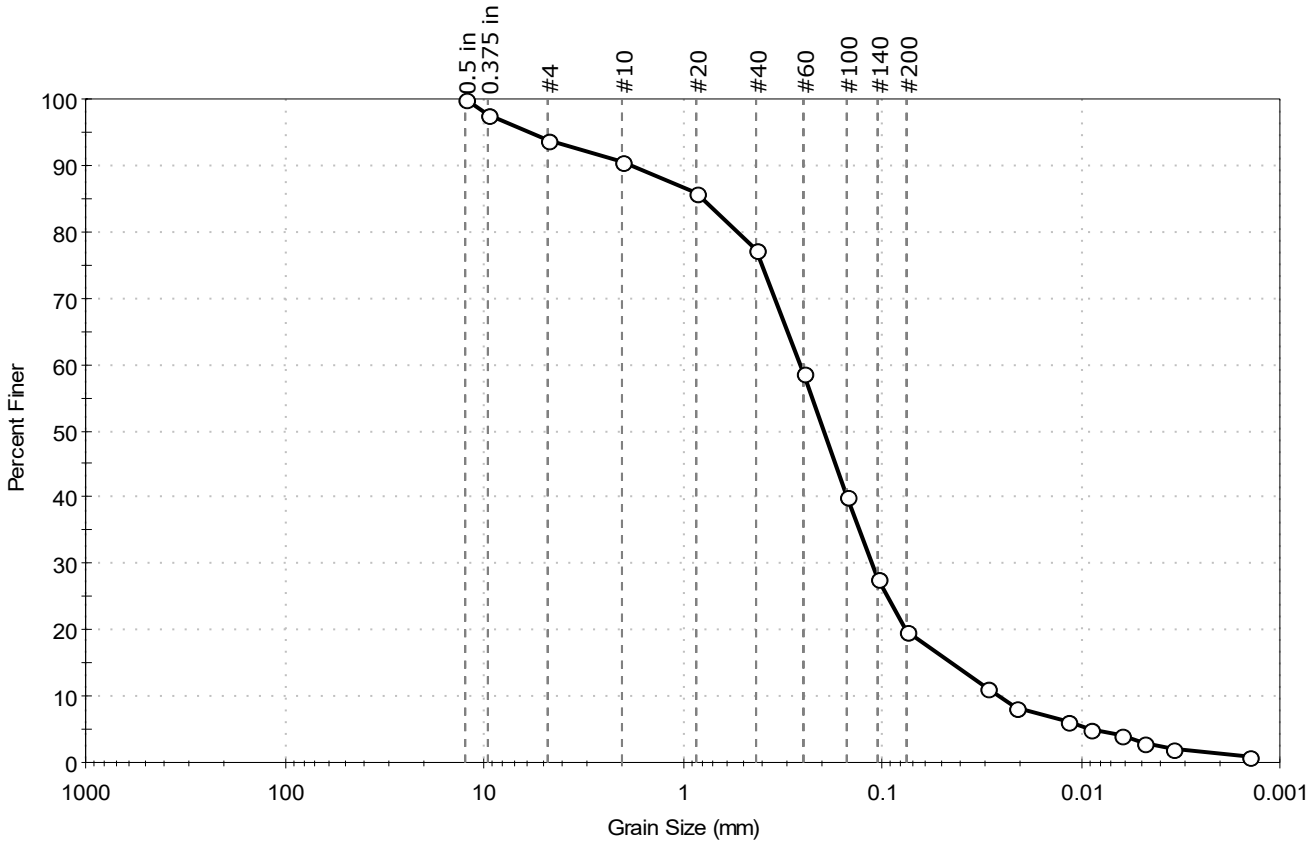
Client:	Schonewald Engineering Associates, Inc.				
Project:	I-295 over Veranda St (MeDOT WIN21745.00)				
Location:	Portland, ME			Project No:	GTX-308805
Boring ID:	BB-PVS-202	Sample Type:	jar	Tested By:	ckg
Sample ID:	13D	Test Date:	01/22/19	Checked By:	emm
Depth :	86-88 ft	Test Id:	489646		
Test Comment:	---				
Visual Description:	Moist, light olive brown silty sand				
Sample Comment:	---				

Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	6.2	74.1	19.7

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
0.5 in	12.50	100		
0.375 in	9.50	98		
#4	4.75	94		
#10	2.00	91		
#20	0.85	86		
#40	0.42	77		
#60	0.25	59		
#100	0.15	40		
#140	0.11	28		
#200	0.075	20		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
---	0.0299	11		
---	0.0210	8		
---	0.0116	6		
---	0.0090	5		
---	0.0063	4		
---	0.0048	3		
---	0.0035	2		
---	0.0014	1		

Coefficients

D_{85} = 0.7922 mm D_{30} = 0.1133 mm
D_{60} = 0.2585 mm D_{15} = 0.0447 mm
D_{50} = 0.1966 mm D_{10} = 0.0257 mm
C_u = 10.058 C_c = 1.932

Classification

ASTM N/A

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

Sample/Test Description

Sand/Gravel Particle Shape : ROUNDED
Sand/Gravel Hardness : HARD
Dispersion Device : Apparatus A - Mech Mixer
Dispersion Period : 1 minute
Est. Specific Gravity : 2.65
Separation of Sample: #200 Sieve

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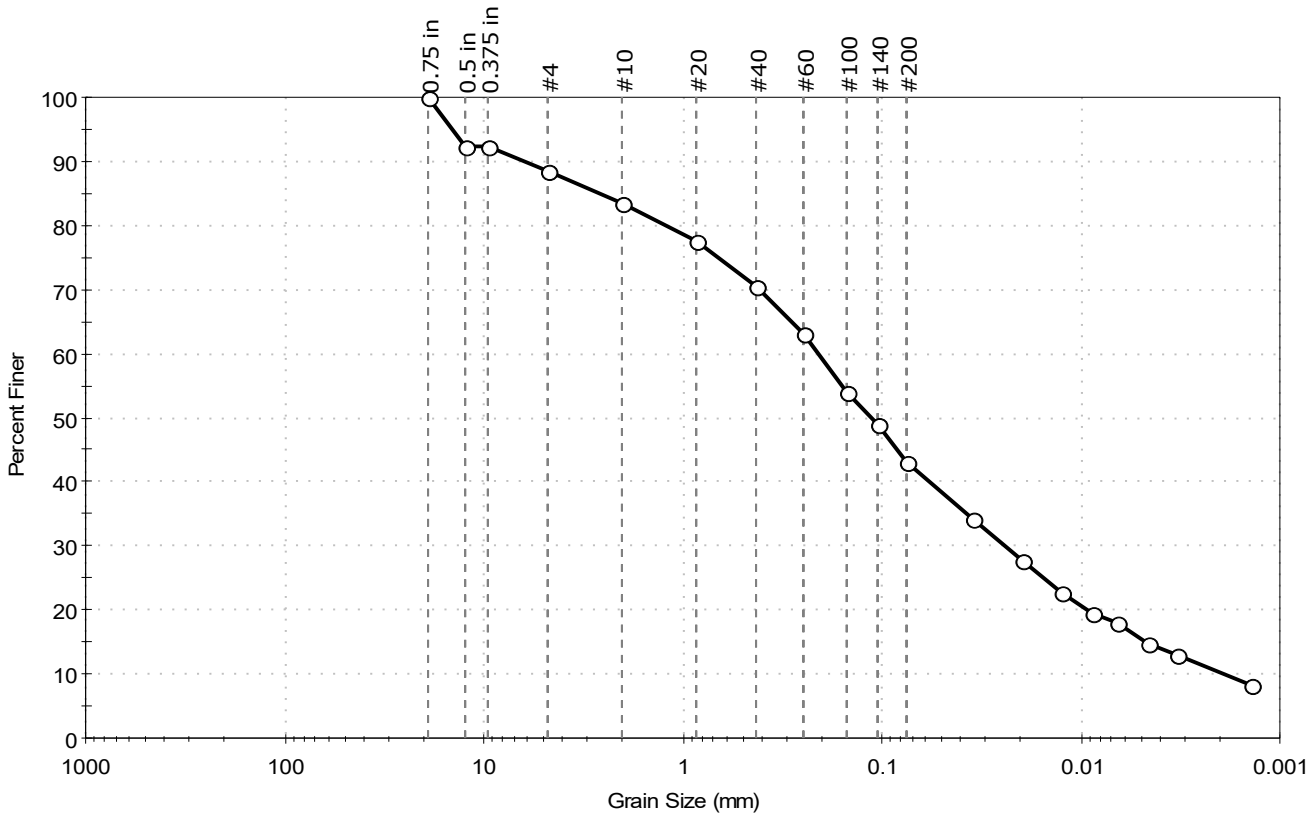
Client:	Schonewald Engineering Associates, Inc.				
Project:	I-295 over Veranda St (MeDOT WIN21745.00)				
Location:	Portland, ME			Project No:	GTX-308805
Boring ID:	BB-PVS-202	Sample Type:	jar	Tested By:	ckg
Sample ID:	18D	Test Date:	01/22/19	Checked By:	emm
Depth :	115-117 ft	Test Id:	489647		
Test Comment:	---				
Visual Description:	Moist, dark gray silty sand				
Sample Comment:	---				

Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
–	11.4	45.4	43.2

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
0.75 in	19.00	100		
0.5 in	12.50	92		
0.375 in	9.50	92		
#4	4.75	89		
#10	2.00	83		
#20	0.85	78		
#40	0.42	70		
#60	0.25	63		
#100	0.15	54		
#140	0.11	49		
#200	0.075	43		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
---	0.0347	34		
---	0.0196	28		
---	0.0126	23		
---	0.0088	20		
---	0.0065	18		
---	0.0046	15		
---	0.0033	13		
---	0.0014	8		

Coefficients

D_{85} = 2.6233 mm	D_{30} = 0.0241 mm
D_{60} = 0.2103 mm	D_{15} = 0.0048 mm
D_{50} = 0.1135 mm	D_{10} = 0.0019 mm
C_u = 110.684	C_c = 1.454

Classification

ASTM N/A

AASHTO Silty Soils (A-4 (0))

Sample/Test Description

Sand/Gravel Particle Shape : ROUNDED

Sand/Gravel Hardness : HARD

Dispersion Device : Apparatus A - Mech Mixer

Dispersion Period : 1 minute

Est. Specific Gravity : 2.65

Separation of Sample: #200 Sieve

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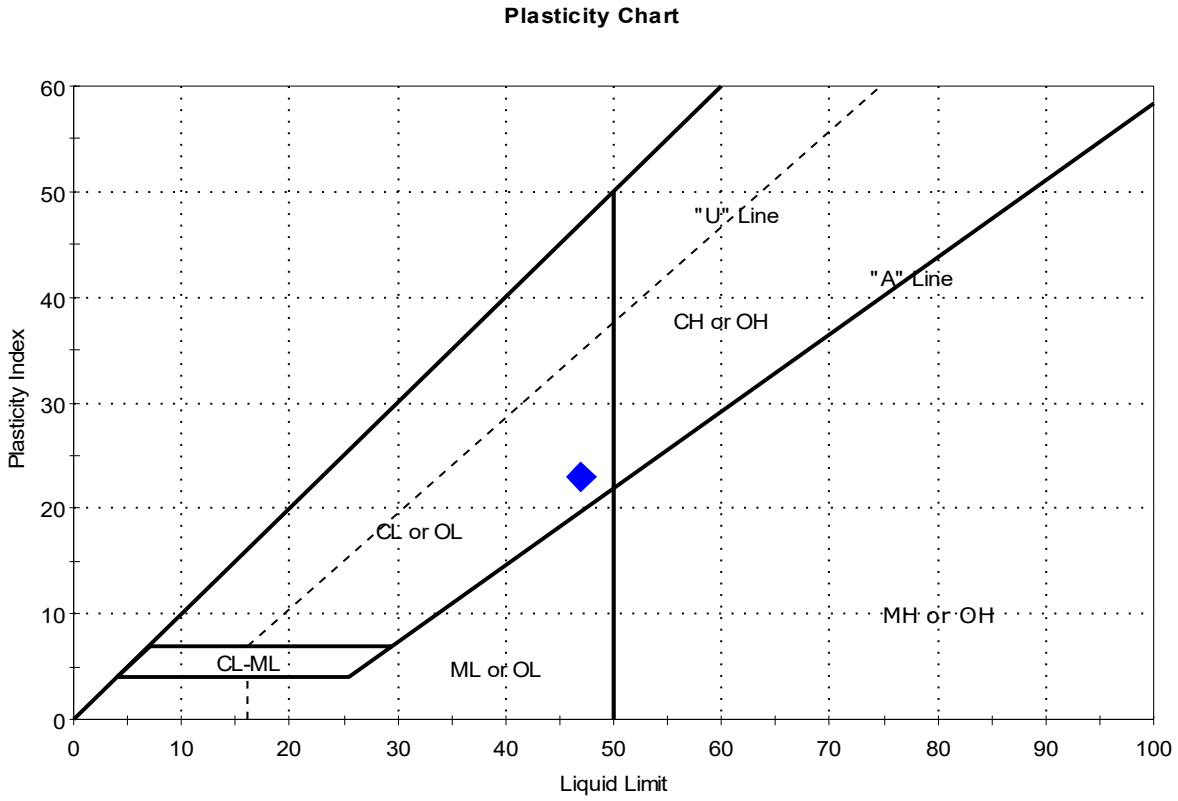
Client:	Schonewald Engineering Associates, Inc.				
Project:	I-295 over Veranda St (MeDOT WIN21745.00)				
Location:	Portland, ME			Project No:	GTX-308805
Boring ID:	BB-PVS-202	Sample Type:	jar	Tested By:	cam
Sample ID:	1D	Test Date:	01/21/19	Checked By:	emm
Depth :	15-17 ft	Test Id:	489632		
Test Comment:	---				
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
◆	1D	B-PVS-20	15-17 ft	47	47	24	23	1	

Sample Prepared using the WET method

Dry Strength: VERY HIGH

Dilatancy: SLOW

Toughness: LOW

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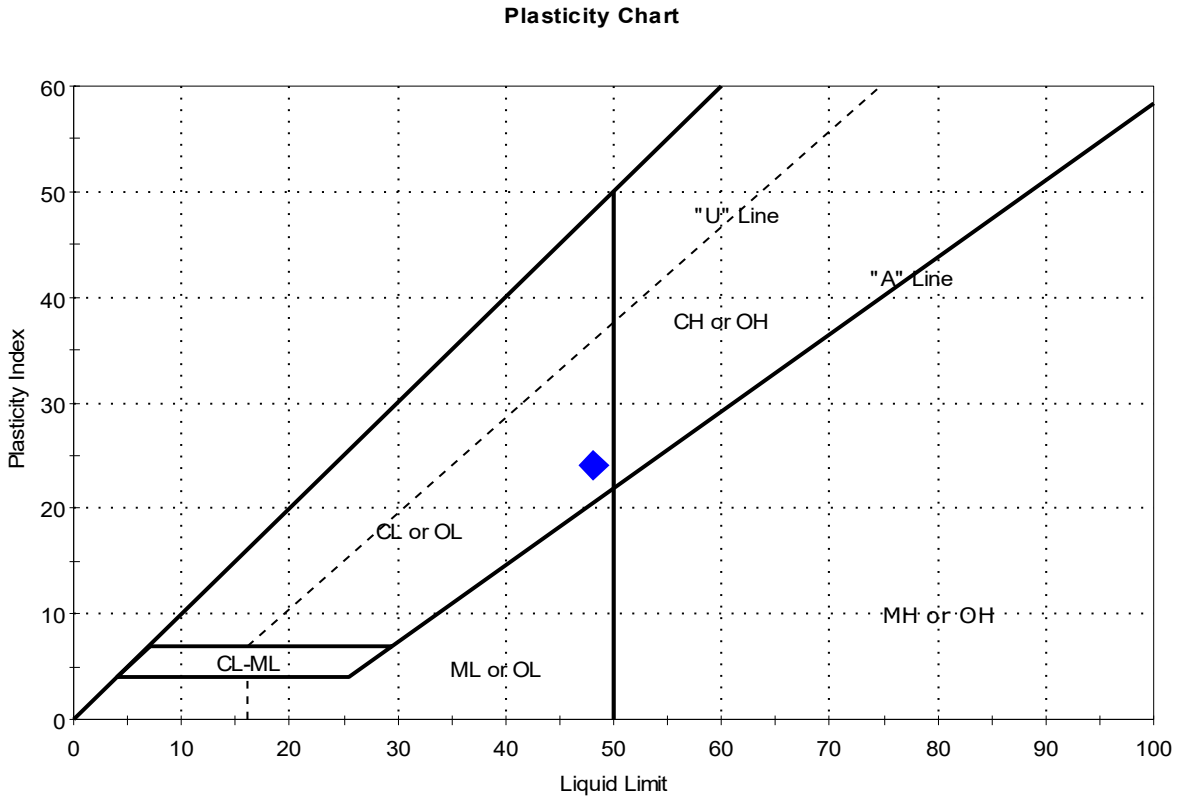
Client:	Schonewald Engineering Associates, Inc.				
Project:	I-295 over Veranda St (MeDOT WIN21745.00)				
Location:	Portland, ME			Project No:	GTX-308805
Boring ID:	BB-PVS-202	Sample Type:	jar	Tested By:	cam
Sample ID:	2D	Test Date:	01/23/19	Checked By:	emm
Depth :	20-22 ft	Test Id:	489633		
Test Comment:	---				
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
◆	2D	B-PVS-20	20-22 ft	44	48	24	24	0.8	

Sample Prepared using the WET method

Dry Strength: VERY HIGH

Dilatancy: SLOW

Toughness: LOW

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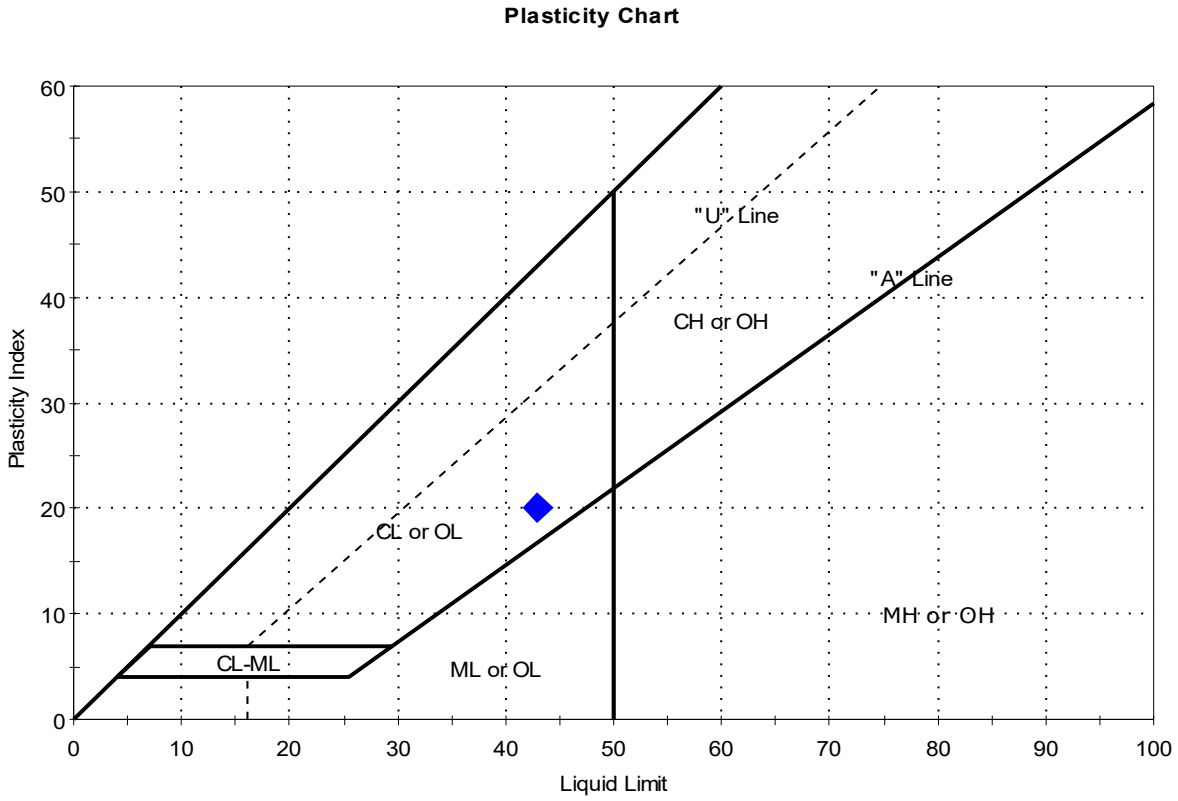
Client:	Schonewald Engineering Associates, Inc.				
Project:	I-295 over Veranda St (MeDOT WIN21745.00)				
Location:	Portland, ME			Project No:	GTX-308805
Boring ID:	BB-PVS-202	Sample Type:	jar	Tested By:	cam
Sample ID:	3D	Test Date:	01/23/19	Checked By:	emm
Depth :	25-27 ft	Test Id:	489634		
Test Comment:	---				
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
◆	3D	B-PVS-20	25-27 ft	43	43	23	20	1	

Sample Prepared using the WET method

Dry Strength: VERY HIGH

Dilatancy: SLOW

Toughness: LOW

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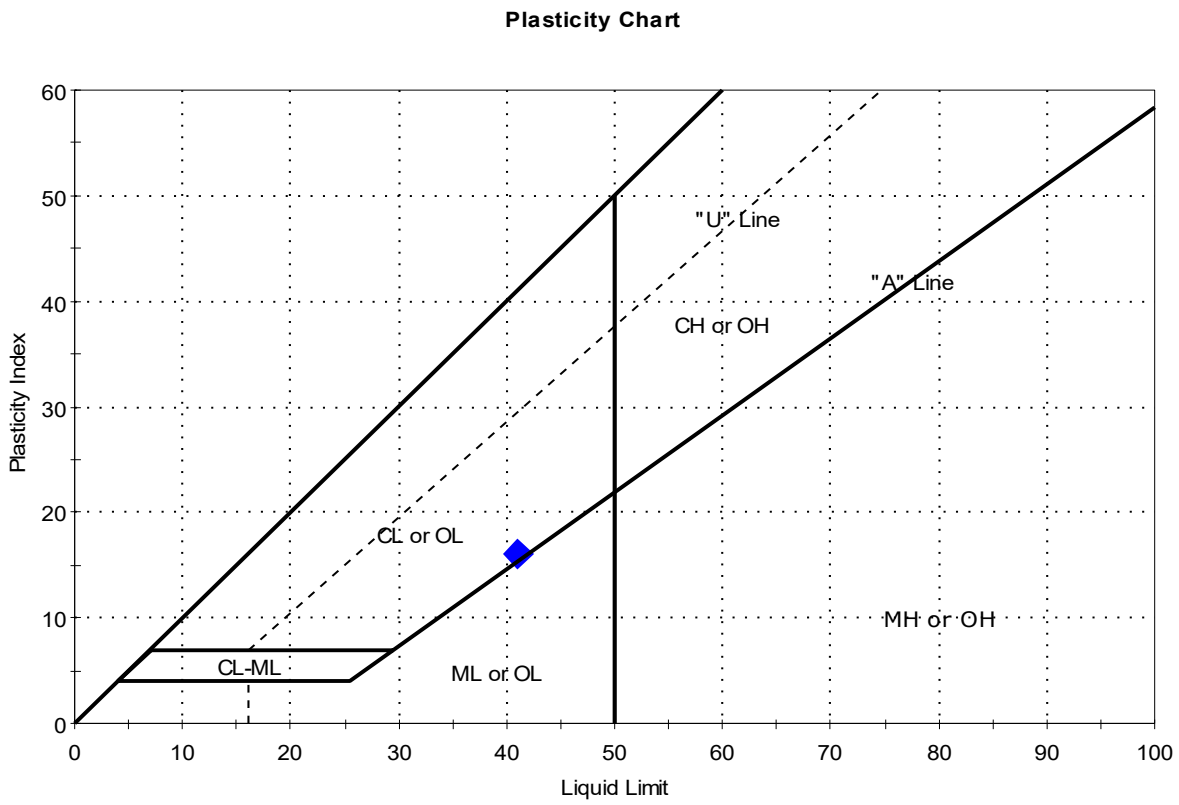
Client:	Schonewald Engineering Associates, Inc.				
Project:	I-295 over Veranda St (MeDOT WIN21745.00)				
Location:	Portland, ME			Project No:	GTX-308805
Boring ID:	BB-PVS-202	Sample Type:	tube	Tested By:	cam
Sample ID:	U1	Test Date:	01/25/19	Checked By:	emm
Depth :	33-35 ft	Test Id:	489628		
Test Comment:	---				
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
◆	U1	B-PVS-20	33-35 ft	42	41	25	16	1.1	

Sample Prepared using the WET method

Dry Strength: VERY HIGH

Dilatancy: SLOW

Toughness: LOW

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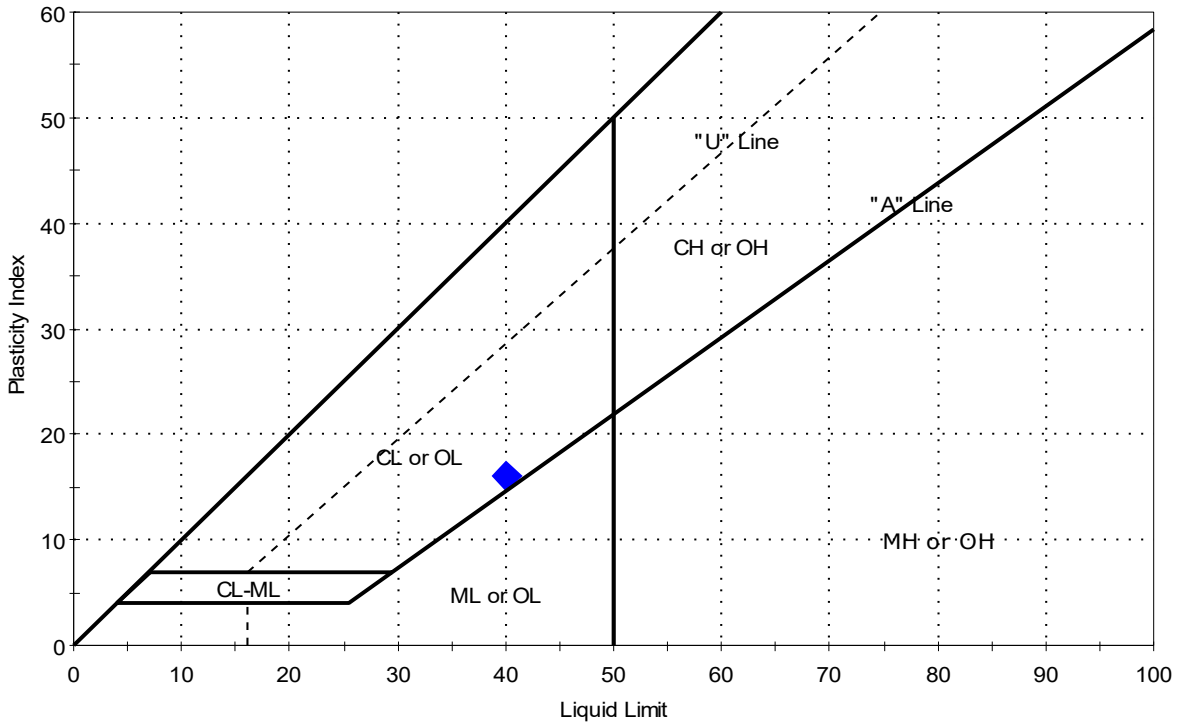
Client:	Schonewald Engineering Associates, Inc.				
Project:	I-295 over Veranda St (MeDOT WIN21745.00)				
Location:	Portland, ME			Project No:	GTX-308805
Boring ID:	BB-PVS-202	Sample Type:	jar	Tested By:	cam
Sample ID:	5D	Test Date:	01/22/19	Checked By:	emm
Depth :	40-42 ft	Test Id:	489635		
Test Comment:	---				
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
◆	5D	B-PVS-20	40-42 ft	41	40	24	16	1	

Sample Prepared using the WET method

Dry Strength: VERY HIGH

Dilatancy: SLOW

Toughness: LOW

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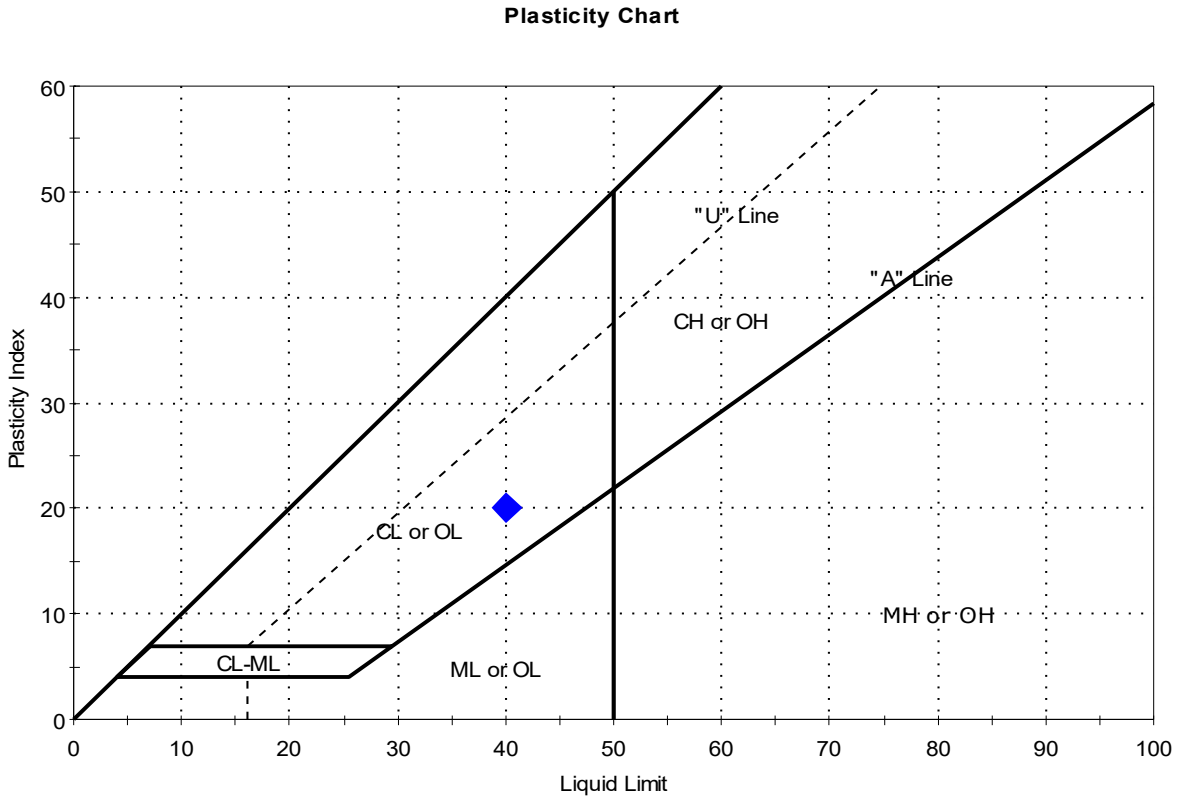
GeoTesting EXPRESS

Client:	Schonewald Engineering Associates, Inc.				
Project:	I-295 over Veranda St (MeDOT WIN21745.00)				
Location:	Portland, ME			Project No:	GTX-308805
Boring ID:	BB-PVS-203	Sample Type:	jar	Tested By:	cam
Sample ID:	1D	Test Date:	01/23/19	Checked By:	emm
Depth :	10-12 ft	Test Id:	489636		
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
◆	1D	B-PVS-20	10-12 ft	44	40	20	20	1.2	

Sample Prepared using the WET method

Dry Strength: VERY HIGH

Dilatancy: SLOW

Toughness: LOW

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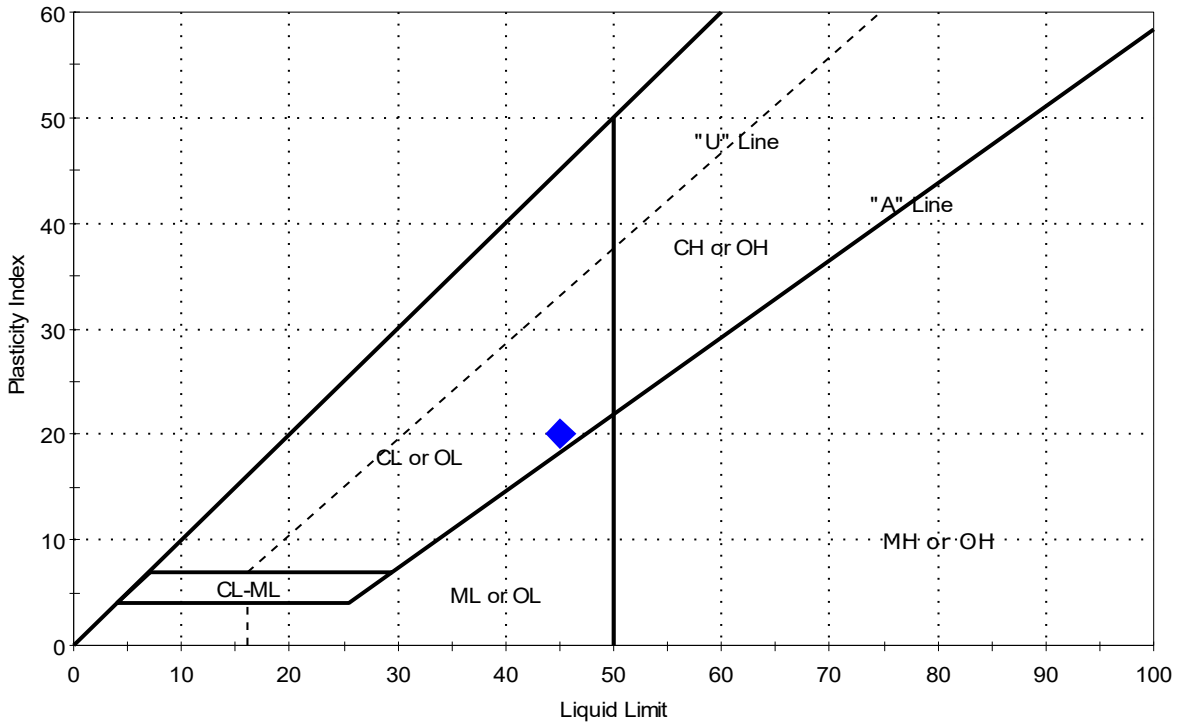
Client:	Schonewald Engineering Associates, Inc.				
Project:	I-295 over Veranda St (MeDOT WIN21745.00)				
Location:	Portland, ME			Project No:	GTX-308805
Boring ID:	BB-PVS-203	Sample Type:	jar	Tested By:	cam
Sample ID:	2D	Test Date:	01/24/19	Checked By:	emm
Depth :	15-17 ft	Test Id:	489637		
Test Comment:	---				
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
◆	2D	B-PVS-20	15-17 ft	44	45	25	20	0.9	

Sample Prepared using the WET method

Dry Strength: VERY HIGH

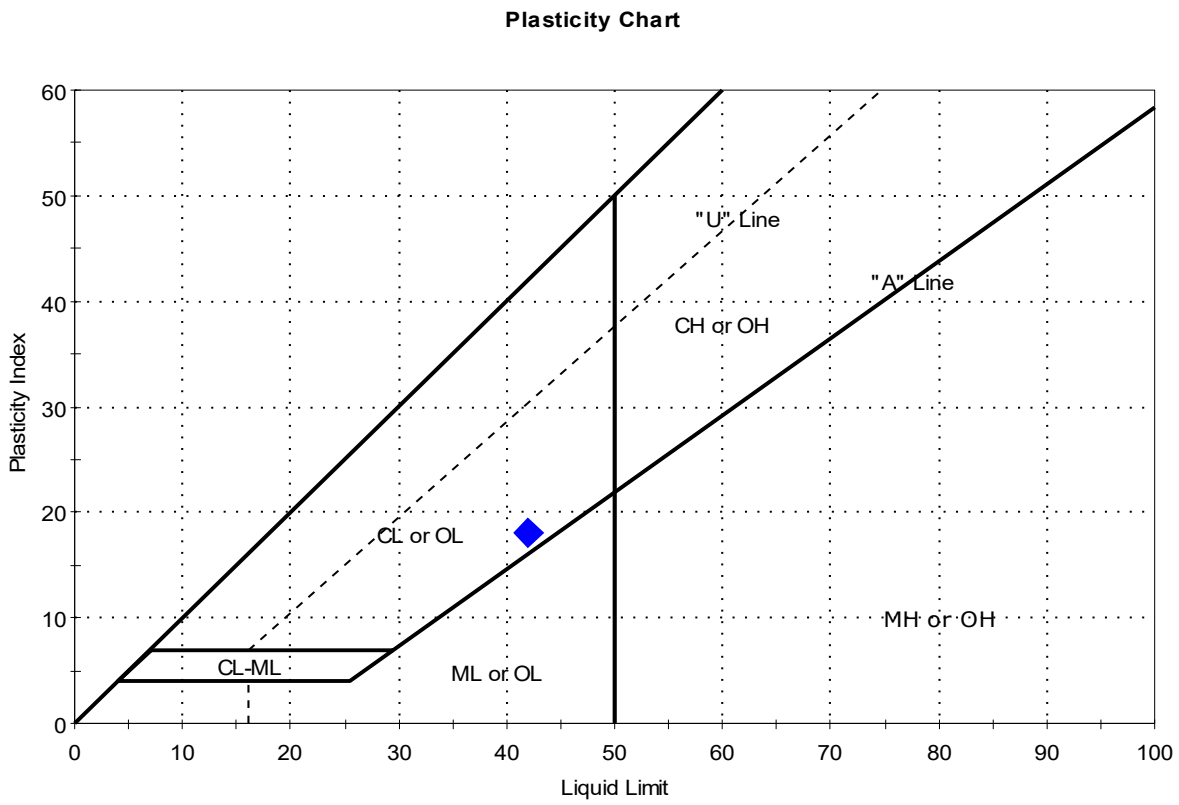
Dilatancy: SLOW

Toughness: LOW

printed 1/29/2019 11:13:52 AM

Client:	Schonewald Engineering Associates, Inc.				
Project:	I-295 over Veranda St (MeDOT WIN21745.00)				
Location:	Portland, ME			Project No:	GTX-308805
Boring ID:	BB-PVS-203	Sample Type:	tube	Tested By:	cam
Sample ID:	U1	Test Date:	01/25/19	Checked By:	emm
Depth :	25-27 ft	Test Id:	489629		
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
◆	U1	B-PVS-20	25-27 ft	38	42	24	18	0.8	

Sample Prepared using the WET method

Dry Strength: VERY HIGH

Dilatancy: SLOW

Toughness: LOW

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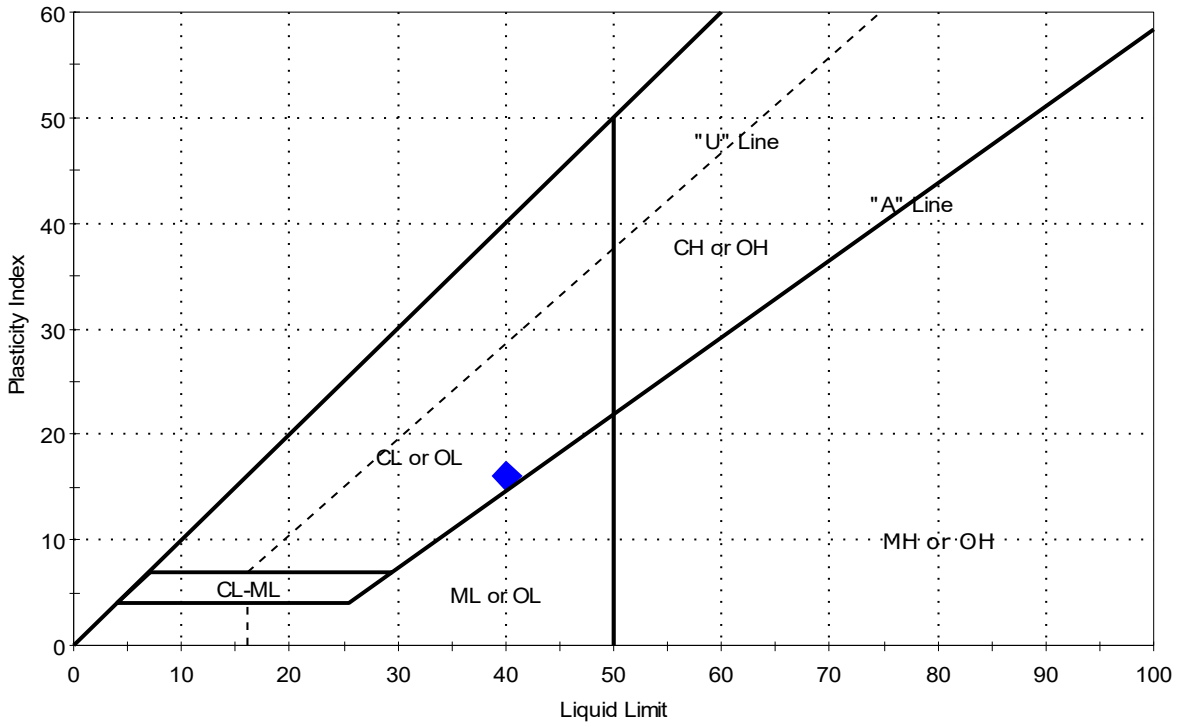
GeoTesting EXPRESS

Client:	Schonewald Engineering Associates, Inc.				
Project:	I-295 over Veranda St (MeDOT WIN21745.00)				
Location:	Portland, ME			Project No:	GTX-308805
Boring ID:	BB-PVS-203	Sample Type:	tube	Tested By:	cam
Sample ID:	U2	Test Date:	01/21/19	Checked By:	emm
Depth :	40-42 ft	Test Id:	489630		
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
◆	U2	B-PVS-20	40-42 ft	39	40	24	16	1	

Sample Prepared using the WET method

Dry Strength: VERY HIGH

Dilatancy: SLOW

Toughness: LOW

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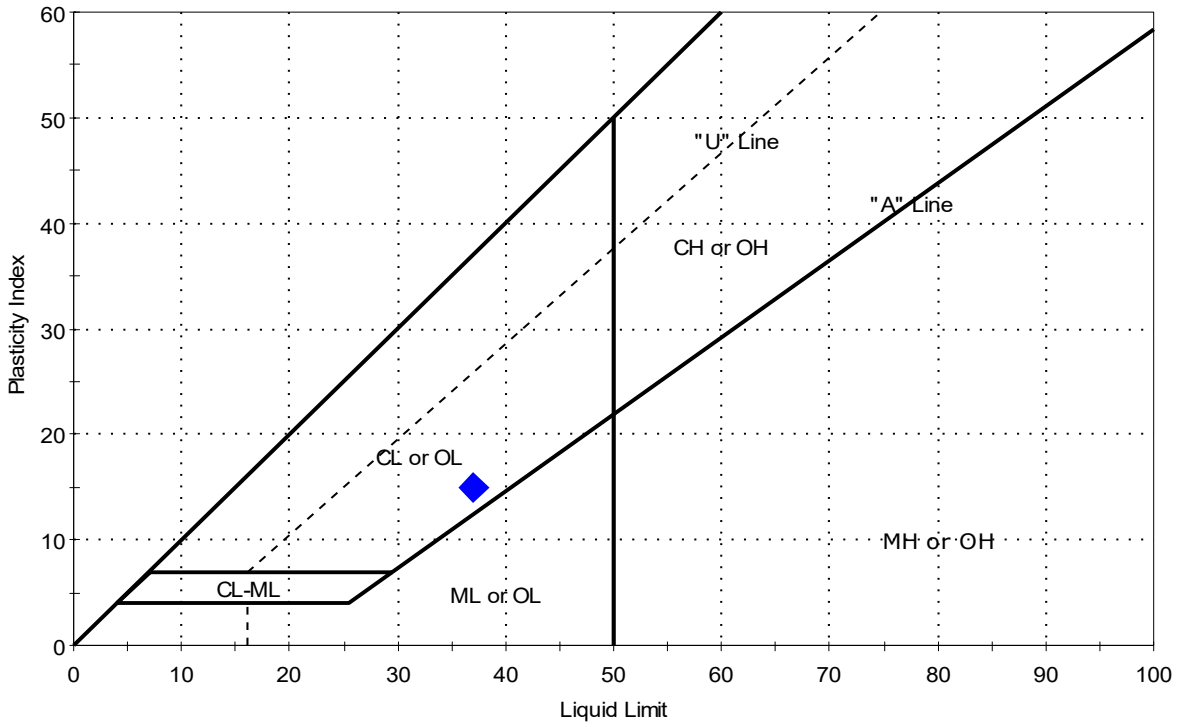
Client:	Schonewald Engineering Associates, Inc.				
Project:	I-295 over Veranda St (MeDOT WIN21745.00)				
Location:	Portland, ME			Project No:	GTX-308805
Boring ID:	BB-PVS-203	Sample Type:	tube	Tested By:	cam
Sample ID:	U3	Test Date:	01/21/19	Checked By:	emm
Depth :	50-52 ft	Test Id:	489631		
Test Comment:	---				
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
◆	U3	B-PVS-20	50-52 ft	37	37	22	15	1	

Sample Prepared using the WET method

Dry Strength: VERY HIGH

Dilatancy: SLOW

Toughness: LOW

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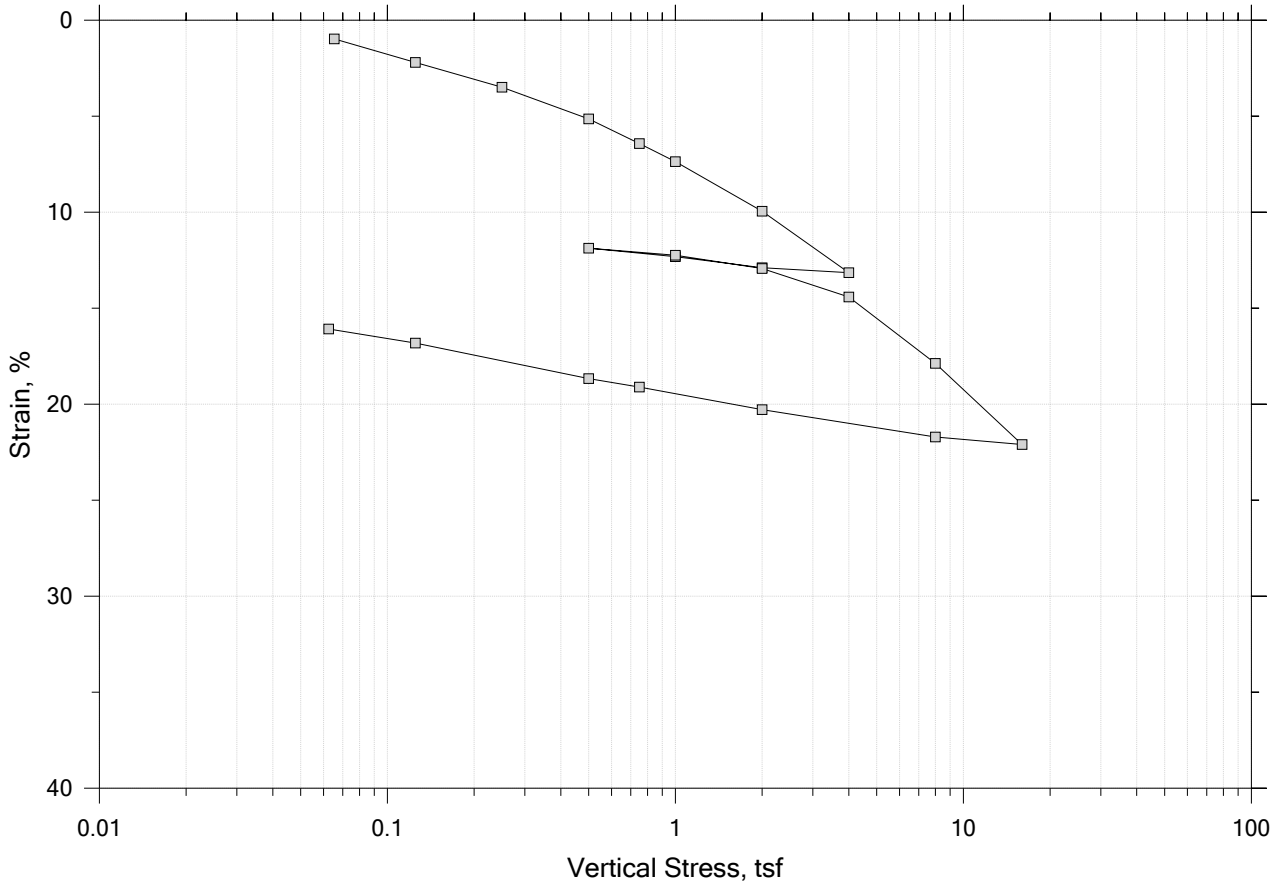
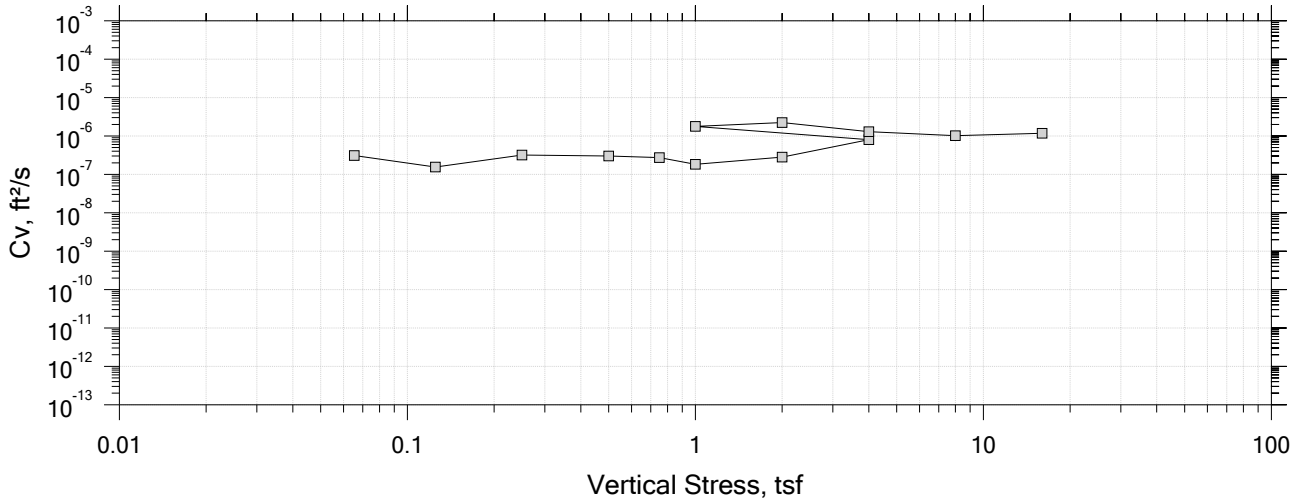
One-Dimensional Consolidation by ASTM D2435 - Method B

Summary Report





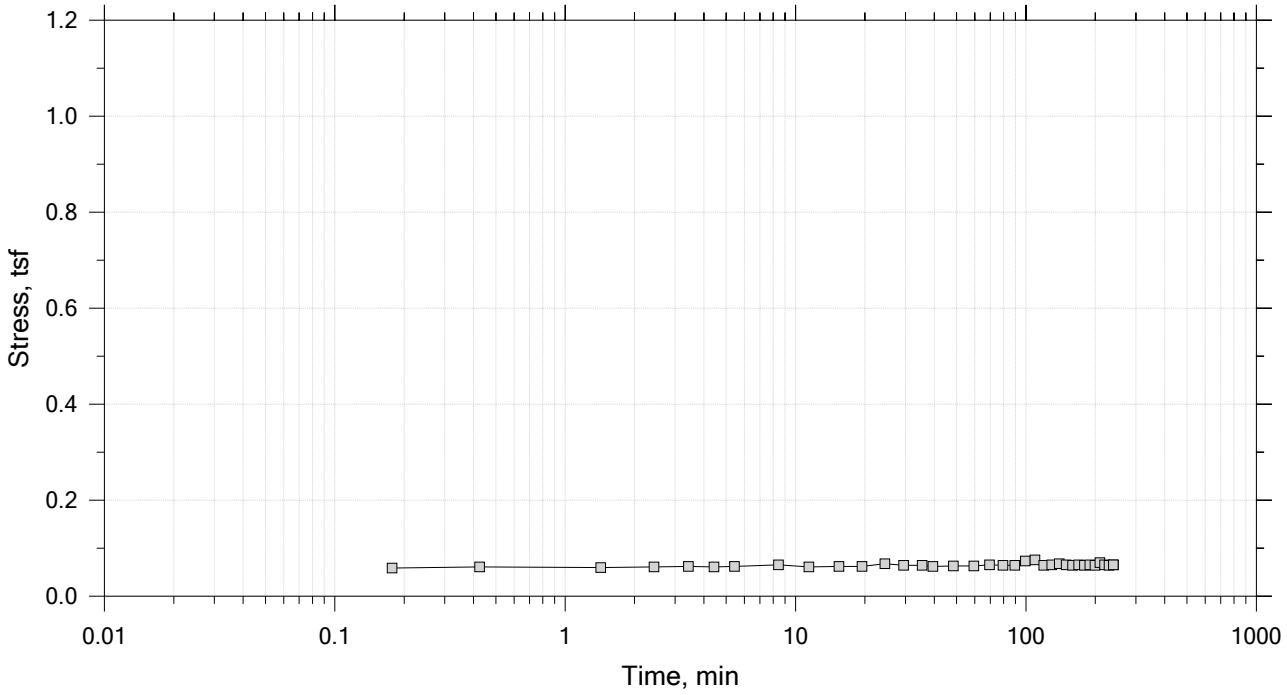
GeoTesting EXPRESS	Project: I-295 Over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-202	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 01/22/19	Depth: 33-35 ft
	Test No.: IP-9	Sample Type: intact	Elevation: ---
	Description: Moist, olive gray clay		
	Remarks: System LTIII-B, Swell Pressure = 0.0654 tsf		
	Displacement at End of Increment		

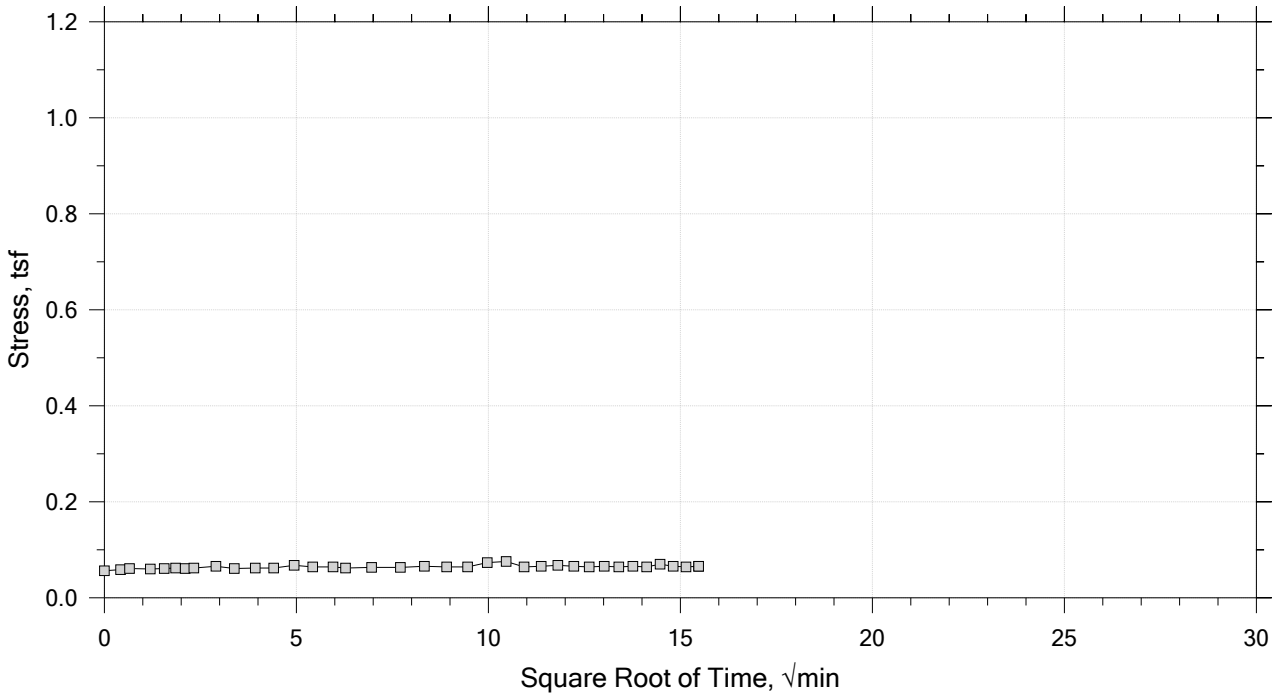
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 1 of 22

Constant Volume Step

Stress: 0.0654 tsf





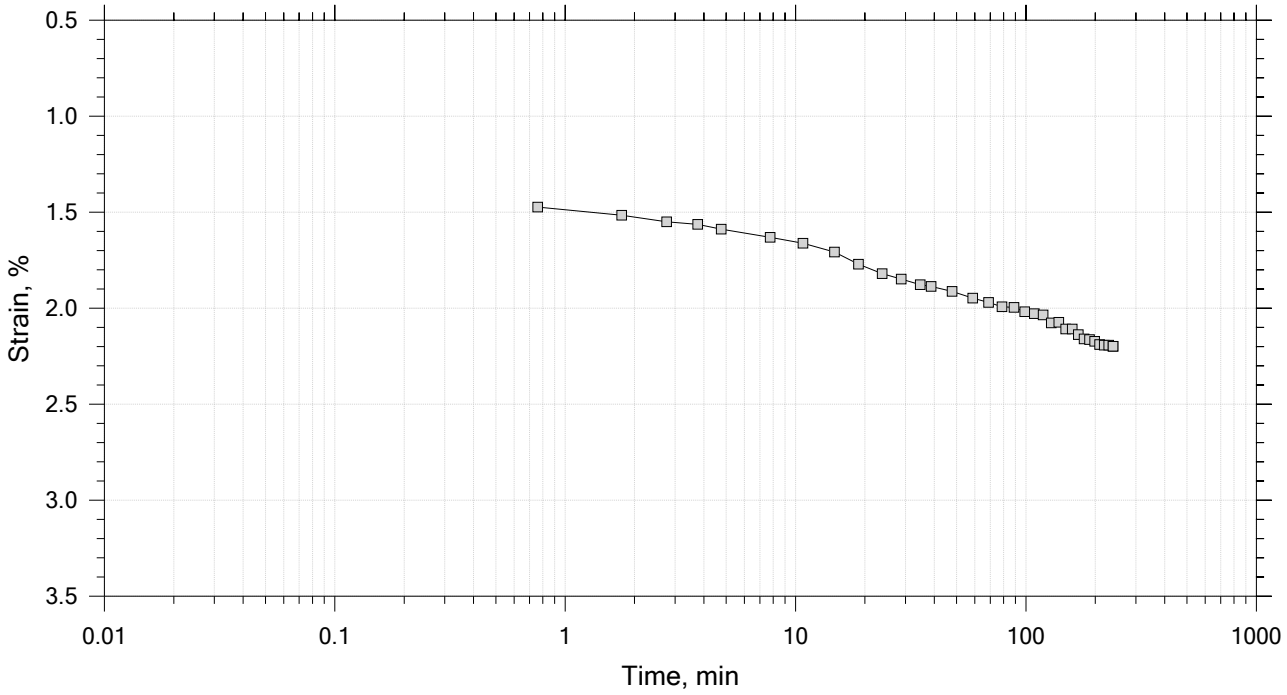
GeoTesting EXPRESS	Project: I-295 Over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-202	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 01/22/19	Depth: 33-35 ft
	Test No.: IP-9	Sample Type: intact	Elevation: ---
	Description: Moist, olive gray clay		
	Remarks: System LTIII-B, Swell Pressure = 0.0654 tsf		

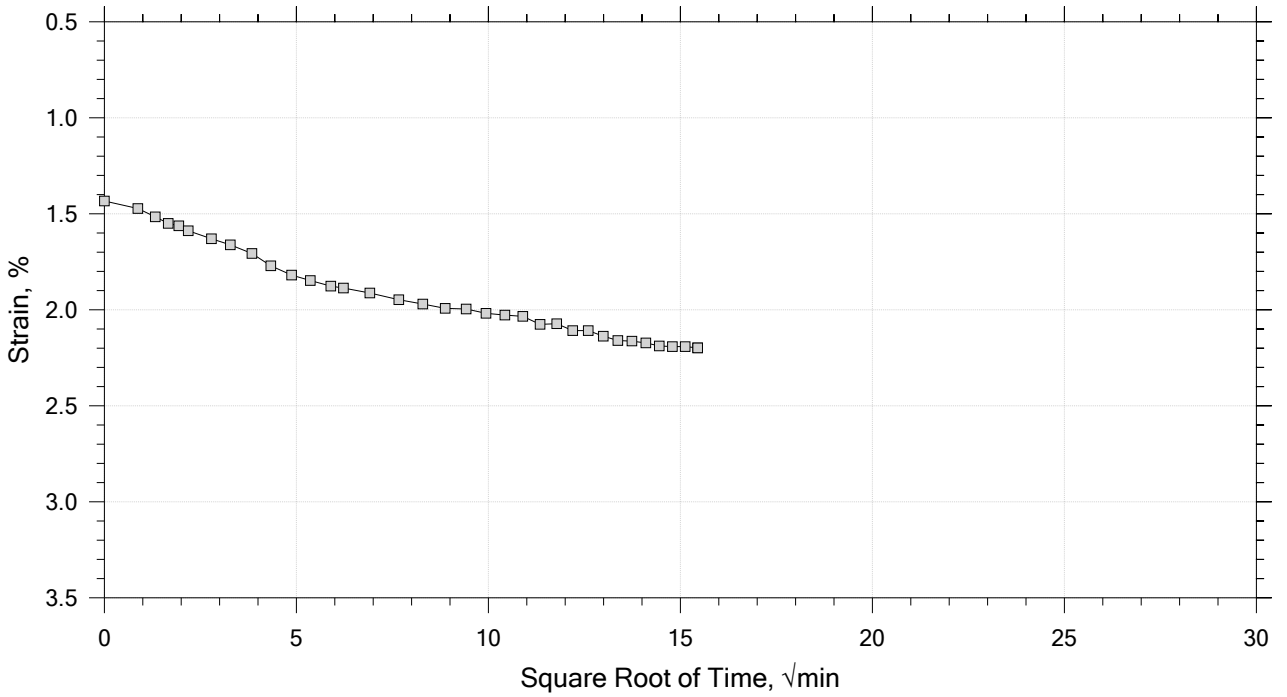
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 2 of 22

Constant Load Step

Stress: 0.125 tsf





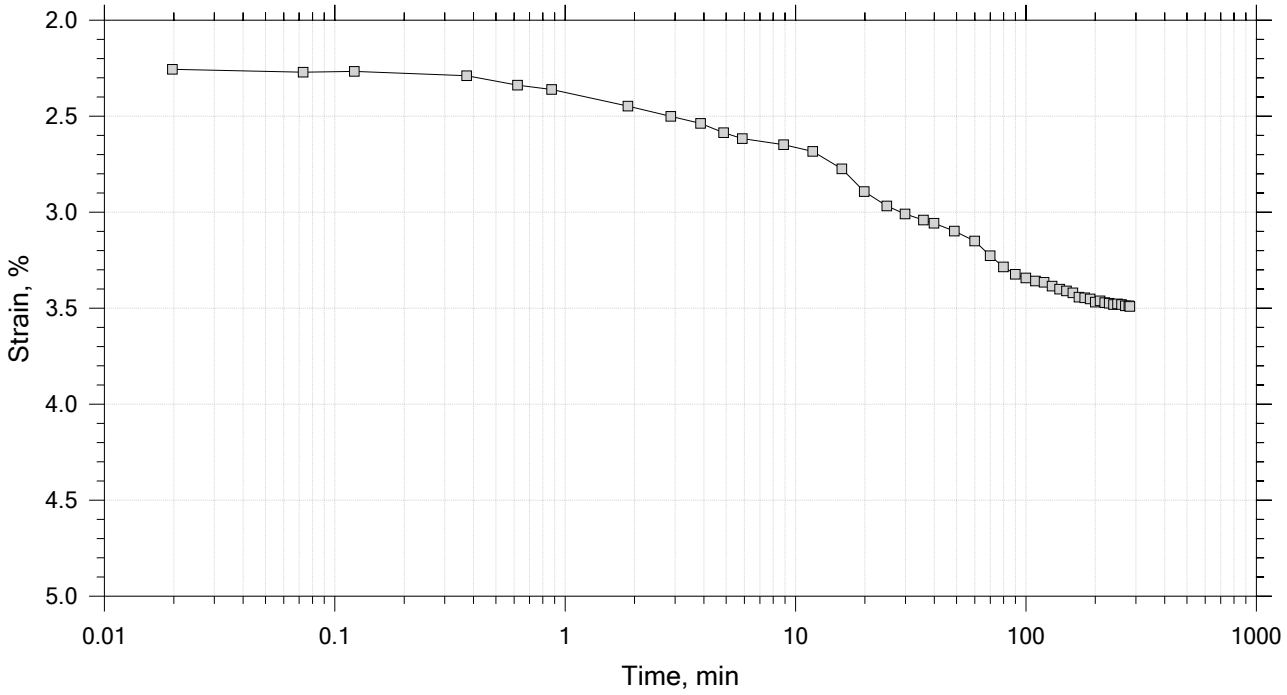
GeoTesting EXPRESS	Project: I-295 Over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-202	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 01/22/19	Depth: 33-35 ft
	Test No.: IP-9	Sample Type: intact	Elevation: ---
	Description: Moist, olive gray clay		
	Remarks: System LTIII-B, Swell Pressure = 0.0654 tsf		

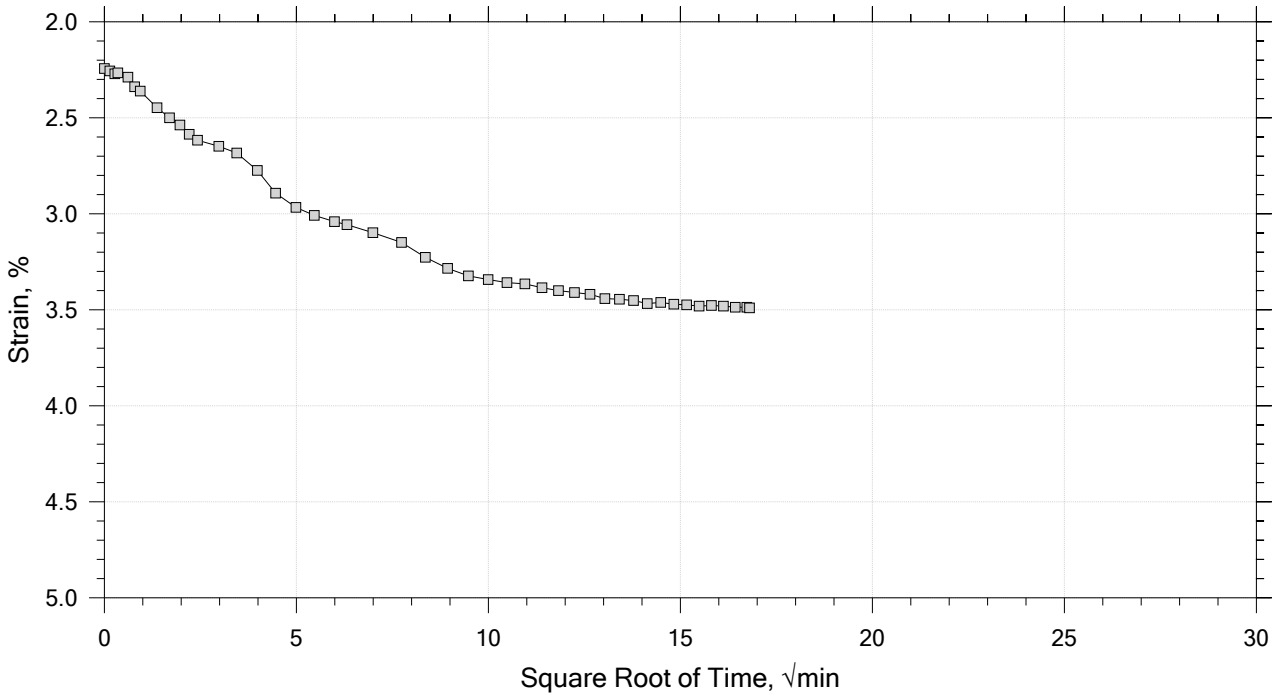
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 3 of 22

Constant Load Step

Stress: 0.25 tsf





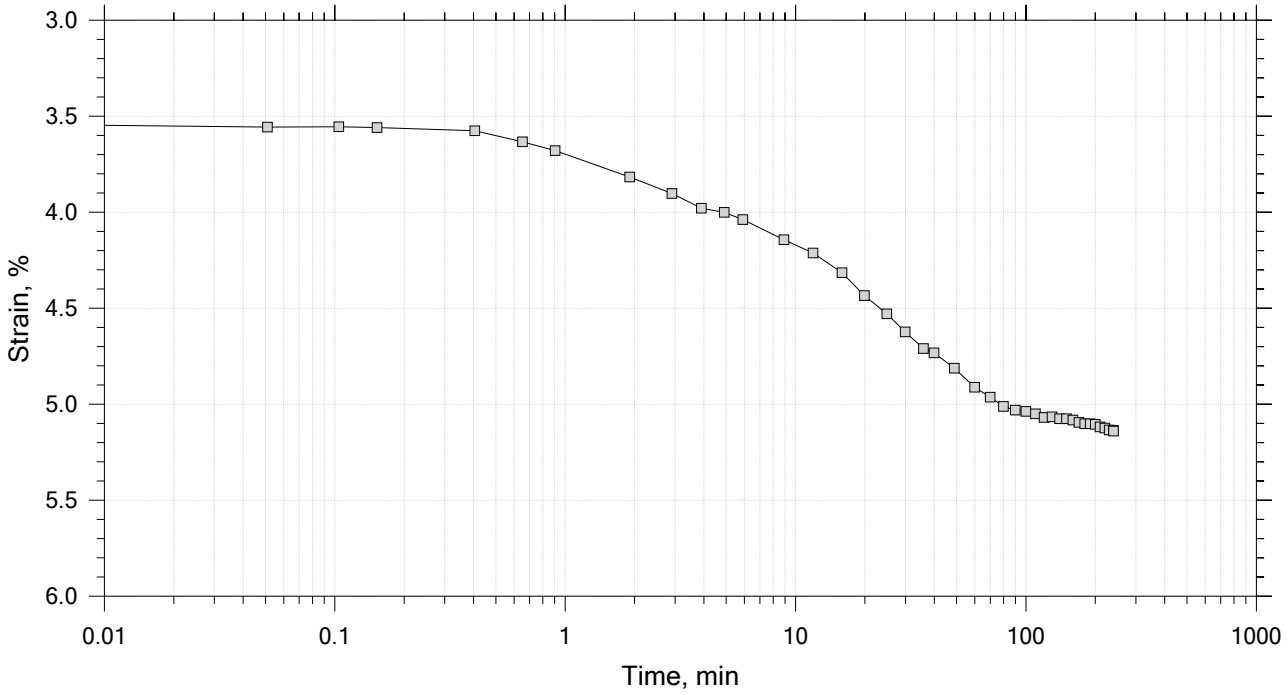
GeoTesting EXPRESS	Project: I-295 Over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-202	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 01/22/19	Depth: 33-35 ft
	Test No.: IP-9	Sample Type: intact	Elevation: ---
	Description: Moist, olive gray clay		
	Remarks: System LTIII-B, Swell Pressure = 0.0654 tsf		

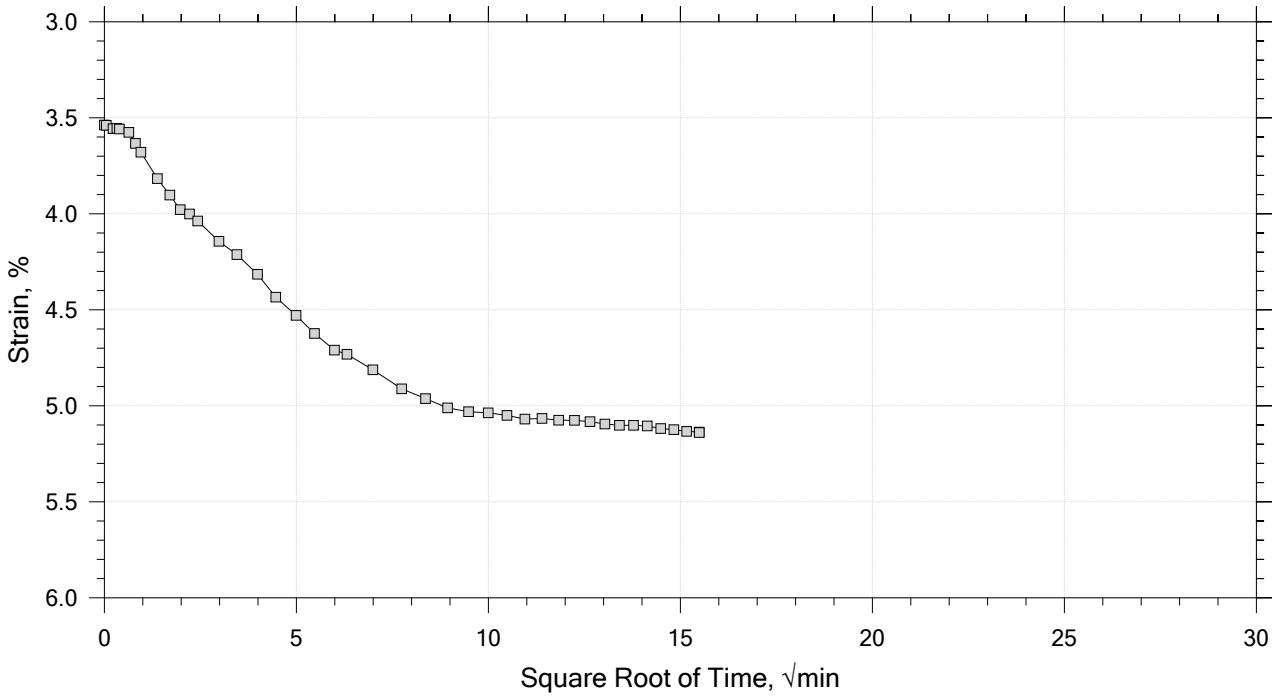
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 4 of 22

Constant Load Step

Stress: 0.5 tsf





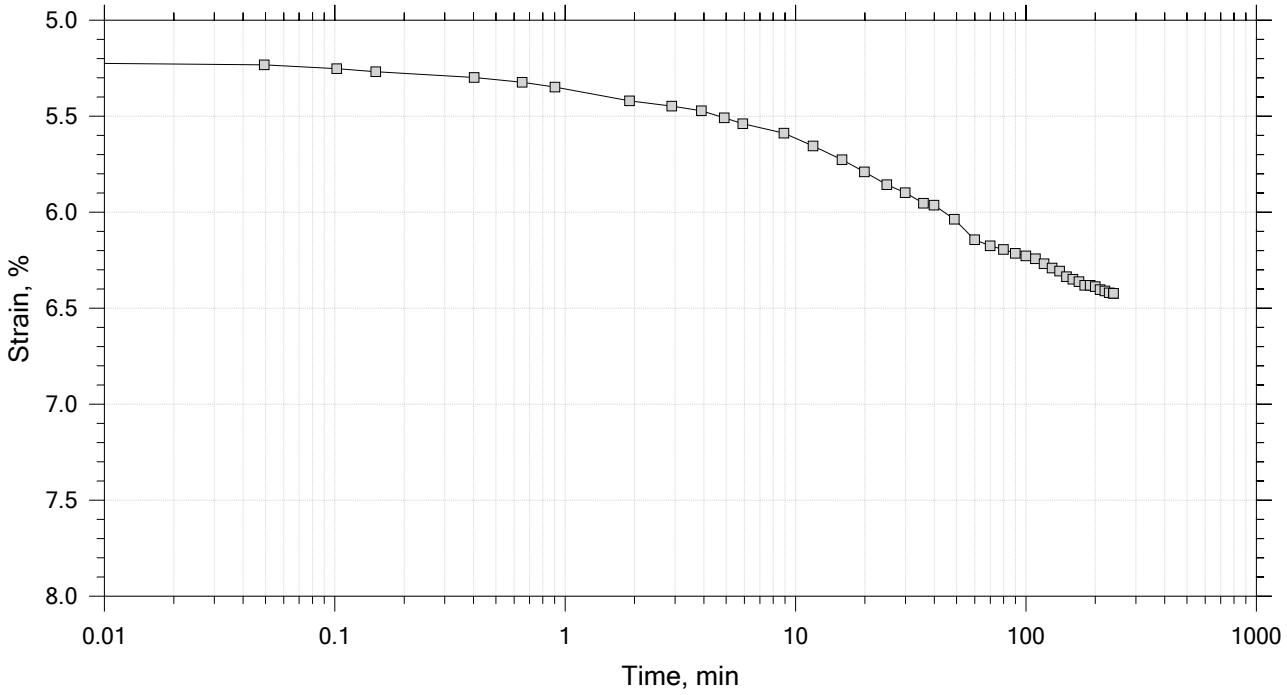
GeoTesting EXPRESS	Project: I-295 Over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-202	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 01/22/19	Depth: 33-35 ft
	Test No.: IP-9	Sample Type: intact	Elevation: ---
	Description: Moist, olive gray clay		
	Remarks: System LTIII-B, Swell Pressure = 0.0654 tsf		

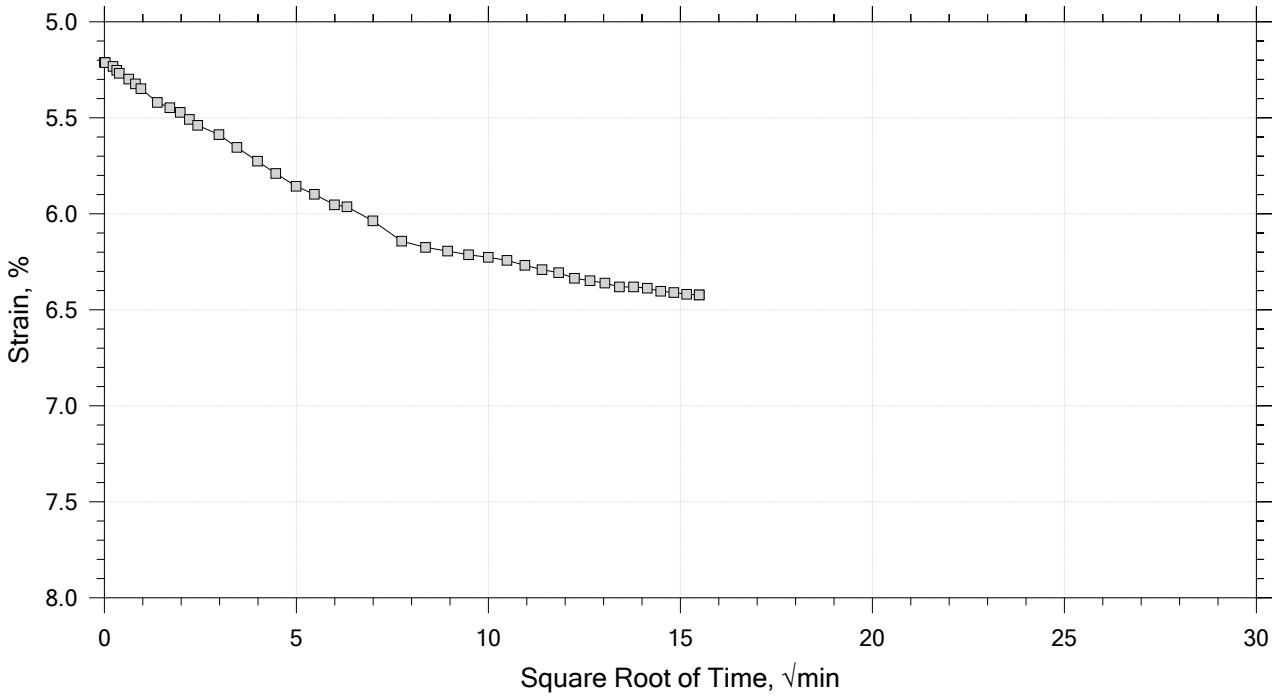
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 5 of 22

Constant Load Step

Stress: 0.75 tsf





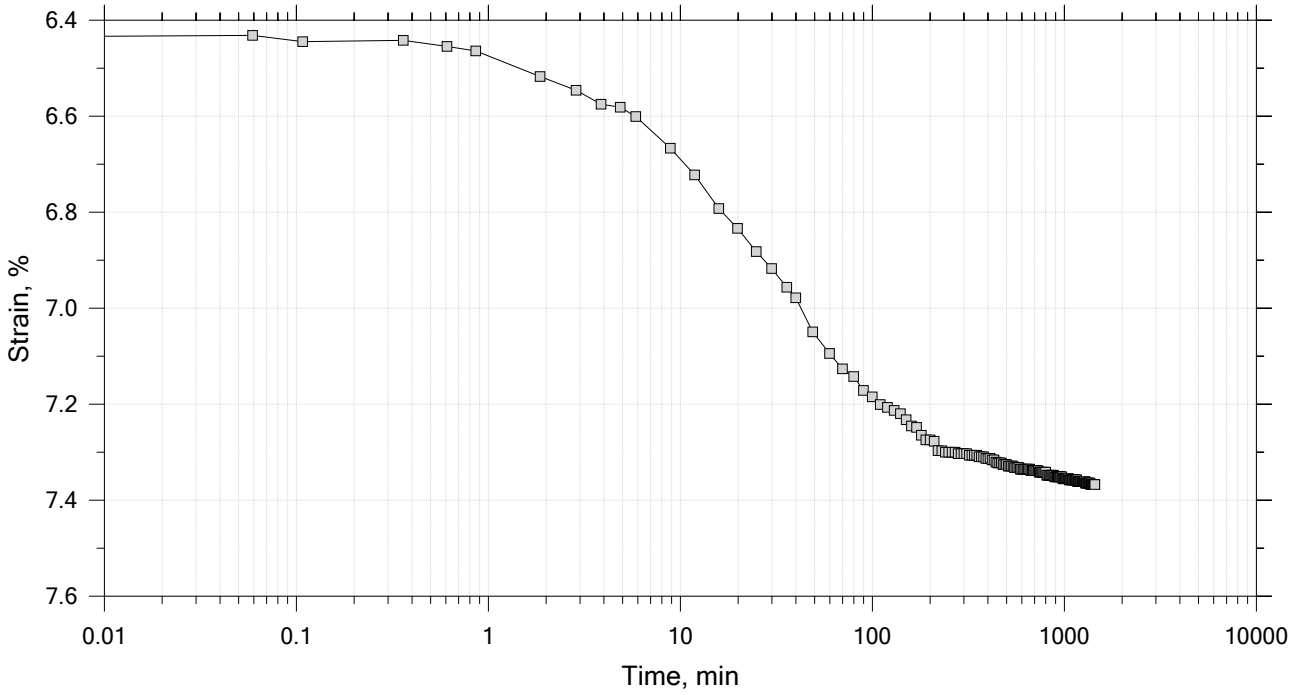
GeoTesting EXPRESS	Project: I-295 Over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-202	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 01/22/19	Depth: 33-35 ft
	Test No.: IP-9	Sample Type: intact	Elevation: ---
	Description: Moist, olive gray clay		
	Remarks: System LTIII-B, Swell Pressure = 0.0654 tsf		

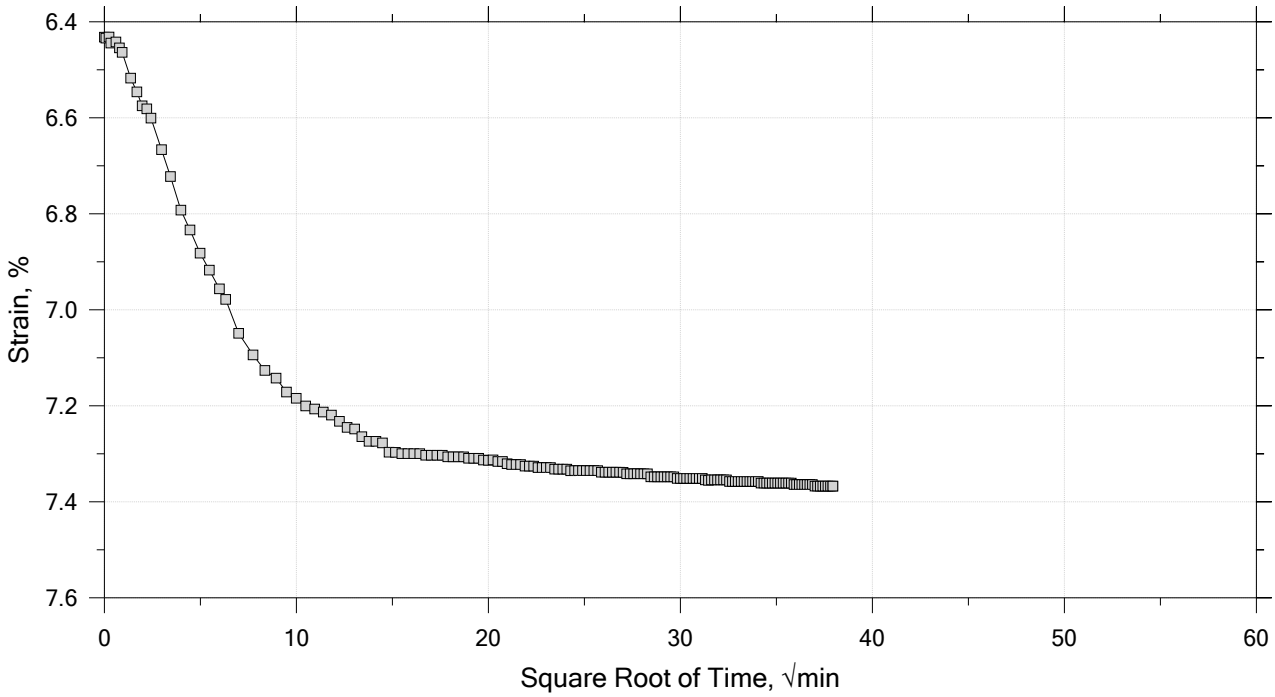
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 6 of 22

Constant Load Step

Stress: 1 tsf





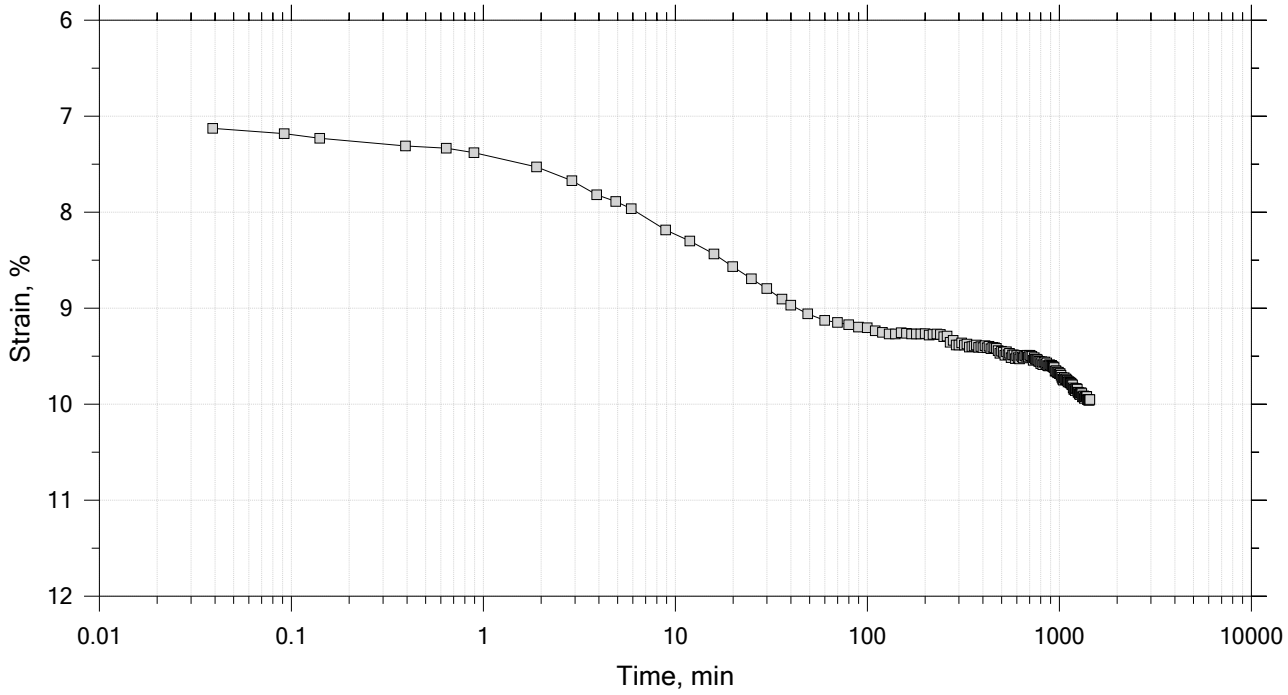
GeoTesting EXPRESS	Project: I-295 Over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-202	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 01/22/19	Depth: 33-35 ft
	Test No.: IP-9	Sample Type: intact	Elevation: ---
	Description: Moist, olive gray clay		
	Remarks: System LTIII-B, Swell Pressure = 0.0654 tsf		

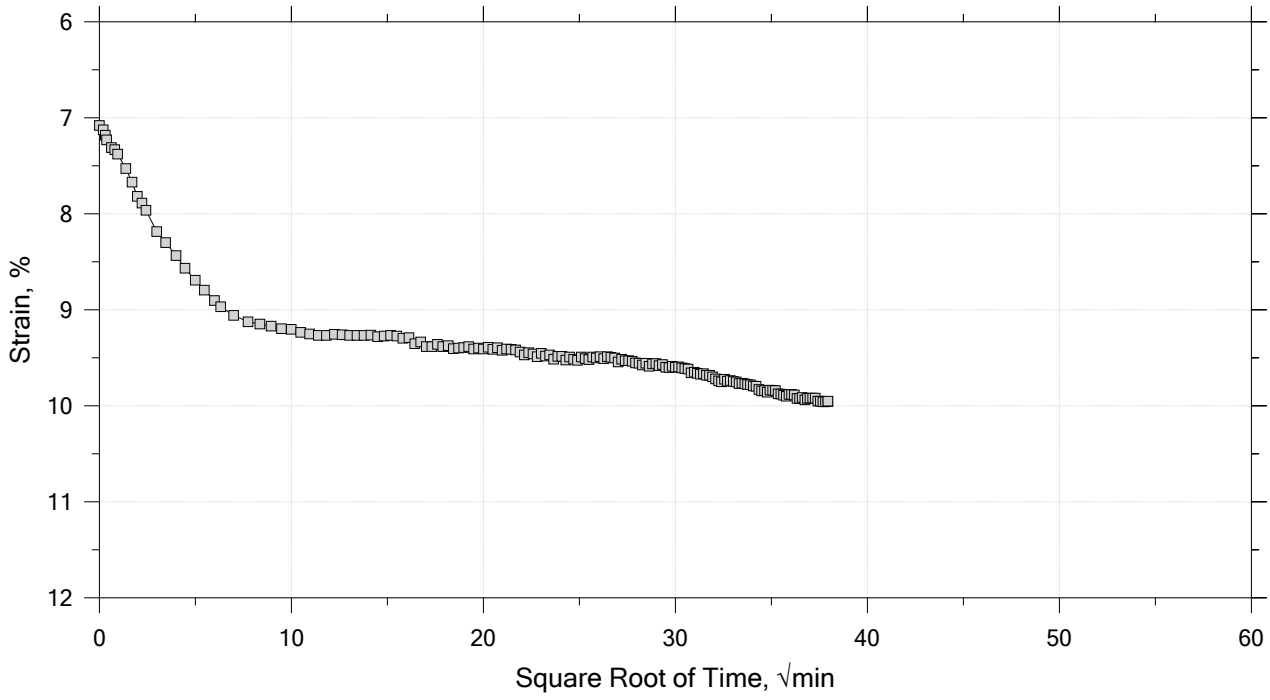
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 7 of 22

Constant Load Step

Stress: 2 tsf





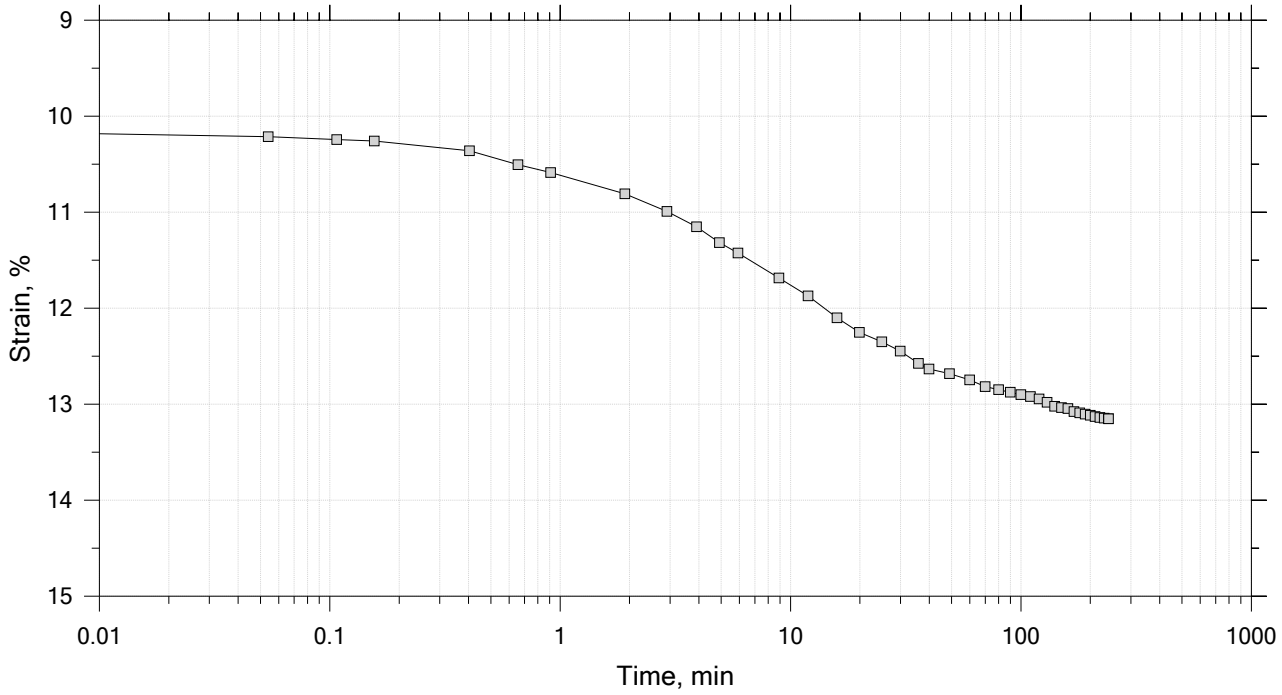
GeoTesting EXPRESS	Project: I-295 Over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-202	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 01/22/19	Depth: 33-35 ft
	Test No.: IP-9	Sample Type: intact	Elevation: ---
	Description: Moist, olive gray clay		
	Remarks: System LTIII-B, Swell Pressure = 0.0654 tsf		

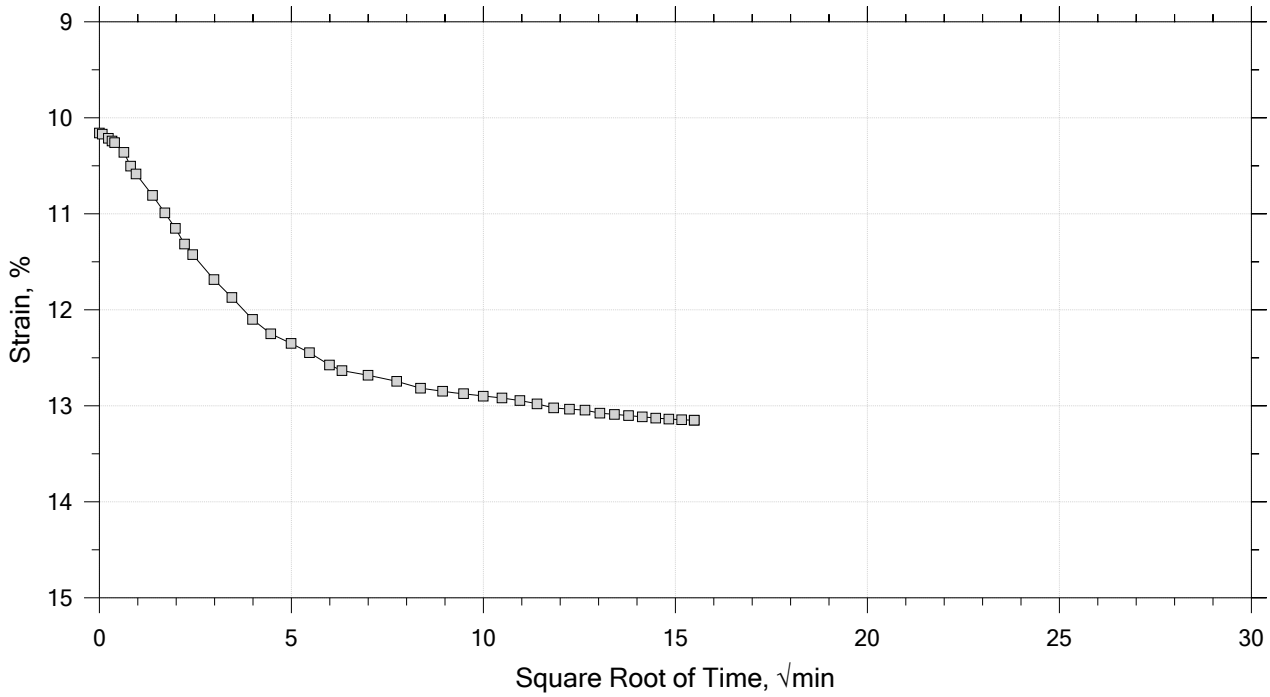
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 8 of 22

Constant Load Step

Stress: 4 tsf





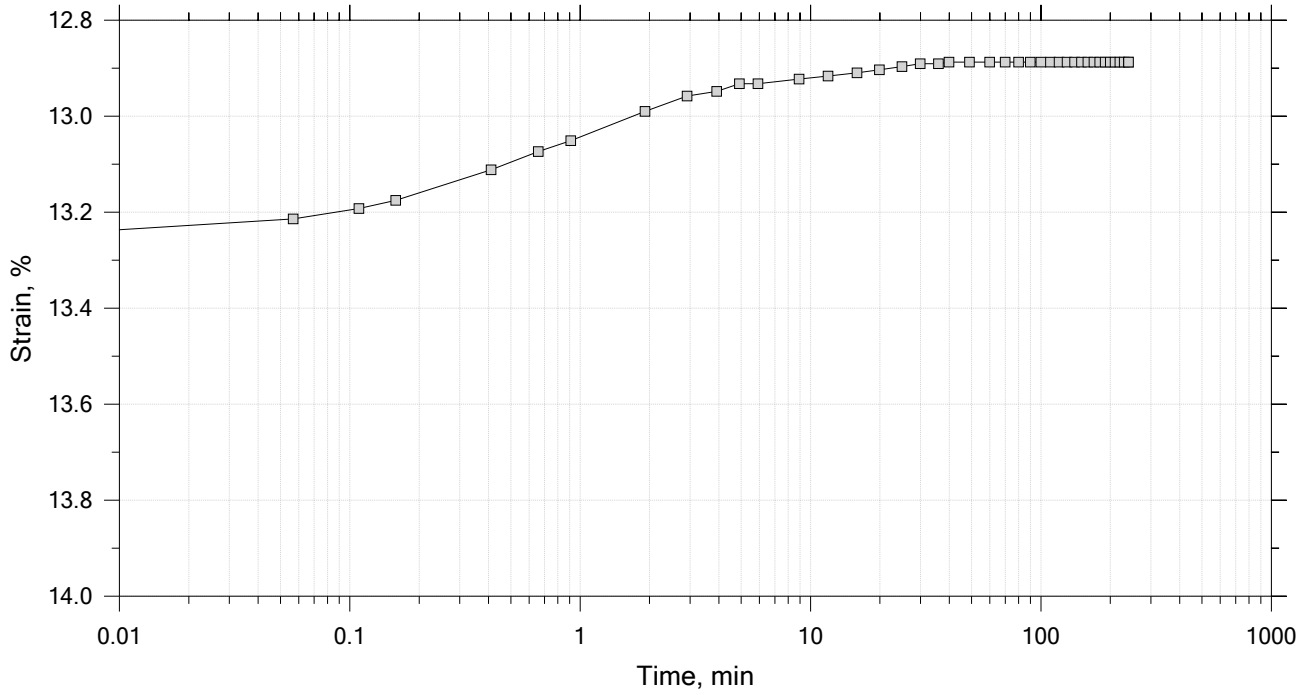
GeoTesting EXPRESS	Project: I-295 Over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-202	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 01/22/19	Depth: 33-35 ft
	Test No.: IP-9	Sample Type: intact	Elevation: ---
	Description: Moist, olive gray clay		
	Remarks: System LTIII-B, Swell Pressure = 0.0654 tsf		

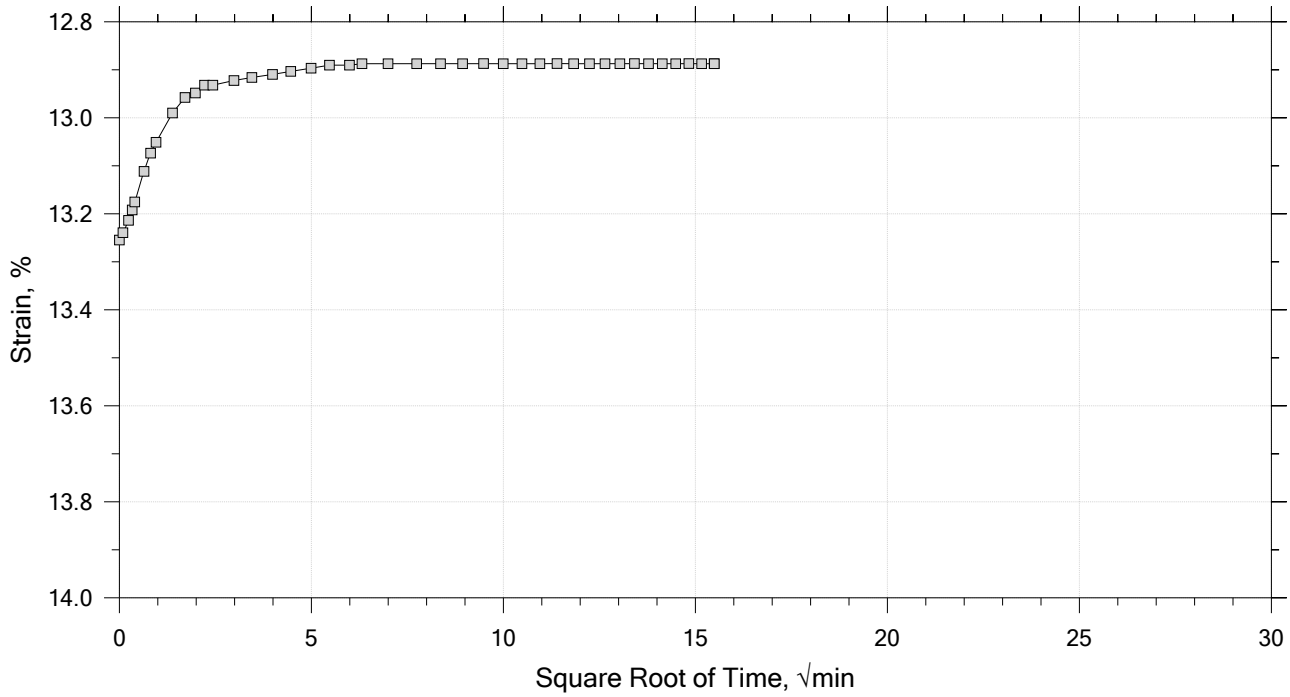
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 9 of 22

Constant Load Step

Stress: 2 tsf

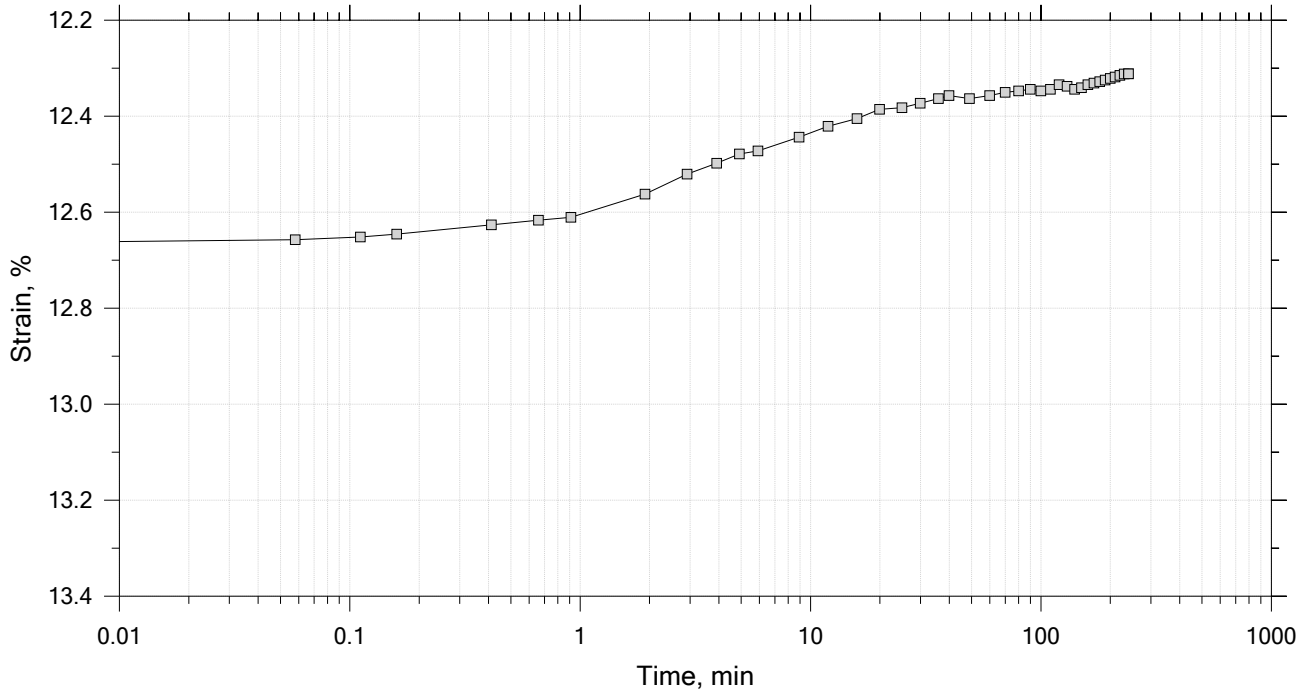


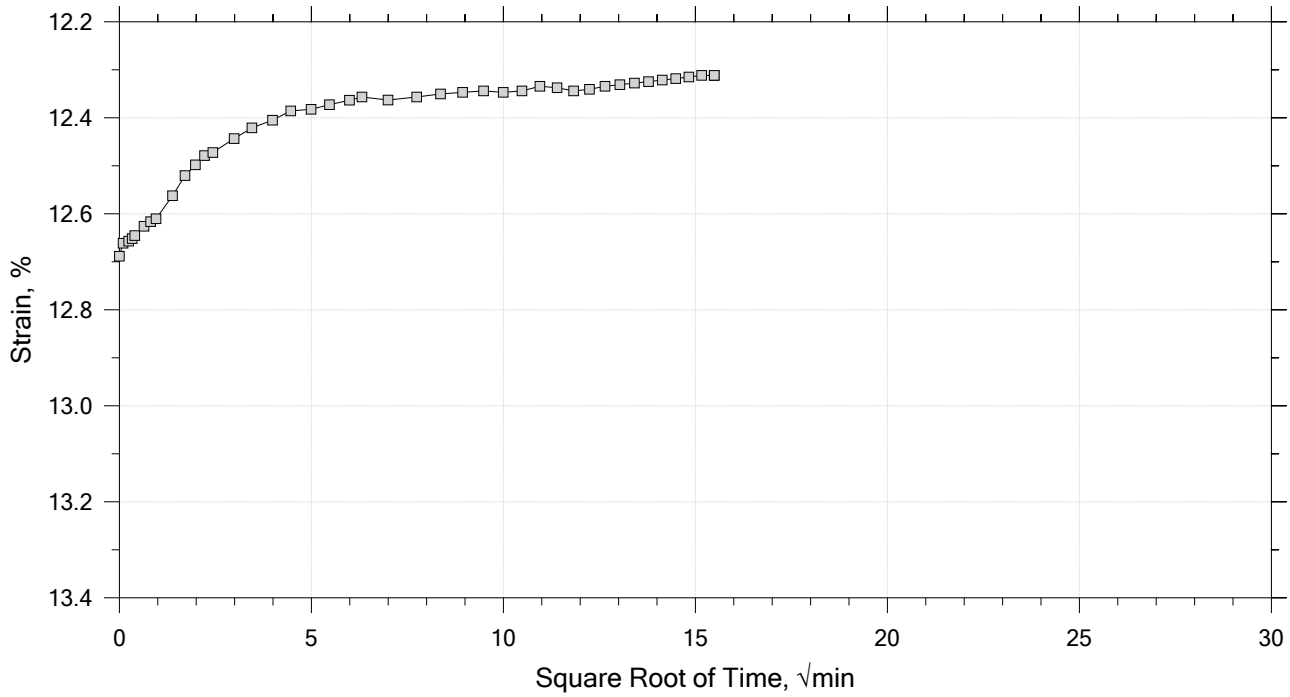


GeoTesting EXPRESS	Project: I-295 Over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-202	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 01/22/19	Depth: 33-35 ft
	Test No.: IP-9	Sample Type: intact	Elevation: ---
	Description: Moist, olive gray clay		
	Remarks: System LTIII-B, Swell Pressure = 0.0654 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 10 of 22
Constant Load Step
Stress: 1 tsf

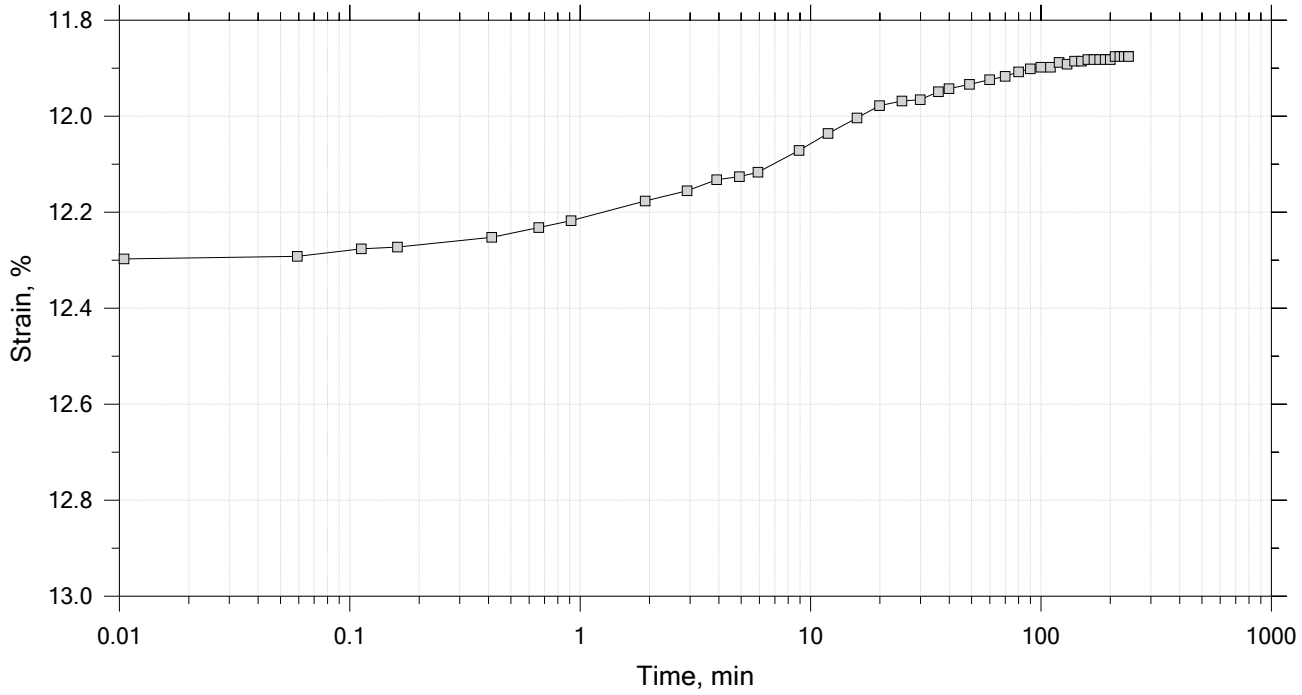


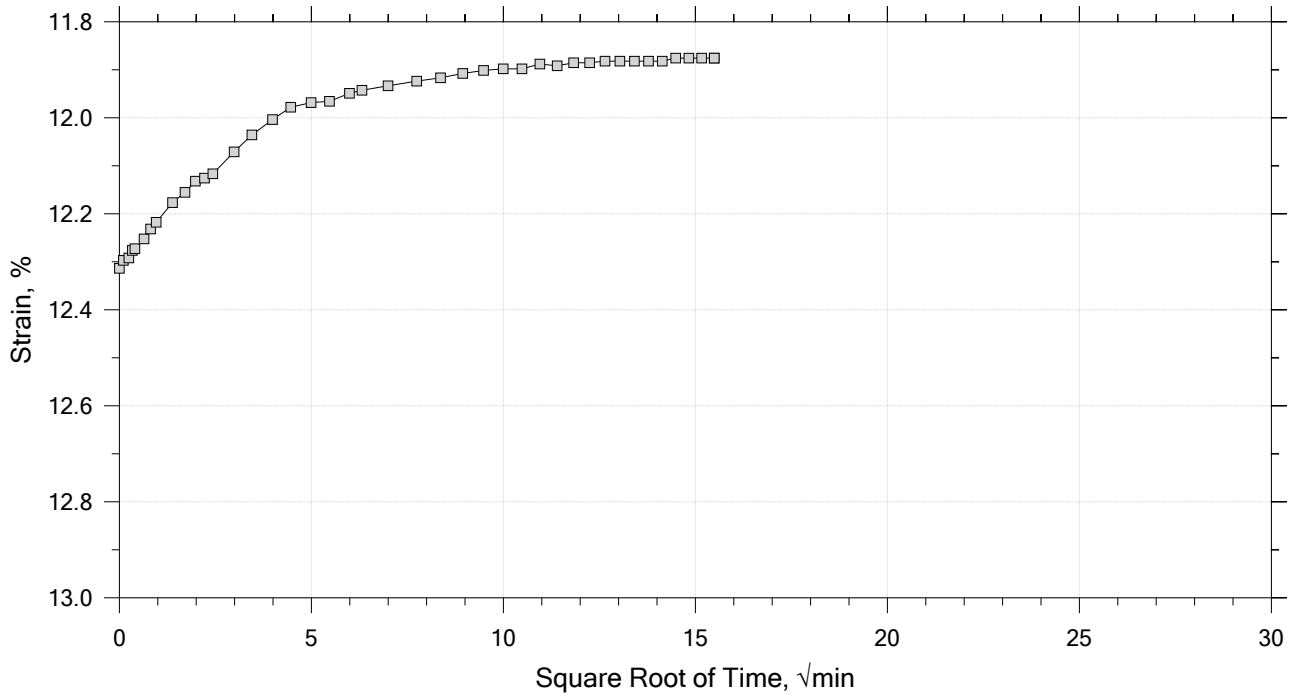


GeoTesting EXPRESS	Project: I-295 Over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-202	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 01/22/19	Depth: 33-35 ft
	Test No.: IP-9	Sample Type: intact	Elevation: ---
	Description: Moist, olive gray clay		
	Remarks: System LTIII-B, Swell Pressure = 0.0654 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 11 of 22
Constant Load Step
Stress: 0.5 tsf

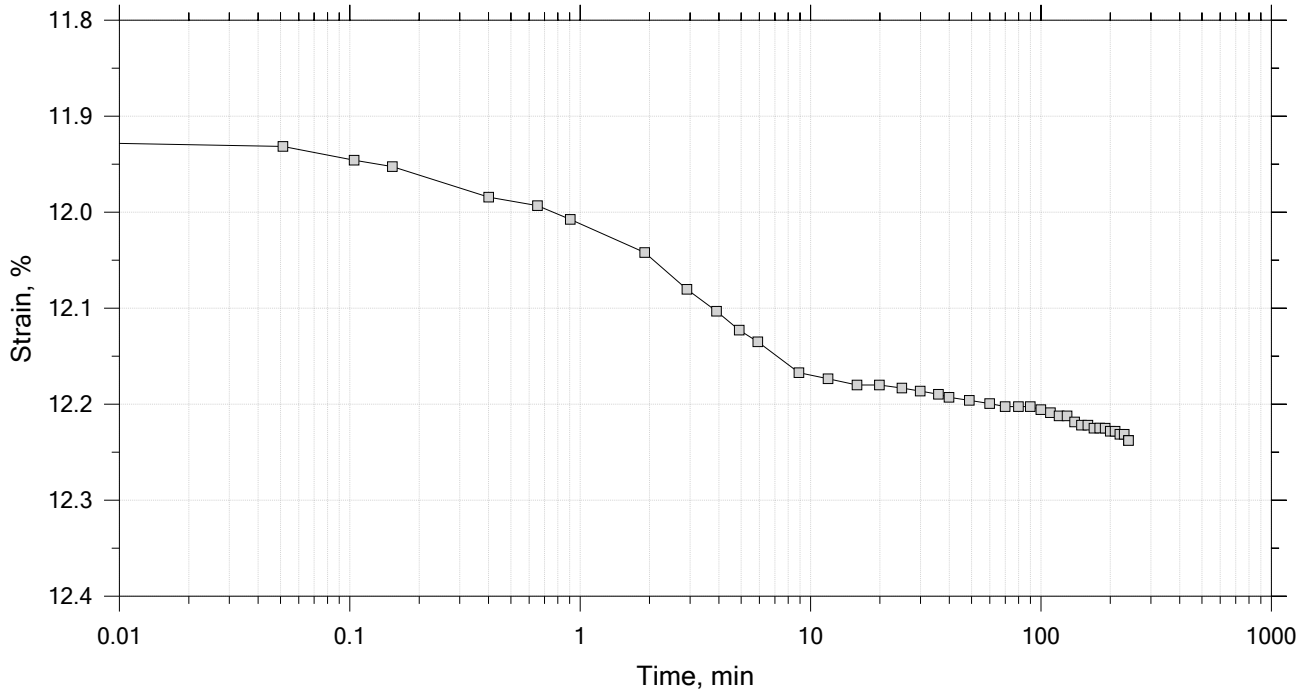


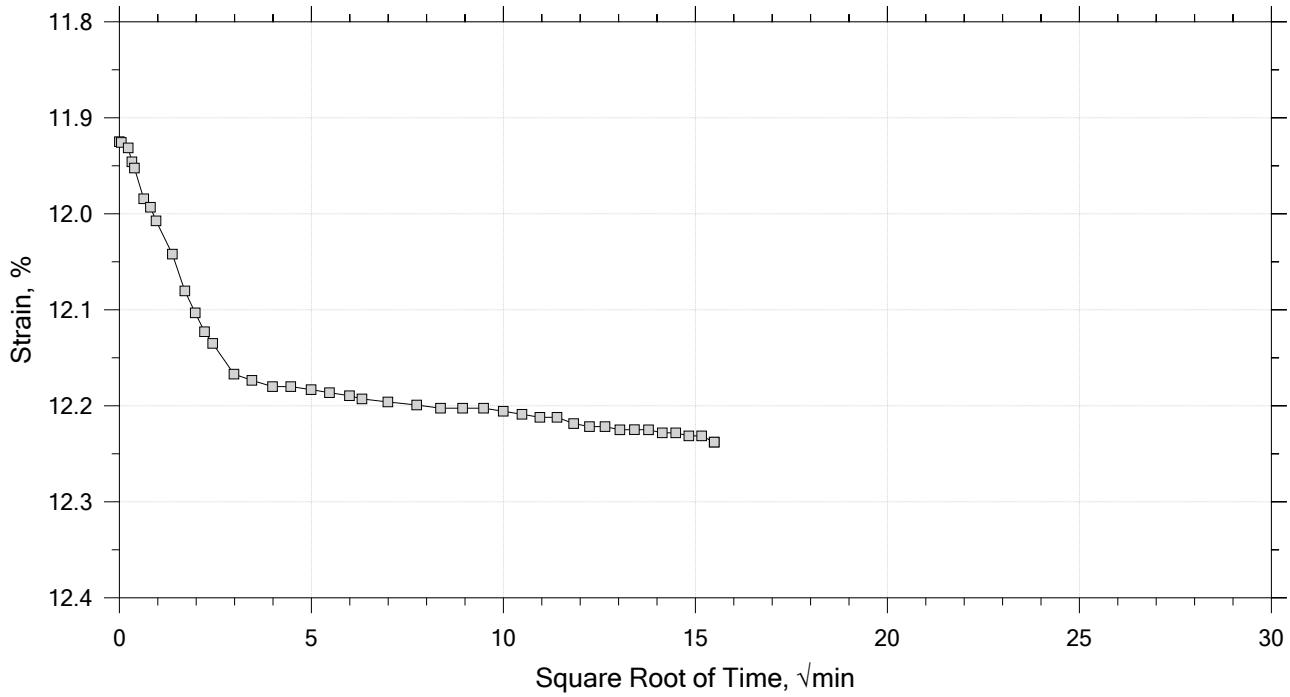


GeoTesting EXPRESS	Project: I-295 Over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-202	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 01/22/19	Depth: 33-35 ft
	Test No.: IP-9	Sample Type: intact	Elevation: ---
	Description: Moist, olive gray clay		
	Remarks: System LTIII-B, Swell Pressure = 0.0654 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 12 of 22
Constant Load Step
Stress: 1 tsf

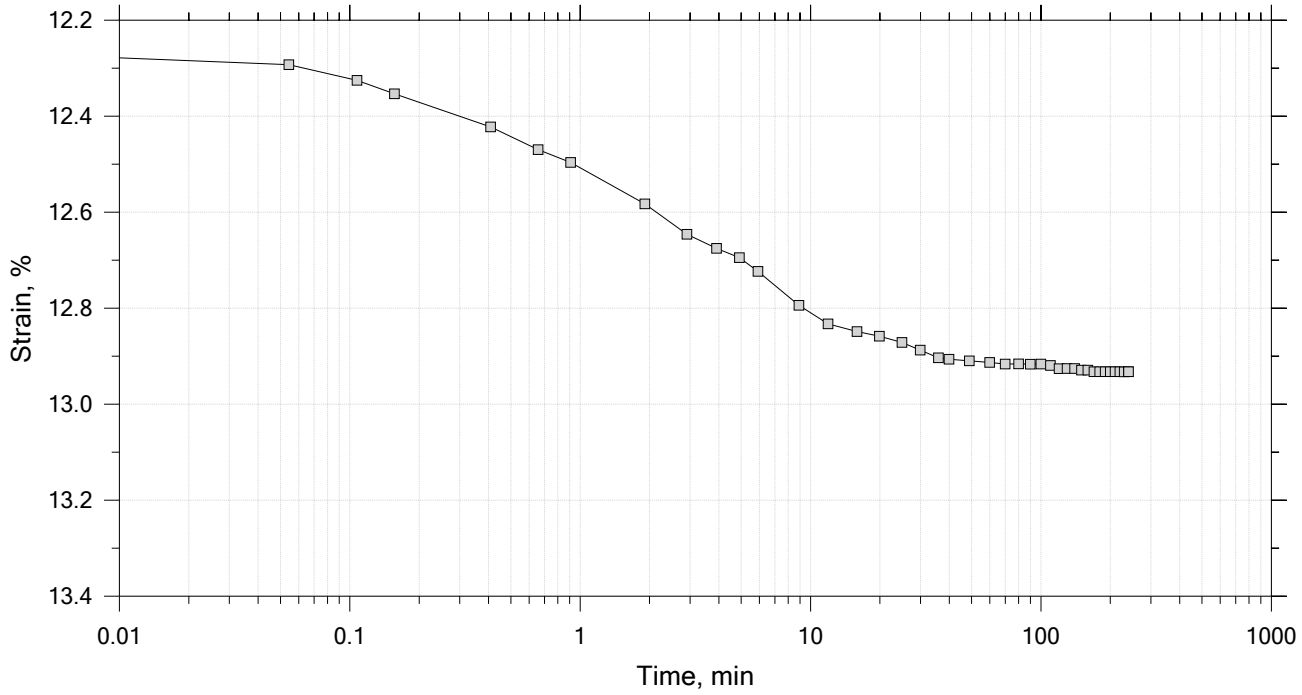


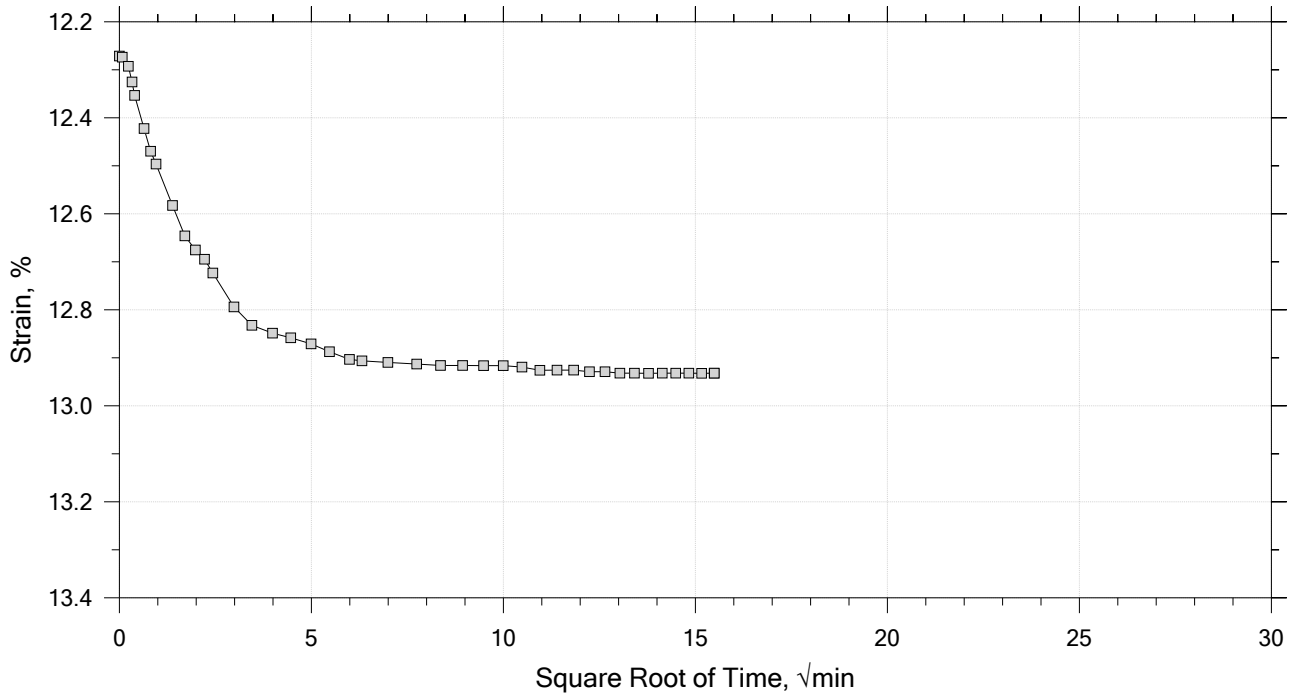


GeoTesting EXPRESS	Project: I-295 Over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-202	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 01/22/19	Depth: 33-35 ft
	Test No.: IP-9	Sample Type: intact	Elevation: ---
	Description: Moist, olive gray clay		
	Remarks: System LTIII-B, Swell Pressure = 0.0654 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 13 of 22
Constant Load Step
Stress: 2 tsf

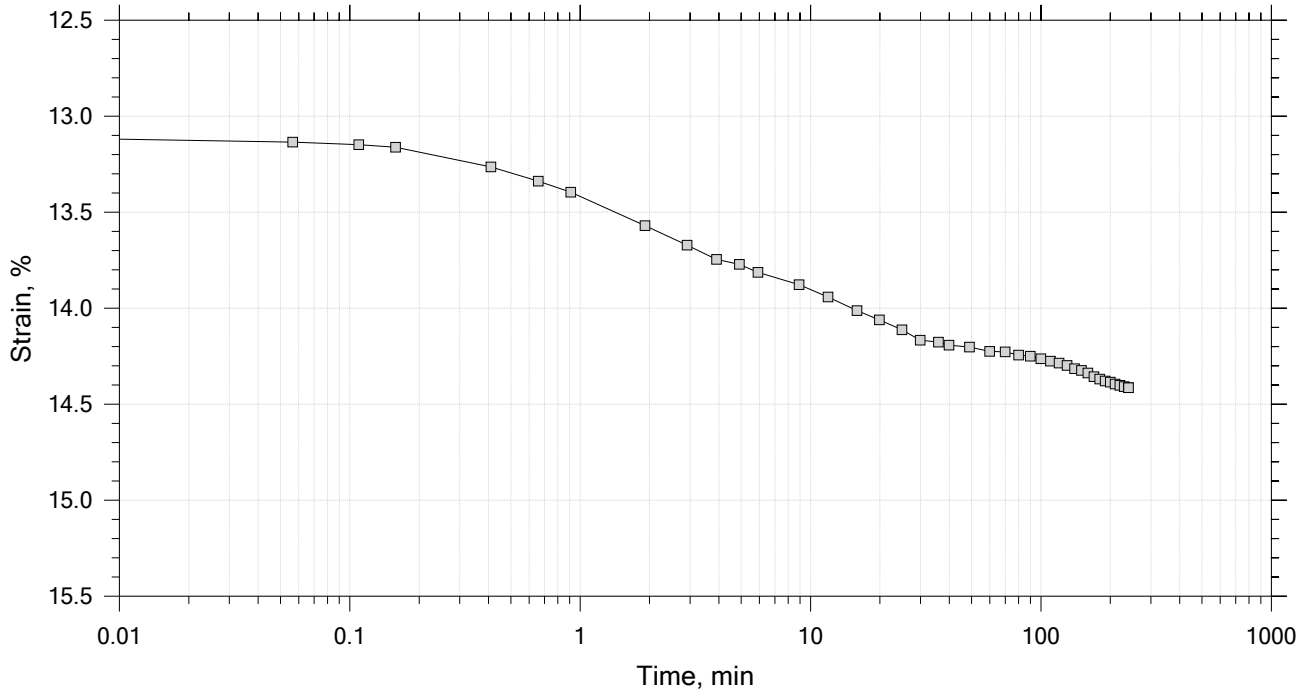


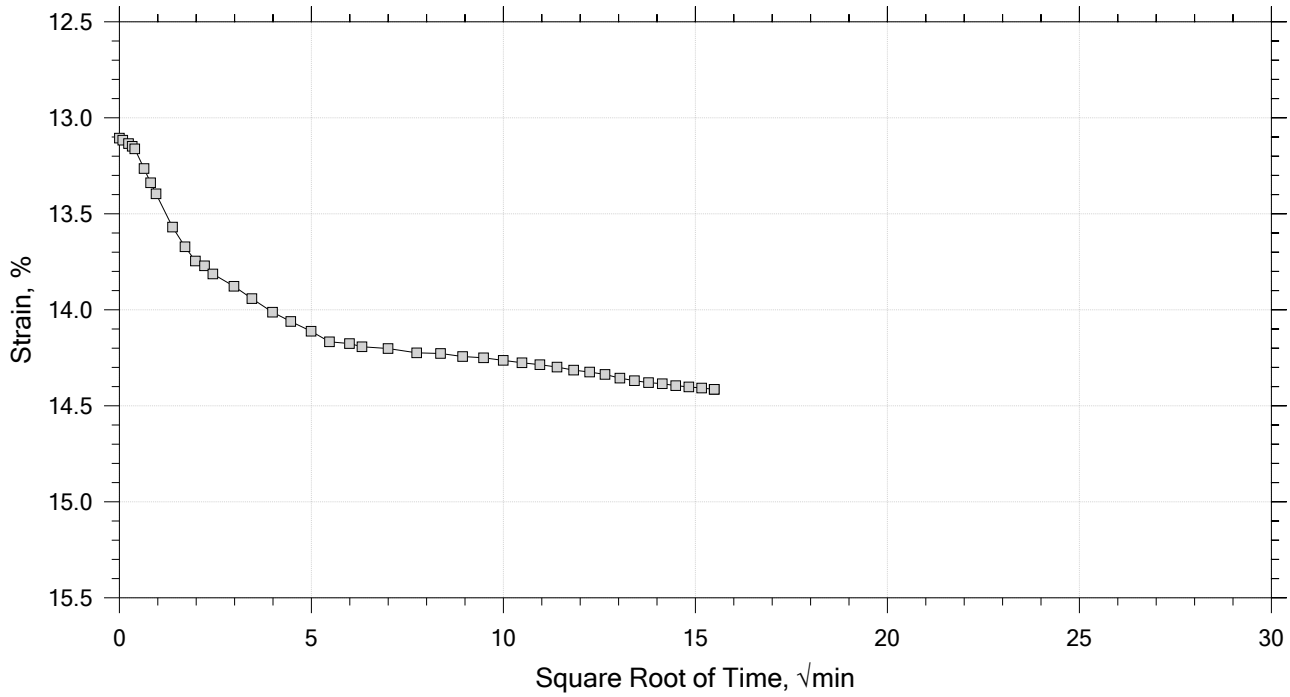


GeoTesting EXPRESS	Project: I-295 Over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-202	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 01/22/19	Depth: 33-35 ft
	Test No.: IP-9	Sample Type: intact	Elevation: ---
	Description: Moist, olive gray clay		
	Remarks: System LTIII-B, Swell Pressure = 0.0654 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 14 of 22
Constant Load Step
Stress: 4 tsf





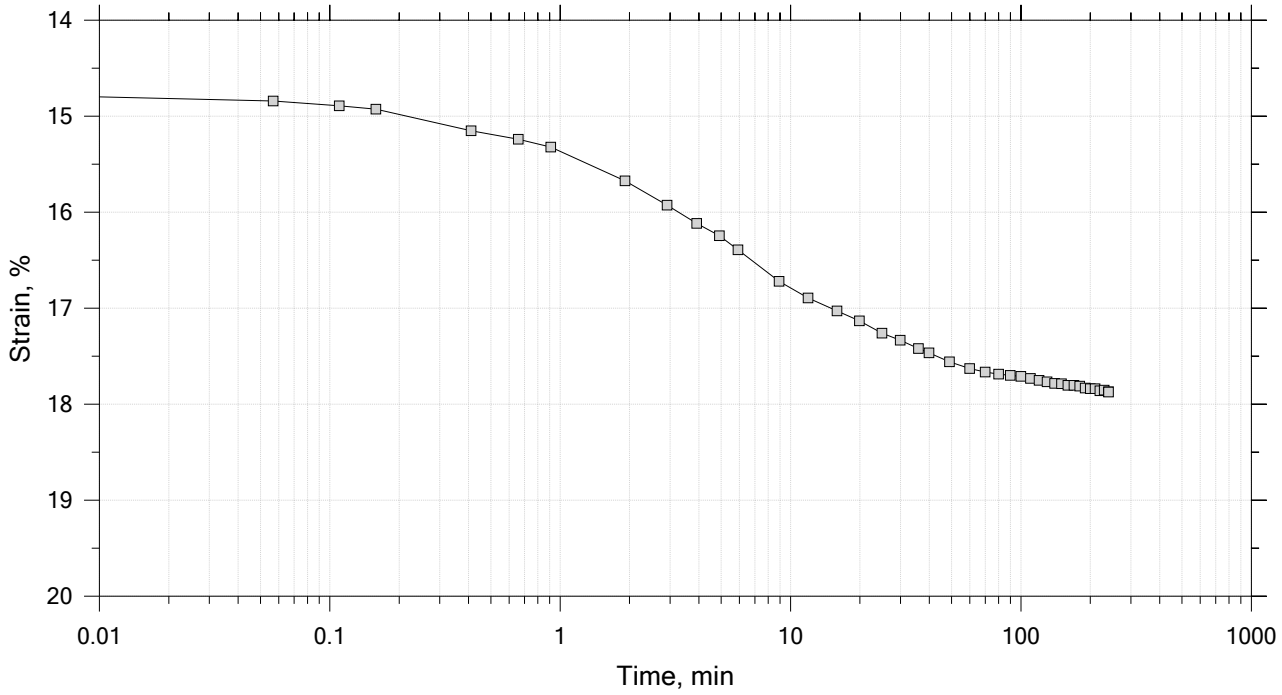
Project: I-295 Over Veranda St	Location: Portland, ME	Project No.: GTX-308805
Boring No.: BB-PVS-202	Tested By: md	Checked By: mcm
Sample No.: U1	Test Date: 01/22/19	Depth: 33-35 ft
Test No.: IP-9	Sample Type: intact	Elevation: ---
Description: Moist, olive gray clay		
Remarks: System LTIII-B, Swell Pressure = 0.0654 tsf		

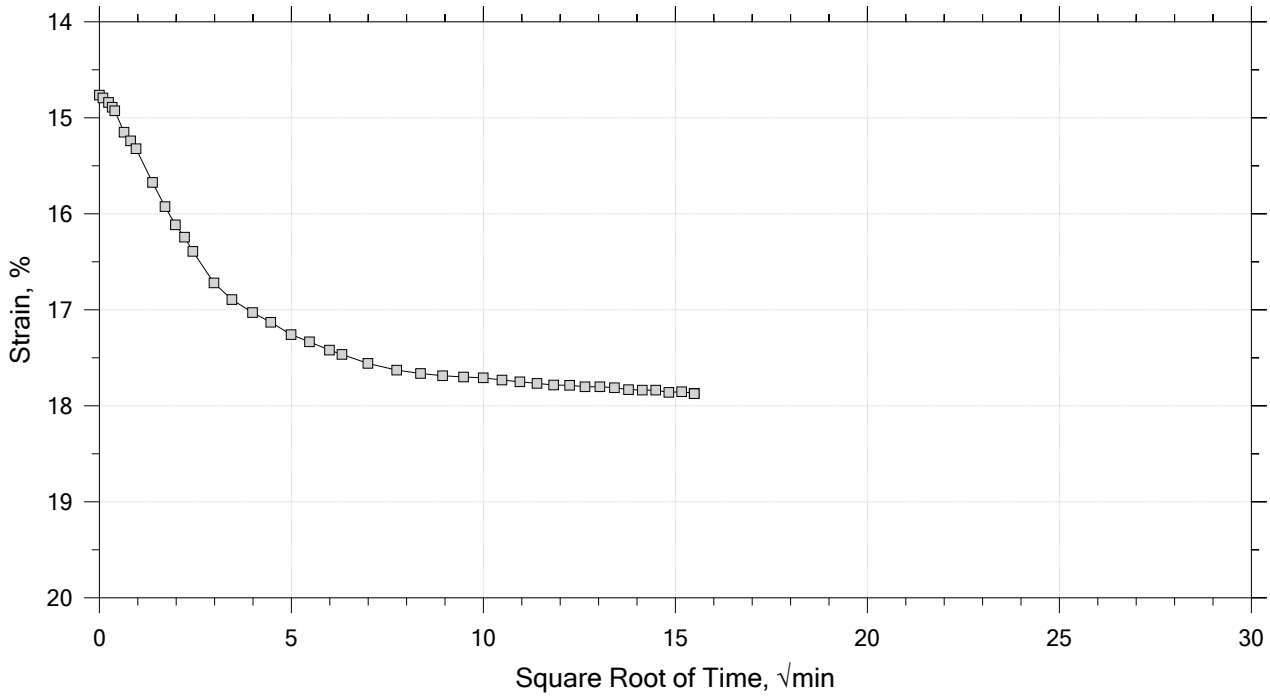
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 15 of 22

Constant Load Step

Stress: 8 tsf

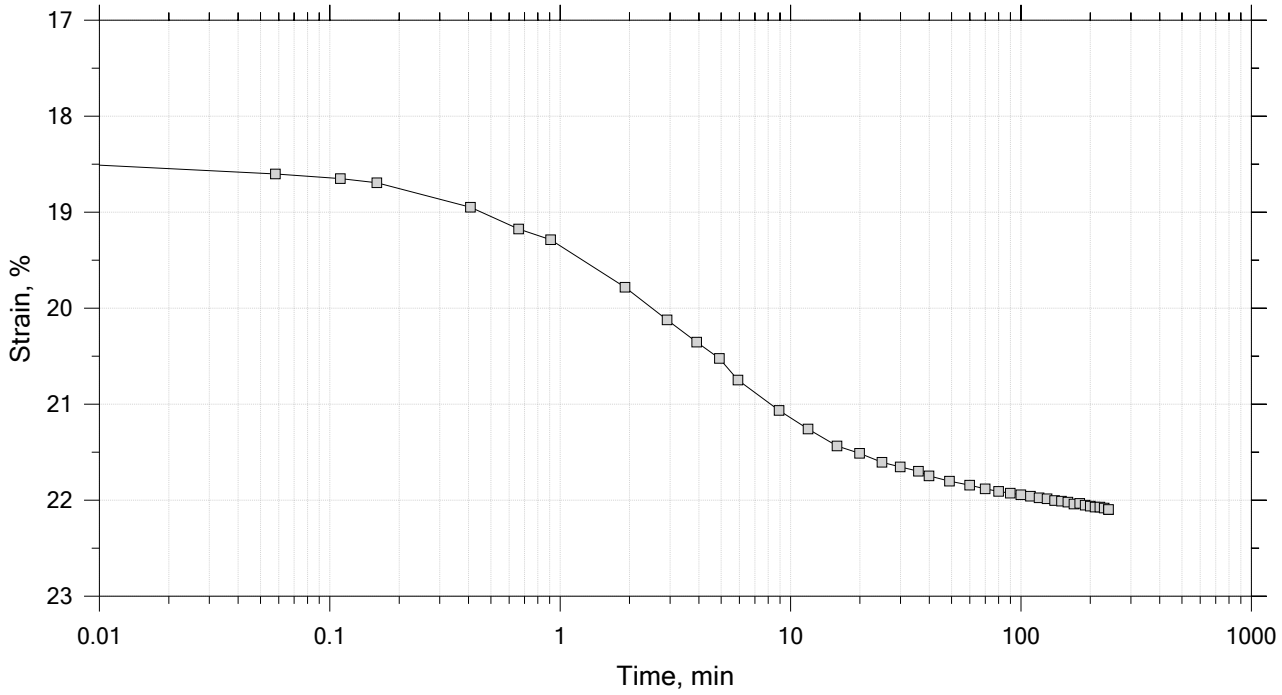


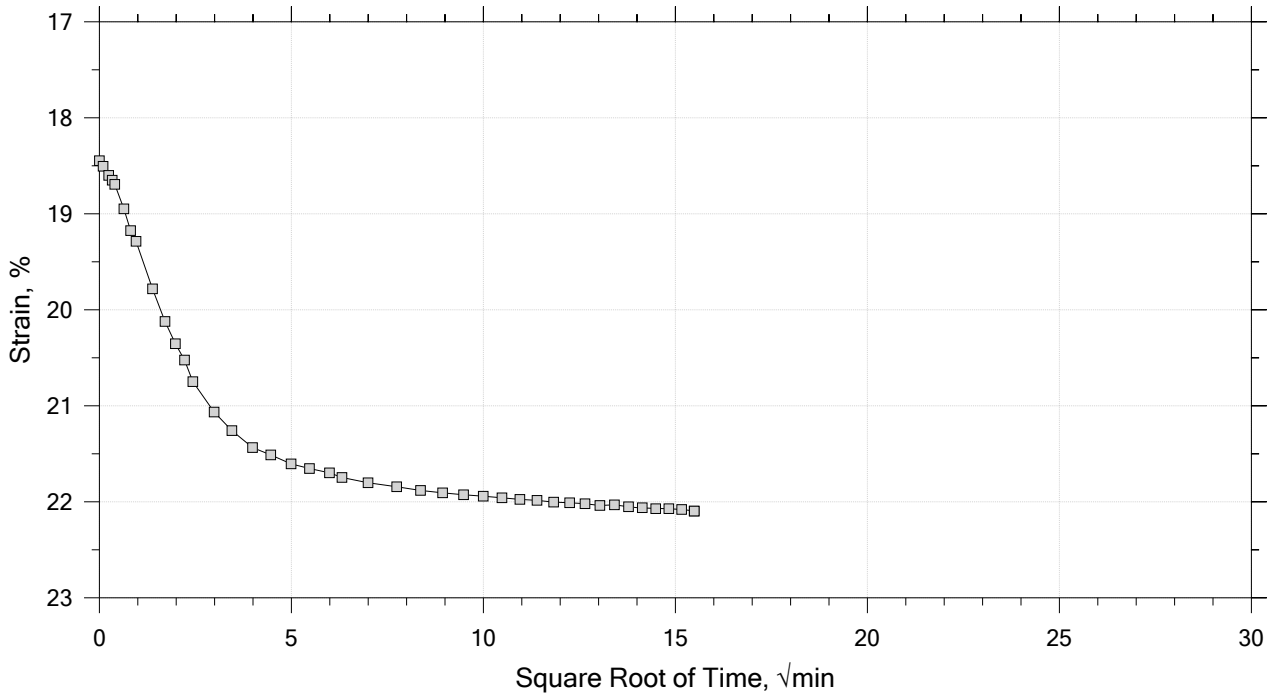


GeoTesting EXPRESS	Project: I-295 Over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-202	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 01/22/19	Depth: 33-35 ft
	Test No.: IP-9	Sample Type: intact	Elevation: ---
	Description: Moist, olive gray clay		
	Remarks: System LTIII-B, Swell Pressure = 0.0654 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 16 of 22
Constant Load Step
Stress: 16 tsf

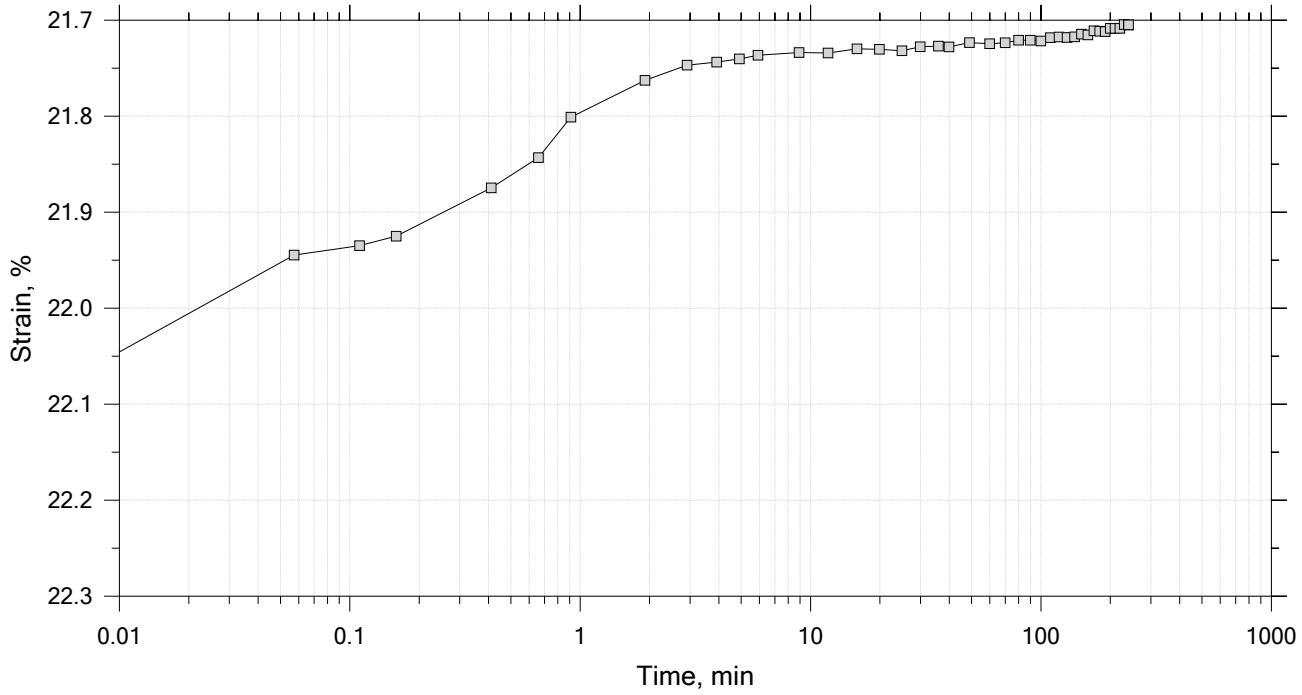


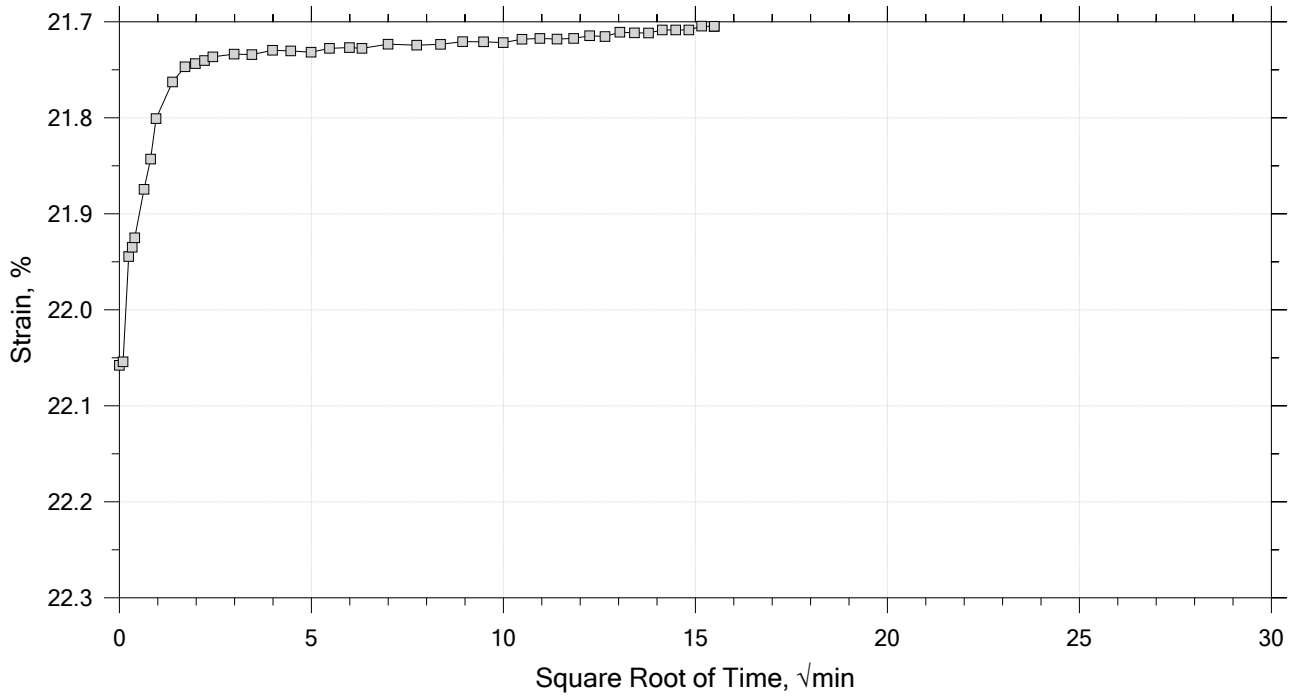


GeoTesting EXPRESS	Project: I-295 Over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-202	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 01/22/19	Depth: 33-35 ft
	Test No.: IP-9	Sample Type: intact	Elevation: ---
	Description: Moist, olive gray clay		
	Remarks: System LTIII-B, Swell Pressure = 0.0654 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 17 of 22
Constant Load Step
Stress: 8 tsf

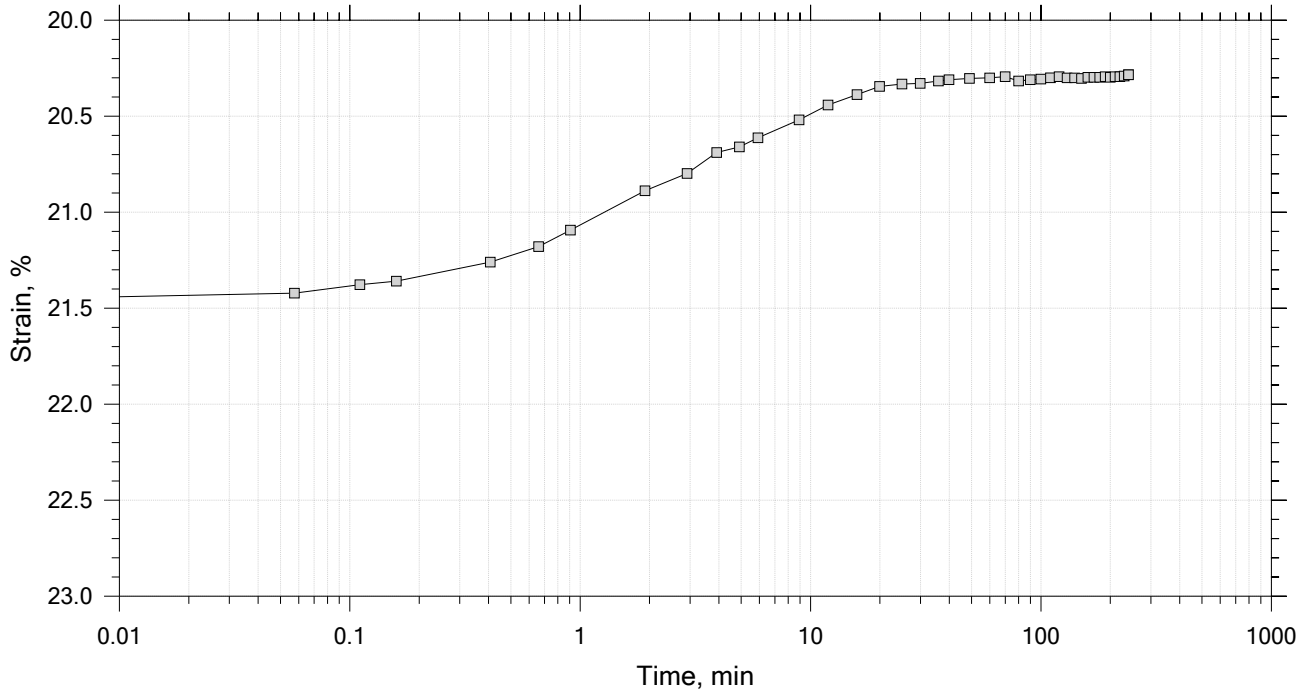


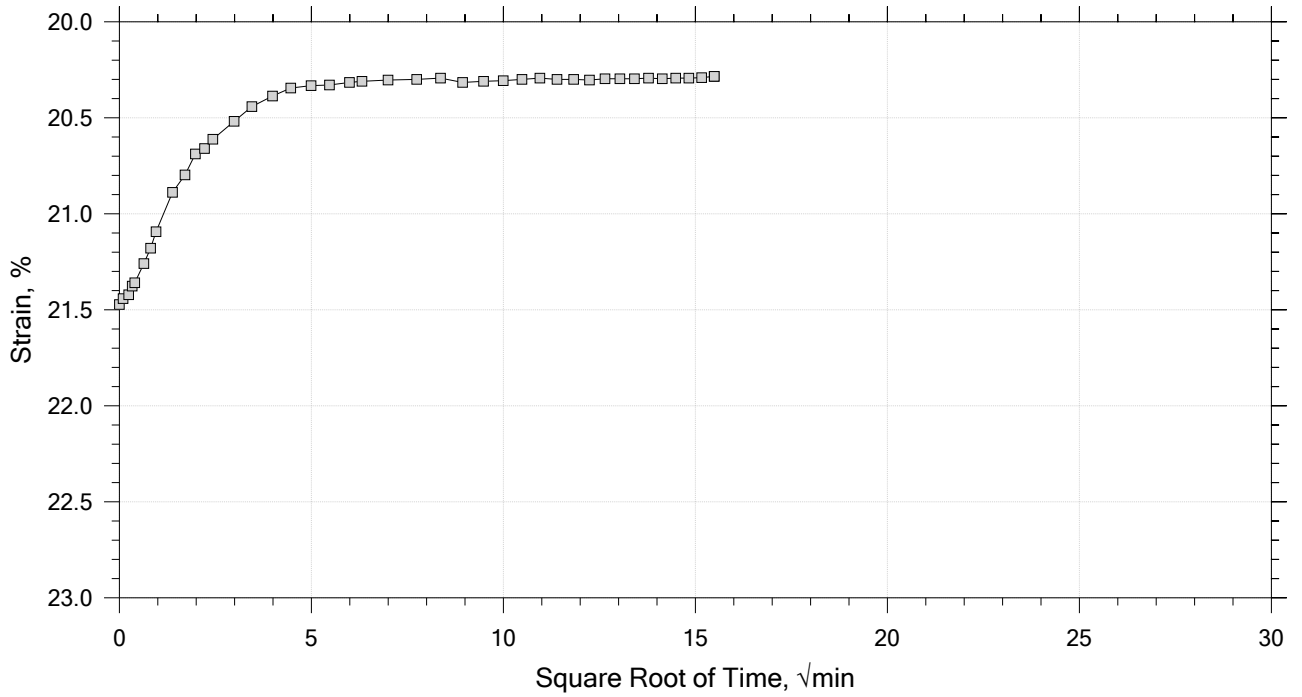


GeoTesting EXPRESS	Project: I-295 Over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-202	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 01/22/19	Depth: 33-35 ft
	Test No.: IP-9	Sample Type: intact	Elevation: ---
	Description: Moist, olive gray clay		
	Remarks: System LTIII-B, Swell Pressure = 0.0654 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 18 of 22
Constant Load Step
Stress: 2 tsf

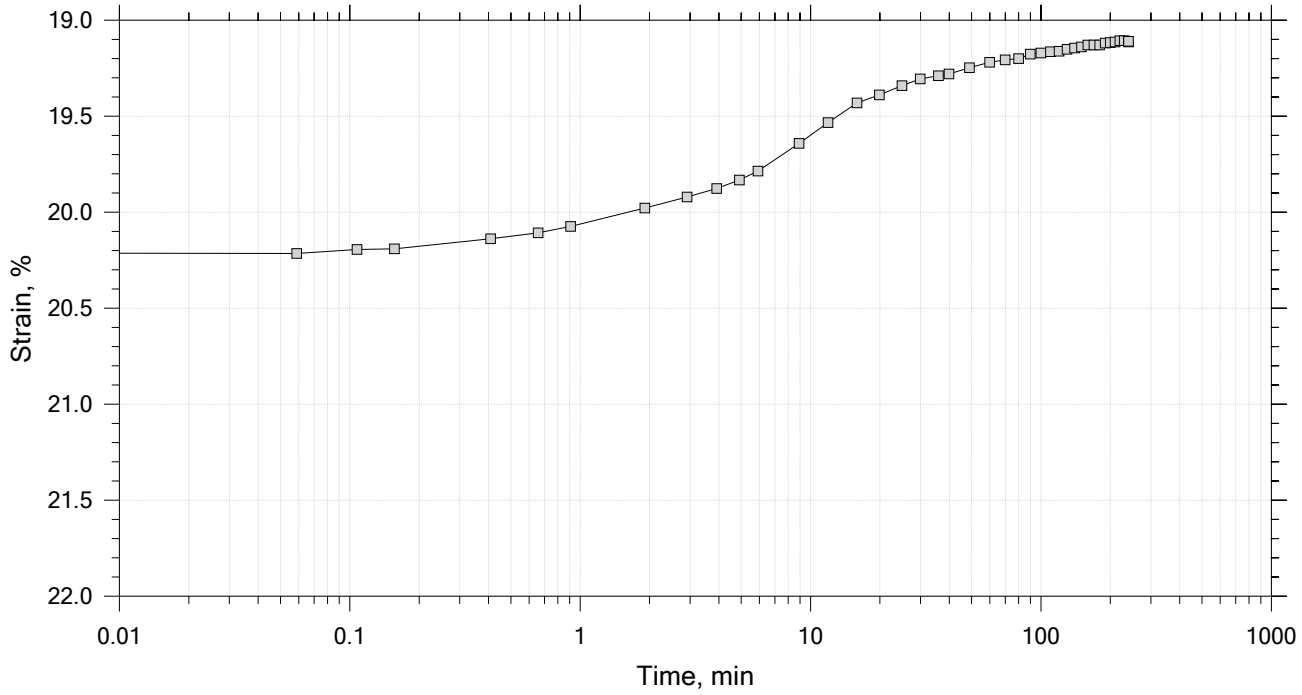


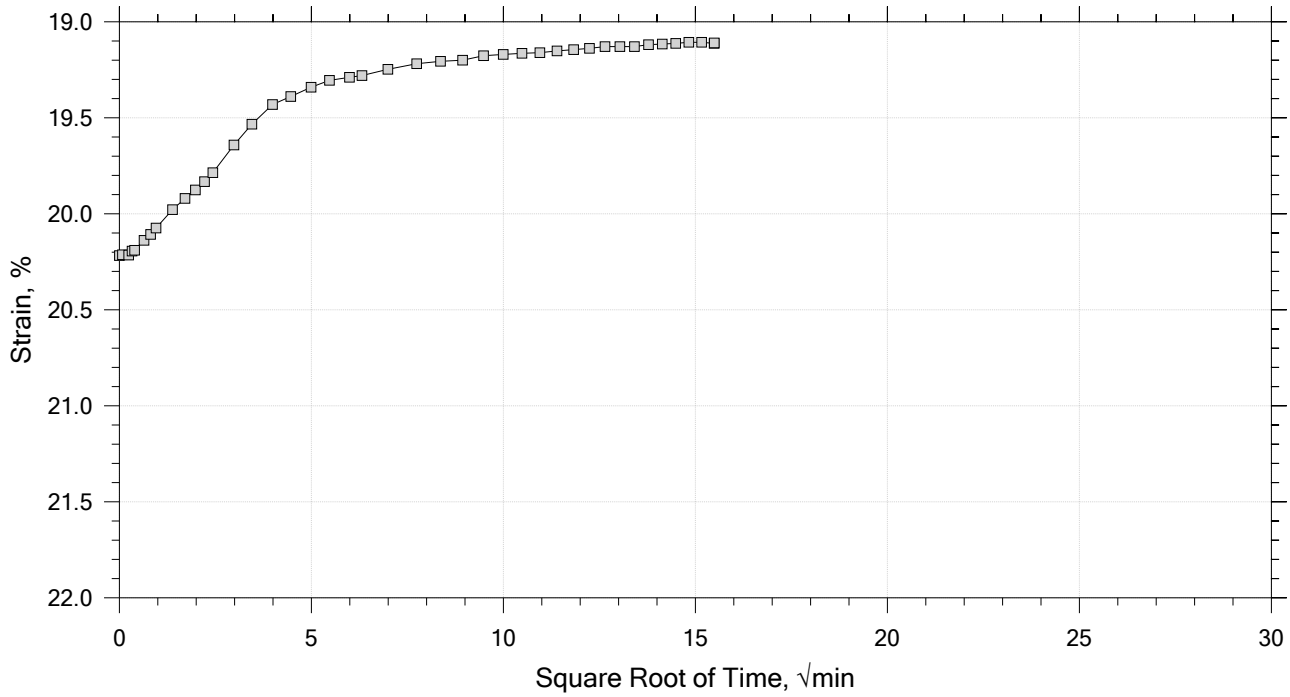


Project: I-295 Over Veranda St	Location: Portland, ME	Project No.: GTX-308805
Boring No.: BB-PVS-202	Tested By: md	Checked By: mcm
Sample No.: U1	Test Date: 01/22/19	Depth: 33-35 ft
Test No.: IP-9	Sample Type: intact	Elevation: ---
Description: Moist, olive gray clay		
Remarks: System LTIII-B, Swell Pressure = 0.0654 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 19 of 22
Constant Load Step
Stress: 0.75 tsf

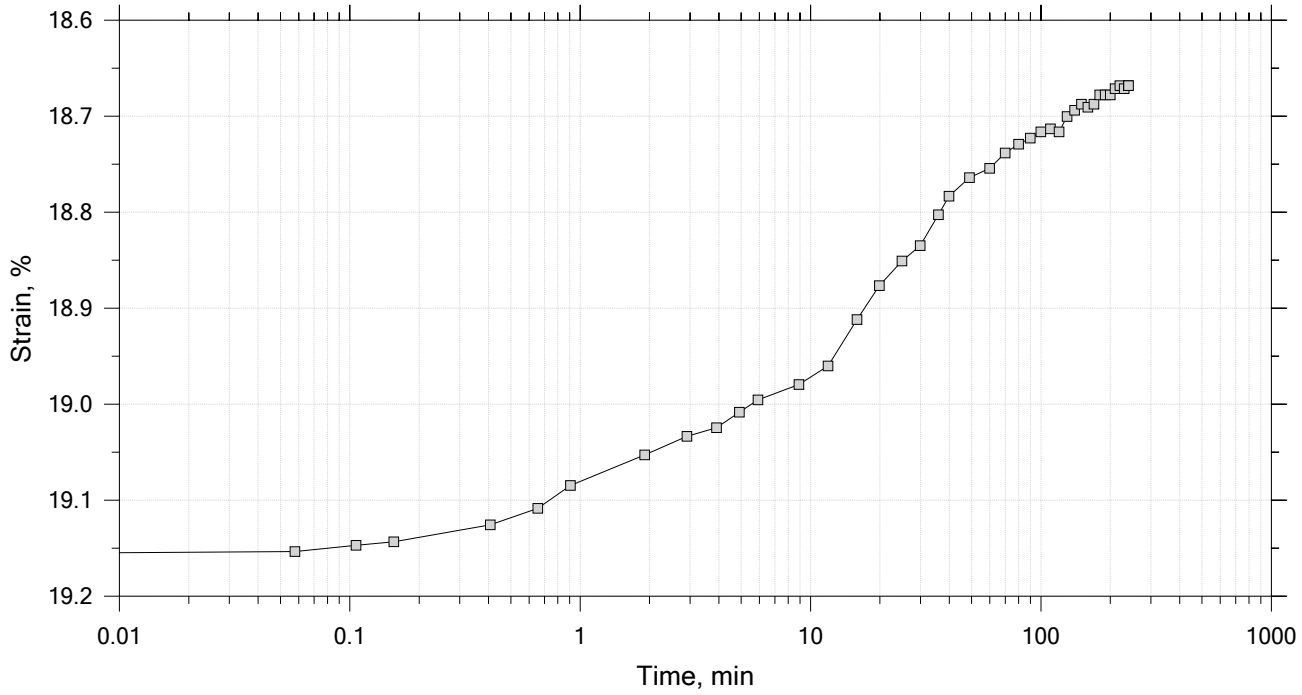


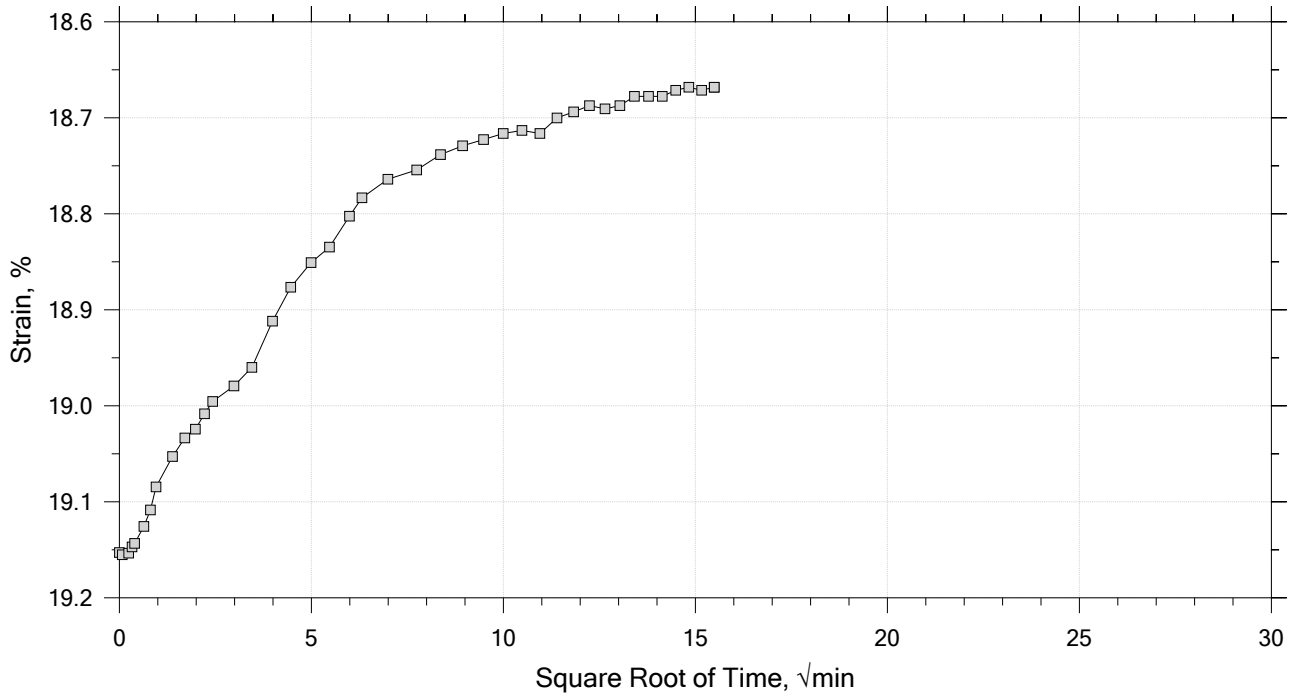


GeoTesting EXPRESS	Project: I-295 Over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-202	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 01/22/19	Depth: 33-35 ft
	Test No.: IP-9	Sample Type: intact	Elevation: ---
	Description: Moist, olive gray clay		
	Remarks: System LTIII-B, Swell Pressure = 0.0654 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 20 of 22
Constant Load Step
Stress: 0.5 tsf

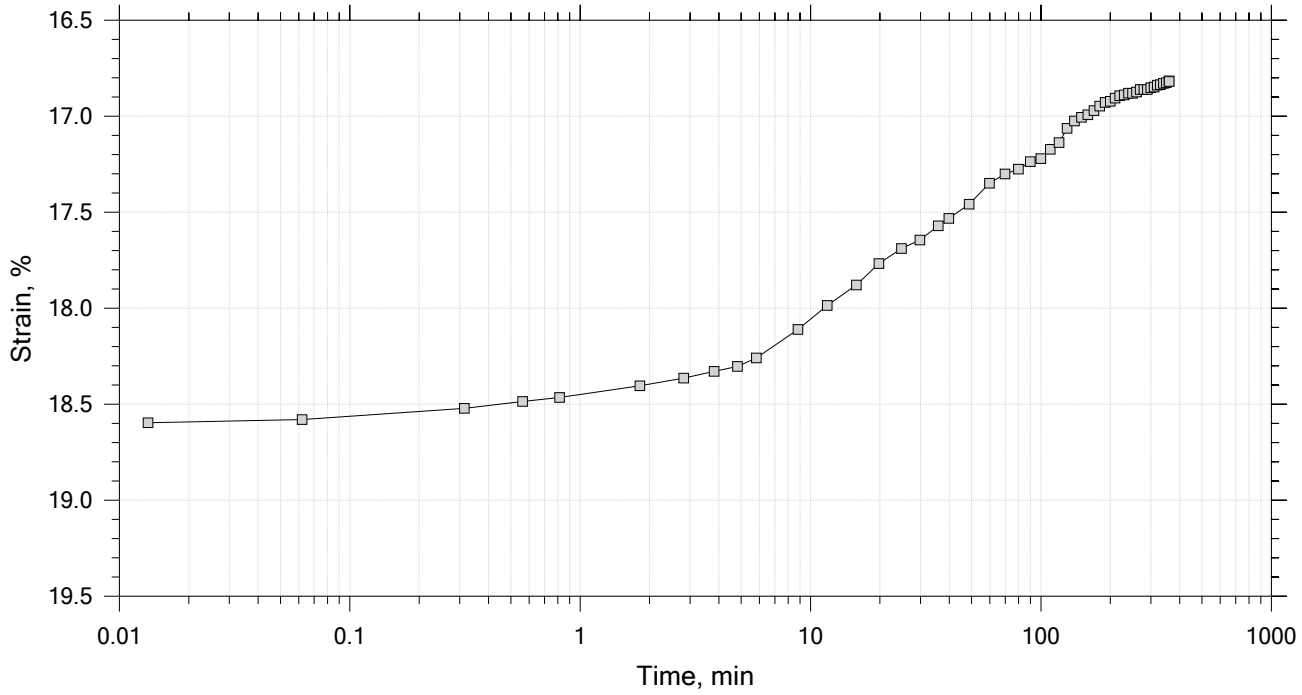


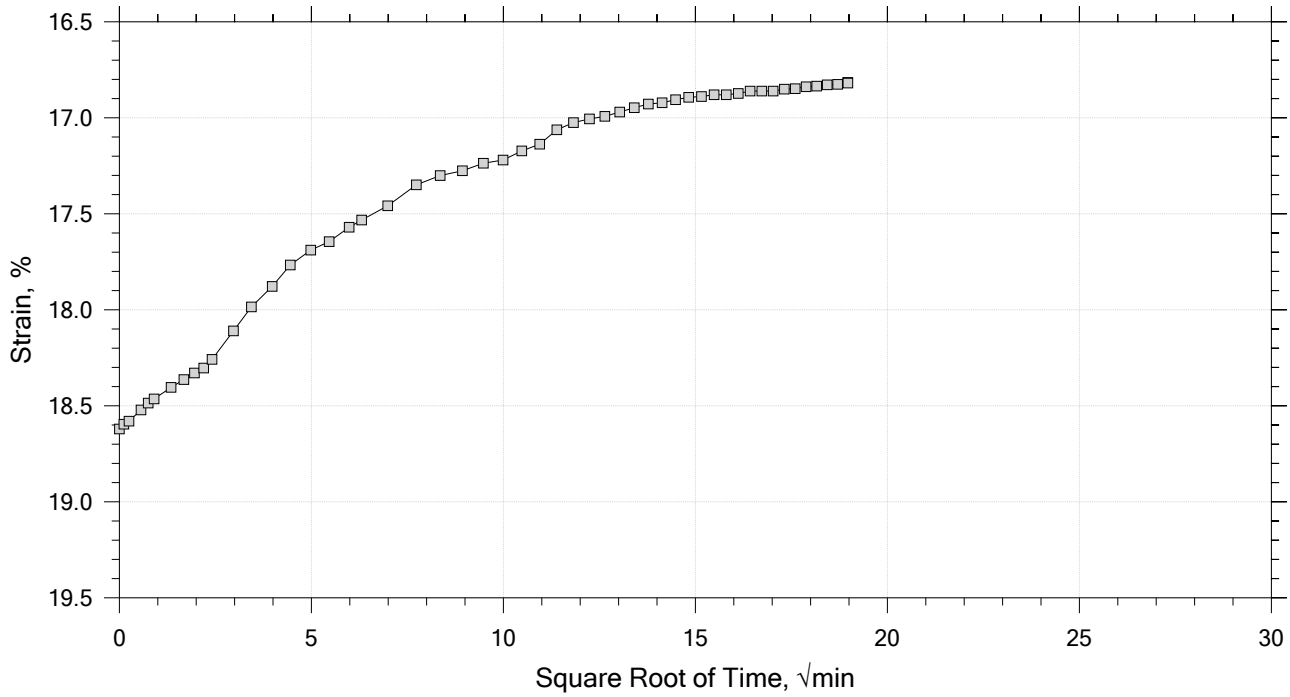


Project: I-295 Over Veranda St	Location: Portland, ME	Project No.: GTX-308805
Boring No.: BB-PVS-202	Tested By: md	Checked By: mcm
Sample No.: U1	Test Date: 01/22/19	Depth: 33-35 ft
Test No.: IP-9	Sample Type: intact	Elevation: ---
Description: Moist, olive gray clay		
Remarks: System LTIII-B, Swell Pressure = 0.0654 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 21 of 22
Constant Load Step
Stress: 0.125 tsf

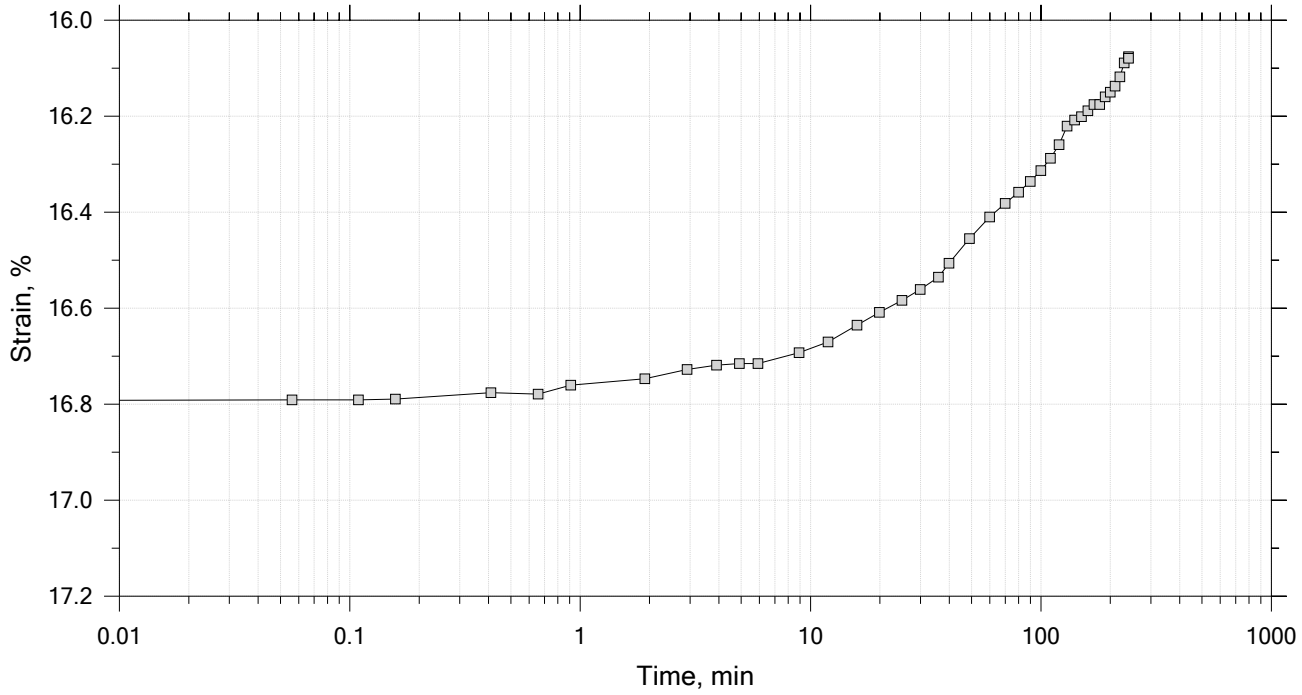


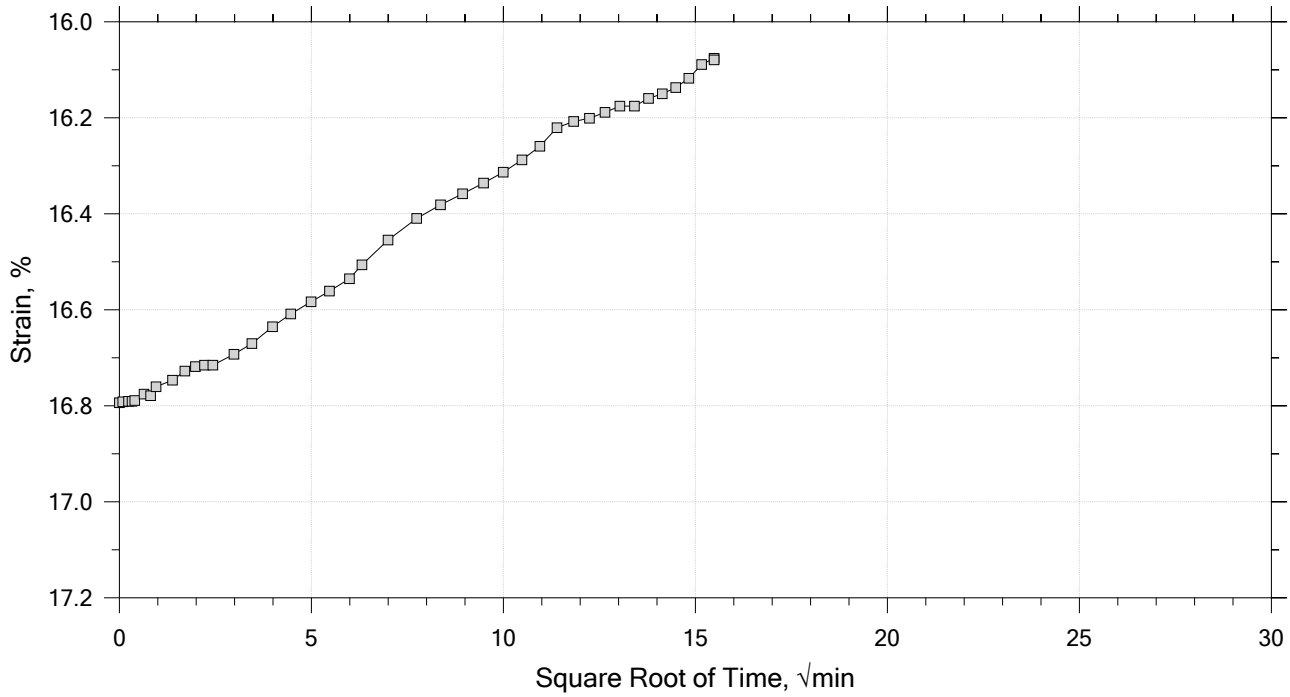


GeoTesting EXPRESS	Project: I-295 Over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-202	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 01/22/19	Depth: 33-35 ft
	Test No.: IP-9	Sample Type: intact	Elevation: ---
	Description: Moist, olive gray clay		
	Remarks: System LTIII-B, Swell Pressure = 0.0654 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 22 of 22
Constant Load Step
Stress: 0.0625 tsf





GeoTesting EXPRESS	Project: I-295 Over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-202	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 01/22/19	Depth: 33-35 ft
	Test No.: IP-9	Sample Type: intact	Elevation: ---
	Description: Moist, olive gray clay		
	Remarks: System LTIII-B, Swell Pressure = 0.0654 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: 1.12	Plastic Limit: 25
Final Height: 0.84 in	Final Void Ratio: 0.783	Plasticity Index: 16

	Before Test Trimmings	Before Test Specimen	After Test Specimen	After Test Trimmings
Container ID	A-2532	RING		A-3059
Mass Container, gm	8.15	108.43	108.43	8.34
Mass Container + Wet Soil, gm	133.37	253.5	243.09	141.87
Mass Container + Dry Soil, gm	96.04	213.44	213.44	112.47
Mass Dry Soil, gm	87.89	105.01	105.01	104.13
Water Content, %	42.47	38.15	28.23	28.23
Void Ratio	---	1.12	0.78	---
Degree of Saturation, %	---	94.07	100.00	---
Dry Unit Weight, pcf	---	81.497	97.112	---

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.

GeoTesting EXPRESS	Project: I-295 Over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-202	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 01/22/19	Depth: 33-35 ft
	Test No.: IP-9	Sample Type: intact	Elevation: ---
	Description: Moist, olive gray clay		
	Remarks: System LTIII-B, Swell Pressure = 0.0654 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Log of Time Coefficients

Step	Applied Stress tsf	Final Displacement in	Void Ratio	Strain at End %	Log T50 min	Cv ft²/s	Mv 1/tsf	k ft/day	Ca %
1	0.0654	0.009760	1.10	0.976	17.878	3.16e-07	1.49e-01	1.27e-04	0.00e+00
2	0.125	0.02198	1.08	2.20	0.000	0.00e+00	2.05e-01	0.00e+00	0.00e+00
3	0.250	0.03490	1.05	3.49	0.000	0.00e+00	1.03e-01	0.00e+00	0.00e+00
4	0.500	0.05140	1.02	5.14	17.827	2.93e-07	6.60e-02	5.21e-05	0.00e+00
5	0.750	0.06423	0.988	6.42	20.667	2.45e-07	5.13e-02	3.39e-05	0.00e+00
6	1.00	0.07367	0.968	7.37	0.000	0.00e+00	3.78e-02	0.00e+00	0.00e+00
7	2.00	0.09952	0.913	9.95	0.000	0.00e+00	2.58e-02	0.00e+00	0.00e+00
8	4.00	0.1315	0.845	13.2	5.527	8.07e-07	1.60e-02	3.48e-05	0.00e+00
9	2.00	0.1289	0.851	12.9	0.000	0.00e+00	1.32e-03	0.00e+00	0.00e+00
10	1.00	0.1231	0.863	12.3	2.744	1.59e-06	5.76e-03	2.46e-05	0.00e+00
11	0.500	0.1188	0.873	11.9	6.249	7.05e-07	8.72e-03	1.66e-05	0.00e+00
12	1.00	0.1224	0.865	12.2	2.493	1.77e-06	7.25e-03	3.46e-05	0.00e+00
13	2.00	0.1293	0.850	12.9	2.068	2.11e-06	6.94e-03	3.94e-05	0.00e+00
14	4.00	0.1441	0.819	14.4	0.000	0.00e+00	7.41e-03	0.00e+00	0.00e+00
15	8.00	0.1787	0.745	17.9	4.299	9.32e-07	8.65e-03	2.17e-05	0.00e+00
16	16.0	0.2210	0.655	22.1	2.859	1.28e-06	5.28e-03	1.82e-05	0.00e+00
17	8.00	0.2170	0.664	21.7	0.420	8.29e-06	4.91e-04	1.10e-05	0.00e+00
18	2.00	0.2028	0.694	20.3	1.805	1.97e-06	2.37e-03	1.26e-05	0.00e+00
19	0.750	0.1911	0.719	19.1	6.976	5.27e-07	9.40e-03	1.34e-05	0.00e+00
20	0.500	0.1867	0.728	18.7	14.586	2.57e-07	1.77e-02	1.22e-05	0.00e+00
21	0.125	0.1682	0.767	16.8	0.000	0.00e+00	4.93e-02	0.00e+00	0.00e+00
22	0.0625	0.1608	0.783	16.1	0.000	0.00e+00	1.18e-01	0.00e+00	0.00e+00

GeoTesting EXPRESS	Project: I-295 Over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-202	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 01/22/19	Depth: 33-35 ft
	Test No.: IP-9	Sample Type: intact	Elevation: ---
	Description: Moist, olive gray clay		
	Remarks: System LTIII-B, Swell Pressure = 0.0654 tsf		
	Displacement at End of Increment		

One-Dimensional Consolidation by ASTM D2435 - Method B

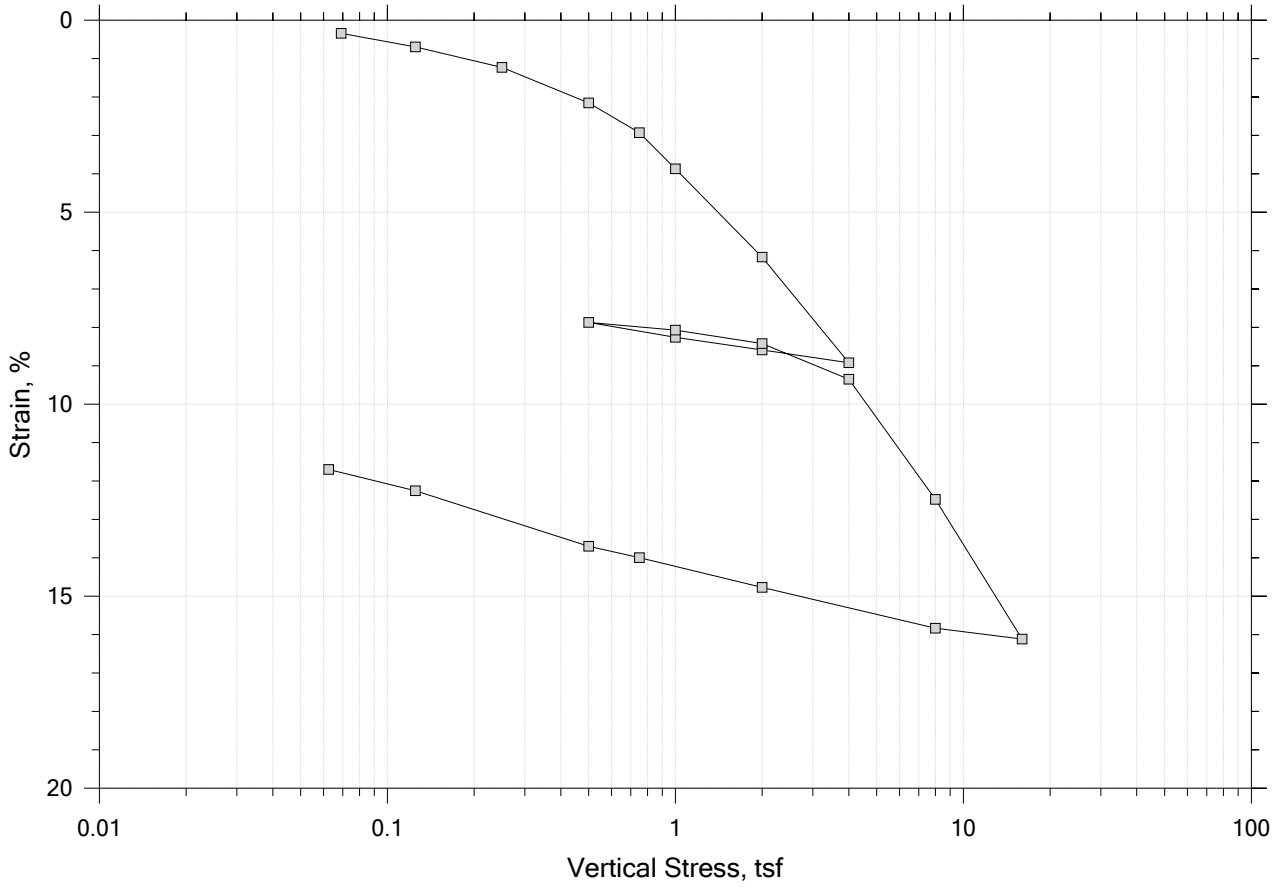
Square Root of Time Coefficients

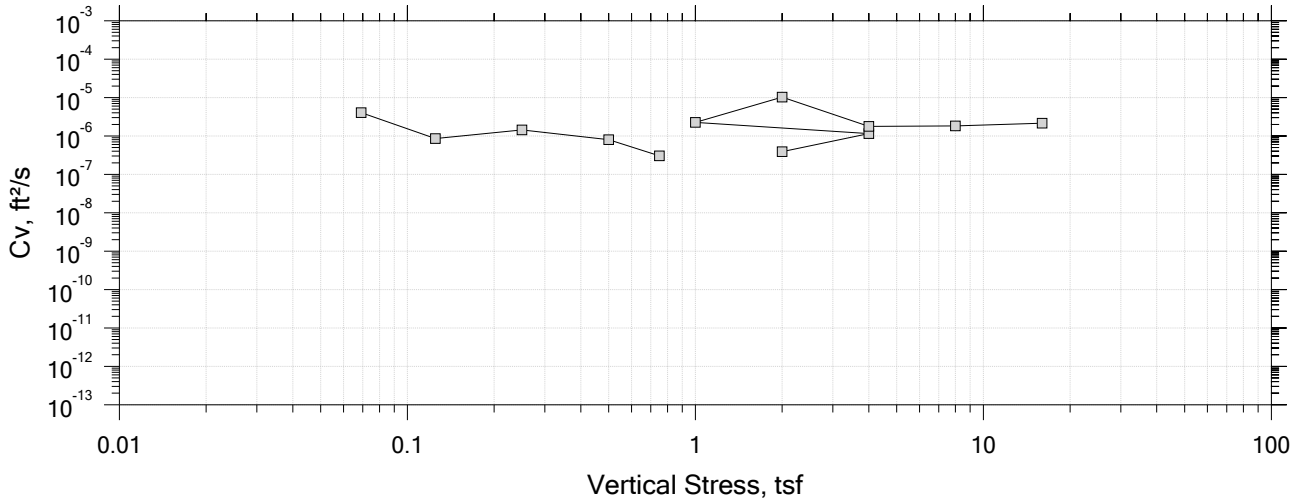
Step	Applied Stress tsf	Final Displacement in	Void Ratio	Strain at End %	Sq.Rt. T90 min	Cv ft²/s	Mv 1/tsf	k ft/day
1	0.0654	0.009760	1.10	0.976	83.859	2.90e-07	1.49e-01	1.17e-04
2	0.125	0.02198	1.08	2.20	176.778	1.34e-07	2.05e-01	7.44e-05
3	0.250	0.03490	1.05	3.49	71.830	3.22e-07	1.03e-01	8.99e-05
4	0.500	0.05140	1.02	5.14	69.934	3.21e-07	6.60e-02	5.72e-05
5	0.750	0.06423	0.988	6.42	62.533	3.48e-07	5.13e-02	4.82e-05
6	1.00	0.07367	0.968	7.37	168.114	1.27e-07	3.78e-02	1.29e-05
7	2.00	0.09952	0.913	9.95	127.283	1.61e-07	2.58e-02	1.12e-05
8	4.00	0.1315	0.845	13.2	26.276	7.31e-07	1.60e-02	3.15e-05
9	2.00	0.1289	0.851	12.9	4.536	4.09e-06	1.32e-03	1.45e-05
10	1.00	0.1231	0.863	12.3	15.422	1.22e-06	5.76e-03	1.89e-05
11	0.500	0.1188	0.873	11.9	23.065	8.22e-07	8.72e-03	1.93e-05
12	1.00	0.1224	0.865	12.2	11.088	1.71e-06	7.25e-03	3.34e-05
13	2.00	0.1293	0.850	12.9	8.940	2.10e-06	6.94e-03	3.93e-05
14	4.00	0.1441	0.819	14.4	17.575	1.04e-06	7.41e-03	2.08e-05
15	8.00	0.1787	0.745	17.9	16.571	1.04e-06	8.65e-03	2.43e-05
16	16.0	0.2210	0.655	22.1	15.802	9.94e-07	5.28e-03	1.42e-05
17	8.00	0.2170	0.664	21.7	2.071	7.23e-06	4.91e-04	9.56e-06
18	2.00	0.2028	0.694	20.3	11.741	1.30e-06	2.37e-03	8.33e-06
19	0.750	0.1911	0.719	19.1	35.930	4.40e-07	9.40e-03	1.12e-05
20	0.500	0.1867	0.728	18.7	60.585	2.66e-07	1.77e-02	1.27e-05
21	0.125	0.1682	0.767	16.8	77.541	2.14e-07	4.93e-02	2.85e-05
22	0.0625	0.1608	0.783	16.1	203.530	8.42e-08	1.18e-01	2.69e-05

GeoTesting EXPRESS	Project: I-295 Over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-202	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 01/22/19	Depth: 33-35 ft
	Test No.: IP-9	Sample Type: intact	Elevation: ---
	Description: Moist, olive gray clay		
	Remarks: System LTIII-B, Swell Pressure = 0.0654 tsf		
	Displacement at End of Increment		

One-Dimensional Consolidation by ASTM D2435 - Method B

Summary Report





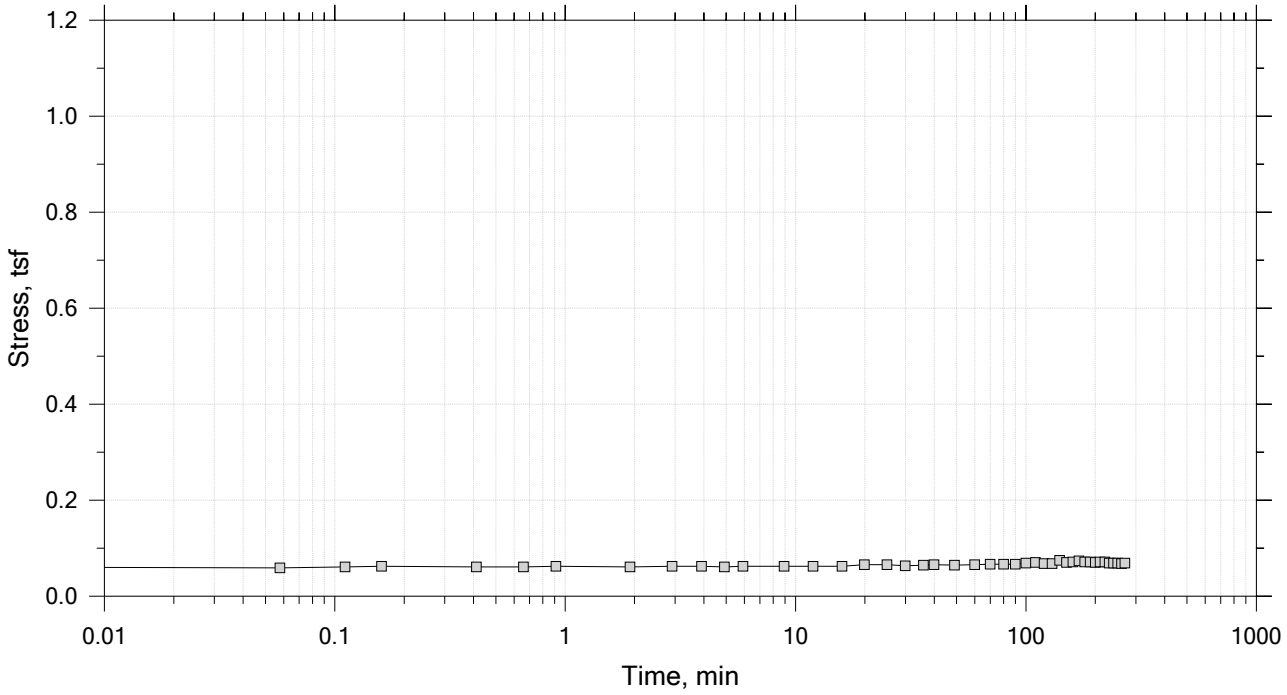
GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Brooklyn, NY	Project No.: GTX-308805
	Boring No.: BB-PVS-203	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 01/22/19	Depth: 25-27 ft
	Test No.: IP-10	Sample Type: intact	Elevation: ---
	Description: Moist, grey clay w/silt		
	Remarks: System S, Swell Pressure = 0.0691 tsf		
	Displacement at End of Increment		

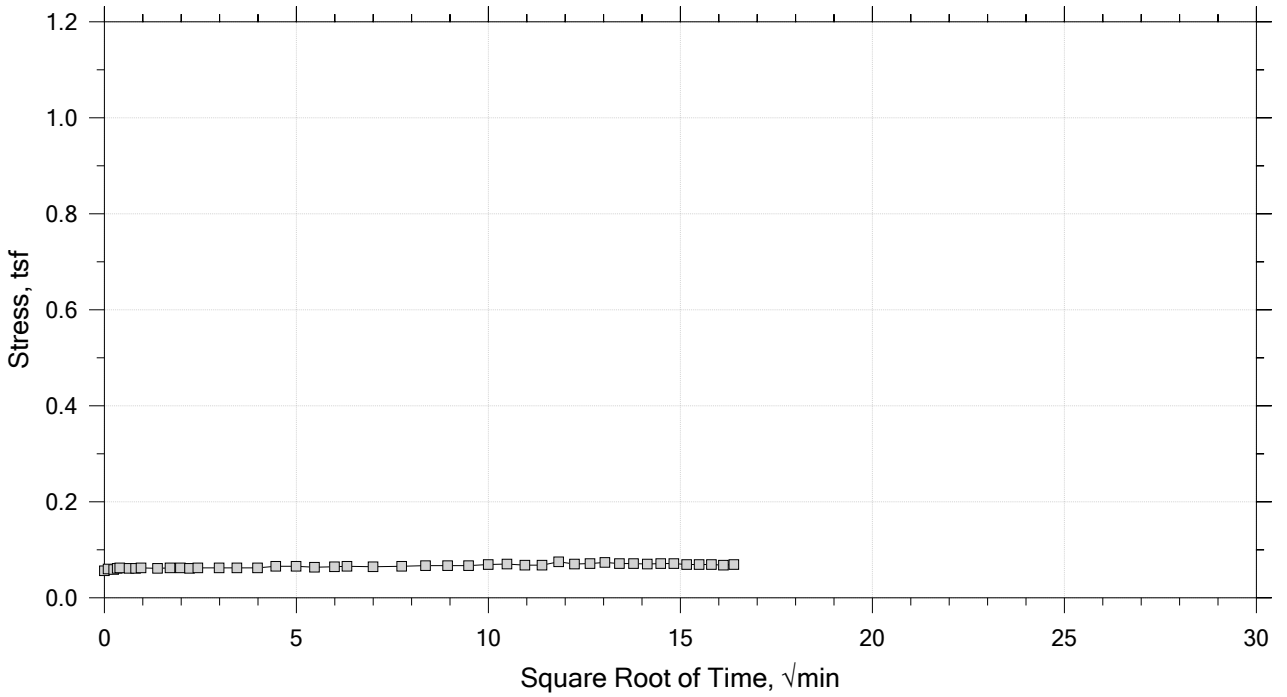
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 1 of 22

Constant Volume Step

Stress: 0.0691 tsf





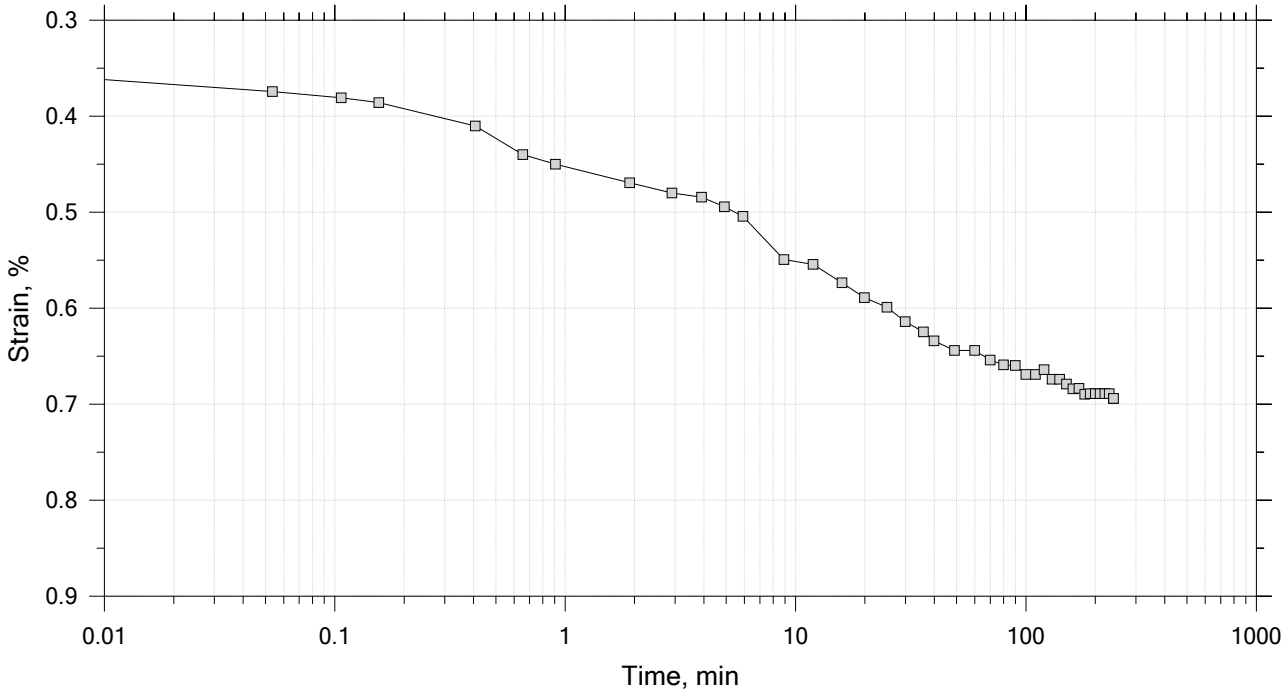
GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Brooklyn, NY	Project No.: GTX-308805
	Boring No.: BB-PVS-203	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 01/22/19	Depth: 25-27 ft
	Test No.: IP-10	Sample Type: intact	Elevation: ---
	Description: Moist, grey clay w/silt		
	Remarks: System S, Swell Pressure = 0.0691 tsf		

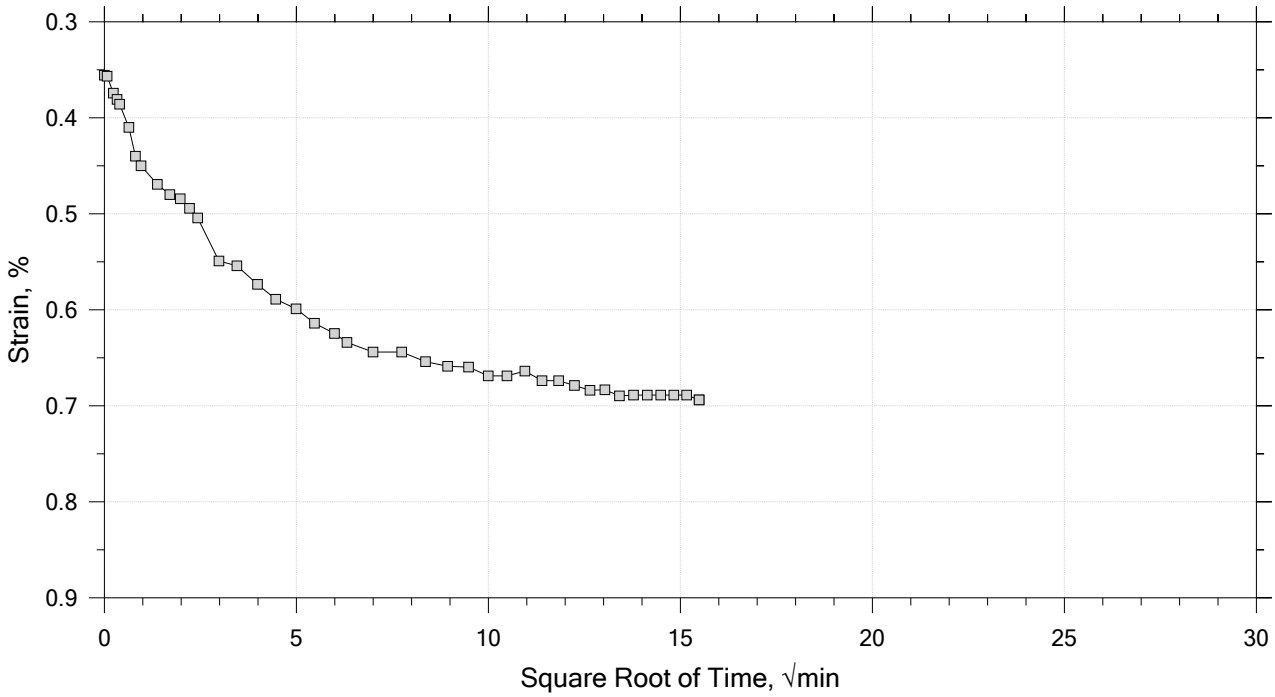
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 2 of 22

Constant Load Step

Stress: 0.125 tsf





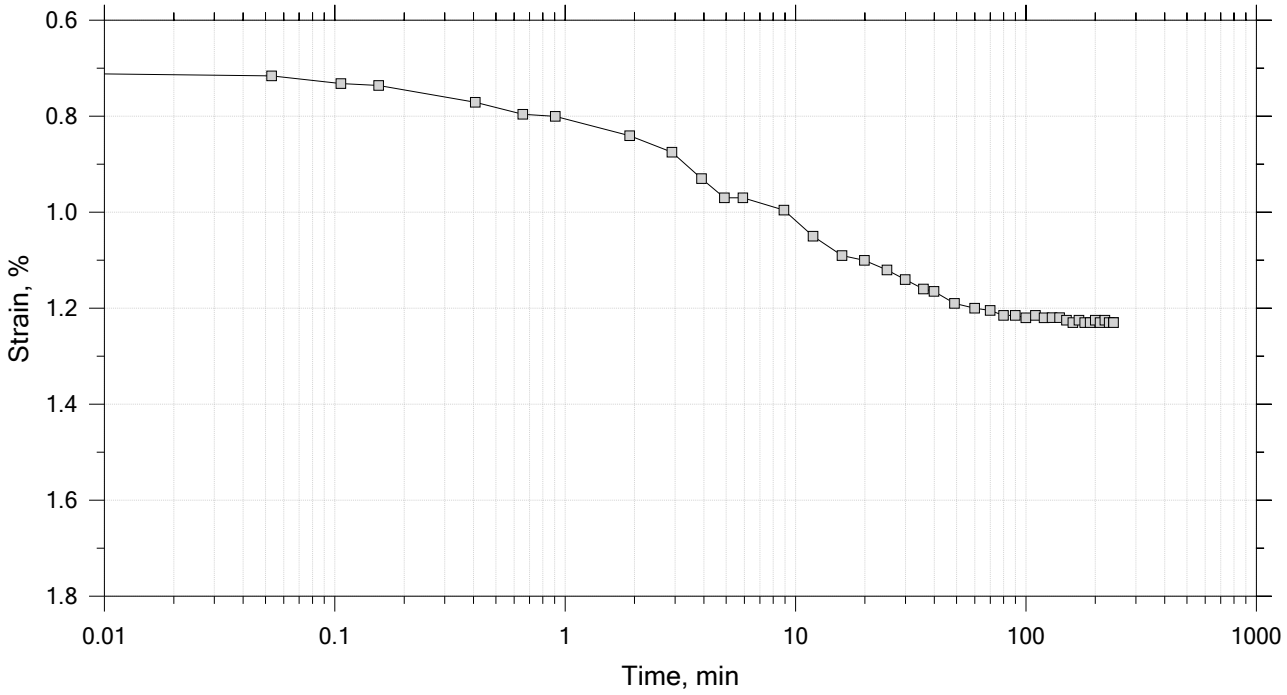
GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Brooklyn, NY	Project No.: GTX-308805
	Boring No.: BB-PVS-203	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 01/22/19	Depth: 25-27 ft
	Test No.: IP-10	Sample Type: intact	Elevation: ---
	Description: Moist, grey clay w/silt		
	Remarks: System S, Swell Pressure = 0.0691 tsf		

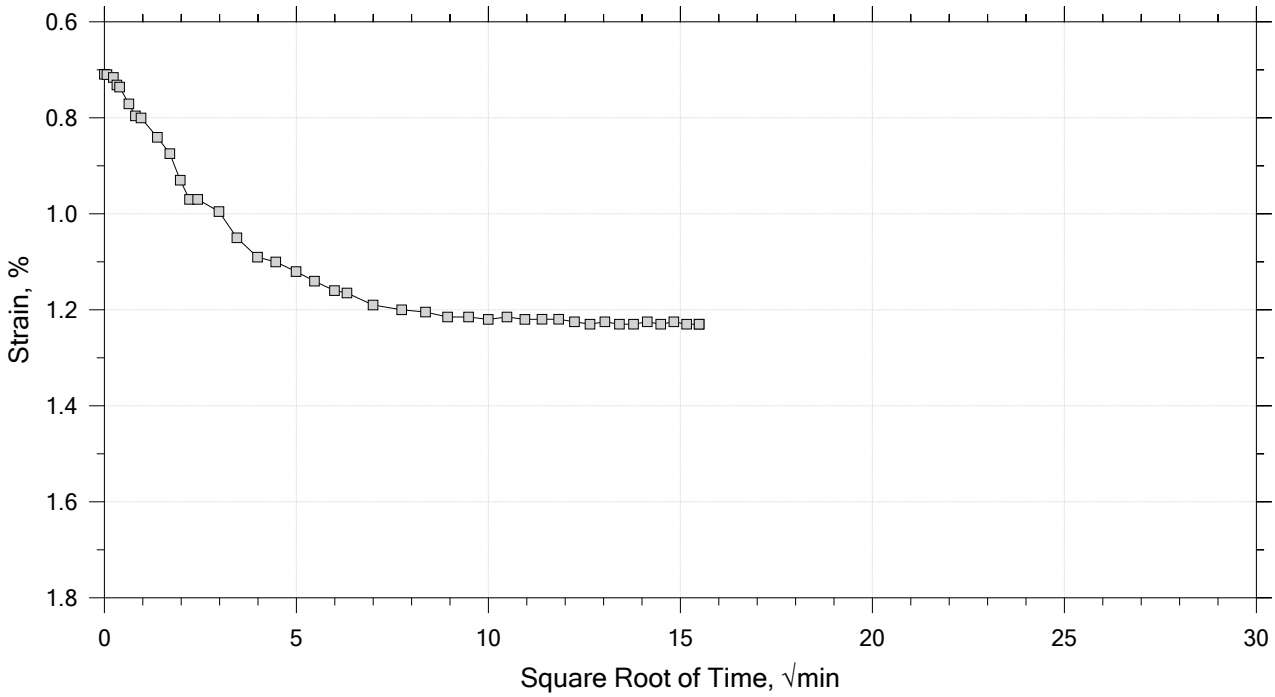
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 3 of 22

Constant Load Step

Stress: 0.25 tsf





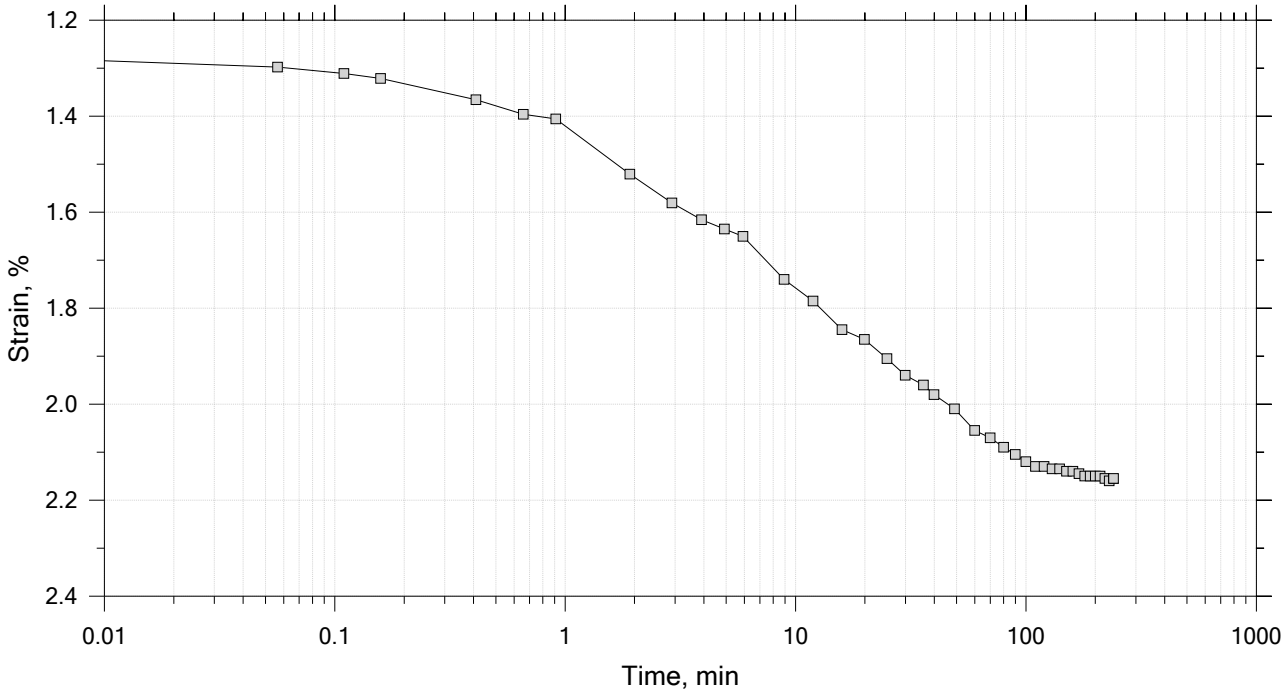
GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Brooklyn, NY	Project No.: GTX-308805
	Boring No.: BB-PVS-203	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 01/22/19	Depth: 25-27 ft
	Test No.: IP-10	Sample Type: intact	Elevation: ---
	Description: Moist, grey clay w/silt		
	Remarks: System S, Swell Pressure = 0.0691 tsf		

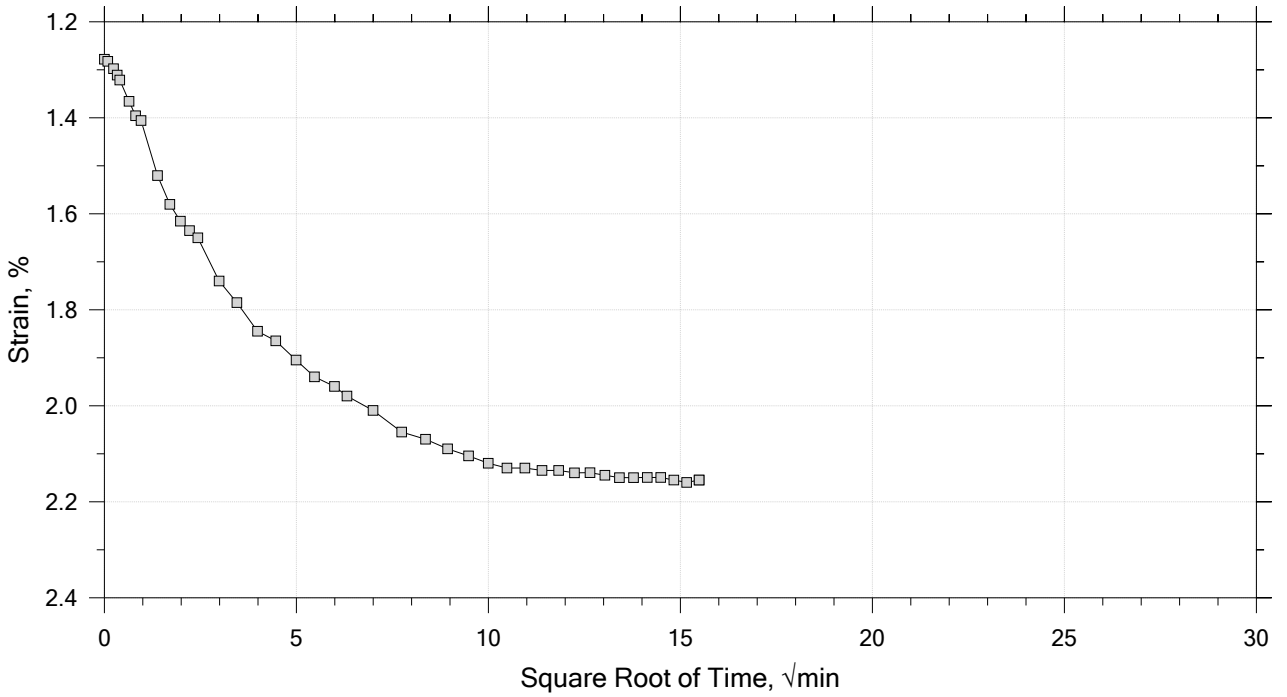
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 4 of 22

Constant Load Step

Stress: 0.5 tsf

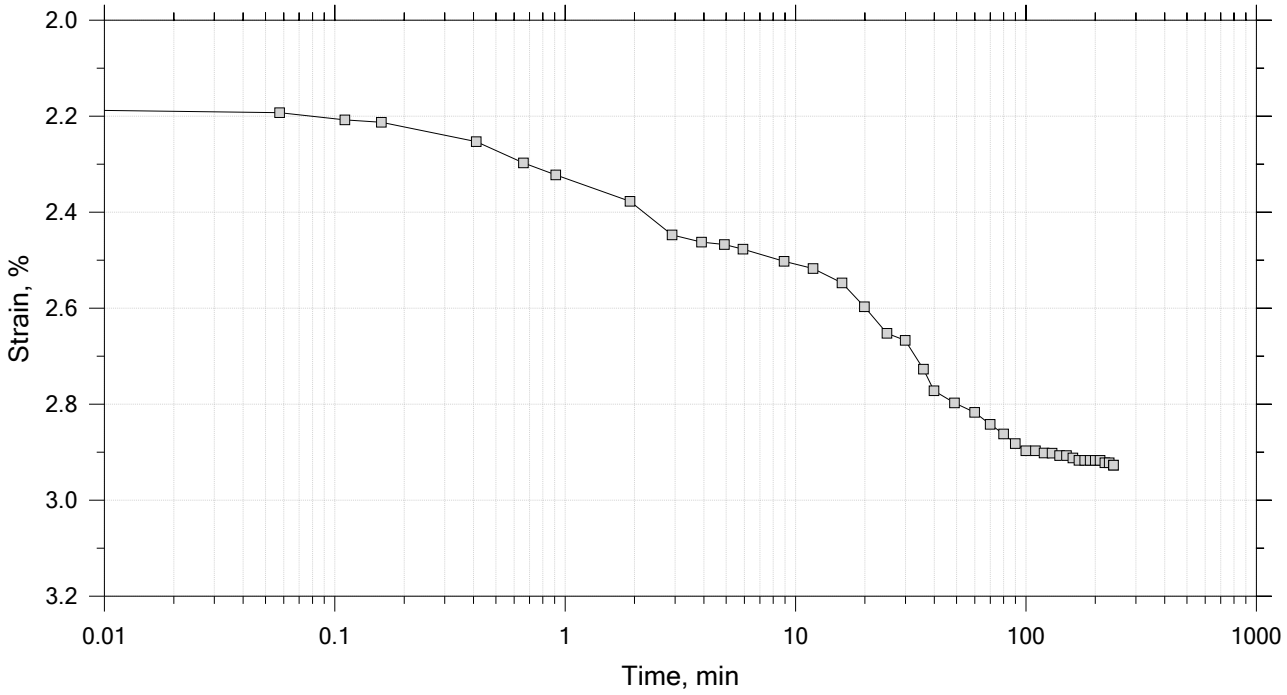


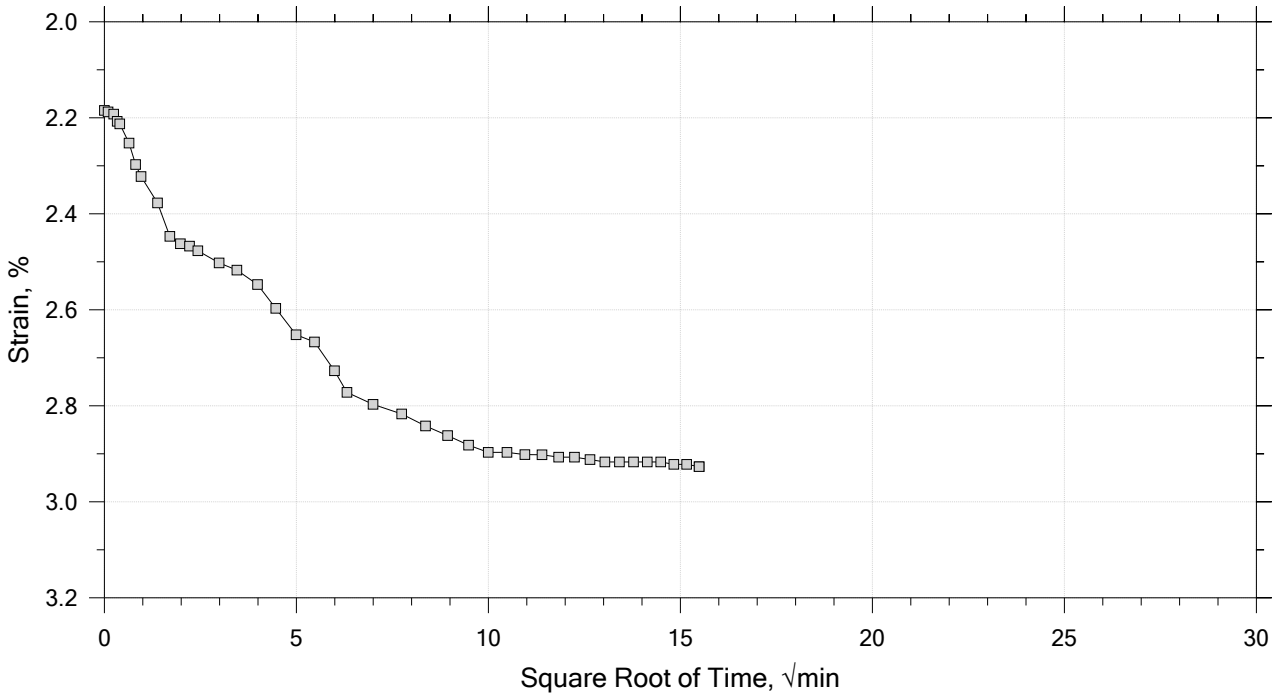


GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Brooklyn, NY	Project No.: GTX-308805
	Boring No.: BB-PVS-203	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 01/22/19	Depth: 25-27 ft
	Test No.: IP-10	Sample Type: intact	Elevation: ---
	Description: Moist, grey clay w/silt		
	Remarks: System S, Swell Pressure = 0.0691 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 5 of 22
Constant Load Step
Stress: 0.75 tsf





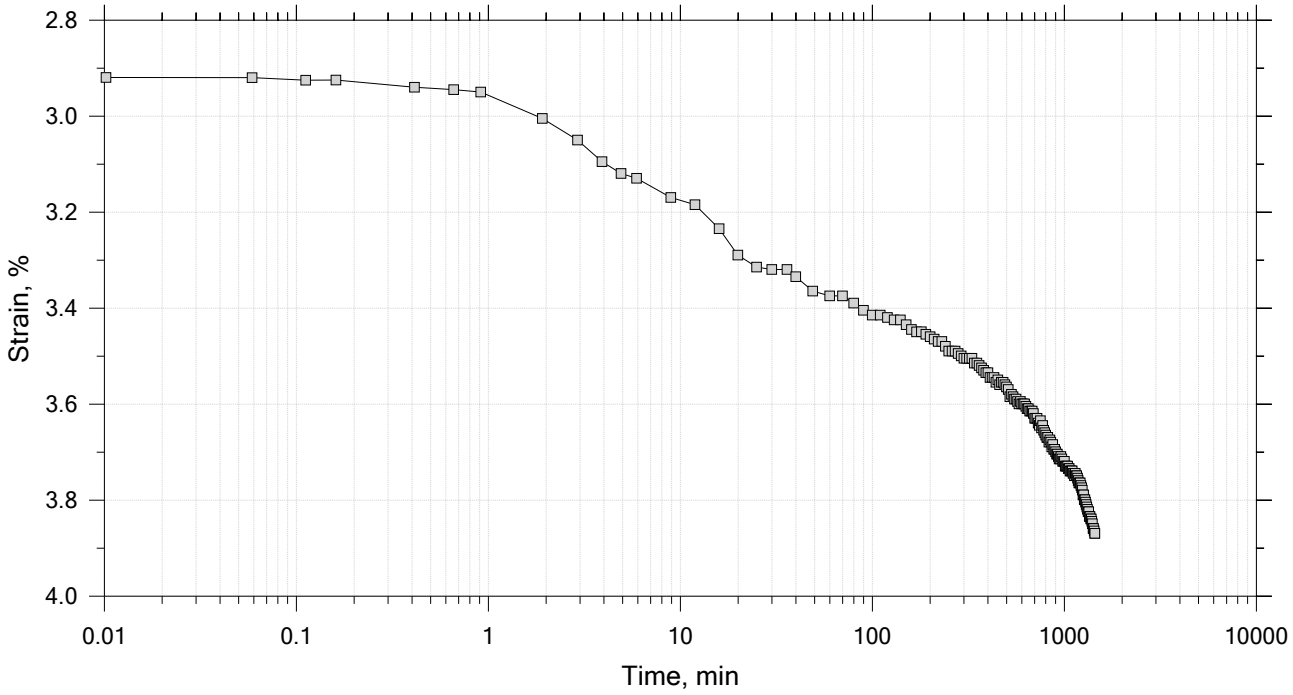
GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Brooklyn, NY	Project No.: GTX-308805
	Boring No.: BB-PVS-203	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 01/22/19	Depth: 25-27 ft
	Test No.: IP-10	Sample Type: intact	Elevation: ---
	Description: Moist, grey clay w/silt		
	Remarks: System S, Swell Pressure = 0.0691 tsf		

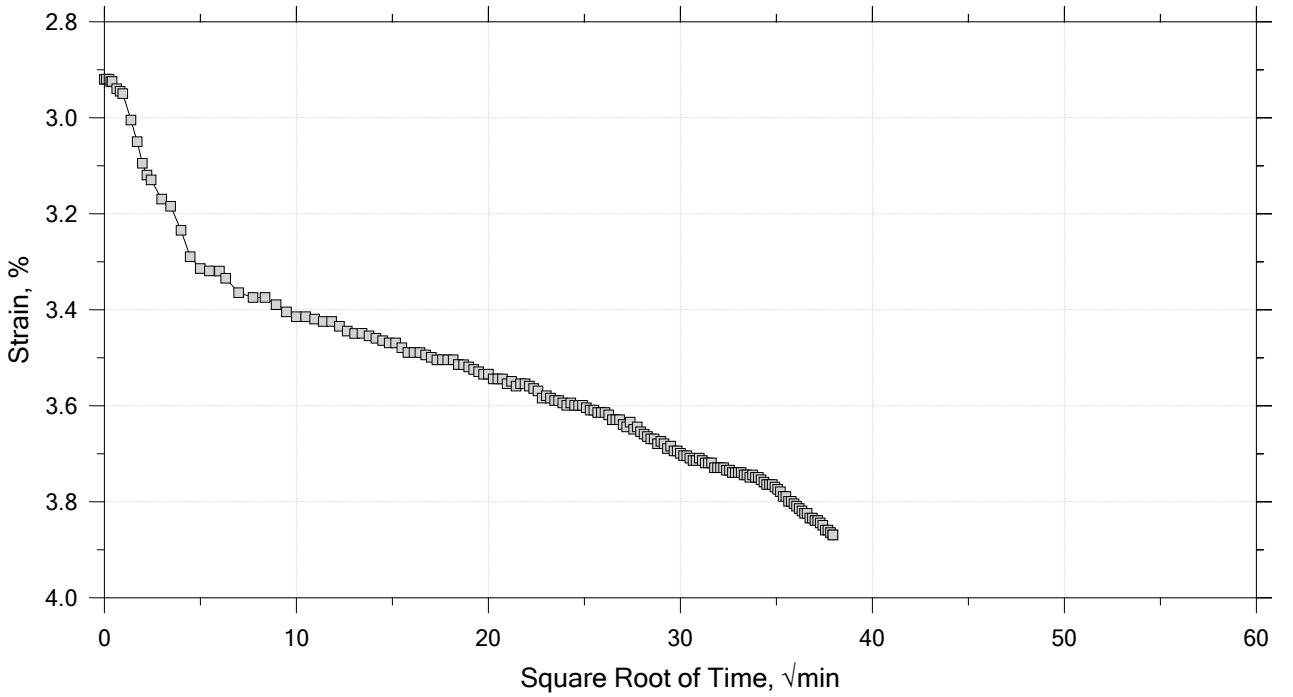
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 6 of 22

Constant Load Step

Stress: 1 tsf





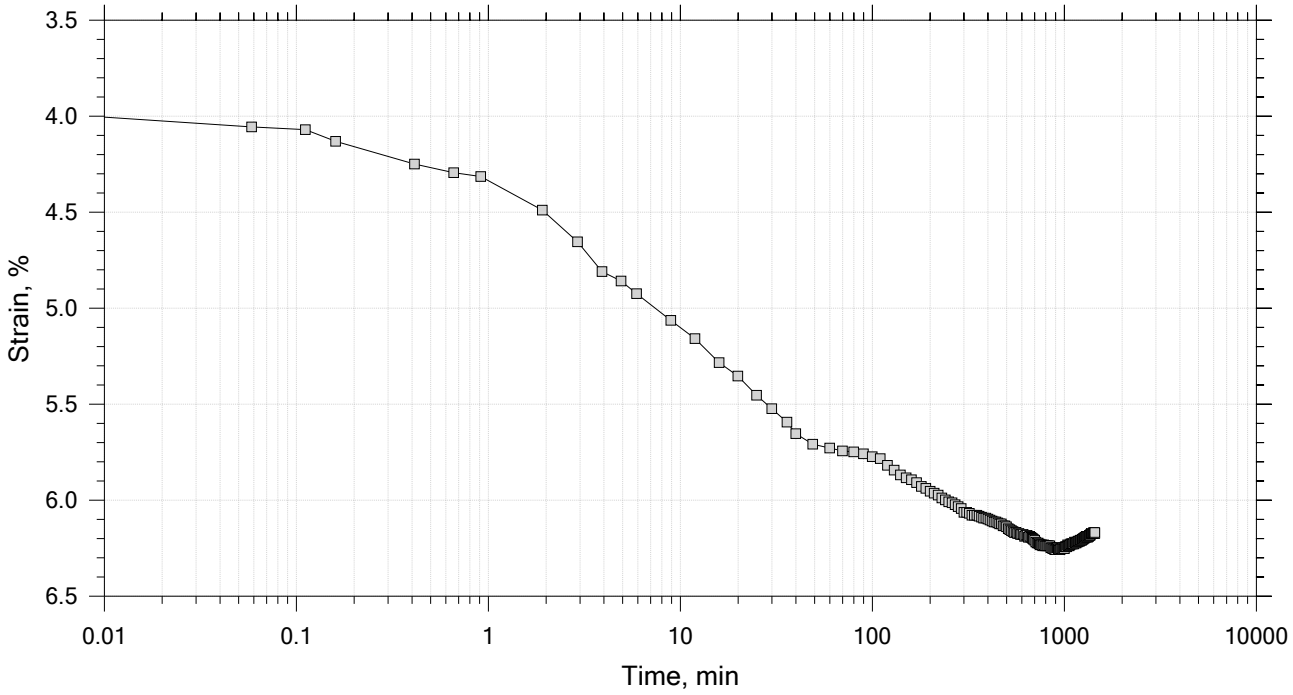
Project: I-295 over Veranda St	Location: Brooklyn, NY	Project No.: GTX-308805
Boring No.: BB-PVS-203	Tested By: md	Checked By: mcm
Sample No.: U1	Test Date: 01/22/19	Depth: 25-27 ft
Test No.: IP-10	Sample Type: intact	Elevation: ---
Description: Moist, grey clay w/silt		
Remarks: System S, Swell Pressure = 0.0691 tsf		

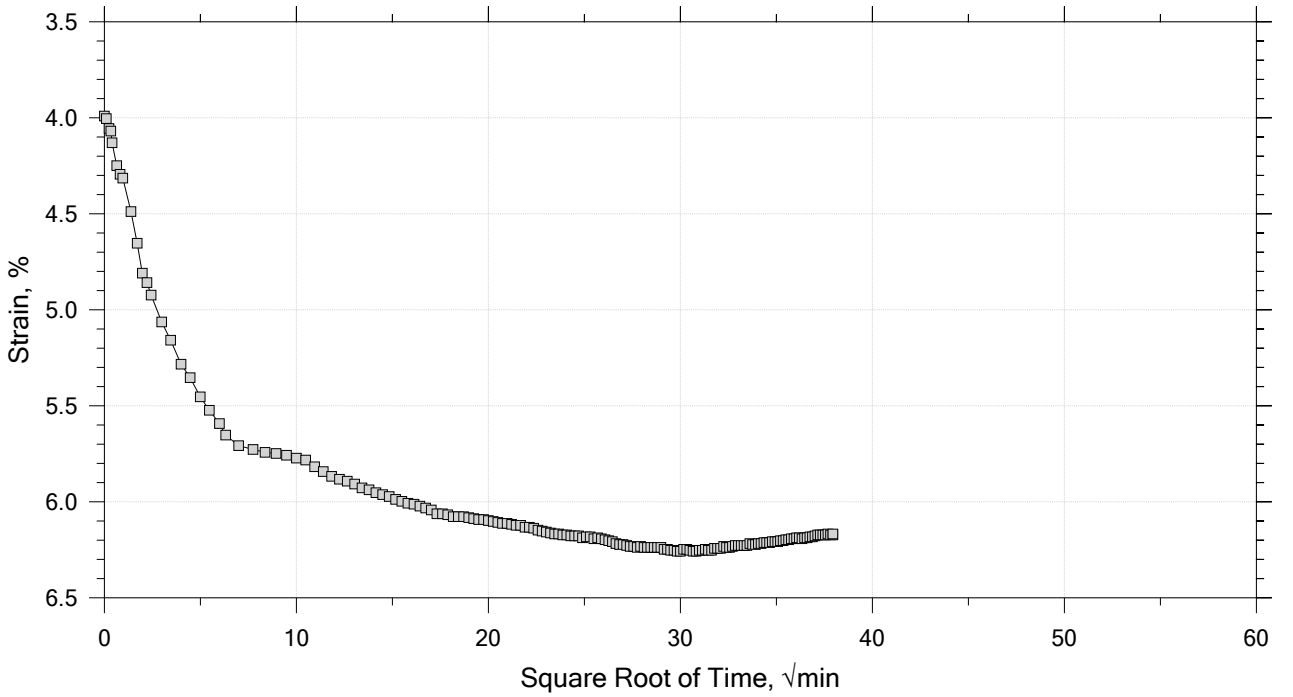
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 7 of 22

Constant Load Step

Stress: 2 tsf





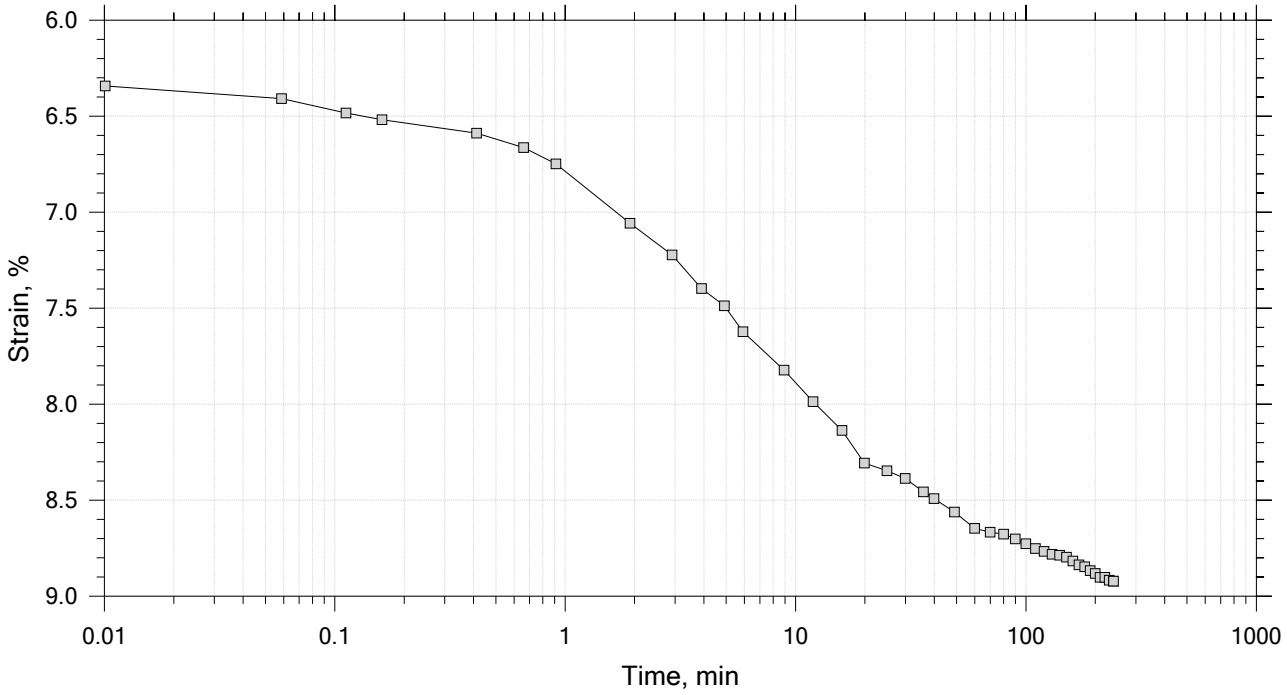
GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Brooklyn, NY	Project No.: GTX-308805
	Boring No.: BB-PVS-203	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 01/22/19	Depth: 25-27 ft
	Test No.: IP-10	Sample Type: intact	Elevation: ---
	Description: Moist, grey clay w/silt		
	Remarks: System S, Swell Pressure = 0.0691 tsf		

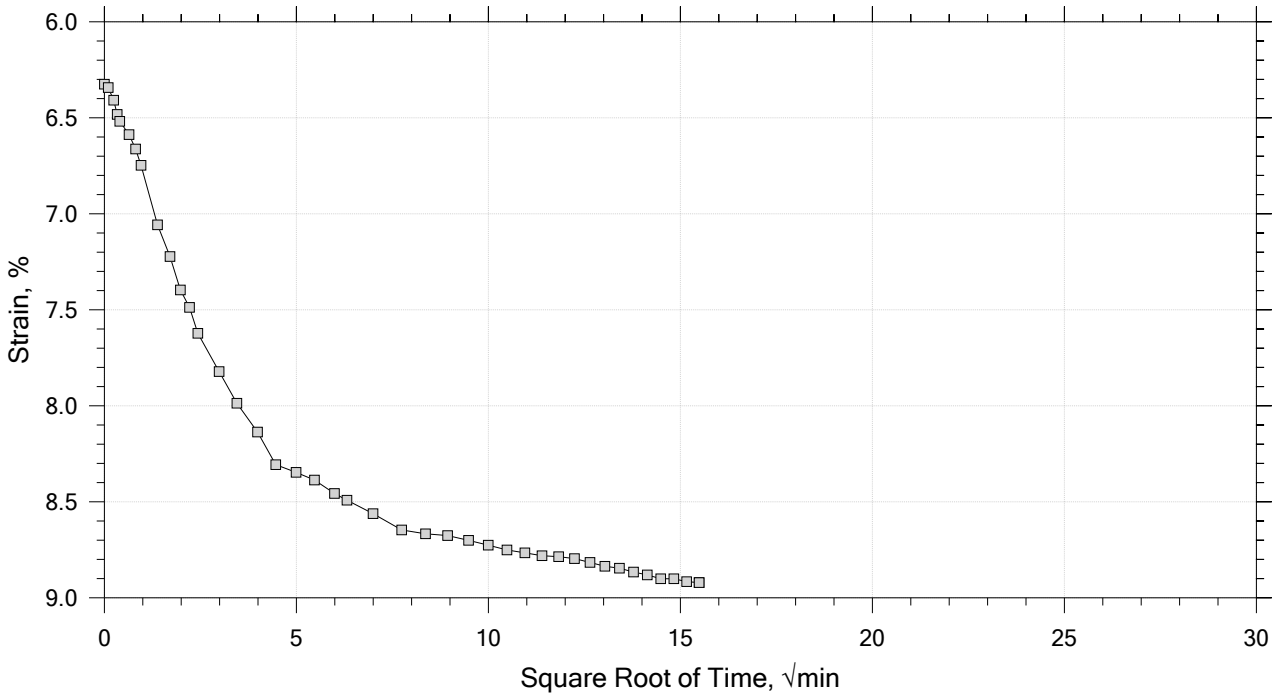
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 8 of 22

Constant Load Step

Stress: 4 tsf





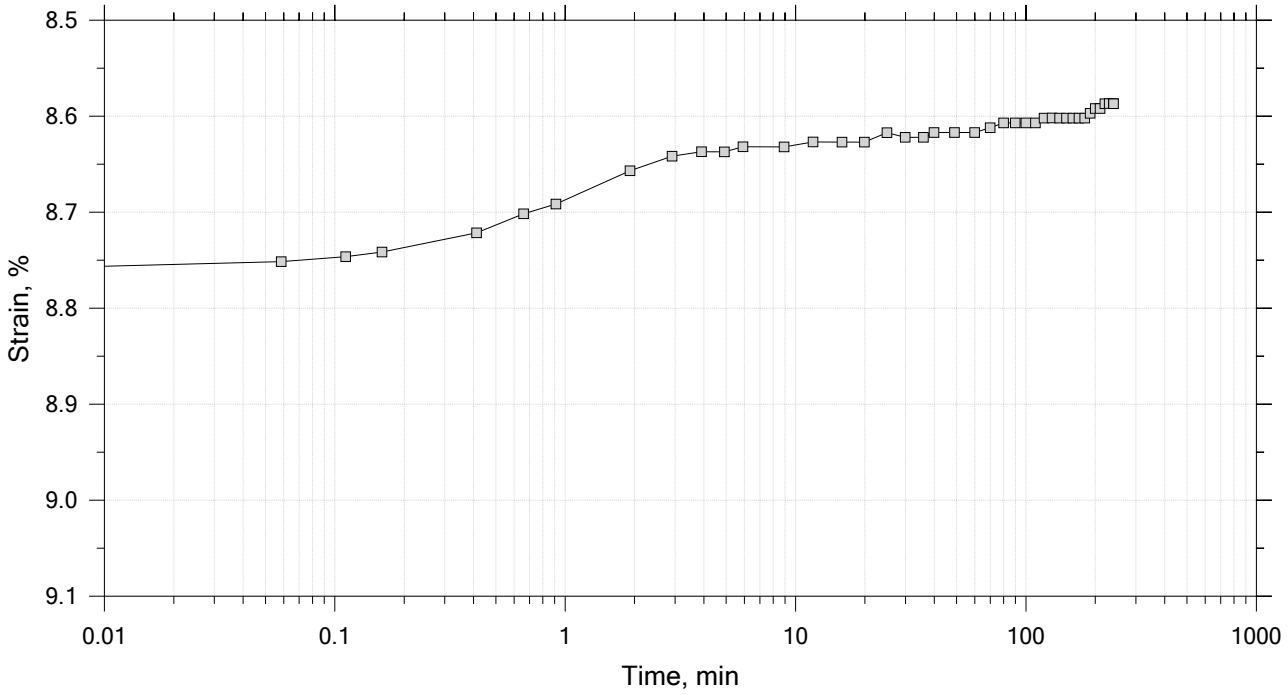
GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Brooklyn, NY	Project No.: GTX-308805
	Boring No.: BB-PVS-203	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 01/22/19	Depth: 25-27 ft
	Test No.: IP-10	Sample Type: intact	Elevation: ---
	Description: Moist, grey clay w/silt		
	Remarks: System S, Swell Pressure = 0.0691 tsf		

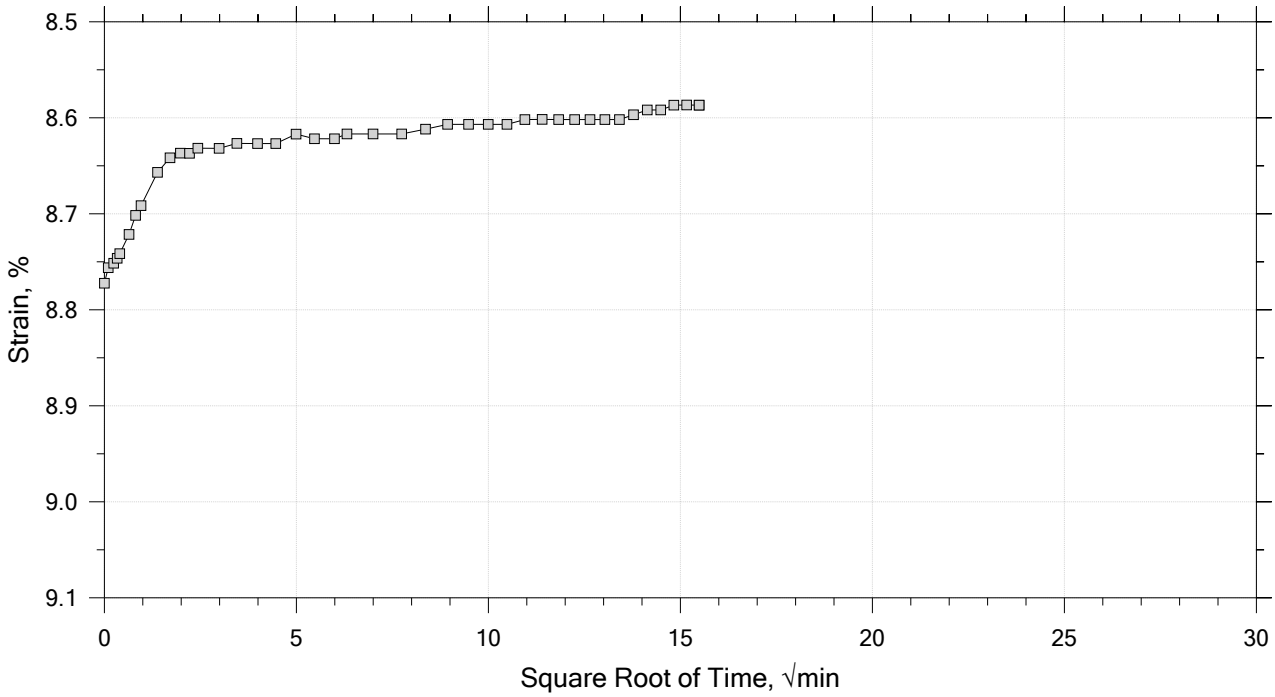
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 9 of 22

Constant Load Step

Stress: 2 tsf

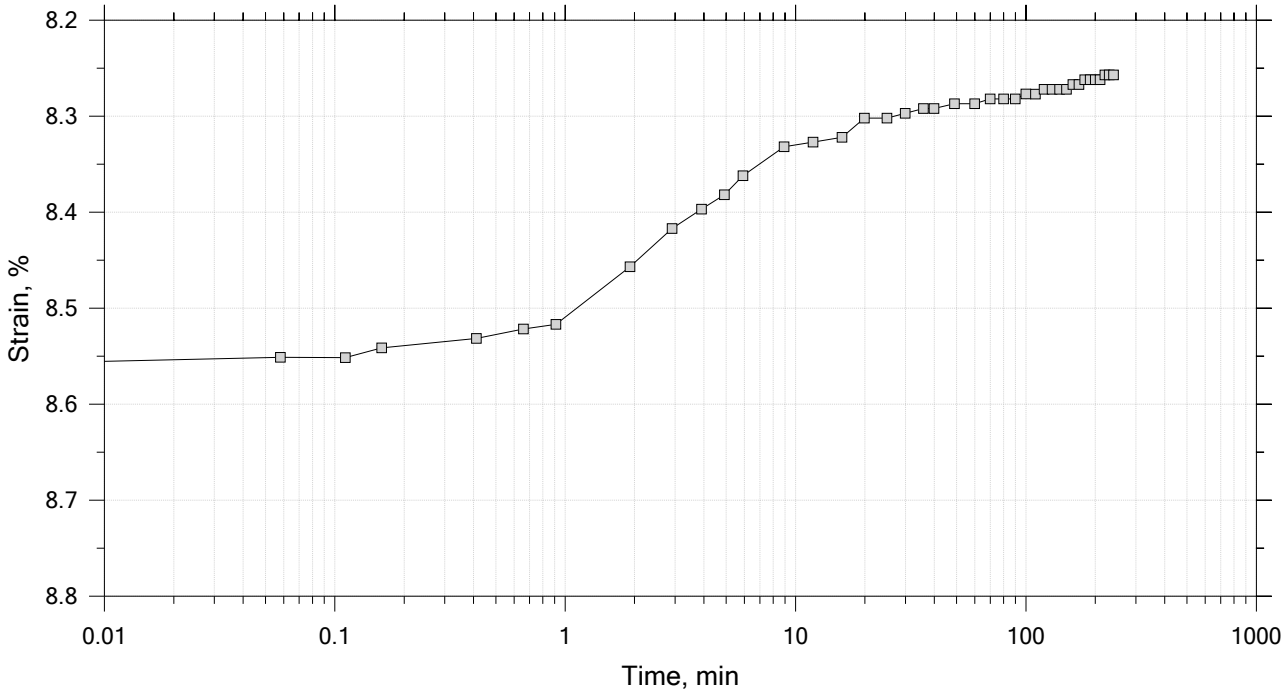


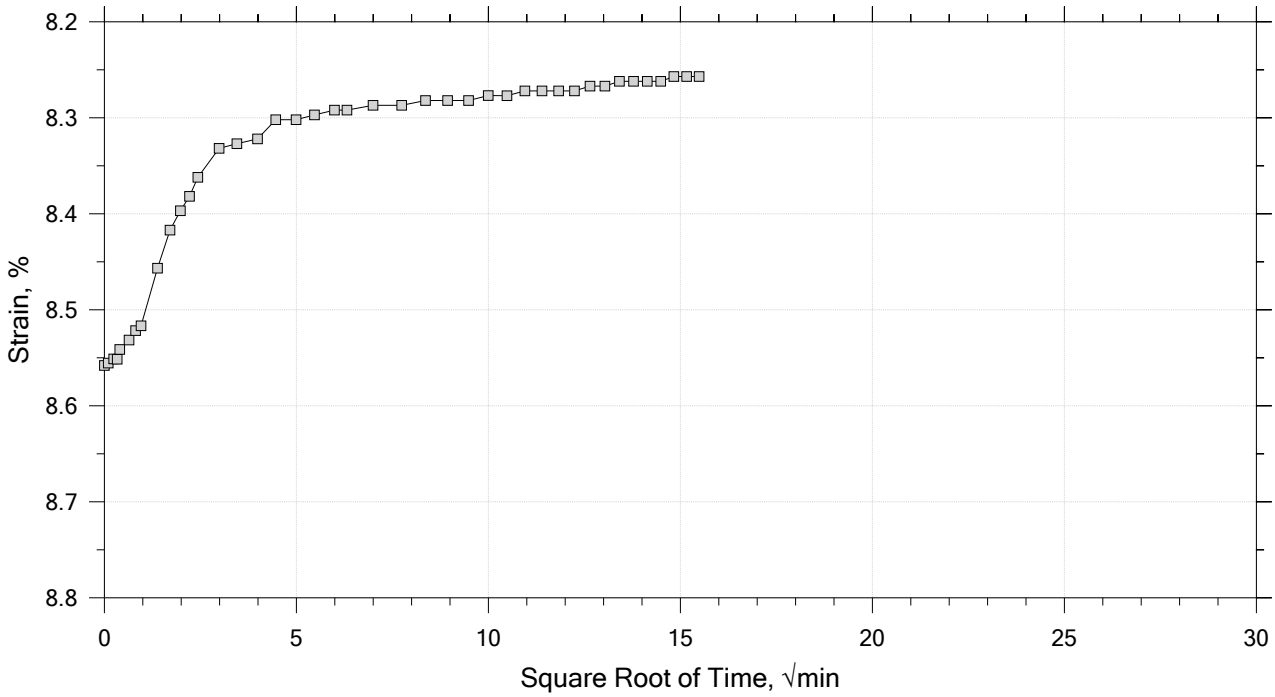


GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Brooklyn, NY	Project No.: GTX-308805
	Boring No.: BB-PVS-203	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 01/22/19	Depth: 25-27 ft
	Test No.: IP-10	Sample Type: intact	Elevation: ---
	Description: Moist, grey clay w/silt		
	Remarks: System S, Swell Pressure = 0.0691 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 10 of 22
Constant Load Step
Stress: 1 tsf

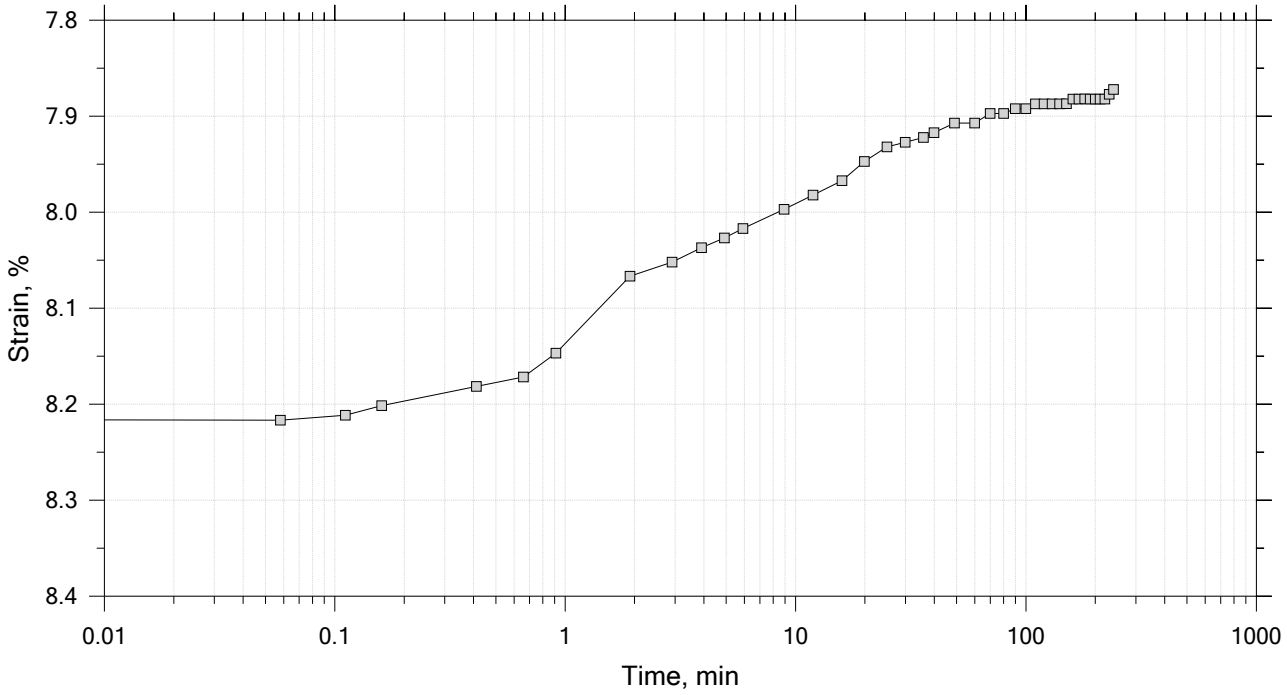


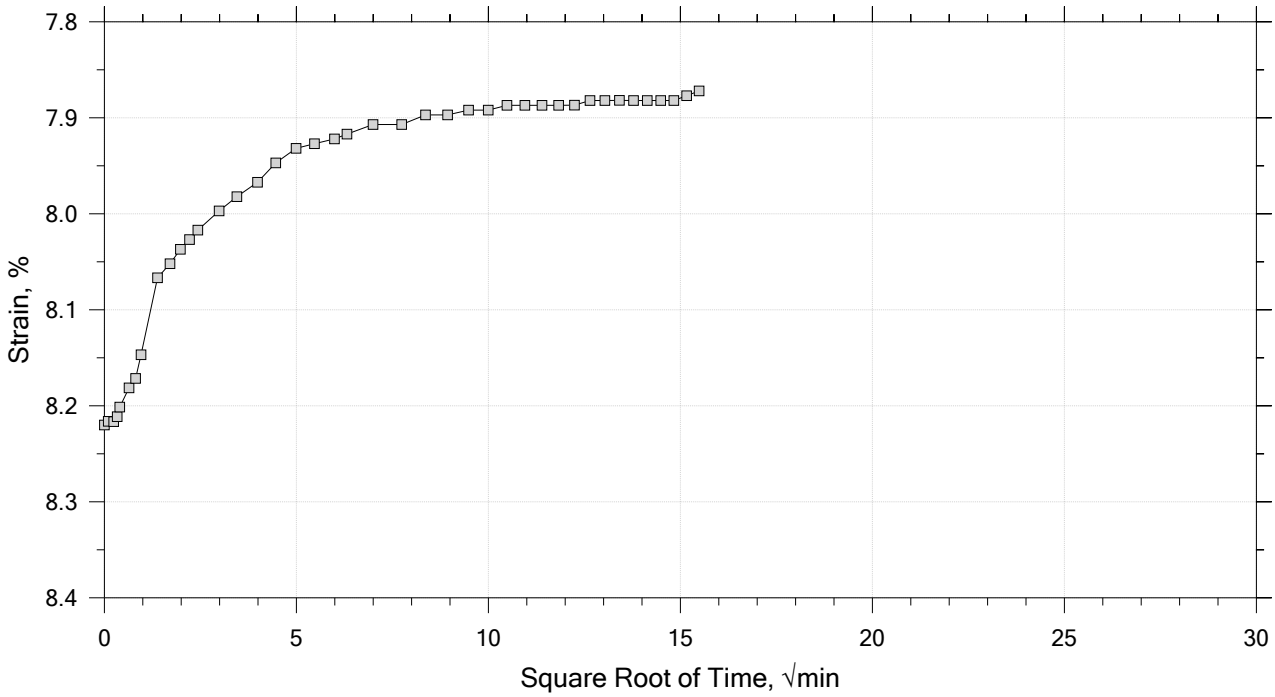


GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Brooklyn, NY	Project No.: GTX-308805
	Boring No.: BB-PVS-203	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 01/22/19	Depth: 25-27 ft
	Test No.: IP-10	Sample Type: intact	Elevation: ---
	Description: Moist, grey clay w/silt		
	Remarks: System S, Swell Pressure = 0.0691 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 11 of 22
Constant Load Step
Stress: 0.5 tsf





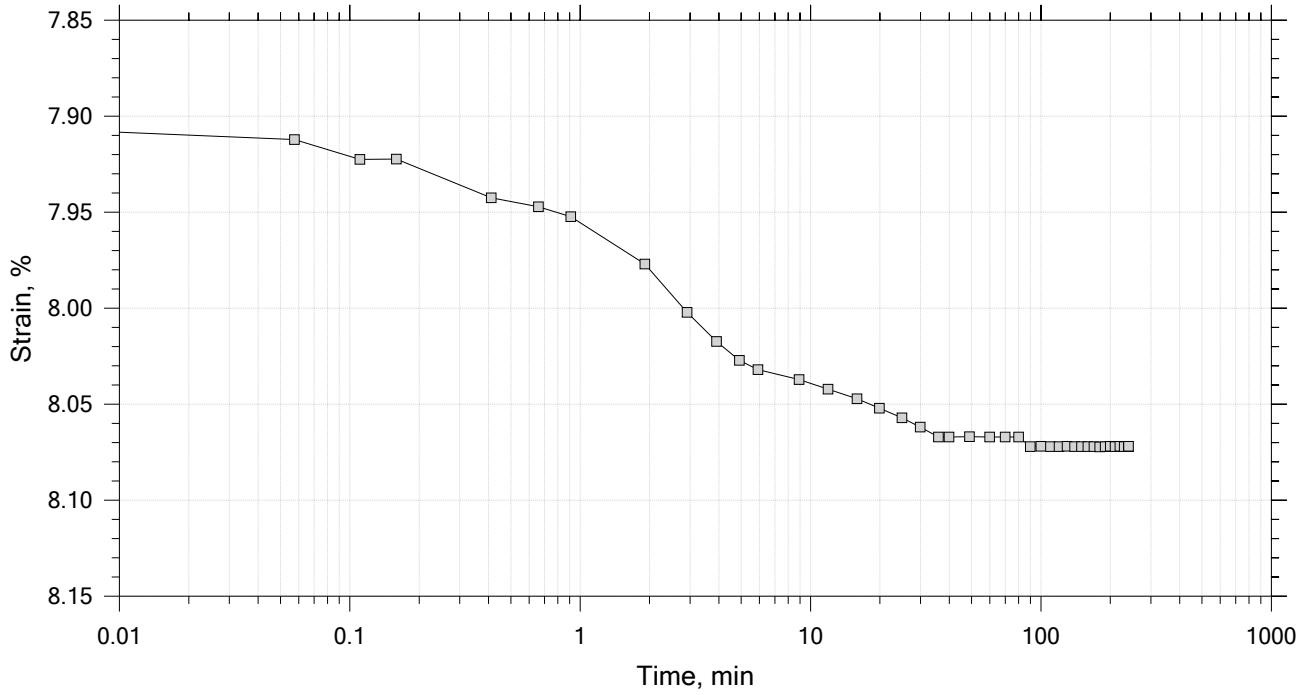
GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Brooklyn, NY	Project No.: GTX-308805
	Boring No.: BB-PVS-203	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 01/22/19	Depth: 25-27 ft
	Test No.: IP-10	Sample Type: intact	Elevation: ---
	Description: Moist, grey clay w/silt		
	Remarks: System S, Swell Pressure = 0.0691 tsf		

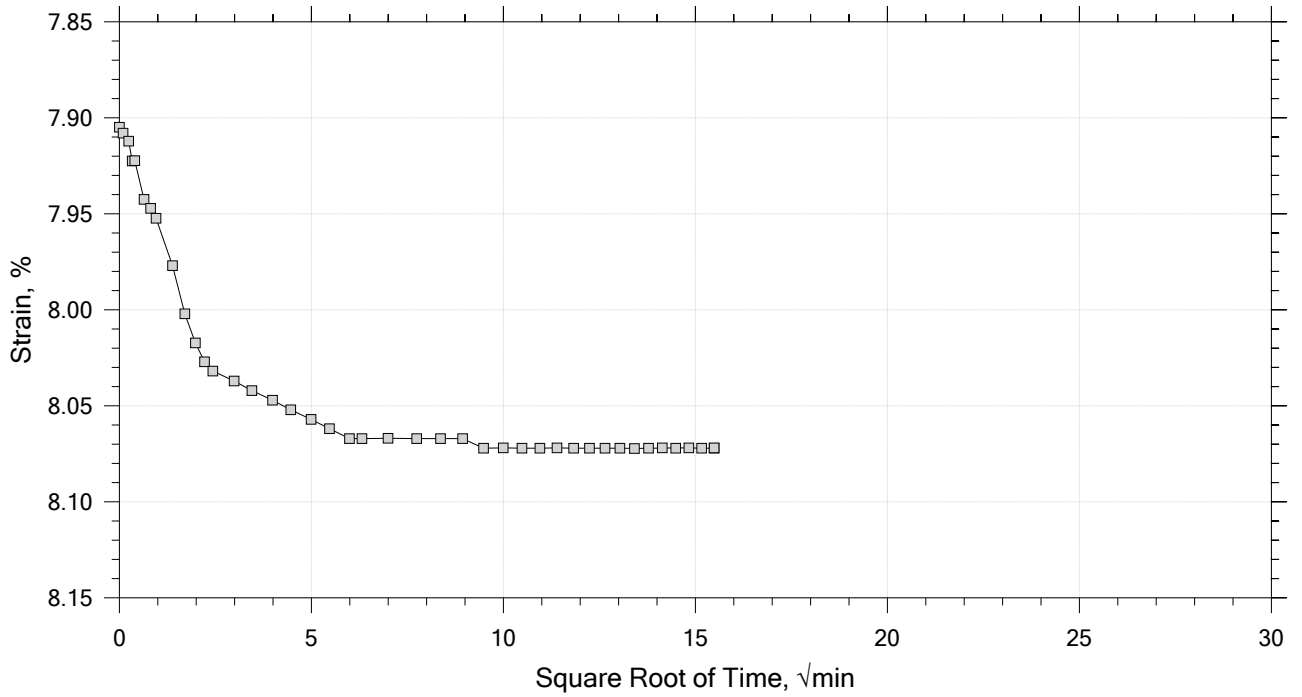
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 12 of 22

Constant Load Step

Stress: 1 tsf

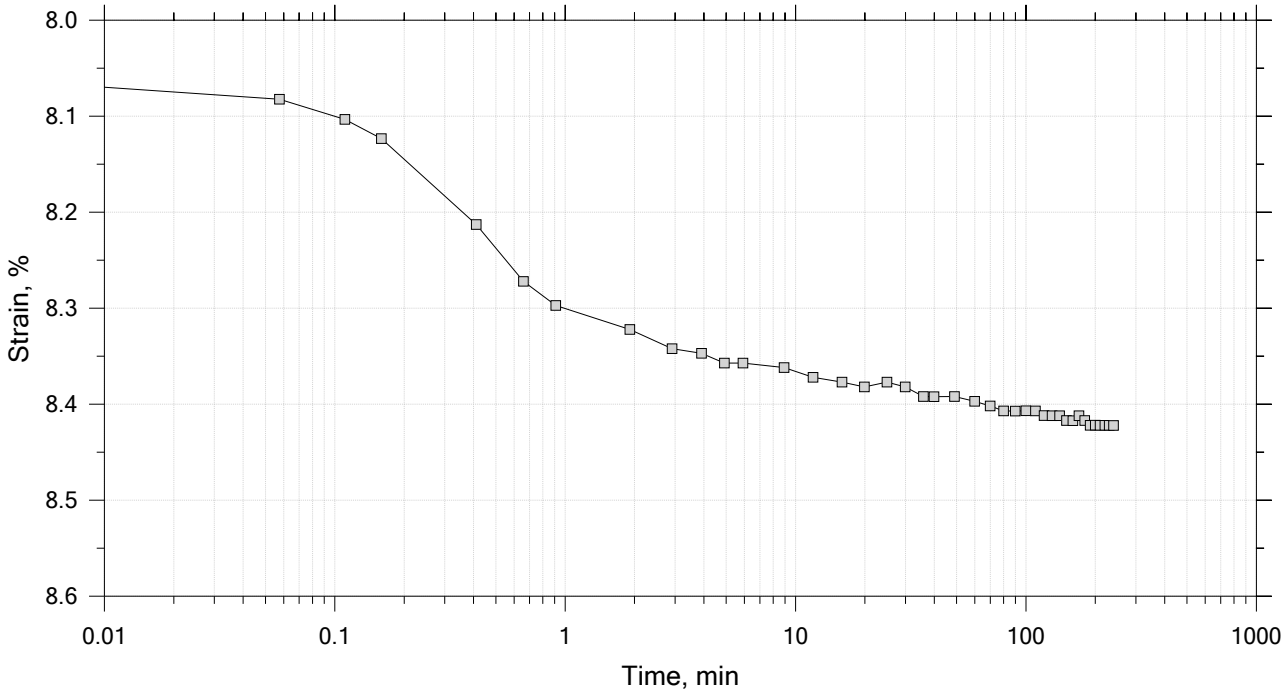


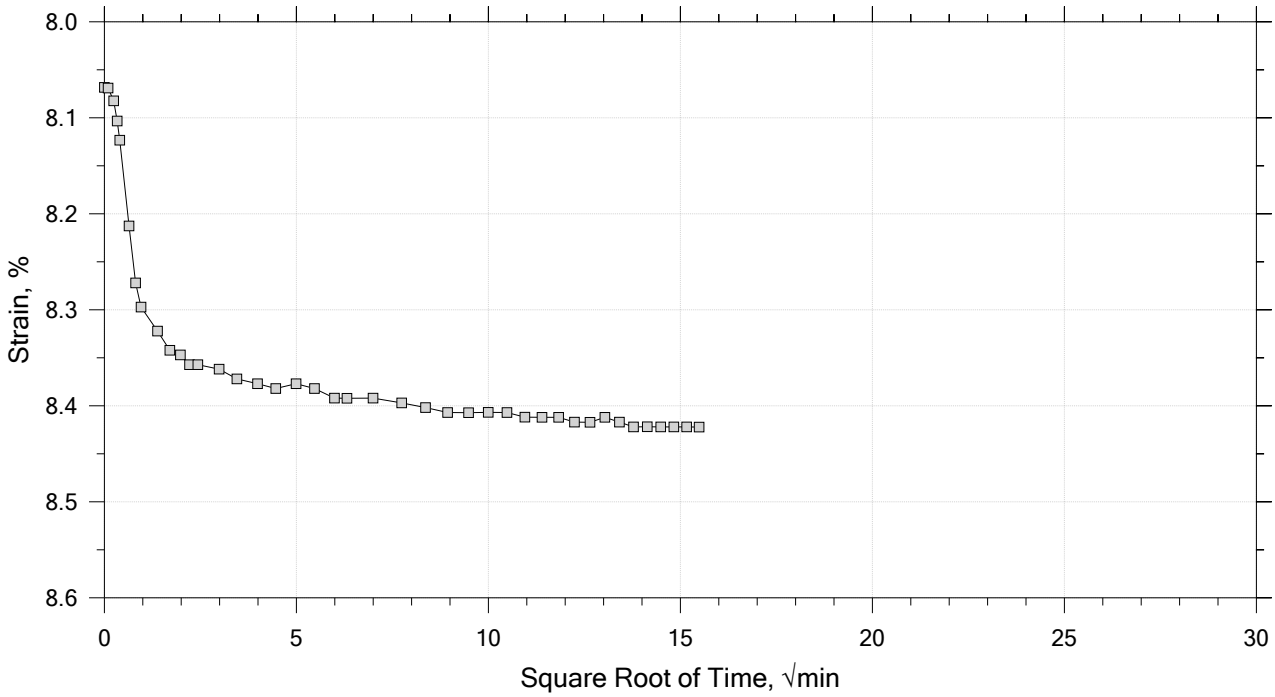


Project: I-295 over Veranda St	Location: Brooklyn, NY	Project No.: GTX-308805
Boring No.: BB-PVS-203	Tested By: md	Checked By: mcm
Sample No.: U1	Test Date: 01/22/19	Depth: 25-27 ft
Test No.: IP-10	Sample Type: intact	Elevation: ---
Description: Moist, grey clay w/silt		
Remarks: System S, Swell Pressure = 0.0691 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 13 of 22
Constant Load Step
Stress: 2 tsf

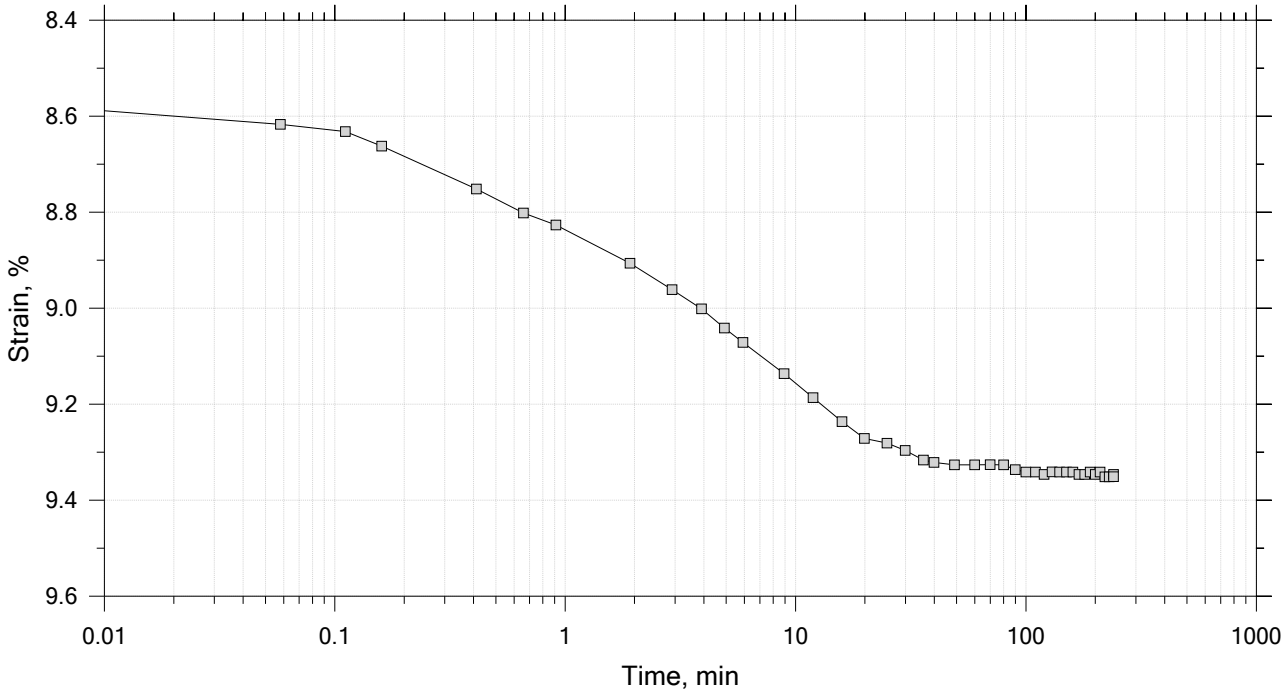


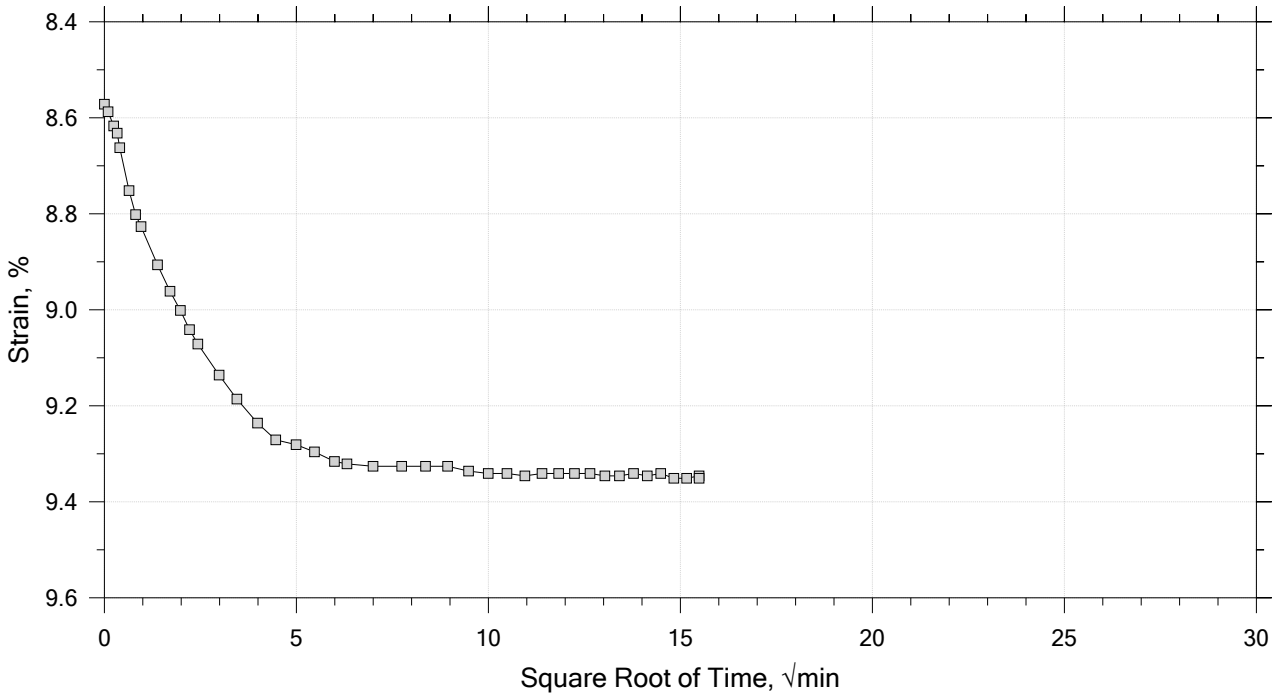


GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Brooklyn, NY	Project No.: GTX-308805
	Boring No.: BB-PVS-203	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 01/22/19	Depth: 25-27 ft
	Test No.: IP-10	Sample Type: intact	Elevation: ---
	Description: Moist, grey clay w/silt		
	Remarks: System S, Swell Pressure = 0.0691 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 14 of 22
Constant Load Step
Stress: 4 tsf

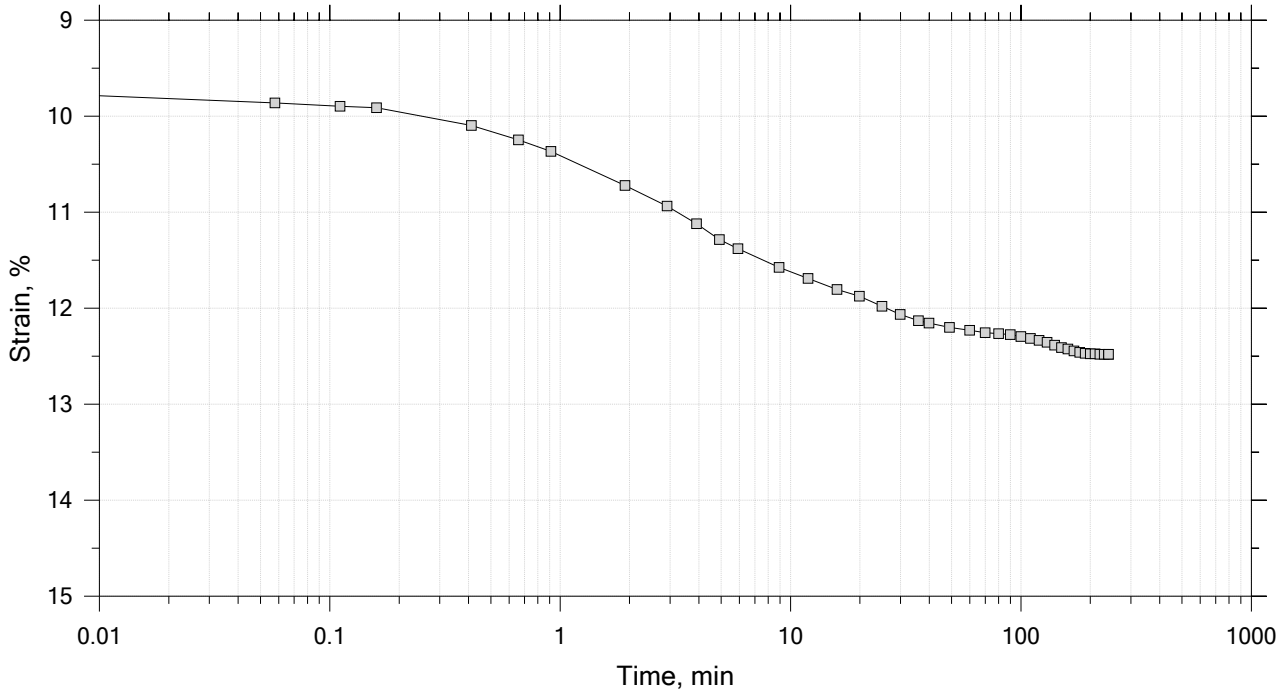


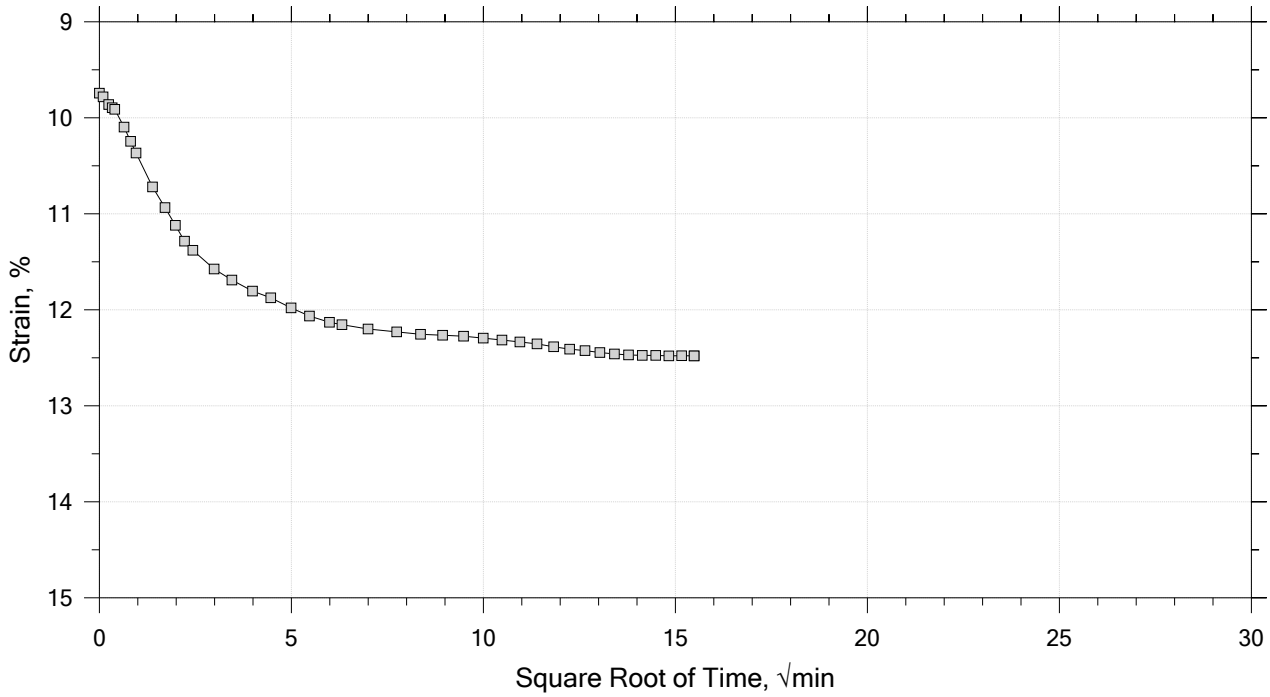


GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Brooklyn, NY	Project No.: GTX-308805
	Boring No.: BB-PVS-203	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 01/22/19	Depth: 25-27 ft
	Test No.: IP-10	Sample Type: intact	Elevation: ---
	Description: Moist, grey clay w/silt		
	Remarks: System S, Swell Pressure = 0.0691 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 15 of 22
Constant Load Step
Stress: 8 tsf





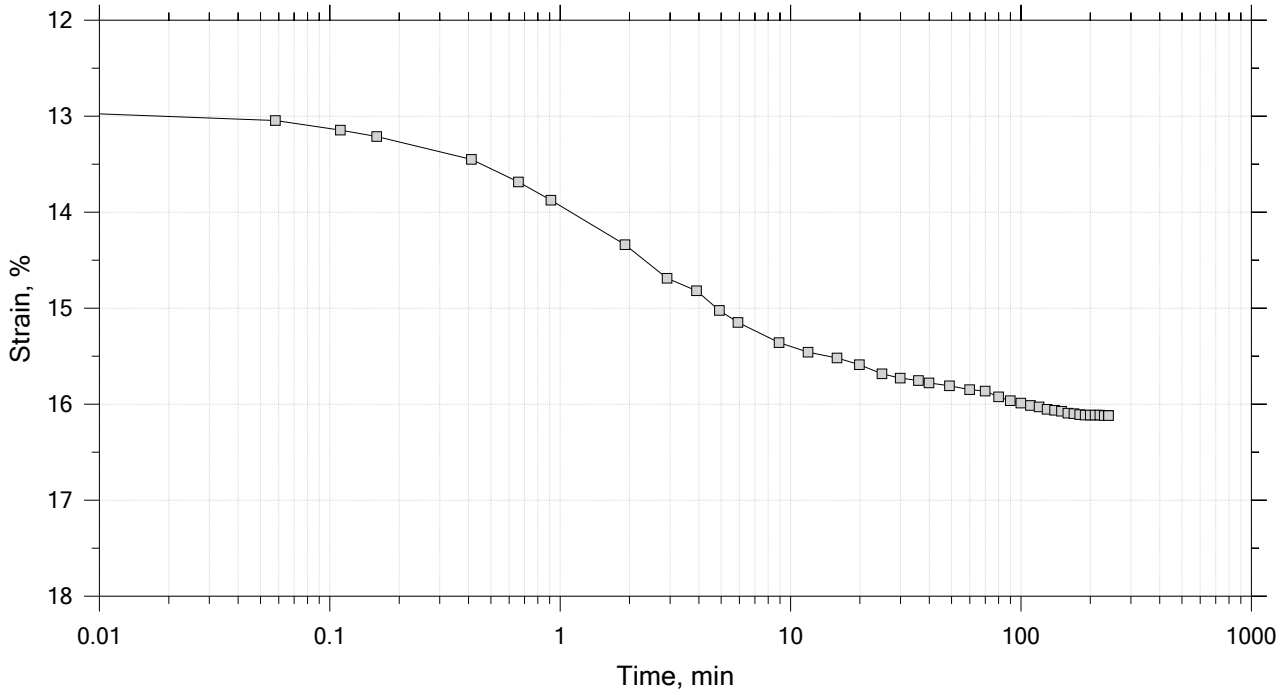
GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Brooklyn, NY	Project No.: GTX-308805
	Boring No.: BB-PVS-203	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 01/22/19	Depth: 25-27 ft
	Test No.: IP-10	Sample Type: intact	Elevation: ---
	Description: Moist, grey clay w/silt		
	Remarks: System S, Swell Pressure = 0.0691 tsf		

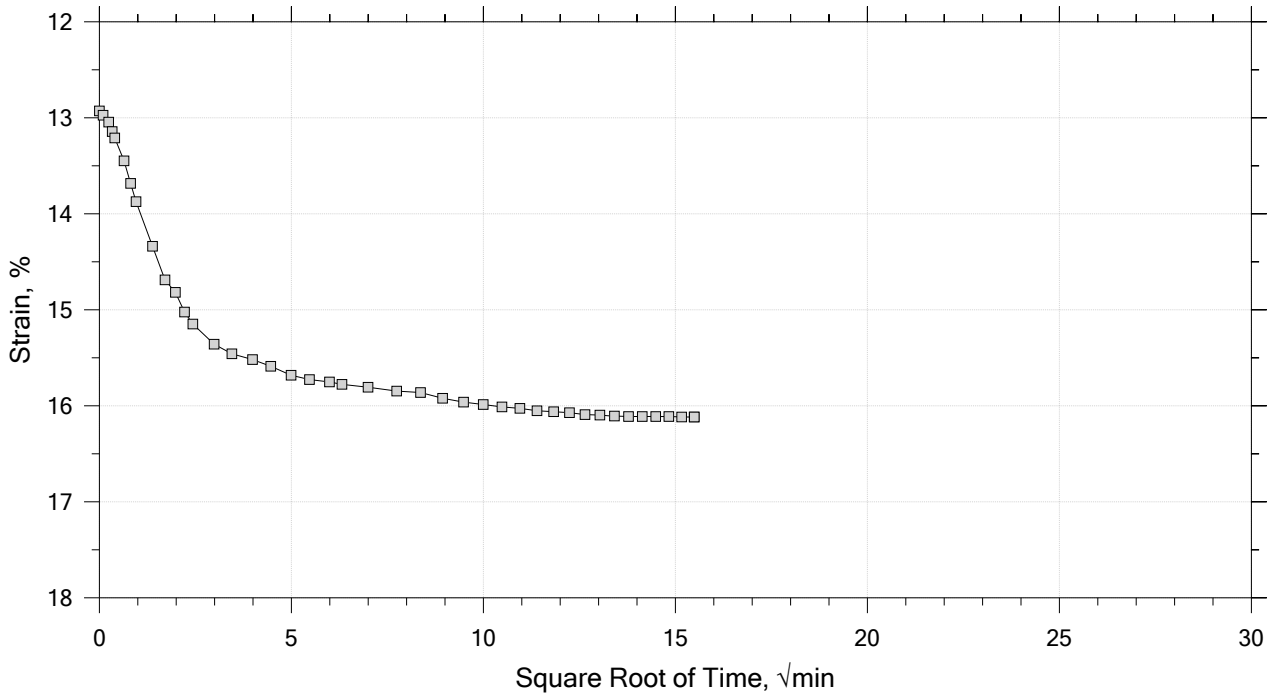
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 16 of 22

Constant Load Step

Stress: 16 tsf





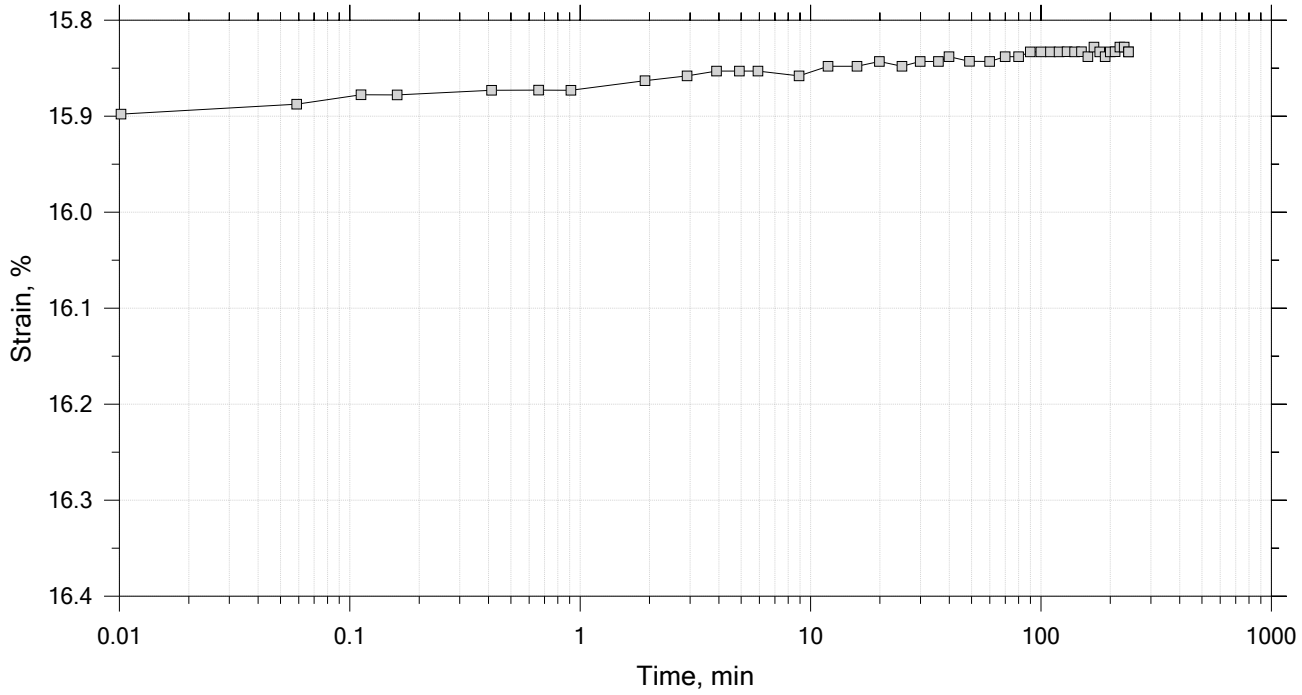
GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Brooklyn, NY	Project No.: GTX-308805
	Boring No.: BB-PVS-203	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 01/22/19	Depth: 25-27 ft
	Test No.: IP-10	Sample Type: intact	Elevation: ---
	Description: Moist, grey clay w/silt		
	Remarks: System S, Swell Pressure = 0.0691 tsf		

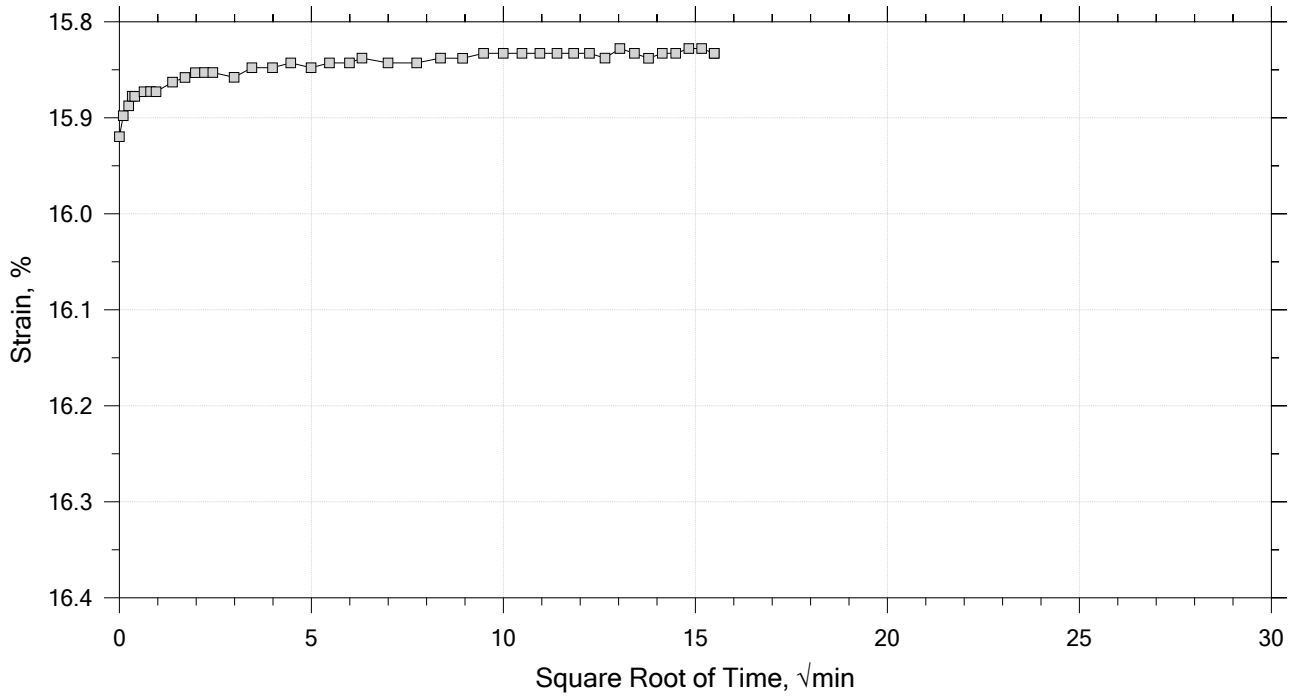
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 17 of 22

Constant Load Step

Stress: 8 tsf

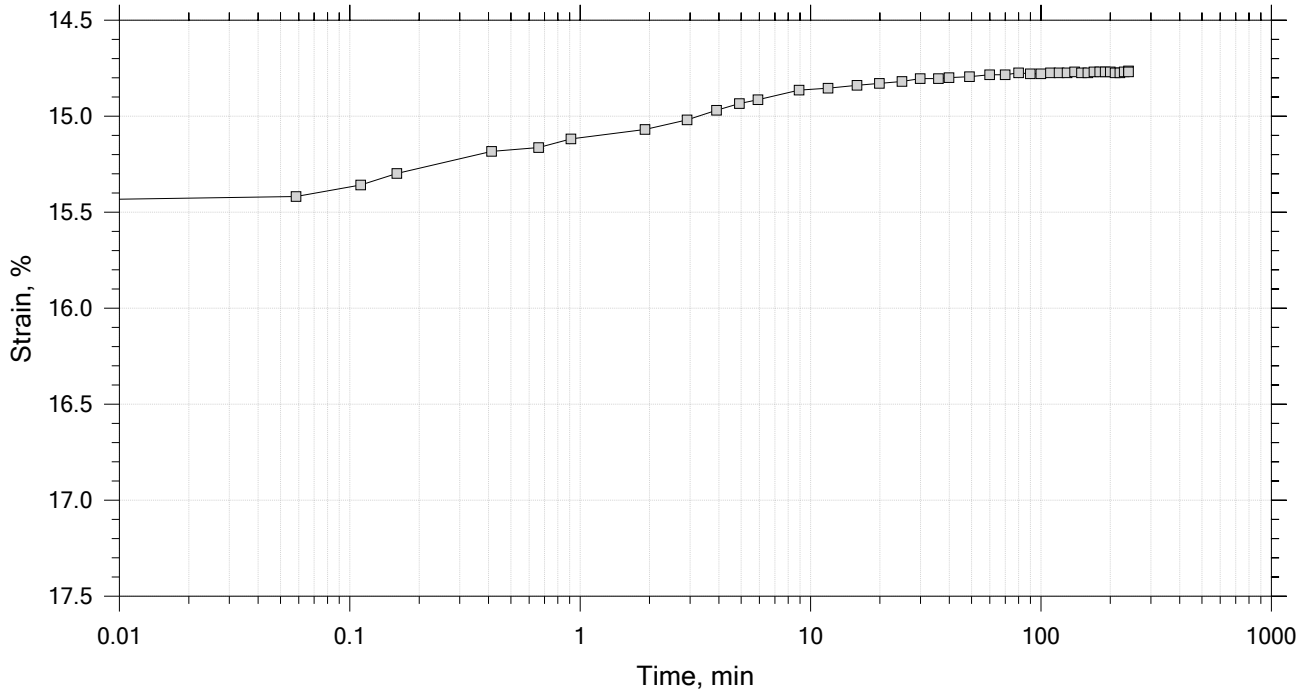


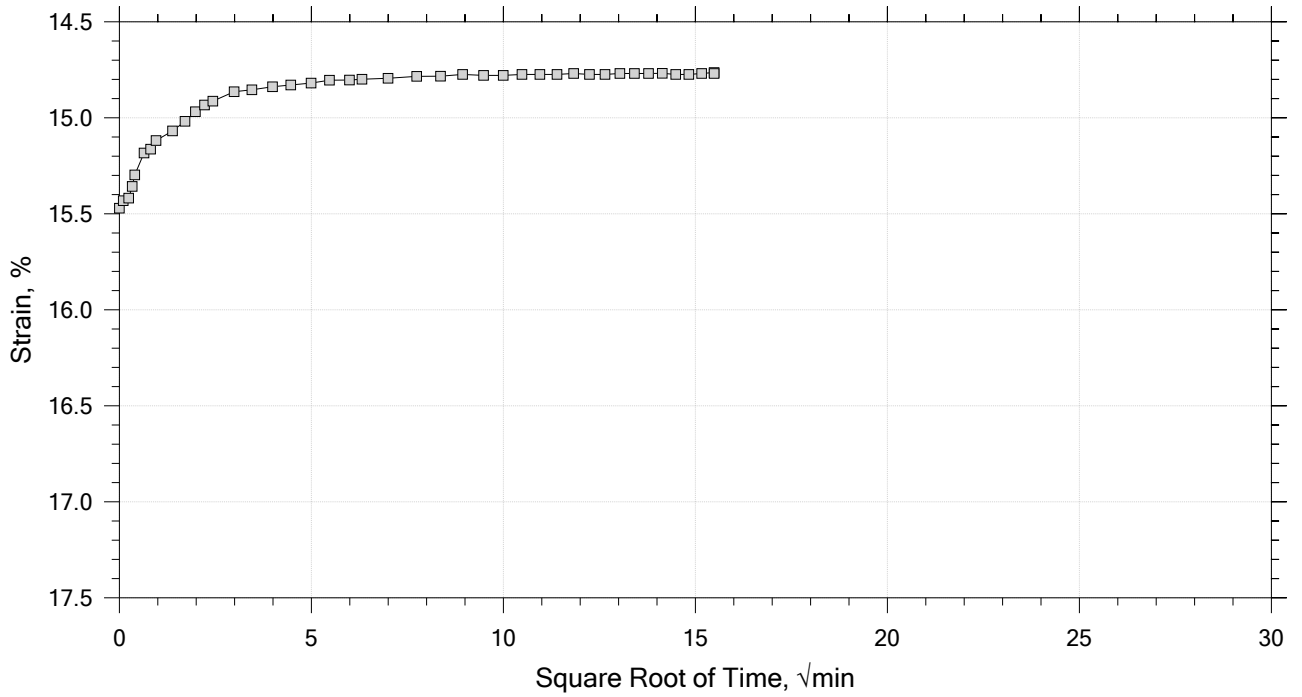


Project: I-295 over Veranda St	Location: Brooklyn, NY	Project No.: GTX-308805
Boring No.: BB-PVS-203	Tested By: md	Checked By: mcm
Sample No.: U1	Test Date: 01/22/19	Depth: 25-27 ft
Test No.: IP-10	Sample Type: intact	Elevation: ---
Description: Moist, grey clay w/silt		
Remarks: System S, Swell Pressure = 0.0691 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 18 of 22
Constant Load Step
Stress: 2 tsf

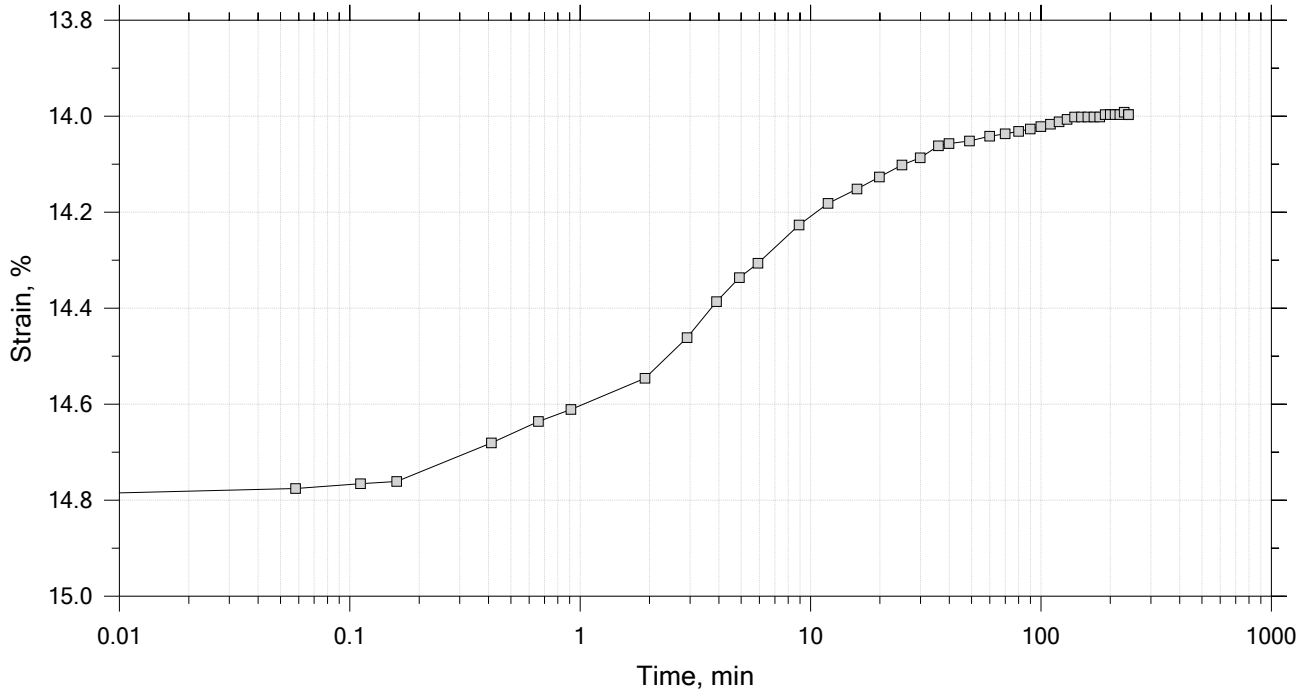


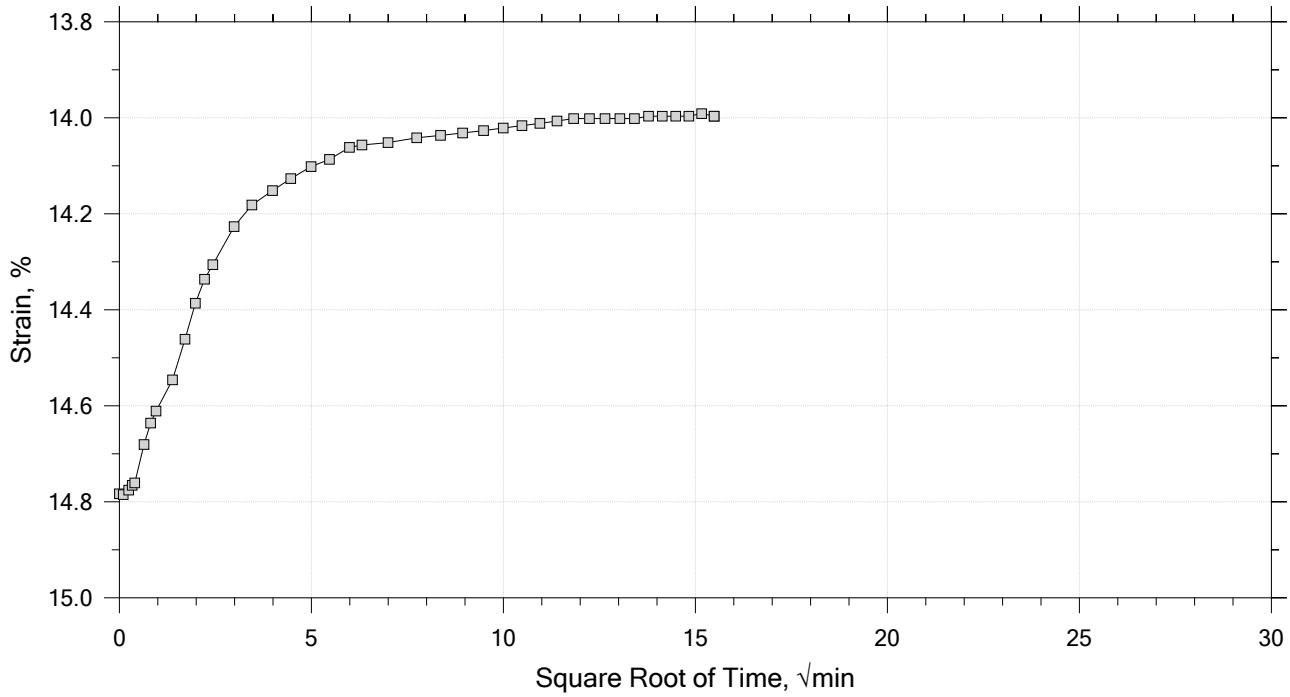


GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Brooklyn, NY	Project No.: GTX-308805
	Boring No.: BB-PVS-203	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 01/22/19	Depth: 25-27 ft
	Test No.: IP-10	Sample Type: intact	Elevation: ---
	Description: Moist, grey clay w/silt		
	Remarks: System S, Swell Pressure = 0.0691 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 19 of 22
Constant Load Step
Stress: 0.75 tsf

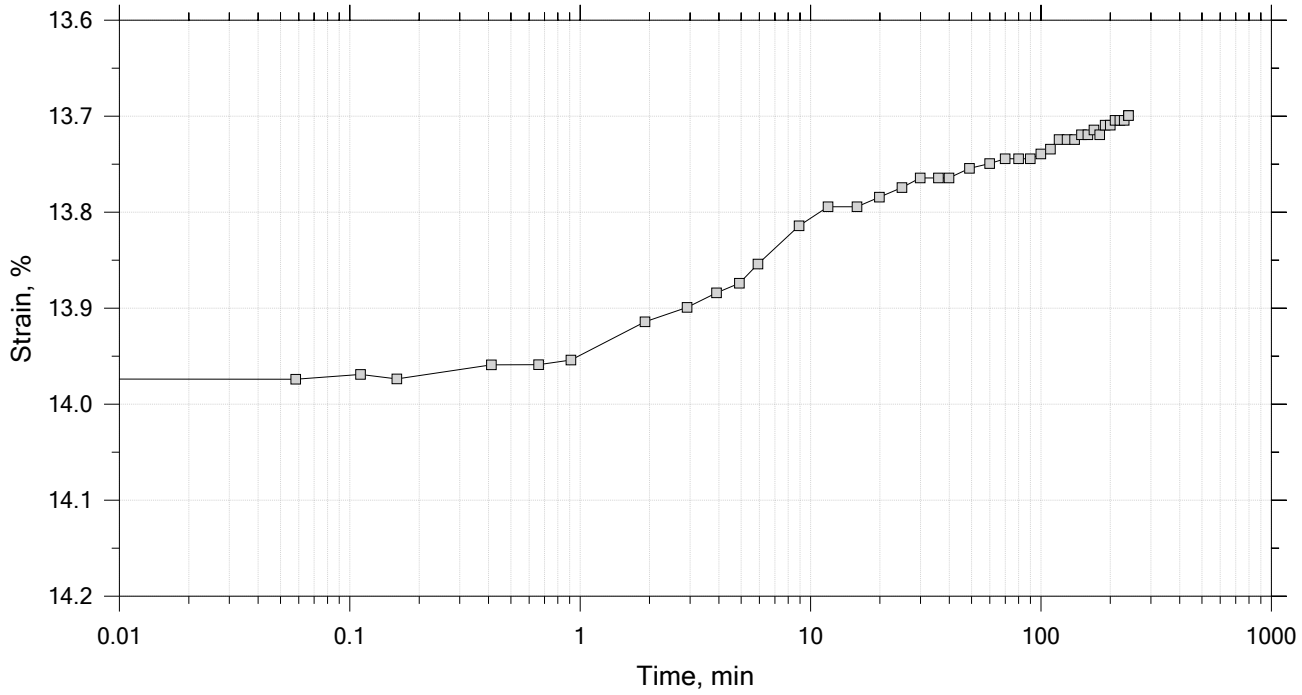


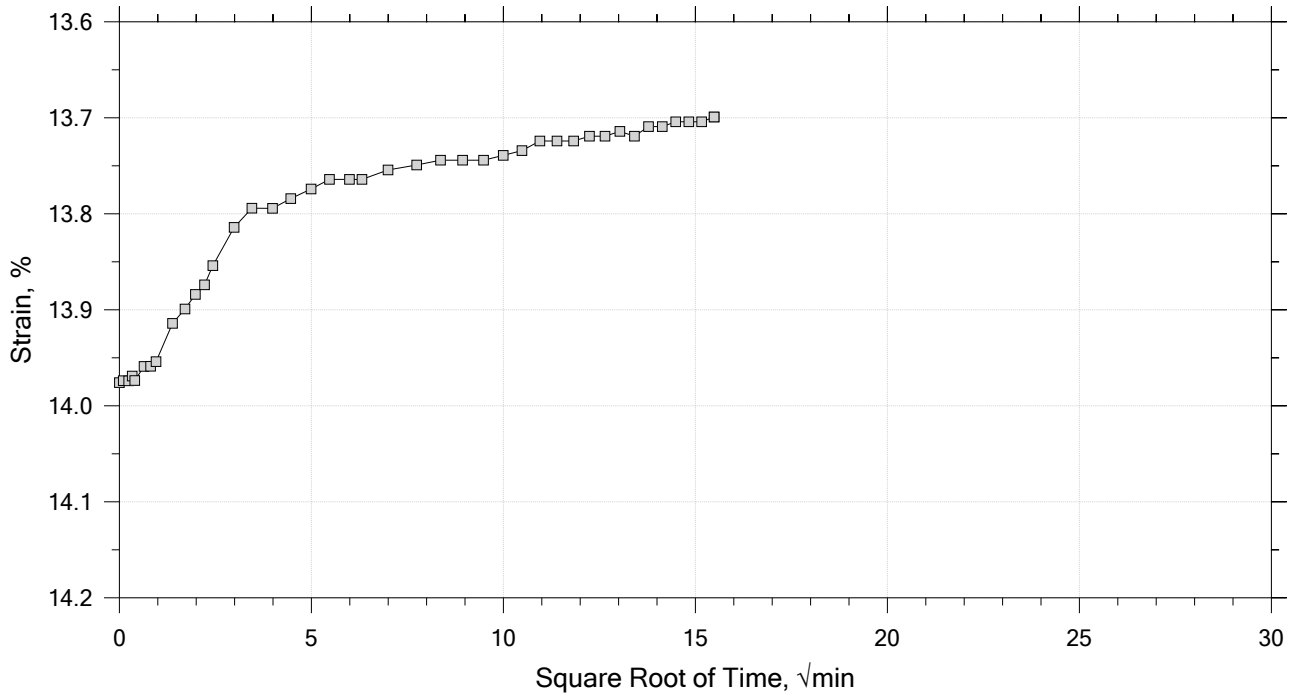


GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Brooklyn, NY	Project No.: GTX-308805
	Boring No.: BB-PVS-203	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 01/22/19	Depth: 25-27 ft
	Test No.: IP-10	Sample Type: intact	Elevation: ---
	Description: Moist, grey clay w/silt		
	Remarks: System S, Swell Pressure = 0.0691 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 20 of 22
Constant Load Step
Stress: 0.5 tsf

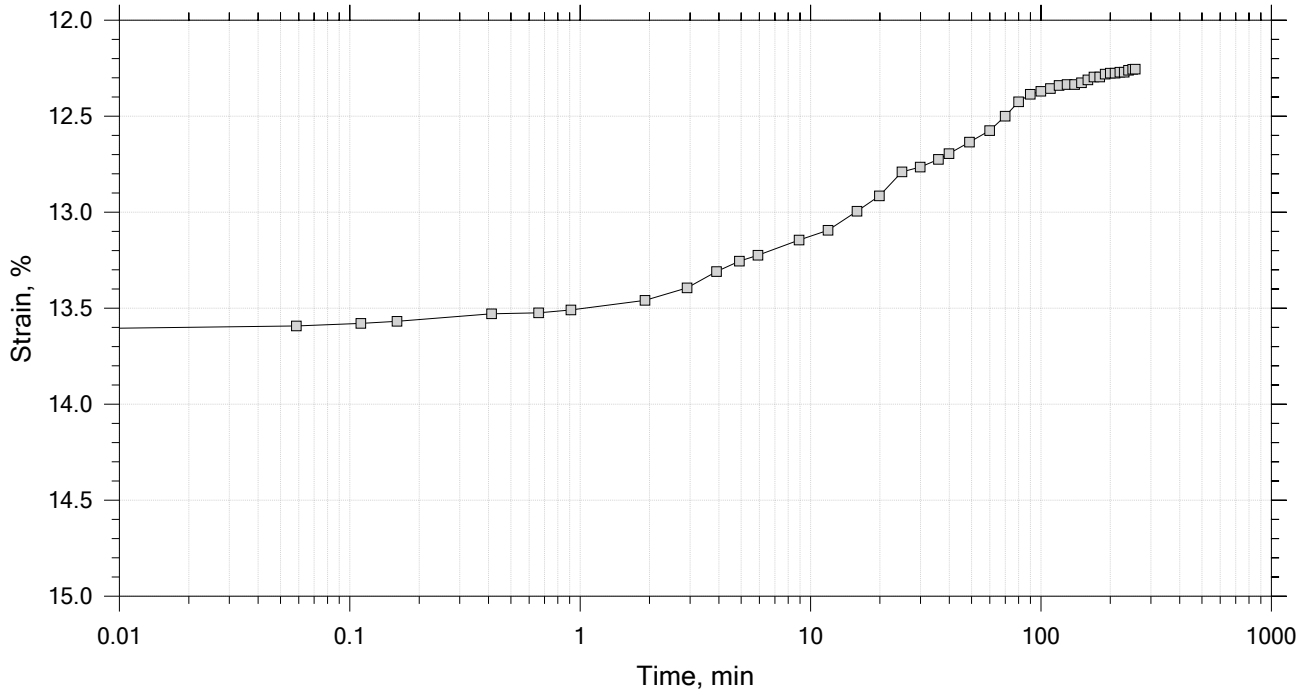


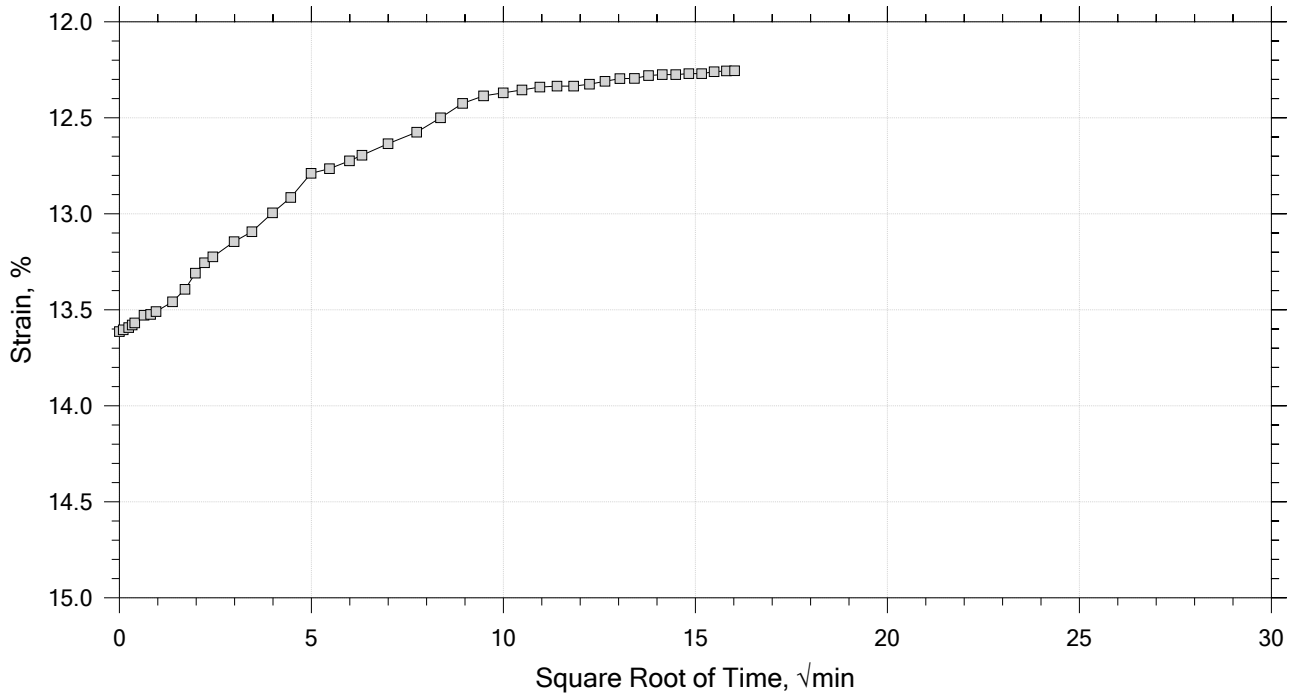


Project: I-295 over Veranda St	Location: Brooklyn, NY	Project No.: GTX-308805
Boring No.: BB-PVS-203	Tested By: md	Checked By: mcm
Sample No.: U1	Test Date: 01/22/19	Depth: 25-27 ft
Test No.: IP-10	Sample Type: intact	Elevation: ---
Description: Moist, grey clay w/silt		
Remarks: System S, Swell Pressure = 0.0691 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 21 of 22
Constant Load Step
Stress: 0.125 tsf

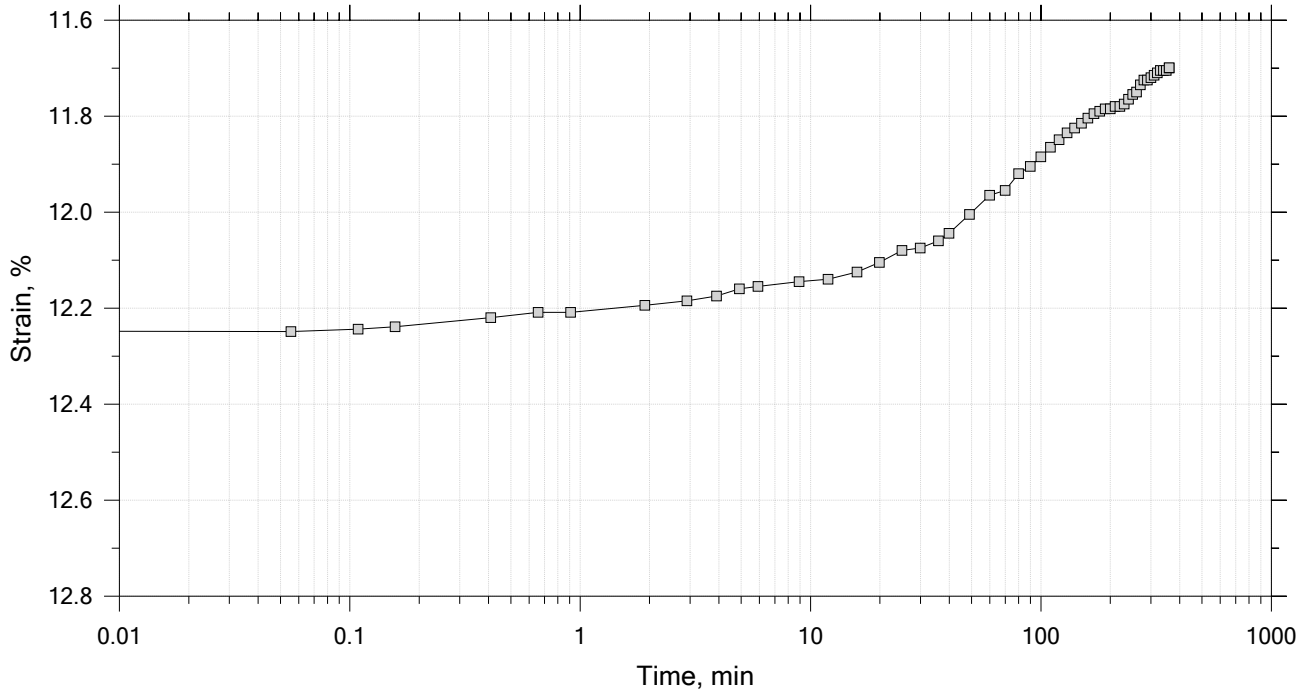


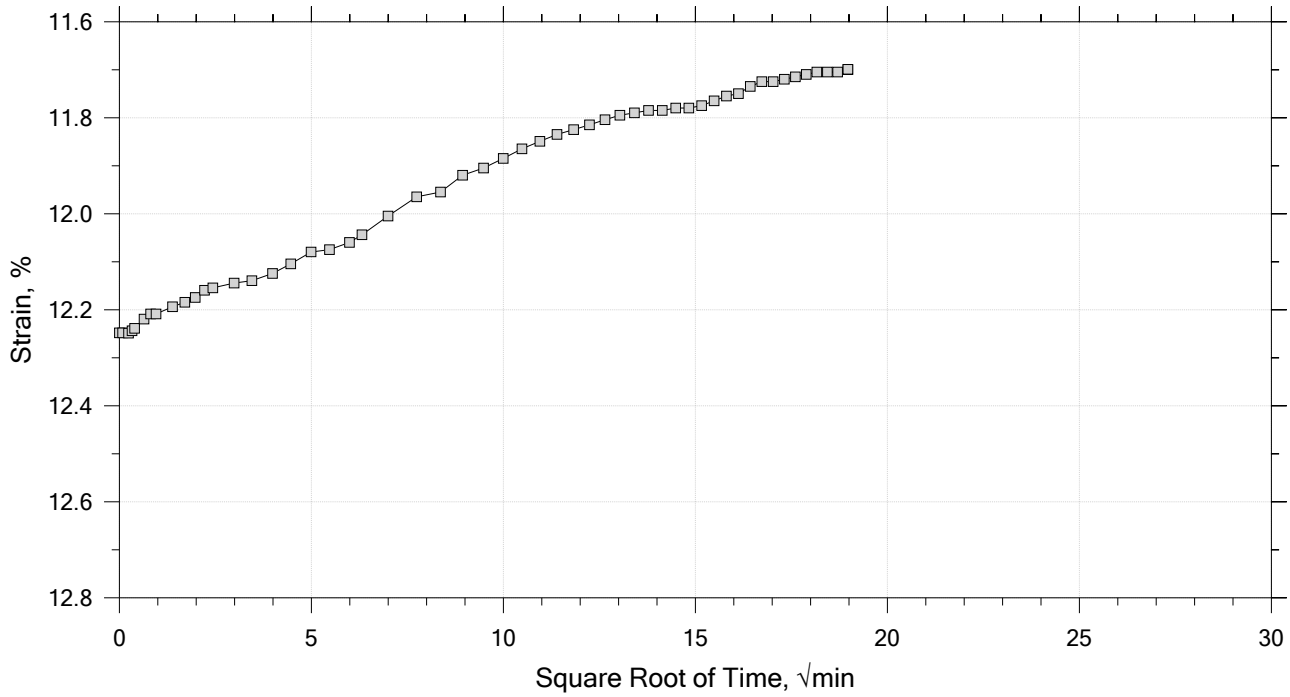


Project: I-295 over Veranda St	Location: Brooklyn, NY	Project No.: GTX-308805
Boring No.: BB-PVS-203	Tested By: md	Checked By: mcm
Sample No.: U1	Test Date: 01/22/19	Depth: 25-27 ft
Test No.: IP-10	Sample Type: intact	Elevation: ---
Description: Moist, grey clay w/silt		
Remarks: System S, Swell Pressure = 0.0691 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 22 of 22
Constant Load Step
Stress: 0.0625 tsf





GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Brooklyn, NY	Project No.: GTX-308805
	Boring No.: BB-PVS-203	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 01/22/19	Depth: 25-27 ft
	Test No.: IP-10	Sample Type: intact	Elevation: ---
	Description: Moist, grey clay w/silt		
	Remarks: System S, Swell Pressure = 0.0691 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Specimen Diameter: 2.50 in	Estimated Specific Gravity: 2.77	Liquid Limit: 42
Initial Height: 1.00 in	Initial Void Ratio: 0.911	Plastic Limit: 24
Final Height: 0.88 in	Final Void Ratio: 0.687	Plasticity Index: 18

	Before Test Trimmings	Before Test Specimen	After Test Specimen	After Test Trimmings
Container ID	A-2490	RING		A-1149
Mass Container, gm	8.16	111.26	111.26	8.52
Mass Container + Wet Soil, gm	244.87	265.22	256.71	153.65
Mass Container + Dry Soil, gm	179.25	227.78	227.78	124.78
Mass Dry Soil, gm	171.09	116.52	116.52	116.26
Water Content, %	38.35	32.14	24.83	24.83
Void Ratio	---	0.91	0.69	---
Degree of Saturation, %	---	97.65	100.00	---
Dry Unit Weight, pcf	---	90.426	102.41	---

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.

GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Brooklyn, NY	Project No.: GTX-308805
	Boring No.: BB-PVS-203	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 01/22/19	Depth: 25-27 ft
	Test No.: IP-10	Sample Type: intact	Elevation: ---
	Description: Moist, grey clay w/silt		
	Remarks: System S, Swell Pressure = 0.0691 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Log of Time Coefficients

Step	Applied Stress tsf	Final Displacement in	Void Ratio	Strain at End %	Log T50 min	Cv ft²/s	Mv 1/tsf	k ft/day	Ca %
1	0.0691	0.003400	0.904	0.340	1.312	4.33e-06	4.92e-02	5.74e-04	0.00e+00
2	0.125	0.006939	0.898	0.694	6.308	8.94e-07	6.33e-02	1.53e-04	0.00e+00
3	0.250	0.01230	0.887	1.23	0.000	0.00e+00	4.29e-02	0.00e+00	0.00e+00
4	0.500	0.02155	0.870	2.15	6.898	7.99e-07	3.70e-02	7.97e-05	0.00e+00
5	0.750	0.02927	0.855	2.93	17.863	3.03e-07	3.09e-02	2.52e-05	0.00e+00
6	1.00	0.03869	0.837	3.87	0.000	0.00e+00	3.77e-02	0.00e+00	0.00e+00
7	2.00	0.06168	0.793	6.17	0.000	0.00e+00	2.30e-02	0.00e+00	0.00e+00
8	4.00	0.08921	0.740	8.92	3.930	1.24e-06	1.38e-02	4.60e-05	0.00e+00
9	2.00	0.08587	0.747	8.59	0.000	0.00e+00	1.67e-03	0.00e+00	0.00e+00
10	1.00	0.08257	0.753	8.26	2.496	1.92e-06	3.30e-03	1.70e-05	0.00e+00
11	0.500	0.07872	0.760	7.87	1.674	2.88e-06	7.70e-03	5.98e-05	0.00e+00
12	1.00	0.08072	0.757	8.07	0.000	0.00e+00	4.00e-03	0.00e+00	0.00e+00
13	2.00	0.08422	0.750	8.42	0.415	1.16e-05	3.50e-03	1.09e-04	0.00e+00
14	4.00	0.09351	0.732	9.35	3.322	1.42e-06	4.64e-03	1.78e-05	0.00e+00
15	8.00	0.1248	0.672	12.5	2.489	1.82e-06	7.82e-03	3.83e-05	0.00e+00
16	16.0	0.1612	0.603	16.1	1.771	2.36e-06	4.55e-03	2.90e-05	0.00e+00
17	8.00	0.1583	0.608	15.8	0.000	0.00e+00	3.56e-04	0.00e+00	0.00e+00
18	2.00	0.1477	0.629	14.8	0.000	0.00e+00	1.77e-03	0.00e+00	0.00e+00
19	0.750	0.1400	0.643	14.0	3.127	1.34e-06	6.18e-03	2.23e-05	0.00e+00
20	0.500	0.1370	0.649	13.7	5.602	7.55e-07	1.19e-02	2.42e-05	0.00e+00
21	0.125	0.1225	0.677	12.3	0.000	0.00e+00	3.85e-02	0.00e+00	0.00e+00
22	0.0625	0.1170	0.687	11.7	0.000	0.00e+00	8.89e-02	0.00e+00	0.00e+00

GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Brooklyn, NY	Project No.: GTX-308805
	Boring No.: BB-PVS-203	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 01/22/19	Depth: 25-27 ft
	Test No.: IP-10	Sample Type: intact	Elevation: ---
	Description: Moist, grey clay w/silt		
	Remarks: System S, Swell Pressure = 0.0691 tsf		
	Displacement at End of Increment		

One-Dimensional Consolidation by ASTM D2435 - Method B

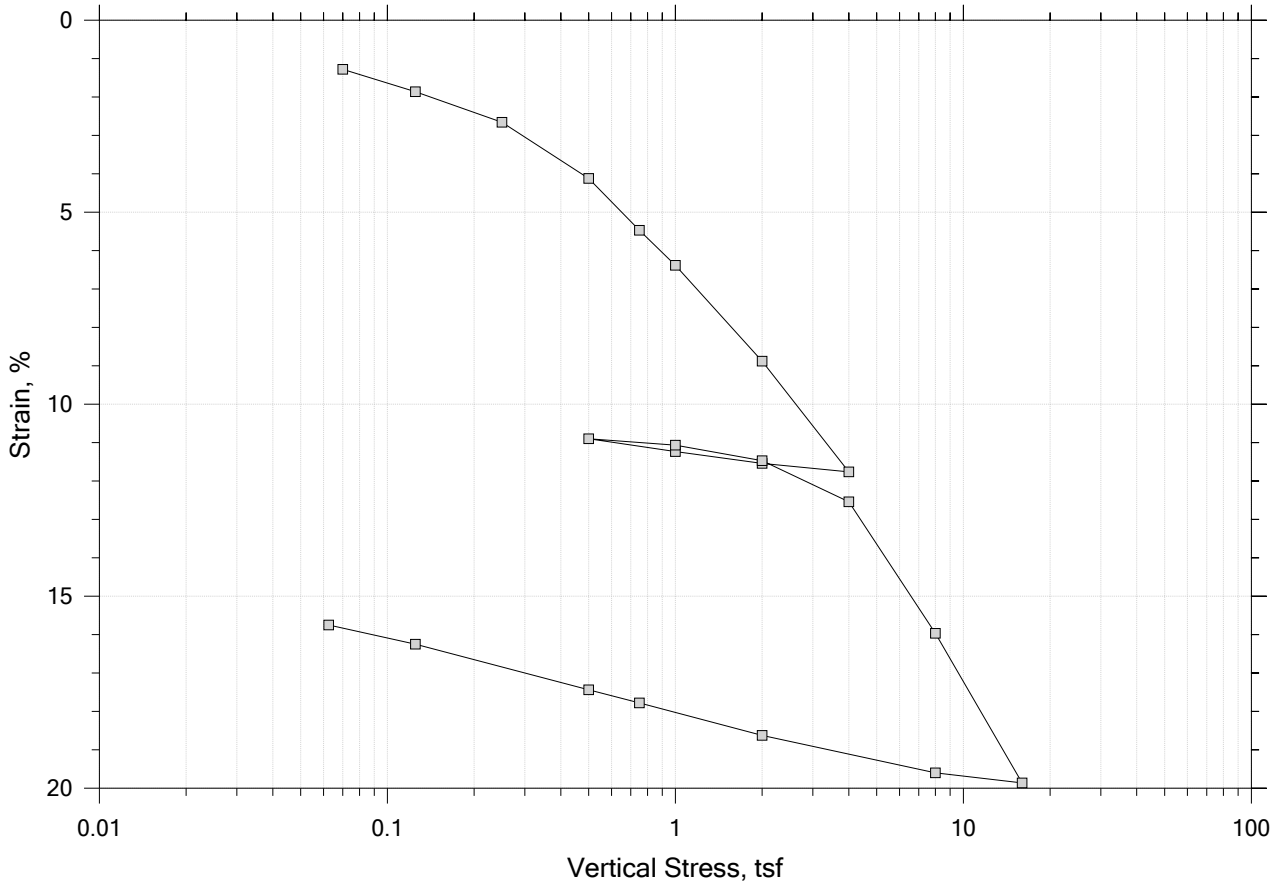
Square Root of Time Coefficients

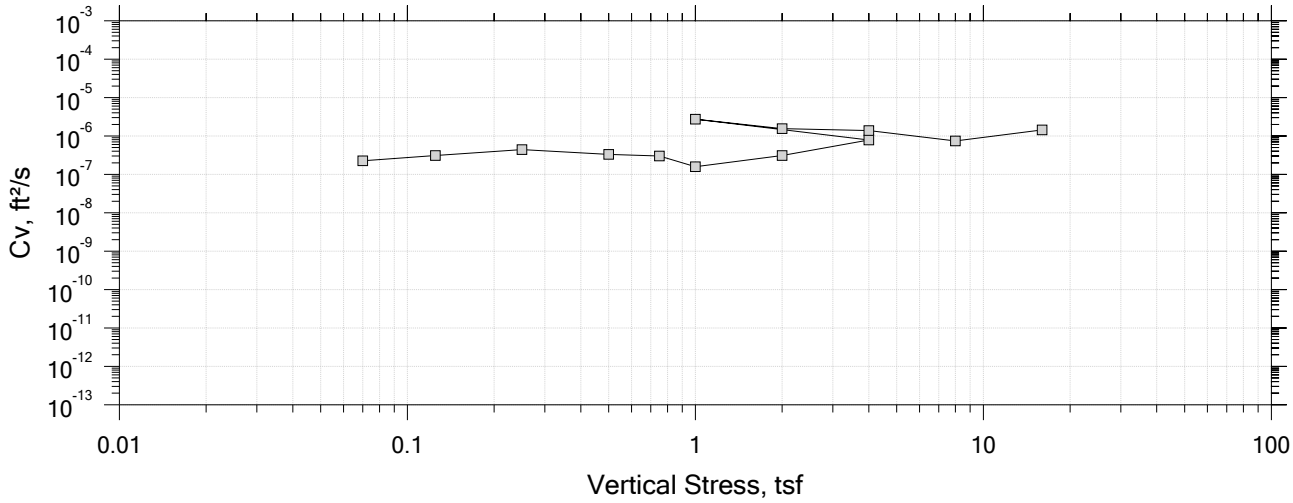
Step	Applied Stress tsf	Final Displacement in	Void Ratio	Strain at End %	Sq.Rt. T90 min	Cv ft²/s	Mv 1/tsf	k ft/day
1	0.0691	0.003400	0.904	0.340	7.351	3.33e-06	4.92e-02	4.41e-04
2	0.125	0.006939	0.898	0.694	31.521	7.70e-07	6.33e-02	1.32e-04
3	0.250	0.01230	0.887	1.23	19.495	1.23e-06	4.29e-02	1.43e-04
4	0.500	0.02155	0.870	2.15	28.462	8.33e-07	3.70e-02	8.31e-05
5	0.750	0.02927	0.855	2.93	74.226	3.14e-07	3.09e-02	2.62e-05
6	1.00	0.03869	0.837	3.87	0.000	0.00e+00	3.77e-02	0.00e+00
7	2.00	0.06168	0.793	6.17	132.515	1.67e-07	2.30e-02	1.04e-05
8	4.00	0.08921	0.740	8.92	20.854	1.01e-06	1.38e-02	3.73e-05
9	2.00	0.08587	0.747	8.59	5.164	3.96e-06	1.67e-03	1.78e-05
10	1.00	0.08257	0.753	8.26	19.908	1.03e-06	3.30e-03	9.20e-06
11	0.500	0.07872	0.760	7.87	14.845	1.40e-06	7.70e-03	2.90e-05
12	1.00	0.08072	0.757	8.07	9.208	2.26e-06	4.00e-03	2.43e-05
13	2.00	0.08422	0.750	8.42	3.726	5.54e-06	3.50e-03	5.24e-05
14	4.00	0.09351	0.732	9.35	9.456	2.15e-06	4.64e-03	2.70e-05
15	8.00	0.1248	0.672	12.5	11.412	1.71e-06	7.82e-03	3.60e-05
16	16.0	0.1612	0.603	16.1	10.438	1.73e-06	4.55e-03	2.12e-05
17	8.00	0.1583	0.608	15.8	11.909	1.45e-06	3.56e-04	1.40e-06
18	2.00	0.1477	0.629	14.8	3.983	4.42e-06	1.77e-03	2.11e-05
19	0.750	0.1400	0.643	14.0	15.163	1.19e-06	6.18e-03	1.98e-05
20	0.500	0.1370	0.649	13.7	24.621	7.40e-07	1.19e-02	2.37e-05
21	0.125	0.1225	0.677	12.3	65.175	2.85e-07	3.85e-02	2.96e-05
22	0.0625	0.1170	0.687	11.7	279.906	6.79e-08	8.89e-02	1.63e-05

GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Brooklyn, NY	Project No.: GTX-308805
	Boring No.: BB-PVS-203	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 01/22/19	Depth: 25-27 ft
	Test No.: IP-10	Sample Type: intact	Elevation: ---
	Description: Moist, grey clay w/silt		
	Remarks: System S, Swell Pressure = 0.0691 tsf		
	Displacement at End of Increment		

One-Dimensional Consolidation by ASTM D2435 - Method B

Summary Report

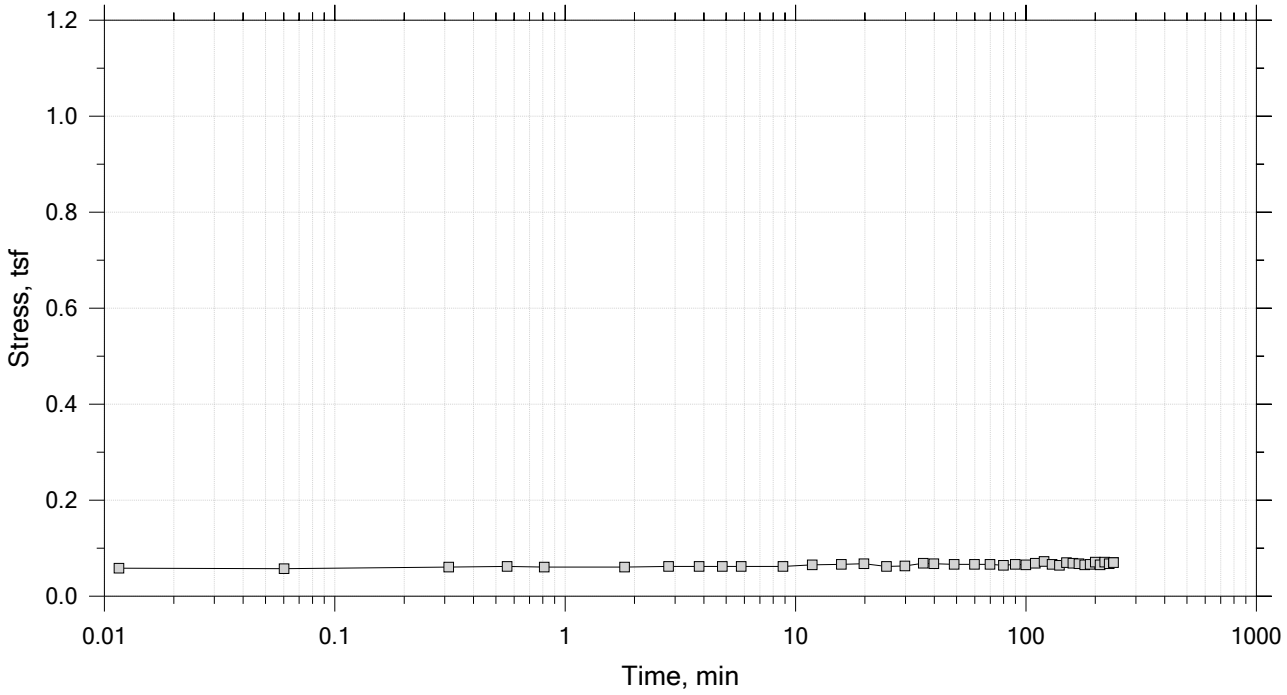


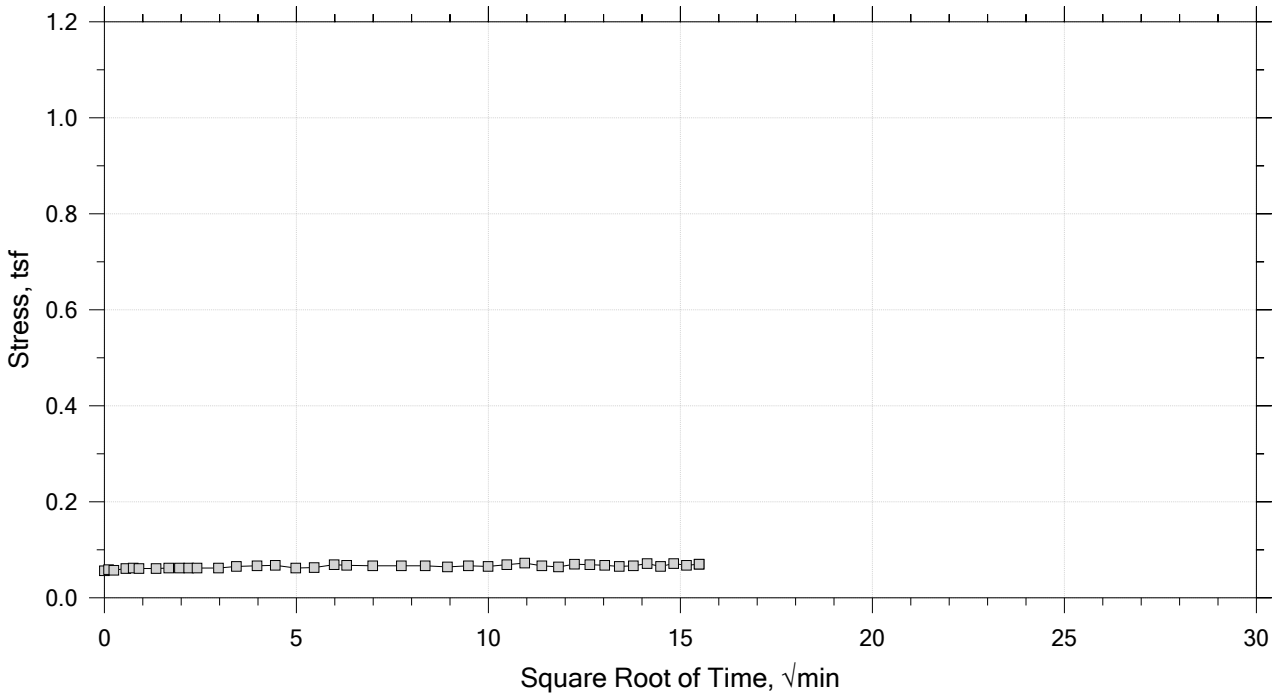


GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-203	Tested By: md	Checked By: mcm
	Sample No.: U2	Test Date: 01/16/19	Depth: 40-42 ft
	Test No.: IP-7	Sample Type: intact	Elevation: ---
	Description: Moist, olive gray clay		
	Remarks: System KK, Swell Pressure = 0.0699 tsf		
	Displacement at End of Increment		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 1 of 22
Constant Volume Step
Stress: 0.0699 tsf





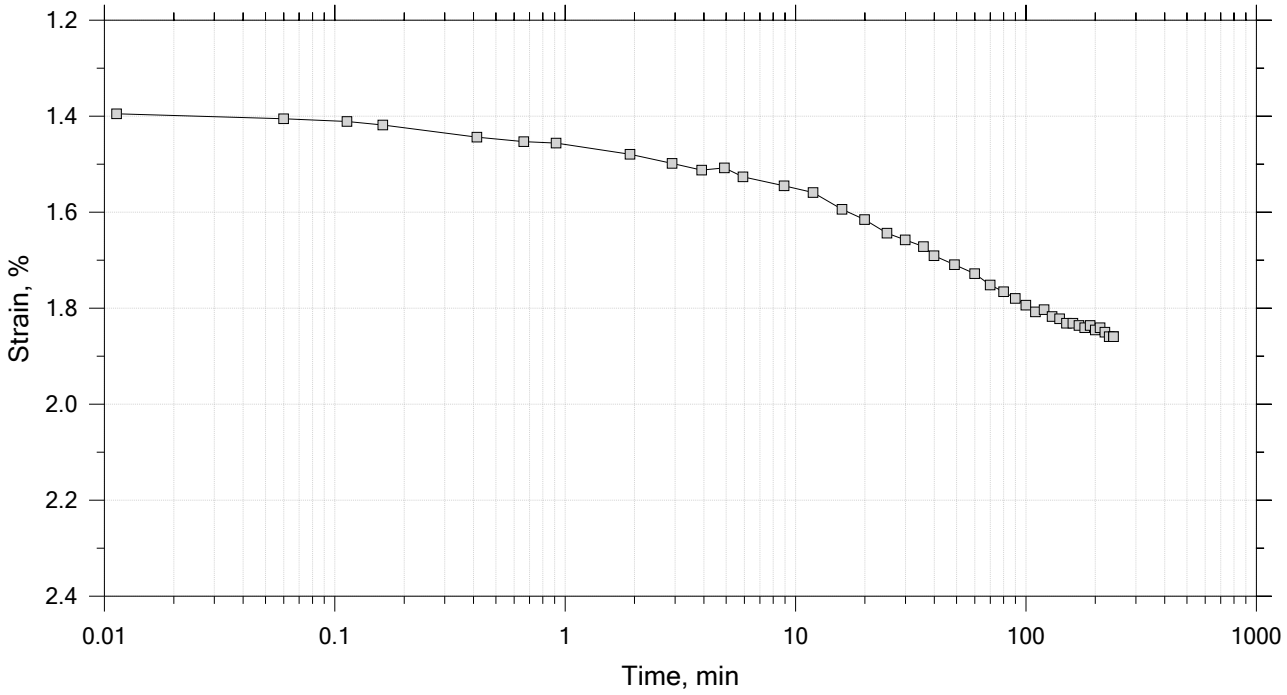
GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-203	Tested By: md	Checked By: mcm
	Sample No.: U2	Test Date: 01/16/19	Depth: 40-42 ft
	Test No.: IP-7	Sample Type: intact	Elevation: ---
	Description: Moist, olive gray clay		
	Remarks: System KK, Swell Pressure = 0.0699 tsf		

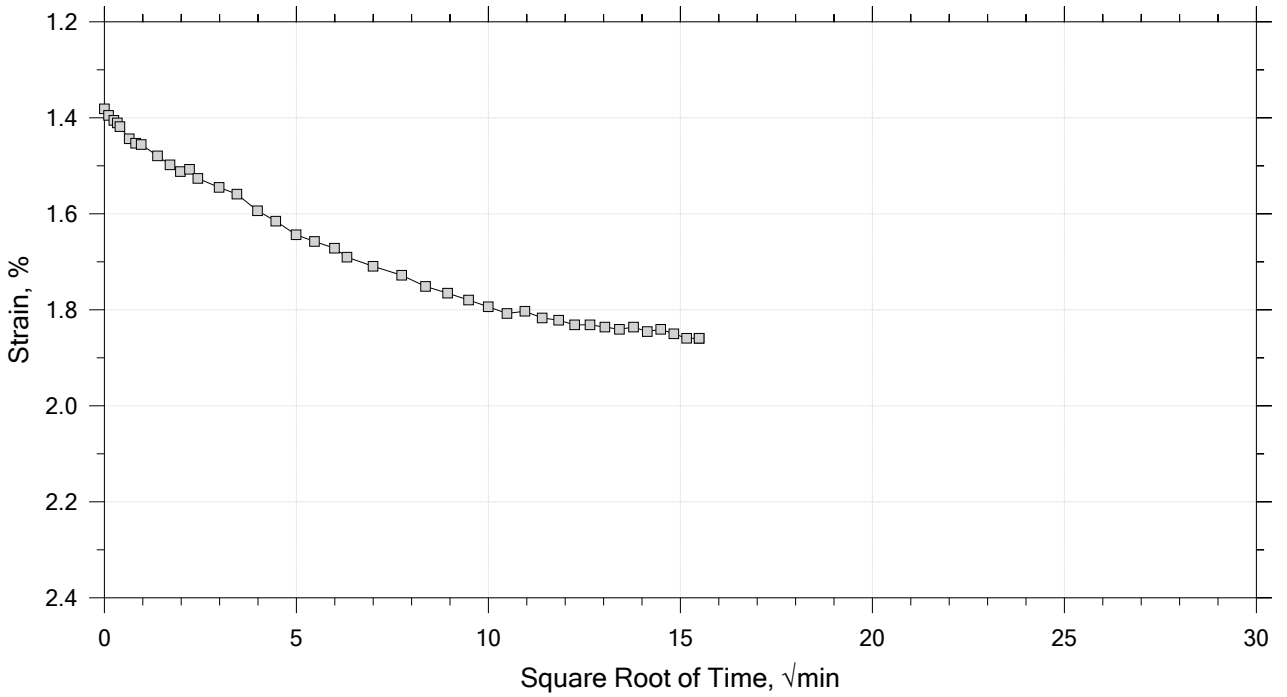
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 2 of 22

Constant Load Step

Stress: 0.125 tsf

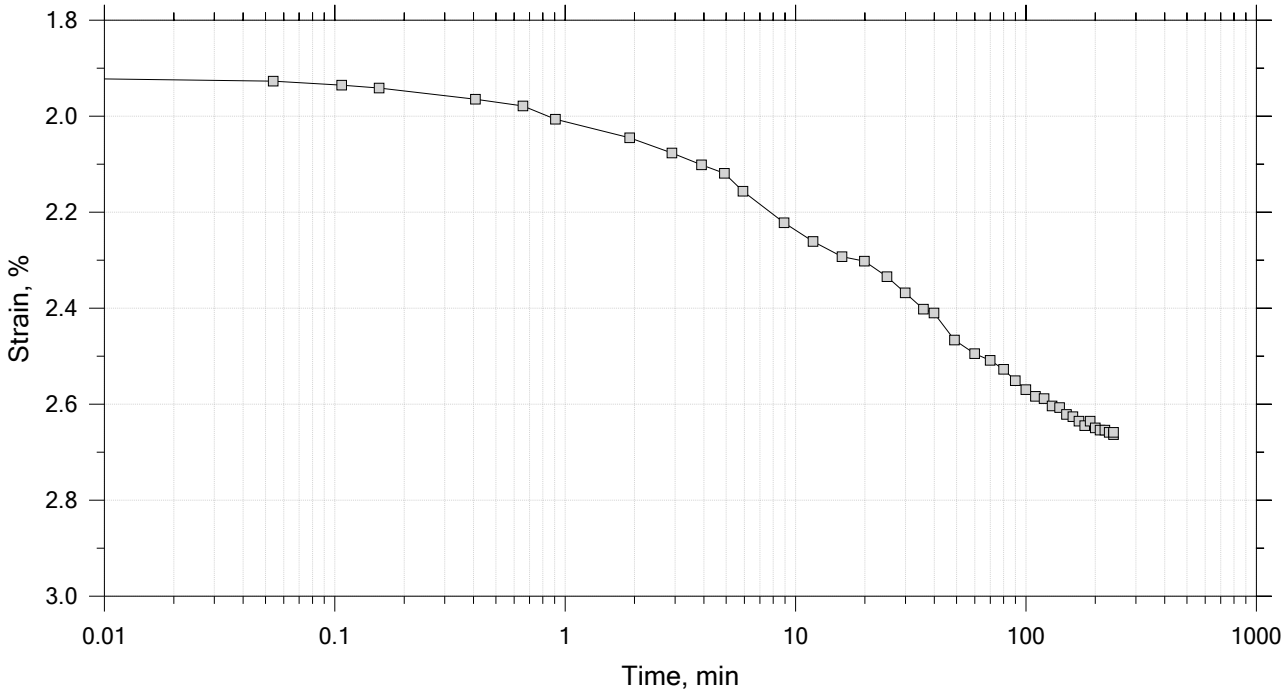


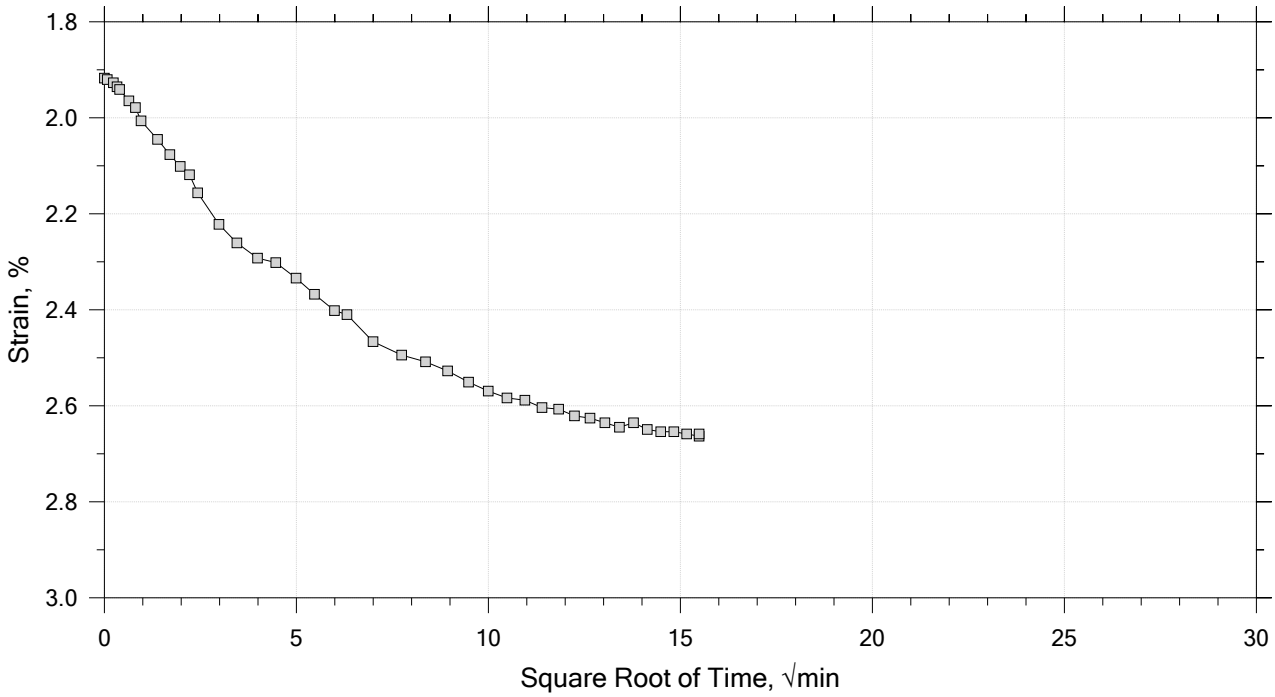


Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
Boring No.: BB-PVS-203	Tested By: md	Checked By: mcm
Sample No.: U2	Test Date: 01/16/19	Depth: 40-42 ft
Test No.: IP-7	Sample Type: intact	Elevation: ---
Description: Moist, olive gray clay		
Remarks: System KK, Swell Pressure = 0.0699 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 3 of 22
Constant Load Step
Stress: 0.25 tsf





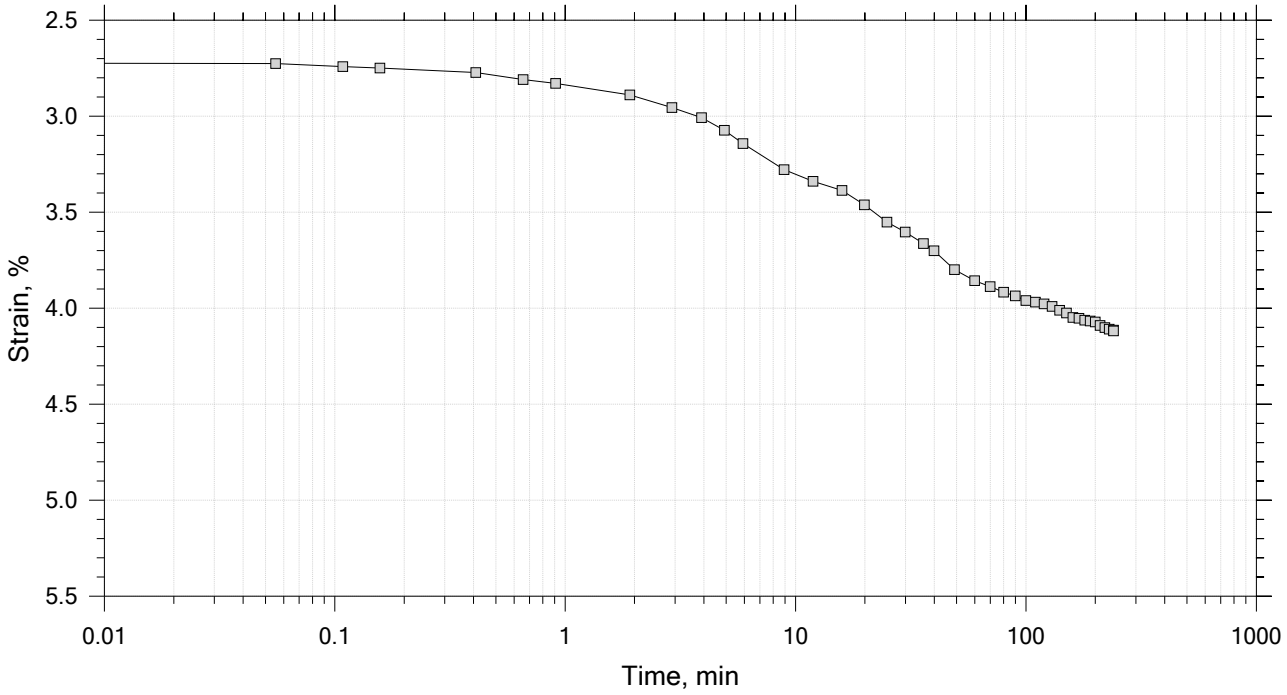
GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-203	Tested By: md	Checked By: mcm
	Sample No.: U2	Test Date: 01/16/19	Depth: 40-42 ft
	Test No.: IP-7	Sample Type: intact	Elevation: ---
	Description: Moist, olive gray clay		
	Remarks: System KK, Swell Pressure = 0.0699 tsf		

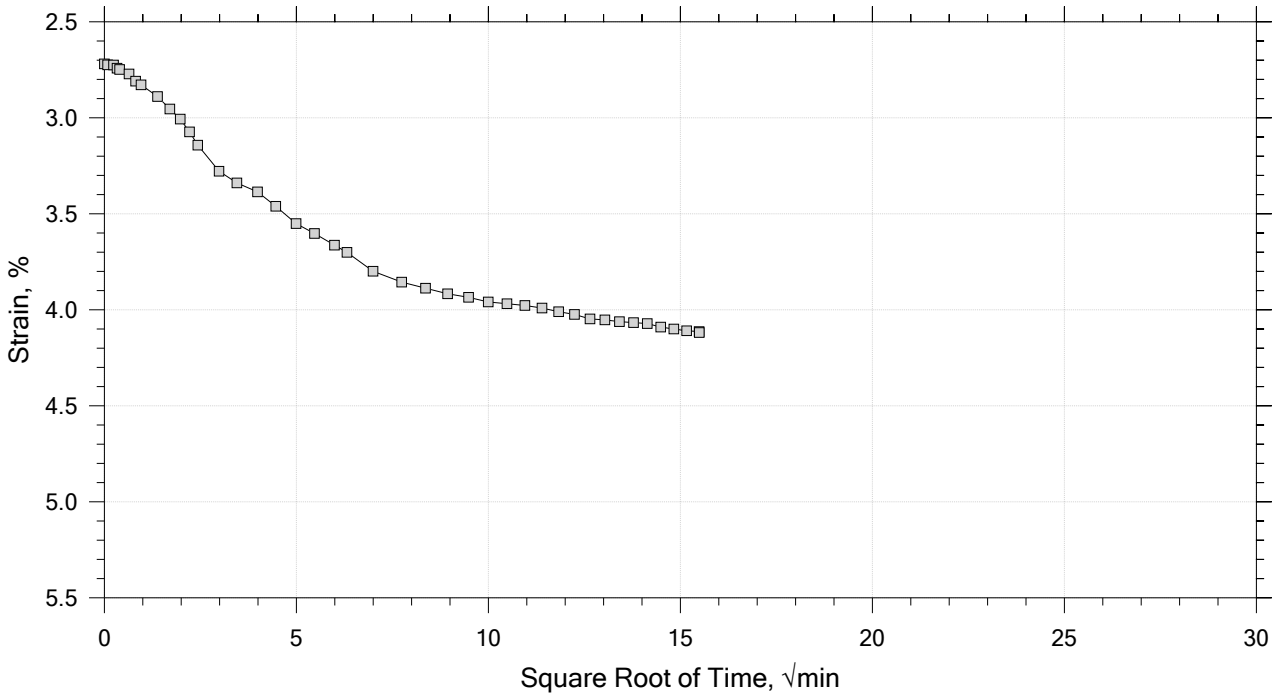
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 4 of 22

Constant Load Step

Stress: 0.5 tsf





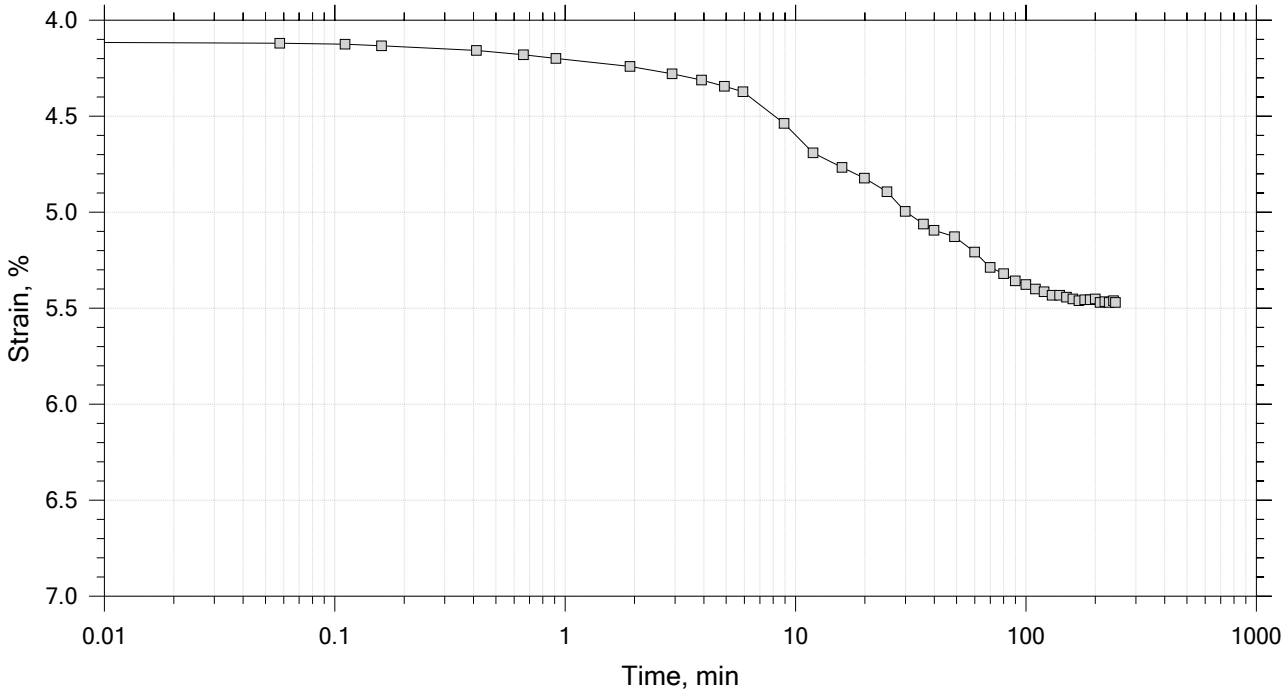
Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
Boring No.: BB-PVS-203	Tested By: md	Checked By: mcm
Sample No.: U2	Test Date: 01/16/19	Depth: 40-42 ft
Test No.: IP-7	Sample Type: intact	Elevation: ---
Description: Moist, olive gray clay		
Remarks: System KK, Swell Pressure = 0.0699 tsf		

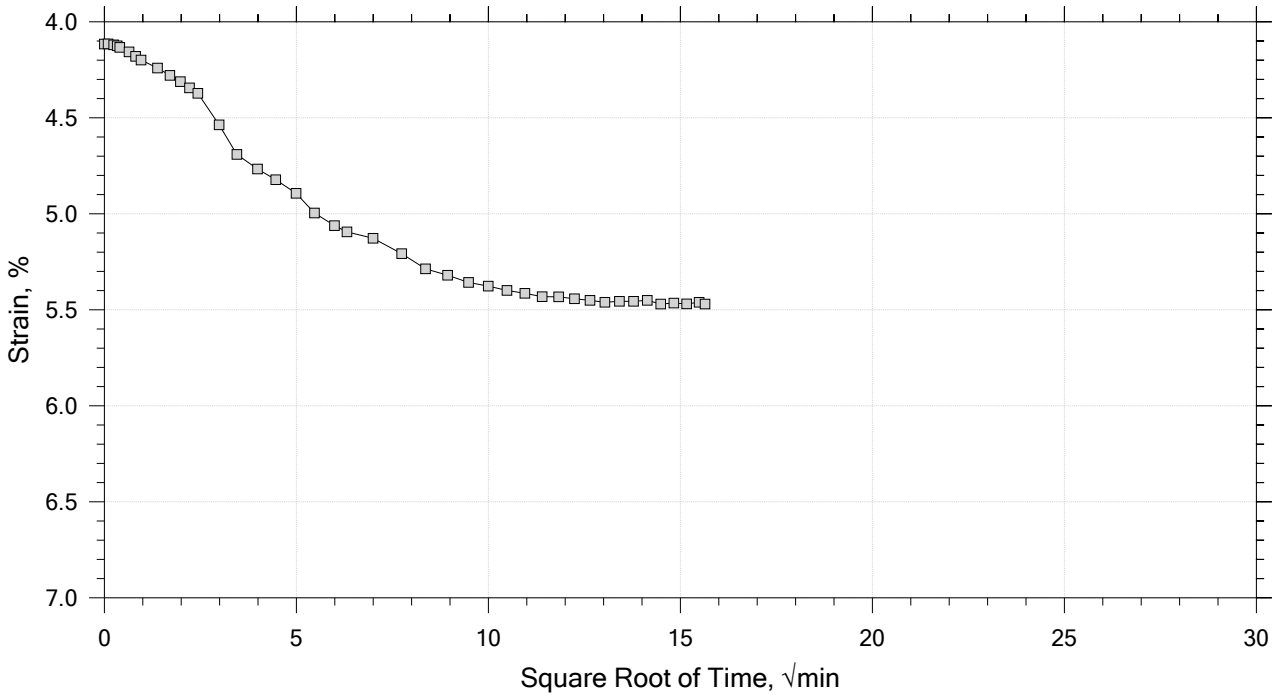
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 5 of 22

Constant Load Step

Stress: 0.75 tsf





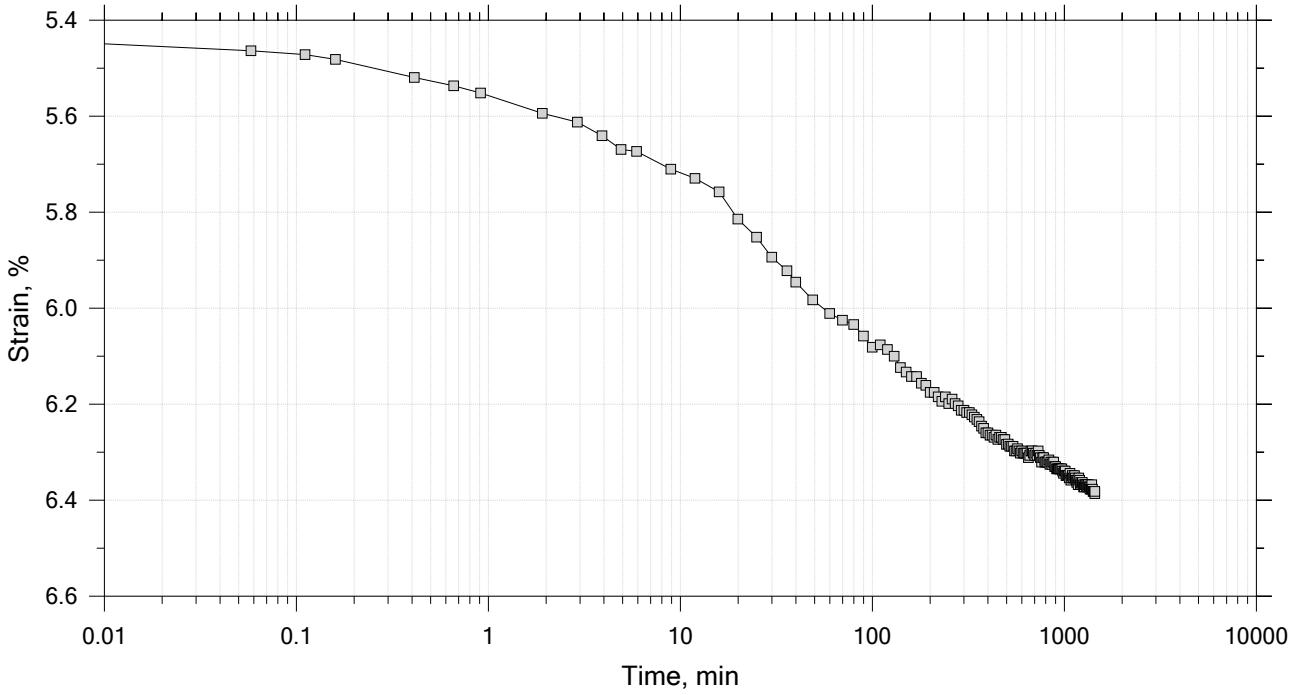
GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-203	Tested By: md	Checked By: mcm
	Sample No.: U2	Test Date: 01/16/19	Depth: 40-42 ft
	Test No.: IP-7	Sample Type: intact	Elevation: ---
	Description: Moist, olive gray clay		
	Remarks: System KK, Swell Pressure = 0.0699 tsf		

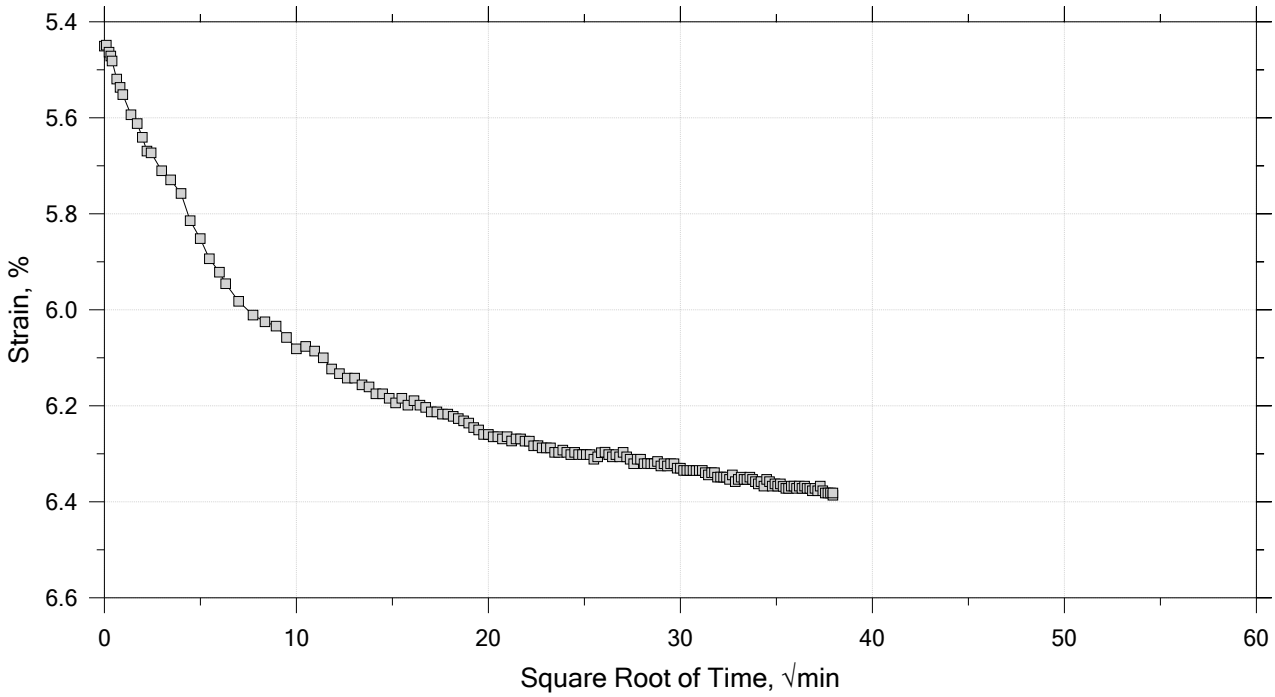
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 6 of 22

Constant Load Step

Stress: 1 tsf





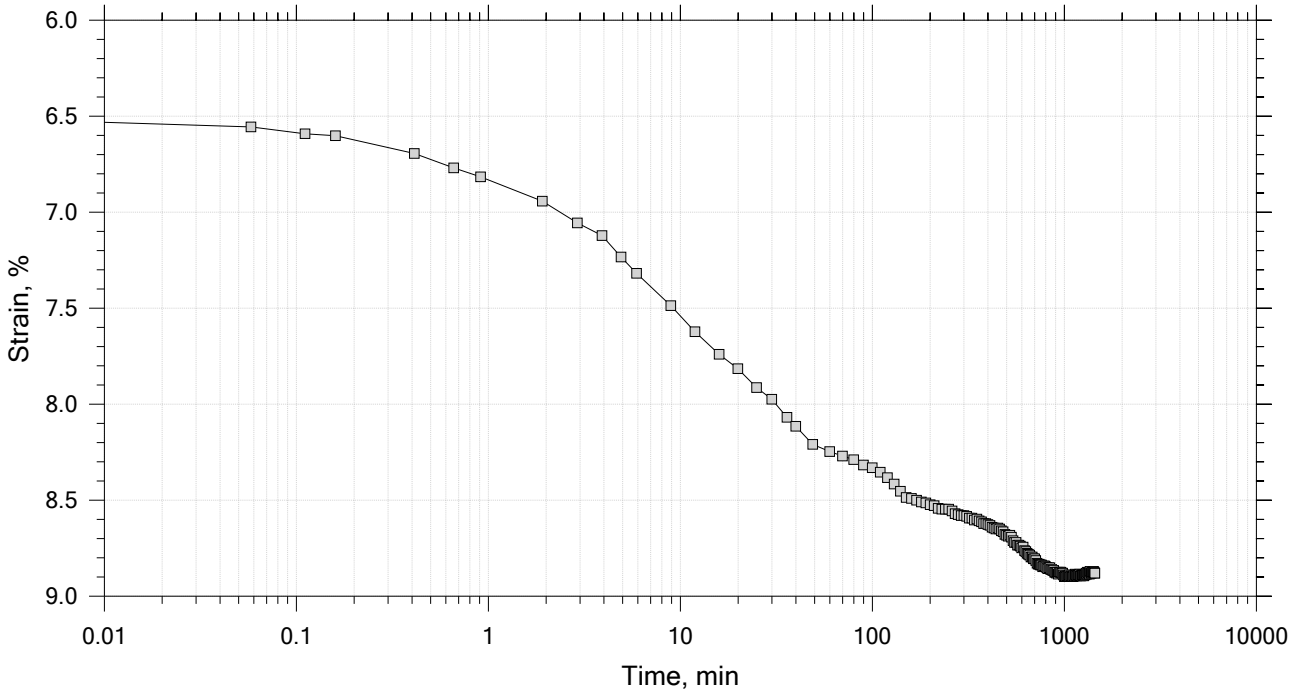
GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-203	Tested By: md	Checked By: mcm
	Sample No.: U2	Test Date: 01/16/19	Depth: 40-42 ft
	Test No.: IP-7	Sample Type: intact	Elevation: ---
	Description: Moist, olive gray clay		
	Remarks: System KK, Swell Pressure = 0.0699 tsf		

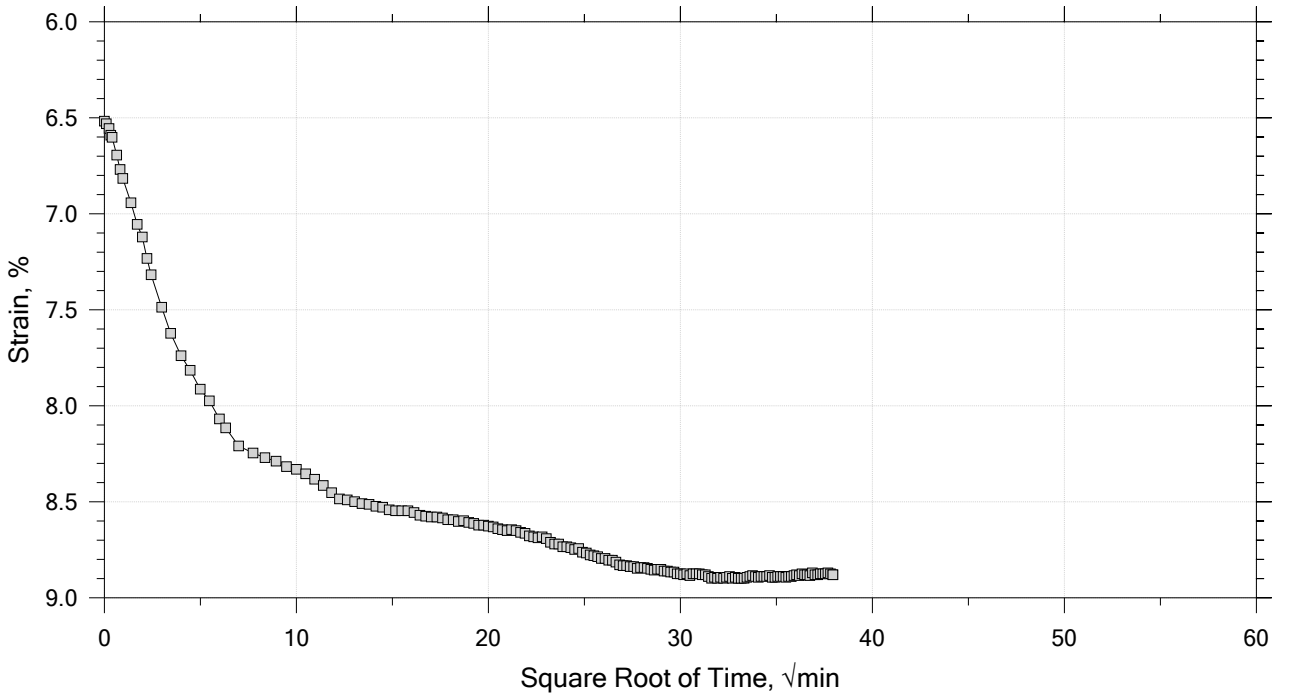
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 7 of 22

Constant Load Step

Stress: 2 tsf





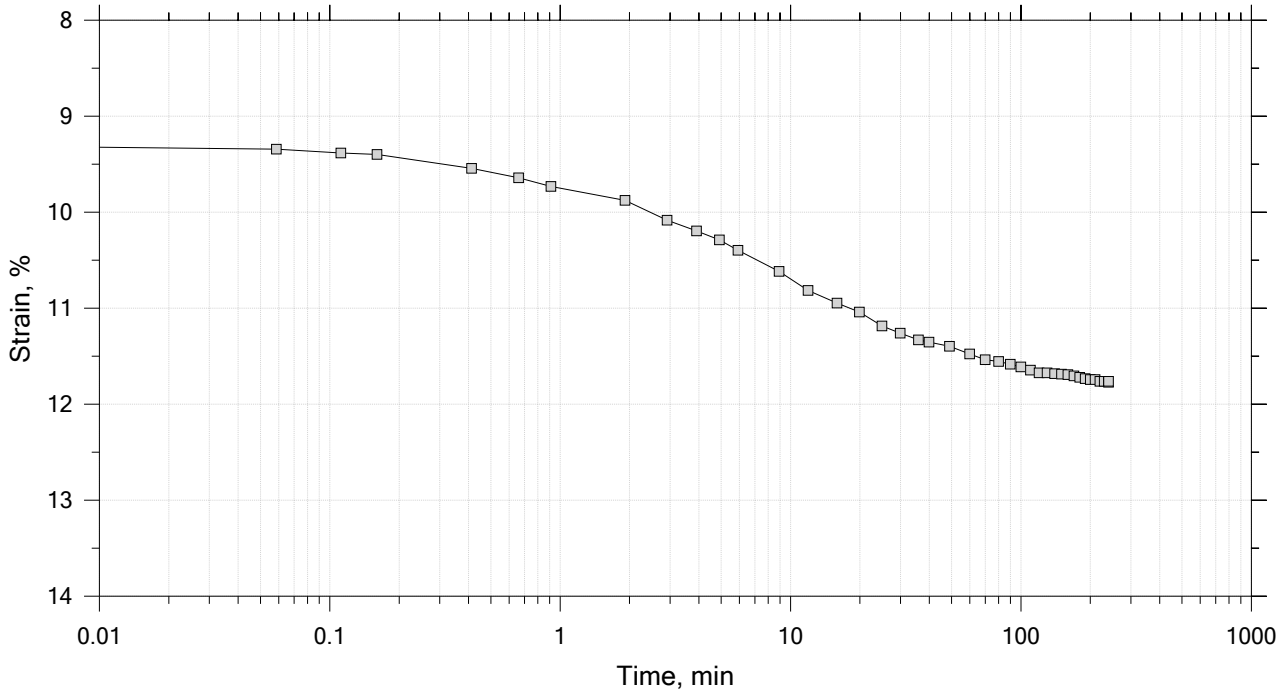
GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-203	Tested By: md	Checked By: mcm
	Sample No.: U2	Test Date: 01/16/19	Depth: 40-42 ft
	Test No.: IP-7	Sample Type: intact	Elevation: ---
	Description: Moist, olive gray clay		
	Remarks: System KK, Swell Pressure = 0.0699 tsf		

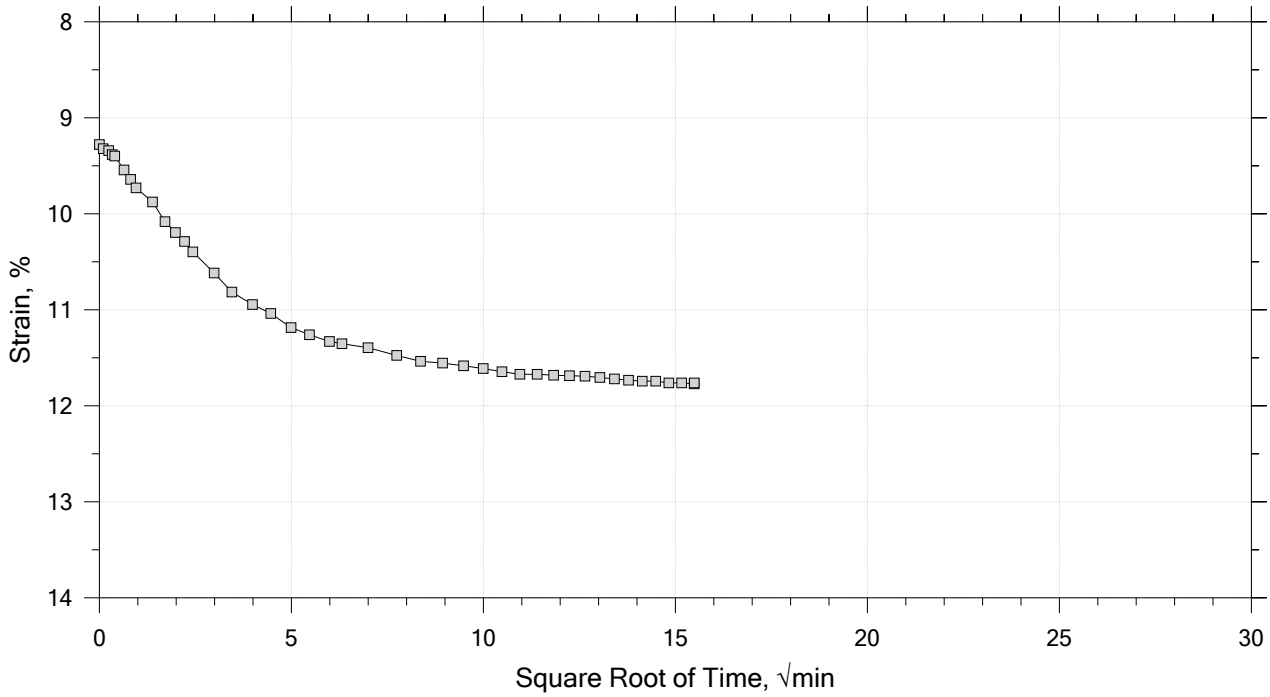
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 8 of 22

Constant Load Step

Stress: 4 tsf





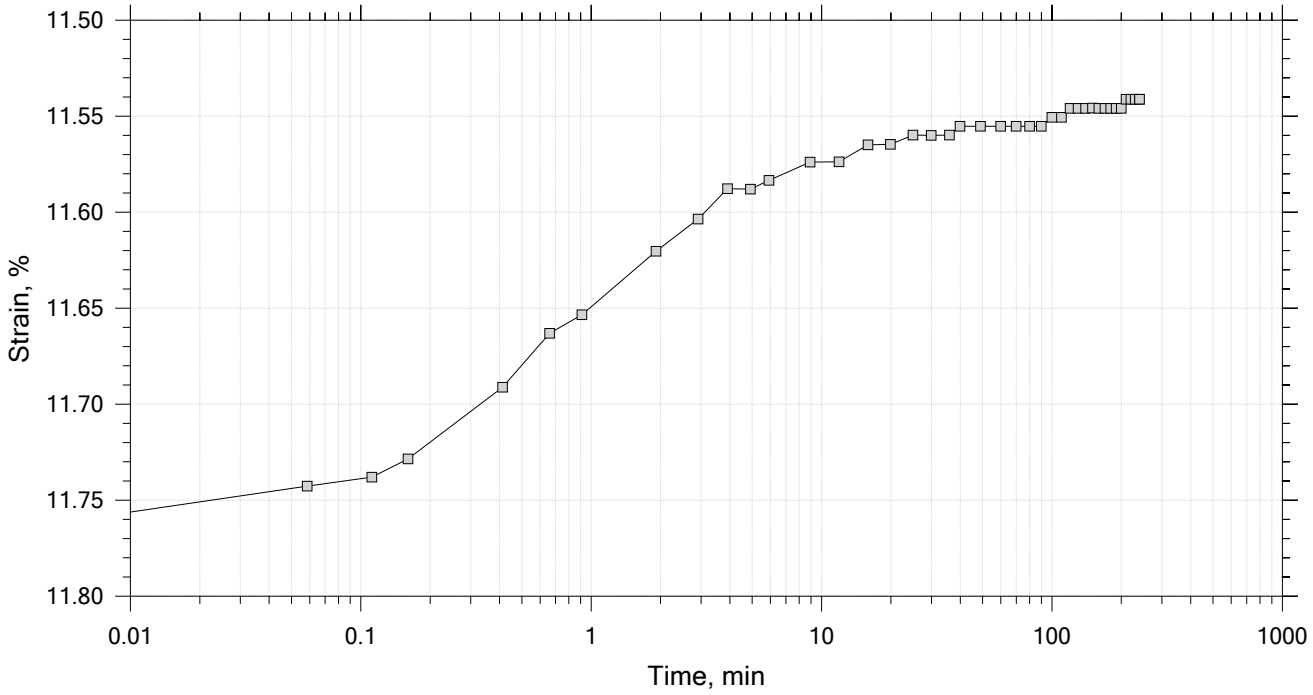
GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-203	Tested By: md	Checked By: mcm
	Sample No.: U2	Test Date: 01/16/19	Depth: 40-42 ft
	Test No.: IP-7	Sample Type: intact	Elevation: ---
	Description: Moist, olive gray clay		
	Remarks: System KK, Swell Pressure = 0.0699 tsf		

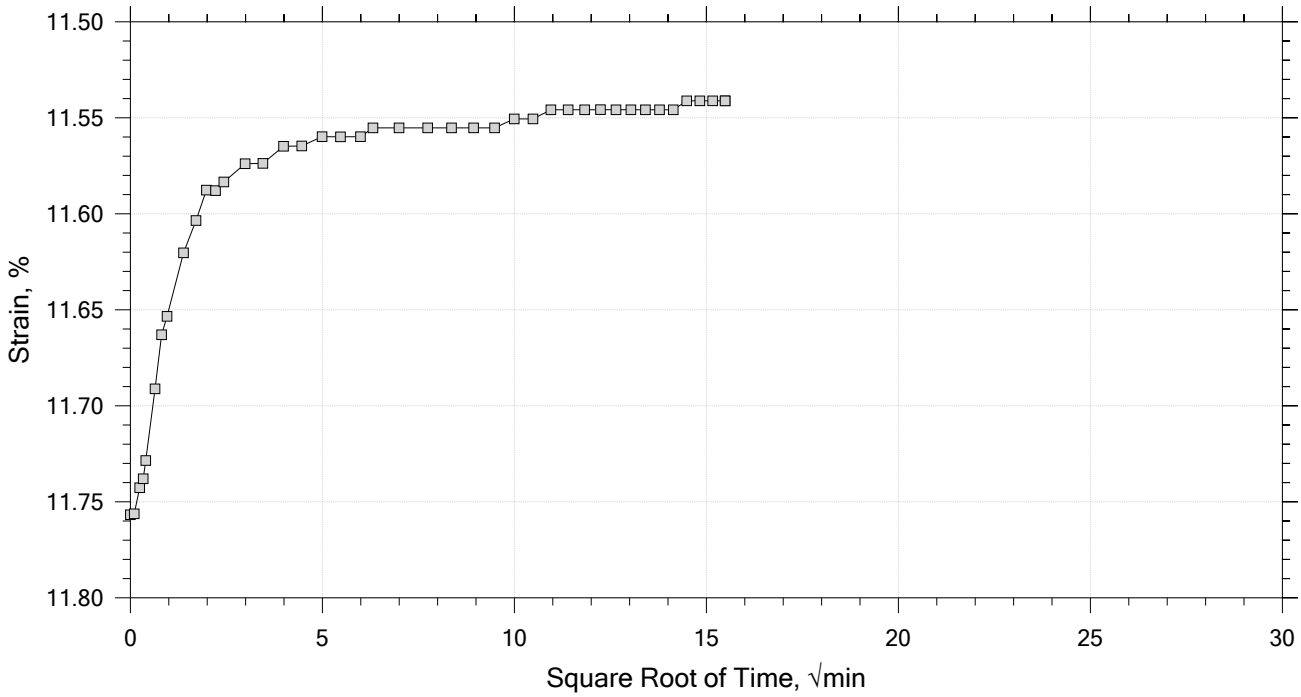
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 9 of 22

Constant Load Step

Stress: 2 tsf

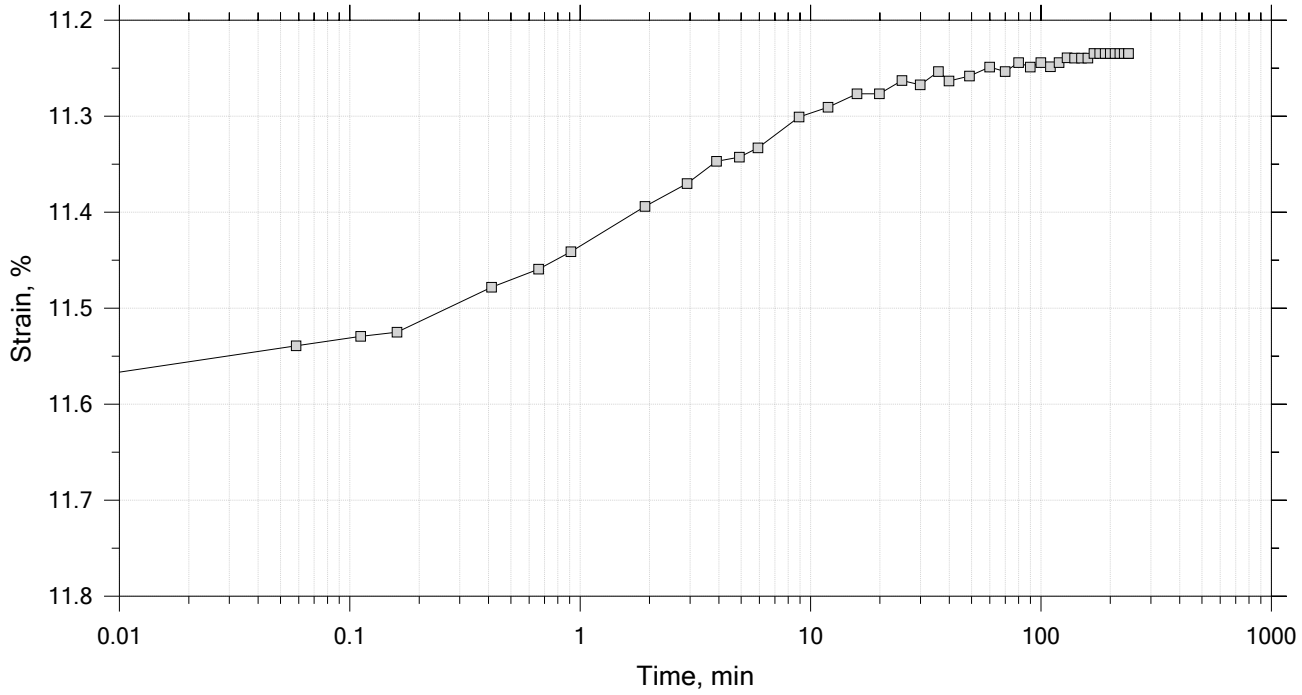


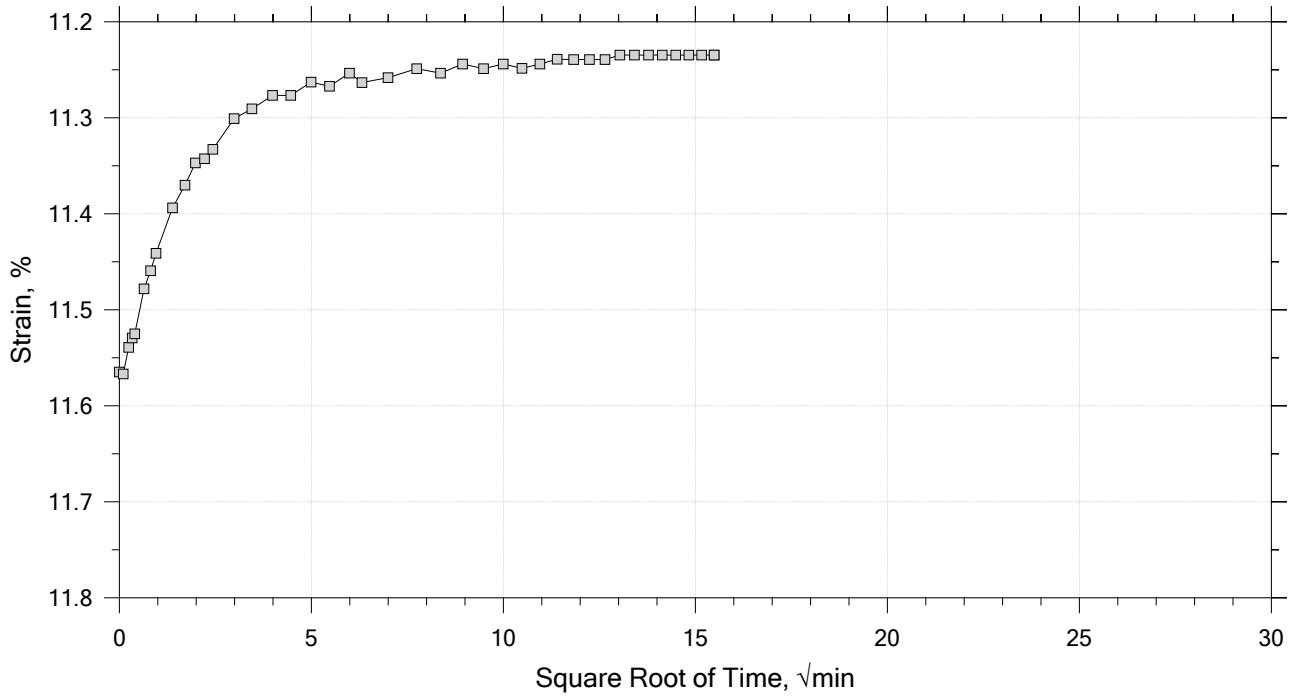


GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-203	Tested By: md	Checked By: mcm
	Sample No.: U2	Test Date: 01/16/19	Depth: 40-42 ft
	Test No.: IP-7	Sample Type: intact	Elevation: ---
	Description: Moist, olive gray clay		
	Remarks: System KK, Swell Pressure = 0.0699 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 10 of 22
Constant Load Step
Stress: 1 tsf

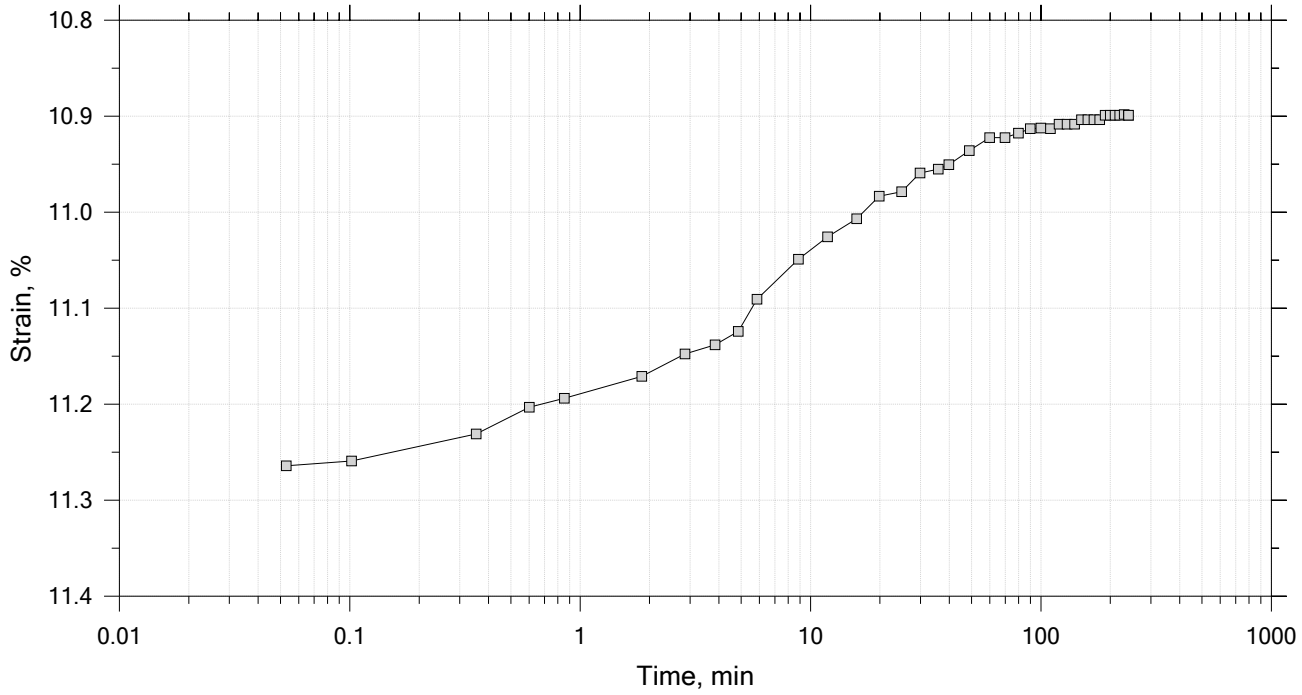


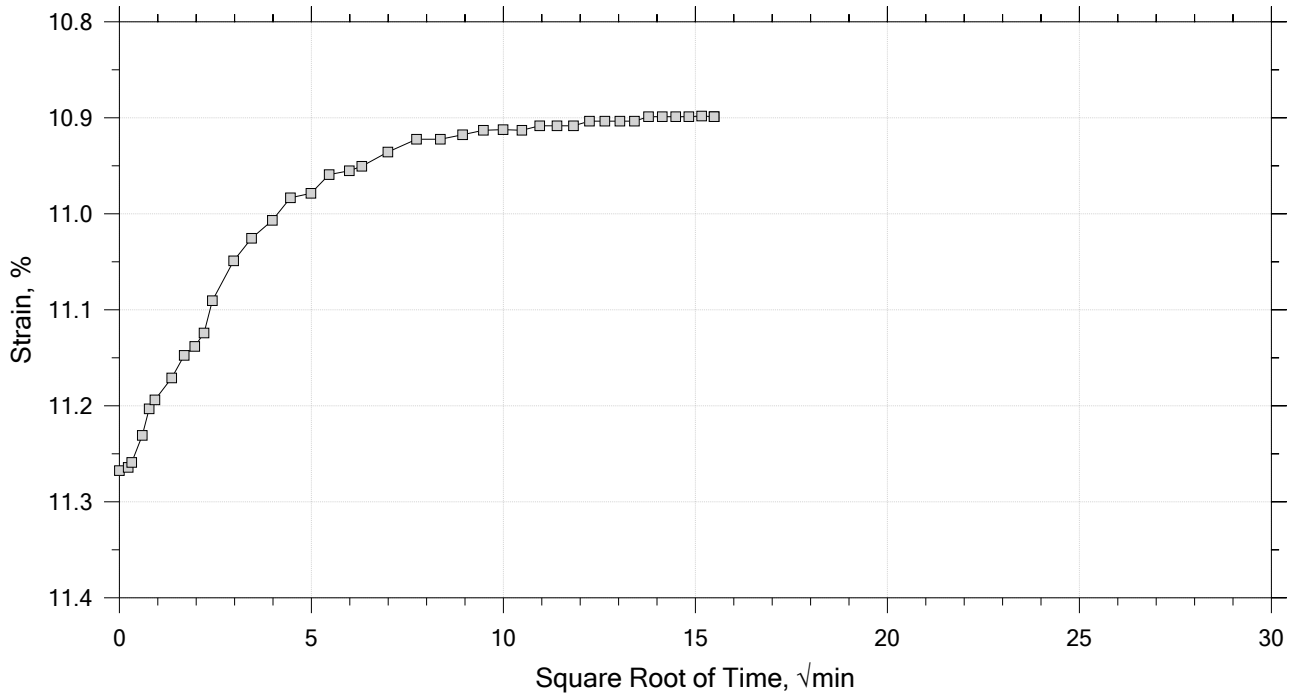


GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-203	Tested By: md	Checked By: mcm
	Sample No.: U2	Test Date: 01/16/19	Depth: 40-42 ft
	Test No.: IP-7	Sample Type: intact	Elevation: ---
	Description: Moist, olive gray clay		
	Remarks: System KK, Swell Pressure = 0.0699 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 11 of 22
Constant Load Step
Stress: 0.5 tsf





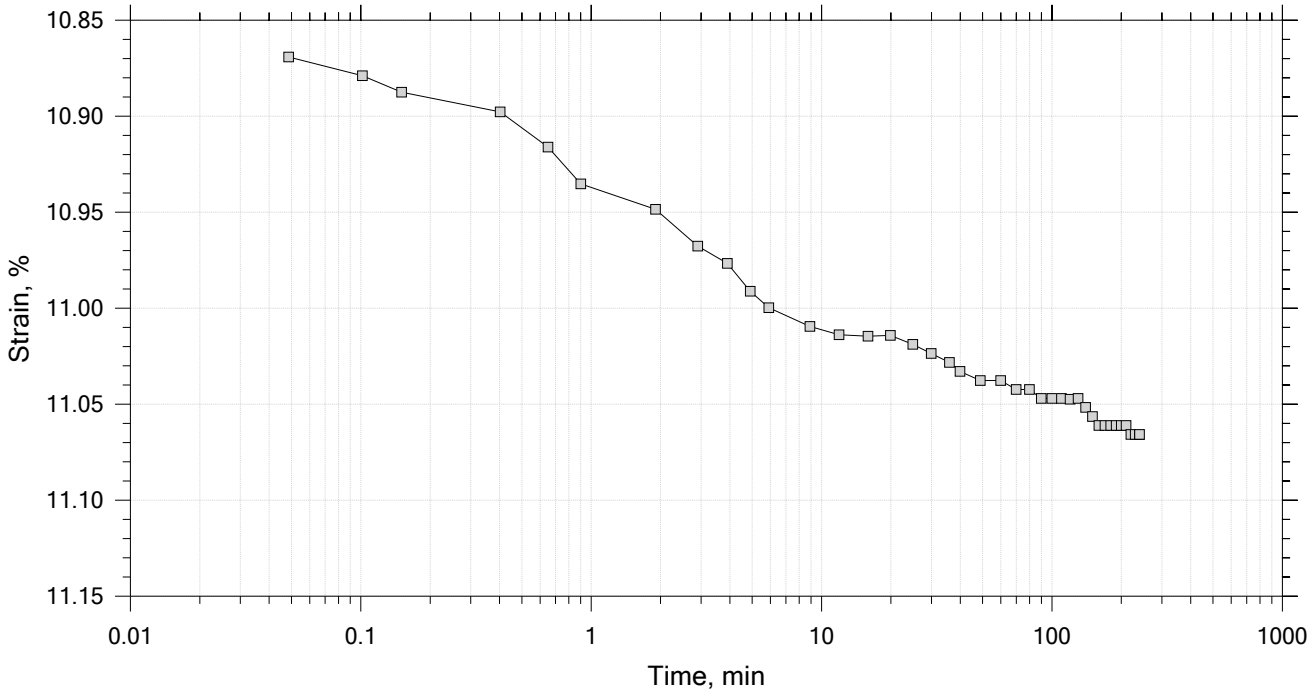
GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-203	Tested By: md	Checked By: mcm
	Sample No.: U2	Test Date: 01/16/19	Depth: 40-42 ft
	Test No.: IP-7	Sample Type: intact	Elevation: ---
	Description: Moist, olive gray clay		
	Remarks: System KK, Swell Pressure = 0.0699 tsf		

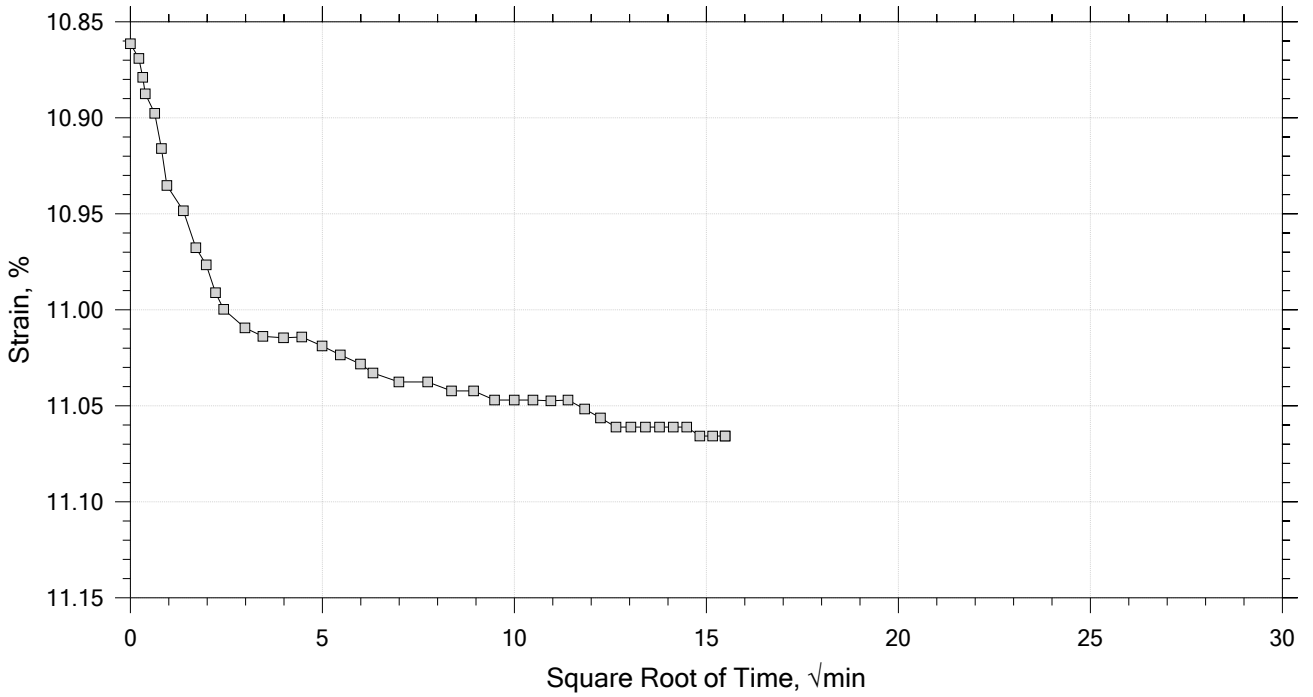
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 12 of 22

Constant Load Step

Stress: 1 tsf

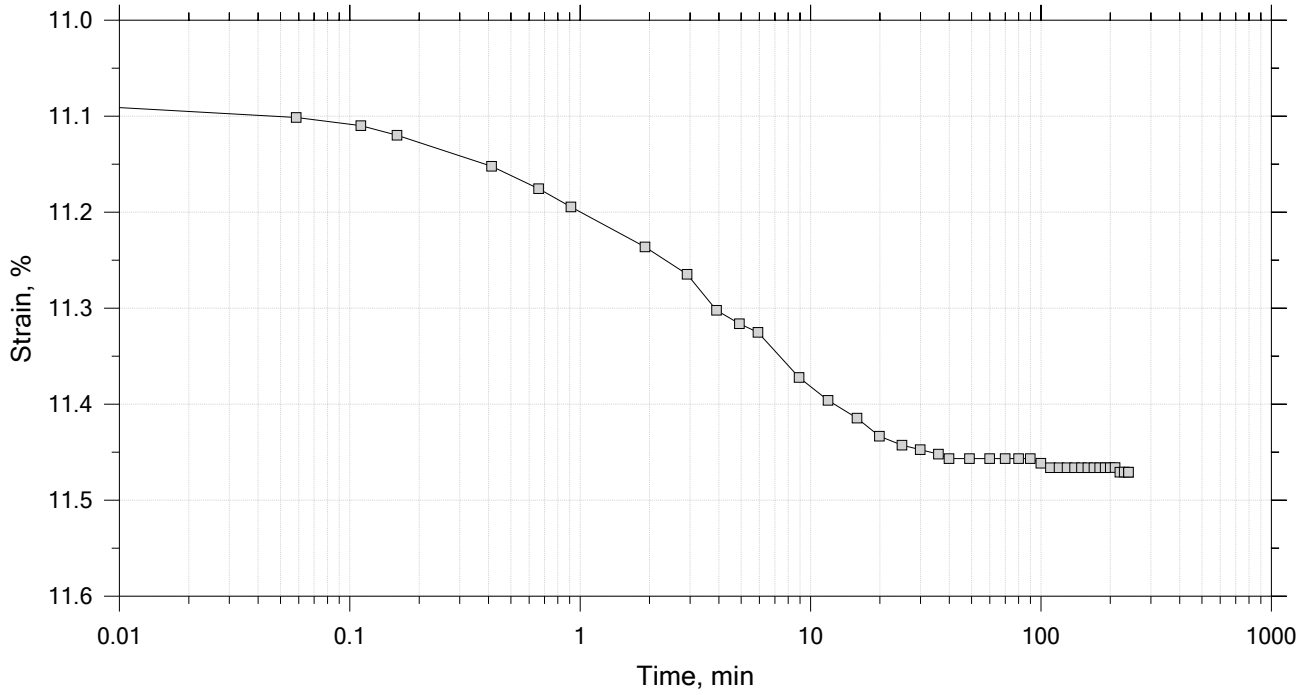


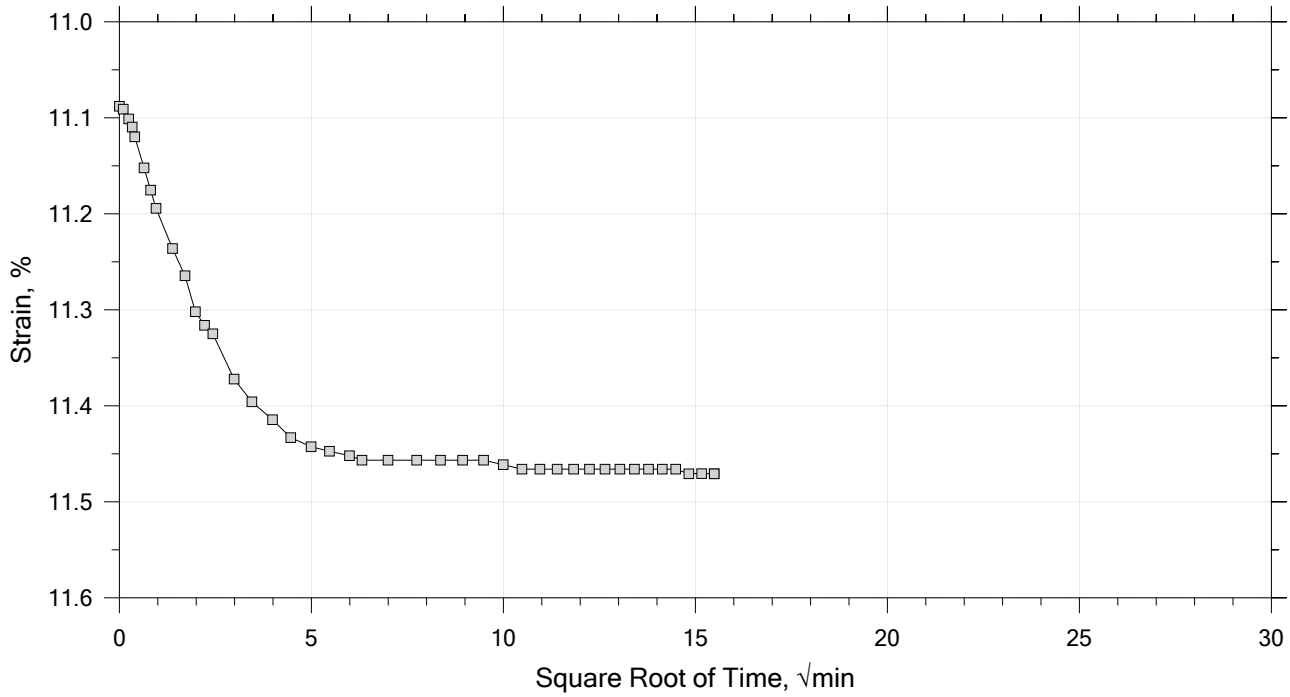


Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
Boring No.: BB-PVS-203	Tested By: md	Checked By: mcm
Sample No.: U2	Test Date: 01/16/19	Depth: 40-42 ft
Test No.: IP-7	Sample Type: intact	Elevation: ---
Description: Moist, olive gray clay		
Remarks: System KK, Swell Pressure = 0.0699 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 13 of 22
Constant Load Step
Stress: 2 tsf

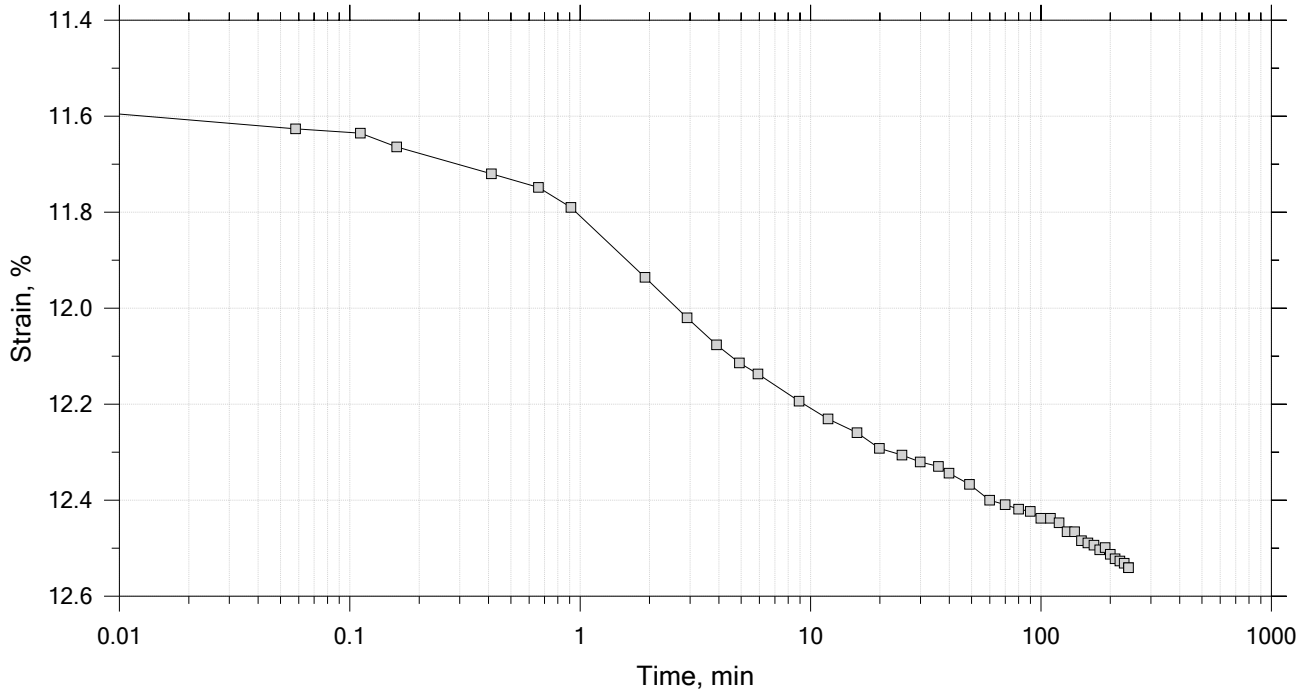


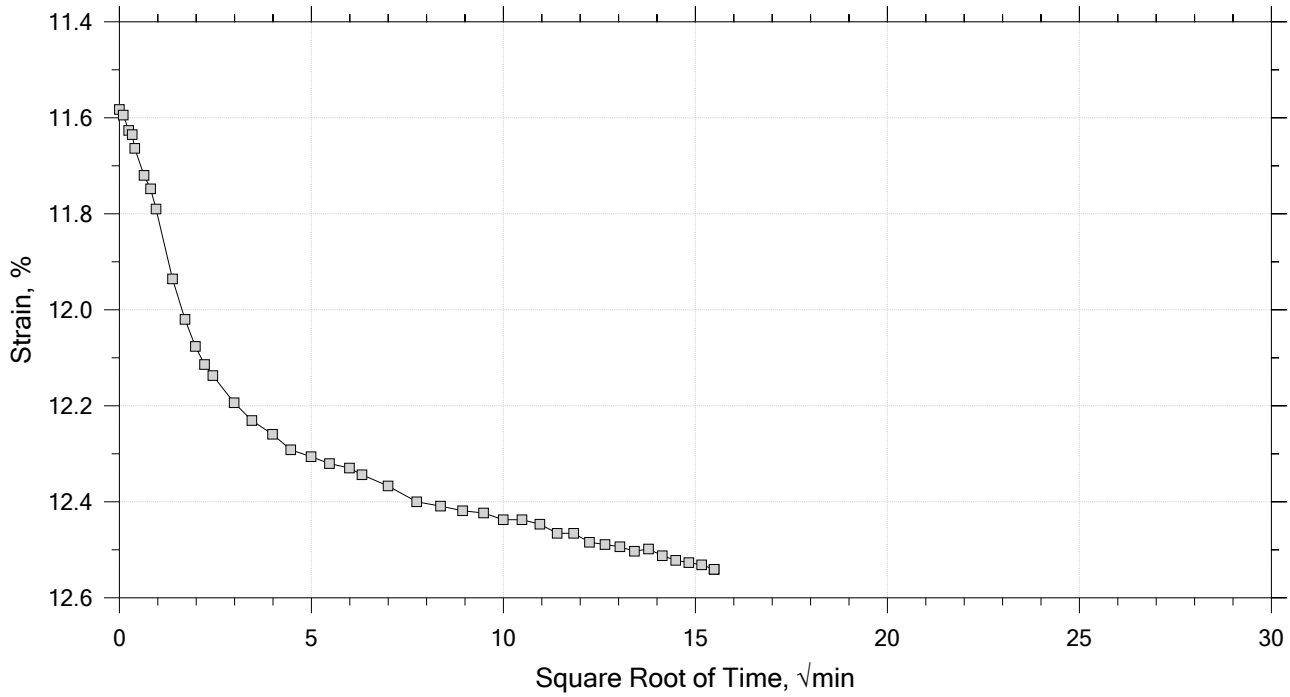


GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-203	Tested By: md	Checked By: mcm
	Sample No.: U2	Test Date: 01/16/19	Depth: 40-42 ft
	Test No.: IP-7	Sample Type: intact	Elevation: ---
	Description: Moist, olive gray clay		
	Remarks: System KK, Swell Pressure = 0.0699 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 14 of 22
Constant Load Step
Stress: 4 tsf

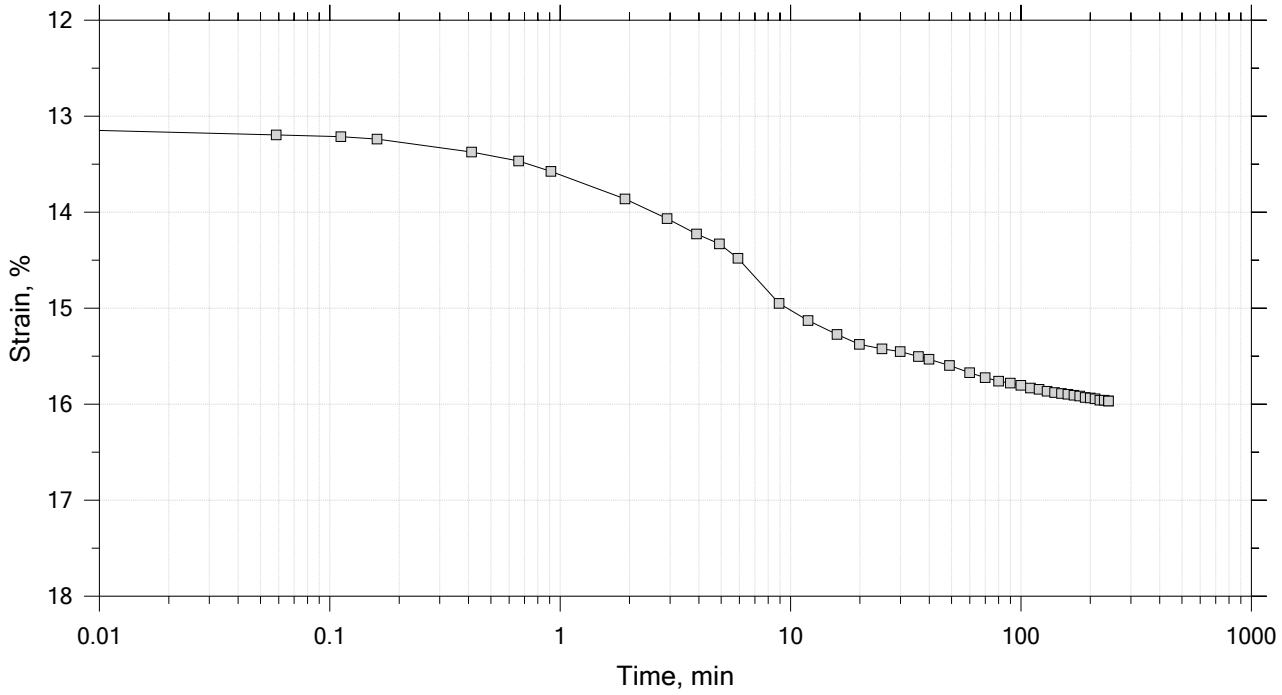


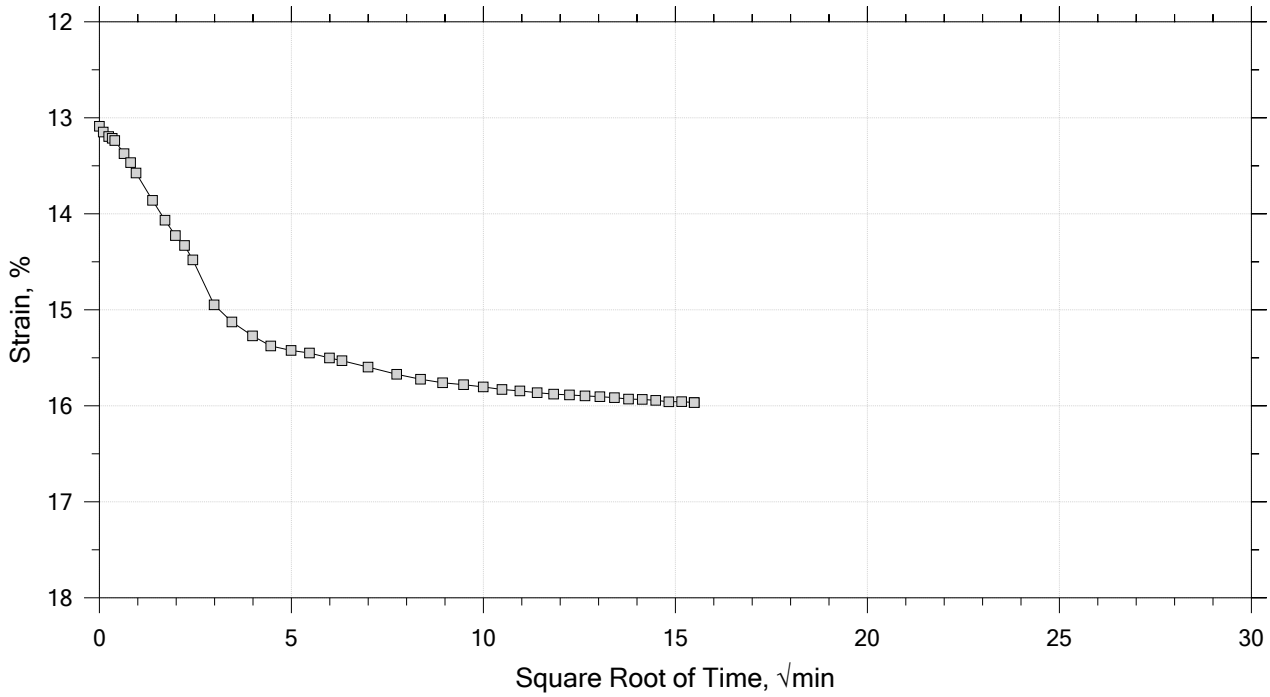


Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
Boring No.: BB-PVS-203	Tested By: md	Checked By: mcm
Sample No.: U2	Test Date: 01/16/19	Depth: 40-42 ft
Test No.: IP-7	Sample Type: intact	Elevation: ---
Description: Moist, olive gray clay		
Remarks: System KK, Swell Pressure = 0.0699 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 15 of 22
Constant Load Step
Stress: 8 tsf

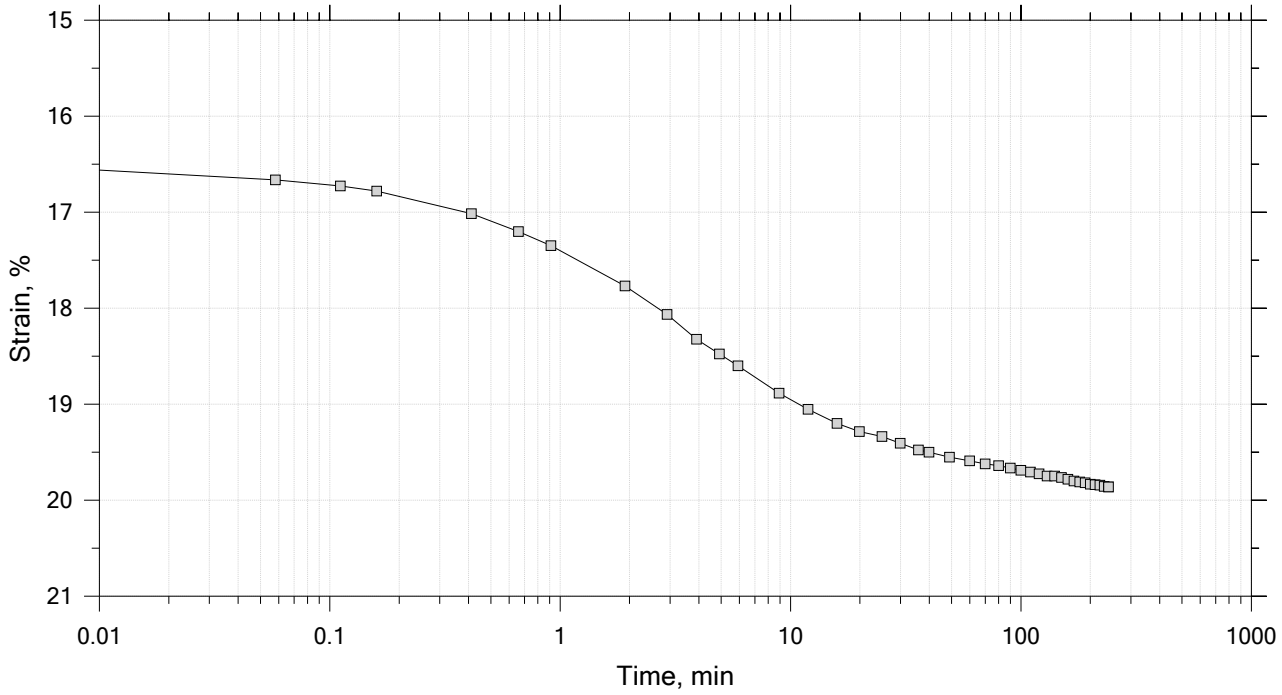


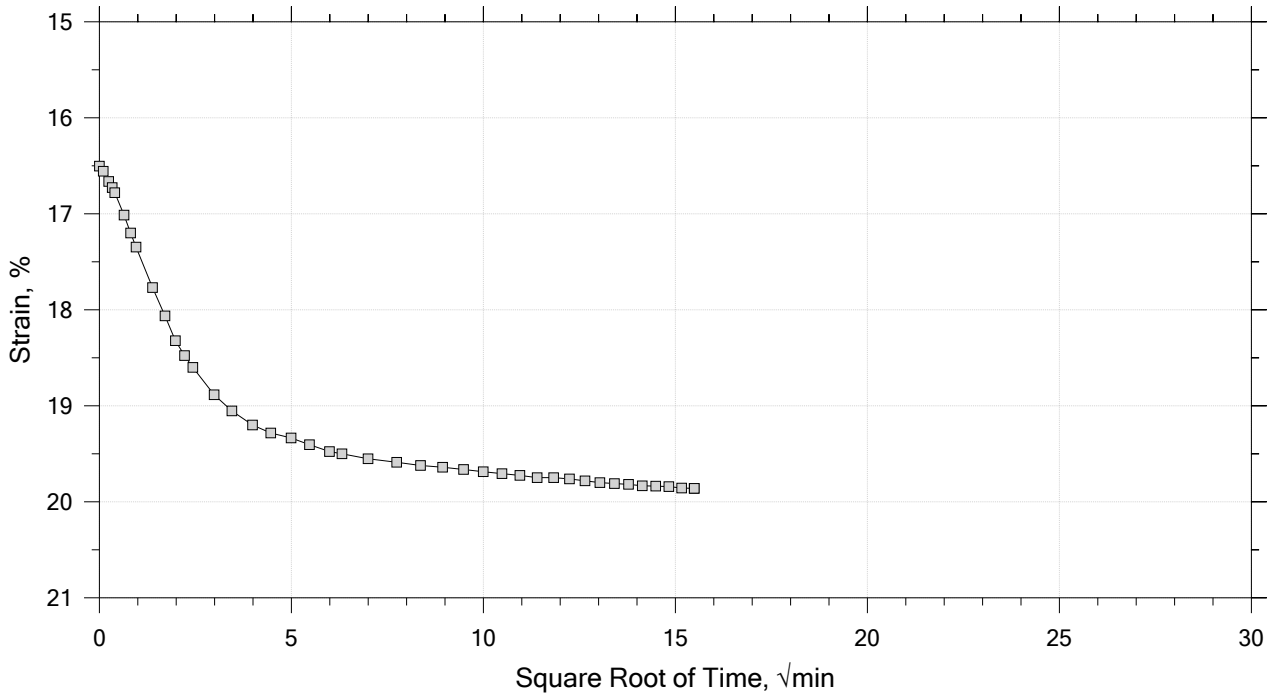


GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-203	Tested By: md	Checked By: mcm
	Sample No.: U2	Test Date: 01/16/19	Depth: 40-42 ft
	Test No.: IP-7	Sample Type: intact	Elevation: ---
	Description: Moist, olive gray clay		
	Remarks: System KK, Swell Pressure = 0.0699 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 16 of 22
Constant Load Step
Stress: 16 tsf

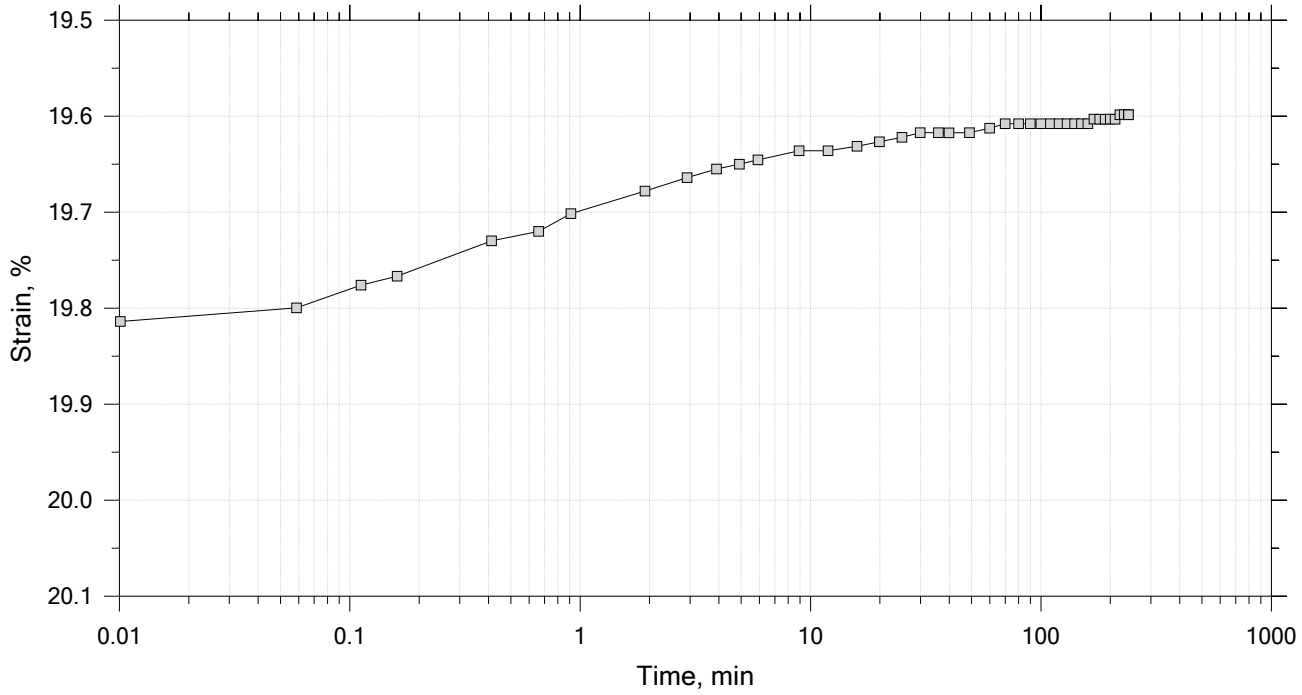


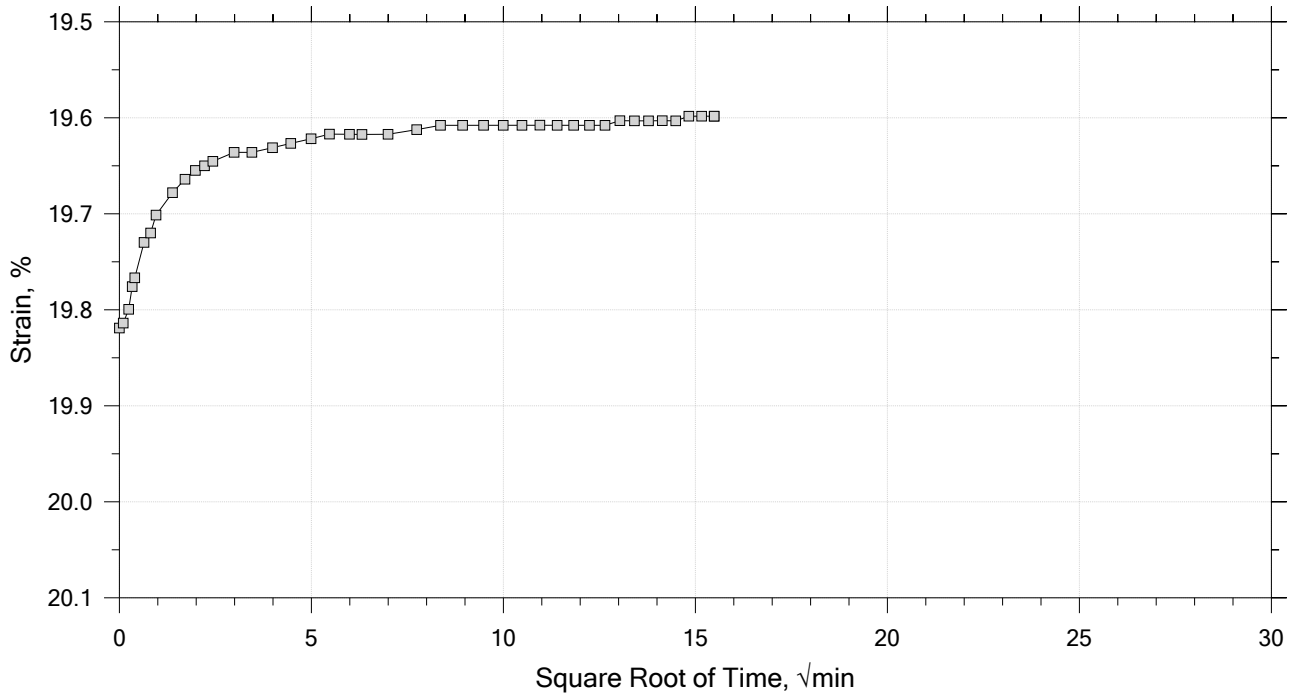


GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-203	Tested By: md	Checked By: mcm
	Sample No.: U2	Test Date: 01/16/19	Depth: 40-42 ft
	Test No.: IP-7	Sample Type: intact	Elevation: ---
	Description: Moist, olive gray clay		
	Remarks: System KK, Swell Pressure = 0.0699 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 17 of 22
Constant Load Step
Stress: 8 tsf

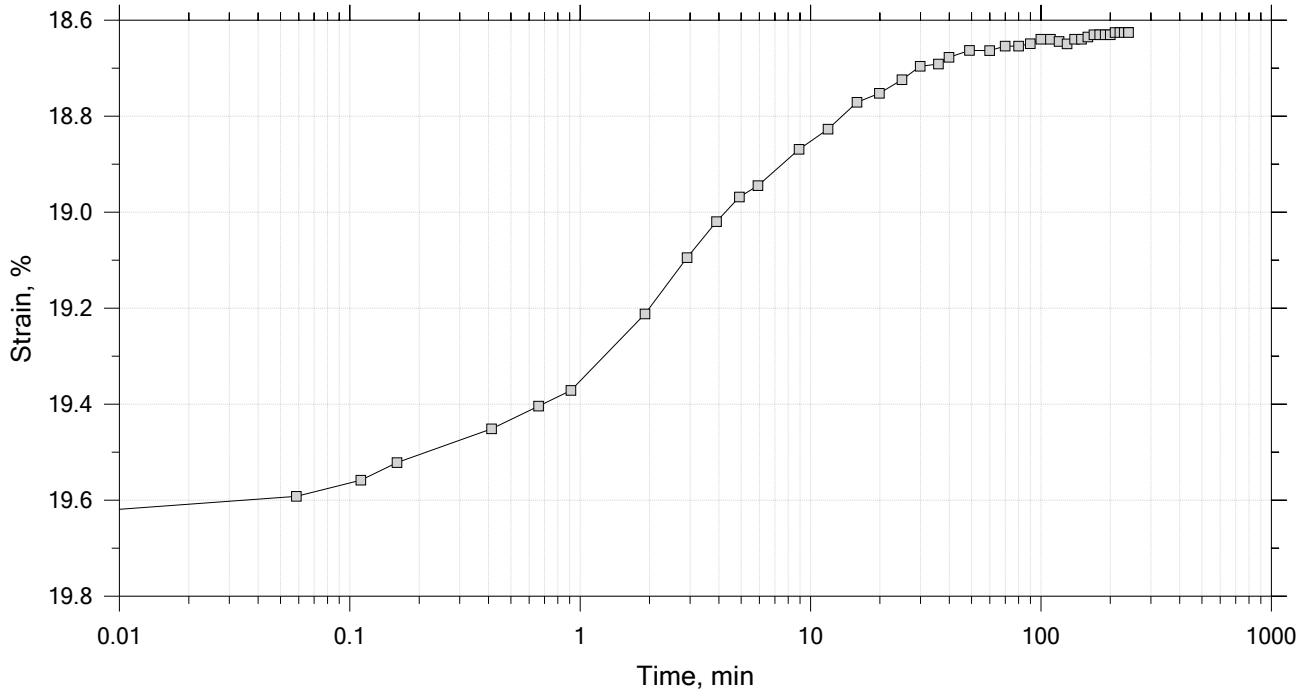


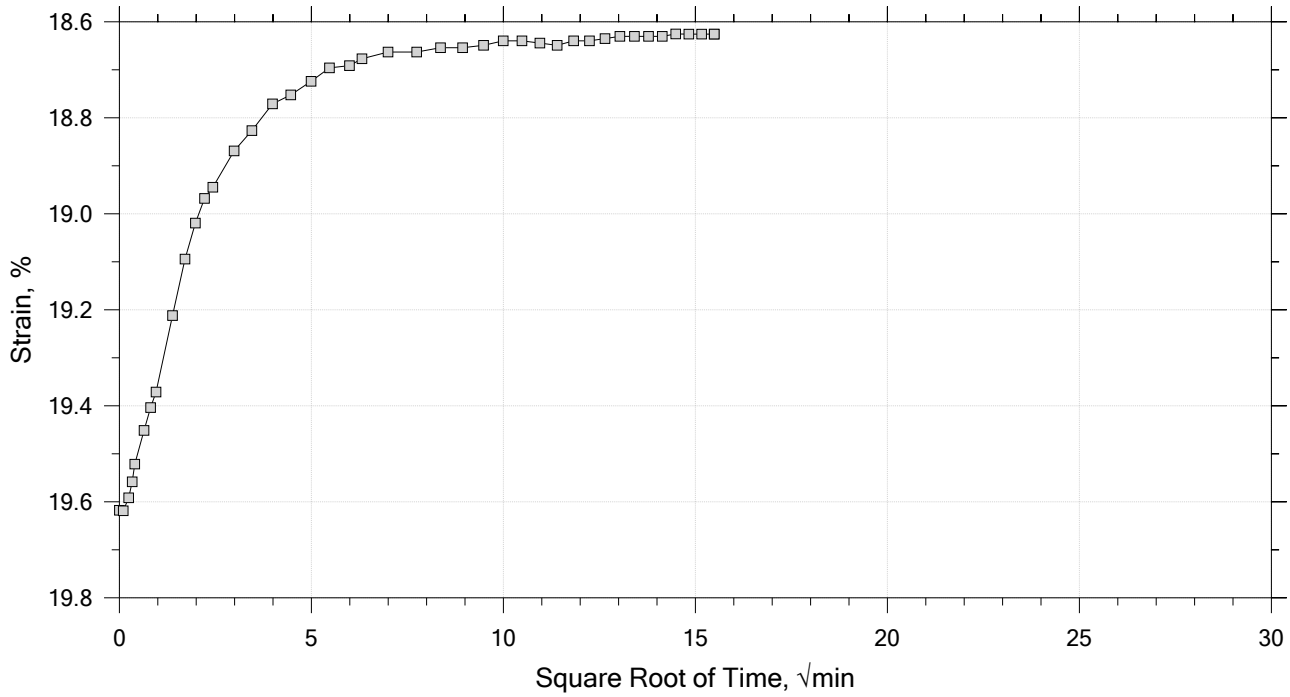


GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-203	Tested By: md	Checked By: mcm
	Sample No.: U2	Test Date: 01/16/19	Depth: 40-42 ft
	Test No.: IP-7	Sample Type: intact	Elevation: ---
	Description: Moist, olive gray clay		
	Remarks: System KK, Swell Pressure = 0.0699 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 18 of 22
Constant Load Step
Stress: 2 tsf

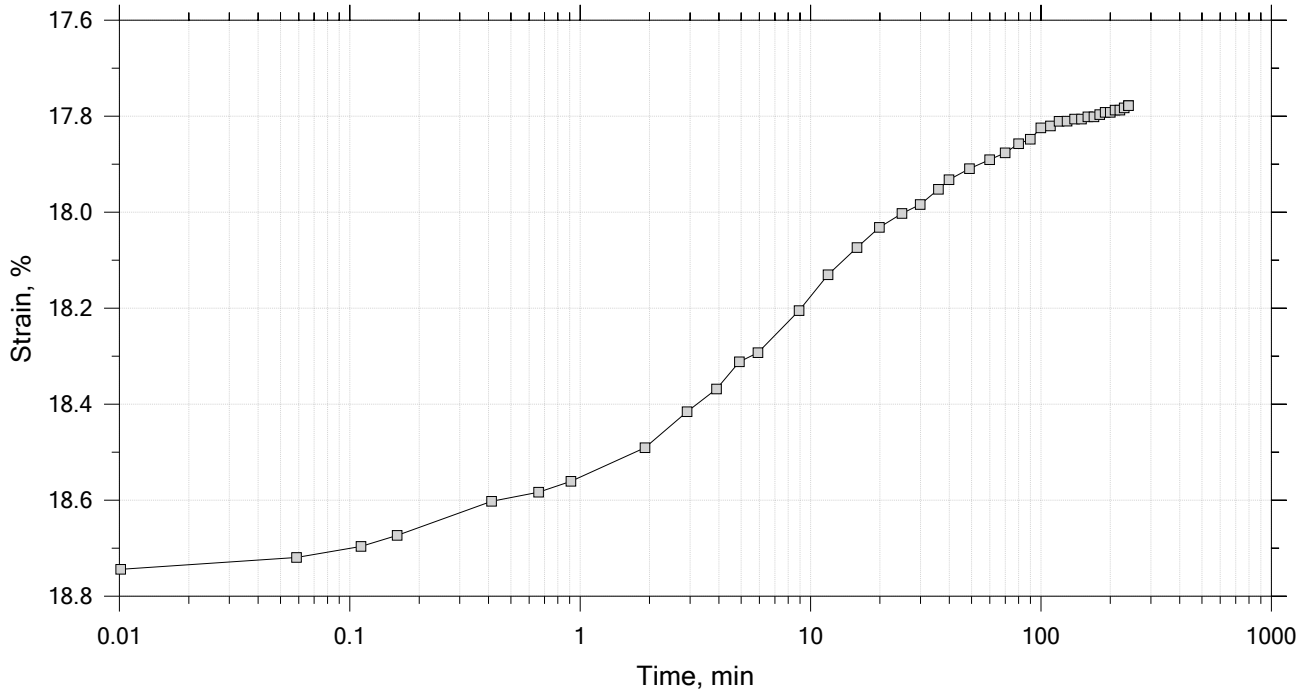


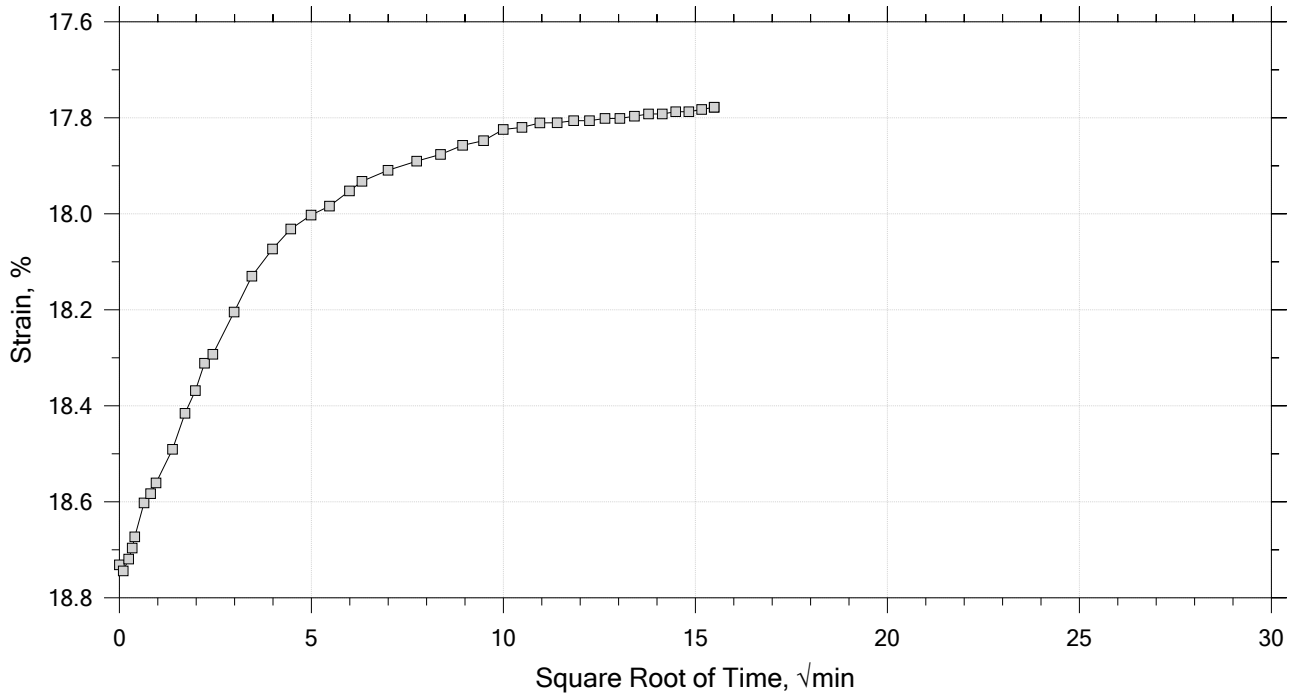


GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-203	Tested By: md	Checked By: mcm
	Sample No.: U2	Test Date: 01/16/19	Depth: 40-42 ft
	Test No.: IP-7	Sample Type: intact	Elevation: ---
	Description: Moist, olive gray clay		
	Remarks: System KK, Swell Pressure = 0.0699 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 19 of 22
Constant Load Step
Stress: 0.75 tsf

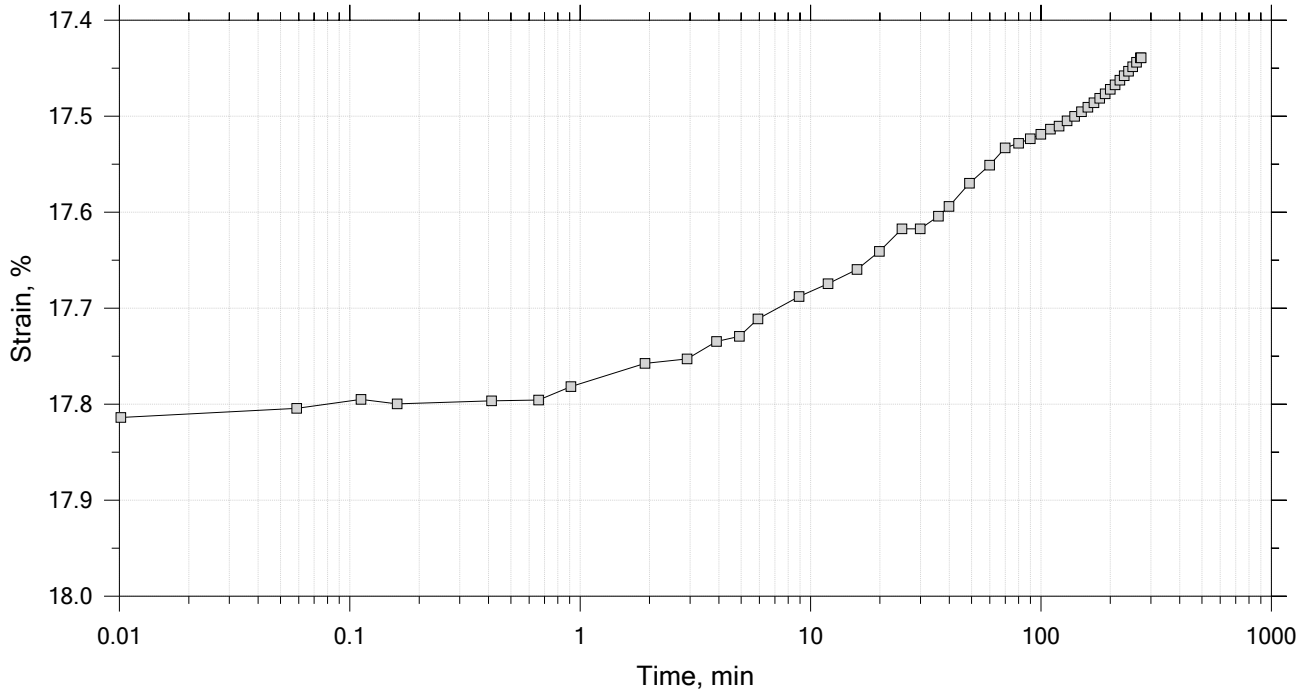


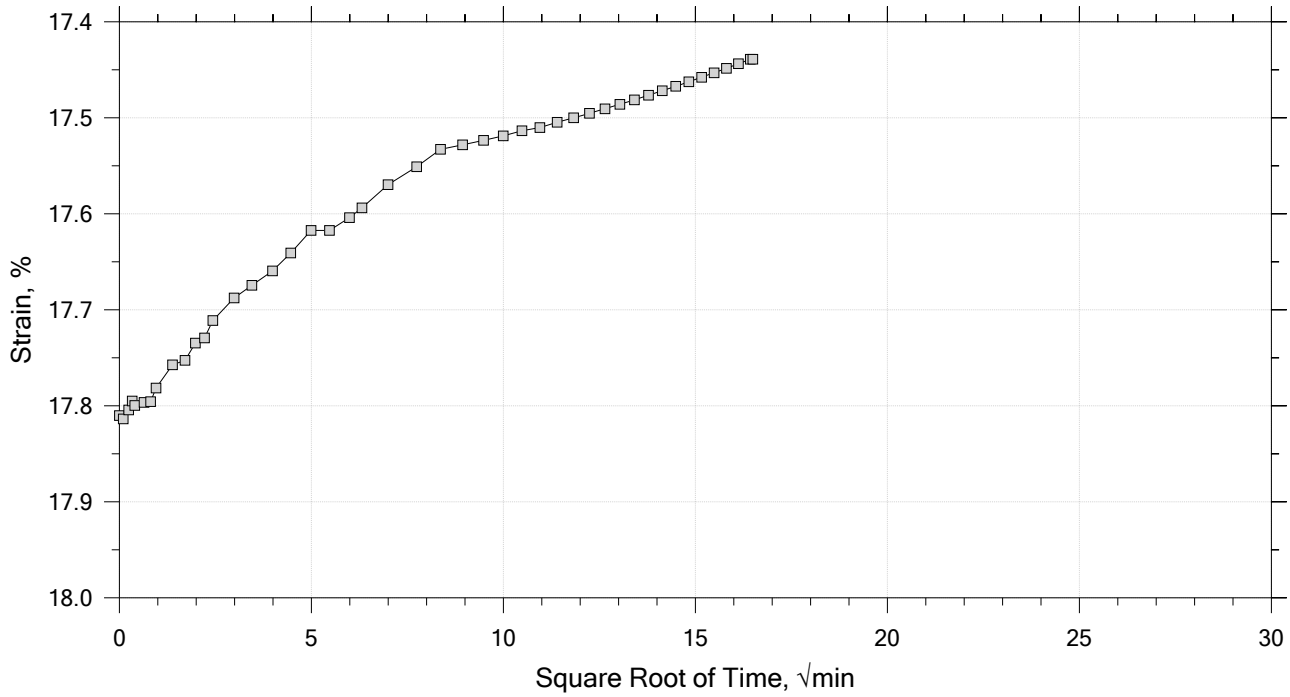


GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-203	Tested By: md	Checked By: mcm
	Sample No.: U2	Test Date: 01/16/19	Depth: 40-42 ft
	Test No.: IP-7	Sample Type: intact	Elevation: ---
	Description: Moist, olive gray clay		
	Remarks: System KK, Swell Pressure = 0.0699 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 20 of 22
Constant Load Step
Stress: 0.5 tsf

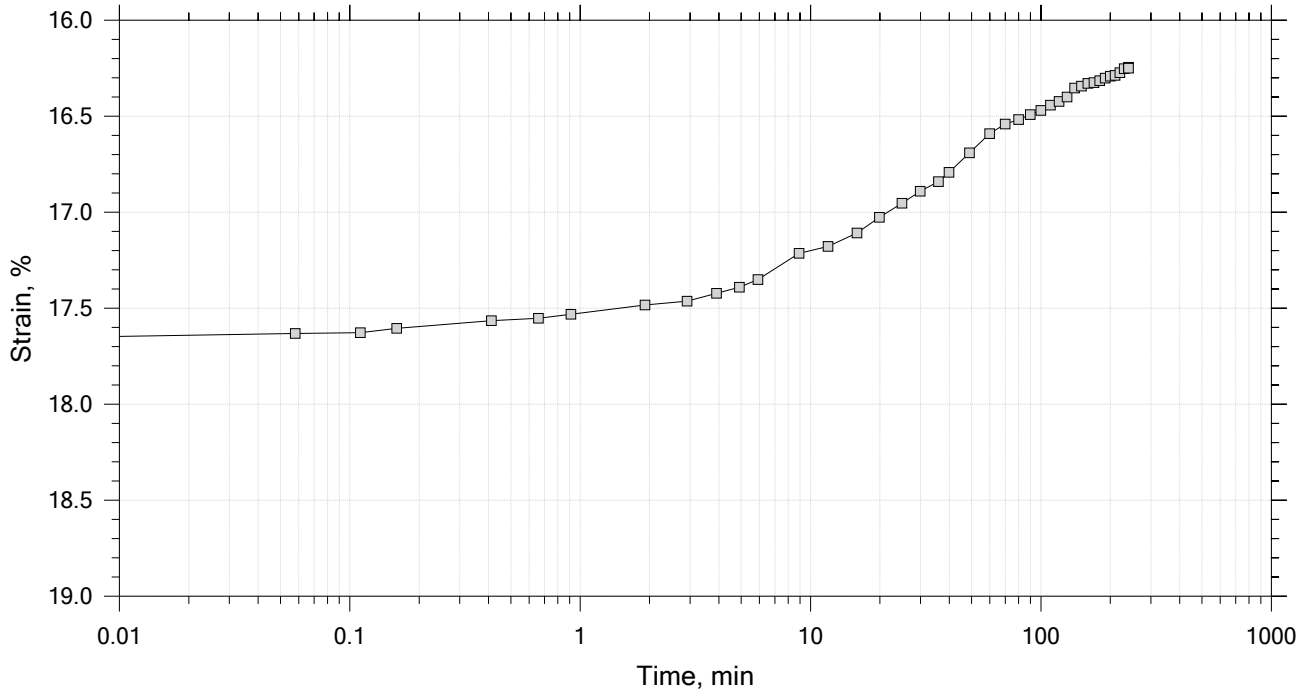


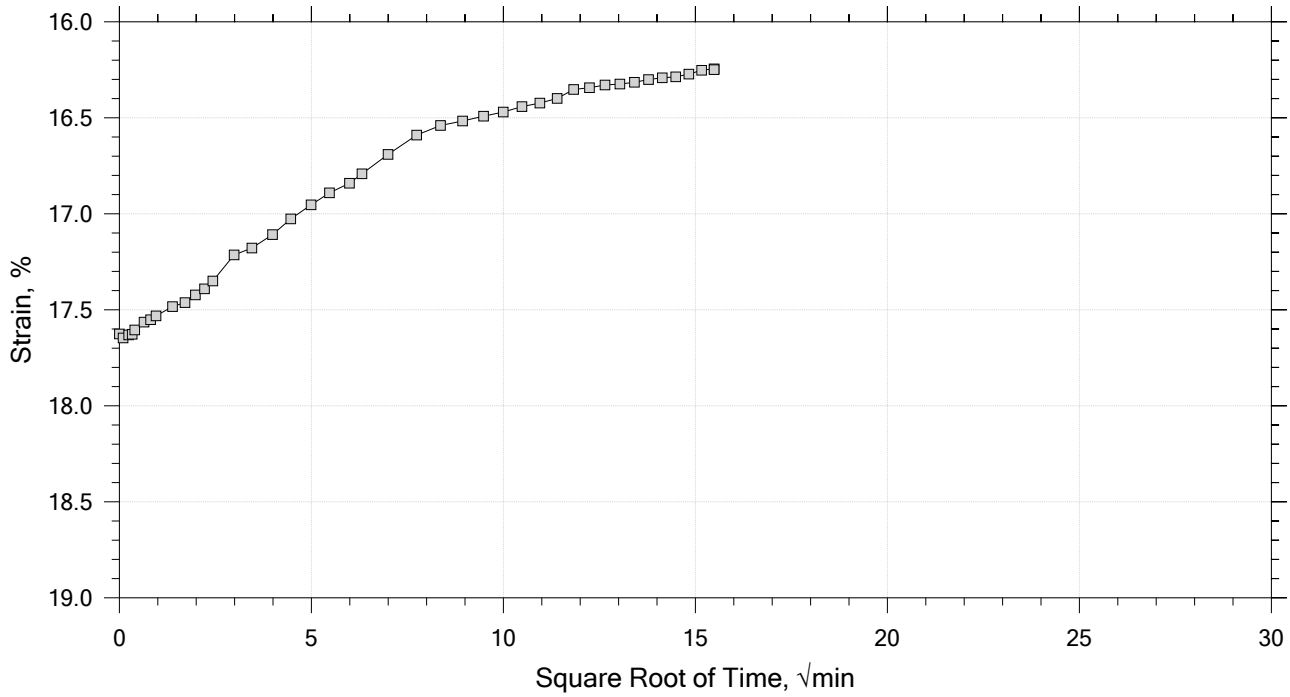


Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
Boring No.: BB-PVS-203	Tested By: md	Checked By: mcm
Sample No.: U2	Test Date: 01/16/19	Depth: 40-42 ft
Test No.: IP-7	Sample Type: intact	Elevation: ---
Description: Moist, olive gray clay		
Remarks: System KK, Swell Pressure = 0.0699 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 21 of 22
Constant Load Step
Stress: 0.125 tsf

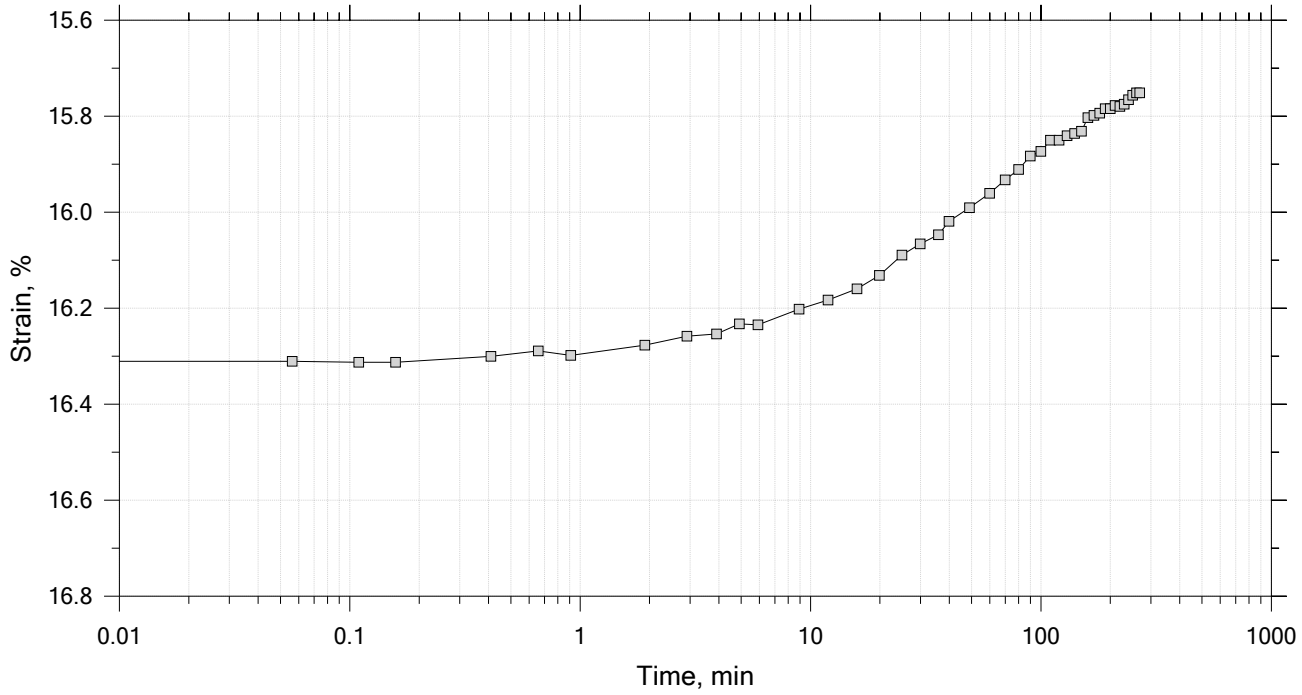


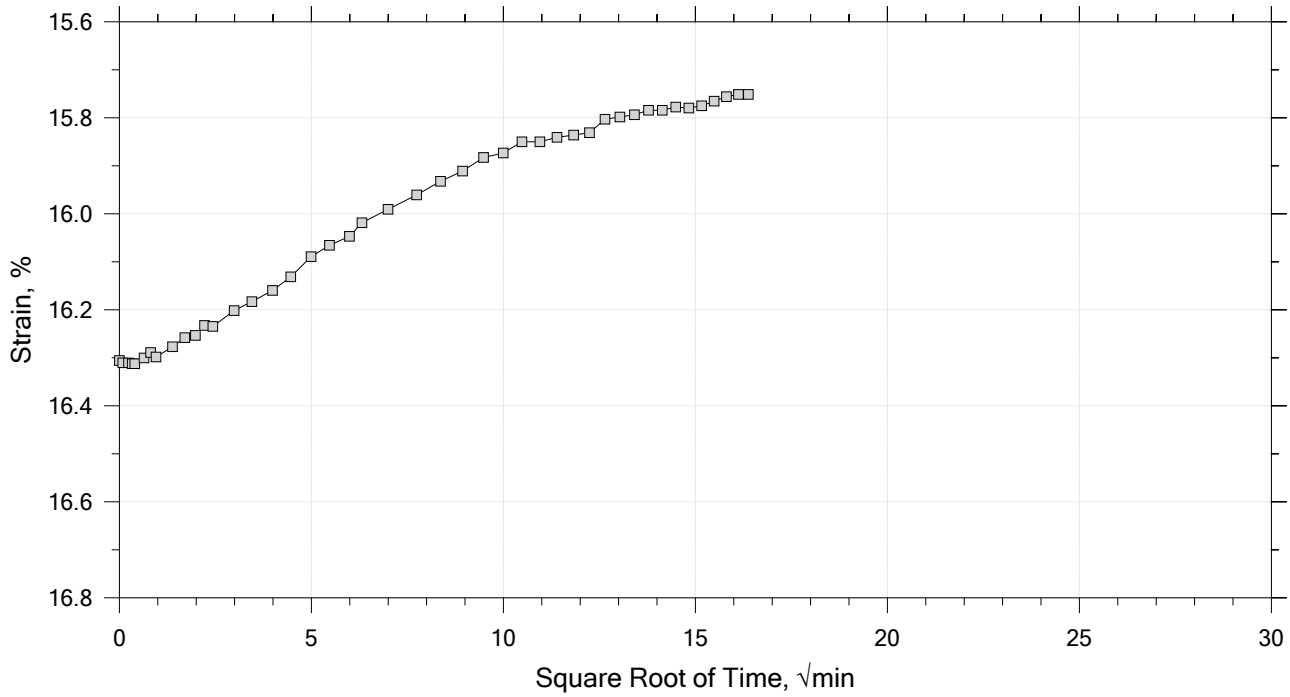


GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-203	Tested By: md	Checked By: mcm
	Sample No.: U2	Test Date: 01/16/19	Depth: 40-42 ft
	Test No.: IP-7	Sample Type: intact	Elevation: ---
	Description: Moist, olive gray clay		
	Remarks: System KK, Swell Pressure = 0.0699 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 22 of 22
Constant Load Step
Stress: 0.0625 tsf





Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
Boring No.: BB-PVS-203	Tested By: md	Checked By: mcm
Sample No.: U2	Test Date: 01/16/19	Depth: 40-42 ft
Test No.: IP-7	Sample Type: intact	Elevation: ---
Description: Moist, olive gray clay		
Remarks: System KK, Swell Pressure = 0.0699 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Specimen Diameter: 2.50 in	Estimated Specific Gravity: 2.77	Liquid Limit: 40
Initial Height: 1.00 in	Initial Void Ratio: 0.998	Plastic Limit: 24
Final Height: 0.84 in	Final Void Ratio: 0.683	Plasticity Index: 16

	Before Test Trimmings	Before Test Specimen	After Test Specimen	After Test Trimmings
Container ID	D-2442	RING		A-2857
Mass Container, gm	8.34	108.9	108.9	8.27
Mass Container + Wet Soil, gm	162.27	258.24	247.84	147.02
Mass Container + Dry Soil, gm	118.7	220.33	220.33	119.55
Mass Dry Soil, gm	110.36	111.43	111.43	111.28
Water Content, %	39.48	34.02	24.69	24.69
Void Ratio	---	1.00	0.68	---
Degree of Saturation, %	---	94.35	100.00	---
Dry Unit Weight, pcf	---	86.481	102.65	---

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.

GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-203	Tested By: md	Checked By: mcm
	Sample No.: U2	Test Date: 01/16/19	Depth: 40-42 ft
	Test No.: IP-7	Sample Type: intact	Elevation: ---
	Description: Moist, olive gray clay		
	Remarks: System KK, Swell Pressure = 0.0699 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Log of Time Coefficients

Step	Applied Stress tsf	Final Displacement in	Void Ratio	Strain at End %	Log T50 min	Cv ft²/s	Mv 1/tsf	k ft/day	Ca %
1	0.0699	0.01277	0.972	1.28	0.000	0.00e+00	1.83e-01	0.00e+00	0.00e+00
2	0.125	0.01859	0.961	1.86	0.000	0.00e+00	1.06e-01	0.00e+00	0.00e+00
3	0.250	0.02659	0.945	2.66	12.964	4.20e-07	6.39e-02	7.24e-05	0.00e+00
4	0.500	0.04118	0.916	4.12	16.314	3.26e-07	5.84e-02	5.14e-05	0.00e+00
5	0.750	0.05470	0.889	5.47	11.474	4.50e-07	5.41e-02	6.57e-05	0.00e+00
6	1.00	0.06382	0.870	6.38	37.351	1.35e-07	3.65e-02	1.33e-05	0.00e+00
7	2.00	0.08880	0.821	8.88	0.000	0.00e+00	2.50e-02	0.00e+00	0.00e+00
8	4.00	0.1176	0.763	11.8	5.829	7.86e-07	1.44e-02	3.06e-05	0.00e+00
9	2.00	0.1154	0.767	11.5	0.000	0.00e+00	1.10e-03	0.00e+00	0.00e+00
10	1.00	0.1123	0.773	11.2	1.489	3.00e-06	3.06e-03	2.48e-05	0.00e+00
11	0.500	0.1090	0.780	10.9	5.236	8.61e-07	6.72e-03	1.56e-05	0.00e+00
12	1.00	0.1107	0.777	11.1	0.000	0.00e+00	3.34e-03	0.00e+00	0.00e+00
13	2.00	0.1147	0.769	11.5	0.000	0.00e+00	4.05e-03	0.00e+00	0.00e+00
14	4.00	0.1254	0.747	12.5	2.217	1.99e-06	5.35e-03	2.87e-05	0.00e+00
15	8.00	0.1597	0.679	16.0	5.591	7.50e-07	8.57e-03	1.73e-05	0.00e+00
16	16.0	0.1986	0.601	19.9	2.716	1.41e-06	4.87e-03	1.86e-05	0.00e+00
17	8.00	0.1960	0.606	19.6	0.000	0.00e+00	3.29e-04	0.00e+00	0.00e+00
18	2.00	0.1863	0.626	18.6	2.062	1.81e-06	1.62e-03	7.91e-06	0.00e+00
19	0.750	0.1778	0.643	17.8	4.058	9.40e-07	6.78e-03	1.72e-05	0.00e+00
20	0.500	0.1744	0.650	17.4	0.000	0.00e+00	1.36e-02	0.00e+00	0.00e+00
21	0.125	0.1625	0.673	16.2	24.119	1.63e-07	3.17e-02	1.40e-05	0.00e+00
22	0.0625	0.1575	0.683	15.8	36.797	1.09e-07	7.97e-02	2.35e-05	0.00e+00

GeoTesting EXPRESS

Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
Boring No.: BB-PVS-203	Tested By: md	Checked By: mcm
Sample No.: U2	Test Date: 01/16/19	Depth: 40-42 ft
Test No.: IP-7	Sample Type: intact	Elevation: ---
Description: Moist, olive gray clay		
Remarks: System KK, Swell Pressure = 0.0699 tsf		
Displacement at End of Increment		

One-Dimensional Consolidation by ASTM D2435 - Method B

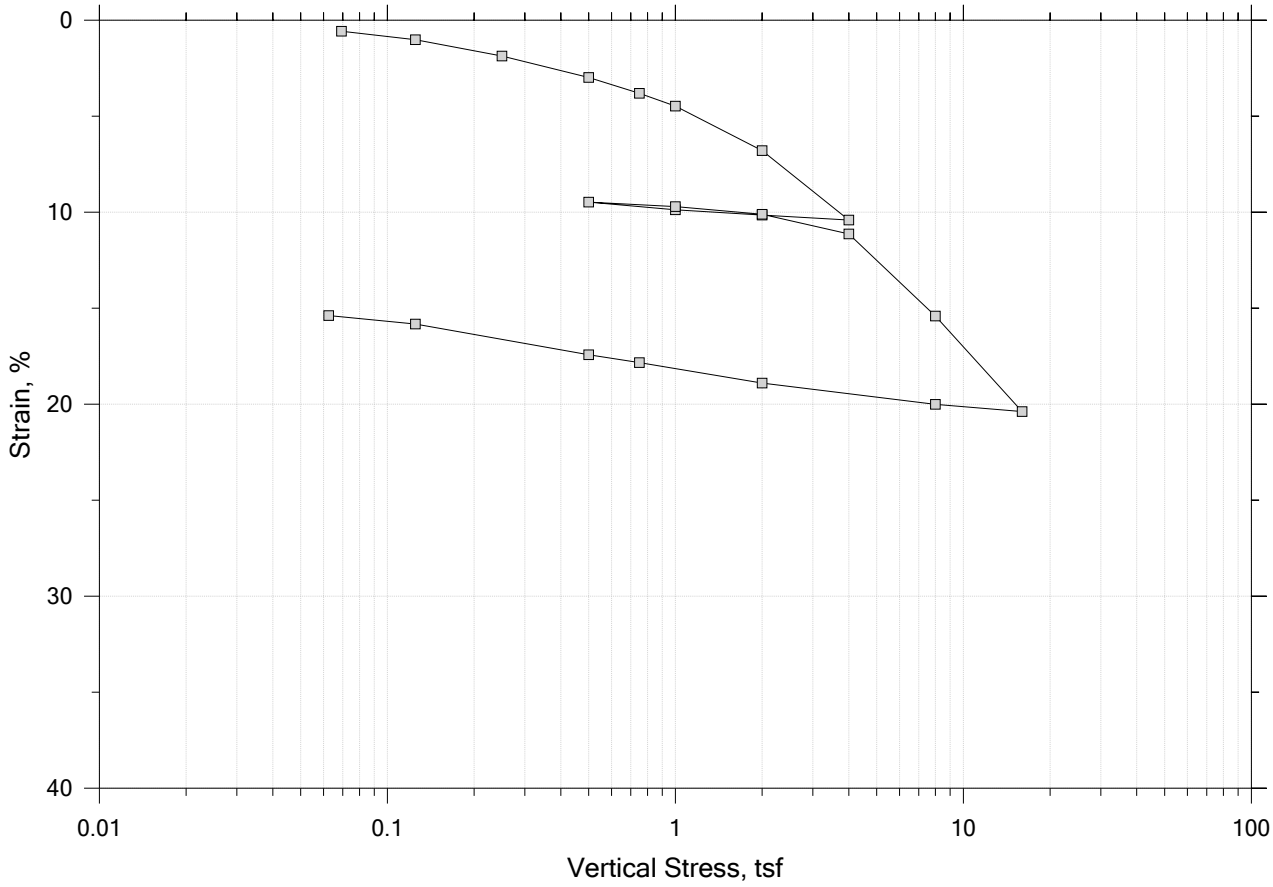
Square Root of Time Coefficients

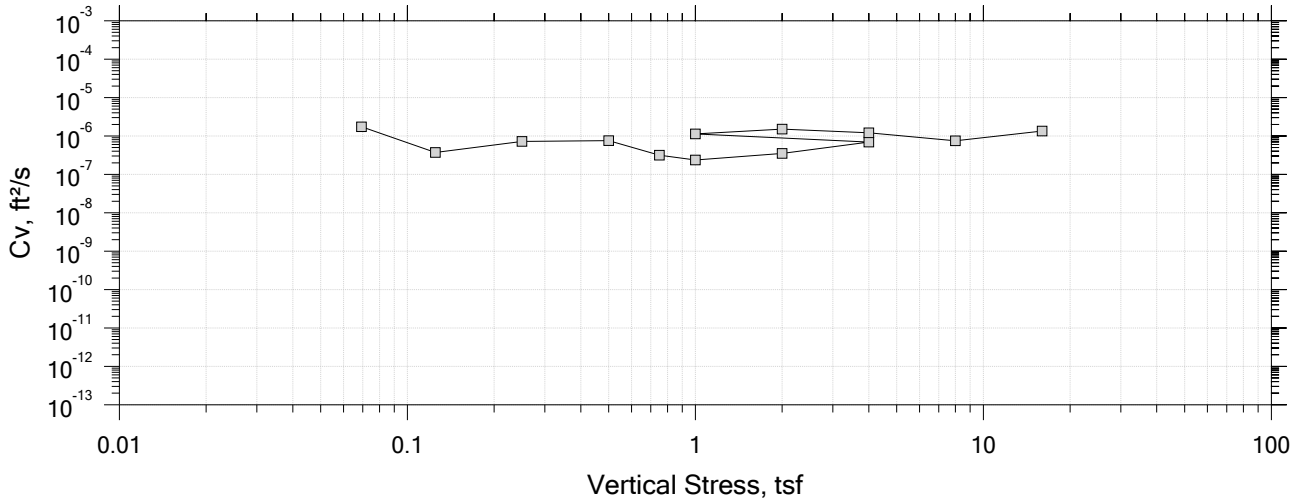
Step	Applied Stress tsf	Final Displacement in	Void Ratio	Strain at End %	Sq.Rt. T90 min	Cv ft²/s	Mv 1/tsf	k ft/day
1	0.0699	0.01277	0.972	1.28	100.442	2.41e-07	1.83e-01	1.19e-04
2	0.125	0.01859	0.961	1.86	77.452	3.07e-07	1.06e-01	8.76e-05
3	0.250	0.02659	0.945	2.66	60.966	3.84e-07	6.39e-02	6.63e-05
4	0.500	0.04118	0.916	4.12	67.079	3.41e-07	5.84e-02	5.38e-05
5	0.750	0.05470	0.889	5.47	95.630	2.33e-07	5.41e-02	3.39e-05
6	1.00	0.06382	0.870	6.38	159.910	1.36e-07	3.65e-02	1.34e-05
7	2.00	0.08880	0.821	8.88	145.670	1.44e-07	2.50e-02	9.68e-06
8	4.00	0.1176	0.763	11.8	26.791	7.37e-07	1.44e-02	2.86e-05
9	2.00	0.1154	0.767	11.5	3.899	4.91e-06	1.10e-03	1.46e-05
10	1.00	0.1123	0.773	11.2	6.353	3.03e-06	3.06e-03	2.51e-05
11	0.500	0.1090	0.780	10.9	23.348	8.31e-07	6.72e-03	1.51e-05
12	1.00	0.1107	0.777	11.1	7.872	2.47e-06	3.34e-03	2.22e-05
13	2.00	0.1147	0.769	11.5	12.384	1.56e-06	4.05e-03	1.70e-05
14	4.00	0.1254	0.747	12.5	21.221	8.95e-07	5.35e-03	1.29e-05
15	8.00	0.1597	0.679	16.0	24.017	7.51e-07	8.57e-03	1.74e-05
16	16.0	0.1986	0.601	19.9	12.155	1.36e-06	4.87e-03	1.79e-05
17	8.00	0.1960	0.606	19.6	3.324	4.76e-06	3.29e-04	4.21e-06
18	2.00	0.1863	0.626	18.6	10.493	1.53e-06	1.62e-03	6.69e-06
19	0.750	0.1778	0.643	17.8	16.677	9.84e-07	6.78e-03	1.80e-05
20	0.500	0.1744	0.650	17.4	65.120	2.56e-07	1.36e-02	9.35e-06
21	0.125	0.1625	0.673	16.2	98.156	1.73e-07	3.17e-02	1.48e-05
22	0.0625	0.1575	0.683	15.8	170.781	1.01e-07	7.97e-02	2.18e-05

GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-203	Tested By: md	Checked By: mcm
	Sample No.: U2	Test Date: 01/16/19	Depth: 40-42 ft
	Test No.: IP-7	Sample Type: intact	Elevation: ---
	Description: Moist, olive gray clay		
	Remarks: System KK, Swell Pressure = 0.0699 tsf		
	Displacement at End of Increment		

One-Dimensional Consolidation by ASTM D2435 - Method B

Summary Report





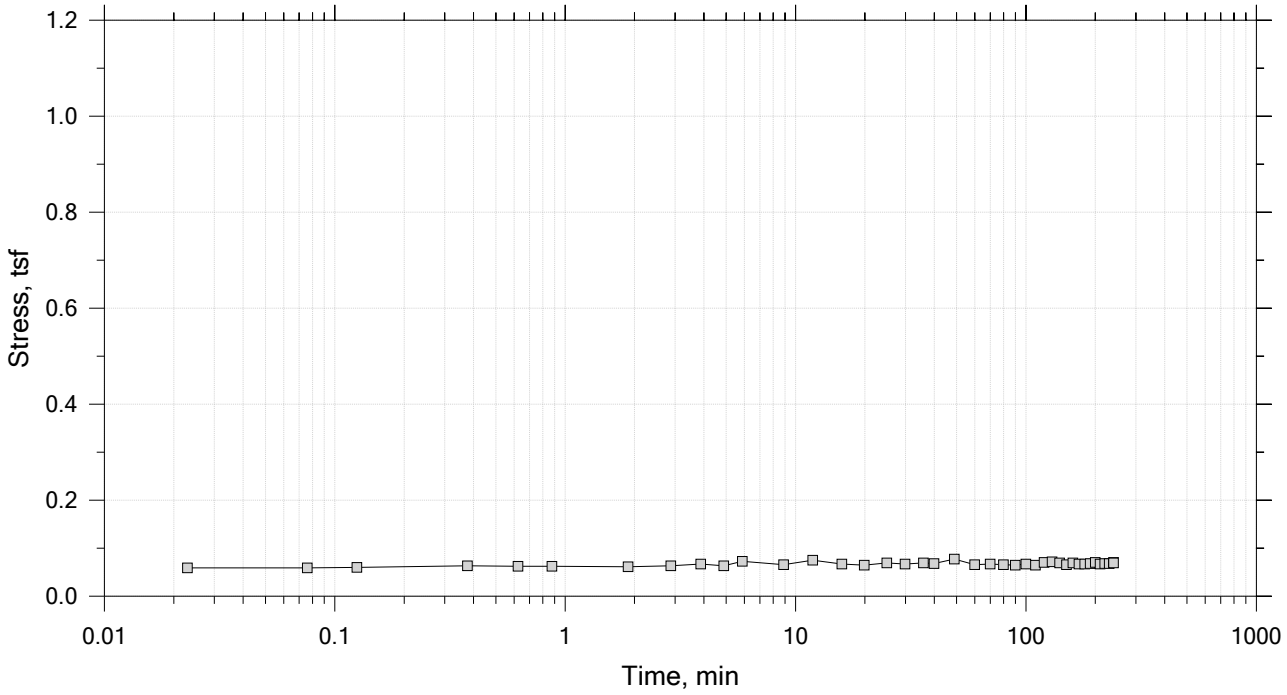
GeoTesting EXPRESS	Project: I-295 over Vernada St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-203	Tested By: md	Checked By: mcm
	Sample No.: U3	Test Date: 01/16/19	Depth: 50-52 ft
	Test No.: IP-8	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System X, Swell Pressure = 0.0692 tsf		
	Displacement at End of Increment		

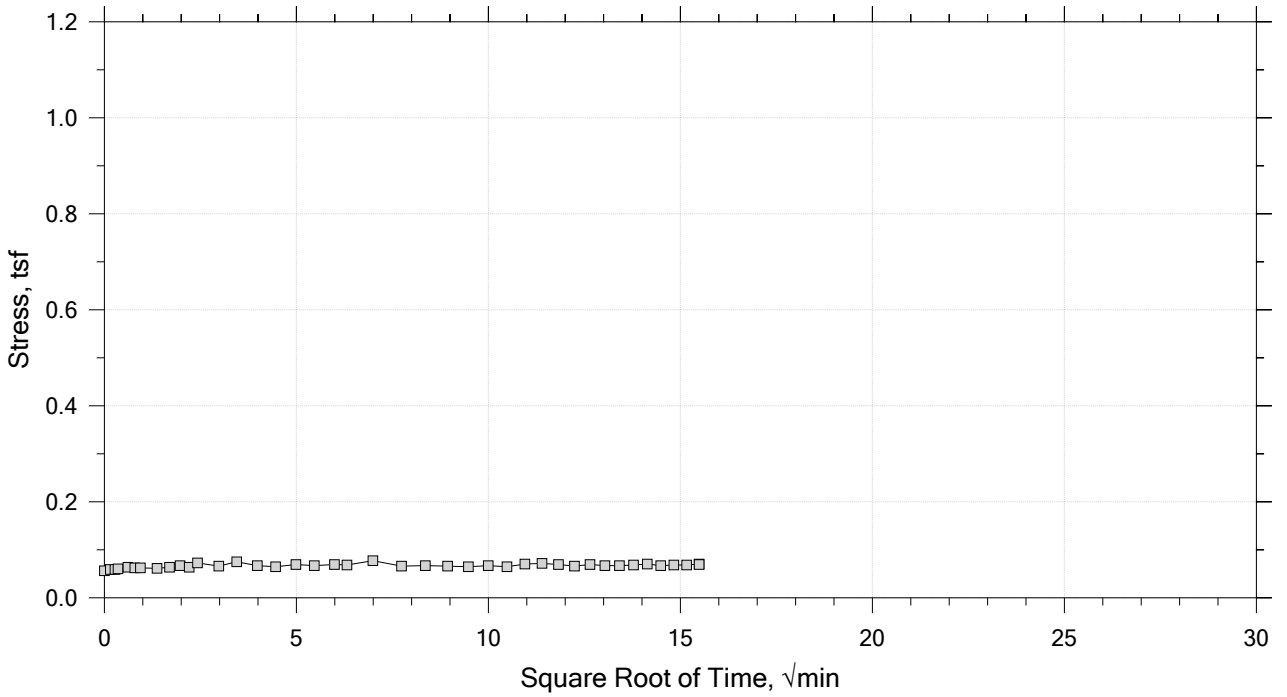
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 1 of 22

Constant Volume Step

Stress: 0.0692 tsf





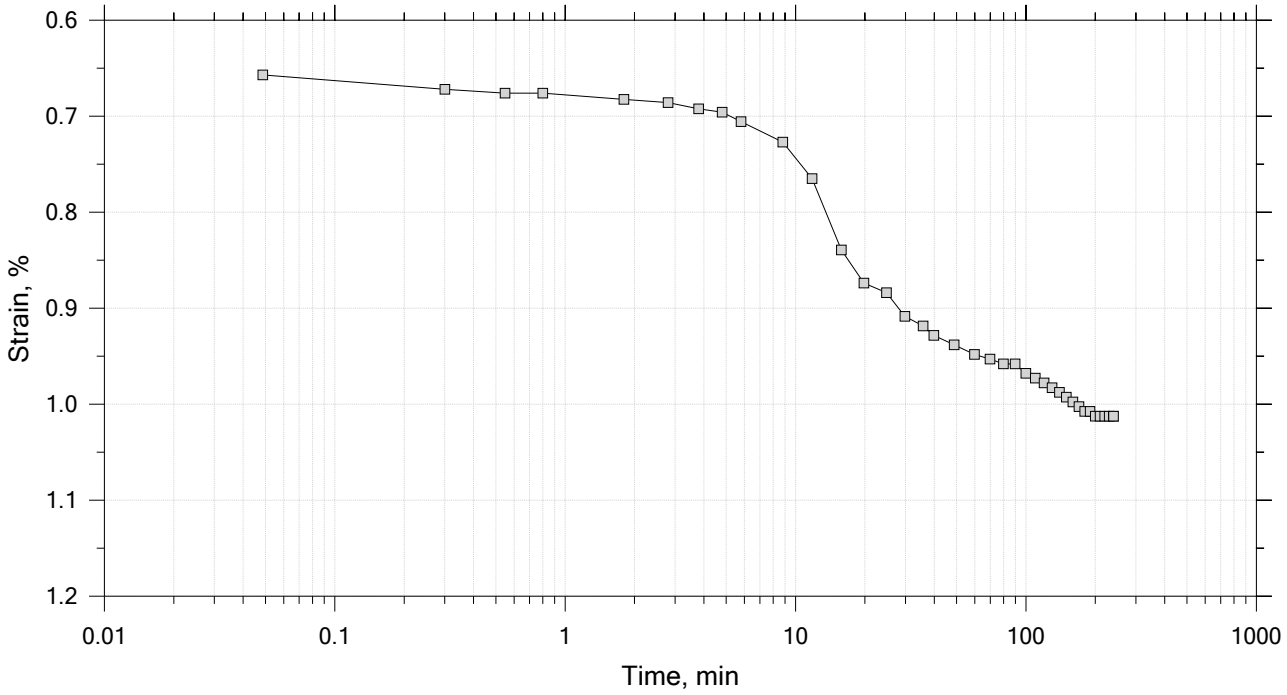
GeoTesting EXPRESS	Project: I-295 over Vernada St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-203	Tested By: md	Checked By: mcm
	Sample No.: U3	Test Date: 01/16/19	Depth: 50-52 ft
	Test No.: IP-8	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System X, Swell Pressure = 0.0692 tsf		

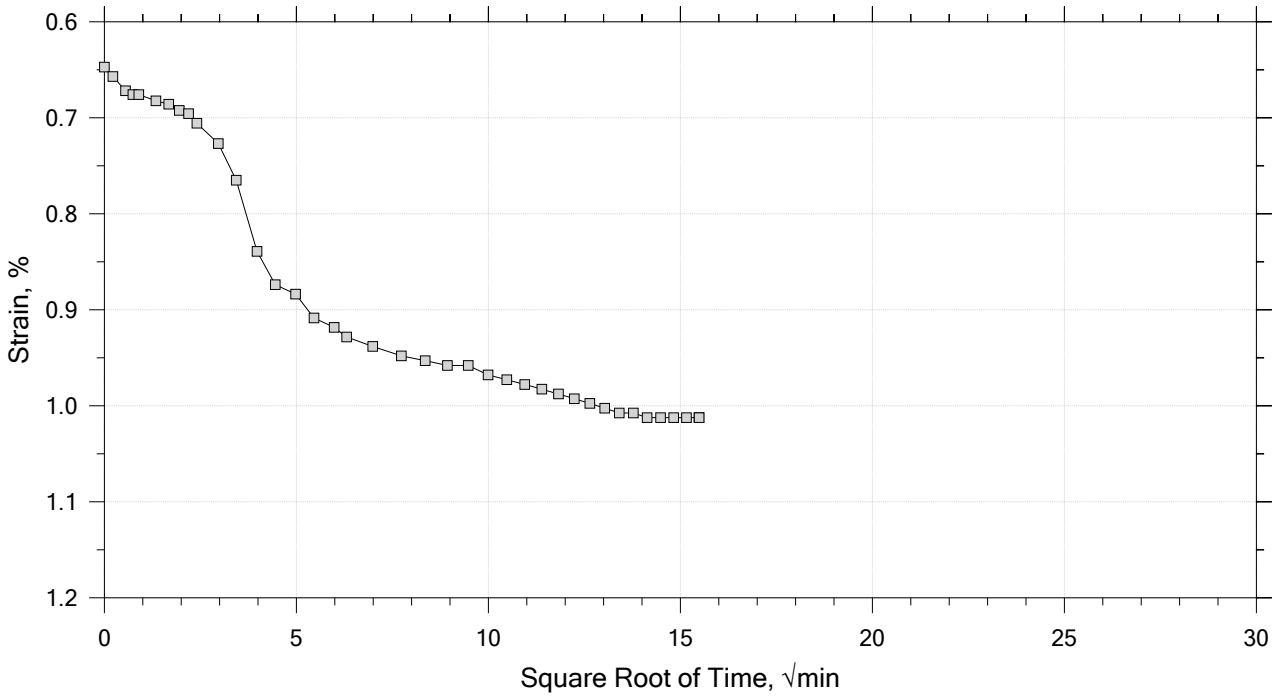
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 2 of 22

Constant Load Step

Stress: 0.125 tsf





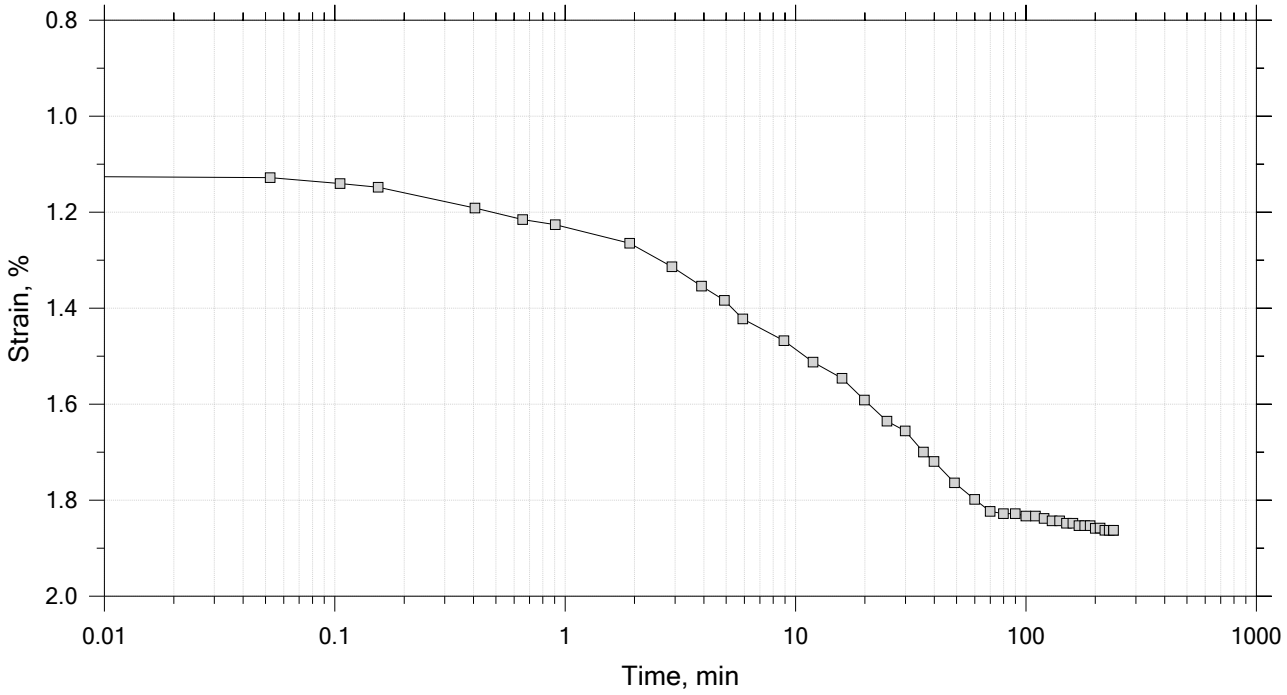
GeoTesting EXPRESS	Project: I-295 over Vernada St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-203	Tested By: md	Checked By: mcm
	Sample No.: U3	Test Date: 01/16/19	Depth: 50-52 ft
	Test No.: IP-8	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System X, Swell Pressure = 0.0692 tsf		

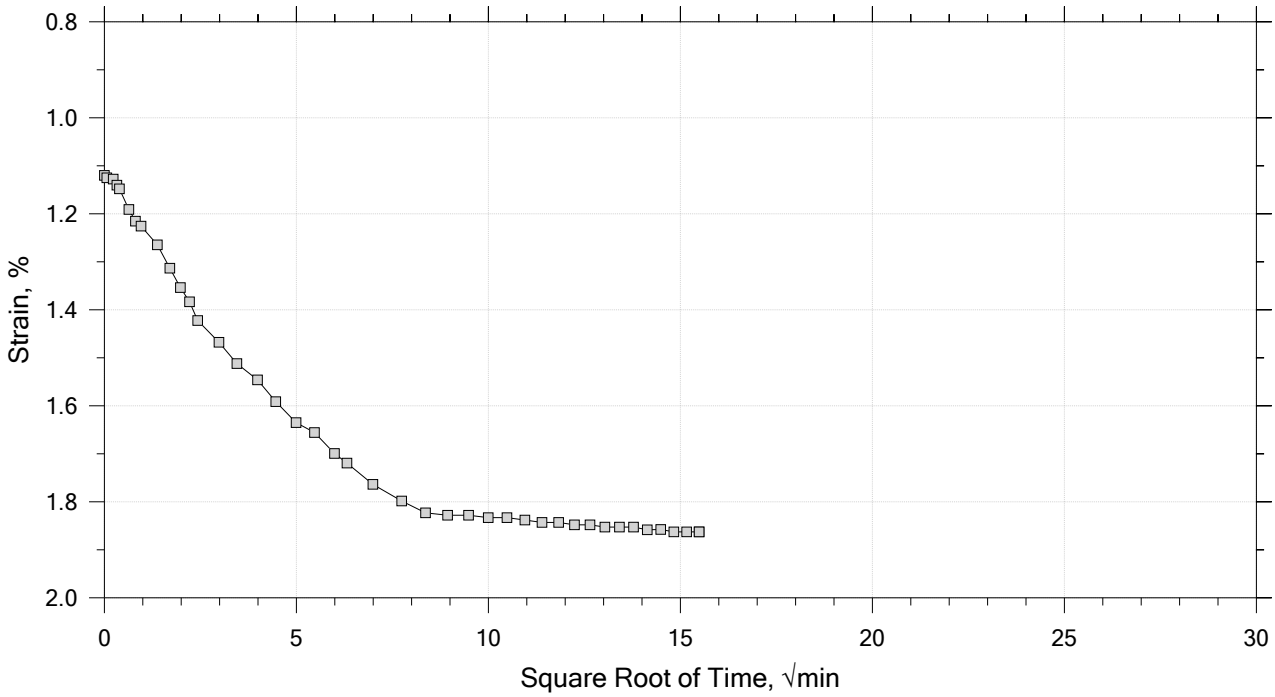
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 3 of 22

Constant Load Step

Stress: 0.25 tsf





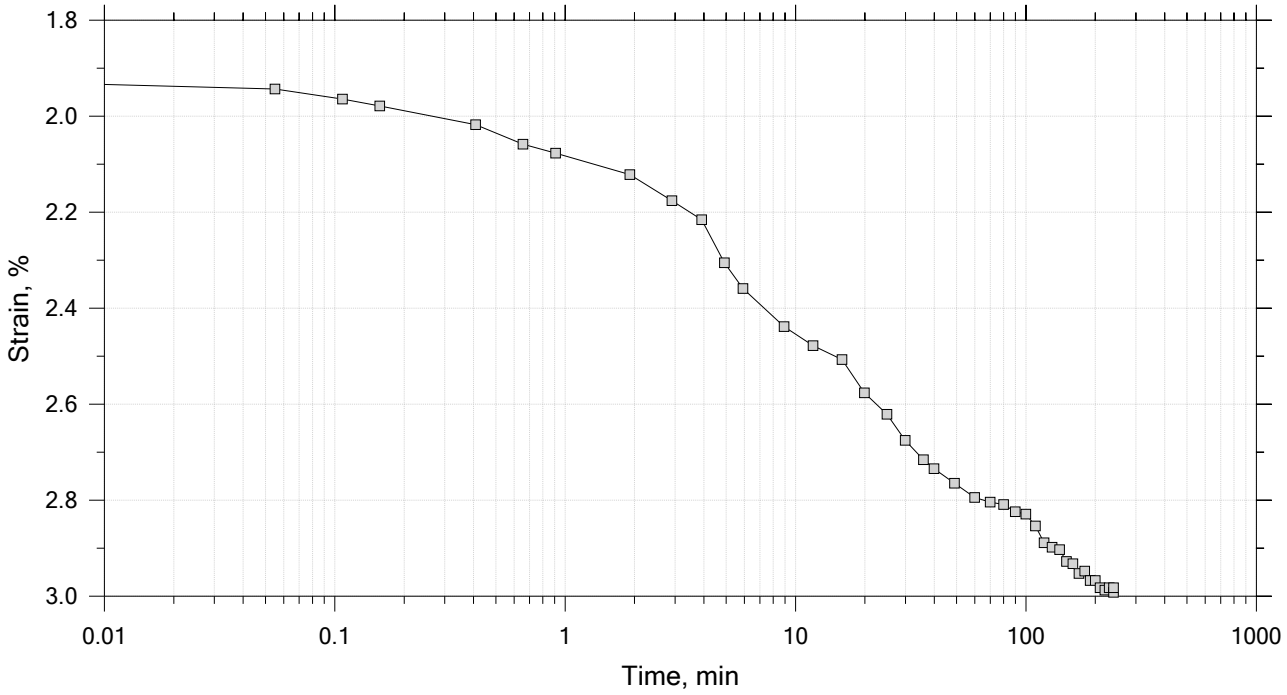
GeoTesting EXPRESS	Project: I-295 over Vernada St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-203	Tested By: md	Checked By: mcm
	Sample No.: U3	Test Date: 01/16/19	Depth: 50-52 ft
	Test No.: IP-8	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System X, Swell Pressure = 0.0692 tsf		

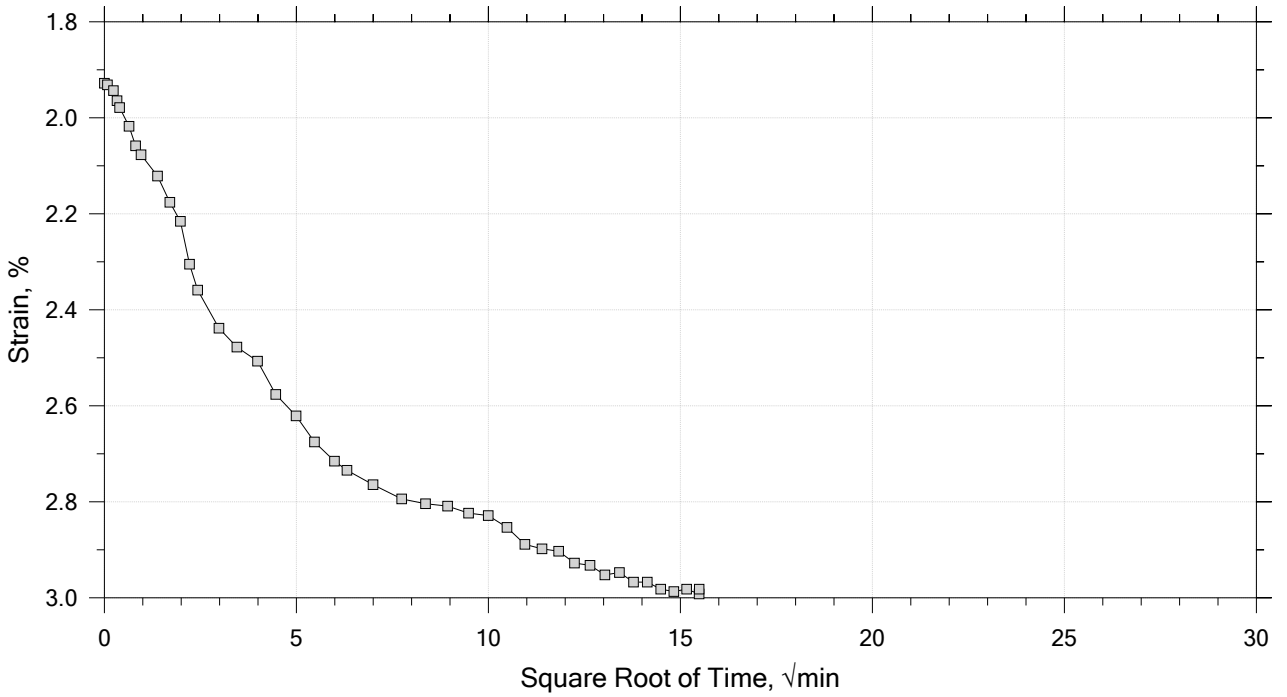
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 4 of 22

Constant Load Step

Stress: 0.5 tsf

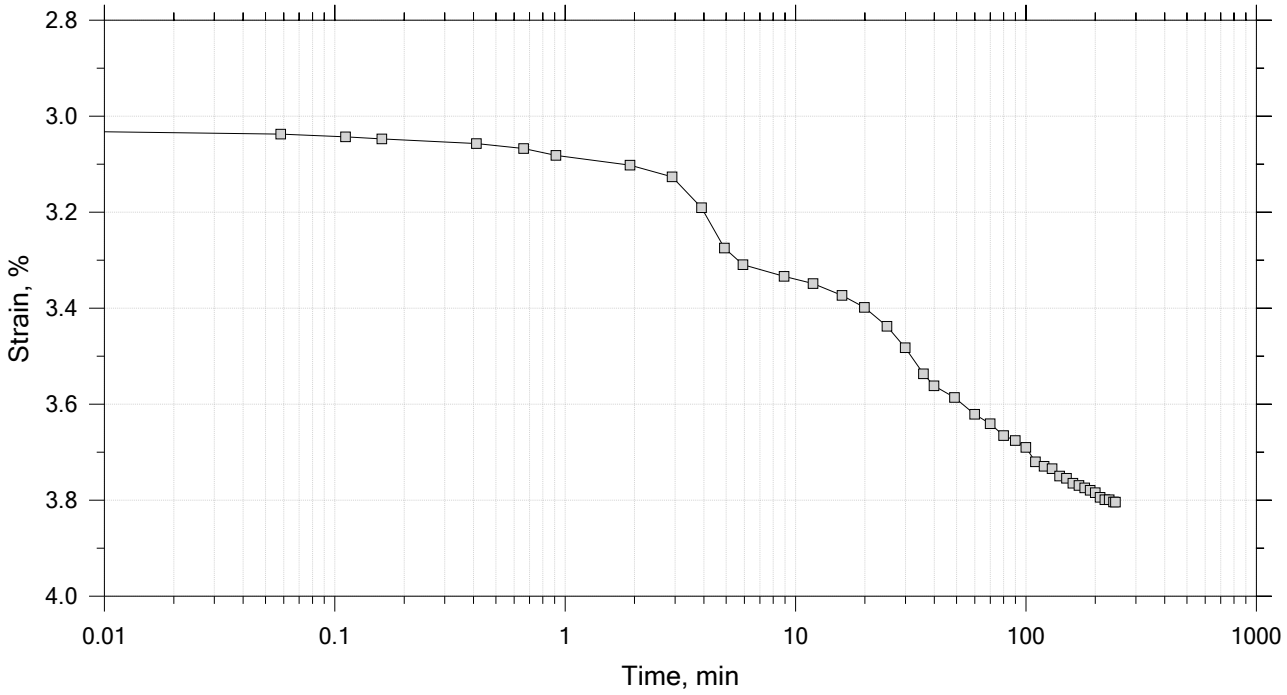


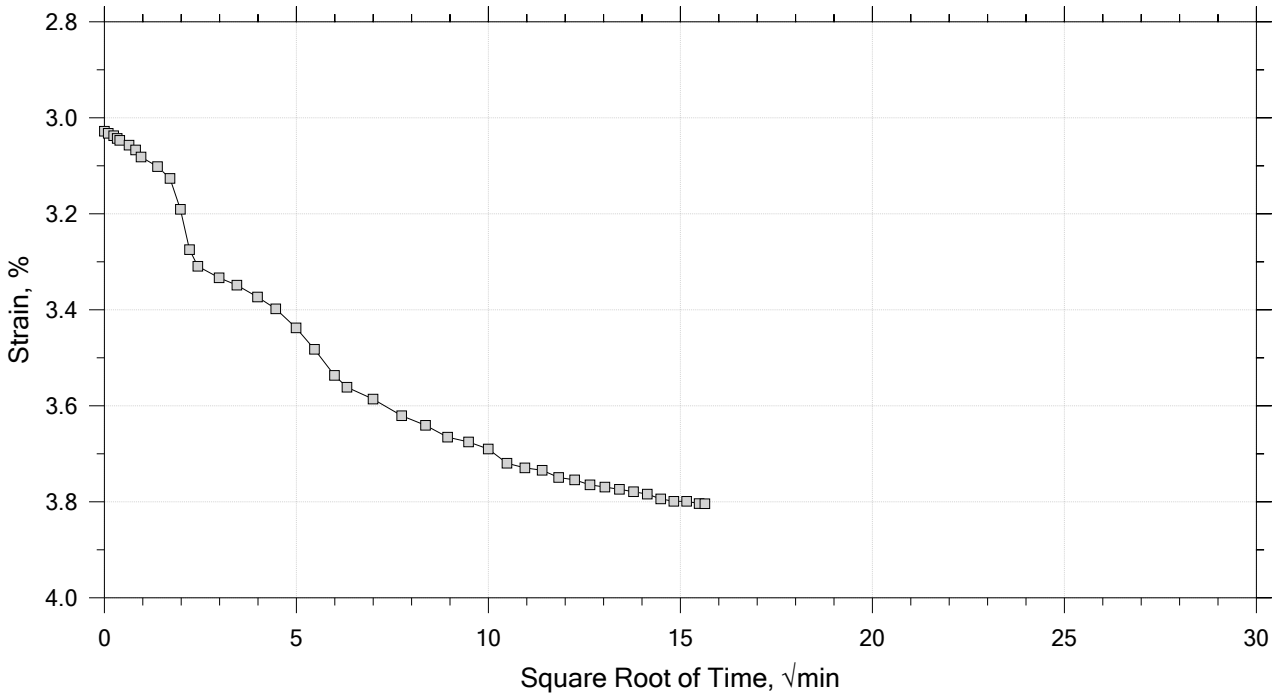


GeoTesting EXPRESS	Project: I-295 over Vernada St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-203	Tested By: md	Checked By: mcm
	Sample No.: U3	Test Date: 01/16/19	Depth: 50-52 ft
	Test No.: IP-8	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System X, Swell Pressure = 0.0692 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 5 of 22
Constant Load Step
Stress: 0.75 tsf





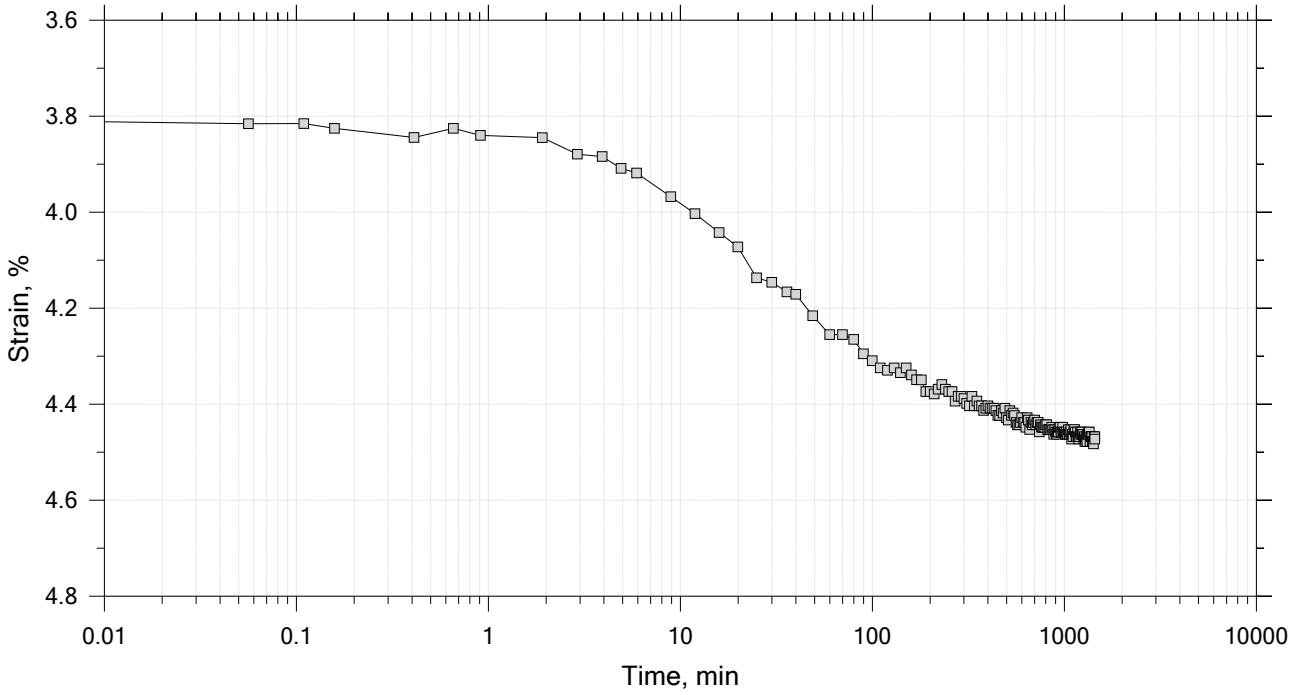
Project: I-295 over Vernada St	Location: Portland, ME	Project No.: GTX-308805
Boring No.: BB-PVS-203	Tested By: md	Checked By: mcm
Sample No.: U3	Test Date: 01/16/19	Depth: 50-52 ft
Test No.: IP-8	Sample Type: intact	Elevation: ---
Description: Moist, dark gray clay		
Remarks: System X, Swell Pressure = 0.0692 tsf		

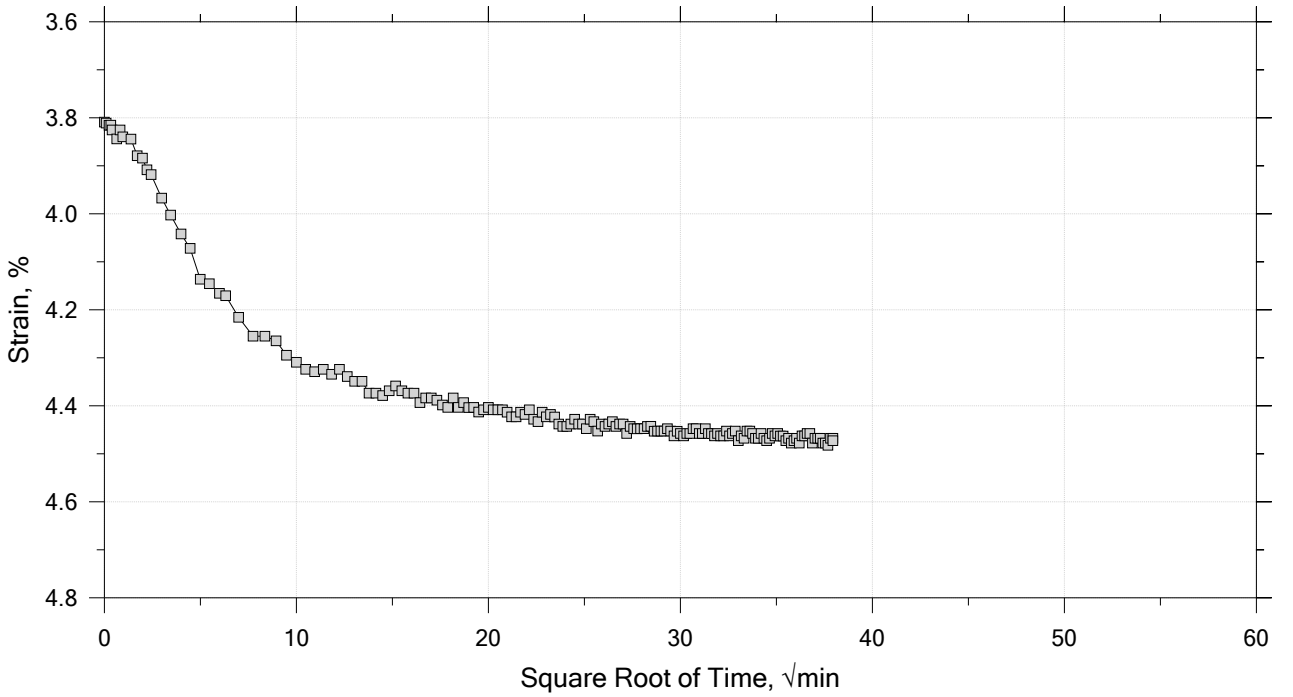
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 6 of 22

Constant Load Step

Stress: 1 tsf





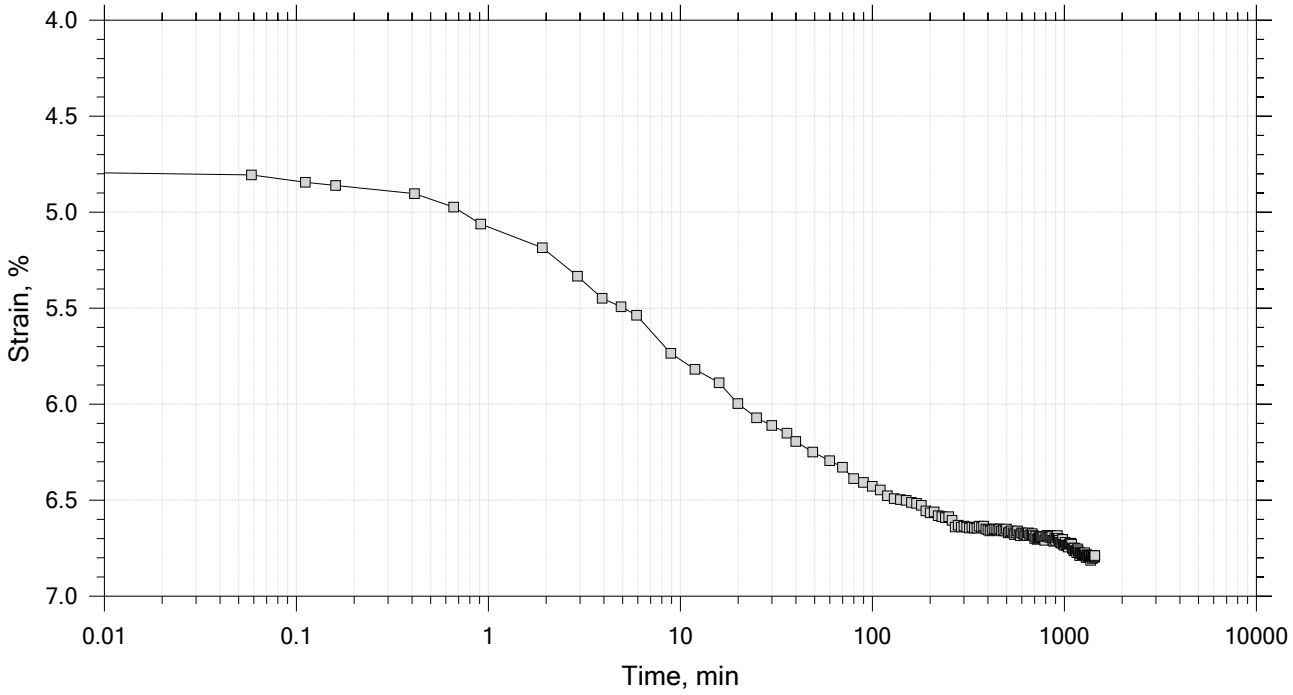
Project: I-295 over Vernada St	Location: Portland, ME	Project No.: GTX-308805
Boring No.: BB-PVS-203	Tested By: md	Checked By: mcm
Sample No.: U3	Test Date: 01/16/19	Depth: 50-52 ft
Test No.: IP-8	Sample Type: intact	Elevation: ---
Description: Moist, dark gray clay		
Remarks: System X, Swell Pressure = 0.0692 tsf		

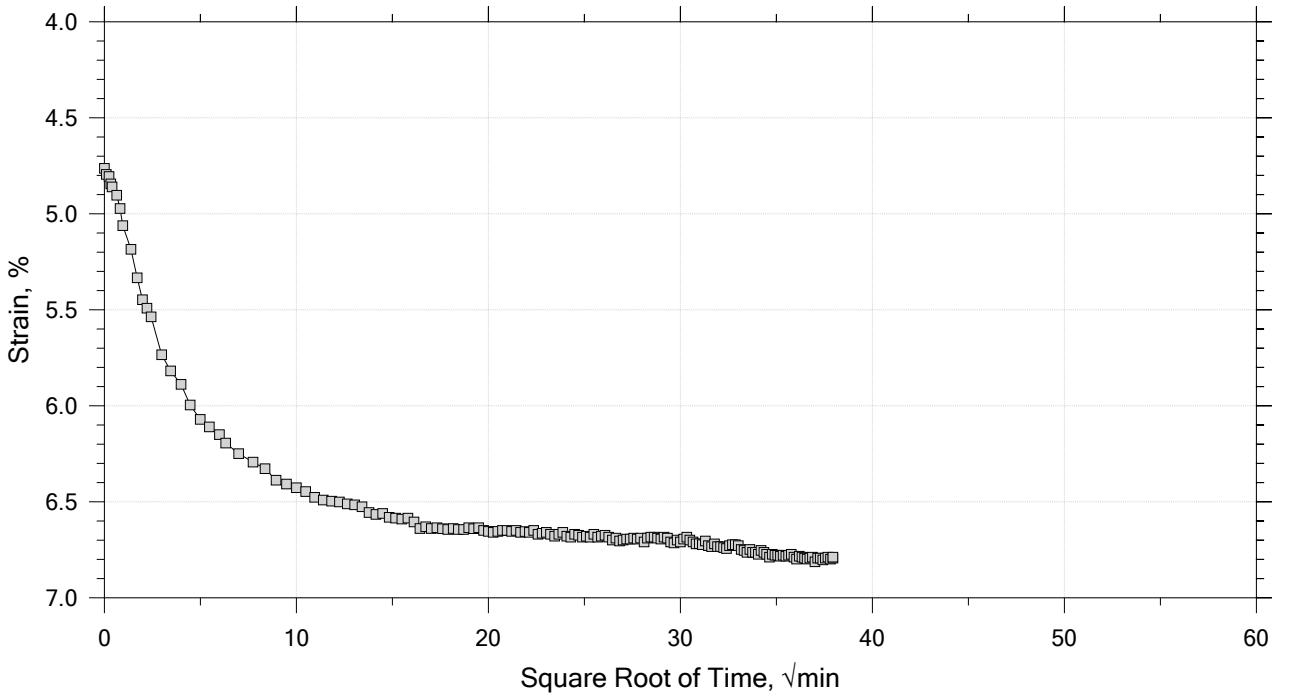
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 7 of 22

Constant Load Step

Stress: 2 tsf





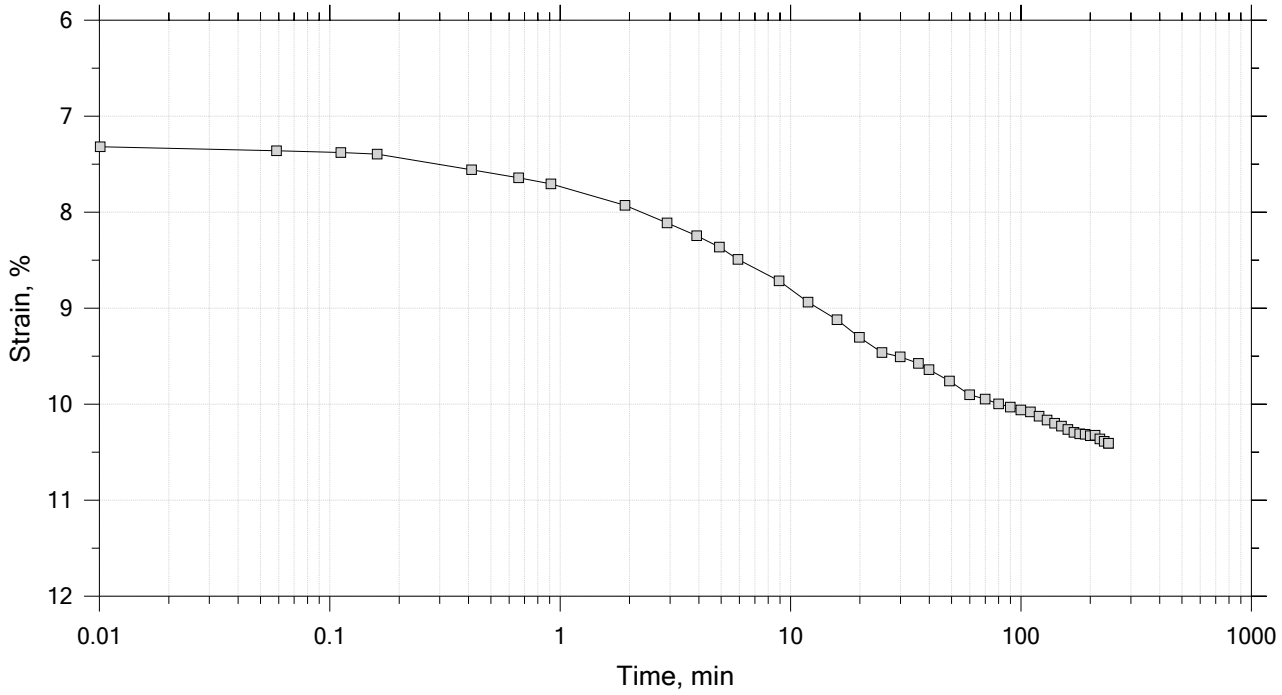
Project: I-295 over Vernada St	Location: Portland, ME	Project No.: GTX-308805
Boring No.: BB-PVS-203	Tested By: md	Checked By: mcm
Sample No.: U3	Test Date: 01/16/19	Depth: 50-52 ft
Test No.: IP-8	Sample Type: intact	Elevation: ---
Description: Moist, dark gray clay		
Remarks: System X, Swell Pressure = 0.0692 tsf		

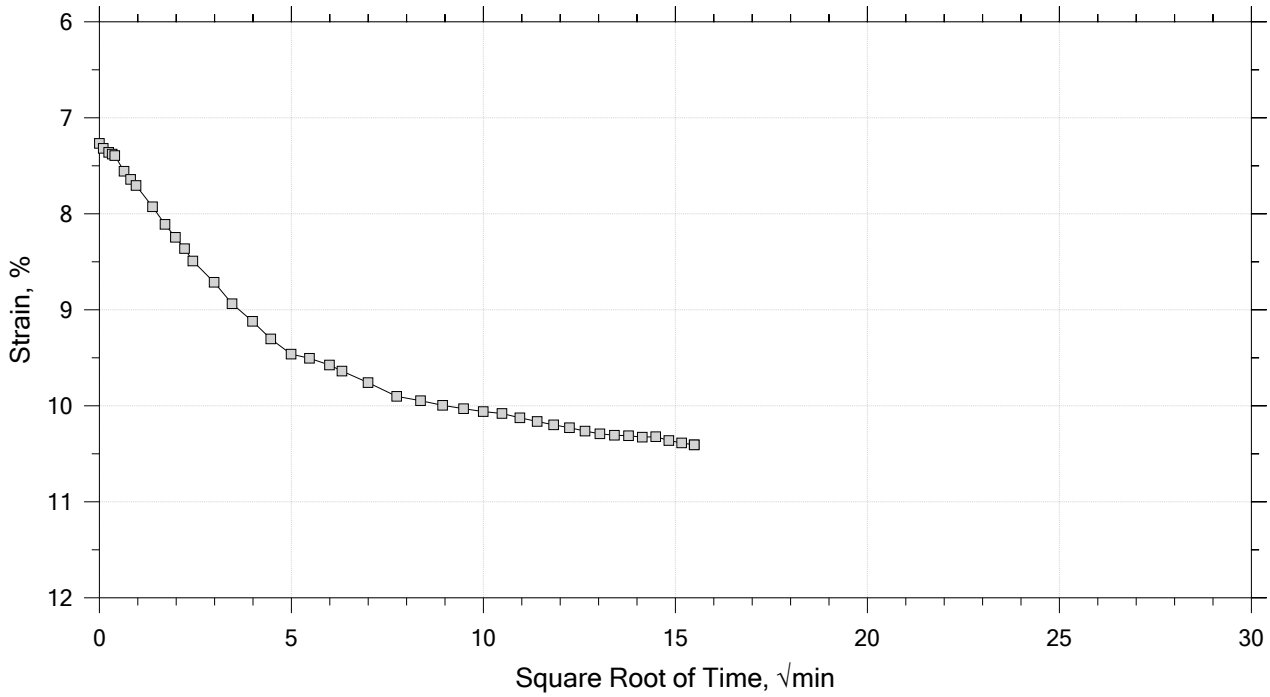
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 8 of 22

Constant Load Step

Stress: 4 tsf





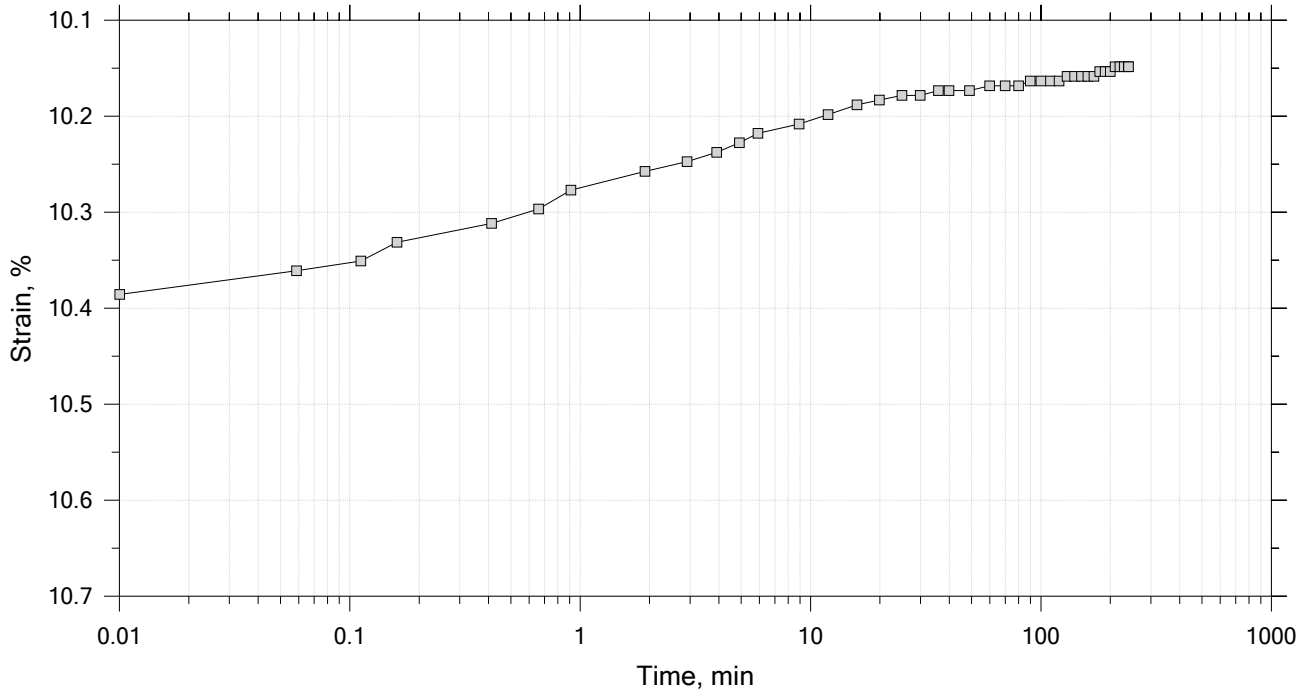
GeoTesting EXPRESS	Project: I-295 over Vernada St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-203	Tested By: md	Checked By: mcm
	Sample No.: U3	Test Date: 01/16/19	Depth: 50-52 ft
	Test No.: IP-8	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System X, Swell Pressure = 0.0692 tsf		

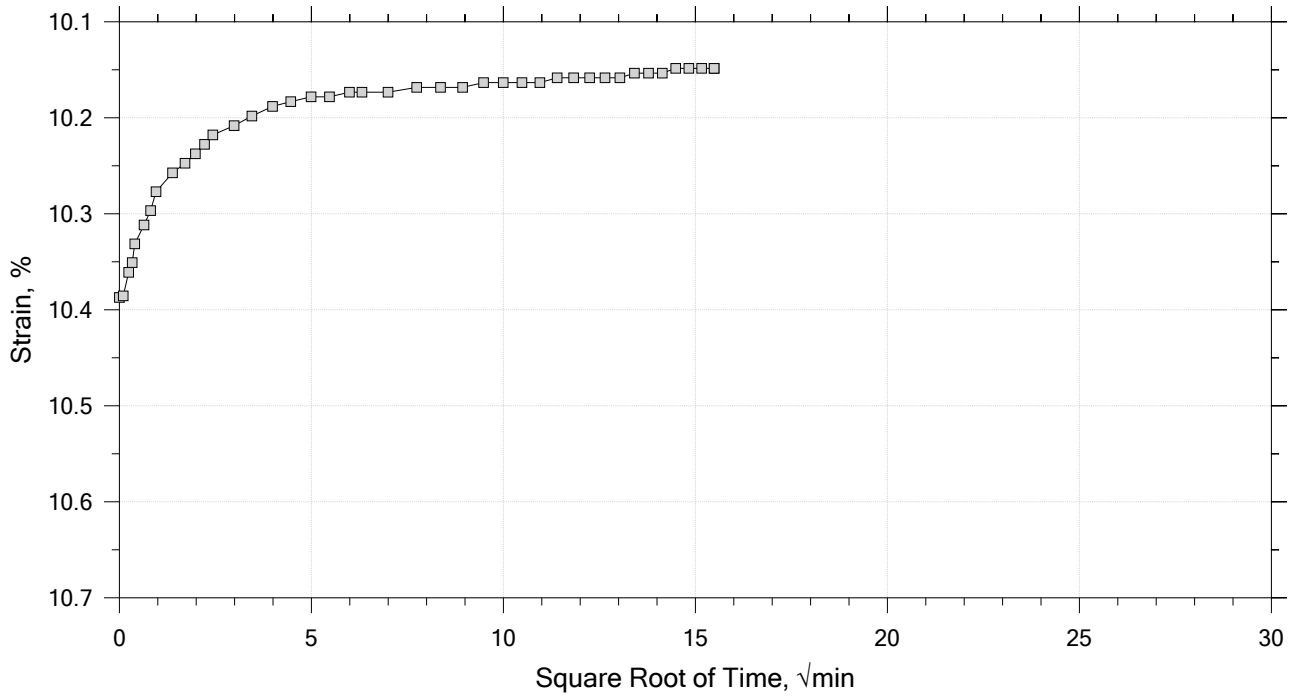
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 9 of 22

Constant Load Step

Stress: 2 tsf

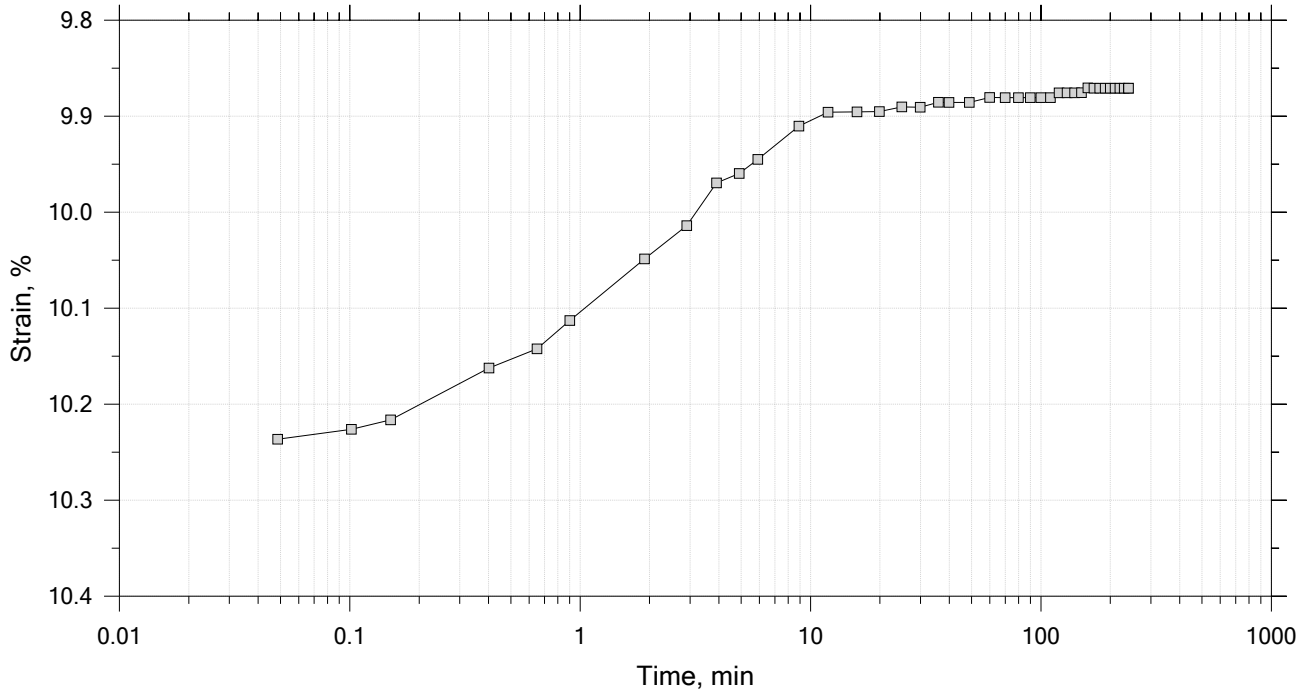


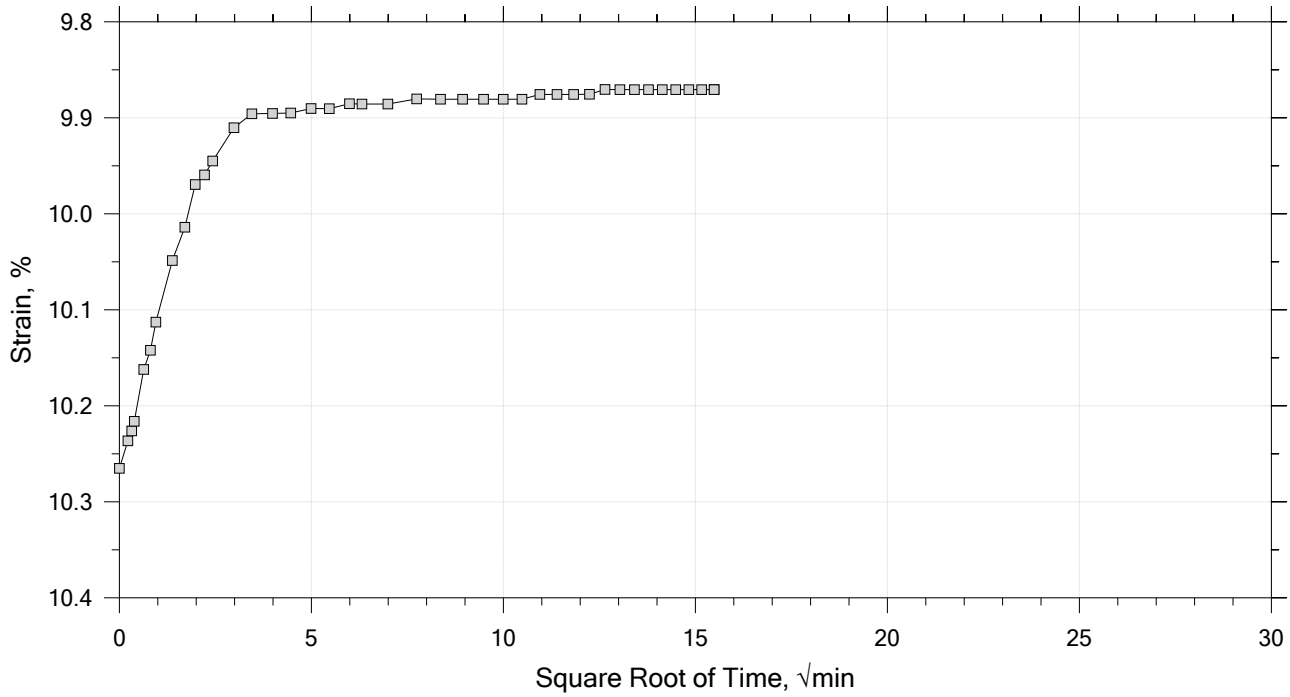


GeoTesting EXPRESS	Project: I-295 over Vernada St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-203	Tested By: md	Checked By: mcm
	Sample No.: U3	Test Date: 01/16/19	Depth: 50-52 ft
	Test No.: IP-8	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System X, Swell Pressure = 0.0692 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 10 of 22
Constant Load Step
Stress: 1 tsf

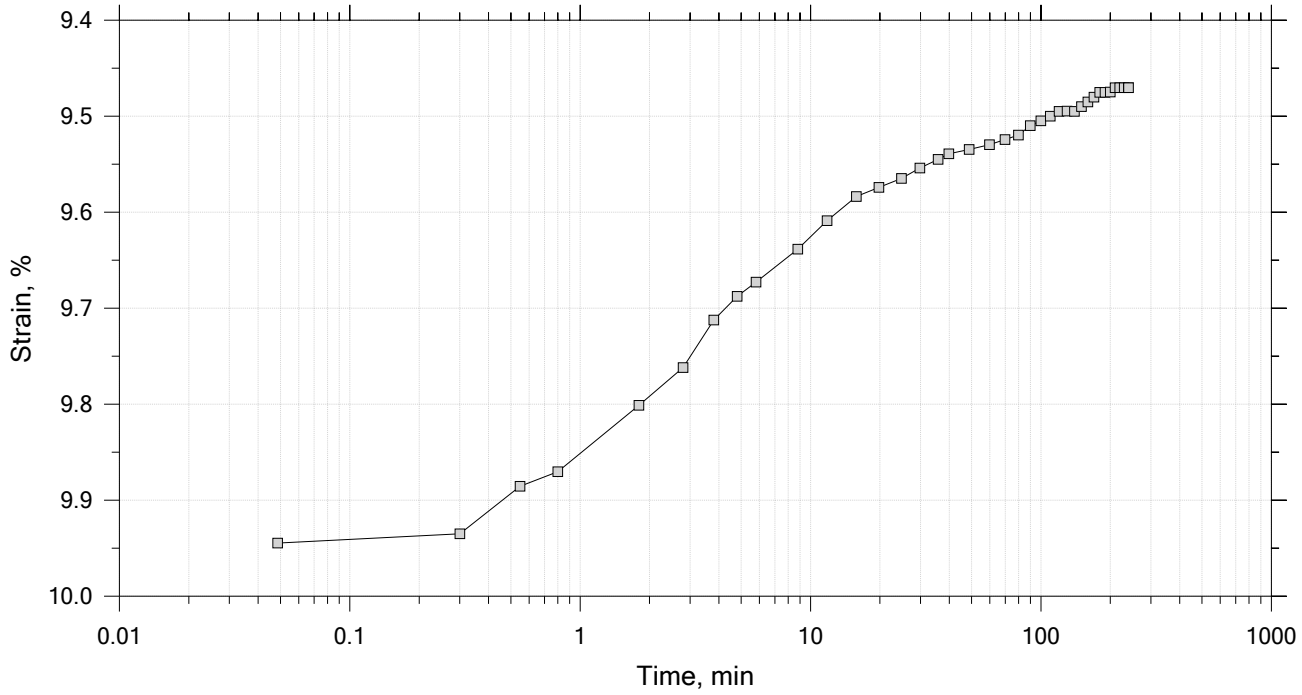


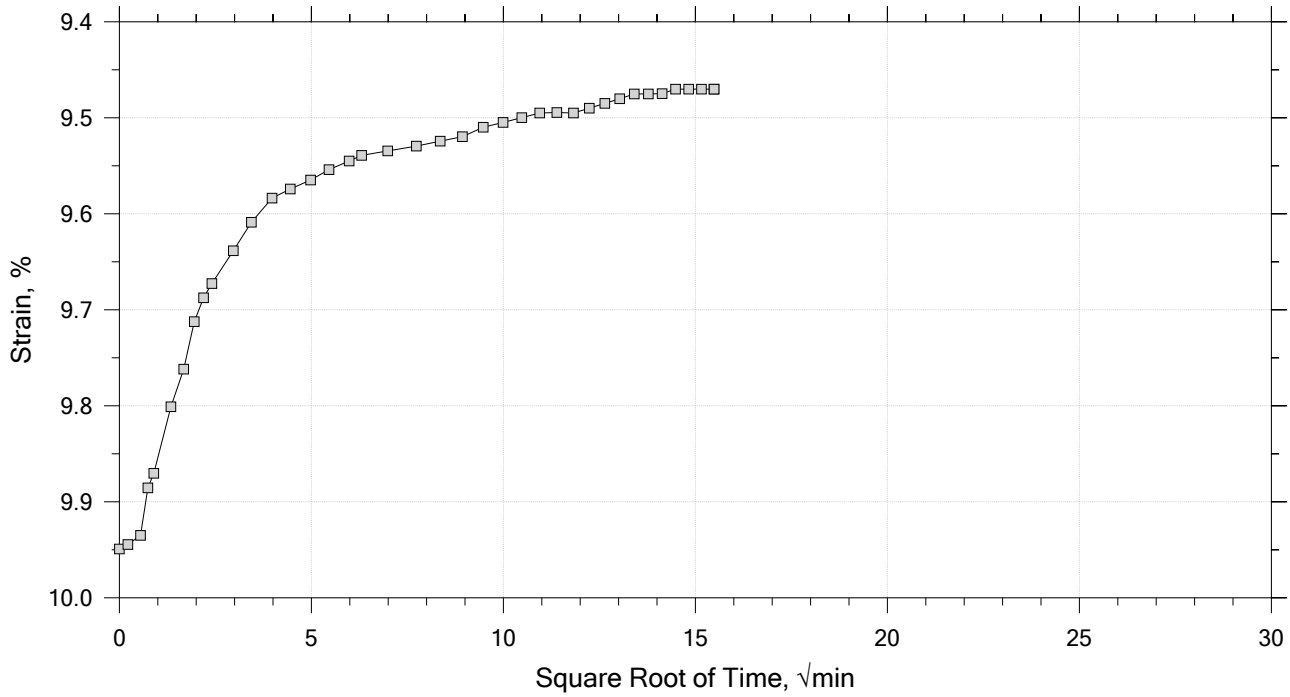


GeoTesting EXPRESS	Project: I-295 over Vernada St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-203	Tested By: md	Checked By: mcm
	Sample No.: U3	Test Date: 01/16/19	Depth: 50-52 ft
	Test No.: IP-8	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System X, Swell Pressure = 0.0692 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 11 of 22
Constant Load Step
Stress: 0.5 tsf

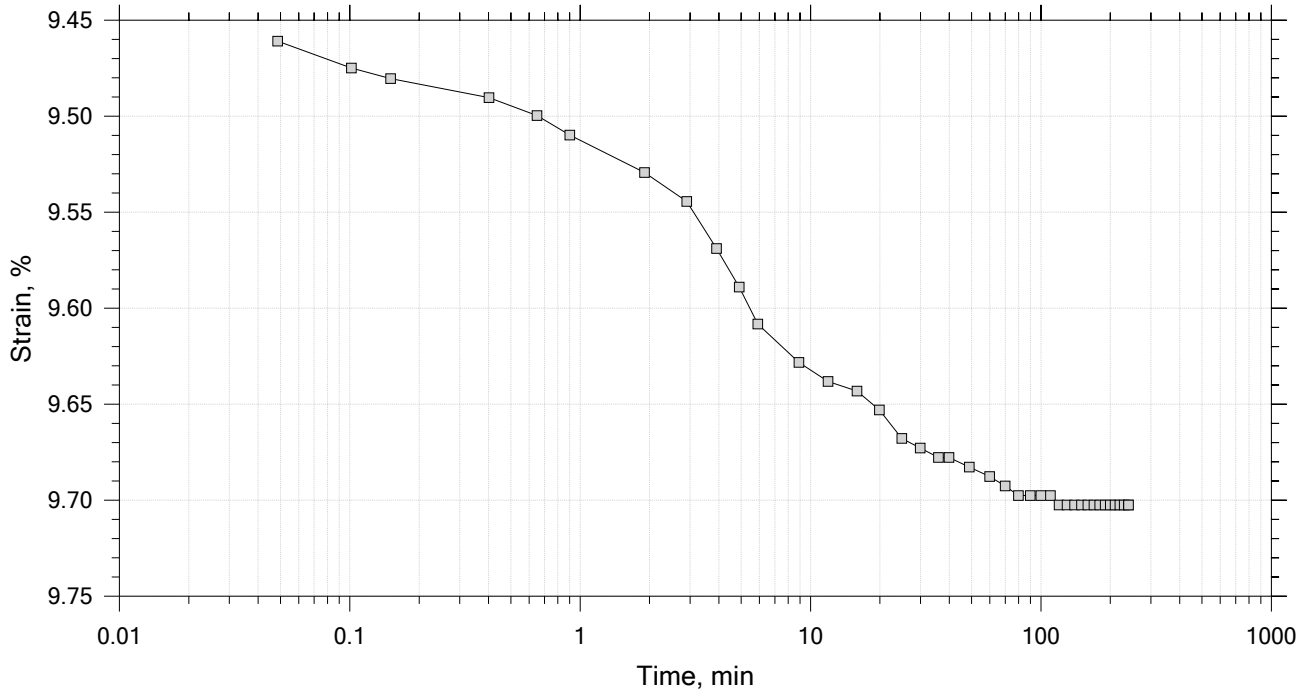


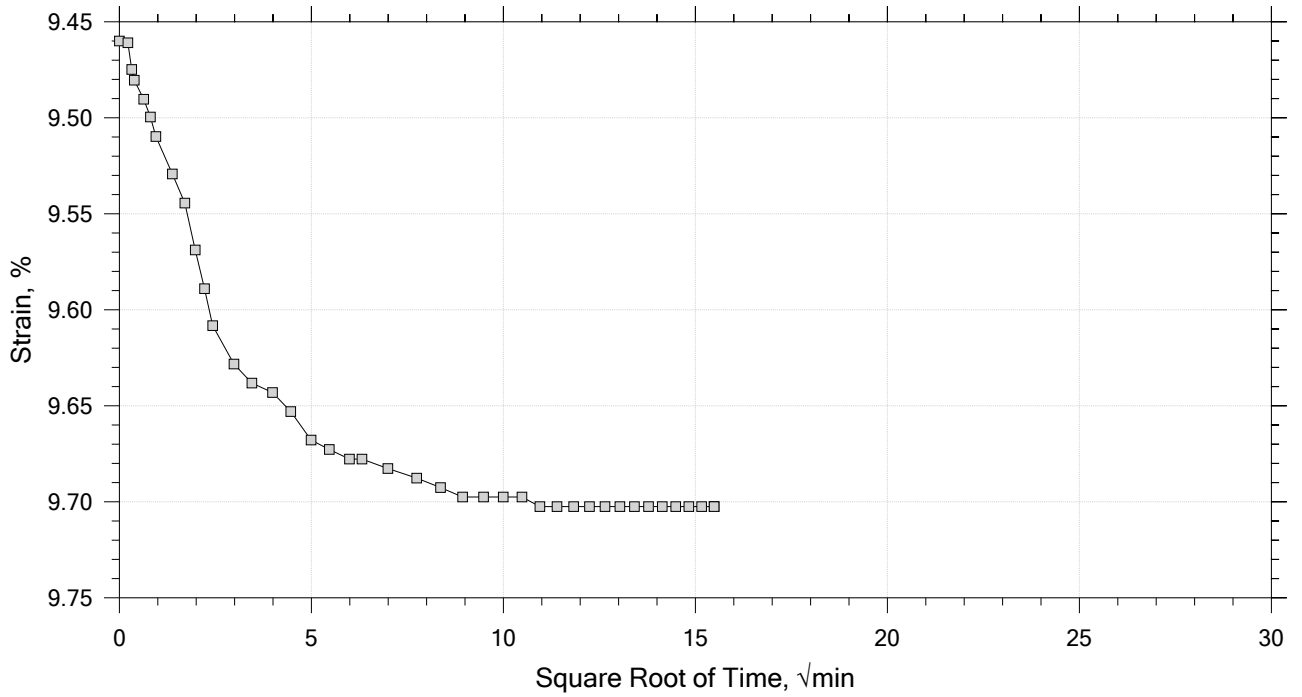


GeoTesting EXPRESS	Project: I-295 over Vernada St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-203	Tested By: md	Checked By: mcm
	Sample No.: U3	Test Date: 01/16/19	Depth: 50-52 ft
	Test No.: IP-8	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System X, Swell Pressure = 0.0692 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 12 of 22
Constant Load Step
Stress: 1 tsf

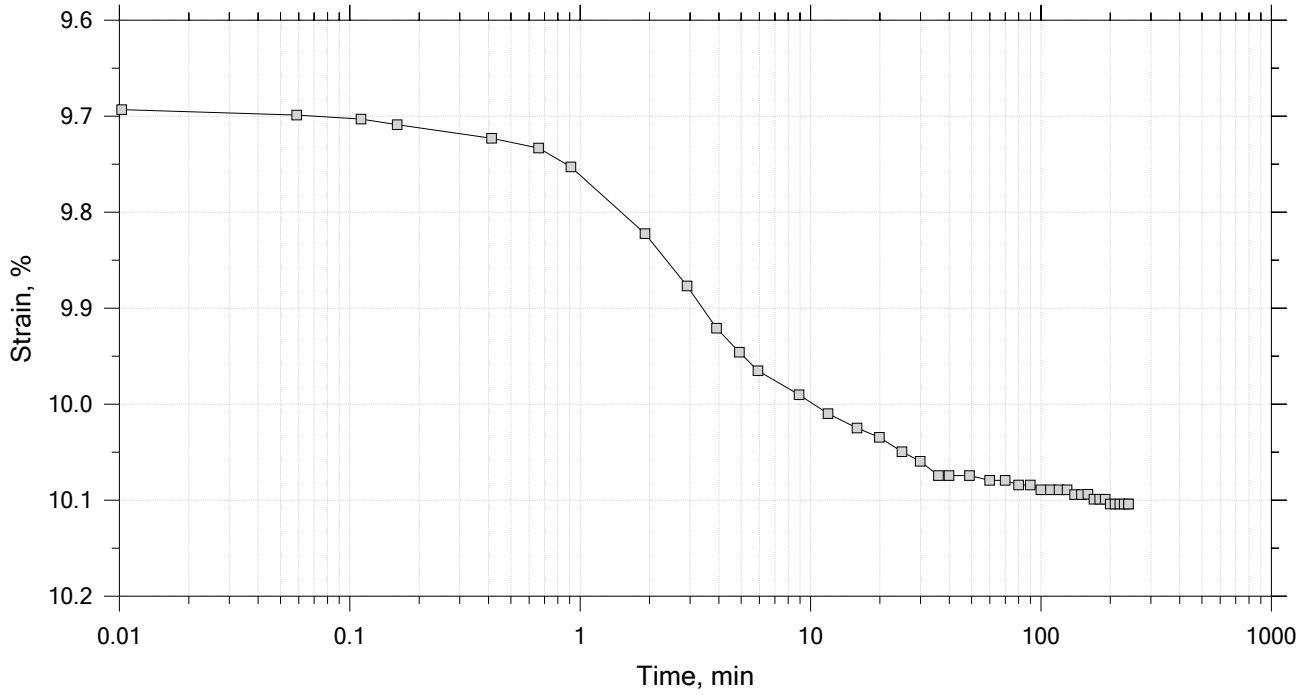


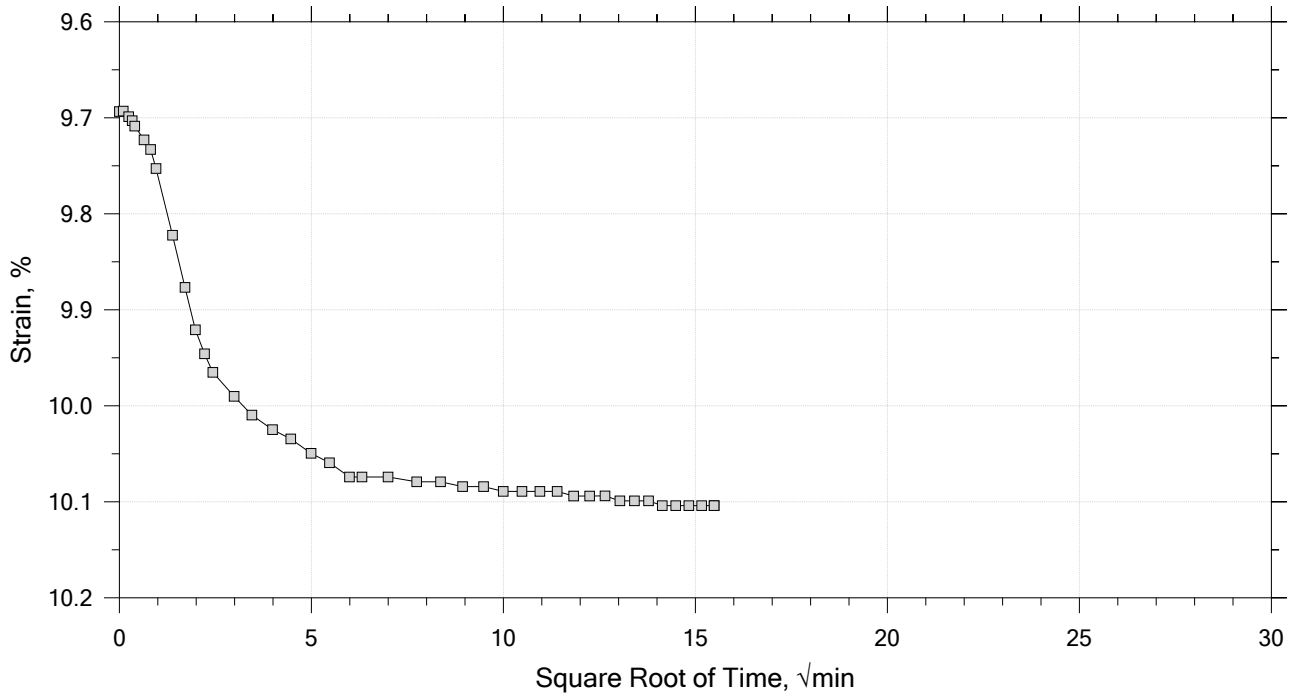


GeoTesting EXPRESS	Project: I-295 over Vernada St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-203	Tested By: md	Checked By: mcm
	Sample No.: U3	Test Date: 01/16/19	Depth: 50-52 ft
	Test No.: IP-8	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System X, Swell Pressure = 0.0692 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 13 of 22
Constant Load Step
Stress: 2 tsf

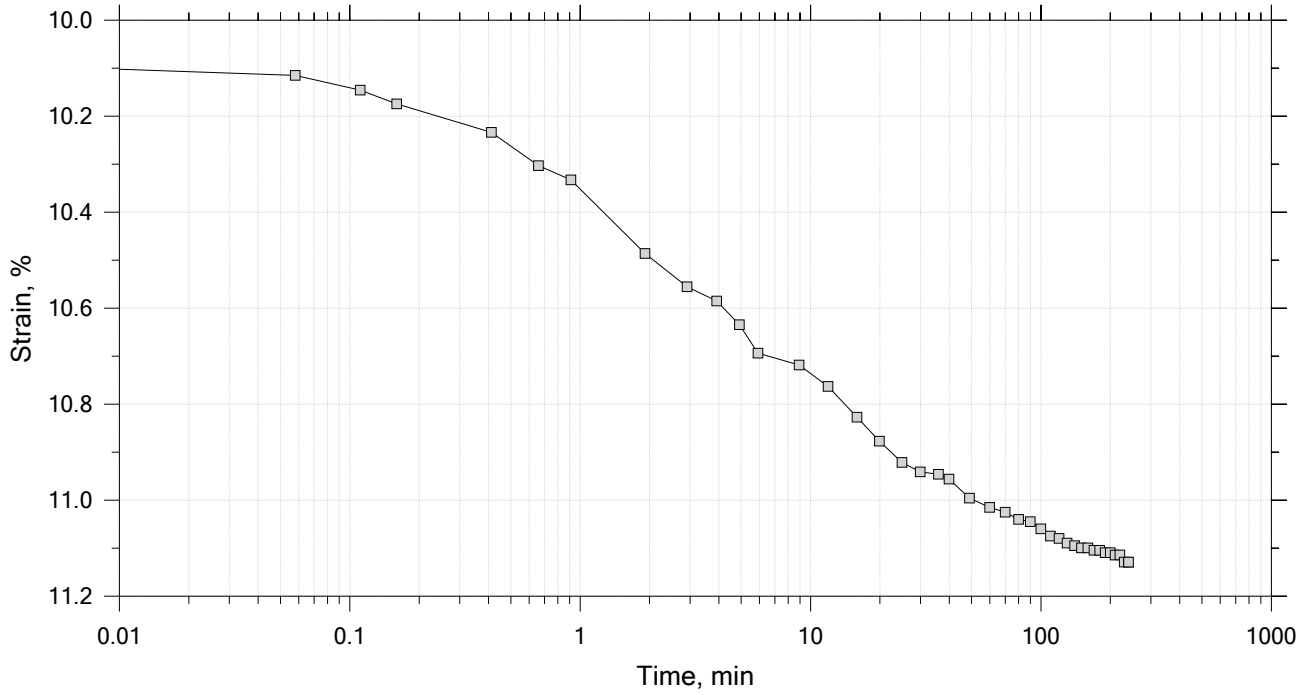


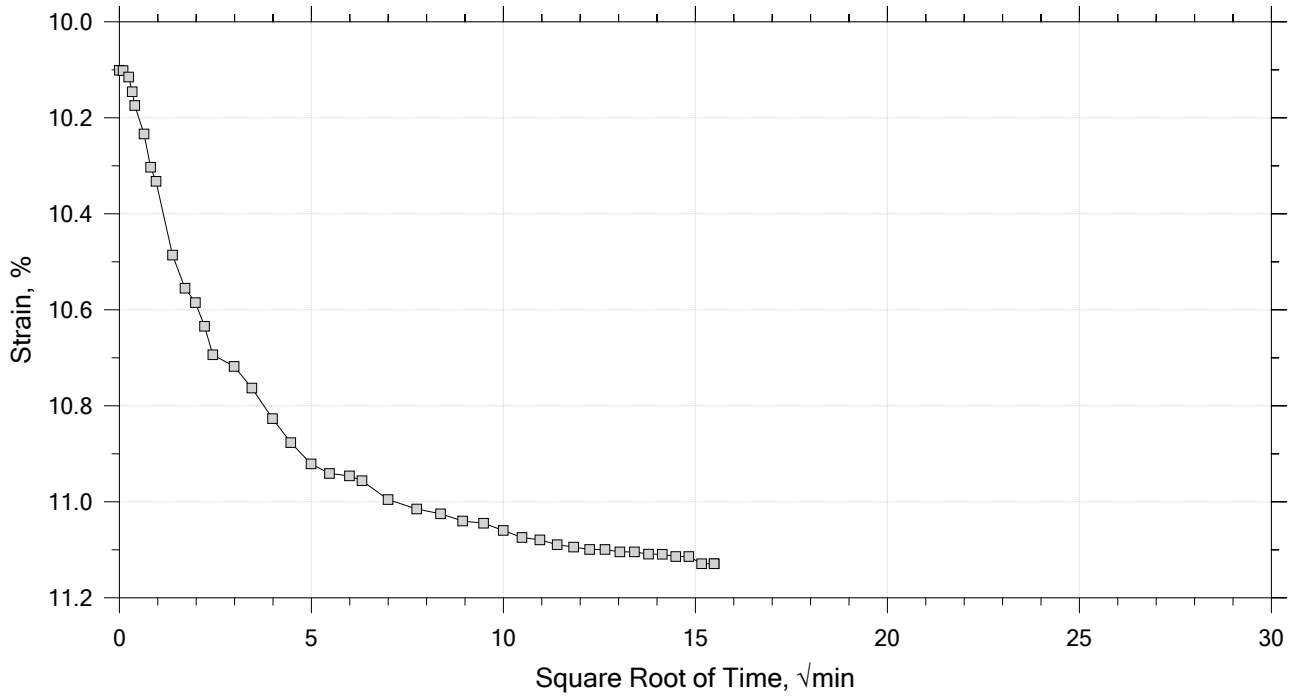


Project: I-295 over Vernada St	Location: Portland, ME	Project No.: GTX-308805
Boring No.: BB-PVS-203	Tested By: md	Checked By: mcm
Sample No.: U3	Test Date: 01/16/19	Depth: 50-52 ft
Test No.: IP-8	Sample Type: intact	Elevation: ---
Description: Moist, dark gray clay		
Remarks: System X, Swell Pressure = 0.0692 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 14 of 22
Constant Load Step
Stress: 4 tsf

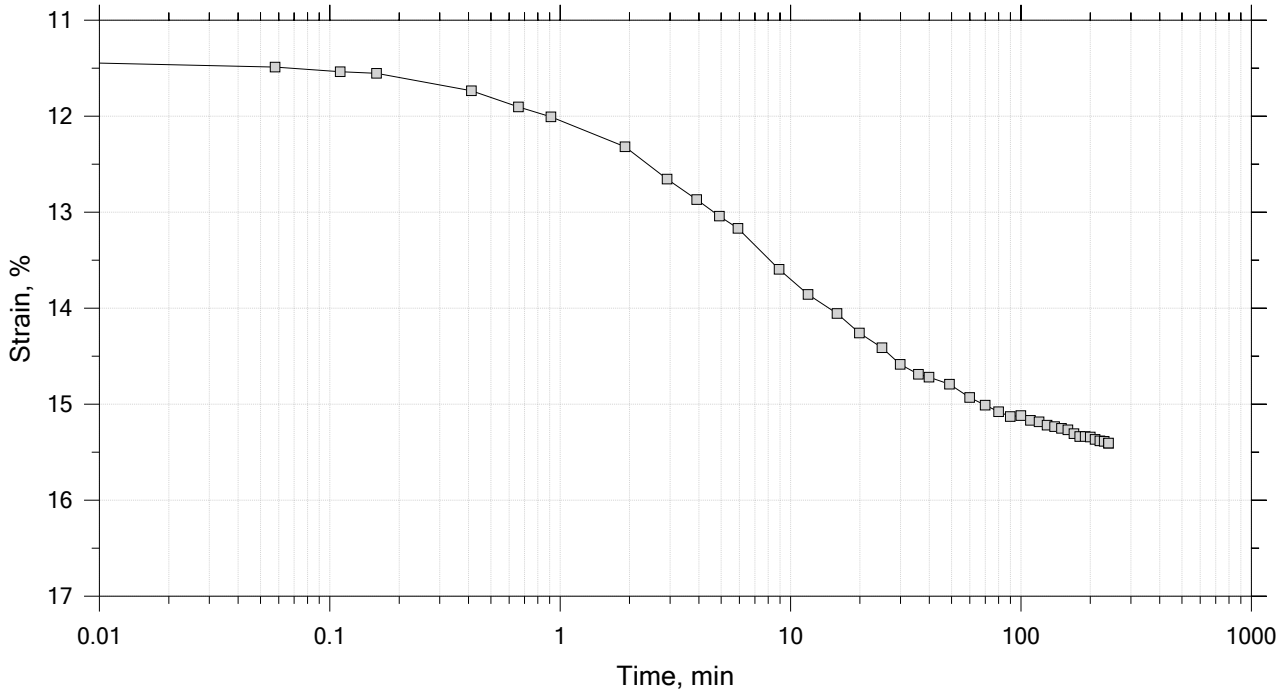


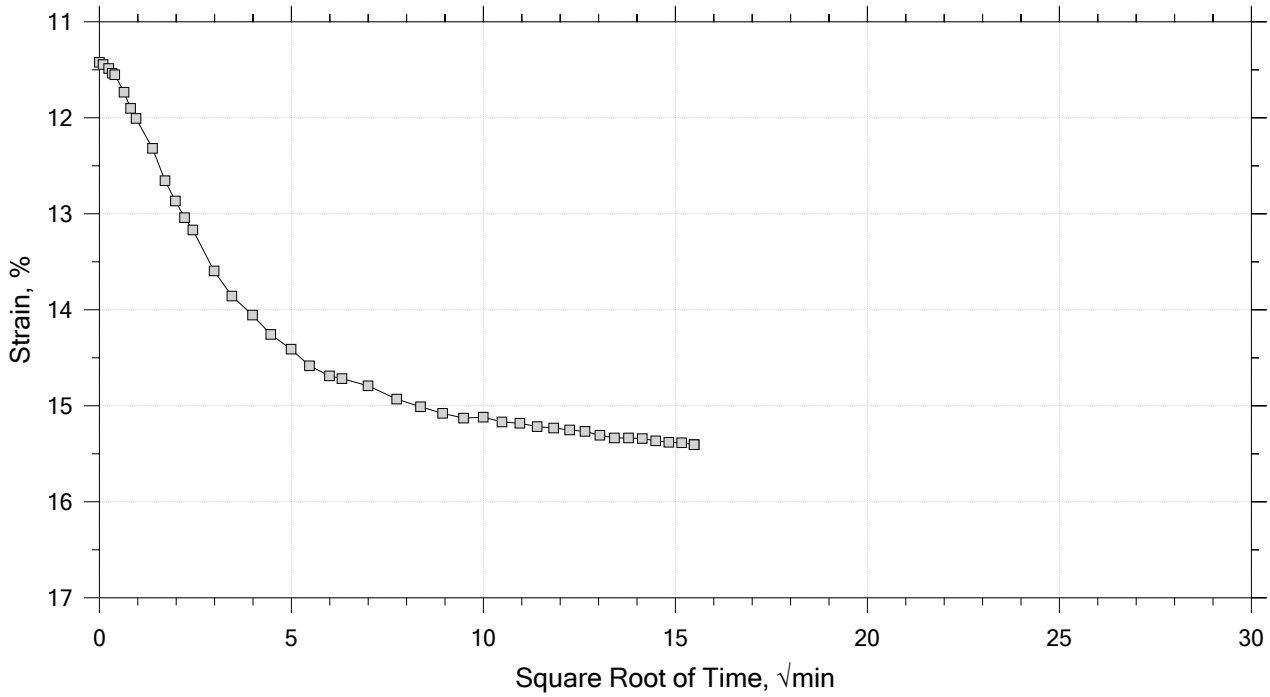


GeoTesting EXPRESS	Project: I-295 over Vernada St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-203	Tested By: md	Checked By: mcm
	Sample No.: U3	Test Date: 01/16/19	Depth: 50-52 ft
	Test No.: IP-8	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System X, Swell Pressure = 0.0692 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 15 of 22
Constant Load Step
Stress: 8 tsf





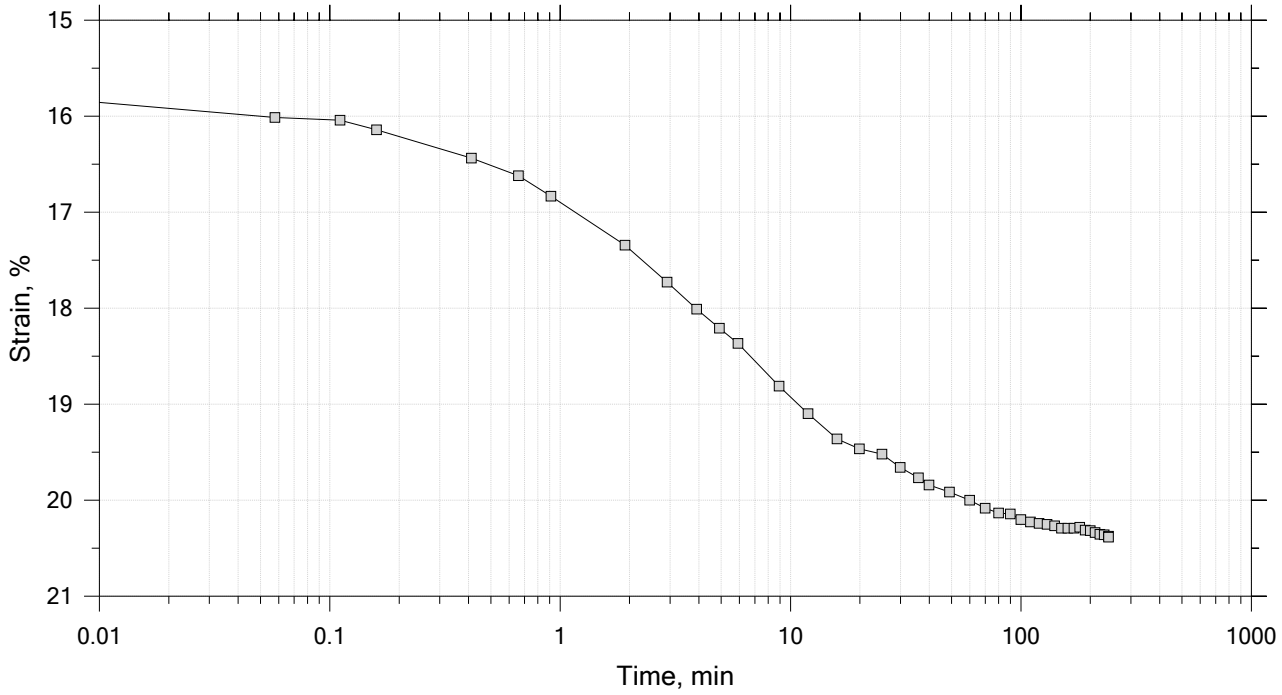
GeoTesting EXPRESS	Project: I-295 over Vernada St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-203	Tested By: md	Checked By: mcm
	Sample No.: U3	Test Date: 01/16/19	Depth: 50-52 ft
	Test No.: IP-8	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System X, Swell Pressure = 0.0692 tsf		

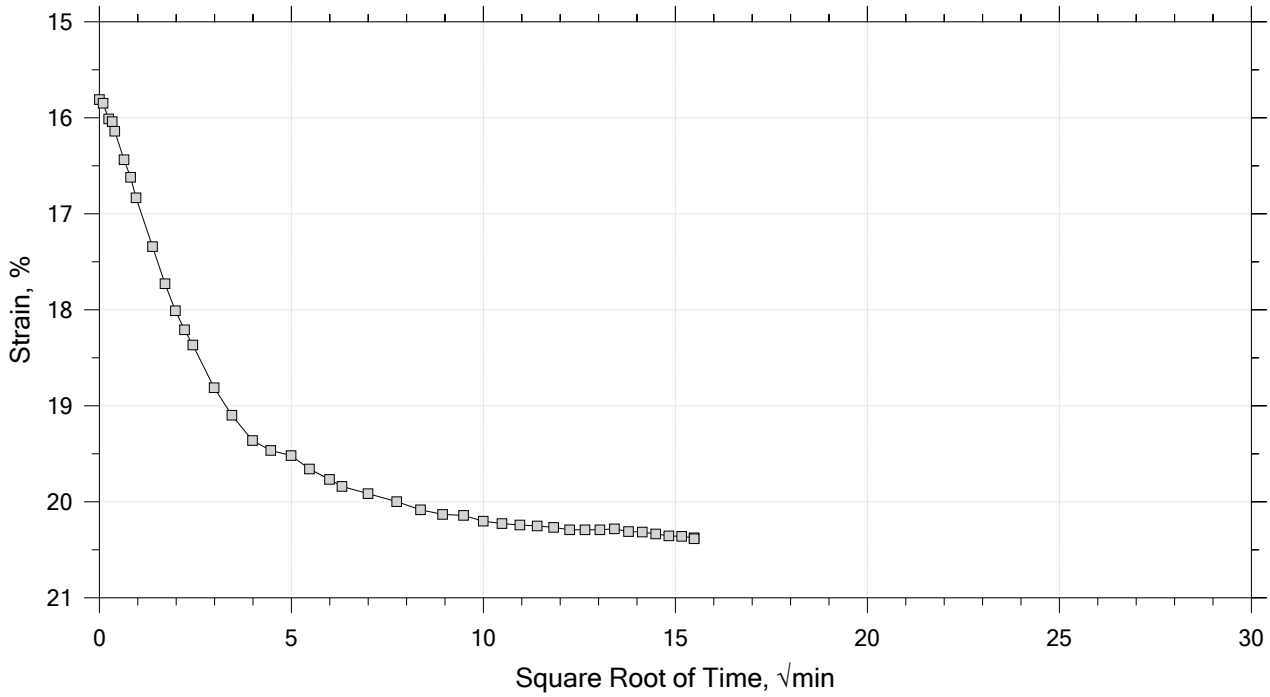
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 16 of 22

Constant Load Step

Stress: 16 tsf





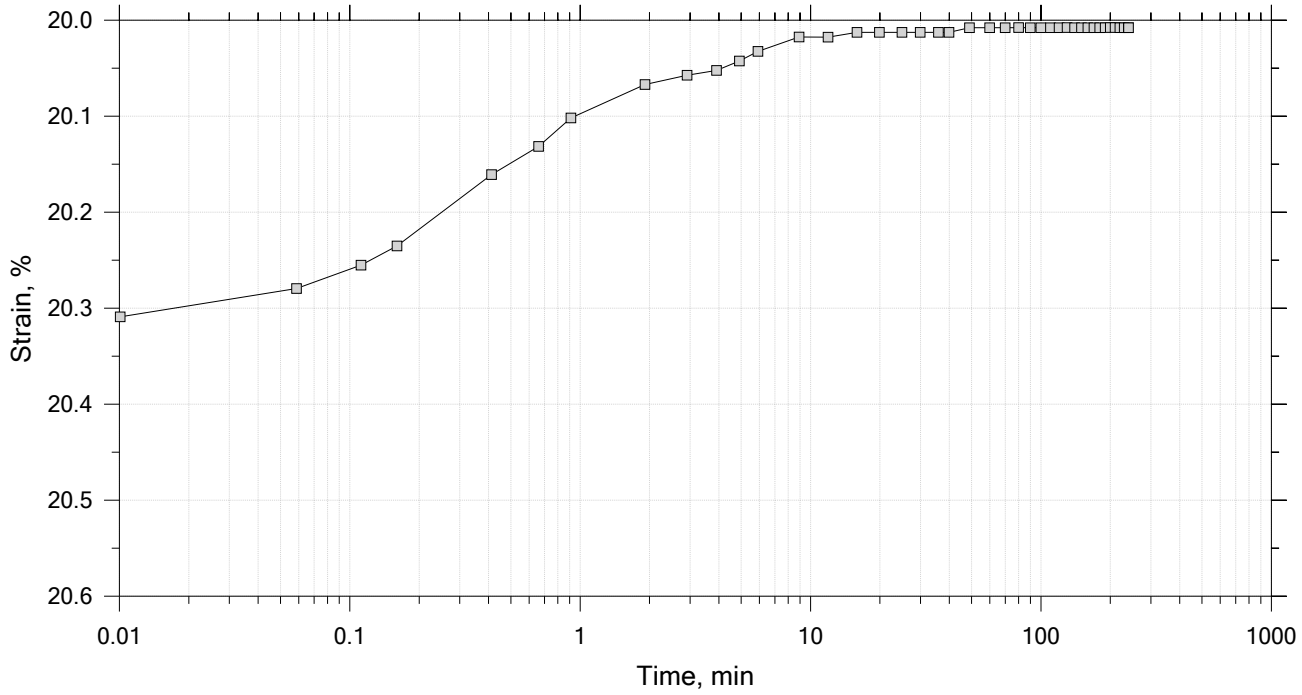
GeoTesting EXPRESS	Project: I-295 over Vernada St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-203	Tested By: md	Checked By: mcm
	Sample No.: U3	Test Date: 01/16/19	Depth: 50-52 ft
	Test No.: IP-8	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System X, Swell Pressure = 0.0692 tsf		

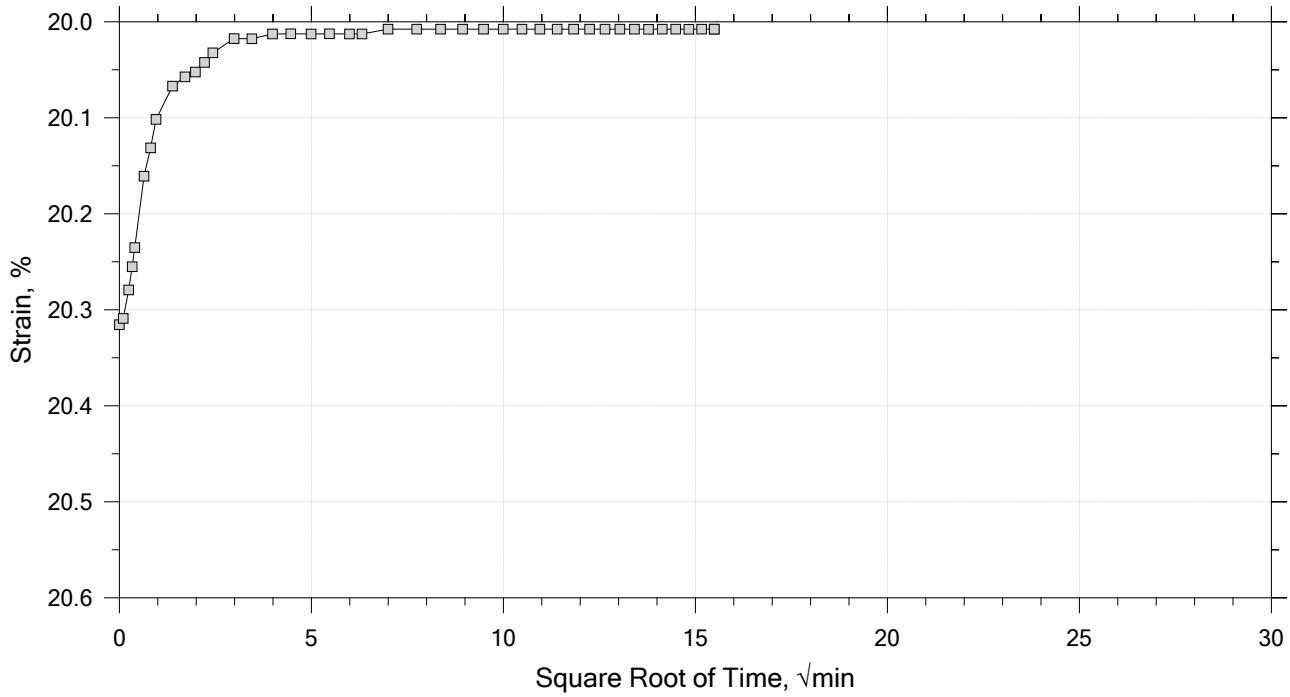
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 17 of 22

Constant Load Step

Stress: 8 tsf

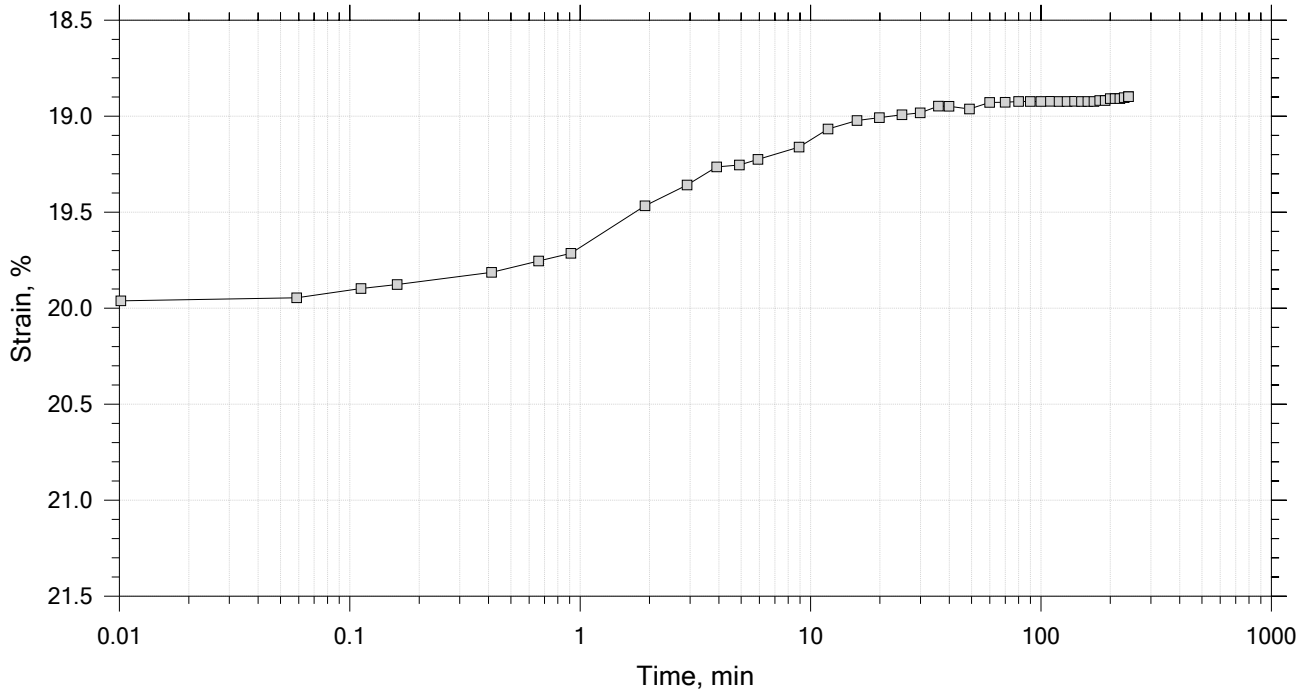


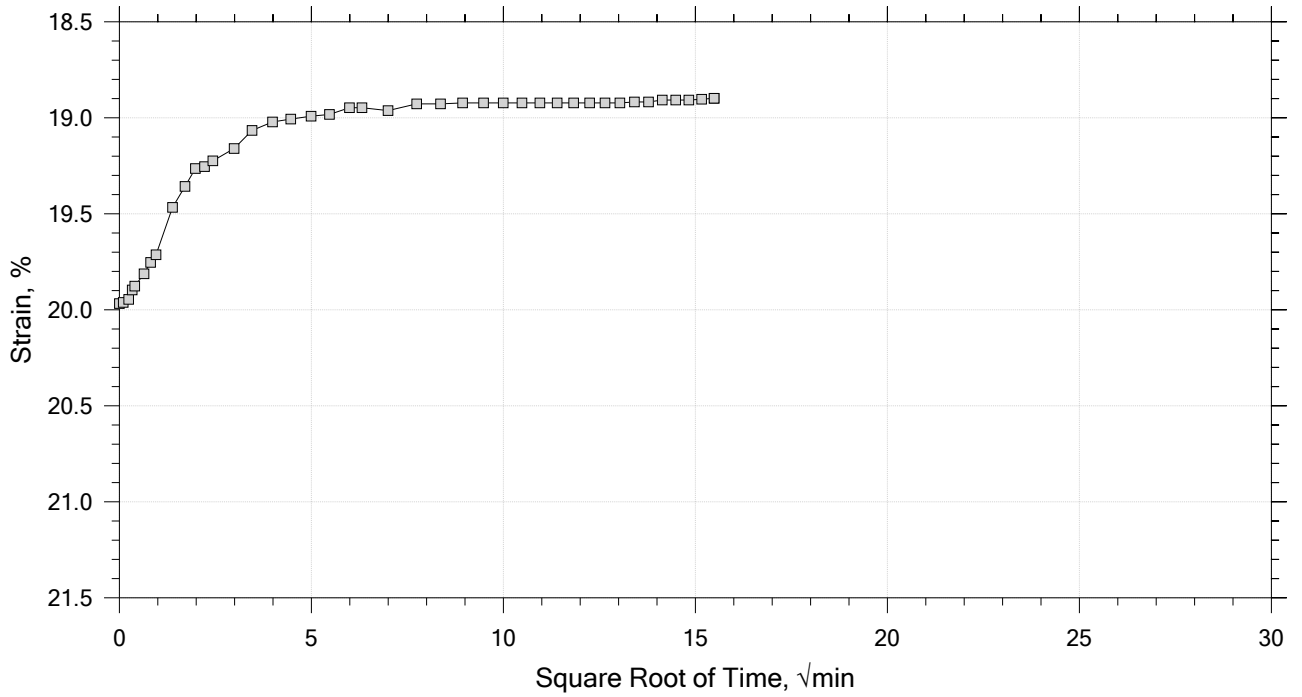


Project: I-295 over Vernada St	Location: Portland, ME	Project No.: GTX-308805
Boring No.: BB-PVS-203	Tested By: md	Checked By: mcm
Sample No.: U3	Test Date: 01/16/19	Depth: 50-52 ft
Test No.: IP-8	Sample Type: intact	Elevation: ---
Description: Moist, dark gray clay		
Remarks: System X, Swell Pressure = 0.0692 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 18 of 22
Constant Load Step
Stress: 2 tsf

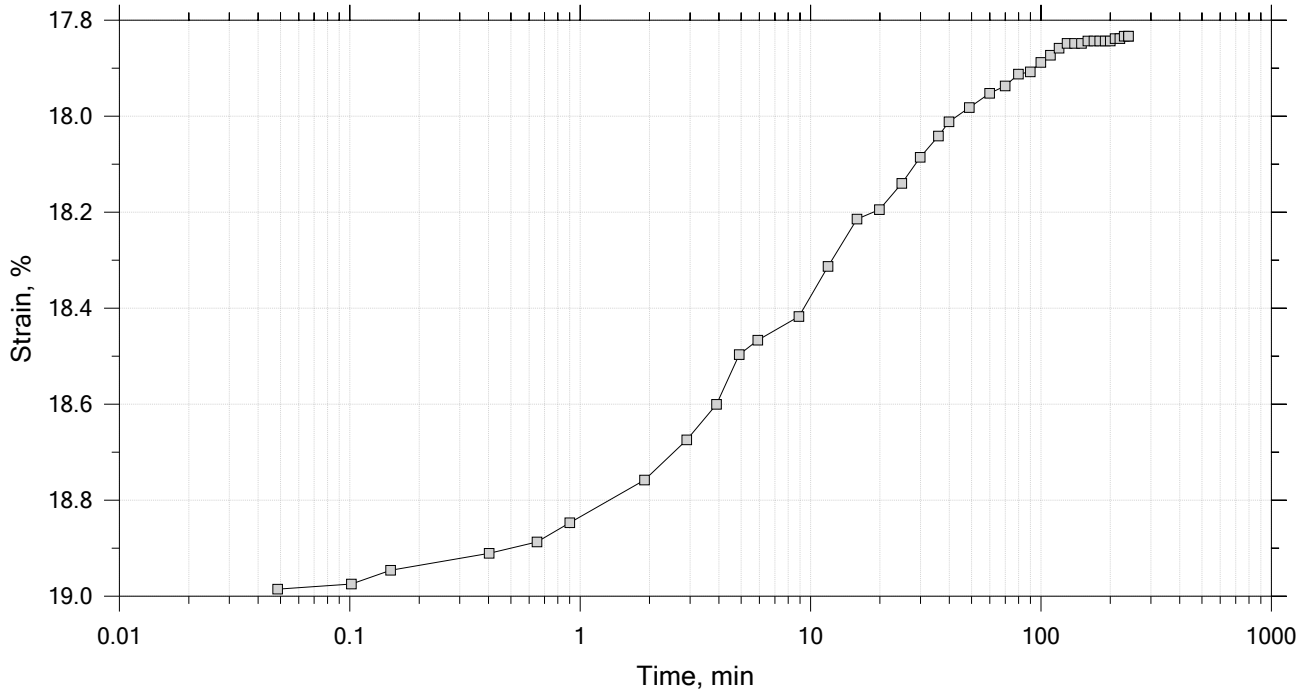


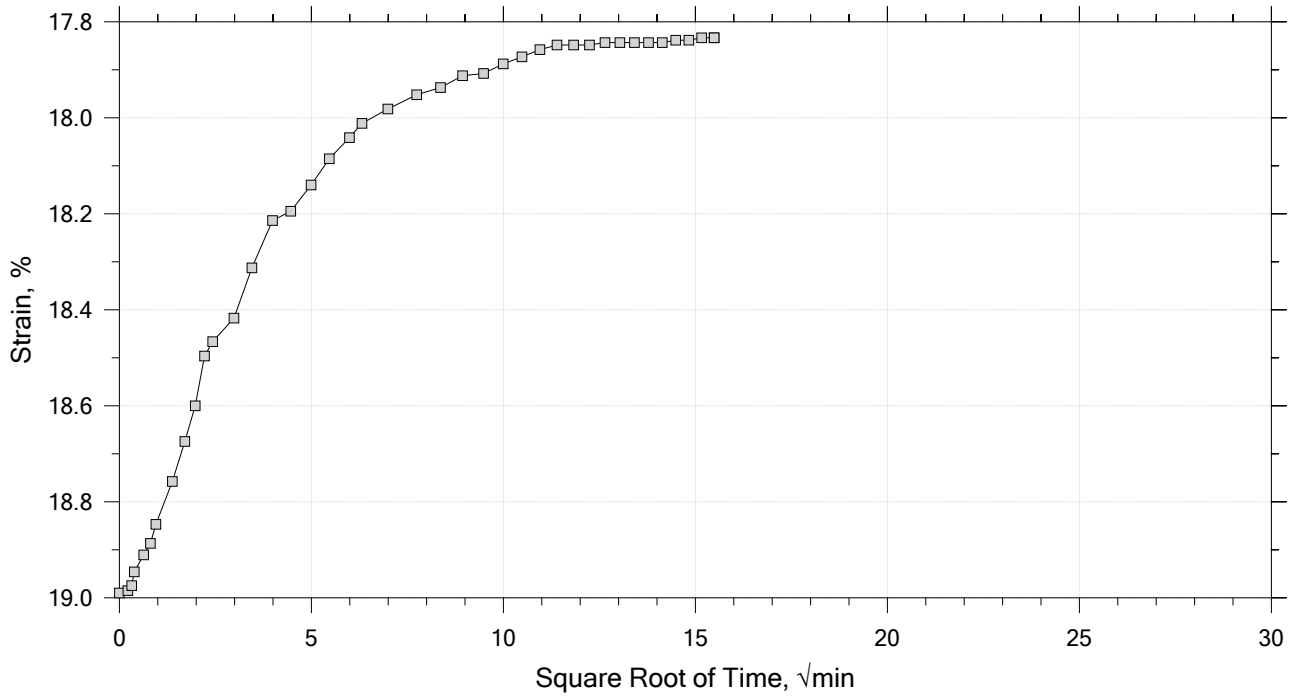


Project: I-295 over Vernada St	Location: Portland, ME	Project No.: GTX-308805
Boring No.: BB-PVS-203	Tested By: md	Checked By: mcm
Sample No.: U3	Test Date: 01/16/19	Depth: 50-52 ft
Test No.: IP-8	Sample Type: intact	Elevation: ---
Description: Moist, dark gray clay		
Remarks: System X, Swell Pressure = 0.0692 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 19 of 22
Constant Load Step
Stress: 0.75 tsf

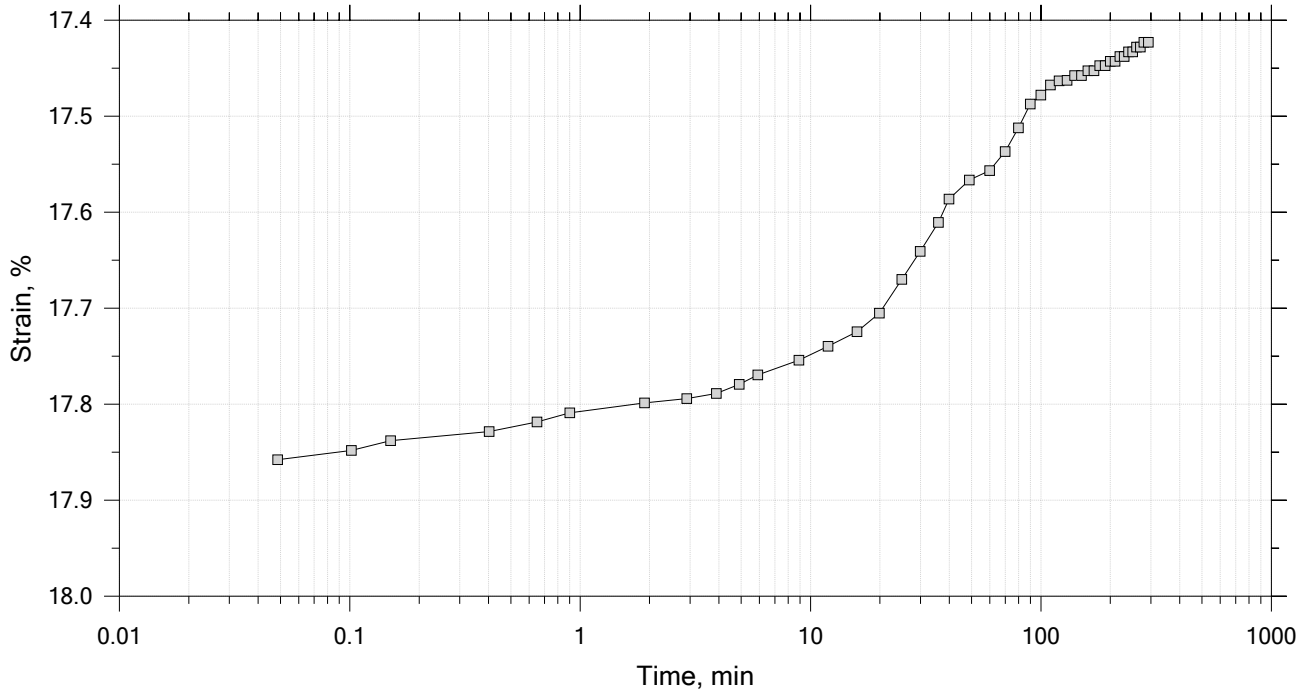


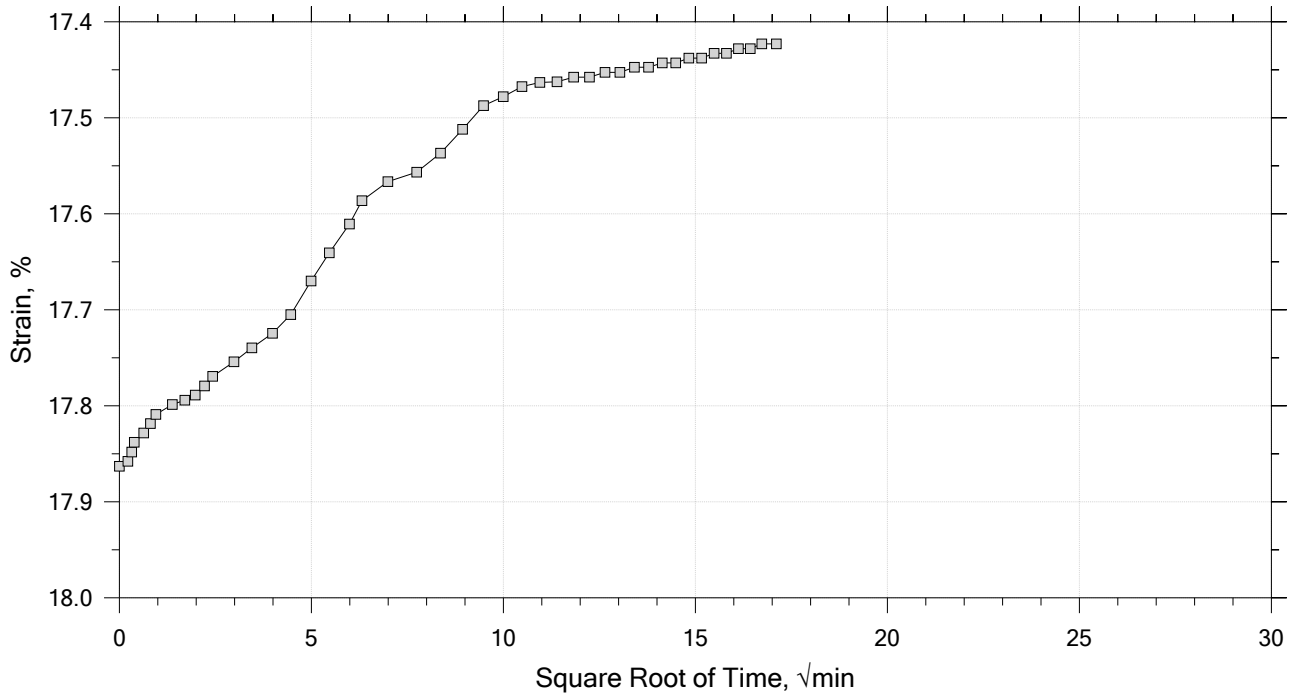


Project: I-295 over Vernada St	Location: Portland, ME	Project No.: GTX-308805
Boring No.: BB-PVS-203	Tested By: md	Checked By: mcm
Sample No.: U3	Test Date: 01/16/19	Depth: 50-52 ft
Test No.: IP-8	Sample Type: intact	Elevation: ---
Description: Moist, dark gray clay		
Remarks: System X, Swell Pressure = 0.0692 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 20 of 22
Constant Load Step
Stress: 0.5 tsf

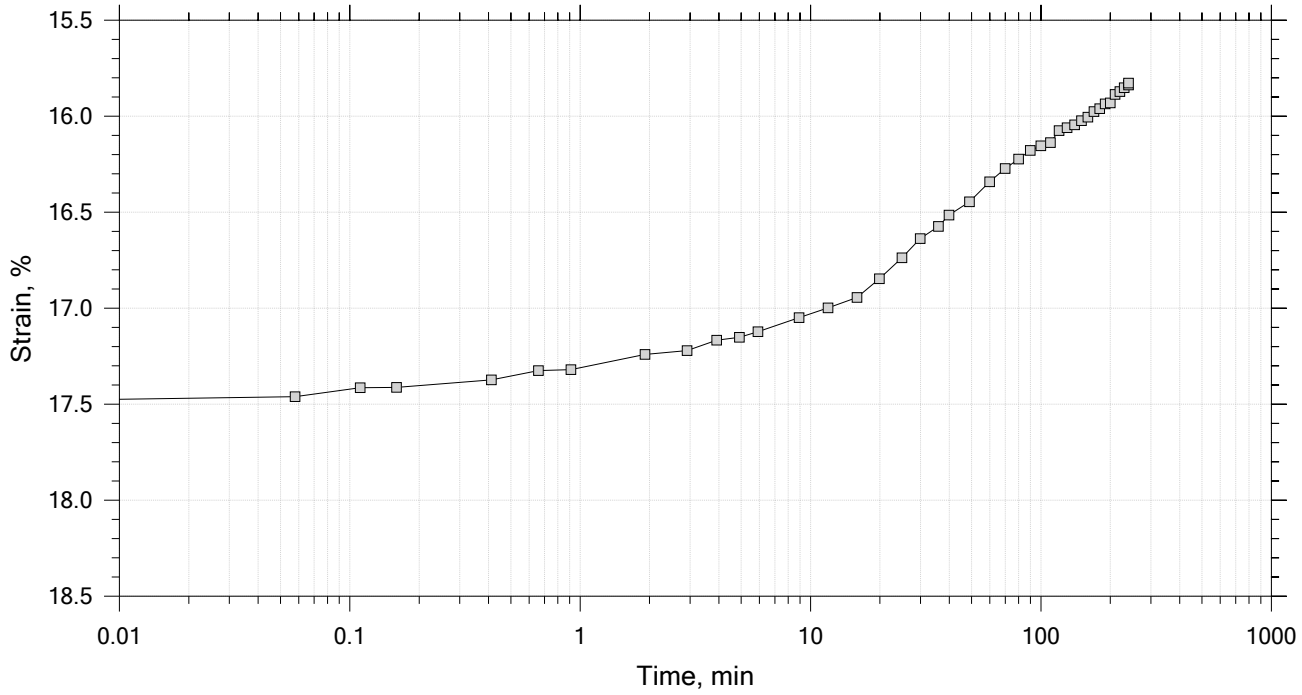


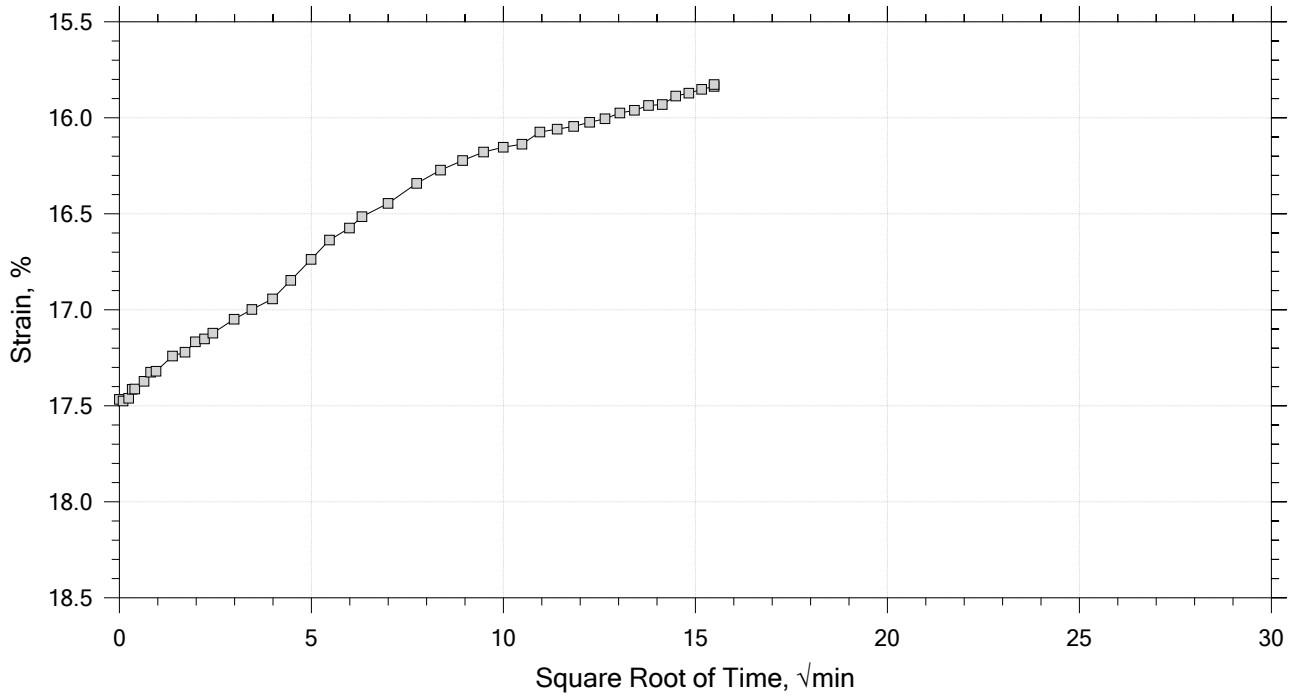


Project: I-295 over Vernada St	Location: Portland, ME	Project No.: GTX-308805
Boring No.: BB-PVS-203	Tested By: md	Checked By: mcm
Sample No.: U3	Test Date: 01/16/19	Depth: 50-52 ft
Test No.: IP-8	Sample Type: intact	Elevation: ---
Description: Moist, dark gray clay		
Remarks: System X, Swell Pressure = 0.0692 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 21 of 22
Constant Load Step
Stress: 0.125 tsf

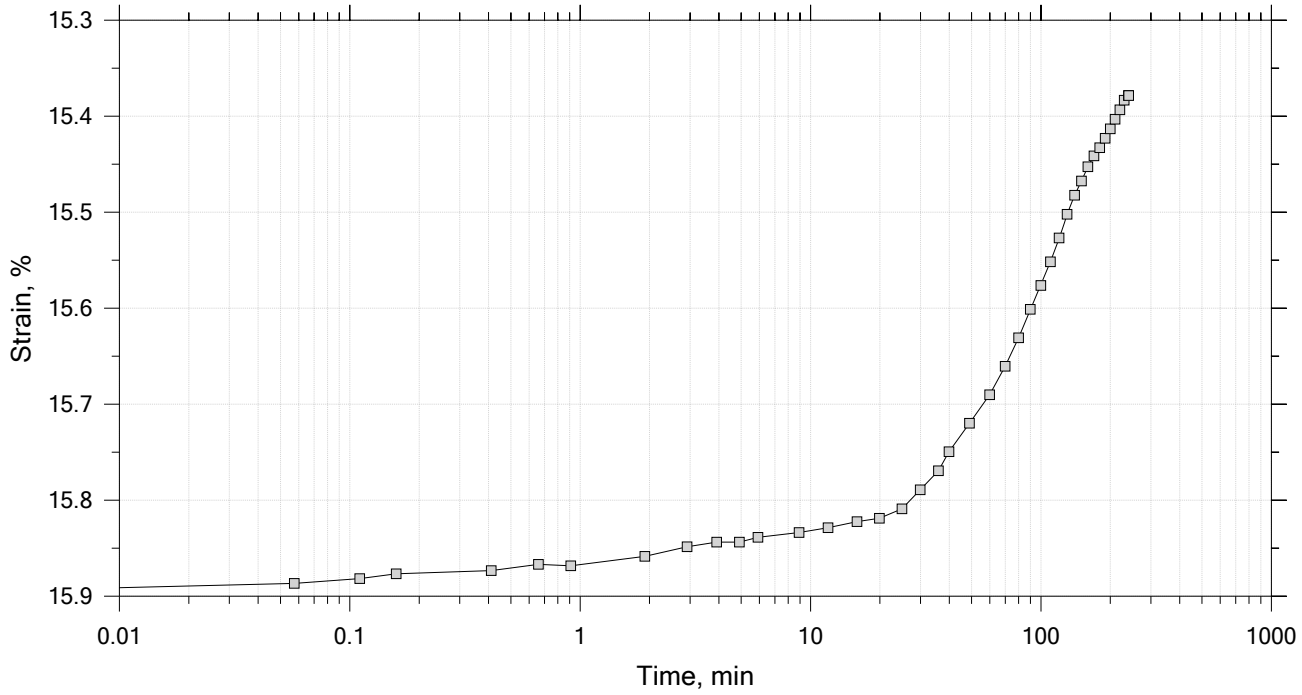


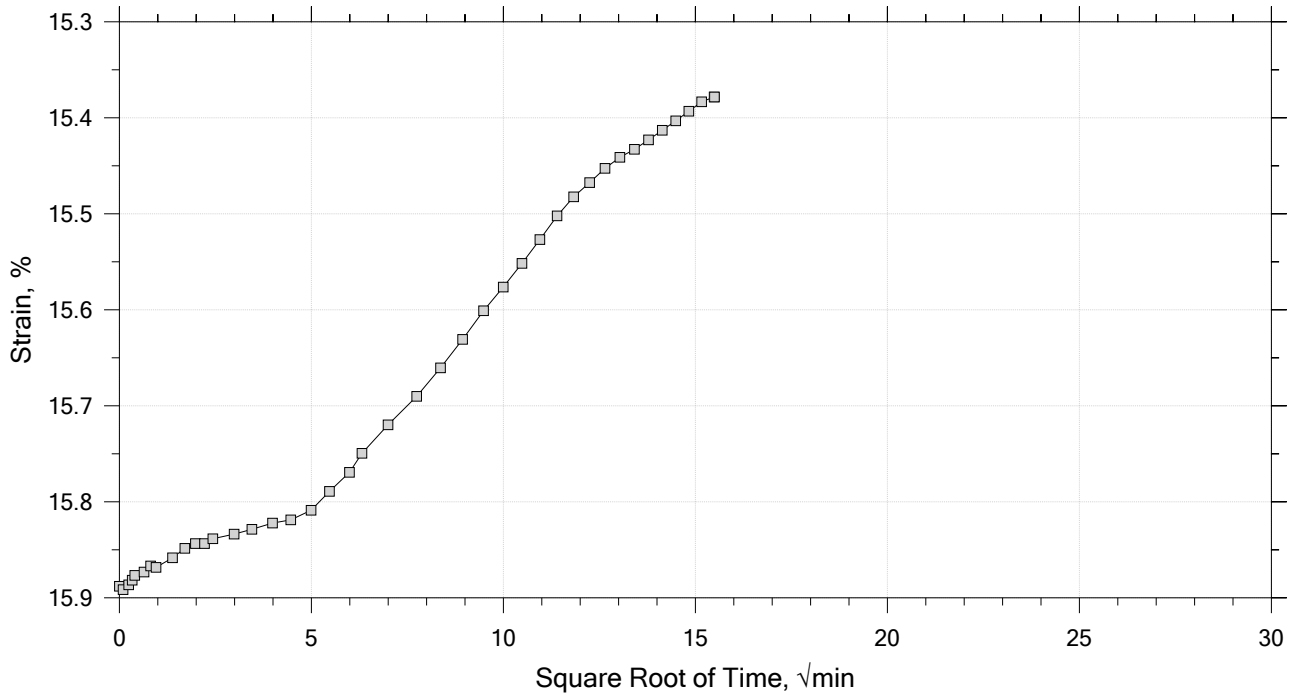


Project: I-295 over Vernada St	Location: Portland, ME	Project No.: GTX-308805
Boring No.: BB-PVS-203	Tested By: md	Checked By: mcm
Sample No.: U3	Test Date: 01/16/19	Depth: 50-52 ft
Test No.: IP-8	Sample Type: intact	Elevation: ---
Description: Moist, dark gray clay		
Remarks: System X, Swell Pressure = 0.0692 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 22 of 22
Constant Load Step
Stress: 0.0625 tsf





Project: I-295 over Vernada St	Location: Portland, ME	Project No.: GTX-308805
Boring No.: BB-PVS-203	Tested By: md	Checked By: mcm
Sample No.: U3	Test Date: 01/16/19	Depth: 50-52 ft
Test No.: IP-8	Sample Type: intact	Elevation: ---
Description: Moist, dark gray clay		
Remarks: System X, Swell Pressure = 0.0692 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Specimen Diameter: 2.50 in	Estimated Specific Gravity: 2.78	Liquid Limit: 37
Initial Height: 1.00 in	Initial Void Ratio: 1.02	Plastic Limit: 22
Final Height: 0.85 in	Final Void Ratio: 0.707	Plasticity Index: 15

	Before Test Trimmings	Before Test Specimen	After Test Specimen	After Test Trimmings
Container ID	A-1588	RING		A-1568
Mass Container, gm	8.33	111.29	111.29	8.23
Mass Container + Wet Soil, gm	216.79	261.6	250.19	146.88
Mass Container + Dry Soil, gm	160.86	221.99	221.99	118.73
Mass Dry Soil, gm	152.53	110.7	110.7	110.5
Water Content, %	36.67	35.78	25.48	25.48
Void Ratio	---	1.02	0.71	---
Degree of Saturation, %	---	97.63	100.00	---
Dry Unit Weight, pcf	---	85.912	101.52	---

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.

GeoTesting EXPRESS	Project: I-295 over Vernada St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-203	Tested By: md	Checked By: mcm
	Sample No.: U3	Test Date: 01/16/19	Depth: 50-52 ft
	Test No.: IP-8	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System X, Swell Pressure = 0.0692 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Log of Time Coefficients

Step	Applied Stress tsf	Final Displacement in	Void Ratio	Strain at End %	Log T50 min	Cv ft²/s	Mv 1/tsf	k ft/day	Ca %
1	0.0692	0.005698	1.01	0.570	0.000	0.00e+00	8.23e-02	0.00e+00	0.00e+00
2	0.125	0.01012	0.997	1.01	14.188	3.95e-07	7.94e-02	8.47e-05	0.00e+00
3	0.250	0.01863	0.980	1.86	0.000	0.00e+00	6.80e-02	0.00e+00	0.00e+00
4	0.500	0.02982	0.957	2.98	0.000	0.00e+00	4.48e-02	0.00e+00	0.00e+00
5	0.750	0.03804	0.941	3.80	18.927	2.81e-07	3.29e-02	2.49e-05	0.00e+00
6	1.00	0.04473	0.927	4.47	0.000	0.00e+00	2.67e-02	0.00e+00	0.00e+00
7	2.00	0.06788	0.881	6.79	0.000	0.00e+00	2.32e-02	0.00e+00	0.00e+00
8	4.00	0.1041	0.808	10.4	7.289	6.53e-07	1.81e-02	3.19e-05	0.00e+00
9	2.00	0.1015	0.813	10.1	0.000	0.00e+00	1.29e-03	0.00e+00	0.00e+00
10	1.00	0.09871	0.818	9.87	0.000	0.00e+00	2.78e-03	0.00e+00	0.00e+00
11	0.500	0.09470	0.827	9.47	2.812	1.65e-06	8.01e-03	3.57e-05	0.00e+00
12	1.00	0.09702	0.822	9.70	0.000	0.00e+00	4.65e-03	0.00e+00	0.00e+00
13	2.00	0.1010	0.814	10.1	2.474	1.87e-06	4.01e-03	2.02e-05	0.00e+00
14	4.00	0.1113	0.793	11.1	3.509	1.30e-06	5.13e-03	1.79e-05	0.00e+00
15	8.00	0.1541	0.707	15.4	5.900	7.27e-07	1.07e-02	2.10e-05	0.00e+00
16	16.0	0.2039	0.606	20.4	2.662	1.44e-06	6.22e-03	2.42e-05	0.00e+00
17	8.00	0.2001	0.614	20.0	0.000	0.00e+00	4.72e-04	0.00e+00	0.00e+00
18	2.00	0.1890	0.636	18.9	0.000	0.00e+00	1.85e-03	0.00e+00	0.00e+00
19	0.750	0.1783	0.658	17.8	9.836	3.86e-07	8.52e-03	8.87e-06	0.00e+00
20	0.500	0.1742	0.666	17.4	23.174	1.67e-07	1.64e-02	7.39e-06	0.00e+00
21	0.125	0.1583	0.698	15.8	20.524	1.93e-07	4.26e-02	2.22e-05	0.00e+00
22	0.0625	0.1538	0.707	15.4	0.000	0.00e+00	7.18e-02	0.00e+00	0.00e+00

GeoTesting EXPRESS	Project: I-295 over Vernada St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-203	Tested By: md	Checked By: mcm
	Sample No.: U3	Test Date: 01/16/19	Depth: 50-52 ft
	Test No.: IP-8	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System X, Swell Pressure = 0.0692 tsf		
	Displacement at End of Increment		

One-Dimensional Consolidation by ASTM D2435 - Method B

Square Root of Time Coefficients

Step	Applied Stress tsf	Final Displacement in	Void Ratio	Strain at End %	Sq.Rt. T90 min	Cv ft²/s	Mv 1/tsf	k ft/day
1	0.0692	0.005698	1.01	0.570	16.045	1.52e-06	8.23e-02	3.37e-04
2	0.125	0.01012	0.997	1.01	60.298	4.01e-07	7.94e-02	8.57e-05
3	0.250	0.01863	0.980	1.86	36.297	6.57e-07	6.80e-02	1.20e-04
4	0.500	0.02982	0.957	2.98	38.290	6.10e-07	4.48e-02	7.37e-05
5	0.750	0.03804	0.941	3.80	60.775	3.77e-07	3.29e-02	3.34e-05
6	1.00	0.04473	0.927	4.47	112.330	2.01e-07	2.67e-02	1.45e-05
7	2.00	0.06788	0.881	6.79	139.143	1.57e-07	2.32e-02	9.81e-06
8	4.00	0.1041	0.808	10.4	29.563	6.93e-07	1.81e-02	3.38e-05
9	2.00	0.1015	0.813	10.1	5.879	3.36e-06	1.29e-03	1.17e-05
10	1.00	0.09871	0.818	9.87	8.536	2.33e-06	2.78e-03	1.74e-05
11	0.500	0.09470	0.827	9.47	13.782	1.45e-06	8.01e-03	3.14e-05
12	1.00	0.09702	0.822	9.70	18.385	1.09e-06	4.65e-03	1.37e-05
13	2.00	0.1010	0.814	10.1	18.145	1.10e-06	4.01e-03	1.19e-05
14	4.00	0.1113	0.793	11.1	19.179	1.02e-06	5.13e-03	1.41e-05
15	8.00	0.1541	0.707	15.4	24.956	7.40e-07	1.07e-02	2.13e-05
16	16.0	0.2039	0.606	20.4	14.574	1.13e-06	6.22e-03	1.91e-05
17	8.00	0.2001	0.614	20.0	2.841	5.50e-06	4.72e-04	7.00e-06
18	2.00	0.1890	0.636	18.9	10.460	1.52e-06	1.85e-03	7.59e-06
19	0.750	0.1783	0.658	17.8	33.376	4.90e-07	8.52e-03	1.13e-05
20	0.500	0.1742	0.666	17.4	139.901	1.19e-07	1.64e-02	5.27e-06
21	0.125	0.1583	0.698	15.8	122.103	1.40e-07	4.26e-02	1.60e-05
22	0.0625	0.1538	0.707	15.4	181.977	9.60e-08	7.18e-02	1.86e-05

GeoTesting EXPRESS	Project: I-295 over Vernada St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-203	Tested By: md	Checked By: mcm
	Sample No.: U3	Test Date: 01/16/19	Depth: 50-52 ft
	Test No.: IP-8	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System X, Swell Pressure = 0.0692 tsf		
	Displacement at End of Increment		

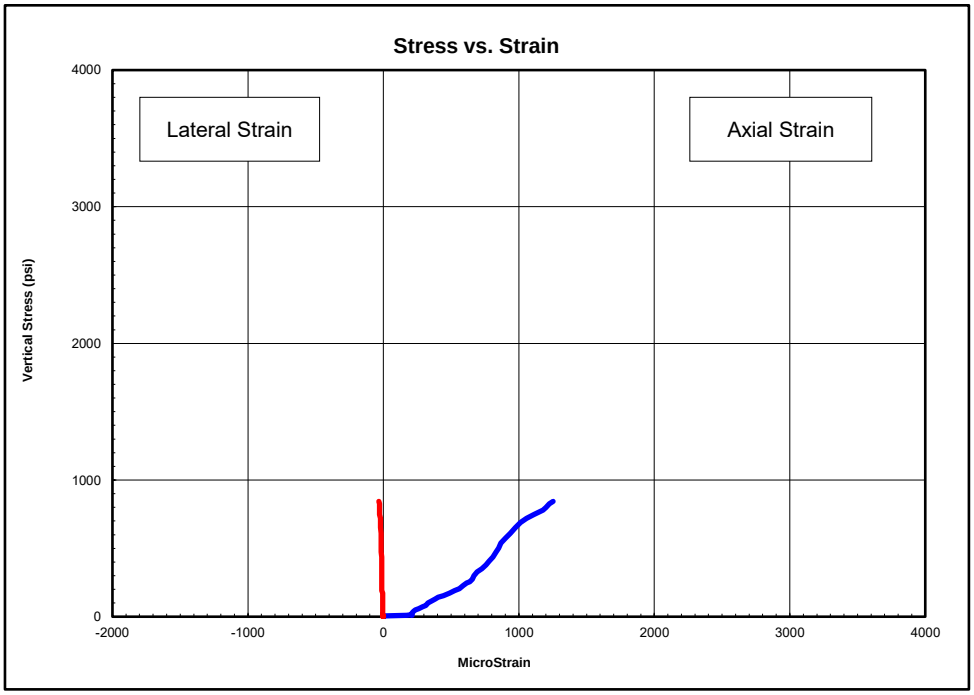
SCHONEWALD ENGINEERING ASSOCIATES, INC.
■ www.SchonewaldEngineering.com ■

RESULTS OF LABORATORY TESTS ON ROCK CORE SPECIMENS – PHASE 1 ((BB-PVS-105, -106, AND -201)

TABULATION OF PHASE 1 ROCK TESTING (GTX PROJECT NO. 308805) (listed in order of test report presentation)				
Boring No.	**Core No.**	**Specimen Depth (ft., BGS)**	**GTX TEST ID / NO. (Boring ID-Sample ID)**	**Tests Completed**
BB-PVS-105	R1	79.5-79.9	not assigned (used boring ID-sample ID)	Unconfined Compression Test on rock
BB-PVS-105	R3	89.3-89.9	not assigned (used boring ID-sample ID)	Unconfined Compression Test on rock
BB-PVS-105	R5	98.9-99.4	not assigned (used boring ID-sample ID)	Unconfined Compression Test on rock
BB-PVS-106	R1	62.9-63.3	not assigned (used boring ID-sample ID)	Unconfined Compression Test on rock
BB-PVS-201	R2	108.6-109.1	not assigned (used boring ID-sample ID)	Unconfined Compression Test on rock
BB-PVS-201	R4	120.9-121.6	not assigned (used boring ID-sample ID)	Unconfined Compression Test on rock
BB-PVS-201	R6	128.2-129.1	not assigned (used boring ID-sample ID)	Unconfined Compression Test on rock

Client:	Schonewald Engineering Associates, Inc.
Project Name:	I-295 Over Veranda St (MaineDOT WIN21745.00)
Project Location:	Portland, ME
GTX #:	308805
Test Date:	9/20/2018
Tested By:	crs
Checked By:	jsc
Boring ID:	BB-PVS-105
Sample ID:	R3
Depth, ft:	89.3-89.9
Sample Type:	rock core
Sample Description:	See photographs Discontinuity failure

Compressive Strength and Elastic Moduli of Rock by ASTM D7012 - Method D



Peak Compressive Stress: 844 psi

Stress Range, psi	Young's Modulus, psi	Poisson's Ratio
100-300	503,000	0.03
300-500	1,010,000	0.05
500-800	844,000	0.04

Notes: Test specimen tested at the approximate as-received moisture content and at standard laboratory temperature.
The axial load was applied continuously at a stress rate that produced failure in a test time between 2 and 15 minutes.
Young's Modulus and Poisson's Ratio calculated using the tangent to the line in the stress range listed.
Calculations assume samples are isotropic, which is not necessarily the case.

Client:	Schonewald Engineering Associates, Inc.	Test Date:	9/19/2018
Project Name:	I-295 Over Veranda St (MaineDOT WIN21745.00)	Tested By:	crs
Project Location:	Portland, ME	Checked By:	jsc
GTX #:	308805		
Boring ID:	BB-PVS-105		
Sample ID:	R3		
Depth:	89.3-89.9 ft		
Visual Description:	See photographs		

UNIT WEIGHT DETERMINATION AND DIMENSIONAL AND SHAPE TOLERANCES OF ROCK CORE SPECIMENS BY ASTM D4543

BULK DENSITY

	1	2	Average
Specimen Length, in:	4.26	4.26	4.26
Specimen Diameter, in:	1.98	1.98	1.98
Specimen Mass, g:	578.68		
Bulk Density, lb/ft^3	168	**Minimum Diameter Tolerence Met?**	YES
Length to Diameter Ratio:	2.2	**Length to Diameter Ratio Tolerance Met?**	YES

DEVIATION FROM STRAIGHTNESS (Procedure S1)

Maximum gap between side of core and reference surface plate:
Is the maximum gap ≤ 0.02 in.? YES

Maximum difference must be < 0.020 in.
Straightness Tolerance Met? YES

END FLATNESS AND PARALLELISM (Procedure FP1)

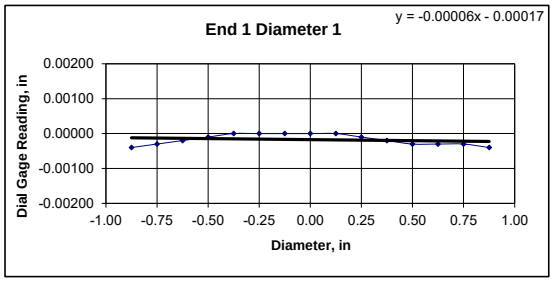
END 1	-0.875	-0.750	-0.625	-0.500	-0.375	-0.250	-0.125	0.000	0.125	0.250	0.375	0.500	0.625	0.750	0.875
Diameter 1, in	-0.00040	-0.00030	-0.00020	-0.00010	0.00000	0.00000	0.00000	0.00000	0.00000	-0.00010	-0.00020	-0.00030	-0.00030	-0.00030	-0.00040
Diameter 2, in (rotated 90°)	-0.00060	-0.00050	-0.00040	-0.00030	-0.00020	-0.00010	0.00000	0.00000	0.00010	0.00020	0.00030	0.00040	0.00050	0.00060	0.00070

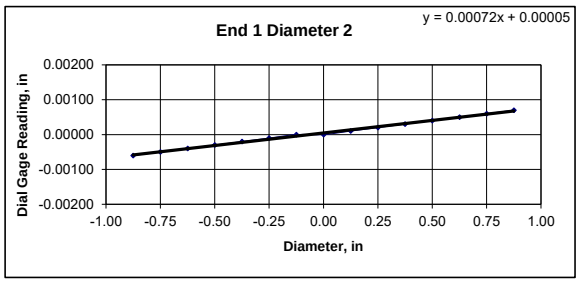
Difference between max and min readings, in:
0° = 0.00040 90° = 0.00130

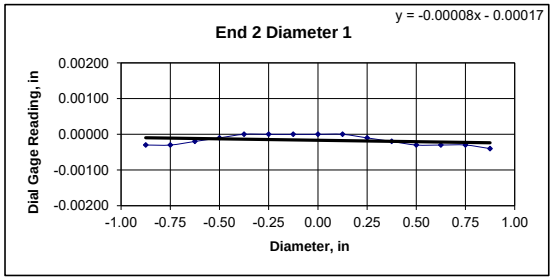
END 2	-0.875	-0.750	-0.625	-0.500	-0.375	-0.250	-0.125	0.000	0.125	0.250	0.375	0.500	0.625	0.750	0.875
Diameter 1, in	-0.00030	-0.00030	-0.00020	-0.00010	0.00000	0.00000	0.00000	0.00000	0.00000	-0.00010	-0.00020	-0.00030	-0.00030	-0.00030	-0.00040
Diameter 2, in (rotated 90°)	-0.00060	-0.00050	-0.00040	-0.00030	-0.00020	-0.00010	0.00000	0.00000	0.00010	0.00020	0.00030	0.00040	0.00050	0.00060	0.00060

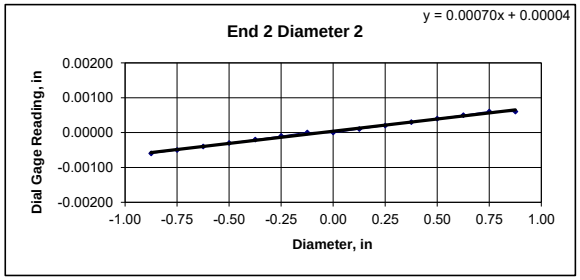
Difference between max and min readings, in:
0° = 0.0004 90° = 0.0012

Maximum difference must be < 0.0020 in. Difference = ± 0.00065
Flatness Tolerance Met? YES









DIAMETER 1

End 1:
Slope of Best Fit Line 0.00006
Angle of Best Fit Line: 0.00344

End 2:
Slope of Best Fit Line 0.00008
Angle of Best Fit Line: 0.00458

Maximum Angular Difference: 0.00115

Parallelism Tolerance Met? YES
Spherically Seated

DIAMETER 2

End 1:
Slope of Best Fit Line 0.00072
Angle of Best Fit Line: 0.04125

End 2:
Slope of Best Fit Line 0.00070
Angle of Best Fit Line: 0.04011

Maximum Angular Difference: 0.00115

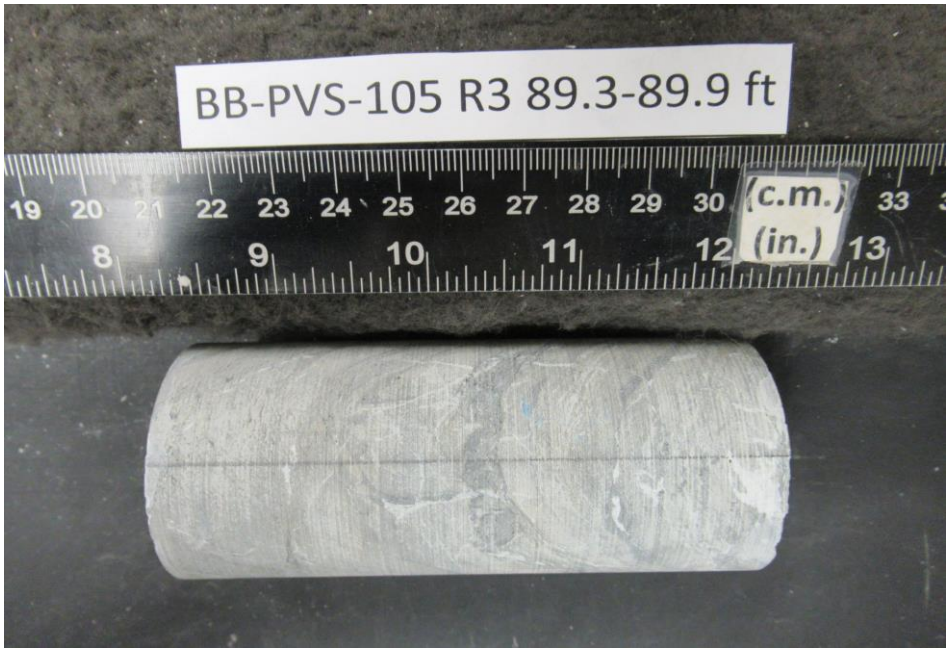
Parallelism Tolerance Met? YES
Spherically Seated

PERPENDICULARITY (Procedure P1) (Calculated from End Flatness and Parallelism measurements above)

END 1	Difference, Maximum and Minimum (in.)	Diameter (in.)	Slope	Angle°	Perpendicularity Tolerance Met?
Diameter 1, in	0.00040	1.980	0.00020	0.012	YES
Diameter 2, in (rotated 90°)	0.00130	1.980	0.00066	0.038	YES
END 2					
Diameter 1, in	0.00040	1.980	0.00020	0.012	YES
Diameter 2, in (rotated 90°)	0.00120	1.980	0.00061	0.035	YES

Maximum angle of departure must be ≤ 0.25°
Perpendicularity Tolerance Met? YES

Client:	Schonewald Engineering Associates, Inc.
Project Name:	I-295 Over Veranda St (MaineDOT WIN21745.00)
Project Location:	Portland, ME
GTX #:	308805
Test Date:	09/20/18
Tested By:	crs
Checked By:	jsc
Boring ID:	BB-PVS-105
Sample ID:	R-3
Depth, ft:	89.3-89.9

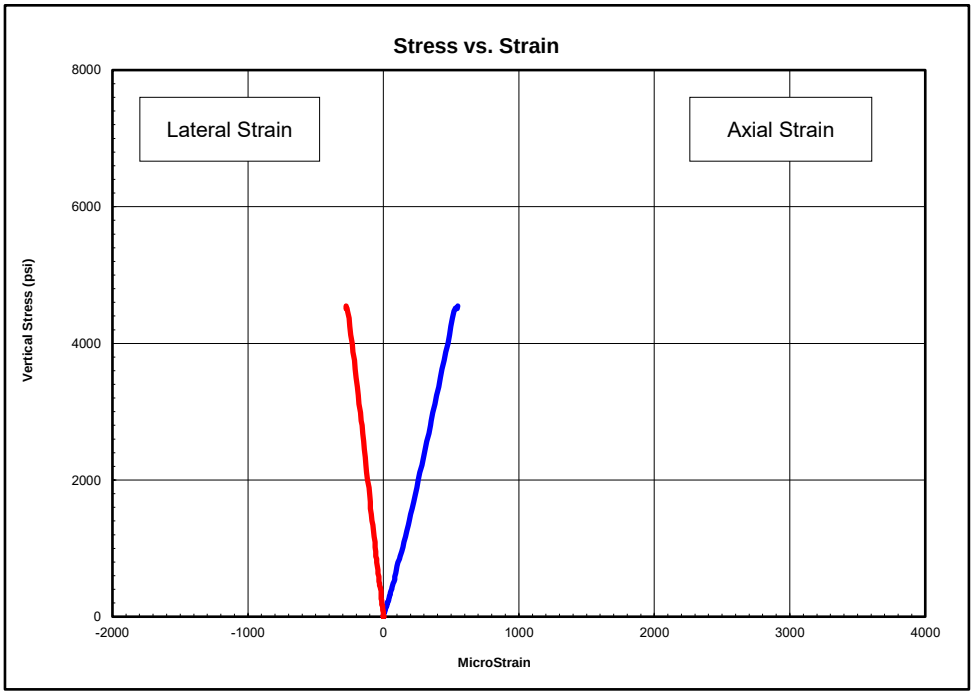


After cutting and lapping

After break

Client:	Schonewald Engineering Associates, Inc.
Project Name:	I-295 Over Veranda St (MaineDOT WIN21745.00)
Project Location:	Portland, ME
GTX #:	308805
Test Date:	9/20/2018
Tested By:	crs
Checked By:	jsc
Boring ID:	BB-PVS-105
Sample ID:	R5
Depth, ft:	98.9-99.4
Sample Type:	rock core
Sample Description:	See photographs Discontinuity failure

Compressive Strength and Elastic Moduli of Rock by ASTM D7012 - Method D



Peak Compressive Stress: 4,548 psi

Stress Range, psi	Young's Modulus, psi	Poisson's Ratio
500-1700	7,680,000	0.45
1700-2900	9,010,000	0.50
2900-4100	9,410,000	---

Notes:
Test specimen tested at the approximate as-received moisture content and at standard laboratory temperature.
The axial load was applied continuously at a stress rate that produced failure in a test time between 2 and 15 minutes.
Young's Modulus and Poisson's Ratio calculated using the tangent to the line in the stress range listed.
Calculations assume samples are isotropic, which is not necessarily the case.

Client:	Schonewald Engineering Associates, Inc.	Test Date:	9/19/2018
Project Name:	I-295 Over Veranda St (MaineDOT WIN21745.00)	Tested By:	crs
Project Location:	Portland, ME	Checked By:	jsc
GTX #:	308805		
Boring ID:	BB-PVS-105		
Sample ID:	R5		
Depth:	98.9-99.4 ft		
Visual Description:	See photographs		

UNIT WEIGHT DETERMINATION AND DIMENSIONAL AND SHAPE TOLERANCES OF ROCK CORE SPECIMENS BY ASTM D4543

BULK DENSITY

	1	2	Average
Specimen Length, in:	4.28	4.28	4.28
Specimen Diameter, in:	1.98	1.98	1.98
Specimen Mass, g:	576.33		
Bulk Density, lb/ft^3	166	**Minimum Diameter Tolerence Met?**	YES
Length to Diameter Ratio:	2.2	**Length to Diameter Ratio Tolerance Met?**	YES

DEVIATION FROM STRAIGHTNESS (Procedure S1)

Maximum gap between side of core and reference surface plate:
Is the maximum gap ≤ 0.02 in.? NO

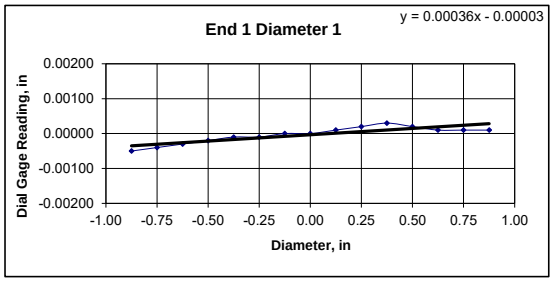
Maximum difference must be < 0.020 in.
Straightness Tolerance Met? NO

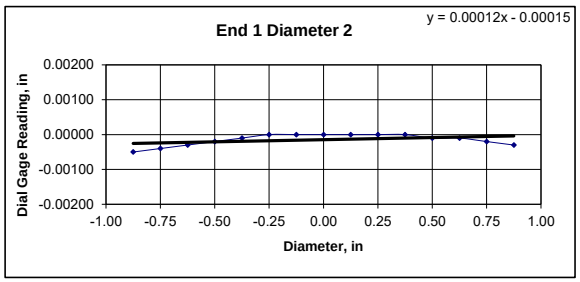
END FLATNESS AND PARALLELISM (Procedure FP1)

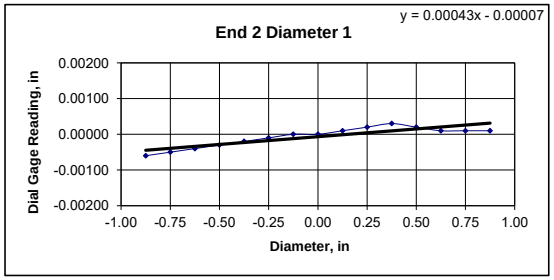
END 1	-0.875	-0.750	-0.625	-0.500	-0.375	-0.250	-0.125	0.000	0.125	0.250	0.375	0.500	0.625	0.750	0.875
Diameter 1, in	-0.00050	-0.00040	-0.00030	-0.00020	-0.00010	-0.00010	0.00000	0.00000	0.00010	0.00020	0.00030	0.00020	0.00010	0.00010	0.00010
Diameter 2, in (rotated 90°)	-0.00050	-0.00040	-0.00030	-0.00020	-0.00010	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	-0.00010	-0.00010	-0.00020	-0.00030
											Difference between max and min readings, in:				
											0° =	0.00080	90° =	0.00050	

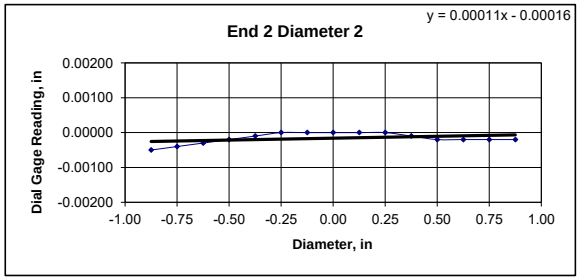
END 2	-0.875	-0.750	-0.625	-0.500	-0.375	-0.250	-0.125	0.000	0.125	0.250	0.375	0.500	0.625	0.750	0.875
Diameter 1, in	-0.00060	-0.00050	-0.00040	-0.00030	-0.00020	-0.00010	0.00000	0.00000	0.00010	0.00020	0.00030	0.00020	0.00010	0.00010	0.00010
Diameter 2, in (rotated 90°)	-0.00050	-0.00040	-0.00030	-0.00020	-0.00010	0.00000	0.00000	0.00000	0.00000	0.00000	-0.00010	-0.00020	-0.00020	-0.00020	-0.00020
											Difference between max and min readings, in:				
											0° =	0.0009	90° =	0.0005	

Maximum difference must be < 0.0020 in. Difference = ± 0.00045
Flatness Tolerance Met? YES









DIAMETER 1

End 1:
Slope of Best Fit Line 0.00036
Angle of Best Fit Line: 0.02079

End 2:
Slope of Best Fit Line 0.00043
Angle of Best Fit Line: 0.02488

Maximum Angular Difference: 0.00409

Parallelism Tolerance Met? YES
Spherically Seated

DIAMETER 2

End 1:
Slope of Best Fit Line 0.00012
Angle of Best Fit Line: 0.00704

End 2:
Slope of Best Fit Line 0.00011
Angle of Best Fit Line: 0.00622

Maximum Angular Difference: 0.00082

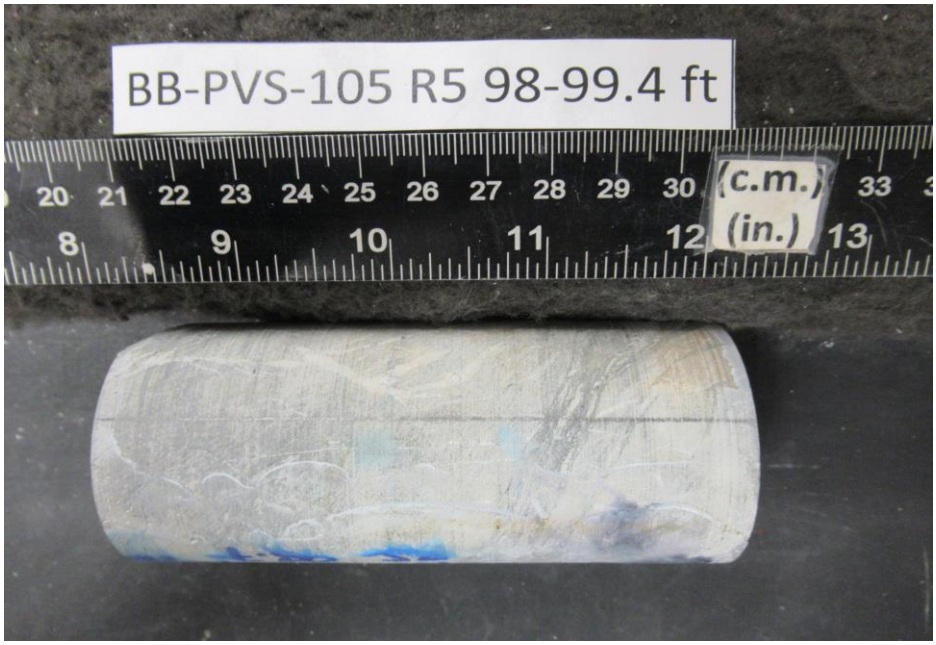
Parallelism Tolerance Met? YES
Spherically Seated

PERPENDICULARITY (Procedure P1) (Calculated from End Flatness and Parallelism measurements above)

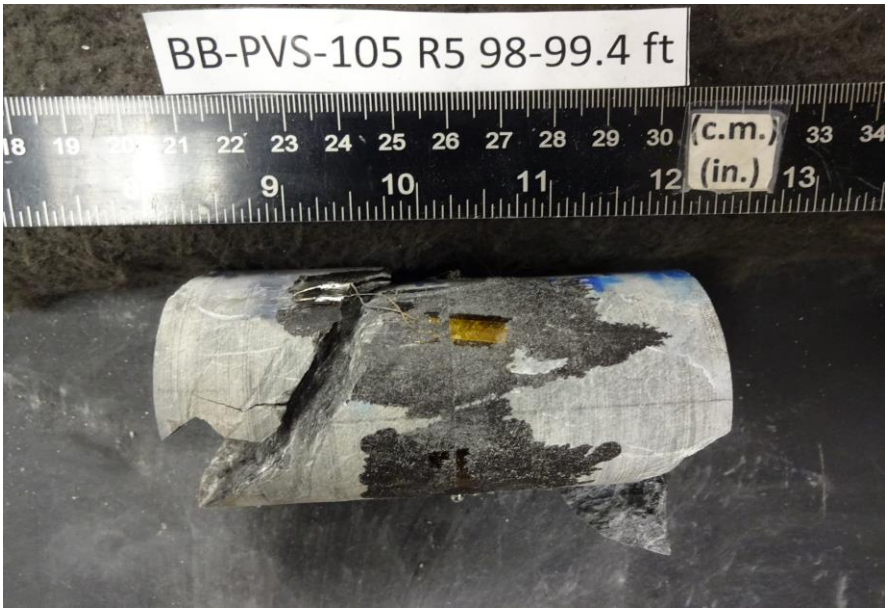
END 1	Difference, Maximum and Minimum (in.)	Diameter (in.)	Slope	Angle°	Perpendicularity Tolerance Met?
Diameter 1, in	0.00080	1.980	0.00040	0.023	YES
Diameter 2, in (rotated 90°)	0.00050	1.980	0.00025	0.014	YES
END 2					
Diameter 1, in	0.00090	1.980	0.00045	0.026	YES
Diameter 2, in (rotated 90°)	0.00050	1.980	0.00025	0.014	YES

Maximum angle of departure must be ≤ 0.25°
Perpendicularity Tolerance Met? YES

Client:	Schonewald Engineering Associates, Inc.
Project Name:	I-295 Over Veranda St (MaineDOT WIN21745.00)
Project Location:	Portland, ME
GTX #:	308805
Test Date:	09/20/18
Tested By:	crs
Checked By:	jsc
Boring ID:	BB-PVS-105
Sample ID:	R-5
Depth, ft:	98-99.4



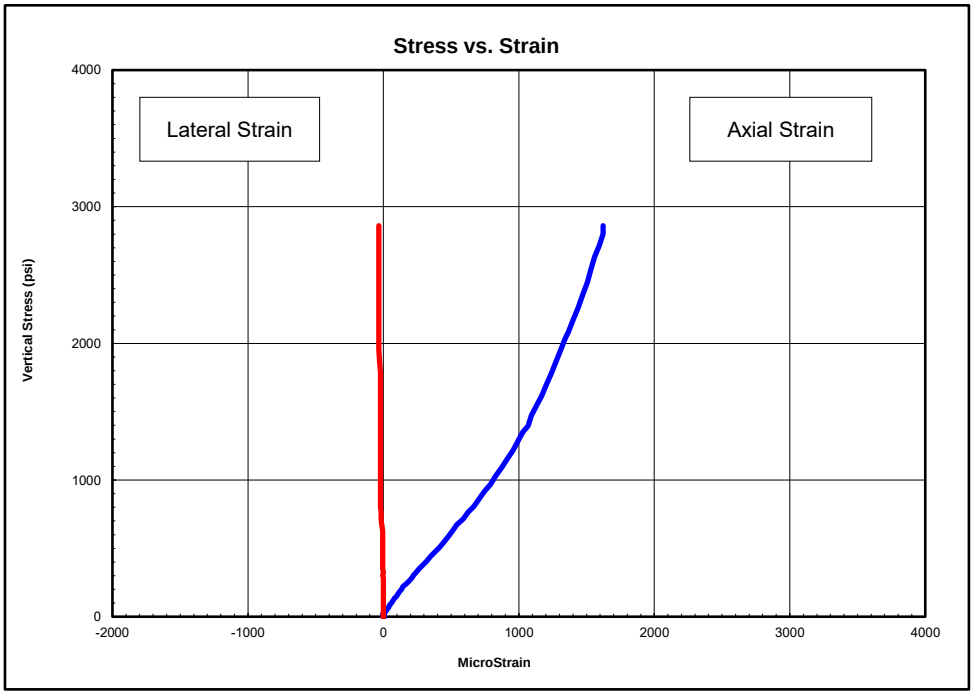
After cutting and lapping



After break

Client:	Schonewald Engineering Associates, Inc.
Project Name:	I-295 Over Veranda St (MaineDOT WIN21745.00)
Project Location:	Portland, ME
GTX #:	308805
Test Date:	9/20/2018
Tested By:	crs
Checked By:	jsc
Boring ID:	BB-PVS-106
Sample ID:	R1
Depth, ft:	62.9-63.3
Sample Type:	rock core
Sample Description:	See photographs Discontinuity failure

Compressive Strength and Elastic Moduli of Rock by ASTM D7012 - Method D



Peak Compressive Stress: 2,861 psi

Stress Range, psi	Young's Modulus, psi	Poisson's Ratio
300-1000	1,170,000	0.05
1000-1800	1,780,000	---
1800-2600	2,540,000	0.06

Notes: Test specimen tested at the approximate as-received moisture content and at standard laboratory temperature.
The axial load was applied continuously at a stress rate that produced failure in a test time between 2 and 15 minutes.
Young's Modulus and Poisson's Ratio calculated using the tangent to the line in the stress range listed.
Calculations assume samples are isotropic, which is not necessarily the case.

Client:	Schonewald Engineering Associates, Inc.	Test Date:	9/19/2018
Project Name:	I-295 Over Veranda St (MaineDOT WIN21745.00)	Tested By:	crs
Project Location:	Portland, ME	Checked By:	jsc
GTX #:	308805		
Boring ID:	BB-PVS-106		
Sample ID:	R1		
Depth:	62.9-63.3 ft		
Visual Description:	See photographs		

UNIT WEIGHT DETERMINATION AND DIMENSIONAL AND SHAPE TOLERANCES OF ROCK CORE SPECIMENS BY ASTM D4543

BULK DENSITY

	1	2	Average
Specimen Length, in:	4.16	4.16	4.16
Specimen Diameter, in:	1.97	1.97	1.97
Specimen Mass, g:	557.78		
Bulk Density, lb/ft^3	167	**Minimum Diameter Tolerence Met?**	YES
Length to Diameter Ratio:	2.1	**Length to Diameter Ratio Tolerance Met?**	YES

DEVIATION FROM STRAIGHTNESS (Procedure S1)

Maximum gap between side of core and reference surface plate:
Is the maximum gap ≤ 0.02 in.? NO

Maximum difference must be < 0.020 in.
Straightness Tolerance Met? NO

END FLATNESS AND PARALLELISM (Procedure FP1)

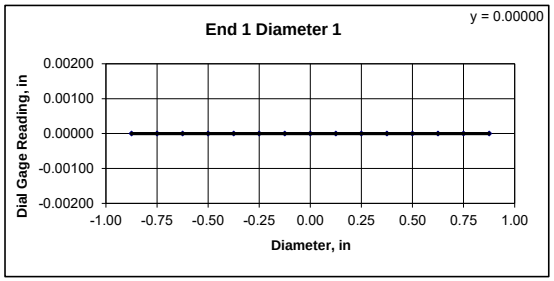
END 1	-0.875	-0.750	-0.625	-0.500	-0.375	-0.250	-0.125	0.000	0.125	0.250	0.375	0.500	0.625	0.750	0.875
Diameter 1, in	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Diameter 2, in (rotated 90°)	-0.00040	-0.00030	-0.00020	-0.00010	0.00000	0.00000	0.00000	0.00000	0.00000	-0.00010	-0.00020	-0.00030	-0.00040	-0.00050	-0.00060

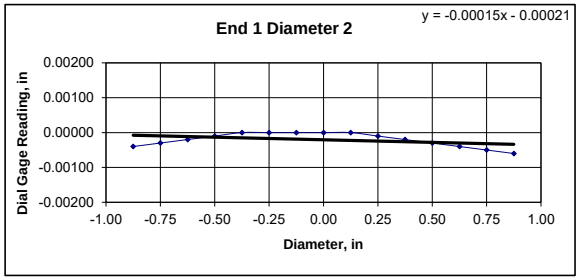
Difference between max and min readings, in:
0° = 0.00000 90° = 0.00060

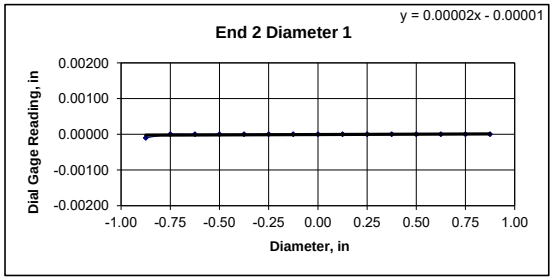
END 2	-0.875	-0.750	-0.625	-0.500	-0.375	-0.250	-0.125	0.000	0.125	0.250	0.375	0.500	0.625	0.750	0.875
Diameter 1, in	-0.00010	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Diameter 2, in (rotated 90°)	-0.00040	-0.00030	-0.00020	-0.00010	0.00000	0.00000	0.00000	0.00000	0.00000	-0.00010	-0.00010	-0.00020	-0.00030	-0.00040	-0.00050

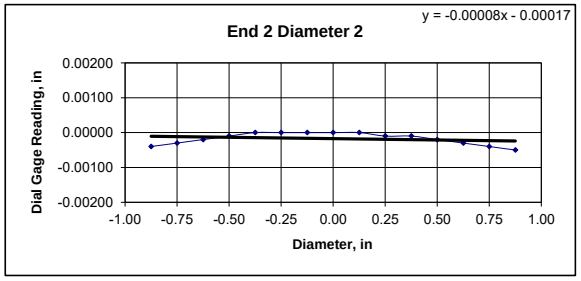
Difference between max and min readings, in:
0° = 0.0001 90° = 0.0005

Maximum difference must be < 0.0020 in. Difference = ± 0.00030
Flatness Tolerance Met? YES









DIAMETER 1

End 1:
Slope of Best Fit Line 0.00000
Angle of Best Fit Line: 0.00000

End 2:
Slope of Best Fit Line 0.00002
Angle of Best Fit Line: 0.00115

Maximum Angular Difference: 0.00115

Parallelism Tolerance Met? YES
Spherically Seated

DIAMETER 2

End 1:
Slope of Best Fit Line 0.00015
Angle of Best Fit Line: 0.00851

End 2:
Slope of Best Fit Line 0.00008
Angle of Best Fit Line: 0.00442

Maximum Angular Difference: 0.00409

Parallelism Tolerance Met? YES
Spherically Seated

PERPENDICULARITY (Procedure P1) (Calculated from End Flatness and Parallelism measurements above)

END 1	Difference, Maximum and Minimum (in.)	Diameter (in.)	Slope	Angle°	Perpendicularity Tolerance Met?
Diameter 1, in	0.00000	1.970	0.00000	0.000	YES
Diameter 2, in (rotated 90°)	0.00060	1.970	0.00030	0.017	YES
END 2					
Diameter 1, in	0.00010	1.970	0.00005	0.003	YES
Diameter 2, in (rotated 90°)	0.00050	1.970	0.00025	0.015	YES

Maximum angle of departure must be ≤ 0.25°
Perpendicularity Tolerance Met? YES

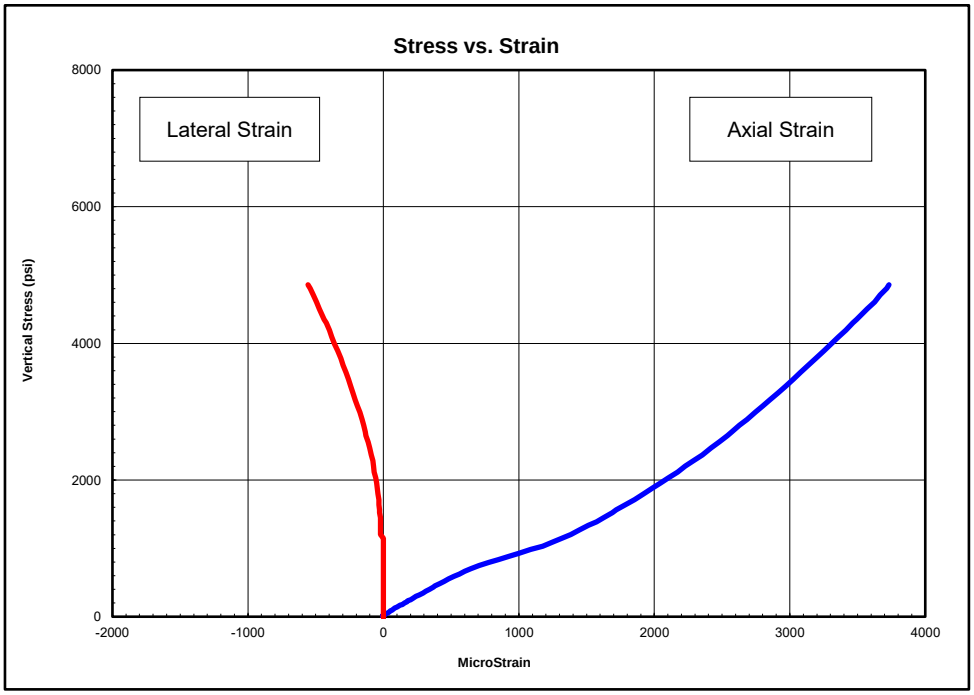
Client:	Schonewald Engineering Associates, Inc.
Project Name:	I-295 Over Veranda St (MaineDOT WIN21745.00)
Project Location:	Portland, ME
GTX #:	308805
Test Date:	09/20/18
Tested By:	crs
Checked By:	jsc
Boring ID:	BB-PVS-106
Sample ID:	R-1
Depth, ft:	62.9-63.3

After cutting and lapping

After break

Client:	Schonewald Engineering Associates, Inc.
Project Name:	I-295 Over Veranda St (MaineDOT WIN21745.00)
Project Location:	Portland, ME
GTX #:	308805
Test Date:	9/20/2018
Tested By:	crs
Checked By:	jsc
Boring ID:	BB-PVS-201
Sample ID:	R2
Depth, ft:	108.6-109.1
Sample Type:	rock core
Sample Description:	See photographs Intact material failure

Compressive Strength and Elastic Moduli of Rock by ASTM D7012 - Method D



Peak Compressive Stress: 4,858 psi

Stress Range, psi	Young's Modulus, psi	Poisson's Ratio
500-1800	794,000	0.03
1800-3100	1,440,000	0.17
3100-4400	1,830,000	0.35

Notes:
Test specimen tested at the approximate as-received moisture content and at standard laboratory temperature.
The axial load was applied continuously at a stress rate that produced failure in a test time between 2 and 15 minutes.
Young's Modulus and Poisson's Ratio calculated using the tangent to the line in the stress range listed.
Calculations assume samples are isotropic, which is not necessarily the case.

Client:	Schonewald Engineering Associates, Inc.	Test Date:	9/19/2018
Project Name:	I-295 Over Veranda St (MaineDOT WIN21745.00)	Tested By:	crs
Project Location:	Portland, ME	Checked By:	jsc
GTX #:	308805		
Boring ID:	BB-PVS-201		
Sample ID:	R2		
Depth:	108.6-109.1 ft		
Visual Description:	See photographs		

UNIT WEIGHT DETERMINATION AND DIMENSIONAL AND SHAPE TOLERANCES OF ROCK CORE SPECIMENS BY ASTM D4543

BULK DENSITY

	1	2	Average
Specimen Length, in:	4.27	4.27	4.27
Specimen Diameter, in:	1.98	1.98	1.98
Specimen Mass, g:	585.43		
Bulk Density, lb/ft^3	169	**Minimum Diameter Tolerence Met?**	YES
Length to Diameter Ratio:	2.2	**Length to Diameter Ratio Tolerance Met?**	YES

DEVIATION FROM STRAIGHTNESS (Procedure S1)

Maximum gap between side of core and reference surface plate:
Is the maximum gap ≤ 0.02 in.? YES

Maximum difference must be < 0.020 in.
Straightness Tolerance Met? YES

END FLATNESS AND PARALLELISM (Procedure FP1)

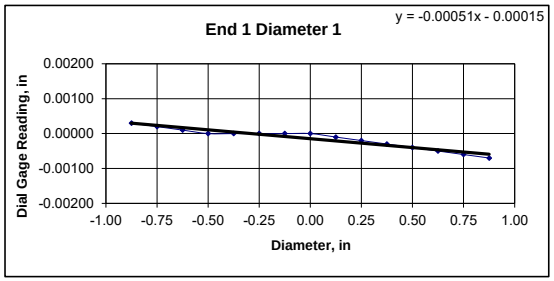
END 1	-0.875	-0.750	-0.625	-0.500	-0.375	-0.250	-0.125	0.000	0.125	0.250	0.375	0.500	0.625	0.750	0.875
Diameter 1, in	0.00030	0.00020	0.00010	0.00000	0.00000	0.00000	0.00000	0.00000	-0.00010	-0.00020	-0.00030	-0.00040	-0.00050	-0.00060	-0.00070
Diameter 2, in (rotated 90°)	0.00010	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	-0.00010	-0.00020	-0.00030	-0.00040	-0.00050	-0.00060

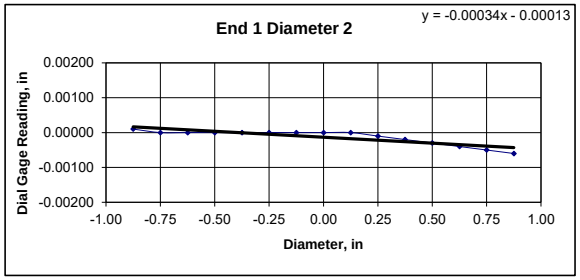
Difference between max and min readings, in:
0° = 0.00100 90° = 0.00070

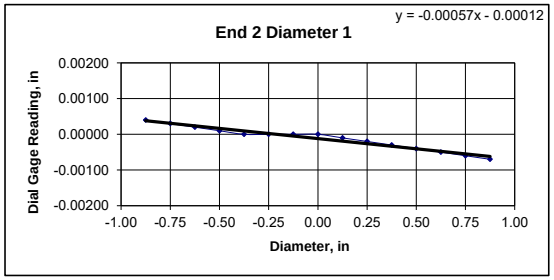
END 2	-0.875	-0.750	-0.625	-0.500	-0.375	-0.250	-0.125	0.000	0.125	0.250	0.375	0.500	0.625	0.750	0.875
Diameter 1, in	0.00040	0.00030	0.00020	0.00010	0.00000	0.00000	0.00000	0.00000	-0.00010	-0.00020	-0.00030	-0.00040	-0.00050	-0.00060	-0.00070
Diameter 2, in (rotated 90°)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00010	0.00000	-0.00010	-0.00020	-0.00030	-0.00030	-0.00040	-0.00050

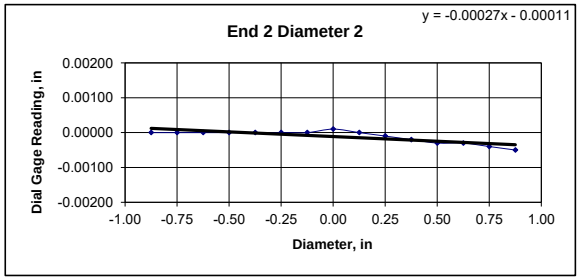
Difference between max and min readings, in:
0° = 0.0011 90° = 0.0006

Maximum difference must be < 0.0020 in. Difference = ± 0.00055
Flatness Tolerance Met? YES









DIAMETER 1

End 1:
Slope of Best Fit Line 0.00051
Angle of Best Fit Line: 0.02914

End 2:
Slope of Best Fit Line 0.00057
Angle of Best Fit Line: 0.03274

Maximum Angular Difference: 0.00360

Parallelism Tolerance Met? YES
Spherically Seated

DIAMETER 2

End 1:
Slope of Best Fit Line 0.00034
Angle of Best Fit Line: 0.01948

End 2:
Slope of Best Fit Line 0.00027
Angle of Best Fit Line: 0.01539

Maximum Angular Difference: 0.00409

Parallelism Tolerance Met? YES
Spherically Seated

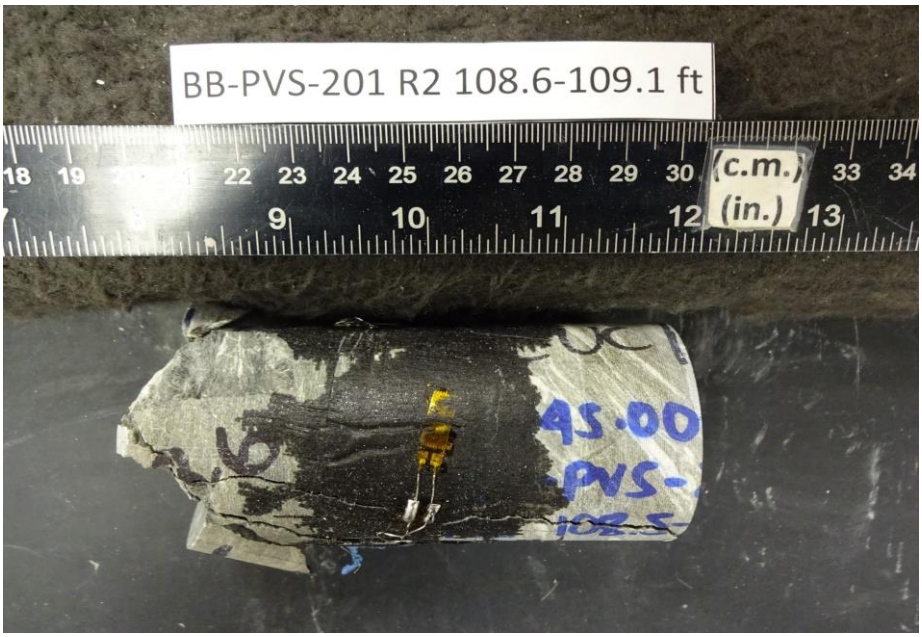
PERPENDICULARITY (Procedure P1) (Calculated from End Flatness and Parallelism measurements above)

END 1	Difference, Maximum and Minimum (in.)	Diameter (in.)	Slope	Angle°	Perpendicularity Tolerance Met?
Diameter 1, in	0.00100	1.980	0.00051	0.029	YES
Diameter 2, in (rotated 90°)	0.00070	1.980	0.00035	0.020	YES
END 2					
Diameter 1, in	0.00110	1.980	0.00056	0.032	YES
Diameter 2, in (rotated 90°)	0.00060	1.980	0.00030	0.017	YES

Maximum angle of departure must be ≤ 0.25°
Perpendicularity Tolerance Met? YES

Client:	Schonewald Engineering Associates, Inc.
Project Name:	I-295 Over Veranda St (MaineDOT WIN21745.00)
Project Location:	Portland, ME
GTX #:	308805
Test Date:	09/20/18
Tested By:	crs
Checked By:	jsc
Boring ID:	BB-PVS-201
Sample ID:	R2
Depth, ft:	108.6-109.1

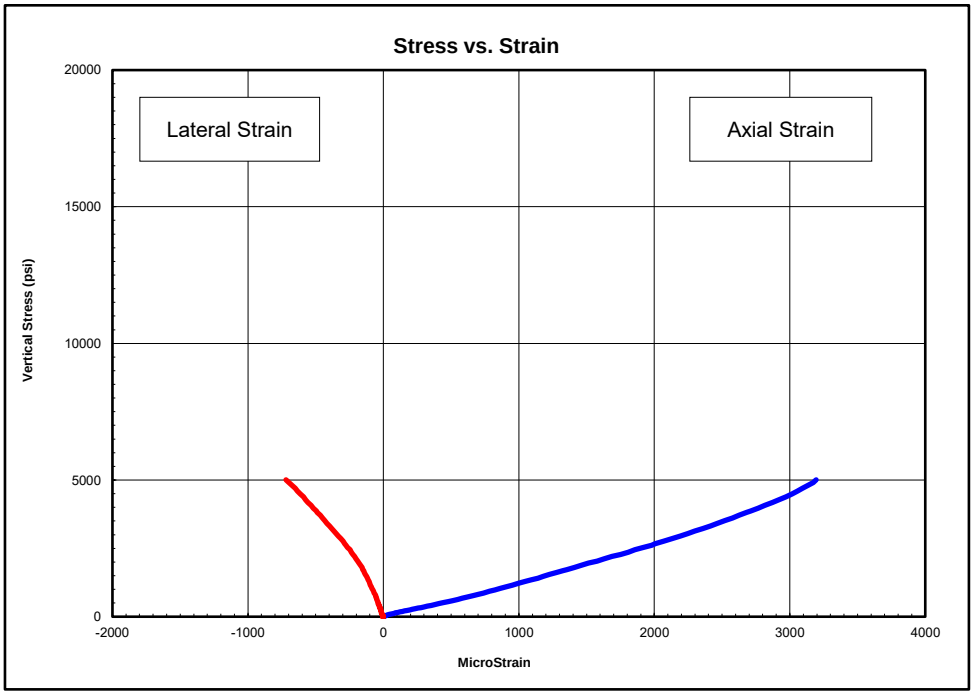
After cutting and lapping



After break

Client:	Schonewald Engineering Associates, Inc.
Project Name:	I-295 Over Veranda St (MaineDOT WIN21745.00)
Project Location:	Portland, ME
GTX #:	308805
Test Date:	9/20/2018
Tested By:	crs
Checked By:	jsc
Boring ID:	BB-PVS-201
Sample ID:	R4
Depth, ft:	120.9-121.6
Sample Type:	rock core
Sample Description:	See photographs Intact material failure

Compressive Strength and Elastic Moduli of Rock by ASTM D7012 - Method D



Peak Compressive Stress: 6,460 psi

The strain gauges failed before the peak value was attained. Young's Modulus and Poisson's Ratio could not be determined within the third stress range.

Stress Range, psi	Young's Modulus, psi	Poisson's Ratio
600-2400	1,390,000	0.15
2400-4100	1,690,000	0.30
4100-5800	---	---

Notes:
Test specimen tested at the approximate as-received moisture content and at standard laboratory temperature.
The axial load was applied continuously at a stress rate that produced failure in a test time between 2 and 15 minutes.
Young's Modulus and Poisson's Ratio calculated using the tangent to the line in the stress range listed.
Calculations assume samples are isotropic, which is not necessarily the case.

GeoTesting EXPRESS

Client:	Schonewald Engineering Associates, Inc.	Test Date:	9/19/2018
Project Name:	I-295 Over Veranda St (MaineDOT WIN21745.00)	Tested By:	crs
Project Location:	Portland, ME	Checked By:	jsc
GTX #:	308805		
Boring ID:	BB-PVS-201		
Sample ID:	R4		
Depth:	120.9-121.6 ft		
Visual Description:	See photographs		

UNIT WEIGHT DETERMINATION AND DIMENSIONAL AND SHAPE TOLERANCES OF ROCK CORE SPECIMENS BY ASTM D4543

BULK DENSITY

	1	2	Average
Specimen Length, in:	4.38	4.38	4.38
Specimen Diameter, in:	1.97	1.97	1.97
Specimen Mass, g:	596.79		
Bulk Density, lb/ft^3	170	**Minimum Diameter Tolerence Met?**	YES
Length to Diameter Ratio:	2.2	**Length to Diameter Ratio Tolerance Met?**	YES

DEVIATION FROM STRAIGHTNESS (Procedure S1)

Maximum gap between side of core and reference surface plate:
Is the maximum gap ≤ 0.02 in.? NO

Maximum difference must be < 0.020 in.
Straightness Tolerance Met? NO

END FLATNESS AND PARALLELISM (Procedure FP1)

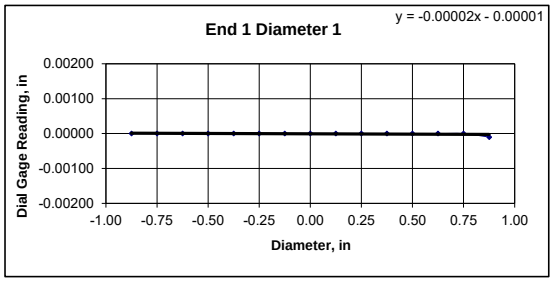
END 1	-0.875	-0.750	-0.625	-0.500	-0.375	-0.250	-0.125	0.000	0.125	0.250	0.375	0.500	0.625	0.750	0.875
Diameter 1, in	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	-0.00010
Diameter 2, in (rotated 90°)	-0.00030	-0.00020	-0.00010	-0.00010	0.00000	0.00000	0.00000	0.00000	0.00000	-0.00010	-0.00020	-0.00030	-0.00040	-0.00050	-0.00060	-0.00070

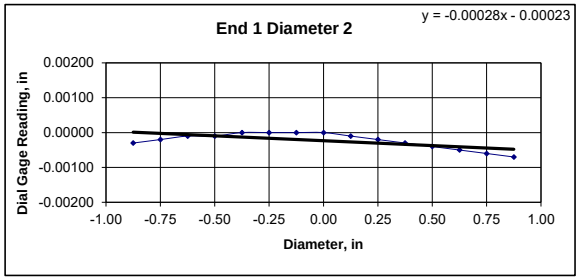
Difference between max and min readings, in:
0° = 0.00010 90° = 0.00070

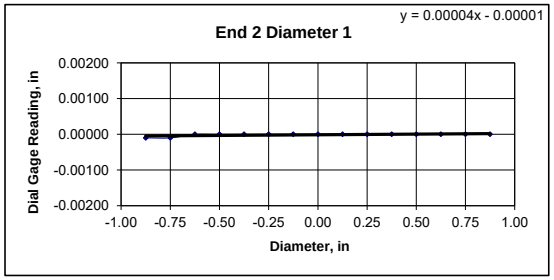
END 2	-0.875	-0.750	-0.625	-0.500	-0.375	-0.250	-0.125	0.000	0.125	0.250	0.375	0.500	0.625	0.750	0.875
Diameter 1, in	-0.00010	-0.00010	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Diameter 2, in (rotated 90°)	-0.00030	-0.00020	-0.00010	0.00000	0.00000	0.00000	0.00000	0.00000	-0.00010	-0.00010	-0.00020	-0.00030	-0.00040	-0.00050	-0.00060

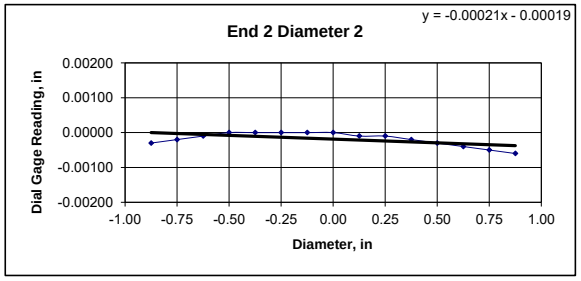
Difference between max and min readings, in:
0° = 0.0001 90° = 0.0006

Maximum difference must be < 0.0020 in. Difference = ± 0.00035
Flatness Tolerance Met? YES









DIAMETER 1

End 1:
Slope of Best Fit Line 0.00002
Angle of Best Fit Line: 0.00115

End 2:
Slope of Best Fit Line 0.00004
Angle of Best Fit Line: 0.00213

Maximum Angular Difference: 0.00098

Parallelism Tolerance Met? YES
Spherically Seated

DIAMETER 2

End 1:
Slope of Best Fit Line 0.00028
Angle of Best Fit Line: 0.01604

End 2:
Slope of Best Fit Line 0.00021
Angle of Best Fit Line: 0.01228

Maximum Angular Difference: 0.00377

Parallelism Tolerance Met? YES
Spherically Seated

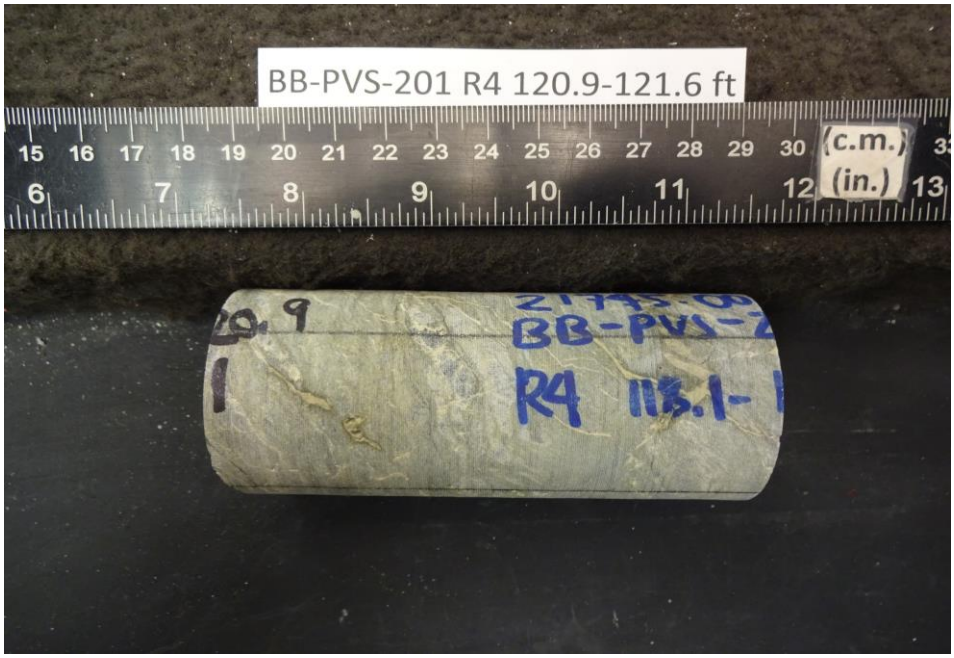
PERPENDICULARITY (Procedure P1) (Calculated from End Flatness and Parallelism measurements above)

END 1	Difference, Maximum and Minimum (in.)	Diameter (in.)	Slope	Angle°	Perpendicularity Tolerance Met?
Diameter 1, in	0.00010	1.970	0.00005	0.003	YES
Diameter 2, in (rotated 90°)	0.00070	1.970	0.00036	0.020	YES

Maximum angle of departure must be ≤ 0.25°
Perpendicularity Tolerance Met? YES

END 2					
Diameter 1, in	0.00010	1.970	0.00005	0.003	YES
Diameter 2, in (rotated 90°)	0.00060	1.970	0.00030	0.017	YES

Client:	Schonewald Engineering Associates, Inc.
Project Name:	I-295 Over Veranda St (MaineDOT WIN21745.00)
Project Location:	Portland, ME
GTX #:	308805
Test Date:	09/20/18
Tested By:	crs
Checked By:	jsc
Boring ID:	BB-PVS-201
Sample ID:	R2
Depth, ft:	108.6-109.1

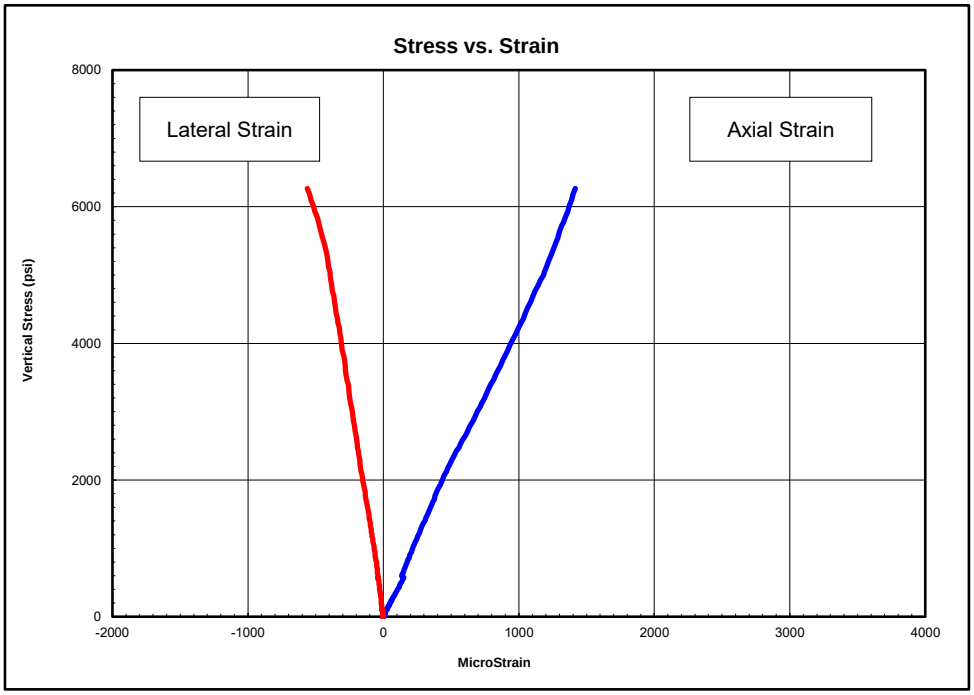


After cutting and lapping

After break

Client:	Schonewald Engineering Associates, Inc.
Project Name:	I-295 Over Veranda St (MaineDOT WIN21745.00)
Project Location:	Portland, ME
GTX #:	308805
Test Date:	10/1/2018
Tested By:	tlm
Checked By:	jsc
Boring ID:	BB-PVS-201
Sample ID:	R6
Depth, ft:	128.2-129.1
Sample Type:	rock core
Sample Description:	See photographs Intact material failure

Compressive Strength and Elastic Moduli of Rock by ASTM D7012 - Method D



Peak Compressive Stress: 6,267 psi

Stress Range, psi	Young's Modulus, psi	Poisson's Ratio
600-2300	4,610,000	0.38
2300-4000	3,880,000	0.30
4000-5600	4,430,000	0.39

Notes:
Test specimen tested at the approximate as-received moisture content and at standard laboratory temperature.
The axial load was applied continuously at a stress rate that produced failure in a test time between 2 and 15 minutes.
Young's Modulus and Poisson's Ratio calculated using the tangent to the line in the stress range listed.
Calculations assume samples are isotropic, which is not necessarily the case.

Client:	Schonewald Engineering Associates, Inc.	Test Date:	9/27/2018
Project Name:	I-295 Over Veranda St (MaineDOT WIN21745.00)	Tested By:	tlm
Project Location:	Portland, ME	Checked By:	jsc
GTX #:	308805		
Boring ID:	BB-PVS-201		
Sample ID:	R6		
Depth:	128.2-129.1 ft		
Visual Description:	See photographs		

UNIT WEIGHT DETERMINATION AND DIMENSIONAL AND SHAPE TOLERANCES OF ROCK CORE SPECIMENS BY ASTM D4543

BULK DENSITY

	1	2	Average
Specimen Length, in:	3.86	3.86	3.86
Specimen Diameter, in:	1.98	1.97	1.98
Specimen Mass, g:	585.97		
Bulk Density, lb/ft^3	188	**Minimum Diameter Tolerence Met?**	YES
Length to Diameter Ratio:	2.0	**Length to Diameter Ratio Tolerance Met?**	YES

DEVIATION FROM STRAIGHTNESS (Procedure S1)

Maximum gap between side of core and reference surface plate:
Is the maximum gap ≤ 0.02 in.? YES

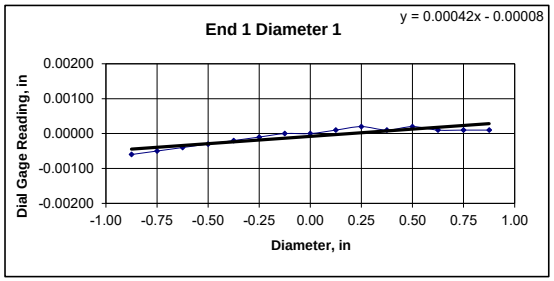
Maximum difference must be < 0.020 in.
Straightness Tolerance Met? YES

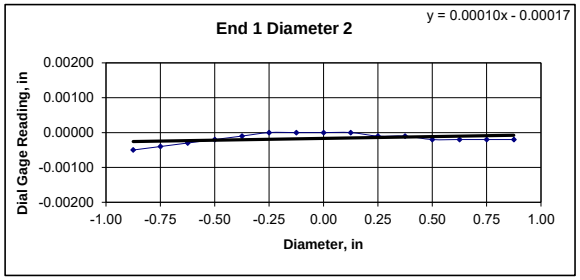
END FLATNESS AND PARALLELISM (Procedure FP1)

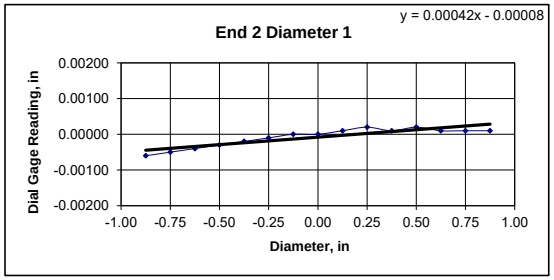
END 1	-0.875	-0.750	-0.625	-0.500	-0.375	-0.250	-0.125	0.000	0.125	0.250	0.375	0.500	0.625	0.750	0.875
Diameter 1, in	-0.00060	-0.00050	-0.00040	-0.00030	-0.00020	-0.00010	0.00000	0.00000	0.00010	0.00020	0.00010	0.00020	0.00010	0.00010	0.00010
Diameter 2, in (rotated 90°)	-0.00050	-0.00040	-0.00030	-0.00020	-0.00010	0.00000	0.00000	0.00000	0.00000	-0.00010	-0.00010	-0.00020	-0.00020	-0.00020	-0.00020
											Difference between max and min readings, in:				
											0° =	0.00080	90° =	0.00050	

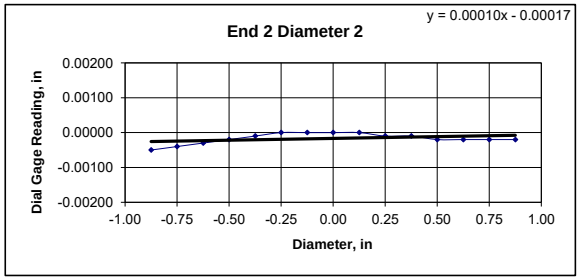
END 2	-0.875	-0.750	-0.625	-0.500	-0.375	-0.250	-0.125	0.000	0.125	0.250	0.375	0.500	0.625	0.750	0.875
Diameter 1, in	-0.00060	-0.00050	-0.00040	-0.00030	-0.00020	-0.00010	0.00000	0.00000	0.00010	0.00020	0.00010	0.00020	0.00010	0.00010	0.00010
Diameter 2, in (rotated 90°)	-0.00050	-0.00040	-0.00030	-0.00020	-0.00010	0.00000	0.00000	0.00000	0.00000	-0.00010	-0.00010	-0.00020	-0.00020	-0.00020	-0.00020
											Difference between max and min readings, in:				
											0° =	0.0008	90° =	0.0005	

Maximum difference must be < 0.0020 in. Difference = ± 0.00040
Flatness Tolerance Met? YES









DIAMETER 1

End 1:
Slope of Best Fit Line 0.00042
Angle of Best Fit Line: 0.02390

End 2:
Slope of Best Fit Line 0.00042
Angle of Best Fit Line: 0.02390

Maximum Angular Difference: 0.00000

Parallelism Tolerance Met? YES
Spherically Seated

DIAMETER 2

End 1:
Slope of Best Fit Line 0.00010
Angle of Best Fit Line: 0.00589

End 2:
Slope of Best Fit Line 0.00010
Angle of Best Fit Line: 0.00589

Maximum Angular Difference: 0.00000

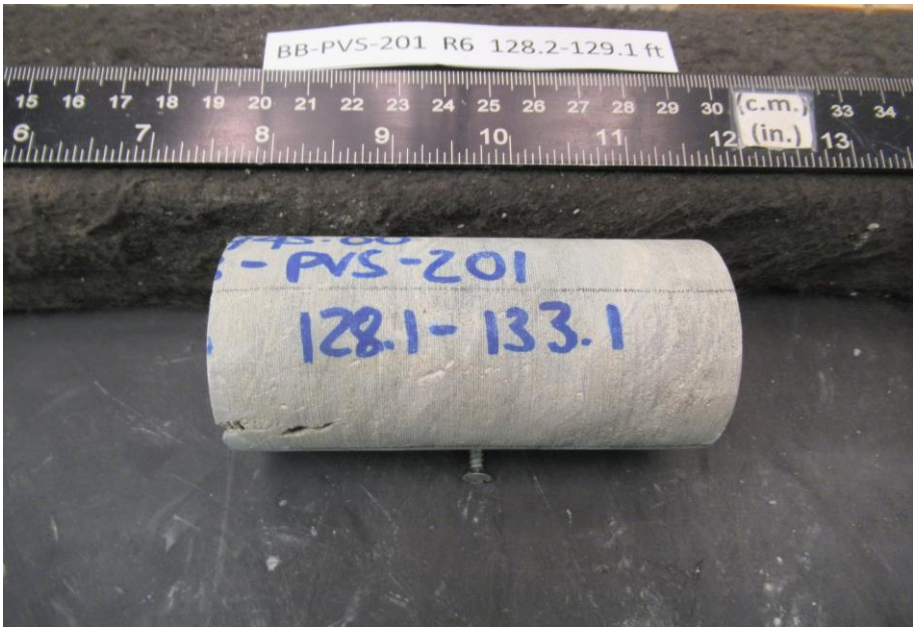
Parallelism Tolerance Met? YES
Spherically Seated

PERPENDICULARITY (Procedure P1) (Calculated from End Flatness and Parallelism measurements above)

END 1	Difference, Maximum and Minimum (in.)	Diameter (in.)	Slope	Angle°	Perpendicularity Tolerance Met?
Diameter 1, in	0.00080	1.975	0.00041	0.023	YES
Diameter 2, in (rotated 90°)	0.00050	1.975	0.00025	0.015	YES
END 2					
Diameter 1, in	0.00080	1.975	0.00041	0.023	YES
Diameter 2, in (rotated 90°)	0.00050	1.975	0.00025	0.015	YES

Maximum angle of departure must be ≤ 0.25°
Perpendicularity Tolerance Met? YES

Client:	Schonewald Engineering Associates, Inc.
Project Name:	I-295 Over Veranda St (MaineDOT WIN21745.00)
Project Location:	Portland, ME
GTX #:	308805
Test Date:	10/01/18
Tested By:	cmh
Checked By:	jsc
Boring ID:	BB-PVS-201
Sample ID:	R6
Depth, ft:	128.2-129.1



After cutting and lapping

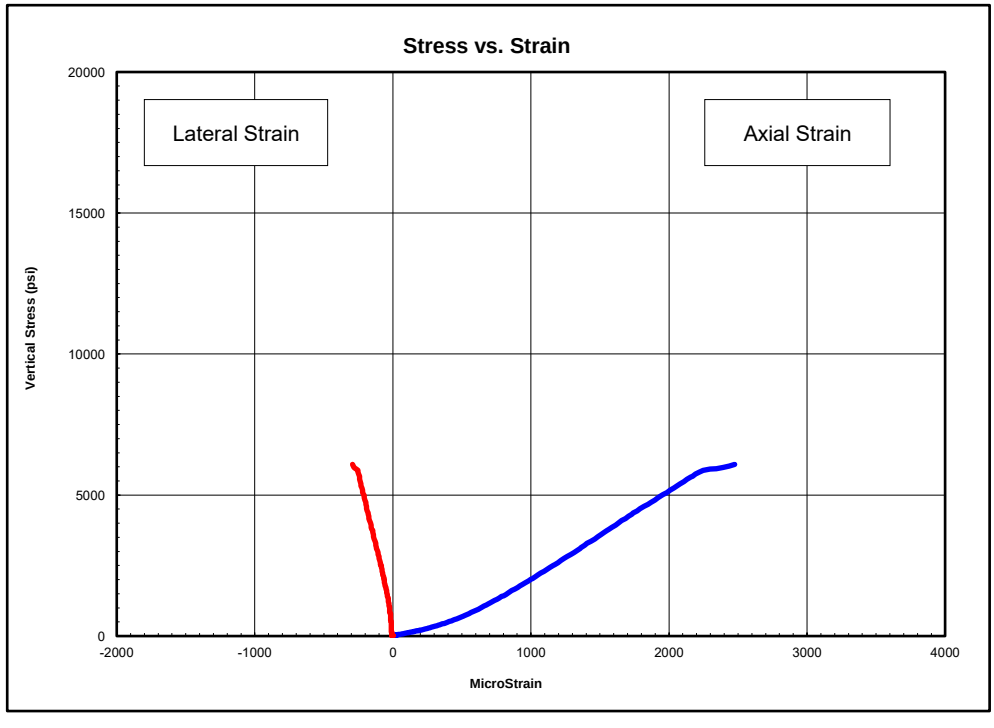
After break

**RESULTS OF LABORATORY TESTS ON ROCK CORE SPECIMENS –
PHASE 2 (BB-PVS-202 AND -203)**

TABULATION OF PHASE 2 ROCK TESTING (GTX PROJECT NO. 308805) (listed in order of test report presentation)				
Boring No.	**Core No.**	**Specimen Depth (ft., BGS)**	**GTX TEST ID / NO. (Boring ID-Sample ID)**	**Tests Completed**
BB-PVS-202	R1	151.4-151.9	not assigned (used boring ID-sample ID)	Unconfined Compression Test on rock
BB-PVS-202	R2	153.5-154.0	not assigned (used boring ID-sample ID)	Unconfined Compression Test on rock
BB-PVS-202	R3	157.2-157.6	not assigned (used boring ID-sample ID)	Unconfined Compression Test on rock
BB-PVS-203	R1	111.1-111.8	not assigned (used boring ID-sample ID)	Unconfined Compression Test on rock
BB-PVS-203	R2	116.4-116.8	not assigned (used boring ID-sample ID)	Unconfined Compression Test on rock
BB-PVS-203	R4	125.0-125.5	not assigned (used boring ID-sample ID)	Unconfined Compression Test on rock

Client:	Schonewald Engineering Associates, Inc.
Project Name:	I-295 over Veranda St (MeDOT WIN21745.00)
Project Location:	Portland, ME
GTX #:	308805
Test Date:	1/22/2019
Tested By:	cmh
Checked By:	jsc
Boring ID:	BB-PVS-202
Sample ID:	R1
Depth, ft:	151.42-151.81
Sample Type:	rock core
Sample Description:	See photographs Intact material failure

Compressive Strength and Elastic Moduli of Rock by ASTM D7012 - Method D



Peak Compressive Stress: 6,087 psi

Stress Range, psi	Young's Modulus, psi	Poisson's Ratio
600-2200	2,650,000	0.10
2200-3900	3,170,000	0.16
3900-5500	3,080,000	0.15

Notes:
Test specimen tested at the approximate as-received moisture content and at standard laboratory temperature.
The axial load was applied continuously at a stress rate that produced failure in a test time between 2 and 15 minutes.
Young's Modulus and Poisson's Ratio calculated using the tangent to the line in the stress range listed.
Calculations assume samples are isotropic, which is not necessarily the case.

Client:	Schonewald Engineering Associates, Inc.	Test Date:	1/17/2019
Project Name:	I-295 over Veranda St (MeDOT WIN21745.00)	Tested By:	cmh
Project Location:	Portland, ME	Checked By:	jsc
GTX #:	308805		
Boring ID:	BB-PVS-202		
Sample ID:	R1		
Depth:	151.42-151.81 ft		
Visual Description:	See photographs		

UNIT WEIGHT DETERMINATION AND DIMENSIONAL AND SHAPE TOLERANCES OF ROCK CORE SPECIMENS BY ASTM D4543

BULK DENSITY

	1	2	Average
Specimen Length, in:	4.33	4.33	4.33
Specimen Diameter, in:	1.99	1.98	1.99
Specimen Mass, g:	576.24		
Bulk Density, lb/ft^3	163	**Minimum Diameter Tolerence Met?**	**YES**
Length to Diameter Ratio:	2.2	**Length to Diameter Ratio Tolerance Met?**	**YES**

DEVIATION FROM STRAIGHTNESS (Procedure S1)

Maximum gap between side of core and reference surface plate:
Is the maximum gap ≤ 0.02 in.? YES

Maximum difference must be < 0.020 in.
Straightness Tolerance Met? **YES**

END FLATNESS AND PARALLELISM (Procedure FP1)

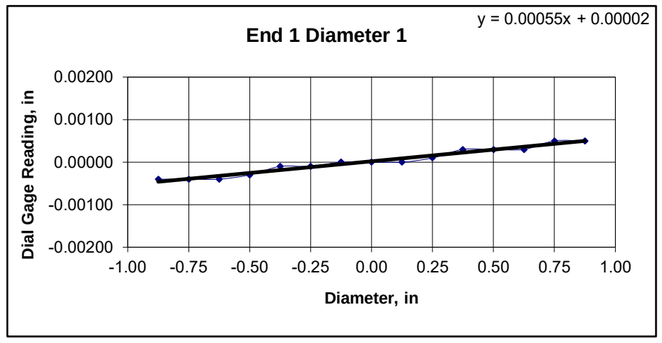
END 1	-0.875	-0.750	-0.625	-0.500	-0.375	-0.250	-0.125	0.000	0.125	0.250	0.375	0.500	0.625	0.750	0.875
Diameter 1, in	-0.00040	-0.00040	-0.00040	-0.00030	-0.00010	-0.00010	0.00000	0.00000	0.00000	0.00010	0.00030	0.00030	0.00030	0.00050	0.00050
Diameter 2, in (rotated 90°)	-0.00010	-0.00010	-0.00020	-0.00010	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	-0.00010	-0.00010	-0.00020	-0.00020	-0.00020

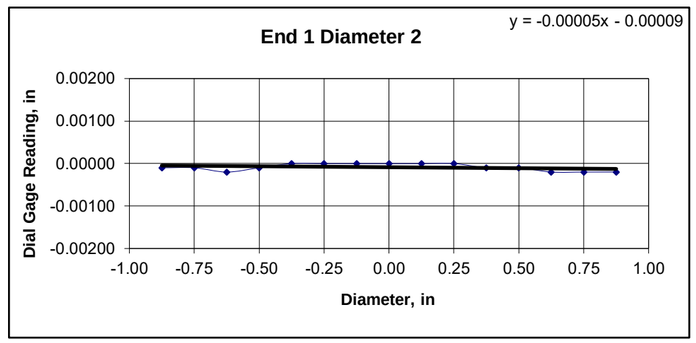
Difference between max and min readings, in:
0° = 0.00090 90° = 0.00020

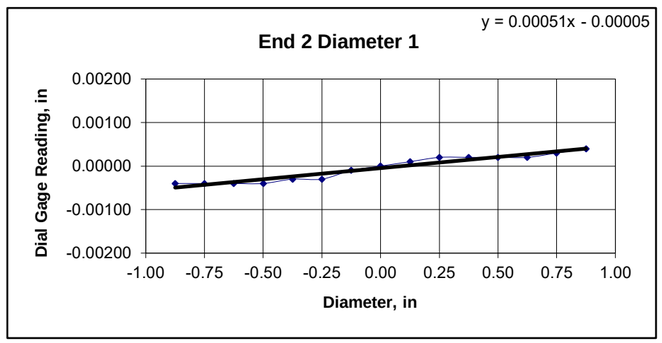
END 2	-0.875	-0.750	-0.625	-0.500	-0.375	-0.250	-0.125	0.000	0.125	0.250	0.375	0.500	0.625	0.750	0.875
Diameter 1, in	-0.00040	-0.00040	-0.00040	-0.00040	-0.00030	-0.00030	-0.00010	0.00000	0.00010	0.00020	0.00020	0.00020	0.00020	0.00030	0.00040
Diameter 2, in (rotated 90°)	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00000	0.00000	0.00000	0.00000	-0.00010	0.00000	0.00010	0.00000

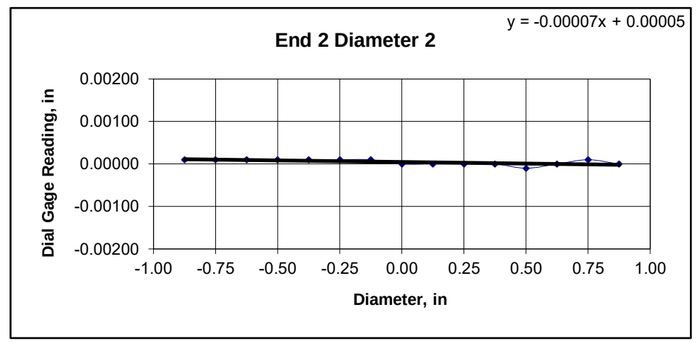
Difference between max and min readings, in:
0° = 0.0008 90° = 0.0002

Maximum difference must be < 0.0020 in. Difference = ± 0.00045
Flatness Tolerance Met? **YES**









DIAMETER 1

End 1:
Slope of Best Fit Line 0.00055
Angle of Best Fit Line: 0.03143

End 2:
Slope of Best Fit Line 0.00051
Angle of Best Fit Line: 0.02930

Maximum Angular Difference: 0.00213

Parallelism Tolerance Met? **YES**
Spherically Seated

DIAMETER 2

End 1:
Slope of Best Fit Line 0.00005
Angle of Best Fit Line: 0.00262

End 2:
Slope of Best Fit Line 0.00007
Angle of Best Fit Line: 0.00426

Maximum Angular Difference: 0.00164

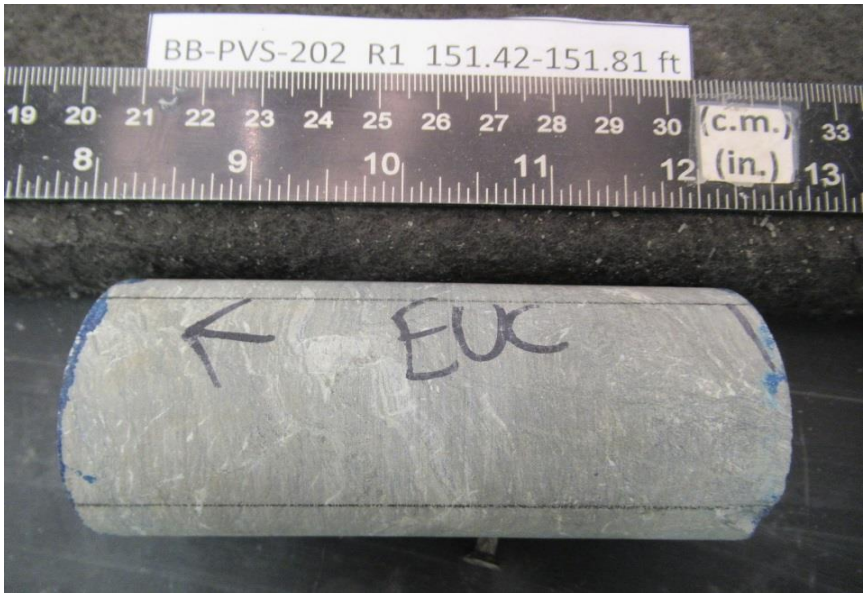
Parallelism Tolerance Met? **YES**
Spherically Seated

PERPENDICULARITY (Procedure P1) (Calculated from End Flatness and Parallelism measurements above)

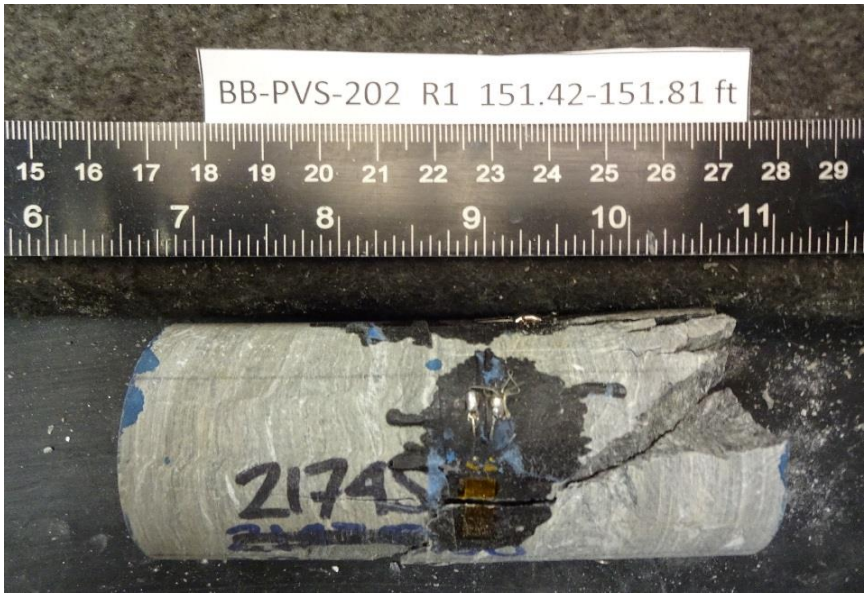
END 1	Difference, Maximum and Minimum (in.)	Diameter (in.)	Slope	Angle°	Perpendicularity Tolerance Met?
Diameter 1, in	0.00090	1.985	0.00045	0.026	YES
Diameter 2, in (rotated 90°)	0.00020	1.985	0.00010	0.006	YES
END 2					
Diameter 1, in	0.00080	1.985	0.00040	0.023	YES
Diameter 2, in (rotated 90°)	0.00020	1.985	0.00010	0.006	YES

Maximum angle of departure must be ≤ 0.25°
Perpendicularity Tolerance Met? **YES**

Client:	Schonewald Engineering Associates, Inc.
Project Name:	I-295 over Veranda St (MeDOT WIN21745.00)
Project Location:	Portland, ME
GTX #:	308805
Test Date:	1/22/2019
Tested By:	cmh/jck
Checked By:	jsc
Boring ID:	BB-PVS-202
Sample ID:	R1
Depth, ft:	151.42-151.81



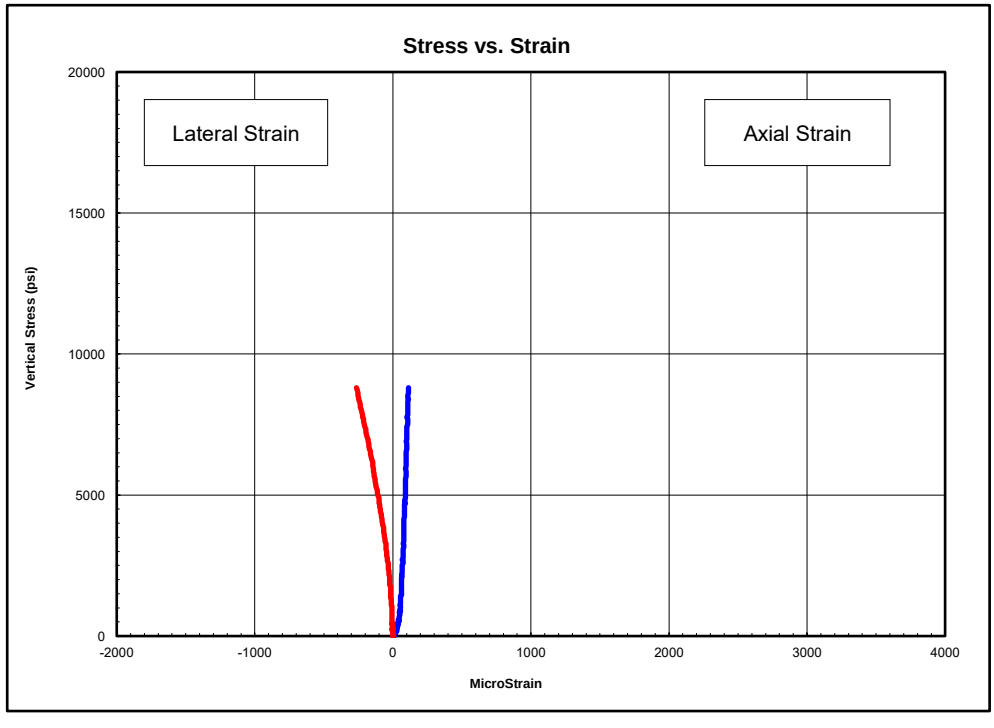
After cutting and grinding



After break

Client:	Schonewald Engineering Associates, Inc.
Project Name:	I-295 over Veranda St (MeDOT WIN21745.00)
Project Location:	Portland, ME
GTX #:	308805
Test Date:	1/22/2019
Tested By:	cmh
Checked By:	jsc
Boring ID:	BB-PVS-202
Sample ID:	R2
Depth, ft:	153.50-153.91
Sample Type:	rock core
Sample Description:	See photographs Intact material failure

Compressive Strength and Elastic Moduli of Rock by ASTM D7012 - Method D



Peak Compressive Stress: 8,805 psi

The strain values recorded for this test produce values of Poisson's Ratio that exceed maximum values found in rocks. One axial and one lateral strain gauge failed to record meaningful data. Young's Modulus reported based on results of a single axial and lateral strain gauge.

Stress Range, psi	Young's Modulus, psi	Poisson's Ratio
900-3200	92,300,000	---
3200-5600	126,000,000	---
5600-7900	129,000,000	---

Notes:
Test specimen tested at the approximate as-received moisture content and at standard laboratory temperature.
The axial load was applied continuously at a stress rate that produced failure in a test time between 2 and 15 minutes.
Young's Modulus and Poisson's Ratio calculated using the tangent to the line in the stress range listed.
Calculations assume samples are isotropic, which is not necessarily the case.

Client:	Schonewald Engineering Associates, Inc.	Test Date:	1/17/2019
Project Name:	I-295 over Veranda St (MeDOT WIN21745.00)	Tested By:	cmh
Project Location:	Portland, ME	Checked By:	jsc
GTX #:	308805		
Boring ID:	BB-PVS-202		
Sample ID:	R2		
Depth:	153.50-153.91 ft		
Visual Description:	See photographs		

UNIT WEIGHT DETERMINATION AND DIMENSIONAL AND SHAPE TOLERANCES OF ROCK CORE SPECIMENS BY ASTM D4543

BULK DENSITY

	1	2	Average
Specimen Length, in:	4.43	4.43	4.43
Specimen Diameter, in:	1.99	1.99	1.99
Specimen Mass, g:	593.46		
Bulk Density, lb/ft^3	164	**Minimum Diameter Tolerence Met?**	**YES**
Length to Diameter Ratio:	2.2	**Length to Diameter Ratio Tolerance Met?**	**YES**

DEVIATION FROM STRAIGHTNESS (Procedure S1)

Maximum gap between side of core and reference surface plate:
Is the maximum gap ≤ 0.02 in.? YES

Maximum difference must be < 0.020 in.
Straightness Tolerance Met? **YES**

END FLATNESS AND PARALLELISM (Procedure FP1)

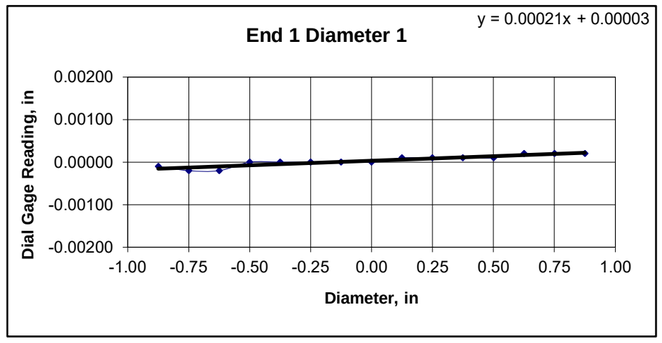
END 1	-0.875	-0.750	-0.625	-0.500	-0.375	-0.250	-0.125	0.000	0.125	0.250	0.375	0.500	0.625	0.750	0.875
Diameter 1, in	-0.00010	-0.00020	-0.00020	0.00000	0.00000	0.00000	0.00000	0.00000	0.00010	0.00010	0.00010	0.00010	0.00020	0.00020	0.00020
Diameter 2, in (rotated 90°)	-0.00010	-0.00010	-0.00010	-0.00010	-0.00010	-0.00010	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

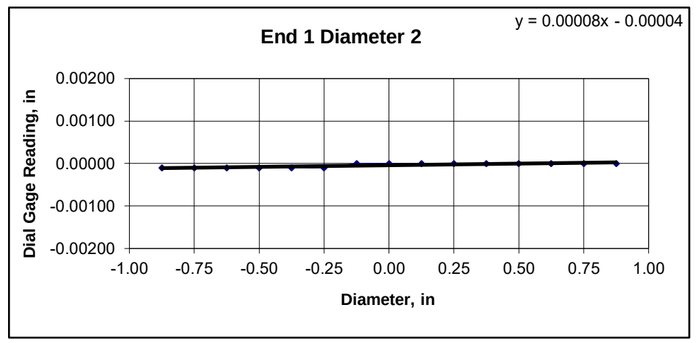
Difference between max and min readings, in:
0° = 0.00040 90° = 0.00010

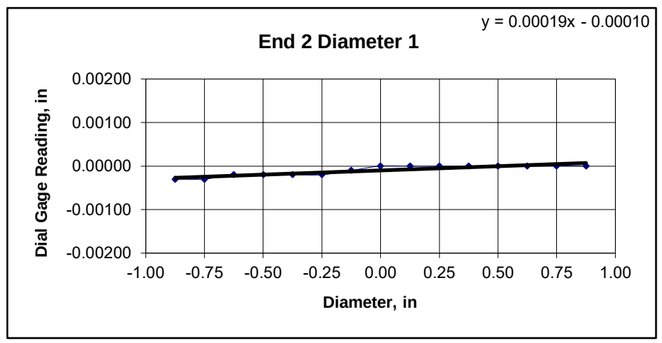
END 2	-0.875	-0.750	-0.625	-0.500	-0.375	-0.250	-0.125	0.000	0.125	0.250	0.375	0.500	0.625	0.750	0.875
Diameter 1, in	-0.00030	-0.00030	-0.00020	-0.00020	-0.00020	-0.00020	-0.00010	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Diameter 2, in (rotated 90°)	-0.00010	-0.00010	-0.00010	-0.00010	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

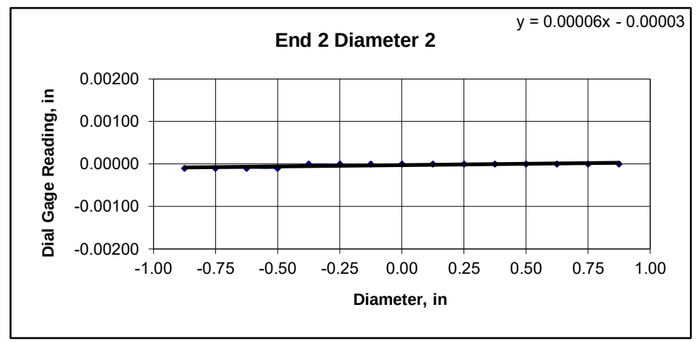
Difference between max and min readings, in:
0° = 0.0003 90° = 0.0001

Maximum difference must be < 0.0020 in. Difference = ± 0.00020
Flatness Tolerance Met? **YES**









DIAMETER 1

End 1:
Slope of Best Fit Line 0.00021
Angle of Best Fit Line: 0.01228

End 2:
Slope of Best Fit Line 0.00019
Angle of Best Fit Line: 0.01113

Maximum Angular Difference: 0.00115

Parallelism Tolerance Met? **YES**
Spherically Seated

DIAMETER 2

End 1:
Slope of Best Fit Line 0.00008
Angle of Best Fit Line: 0.00442

End 2:
Slope of Best Fit Line 0.00006
Angle of Best Fit Line: 0.00360

Maximum Angular Difference: 0.00082

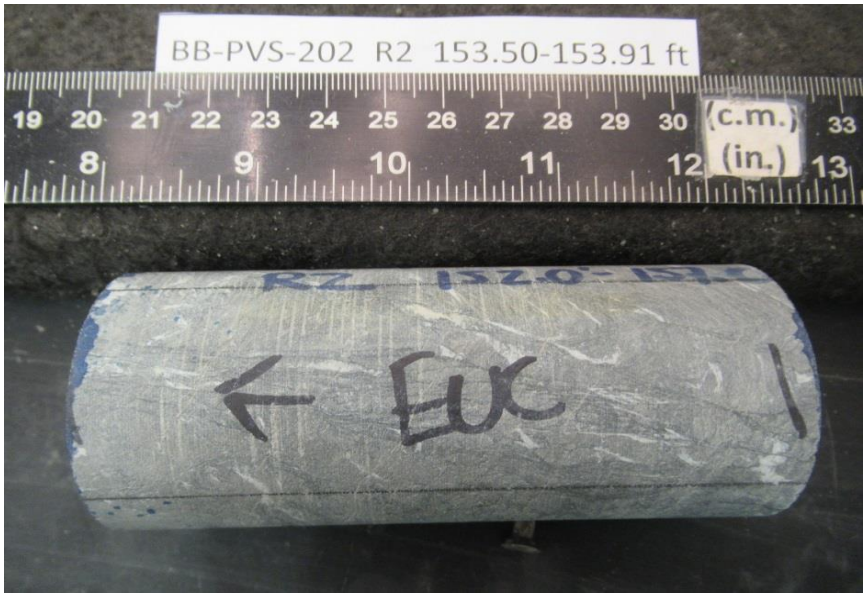
Parallelism Tolerance Met? **YES**
Spherically Seated

PERPENDICULARITY (Procedure P1) (Calculated from End Flatness and Parallelism measurements above)

END 1	Difference, Maximum and Minimum (in.)	Diameter (in.)	Slope	Angle°	Perpendicularity Tolerance Met?
Diameter 1, in	0.00040	1.990	0.00020	0.012	YES
Diameter 2, in (rotated 90°)	0.00010	1.990	0.00005	0.003	YES
END 2					
Diameter 1, in	0.00030	1.990	0.00015	0.009	YES
Diameter 2, in (rotated 90°)	0.00010	1.990	0.00005	0.003	YES

Maximum angle of departure must be ≤ 0.25°
Perpendicularity Tolerance Met? **YES**

Client:	Schonewald Engineering Associates, Inc.
Project Name:	I-295 over Veranda St (MeDOT WIN21745.00)
Project Location:	Portland, ME
GTX #:	308805
Test Date:	1/22/2019
Tested By:	cmh/jck
Checked By:	jsc
Boring ID:	BB-PVS-202
Sample ID:	R2
Depth, ft:	153.50-153.91

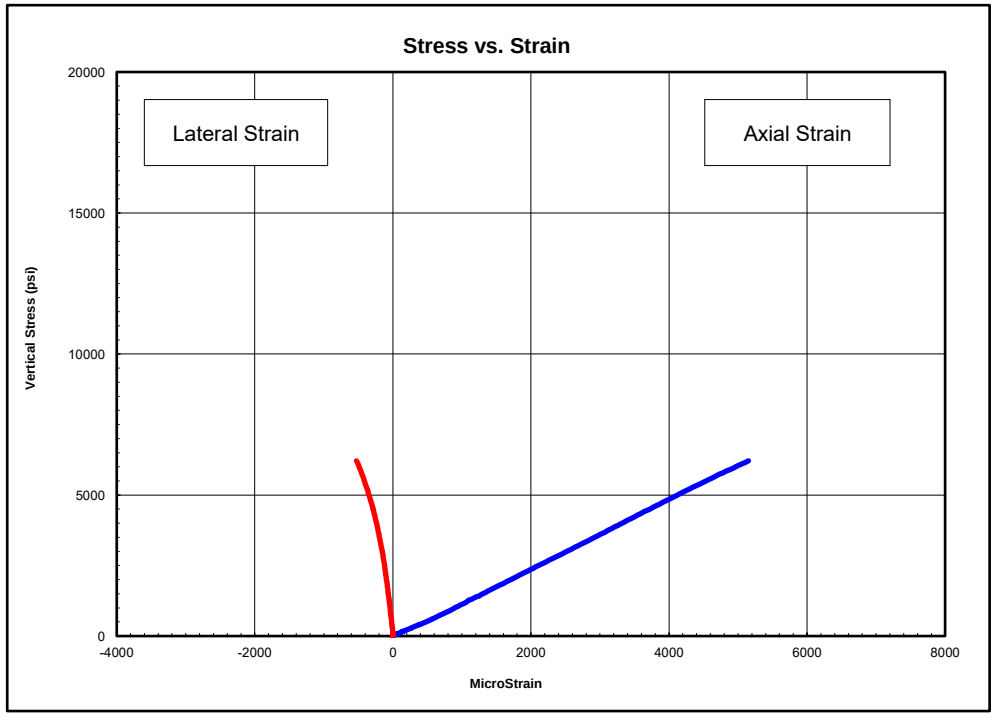


After cutting and grinding

After break

Client:	Schonewald Engineering Associates, Inc.
Project Name:	I-295 over Veranda St (MeDOT WIN21745.00)
Project Location:	Portland, ME
GTX #:	308805
Test Date:	1/22/2019
Tested By:	cmh
Checked By:	jsc
Boring ID:	BB-PVS-202
Sample ID:	R3
Depth, ft:	157.20-157.60
Sample Type:	rock core
Sample Description:	See photographs Intact material failure

Compressive Strength and Elastic Moduli of Rock by ASTM D7012 - Method D



Peak Compressive Stress: 6,213 psi

Stress Range, psi	Young's Modulus, psi	Poisson's Ratio
600-2300	1,240,000	0.06
2300-3900	1,240,000	0.09
3900-5600	1,230,000	0.15

Notes:
Test specimen tested at the approximate as-received moisture content and at standard laboratory temperature.
The axial load was applied continuously at a stress rate that produced failure in a test time between 2 and 15 minutes.
Young's Modulus and Poisson's Ratio calculated using the tangent to the line in the stress range listed.
Calculations assume samples are isotropic, which is not necessarily the case.

Client:	Schonewald Engineering Associates, Inc.	Test Date:	1/17/2019
Project Name:	I-295 over Veranda St (MeDOT WIN21745.00)	Tested By:	cmh
Project Location:	Portland, ME	Checked By:	jsc
GTX #:	308805		
Boring ID:	BB-PVS-202		
Sample ID:	R3		
Depth:	157.20-157.60 ft		
Visual Description:	See photographs		

UNIT WEIGHT DETERMINATION AND DIMENSIONAL AND SHAPE TOLERANCES OF ROCK CORE SPECIMENS BY ASTM D4543

BULK DENSITY

	1	2	Average
Specimen Length, in:	4.24	4.24	4.24
Specimen Diameter, in:	1.98	1.99	1.99
Specimen Mass, g:	553.88		
Bulk Density, lb/ft^3	160	**Minimum Diameter Tolerence Met?**	**YES**
Length to Diameter Ratio:	2.1	**Length to Diameter Ratio Tolerance Met?**	**YES**

DEVIATION FROM STRAIGHTNESS (Procedure S1)

Maximum gap between side of core and reference surface plate:
Is the maximum gap ≤ 0.02 in.? YES

Maximum difference must be < 0.020 in.
Straightness Tolerance Met? **YES**

END FLATNESS AND PARALLELISM (Procedure FP1)

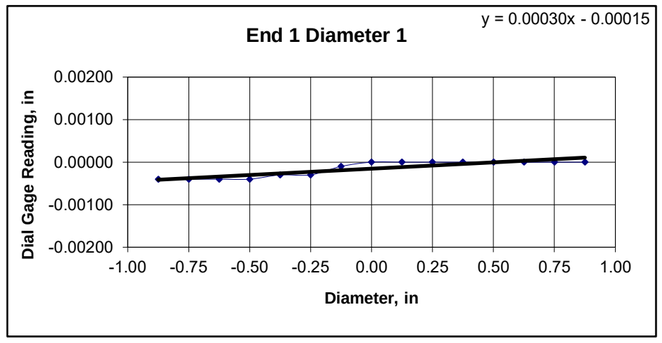
END 1	-0.875	-0.750	-0.625	-0.500	-0.375	-0.250	-0.125	0.000	0.125	0.250	0.375	0.500	0.625	0.750	0.875
Diameter 1, in	-0.00040	-0.00040	-0.00040	-0.00040	-0.00030	-0.00030	-0.00010	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Diameter 2, in (rotated 90°)	-0.00030	-0.00030	-0.00030	-0.00030	-0.00020	-0.00010	0.00000	0.00000	0.00010	0.00020	0.00030	0.00030	0.00040	0.00040	0.00050

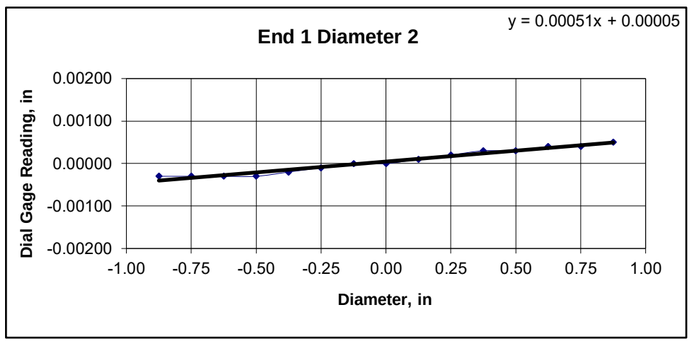
Difference between max and min readings, in:
0° = 0.00040 90° = 0.00080

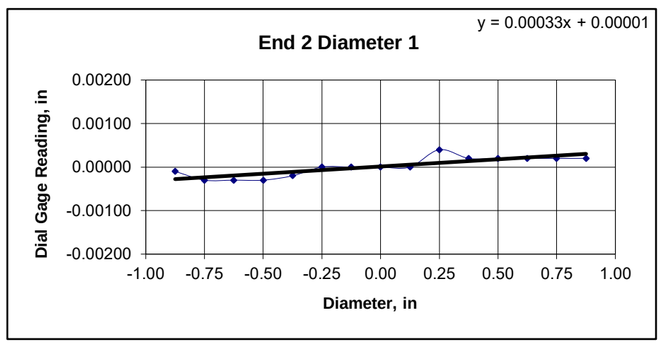
END 2	-0.875	-0.750	-0.625	-0.500	-0.375	-0.250	-0.125	0.000	0.125	0.250	0.375	0.500	0.625	0.750	0.875
Diameter 1, in	-0.00010	-0.00030	-0.00030	-0.00030	-0.00020	0.00000	0.00000	0.00000	0.00000	0.00040	0.00020	0.00020	0.00020	0.00020	0.00020
Diameter 2, in (rotated 90°)	-0.00040	-0.00040	-0.00040	-0.00040	-0.00040	-0.00030	-0.00030	0.00000	0.00010	0.00010	0.00010	0.00020	0.00020	0.00030	0.00030

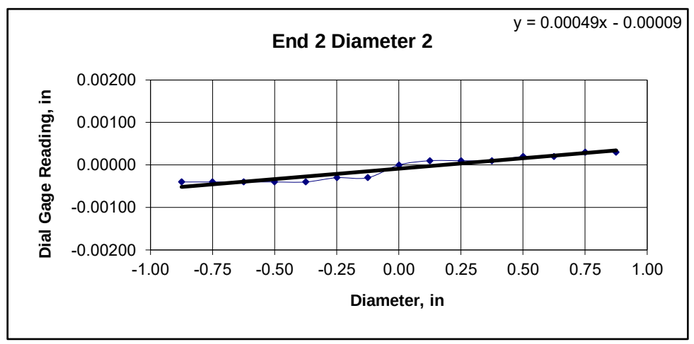
Difference between max and min readings, in:
0° = 0.0007 90° = 0.0007

Maximum difference must be < 0.0020 in. Difference = ± 0.00040
Flatness Tolerance Met? **YES**









DIAMETER 1

End 1:
Slope of Best Fit Line 0.00030
Angle of Best Fit Line: 0.01703

End 2:
Slope of Best Fit Line 0.00033
Angle of Best Fit Line: 0.01899

Maximum Angular Difference: 0.00196

Parallelism Tolerance Met? **YES**
Spherically Seated

DIAMETER 2

End 1:
Slope of Best Fit Line 0.00051
Angle of Best Fit Line: 0.02930

End 2:
Slope of Best Fit Line 0.00049
Angle of Best Fit Line: 0.02816

Maximum Angular Difference: 0.00115

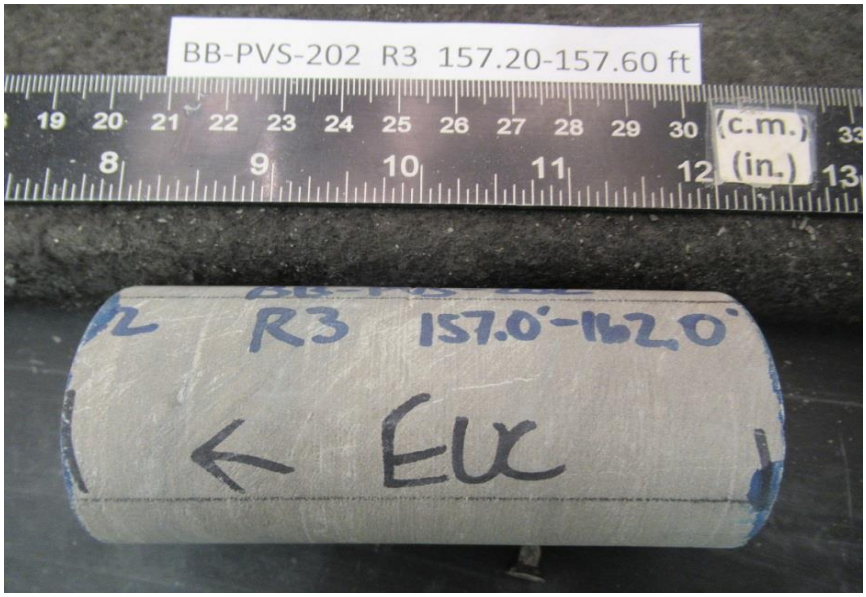
Parallelism Tolerance Met? **YES**
Spherically Seated

PERPENDICULARITY (Procedure P1) (Calculated from End Flatness and Parallelism measurements above)

END 1	Difference, Maximum and Minimum (in.)	Diameter (in.)	Slope	Angle°	Perpendicularity Tolerance Met?
Diameter 1, in	0.00040	1.985	0.00020	0.012	YES
Diameter 2, in (rotated 90°)	0.00080	1.985	0.00040	0.023	YES
END 2					
Diameter 1, in	0.00070	1.985	0.00035	0.020	YES
Diameter 2, in (rotated 90°)	0.00070	1.985	0.00035	0.020	YES

Maximum angle of departure must be ≤ 0.25°
Perpendicularity Tolerance Met? **YES**

Client:	Schonewald Engineering Associates, Inc.
Project Name:	I-295 over Veranda St (MeDOT WIN21745.00)
Project Location:	Portland, ME
GTX #:	308805
Test Date:	1/22/2019
Tested By:	cmh/jck
Checked By:	jsc
Boring ID:	BB-PVS-202
Sample ID:	R3
Depth, ft:	157.20-157.60

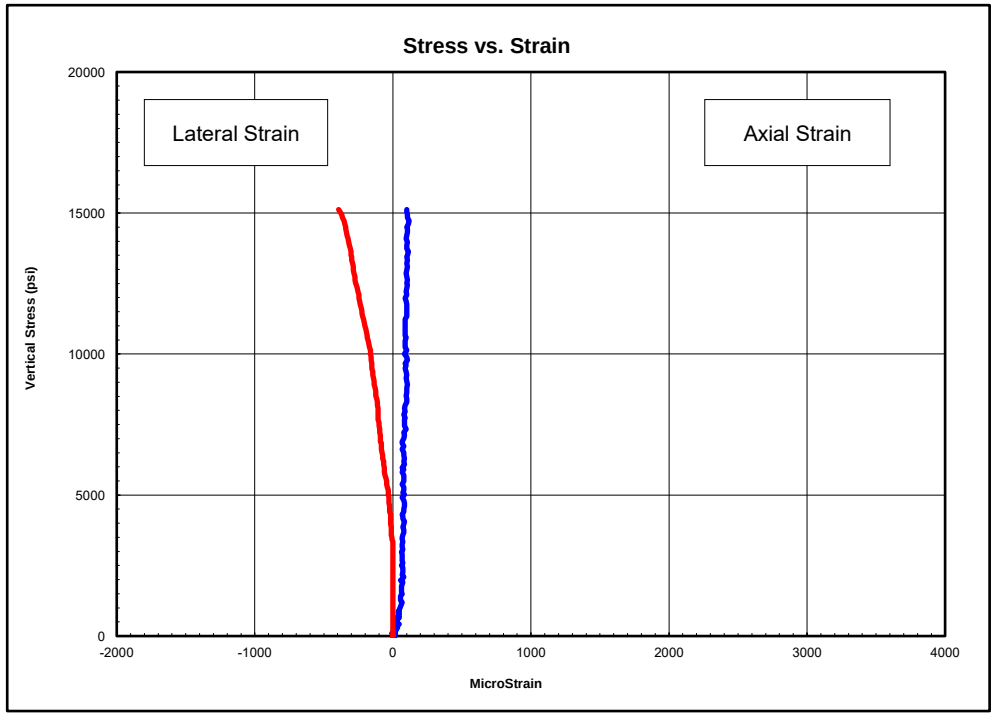


After cutting and grinding

After break

Client:	Schonewald Engineering Associates, Inc.
Project Name:	I-295 over Veranda St (MeDOT WIN21745.00)
Project Location:	Portland, ME
GTX #:	308805
Test Date:	1/22/2019
Tested By:	cmh
Checked By:	jsc
Boring ID:	BB-PVS-203
Sample ID:	R1
Depth, ft:	111.10-111.41
Sample Type:	rock core
Sample Description:	See photographs Intact material failure

Compressive Strength and Elastic Moduli of Rock by ASTM D7012 - Method D



Peak Compressive Stress: 15,122 psi

The strain values recorded for this test produce values of Poisson's Ratio that exceed maximum values found in rocks. One axial and one lateral strain gauge failed to record meaningful data. Young's Modulus reported based on results of a single axial and lateral strain gauge.

Stress Range, psi	Young's Modulus, psi	Poisson's Ratio
1500-5500	106,000,000	---
5500-9600	87,800,000	---
9600-13600	113,000,000	---

Notes:
Test specimen tested at the approximate as-received moisture content and at standard laboratory temperature.
The axial load was applied continuously at a stress rate that produced failure in a test time between 2 and 15 minutes.
Young's Modulus and Poisson's Ratio calculated using the tangent to the line in the stress range listed.
Calculations assume samples are isotropic, which is not necessarily the case.

Client:	Schonewald Engineering Associates, Inc.	Test Date:	1/17/2019
Project Name:	I-295 over Veranda St (MeDOT WIN21745.00)	Tested By:	cmh
Project Location:	Portland, ME	Checked By:	jsc
GTX #:	308805		
Boring ID:	BB-PVS-203		
Sample ID:	R1		
Depth:	111.10-111.41 ft		
Visual Description:	See photographs		

UNIT WEIGHT DETERMINATION AND DIMENSIONAL AND SHAPE TOLERANCES OF ROCK CORE SPECIMENS BY ASTM D4543

BULK DENSITY

	1	2	Average
Specimen Length, in:	4.21	4.20	4.21
Specimen Diameter, in:	1.99	1.98	1.99
Specimen Mass, g:	567.88		
Bulk Density, lb/ft^3	166	**Minimum Diameter Tolerence Met?**	**YES**
Length to Diameter Ratio:	2.1	**Length to Diameter Ratio Tolerance Met?**	**YES**

DEVIATION FROM STRAIGHTNESS (Procedure S1)

Maximum gap between side of core and reference surface plate:
Is the maximum gap ≤ 0.02 in.? YES

Maximum difference must be < 0.020 in.
Straightness Tolerance Met? **YES**

END FLATNESS AND PARALLELISM (Procedure FP1)

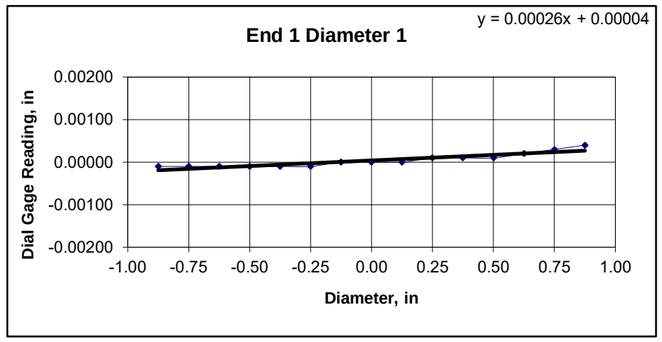
END 1	-0.875	-0.750	-0.625	-0.500	-0.375	-0.250	-0.125	0.000	0.125	0.250	0.375	0.500	0.625	0.750	0.875
Diameter 1, in	-0.00010	-0.00010	-0.00010	-0.00010	-0.00010	-0.00010	0.00000	0.00000	0.00000	0.00010	0.00010	0.00010	0.00020	0.00030	0.00040
Diameter 2, in (rotated 90°)	-0.00010	-0.00010	-0.00010	-0.00010	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	-0.00010	-0.00010

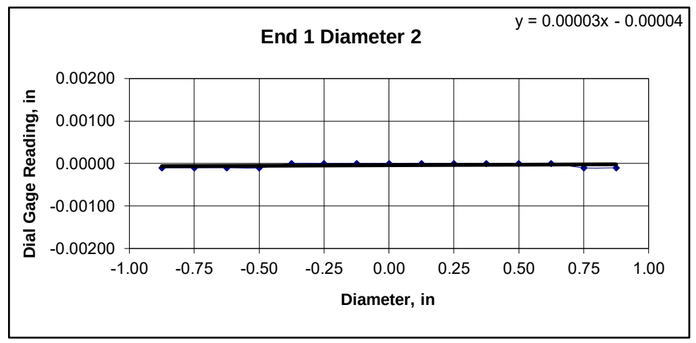
Difference between max and min readings, in:
0° = 0.00050 90° = 0.00010

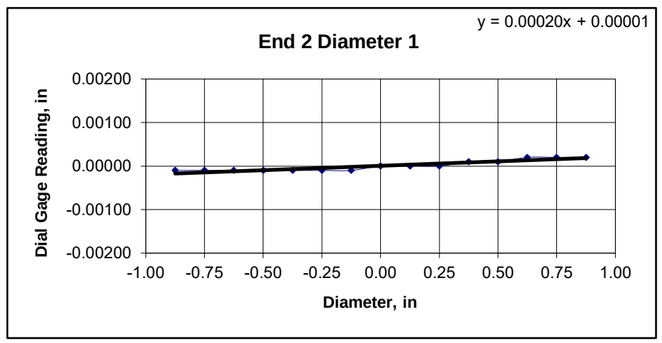
END 2	-0.875	-0.750	-0.625	-0.500	-0.375	-0.250	-0.125	0.000	0.125	0.250	0.375	0.500	0.625	0.750	0.875
Diameter 1, in	-0.00010	-0.00010	-0.00010	-0.00010	-0.00010	-0.00010	-0.00010	0.00000	0.00000	0.00000	0.00010	0.00010	0.00020	0.00020	0.00020
Diameter 2, in (rotated 90°)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00010	0.00010	0.00010	-0.00010	-0.00010	-0.00010	-0.00010

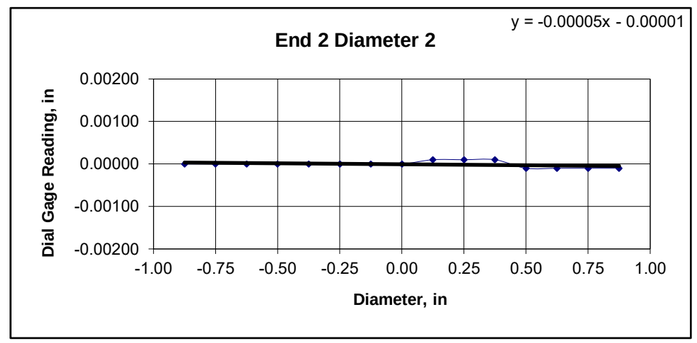
Difference between max and min readings, in:
0° = 0.0003 90° = 0.0002

Maximum difference must be < 0.0020 in. Difference = ± 0.00025
Flatness Tolerance Met? **YES**









DIAMETER 1

End 1:
Slope of Best Fit Line 0.00026
Angle of Best Fit Line: 0.01506

End 2:
Slope of Best Fit Line 0.00020
Angle of Best Fit Line: 0.01162

Maximum Angular Difference: 0.00344

Parallelism Tolerance Met? **YES**
Spherically Seated

DIAMETER 2

End 1:
Slope of Best Fit Line 0.00003
Angle of Best Fit Line: 0.00147

End 2:
Slope of Best Fit Line 0.00005
Angle of Best Fit Line: 0.00262

Maximum Angular Difference: 0.00115

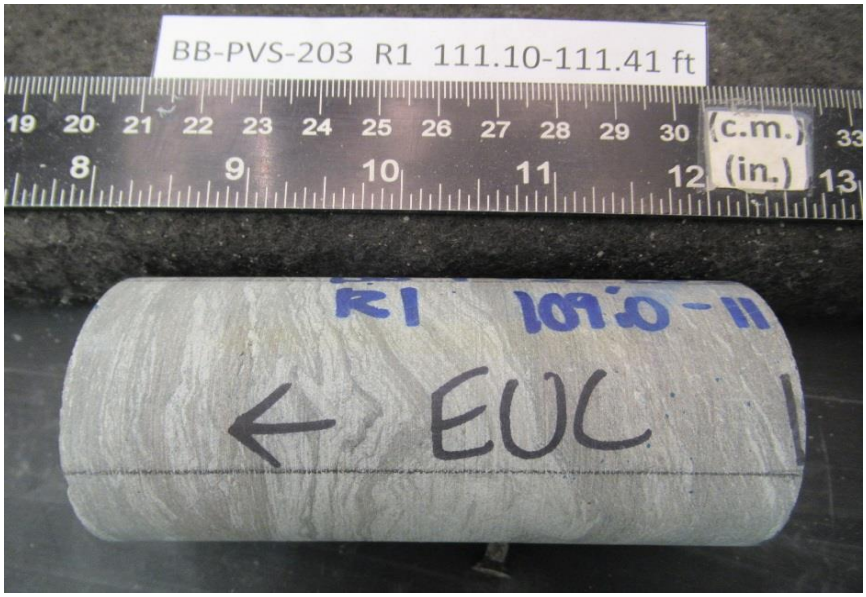
Parallelism Tolerance Met? **YES**
Spherically Seated

PERPENDICULARITY (Procedure P1) (Calculated from End Flatness and Parallelism measurements above)

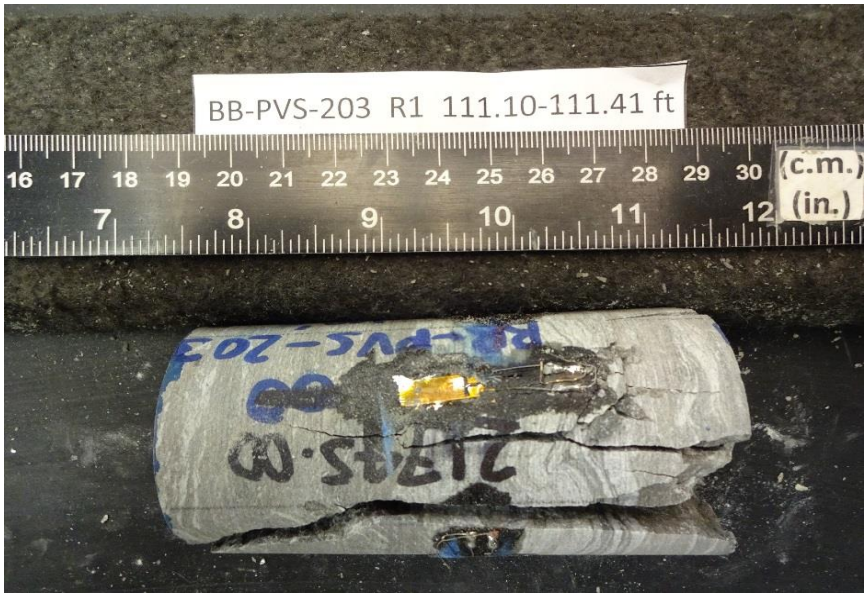
END 1	Difference, Maximum and Minimum (in.)	Diameter (in.)	Slope	Angle°	Perpendicularity Tolerance Met?
Diameter 1, in	0.00050	1.985	0.00025	0.014	YES
Diameter 2, in (rotated 90°)	0.00010	1.985	0.00005	0.003	YES
END 2					
Diameter 1, in	0.00030	1.985	0.00015	0.009	YES
Diameter 2, in (rotated 90°)	0.00020	1.985	0.00010	0.006	YES

Maximum angle of departure must be ≤ 0.25°
Perpendicularity Tolerance Met? **YES**

Client:	Schonewald Engineering Associates, Inc.
Project Name:	I-295 over Veranda St (MeDOT WIN21745.00)
Project Location:	Portland, ME
GTX #:	308805
Test Date:	1/22/2019
Tested By:	cmh/jck
Checked By:	jsc
Boring ID:	BB-PVS-203
Sample ID:	R1
Depth, ft:	111.10-111.41



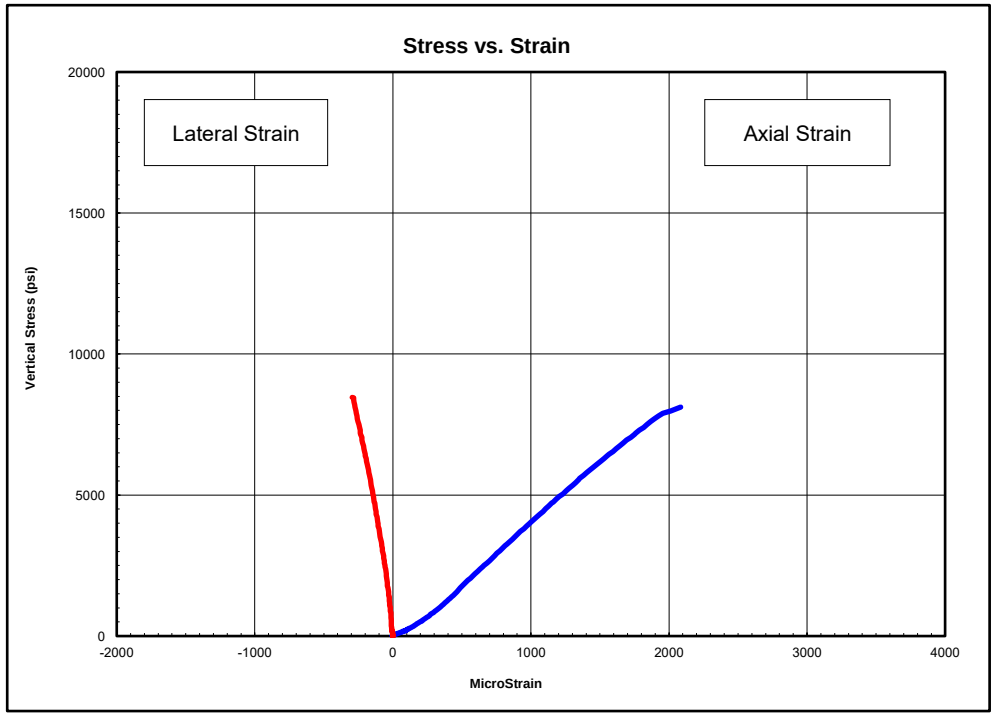
After cutting and grinding



After break

Client:	Schonewald Engineering Associates, Inc.
Project Name:	I-295 over Veranda St (MeDOT WIN21745.00)
Project Location:	Portland, ME
GTX #:	308805
Test Date:	1/22/2019
Tested By:	cmh
Checked By:	jsc
Boring ID:	BB-PVS-203
Sample ID:	R2
Depth, ft:	116.40-116.78
Sample Type:	rock core
Sample Description:	See photographs Intact material failure

Compressive Strength and Elastic Moduli of Rock by ASTM D7012 - Method D



Peak Compressive Stress: 8,958 psi

Stress Range, psi	Young's Modulus, psi	Poisson's Ratio
900-3300	4,650,000	0.13
3300-5700	4,390,000	0.16
5700-8100	3,700,000	0.16

Notes:
Test specimen tested at the approximate as-received moisture content and at standard laboratory temperature.
The axial load was applied continuously at a stress rate that produced failure in a test time between 2 and 15 minutes.
Young's Modulus and Poisson's Ratio calculated using the tangent to the line in the stress range listed.
Calculations assume samples are isotropic, which is not necessarily the case.

Client:	Schonewald Engineering Associates, Inc.	Test Date:	1/17/2019
Project Name:	I-295 over Veranda St (MeDOT WIN21745.00)	Tested By:	cmh
Project Location:	Portland, ME	Checked By:	jsc
GTX #:	308805		
Boring ID:	BB-PVS-203		
Sample ID:	R2		
Depth:	116.40-116.78 ft		
Visual Description:	See photographs		

UNIT WEIGHT DETERMINATION AND DIMENSIONAL AND SHAPE TOLERANCES OF ROCK CORE SPECIMENS BY ASTM D4543

BULK DENSITY

	1	2	Average
Specimen Length, in:	4.32	4.32	4.32
Specimen Diameter, in:	1.99	1.98	1.99
Specimen Mass, g:	584.02		
Bulk Density, lb/ft^3	166	**Minimum Diameter Tolerence Met?**	**YES**
Length to Diameter Ratio:	2.2	**Length to Diameter Ratio Tolerance Met?**	**YES**

DEVIATION FROM STRAIGHTNESS (Procedure S1)

Maximum gap between side of core and reference surface plate:
Is the maximum gap ≤ 0.02 in.? YES

Maximum difference must be < 0.020 in.
Straightness Tolerance Met? **YES**

END FLATNESS AND PARALLELISM (Procedure FP1)

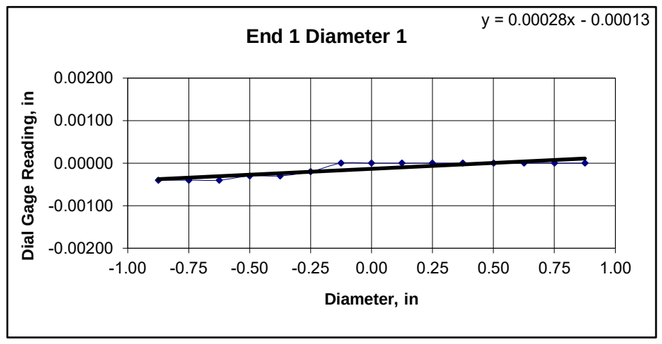
END 1	-0.875	-0.750	-0.625	-0.500	-0.375	-0.250	-0.125	0.000	0.125	0.250	0.375	0.500	0.625	0.750	0.875
Diameter 1, in	-0.00040	-0.00040	-0.00040	-0.00030	-0.00030	-0.00020	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Diameter 2, in (rotated 90°)	-0.00050	-0.00050	-0.00050	-0.00050	-0.00040	-0.00040	-0.00030	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

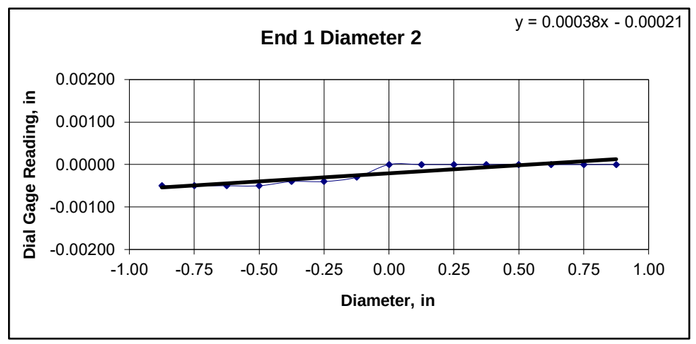
Difference between max and min readings, in:
0° = 0.00040 90° = 0.00050

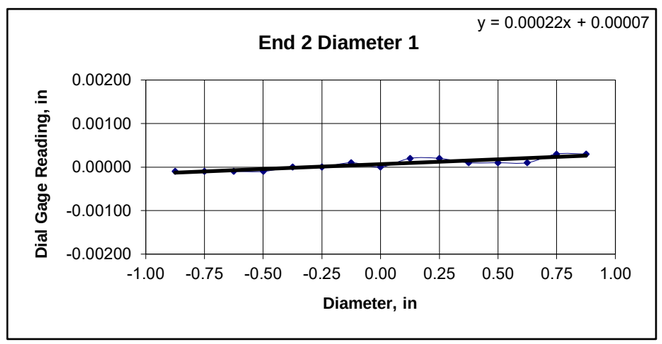
END 2	-0.875	-0.750	-0.625	-0.500	-0.375	-0.250	-0.125	0.000	0.125	0.250	0.375	0.500	0.625	0.750	0.875
Diameter 1, in	-0.00010	-0.00010	-0.00010	-0.00010	0.00000	0.00000	0.00010	0.00000	0.00020	0.00020	0.00010	0.00010	0.00010	0.00030	0.00030
Diameter 2, in (rotated 90°)	-0.00010	-0.00010	0.00000	0.00010	0.00010	0.00010	0.00010	0.00000	0.00010	0.00010	0.00040	0.00050	0.00050	0.00050	0.00050

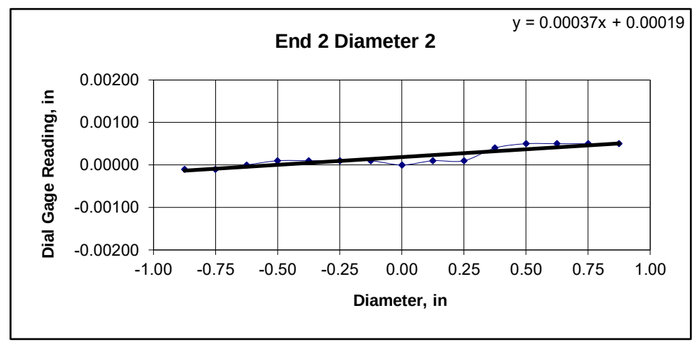
Difference between max and min readings, in:
0° = 0.0004 90° = 0.0006

Maximum difference must be < 0.0020 in. Difference = ± 0.00030
Flatness Tolerance Met? **YES**









DIAMETER 1

End 1:
Slope of Best Fit Line 0.00028
Angle of Best Fit Line: 0.01588

End 2:
Slope of Best Fit Line 0.00022
Angle of Best Fit Line: 0.01277

Maximum Angular Difference: 0.00311

Parallelism Tolerance Met? **YES**
Spherically Seated

DIAMETER 2

End 1:
Slope of Best Fit Line 0.00038
Angle of Best Fit Line: 0.02177

End 2:
Slope of Best Fit Line 0.00037
Angle of Best Fit Line: 0.02095

Maximum Angular Difference: 0.00082

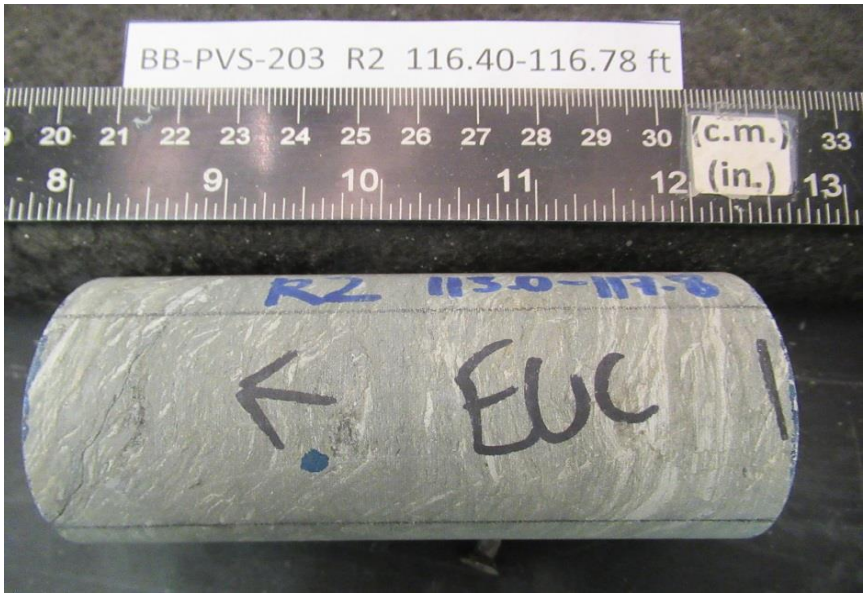
Parallelism Tolerance Met? **YES**
Spherically Seated

PERPENDICULARITY (Procedure P1) (Calculated from End Flatness and Parallelism measurements above)

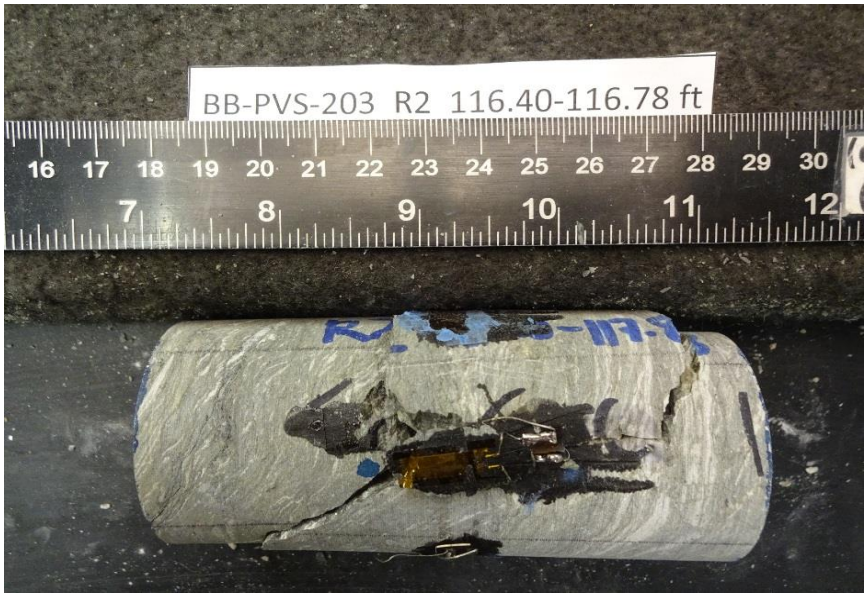
END 1	Difference, Maximum and Minimum (in.)	Diameter (in.)	Slope	Angle°	Perpendicularity Tolerance Met?
Diameter 1, in	0.00040	1.985	0.00020	0.012	YES
Diameter 2, in (rotated 90°)	0.00050	1.985	0.00025	0.014	YES
END 2					
Diameter 1, in	0.00040	1.985	0.00020	0.012	YES
Diameter 2, in (rotated 90°)	0.00060	1.985	0.00030	0.017	YES

Maximum angle of departure must be ≤ 0.25°
Perpendicularity Tolerance Met? **YES**

Client:	Schonewald Engineering Associates, Inc.
Project Name:	I-295 over Veranda St (MeDOT WIN21745.00)
Project Location:	Portland, ME
GTX #:	308805
Test Date:	1/22/2019
Tested By:	cmh/jck
Checked By:	jsc
Boring ID:	BB-PVS-203
Sample ID:	R2
Depth, ft:	116.40-116.78



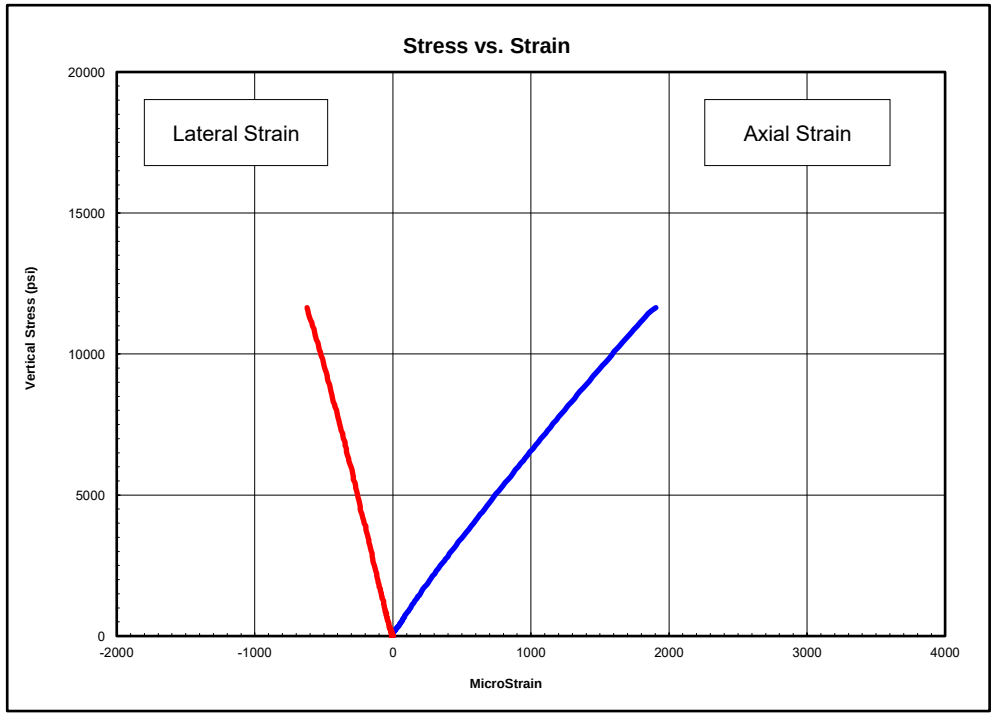
After cutting and grinding



After break

Client:	Schonewald Engineering Associates, Inc.
Project Name:	I-295 over Veranda St (MeDOT WIN21745.00)
Project Location:	Portland, ME
GTX #:	308805
Test Date:	1/24/2019
Tested By:	cmh
Checked By:	jsc
Boring ID:	BB-PVS-203
Sample ID:	R4
Depth, ft:	125.00-125.40
Sample Type:	rock core
Sample Description:	See photographs Intact material failure

Compressive Strength and Elastic Moduli of Rock by ASTM D7012 - Method D



Peak Compressive Stress: 11,645 psi

One axial and one lateral strain gauge failed to record meaningful data. Young's Modulus and Poisson's Ratio reported based on results of a single axial and lateral strain gauge.

Stress Range, psi	Young's Modulus, psi	Poisson's Ratio
1200-4300	6,480,000	0.32
4300-7400	6,080,000	0.31
7400-10500	5,740,000	0.32

Notes:
Test specimen tested at the approximate as-received moisture content and at standard laboratory temperature.
The axial load was applied continuously at a stress rate that produced failure in a test time between 2 and 15 minutes.
Young's Modulus and Poisson's Ratio calculated using the tangent to the line in the stress range listed.
Calculations assume samples are isotropic, which is not necessarily the case.

Client:	Schonewald Engineering Associates, Inc.	Test Date:	1/17/2019
Project Name:	I-295 over Veranda St (MeDOT WIN21745.00)	Tested By:	cmh
Project Location:	Portland, ME	Checked By:	jsc
GTX #:	308805		
Boring ID:	BB-PVS-203		
Sample ID:	R4		
Depth:	125.00-125.40 ft		
Visual Description:	See photographs		

UNIT WEIGHT DETERMINATION AND DIMENSIONAL AND SHAPE TOLERANCES OF ROCK CORE SPECIMENS BY ASTM D4543

BULK DENSITY

	1	2	Average
Specimen Length, in:	4.32	4.32	4.32
Specimen Diameter, in:	1.99	1.99	1.99
Specimen Mass, g:	584.99		
Bulk Density, lb/ft^3	166	**Minimum Diameter Tolerence Met?**	**YES**
Length to Diameter Ratio:	2.2	**Length to Diameter Ratio Tolerance Met?**	**YES**

DEVIATION FROM STRAIGHTNESS (Procedure S1)

Maximum gap between side of core and reference surface plate:
Is the maximum gap ≤ 0.02 in.? YES

Maximum difference must be < 0.020 in.
Straightness Tolerance Met? **YES**

END FLATNESS AND PARALLELISM (Procedure FP1)

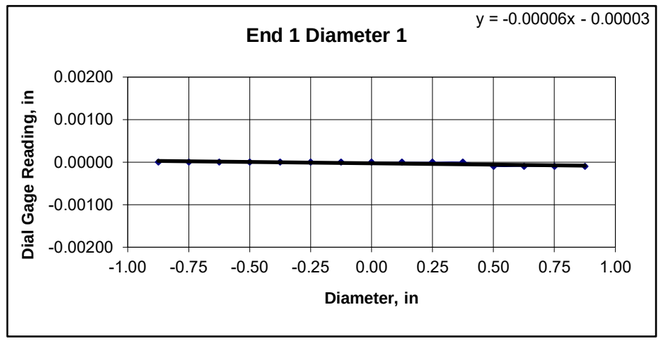
END 1	-0.875	-0.750	-0.625	-0.500	-0.375	-0.250	-0.125	0.000	0.125	0.250	0.375	0.500	0.625	0.750	0.875
Diameter 1, in	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	-0.00010	-0.00010	-0.00010	-0.00010
Diameter 2, in (rotated 90°)	-0.00040	-0.00040	-0.00040	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00010	0.00010	0.00010	0.00020	0.00020	0.00020

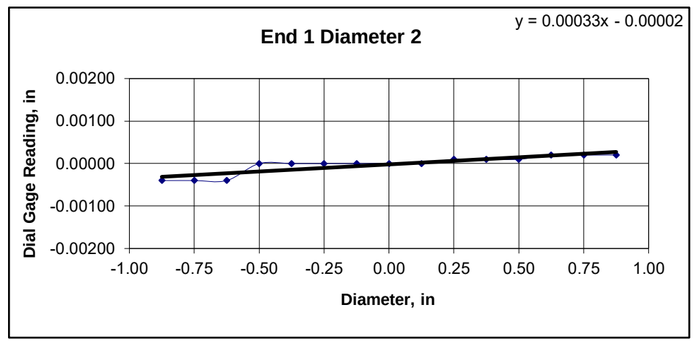
Difference between max and min readings, in:
0° = 0.00010 90° = 0.00060

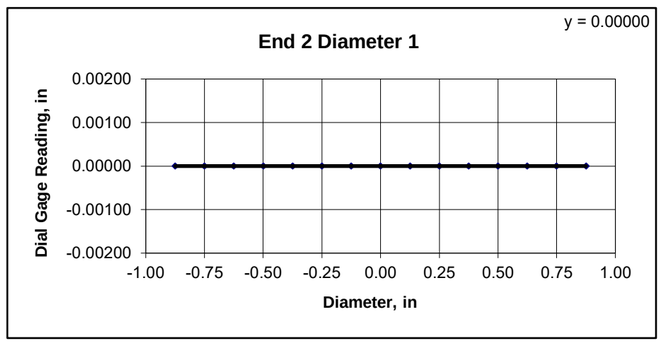
END 2	-0.875	-0.750	-0.625	-0.500	-0.375	-0.250	-0.125	0.000	0.125	0.250	0.375	0.500	0.625	0.750	0.875
Diameter 1, in	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Diameter 2, in (rotated 90°)	-0.00020	-0.00020	-0.00020	-0.00020	-0.00020	-0.00020	-0.00020	0.00000	0.00010	0.00010	0.00010	0.00020	0.00020	0.00020	0.00030

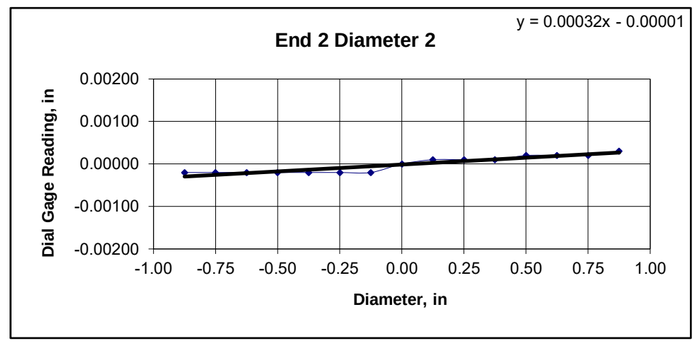
Difference between max and min readings, in:
0° = 0 90° = 0.0005

Maximum difference must be < 0.0020 in. Difference = ± 0.00030
Flatness Tolerance Met? **YES**









DIAMETER 1

End 1:
Slope of Best Fit Line 0.00006
Angle of Best Fit Line: 0.00360

End 2:
Slope of Best Fit Line 0.00000
Angle of Best Fit Line: 0.00000

Maximum Angular Difference: 0.00360

Parallelism Tolerance Met? **YES**
Spherically Seated

DIAMETER 2

End 1:
Slope of Best Fit Line 0.00033
Angle of Best Fit Line: 0.01915

End 2:
Slope of Best Fit Line 0.00032
Angle of Best Fit Line: 0.01850

Maximum Angular Difference: 0.00065

Parallelism Tolerance Met? **YES**
Spherically Seated

PERPENDICULARITY (Procedure P1) (Calculated from End Flatness and Parallelism measurements above)

END 1	Difference, Maximum and Minimum (in.)	Diameter (in.)	Slope	Angle°	Perpendicularity Tolerance Met?
Diameter 1, in	0.00010	1.990	0.00005	0.003	YES
Diameter 2, in (rotated 90°)	0.00060	1.990	0.00030	0.017	YES
END 2					
Diameter 1, in	0.00000	1.990	0.00000	0.000	YES
Diameter 2, in (rotated 90°)	0.00050	1.990	0.00025	0.014	YES

Maximum angle of departure must be ≤ 0.25°
Perpendicularity Tolerance Met? **YES**

Client:	Schonewald Engineering Associates, Inc.
Project Name:	I-295 over Veranda St (MeDOT WIN21745.00)
Project Location:	Portland, ME
GTX #:	308805
Test Date:	1/22/2019
Tested By:	cmh/jck
Checked By:	jsc
Boring ID:	BB-PVS-203
Sample ID:	R4
Depth, ft:	125.00-125.40

After cutting and grinding

After break

Appendix A2

Field and Laboratory Data Report, Final Design Geotechnical Program

(By Schonewald Engineering Associates)

SCHONEWALD
ENGINEERING
ASSOCIATES, INC.
■ www.SchonewaldEngineering.com ■

FIELD AND LABORATORY DATA REPORT
FINAL DESIGN GEOTECHNICAL PROGRAM
BRIDGE #5933
I-295 OVER VERANDA STREET
PORTLAND, MAINE

PREPARED FOR:

HNTB Corporation
Westbrook, Maine

PREPARED BY:

Isabel V. (Be) Schonewald, P.E.
Schonewald Engineering Associates, Inc. (SchonewaldEA)
129 Middle Road
Cumberland, Maine 04021
Be@SchonewaldEngineering.com

September 2019

SchonewaldEA Project No. 19-107

SCHONEWALD ENGINEERING ASSOCIATES, INC.
■ www.SchonewaldEngineering.com ■

FIELD AND LABORATORY DATA REPORT
FINAL DESIGN GEOTECHNICAL PROGRAM
BRIDGE #5933
I-295 OVER VERANDA STREET
PORTLAND, MAINE

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RESULTS OF LABORATORY TESTS ON SOIL SAMPLES 300-SERIES BORINGS	**22-100**

300-SERIES BORING LOCATION SKETCH

Username:

Division:

Filename: 0XX_Phase3Borings.dgn

Date:6/20/2019

JIMMY H. DANG
TAX MAP/LOT - 432/D/2
DEED BOOK/PAGE - 28895/52
POR NO. 15

IAN SCHLEH
TAX MAP/LOT - 432/D/3
DEED BOOK/PAGE - 33521/154
POR NO. - 16

HEWITT PROPERTIES, LLC
TAX MAP/LOT - 432/E/3, 433/B/16 ET AL
DEED BOOK/PAGE - 32021/133
POR NO. - 17

CINDY LOU MEOLI LIVING TRUST
CINDY LOU MEOLI, TRUSTEE
RICHARD A. MEOLI, TRUSTEE
TAX MAP/LOT - 432/E/4
DEED BOOK/PAGE - 32883/62
POR NO. - 18

226 VERANDA STREET CONDOMINIUM ASSOCIATION
TAX MAP/LOT - 432/E/5
DEED BOOK/PAGE - 32912/252
POR NO. - 19

CONDOMINIUM PLAT OF
226 VERANDA STREET CONDOMIN
MADE FOR JWAY, LLC
BY OWEN HASKELL, INC.
DATED JULY 10, 2015
C.C.R.D. PLAN BOOK 216, PAGE 29

S.H.C. FILE 3-132

CONTROL OF ACCESS

BB-PVS-304

BB-PVS-303

BB-PVS-302

BB-PVS-301

62.46'

57.41'

19.26'

12.08'

27.12'

10.12'

127.78'

N 45°51'04.15" E

N 42°48'18.86" W

103+00 104+00 105+00 106+00 107+00 108+00

307+00 308+00

PLAN

20 0 20 40

Scale of Feet

APPROXIMATE LOCATIONS OF 300-SERIES BORINGS

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

NHPP-2174(500)

PIN 021745.00

BRIDGE PLANS

BRIDGE NO.5933

P.E. NUMBER

DATE

SIGNATURE

	TRC	BY	DATE
PROJ. MANAGER			
DESIGN-DETAILED	EDD	CDH	11\18
CHECKED-REVIEWED	RWH	LZD	11\18
DESIGN2-DETAILED2			
DESIGN3-DETAILED3			
REVISIONS 1			
REVISIONS 2			
REVISIONS 3			
REVISIONS 4			
FIELD CHANGES			

INTERSTATE 295 OVER
VERANDA STREET
CUMBERLAND COUNTY
PORTLAND

PHASE 3 BORINGS

SHEET NUMBER
1
OF 1

LOGS OF 300-SERIES BORINGS

Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: Bridge #5933
I-295 over Veranda Street
Location: Portland, ME

Boring No.: BB-PVS-301

WIN: 21745.00

Driller:	New England Boring Contractors	**Elevation (ft.)**	15.1	**Auger ID/OD:**	SSA (--/4.5")
Operator:	Enos/Maynard	**Datum:**	NAVD88	**Sampler:**	standard split-spoon
Logged By:	Schonewald	**Rig Type:**	Mobile Drill B-53 (NEBC ATV Rig 23)	**Hammer Wt./Fall:**	140 lbs / 30 inches
Date Start/Finish:	7/18/19; 1125-1610	**Drilling Method:**	cased wash boring	**Core Barrel:**	not applicable
Boring Location:	N 310603, E 1016795	**Casing ID/OD:**	HW (4/4.5") NW (3/3.5")	**Water Level*:**	11 ft +/- (Sample 6D)
Hammer Efficiency Factor:	.842	**Hammer Type:**	Automatic ☒ Hydraulic ☐ Rope & Cathead ☐		

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

Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N_{60}	Casing Blows	Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.
0	1D	24/6	0.0 - 2.0	4-9-10-10	19	27	SSA			Brown TOPSOIL with organics; one piece large gravel in tip of spoon.	
	2D	24/10	2.0 - 4.0	8-9-8-9	17	24				Tan, damp, medium dense, fine to medium SAND, trace coarse sand, trace fine gravel, trace silt. GRANULAR FILL	
	3D	24/16	4.0 - 6.0	3-7-10-9	17	24				Tan, damp, medium dense, fine to coarse SAND, trace fine gravel, trace silt, with one 5-inch layer silty fine to medium sand, trace coarse sand. GRANULAR FILL	GTX#519173 WASH SIEVE A-1-b(1) -#200=5.5%
5	4D	24/17	6.0 - 8.0	7-11-13-13	24	34				Tan, damp, medium dense, fine to medium SAND, trace coarse sand, trace fine gravel, trace silt. GRANULAR FILL	GTX#519345 WC=4.8%
	5D	24/20	8.0 - 10.0	14-19-14-13	33	46				Tan, damp to moist, dense, fine to medium SAND, trace to little silt, trace coarse sand, trace fine gravel. GRANULAR FILL	
10	6D	24/20	10.0 - 12.0	4-3-2-2	5	7	25			Tan-brown, moist to wet, loose, fine to medium SAND, trace to little silt, trace coarse sand, trace fine gravel. GRANULAR FILL	GTX#519174 WASH SIEVE A-2-4(0) -#200=10.5% GTX#519345 WC=18.5%
							25				
							18				
							20	2.1		13.0	
15	7D	24/12	14.0 - 16.0	1-3-9-4	3"dia	4	HW RC			MV: Unable to push vane deeper than 14.0 ft. Tan-brown, fine to coarse SAND, little silt, little fine gravel; over a 3-inch layer olive brown, SILT, some clay; over a 7-inch layer (7D) brown-black, Silty fine to coarse SAND, some gravel with strong organic odor. MISCELLANEOUS FILL	
								-0.3		15.4	
										Organic silt noted in wash water at approximately 17 feet.	
								-2.9		18.0	
	1U	24/19	19.0 - 21.0	HYD PUSH						Olive grey, Clayey SILT. MARINE SILT-CLAY CRUST (Piston sampler not fully extend.)	GTX#IP-11 CONSOL (Cv, Cα)
20	8D	24/24	20.8 - 22.8	WOH/12"-2-3	2	3				Dark olive grey, Clayey SILT to Silty CLAY. MARINE SILT-CLAY CRUST to MARINE SILT-CLAY WITH SAND SEAMS	GTX#519169 WC=34% LL=42 PL=22 PI=20
								-6.7		21.8	
25	9D	24/24	24.0 - 26.0	(VANE/12")-WOH-2	--					Olive grey, stiff, Silty CLAY, with one 1/4-inch seam fine Sandy SILT and few concretions at approx. 25 ft. MARINE SILT-CLAY	

Remarks:

NEBC ATV Rig 23 automatic hammer calibrated on 7/8/2019.

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

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Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: Bridge #5933
I-295 over Veranda Street
Location: Portland, ME

Boring No.: BB-PVS-301

WIN: 21745.00

Driller:	New England Boring Contractors	**Elevation (ft.)**	15.1	**Auger ID/OD:**	SSA (--/4.5")
Operator:	Enos/Maynard	**Datum:**	NAVD88	**Sampler:**	standard split-spoon
Logged By:	Schonewald	**Rig Type:**	Mobile Drill B-53 (NEBC ATV Rig 23)	**Hammer Wt./Fall:**	140 lbs / 30 inches
Date Start/Finish:	7/18/19; 1125-1610	**Drilling Method:**	cased wash boring	**Core Barrel:**	not applicable
Boring Location:	N 310603, E 1016795	**Casing ID/OD:**	HW (4/4.5") NW (3/3.5")	**Water Level*:**	11 ft +/- (Sample 6D)
Hammer Efficiency Factor: .842		**Hammer Type:**	Automatic ☒ Hydraulic ☐ Rope & Cathead ☐		

Definitions:
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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 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	V1		24.6 - 25.0	Su=1,607/89 psf						WITH SAND SEAMS V1: 36 / 2 ft-lbs (55 mm x 110 mm vane raw torque readings) MV: Unable to push vane deeper than 25.0 ft.	
	2U	24/24	26.5 - 28.5	HYD PUSH						Olive brown grey, Silty CLAY; sand on bottom of sample. MARINE SILT-CLAY WITH SAND SEAMS	GTX#IP-12 CONSOL (Cv, Cα) GTX#519170 WC=32% LL=38 PL=19 PI=19
	10D	24/24	28.5 - 30.5	2-6-3-5	9	13				MV: Unable to push vane deeper than 28.5 ft.	
								-14.2		Olive grey, Silty CLAY, with multiple layers and seams fine Sandy SILT. MARINE SILT-CLAY WITH SAND SEAMS Changing at 29.3 ft to:	
30										29.3	
										Brown, fine Sandy SILT with one 3-inch layer fine sand, little to some silt.	
								-17.4		32.5	
	11D	24/16	34.0 - 36.0	6-10-12-9	22	31				Brown, medium dense, fine to medium SAND, little silt, trace coarse sand, trace fine gravel, with one 2-inch seam fine sandy silt. TILL	
35											
										38.3 ft: Gravel layer noted. 38.5 ft: Grinding on hard layer. Slowly advance roller cone to refusal at 41.6 ft.	
40											
								-26.5		41.6	
										Bottom of Exploration at 41.6 feet below ground surface.	
45											
50											

Remarks:

NEBC ATV Rig 23 automatic hammer calibrated on 7/8/2019.

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Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: Bridge #5933
I-295 over Veranda Street
Location: Portland, ME

Boring No.: BB-PVS-302

WIN: 21745.00

Driller:	New England Boring Contractors	**Elevation (ft.)**	13.7	**Auger ID/OD:**	SSA (--/4.5")
Operator:	Enos/Maynard	**Datum:**	NAVD88	**Sampler:**	standard split-spoon
Logged By:	Schonewald	**Rig Type:**	Mobile Drill B-53 (NEBC ATV Rig 23)	**Hammer Wt./Fall:**	140 lbs / 30 inches
Date Start/Finish:	7/17/19; 1525- 7/18/19; 1110	**Drilling Method:**	cased wash boring	**Core Barrel:**	NQ2
Boring Location:	N 310718, E 1016824	**Casing ID/OD:**	HW (4/4.5") NW (3/3.5")	**Water Level*:**	9 ft (open)
Hammer Efficiency Factor:	.842	**Hammer Type:**	Automatic ☒ Hydraulic ☐ Rope & Cathead ☐		

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

Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N_{60}	Casing Blows	Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.
0	1D	24/14	0.0 - 2.0	3-4-6-7	10	14	SSA			6-inch layer TOPSOIL with organics, underlain by 1D: Light brown, damp, loose, fine to coarse SAND, little to some silt, little gravel. GRANULAR FILL	
	2D	24/12	2.0 - 4.0	5-5-5-7	10	14				Brown, damp, loose, fine to coarse SAND, little silt, trace to little fine gravel. GRANULAR FILL	GTX#519175 WASH SIEVE A-2-4(0) -#200=10.9%
	3D	24/14	4.0 - 6.0	6-6-8-16	14	20				Light brown-tan, damp, medium dense, fine to medium SAND, trace to little silt, trace gravel, trace coarse sand. GRANULAR FILL	GTX#519345 WC=6.1%
5	4D	24/19	6.0 - 8.0	16-14-11-10	25	35				Light brown-tan, damp to moist, medium dense, fine to medium SAND, trace to little silt, trace coarse sand, trace gravel. GRANULAR FILL	
	5D	24/19	8.0 - 10.0	4-3-2-3	5	7	15			Light brown, moist to wet, loose, fine to medium SAND, trace to little silt, trace coarse sand, trace gravel. GRANULAR FILL	
							21				
10	6D	24/7	10.0 - 12.0	4-5-6-3	11	15	21			Light brown, medium dense, fine to medium SAND, little silt, trace gravel, trace coarse sand. GRANULAR FILL Changing at 11.6 ft to:	
							31	2.1		11.6	
							33			6D: Dark grey brown, fine to medium SAND, some silt, trace to little gravel, trace coarse sand, with minor organics. ORIGINAL GROUND	
							39	0.7		13.0	
15	7D	24/22	14.0 - 16.0	1-2-2-3	4	6	HW RC			Olive brown grey, slightly mottled, soft, SILT, some clay to Clayey SILT. MARINE SILT-CLAY CRUST	GTX#519153 WC=35% LL=45 PL=22 PI=23
	8D	24/24	19.0 - 21.0	WOR-1/18"	--					Olive brown, Clayey SILT grading to olive grey with occasional black streaks, Silty CLAY. MARINE SILT-CLAY CRUST grading to MARINE SILT-CLAY	
20								-6.3		20.0	
25	9D	24/24	24.0 - 26.0	push thru vane						Dark grey black, medium stiff, Silty CLAY with occasional seams of find sandy silt. MARINE SILT-CLAY	GTX#519154 WC=35%

Remarks:

NEBC ATV Rig 23 automatic hammer calibrated on 7/8/2019.

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Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: Bridge #5933
I-295 over Veranda Street
Location: Portland, ME

Boring No.: BB-PVS-302

WIN: 21745.00

Driller:	New England Boring Contractors	**Elevation (ft.)**	13.7	**Auger ID/OD:**	SSA (--/4.5")
Operator:	Enos/Maynard	**Datum:**	NAVD88	**Sampler:**	standard split-spoon
Logged By:	Schonewald	**Rig Type:**	Mobile Drill B-53 (NEBC ATV Rig 23)	**Hammer Wt./Fall:**	140 lbs / 30 inches
Date Start/Finish:	7/17/19; 1525- 7/18/19; 1110	**Drilling Method:**	cased wash boring	**Core Barrel:**	NQ2
Boring Location:	N 310718, E 1016824	**Casing ID/OD:**	HW (4/4.5") NW (3/3.5")	**Water Level*:**	9 ft (open)
Hammer Efficiency Factor:	.842	**Hammer Type:**	Automatic ☒ Hydraulic ☐ Rope & Cathead ☐		

Definitions:
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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 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	V1		24.6 - 25.0	Su= 558/ 45 psf						V1: 12.5 / 1 ft-lbs (55 mm x 110 mm vane raw torque readings)	LL=37
	V2		25.6 - 26.0	Su= 781/ 112 psf						V2: 17.5 / 2.5 ft-lbs (55 mm x 110 mm vane raw torque readings)	PL=19
											PI=18
	10D	24/24	29.0 - 31.0	push thru vane						Dark olive grey with occasional black streaks, medium stiff, Silty CLAY. MARINE SILT-CLAY	
30	V3		29.6 - 30.0	Su= 848/ 89 psf						V3: 19 / 2 ft-lbs (55 mm x 110 mm vane raw torque readings)	
	V4		30.6 - 31.0	Su= 938/ 134 psf						V4: 21 / 35 ft-lbs (55 mm x 110 mm vane raw torque readings)	
	11D	24/24	34.0 - 36.0	push thru vane						Dark grey with occasional black streaks, stiff, Silty CLAY. MARINE SILT- CLAY	GTX#519155
35	V5		34.6 - 35.0	Su=1,205/223 psf						V5: 27 / 5 ft-lbs (55 mm x 110 mm vane raw torque readings)	WC=30%
	V6		35.6 - 36.0	Su=1,340/268 psf						V6: 30 / 6 ft-lbs (55 mm x 110 mm vane raw torque readings)	LL=36
											PL=20
											PI=16
	12D	24/20	39.0 - 41.0	(vane)-4-4-9	8	11				Unable to push vane deeper than 39.4 ft. Dark grey black, Silty CLAY. MARINE SILT-CLAY Grading through grey, SILT, some clay, some fine sand to:	
40								-26.7		40.4	
										Grading at 40.4 ft to 12D: Brown, fine Sandy SILT; with brown, fine sand trace silt in tip of spoon. MARINE SANDS AND SILT	
	13D	24/9	44.0 - 46.0	4-10-11-12	21	29				Brown, medium dense, fine to medium SAND, trace silt, trace coarse sand; with siltier material in tip of spoon. MARINE SANDS AND SILT	
45											
								-33.6		47.3	
										Top of Bedrock at Elev. -33.6 ft. 47.3 ft: Grinding on hard layer. Slowly advance roller cone to refusal at 49.4 ft. Set NW casing for rock coring.	
50	R1	60/60	49.4 - 54.4	RQD: 35" = 58%			NQ2			R1: Bedrock: Grey, aphanitic to fine grained, PHYLLITE with	

Remarks:

NEBC ATV Rig 23 automatic hammer calibrated on 7/8/2019.

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Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: Bridge #5933
I-295 over Veranda Street
Location: Portland, ME

Boring No.: BB-PVS-302

WIN: 21745.00

Driller:	New England Boring Contractors	**Elevation (ft.)**	13.7	**Auger ID/OD:**	SSA (--/4.5")
Operator:	Enos/Maynard	**Datum:**	NAVD88	**Sampler:**	standard split-spoon
Logged By:	Schonewald	**Rig Type:**	Mobile Drill B-53 (NEBC ATV Rig 23)	**Hammer Wt./Fall:**	140 lbs / 30 inches
Date Start/Finish:	7/17/19; 1525- 7/18/19; 1110	**Drilling Method:**	cased wash boring	**Core Barrel:**	NQ2
Boring Location:	N 310718, E 1016824	**Casing ID/OD:**	HW (4/4.5") NW (3/3.5")	**Water Level*:**	9 ft (open)
Hammer Efficiency Factor: .842		**Hammer Type:**	Automatic ☒ Hydraulic ☐ Rope & Cathead ☐		

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MV = Unsuccessful Field Vane Shear Test Attempt
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SSA = Solid Stem Auger
HSA = Hollow Stem Auger
RC = Roller Cone
WOH = Weight of 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: Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N_{60}	Casing Blows	Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.
50										moderately dipping remnant bedding and calcsilicate veins; hard, typically fresh. Low angle to moderately dipping, closely spaced breaks; undulating, rough, typically fresh, and open with occasional mud infilling; somewhat shiny. (ELIOT FORMATION) Core times: 3:10/ 2:50/ 2:45/ 2:50/ 3:10 min:sec/ft. ROCK QUALITY = FAIR	
								-40.7		54.4	
										Bottom of Exploration at 54.4 feet below ground surface.	
55											
60											
65											
70											
75											

Remarks:

NEBC ATV Rig 23 automatic hammer calibrated on 7/8/2019.

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Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: Bridge #5933
I-295 over Veranda Street
Location: Portland, ME

Boring No.: BB-PVS-303

WIN: 21745.00

Driller:	New England Boring Contractors	**Elevation (ft.)**	12.0	**Auger ID/OD:**	SSA (--/4.5")
Operator:	Enos/Maynard	**Datum:**	NAVD88	**Sampler:**	standard split-spoon
Logged By:	Schonewald	**Rig Type:**	Mobile Drill B-53 (NEBC ATV Rig 23)	**Hammer Wt./Fall:**	140 lbs / 30 inches
Date Start/Finish:	7/16/19; 1415- 7/17/19; 1430	**Drilling Method:**	cased wash boring	**Core Barrel:**	NQ2
Boring Location:	N 310873, E 1016831	**Casing ID/OD:**	HW (4/4.5") NW (3/3.5")	**Water Level*:**	8.4 ft (open)
Hammer Efficiency Factor:	.842	**Hammer Type:**	Automatic ☒ Hydraulic ☐ Rope & Cathead ☐		

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

Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N_{60}	Casing Blows	Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.
0	1D	24/10	0.0 - 2.0	4-8-6-5	14	20	SSA			1 inch HMA (parking lot) underlain by Brown-dark brown, damp, medium dense, fine to coarse SAND, some gravel, some silt. GRANULAR FILL	
	2D	24/17	2.0 - 4.0	1-1-1-2	2	3				Grey brown, damp to moist, very loose, fine Sandy SILT, trace medium to coarse sand. FILL	
	3D	24/17	4.0 - 6.0	1-2-3-2	5	7				Olive grey, mottled, moist, loose, SILT, trace fine sand. FILL	GTX#519172 MATL PASSING #200 -#200=95.3%
5	4D	24/19	6.0 - 8.0	3-4-4-4	8	11				Olive brown grey, mottled, moist, loose, SILT, some fine sand grading to SILT, some clay, little to some fine sand; appears reworked. FILL	GTX#519156 WC=25% LL=31 PL=19 PI=12
	5D	24/24	8.0 - 10.0	WOH/12"-1-2	1	1				Olive brown grey, mottled, wet, SILT, some clay to Clayey SILT; appears reworked. FILL	
								2.5		9.5	
10	6D	24/24	10.0 - 12.0	WOH/24"	--		HW RC	2.0		Bottom 6 inches of sample (5D) very mottled with few pieces of gravel and minor roots. ORIGINAL GROUND	GTX#519157 WC=43% LL=40 PL=22 PI=18
										10.0 Olive grey, slightly mottled, Clayey SILT with occasional pockets silty fine sand. MARINE SILT-CLAY CRUST	
								-2.0		14.0	
	7D	24/24	14.0 - 16.0	push thru vane						Olive grey with occasional black streaks, soft to medium stiff, Silty CLAY with few partings fine sandy silt. MARINE SILT-CLAY	GTX#519158 WC=44% LL=44 PL=23 PI=21
15	V1		14.6 - 15.0	Su= 491/ 0 psf						V1: 11 / 0 ft-lbs (55 mm x 110 mm vane raw torque readings)	
	V2		15.6 - 16.0	Su= 536/ 67 psf						V2: 12 / 1.5 ft-lbs (55 mm x 110 mm vane raw torque readings)	
	8D	24/11	19.0 - 21.0	push thru vane						Olive grey with occasional black streaks, medium stiff, Silty CLAY. MARINE SILT-CLAY	
20	V3		19.6 - 20.0	Su= 580/ 89 psf						V3: 13 / 2 ft-lbs (55 mm x 110 mm vane raw torque readings)	
	V4		20.6 - 21.0	Su= 670/ 112 psf						V4: 15 / 2.5 ft-lbs (55 mm x 110 mm vane raw torque readings)	
25	9D	24/24	24.0 - 26.0	push thru vane						Olive grey, medium stiff, Silty CLAY. MARINE SILT-CLAY	GTX#519159 WC=42%

Remarks:

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Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: Bridge #5933
I-295 over Veranda Street
Location: Portland, ME

Boring No.: BB-PVS-303

WIN: 21745.00

Driller:	New England Boring Contractors	**Elevation (ft.)**	12.0	**Auger ID/OD:**	SSA (--/4.5")
Operator:	Enos/Maynard	**Datum:**	NAVD88	**Sampler:**	standard split-spoon
Logged By:	Schonewald	**Rig Type:**	Mobile Drill B-53 (NEBC ATV Rig 23)	**Hammer Wt./Fall:**	140 lbs / 30 inches
Date Start/Finish:	7/16/19; 1415- 7/17/19; 1430	**Drilling Method:**	cased wash boring	**Core Barrel:**	NQ2
Boring Location:	N 310873, E 1016831	**Casing ID/OD:**	HW (4/4.5") NW (3/3.5")	**Water Level*:**	8.4 ft (open)
Hammer Efficiency Factor:	.842	**Hammer Type:**	Automatic ☒ Hydraulic ☐ Rope & Cathead ☐		

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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 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	V5		24.6 - 25.0	Su= 714/ 45 psf						V5: 16 / 1 ft-lbs (55 mm x 110 mm vane raw torque readings)	LL=45
	V6		25.6 - 26.0	Su= 804/ 134 psf						V6: 18 / 3 ft-lbs (55 mm x 110 mm vane raw torque readings)	PL=22
											PI=23
	10D	24/24	29.0 - 31.0	push thru vane						Olive grey, medium stiff to stiff, Silty CLAY. MARINE SILT-CLAY	
30	V7		29.6 - 30.0	Su= 960/ 179 psf						V7: 21.5 / 4 ft-lbs (55 mm x 110 mm vane raw torque readings)	
	V8		30.6 - 31.0	Su=1,072/179 psf						V8: 24 / 4 ft-lbs (55 mm x 110 mm vane raw torque readings)	
	11D	24/24	34.0 - 36.0	push thru vane						Olive grey, stiff, Silty CLAY. MARINE SILT-CLAY	GTX#519160
35	V9		34.6 - 35.0	Su=1,072/201 psf						V9: 24 / 4.5 ft-lbs (55 mm x 110 mm vane raw torque readings)	WC=40%
	V10		35.6 - 36.0	Su=1,027/201 psf						V10: 23 / 4.5 ft-lbs (55 mm x 110 mm vane raw torque readings)	LL=49
											PL=22
											PI=27
	12D	24/24	39.0 - 41.0	push thru vane						Dark grey black, medium stiff, Silty CLAY. MARINE SILT-CLAY	
40	V11		39.6 - 40.0	Su= 826/ 179 psf						V11: 18.5 / 4 ft-lbs (55 mm x 110 mm vane raw torque readings)	
	V12		40.6 - 41.0	Su= 848/ 134 psf						V12: 19 / 3 ft-lbs (55 mm x 110 mm vane raw torque readings)	
	13D	24/24	44.0 - 46.0	push thru vane						Olive grey with occasional black streaks, stiff, Silty CLAY. MARINE SILT- CLAY	GTX#519161
45	V13		44.6 - 45.0	Su=1,250/201 psf						V13: 28 / 4.5 ft-lbs (55 mm x 110 mm vane raw torque readings)	WC=40%
	V14		45.6 - 46.0	Su=1,116/156 psf						V14: 25 / 3.5 ft-lbs (55 mm x 110 mm vane raw torque readings)	LL=43
											PL=22
											PI=21
50	14D	24/24	49.0 - 51.0	push thru vane						Olive grey with occasional black streaks, stiff, Silty CLAY. MARINE SILT- CLAY	

Remarks:

NEBC ATV Rig 23 automatic hammer calibrated on 7/8/2019.

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: Bridge #5933
I-295 over Veranda Street
Location: Portland, ME

Boring No.: BB-PVS-303

WIN: 21745.00

Driller:	New England Boring Contractors	**Elevation (ft.)**	12.0	**Auger ID/OD:**	SSA (--/4.5")
Operator:	Enos/Maynard	**Datum:**	NAVD88	**Sampler:**	standard split-spoon
Logged By:	Schonewald	**Rig Type:**	Mobile Drill B-53 (NEBC ATV Rig 23)	**Hammer Wt./Fall:**	140 lbs / 30 inches
Date Start/Finish:	7/16/19; 1415- 7/17/19; 1430	**Drilling Method:**	cased wash boring	**Core Barrel:**	NQ2
Boring Location:	N 310873, E 1016831	**Casing ID/OD:**	HW (4/4.5") NW (3/3.5")	**Water Level*:**	8.4 ft (open)
Hammer Efficiency Factor:	.842	**Hammer Type:**	Automatic ☒ Hydraulic ☐ Rope & Cathead ☐		

Definitions:
D = Split Spoon Sample
MD = Unsuccessful Split Spoon Sample Attempt
U = Thin Wall Tube Sample
MU = Unsuccessful Thin Wall Tube Sample Attempt
V = Field Vane Shear Test, PP = Pocket Penetrometer
MV = Unsuccessful Field Vane Shear Test Attempt
R = Rock Core Sample
SSA = Solid Stem Auger
HSA = Hollow Stem Auger
RC = Roller Cone
WOH = Weight of 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 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.
				Sample Information							
50	V15		49.6 - 50.0	Su=1,027/179 psf						V15: 23 / 4 ft-lbs (55 mm x 110 mm vane raw torque readings)	
	V16		50.6 - 51.0	Su=1,027/156 psf						V16: 23 / 3.5 ft-lbs (55 mm x 110 mm vane raw torque readings)	
	15D	24/24	54.0 - 56.0	(vane/12")-1-3	--					Dark grey black, stiff, Silty CLAY with occasional partings and one 1/2-inch seam silty fine sand. MARINE SILT-CLAY	GTX#519162 WC=30% LL=34 PL=18 PI=16
55	V17		54.6 - 55.0	Su=1,295/201 psf						V17: 29 / 4.5 ft-lbs (55 mm x 110 mm vane raw torque readings)	
	MV									MV: Unable to push vane deeper than 55.4 ft.	
	16D	24/17	59.0 - 61.0	(vane/12")-8-11	--					Dark grey black, Silty CLAY with multiple seams and layers fine sandy silt. MARINE SILT-CLAY Changing at 60.2 ft to:	
60	V18		59.6 - 60.0	Su=1,563/246 psf				-48.2		V18: 35 / 5.5 ft-lbs; multiple sand seams noted. (55 mm x 110 mm vane raw torque readings)	
	MV									MV: Unable to push vane deeper than 60.0 ft.	
										60.2	
										16D: Grey, fine SAND, some silt. MARINE SANDS AND SILT	
	17D	24/14	64.0 - 66.0	3-12-12-15	24	34				Grey, medium dense, Silty fine to medium SAND. MARINE SANDS AND SILT	GTX#519172 MATL PASSING #200 -#200=22.9%
65											GTX#519345 WC=18.3%
								-55.0		67.0	
	18D	24/11	69.0 - 71.0	14-17-17-17	34	48				Brown with grey and rust layers, dense, fine to coarse SAND, little to some silt; silt content variable in layers. TILL	
70											
75	19D	24/12	74.0 - 76.0	19-12-11-12	23	32				Grey, medium dense, fine to medium SAND, little to some silt, little fine gravel, trace coarse sand. TILL	

Remarks:

NEBC ATV Rig 23 automatic hammer calibrated on 7/8/2019.

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Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: Bridge #5933
I-295 over Veranda Street
Location: Portland, ME

Boring No.: BB-PVS-303

WIN: 21745.00

Driller:	New England Boring Contractors	**Elevation (ft.)**	12.0	**Auger ID/OD:**	SSA (--/4.5")
Operator:	Enos/Maynard	**Datum:**	NAVD88	**Sampler:**	standard split-spoon
Logged By:	Schonewald	**Rig Type:**	Mobile Drill B-53 (NEBC ATV Rig 23)	**Hammer Wt./Fall:**	140 lbs / 30 inches
Date Start/Finish:	7/16/19; 1415- 7/17/19; 1430	**Drilling Method:**	cased wash boring	**Core Barrel:**	NQ2
Boring Location:	N 310873, E 1016831	**Casing ID/OD:**	HW (4/4.5") NW (3/3.5")	**Water Level*:**	8.4 ft (open)
Hammer Efficiency Factor:	.842	**Hammer Type:**	Automatic ☒ Hydraulic ☐ Rope & Cathead ☐		

Definitions:
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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 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.
75											
	20D	24/2	79.0 - 81.0	20-22-22-17	44	62				(limited sample) Grey, dense, fine to coarse SAND, some silt, some gravel. TILL	
80											
	21D	15/2	84.0 - 85.3	24-28-70/3"	--					Grey, Silty GRAVEL, some fine to coarse sand; crushed rock in tip of spoon.	
85								-73.3		85.3	
										Top of Bedrock at Elev. -73.3 ft. 85.3 ft: Grinding on hard layer. Slowly advance roller cone to refusal at 87.0 ft. Set NW casing for rock coring.	
	R1	58/58	87.0 - 91.8	RQD: 47" = 81%			NQ2			R1: Bedrock: Grey, aphanitic to fine grained, PHYLLITE with moderately dipping remnant bedding and calcsilicate veins; hard, typically fresh. Moderately dipping, moderately spaced breaks; undulating, rough, typically fresh, and open with occasional infilling; somewhat shiny. (ELIOT FORMATION) Core times: 3:30/ 4:15/ 3:50/ 4:05/ - min:sec/ft. ROCK QUALITY = GOOD	
90											
								-79.8		91.8	
										Bottom of Exploration at 91.8 feet below ground surface.	
95											
100											

Remarks:

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Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: Bridge #5933
I-295 over Veranda Street
Location: Portland, ME

Boring No.: BB-PVS-304

WIN: 21745.00

Driller:	New England Boring Contractors	**Elevation (ft.)**	14.4	**Auger ID/OD:**	SSA (--/4.5")
Operator:	Enos/Maynard	**Datum:**	NAVD88	**Sampler:**	standard split-spoon
Logged By:	Schonewald	**Rig Type:**	Mobile Drill B-53 (NEBC ATV Rig 23)	**Hammer Wt./Fall:**	140 lbs / 30 inches
Date Start/Finish:	7/11/19; 1015- 7/16/19; 1405	**Drilling Method:**	cased wash boring	**Core Barrel:**	NQ2
Boring Location:	N 310852, E 1016768	**Casing ID/OD:**	HW (4/4.5") NW (3/3.5")	**Water Level*:**	5.5 ft (open)
Hammer Efficiency Factor: 0.842		**Hammer Type:**	Automatic ☒ Hydraulic ☐ Rope & Cathead ☐		

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

Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N_{60}	Casing Blows	Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.
0							SSA				
	1D	24/18	2.0 - 4.0	80-43-17-14	60	84				Brown, damp, Silty Urban Fill including brick and concrete. MISCELLANEOUS FILL	
	2D	7/3	4.0 - 4.6	71-50/1"	-					Brown, damp, Silty fine to coarse SAND, some gravel (concrete). MISCELLANEOUS FILL	
5	3D	24/10	5.0 - 7.0	4-8-64-7	72	101	--			White/red/brown, wet, Silty Urban Fill including brick and concrete. MISCELLANEOUS FILL	
							--	7.4		7.0	
	4D	24/20	7.0 - 9.0	1/24"	-		HW PUSH			Olive grey, Clayey SILT, with multiple layers silty fine sand. MARINE SILT-CLAY CRUST	
	5D	24/24	9.0 - 11.0	WOH/18"-1	-					Olive grey, Clayey SILT, with multiple layers silty fine sand. MARINE SILT-CLAY CRUST	GTX#519163 WC=33% LL=28 PL=18 PI=10
10								1.9		12.5	
	6D	24/24	14.0 - 16.0	push thru vane			HW			Olive grey, soft to medium stiff, Silty CLAY. MARINE SILT-CLAY	
	V1		14.6 - 15.0	Su= 491/ 22 psf			RC			V1: 11 / 0.5 ft-lbs (55 mm x 110 mm vane raw torque readings)	
15	V2		15.6 - 16.0	Su= 536/ 45 psf						V2: 12 / 1 ft-lbs (55 mm x 110 mm vane raw torque readings)	
	7D	24/20	19.0 - 21.0	push thru vane						Dark olive grey with occasional black streaks, medium stiff, Silty CLAY. MARINE SILT-CLAY	GTX#519164 WC=45% LL=49 PL=23 PI=26
	V3		19.6 - 20.0	Su= 625/ 45 psf						V3: 14 / 1 ft-lbs (55 mm x 110 mm vane raw torque readings)	
20	V4		20.6 - 21.0	Su= 692/ 45 psf						V4: 15.5 / 1 ft-lbs (55 mm x 110 mm vane raw torque readings)	
	8D	24/24	24.0 - 26.0	push thru vane						Dark olive grey with occasional black streaks, medium stiff, Silty CLAY. MARINE SILT-CLAY	
25											

Remarks:

NEBC ATV Rig 23 automatic hammer calibrated on 7/8/2019.

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Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: Bridge #5933
I-295 over Veranda Street
Location: Portland, ME

Boring No.: BB-PVS-304

WIN: 21745.00

Driller:	New England Boring Contractors	**Elevation (ft.)**	14.4	**Auger ID/OD:**	SSA (--/4.5")
Operator:	Enos/Maynard	**Datum:**	NAVD88	**Sampler:**	standard split-spoon
Logged By:	Schonewald	**Rig Type:**	Mobile Drill B-53 (NEBC ATV Rig 23)	**Hammer Wt./Fall:**	140 lbs / 30 inches
Date Start/Finish:	7/11/19; 1015- 7/16/19; 1405	**Drilling Method:**	cased wash boring	**Core Barrel:**	NQ2
Boring Location:	N 310852, E 1016768	**Casing ID/OD:**	HW (4/4.5") NW (3/3.5")	**Water Level*:**	5.5 ft (open)
Hammer Efficiency Factor: 0.842		**Hammer Type:**	Automatic ☒ Hydraulic ☐ Rope & Cathead ☐		

Definitions:
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MD = Unsuccessful Split Spoon Sample Attempt
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MU = Unsuccessful Thin Wall Tube Sample Attempt
V = Field Vane Shear Test, PP = Pocket Penetrometer
MV = Unsuccessful Field Vane Shear Test Attempt
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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: 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	V5		24.6 - 25.0	Su= 536/ 67 psf						V5: 12 / 1.5 ft-lbs (55 mm x 110 mm vane raw torque readings)	
	V6		25.6 - 26.0	Su= 670/ 45 psf						V6: 15 / 1 ft-lbs (55 mm x 110 mm vane raw torque readings)	
	9D	24/24	29.0 - 31.0	push thru vane						Dark olive grey with occasional black streaks, medium stiff, Silty CLAY. MARINE SILT-CLAY	GTX#519165 WC=41% LL=46 PL=22 PI=24
30	V7		29.6 - 30.0	Su= 781/ 67 psf						V7: 17.5 / 1.5 ft-lbs (55 mm x 110 mm vane raw torque readings)	
	V8		30.6 - 31.0	Su= 781/ 67 psf						V8: 17.5 / 1.5 ft-lbs (55 mm x 110 mm vane raw torque readings)	
	10D	24/24	34.0 - 36.0	push thru vane						Dark olive grey with occasional black streaks, medium stiff, Silty CLAY. MARINE SILT-CLAY	
35	V9		34.6 - 35.0	Su= 871/ 89 psf						V9: 19.5 / 2 ft-lbs (55 mm x 110 mm vane raw torque readings)	
	V10		35.6 - 36.0	Su= 915/ 89 psf						V10: 20.5 / 2 ft-lbs (55 mm x 110 mm vane raw torque readings)	
	11D	24/24	39.0 - 41.0	push thru vane						Dark olive grey with occasional black streaks, medium stiff, Silty CLAY. MARINE SILT-CLAY	GTX#519166 WC=40% LL=43 PL=21 PI=22
40	V11		39.6 - 40.0	Su= 804/ 134 psf						V11: 18 / 3 ft-lbs (55 mm x 110 mm vane raw torque readings)	
	V12		40.6 - 41.0	Su= 893/ 112 psf						V12: 20 / 2.5 ft-lbs (55 mm x 110 mm vane raw torque readings)	
	12D	24/24	44.0 - 46.0	push thru vane						Dark grey black, medium stiff, Silty CLAY. MARINE SILT-CLAY	
45	V13		44.6 - 45.0	Su= 714/ 45 psf						V13: 16 / 1 ft-lbs (55 mm x 110 mm vane raw torque readings)	
	V14		45.6 - 46.0	Su= 692/ 22 psf						V14: 15.5 / 0.5 ft-lbs (55 mm x 110 mm vane raw torque readings)	
50	13D	24/24	49.0 - 51.0	push thru vane						Dark olive grey with occasional black streaks, medium stiff, Silty CLAY. MARINE SILT-CLAY	GTX#519167 WC=37%

Remarks:

NEBC ATV Rig 23 automatic hammer calibrated on 7/8/2019.

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Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: Bridge #5933
I-295 over Veranda Street
Location: Portland, ME

Boring No.: BB-PVS-304

WIN: 21745.00

Driller:	New England Boring Contractors	**Elevation (ft.)**	14.4	**Auger ID/OD:**	SSA (--/4.5")
Operator:	Enos/Maynard	**Datum:**	NAVD88	**Sampler:**	standard split-spoon
Logged By:	Schonewald	**Rig Type:**	Mobile Drill B-53 (NEBC ATV Rig 23)	**Hammer Wt./Fall:**	140 lbs / 30 inches
Date Start/Finish:	7/11/19; 1015- 7/16/19; 1405	**Drilling Method:**	cased wash boring	**Core Barrel:**	NQ2
Boring Location:	N 310852, E 1016768	**Casing ID/OD:**	HW (4/4.5") NW (3/3.5")	**Water Level*:**	5.5 ft (open)
Hammer Efficiency Factor: 0.842		**Hammer Type:**	Automatic ☒ Hydraulic ☐ Rope & Cathead ☐		

Definitions:
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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
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C = Consolidation Test

Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N_{60}	Casing Blows	Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.
				Sample Information							
50	V15		49.6 - 50.0	Su= 982/ 45 psf						V15: 22 / 1 ft-lbs (55 mm x 110 mm vane raw torque readings)	LL=43
	V16		50.6 - 51.0	Su= 960/ 45 psf						V16: 21.5 / 1 ft-lbs (55 mm x 110 mm vane raw torque readings)	PL=21
											PI=22
	MD	24/0	54.0 - 56.0	push thru vane						Possibly pushed a concretion.	
55	V17		54.6 - 55.0	Su= 781/ 67 psf						V17: 17.5 / 1.5 ft-lbs; concretion noted (55 mm x 110 mm vane raw torque readings)	
	V18		55.6 - 56.0	Su= 938/ 89 psf						V18: 21 / 2 ft-lbs (55 mm x 110 mm vane raw torque readings)	
	14D	24/23	59.0 - 61.0	push thru vane						Dark grey black, stiff, Silty CLAY with nodules throughout and occasional concretions. MARINE SILT-CLAY	GTX#519168
60	V19		59.6 - 60.0	Su=1,139/112 psf						V19: 25.5 / 2.5 ft-lbs (55 mm x 110 mm vane raw torque readings)	WC=38%
	V20		60.6 - 61.0	Su=1,161/ 89 psf						V20: 26 / 2 ft-lbs (55 mm x 110 mm vane raw torque readings)	LL=35
											PL=19
											PI=16
	15D	24/20	64.0 - 66.0	(vane/12")-9-10	--					Dark grey black, stiff, Silty CLAY with nodules and concretions. MARINE SILT-CLAY Changing at 65.3 ft to:	
65	V21		64.6 - 65.0	Su=1,585/313 psf						V18: 35.5 / 7 ft-lbs (55 mm x 110 mm vane raw torque readings)	
	MV							-50.9		Unable to push vane deeper than 65.0 ft.	
										65.3	
										15D: Grey, fine SAND, trace to little silt. MARINE SANDS AND SILT	
	16D	24/14	69.0 - 71.0	8-11-16-13	27	38				Dark grey, medium dense, tight, fine to medium SAND, trace to little silt. MARINE SANDS AND SILT	
70											
	17D	24/13	74.0 - 76.0	7-13-21-14	34	48				Dark grey, dense, tight, fine to medium SAND, trace to little silt. MARINE SANDS AND SILT	
75											

Remarks:

NEBC ATV Rig 23 automatic hammer calibrated on 7/8/2019.

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: Bridge #5933
I-295 over Veranda Street
Location: Portland, ME

Boring No.: BB-PVS-304

WIN: 21745.00

Driller:	New England Boring Contractors	**Elevation (ft.)**	14.4	**Auger ID/OD:**	SSA (--/4.5")
Operator:	Enos/Maynard	**Datum:**	NAVD88	**Sampler:**	standard split-spoon
Logged By:	Schonewald	**Rig Type:**	Mobile Drill B-53 (NEBC ATV Rig 23)	**Hammer Wt./Fall:**	140 lbs / 30 inches
Date Start/Finish:	7/11/19; 1015- 7/16/19; 1405	**Drilling Method:**	cased wash boring	**Core Barrel:**	NQ2
Boring Location:	N 310852, E 1016768	**Casing ID/OD:**	HW (4/4.5") NW (3/3.5")	**Water Level*:**	5.5 ft (open)
Hammer Efficiency Factor: 0.842		**Hammer Type:**	Automatic ☒ Hydraulic ☐ Rope & Cathead ☐		

Definitions:
D = Split Spoon Sample
MD = Unsuccessful Split Spoon Sample Attempt
U = Thin Wall Tube Sample
MU = Unsuccessful Thin Wall Tube Sample Attempt
V = Field Vane Shear Test, PP = Pocket Penetrometer
MV = Unsuccessful Field Vane Shear Test Attempt
R = Rock Core Sample
SSA = Solid Stem Auger
HSA = Hollow Stem Auger
RC = Roller Cone
WOH = Weight of 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: 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.
75											
	18D	24/9	79.0 - 81.0	15-15-14-19	29	41				Dark grey, medium dense, tight, fine to medium SAND, trace to little silt. MARINE SANDS AND SILT	
80										Changing at 80.5 ft to:	
								-66.1		80.5	
										18D: Brown, fine to coarse SAND, some fine gravel, little silt. MARINE SAND	
	19D	24/14	84.0 - 86.0	17-61-41-26	102	143				Brown, fine to coarse SAND, some fine gravel, little silt. MARINE SAND	
85								-70.6		Changing at 85 ft to:	
										85.0	
										19D: Brown tan, Gravelly fine to coarse SAND, some silt. TILL	
	20D	24/10	89.0 - 91.0	16-13-23-16	36	51				Grey, dense, fine to coarse SAND, some gravel, some silt. TILL	
90											
										92.9 ft: Roller cone refusal; flush borehole; set NW casing.	
							NW RC			94.0 ft: NW refusal; wash out; attempt core run.	
95										95.5 ft: Pop through boulder; continue test boring.	
	21D	24/15	99.0 - 101.0	23-27-24-22	51	72				Grey, very dense, fine to coarse SAND, some fine gravel, some silt. TILL	
100											

Remarks:

NEBC ATV Rig 23 automatic hammer calibrated on 7/8/2019.

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Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: Bridge #5933
I-295 over Veranda Street
Location: Portland, ME

Boring No.: BB-PVS-304

WIN: 21745.00

Driller:	New England Boring Contractors	**Elevation (ft.)**	14.4	**Auger ID/OD:**	SSA (--/4.5")
Operator:	Enos/Maynard	**Datum:**	NAVD88	**Sampler:**	standard split-spoon
Logged By:	Schonewald	**Rig Type:**	Mobile Drill B-53 (NEBC ATV Rig 23)	**Hammer Wt./Fall:**	140 lbs / 30 inches
Date Start/Finish:	7/11/19; 1015- 7/16/19; 1405	**Drilling Method:**	cased wash boring	**Core Barrel:**	NQ2
Boring Location:	N 310852, E 1016768	**Casing ID/OD:**	HW (4/4.5") NW (3/3.5")	**Water Level*:**	5.5 ft (open)
Hammer Efficiency Factor: 0.842		**Hammer Type:**	Automatic ☒ Hydraulic ☐ Rope & Cathead ☐		

Definitions:
D = Split Spoon Sample
MD = Unsuccessful Split Spoon Sample Attempt
U = Thin Wall Tube Sample
MU = Unsuccessful Thin Wall Tube Sample Attempt
V = Field Vane Shear Test, PP = Pocket Penetrometer
MV = Unsuccessful Field Vane Shear Test Attempt
R = Rock Core Sample
SSA = Solid Stem Auger
HSA = Hollow Stem Auger
RC = Roller Cone
WOH = Weight of 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 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.
100											
	22D	24/22	104.0 - 106.0	62-34-44-54	78	109				Grey, very dense, fine to coarse SAND, some fine gravel, some silt. TILL	
105											
110											
	23D	24/16	114.0 - 116.0	69-92-86-106	178	250				Grey, very dense, tight, Silty fine to medium SAND, trace to little fine gravel, trace coarse sand with one 4-inch layer fine to coarse sandy gravel, some silt. TILL	
115											
120								-105.8		119.8 ft: Weathered rock based on drilling behavior and wash water. 120.2 Top of Bedrock at Elev. -105.8 ft. 120.2 ft: Grinding on hard layer. Slowly advance roller cone to refusal at 123.2 ft.	
	R1	60/60	123.2 - 128.2	RQD: 39" = 65%			NQ2			R1: Bedrock: Grey, aphanitic to fine grained, PHYLLITE with moderately dipping remnant bedding, calcsilicate veins, and healed cracks (cross bedding); hard, typically fresh. Moderately dipping, close to moderately spaced breaks; undulating, rough, typically fresh,	
125											

Remarks:

NEBC ATV Rig 23 automatic hammer calibrated on 7/8/2019.

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Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: Bridge #5933
I-295 over Veranda Street
Location: Portland, ME

Boring No.: BB-PVS-304

WIN: 21745.00

Driller:	New England Boring Contractors	**Elevation (ft.)**	14.4	**Auger ID/OD:**	SSA (--/4.5")
Operator:	Enos/Maynard	**Datum:**	NAVD88	**Sampler:**	standard split-spoon
Logged By:	Schonewald	**Rig Type:**	Mobile Drill B-53 (NEBC ATV Rig 23)	**Hammer Wt./Fall:**	140 lbs / 30 inches
Date Start/Finish:	7/11/19; 1015- 7/16/19; 1405	**Drilling Method:**	cased wash boring	**Core Barrel:**	NQ2
Boring Location:	N 310852, E 1016768	**Casing ID/OD:**	HW (4/4.5") NW (3/3.5")	**Water Level*:**	5.5 ft (open)
Hammer Efficiency Factor: 0.842		**Hammer Type:**	Automatic ☒ Hydraulic ☐ Rope & Cathead ☐		

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

Depth (ft.)	Sample Information: Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N_{60}	Casing Blows	Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.
125										and open with occasional infilling (sand, mud); somewhat shiny. (ELIOT FORMATION) Core times: 7:45/ 5:05/ 5:10/ 5:20/ 5:15 min:sec/ft. ROCK QUALITY = FAIR	
								-113.8		128.2 **Bottom of Exploration at 128.2 feet below ground surface.**	
130											
135											
140											
145											
150											

Remarks:

NEBC ATV Rig 23 automatic hammer calibrated on 7/8/2019.

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SCHONEWALD
ENGINEERING
ASSOCIATES, INC.
■ www.SchonewaldEngineering.com ■

PHOTOGRAPHS OF ROCK CORE OBTAINED IN

300-SERIES BORINGS

Photo 1: Core box containing dried rock core from test borings BB-PVS-302, -303, and -304; left side of core box (top portion of cores). Slots from top to bottom:
1) BB-PVS-304, R1;
2) BB-PVS-303, R1;
3) BB-PVS-302, R1;
4) Empty.

Photo 2: Core box containing dried rock core from test borings BB-PVS-302, -303, and -304; right side of core box (bottom portion of cores). Slots from top to bottom:
1) BB-PVS-304, R1;
2) BB-PVS-303, R1;
3) BB-PVS-302, R1;
4) BB-PVS-302, R1 (bottom piece).

SCHONEWALD ENGINEERING ASSOCIATES, INC.

ROCK CORE PHOTOGRAPHS
BRIDGE #5933
I-295 OVER VERANDA STREET
PORTLAND, MAINE
MAINEDOT WIN 21745.00

Sheet No.:

1 of 1

RESULTS OF LABORATORY TESTS ON SOIL SAMPLES

300-SERIES BORINGS

TABULATION OF SOIL TESTING (GTX PROJECT NO. 308805) (listed in order of test report presentation)				
Boring No.	**Sample No.**	**Sample Depth (ft., BGS)**	**GTX TEST ID / NO.**	**Tests Completed**
BB-PVS-301	3D	4-6	519345	moisture content
BB-PVS-301	6D	10-12	519345	moisture content
BB-PVS-302	2D	2-4	519345	moisture content
BB-PVS-303	17D	64-66	519345	moisture content
BB-PVS-303	3D	4-6	519172	fines content (% passing #200 sieve)
BB-PVS-303	17D	64-66	519172	fines content (% passing #200 sieve)
BB-PVS-301	3D	4-6	519173	grain size (w/o hydrometer)
BB-PVS-301	6D	10-12	519174	grain size (w/o hydrometer)
BB-PVS-302	2D	2-4	519175	grain size (w/o hydrometer)
BB-PVS-302	7D	14-16	519153	Atterberg Limits
BB-PVS-302	9D	24-26	519154	Atterberg Limits
BB-PVS-302	11D	34-36	519155	Atterberg Limits
BB-PVS-303	3D	4-6	519156	Atterberg Limits
BB-PVS-303	6D	10-12	519157	Atterberg Limits
BB-PVS-303	7D	14-16	519158	Atterberg Limits
BB-PVS-303	9D	24-26	519159	Atterberg Limits
BB-PVS-303	11D	34-36	519160	Atterberg Limits
BB-PVS-303	13D	44-46	519161	Atterberg Limits
BB-PVS-303	15D	54-56	519162	Atterberg Limits
BB-PVS-304	5D	9-11	519163	Atterberg Limits
BB-PVS-304	7D	19-21	519164	Atterberg Limits
BB-PVS-304	9D	29-31	519165	Atterberg Limits
BB-PVS-304	11D	39-41	519166	Atterberg Limits
BB-PVS-304	13D	49-51	519167	Atterberg Limits
BB-PVS-304	14D	59-61	519168	Atterberg Limits
BB-PVS-301	1U	19-21	519169	Atterberg Limits
BB-PVS-301	2U	26.5-28.5	519170	Atterberg Limits
BB-PVS-301	1U	19-21	IP-11	1D consolidation
BB-PVS-301	2U	26.5-28.5	IP-12	1D consolidation

Transmittal

TO:

Isabel Schonewald

Schonewald Engineering Associates, Inc.

129 Middle Road

Cumberland, ME 04021

DATE: 9/17/2019	GTX NO: 308805
RE: I-295 over Veranda St (MeDOT WIN21745.00)	

COPIES	DATE	DESCRIPTION
	9/17/2019	**September 2019 Laboratory Test Report**

REMARKS:

SIGNED:

Jonathan Campbell, Laboratory Manager

CC:

APPROVED BY:

Joe Tomei, Director of Testing Services

September 17, 2019

Isabel Schonewald
Schonewald Engineering Associates, Inc.
129 Middle Road,
Cumberland, ME 04021

RE: I-295 over Veranda St (MeDOT WIN21745.00), Portland, ME (GTX-308805)

Dear Isabel:

Enclosed are the test results you requested for the above referenced project. GeoTesting Express, Inc. (GTX) received 22 samples from you on 8/19/2019. These samples were labeled as follows:

Boring Number	Sample Number	Depth
BB-PVS-301	1U	19-21 ft
BB-PVS-301	2U	26.5-28.5 ft
BB-PVS-301	3D	4-6 ft
BB-PVS-301	6D	10-12 ft
BB-PVS-302	2D	2-4 ft
BB-PVS-302	7D	14-16 ft
BB-PVS-302	9D	24-26 ft
BB-PVS-302	11D	34-36 ft
BB-PVS-303	3D	4-6 ft
BB-PVS-303	6D	10-12 ft
BB-PVS-303	7D	14-16 ft
BB-PVS-303	9D	24-26 ft
BB-PVS-303	11D	34-36 ft
BB-PVS-303	13D	44-46 ft
BB-PVS-303	15D	54-56 ft
BB-PVS-303	17D	64-66 ft
BB-PVS-304	5D	9-11 ft
BB-PVS-304	7D	19-21 ft
BB-PVS-304	9D	29-31 ft
BB-PVS-304	11D	39-41 ft
BB-PVS-304	13D	49-51 ft
BB-PVS-304	14D	59-61 ft

GTX performed the following tests on these samples:

3 AASHTO T 88 - Grain Size Analysis - Sieve Only
2 ASTM D1140 - Percent Finer Than #200 Sieve
4 ASTM D2216 - Moisture Content
2 ASTM D2435 - Incremental Consolidation
18 ASTM D4318 - Atterberg Limits

A copy of your test request is attached.

The results presented in this report apply only to the items tested. This report shall not be reproduced except in full, without written approval from GeoTesting Express. The remainder of these samples will be retained for a period of sixty (60) days and will then be discarded unless otherwise notified by you. Please call me if you have any questions or require additional information. Thank you for allowing GeoTesting Express the opportunity of providing you with testing services. We look forward to working with you again in the future.

Respectfully yours,

Jonathan Campbell
Laboratory Manager

Geotechnical Test Report **9/17/2019**

GTX-308805

I-295 over Veranda St (MeDOT WIN21745.00)

Portland, ME

Client Project No.: 18-007

Prepared for:

Schonewald Engineering Associates, Inc.

GeoTesting EXPRESS

Client:	Schonewald Engineering Associates, Inc.				
Project:	I-295 over Veranda St (MeDOT WIN21745.00)				
Location:	Portland, ME			Project No:	GTX-308805
Boring ID:	---	Sample Type:	---	Tested By:	GA
Sample ID:	---	Test Date:	08/30/19	Checked By:	bfs
Depth :	---	Test Id:	519345		

Moisture Content of Soil and Rock - ASTM D2216

Boring ID	Sample ID	Depth	Description	Moisture Content,%
BB-PVS-301	3D	4-6 ft	Moist, pale brown sand with silt	4.8
BB-PVS-301	6D	10-12 ft	Moist, pale brown sand with silt	18.5
BB-PVS-302	2D	2-4 ft	Moist, brown sand with silt	6.1
BB-PVS-303	17D	64-66 ft	Moist, gray silty sand	18.3

Notes: Temperature of Drying : 110º Celsius

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Client:	Schonewald Engineering Associates, Inc.				
Project:	I-295 over Veranda St (MeDOT WIN21745.00)				
Location:	Portland, ME			Project No:	GTX-308805
Boring ID:	---	Sample Type:	---	Tested By:	GA
Sample ID:	---	Test Date:	08/30/19	Checked By:	bfs
Depth :	---	Test Id:	519172		

Amount of Material Passing #200 Sieve - ASTM D1140

Boring ID	Sample ID	Depth	Visual Description	Fines, %
BB-PVS-303	3D	4-6 ft	Moist, olive gray clay	95.3
BB-PVS-303	17D	64-66 ft	Moist, gray silty sand	22.9

Notes: Tests performed using Method B - washing using a wetting agent
Dry mass of test specimen was determined directly

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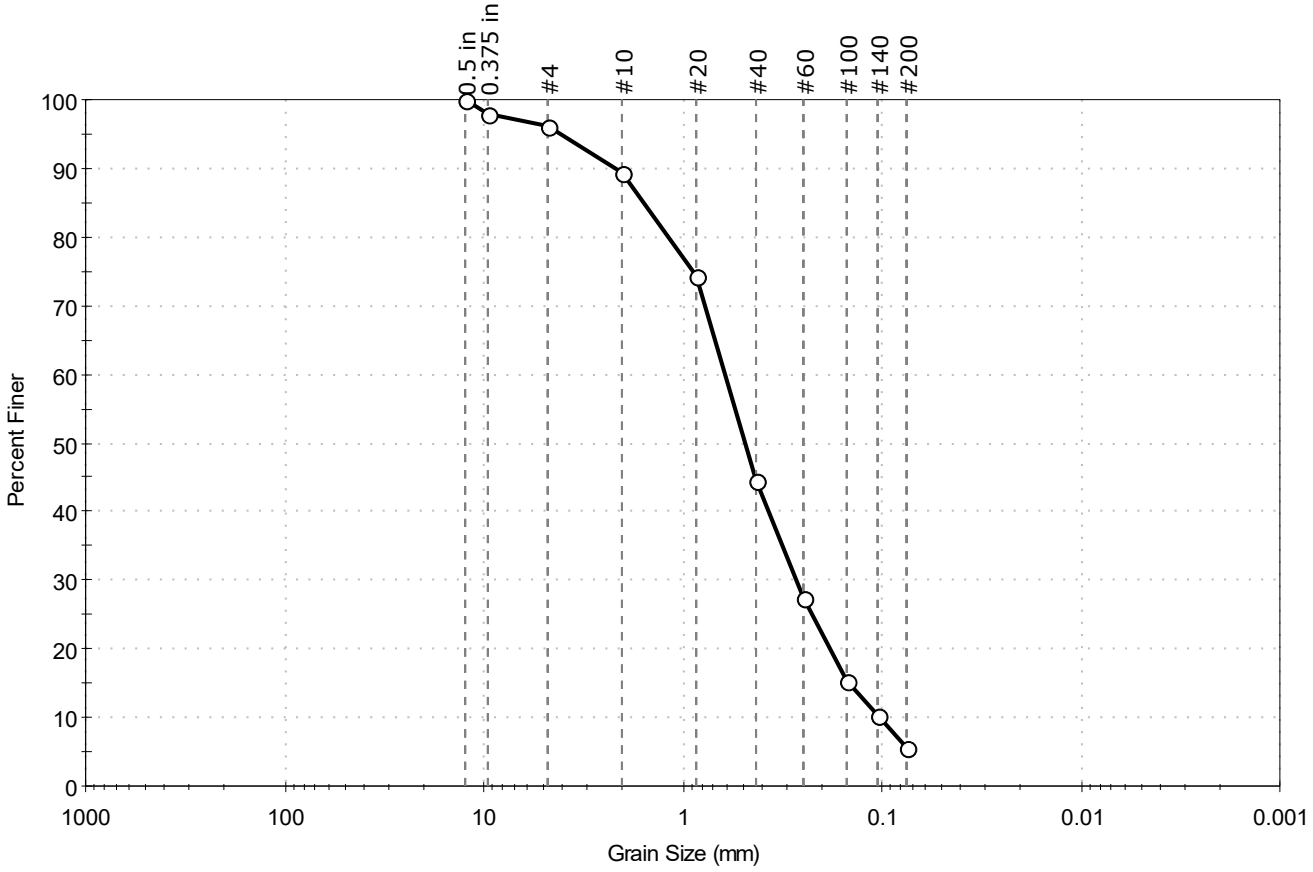
GeoTesting EXPRESS

Client:	Schonewald Engineering Associates, Inc.				
Project:	I-295 over Veranda St (MeDOT WIN21745.00)				
Location:	Portland, ME			Project No:	GTX-308805
Boring ID:	BB-PVS-301	Sample Type:	jar	Tested By:	GA
Sample ID:	3D	Test Date:	08/30/19	Checked By:	bfs
Depth :	4-6 ft	Test Id:	519173		
Test Comment:	---				
Visual Description:	Moist, pale brown sand with silt				
Sample Comment:	---				

Particle Size Analysis - AASHTO T 88



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	3.8	90.7	5.5

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
0.5 in	12.50	100		
0.375 in	9.50	98		
#4	4.75	96		
#10	2.00	89		
#20	0.85	74		
#40	0.42	45		
#60	0.25	27		
#100	0.15	15		
#140	0.11	10		
#200	0.075	5.5		

Coefficients

D_{85} = 1.5601 mm
D_{30} = 0.2714 mm
D_{60} = 0.6082 mm
D_{15} = 0.1452 mm
D_{50} = 0.4825 mm
D_{10} = 0.1028 mm
C_u = 5.916
C_c = 1.178

Classification

ASTM N/A

AASHTO Stone Fragments, Gravel and Sand (A-1-b (1))

Sample/Test Description

Sand/Gravel Particle Shape : ANGULAR

Sand/Gravel Hardness : HARD

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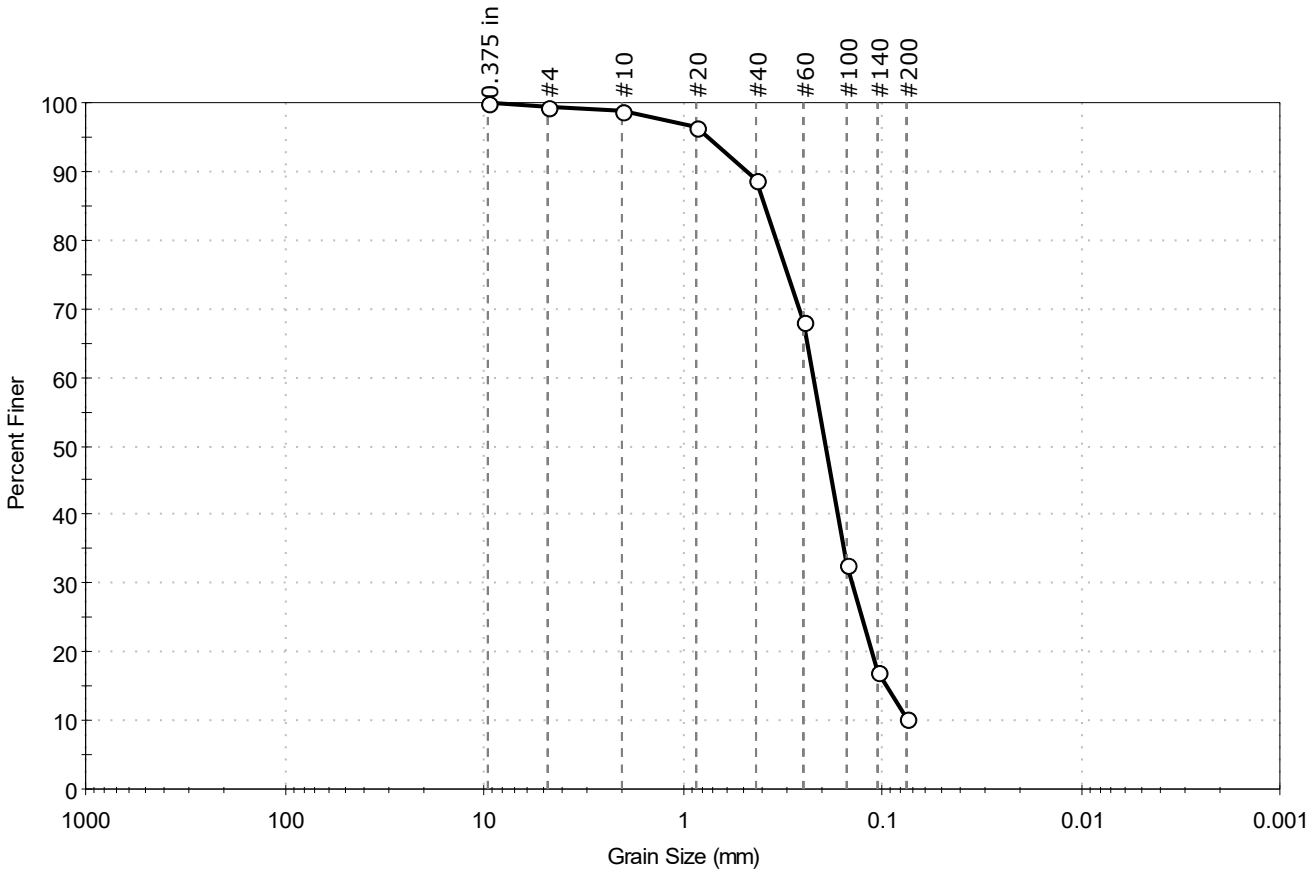
GeoTesting EXPRESS

Client:	Schonewald Engineering Associates, Inc.				
Project:	I-295 over Veranda St (MeDOT WIN21745.00)				
Location:	Portland, ME			Project No:	GTX-308805
Boring ID:	BB-PVS-301	Sample Type:	jar	Tested By:	GA
Sample ID:	6D	Test Date:	08/30/19	Checked By:	bfs
Depth :	10-12 ft	Test Id:	519174		
Test Comment:	---				
Visual Description:	Moist, pale brown sand with silt				
Sample Comment:	---				

Particle Size Analysis - AASHTO T 88



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	0.7	88.8	10.5

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
0.375 in	9.50	100		
#4	4.75	99		
#10	2.00	99		
#20	0.85	97		
#40	0.42	89		
#60	0.25	68		
#100	0.15	33		
#140	0.11	17		
#200	0.075	10		

Coefficients

D_{85} = 0.3860 mm D_{30} = 0.1413 mm
D_{60} = 0.2222 mm D_{15} = 0.0947 mm
D_{50} = 0.1925 mm D_{10} = N/A
C_u = N/A C_c = N/A

Classification

ASTM N/A

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

Sample/Test Description

Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness : ---

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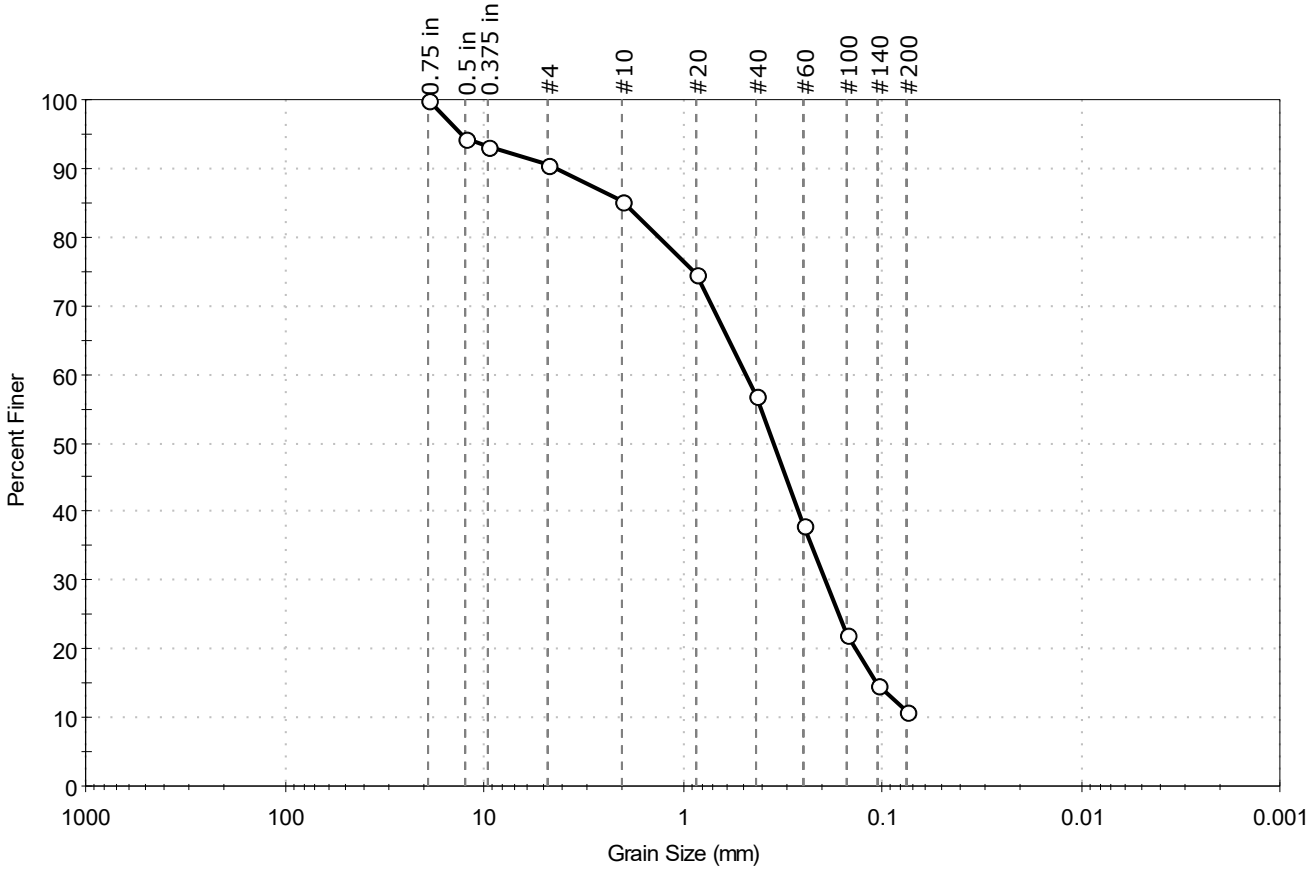
GeoTesting EXPRESS

Client:	Schonewald Engineering Associates, Inc.				
Project:	I-295 over Veranda St (MeDOT WIN21745.00)				
Location:	Portland, ME			Project No:	GTX-308805
Boring ID:	BB-PVS-302	Sample Type:	jar	Tested By:	GA
Sample ID:	2D	Test Date:	08/30/19	Checked By:	bfs
Depth :	2-4 ft	Test Id:	519175		
Test Comment:	---				
Visual Description:	Moist, brown sand with silt				
Sample Comment:	---				

Particle Size Analysis - AASHTO T 88



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	9.5	79.6	10.9

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
0.75 in	19.00	100		
0.5 in	12.50	94		
0.375 in	9.50	93		
#4	4.75	90		
#10	2.00	85		
#20	0.85	75		
#40	0.42	57		
#60	0.25	38		
#100	0.15	22		
#140	0.11	15		
#200	0.075	11		

Coefficients

D_{85} = 1.9814 mm D_{30} = 0.1929 mm
D_{60} = 0.4782 mm D_{15} = 0.1078 mm
D_{50} = 0.3491 mm D_{10} = N/A
C_u = N/A C_c = N/A

Classification

ASTM N/A

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

Sample/Test Description

Sand/Gravel Particle Shape : ANGULAR

Sand/Gravel Hardness : HARD

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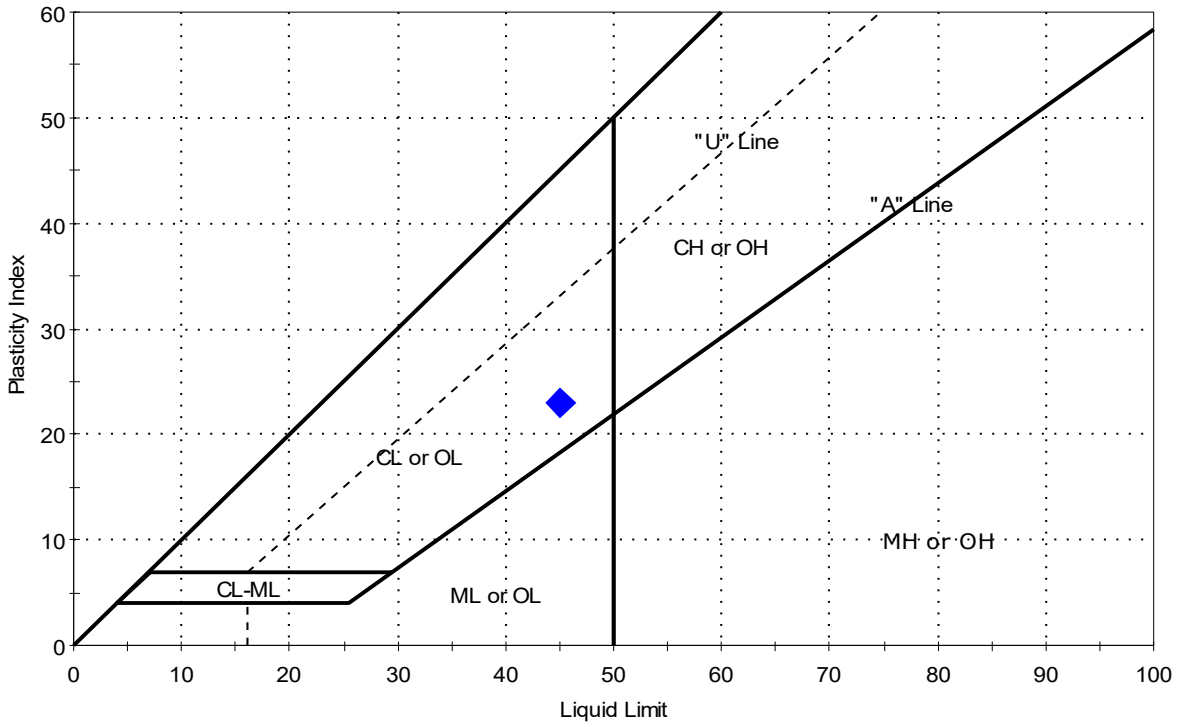
Client:	Schonewald Engineering Associates, Inc.				
Project:	I-295 over Veranda St (MeDOT WIN21745.00)				
Location:	Portland, ME			Project No:	GTX-308805
Boring ID:	BB-PVS-302	Sample Type:	jar	Tested By:	GA
Sample ID:	7D	Test Date:	09/04/19	Checked By:	bfs
Depth :	14-16 ft	Test Id:	519153		
Test Comment:	---				
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
◆	7D	B-PVS-30	14-16 ft	35	45	22	23	0.6	

Sample Prepared using the WET method

Dry Strength: VERY HIGH

Dilatancy: NONE

Toughness: MEDIUM

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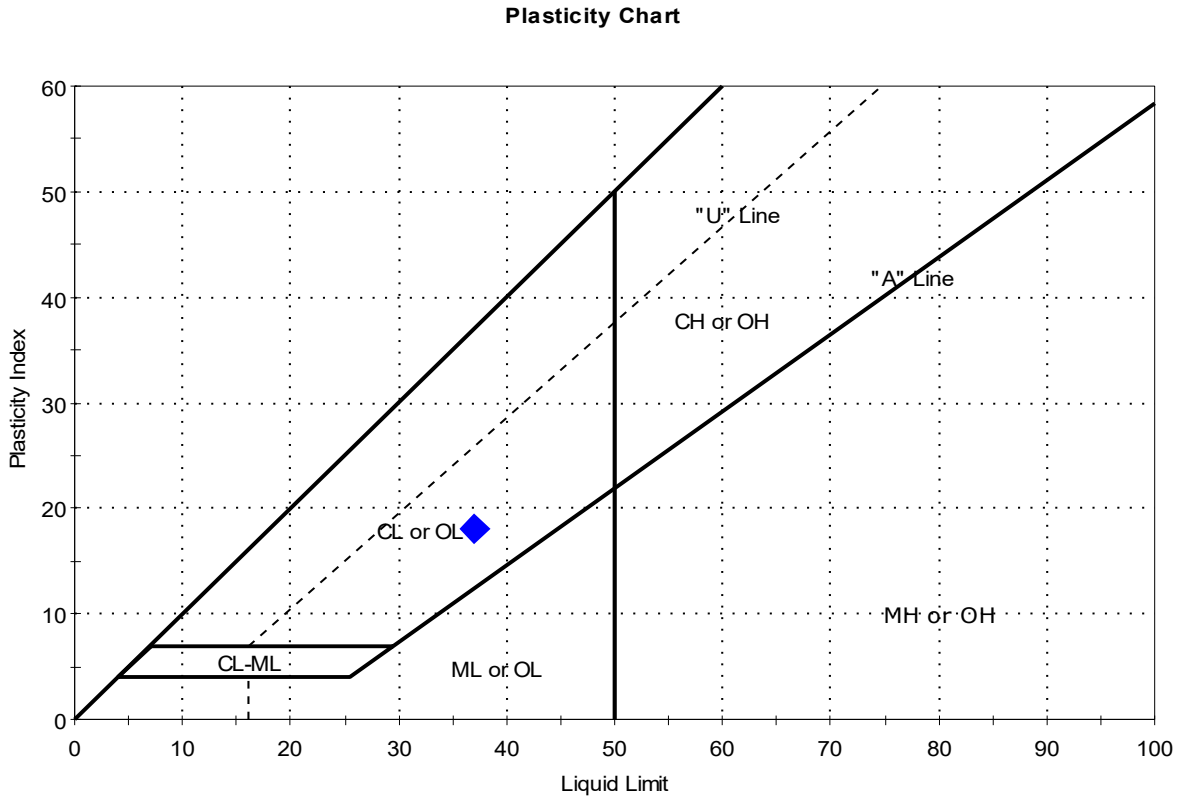
Client:	Schonewald Engineering Associates, Inc.				
Project:	I-295 over Veranda St (MeDOT WIN21745.00)				
Location:	Portland, ME			Project No:	GTX-308805
Boring ID:	BB-PVS-302	Sample Type:	jar	Tested By:	GA
Sample ID:	9D	Test Date:	09/04/19	Checked By:	bfs
Depth :	24-26 ft	Test Id:	519154		
Test Comment:	---				
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
◆	9D	B-PVS-30	24-26 ft	35	37	19	18	0.9	

Sample Prepared using the WET method

Dry Strength: HIGH

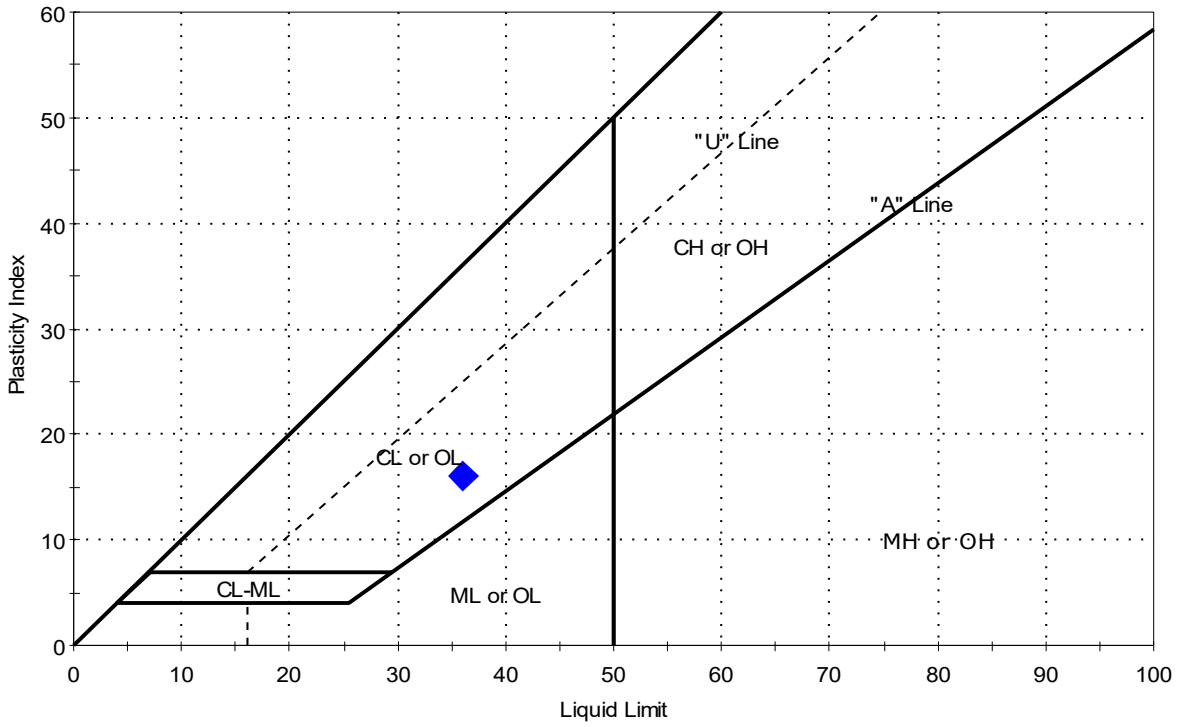
Dilatancy: NONE

Toughness: MEDIUM

printed 9/4/2019 3:23:08 PM

Client:	Schonewald Engineering Associates, Inc.				
Project:	I-295 over Veranda St (MeDOT WIN21745.00)				
Location:	Portland, ME			Project No:	GTX-308805
Boring ID:	BB-PVS-302	Sample Type:	jar	Tested By:	GA
Sample ID:	11D	Test Date:	09/04/19	Checked By:	bfs
Depth :	34-36 ft	Test Id:	519155		
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
◆	11D	B-PVS-30	34-36 ft	30	36	20	16	0.6	

Sample Prepared using the WET method

Dry Strength: VERY HIGH

Dilatancy: NONE

Toughness: MEDIUM

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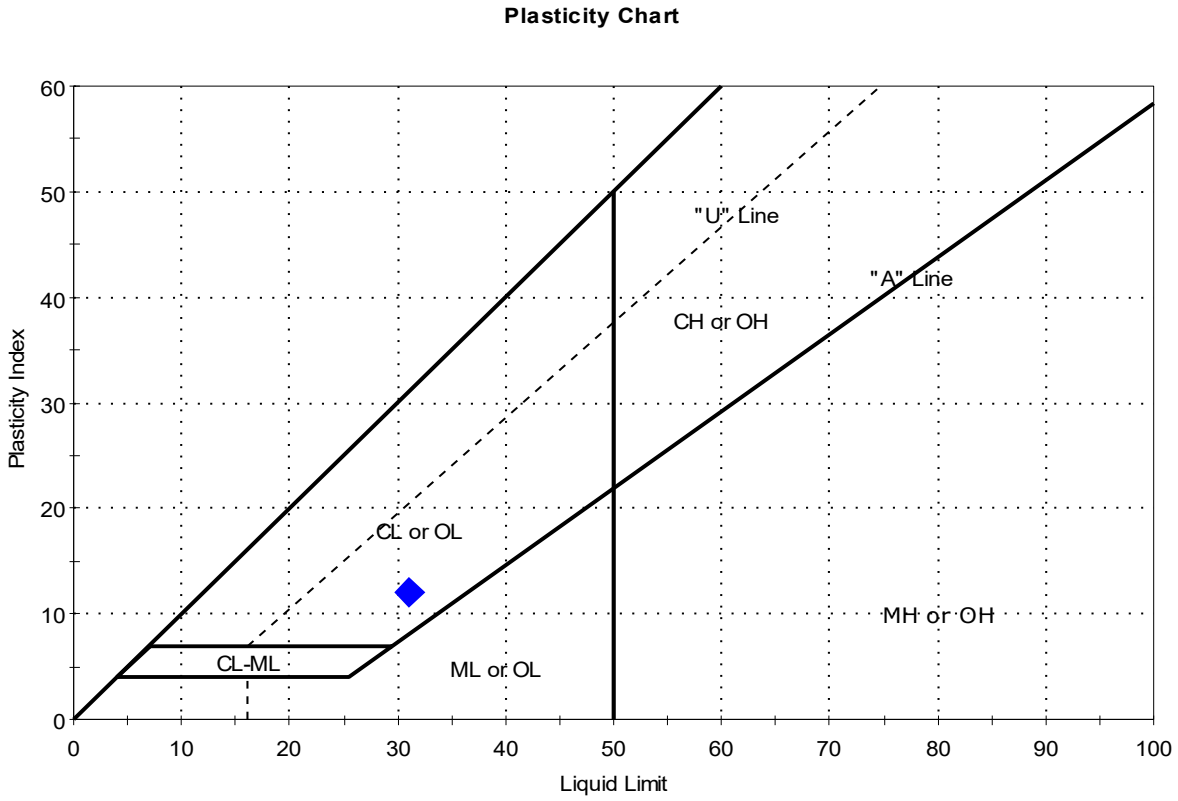
Client:	Schonewald Engineering Associates, Inc.				
Project:	I-295 over Veranda St (MeDOT WIN21745.00)				
Location:	Portland, ME			Project No:	GTX-308805
Boring ID:	BB-PVS-303	Sample Type:	jar	Tested By:	GA
Sample ID:	3D	Test Date:	08/30/19	Checked By:	bfs
Depth :	4-6 ft	Test Id:	519156		
Test Comment:	---				
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
◆	3D	B-PVS-30	4-6 ft	25	31	19	12	0.5	

Sample Prepared using the WET method

Dry Strength: HIGH

Dilatancy: NONE

Toughness: MEDIUM

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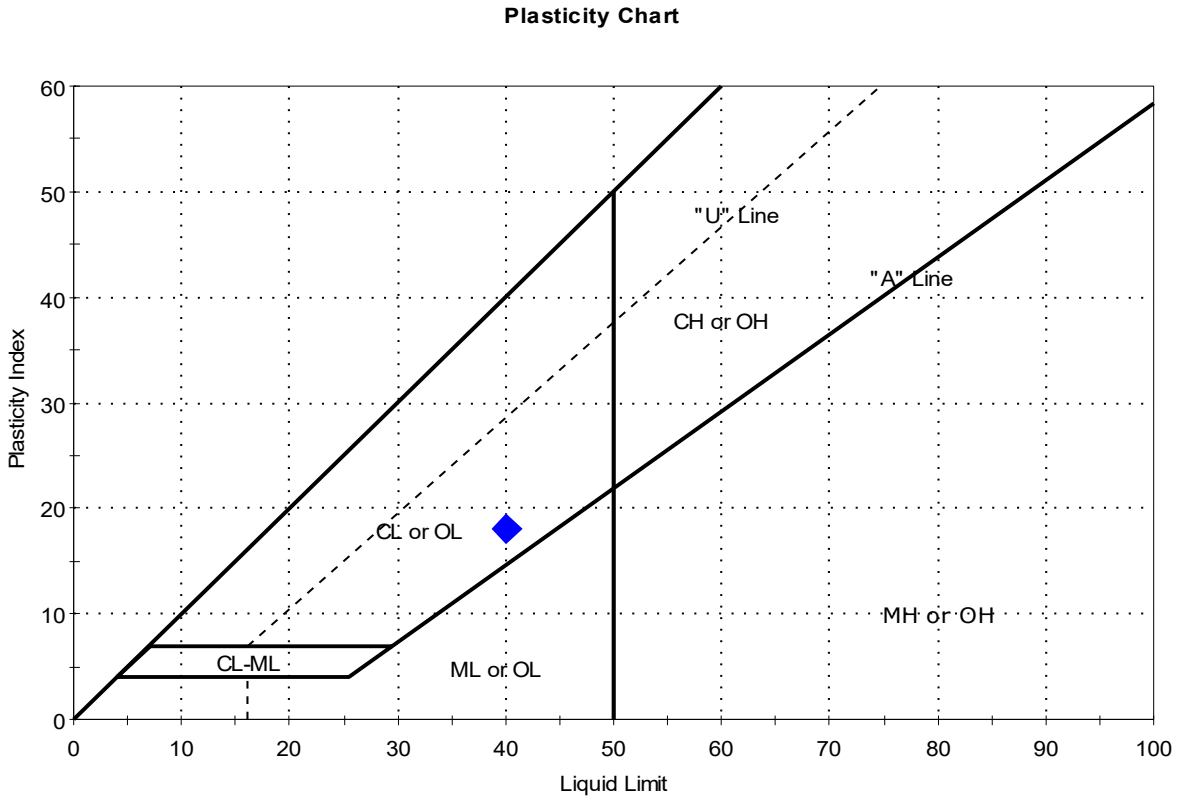
GeoTesting EXPRESS

Client:	Schonewald Engineering Associates, Inc.				
Project:	I-295 over Veranda St (MeDOT WIN21745.00)				
Location:	Portland, ME			Project No:	GTX-308805
Boring ID:	BB-PVS-303	Sample Type:	jar	Tested By:	GA
Sample ID:	6D	Test Date:	09/04/19	Checked By:	bfs
Depth :	10-12 ft	Test Id:	519157		
Test Comment:	---				
Visual Description:	Moist, olive gray clay				
Sample Comment:	---				

Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
◆	6D	B-PVS-30	10-12 ft	43	40	22	18	1.2	

Sample Prepared using the WET method

Dry Strength: HIGH

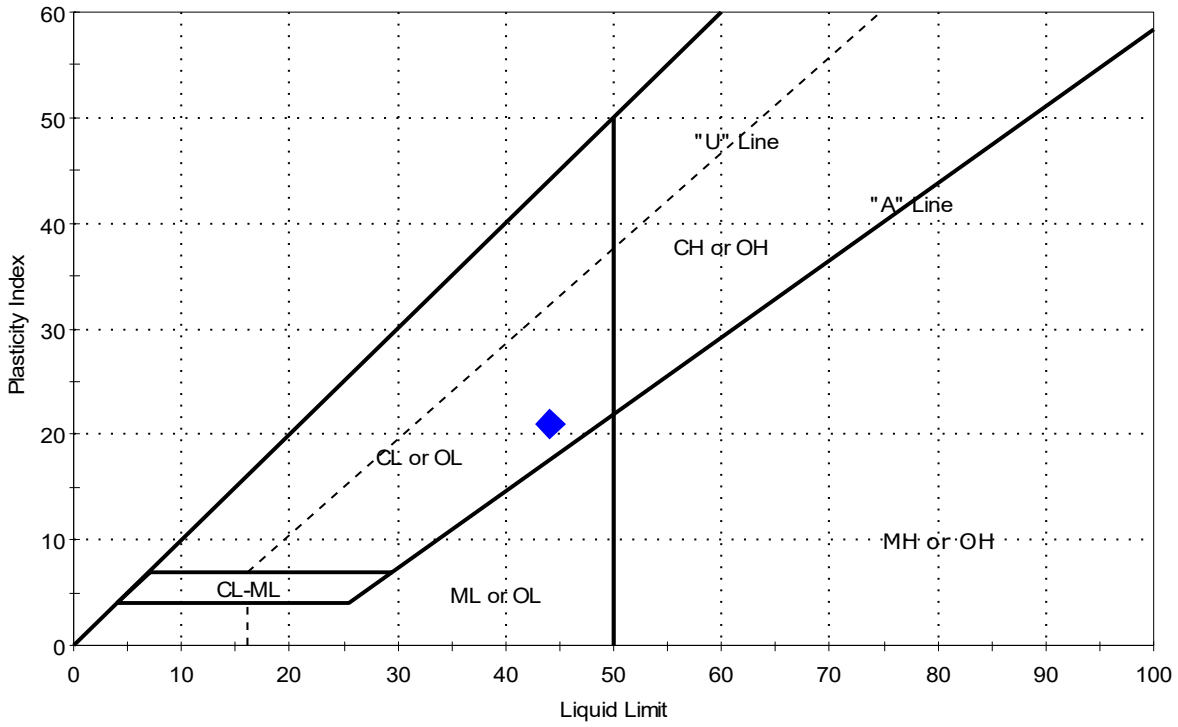
Dilatancy: NONE

Toughness: MEDIUM

GeoTesting EXPRESS

Client:	Schonewald Engineering Associates, Inc.				
Project:	I-295 over Veranda St (MeDOT WIN21745.00)				
Location:	Portland, ME			Project No:	GTX-308805
Boring ID:	BB-PVS-303	Sample Type:	jar	Tested By:	GA
Sample ID:	7D	Test Date:	09/04/19	Checked By:	bfs
Depth :	14-16 ft	Test Id:	519158		
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
◆	7D	B-PVS-30	14-16 ft	44	44	23	21	1	

Sample Prepared using the WET method

Dry Strength: HIGH

Dilatancy: NONE

Toughness: MEDIUM

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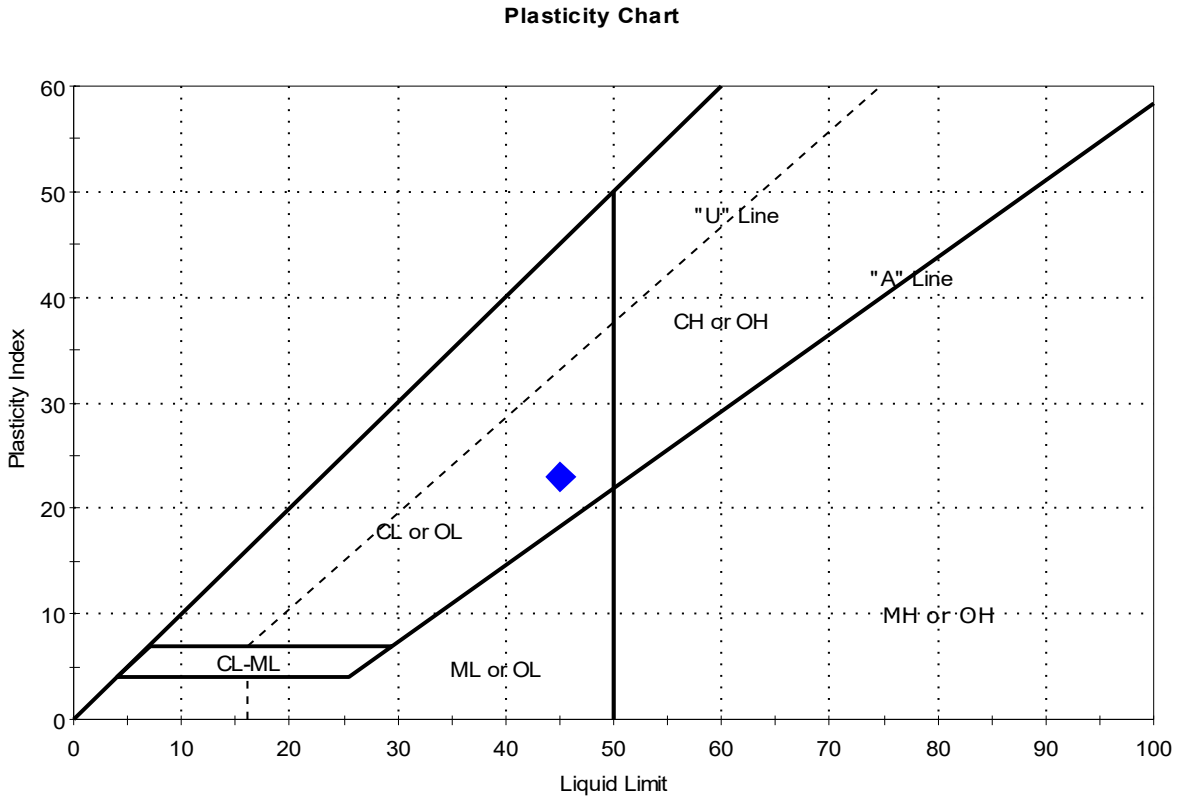
GeoTesting EXPRESS

Client:	Schonewald Engineering Associates, Inc.				
Project:	I-295 over Veranda St (MeDOT WIN21745.00)				
Location:	Portland, ME			Project No:	GTX-308805
Boring ID:	BB-PVS-303	Sample Type:	jar	Tested By:	GA
Sample ID:	9D	Test Date:	08/30/19	Checked By:	bfs
Depth :	24-26 ft	Test Id:	519159		
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
◆	9D	B-PVS-30	24-26 ft	42	45	22	23	0.9	

Sample Prepared using the WET method

Dry Strength: HIGH

Dilatancy: NONE

Toughness: MEDIUM

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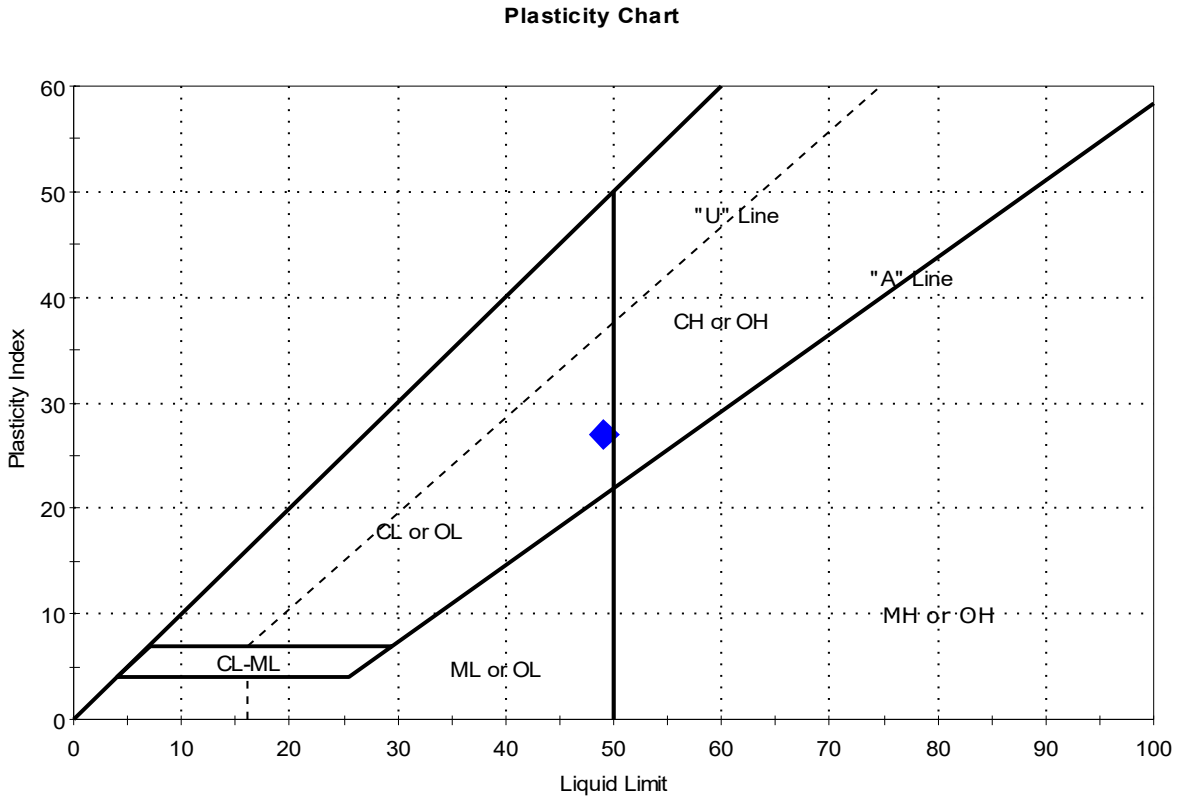
GeoTesting EXPRESS

Client:	Schonewald Engineering Associates, Inc.				
Project:	I-295 over Veranda St (MeDOT WIN21745.00)				
Location:	Portland, ME			Project No:	GTX-308805
Boring ID:	BB-PVS-303	Sample Type:	jar	Tested By:	GA
Sample ID:	11D	Test Date:	08/30/19	Checked By:	bfs
Depth :	34-36 ft	Test Id:	519160		
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
◆	11D	B-PVS-30	34-36 ft	40	49	22	27	0.7	

Sample Prepared using the WET method

Dry Strength: HIGH

Dilatancy: NONE

Toughness: MEDIUM

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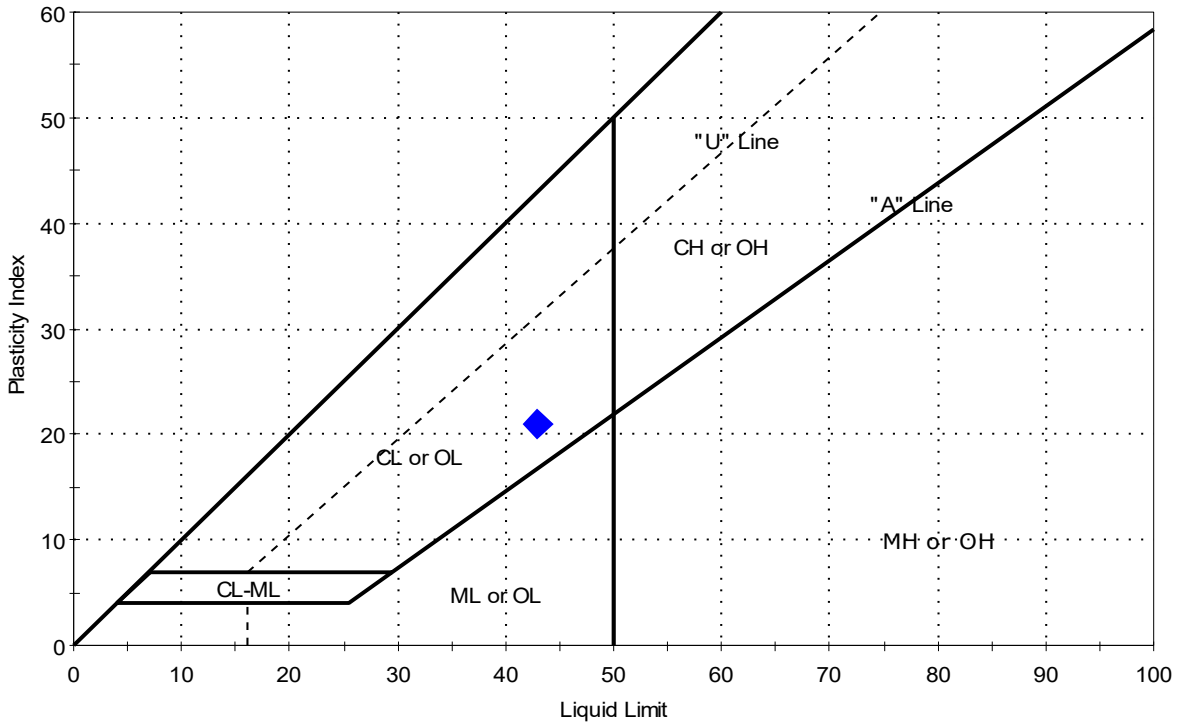
GeoTesting EXPRESS

Client:	Schonewald Engineering Associates, Inc.				
Project:	I-295 over Veranda St (MeDOT WIN21745.00)				
Location:	Portland, ME			Project No:	GTX-308805
Boring ID:	BB-PVS-303	Sample Type:	jar	Tested By:	GA
Sample ID:	13D	Test Date:	09/04/19	Checked By:	bfs
Depth :	44-46 ft	Test Id:	519161		
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
◆	13D	B-PVS-30	44-46 ft	39	43	22	21	0.8	

Sample Prepared using the WET method

Dry Strength: HIGH

Dilatancy: NONE

Toughness: MEDIUM

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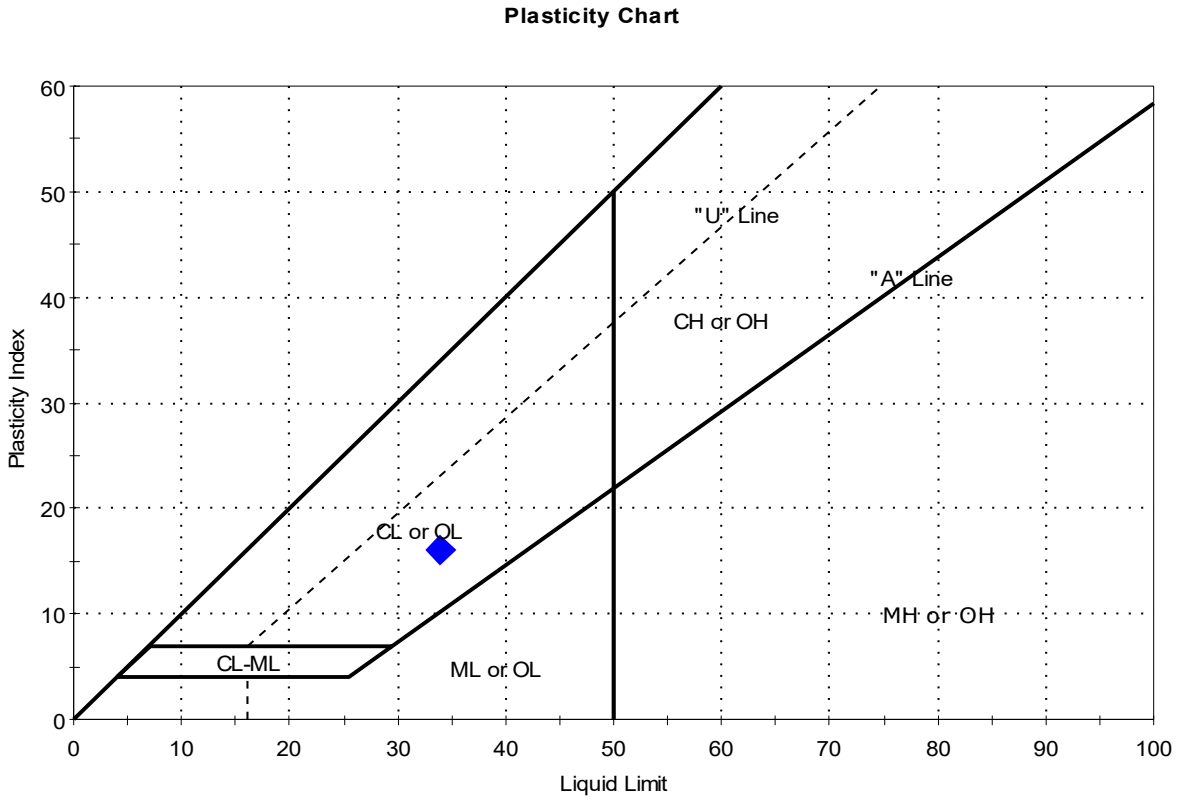
Client:	Schonewald Engineering Associates, Inc.				
Project:	I-295 over Veranda St (MeDOT WIN21745.00)				
Location:	Portland, ME			Project No:	GTX-308805
Boring ID:	BB-PVS-303	Sample Type:	jar	Tested By:	GA
Sample ID:	15D	Test Date:	08/30/19	Checked By:	bfs
Depth :	54-56 ft	Test Id:	519162		
Test Comment:	---				
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
◆	15D	B-PVS-30	54-56 ft	30	34	18	16	0.8	

Sample Prepared using the WET method

Dry Strength: HIGH

Dilatancy: NONE

Toughness: MEDIUM

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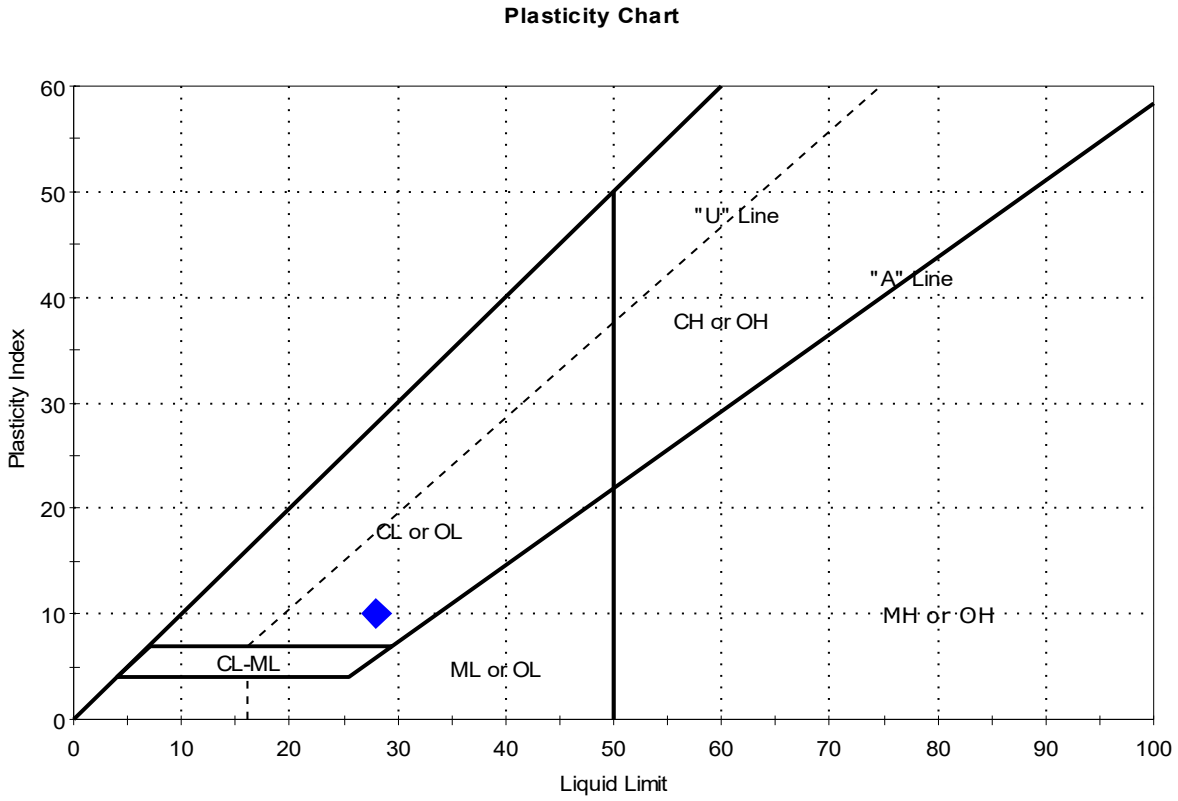
Client:	Schonewald Engineering Associates, Inc.				
Project:	I-295 over Veranda St (MeDOT WIN21745.00)				
Location:	Portland, ME			Project No:	GTX-308805
Boring ID:	BB-PVS-304	Sample Type:	jar	Tested By:	GA
Sample ID:	5D	Test Date:	09/04/19	Checked By:	bfs
Depth :	9-11 ft	Test Id:	519163		
Test Comment:	---				
Visual Description:	Wet, 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
◆	5D	B-PVS-30	9-11 ft	33	28	18	10	1.5	

Sample Prepared using the WET method

Dry Strength: HIGH

Dilatancy: NONE

Toughness: MEDIUM

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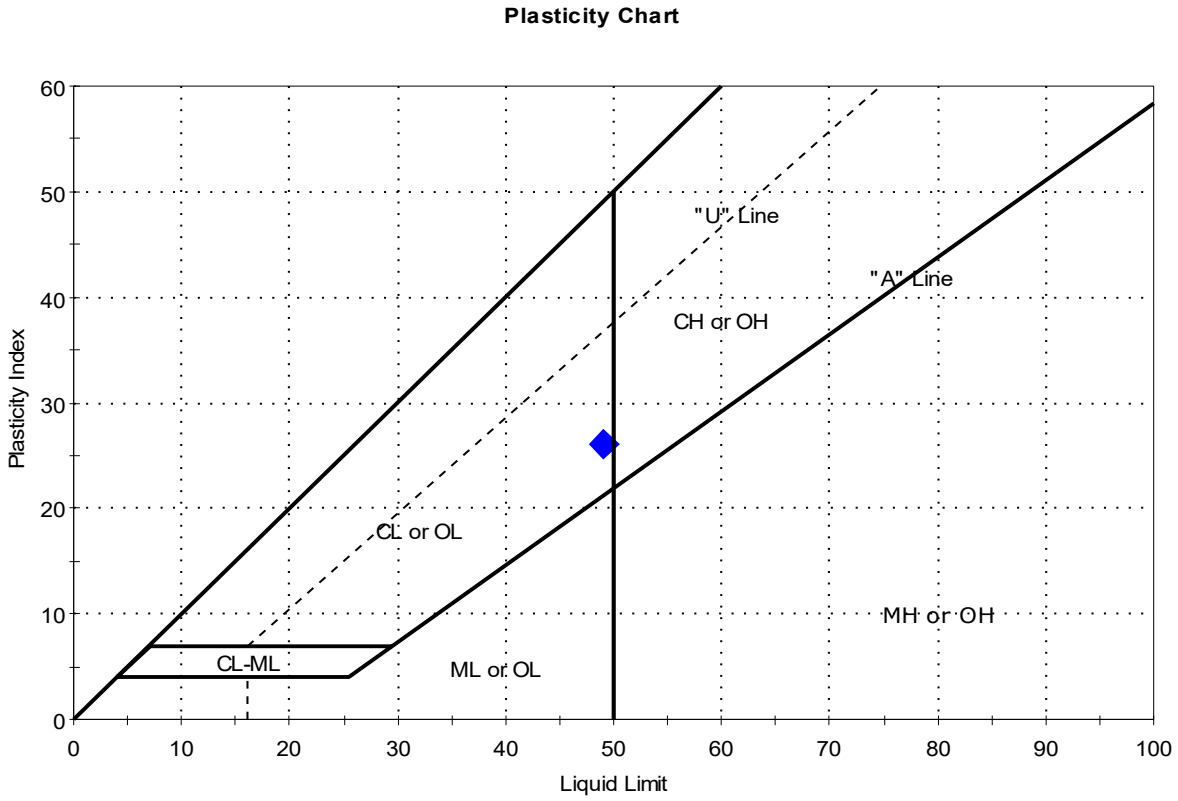
Client:	Schonewald Engineering Associates, Inc.				
Project:	I-295 over Veranda St (MeDOT WIN21745.00)				
Location:	Portland, ME			Project No:	GTX-308805
Boring ID:	BB-PVS-304	Sample Type:	jar	Tested By:	GA
Sample ID:	7D	Test Date:	08/30/19	Checked By:	bfs
Depth :	19-21 ft	Test Id:	519164		
Test Comment:	---				
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
◆	7D	B-PVS-30	19-21 ft	45	49	23	26	0.8	

Sample Prepared using the WET method

Dry Strength: HIGH

Dilatancy: NONE

Toughness: MEDIUM

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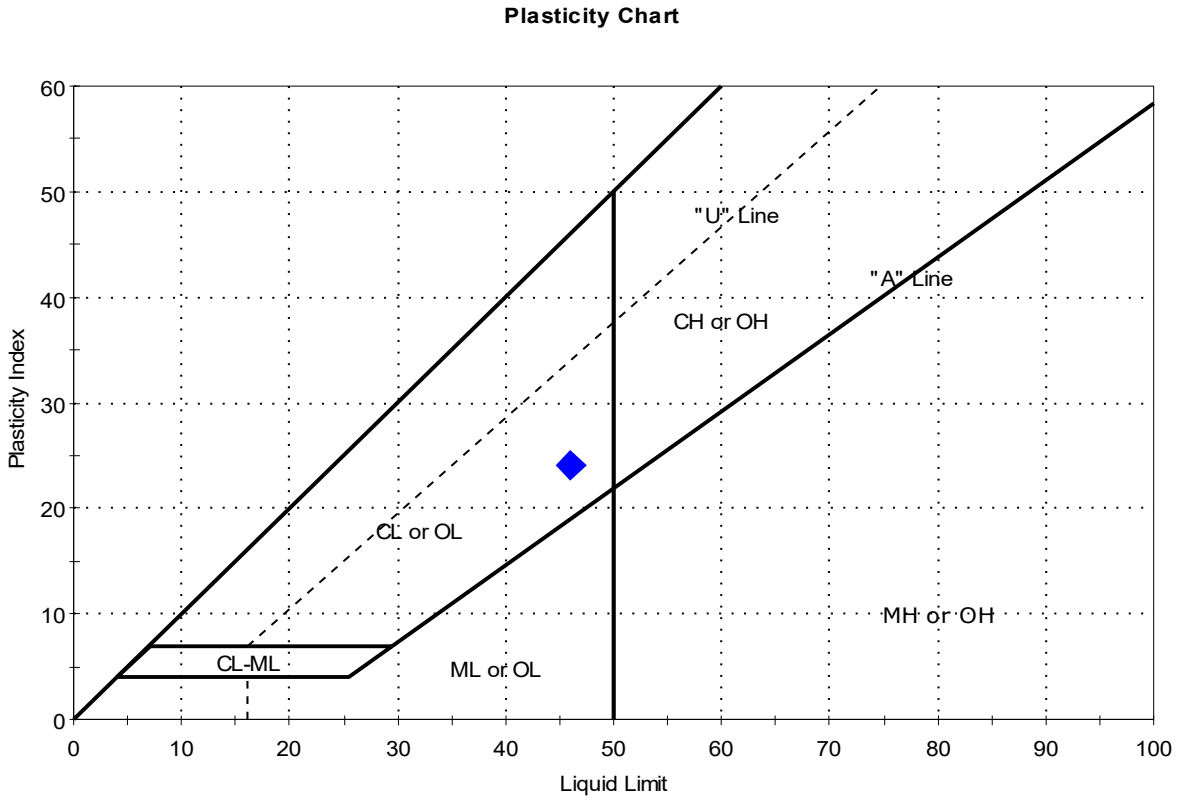
Client:	Schonewald Engineering Associates, Inc.				
Project:	I-295 over Veranda St (MeDOT WIN21745.00)				
Location:	Portland, ME			Project No:	GTX-308805
Boring ID:	BB-PVS-304	Sample Type:	jar	Tested By:	GA
Sample ID:	9D	Test Date:	09/04/19	Checked By:	bfs
Depth :	29-31 ft	Test Id:	519165		
Test Comment:	---				
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
◆	9D	B-PVS-30	29-31 ft	41	46	22	24	0.8	

Sample Prepared using the WET method

Dry Strength: HIGH

Dilatancy: NONE

Toughness: MEDIUM

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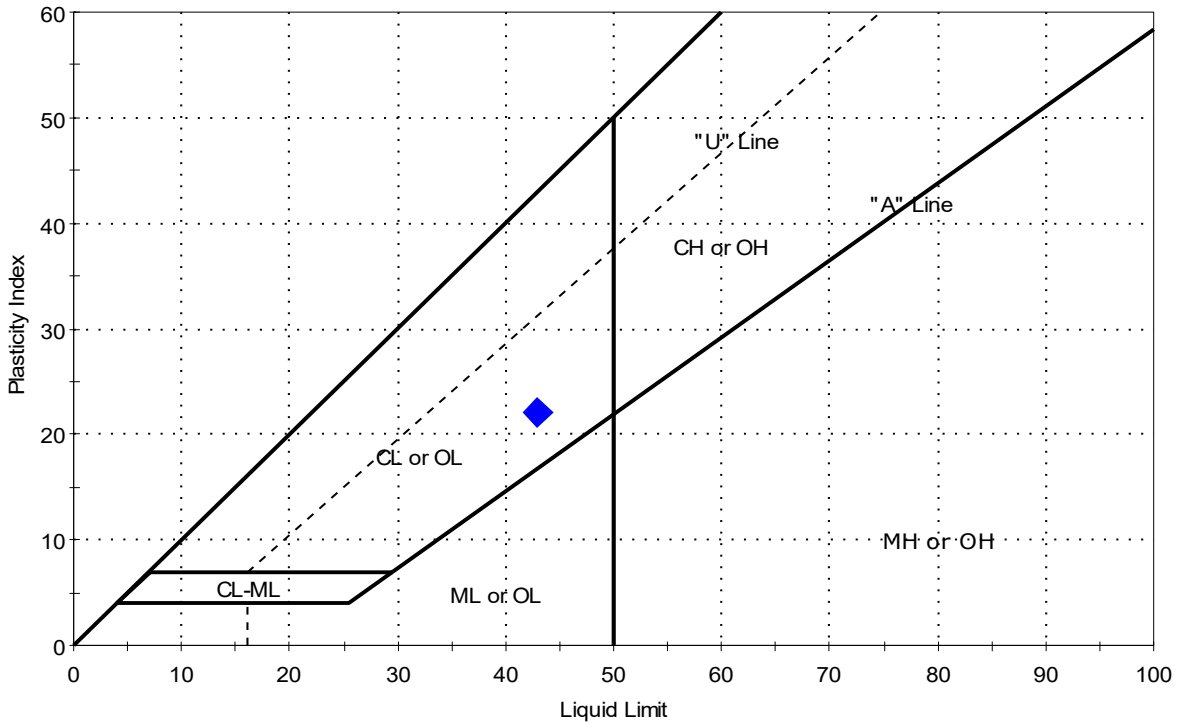
Client:	Schonewald Engineering Associates, Inc.				
Project:	I-295 over Veranda St (MeDOT WIN21745.00)				
Location:	Portland, ME			Project No:	GTX-308805
Boring ID:	BB-PVS-304	Sample Type:	jar	Tested By:	GA
Sample ID:	11D	Test Date:	09/04/19	Checked By:	bfs
Depth :	39-41 ft	Test Id:	519166		
Test Comment:	---				
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
◆	11D	B-PVS-30	39-41 ft	40	43	21	22	0.9	

Sample Prepared using the WET method

Dry Strength: VERY HIGH

Dilatancy: NONE

Toughness: MEDIUM

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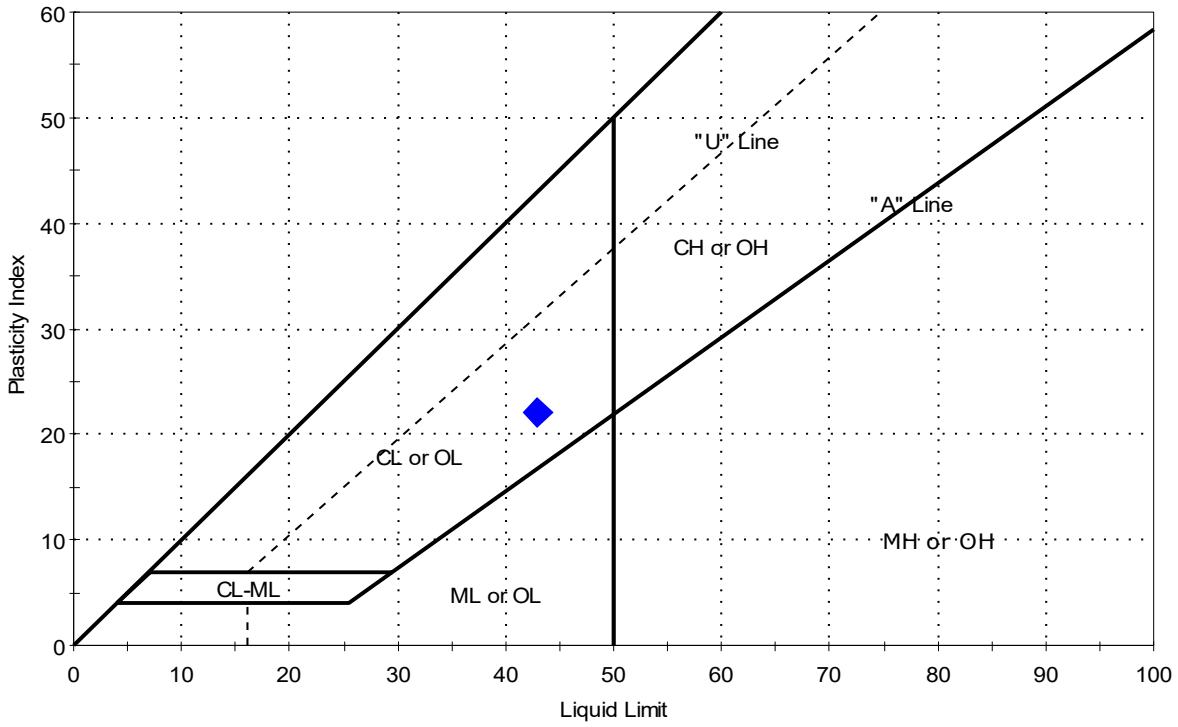
GeoTesting EXPRESS

Client:	Schonewald Engineering Associates, Inc.				
Project:	I-295 over Veranda St (MeDOT WIN21745.00)				
Location:	Portland, ME			Project No:	GTX-308805
Boring ID:	BB-PVS-304	Sample Type:	jar	Tested By:	GA
Sample ID:	13D	Test Date:	09/04/19	Checked By:	bfs
Depth :	49-51 ft	Test Id:	519167		
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
◆	13D	B-PVS-30	49-51 ft	37	43	21	22	0.7	

Sample Prepared using the WET method

Dry Strength: VERY HIGH

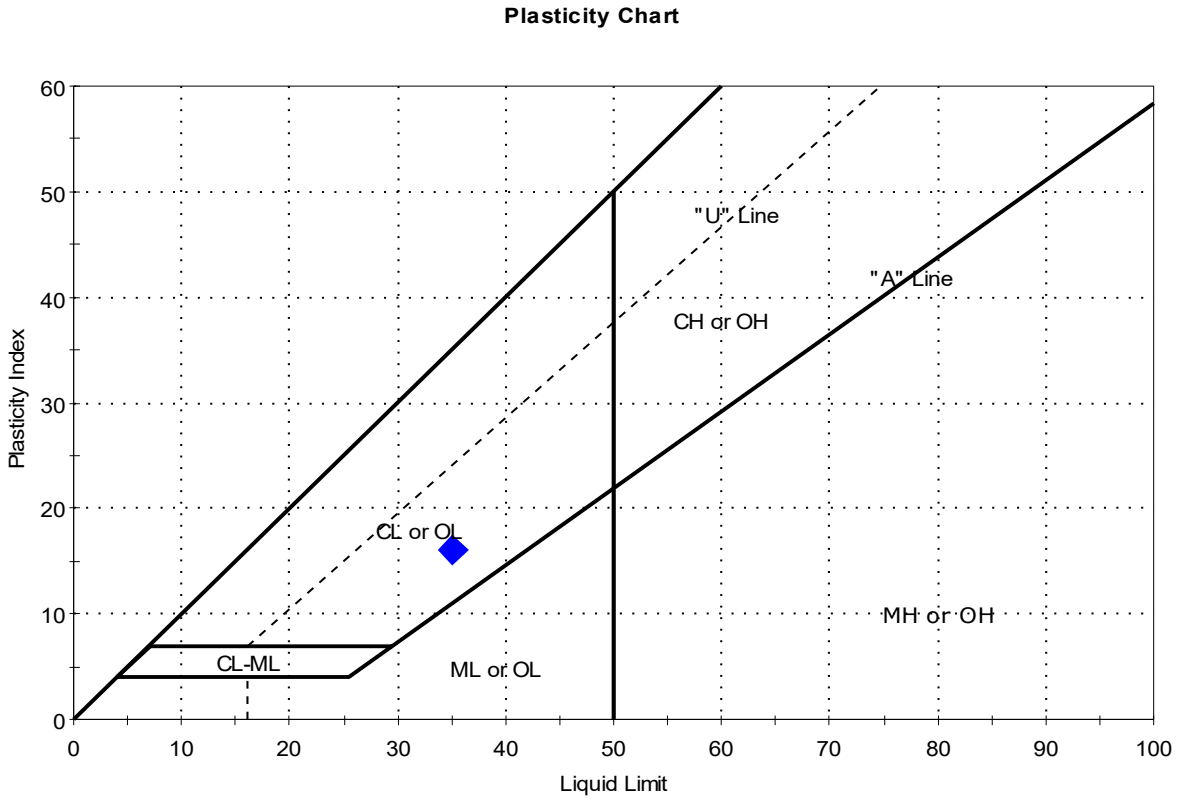
Dilatancy: NONE

Toughness: MEDIUM

printed 9/4/2019 3:23:16 PM

Client:	Schonewald Engineering Associates, Inc.				
Project:	I-295 over Veranda St (MeDOT WIN21745.00)				
Location:	Portland, ME			Project No:	GTX-308805
Boring ID:	BB-PVS-304	Sample Type:	jar	Tested By:	GA
Sample ID:	14D	Test Date:	08/30/19	Checked By:	bfs
Depth :	59-61 ft	Test Id:	519168		
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
◆	14D	B-PVS-30	59-61 ft	38	35	19	16	1.2	

Sample Prepared using the WET method

Dry Strength: HIGH

Dilatancy: NONE

Toughness: MEDIUM

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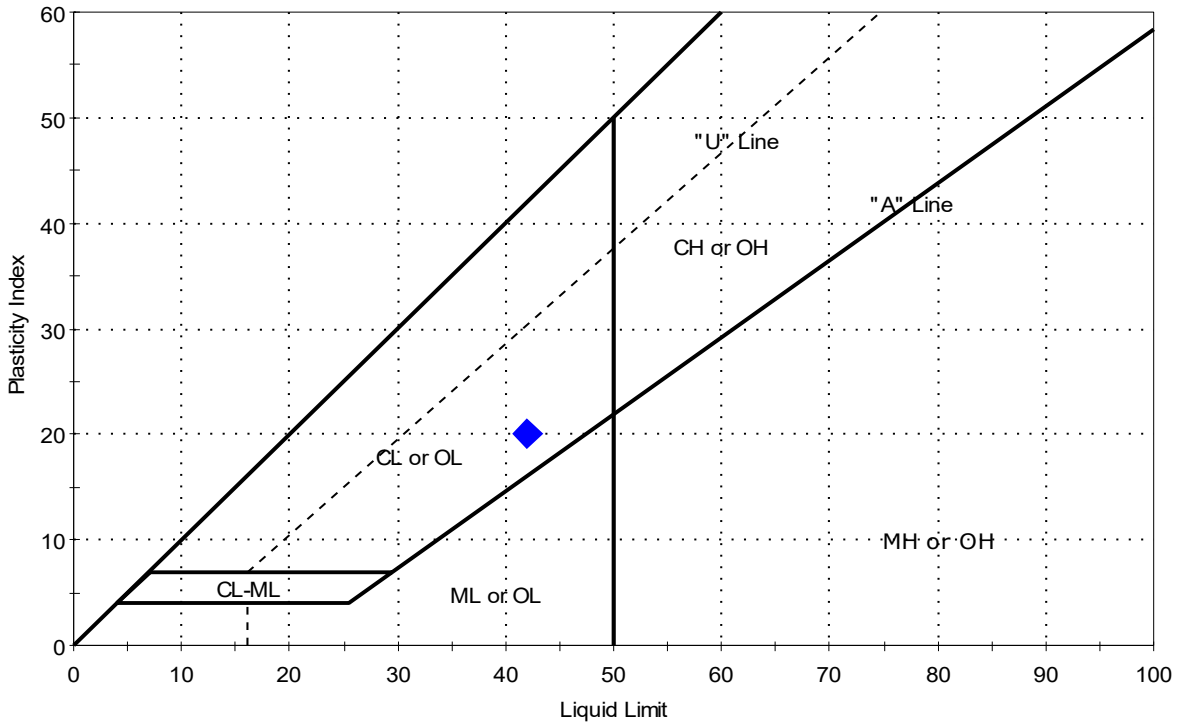
Client:	Schonewald Engineering Associates, Inc.				
Project:	I-295 over Veranda St (MeDOT WIN21745.00)				
Location:	Portland, ME			Project No:	GTX-308805
Boring ID:	BB-PVS-301	Sample Type:	tube	Tested By:	cam
Sample ID:	1U	Test Date:	08/28/19	Checked By:	bfs
Depth :	19-21 ft	Test Id:	519169		
Test Comment:	---				
Visual Description:	Moist, olive clay				
Sample Comment:	---				

Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
◆	1U	B-PVS-30	19-21 ft	34	42	22	20	0.6	

Sample Prepared using the WET method

Dry Strength: VERY HIGH

Dilatancy: SLOW

Toughness: LOW

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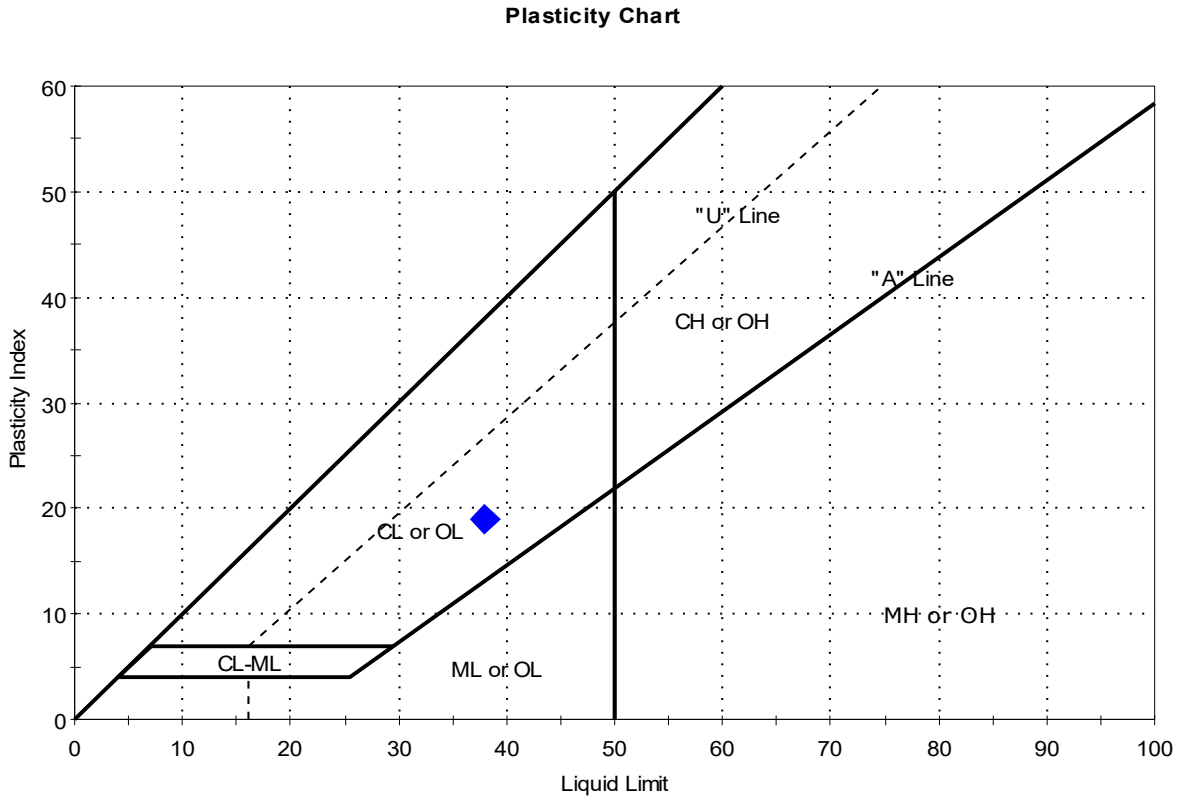
Client:	Schonewald Engineering Associates, Inc.				
Project:	I-295 over Veranda St (MeDOT WIN21745.00)				
Location:	Portland, ME			Project No:	GTX-308805
Boring ID:	BB-PVS-301	Sample Type:	tube	Tested By:	cam
Sample ID:	2U	Test Date:	09/03/19	Checked By:	emm
Depth :	26.5-28.5 ft	Test Id:	519170		
Test 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
◆	2U	B-PVS-30	26.5-28.5 ft	32	38	19	19	0.7	

Sample Prepared using the WET method

Dry Strength: VERY HIGH

Dilatancy: SLOW

Toughness: LOW

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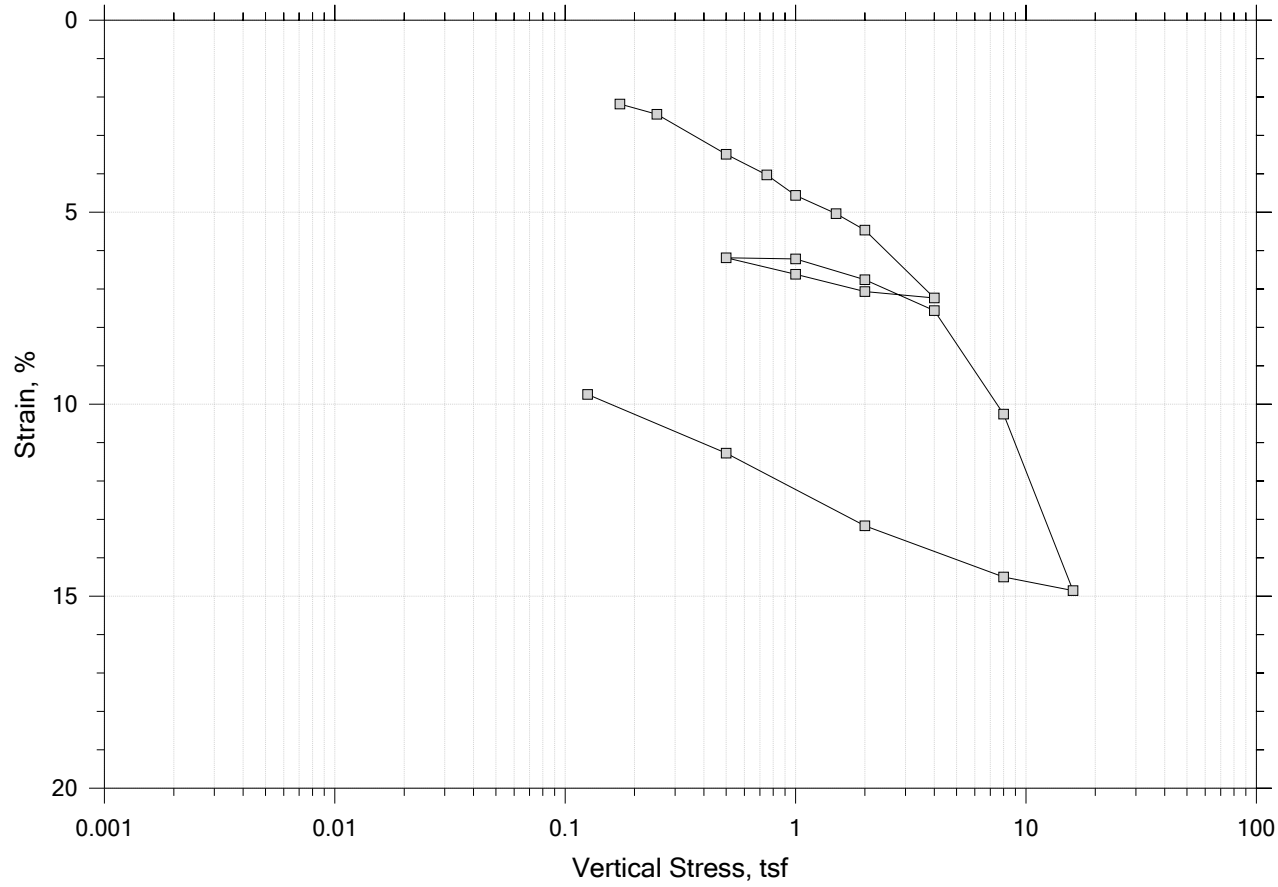
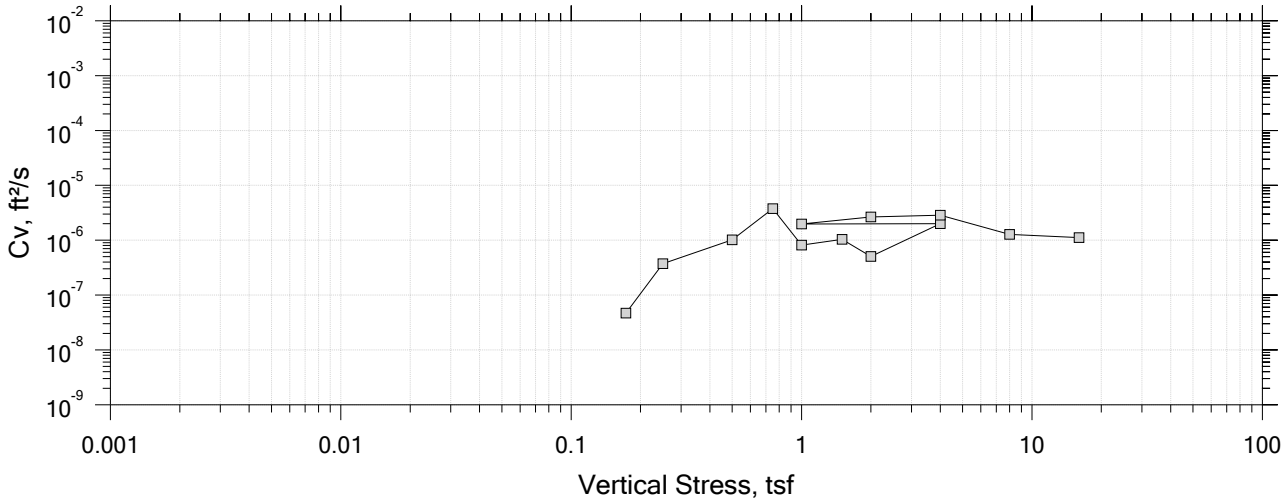
One-Dimensional Consolidation by ASTM D2435 - Method B

Summary Report





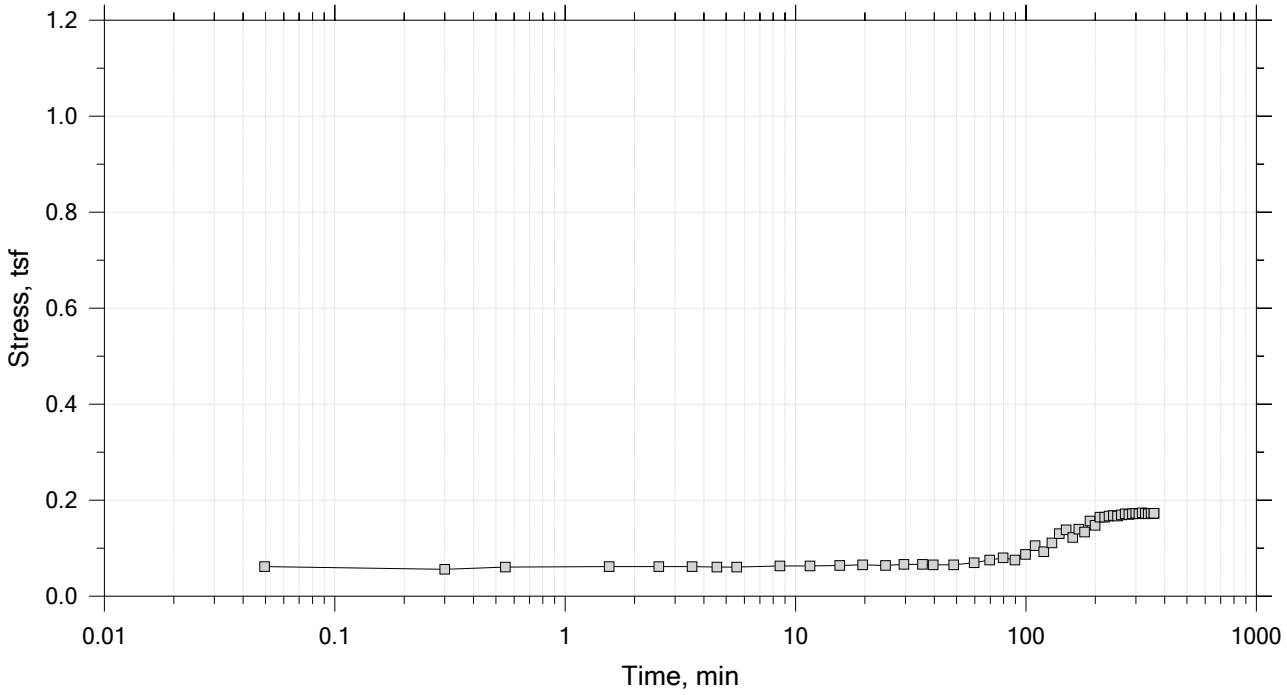
GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-301	Tested By: trm	Checked By: njh/anm
	Sample No.: 1U	Test Date: 8/26/19	Depth: 19-21 ft
	Test No.: IP-11	Sample Type: intact	Elevation: ---
	Description: Moist, olive clay		
	Remarks: System LTIII-A		
	Displacement at End of Increment		

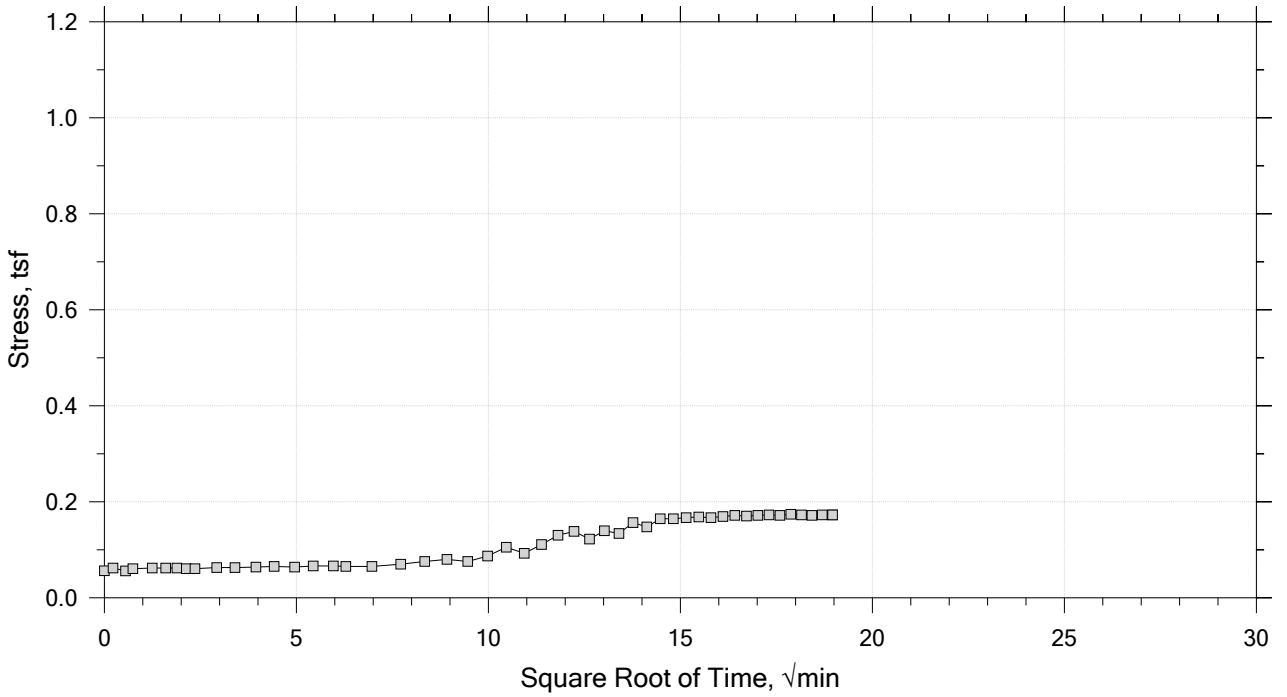
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 1 of 20

Constant Volume Step

Stress: 0.173 tsf

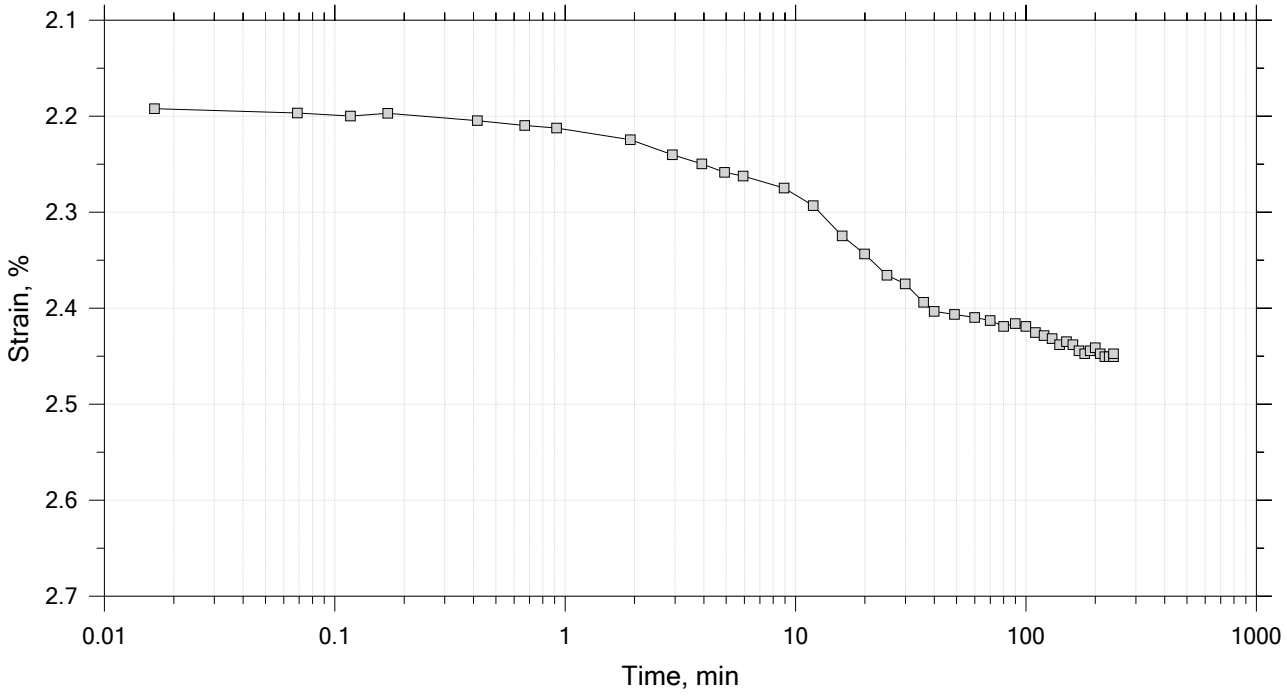


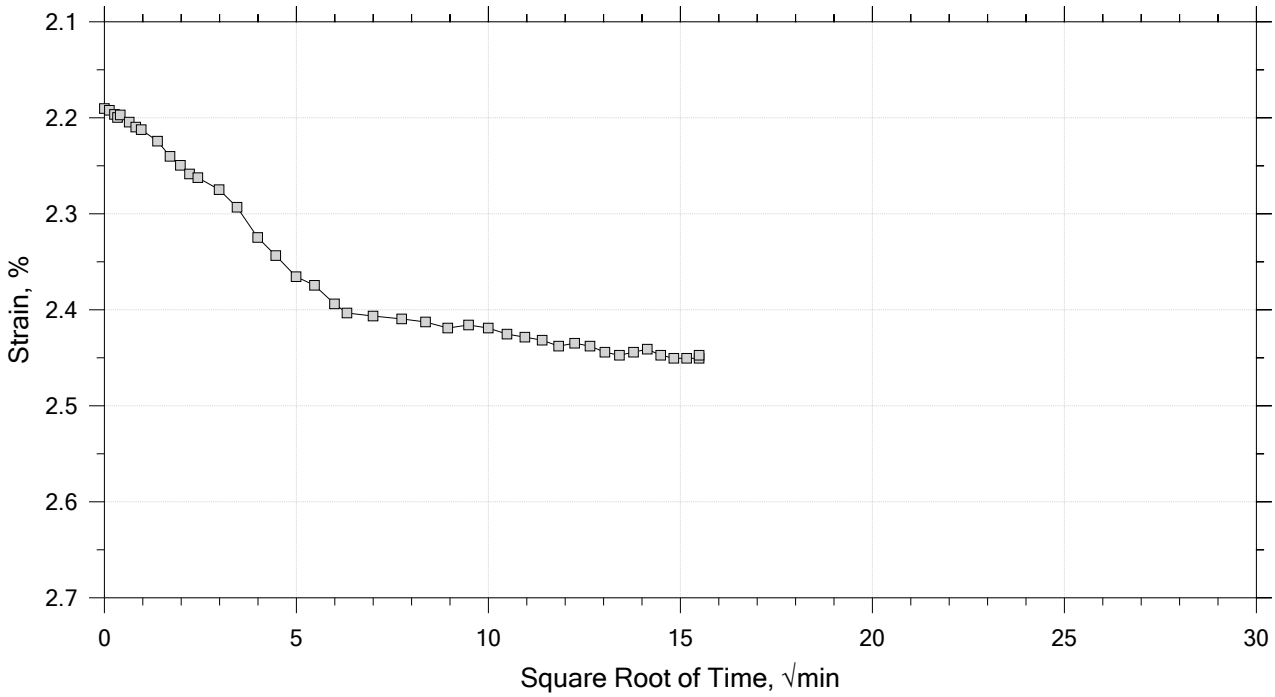


GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-301	Tested By: trm	Checked By: njh/anm
	Sample No.: 1U	Test Date: 8/26/19	Depth: 19-21 ft
	Test No.: IP-11	Sample Type: intact	Elevation: ---
	Description: Moist, olive clay		
	Remarks: System LTIII-A		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 2 of 20
Constant Load Step
Stress: 0.25 tsf





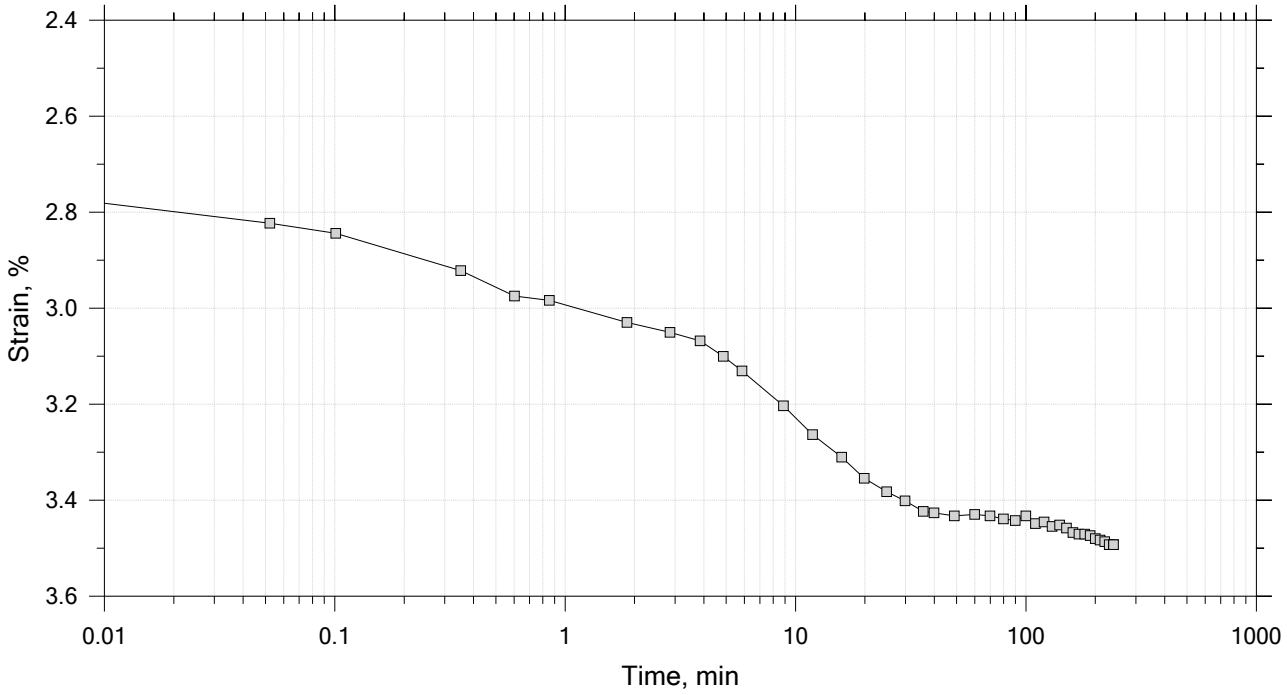
Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
Boring No.: BB-PVS-301	Tested By: trm	Checked By: njh/anm
Sample No.: 1U	Test Date: 8/26/19	Depth: 19-21 ft
Test No.: IP-11	Sample Type: intact	Elevation: ---
Description: Moist, olive clay		
Remarks: System LTIII-A		

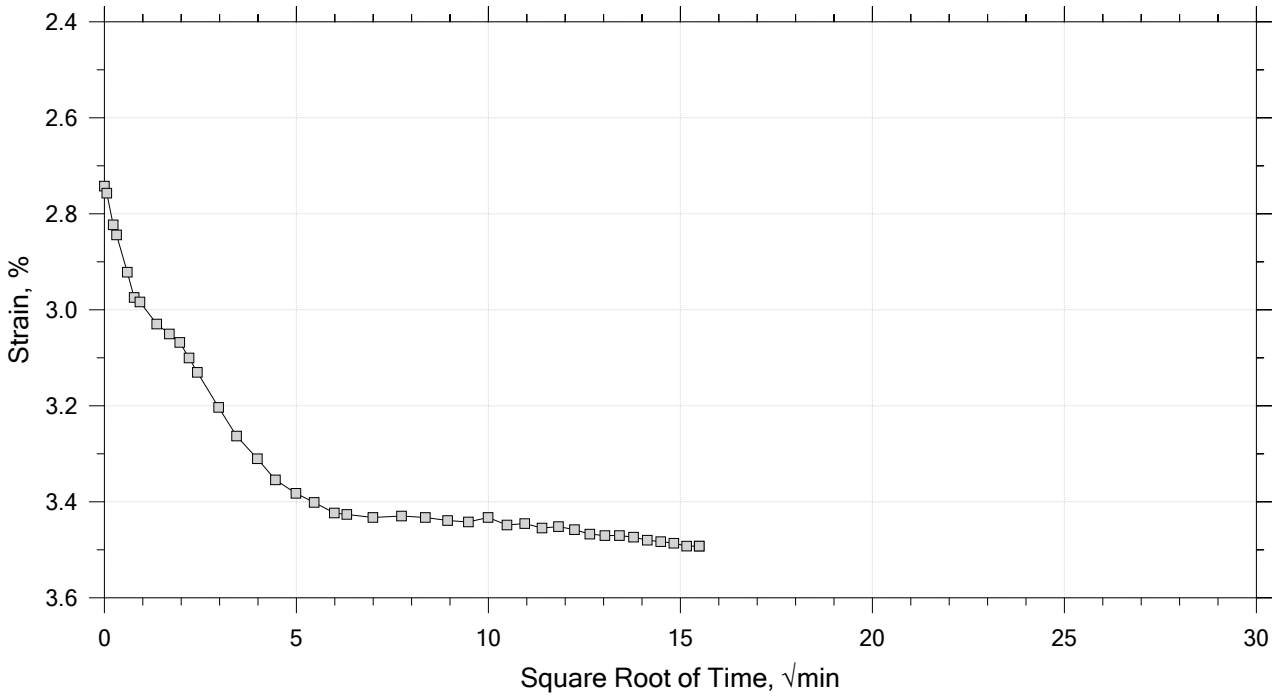
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 3 of 20

Constant Load Step

Stress: 0.5 tsf

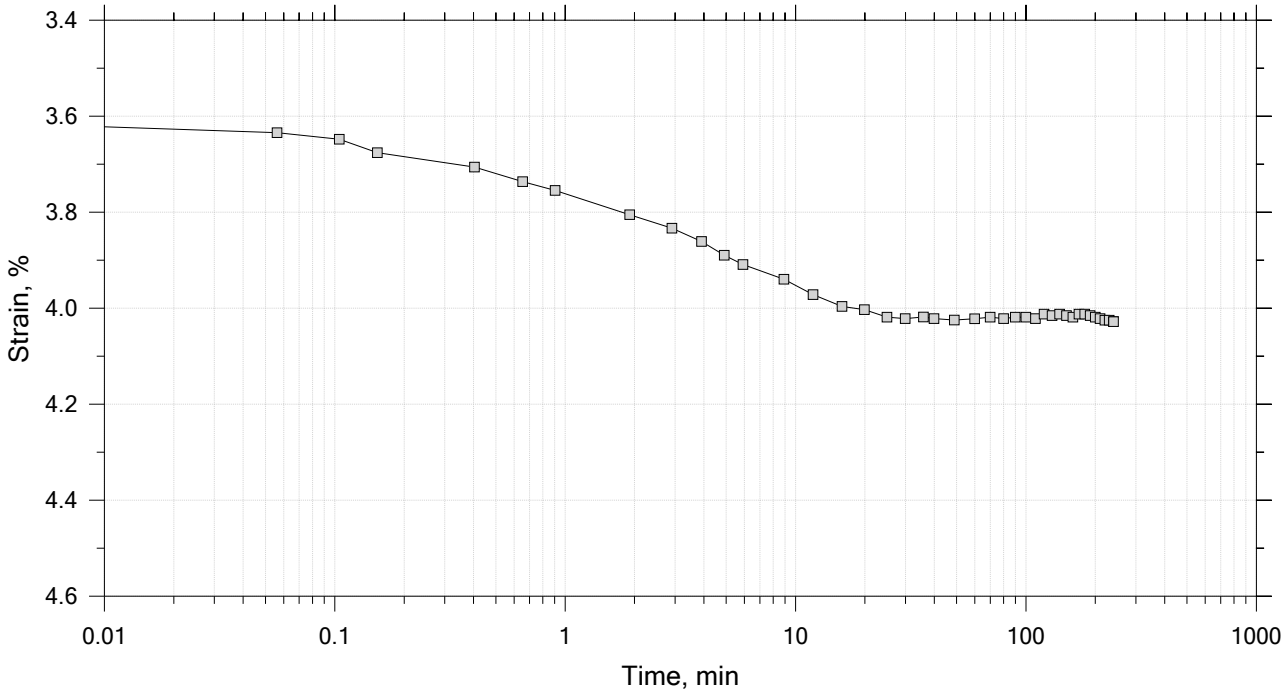


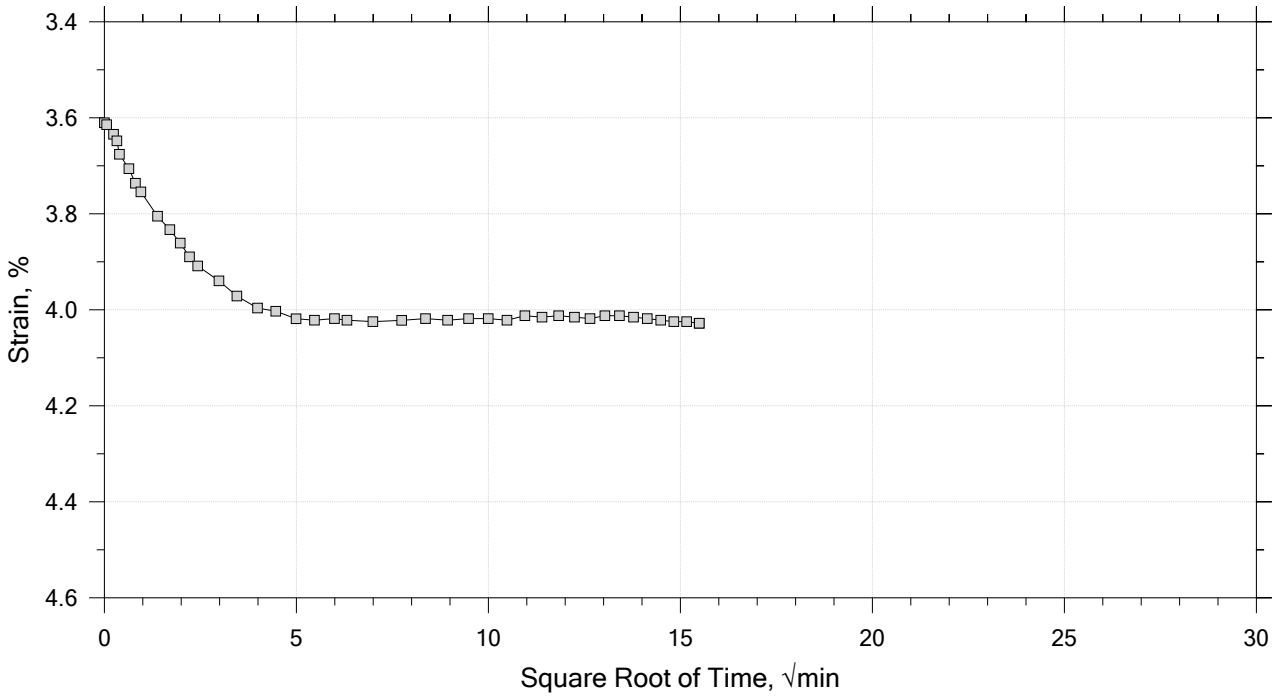


GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-301	Tested By: trm	Checked By: njh/anm
	Sample No.: 1U	Test Date: 8/26/19	Depth: 19-21 ft
	Test No.: IP-11	Sample Type: intact	Elevation: ---
	Description: Moist, olive clay		
	Remarks: System LTIII-A		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 4 of 20
Constant Load Step
Stress: 0.75 tsf





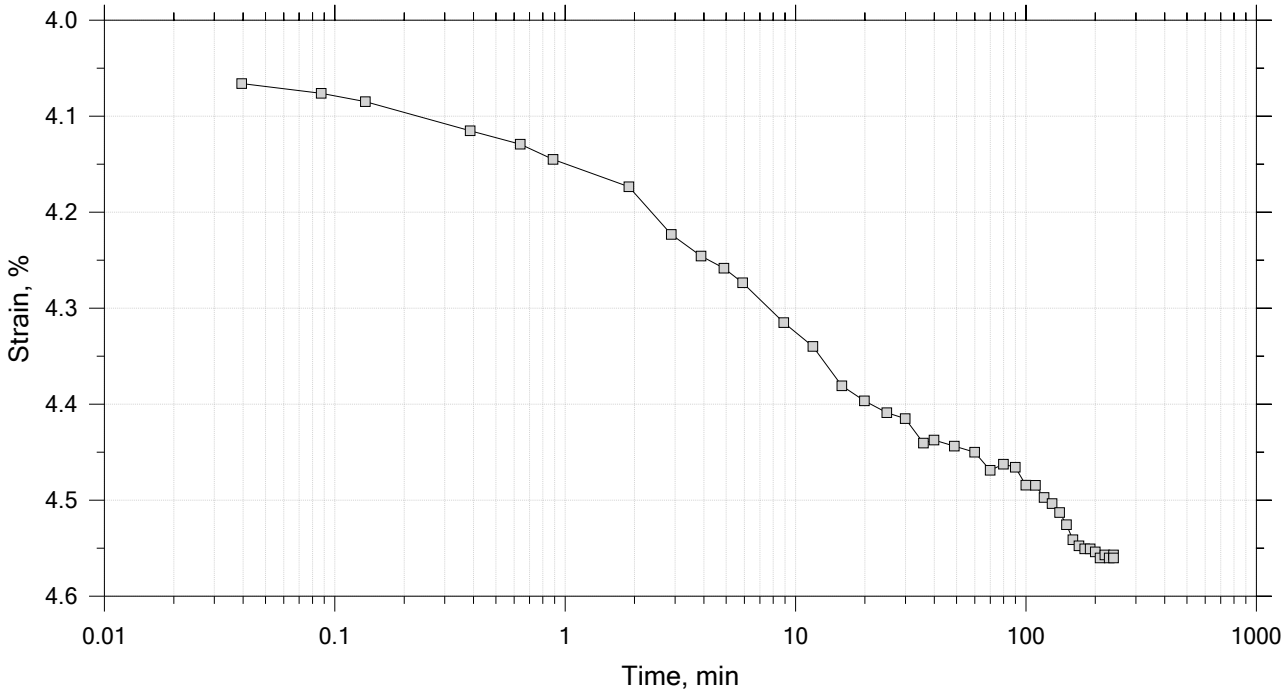
Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
Boring No.: BB-PVS-301	Tested By: trm	Checked By: njh/anm
Sample No.: 1U	Test Date: 8/26/19	Depth: 19-21 ft
Test No.: IP-11	Sample Type: intact	Elevation: ---
Description: Moist, olive clay		
Remarks: System LTIII-A		

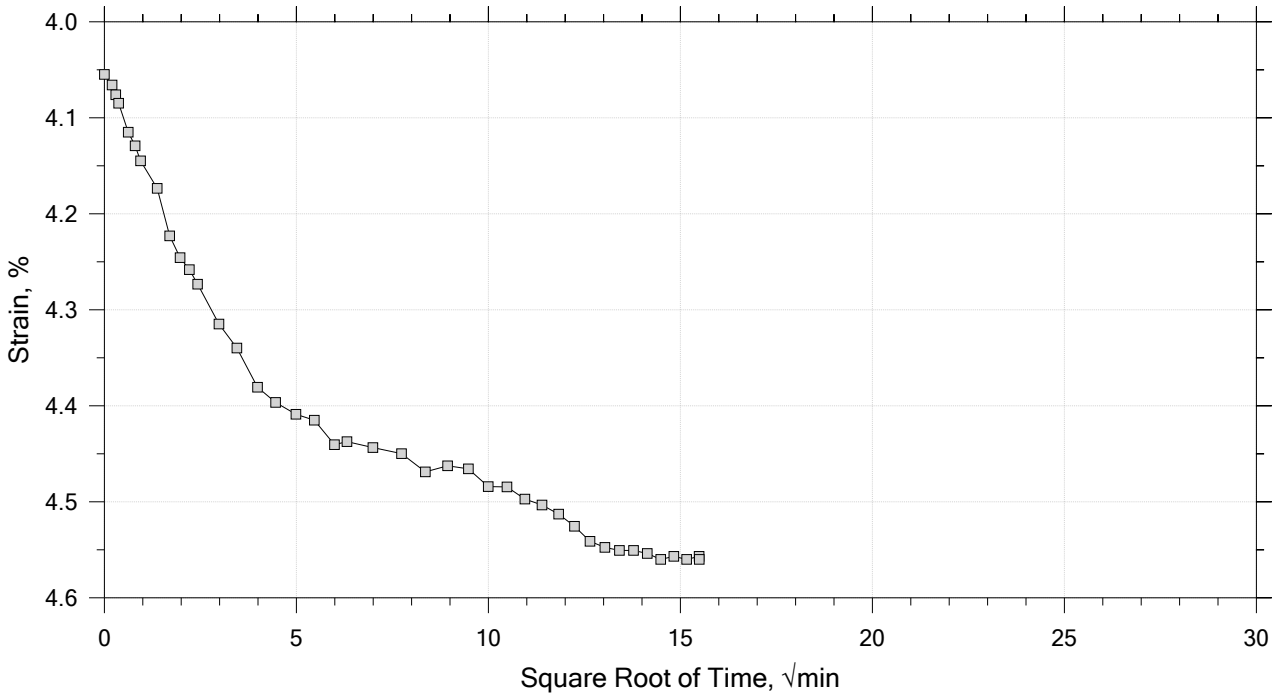
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 5 of 20

Constant Load Step

Stress: 1 tsf

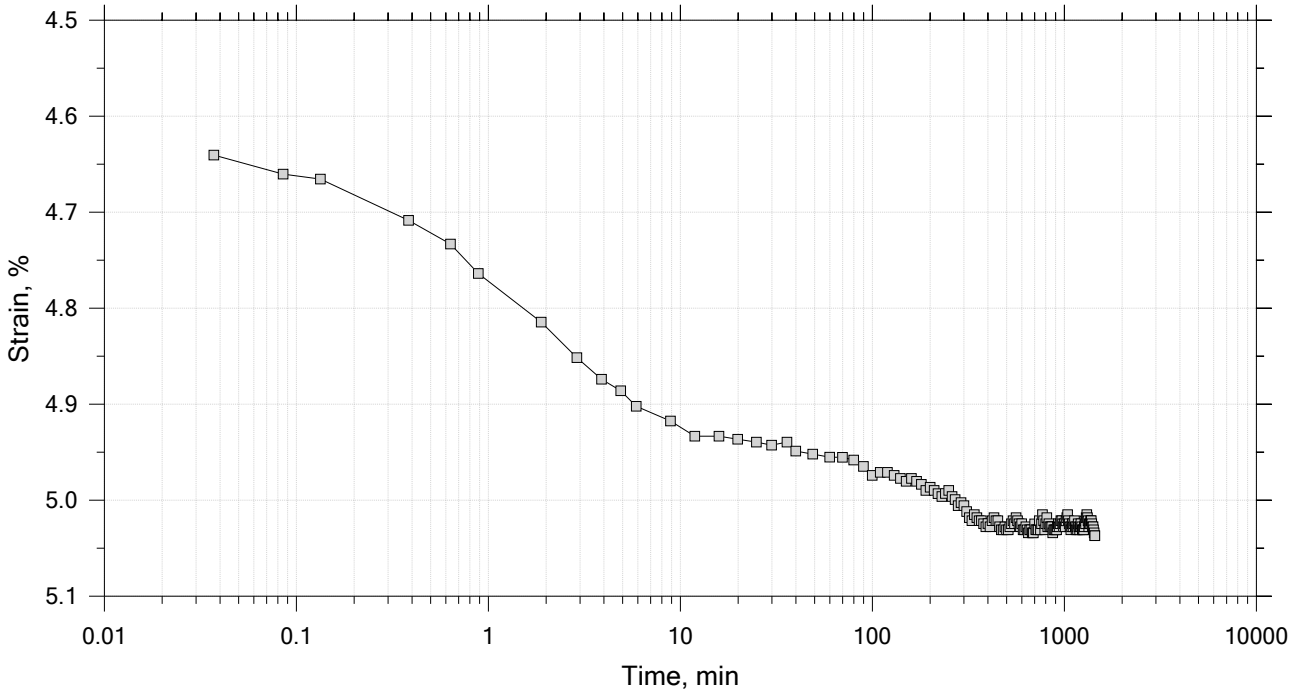


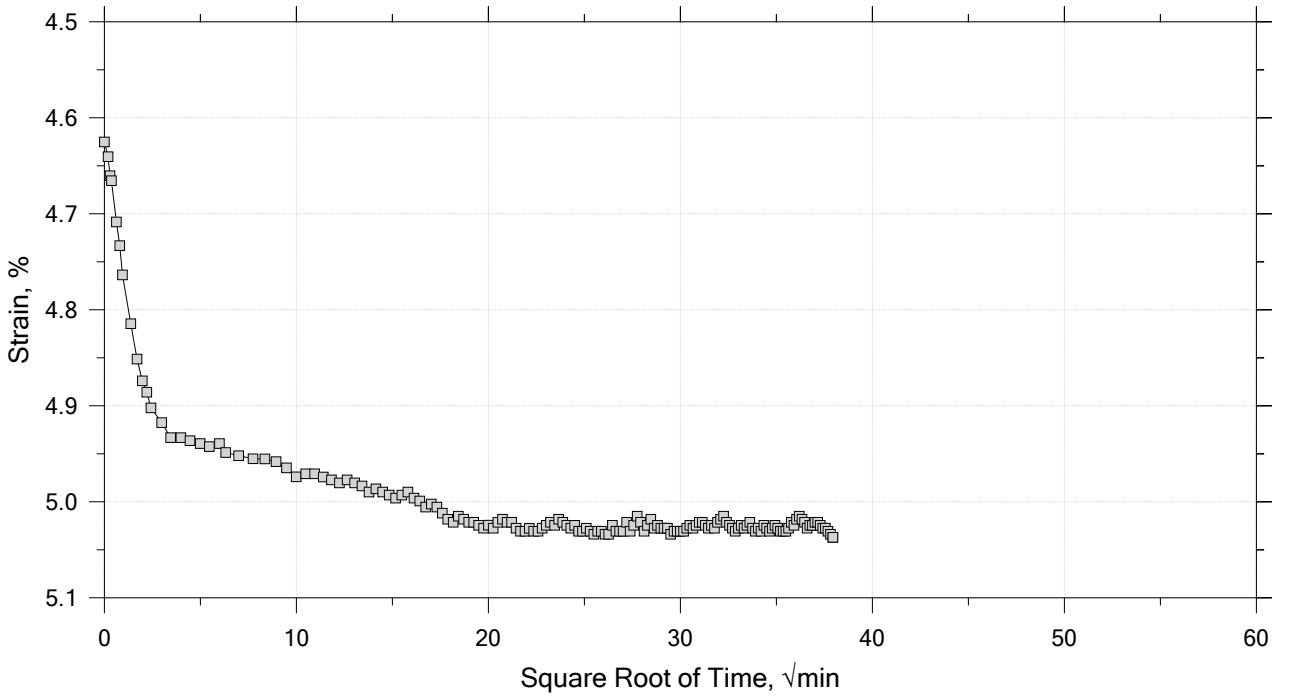


GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-301	Tested By: trm	Checked By: njh/anm
	Sample No.: 1U	Test Date: 8/26/19	Depth: 19-21 ft
	Test No.: IP-11	Sample Type: intact	Elevation: ---
	Description: Moist, olive clay		
	Remarks: System LTIII-A		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 6 of 20
Constant Load Step
Stress: 1.5 tsf

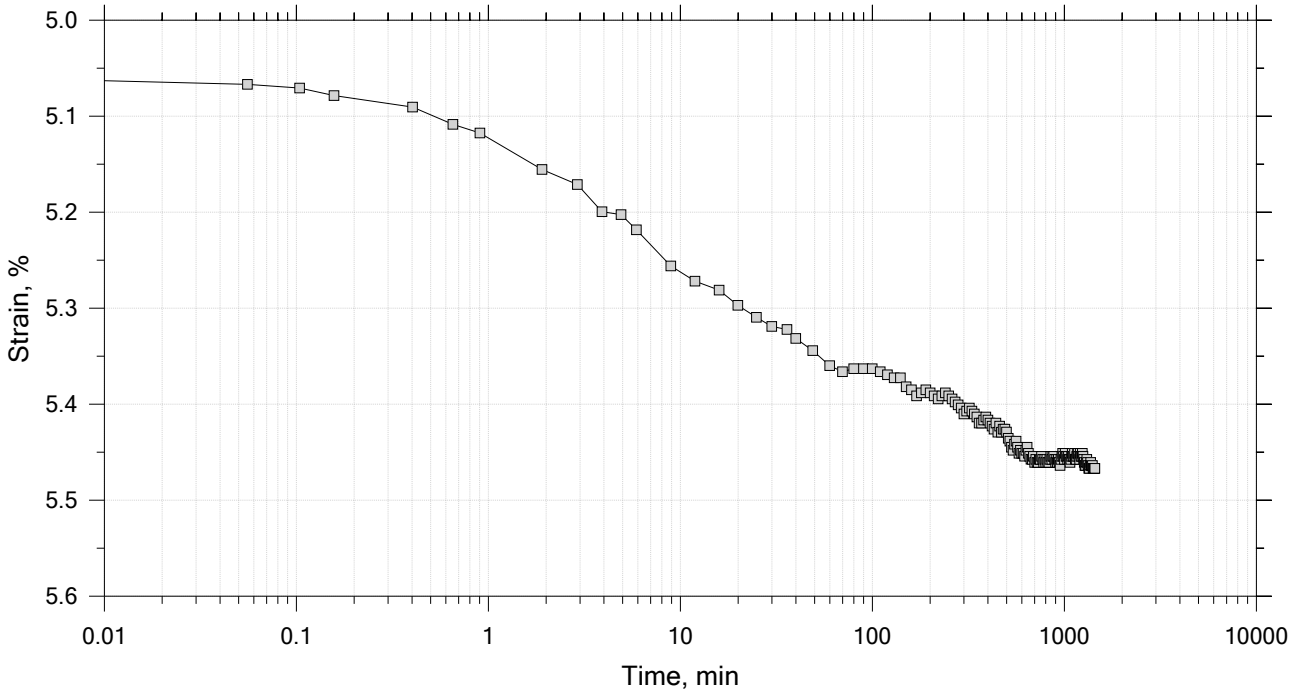


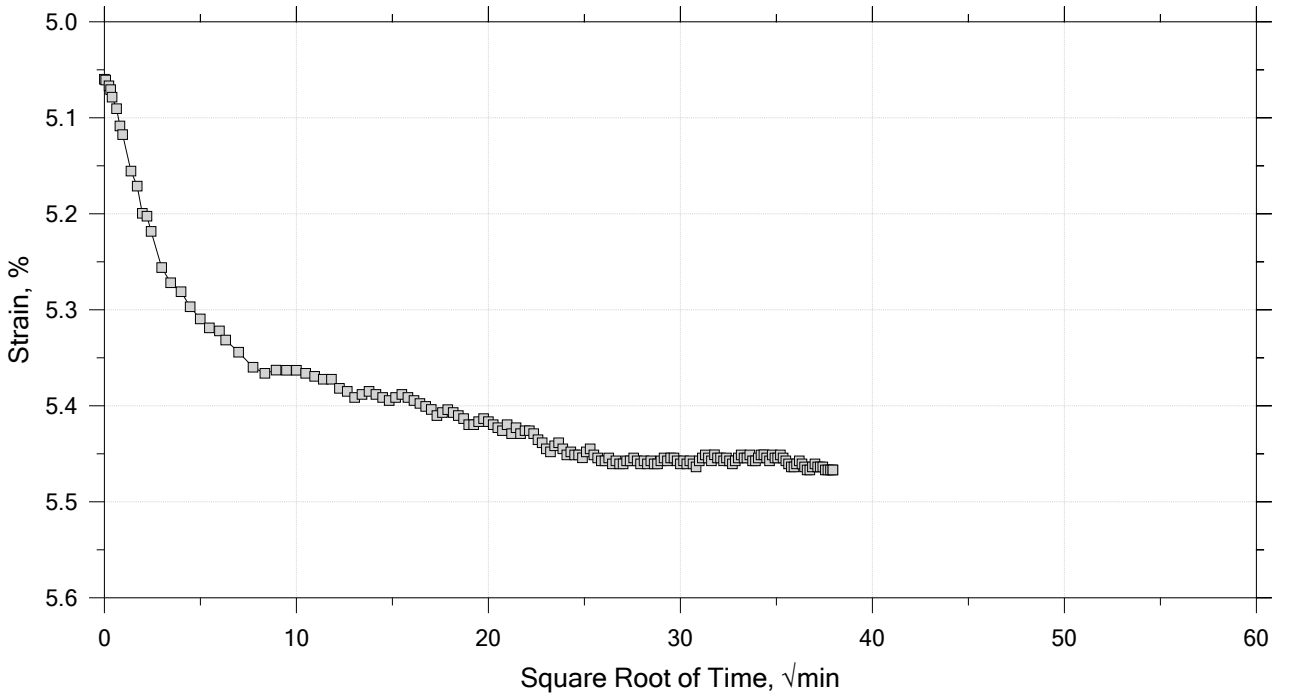


GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-301	Tested By: trm	Checked By: njh/anm
	Sample No.: 1U	Test Date: 8/26/19	Depth: 19-21 ft
	Test No.: IP-11	Sample Type: intact	Elevation: ---
	Description: Moist, olive clay		
	Remarks: System LTIII-A		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 7 of 20
Constant Load Step
Stress: 2 tsf





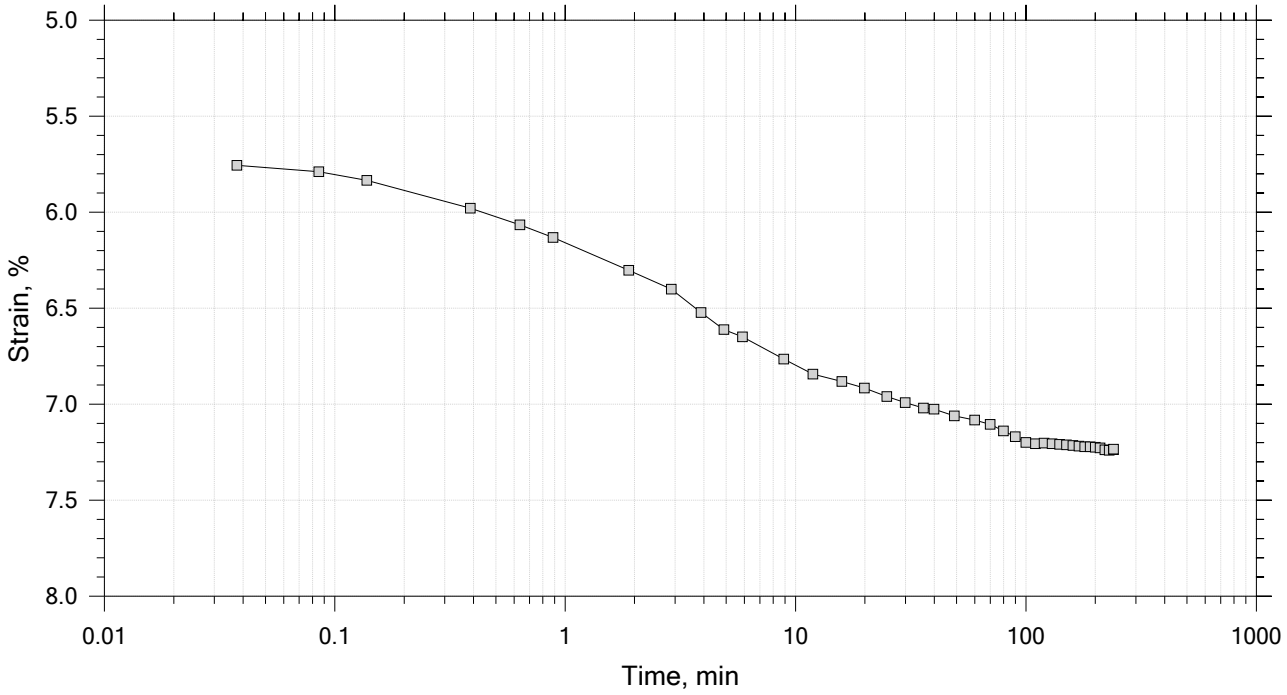
GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-301	Tested By: trm	Checked By: njh/anm
	Sample No.: 1U	Test Date: 8/26/19	Depth: 19-21 ft
	Test No.: IP-11	Sample Type: intact	Elevation: ---
	Description: Moist, olive clay		
	Remarks: System LTIII-A		

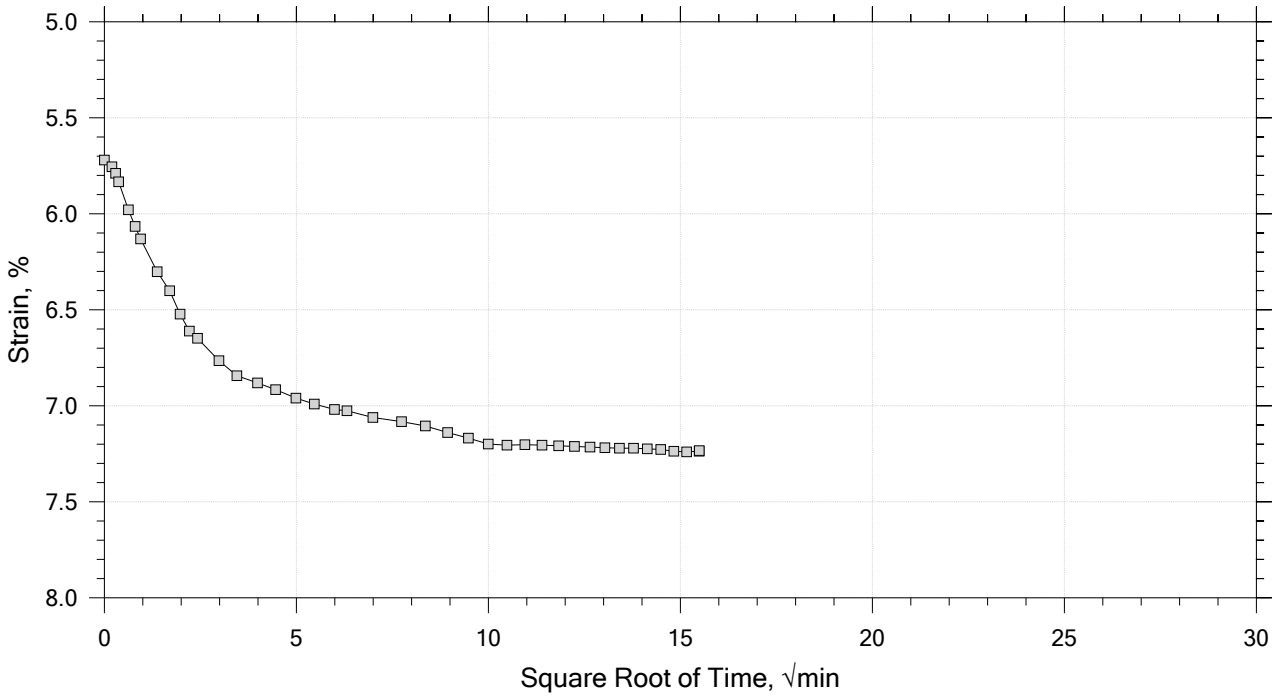
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 8 of 20

Constant Load Step

Stress: 4 tsf





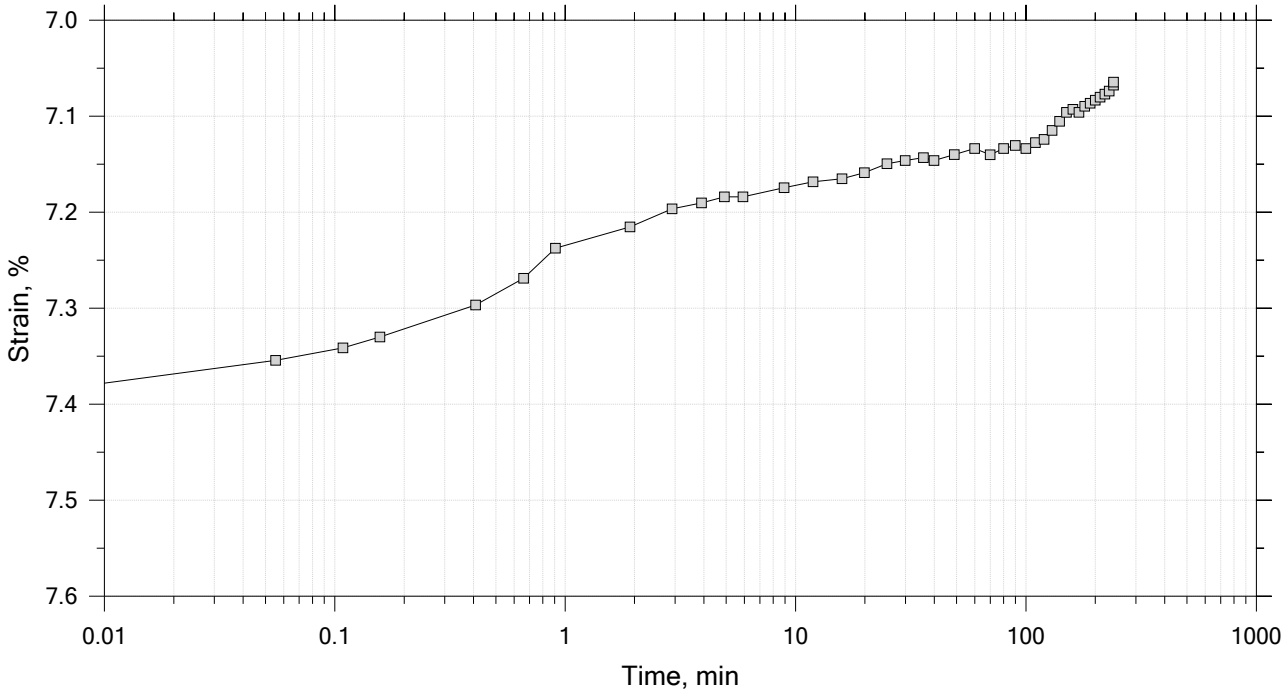
Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
Boring No.: BB-PVS-301	Tested By: trm	Checked By: njh/anm
Sample No.: 1U	Test Date: 8/26/19	Depth: 19-21 ft
Test No.: IP-11	Sample Type: intact	Elevation: ---
Description: Moist, olive clay		
Remarks: System LTIII-A		

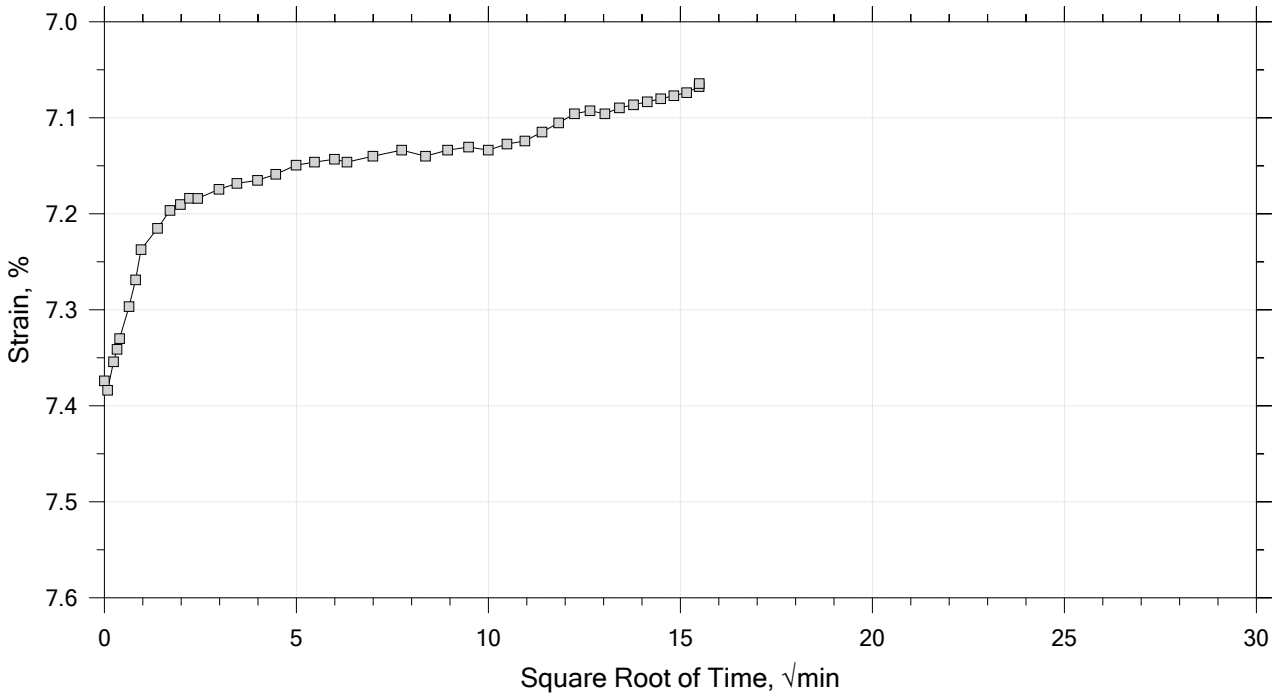
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 9 of 20

Constant Load Step

Stress: 2 tsf





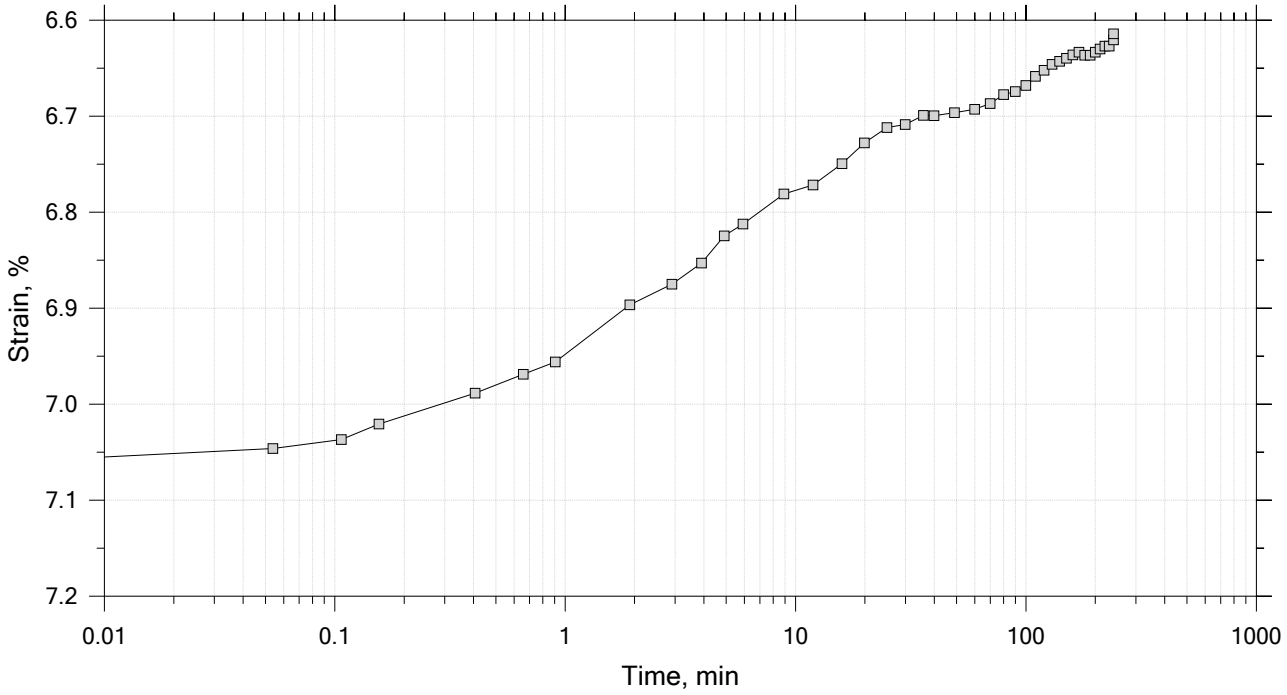
GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-301	Tested By: trm	Checked By: njh/anm
	Sample No.: 1U	Test Date: 8/26/19	Depth: 19-21 ft
	Test No.: IP-11	Sample Type: intact	Elevation: ---
	Description: Moist, olive clay		
	Remarks: System LTIII-A		

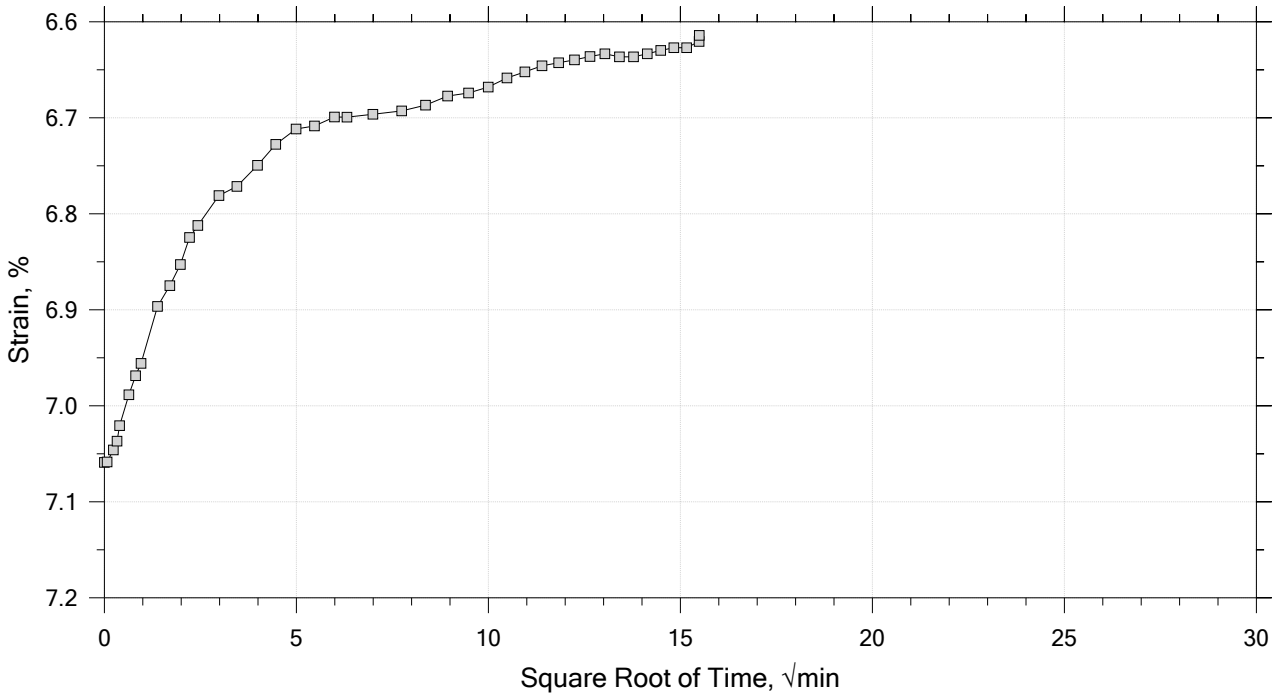
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 10 of 20

Constant Load Step

Stress: 1 tsf

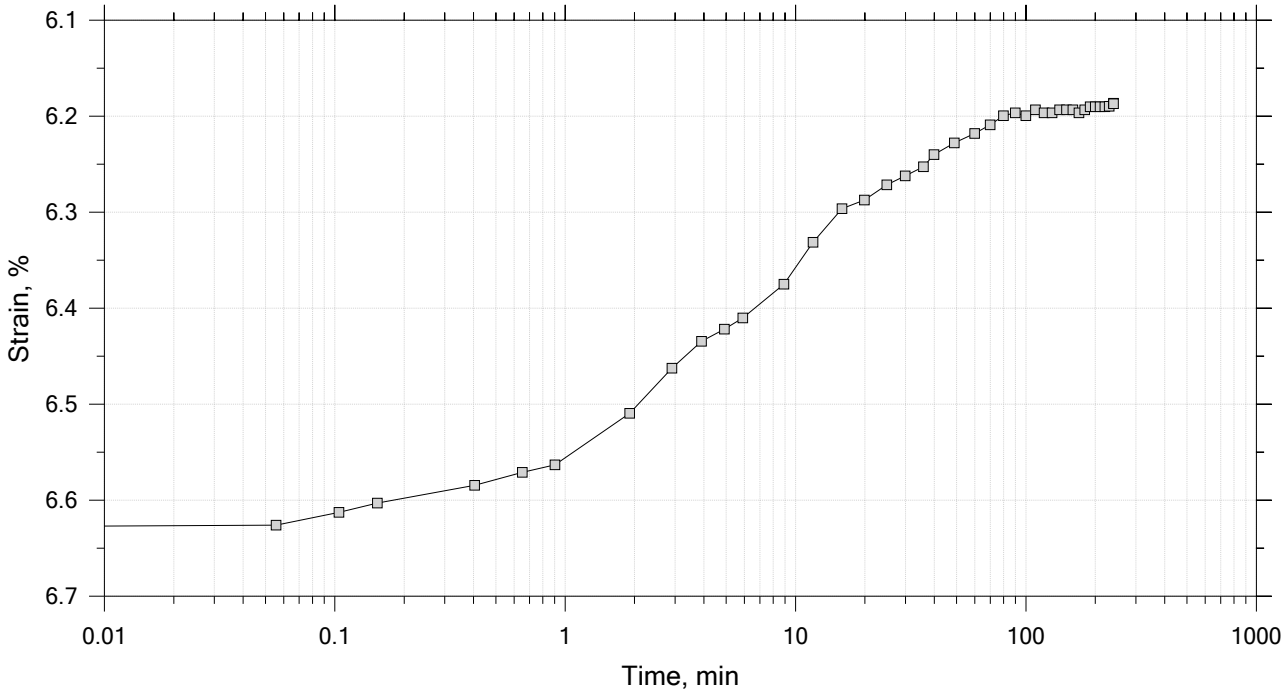


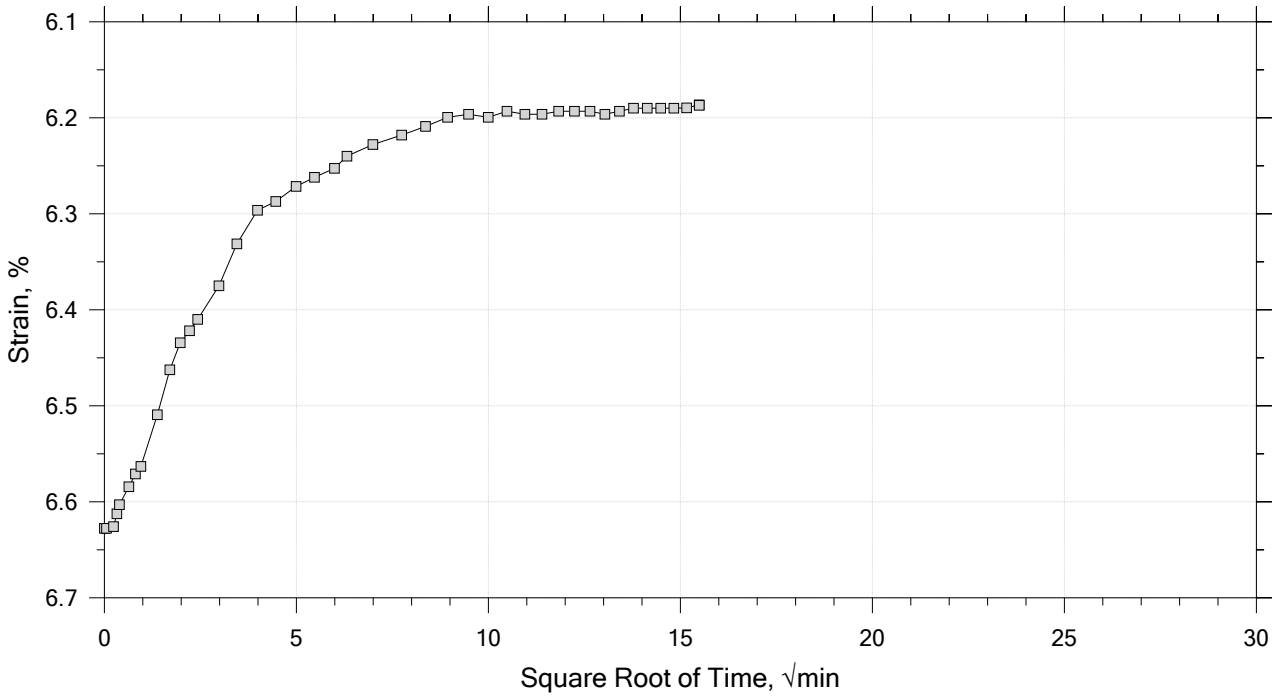


GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-301	Tested By: trm	Checked By: njh/anm
	Sample No.: 1U	Test Date: 8/26/19	Depth: 19-21 ft
	Test No.: IP-11	Sample Type: intact	Elevation: ---
	Description: Moist, olive clay		
	Remarks: System LTIII-A		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 11 of 20
Constant Load Step
Stress: 0.5 tsf





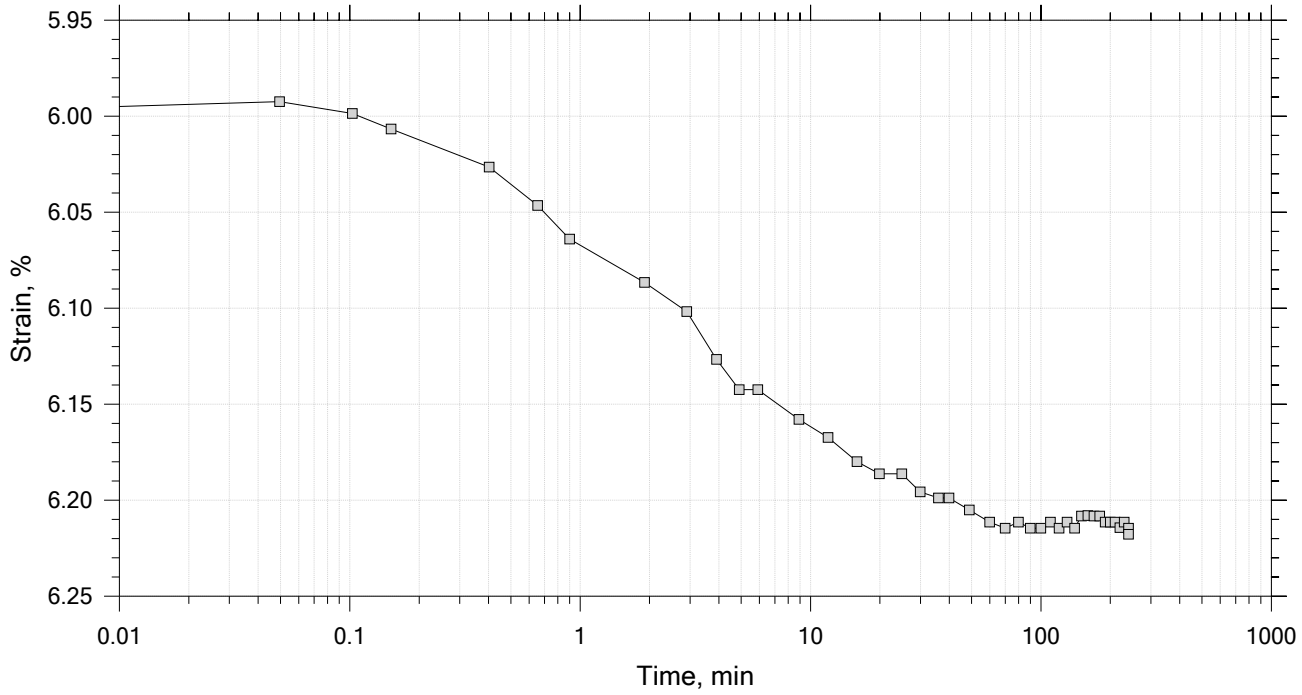
GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-301	Tested By: trm	Checked By: njh/anm
	Sample No.: 1U	Test Date: 8/26/19	Depth: 19-21 ft
	Test No.: IP-11	Sample Type: intact	Elevation: ---
	Description: Moist, olive clay		
	Remarks: System LTIII-A		

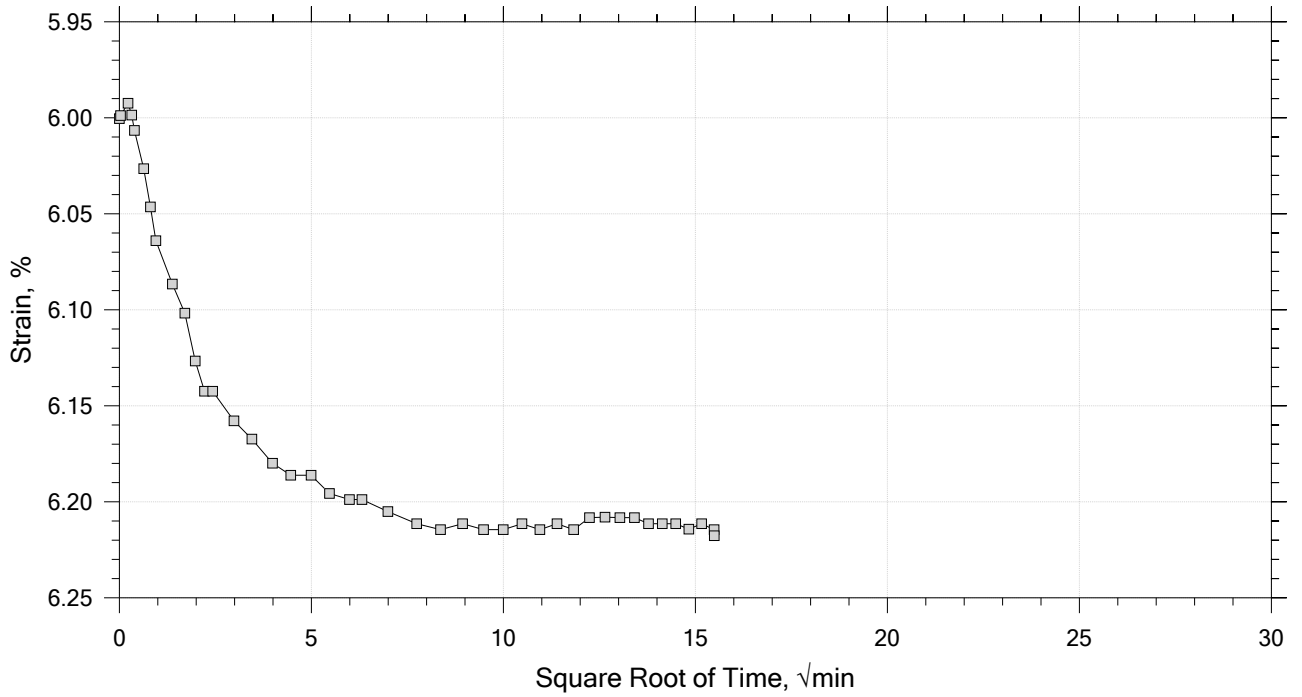
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 12 of 20

Constant Load Step

Stress: 1 tsf

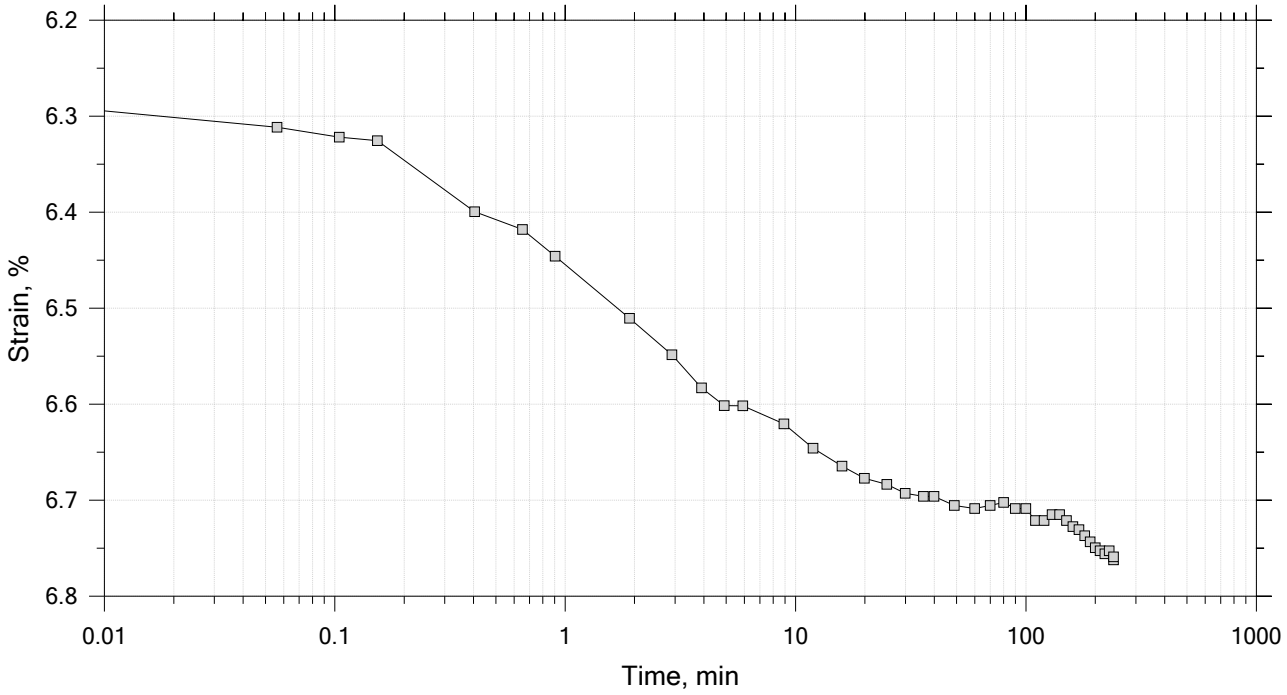


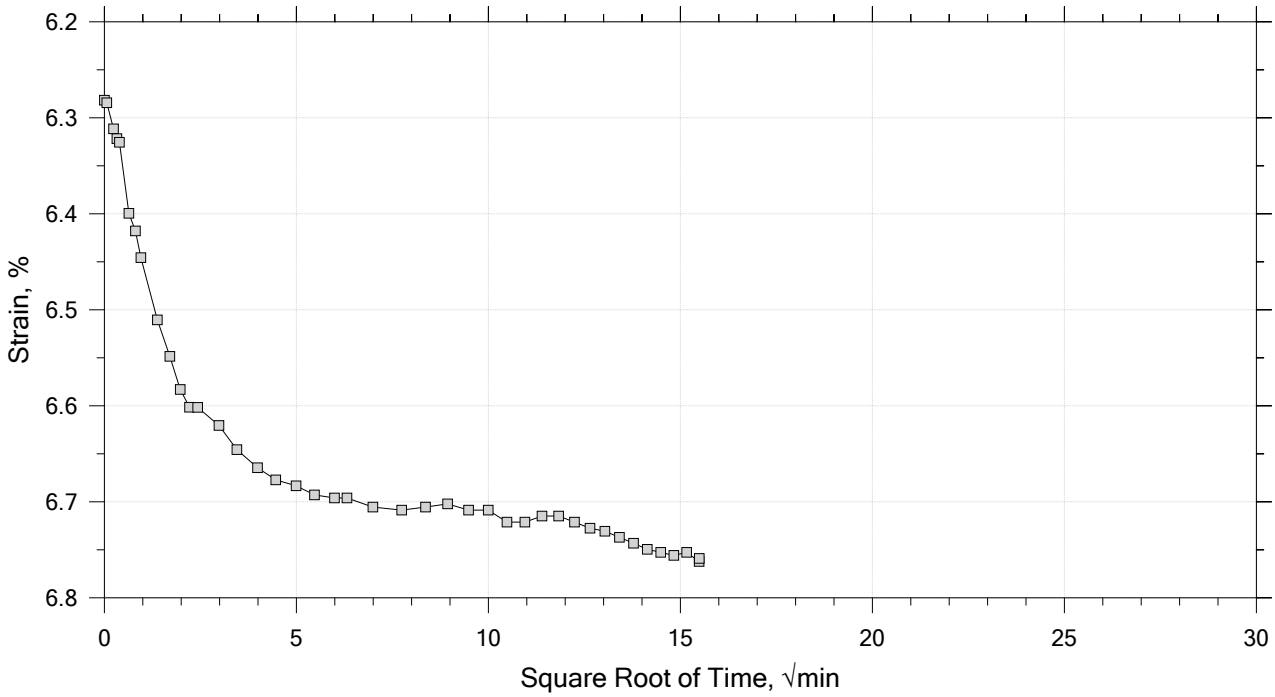


Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
Boring No.: BB-PVS-301	Tested By: trm	Checked By: njh/anm
Sample No.: 1U	Test Date: 8/26/19	Depth: 19-21 ft
Test No.: IP-11	Sample Type: intact	Elevation: ---
Description: Moist, olive clay		
Remarks: System LTIII-A		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 13 of 20
Constant Load Step
Stress: 2 tsf

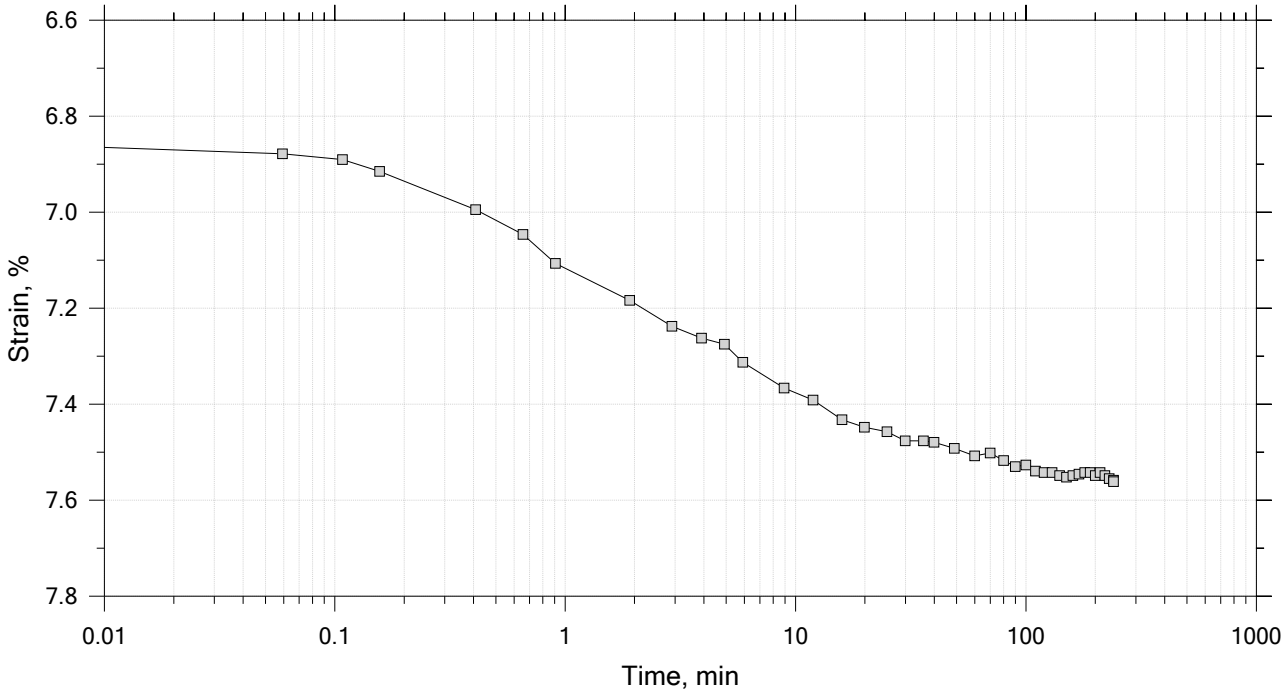


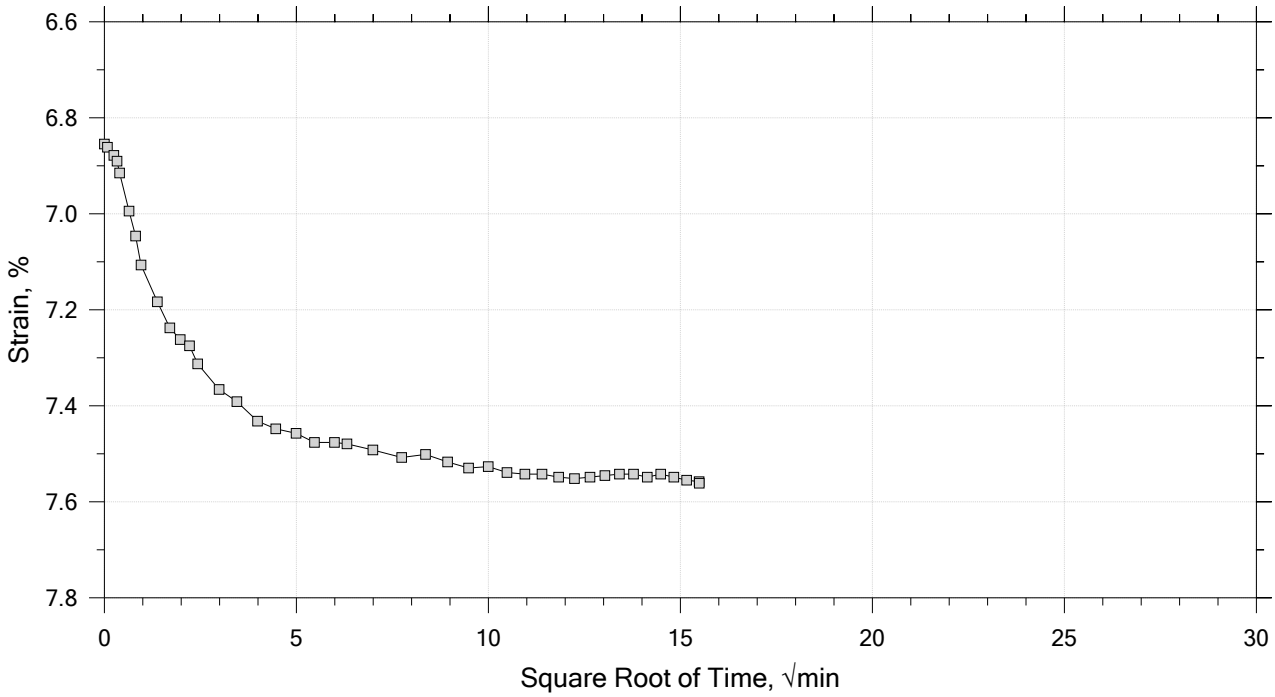


GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-301	Tested By: trm	Checked By: njh/anm
	Sample No.: 1U	Test Date: 8/26/19	Depth: 19-21 ft
	Test No.: IP-11	Sample Type: intact	Elevation: ---
	Description: Moist, olive clay		
	Remarks: System LTIII-A		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 14 of 20
Constant Load Step
Stress: 4 tsf





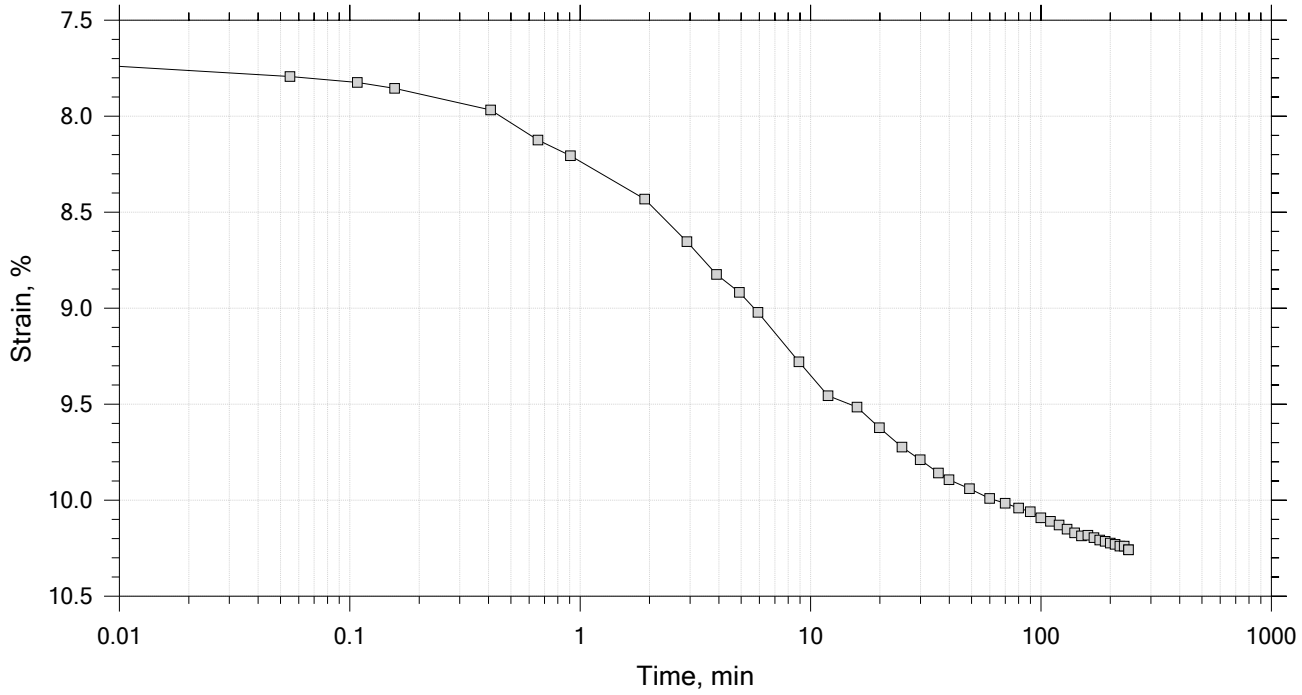
GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-301	Tested By: trm	Checked By: njh/anm
	Sample No.: 1U	Test Date: 8/26/19	Depth: 19-21 ft
	Test No.: IP-11	Sample Type: intact	Elevation: ---
	Description: Moist, olive clay		
	Remarks: System LTIII-A		

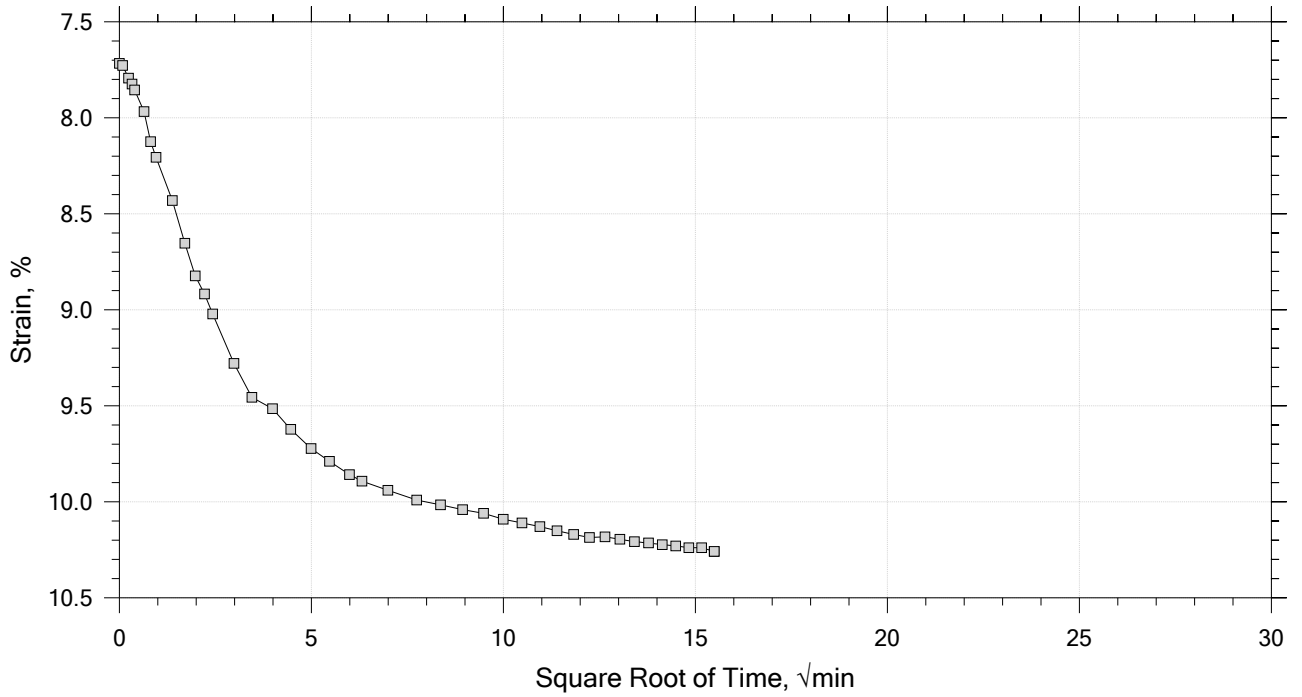
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 15 of 20

Constant Load Step

Stress: 8 tsf





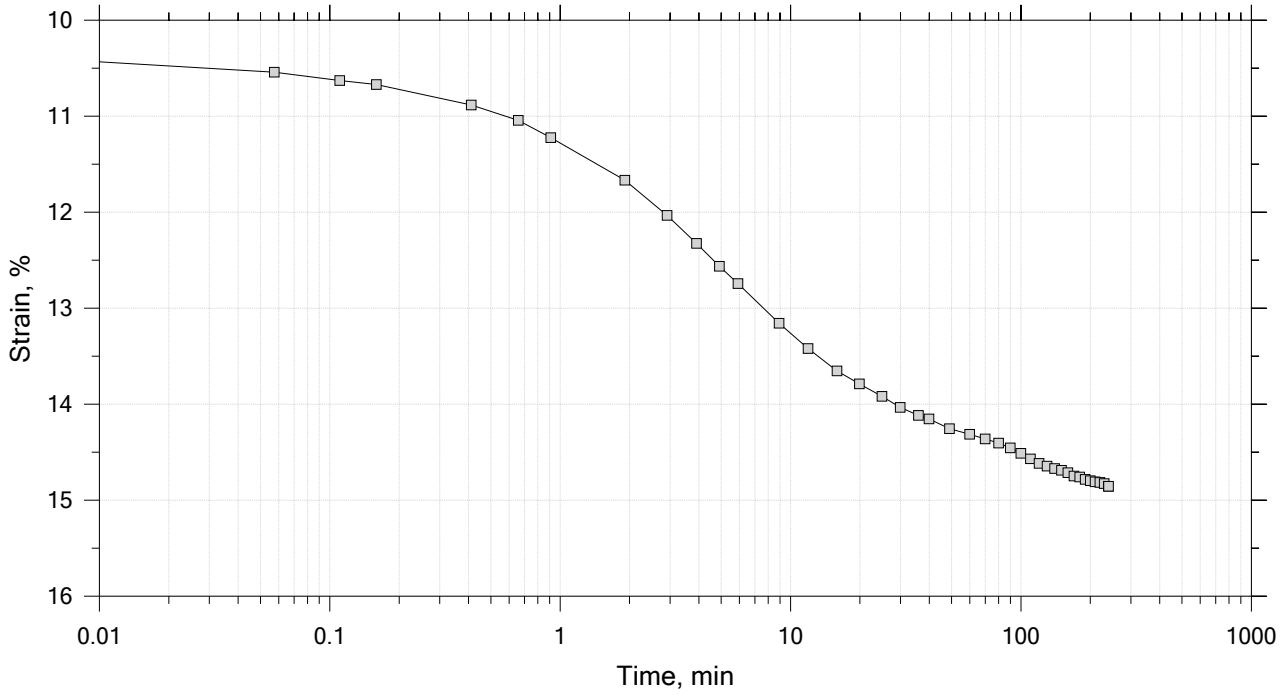
Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
Boring No.: BB-PVS-301	Tested By: trm	Checked By: njh/anm
Sample No.: 1U	Test Date: 8/26/19	Depth: 19-21 ft
Test No.: IP-11	Sample Type: intact	Elevation: ---
Description: Moist, olive clay		
Remarks: System LTIII-A		

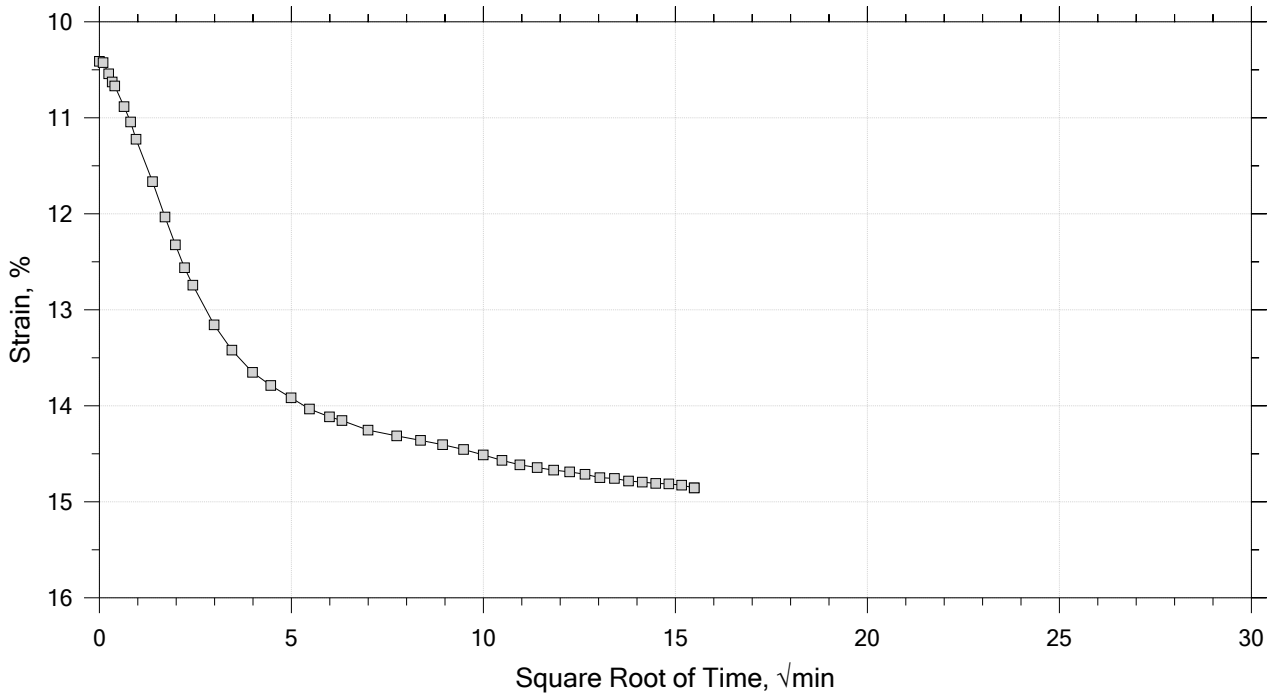
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 16 of 20

Constant Load Step

Stress: 16 tsf

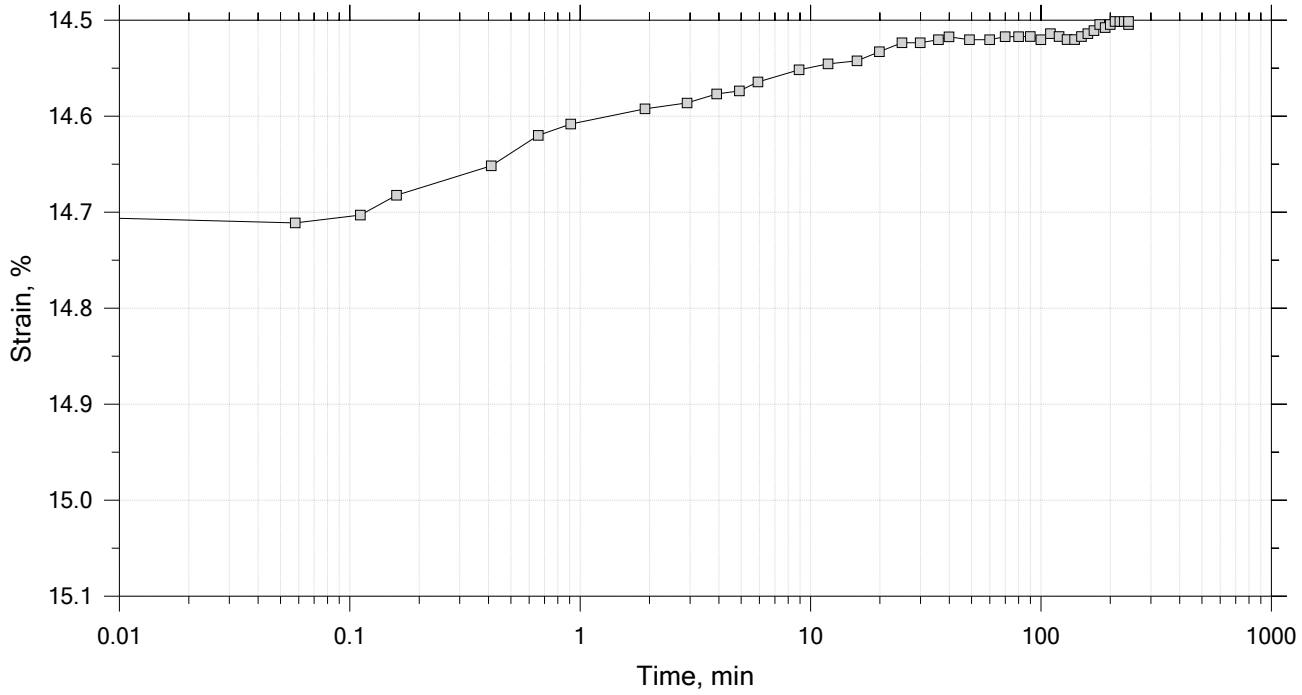


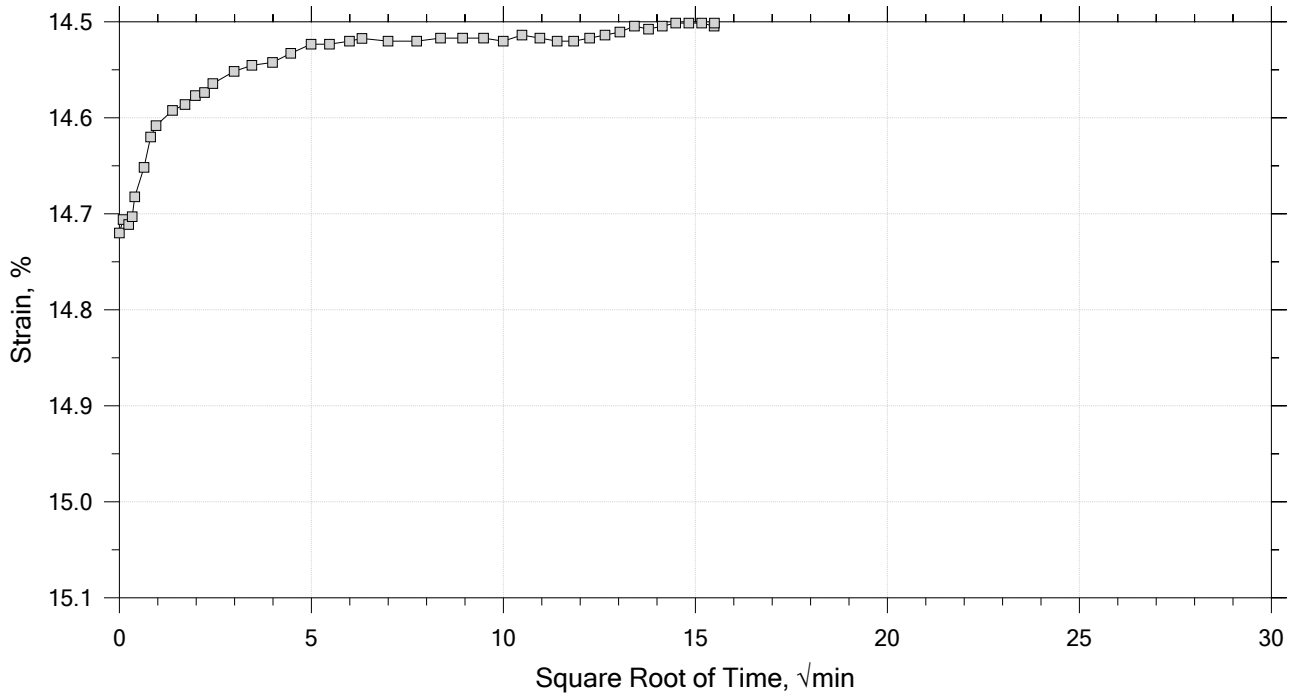


GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-301	Tested By: trm	Checked By: njh/anm
	Sample No.: 1U	Test Date: 8/26/19	Depth: 19-21 ft
	Test No.: IP-11	Sample Type: intact	Elevation: ---
	Description: Moist, olive clay		
	Remarks: System LTIII-A		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 17 of 20
Constant Load Step
Stress: 8 tsf

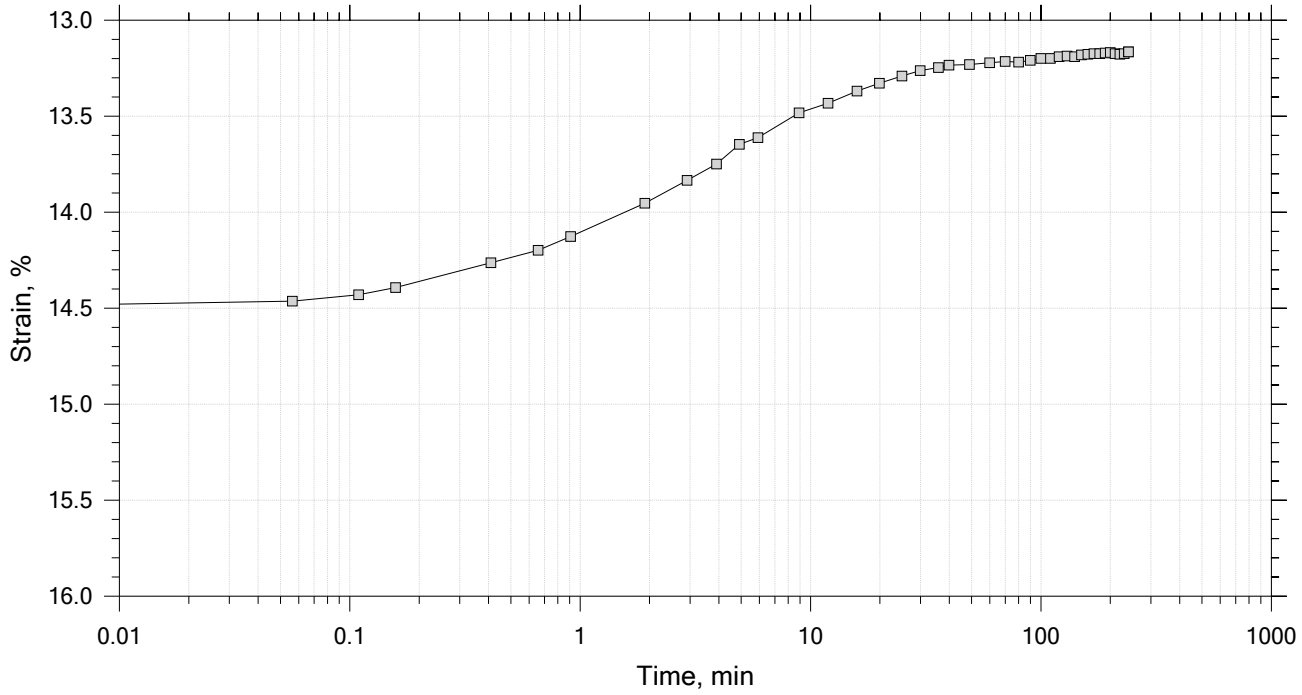


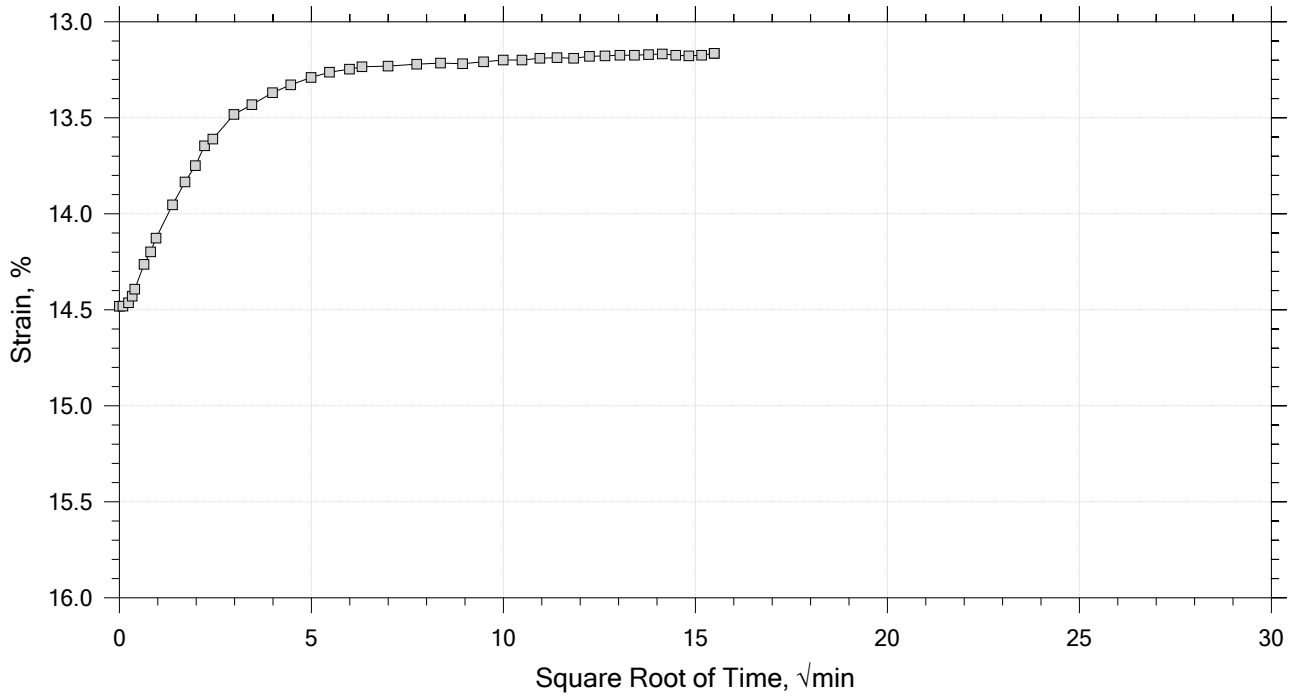


GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-301	Tested By: trm	Checked By: njh/anm
	Sample No.: 1U	Test Date: 8/26/19	Depth: 19-21 ft
	Test No.: IP-11	Sample Type: intact	Elevation: ---
	Description: Moist, olive clay		
	Remarks: System LTIII-A		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 18 of 20
Constant Load Step
Stress: 2 tsf

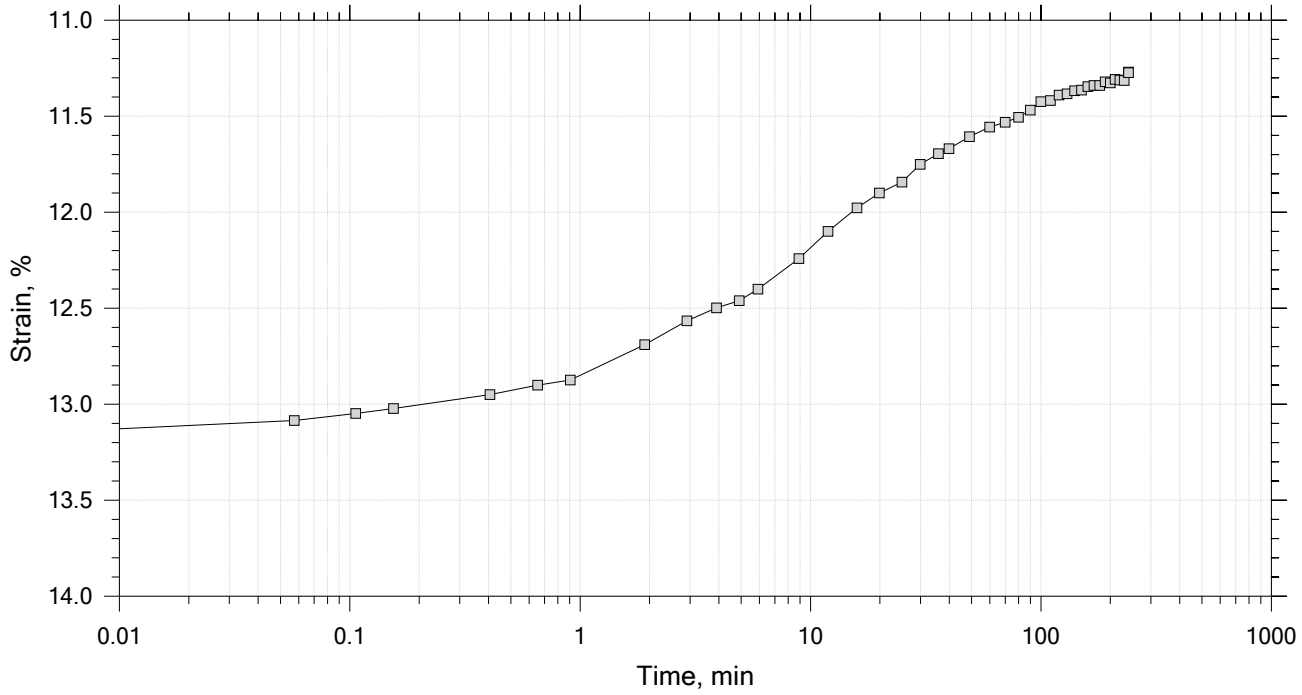


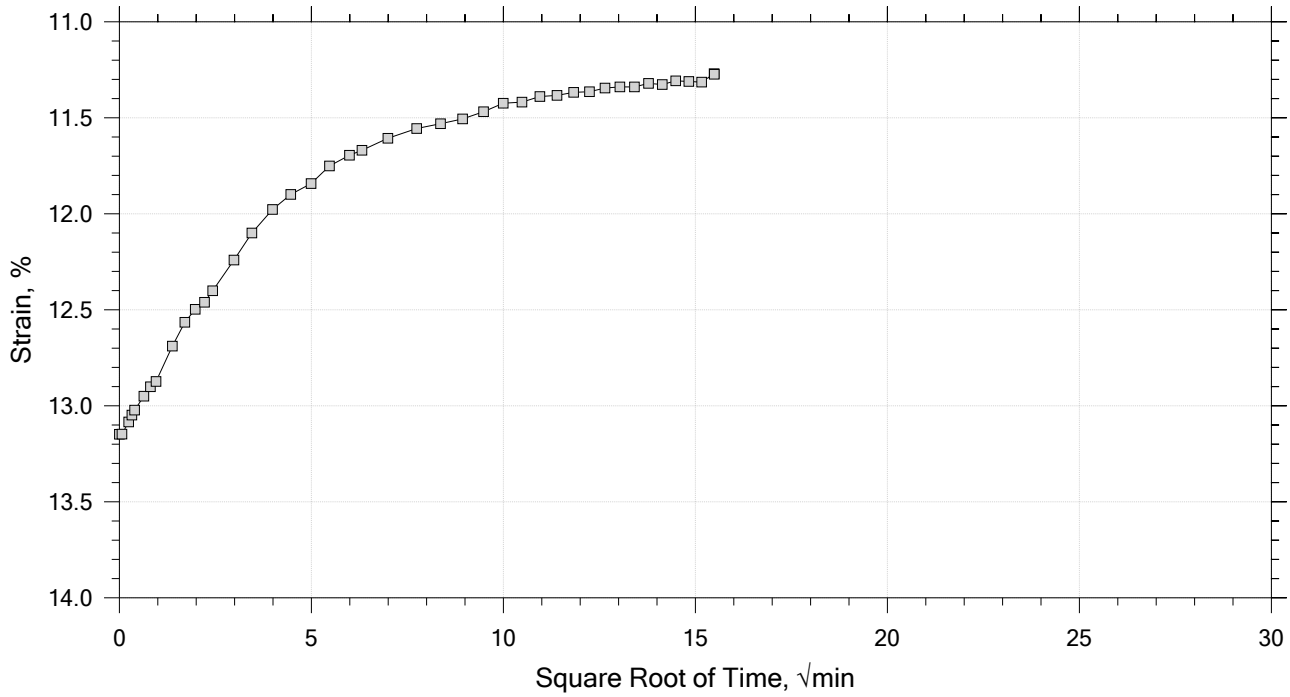


Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
Boring No.: BB-PVS-301	Tested By: trm	Checked By: njh/anm
Sample No.: 1U	Test Date: 8/26/19	Depth: 19-21 ft
Test No.: IP-11	Sample Type: intact	Elevation: ---
Description: Moist, olive clay		
Remarks: System LTIII-A		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 19 of 20
Constant Load Step
Stress: 0.5 tsf

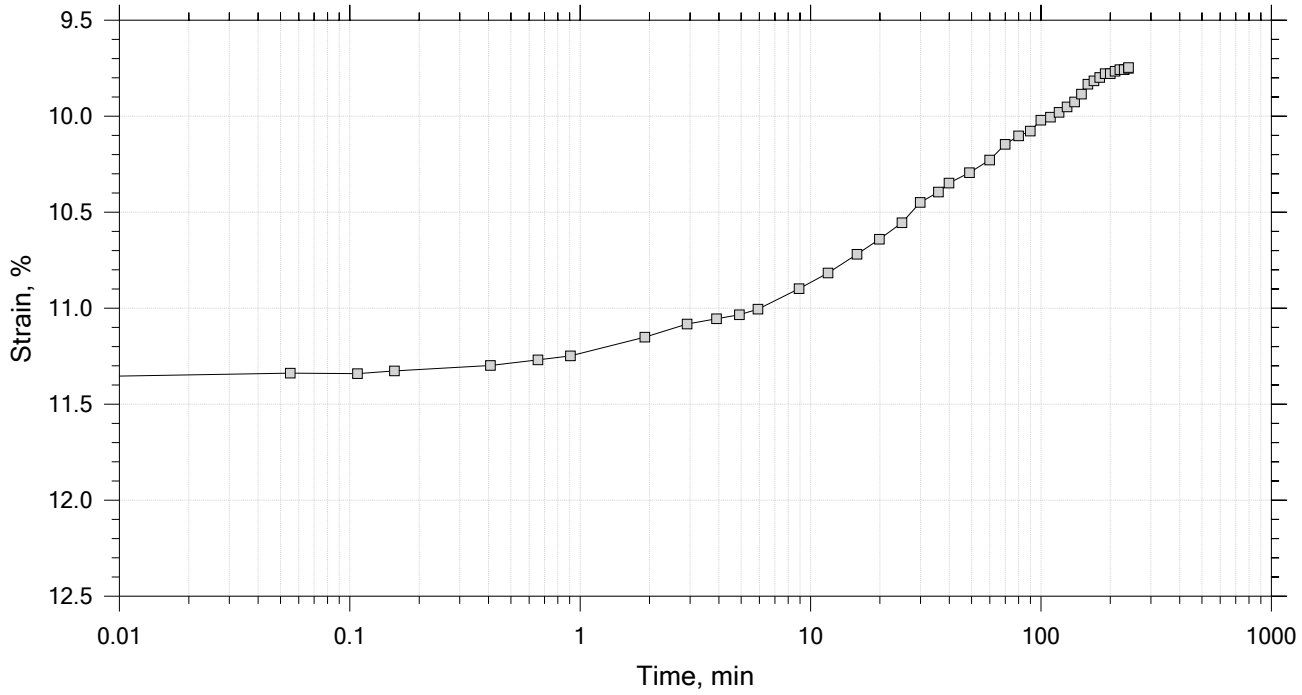


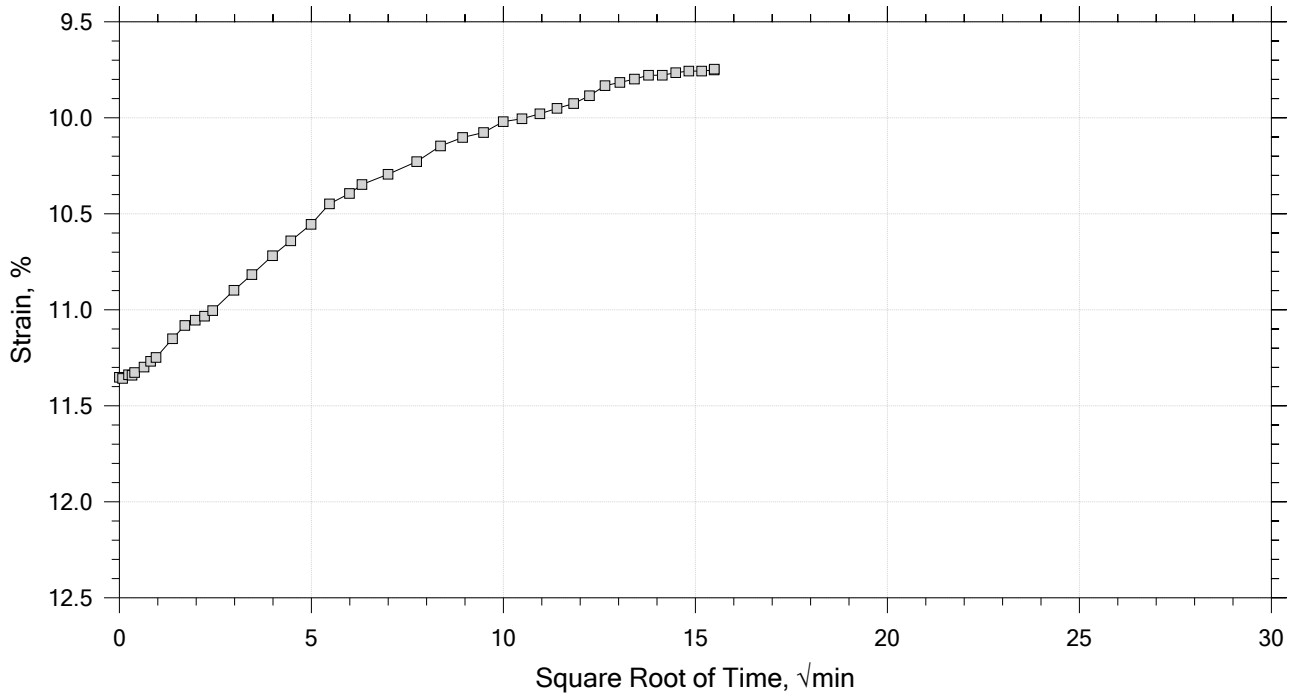


Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
Boring No.: BB-PVS-301	Tested By: trm	Checked By: njh/anm
Sample No.: 1U	Test Date: 8/26/19	Depth: 19-21 ft
Test No.: IP-11	Sample Type: intact	Elevation: ---
Description: Moist, olive clay		
Remarks: System LTIII-A		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 20 of 20
Constant Load Step
Stress: 0.125 tsf





Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
Boring No.: BB-PVS-301	Tested By: trm	Checked By: njh/anm
Sample No.: 1U	Test Date: 8/26/19	Depth: 19-21 ft
Test No.: IP-11	Sample Type: intact	Elevation: ---
Description: Moist, olive clay		
Remarks: System LTIII-A		

One-Dimensional Consolidation by ASTM D2435 - Method B

Specimen Diameter: 2.50 in	Estimated Specific Gravity: 2.76	Liquid Limit: 42
Initial Height: 1.00 in	Initial Void Ratio: 0.936	Plastic Limit: 22
Final Height: 0.92 in	Final Void Ratio: 0.781	Plasticity Index: 20

	Before Test Trimmings	Before Test Specimen	After Test Specimen	After Test Trimmings
Container ID	A2107	RING		A-2981
Mass Container, gm	8.62	111.2	111.2	8.54
Mass Container + Wet Soil, gm	117.71	264.41	258.15	156.09
Mass Container + Dry Soil, gm	89.54	225.69	225.69	123.5
Mass Dry Soil, gm	80.92	114.49	114.49	114.96
Water Content, %	34.81	33.82	28.35	28.35
Void Ratio	---	0.94	0.78	---
Degree of Saturation, %	---	99.55	100.00	---
Dry Unit Weight, pcf	---	88.856	96.582	---

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.

GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-301	Tested By: trm	Checked By: njh/anm
	Sample No.: 1U	Test Date: 8/26/19	Depth: 19-21 ft
	Test No.: IP-11	Sample Type: intact	Elevation: ---
	Description: Moist, olive clay		
	Remarks: System LTIII-A		

One-Dimensional Consolidation by ASTM D2435 - Method B

Log of Time Coefficients

Step	Applied Stress tsf	Final Displacement in	Void Ratio	Strain at End %	Log T50 min	Cv ft²/s	Mv 1/tsf	k ft/day	Ca %
1	0.173	0.02181	0.894	2.18	0.000	0.00e+00	1.26e-01	0.00e+00	0.00e+00
2	0.250	0.02447	0.889	2.45	14.707	3.70e-07	3.44e-02	3.43e-05	0.00e+00
3	0.500	0.03493	0.868	3.49	5.434	9.88e-07	4.18e-02	1.11e-04	0.00e+00
4	0.750	0.04028	0.858	4.03	0.000	0.00e+00	2.14e-02	0.00e+00	0.00e+00
5	1.00	0.04560	0.848	4.56	0.000	0.00e+00	2.13e-02	0.00e+00	0.00e+00
6	1.50	0.05037	0.839	5.04	0.000	0.00e+00	9.54e-03	0.00e+00	0.00e+00
7	2.00	0.05467	0.830	5.47	0.000	0.00e+00	8.60e-03	0.00e+00	0.00e+00
8	4.00	0.07234	0.796	7.23	2.795	1.79e-06	8.83e-03	4.26e-05	0.00e+00
9	2.00	0.07064	0.799	7.06	0.000	0.00e+00	8.47e-04	0.00e+00	0.00e+00
10	1.00	0.06614	0.808	6.61	3.537	1.40e-06	4.50e-03	1.70e-05	0.00e+00
11	0.500	0.06187	0.816	6.19	5.375	9.29e-07	8.54e-03	2.14e-05	0.00e+00
12	1.00	0.06218	0.816	6.22	0.000	0.00e+00	6.15e-04	0.00e+00	0.00e+00
13	2.00	0.06759	0.805	6.76	0.000	0.00e+00	5.41e-03	0.00e+00	0.00e+00
14	4.00	0.07561	0.790	7.56	0.000	0.00e+00	4.01e-03	0.00e+00	0.00e+00
15	8.00	0.1026	0.737	10.3	4.022	1.18e-06	6.74e-03	2.14e-05	0.00e+00
16	16.0	0.1486	0.648	14.9	4.107	1.06e-06	5.75e-03	1.64e-05	0.00e+00
17	8.00	0.1450	0.655	14.5	0.000	0.00e+00	4.43e-04	0.00e+00	0.00e+00
18	2.00	0.1316	0.681	13.2	2.660	1.59e-06	2.23e-03	9.56e-06	0.00e+00
19	0.500	0.1127	0.718	11.3	7.423	5.92e-07	1.26e-02	2.01e-05	0.00e+00
20	0.125	0.09747	0.747	9.75	0.000	0.00e+00	4.07e-02	0.00e+00	0.00e+00

GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-301	Tested By: trm	Checked By: njh/anm
	Sample No.: 1U	Test Date: 8/26/19	Depth: 19-21 ft
	Test No.: IP-11	Sample Type: intact	Elevation: ---
	Description: Moist, olive clay		
	Remarks: System LTIII-A		
	Displacement at End of Increment		

One-Dimensional Consolidation by ASTM D2435 - Method B

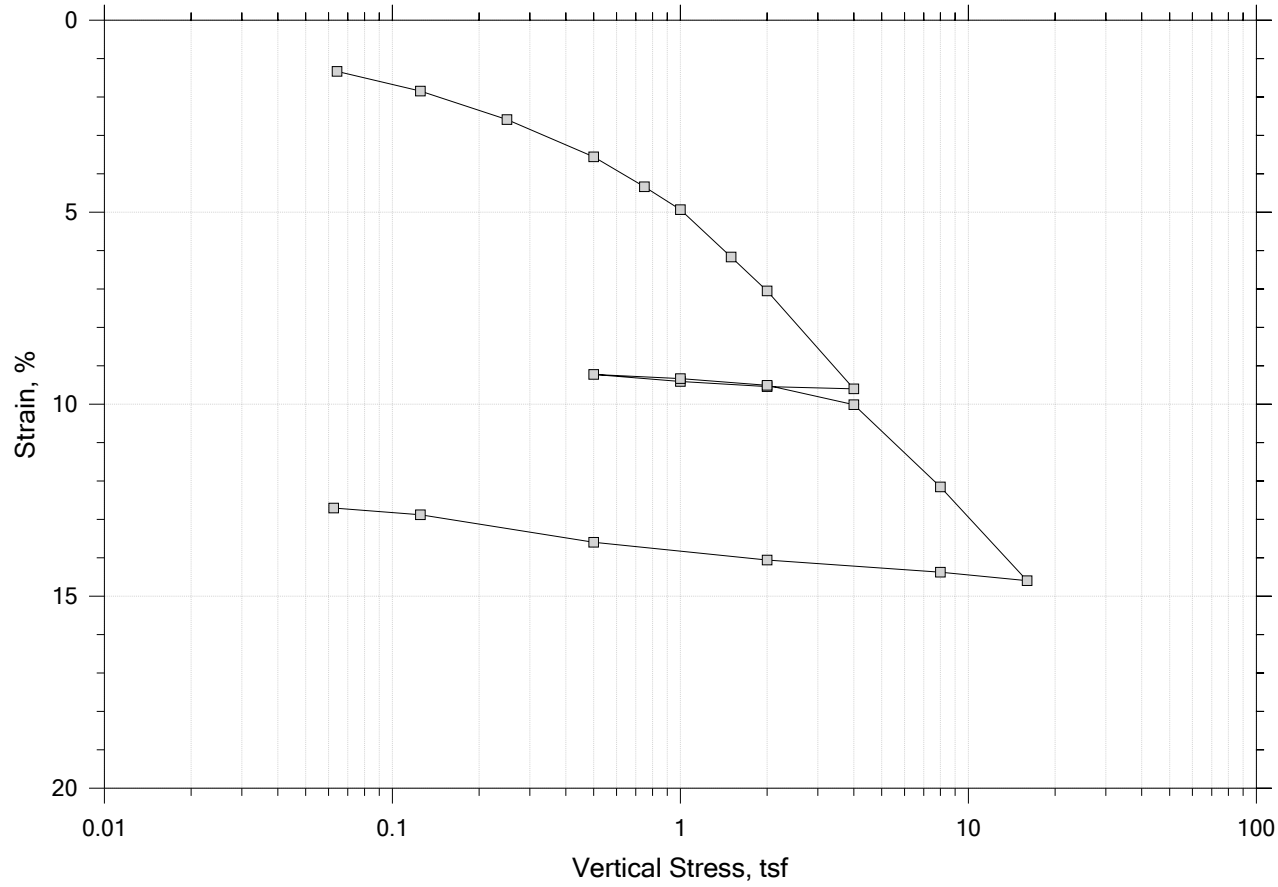
Square Root of Time Coefficients

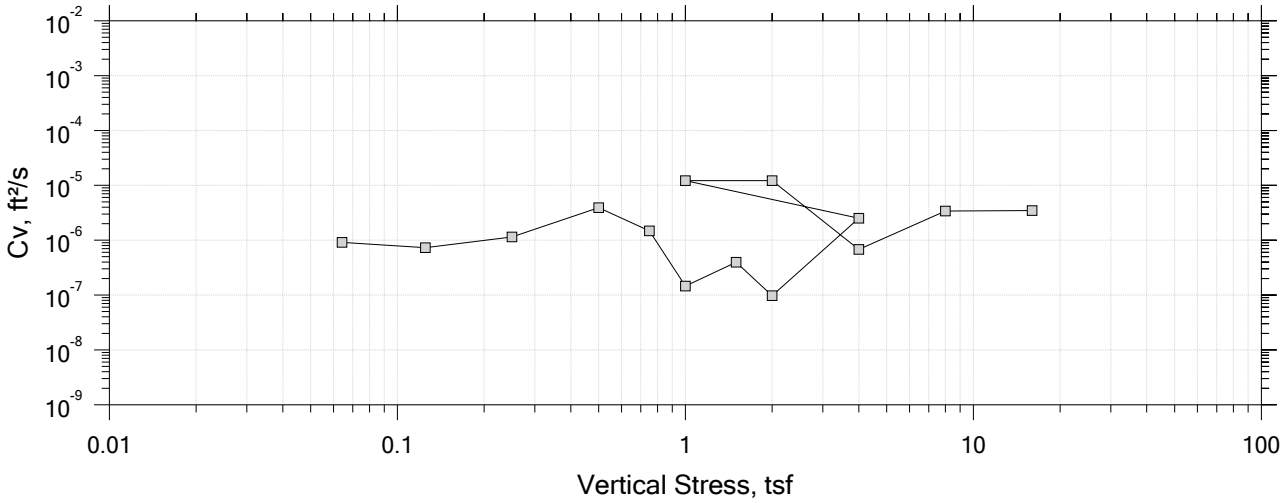
Step	Applied Stress tsf	Final Displacement in	Void Ratio	Strain at End %	Sq.Rt. T90 min	Cv ft²/s	Mv 1/tsf	k ft/day
1	0.173	0.02181	0.894	2.18	274.691	8.74e-08	1.26e-01	2.98e-05
2	0.250	0.02447	0.889	2.45	58.099	4.03e-07	3.44e-02	3.74e-05
3	0.500	0.03493	0.868	3.49	17.994	1.28e-06	4.18e-02	1.45e-04
4	0.750	0.04028	0.858	4.03	6.481	3.51e-06	2.14e-02	2.03e-04
5	1.00	0.04560	0.848	4.56	27.763	8.10e-07	2.13e-02	4.65e-05
6	1.50	0.05037	0.839	5.04	99.599	2.23e-07	9.54e-03	5.74e-06
7	2.00	0.05467	0.830	5.47	128.072	1.72e-07	8.60e-03	3.99e-06
8	4.00	0.07234	0.796	7.23	9.811	2.19e-06	8.83e-03	5.23e-05
9	2.00	0.07064	0.799	7.06	199.505	1.06e-07	8.47e-04	2.42e-07
10	1.00	0.06614	0.808	6.61	26.170	8.14e-07	4.50e-03	9.88e-06
11	0.500	0.06187	0.816	6.19	19.589	1.10e-06	8.54e-03	2.53e-05
12	1.00	0.06218	0.816	6.22	10.731	2.01e-06	6.15e-04	3.34e-06
13	2.00	0.06759	0.805	6.76	9.368	2.29e-06	5.41e-03	3.34e-05
14	4.00	0.07561	0.790	7.56	9.357	2.26e-06	4.01e-03	2.45e-05
15	8.00	0.1026	0.737	10.3	15.782	1.29e-06	6.74e-03	2.35e-05
16	16.0	0.1486	0.648	14.9	17.141	1.09e-06	5.75e-03	1.70e-05
17	8.00	0.1450	0.655	14.5	6.245	2.86e-06	4.43e-04	3.41e-06
18	2.00	0.1316	0.681	13.2	11.584	1.57e-06	2.23e-03	9.45e-06
19	0.500	0.1127	0.718	11.3	30.892	6.12e-07	1.26e-02	2.08e-05
20	0.125	0.09747	0.747	9.75	86.776	2.26e-07	4.07e-02	2.49e-05

GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-301	Tested By: trm	Checked By: njh/anm
	Sample No.: 1U	Test Date: 8/26/19	Depth: 19-21 ft
	Test No.: IP-11	Sample Type: intact	Elevation: ---
	Description: Moist, olive clay		
	Remarks: System LTIII-A		
	Displacement at End of Increment		

One-Dimensional Consolidation by ASTM D2435 - Method B

Summary Report





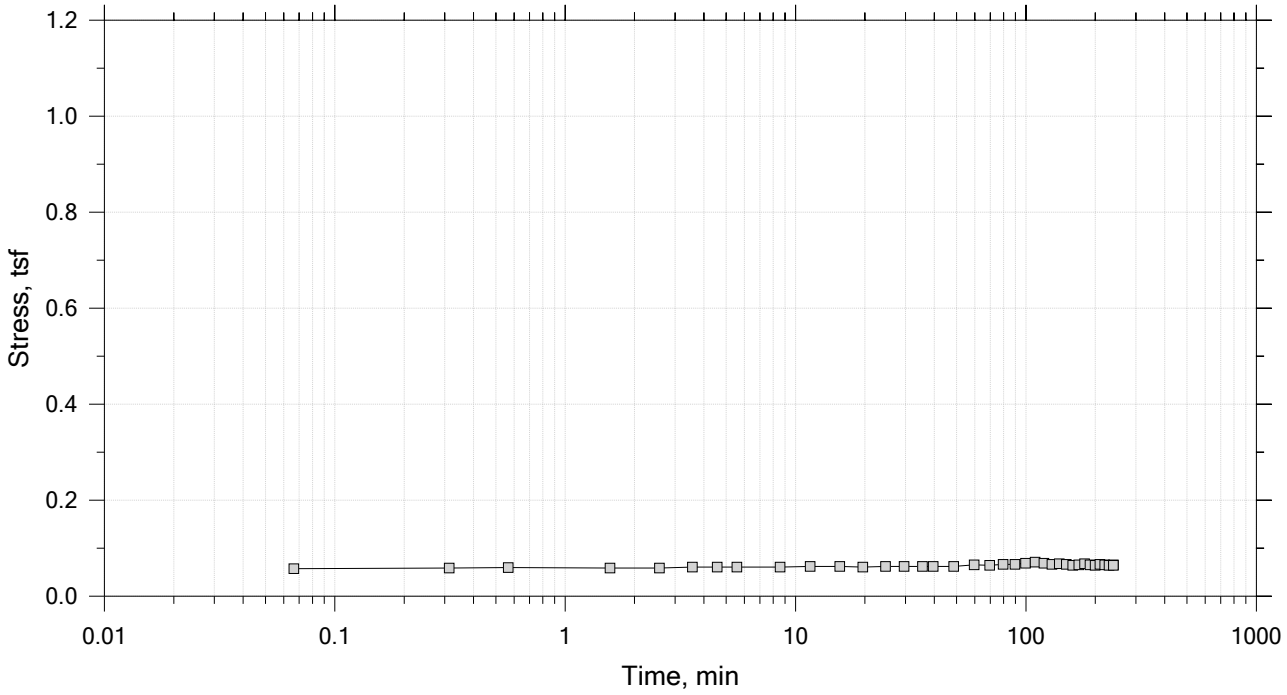
GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-301	Tested By: trm	Checked By: njh/anm
	Sample No.: 2U	Test Date: 8/30/19	Depth: 26.5-28.5 ft
	Test No.: IP-12	Sample Type: intact	Elevation: ---
	Description: Moist, olive gray clay		
	Remarks: System Y, Swell Pressure = 0.0642 tsf		
	Displacement at End of Increment		

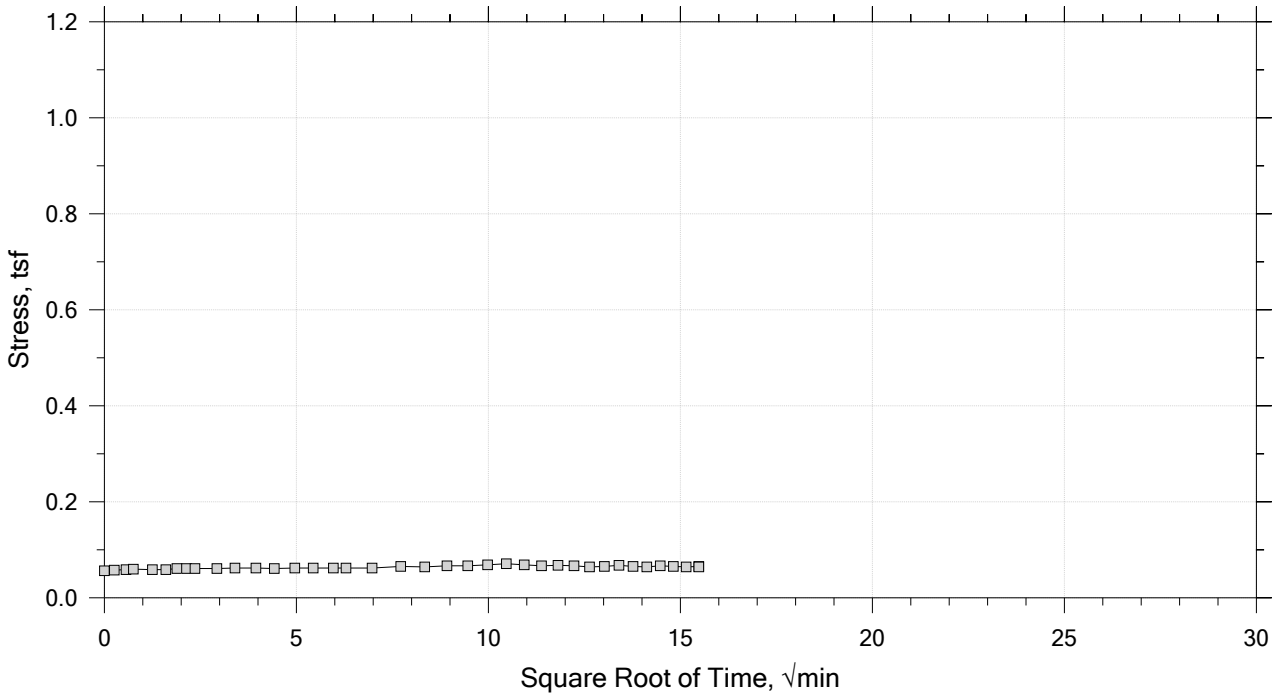
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 1 of 22

Constant Volume Step

Stress: 0.0642 tsf





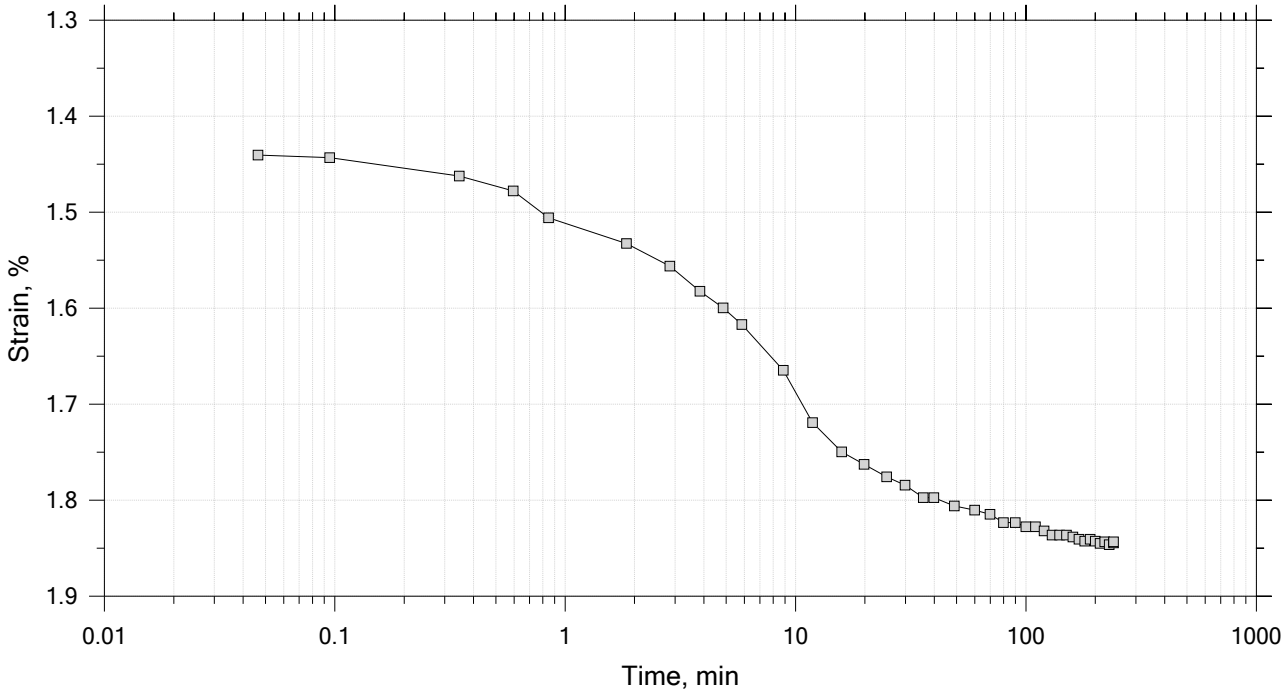
GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-301	Tested By: trm	Checked By: njh/anm
	Sample No.: 2U	Test Date: 8/30/19	Depth: 26.5-28.5 ft
	Test No.: IP-12	Sample Type: intact	Elevation: ---
	Description: Moist, olive gray clay		
	Remarks: System Y, Swell Pressure = 0.0642 tsf		

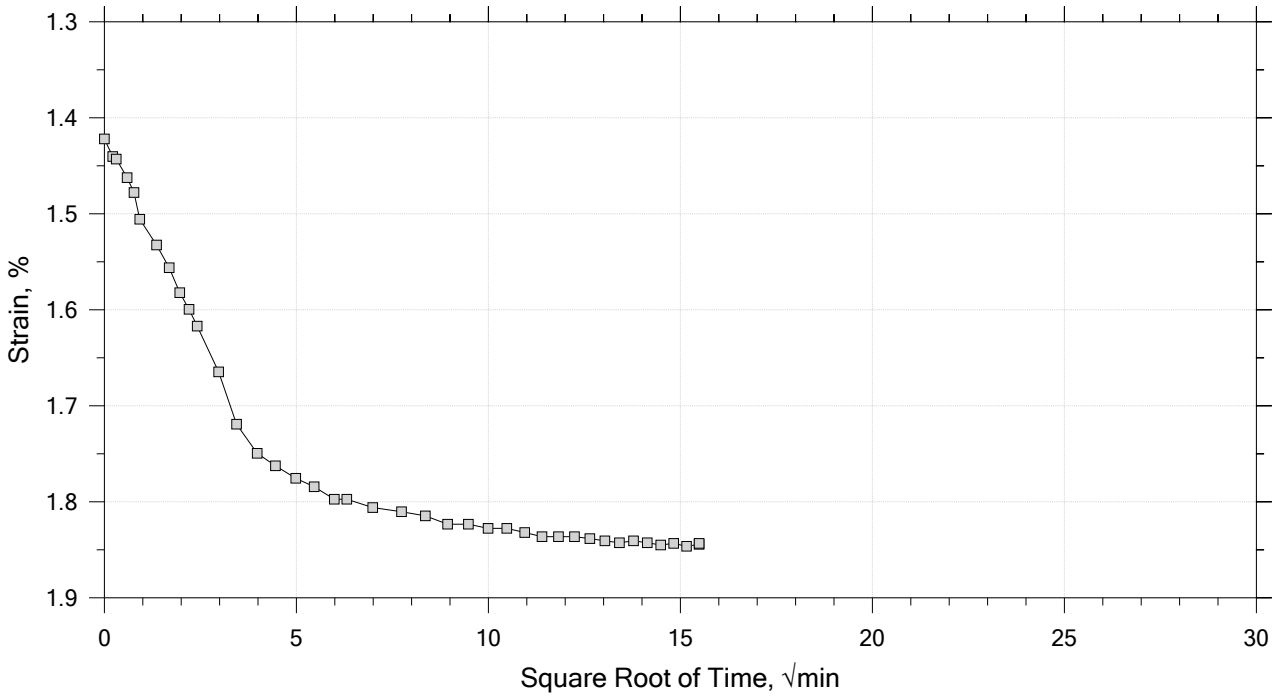
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 2 of 22

Constant Load Step

Stress: 0.125 tsf





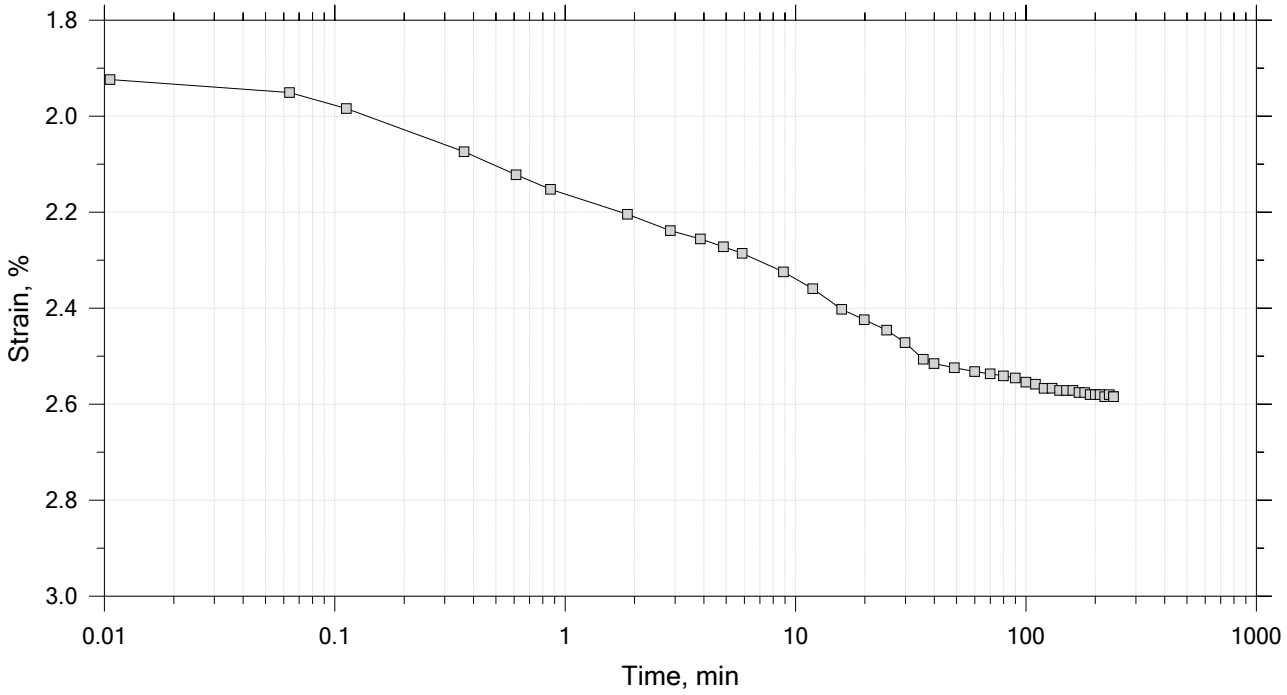
GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-301	Tested By: trm	Checked By: njh/anm
	Sample No.: 2U	Test Date: 8/30/19	Depth: 26.5-28.5 ft
	Test No.: IP-12	Sample Type: intact	Elevation: ---
	Description: Moist, olive gray clay		
	Remarks: System Y, Swell Pressure = 0.0642 tsf		

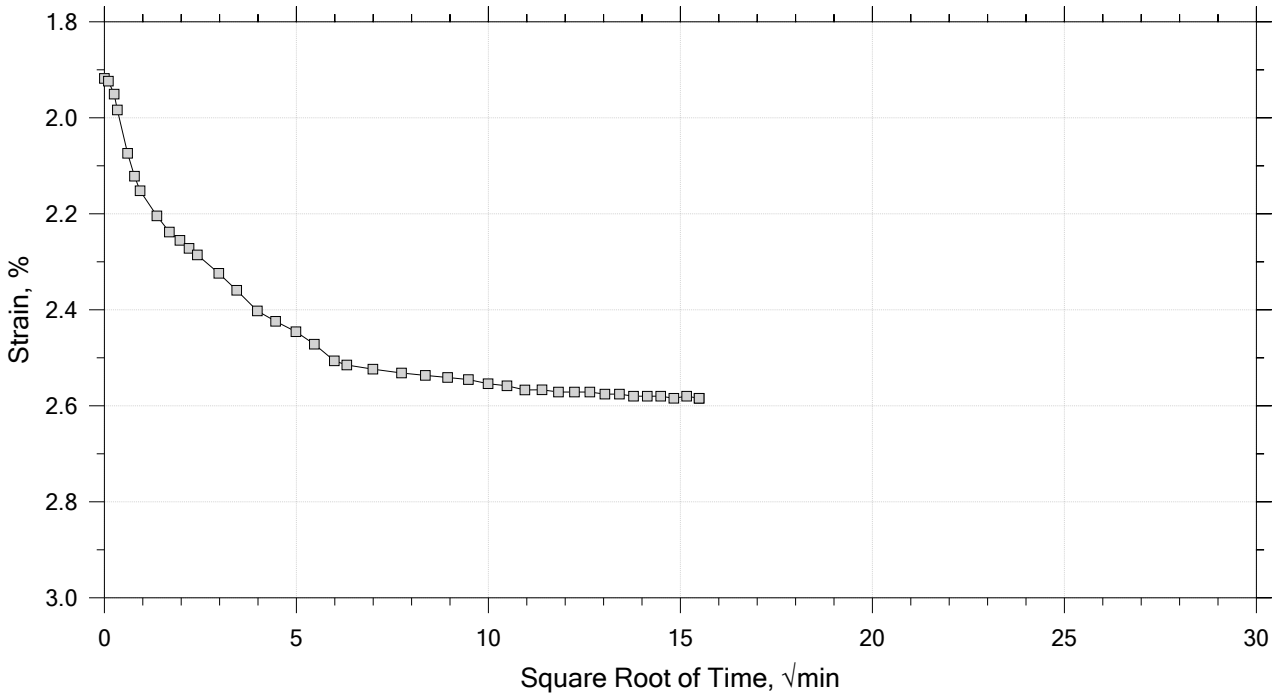
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 3 of 22

Constant Load Step

Stress: 0.25 tsf





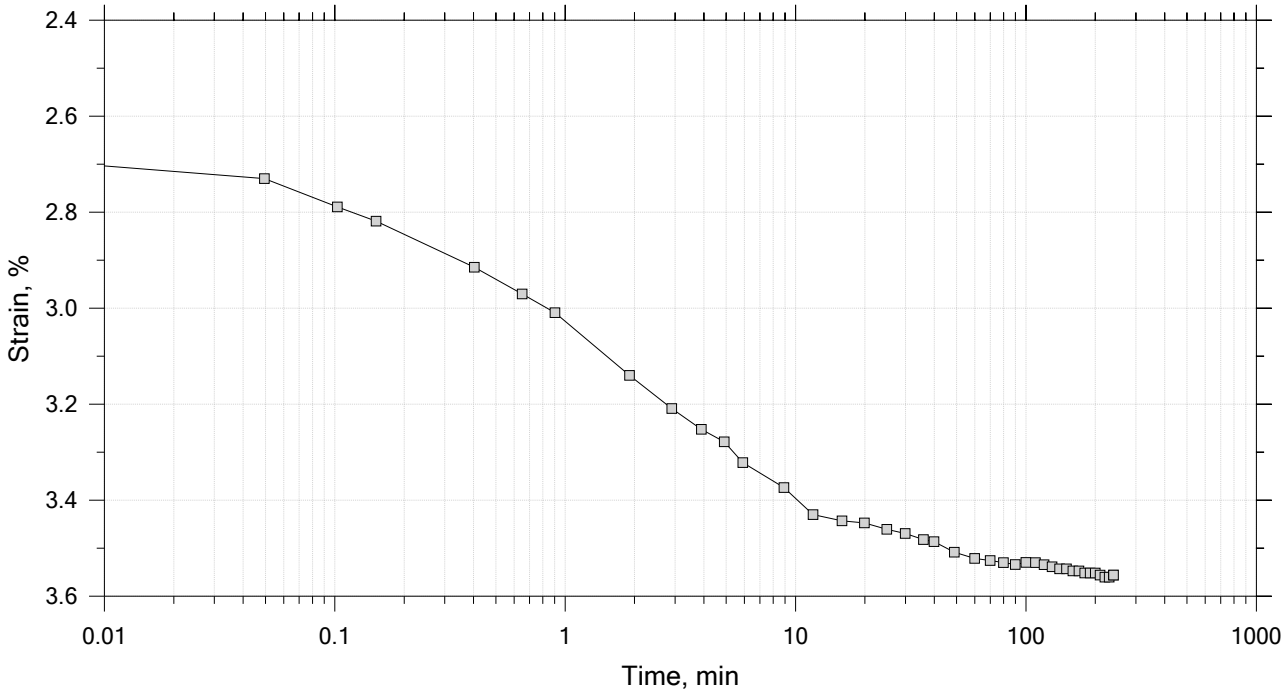
Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
Boring No.: BB-PVS-301	Tested By: trm	Checked By: njh/anm
Sample No.: 2U	Test Date: 8/30/19	Depth: 26.5-28.5 ft
Test No.: IP-12	Sample Type: intact	Elevation: ---
Description: Moist, olive gray clay		
Remarks: System Y, Swell Pressure = 0.0642 tsf		

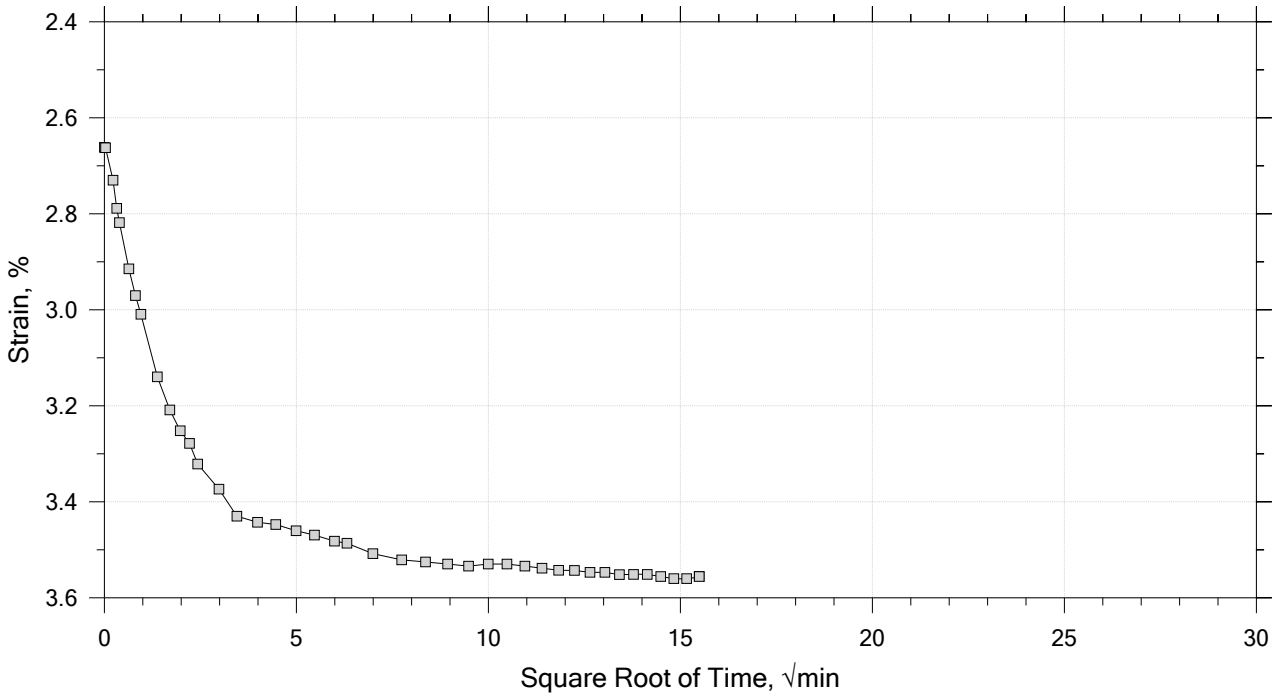
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 4 of 22

Constant Load Step

Stress: 0.5 tsf





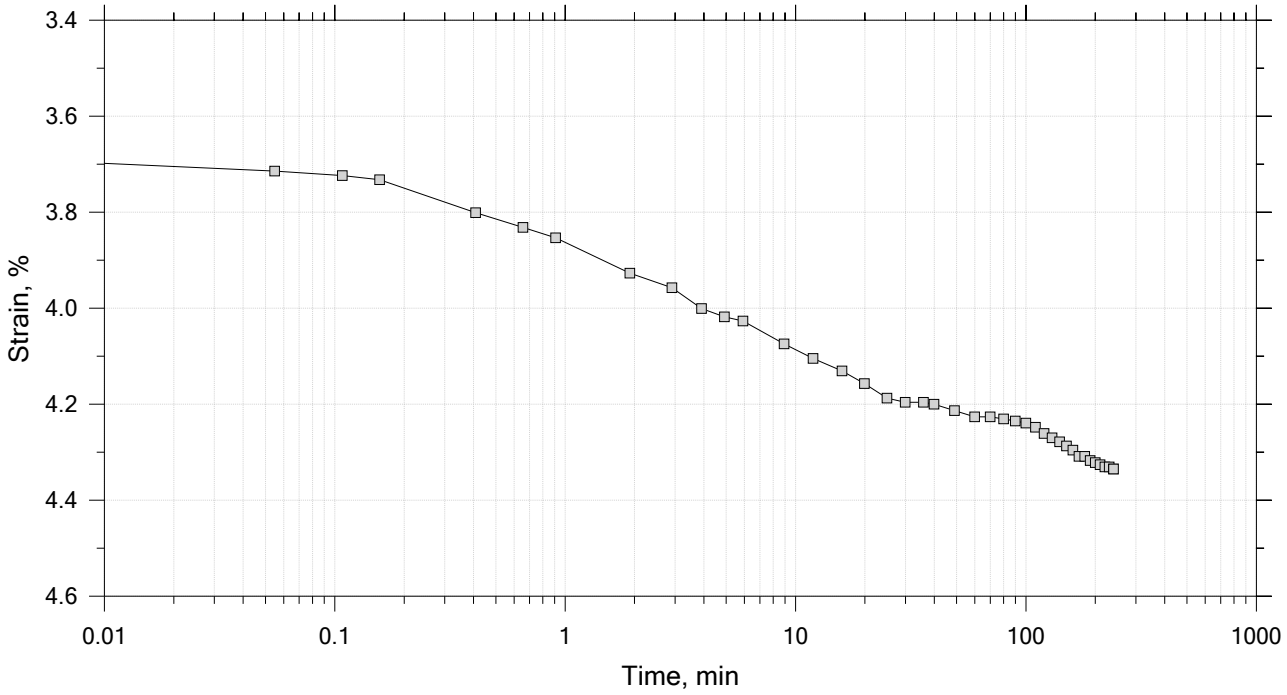
GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-301	Tested By: trm	Checked By: njh/anm
	Sample No.: 2U	Test Date: 8/30/19	Depth: 26.5-28.5 ft
	Test No.: IP-12	Sample Type: intact	Elevation: ---
	Description: Moist, olive gray clay		
	Remarks: System Y, Swell Pressure = 0.0642 tsf		

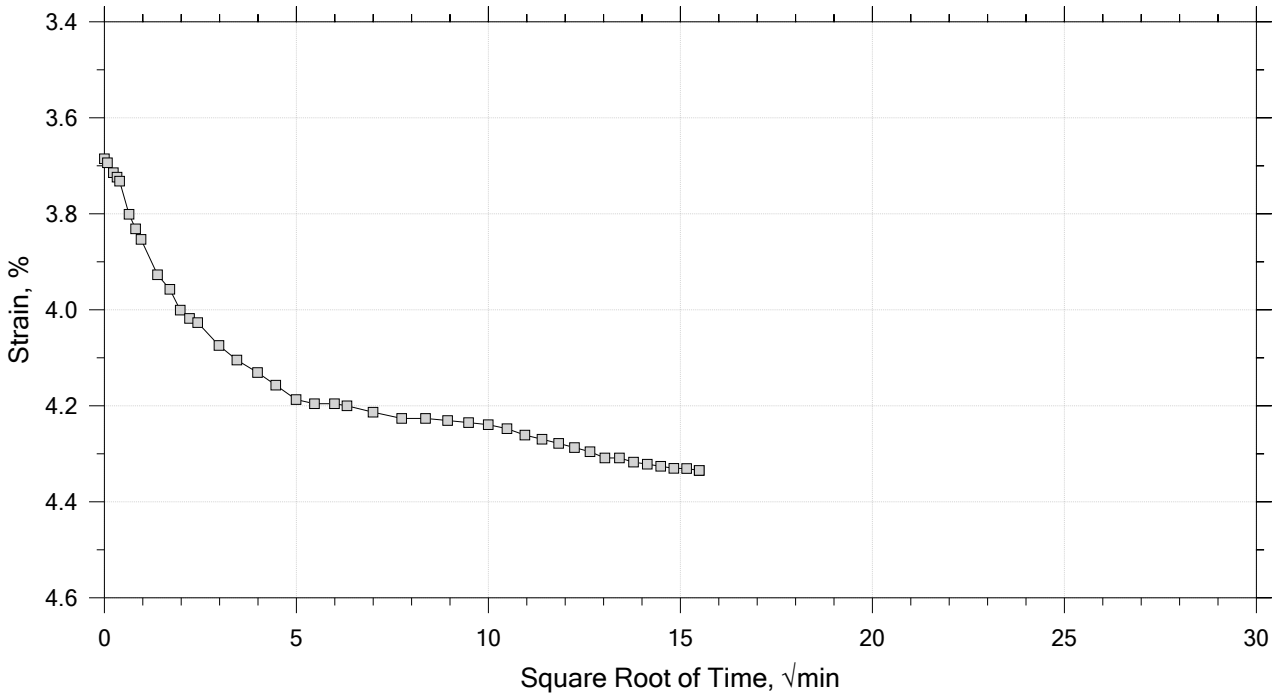
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 5 of 22

Constant Load Step

Stress: 0.75 tsf





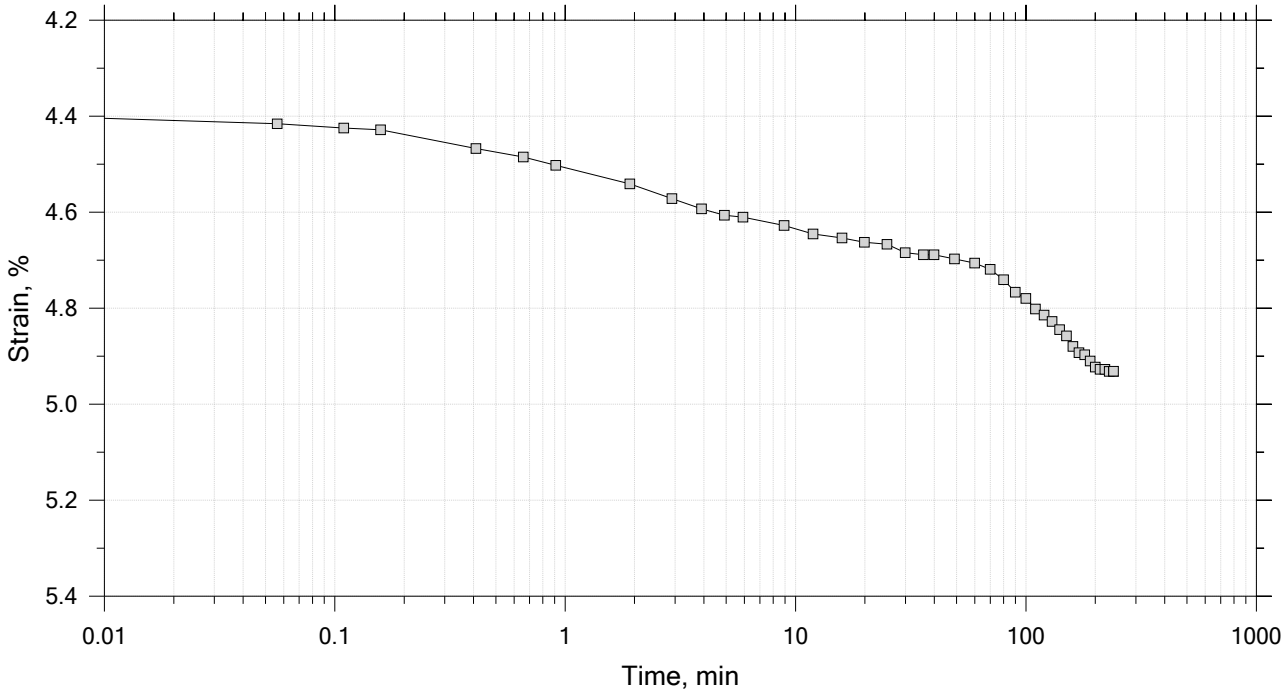
GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-301	Tested By: trm	Checked By: njh/anm
	Sample No.: 2U	Test Date: 8/30/19	Depth: 26.5-28.5 ft
	Test No.: IP-12	Sample Type: intact	Elevation: ---
	Description: Moist, olive gray clay		
	Remarks: System Y, Swell Pressure = 0.0642 tsf		

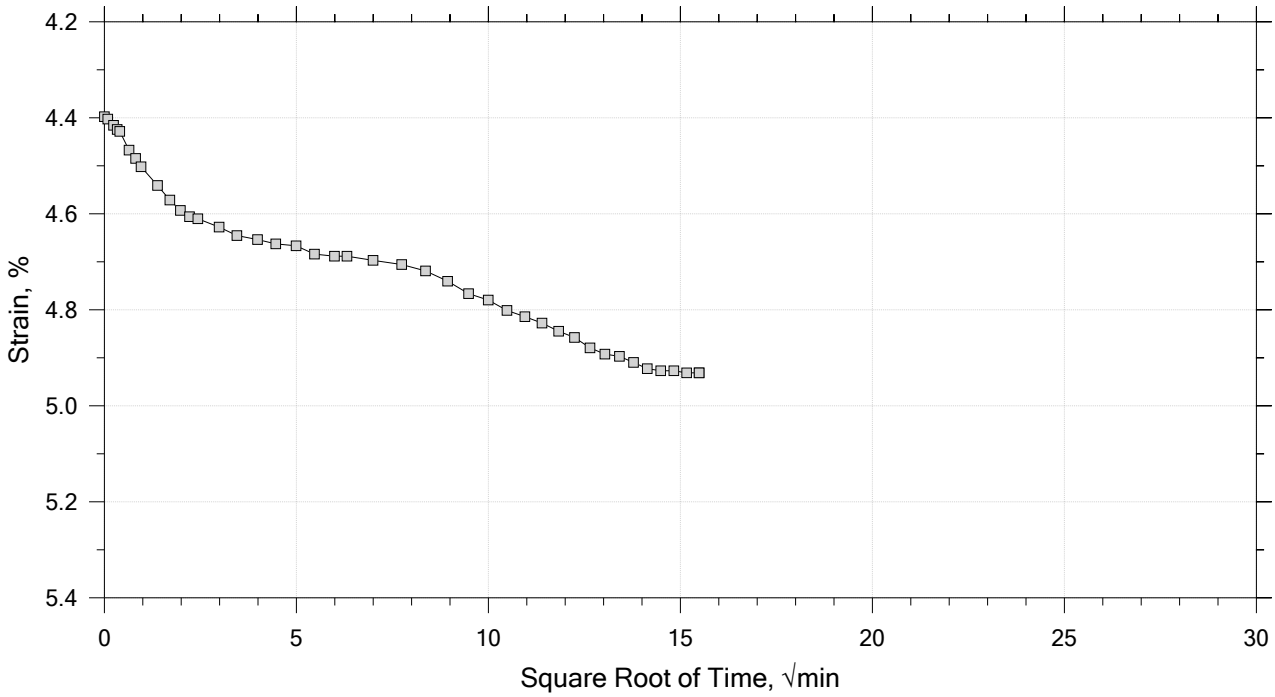
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 6 of 22

Constant Load Step

Stress: 1 tsf





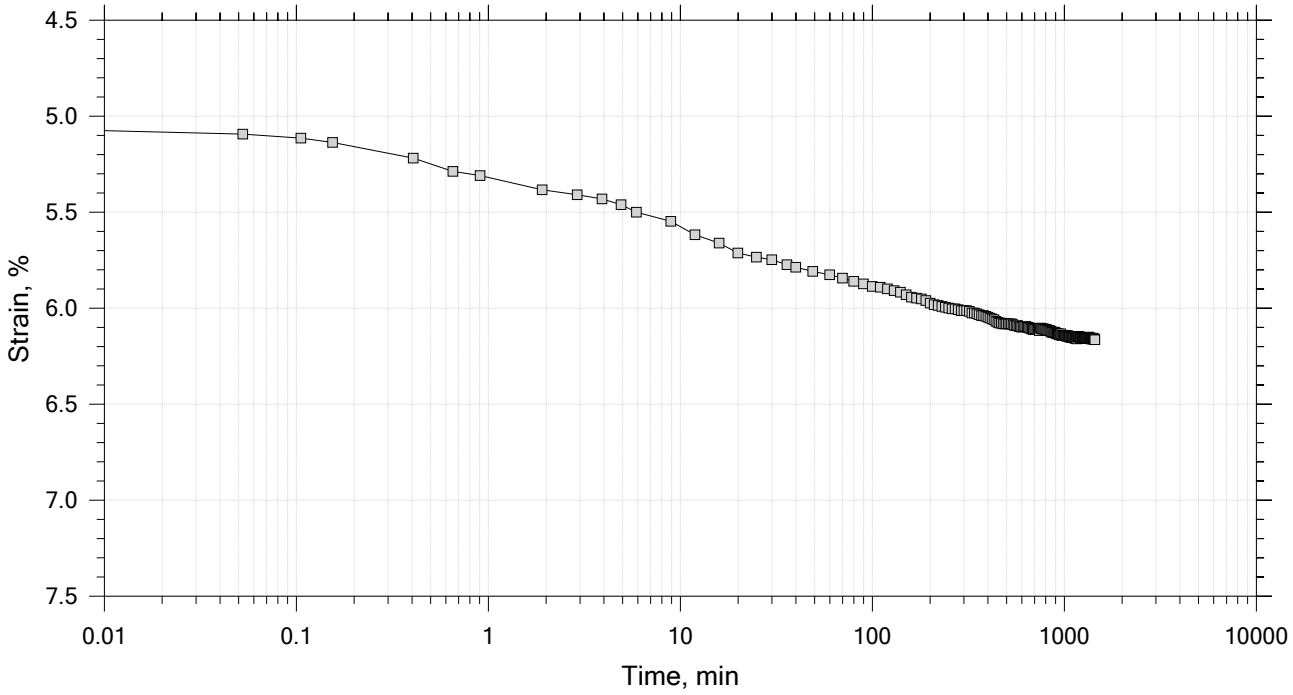
Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
Boring No.: BB-PVS-301	Tested By: trm	Checked By: njh/anm
Sample No.: 2U	Test Date: 8/30/19	Depth: 26.5-28.5 ft
Test No.: IP-12	Sample Type: intact	Elevation: ---
Description: Moist, olive gray clay		
Remarks: System Y, Swell Pressure = 0.0642 tsf		

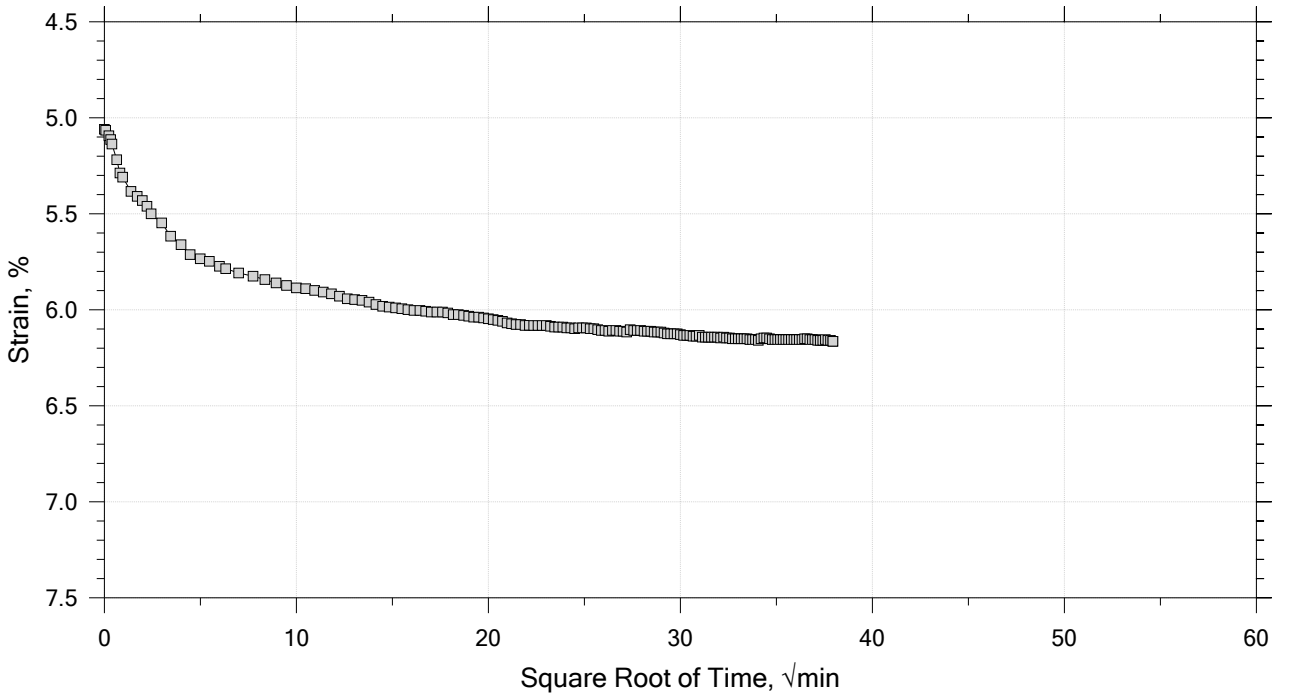
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 7 of 22

Constant Load Step

Stress: 1.5 tsf





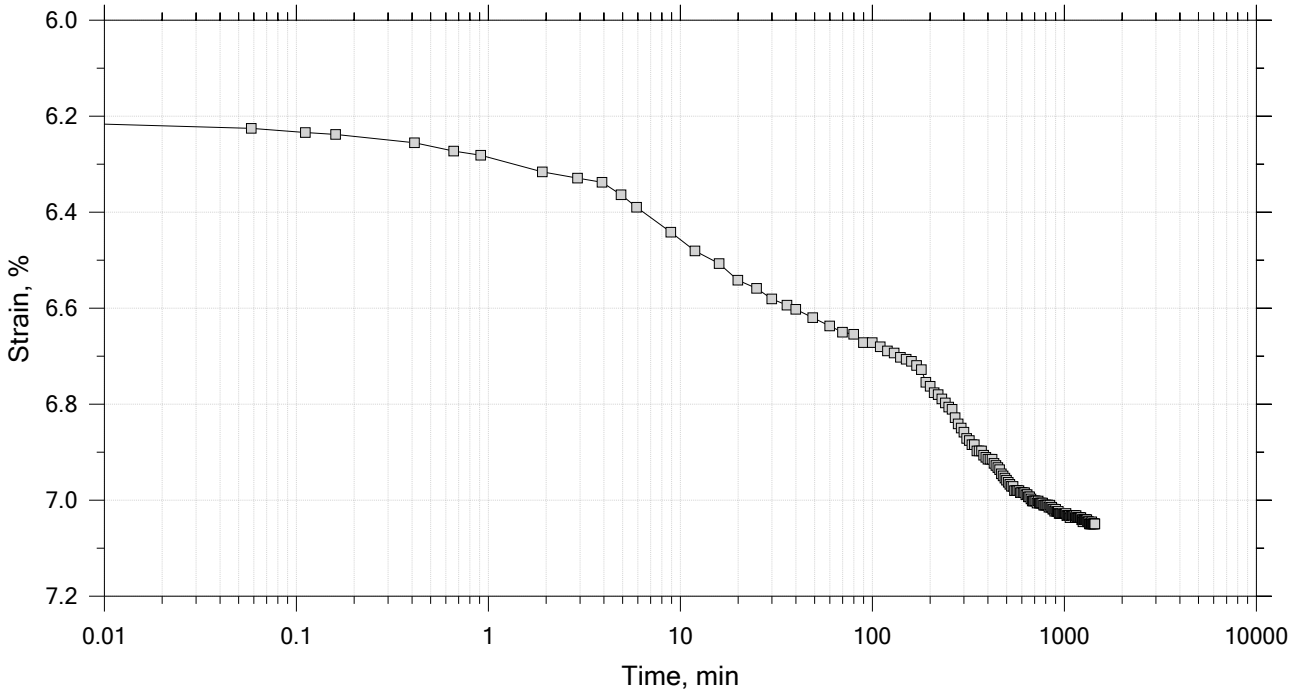
GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-301	Tested By: trm	Checked By: njh/anm
	Sample No.: 2U	Test Date: 8/30/19	Depth: 26.5-28.5 ft
	Test No.: IP-12	Sample Type: intact	Elevation: ---
	Description: Moist, olive gray clay		
	Remarks: System Y, Swell Pressure = 0.0642 tsf		

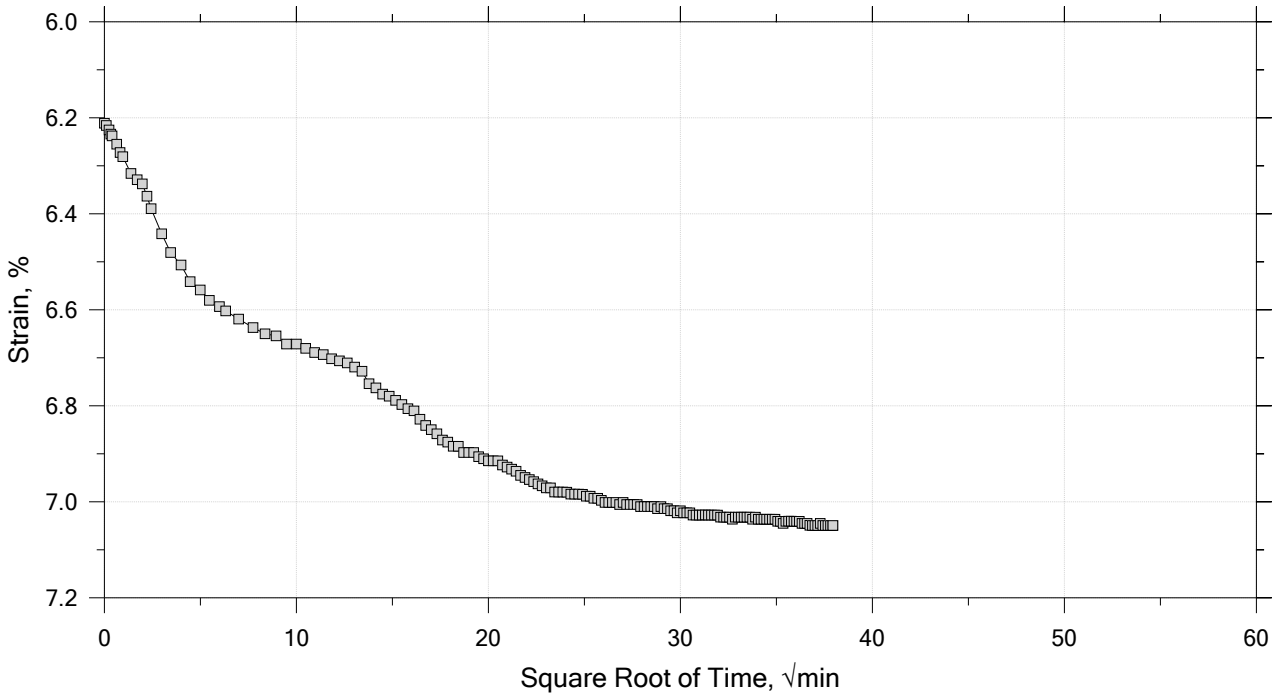
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 8 of 22

Constant Load Step

Stress: 2 tsf





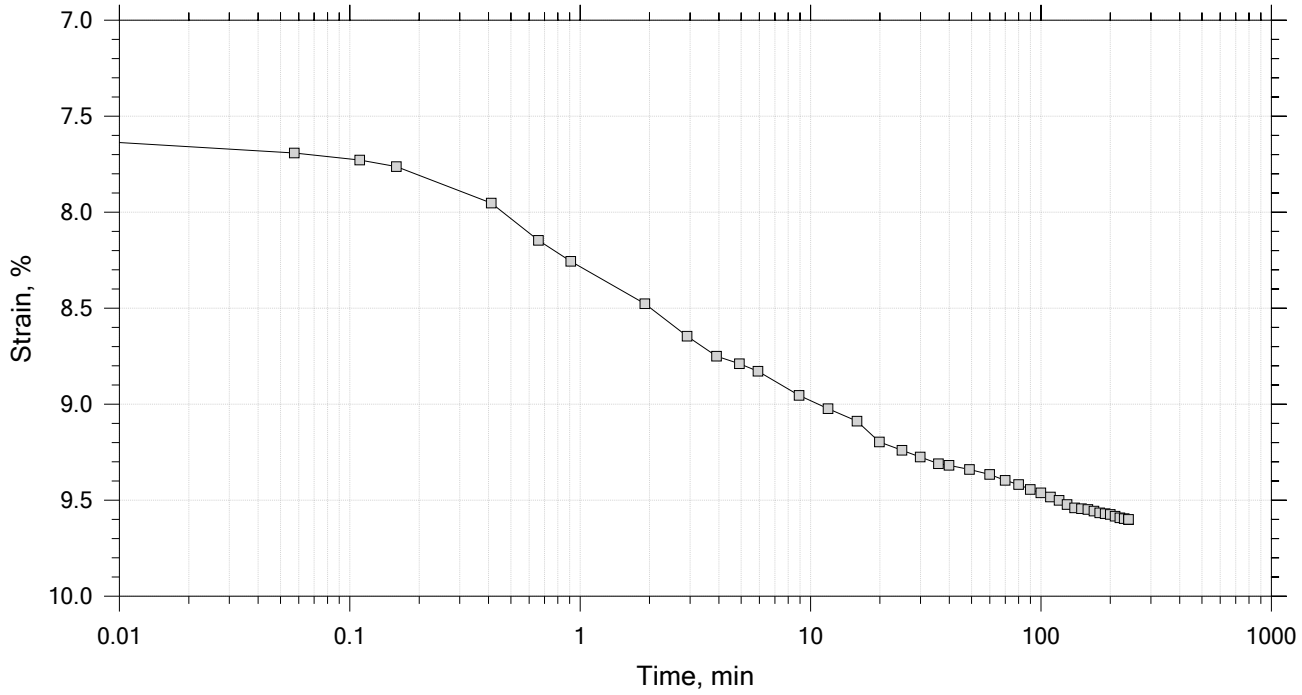
Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
Boring No.: BB-PVS-301	Tested By: trm	Checked By: njh/anm
Sample No.: 2U	Test Date: 8/30/19	Depth: 26.5-28.5 ft
Test No.: IP-12	Sample Type: intact	Elevation: ---
Description: Moist, olive gray clay		
Remarks: System Y, Swell Pressure = 0.0642 tsf		

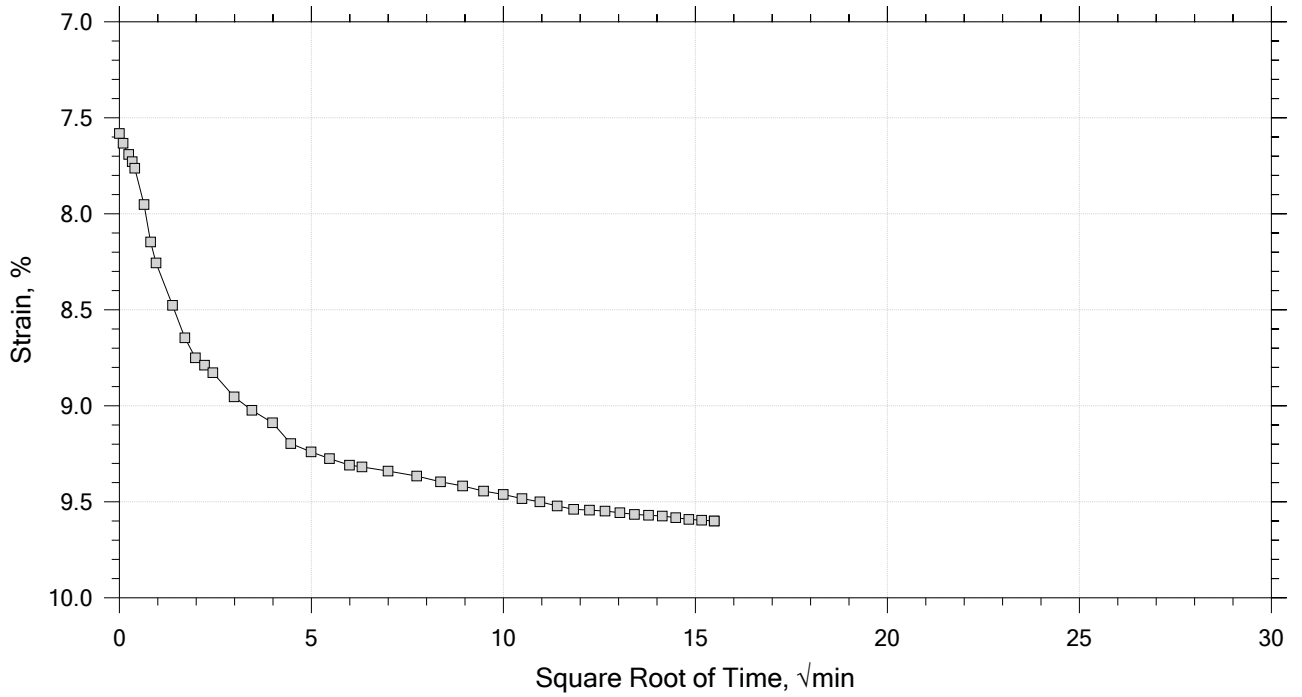
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 9 of 22

Constant Load Step

Stress: 4 tsf





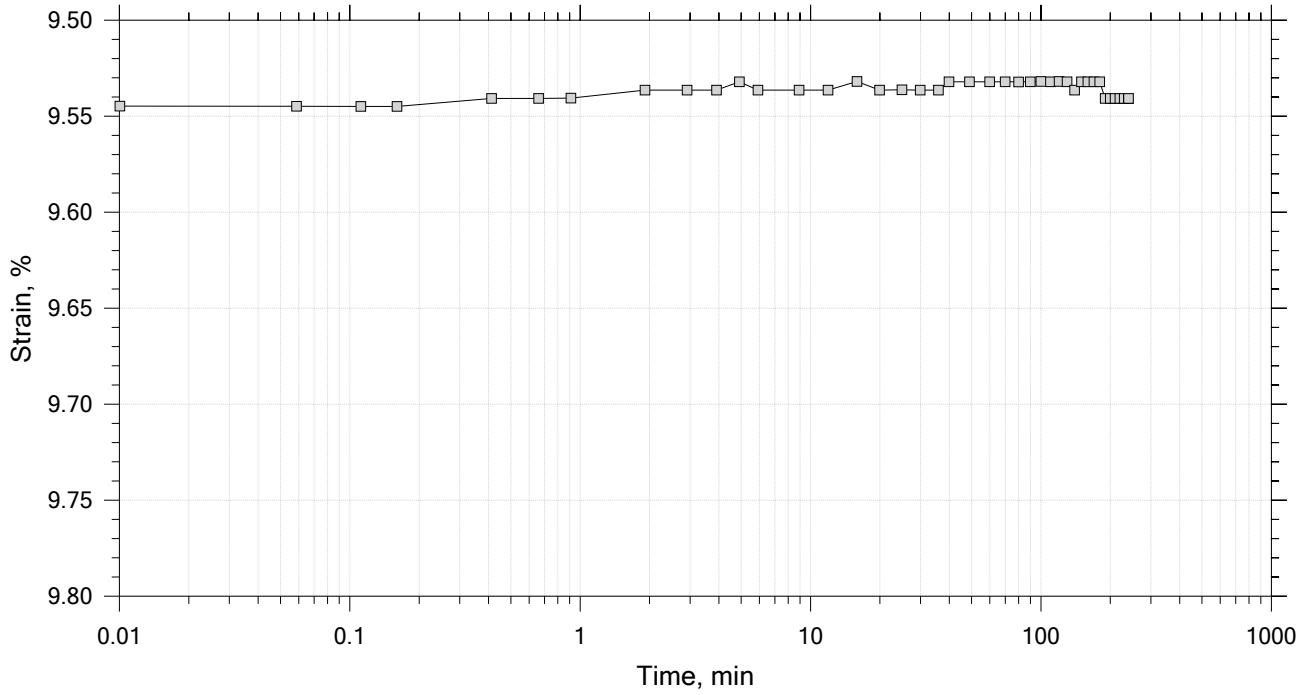
GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-301	Tested By: trm	Checked By: njh/anm
	Sample No.: 2U	Test Date: 8/30/19	Depth: 26.5-28.5 ft
	Test No.: IP-12	Sample Type: intact	Elevation: ---
	Description: Moist, olive gray clay		
	Remarks: System Y, Swell Pressure = 0.0642 tsf		

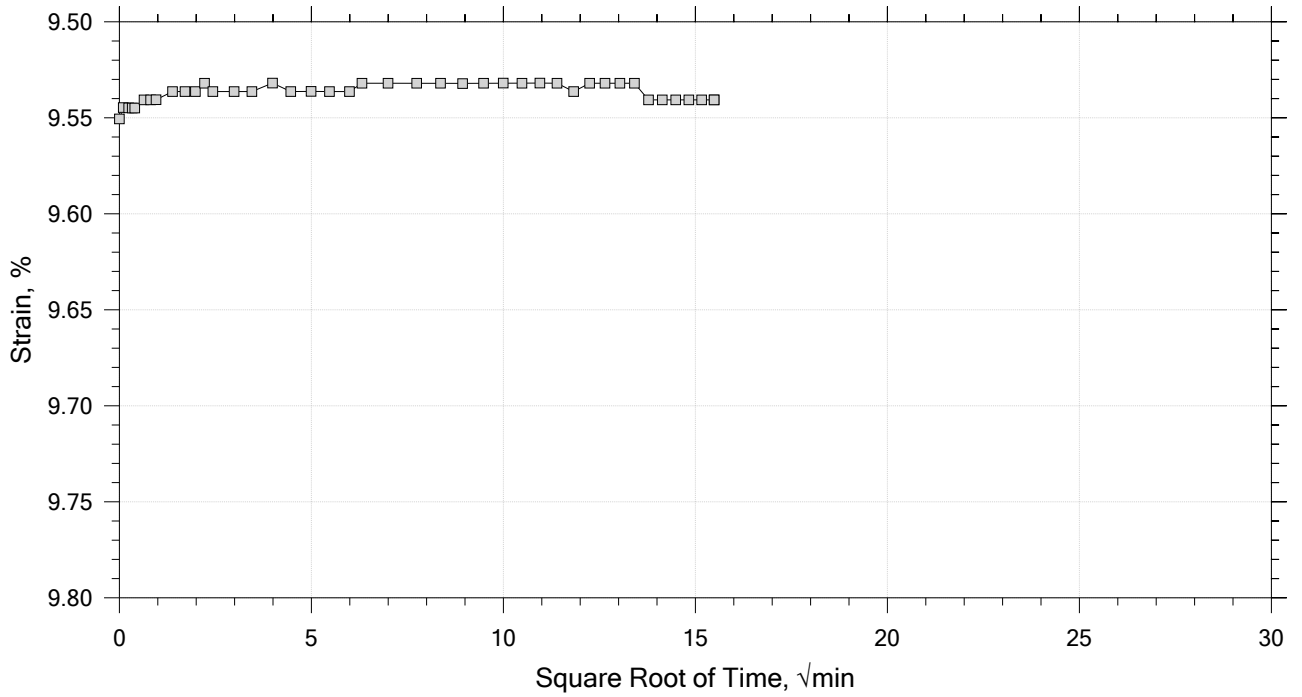
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 10 of 22

Constant Load Step

Stress: 2 tsf

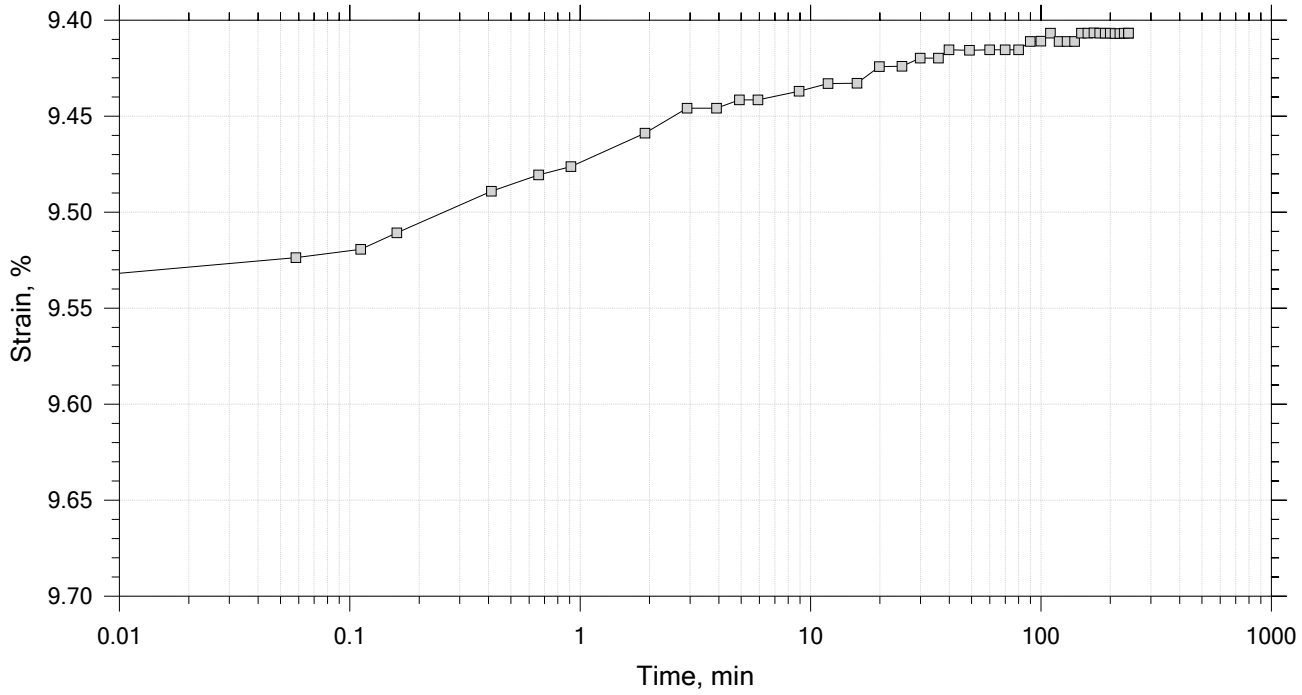


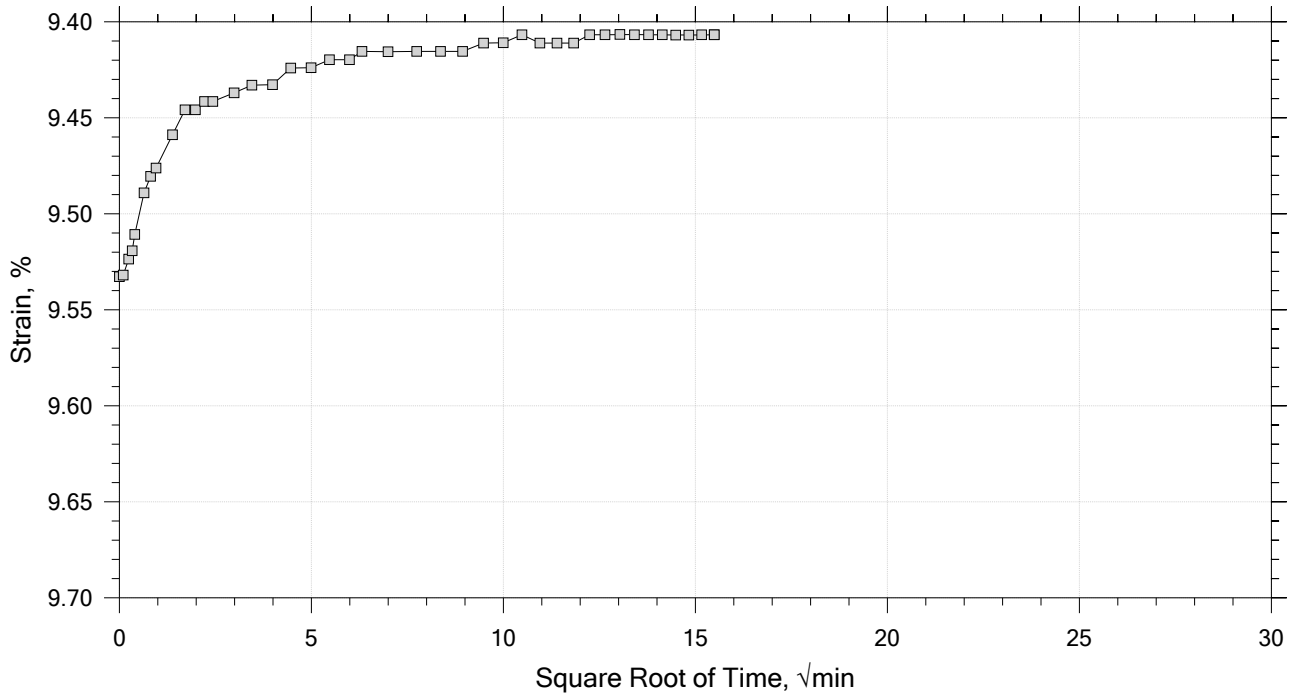


GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-301	Tested By: trm	Checked By: njh/anm
	Sample No.: 2U	Test Date: 8/30/19	Depth: 26.5-28.5 ft
	Test No.: IP-12	Sample Type: intact	Elevation: ---
	Description: Moist, olive gray clay		
	Remarks: System Y, Swell Pressure = 0.0642 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 11 of 22
Constant Load Step
Stress: 1 tsf





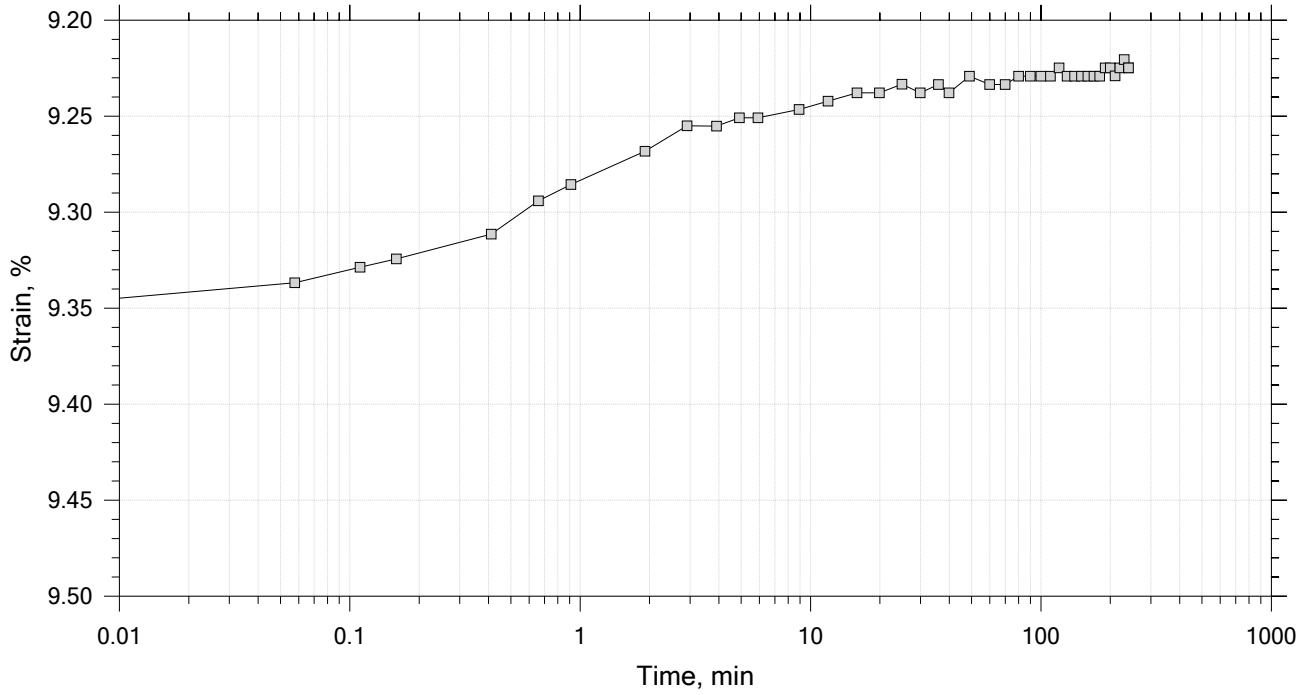
GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-301	Tested By: trm	Checked By: njh/anm
	Sample No.: 2U	Test Date: 8/30/19	Depth: 26.5-28.5 ft
	Test No.: IP-12	Sample Type: intact	Elevation: ---
	Description: Moist, olive gray clay		
	Remarks: System Y, Swell Pressure = 0.0642 tsf		

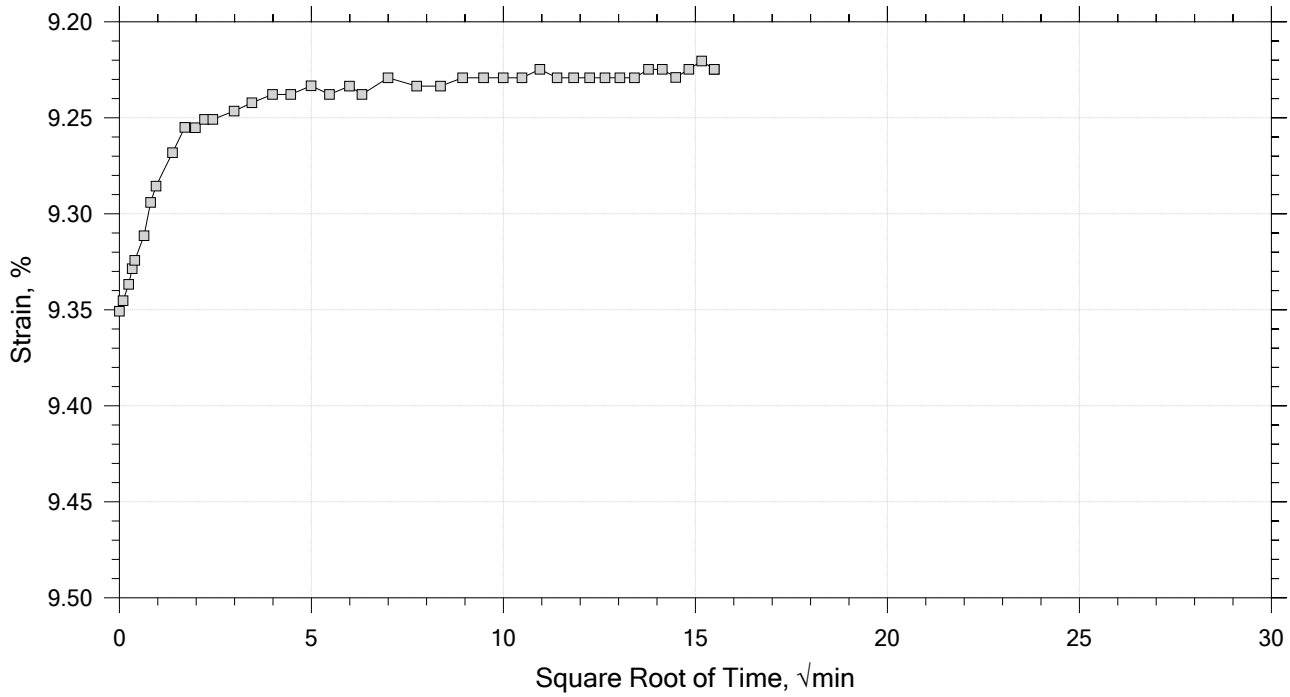
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 12 of 22

Constant Load Step

Stress: 0.5 tsf





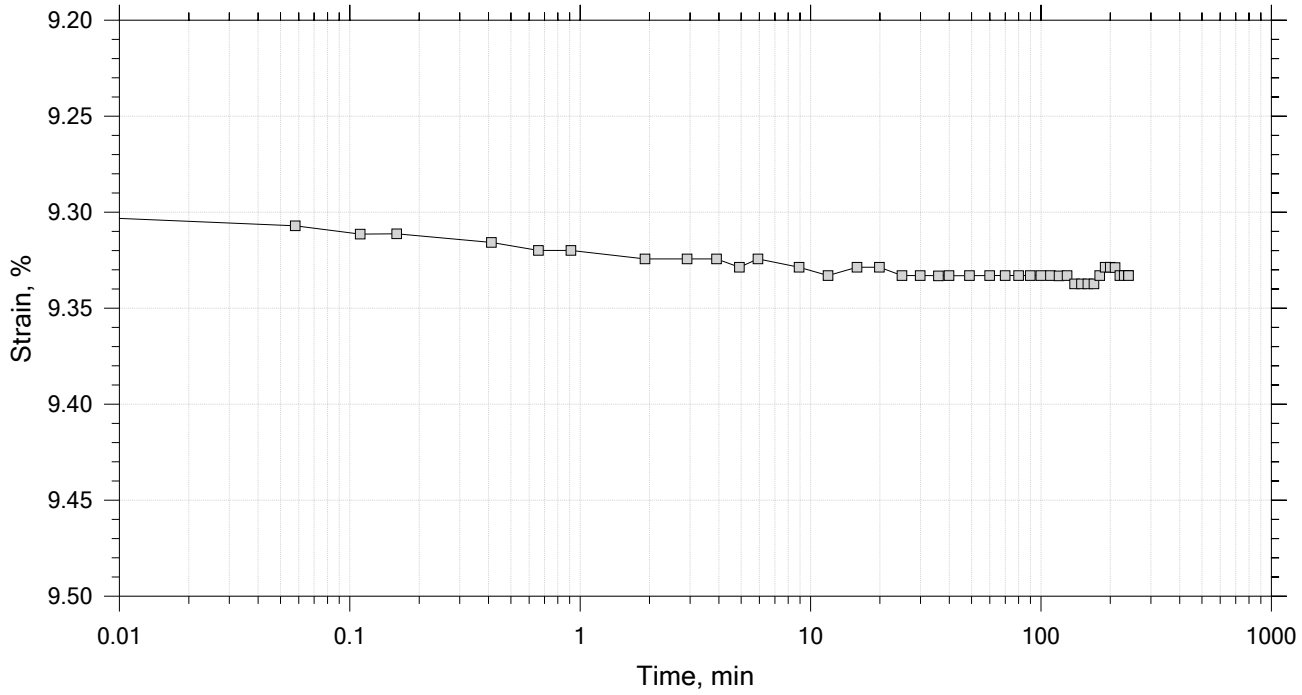
GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-301	Tested By: trm	Checked By: njh/anm
	Sample No.: 2U	Test Date: 8/30/19	Depth: 26.5-28.5 ft
	Test No.: IP-12	Sample Type: intact	Elevation: ---
	Description: Moist, olive gray clay		
	Remarks: System Y, Swell Pressure = 0.0642 tsf		

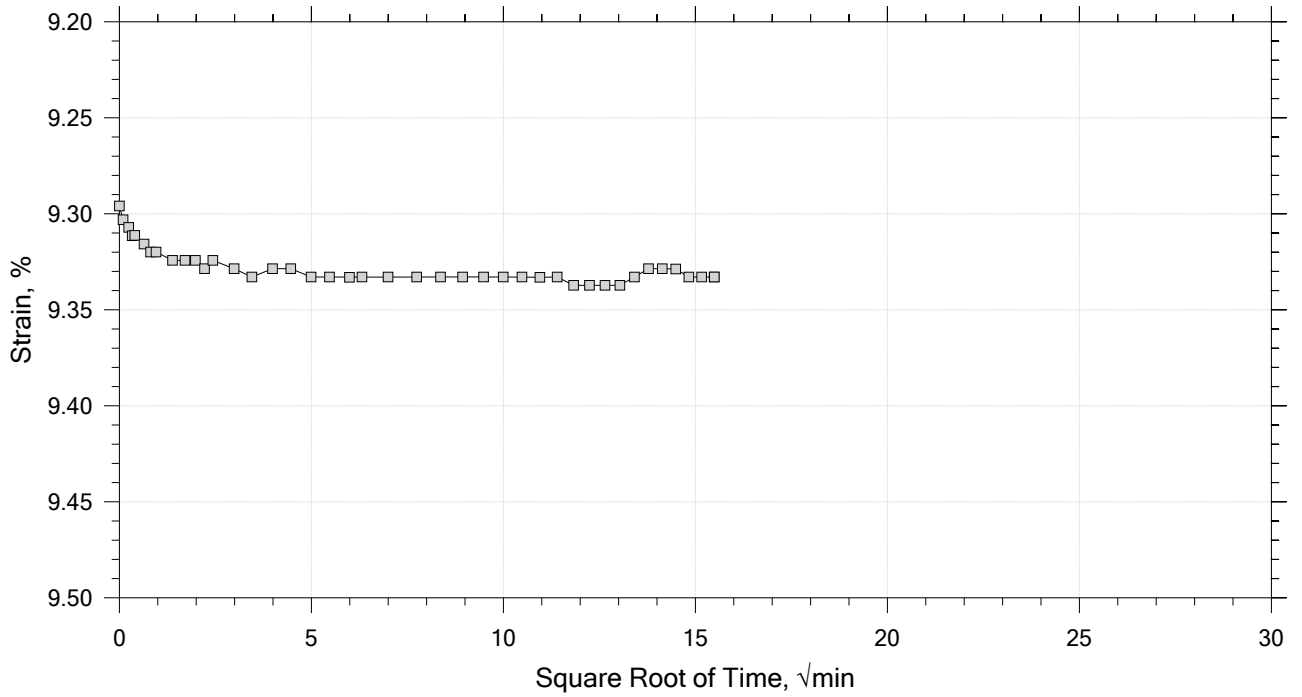
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 13 of 22

Constant Load Step

Stress: 1 tsf





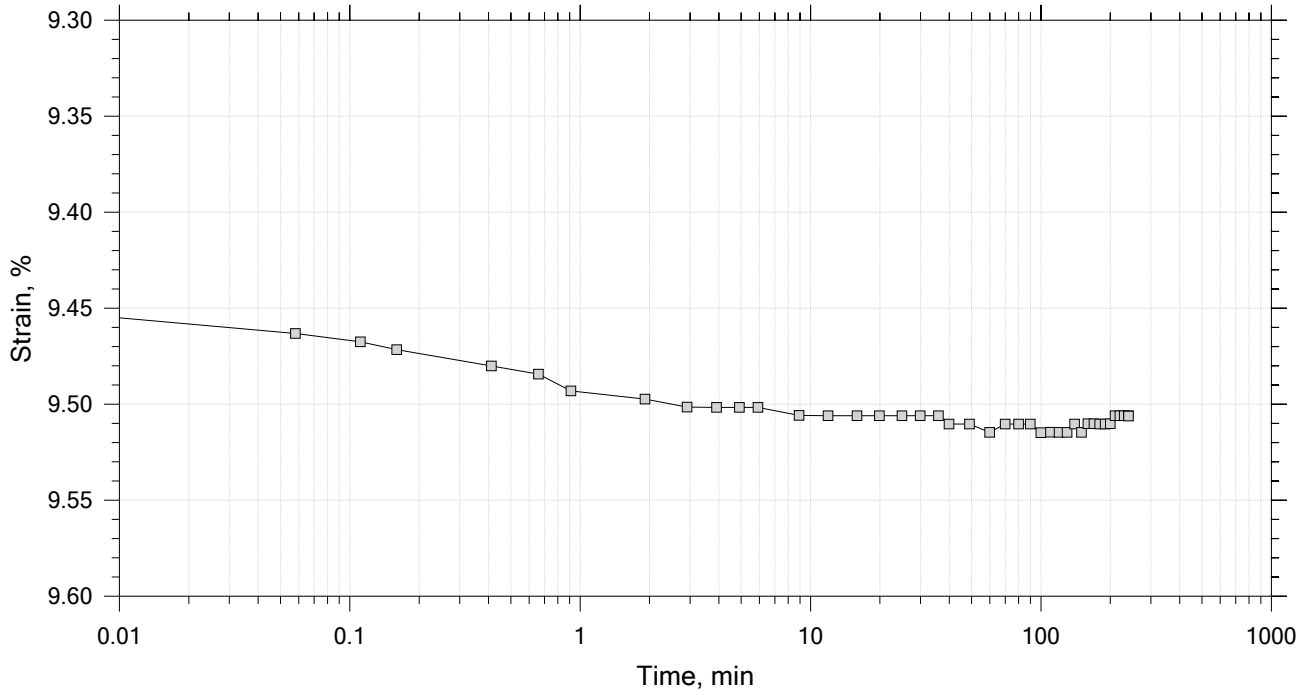
Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
Boring No.: BB-PVS-301	Tested By: trm	Checked By: njh/anm
Sample No.: 2U	Test Date: 8/30/19	Depth: 26.5-28.5 ft
Test No.: IP-12	Sample Type: intact	Elevation: ---
Description: Moist, olive gray clay		
Remarks: System Y, Swell Pressure = 0.0642 tsf		

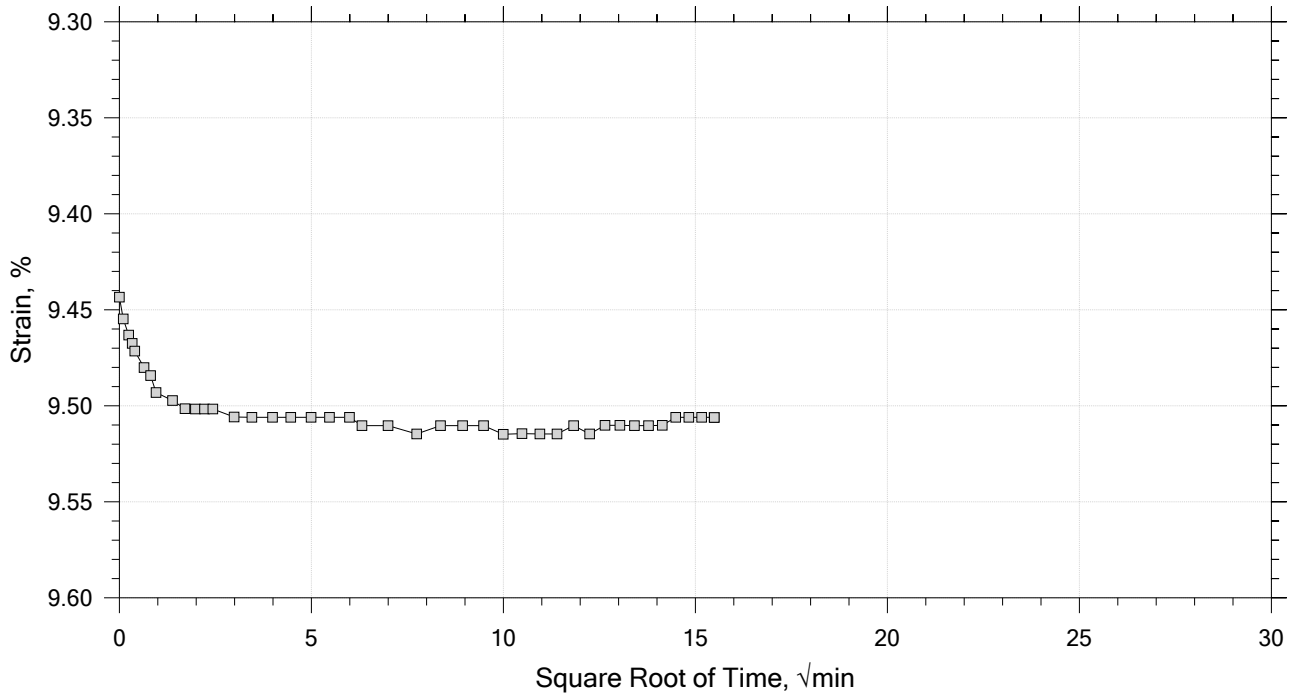
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 14 of 22

Constant Load Step

Stress: 2 tsf

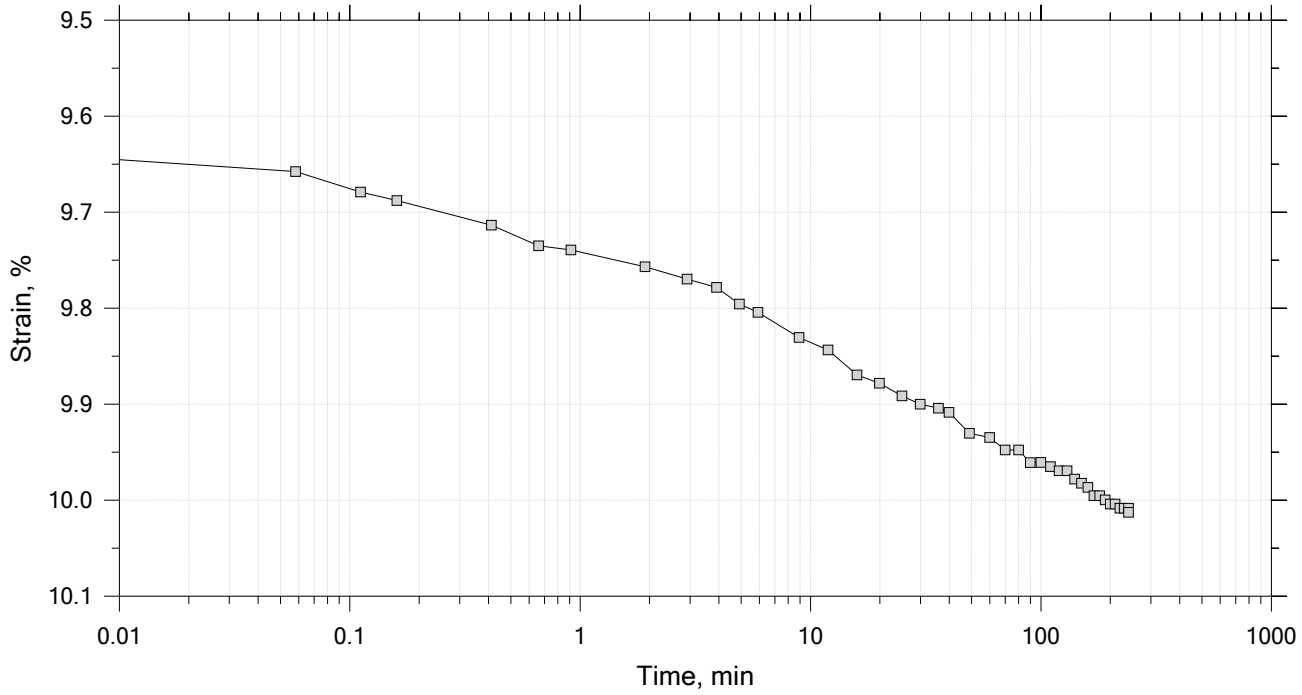


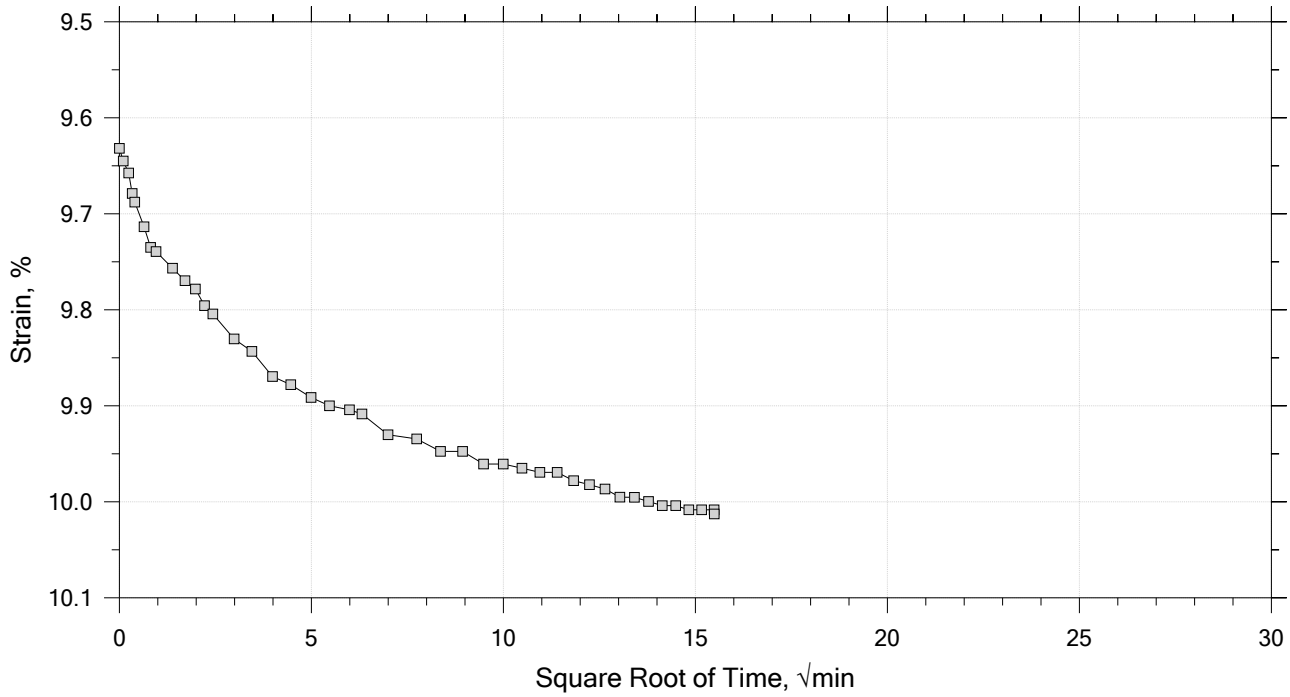


Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
Boring No.: BB-PVS-301	Tested By: trm	Checked By: njh/anm
Sample No.: 2U	Test Date: 8/30/19	Depth: 26.5-28.5 ft
Test No.: IP-12	Sample Type: intact	Elevation: ---
Description: Moist, olive gray clay		
Remarks: System Y, Swell Pressure = 0.0642 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 15 of 22
Constant Load Step
Stress: 4 tsf





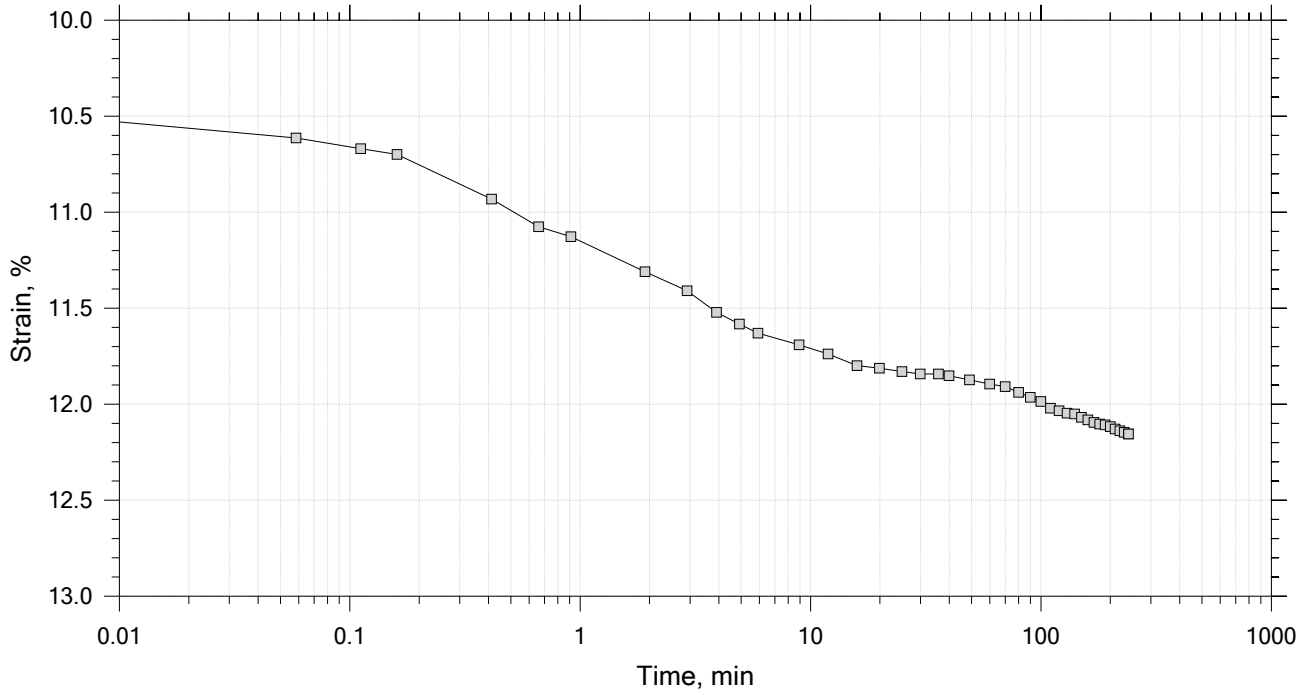
GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-301	Tested By: trm	Checked By: njh/anm
	Sample No.: 2U	Test Date: 8/30/19	Depth: 26.5-28.5 ft
	Test No.: IP-12	Sample Type: intact	Elevation: ---
	Description: Moist, olive gray clay		
	Remarks: System Y, Swell Pressure = 0.0642 tsf		

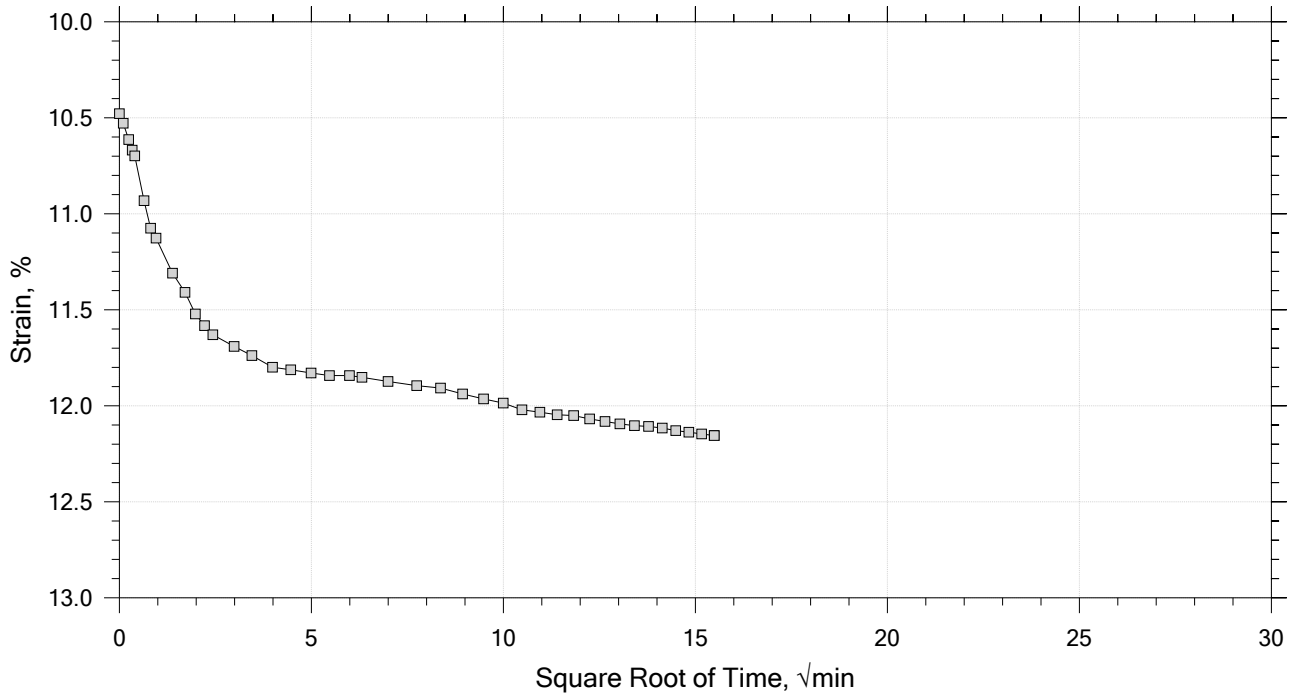
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 16 of 22

Constant Load Step

Stress: 8 tsf

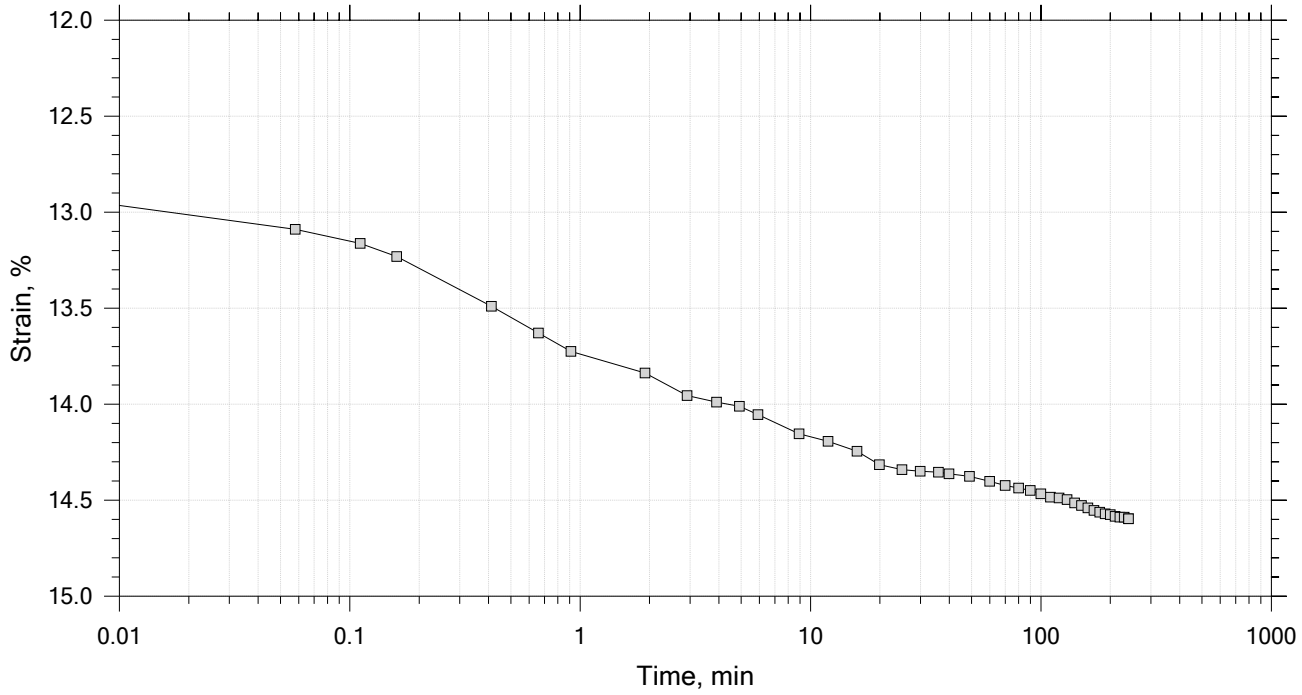


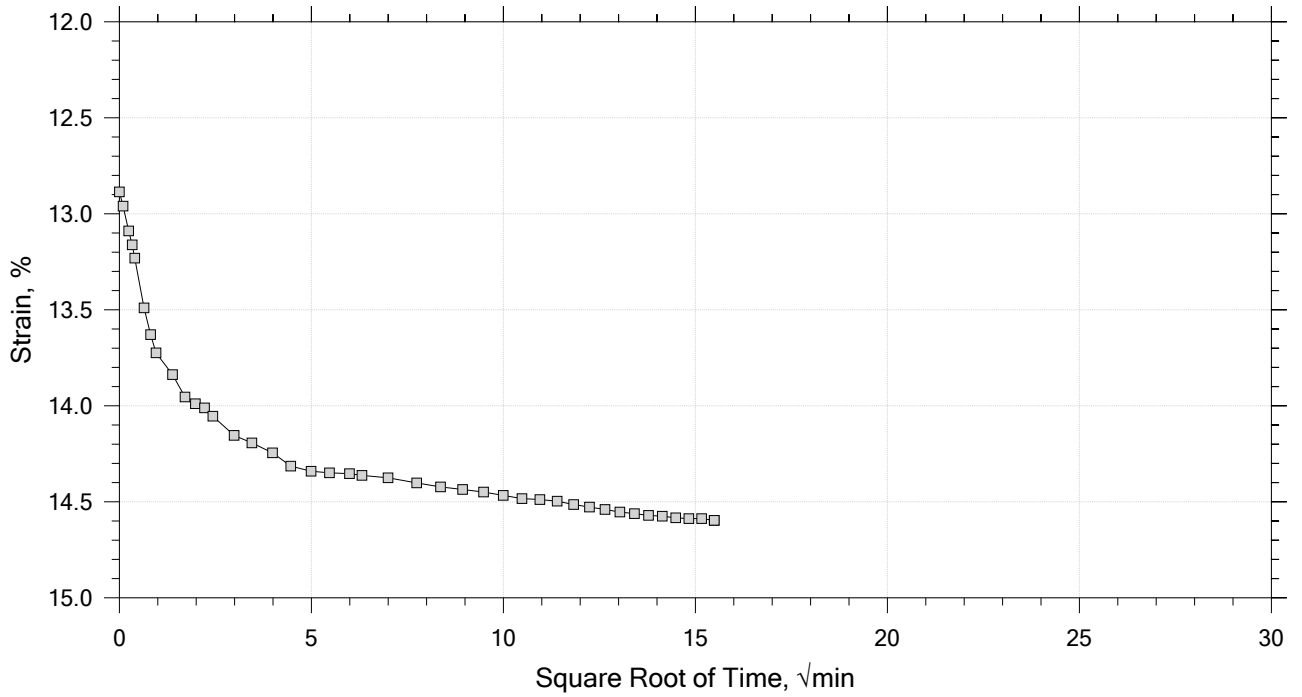


GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-301	Tested By: trm	Checked By: njh/anm
	Sample No.: 2U	Test Date: 8/30/19	Depth: 26.5-28.5 ft
	Test No.: IP-12	Sample Type: intact	Elevation: ---
	Description: Moist, olive gray clay		
	Remarks: System Y, Swell Pressure = 0.0642 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 17 of 22
Constant Load Step
Stress: 16 tsf





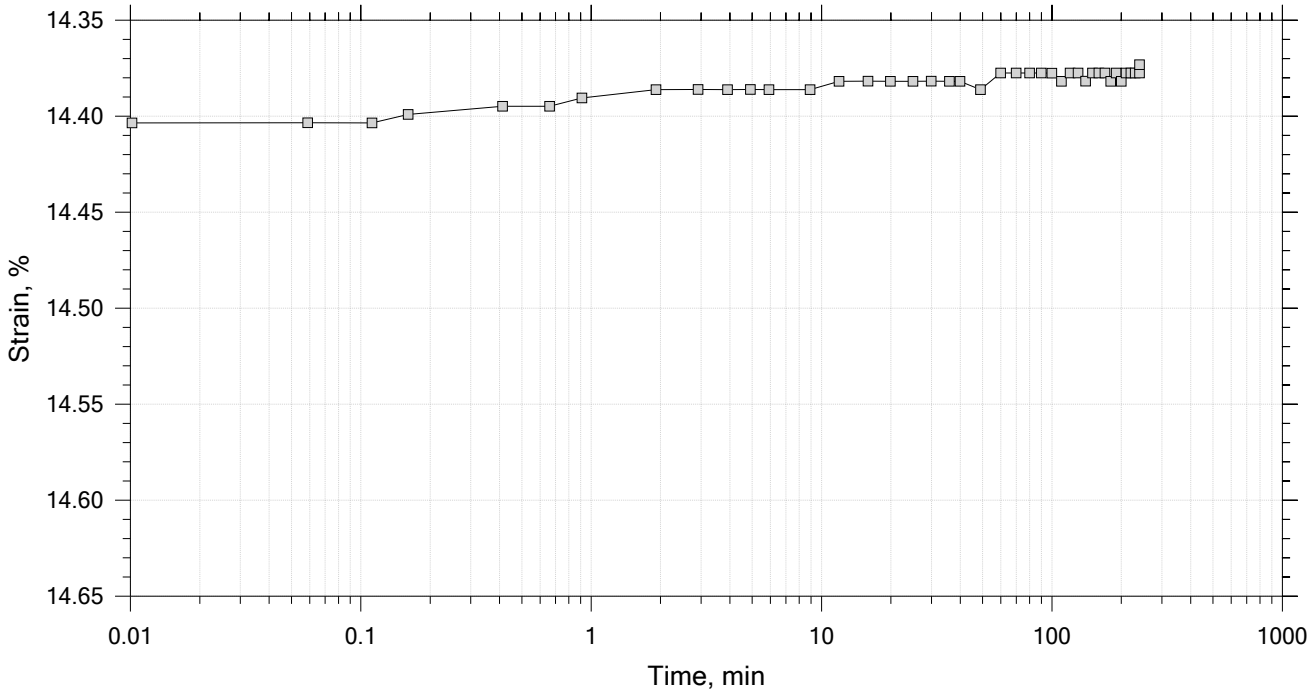
Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
Boring No.: BB-PVS-301	Tested By: trm	Checked By: njh/anm
Sample No.: 2U	Test Date: 8/30/19	Depth: 26.5-28.5 ft
Test No.: IP-12	Sample Type: intact	Elevation: ---
Description: Moist, olive gray clay		
Remarks: System Y, Swell Pressure = 0.0642 tsf		

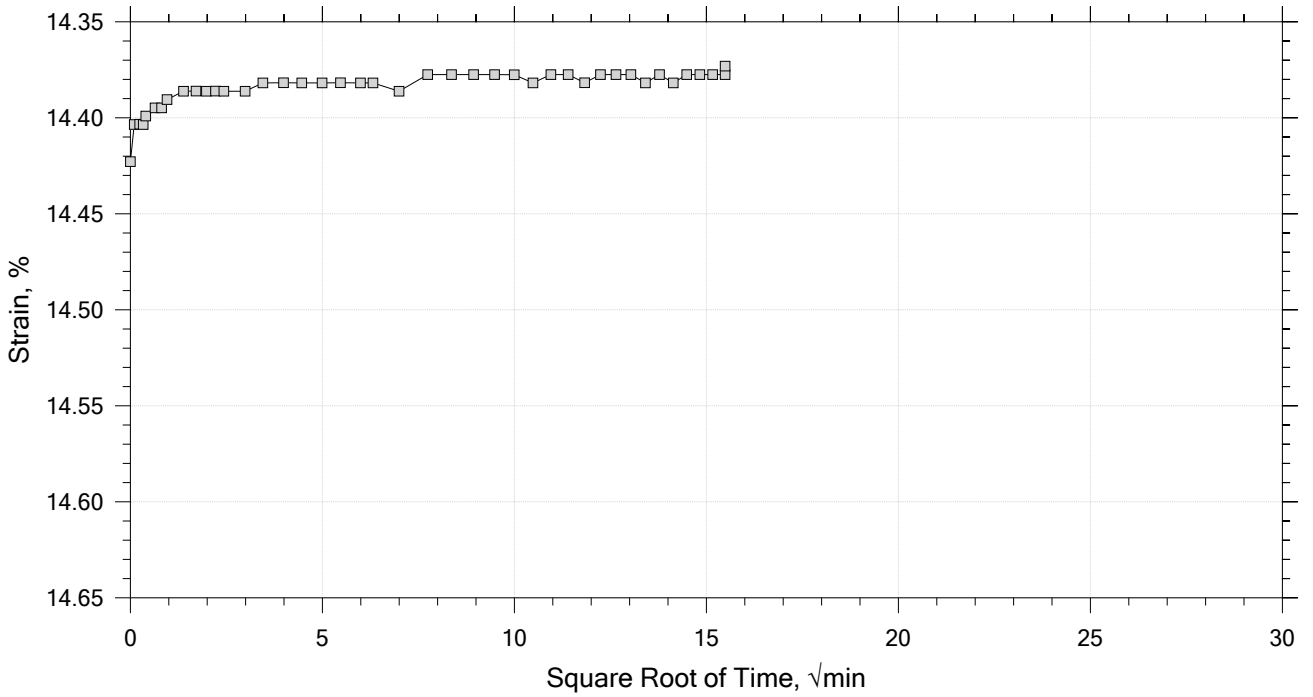
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 18 of 22

Constant Load Step

Stress: 8 tsf

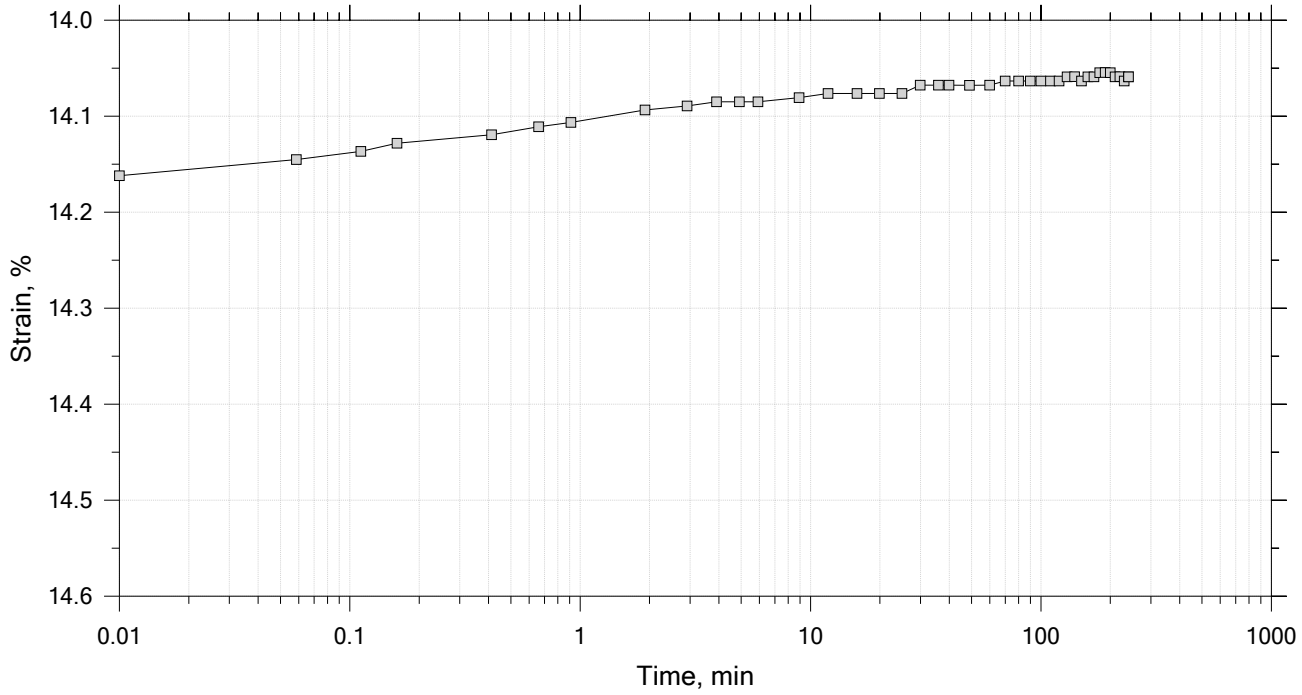


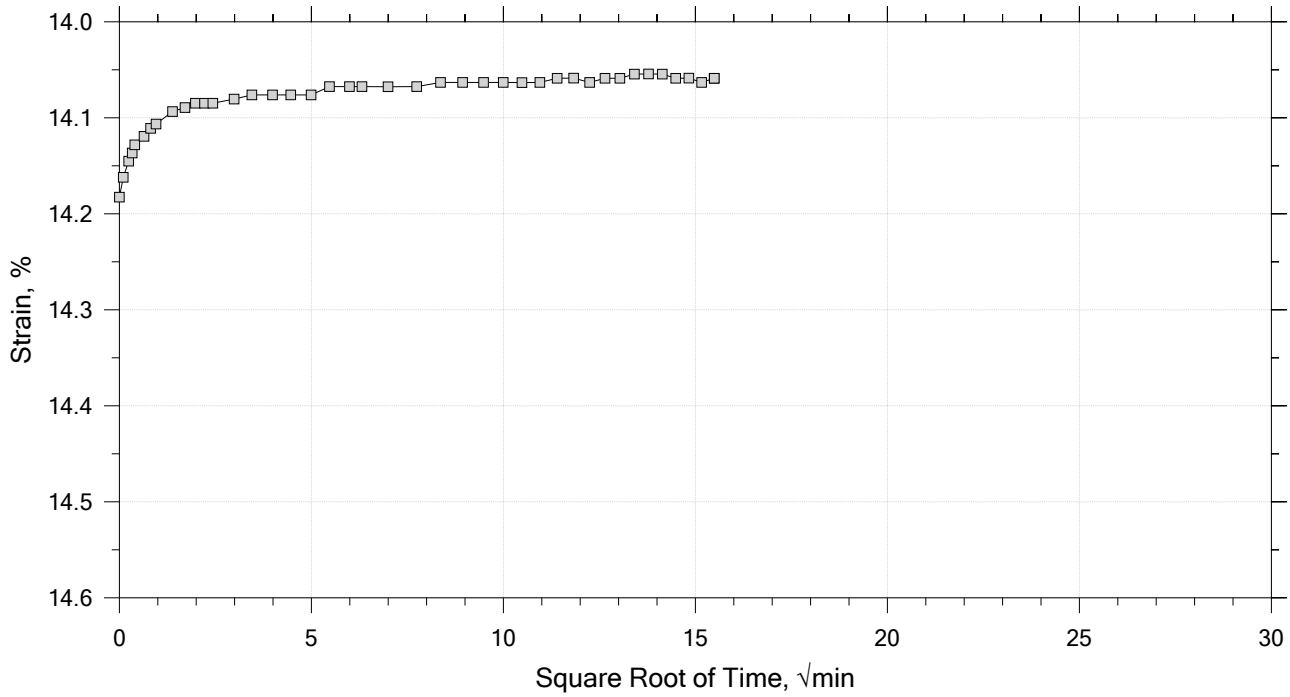


GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-301	Tested By: trm	Checked By: njh/anm
	Sample No.: 2U	Test Date: 8/30/19	Depth: 26.5-28.5 ft
	Test No.: IP-12	Sample Type: intact	Elevation: ---
	Description: Moist, olive gray clay		
	Remarks: System Y, Swell Pressure = 0.0642 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 19 of 22
Constant Load Step
Stress: 2 tsf

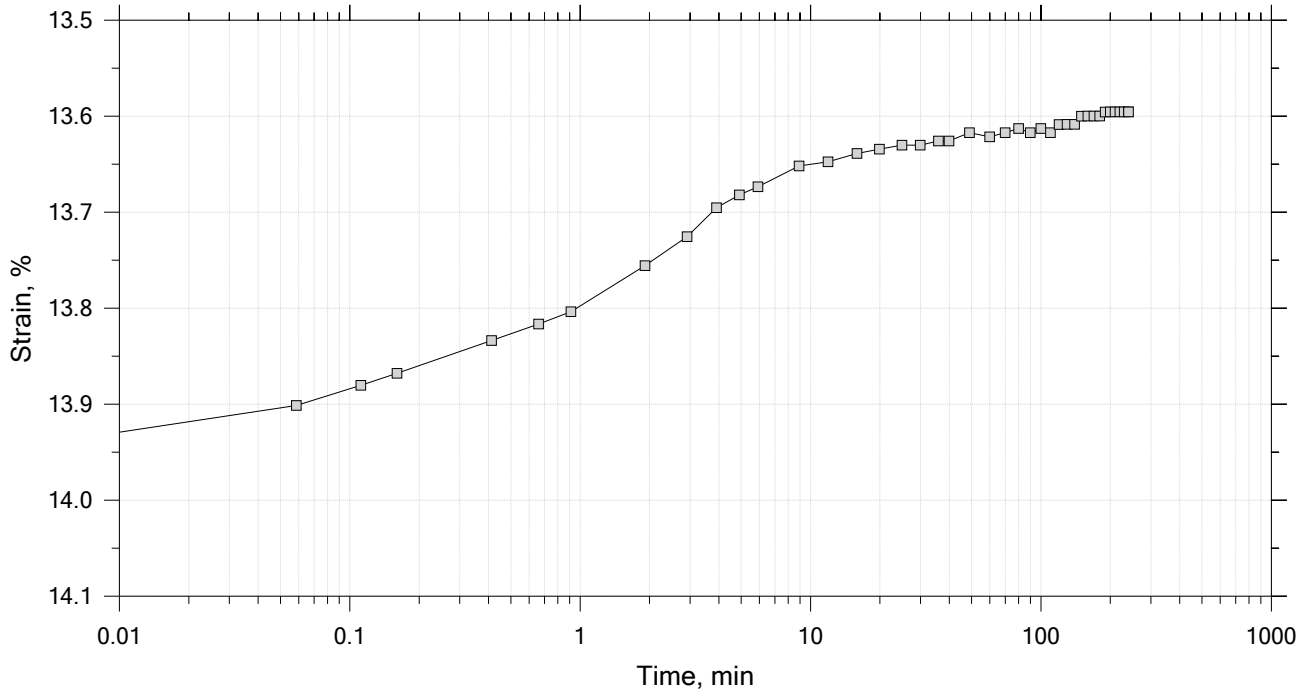


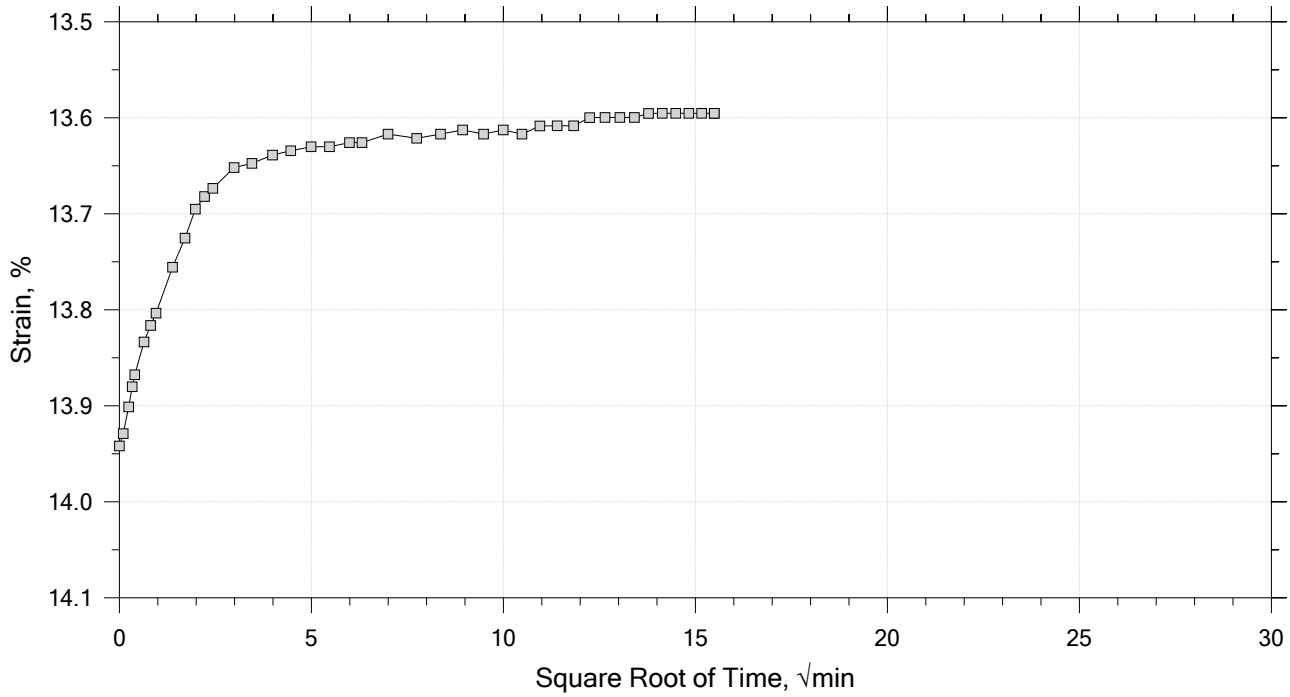


GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-301	Tested By: trm	Checked By: njh/anm
	Sample No.: 2U	Test Date: 8/30/19	Depth: 26.5-28.5 ft
	Test No.: IP-12	Sample Type: intact	Elevation: ---
	Description: Moist, olive gray clay		
	Remarks: System Y, Swell Pressure = 0.0642 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 20 of 22
Constant Load Step
Stress: 0.5 tsf

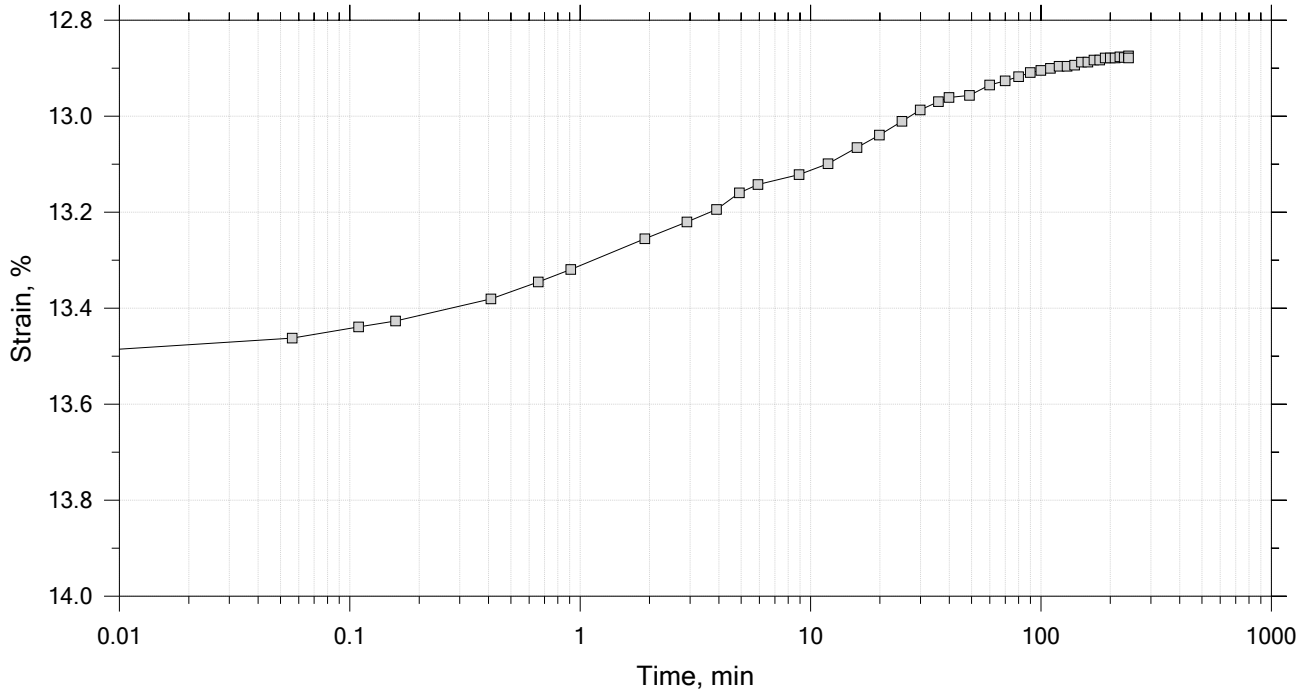


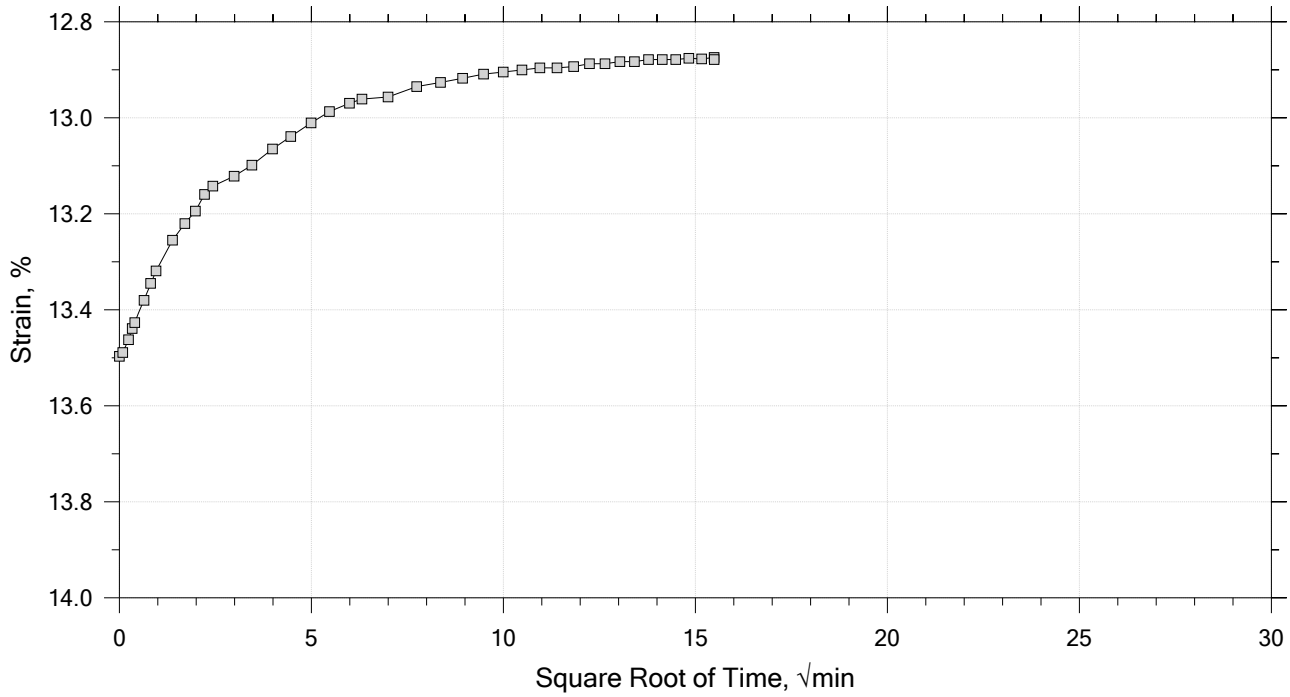


GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-301	Tested By: trm	Checked By: njh/anm
	Sample No.: 2U	Test Date: 8/30/19	Depth: 26.5-28.5 ft
	Test No.: IP-12	Sample Type: intact	Elevation: ---
	Description: Moist, olive gray clay		
	Remarks: System Y, Swell Pressure = 0.0642 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 21 of 22
Constant Load Step
Stress: 0.125 tsf

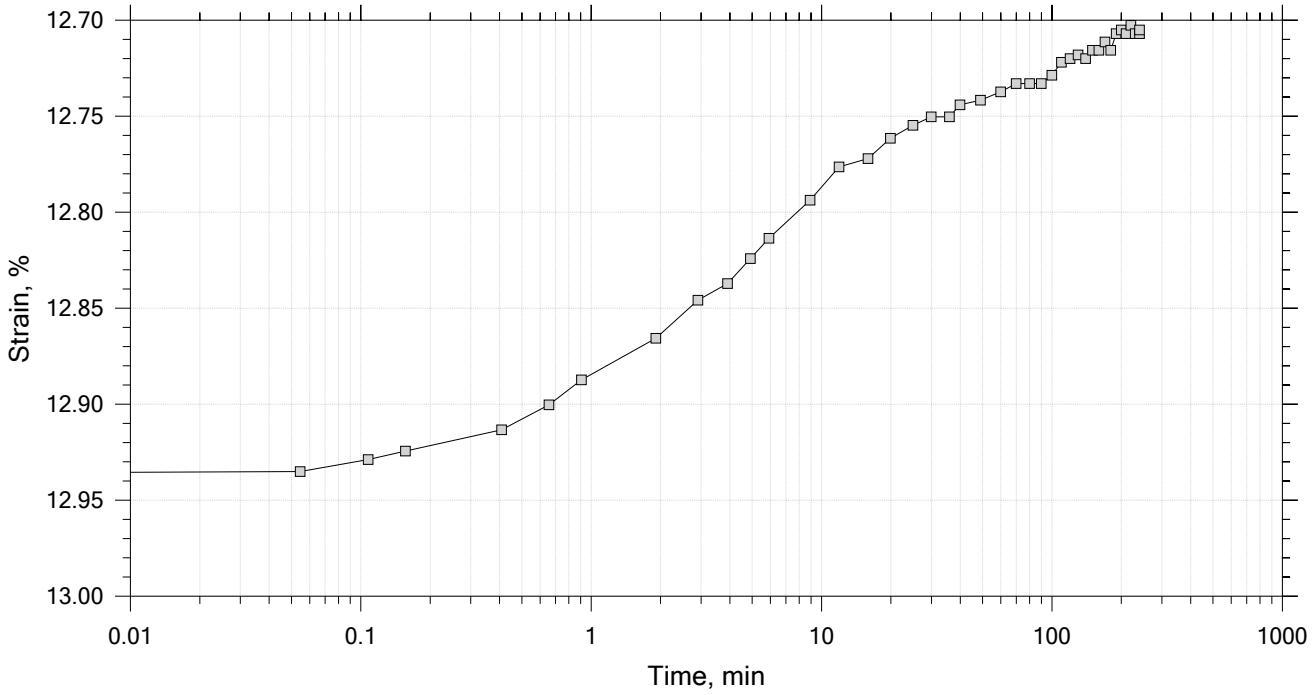


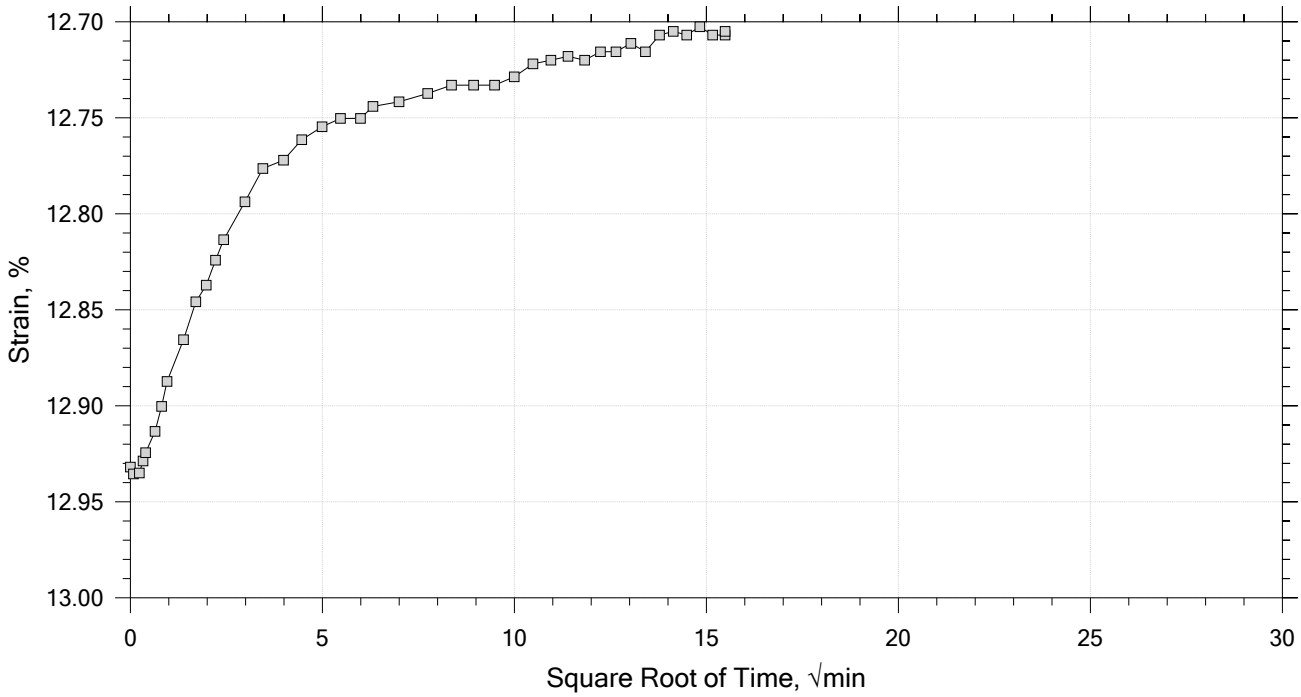


GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-301	Tested By: trm	Checked By: njh/anm
	Sample No.: 2U	Test Date: 8/30/19	Depth: 26.5-28.5 ft
	Test No.: IP-12	Sample Type: intact	Elevation: ---
	Description: Moist, olive gray clay		
	Remarks: System Y, Swell Pressure = 0.0642 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 22 of 22
Constant Load Step
Stress: 0.0625 tsf





GeoTesting EXPRESS	Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
	Boring No.: BB-PVS-301	Tested By: trm	Checked By: njh/anm
	Sample No.: 2U	Test Date: 8/30/19	Depth: 26.5-28.5 ft
	Test No.: IP-12	Sample Type: intact	Elevation: ---
	Description: Moist, olive gray clay		
	Remarks: System Y, Swell Pressure = 0.0642 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Specimen Diameter: 2.50 in	Estimated Specific Gravity: 2.74	Liquid Limit: 38
Initial Height: 1.00 in	Initial Void Ratio: 0.826	Plastic Limit: 19
Final Height: 0.86 in	Final Void Ratio: 0.57	Plasticity Index: 19

	Before Test Trimmings	Before Test Specimen	After Test Specimen	After Test Trimmings
Container ID	C142	RING		D-895
Mass Container, gm	8.46	108.95	108.95	8.42
Mass Container + Wet Soil, gm	144.35	265.38	254.92	156.12
Mass Container + Dry Soil, gm	111.02	229.8	229.8	130.7
Mass Dry Soil, gm	102.56	120.85	120.85	122.28
Water Content, %	32.50	29.44	20.79	20.79
Void Ratio	---	0.83	0.57	---
Degree of Saturation, %	---	97.80	100.00	---
Dry Unit Weight, pcf	---	93.788	109.06	---

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.

GeoTesting EXPRESS

Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
Boring No.: BB-PVS-301	Tested By: trm	Checked By: njh/anm
Sample No.: 2U	Test Date: 8/30/19	Depth: 26.5-28.5 ft
Test No.: IP-12	Sample Type: intact	Elevation: ---
Description: Moist, olive gray clay		
Remarks: System Y, Swell Pressure = 0.0642 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Log of Time Coefficients

Step	Applied Stress tsf	Final Displacement in	Void Ratio	Strain at End %	Log T50 min	Cv ft²/s	Mv 1/tsf	k ft/day	Ca %
1	0.0642	0.01332	0.802	1.33	0.000	0.00e+00	2.07e-01	0.00e+00	0.00e+00
2	0.125	0.01843	0.792	1.84	7.111	7.76e-07	8.41e-02	1.76e-04	0.00e+00
3	0.250	0.02584	0.779	2.58	0.000	0.00e+00	5.93e-02	0.00e+00	0.00e+00
4	0.500	0.03556	0.761	3.56	1.535	3.49e-06	3.89e-02	3.66e-04	0.00e+00
5	0.750	0.04335	0.747	4.33	0.000	0.00e+00	3.12e-02	0.00e+00	0.00e+00
6	1.00	0.04931	0.736	4.93	0.000	0.00e+00	2.39e-02	0.00e+00	0.00e+00
7	1.50	0.06164	0.713	6.16	0.000	0.00e+00	2.47e-02	0.00e+00	0.00e+00
8	2.00	0.07049	0.697	7.05	0.000	0.00e+00	1.77e-02	0.00e+00	0.00e+00
9	4.00	0.09600	0.651	9.60	1.638	2.92e-06	1.28e-02	1.01e-04	0.00e+00
10	2.00	0.09541	0.652	9.54	0.000	0.00e+00	2.98e-04	0.00e+00	0.00e+00
11	1.00	0.09407	0.654	9.41	0.000	0.00e+00	1.34e-03	0.00e+00	0.00e+00
12	0.500	0.09225	0.657	9.22	0.000	0.00e+00	3.64e-03	0.00e+00	0.00e+00
13	1.00	0.09333	0.655	9.33	0.000	0.00e+00	2.16e-03	0.00e+00	0.00e+00
14	2.00	0.09506	0.652	9.51	0.000	0.00e+00	1.73e-03	0.00e+00	0.00e+00
15	4.00	0.1001	0.643	10.0	0.000	0.00e+00	2.53e-03	0.00e+00	0.00e+00
16	8.00	0.1216	0.604	12.2	1.031	4.37e-06	5.36e-03	6.31e-05	0.00e+00
17	16.0	0.1460	0.559	14.6	0.758	5.64e-06	3.05e-03	4.64e-05	0.00e+00
18	8.00	0.1437	0.563	14.4	0.000	0.00e+00	2.80e-04	0.00e+00	0.00e+00
19	2.00	0.1406	0.569	14.1	0.000	0.00e+00	5.24e-04	0.00e+00	0.00e+00
20	0.500	0.1360	0.578	13.6	1.731	2.45e-06	3.09e-03	2.04e-05	0.00e+00
21	0.125	0.1288	0.591	12.9	0.000	0.00e+00	1.91e-02	0.00e+00	0.00e+00
22	0.0625	0.1271	0.594	12.7	4.108	1.06e-06	2.78e-02	7.90e-05	0.00e+00

GeoTesting EXPRESS

Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
Boring No.: BB-PVS-301	Tested By: trm	Checked By: njh/anm
Sample No.: 2U	Test Date: 8/30/19	Depth: 26.5-28.5 ft
Test No.: IP-12	Sample Type: intact	Elevation: ---
Description: Moist, olive gray clay		
Remarks: System Y, Swell Pressure = 0.0642 tsf		
Displacement at End of Increment		

One-Dimensional Consolidation by ASTM D2435 - Method B

Square Root of Time Coefficients

Step	Applied Stress tsf	Final Displacement in	Void Ratio	Strain at End %	Sq.Rt. T90 min	Cv ft²/s	Mv 1/tsf	k ft/day
1	0.0642	0.01332	0.802	1.33	25.203	9.61e-07	2.07e-01	5.37e-04
2	0.125	0.01843	0.792	1.84	31.393	7.57e-07	8.41e-02	1.72e-04
3	0.250	0.02584	0.779	2.58	21.196	1.11e-06	5.93e-02	1.77e-04
4	0.500	0.03556	0.761	3.56	5.815	3.96e-06	3.89e-02	4.16e-04
5	0.750	0.04335	0.747	4.33	17.815	1.27e-06	3.12e-02	1.07e-04
6	1.00	0.04931	0.736	4.93	187.079	1.19e-07	2.39e-02	7.68e-06
7	1.50	0.06164	0.713	6.16	135.309	1.62e-07	2.47e-02	1.08e-05
8	2.00	0.07049	0.697	7.05	329.911	6.49e-08	1.77e-02	3.10e-06
9	4.00	0.09600	0.651	9.60	10.791	1.91e-06	1.28e-02	6.57e-05
10	2.00	0.09541	0.652	9.54	0.000	0.00e+00	2.98e-04	0.00e+00
11	1.00	0.09407	0.654	9.41	4.286	4.69e-06	1.34e-03	1.69e-05
12	0.500	0.09225	0.657	9.22	4.294	4.70e-06	3.64e-03	4.61e-05
13	1.00	0.09333	0.655	9.33	1.910	1.06e-05	2.16e-03	6.17e-05
14	2.00	0.09506	0.652	9.51	2.045	9.84e-06	1.73e-03	4.60e-05
15	4.00	0.1001	0.643	10.0	31.261	6.39e-07	2.53e-03	4.37e-06
16	8.00	0.1216	0.604	12.2	7.822	2.48e-06	5.36e-03	3.58e-05
17	16.0	0.1460	0.559	14.6	8.985	2.05e-06	3.05e-03	1.69e-05
18	8.00	0.1437	0.563	14.4	13.729	1.31e-06	2.80e-04	9.85e-07
19	2.00	0.1406	0.569	14.1	3.342	5.40e-06	5.24e-04	7.63e-06
20	0.500	0.1360	0.578	13.6	4.394	4.15e-06	3.09e-03	3.46e-05
21	0.125	0.1288	0.591	12.9	19.241	9.60e-07	1.91e-02	4.95e-05
22	0.0625	0.1271	0.594	12.7	14.260	1.31e-06	2.78e-02	9.80e-05

GeoTesting EXPRESS

Project: I-295 over Veranda St	Location: Portland, ME	Project No.: GTX-308805
Boring No.: BB-PVS-301	Tested By: trm	Checked By: njh/anm
Sample No.: 2U	Test Date: 8/30/19	Depth: 26.5-28.5 ft
Test No.: IP-12	Sample Type: intact	Elevation: ---
Description: Moist, olive gray clay		
Remarks: System Y, Swell Pressure = 0.0642 tsf		
Displacement at End of Increment		

SCHONEWALD ENGINEERING ASSOCIATES, INC.
129 Middle Road
Cumberland, ME 04021
207/ 829-5226

LETTER OF TRANSMITTAL

DATE	8/19/19	JOB NO.	19-107
ATTENTION	Mark Dobday		
RE.	Geotechnical Laboratory Testing		
	Soil Jar and Tube Samples		
	Final Design Phase		
	I-295 over Veranda, Portland, ME		

TO **GeoTesting Express**
Geotechnical Testing Laboratory
125 Nagog Park
Acton, MA 01720

WE ARE SENDING YOU: ☐ Enclosed ☑ soil samples

COPIES	DATE	NO.	DESCRIPTION
		2	undisturbed tube samples of soils as described below submitted for lab testing
		20	jar samples of soils as described below submitted for lab testing

REMARKS:

Hi Mark-

Please complete the following tests on the soil samples listed below. Please reference SchonewaldEA's project No. 19-107: "I-295 over Veranda St, Portland, ME (MaineDOT WIN21745.00)" on results and invoice. Please call with any questions regarding test specifics, or any concerns or issues; my cell number is 207/272-9879.

Thanks- Be

Boring No.	Tube No.	Sample Depth (ft., BGS)	Material	Requested Tests
BB-PVS-301	1U	19-21	marine silt-clay	1D consolidation (C-alpha at 1.5 tsf), Atterberg Limits
BB-PVS-301	2U	26.5-28.5	marine silt-clay	1D consolidation (C-alpha at 2.0 tsf), Atterberg Limits
Boring No.	**Sample No.**	**Sample Depth (ft., BGS)**	**Material**	**Requested Tests**
BB-PVS-301	3D	4-6	Granular Fill	Grain Size (Wash Sieve)
BB-PVS-301	6D	10-12	Granular Fill	Grain Size (Wash Sieve)
BB-PVS-302	2D	2-4	Granular Fill	Grain Size (Wash Sieve)
BB-PVS-302	7D	14-16	marine silt-clay	Atterberg Limits
BB-PVS-302	9D	24-26	marine silt-clay	Atterberg Limits
BB-PVS-302	11D	34-36	marine silt-clay	Atterberg Limits
BB-PVS-303	3D	4-6	Fill	Atterberg Limits, Fines Content (% Passing #200)
BB-PVS-303	6D	10-12	marine silt-clay	Atterberg Limits
BB-PVS-303	7D	14-16	marine silt-clay	Atterberg Limits
BB-PVS-303	9D	24-26	marine silt-clay	Atterberg Limits
BB-PVS-303	11D	34-36	marine silt-clay	Atterberg Limits
BB-PVS-303	13D	44-46	marine silt-clay	Atterberg Limits
BB-PVS-303	15D	54-56	marine silt-clay	Atterberg Limits
BB-PVS-303	17D	64-66	Marine Sand & Silt	Fines Content (% Passing #200)
BB-PVS-304	5D	9-11	marine silt-clay	Atterberg Limits
BB-PVS-304	7D	19-21	marine silt-clay	Atterberg Limits
BB-PVS-304	9D	29-31	marine silt-clay	Atterberg Limits
BB-PVS-304	11D	39-41	marine silt-clay	Atterberg Limits
BB-PVS-304	13D	49-51	marine silt-clay	Atterberg Limits
BB-PVS-304	14D	59-61	marine silt-clay	Atterberg Limits

For grain size analyses, report AASHTO and USCS classifications and moisture content.
For Atterberg Limits, report moisture content.
For 1D Consolidation Tests on tube samples: ASTM D2435, Method B (end of primary with 1 load held longer for secondary compression evaluations); add 0.75 and 1.5 tsf load increments; delete 32 tsf load increment; 1 unload-reload sequence starting at 4 tsf; time-deformation readings for all load increments; square root of time method of determining coefficient of consolidation; hold (one) load noted in above table for Calpha determinations using log time method.

SIGNED: BE

Isabel V. (Be) Schonewald, P.E.

Appendix B

Traffic Signal Foundation Recommendations

SCHONEWALD ENGINEERING ASSOCIATES, INC.
■ www.SchonewaldEngineering.com ■

129 MIDDLE ROAD, CUMBERLAND, MAINE 04021
phone 207/829-5226
cell 207/272-9879

VIA EMAIL

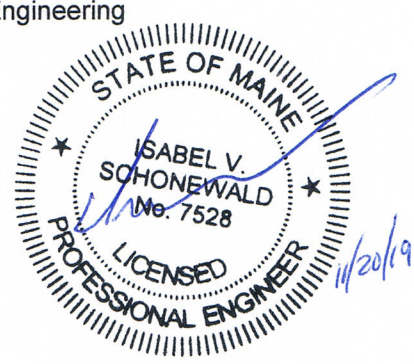
TO: Tim Cote, P.E., HNTB Corporation (HNTB)

FROM: Isabel V. (Be) Schonewald, P.E., Schonewald Engineering Associates, Inc. (SchonewaldEA)

DATE: November 8, 2019

PROJ. NO.: 19-107

RE: Geotechnical Recommendations
Traffic Signal Mast Arm Foundations
I-295 Ramps at Veranda Street
Portland, Maine
MaineDOT WIN 21745.00



Per your request, SchonewaldEA has prepared this memorandum to summarize geotechnical recommendations that were provided by way of email correspondence for the proposed traffic signal mast arm foundations for the SB on ramp and NB off ramp of I-295 at Veranda Street in Portland, Maine (MaineDOT WIN 21745.00).

I-295 SB On Ramp (intersection of Veranda and Wordsworth Streets): Test boring BB-PVS-401 was drilled for the traffic signal to be located at the intersection of Veranda and Wordsworth Streets. The boring log was provided to HNTB via email on October 25th. The subsurface information from the boring was supplemented by data from the test borings that were drilled previously for the bridge replacement to the extent applicable. Base on the evaluation, SchonewaldEA recommends that the design of the concrete foundation for the traffic signal mast arm be in accordance with MaineDOT Standard Specification 626.034 included in the Supplemental Specifications dated July 10, 2019, or more recent if available. If a single drilled shaft foundation is proposed, sizing of the drilled shaft foundation should be based on Standard Details 626(03) and 626(04) with Charts S600-1 through 3 (soils with Su = 600 psf) using the actual loads (bending moment and torsion) that will be imparted to the foundation element by the traffic signal superstructure. The charts were developed based on groundwater being at 5 ft BGS and a frost depth of 5 ft BGS; both assumptions being appropriate for this location. Charts for Su = 600 psf were selected to account for the stronger soil in the upper 13 ft of the soil profile and the general assumption that the drilled shafts would not extend deeper (be longer) than 20 ft BGS.

If a pair of (smaller diameter) drilled shafts is proposed, SchonewaldEA recommends that HNTB evaluate the reactions at the top of each drilled shaft that will be imparted by the actual loads (axial, bending moment, and torsion) by use of vetted group drilled shaft software, such as Group or FB Multipier. A geotechnical engineer can assist with the selection of appropriate resistance factors, as well as site-specific values for groundwater depth, and nominal unit side resistance and tip resistance to evaluate the resistance provided by the drilled shafts.

I-295 NB Off Ramp: SchonewaldEA notes that the foundation for the NB off ramp traffic signal is not quite as straight forward as the one for the SB on ramp traffic signal. The primary difference is in the type and consistency of the near surface soils (fill or silt-clay crust) that were encountered in the test borings completed for the bridge replacement that are located in the vicinity of the proposed traffic signal (BB-PVS-105, -106, -303, and -304). The fill encountered in borings -303 and -304 had very high silt contents and very loose/soft consistency and the silt-clay soils encountered in borings -105 and -106 were soft. (Boring BB-PVS-203 does not provide near surface information because we had to vacuum excavate the upper several feet due to the proximity of underground utilities.)

Given that HNTB had estimated the reactions (bending moment and torsion) at the top of the foundation, SchonewaldEA recommended an informal "parametric study" by plugging those numbers into the following charts associated with Standard Details 626(03) and 626(04): S400 (Su=400 psf), S600 (Su=600 psf), and P30 (phi=30 deg). Upon further review of boring logs, we collectively assessed these three soil types, as well as a soil having a phi=28 deg and a soil having Su=500 psf.

In summary:

- predicted applied bending moment of 110 ft-kip (from HNTB);
- predicted applied torsion is 70 kip-ft (from HNTB);
- based on the charts in aggregate, torsion controls;
- charts assume level ground and groundwater at 5 ft BGS, both of which are appropriate;
- presumed proposed ground surface at the foundation will be approximately Elevation 13.0 to 13.5 ft.;
- considered granular soils having phi=30 deg and phi=28 deg;
- considered cohesive soils, having Su=400, Su=500 psf, and Su=600 psf.

Based on the results of those 5 soil types, cohesive soils control and, based on the logs, is the more appropriate model. That said, for the cohesive soils, Su=400 psf is overly conservative, but offers a good worst case boundary condition. The basis of the design, therefore, considered soils modeled as Su=500 psf and Su=600 psf, which when plugged into the charts/workbook upon which the charts were developed, results in the following options:

- Su=600 psf requires a 42" dia shaft to be 18 ft long
- Su=500 psf requires a 42" dia shaft to be 19.5 ft long

- Su=600 psf requires a 48" dia shaft to be 15 ft long
- Su=500 psf requires a 48" dia shaft to be 16.5 ft long

Based on the above assessment for the NB off ramp, SchonewaldEA recommends using a 16-ft-long, 48-inch-diameter shaft, but notes that a 19-ft-long, 42-inch-diameter shaft would also be adequate based on this assessment. If the proposed ground surface is higher than the presumed Elevation 13 feet, this evaluation becomes more conservative given a granular soil is placed and compacted to achieve the higher grade.

Please call/reply should you have any questions or need clarification.

Appendix C

Historic 1957 Geotechnical Data

B. P. R. R&B. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
1	MAINE	I-095-B(8)	40	59

PORTLAND

BORING V1

GR. ELEV. 15.20

- BROWN SAND
- HARD GRAY SILT
- GRAY SILTY SAND
- BROWN SAND
- 54% RECOVERY
- 96% RECOVERY
- LEDGE 96% RECOVERY

BORING V2

GR. ELEV. 16.45

- BROWN SAND
- BROWN SILT
- BLUE-GRAY SILT
- GRAY SILT
- DARK BLUE SILT
- GRAY SILT WITH STREAKS OF BLUE SILT
- FINE BROWN SAND
- FINE GRAY SAND
- 67% RECOVERY
- LEDGE 67% RECOVERY
- 85% RECOVERY

BORING V3

GR. ELEV. 14.20

- L.O.AM
- BROWN SAND GRAVEL & ASHES
- BROWN SILT
- GRAY SILT
- DARK GRAY SILT
- GRAY SILT
- GRAY SANDY SILT
- FINE BROWN SAND
- COARSE BROWN SAND
- FINE GRAY SAND
- HARD GRAY SILTY SAND & GRAVEL (DRY)
- REFUSAL

BORING V4

GR. ELEV. 14.04

- DARK BROWN SAND
- LIGHT BROWN SAND
- GRAY SILT
- GRAY SILT WITH DARK BLUE SPECKS
- GRAY SILT
- GRAY SANDY SILT
- BROWN SAND
- 92% RECOVERY
- REF. SAL
- 67% RECOVERY
- 75% RECOVERY
- LEDGE

BORING V5

GR. ELEV. 14.14

- BROWN SILT & SHELL
- GRAY SILT
- BROWN SAND
- GRAY SILTY SAND
- ROCK
- GRAY SILTY SAND
- GRAY SAND

BORING V9

GR. ELEV. 14.05

- BROWN SILTY SAND & GRAVEL
- GRAY SILT
- GRAY SILTY SAND
- 2½" CASING
- BROWN SAND
- GRAY SAND
- GRAY SILTY SAND
- 28% RECOVERY
- LEDGE

BORING V8

GR. ELEV. 15.05

- BROWN SAND & LEDGE FILL
- GRAY PEAT
- GRAY SILTY SAND
- GRAY SILT
- BROWN SILTY SAND
- GRAY SAND
- BROWN SAND
- 38% RECOVERY
- 17% RECOVERY
- LEDGE

NOTE: For location of borings and for boring notes See Sheet No. 41

DES.	
DR.	J. McG.
TR.	
CHK.	R.F.C.
APPD.	

STATE HIGHWAY COMMISSION
AUGUSTA, MAINE

PORTLAND-YARMOUTH INTERSTATE

INTERSTATE OVER VERANDA STREET

BORING DATA
PART I

SHEET NO. 40 OF 59 | SCALE: AS NOTED

FAY, SPOFFORD & THORNDIKE, INC. ENGINEERS BOSTON, MASS.

Qm-14
19

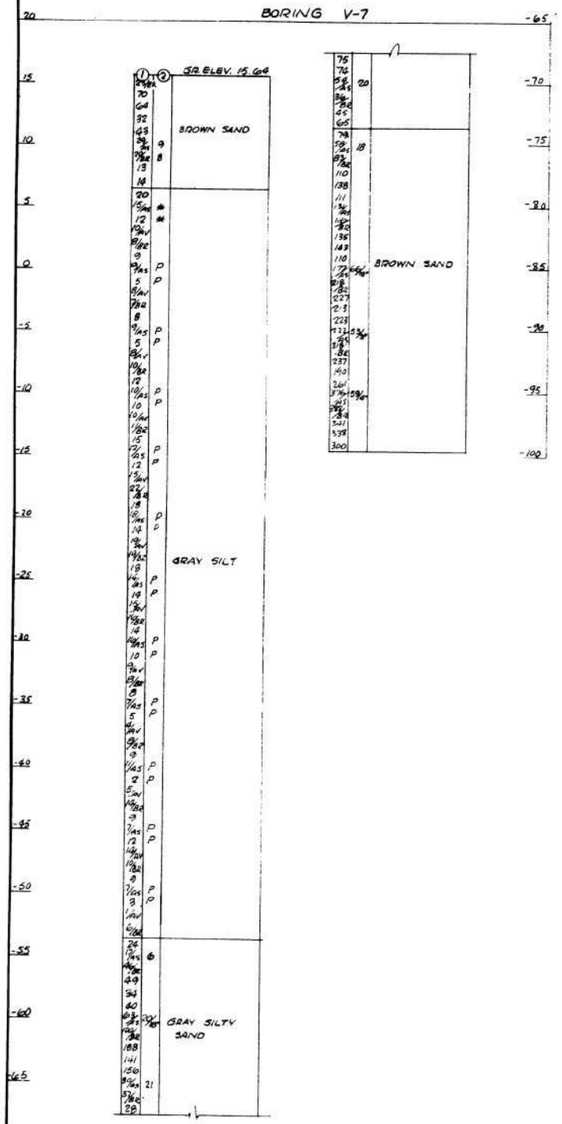
M-1359

0 1 2 3 4 5 INCHES

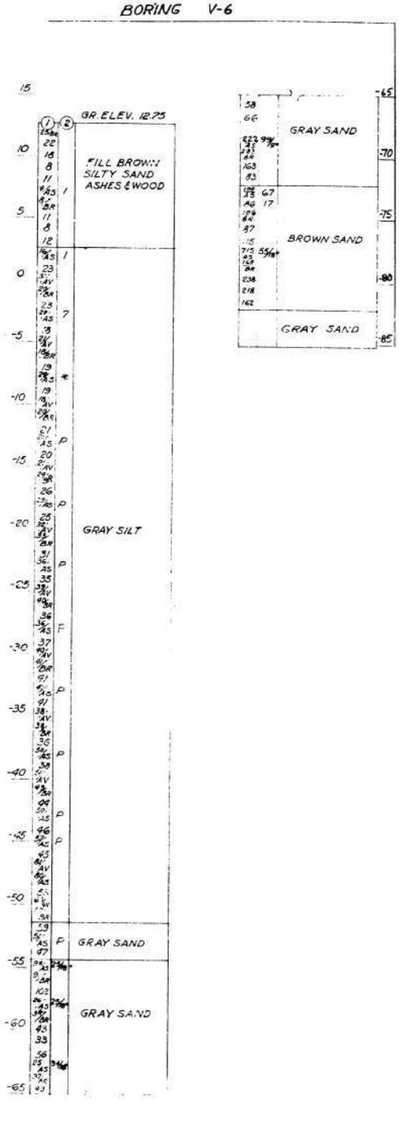
S. P. R. REG. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
1	MAINE	I-295-B(8)	41	59

PORTLAND

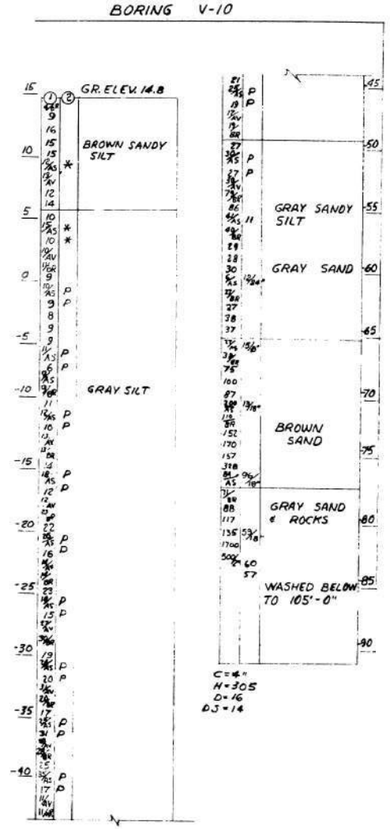
BORING V-7

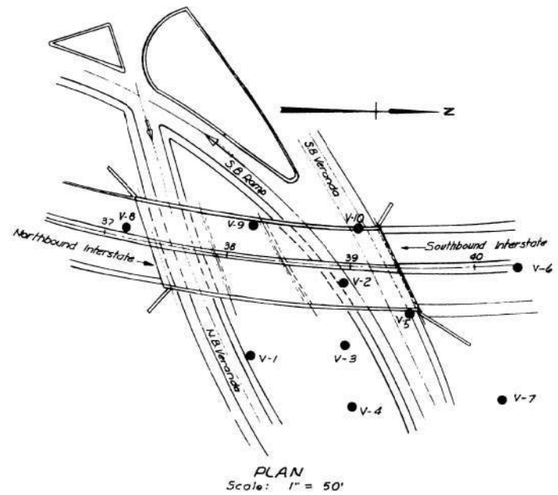


BORING V-6



BORING V-10





PLAN
Scale: 1" = 50'

GENERAL NOTES

1. BORINGS WERE MADE BY THE MAINE STATE HIGHWAY COMMISSION: MARCH, APRIL, JULY & AUGUST, 1957
2. FIGURES IN COLUMN (1) = BLOWS PER FOOT ON CASING EXCEPT AS NOTED. FIGURES IN COLUMN (2) = BLOWS PER FOOT ON SAMPLER ROD EXCEPT AS NOTED.
3. ELEVATIONS ARE REFERRED TO MEAN SEA LEVEL.
4. ADDITIONAL SOIL INFORMATION OBTAINED FROM LABORATORY TESTS IS AVAILABLE FROM THE MAINE STATE HIGHWAY COMMISSION

LEGEND

A.S. = CASING WAS DRIVEN AFTER SAMPLING
C. = DIAMETER OF CASING IN INCHES.
H. = WEIGHT OF HAMMER IN POUNDS.
D. = DROP ON CASING IN INCHES
DS. = DROP ON SAMPLER ROD IN INCHES.
AR. = CASING WAS DRIVEN WASHING AHEAD OF CASING.
BR. =
AV. =
W = WEIGHT OF HAMMER
* = WEIGHT OF RODS
J = SAMPLER DRIVEN BY STATIC LOAD NOT EXCEEDING ½ TON
P = PISTON
** = WEIGHT OF 3 MEN
♣ = WEIGHT OF CASING

DES.	
DR.	
TR.	
CHK.	R.F.C.
APPD.	ABC

STATE HIGHWAY COMMISSION
AUGUSTA, MAINE

PORTLAND-YARMOUTH INTERSTATE

INTERSTATE OVER VERANDA STREET

BORING DATA
PART II

SHEET NO. 41 OF 59 | SCALE: AS NOTED

FAY, SPOFFORD & THORNDIKE, INC.
ENGINEERS BOSTON, MASS.

Qm-14
20

M-1360

Mr. Boyce

HALEY & ALDRICH
CONSULTING SOIL ENGINEERS
238 MAIN STREET, CAMBRIDGE 42, MASS.

UNIVERSITY [redacted] 4-3985

March 20, 1958

File No. 57-12

Fay, Spofford & Thorndike, Inc.
11 Beacon St.
Boston, Mass.

Attention: Mr. E. C. Keane

Subject: Portland-Yarmouth Interstate
Veranda Street Crossing

Gentlemen:

This letter summarizes the results of our soils investigation relative to embankment settlement and stability in the Veranda St. area of the Portland-Yarmouth Interstate. Although soils problems in this area are complicated by highway construction several years ago, it appears that the only real problem exists at the Interstate embankment to the North of the proposed bridge over Veranda St. This embankment is expected to ultimately settle from 18 to 22 inches about 100 feet from the abutment and from 6 to 10 inches at the abutment. The factor of safety of the slope against a deep seated slide through underlying medium to soft grey varved silty clay is about 1.3 which is believed to be satisfactory.

Site Conditions

A plan of the site showing the location of borings is given in the accompanying Figure 1. Prior to 1952, the area to the east of the proposed Interstate embankment and bridge was tidal, sloping gradually eastward from the dashed line labeled "Approximately Original Toe of Slope, 1952". Interchange construction about 5 years ago for the Portland Expressway connection to Rt. 1 raised the grade in the area to approximately El. +15. As much as 15 ft. of fill was added to move the toe of slope to its present position, also shown on the plan.

The locations of borings made in 1952 by the Maine State Highway Commission prior to constructing are shown on the plan. We have examined laboratory logs of these borings and results of consolidation and shear tests as well as stratigraphic profiles through the area which were prepared by Dr. Arthur Casagrande. In general, soil conditions in the area within which these borings were made consist of brown silty sands and stiff gray silty clays extending to refusal at 37 to 50 ft. Some thin surface deposits of soft organic sandy silt and other unsuitable materials were found. Dr. Gray had recommended that these materials be excavated prior to the placement of granular fill. Otherwise, no serious soils problems were anticipated for the Expressway Interchange.

Borings W4-34, V-1 and V-8, taken in 1957 throughout the same area, confirm these soil conditions. Furthermore, the 1957 borings indicate that fill used for the Portland Expressway construction was brown medium to fine sand reported to be in a loose to medium dense state.

South Approach Embankment and Northbound Ramp

Embankment fill for the Interstate between stations 32 and 37 will raise the grade to a maximum El. 36.5 requiring the placement of approximately 20 feet of fill. The adjacent Northbound ramp requires a maximum of 25 feet of fill between Sta. 6+50 and 9+50 where the present grade is about El. 0.

These embankments are expected to be adequately stable with the following qualifying remarks: 1) Surface deposits of organic silt and other soft soils encountered during construction should be removed. 2) Granular borrow is recommended for the embankment. 3) It is assumed that granular borrow has been used for the existing fill and that unsuitable materials were removed before Expressway fill was placed. (A thin layer of "soft gray silty peat" was encountered below fill in boring V-8 only. This should not be serious unless significant areas not explored by borings are as bad or worse.)

Settlement of the south approach embankment and Northbound ramp should not exceed 2 to 3 inches following construction since underlying materials are granular or somewhat precompressed. As before, gravel borrow is recommended in those areas where filling, without compaction, is required below water. This appears to be the case between Sta 6+50 and 9+50 on the Northbound ramp.

North Approach Embankment

Soil conditions rapidly become unfavorable to the north of the Interstate bridge over Veranda St. where 60 feet of soft to medium gray sensitive varved silty clay was encountered from El. +6 to El. -54 in Boring V-7. Existing ground surface is approximately El. +15 while the Interstate grade is El. +35. Therefore the embankment is 20 feet.

An unusually thorough laboratory testing program on the soft to medium gray varved silty clay was carried out at the Soils Laboratory in Orono. A summary of test results is included in accompanying Tables and in Figure 2.

A comparison of maximum past pressure values from consolidation tests with the present overburden intergranular pressure indicates that the clay has been somewhat preconsolidated, possibly by a combination of ground water lowering and removal of overburden by erosion. The preconsolidation, however, is considerably smaller than the applied load for a 20 ft. embankment. Therefore substantial settlement can be expected to occur.

For the settlement computation the following assumptions were made:

1. Unit weight of embankment material is 125 lb. per cu. ft., that of natural soil above ground water level is 120 lb. per cu. ft., and that of submerged soil is an effective 58 lb. per cu. ft.

2. Preconsolidation has occurred in the past as a result of a general ground water lowering to between El. -20 and -25. Only that portion of the embankment pressure increment which exceeds the preconsolidation pressure from this condition is considered effective in causing consolidation.

3. The compression ratio $\frac{C_c}{1+e_o}$ is equal to 0.25.

4. Finish embankment grade is El. +35 and 55 to 60 feet of gray varved clay underlies the fill.

Under these assumptions, the embankment near Sta. 40+50 is expected to ultimately settle from 16 to 22 inches. At the north abutment (Sta. 39+40) the total settlement is expected to be between 6 and 10 inches exclusive of compression in the embankment material itself. Based on a coefficient of consolidation of 4.0×10^{-4} $cm^2/sec.$ and one-dimensional drainage, approximately 40% of this settlement can be anticipated in 5 to 6 years at Sta. 40+50 and from 1 to 2 years at the abutment while settlement can be expected to be 90% complete after 25 years. In reality, however, settlement will be appreciably faster due to lateral drainage from sand and silt varves.

The effect of this settlement on existing utilities, water mains, sewers, etc., along or crossing Whittier St. must be given consideration.

Embankment Stability

The assumptions involved in the stability analysis of the North embankment in the vicinity of Sta. 40+50 are:

1. The embankment is built from El. +14 to El. +35 with 2:1 side slopes.

2. The embankment fill has an internal friction angle of 30° and weighs 125 lb. per cu. ft.

3. Brown silty sand underlies the embankment to El. +5 and has a unit weight of 125 lb. per cu. ft. and an internal friction angle of 30°.

4. Shear strength of the varved clay varies as shown in Figure 2.

Under these assumptions the most critical circle is one having a base tangent to El. -12 on which the factor of safety is 1.30. This factor of safety is considered satisfactory under the assumptions which have been made in the analysis.

Recommendations

In view of the anticipated settlement of the north embankment at Veranda St. and the uncertainties involved in predicting the time rate at which this settlement will occur, it is recommended that settlement observation platforms be installed at original ground surface. In addition it is recommended that provisions be made in

the contract for overloading if required. Thus, if observed settlements during construction indicate that overloading is desirable, as much as 4 feet of additional fill may be added without causing an embankment failure. A total of six settlement platforms are recommended at the shoulders of the embankment at Stations 39+50, 40+50 and 41+50. Four platforms are recommended at Sta. 35+00 and 37+00. It will be desirable to allow the north embankment to stabilize for as long a period as possible before the pavement, preferably bituminous concrete, is constructed.

If you have questions or need additional information, please do not hesitate to call.

Sincerely yours,

Karl P. Aldrich, Jr.

HPA/MC
Enclosures

HALEY & ALDRICH
CONSULTING SOIL ENGINEERS
238 MAIN STREET, CAMBRIDGE 42, MASS.
UNIVERSITY 4-3935

March 20, 1958

File No. 57-12

SUMMARY OF
CONSOLIDATION TESTS

VERANDA ST., PORTLAND - YARMOUTH INTERSTATE

Boring No.	Sample No.	El. (ft.)	Approx. Initial Void Ratio	Range of Maximum Past Pressure (tons/sq.ft.)	Virgin Compression Index
V-1	1U	-6.3	0.97	More than 5	-
V-2	1U	-1.9	1.33	0.9 - 1.1	0.63
V-3	1U	-7.2	1.17	1.3 - 1.6	0.39
V-4	1U	-12.6	1.34	1.8 - 2.1	0.53
V-4	3U	-27.4	0.94	More than 5	-
V-5	1U	-2.6	1.34	0.9 - 1.1	0.58
V-5	5U	-32.6	1.13	2.1 - 2.4	0.54
V-7	1U	-1.0	1.14	0.9 - 1.1	0.64
V-7	4U	-16.0	1.30	1.9 - 2.3	0.56
V-7	8U	-36.0	1.29	1.8 - 2.3	0.48
V-10	10U	-1.9	1.29	1.3 - 1.6	0.61

HALEY & ALDRICH
CONSULTING SOIL ENGINEERS
238 MAIN STREET, CAMBRIDGE 42, MASS.
UNIVERSITY 4-2770 UN 4-3985

March 20, 1958

File No. 57-12

SUMMARY OF NATURAL WATER CONTENTS and ATTERBERG LIMITS

VERANDA ST., PORTLAND-YARMOUTH INTERESTATE

Boring No.	Natural Water Content: No. of Tests	Ave.	Range	Liquid Limit	Plastic Limit
V-2	31	41.6%	38.5 - 47.0%	40.5% 44.0% 48.9% 43.4%	25.0% 26.0% 27.0% 24.0%
V-3	12	40.9%	34.5 - 45.0%	51.0% 50.0%	27.0% 27.5%
V-4	8	45.0%	41.0 - 49.0%	54.8%	28.1%
V-5	21	41.5%	37.5 - 45.0%	47.3% 45.8% 37.0%	26.1% 25.0% 23.0%
V-6	13	37.4%	24.0 - 49.0%	44.0% 50.9% 41.0%	28.0% 31.0% 20.0%
V-7	27	41.4%	29.0 - 49.0%	38.0% 44.9% 32.4% 41.2%	21.0% 27.8% 18.0% 22.1%
V-9	22	37.6%	25.0 - 49.0%	42.8%	23.0%
V-10	36	41.0%	21.0 - 46.0%	46.5% 45.5% 40.6% 36.8%	23.0% 23.0% 23.6% 23.0%

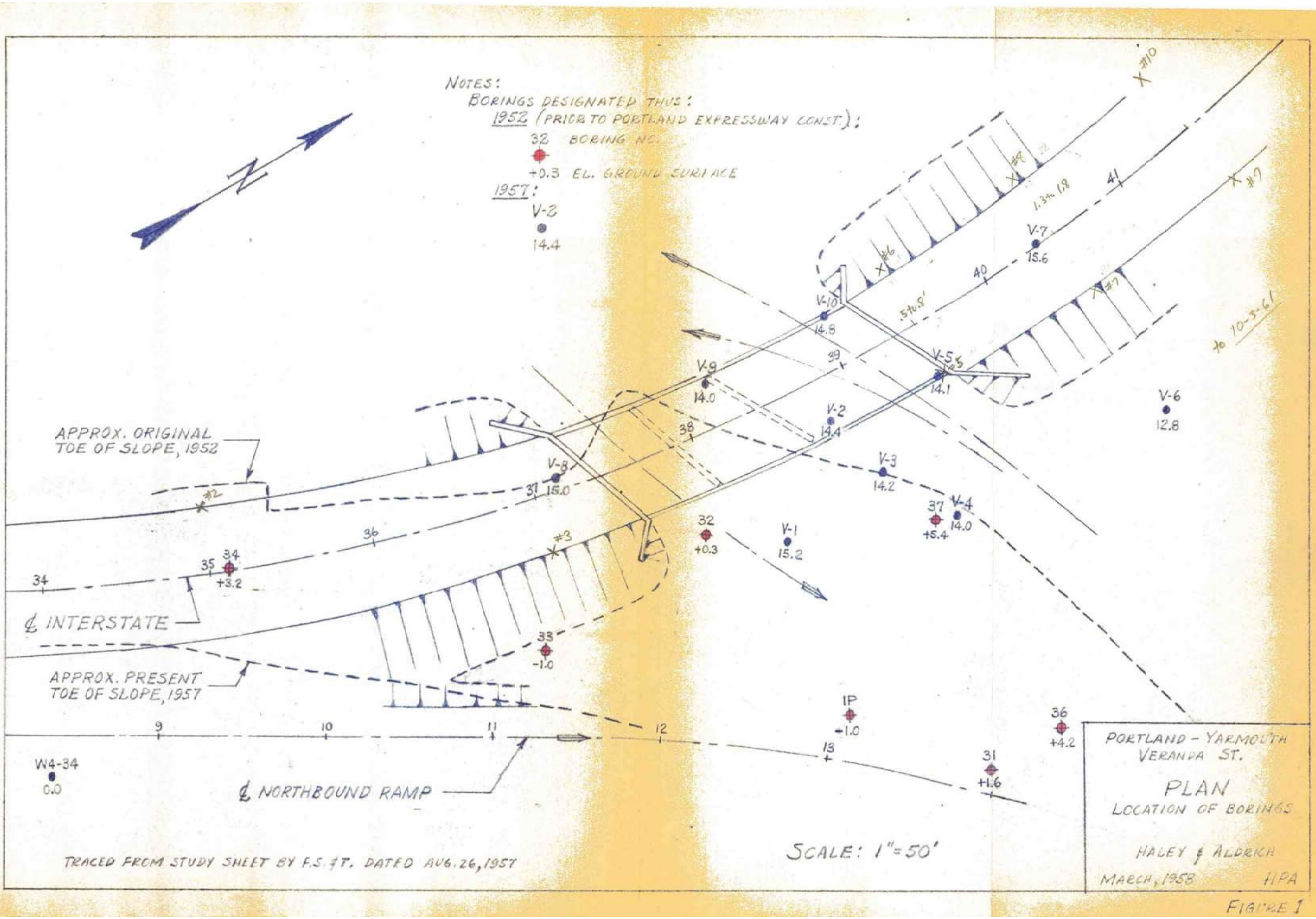

NOTES:
BORINGS DESIGNATED THUS:
1952 (PRIOR TO PORTLAND EXPRESSWAY CONST.):
32 BORING NO.
+0.3 EL. GROUND SURFACE
1957:
V-2
14.4
APPROX. ORIGINAL TOE OF SLOPE, 1952
APPROX. PRESENT TOE OF SLOPE, 1957
℄ INTERSTATE
℄ NORTHBOUND RAMP
V-1 15.2
V-2 14.4
V-3 14.2
V-4 14.0
V-5 14.1
V-6 12.8
V-7 15.6
V-8 15.0
V-9 14.0
V-10 14.8
W4-34 0.0
32 +0.3
33 -1.0
34 +3.2
35
36
37 +5.4
38
39
40
41
1P -1.0
13
31 +1.6
36 +4.2
9
10
11
12
#2
#3
#6
#7
#10
1.34
1.8
54.8'
10-3-61
SCALE: 1"=50'
TRACED FROM STUDY SHEET BY F.S.&T. DATED AUG. 26, 1957
PORTLAND - YARMOUTH
VERANDA ST.
PLAN
LOCATION OF BORINGS
HALEY & ALDRICH
MARCH, 1958 HPA

FIGURE 1

HALEY & ALDRICH
CONSULTING SOIL ENGINEERS
238 MAIN ST., CAMBRIDGE 42, MASS.

PROJECT Southern Artery

JOB NUMBER 57-12
SHEET NUMBER 1
DATE FEB. 18, '58
COMPUTED BY HPA
CHECKED BY

SUBJECT Verulam Ave

Composite Shear Strength V-1 through V-10

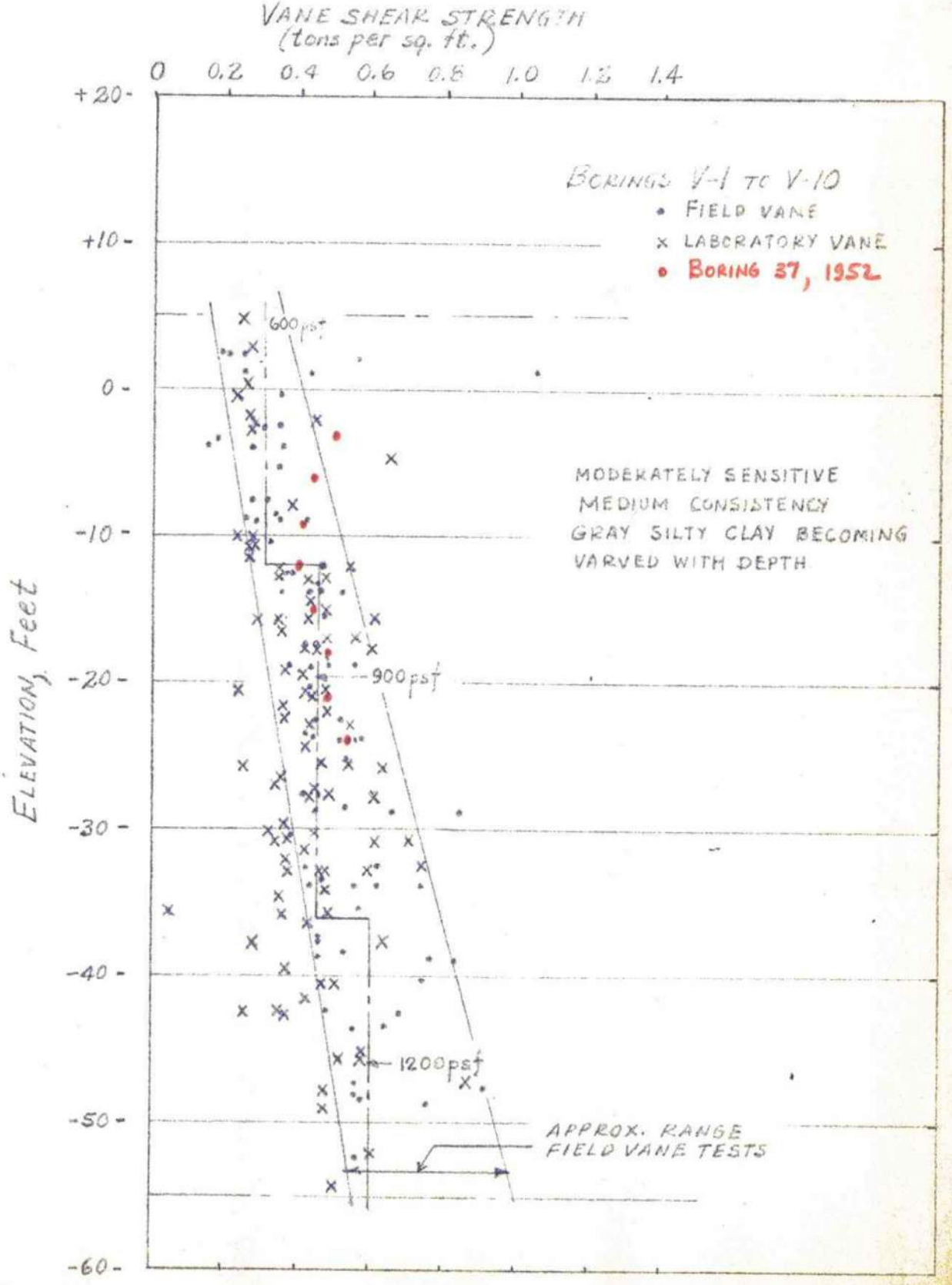


FIGURE 2

FAY, SPOFFORD & THORNDIKE, INC.
ENGINEERS
BOSTON

COPY

March 27, 1958

Mr. Vaughan M. Daggett, Chief Engineer
Maine State Highway Commission
State Office Building
Augusta, Maine

Attention: Mr. Dana T. Bartlett

Subject: Portland-Yarmouth Interstate Highway
Soil Conditions, Veranda Street Area

Dear Sir:

Forwarded herewith in duplicate is a letter report dated March 20, 1958, by Haley & Aldrich, Consulting Soil Engineers, covering soil conditions and recommended procedures in the Veranda Street area.

We concur with the recommendations therein, which require the following to be incorporated in the plans and special provisions:

(1) In the areas of the embankments for the southerly approach and northbound ramp, remove surface deposits of organic silt and other soft soils encountered during construction. In water areas, use gravel borrow for portions of embankment below high tide, back of the rock which will be used on exposed slopes, and use granular borrow for other embankments. This will have little effect on cost, since this contract will be a "borrow" job. Install pairs of settlement platforms in shoulders at Stations 35+00 and 37+00.

(2) In the embankment for the northerly bridge approach, use granular borrow back of the abutment and where fills exceed 10 feet, in order to secure the required degree of internal friction. (The height figure has been checked with Dr. Aldrich.)

FAY, SPOFFORD & THORNDIKE, INC.
ENGINEERS
BOSTON

COPY

Install pairs of settlement platforms in the shoulders at Stations 39+50, 40+50, and 41+50. Provide in the contract for placement of overload up to four feet, for use in case observations during construction indicate that this is desirable. Schedule the grading contract as far in advance of the paving contract as feasible, in order to allow as much as possible of the compression in underlying soils to take place before paving. In designing utilities alterations along Whittier Street, locate the structures so that they will be affected as little as possible by the expected settlement of the embankment.

(3) Use bituminous concrete pavement in areas subject to considerable settlement. This recommendation is particularly applicable in a stretch of several hundred feet north of the bridge. We have previously recommended bituminous concrete for the crossing of the cove beyond Station 46. It would appear advisable to use this type of pavement all the way from the southerly end of the project to some point north of the cove crossing.

Very truly yours,

FAY, SPOFFORD & THORNDIKE, INC.
By

ECKeane:ew
cc: Mr. Boyce, Orono
FS&T, Portland