

PHASE II GEOTECHNICAL DATA REPORT  
PARKWAY SOUTH OVER INTERSTATE 395  
BRIDGE NO. 1562, MAINEDOT WIN 029484.00  
BREWER, MAINE

by  
Haley & Aldrich, Inc.  
Portland, Maine

for  
HNTB Corporation  
South Portland, Maine

File No. 0210037-001  
May 2026





HALEY & ALDRICH, INC.  
75 Washington Avenue  
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May 15, 2026  
File No. 0210037-001

HNTB Corporation  
82 Running Hill Road, Suite 201  
South Portland, Maine 04106-3218

Attention: Josh Olund, P.E., PhD  
Associate Vice President/Structures Department Manager

Subject: Phase II Geotechnical Data Report  
Parkway South over Interstate 395  
Bridge No. 1562, MaineDOT WIN 029484.00  
Brewer, Maine

Ladies and Gentlemen:

This Phase II Geotechnical Data Report presents the results of the recent geotechnical field investigation and geotechnical laboratory testing programs conducted at the site. This work has been completed in accordance with our proposal dated June 4, 2025 and our executed contract signed on October 2, 2025.

## **Project Understanding**

The existing 240-foot (ft)-long, two-span bridge carries Parkway South over Interstate 395 (I-395; see Figures 1 and 2). Based on our review of the historical bridge drawings, the existing cast-in-place concrete abutments, wingwalls, and pier are supported on spread footings bearing on bedrock. A near-vertical bedrock slope is exposed below the existing abutment footings. The exposed bedrock slope height present below the footings varies from approximately 5 to 10 ft at the west abutment (with a limited zone of only a few feet on the south side) and approximately 15 ft at the east abutment.

Based on discussions with HNTB Corporation (HNTB), the project will include a full bridge replacement.

## **Horizontal Coordinate System and Elevation Datum**

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

## Geologic Setting

According to Maine Geological Survey's Bangor Surficial Geology Quadrangle, Maine (2011), the surficial geologic unit mapped within the site vicinity is glacial till which consists of loose to very compact, poorly sorted, massive to weakly stratified mixture of sand, silt, and gravel-size rock debris with bedrock outcrops/thin-drift areas. According to Maine Geological Survey's Bangor Bedrock Geology Quadrangle, Maine (2011), bedrock at the site vicinity is mapped as the Brewer Formation of the Vassalboro Group which consists of Silurian Age siltstone and claystone slate.

## Geotechnical Field Investigations

### HISTORICAL GEOTECHNICAL FIELD INVESTIGATIONS

Two phases of historical geotechnical field investigations were conducted at the site by the MaineDOT in 1981 and 1982, in support of the design and construction of the existing bridge. The results of these investigations are summarized in the Phase I Geotechnical Data Report prepared by Haley & Aldrich, dated May 15, 2026.

### GEOTECHNICAL FIELD INVESTIGATION CONDUCTED BY HALEY & ALDRICH

Haley & Aldrich conducted a geotechnical field investigation at the site in October 2025. Three borings, designated BB-BPSR-101, BB-BPSR-102 and BB-BPSR-103, were completed along the existing bridge alignment. Borings BB-BPSR-101 and BB-BPSR-103 were drilled through the approach embankments behind the existing abutments. Boring BB-BPSR-102 was drilled through the existing bridge deck and casing was advanced from the bridge deck to the ground surface below.

The boring locations were laid out in the field prior to the start of drilling by taping distances from existing site features. "As-drilled" boring locations and ground surface elevations were determined in the field by MaineDOT using global positioning system (GPS) survey equipment upon the completion of drilling and were provided to Haley & Aldrich. The "as-drilled" boring locations and ground surface elevations are summarized on the boring logs and Table I and are shown on Figure 2.

The borings were drilled by New England Boring Contractors (NEBC) of Hermon, Maine using a track-mounted Mobile B53 drill rig. The borings were drilled to depths ranging from approximately 17 to 24 ft below ground surface (BGS).

The borings were advanced using cased-wash drilling methods by either driving or spinning casing. Casing consisted of 4-inch (in.; HW-size) inside diameter (ID) steel casing and/or 3-in. (NW-size) ID steel casing. Casing blow count data is provided on the logs in Appendix A. Soil samples were generally collected continuously through the man-placed/existing fill (fill) and then typically at 5-ft intervals once naturally-deposited soils were encountered. The borings were extended to bedrock and collected approximately 10 to 11 ft of bedrock core.

Soil samples were collected by driving a 1-3/8-in. ID split-spoon sampler with a 140-lb hammer dropped from a height of 30 in., as indicated on the boring logs. Drilling and sampling were performed in accordance with MaineDOT specifications. The drill rig was equipped with an automatic hammer calibrated annually per MaineDOT requirements (Appendix A of MaineDOT Geotechnical Drilling Contract Specifications, revised June 2007). Haley & Aldrich reviewed the hammer calibration report provided by NEBC, confirmed that the hammer was calibrated within 12 months of when drilling was completed, and confirmed the hammer efficiency factor. A calculated hammer efficiency of 0.786 was used for the calibrated automatic hammer system for the drill rig.

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

The borings sampled approximately 10 to 11 ft of bedrock using a 2-in. (NQ-size) ID diamond-tipped core barrel.

All soil and bedrock samples were classified in accordance with MaineDOT classification system and were preserved in glass sample jars and wooden core boxes. The samples that were not submitted for laboratory testing are available for review upon request.

#### **GEOLOGIC BEDROCK MAPPING AT EXISTING BRIDGE ABUTMENTS**

A Haley & Aldrich geologist documented the exposed bedrock outcrops at the existing bridge abutments (see Photograph Nos. 1 and 2 in Appendix D) on January 8, 2026.

The outcrops appear to have been constructed using blasting techniques, with 3-in. half casts present across the entire cut. The orientation of the face of the cuts parallels the I-395 eastbound (EB) and westbound (WB) lanes, with slope Dip Directions of 30 and 210 respectively.

The bedrock exposed was a grey metasiltstone. Structurally, the metasiltstone is thinly laminated and contains texturally gradational bedding (see Photograph No. 3 in Appendix D). Veining of quartz, parallel to the cleavage, disrupts the bedding and creates weak zones in the bedrock. Along these weakened zones, weathering is higher, and the bedrock is visibly eroding. While field observations noted that the bedrock is mostly hard, slightly weathered and intact, secondary jointing and the folded nature of this bedrock have also created intersecting structures which may impact the foundation design for the proposed bridge replacement.

The bedding is oriented near vertical and oblique to I-395, as noted in the measurements provided in the table below and projected stereographically in Appendix D.

Bedrock Outcrop Name	Bedrock Type	Structure <sup>1,2</sup>	Dip	Dip Direction
I-395 EB Lane (Existing Abutment No. 1)	Metasiltstone	Bed/Clvg	58	330
		Bed/Clvg	58	325
		Joint	80	65
		Joint	82	10
I-395 WB Lane (Existing Abutment No. 2)	Metasiltstone	Bed/Clvg	67	330
		Bed/Clvg	80	345
		Bed/Clvg	72	340
		Bed/Clvg	68	325
		Bed/Clvg	62	345
		Joint 1	80	245
		Joint 1	67	65
		Joint 1	66	210
		Joint 2	50	120
		Joint 2	50	123
		Joint 2	48	178

**Notes:**

1. Bed = Bedding
2. Clvg = Cleavage

## Generalized Subsurface Conditions

The subsurface conditions encountered at the site consist of the following geologic units presented in order of increasing depth below ground surface: fill, weathered bedrock and bedrock.

### SOIL AND BEDROCK DESCRIPTIONS

#### Soil

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

Geologic Unit	Range in Encountered Thickness (ft)	Generalized Description
Bituminous Concrete	0.4 to 0.8	Approximate 5 to 10-in.-thick layer of bituminous concrete was encountered at the ground surface in all borings.
Fill	5.0 to 10.6	Medium dense to very dense fine to coarse SAND, little to some gravel, and trace silt; medium dense fine to coarse GRAVEL, little to some fine to coarse sand, trace silt. Occasional Gravelly SAND, Sandy GRAVEL, and Silty SAND. <i>(encountered in all borings)</i>
Weathered Bedrock	2.4 to 3.0	Dense Gravelly fine to coarse SAND, trace silt; very dense Silty fine to coarse SAND, some gravel. <i>(encountered in all borings except boring BB-BPSR-103)</i>
Bedrock		Bedrock was encountered in all borings. Top of bedrock surface was encountered at depths ranging from 5.8 to 14.0 ft BGS.

Boring BB-BPSR-102 penetrated through the approximately 1.3-ft thick existing concrete bridge deck.

## Bedrock

As stated previously, approximately 10 to 11 ft of bedrock was cored in the borings. The sampled and recovered bedrock generally consisted of moderately hard to hard, fresh to moderately weathered, grey, aphanitic, METASILTSTONE. Primary joints were observed dipping at moderate to steep angles, are very close to widely spaced, and tight to open.

Rock quality designation (RQD) is a common parameter that is used to help assess the competency of sampled bedrock. RQD is defined as the sum of pieces of recovered bedrock greater than 4 in. in length divided by the total length of the bedrock core run. RQD values for the bedrock encountered in the borings drilled at the site ranged from 30 to 100 percent, indicating variable bedrock quality; from poor to excellent in accordance with the MaineDOT Geotechnical Section “Key to Soil and Rock Descriptions and Terms Field Identification Information” document, dated May 2024.

Detailed bedrock core data and descriptions are provided on Table III and on the boring logs in Appendix A. In addition, photographs of the recovered bedrock core samples are provided for reference in Appendix B.

## GROUNDWATER CONDITIONS

Groundwater levels were measured in borings BB-BPSR-101 and BB-BPSR-102, during or shortly after the completion of drilling. Groundwater was not encountered in boring BB-BPSR-103. Observed groundwater levels measured in the borings are summarized in the table below:

Boring No.	Groundwater Depth (ft, BGS)	Groundwater Elevation (ft, NAVD 88)
BB-BPSR-101	12.6	112.8
BB-BPSR-102	11.5	89.5

Please note that these groundwater levels were measured during advancement of the borings and were influenced by drilling activities. It is important to note that the readings were taken over a relatively brief time and do not reflect static groundwater levels.

In general, groundwater levels are subject to variation due to seasonal changes, local soil and bedrock conditions, topography, precipitation, and the presence of below-grade structures. As such, groundwater conditions encountered during construction may differ from those measured during the recent geotechnical field investigation presented in Appendix A.

## Geotechnical Laboratory Testing Program

A geotechnical laboratory testing program was completed on relatively undisturbed soil samples and bedrock samples collected during the recent geotechnical field investigation to assist in soil classification and determination of engineering properties. All geotechnical laboratory soil and bedrock testing was performed by GeoTesting Express, Inc. of Acton, Massachusetts. Geotechnical laboratory testing was performed in accordance with applicable ASTM International (ASTM) testing procedures. A summary of the geotechnical laboratory test results is below.

Laboratory Test	ASTM Test Designation	Geologic Unit	No. of Tests Completed	Range in Test Results
Grain Size	D6913	Fill	4	AASHTO Classification: A-1-a, A-1-b USCS Classification: GP-GM, SW, GW, SW-SM
Bulk Density and Compressive Strength of Rock	D7012	Bedrock	3	$q_p = 1,669$ to $8,362$ psi $\gamma_B = 168$ to $174$ pcf

**Note:**

AASHTO = American Association of State and Highway Transportation Officials

USCS = Unified Soil Classification System

$q_p$  = peak compressive stress

psi = pounds per square inch

$\gamma_B$  = bulk density

pcf = pounds per cubic foot

All laboratory test results are shown on boring logs included in Appendix A and complete results are provided in Appendix C.

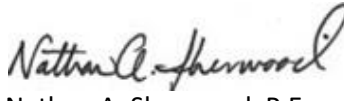
## Closure

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

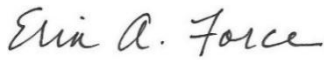
Sincerely yours,  
**HALEY & ALDRICH, INC.**



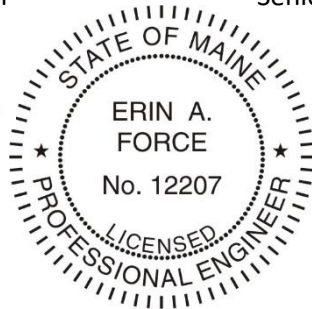
Camilo J. Fernandez-Escobar  
Staff Geotechnical Engineer



Nathan A. Sherwood, P.E.  
Senior Project Manager



Erin A. Force, P.E.  
Senior Associate



### Enclosures:

- Table I – Subsurface Exploration Location Data
- Table II – Subsurface Exploration Subsurface Data
- Table III – Subsurface Exploration Bedrock Core Data
- Figure 1 – Project Locus
- Figure 2 – Boring Location Plan
- Appendix A – Boring Logs
- Appendix B – Bedrock Core Photographs
- Appendix C – Laboratory Test Results
- Appendix D – Geologic Bedrock Mapping Results

<https://haleyaldrich.sharepoint.com/sites/MaineDepartmentofTransportation2/Shared Documents/0210037.MaineDOT-Brewer I-395 Design Build/Deliverables/Phase 2 - Geotech Data Reports/Parkway South Bridge No. 1562/2026-0515-HAI-I395 Parkway South Bridge-Phase II GDR-F.docx>

## References

1. Syverson, Kent M., & Thompson, Andrew H., *Surficial Geology Bangor Quadrangle, Maine*, Maine Geological Survey, Department of Conservation, Augusta, Maine, Open File Report No. 11-6, 2011.
2. Pollock, Stephen G., *Bedrock Geology of the Bangor Quadrangle, Maine*, Maine Geological Survey, Department of Conservation, Augusta, Maine, Open File Report No. 11-57, 2011.

<https://haleyaldrich.sharepoint.com/sites/MaineDepartmentofTransportation2/Shared Documents/0210037.MaineDOT-Brewer I-395 Design Build/Deliverables/Phase 2 - Geotech Data Reports/Parkway South Bridge No. 1562/2026-0515-HAI-I395 Parkway South Bridge-Phase II GDR-F.docx>

## TABLES

**TABLE I**

Subsurface Exploration Location Data  
 Parkway South over Interstate 395  
 Bridge No. 1562, MaineDOT WIN 029484.00  
 Brewer, Maine

Haley & Aldrich, Inc. File No.: 0210037-001

Boring No. <sup>1</sup>	Ground Surface Elevation <sup>2</sup> (ft)	Station <sup>3</sup>	Offset Distance (ft) & Direction <sup>3</sup>	Horizontal Coordinates <sup>4</sup>	
				Northing (Y)	Easting (X)
BB-BPSR-101	125.4	TBD	TBD	466,966	1,735,373
BB-BPSR-102	101.0	TBD	TBD	467,012	1,735,517
BB-BPSR-103	131.3	TBD	TBD	467,050	1,735,637

Notes:

<sup>1</sup> Boring locations are shown on Figure 2, Boring Location Plan.

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

<sup>3</sup> Station and offset and direction information to be determined (TBD) after baseline stationing is available.

<sup>4</sup> As-drilled coordinates of borings were determined by MaineDOT using GPS survey equipment, are measured in feet (ft), and reference the NAD83, Maine 2000 West Zone coordinate system.

	Individual	Date
Prepared By:	CFE	1/16/2025
Checked By:	SLB	1/22/2026
Reviewed By:	NAS	1/28/2026

**TABLE II**  
Subsurface Exploration Subsurface Data  
Parkway South over Interstate 395  
Bridge No. 1562, MaineDOT WIN 029484.00  
Brewer, Maine

Haley & Aldrich, Inc. File No.: 0210037-001

Boring No. <sup>1</sup>	Ground Surface Elevation <sup>2</sup> (ft)	Stratigraphic Data <sup>2,3</sup>									Bottom of Exploration Depth (ft)	Elevation of Bottom of Exploration <sup>2</sup> (ft)
		Bituminous Concrete Thickness (ft)	Fill			Weathered Bedrock			Bedrock			
			Depth to Top (ft)	Elevation of Top (ft)	Thickness (ft)	Depth to Top (ft)	Elevation of Top (ft)	Thickness (ft)	Depth to Top (ft)	Elevation of Top (ft)		
BB-BPSR-101	125.4	0.8	0.8	124.6	5.0	5.8	119.6	2.4	8.2	117.2	18.9	106.5
BB-BPSR-102	101.0	0.4	0.4	100.6	10.6	11.0	90.0	3.0	14.0	87.0	24.0	77.0
BB-BPSR-103	131.3	0.8	0.8	130.5	5.0	NE	NE	NE	5.8	125.5	17.0	114.3

Notes:  
<sup>1</sup> Boring locations are shown on Figure 2, Boring Location Plan.  
<sup>2</sup> Ground surface elevations at boring locations were determined in the field by MaineDOT using GPS survey equipment, are measured in feet (ft), and reference the North American Vertical Datum of 1988 (NAVD 88).  
<sup>3</sup> "NE" means stratum was not encountered in boring.

	Individual	Date
Prepared By:	CFE	1/16/2026
Checked By:	SLB	1/22/2026
Reviewed By:	NAS	1/28/2026

**TABLE III**  
Subsurface Exploration Bedrock Core Data  
Parkway South over Interstate 395  
Bridge No. 1562, MaineDOT WIN 029484.00  
Brewer, Maine

Haley & Aldrich, Inc. File No.: 0210037-001

Boring No. <sup>1</sup>	Ground Surface Elevation <sup>2</sup> (ft)	Bedrock Core Diameter (in.)	Run					Total Core Recovery <sup>3</sup>		Rock Quality Designation <sup>4,5</sup>			Physical Rock Parameters		Lithologic, Bedrock Mass, and Discontinuity Description <sup>6</sup>
			No.	Depth Below Ground Surface (ft)			Total Length (in.)	Recovered Length (in.)	%	Length (in.)	%	Rock Quality	Weathering	Estimated Field Strength	
				Top	Bottom	Midpoint									
BB-BPSR-101	125.4	NQ-2"	R1	8.5	12.1	10.3	43.2	39.0	91%	13.0	30%	Poor	Slightly to Moderately Weathered	Moderately Hard	Grey-brown to reddish-brown, aphanitic, METASILTSTONE, moderately hard, slightly to moderately weathered. Joints are moderately dipping to steep, spaced very close to close, primarily along foliation plane, rough, planar to undulating, discolored to highly oxidized, tight to open. Frequent calcite veins, occasional olive-brown clay-silt infilling.
			R2	12.1	16.9	14.5	57.6	58.0	100%	39.7	69%	Fair	Fresh	Hard	Grey to light grey, aphanitic, METASILTSTONE, hard, fresh. Joints are moderately dipping to steep, very close to wide, primarily along foliation, rough, planar, fresh to slightly discolored, tight. Frequent calcite veins with occasional pitting.
			R3	16.9	18.9	17.9	24.0	22.0	92%	22.1	92%	Excellent	Fresh	Hard	Similar to R2, except one joint moderately dipping.
BB-BPSR-102	101.0		R1	14.0	17.7	15.9	44.4	42.0	95%	26.0	60%	Fair	Fresh	Hard	Grey to dark grey and white, aphanitic, calcareous METASILTSTONE and carbonaceous SHALE, hard, fresh. Joints are steep to vertical, spaced close to moderately close, primarily along foliation plane, rough, undulating, fresh, tight. Abundant calcite veining, minor pyrite.
			R2	17.7	22.7	20.2	60.0	60.0	100%	60.0	100%	Excellent	Fresh	Hard	Similar to R1, except no joints but easily broken along steep to vertical foliation plane, abundant calcite veining, minor pyrite.
			R3	22.7	24.0	23.4	15.0	15.0	100%	15.0	100%	Excellent	Fresh	Hard	Similar to R2.

Boring No. <sup>1</sup>	Ground Surface Elevation <sup>2</sup> (ft)	Bedrock Core Diameter (in.)	Run					Total Core Recovery <sup>3</sup>		Rock Quality Designation <sup>4,5</sup>			Physical Rock Parameters		Lithologic, Bedrock Mass, and Discontinuity Description <sup>6</sup>
			No.	Depth Below Ground Surface (ft)			Total Length (in.)	Recovered Length (in.)	%	Length (in.)	%	Rock Quality	Weathering	Estimated Field Strength	
				Top	Bottom	Midpoint									
BB-BPSR-103	131.3	NQ-2"	R1	7.0	10.3	8.7	39.0	36.0	92%	23.0	59%	Fair	Fresh to Slightly Weathered	Hard	Grey to white, aphanitic calcareous METASILTSTONE, hard, fresh to slightly weathered. Joints are steep, very close to moderately close, primarily along foliation plane, rough to smooth, undulating to planar, fresh to moderately discolored and oxidized, tight to open, adundant calcite veining. Moderately weathered and highly fractured zone from 9.5 to 10.3 ft.
			R2	10.3	14.9	12.6	55.2	55.0	100%	25.9	47%	Poor	Fresh to Slightly Weathered	Hard	Similar to R1, except occasional pitting along calcite veins.
			R3	14.9	17.0	16.0	25.2	25.0	100%	25.2	100%	Excellent	Fresh	Hard	Dark grey to grey and white, aphanitic, calcareous METASILTSTONE, hard fresh. One steep joint, rough, undulating, slightly discolored and oxidized, tight. Abundant calcite veining.

Notes:

<sup>1</sup> Boring locations are shown on Figure 2, Boring Location Plan.

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

<sup>3</sup> Total core recovery (TCR) is the length of core recovered divided by the length of the run.

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

<sup>5</sup> Designation based on RQD in accordance with MaineDOT Geotechnical Section "Key to Soil and Rock Descriptions and Terms" Field Identification Information, dated May 2024.

<sup>6</sup> Refer to the boring logs in Appendix A and bedrock core photographs in Appendix B for additional information.

	Individual	Date
Prepared By:	CFE	1/16/2026
Checked By:	SLB	1/22/2026
Reviewed By:	NAS	1/28/2026

## FIGURES



SITE COORDINATES: 44°46'49"N, 68°45'31"W

**HALEY  
ALDRICH**

PARKWAY SOUTH OVER INTERSTATE 395  
BRIDGE NO. 1562, MAINEDOT WIN 029484.00  
BREWER, MAINE

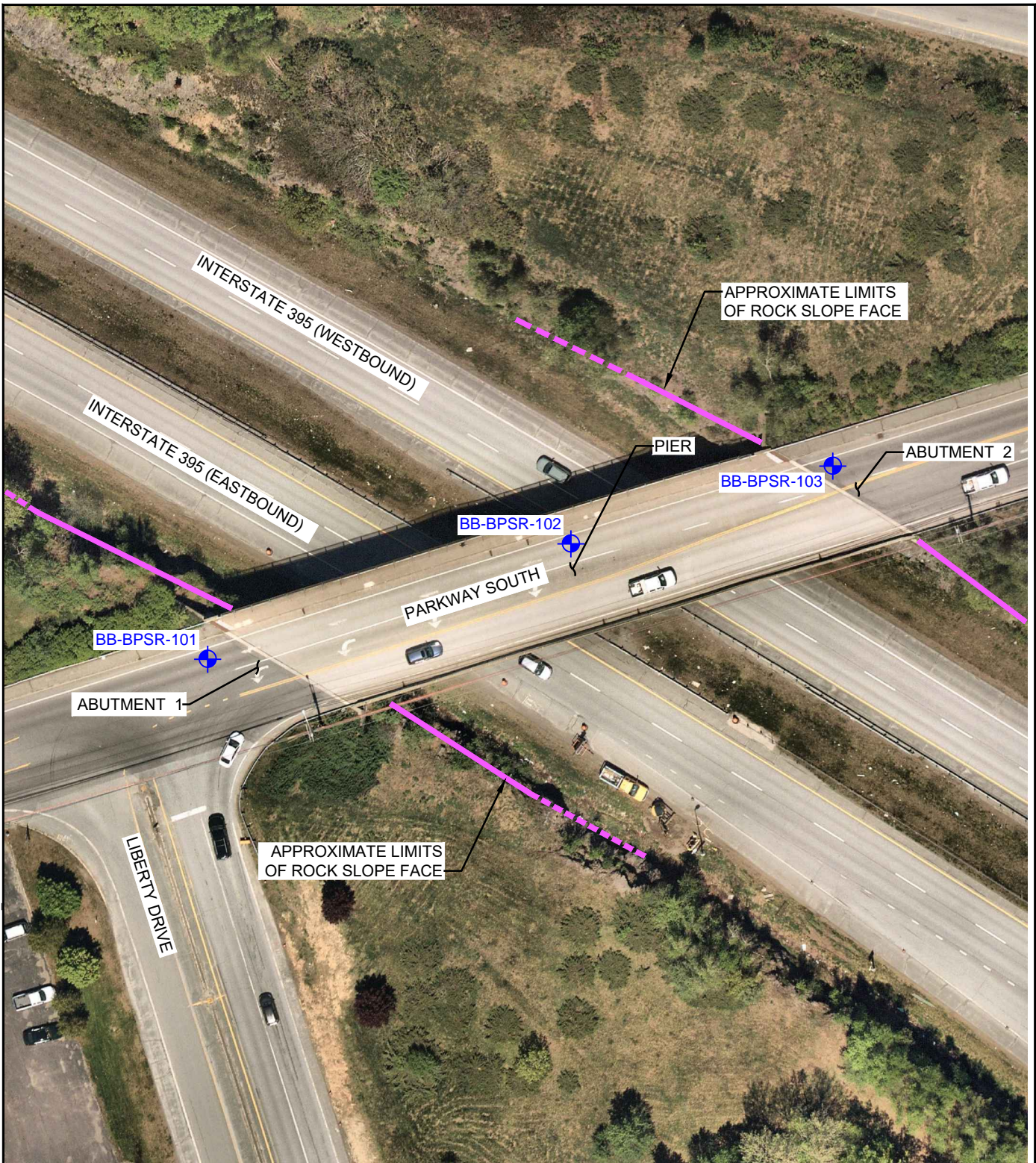


MAP SOURCE: USGS

## PROJECT LOCUS

APPROXIMATE SCALE: 1 INCH = 2,000 FEET  
MAY 2026

**FIGURE 1**



#### LEGEND

— ROCK SLOPE FACE

BB-BPSR-101



DESIGNATION AND AS-DRILLED  
LOCATION OF TEST BORING  
DRILLED BY NEW ENGLAND BORING  
CONTRACTORS AND MONITORED IN  
THE FIELD BY HALEY & ALDRICH,  
INC. IN OCTOBER 2025.

#### NOTES

1. AERIAL IMAGE SHOWN IS DATED MAY 22, 2023 AND WAS DOWNLOADED FROM THE NEARMAP ONLINE DATABASE.
2. THE BORING LOCATIONS SHOWN ARE APPROXIMATE AND ARE NOT POSITIONED BASED ON THE SURVEY DATA.



0 30 60  
SCALE IN FEET

**HALEY  
ALDRICH**

PARKWAY SOUTH OVER INTERSTATE 395  
BRIDGE NO. 1562, MAINEDOT WIN 029484.00  
BREWSTER, MAINE

#### BORING LOCATION PLAN






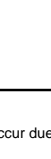





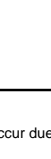





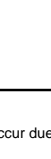
SCALE: AS SHOWN  
MAY 2026

FIGURE 2

## **APPENDIX A**

### **Boring Logs**

UNIFIED SOIL CLASSIFICATION SYSTEM					MODIFIED BURMISTER SYSTEM			
MAJOR DIVISIONS			GROUP SYMBOLS	TYPICAL NAMES				
COARSE-GRAINED SOILS  (more than half of material is larger than No. 200 sieve size)	GRAVELS  (more than half of coarse fraction is larger than No. 4 sieve size)	CLEAN GRAVELS	GW	Well-graded gravels, gravel-sand mixtures, little or no fines.	<u>Descriptive Term</u>  trace little some adjective (e.g. Sandy, Clayey)	<u>Portion of Total (%)</u>  0 - 10 11 - 20 21 - 35 36 - 50		
		(little or no fines)	GP	Poorly-graded gravels, gravel sand mixtures, little or no fines.				
		GRAVEL WITH FINES (Appreciable amount of fines)	GM	Silty gravels, gravel-sand-silt mixtures.				
	SANDS  (more than half of coarse fraction is smaller than No. 4 sieve size)	CLEAN SANDS	SW	Well-graded sands, Gravelly sands, little or no fines		<b>TERMS DESCRIBING DENSITY/CONSISTENCY</b>  <u>Coarse-grained soils</u> (more than half of material is larger than No. 200 sieve): Includes (1) clean gravels; (2) Silty or Clayey gravels; and (3) Silty, Clayey or Gravelly sands. Density is rated according to standard penetration resistance (N-value).  <u>Density of Cohesionless Soils</u>  Very loose Loose Medium Dense Dense Very Dense  <u>Standard Penetration Resistance</u> N <sub>60</sub> -Value (blows per foot)  0 - 4 5 - 10 11 - 30 31 - 50 > 50  <u>Fine-grained soils</u> (more than half of material is smaller than No. 200 sieve): Includes (1) inorganic and organic silts and clays; (2) Gravelly, Sandy or Silty clays; and (3) Clayey silts. Consistency is rated according to undrained shear strength as indicated.  <u>Consistency of Cohesive soils</u>  Very Soft Soft Medium Stiff  Stiff  Very Stiff Hard		
		(little or no fines)	SP	Poorly-graded sands, Gravelly sand, little or no fines.				
		SANDS WITH FINES (Appreciable amount of fines)	SM	Silty sands, sand-silt mixtures				
FINE-GRAINED SOILS  (more than half of material is smaller than No. 200 sieve size)	SILTS AND CLAYS  (liquid limit less than 50)	ML	Inorganic silts and very fine sands, rock flour, Silty or Clayey fine sands, or Clayey silts with slight plasticity.	<u>Approximate Undrained Shear Strength (psf)</u>  WOH, WOR, WOP, <2 2 - 4 5 - 8  9 - 15  16 - 30 >30	<u>Field Guidelines</u>  Fist easily penetrates Thumb easily penetrates Thumb penetrates with moderate effort Indented by thumb with great effort Indented by thumbnail Indented by thumbnail with difficulty			
		CL	Inorganic clays of low to medium plasticity, Gravelly clays, Sandy clays, Silty clays, lean clays.					
		OL	Organic silts and organic Silty clays of low plasticity.					
	SILTS AND CLAYS  (liquid limit greater than 50)	MH	Inorganic silts, micaceous or diatomaceous fine Sandy or Silty soils, elastic silts.					
		CH	Inorganic clays of high plasticity, fat clays.					
		OH	Organic clays of medium to high plasticity, organic silts.					
HIGHLY ORGANIC SOILS	Pt	Peat and other highly organic soils.						
	<b>Desired Soil Observations (in this order, if applicable):</b> Color (Munsell color chart) Moisture (dry, damp, moist, wet) Density/Consistency (from above right hand side) Texture (fine, medium, coarse, etc.) Name (Sand, Silty Sand, Clay, etc., including portions - trace, little, etc.) Gradation (well-graded, poorly-graded, uniform, etc.) Plasticity (non-plastic, slightly plastic, moderately plastic, highly plastic) Structure (layering, fractures, cracks, etc.) Bonding (well, moderately, loosely, etc., ) Cementation (weak, moderate, or strong) Geologic Origin (till, marine clay, alluvium, etc.) Groundwater level							
<b>Maine Department of Transportation Geotechnical Section Key to Soil and Rock Descriptions and Terms Field Identification Information</b>					<b>Sample Container Labeling Requirements:</b> WIN Bridge Name / Town Boring Number Sample Number Sample Depth			

<div>Maine Department of Transportation</div> <div>Soil/Rock Exploration Log</div> <div>US CUSTOMARY UNITS</div>				<div>Project: Parkway South over Interstate 395, Bridge No. 1562</div> <div>Location: Brewer, Maine</div>		<div>Boring No.: BB-BPSR-101</div> <div>WIN: 029484.00</div>																																																																																																																																																																																																																													
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Maine Department of Transportation				Project: Parkway South over Interstate 395, Bridge No. 1562		Boring No.: BB-BPSR-102				
Soil/Rock Exploration Log US CUSTOMARY UNITS				Location: Brewer, Maine		WIN: 029484.00				
Driller:		New England Boring Contractors		Elevation (ft.):		101.0				
Operator:		G. McDougal		Datum:		NAVD88				
Logged By:		R. Estes		Rig Type:		Mobile Drill B-53				
Date Start/Finish:		10/7/2025-10/9/2025		Drilling Method:		Cased Wash Boring				
Boring Location:		N: 467,012; E: 1,735,517		Casing ID/OD:		HW/NW-4.0/3.0" ID				
Hammer Efficiency Factor:		0.786		Hammer Type:		Automatic <input checked="" type="checkbox"/> Hydraulic <input type="checkbox"/> Rope & Cathead <input type="checkbox"/>				
Definitions: D = Split Spoon Sample MD = Unsuccessful Split Spoon Sample Attempt U = Thin Wall Tube Sample MU = Unsuccessful Thin Wall Tube Sample Attempt V = Field Vane Shear Test, PP = Pocket Penetrometer MV = Unsuccessful Field Vane Shear Test Attempt				R = Rock Core Sample SSA = Solid Stem Auger HSA = Hollow Stem Auger RC = Roller Cone WOH = Weight of 140lb. Hammer WOR/C = Weight of Rods or Casing WO1P = Weight of One Person						
S <sub>U</sub> = Peak/Remolded Field Vane Undrained Shear Strength (psf) S <sub>U(lab)</sub> = Lab Vane Undrained Shear Strength (psf) q <sub>p</sub> = Unconfined Compressive Strength (ksf) N-uncorrected = Raw Field SPT N-value Hammer Efficiency Factor = Rig Specific Annual Calibration Value N <sub>60</sub> = SPT N-uncorrected Corrected for Hammer Efficiency N <sub>60</sub> = (Hammer Efficiency Factor/60%)*N-uncorrected				T <sub>V</sub> = Pocket Torvane Shear Strength (psf) WC = Water Content, percent LL = Liquid Limit PL = Plastic Limit PI = Plasticity Index G = Grain Size Analysis C = Consolidation Test						
Depth (ft.)	Sample Information							Graphic Log	Visual Description and Remarks	Laboratory Testing Results/AASHTO and Unified Class.
	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N <sub>60</sub>	Casing Blows			
0	1D	24/10	0.0 - 2.0	10/5/7/11	12	16	HW	100.6		G#847812 A-1-a, SW  G#847811 A-1-a, GW
							44			
	2D	4/4	2.4 - 2.7	50(4")			20(6")			
							31			
5	3D	24/16	4.0 - 6.0	5/18/16/11	34	45	32	97.0		
							59			
	4D	24/5	6.0 - 8.0	6/6/8/17	14	18	45	95.0		
							115			
	5D	24/14	8.0 - 10.0	27/28/20/25	48	63	67			
							92			
10	6D	24/5	10.0 - 12.0	27/14/31/35	45	59	105	90.0	GTX#322339 qp=1,669 psi 18.1-18.5 ft	
							91			
	7D	24/11	12.0 - 14.0	23/19/29/23	48	63	NW			
	R1	44/42	14.0 - 17.7	RQD = 60%			NQ	87.0		
15										
	R2	60/60	17.7 - 22.7	RQD = 100%						
20										
	R3	15/15	22.7 - 24.0	RQD = 100%						
25								77.0		
<b>Remarks:</b> 1. BGS = Below Existing Ground Surface. 2. Boring advanced from top of existing bridge deck. 3. Existing ground surface measured 27.6 ft below top of existing bridge deck surface.										
Stratification lines represent approximate boundaries between soil types; transitions may be gradual.									Page 1 of 2 <b>Boring No.: BB-BPSR-102</b>	

<div>Maine Department of Transportation</div> <div>Soil/Rock Exploration Log</div> <div>US CUSTOMARY UNITS</div>				<div>Project: Parkway South over Interstate 395, Bridge No. 1562</div> <div>Location: Brewer, Maine</div>				<div>Boring No.: BB-BPSR-102</div> <div>WIN: 029484.00</div>			
Driller: New England Boring Contractors			Elevation (ft.): 101.0			Auger ID/OD: SSA-5.0" OD					
Operator: G. McDougal			Datum: NAVD88			Sampler: 24" Standard Split Spoon					
Logged By: R. Estes			Rig Type: Mobile Drill B-53			Hammer Wt./Fall: 140#/30"					
Date Start/Finish: 10/7/2025-10/9/2025			Drilling Method: Cased Wash Boring			Core Barrel: NQ-2.0" ID					
Boring Location: N: 467,012; E: 1,735,517			Casing ID/OD: HW/NW-4.0/3.0" ID			Water Level*: 11.5 ft BGS					
Hammer Efficiency Factor: 0.786			Hammer Type: Automatic <input checked="" type="checkbox"/> Hydraulic <input type="checkbox"/> Rope & Cathead <input type="checkbox"/>								
Definitions: D = Split Spoon Sample MD = Unsuccessful Split Spoon Sample Attempt U = Thin Wall Tube Sample MU = Unsuccessful Thin Wall Tube Sample Attempt V = Field Vane Shear Test, PP = Pocket Penetrometer MV = Unsuccessful Field Vane Shear Test Attempt			R = Rock Core Sample SSA = Solid Stem Auger HSA = Hollow Stem Auger RC = Roller Cone WOH = Weight of 140 lb. Hammer WOR/C = Weight of Rods or Casing WO1P = Weight of One Person			S <sub>u</sub> = Peak/Remolded Field Vane Undrained Shear Strength (psf) S <sub>u(lab)</sub> = Lab Vane Undrained Shear Strength (psf) q <sub>p</sub> = Unconfined Compressive Strength (ksf) N-uncorrected = Raw Field SPT N-value Hammer Efficiency Factor = Rig Specific Annual Calibration Value N <sub>60</sub> = SPT N-uncorrected Corrected for Hammer Efficiency N <sub>60</sub> = (Hammer Efficiency Factor/60%)*N-uncorrected					
			T <sub>v</sub> = Pocket Torvane Shear Strength (psf) WC = Water Content, percent LL = Liquid Limit PL = Plastic Limit PI = Plasticity Index G = Grain Size Analysis C = Consolidation Test								
Depth (ft.)	Sample Information								Graphic Log	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.
	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N <sub>60</sub>	Casing Blows	Elevation (ft.)			
25									20.7-21.7 ft (2:07) 21.7-22.7 ft (1:35) R3: Similar to R2. BREWER FORMATION Recovery = 100% Rock Mass Quality = Excellent R3 Core Times (min:sec) 22.7-23.7 ft (1:49) 23.7-24.0 ft (0:27)  24.0 Bottom of Exploration at 24.0 feet below ground surface.		
Remarks:	1. BGS = Below Existing Ground Surface. 2. Boring advanced from top of existing bridge deck. 3. Existing ground surface measured 27.6 ft below top of existing bridge deck surface.										
Stratification lines represent approximate boundaries between soil types; transitions may be gradual.										Page 2 of 2	
* Water level readings have been made at times and under conditions stated. Groundwater fluctuations may occur due to conditions other than those present at the time measurements were made.										Boring No.: BB-BPSR-102	

<b>Maine Department of Transportation</b> <u>Soil/Rock Exploration Log</u> <u>US CUSTOMARY UNITS</u>				<b>Project:</b> Parkway South over Interstate 395, Bridge No. 1562 <b>Location:</b> Brewer, Maine				<b>Boring No.:</b> BB-BPSR-103 <b>WIN:</b> 029484.00					
<b>Driller:</b> New England Boring Contractors				<b>Elevation (ft.):</b> 131.3				<b>Auger ID/OD:</b> SSA-5.0" OD					
<b>Operator:</b> G. McDougal				<b>Datum:</b> NAVD88				<b>Sampler:</b> 24" Standard Split Spoon					
<b>Logged By:</b> R. Estes				<b>Rig Type:</b> Mobile Drill B-53				<b>Hammer Wt./Fall:</b> 140#/30"					
<b>Date Start/Finish:</b> 10/6/2025-10/7/2025				<b>Drilling Method:</b> Cased Wash Boring				<b>Core Barrel:</b> NQ-2.0" ID					
<b>Boring Location:</b> N: 467,050; E: 1,735,637				<b>Casing ID/OD:</b> HW/NW-4.0/3.0" ID				<b>Water Level*:</b> Not Encountered					
<b>Hammer Efficiency Factor:</b> 0.786				<b>Hammer Type:</b> Automatic <input checked="" type="checkbox"/> Hydraulic <input type="checkbox"/> Rope & Cathead <input type="checkbox"/>									
Definitions: D = Split Spoon Sample MD = Unsuccessful Split Spoon Sample Attempt U = Thin Wall Tube Sample MU = Unsuccessful Thin Wall Tube Sample Attempt V = Field Vane Shear Test, PP = Pocket Penetrometer MV = Unsuccessful Field Vane Shear Test Attempt				R = Rock Core Sample SSA = Solid Stem Auger HSA = Hollow Stem Auger RC = Roller Cone WOH = Weight of 140lb. Hammer WOR/C = Weight of Rods or Casing WO1P = Weight of One Person				Su = Peak/Remolded Field Vane Undrained Shear Strength (psf) Su(lab) = Lab Vane Undrained Shear Strength (psf) qp = Unconfined Compressive Strength (ksf) N-uncorrected = Raw Field SPT N-value Hammer Efficiency Factor = Rig Specific Annual Calibration Value N60 = SPT N-uncorrected Corrected for Hammer Efficiency N60 = (Hammer Efficiency Factor/60%)*N-uncorrected					
				Tv = Pocket Torvane Shear Strength (psf) WC = Water Content, percent LL = Liquid Limit PL = Plastic Limit PI = Plasticity Index G = Grain Size Analysis C = Consolidation Test									
<b>Sample Information</b>													
Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N60	Casing Blows	Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.		
0							SSA	130.5		BROWN TO REDDISH-BROWN, FINE TO COARSE SAND, WELL-GRADED, SOME GRAVEL, TRACE SILT, (Fill).			
	1D	19/15	1.0 - 2.6	15/17/31/50(1")	48	63		128.3		Note: SPT refusal at approximately 2.6 ft on probable gravel or cobble.			
	2D	23/14	3.0 - 4.9	22/14/19/50(5")	33	43		125.5		Brown to rusty-brown, dry to moist, dense, Sandy fine to coarse GRAVEL, poorly-graded, little silt, (Fill). Note: SPT refusal at approximately 4.9 ft on probable cobble. Similar to 2D, except trace silt, (Fill). Note: Washed ahead of casing.			
5	3D	10/8	5.0 - 5.8	22/50(4")			51 NW			Top of Bedrock Elev. 119.6 ft. R1: Grey to white, aphanitic calcareous METASILTSTONE, hard, fresh to slightly weathered. Joints are steep, very close to moderately close, primarily along foliation plane, rough to smooth, undulating to planar, fresh to moderately discolored and oxidized, tight to open, abundant calcite veining. Moderately weathered and highly fractured zone from 9.5-10.3 ft.			
	R1	39/36	7.0 - 10.3	RQD = 59%			NQ			BREWER FORMATION Recovery = 92% Rock Mass Quality = Fair R1 Core Times (min:sec) 7.0-8.0 ft (2:40) 8.0-9.0 ft (3:29) 9.0-10.0 ft (2:43) 10.0-10.3 ft (0:57) R2: Similar to R1, except occasional pitting along calcite veins.			
10	R2	55/55	10.3 - 14.9	RQD = 47%						BREWER FORMATION Recovery = 100% Rock Mass Quality = Poor R2 Core Times (min:sec) 10.3-11.3 ft (2:26) 11.3-12.3 ft (3:52) 12.3-13.3 ft (2:35) 13.3-14.3 ft (2:32) 14.3-14.9 ft (1:05) R3: Dark grey to grey and white, aphanitic, calcareous METASILTSTONE, hard, fresh. One steep joint, rough, undulating, slightly discolored and oxidized, tight. Abundant calcite veining.			
15	R3	25/25	14.9 - 17.0	RQD = 100%						BREWER FORMATION Recovery = 100% Rock Mass Quality = Excellent R3 Core Times (min:sec) 14.9-15.9 ft (3:32) 15.9-17.0 ft (3:41)			
20													
25													
<b>Remarks:</b> 1. BGS = Below Existing Ground Surface.													
Stratification lines represent approximate boundaries between soil types; transitions may be gradual.										Page 1 of 1			
* Water level readings have been made at times and under conditions stated. Groundwater fluctuations may occur due to conditions other than those present at the time measurements were made.										<b>Boring No.:</b> BB-BPSR-103			

## **APPENDIX B**

### **Bedrock Core Photographs**

**BEDROCK CORE PHOTOGRAPHS  
PARKWAY SOUTH OVER INTERSTATE 395  
BRIDGE NO. 1562, MAINEDOT WIN 029484.00  
Brewer, Maine**

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**Top Row:** BB-BPSR-101, Run No. R1: 8.5 ft (left) to 12.1 ft (middle-right), Run No. R2: 12.1 ft (middle-right) to 13.8 ft (right)  
**Top Middle Row:** BB-BPSR-101, Run No. R2: 13.8 ft (left) to 16.9 ft (middle-right), Run No. R3: 16.9 ft (middle-right) to 18.9 ft (right)  
**Bottom Middle Row:** BB-BPSR-103, Run No. R1: 7.0 ft (left) to 10.3 ft (middle-right), Run No. R2: 10.3 ft (middle-right) to 12.3 ft (right)  
**Bottom Row:** BB-BPSR-103, Run No. R2: 12.3 ft (left) to 14.9 ft (middle-right), Run No. R3: 14.9 ft (middle-right) to 17.0 ft (right)

**BEDROCK CORE PHOTOGRAPHS  
PARKWAY SOUTH OVER INTERSTATE 395  
BRIDGE NO. 1562, MAINEDOT WIN 029484.00  
Brewer, Maine**

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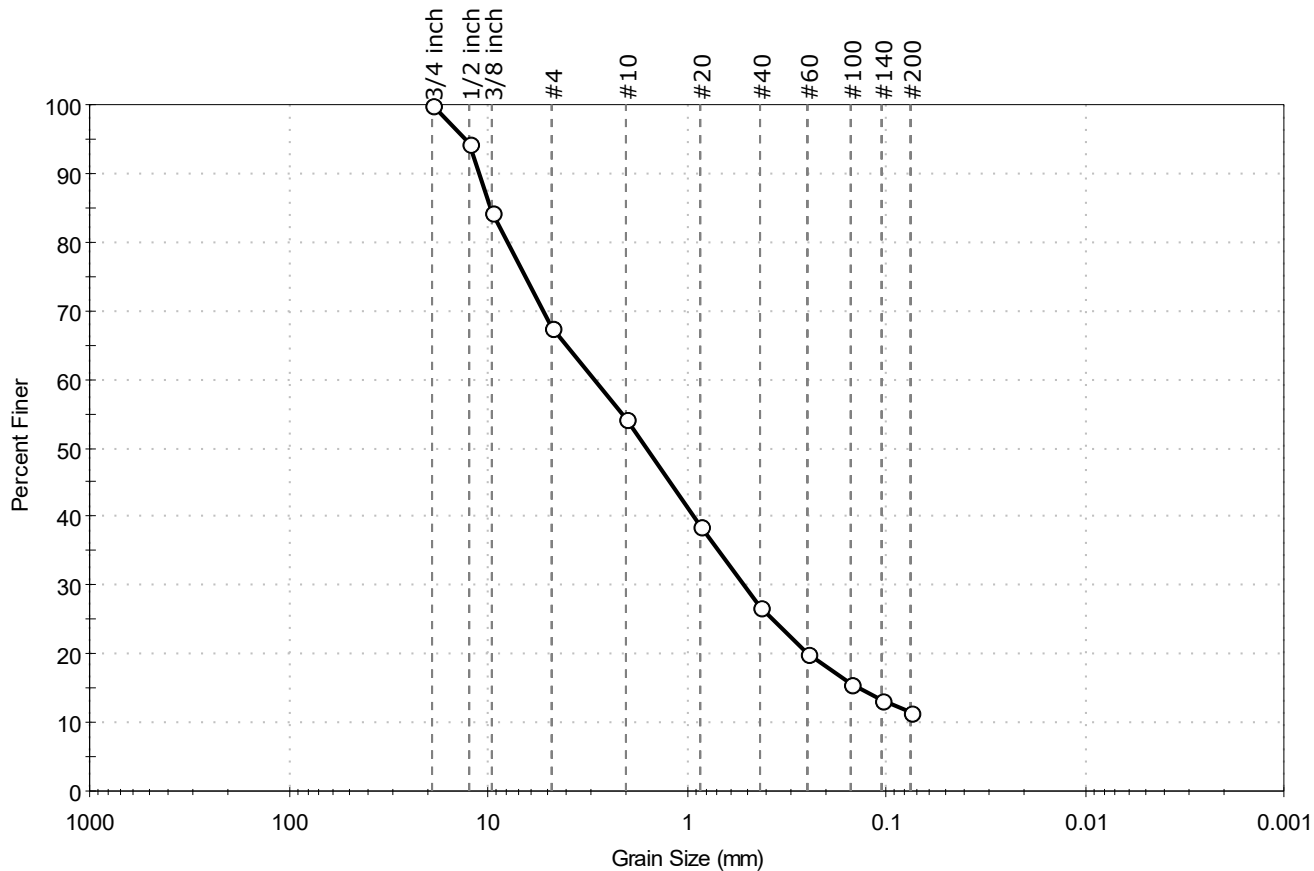
**Top Row:** BB-BPSR-102, Run No. R1: 14.0 ft (left) to 17.7 ft (middle-right), Run No. R2: 17.7 ft (middle-right) to 19.1 ft (right)  
**Top Middle Row:** BB-BPSR-102, Run No. R2: 19.1 ft (left) to 22.7 ft (middle-right), Run No. R3: 22.7 (middle right) to 24 ft (right)  
**Bottom Middle Row:** Empty.  
**Bottom Row:** Empty.

## **APPENDIX C**

### **Laboratory Test Results**

Client: Haley & Aldrich, Inc.	Project No: GTX-322339	
Project: I-395 Parkway South		
Location: Brewer, ME	Sample Type: Bag	Tested By: ajl
Boring ID: BB-BPSR-101	Test Date: 12/19/25	Checked By: ank
Sample ID: 2D	Test Id: 847813	
Depth : 2.6-4.6 ft		
Test Comment: ---		
Visual Description: Moist, brown sand with silt and gravel		
Sample Comment: ---		

## Particle Size Analysis - ASTM D6913



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	32.4	56.0	11.6

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
3/4 inch	19.00	100		
1/2 inch	12.50	94		
3/8 inch	9.50	84		
#4	4.75	68		
#10	2.00	54		
#20	0.85	39		
#40	0.42	27		
#60	0.25	20		
#100	0.15	16		
#140	0.11	13		
#200	0.075	12		

### Coefficients

$D_{85} = 9.6658 \text{ mm}$        $D_{30} = 0.5088 \text{ mm}$   
 $D_{60} = 2.9107 \text{ mm}$        $D_{15} = 0.1360 \text{ mm}$   
 $D_{50} = 1.5865 \text{ mm}$        $D_{10} = \text{N/A}$   
 $C_u = \text{N/A}$        $C_c = \text{N/A}$

### Classification

ASTM N/A

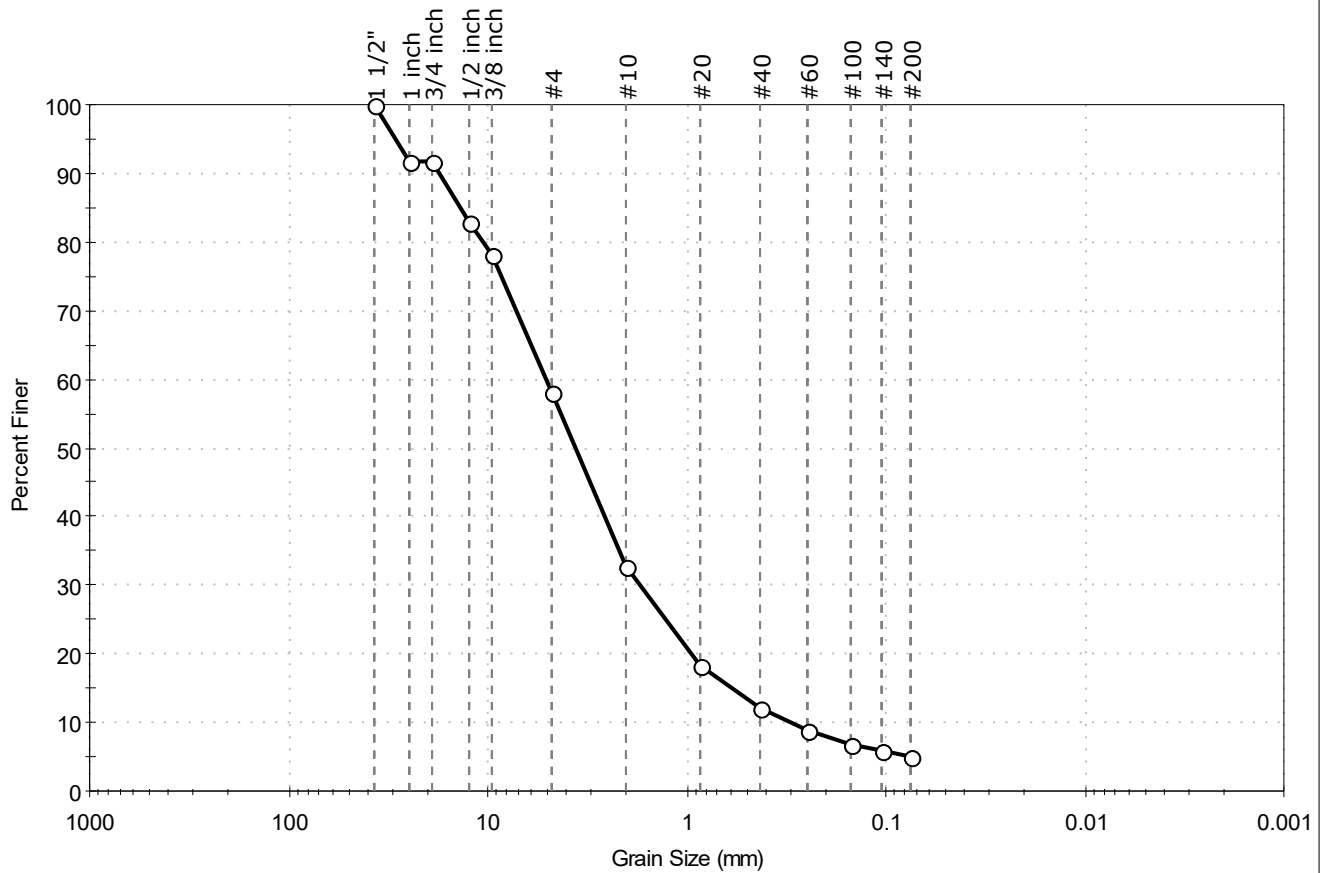
AASHTO Stone Fragments, Gravel and Sand (A-1-b (0))

### Sample/Test Description

Sand/Gravel Particle Shape : ANGULAR  
 Sand/Gravel Hardness : HARD

Client: Haley & Aldrich, Inc.	Project No: GTX-322339	
Project: I-395 Parkway South		
Location: Brewer, ME	Sample Type: Bag	Tested By: ajl
Boring ID: BB-BPSR-102	Test Date: 12/19/25	Checked By: ank
Sample ID: 3D	Test Id: 847812	
Depth: 4-6 ft		
Test Comment: ---		
Visual Description: Moist, brown sand with silt and gravel		
Sample Comment: ---		

## Particle Size Analysis - ASTM D6913



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	42.0	53.0	5.0

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
1 1/2"	37.50	100		
1 inch	25.00	92		
3/4 inch	19.00	92		
1/2 inch	12.50	83		
3/8 inch	9.50	78		
#4	4.75	58		
#10	2.00	33		
#20	0.85	18		
#40	0.42	12		
#60	0.25	9		
#100	0.15	7		
#140	0.11	6		
#200	0.075	5		

### Coefficients

$D_{85} = 13.8448$  mm       $D_{30} = 1.6937$  mm  
 $D_{60} = 5.0929$  mm       $D_{15} = 0.5846$  mm  
 $D_{50} = 3.6113$  mm       $D_{10} = 0.2968$  mm  
 $C_u = 17.159$        $C_c = 1.898$

### Classification

ASTM N/A

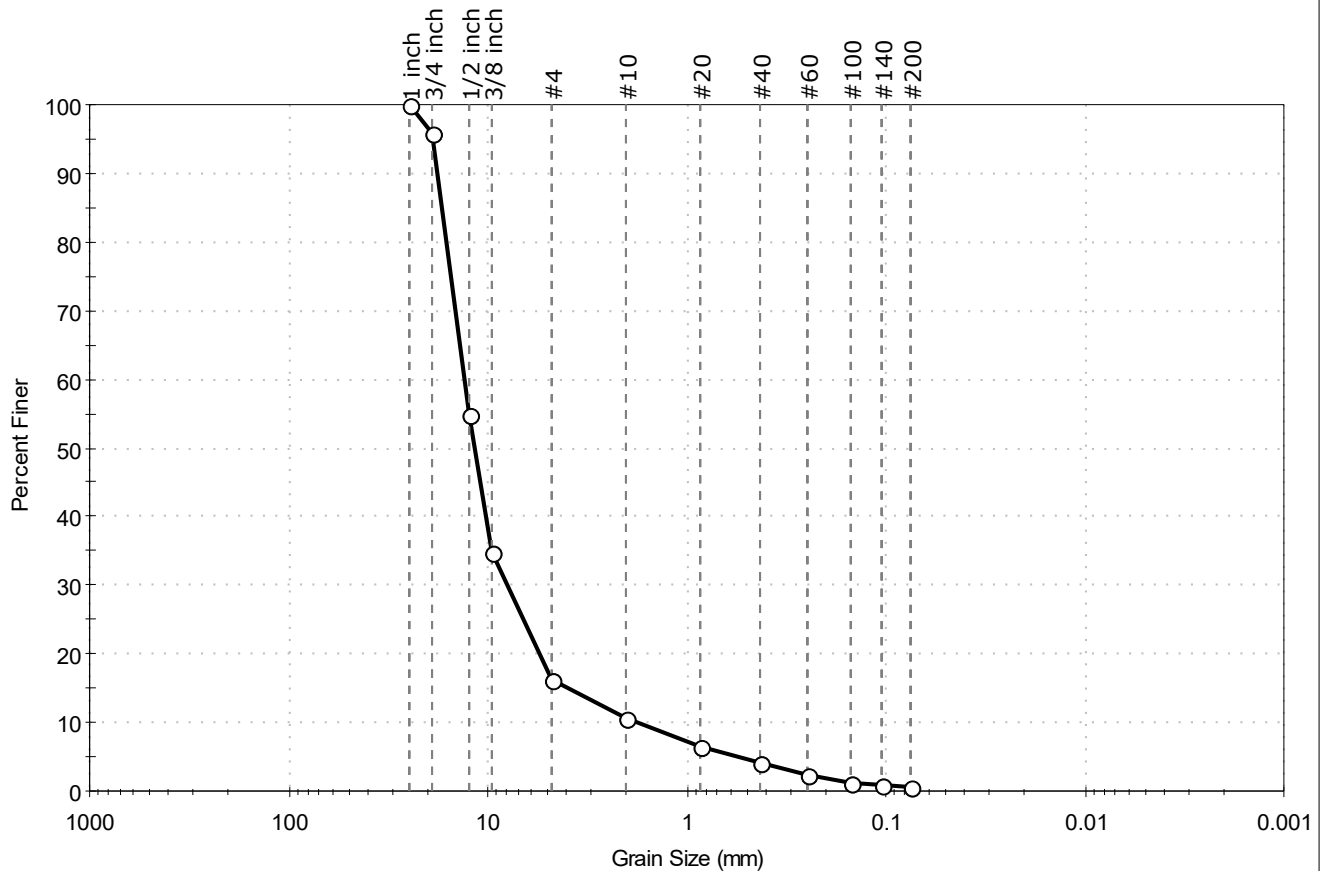
AASHTO Stone Fragments, Gravel and Sand (A-1-a (1))

### Sample/Test Description

Sand/Gravel Particle Shape : ANGULAR  
 Sand/Gravel Hardness : HARD

Client: Haley & Aldrich, Inc.	Project No: GTX-322339	
Project: I-395 Parkway South		
Location: Brewer, ME	Sample Type: Bag	Tested By: ajl
Boring ID: BB-BPSR-102	Test Date: 12/19/25	Checked By: ank
Sample ID: 4D	Test Id: 847811	
Depth: 6-8 ft		
Test Comment: ---		
Visual Description: Moist, grayish brown gravel with sand		
Sample Comment: ---		

## Particle Size Analysis - ASTM D6913



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	83.7	15.6	0.7

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
1 inch	25.00	100		
3/4 inch	19.00	96		
1/2 inch	12.50	55		
3/8 inch	9.50	35		
#4	4.75	16		
#10	2.00	11		
#20	0.85	6		
#40	0.42	4		
#60	0.25	2		
#100	0.15	1		
#140	0.11	1		
#200	0.075	0.7		

### Coefficients

$D_{85} = 17.0056 \text{ mm}$        $D_{30} = 7.9108 \text{ mm}$   
 $D_{60} = 13.1740 \text{ mm}$        $D_{15} = 3.9098 \text{ mm}$   
 $D_{50} = 11.6911 \text{ mm}$        $D_{10} = 1.7430 \text{ mm}$   
 $C_u = 7.558$        $C_c = 2.725$

### Classification

**ASTM** Well-graded GRAVEL with Sand (GW)

**AASHTO** Stone Fragments, Gravel and Sand (A-1-a (1))

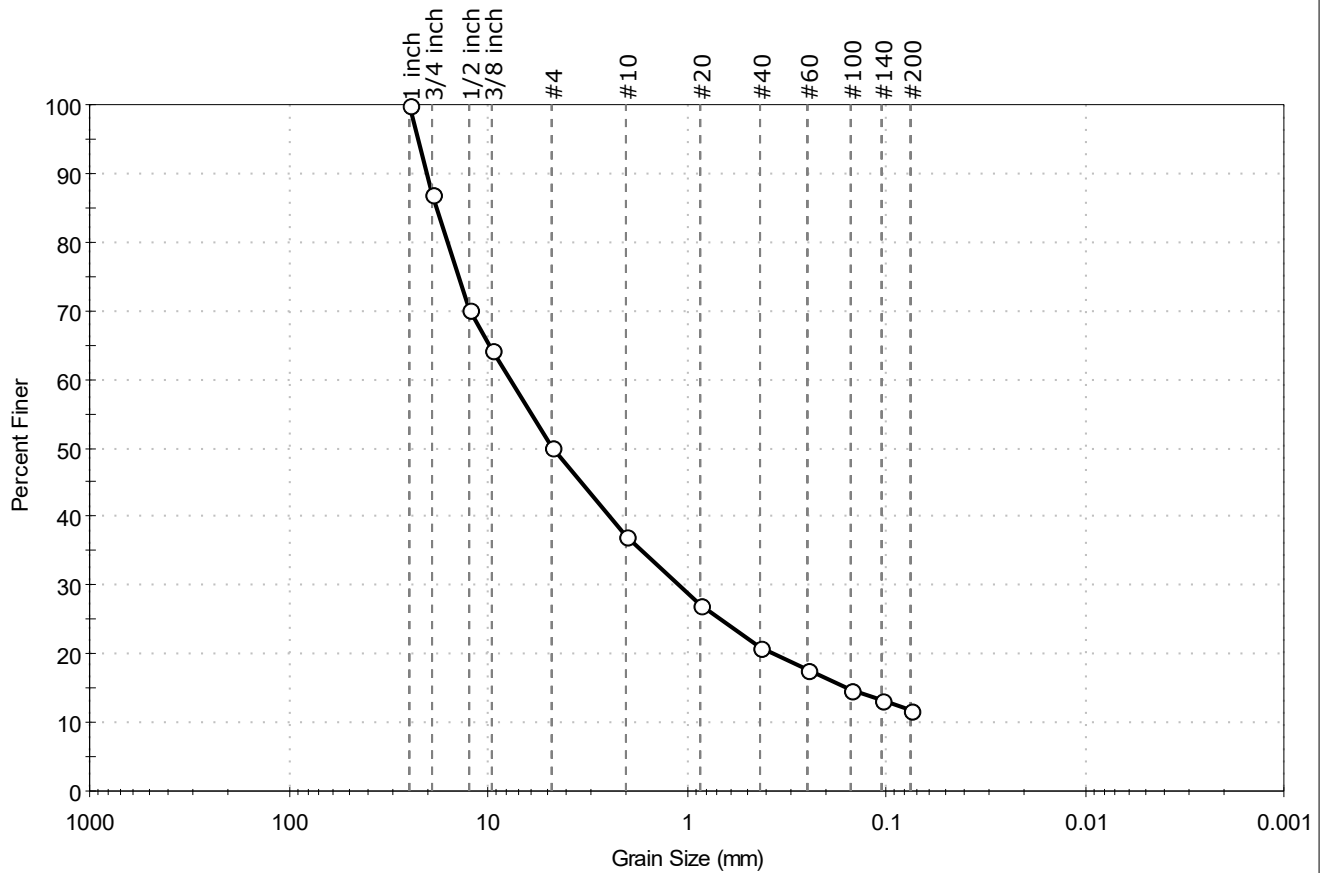
### Sample/Test Description

Sand/Gravel Particle Shape : ANGULAR

Sand/Gravel Hardness : HARD

Client: Haley & Aldrich, Inc.	Project No: GTX-322339	
Project: I-395 Parkway South		
Location: Brewer, ME	Sample Type: Bag	Tested By: ajl
Boring ID: BB-BPSR-103	Test Date: 12/19/25	Checked By: ank
Sample ID: 2D	Test Id: 847810	
Depth: 3-4.9 ft		
Test Comment: ---		
Visual Description: Moist, brown gravel with silt and sand		
Sample Comment: ---		

## Particle Size Analysis - ASTM D6913



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	49.9	38.2	11.9

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
1 inch	25.00	100		
3/4 inch	19.00	87		
1/2 inch	12.50	70		
3/8 inch	9.50	64		
#4	4.75	50		
#10	2.00	37		
#20	0.85	27		
#40	0.42	21		
#60	0.25	18		
#100	0.15	15		
#140	0.11	13		
#200	0.075	12		

### Coefficients

$D_{85} = 18.0984 \text{ mm}$        $D_{30} = 1.0792 \text{ mm}$   
 $D_{60} = 7.7398 \text{ mm}$        $D_{15} = 0.1541 \text{ mm}$   
 $D_{50} = 4.7306 \text{ mm}$        $D_{10} = \text{N/A}$   
 $C_u = \text{N/A}$        $C_c = \text{N/A}$

### Classification

ASTM N/A

AASHTO Stone Fragments, Gravel and Sand (A-1-a (0))

### Sample/Test Description

Sand/Gravel Particle Shape : ANGULAR  
 Sand/Gravel Hardness : HARD

Client:	Haley & Aldrich, Inc.	Project No:	GTX-322339
Project:	I-395 Parkway South		
Location:	Brewer, ME		
Boring ID:	---	Sample Type:	---
Sample ID:	---	Test Date:	12/19/25
Depth :	---	Test Id:	847809
		Tested By:	gp
		Checked By:	smd

## Bulk Density and Compressive Strength of Rock Core Specimens by ASTM D7012 Method C

Boring ID	Sample Number	Depth	Bulk Density, pcf	Compressive strength, psi	Failure Type	Meets ASTM D4543	Note(s)
BB-BPSR-101	R2	13.45-13.80 ft	170	8362	3	Yes	---
BB-BPSR-102	R2	607.5 ft	174	1669	3	Yes	---
BB-BPSR-103	R2	11.34-11.72 ft	168	5149	2	Yes	---

Notes: Density determined on core samples by measuring dimensions and weight and then calculating.  
 All specimens 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.  
 Failure Type: 1 = Intact Material Failure; 2 = Discontinuity Failure; 3 = Intact Material and Discontinuity Failure  
 (See attached photographs)

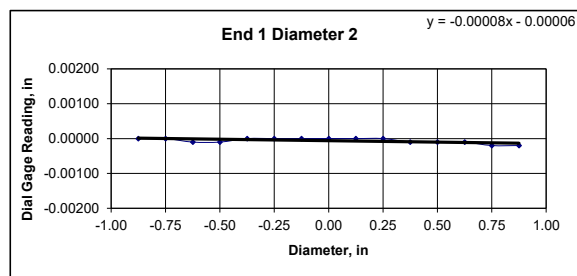
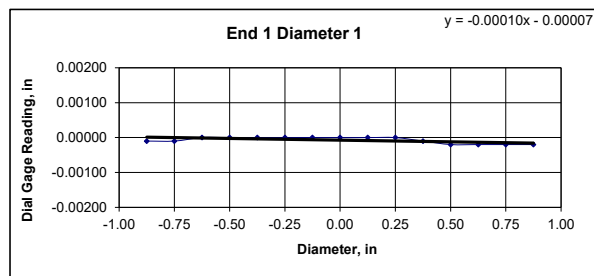


Client:	Haley & Aldrich, Inc.	Test Date:	12/18/2025
Project Name:	I-395 Parkway South	Tested By:	rik
Project Location:	Brewer, ME	Checked By:	smd
GTx #:	322339		
Boring ID:	BB-BPSR-101		
Sample ID:	R2		
Depth (ft):	13.45-13.80		
Visual Description:	See photographs		

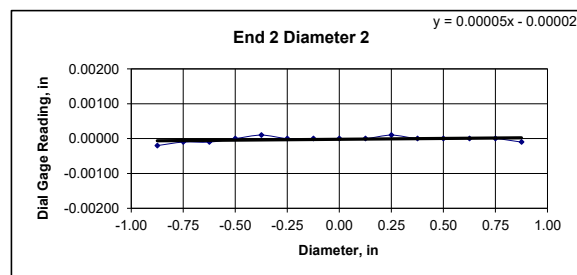
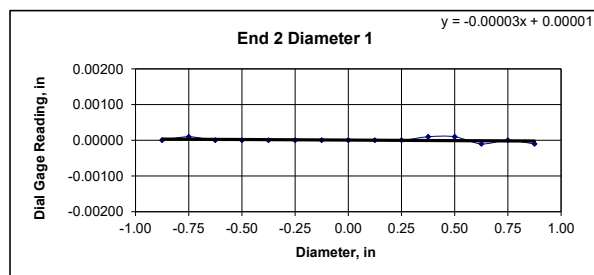
## UNIT WEIGHT DETERMINATION AND DIMENSIONAL AND SHAPE TOLERANCES OF ROCK CORE SPECIMENS BY ASTM D4543

BULK DENSITY				DEVIATION FROM STRAIGHTNESS (Procedure S1)	
	1	2	Average	Maximum gap between side of core and reference surface plate: Is the maximum gap $\leq$ 0.02 in.? YES	
Specimen Length, in:	4.32	4.32	4.32	Maximum difference must be < 0.020 in.	
Specimen Diameter, in:	1.99	1.99	1.99	Straightness Tolerance Met? YES	
Specimen Mass, g:	601.48				
Bulk Density, lb/ft <sup>3</sup>	170				
Length to Diameter Ratio:	2.2	Minimum Diameter Tolerance Met? YES			
		Length to Diameter Ratio 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	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	-0.00010	-0.00020	-0.00020	-0.00020	-0.00020
Diameter 2, in (rotated 90°)	0.00000	0.00000	-0.00010	-0.00010	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	-0.00010	-0.00010	-0.00010	-0.00020	-0.00020
Difference between max and min readings, in: 0° = 0.00020      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	0.00000	0.00010	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00010	0.00010	-0.00010	0.00000	-0.00010
Diameter 2, in (rotated 90°)	-0.00020	-0.00010	-0.00010	0.00000	0.00010	0.00000	0.00000	0.00000	0.00000	0.00010	0.00000	0.00000	0.00000	0.00000	-0.00010
Difference between max and min readings, in: 0° = 0.0002      90° = 0.0003 Maximum difference must be < 0.0020 in.      Difference = ± 0.00015															
Flatness Tolerance Met? YES															



DIAMETER 1	
End 1:	
Slope of Best Fit Line	0.00010
Angle of Best Fit Line:	0.00557
End 2:	
Slope of Best Fit Line	0.00003
Angle of Best Fit Line:	0.00180
Maximum Angular Difference:	0.00377
Parallelism Tolerance Met? Spherically Seated	YES



DIAMETER 2	
End 1:	
Slope of Best Fit Line	0.00008
Angle of Best Fit Line:	0.00475
End 2:	
Slope of Best Fit Line	0.00005
Angle of Best Fit Line:	0.00278
Maximum Angular Difference:	0.00196
Parallelism Tolerance Met? Spherically Seated	YES

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?	Maximum angle of departure must be $\leq$ 0.25°
Diameter 1, in		0.00020	1.990	0.00010	0.006	YES	
Diameter 2, in (rotated 90°)		0.00020	1.990	0.00010	0.006	YES	Perpendicularity Tolerance Met? YES
END 2							
Diameter 1, in		0.00020	1.990	0.00010	0.006	YES	
Diameter 2, in (rotated 90°)		0.00030	1.990	0.00015	0.009	YES	

Client:	Haley & Aldrich
Project Name:	I-395 Parkway South
Project Location:	Brewer, ME
GTX #:	322339
Test Date:	12/19/2025
Tested By:	gp
Checked By:	smd
Boring ID:	BB-BPSR-101
Sample ID:	R2
Depth, ft:	13.45-13.80



After cutting and grinding



After break

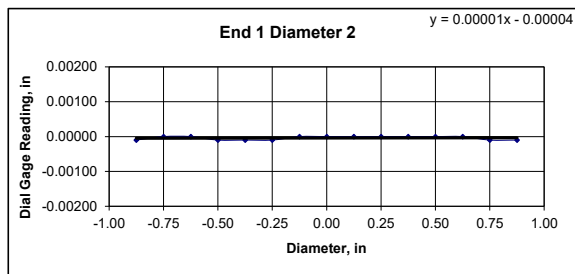
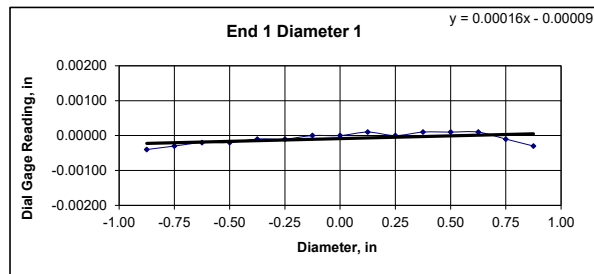


Client:	Haley & Aldrich, Inc.	Test Date:	12/19/2025
Project Name:	I-395 Parkway South	Tested By:	rik
Project Location:	Brewer, ME	Checked By:	smd
GTX #:	322339		
Boring ID:	BB-BPSR-102		
Sample ID:	R2		
Depth (ft):	18.14-18.52		
Visual Description:	See photographs		

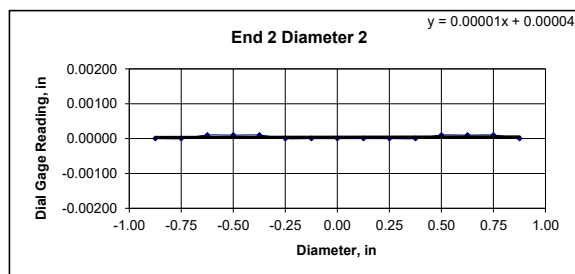
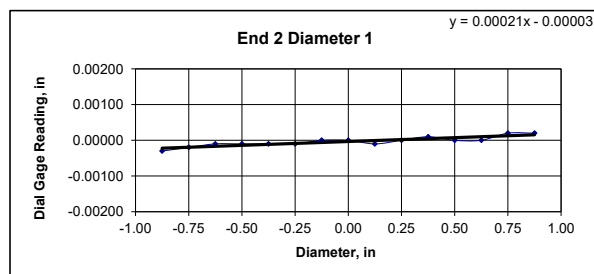
## UNIT WEIGHT DETERMINATION AND DIMENSIONAL AND SHAPE TOLERANCES OF ROCK CORE SPECIMENS BY ASTM D4543

BULK DENSITY				DEVIATION FROM STRAIGHTNESS (Procedure S1)	
	1	2	Average	Maximum gap between side of core and reference surface plate: Is the maximum gap $\leq$ 0.02 in.? YES	
Specimen Length, in:	4.31	4.31	4.31	Maximum difference must be < 0.020 in.	
Specimen Diameter, in:	1.98	1.98	1.98	Straightness Tolerance Met? YES	
Specimen Mass, g:	607.5				
Bulk Density, lb/ft <sup>3</sup>	174				
Length to Diameter Ratio:	2.2	Minimum Diameter Tolerance Met? YES			
		Length to Diameter Ratio 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	-0.00020	-0.00010	-0.00010	0.00000	0.00000	0.00010	0.00000	0.00010	0.00010	0.00010	-0.00010	-0.00030
Diameter 2, in (rotated 90°)	-0.00010	0.00000	0.00000	-0.00010	-0.00010	-0.00010	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	-0.00030	-0.00020	-0.00010	-0.00010	-0.00010	-0.00010	0.00000	0.00000	-0.00010	0.00000	0.00010	0.00000	0.00000	0.00020	0.00020
Diameter 2, in (rotated 90°)	0.00000	0.00000	0.00010	0.00010	0.00010	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00010	0.00010	0.00010	0.00000
Difference between max and min readings, in: 0° = 0.0005      90° = 0.0001 Maximum difference must be < 0.0020 in.      Difference = ± 0.00025 Flatness Tolerance Met?      YES															



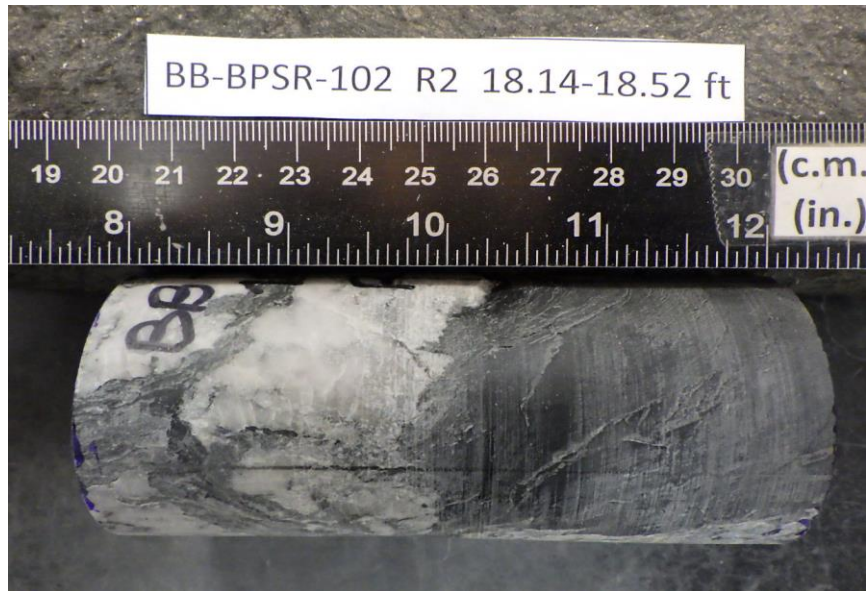
DIAMETER 1	
End 1:	
Slope of Best Fit Line	0.00016
Angle of Best Fit Line:	0.00900
End 2:	
Slope of Best Fit Line	0.00021
Angle of Best Fit Line:	0.01228
Maximum Angular Difference:	0.00327
Parallelism Tolerance Met? Spherically Seated	YES



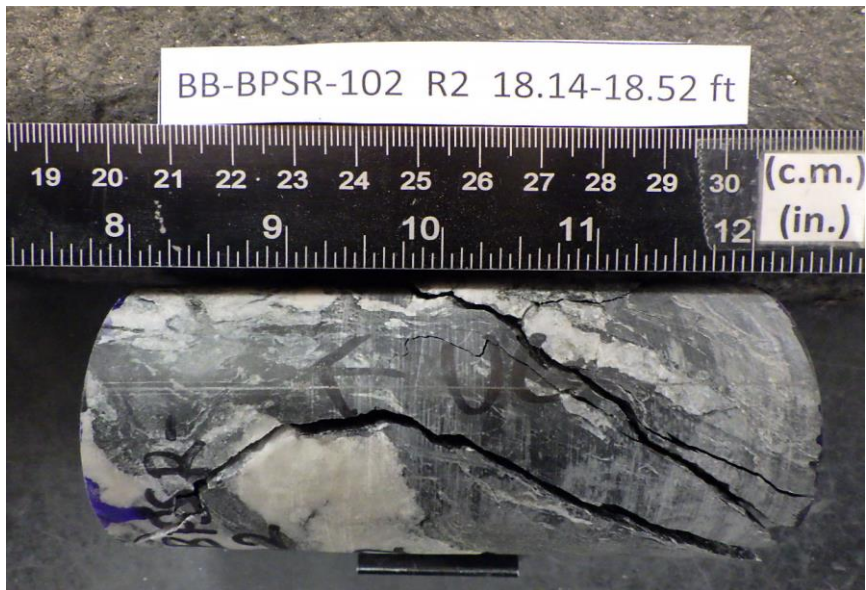
DIAMETER 2	
End 1:	
Slope of Best Fit Line	0.00001
Angle of Best Fit Line:	0.00049
End 2:	
Slope of Best Fit Line	0.00001
Angle of Best Fit Line:	0.00049
Maximum Angular Difference:	0.00000
Parallelism Tolerance Met? Spherically Seated	YES

PERPENDICULARITY (Procedure P1)						Maximum angle of departure must be $\leq$ 0.25°	
END 1	Difference, Maximum and Minimum (in.)	Diameter (in.)	Slope	Angle°	Perpendicularity Tolerance Met?		
Diameter 1, in	0.00050	1.980	0.00025	0.014	YES		
Diameter 2, in (rotated 90°)	0.00010	1.980	0.00005	0.003	YES	Perpendicularity Tolerance Met?	YES
END 2							
Diameter 1, in	0.00050	1.980	0.00025	0.014	YES		
Diameter 2, in (rotated 90°)	0.00010	1.980	0.00005	0.003	YES		

Client:	Haley & Aldrich, Inc.
Project Name:	I-395 Parkway South
Project Location:	Brewer, ME
GTX #:	322339
Test Date:	12/22/2025
Tested By:	gp
Checked By:	smd
Boring ID:	BB-BPSR-102
Sample ID:	R2
Depth, ft:	18.14-18.52



After cutting and grinding



After break

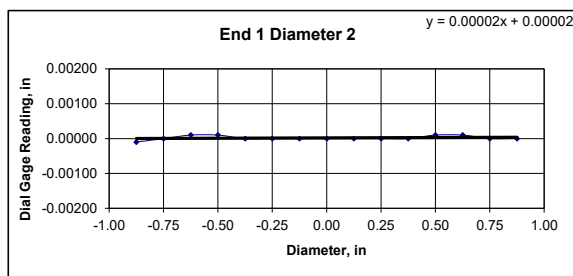
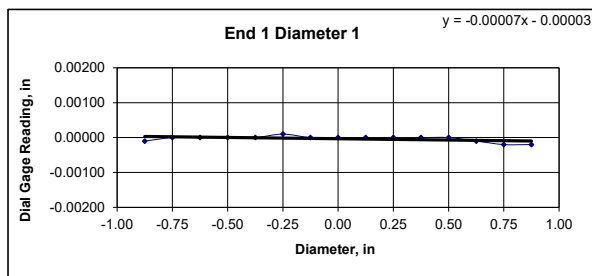


Client:	Haley & Aldrich, Inc.	Test Date:	12/18/2025
Project Name:	I-395 Parkway South	Tested By:	rik
Project Location:	Brewer, ME	Checked By:	smd
GTX #:	322339		
Boring ID:	BB-BPSR-103		
Sample ID:	R2		
Depth (ft):	11.34-11.72		
Visual Description:	See photographs		

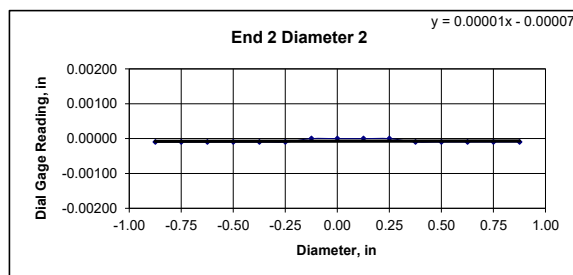
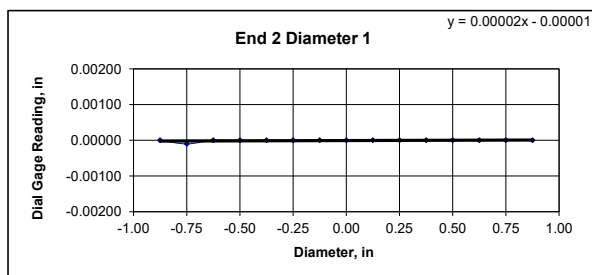
## UNIT WEIGHT DETERMINATION AND DIMENSIONAL AND SHAPE TOLERANCES OF ROCK CORE SPECIMENS BY ASTM D4543

BULK DENSITY				DEVIATION FROM STRAIGHTNESS (Procedure S1)	
	1	2	Average	Maximum gap between side of core and reference surface plate: Is the maximum gap $\leq$ 0.02 in.? YES	
Specimen Length, in:	4.32	4.32	4.32	Maximum difference must be < 0.020 in.	
Specimen Diameter, in:	1.98	1.98	1.98	Straightness Tolerance Met? YES	
Specimen Mass, g:	586.74				
Bulk Density, lb/ft <sup>3</sup>	168				
Length to Diameter Ratio:	2.2	Minimum Diameter Tolerance Met? YES			
		Length to Diameter Ratio 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
Diameter 1, in	-0.00010	0.00000	0.00000	0.00000	0.00000	0.00010	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	-0.00010
Diameter 2, in (rotated 90°)	-0.00010	0.00000	0.00010	0.00010	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00010	0.00000
Difference between max and min readings, in:													
0° = 0.00030 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
Diameter 1, in	0.00000	-0.00010	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°)	-0.00010	-0.00010	-0.00010	-0.00010	-0.00010	-0.00010	0.00000	0.00000	0.00000	0.00000	-0.00010	-0.00010	-0.00010
Difference between max and min readings, in:													
0° = 0.0001 90° = 0.0001													
Maximum difference must be < 0.0020 in. Difference = ± 0.00015													
Flatness Tolerance Met? YES													



DIAMETER 1	
End 1:	
Slope of Best Fit Line	0.00007
Angle of Best Fit Line:	0.00426
End 2:	
Slope of Best Fit Line	0.00002
Angle of Best Fit Line:	0.00098
Maximum Angular Difference:	0.00327
Parallelism Tolerance Met? Spherically Seated	YES



DIAMETER 2	
End 1:	
Slope of Best Fit Line	0.00002
Angle of Best Fit Line:	0.00115
End 2:	
Slope of Best Fit Line	0.00001
Angle of Best Fit Line:	0.00033
Maximum Angular Difference:	0.00082
Parallelism Tolerance Met? Spherically Seated	YES

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?	Maximum angle of departure must be $\leq$ 0.25°
Diameter 1, in		0.00030	1.980	0.00015	0.009	YES	
Diameter 2, in (rotated 90°)		0.00020	1.980	0.00010	0.006	YES	Perpendicularity Tolerance Met? YES
END 2							
Diameter 1, in		0.00010	1.980	0.00005	0.003	YES	
Diameter 2, in (rotated 90°)		0.00010	1.980	0.00005	0.003	YES	

Client:	Haley & Aldrich, Inc.
Project Name:	I-395 Parkway South
Project Location:	Brewer, ME
GTX #:	322339
Test Date:	12/19/2025
Tested By:	gp
Checked By:	smd
Boring ID:	BB-BPSR-103
Sample ID:	R2
Depth, ft:	11.34-11.72



After cutting and grinding



After break

## **APPENDIX D**

### **Geologic Bedrock Mapping Results**

**GEOLOGIC BEDROCK MAPPING PHOTOGRAPHS  
PARKWAY SOUTH OVER INTERSTATE 395  
BRIDGE NO. 1562, MAINEDOT WIN 029484.00  
PHOTOGRAPHS TAKEN ON JANUARY 8, 2026  
Brewer, Maine**

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**Photograph No. 1: Existing Abutment No. 1 (I-395 EB Lane)**

**GEOLOGIC BEDROCK MAPPING PHOTOGRAPHS  
PARKWAY SOUTH OVER INTERSTATE 395  
BRIDGE NO. 1562, MAINEDOT WIN 029484.00  
PHOTOGRAPHS TAKEN ON JANUARY 8, 2026  
Brewer, Maine**

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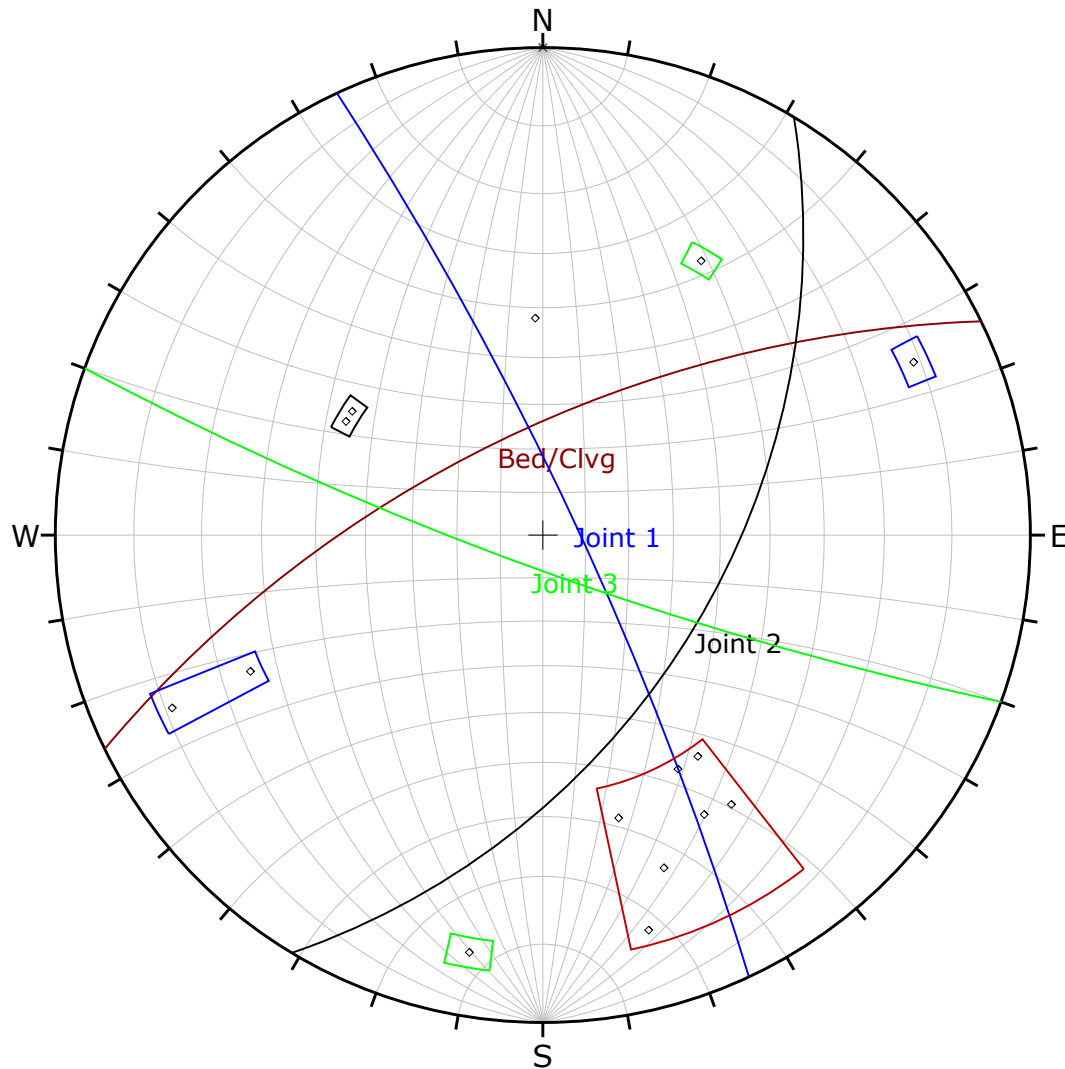
**Photograph No. 2:** Existing Abutment No. 2 (I-395 WB Lane)

**GEOLOGIC BEDROCK MAPPING PHOTOGRAPHS  
PARKWAY SOUTH OVER INTERSTATE 395  
BRIDGE NO. 1562, MAINEDOT WIN 029484.00  
PHOTOGRAPHS TAKEN ON JANUARY 8, 2026  
Brewer, Maine**

---



**Photograph No. 3:** Existing Abutment No. 1 (I-395 EB Lane)



Symbol	Feature			
◇	Pole Vectors			

	Color	Dip	Dip Direction	Label
Mean Set Planes				
1m	Red	66	334	Bed/Clvg
2m	Blue	82	65	Joint 1
3m	Black	50	121	Joint 2
4m	Green	82	200	Joint 3

Plot Mode		Pole Vectors
Vector Count		15 (15 Entries)
Hemisphere		Lower
Projection		Equal Angle

Project

I-395 Design Build, Parkway South Bridge

Analysis Description

Stereonet of all measurements collected

Drawn By

C.Eddy

Owner

Maine DOT

Haley & Aldrich

Project Number

029484.00