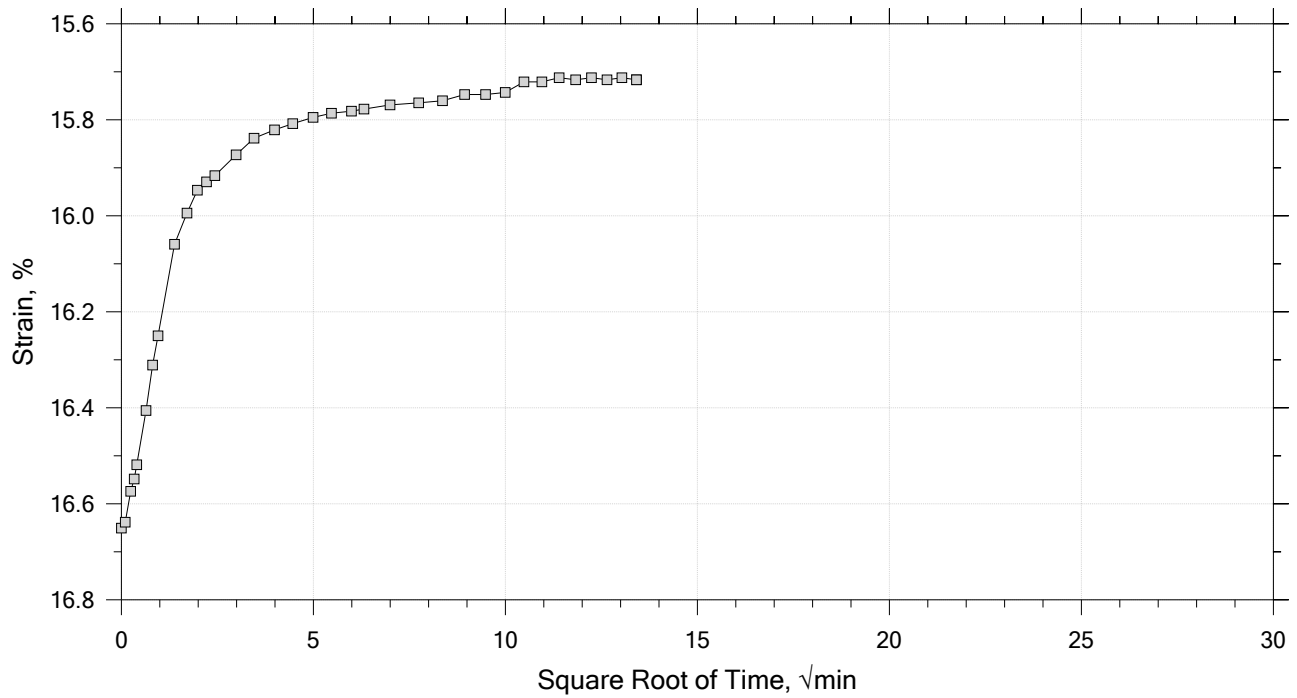
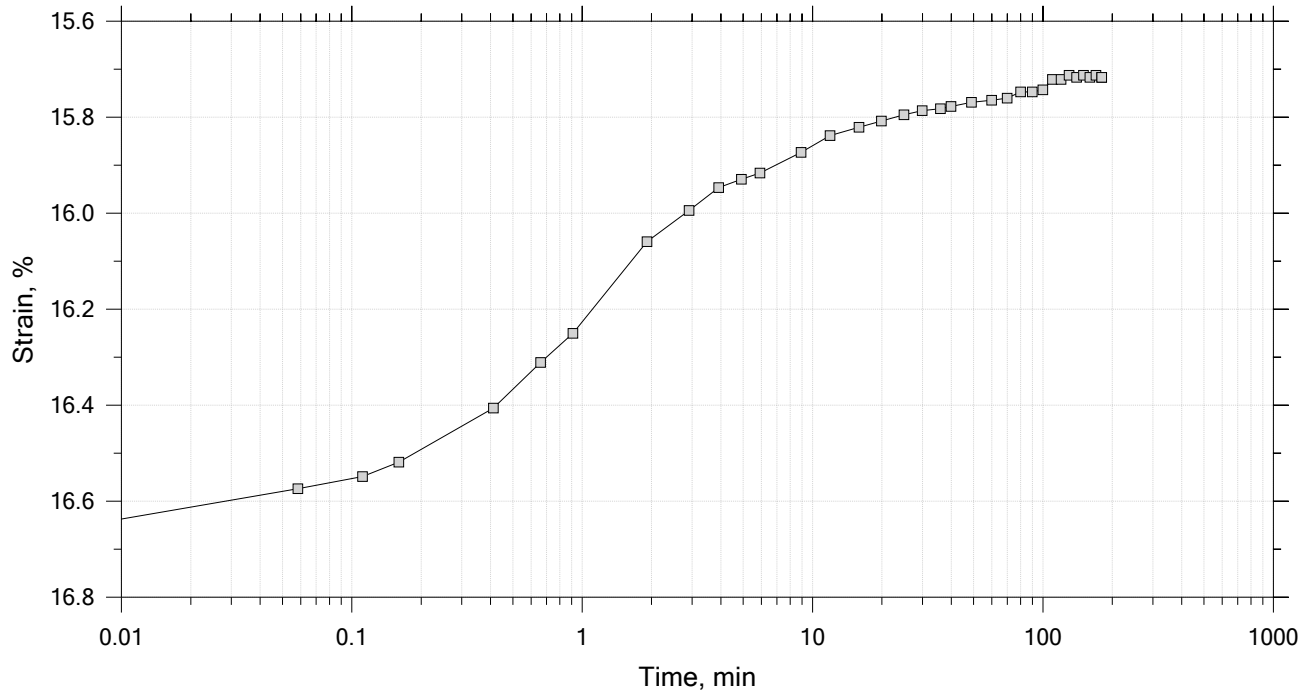



One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 12 of 15

Constant Load Step

Stress: 2 tsf



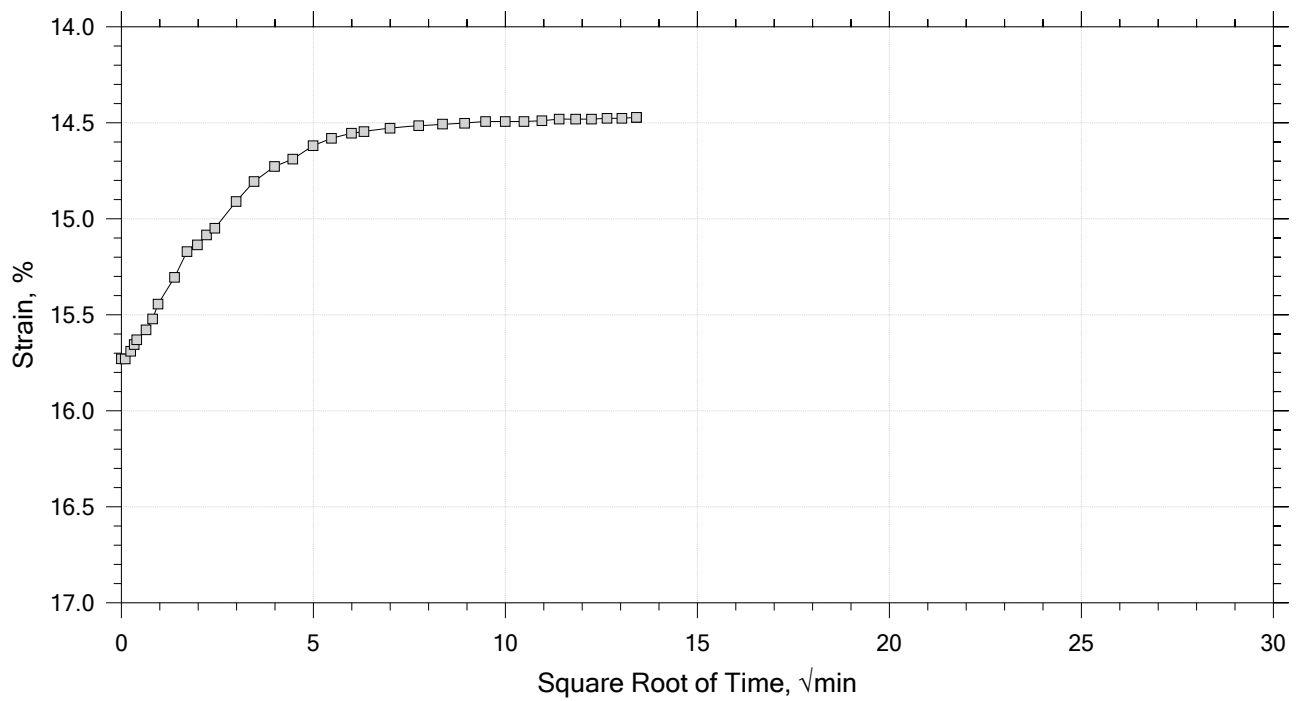
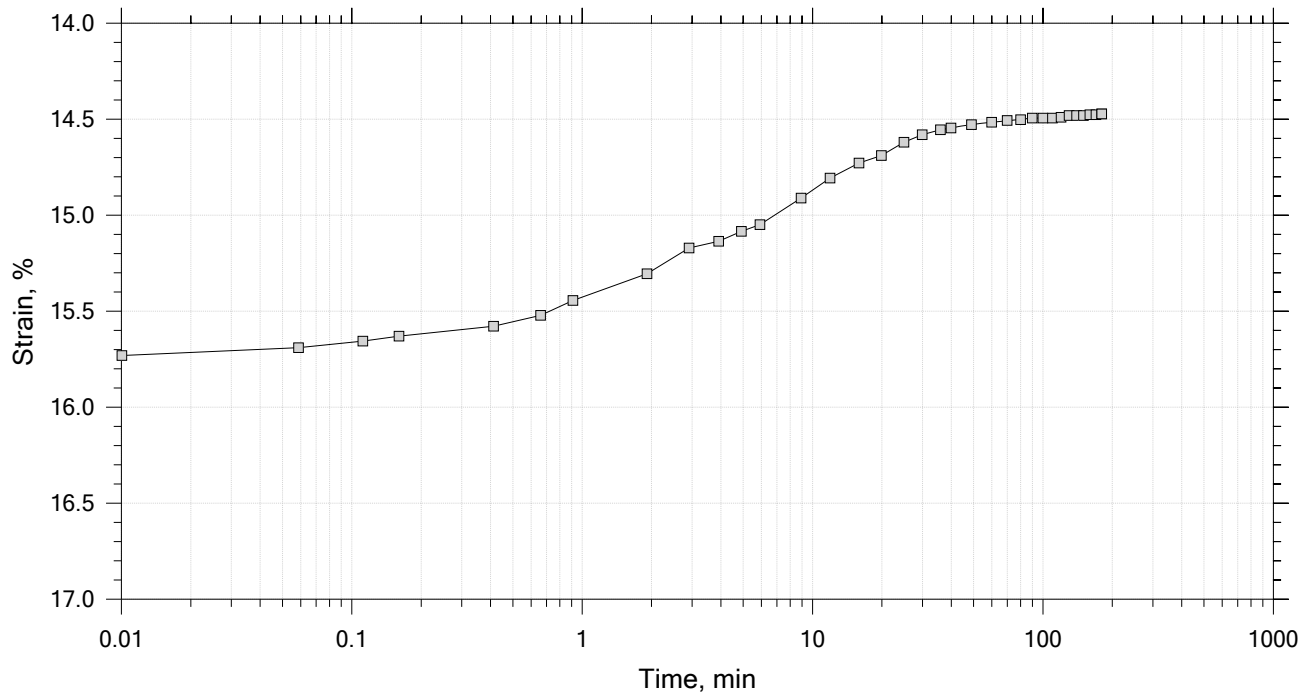
	Project: Rt-9/I-395 Connector	Location: Brewer and Eddington, ME	Project No.: GTX-308853
	Boring No.: HB-BE-138	Tested By: md	Checked By: mcm
	Sample No.: 1U	Test Date: 07/17/19	Depth: 8-10 ft
	Test No.: IP-13	Sample Type: intact	Elevation: ---
	Description: Moist, dark grayish olive clay		
	Remarks: System Y, Swell Pressure = 0.0676 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 13 of 15

Constant Load Step

Stress: 0.5 tsf



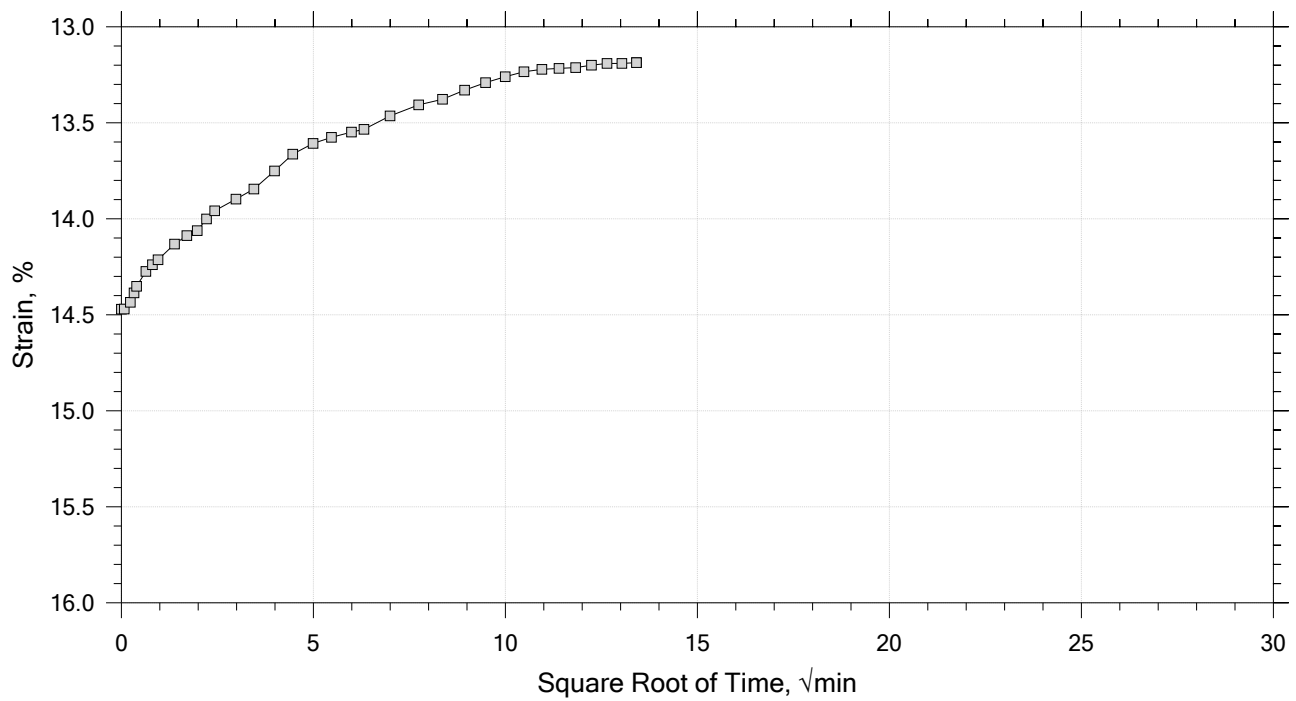
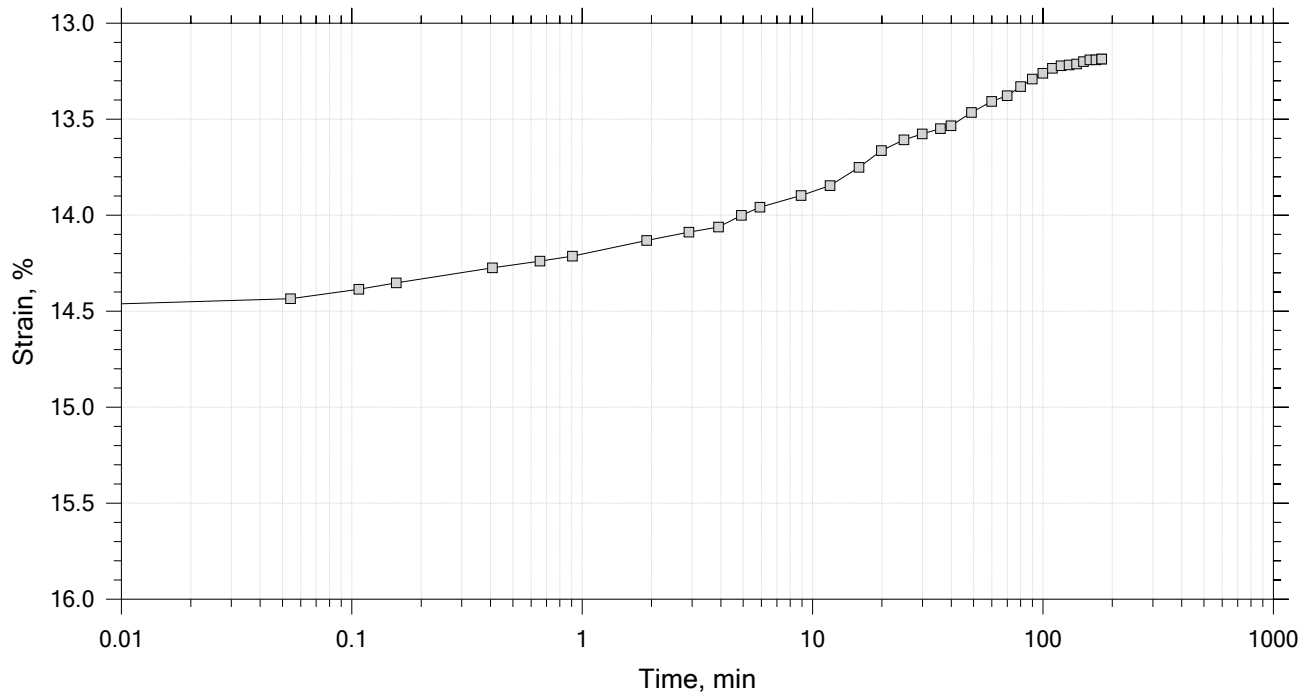
	Project: Rt-9/I-395 Connector	Location: Brewer and Eddington, ME	Project No.: GTX-308853
	Boring No.: HB-BE-138	Tested By: md	Checked By: mcm
	Sample No.: 1U	Test Date: 07/17/19	Depth: 8-10 ft
	Test No.: IP-13	Sample Type: intact	Elevation: ---
	Description: Moist, dark grayish olive clay		
	Remarks: System Y, Swell Pressure = 0.0676 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 14 of 15

Constant Load Step

Stress: 0.125 tsf



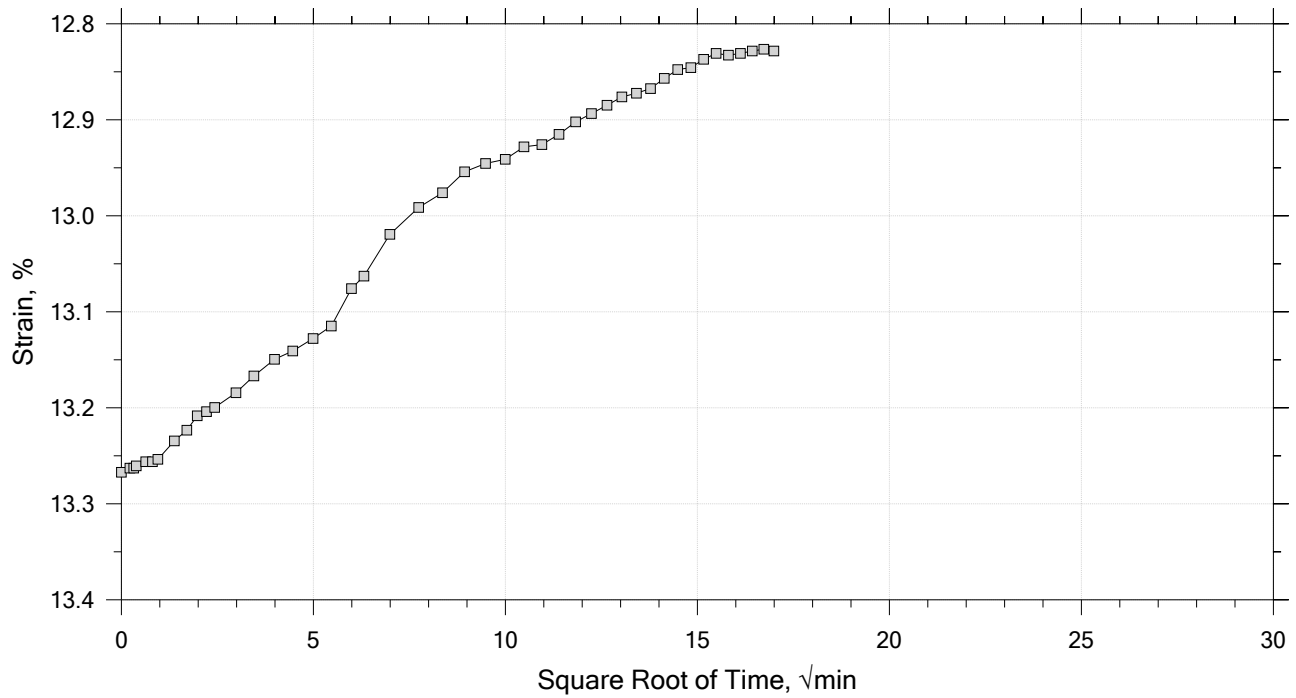
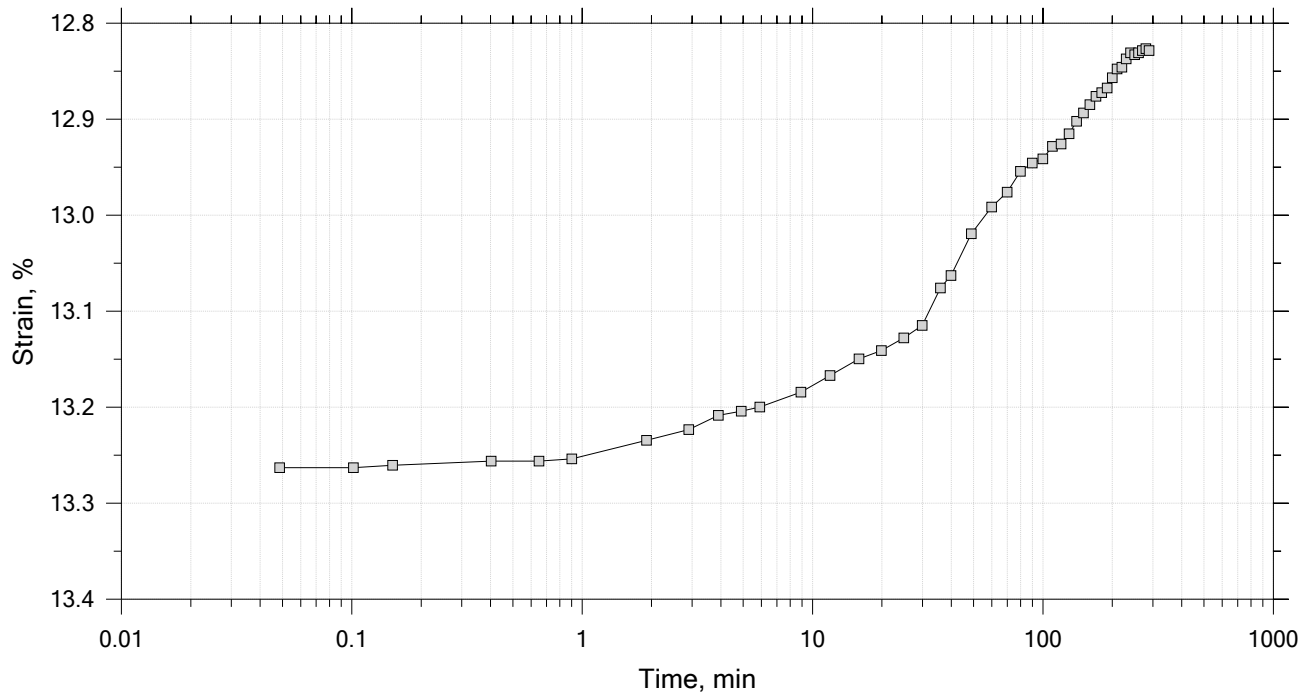
	Project: Rt-9/I-395 Connector	Location: Brewer and Eddington, ME	Project No.: GTX-308853
	Boring No.: HB-BE-138	Tested By: md	Checked By: mcm
	Sample No.: 1U	Test Date: 07/17/19	Depth: 8-10 ft
	Test No.: IP-13	Sample Type: intact	Elevation: ---
	Description: Moist, dark grayish olive clay		
	Remarks: System Y, Swell Pressure = 0.0676 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 15 of 15

Constant Load Step

Stress: 0.0625 tsf




	Project: Rt-9/I-395 Connector	Location: Brewer and Eddington, ME	Project No.: GTX-308853
	Boring No.: HB-BE-138	Tested By: md	Checked By: mcm
	Sample No.: 1U	Test Date: 07/17/19	Depth: 8-10 ft
	Test No.: IP-13	Sample Type: intact	Elevation: ---
	Description: Moist, dark grayish olive clay		
	Remarks: System Y, Swell Pressure = 0.0676 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: 0.832	Plastic Limit: 22
Final Height: 0.87 in	Final Void Ratio: 0.597	Plasticity Index: 18

	Before Test Trimmings	Before Test Specimen	After Test Specimen	After Test Trimmings
Container ID	C-3023	RING		D-2356
Mass Container, gm	9.14	108.86	108.86	8.36
Mass Container + Wet Soil, gm	170.46	265.53	256.91	156.33
Mass Container + Dry Soil, gm	130.48	230.7	230.7	130.13
Mass Dry Soil, gm	121.34	121.84	121.84	121.77
Water Content, %	32.95	28.59	21.52	21.52
Void Ratio	---	0.83	0.60	---
Degree of Saturation, %	---	95.35	100.00	---
Dry Unit Weight, pcf	---	94.555	108.47	---


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

	Project: Rt-9/I-395 Connector	Location: Brewer and Eddington, ME	Project No.: GTX-308853
	Boring No.: HB-BE-138	Tested By: md	Checked By: mcm
	Sample No.: 1U	Test Date: 07/17/19	Depth: 8-10 ft
	Test No.: IP-13	Sample Type: intact	Elevation: ---
	Description: Moist, dark grayish olive clay		
	Remarks: System Y, Swell Pressure = 0.0676 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Log of Time Coefficients


[illegible]

	Project: Rt-9/I-395 Connector	Location: Brewer and Eddington, ME	Project No.: GTX-308853
	Boring No.: HB-BE-138	Tested By: md	Checked By: mcm
	Sample No.: 1U	Test Date: 07/17/19	Depth: 8-10 ft
	Test No.: IP-13	Sample Type: intact	Elevation: ---
	Description: Moist, dark grayish olive clay		
	Remarks: System Y, Swell Pressure = 0.0676 tsf		
	Displacement at End of Increment		

One-Dimensional Consolidation by ASTM D2435 - Method B

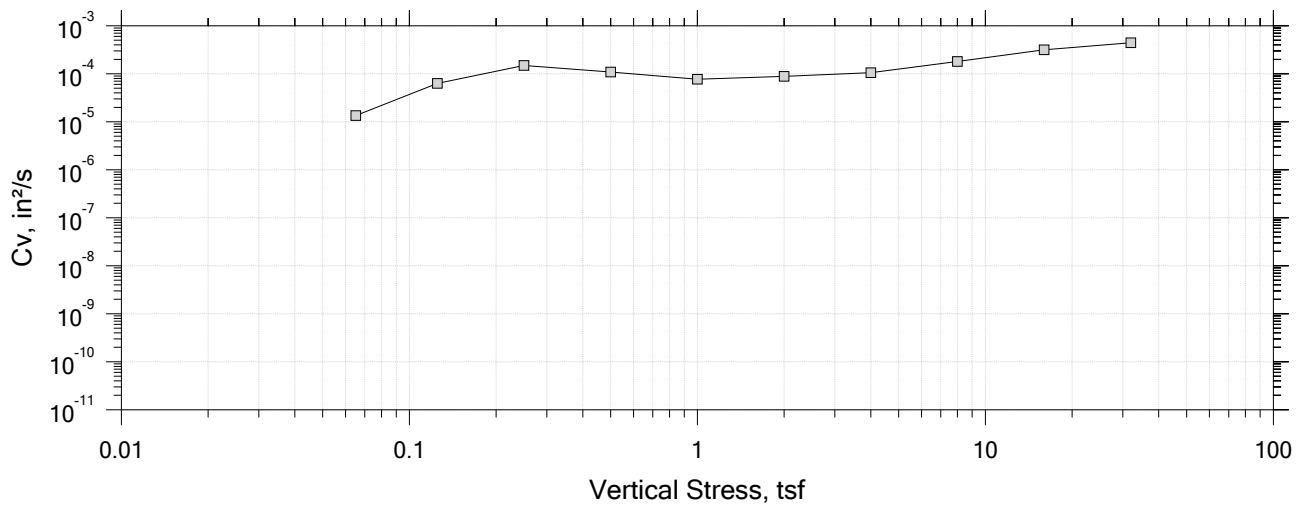
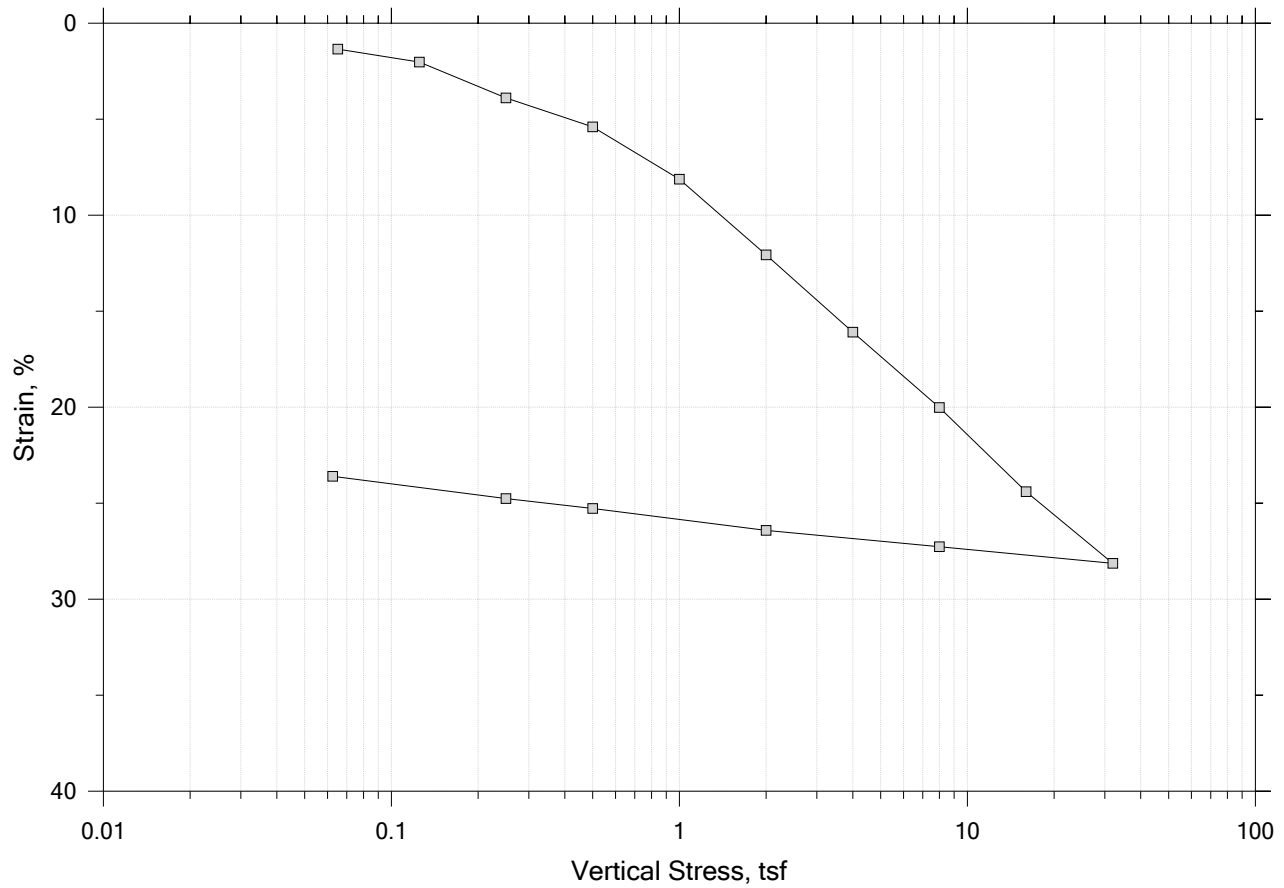
Square Root of Time Coefficients


[illegible]

	Project: Rt-9/I-395 Connector	Location: Brewer and Eddington, ME	Project No.: GTX-308853
	Boring No.: HB-BE-138	Tested By: md	Checked By: mcm
	Sample No.: 1U	Test Date: 07/17/19	Depth: 8-10 ft
	Test No.: IP-13	Sample Type: intact	Elevation: ---
	Description: Moist, dark grayish olive clay		
	Remarks: System Y, Swell Pressure = 0.0676 tsf		
	Displacement at End of Increment		

One-Dimensional Consolidation by ASTM D2435 - Method B

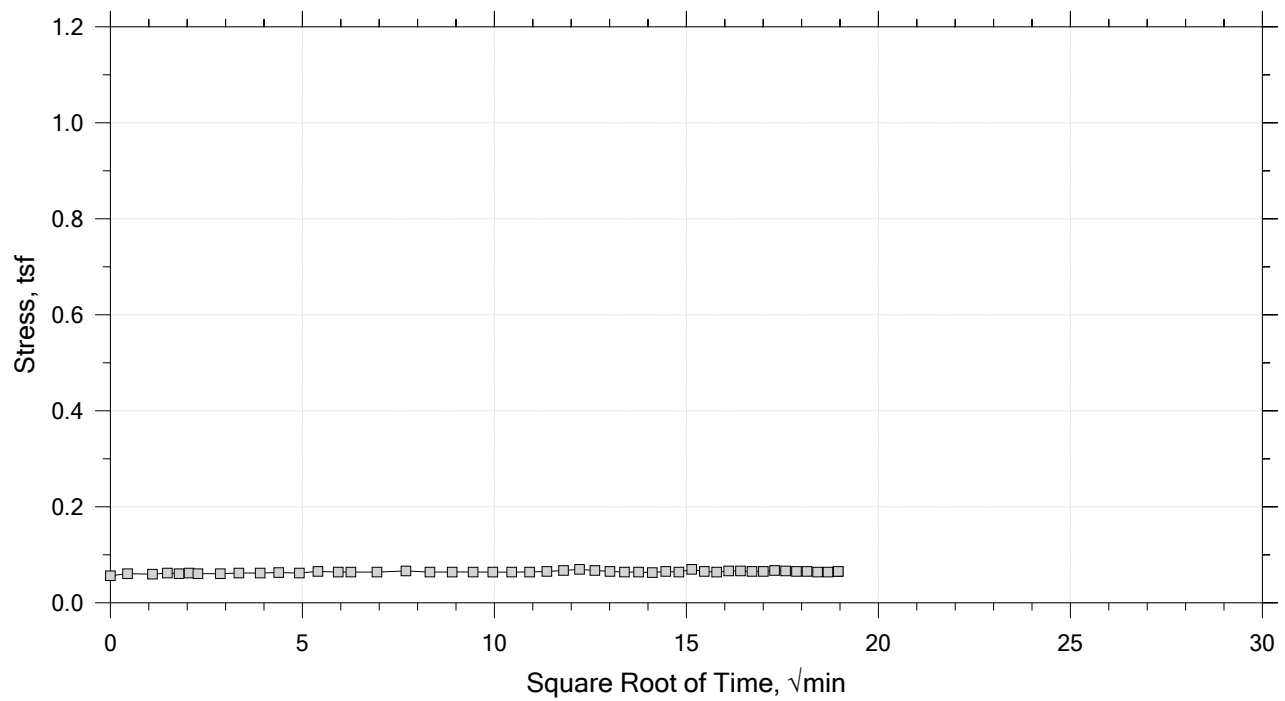
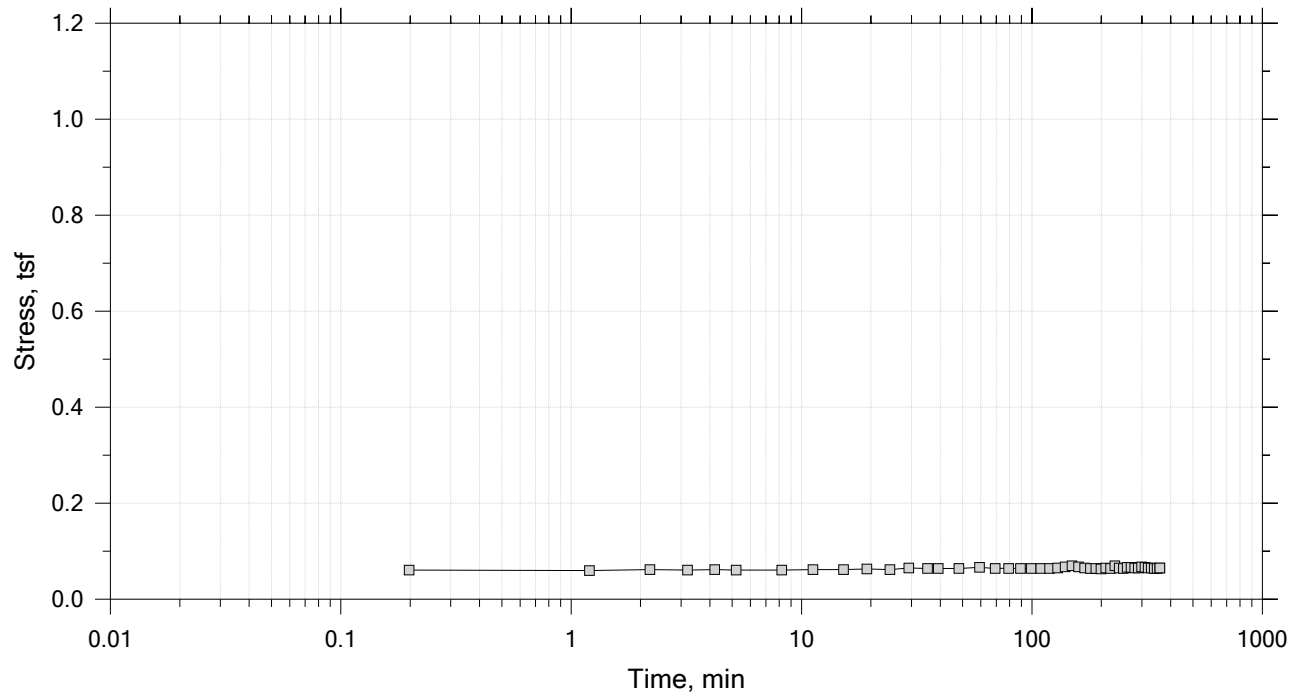
Summary Report




	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-202	Tested By: md	Checked By: mcm
	Sample No.: U2	Test Date: 03/01/21	Depth: 18-20 ft
	Test No.: IP-14	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-0836, Swell Pressure = 0.0651 tsf		
	Displacement at End of Increment		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 1 of 15
Constant Volume Step
Stress: 0.0651 tsf



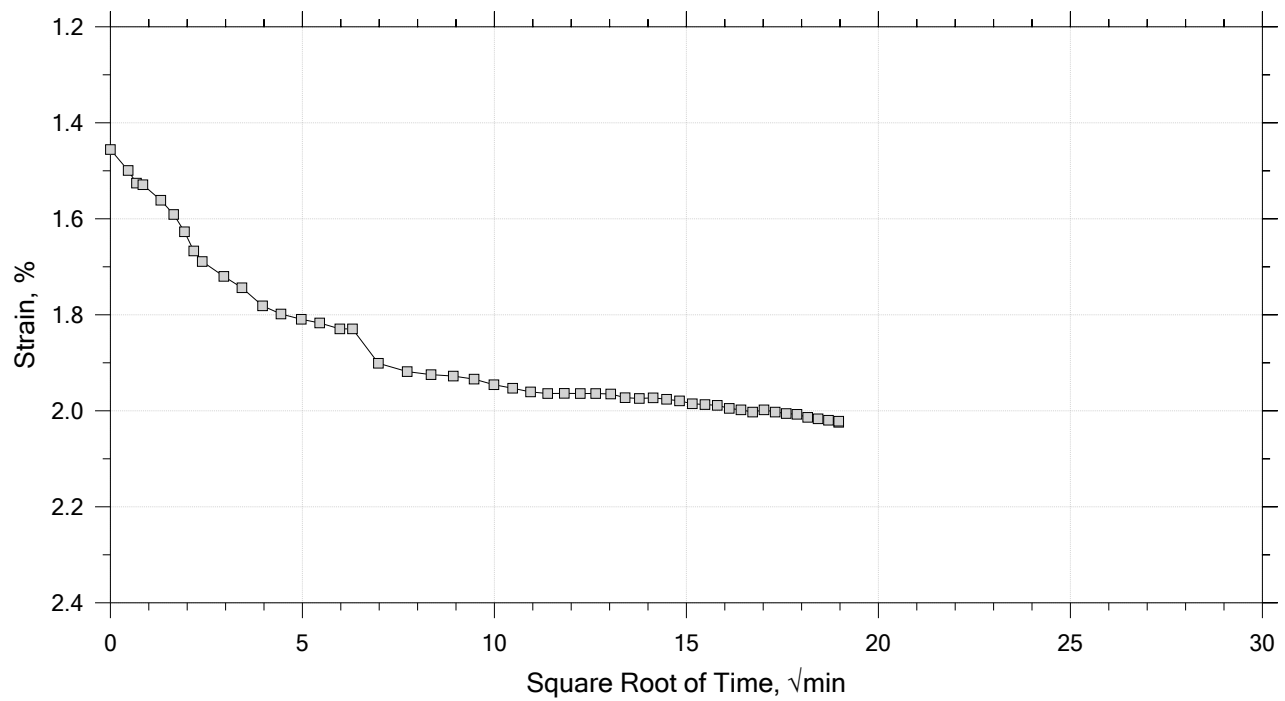
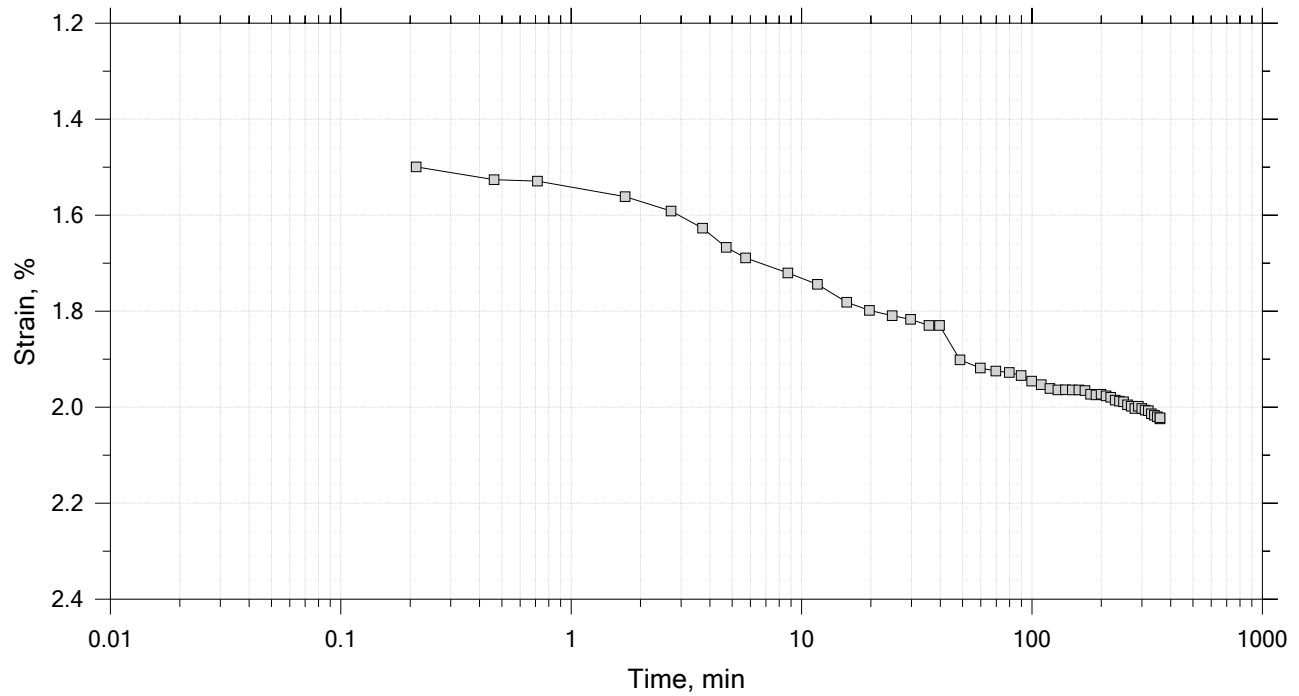
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-202	Tested By: md	Checked By: mcm
	Sample No.: U2	Test Date: 03/01/21	Depth: 18-20 ft
	Test No.: IP-14	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-0836, Swell Pressure = 0.0651 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 2 of 15

Constant Load Step

Stress: 0.125 tsf



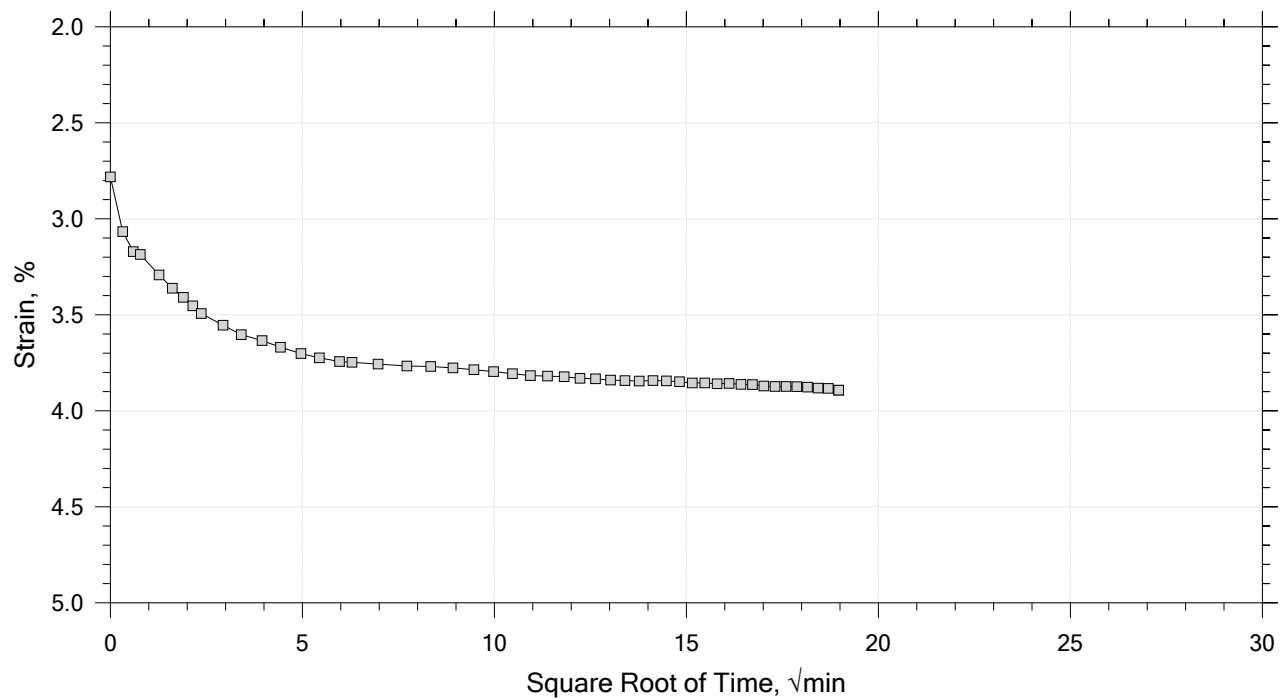
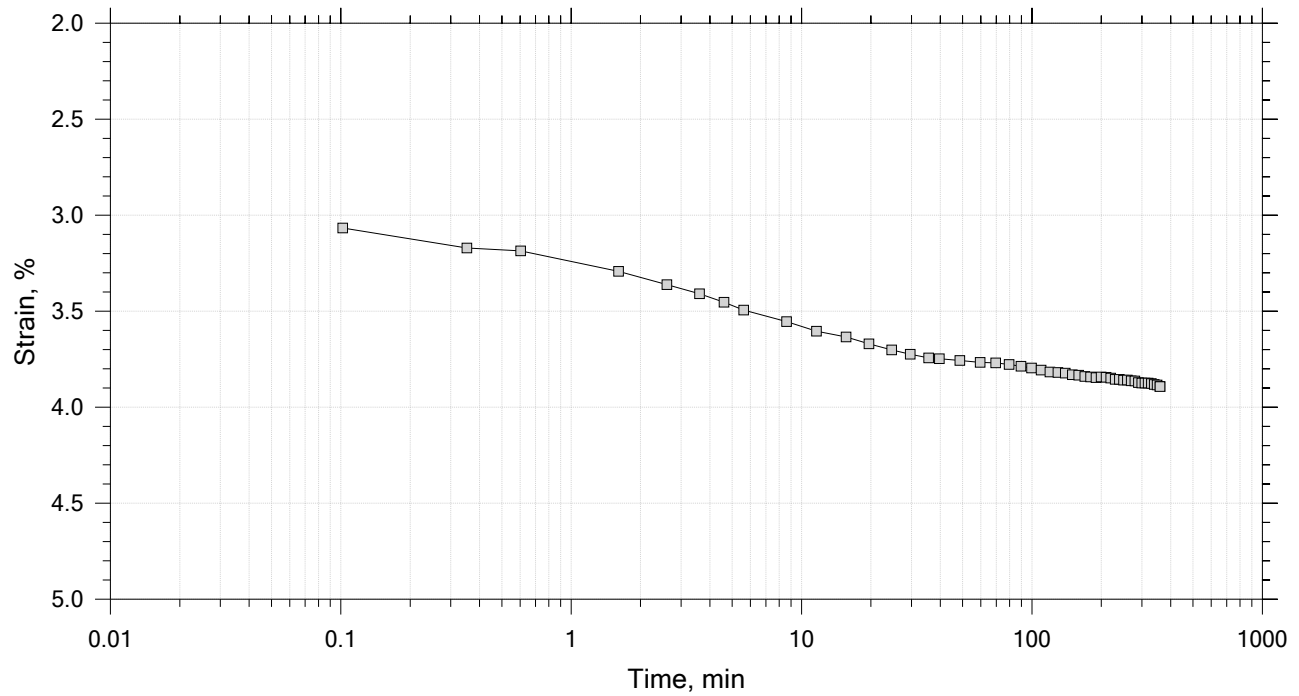
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-202	Tested By: md	Checked By: mcm
	Sample No.: U2	Test Date: 03/01/21	Depth: 18-20 ft
	Test No.: IP-14	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-0836, Swell Pressure = 0.0651 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 3 of 15

Constant Load Step

Stress: 0.25 tsf



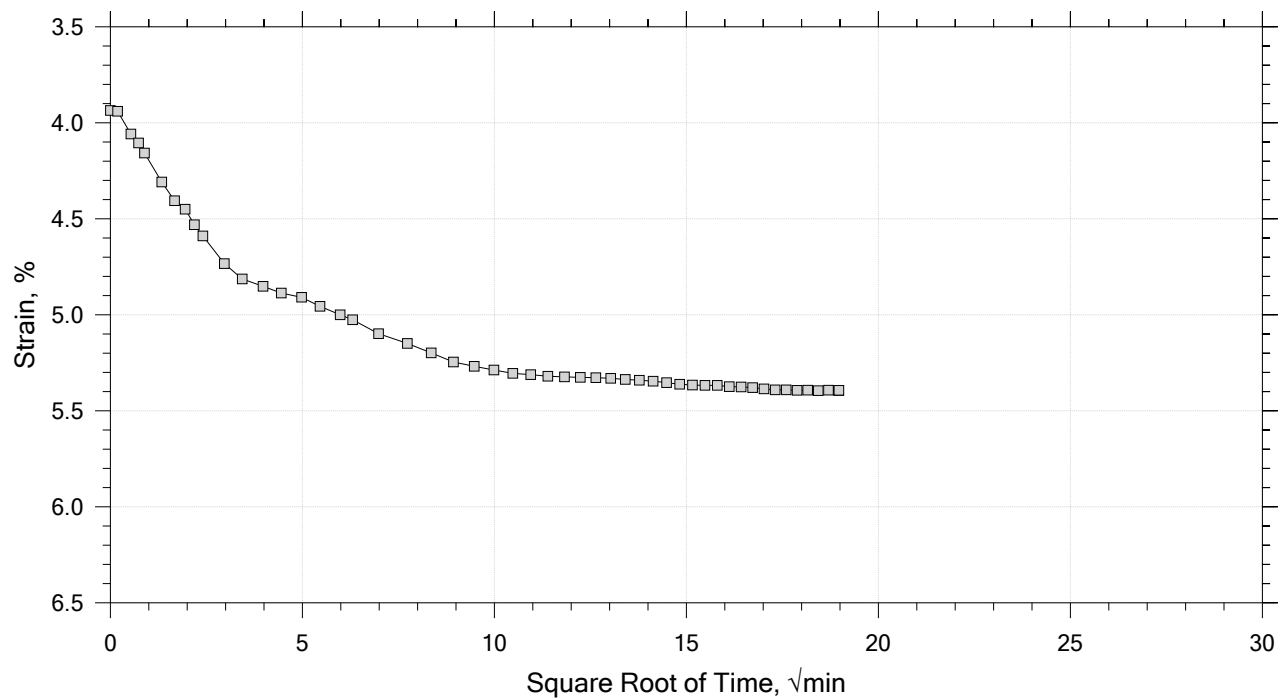
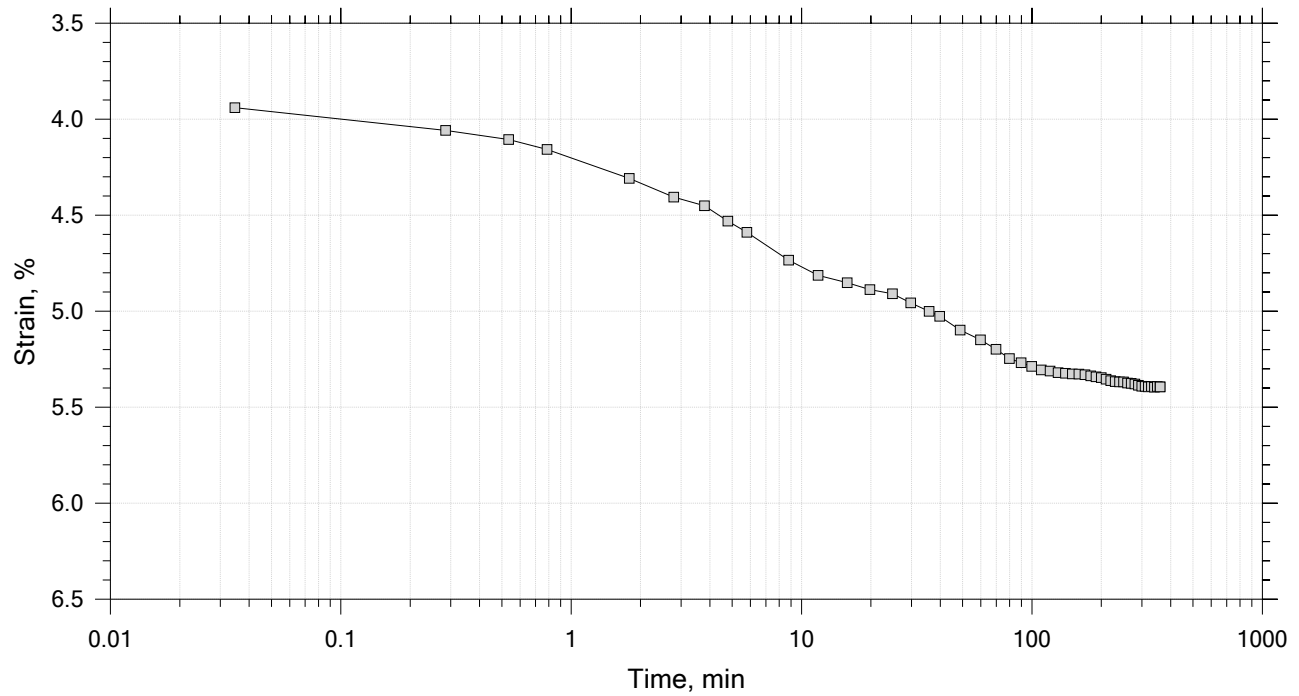
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-202	Tested By: md	Checked By: mcm
	Sample No.: U2	Test Date: 03/01/21	Depth: 18-20 ft
	Test No.: IP-14	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-0836, Swell Pressure = 0.0651 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 4 of 15

Constant Load Step

Stress: 0.5 tsf



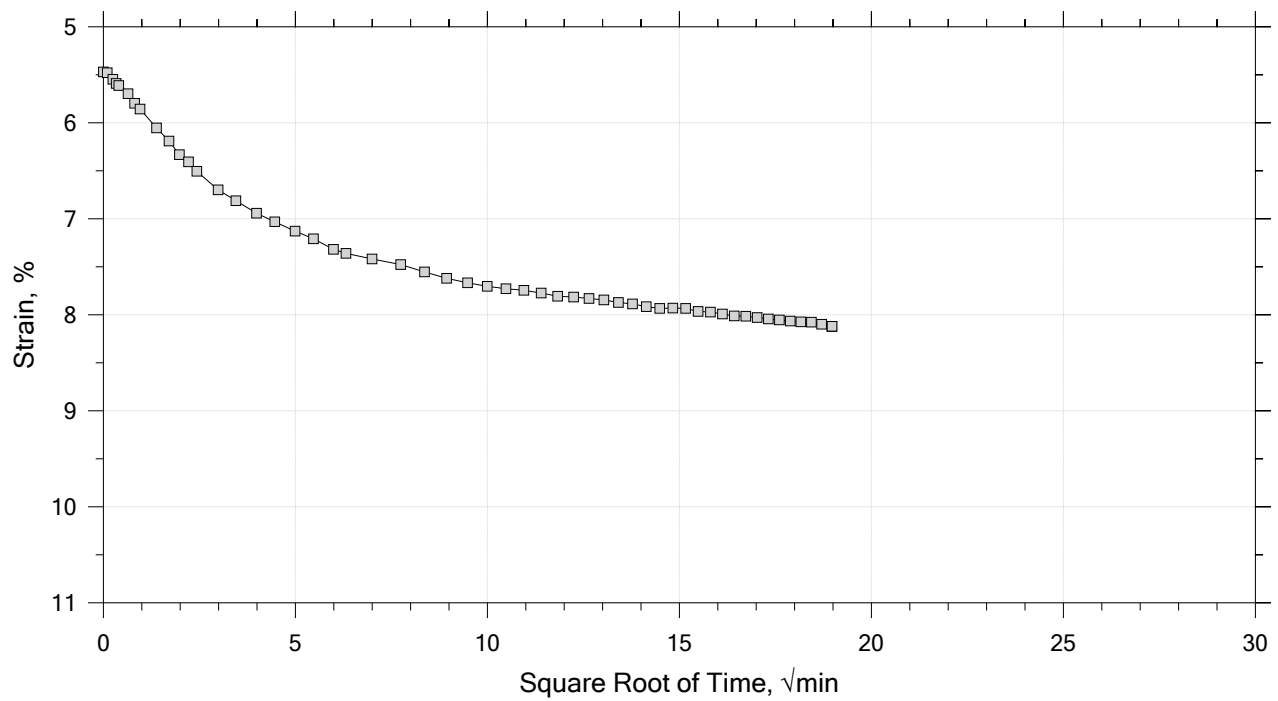
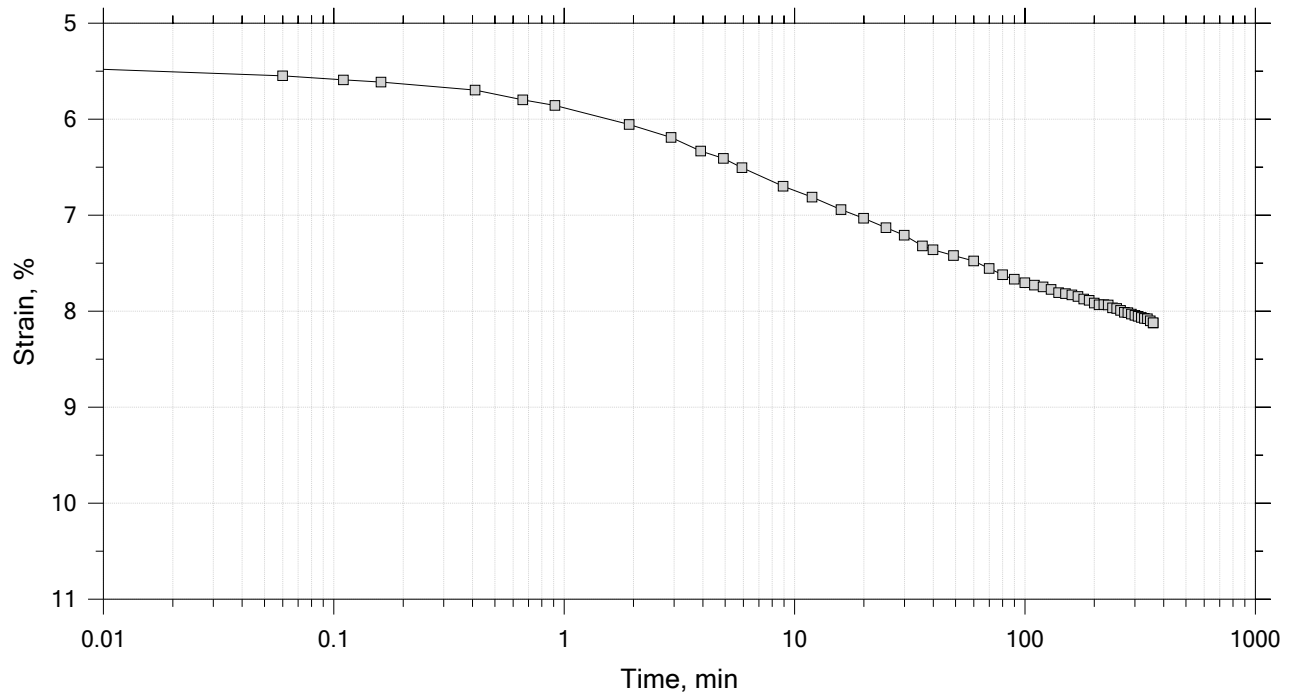
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-202	Tested By: md	Checked By: mcm
	Sample No.: U2	Test Date: 03/01/21	Depth: 18-20 ft
	Test No.: IP-14	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-0836, Swell Pressure = 0.0651 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 5 of 15

Constant Load Step

Stress: 1 tsf



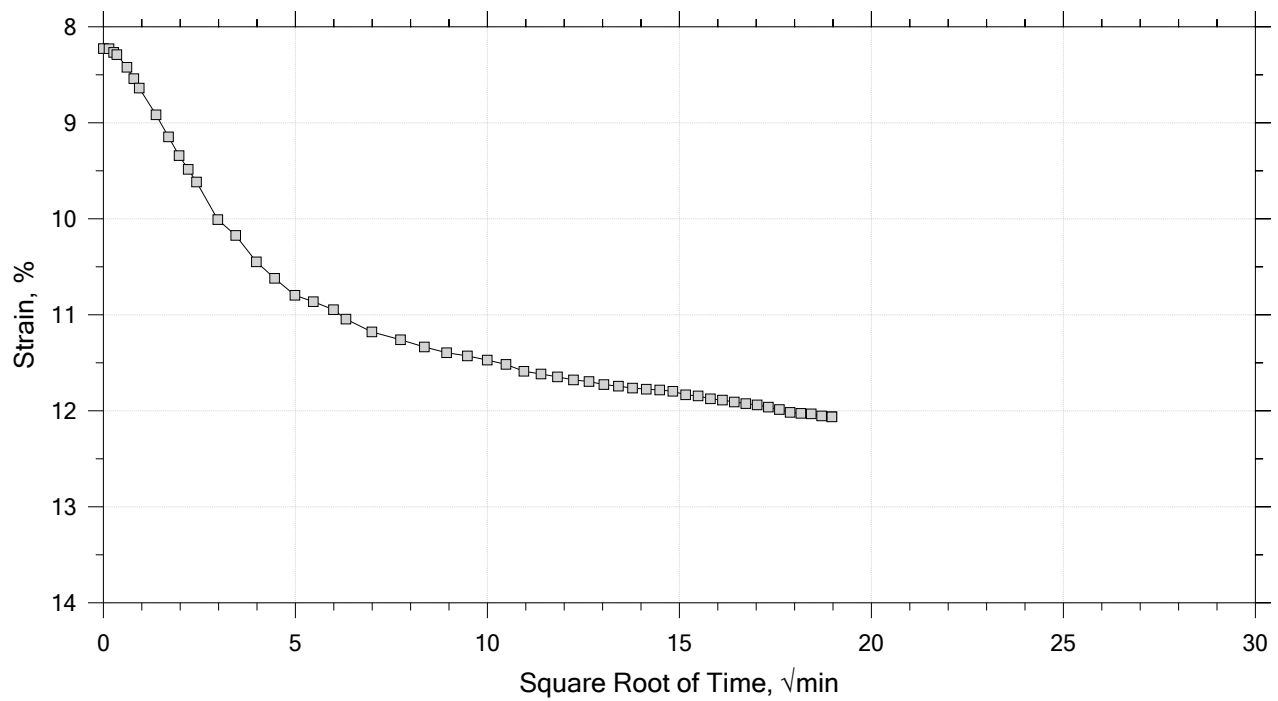
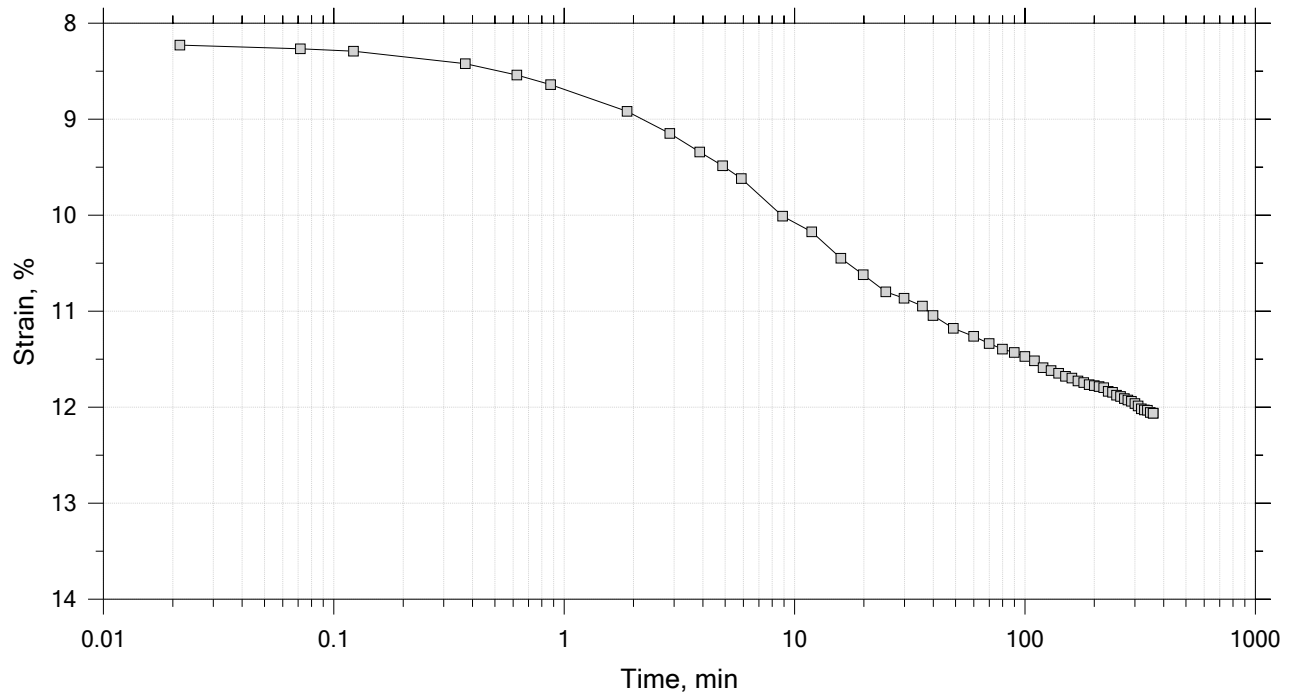
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-202	Tested By: md	Checked By: mcm
	Sample No.: U2	Test Date: 03/01/21	Depth: 18-20 ft
	Test No.: IP-14	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-0836, Swell Pressure = 0.0651 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 6 of 15

Constant Load Step

Stress: 2 tsf



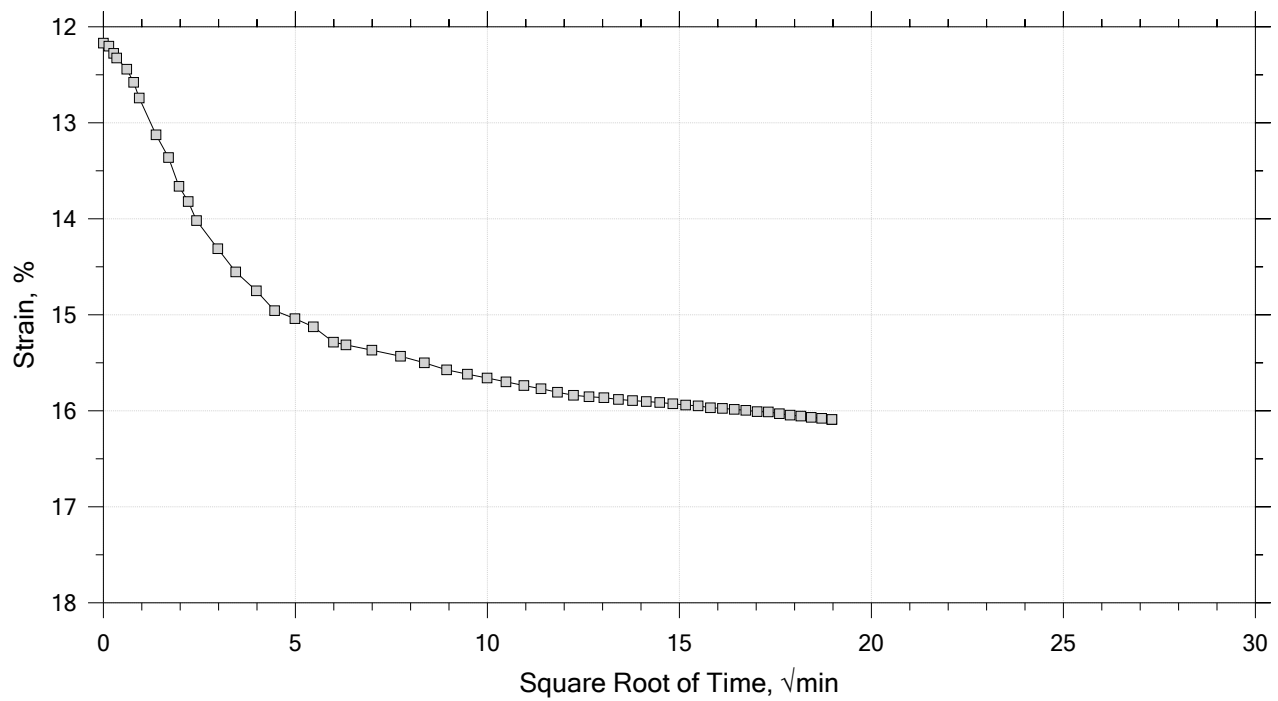
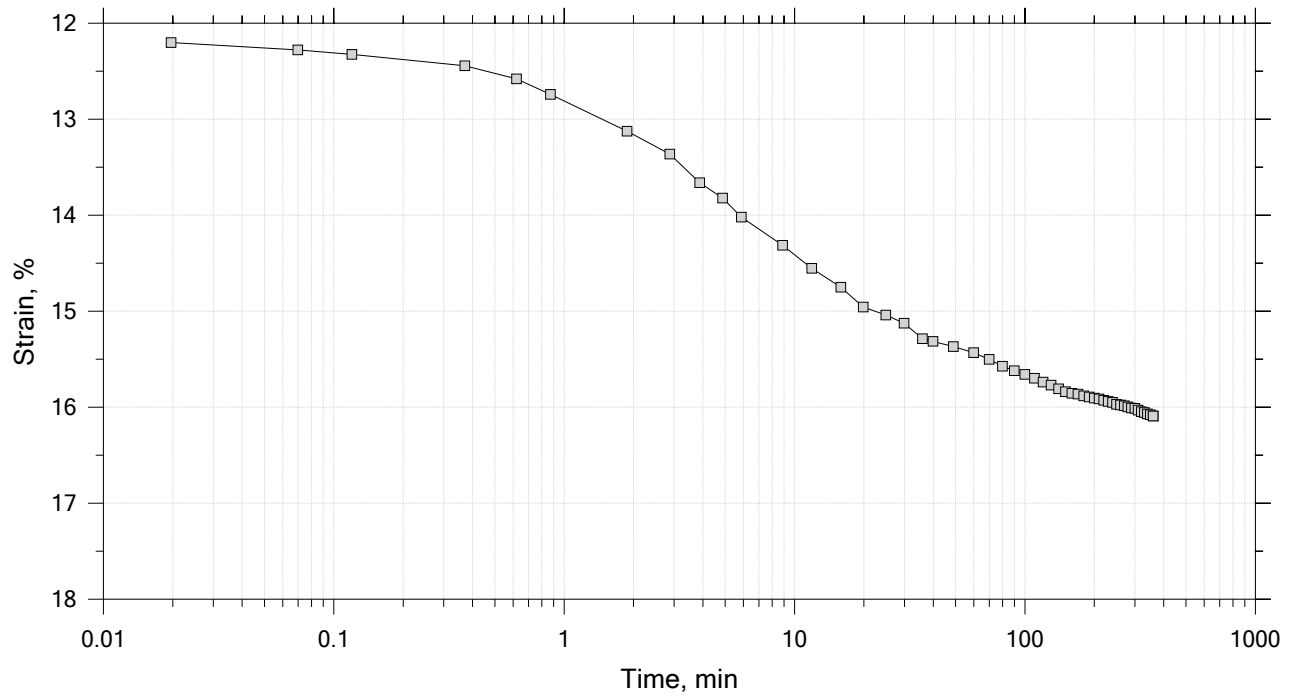
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-202	Tested By: md	Checked By: mcm
	Sample No.: U2	Test Date: 03/01/21	Depth: 18-20 ft
	Test No.: IP-14	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-0836, Swell Pressure = 0.0651 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 7 of 15

Constant Load Step

Stress: 4 tsf



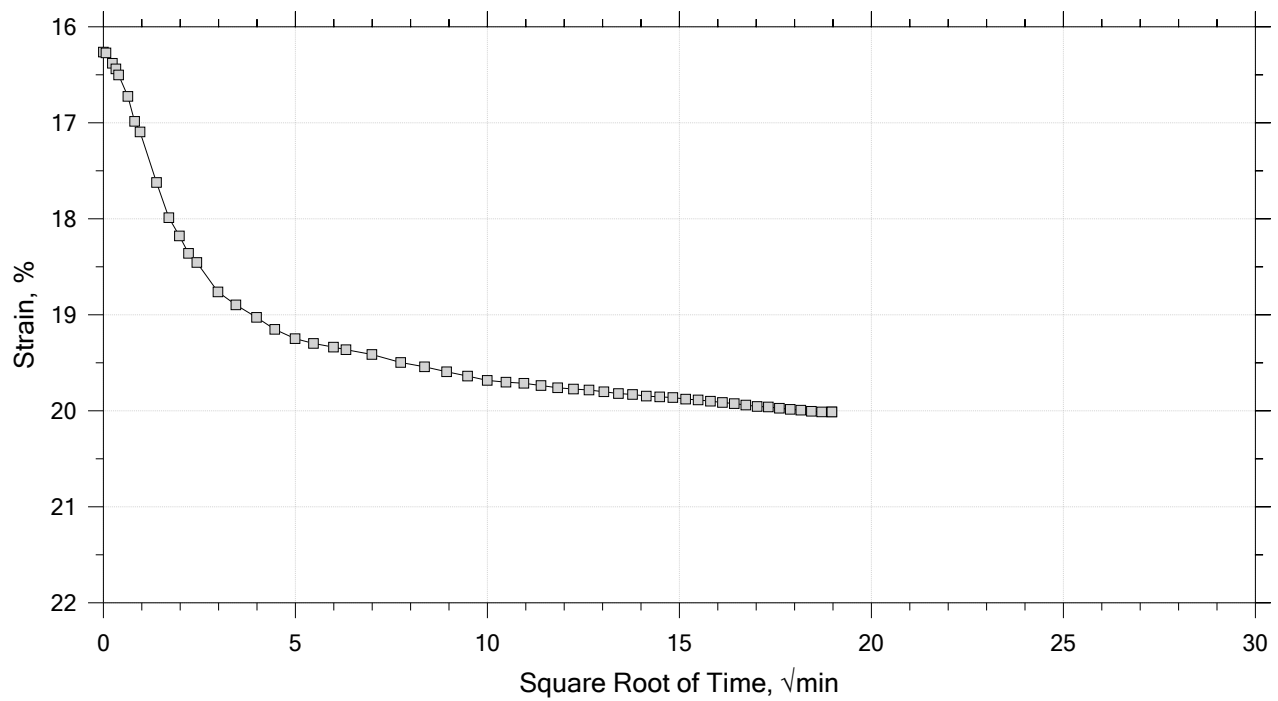
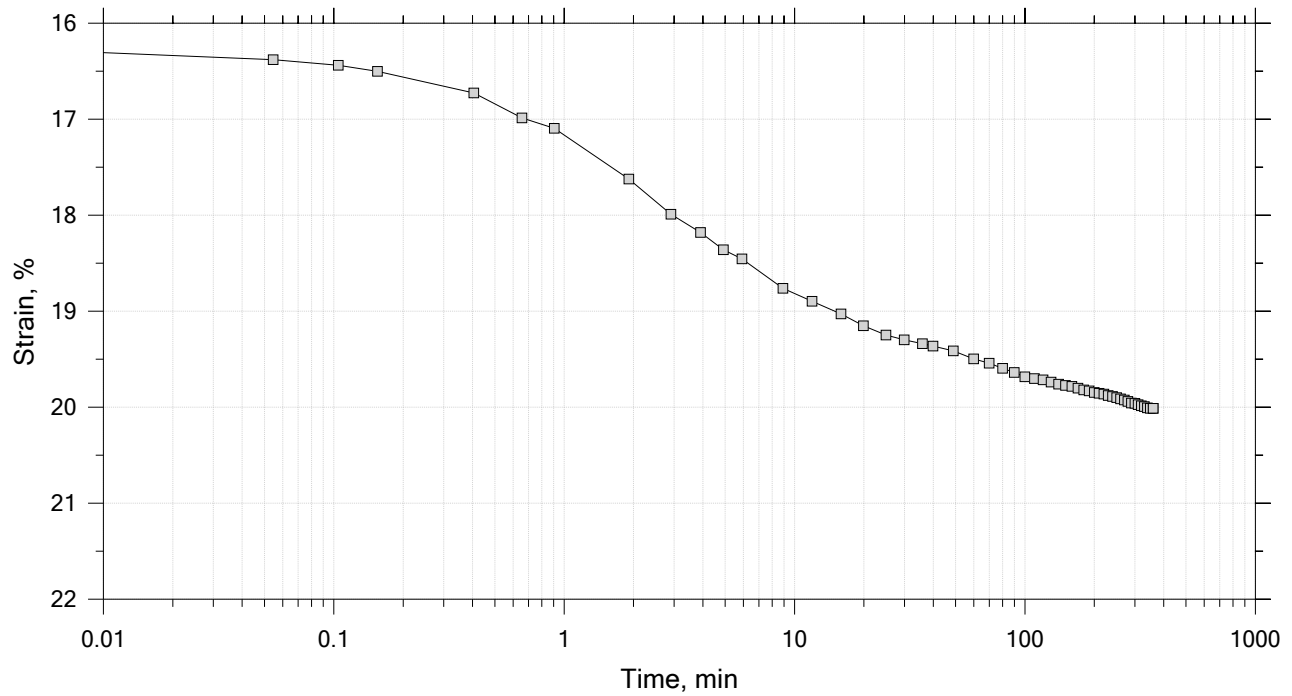
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-202	Tested By: md	Checked By: mcm
	Sample No.: U2	Test Date: 03/01/21	Depth: 18-20 ft
	Test No.: IP-14	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-0836, Swell Pressure = 0.0651 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 8 of 15

Constant Load Step

Stress: 8 tsf



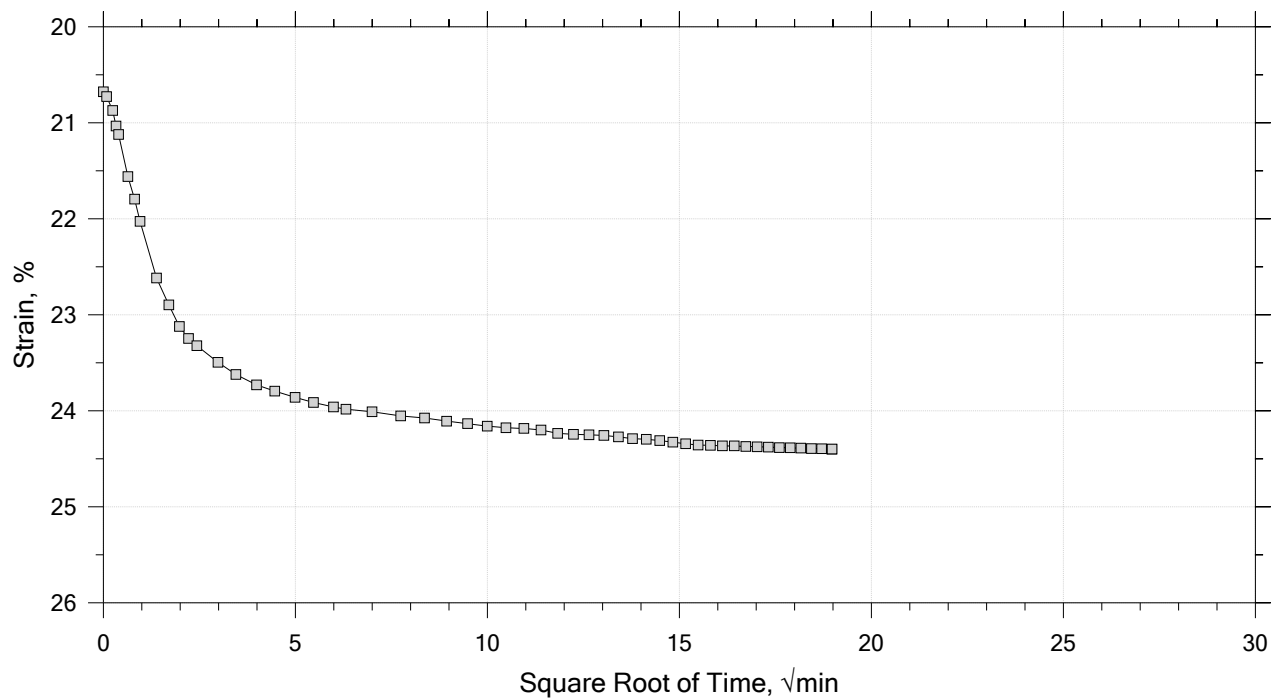
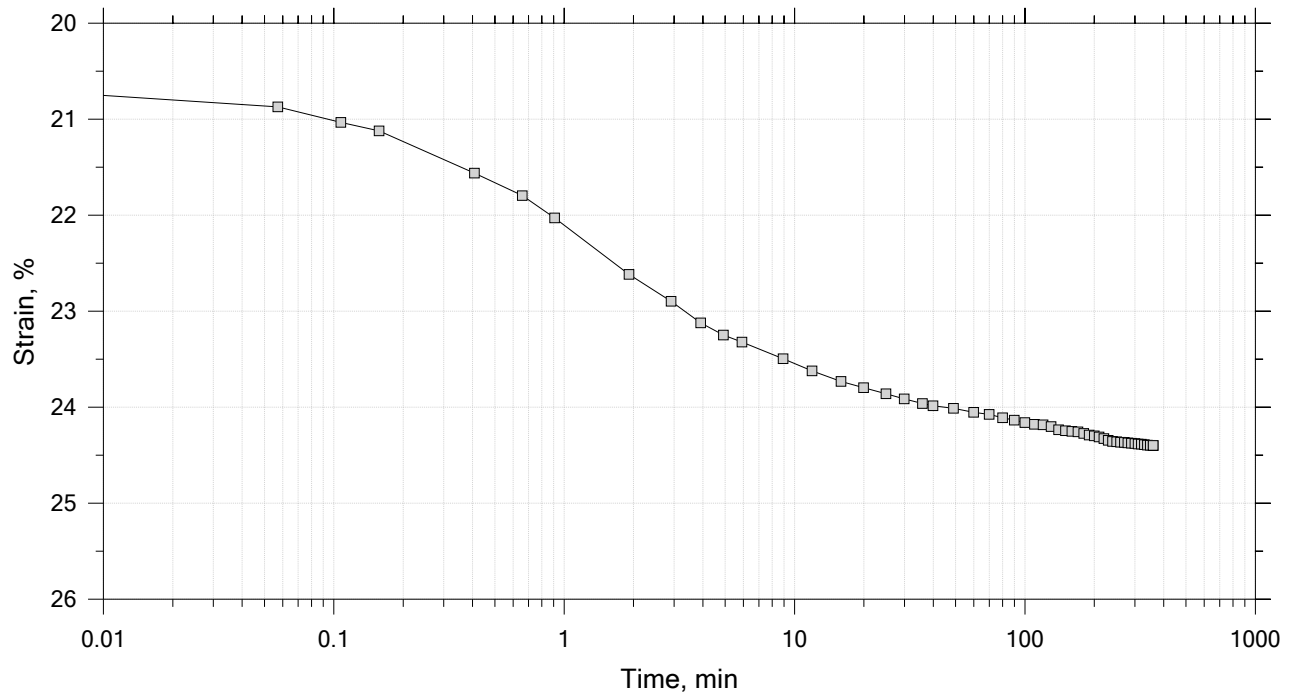
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-202	Tested By: md	Checked By: mcm
	Sample No.: U2	Test Date: 03/01/21	Depth: 18-20 ft
	Test No.: IP-14	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-0836, Swell Pressure = 0.0651 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 9 of 15

Constant Load Step

Stress: 16 tsf



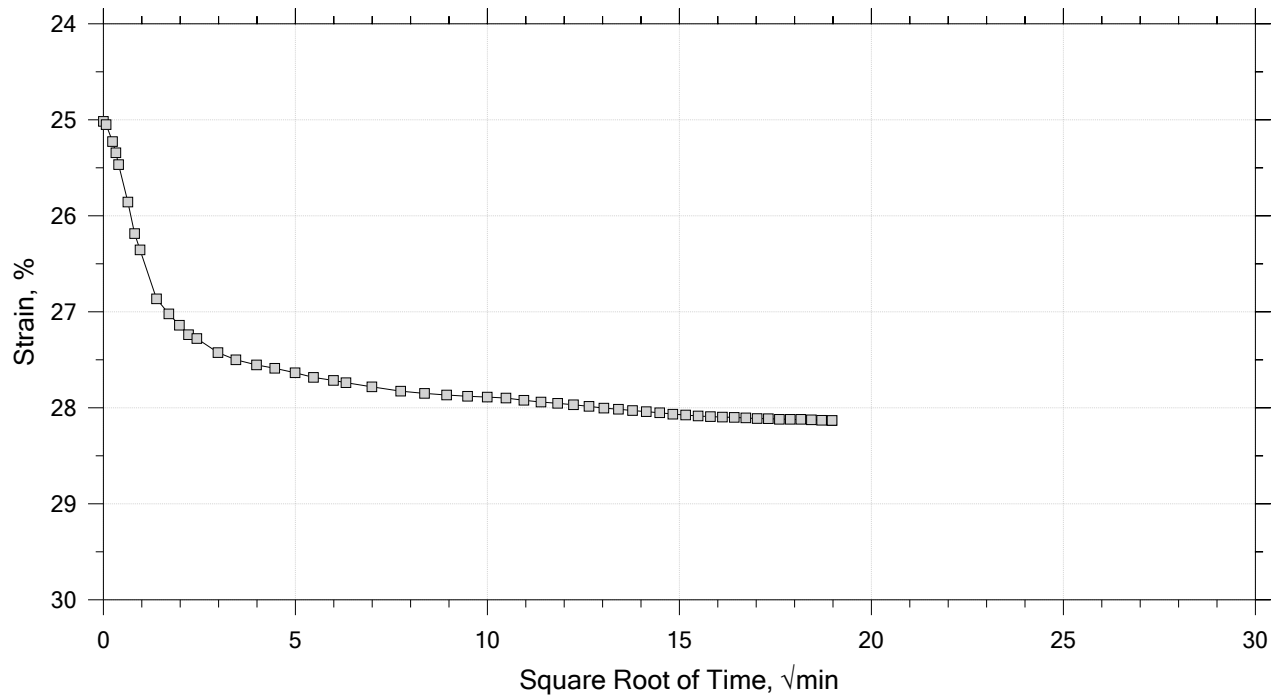
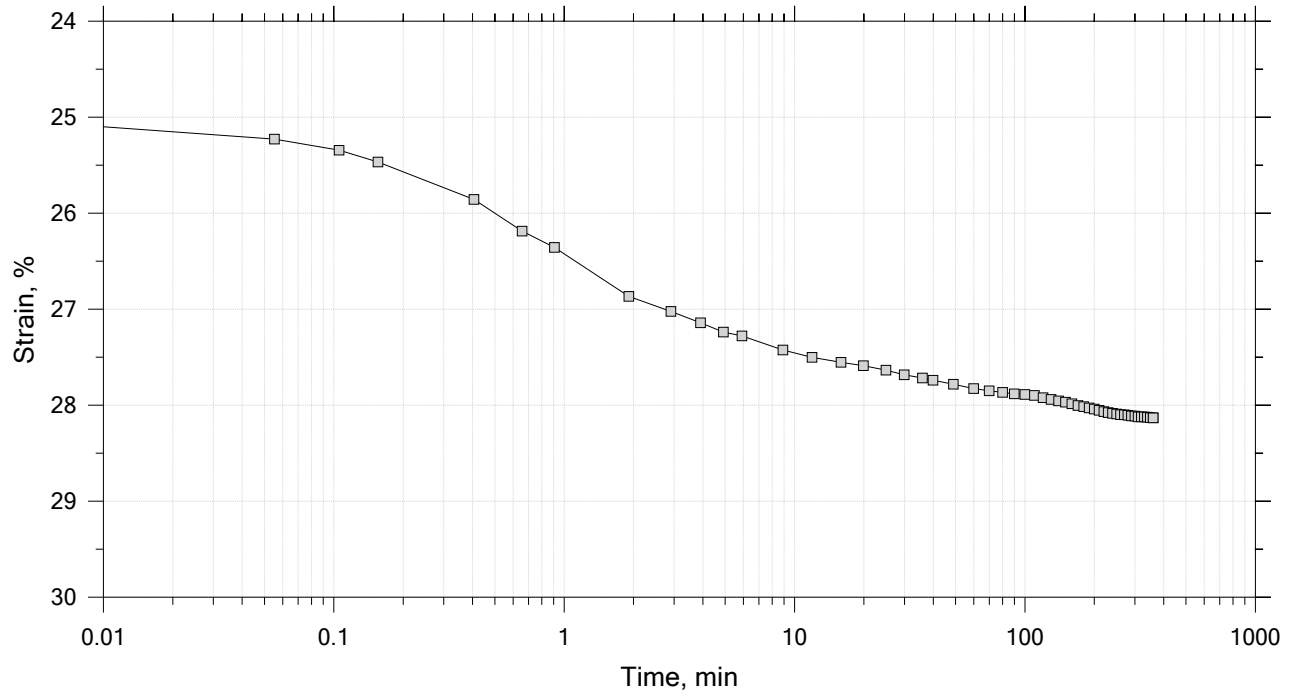
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-202	Tested By: md	Checked By: mcm
	Sample No.: U2	Test Date: 03/01/21	Depth: 18-20 ft
	Test No.: IP-14	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-0836, Swell Pressure = 0.0651 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 10 of 15

Constant Load Step

Stress: 32 tsf



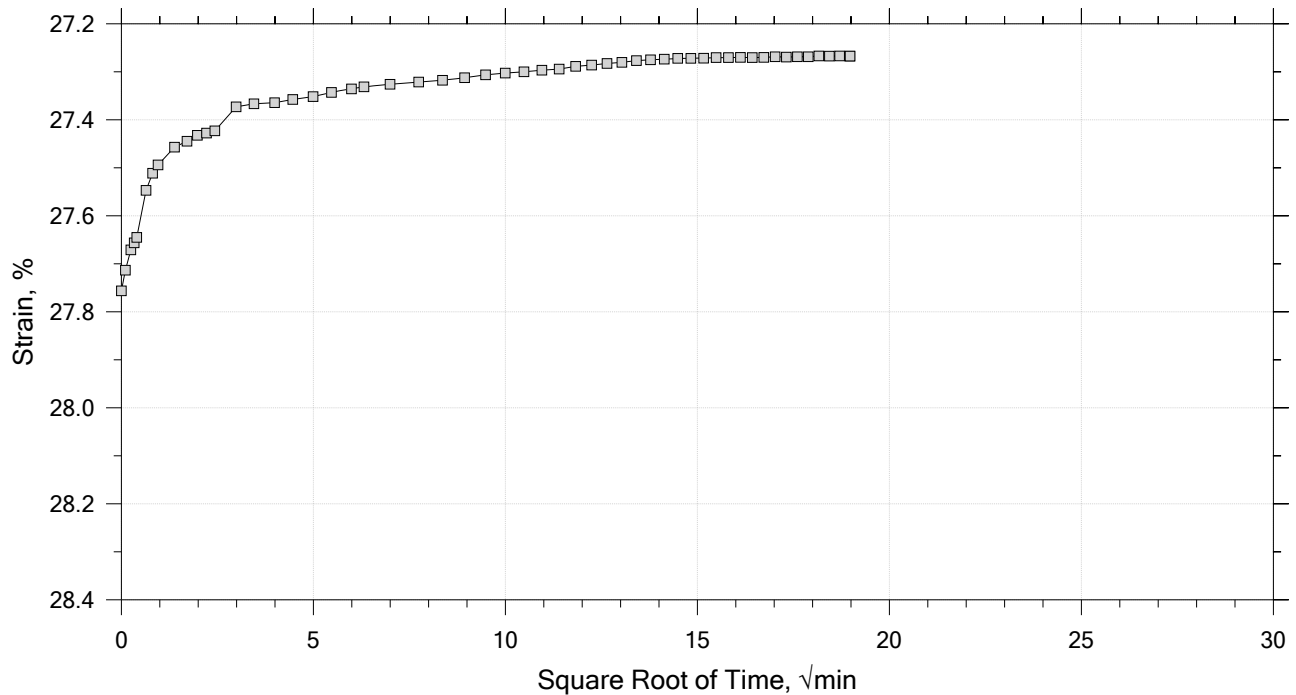
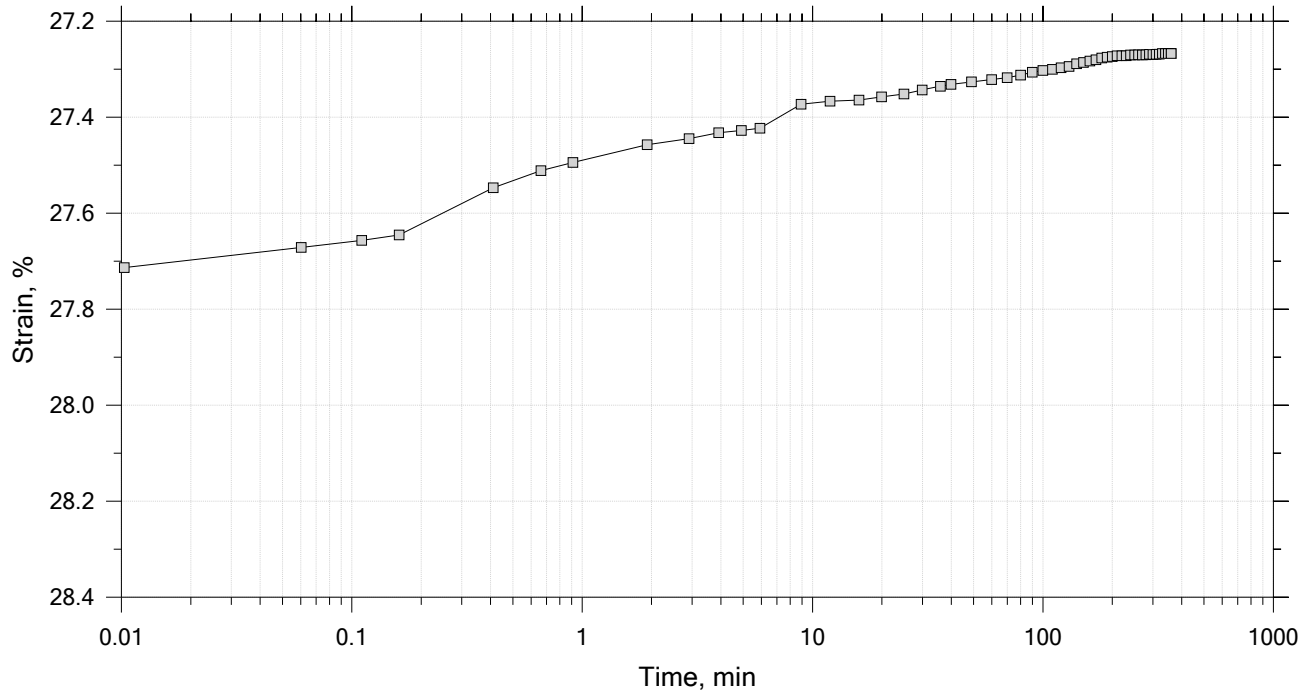
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-202	Tested By: md	Checked By: mcm
	Sample No.: U2	Test Date: 03/01/21	Depth: 18-20 ft
	Test No.: IP-14	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-0836, Swell Pressure = 0.0651 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 11 of 15

Constant Load Step

Stress: 8 tsf



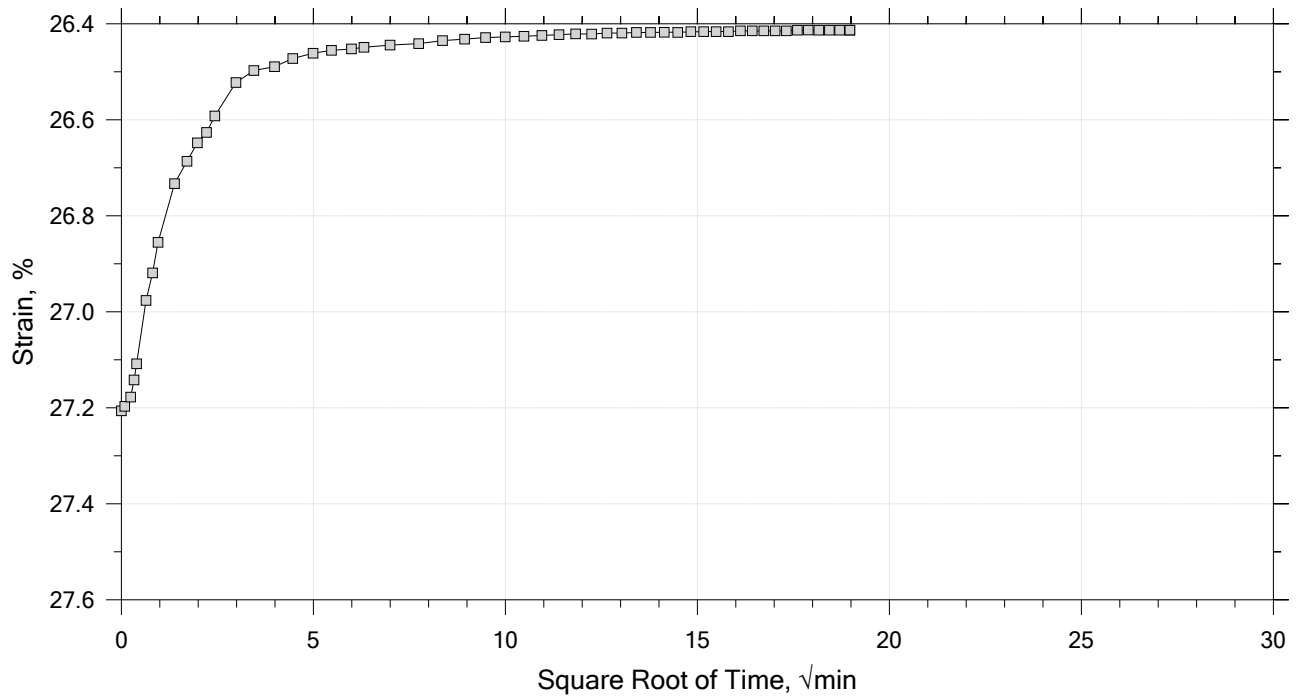
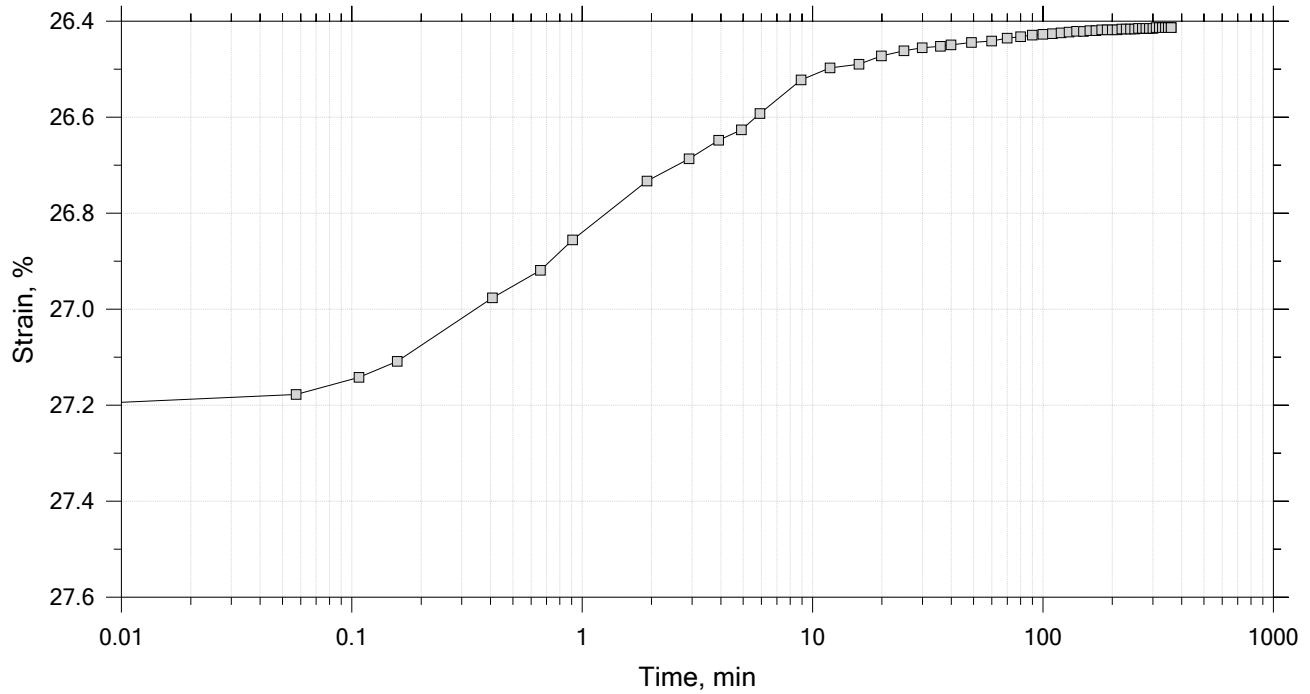
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-202	Tested By: md	Checked By: mcm
	Sample No.: U2	Test Date: 03/01/21	Depth: 18-20 ft
	Test No.: IP-14	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-0836, Swell Pressure = 0.0651 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 12 of 15

Constant Load Step

Stress: 2 tsf



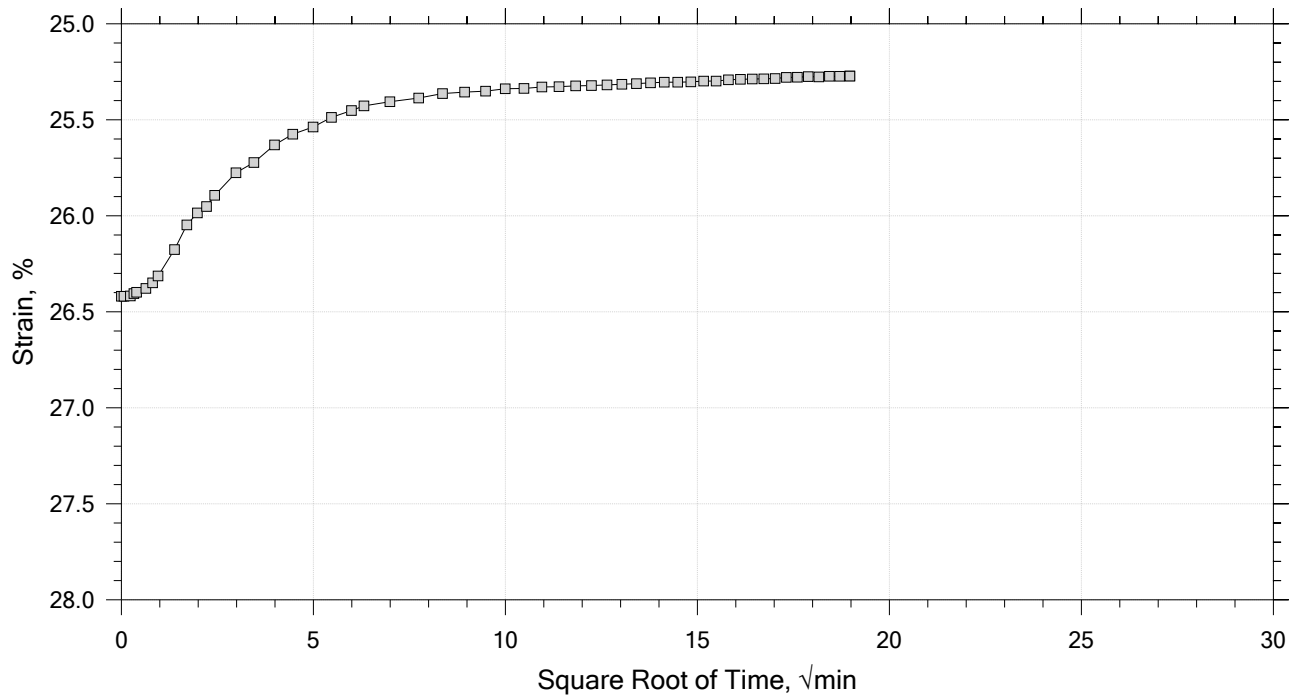
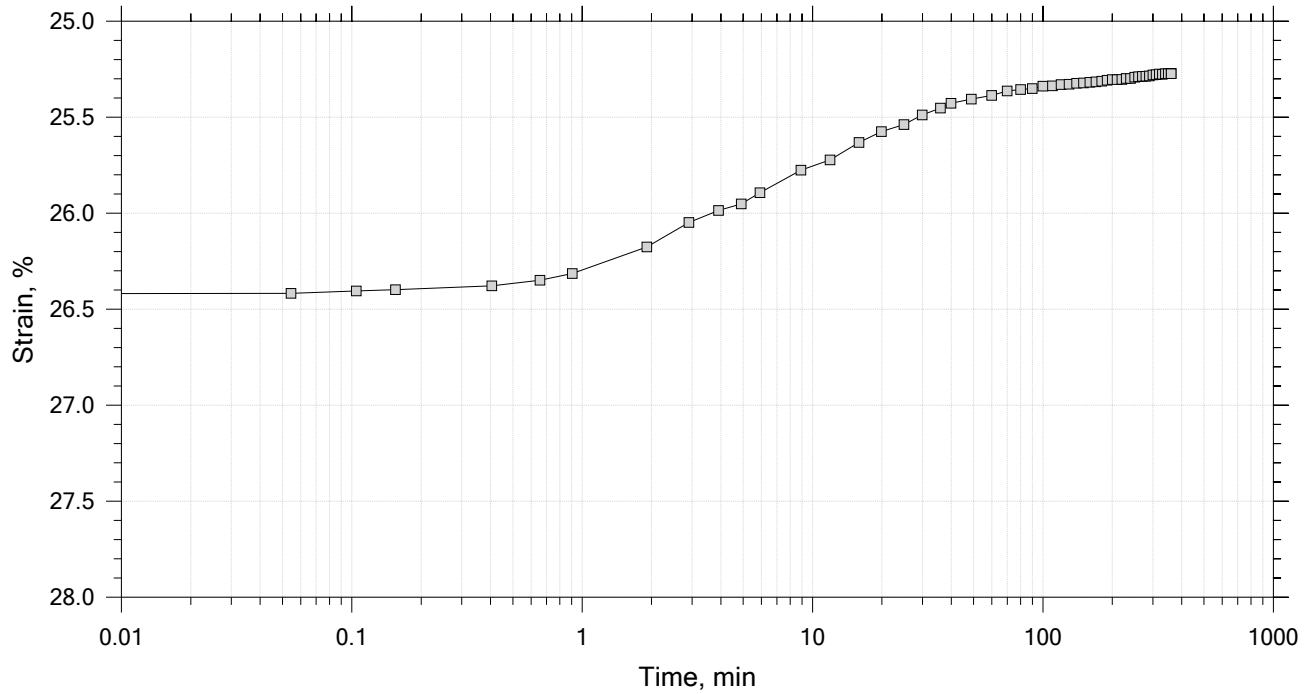
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-202	Tested By: md	Checked By: mcm
	Sample No.: U2	Test Date: 03/01/21	Depth: 18-20 ft
	Test No.: IP-14	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-0836, Swell Pressure = 0.0651 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 13 of 15

Constant Load Step

Stress: 0.5 tsf



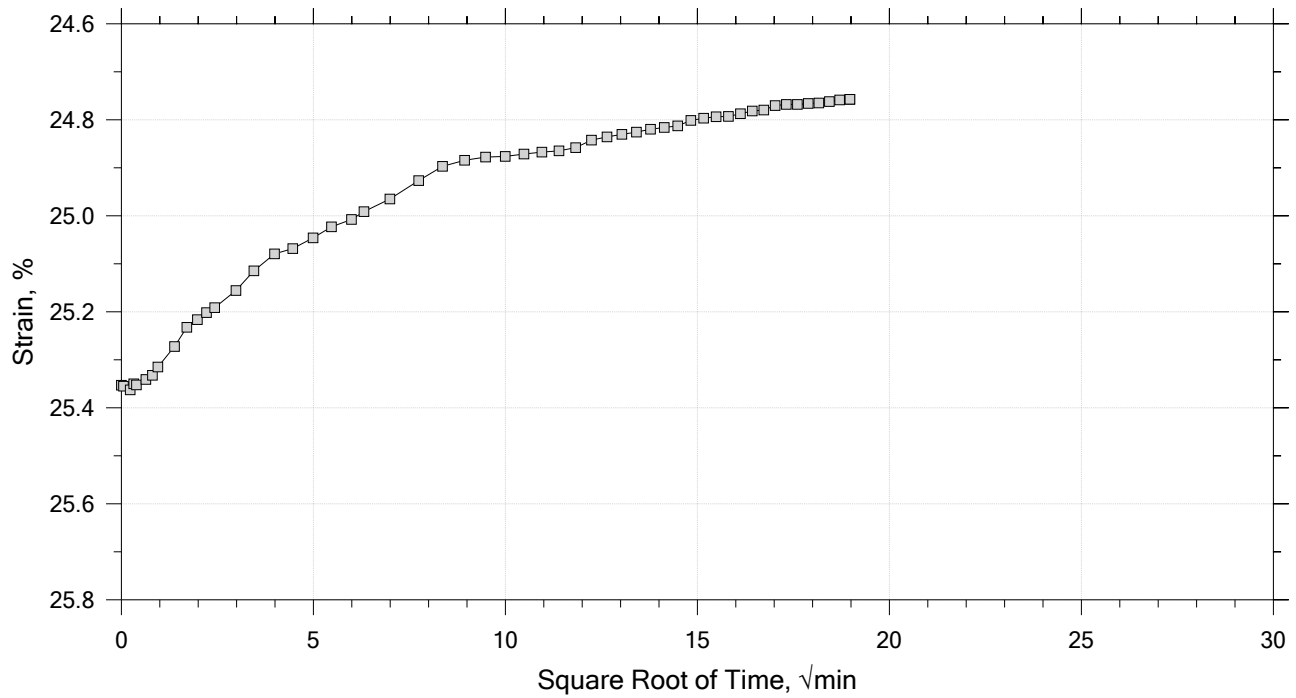
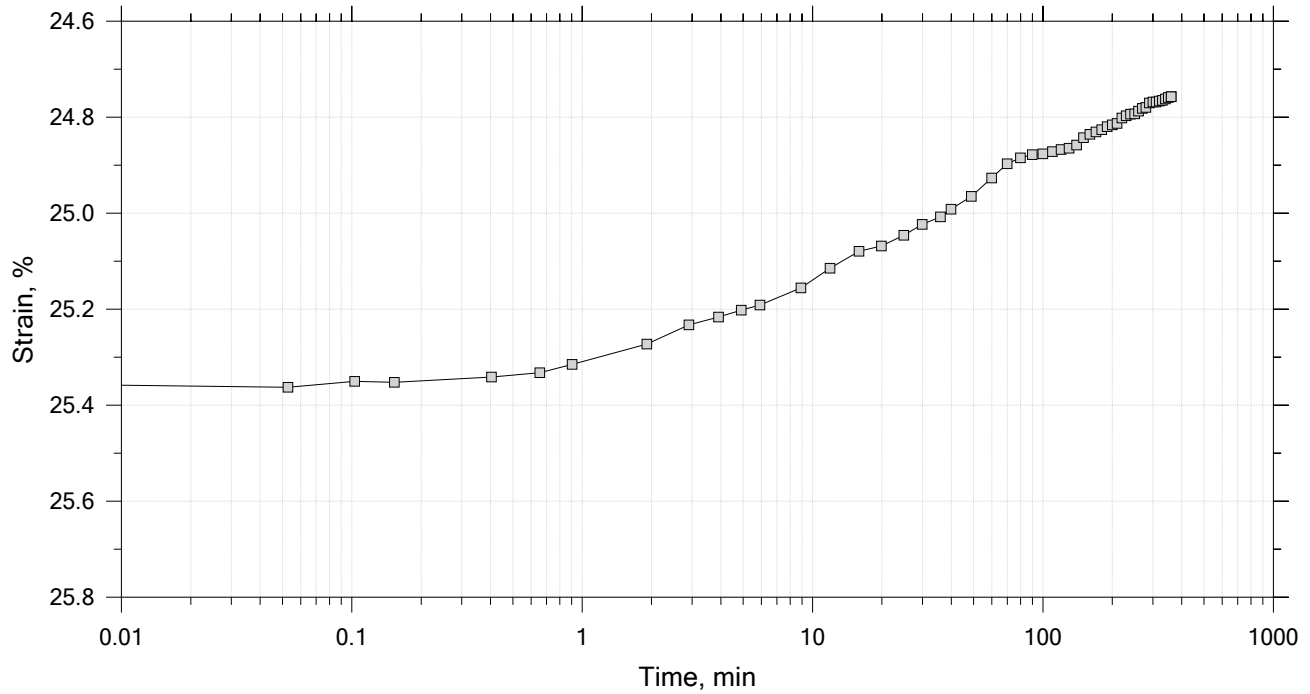
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-202	Tested By: md	Checked By: mcm
	Sample No.: U2	Test Date: 03/01/21	Depth: 18-20 ft
	Test No.: IP-14	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-0836, Swell Pressure = 0.0651 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 14 of 15

Constant Load Step

Stress: 0.25 tsf



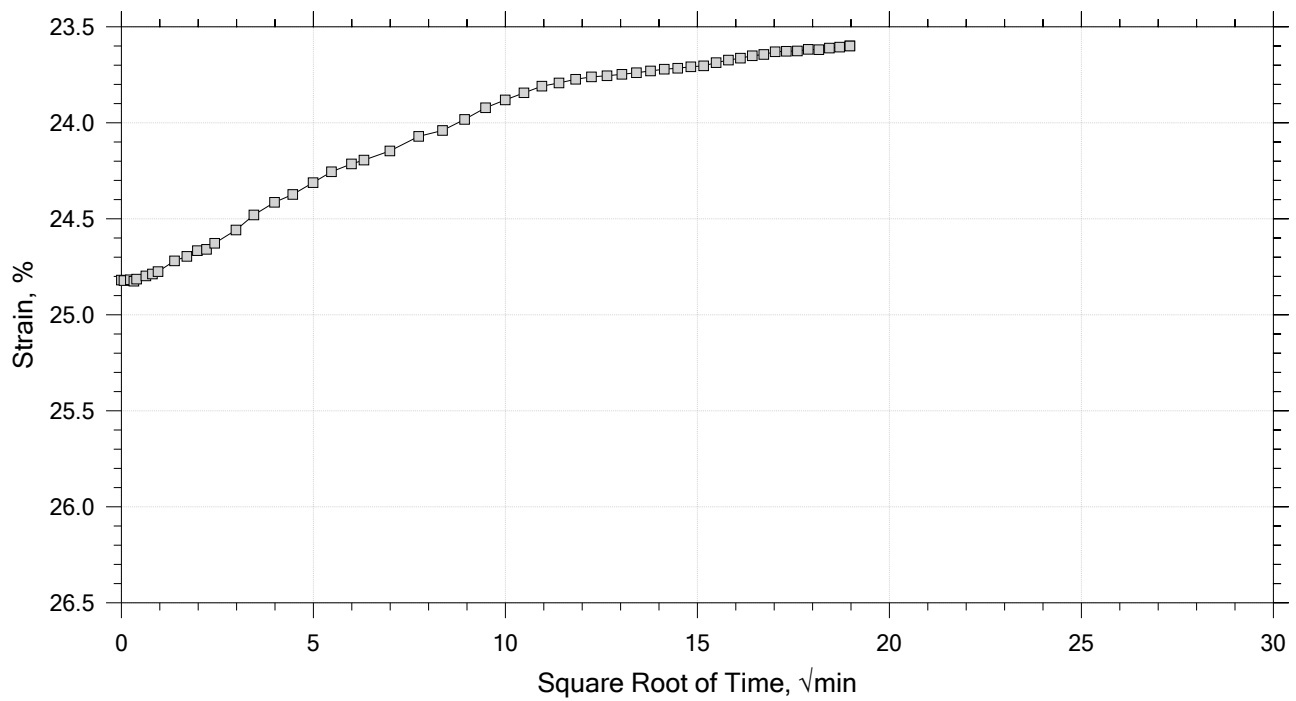
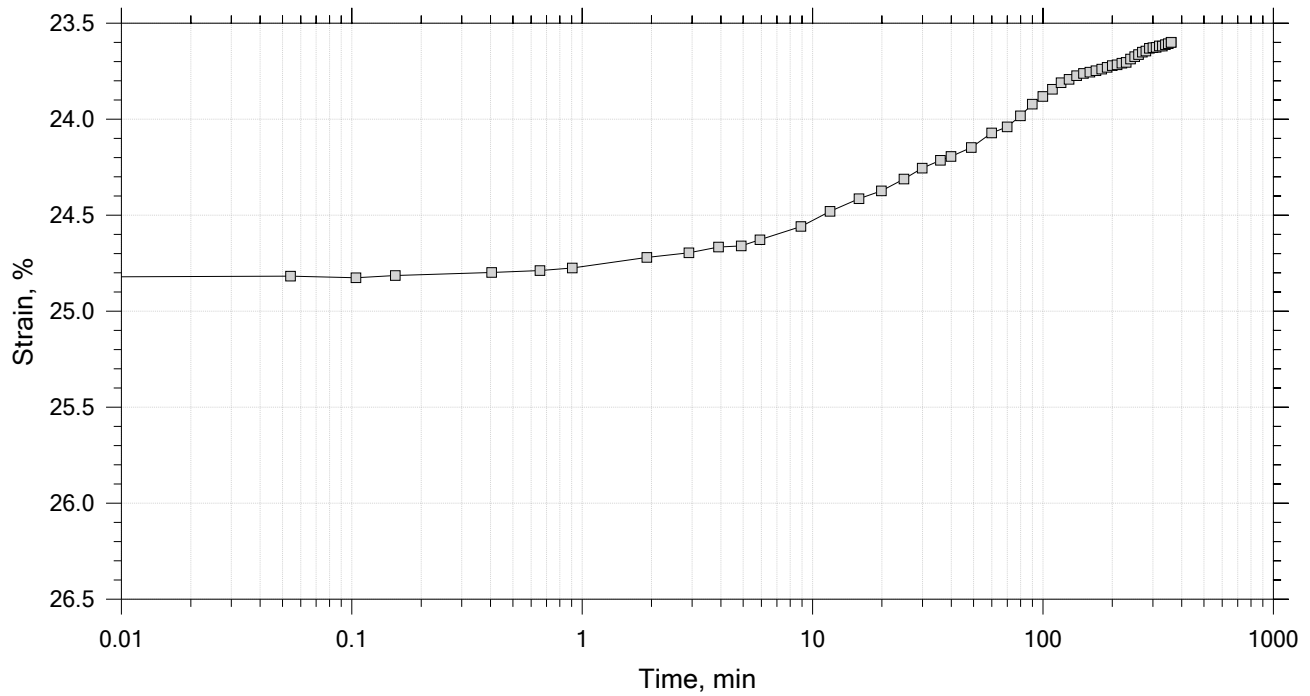
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-202	Tested By: md	Checked By: mcm
	Sample No.: U2	Test Date: 03/01/21	Depth: 18-20 ft
	Test No.: IP-14	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-0836, Swell Pressure = 0.0651 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 15 of 15

Constant Load Step

Stress: 0.0625 tsf




	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-202	Tested By: md	Checked By: mcm
	Sample No.: U2	Test Date: 03/01/21	Depth: 18-20 ft
	Test No.: IP-14	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-0836, Swell Pressure = 0.0651 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Specimen Diameter: 2.50 in	Measured Specific Gravity: 2.77	Liquid Limit: 40
Initial Height: 1.00 in	Initial Void Ratio: 1.01	Plastic Limit: 23
Final Height: 0.78 in	Final Void Ratio: 0.566	Plasticity Index: 17

	Before Test Trimmings	Before Test Specimen	After Test Specimen	After Test Trimmings
Container ID	E-0556	RING		a1819
Mass Container, gm	8.2	111.43	111.43	8.42
Mass Container + Wet Soil, gm	194.68	260.75	244.93	141.68
Mass Container + Dry Soil, gm	146.3	222.25	222.25	119.04
Mass Dry Soil, gm	138.1	110.82	110.82	110.62
Water Content, %	35.03	34.74	20.47	20.47
Void Ratio	---	1.01	0.57	---
Degree of Saturation, %	---	95.35	100.00	---
Dry Unit Weight, pcf	---	86.005	110.26	---


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

	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-202	Tested By: md	Checked By: mcm
	Sample No.: U2	Test Date: 03/01/21	Depth: 18-20 ft
	Test No.: IP-14	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-0836, Swell Pressure = 0.0651 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

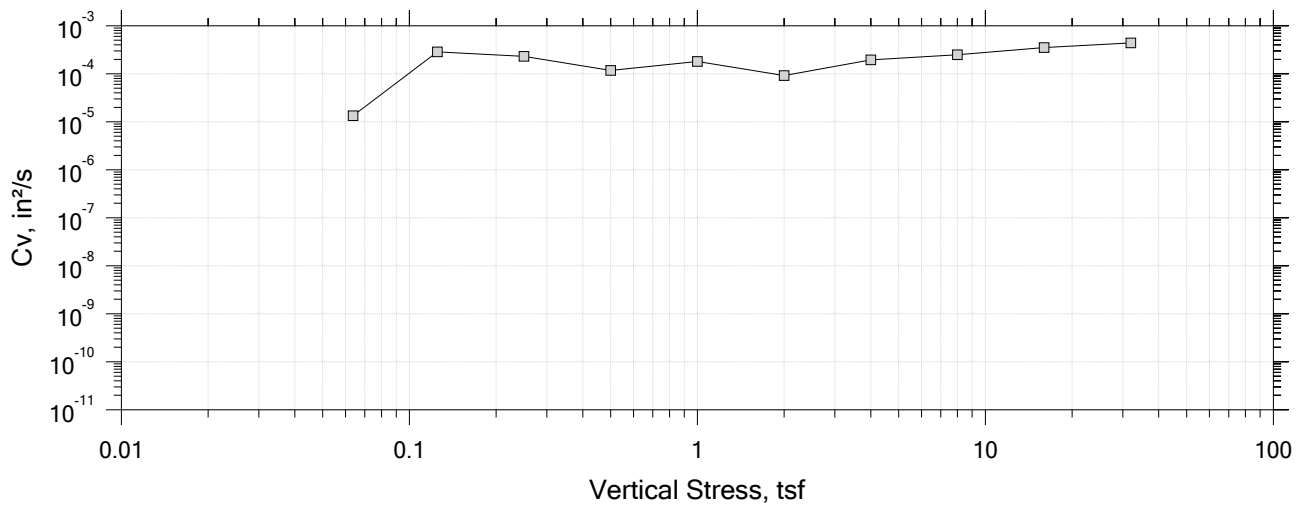
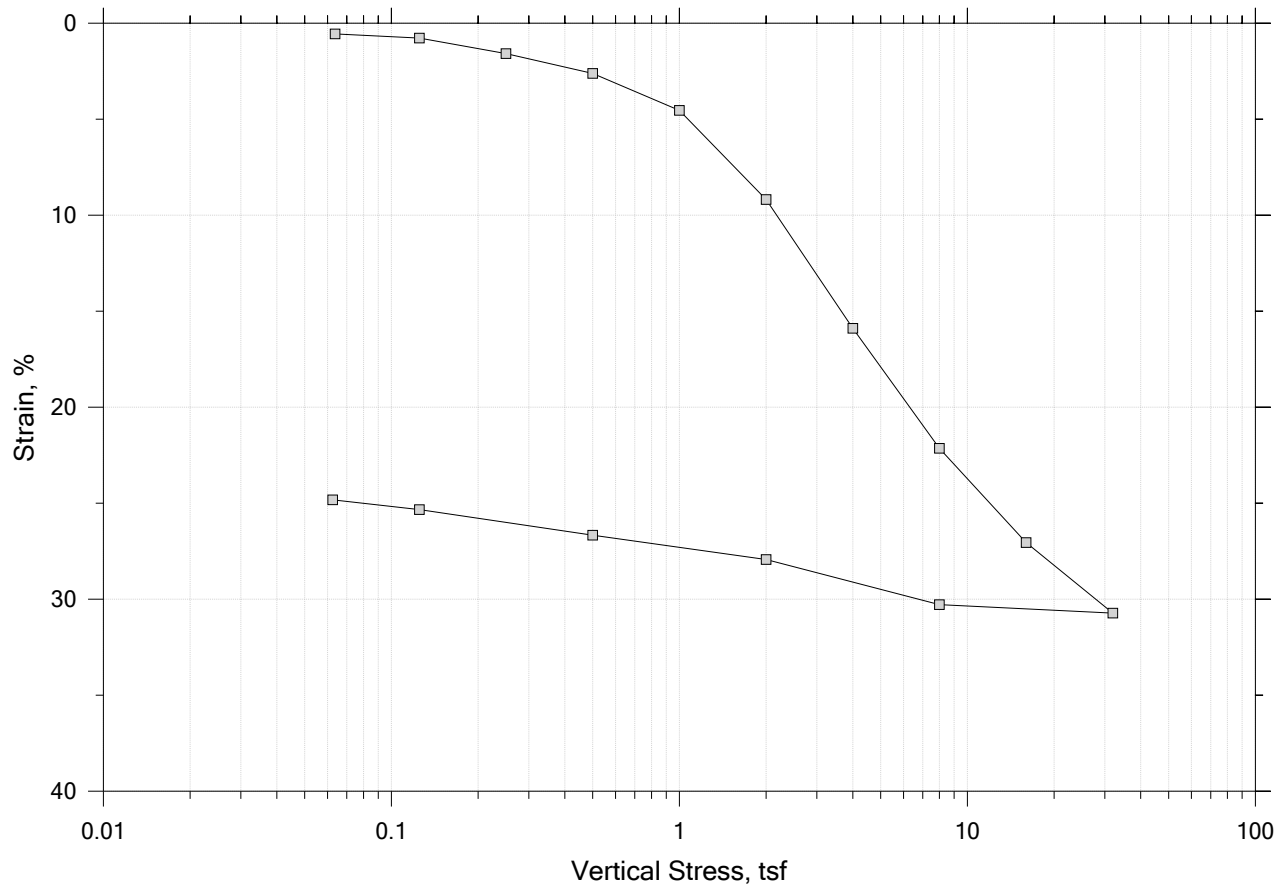
Square Root of Time Coefficients


[illegible]

	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-202	Tested By: md	Checked By: mcm
	Sample No.: U2	Test Date: 03/01/21	Depth: 18-20 ft
	Test No.: IP-14	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-0836, Swell Pressure = 0.0651 tsf		
Displacement at End of Increment			

One-Dimensional Consolidation by ASTM D2435 - Method B

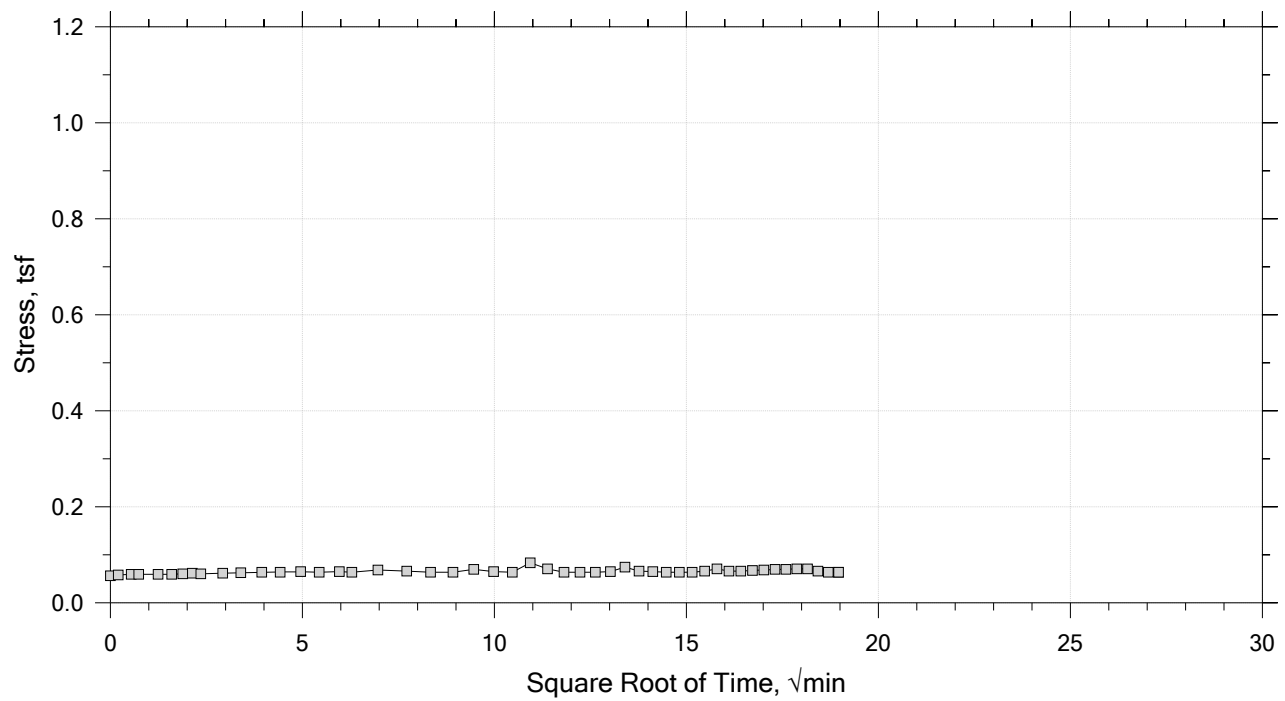
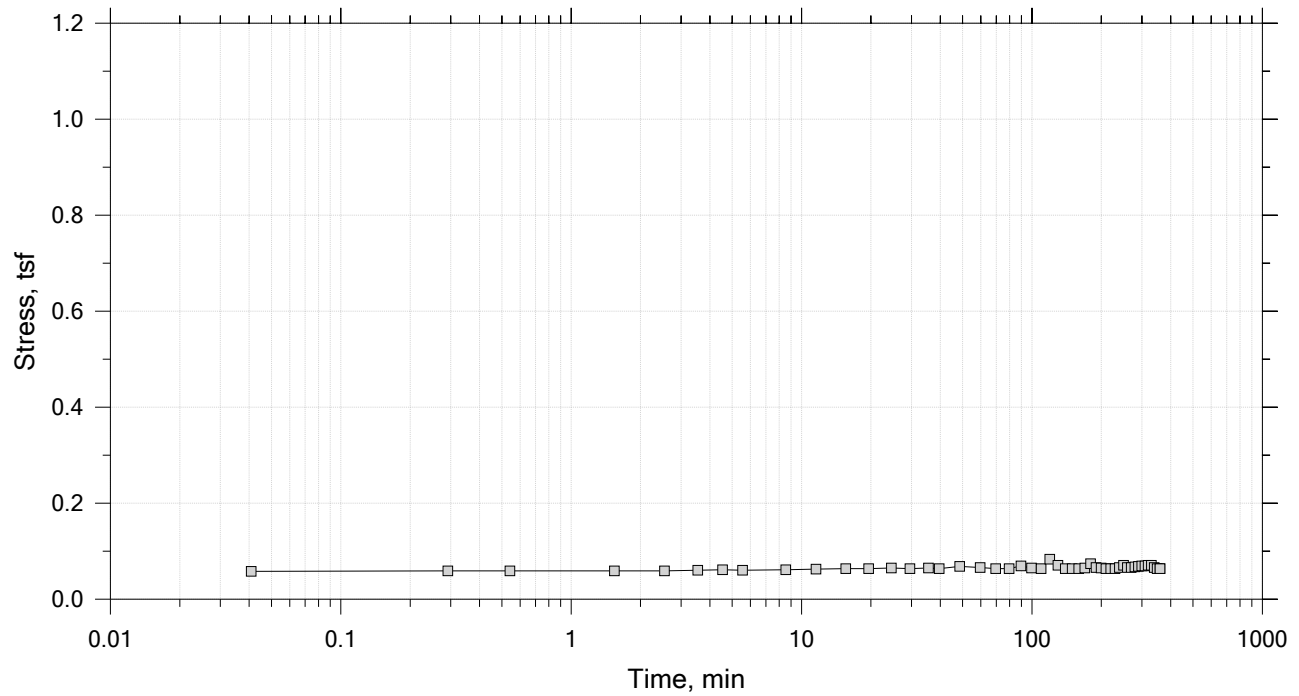
Summary Report




	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-205	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 02/23/21	Depth: 12-14 ft
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-E, Swell Pressure = 0.0637 tsf		
	Displacement at End of Increment		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 1 of 15
Constant Volume Step
Stress: 0.0637 tsf



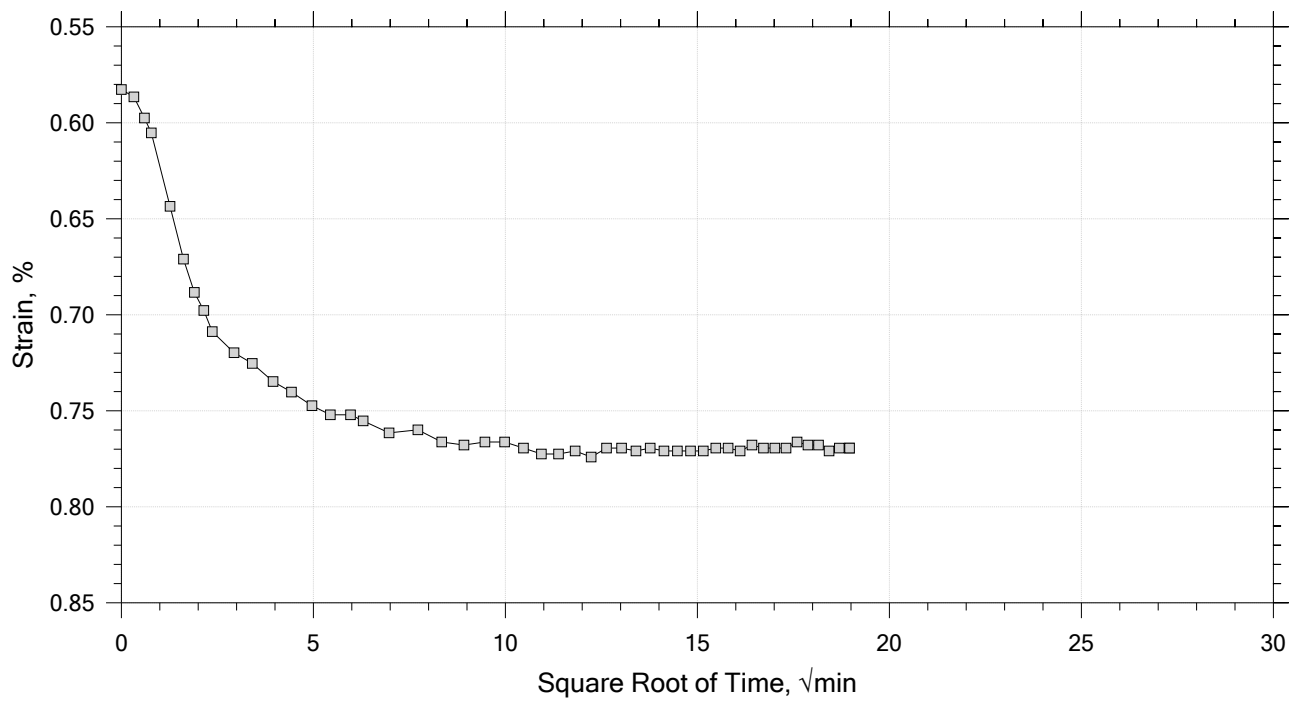
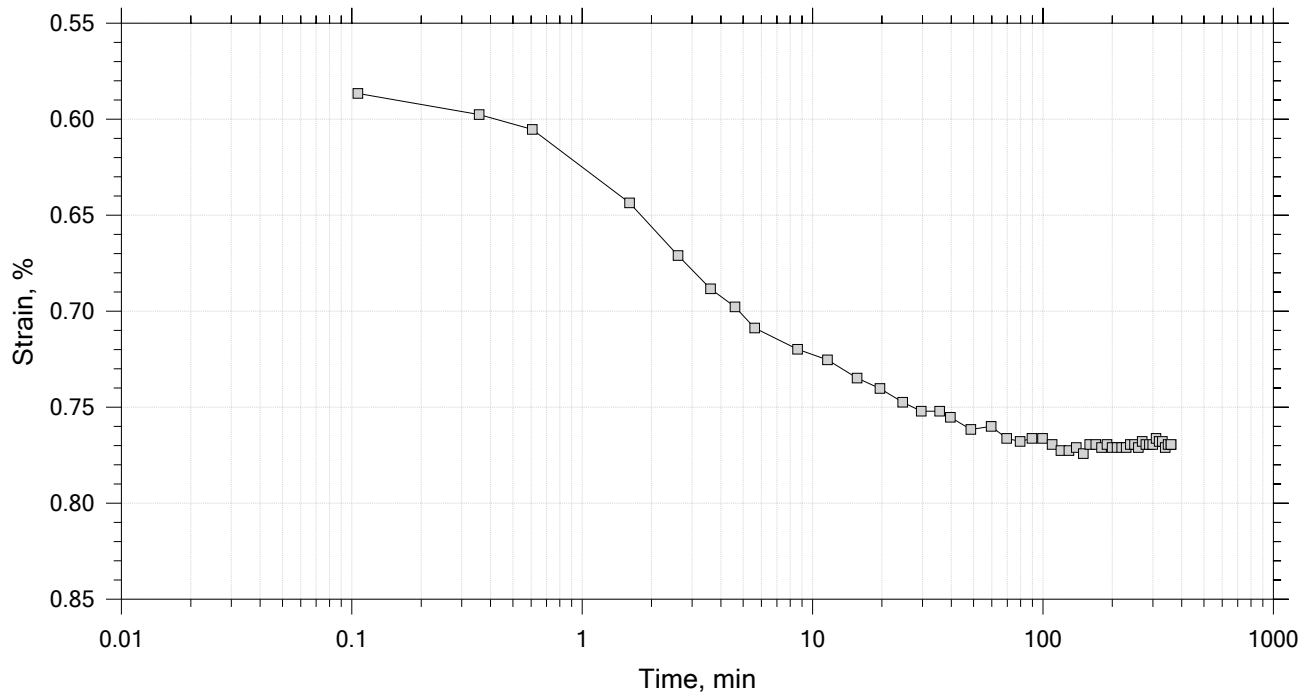
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-205	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 02/23/21	Depth: 12-14 ft
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-E, Swell Pressure = 0.0637 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 2 of 15

Constant Load Step

Stress: 0.125 tsf



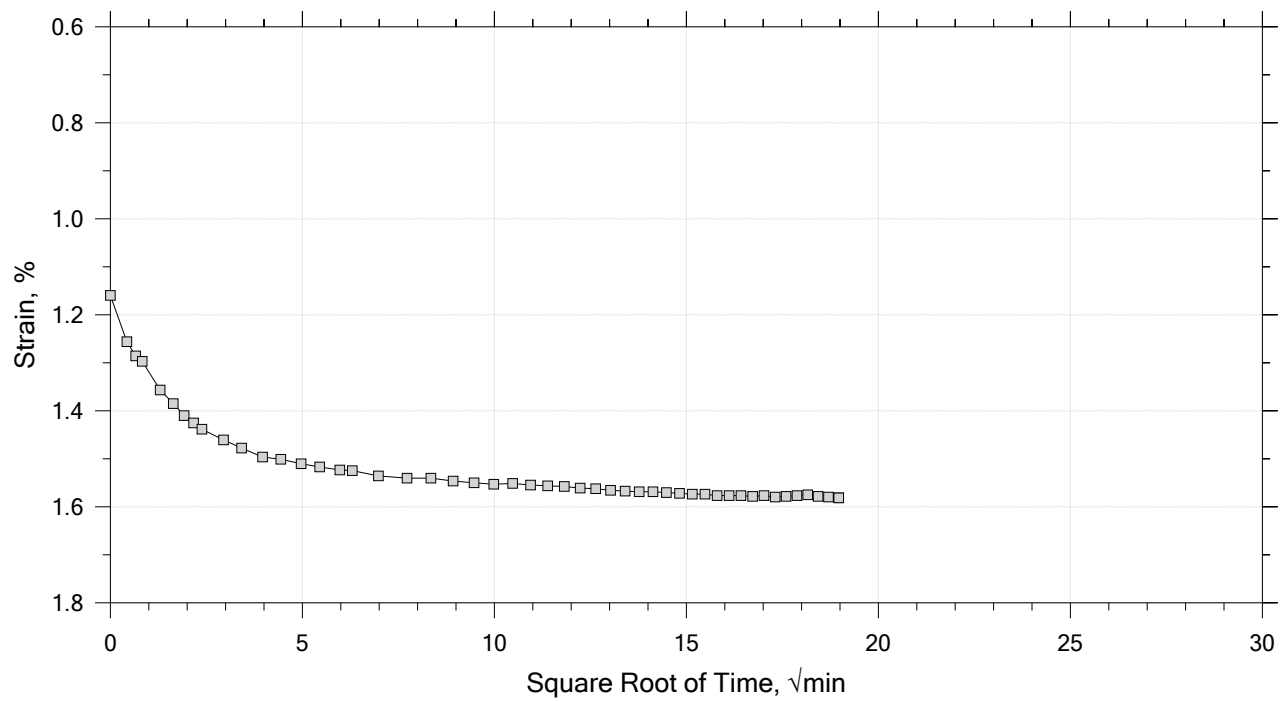
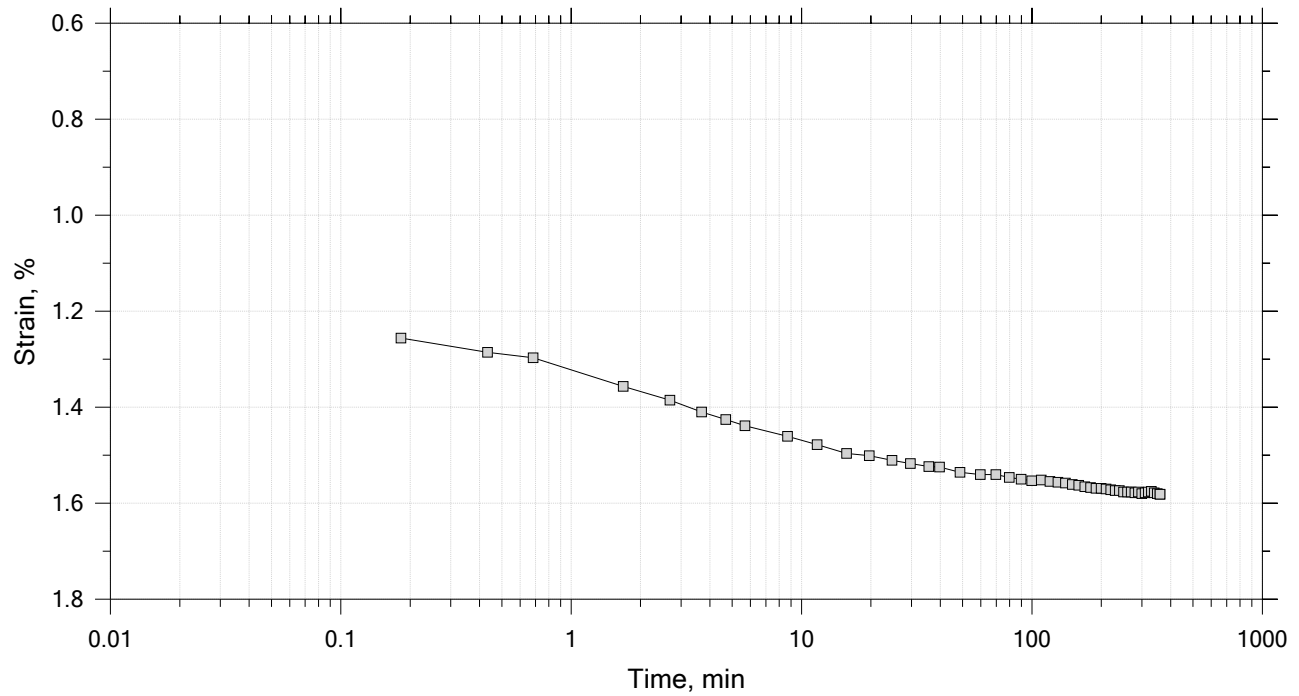
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-205	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 02/23/21	Depth: 12-14 ft
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-E, Swell Pressure = 0.0637 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 3 of 15

Constant Load Step

Stress: 0.25 tsf



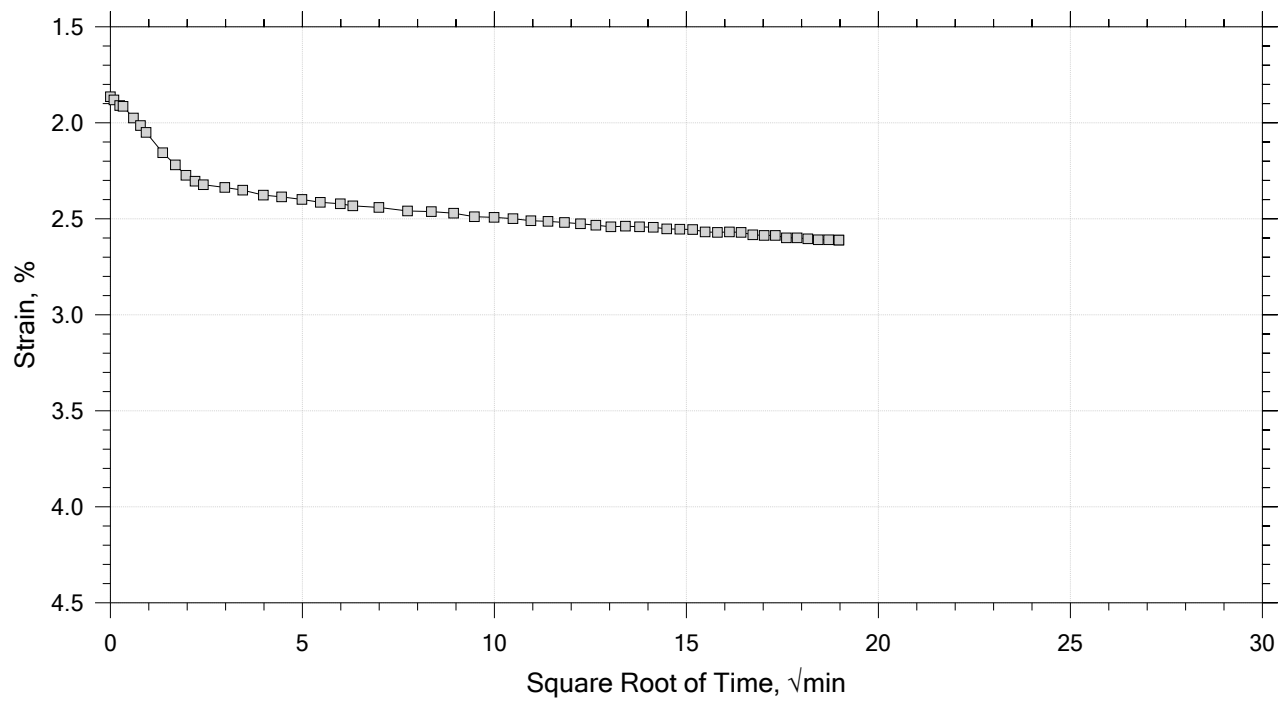
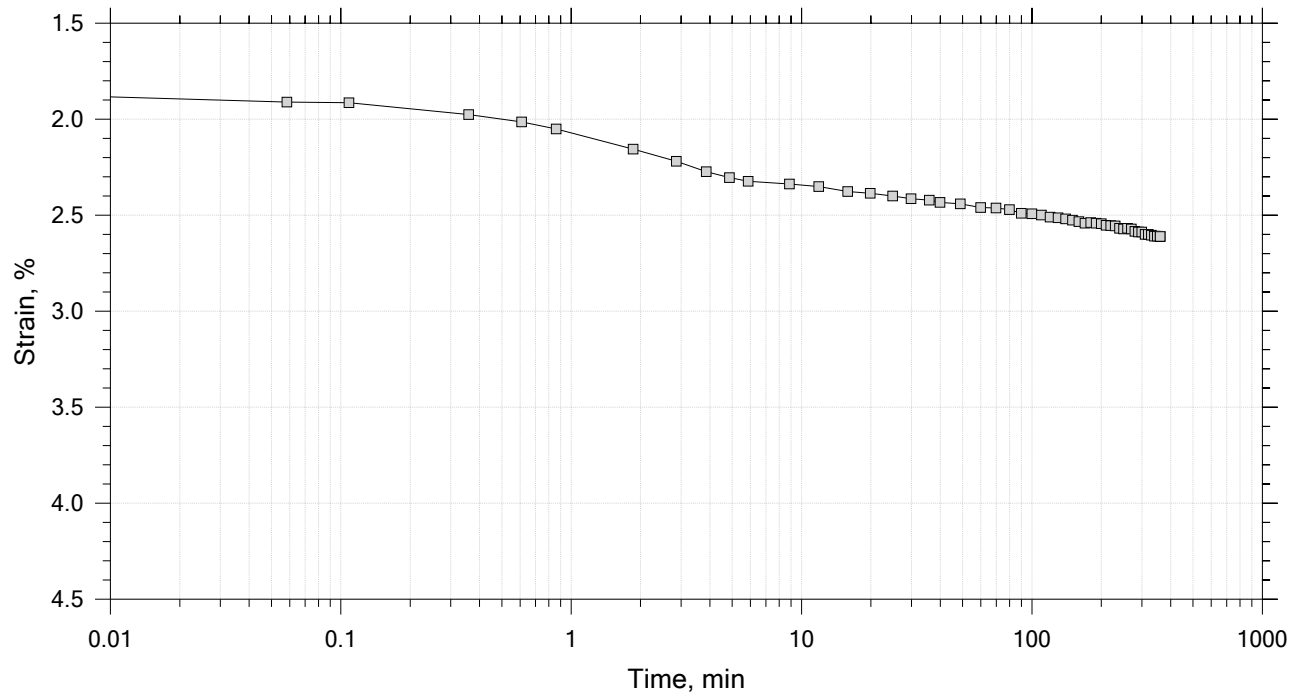
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-205	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 02/23/21	Depth: 12-14 ft
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-E, Swell Pressure = 0.0637 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 4 of 15

Constant Load Step

Stress: 0.5 tsf



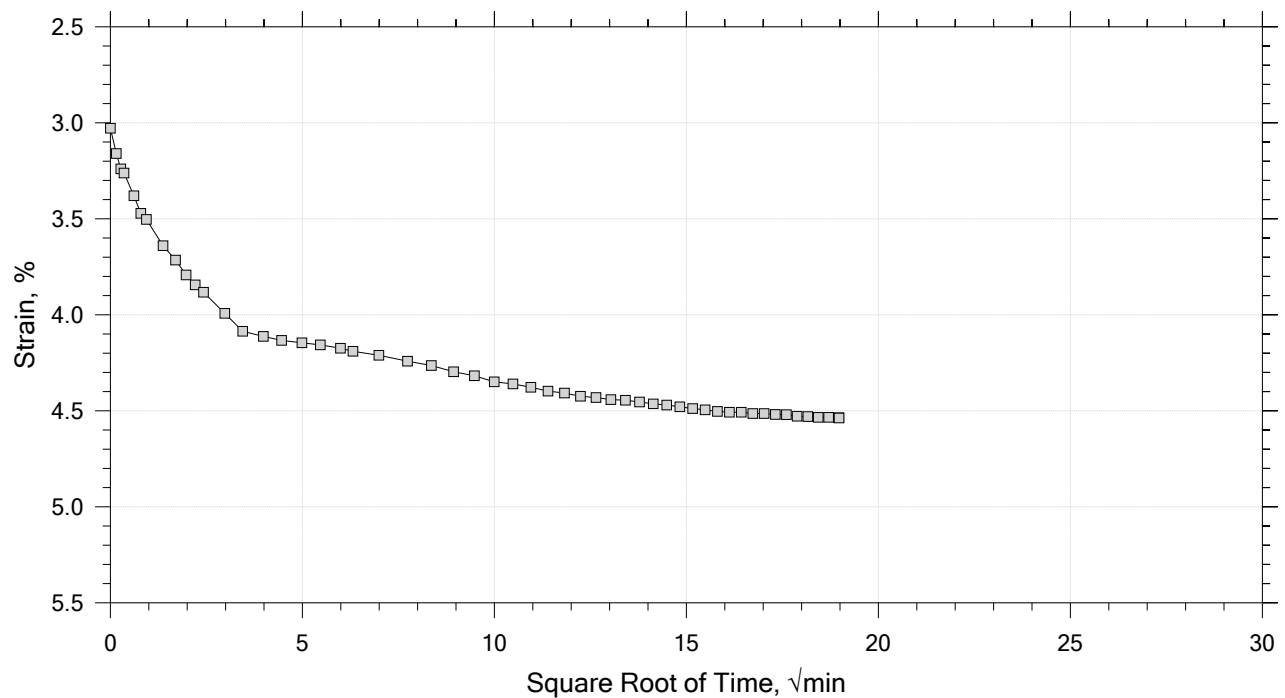
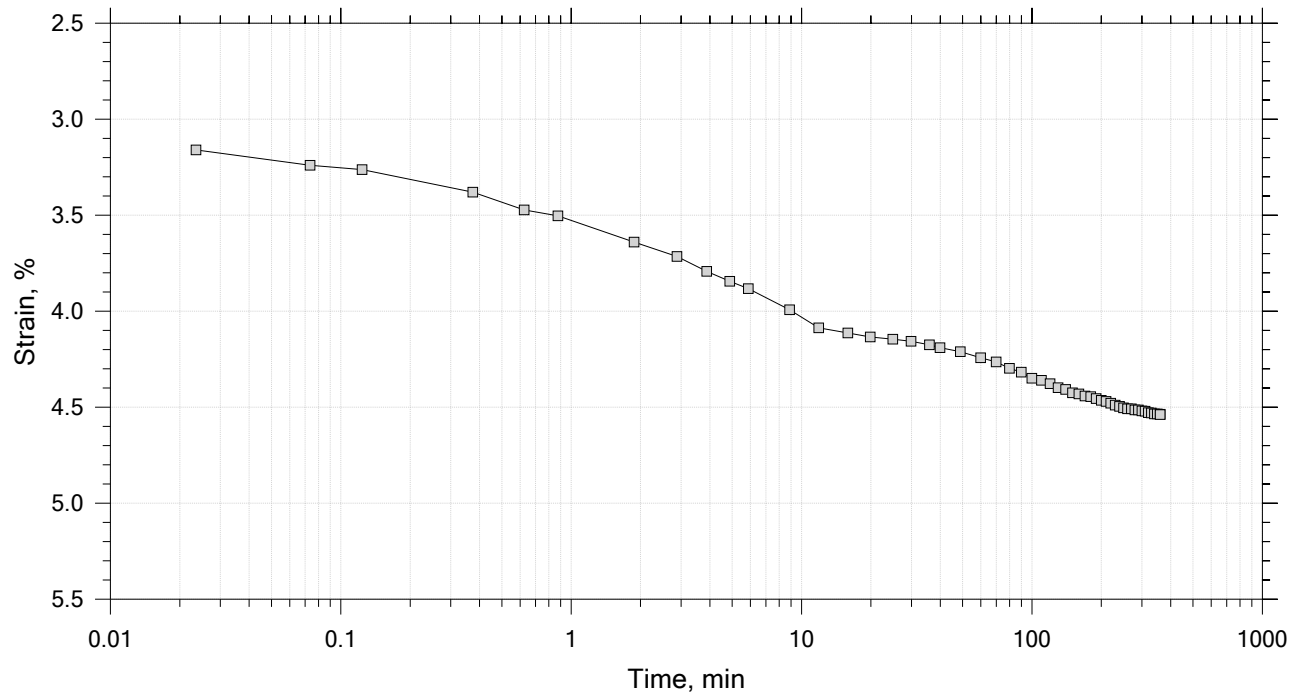
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-205	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 02/23/21	Depth: 12-14 ft
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-E, Swell Pressure = 0.0637 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 5 of 15

Constant Load Step

Stress: 1 tsf



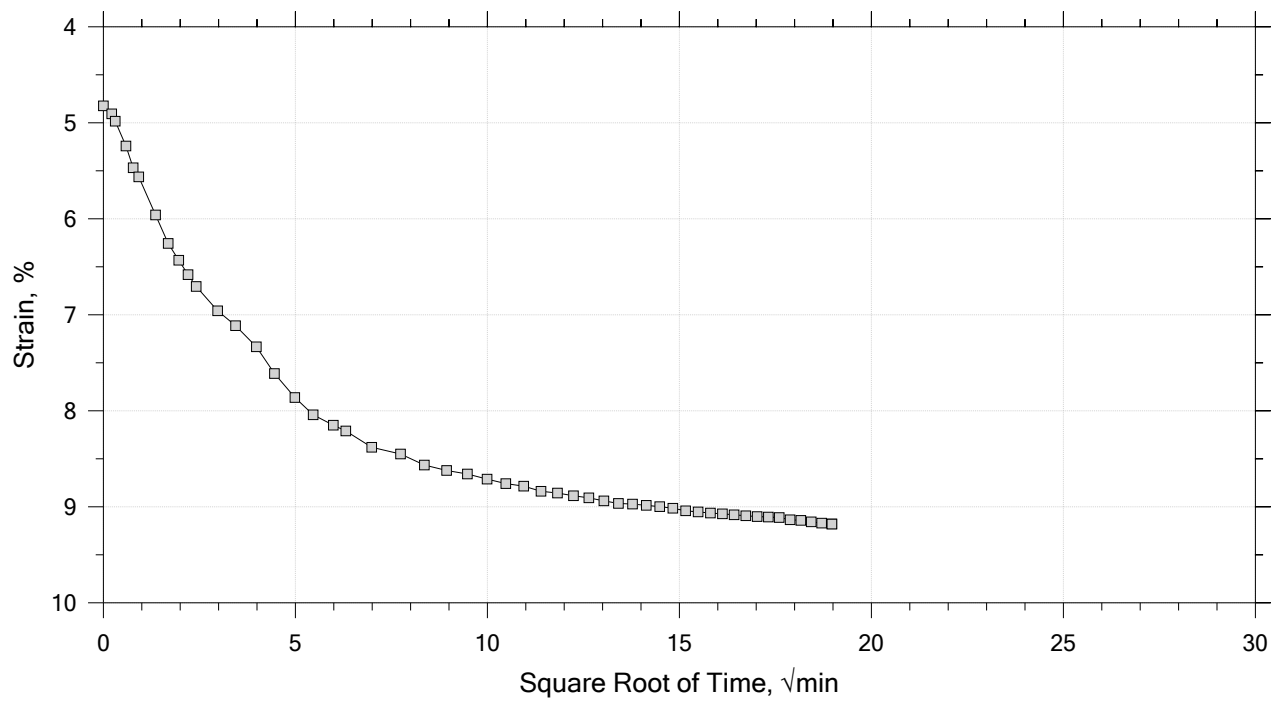
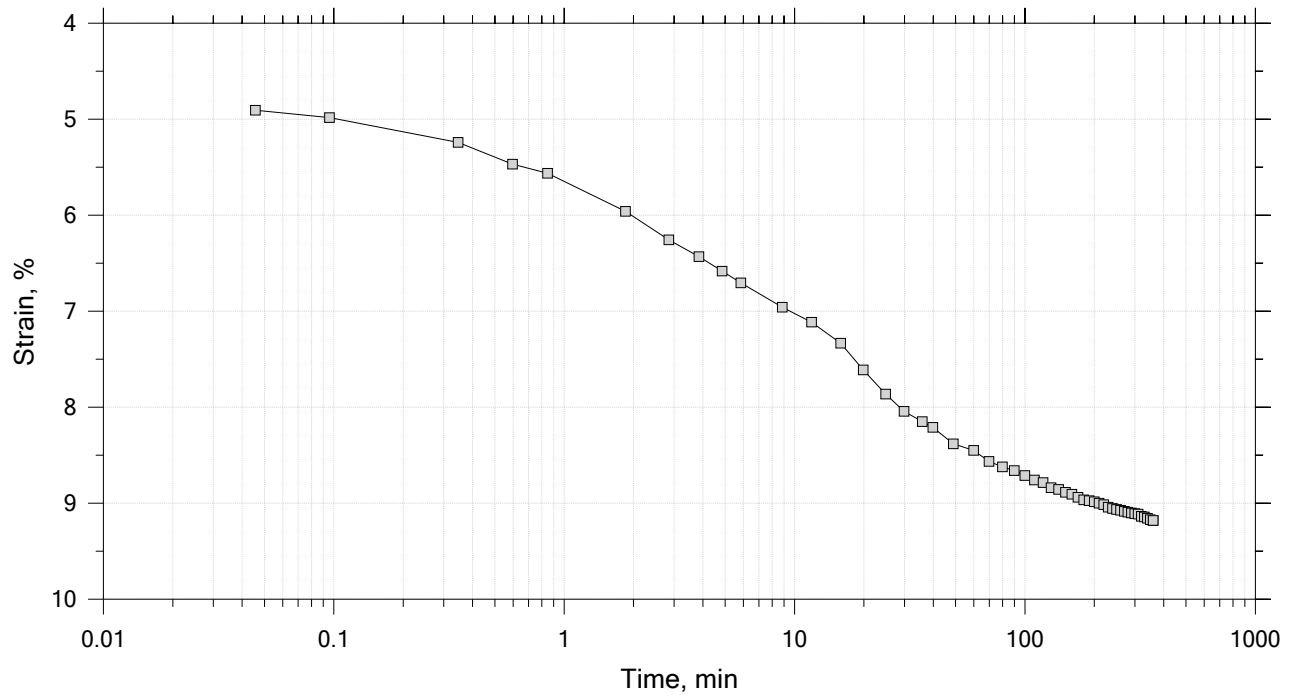
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-205	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 02/23/21	Depth: 12-14 ft
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-E, Swell Pressure = 0.0637 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 6 of 15

Constant Load Step

Stress: 2 tsf



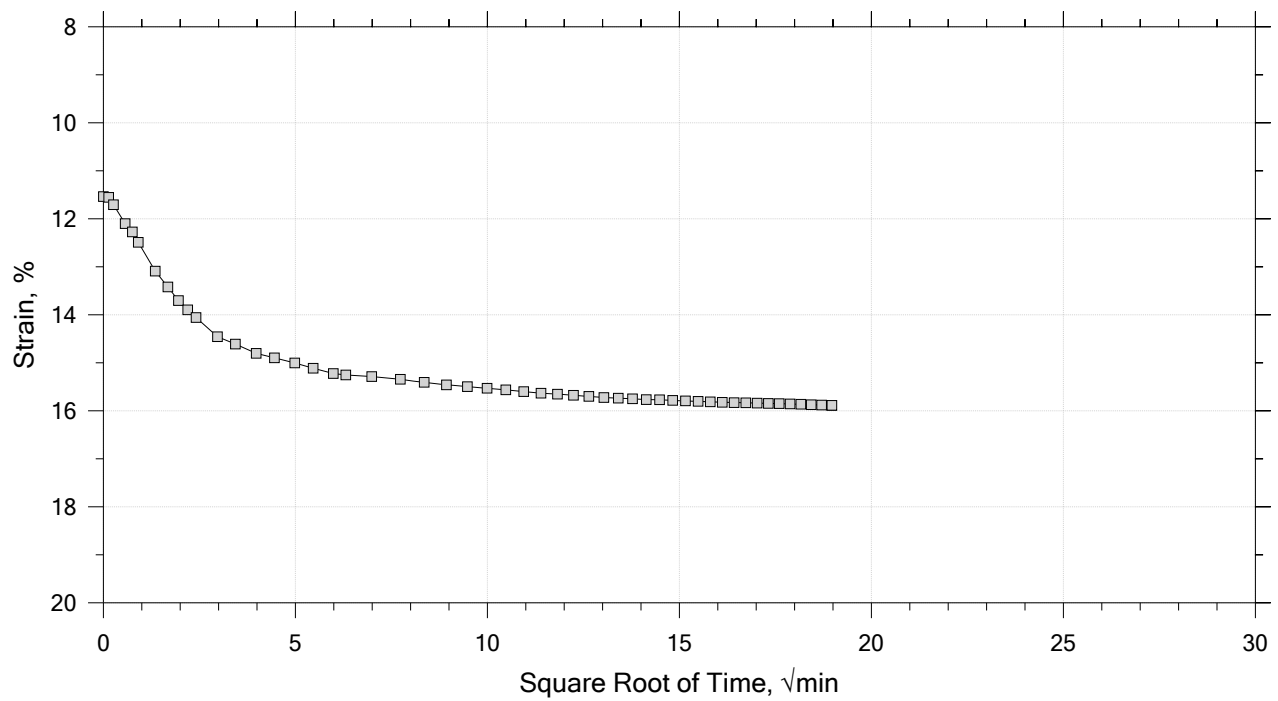
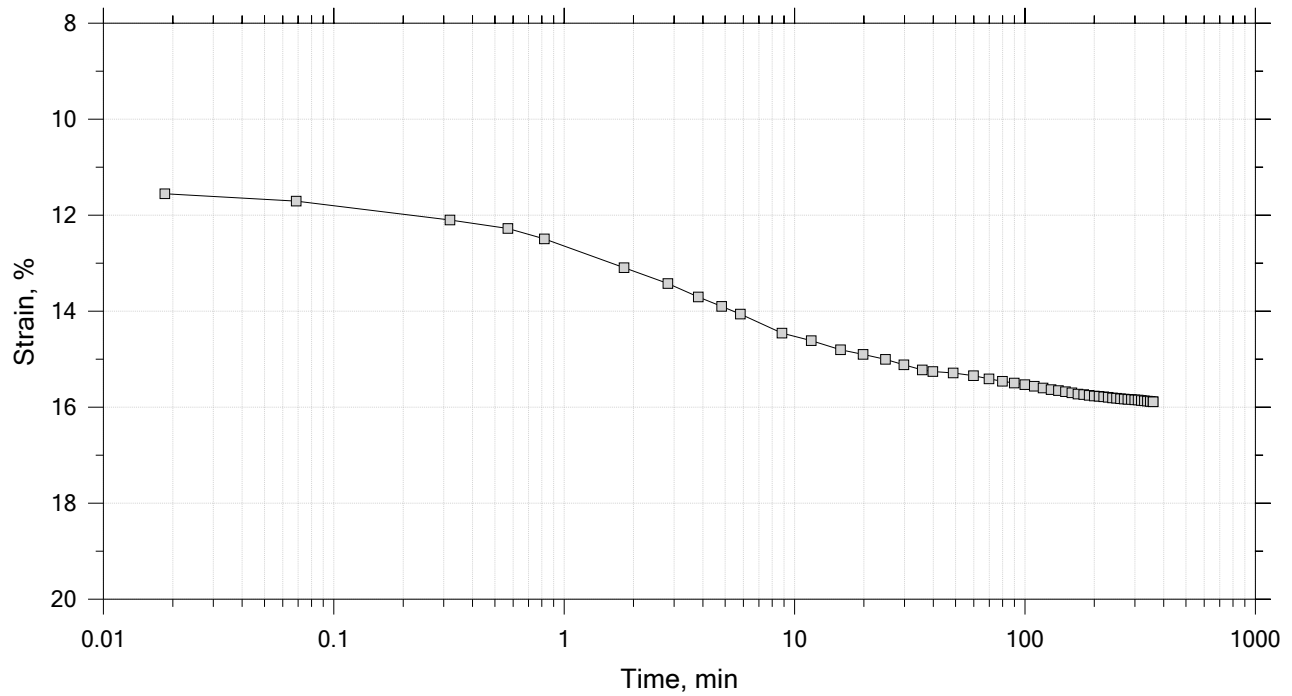
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-205	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 02/23/21	Depth: 12-14 ft
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-E, Swell Pressure = 0.0637 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 7 of 15

Constant Load Step

Stress: 4 tsf



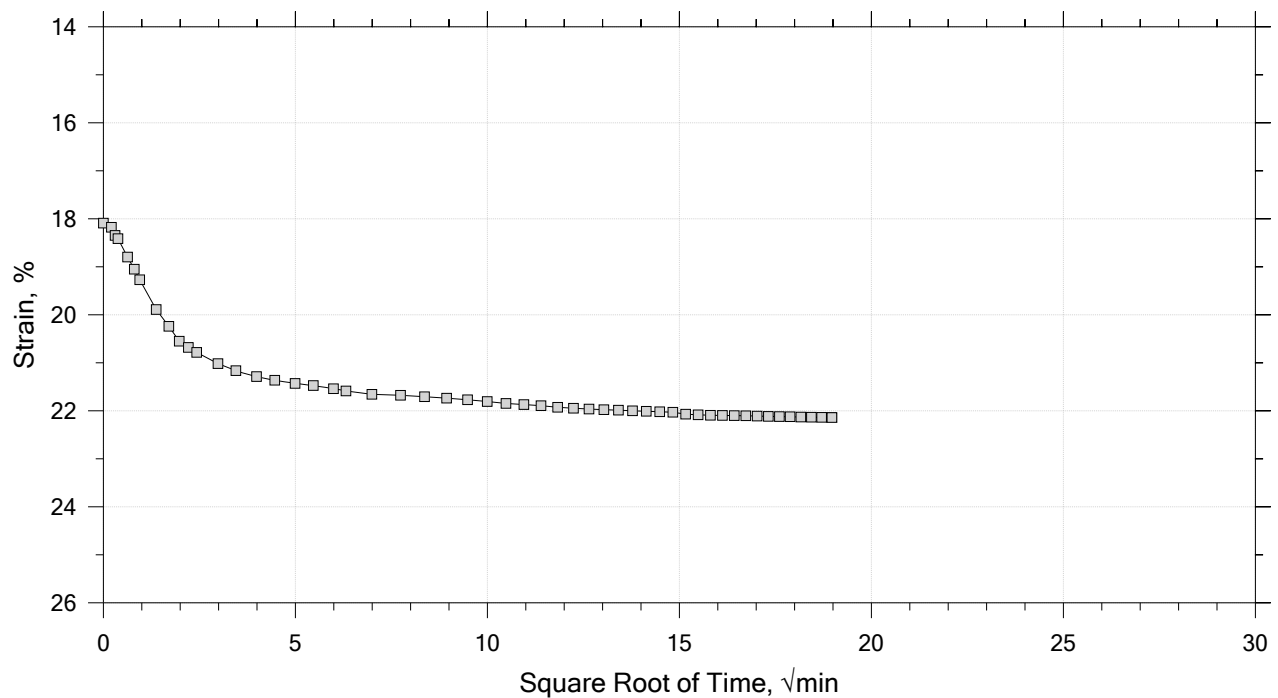
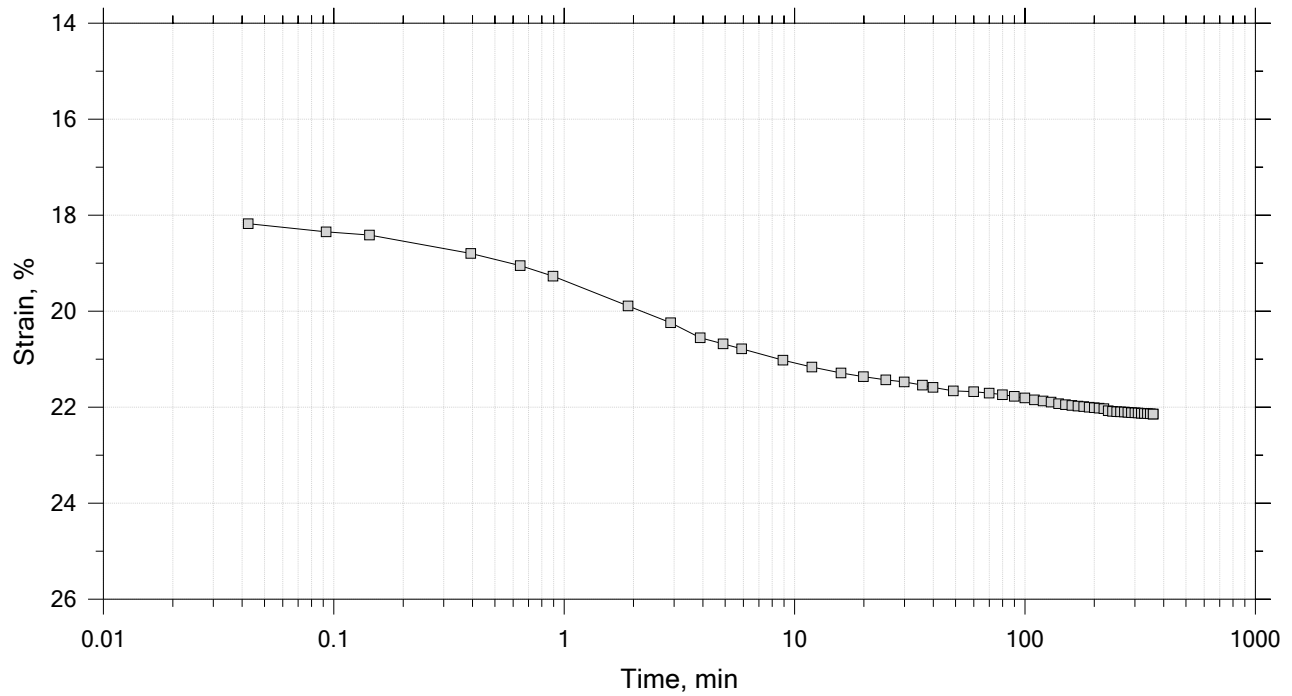
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-205	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 02/23/21	Depth: 12-14 ft
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-E, Swell Pressure = 0.0637 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 8 of 15

Constant Load Step

Stress: 8 tsf



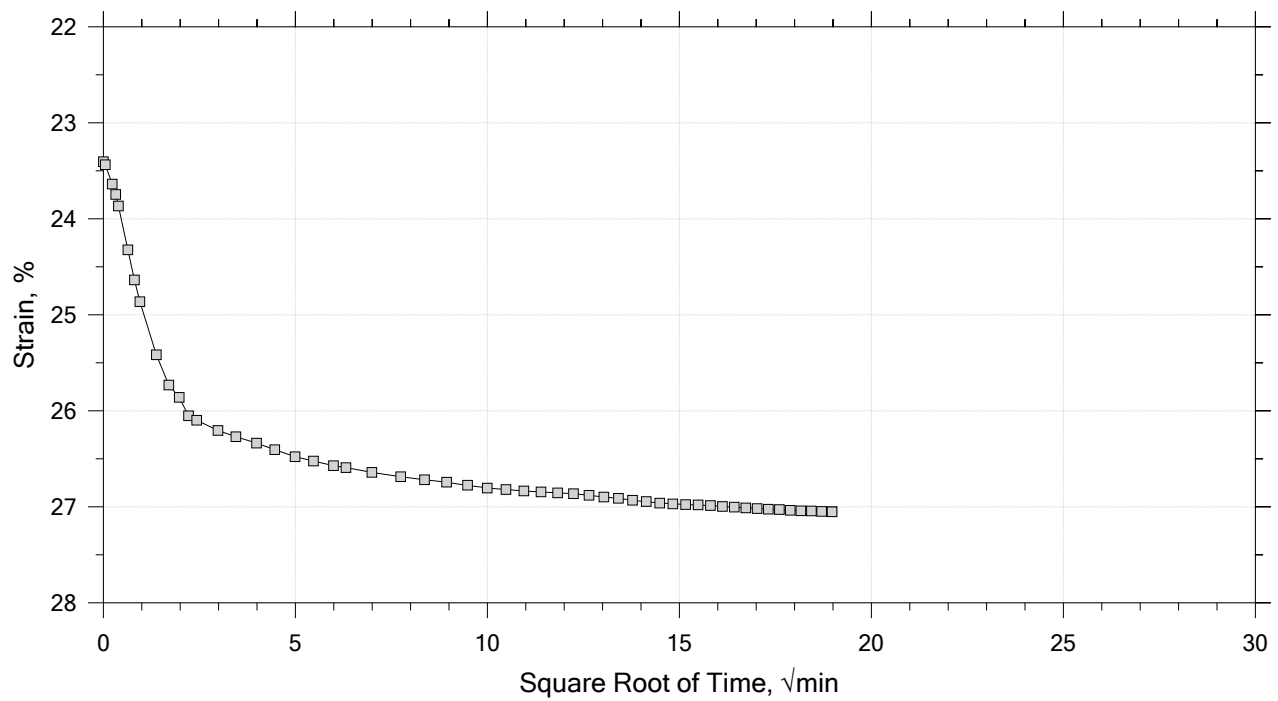
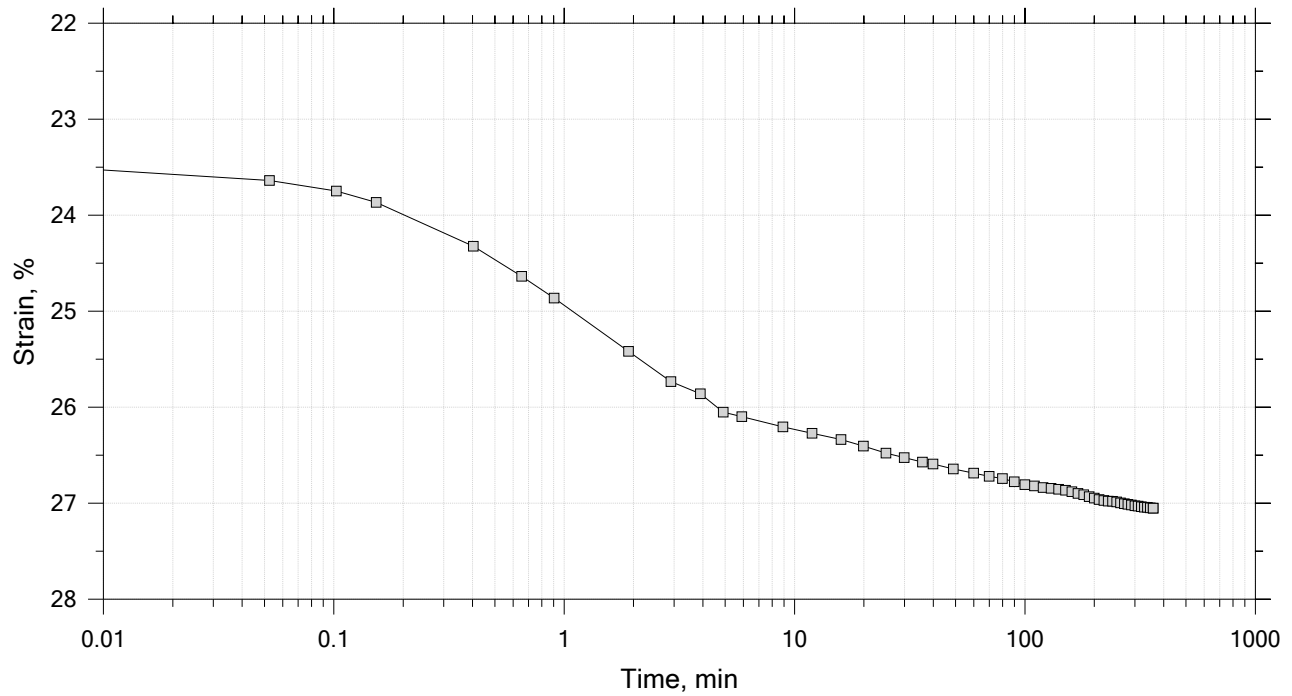
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-205	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 02/23/21	Depth: 12-14 ft
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-E, Swell Pressure = 0.0637 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 9 of 15

Constant Load Step

Stress: 16 tsf



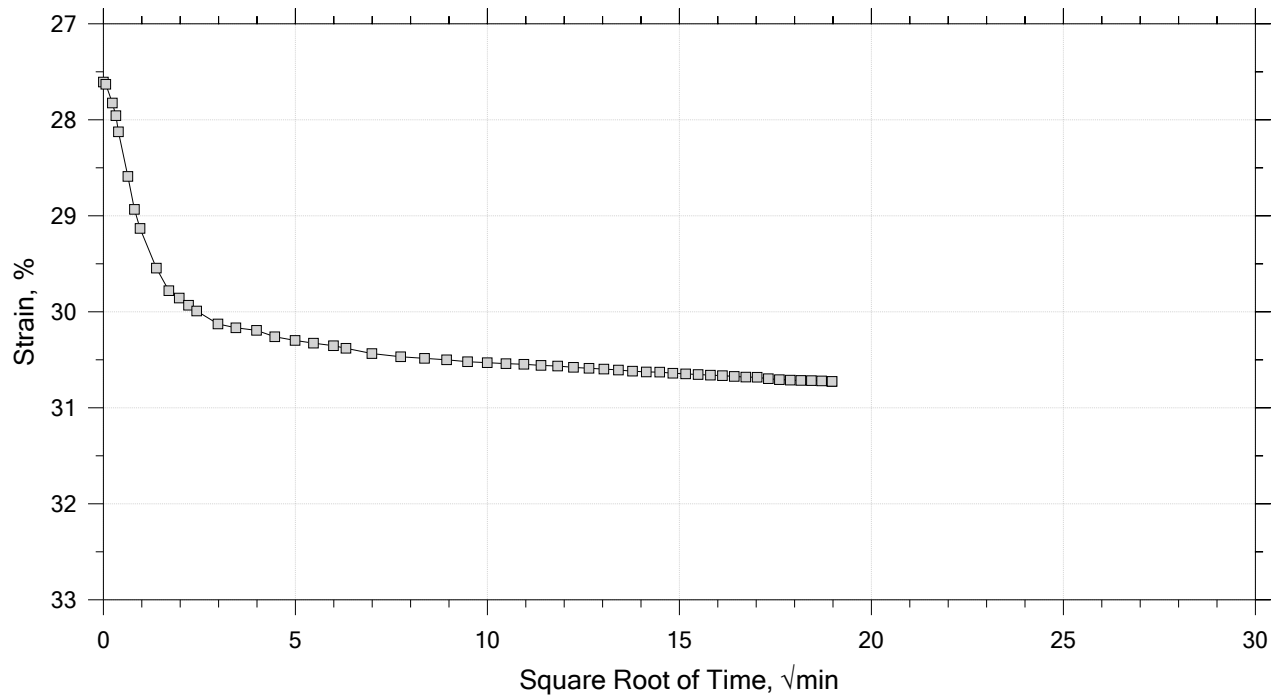
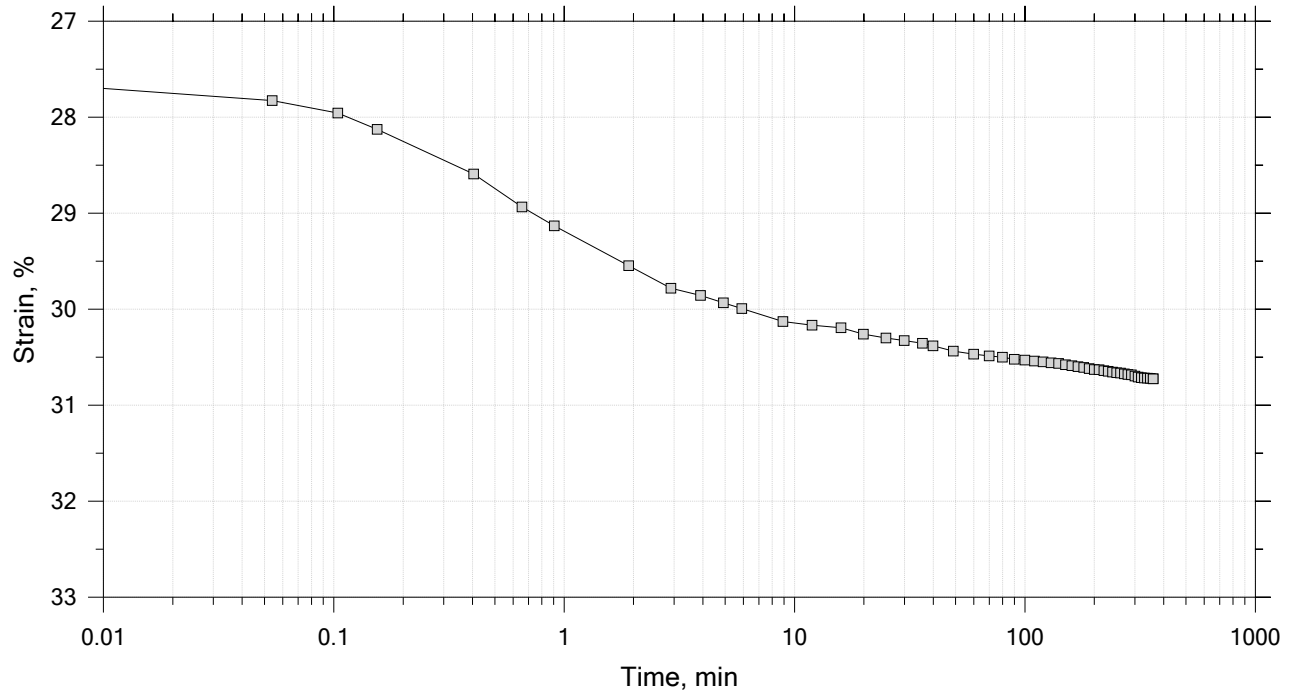
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-205	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 02/23/21	Depth: 12-14 ft
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-E, Swell Pressure = 0.0637 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 10 of 15

Constant Load Step

Stress: 32 tsf



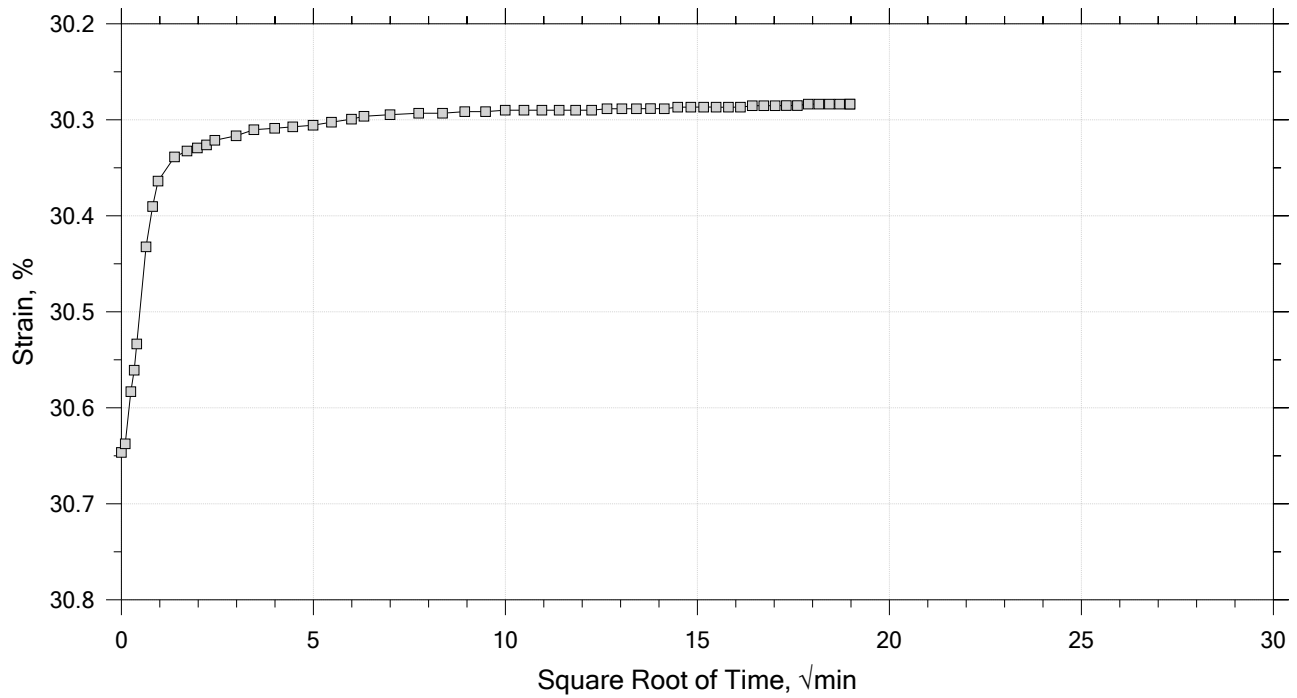
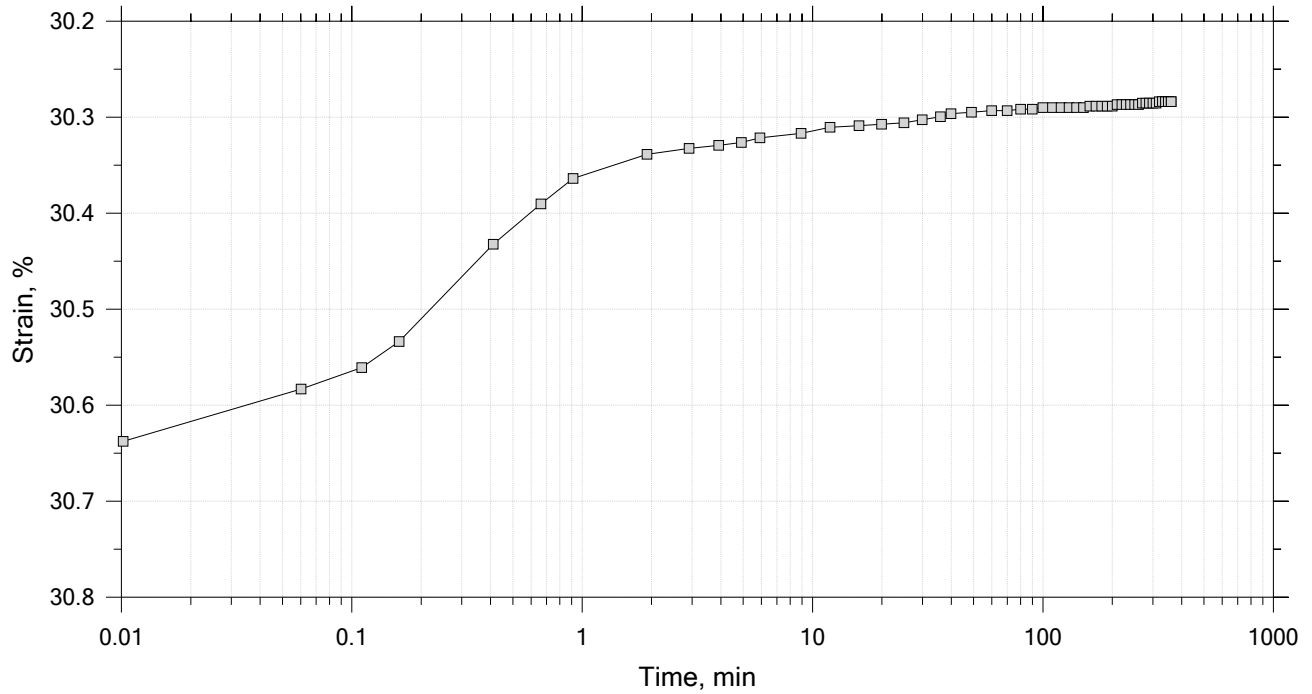
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-205	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 02/23/21	Depth: 12-14 ft
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-E, Swell Pressure = 0.0637 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 11 of 15

Constant Load Step

Stress: 8 tsf



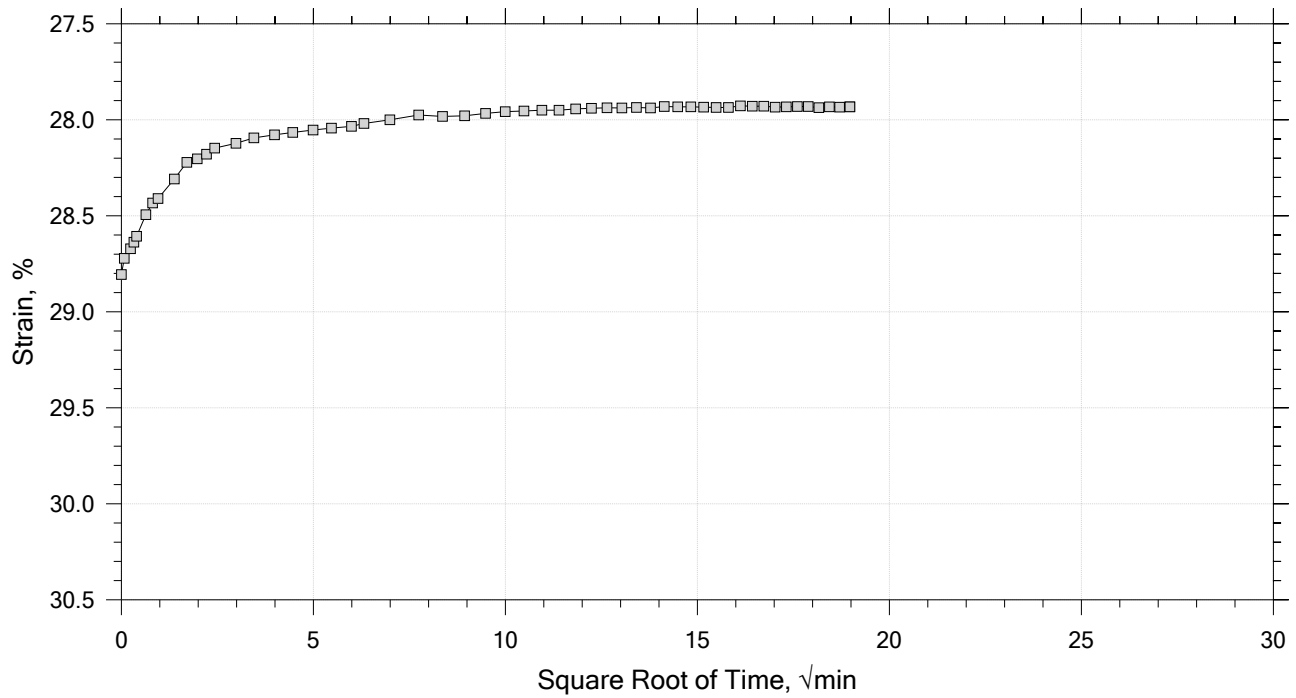
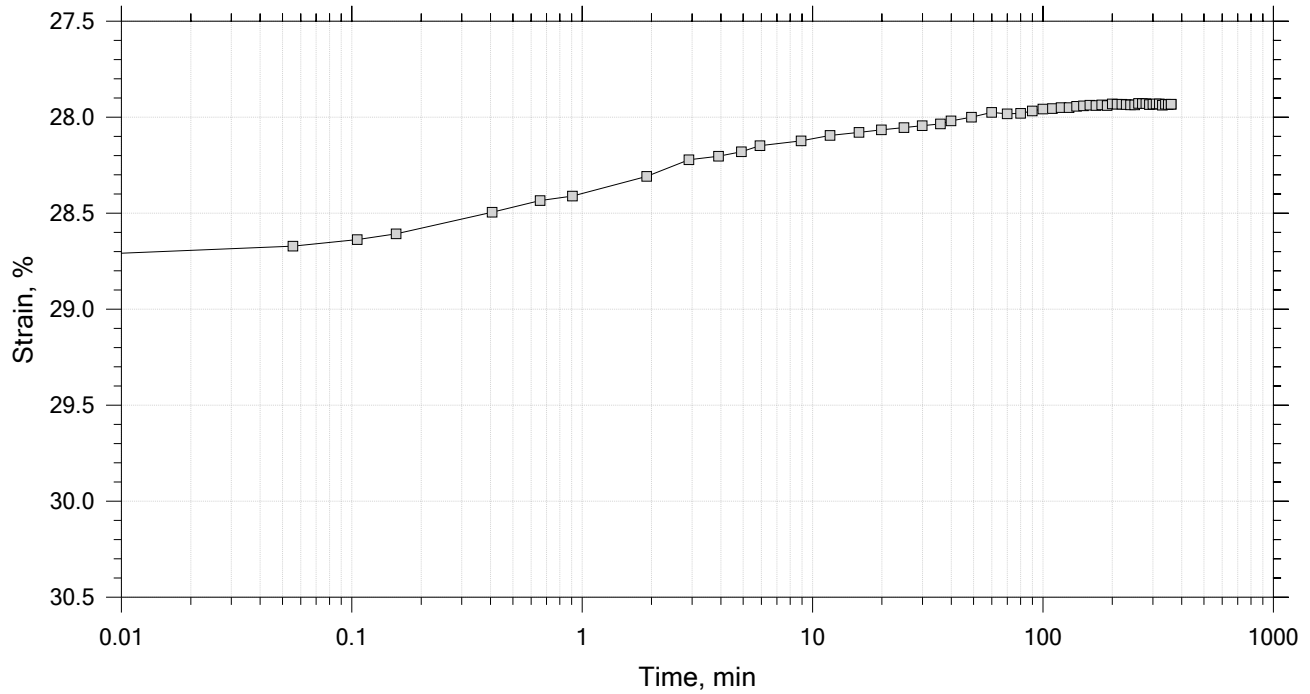
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-205	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 02/23/21	Depth: 12-14 ft
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-E, Swell Pressure = 0.0637 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 12 of 15

Constant Load Step

Stress: 2 tsf



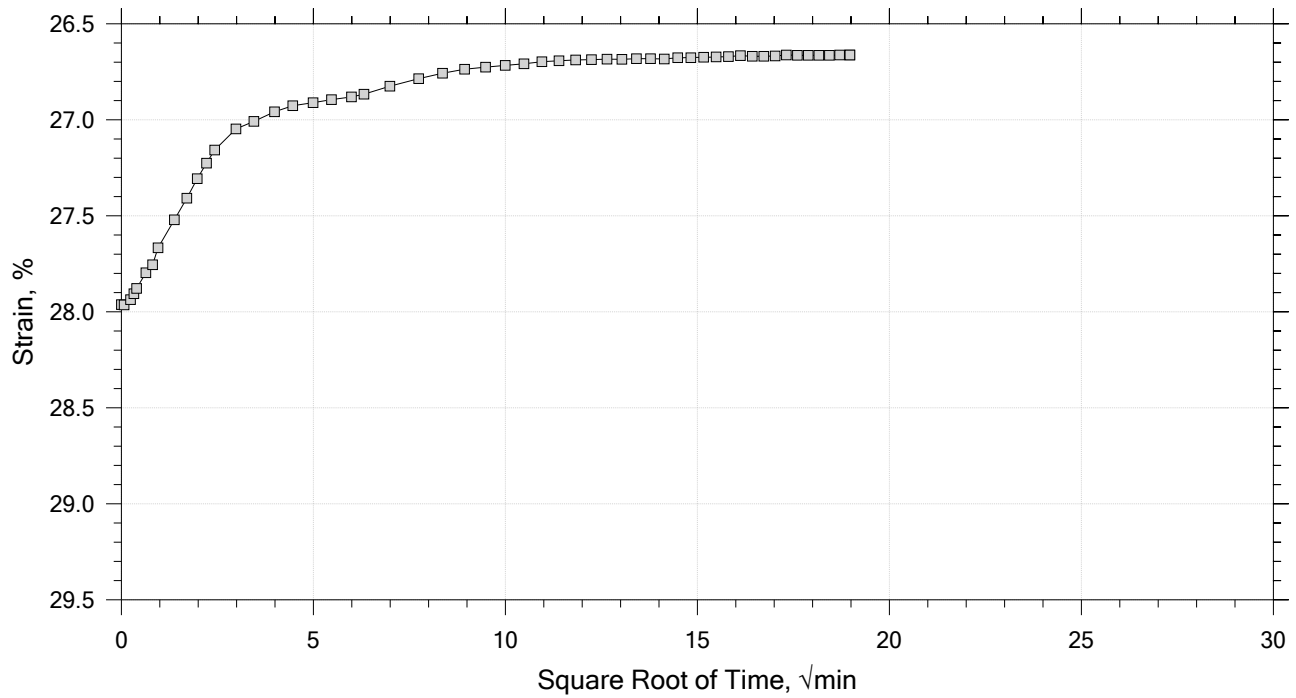
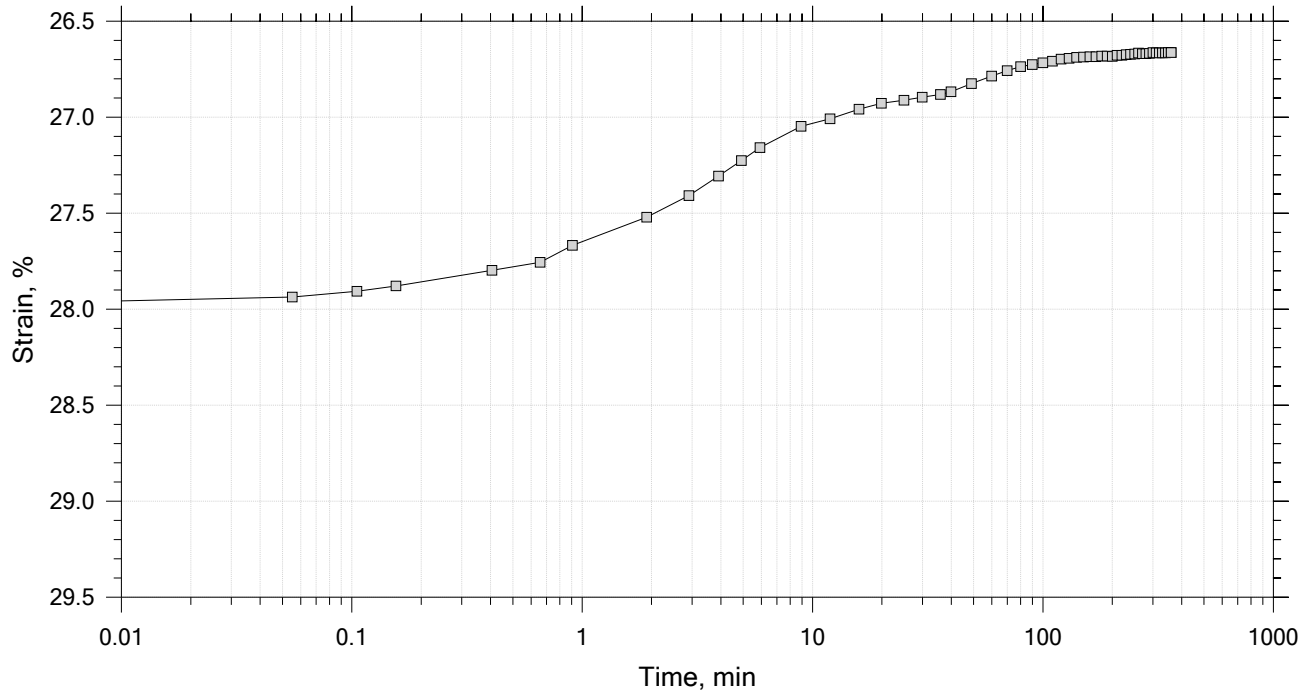
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-205	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 02/23/21	Depth: 12-14 ft
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-E, Swell Pressure = 0.0637 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 13 of 15

Constant Load Step

Stress: 0.5 tsf



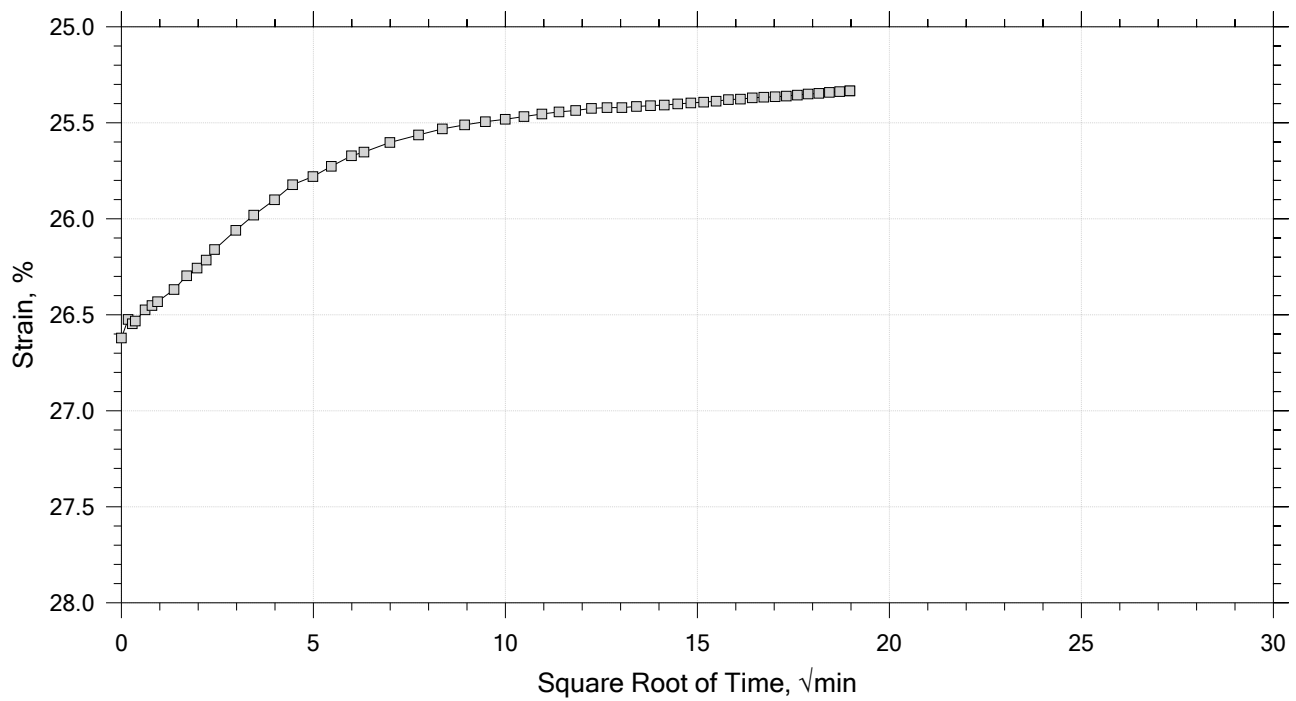
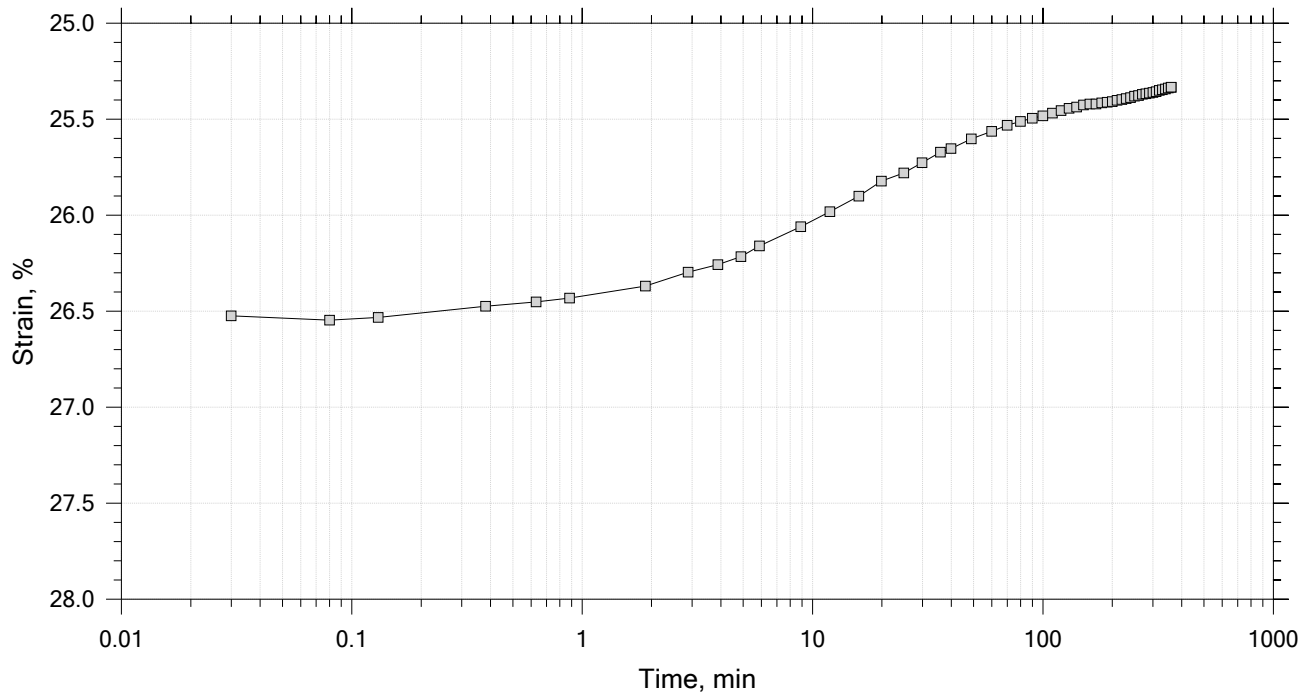
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-205	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 02/23/21	Depth: 12-14 ft
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-E, Swell Pressure = 0.0637 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 14 of 15

Constant Load Step

Stress: 0.125 tsf



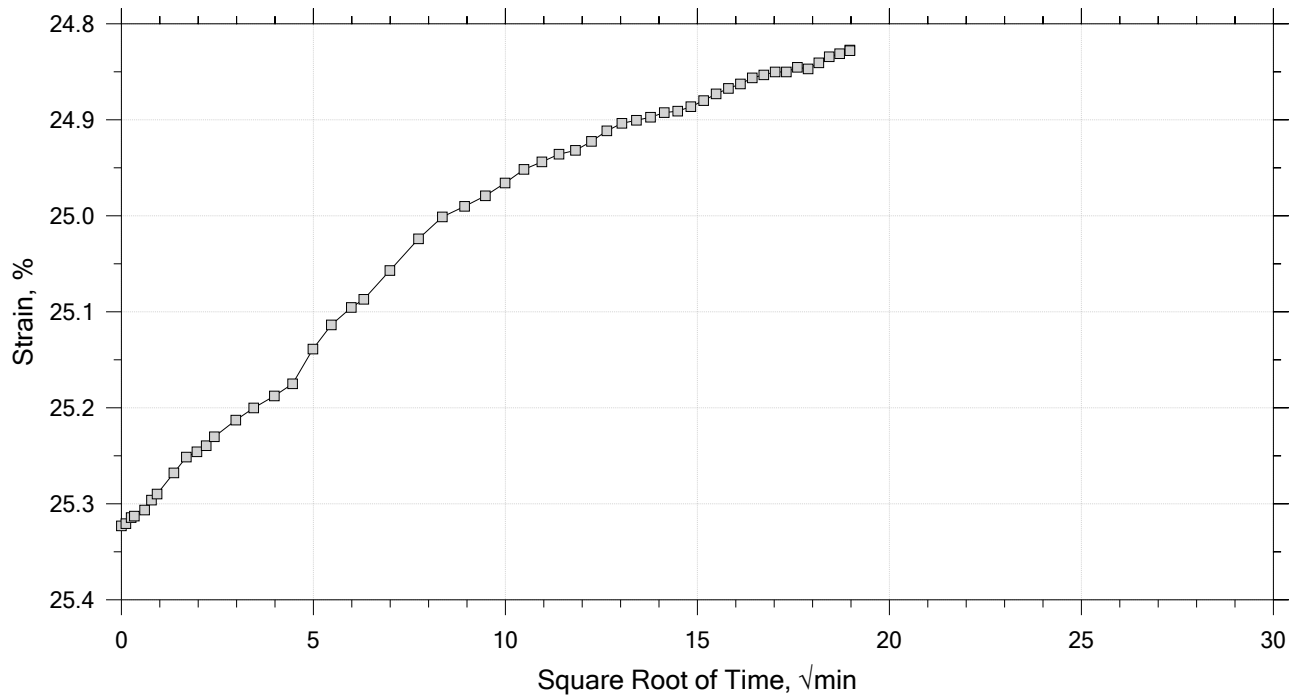
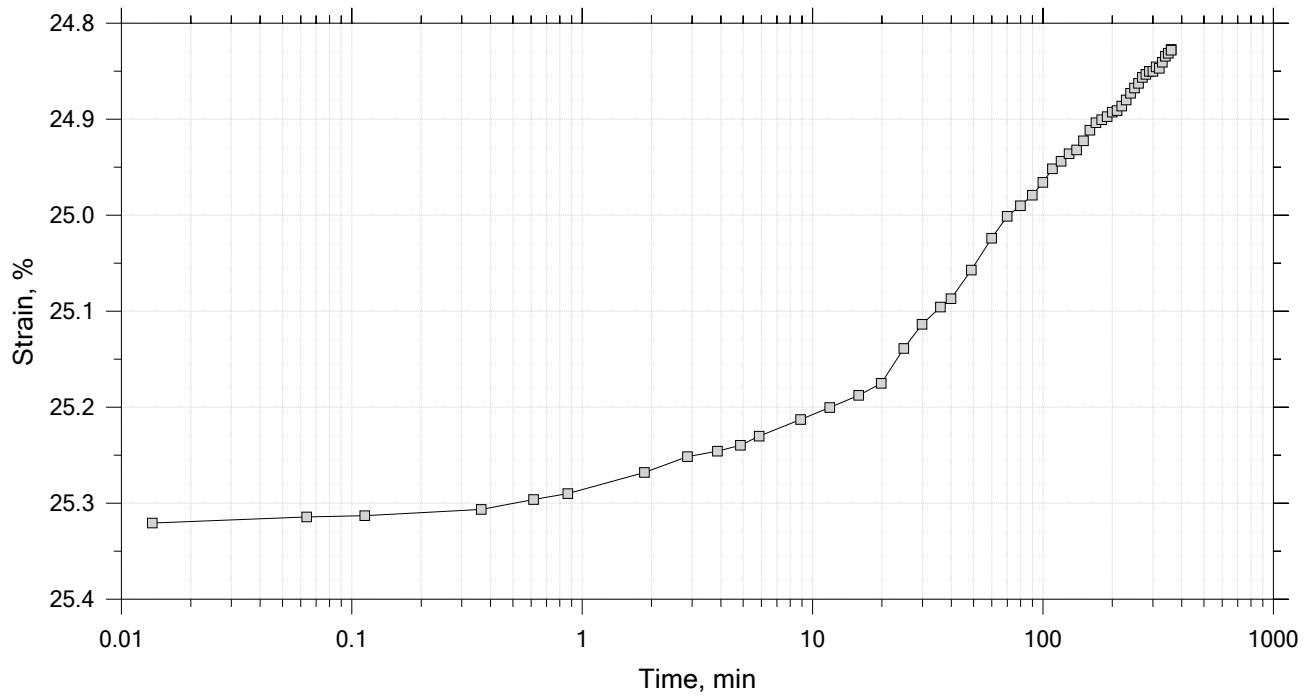
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-205	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 02/23/21	Depth: 12-14 ft
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-E, Swell Pressure = 0.0637 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 15 of 15

Constant Load Step

Stress: 0.0625 tsf




	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-205	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 02/23/21	Depth: 12-14 ft
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-E, Swell Pressure = 0.0637 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Specimen Diameter: 2.50 in	Estimated Specific Gravity: 2.76	Liquid Limit: 36
Initial Height: 1.00 in	Initial Void Ratio: 1	Plastic Limit: 19
Final Height: 0.80 in	Final Void Ratio: 0.604	Plasticity Index: 17

	Before Test Trimmings	Before Test Specimen	After Test Specimen	After Test Trimmings
Container ID	E-1315	RING		E0855
Mass Container, gm	8.22	109.79	109.79	8.26
Mass Container + Wet Soil, gm	112.84	259.67	244.84	143.09
Mass Container + Dry Soil, gm	85.34	220.61	220.61	118.9
Mass Dry Soil, gm	77.12	110.82	110.82	110.64
Water Content, %	35.66	35.25	21.86	21.86
Void Ratio	---	1.00	0.60	---
Degree of Saturation, %	---	96.88	100.00	---
Dry Unit Weight, pcf	---	86.006	107.51	---


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

	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-205	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 02/23/21	Depth: 12-14 ft
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-E, Swell Pressure = 0.0637 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

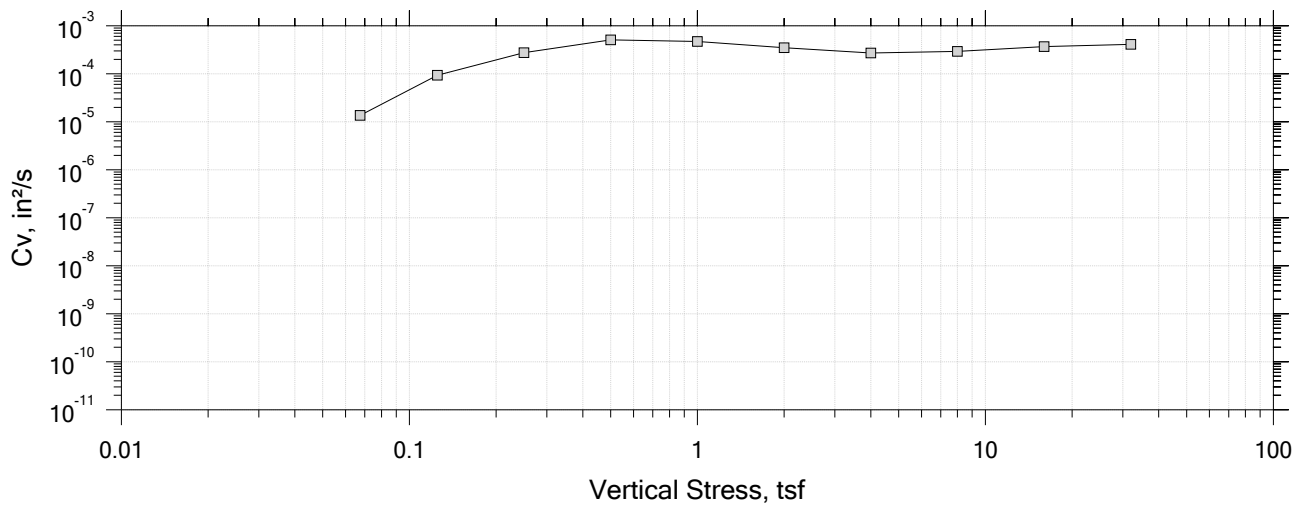
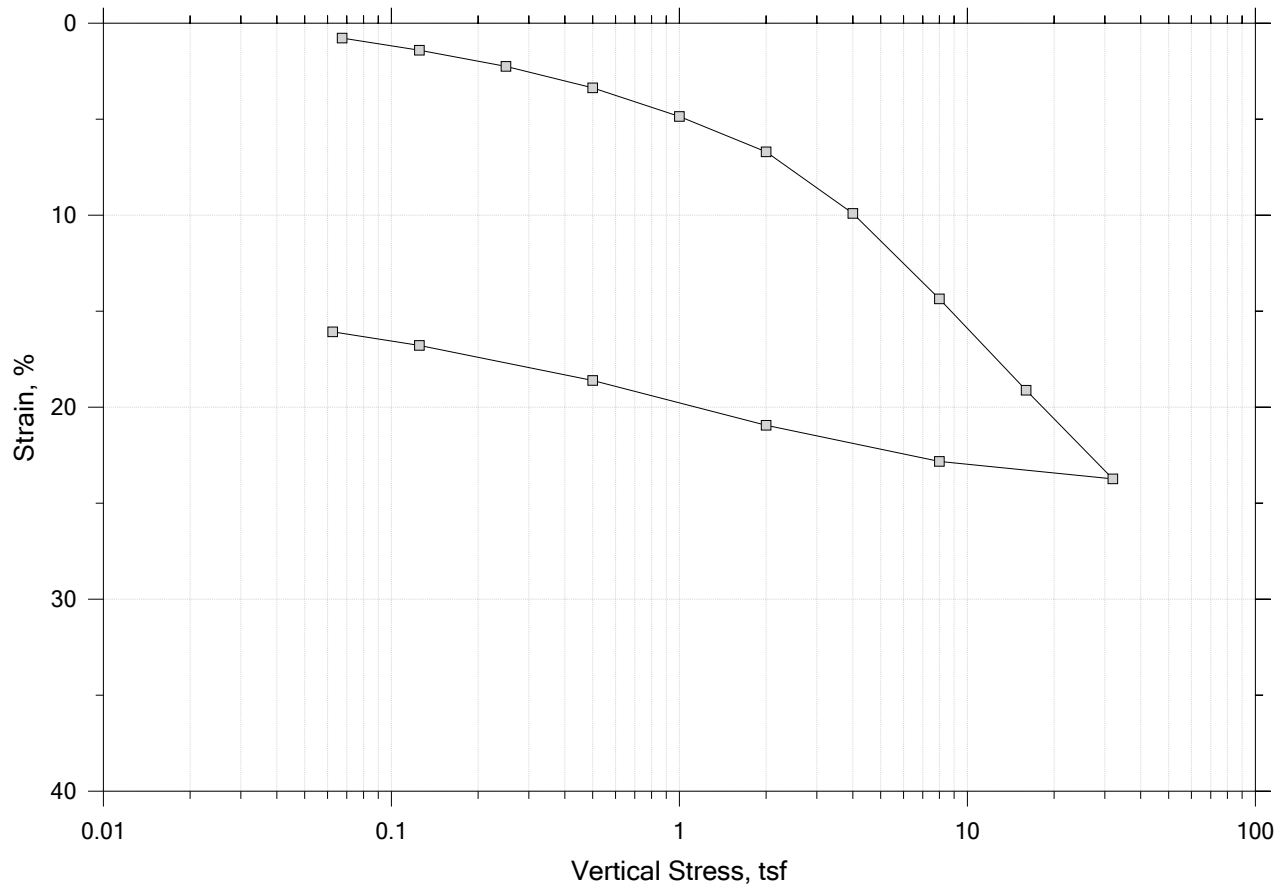
Square Root of Time Coefficients


[illegible]

	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-205	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 02/23/21	Depth: 12-14 ft
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-E, Swell Pressure = 0.0637 tsf		
	Displacement at End of Increment		

One-Dimensional Consolidation by ASTM D2435 - Method B

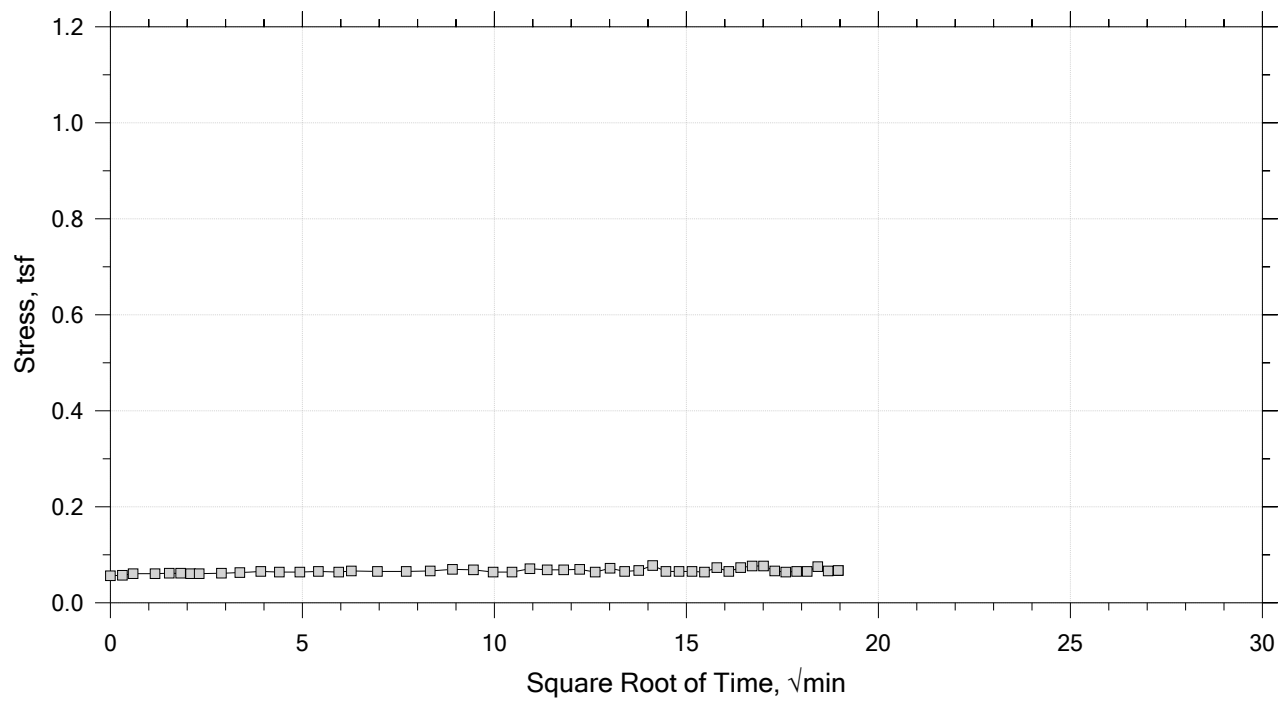
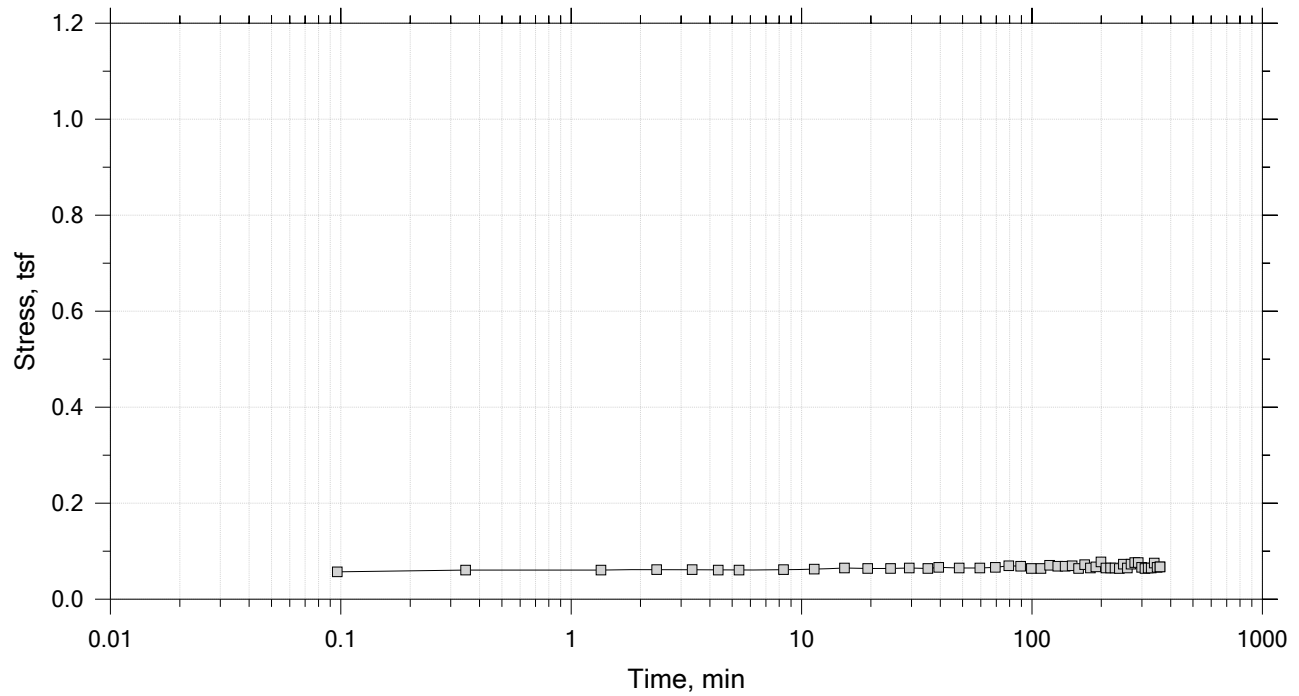
Summary Report




	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-208	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 03/01/21	Depth: 10-12 ft
	Test No.: IP-15	Sample Type: intact	Elevation:
	Description: Moist gray and olive yellow clay		
	Remarks: System LTIII-A, Swell Pressure = 0.0674 tsf		
	Displacement at End of Increment		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 1 of 15
Constant Volume Step
Stress: 0.0674 tsf



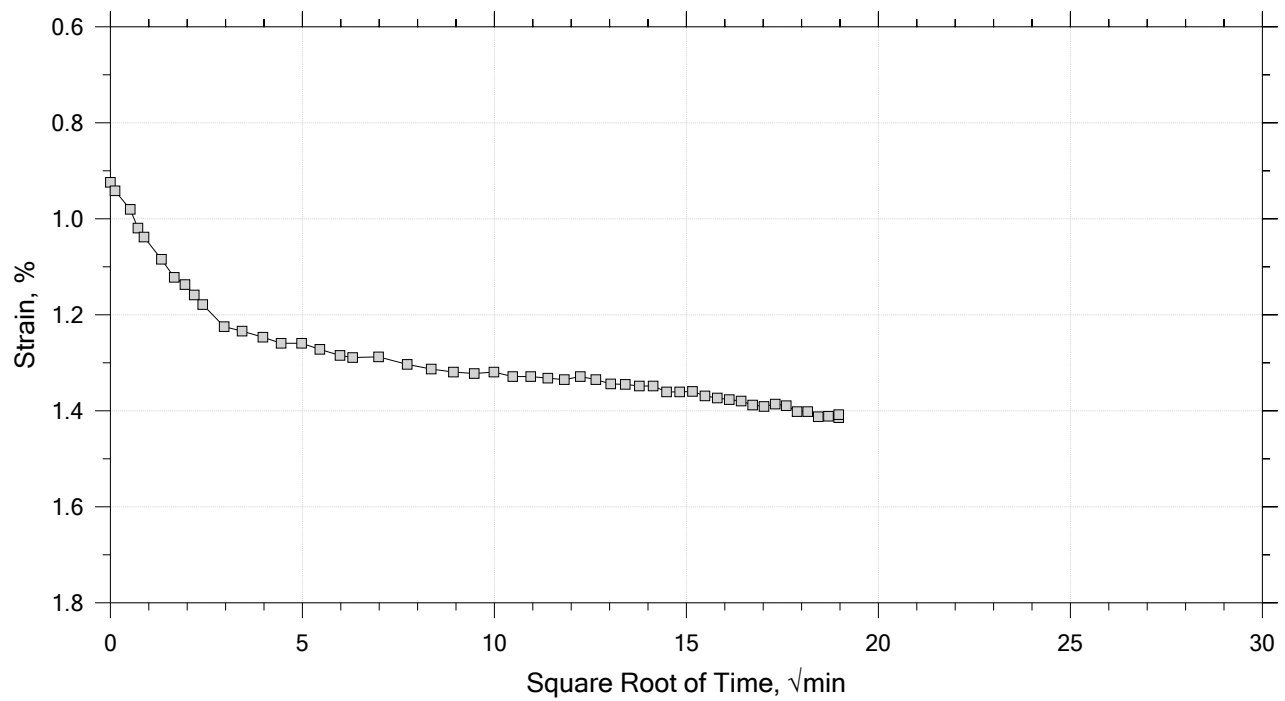
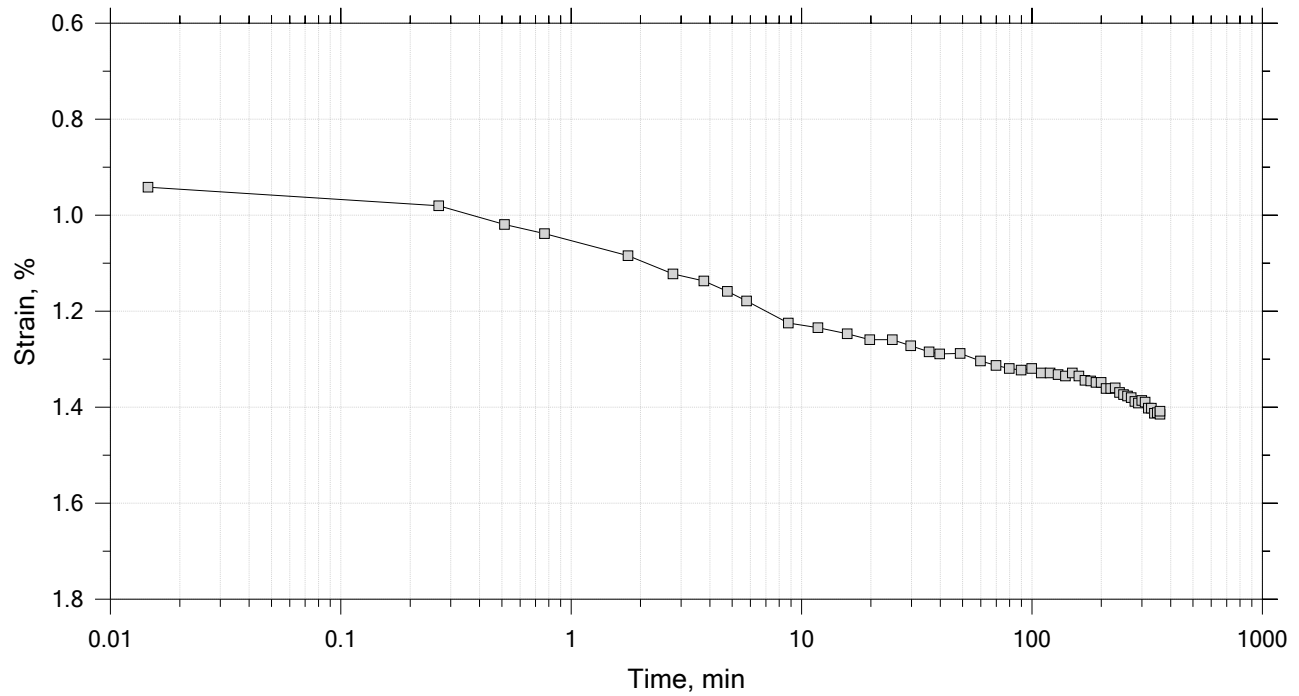
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-208	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 03/01/21	Depth: 10-12 ft
	Test No.: IP-15	Sample Type: intact	Elevation:
	Description: Moist gray and olive yellow clay		
	Remarks: System LTIII-A, Swell Pressure = 0.0674 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 2 of 15

Constant Load Step

Stress: 0.125 tsf



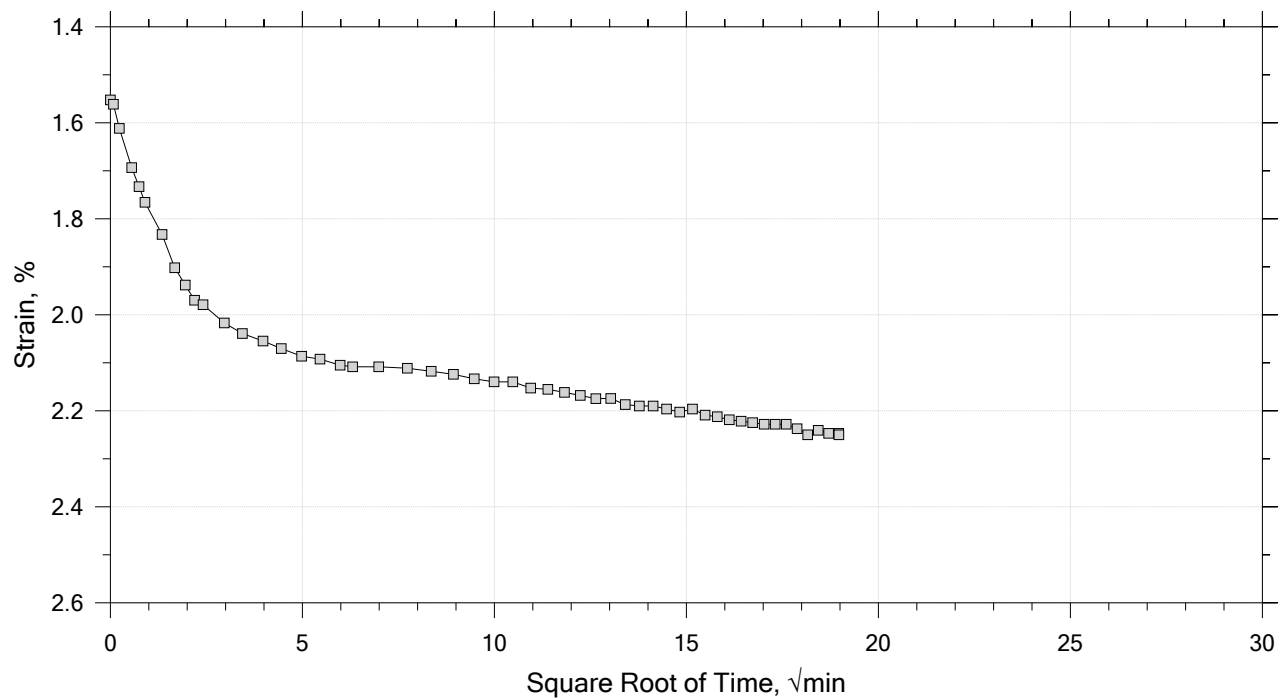
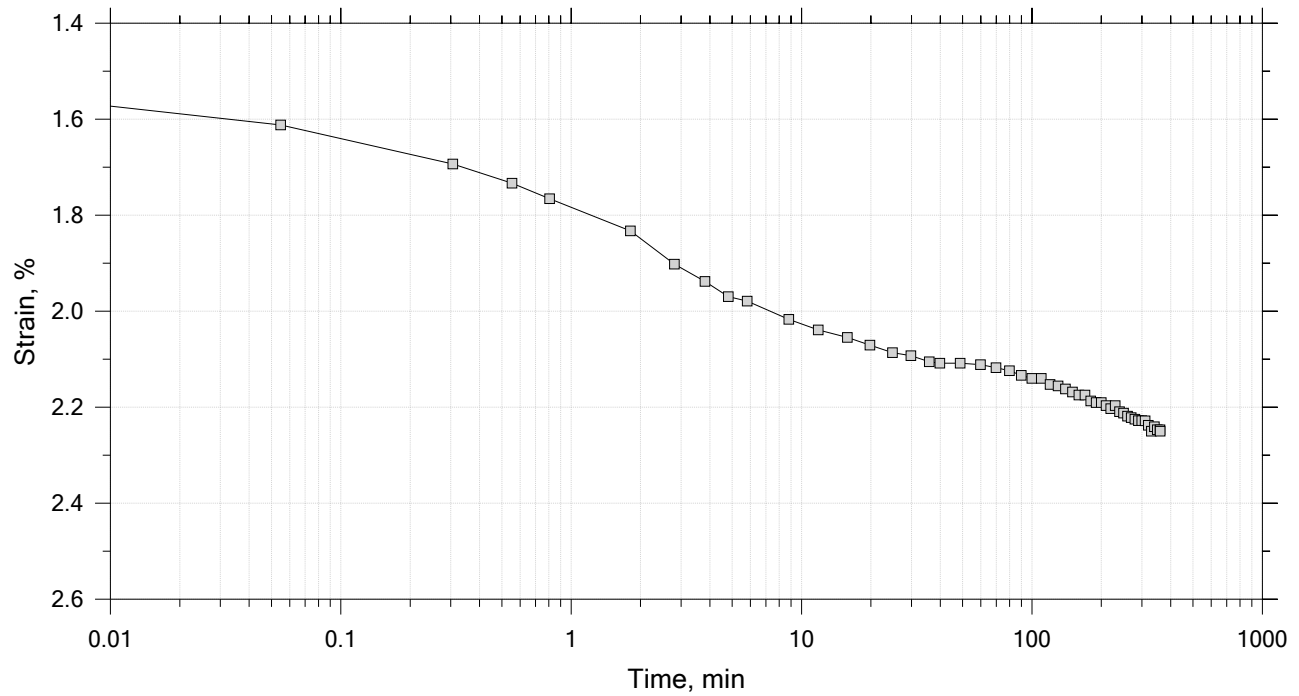
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-208	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 03/01/21	Depth: 10-12 ft
	Test No.: IP-15	Sample Type: intact	Elevation:
	Description: Moist gray and olive yellow clay		
	Remarks: System LTIII-A, Swell Pressure = 0.0674 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 3 of 15

Constant Load Step

Stress: 0.25 tsf



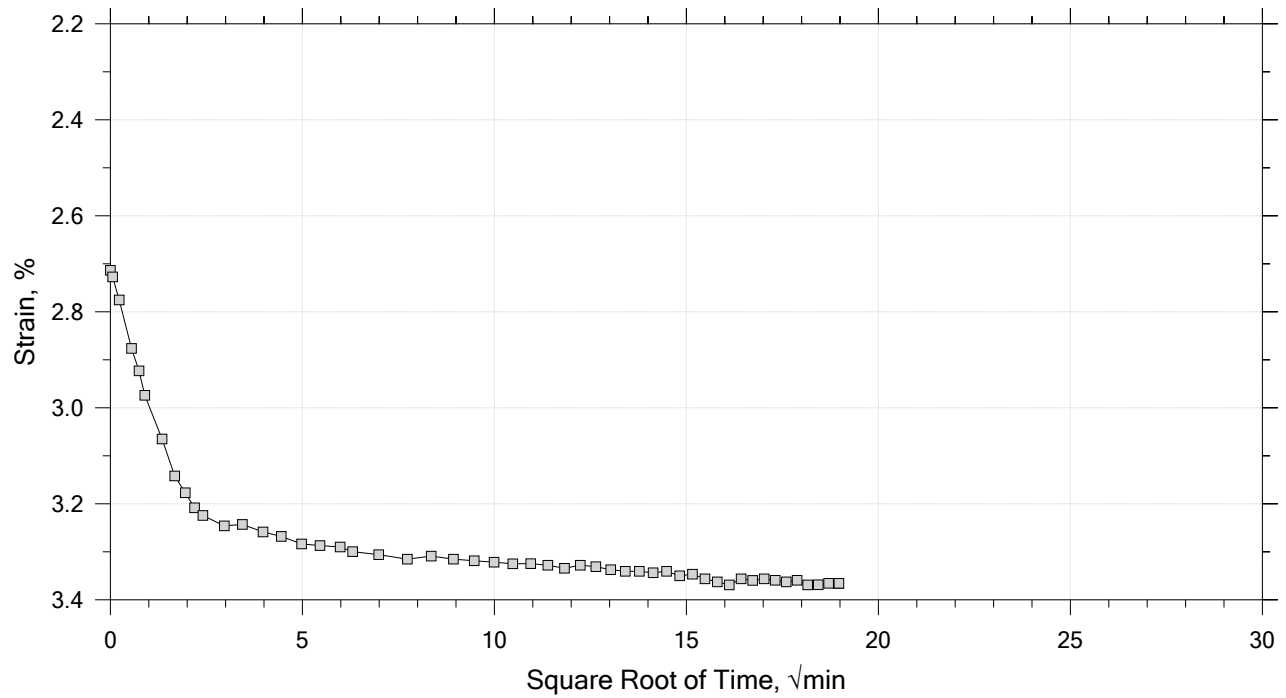
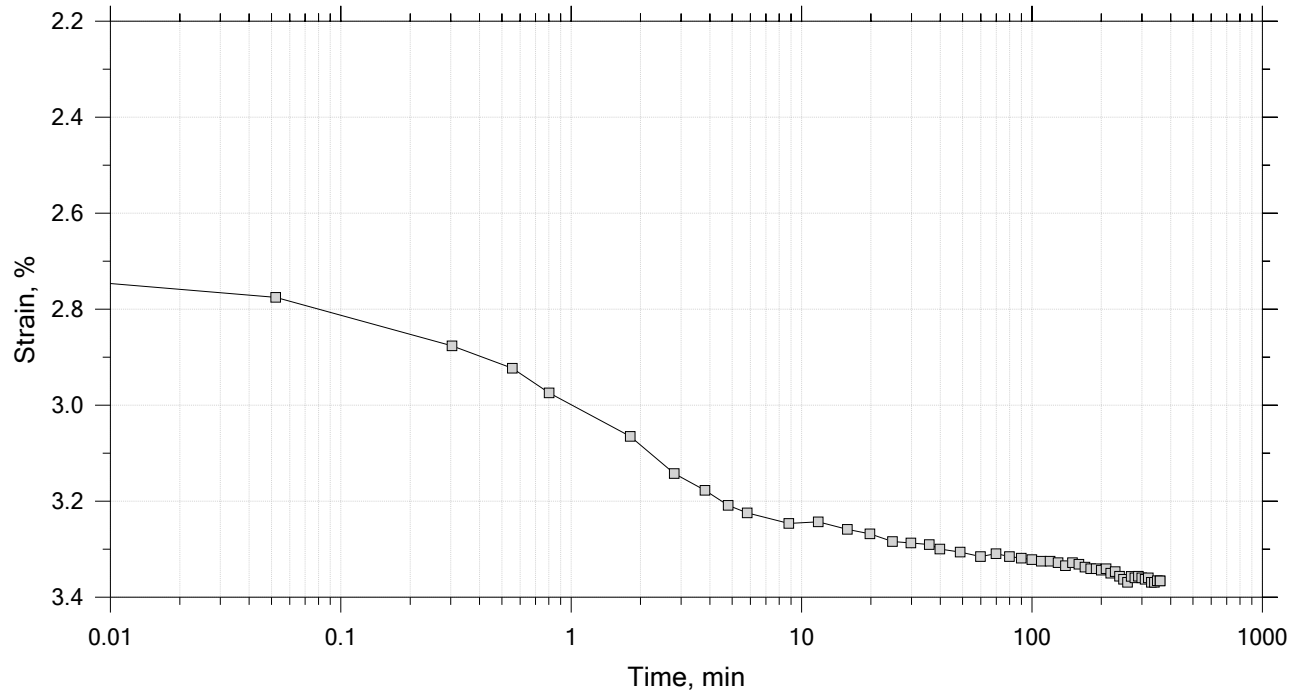
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-208	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 03/01/21	Depth: 10-12 ft
	Test No.: IP-15	Sample Type: intact	Elevation:
	Description: Moist gray and olive yellow clay		
	Remarks: System LTIII-A, Swell Pressure = 0.0674 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 4 of 15

Constant Load Step

Stress: 0.5 tsf



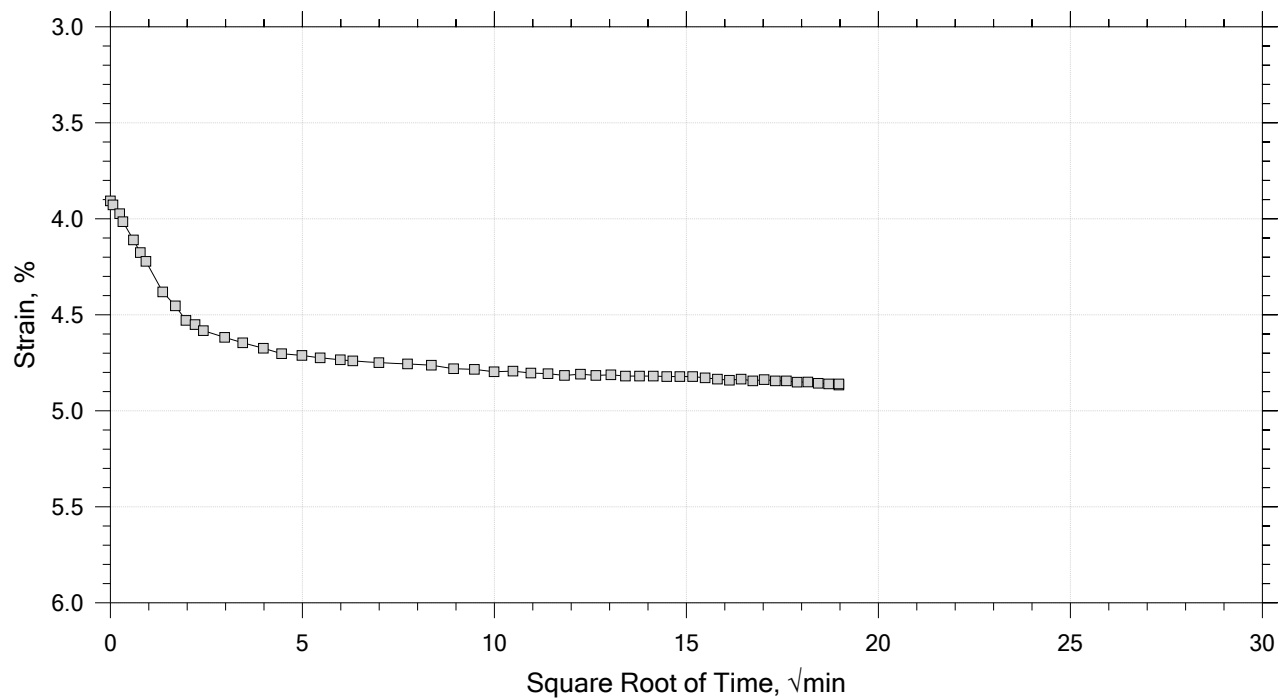
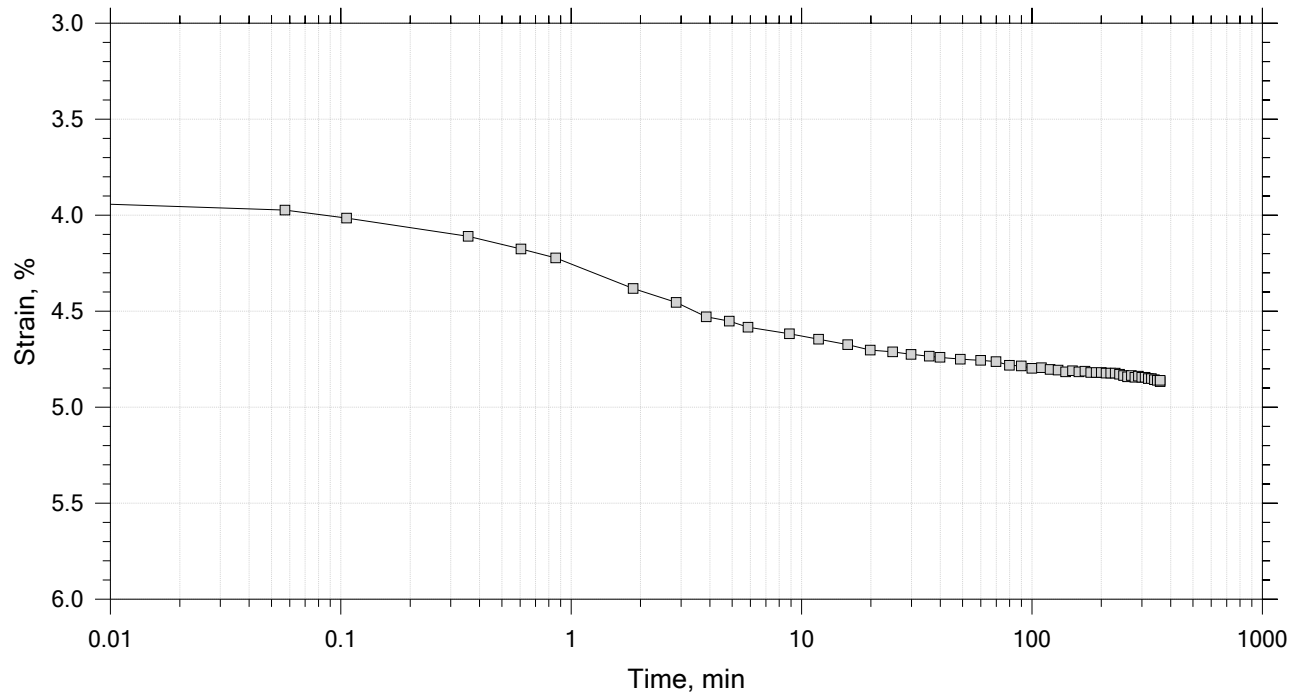
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-208	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 03/01/21	Depth: 10-12 ft
	Test No.: IP-15	Sample Type: intact	Elevation:
	Description: Moist gray and olive yellow clay		
	Remarks: System LTIII-A, Swell Pressure = 0.0674 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 5 of 15

Constant Load Step

Stress: 1 tsf



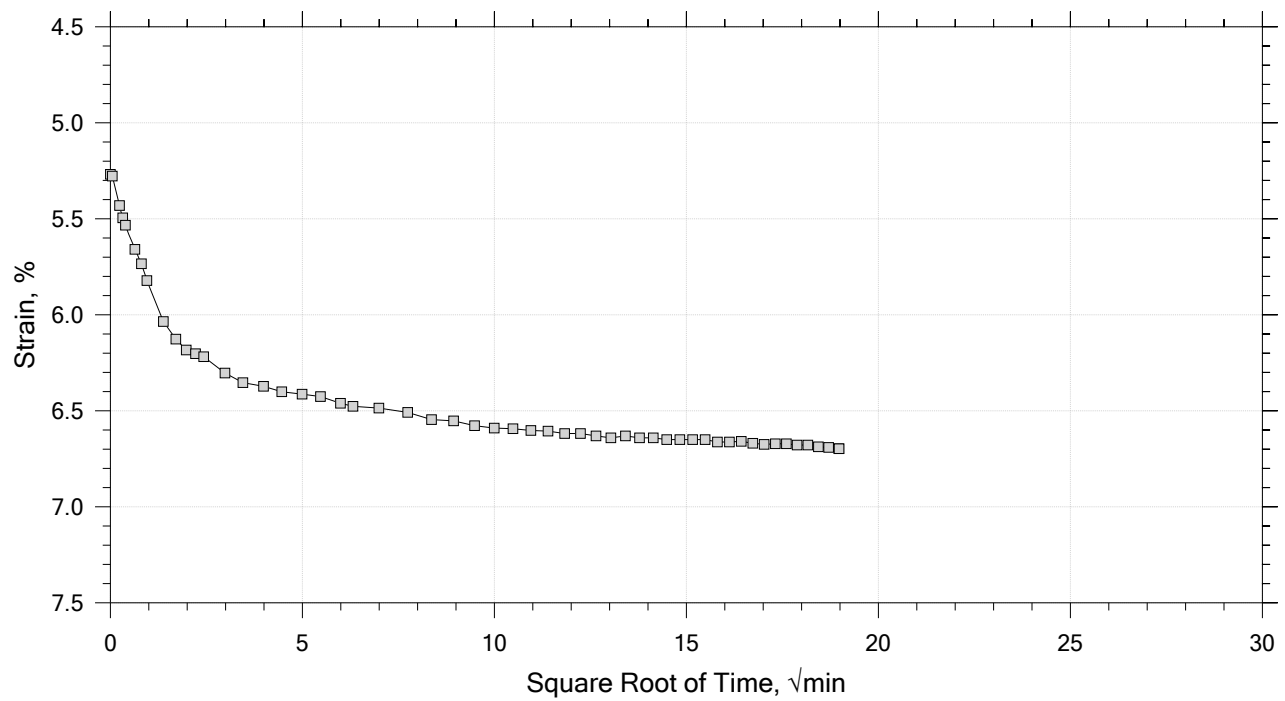
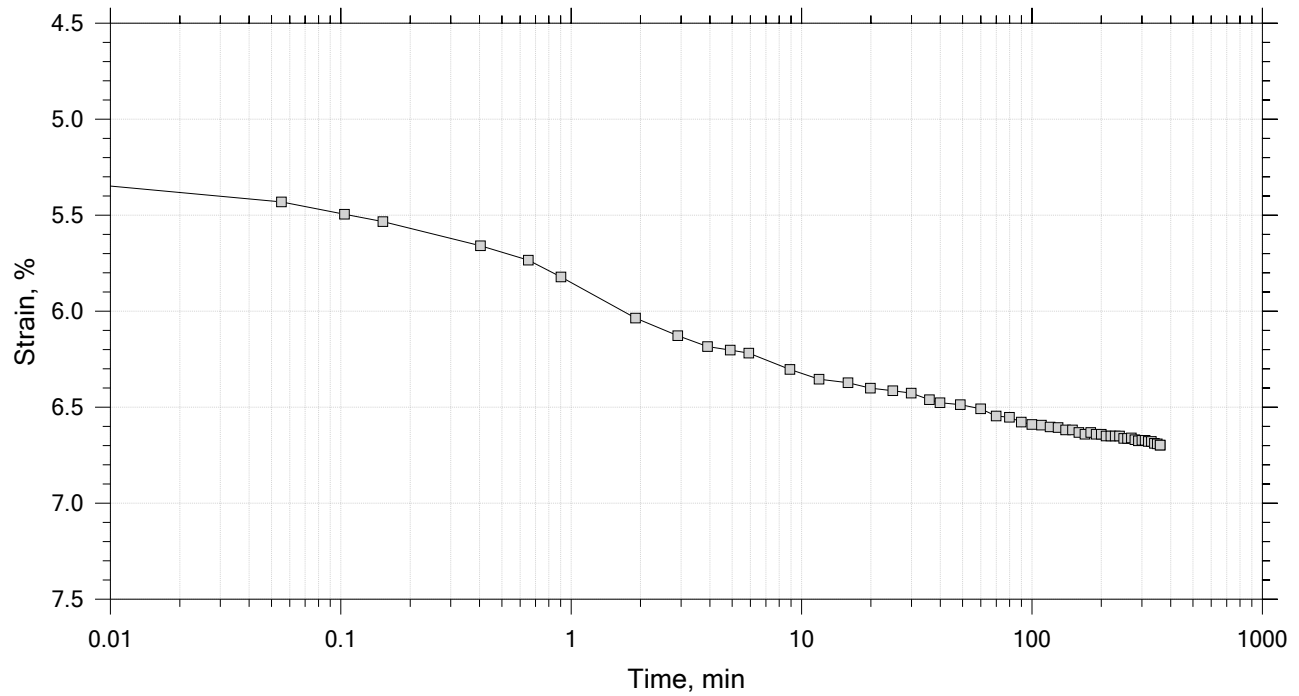
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-208	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 03/01/21	Depth: 10-12 ft
	Test No.: IP-15	Sample Type: intact	Elevation:
	Description: Moist gray and olive yellow clay		
	Remarks: System LTIII-A, Swell Pressure = 0.0674 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 6 of 15

Constant Load Step

Stress: 2 tsf



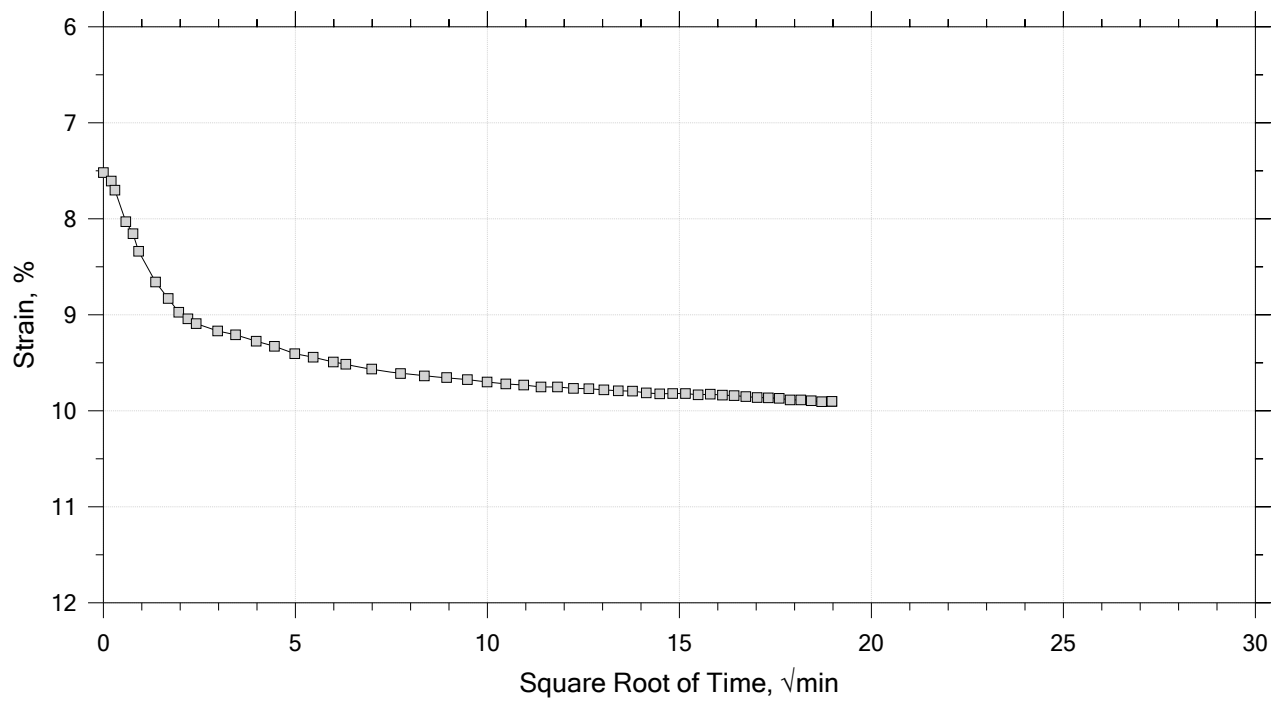
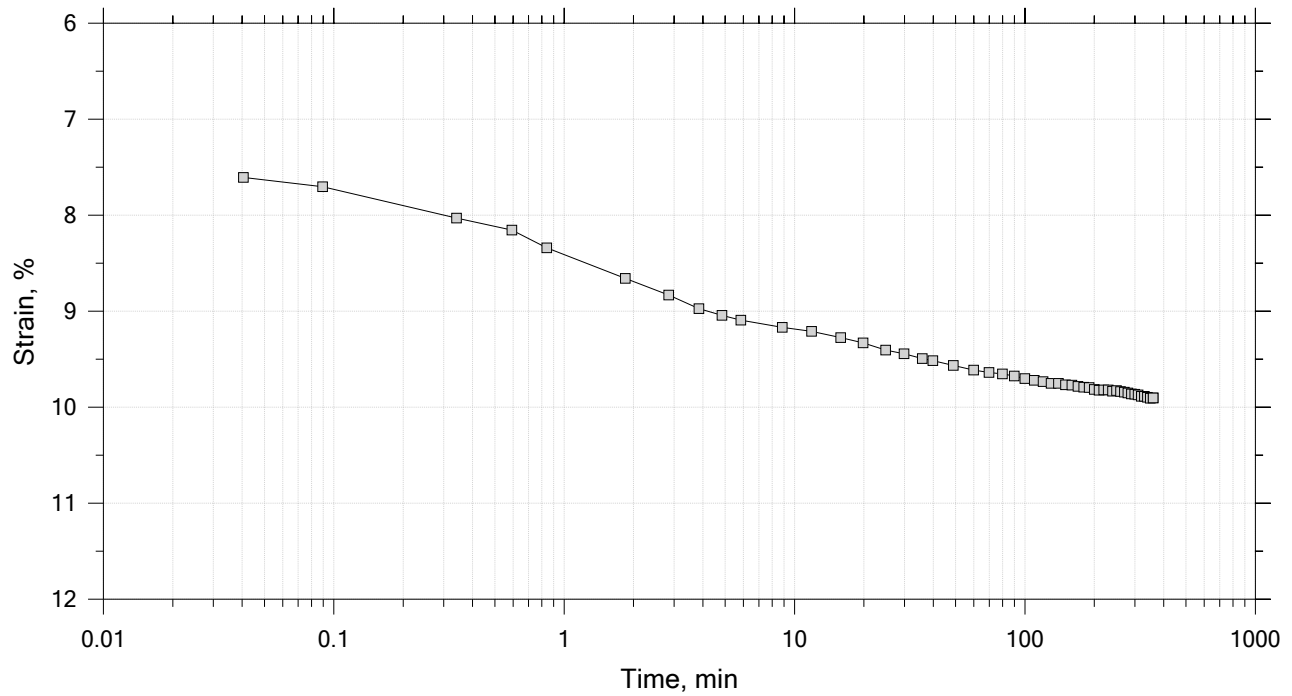
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-208	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 03/01/21	Depth: 10-12 ft
	Test No.: IP-15	Sample Type: intact	Elevation:
	Description: Moist gray and olive yellow clay		
	Remarks: System LTIII-A, Swell Pressure = 0.0674 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 7 of 15

Constant Load Step

Stress: 4 tsf



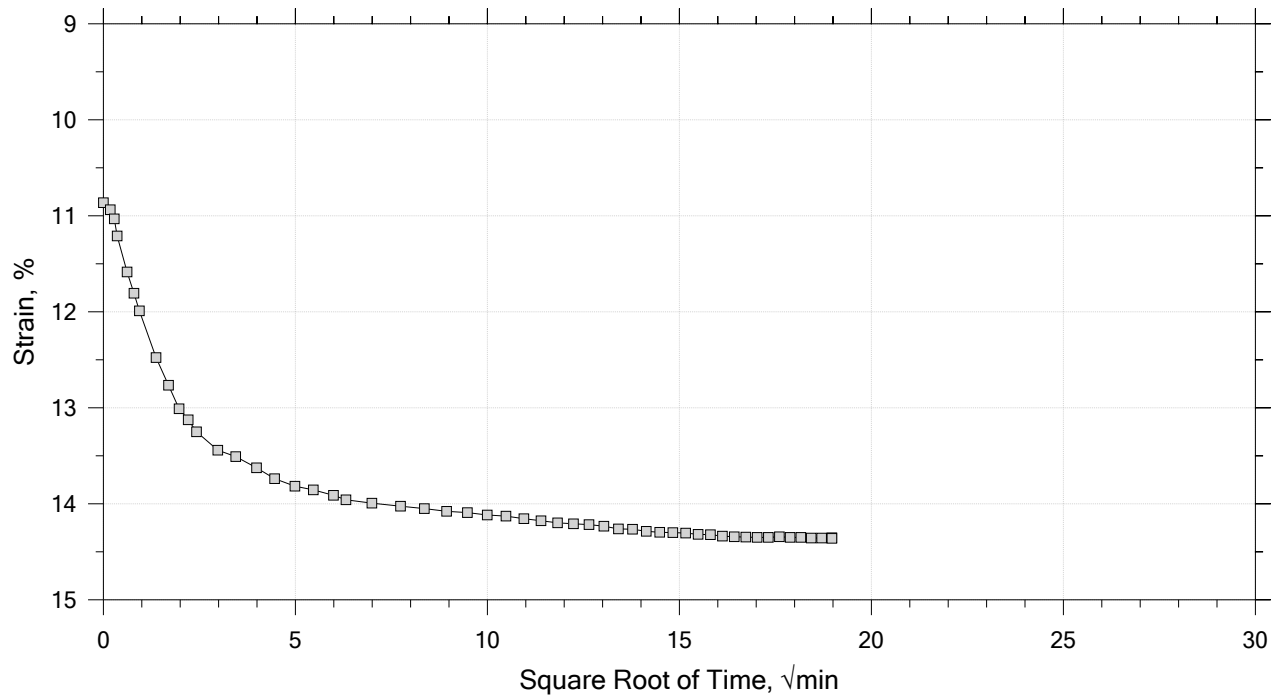
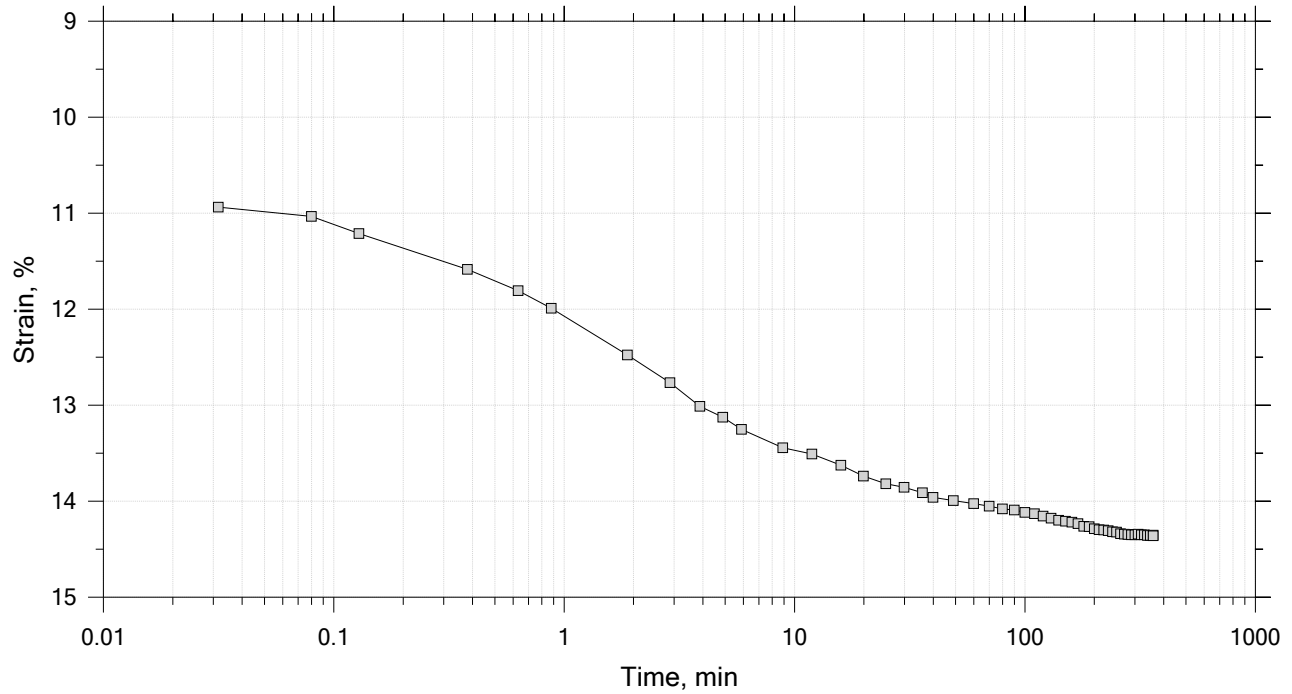
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-208	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 03/01/21	Depth: 10-12 ft
	Test No.: IP-15	Sample Type: intact	Elevation:
	Description: Moist gray and olive yellow clay		
	Remarks: System LTIII-A, Swell Pressure = 0.0674 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 8 of 15

Constant Load Step

Stress: 8 tsf



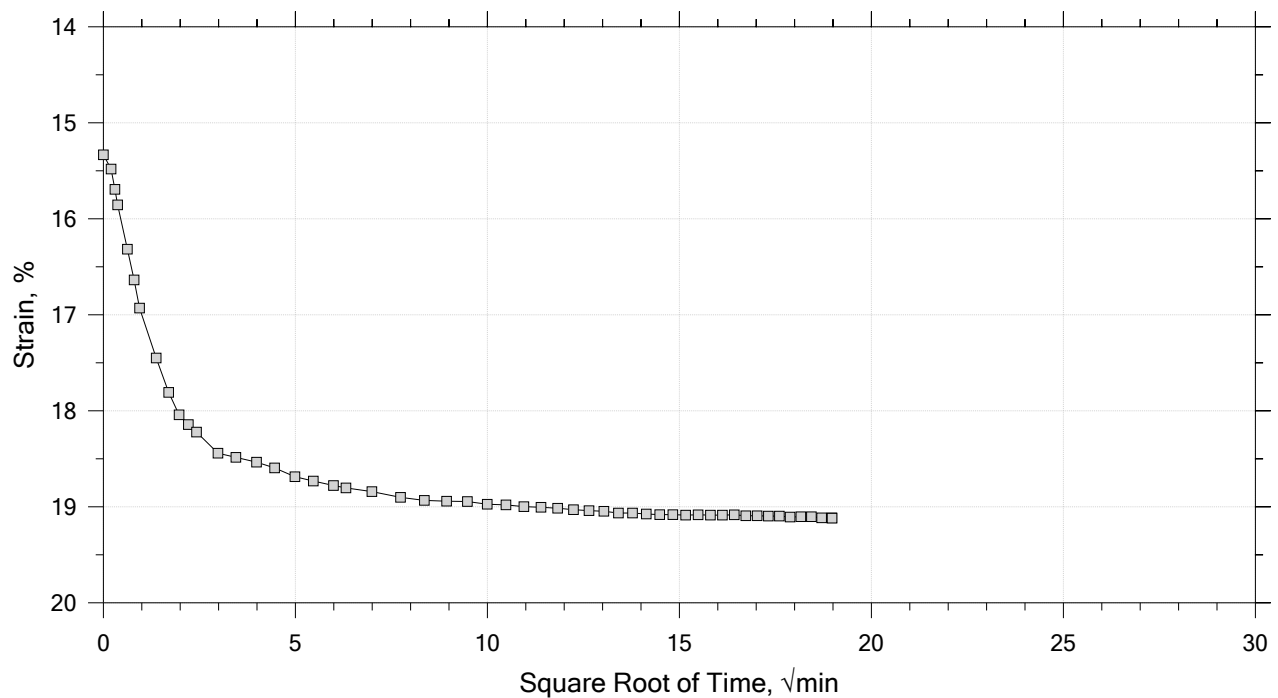
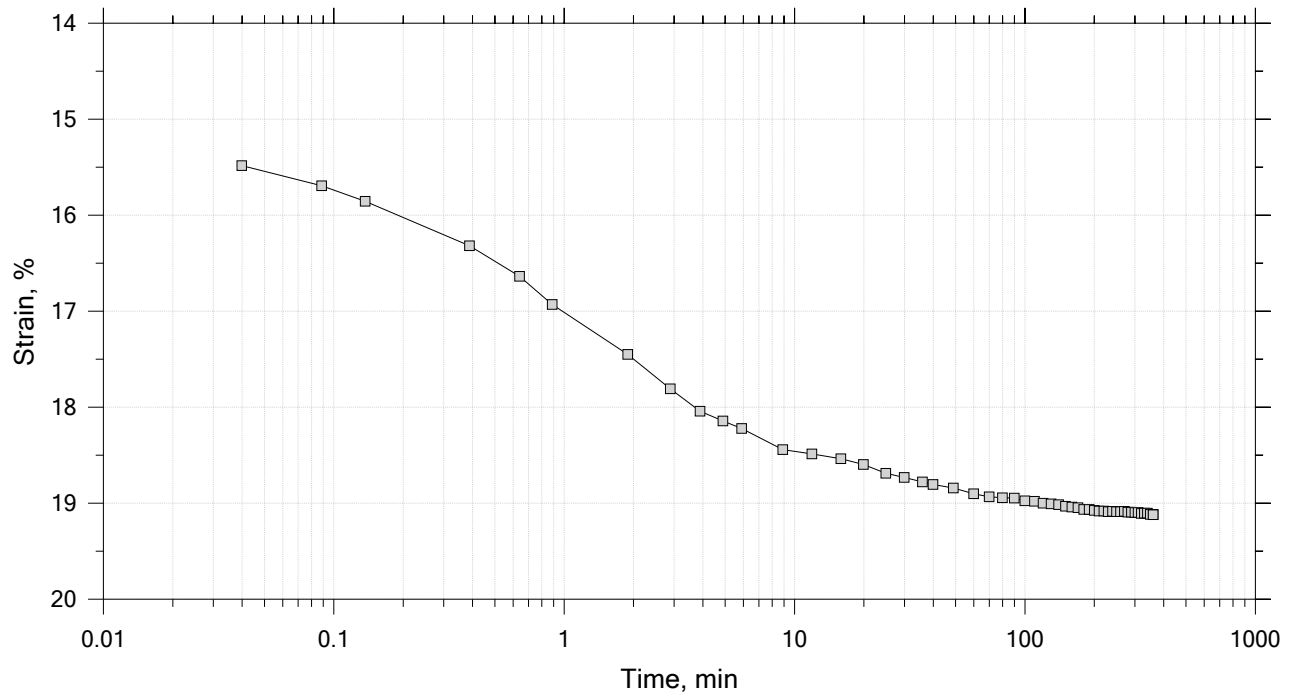
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-208	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 03/01/21	Depth: 10-12 ft
	Test No.: IP-15	Sample Type: intact	Elevation:
	Description: Moist gray and olive yellow clay		
	Remarks: System LTIII-A, Swell Pressure = 0.0674 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 9 of 15

Constant Load Step

Stress: 16 tsf



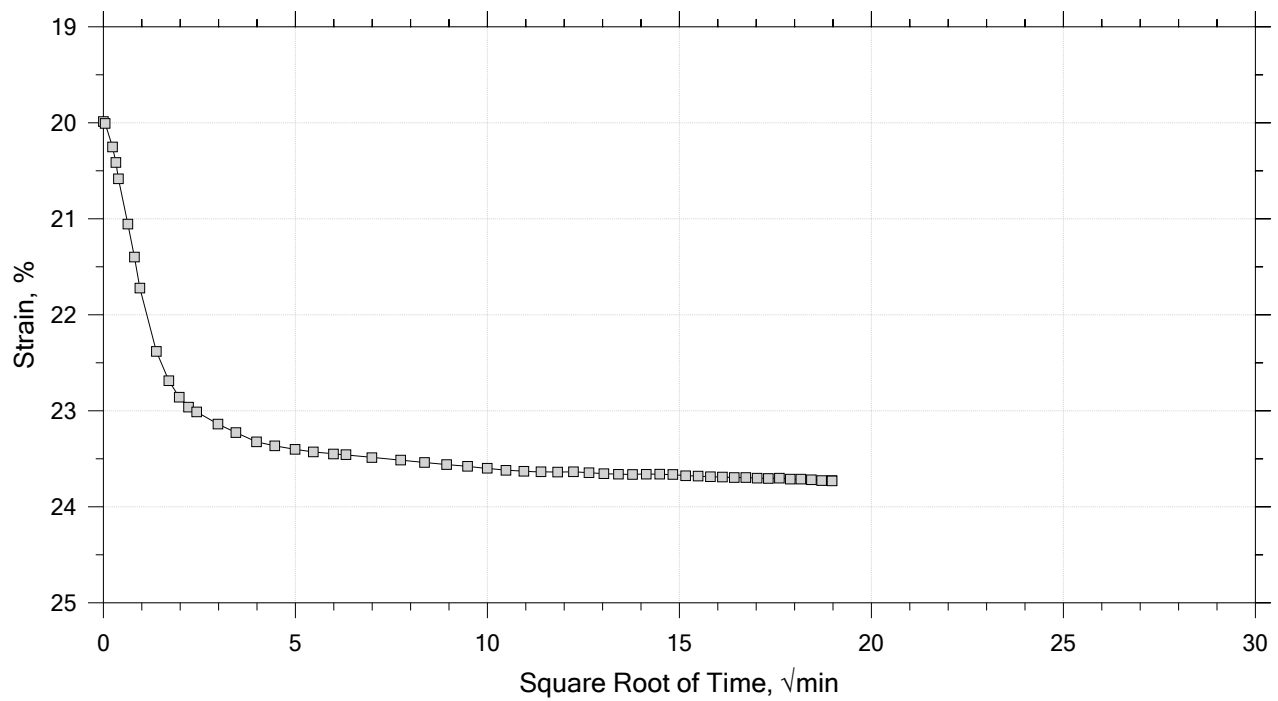
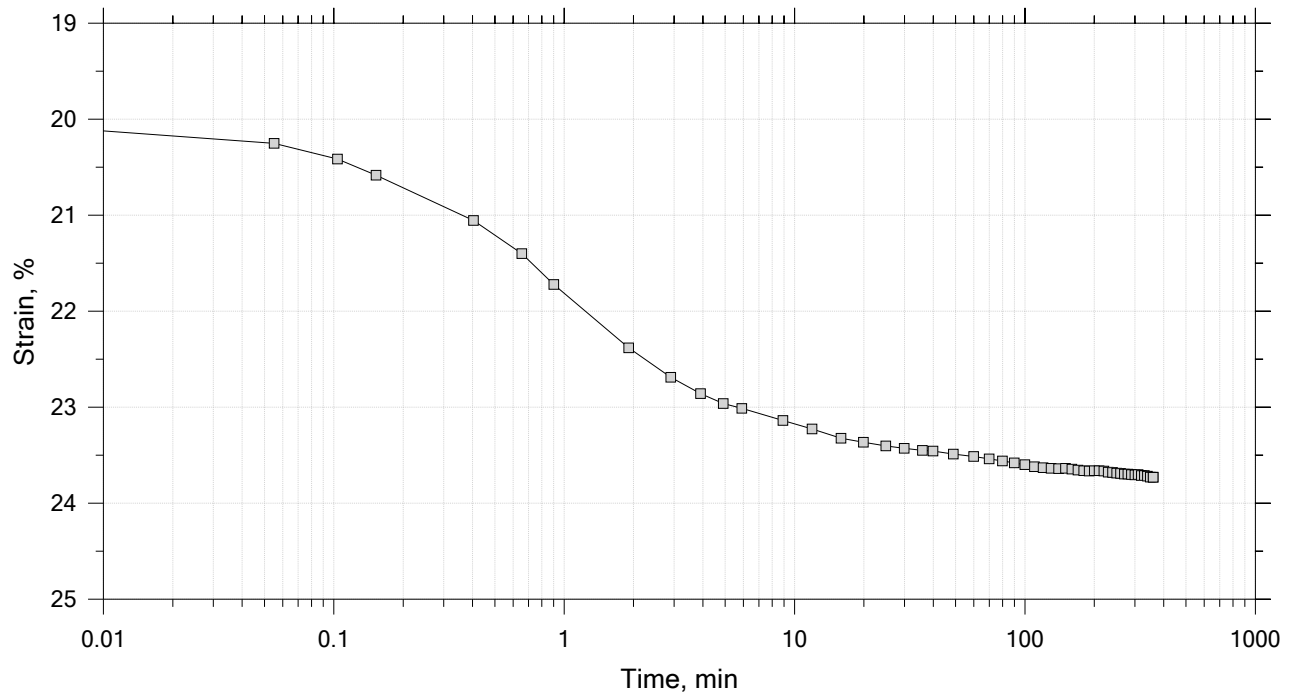
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-208	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 03/01/21	Depth: 10-12 ft
	Test No.: IP-15	Sample Type: intact	Elevation:
	Description: Moist gray and olive yellow clay		
	Remarks: System LTIII-A, Swell Pressure = 0.0674 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 10 of 15

Constant Load Step

Stress: 32 tsf



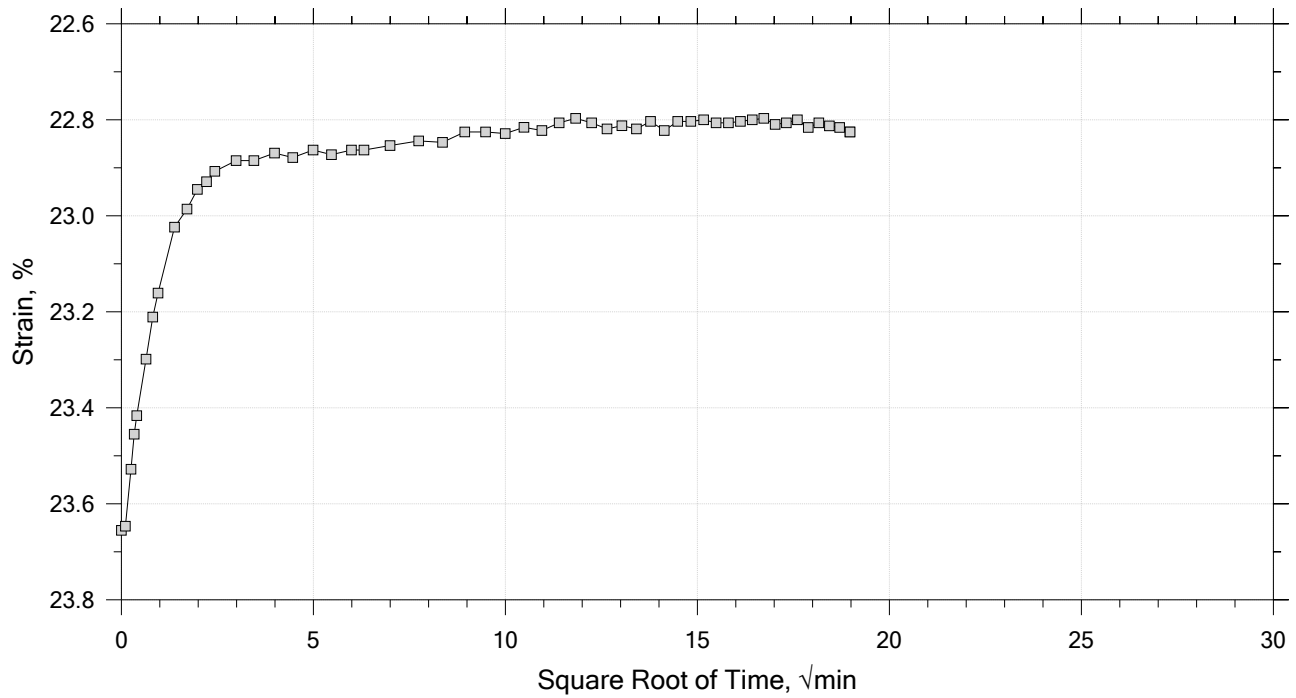
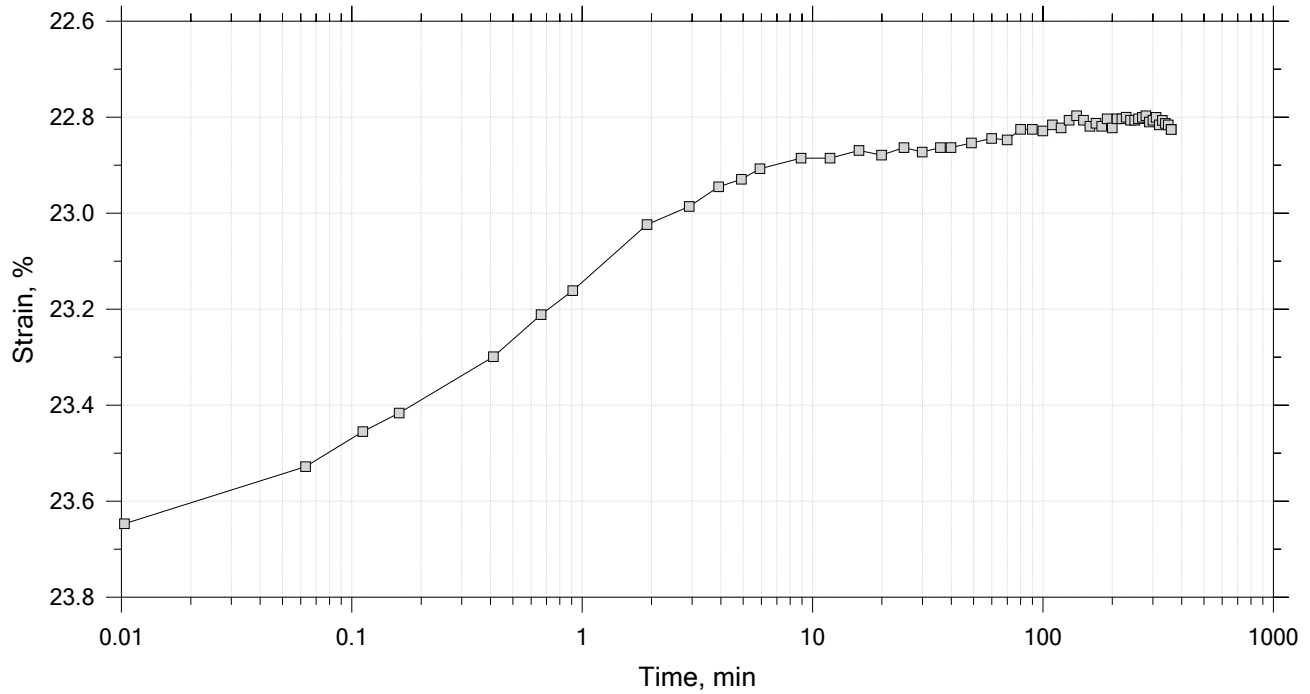
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-208	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 03/01/21	Depth: 10-12 ft
	Test No.: IP-15	Sample Type: intact	Elevation:
	Description: Moist gray and olive yellow clay		
	Remarks: System LTIII-A, Swell Pressure = 0.0674 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 11 of 15

Constant Load Step

Stress: 8 tsf



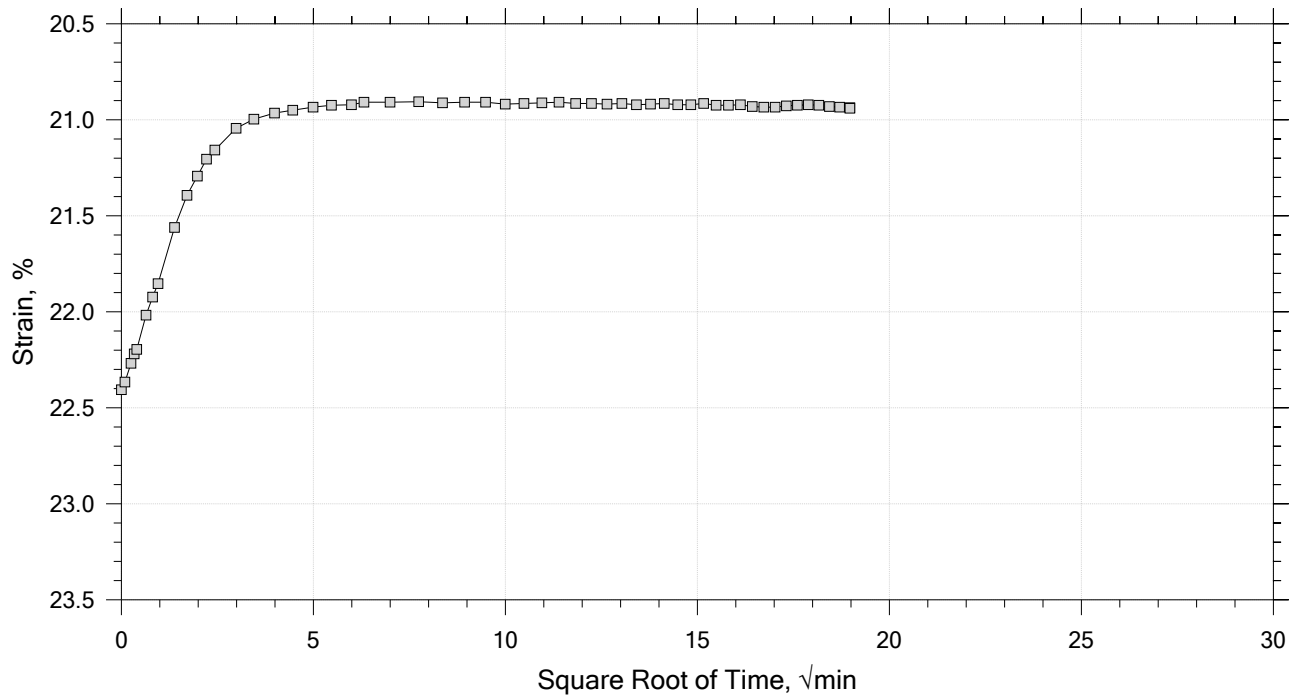
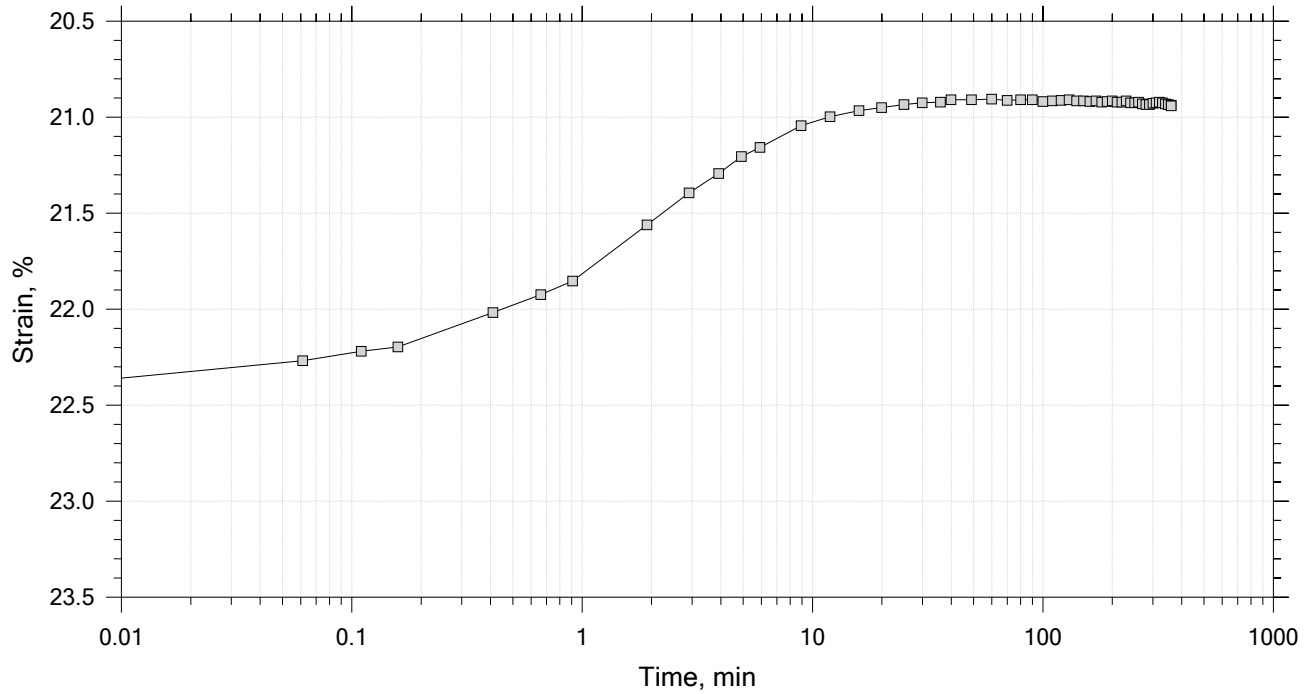
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-208	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 03/01/21	Depth: 10-12 ft
	Test No.: IP-15	Sample Type: intact	Elevation:
	Description: Moist gray and olive yellow clay		
	Remarks: System LTIII-A, Swell Pressure = 0.0674 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 12 of 15

Constant Load Step

Stress: 2 tsf



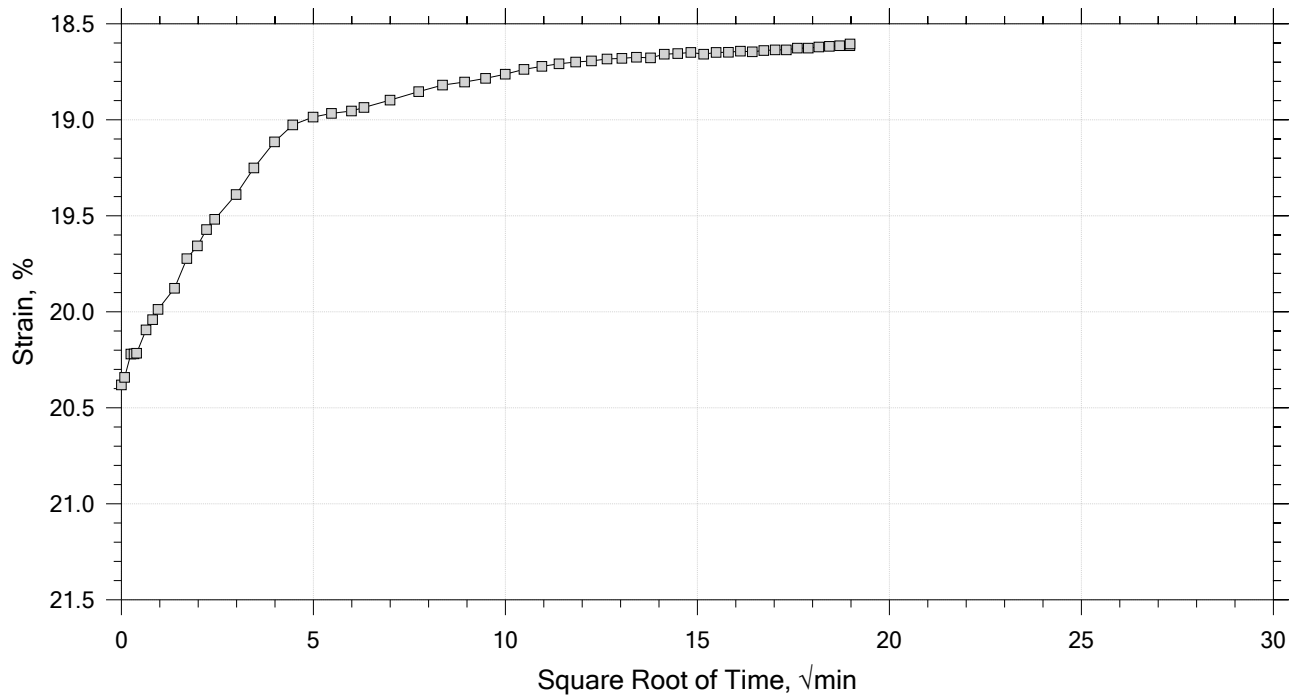
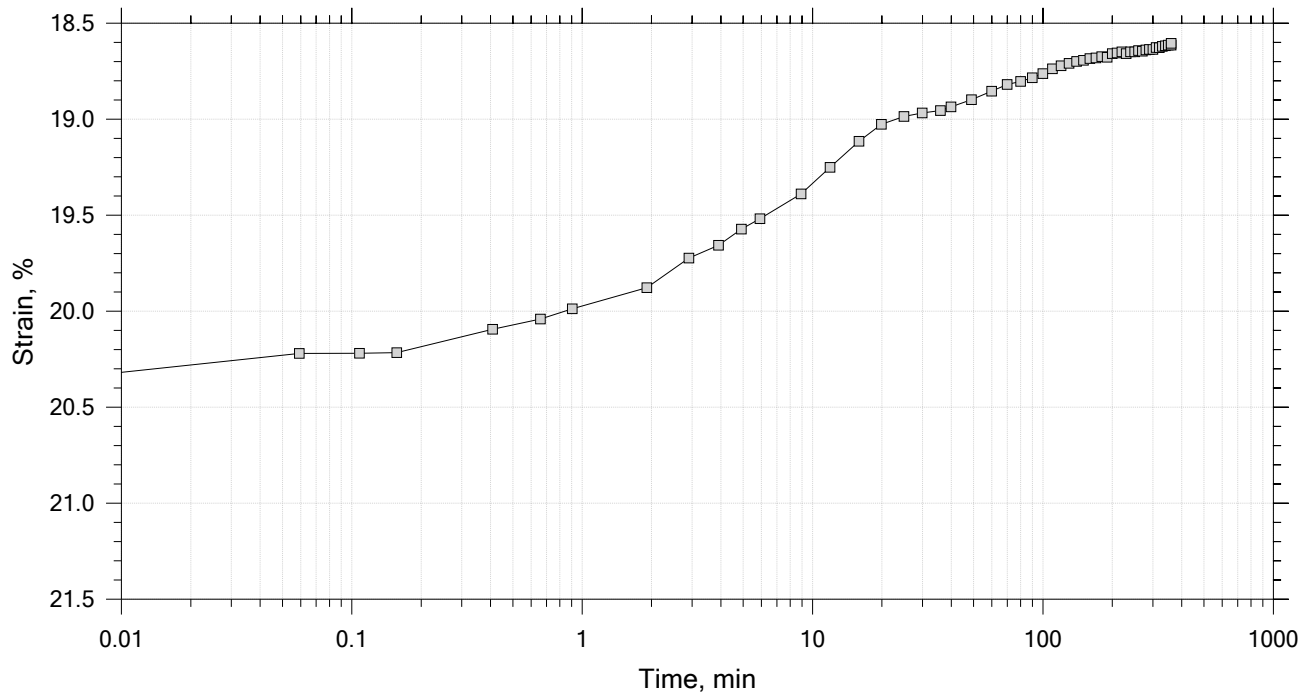
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-208	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 03/01/21	Depth: 10-12 ft
	Test No.: IP-15	Sample Type: intact	Elevation:
	Description: Moist gray and olive yellow clay		
	Remarks: System LTIII-A, Swell Pressure = 0.0674 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 13 of 15

Constant Load Step

Stress: 0.5 tsf



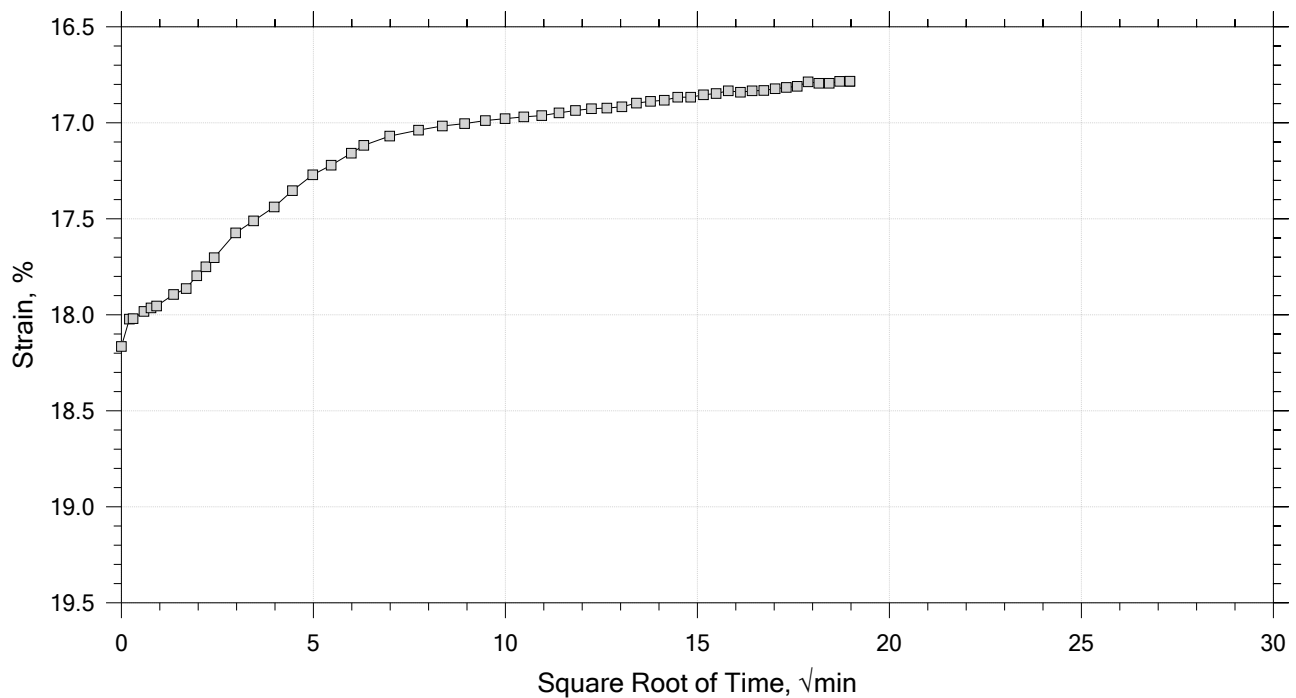
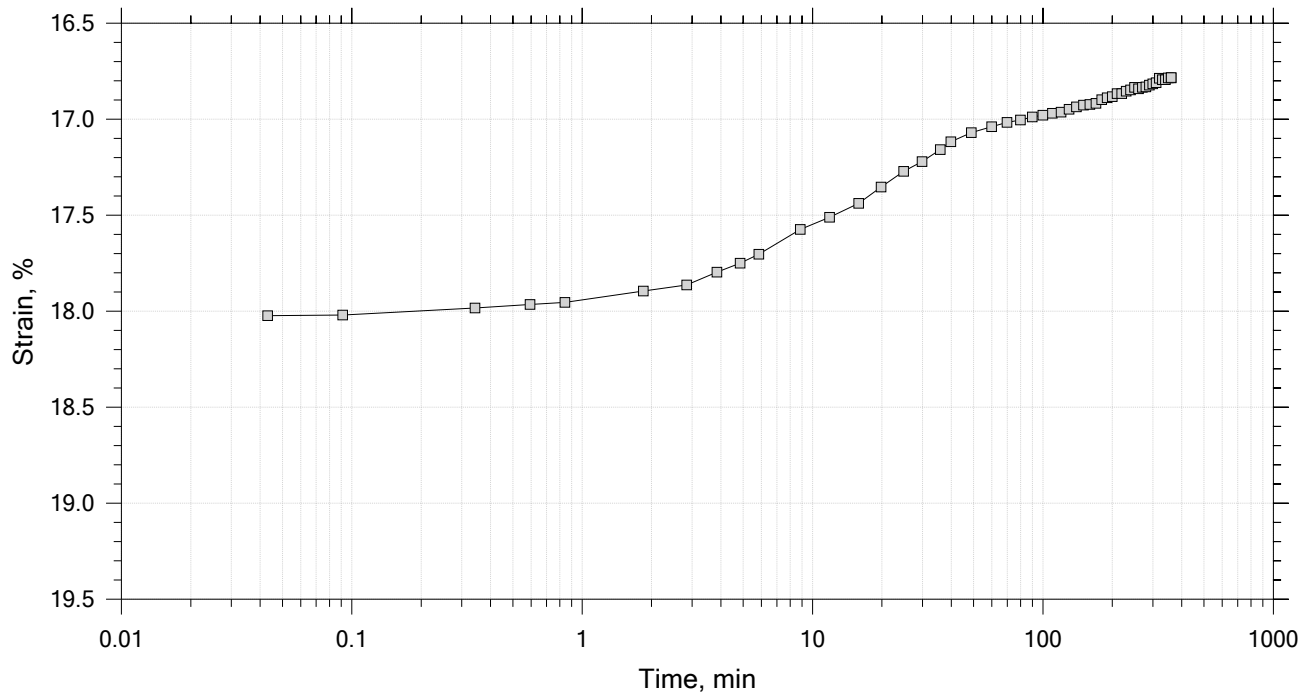
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-208	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 03/01/21	Depth: 10-12 ft
	Test No.: IP-15	Sample Type: intact	Elevation:
	Description: Moist gray and olive yellow clay		
	Remarks: System LTIII-A, Swell Pressure = 0.0674 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 14 of 15

Constant Load Step

Stress: 0.125 tsf



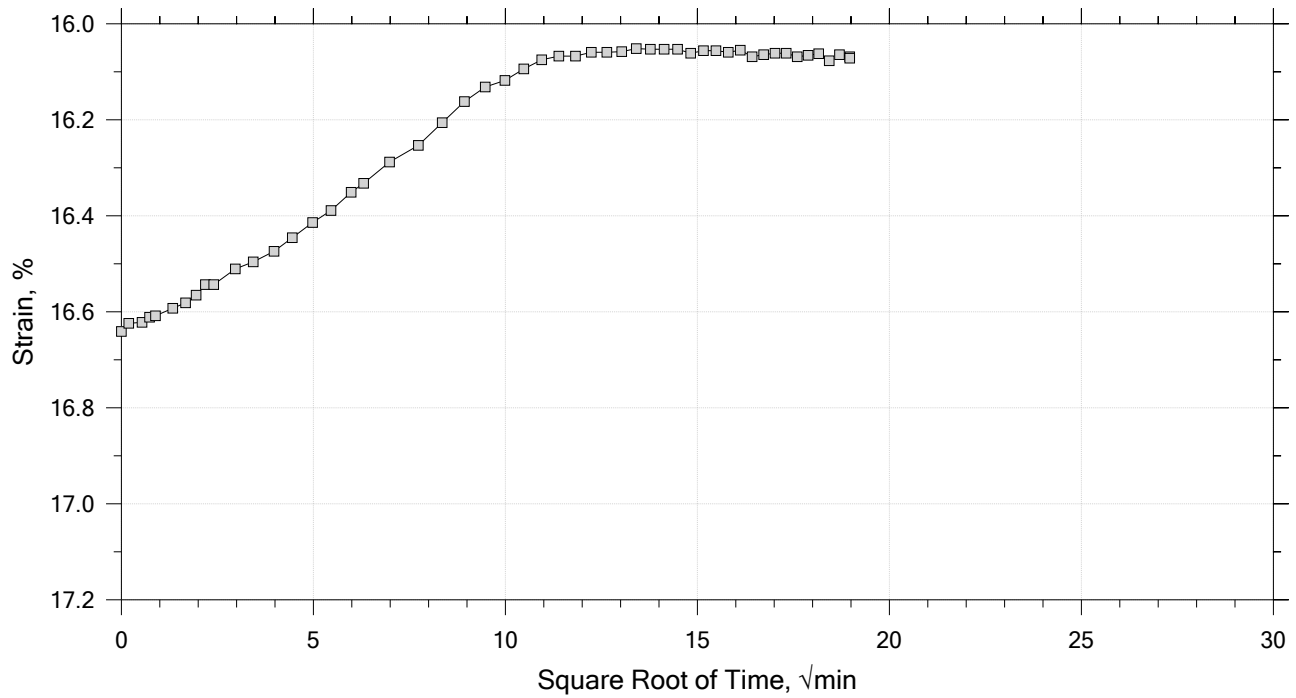
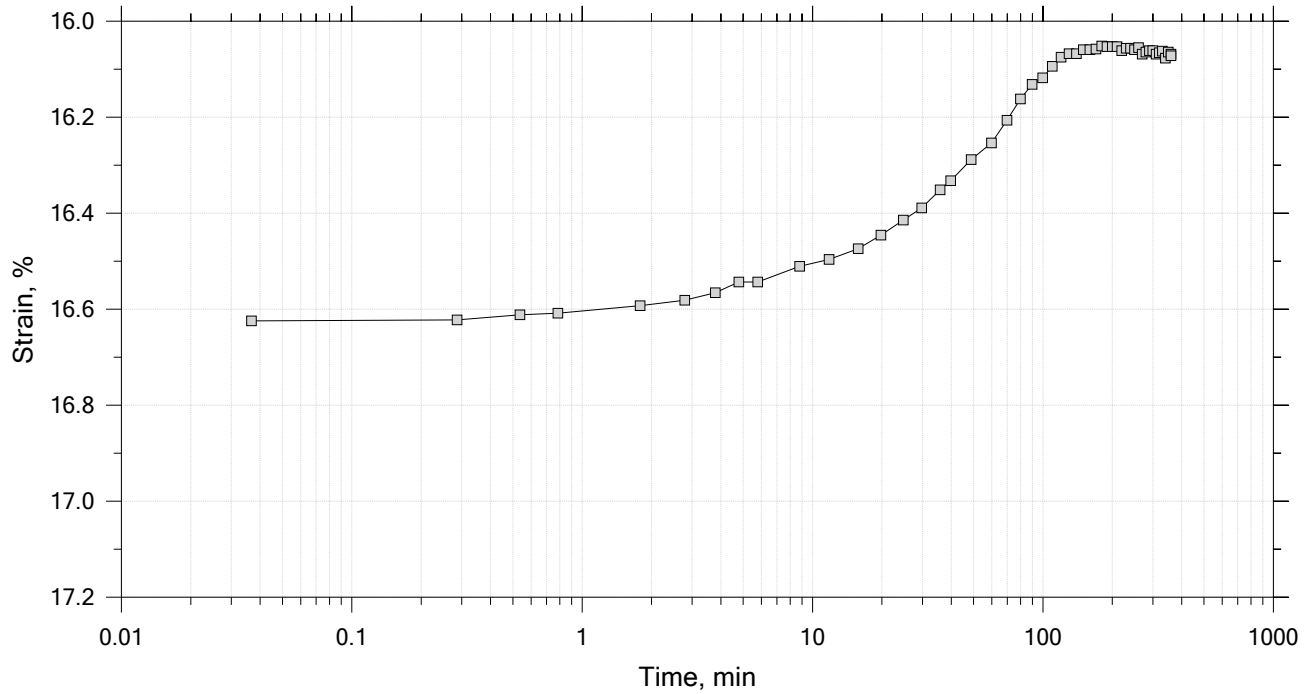
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-208	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 03/01/21	Depth: 10-12 ft
	Test No.: IP-15	Sample Type: intact	Elevation:
	Description: Moist gray and olive yellow clay		
	Remarks: System LTIII-A, Swell Pressure = 0.0674 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 15 of 15

Constant Load Step

Stress: 0.0625 tsf




	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-208	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 03/01/21	Depth: 10-12 ft
	Test No.: IP-15	Sample Type: intact	Elevation:
	Description: Moist gray and olive yellow clay		
	Remarks: System LTIII-A, Swell Pressure = 0.0674 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Specimen Diameter: 2.50 in	Measured Specific Gravity: 2.71	Liquid Limit: 34
Initial Height: 1.00 in	Initial Void Ratio: 1.12	Plastic Limit: 17
Final Height: 0.83 in	Final Void Ratio: 0.76	Plasticity Index: 17

	Before Test Trimmings	Before Test Specimen	After Test Specimen	After Test Trimmings
Container ID	D-2963	RING		d257
Mass Container, gm	8.43	108	108	8.35
Mass Container + Wet Soil, gm	109.04	248.67	239.64	140
Mass Container + Dry Soil, gm	82.56	210.8	210.8	111.16
Mass Dry Soil, gm	74.13	102.8	102.8	102.81
Water Content, %	35.72	36.84	28.05	28.05
Void Ratio	---	1.12	0.76	---
Degree of Saturation, %	---	89.07	100.00	---
Dry Unit Weight, pcf	---	79.783	96.124	---


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

	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-208	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 03/01/21	Depth: 10-12 ft
	Test No.: IP-15	Sample Type: intact	Elevation:
	Description: Moist gray and olive yellow clay		
	Remarks: System LTIII-A, Swell Pressure = 0.0674 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

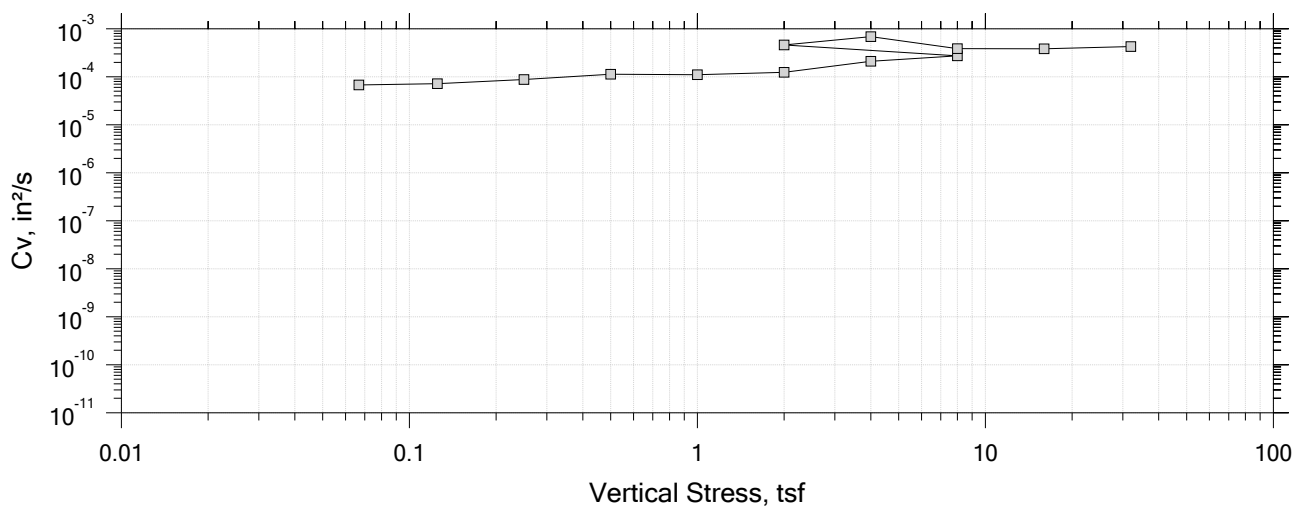
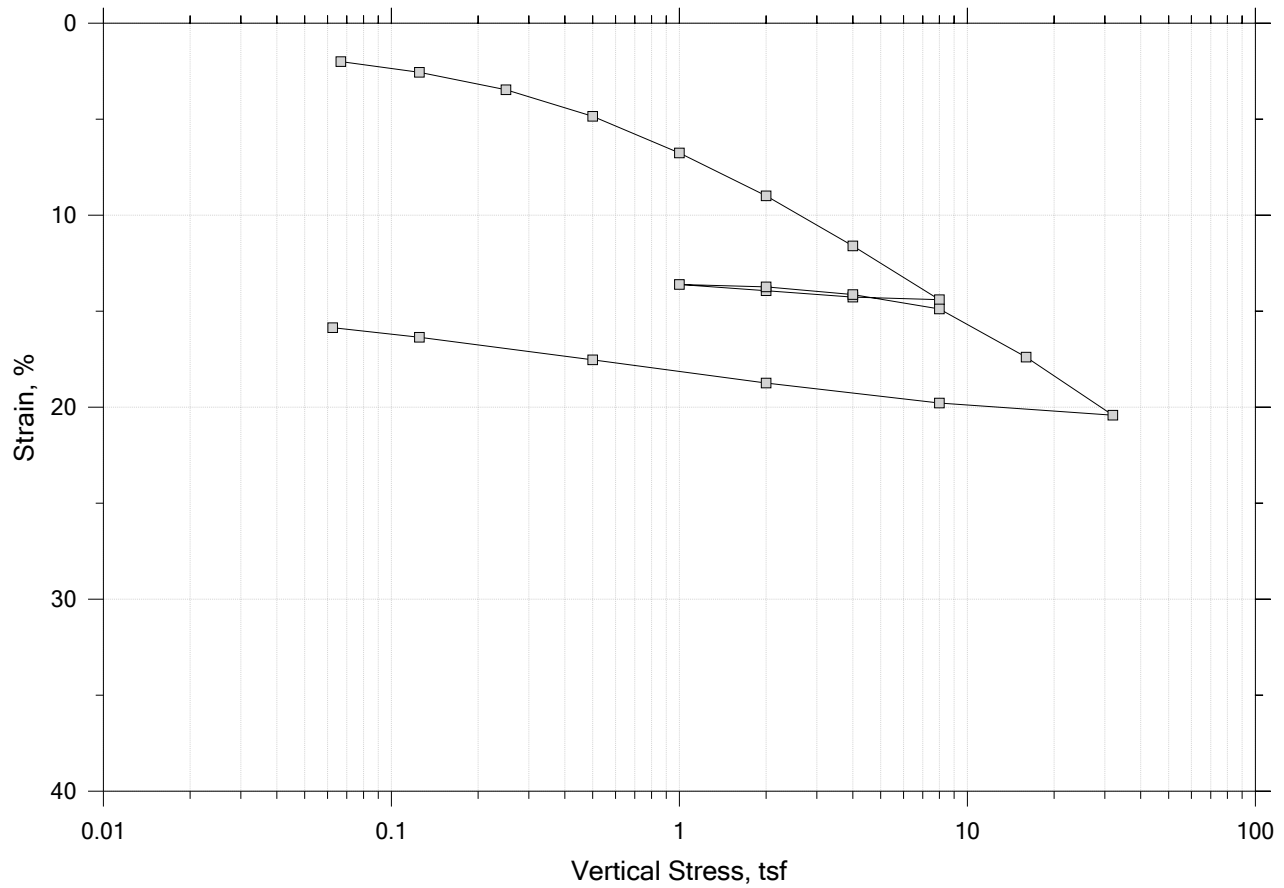
Square Root of Time Coefficients


[illegible]

	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-208	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 03/01/21	Depth: 10-12 ft
	Test No.: IP-15	Sample Type: intact	Elevation:
	Description: Moist gray and olive yellow clay		
	Remarks: System LTIII-A, Swell Pressure = 0.0674 tsf		
	Displacement at End of Increment		

One-Dimensional Consolidation by ASTM D2435 - Method B

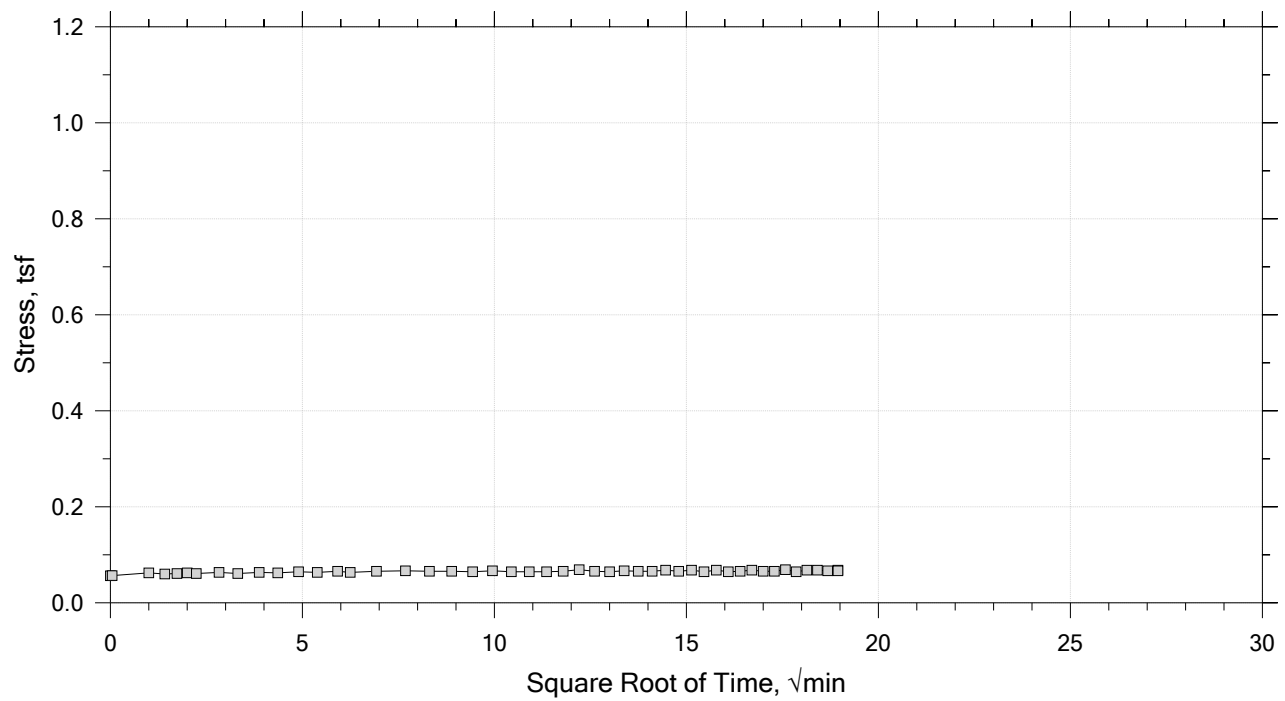
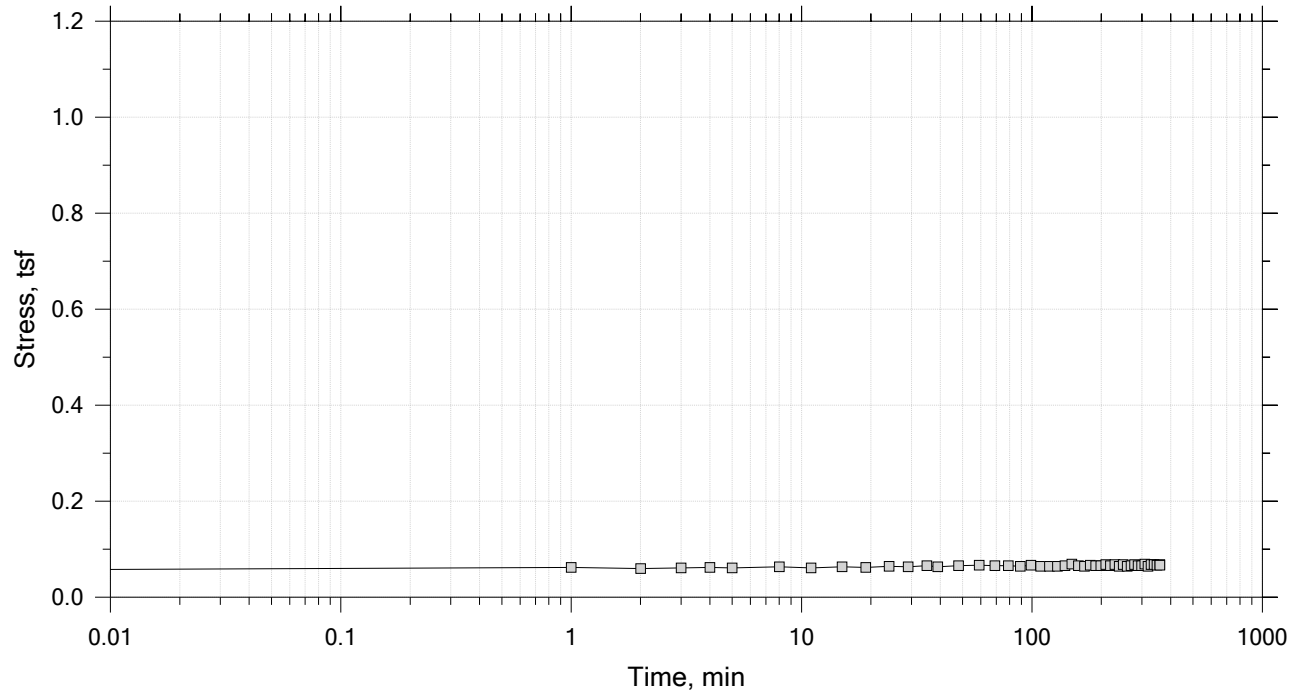
Summary Report




	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-210	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 03/01/21	Depth: 15-17 ft
	Test No.: IP-11	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-F, Swell Pressure - 0.0667 tsf		
	Displacement at End of Increment		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 1 of 21
Constant Volume Step
Stress: 0.0667 tsf



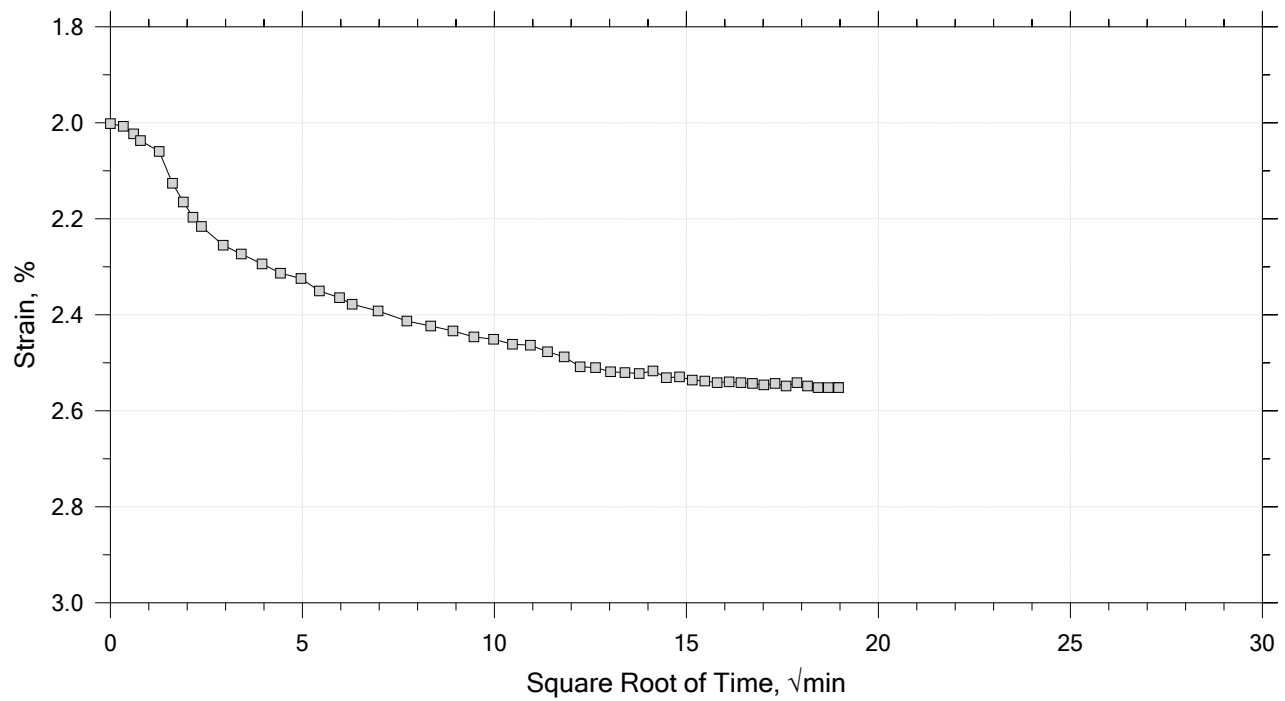
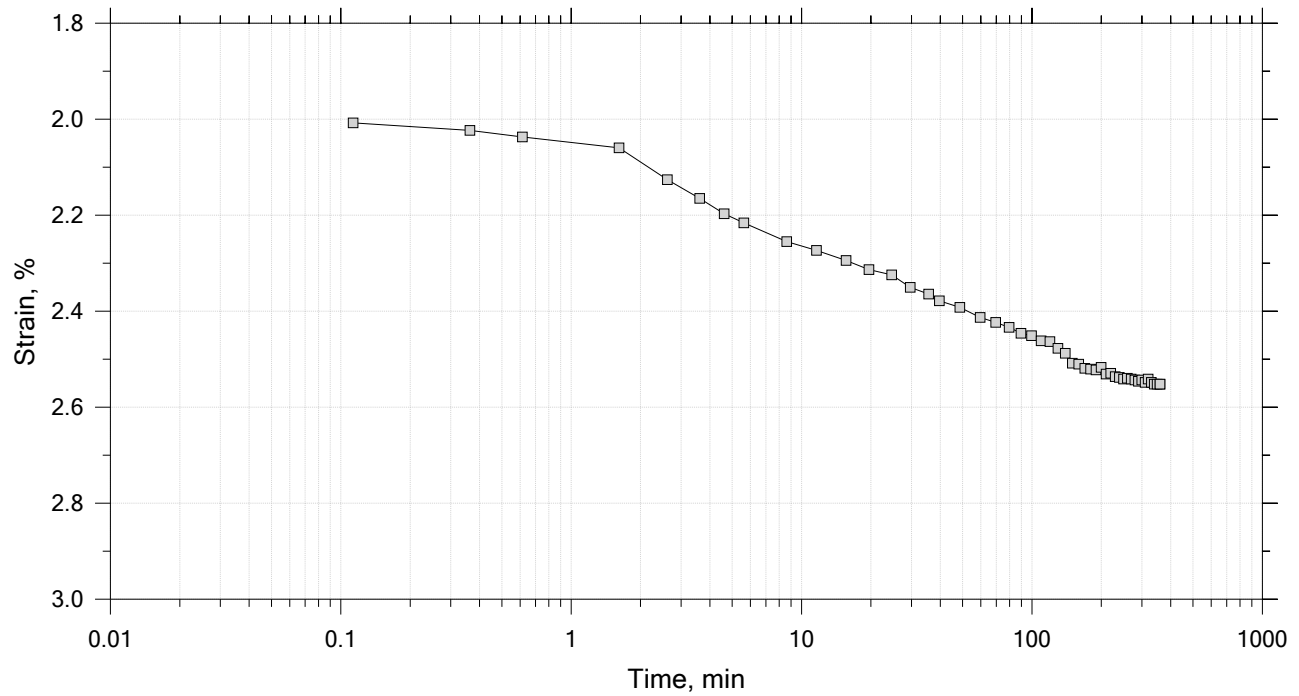
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-210	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 03/01/21	Depth: 15-17 ft
	Test No.: IP-11	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-F, Swell Pressure - 0.0667 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 2 of 21

Constant Load Step

Stress: 0.125 tsf



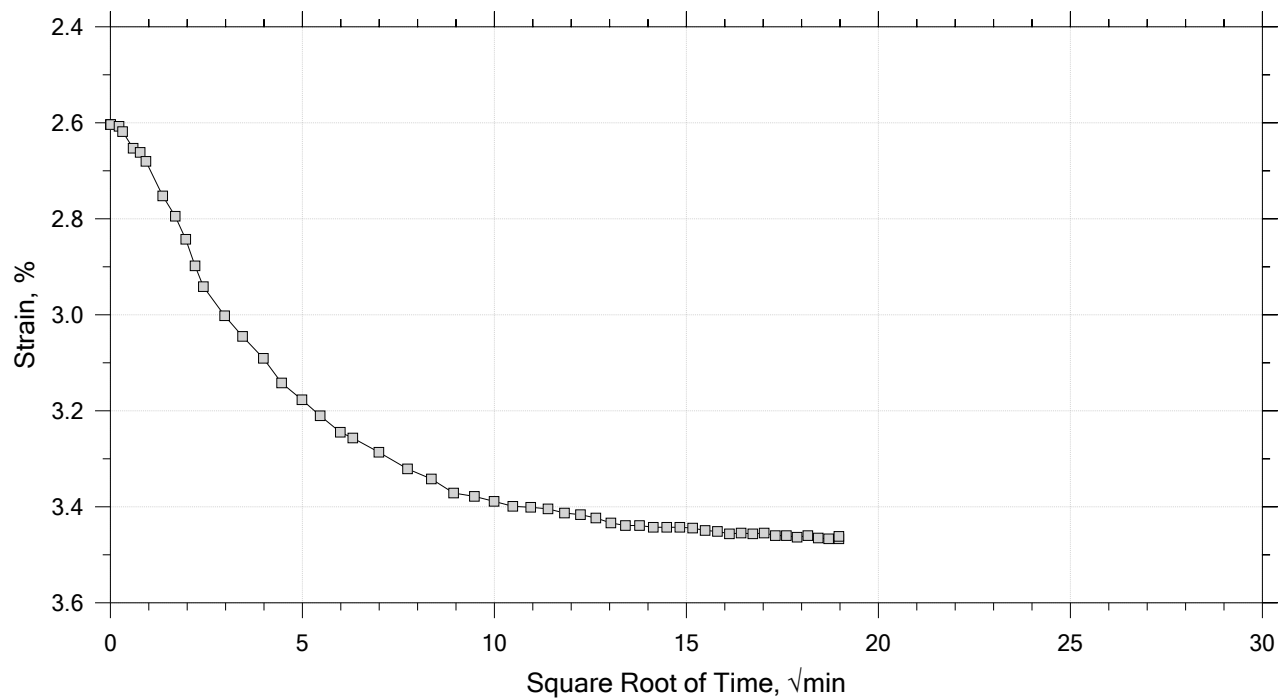
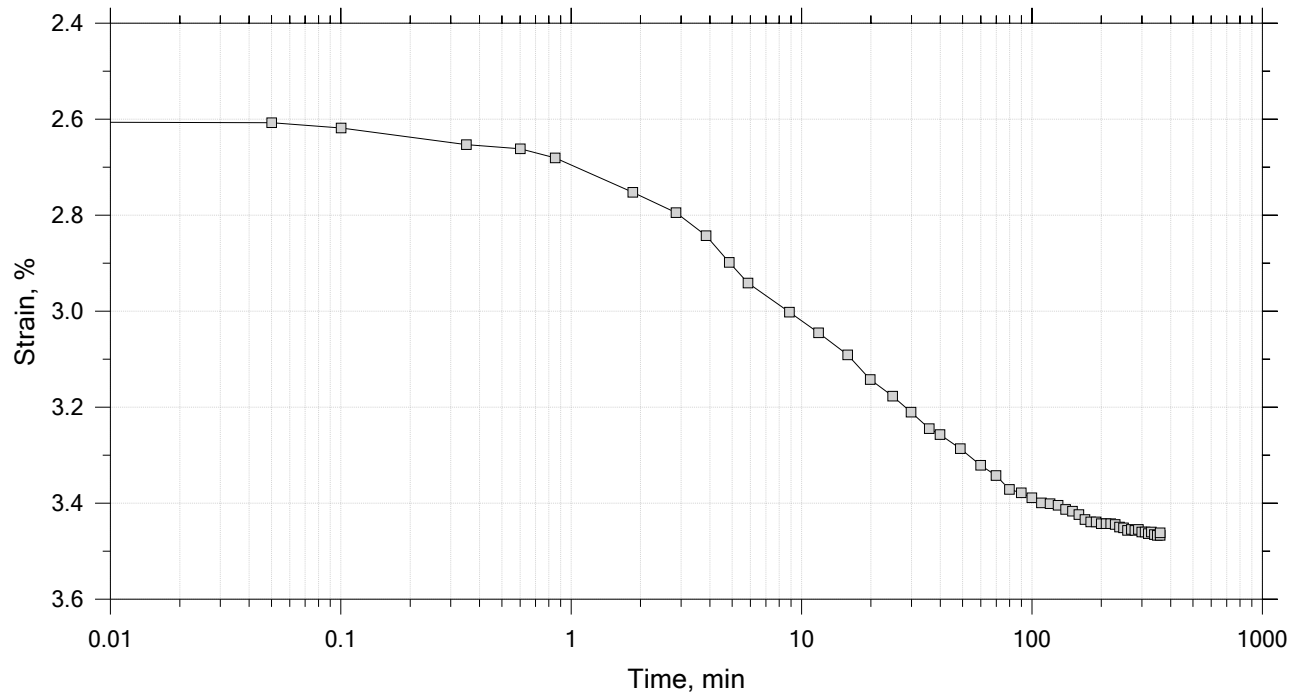
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-210	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 03/01/21	Depth: 15-17 ft
	Test No.: IP-11	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-F, Swell Pressure - 0.0667 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 3 of 21

Constant Load Step

Stress: 0.25 tsf



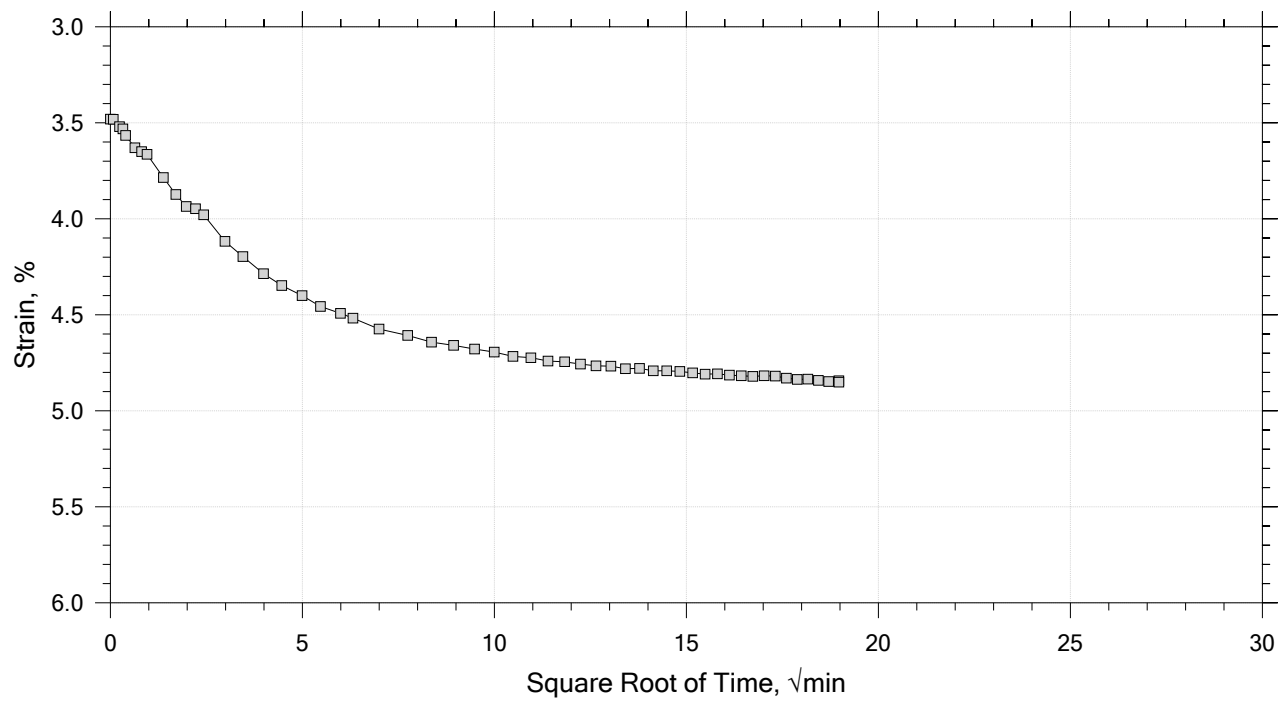
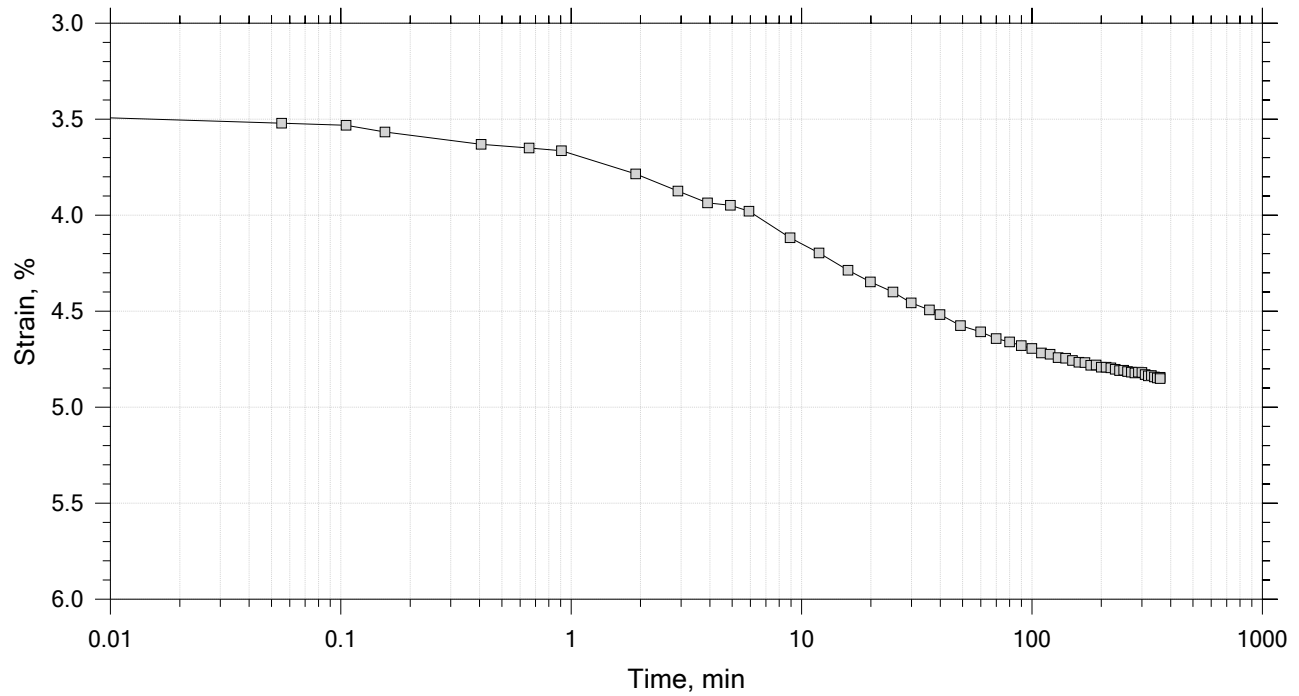
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-210	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 03/01/21	Depth: 15-17 ft
	Test No.: IP-11	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-F, Swell Pressure - 0.0667 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 4 of 21

Constant Load Step

Stress: 0.5 tsf



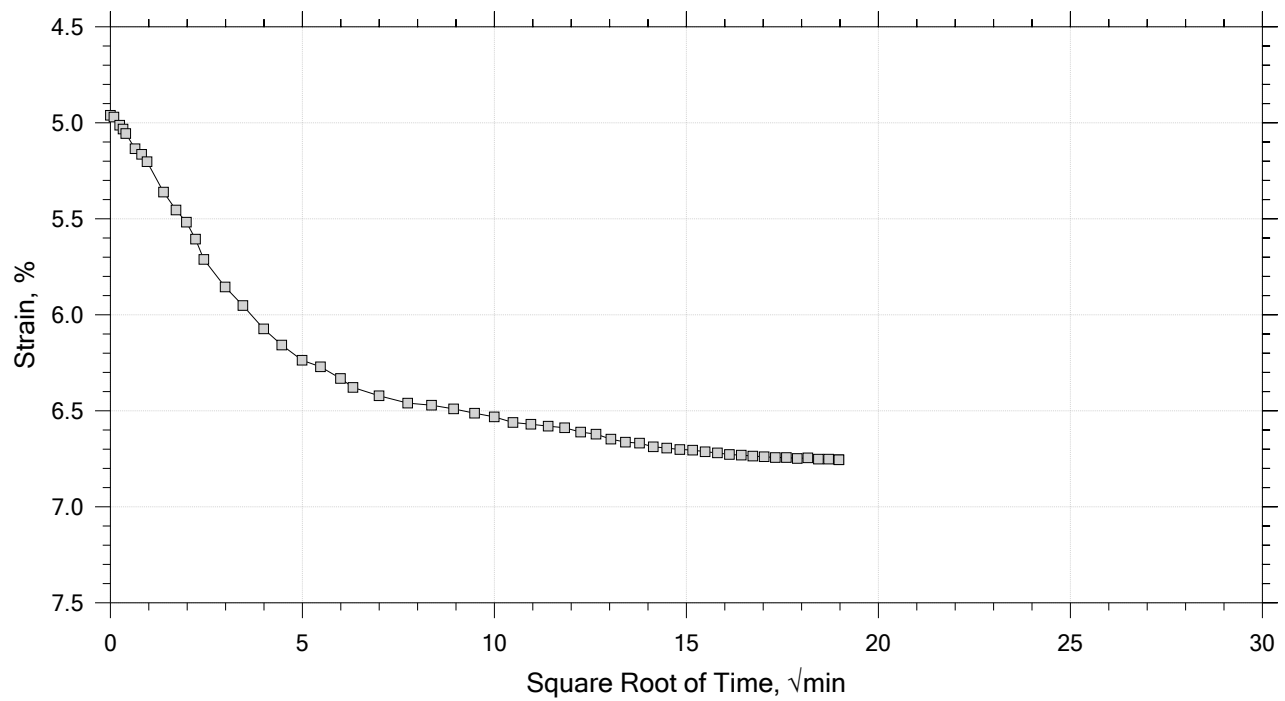
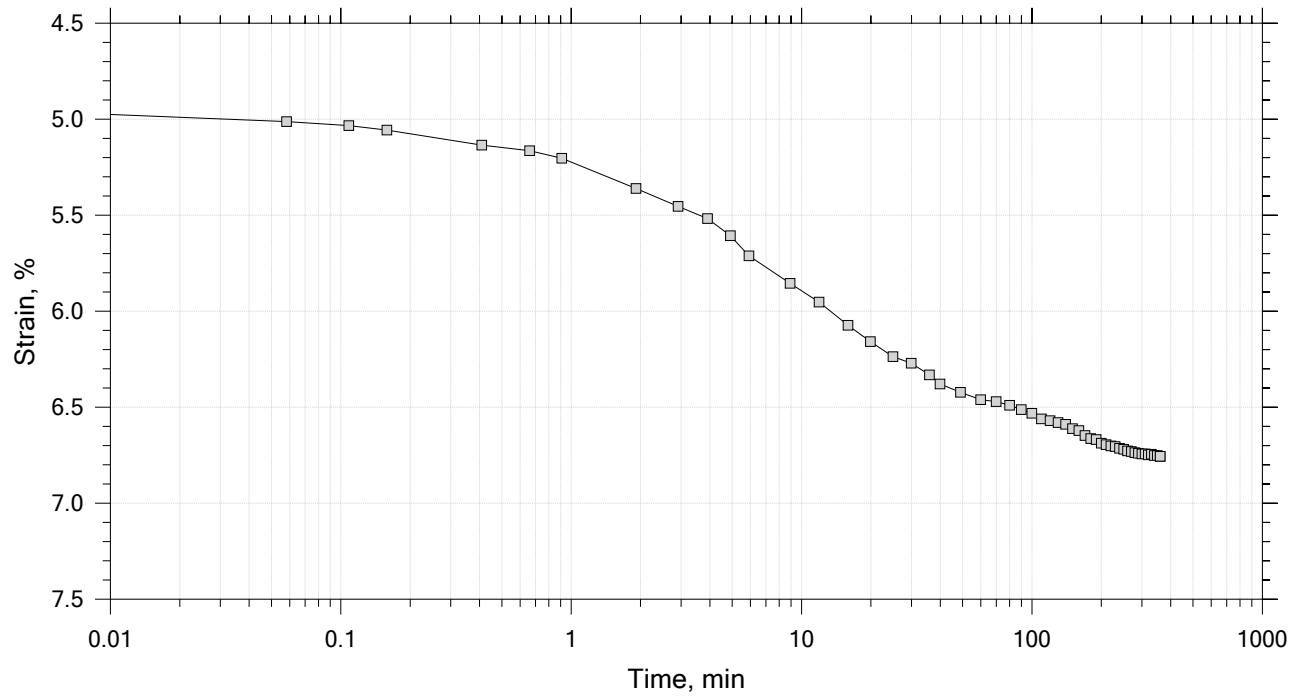
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-210	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 03/01/21	Depth: 15-17 ft
	Test No.: IP-11	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-F, Swell Pressure - 0.0667 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 5 of 21

Constant Load Step

Stress: 1 tsf



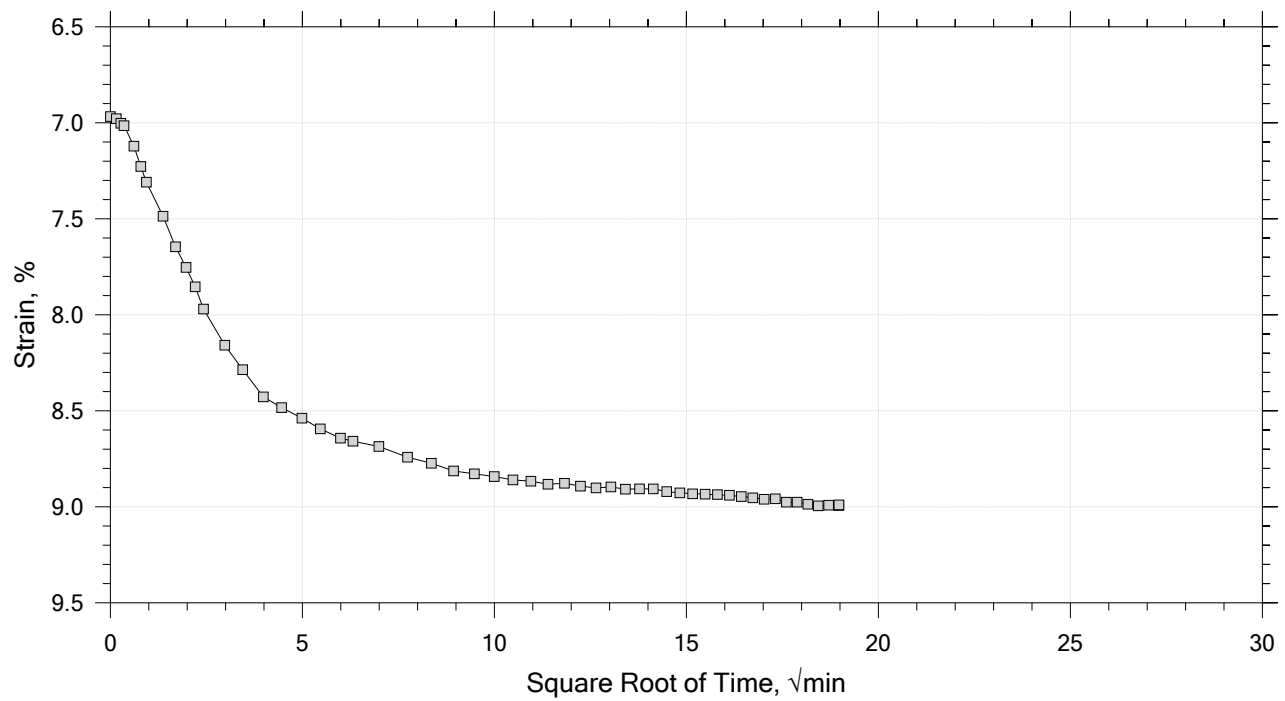
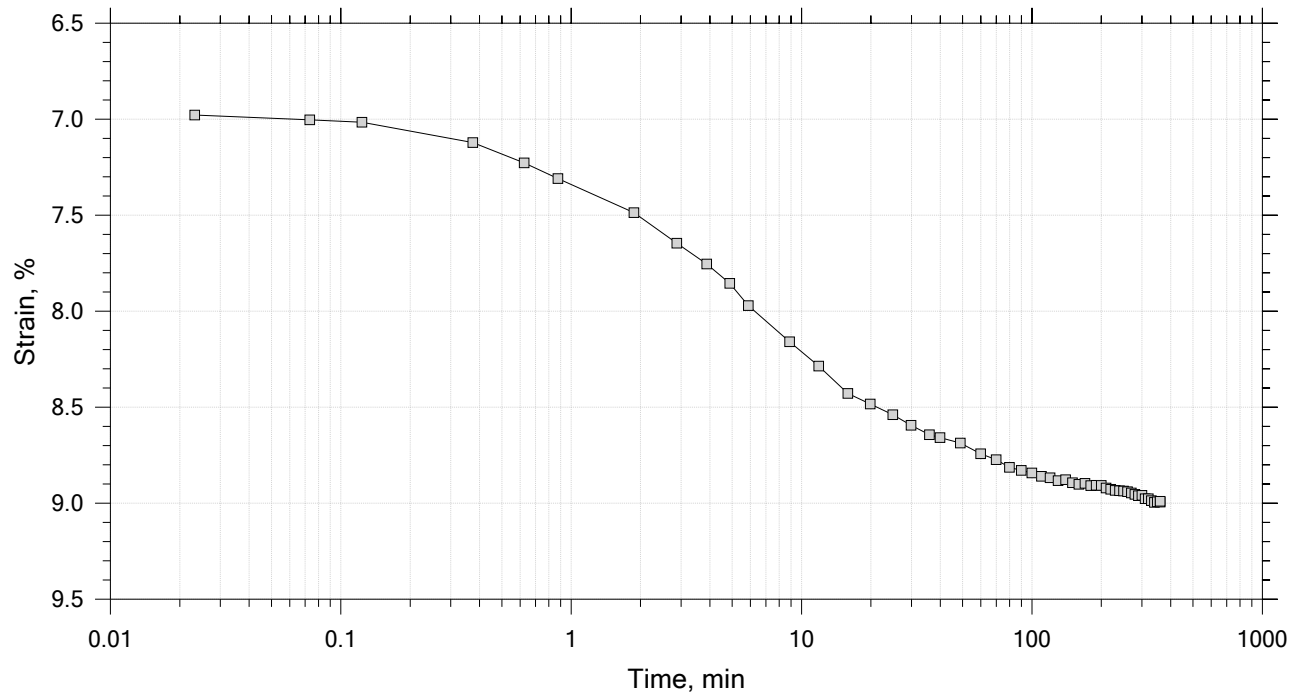
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-210	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 03/01/21	Depth: 15-17 ft
	Test No.: IP-11	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-F, Swell Pressure - 0.0667 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 6 of 21

Constant Load Step

Stress: 2 tsf



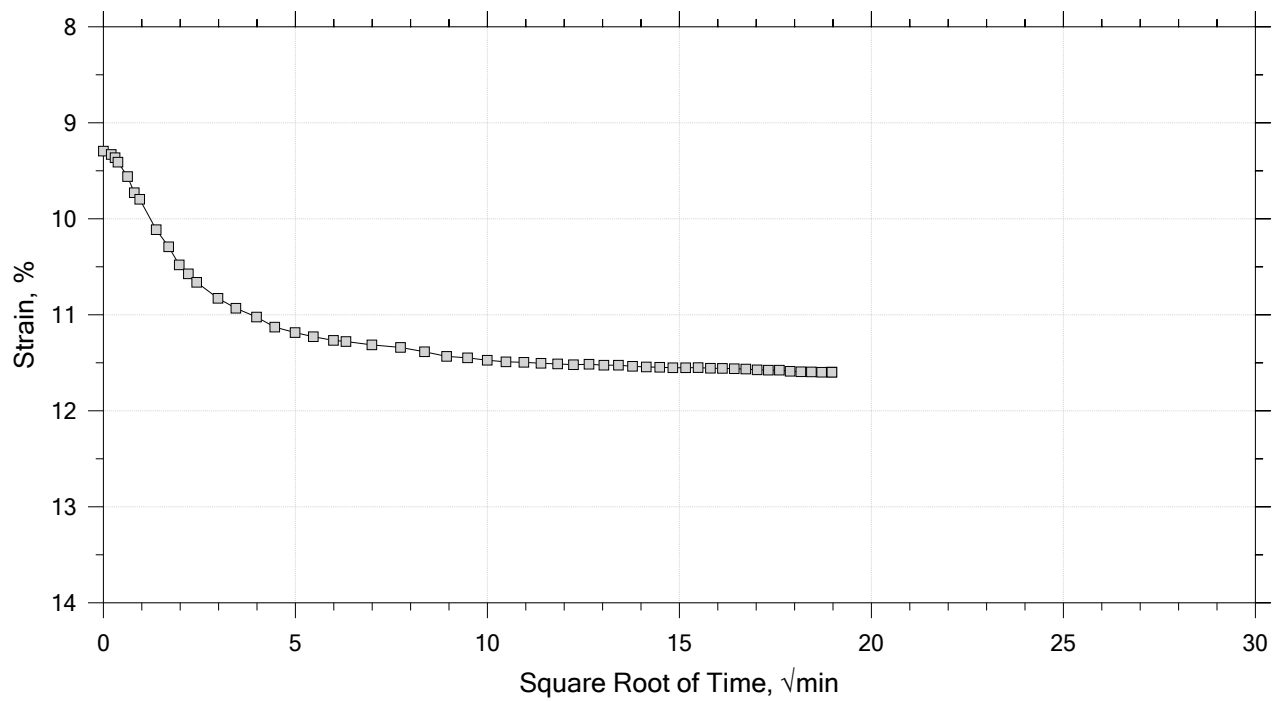
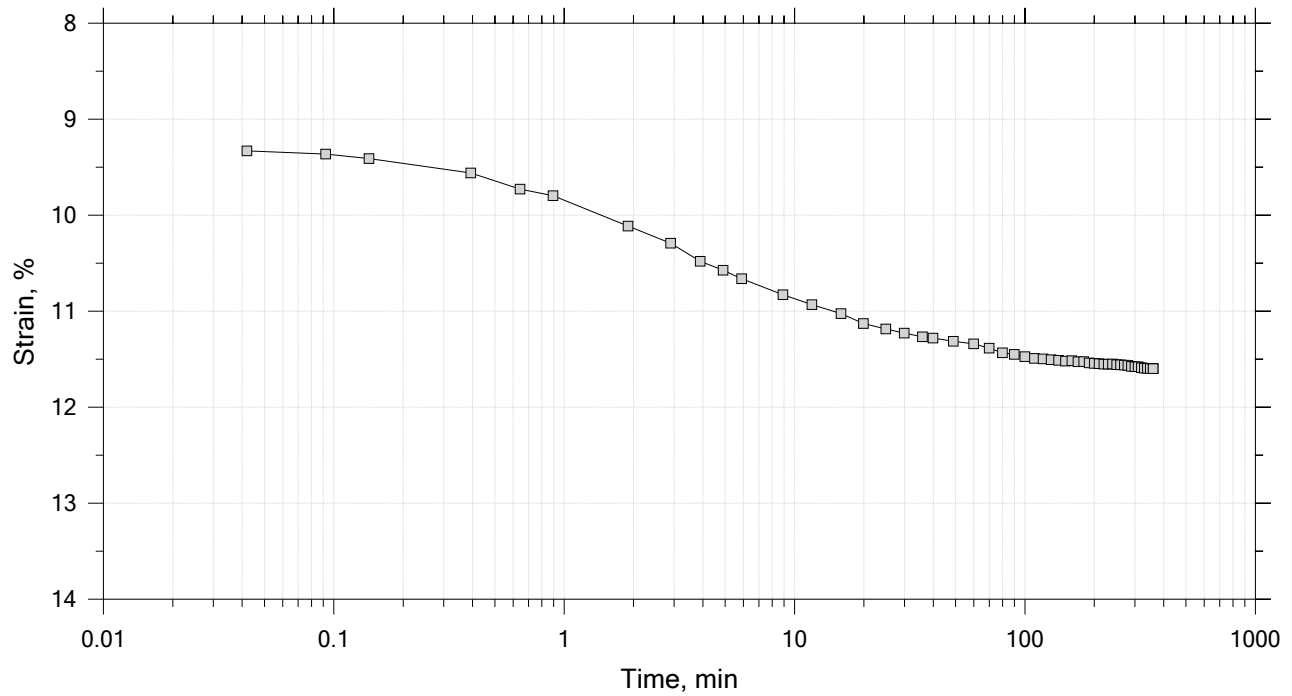
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-210	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 03/01/21	Depth: 15-17 ft
	Test No.: IP-11	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-F, Swell Pressure - 0.0667 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 7 of 21

Constant Load Step

Stress: 4 tsf



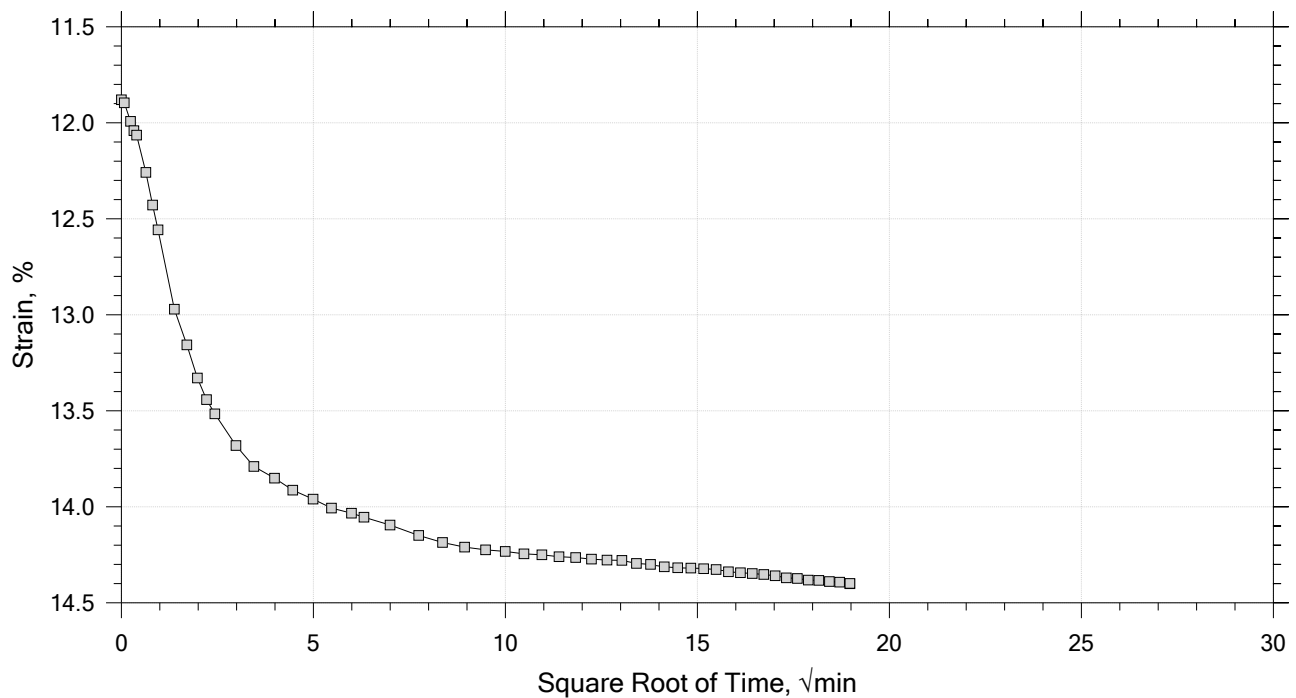
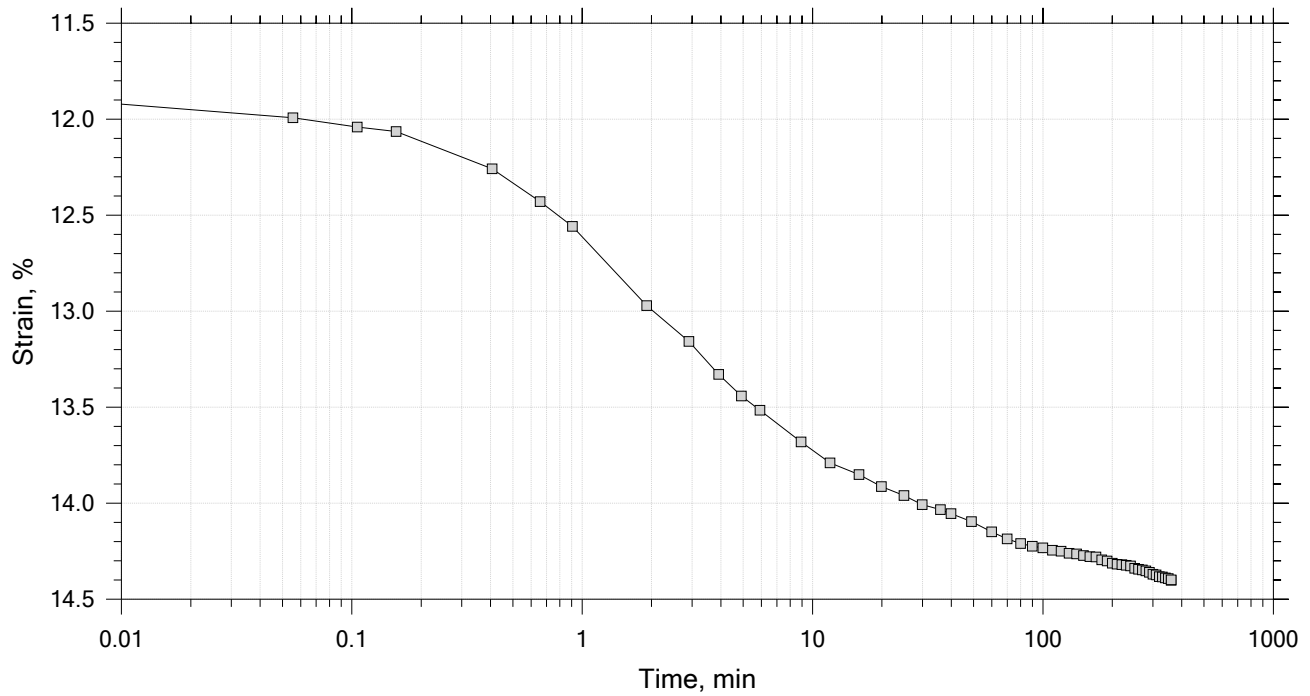
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-210	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 03/01/21	Depth: 15-17 ft
	Test No.: IP-11	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-F, Swell Pressure - 0.0667 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 8 of 21

Constant Load Step

Stress: 8 tsf



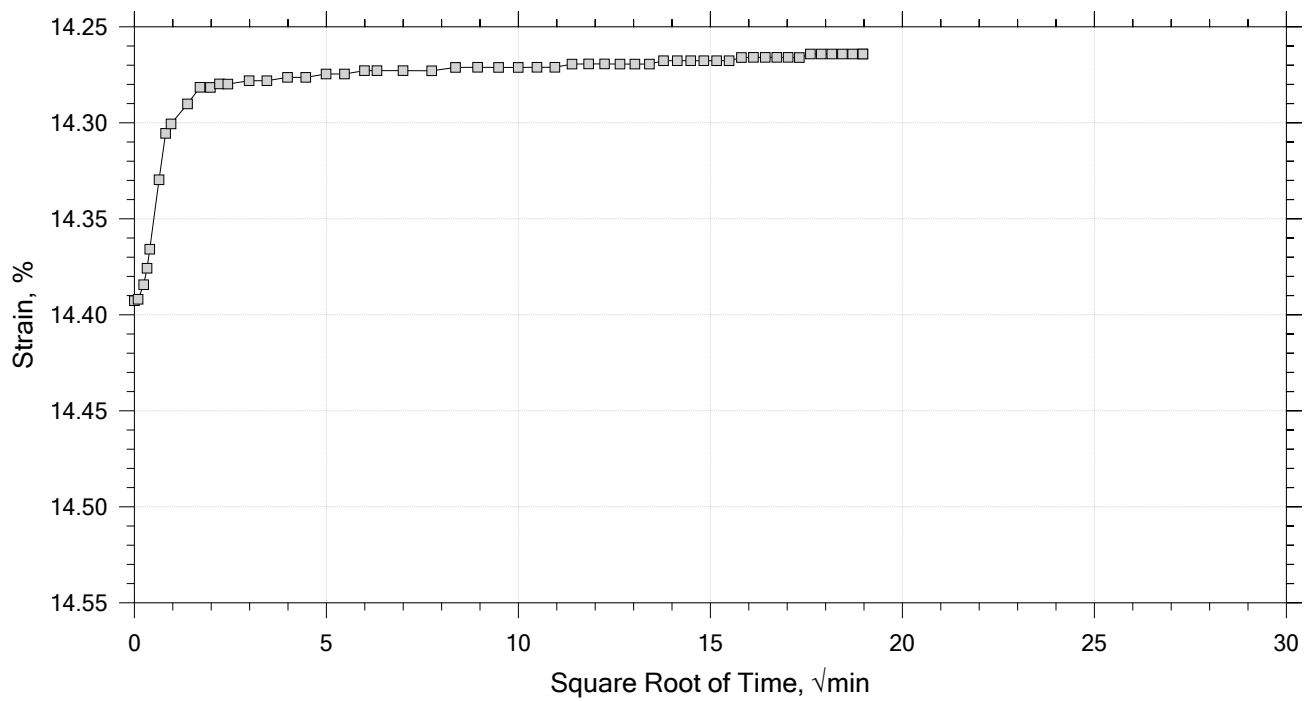
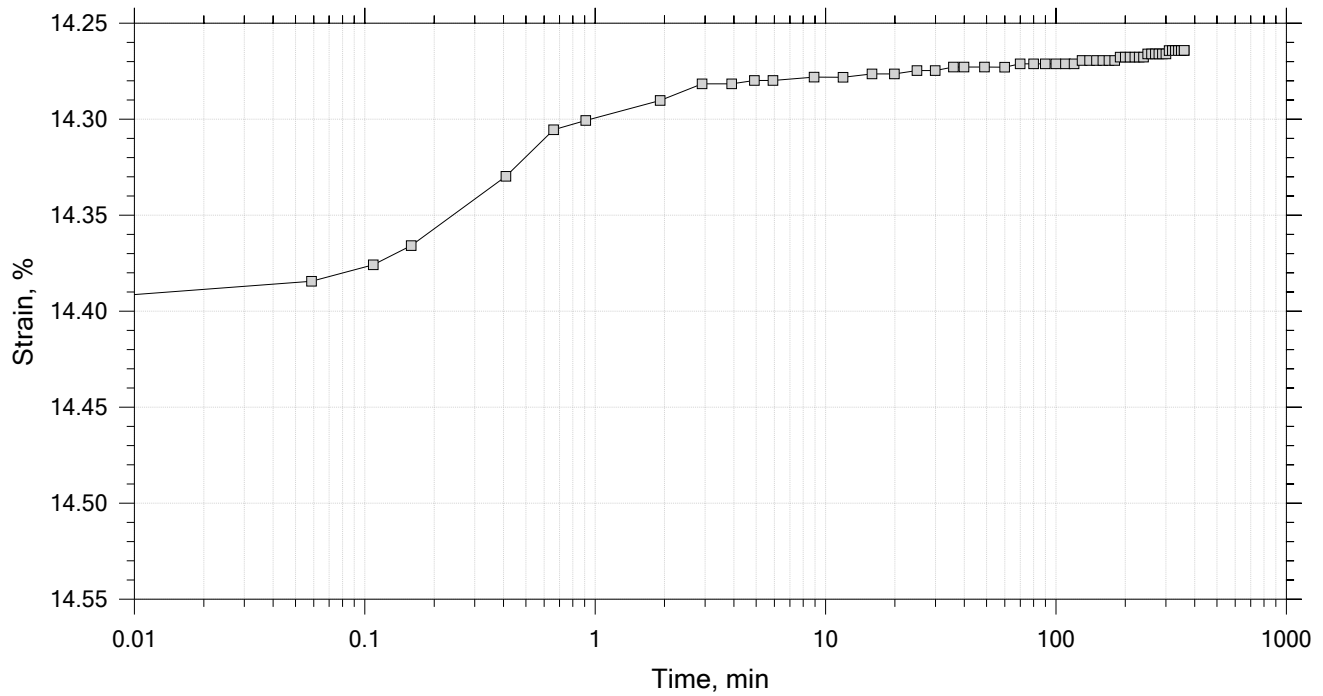
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-210	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 03/01/21	Depth: 15-17 ft
	Test No.: IP-11	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-F, Swell Pressure - 0.0667 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 9 of 21

Constant Load Step

Stress: 4 tsf



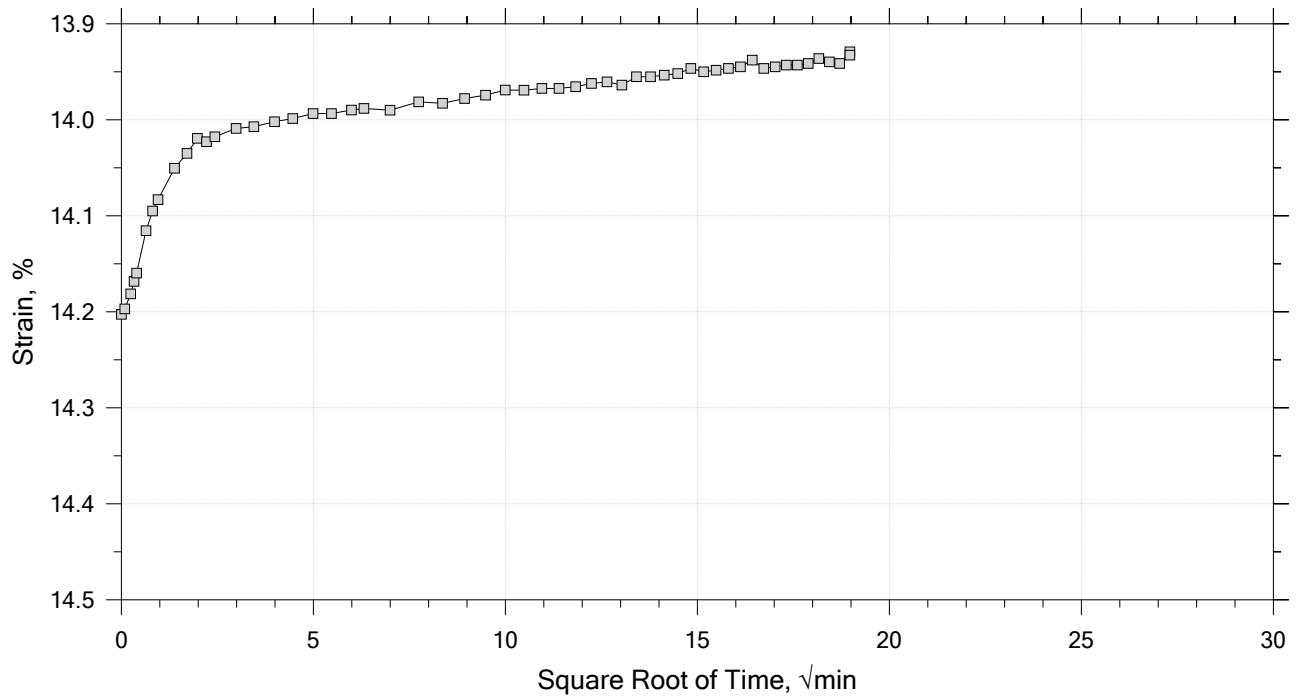
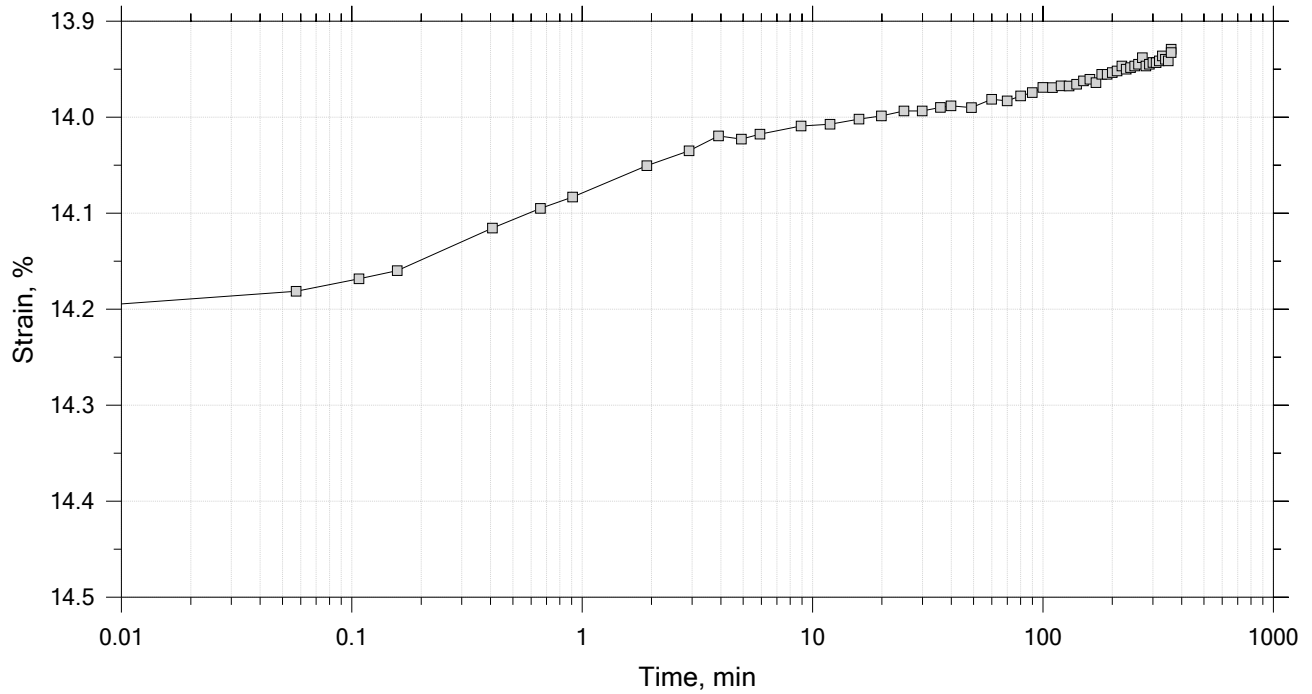
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-210	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 03/01/21	Depth: 15-17 ft
	Test No.: IP-11	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-F, Swell Pressure - 0.0667 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 10 of 21

Constant Load Step

Stress: 2 tsf



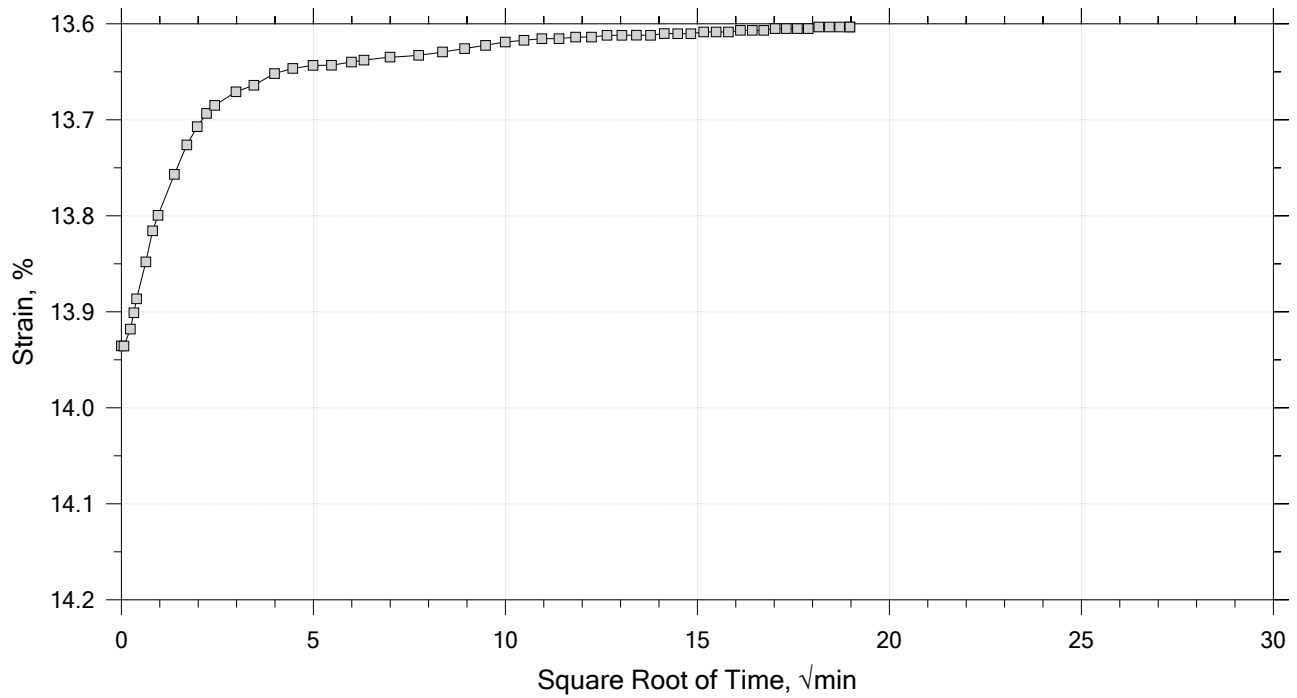
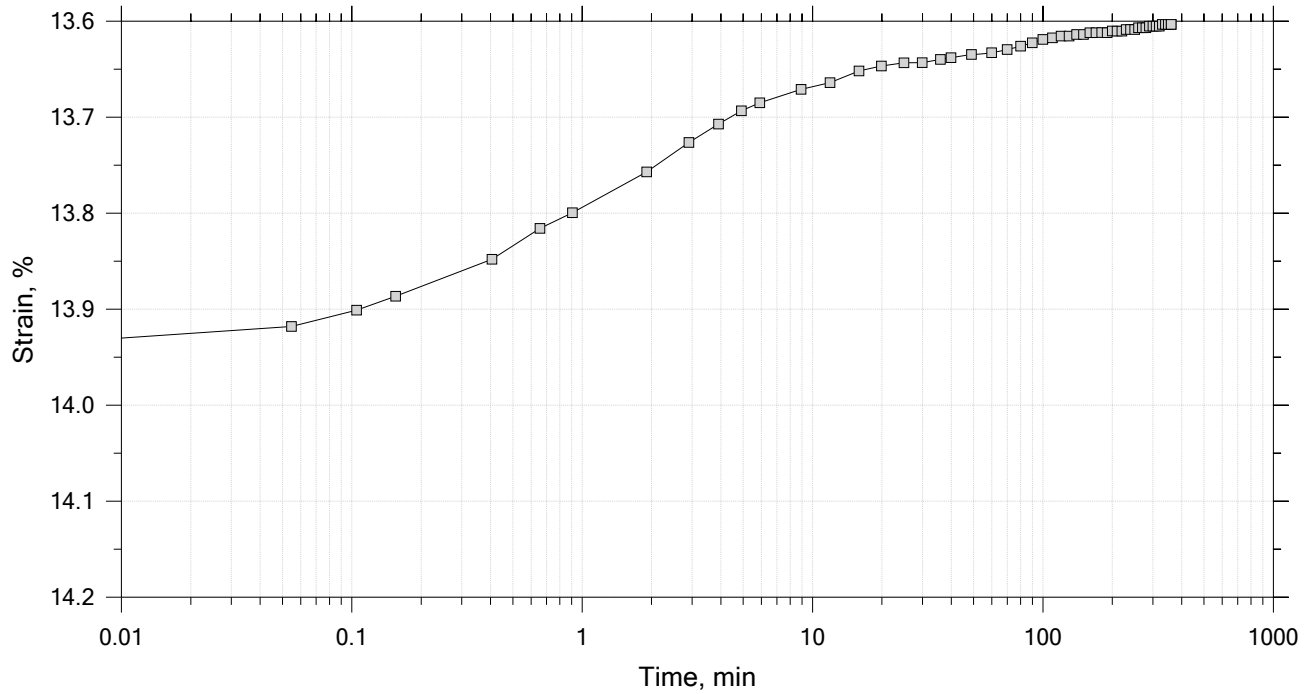
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-210	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 03/01/21	Depth: 15-17 ft
	Test No.: IP-11	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-F, Swell Pressure - 0.0667 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 11 of 21

Constant Load Step

Stress: 1 tsf



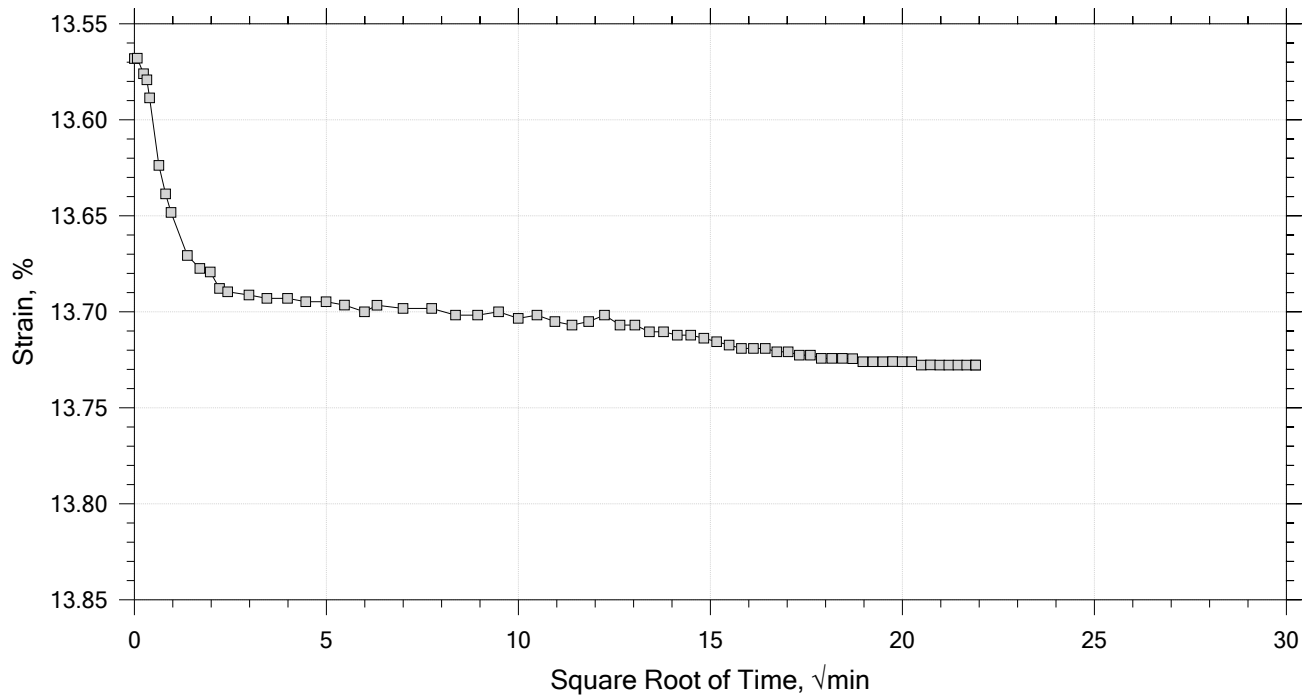
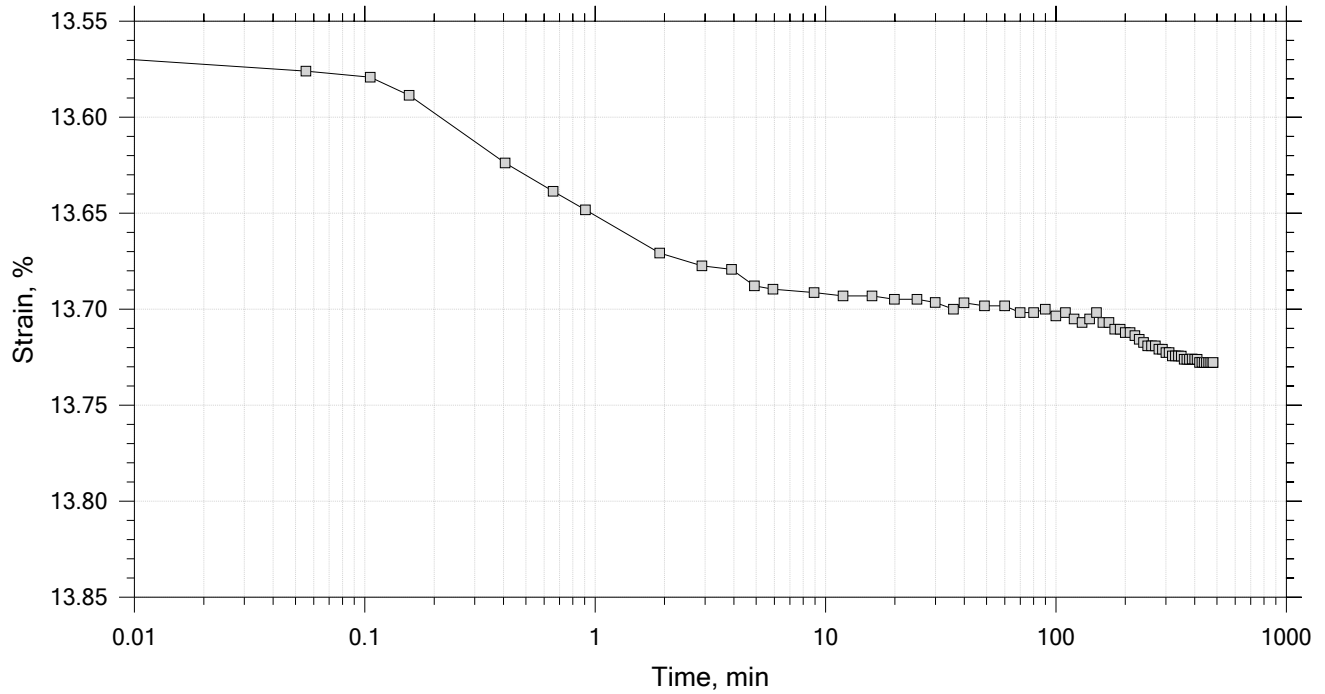
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-210	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 03/01/21	Depth: 15-17 ft
	Test No.: IP-11	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-F, Swell Pressure - 0.0667 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 12 of 21

Constant Load Step

Stress: 2 tsf



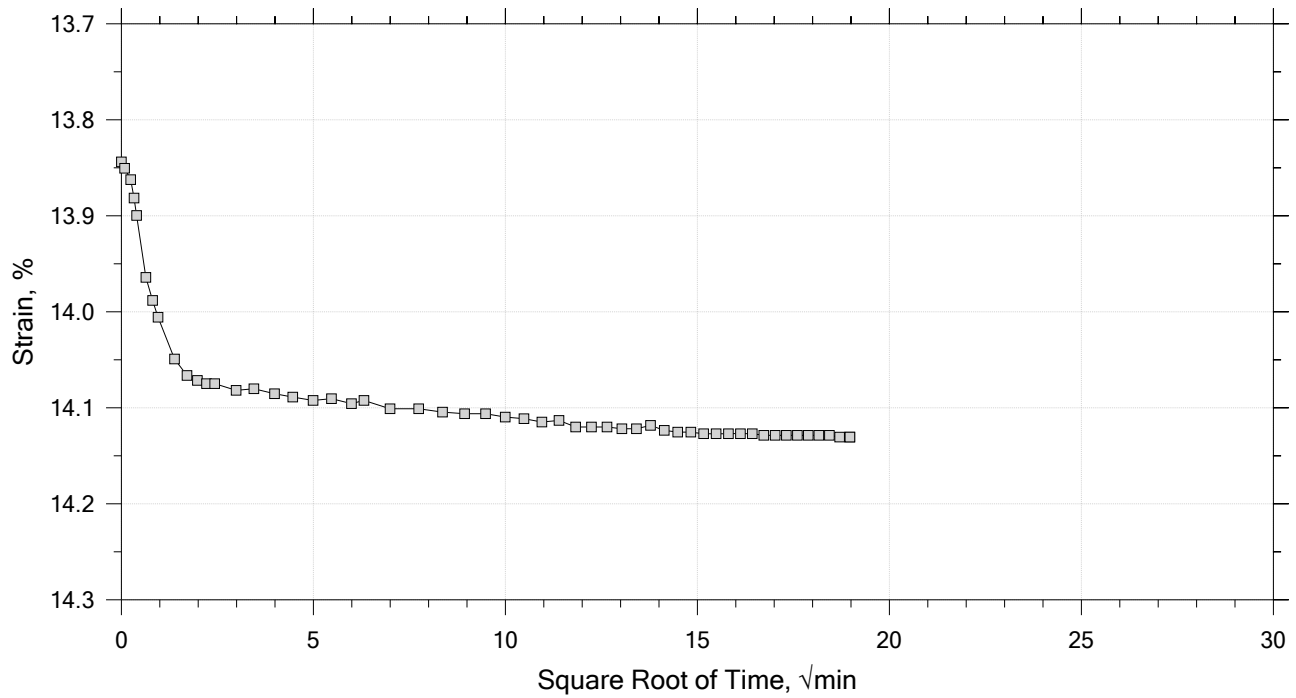
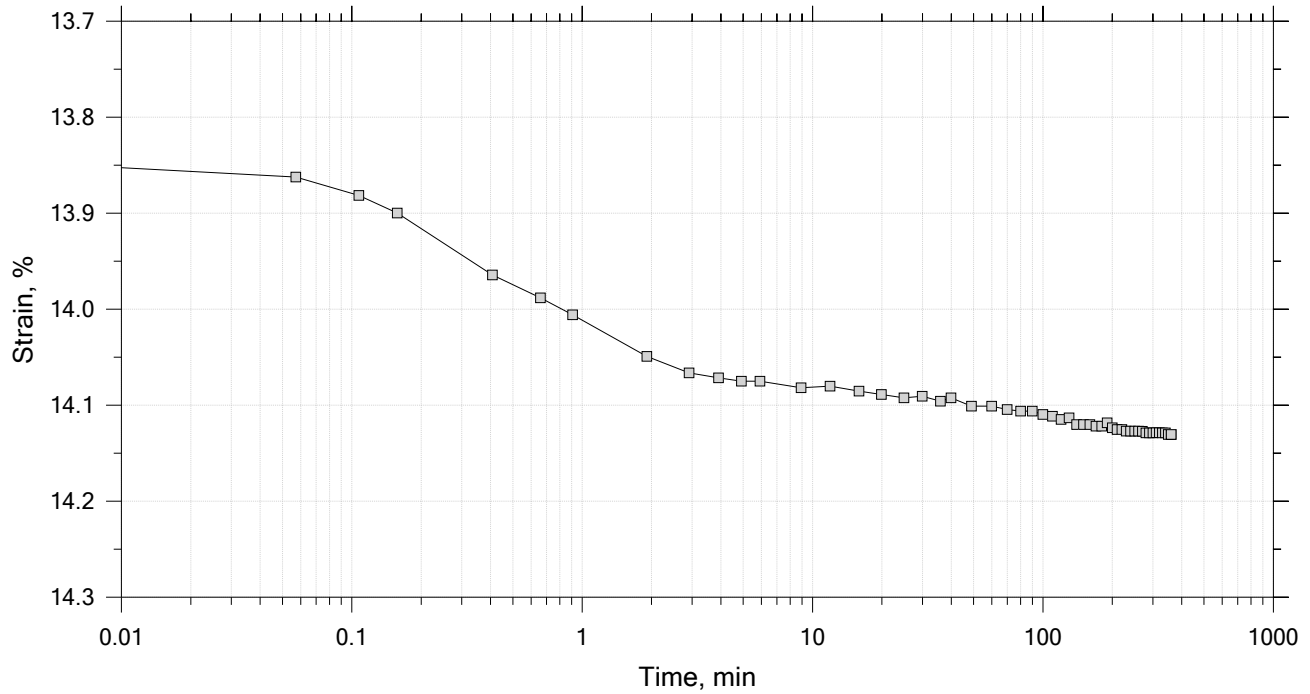
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-210	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 03/01/21	Depth: 15-17 ft
	Test No.: IP-11	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-F, Swell Pressure - 0.0667 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 13 of 21

Constant Load Step

Stress: 4 tsf



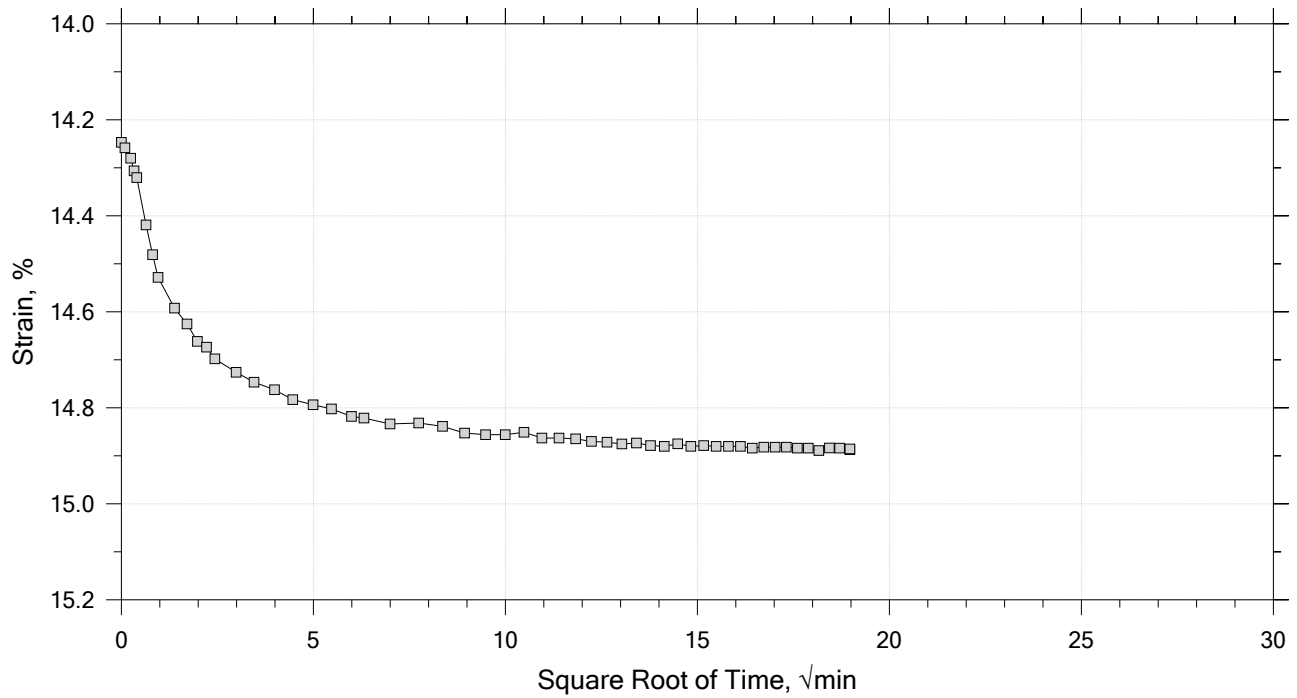
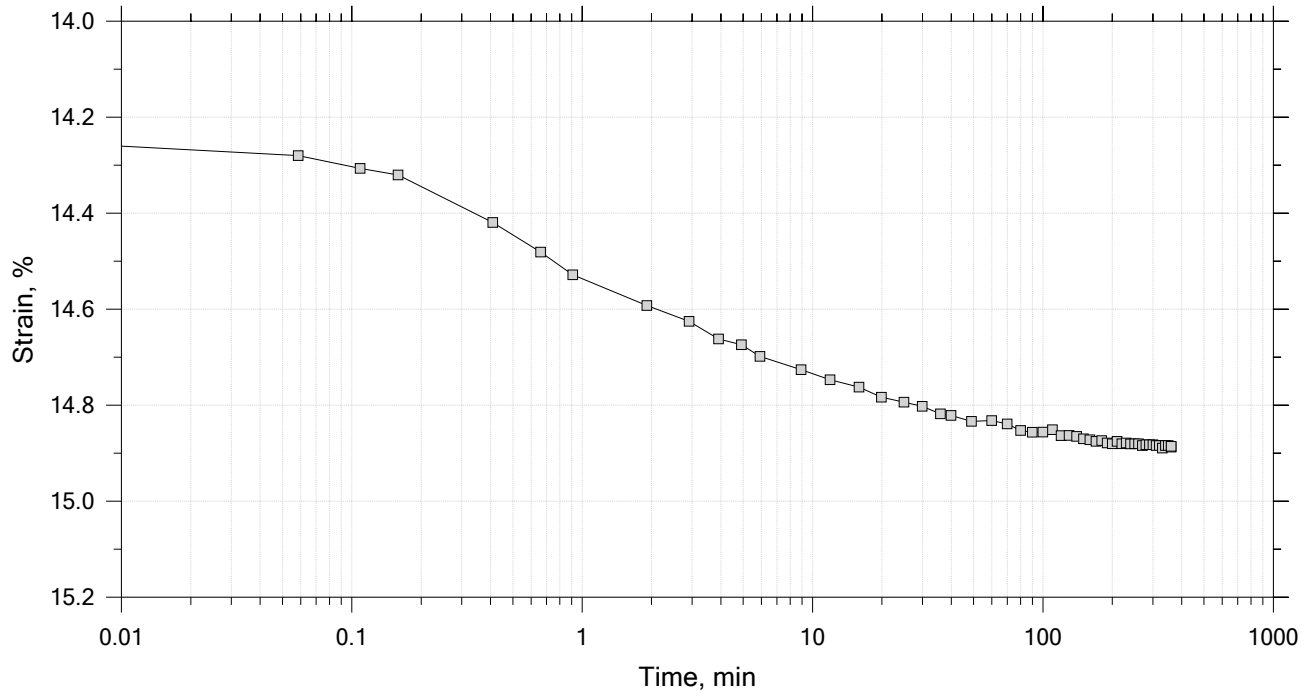
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-210	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 03/01/21	Depth: 15-17 ft
	Test No.: IP-11	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-F, Swell Pressure - 0.0667 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 14 of 21

Constant Load Step

Stress: 8 tsf



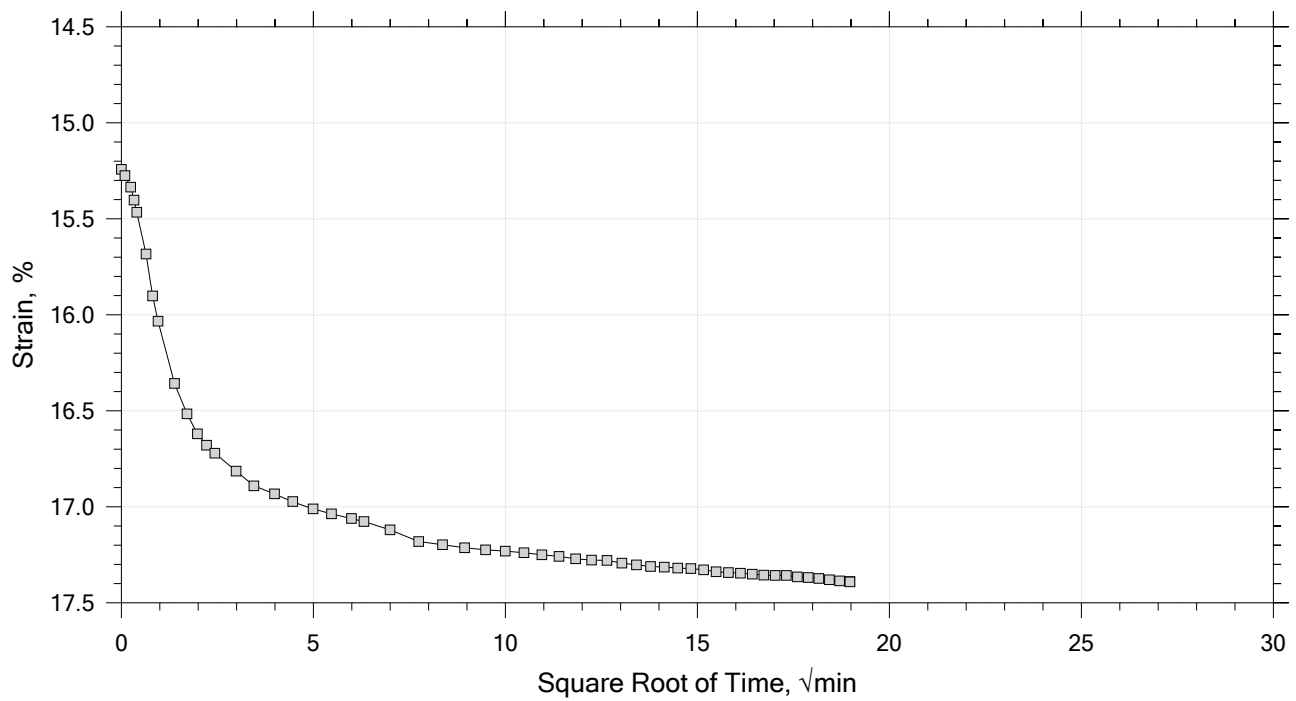
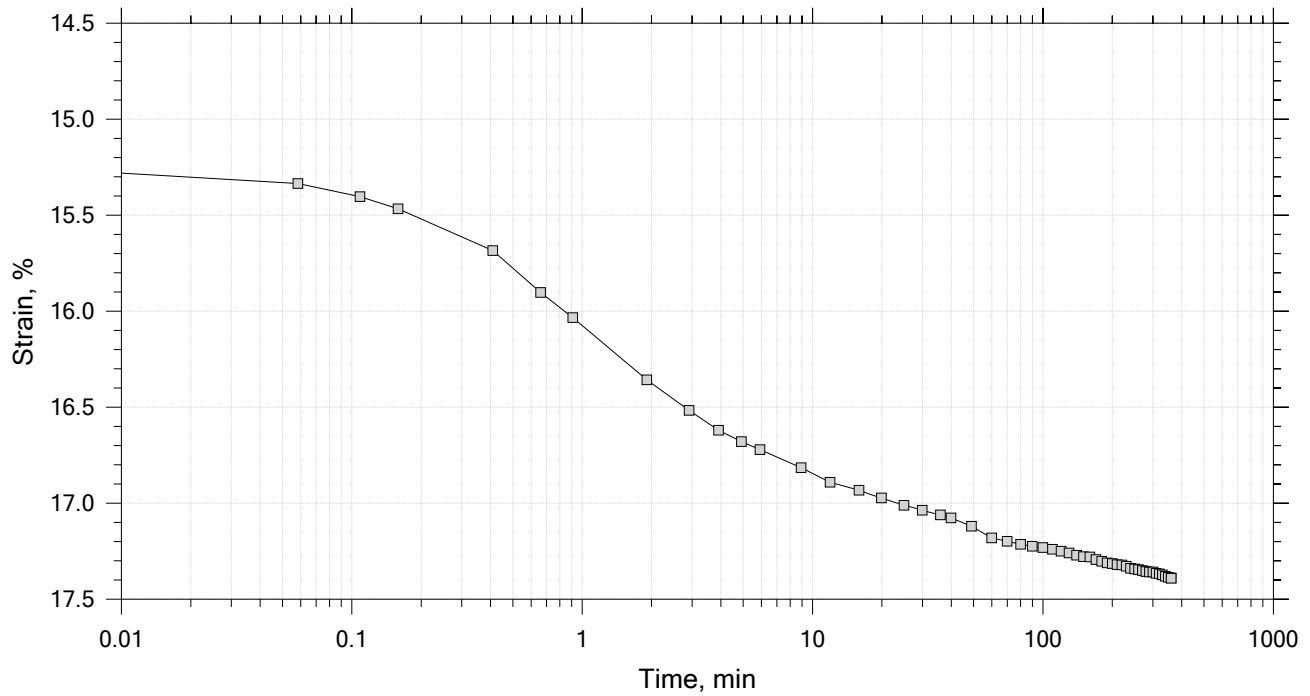
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-210	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 03/01/21	Depth: 15-17 ft
	Test No.: IP-11	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-F, Swell Pressure - 0.0667 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 15 of 21

Constant Load Step

Stress: 16 tsf



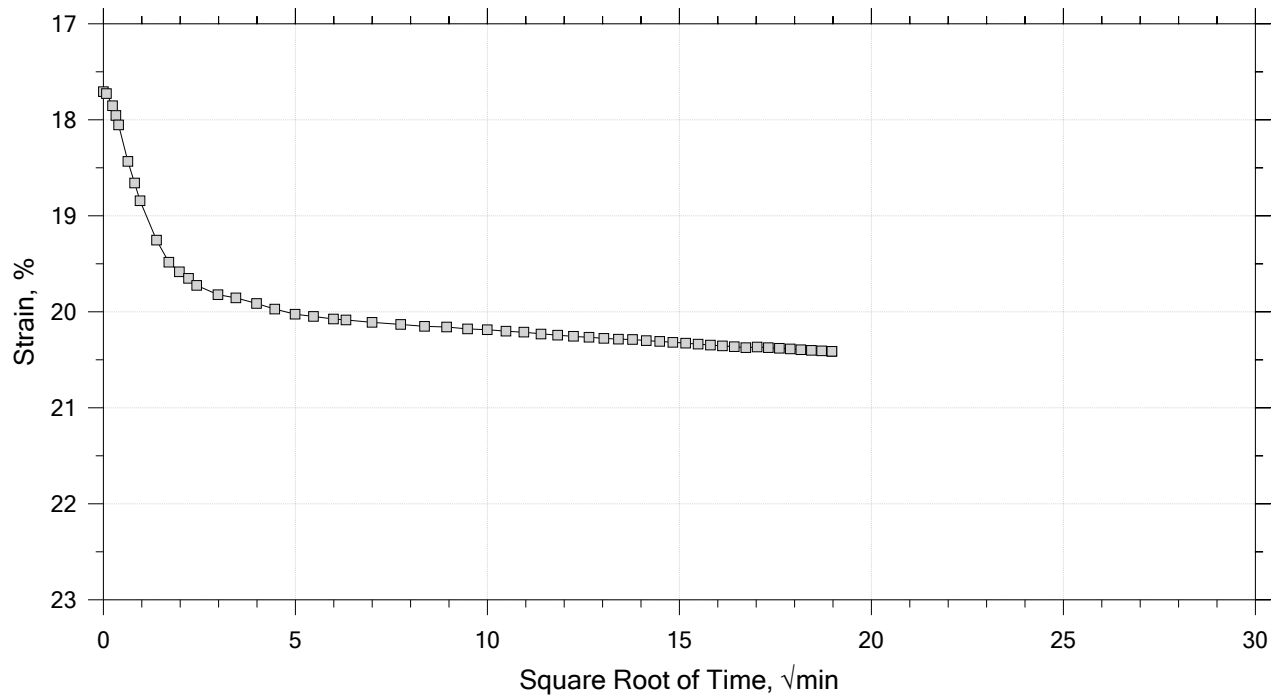
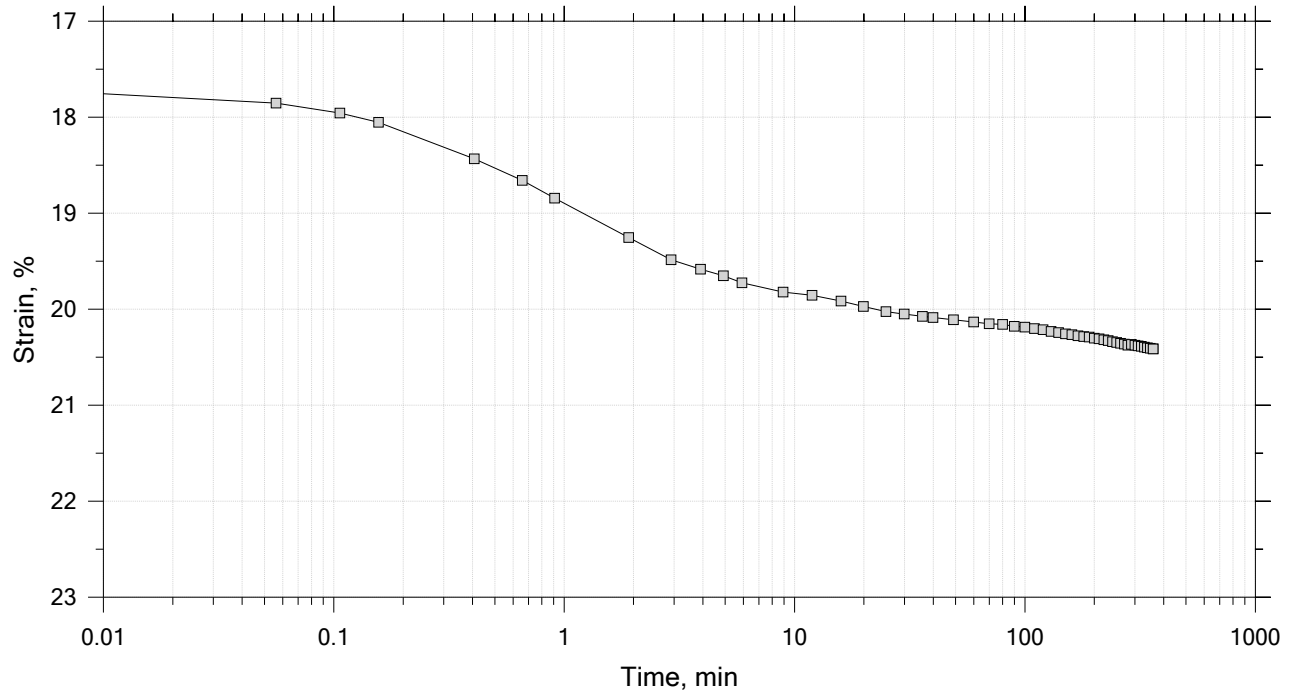
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-210	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 03/01/21	Depth: 15-17 ft
	Test No.: IP-11	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-F, Swell Pressure - 0.0667 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 16 of 21

Constant Load Step

Stress: 32 tsf



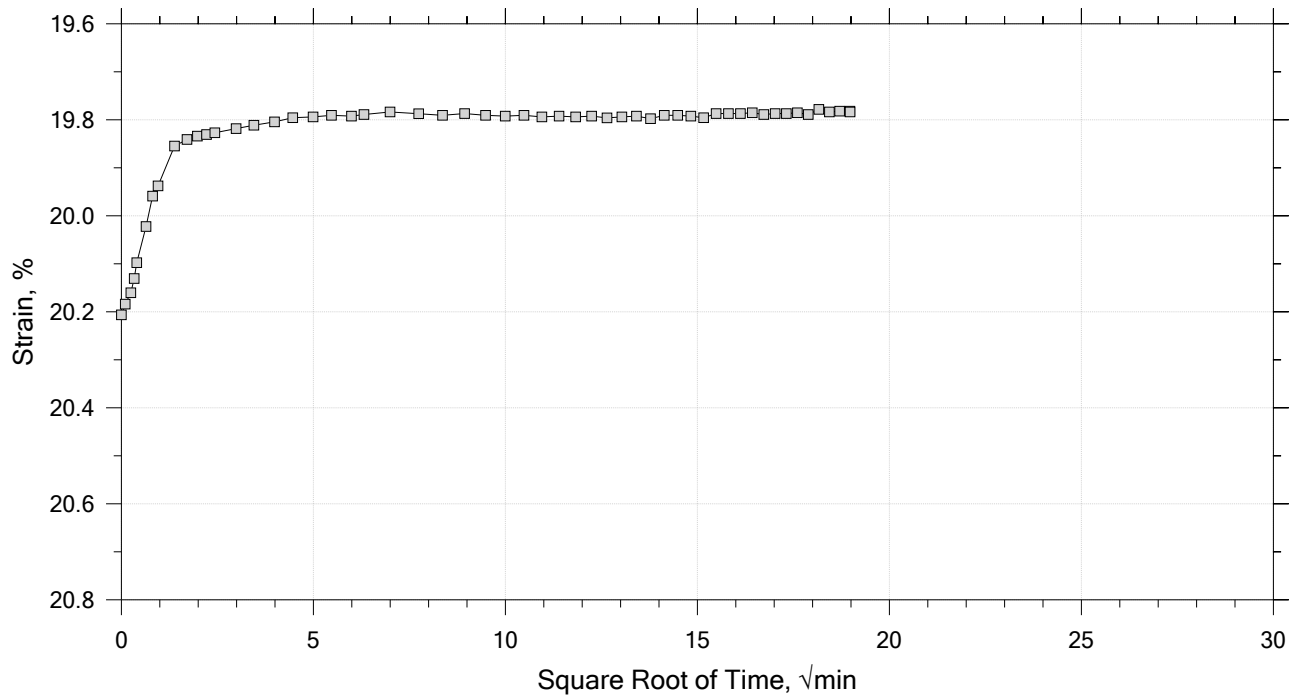
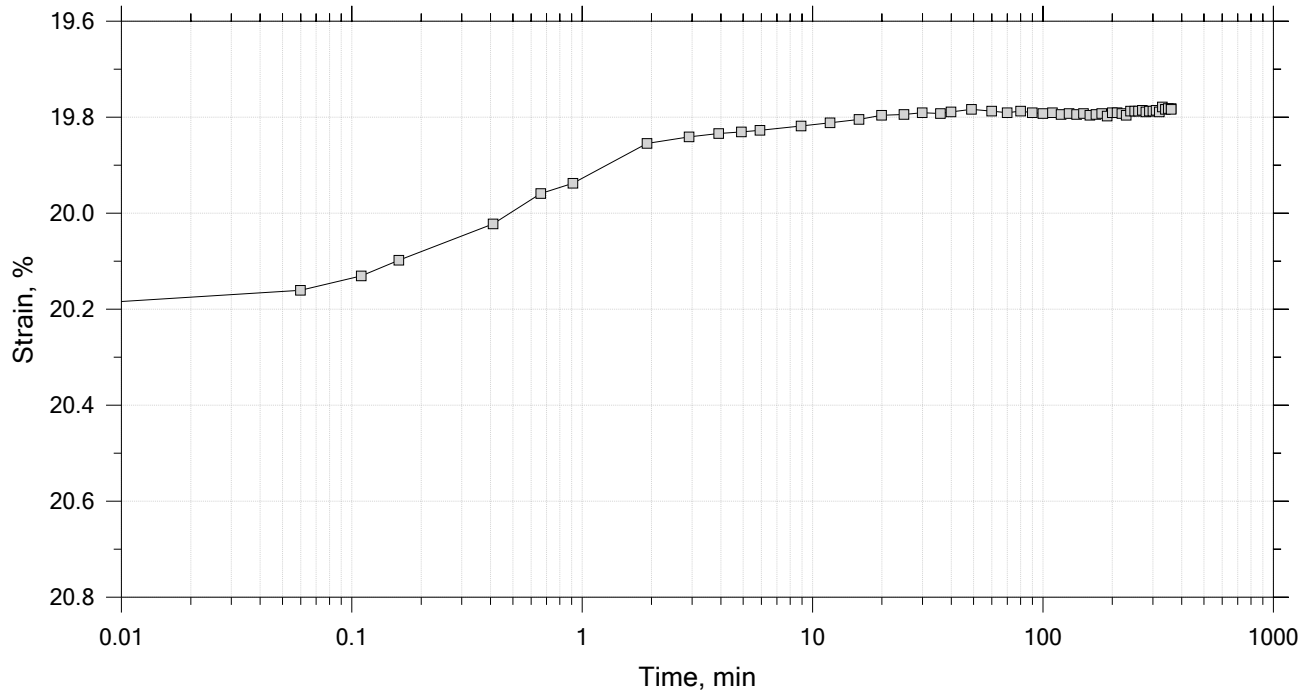
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-210	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 03/01/21	Depth: 15-17 ft
	Test No.: IP-11	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-F, Swell Pressure - 0.0667 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 17 of 21

Constant Load Step

Stress: 8 tsf



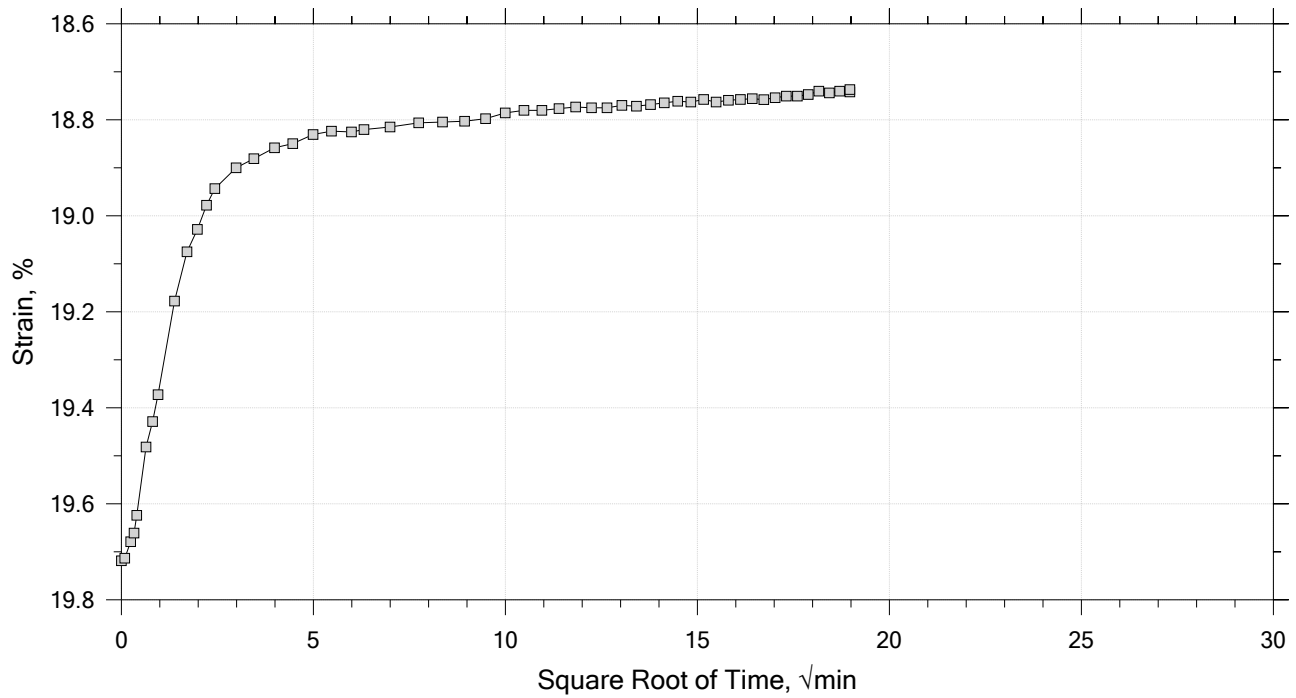
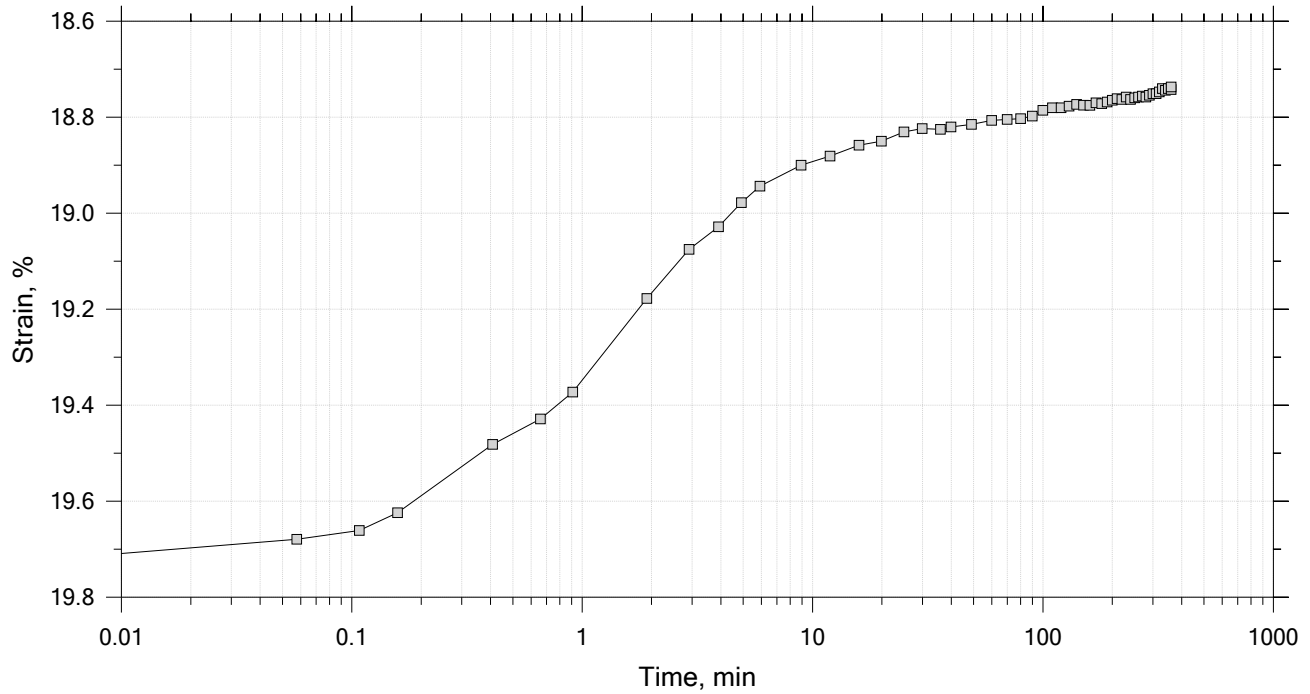
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-210	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 03/01/21	Depth: 15-17 ft
	Test No.: IP-11	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-F, Swell Pressure - 0.0667 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 18 of 21

Constant Load Step

Stress: 2 tsf



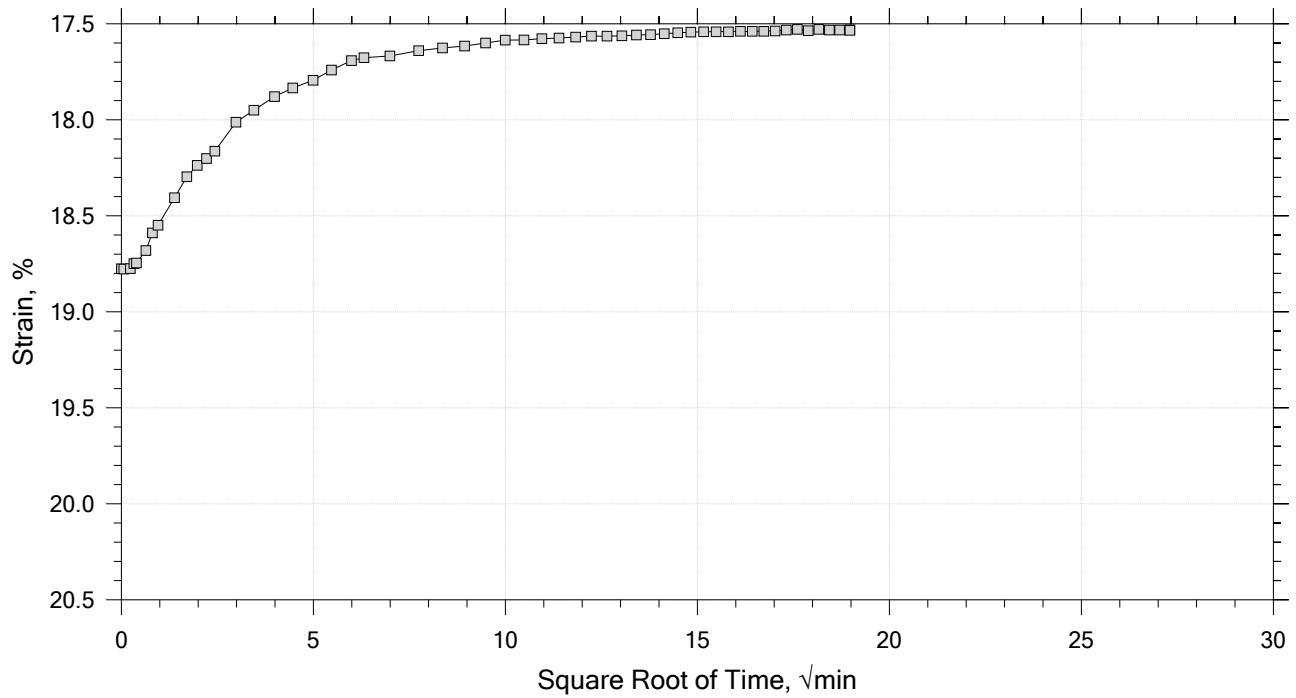
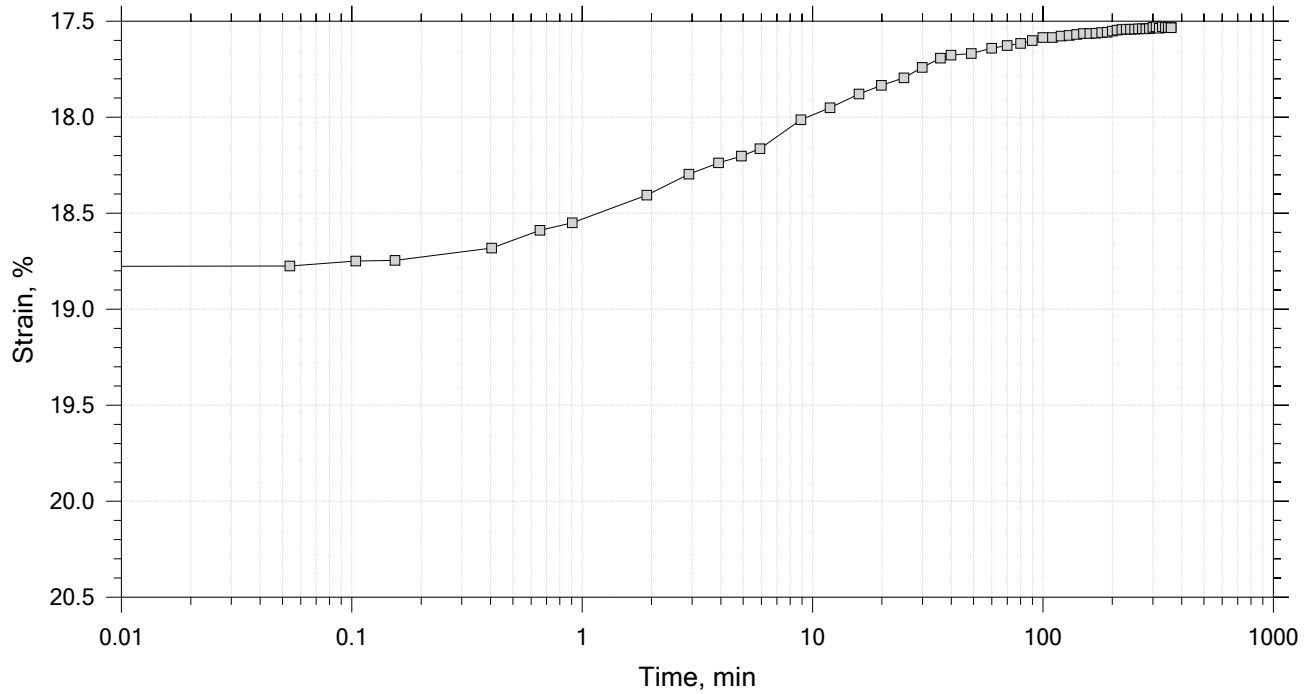
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-210	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 03/01/21	Depth: 15-17 ft
	Test No.: IP-11	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-F, Swell Pressure - 0.0667 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 19 of 21

Constant Load Step

Stress: 0.5 tsf



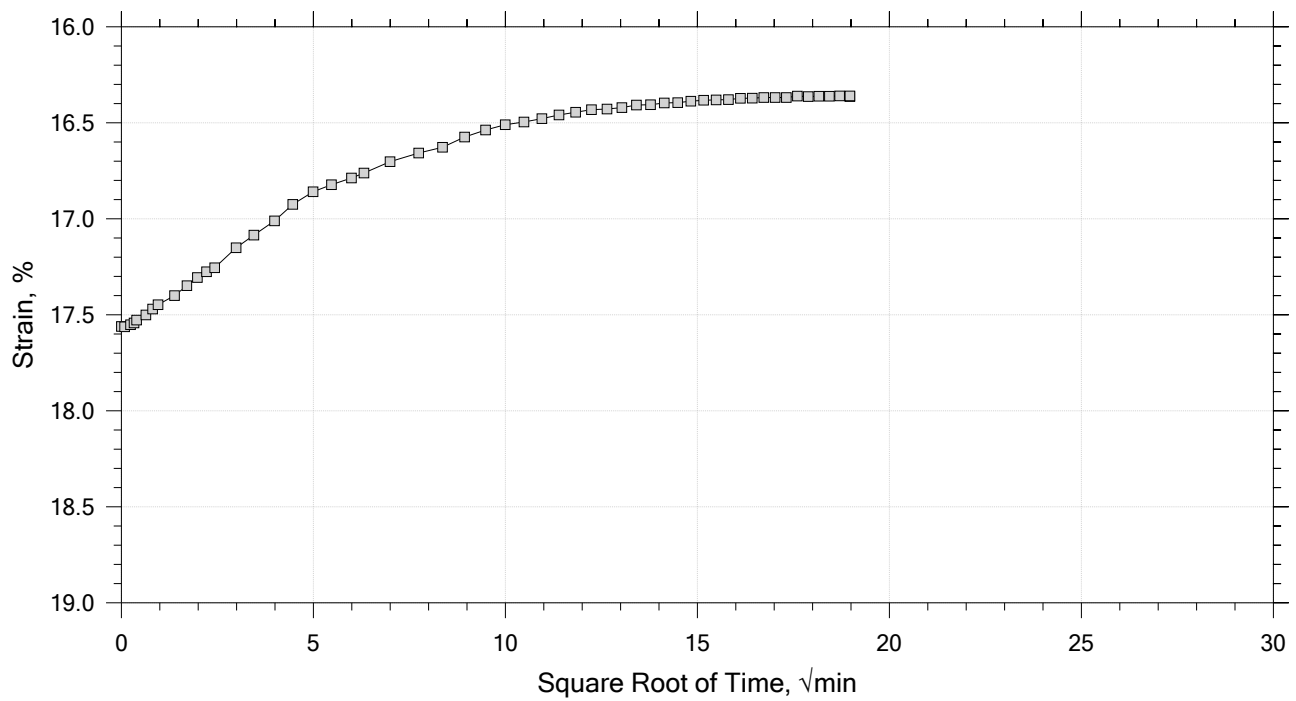
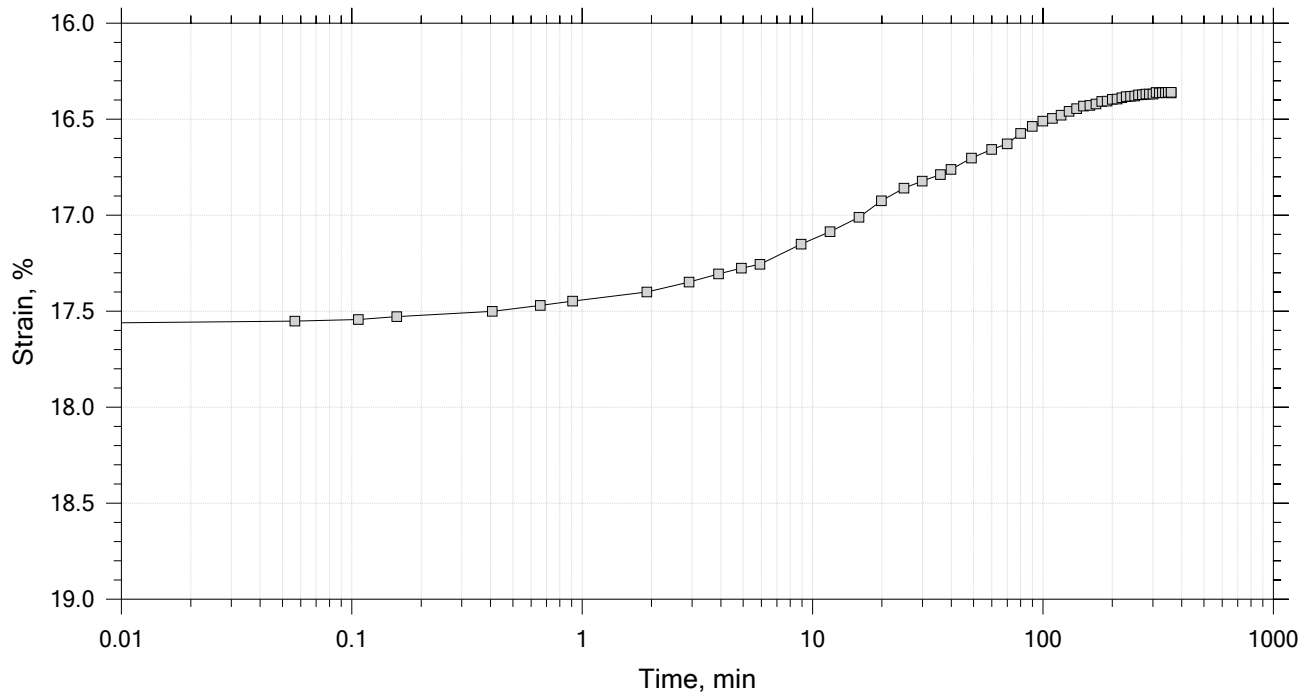
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-210	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 03/01/21	Depth: 15-17 ft
	Test No.: IP-11	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-F, Swell Pressure - 0.0667 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 20 of 21

Constant Load Step

Stress: 0.125 tsf



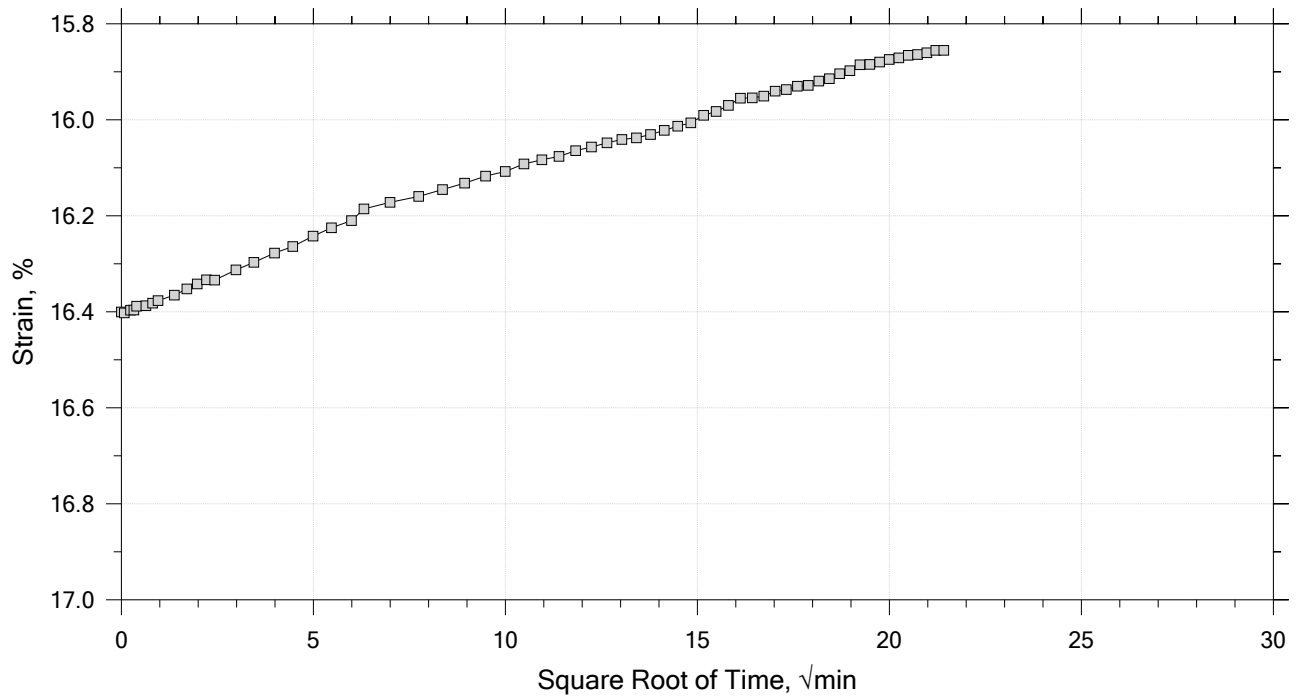
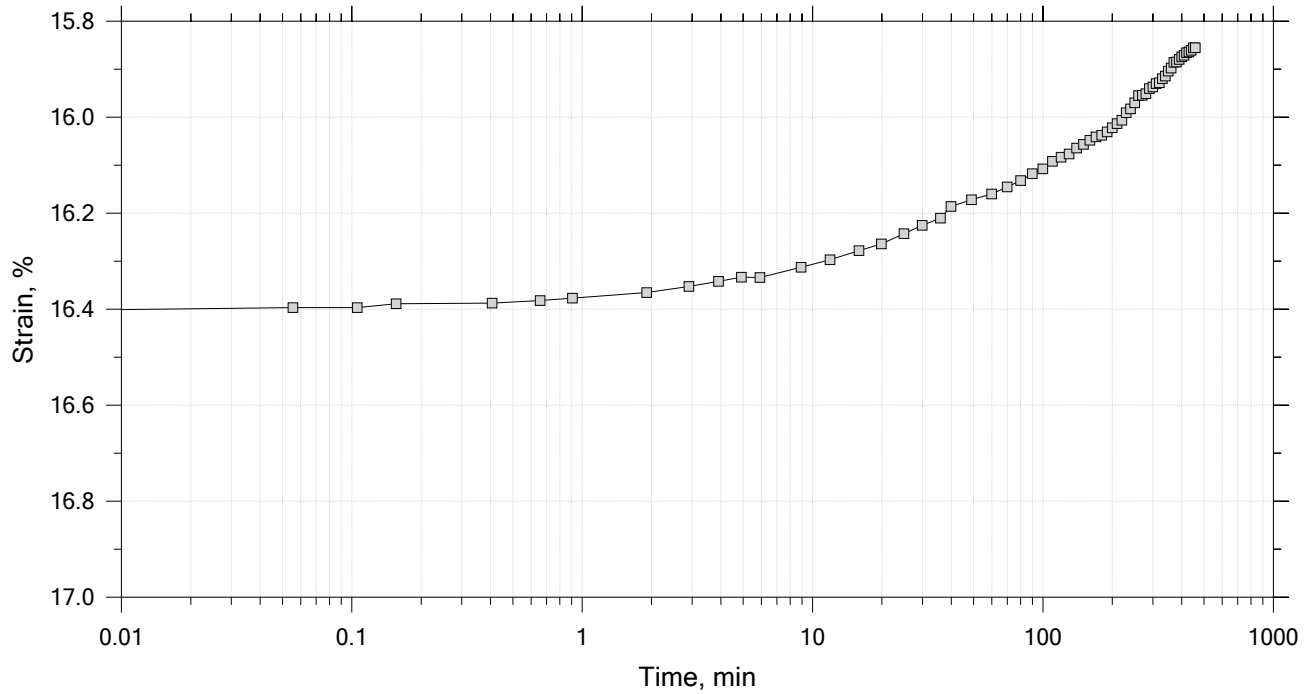
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-210	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 03/01/21	Depth: 15-17 ft
	Test No.: IP-11	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-F, Swell Pressure - 0.0667 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 21 of 21

Constant Load Step

Stress: 0.0625 tsf




	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-210	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 03/01/21	Depth: 15-17 ft
	Test No.: IP-11	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-F, Swell Pressure - 0.0667 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Specimen Diameter: 2.50 in	Estimated Specific Gravity: 2.76	Liquid Limit: 34
Initial Height: 1.00 in	Initial Void Ratio: 0.842	Plastic Limit: 18
Final Height: 0.85 in	Final Void Ratio: 0.566	Plasticity Index: 16

	Before Test Trimmings	Before Test Specimen	After Test Specimen	After Test Trimmings
Container ID	E-1904	RING		e0803
Mass Container, gm	8.16	111.26	111.26	8.33
Mass Container + Wet Soil, gm	225.47	267.7	256.3	153.1
Mass Container + Dry Soil, gm	174.07	231.59	231.59	128.44
Mass Dry Soil, gm	165.91	120.33	120.33	120.11
Water Content, %	30.98	30.00	20.53	20.53
Void Ratio	---	0.84	0.57	---
Degree of Saturation, %	---	98.19	100.00	---
Dry Unit Weight, pcf	---	93.389	109.87	---


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

	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-210	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 03/01/21	Depth: 15-17 ft
	Test No.: IP-11	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-F, Swell Pressure - 0.0667 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

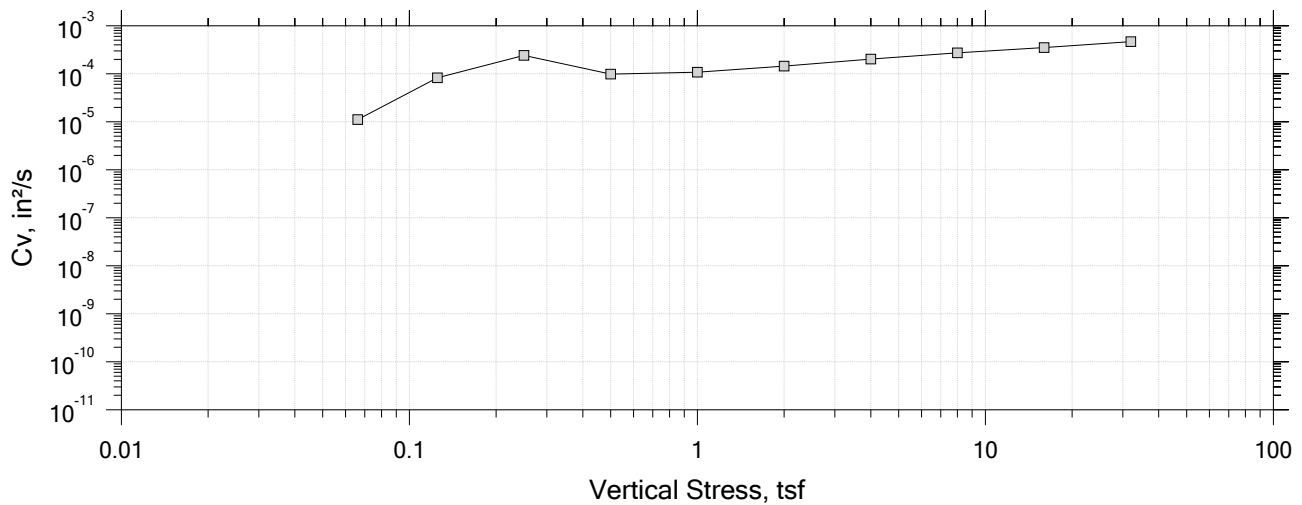
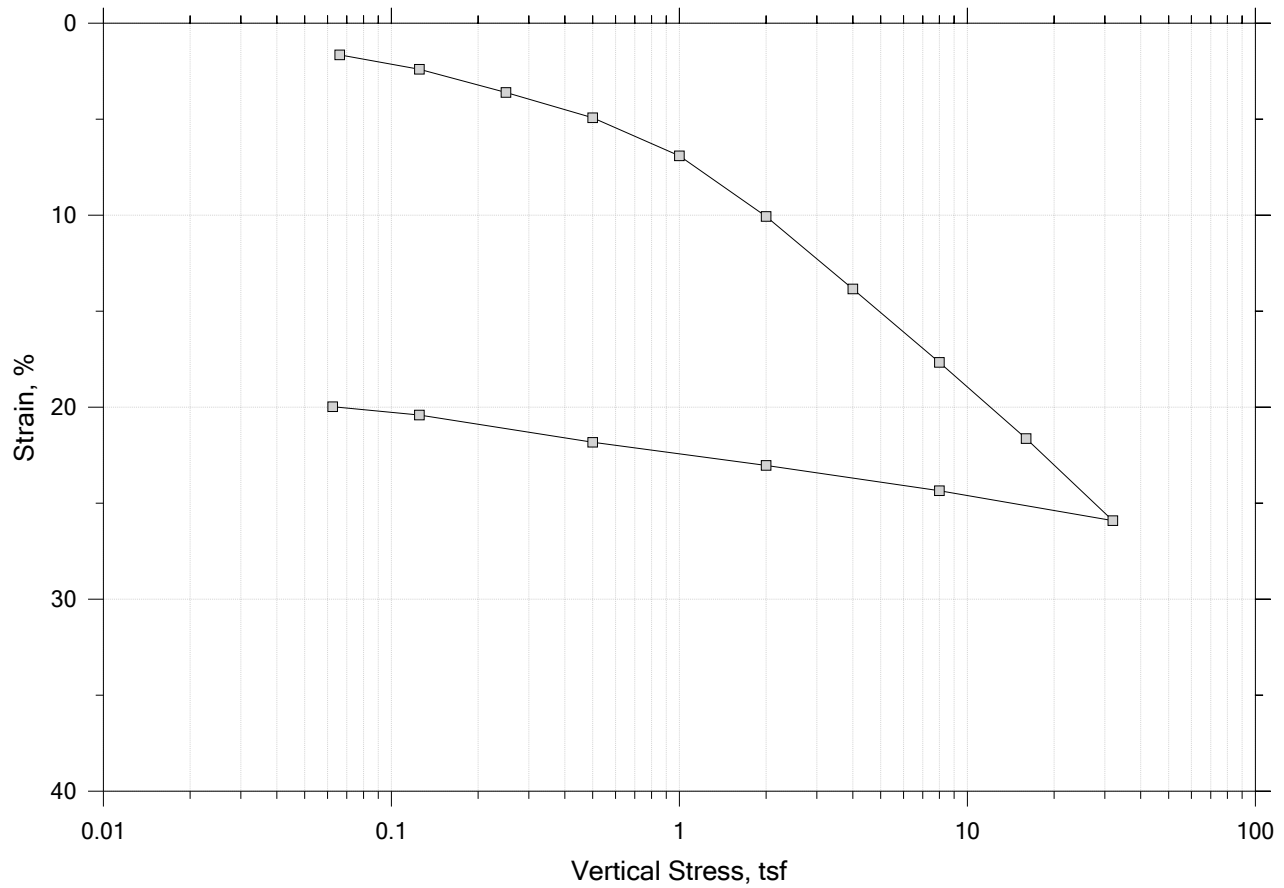
Square Root of Time Coefficients


[illegible]

	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-210	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 03/01/21	Depth: 15-17 ft
	Test No.: IP-11	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-F, Swell Pressure - 0.0667 tsf		
	Displacement at End of Increment		

One-Dimensional Consolidation by ASTM D2435 - Method B

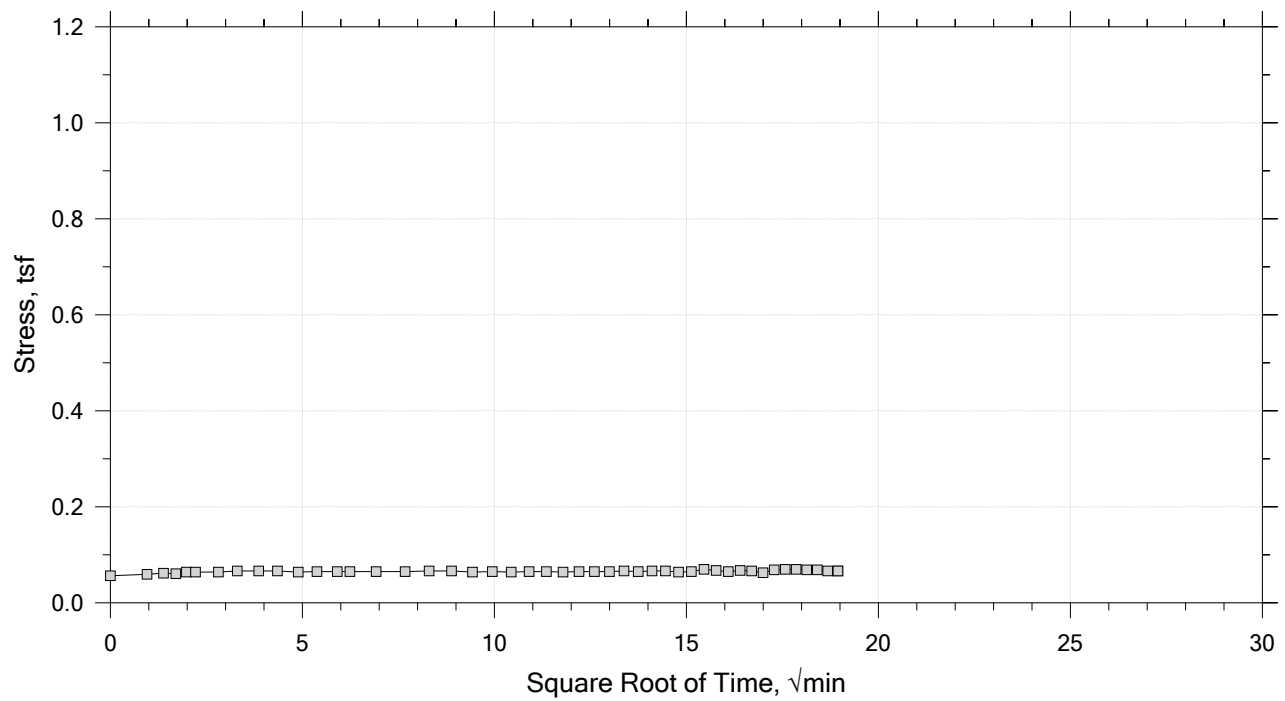
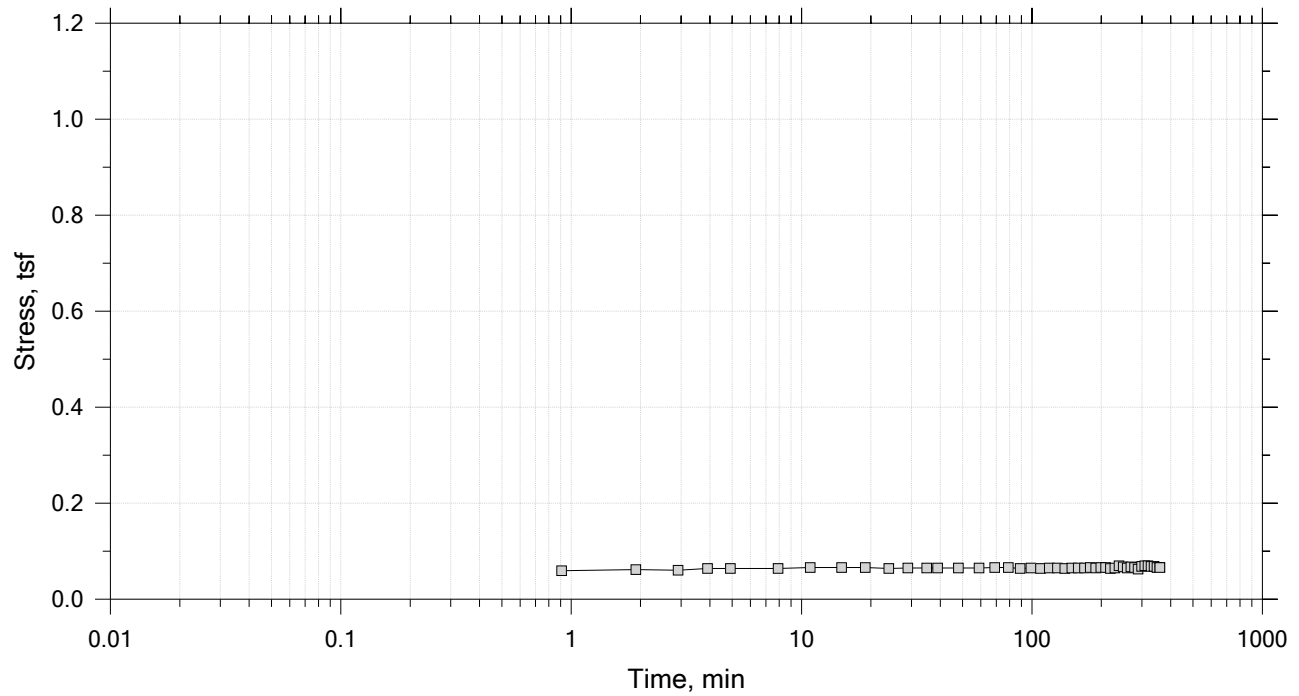
Summary Report




	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-215	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 02/23/21	Depth: 10-12 ft
	Test No.: IP-4	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-D, Swell Pressure= 0.0661 tsf		
	Displacement at End of Increment		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 1 of 15
Constant Volume Step
Stress: 0.0661 tsf



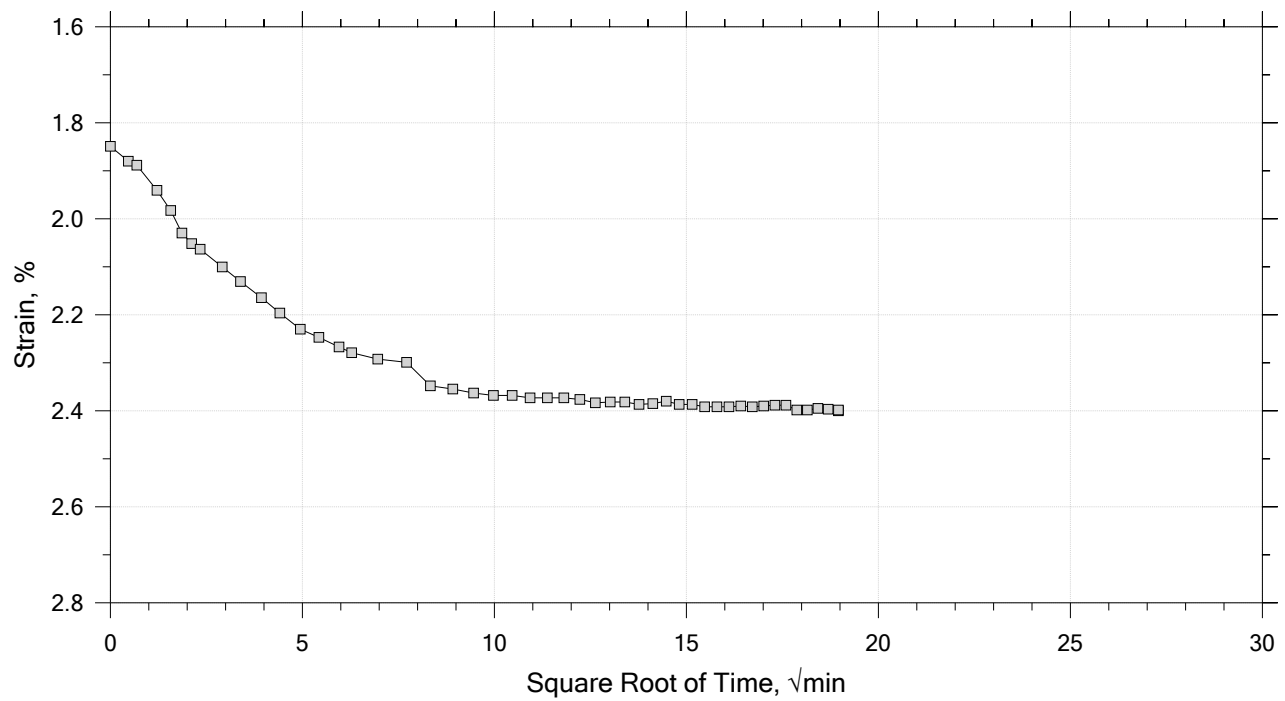
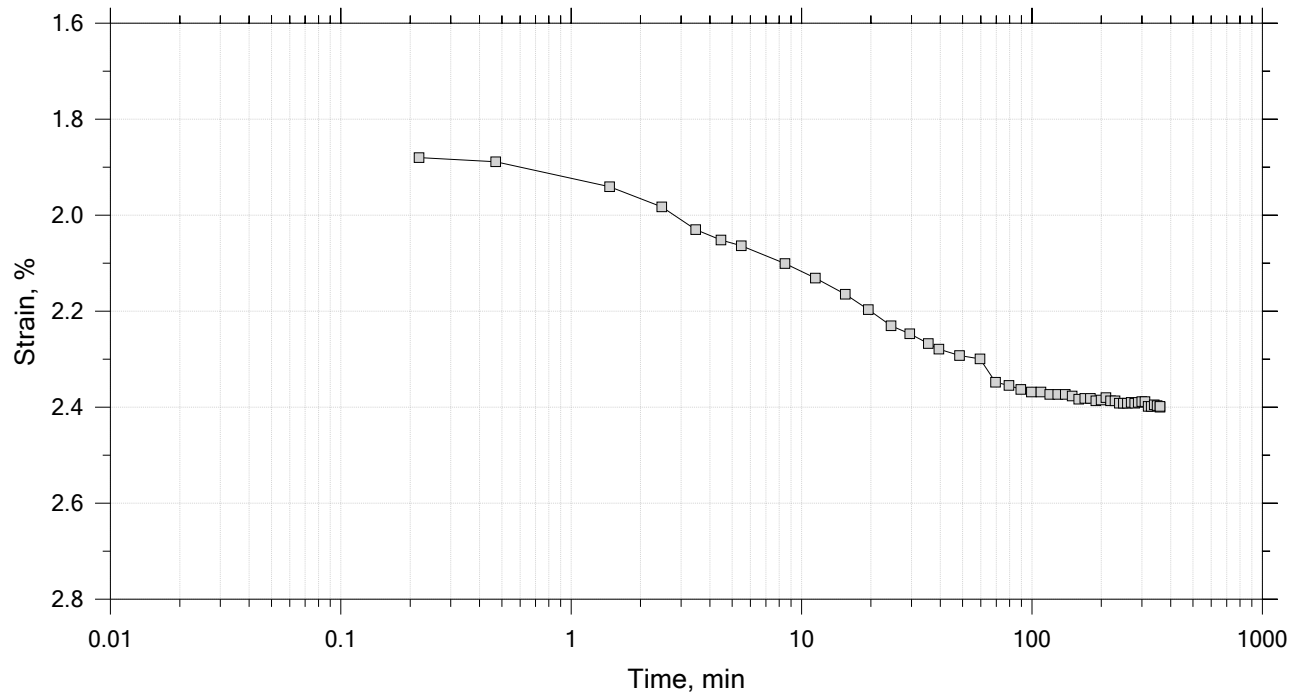
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-215	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 02/23/21	Depth: 10-12 ft
	Test No.: IP-4	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-D, Swell Pressure= 0.0661 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 2 of 15

Constant Load Step

Stress: 0.125 tsf



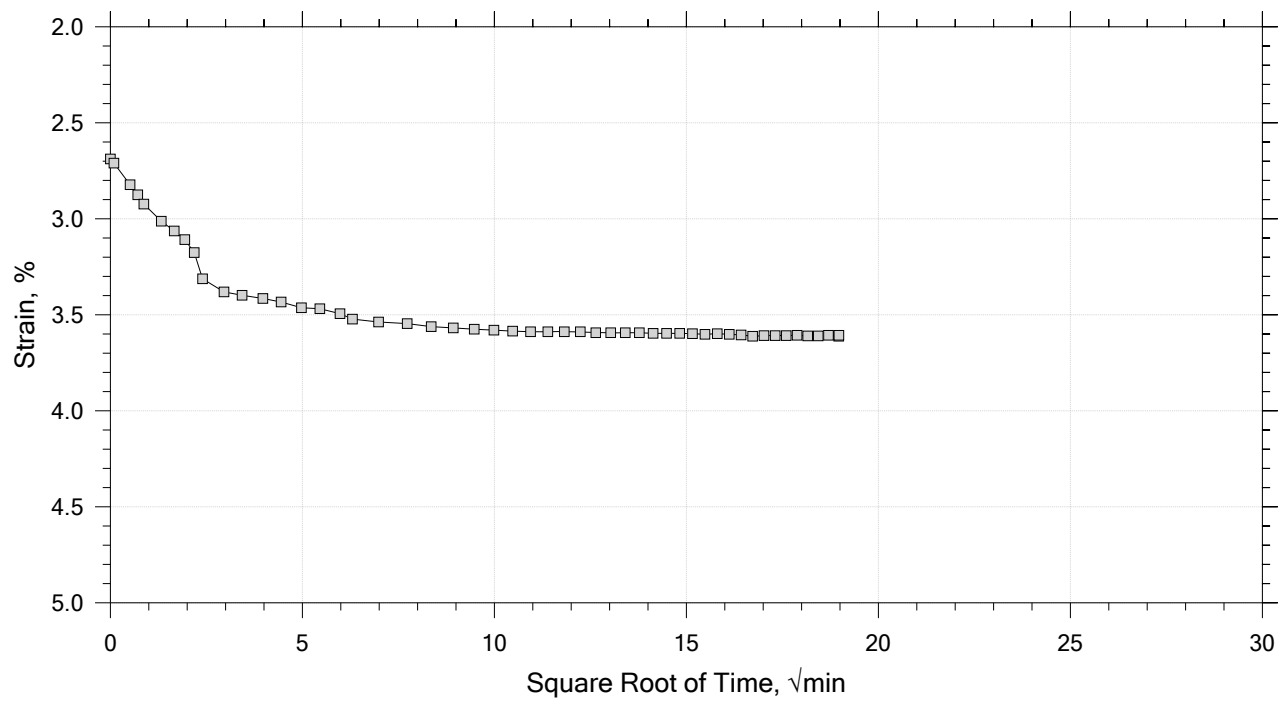
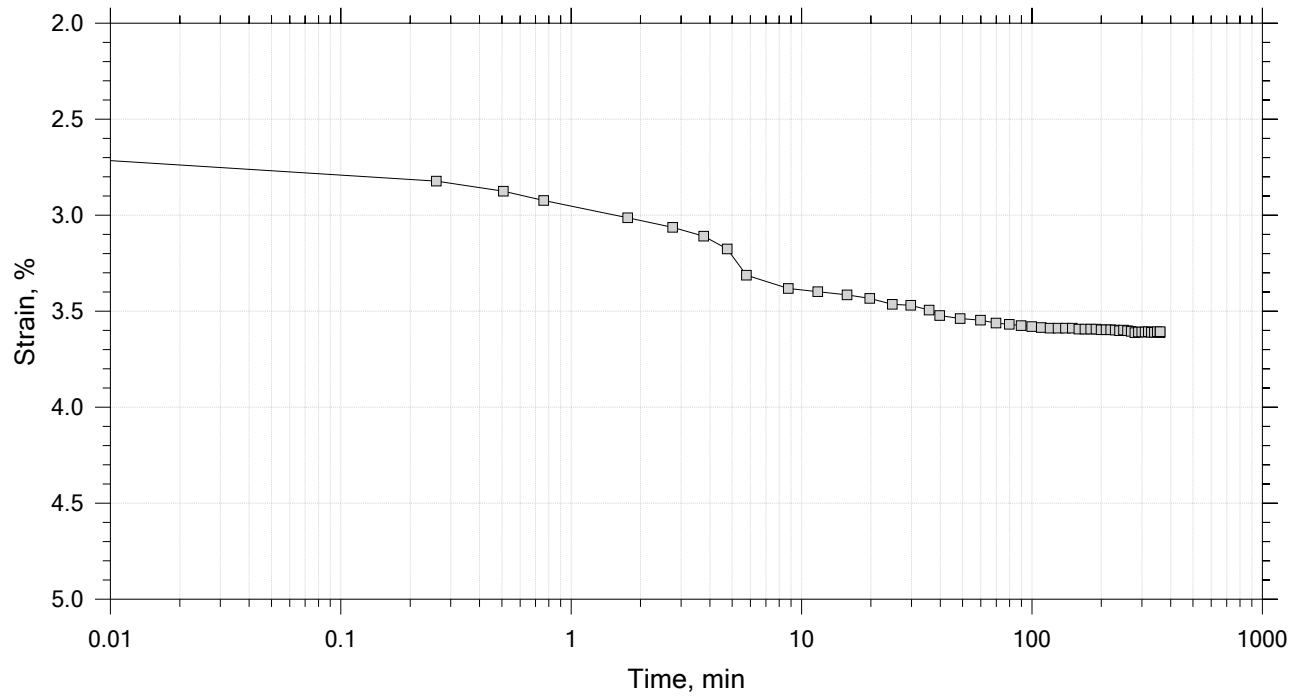
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-215	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 02/23/21	Depth: 10-12 ft
	Test No.: IP-4	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-D, Swell Pressure= 0.0661 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 3 of 15

Constant Load Step

Stress: 0.25 tsf



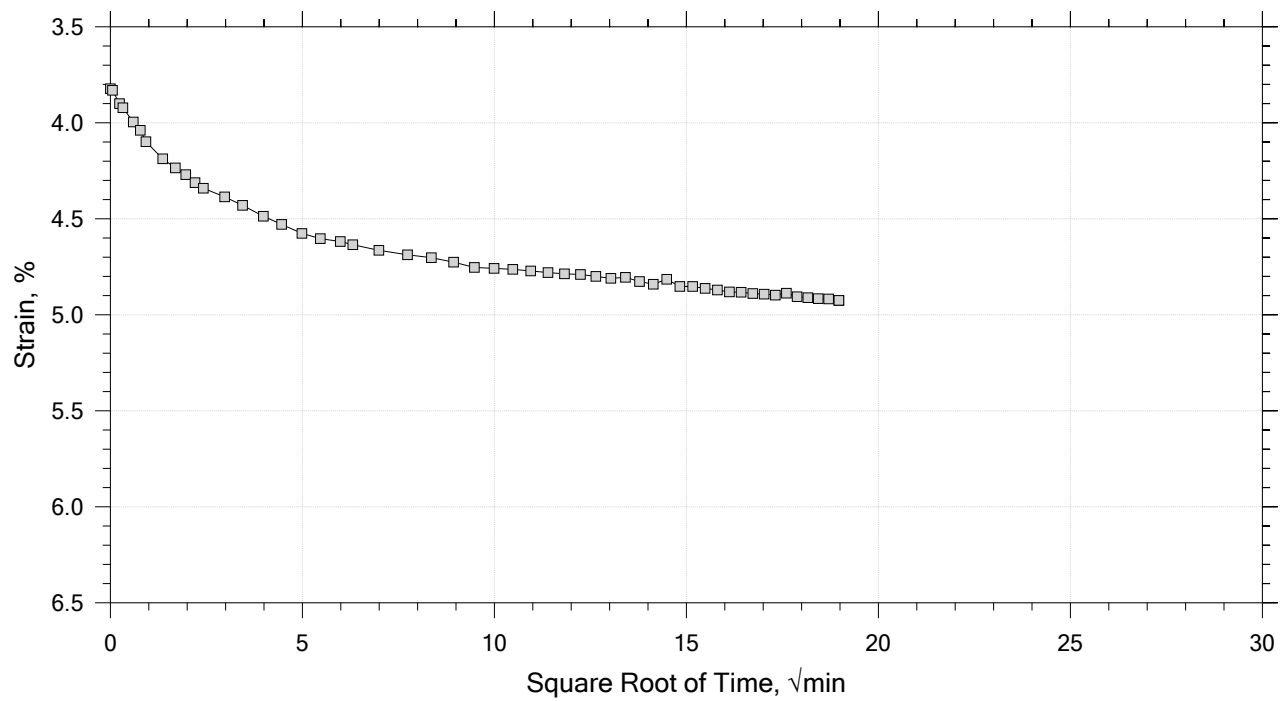
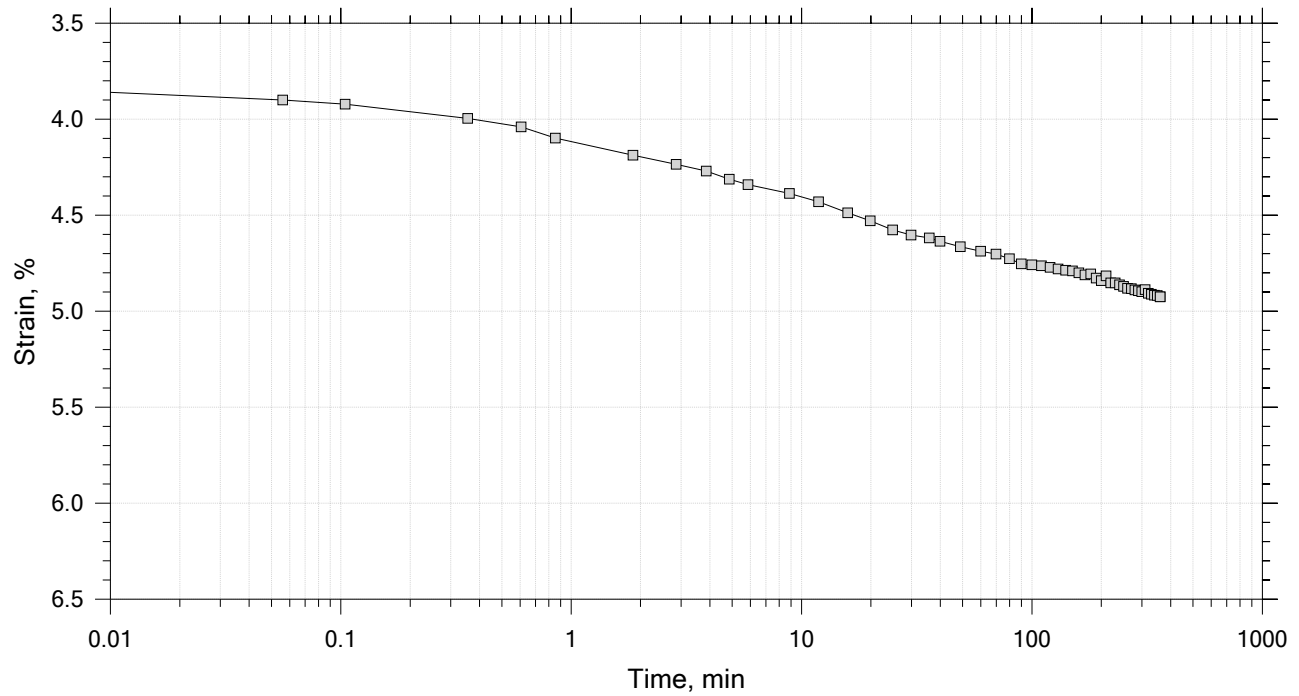
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-215	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 02/23/21	Depth: 10-12 ft
	Test No.: IP-4	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-D, Swell Pressure= 0.0661 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 4 of 15

Constant Load Step

Stress: 0.5 tsf



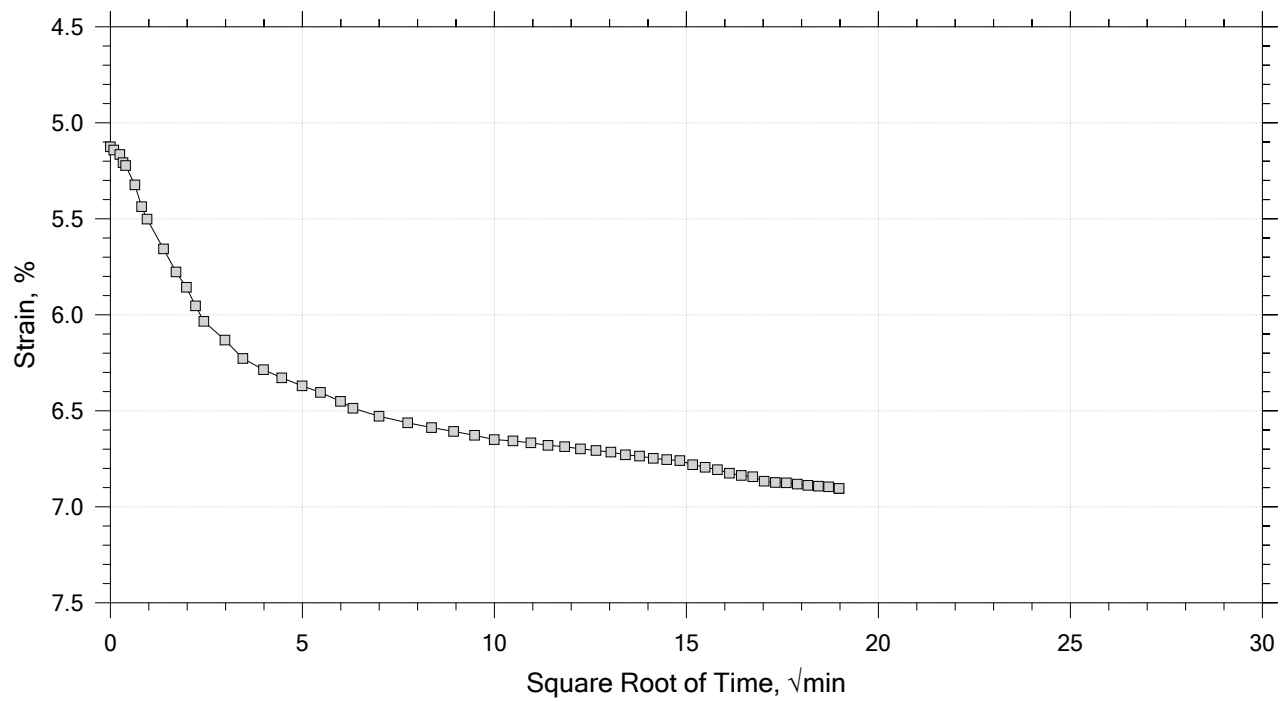
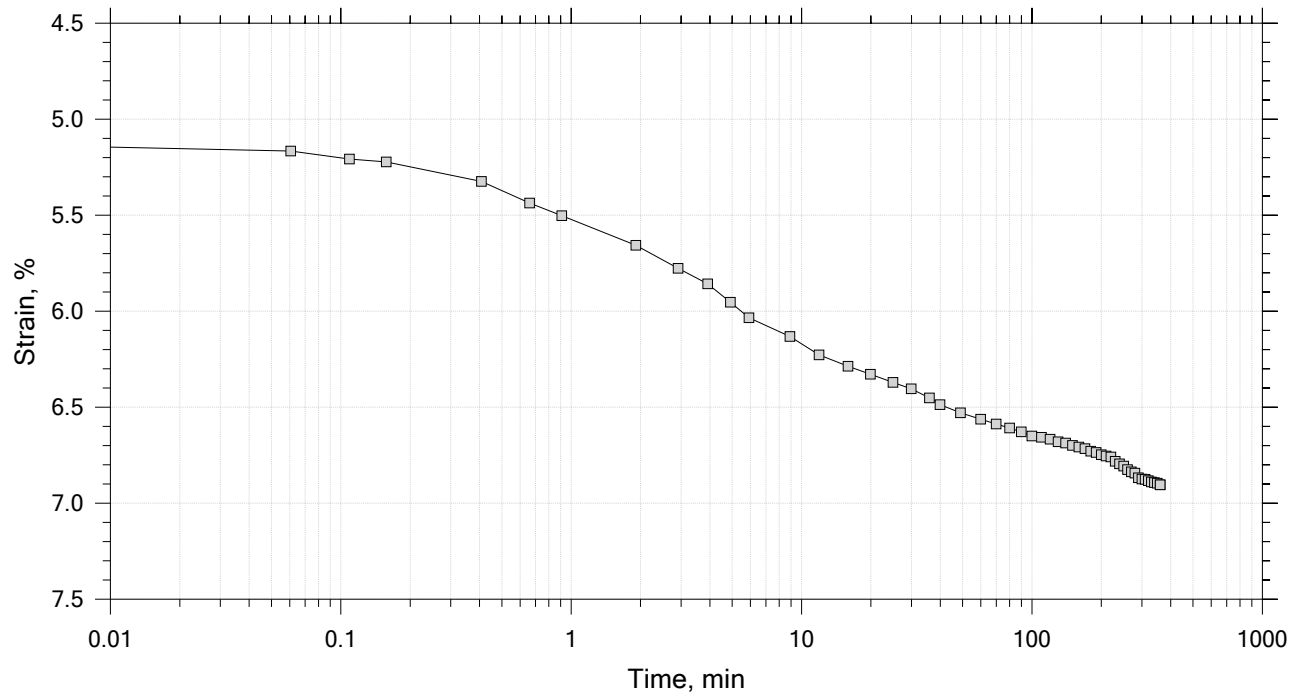
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-215	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 02/23/21	Depth: 10-12 ft
	Test No.: IP-4	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-D, Swell Pressure= 0.0661 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 5 of 15

Constant Load Step

Stress: 1 tsf



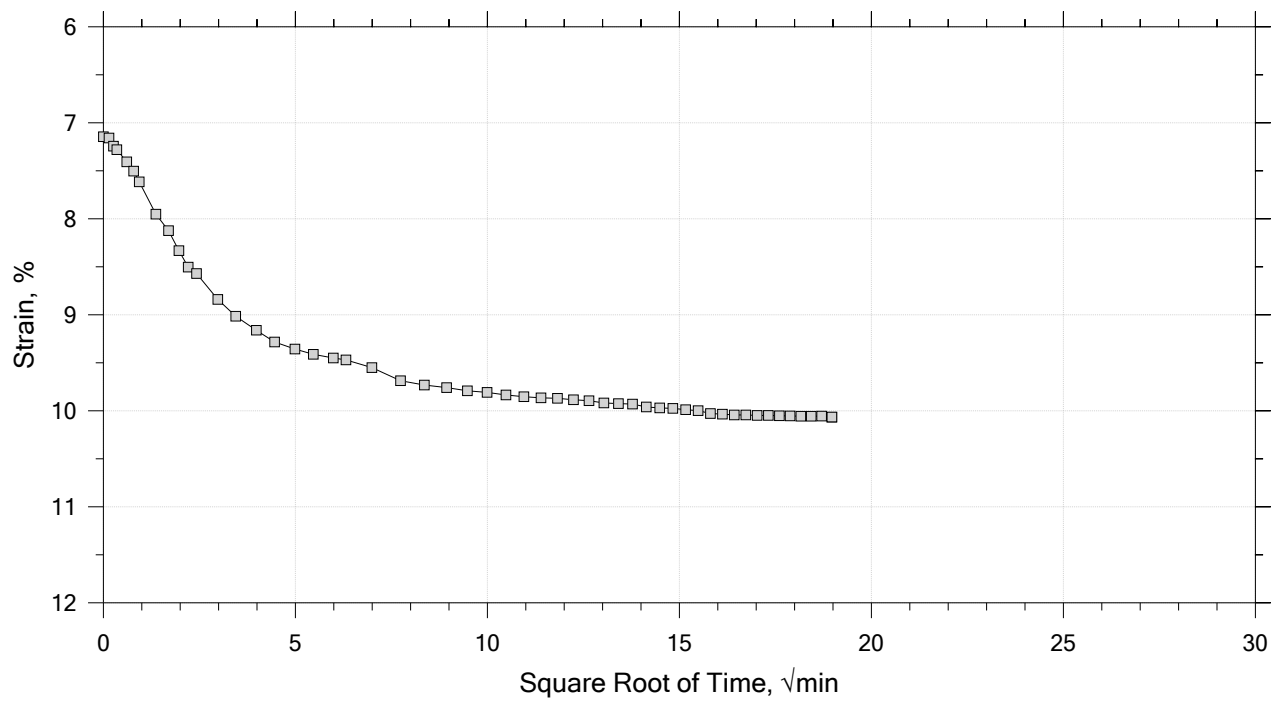
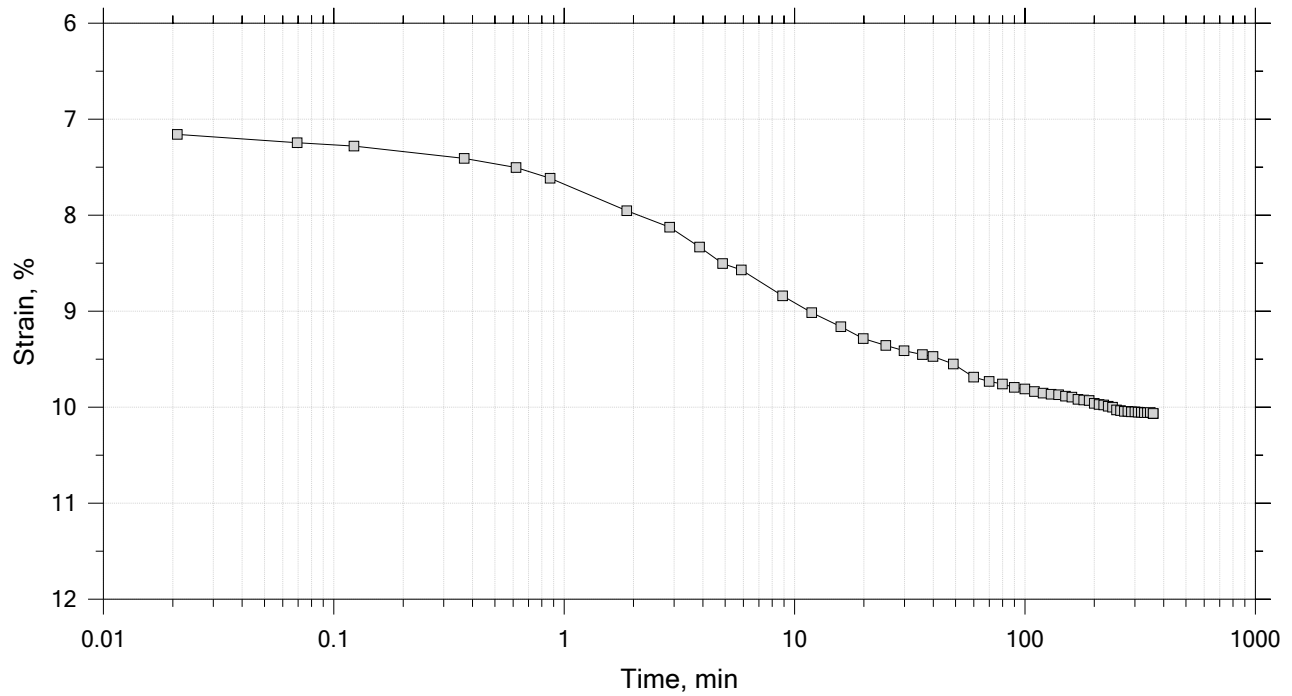
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-215	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 02/23/21	Depth: 10-12 ft
	Test No.: IP-4	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-D, Swell Pressure= 0.0661 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 6 of 15

Constant Load Step

Stress: 2 tsf



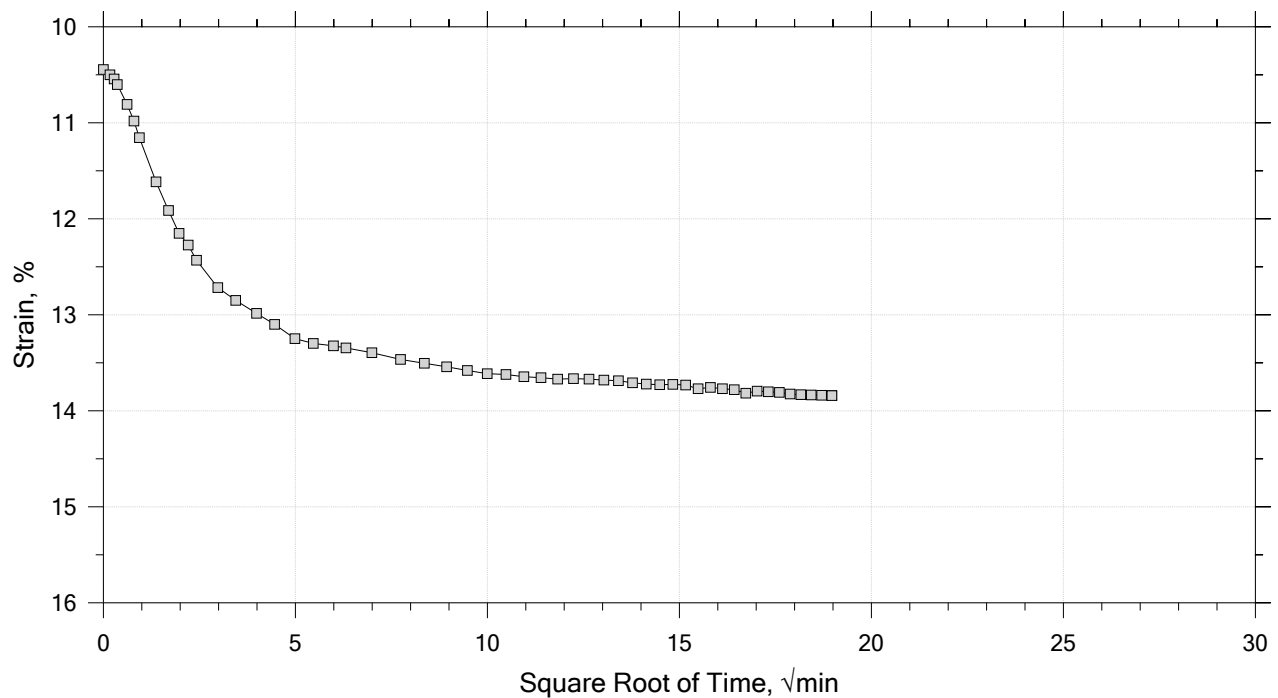
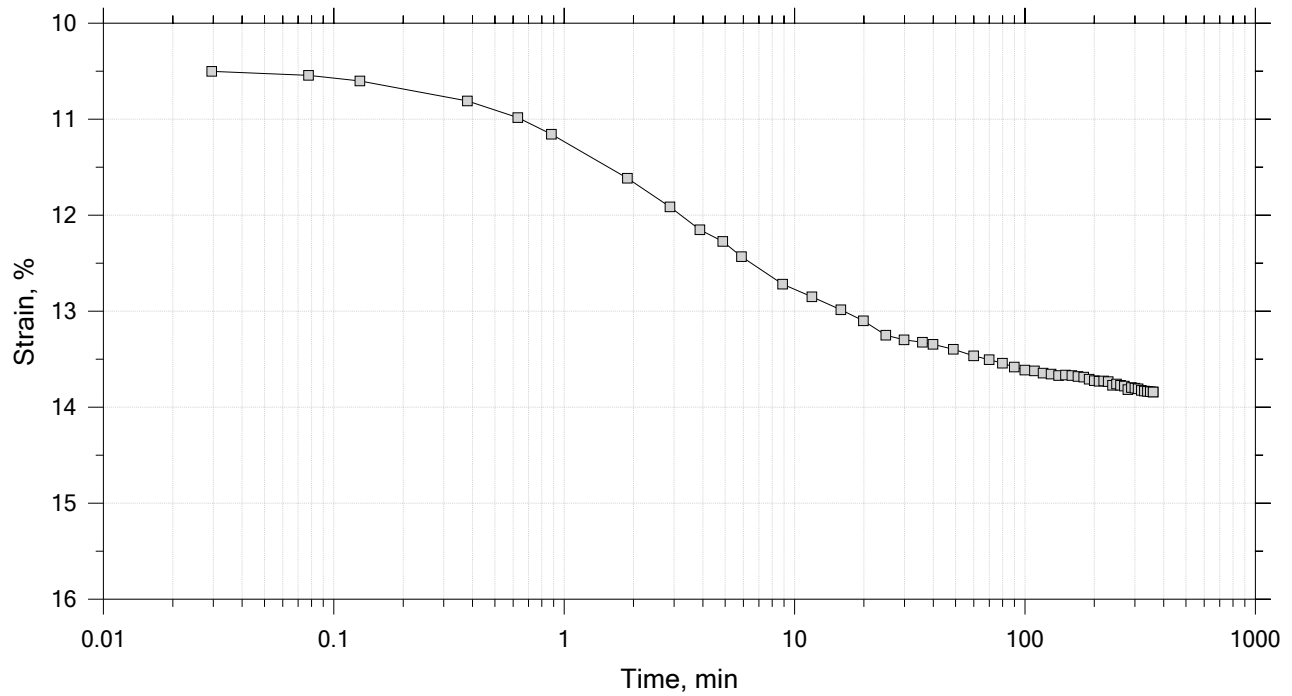
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-215	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 02/23/21	Depth: 10-12 ft
	Test No.: IP-4	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-D, Swell Pressure= 0.0661 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 7 of 15

Constant Load Step

Stress: 4 tsf



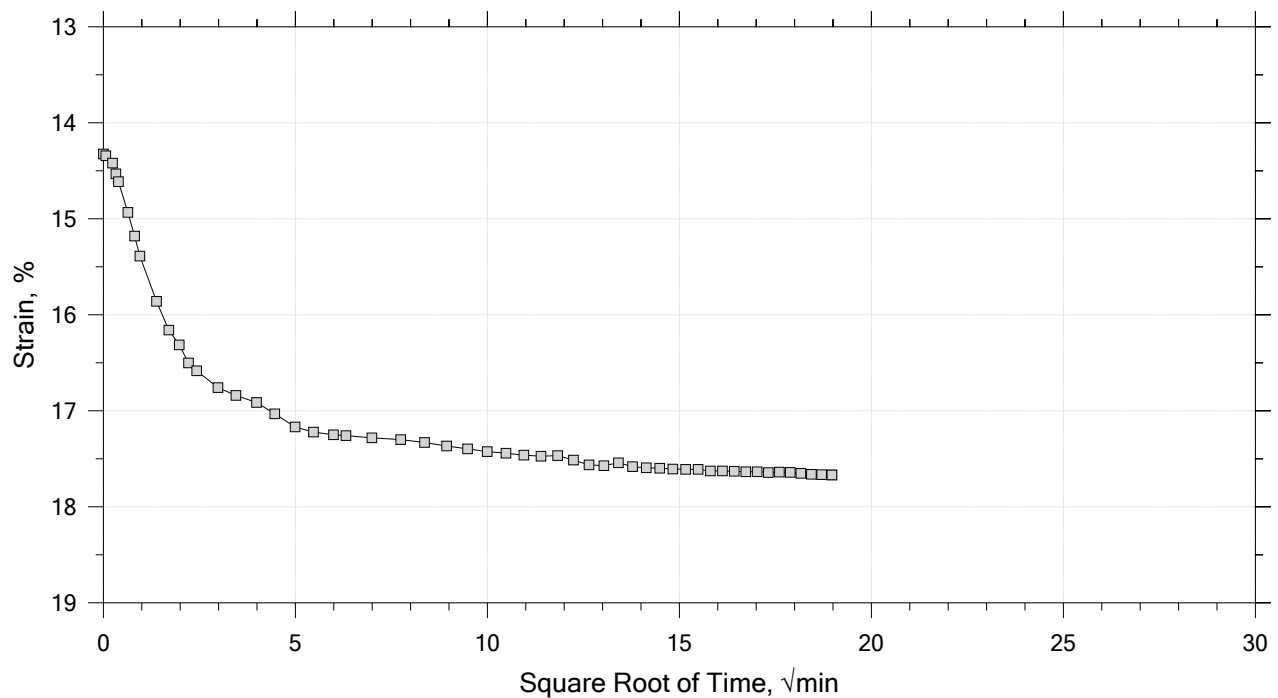
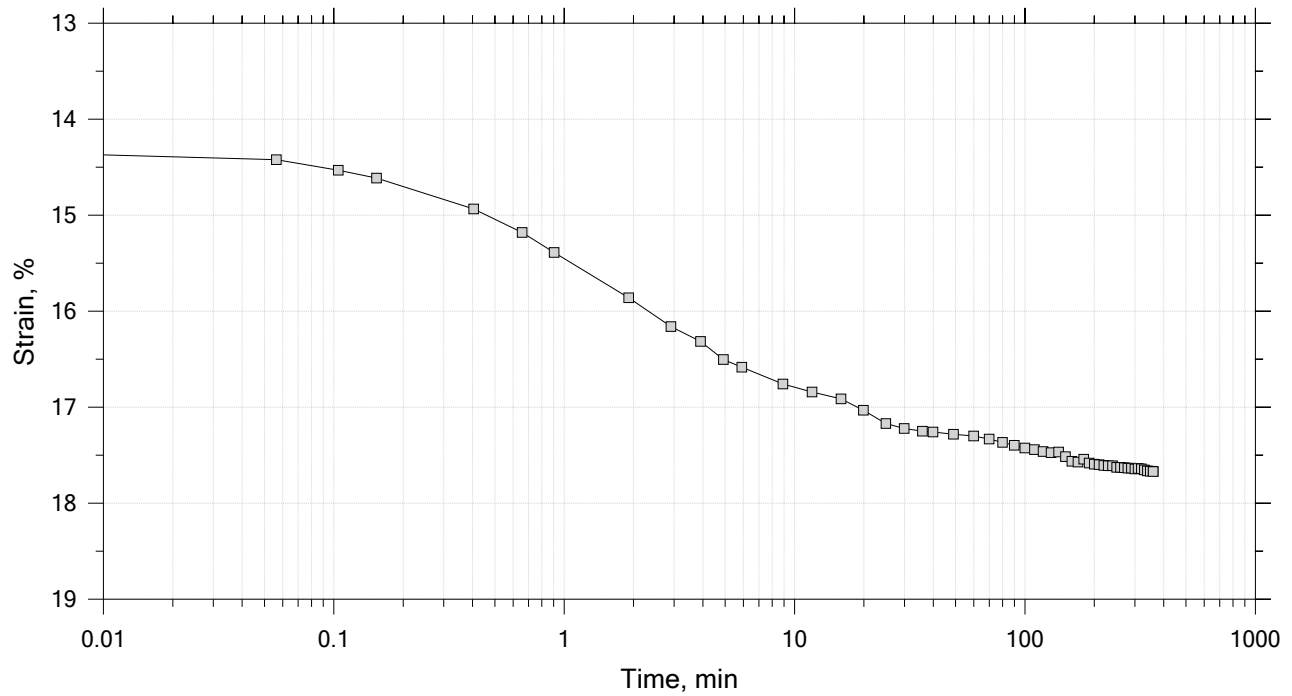
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-215	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 02/23/21	Depth: 10-12 ft
	Test No.: IP-4	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-D, Swell Pressure= 0.0661 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 8 of 15

Constant Load Step

Stress: 8 tsf



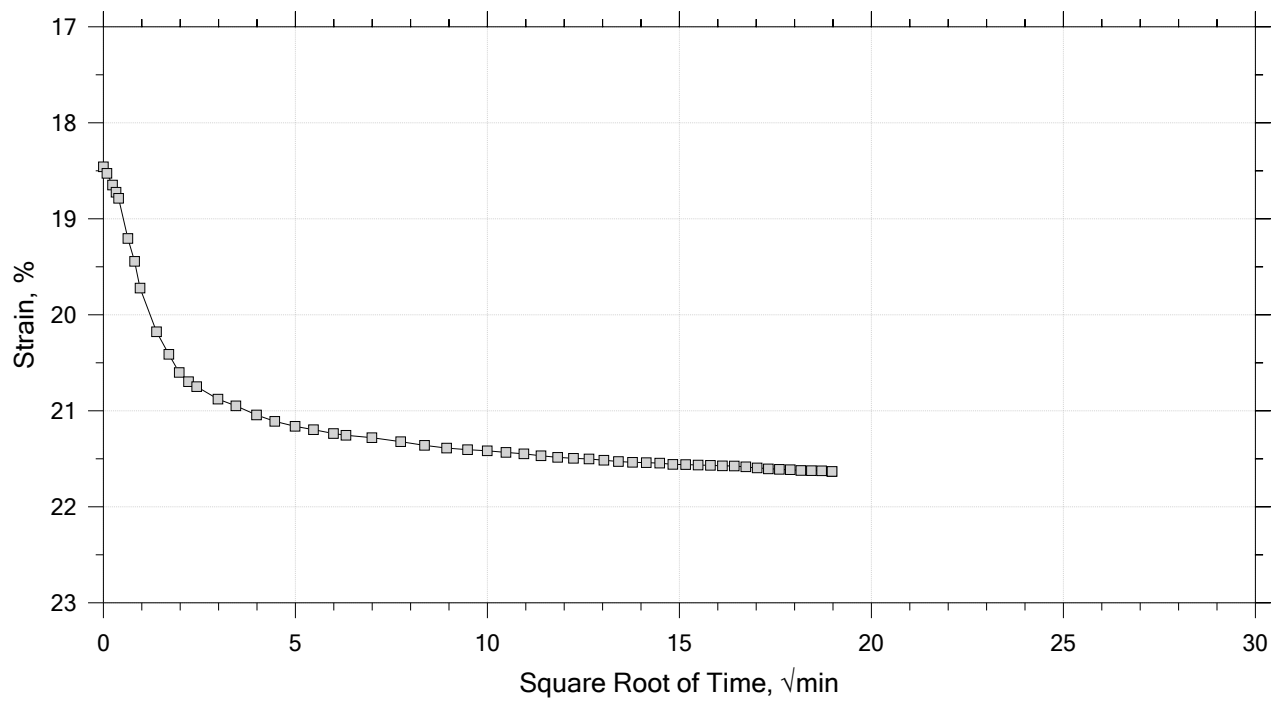
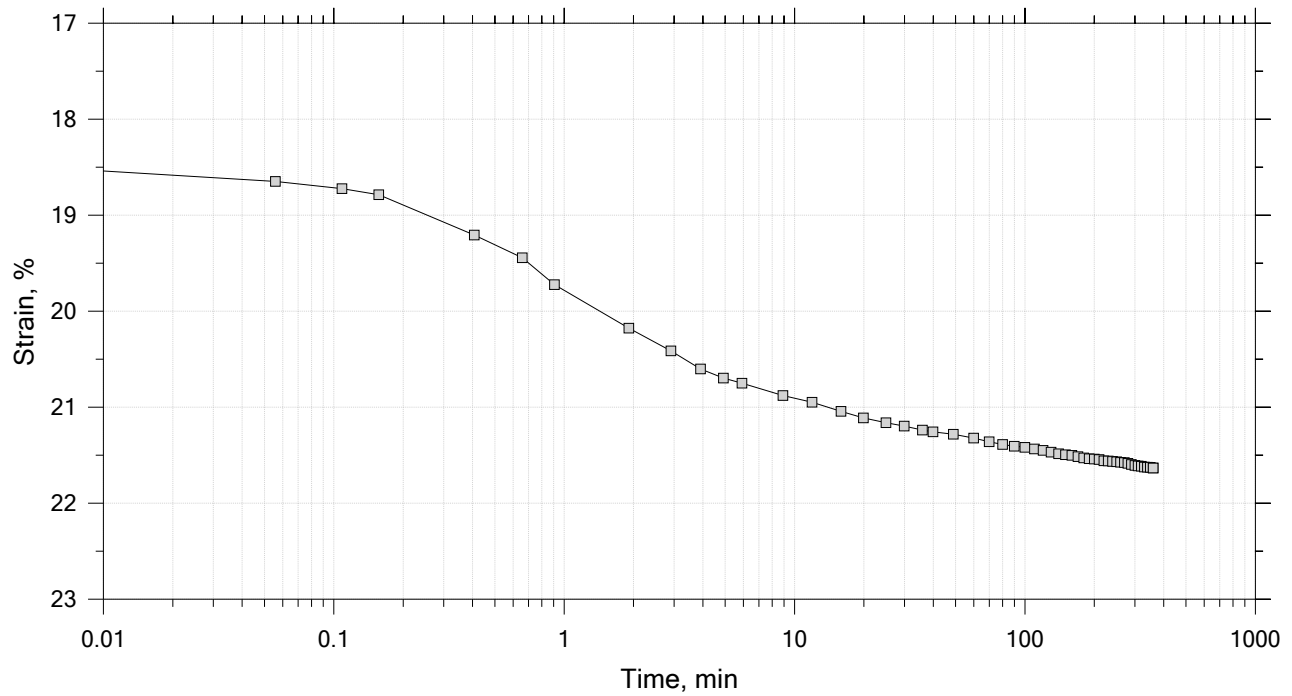
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-215	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 02/23/21	Depth: 10-12 ft
	Test No.: IP-4	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-D, Swell Pressure= 0.0661 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 9 of 15

Constant Load Step

Stress: 16 tsf



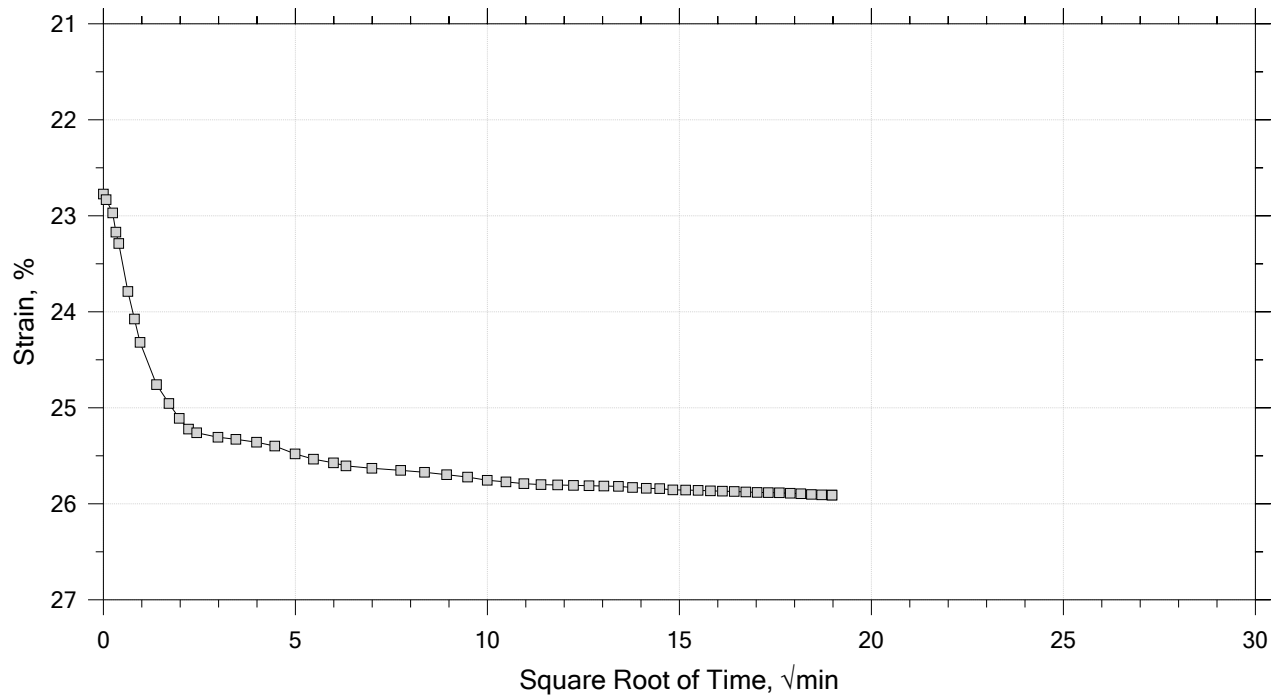
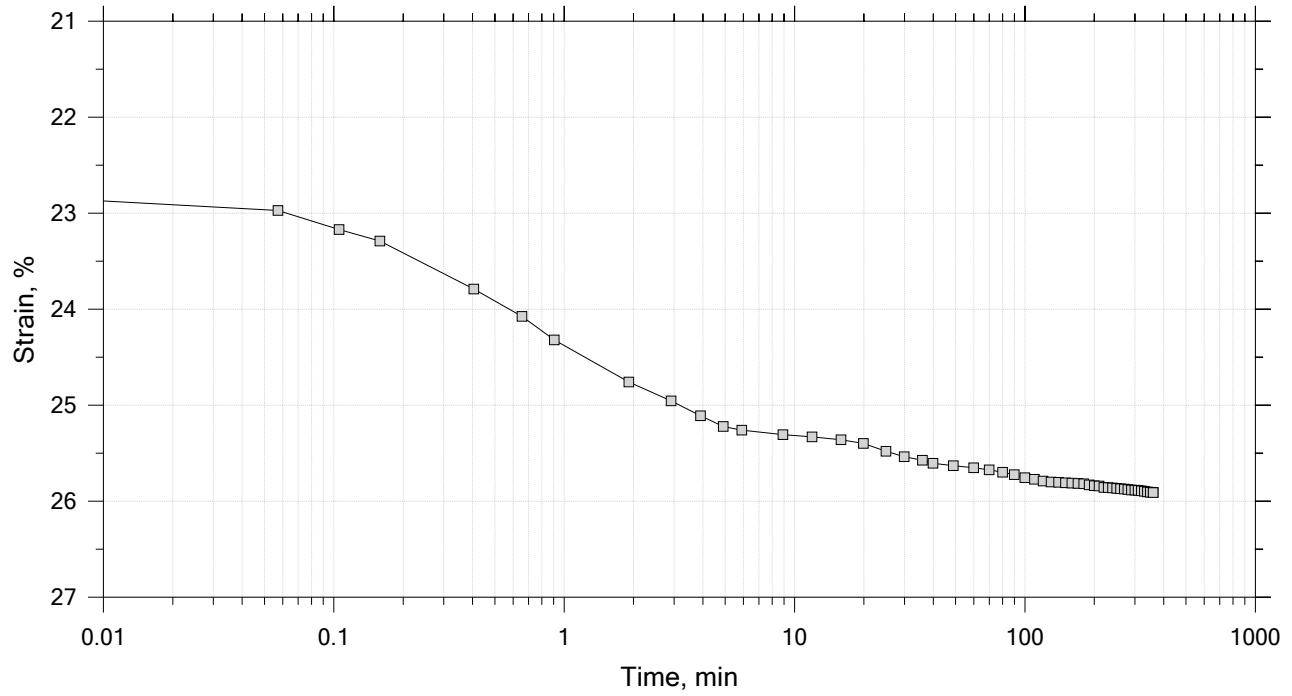
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-215	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 02/23/21	Depth: 10-12 ft
	Test No.: IP-4	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-D, Swell Pressure= 0.0661 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 10 of 15

Constant Load Step

Stress: 32 tsf



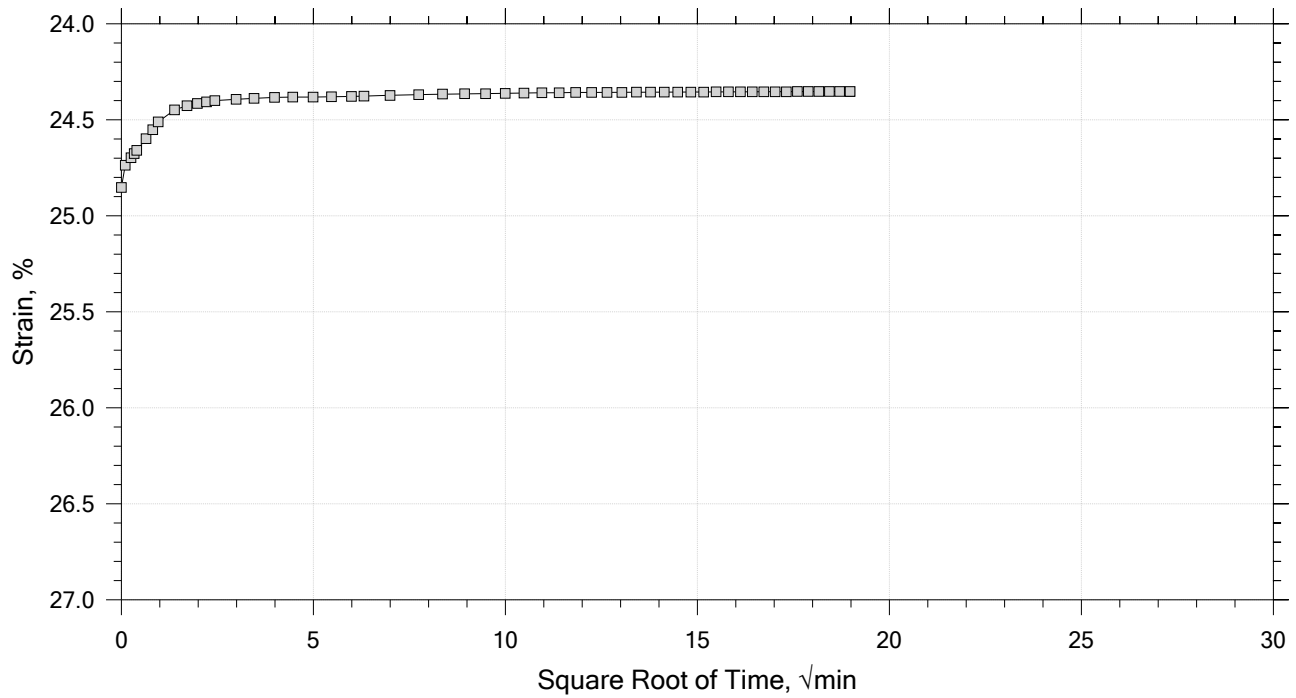
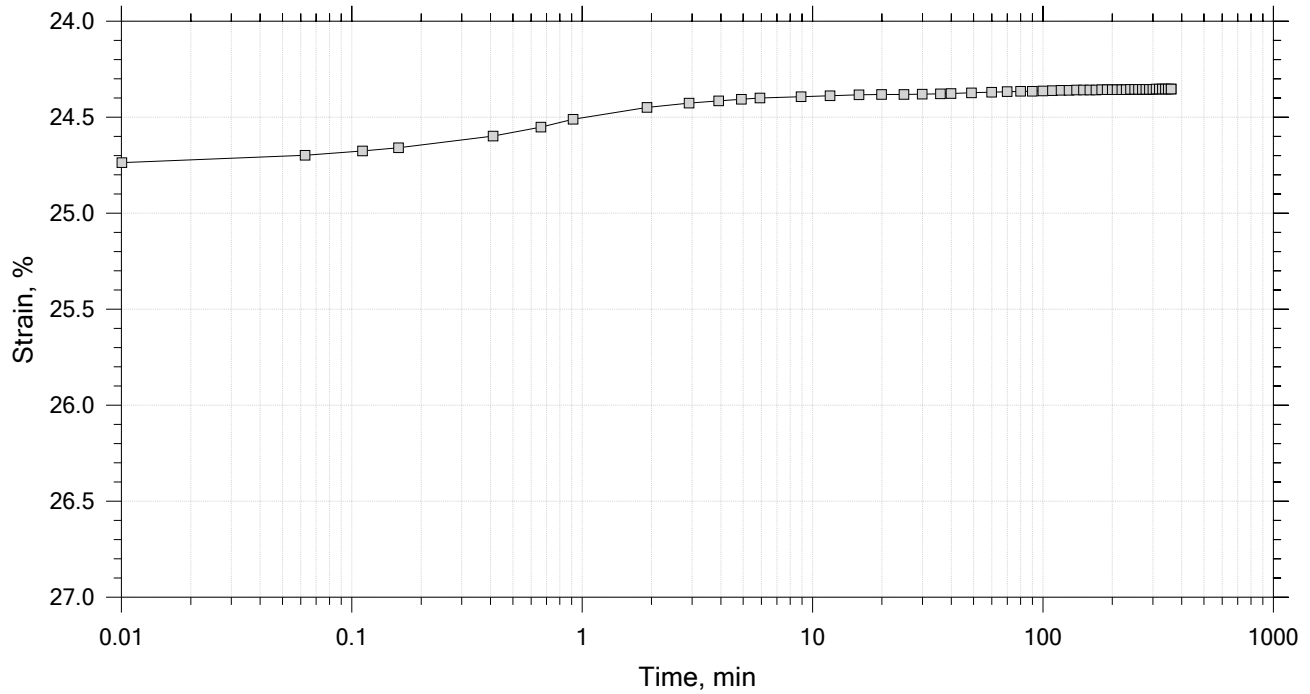
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-215	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 02/23/21	Depth: 10-12 ft
	Test No.: IP-4	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-D, Swell Pressure= 0.0661 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 11 of 15

Constant Load Step

Stress: 8 tsf



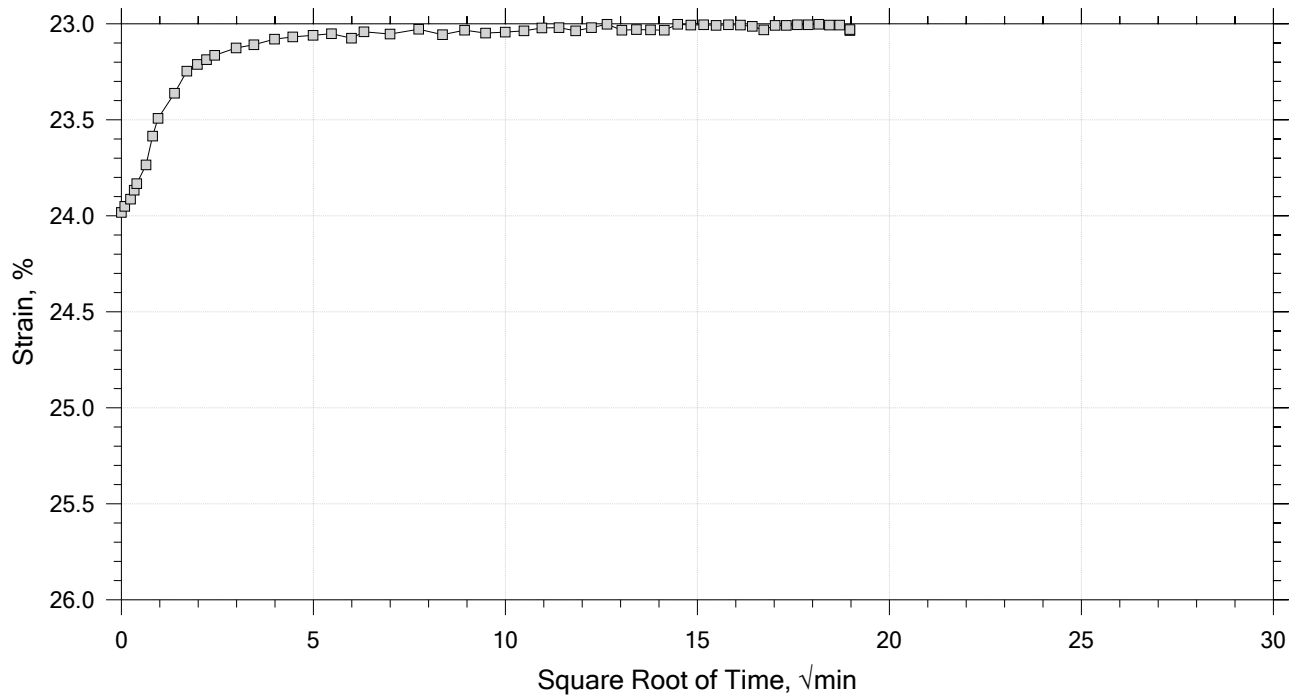
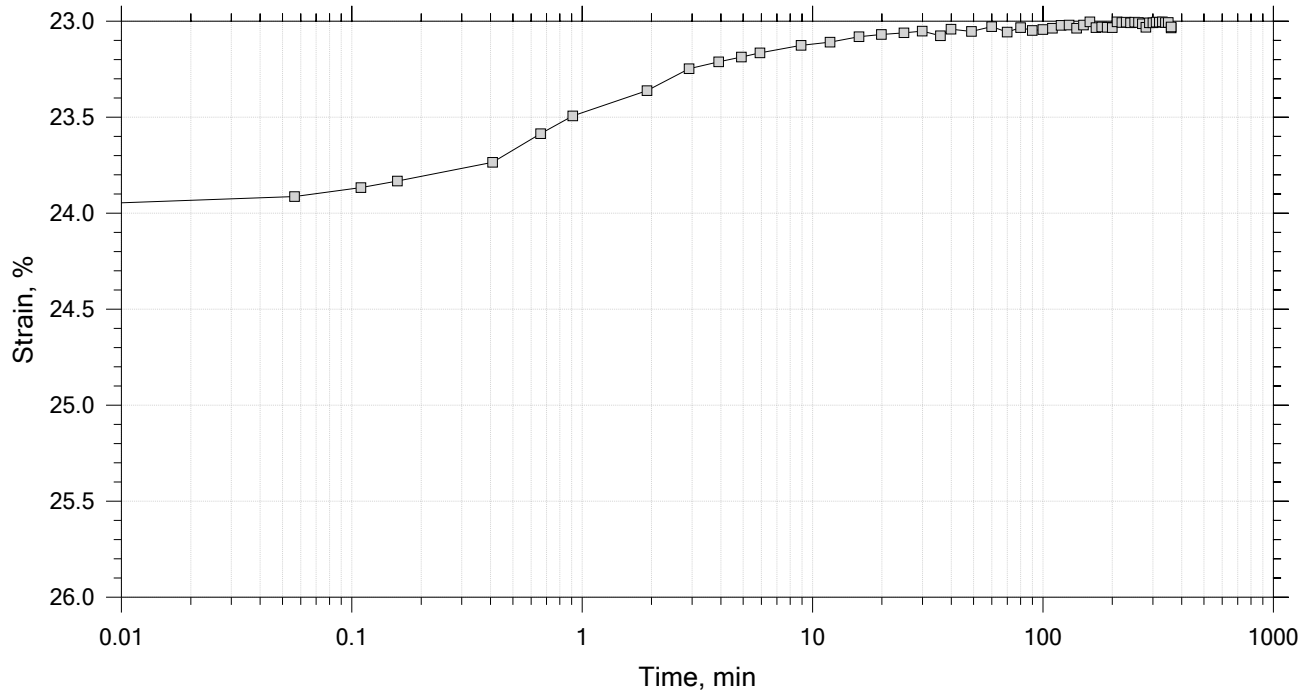
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-215	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 02/23/21	Depth: 10-12 ft
	Test No.: IP-4	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-D, Swell Pressure= 0.0661 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 12 of 15

Constant Load Step

Stress: 2 tsf



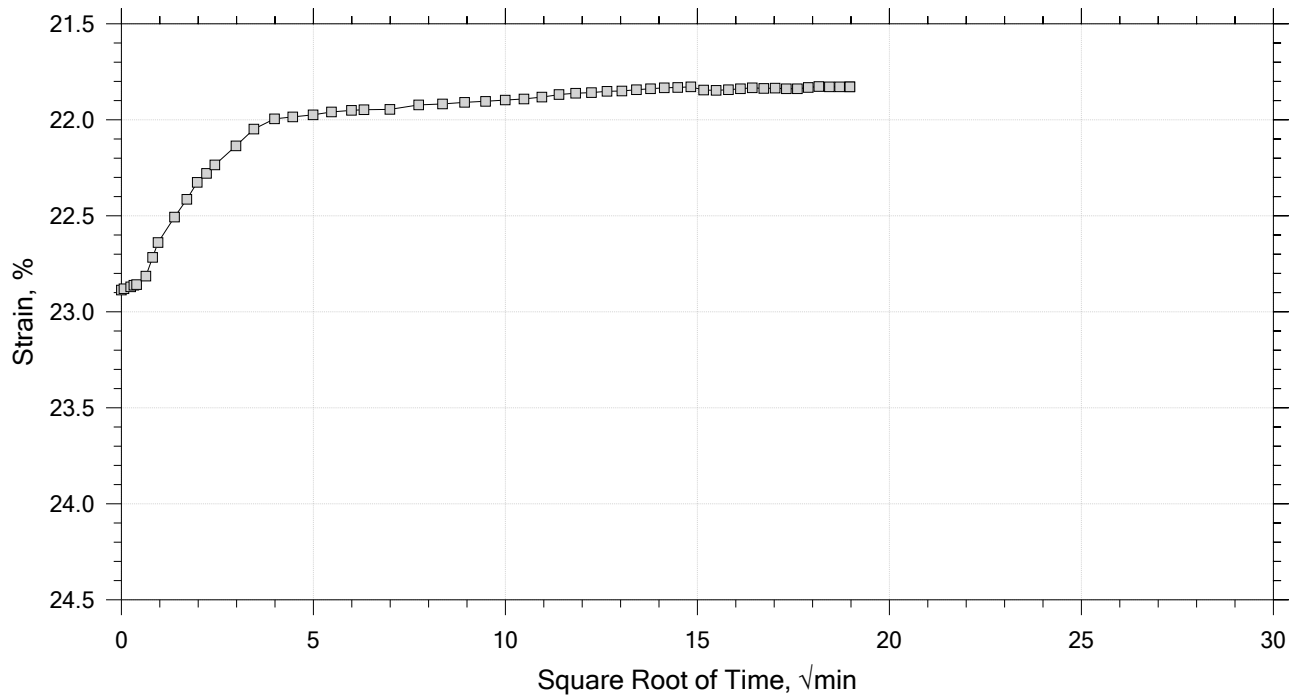
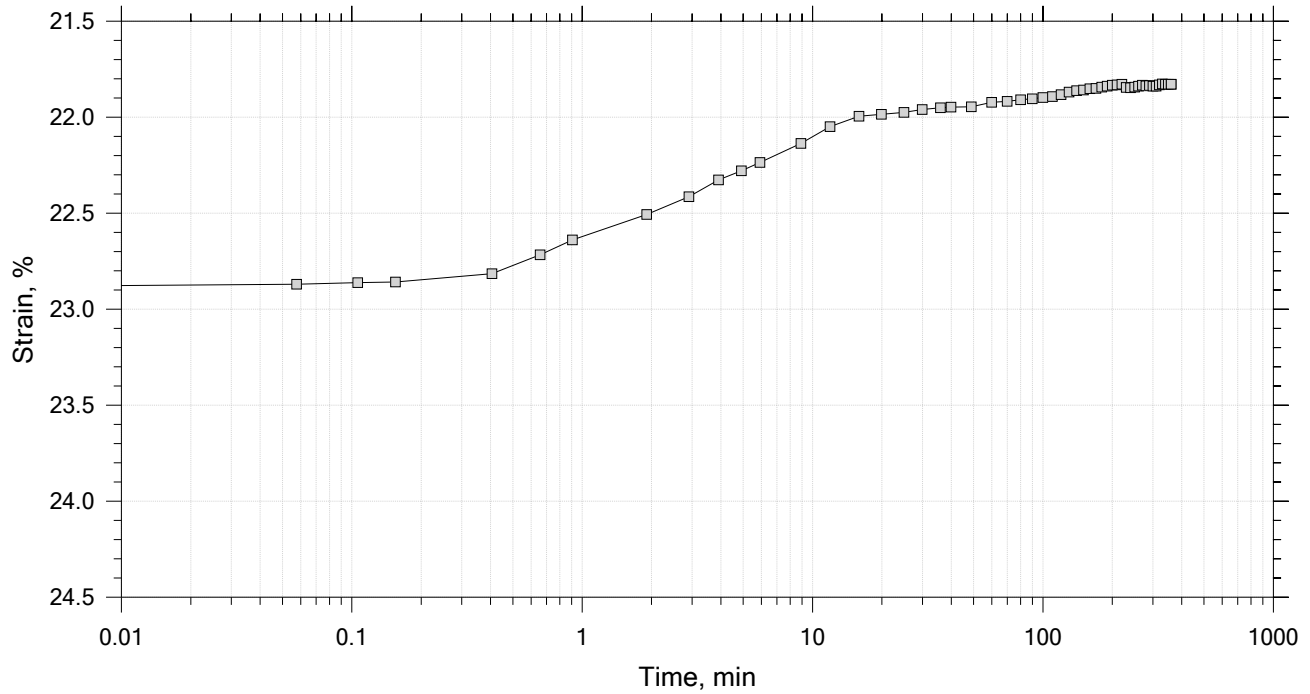
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-215	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 02/23/21	Depth: 10-12 ft
	Test No.: IP-4	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-D, Swell Pressure= 0.0661 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 13 of 15

Constant Load Step

Stress: 0.5 tsf



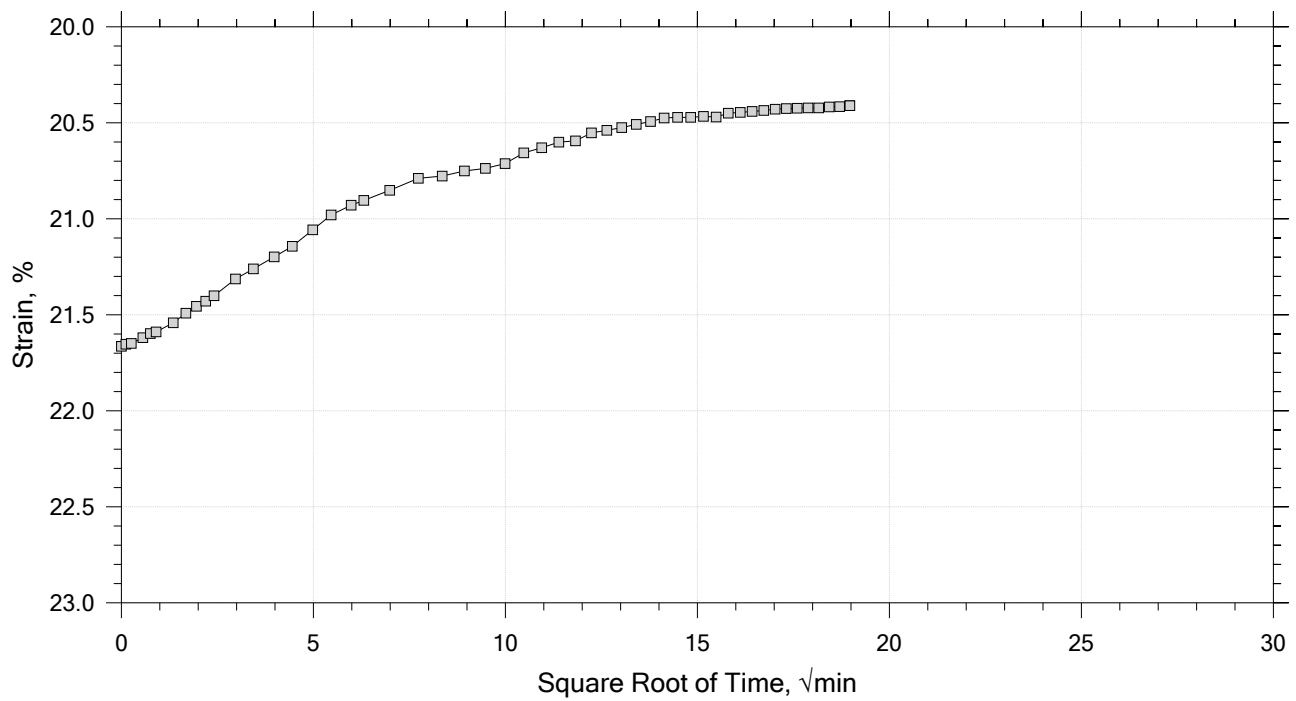
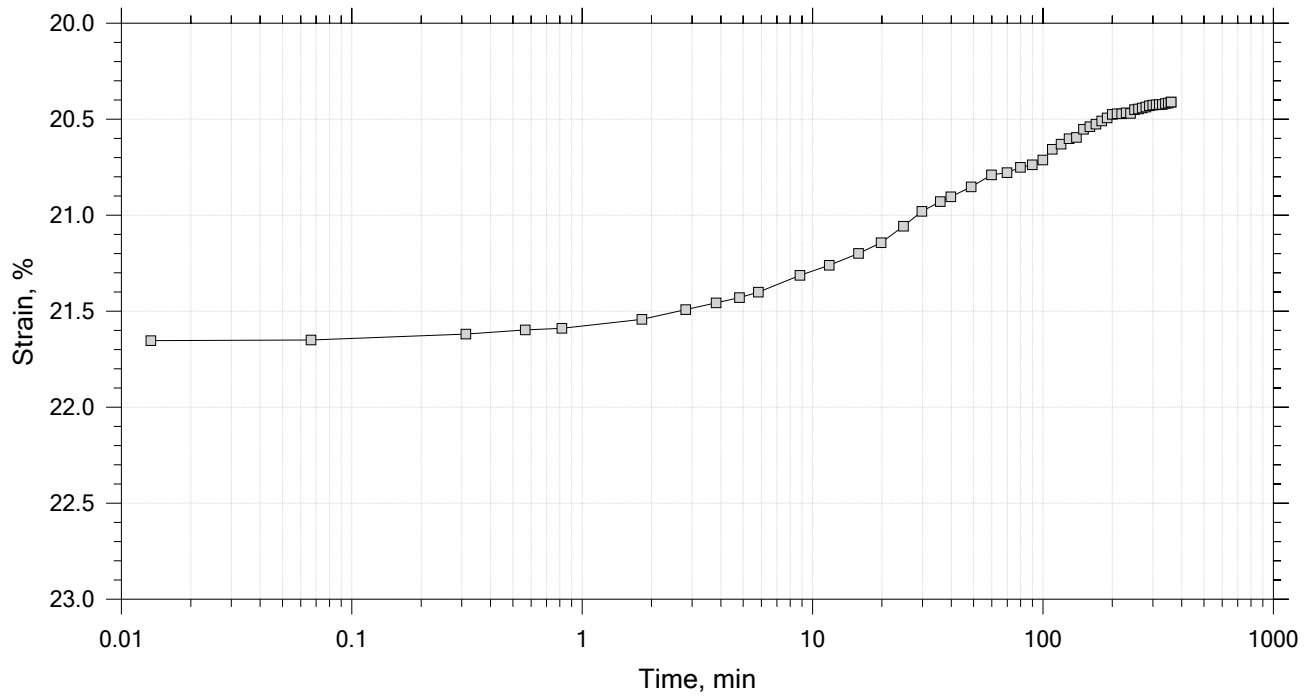
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-215	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 02/23/21	Depth: 10-12 ft
	Test No.: IP-4	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-D, Swell Pressure= 0.0661 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 14 of 15

Constant Load Step

Stress: 0.125 tsf



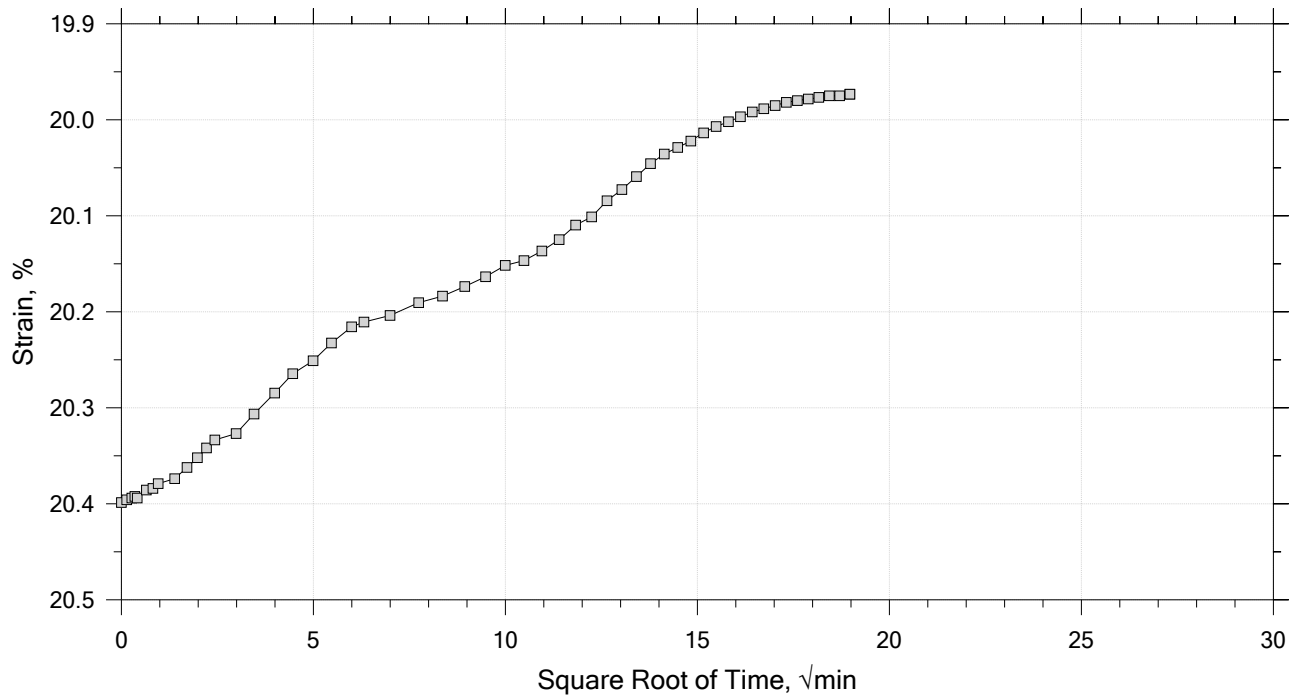
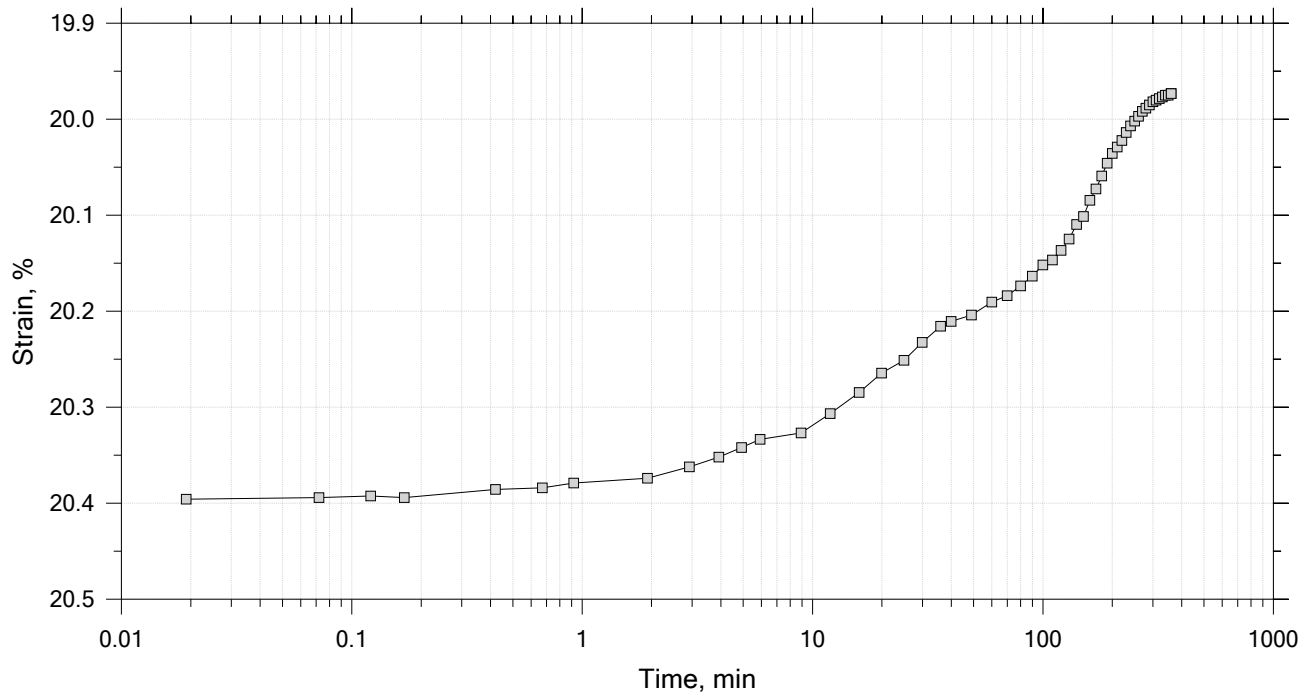
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-215	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 02/23/21	Depth: 10-12 ft
	Test No.: IP-4	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-D, Swell Pressure= 0.0661 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 15 of 15

Constant Load Step

Stress: 0.0625 tsf




	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-215	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 02/23/21	Depth: 10-12 ft
	Test No.: IP-4	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-D, Swell Pressure= 0.0661 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Specimen Diameter: 2.50 in	Estimated Specific Gravity: 2.74	Liquid Limit: 37
Initial Height: 1.00 in	Initial Void Ratio: 0.915	Plastic Limit: 19
Final Height: 0.80 in	Final Void Ratio: 0.532	Plasticity Index: 18

	Before Test Trimmings	Before Test Specimen	After Test Specimen	After Test Trimmings
Container ID	E-0866	RING		E2385
Mass Container, gm	8.54	110.49	110.49	8.15
Mass Container + Wet Soil, gm	115.37	261.3	247.91	145.32
Mass Container + Dry Soil, gm	89.81	225.55	225.55	123
Mass Dry Soil, gm	81.27	115.06	115.06	114.85
Water Content, %	31.45	31.07	19.43	19.43
Void Ratio	---	0.91	0.53	---
Degree of Saturation, %	---	93.03	100.00	---
Dry Unit Weight, pcf	---	89.296	111.58	---


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

	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-215	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 02/23/21	Depth: 10-12 ft
	Test No.: IP-4	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-D, Swell Pressure= 0.0661 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

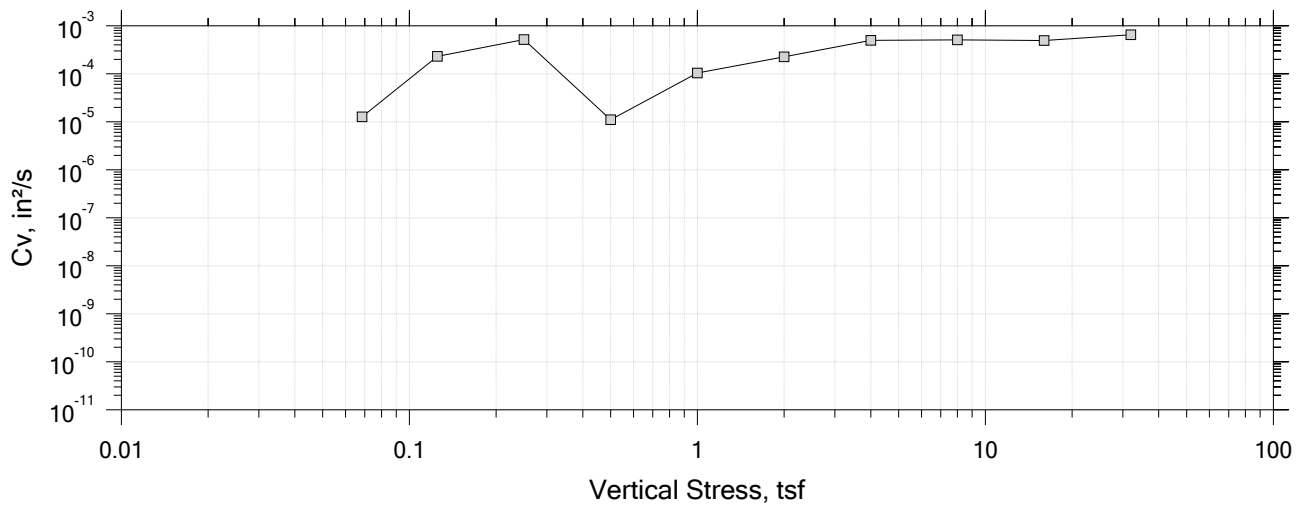
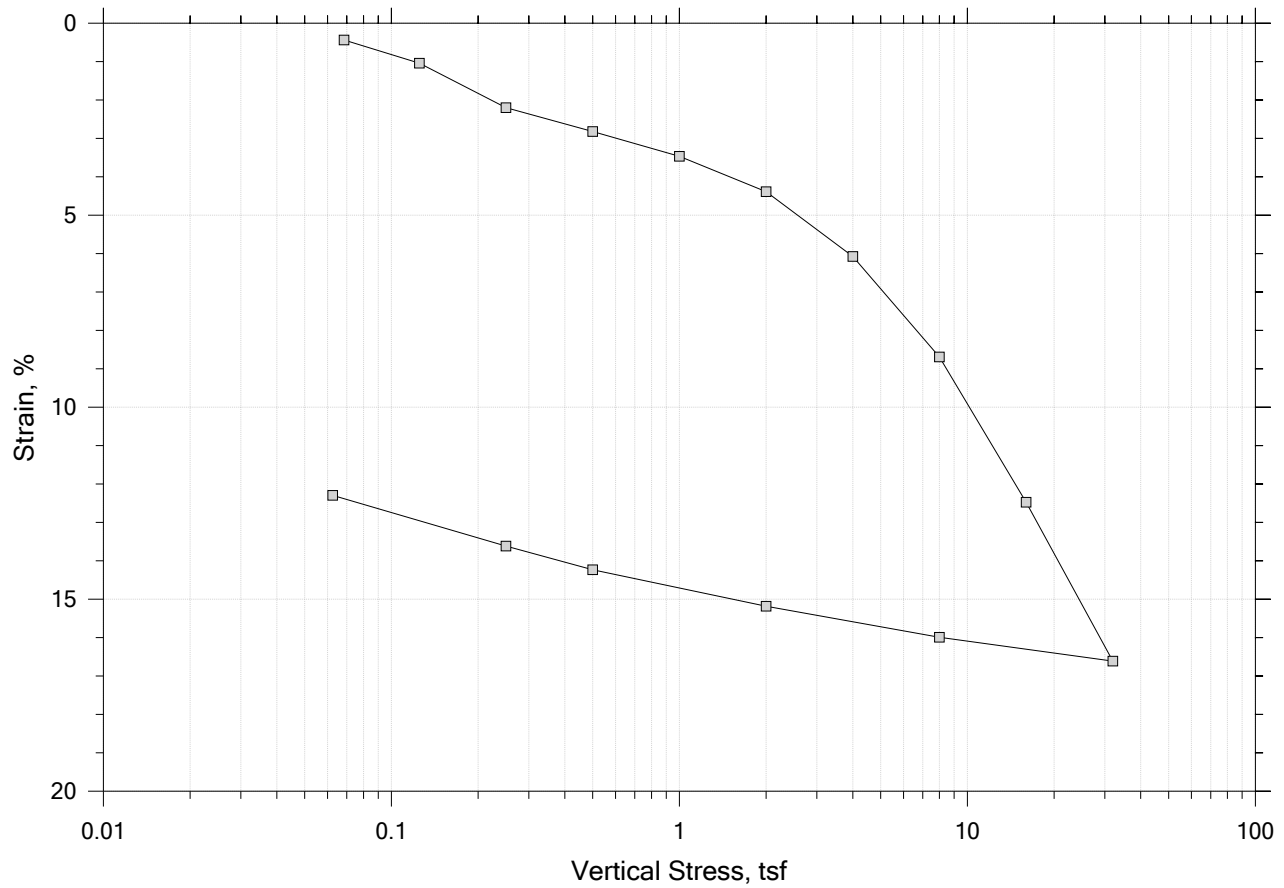
Square Root of Time Coefficients


[illegible]

	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-215	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 02/23/21	Depth: 10-12 ft
	Test No.: IP-4	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIID, Swell Pressure= 0.0661 tsf		
	Displacement at End of Increment		

One-Dimensional Consolidation by ASTM D2435 - Method B

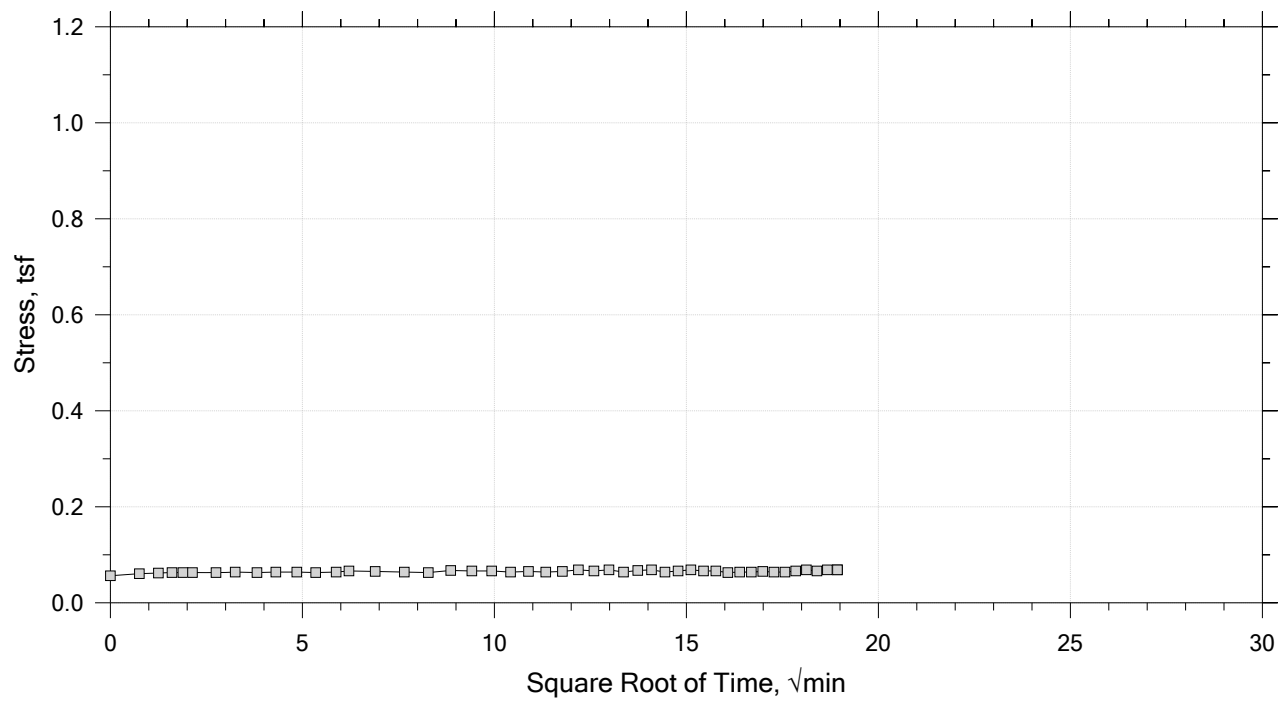
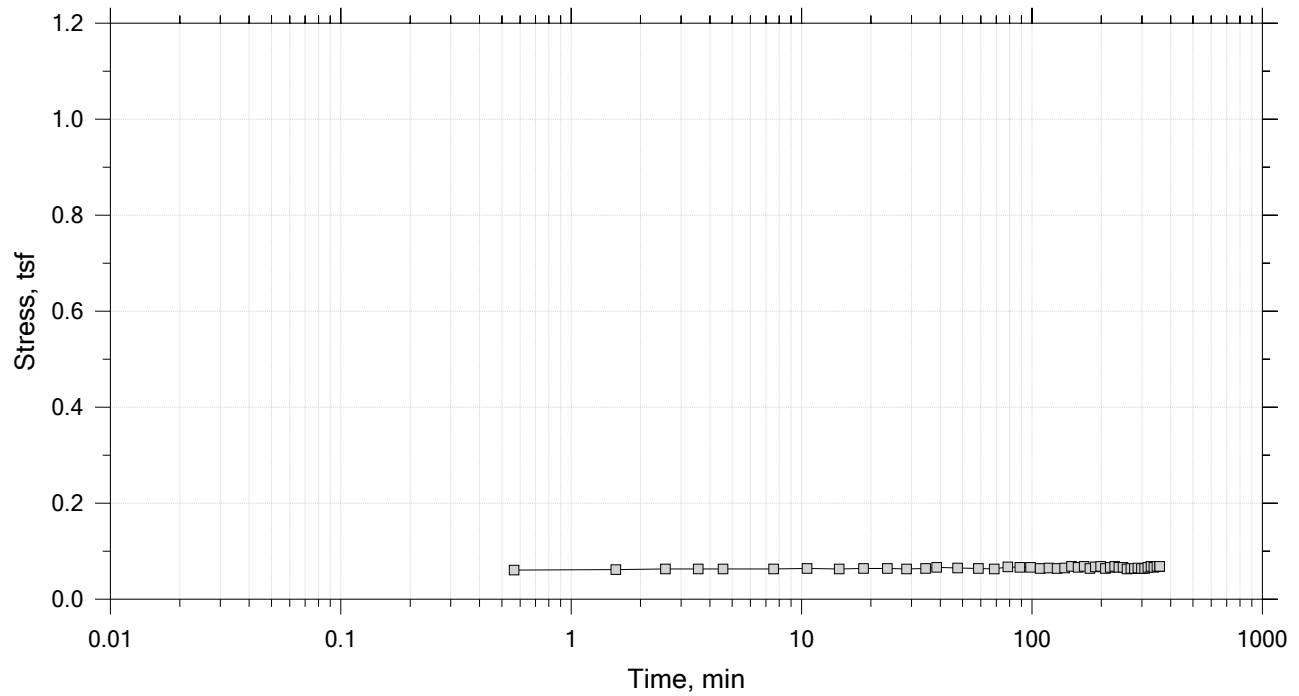
Summary Report




	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-216	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 02/23/21	Depth: 8-10 ft
	Test No.: IP-5	Sample Type: intact	Elevation: ---
	Description: Moist olive gray clay		
	Remarks: System LTIII-0836, Swell Pressure = 0.0685 tsf		
	Displacement at End of Increment		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 1 of 15
Constant Volume Step
Stress: 0.0685 tsf



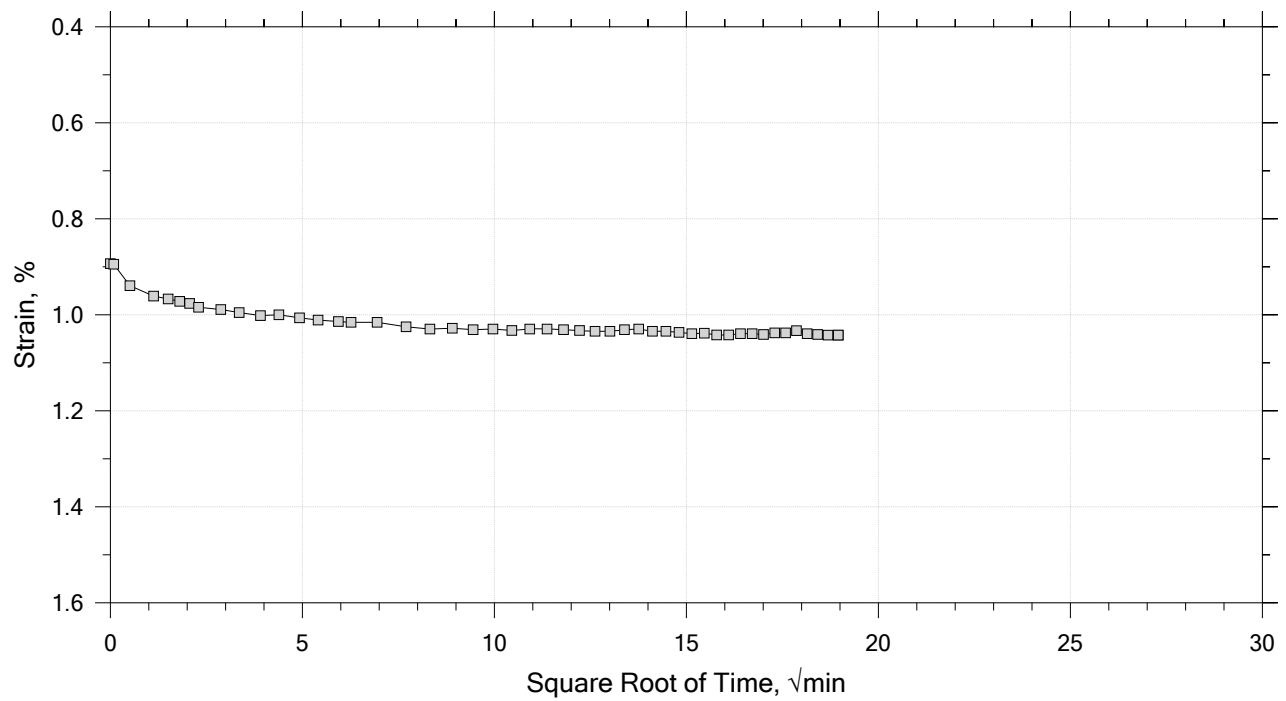
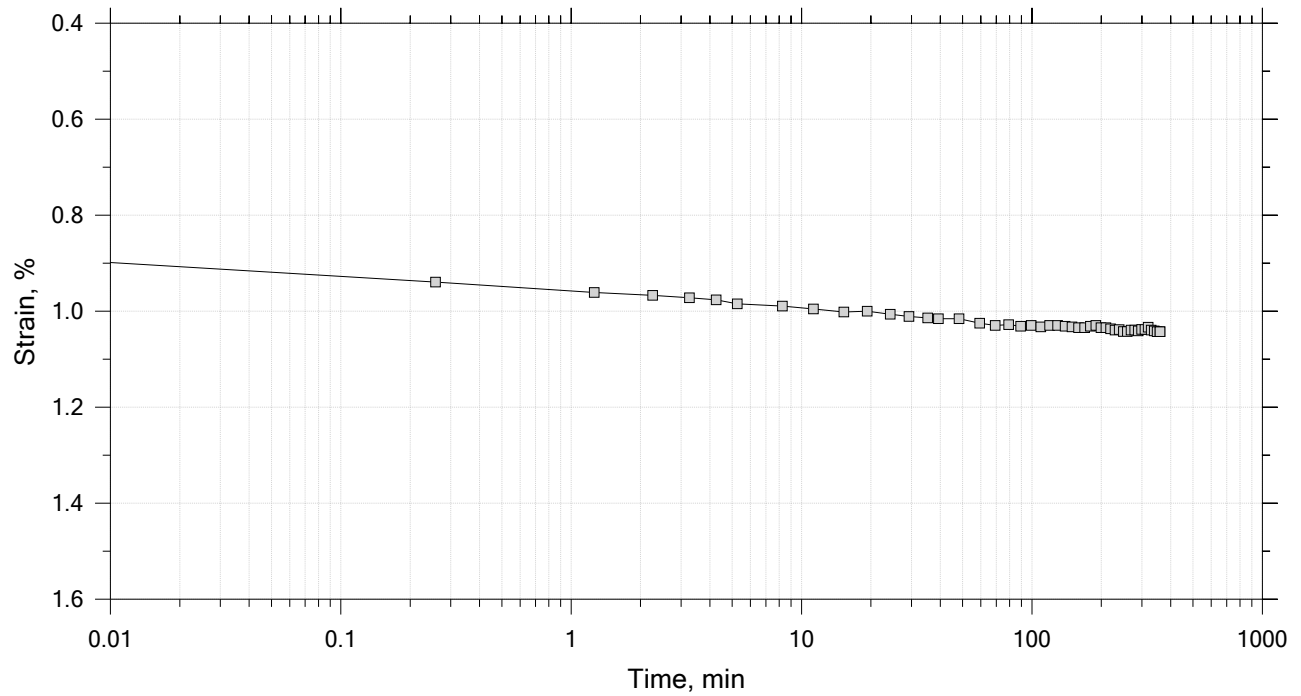
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-216	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 02/23/21	Depth: 8-10 ft
	Test No.: IP-5	Sample Type: intact	Elevation: ---
	Description: Moist olive gray clay		
	Remarks: System LTIII-0836, Swell Pressure = 0.0685 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 2 of 15

Constant Load Step

Stress: 0.125 tsf



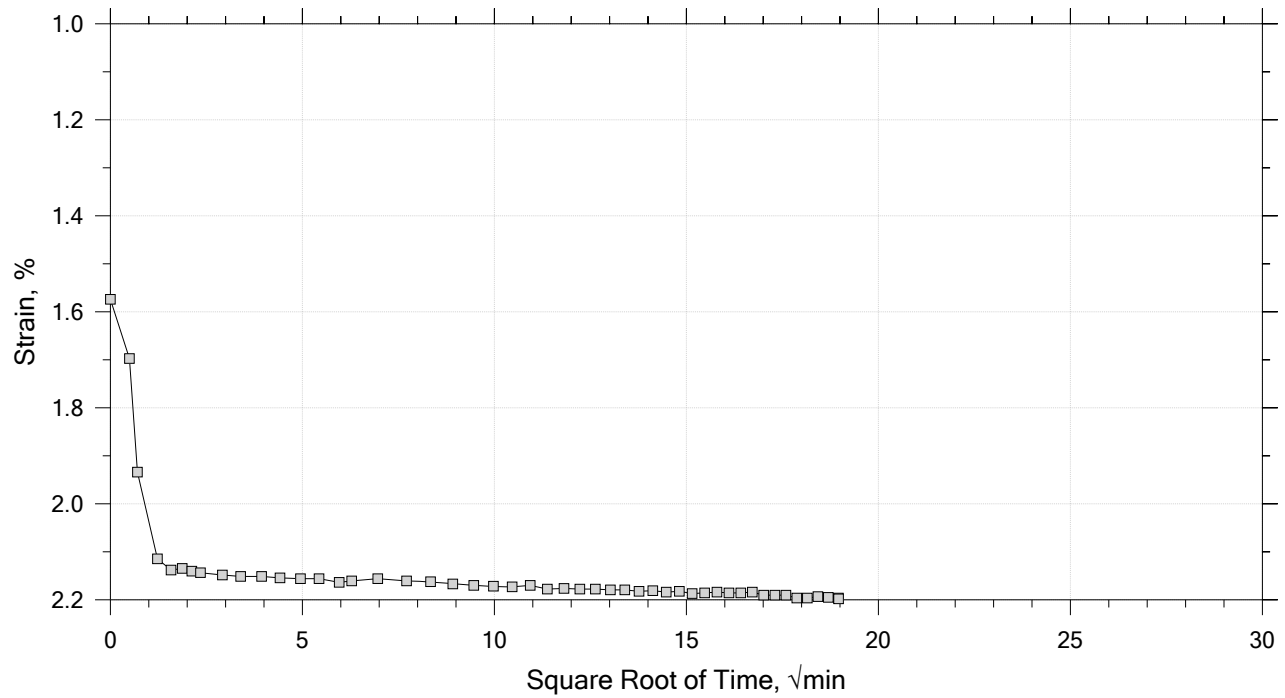
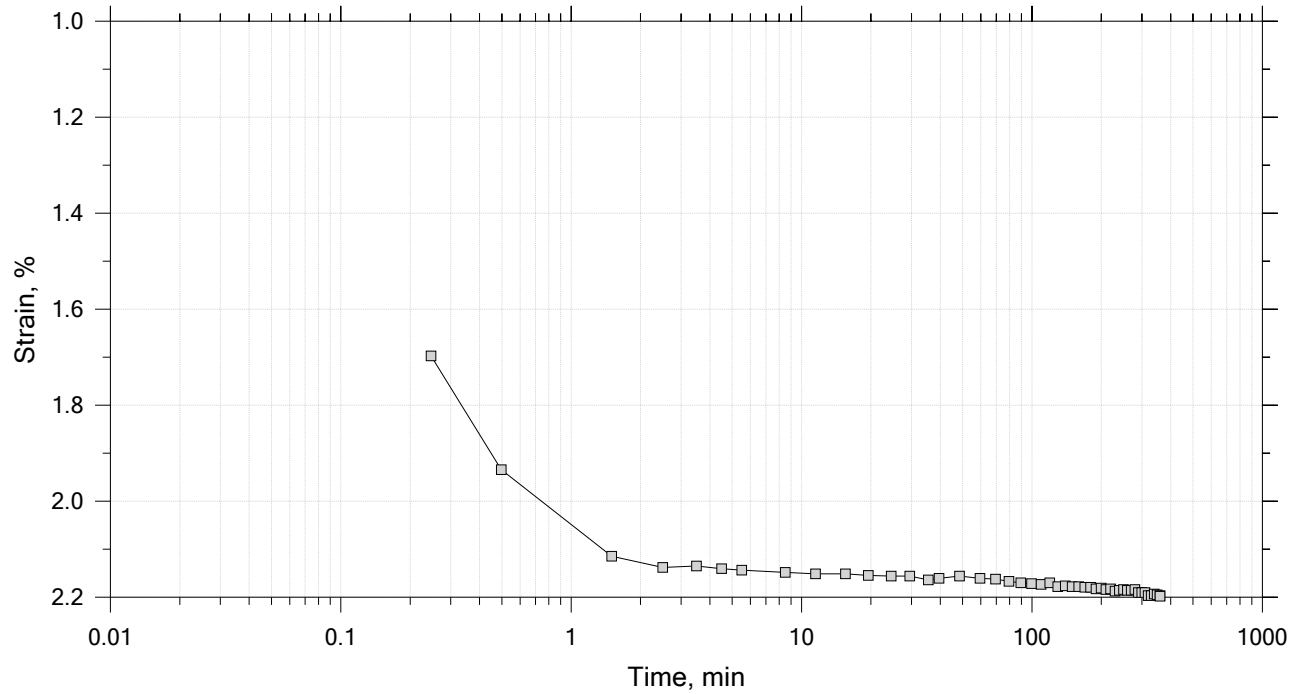
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-216	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 02/23/21	Depth: 8-10 ft
	Test No.: IP-5	Sample Type: intact	Elevation: ---
	Description: Moist olive gray clay		
	Remarks: System LTIII-0836, Swell Pressure = 0.0685 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 3 of 15

Constant Load Step

Stress: 0.25 tsf



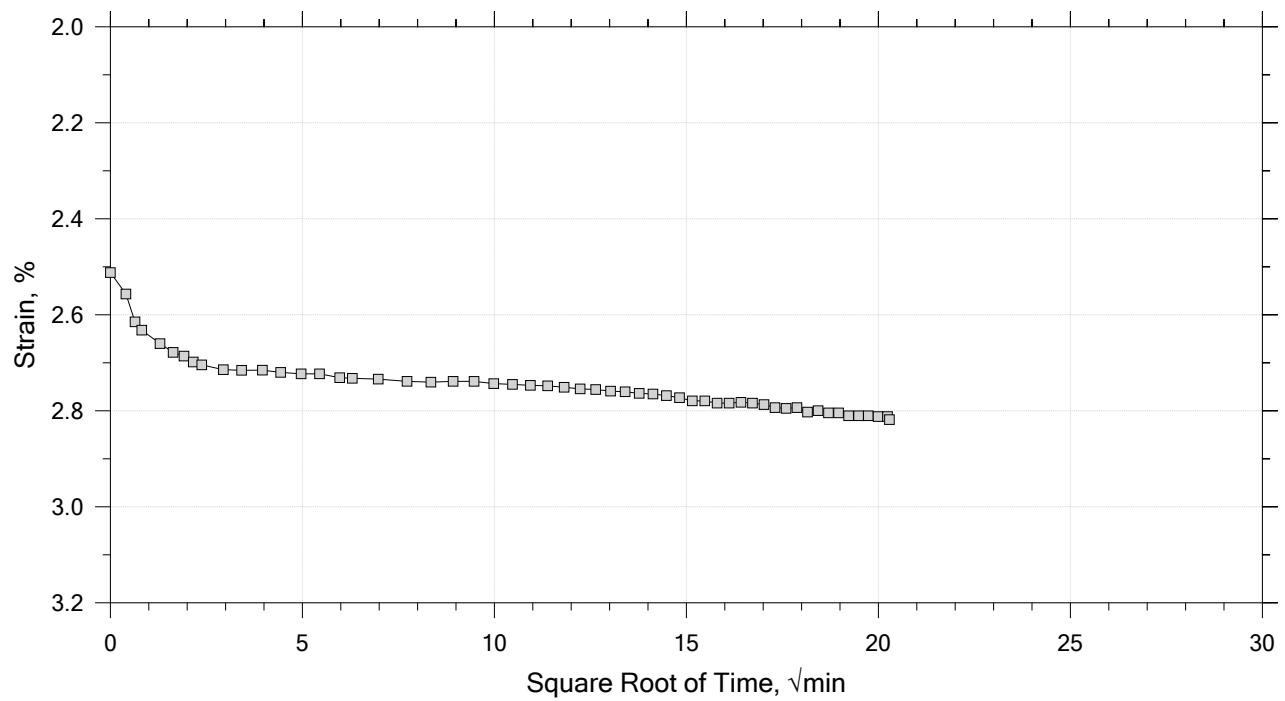
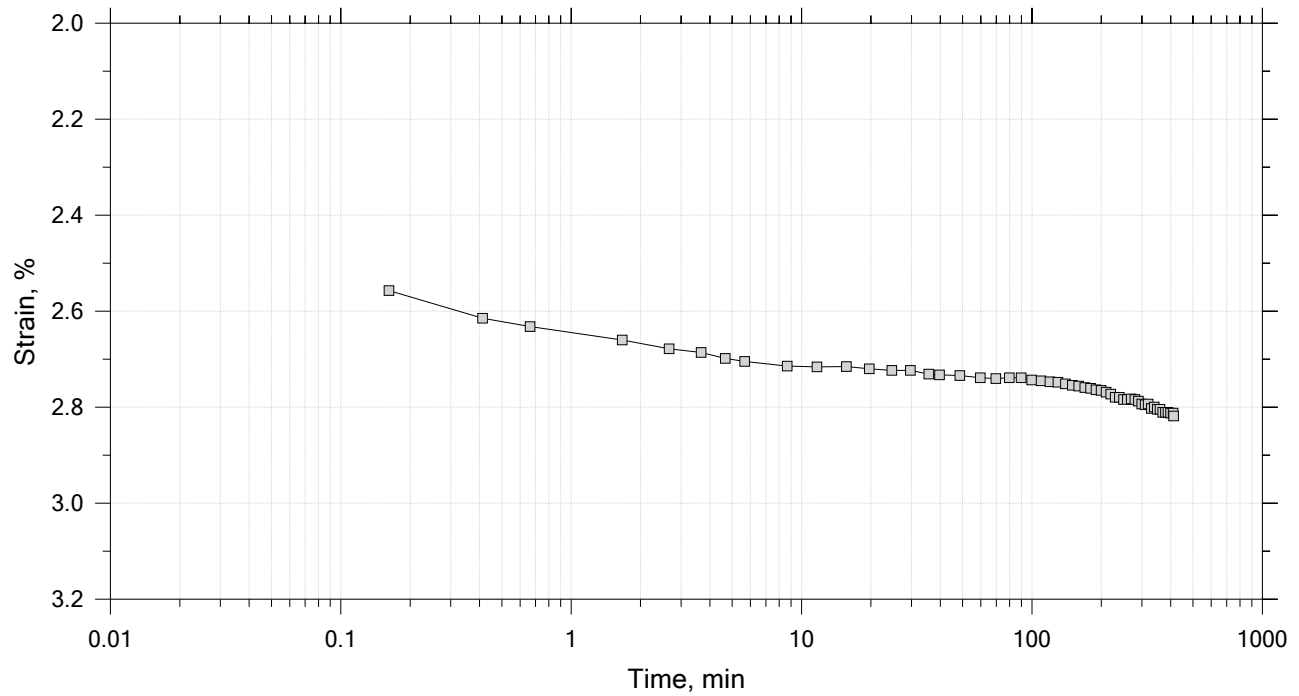
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-216	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 02/23/21	Depth: 8-10 ft
	Test No.: IP-5	Sample Type: intact	Elevation: ---
	Description: Moist olive gray clay		
	Remarks: System LTIII-0836, Swell Pressure = 0.0685 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 4 of 15

Constant Load Step

Stress: 0.5 tsf



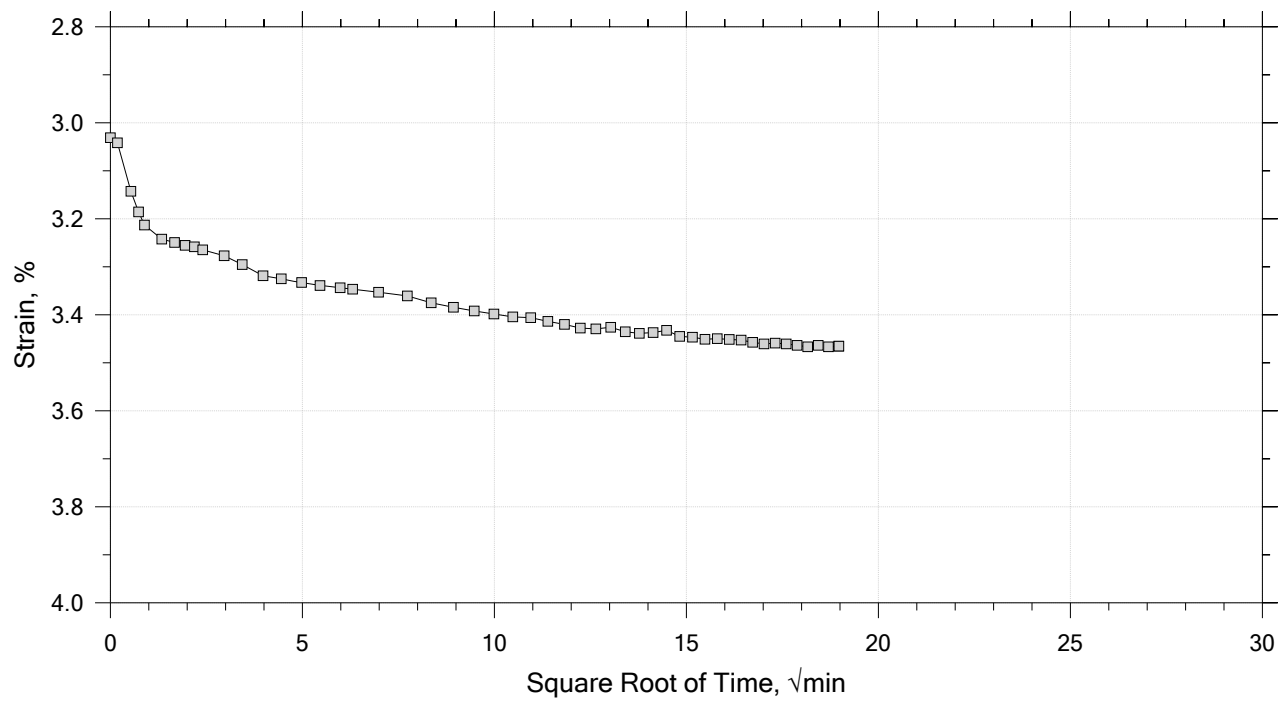
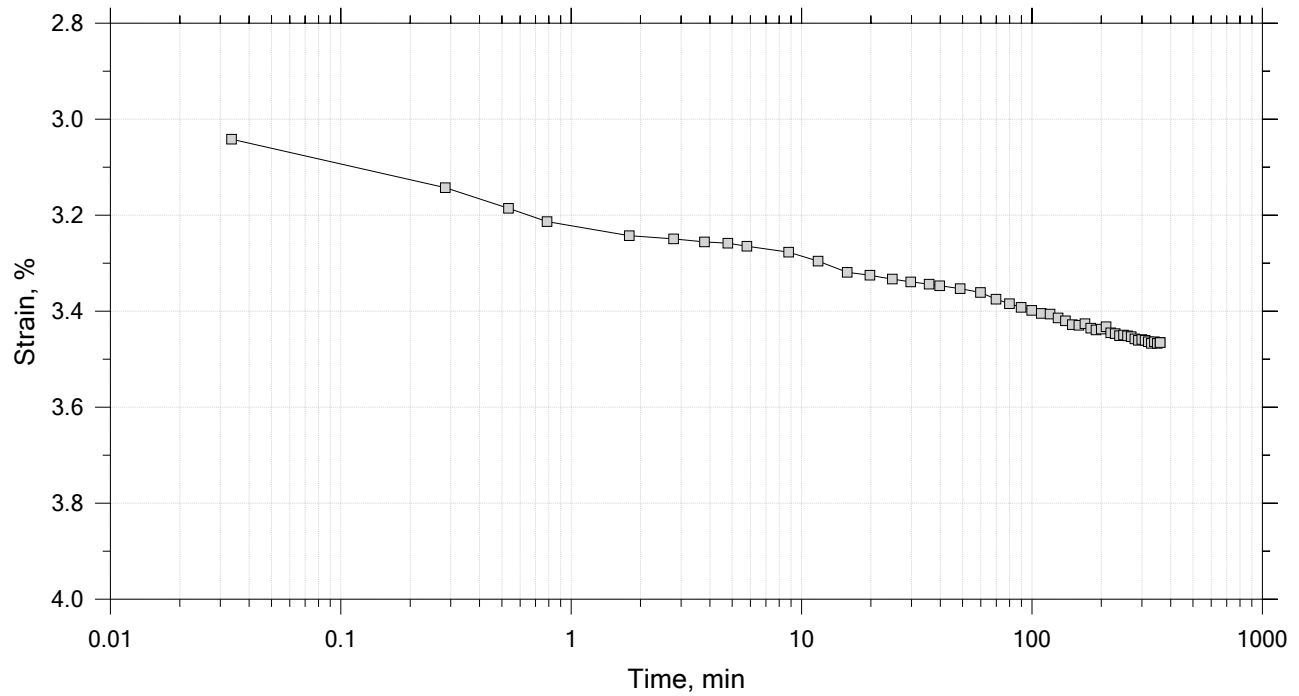
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-216	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 02/23/21	Depth: 8-10 ft
	Test No.: IP-5	Sample Type: intact	Elevation: ---
	Description: Moist olive gray clay		
	Remarks: System LTIII-0836, Swell Pressure = 0.0685 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 5 of 15

Constant Load Step

Stress: 1 tsf



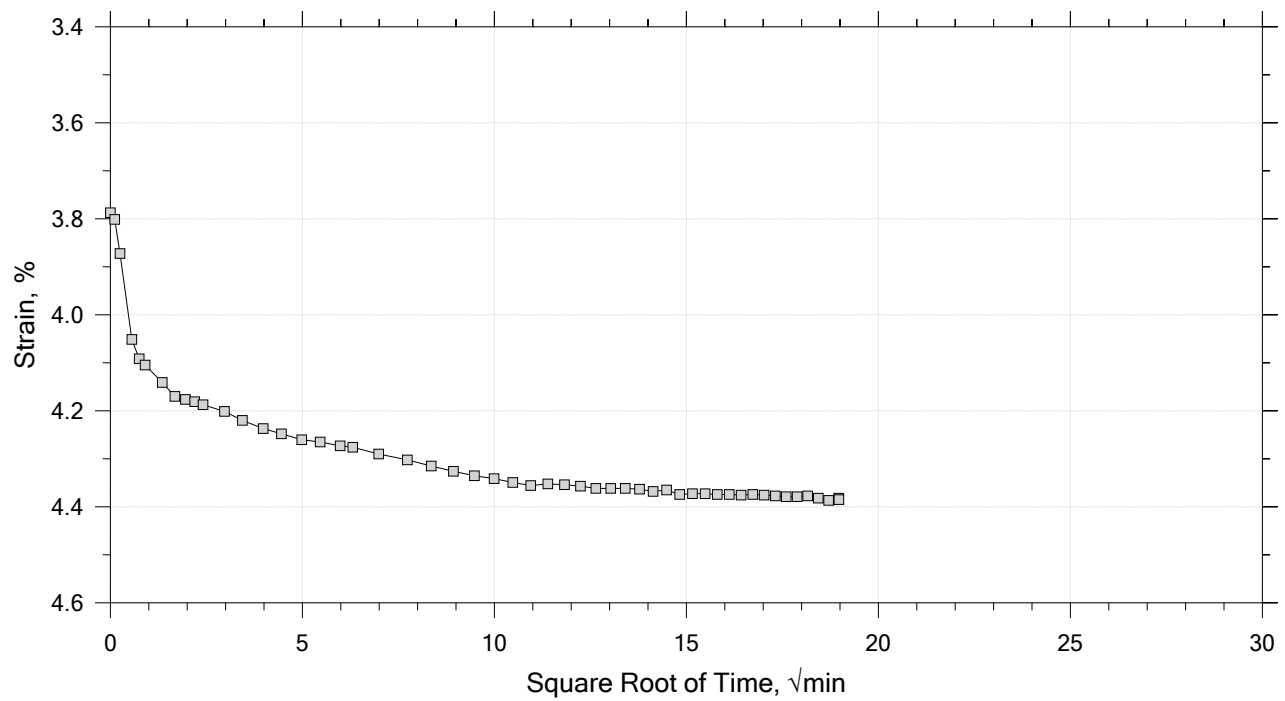
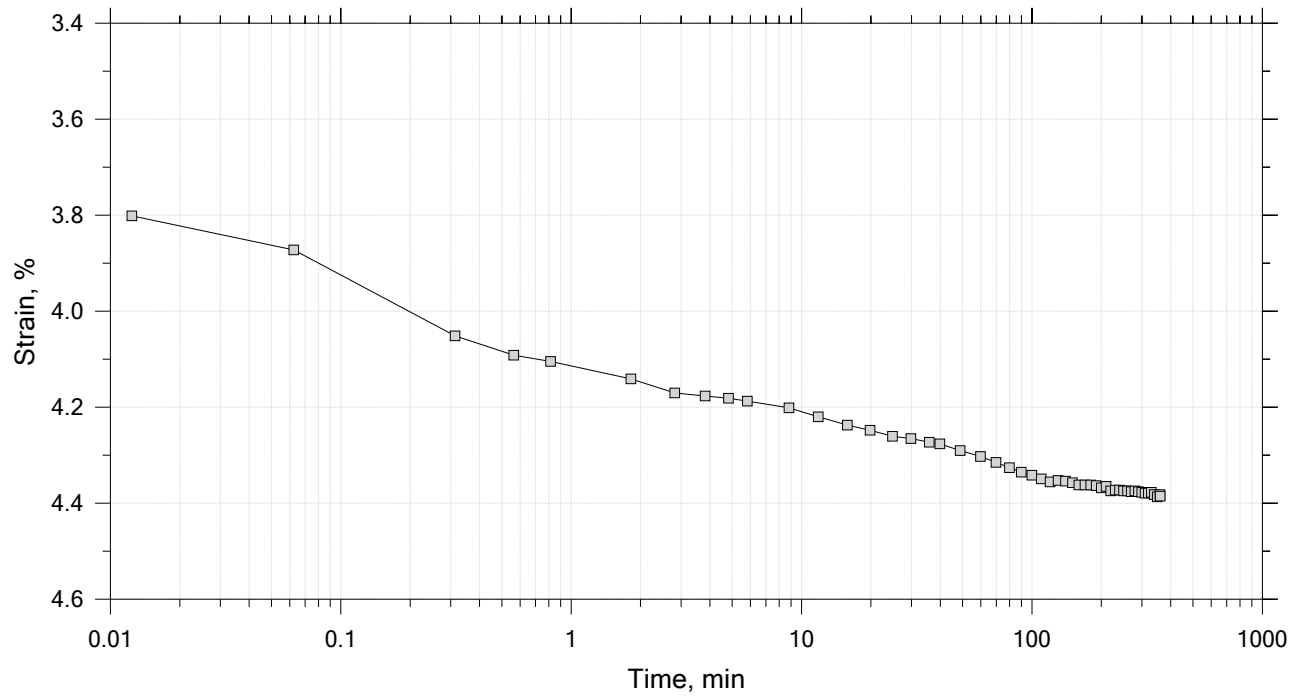
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-216	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 02/23/21	Depth: 8-10 ft
	Test No.: IP-5	Sample Type: intact	Elevation: ---
	Description: Moist olive gray clay		
	Remarks: System LTIII-0836, Swell Pressure = 0.0685 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 6 of 15

Constant Load Step

Stress: 2 tsf



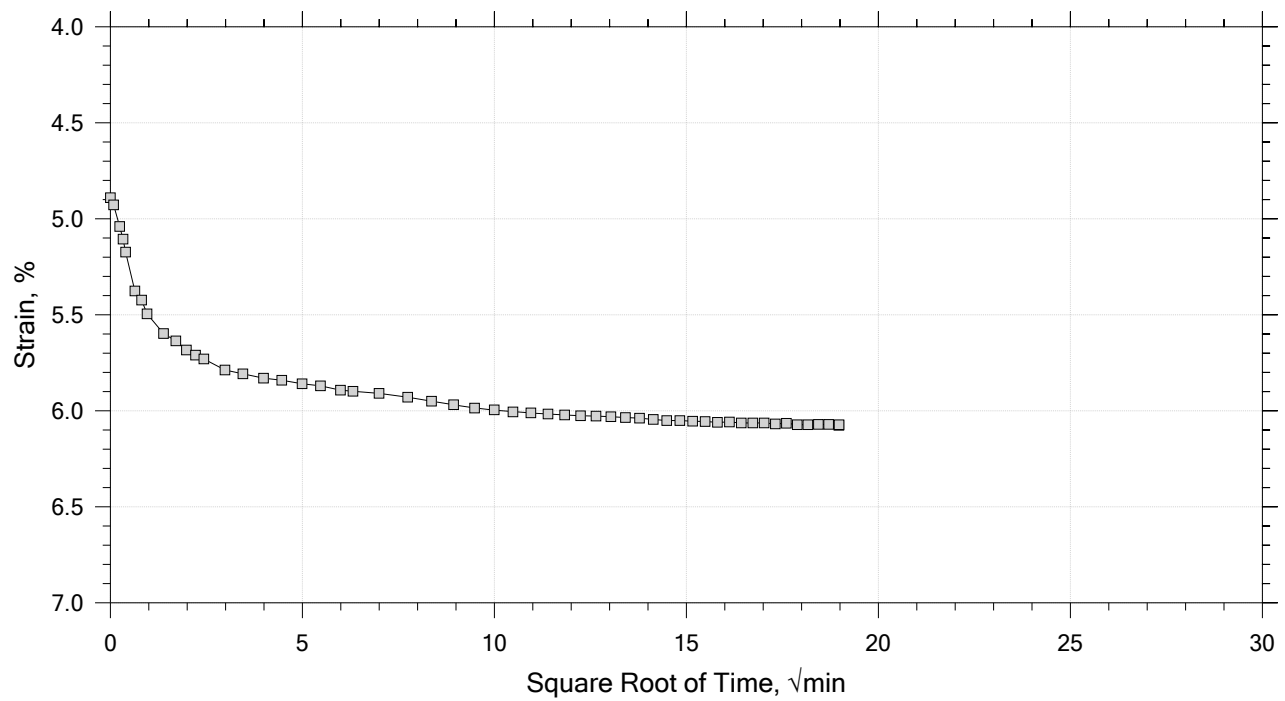
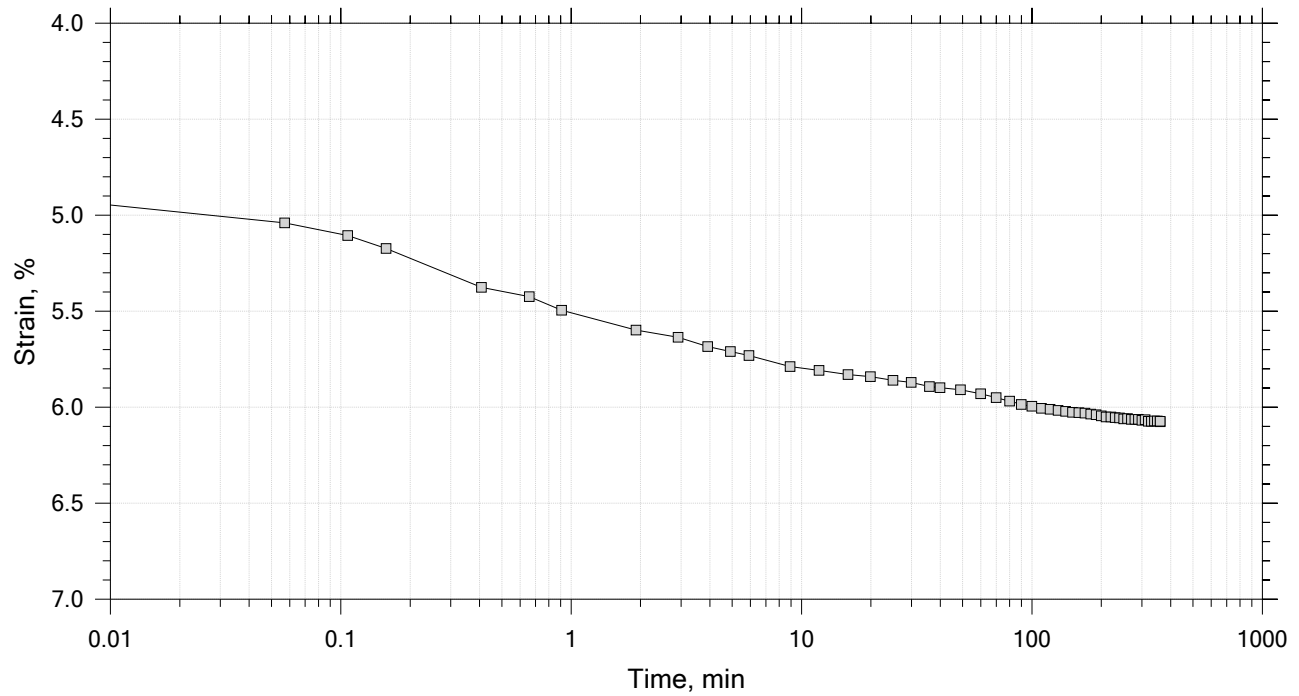
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-216	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 02/23/21	Depth: 8-10 ft
	Test No.: IP-5	Sample Type: intact	Elevation: ---
	Description: Moist olive gray clay		
	Remarks: System LTIII-0836, Swell Pressure = 0.0685 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 7 of 15

Constant Load Step

Stress: 4 tsf



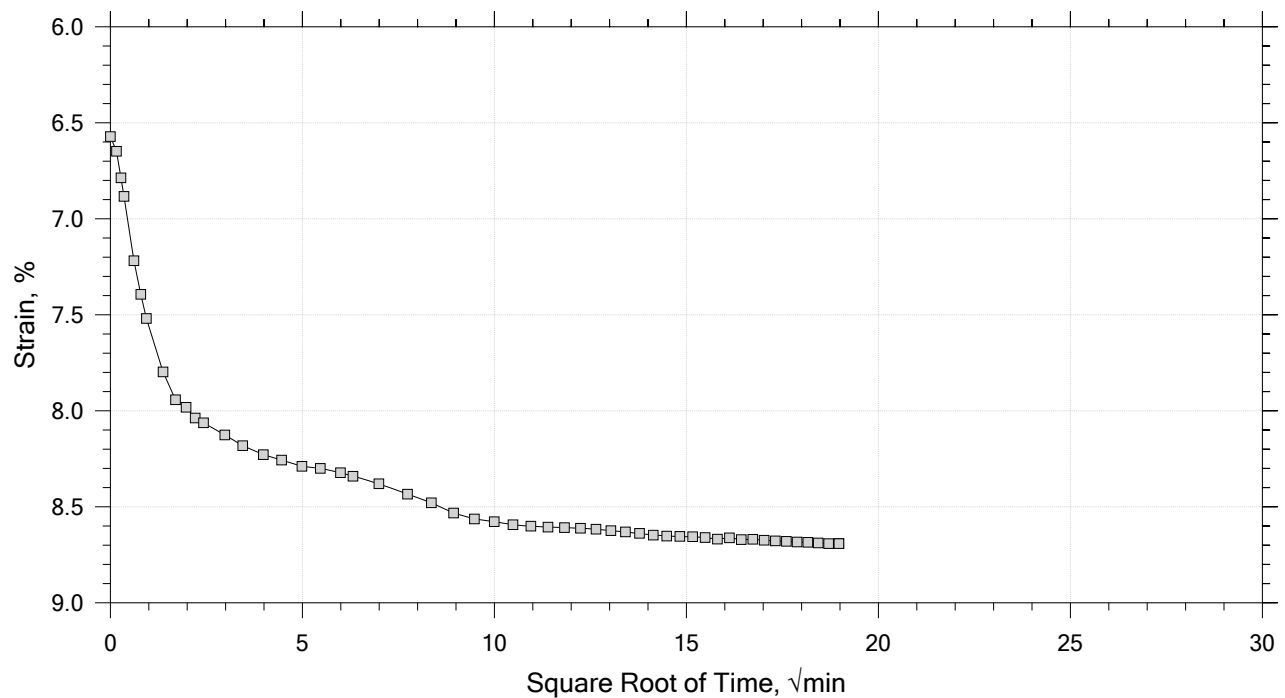
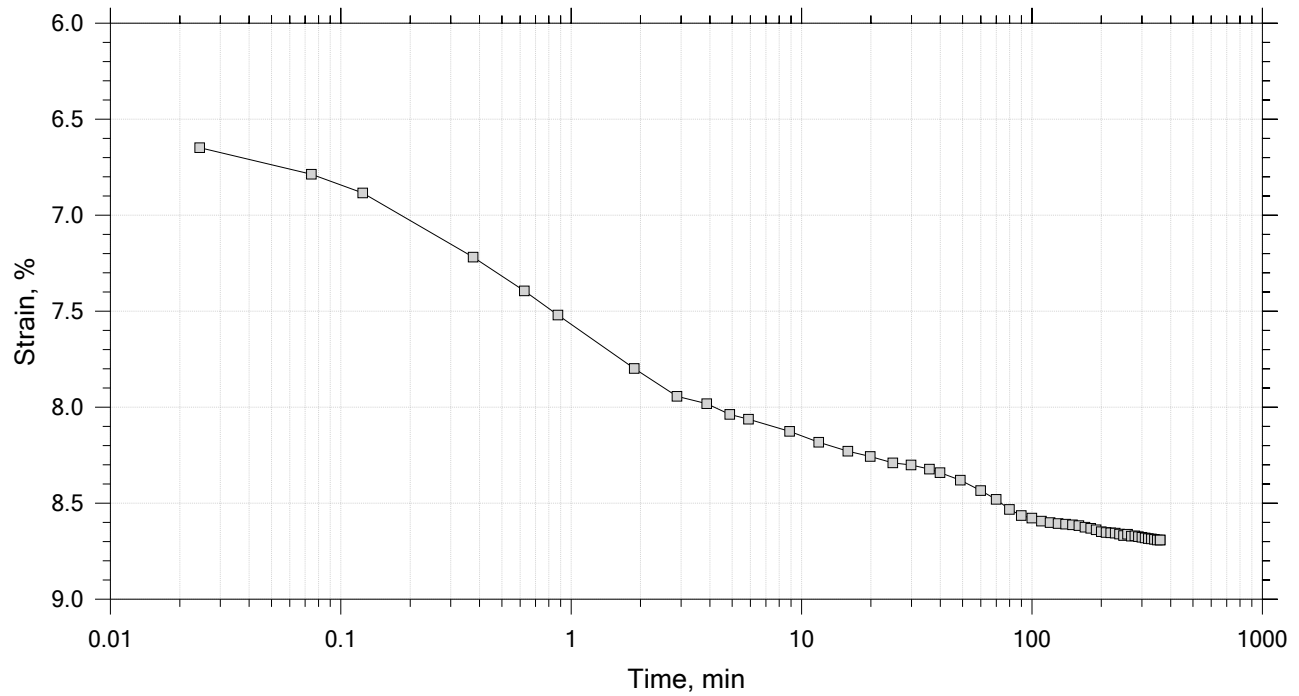
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-216	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 02/23/21	Depth: 8-10 ft
	Test No.: IP-5	Sample Type: intact	Elevation: ---
	Description: Moist olive gray clay		
	Remarks: System LTIII-0836, Swell Pressure = 0.0685 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 8 of 15

Constant Load Step

Stress: 8 tsf



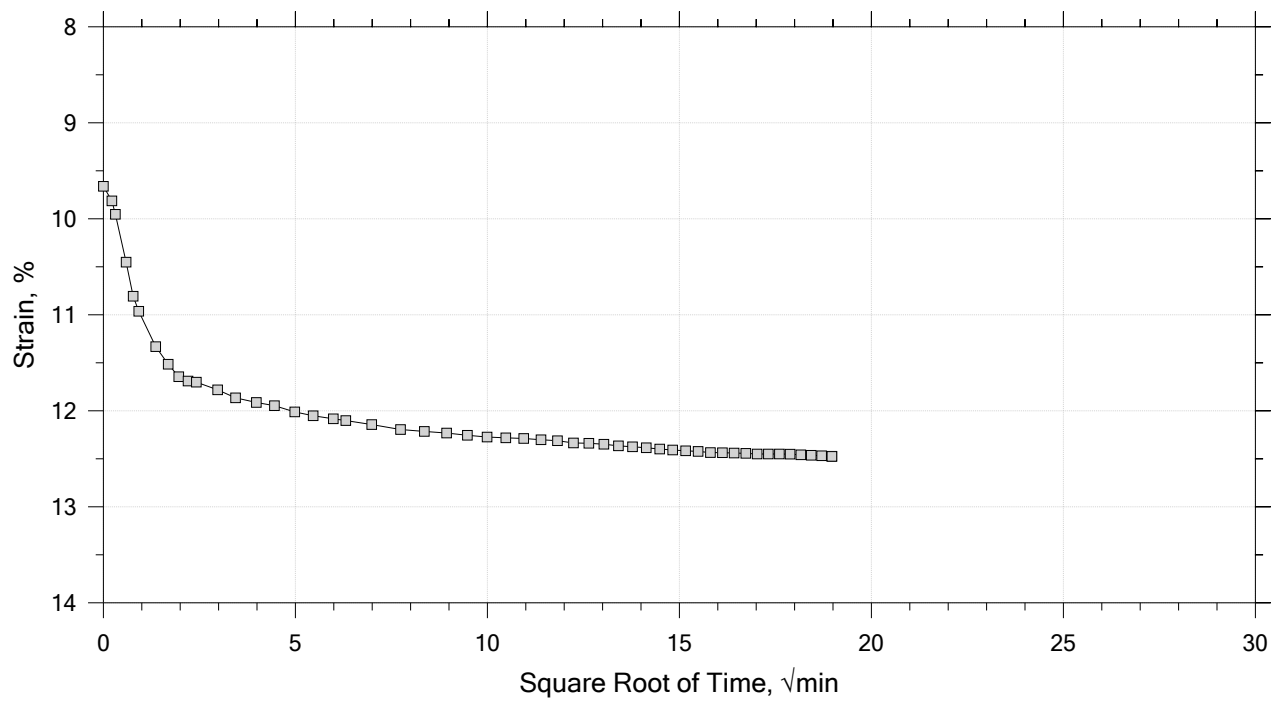
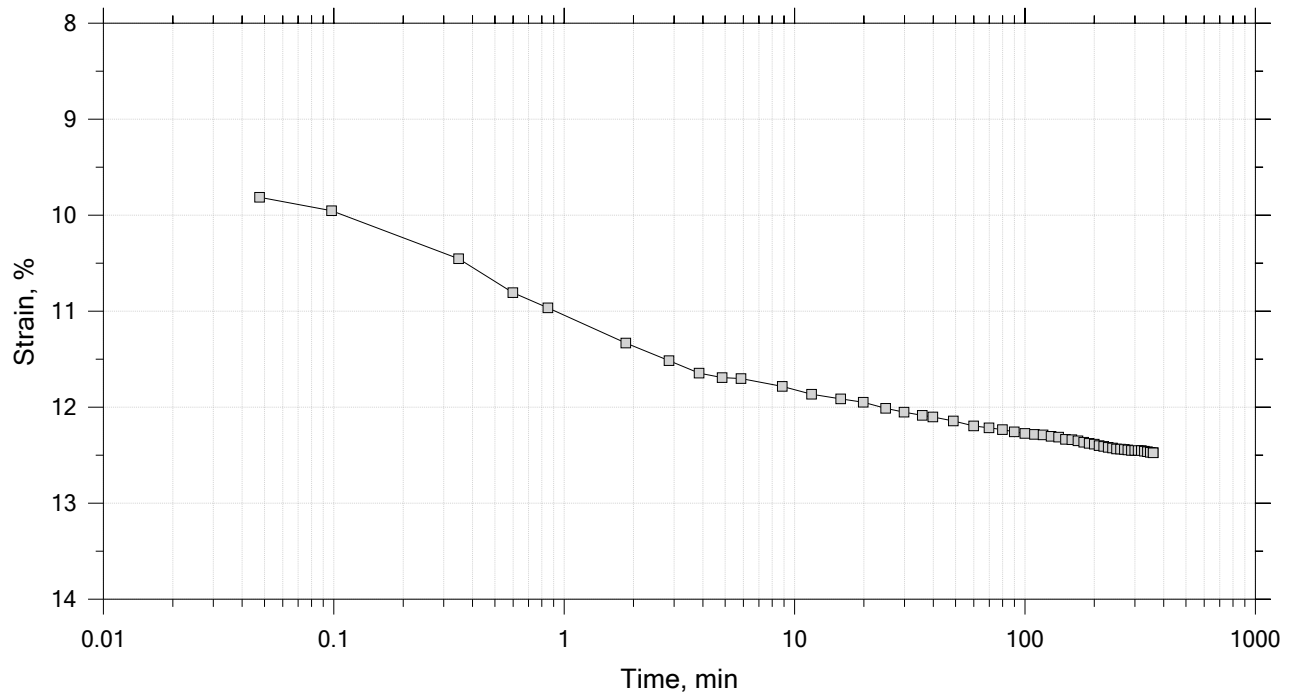
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-216	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 02/23/21	Depth: 8-10 ft
	Test No.: IP-5	Sample Type: intact	Elevation: ---
	Description: Moist olive gray clay		
	Remarks: System LTIII-0836, Swell Pressure = 0.0685 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 9 of 15

Constant Load Step

Stress: 16 tsf



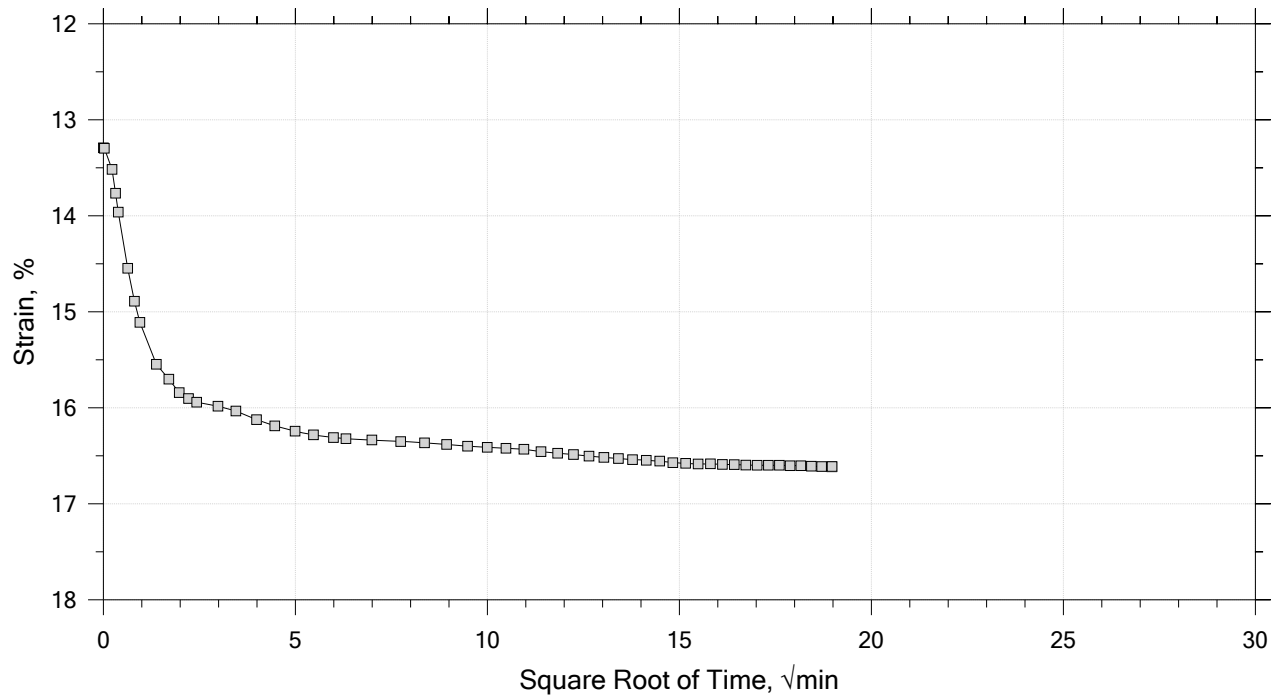
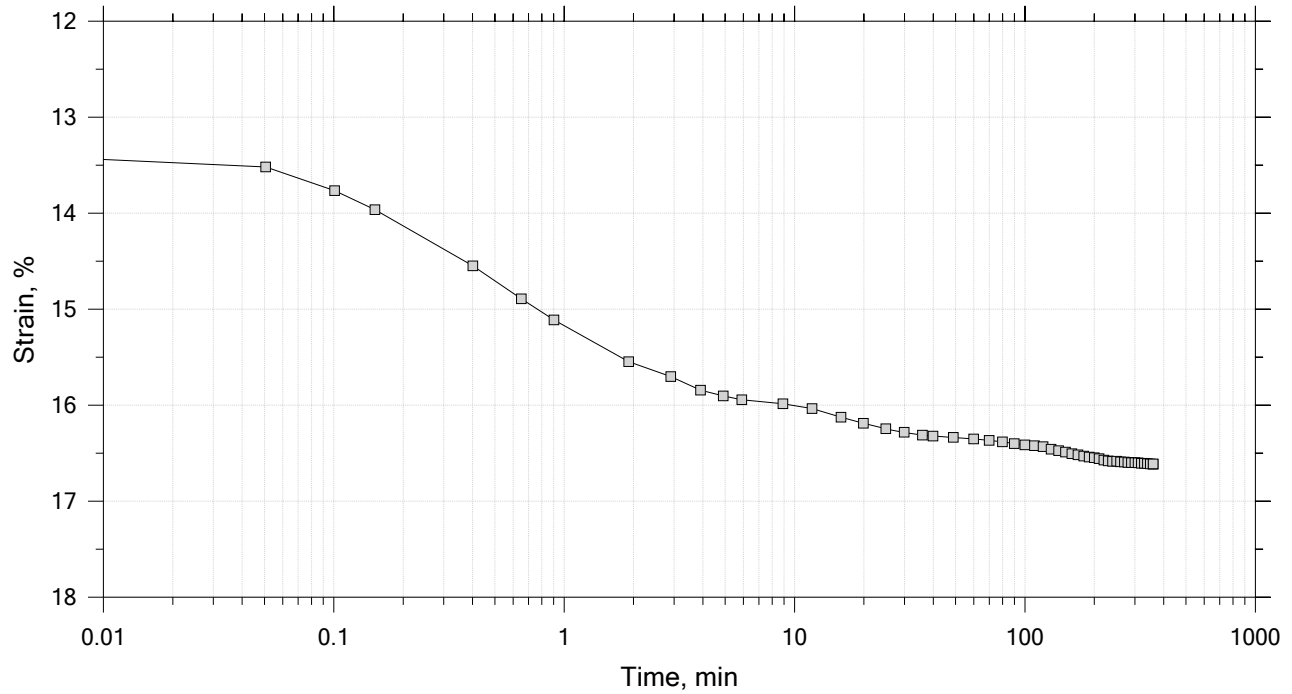
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-216	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 02/23/21	Depth: 8-10 ft
	Test No.: IP-5	Sample Type: intact	Elevation: ---
	Description: Moist olive gray clay		
	Remarks: System LTIII-0836, Swell Pressure = 0.0685 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 10 of 15

Constant Load Step

Stress: 32 tsf



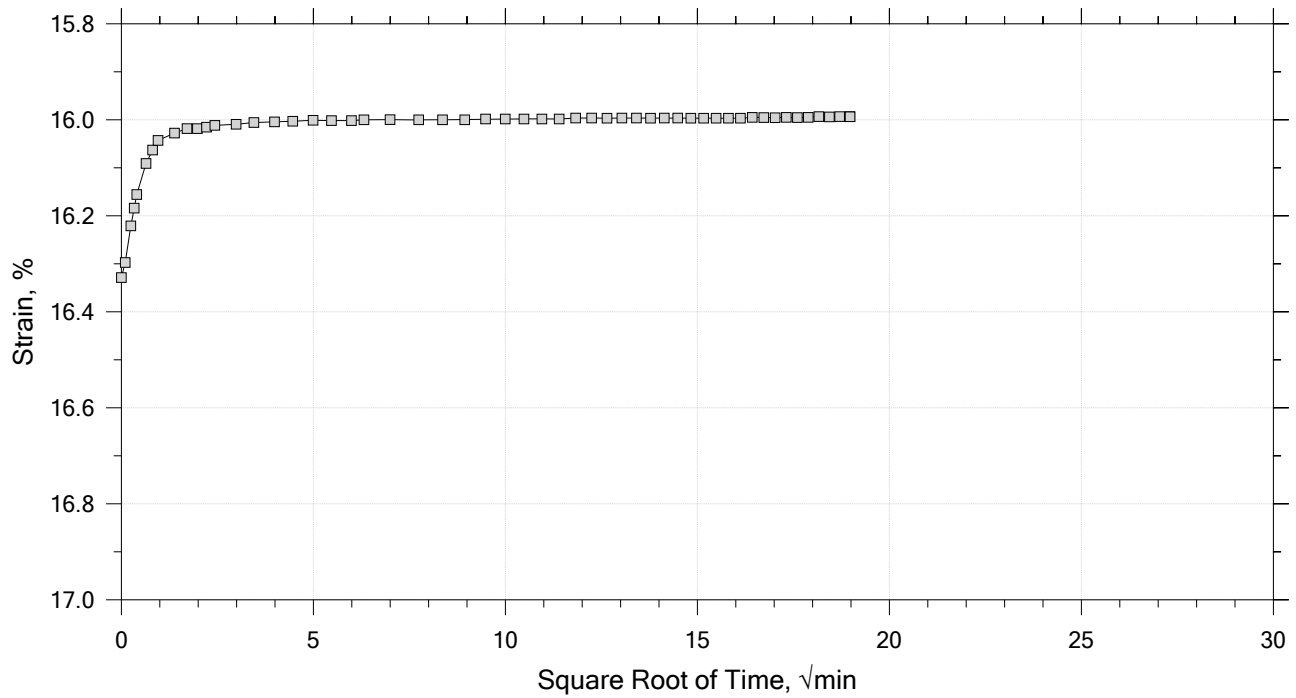
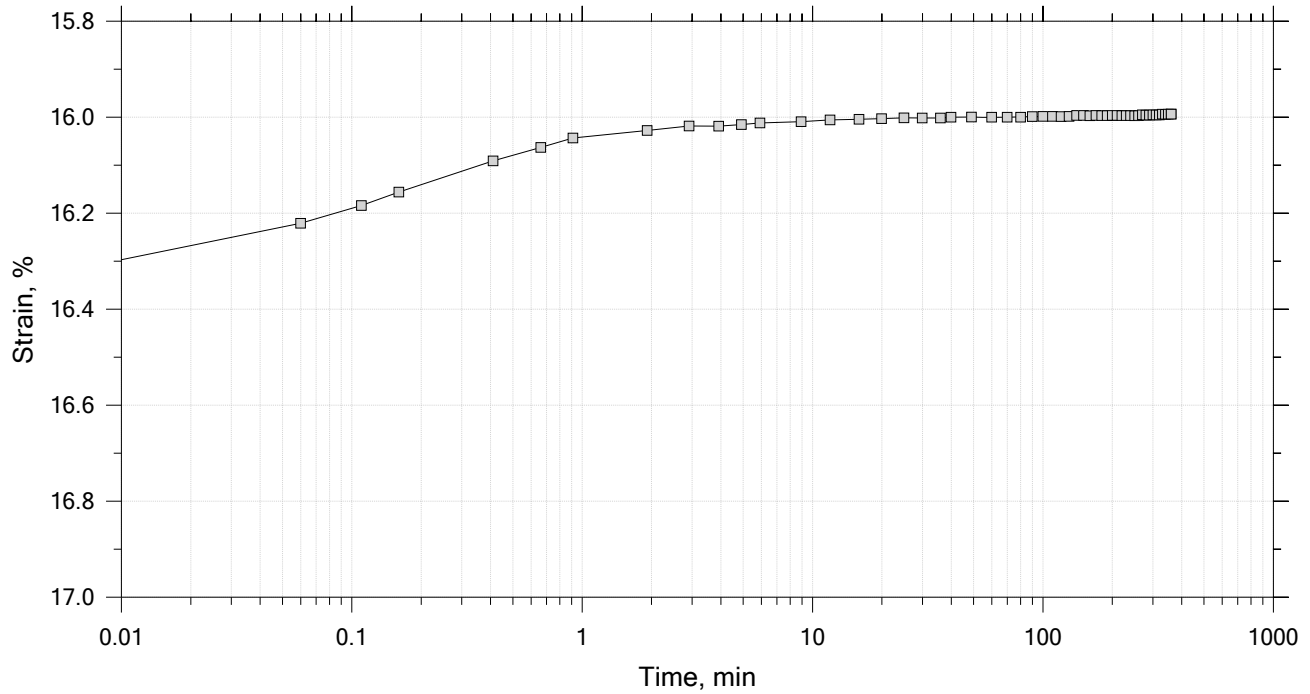
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-216	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 02/23/21	Depth: 8-10 ft
	Test No.: IP-5	Sample Type: intact	Elevation: ---
	Description: Moist olive gray clay		
	Remarks: System LTIII-0836, Swell Pressure = 0.0685 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 11 of 15

Constant Load Step

Stress: 8 tsf



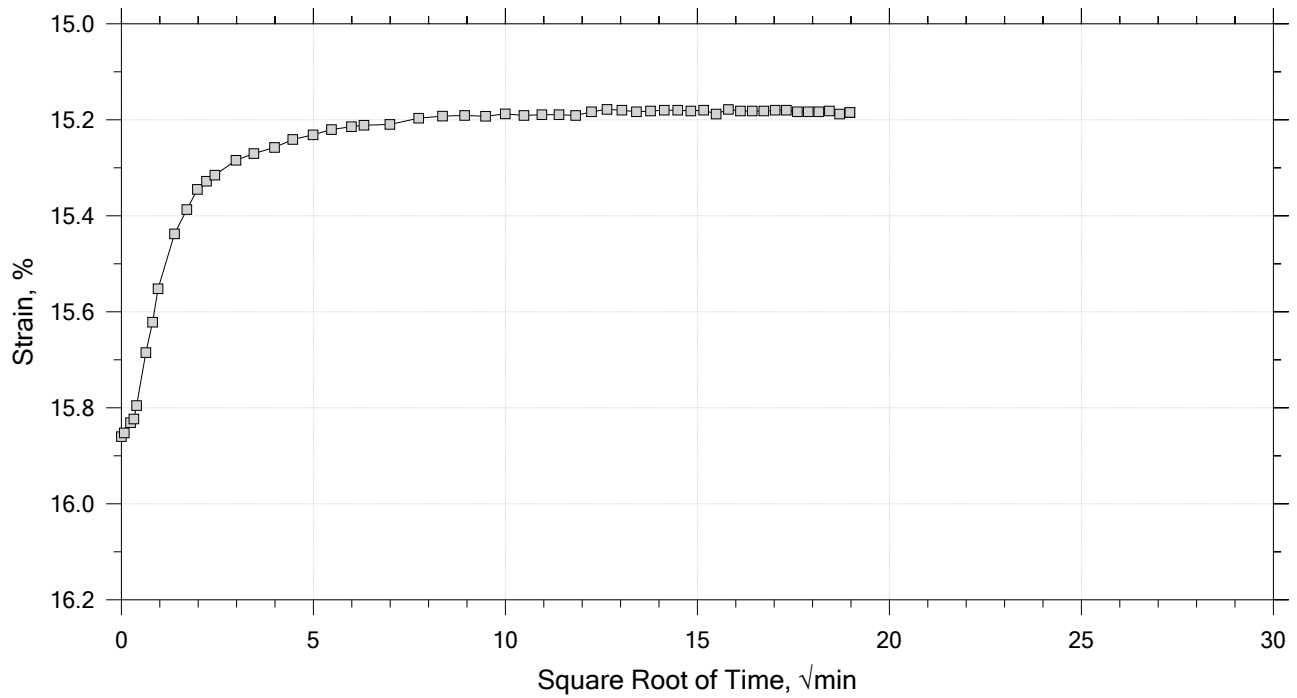
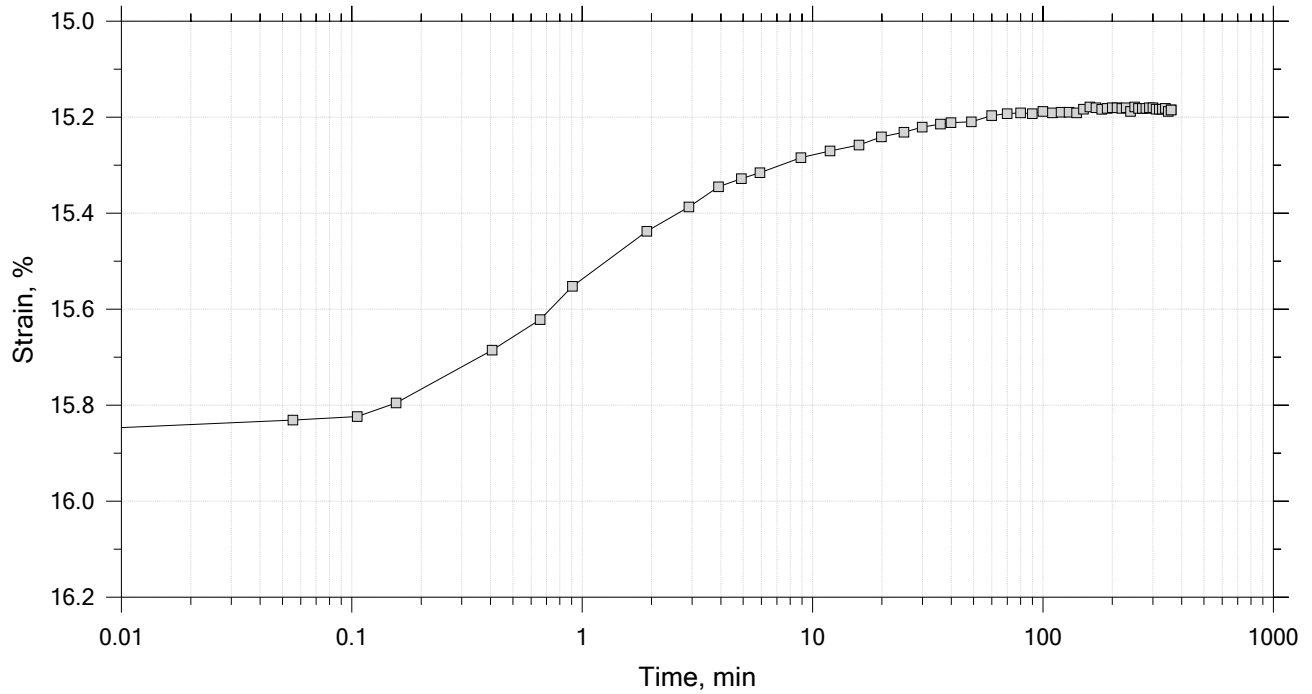
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-216	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 02/23/21	Depth: 8-10 ft
	Test No.: IP-5	Sample Type: intact	Elevation: ---
	Description: Moist olive gray clay		
	Remarks: System LTIII-0836, Swell Pressure = 0.0685 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 12 of 15

Constant Load Step

Stress: 2 tsf



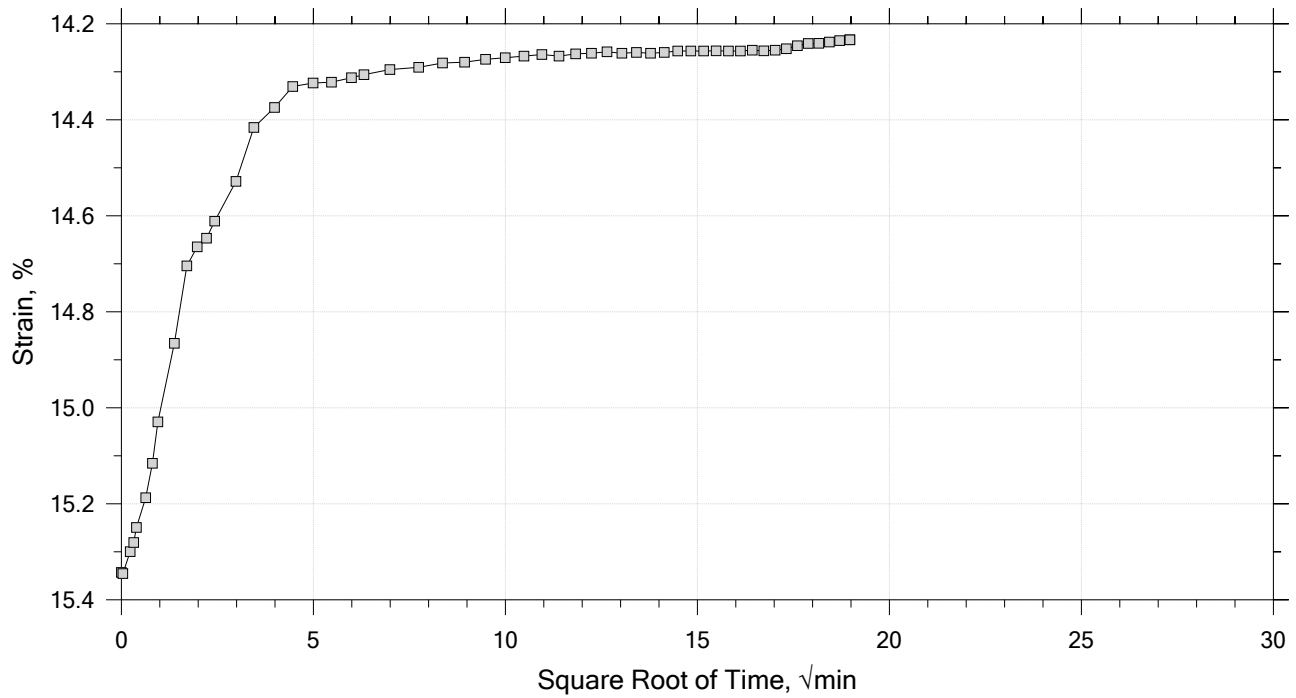
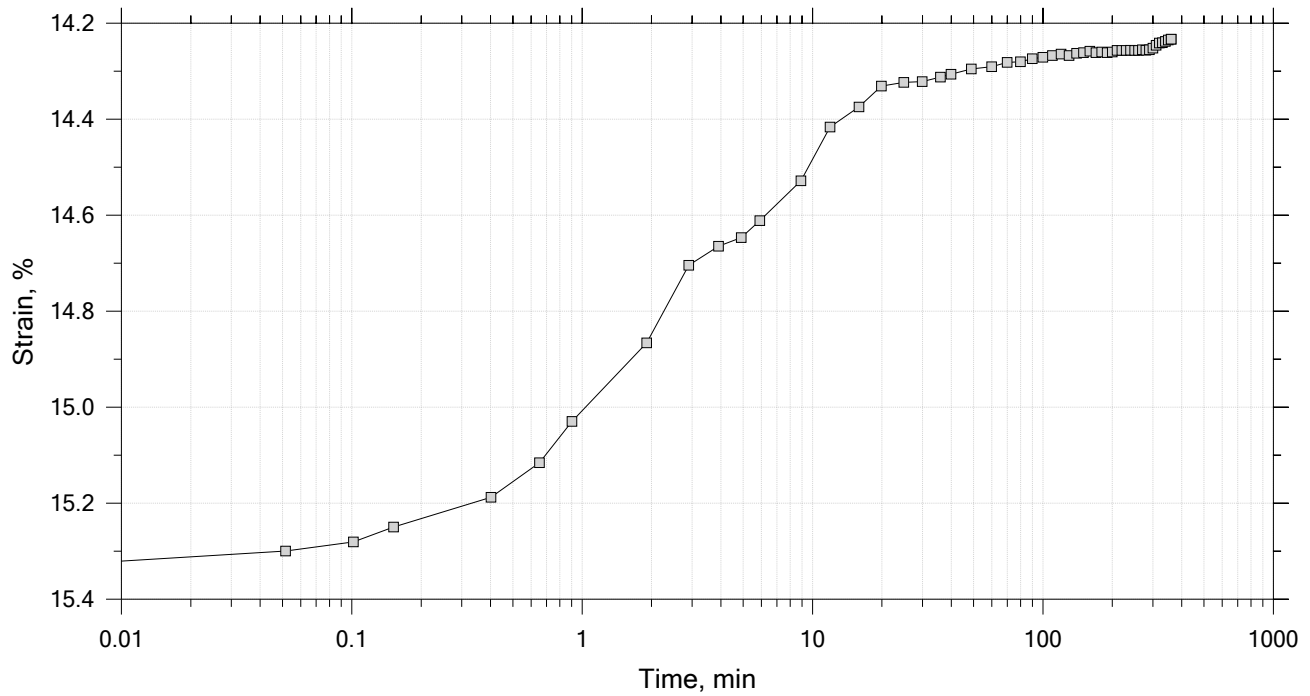
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-216	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 02/23/21	Depth: 8-10 ft
	Test No.: IP-5	Sample Type: intact	Elevation: ---
	Description: Moist olive gray clay		
	Remarks: System LTIII-0836, Swell Pressure = 0.0685 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 13 of 15

Constant Load Step

Stress: 0.5 tsf



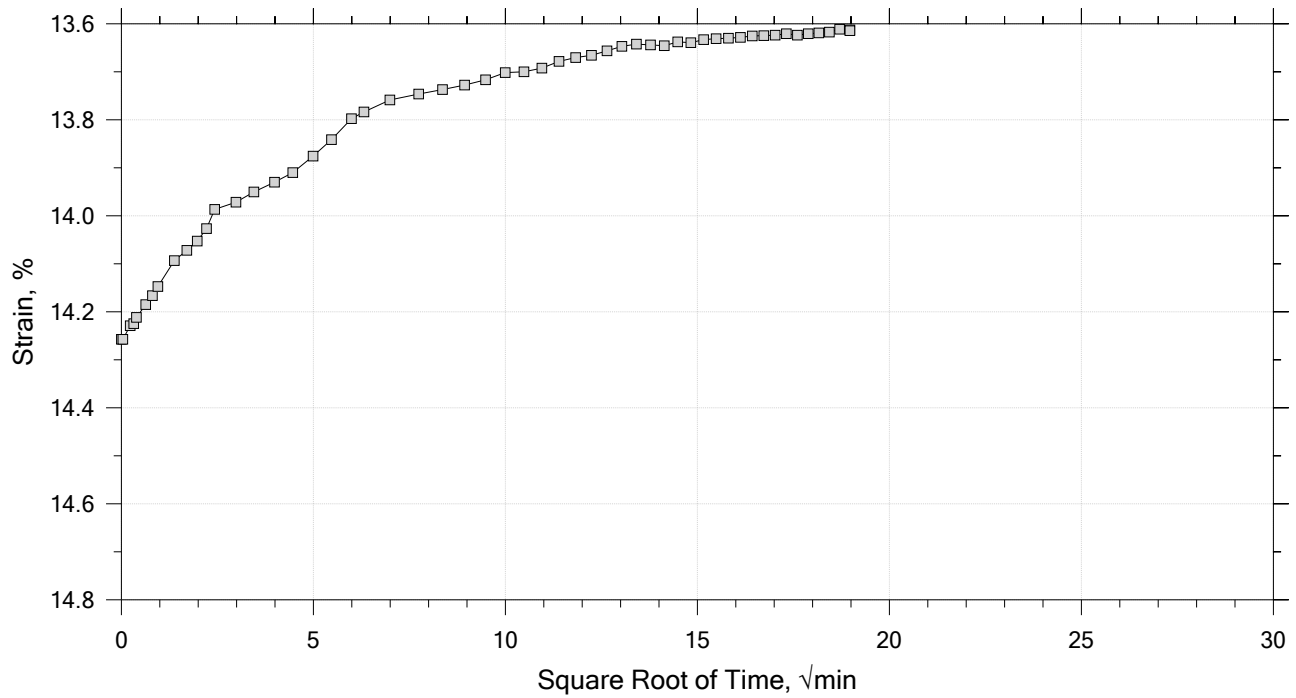
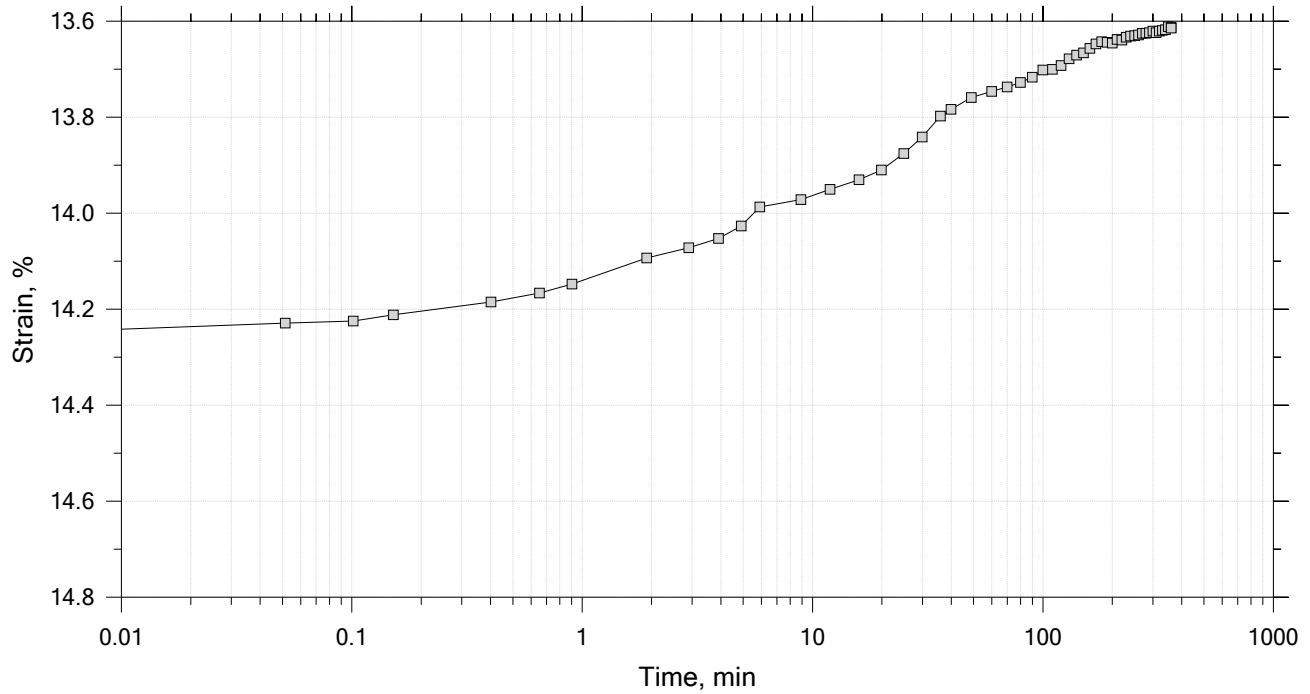
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-216	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 02/23/21	Depth: 8-10 ft
	Test No.: IP-5	Sample Type: intact	Elevation: ---
	Description: Moist olive gray clay		
	Remarks: System LTIII-0836, Swell Pressure = 0.0685 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 14 of 15

Constant Load Step

Stress: 0.25 tsf



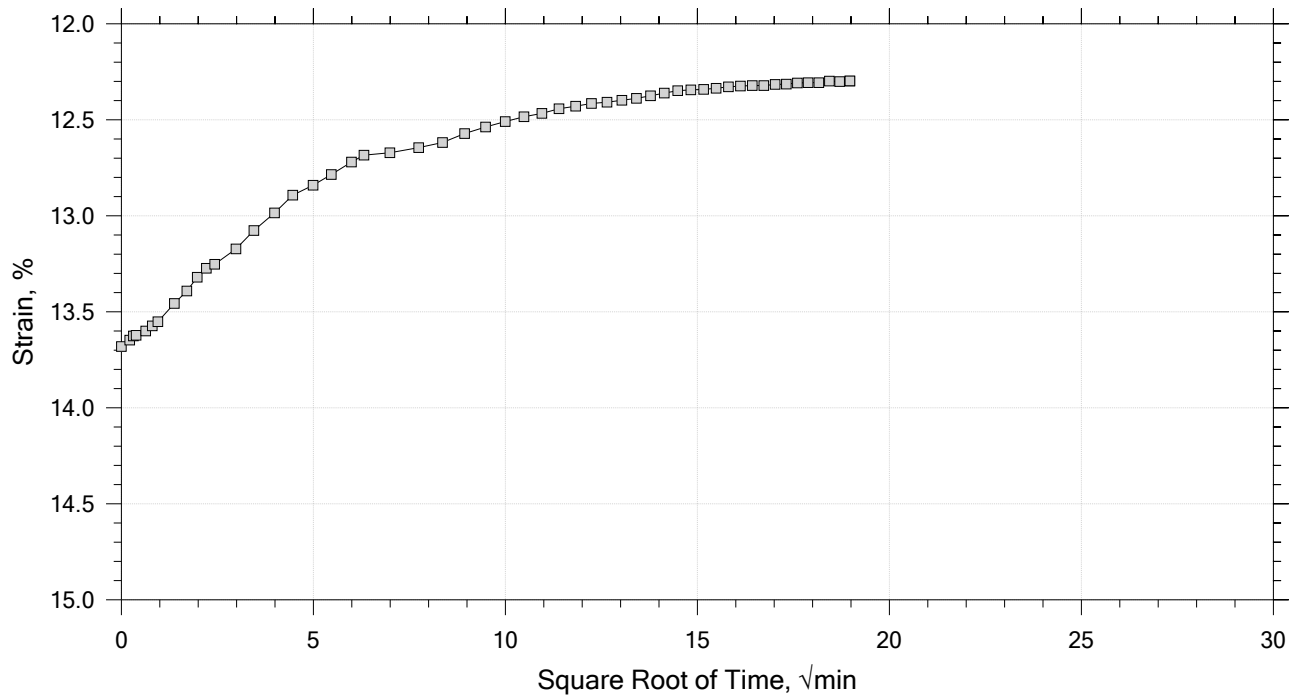
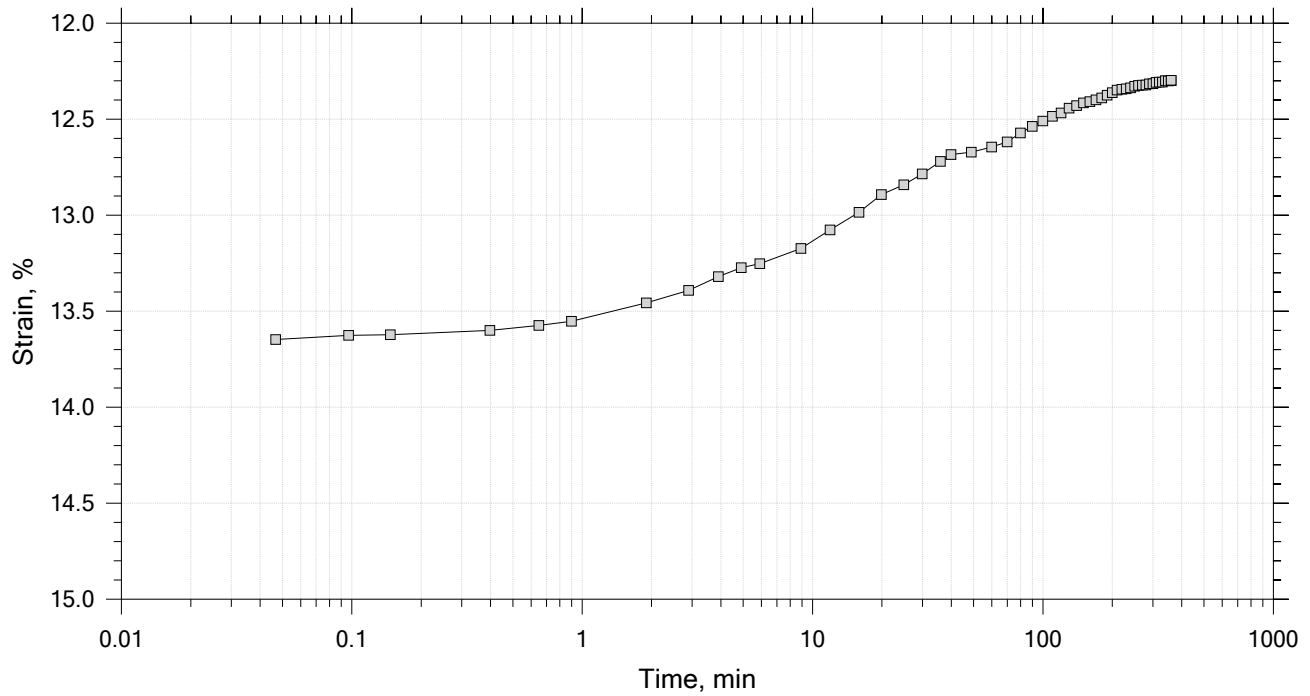
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-216	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 02/23/21	Depth: 8-10 ft
	Test No.: IP-5	Sample Type: intact	Elevation: ---
	Description: Moist olive gray clay		
	Remarks: System LTIII-0836, Swell Pressure = 0.0685 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 15 of 15

Constant Load Step

Stress: 0.0625 tsf




	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-216	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 02/23/21	Depth: 8-10 ft
	Test No.: IP-5	Sample Type: intact	Elevation: ---
	Description: Moist olive gray clay		
	Remarks: System LTIII-0836, Swell Pressure = 0.0685 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Specimen Diameter: 2.50 in	Measured Specific Gravity: 2.77	Liquid Limit: 35
Initial Height: 1.00 in	Initial Void Ratio: 0.82	Plastic Limit: 18
Final Height: 0.88 in	Final Void Ratio: 0.596	Plasticity Index: 17

	Before Test Trimmings	Before Test Specimen	After Test Specimen	After Test Trimmings
Container ID	B-1531	RING		E2471
Mass Container, gm	8.26	109.39	109.39	9.13
Mass Container + Wet Soil, gm	116.19	264.41	258.36	157.63
Mass Container + Dry Soil, gm	93.45	232.02	232.02	131.37
Mass Dry Soil, gm	85.19	122.63	122.63	122.24
Water Content, %	26.69	26.42	21.48	21.48
Void Ratio	---	0.82	0.60	---
Degree of Saturation, %	---	89.40	100.00	---
Dry Unit Weight, pcf	---	95.169	108.51	---


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

	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-216	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 02/23/21	Depth: 8-10 ft
	Test No.: IP-5	Sample Type: intact	Elevation: ---
	Description: Moist olive gray clay		
	Remarks: System LTIII-0836, Swell Pressure = 0.0685 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

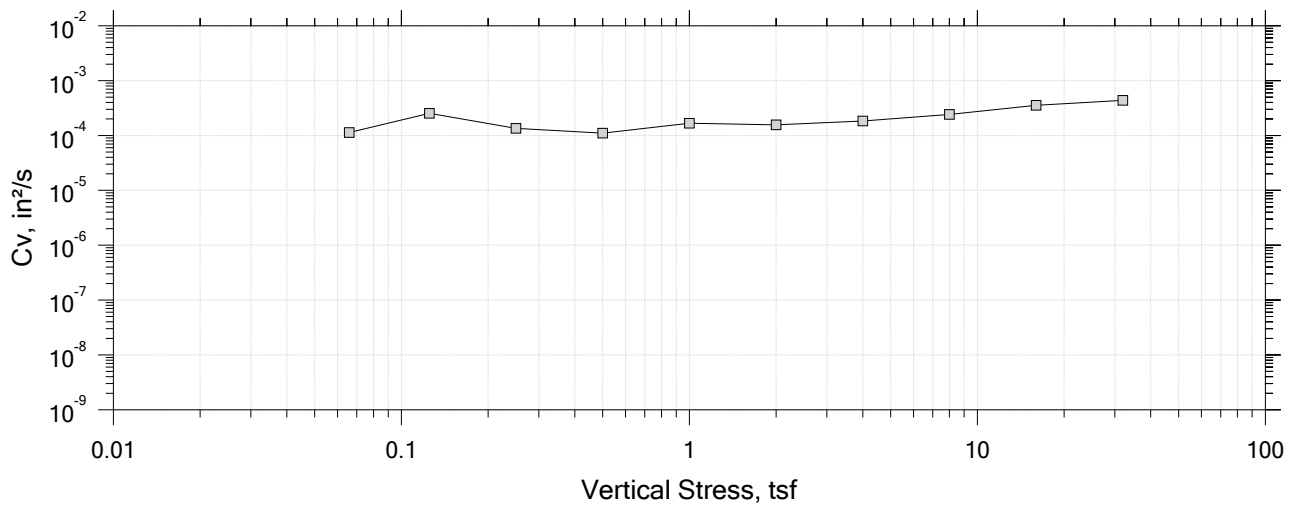
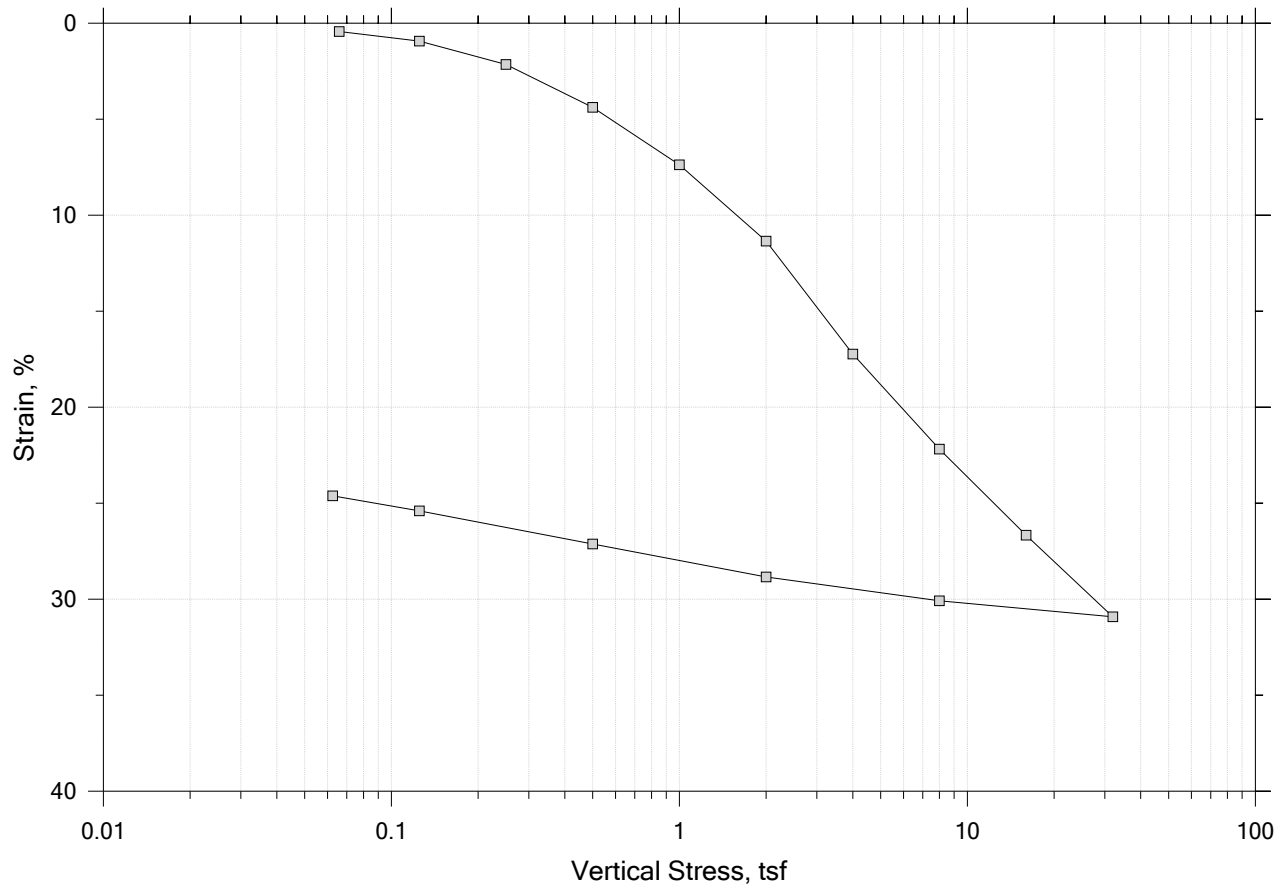
Square Root of Time Coefficients


[illegible]

	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-216	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 02/23/21	Depth: 8-10 ft
	Test No.: IP-5	Sample Type: intact	Elevation: ---
	Description: Moist olive gray clay		
	Remarks: System LTIII-0836, Swell Pressure = 0.0685 tsf		
Displacement at End of Increment			

One-Dimensional Consolidation by ASTM D2435 - Method B

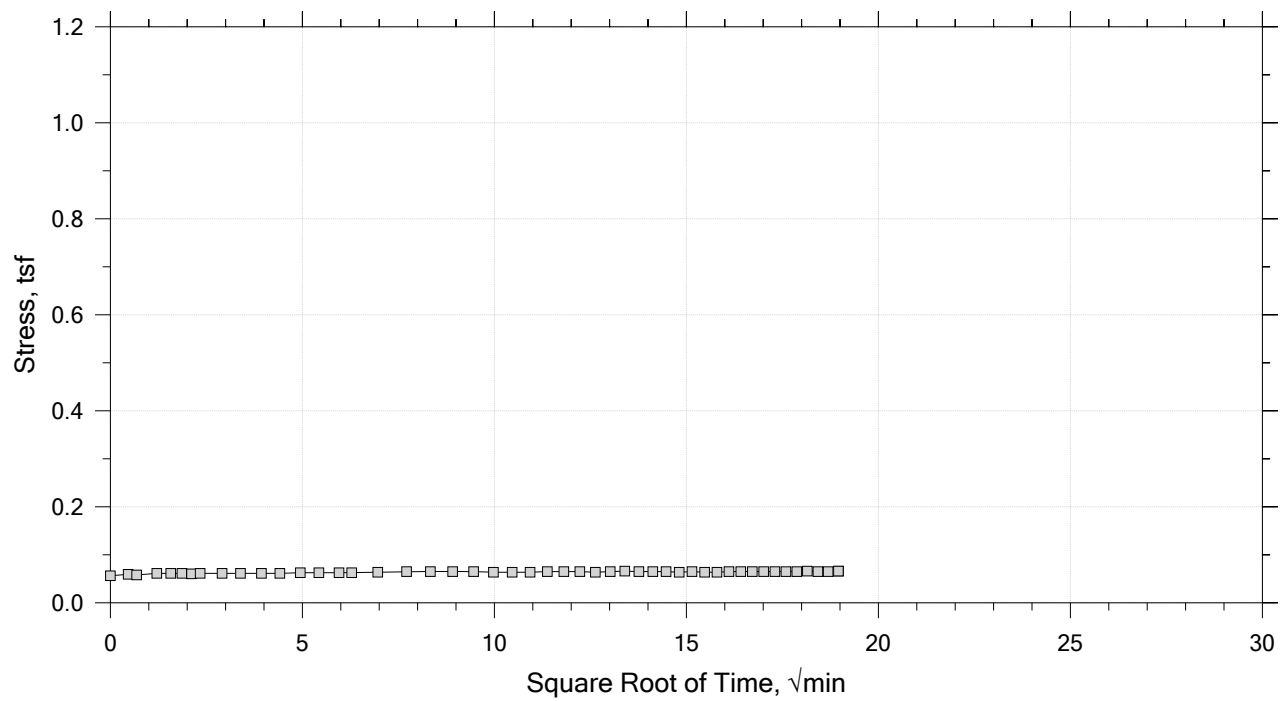
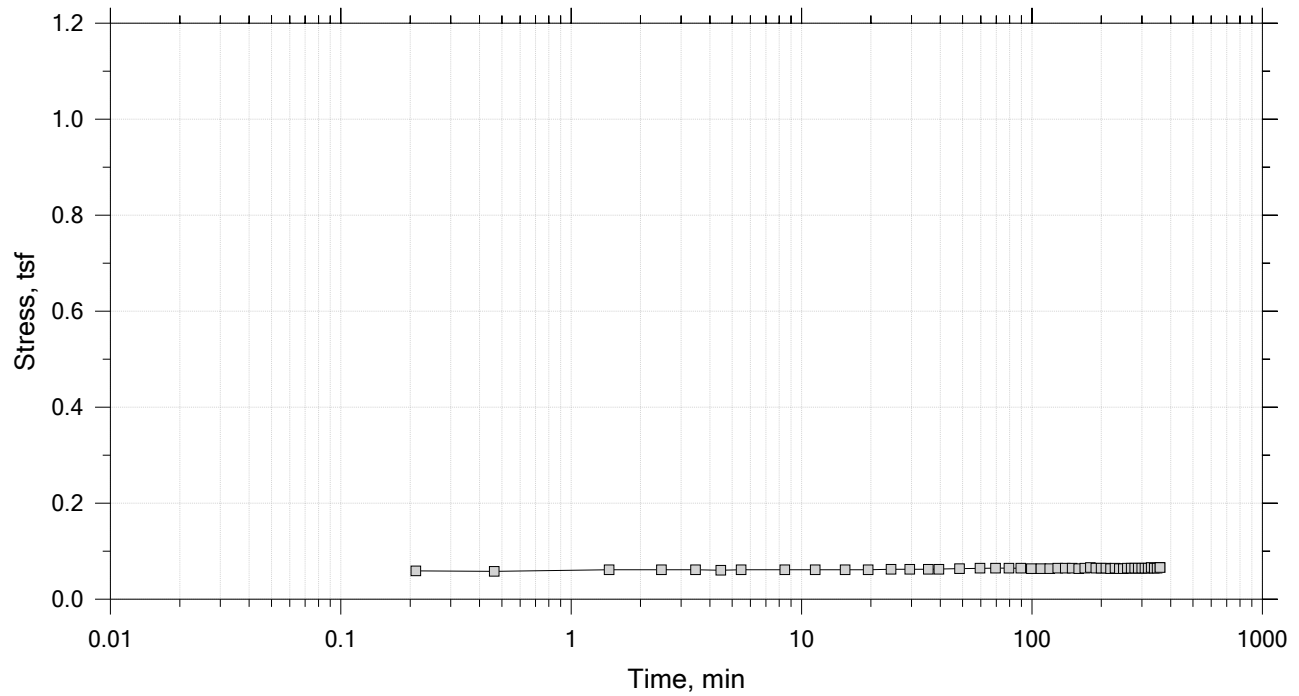
Summary Report




	Project: I-395/Rte 9 Connector	Location: Brewer-Eddington, ME	Project No.: GTX-313197
	Boring No.: HB-BE-223	Tested By: md	Checked By: anm
	Sample No.: U1 (19.2")	Test Date: 06/18/21	Depth: 12-14
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System LTIII-C, Swell Pressure = 0.0659 tsf		
	Displacement at End of Increment		

One-Dimensional Consolidation by ASTM D2435 - Method B

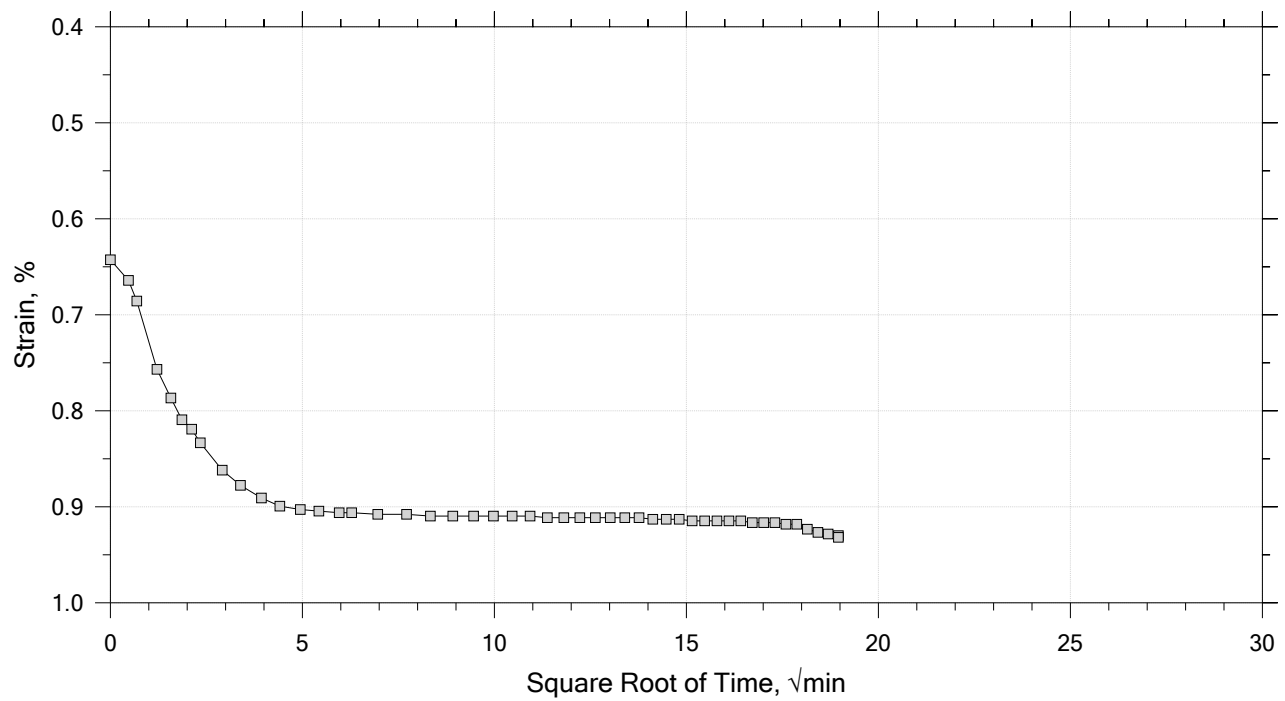
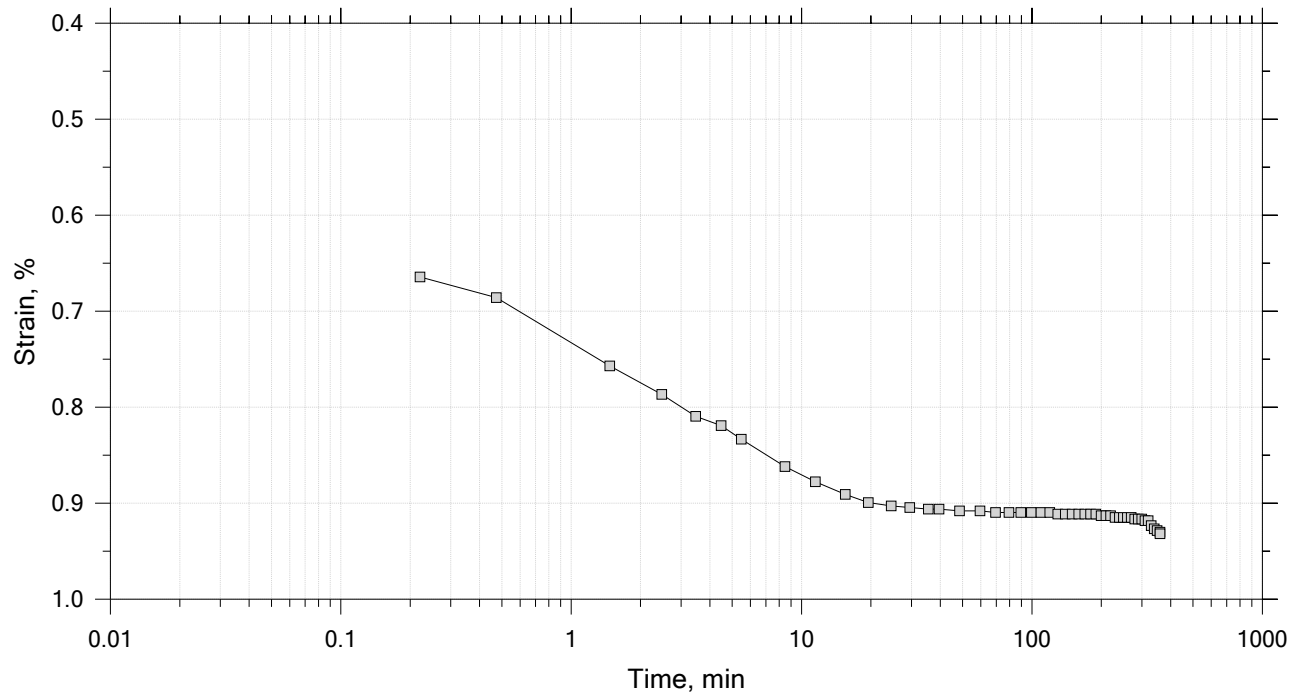
Time Curve 1 of 15
Constant Volume Step
Stress: 0.0659 tsf




	Project: I-395/Rte 9 Connector	Location: Brewer-Eddington, ME	Project No.: GTX-313197
	Boring No.: HB-BE-223	Tested By: md	Checked By: anm
	Sample No.: U1 (19.2")	Test Date: 06/18/21	Depth: 12-14
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System LTIII-C, Swell Pressure = 0.0659 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

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



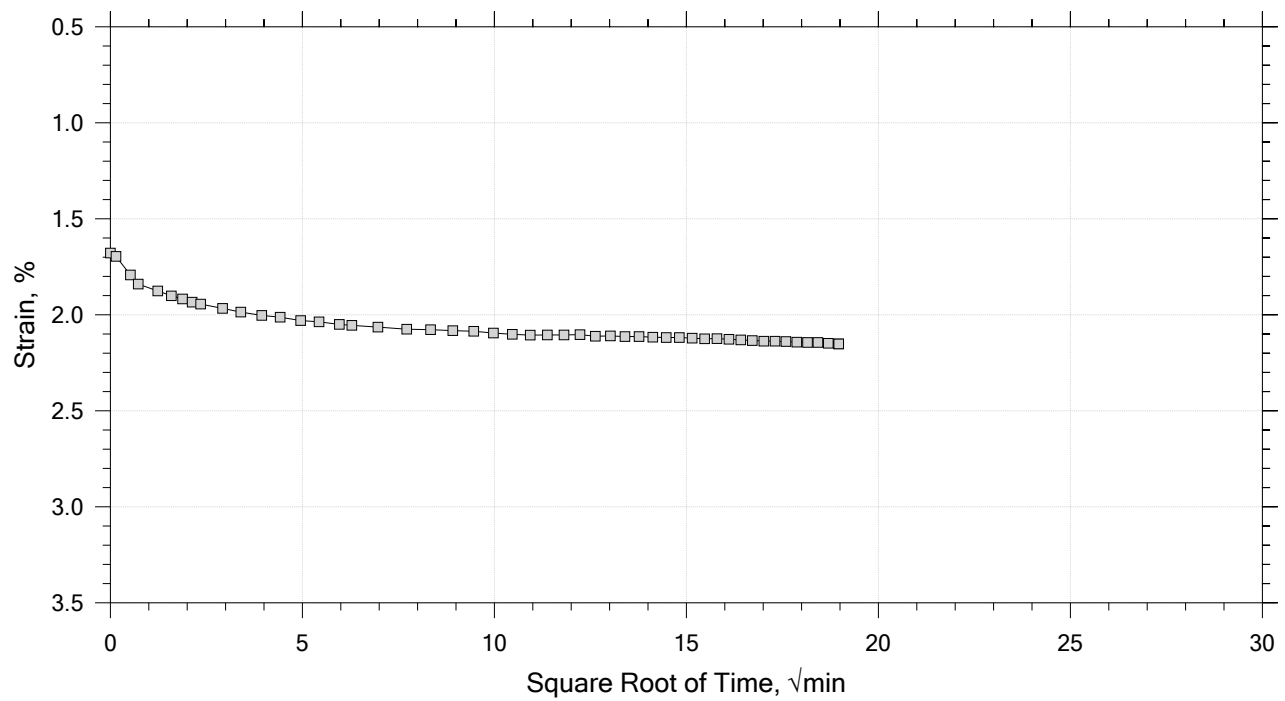
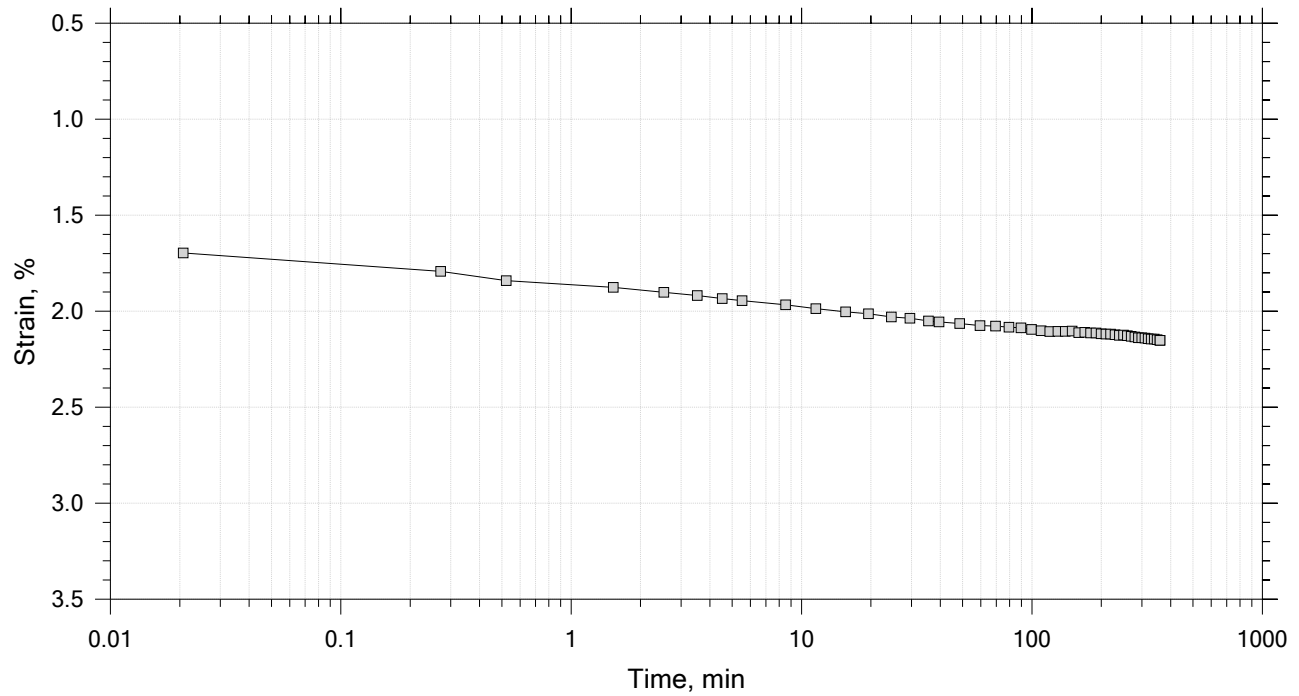
	Project: I-395/Rte 9 Connector	Location: Brewer-Eddington, ME	Project No.: GTX-313197
	Boring No.: HB-BE-223	Tested By: md	Checked By: anm
	Sample No.: U1 (19.2")	Test Date: 06/18/21	Depth: 12-14
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System LTIII-C, Swell Pressure = 0.0659 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 3 of 15

Constant Load Step

Stress: 0.25 tsf



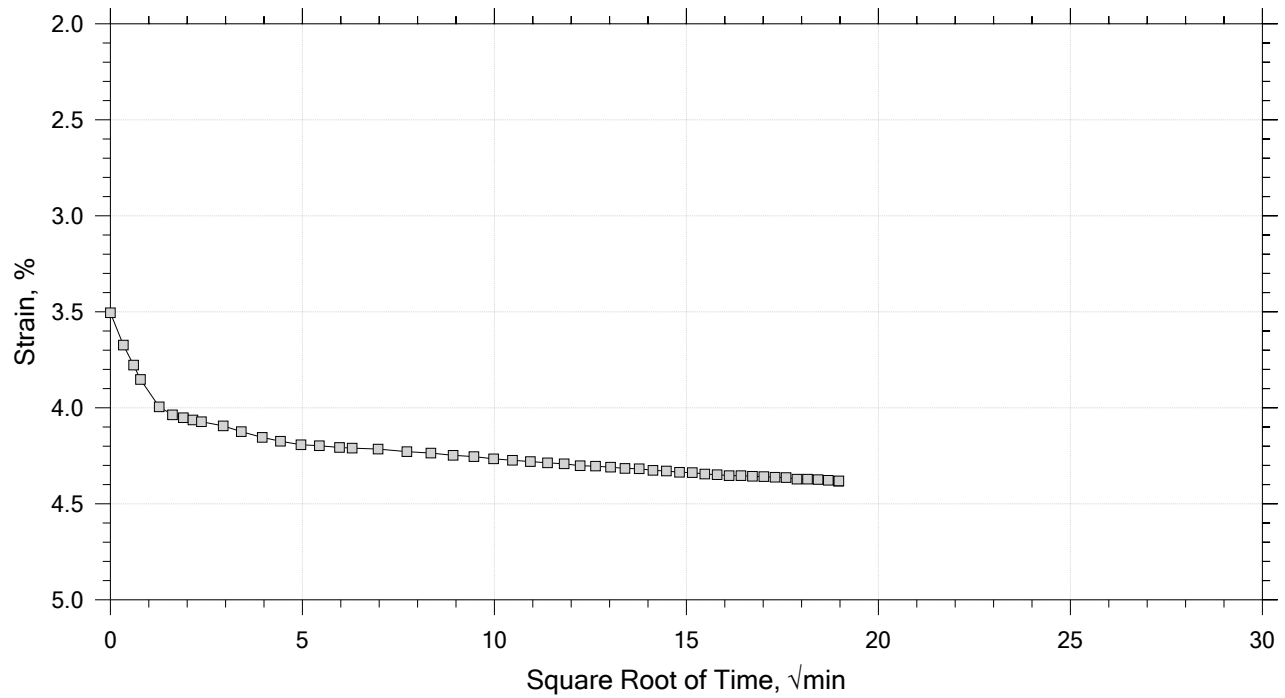
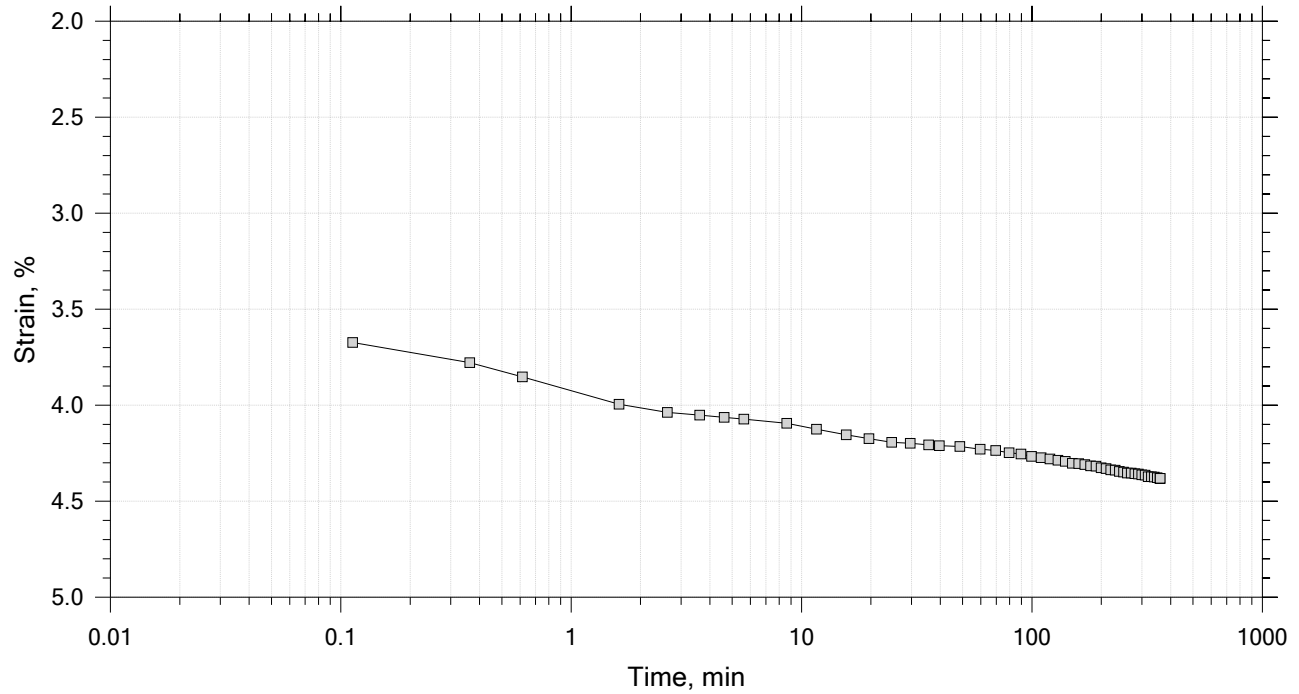
	Project: I-395/Rte 9 Connector	Location: Brewer-Eddington, ME	Project No.: GTX-313197
	Boring No.: HB-BE-223	Tested By: md	Checked By: anm
	Sample No.: U1 (19.2")	Test Date: 06/18/21	Depth: 12-14
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System LTIII-C, Swell Pressure = 0.0659 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 4 of 15

Constant Load Step

Stress: 0.5 tsf



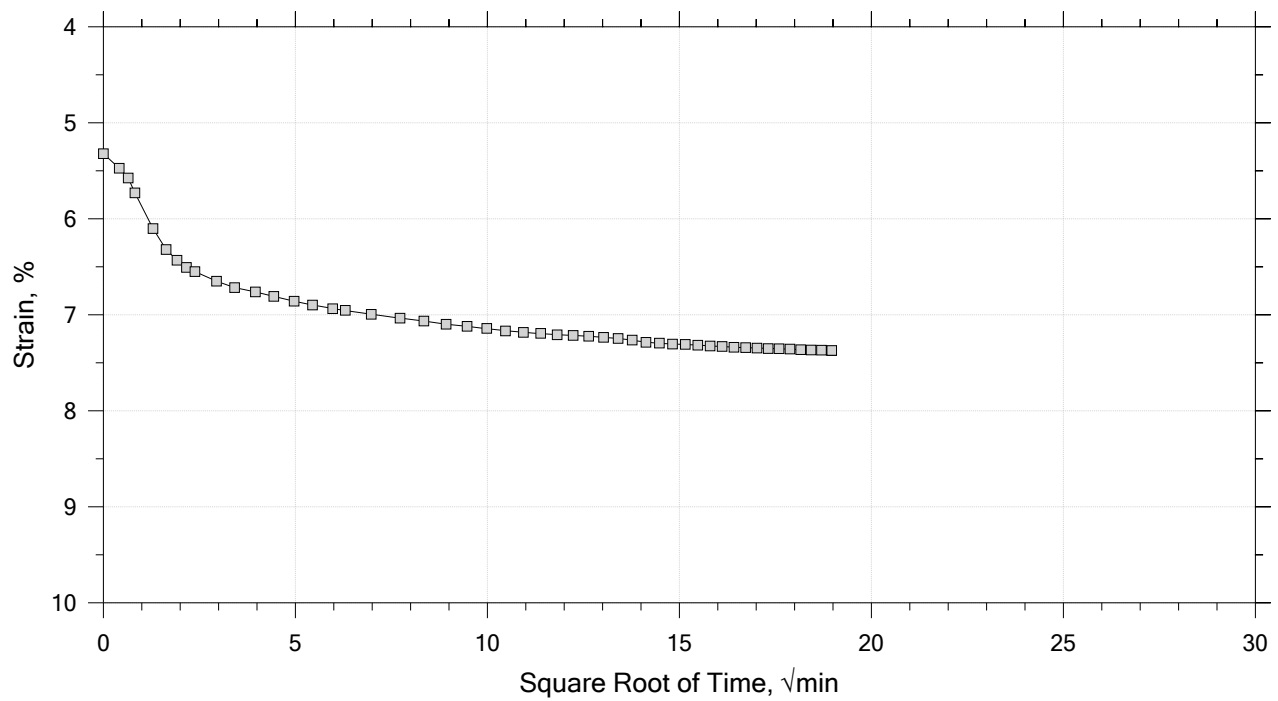
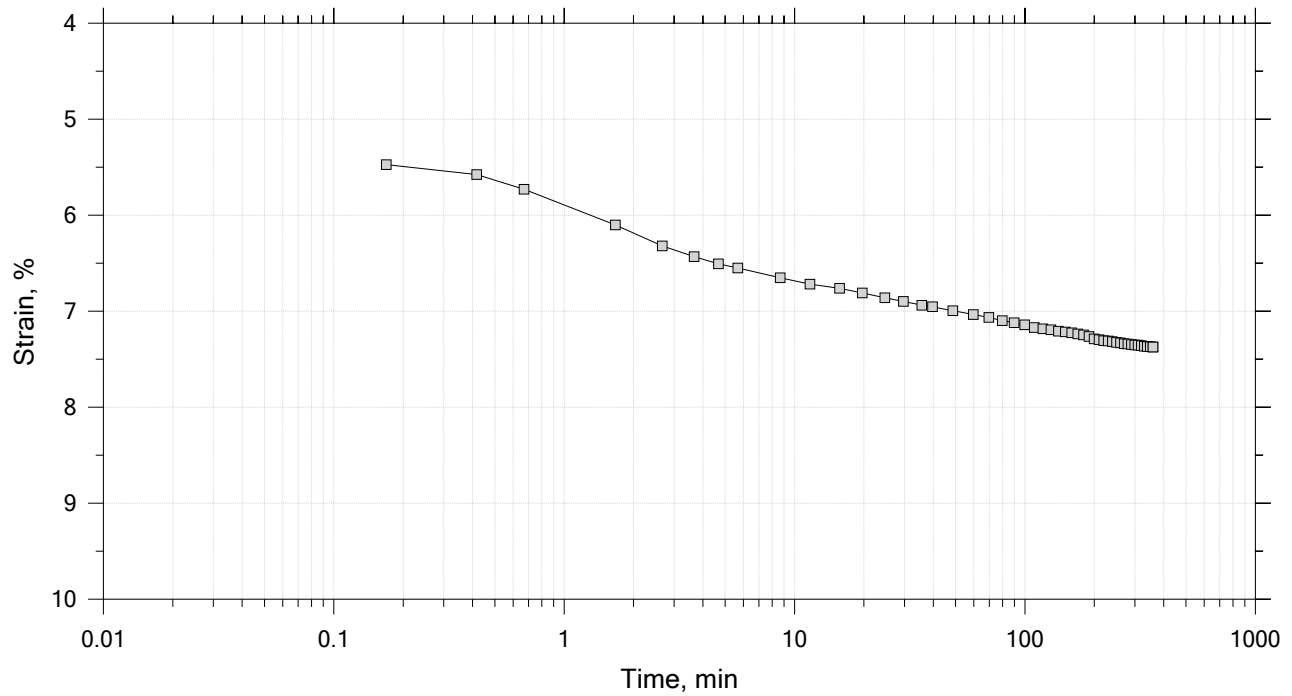
	Project: I-395/Rte 9 Connector	Location: Brewer-Eddington, ME	Project No.: GTX-313197
	Boring No.: HB-BE-223	Tested By: md	Checked By: anm
	Sample No.: U1 (19.2")	Test Date: 06/18/21	Depth: 12-14
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System LTIII-C, Swell Pressure = 0.0659 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 5 of 15

Constant Load Step

Stress: 1 tsf



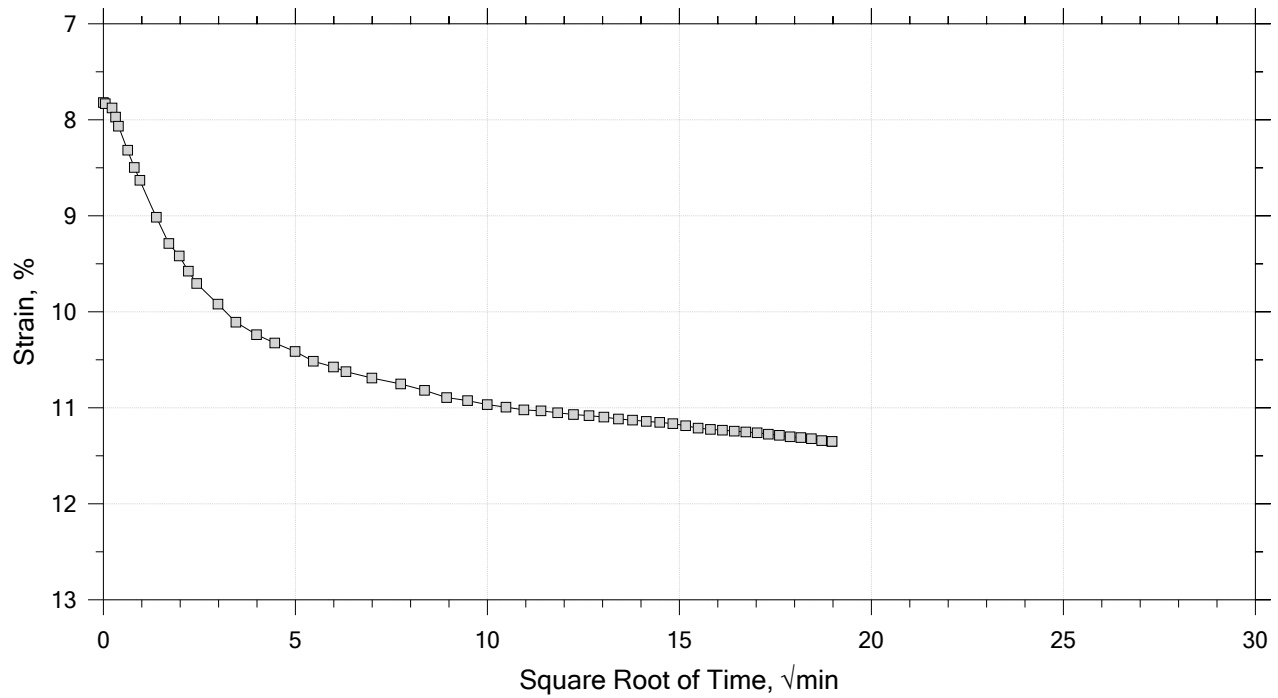
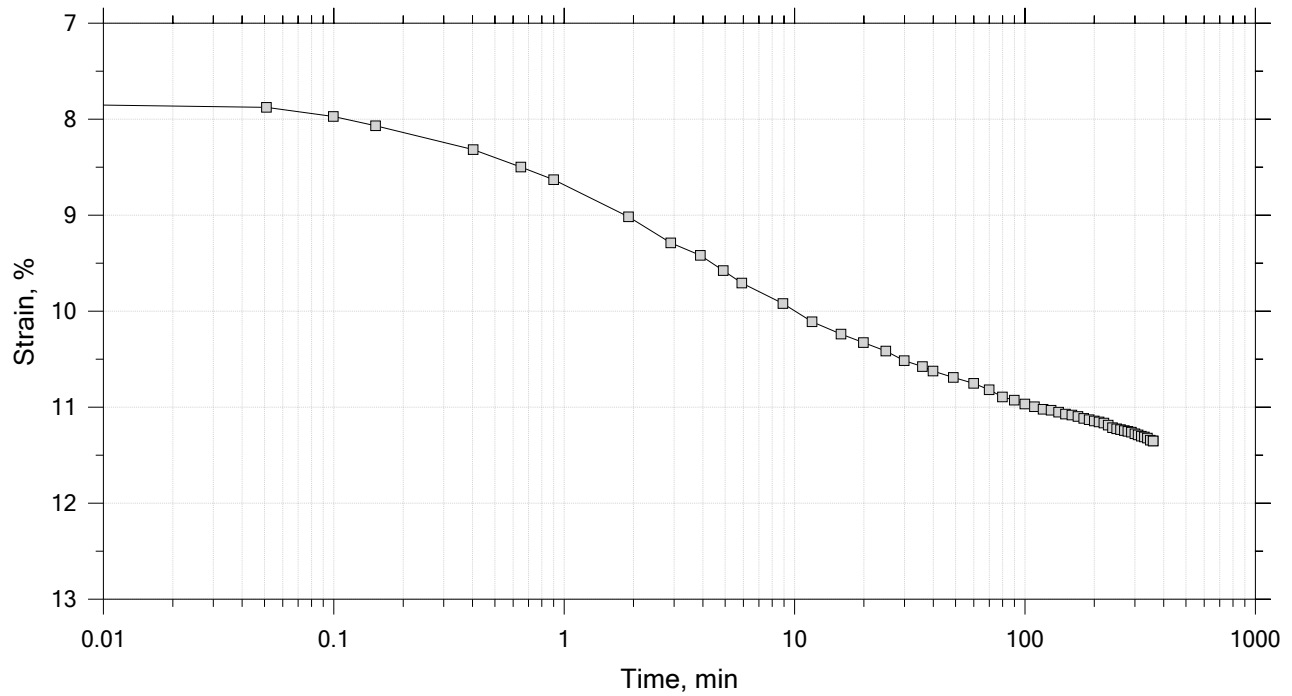
	Project: I-395/Rte 9 Connector	Location: Brewer-Eddington, ME	Project No.: GTX-313197
	Boring No.: HB-BE-223	Tested By: md	Checked By: anm
	Sample No.: U1 (19.2")	Test Date: 06/18/21	Depth: 12-14
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System LTIII-C, Swell Pressure = 0.0659 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 6 of 15

Constant Load Step

Stress: 2 tsf



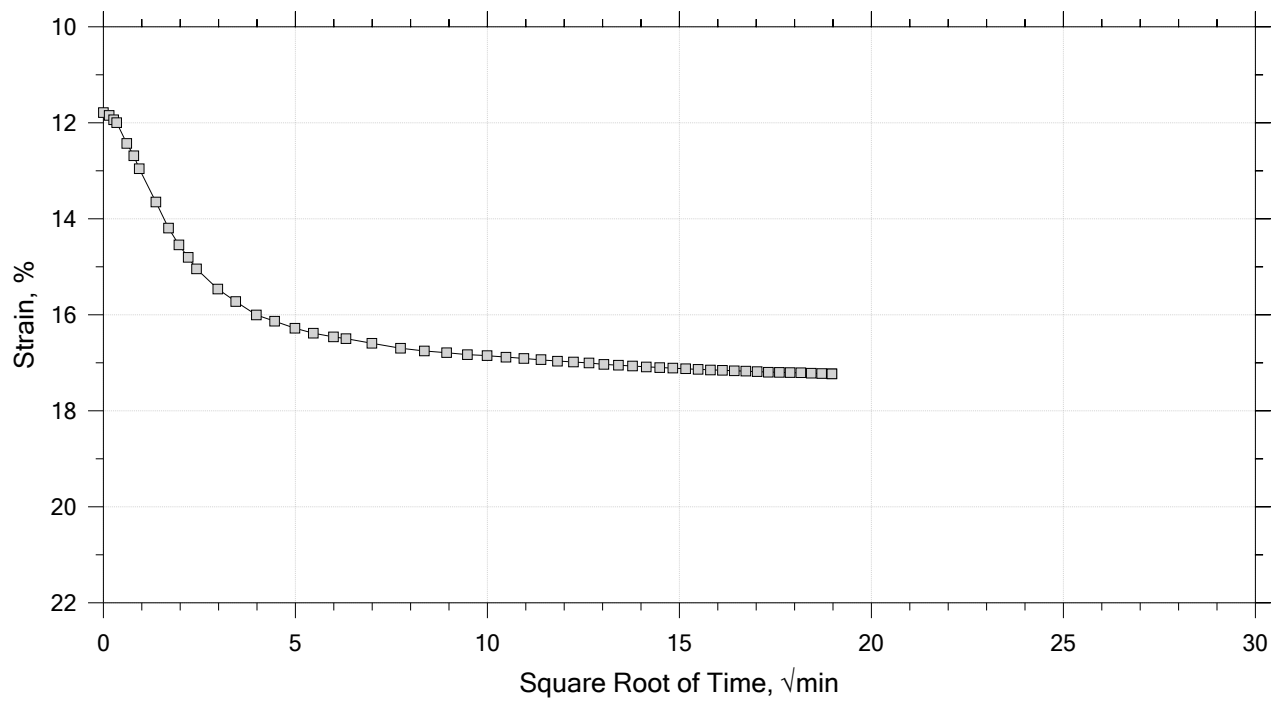
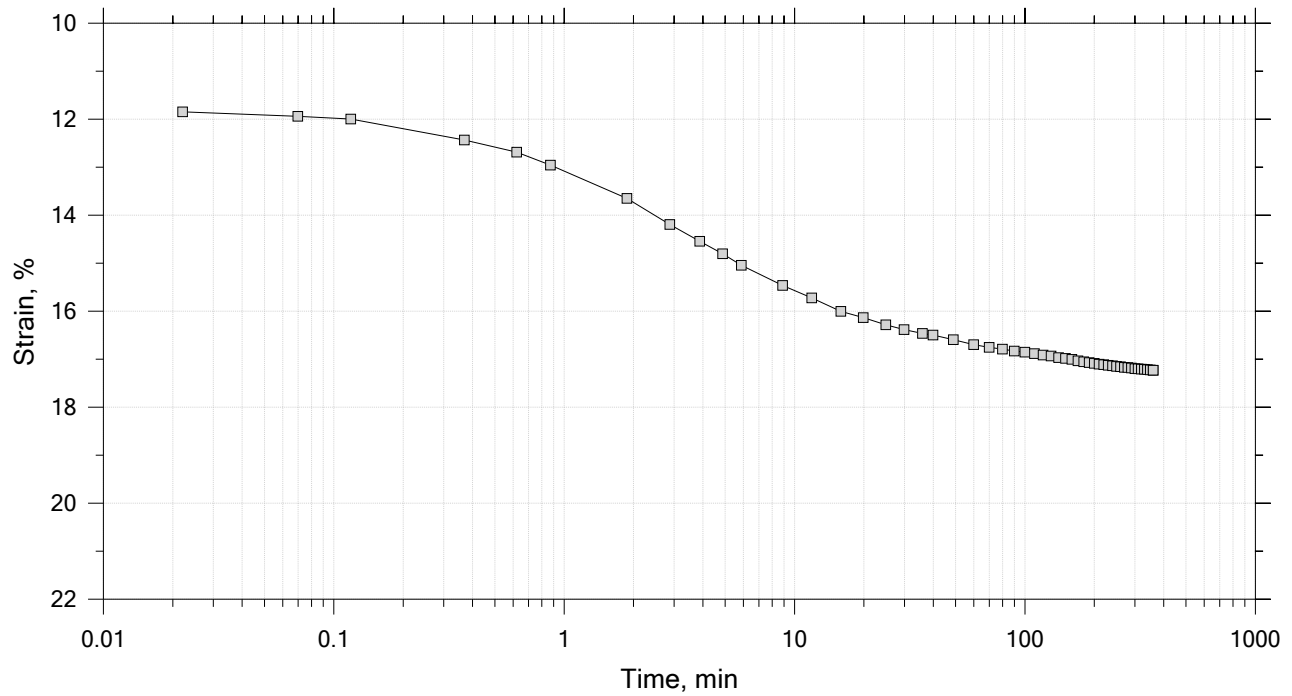
	Project: I-395/Rte 9 Connector	Location: Brewer-Eddington, ME	Project No.: GTX-313197
	Boring No.: HB-BE-223	Tested By: md	Checked By: anm
	Sample No.: U1 (19.2")	Test Date: 06/18/21	Depth: 12-14
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System LTIII-C, Swell Pressure = 0.0659 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 7 of 15

Constant Load Step

Stress: 4 tsf



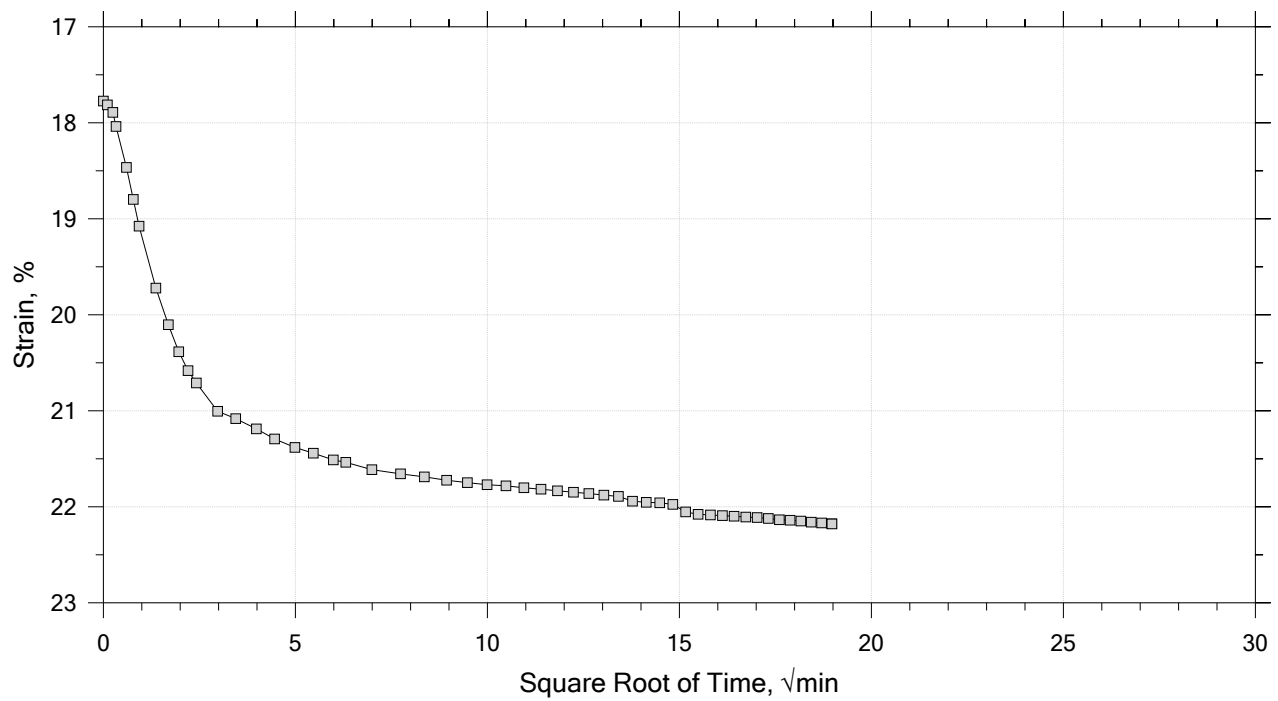
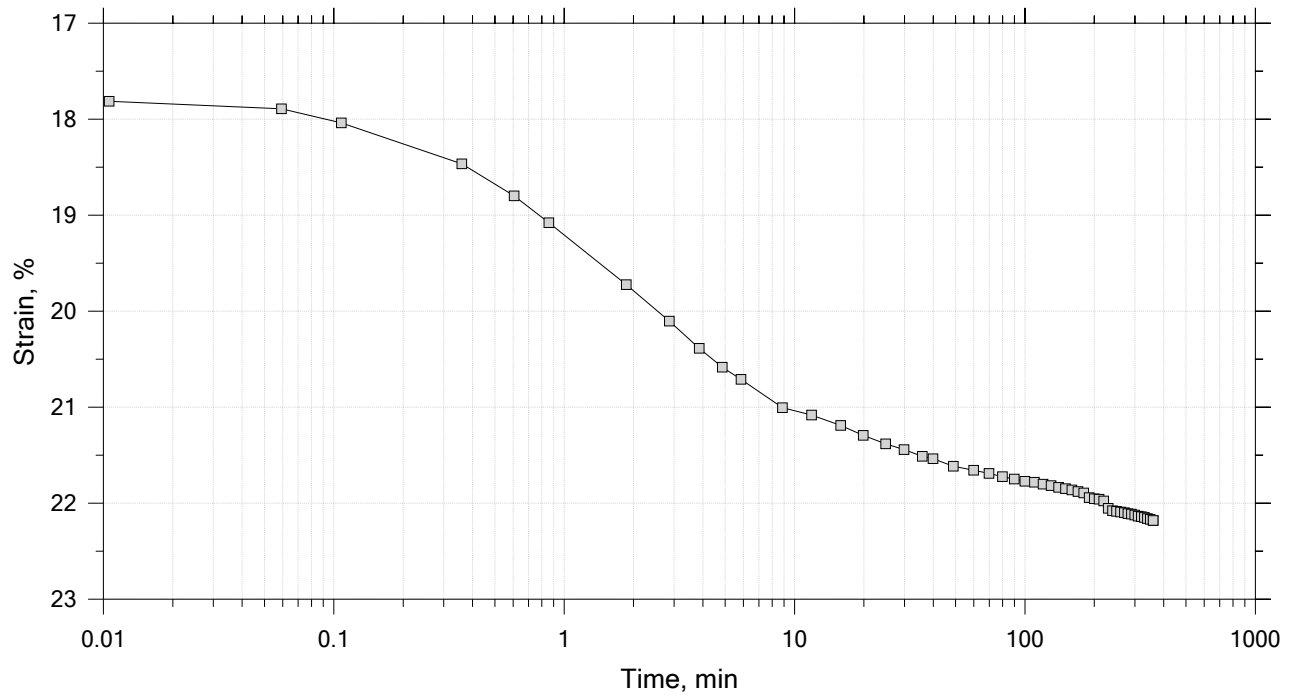
	Project: I-395/Rte 9 Connector	Location: Brewer-Eddington, ME	Project No.: GTX-313197
	Boring No.: HB-BE-223	Tested By: md	Checked By: anm
	Sample No.: U1 (19.2")	Test Date: 06/18/21	Depth: 12-14
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System LTIII-C, Swell Pressure = 0.0659 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 8 of 15

Constant Load Step

Stress: 8 tsf



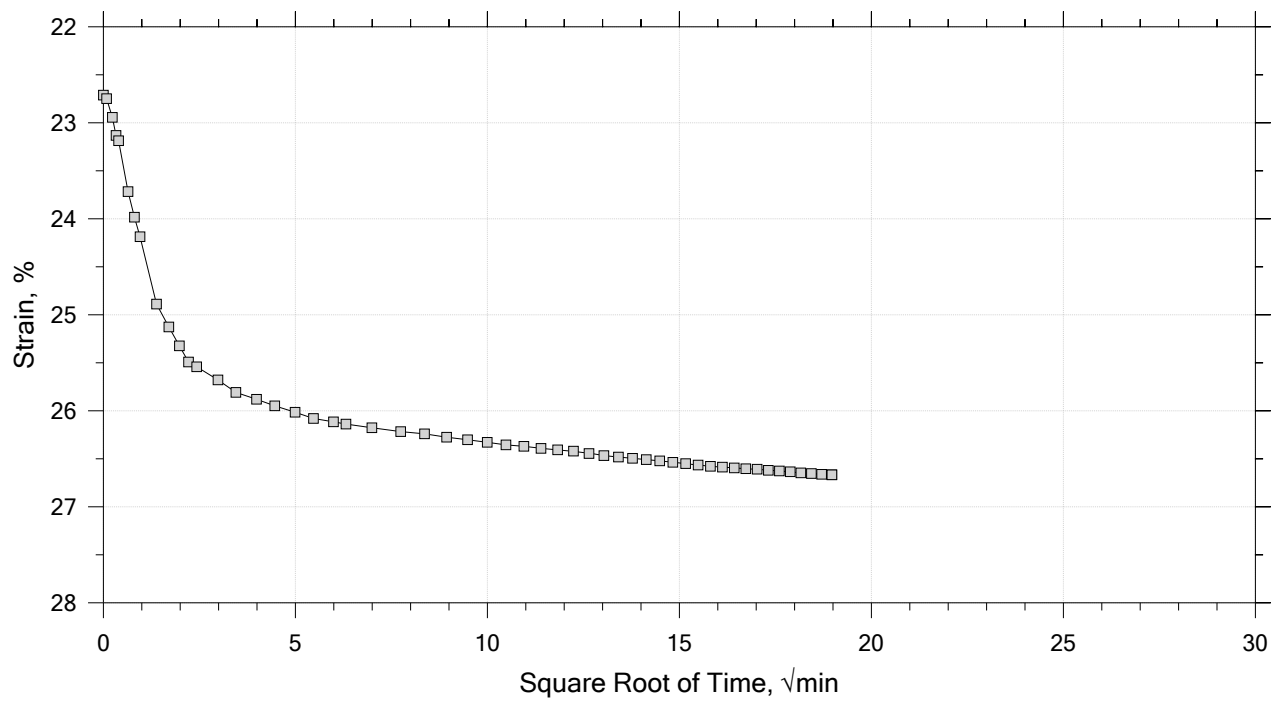
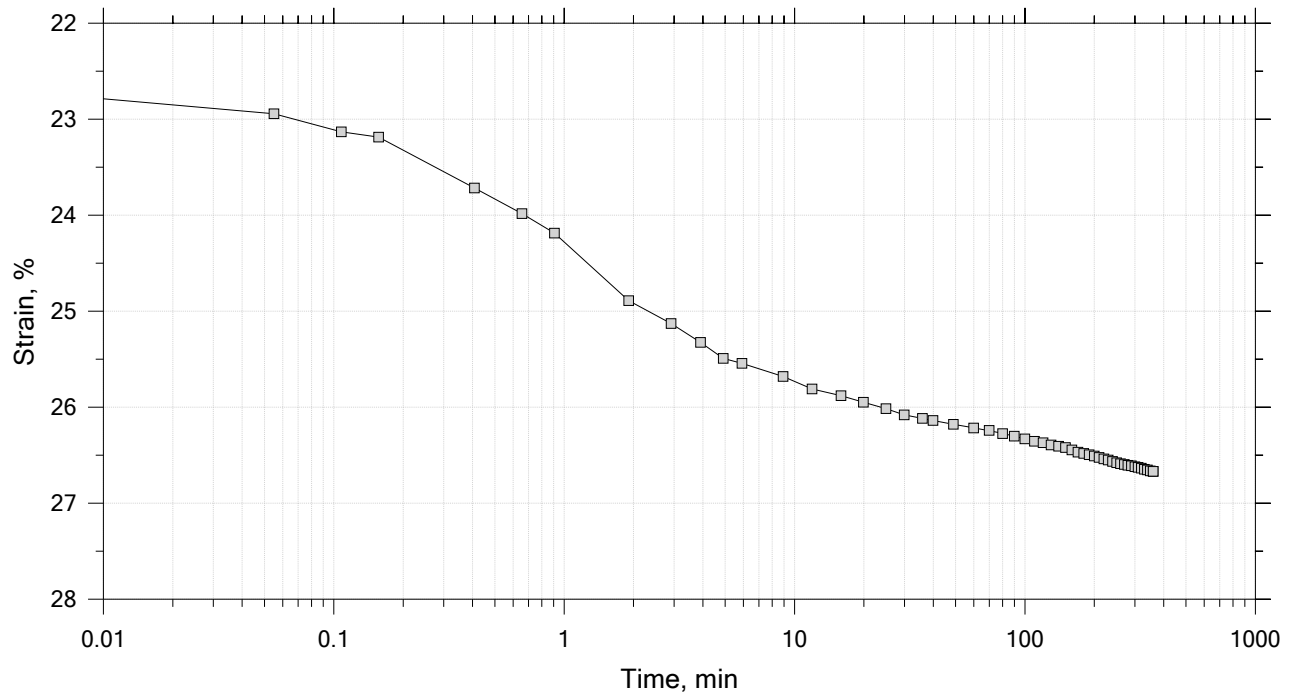
	Project: I-395/Rte 9 Connector	Location: Brewer-Eddington, ME	Project No.: GTX-313197
	Boring No.: HB-BE-223	Tested By: md	Checked By: anm
	Sample No.: U1 (19.2")	Test Date: 06/18/21	Depth: 12-14
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System LTIII-C, Swell Pressure = 0.0659 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 9 of 15

Constant Load Step

Stress: 16 tsf



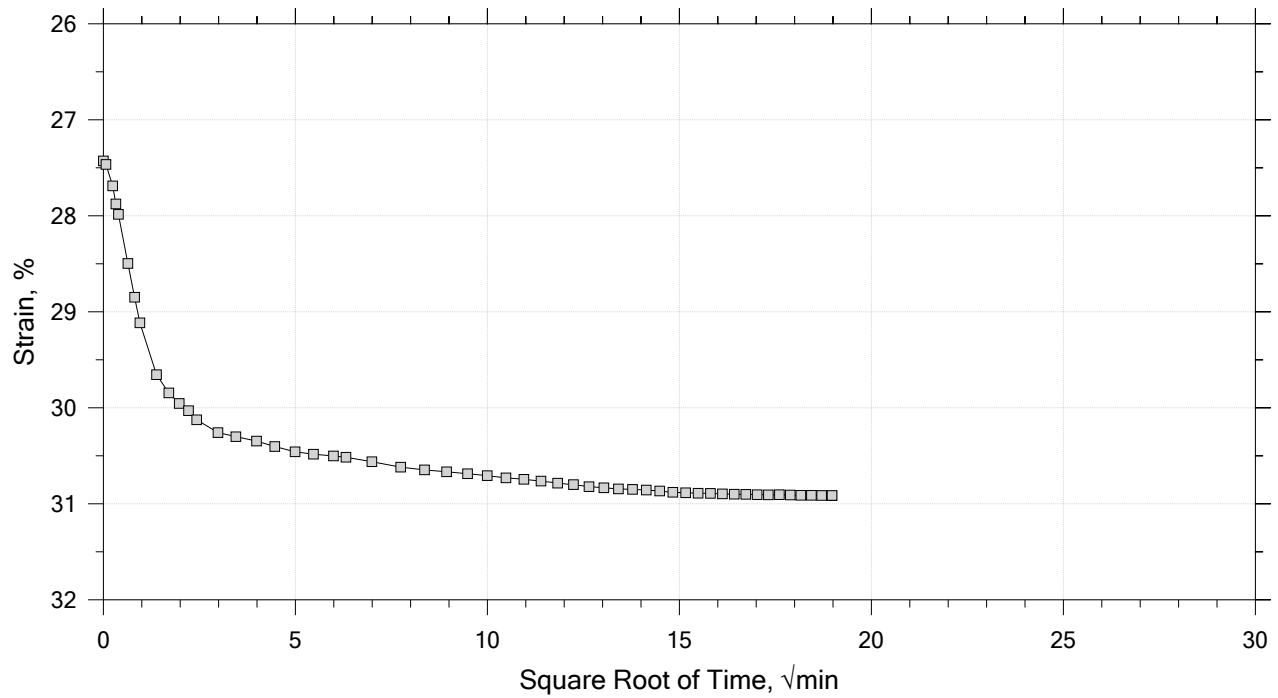
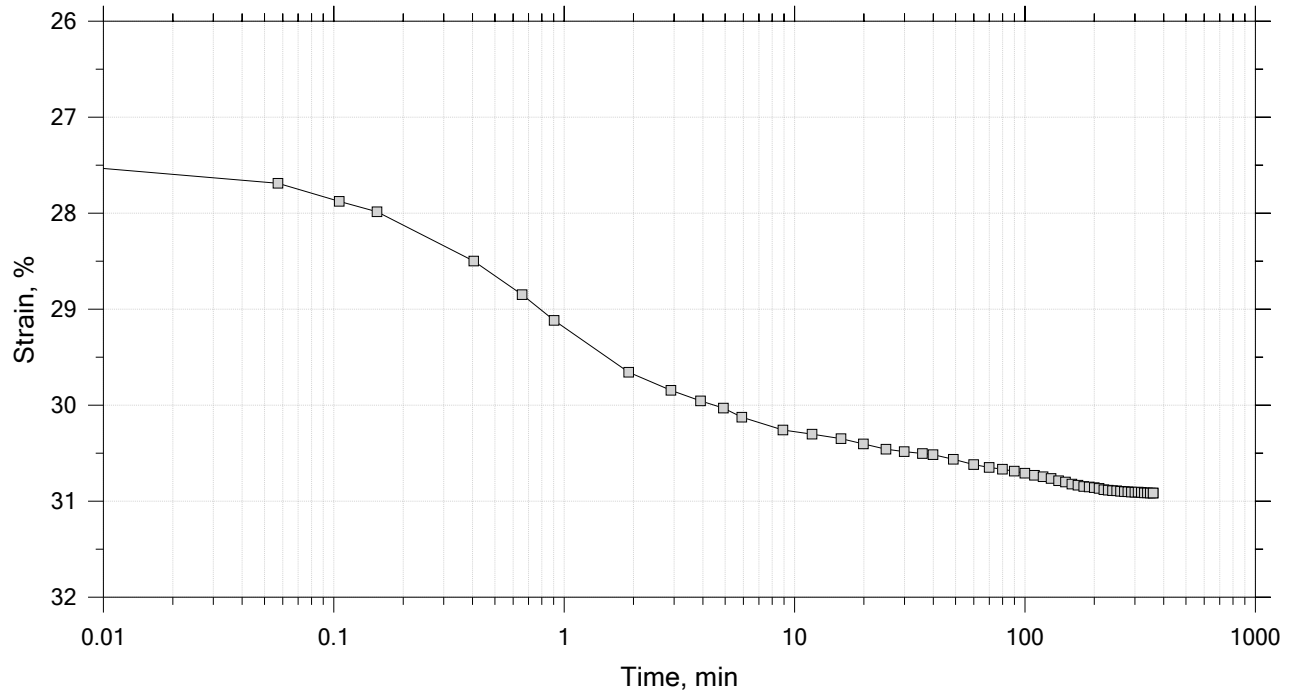
	Project: I-395/Rte 9 Connector	Location: Brewer-Eddington, ME	Project No.: GTX-313197
	Boring No.: HB-BE-223	Tested By: md	Checked By: anm
	Sample No.: U1 (19.2")	Test Date: 06/18/21	Depth: 12-14
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System LTIII-C, Swell Pressure = 0.0659 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 10 of 15

Constant Load Step

Stress: 32 tsf



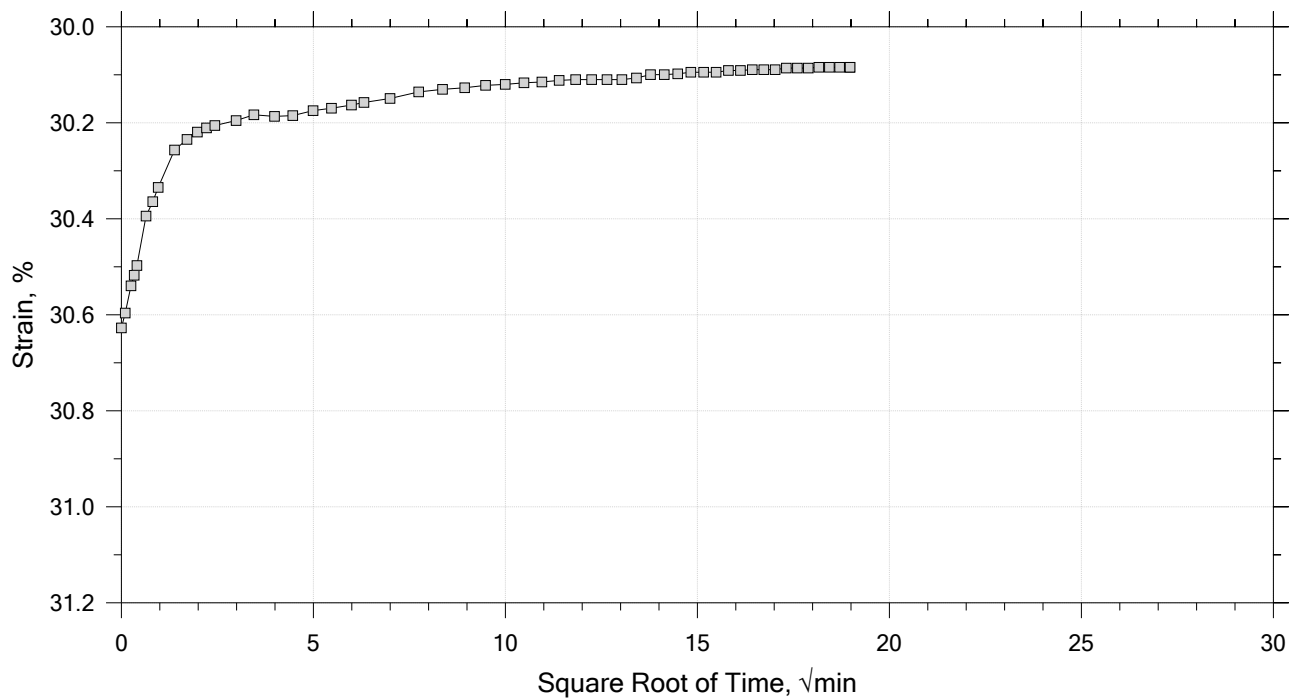
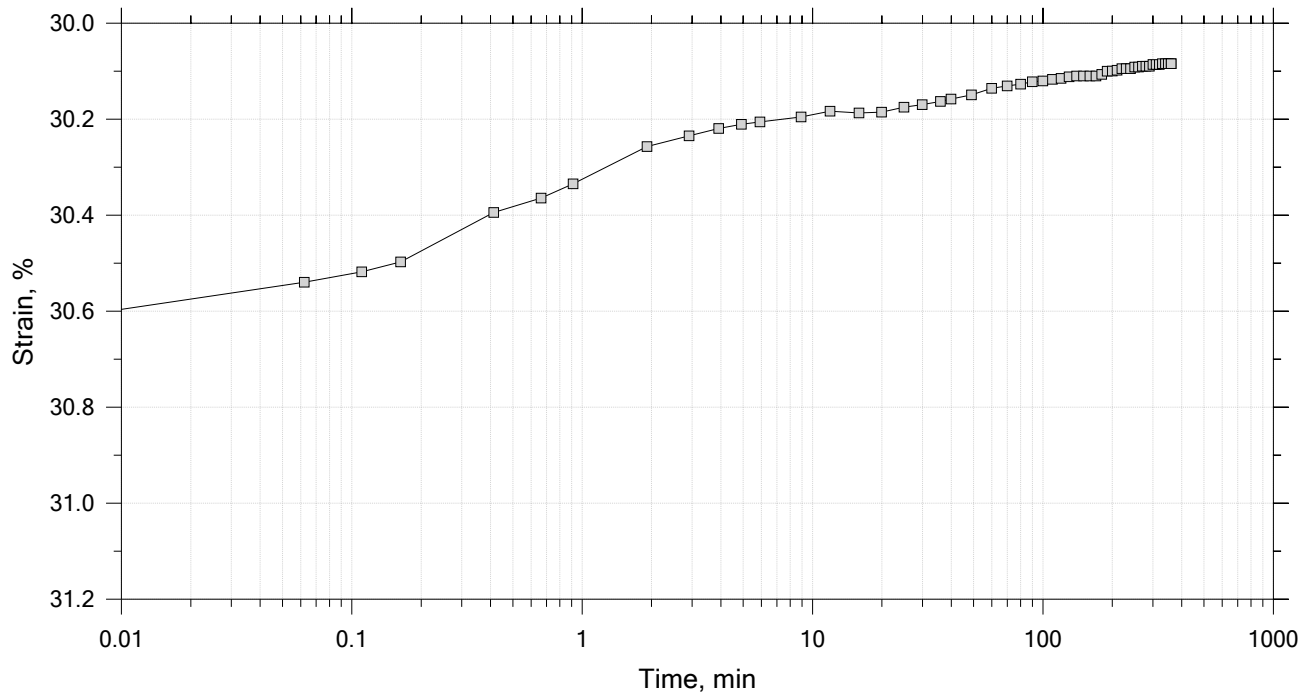
	Project: I-395/Rte 9 Connector	Location: Brewer-Eddington, ME	Project No.: GTX-313197
	Boring No.: HB-BE-223	Tested By: md	Checked By: anm
	Sample No.: U1 (19.2")	Test Date: 06/18/21	Depth: 12-14
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System LTIII-C, Swell Pressure = 0.0659 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 11 of 15

Constant Load Step

Stress: 8 tsf



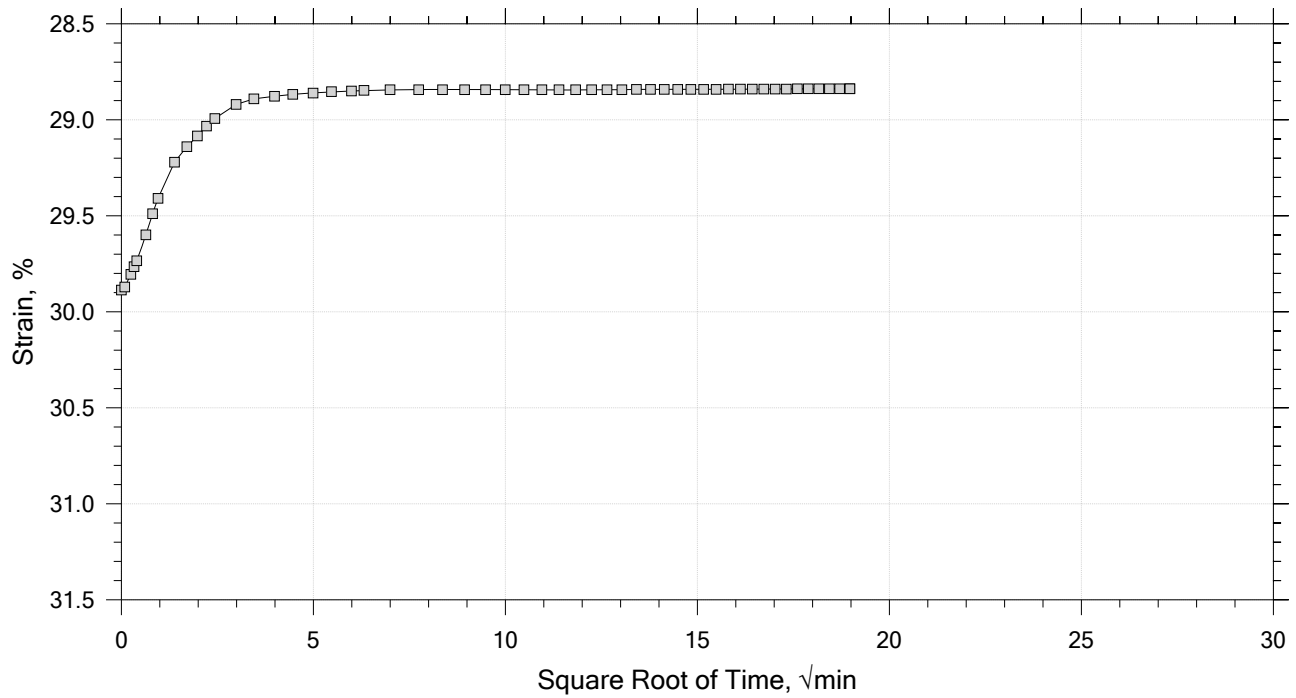
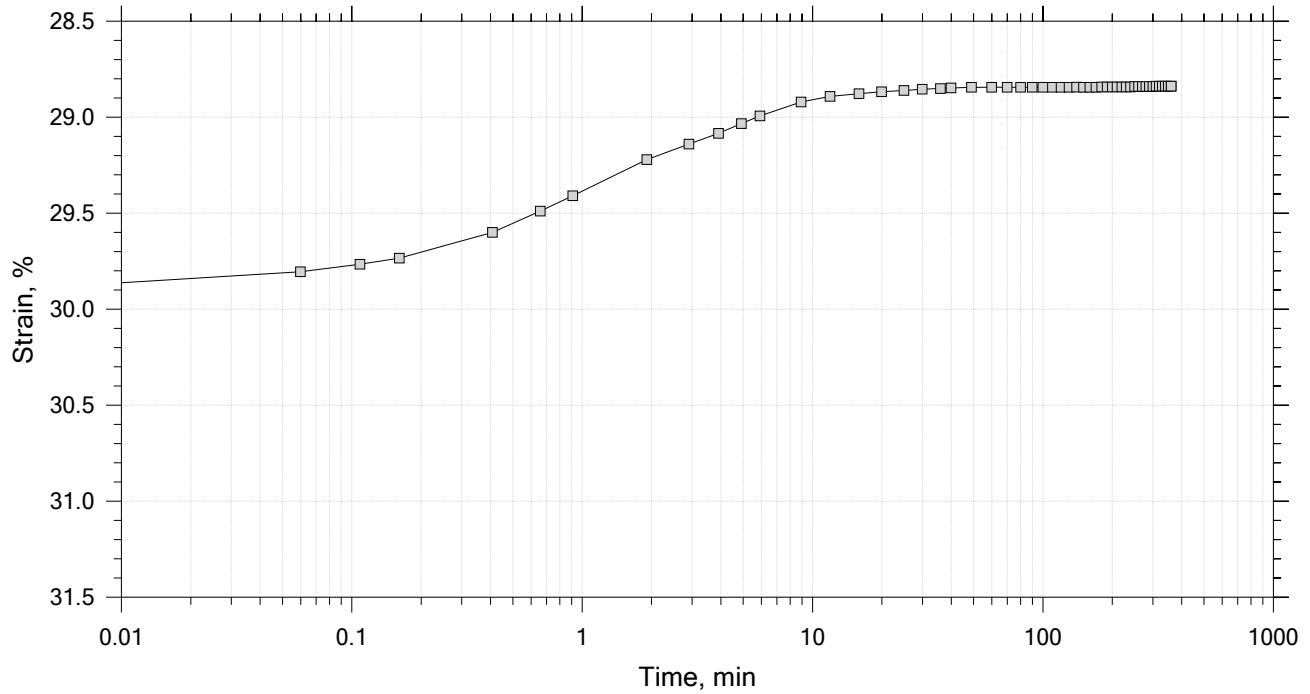
	Project: I-395/Rte 9 Connector	Location: Brewer-Eddington, ME	Project No.: GTX-313197
	Boring No.: HB-BE-223	Tested By: md	Checked By: anm
	Sample No.: U1 (19.2")	Test Date: 06/18/21	Depth: 12-14
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System LTIII-C, Swell Pressure = 0.0659 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 12 of 15

Constant Load Step

Stress: 2 tsf



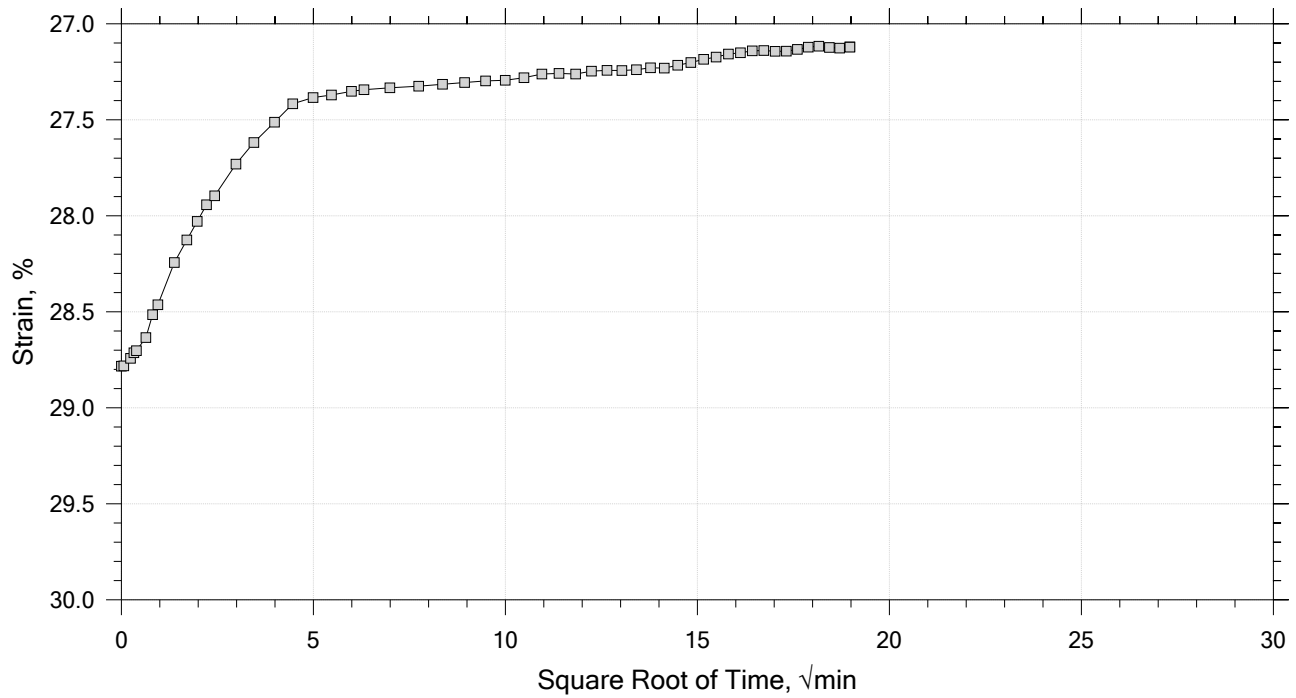
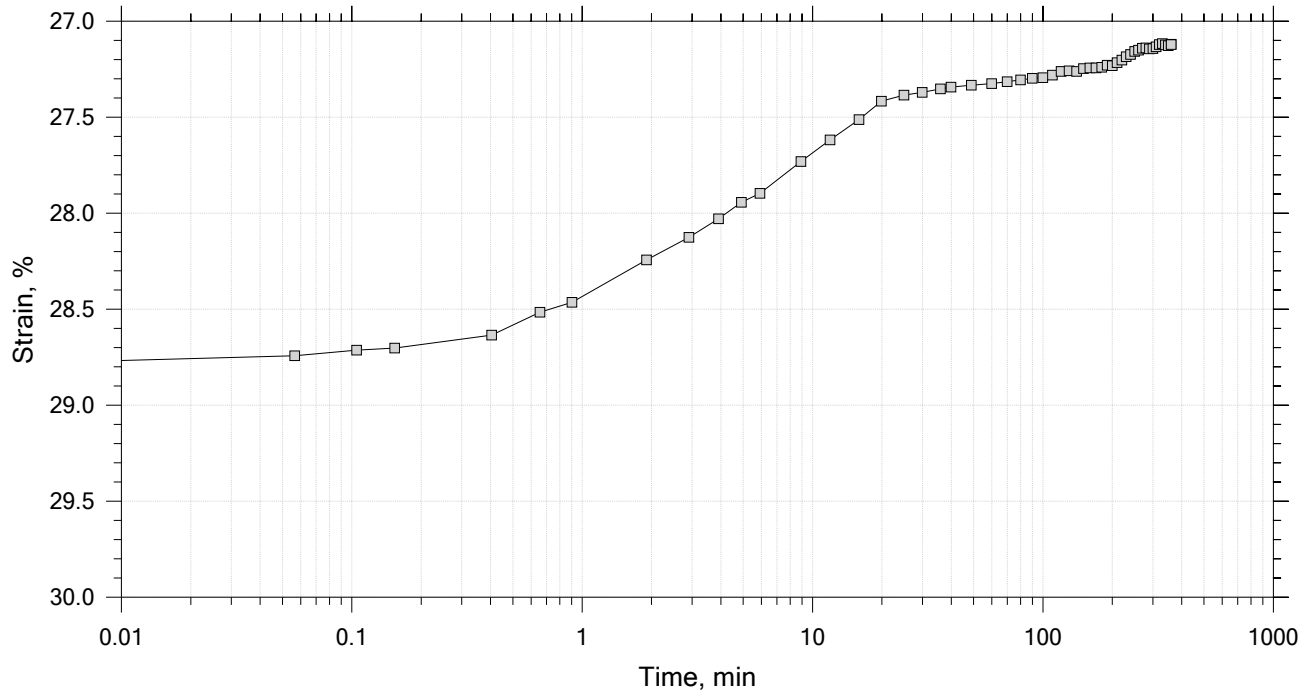
	Project: I-395/Rte 9 Connector	Location: Brewer-Eddington, ME	Project No.: GTX-313197
	Boring No.: HB-BE-223	Tested By: md	Checked By: anm
	Sample No.: U1 (19.2")	Test Date: 06/18/21	Depth: 12-14
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System LTIII-C, Swell Pressure = 0.0659 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 13 of 15

Constant Load Step

Stress: 0.5 tsf



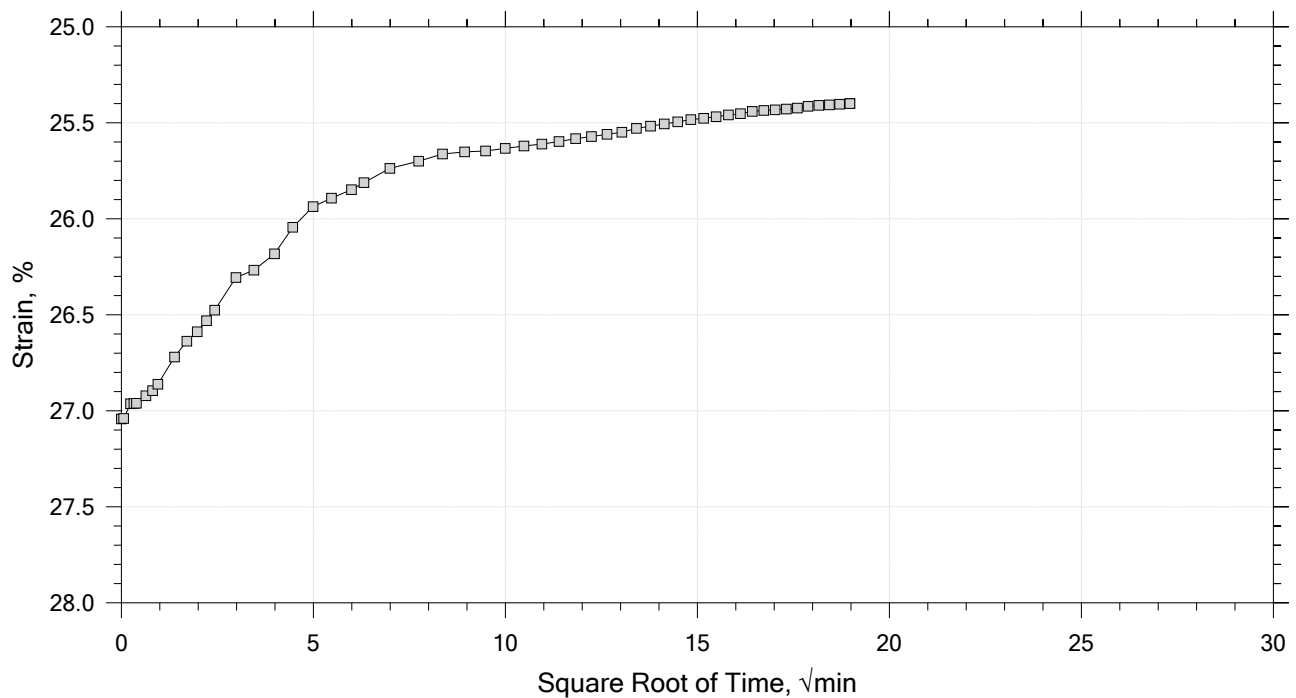
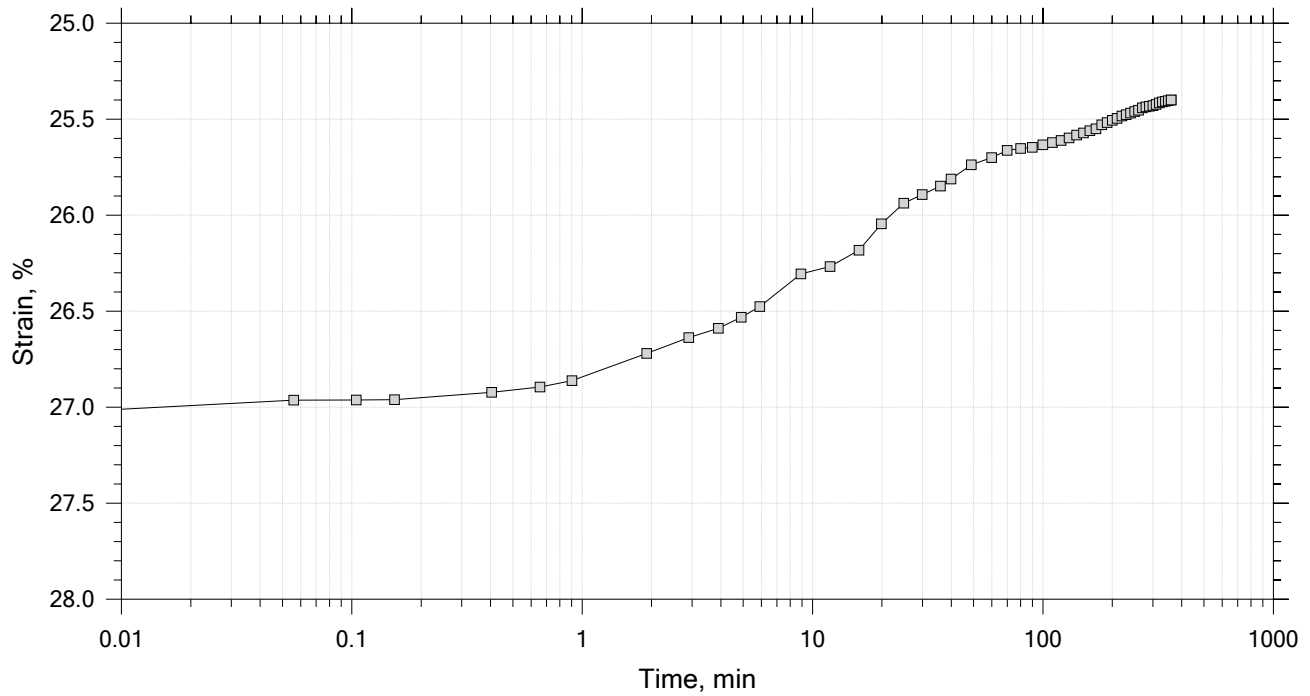
	Project: I-395/Rte 9 Connector	Location: Brewer-Eddington, ME	Project No.: GTX-313197
	Boring No.: HB-BE-223	Tested By: md	Checked By: anm
	Sample No.: U1 (19.2")	Test Date: 06/18/21	Depth: 12-14
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System LTIII-C, Swell Pressure = 0.0659 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 14 of 15

Constant Load Step

Stress: 0.125 tsf



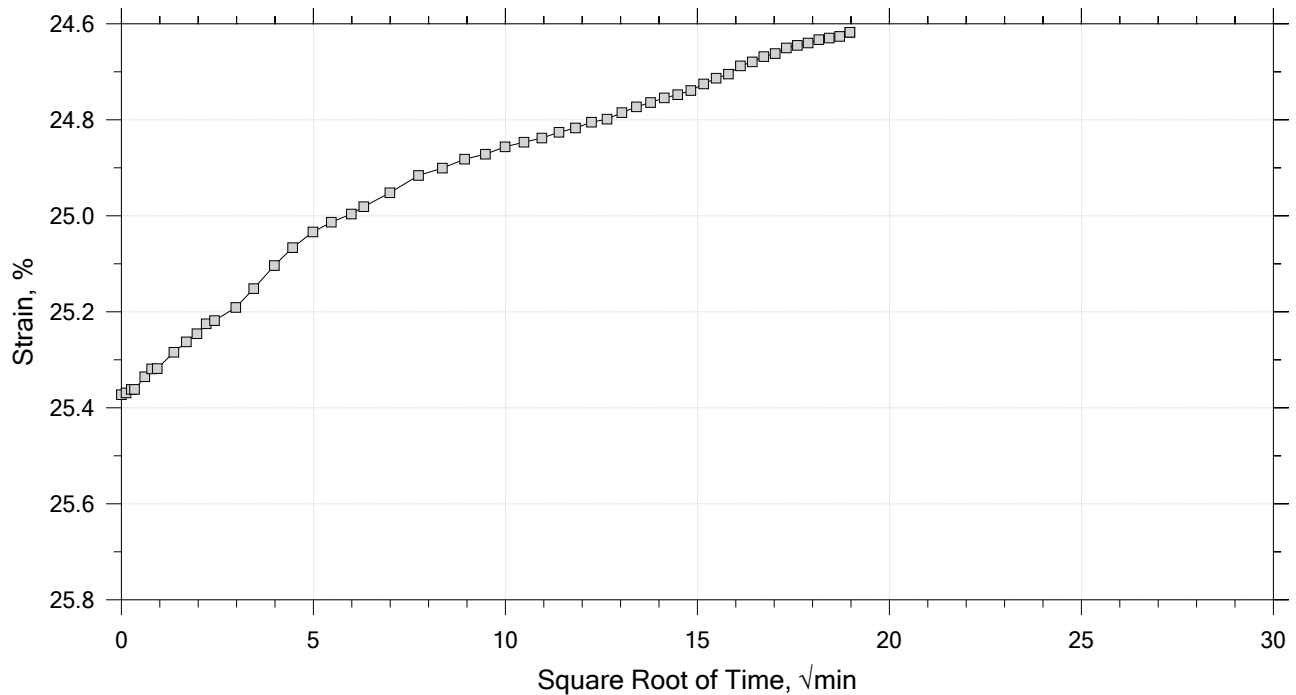
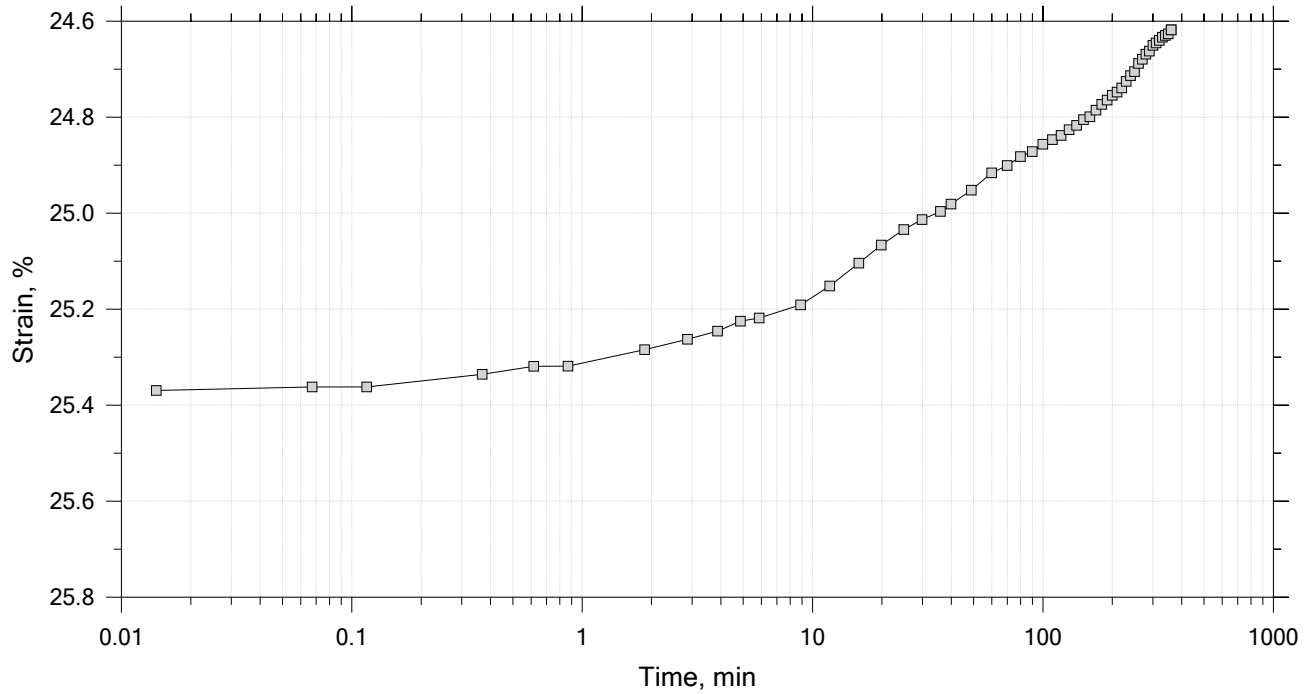
	Project: I-395/Rte 9 Connector	Location: Brewer-Eddington, ME	Project No.: GTX-313197
	Boring No.: HB-BE-223	Tested By: md	Checked By: anm
	Sample No.: U1 (19.2")	Test Date: 06/18/21	Depth: 12-14
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System LTIII-C, Swell Pressure = 0.0659 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 15 of 15

Constant Load Step

Stress: 0.0625 tsf




	Project: I-395/Rte 9 Connector	Location: Brewer-Eddington, ME	Project No.: GTX-313197
	Boring No.: HB-BE-223	Tested By: md	Checked By: anm
	Sample No.: U1 (19.2")	Test Date: 06/18/21	Depth: 12-14
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System LTIII-C, Swell Pressure = 0.0659 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Specimen Diameter: 2.50 in	Estimated Specific Gravity: 2.75	Liquid Limit: 34
Initial Height: 1.00 in	Initial Void Ratio: 1.05	Plastic Limit: 19
Final Height: 0.85 in	Final Void Ratio: 0.741	Plasticity Index: 15

	Before Test Trimmings	Before Test Specimen	After Test Specimen	After Test Trimmings
Container ID	E-0650	RING		E0165
Mass Container, gm	8.17	110.32	110.32	8.17
Mass Container + Wet Soil, gm	80.44	259.29	247.6	141.62
Mass Container + Dry Soil, gm	59.05	218.51	218.51	113.34
Mass Dry Soil, gm	50.88	108.19	108.19	105.17
Water Content, %	42.04	37.70	26.89	26.89
Void Ratio	---	1.05	0.74	---
Degree of Saturation, %	---	99.09	100.00	---
Dry Unit Weight, pcf	---	83.963	98.78	---


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

	Project: I-395/Rte 9 Connector	Location: Brewer-Eddington, ME	Project No.: GTX-313197
	Boring No.: HB-BE-223	Tested By: md	Checked By: anm
	Sample No.: U1 (19.2")	Test Date: 06/18/21	Depth: 12-14
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System LTIII-C, Swell Pressure = 0.0659 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

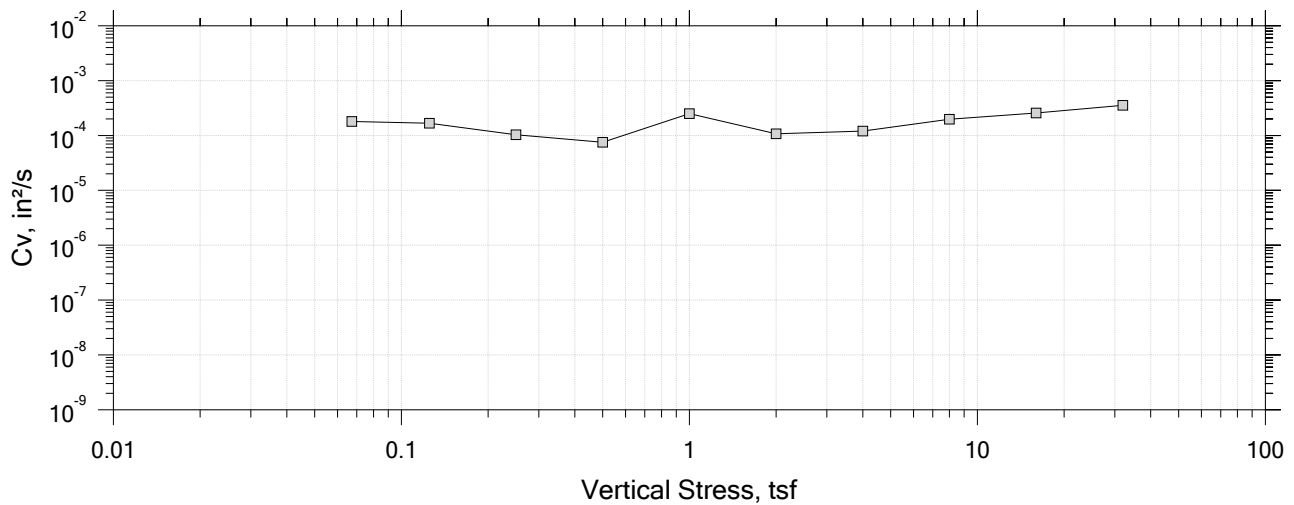
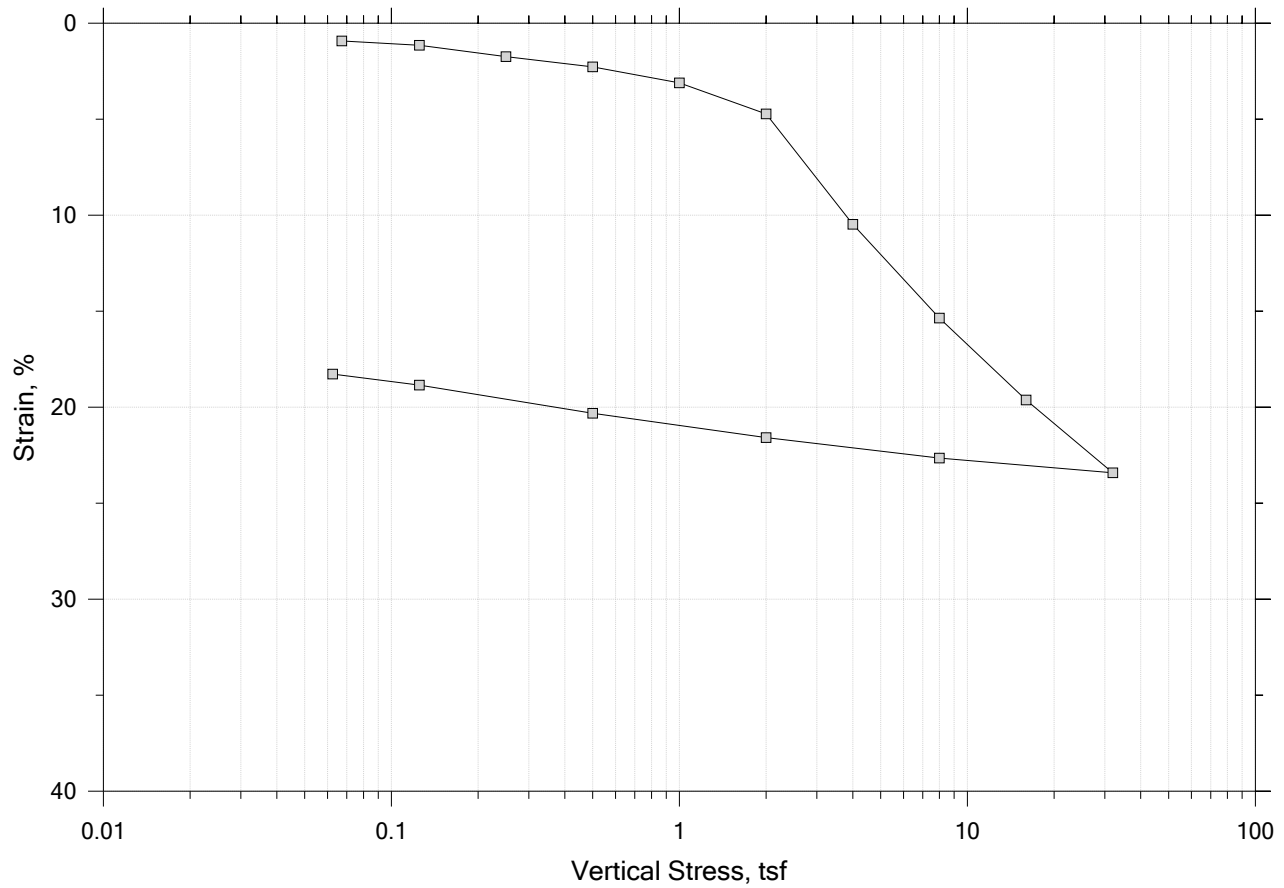
Square Root of Time Coefficients


[illegible]

	Project: I-395/Rte 9 Connector	Location: Brewer-Eddington, ME	Project No.: GTX-313197
	Boring No.: HB-BE-223	Tested By: md	Checked By: anm
	Sample No.: U1 (19.2")	Test Date: 06/18/21	Depth: 12-14
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System LTIII-C, Swell Pressure = 0.0659 tsf		
	Displacement at End of Increment		

One-Dimensional Consolidation by ASTM D2435 - Method B

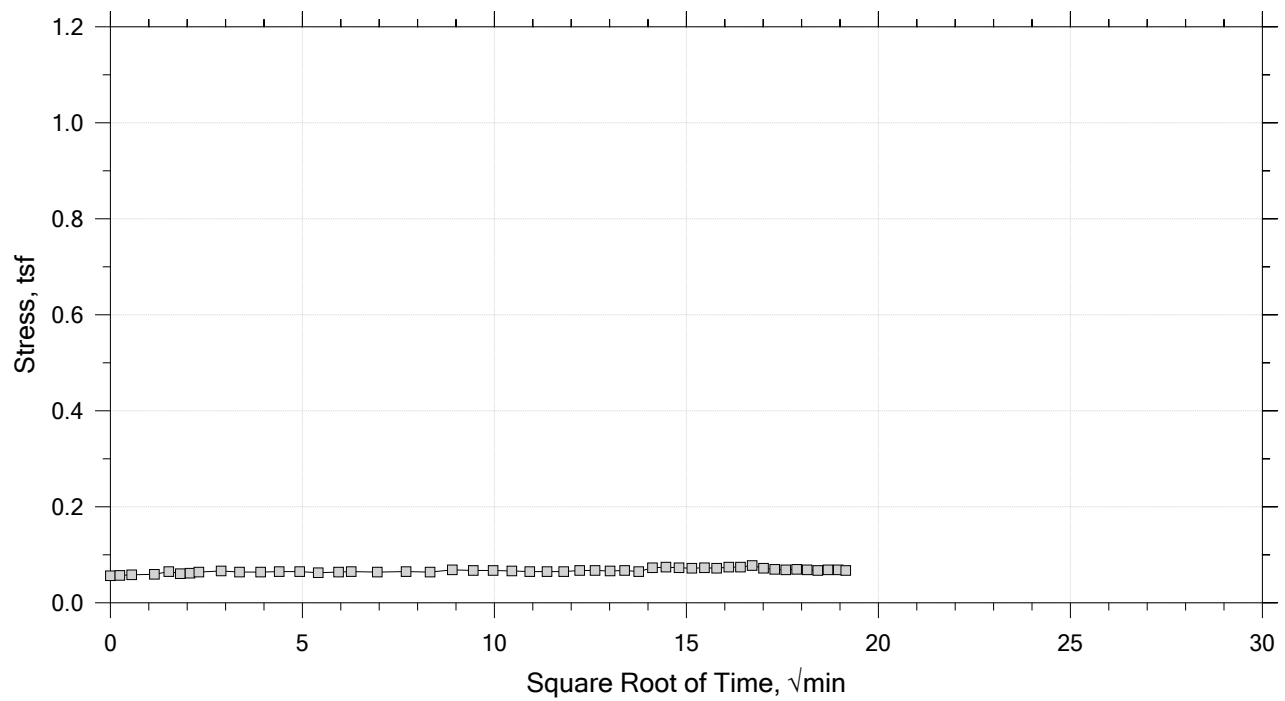
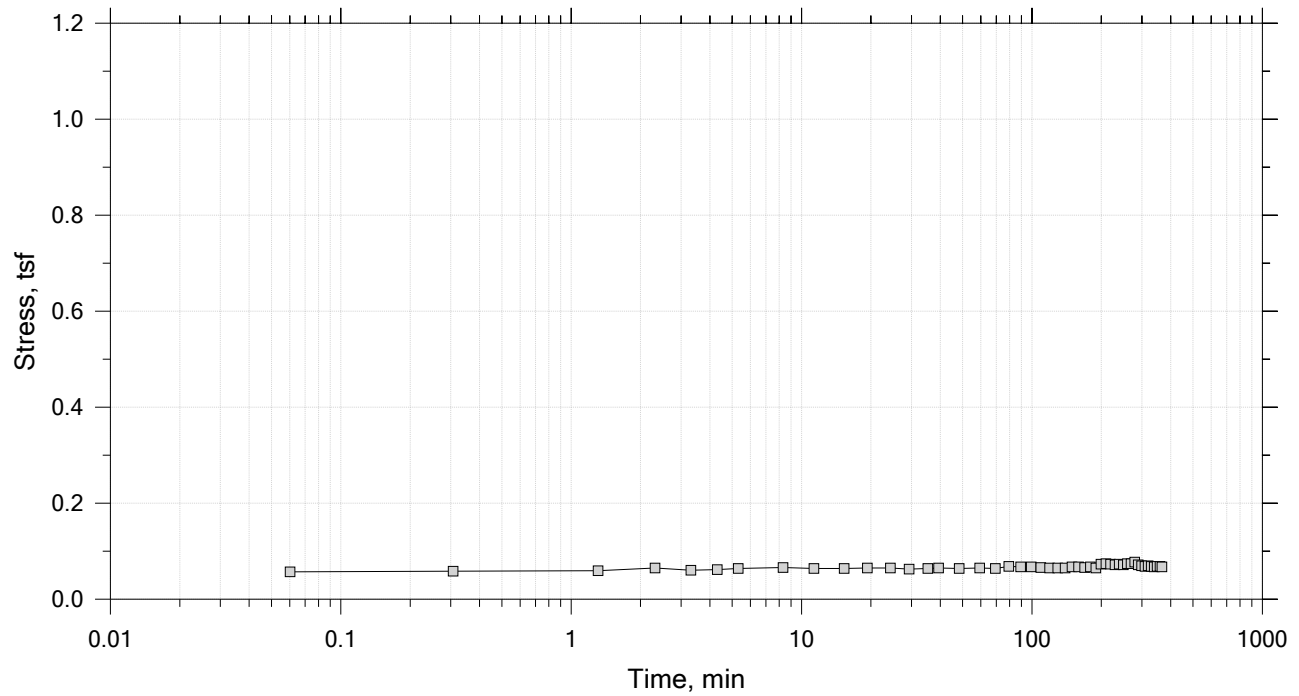
Summary Report




	Project: I-395/Rte 9 Connector	Location: Brewer-Eddington, ME	Project No.: GTX-313197
	Boring No.: HB-BE-223A	Tested By: md	Checked By: anm
	Sample No.: U1 (20.4")	Test Date: 03/18/21	Depth: 8-10
	Test No.: IP-2	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay with silt		
	Remarks: System LTIII-D, Swell Pressure = 0.0673 tsf		
	Displacement at End of Increment		

One-Dimensional Consolidation by ASTM D2435 - Method B

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



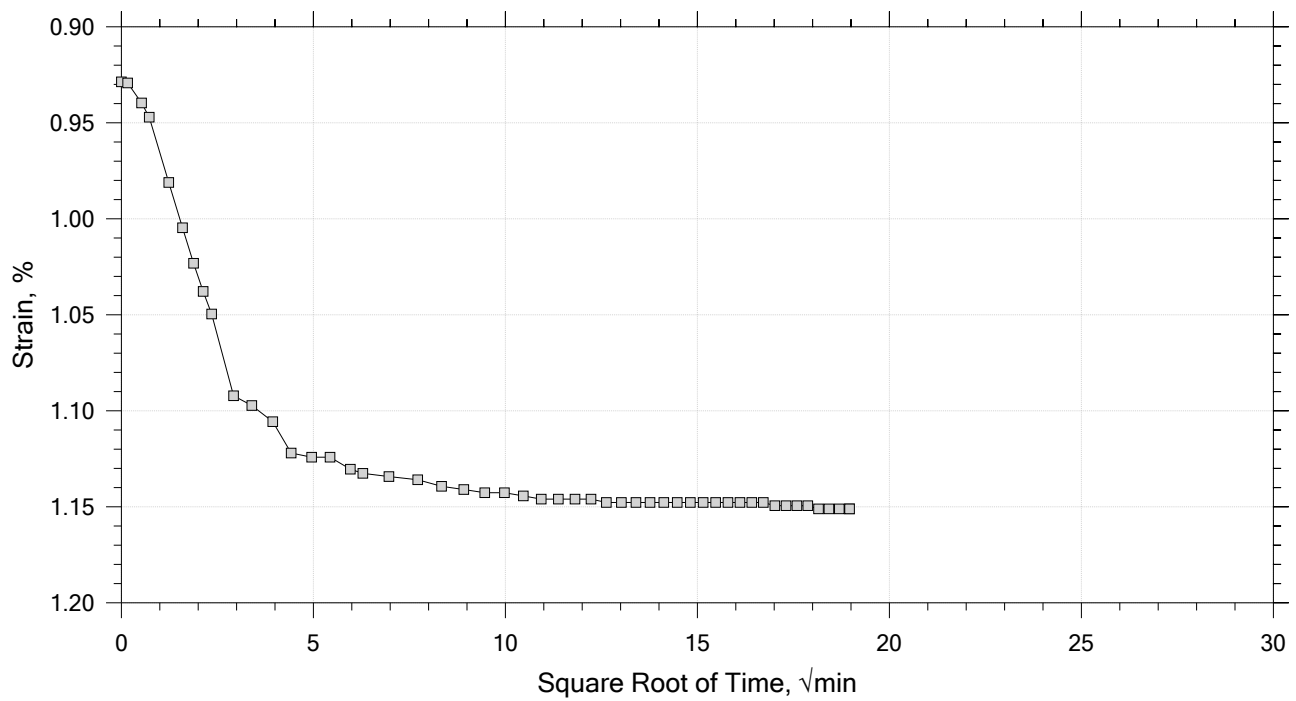
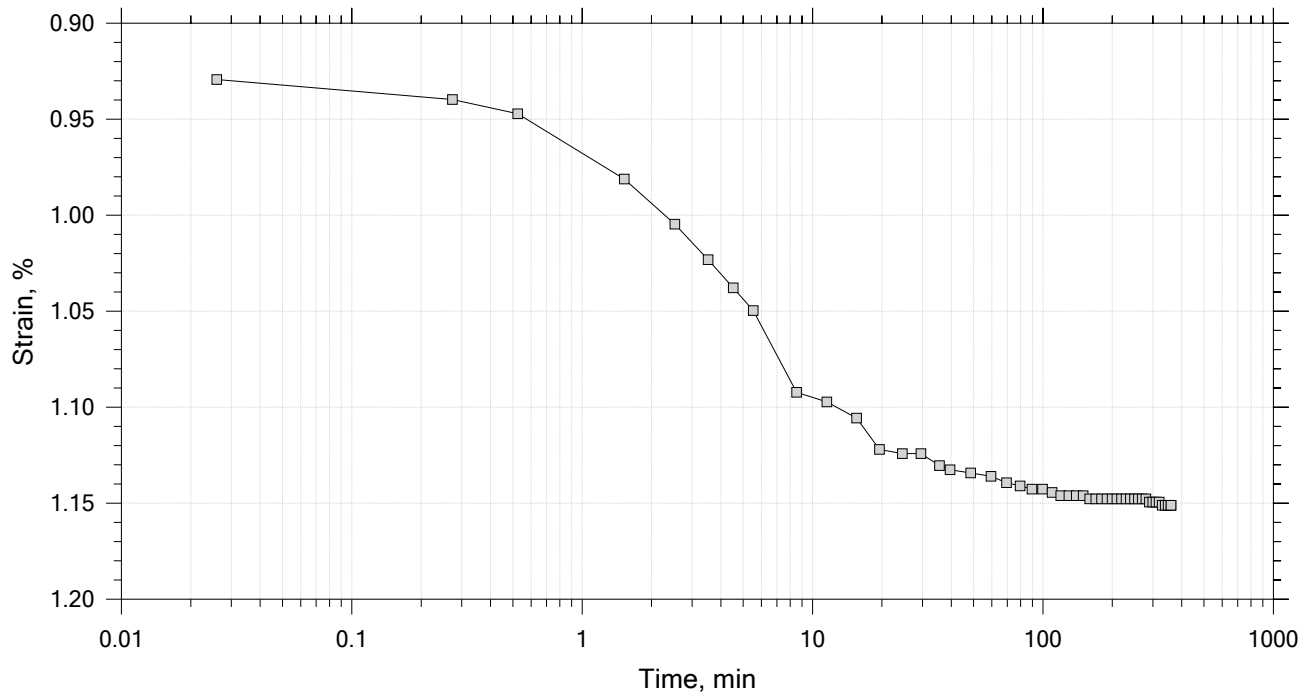
	Project: I-395/Rte 9 Connector	Location: Brewer-Eddington, ME	Project No.: GTX-313197
	Boring No.: HB-BE-223A	Tested By: md	Checked By: anm
	Sample No.: U1 (20.4")	Test Date: 03/18/21	Depth: 8-10
	Test No.: IP-2	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay with silt		
	Remarks: System LTIII-D, Swell Pressure = 0.0673 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 2 of 15

Constant Load Step

Stress: 0.125 tsf



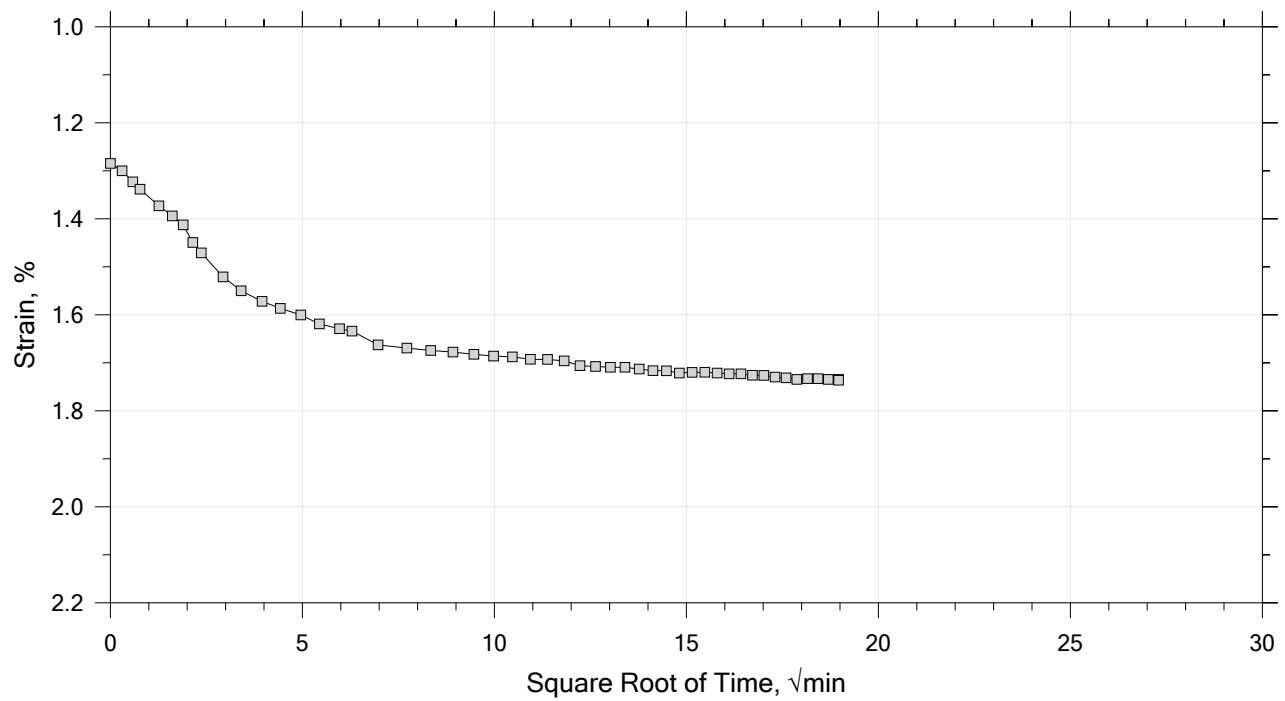
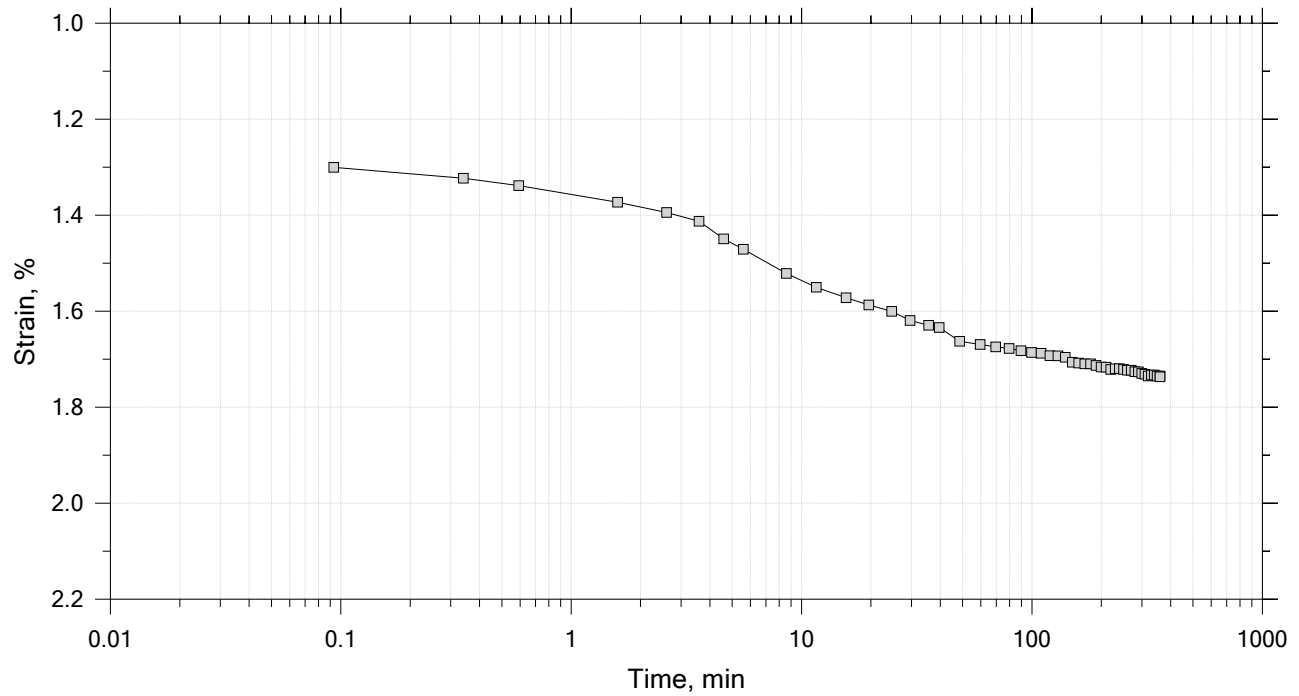
	Project: I-395/Rte 9 Connector	Location: Brewer-Eddington, ME	Project No.: GTX-313197
	Boring No.: HB-BE-223A	Tested By: md	Checked By: anm
	Sample No.: U1 (20.4")	Test Date: 03/18/21	Depth: 8-10
	Test No.: IP-2	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay with silt		
	Remarks: System LTIII-D, Swell Pressure = 0.0673 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 3 of 15

Constant Load Step

Stress: 0.25 tsf



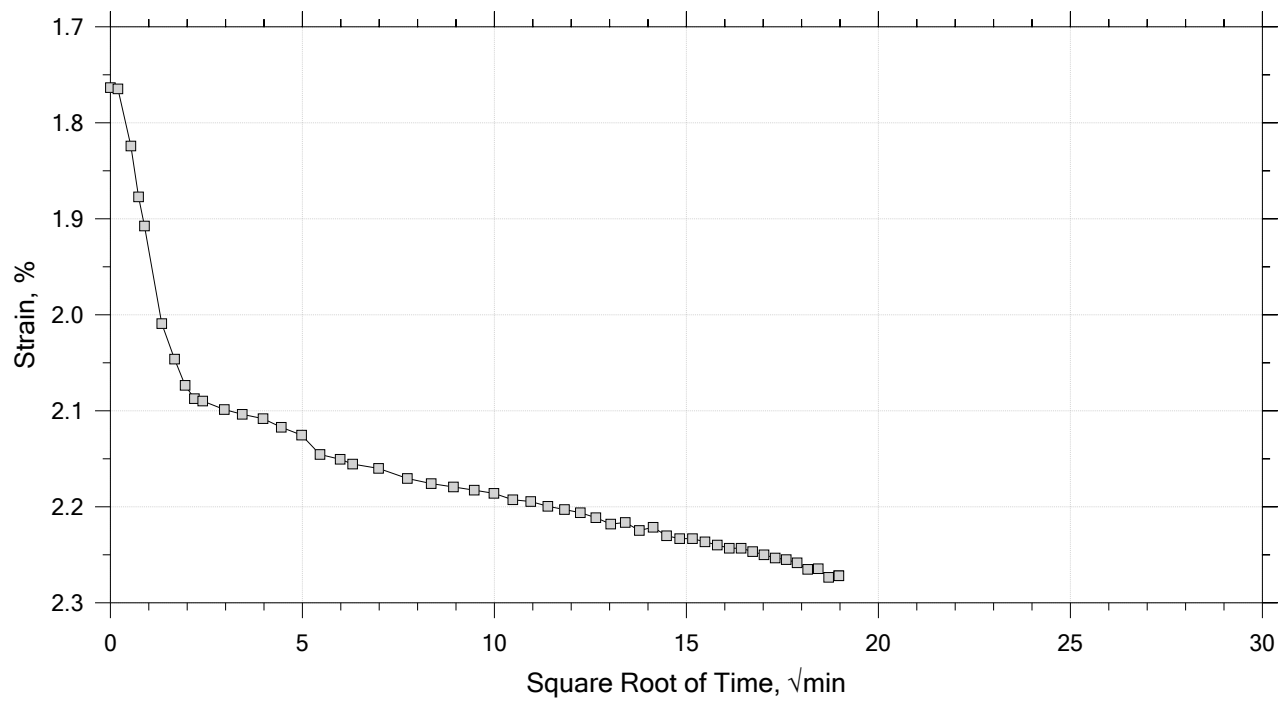
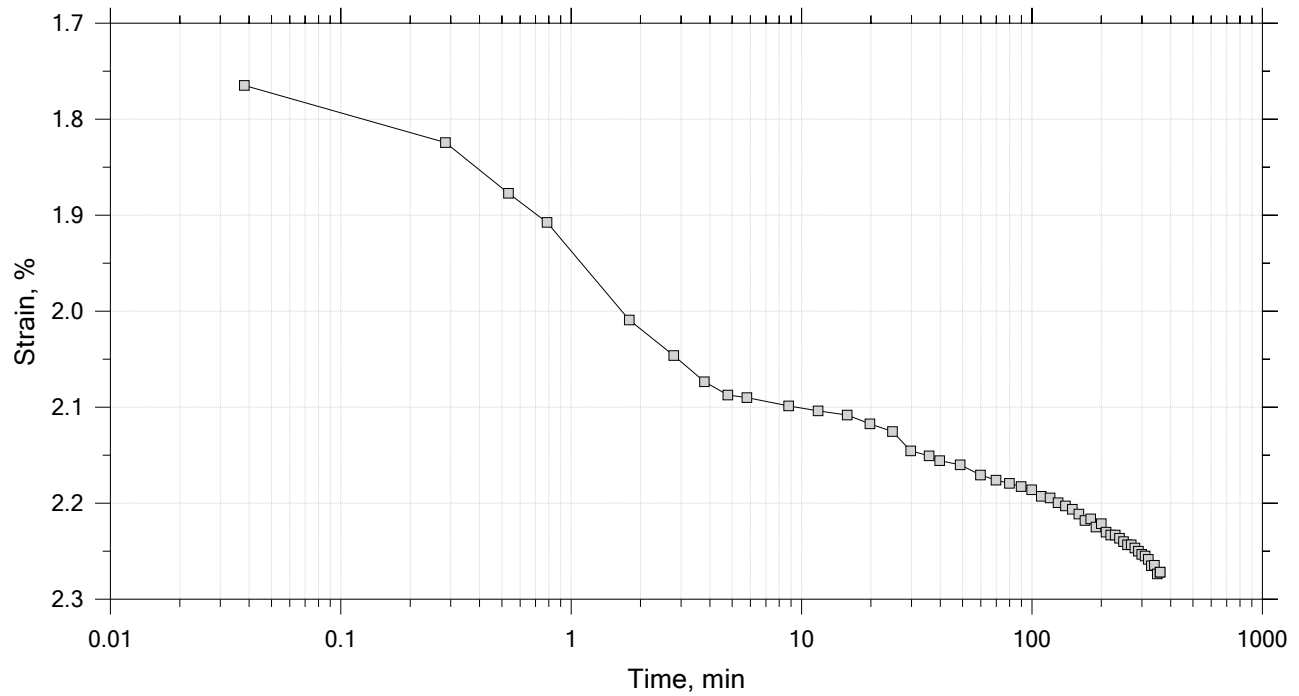
	Project: I-395/Rte 9 Connector	Location: Brewer-Eddington, ME	Project No.: GTX-313197
	Boring No.: HB-BE-223A	Tested By: md	Checked By: anm
	Sample No.: U1 (20.4")	Test Date: 03/18/21	Depth: 8-10
	Test No.: IP-2	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay with silt		
	Remarks: System LTIII-D, Swell Pressure = 0.0673 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 4 of 15

Constant Load Step

Stress: 0.5 tsf



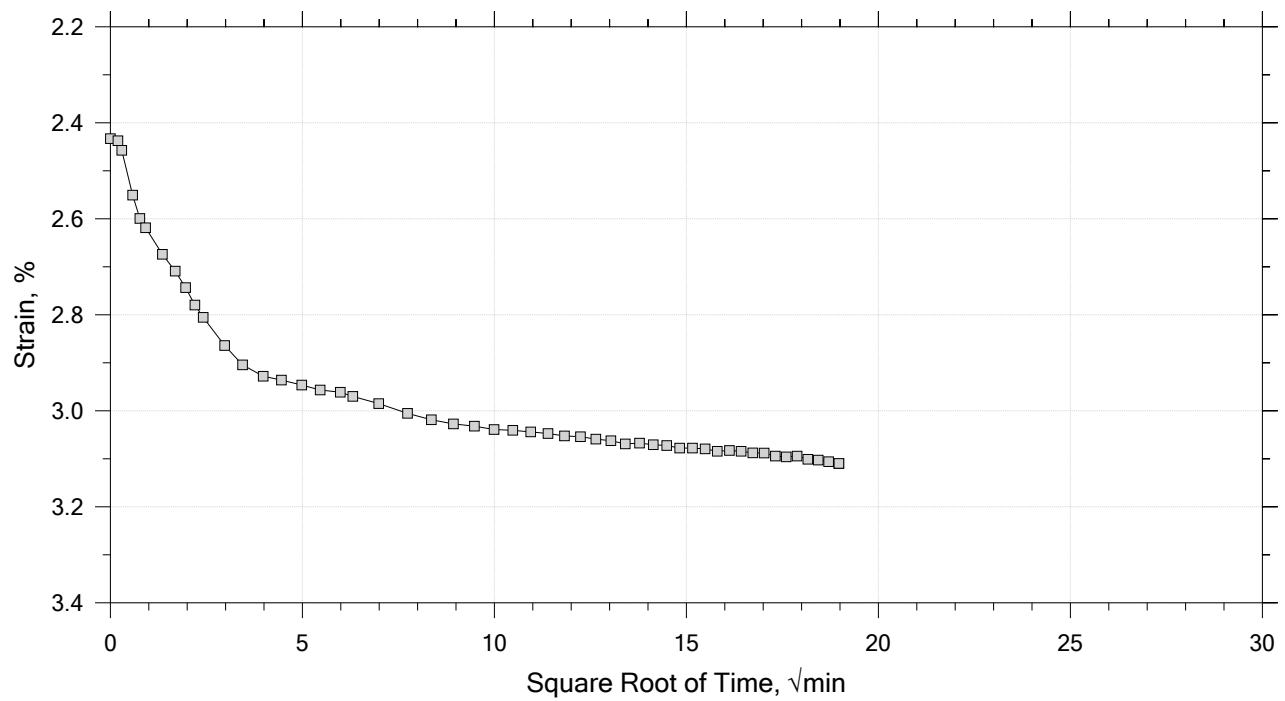
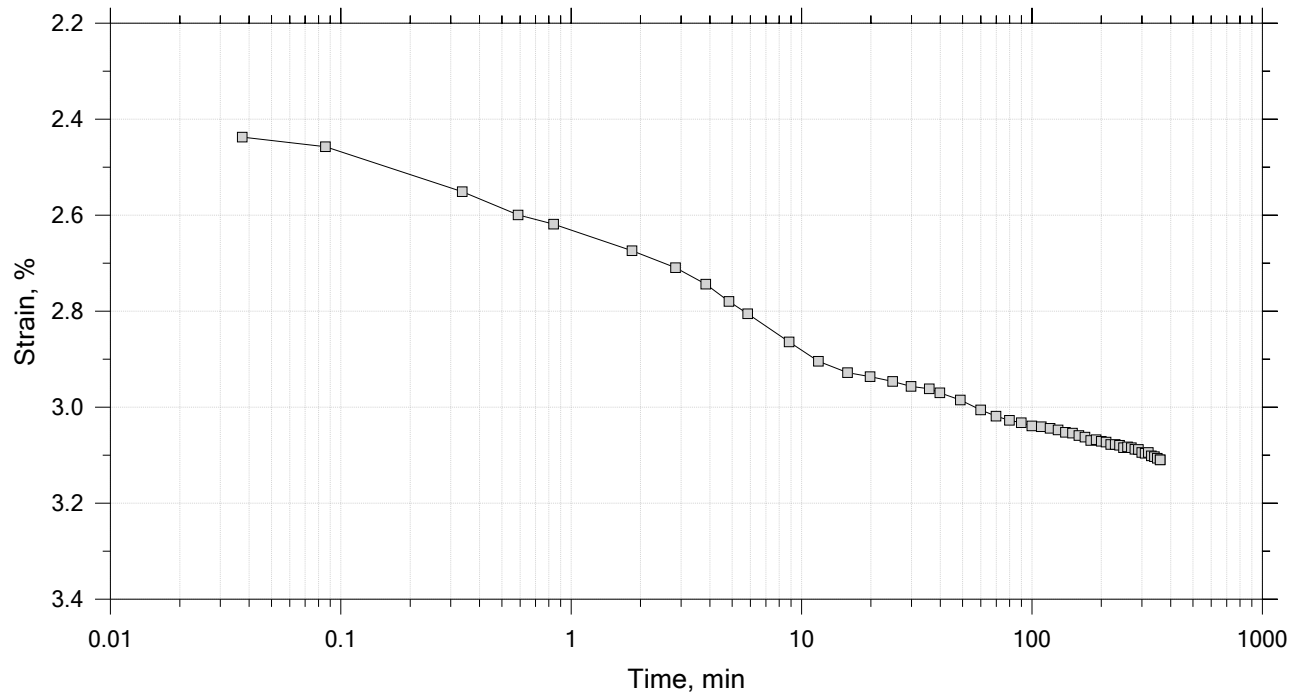
	Project: I-395/Rte 9 Connector	Location: Brewer-Eddington, ME	Project No.: GTX-313197
	Boring No.: HB-BE-223A	Tested By: md	Checked By: anm
	Sample No.: U1 (20.4")	Test Date: 03/18/21	Depth: 8-10
	Test No.: IP-2	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay with silt		
	Remarks: System LTIII-D, Swell Pressure = 0.0673 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 5 of 15

Constant Load Step

Stress: 1 tsf



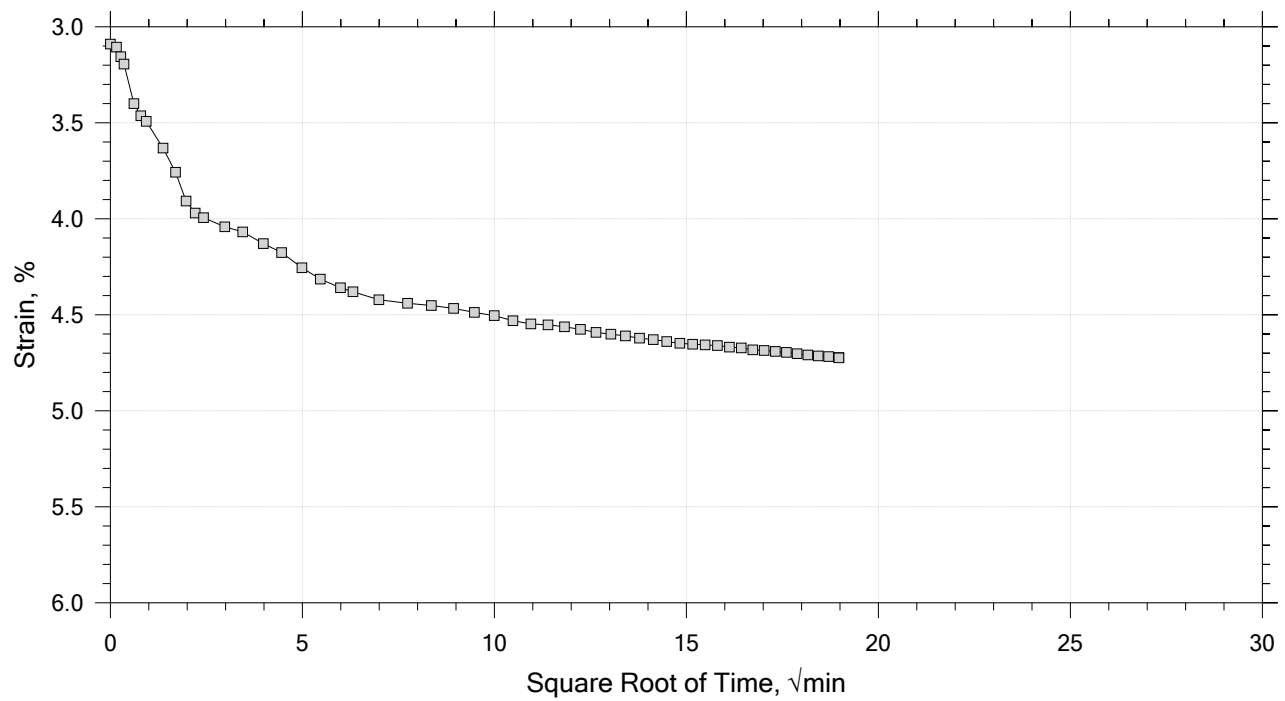
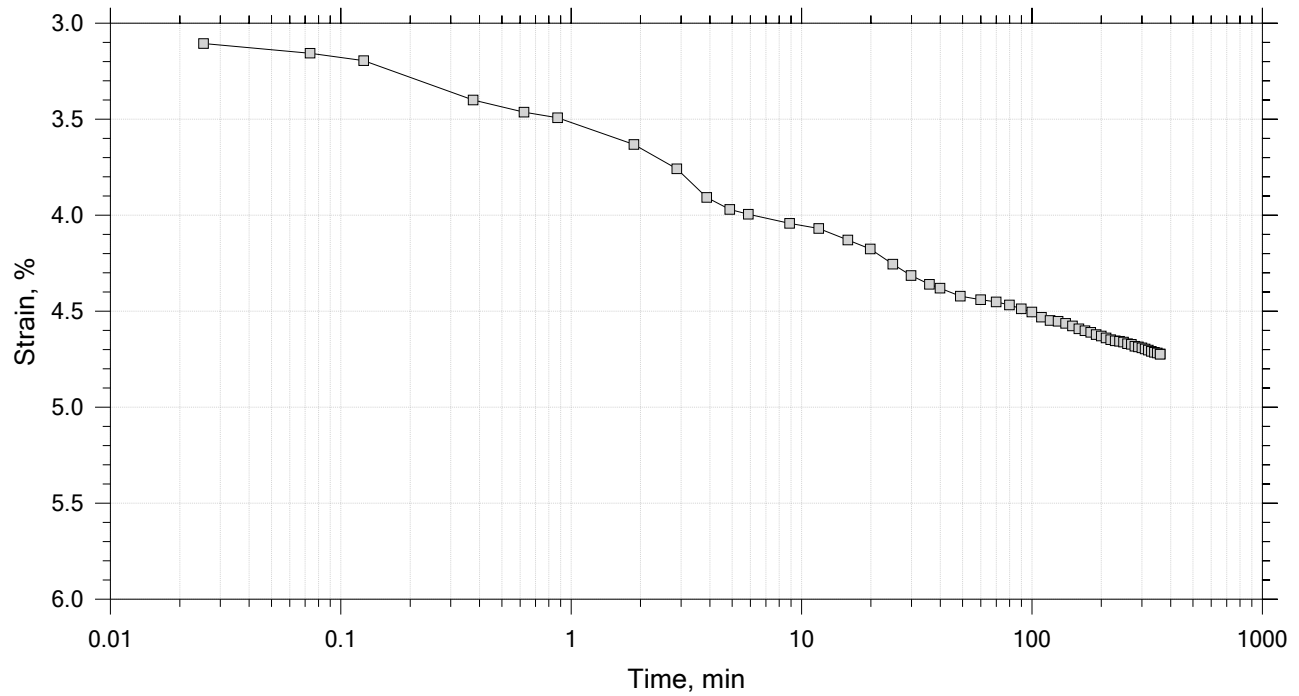
	Project: I-395/Rte 9 Connector	Location: Brewer-Eddington, ME	Project No.: GTX-313197
	Boring No.: HB-BE-223A	Tested By: md	Checked By: anm
	Sample No.: U1 (20.4")	Test Date: 03/18/21	Depth: 8-10
	Test No.: IP-2	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay with silt		
	Remarks: System LTIII-D, Swell Pressure = 0.0673 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 6 of 15

Constant Load Step

Stress: 2 tsf



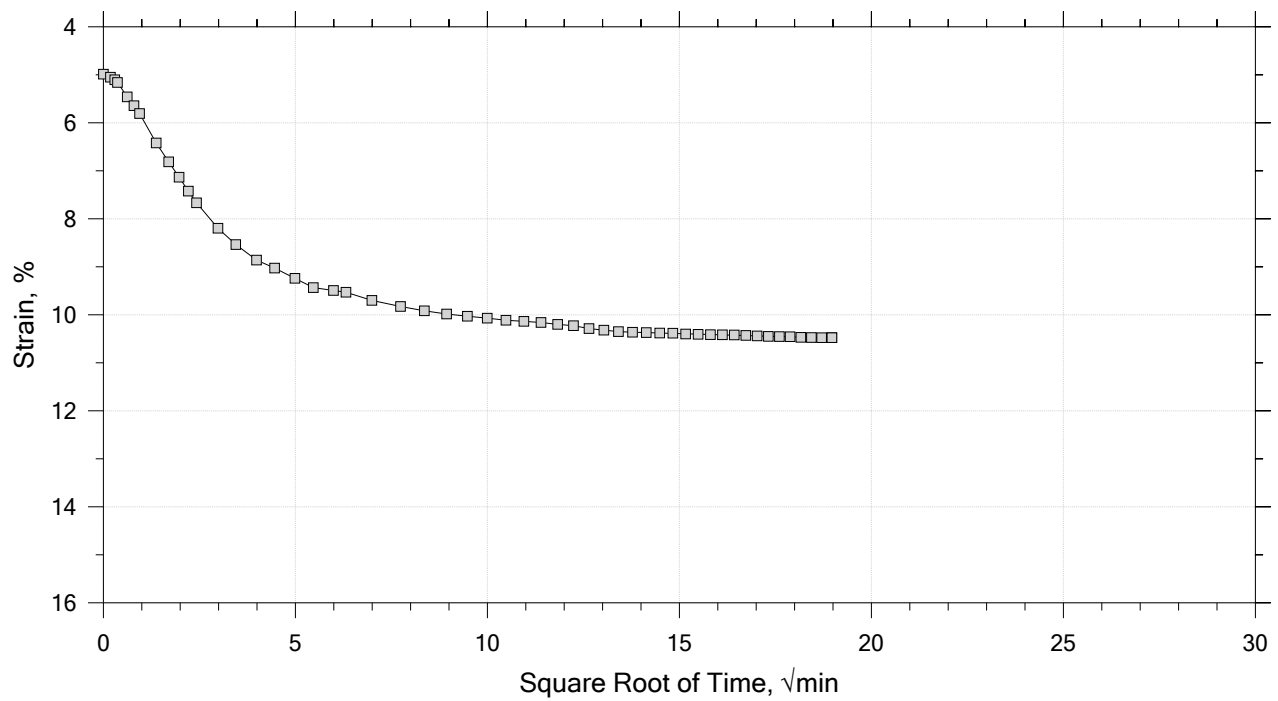
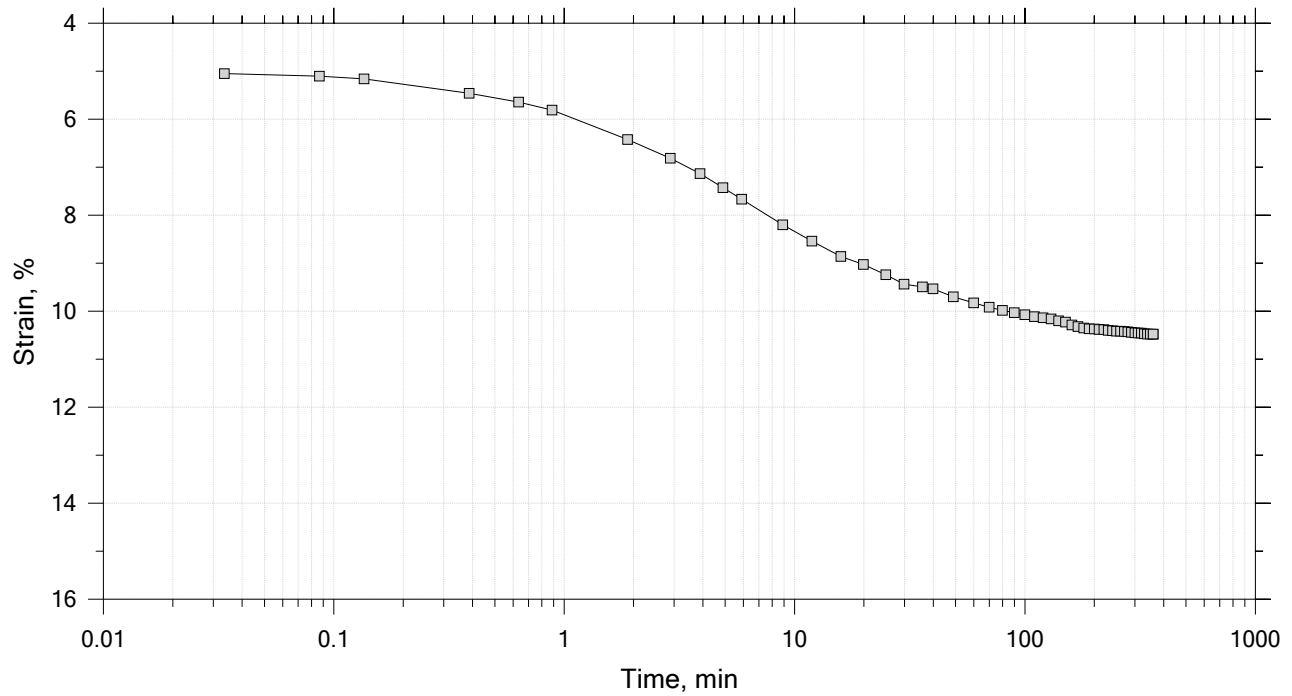
	Project: I-395/Rte 9 Connector	Location: Brewer-Eddington, ME	Project No.: GTX-313197
	Boring No.: HB-BE-223A	Tested By: md	Checked By: anm
	Sample No.: U1 (20.4")	Test Date: 03/18/21	Depth: 8-10
	Test No.: IP-2	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay with silt		
	Remarks: System LTIII-D, Swell Pressure = 0.0673 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 7 of 15

Constant Load Step

Stress: 4 tsf



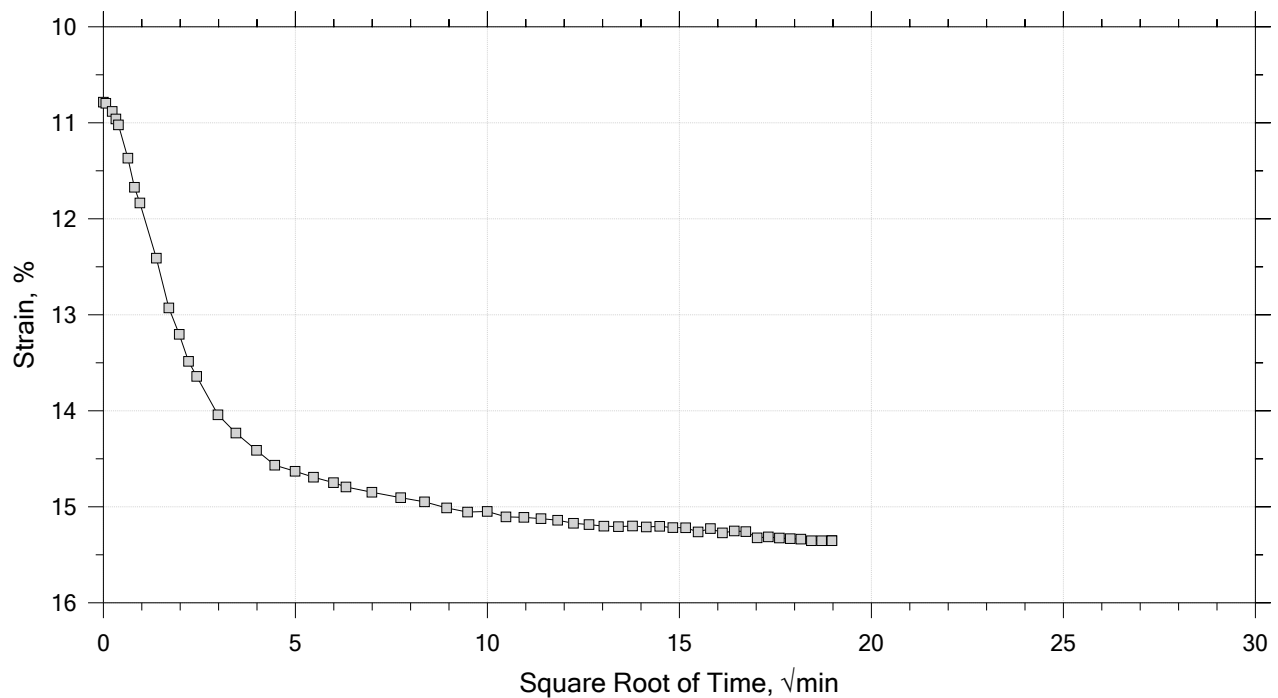
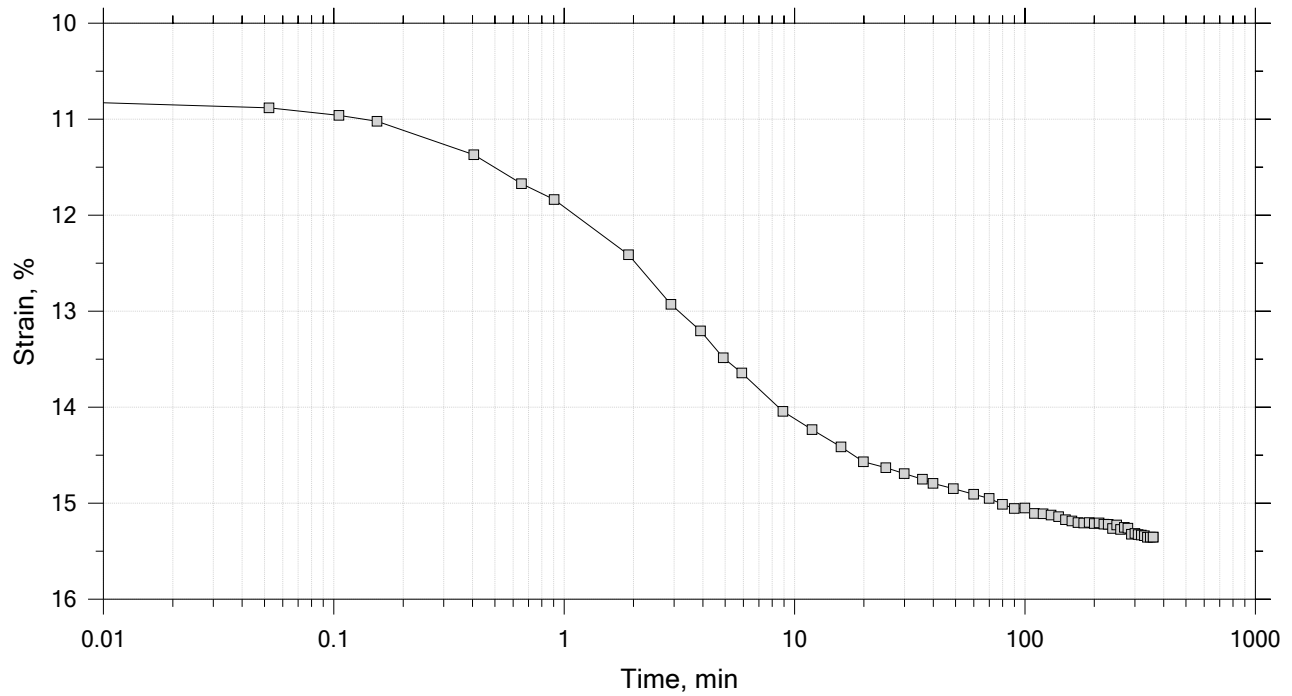
	Project: I-395/Rte 9 Connector	Location: Brewer-Eddington, ME	Project No.: GTX-313197
	Boring No.: HB-BE-223A	Tested By: md	Checked By: anm
	Sample No.: U1 (20.4")	Test Date: 03/18/21	Depth: 8-10
	Test No.: IP-2	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay with silt		
	Remarks: System LTIII-D, Swell Pressure = 0.0673 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 8 of 15

Constant Load Step

Stress: 8 tsf



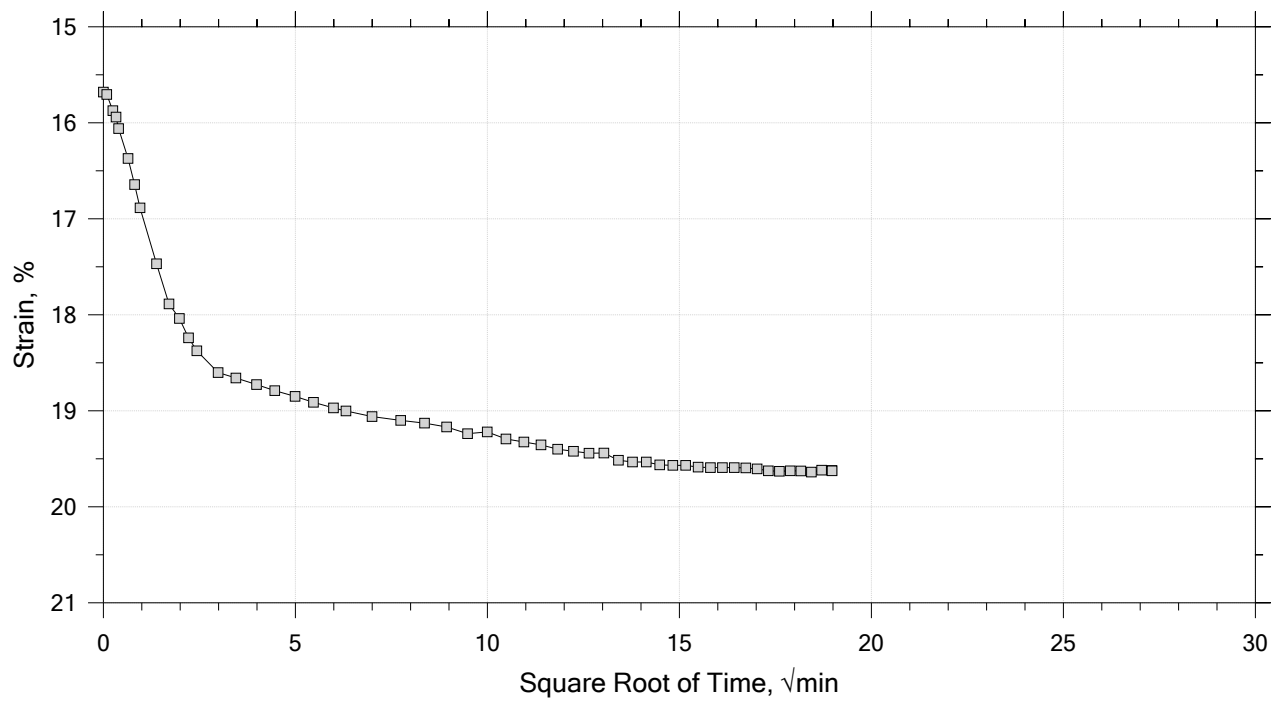
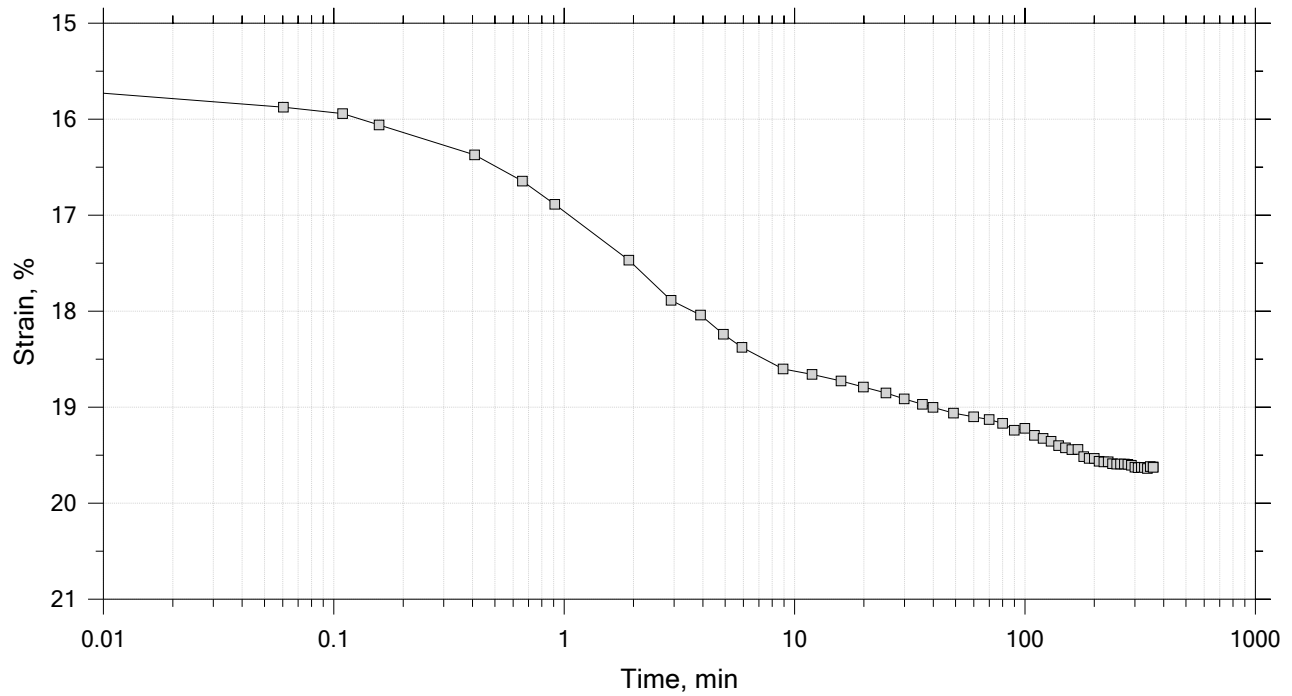
	Project: I-395/Rte 9 Connector	Location: Brewer-Eddington, ME	Project No.: GTX-313197
	Boring No.: HB-BE-223A	Tested By: md	Checked By: anm
	Sample No.: U1 (20.4")	Test Date: 03/18/21	Depth: 8-10
	Test No.: IP-2	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay with silt		
	Remarks: System LTIII-D, Swell Pressure = 0.0673 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 9 of 15

Constant Load Step

Stress: 16 tsf



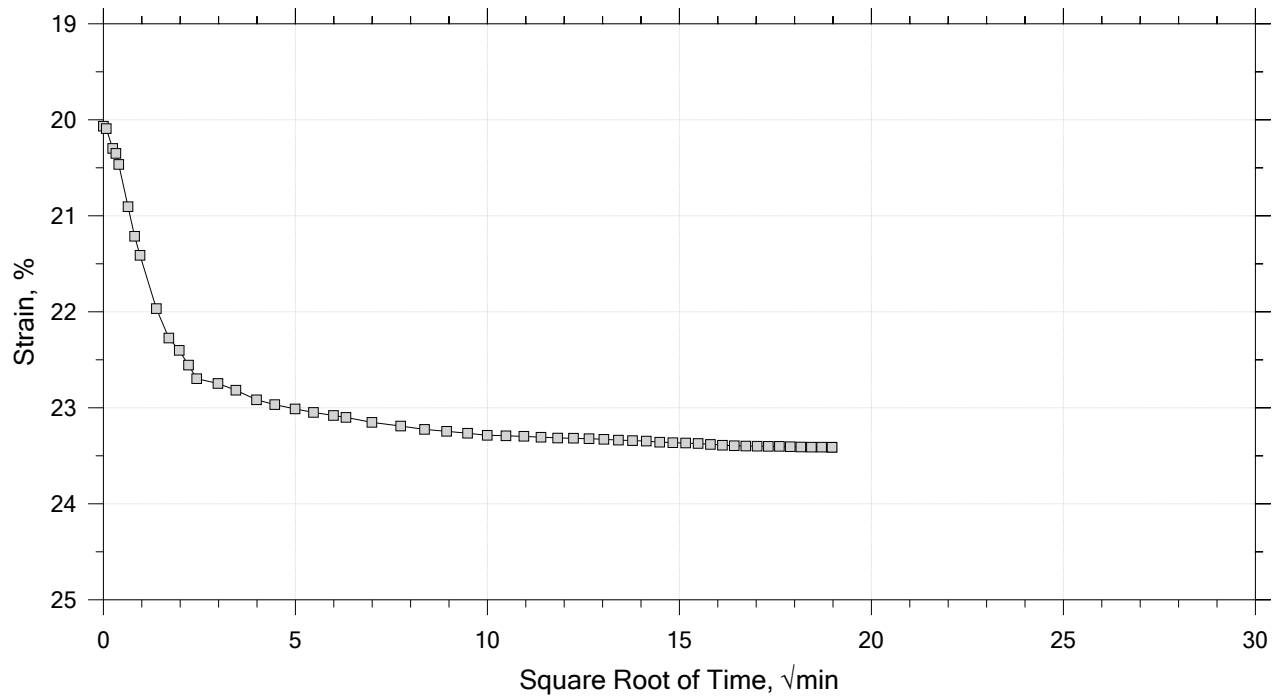
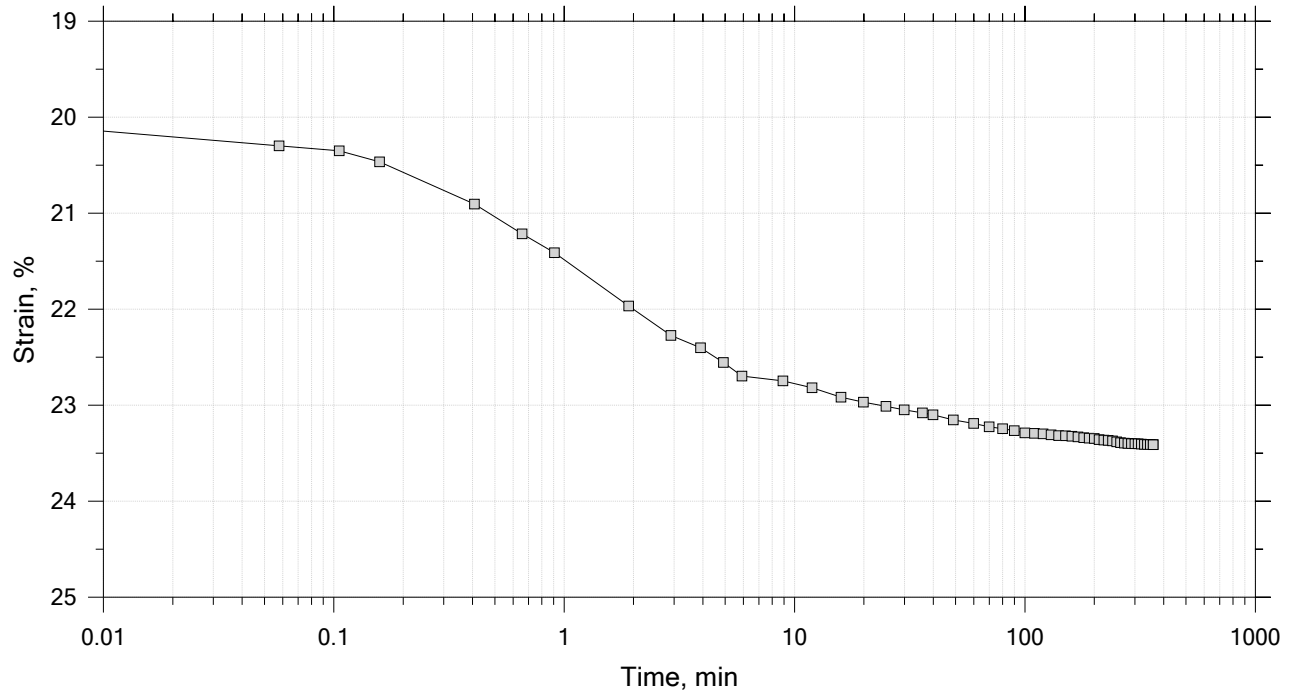
	Project: I-395/Rte 9 Connector	Location: Brewer-Eddington, ME	Project No.: GTX-313197
	Boring No.: HB-BE-223A	Tested By: md	Checked By: anm
	Sample No.: U1 (20.4")	Test Date: 03/18/21	Depth: 8-10
	Test No.: IP-2	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay with silt		
	Remarks: System LTIII-D, Swell Pressure = 0.0673 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 10 of 15

Constant Load Step

Stress: 32 tsf



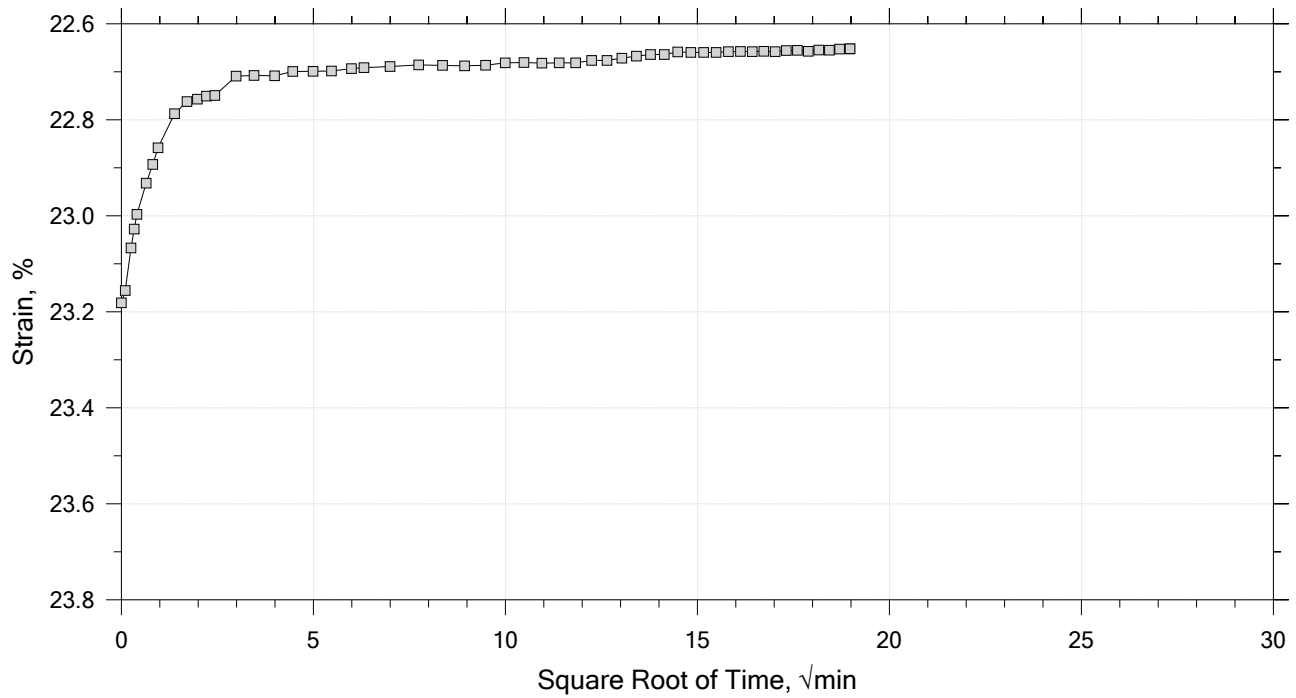
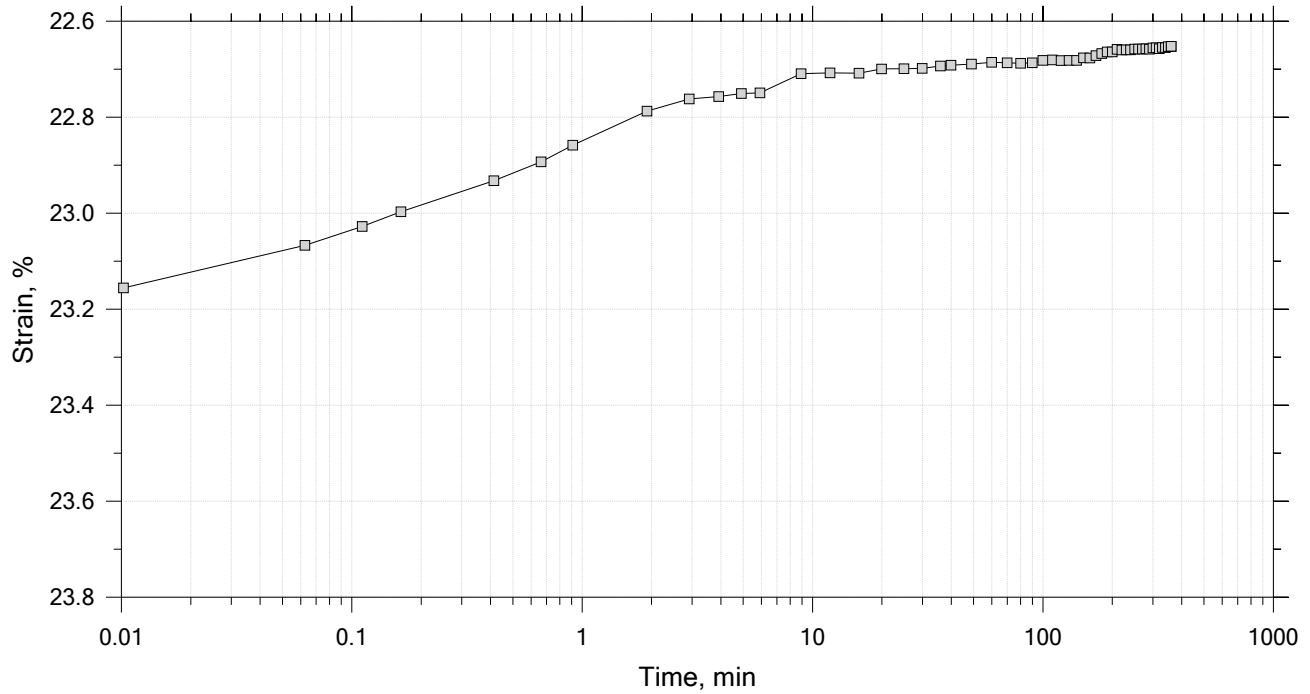
	Project: I-395/Rte 9 Connector	Location: Brewer-Eddington, ME	Project No.: GTX-313197
	Boring No.: HB-BE-223A	Tested By: md	Checked By: anm
	Sample No.: U1 (20.4")	Test Date: 03/18/21	Depth: 8-10
	Test No.: IP-2	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay with silt		
	Remarks: System LTIII-D, Swell Pressure = 0.0673 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 11 of 15

Constant Load Step

Stress: 8 tsf



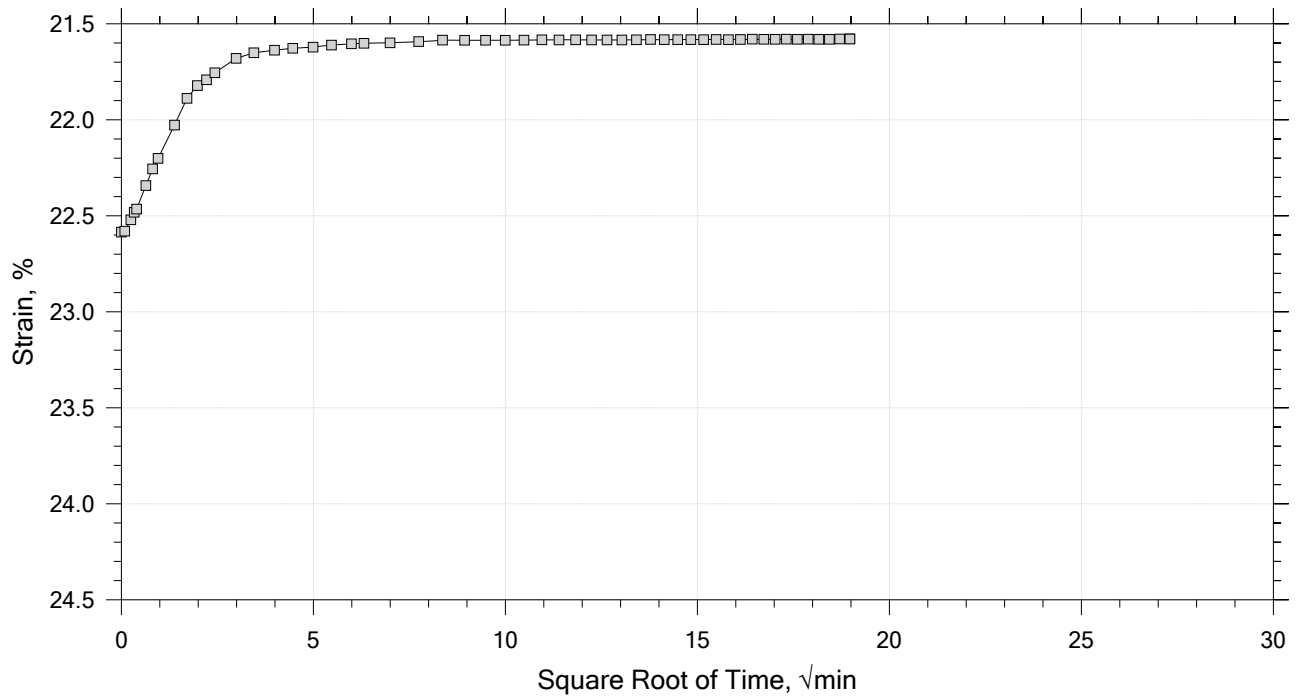
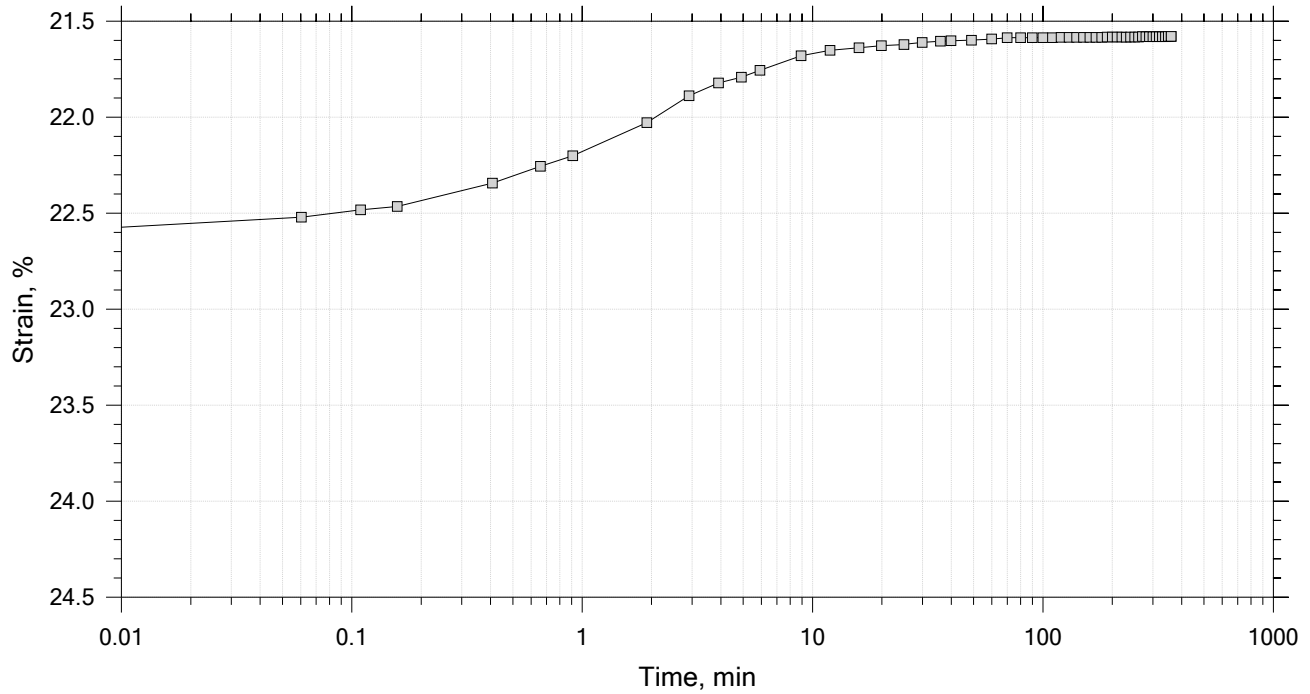
	Project: I-395/Rte 9 Connector	Location: Brewer-Eddington, ME	Project No.: GTX-313197
	Boring No.: HB-BE-223A	Tested By: md	Checked By: anm
	Sample No.: U1 (20.4")	Test Date: 03/18/21	Depth: 8-10
	Test No.: IP-2	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay with silt		
	Remarks: System LTIII-D, Swell Pressure = 0.0673 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 12 of 15

Constant Load Step

Stress: 2 tsf



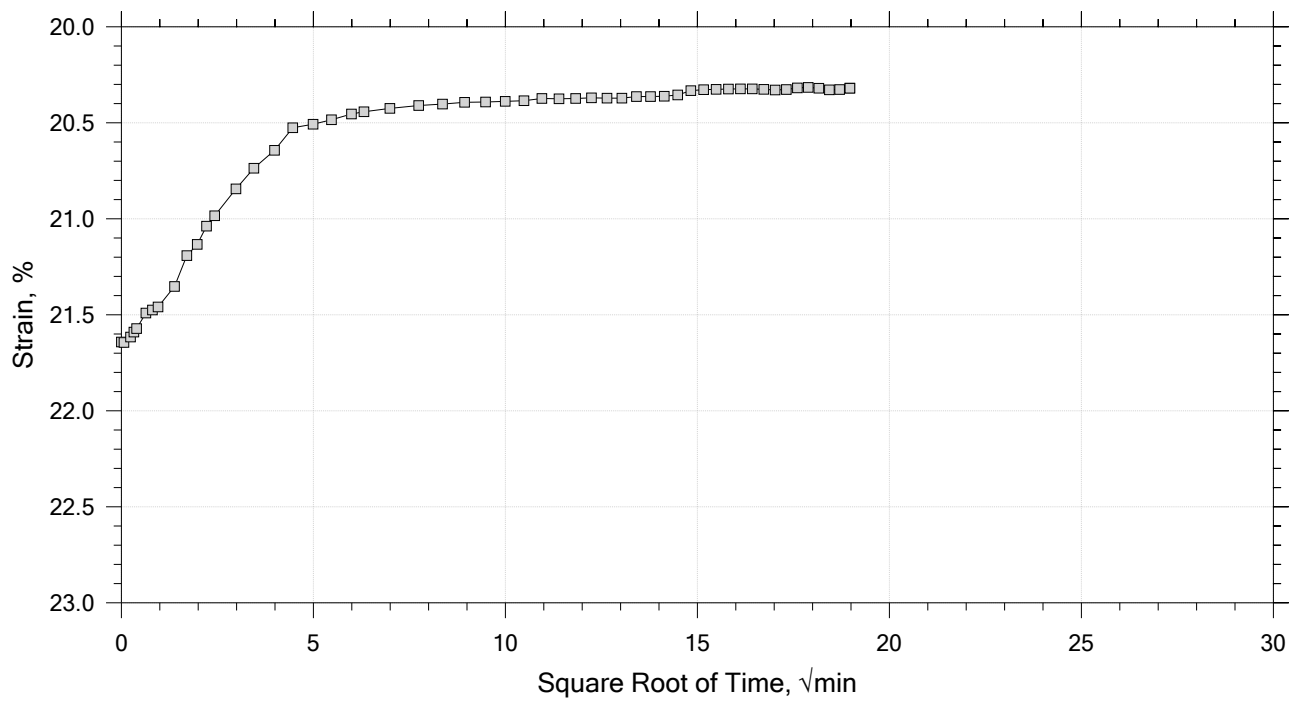
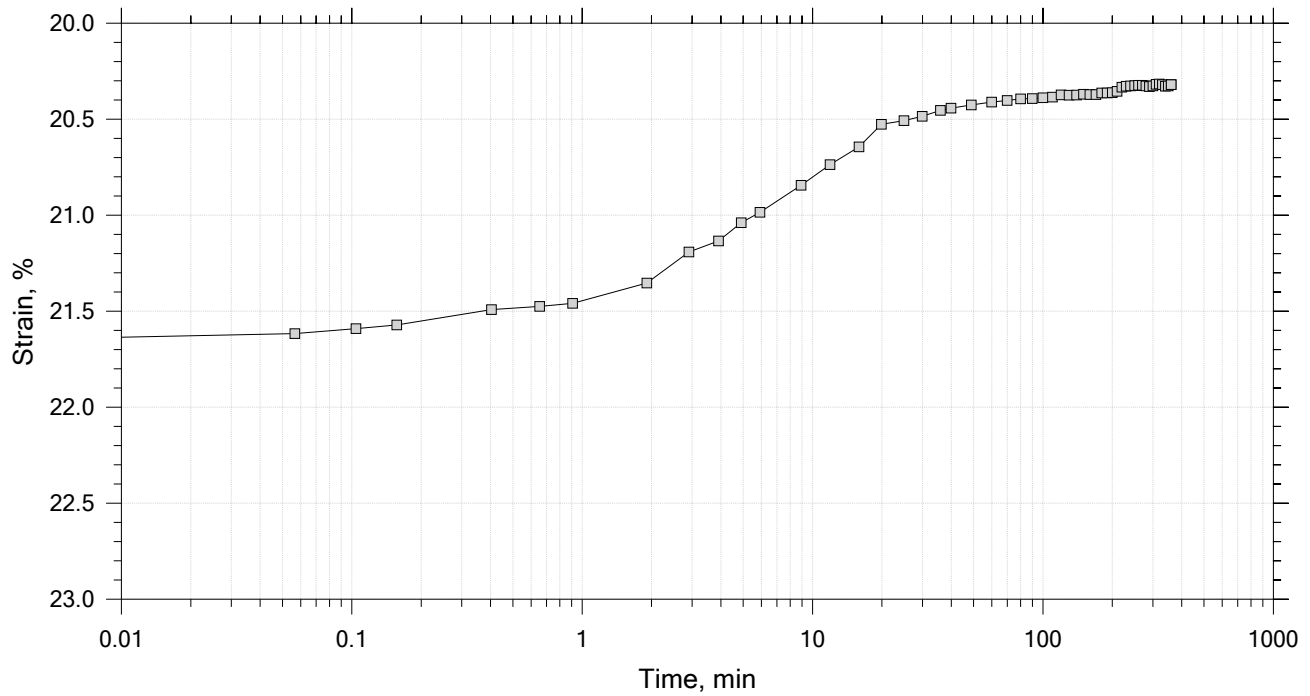
	Project: I-395/Rte 9 Connector	Location: Brewer-Eddington, ME	Project No.: GTX-313197
	Boring No.: HB-BE-223A	Tested By: md	Checked By: anm
	Sample No.: U1 (20.4")	Test Date: 03/18/21	Depth: 8-10
	Test No.: IP-2	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay with silt		
	Remarks: System LTIII-D, Swell Pressure = 0.0673 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 13 of 15

Constant Load Step

Stress: 0.5 tsf



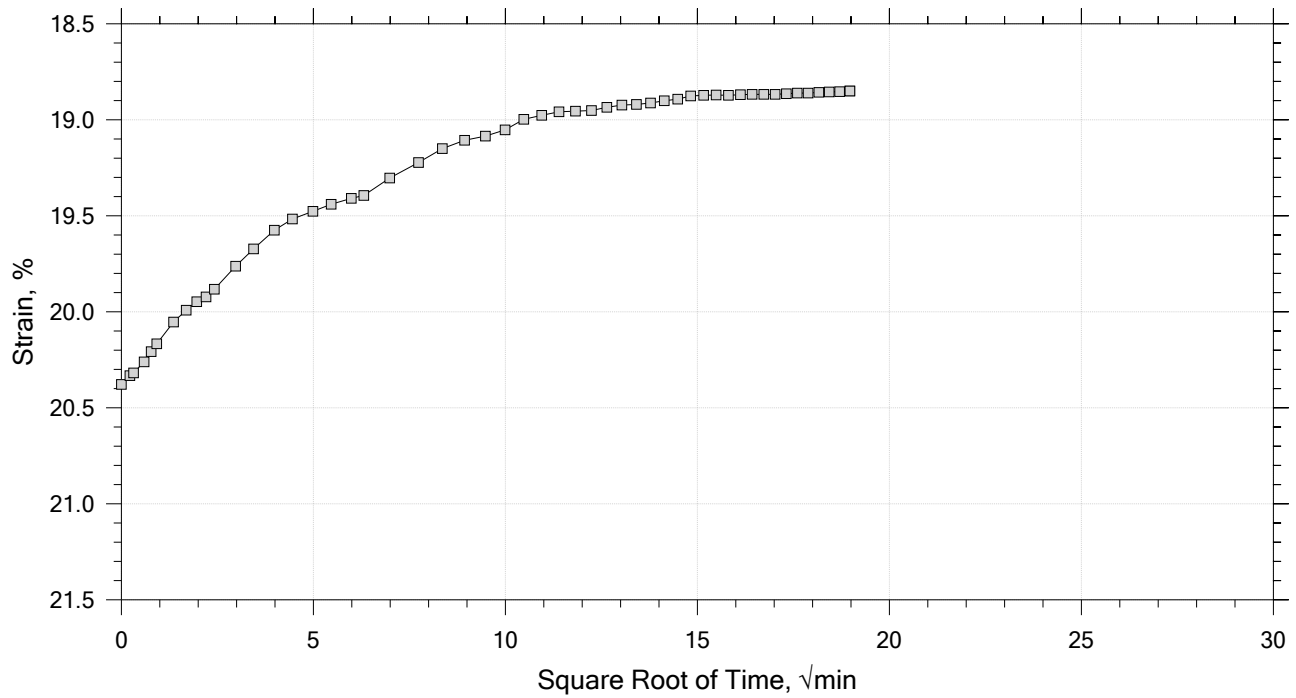
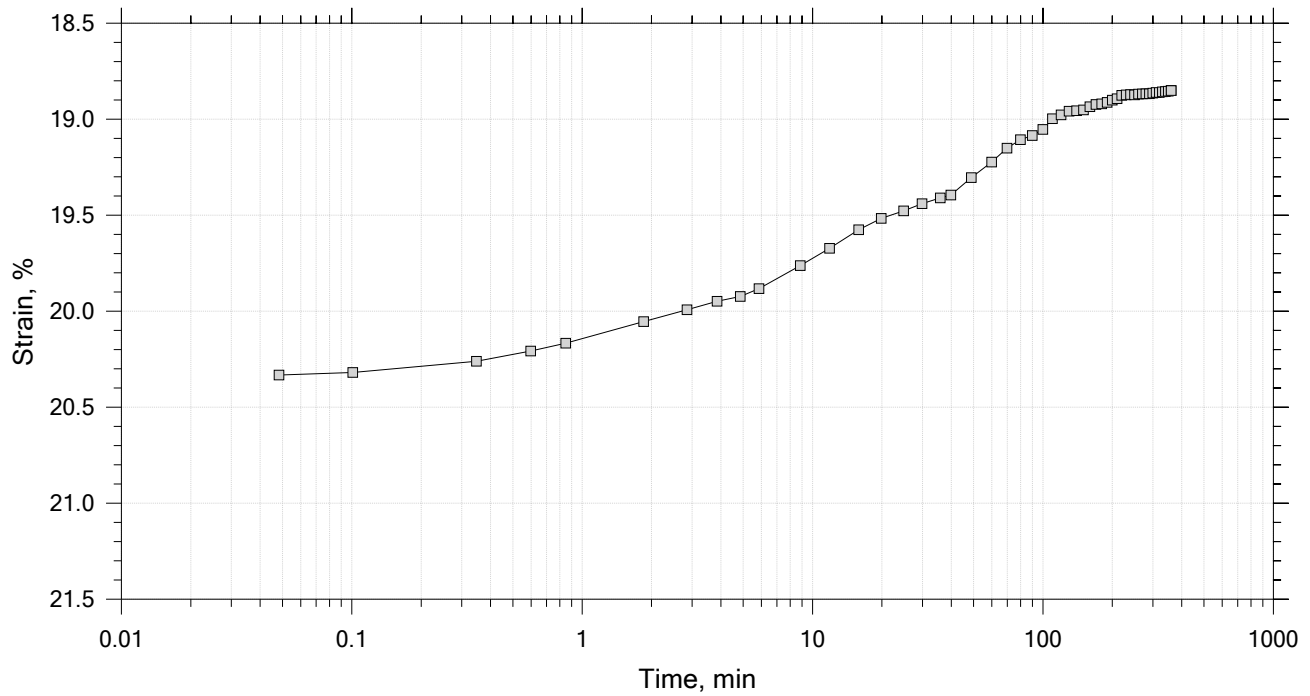
	Project: I-395/Rte 9 Connector	Location: Brewer-Eddington, ME	Project No.: GTX-313197
	Boring No.: HB-BE-223A	Tested By: md	Checked By: anm
	Sample No.: U1 (20.4")	Test Date: 03/18/21	Depth: 8-10
	Test No.: IP-2	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay with silt		
	Remarks: System LTIII-D, Swell Pressure = 0.0673 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 14 of 15

Constant Load Step

Stress: 0.125 tsf



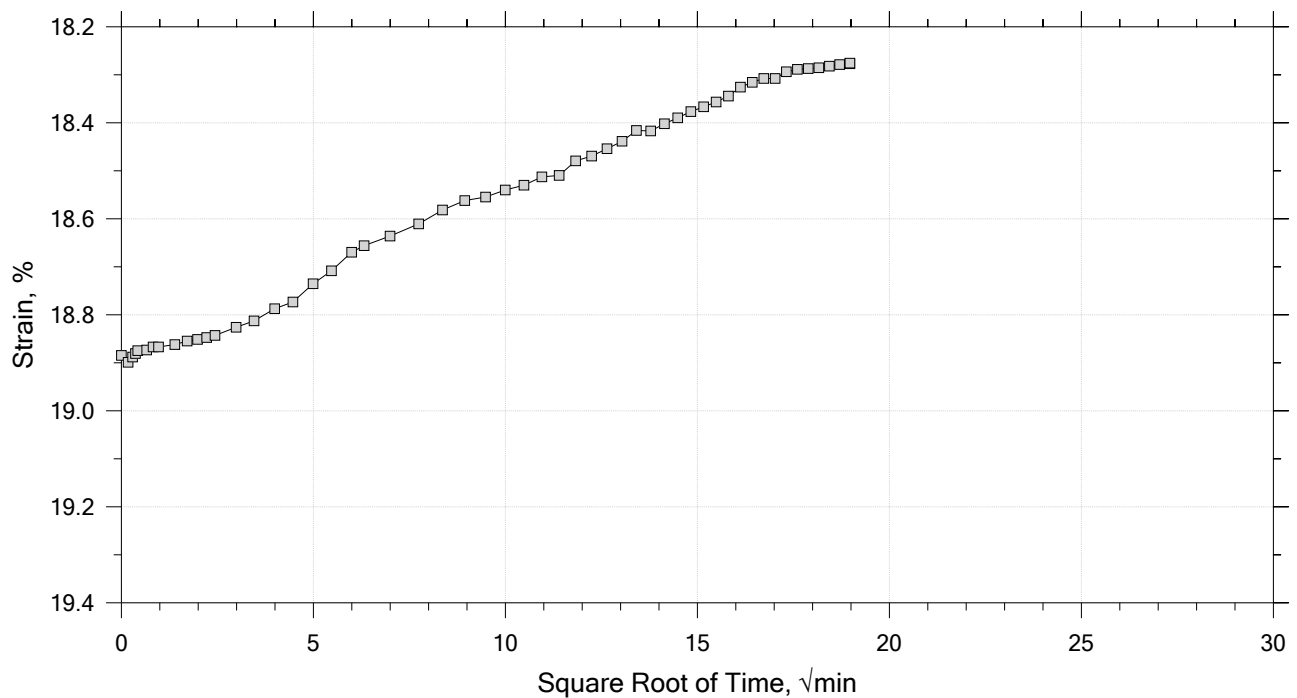
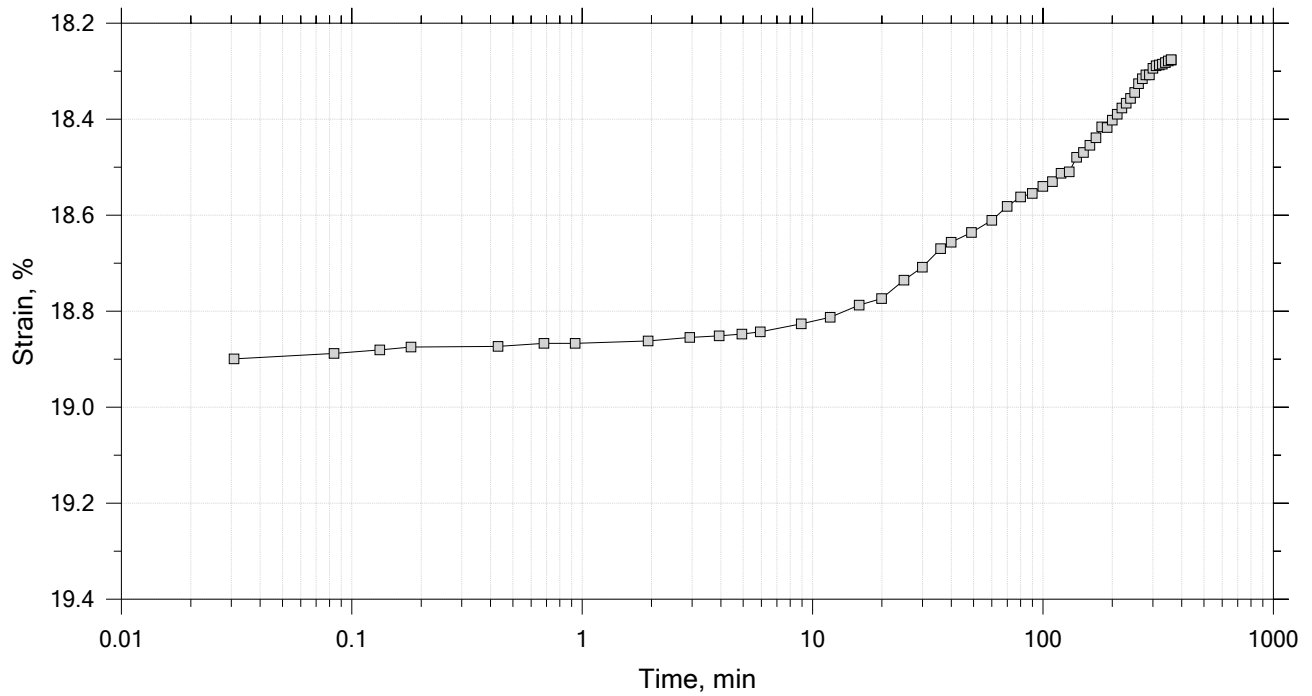
	Project: I-395/Rte 9 Connector	Location: Brewer-Eddington, ME	Project No.: GTX-313197
	Boring No.: HB-BE-223A	Tested By: md	Checked By: anm
	Sample No.: U1 (20.4")	Test Date: 03/18/21	Depth: 8-10
	Test No.: IP-2	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay with silt		
	Remarks: System LTIII-D, Swell Pressure = 0.0673 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 15 of 15

Constant Load Step

Stress: 0.0625 tsf




	Project: I-395/Rte 9 Connector	Location: Brewer-Eddington, ME	Project No.: GTX-313197
	Boring No.: HB-BE-223A	Tested By: md	Checked By: anm
	Sample No.: U1 (20.4")	Test Date: 03/18/21	Depth: 8-10
	Test No.: IP-2	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay with silt		
	Remarks: System LTIII-D, Swell Pressure = 0.0673 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Specimen Diameter: 2.50 in	Estimated Specific Gravity: 2.75	Liquid Limit: 33
Initial Height: 1.00 in	Initial Void Ratio: 0.936	Plastic Limit: 17
Final Height: 0.83 in	Final Void Ratio: 0.607	Plasticity Index: 16

	Before Test Trimmings	Before Test Specimen	After Test Specimen	After Test Trimmings
Container ID	E-2010	RING		E1827
Mass Container, gm	8.29	111.31	111.31	8.14
Mass Container + Wet Soil, gm	146.75	264.01	251	146.56
Mass Container + Dry Soil, gm	109.78	225.79	225.79	121.58
Mass Dry Soil, gm	101.49	114.48	114.48	113.44
Water Content, %	36.43	33.38	22.02	22.02
Void Ratio	---	0.94	0.61	---
Degree of Saturation, %	---	98.29	100.00	---
Dry Unit Weight, pcf	---	88.847	107.04	---


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

	Project: I-395/Rte 9 Connector	Location: Brewer-Eddington, ME	Project No.: GTX-313197
	Boring No.: HB-BE-223A	Tested By: md	Checked By: anm
	Sample No.: U1 (20.4")	Test Date: 03/18/21	Depth: 8-10
	Test No.: IP-2	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay with silt		
	Remarks: System LTIII-D, Swell Pressure = 0.0673 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

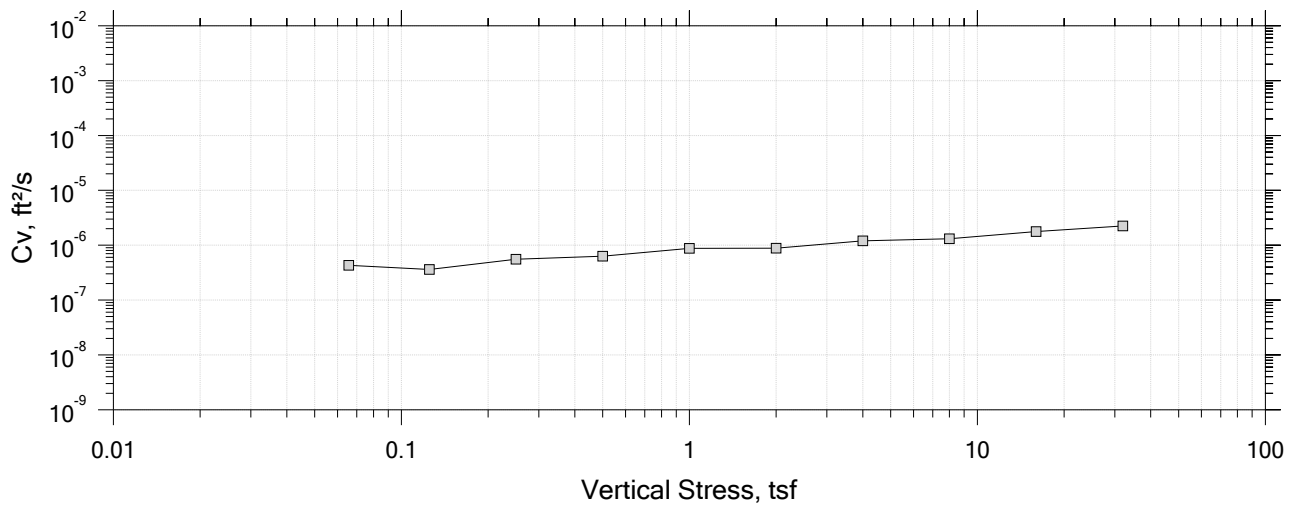
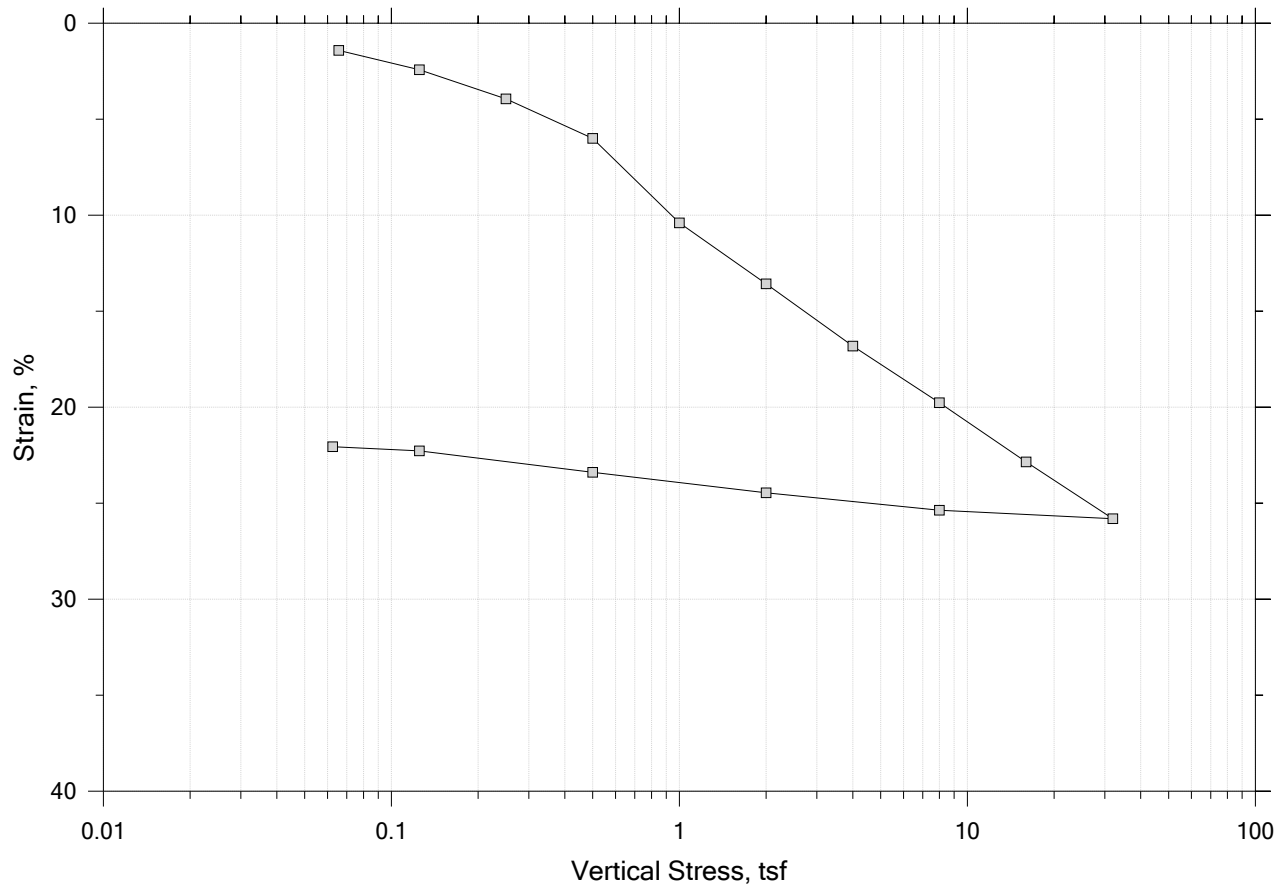
Square Root of Time Coefficients


[illegible]

	Project: I-395/Rte 9 Connector	Location: Brewer-Eddington, ME	Project No.: GTX-313197
	Boring No.: HB-BE-223A	Tested By: md	Checked By: anm
	Sample No.: U1 (20.4")	Test Date: 03/18/21	Depth: 8-10
	Test No.: IP-2	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay with silt		
	Remarks: System LTIII-D, Swell Pressure = 0.0673 tsf		
	Displacement at End of Increment		

One-Dimensional Consolidation by ASTM D2435 - Method B

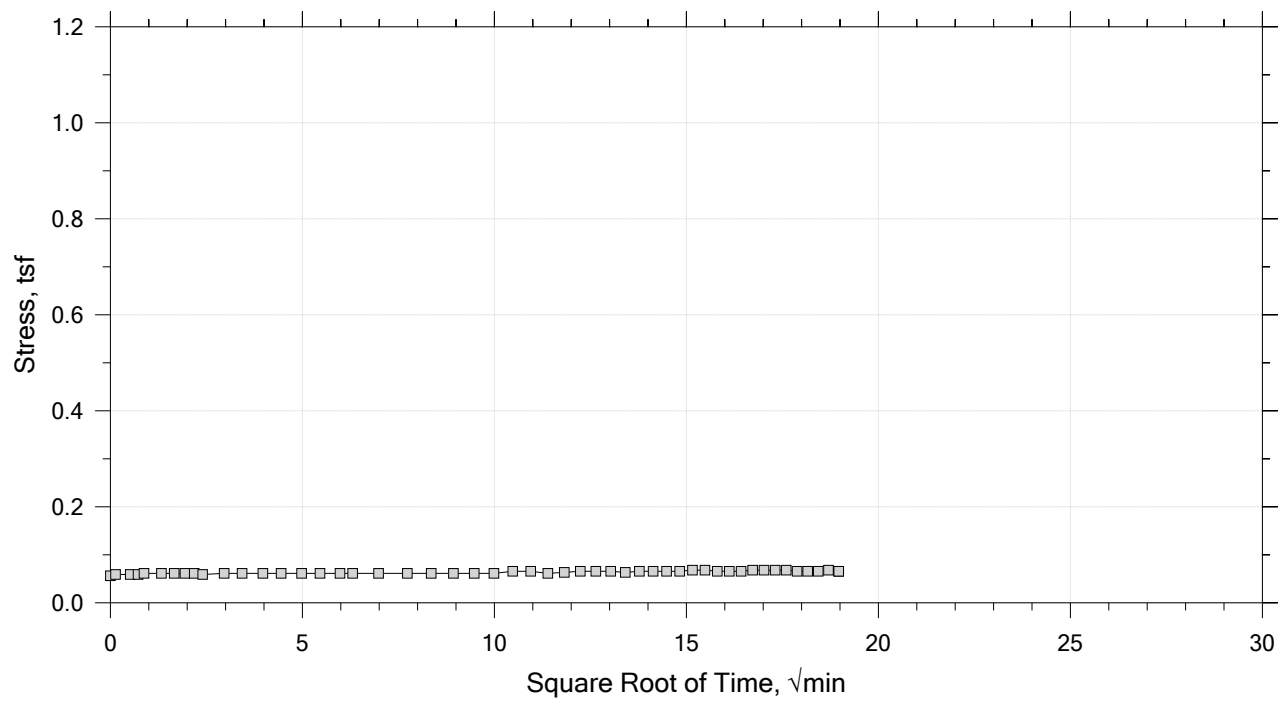
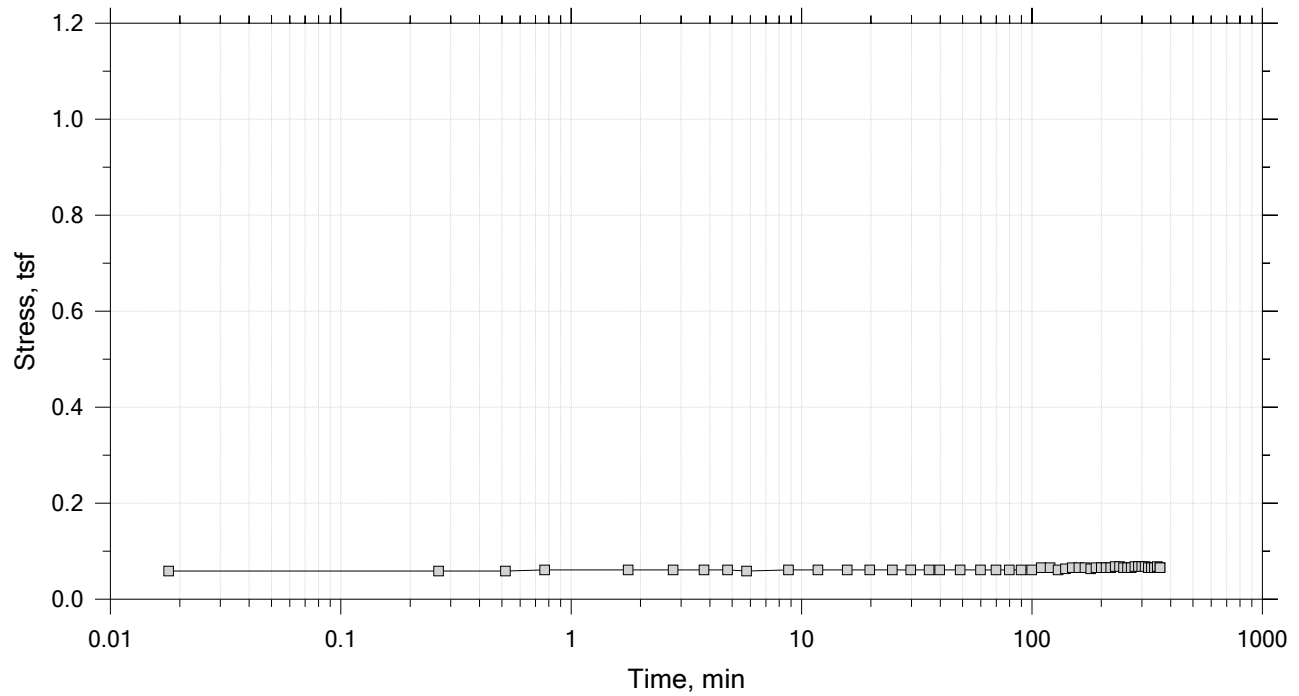
Summary Report




	Project: I-395/Rte 9 Connector	Location: Brewer-Eddington, ME	Project No.: GTX-313198
	Boring No.: HB-BE-225	Tested By: md	Checked By: anm
	Sample No.: U1	Test Date: 03/16/21	Depth: 8-10 ft
	Test No.: IP-2	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System X, Swell Pressure = 0.0656 tsf		
	Displacement at End of Increment		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 1 of 15
Constant Volume Step
Stress: 0.0656 tsf



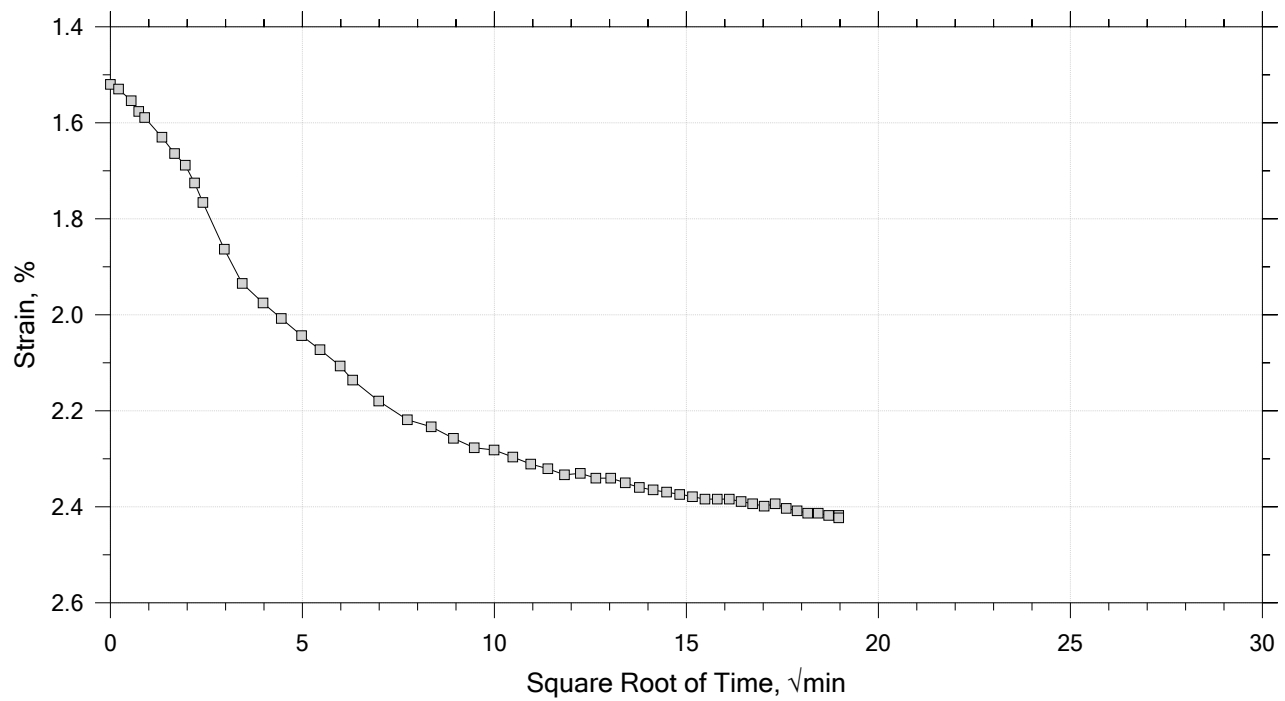
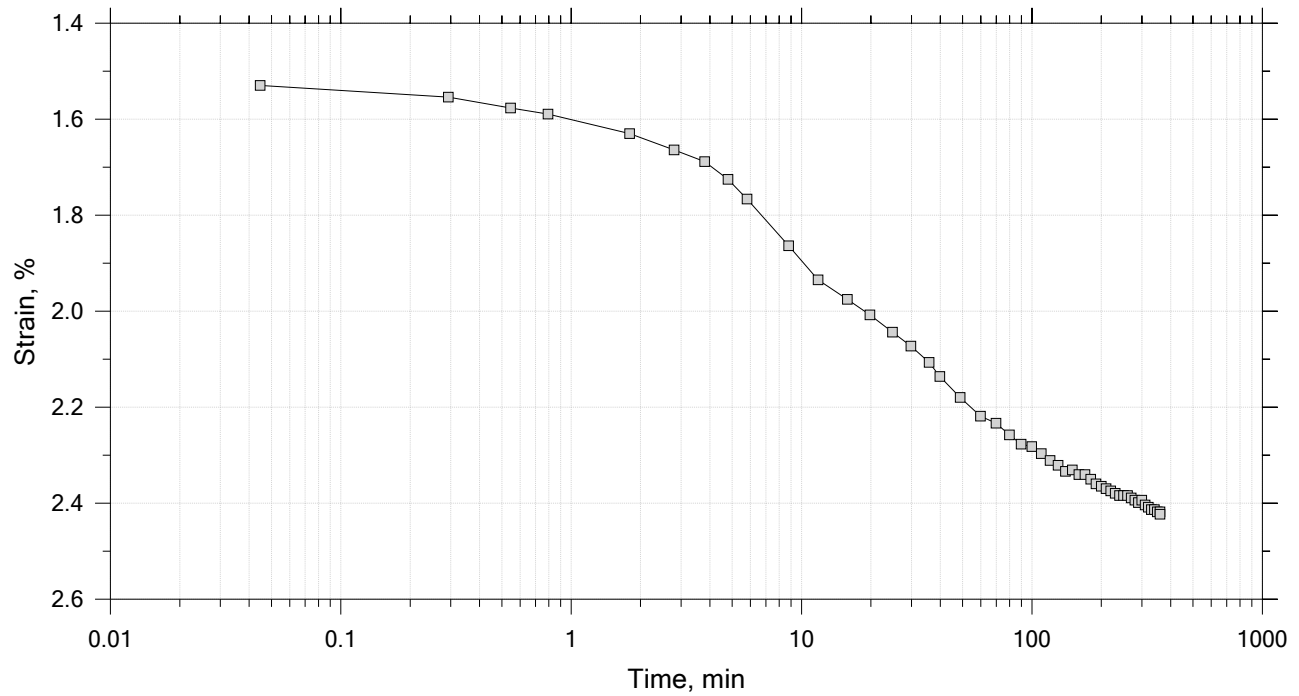
	Project: I-395/Rte 9 Connector	Location: Brewer-Eddington, ME	Project No.: GTX-313198
	Boring No.: HB-BE-225	Tested By: md	Checked By: anm
	Sample No.: U1	Test Date: 03/16/21	Depth: 8-10 ft
	Test No.: IP-2	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System X, Swell Pressure = 0.0656 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 2 of 15

Constant Load Step

Stress: 0.125 tsf



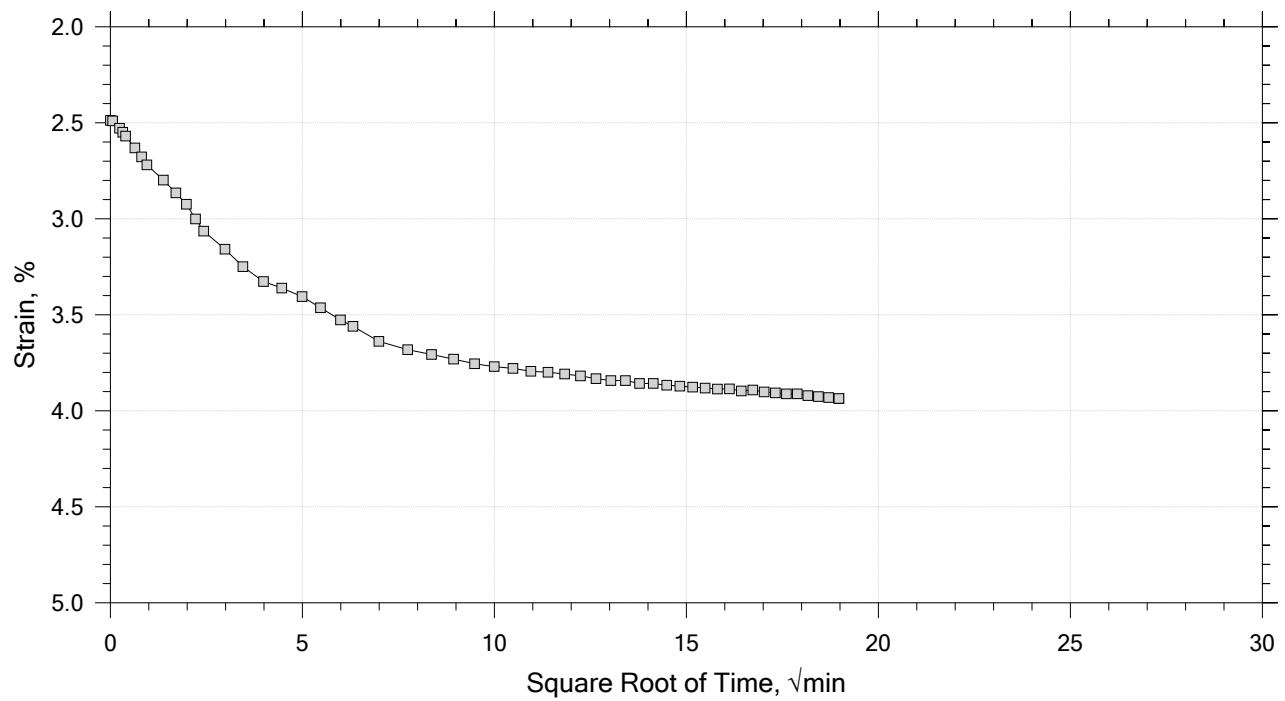
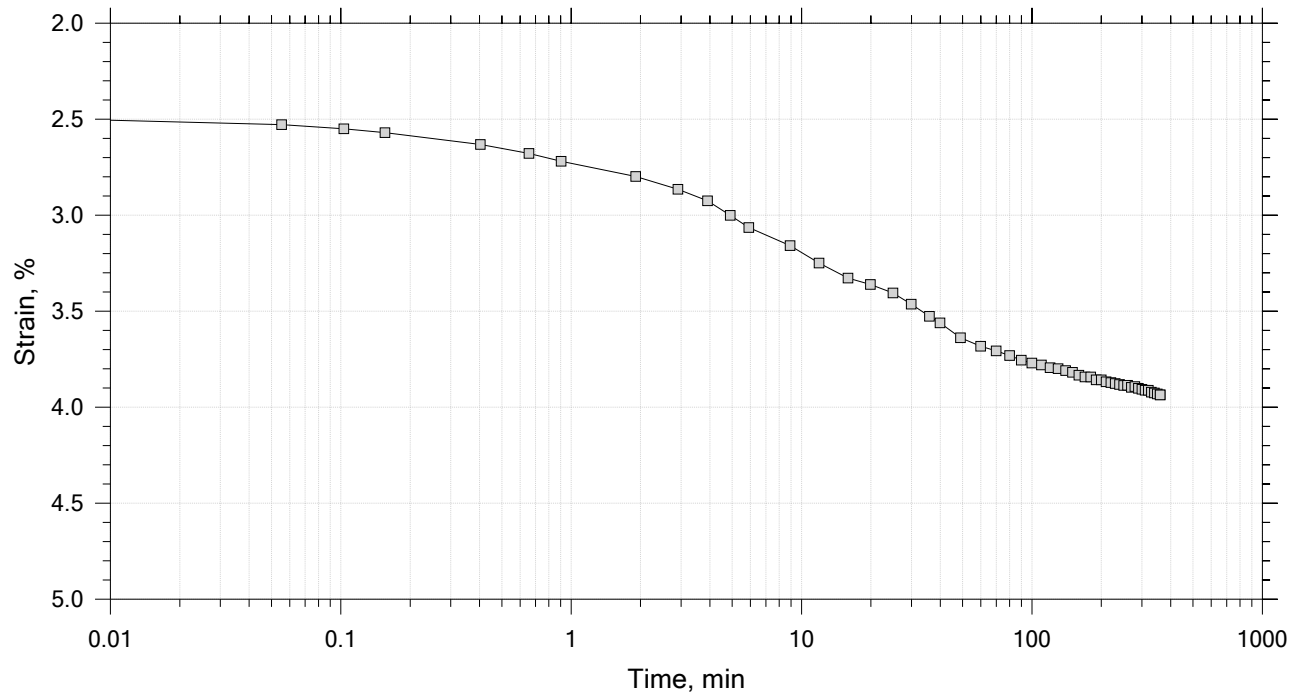
	Project: I-395/Rte 9 Connector	Location: Brewer-Eddington, ME	Project No.: GTX-313198
	Boring No.: HB-BE-225	Tested By: md	Checked By: anm
	Sample No.: U1	Test Date: 03/16/21	Depth: 8-10 ft
	Test No.: IP-2	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System X, Swell Pressure = 0.0656 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 3 of 15

Constant Load Step

Stress: 0.25 tsf



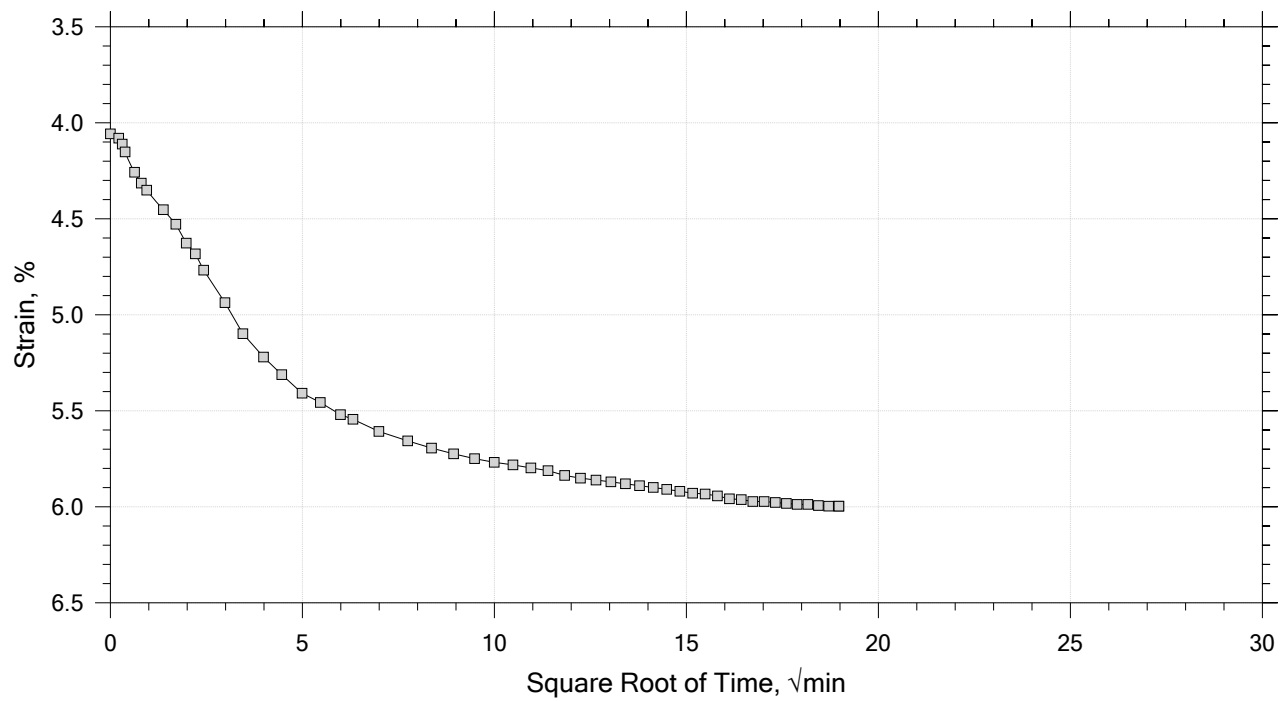
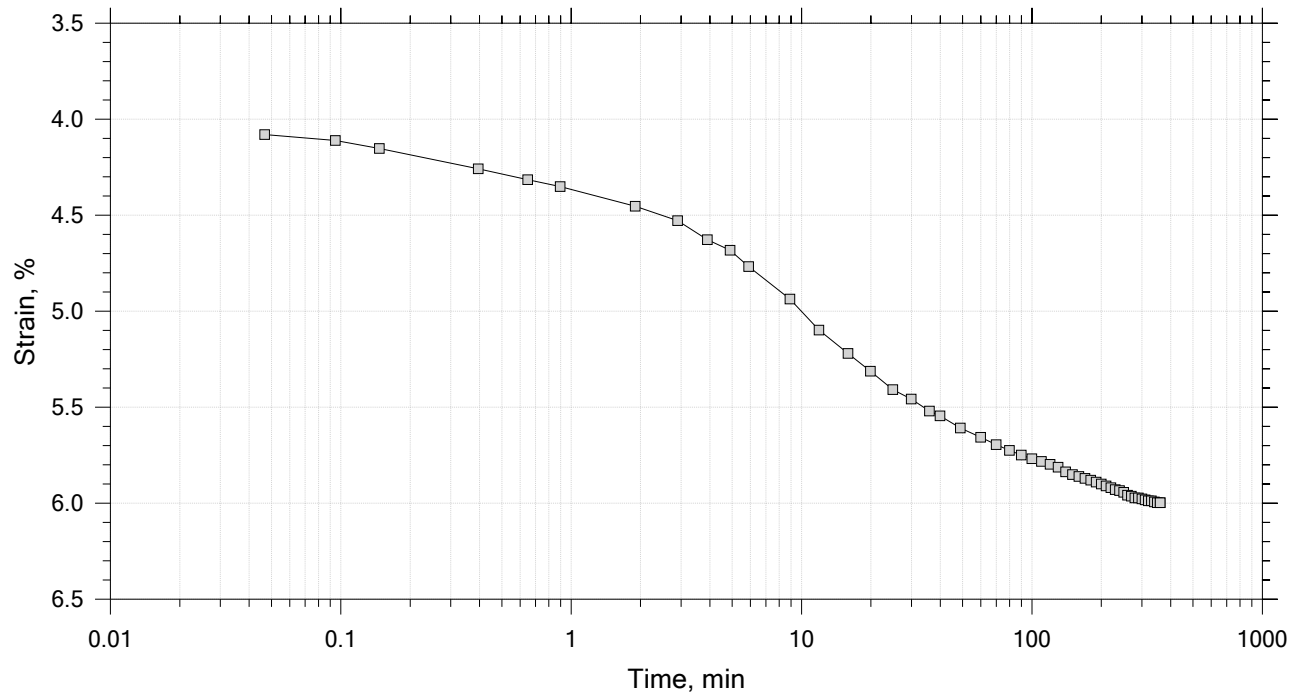
	Project: I-395/Rte 9 Connector	Location: Brewer-Eddington, ME	Project No.: GTX-313198
	Boring No.: HB-BE-225	Tested By: md	Checked By: anm
	Sample No.: U1	Test Date: 03/16/21	Depth: 8-10 ft
	Test No.: IP-2	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System X, Swell Pressure = 0.0656 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 4 of 15

Constant Load Step

Stress: 0.5 tsf



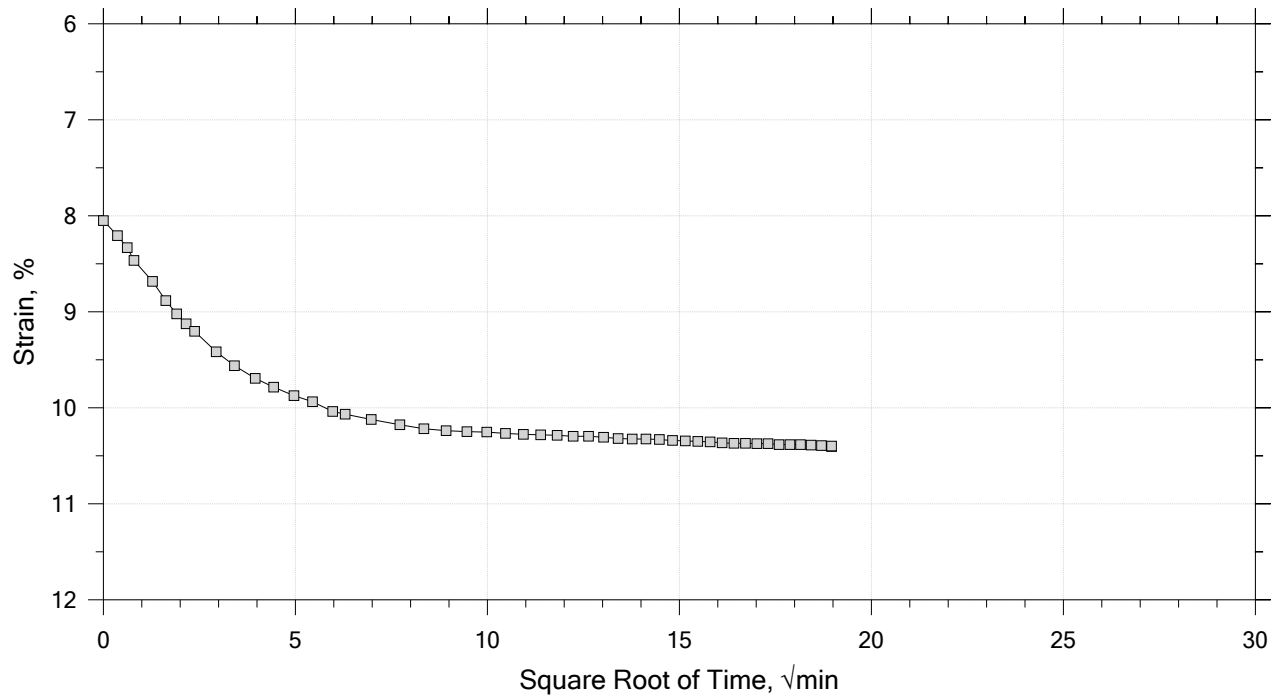
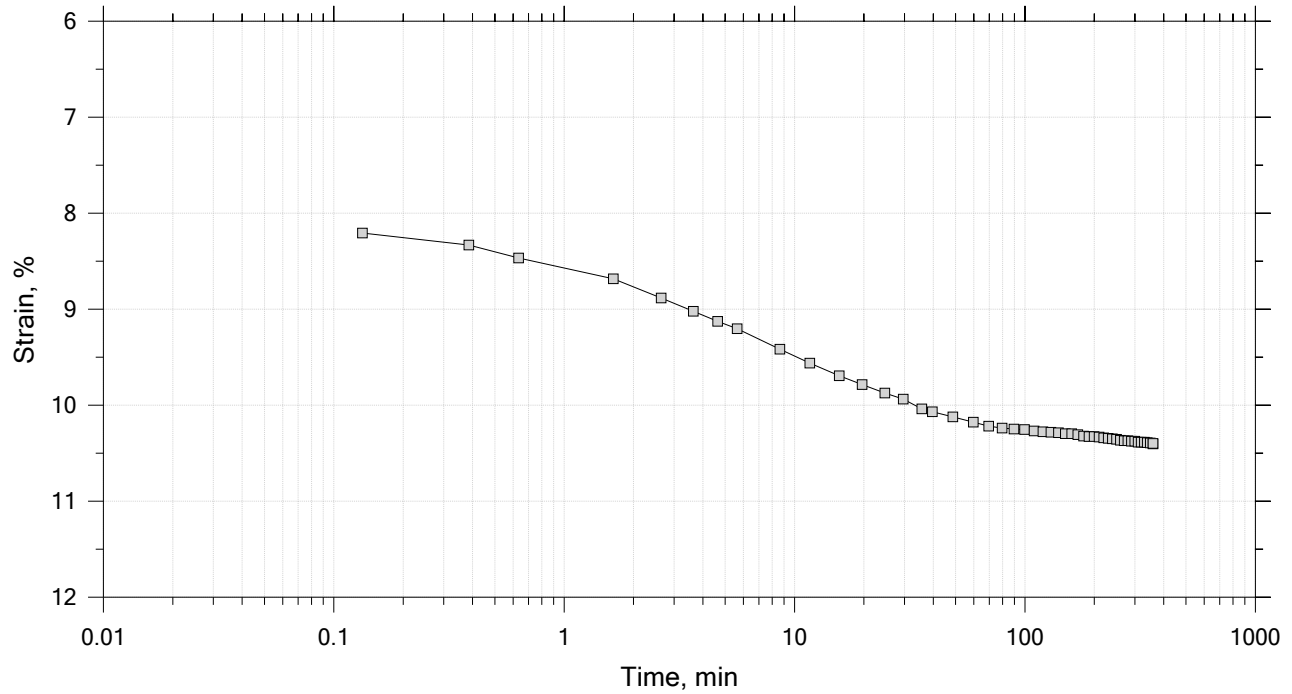
	Project: I-395/Rte 9 Connector	Location: Brewer-Eddington, ME	Project No.: GTX-313198
	Boring No.: HB-BE-225	Tested By: md	Checked By: anm
	Sample No.: U1	Test Date: 03/16/21	Depth: 8-10 ft
	Test No.: IP-2	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System X, Swell Pressure = 0.0656 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 5 of 15

Constant Load Step

Stress: 1 tsf



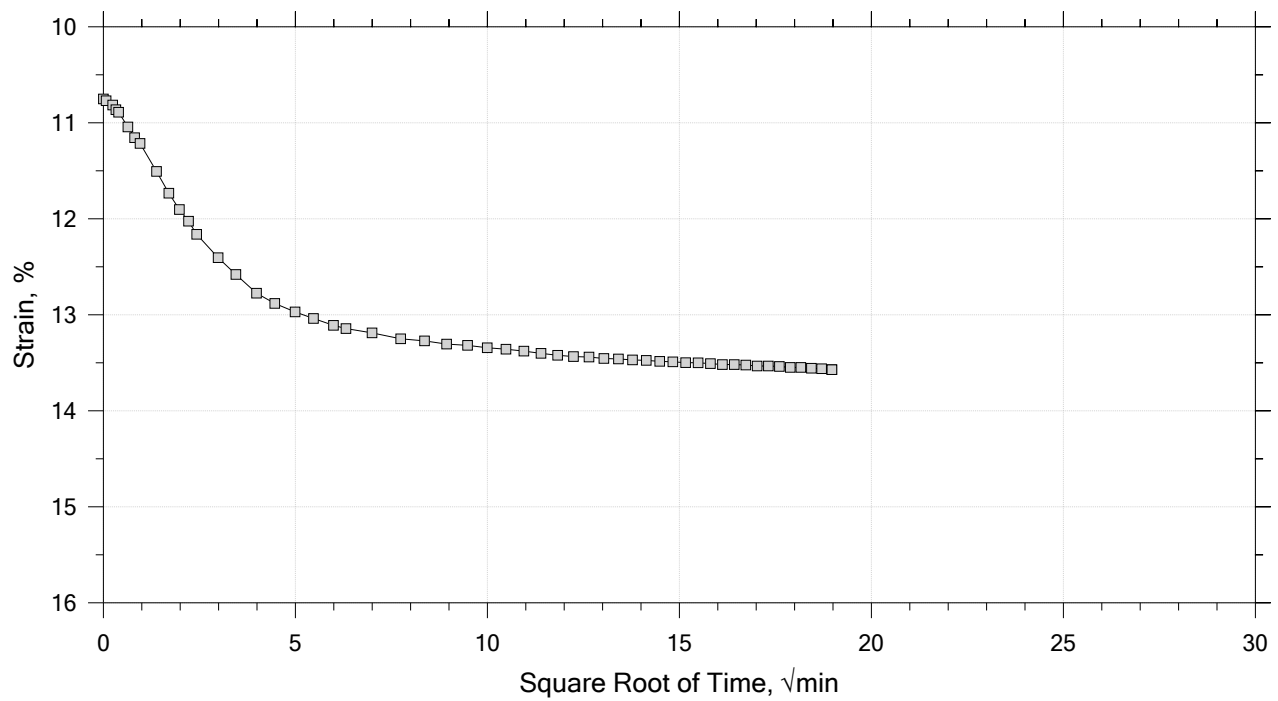
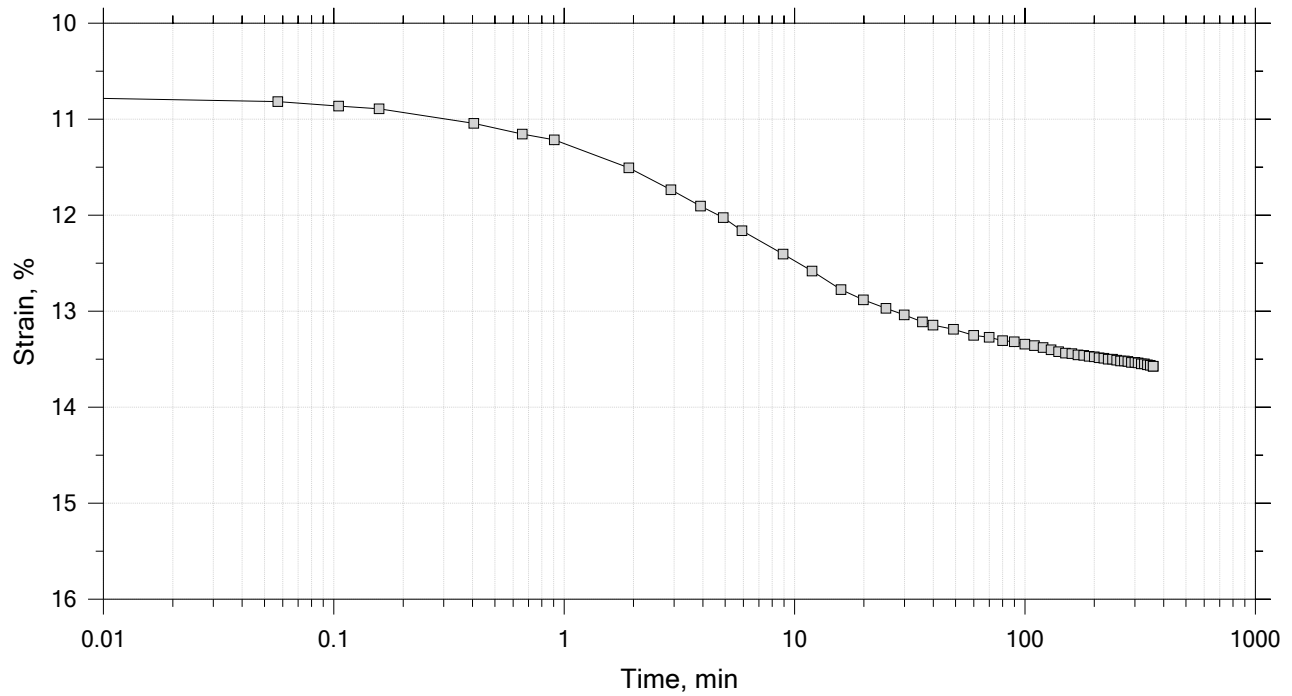
	Project: I-395/Rte 9 Connector	Location: Brewer-Eddington, ME	Project No.: GTX-313198
	Boring No.: HB-BE-225	Tested By: md	Checked By: anm
	Sample No.: U1	Test Date: 03/16/21	Depth: 8-10 ft
	Test No.: IP-2	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System X, Swell Pressure = 0.0656 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 6 of 15

Constant Load Step

Stress: 2 tsf



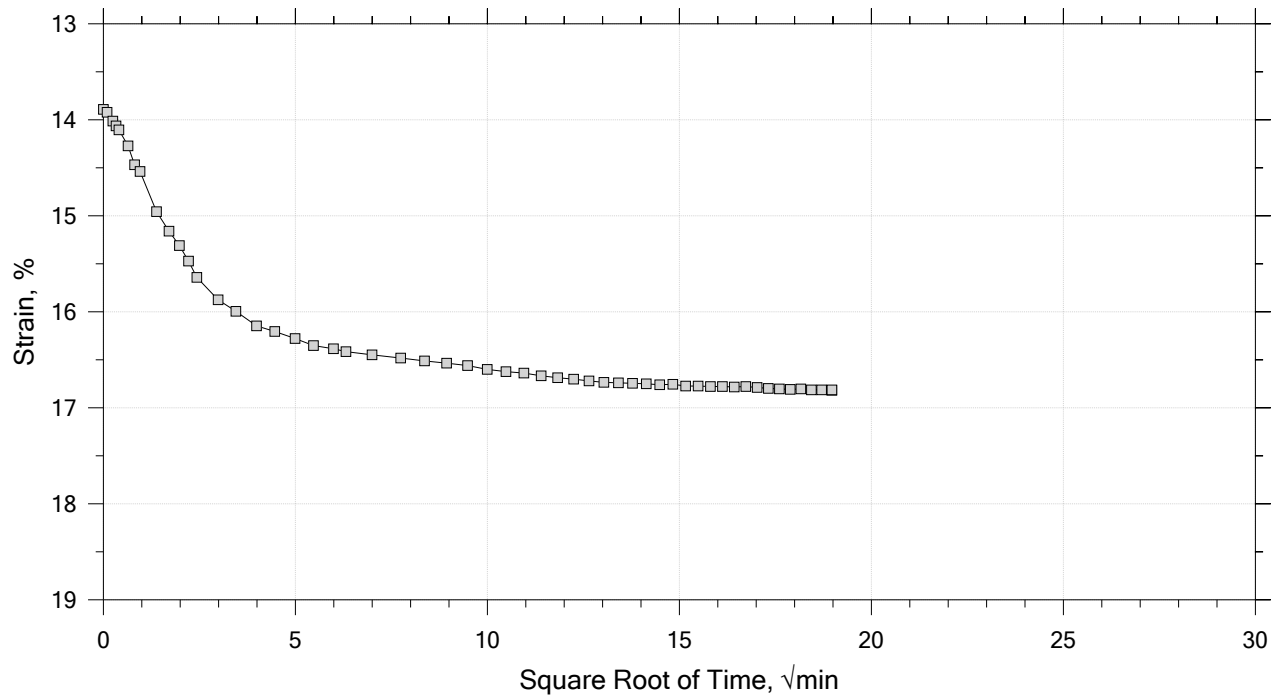
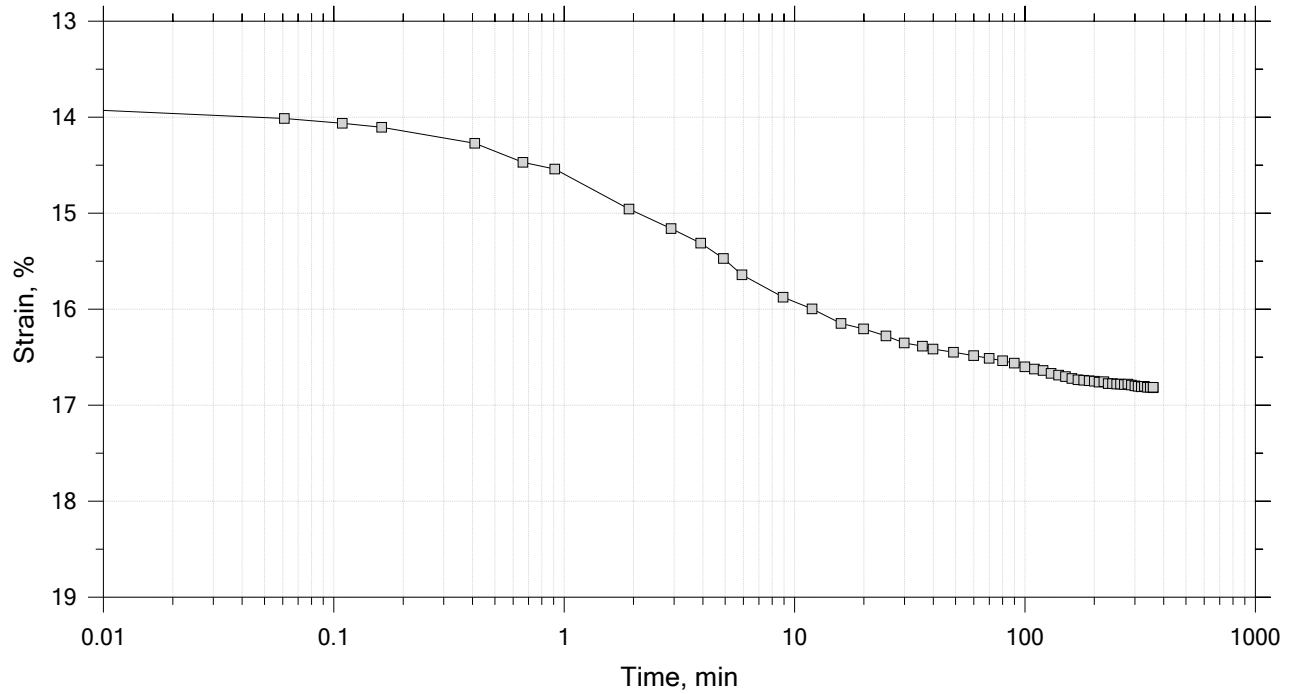
	Project: I-395/Rte 9 Connector	Location: Brewer-Eddington, ME	Project No.: GTX-313198
	Boring No.: HB-BE-225	Tested By: md	Checked By: anm
	Sample No.: U1	Test Date: 03/16/21	Depth: 8-10 ft
	Test No.: IP-2	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System X, Swell Pressure = 0.0656 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 7 of 15

Constant Load Step

Stress: 4 tsf



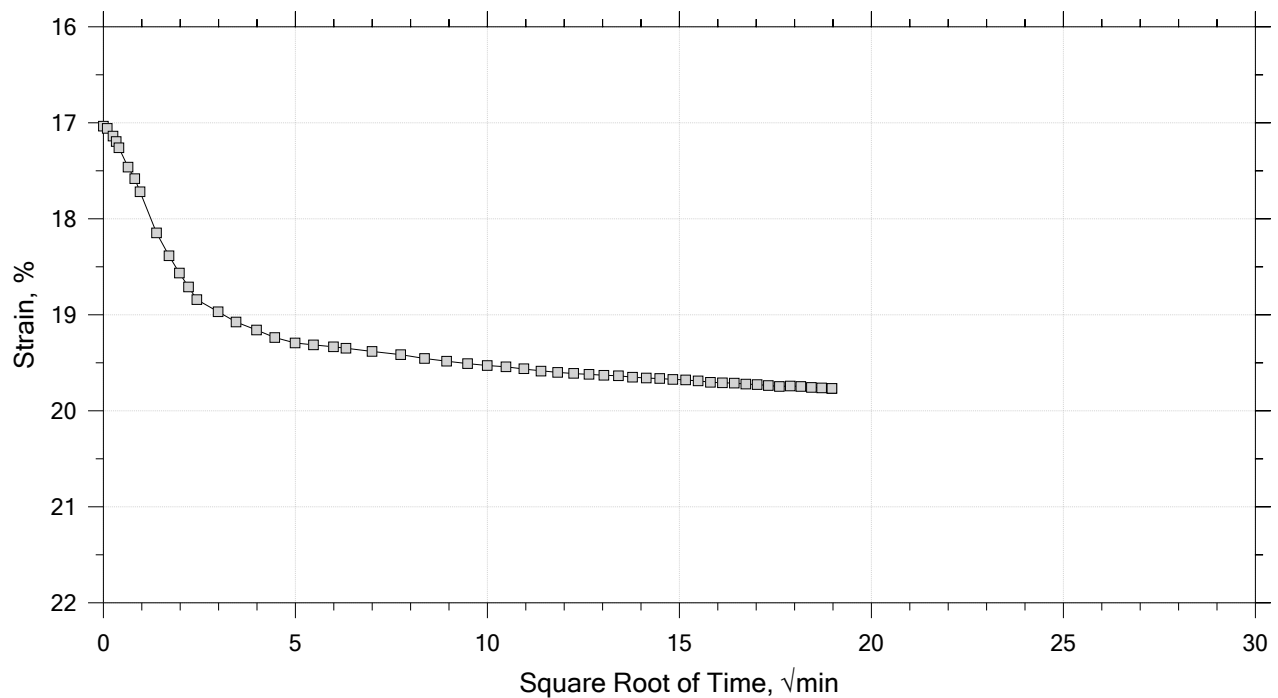
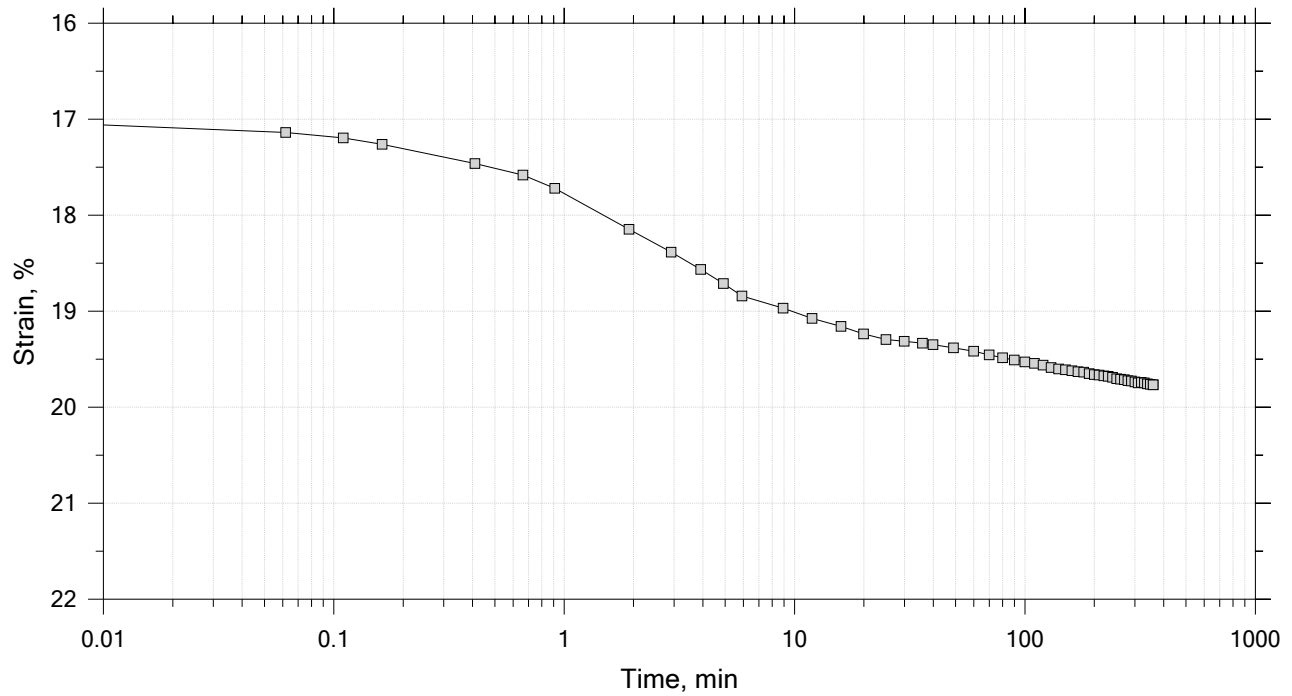
	Project: I-395/Rte 9 Connector	Location: Brewer-Eddington, ME	Project No.: GTX-313198
	Boring No.: HB-BE-225	Tested By: md	Checked By: anm
	Sample No.: U1	Test Date: 03/16/21	Depth: 8-10 ft
	Test No.: IP-2	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System X, Swell Pressure = 0.0656 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 8 of 15

Constant Load Step

Stress: 8 tsf



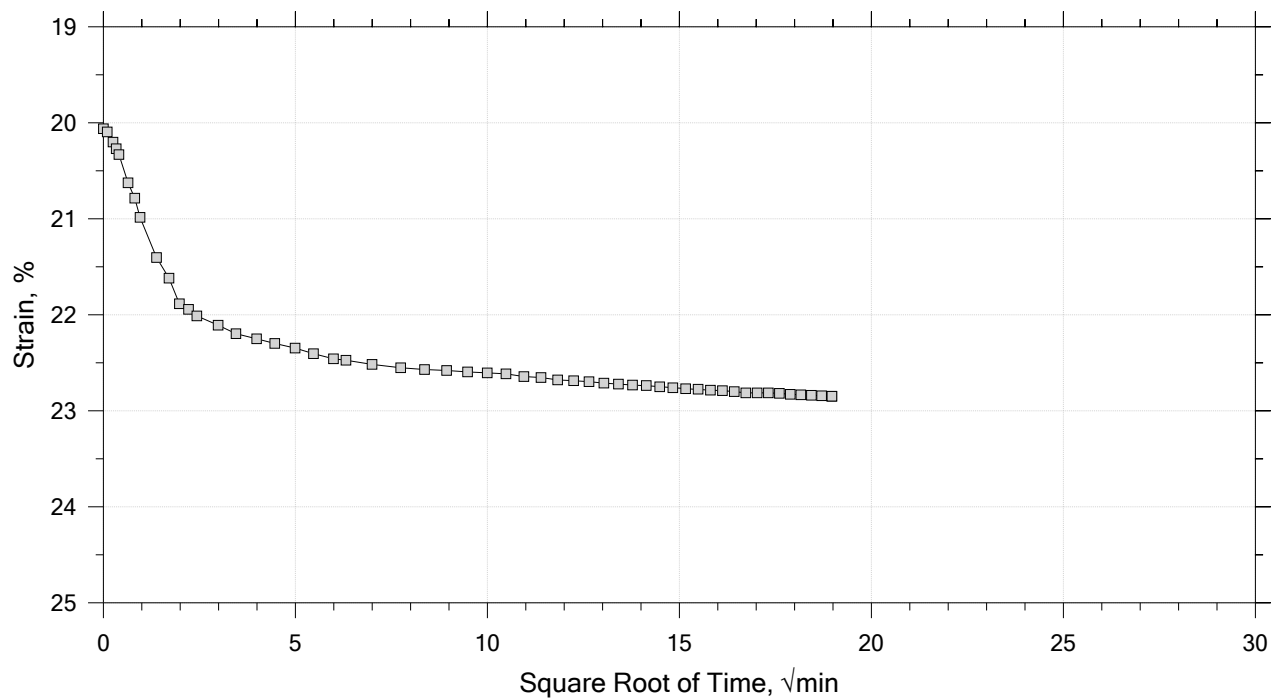
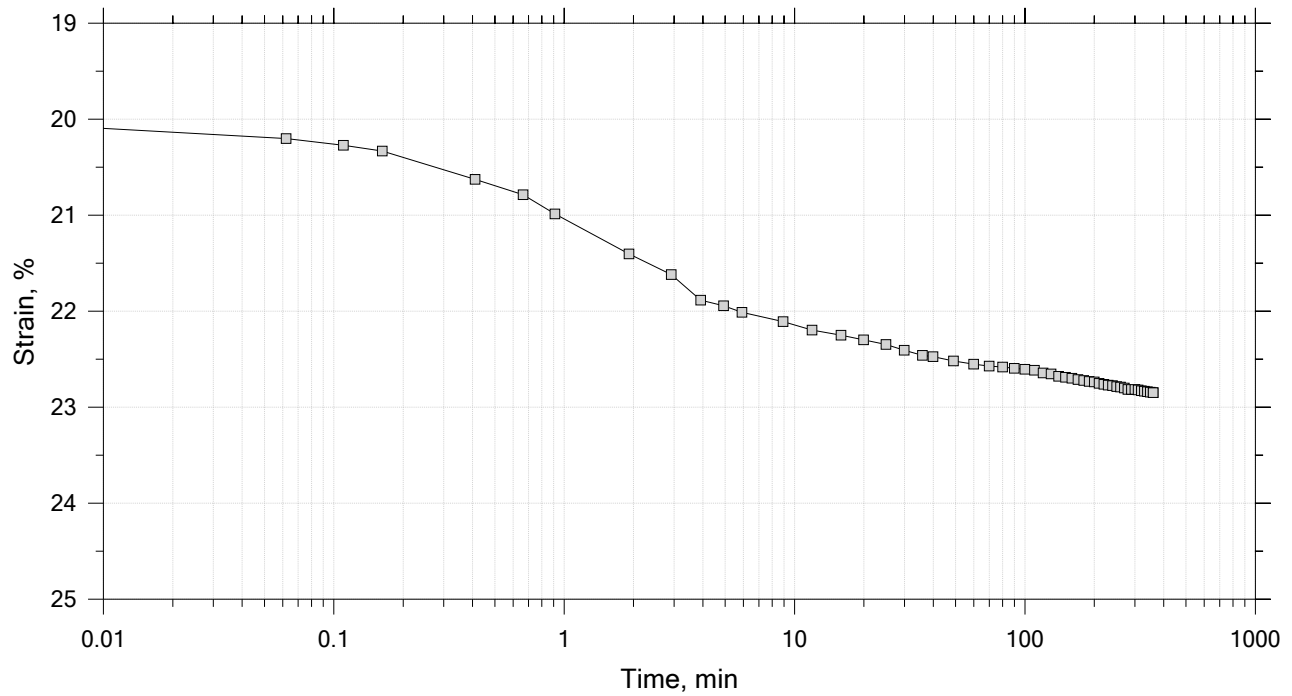
	Project: I-395/Rte 9 Connector	Location: Brewer-Eddington, ME	Project No.: GTX-313198
	Boring No.: HB-BE-225	Tested By: md	Checked By: anm
	Sample No.: U1	Test Date: 03/16/21	Depth: 8-10 ft
	Test No.: IP-2	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System X, Swell Pressure = 0.0656 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 9 of 15

Constant Load Step

Stress: 16 tsf



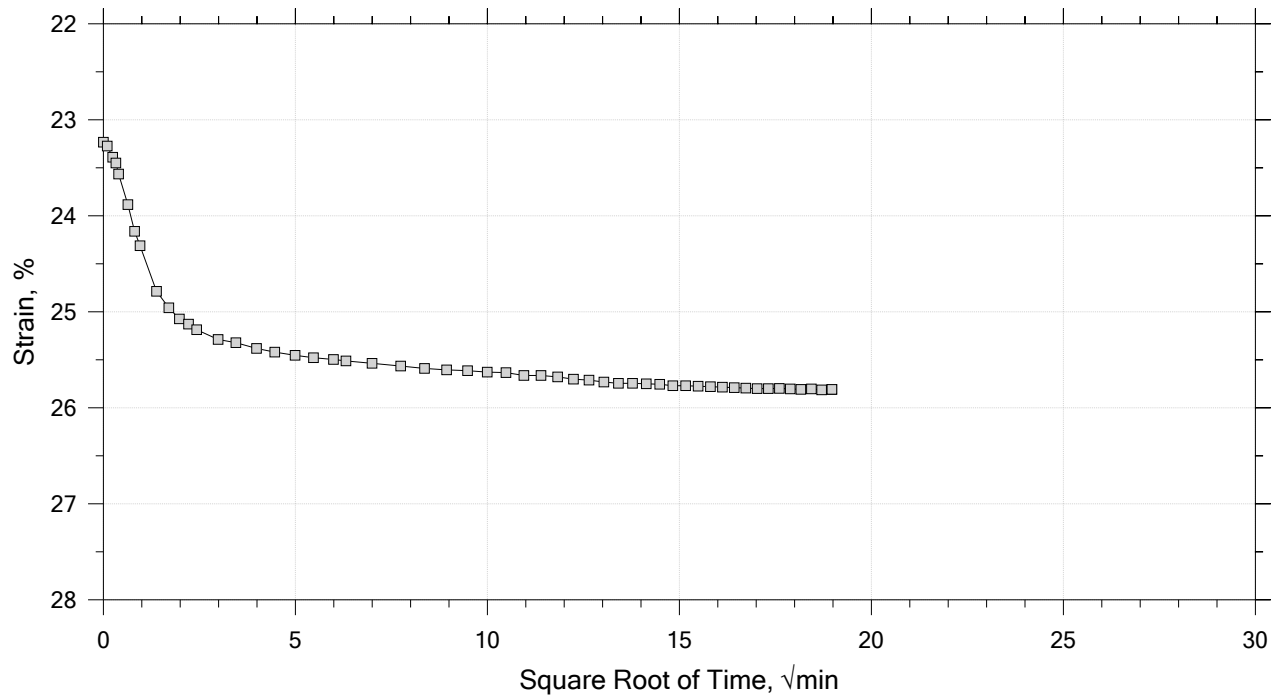
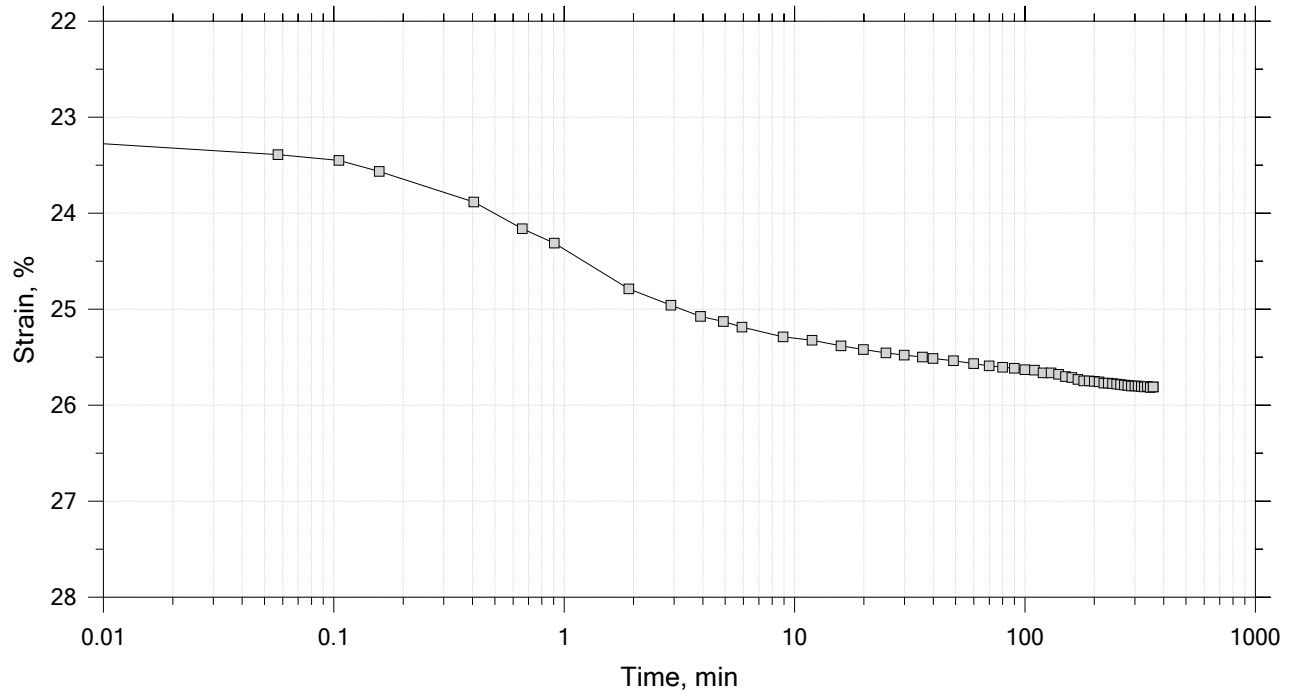
	Project: I-395/Rte 9 Connector	Location: Brewer-Eddington, ME	Project No.: GTX-313198
	Boring No.: HB-BE-225	Tested By: md	Checked By: anm
	Sample No.: U1	Test Date: 03/16/21	Depth: 8-10 ft
	Test No.: IP-2	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System X, Swell Pressure = 0.0656 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 10 of 15

Constant Load Step

Stress: 32 tsf



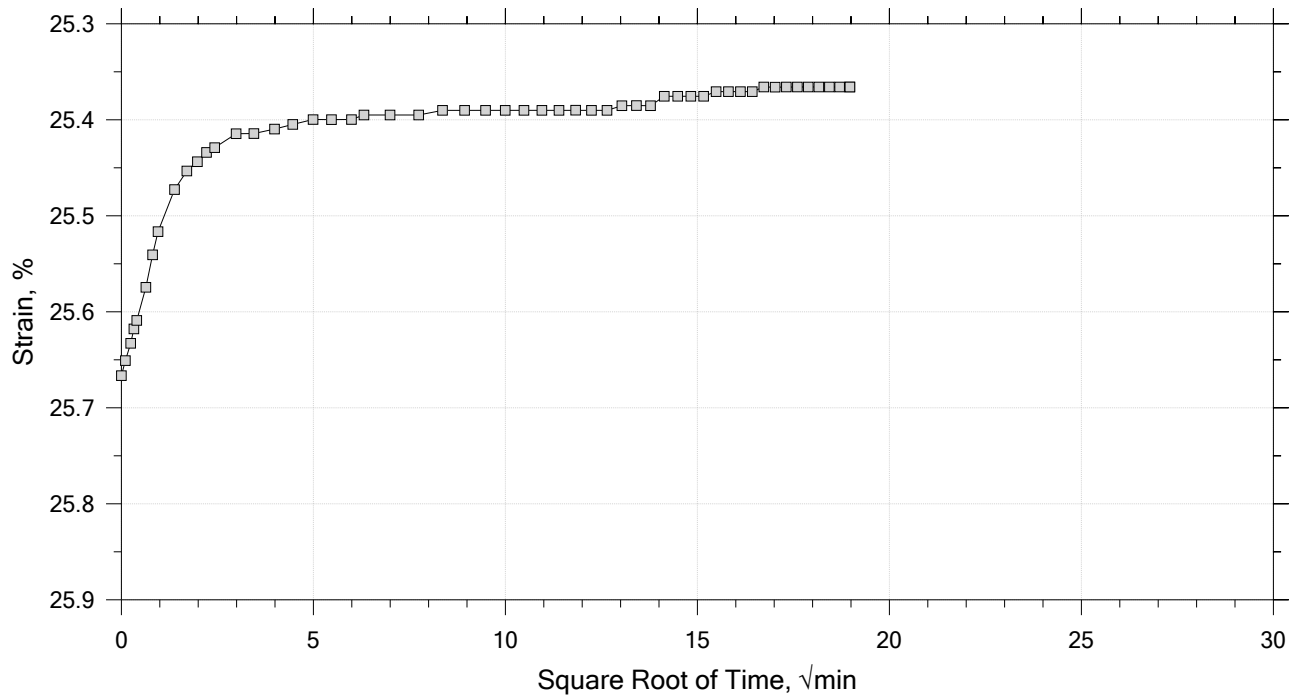
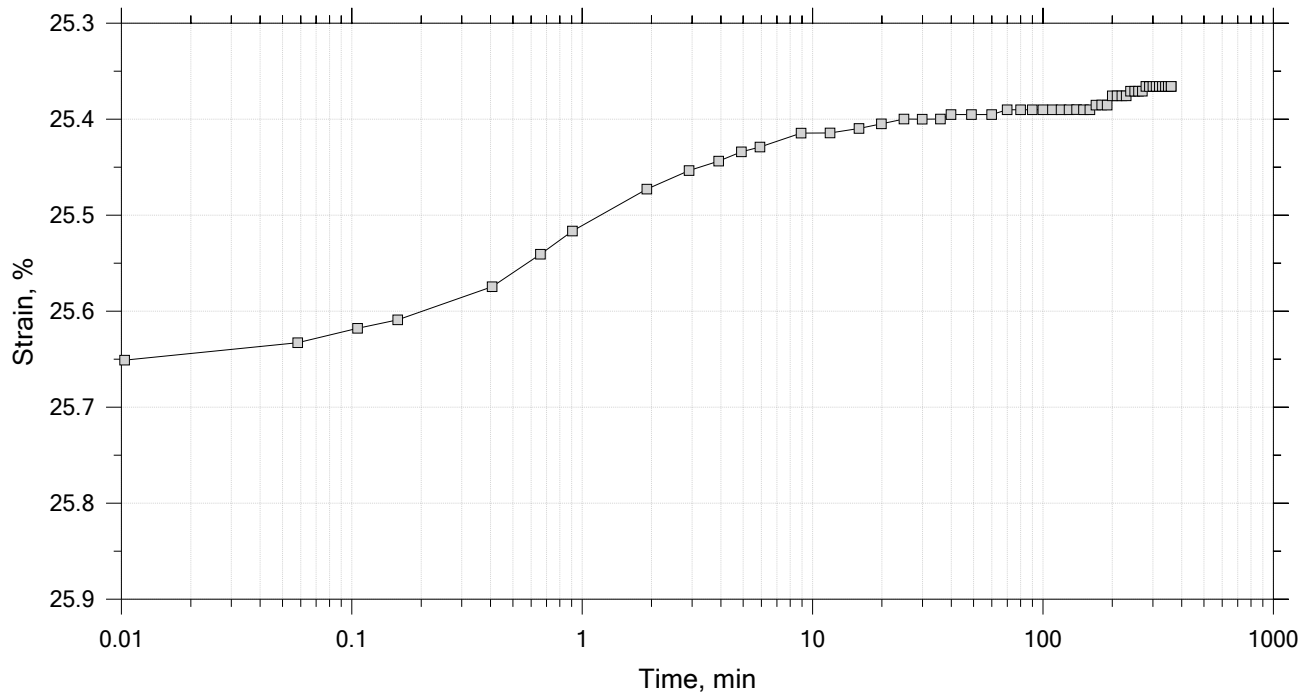
	Project: I-395/Rte 9 Connector	Location: Brewer-Eddington, ME	Project No.: GTX-313198
	Boring No.: HB-BE-225	Tested By: md	Checked By: anm
	Sample No.: U1	Test Date: 03/16/21	Depth: 8-10 ft
	Test No.: IP-2	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System X, Swell Pressure = 0.0656 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 11 of 15

Constant Load Step

Stress: 8 tsf



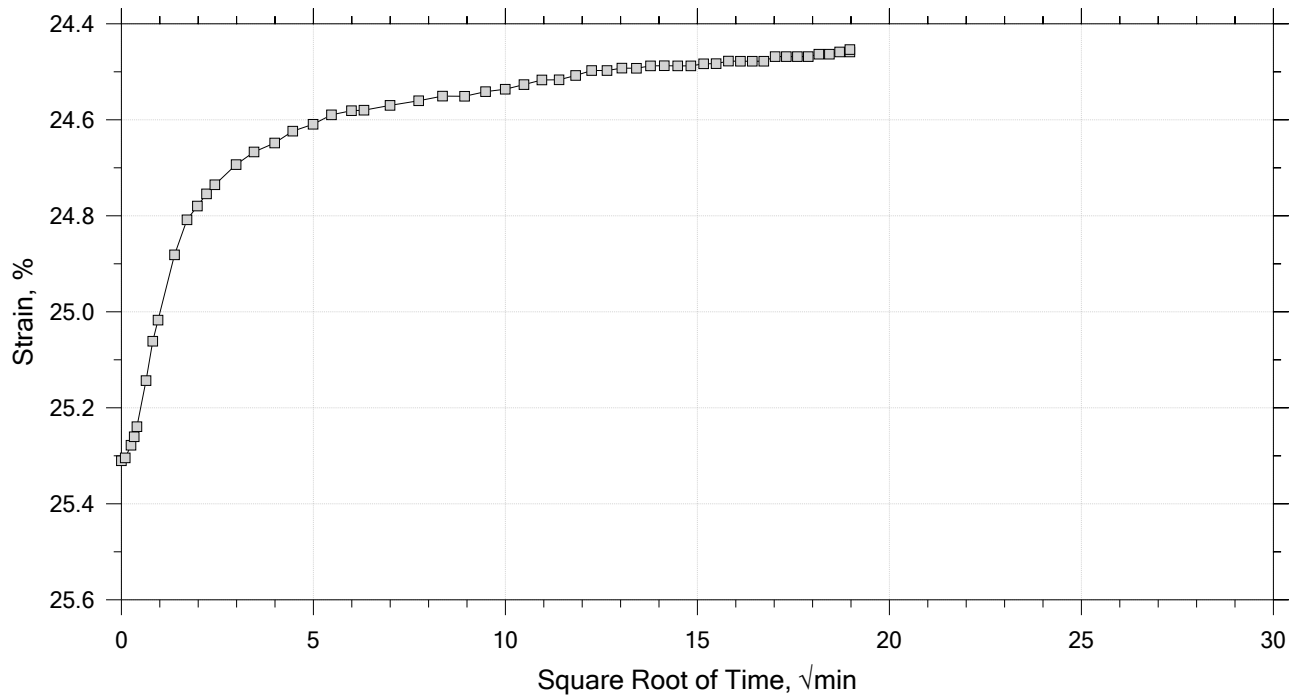
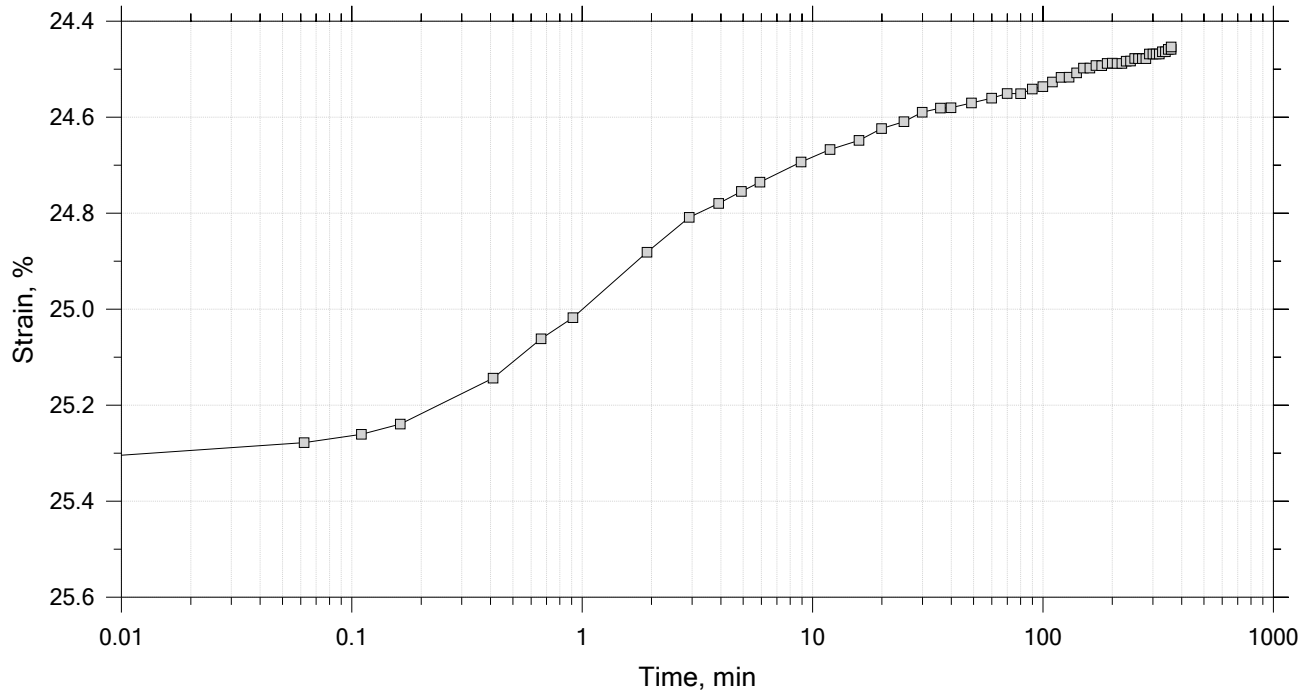
	Project: I-395/Rte 9 Connector	Location: Brewer-Eddington, ME	Project No.: GTX-313198
	Boring No.: HB-BE-225	Tested By: md	Checked By: anm
	Sample No.: U1	Test Date: 03/16/21	Depth: 8-10 ft
	Test No.: IP-2	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System X, Swell Pressure = 0.0656 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 12 of 15

Constant Load Step

Stress: 2 tsf



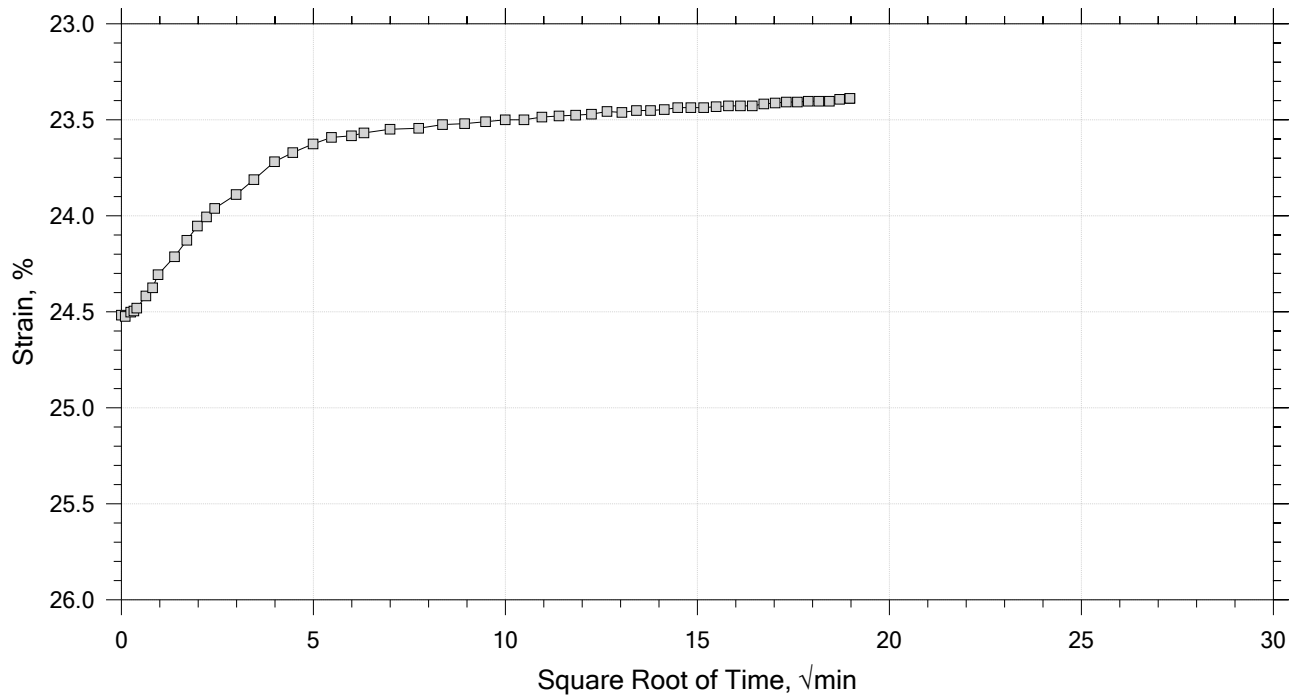
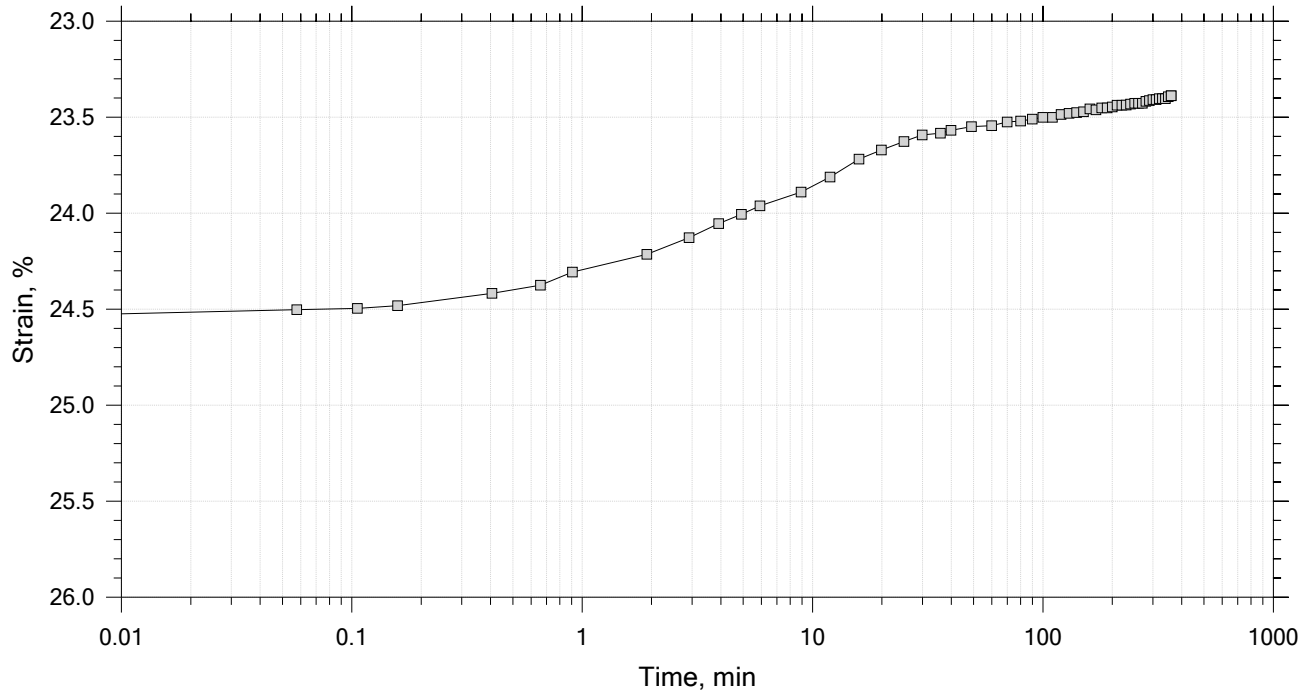
	Project: I-395/Rte 9 Connector	Location: Brewer-Eddington, ME	Project No.: GTX-313198
	Boring No.: HB-BE-225	Tested By: md	Checked By: anm
	Sample No.: U1	Test Date: 03/16/21	Depth: 8-10 ft
	Test No.: IP-2	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System X, Swell Pressure = 0.0656 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 13 of 15

Constant Load Step

Stress: 0.5 tsf



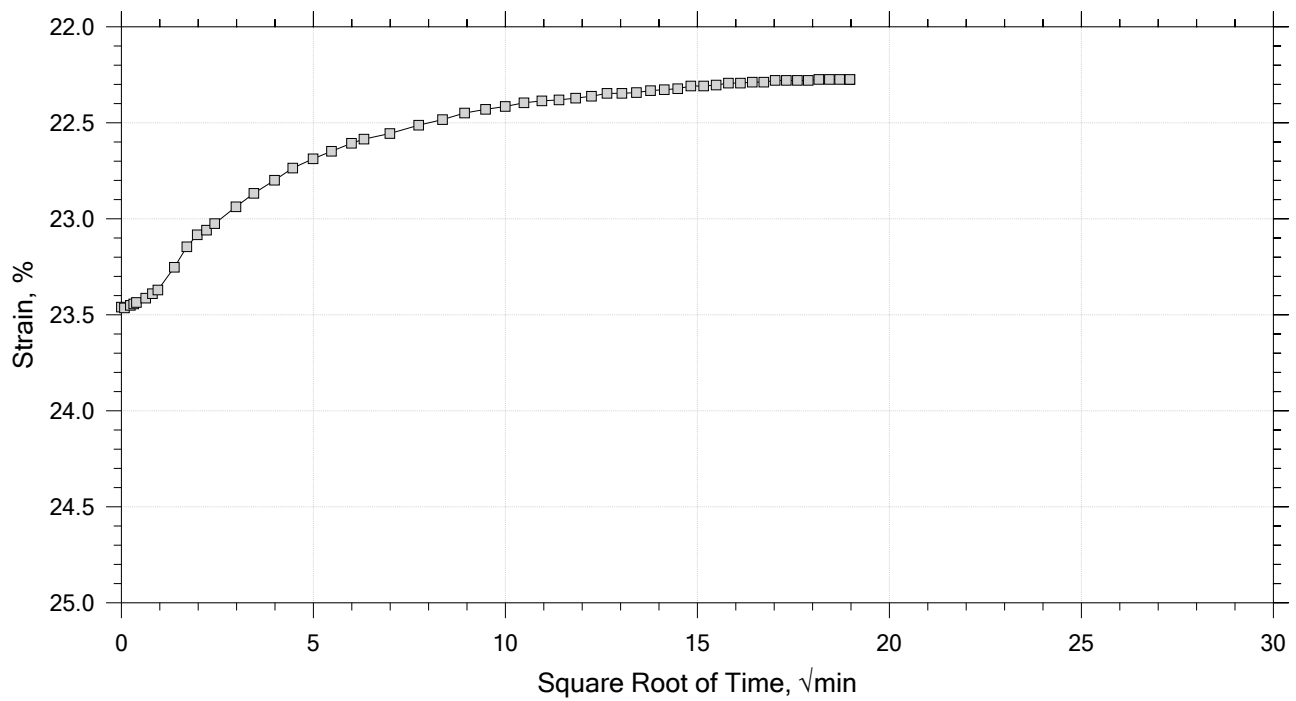
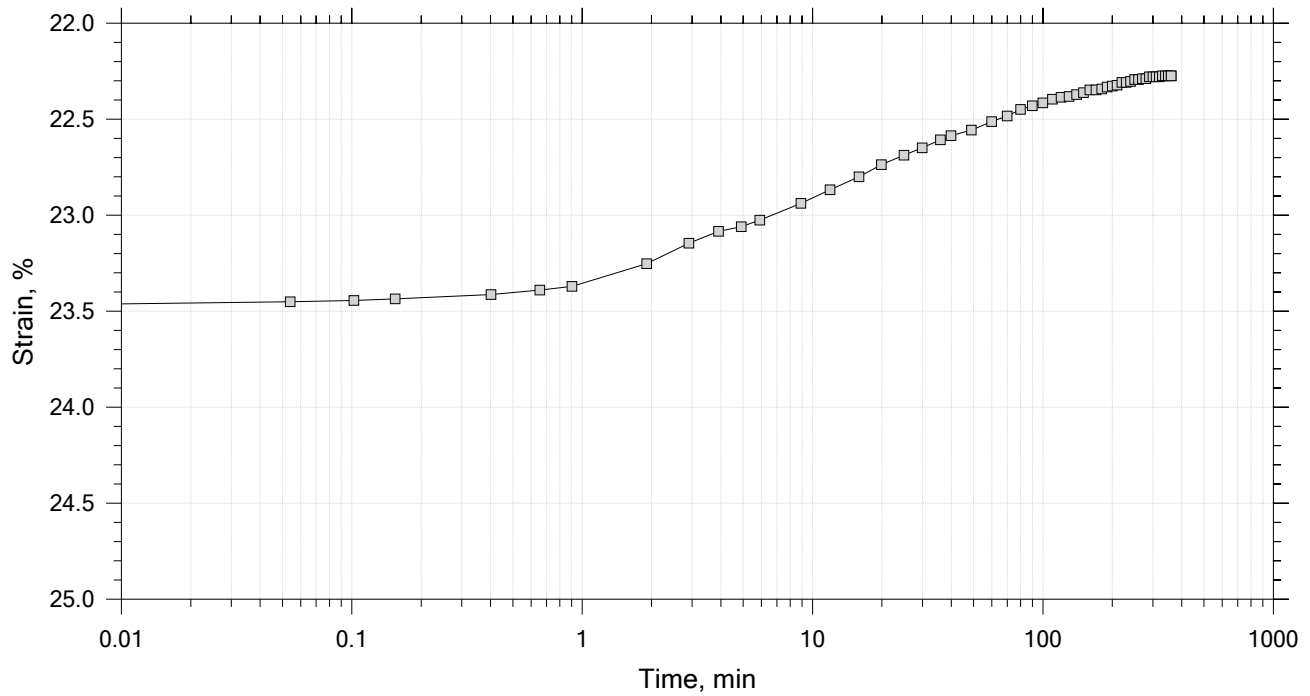
	Project: I-395/Rte 9 Connector	Location: Brewer-Eddington, ME	Project No.: GTX-313198
	Boring No.: HB-BE-225	Tested By: md	Checked By: anm
	Sample No.: U1	Test Date: 03/16/21	Depth: 8-10 ft
	Test No.: IP-2	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System X, Swell Pressure = 0.0656 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 14 of 15

Constant Load Step

Stress: 0.125 tsf



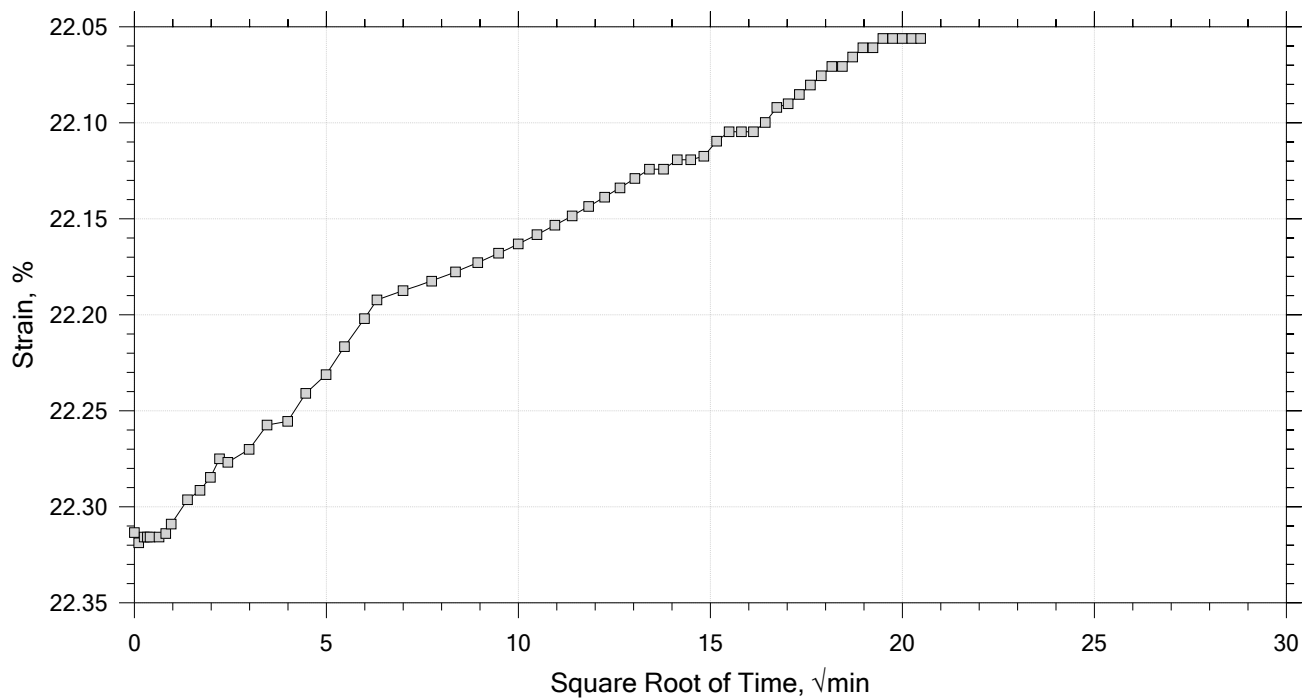
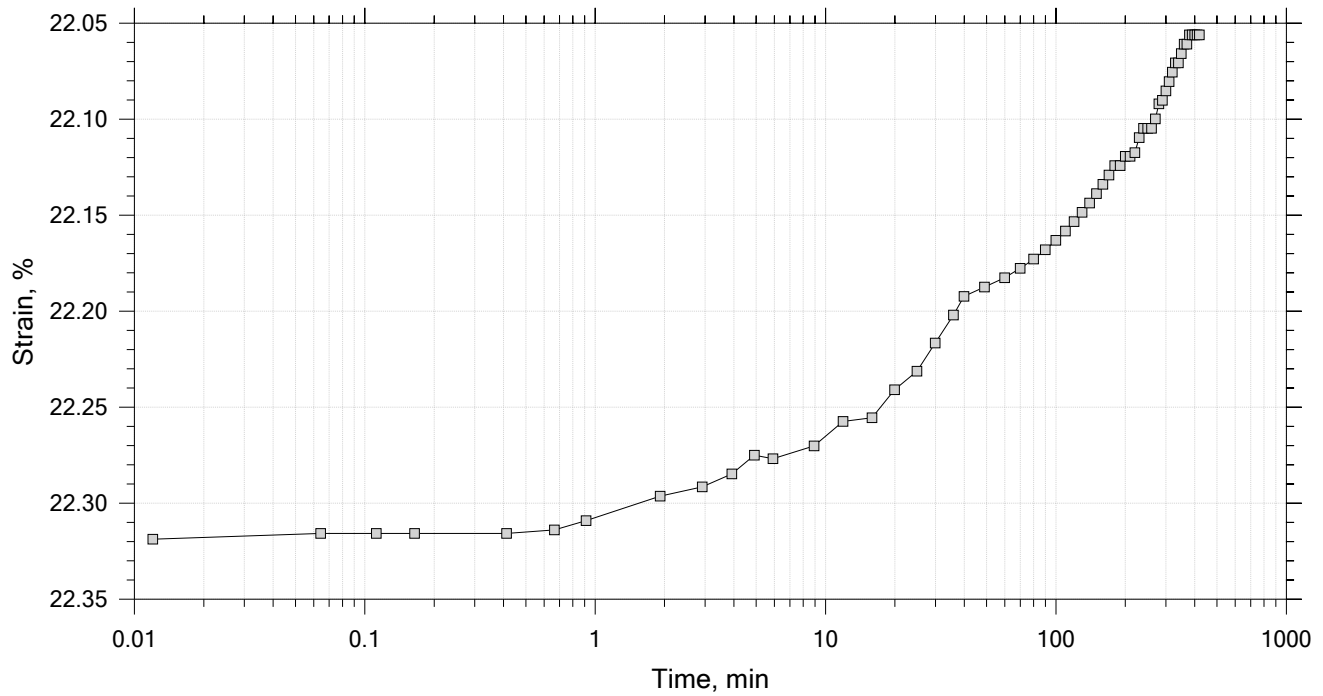
	Project: I-395/Rte 9 Connector	Location: Brewer-Eddington, ME	Project No.: GTX-313198
	Boring No.: HB-BE-225	Tested By: md	Checked By: anm
	Sample No.: U1	Test Date: 03/16/21	Depth: 8-10 ft
	Test No.: IP-2	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System X, Swell Pressure = 0.0656 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 15 of 15

Constant Load Step

Stress: 0.0625 tsf




	Project: I-395/Rte 9 Connector	Location: Brewer-Eddington, ME	Project No.: GTX-313198
	Boring No.: HB-BE-225	Tested By: md	Checked By: anm
	Sample No.: U1	Test Date: 03/16/21	Depth: 8-10 ft
	Test No.: IP-2	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System X, Swell Pressure = 0.0656 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Specimen Diameter: 2.50 in	Estimated Specific Gravity: 2.75	Liquid Limit: 30
Initial Height: 1.00 in	Initial Void Ratio: 0.914	Plastic Limit: 17
Final Height: 0.80 in	Final Void Ratio: 0.531	Plasticity Index: 13

	Before Test Trimmings	Before Test Specimen	After Test Specimen	After Test Trimmings
Container ID	A-2076	RING		E0677
Mass Container, gm	8.32	110.98	110.98	8.16
Mass Container + Wet Soil, gm	133.49	264.76	248.92	146.36
Mass Container + Dry Soil, gm	102.9	226.6	226.6	124
Mass Dry Soil, gm	94.58	115.62	115.62	115.84
Water Content, %	32.34	33.00	19.30	19.30
Void Ratio	---	0.91	0.53	---
Degree of Saturation, %	---	99.35	100.00	---
Dry Unit Weight, pcf	---	89.732	112.17	---


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

	Project: I-395/Rte 9 Connector	Location: Brewer-Eddington, ME	Project No.: GTX-313198
	Boring No.: HB-BE-225	Tested By: md	Checked By: anm
	Sample No.: U1	Test Date: 03/16/21	Depth: 8-10 ft
	Test No.: IP-2	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System X, Swell Pressure = 0.0656 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

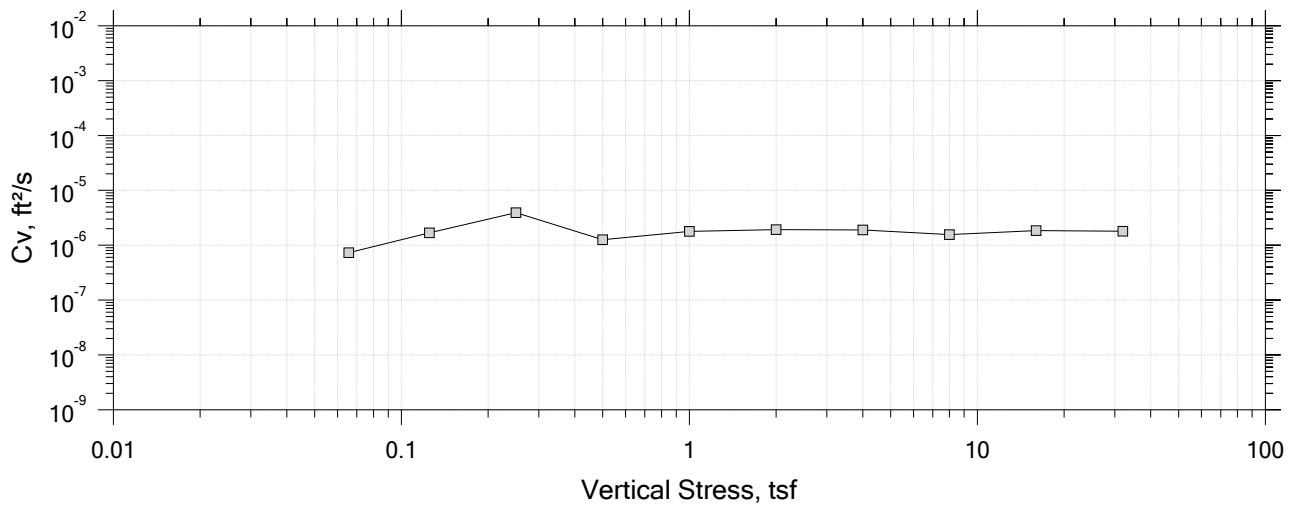
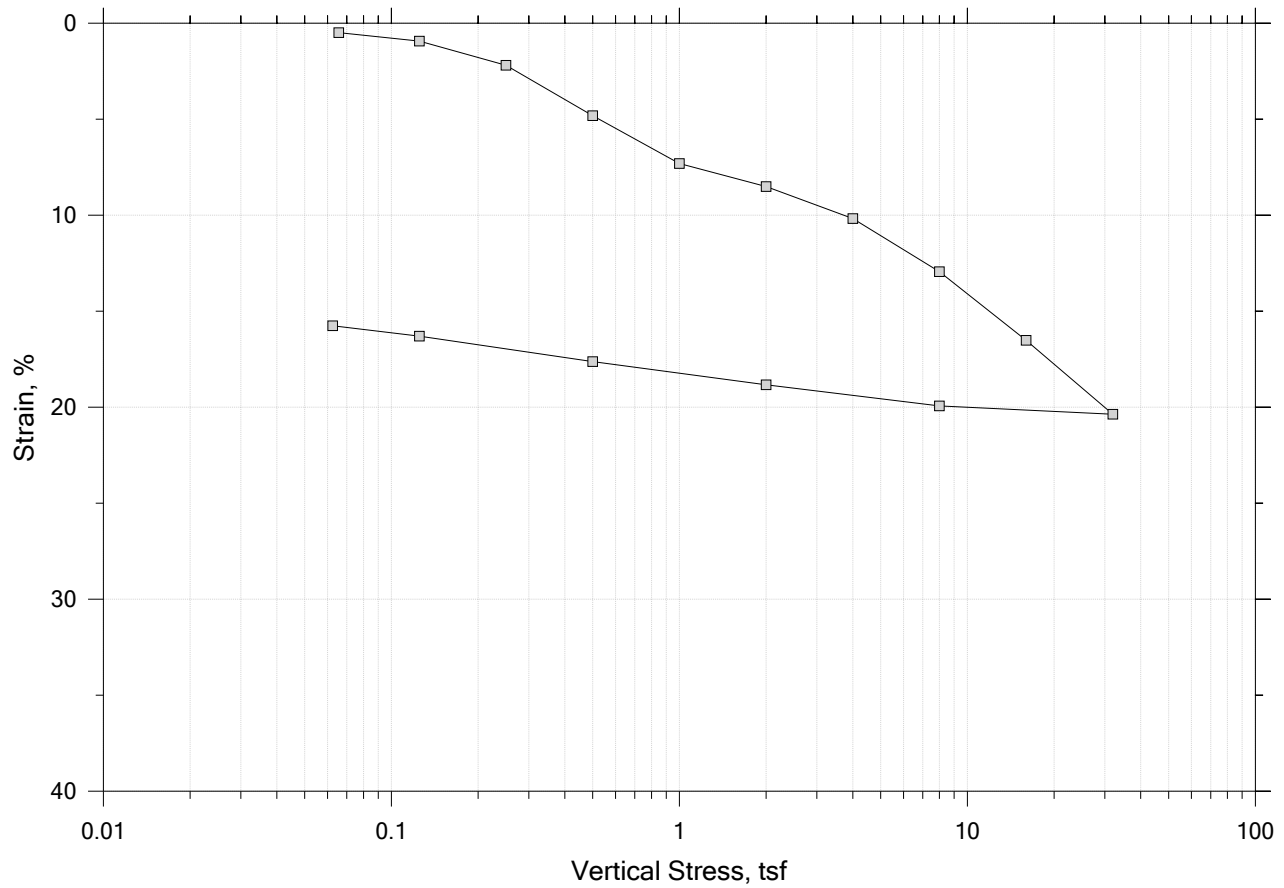
Square Root of Time Coefficients


[illegible]

	Project: I-395/Rte 9 Connector	Location: Brewer-Eddington, ME	Project No.: GTX-313198
	Boring No.: HB-BE-225	Tested By: md	Checked By: anm
	Sample No.: U1	Test Date: 03/16/21	Depth: 8-10 ft
	Test No.: IP-2	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System X, Swell Pressure = 0.0656 tsf		
	Displacement at End of Increment		

One-Dimensional Consolidation by ASTM D2435 - Method B

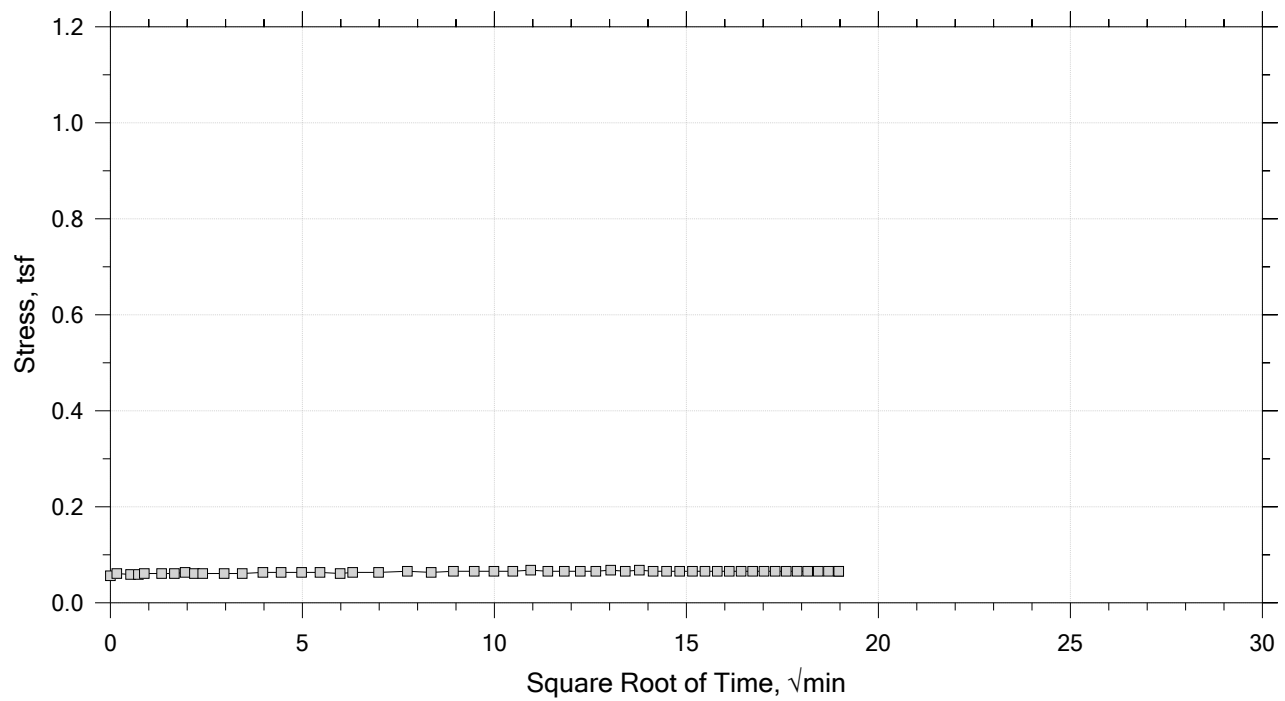
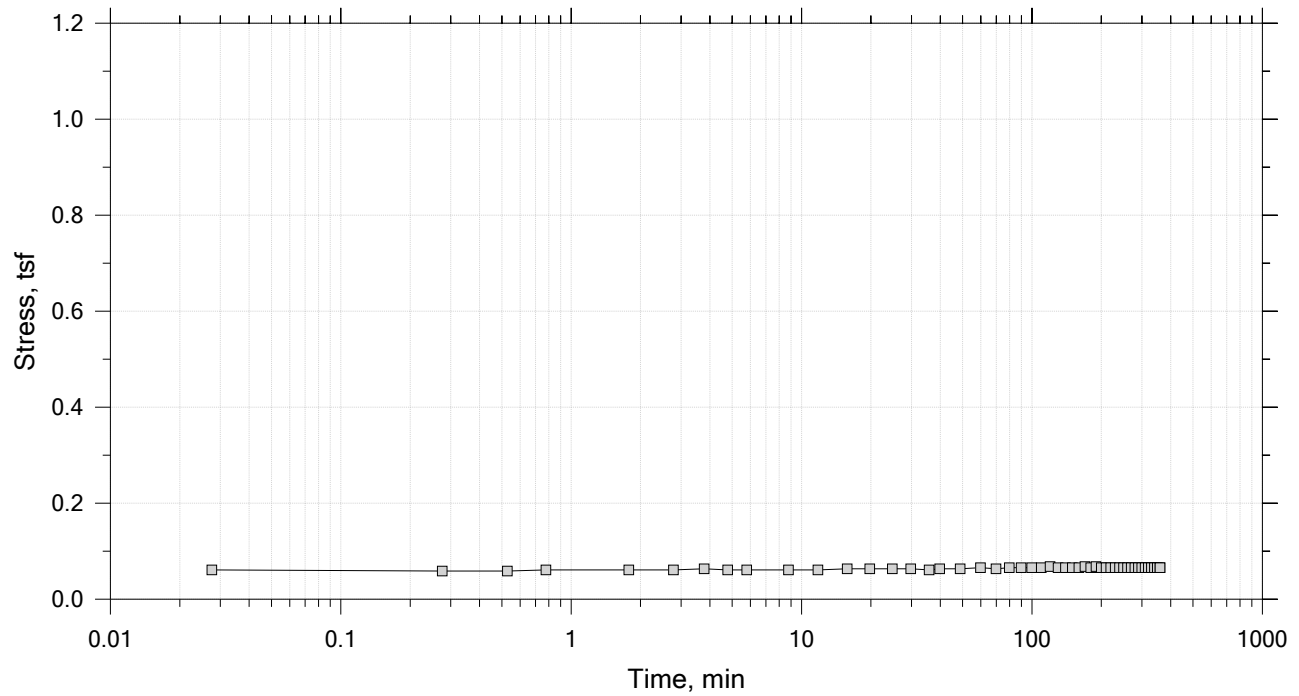
Summary Report




	Project: I-395/Rte 9 Connector	Location: Brewer-Eddington, ME	Project No.: GTX-313198
	Boring No.: HB-BB-226	Tested By: md	Checked By: anm
	Sample No.: U1	Test Date: 03/16/21	Depth: 6-8 ft
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, olive gray clay		
	Remarks: System X, Swell Pressure = 0.0656 tsf		
	Displacement at End of Increment		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 1 of 15
Constant Volume Step
Stress: 0.0656 tsf



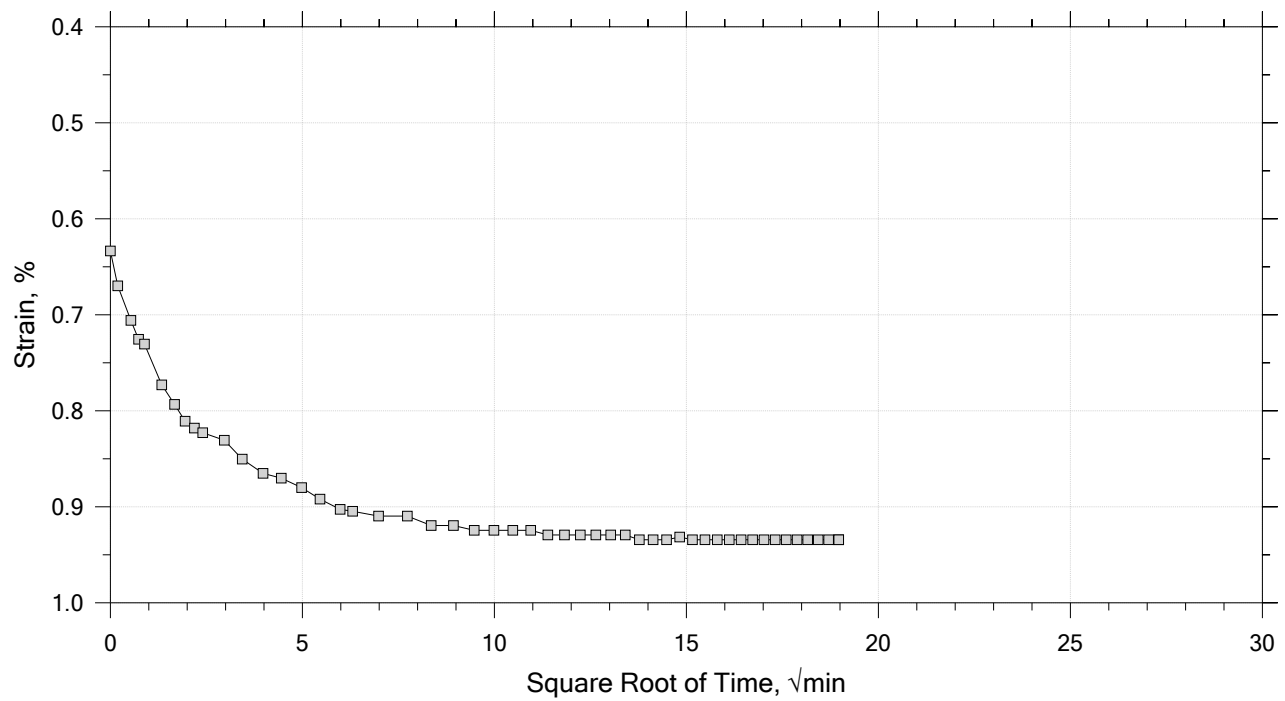
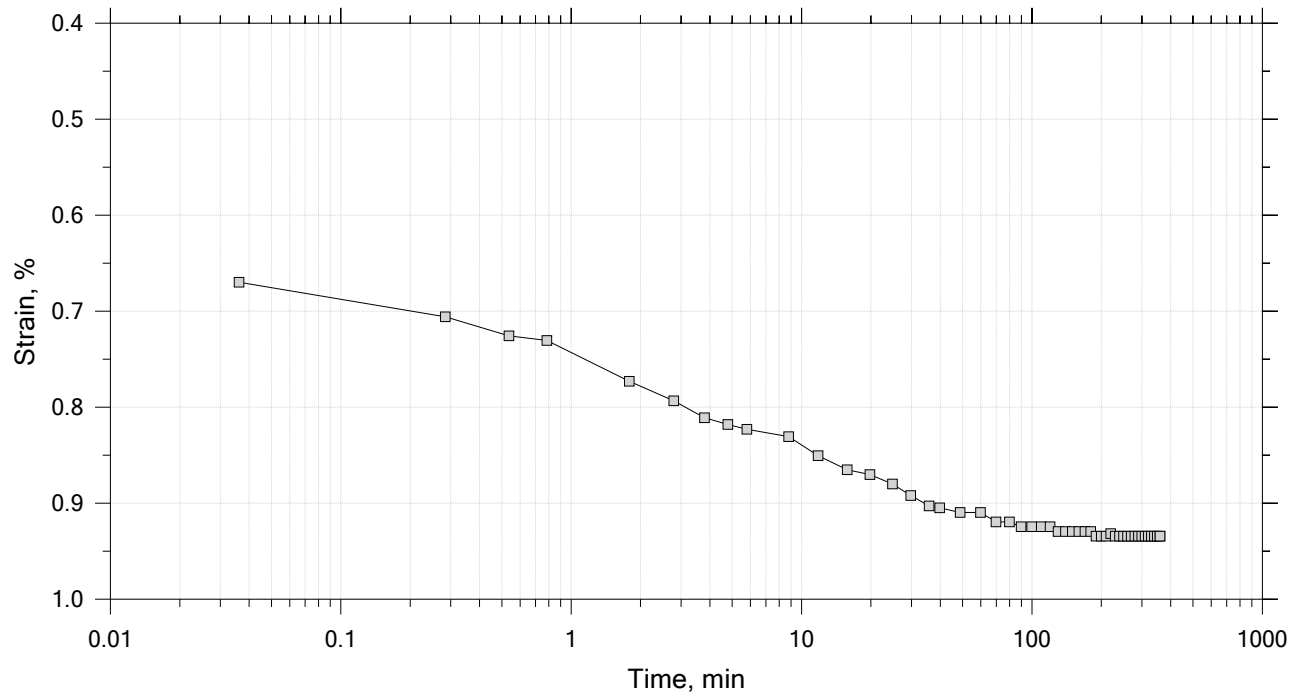
	Project: I-395/Rte 9 Connector	Location: Brewer-Eddington, ME	Project No.: GTX-313198
	Boring No.: HB-BB-226	Tested By: md	Checked By: anm
	Sample No.: U1	Test Date: 03/16/21	Depth: 6-8 ft
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, olive gray clay		
	Remarks: System X, Swell Pressure = 0.0656 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 2 of 15

Constant Load Step

Stress: 0.125 tsf



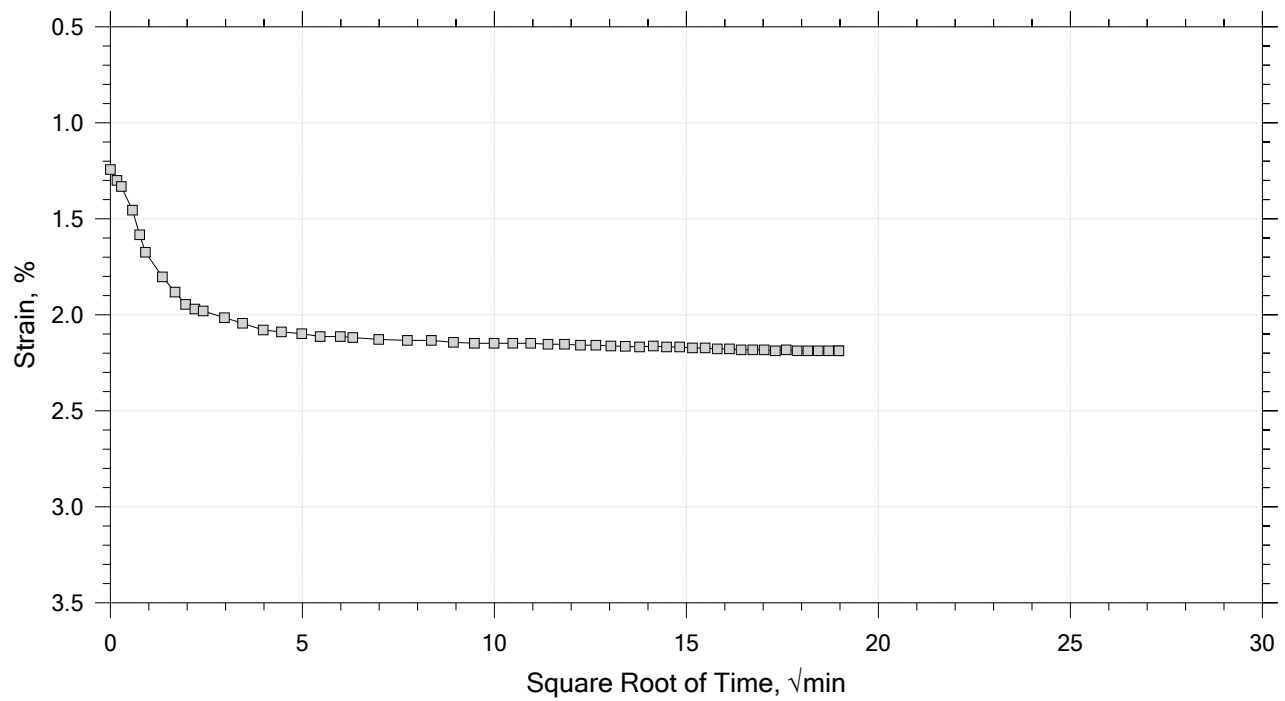
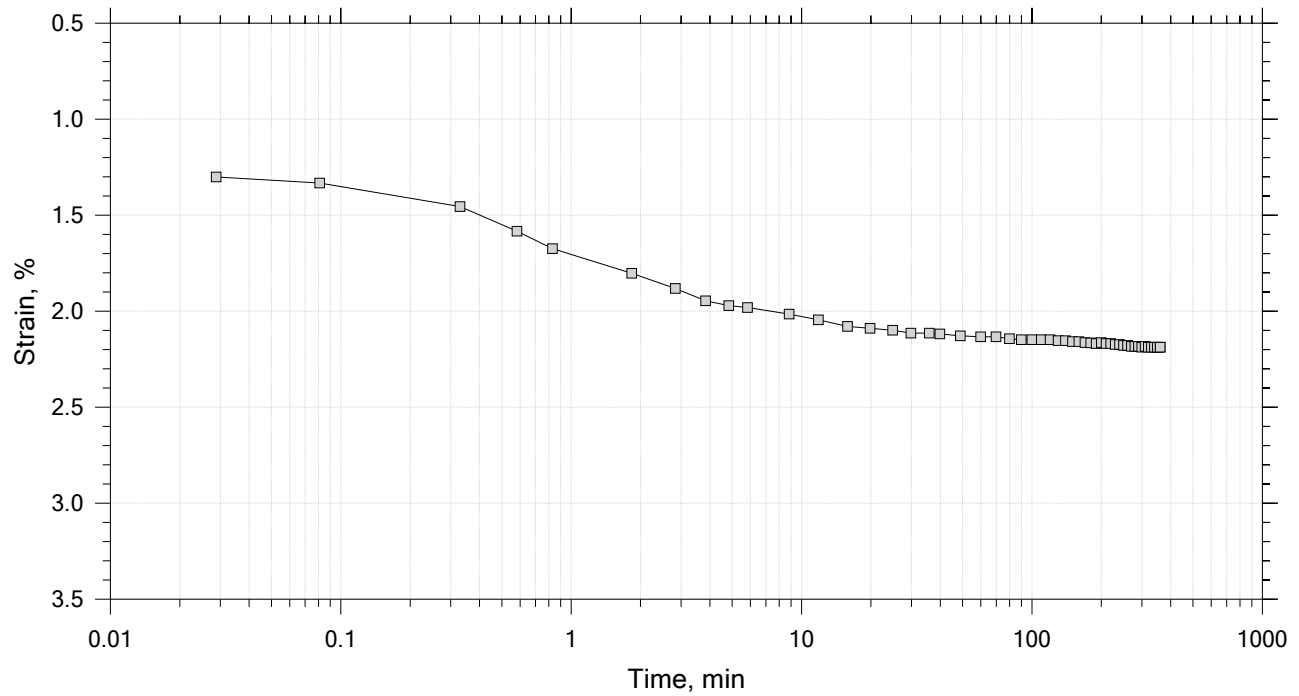
	Project: I-395/Rte 9 Connector	Location: Brewer-Eddington, ME	Project No.: GTX-313198
	Boring No.: HB-BB-226	Tested By: md	Checked By: anm
	Sample No.: U1	Test Date: 03/16/21	Depth: 6-8 ft
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, olive gray clay		
	Remarks: System X, Swell Pressure = 0.0656 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 3 of 15

Constant Load Step

Stress: 0.25 tsf



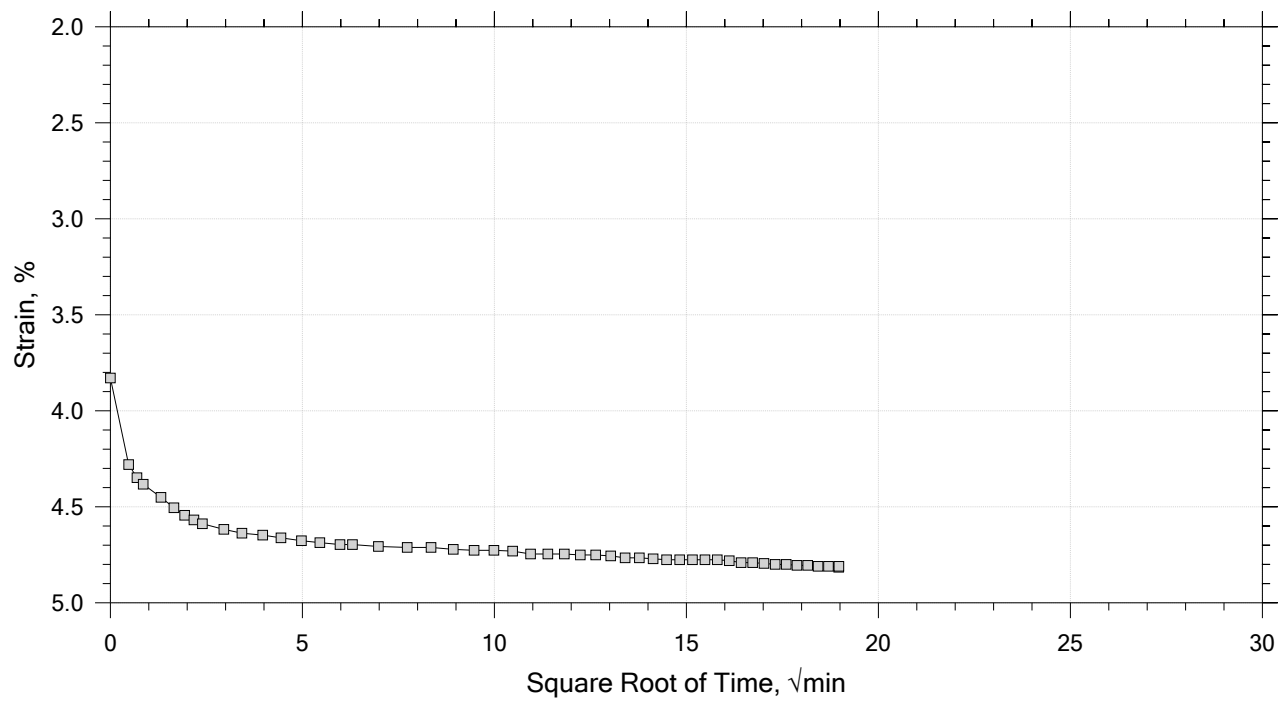
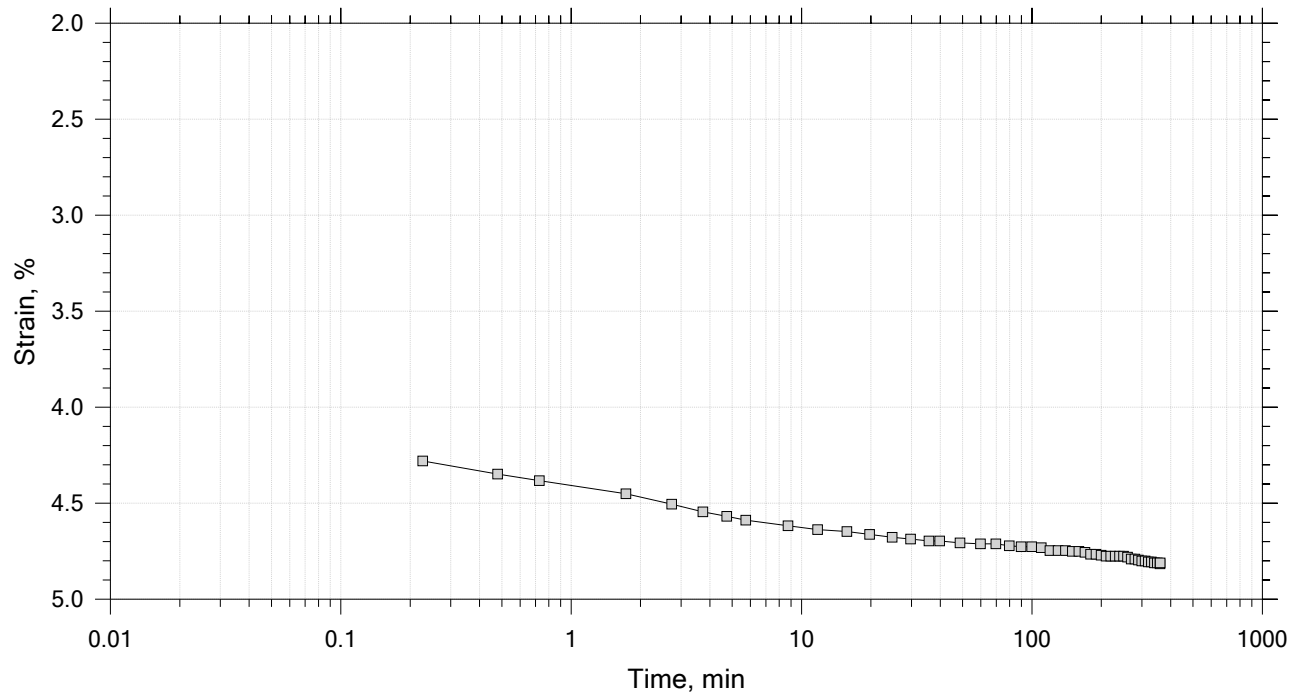
	Project: I-395/Rte 9 Connector	Location: Brewer-Eddington, ME	Project No.: GTX-313198
	Boring No.: HB-BB-226	Tested By: md	Checked By: anm
	Sample No.: U1	Test Date: 03/16/21	Depth: 6-8 ft
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, olive gray clay		
	Remarks: System X, Swell Pressure = 0.0656 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 4 of 15

Constant Load Step

Stress: 0.5 tsf



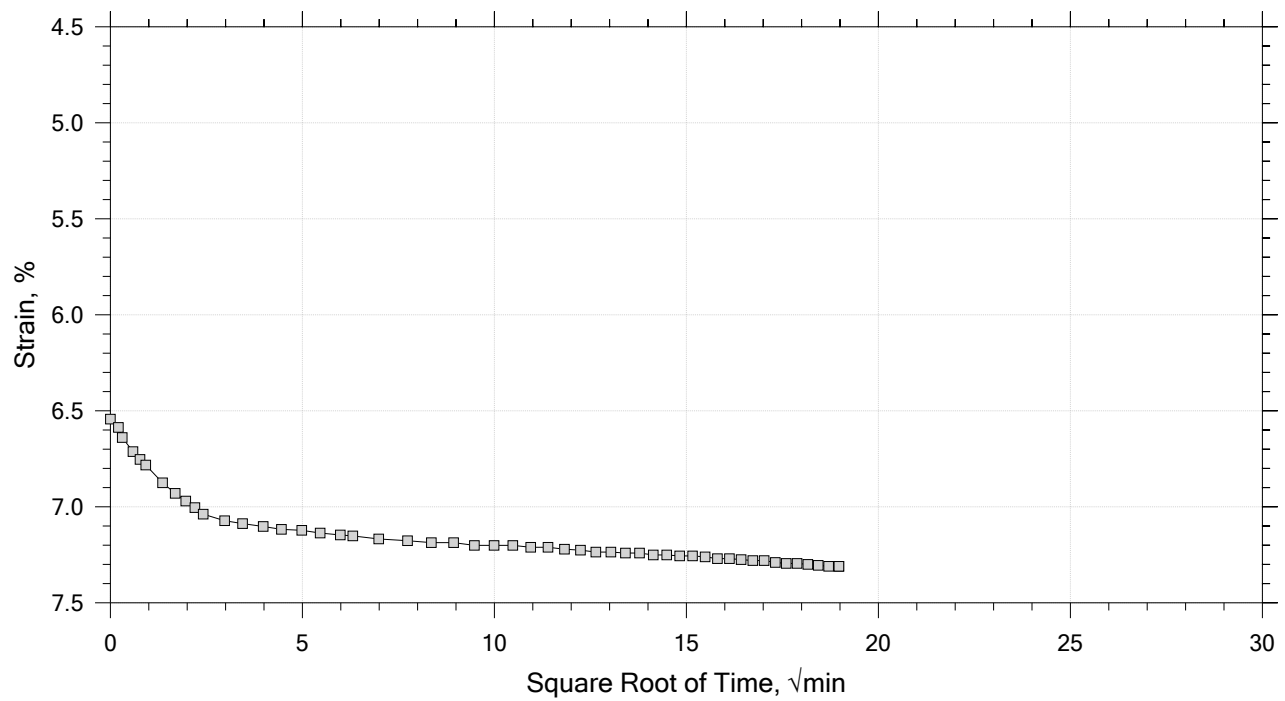
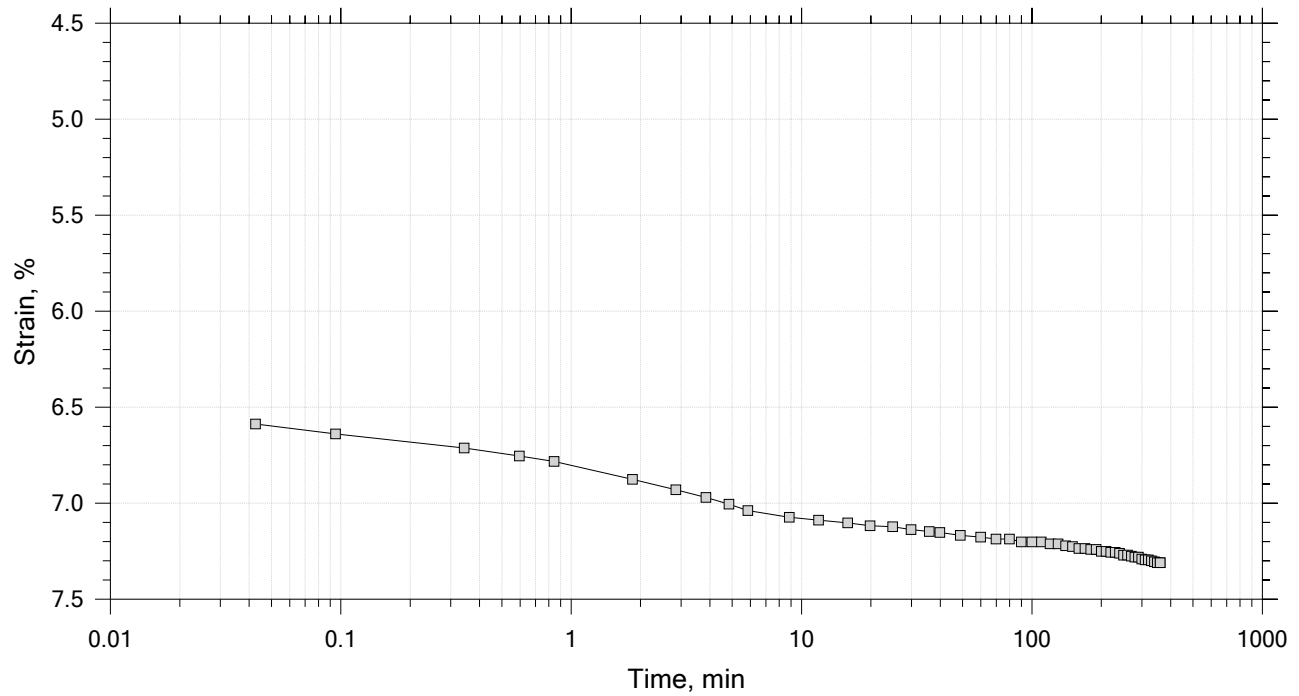
	Project: I-395/Rte 9 Connector	Location: Brewer-Eddington, ME	Project No.: GTX-313198
	Boring No.: HB-BB-226	Tested By: md	Checked By: anm
	Sample No.: U1	Test Date: 03/16/21	Depth: 6-8 ft
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, olive gray clay		
	Remarks: System X, Swell Pressure = 0.0656 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 5 of 15

Constant Load Step

Stress: 1 tsf



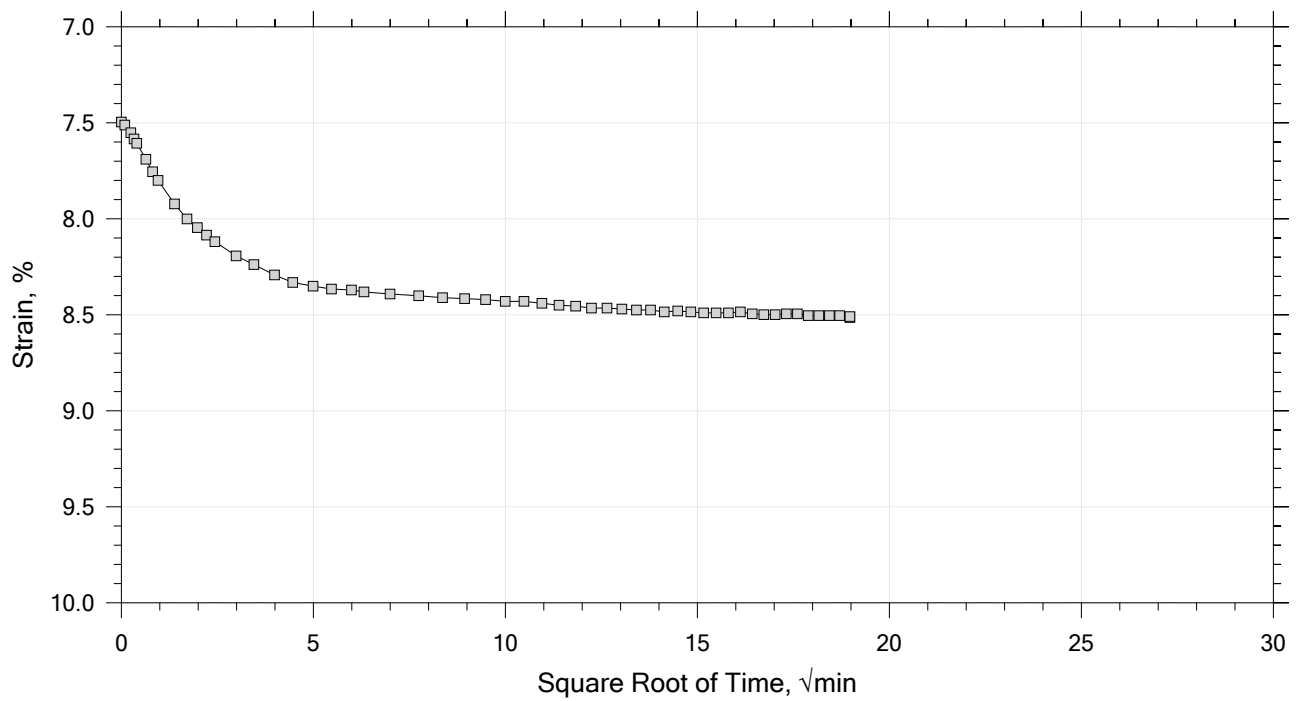
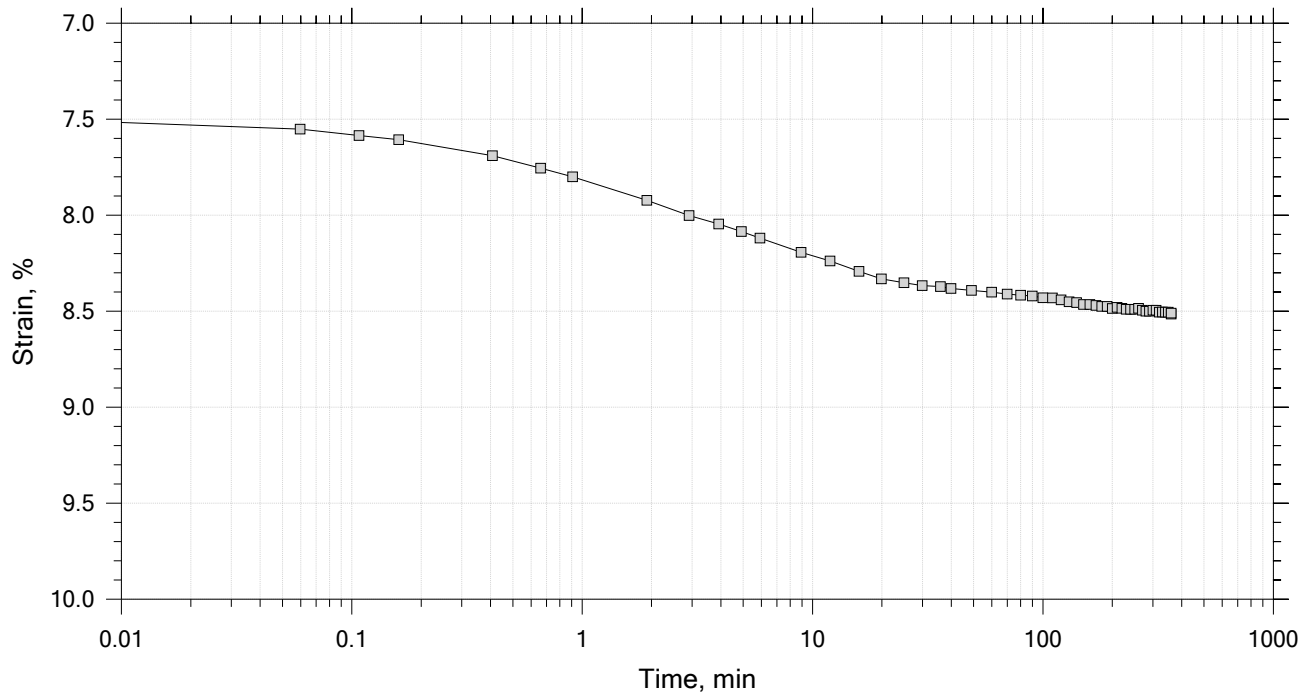
	Project: I-395/Rte 9 Connector	Location: Brewer-Eddington, ME	Project No.: GTX-313198
	Boring No.: HB-BB-226	Tested By: md	Checked By: anm
	Sample No.: U1	Test Date: 03/16/21	Depth: 6-8 ft
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, olive gray clay		
	Remarks: System X, Swell Pressure = 0.0656 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 6 of 15

Constant Load Step

Stress: 2 tsf



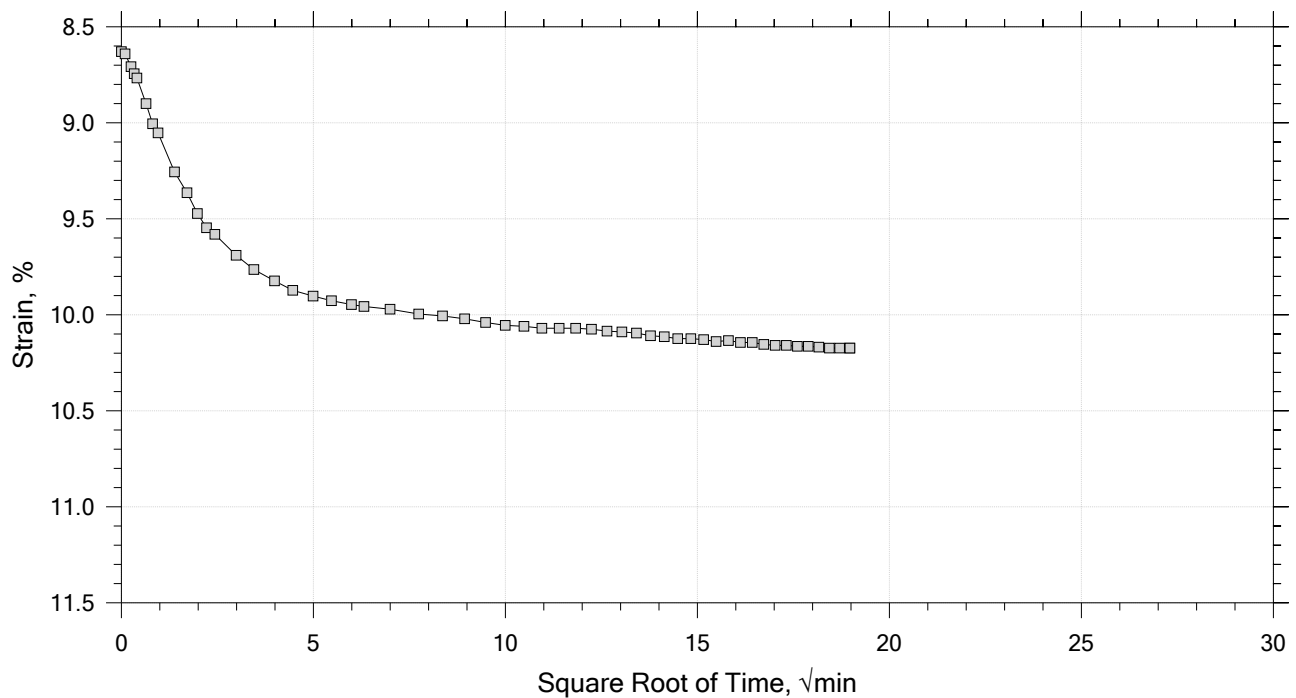
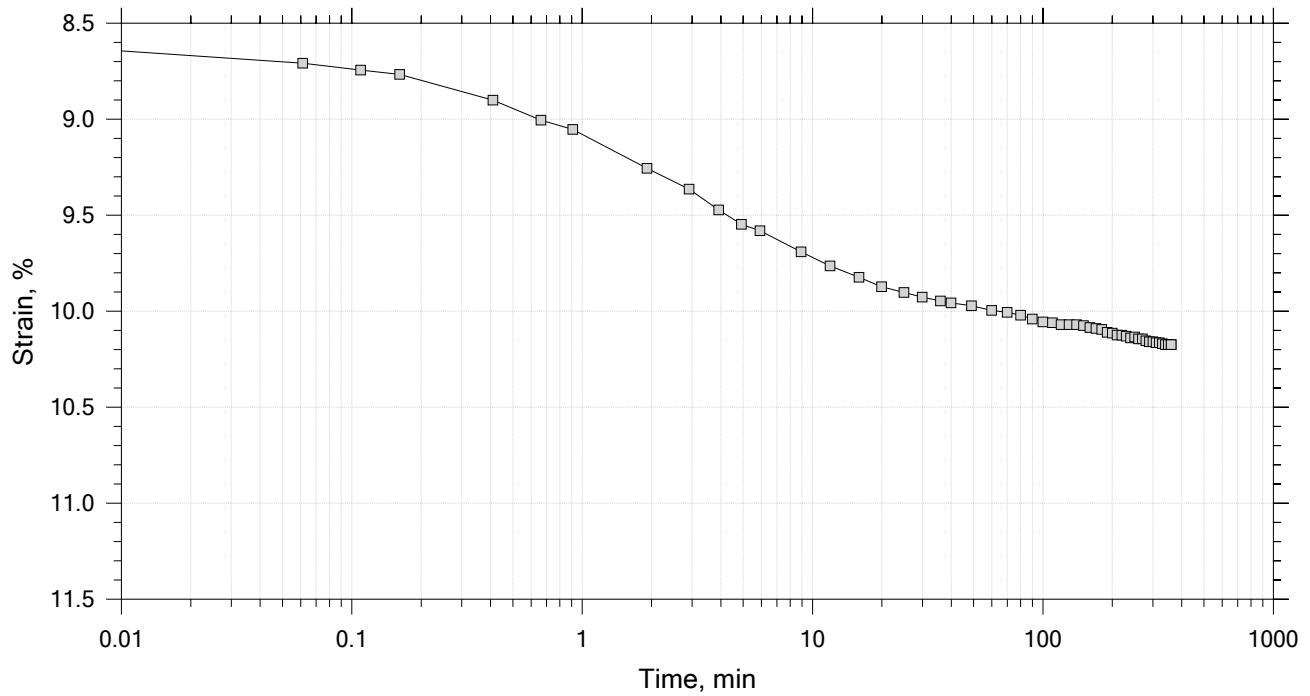
	Project: I-395/Rte 9 Connector	Location: Brewer-Eddington, ME	Project No.: GTX-313198
	Boring No.: HB-BB-226	Tested By: md	Checked By: anm
	Sample No.: U1	Test Date: 03/16/21	Depth: 6-8 ft
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, olive gray clay		
	Remarks: System X, Swell Pressure = 0.0656 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 7 of 15

Constant Load Step

Stress: 4 tsf



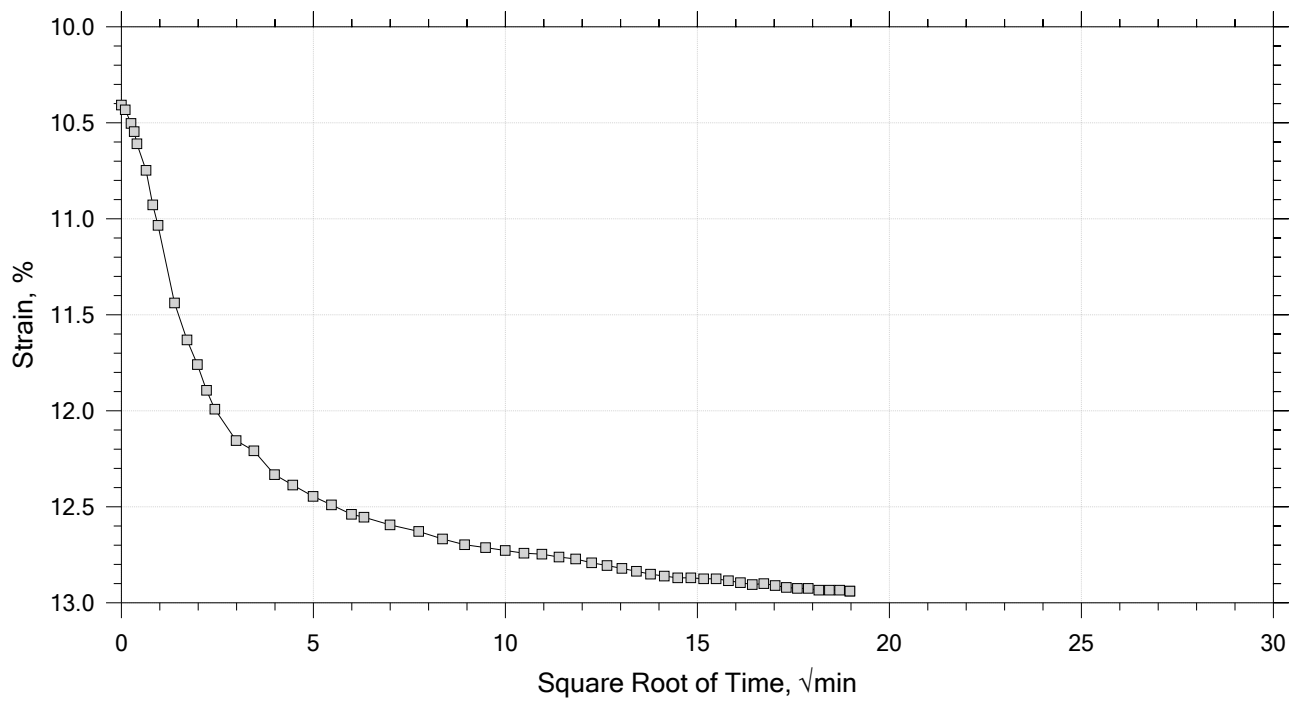
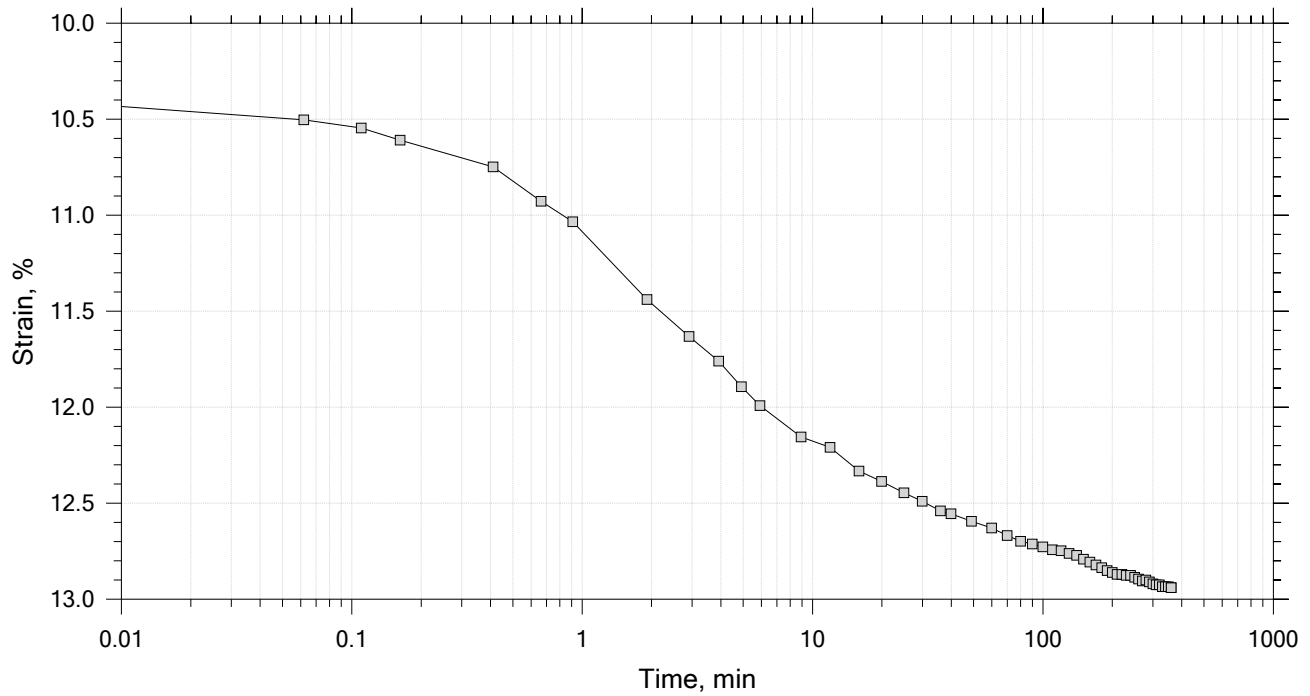
	Project: I-395/Rte 9 Connector	Location: Brewer-Eddington, ME	Project No.: GTX-313198
	Boring No.: HB-BB-226	Tested By: md	Checked By: anm
	Sample No.: U1	Test Date: 03/16/21	Depth: 6-8 ft
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, olive gray clay		
	Remarks: System X, Swell Pressure = 0.0656 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 8 of 15

Constant Load Step

Stress: 8 tsf



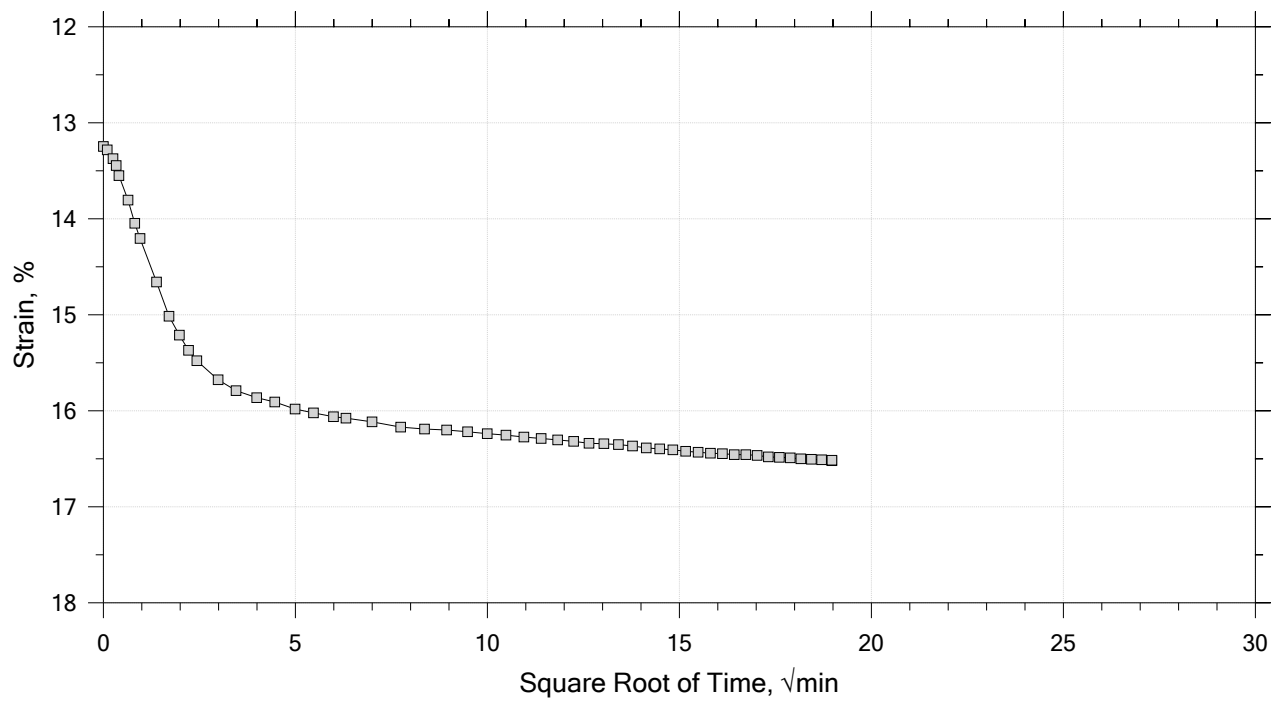
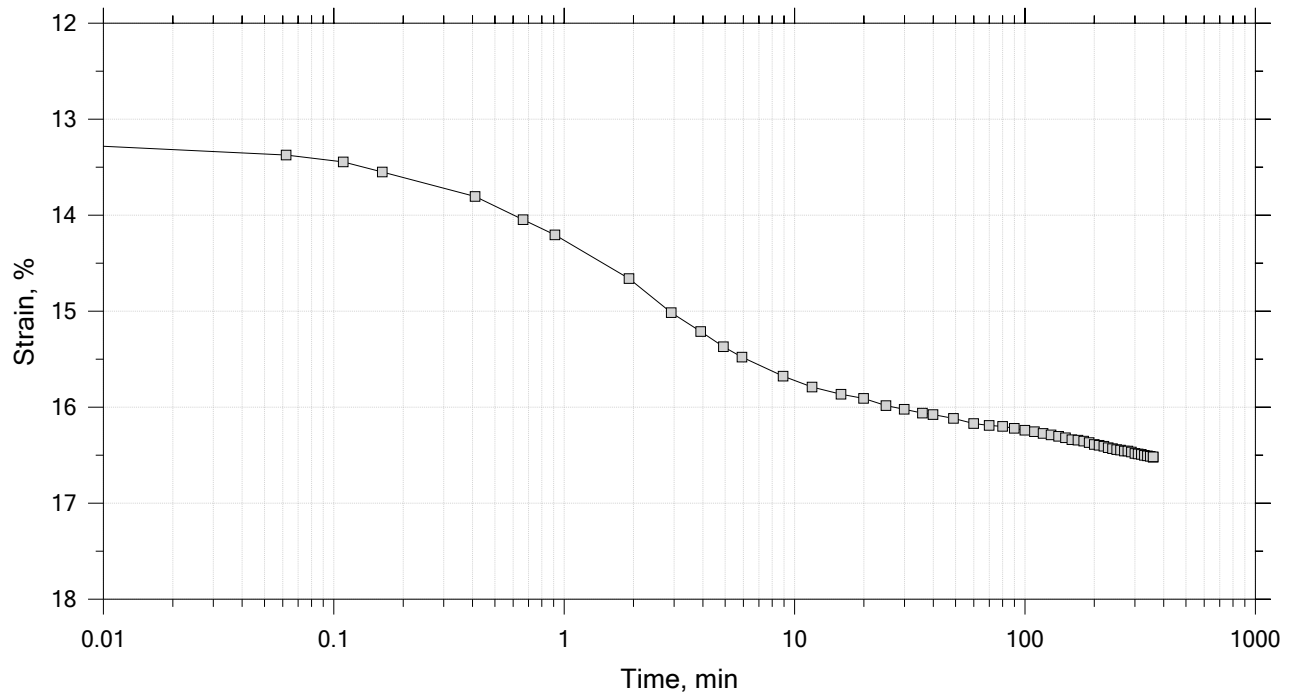
	Project: I-395/Rte 9 Connector	Location: Brewer-Eddington, ME	Project No.: GTX-313198
	Boring No.: HB-BB-226	Tested By: md	Checked By: anm
	Sample No.: U1	Test Date: 03/16/21	Depth: 6-8 ft
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, olive gray clay		
	Remarks: System X, Swell Pressure = 0.0656 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 9 of 15

Constant Load Step

Stress: 16 tsf



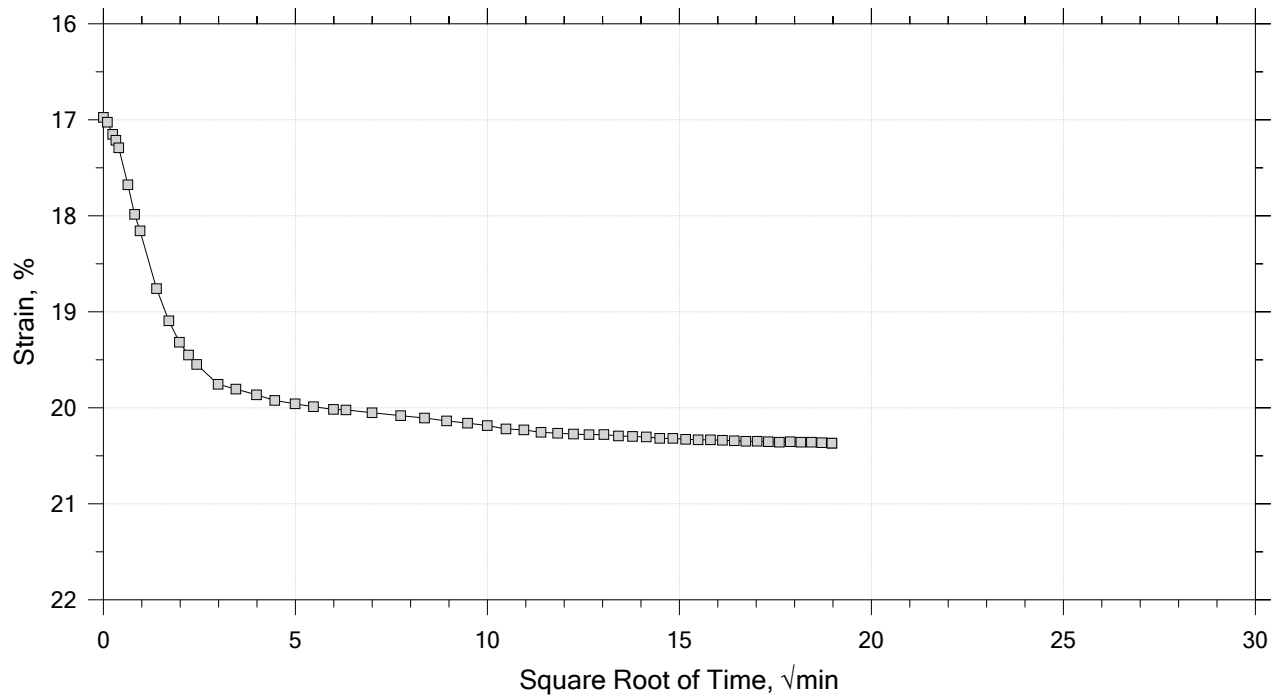
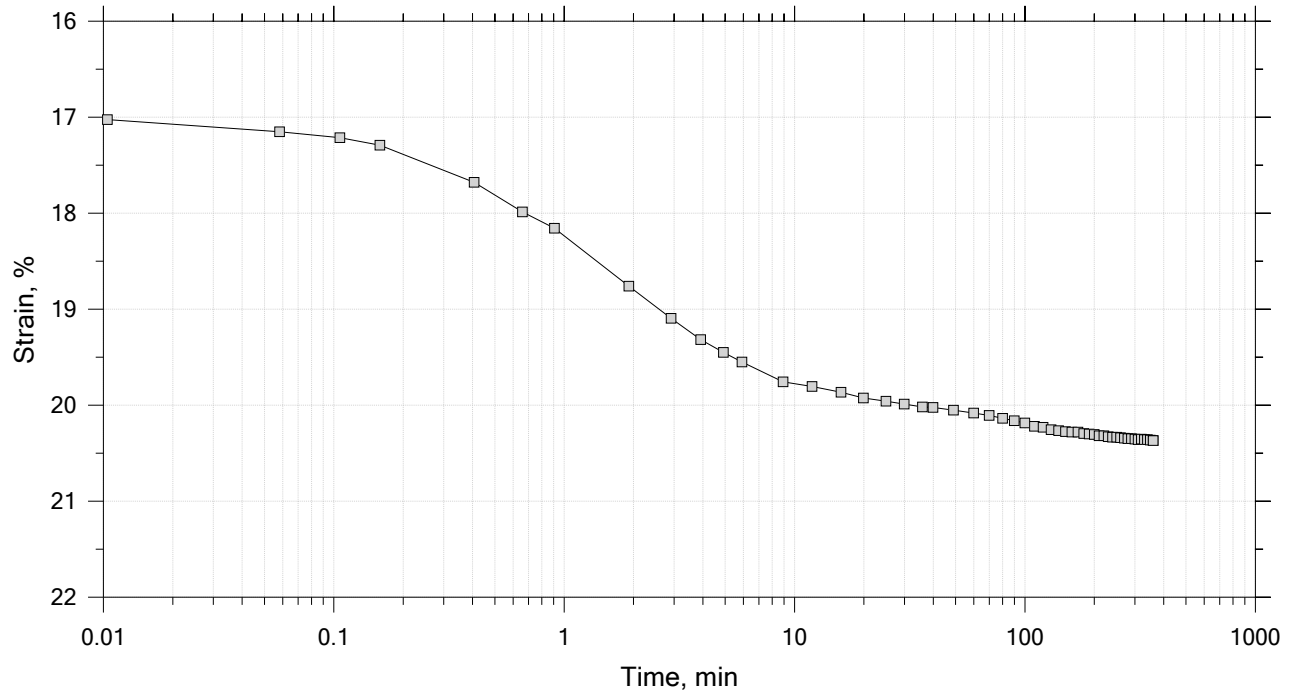
	Project: I-395/Rte 9 Connector	Location: Brewer-Eddington, ME	Project No.: GTX-313198
	Boring No.: HB-BB-226	Tested By: md	Checked By: anm
	Sample No.: U1	Test Date: 03/16/21	Depth: 6-8 ft
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, olive gray clay		
	Remarks: System X, Swell Pressure = 0.0656 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 10 of 15

Constant Load Step

Stress: 32 tsf



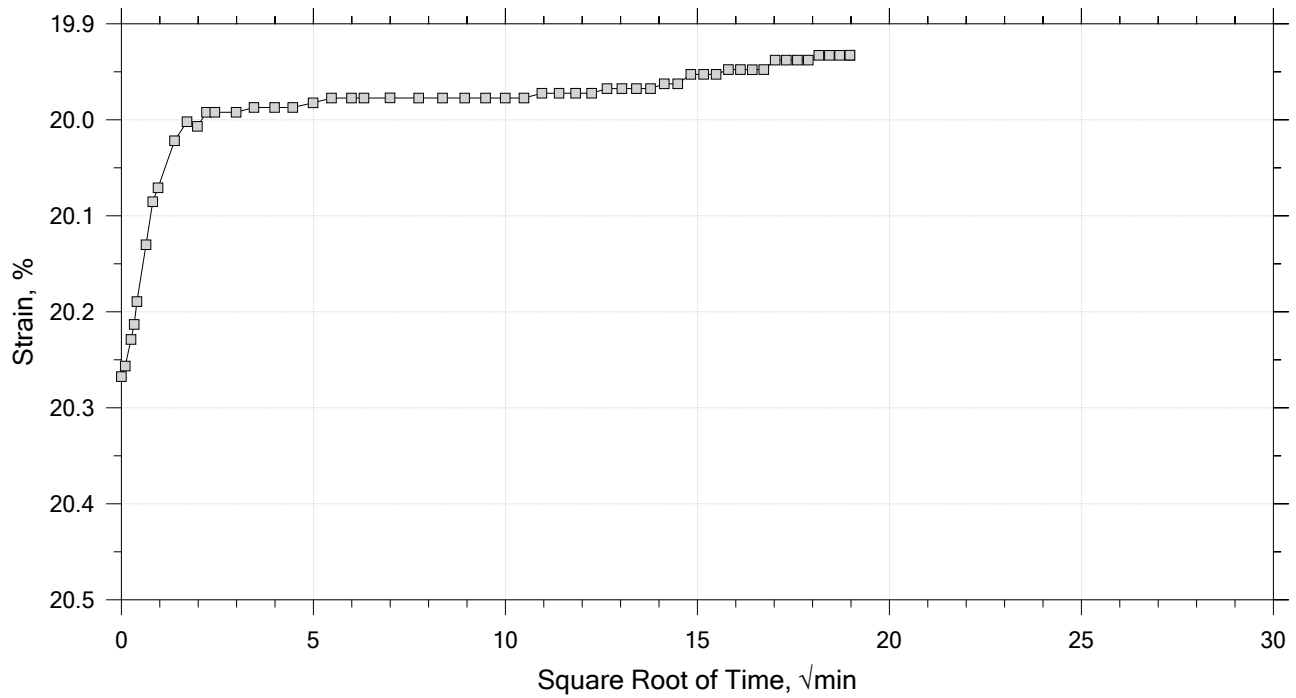
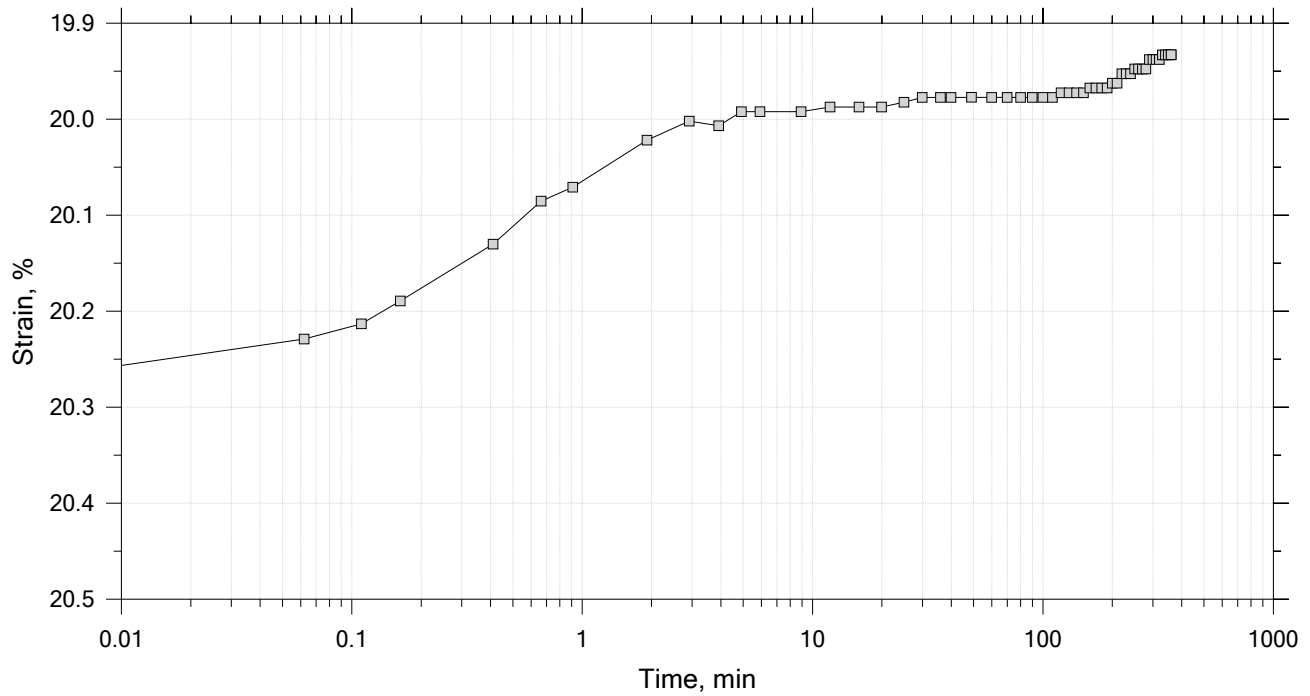
	Project: I-395/Rte 9 Connector	Location: Brewer-Eddington, ME	Project No.: GTX-313198
	Boring No.: HB-BB-226	Tested By: md	Checked By: anm
	Sample No.: U1	Test Date: 03/16/21	Depth: 6-8 ft
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, olive gray clay		
	Remarks: System X, Swell Pressure = 0.0656 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 11 of 15

Constant Load Step

Stress: 8 tsf



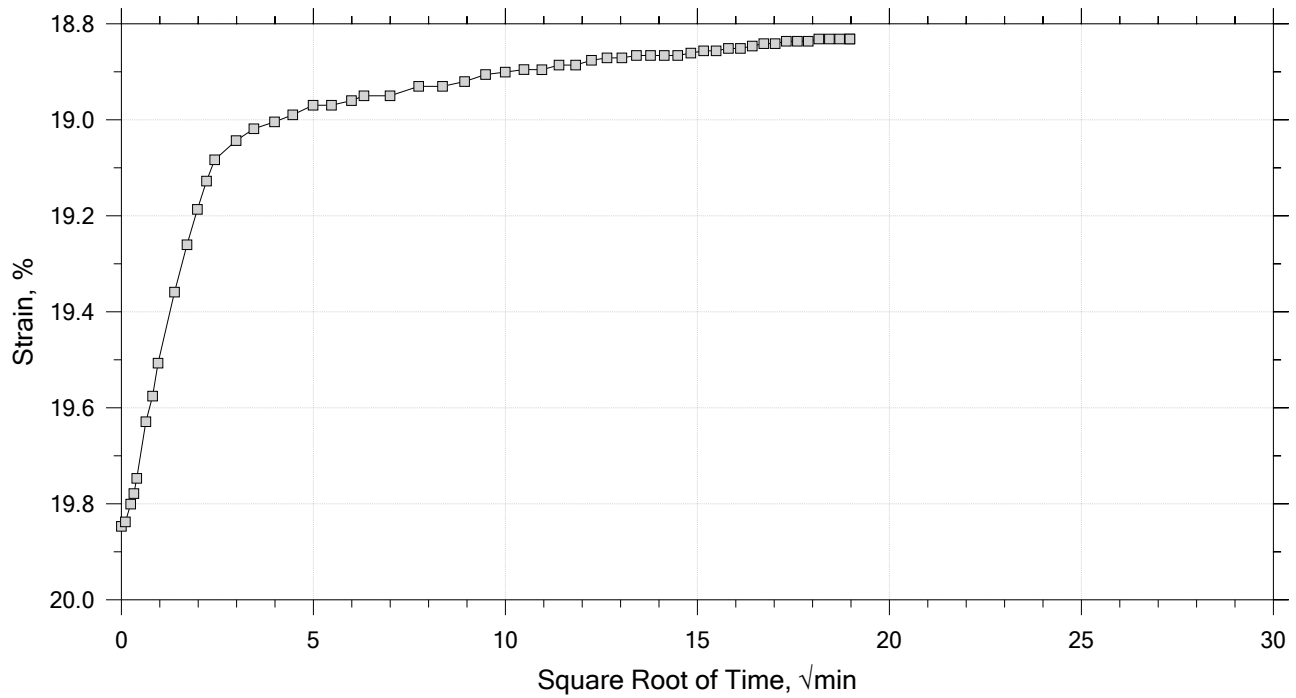
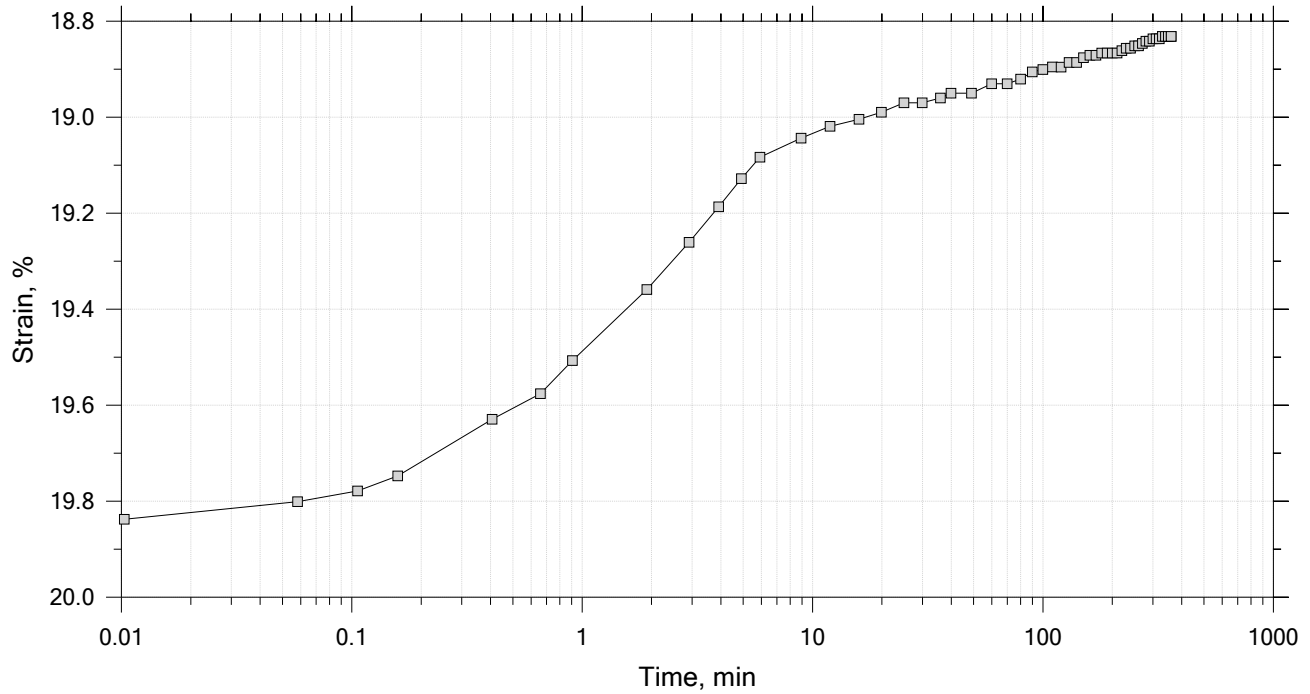
	Project: I-395/Rte 9 Connector	Location: Brewer-Eddington, ME	Project No.: GTX-313198
	Boring No.: HB-BB-226	Tested By: md	Checked By: anm
	Sample No.: U1	Test Date: 03/16/21	Depth: 6-8 ft
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, olive gray clay		
	Remarks: System X, Swell Pressure = 0.0656 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 12 of 15

Constant Load Step

Stress: 2 tsf



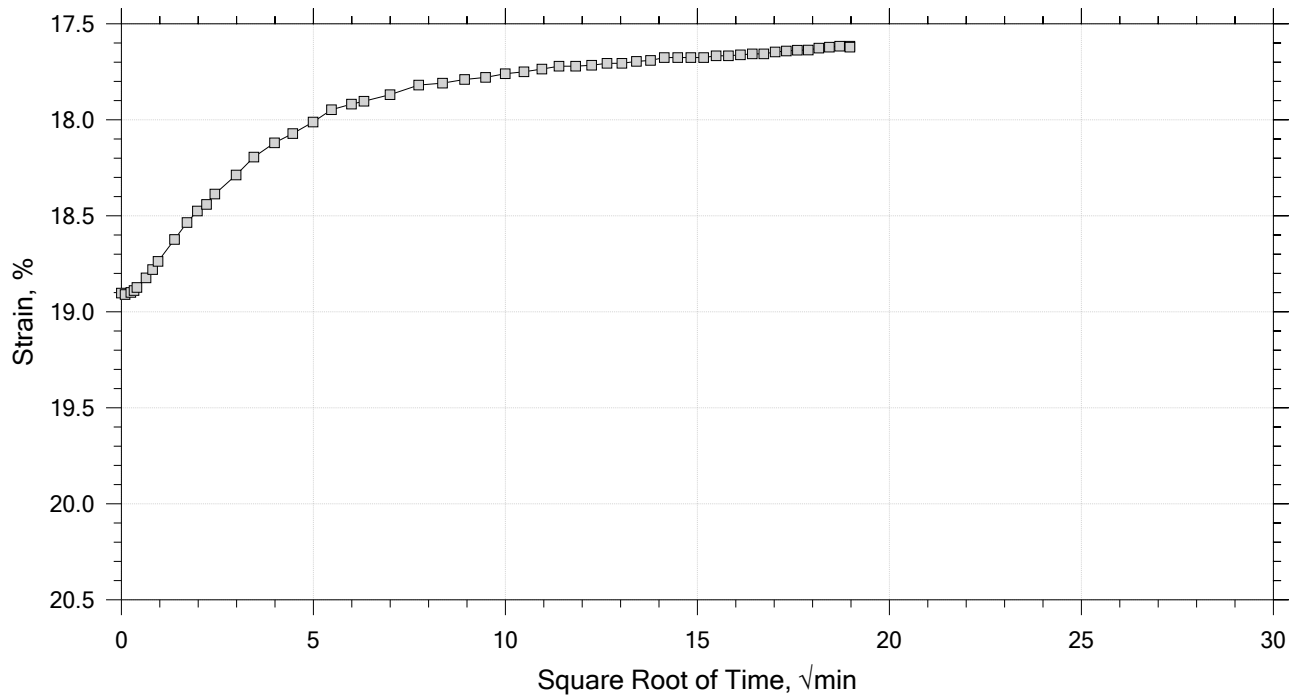
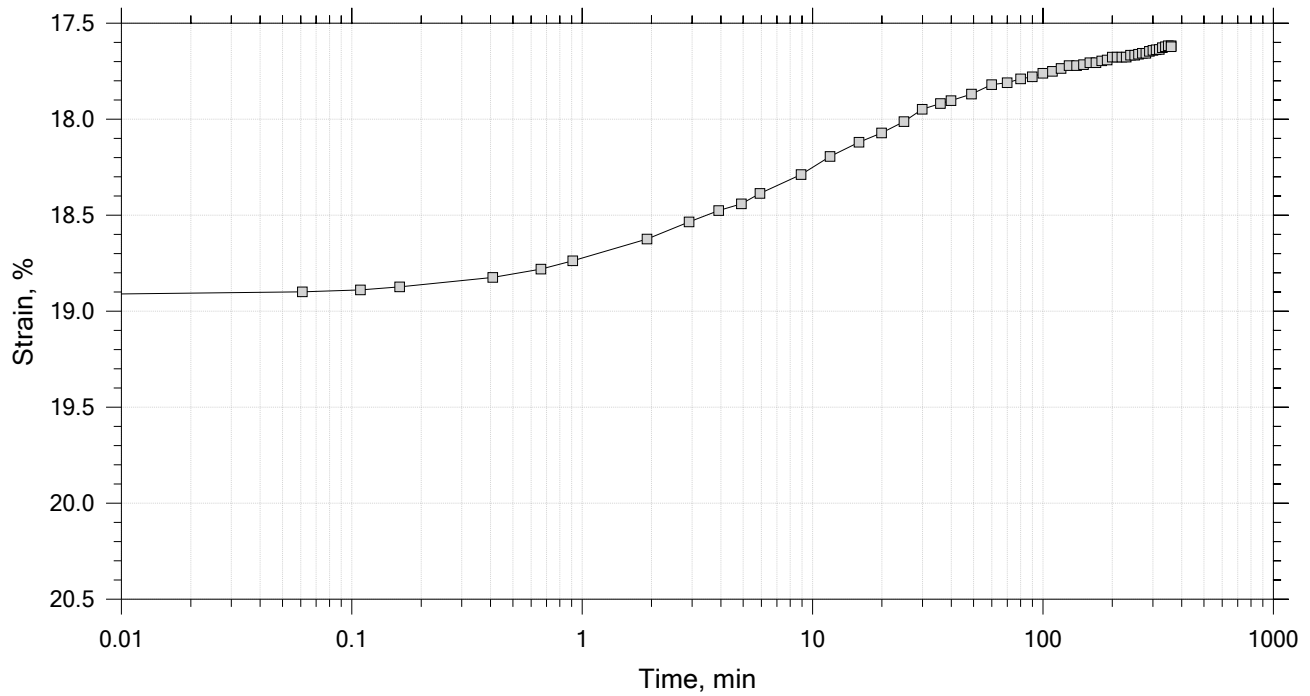
	Project: I-395/Rte 9 Connector	Location: Brewer-Eddington, ME	Project No.: GTX-313198
	Boring No.: HB-BB-226	Tested By: md	Checked By: anm
	Sample No.: U1	Test Date: 03/16/21	Depth: 6-8 ft
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, olive gray clay		
	Remarks: System X, Swell Pressure = 0.0656 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 13 of 15

Constant Load Step

Stress: 0.5 tsf



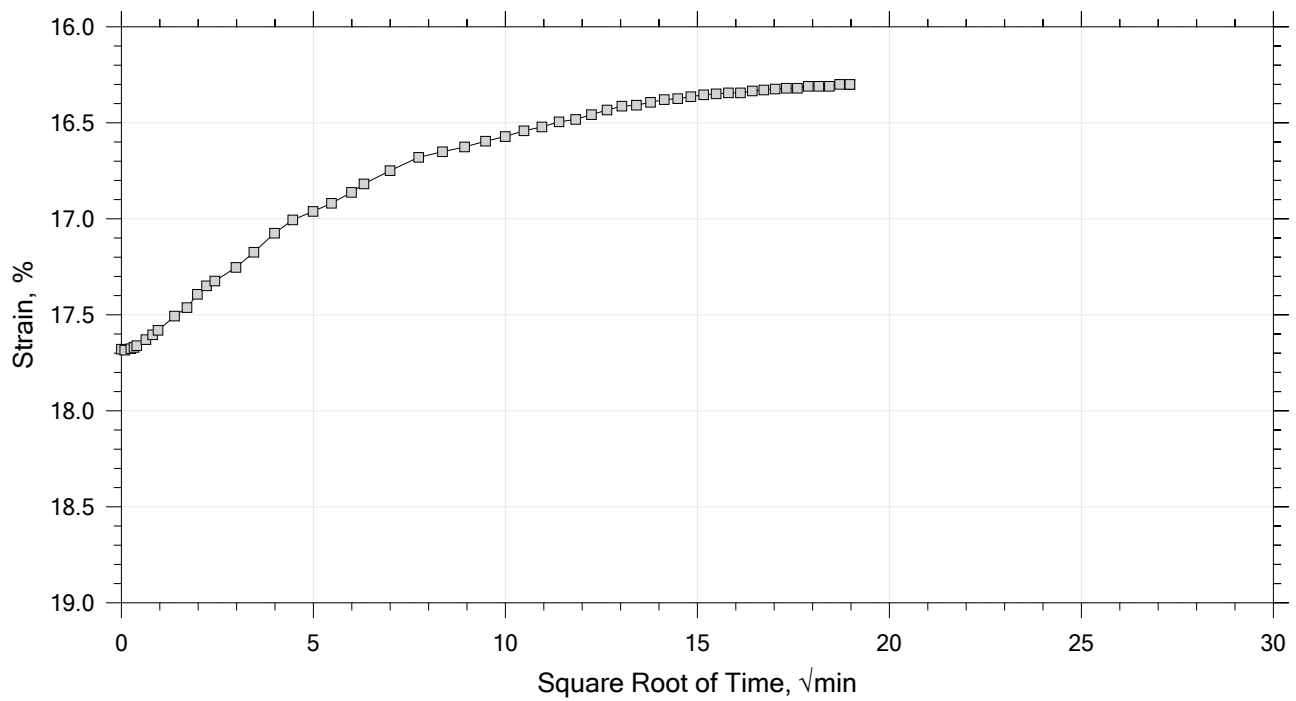
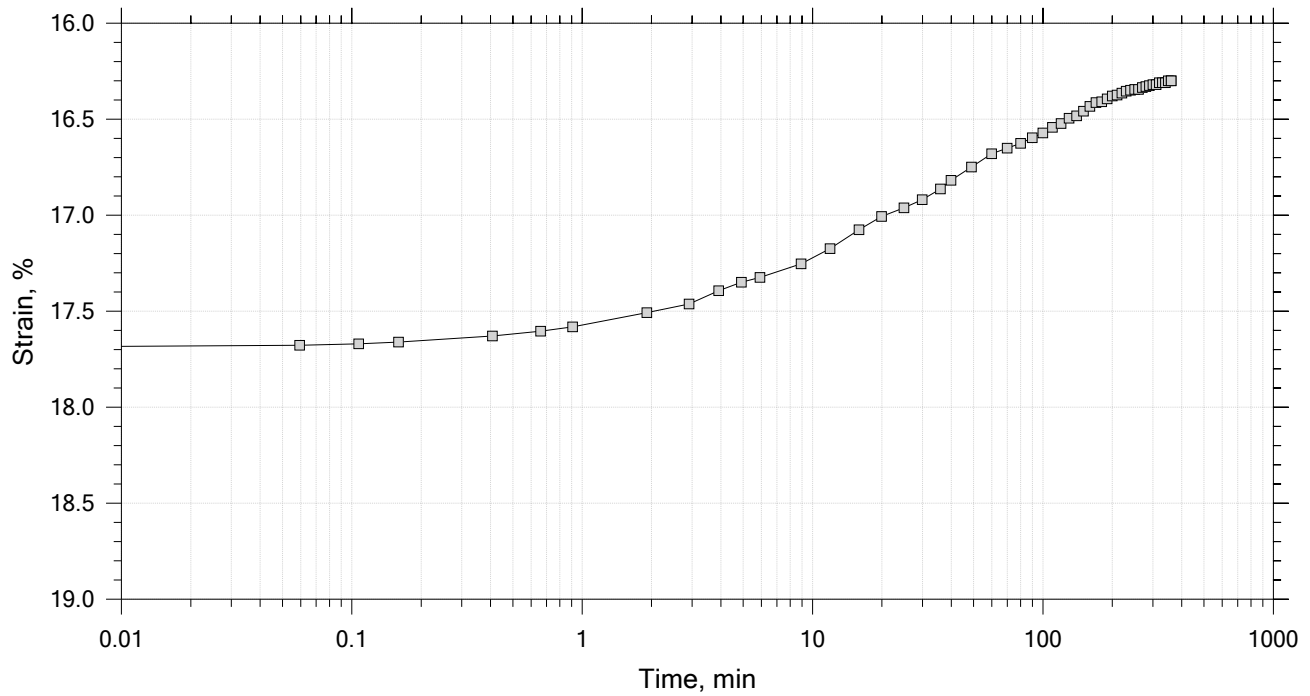
	Project: I-395/Rte 9 Connector	Location: Brewer-Eddington, ME	Project No.: GTX-313198
	Boring No.: HB-BB-226	Tested By: md	Checked By: anm
	Sample No.: U1	Test Date: 03/16/21	Depth: 6-8 ft
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, olive gray clay		
	Remarks: System X, Swell Pressure = 0.0656 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 14 of 15

Constant Load Step

Stress: 0.125 tsf



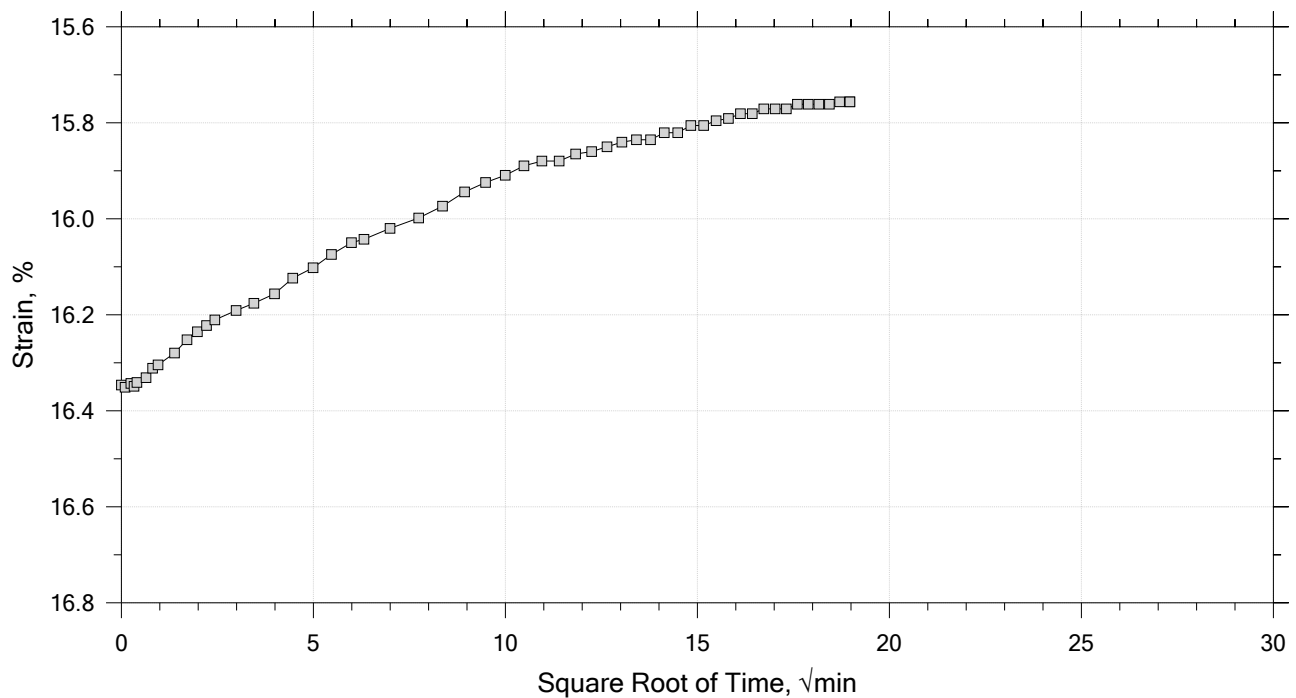
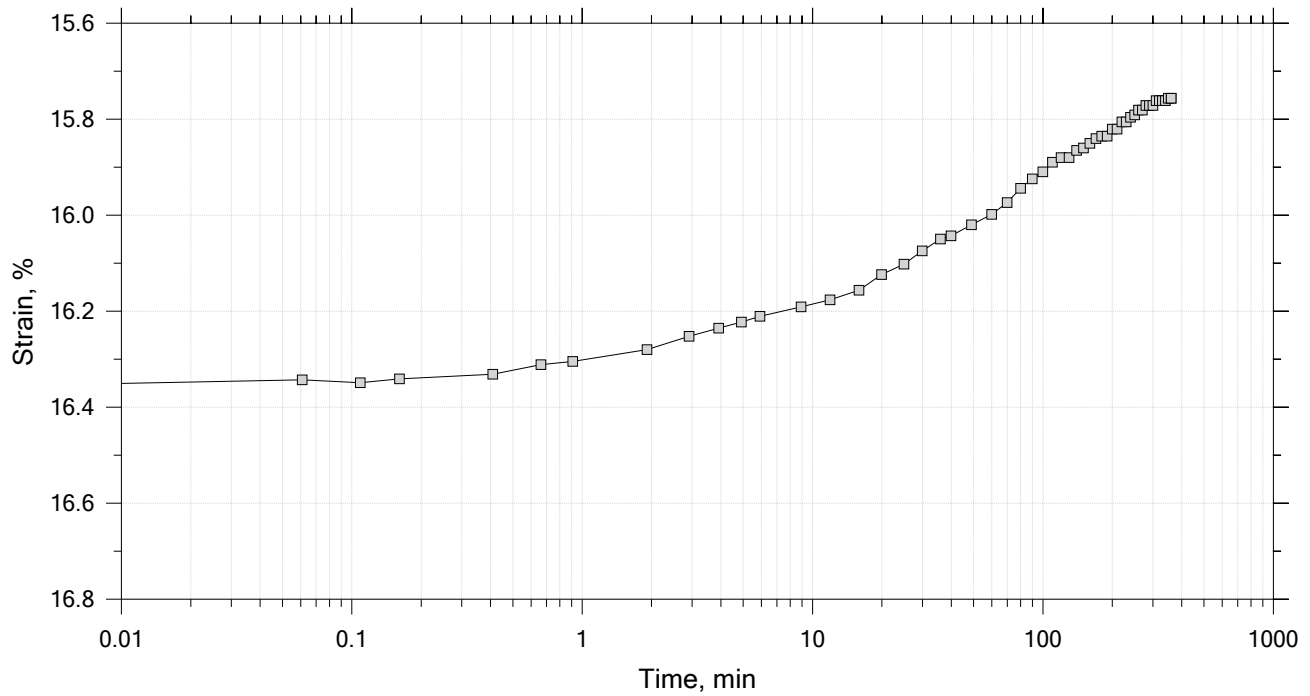
	Project: I-395/Rte 9 Connector	Location: Brewer-Eddington, ME	Project No.: GTX-313198
	Boring No.: HB-BB-226	Tested By: md	Checked By: anm
	Sample No.: U1	Test Date: 03/16/21	Depth: 6-8 ft
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, olive gray clay		
	Remarks: System X, Swell Pressure = 0.0656 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 15 of 15

Constant Load Step

Stress: 0.0625 tsf




	Project: I-395/Rte 9 Connector	Location: Brewer-Eddington, ME	Project No.: GTX-313198
	Boring No.: HB-BB-226	Tested By: md	Checked By: anm
	Sample No.: U1	Test Date: 03/16/21	Depth: 6-8 ft
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, olive gray clay		
	Remarks: System X, Swell Pressure = 0.0656 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Specimen Diameter: 2.50 in	Estimated Specific Gravity: 2.75	Liquid Limit: 33
Initial Height: 1.00 in	Initial Void Ratio: 0.776	Plastic Limit: 18
Final Height: 0.90 in	Final Void Ratio: 0.598	Plasticity Index: 15

	Before Test Trimmings	Before Test Specimen	After Test Specimen	After Test Trimmings
Container ID	E-1948	RING		E2031
Mass Container, gm	8.14	110.91	110.91	8.17
Mass Container + Wet Soil, gm	176.67	270.22	262.5	159.57
Mass Container + Dry Soil, gm	139.02	235.41	235.41	132.51
Mass Dry Soil, gm	130.88	124.5	124.5	124.34
Water Content, %	28.77	27.96	21.76	21.76
Void Ratio	---	0.78	0.60	---
Degree of Saturation, %	---	99.08	100.00	---
Dry Unit Weight, pcf	---	96.619	107.35	---


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

	Project: I-395/Rte 9 Connector	Location: Brewer-Eddington, ME	Project No.: GTX-313198
	Boring No.: HB-BB-226	Tested By: md	Checked By: anm
	Sample No.: U1	Test Date: 03/16/21	Depth: 6-8 ft
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, olive gray clay		
	Remarks: System X, Swell Pressure = 0.0656 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

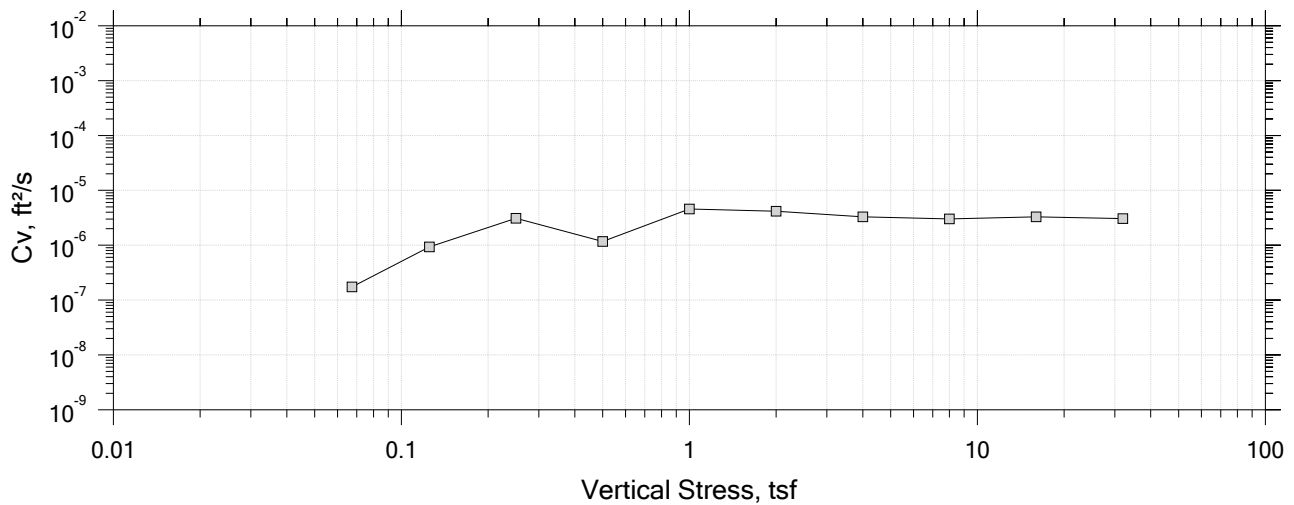
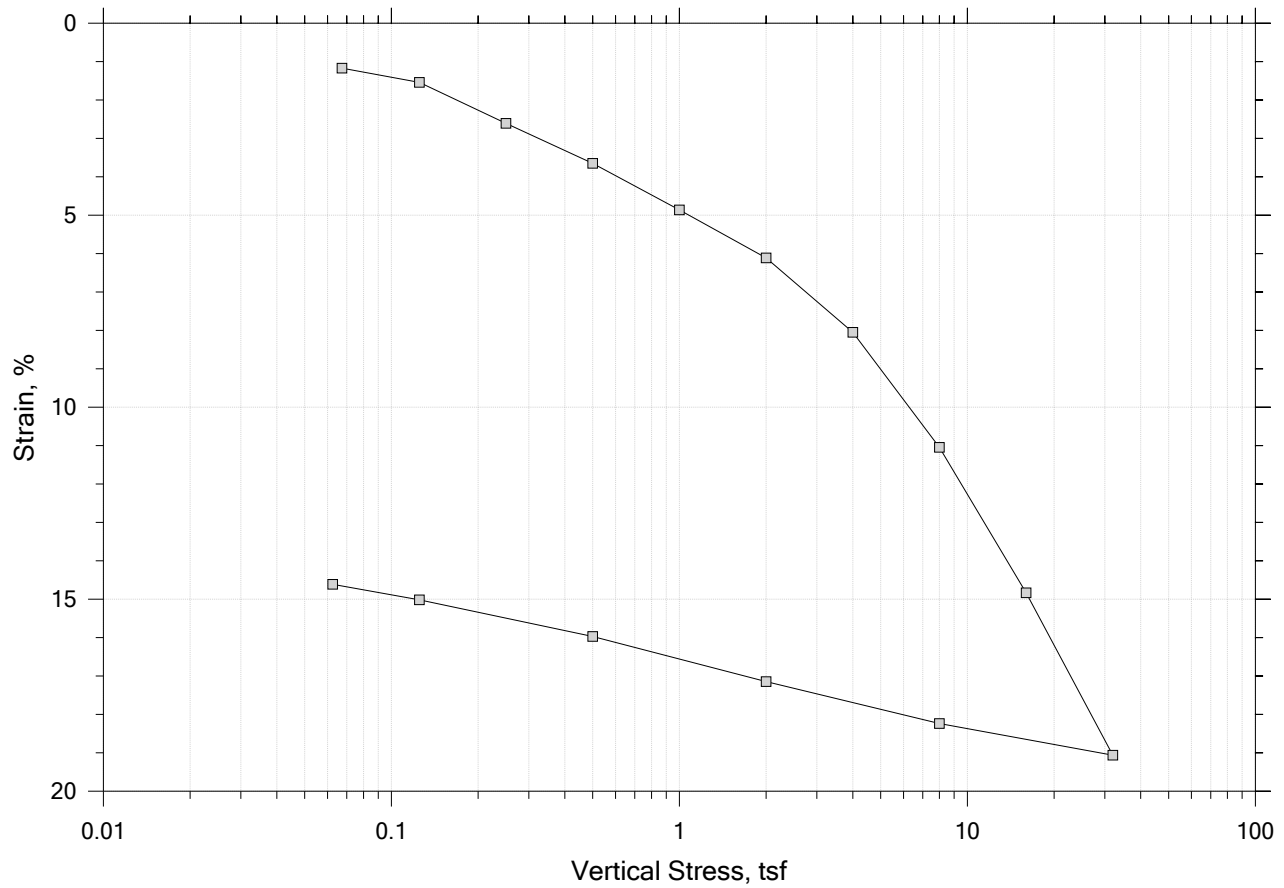
Square Root of Time Coefficients


[illegible]

	Project: I-395/Rte 9 Connector	Location: Brewer-Eddington, ME	Project No.: GTX-313198
	Boring No.: HB-BB-226	Tested By: md	Checked By: anm
	Sample No.: U1	Test Date: 03/16/21	Depth: 6-8 ft
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, olive gray clay		
	Remarks: System X, Swell Pressure = 0.0656 tsf		
	Displacement at End of Increment		

One-Dimensional Consolidation by ASTM D2435 - Method B

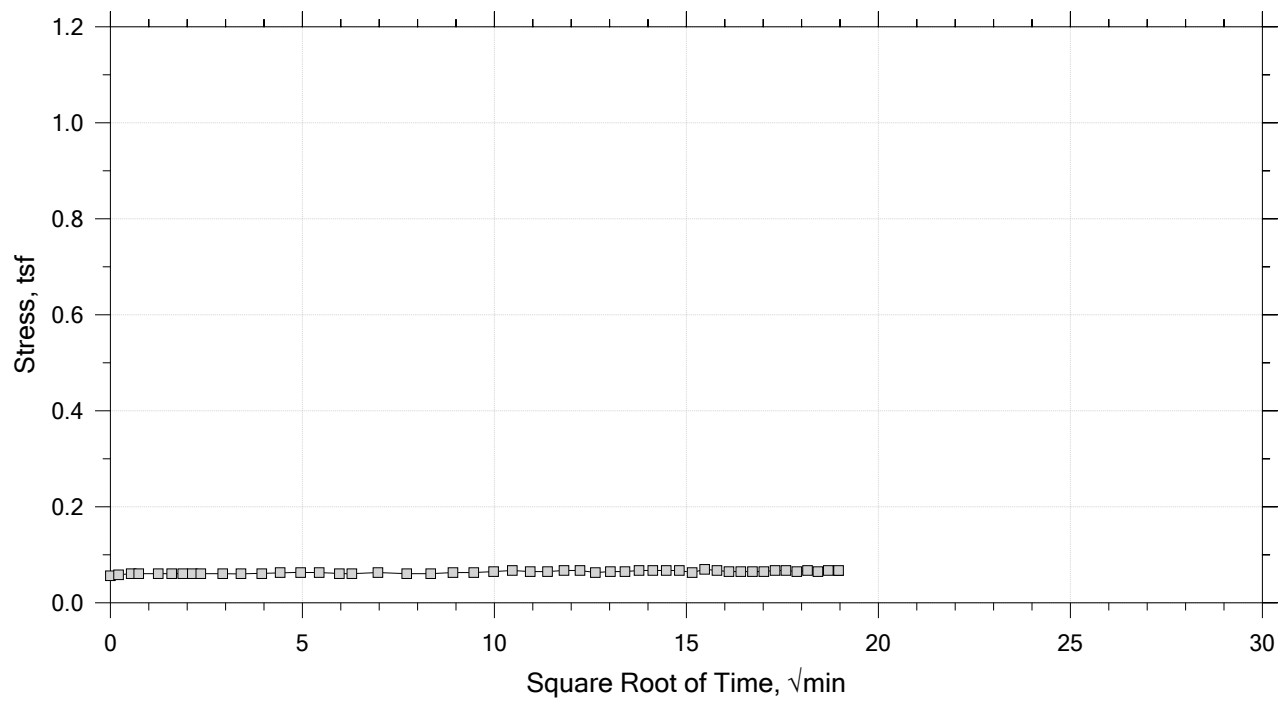
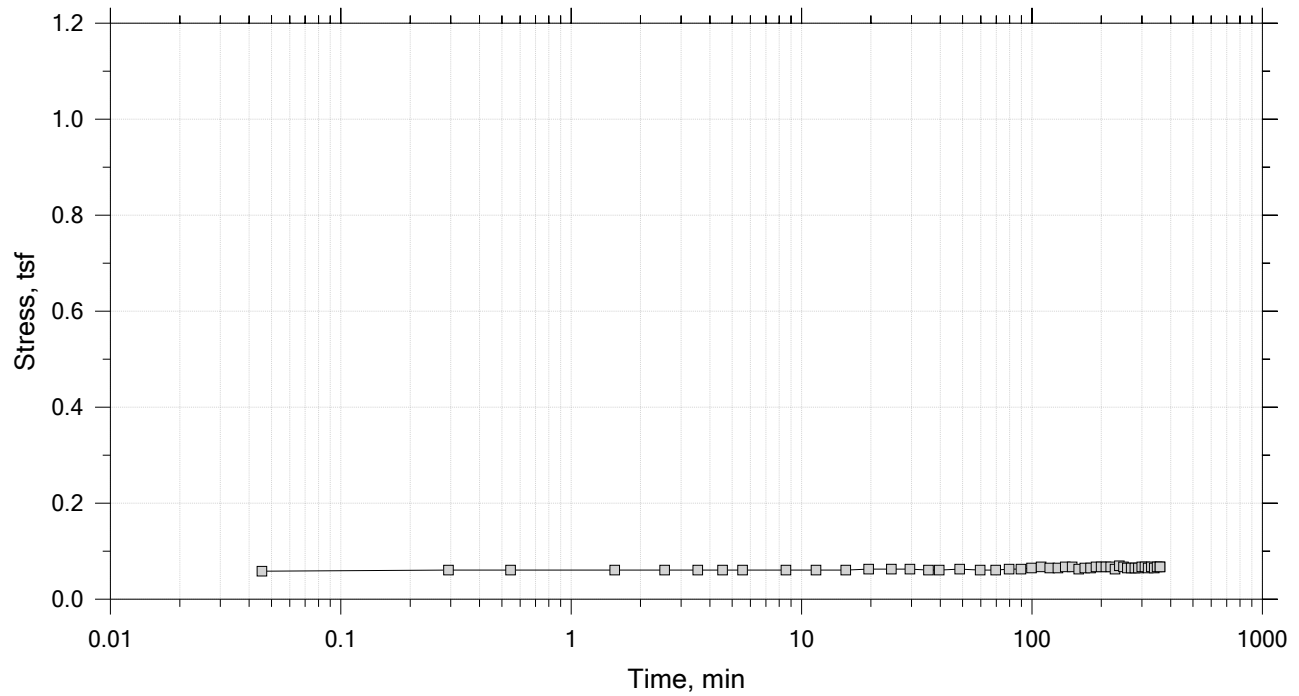
Summary Report




	Project: I-395/Rte 9 Connector	Location: Brewer-Eddington, ME	Project No.: GTX-313198
	Boring No.: HB-BB-227	Tested By: md	Checked By: anm
	Sample No.: U1	Test Date: 03/16/21	Depth: 5-7 ft
	Test No.: IP-3	Sample Type: intact	Elevation: ---
	Description: Moist, olive gray clay		
	Remarks: System X, Swell Pressure = 0.0673 tsf		
	Displacement at End of Increment		

One-Dimensional Consolidation by ASTM D2435 - Method B

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



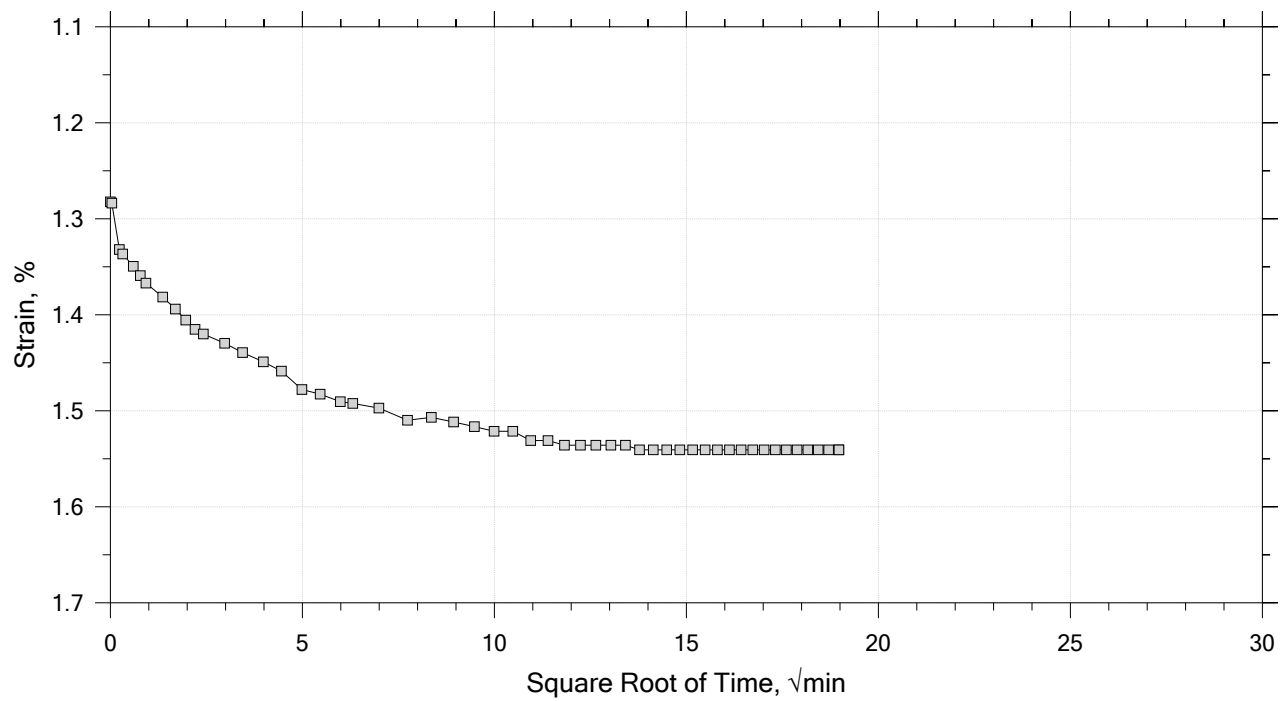
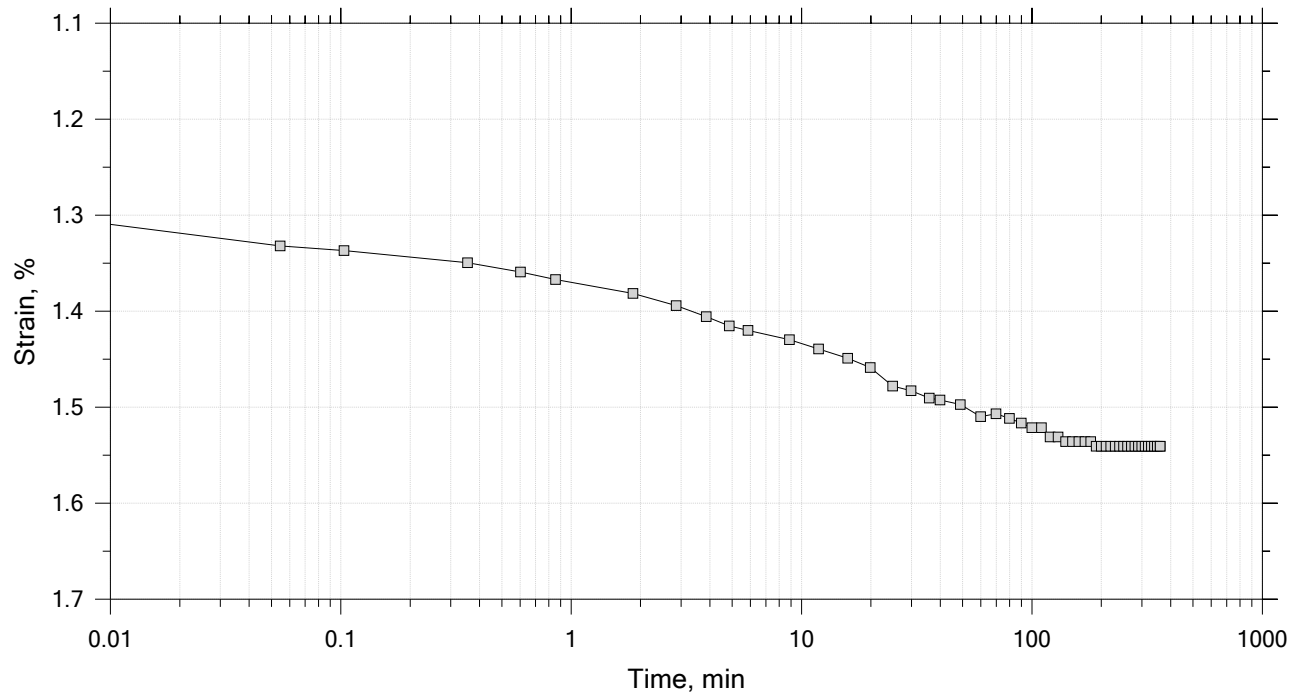
	Project: I-395/Rte 9 Connector	Location: Brewer-Eddington, ME	Project No.: GTX-313198
	Boring No.: HB-BB-227	Tested By: md	Checked By: anm
	Sample No.: U1	Test Date: 03/16/21	Depth: 5-7 ft
	Test No.: IP-3	Sample Type: intact	Elevation: ---
	Description: Moist, olive gray clay		
	Remarks: System X, Swell Pressure = 0.0673 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 2 of 15

Constant Load Step

Stress: 0.125 tsf



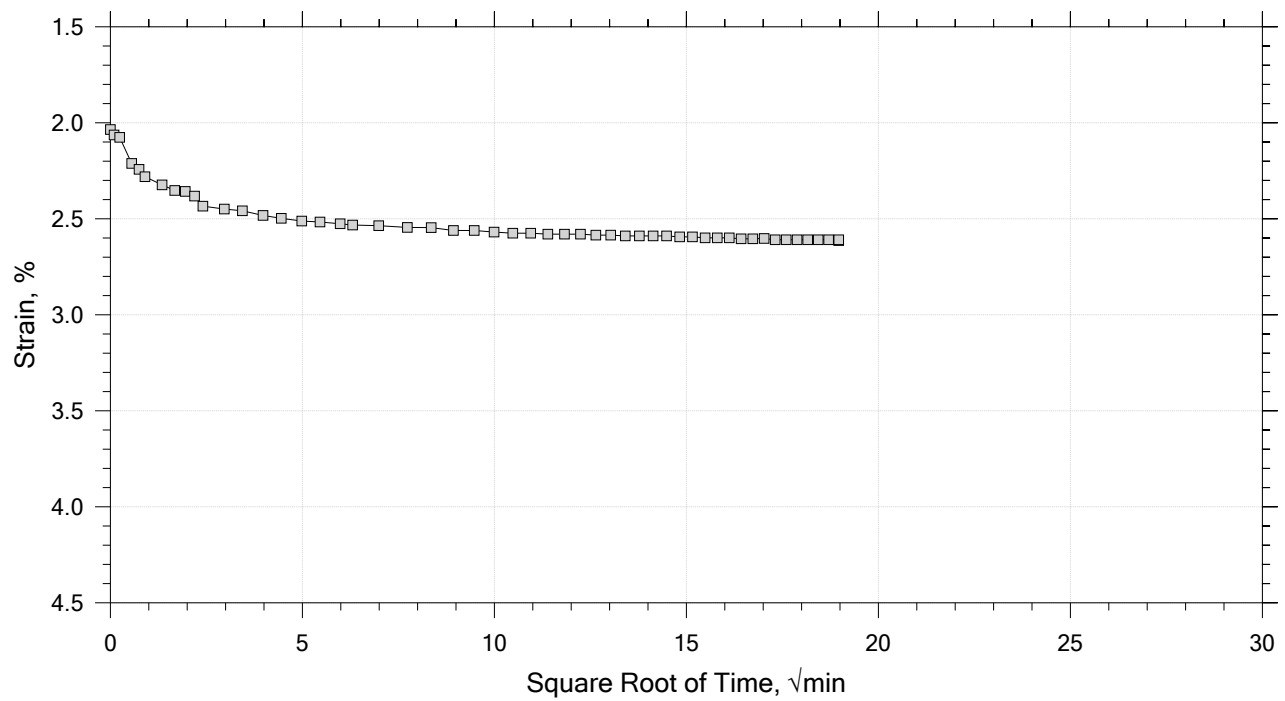
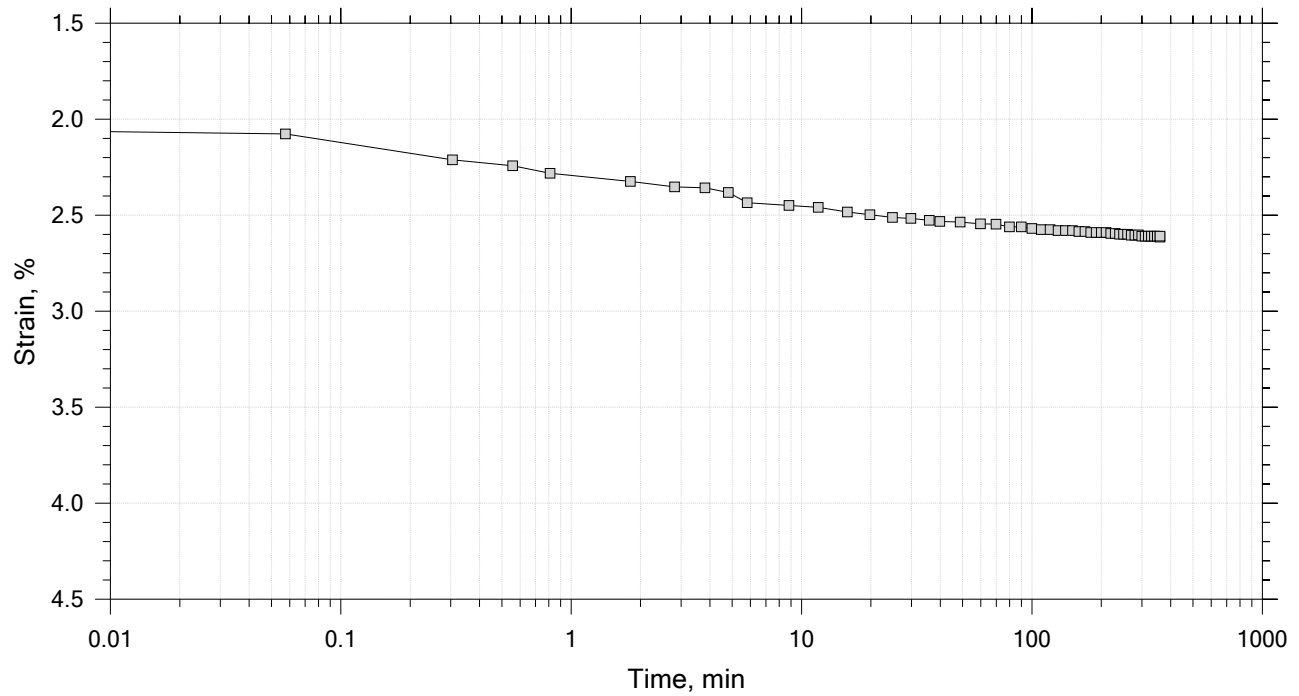
	Project: I-395/Rte 9 Connector	Location: Brewer-Eddington, ME	Project No.: GTX-313198
	Boring No.: HB-BB-227	Tested By: md	Checked By: anm
	Sample No.: U1	Test Date: 03/16/21	Depth: 5-7 ft
	Test No.: IP-3	Sample Type: intact	Elevation: ---
	Description: Moist, olive gray clay		
	Remarks: System X, Swell Pressure = 0.0673 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 3 of 15

Constant Load Step

Stress: 0.25 tsf



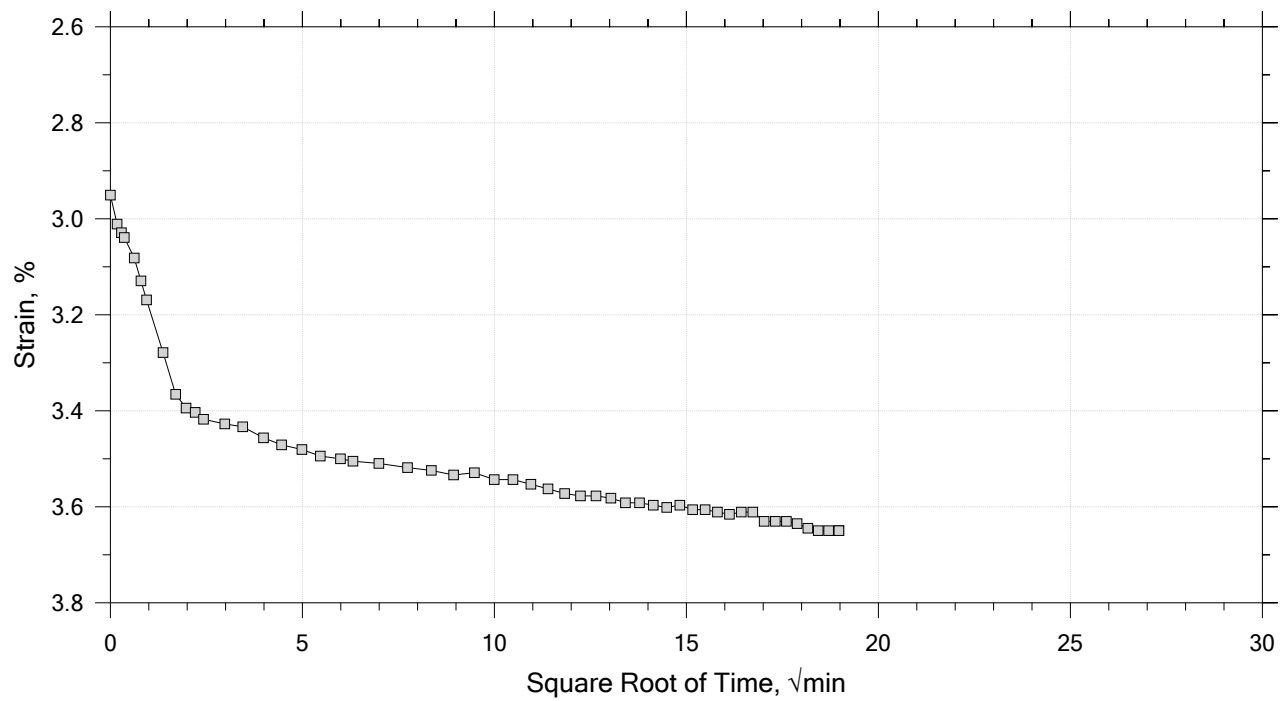
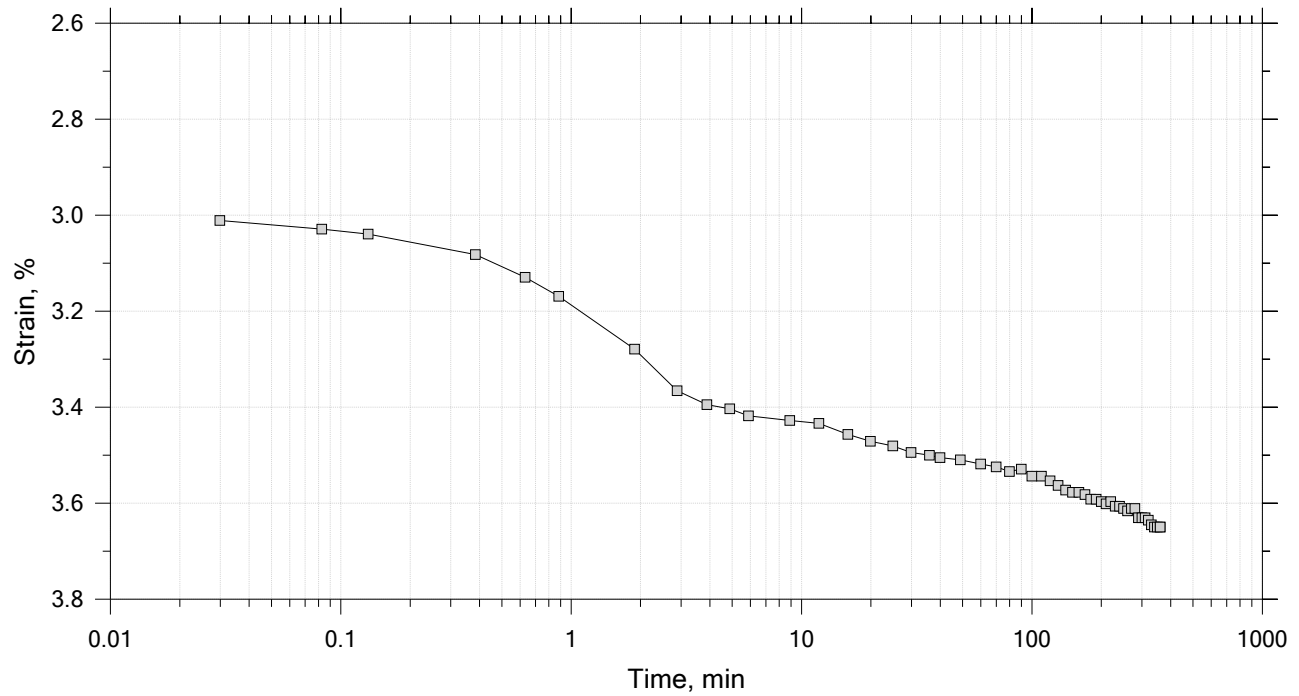
	Project: I-395/Rte 9 Connector	Location: Brewer-Eddington, ME	Project No.: GTX-313198
	Boring No.: HB-BB-227	Tested By: md	Checked By: anm
	Sample No.: U1	Test Date: 03/16/21	Depth: 5-7 ft
	Test No.: IP-3	Sample Type: intact	Elevation: ---
	Description: Moist, olive gray clay		
	Remarks: System X, Swell Pressure = 0.0673 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 4 of 15

Constant Load Step

Stress: 0.5 tsf



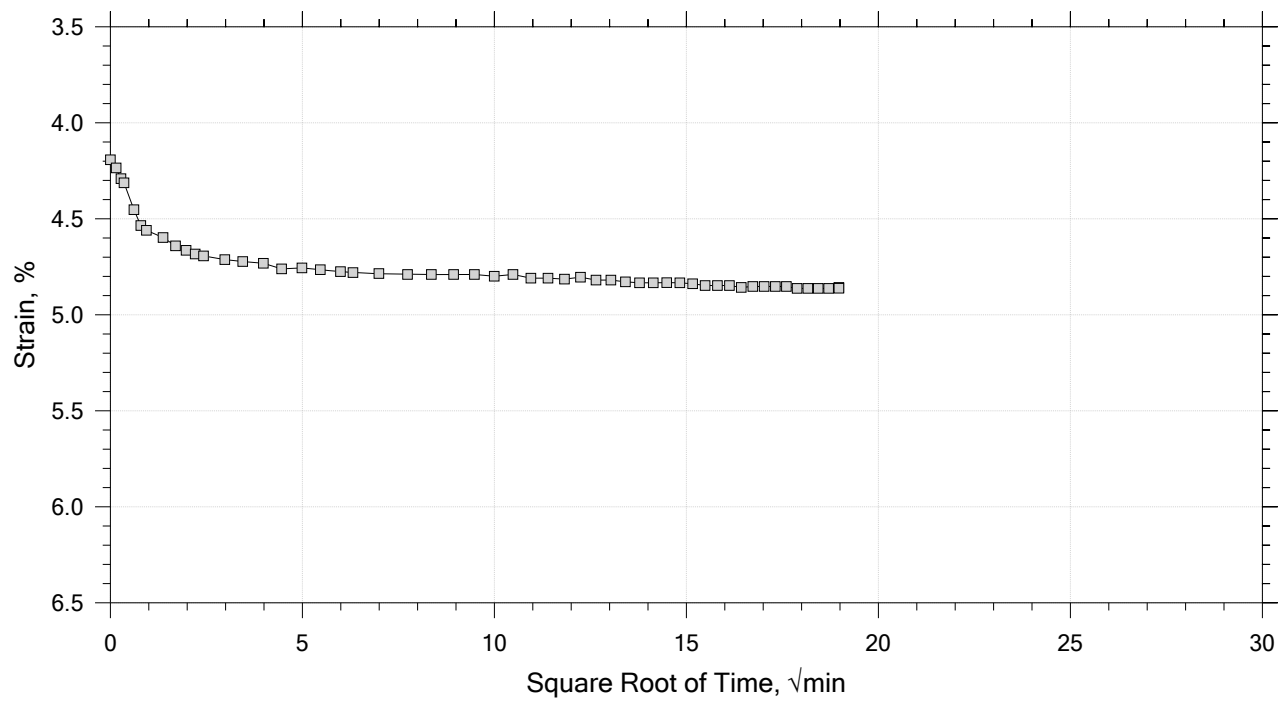
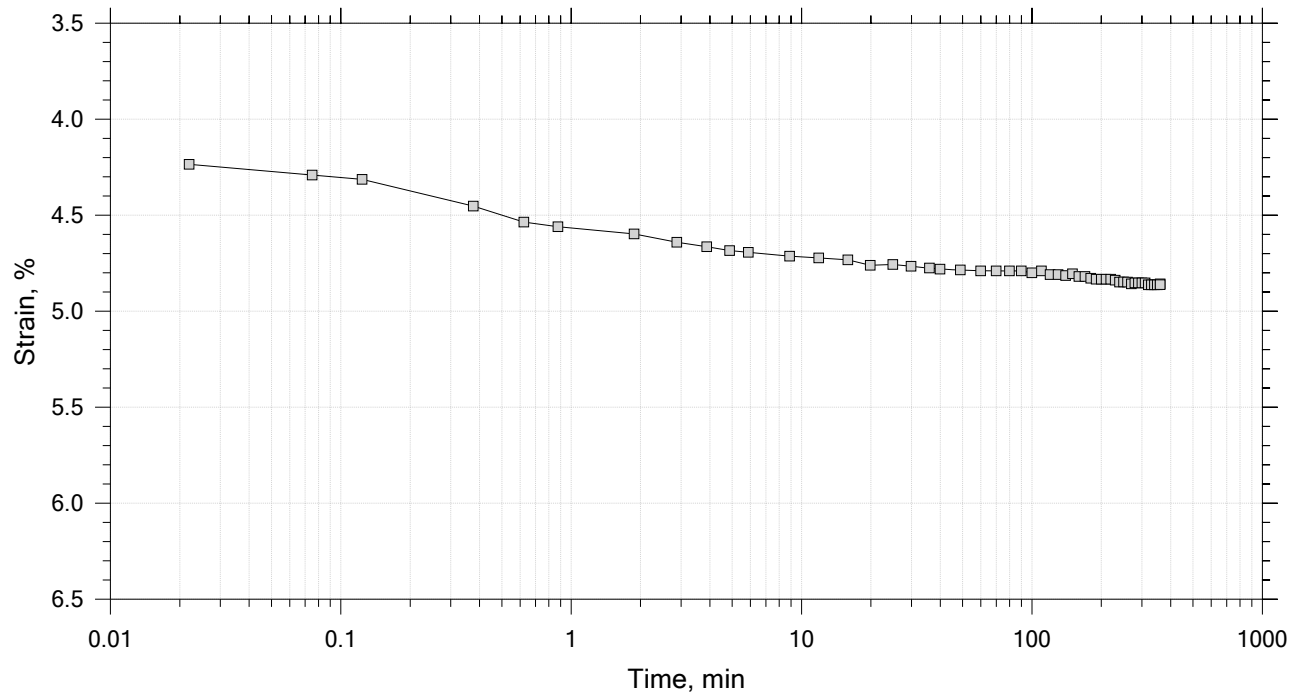
	Project: I-395/Rte 9 Connector	Location: Brewer-Eddington, ME	Project No.: GTX-313198
	Boring No.: HB-BB-227	Tested By: md	Checked By: anm
	Sample No.: U1	Test Date: 03/16/21	Depth: 5-7 ft
	Test No.: IP-3	Sample Type: intact	Elevation: ---
	Description: Moist, olive gray clay		
	Remarks: System X, Swell Pressure = 0.0673 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 5 of 15

Constant Load Step

Stress: 1 tsf



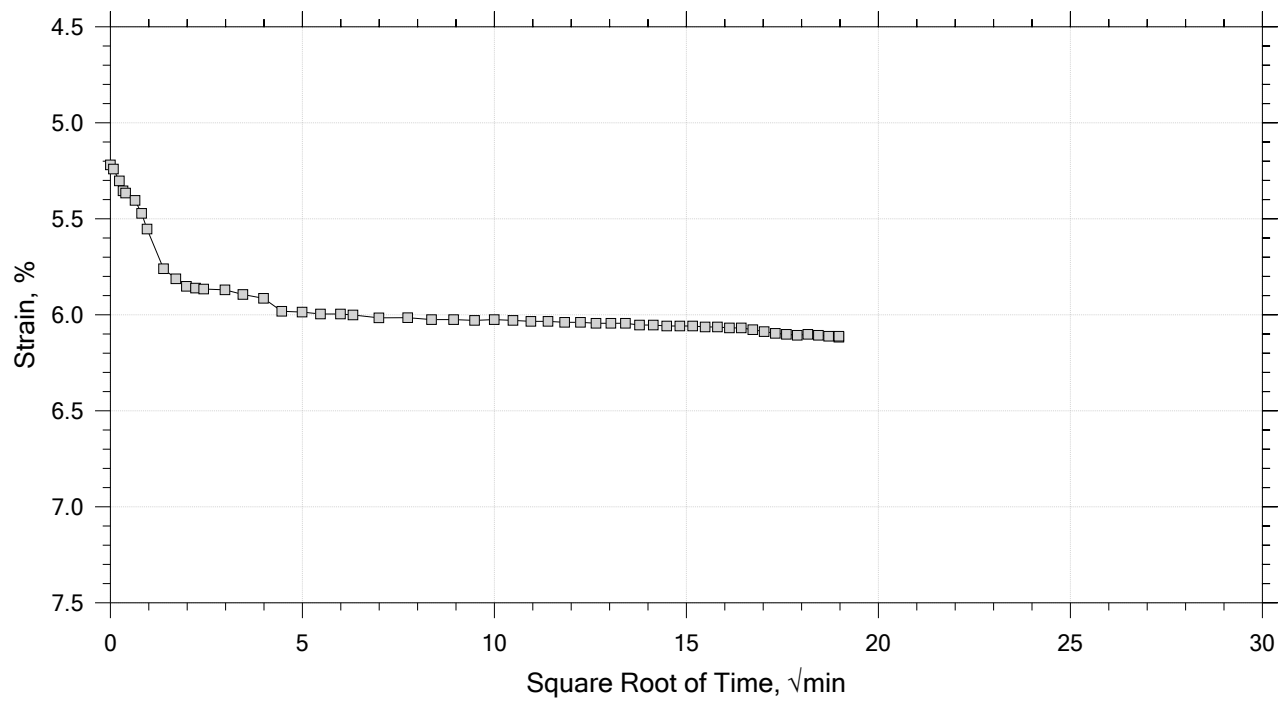
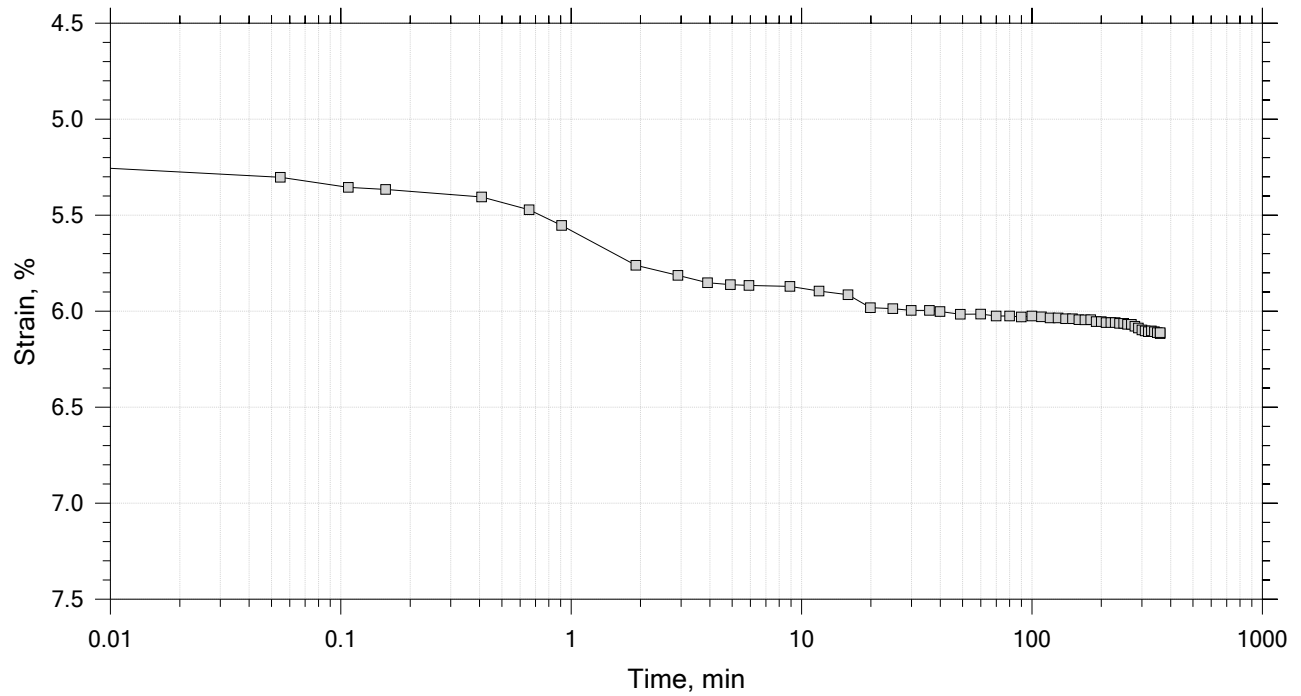
	Project: I-395/Rte 9 Connector	Location: Brewer-Eddington, ME	Project No.: GTX-313198
	Boring No.: HB-BB-227	Tested By: md	Checked By: anm
	Sample No.: U1	Test Date: 03/16/21	Depth: 5-7 ft
	Test No.: IP-3	Sample Type: intact	Elevation: ---
	Description: Moist, olive gray clay		
	Remarks: System X, Swell Pressure = 0.0673 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 6 of 15

Constant Load Step

Stress: 2 tsf



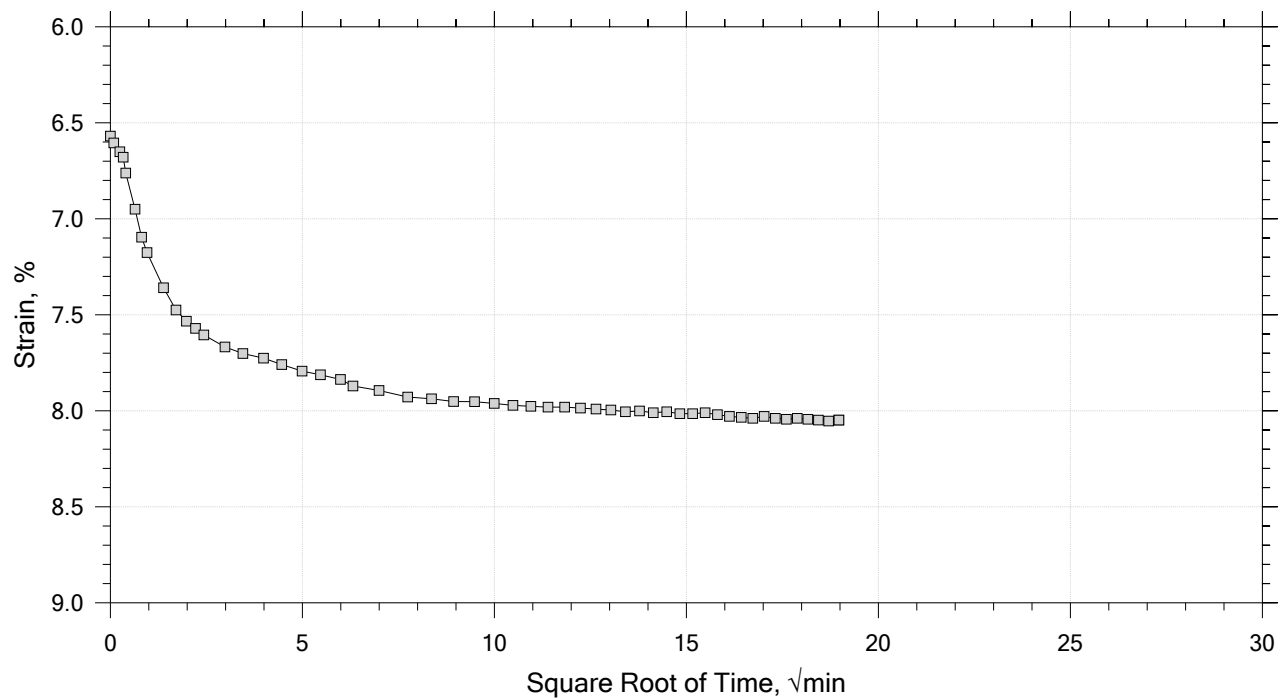
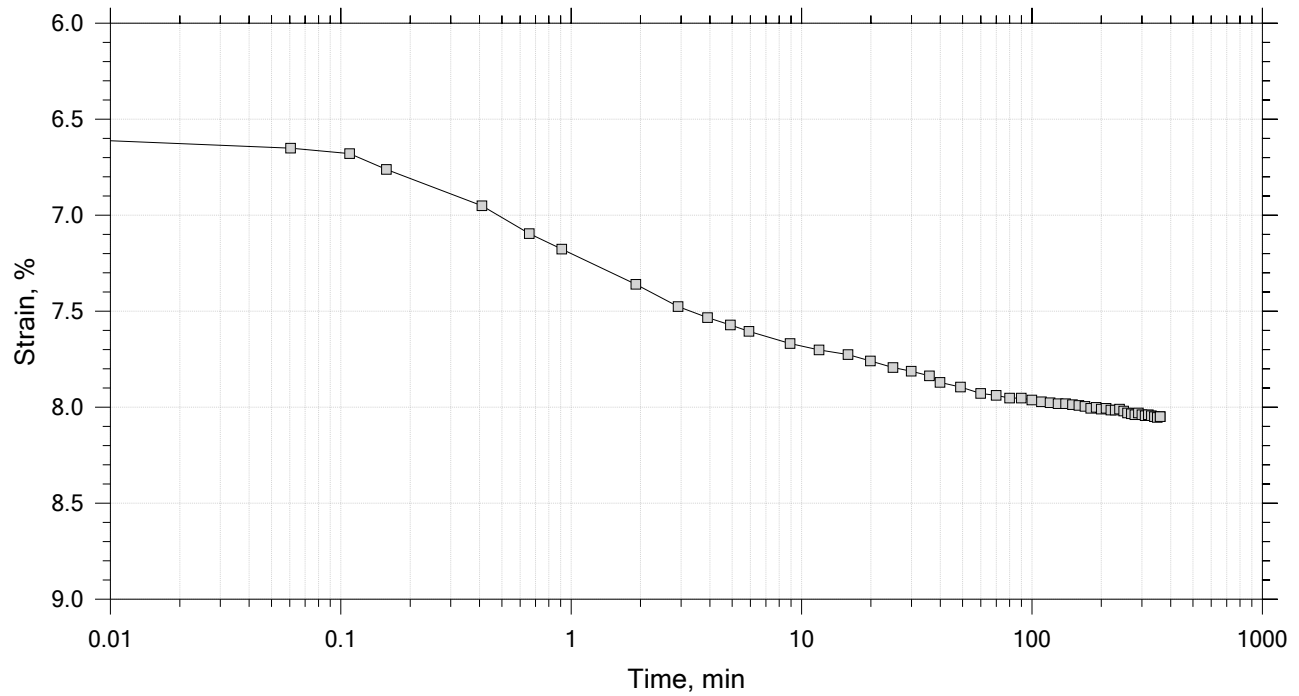
	Project: I-395/Rte 9 Connector	Location: Brewer-Eddington, ME	Project No.: GTX-313198
	Boring No.: HB-BB-227	Tested By: md	Checked By: anm
	Sample No.: U1	Test Date: 03/16/21	Depth: 5-7 ft
	Test No.: IP-3	Sample Type: intact	Elevation: ---
	Description: Moist, olive gray clay		
	Remarks: System X, Swell Pressure = 0.0673 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 7 of 15

Constant Load Step

Stress: 4 tsf



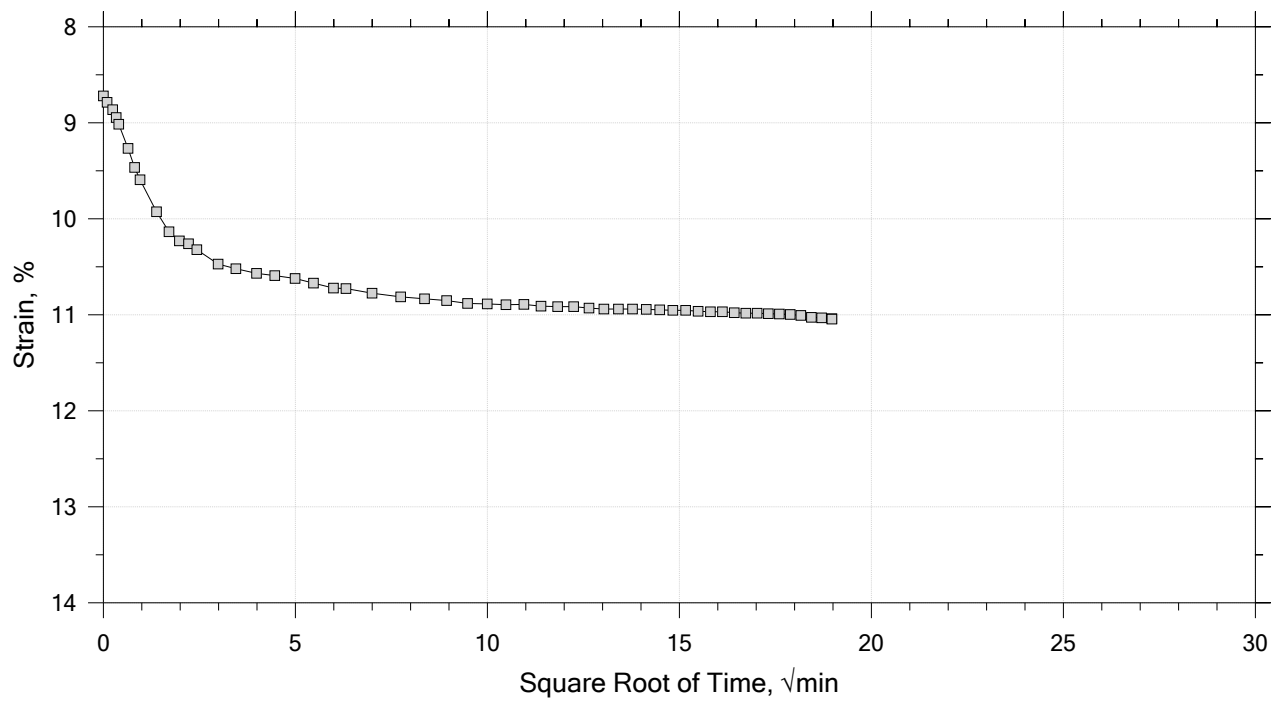
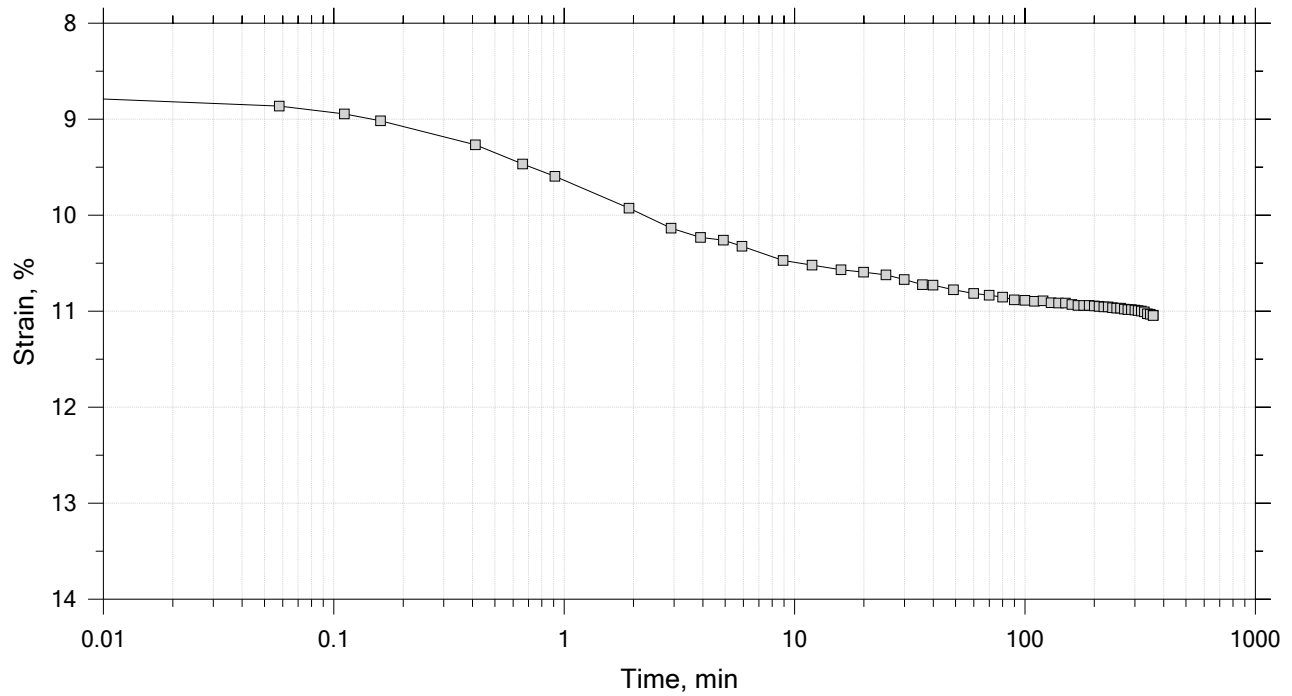
	Project: I-395/Rte 9 Connector	Location: Brewer-Eddington, ME	Project No.: GTX-313198
	Boring No.: HB-BB-227	Tested By: md	Checked By: anm
	Sample No.: U1	Test Date: 03/16/21	Depth: 5-7 ft
	Test No.: IP-3	Sample Type: intact	Elevation: ---
	Description: Moist, olive gray clay		
	Remarks: System X, Swell Pressure = 0.0673 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 8 of 15

Constant Load Step

Stress: 8 tsf



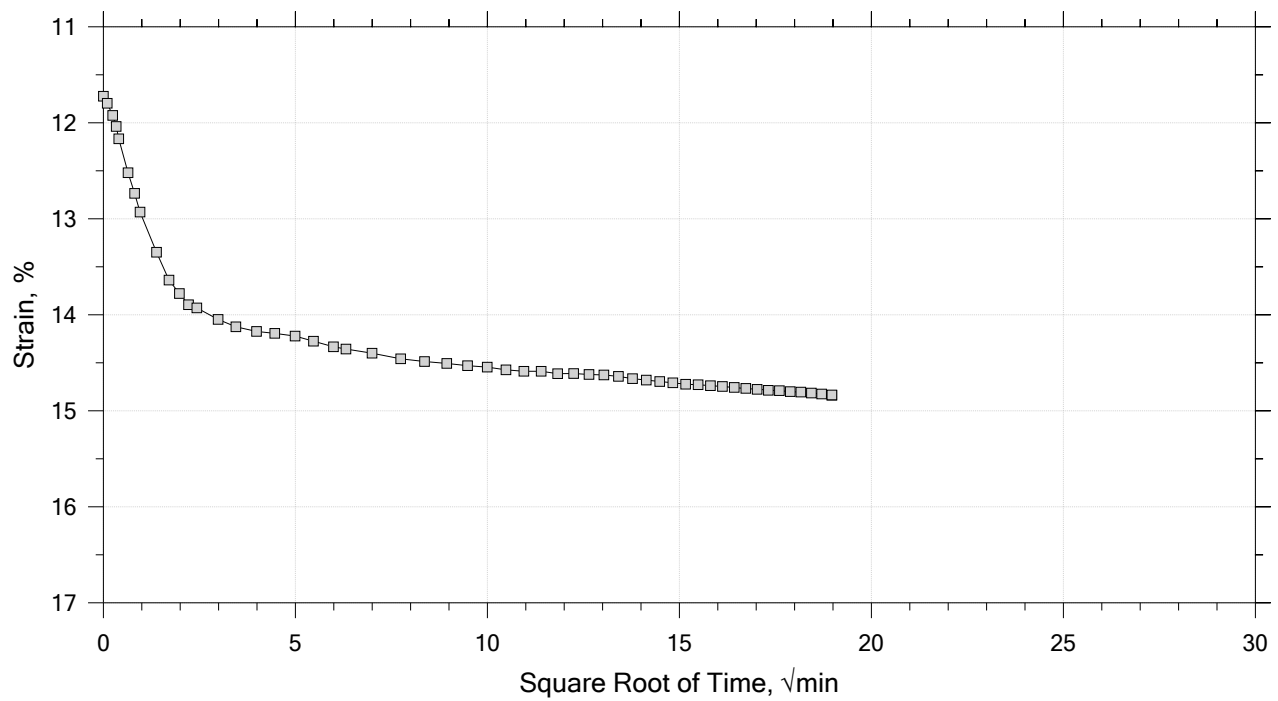
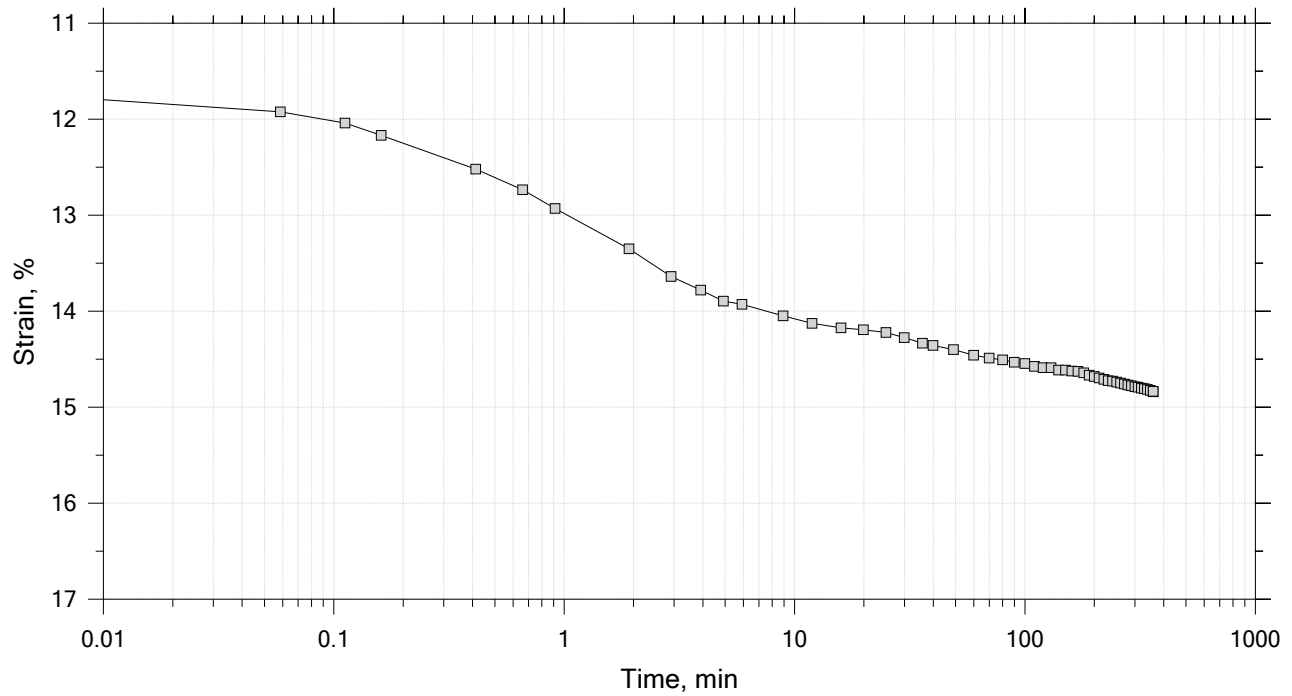
	Project: I-395/Rte 9 Connector	Location: Brewer-Eddington, ME	Project No.: GTX-313198
	Boring No.: HB-BB-227	Tested By: md	Checked By: anm
	Sample No.: U1	Test Date: 03/16/21	Depth: 5-7 ft
	Test No.: IP-3	Sample Type: intact	Elevation: ---
	Description: Moist, olive gray clay		
	Remarks: System X, Swell Pressure = 0.0673 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 9 of 15

Constant Load Step

Stress: 16 tsf



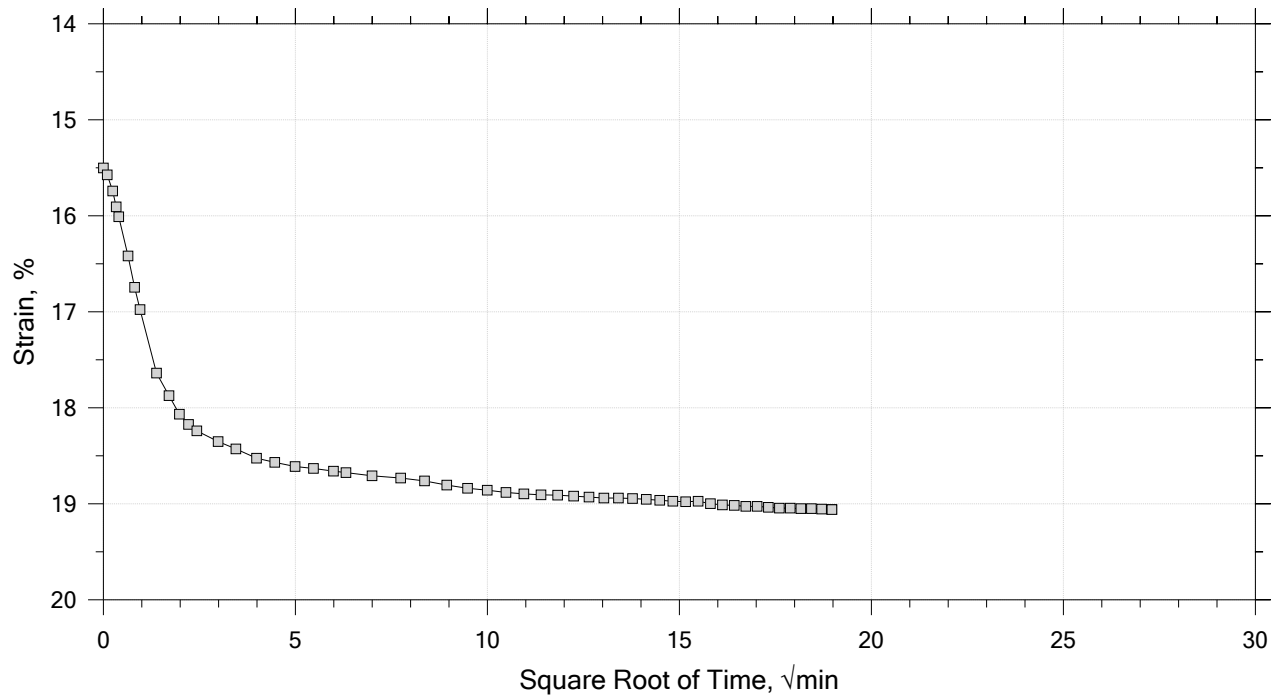
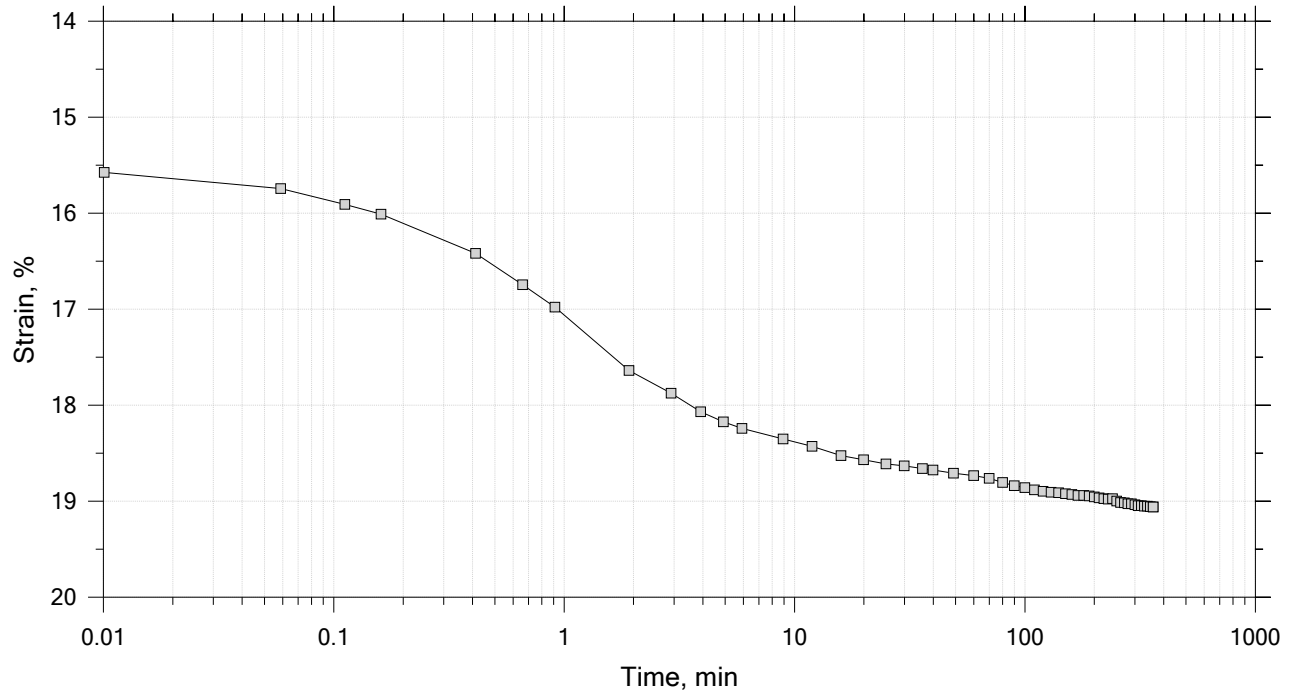
	Project: I-395/Rte 9 Connector	Location: Brewer-Eddington, ME	Project No.: GTX-313198
	Boring No.: HB-BB-227	Tested By: md	Checked By: anm
	Sample No.: U1	Test Date: 03/16/21	Depth: 5-7 ft
	Test No.: IP-3	Sample Type: intact	Elevation: ---
	Description: Moist, olive gray clay		
	Remarks: System X, Swell Pressure = 0.0673 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 10 of 15

Constant Load Step

Stress: 32 tsf



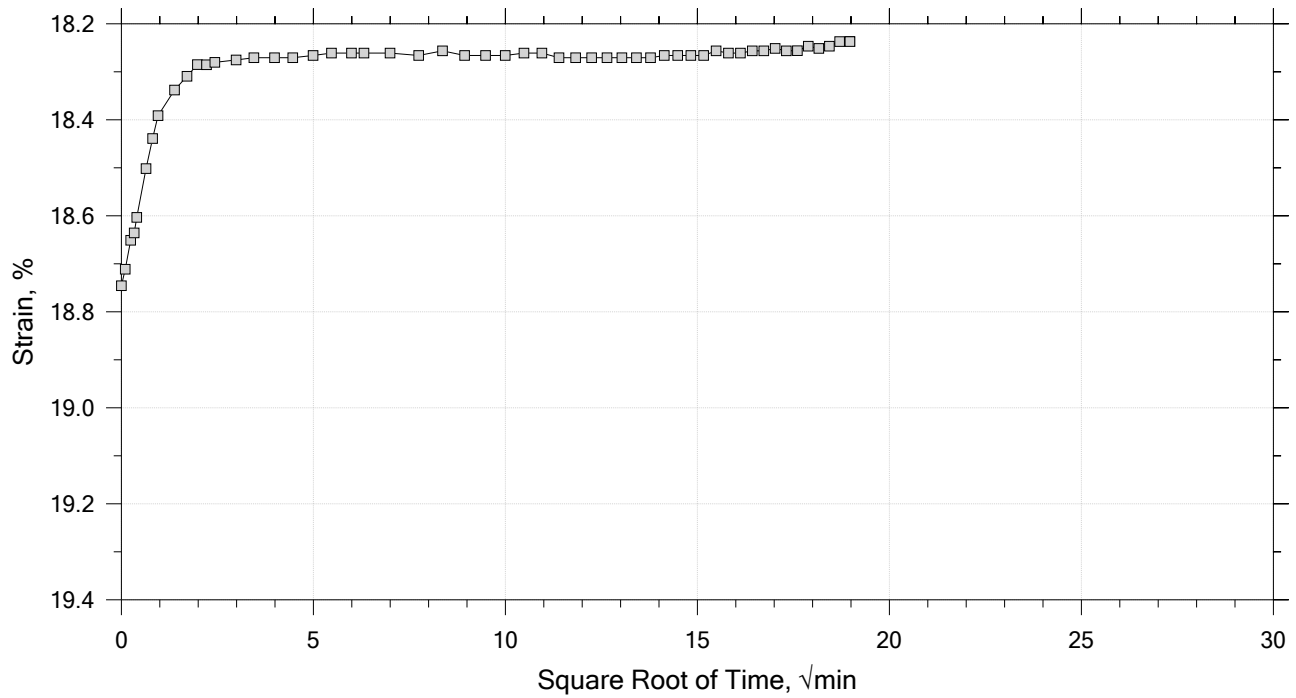
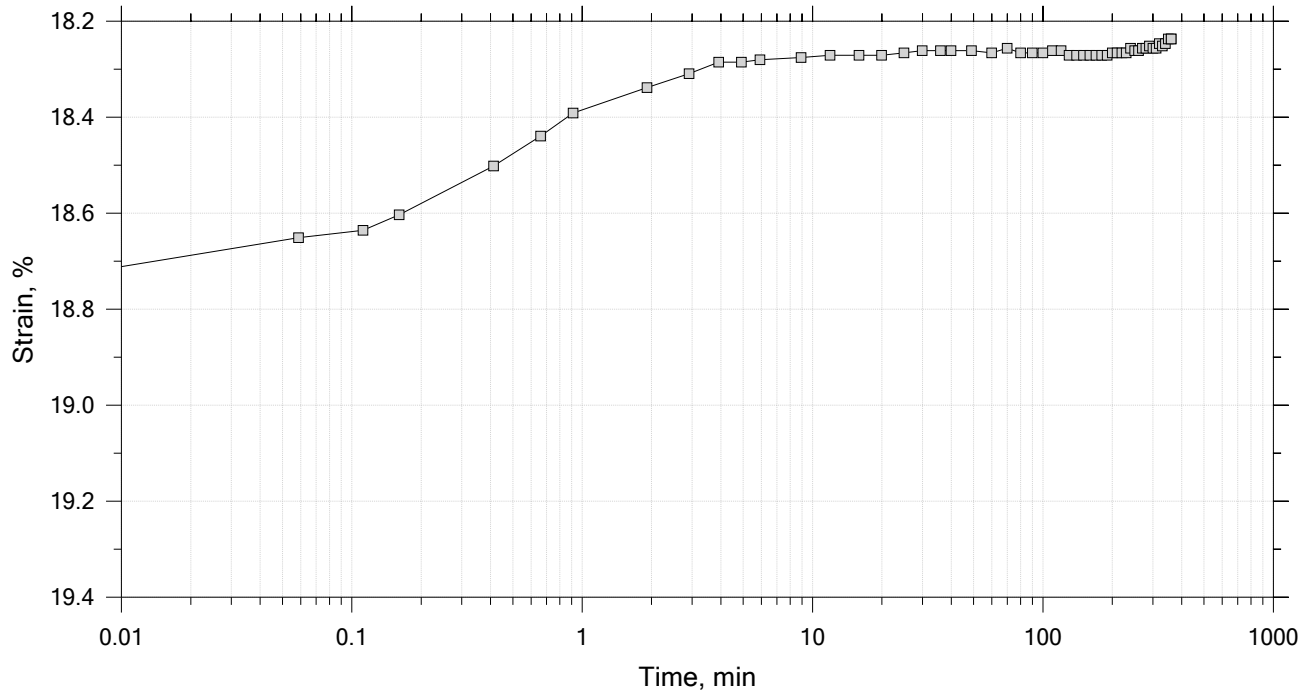
	Project: I-395/Rte 9 Connector	Location: Brewer-Eddington, ME	Project No.: GTX-313198
	Boring No.: HB-BB-227	Tested By: md	Checked By: anm
	Sample No.: U1	Test Date: 03/16/21	Depth: 5-7 ft
	Test No.: IP-3	Sample Type: intact	Elevation: ---
	Description: Moist, olive gray clay		
	Remarks: System X, Swell Pressure = 0.0673 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 11 of 15

Constant Load Step

Stress: 8 tsf



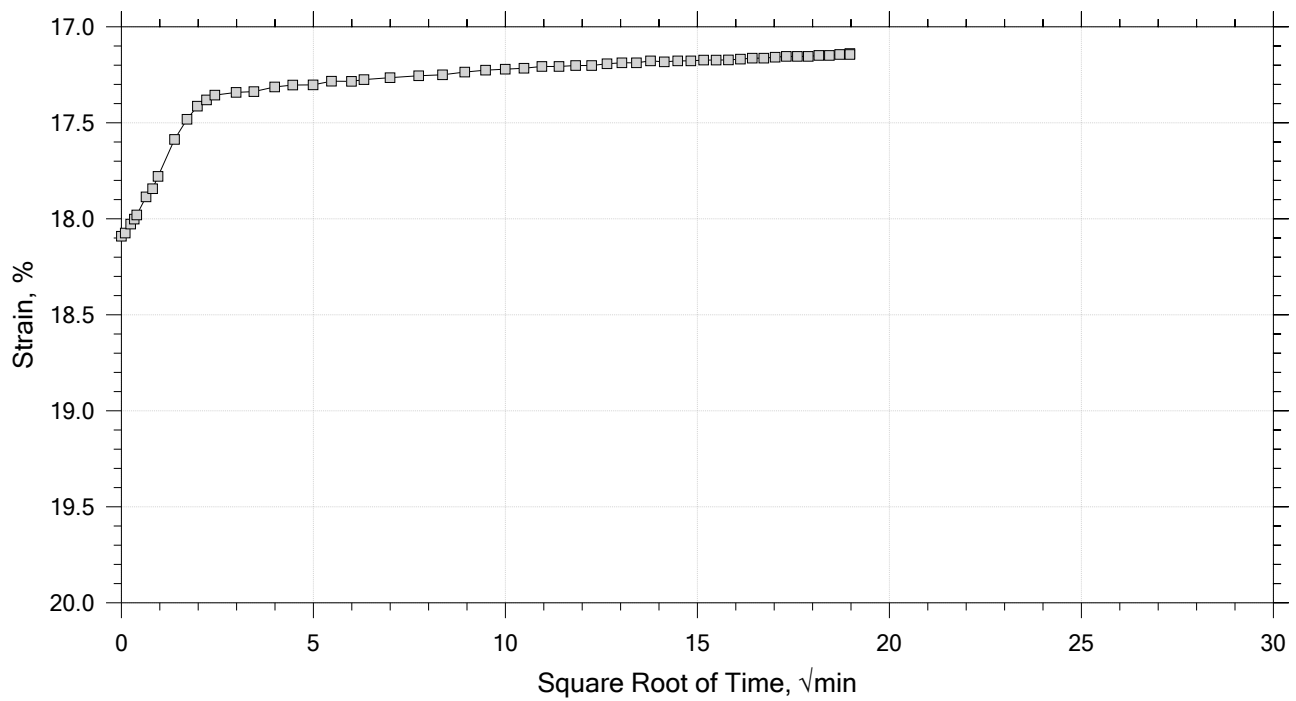
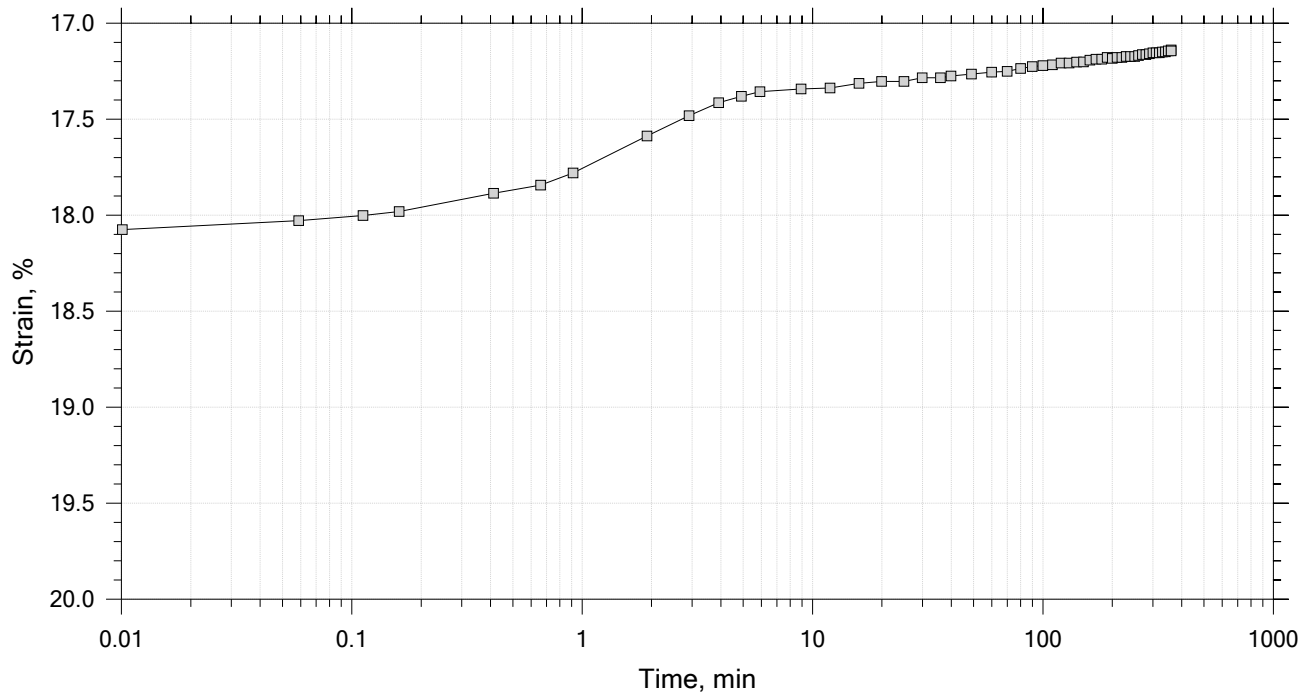
	Project: I-395/Rte 9 Connector	Location: Brewer-Eddington, ME	Project No.: GTX-313198
	Boring No.: HB-BB-227	Tested By: md	Checked By: anm
	Sample No.: U1	Test Date: 03/16/21	Depth: 5-7 ft
	Test No.: IP-3	Sample Type: intact	Elevation: ---
	Description: Moist, olive gray clay		
	Remarks: System X, Swell Pressure = 0.0673 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 12 of 15

Constant Load Step

Stress: 2 tsf



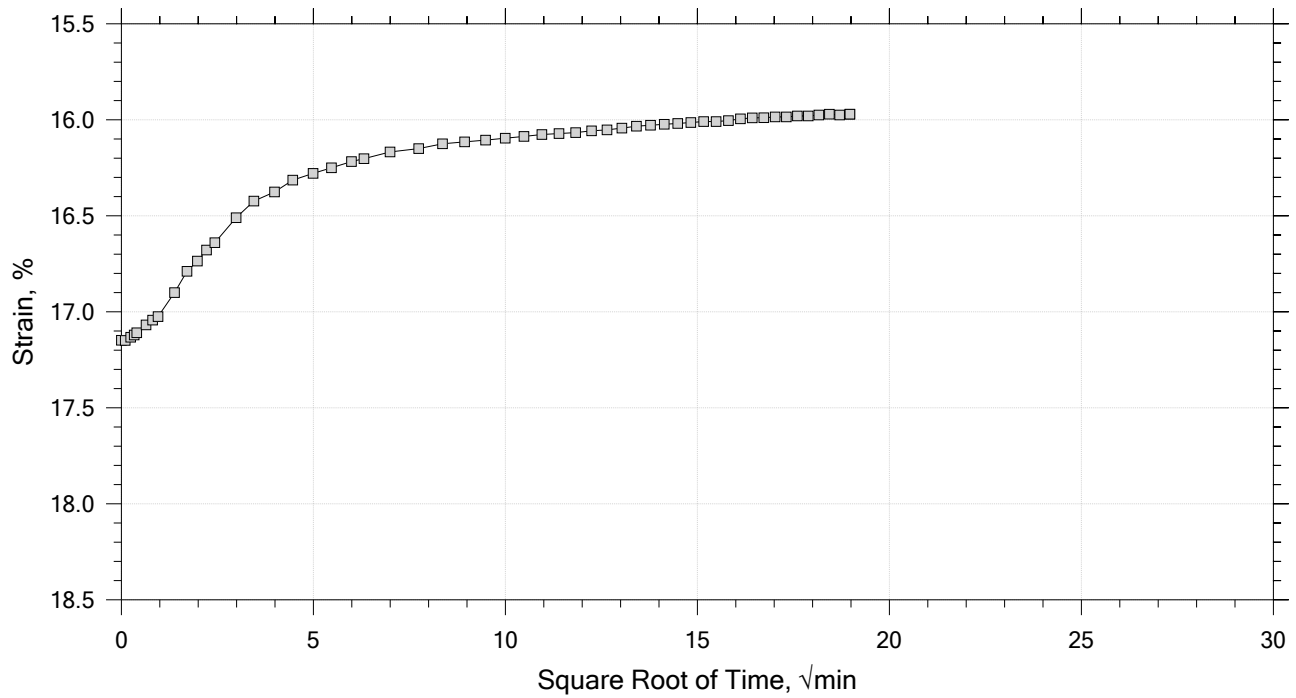
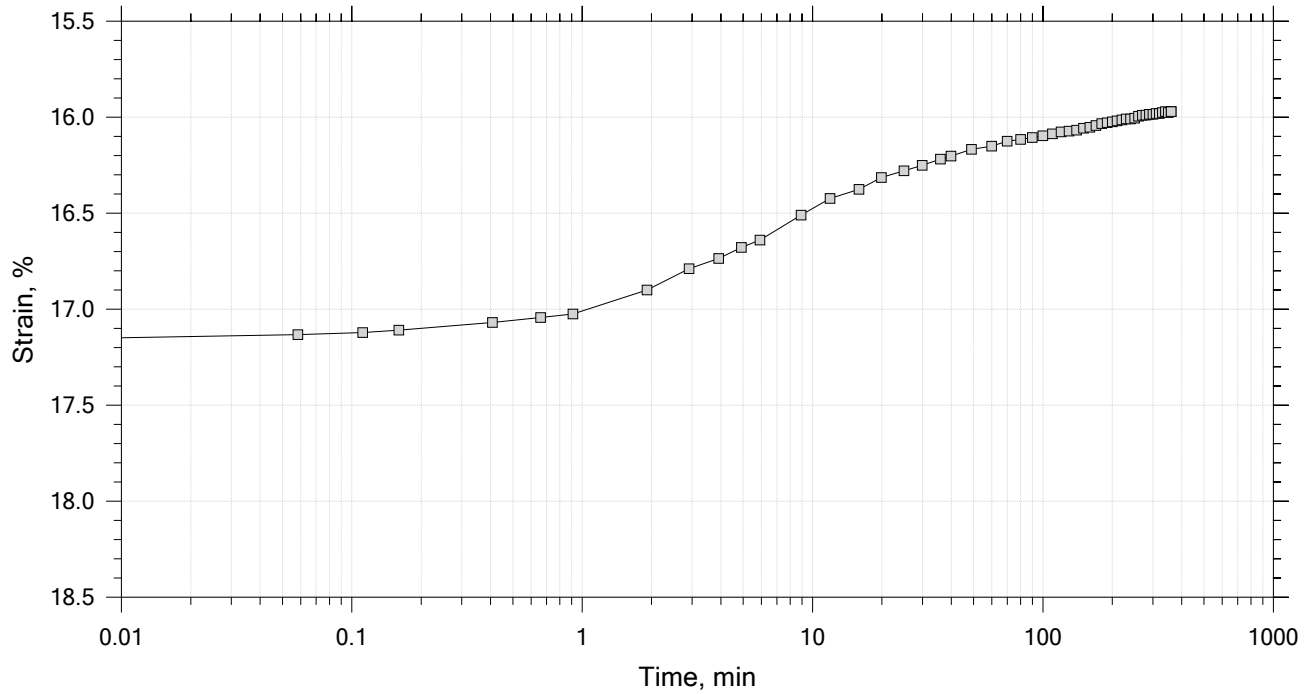
	Project: I-395/Rte 9 Connector	Location: Brewer-Eddington, ME	Project No.: GTX-313198
	Boring No.: HB-BB-227	Tested By: md	Checked By: anm
	Sample No.: U1	Test Date: 03/16/21	Depth: 5-7 ft
	Test No.: IP-3	Sample Type: intact	Elevation: ---
	Description: Moist, olive gray clay		
	Remarks: System X, Swell Pressure = 0.0673 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 13 of 15

Constant Load Step

Stress: 0.5 tsf



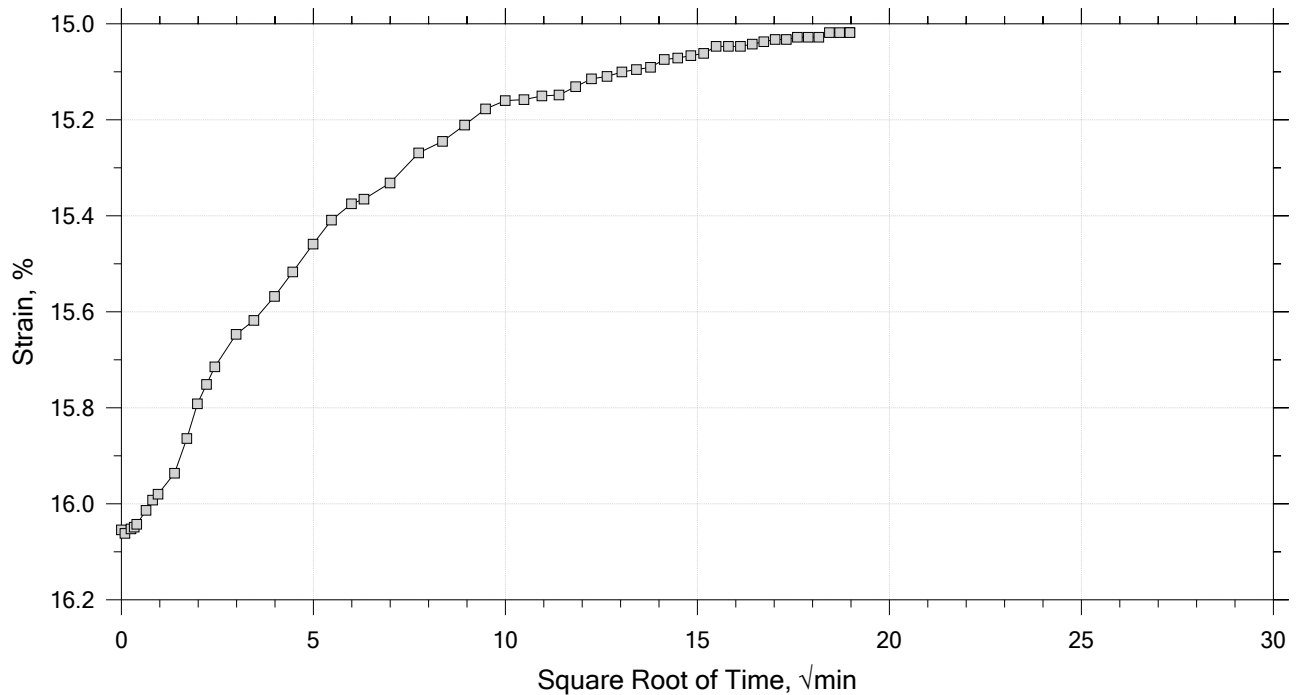
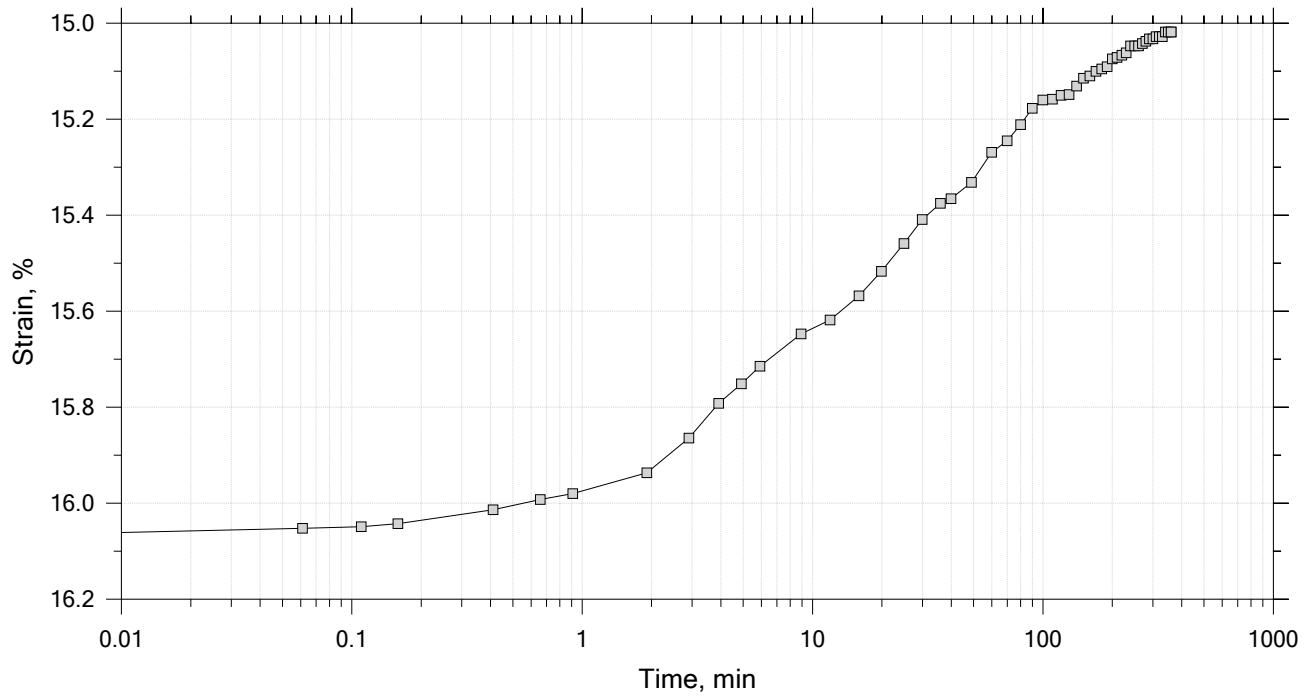
	Project: I-395/Rte 9 Connector	Location: Brewer-Eddington, ME	Project No.: GTX-313198
	Boring No.: HB-BB-227	Tested By: md	Checked By: anm
	Sample No.: U1	Test Date: 03/16/21	Depth: 5-7 ft
	Test No.: IP-3	Sample Type: intact	Elevation: ---
	Description: Moist, olive gray clay		
	Remarks: System X, Swell Pressure = 0.0673 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 14 of 15

Constant Load Step

Stress: 0.125 tsf



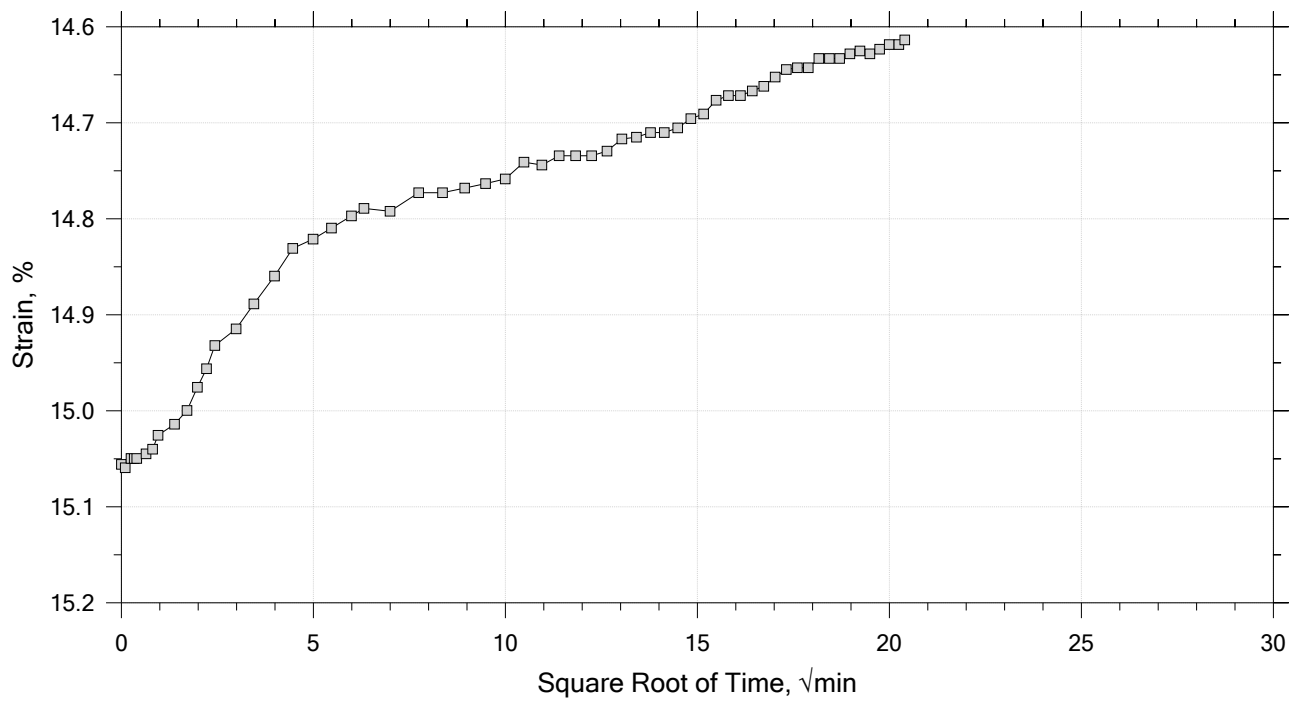
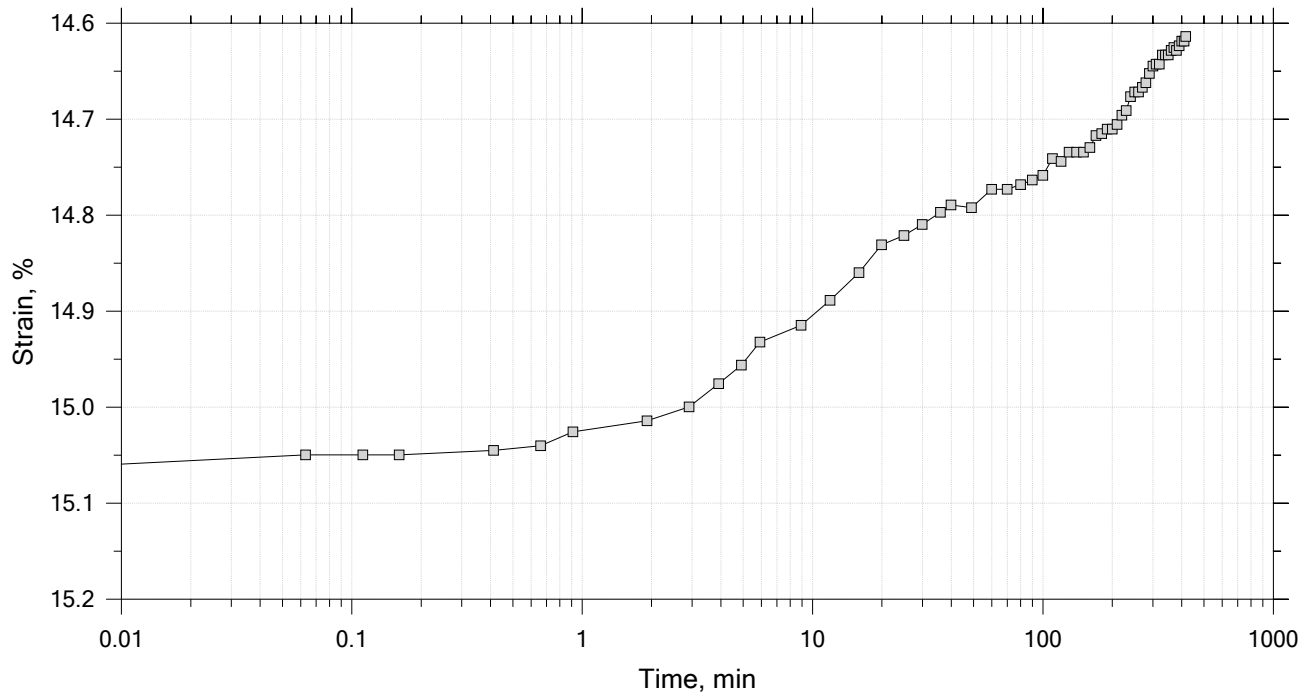
	Project: I-395/Rte 9 Connector	Location: Brewer-Eddington, ME	Project No.: GTX-313198
	Boring No.: HB-BB-227	Tested By: md	Checked By: anm
	Sample No.: U1	Test Date: 03/16/21	Depth: 5-7 ft
	Test No.: IP-3	Sample Type: intact	Elevation: ---
	Description: Moist, olive gray clay		
	Remarks: System X, Swell Pressure = 0.0673 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 15 of 15

Constant Load Step

Stress: 0.0625 tsf




	Project: I-395/Rte 9 Connector	Location: Brewer-Eddington, ME	Project No.: GTX-313198
	Boring No.: HB-BB-227	Tested By: md	Checked By: anm
	Sample No.: U1	Test Date: 03/16/21	Depth: 5-7 ft
	Test No.: IP-3	Sample Type: intact	Elevation: ---
	Description: Moist, olive gray clay		
	Remarks: System X, Swell Pressure = 0.0673 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Specimen Diameter: 2.50 in	Estimated Specific Gravity: 2.75	Liquid Limit: 37
Initial Height: 1.00 in	Initial Void Ratio: 0.854	Plastic Limit: 19
Final Height: 0.89 in	Final Void Ratio: 0.65	Plasticity Index: 18

	Before Test Trimmings	Before Test Specimen	After Test Specimen	After Test Trimmings
Container ID	E-1319	RING		D458
Mass Container, gm	8.29	111.31	111.31	8.35
Mass Container + Wet Soil, gm	124.35	266.16	258.95	153.58
Mass Container + Dry Soil, gm	96.59	230.74	230.74	125.83
Mass Dry Soil, gm	88.3	119.43	119.43	117.48
Water Content, %	31.44	29.66	23.62	23.62
Void Ratio	---	0.85	0.65	---
Degree of Saturation, %	---	95.58	100.00	---
Dry Unit Weight, pcf	---	92.687	104.14	---


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

	Project: I-395/Rte 9 Connector	Location: Brewer-Eddington, ME	Project No.: GTX-313198
	Boring No.: HB-BB-227	Tested By: md	Checked By: anm
	Sample No.: U1	Test Date: 03/16/21	Depth: 5-7 ft
	Test No.: IP-3	Sample Type: intact	Elevation: ---
	Description: Moist, olive gray clay		
	Remarks: System X, Swell Pressure = 0.0673 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

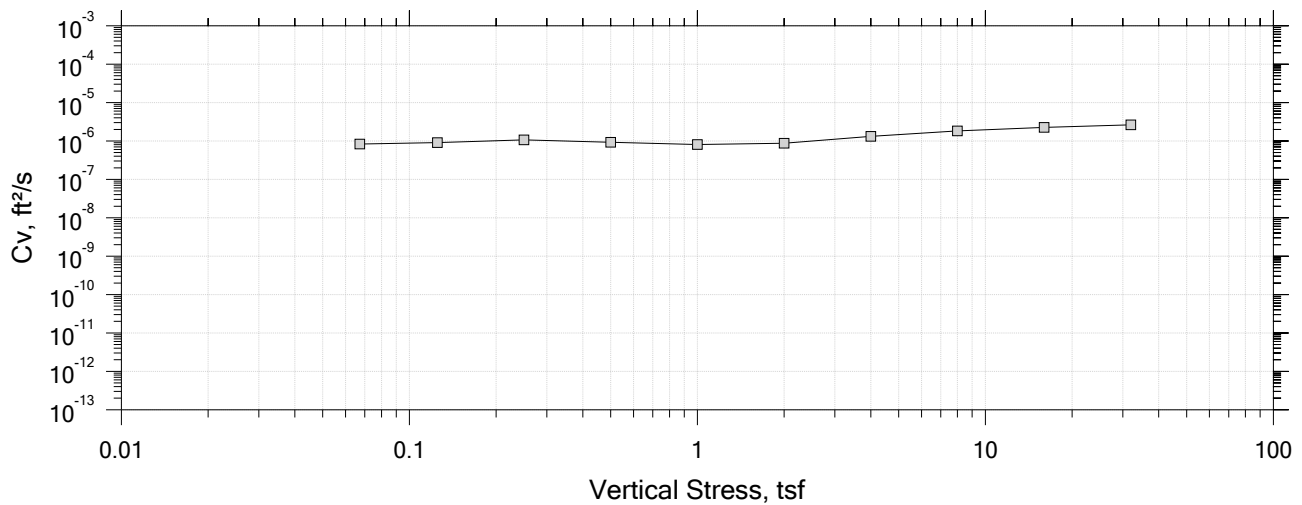
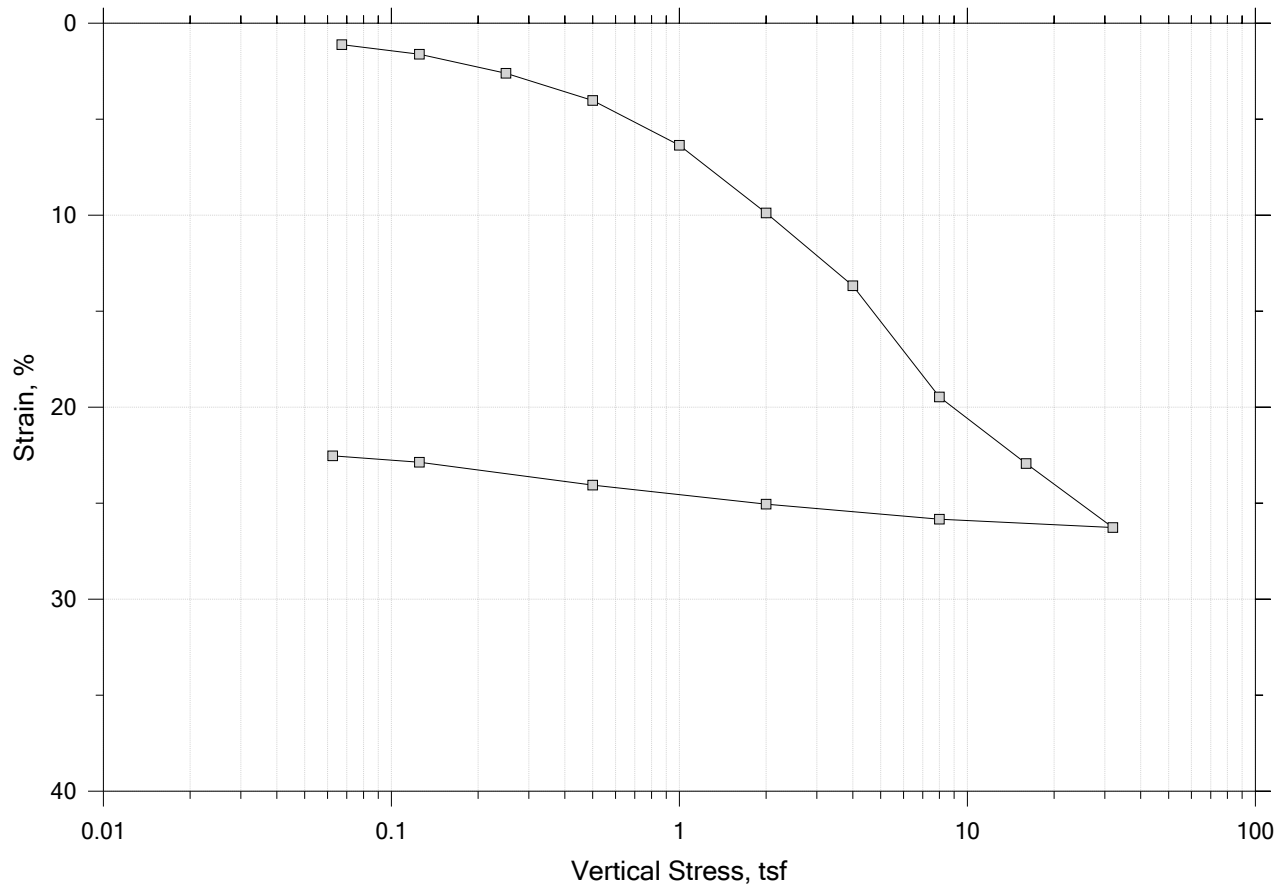
Square Root of Time Coefficients


[illegible]

	Project: I-395/Rte 9 Connector	Location: Brewer-Eddington, ME	Project No.: GTX-313198
	Boring No.: HB-BB-227	Tested By: md	Checked By: anm
	Sample No.: U1	Test Date: 03/16/21	Depth: 5-7 ft
	Test No.: IP-3	Sample Type: intact	Elevation: ---
	Description: Moist, olive gray clay		
	Remarks: System X, Swell Pressure = 0.0673 tsf		
	Displacement at End of Increment		

One-Dimensional Consolidation by ASTM D2435 - Method B

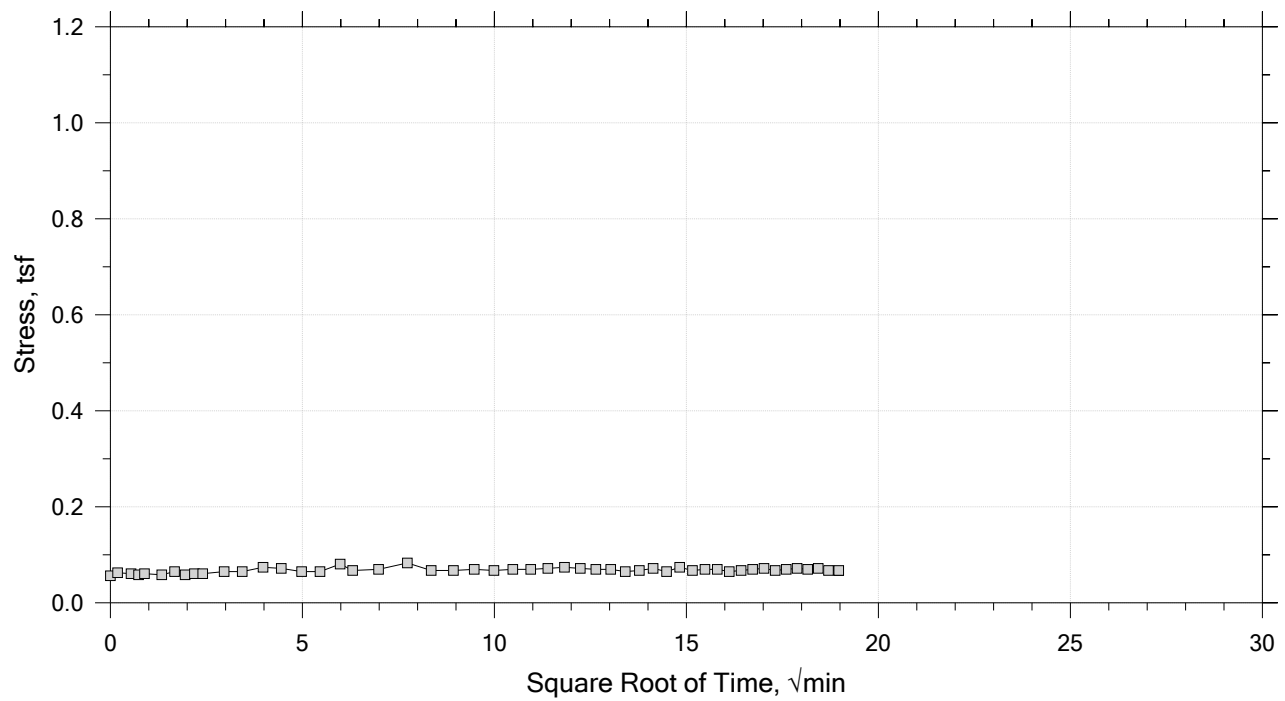
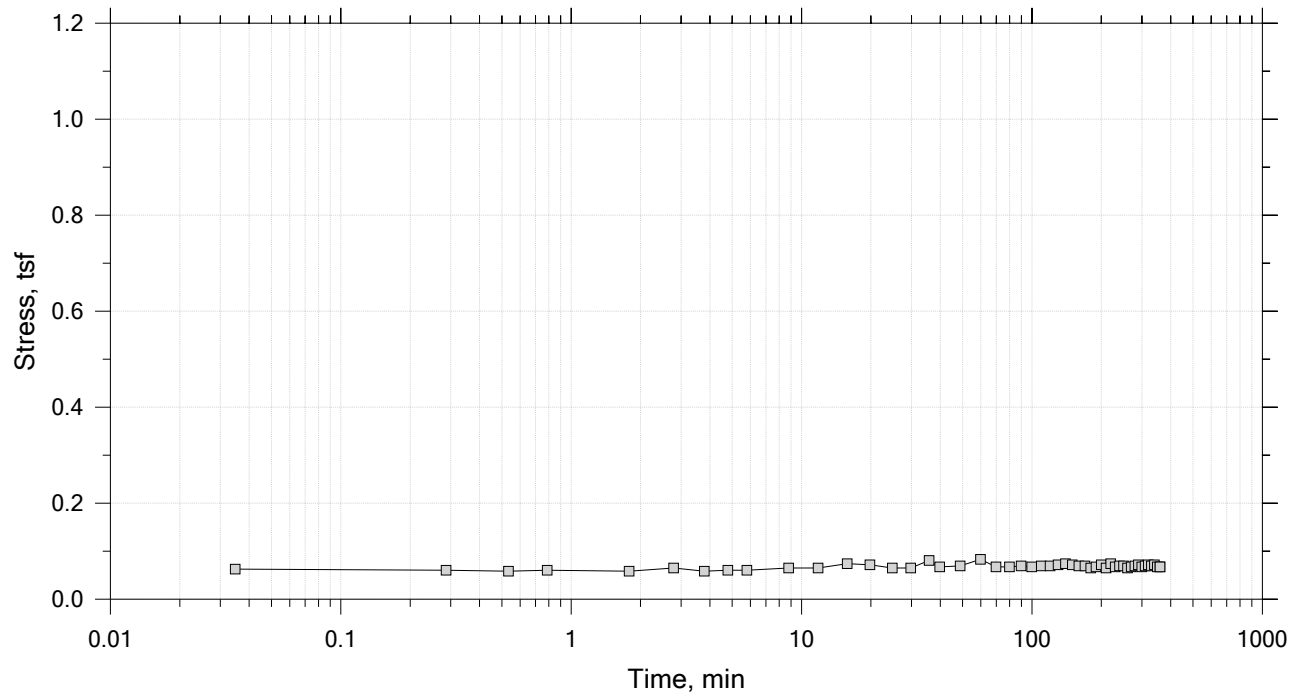
Summary Report




	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: 312665
	Boring No.: HE BE 239	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 03/05/21	Depth: 13-15 ft
	Test No.: IP-16	Sample Type: Intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System X, Swell Pressure = 0.0672 tsf		
	Displacement at End of Increment		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 1 of 15
Constant Volume Step
Stress: 0.0672 tsf



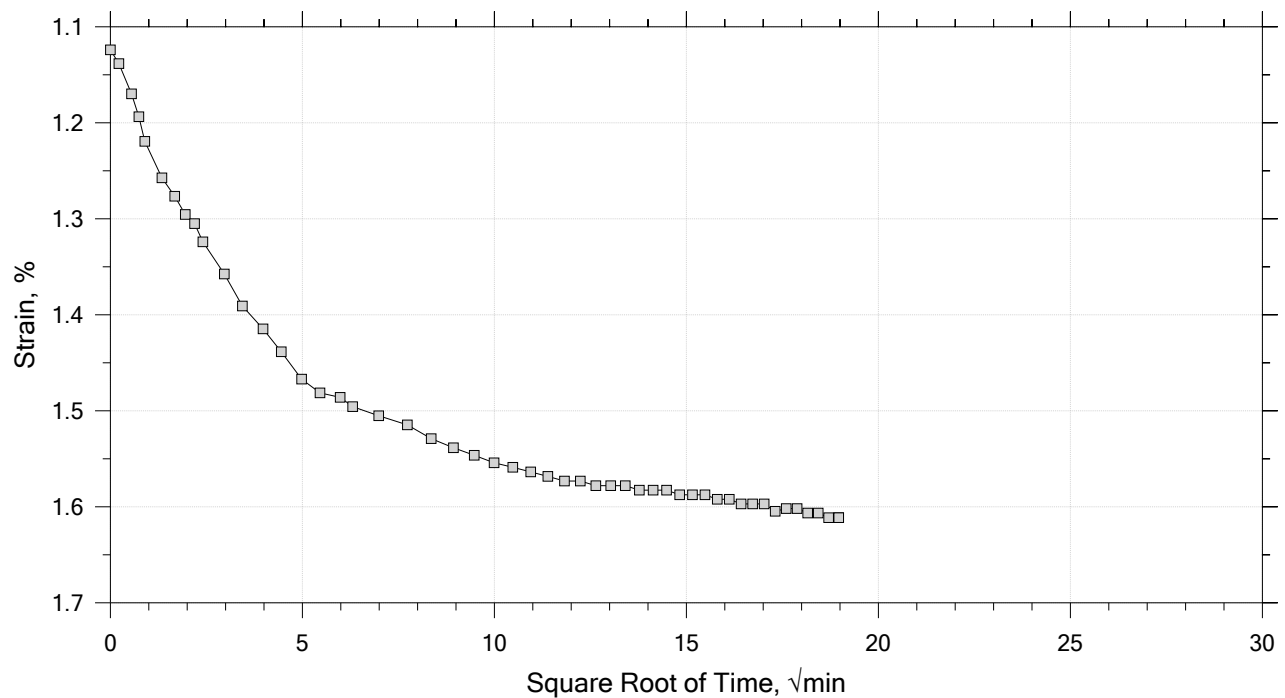
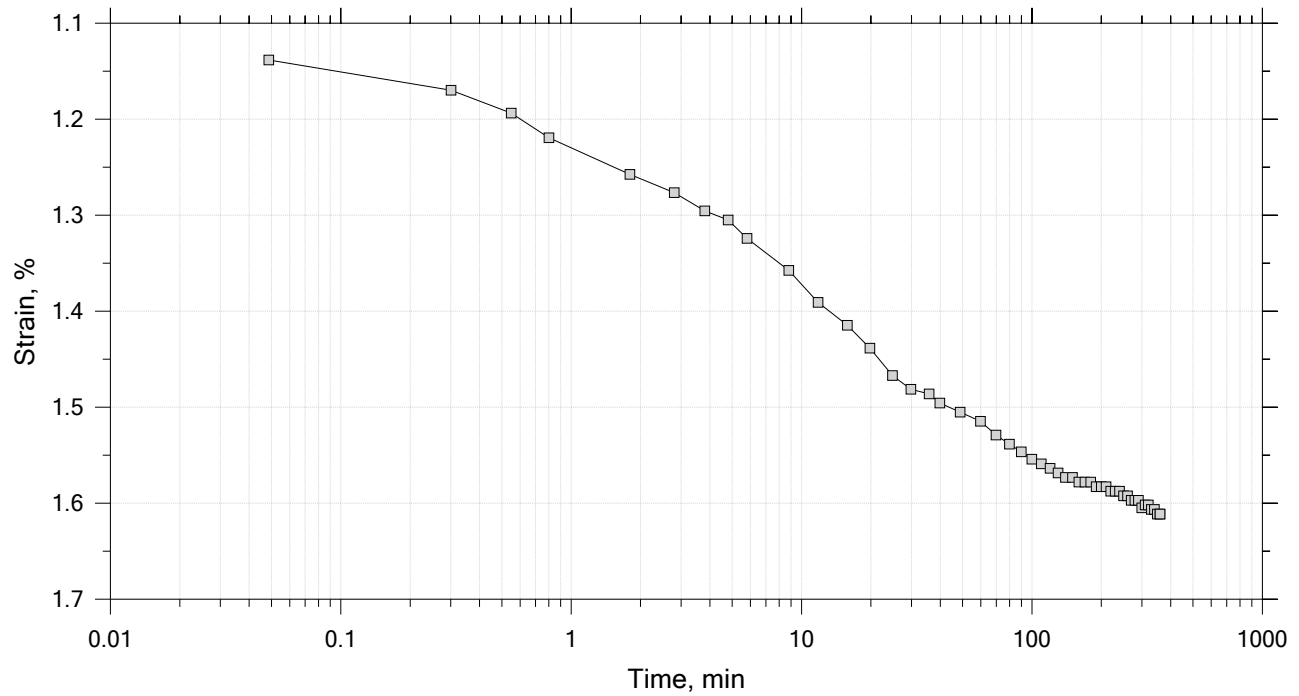
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: 312665
	Boring No.: HE BE 239	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 03/05/21	Depth: 13-15 ft
	Test No.: IP-16	Sample Type: Intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System X, Swell Pressure = 0.0672 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 2 of 15

Constant Load Step

Stress: 0.125 tsf



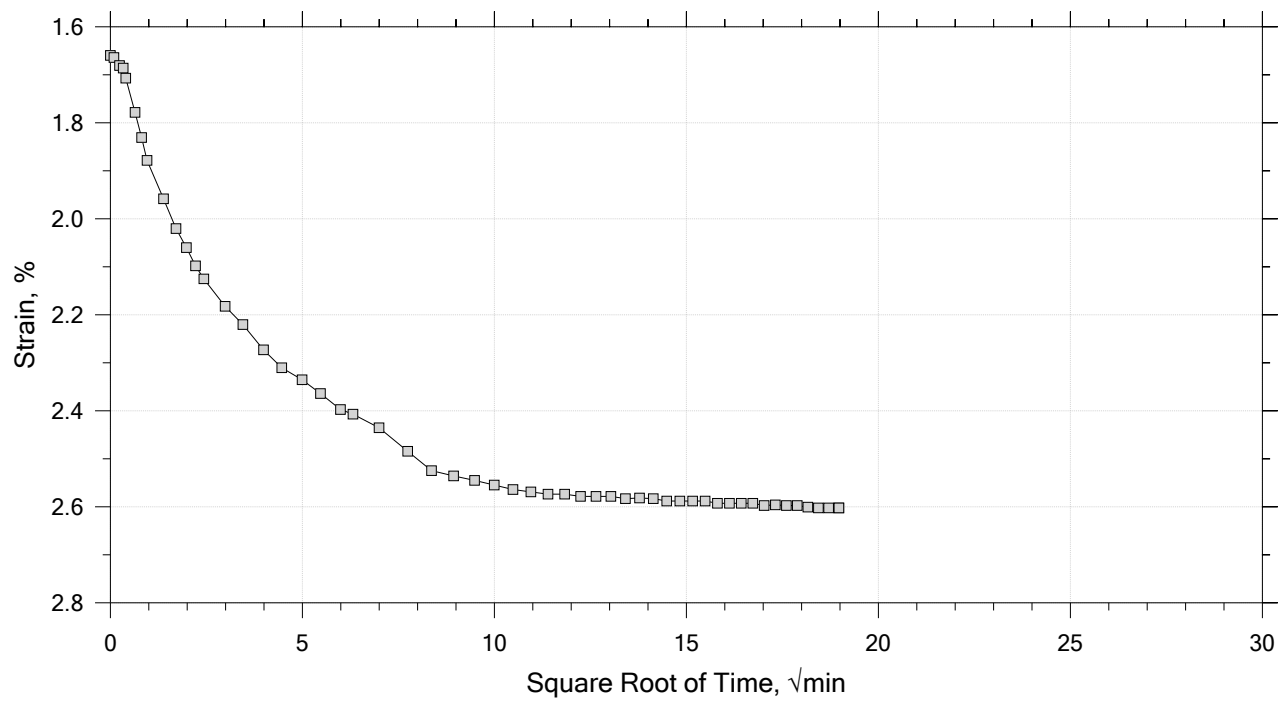
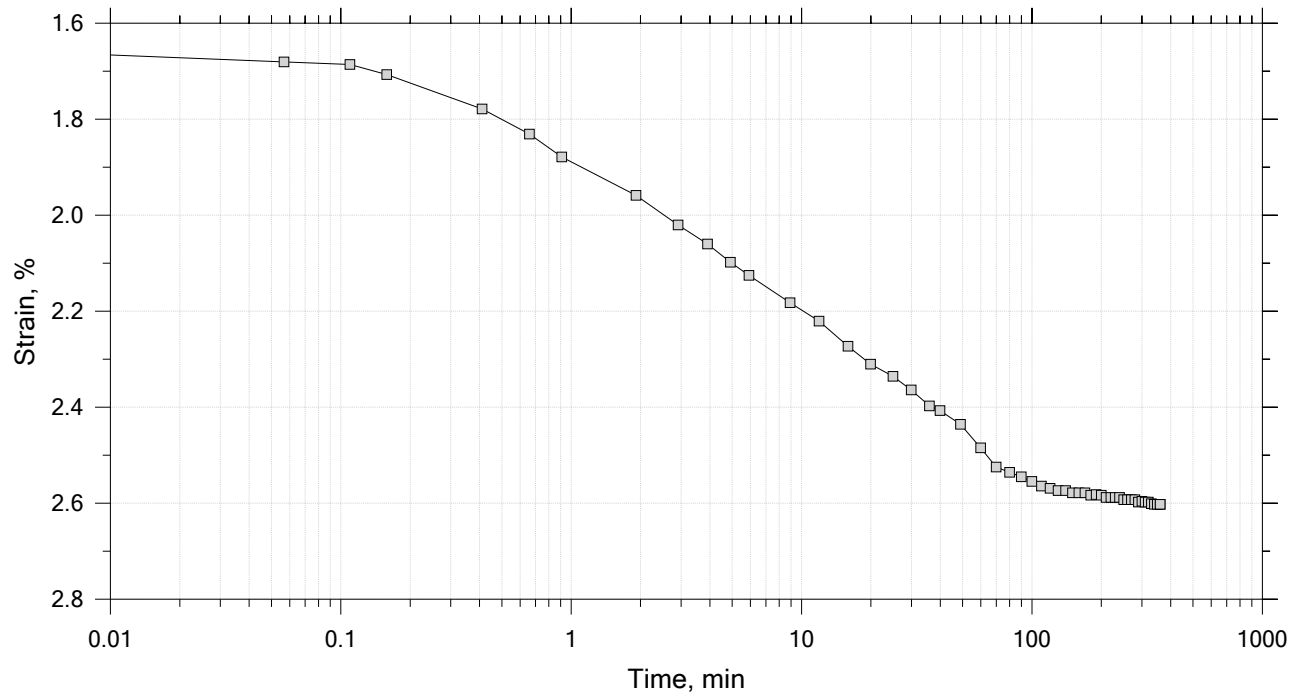
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: 312665
	Boring No.: HE BE 239	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 03/05/21	Depth: 13-15 ft
	Test No.: IP-16	Sample Type: Intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System X, Swell Pressure = 0.0672 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 3 of 15

Constant Load Step

Stress: 0.25 tsf



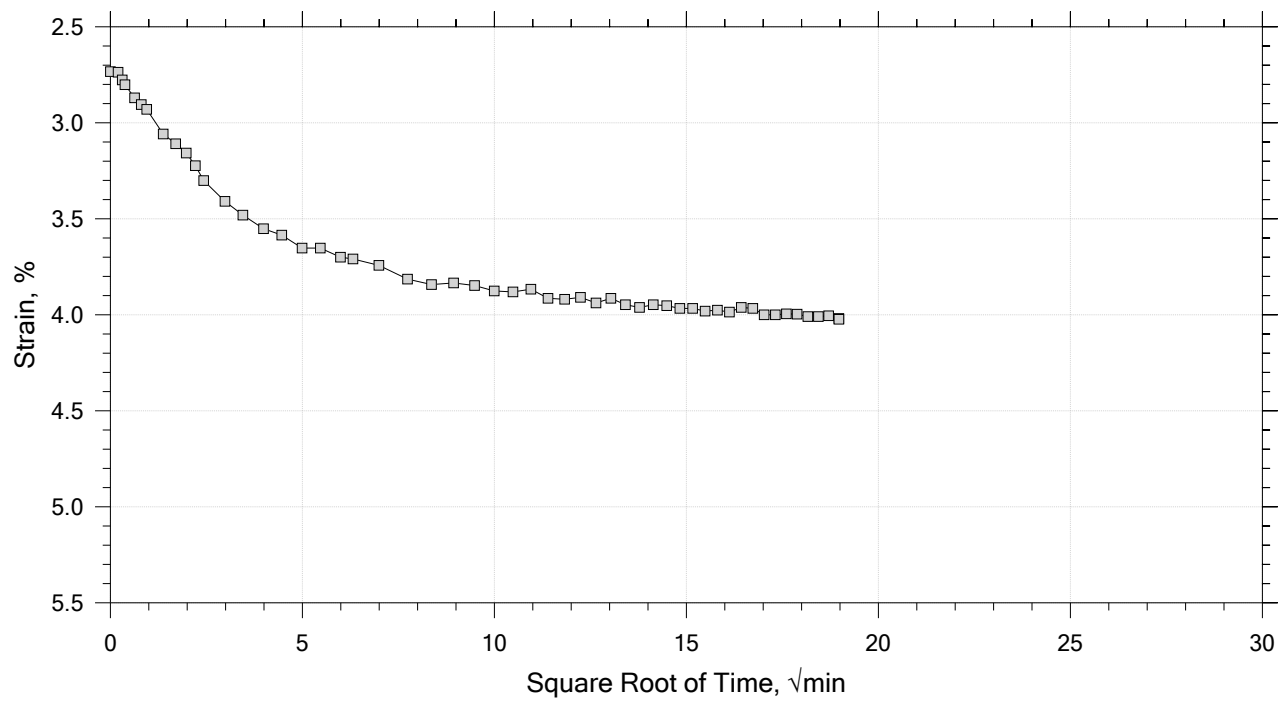
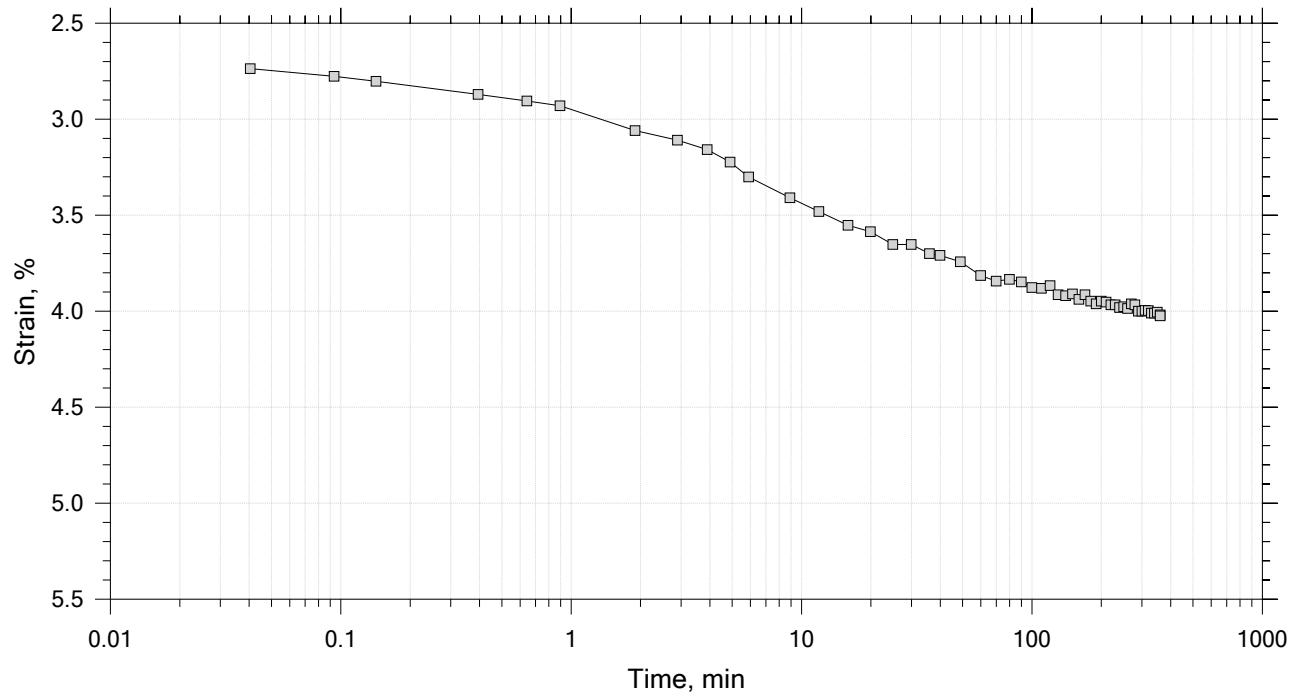
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: 312665
	Boring No.: HE BE 239	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 03/05/21	Depth: 13-15 ft
	Test No.: IP-16	Sample Type: Intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System X, Swell Pressure = 0.0672 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 4 of 15

Constant Load Step

Stress: 0.5 tsf



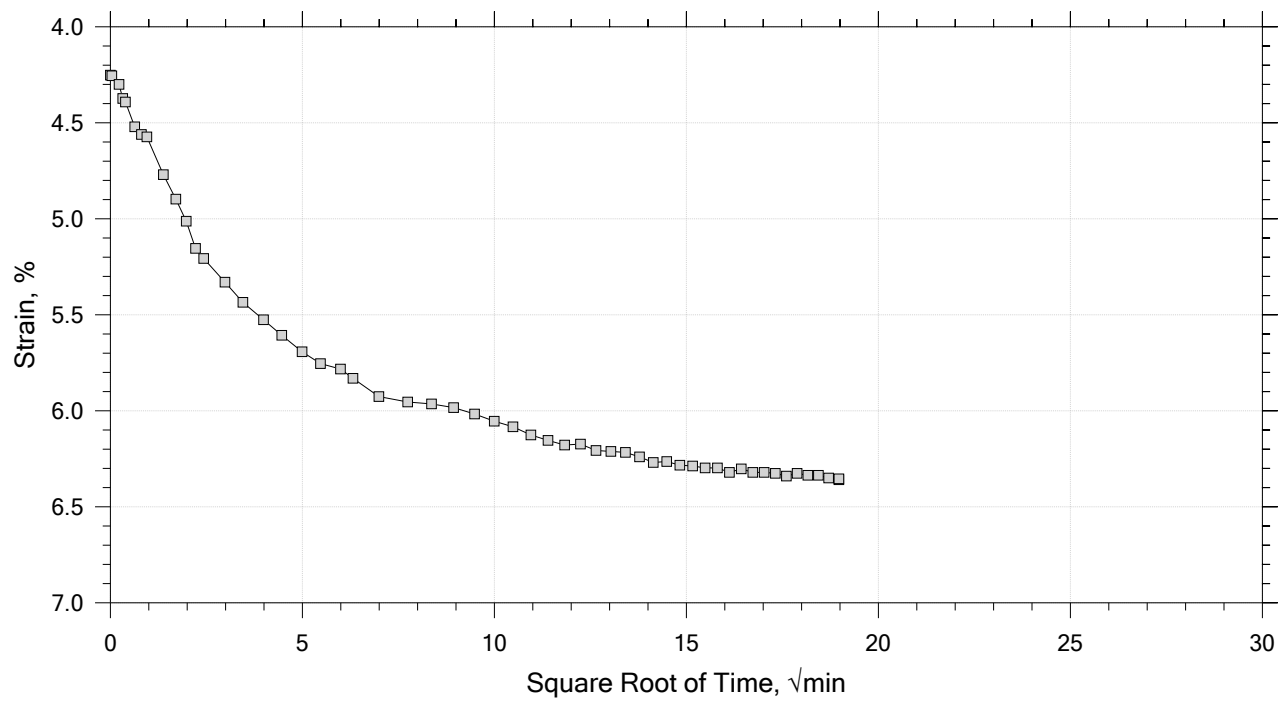
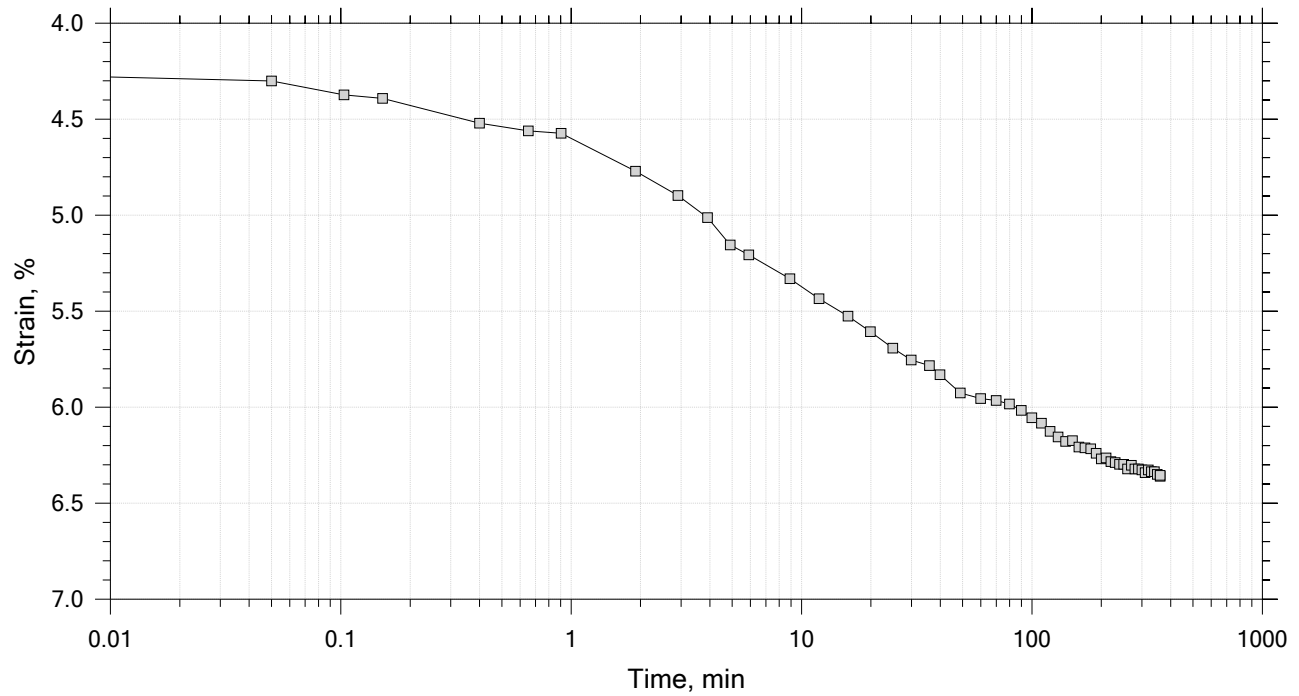
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: 312665
	Boring No.: HE BE 239	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 03/05/21	Depth: 13-15 ft
	Test No.: IP-16	Sample Type: Intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System X, Swell Pressure = 0.0672 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 5 of 15

Constant Load Step

Stress: 1 tsf



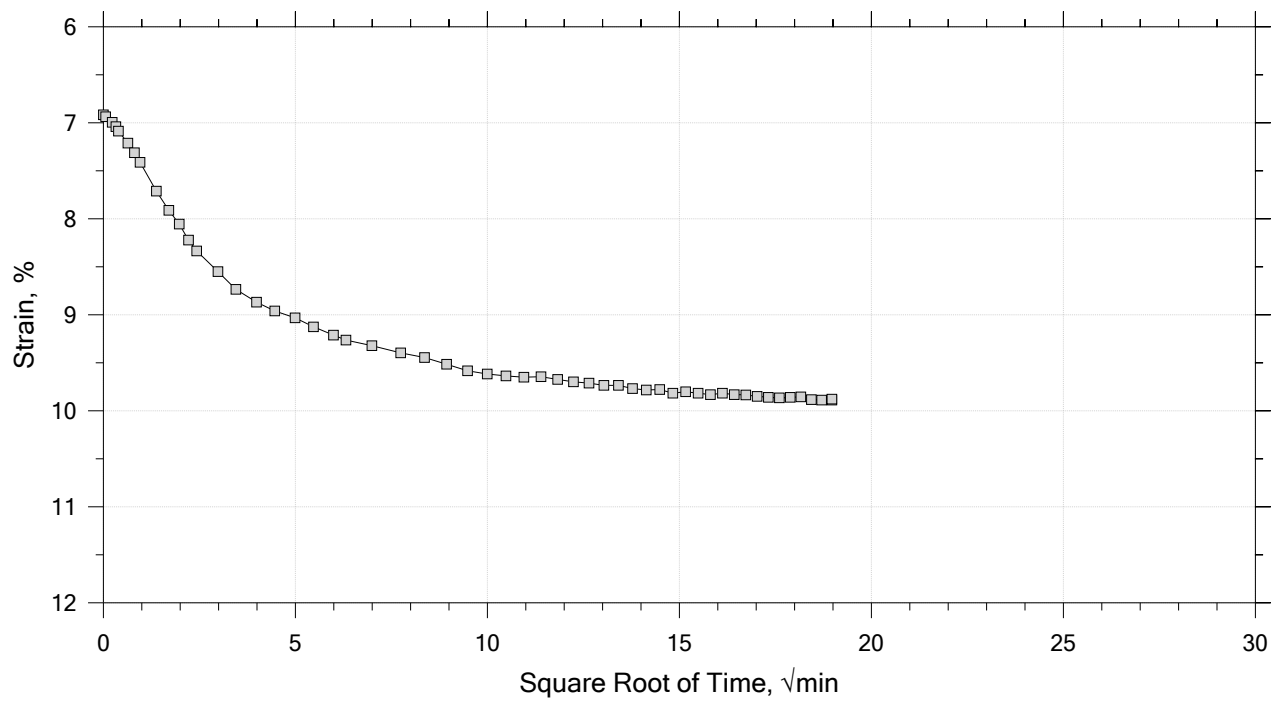
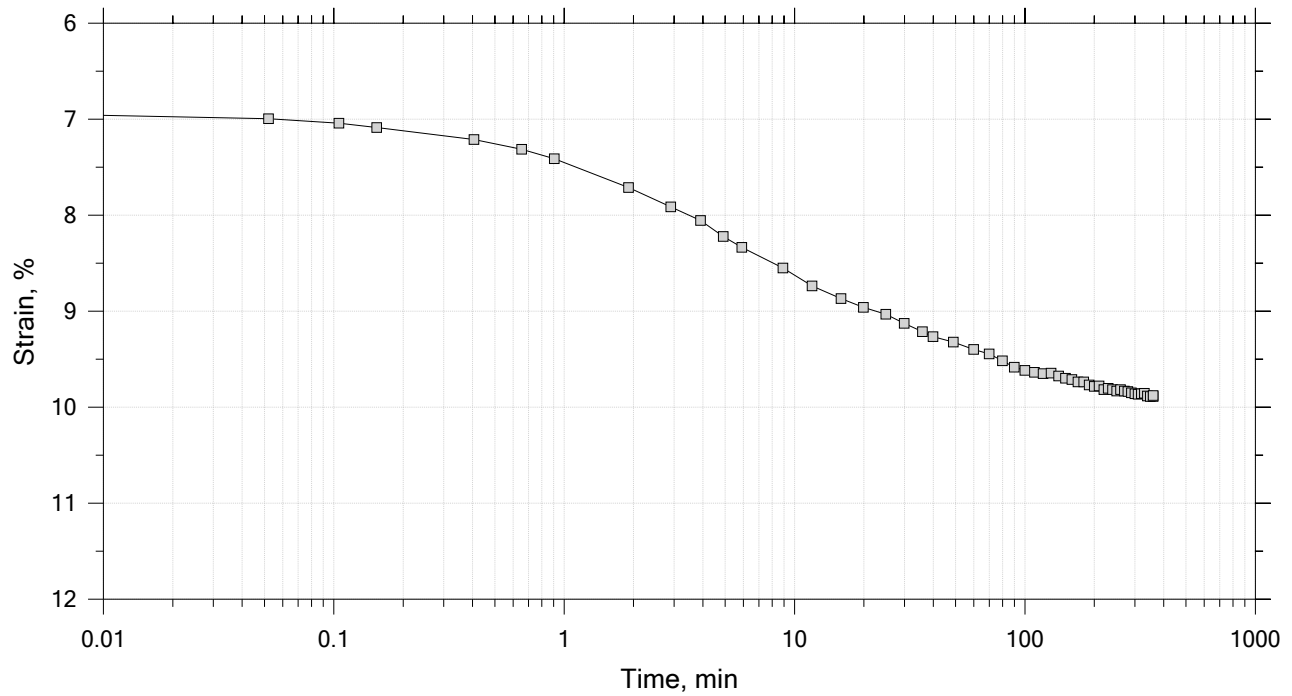
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: 312665
	Boring No.: HE BE 239	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 03/05/21	Depth: 13-15 ft
	Test No.: IP-16	Sample Type: Intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System X, Swell Pressure = 0.0672 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 6 of 15

Constant Load Step

Stress: 2 tsf



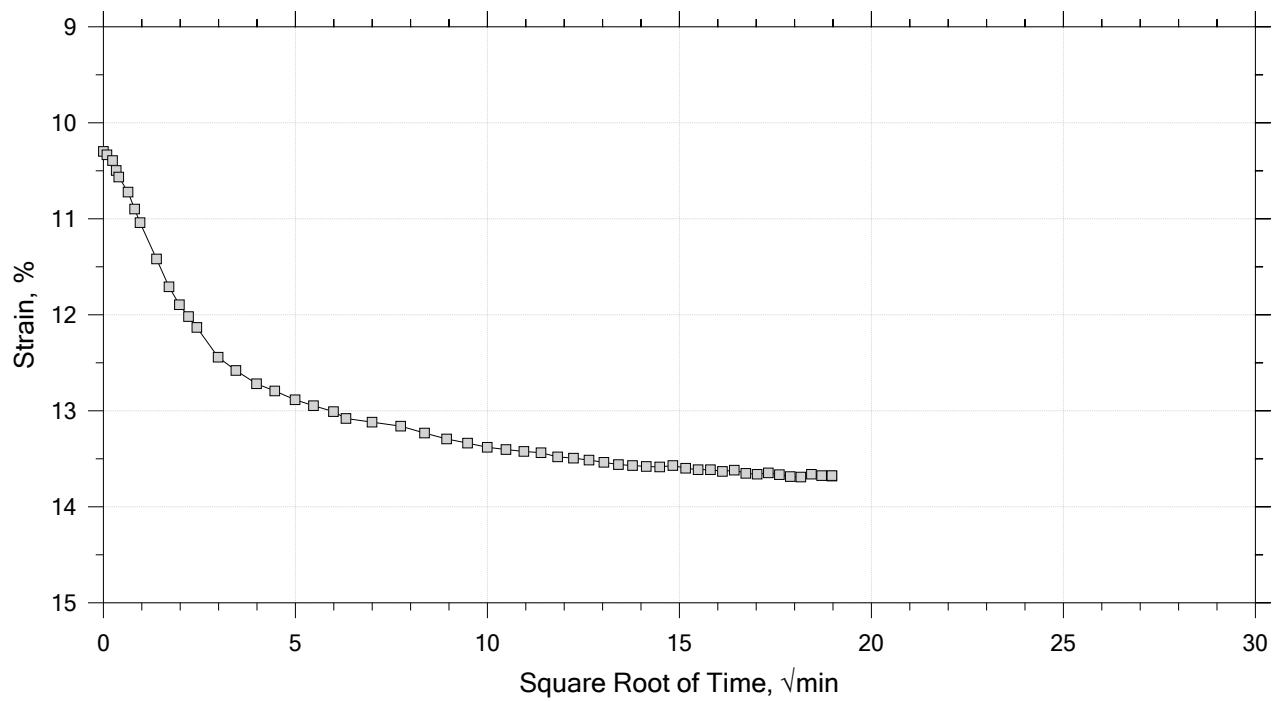
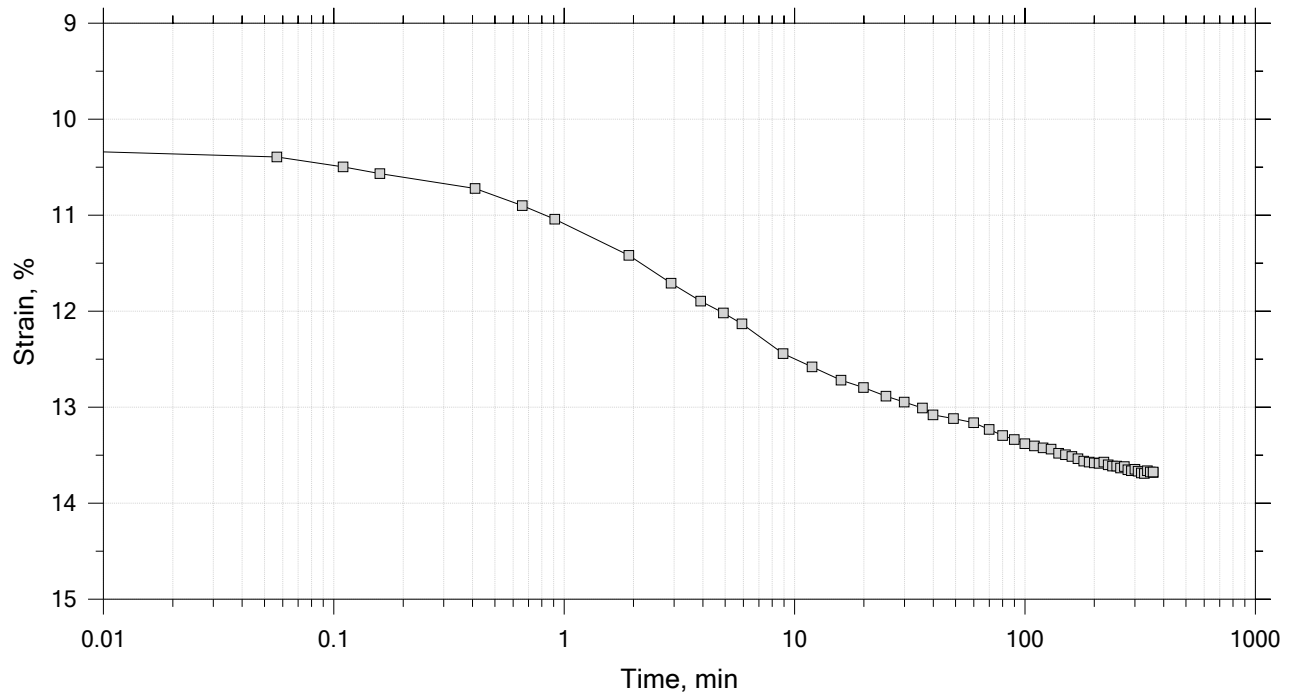
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: 312665
	Boring No.: HE BE 239	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 03/05/21	Depth: 13-15 ft
	Test No.: IP-16	Sample Type: Intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System X, Swell Pressure = 0.0672 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 7 of 15

Constant Load Step

Stress: 4 tsf



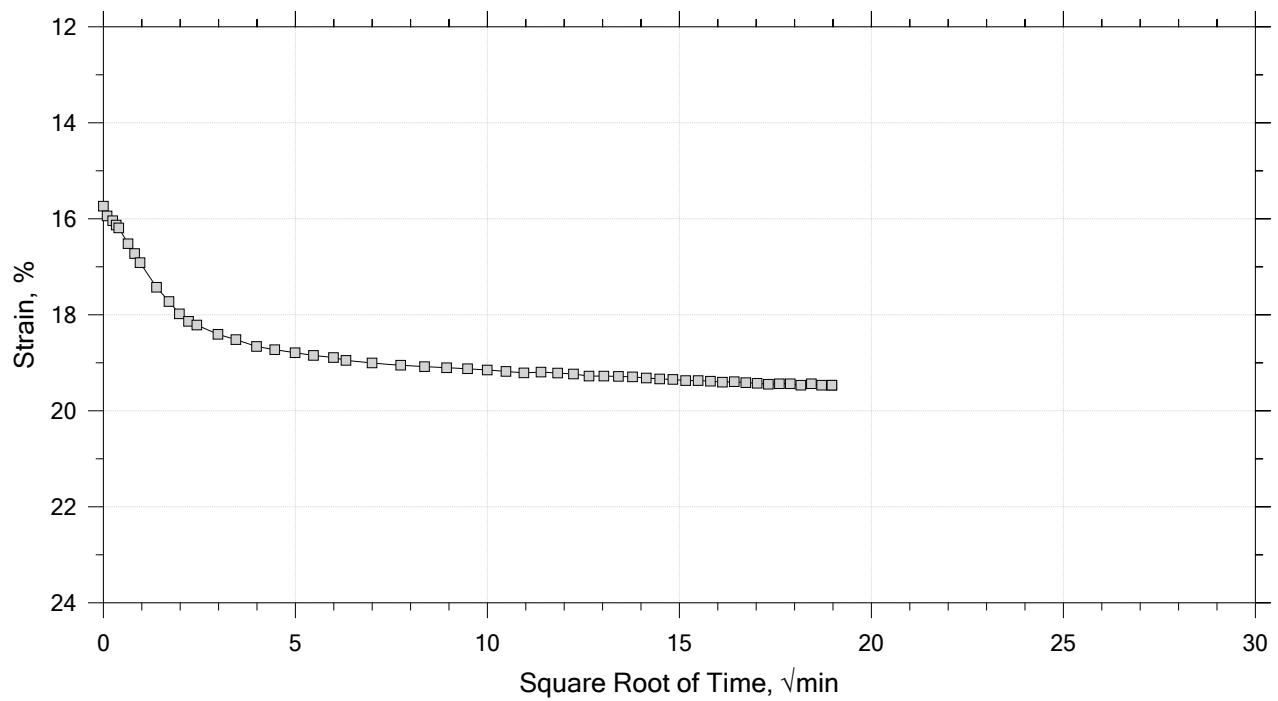
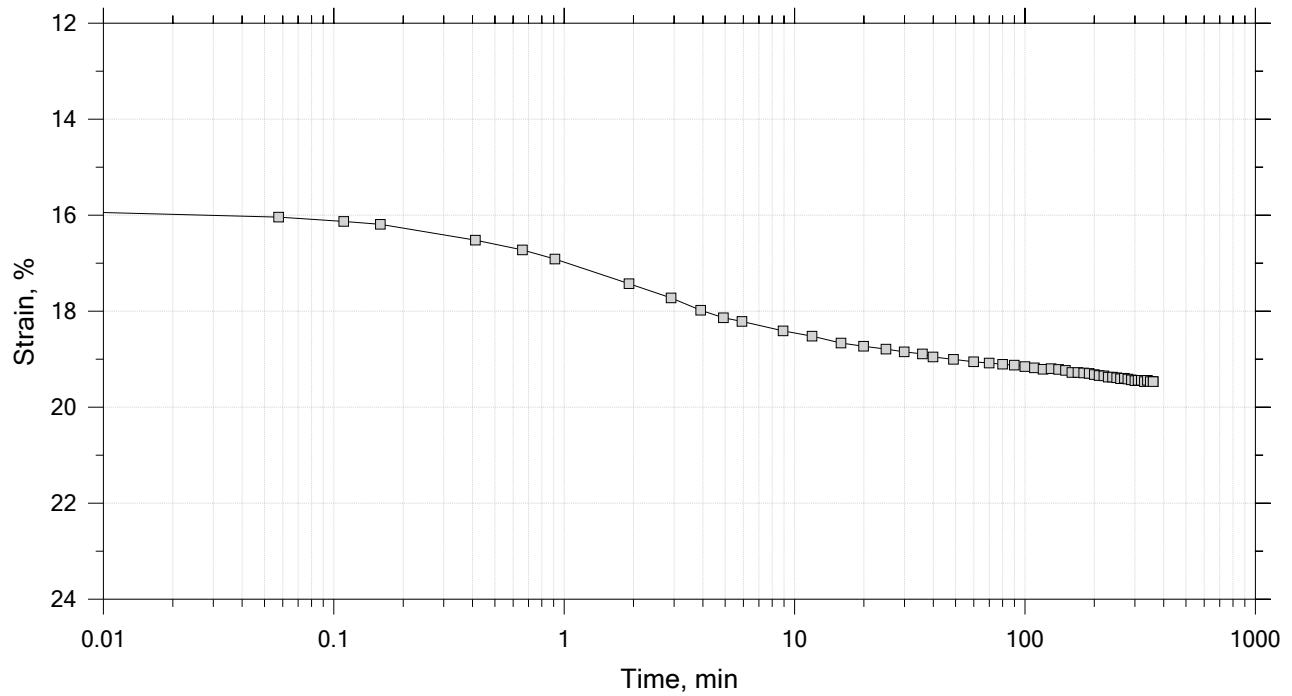
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: 312665
	Boring No.: HE BE 239	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 03/05/21	Depth: 13-15 ft
	Test No.: IP-16	Sample Type: Intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System X, Swell Pressure = 0.0672 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 8 of 15

Constant Load Step

Stress: 8 tsf



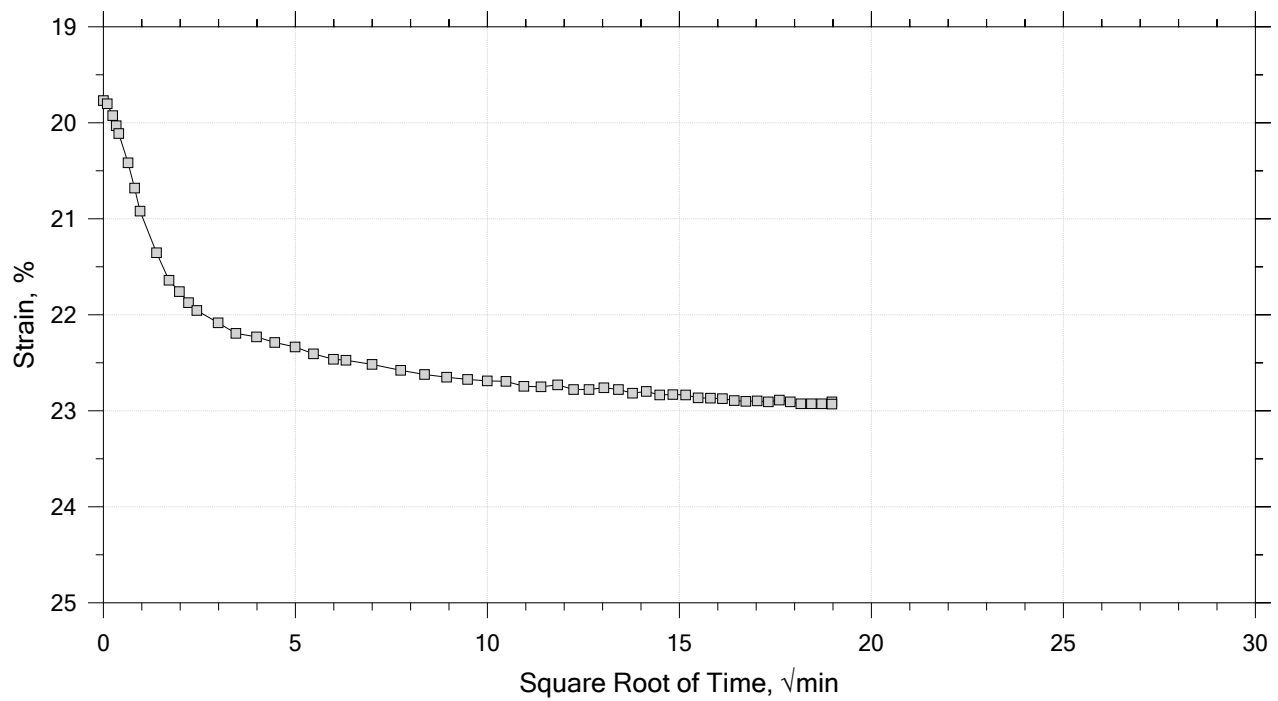
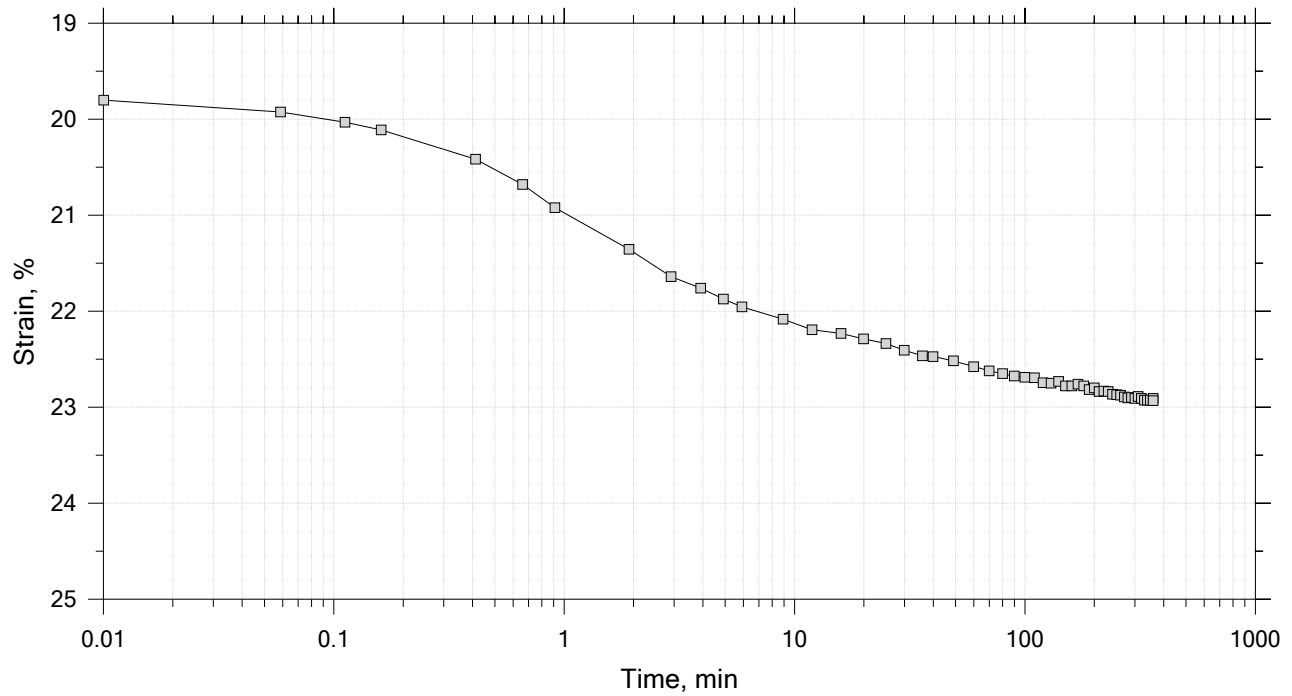
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: 312665
	Boring No.: HE BE 239	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 03/05/21	Depth: 13-15 ft
	Test No.: IP-16	Sample Type: Intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System X, Swell Pressure = 0.0672 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 9 of 15

Constant Load Step

Stress: 16 tsf



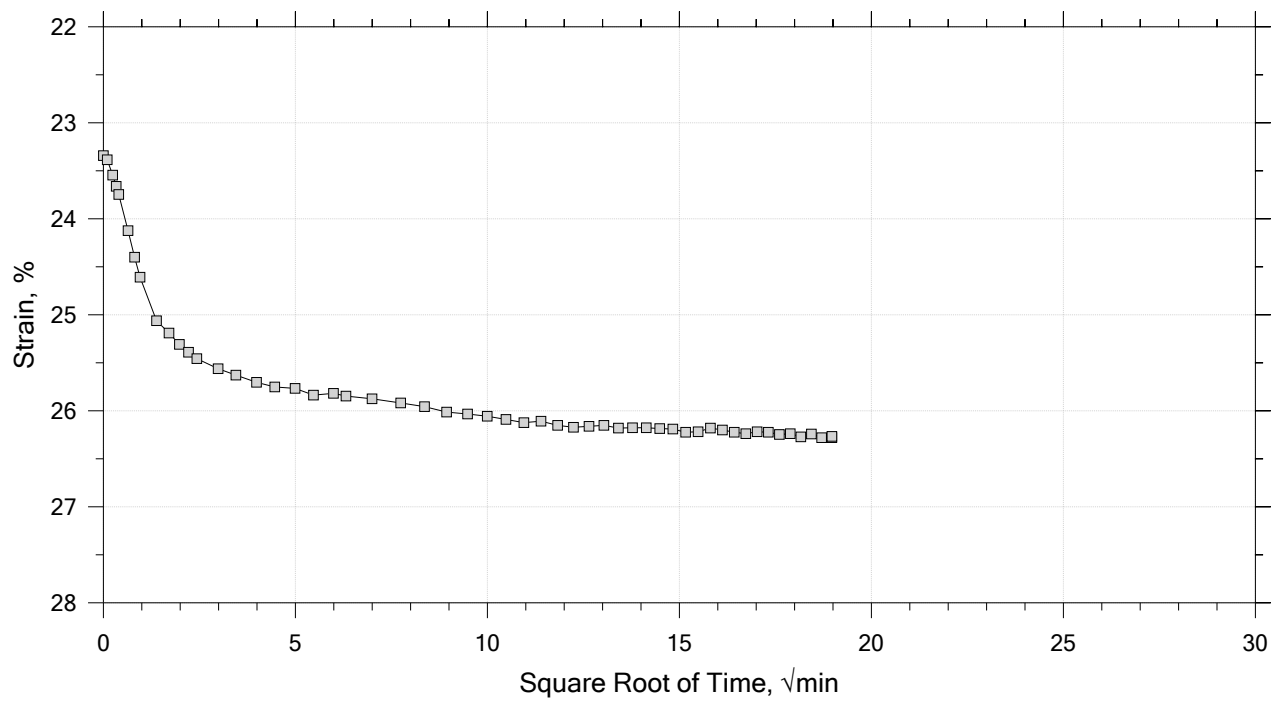
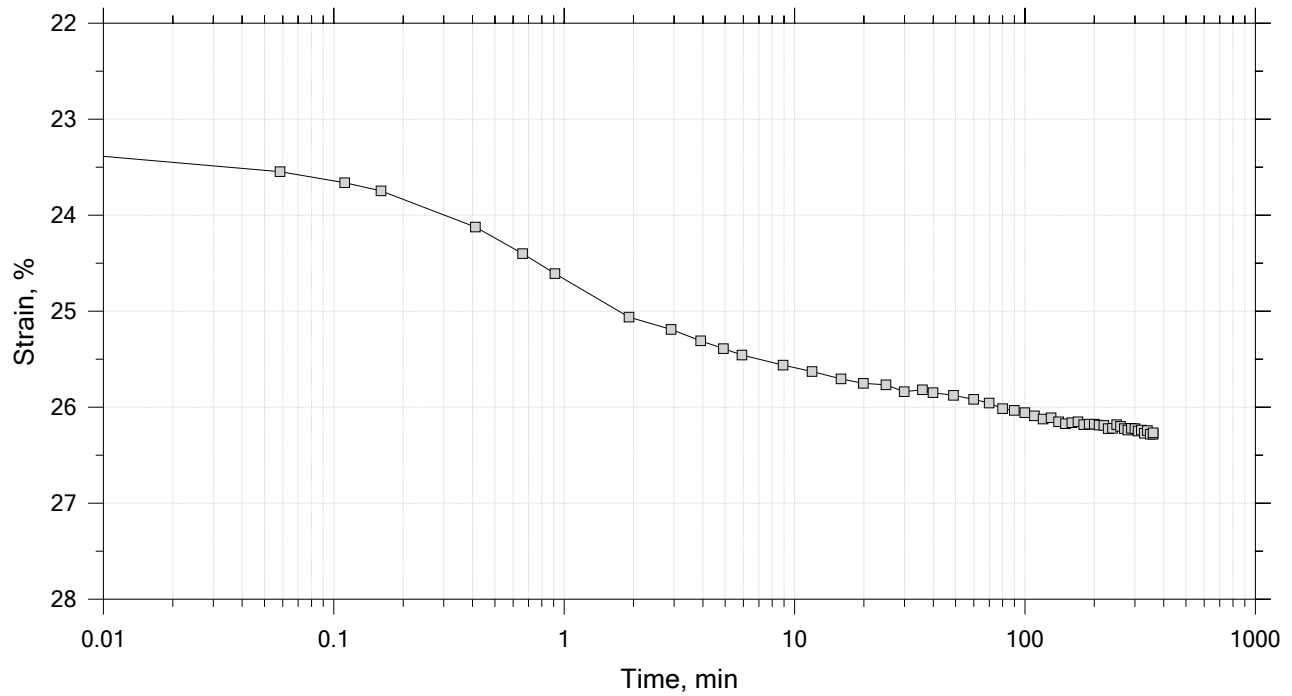
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: 312665
	Boring No.: HE BE 239	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 03/05/21	Depth: 13-15 ft
	Test No.: IP-16	Sample Type: Intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System X, Swell Pressure = 0.0672 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 10 of 15

Constant Load Step

Stress: 32 tsf



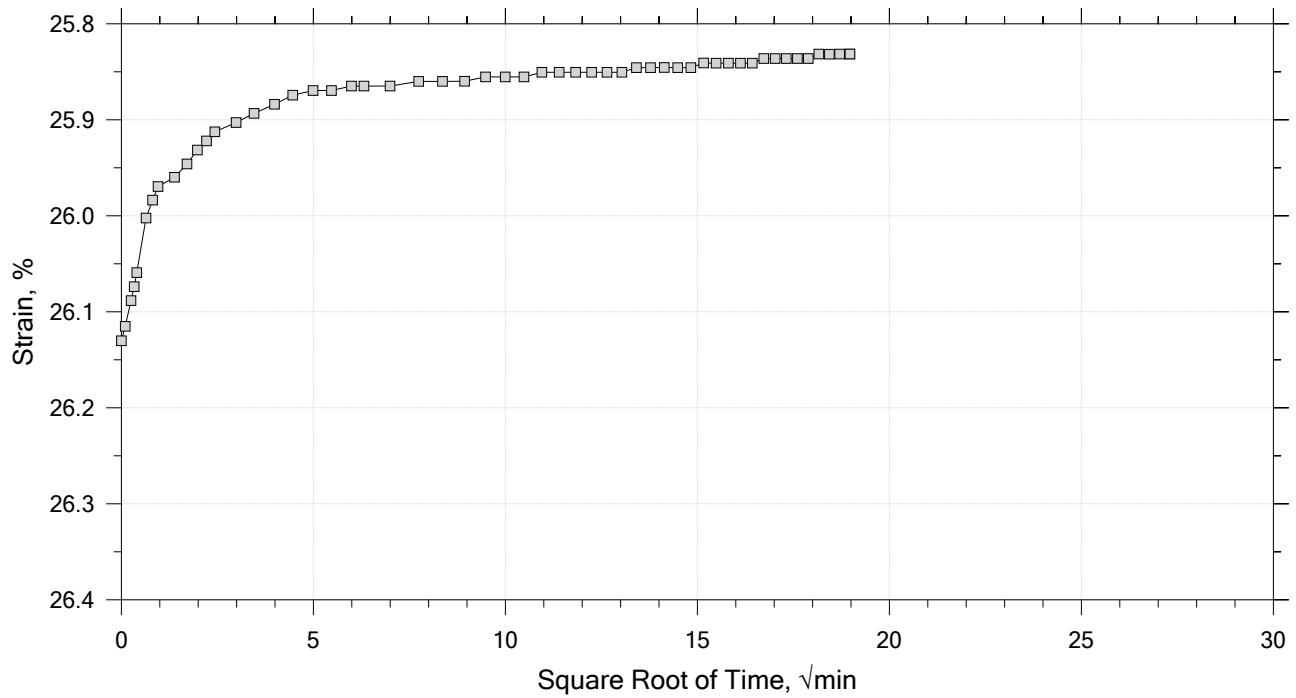
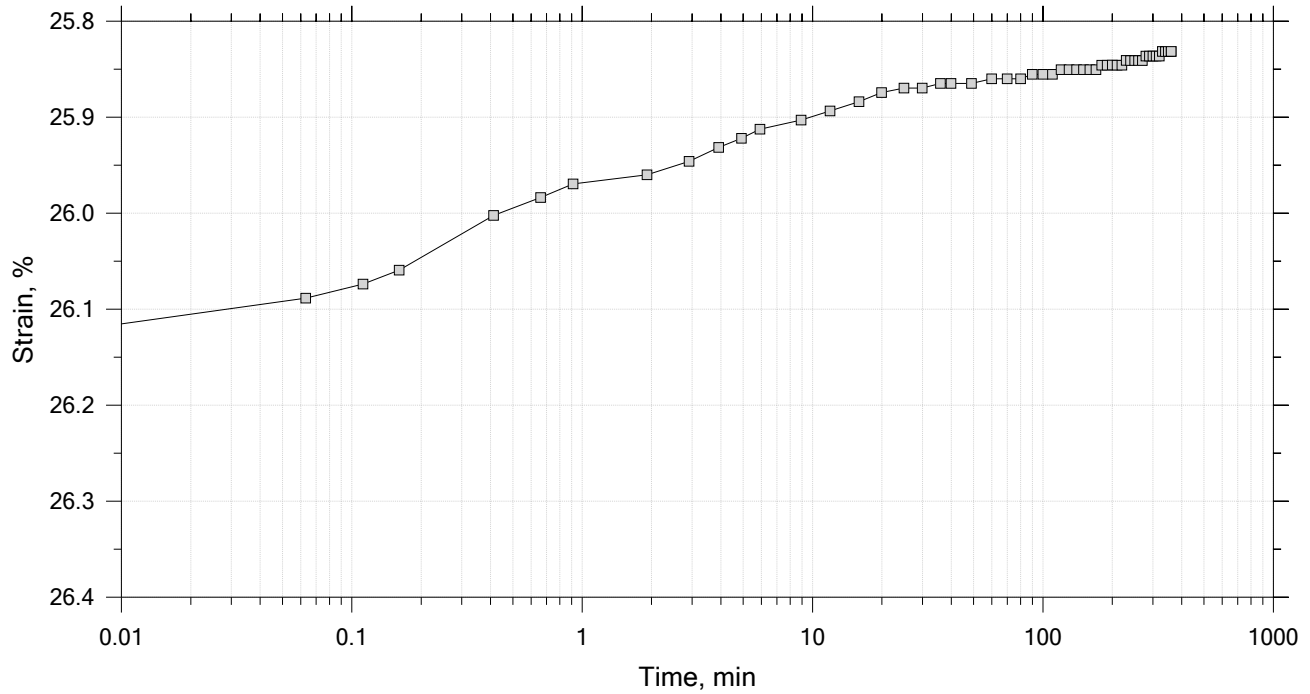
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: 312665
	Boring No.: HE BE 239	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 03/05/21	Depth: 13-15 ft
	Test No.: IP-16	Sample Type: Intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System X, Swell Pressure = 0.0672 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 11 of 15

Constant Load Step

Stress: 8 tsf



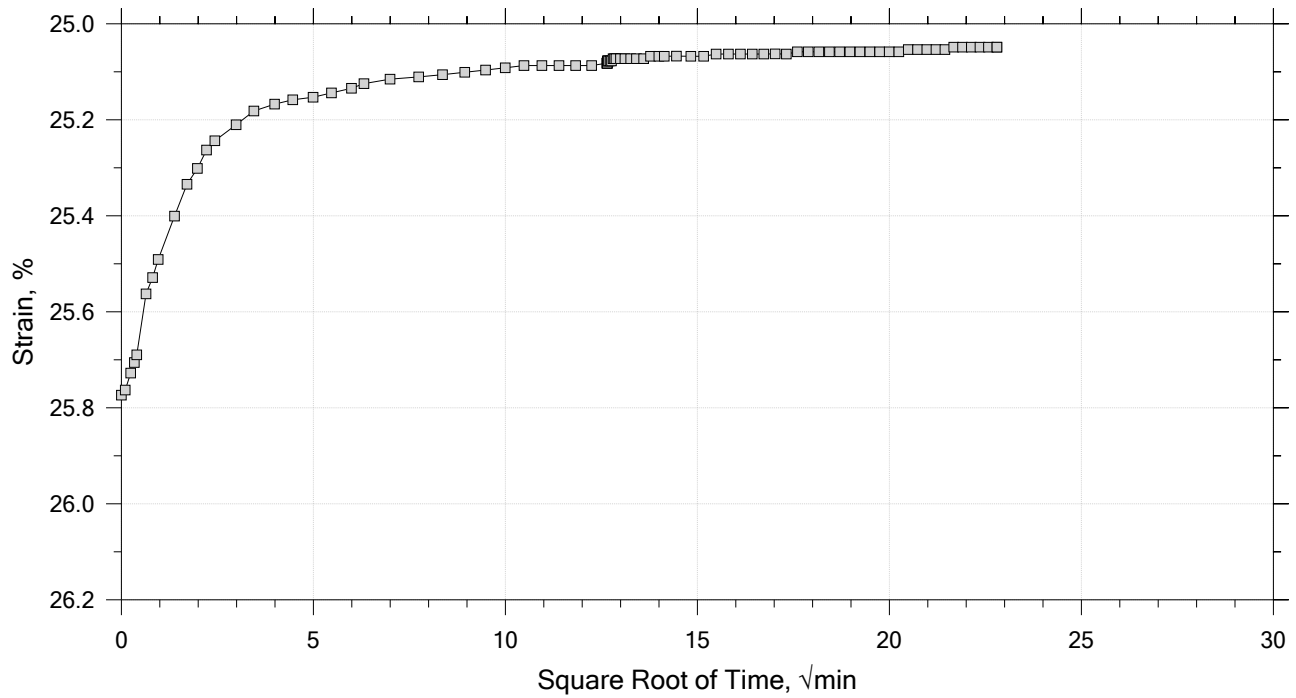
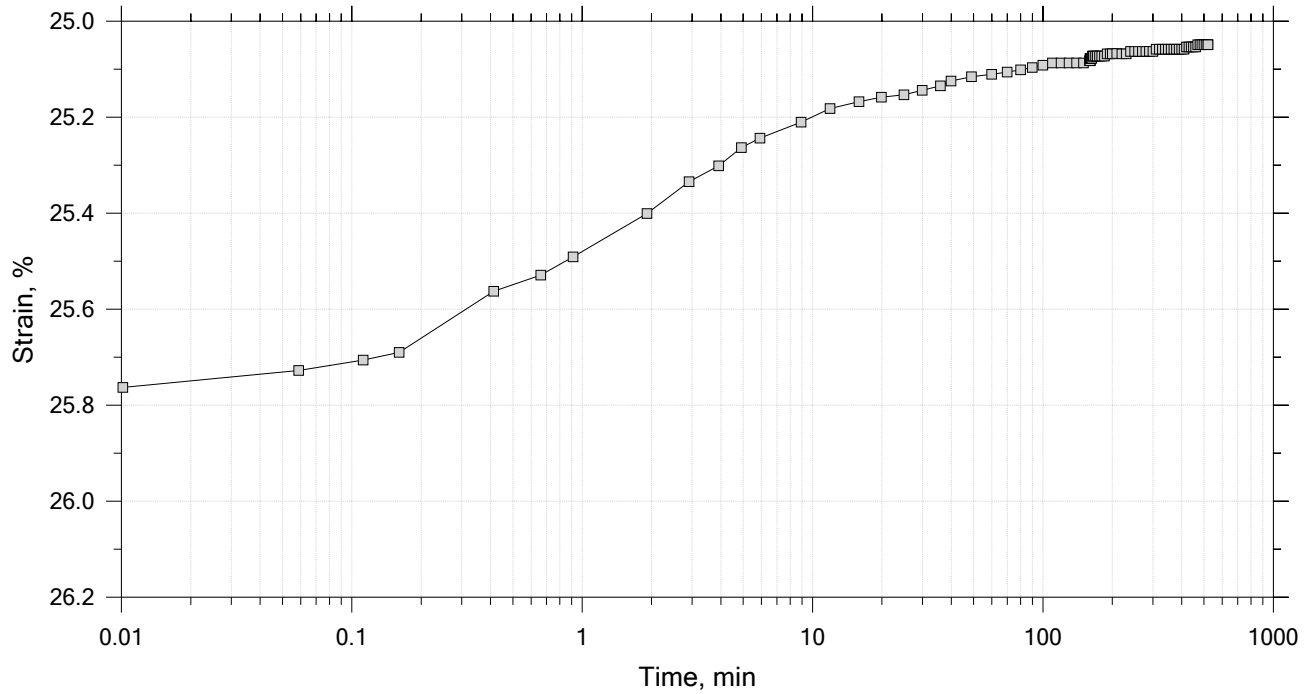
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: 312665
	Boring No.: HE BE 239	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 03/05/21	Depth: 13-15 ft
	Test No.: IP-16	Sample Type: Intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System X, Swell Pressure = 0.0672 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 12 of 15

Constant Load Step

Stress: 2 tsf



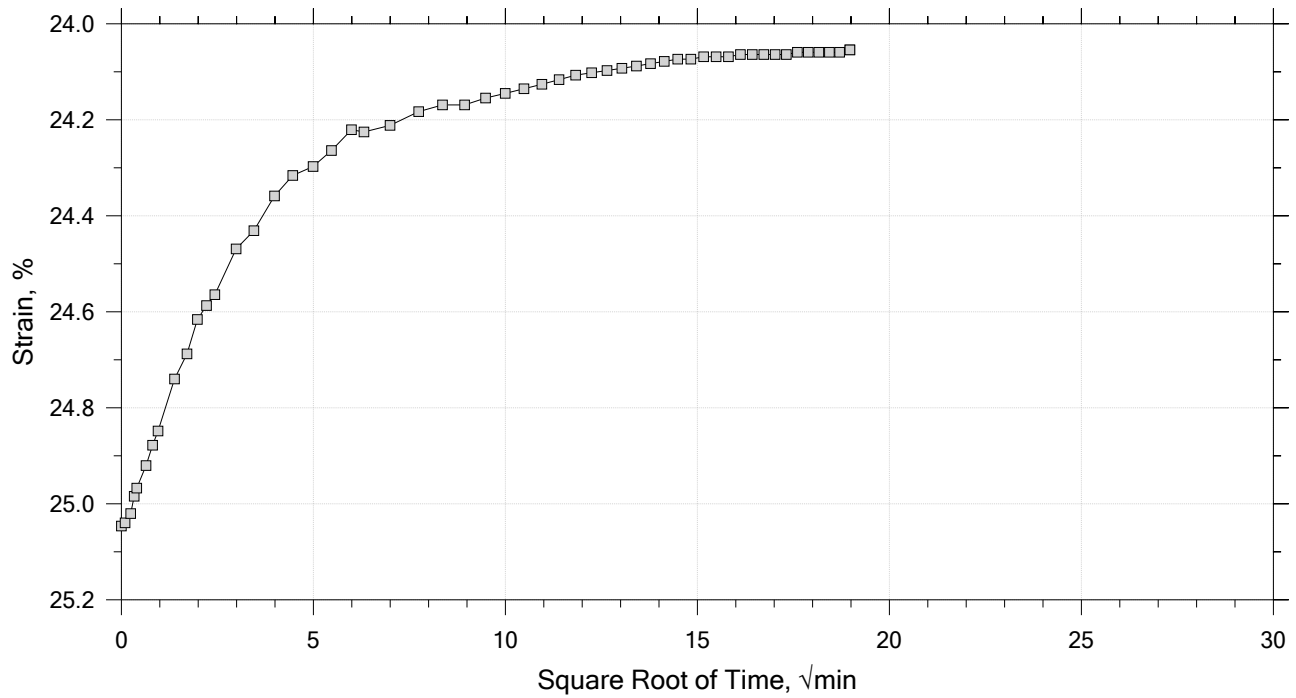
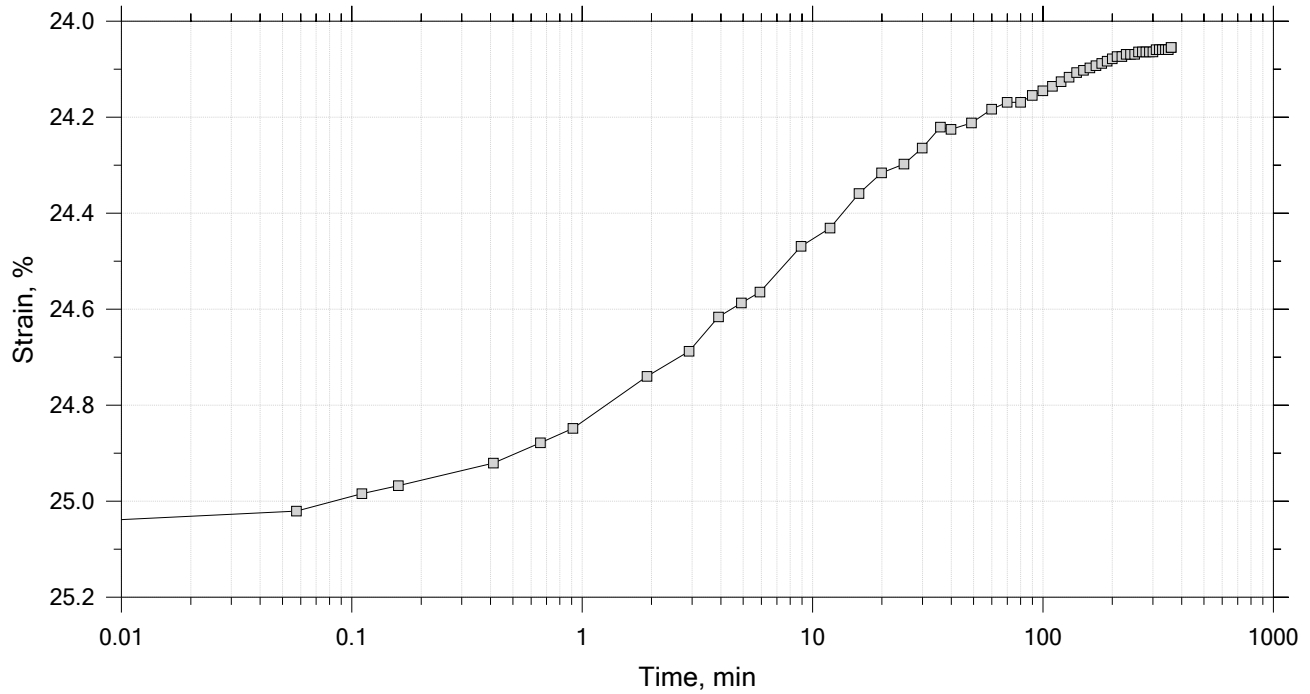
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: 312665
	Boring No.: HE BE 239	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 03/05/21	Depth: 13-15 ft
	Test No.: IP-16	Sample Type: Intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System X, Swell Pressure = 0.0672 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 13 of 15

Constant Load Step

Stress: 0.5 tsf



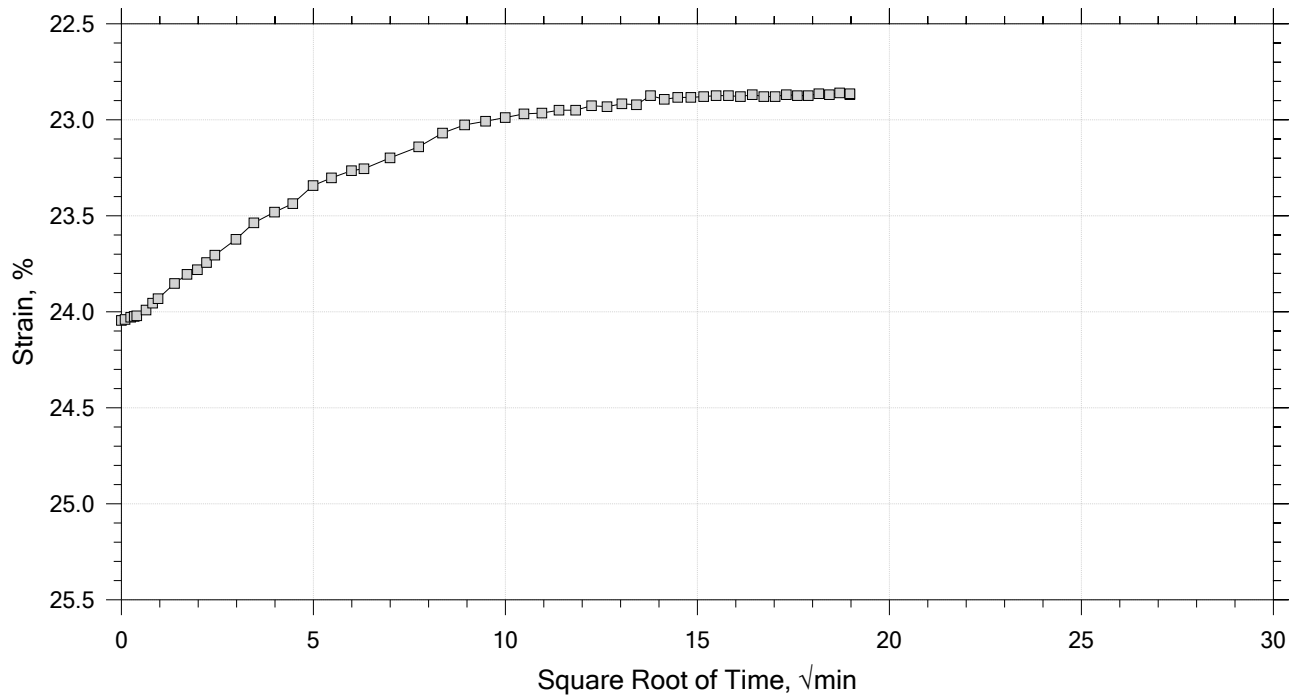
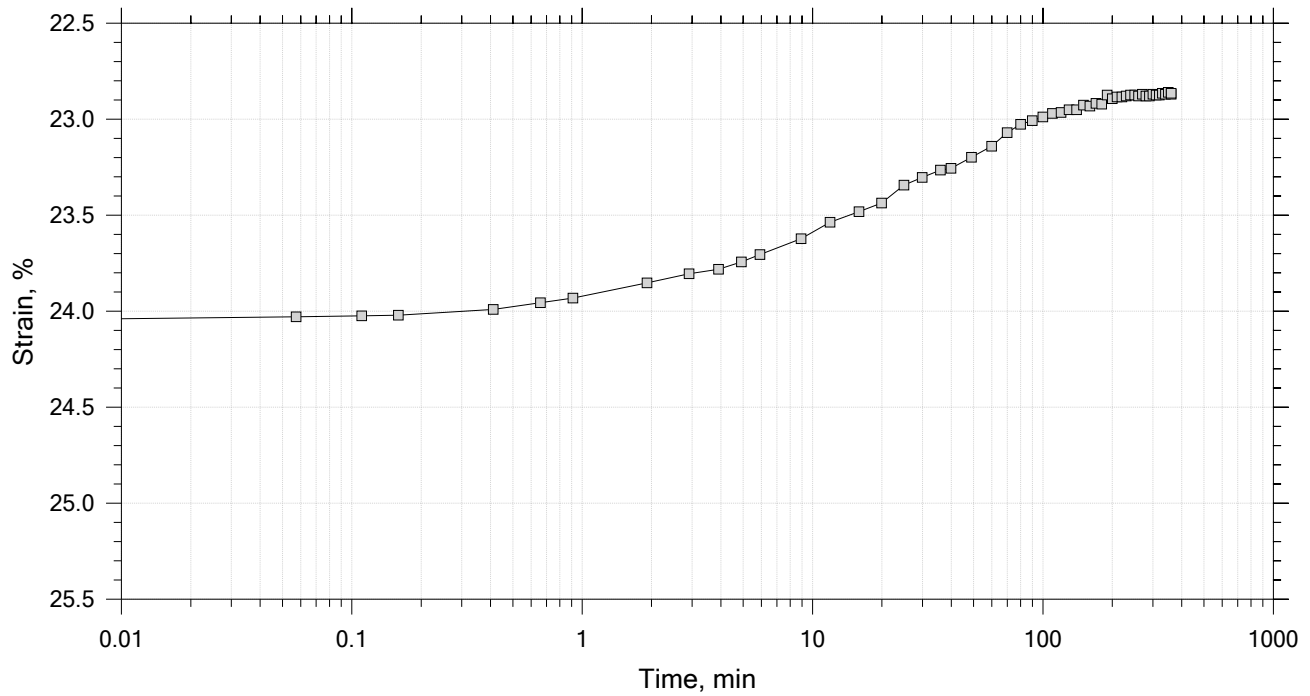
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: 312665
	Boring No.: HE BE 239	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 03/05/21	Depth: 13-15 ft
	Test No.: IP-16	Sample Type: Intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System X, Swell Pressure = 0.0672 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 14 of 15

Constant Load Step

Stress: 0.125 tsf



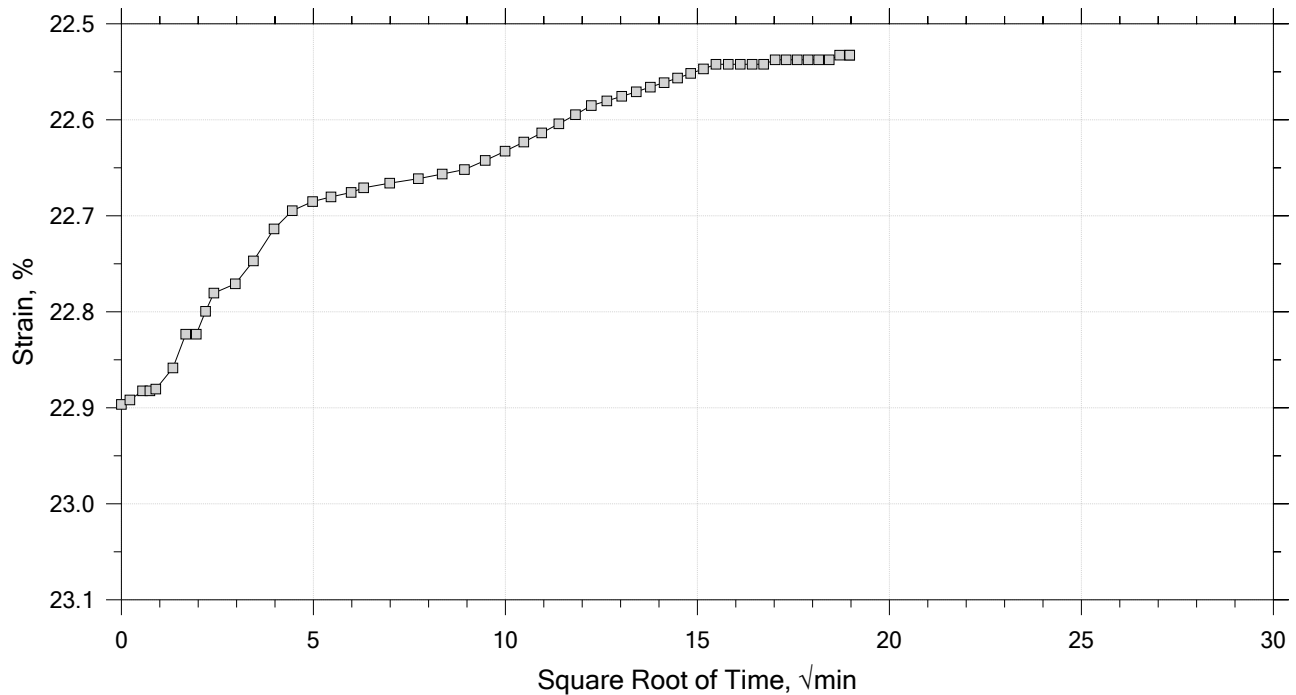
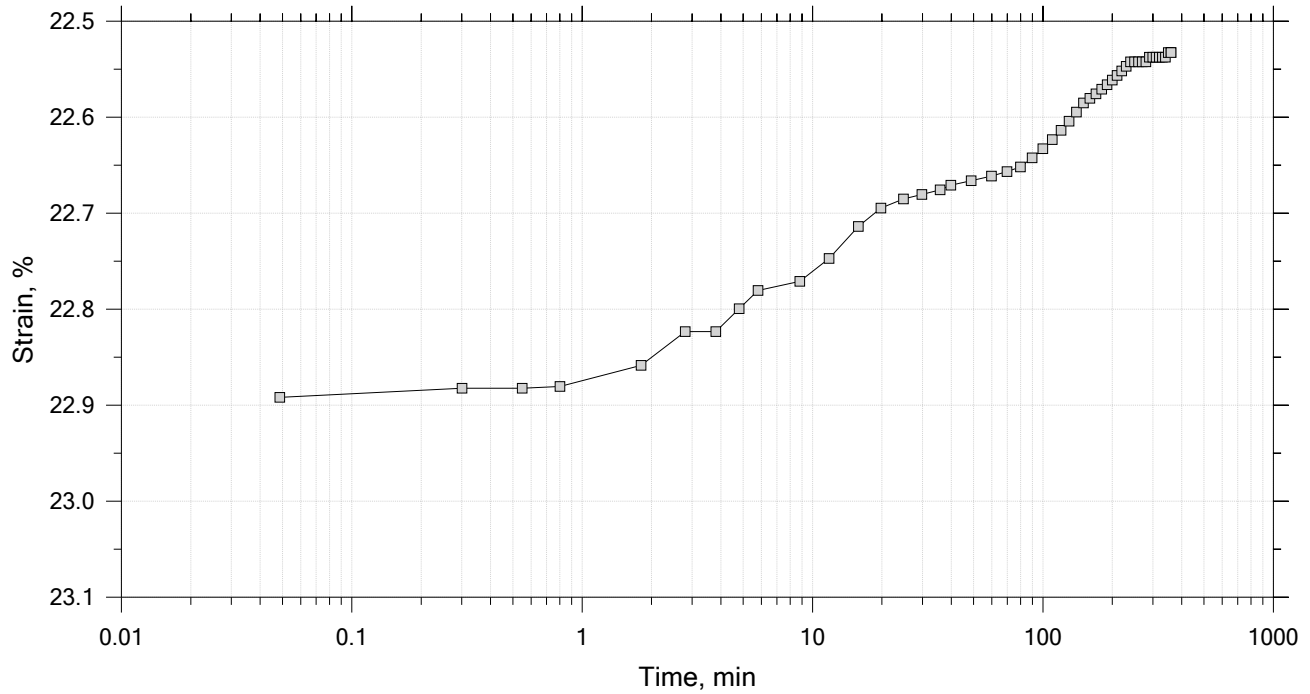
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: 312665
	Boring No.: HE BE 239	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 03/05/21	Depth: 13-15 ft
	Test No.: IP-16	Sample Type: Intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System X, Swell Pressure = 0.0672 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 15 of 15

Constant Load Step

Stress: 0.0625 tsf




	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: 312665
	Boring No.: HE BE 239	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 03/05/21	Depth: 13-15 ft
	Test No.: IP-16	Sample Type: Intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System X, Swell Pressure = 0.0672 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Specimen Diameter: 2.50 in	Estimated Specific Gravity: 2.76	Liquid Limit: 34
Initial Height: 1.00 in	Initial Void Ratio: 0.938	Plastic Limit: 17
Final Height: 0.78 in	Final Void Ratio: 0.52	Plasticity Index: 17

	Before Test Trimmings	Before Test Specimen	After Test Specimen	After Test Trimmings
Container ID	E-1769	RING		E0252
Mass Container, gm	8.21	109.96	109.96	8.3
Mass Container + Wet Soil, gm	117.27	260.95	245.98	144.1
Mass Container + Dry Soil, gm	91.54	224.42	224.42	122.57
Mass Dry Soil, gm	83.33	114.46	114.46	114.27
Water Content, %	30.88	31.92	18.84	18.84
Void Ratio	---	0.94	0.52	---
Degree of Saturation, %	---	93.82	100.00	---
Dry Unit Weight, pcf	---	88.827	113.3	---


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

	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: 312665
	Boring No.: HE BE 239	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 03/05/21	Depth: 13-15 ft
	Test No.: IP-16	Sample Type: Intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System X, Swell Pressure = 0.0672 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

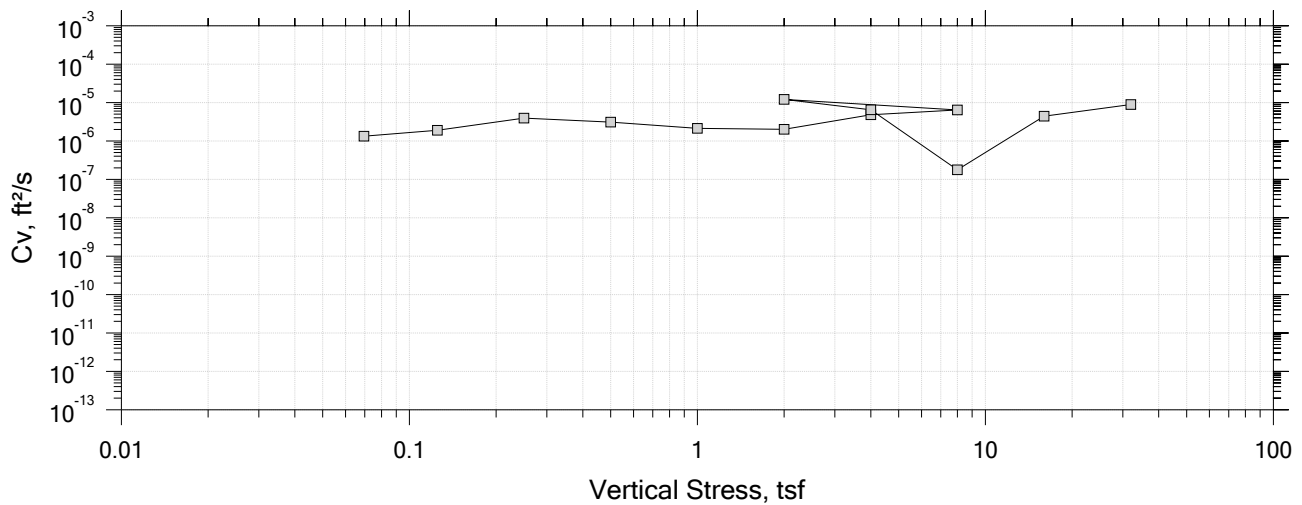
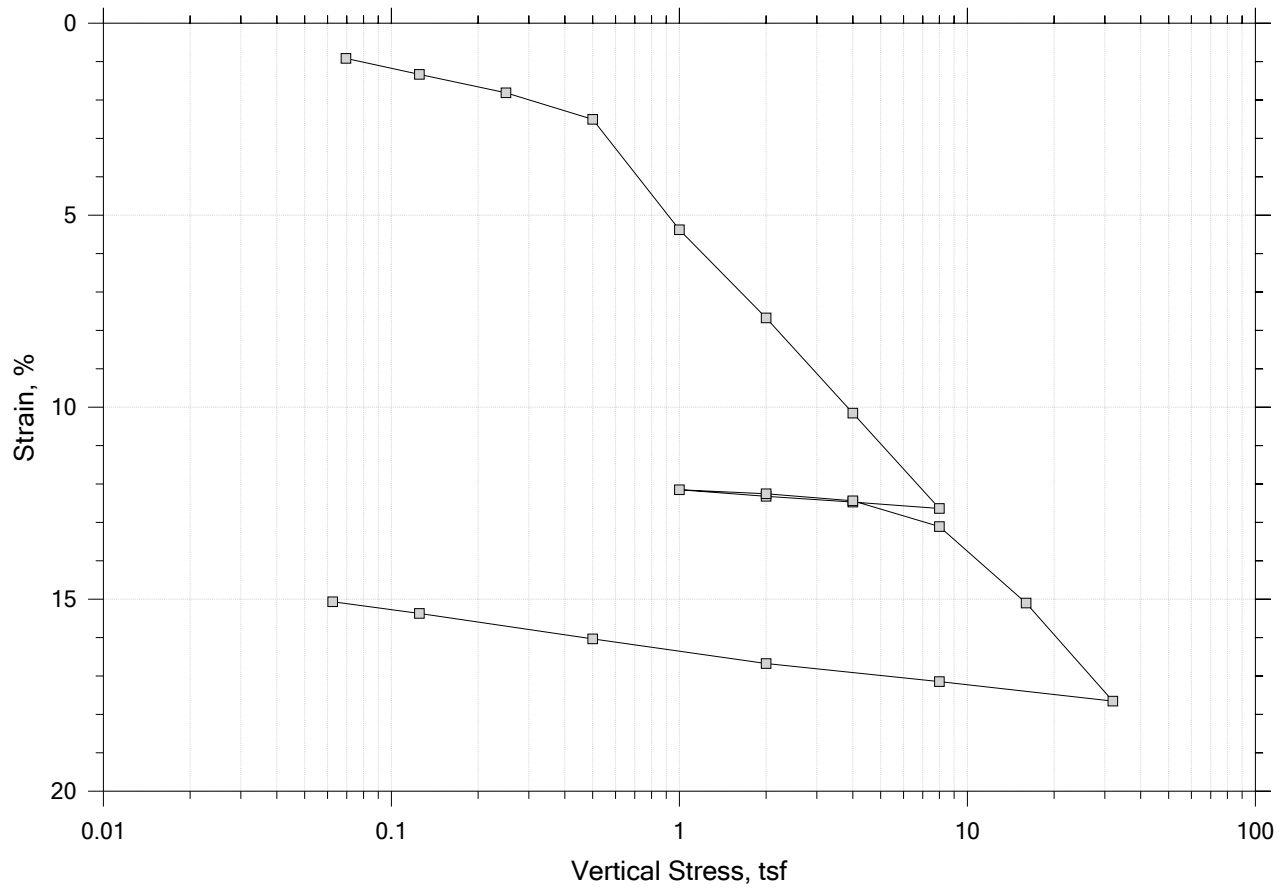
Square Root of Time Coefficients


[illegible]

	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: 312665
	Boring No.: HE BE 239	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 03/05/21	Depth: 13-15 ft
	Test No.: IP-16	Sample Type: Intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System X, Swell Pressure = 0.0672 tsf		
	Displacement at End of Increment		

One-Dimensional Consolidation by ASTM D2435 - Method B

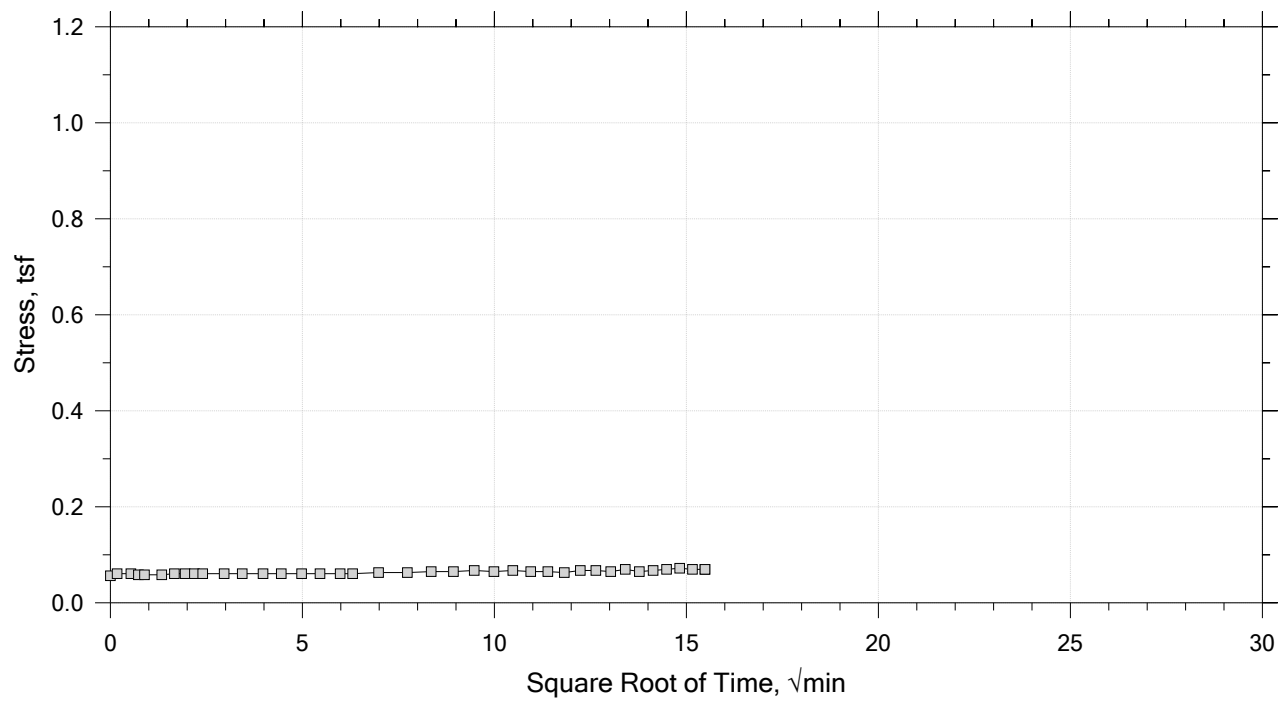
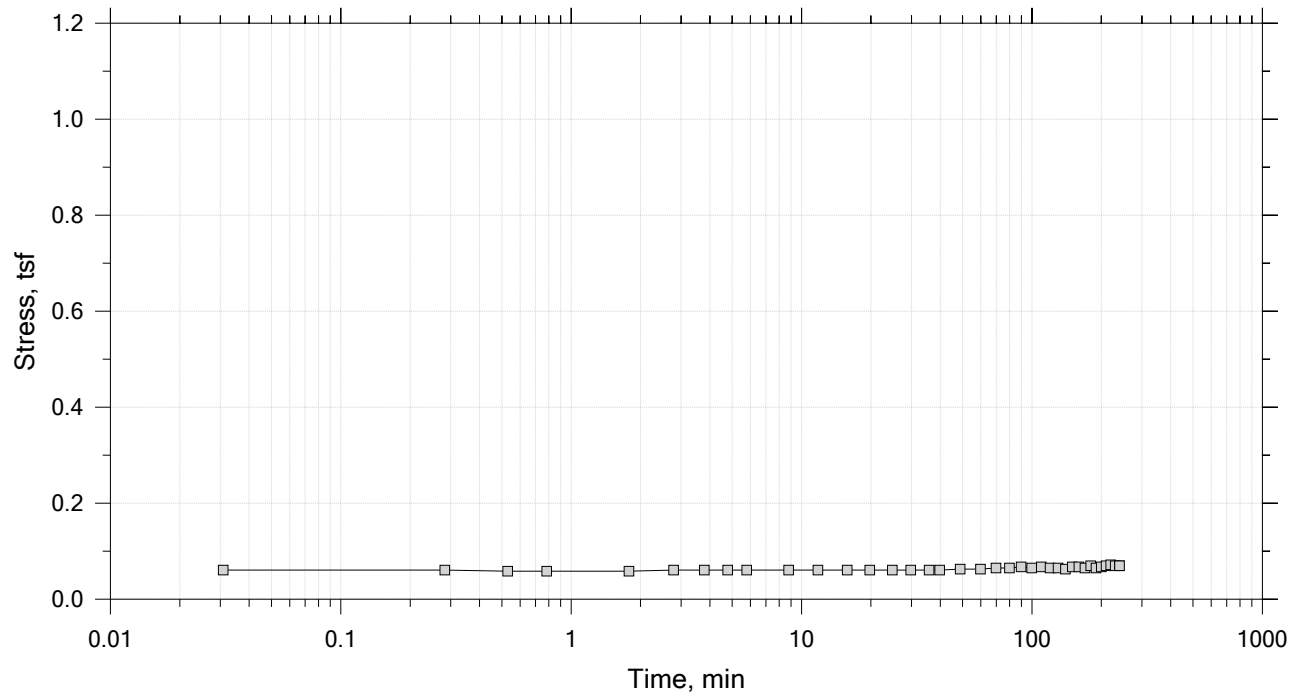
Summary Report




	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-239	Tested By: md	Checked By: mcm
	Sample No.: U2	Test Date: 03/01/21	Depth: 23-25 ft
	Test No.: IP-12	Sample Type: intact	Elevation: ---
	Description: Moist gray clay		
	Remarks: System X, Swell Pressure = 0.0696 tsf		
	Displacement at End of Increment		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 1 of 21
Constant Volume Step
Stress: 0.0696 tsf



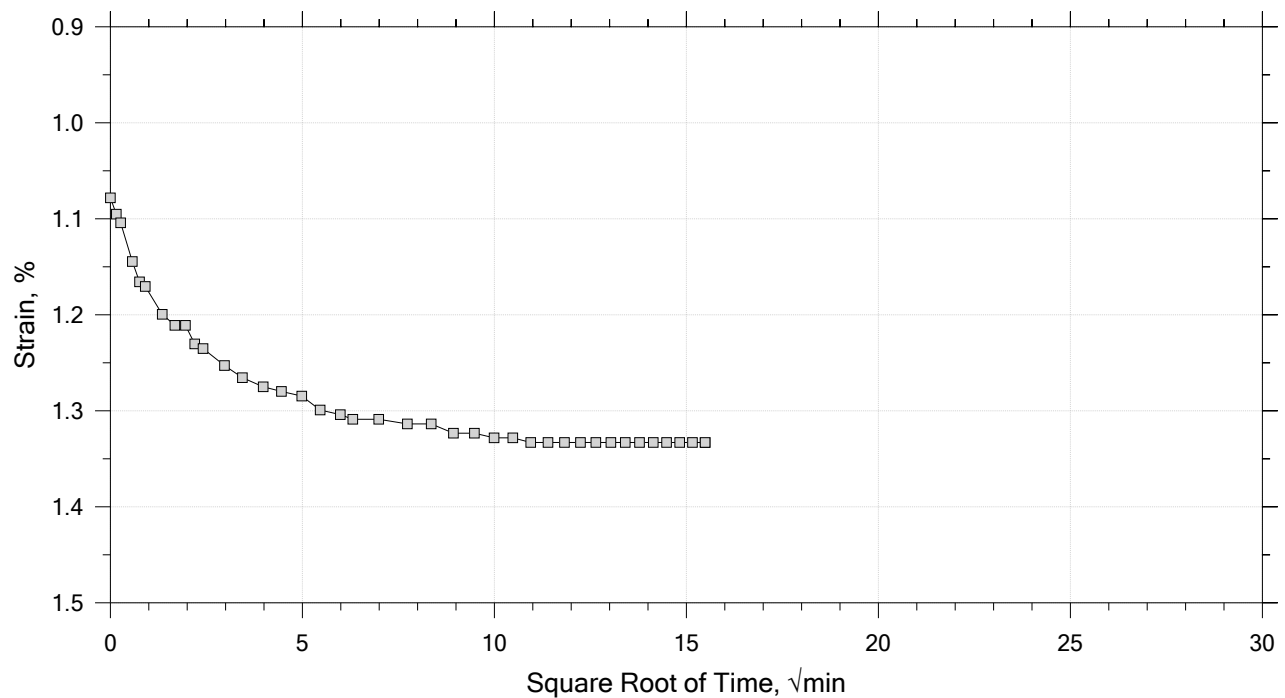
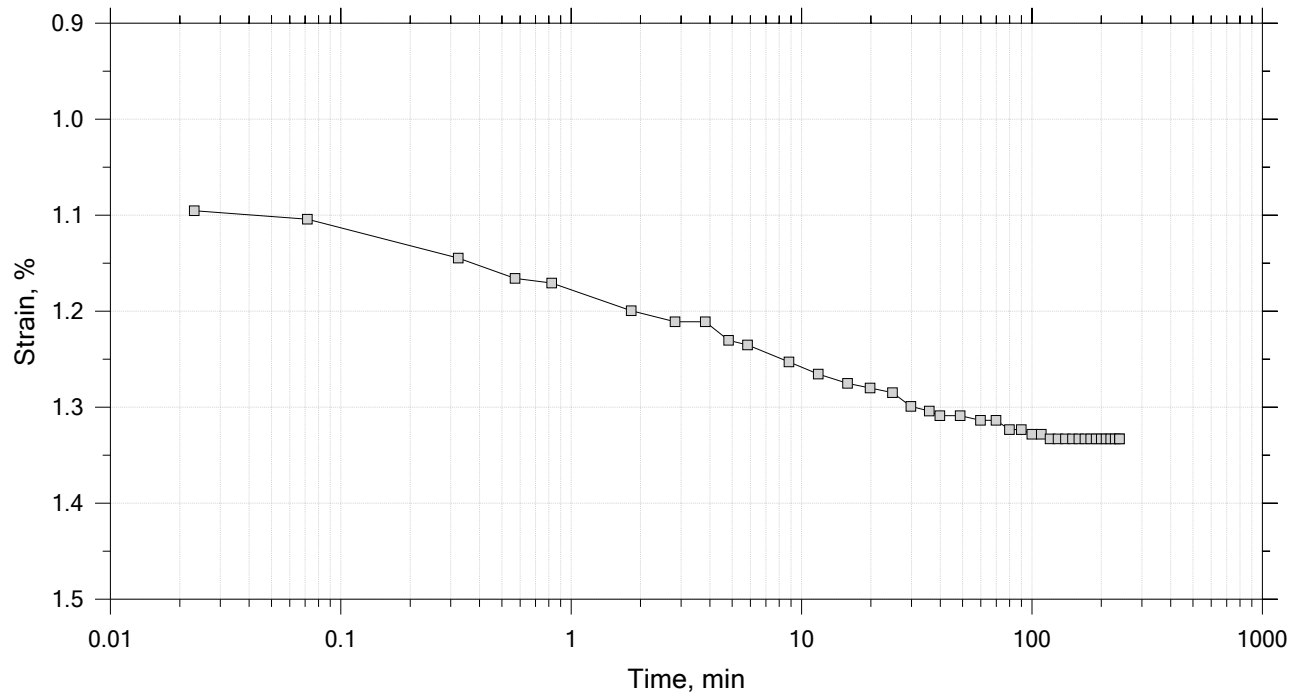
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-239	Tested By: md	Checked By: mcm
	Sample No.: U2	Test Date: 03/01/21	Depth: 23-25 ft
	Test No.: IP-12	Sample Type: intact	Elevation: ---
	Description: Moist gray clay		
	Remarks: System X, Swell Pressure = 0.0696 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 2 of 21

Constant Load Step

Stress: 0.125 tsf



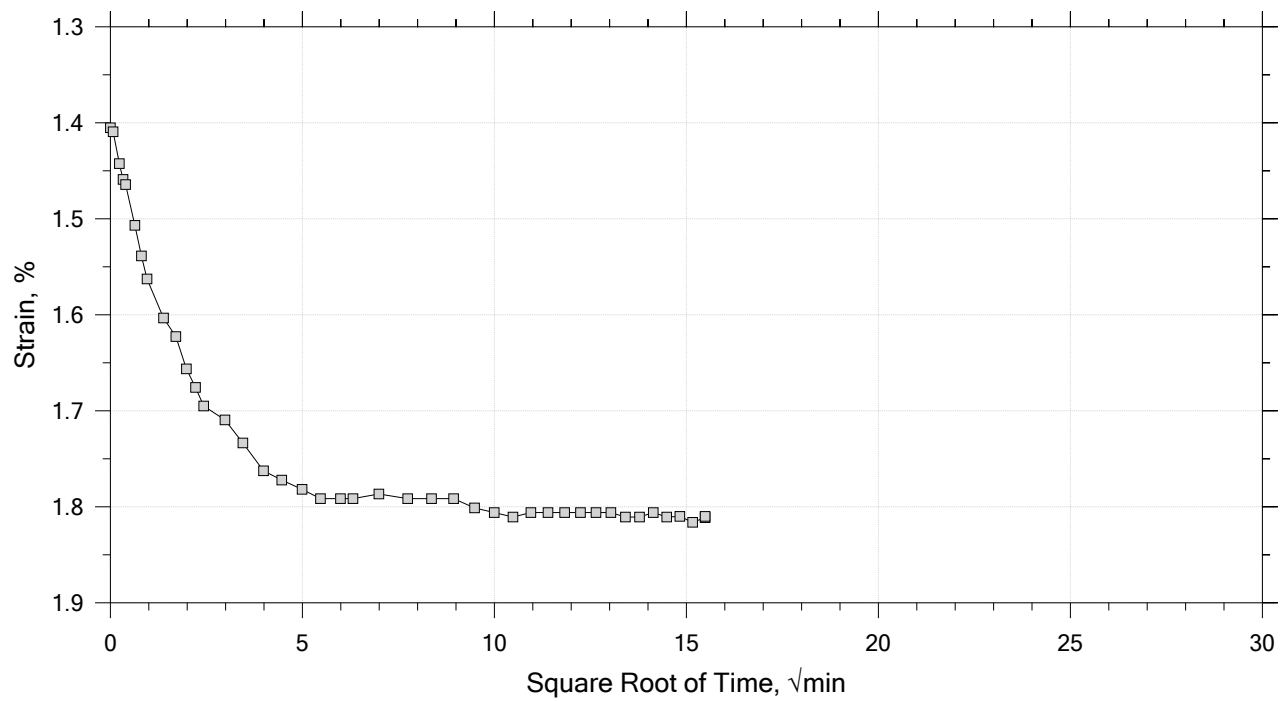
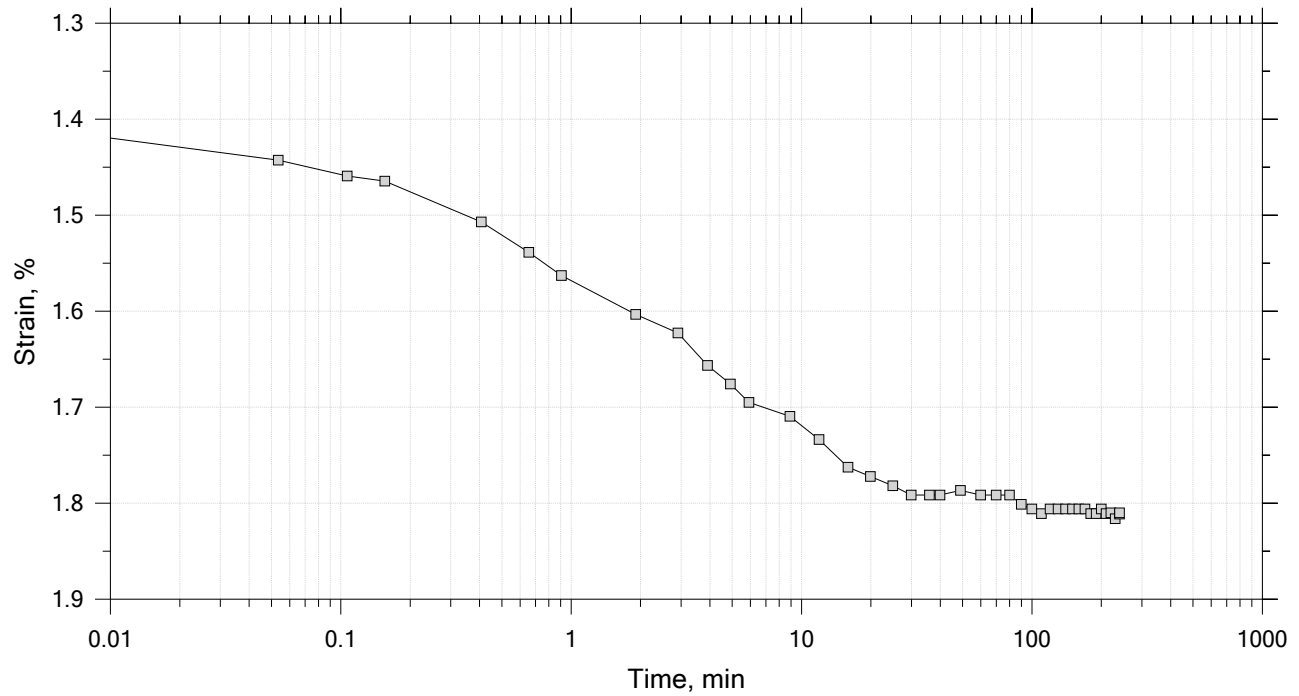
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-239	Tested By: md	Checked By: mcm
	Sample No.: U2	Test Date: 03/01/21	Depth: 23-25 ft
	Test No.: IP-12	Sample Type: intact	Elevation: ---
	Description: Moist gray clay		
	Remarks: System X, Swell Pressure = 0.0696 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 3 of 21

Constant Load Step

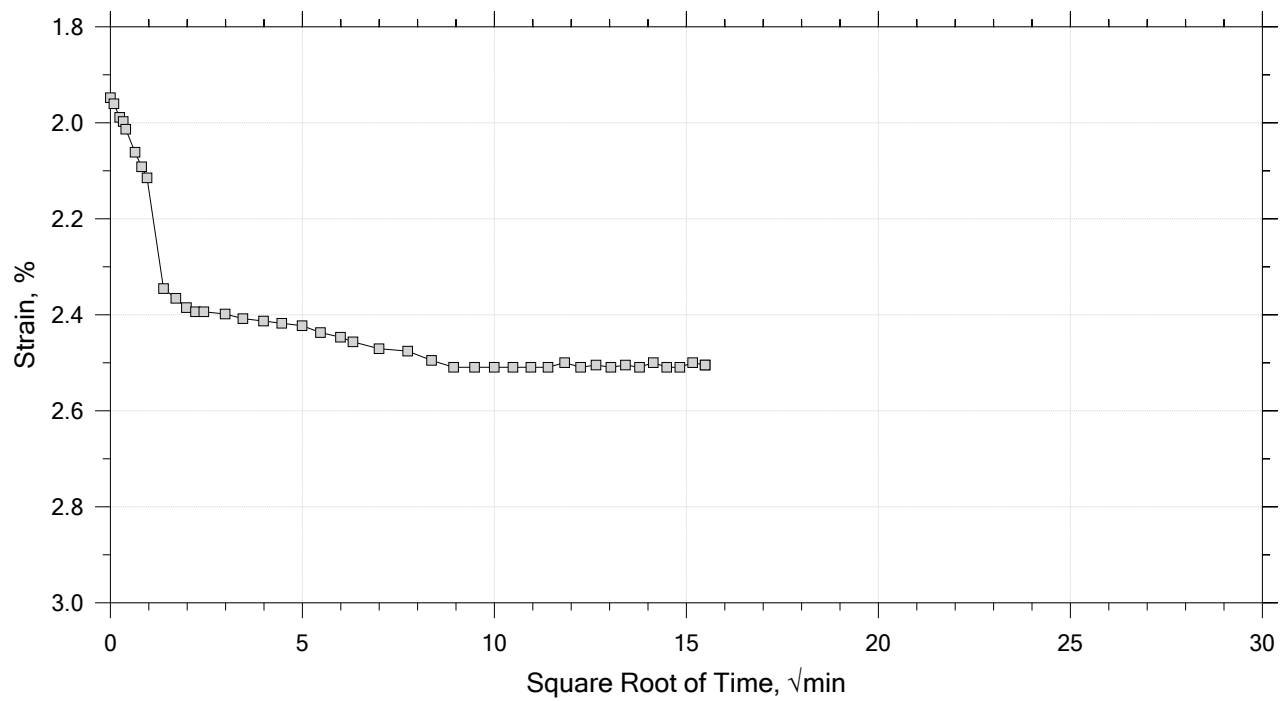
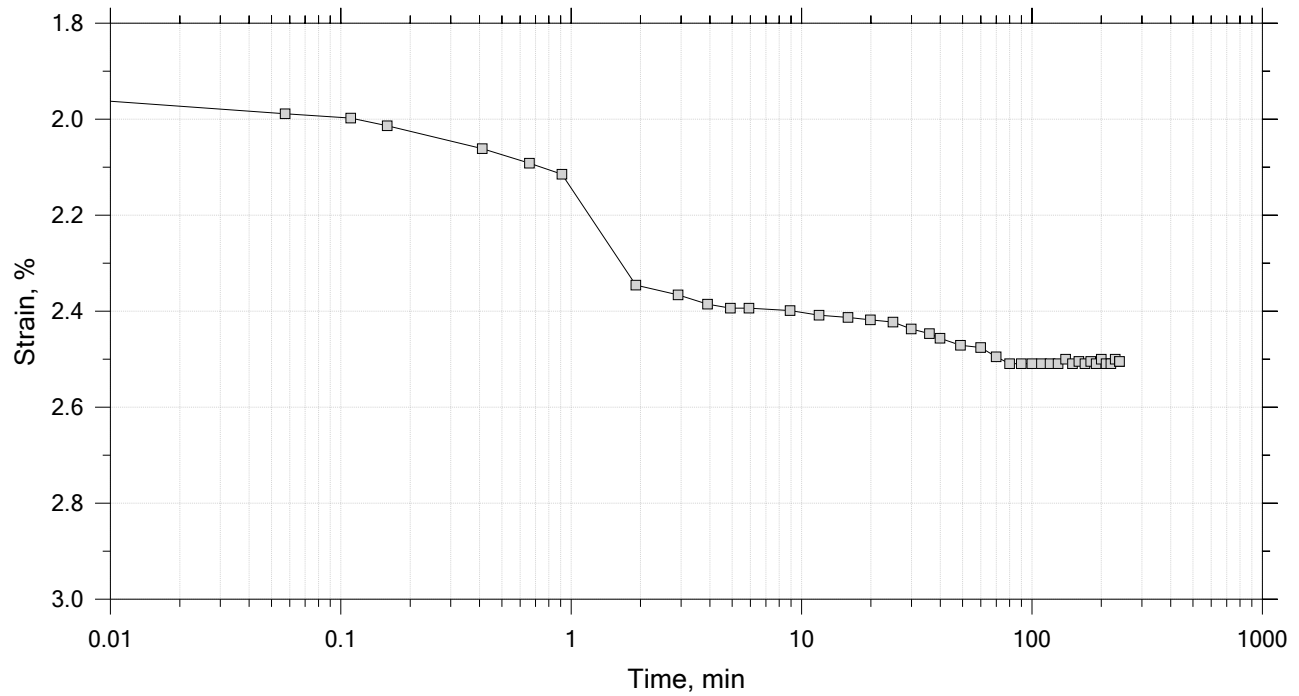
Stress: 0.25 tsf




	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-239	Tested By: md	Checked By: mcm
	Sample No.: U2	Test Date: 03/01/21	Depth: 23-25 ft
	Test No.: IP-12	Sample Type: intact	Elevation: ---
	Description: Moist gray clay		
	Remarks: System X, Swell Pressure = 0.0696 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 4 of 21
Constant Load Step
Stress: 0.5 tsf



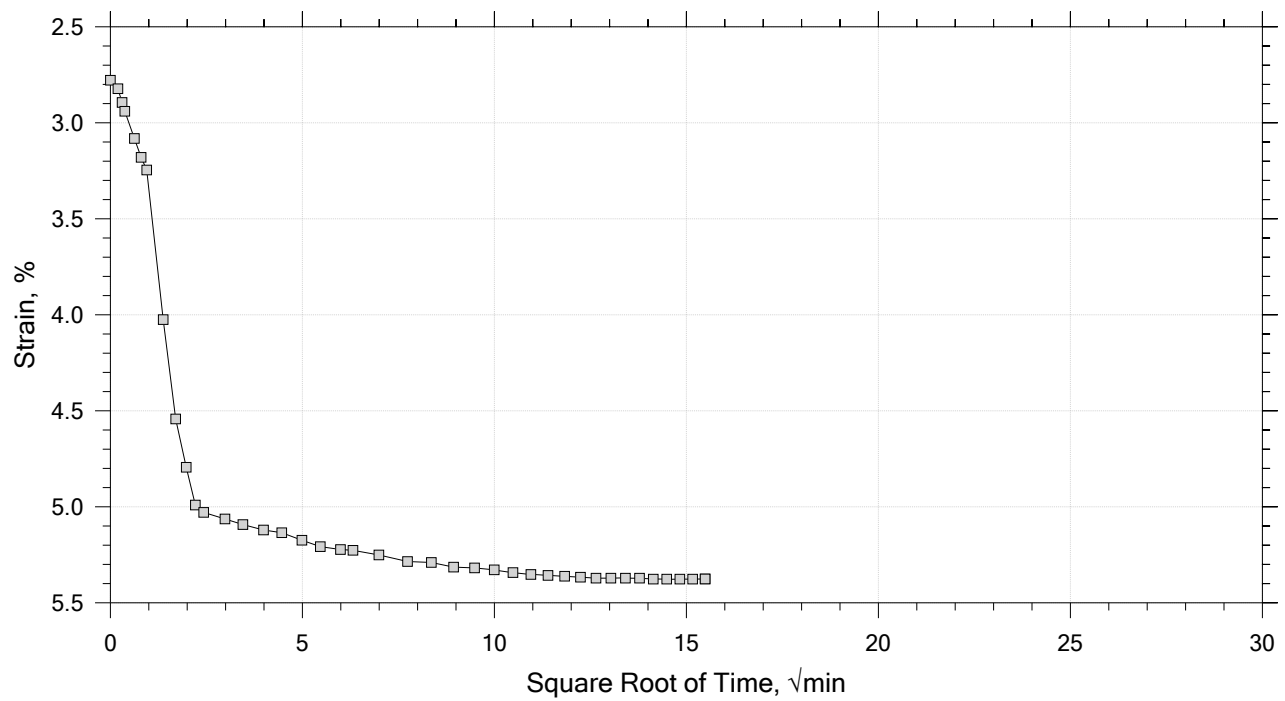
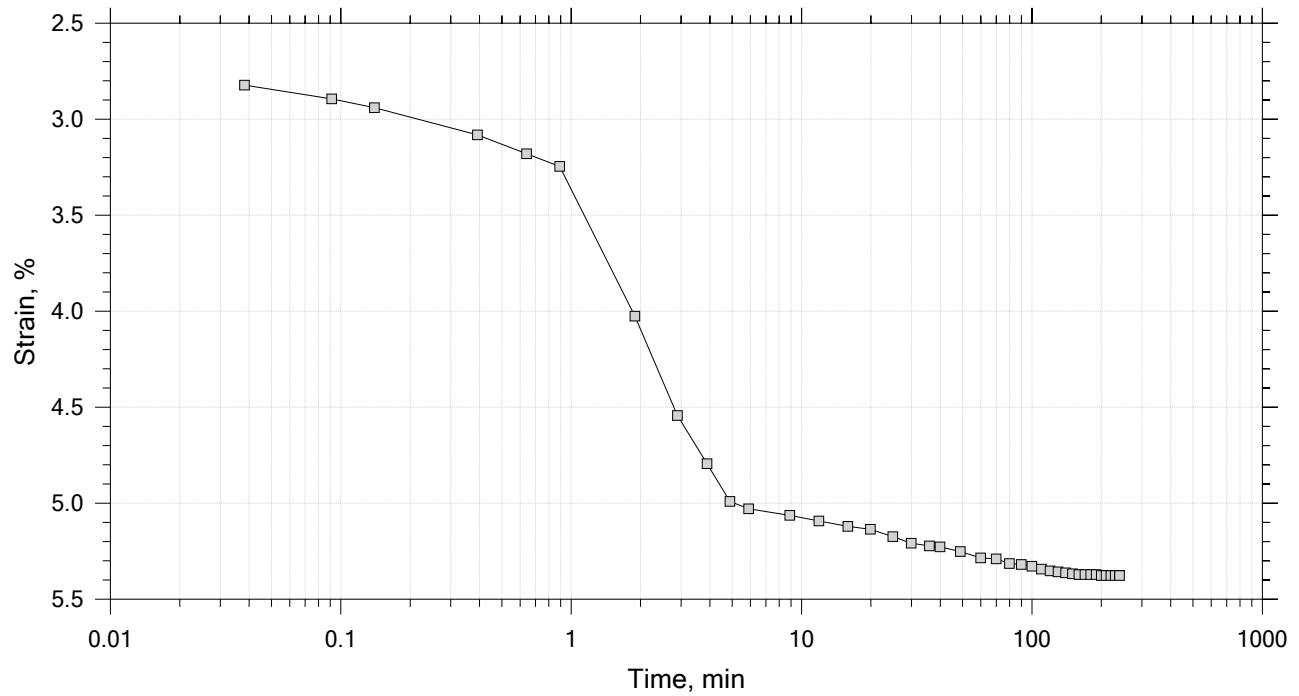
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-239	Tested By: md	Checked By: mcm
	Sample No.: U2	Test Date: 03/01/21	Depth: 23-25 ft
	Test No.: IP-12	Sample Type: intact	Elevation: ---
	Description: Moist gray clay		
	Remarks: System X, Swell Pressure = 0.0696 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 5 of 21

Constant Load Step

Stress: 1 tsf



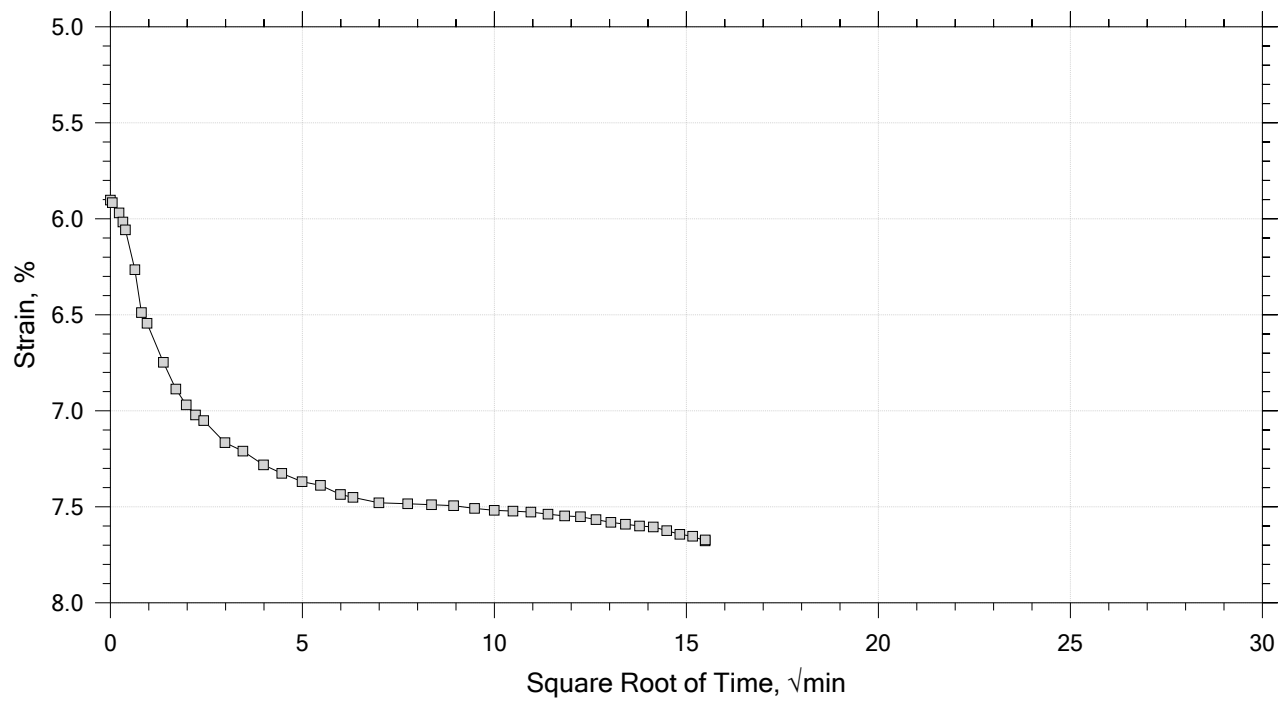
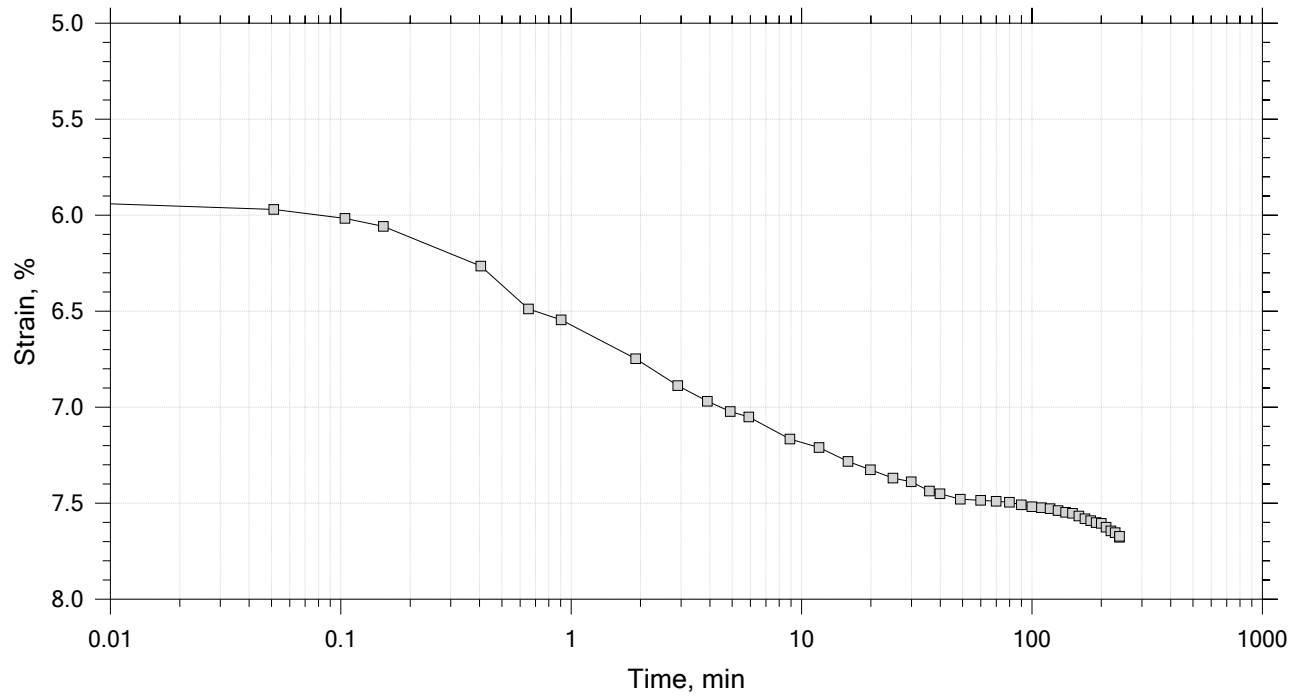
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-239	Tested By: md	Checked By: mcm
	Sample No.: U2	Test Date: 03/01/21	Depth: 23-25 ft
	Test No.: IP-12	Sample Type: intact	Elevation: ---
	Description: Moist gray clay		
	Remarks: System X, Swell Pressure = 0.0696 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 6 of 21

Constant Load Step

Stress: 2 tsf



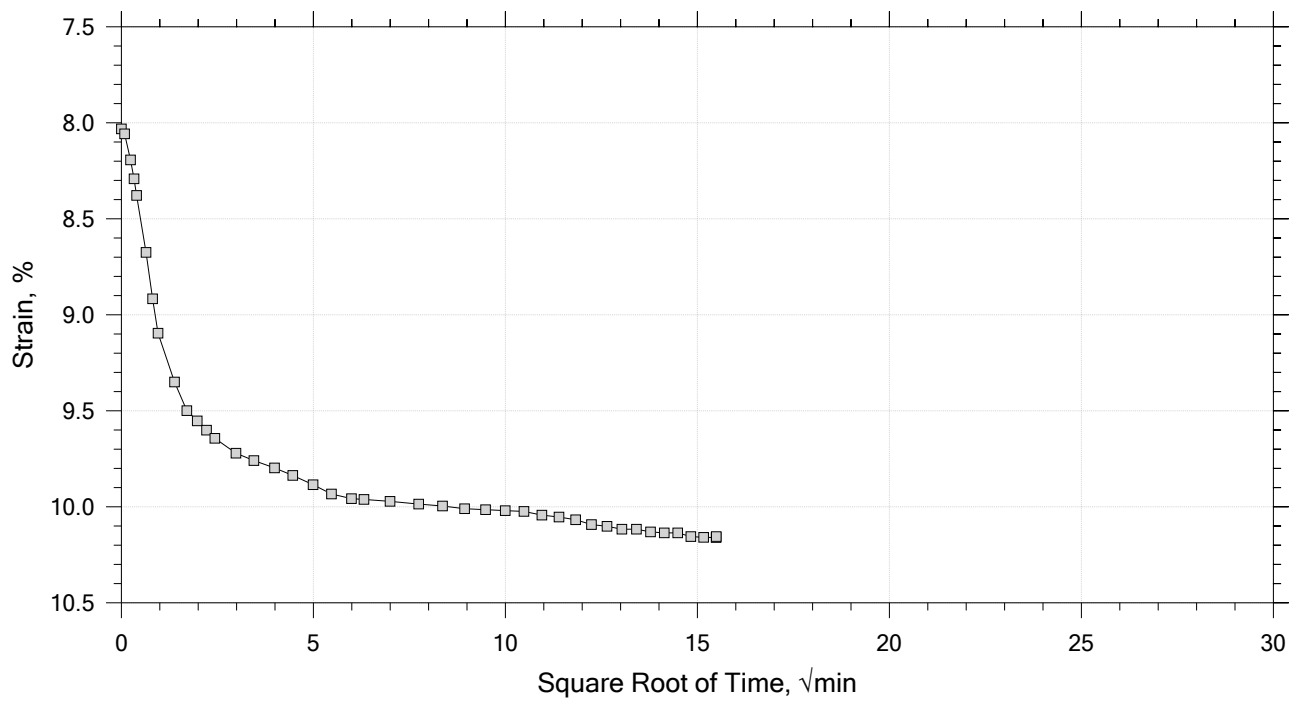
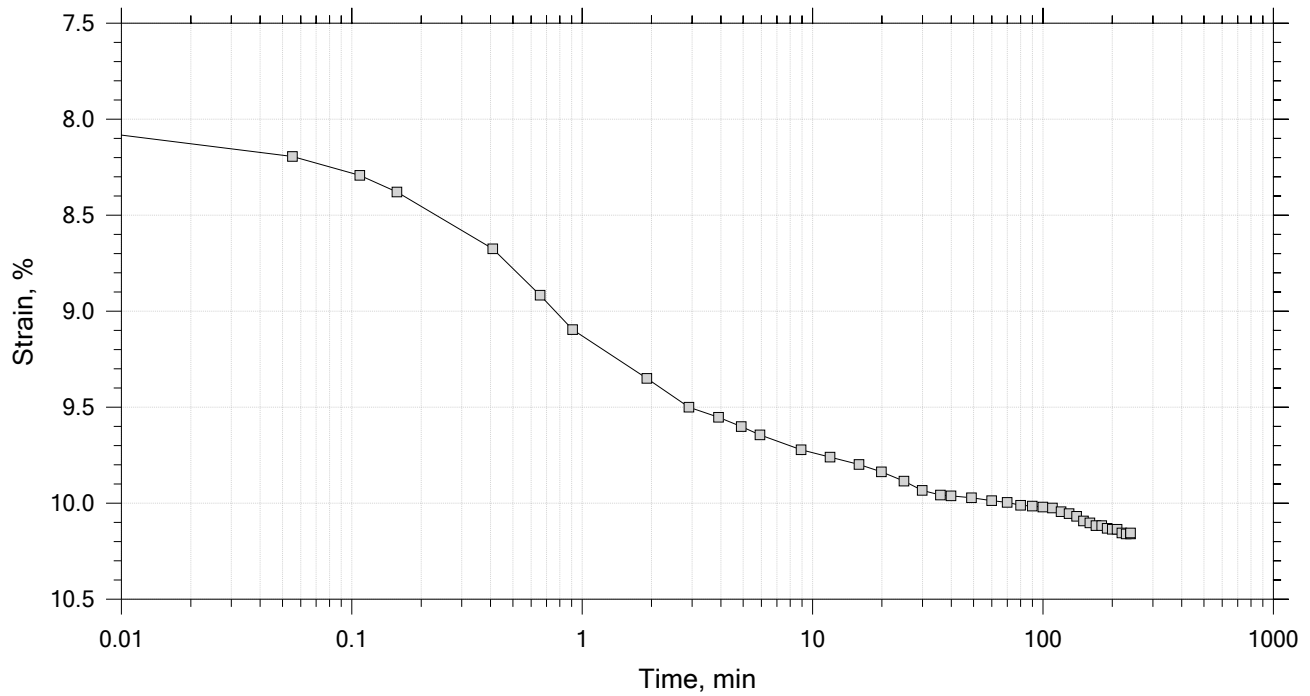
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-239	Tested By: md	Checked By: mcm
	Sample No.: U2	Test Date: 03/01/21	Depth: 23-25 ft
	Test No.: IP-12	Sample Type: intact	Elevation: ---
	Description: Moist gray clay		
	Remarks: System X, Swell Pressure = 0.0696 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 7 of 21

Constant Load Step

Stress: 4 tsf



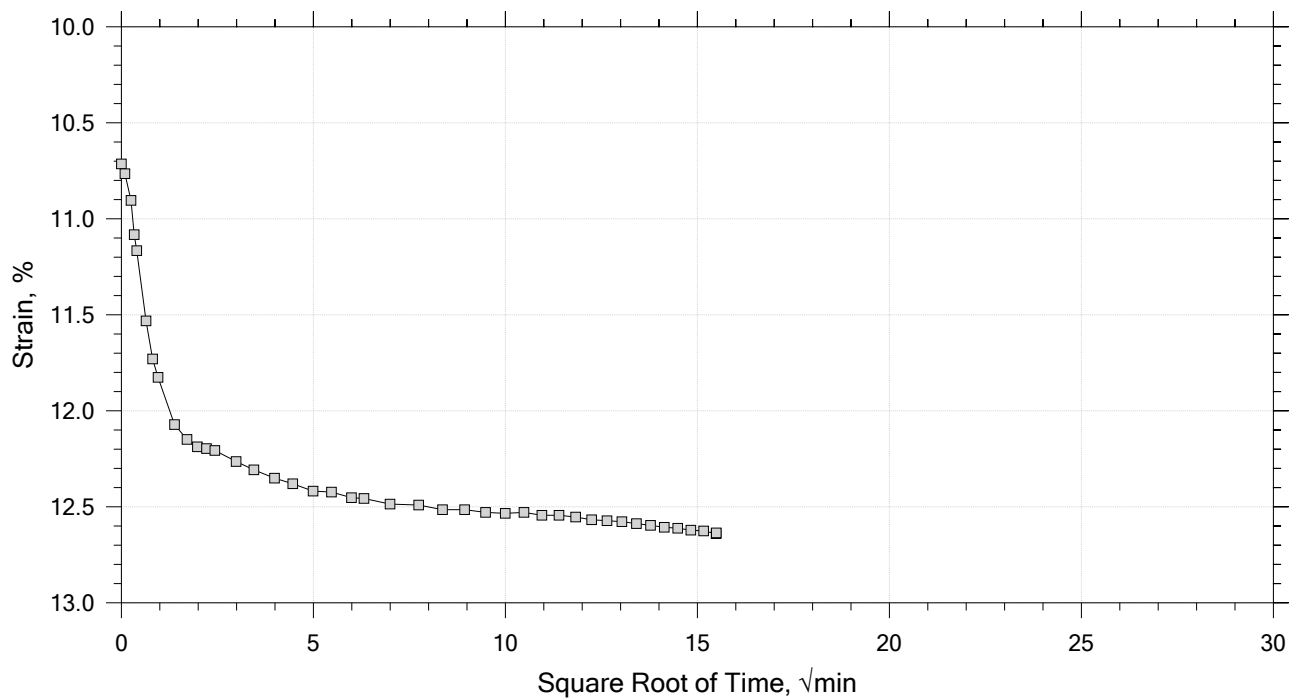
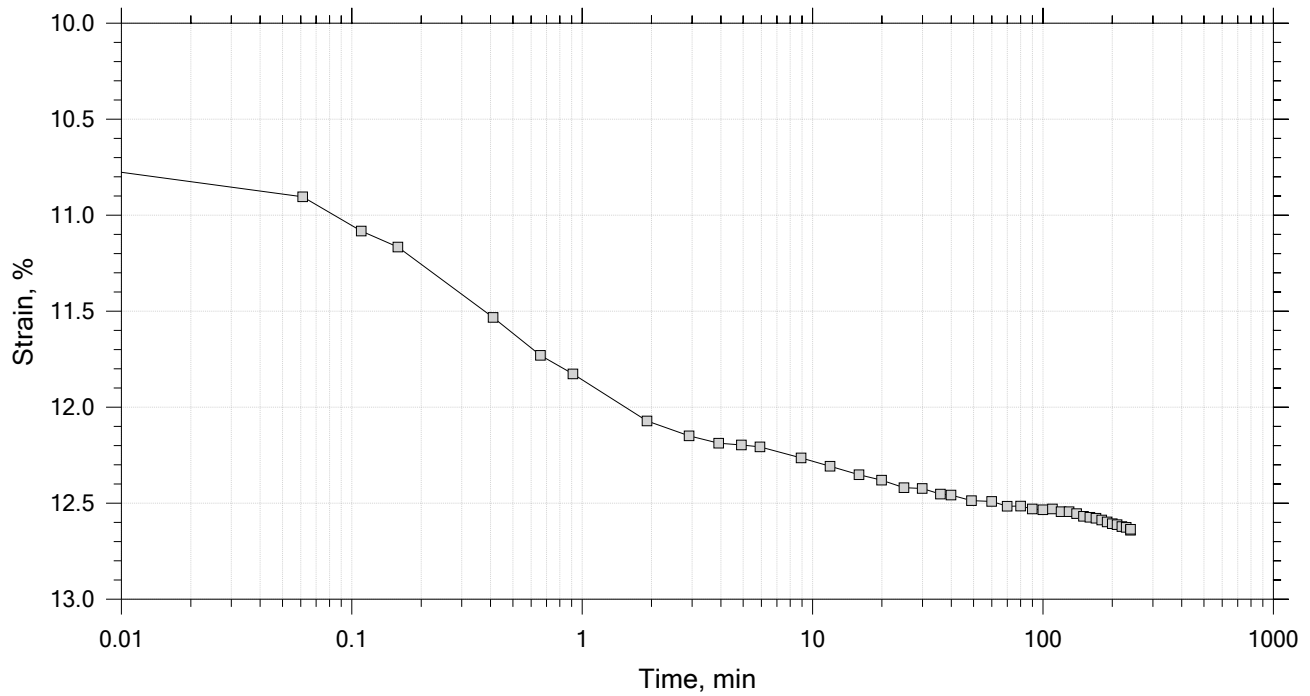
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-239	Tested By: md	Checked By: mcm
	Sample No.: U2	Test Date: 03/01/21	Depth: 23-25 ft
	Test No.: IP-12	Sample Type: intact	Elevation: ---
	Description: Moist gray clay		
	Remarks: System X, Swell Pressure = 0.0696 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 8 of 21

Constant Load Step

Stress: 8 tsf



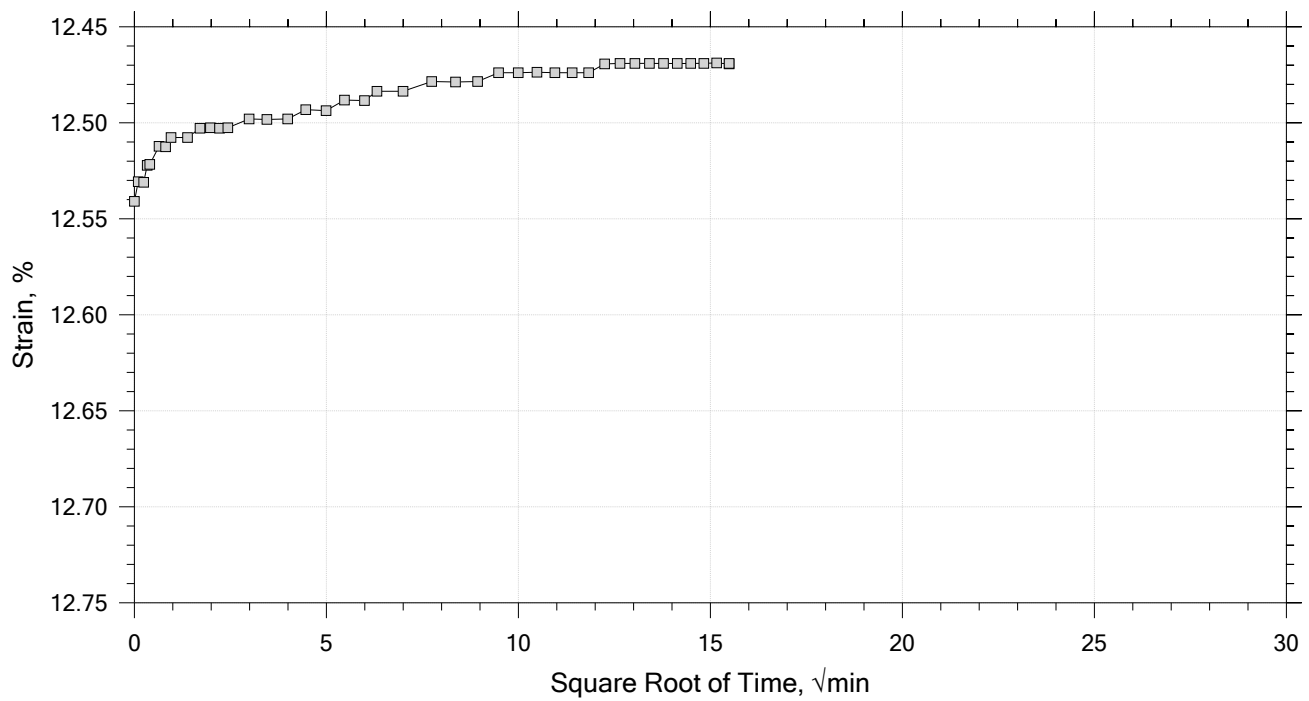
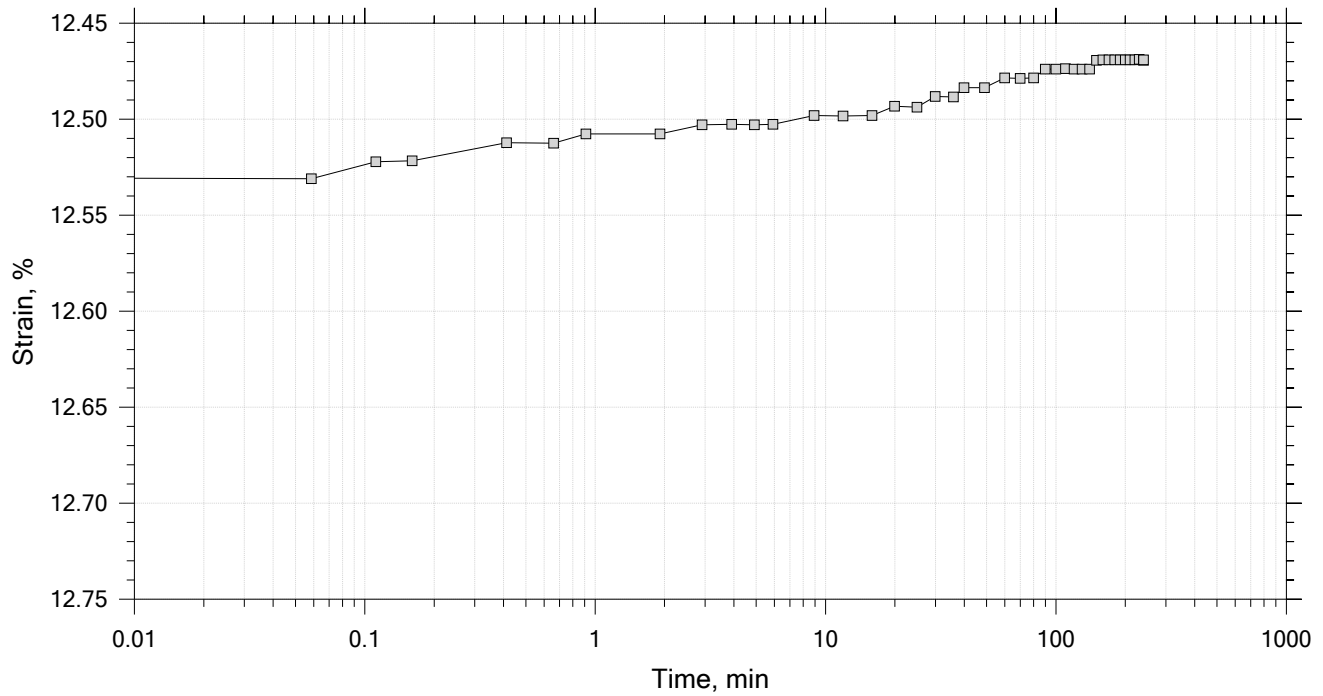
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-239	Tested By: md	Checked By: mcm
	Sample No.: U2	Test Date: 03/01/21	Depth: 23-25 ft
	Test No.: IP-12	Sample Type: intact	Elevation: ---
	Description: Moist gray clay		
	Remarks: System X, Swell Pressure = 0.0696 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 9 of 21

Constant Load Step

Stress: 4 tsf



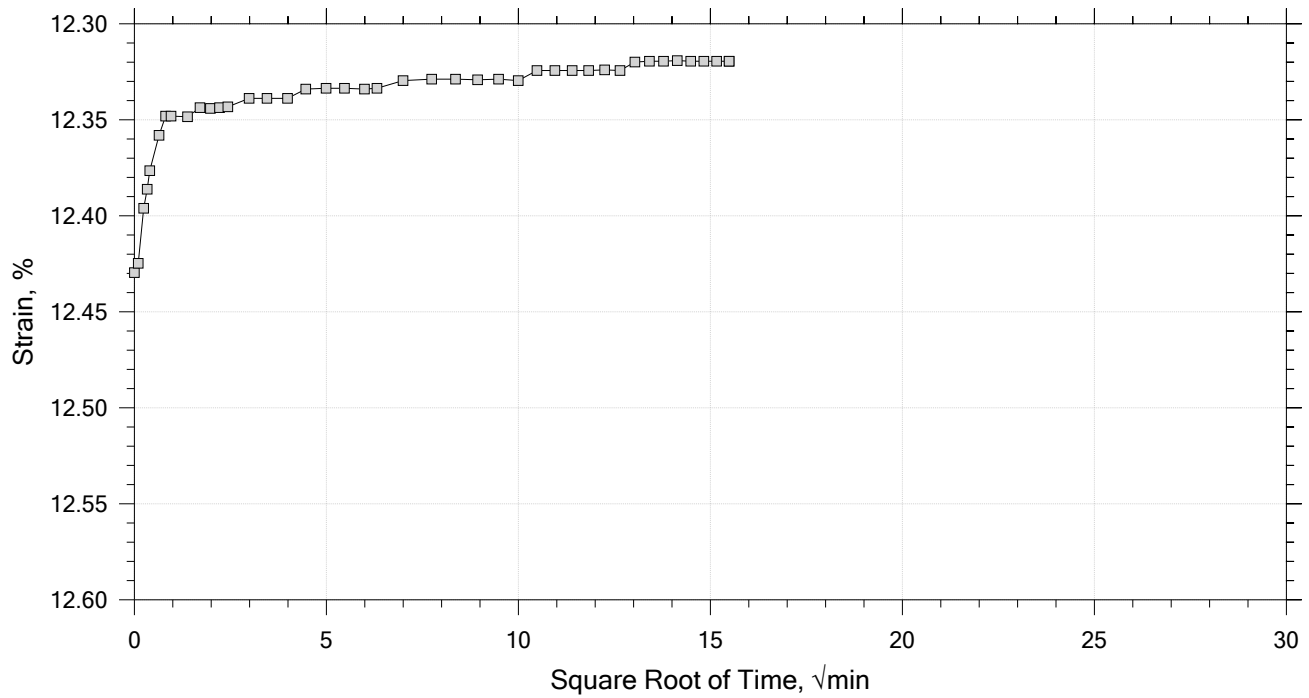
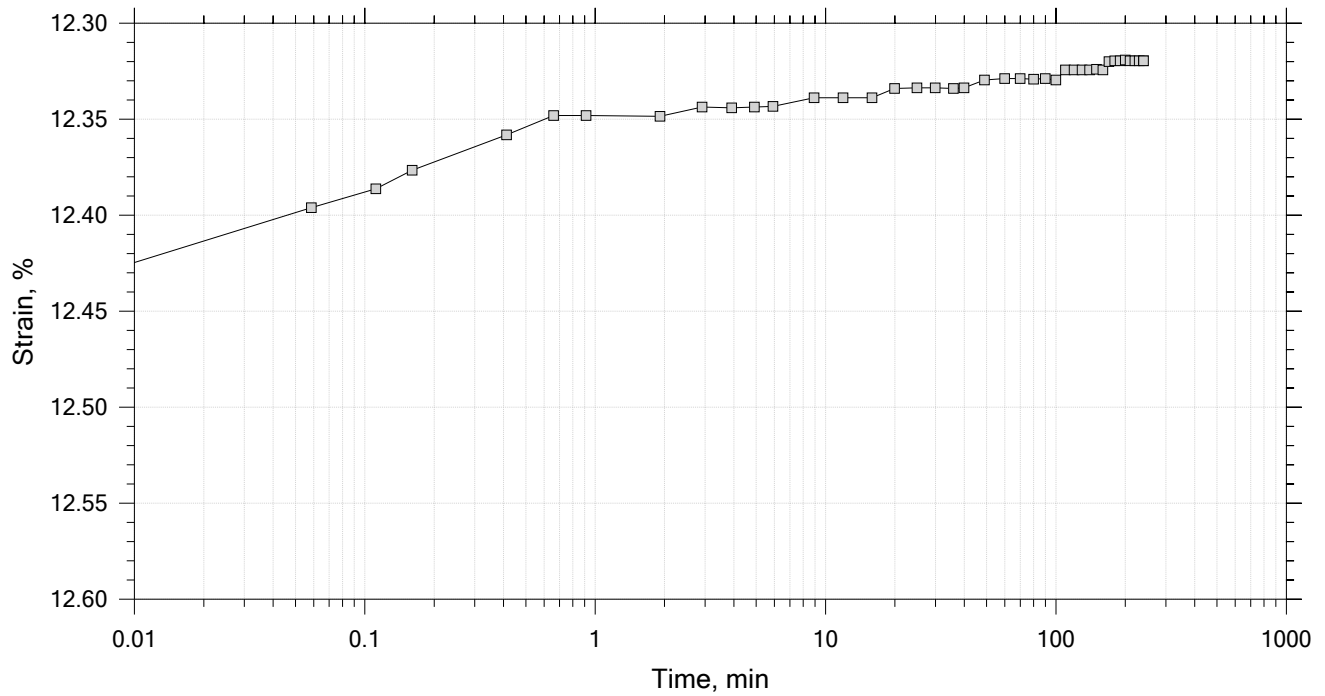
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-239	Tested By: md	Checked By: mcm
	Sample No.: U2	Test Date: 03/01/21	Depth: 23-25 ft
	Test No.: IP-12	Sample Type: intact	Elevation: ---
	Description: Moist gray clay		
	Remarks: System X, Swell Pressure = 0.0696 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 10 of 21

Constant Load Step

Stress: 2 tsf



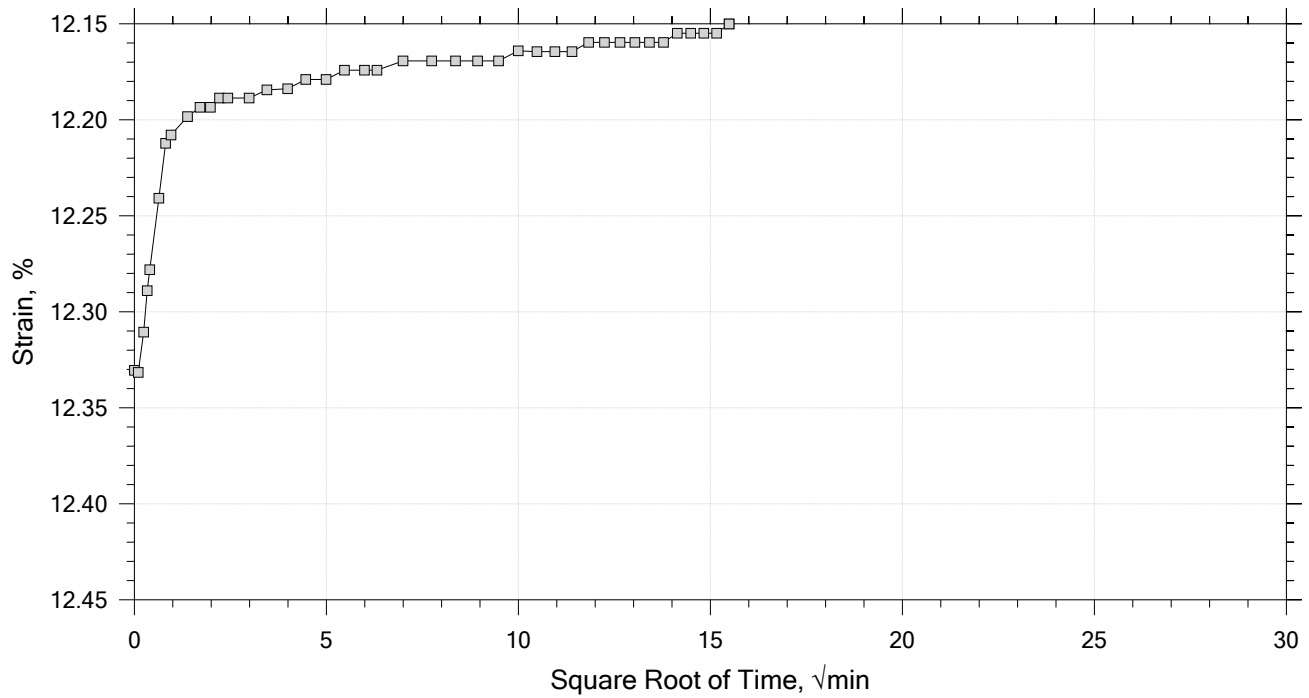
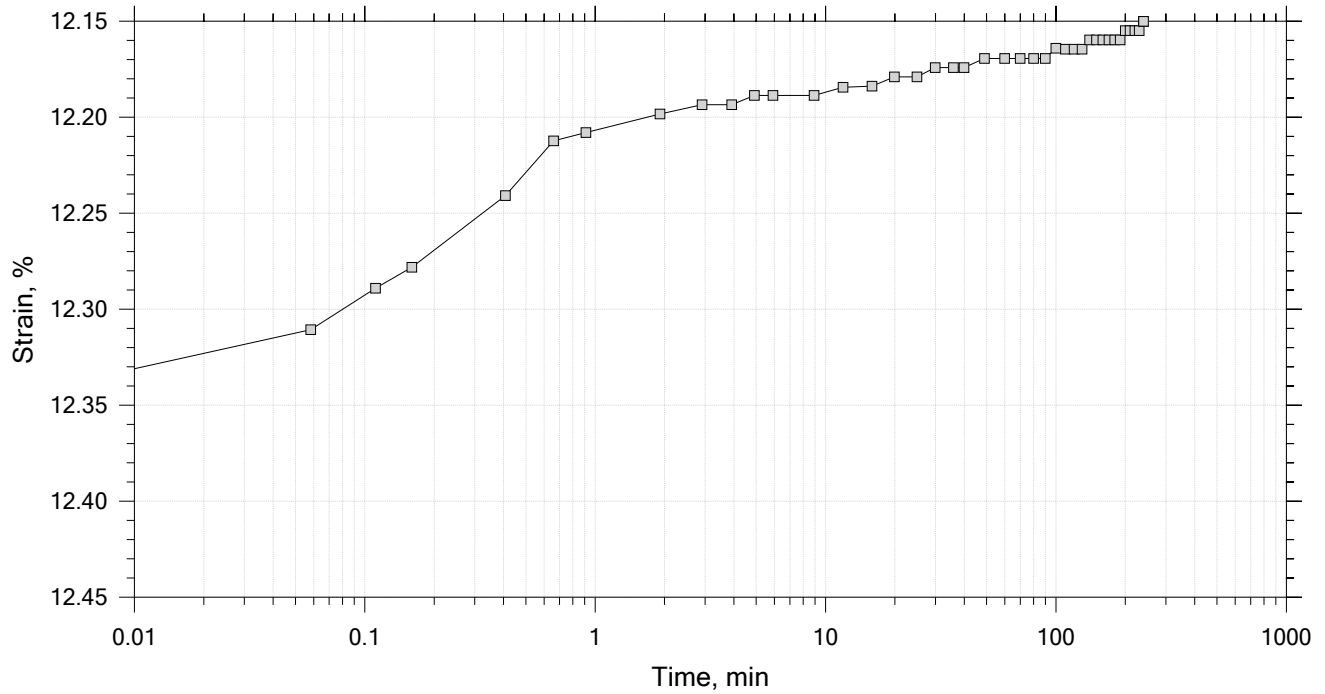
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-239	Tested By: md	Checked By: mcm
	Sample No.: U2	Test Date: 03/01/21	Depth: 23-25 ft
	Test No.: IP-12	Sample Type: intact	Elevation: ---
	Description: Moist gray clay		
	Remarks: System X, Swell Pressure = 0.0696 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 11 of 21

Constant Load Step

Stress: 1 tsf



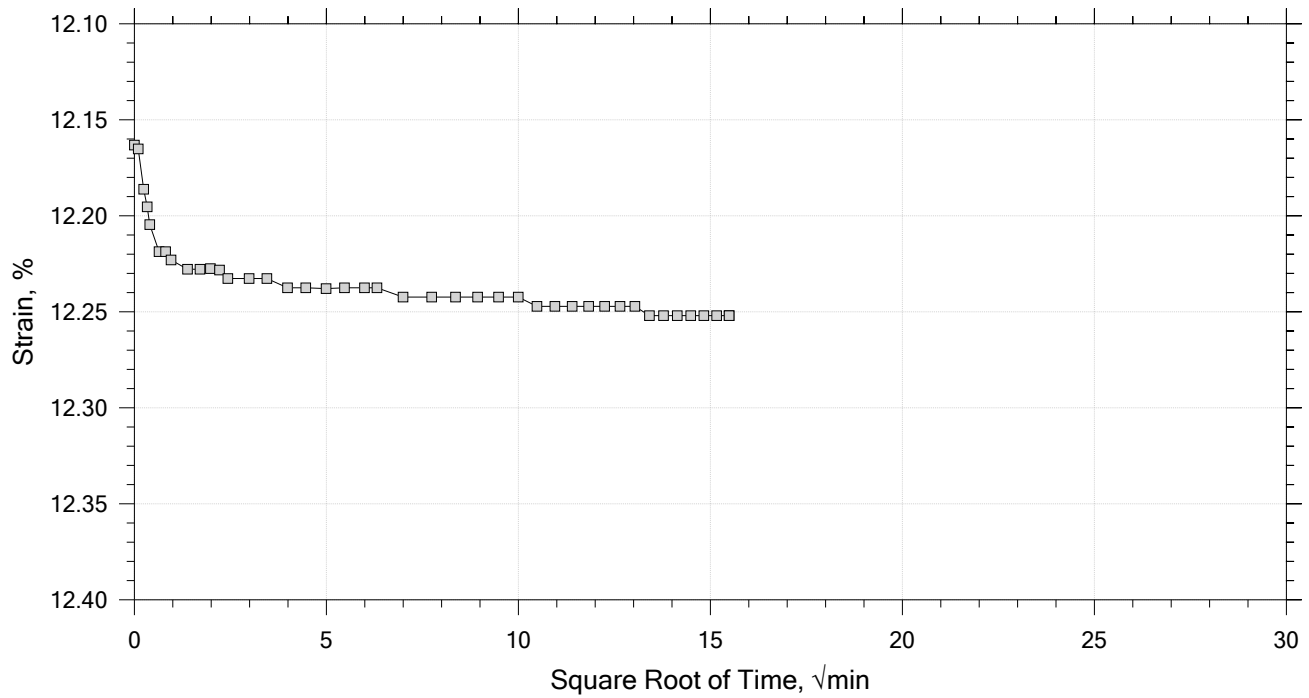
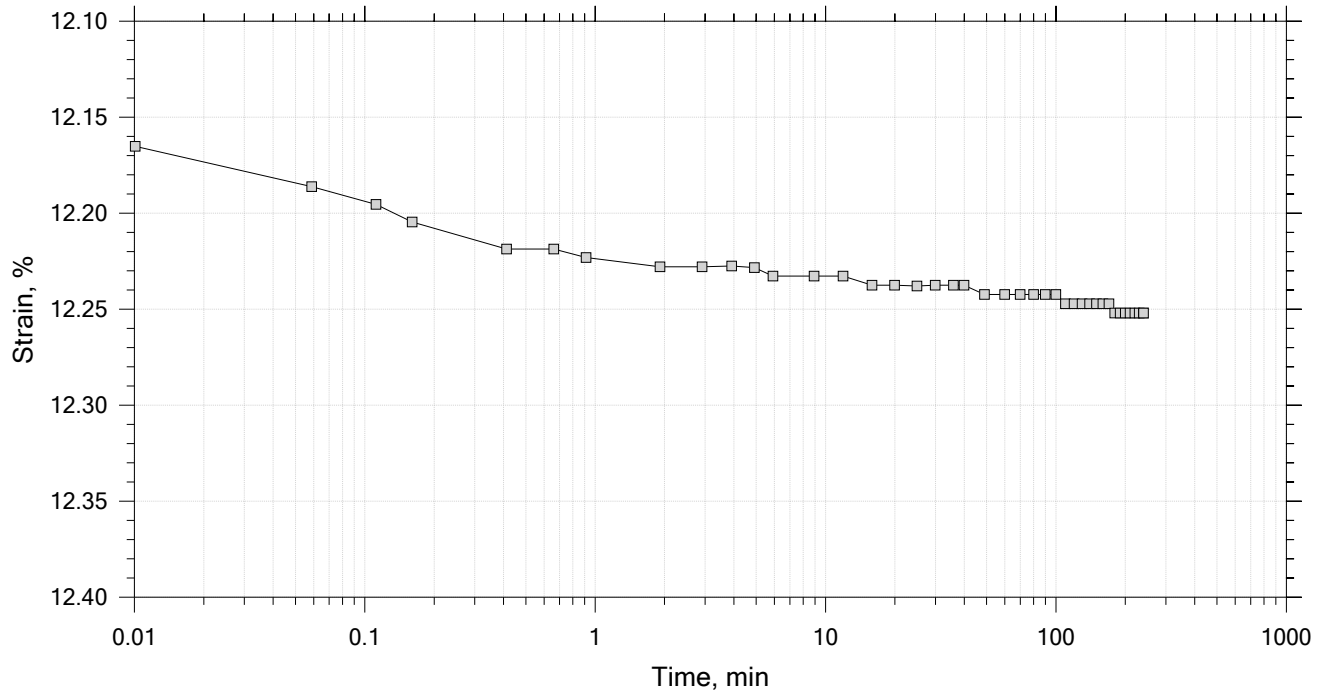
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-239	Tested By: md	Checked By: mcm
	Sample No.: U2	Test Date: 03/01/21	Depth: 23-25 ft
	Test No.: IP-12	Sample Type: intact	Elevation: ---
	Description: Moist gray clay		
	Remarks: System X, Swell Pressure = 0.0696 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 12 of 21

Constant Load Step

Stress: 2 tsf



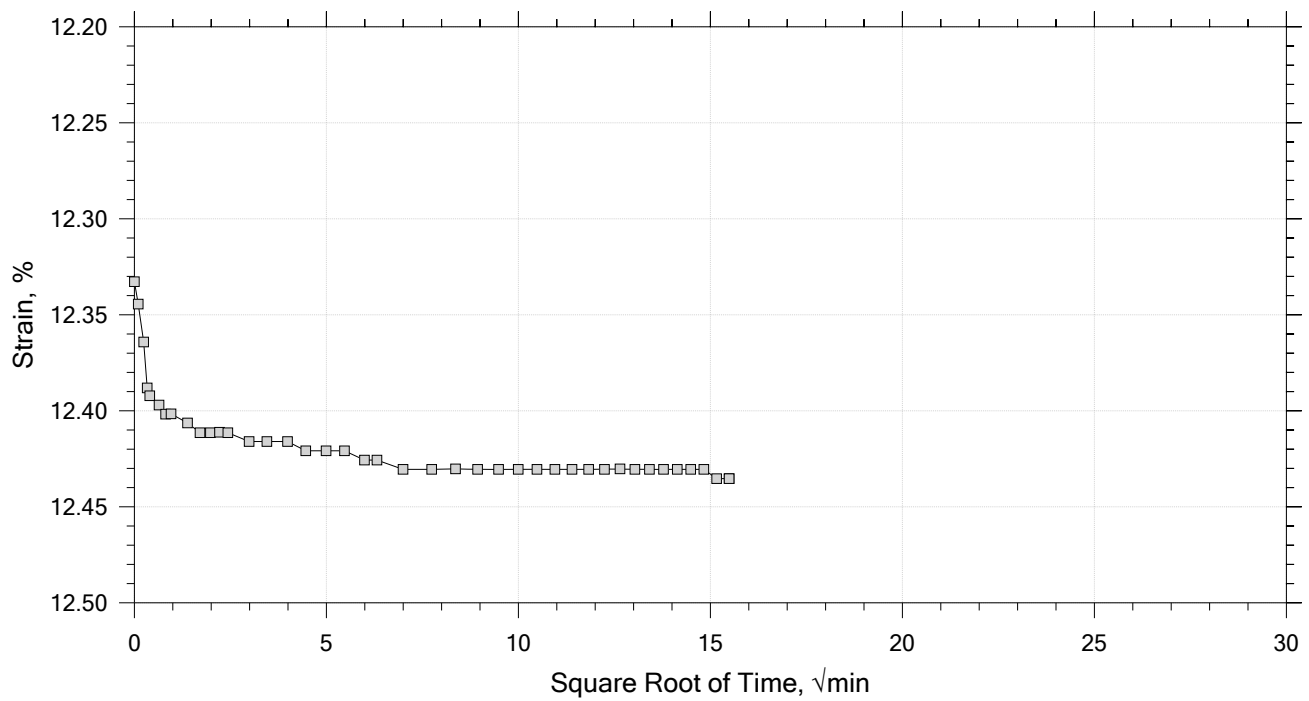
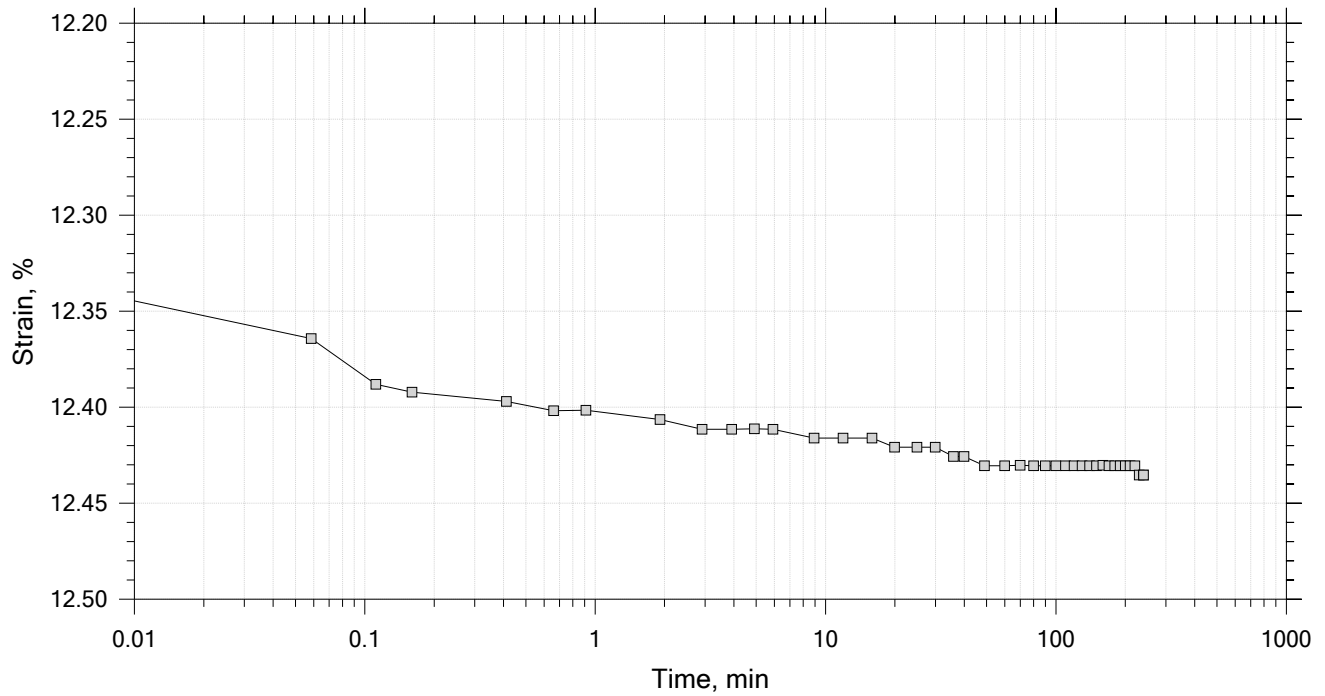
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-239	Tested By: md	Checked By: mcm
	Sample No.: U2	Test Date: 03/01/21	Depth: 23-25 ft
	Test No.: IP-12	Sample Type: intact	Elevation: ---
	Description: Moist gray clay		
	Remarks: System X, Swell Pressure = 0.0696 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 13 of 21

Constant Load Step

Stress: 4 tsf



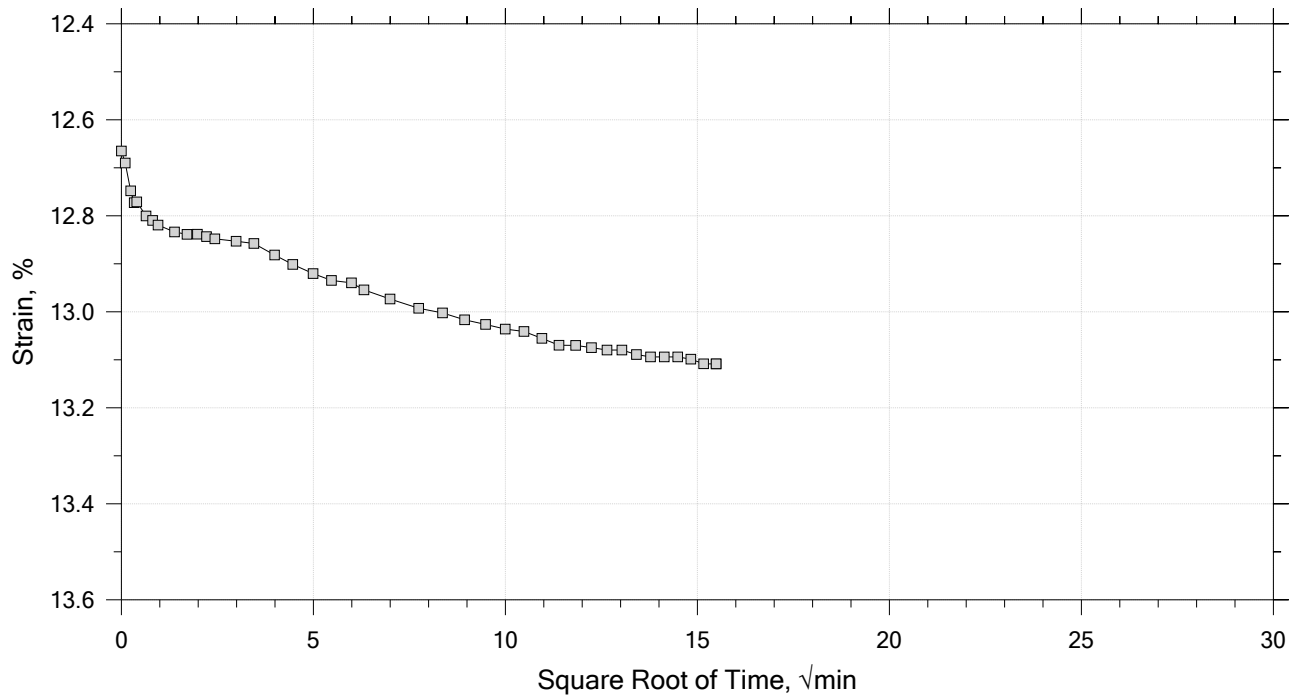
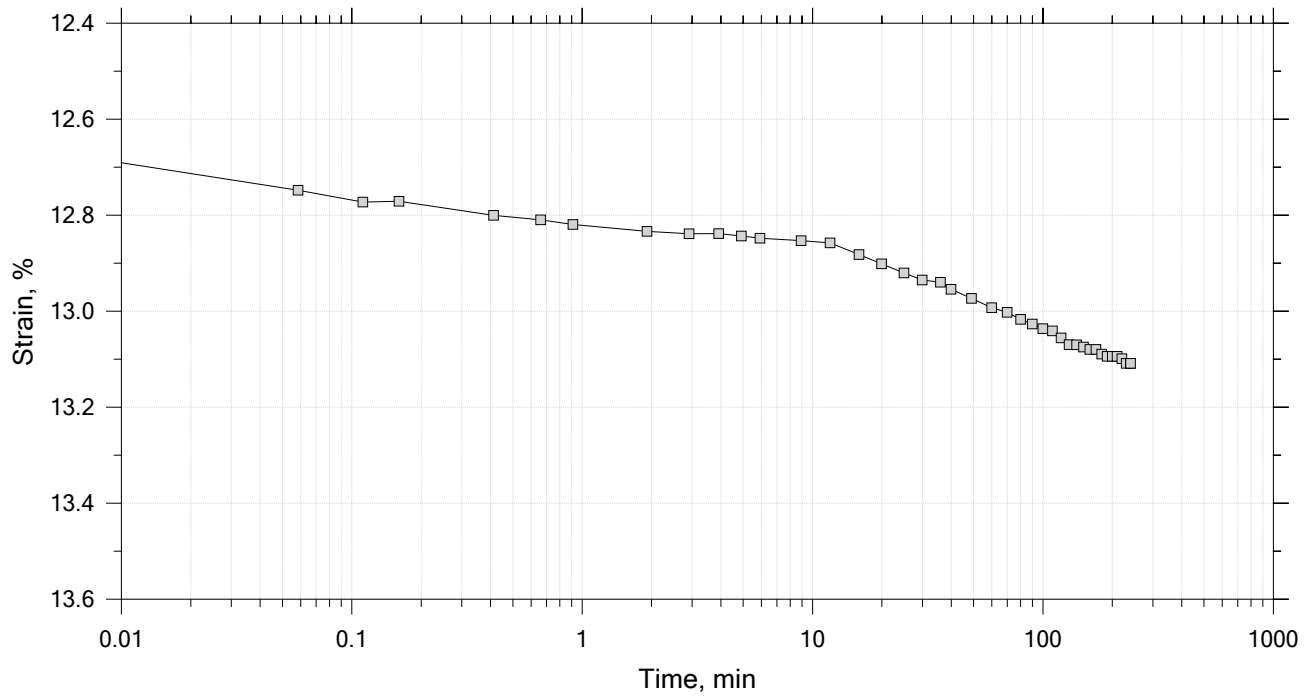
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-239	Tested By: md	Checked By: mcm
	Sample No.: U2	Test Date: 03/01/21	Depth: 23-25 ft
	Test No.: IP-12	Sample Type: intact	Elevation: ---
	Description: Moist gray clay		
	Remarks: System X, Swell Pressure = 0.0696 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 14 of 21

Constant Load Step

Stress: 8 tsf



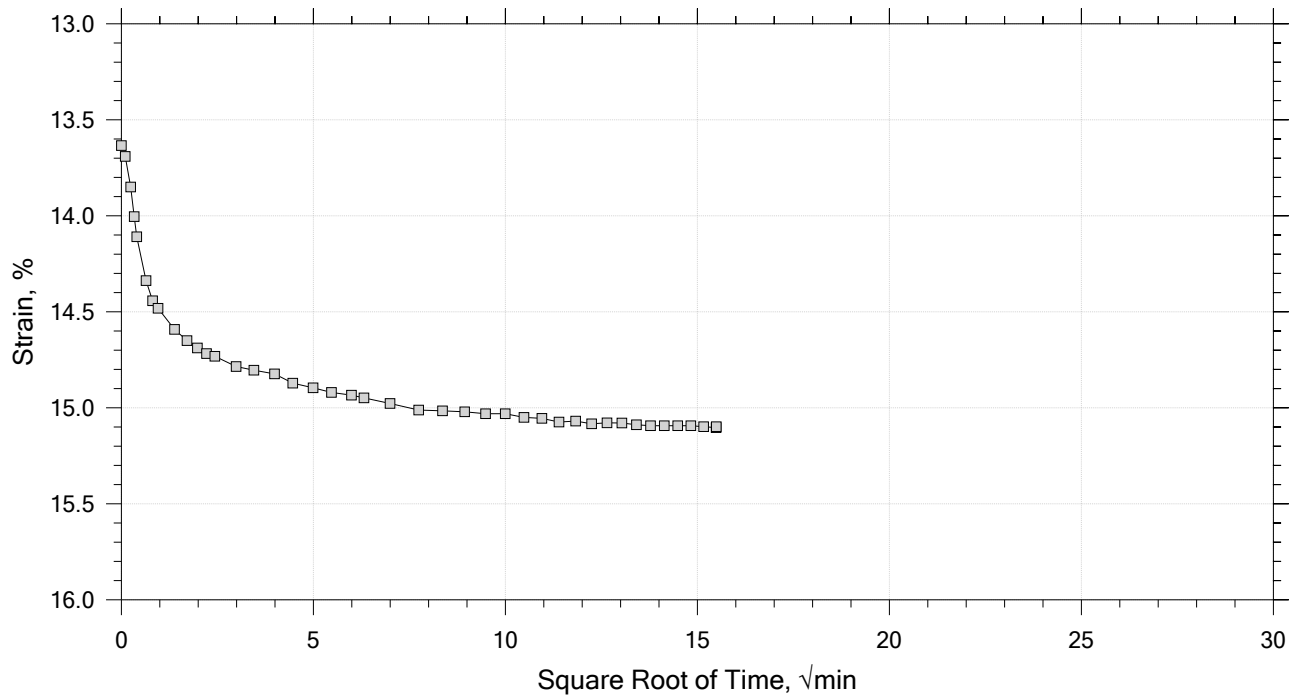
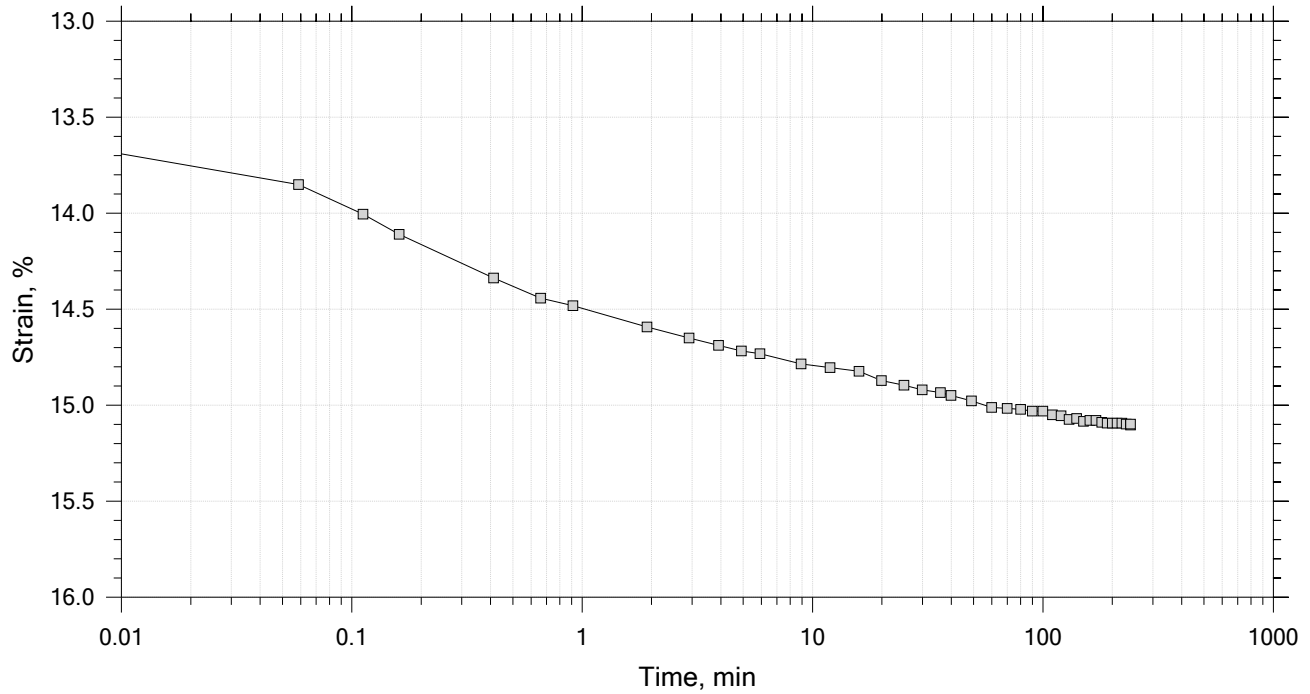
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-239	Tested By: md	Checked By: mcm
	Sample No.: U2	Test Date: 03/01/21	Depth: 23-25 ft
	Test No.: IP-12	Sample Type: intact	Elevation: ---
	Description: Moist gray clay		
	Remarks: System X, Swell Pressure = 0.0696 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 15 of 21

Constant Load Step

Stress: 16 tsf



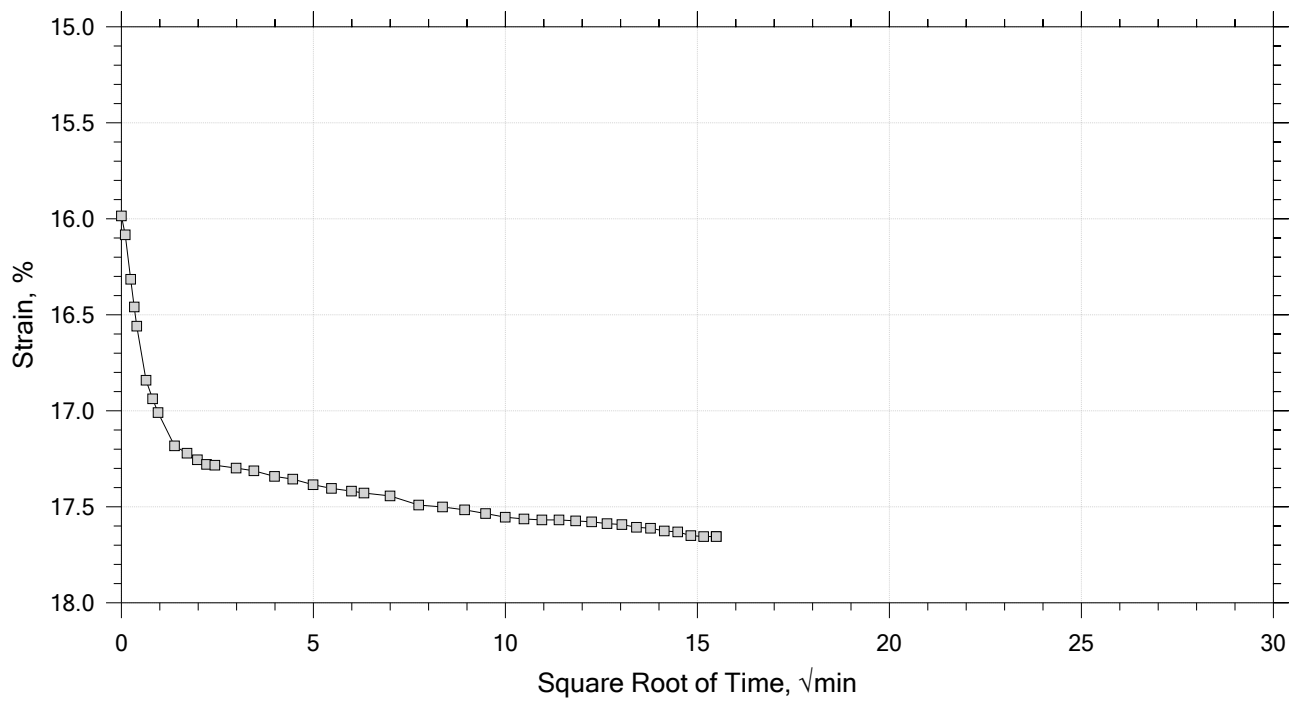
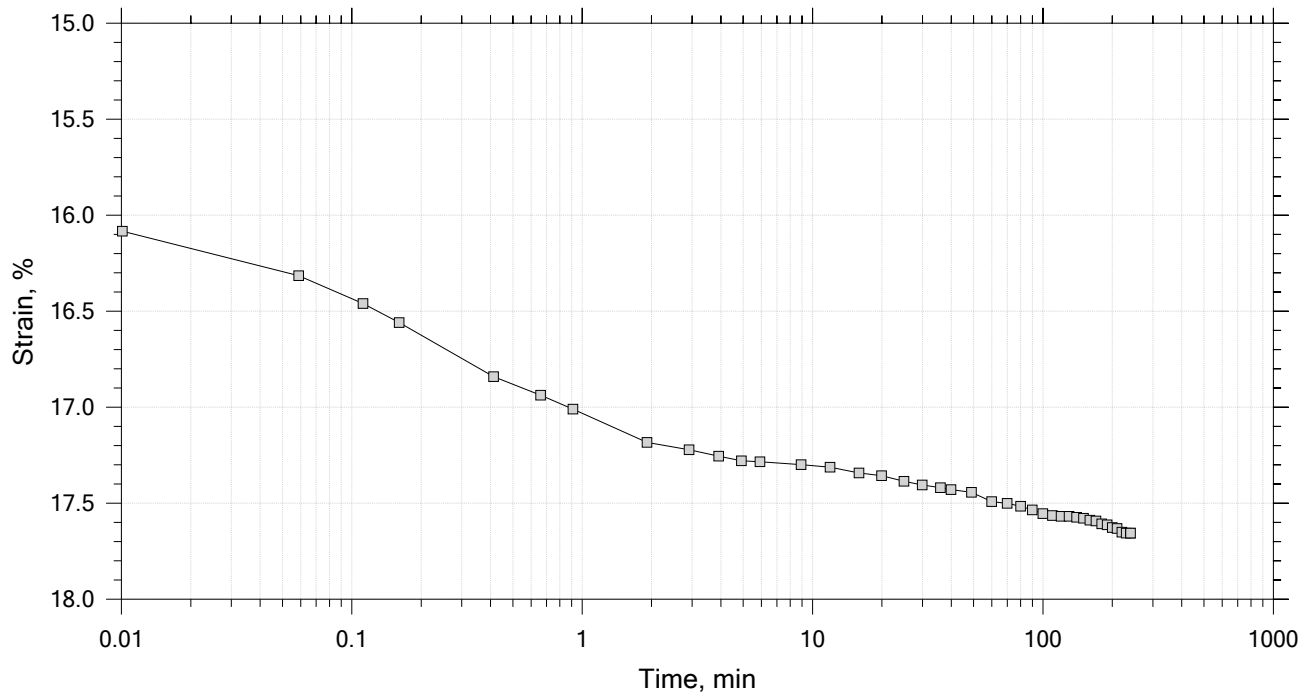
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-239	Tested By: md	Checked By: mcm
	Sample No.: U2	Test Date: 03/01/21	Depth: 23-25 ft
	Test No.: IP-12	Sample Type: intact	Elevation: ---
	Description: Moist gray clay		
	Remarks: System X, Swell Pressure = 0.0696 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 16 of 21

Constant Load Step

Stress: 32 tsf



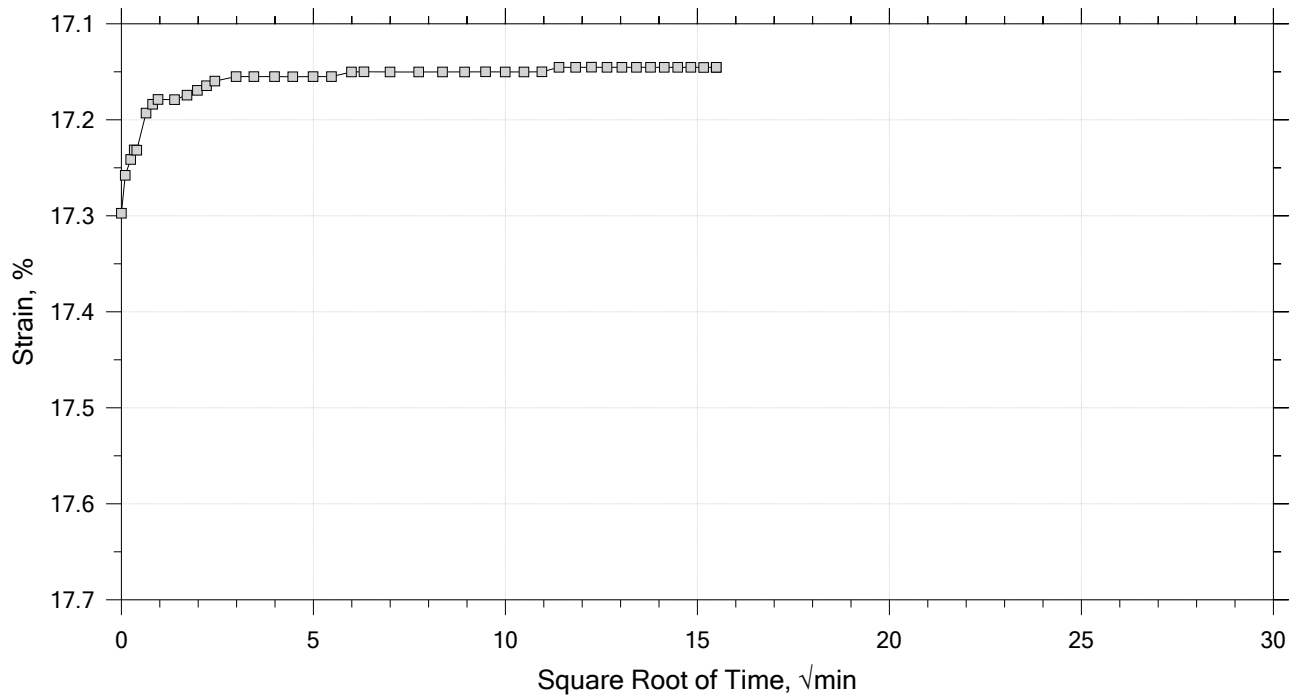
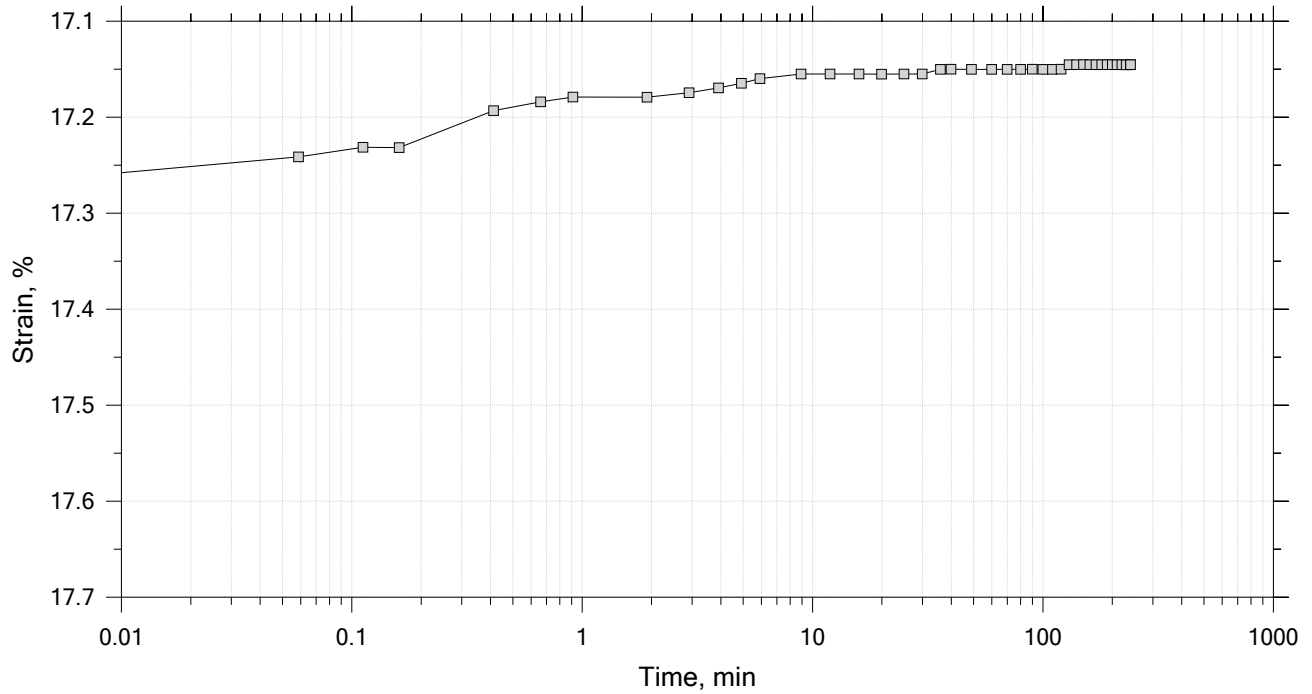
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-239	Tested By: md	Checked By: mcm
	Sample No.: U2	Test Date: 03/01/21	Depth: 23-25 ft
	Test No.: IP-12	Sample Type: intact	Elevation: ---
	Description: Moist gray clay		
	Remarks: System X, Swell Pressure = 0.0696 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 17 of 21

Constant Load Step

Stress: 8 tsf



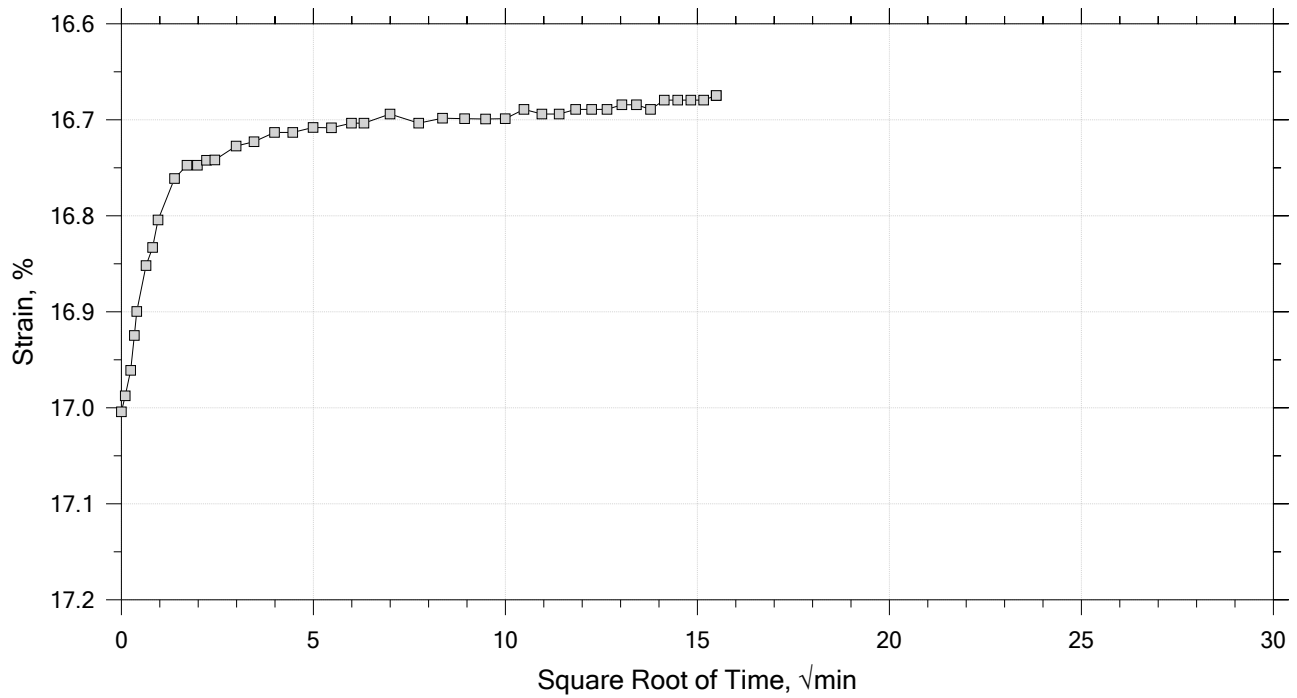
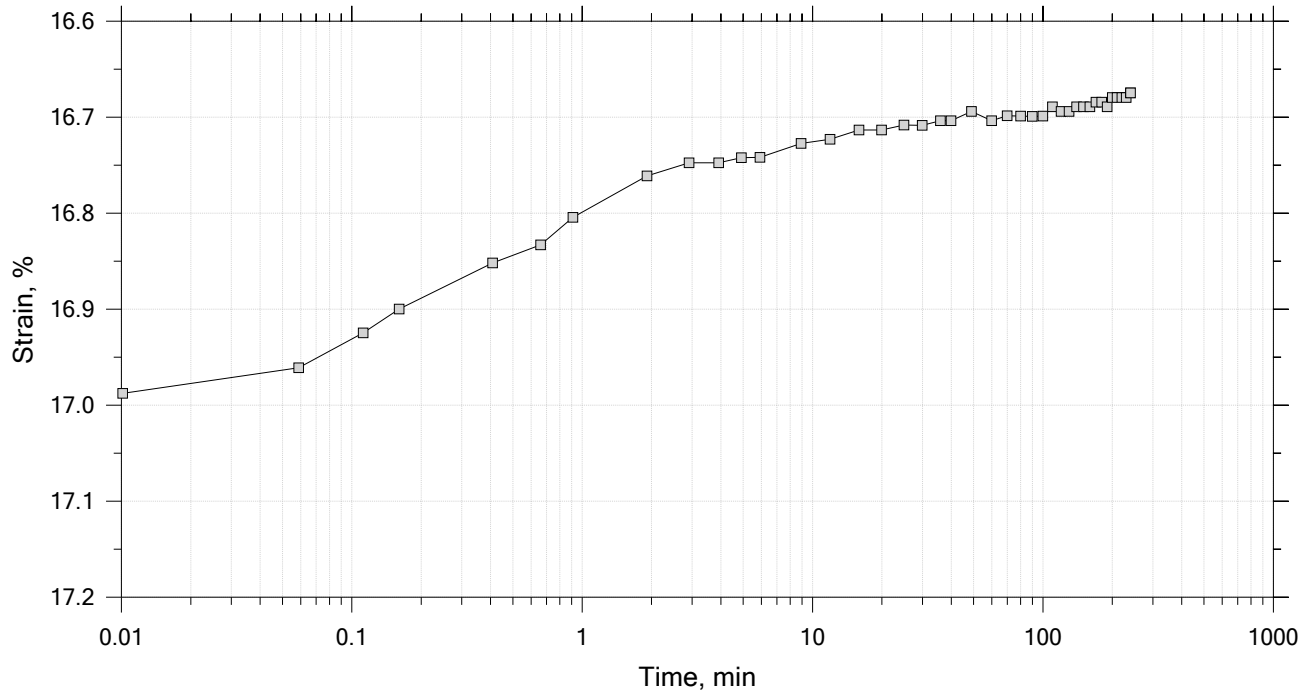
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-239	Tested By: md	Checked By: mcm
	Sample No.: U2	Test Date: 03/01/21	Depth: 23-25 ft
	Test No.: IP-12	Sample Type: intact	Elevation: ---
	Description: Moist gray clay		
	Remarks: System X, Swell Pressure = 0.0696 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 18 of 21

Constant Load Step

Stress: 2 tsf



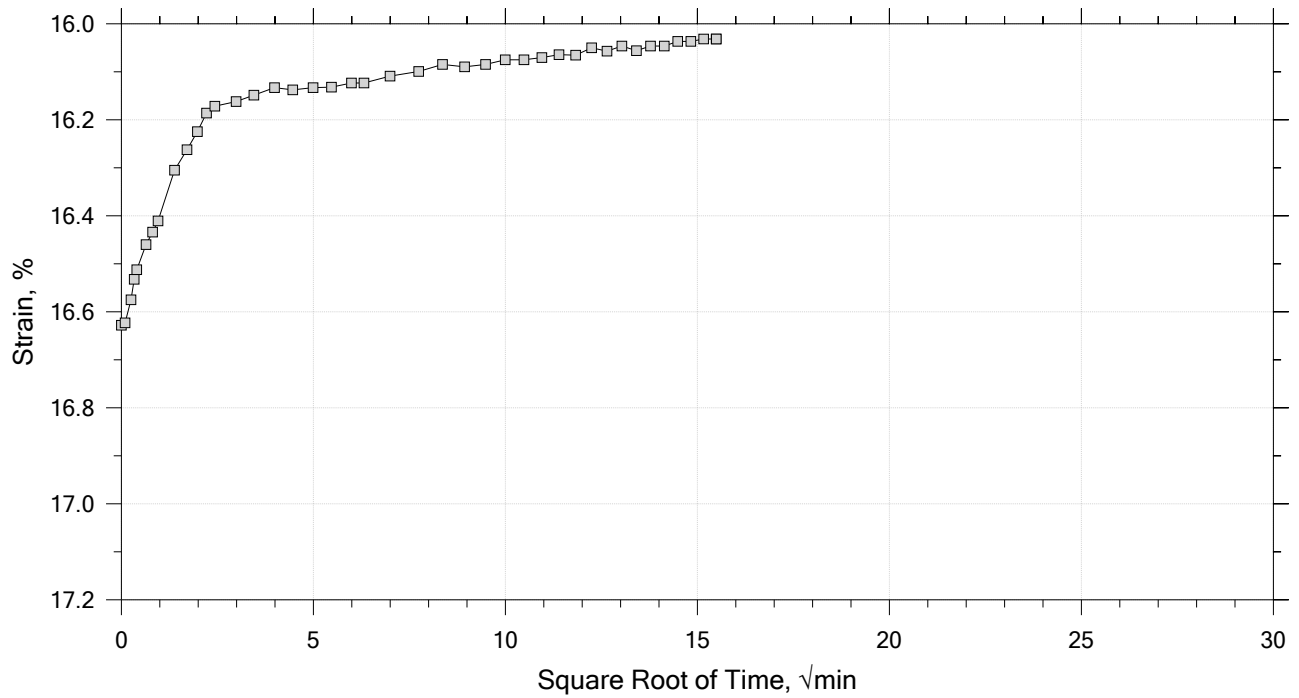
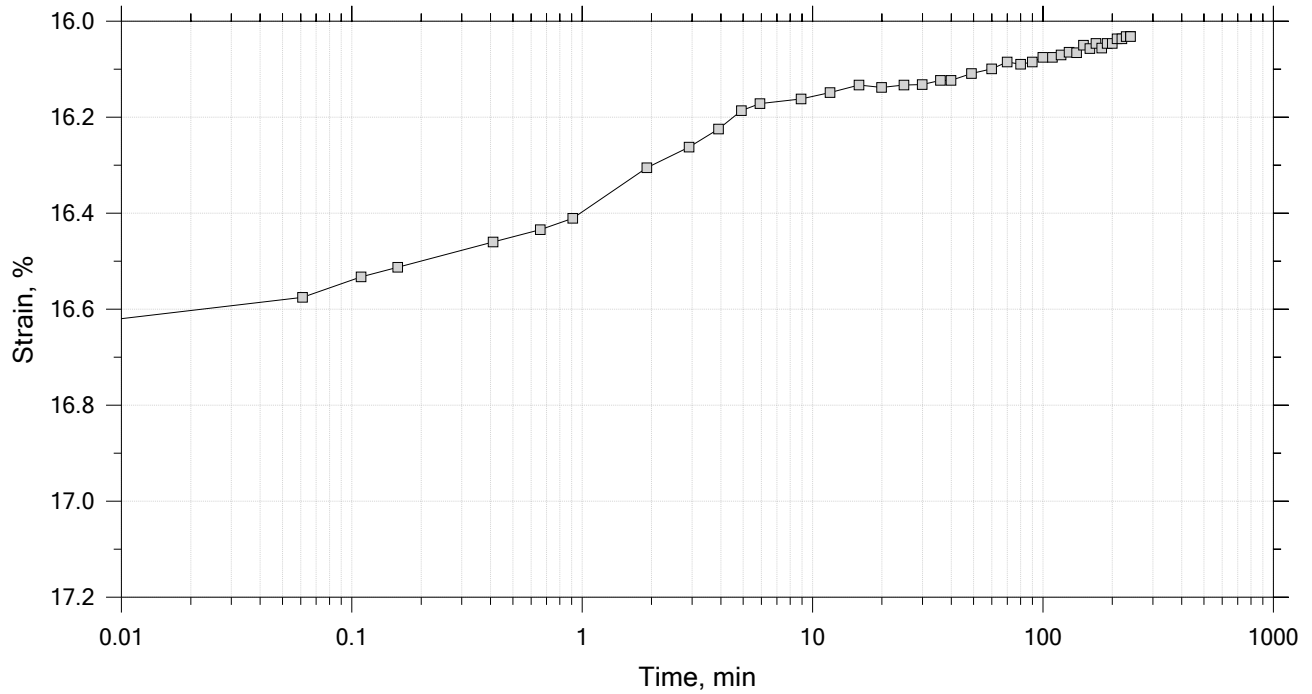
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-239	Tested By: md	Checked By: mcm
	Sample No.: U2	Test Date: 03/01/21	Depth: 23-25 ft
	Test No.: IP-12	Sample Type: intact	Elevation: ---
	Description: Moist gray clay		
	Remarks: System X, Swell Pressure = 0.0696 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 19 of 21

Constant Load Step

Stress: 0.5 tsf



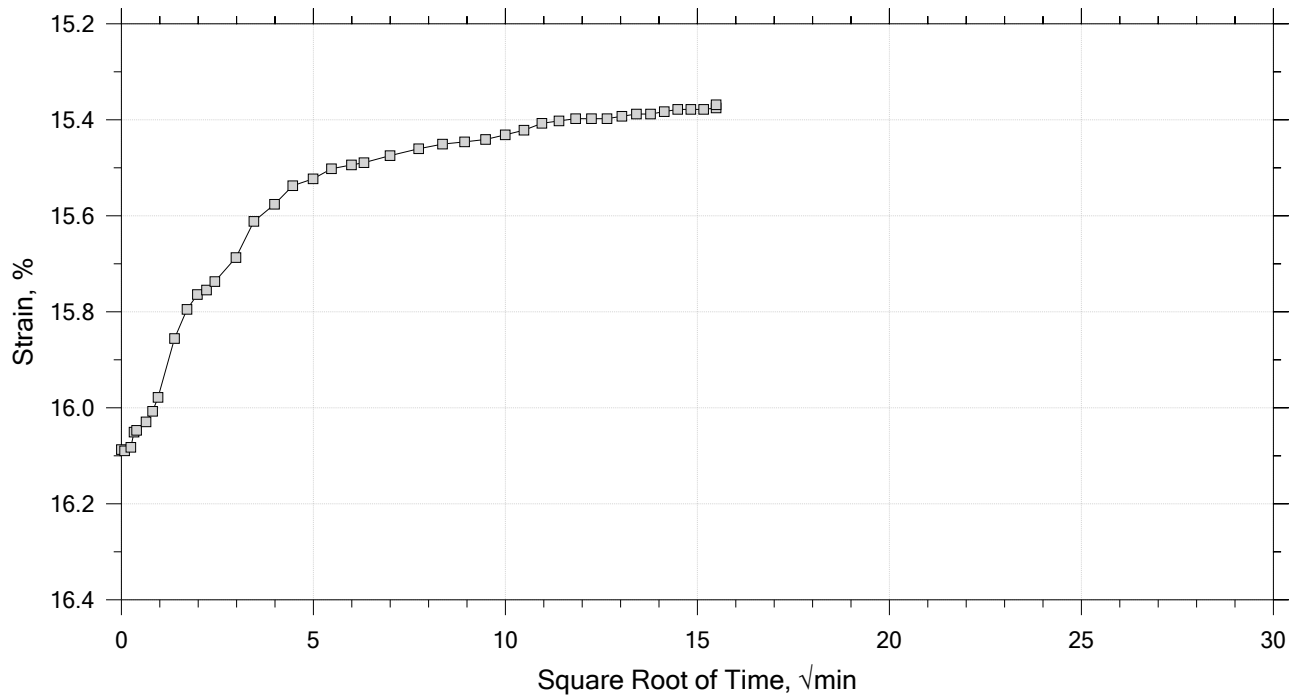
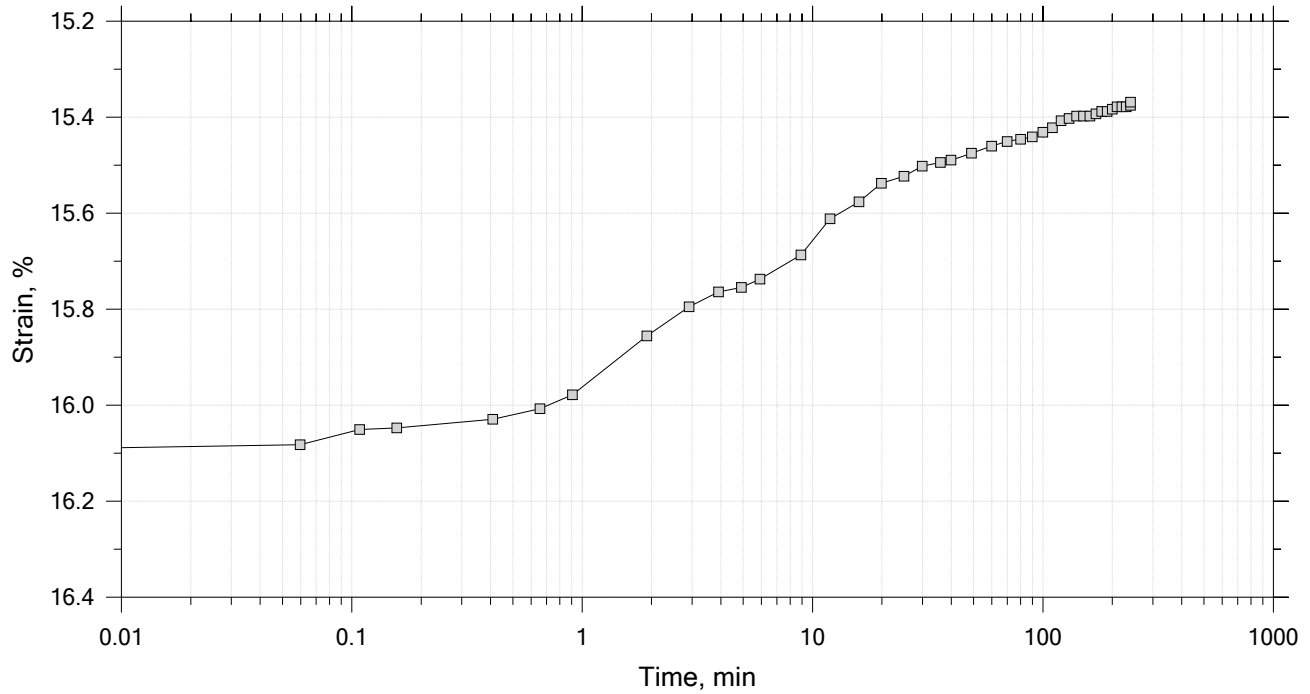
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-239	Tested By: md	Checked By: mcm
	Sample No.: U2	Test Date: 03/01/21	Depth: 23-25 ft
	Test No.: IP-12	Sample Type: intact	Elevation: ---
	Description: Moist gray clay		
	Remarks: System X, Swell Pressure = 0.0696 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 20 of 21

Constant Load Step

Stress: 0.125 tsf



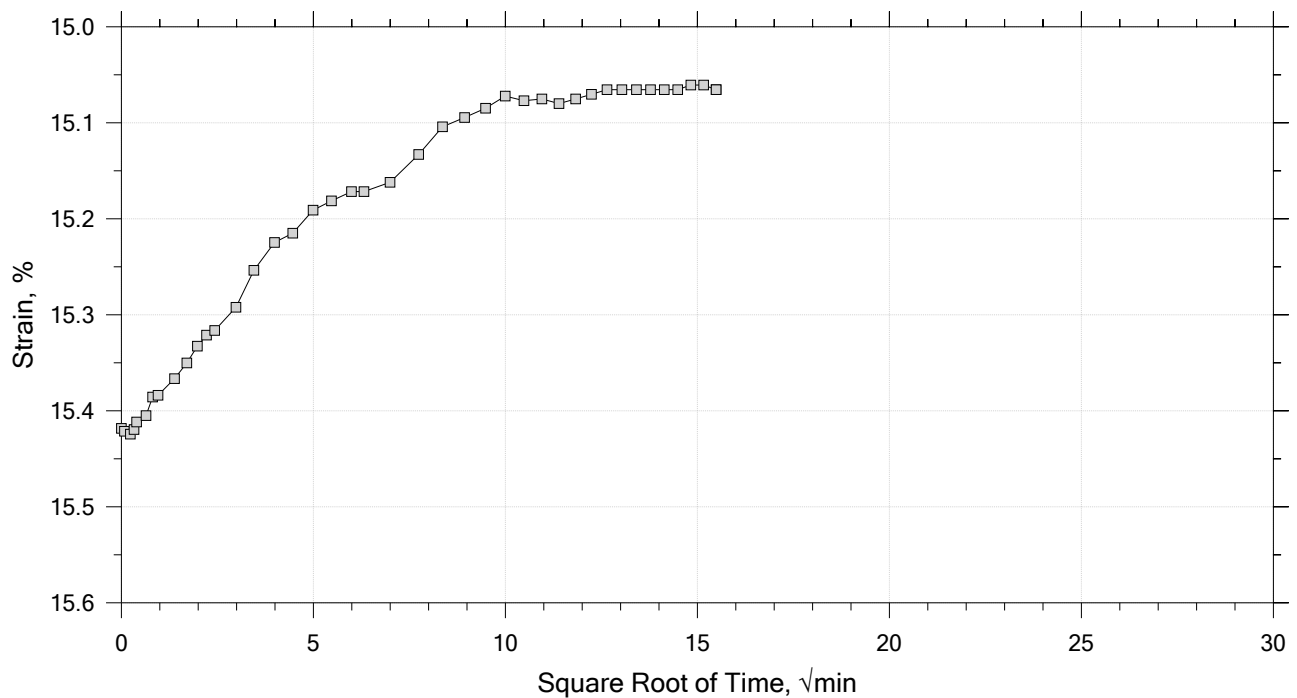
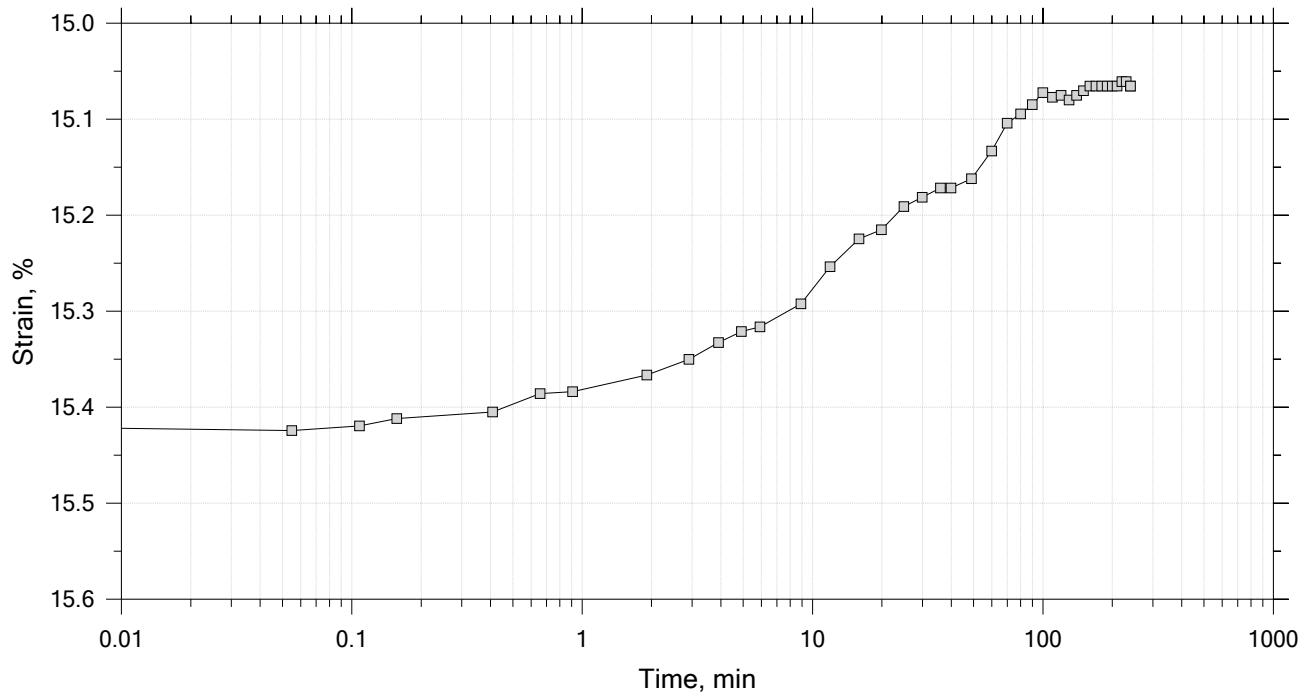
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-239	Tested By: md	Checked By: mcm
	Sample No.: U2	Test Date: 03/01/21	Depth: 23-25 ft
	Test No.: IP-12	Sample Type: intact	Elevation: ---
	Description: Moist gray clay		
	Remarks: System X, Swell Pressure = 0.0696 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 21 of 21

Constant Load Step

Stress: 0.0625 tsf




	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-239	Tested By: md	Checked By: mcm
	Sample No.: U2	Test Date: 03/01/21	Depth: 23-25 ft
	Test No.: IP-12	Sample Type: intact	Elevation: ---
	Description: Moist gray clay		
	Remarks: System X, Swell Pressure = 0.0696 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Specimen Diameter: 2.50 in	Estimated Specific Gravity: 2.91	Liquid Limit: 34
Initial Height: 1.00 in	Initial Void Ratio: 0.952	Plastic Limit: 16
Final Height: 0.85 in	Final Void Ratio: 0.658	Plasticity Index: 18

	Before Test Trimmings	Before Test Specimen	After Test Specimen	After Test Trimmings
Container ID	E-1082	RING		b2879
Mass Container, gm	8.24	109.68	109.68	8.5
Mass Container + Wet Soil, gm	240.76	267.39	256.57	154.54
Mass Container + Dry Soil, gm	182.78	229.46	229.46	127.59
Mass Dry Soil, gm	174.54	119.78	119.78	119.09
Water Content, %	33.22	31.66	22.63	22.63
Void Ratio	---	0.95	0.66	---
Degree of Saturation, %	---	96.69	100.00	---
Dry Unit Weight, pcf	---	92.962	109.45	---


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

	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-239	Tested By: md	Checked By: mcm
	Sample No.: U2	Test Date: 03/01/21	Depth: 23-25 ft
	Test No.: IP-12	Sample Type: intact	Elevation: ---
	Description: Moist gray clay		
	Remarks: System X, Swell Pressure = 0.0696 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

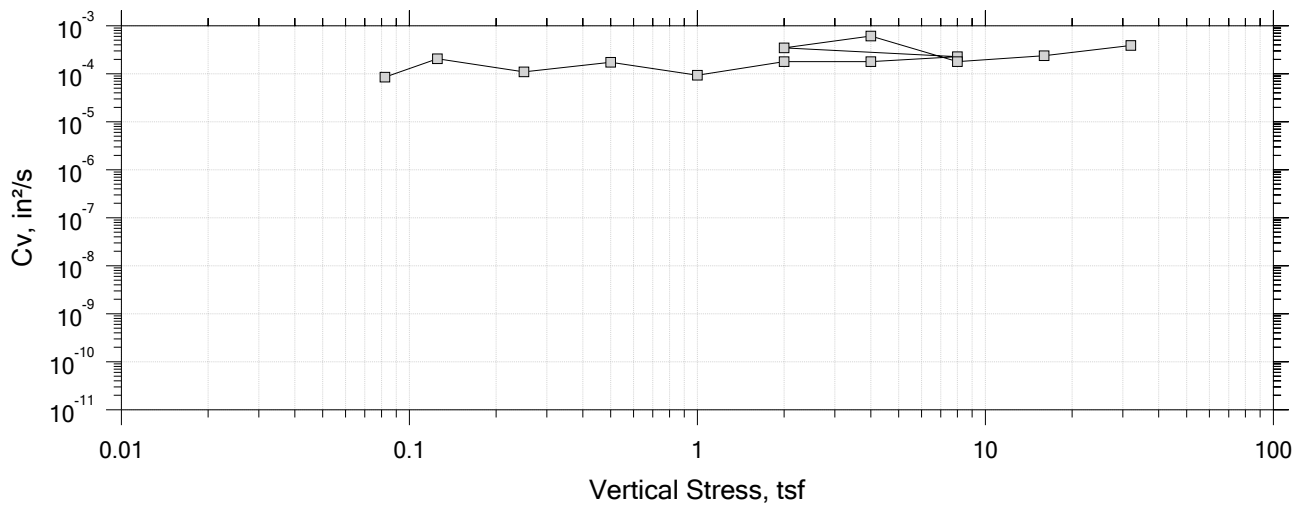
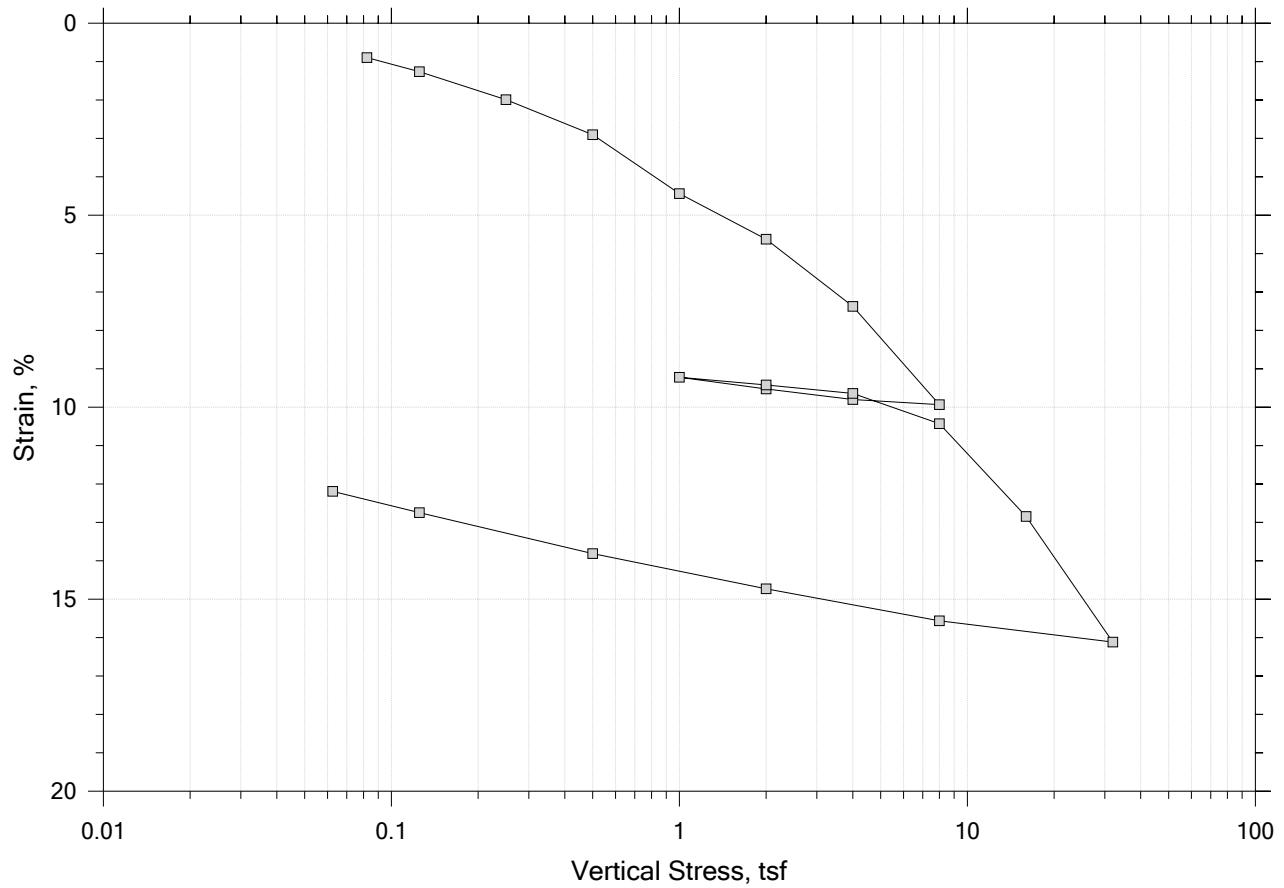
Square Root of Time Coefficients


[illegible]

	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-239	Tested By: md	Checked By: mcm
	Sample No.: U2	Test Date: 03/01/21	Depth: 23-25 ft
	Test No.: IP-12	Sample Type: intact	Elevation: ---
	Description: Moist gray clay		
	Remarks: System X, Swell Pressure = 0.0696 tsf		
	Displacement at End of Increment		

One-Dimensional Consolidation by ASTM D2435 - Method B

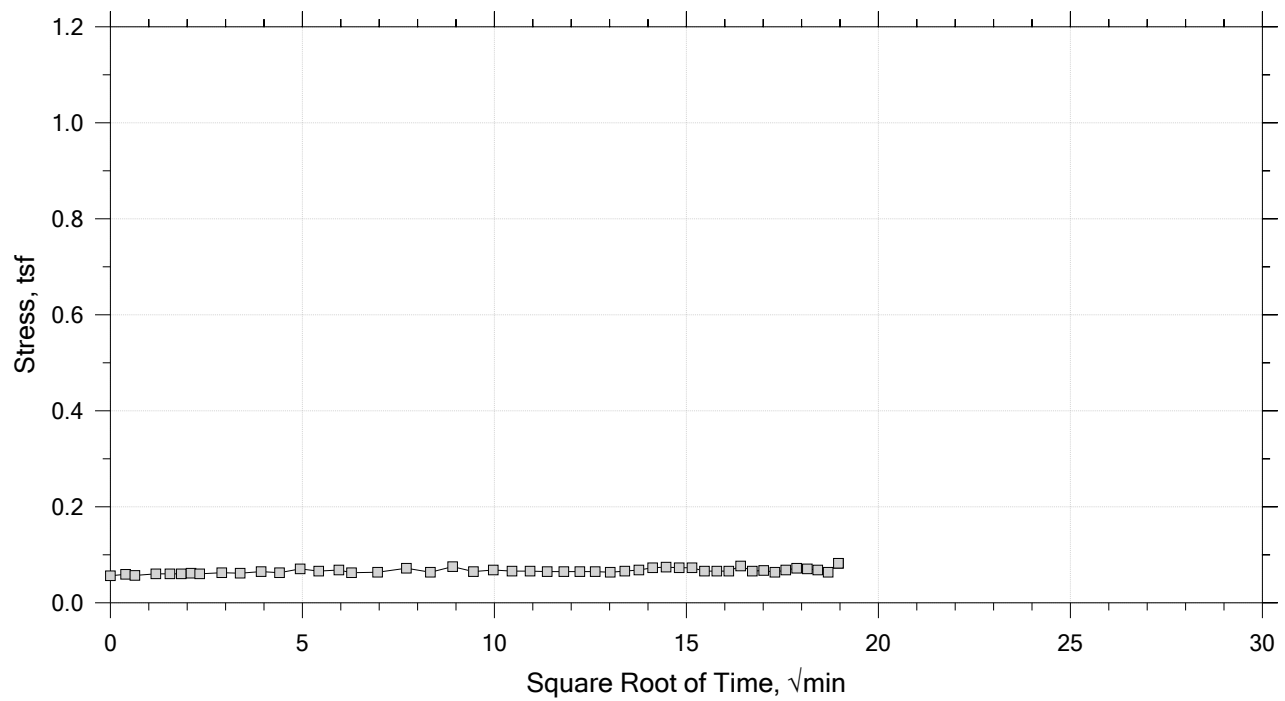
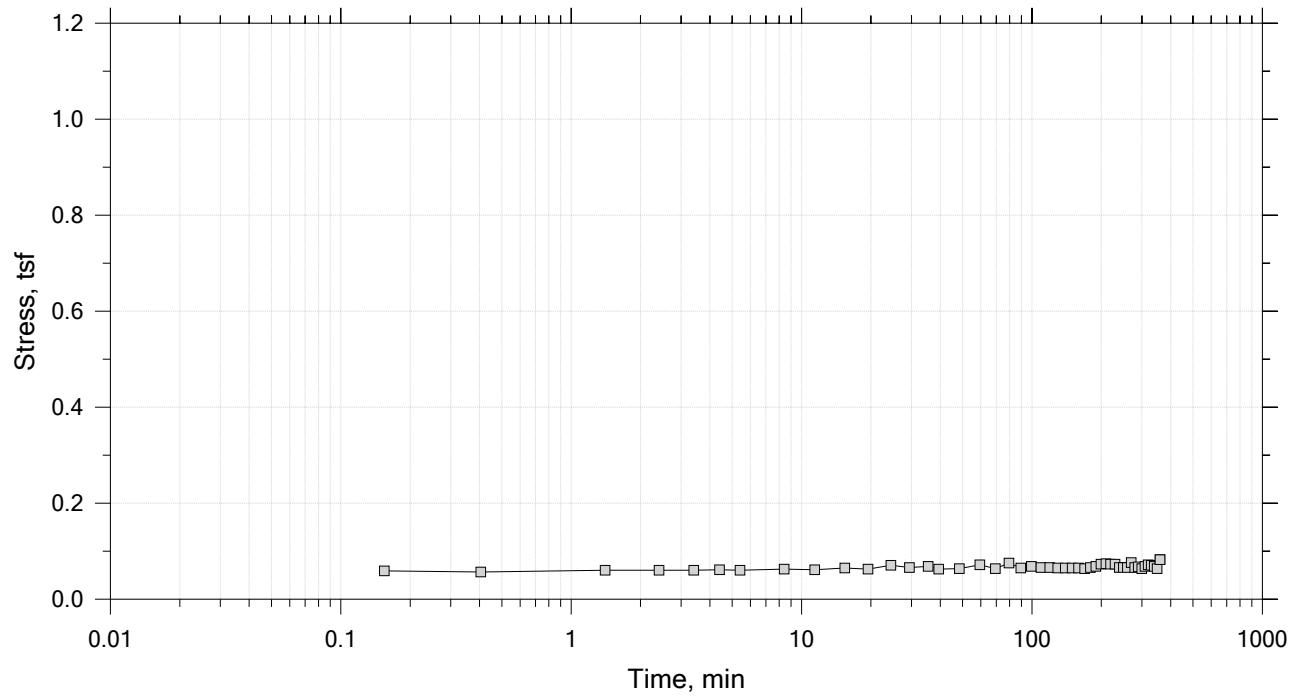
Summary Report




	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-240	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 03/01/21	Depth: 10-12 ft
	Test No.: IP-13	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-E, Swell Pressure = 0.0822 tsf		
	Displacement at End of Increment		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 1 of 21
Constant Volume Step
Stress: 0.0822 tsf



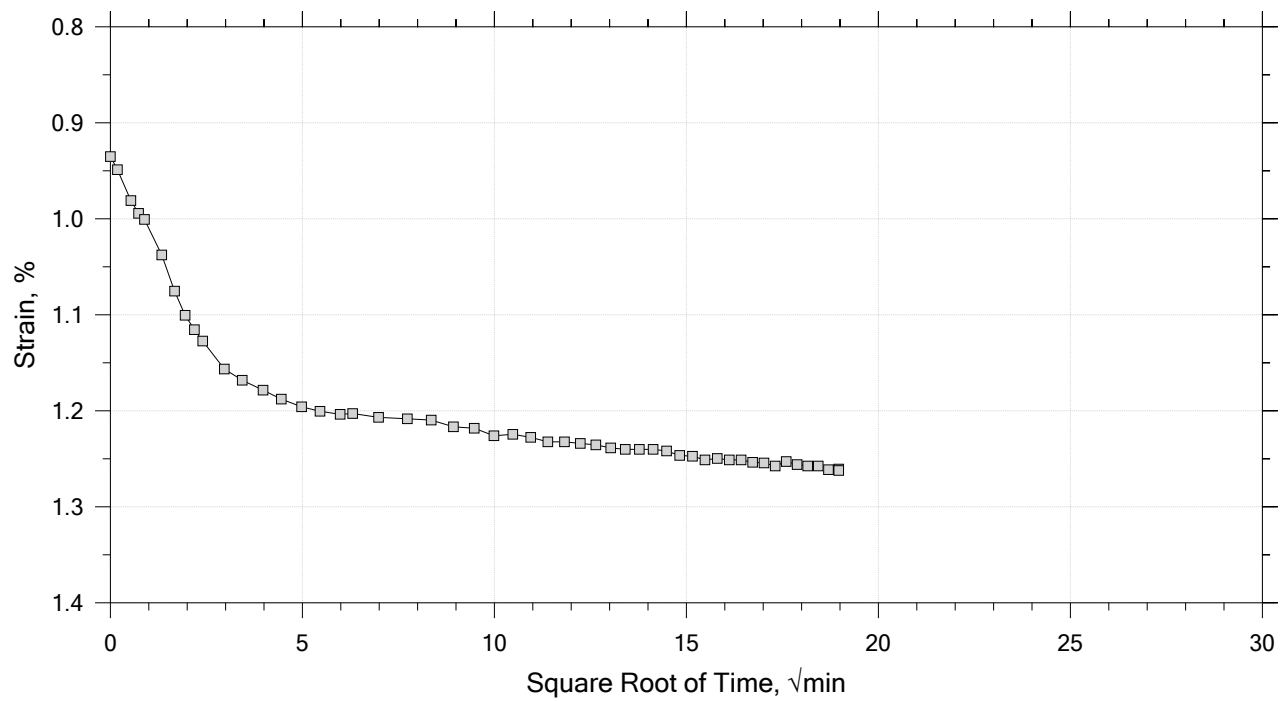
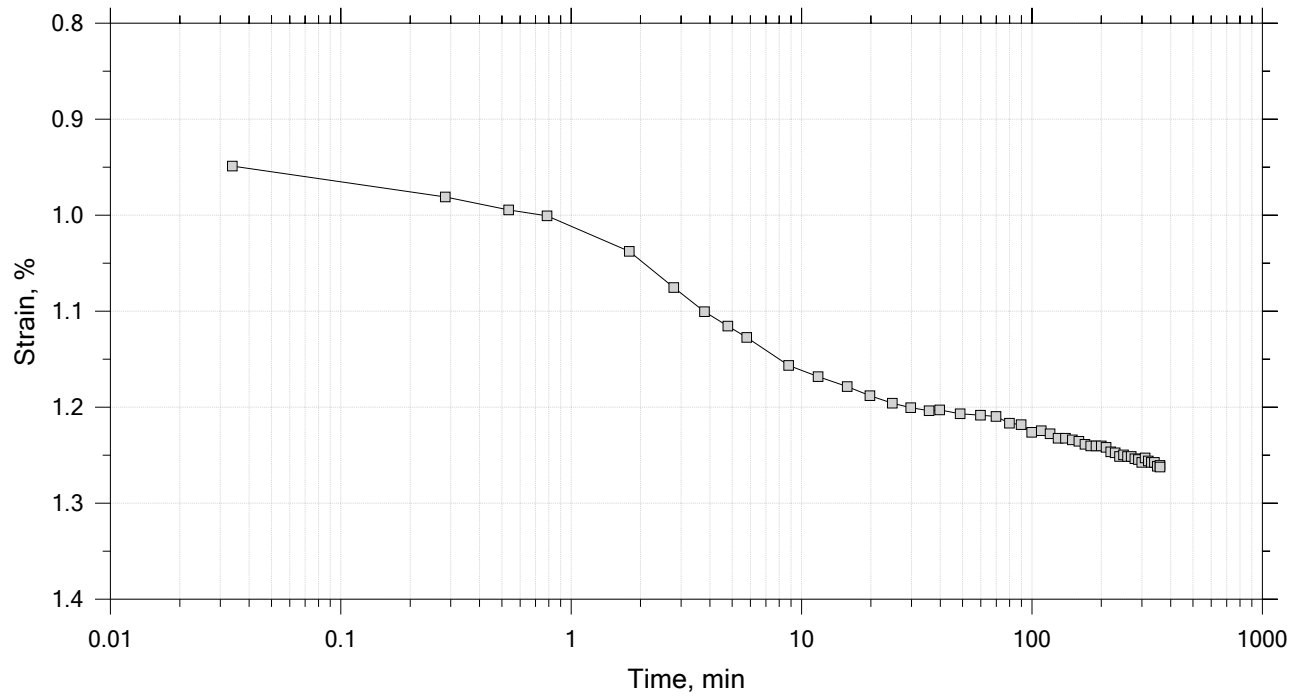
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-240	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 03/01/21	Depth: 10-12 ft
	Test No.: IP-13	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-E, Swell Pressure = 0.0822 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 2 of 21

Constant Load Step

Stress: 0.125 tsf



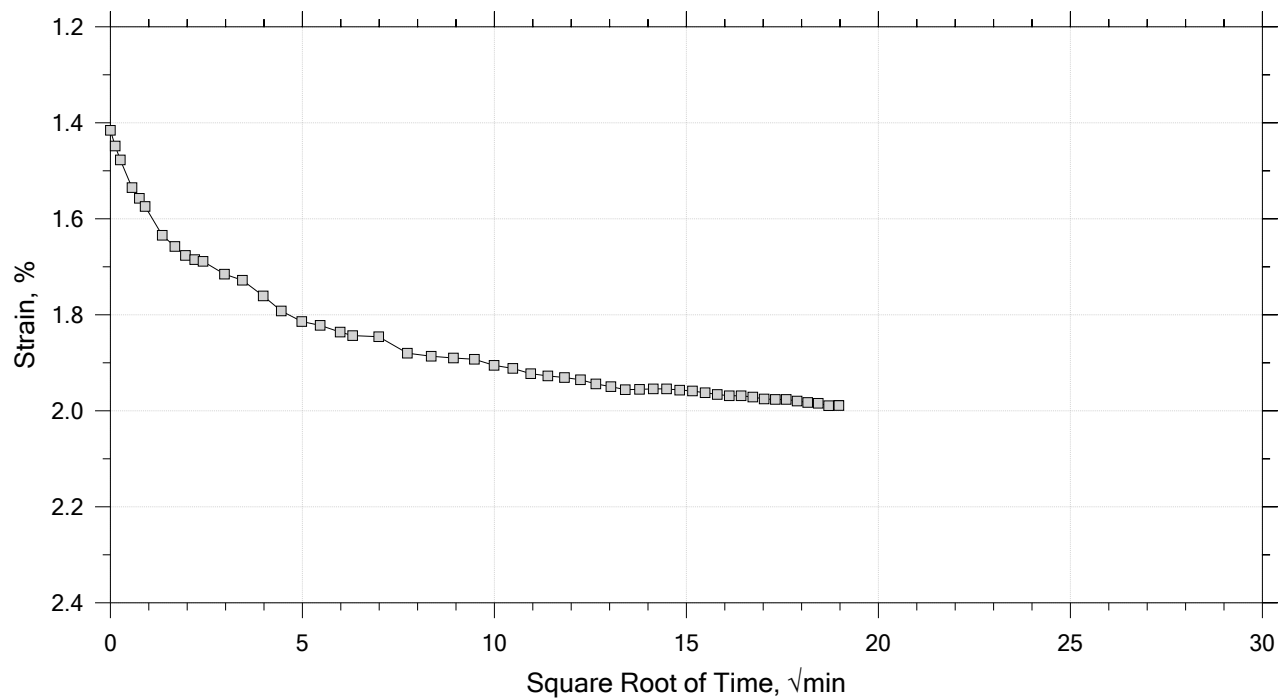
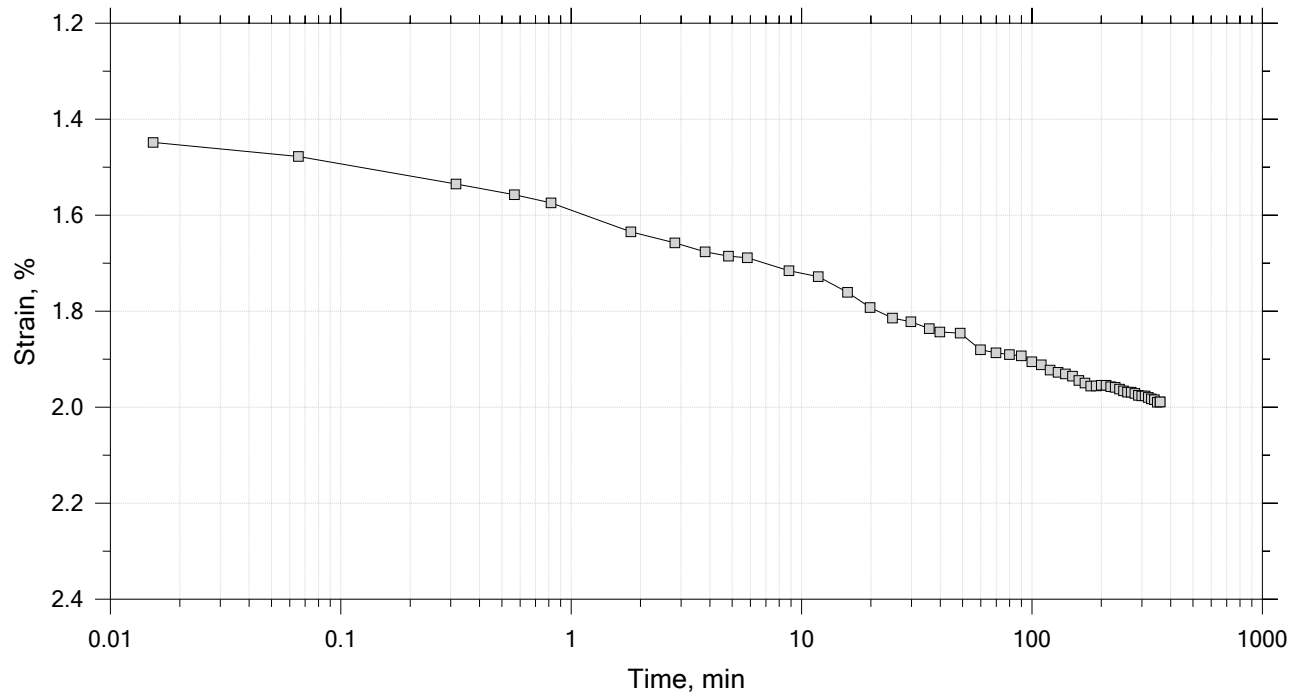
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-240	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 03/01/21	Depth: 10-12 ft
	Test No.: IP-13	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-E, Swell Pressure = 0.0822 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 3 of 21

Constant Load Step

Stress: 0.25 tsf



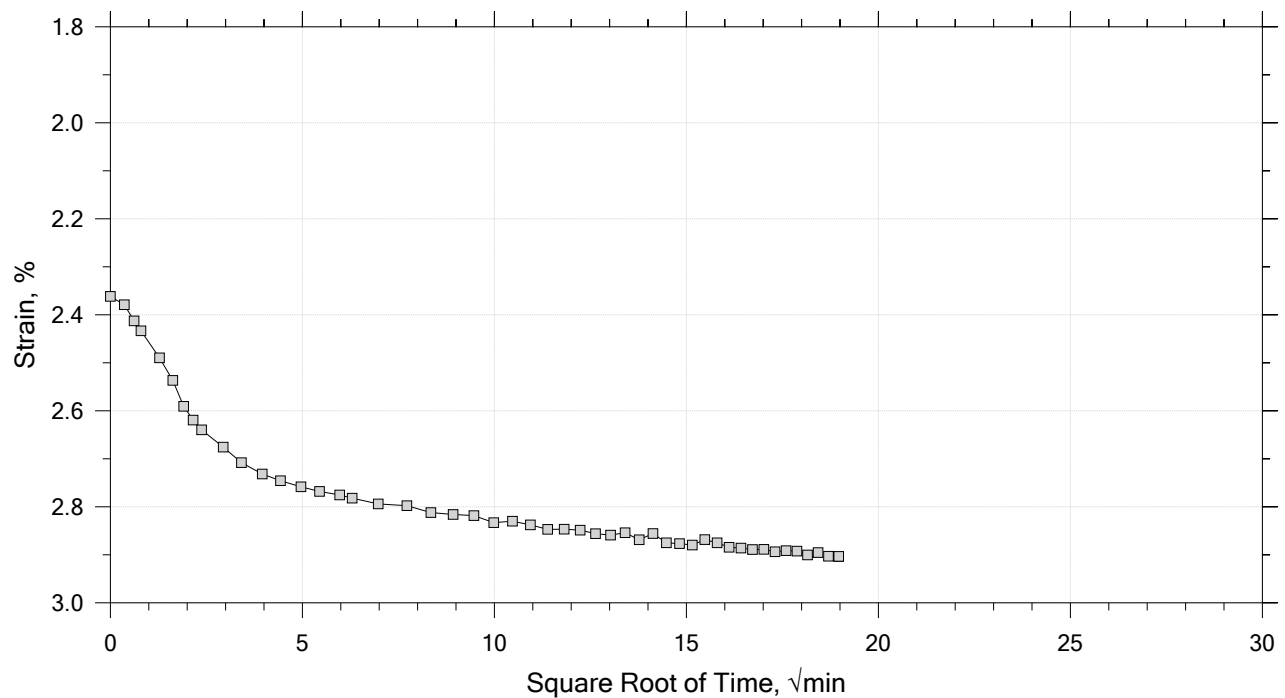
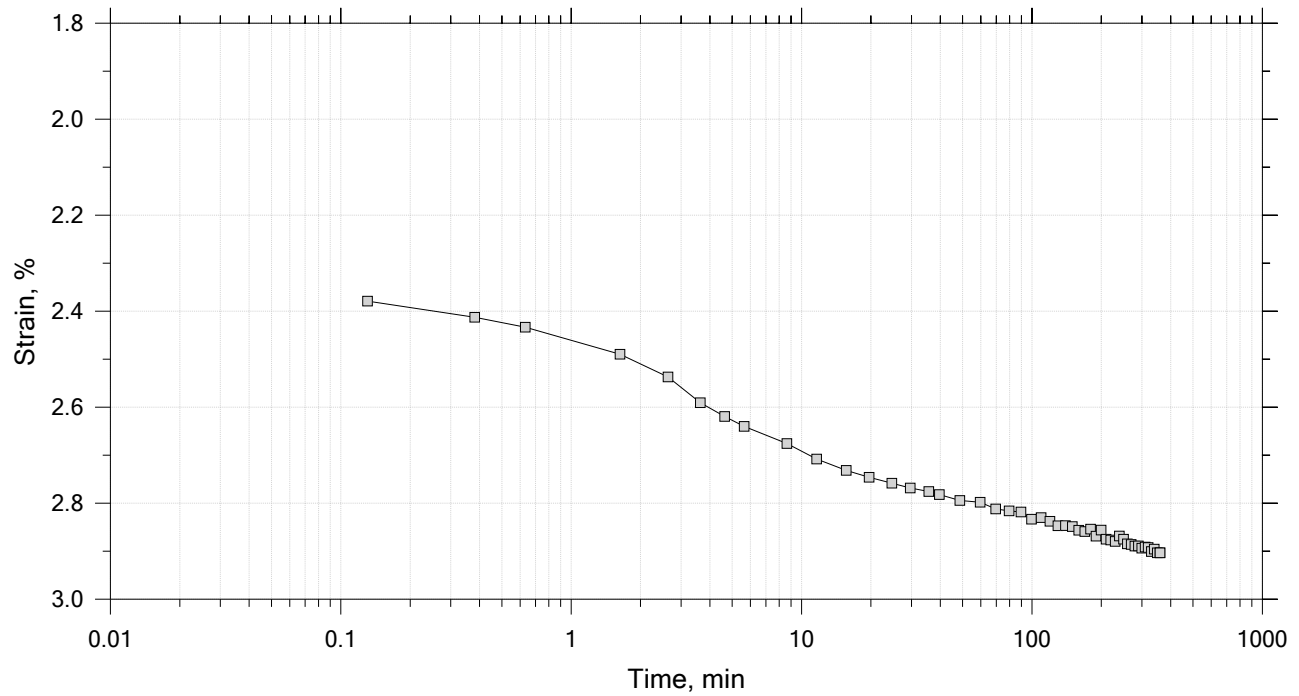
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-240	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 03/01/21	Depth: 10-12 ft
	Test No.: IP-13	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-E, Swell Pressure = 0.0822 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 4 of 21

Constant Load Step

Stress: 0.5 tsf



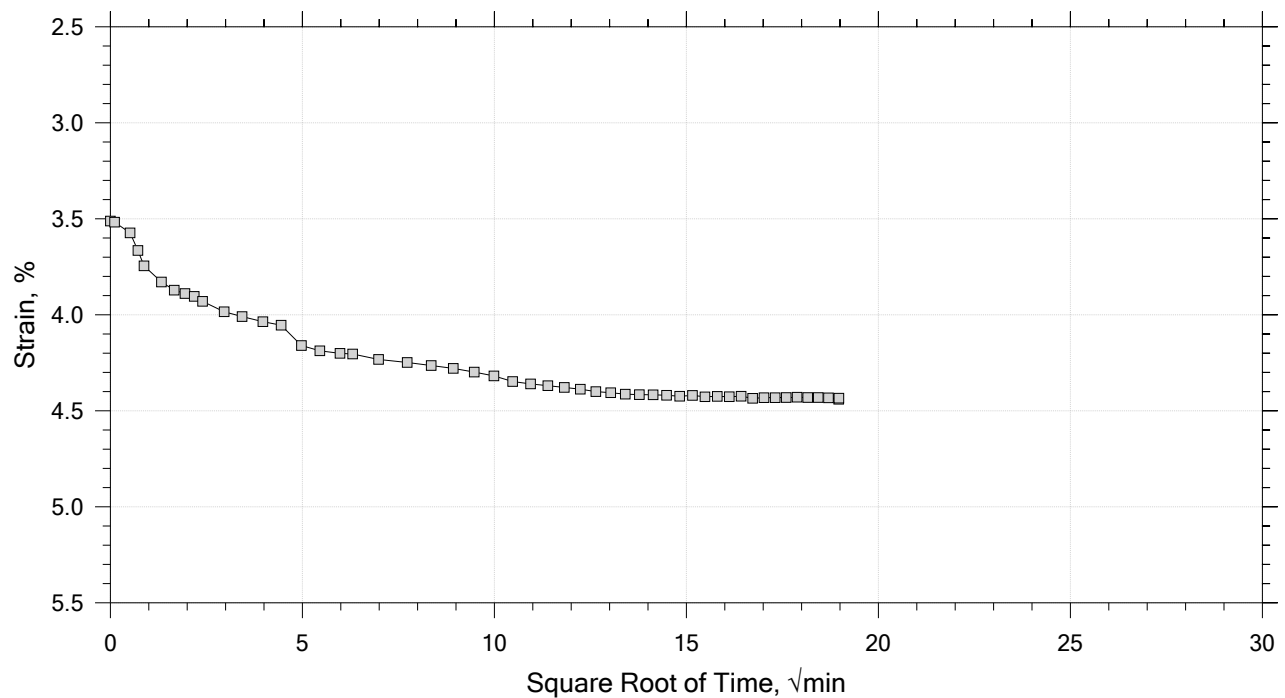
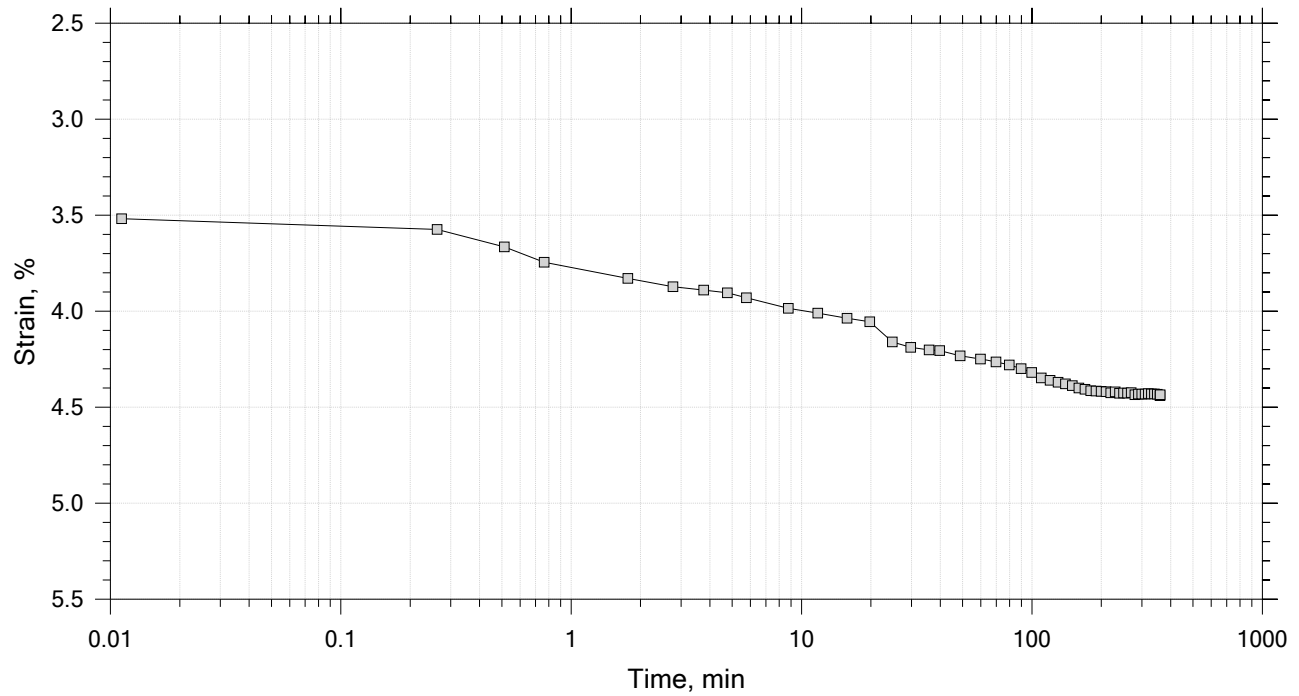
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-240	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 03/01/21	Depth: 10-12 ft
	Test No.: IP-13	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-E, Swell Pressure = 0.0822 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 5 of 21

Constant Load Step

Stress: 1 tsf



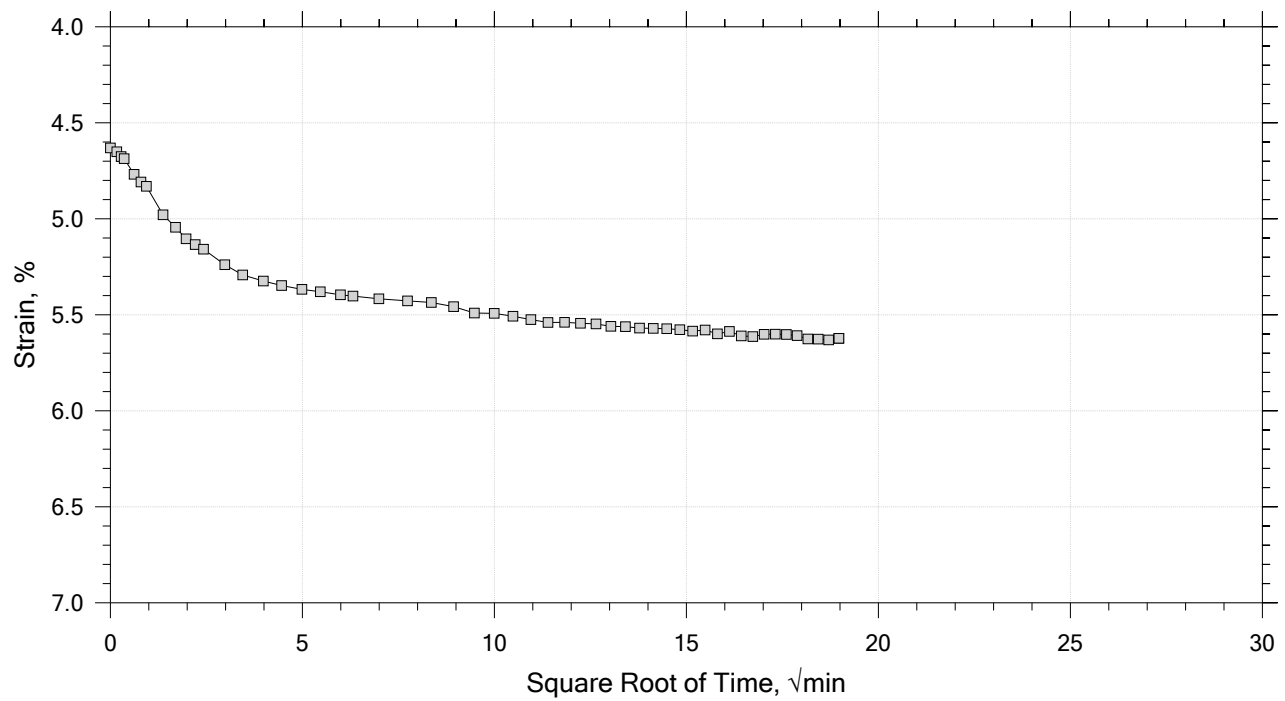
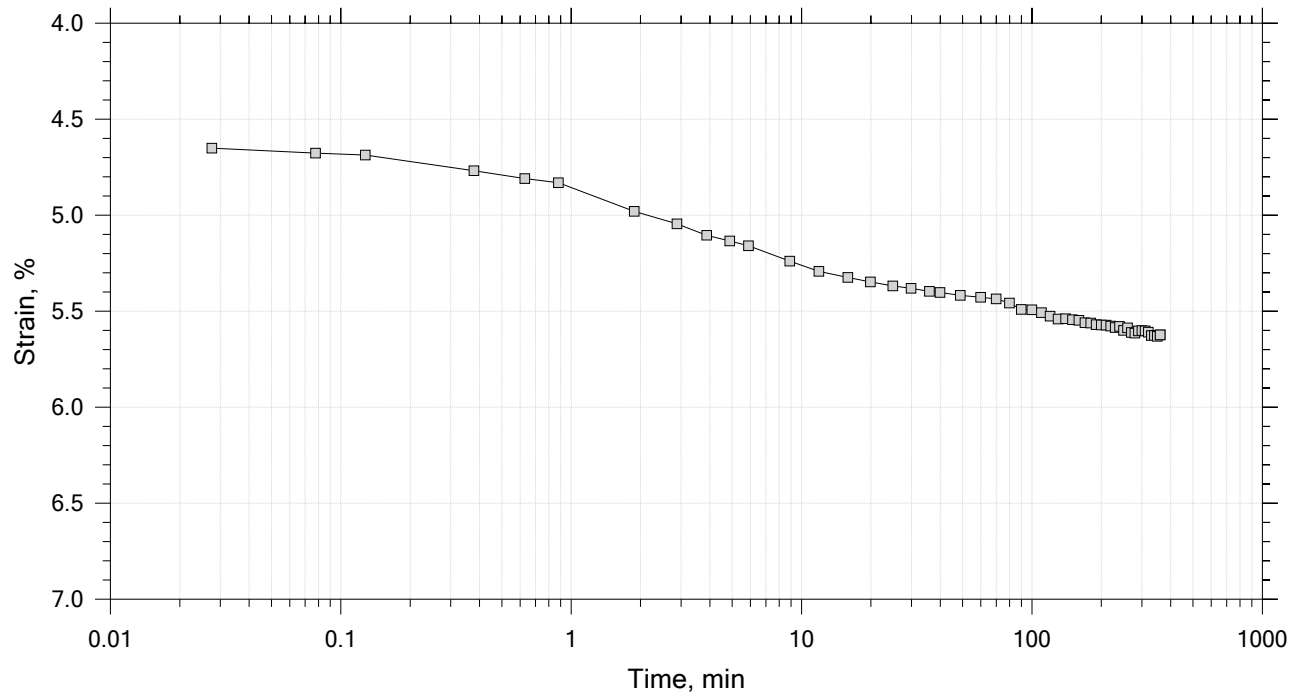
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-240	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 03/01/21	Depth: 10-12 ft
	Test No.: IP-13	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-E, Swell Pressure = 0.0822 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 6 of 21

Constant Load Step

Stress: 2 tsf



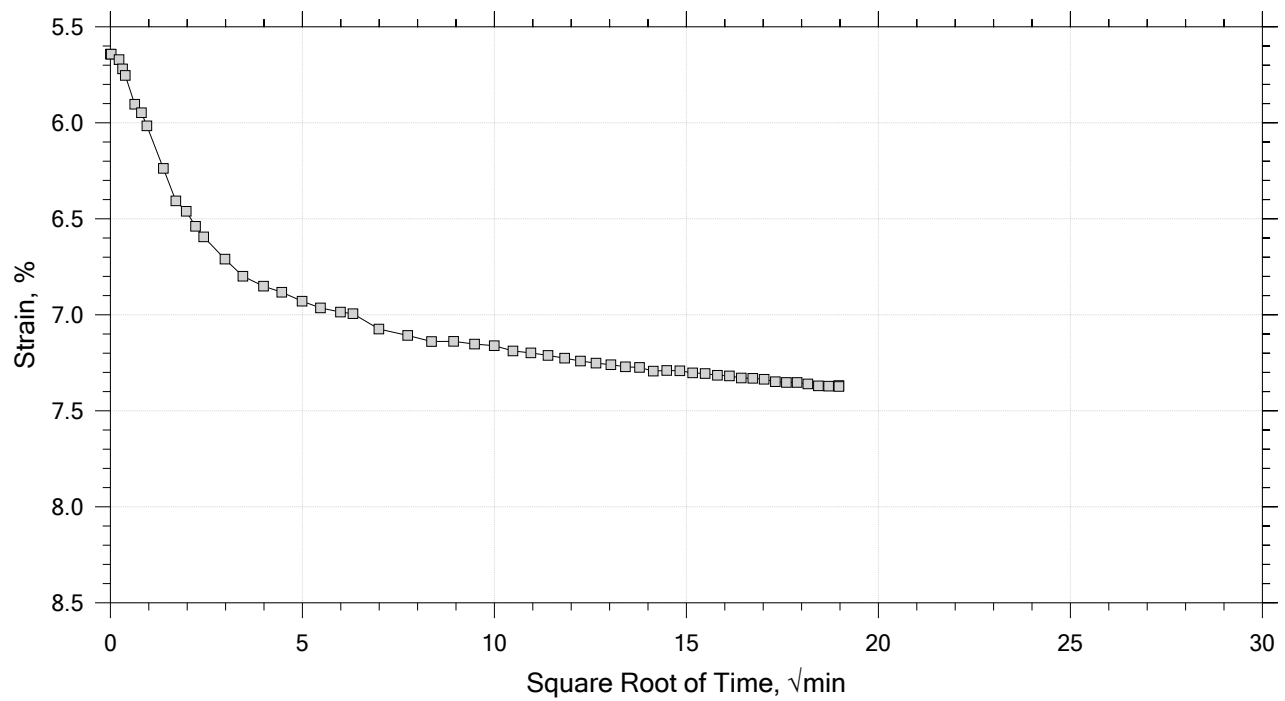
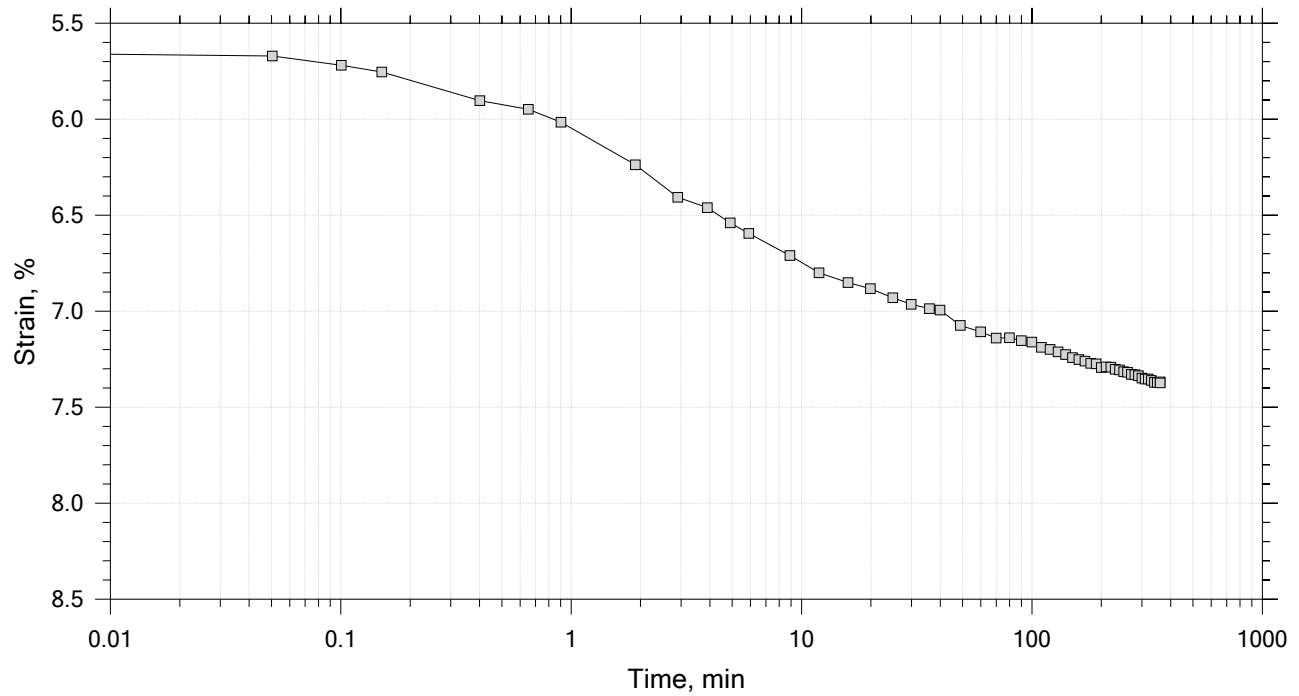
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-240	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 03/01/21	Depth: 10-12 ft
	Test No.: IP-13	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-E, Swell Pressure = 0.0822 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 7 of 21

Constant Load Step

Stress: 4 tsf



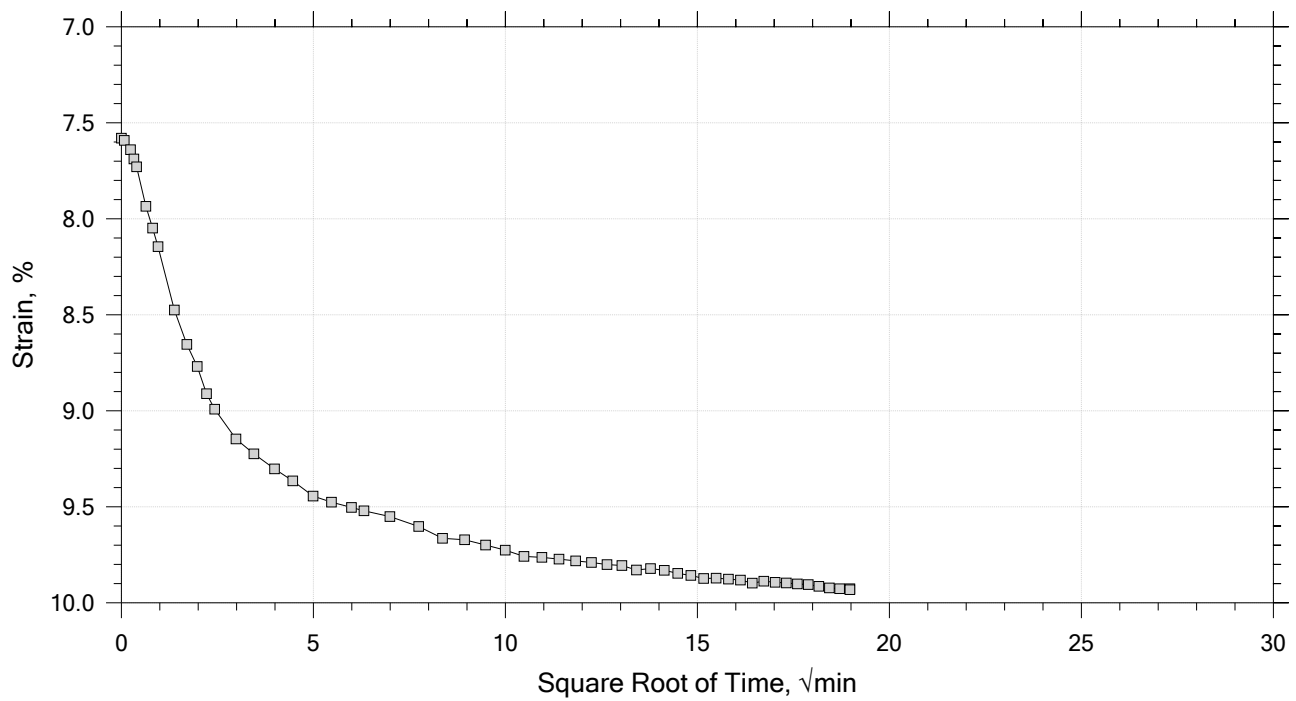
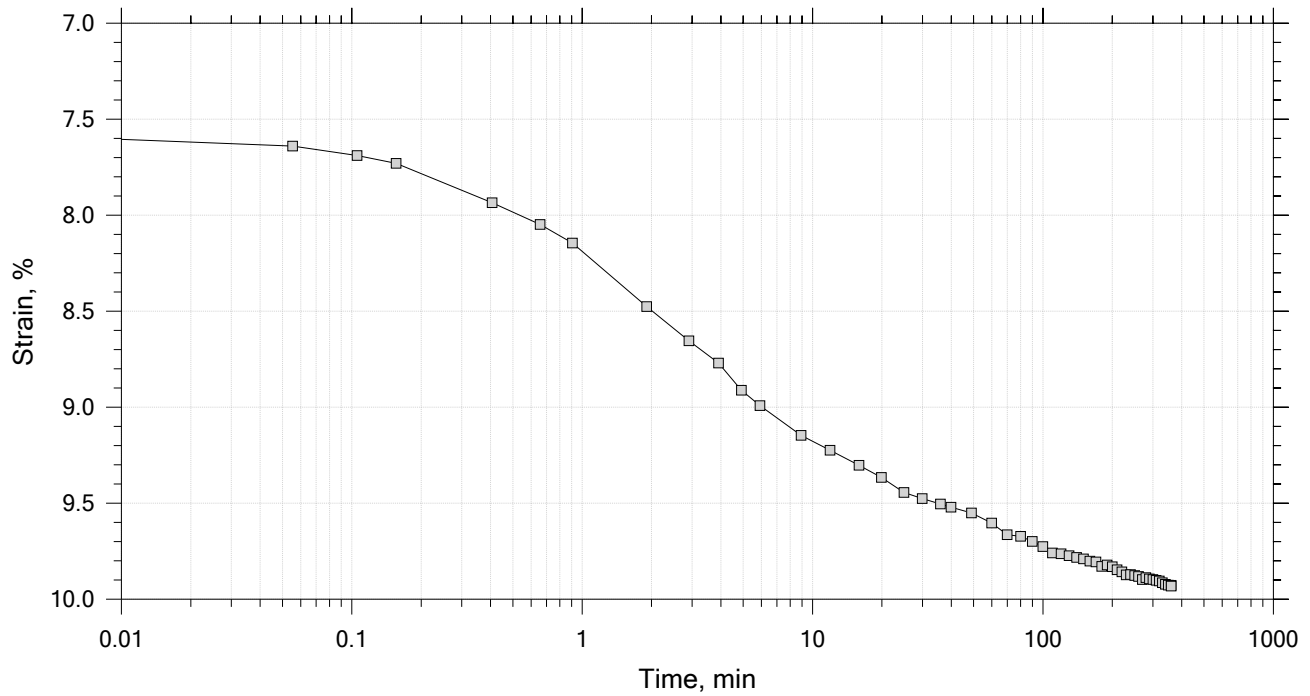
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-240	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 03/01/21	Depth: 10-12 ft
	Test No.: IP-13	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-E, Swell Pressure = 0.0822 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 8 of 21

Constant Load Step

Stress: 8 tsf



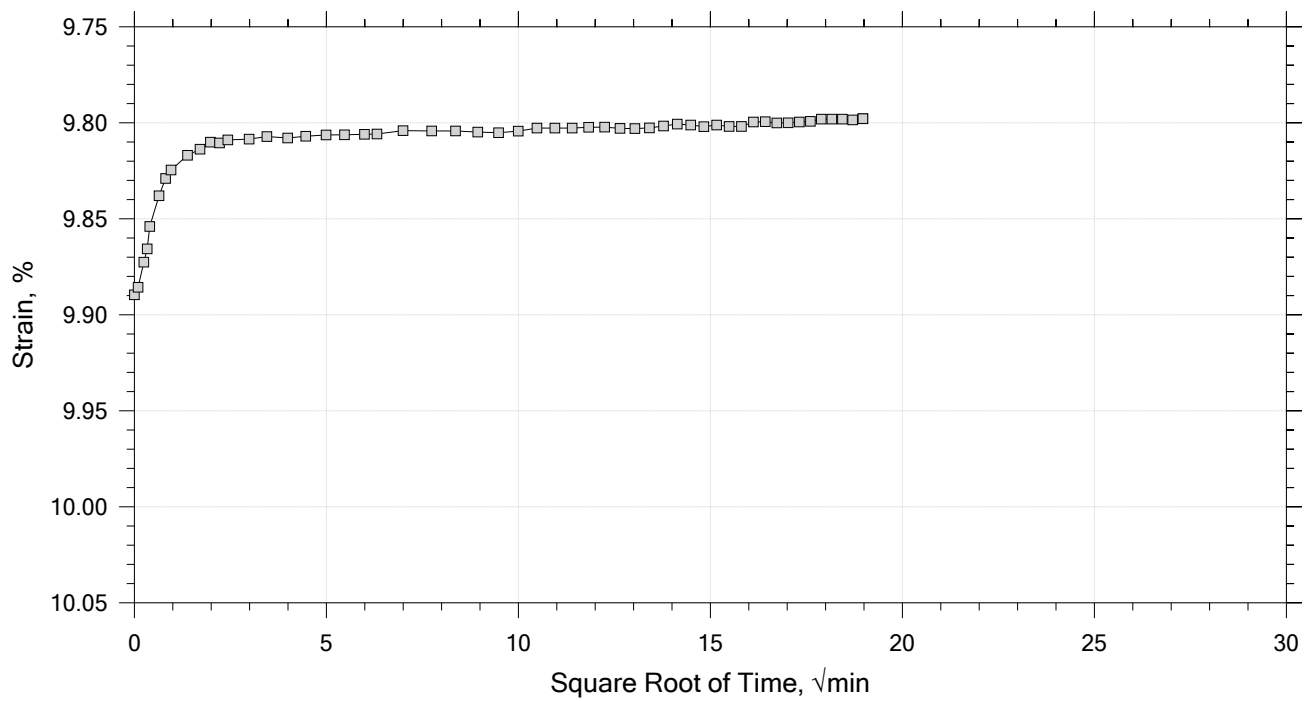
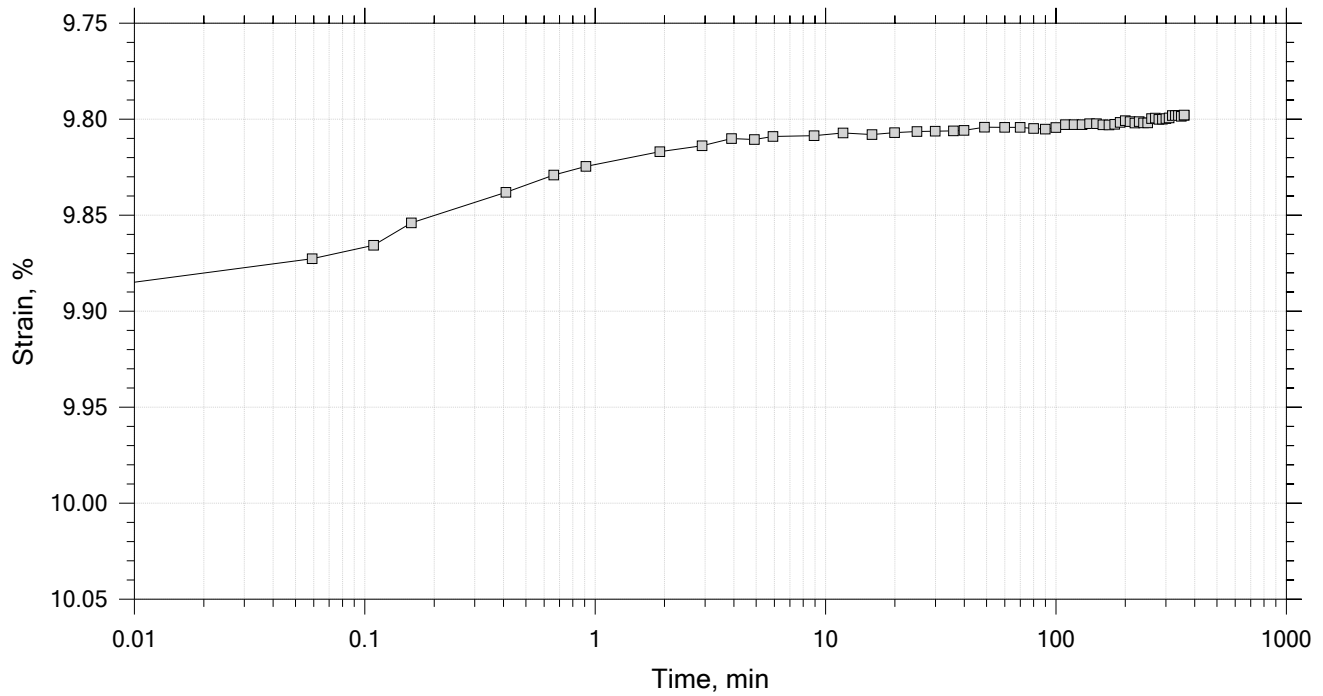
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-240	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 03/01/21	Depth: 10-12 ft
	Test No.: IP-13	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-E, Swell Pressure = 0.0822 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 9 of 21

Constant Load Step

Stress: 4 tsf



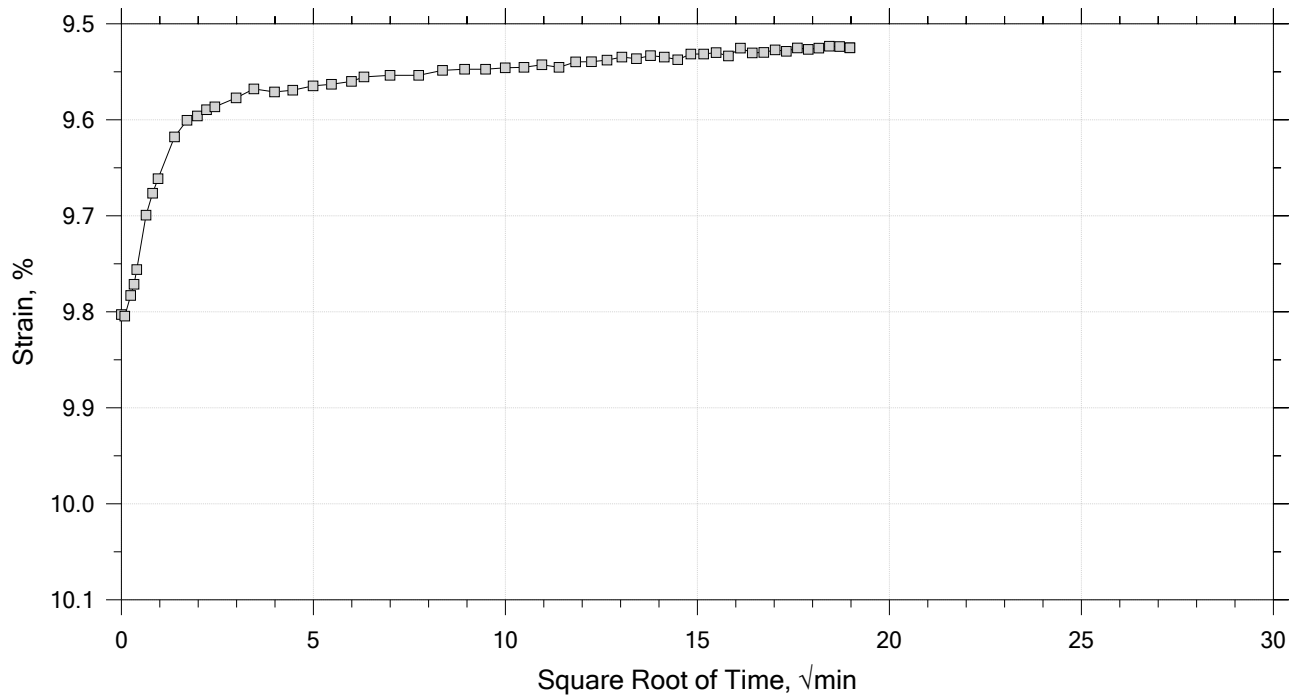
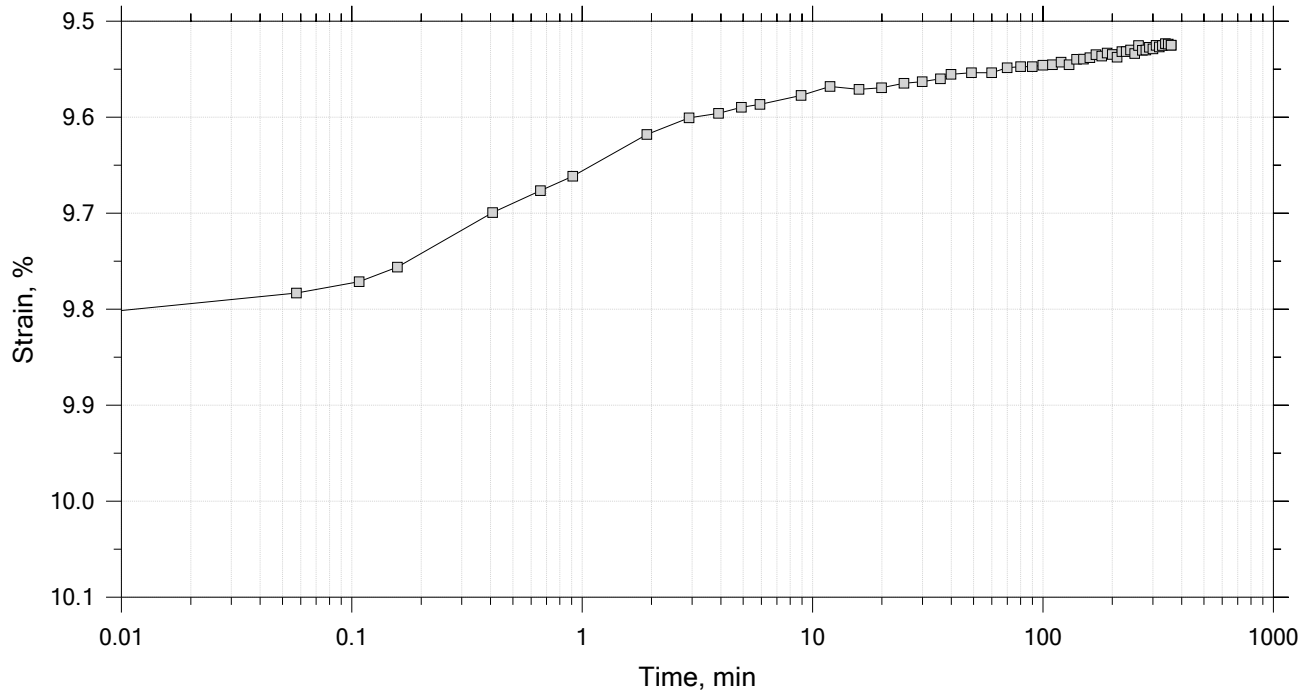
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-240	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 03/01/21	Depth: 10-12 ft
	Test No.: IP-13	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-E, Swell Pressure = 0.0822 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 10 of 21

Constant Load Step

Stress: 2 tsf



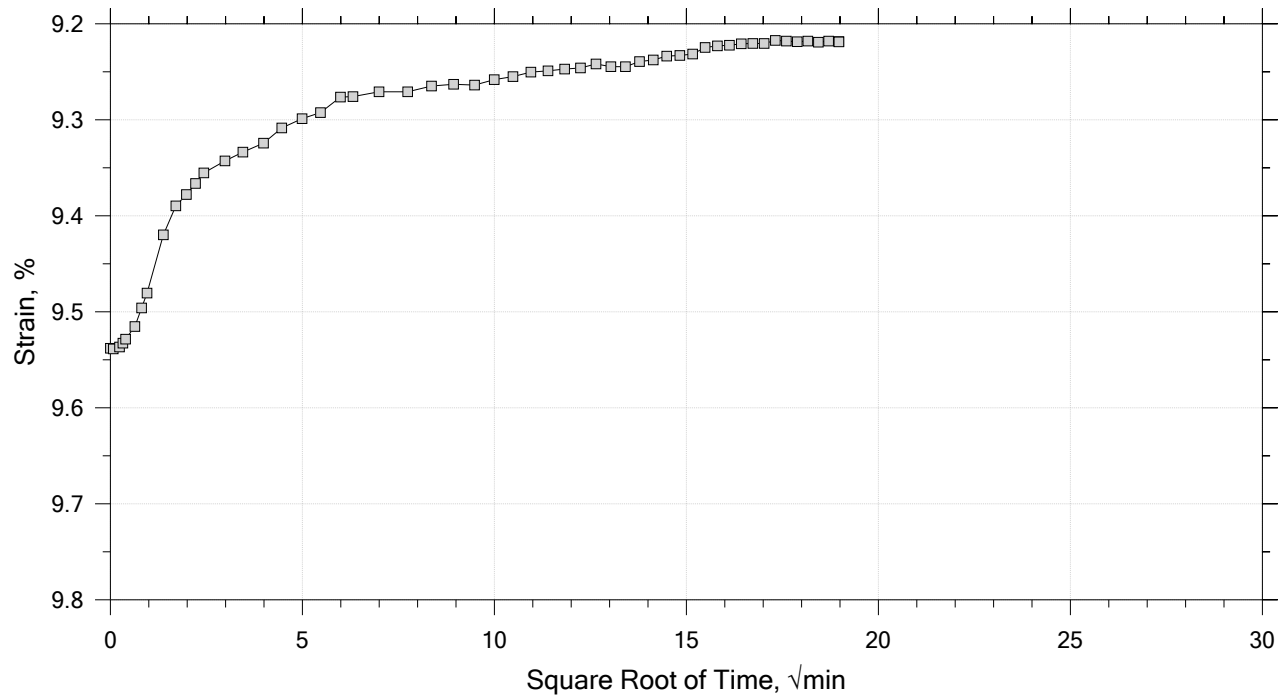
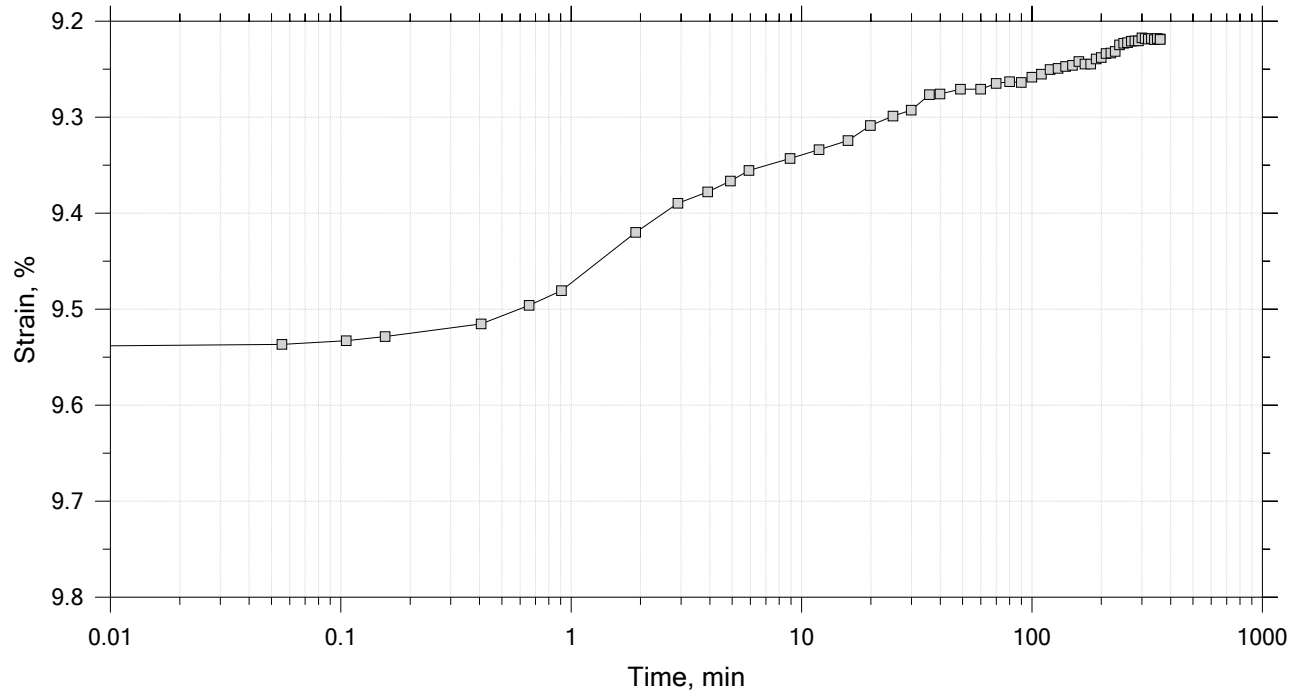
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-240	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 03/01/21	Depth: 10-12 ft
	Test No.: IP-13	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-E, Swell Pressure = 0.0822 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 11 of 21

Constant Load Step

Stress: 1 tsf



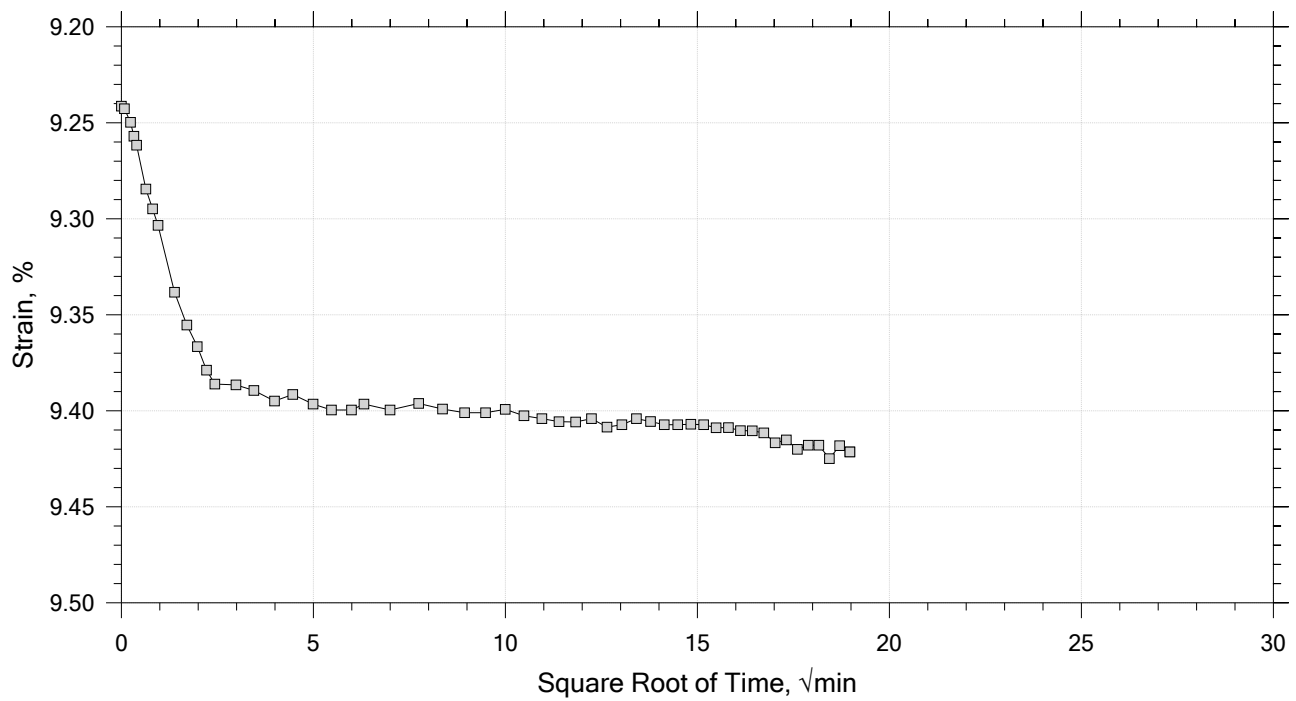
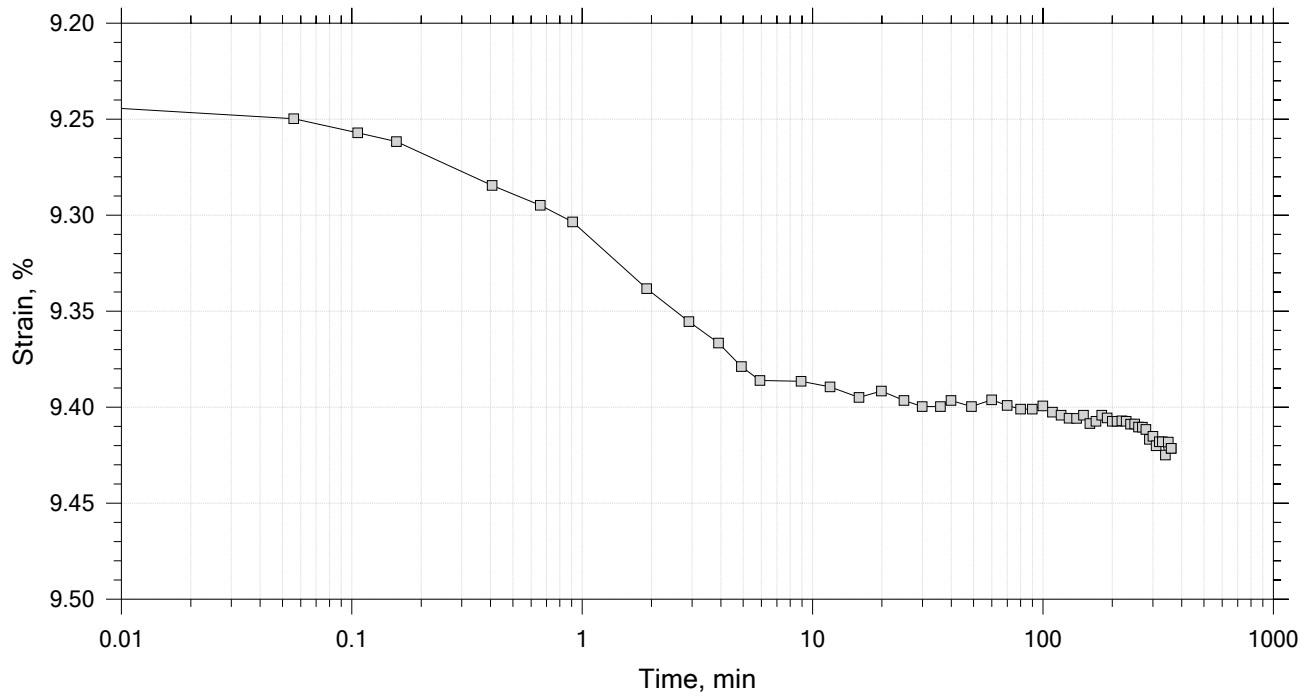
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-240	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 03/01/21	Depth: 10-12 ft
	Test No.: IP-13	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-E, Swell Pressure = 0.0822 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 12 of 21

Constant Load Step

Stress: 2 tsf



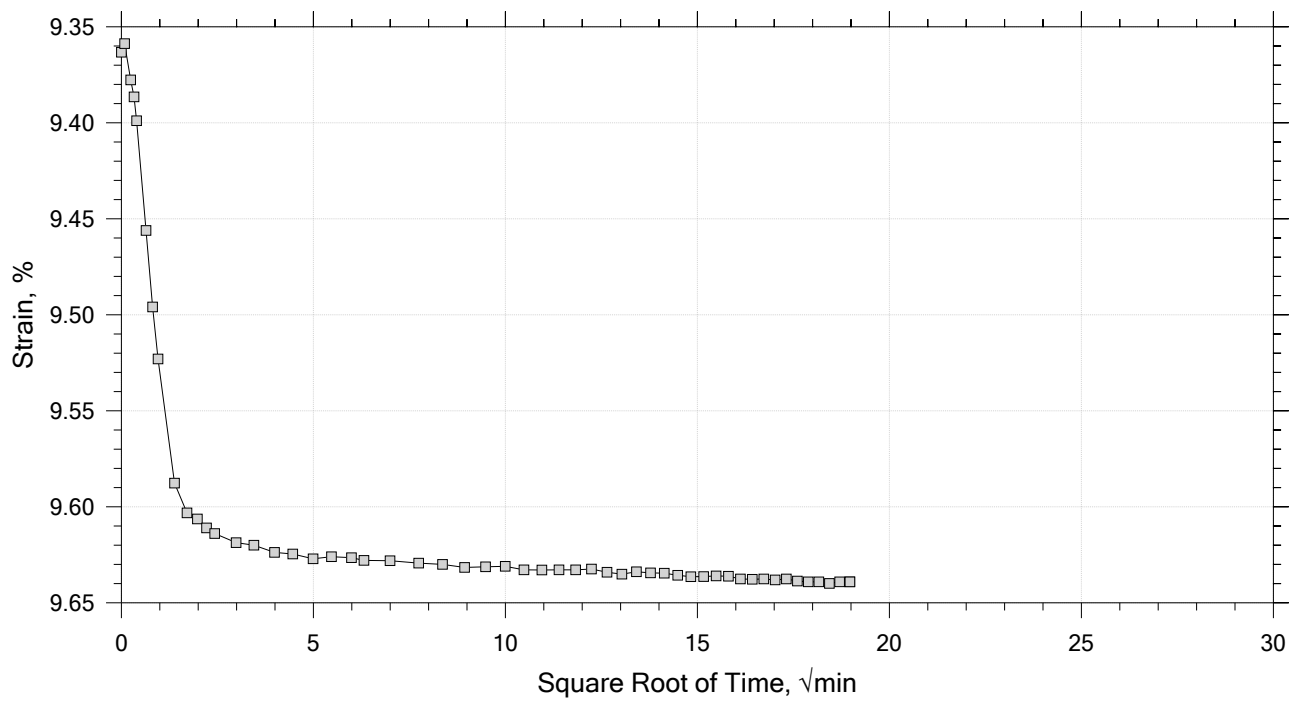
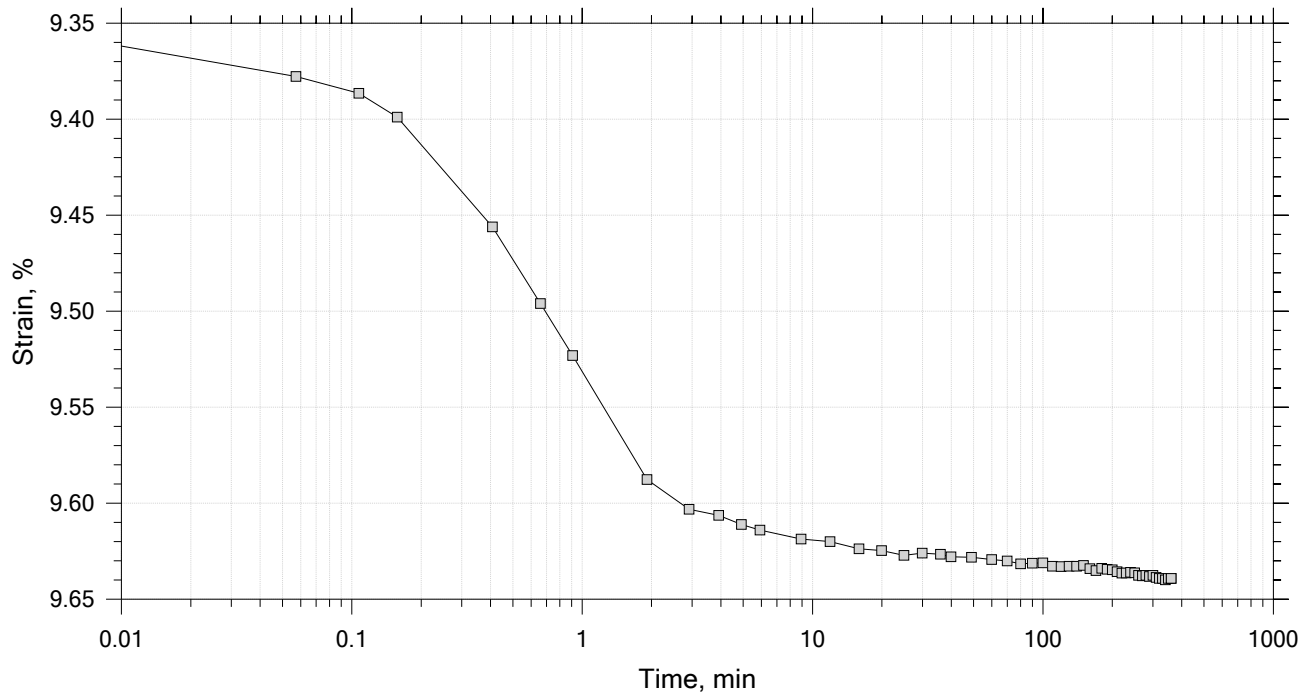
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-240	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 03/01/21	Depth: 10-12 ft
	Test No.: IP-13	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-E, Swell Pressure = 0.0822 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 13 of 21

Constant Load Step

Stress: 4 tsf



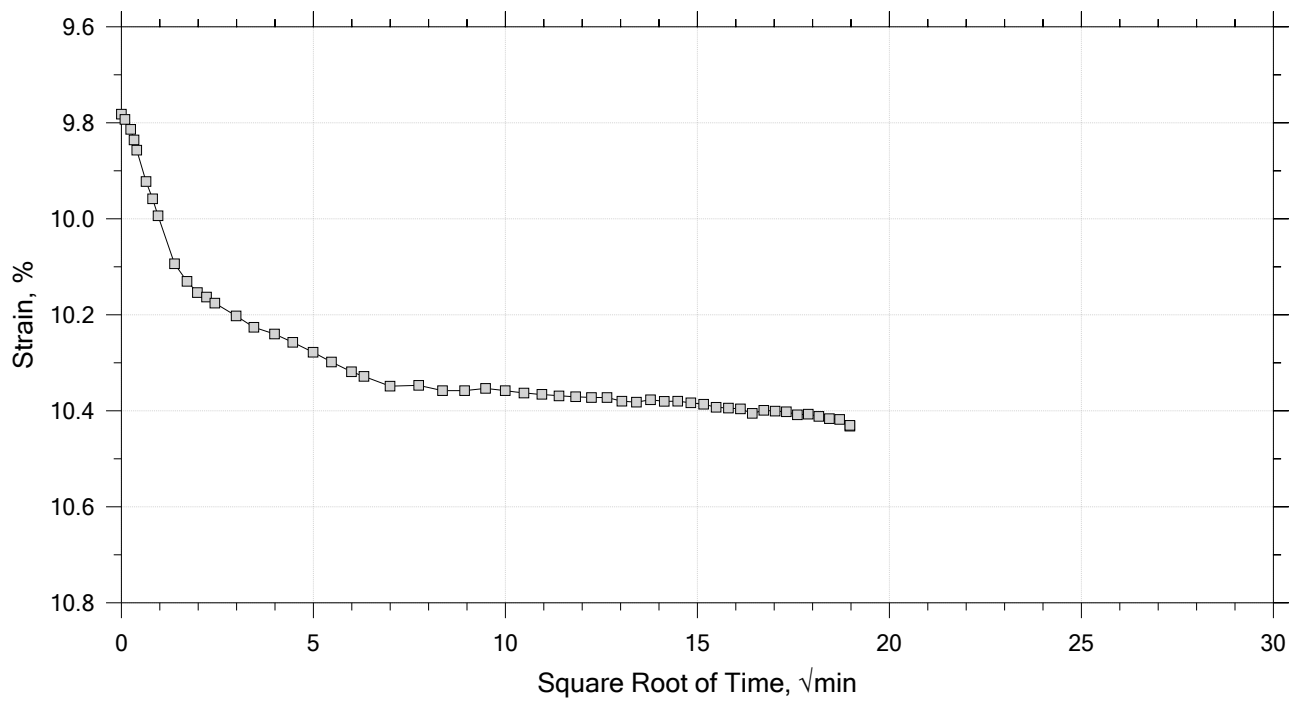
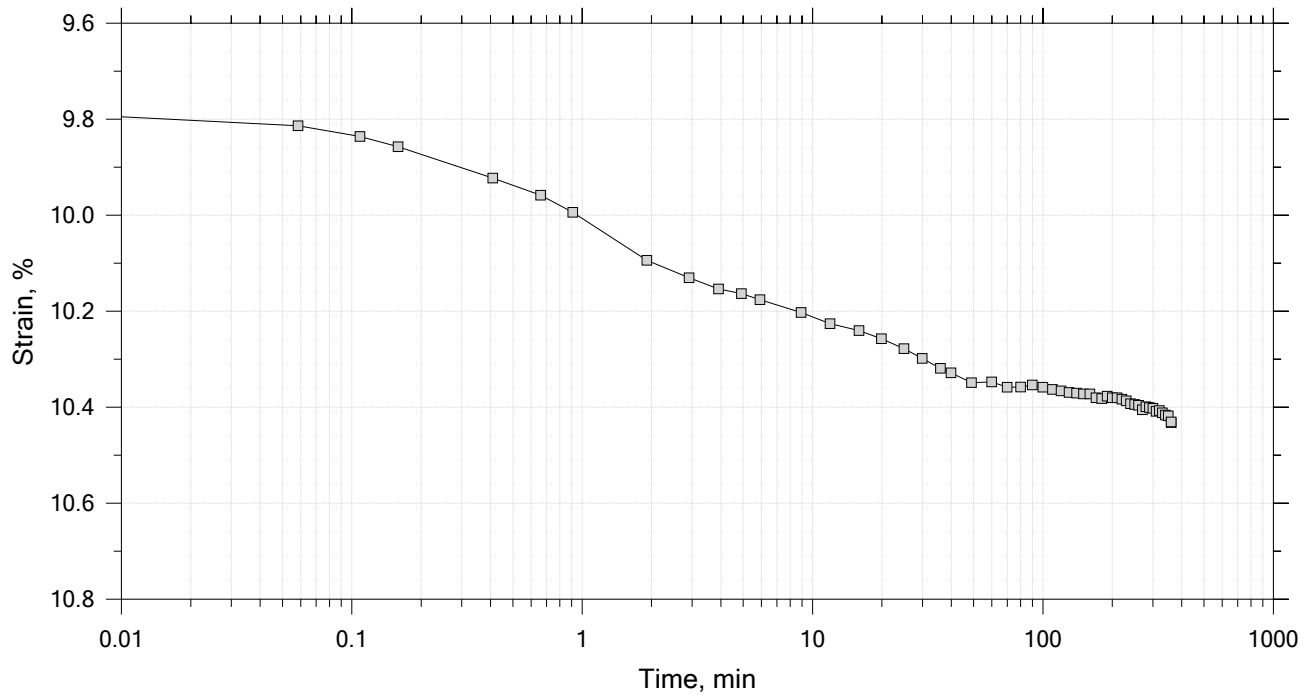
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-240	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 03/01/21	Depth: 10-12 ft
	Test No.: IP-13	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-E, Swell Pressure = 0.0822 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 14 of 21

Constant Load Step

Stress: 8 tsf



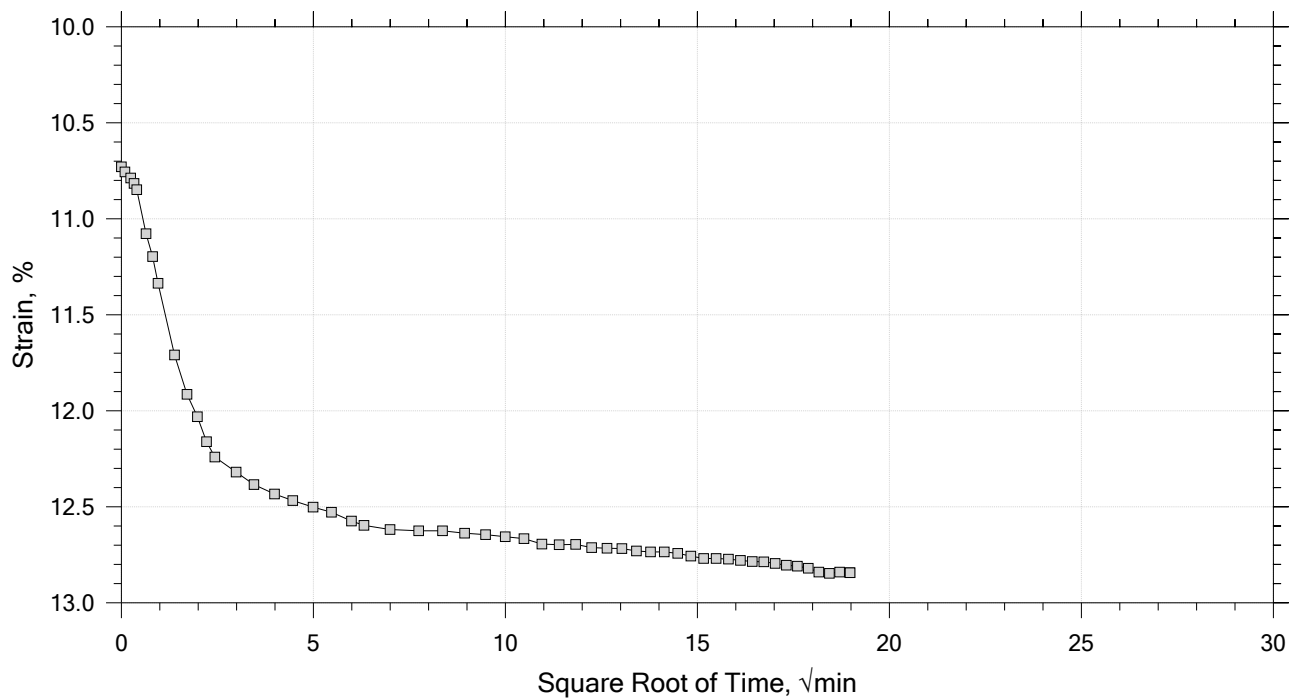
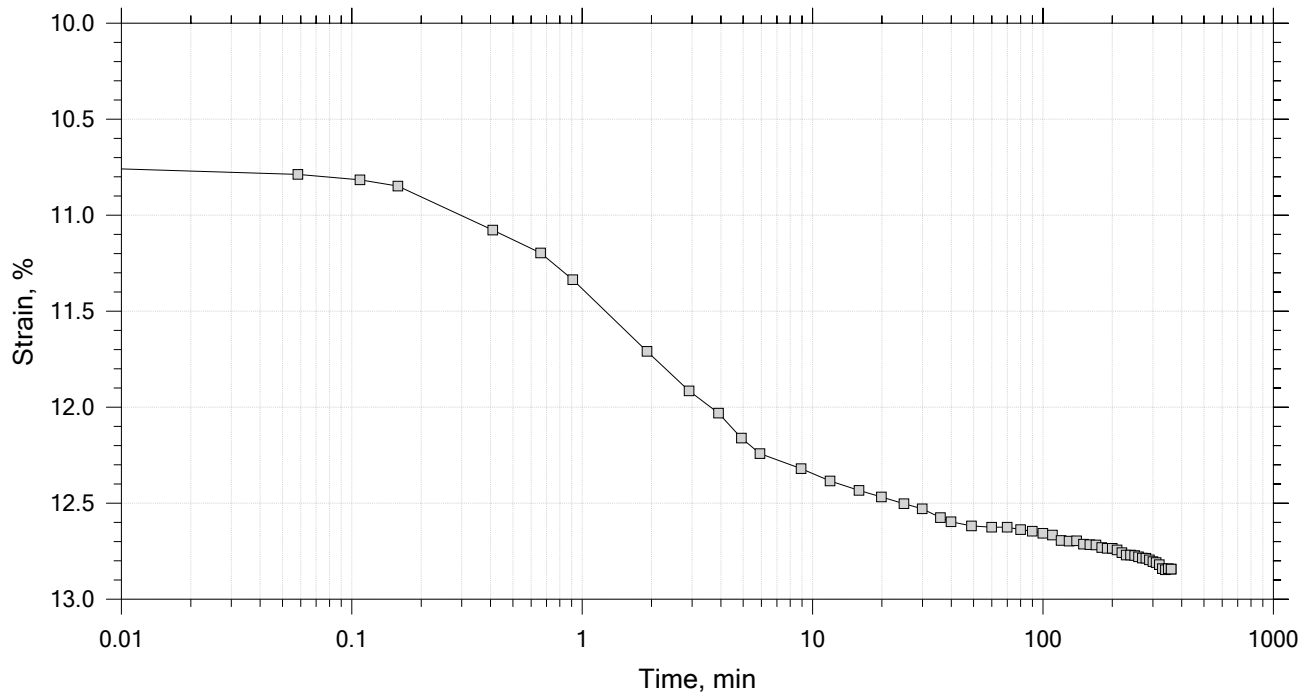
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-240	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 03/01/21	Depth: 10-12 ft
	Test No.: IP-13	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-E, Swell Pressure = 0.0822 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 15 of 21

Constant Load Step

Stress: 16 tsf



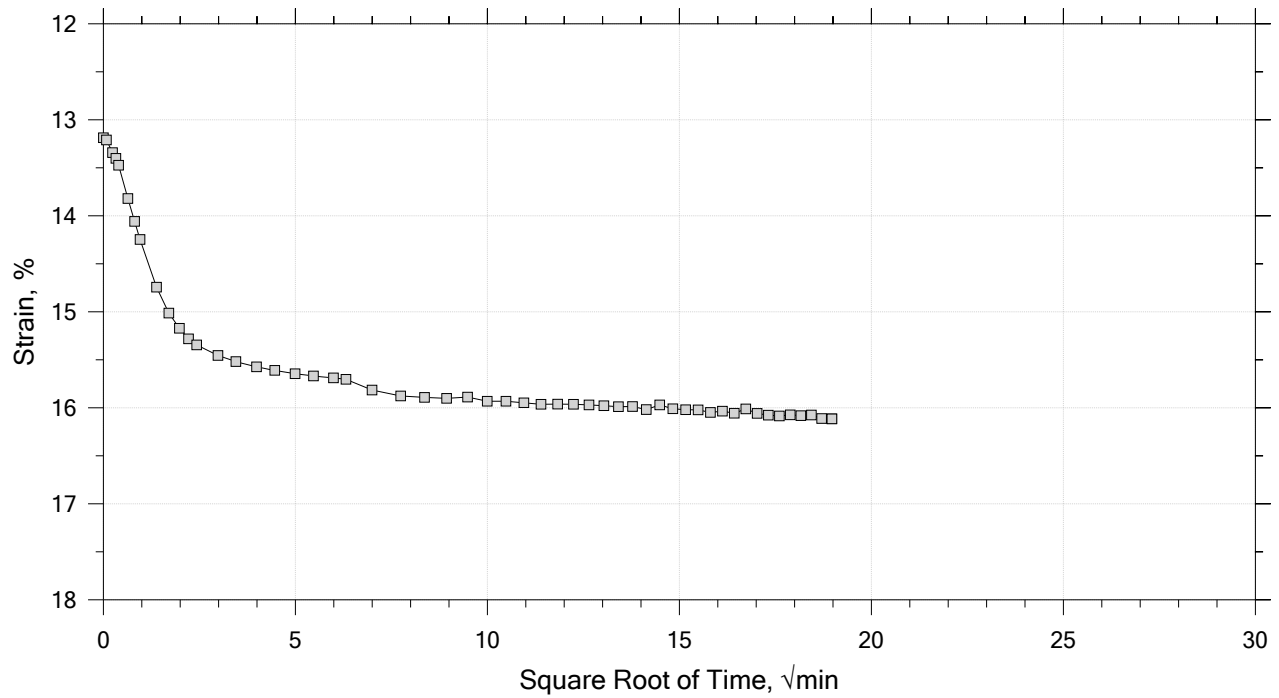
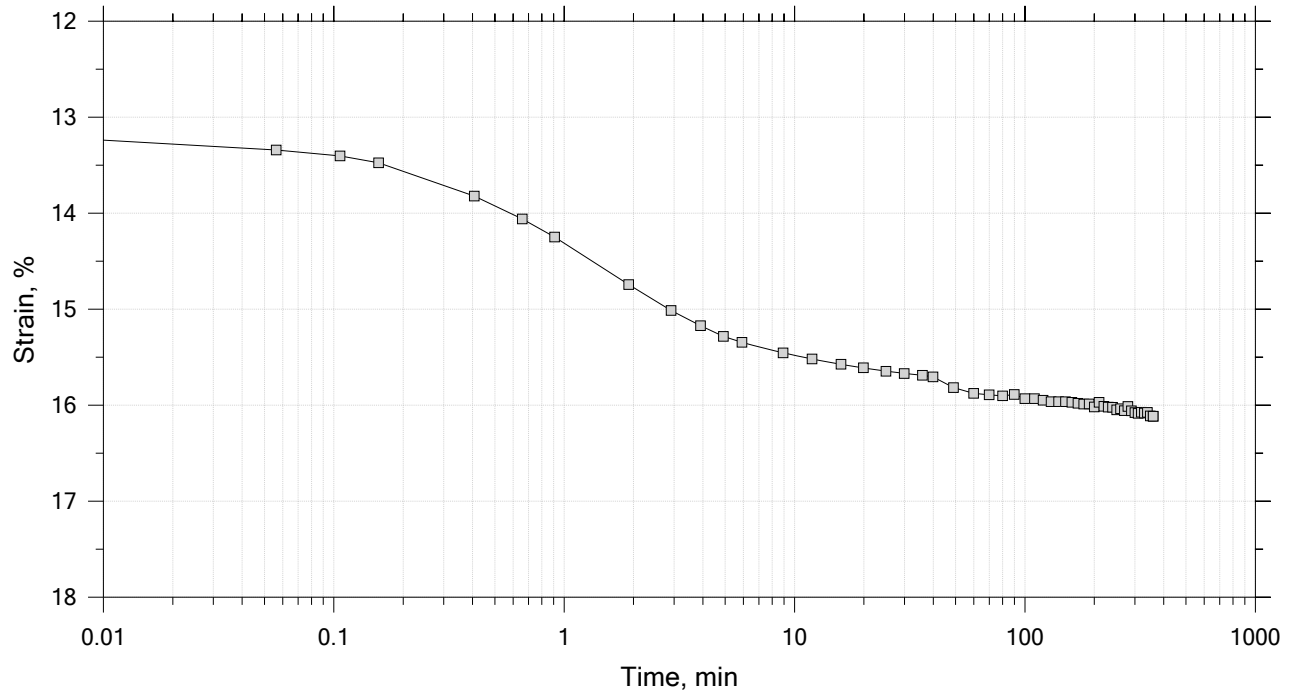
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-240	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 03/01/21	Depth: 10-12 ft
	Test No.: IP-13	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-E, Swell Pressure = 0.0822 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 16 of 21

Constant Load Step

Stress: 32 tsf



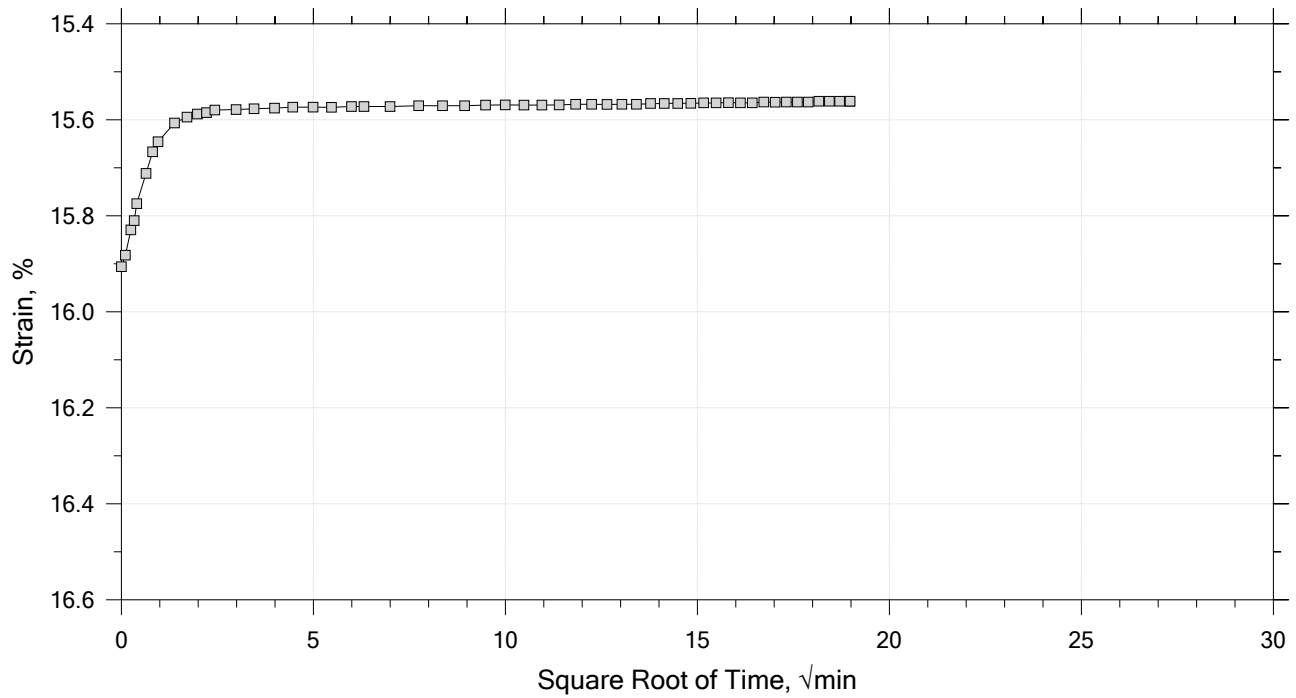
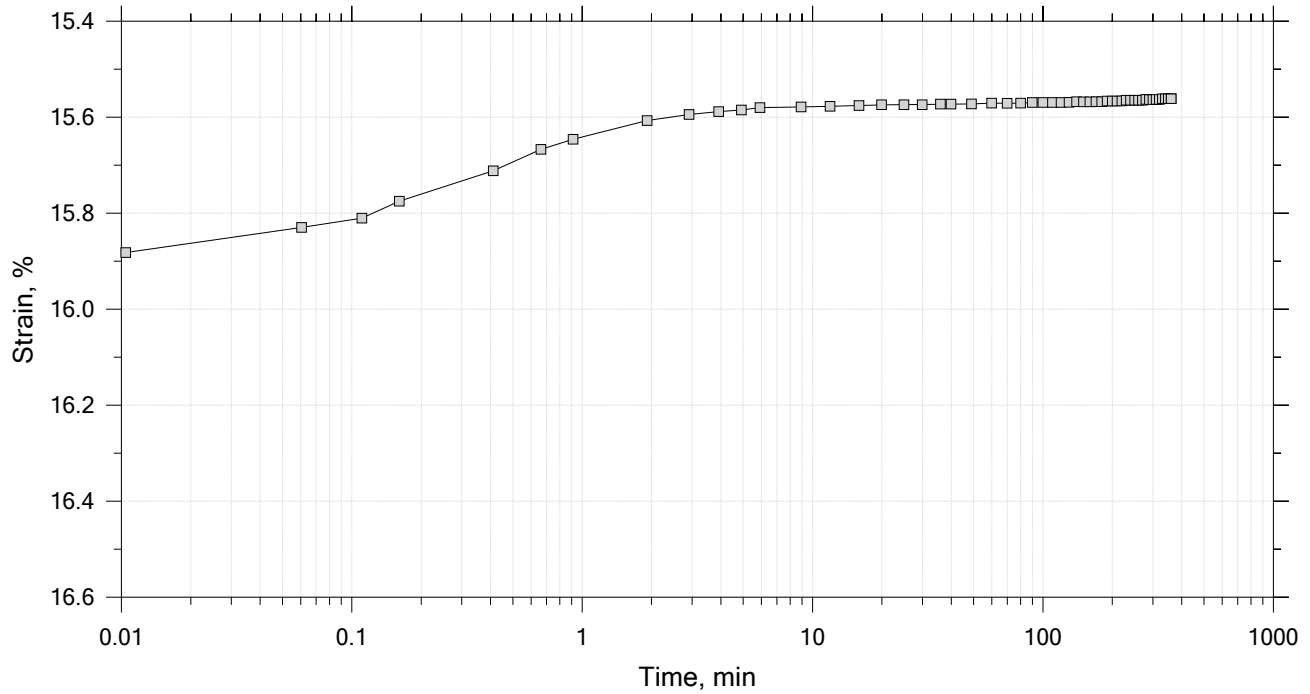
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-240	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 03/01/21	Depth: 10-12 ft
	Test No.: IP-13	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-E, Swell Pressure = 0.0822 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 17 of 21

Constant Load Step

Stress: 8 tsf



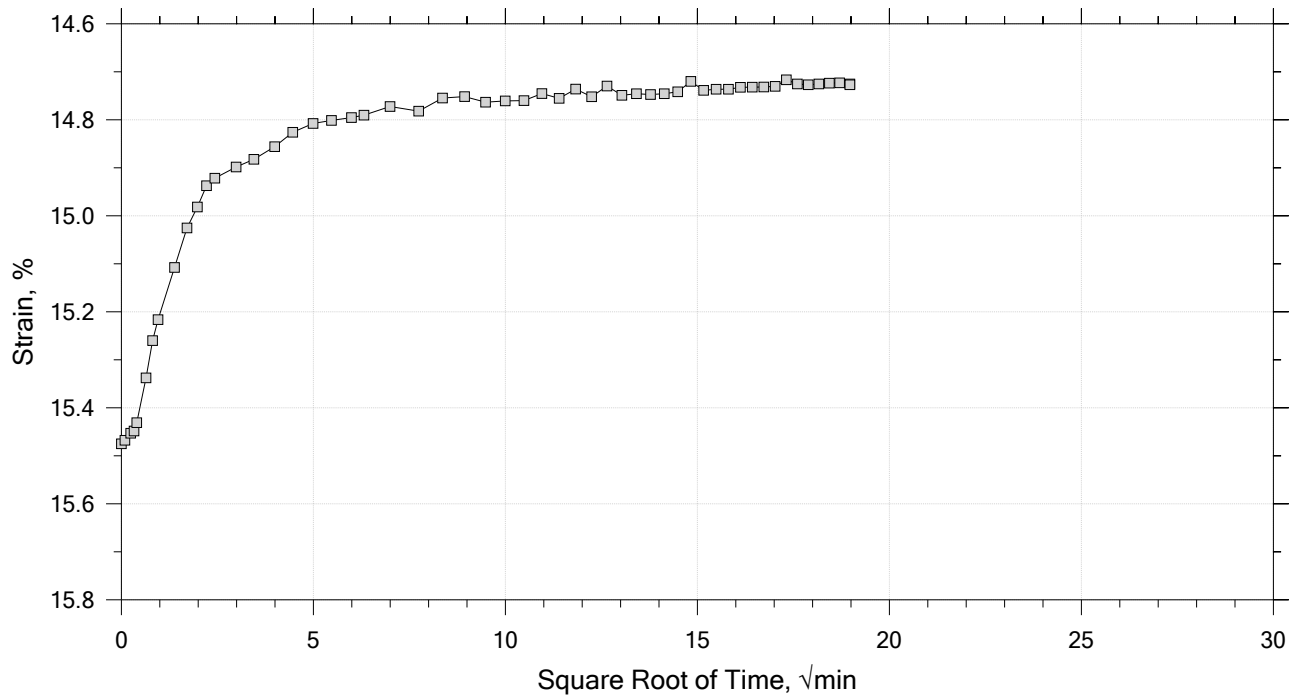
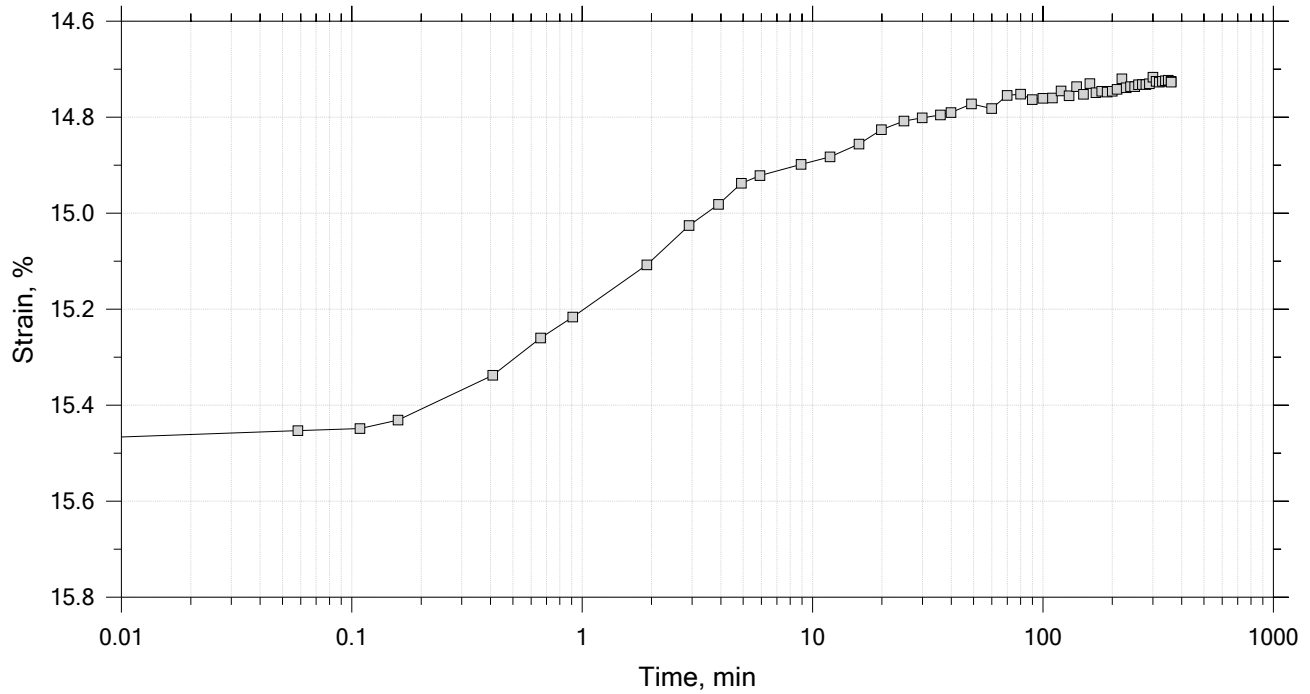
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-240	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 03/01/21	Depth: 10-12 ft
	Test No.: IP-13	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-E, Swell Pressure = 0.0822 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 18 of 21

Constant Load Step

Stress: 2 tsf



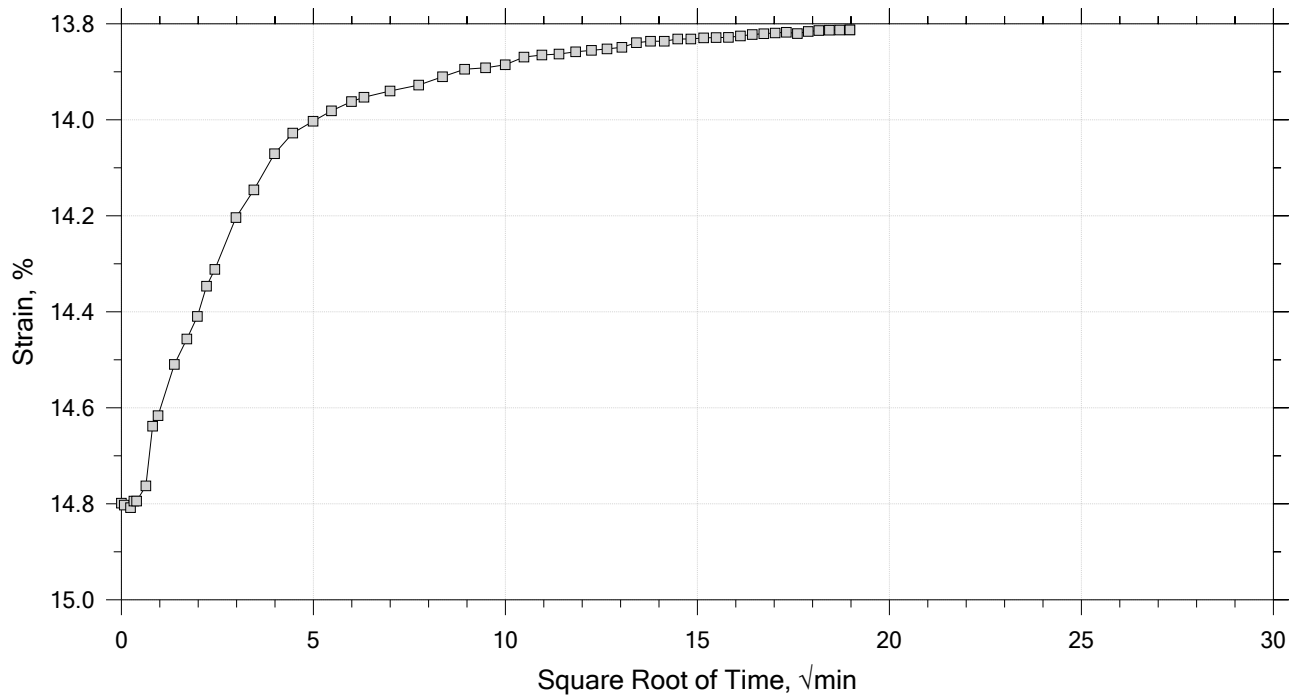
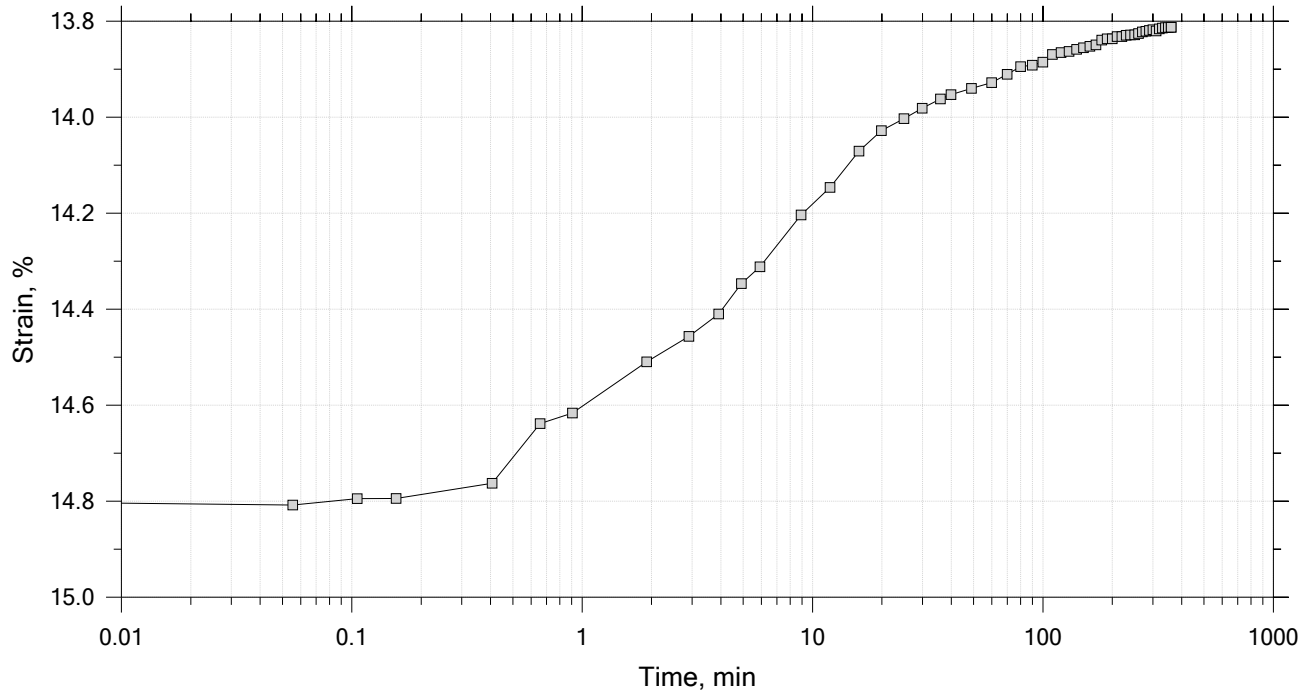
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-240	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 03/01/21	Depth: 10-12 ft
	Test No.: IP-13	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-E, Swell Pressure = 0.0822 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 19 of 21

Constant Load Step

Stress: 0.5 tsf



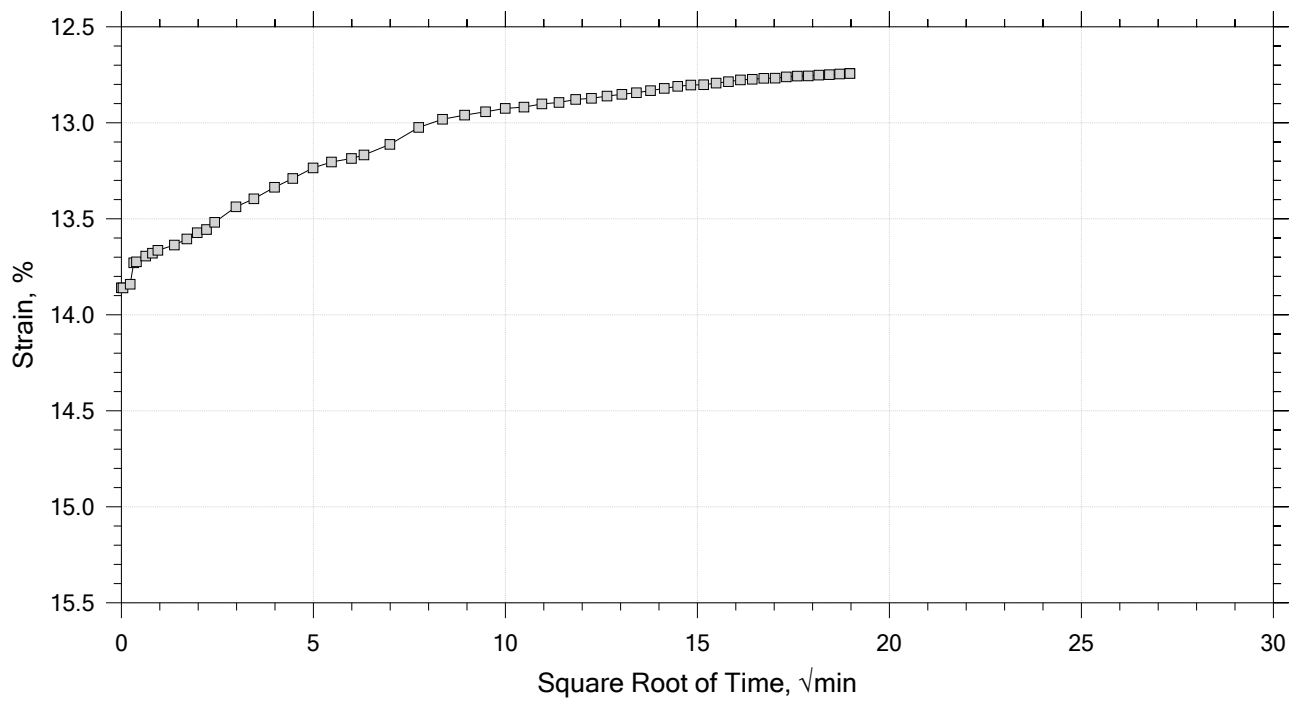
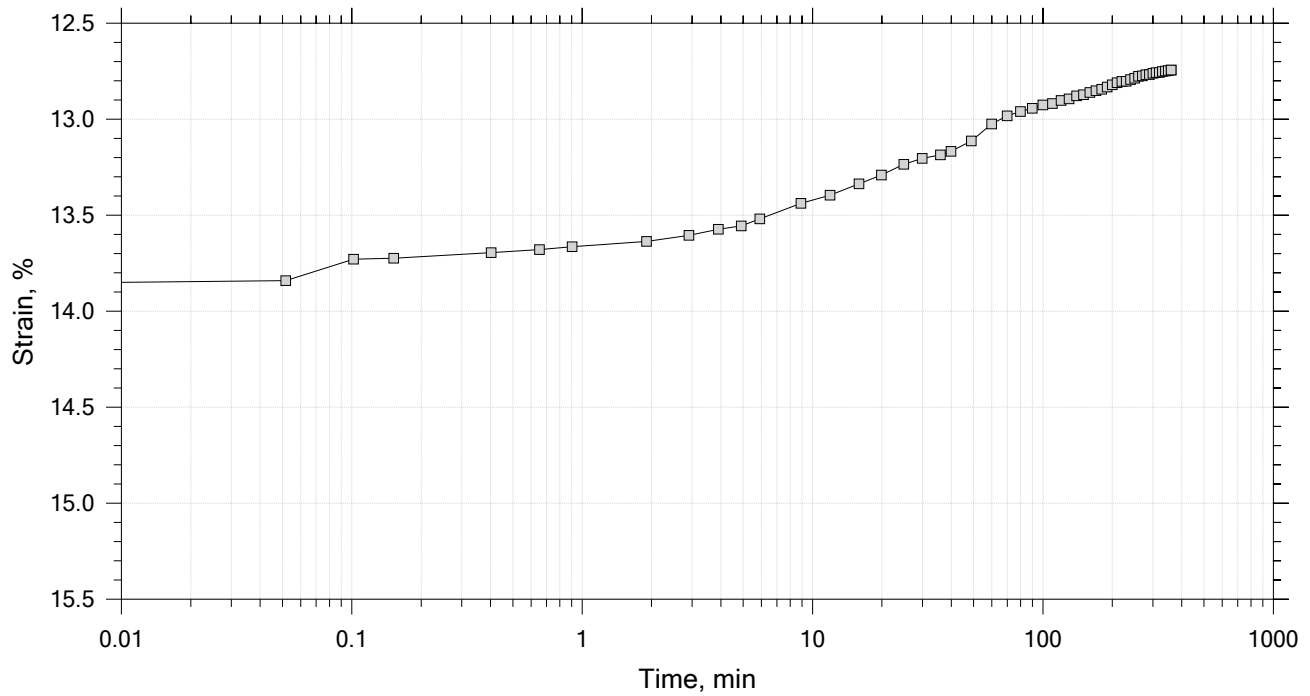
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-240	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 03/01/21	Depth: 10-12 ft
	Test No.: IP-13	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-E, Swell Pressure = 0.0822 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 20 of 21

Constant Load Step

Stress: 0.125 tsf



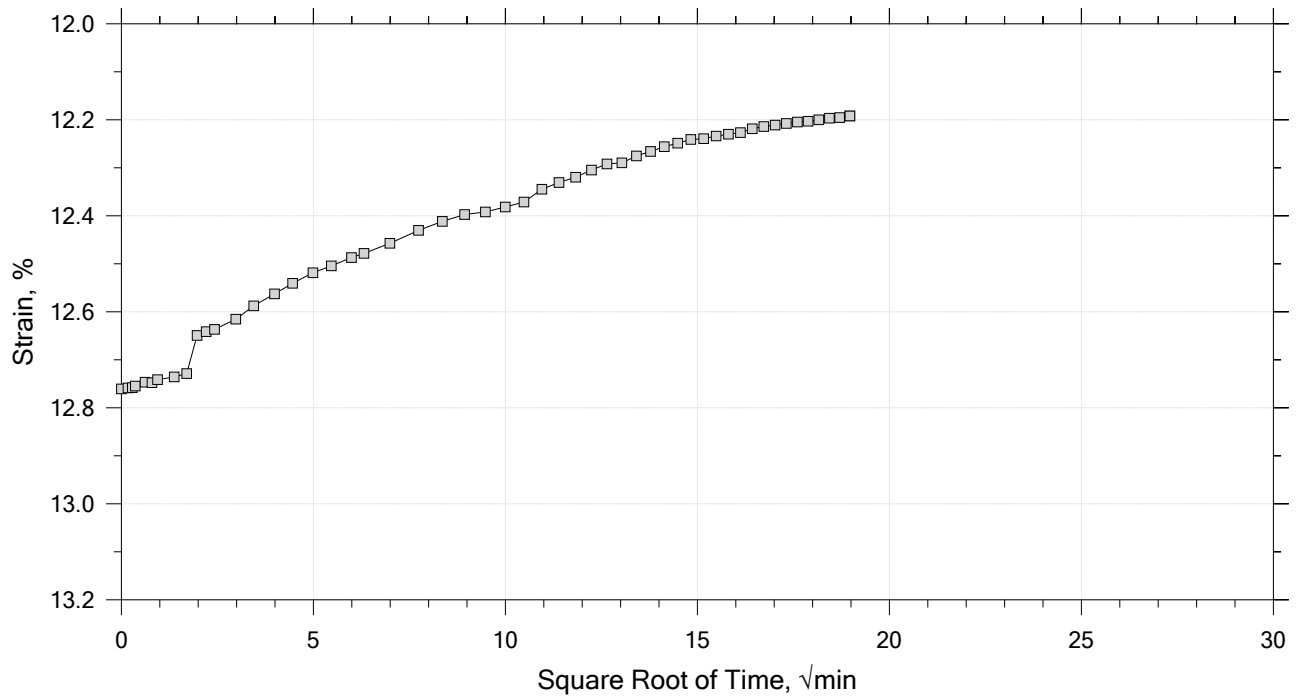
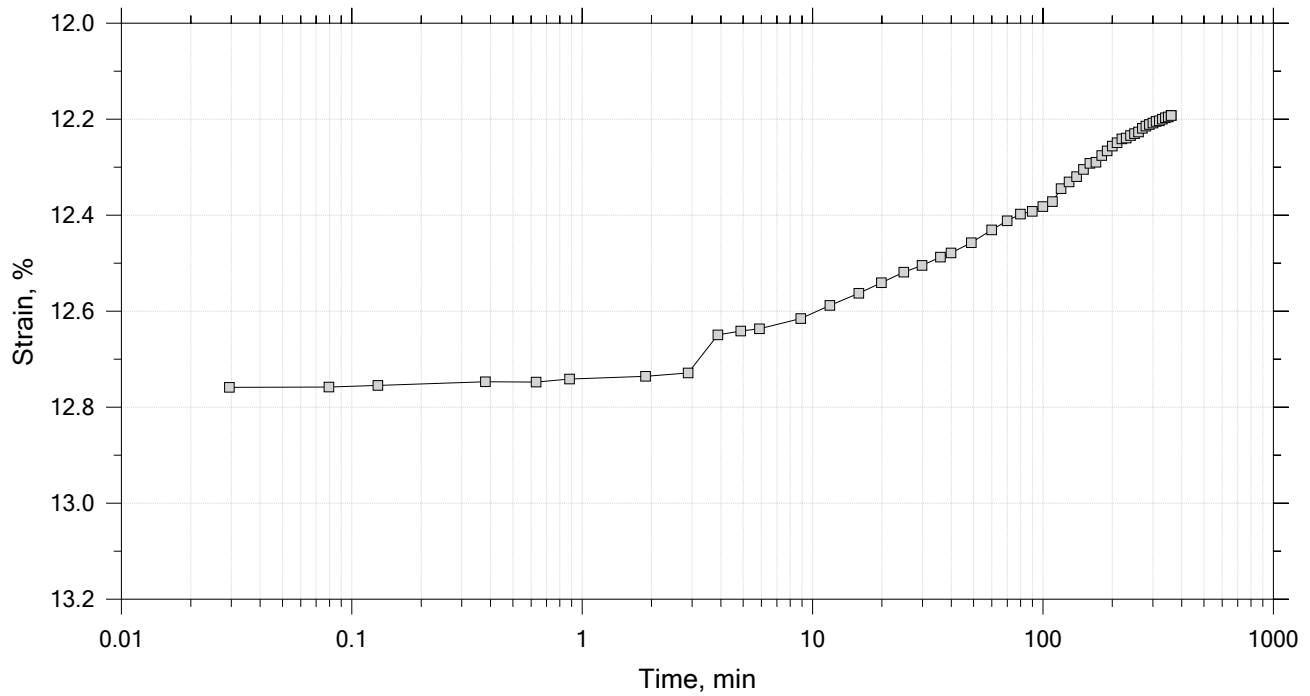
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-240	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 03/01/21	Depth: 10-12 ft
	Test No.: IP-13	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-E, Swell Pressure = 0.0822 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 21 of 21

Constant Load Step

Stress: 0.0625 tsf




	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-240	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 03/01/21	Depth: 10-12 ft
	Test No.: IP-13	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-E, Swell Pressure = 0.0822 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Specimen Diameter: 2.50 in	Estimated Specific Gravity: 2.75	Liquid Limit: 30
Initial Height: 1.00 in	Initial Void Ratio: 0.795	Plastic Limit: 18
Final Height: 0.91 in	Final Void Ratio: 0.634	Plasticity Index: 12

	Before Test Trimmings	Before Test Specimen	After Test Specimen	After Test Trimmings
Container ID	D-2857	RING		e0684
Mass Container, gm	8.25	108.57	108.57	8.34
Mass Container + Wet Soil, gm	192.64	267.42	260.04	159.35
Mass Container + Dry Soil, gm	152.61	231.64	231.64	131.04
Mass Dry Soil, gm	144.36	123.07	123.07	122.7
Water Content, %	27.73	29.07	23.07	23.07
Void Ratio	---	0.80	0.63	---
Degree of Saturation, %	---	100.39	100.00	---
Dry Unit Weight, pcf	---	95.515	104.96	---


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

	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-240	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 03/01/21	Depth: 10-12 ft
	Test No.: IP-13	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-E, Swell Pressure = 0.0822 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

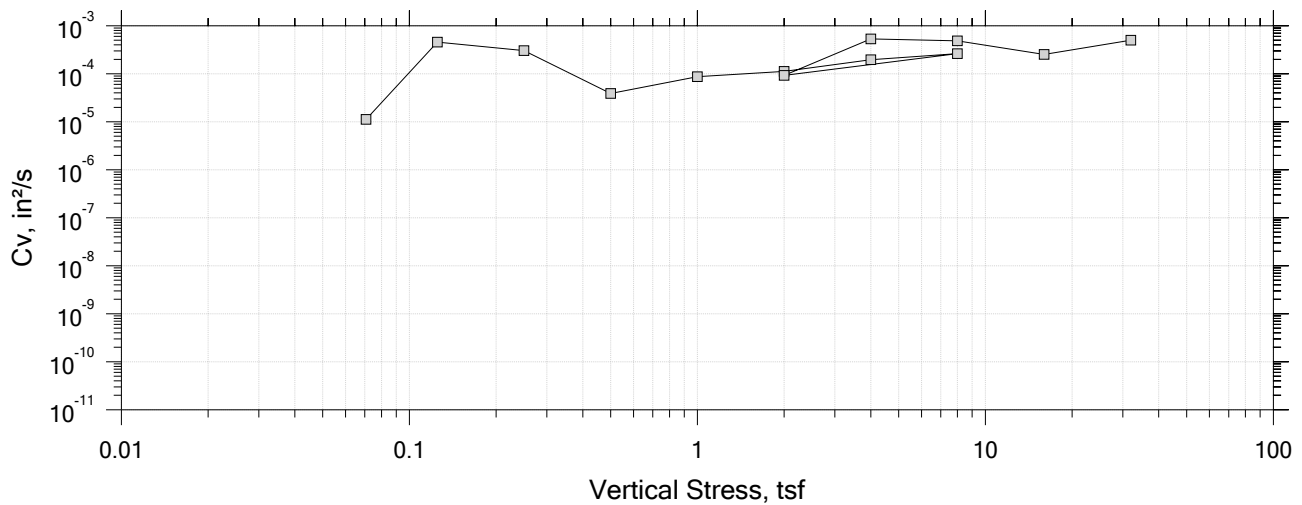
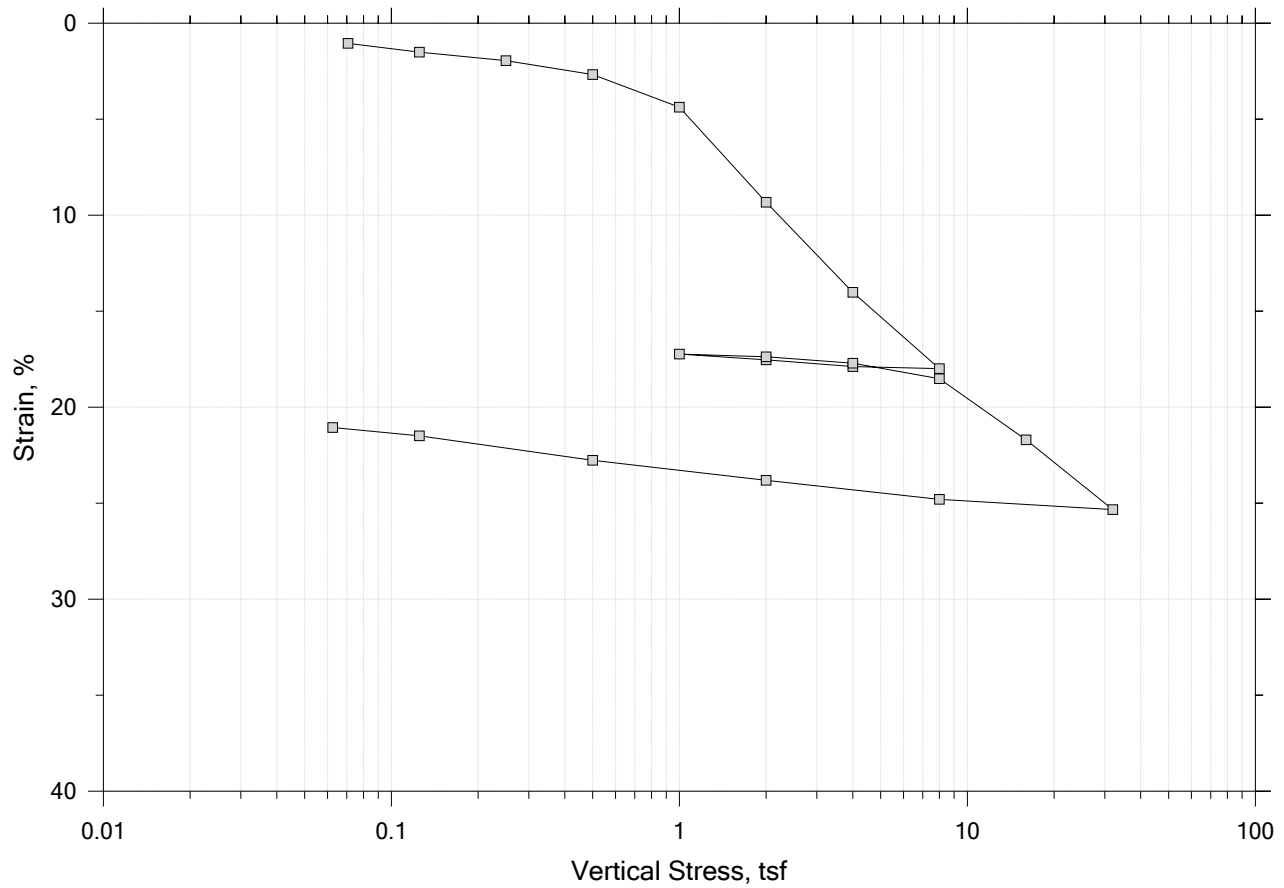
Square Root of Time Coefficients


[illegible]

	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-240	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 03/01/21	Depth: 10-12 ft
	Test No.: IP-13	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIIE, Swell Pressure = 0.0822 tsf		
	Displacement at End of Increment		

One-Dimensional Consolidation by ASTM D2435 - Method B

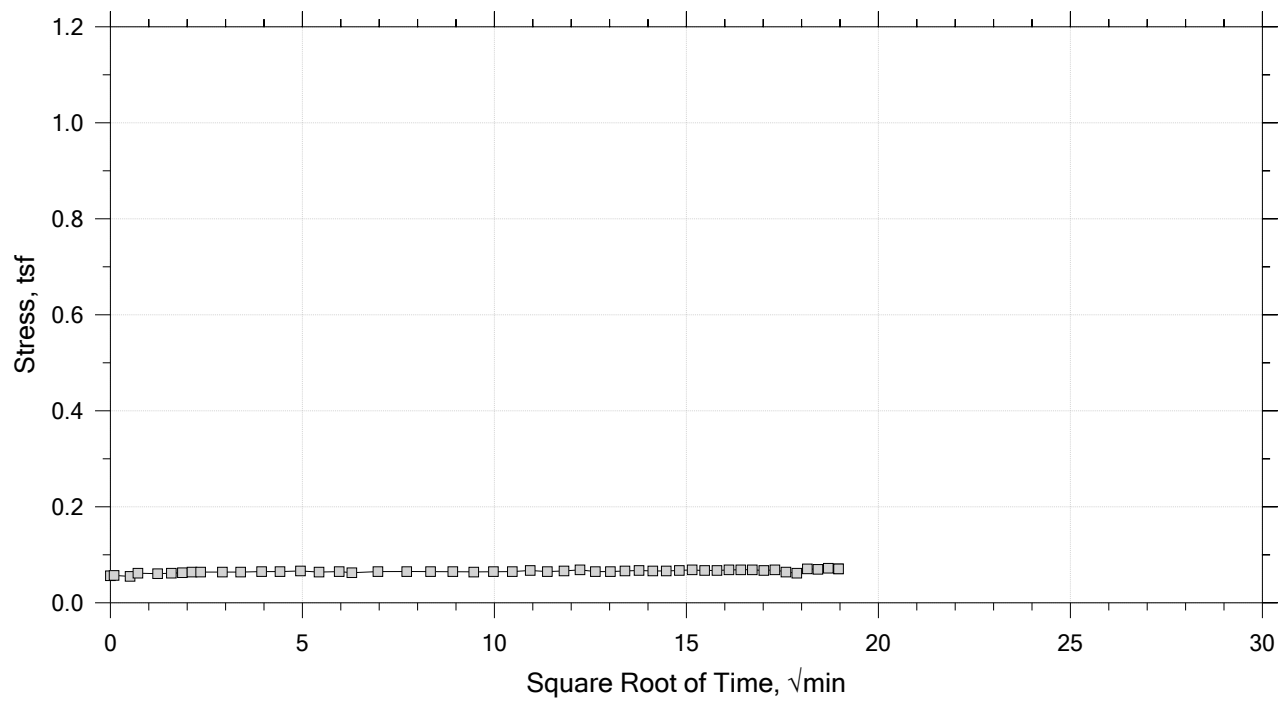
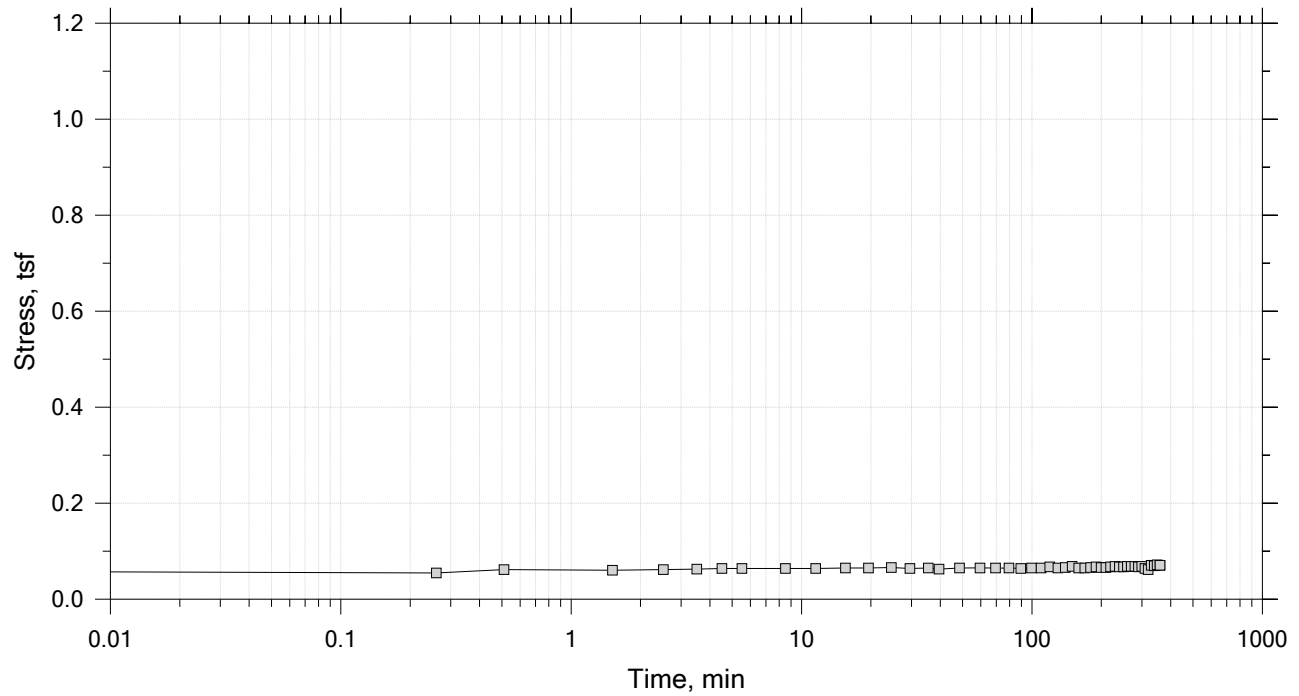
Summary Report




	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-240	Tested By: md	Checked By: mcm
	Sample No.: U2	Test Date: 03/01/21	Depth: 20-22 ft
	Test No.: IP-9	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-D, Swell Pressure = 0.0707 tsf		
	Displacement at End of Increment		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 1 of 21
Constant Volume Step
Stress: 0.0707 tsf



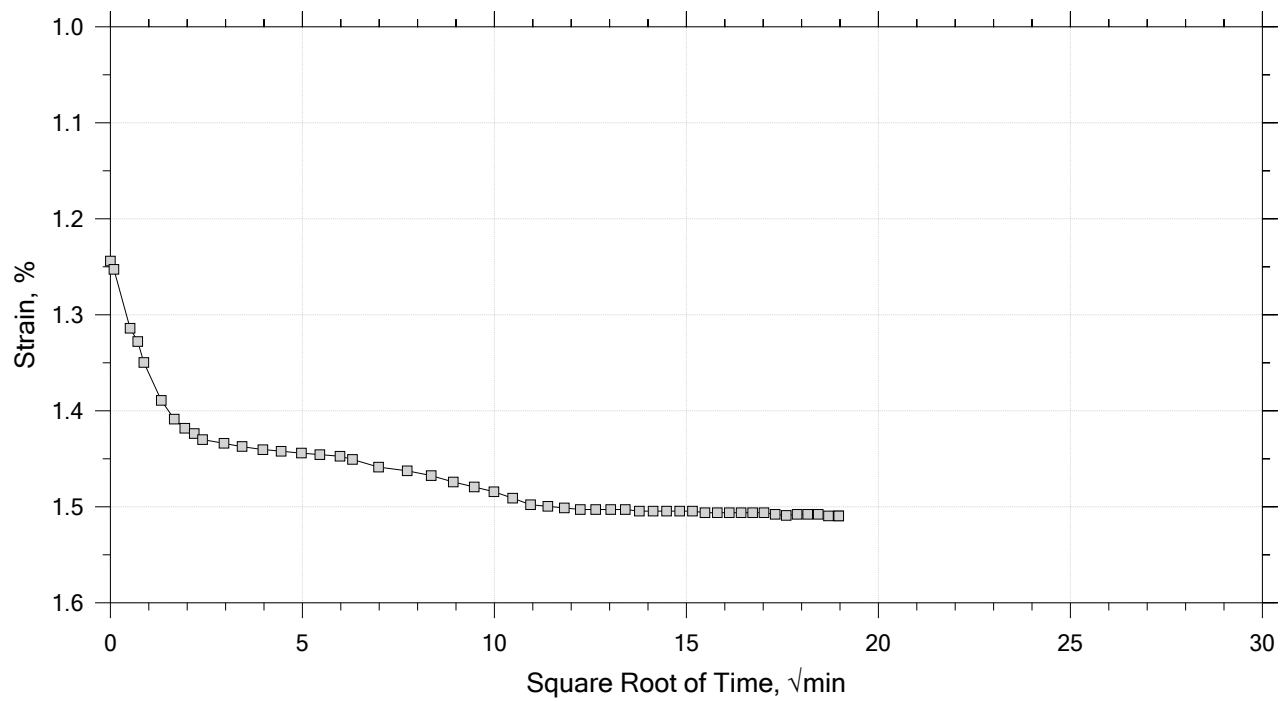
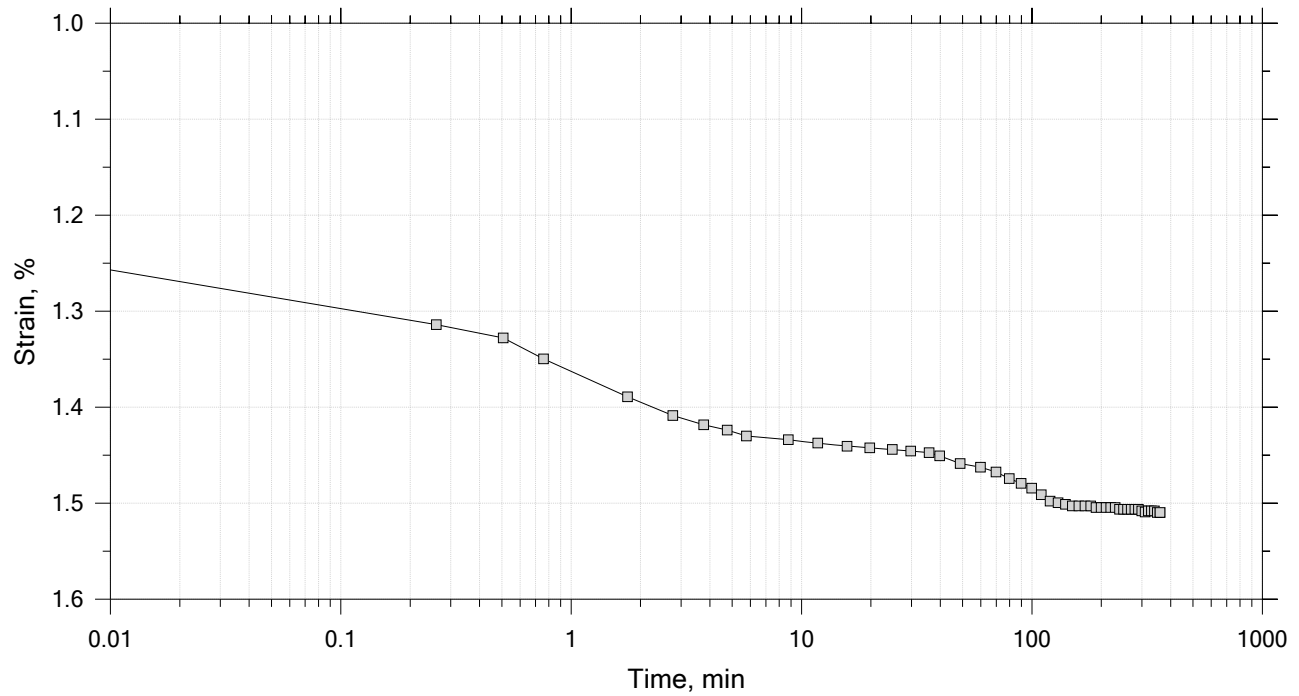
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-240	Tested By: md	Checked By: mcm
	Sample No.: U2	Test Date: 03/01/21	Depth: 20-22 ft
	Test No.: IP-9	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-D, Swell Pressure = 0.0707 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 2 of 21

Constant Load Step

Stress: 0.125 tsf



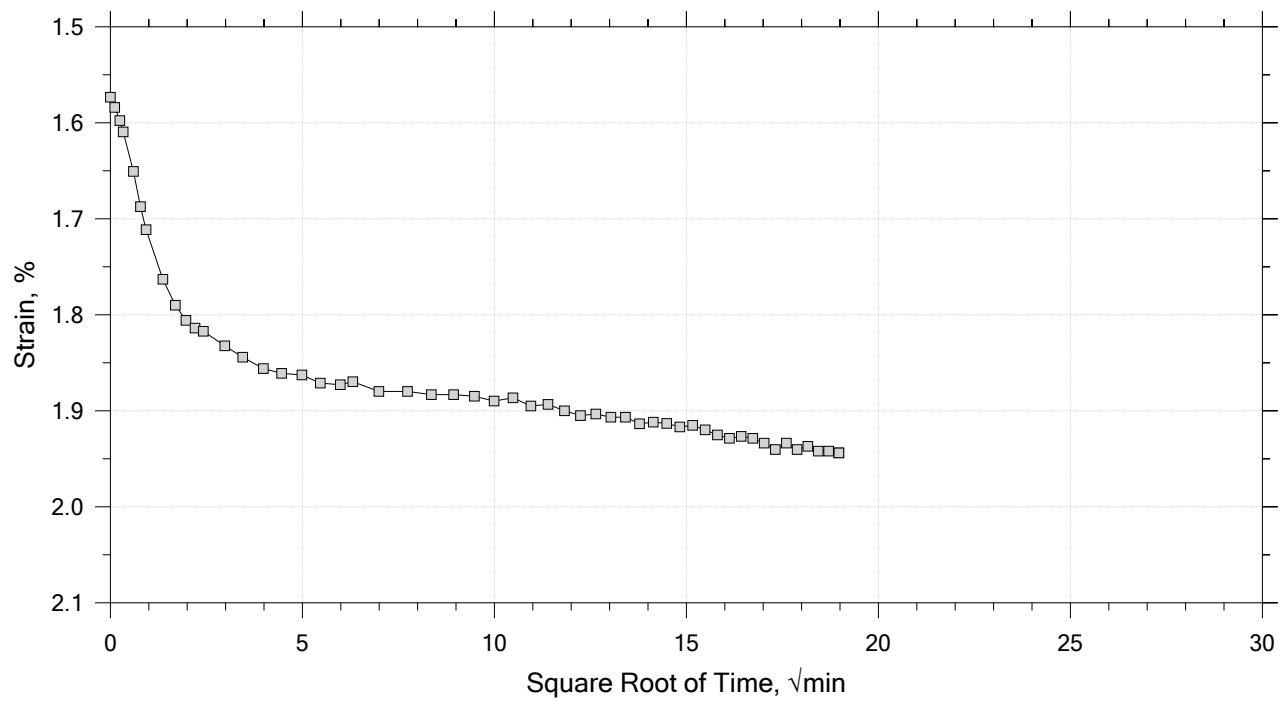
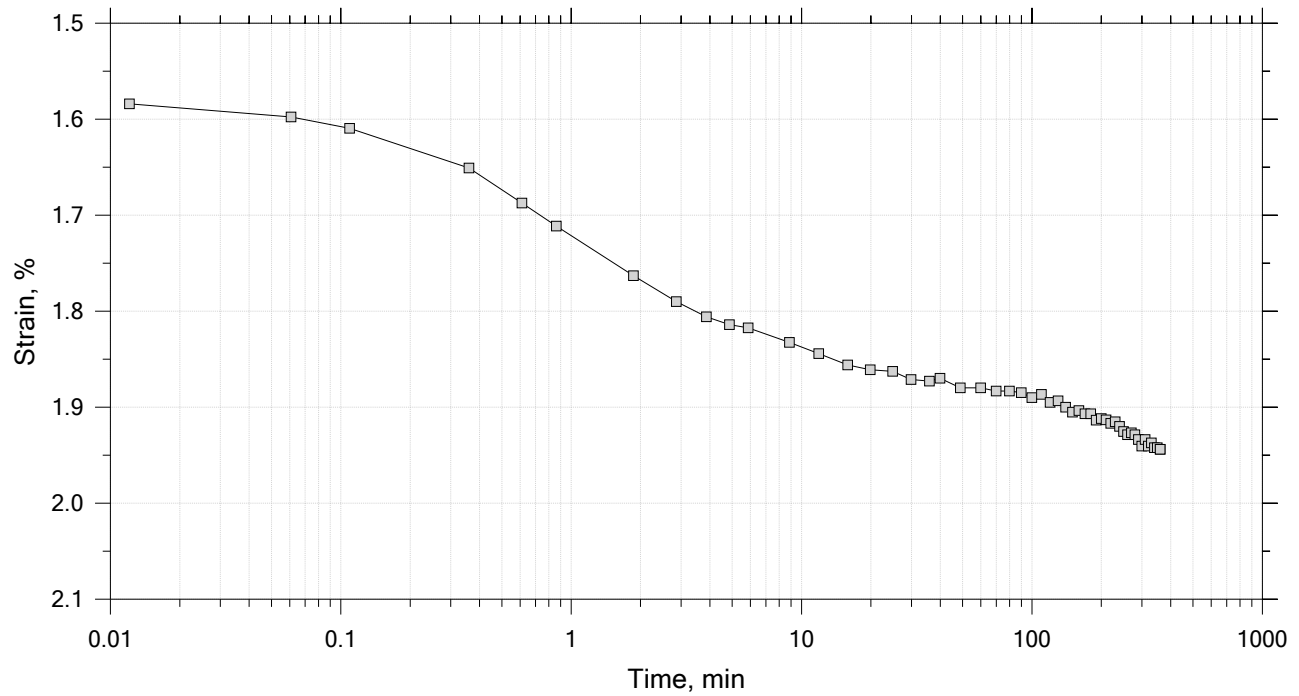
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-240	Tested By: md	Checked By: mcm
	Sample No.: U2	Test Date: 03/01/21	Depth: 20-22 ft
	Test No.: IP-9	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-D, Swell Pressure = 0.0707 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 3 of 21

Constant Load Step

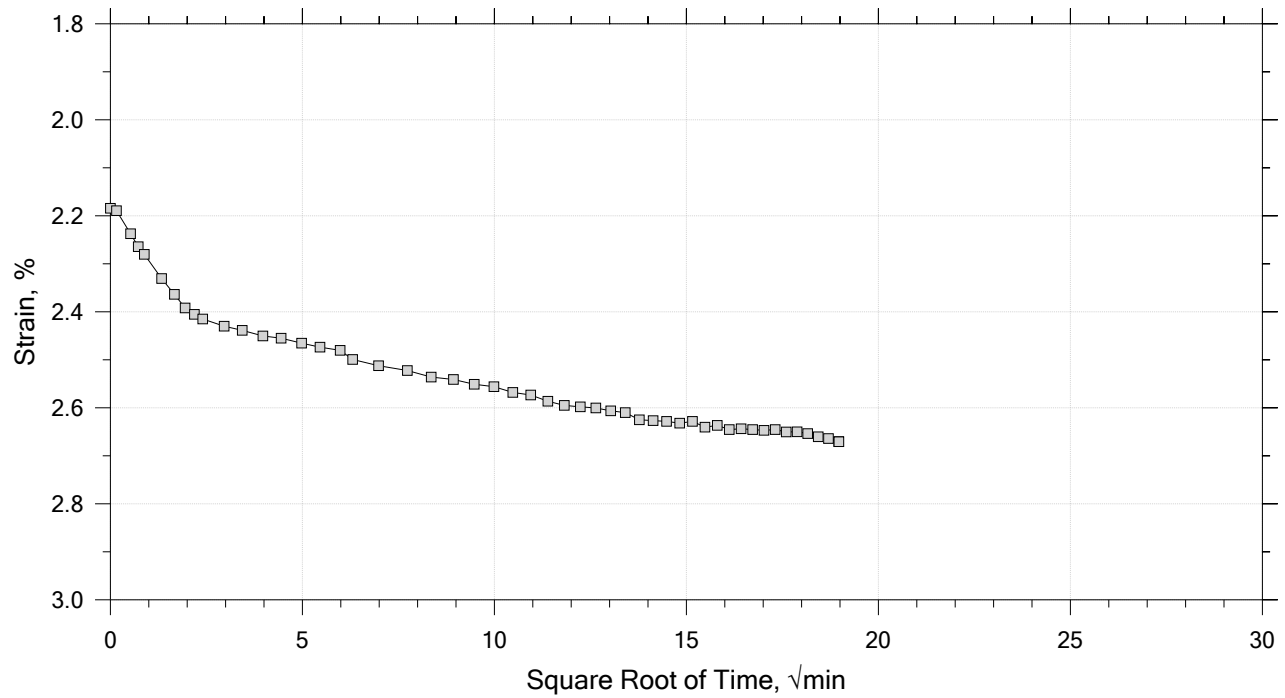
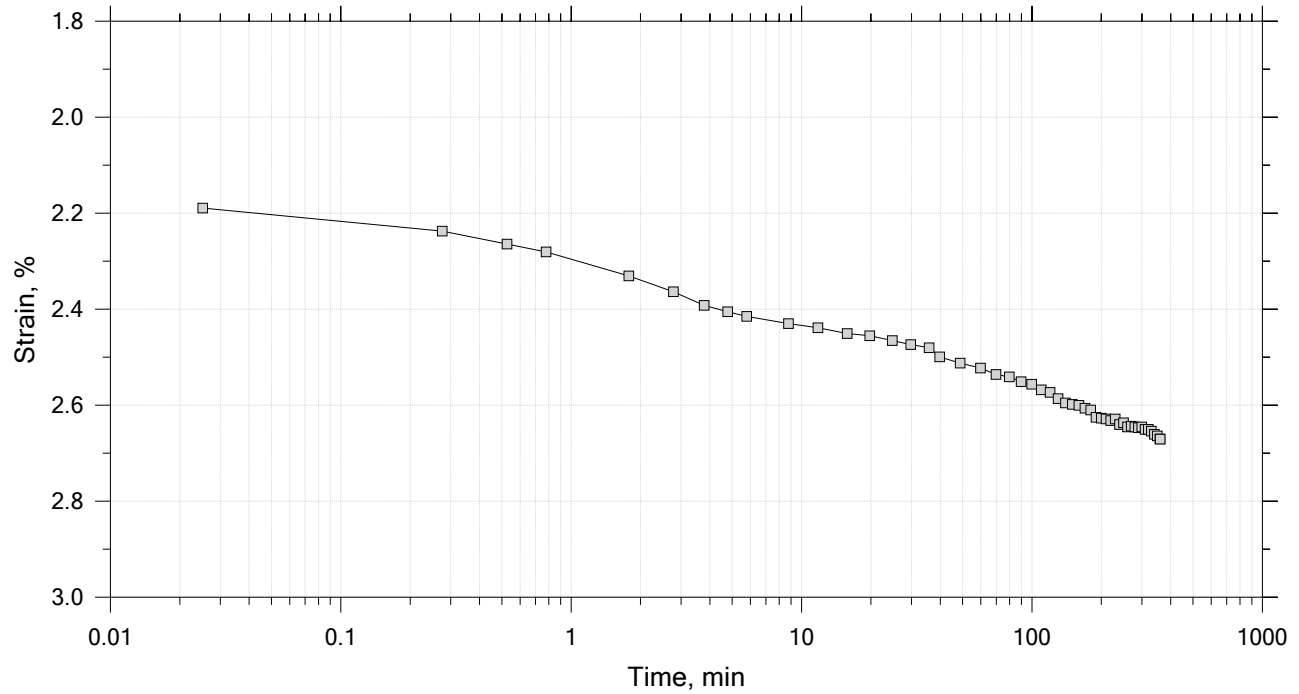
Stress: 0.25 tsf




	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-240	Tested By: md	Checked By: mcm
	Sample No.: U2	Test Date: 03/01/21	Depth: 20-22 ft
	Test No.: IP-9	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-D, Swell Pressure = 0.0707 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 4 of 21
Constant Load Step
Stress: 0.5 tsf



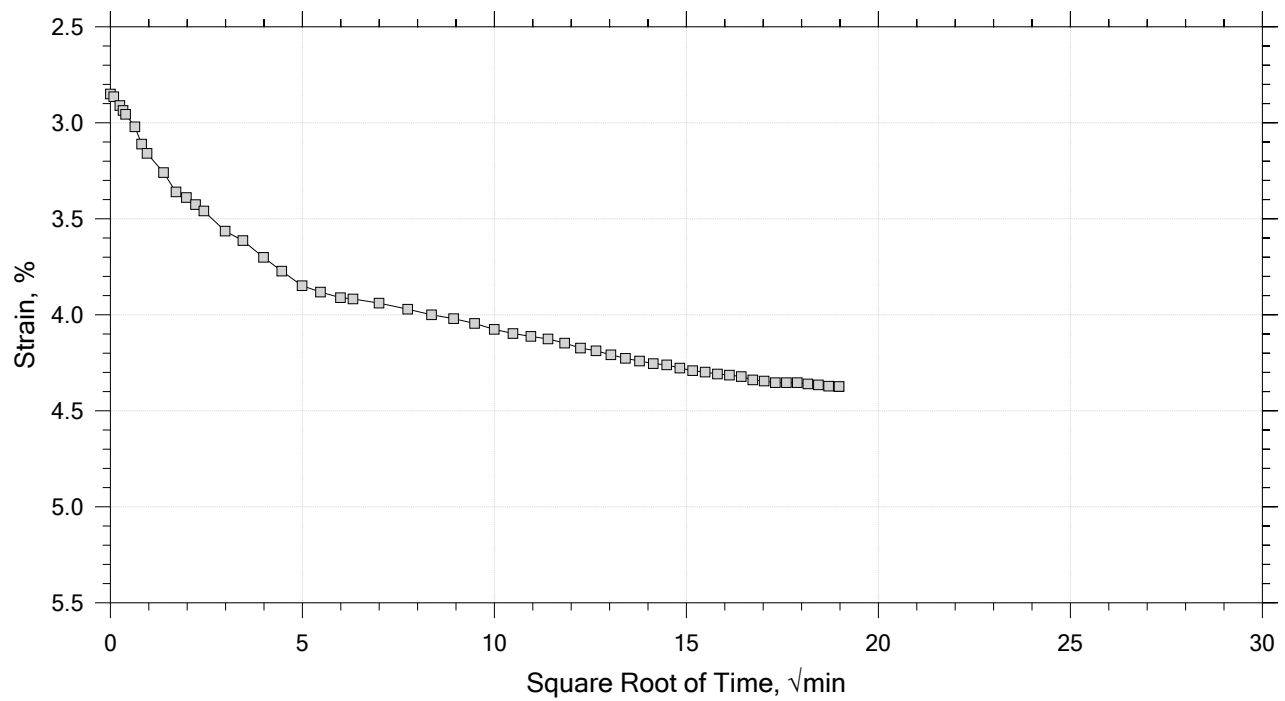
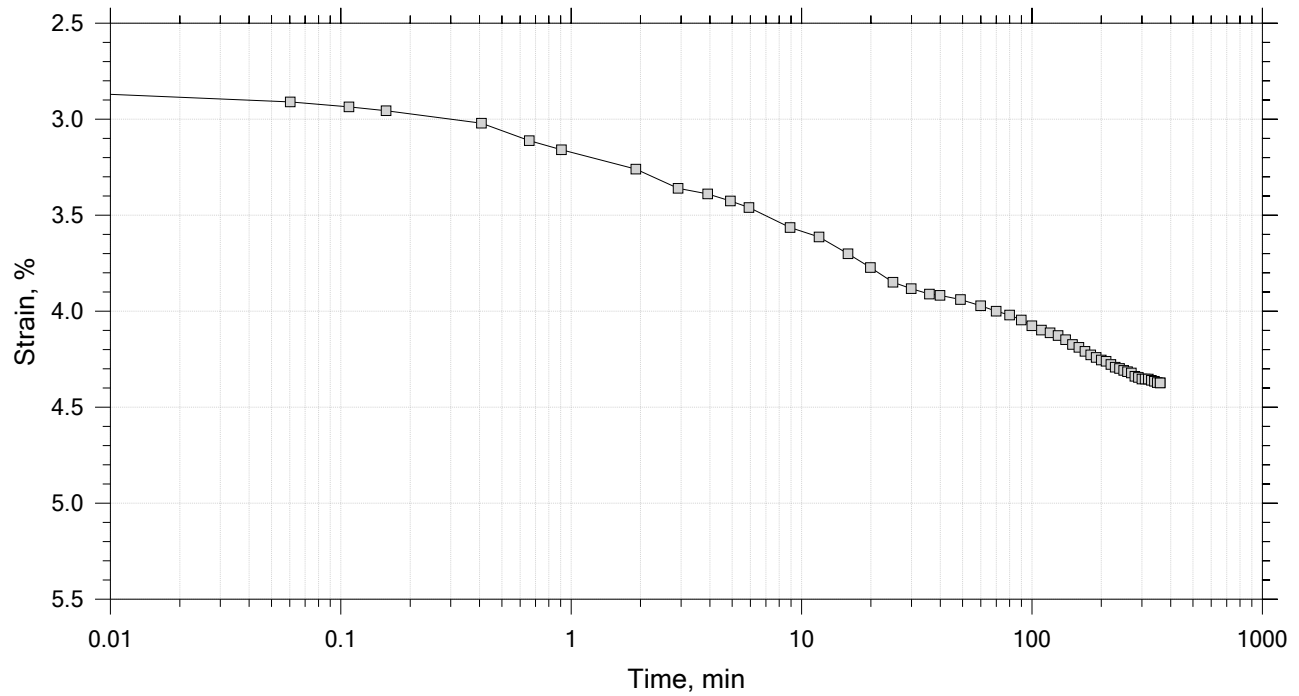
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-240	Tested By: md	Checked By: mcm
	Sample No.: U2	Test Date: 03/01/21	Depth: 20-22 ft
	Test No.: IP-9	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-D, Swell Pressure = 0.0707 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 5 of 21

Constant Load Step

Stress: 1 tsf



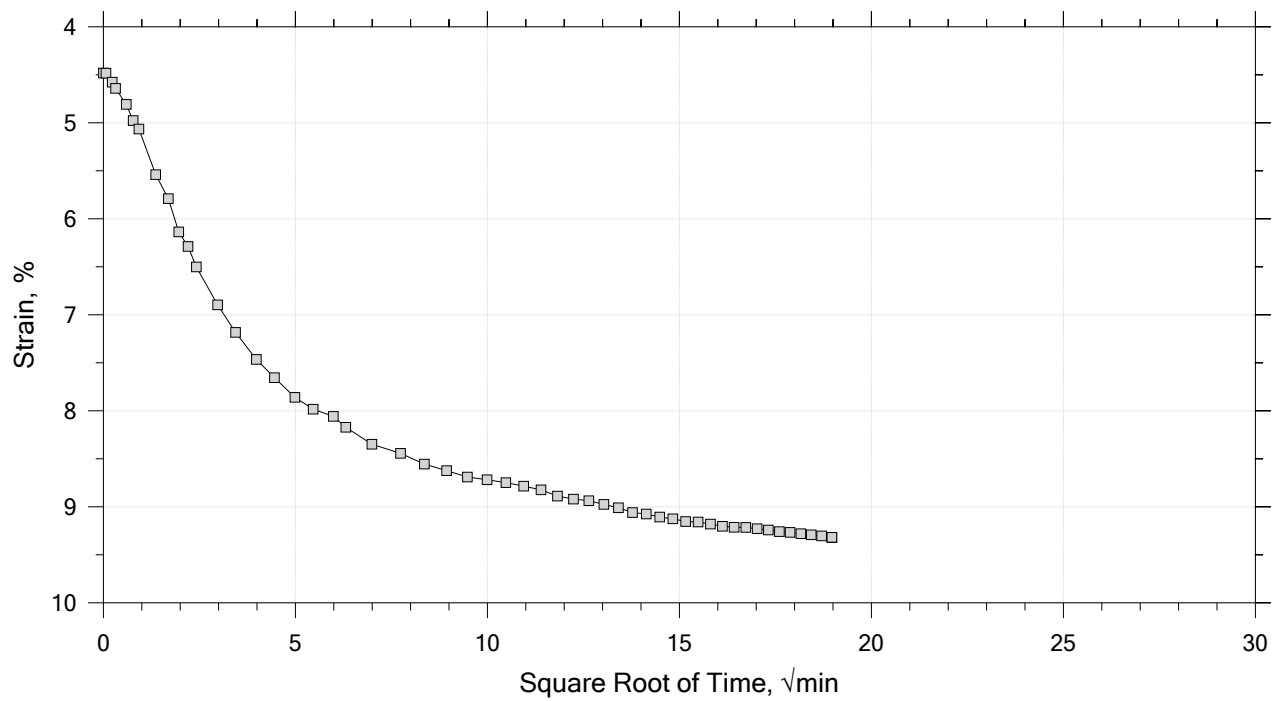
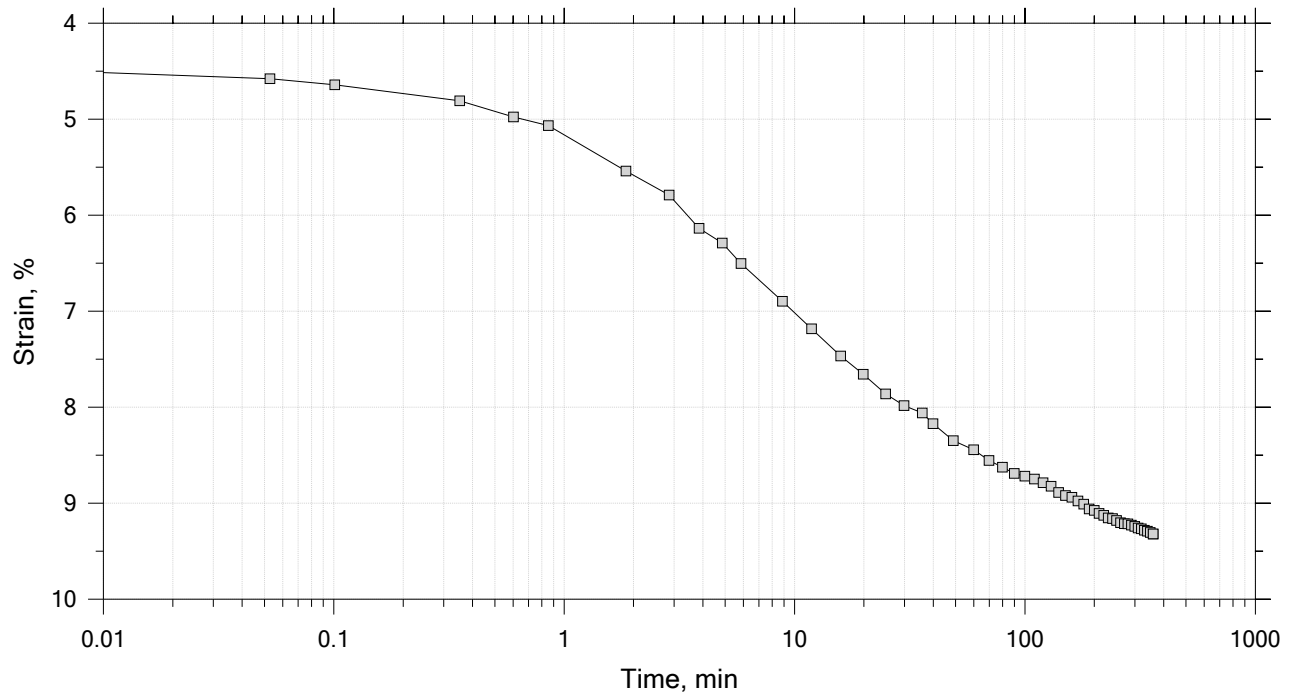
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-240	Tested By: md	Checked By: mcm
	Sample No.: U2	Test Date: 03/01/21	Depth: 20-22 ft
	Test No.: IP-9	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-D, Swell Pressure = 0.0707 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 6 of 21

Constant Load Step

Stress: 2 tsf



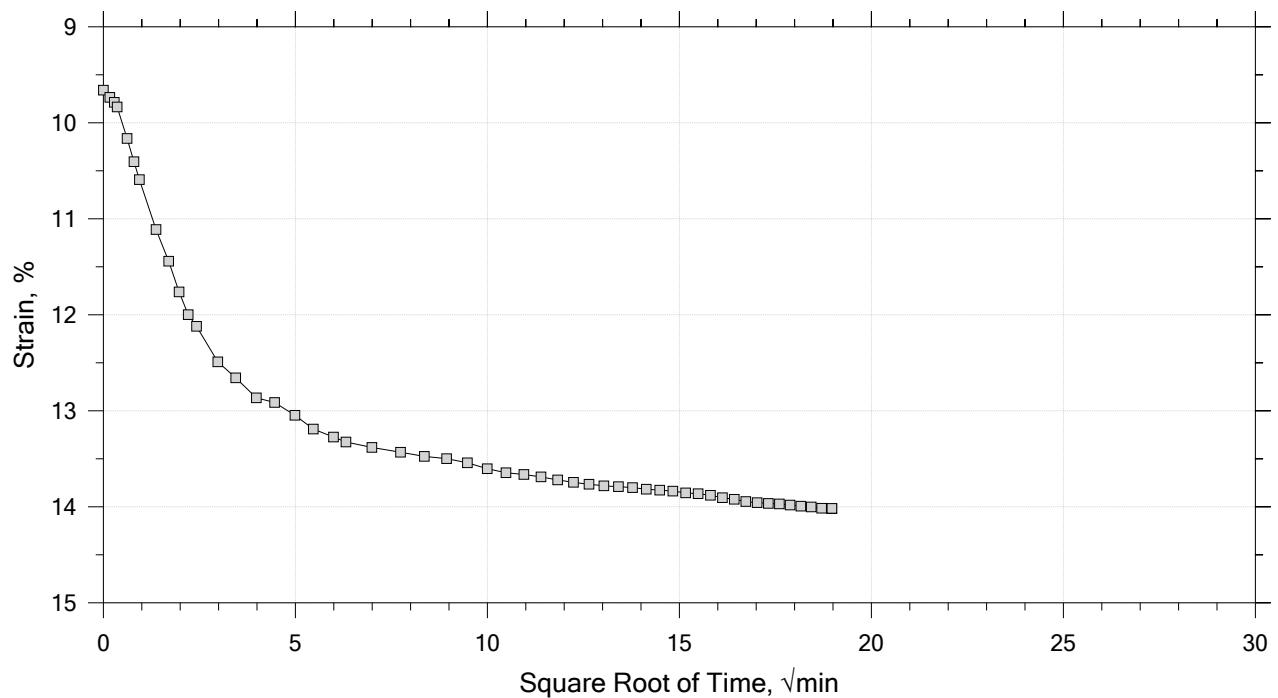
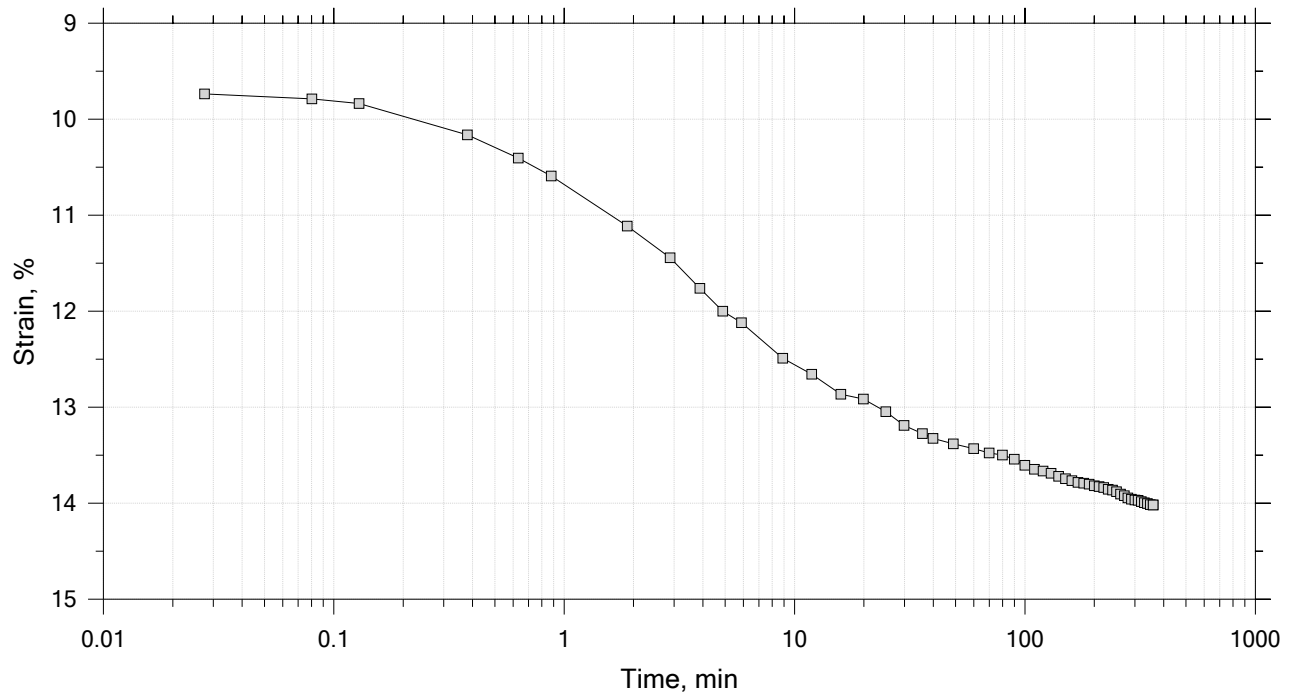
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-240	Tested By: md	Checked By: mcm
	Sample No.: U2	Test Date: 03/01/21	Depth: 20-22 ft
	Test No.: IP-9	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-D, Swell Pressure = 0.0707 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 7 of 21

Constant Load Step

Stress: 4 tsf



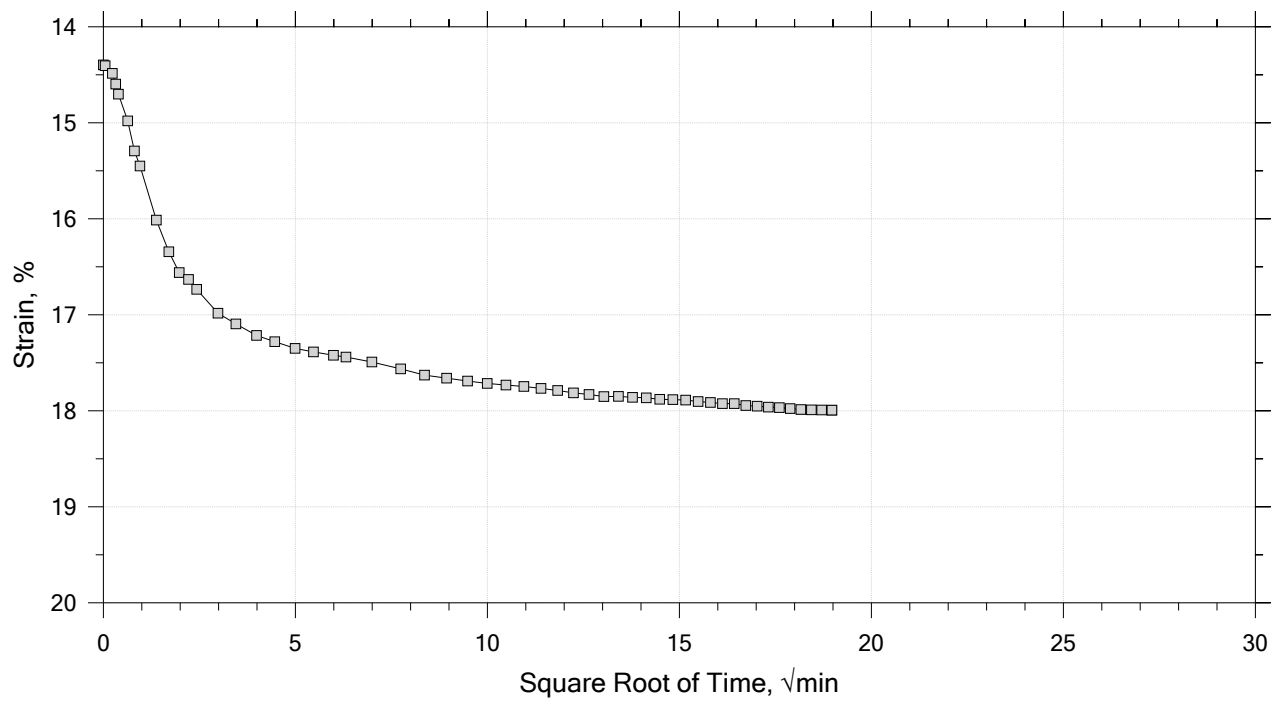
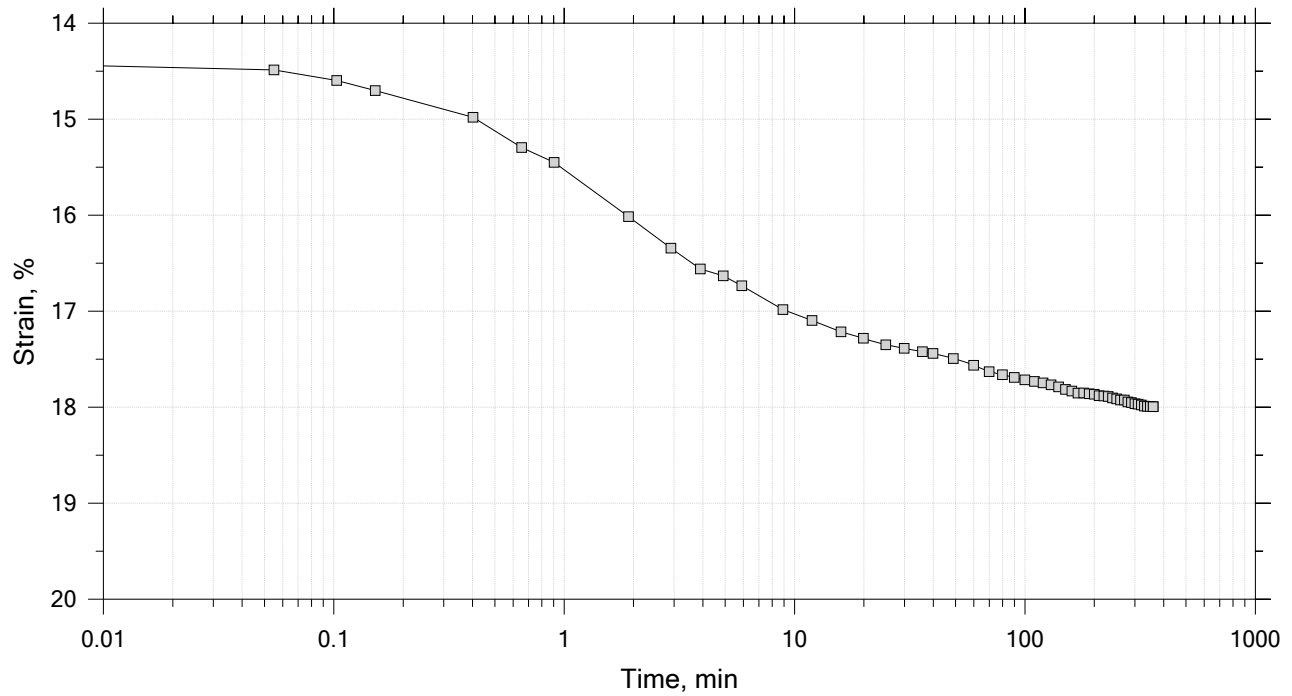
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-240	Tested By: md	Checked By: mcm
	Sample No.: U2	Test Date: 03/01/21	Depth: 20-22 ft
	Test No.: IP-9	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-D, Swell Pressure = 0.0707 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 8 of 21

Constant Load Step

Stress: 8 tsf



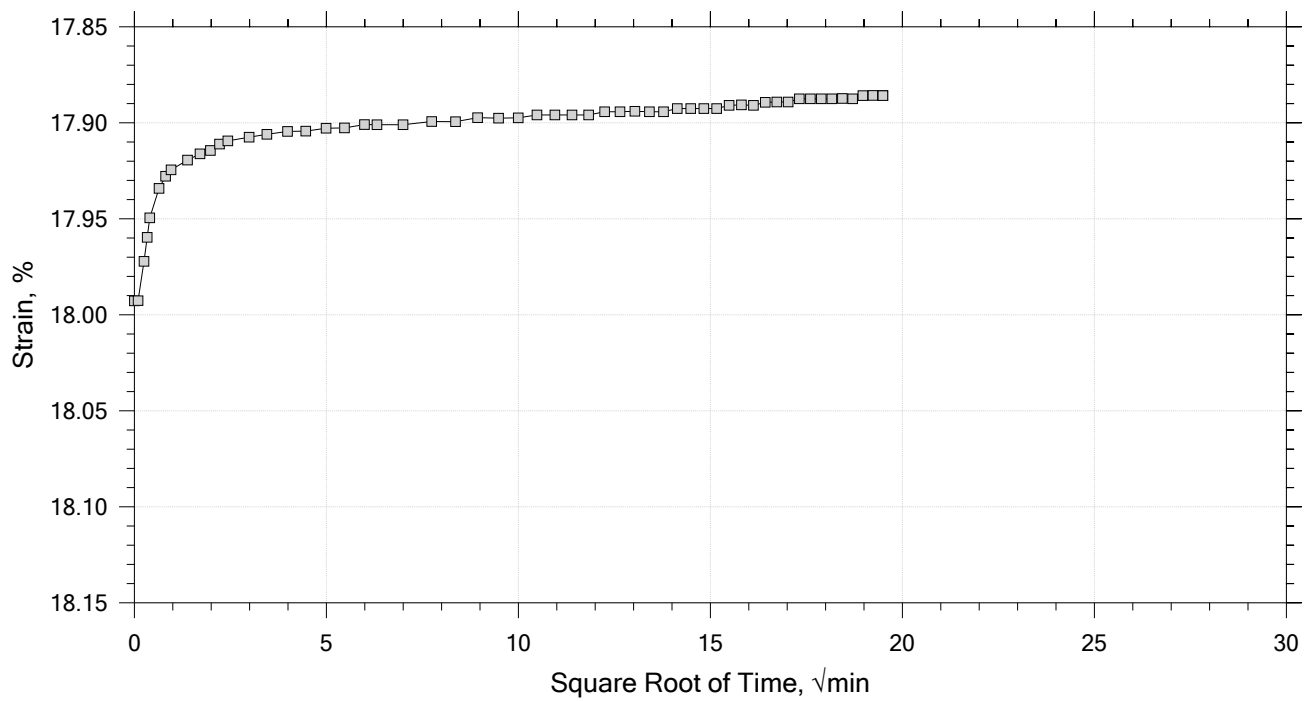
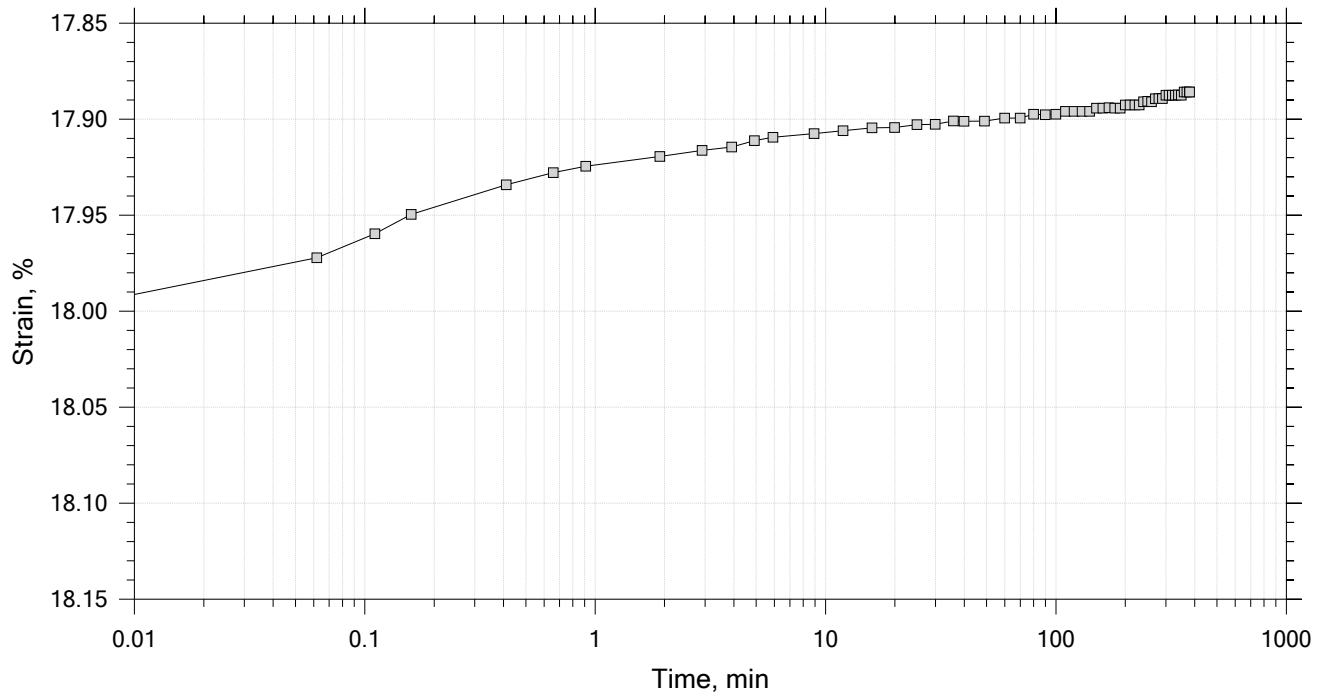
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-240	Tested By: md	Checked By: mcm
	Sample No.: U2	Test Date: 03/01/21	Depth: 20-22 ft
	Test No.: IP-9	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-D, Swell Pressure = 0.0707 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 9 of 21

Constant Load Step

Stress: 4 tsf



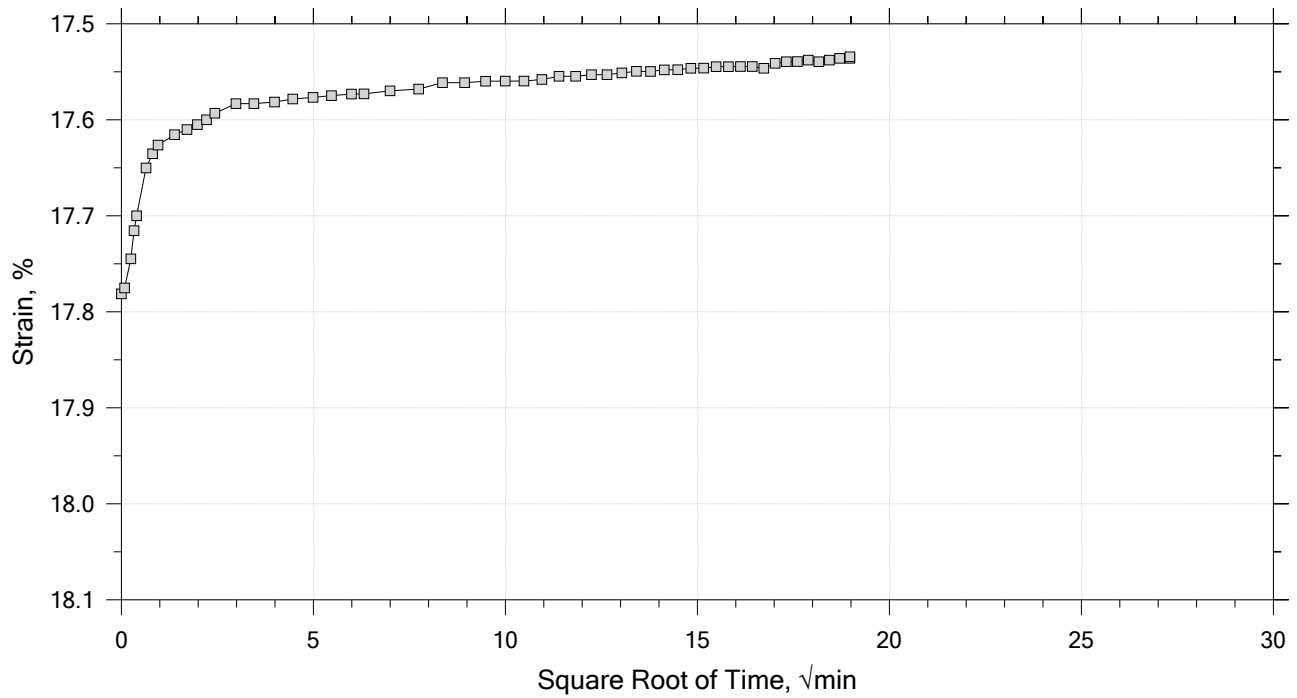
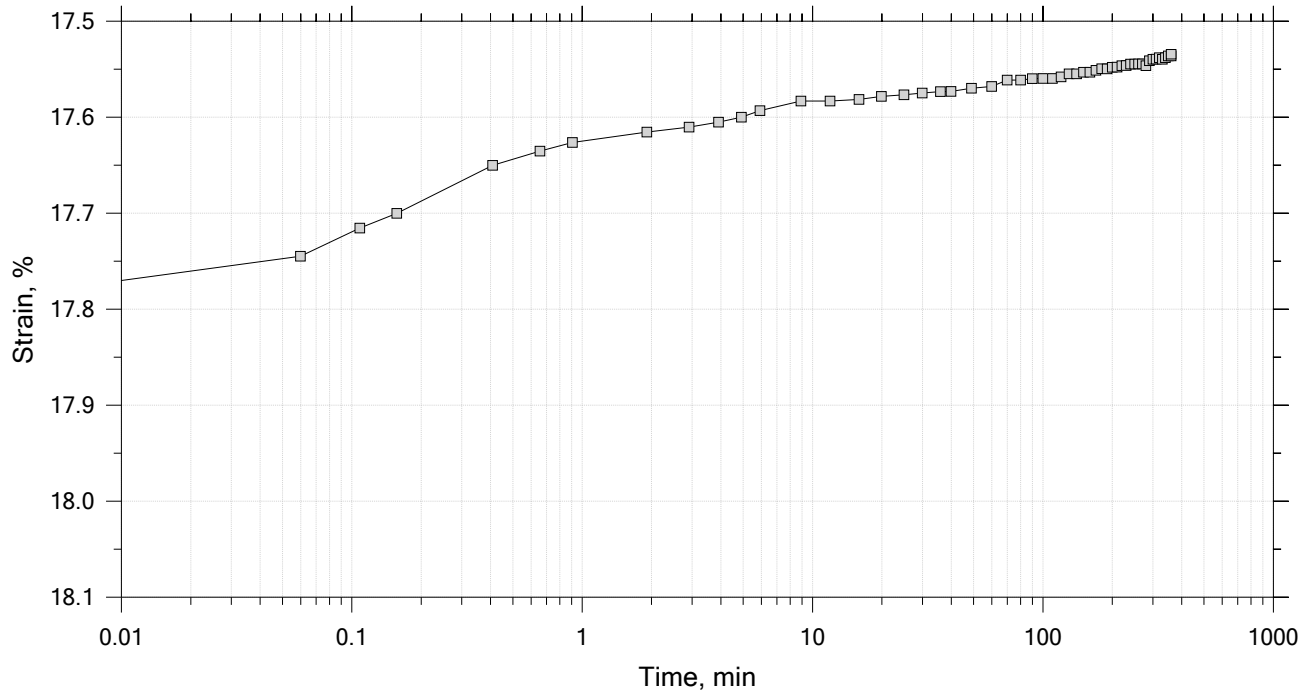
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-240	Tested By: md	Checked By: mcm
	Sample No.: U2	Test Date: 03/01/21	Depth: 20-22 ft
	Test No.: IP-9	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-D, Swell Pressure = 0.0707 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 10 of 21

Constant Load Step

Stress: 2 tsf



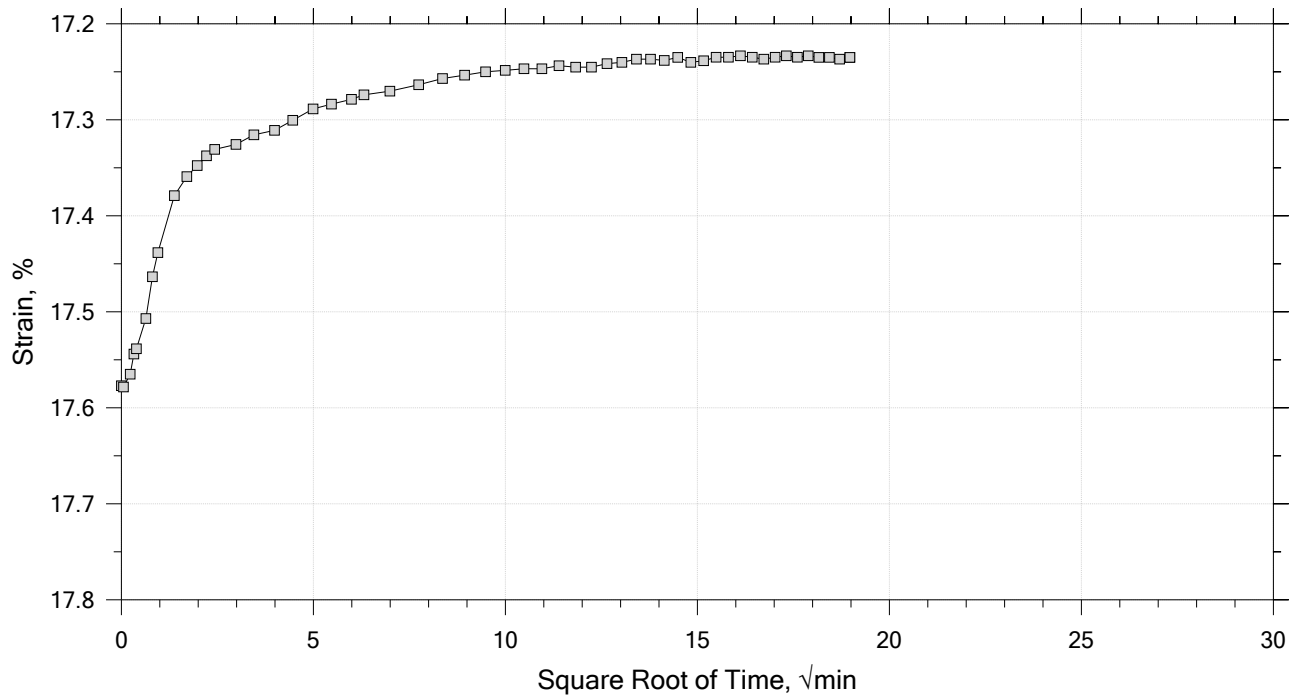
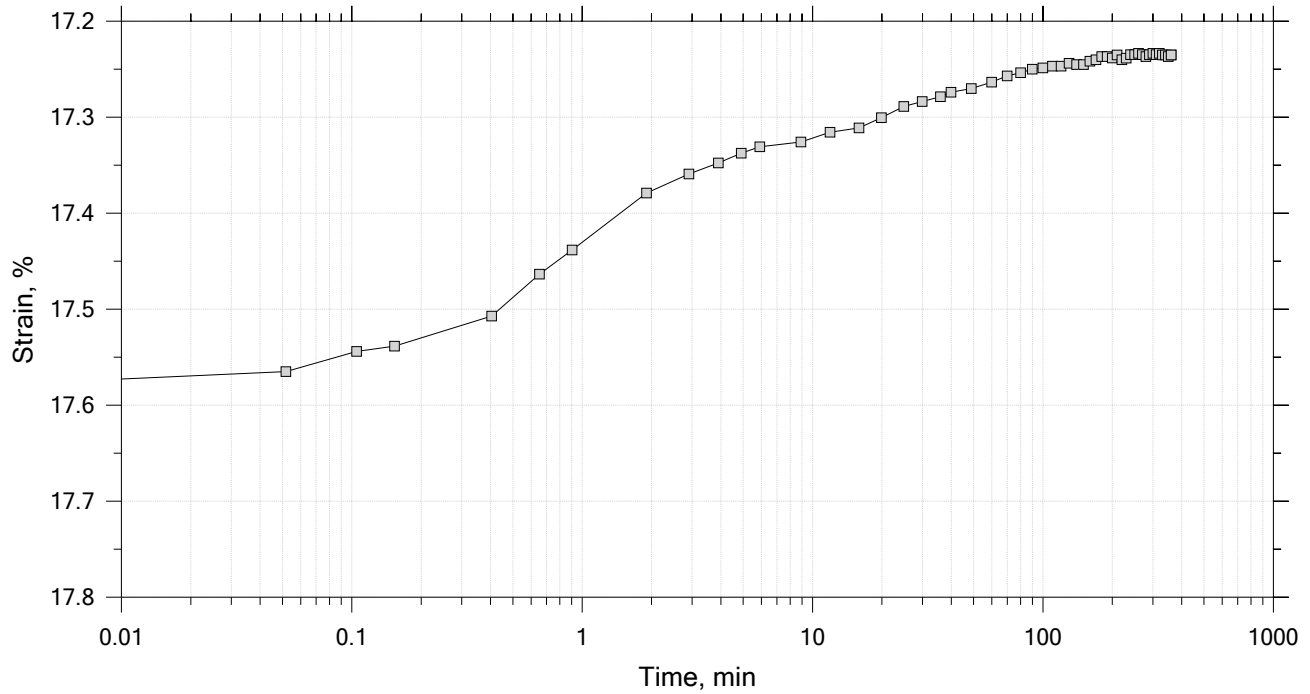
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-240	Tested By: md	Checked By: mcm
	Sample No.: U2	Test Date: 03/01/21	Depth: 20-22 ft
	Test No.: IP-9	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-D, Swell Pressure = 0.0707 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 11 of 21

Constant Load Step

Stress: 1 tsf



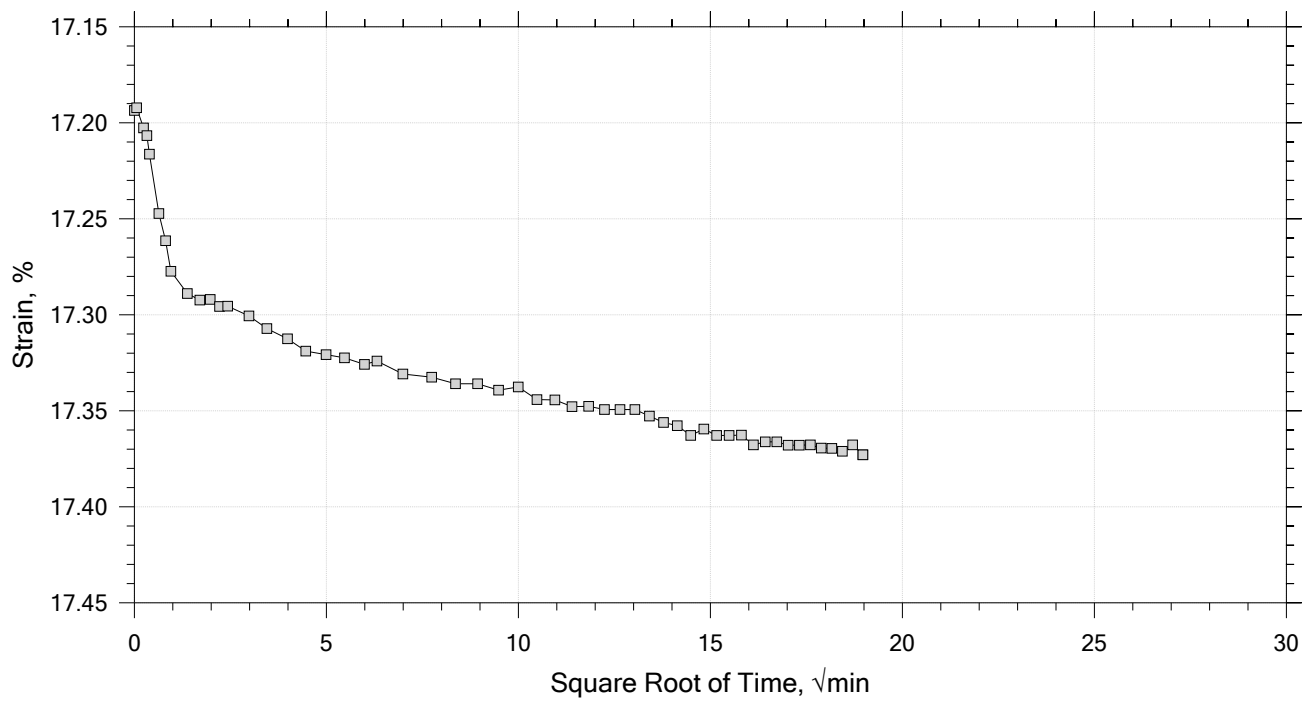
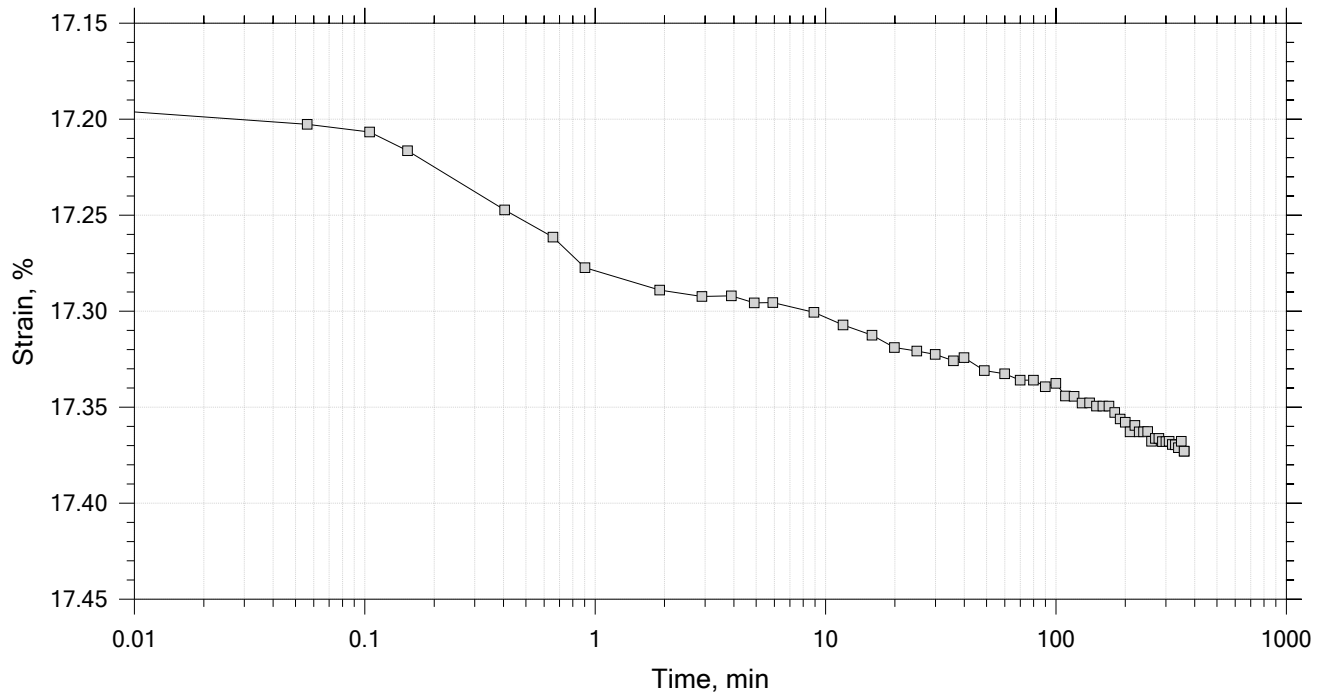
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-240	Tested By: md	Checked By: mcm
	Sample No.: U2	Test Date: 03/01/21	Depth: 20-22 ft
	Test No.: IP-9	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-D, Swell Pressure = 0.0707 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 12 of 21

Constant Load Step

Stress: 2 tsf



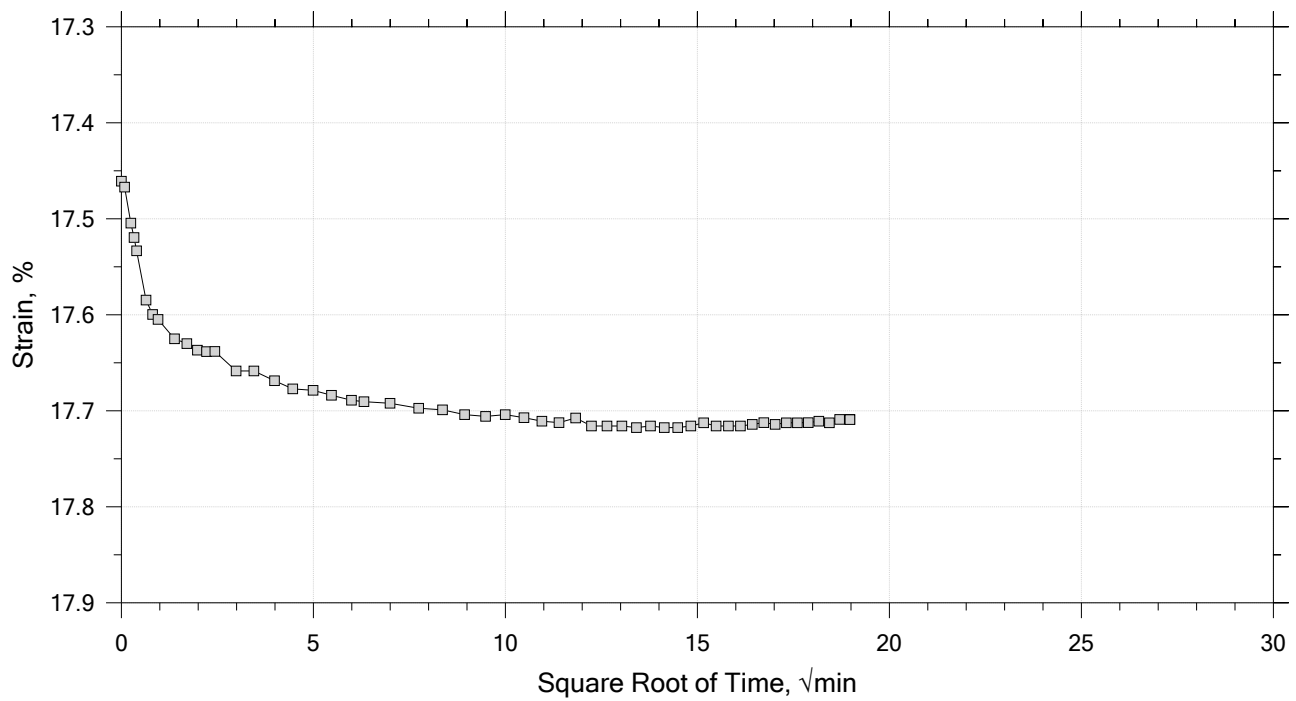
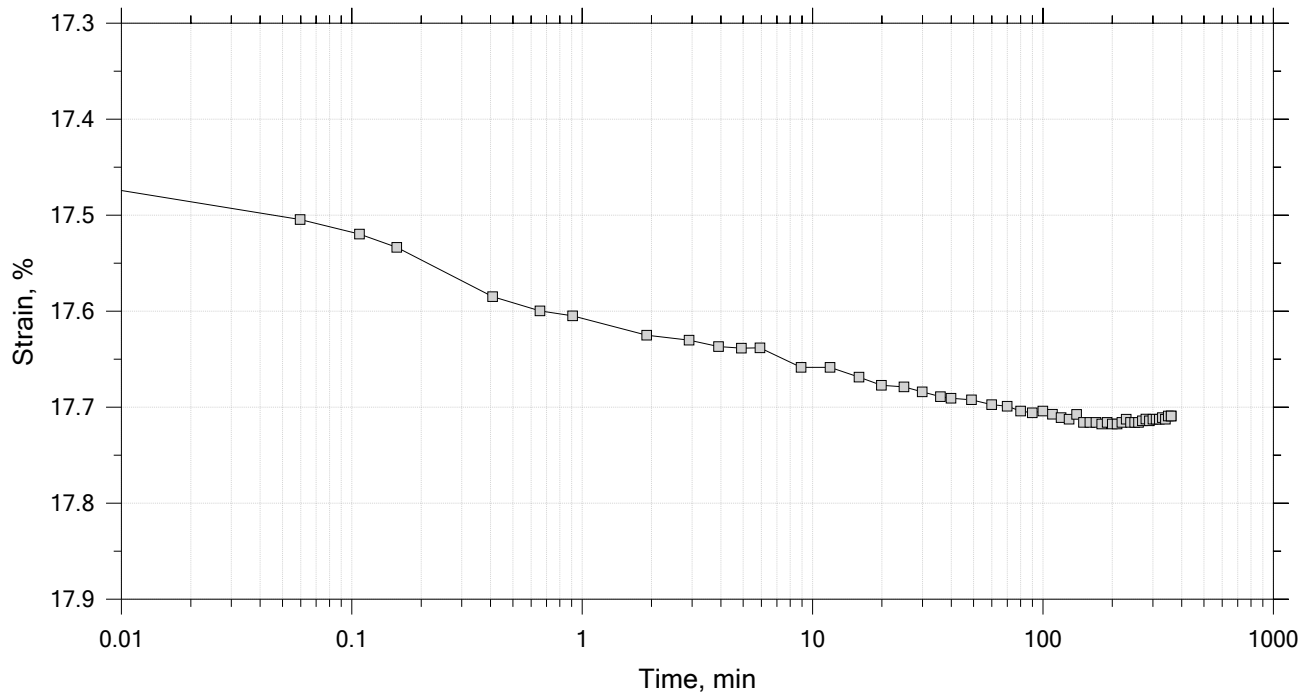
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-240	Tested By: md	Checked By: mcm
	Sample No.: U2	Test Date: 03/01/21	Depth: 20-22 ft
	Test No.: IP-9	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-D, Swell Pressure = 0.0707 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 13 of 21

Constant Load Step

Stress: 4 tsf



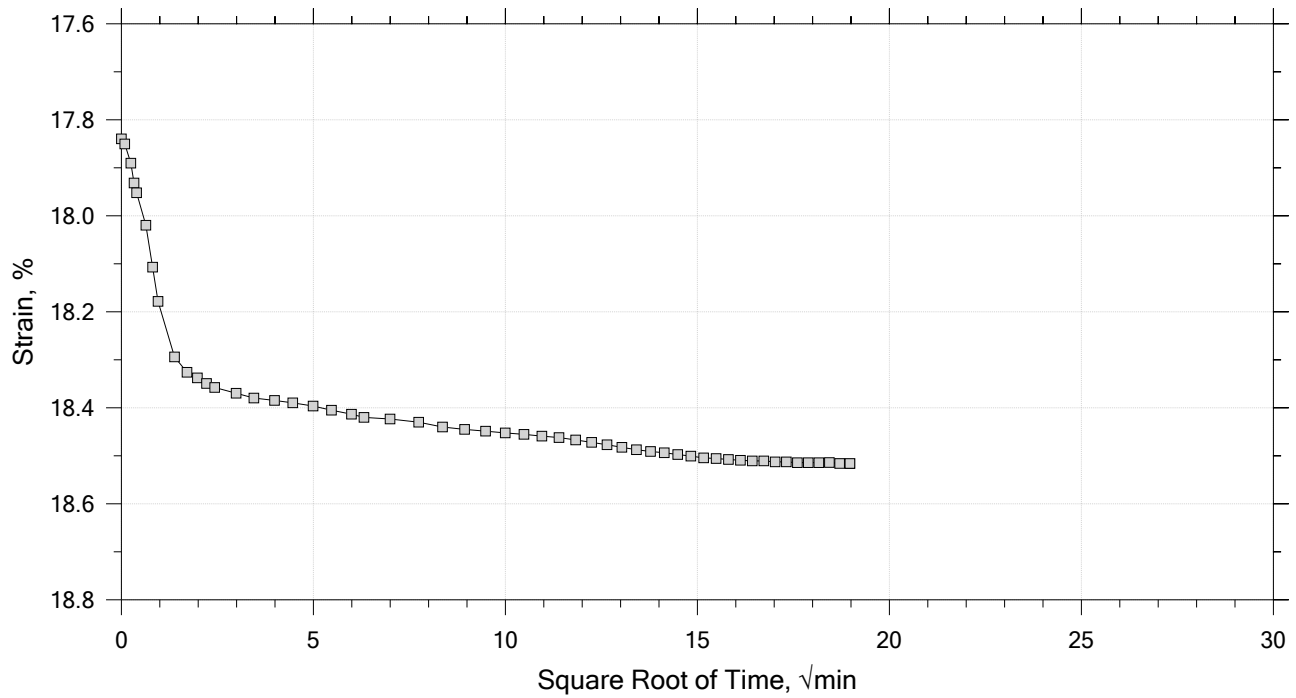
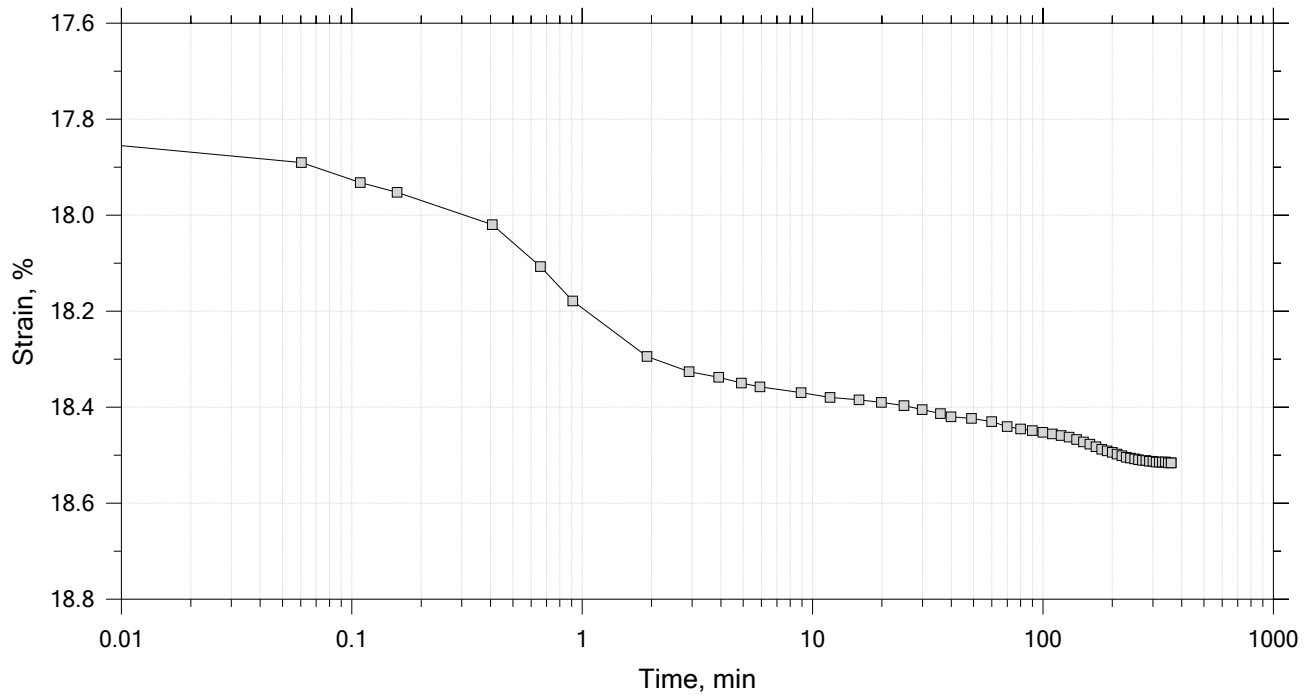
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-240	Tested By: md	Checked By: mcm
	Sample No.: U2	Test Date: 03/01/21	Depth: 20-22 ft
	Test No.: IP-9	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-D, Swell Pressure = 0.0707 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 14 of 21

Constant Load Step

Stress: 8 tsf



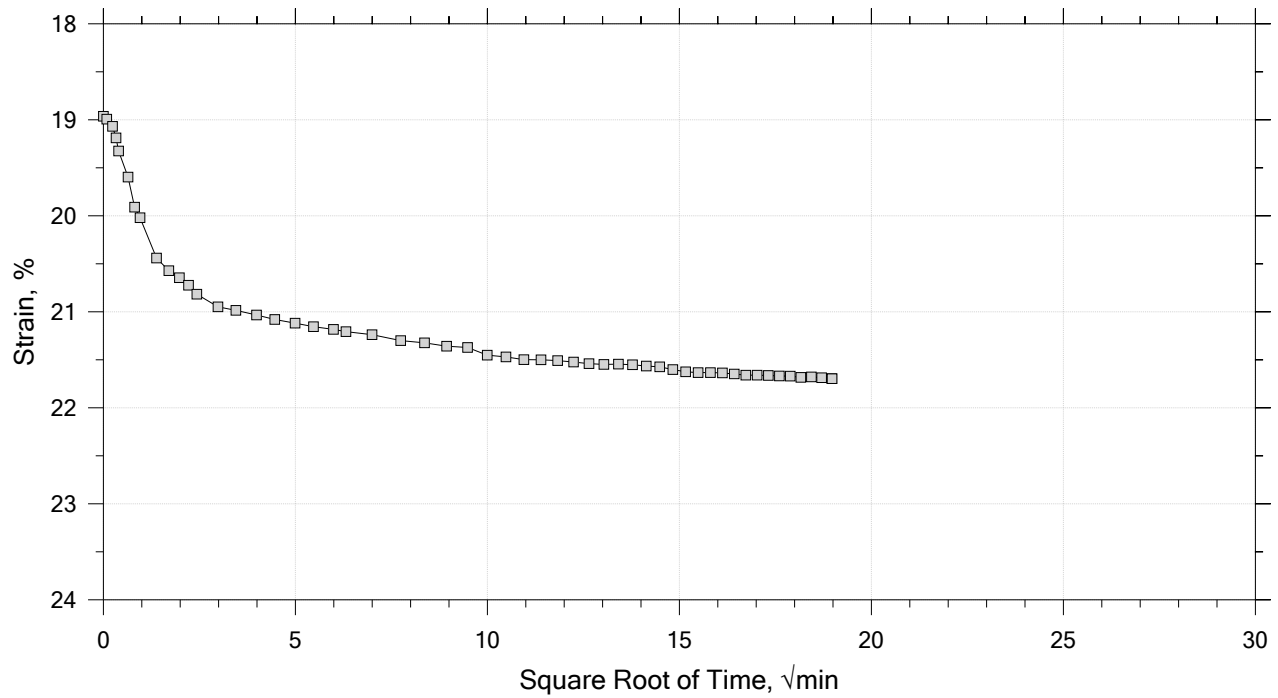
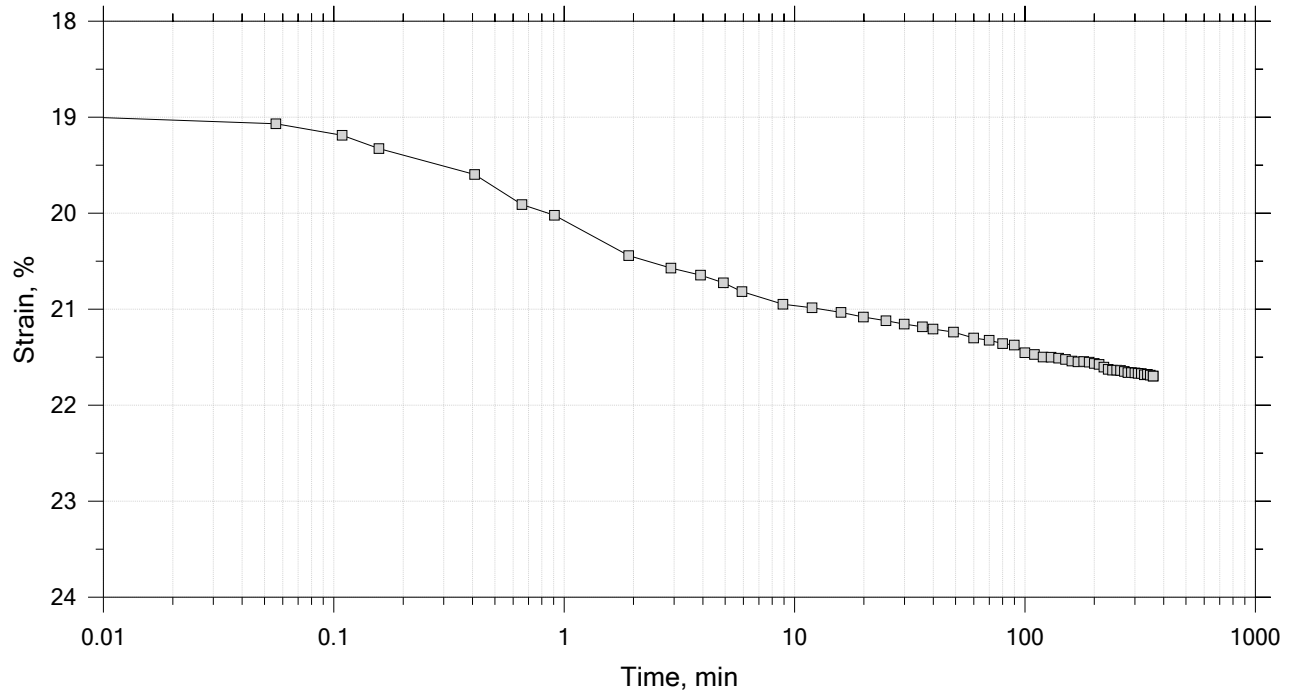
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-240	Tested By: md	Checked By: mcm
	Sample No.: U2	Test Date: 03/01/21	Depth: 20-22 ft
	Test No.: IP-9	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-D, Swell Pressure = 0.0707 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 15 of 21

Constant Load Step

Stress: 16 tsf



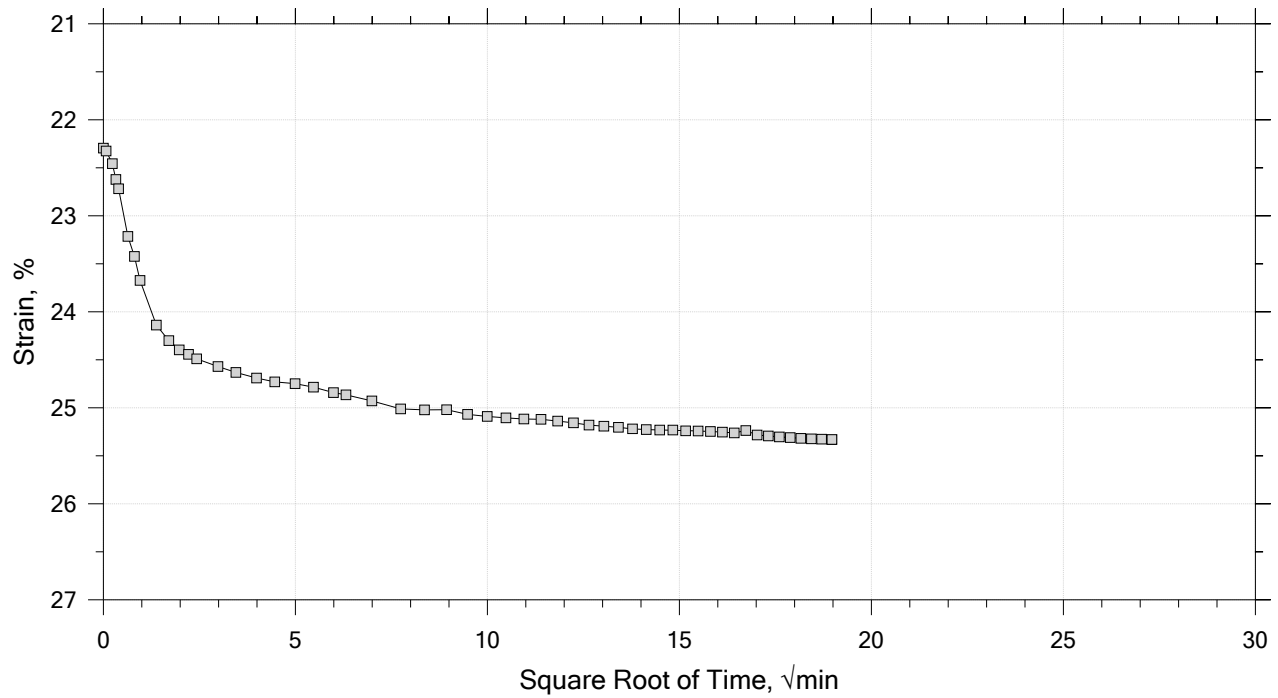
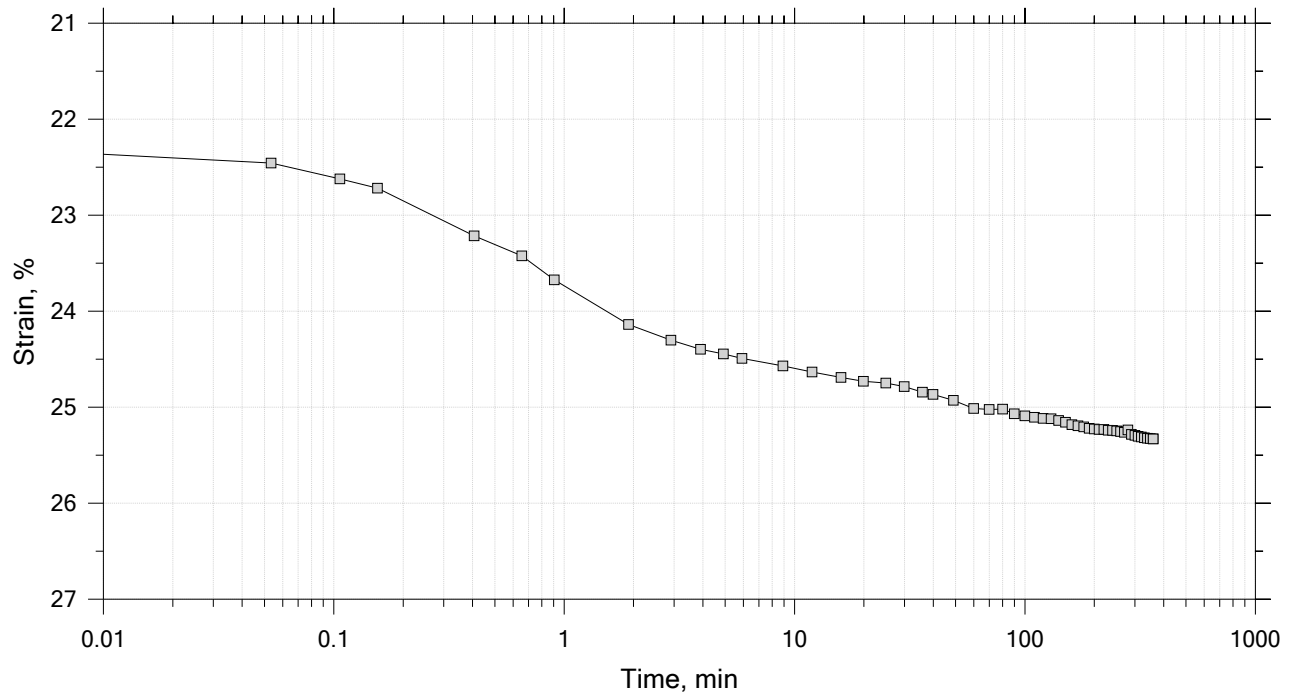
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-240	Tested By: md	Checked By: mcm
	Sample No.: U2	Test Date: 03/01/21	Depth: 20-22 ft
	Test No.: IP-9	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-D, Swell Pressure = 0.0707 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 16 of 21

Constant Load Step

Stress: 32 tsf



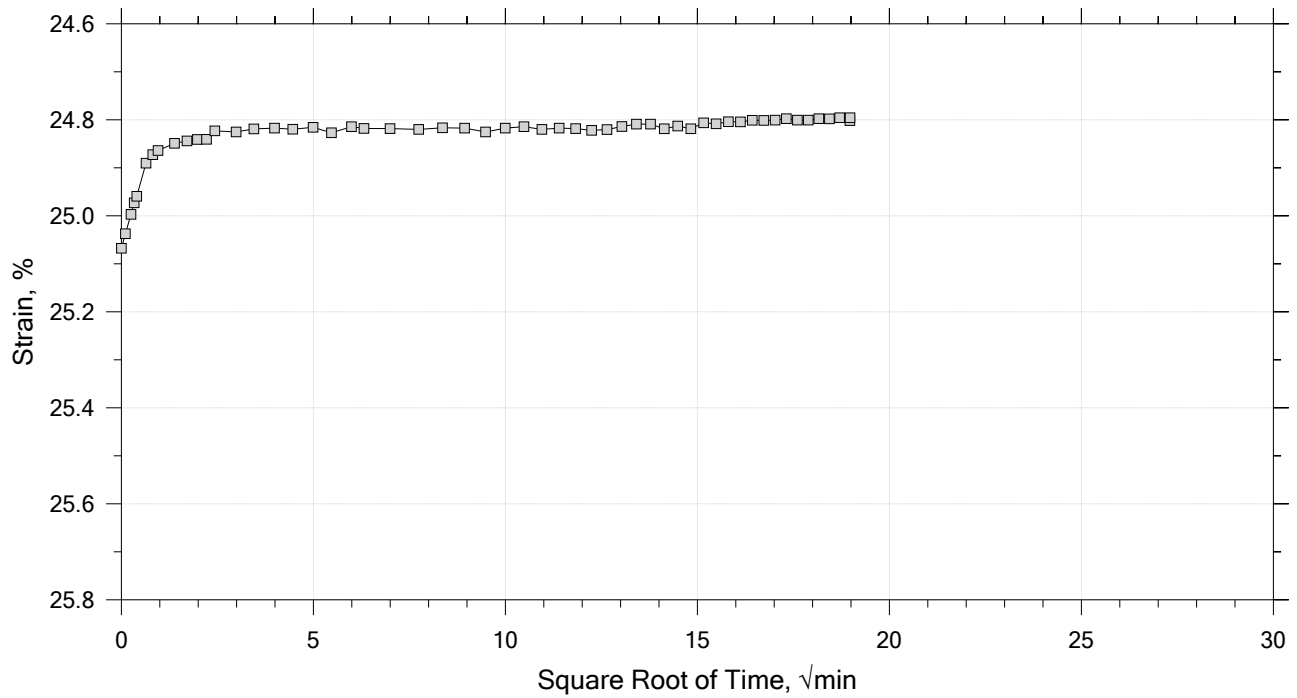
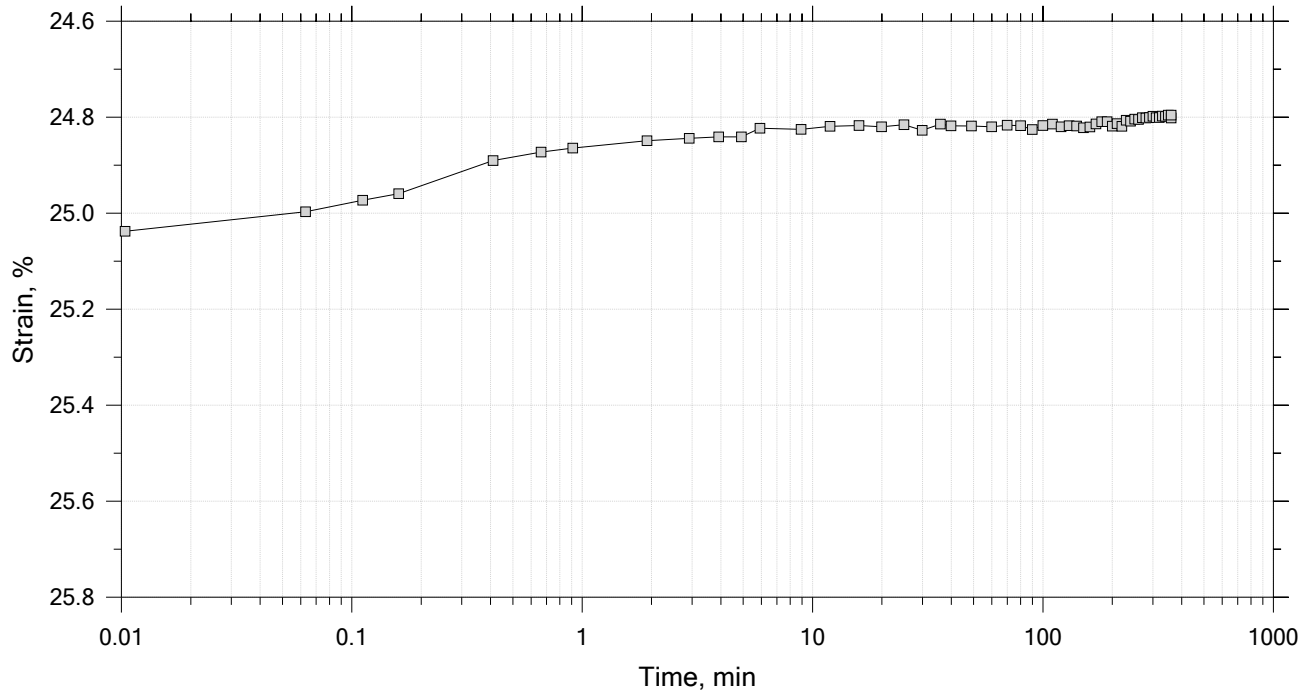
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-240	Tested By: md	Checked By: mcm
	Sample No.: U2	Test Date: 03/01/21	Depth: 20-22 ft
	Test No.: IP-9	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-D, Swell Pressure = 0.0707 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 17 of 21

Constant Load Step

Stress: 8 tsf



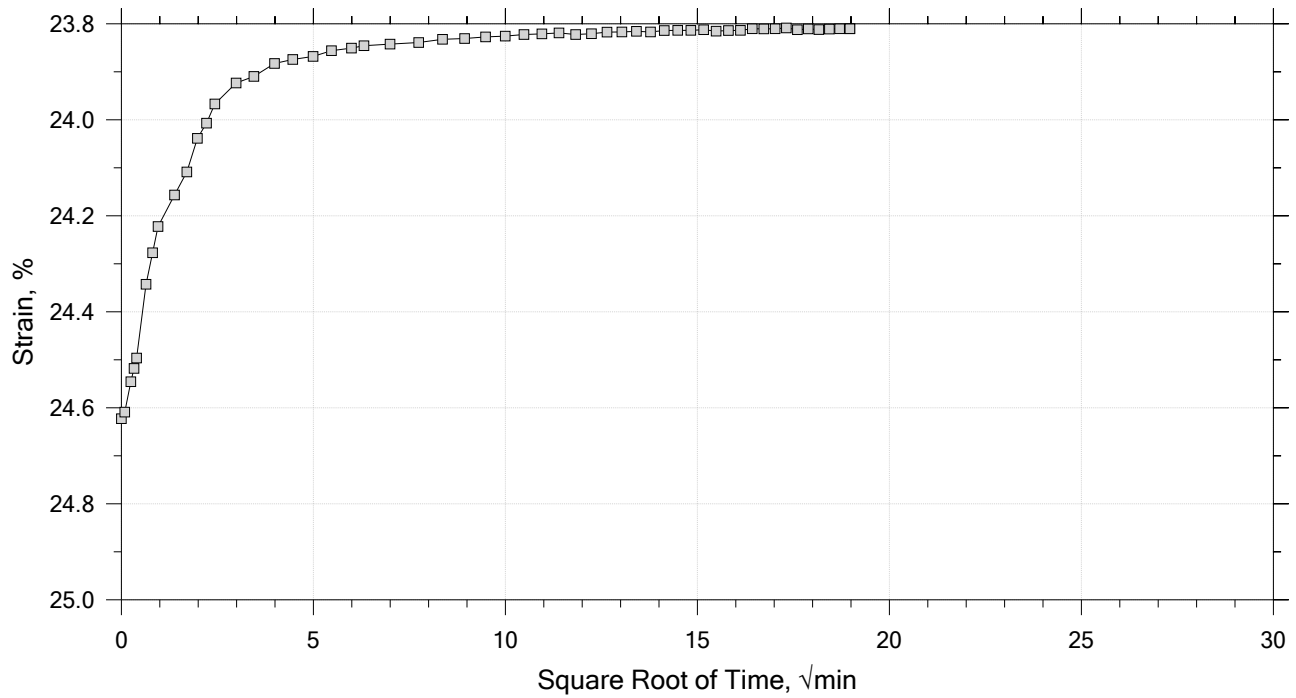
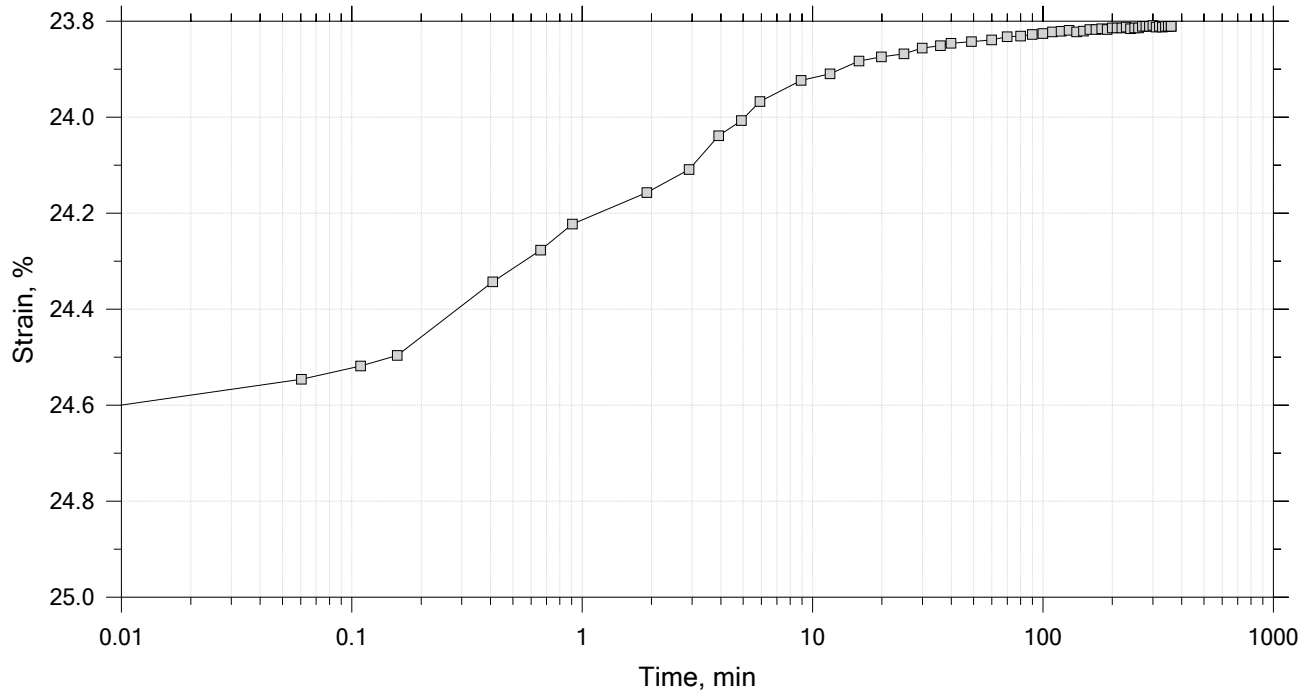
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-240	Tested By: md	Checked By: mcm
	Sample No.: U2	Test Date: 03/01/21	Depth: 20-22 ft
	Test No.: IP-9	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-D, Swell Pressure = 0.0707 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 18 of 21

Constant Load Step

Stress: 2 tsf



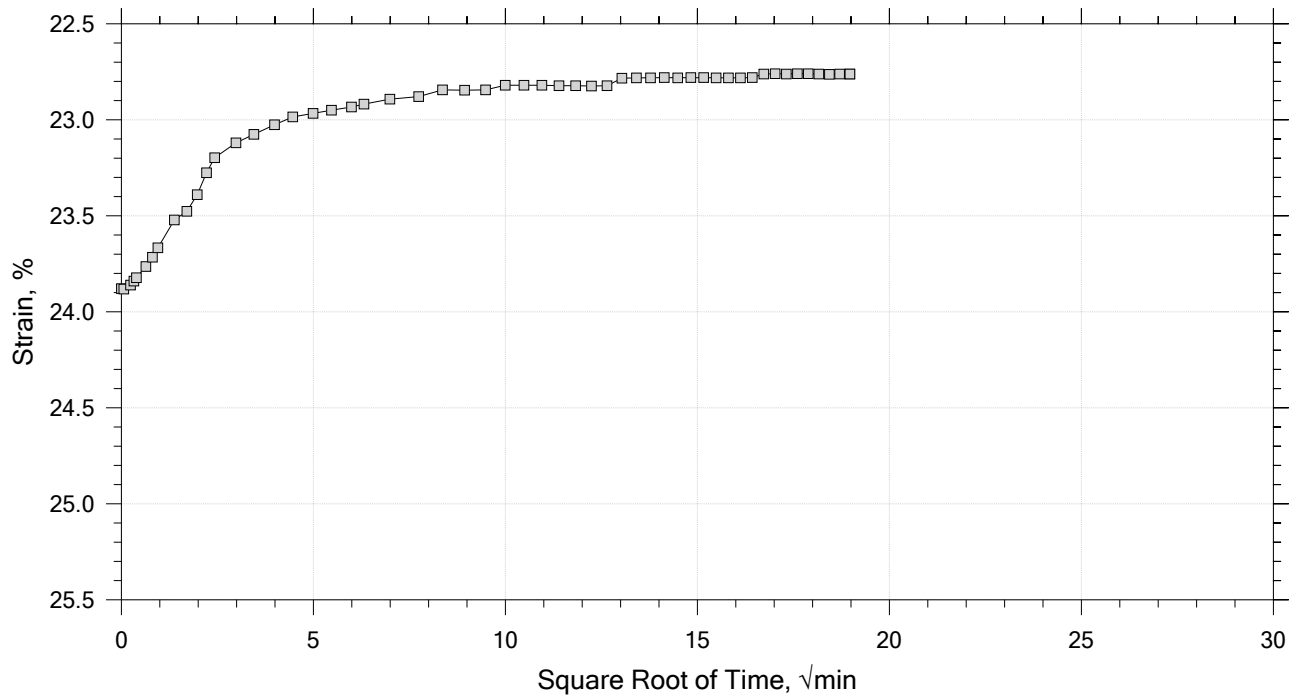
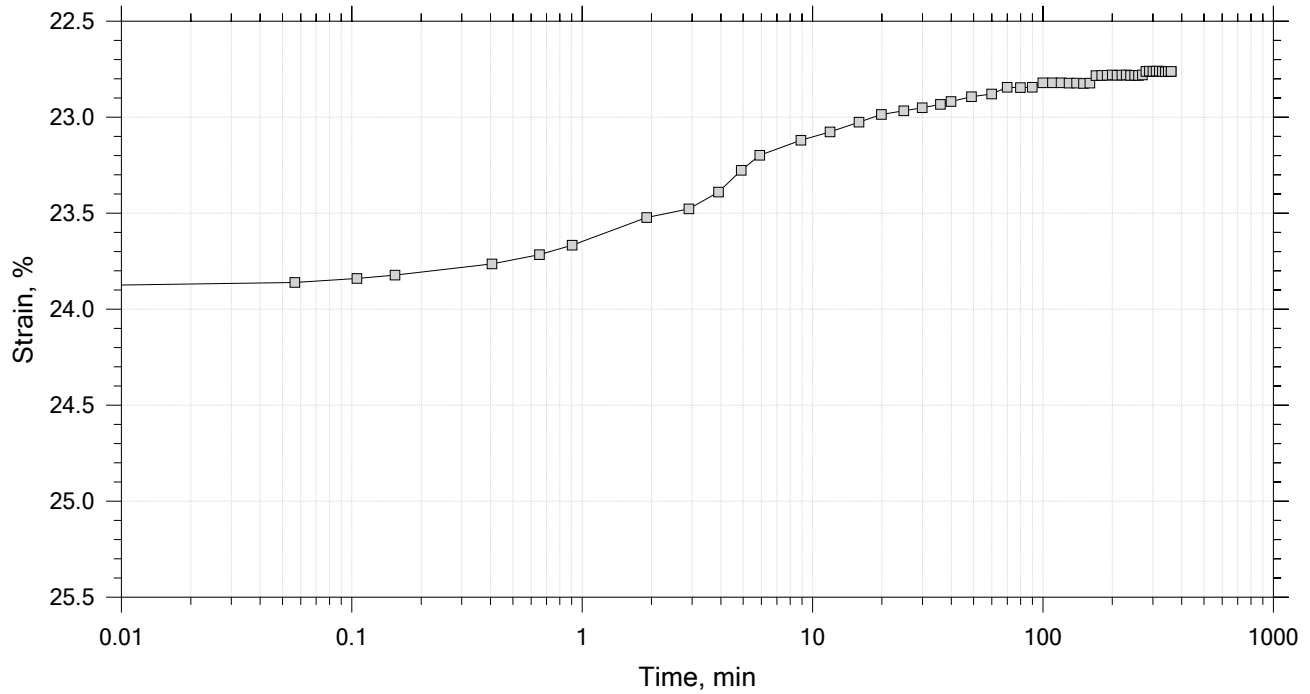
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-240	Tested By: md	Checked By: mcm
	Sample No.: U2	Test Date: 03/01/21	Depth: 20-22 ft
	Test No.: IP-9	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-D, Swell Pressure = 0.0707 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 19 of 21

Constant Load Step

Stress: 0.5 tsf



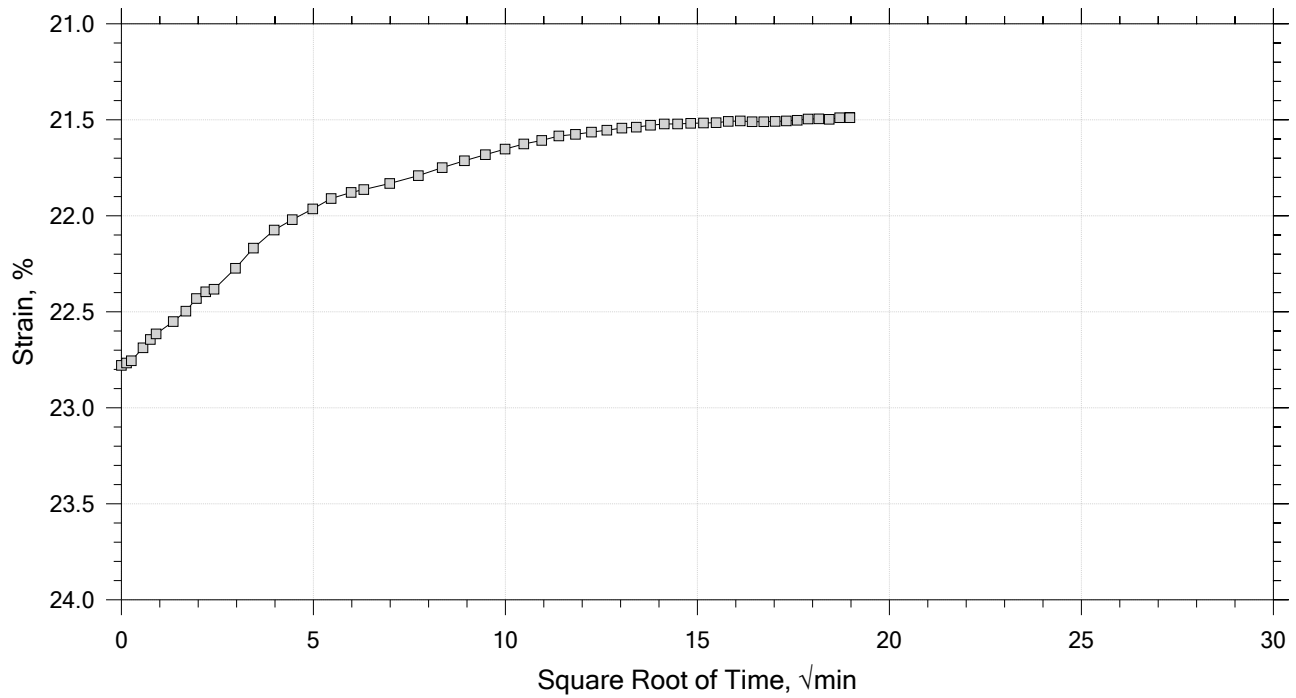
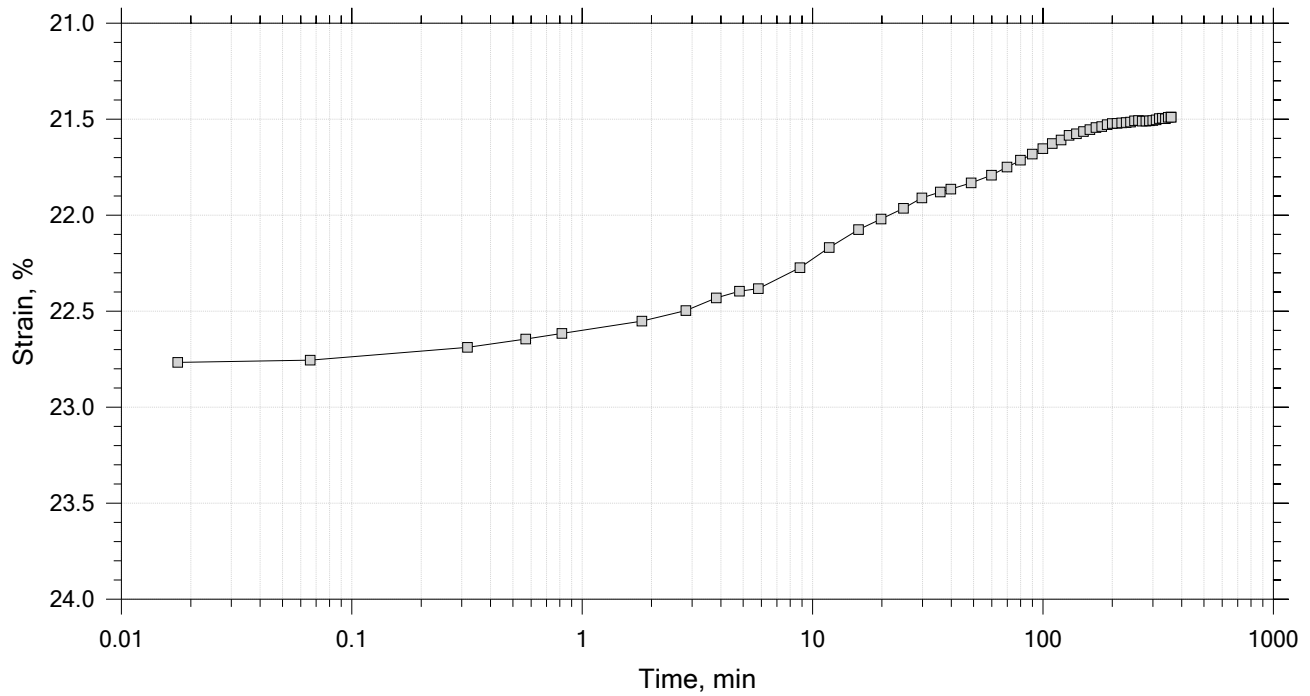
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-240	Tested By: md	Checked By: mcm
	Sample No.: U2	Test Date: 03/01/21	Depth: 20-22 ft
	Test No.: IP-9	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-D, Swell Pressure = 0.0707 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 20 of 21

Constant Load Step

Stress: 0.125 tsf



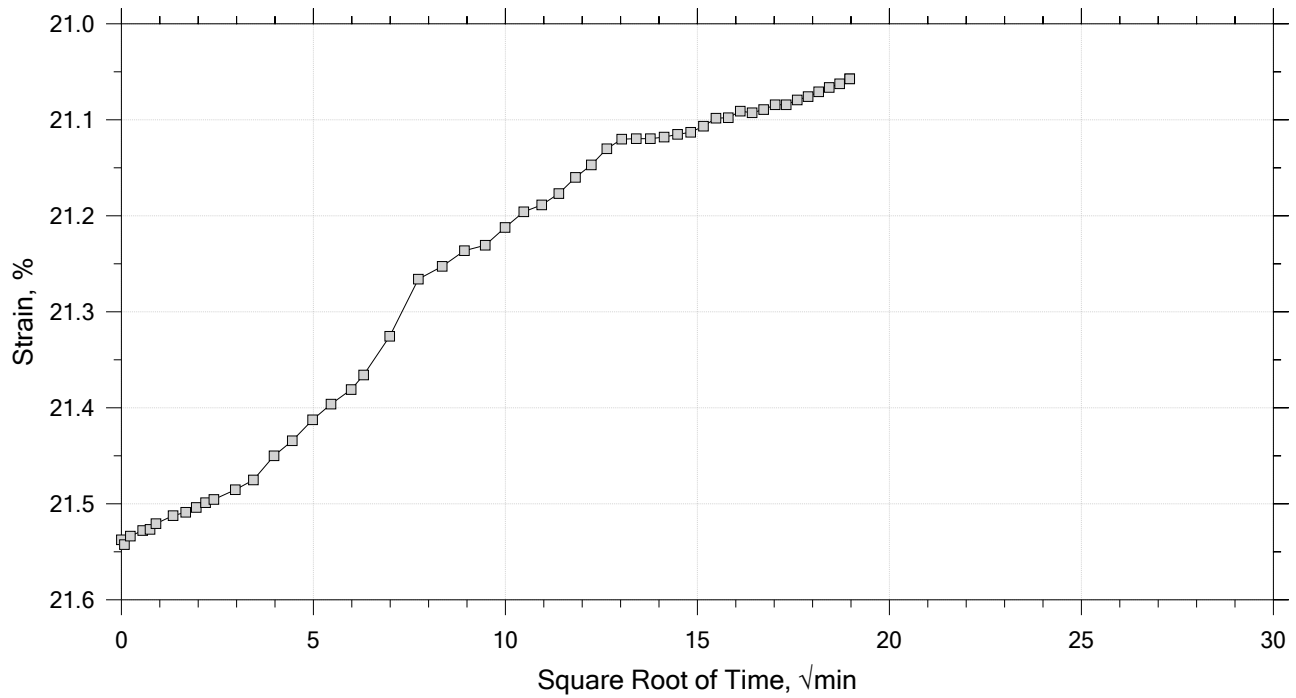
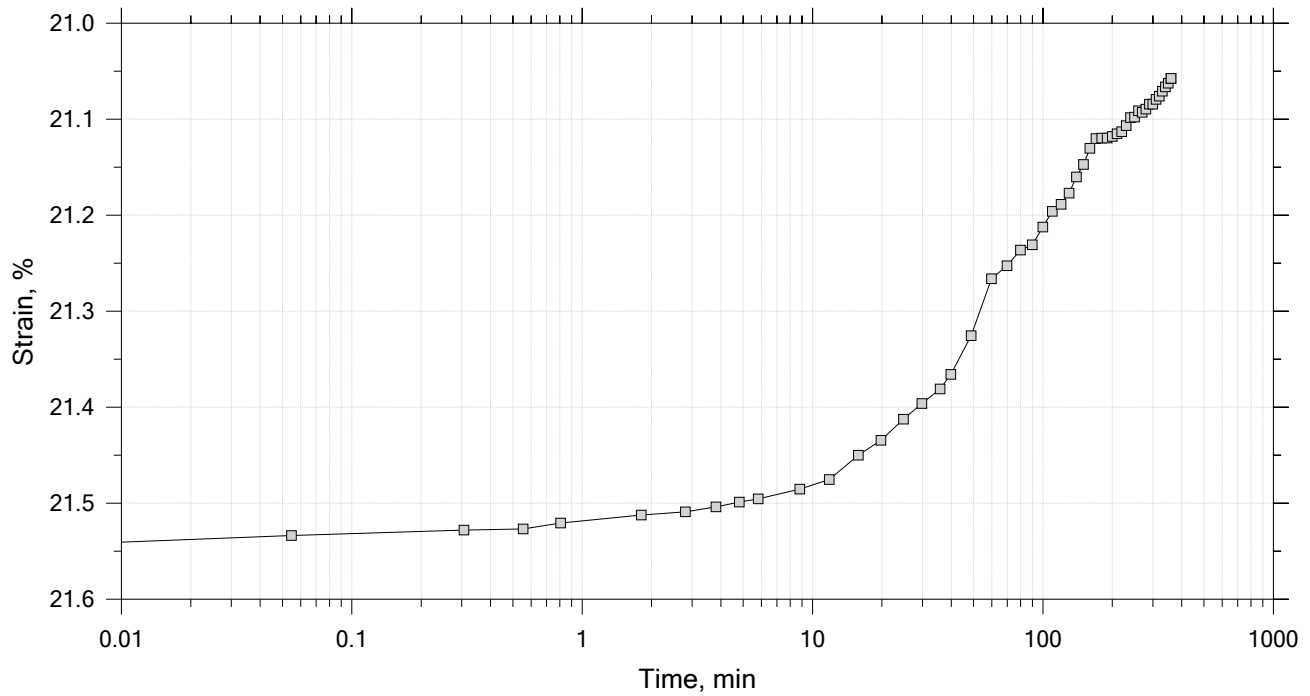
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-240	Tested By: md	Checked By: mcm
	Sample No.: U2	Test Date: 03/01/21	Depth: 20-22 ft
	Test No.: IP-9	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-D, Swell Pressure = 0.0707 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 21 of 21

Constant Load Step

Stress: 0.0625 tsf




	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-240	Tested By: md	Checked By: mcm
	Sample No.: U2	Test Date: 03/01/21	Depth: 20-22 ft
	Test No.: IP-9	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-D, Swell Pressure = 0.0707 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Specimen Diameter: 2.50 in	Estimated Specific Gravity: 2.77	Liquid Limit: 36
Initial Height: 1.00 in	Initial Void Ratio: 1.03	Plastic Limit: 20
Final Height: 0.79 in	Final Void Ratio: 0.606	Plasticity Index: 16

	Before Test Trimmings	Before Test Specimen	After Test Specimen	After Test Trimmings
Container ID	E-1961	RING		E0474
Mass Container, gm	8.38	112.43	112.43	8.26
Mass Container + Wet Soil, gm	228.94	261.57	246.08	141.79
Mass Container + Dry Soil, gm	169.47	222.13	222.13	117.86
Mass Dry Soil, gm	161.09	109.7	109.7	109.6
Water Content, %	36.92	35.95	21.83	21.83
Void Ratio	---	1.03	0.61	---
Degree of Saturation, %	---	96.46	100.00	---
Dry Unit Weight, pcf	---	85.135	107.84	---


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

	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-240	Tested By: md	Checked By: mcm
	Sample No.: U2	Test Date: 03/01/21	Depth: 20-22 ft
	Test No.: IP-9	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-D, Swell Pressure = 0.0707 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

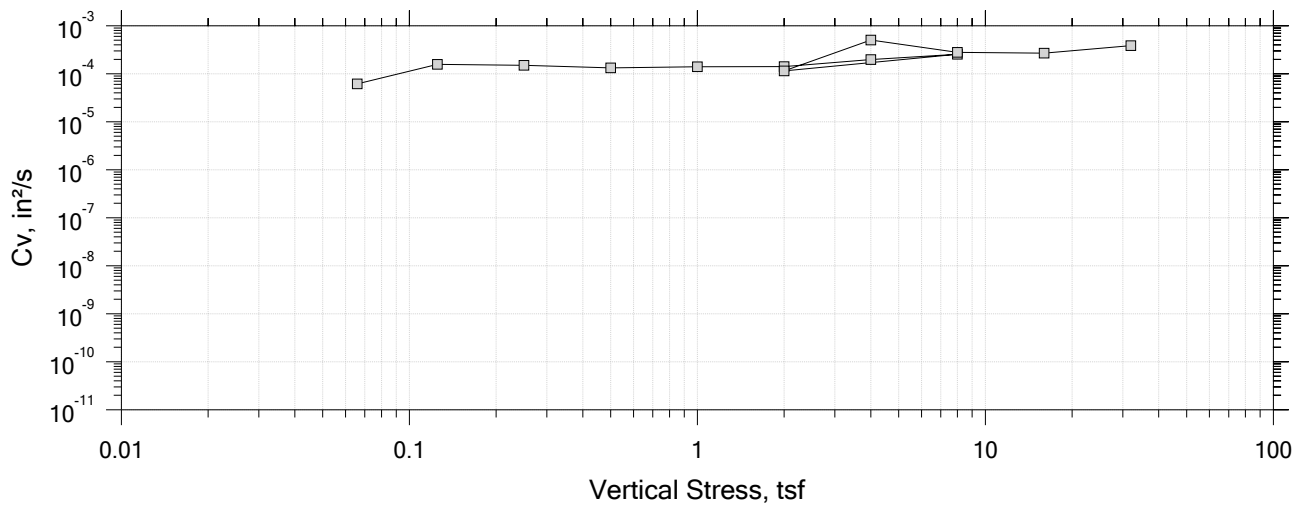
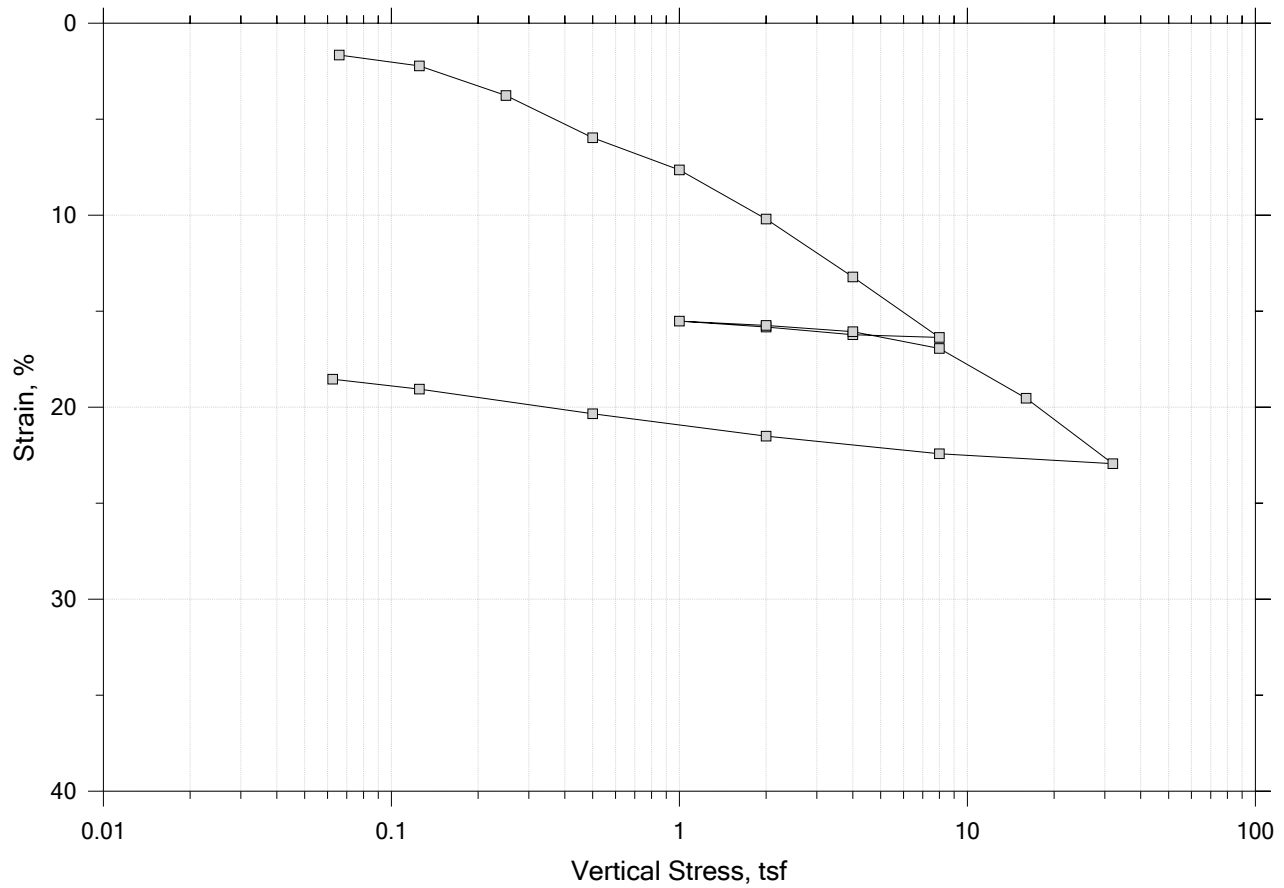
Square Root of Time Coefficients


[illegible]

	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-240	Tested By: md	Checked By: mcm
	Sample No.: U2	Test Date: 03/01/21	Depth: 20-22 ft
	Test No.: IP-9	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-D, Swell Pressure = 0.0707 tsf		
	Displacement at End of Increment		

One-Dimensional Consolidation by ASTM D2435 - Method B

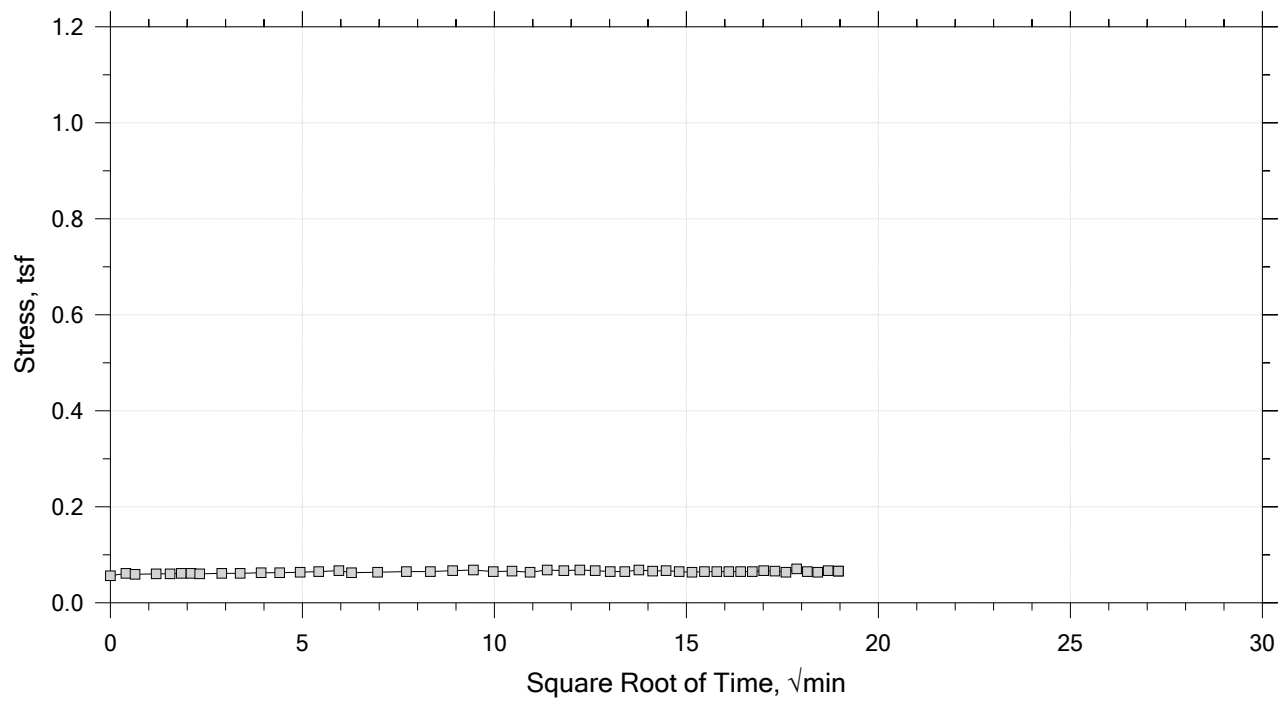
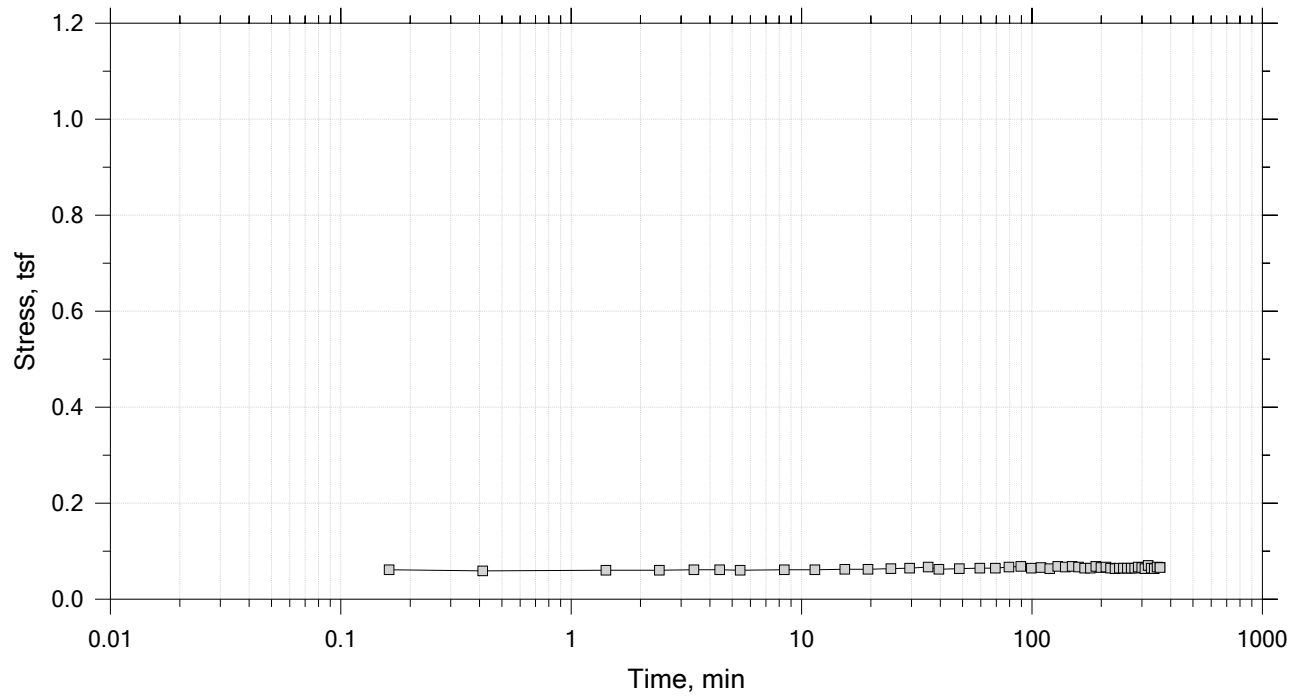
Summary Report




	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-242A	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 03/01/21	Depth: 9-11 ft
	Test No.: IP-10	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-C, Swell Pressure = 0.0659 tsf		
	Displacement at End of Increment		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 1 of 21
Constant Volume Step
Stress: 0.0659 tsf



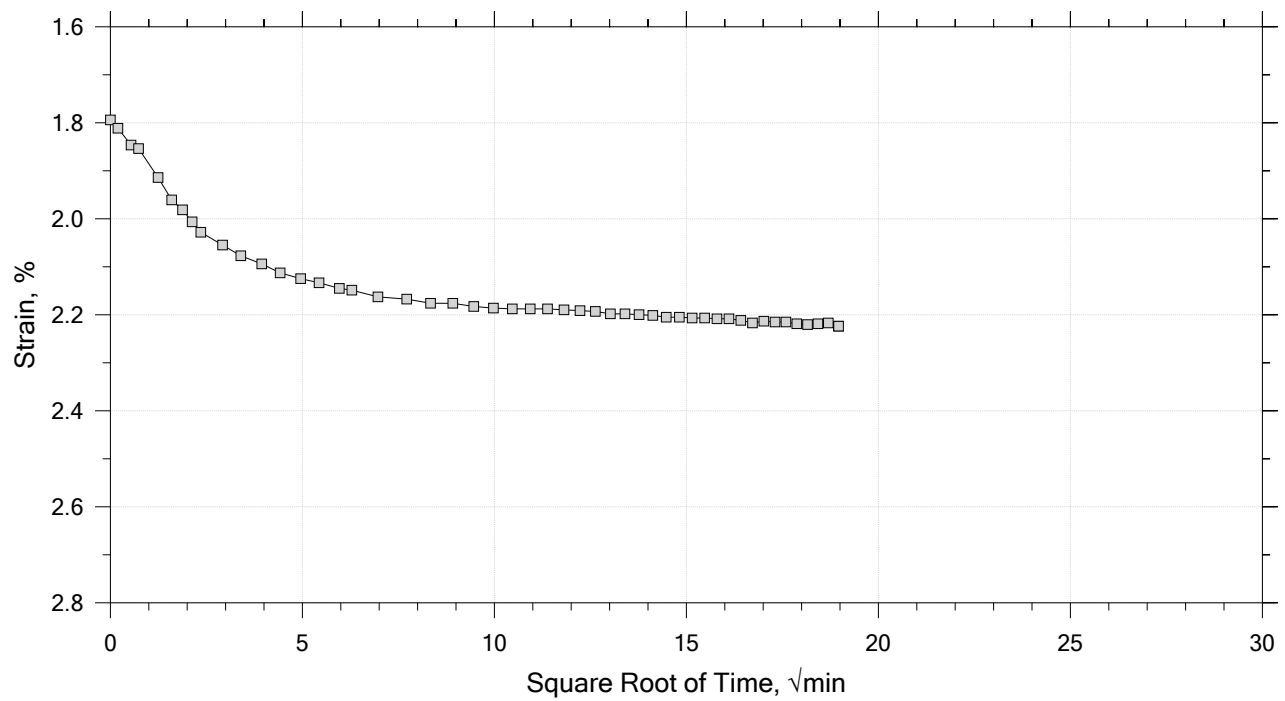
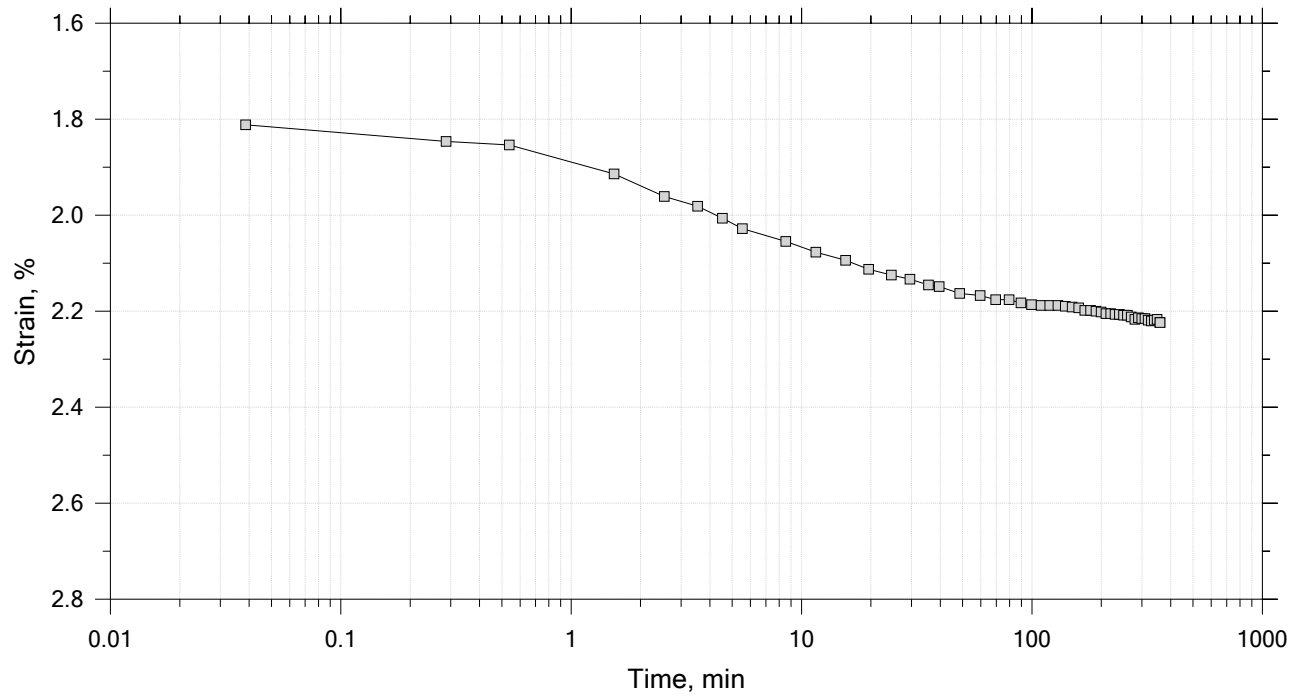
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-242A	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 03/01/21	Depth: 9-11 ft
	Test No.: IP-10	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-C, Swell Pressure = 0.0659 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 2 of 21

Constant Load Step

Stress: 0.125 tsf



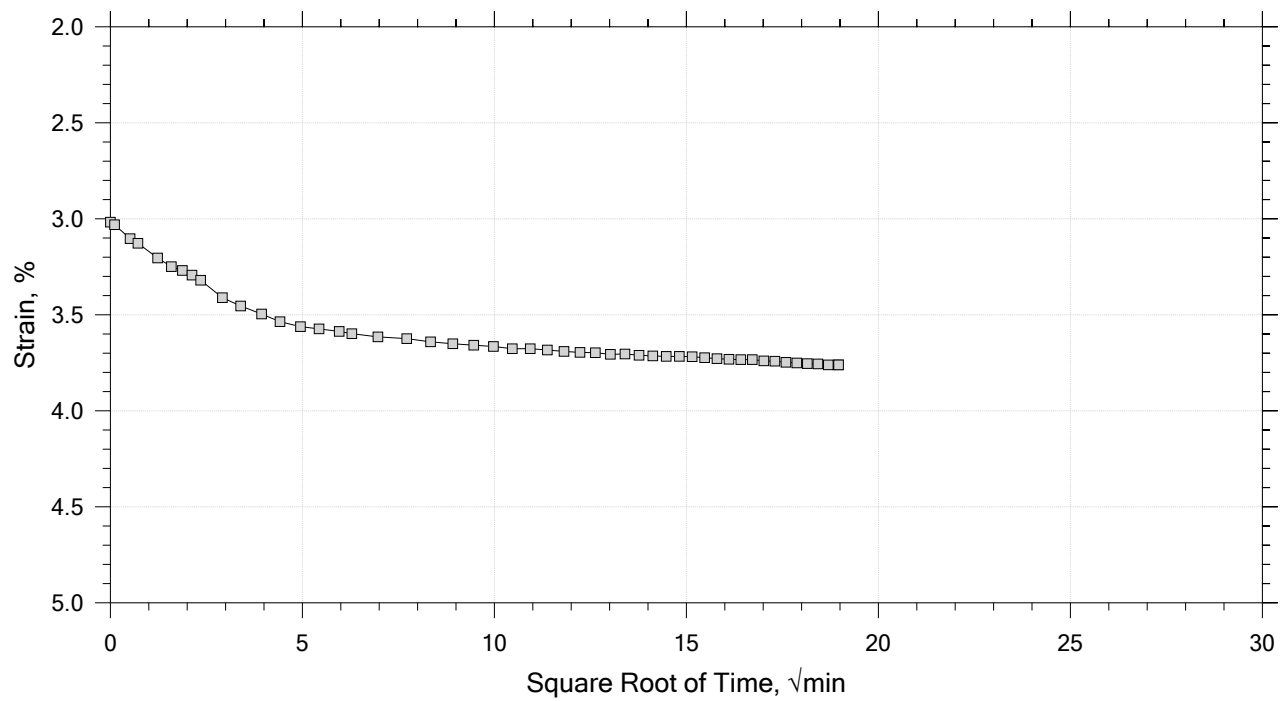
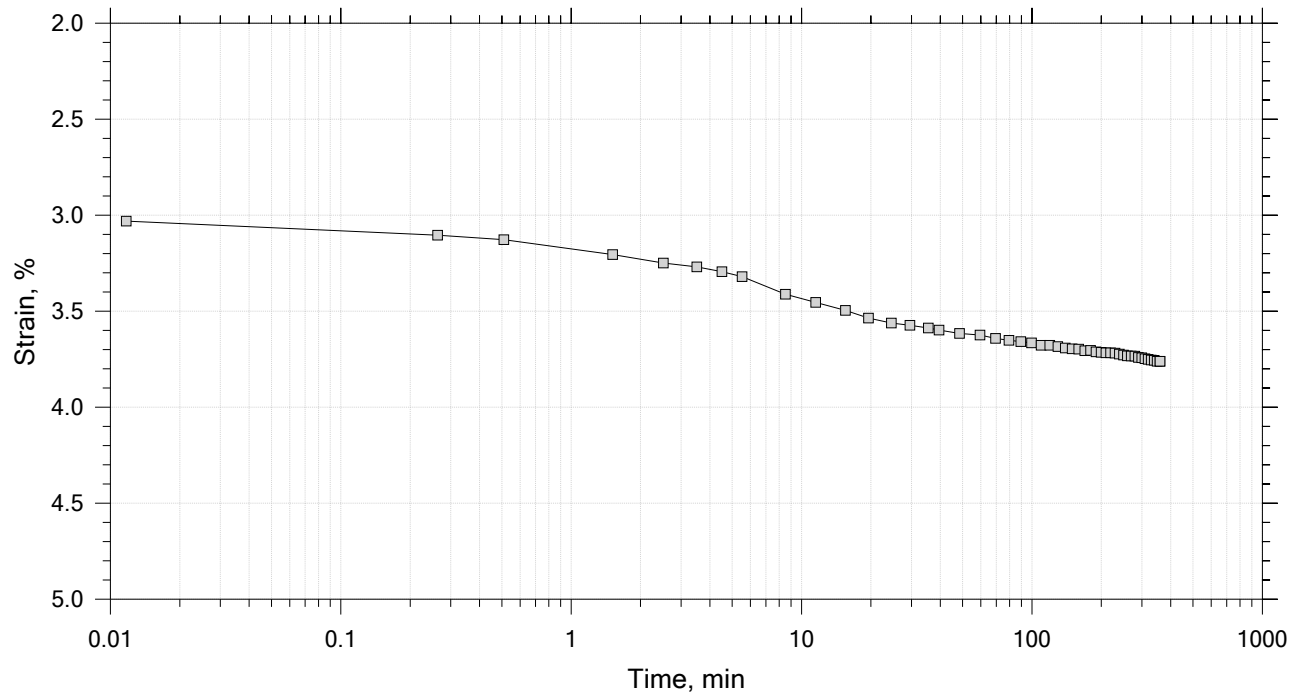
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-242A	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 03/01/21	Depth: 9-11 ft
	Test No.: IP-10	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-C, Swell Pressure = 0.0659 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 3 of 21

Constant Load Step

Stress: 0.25 tsf



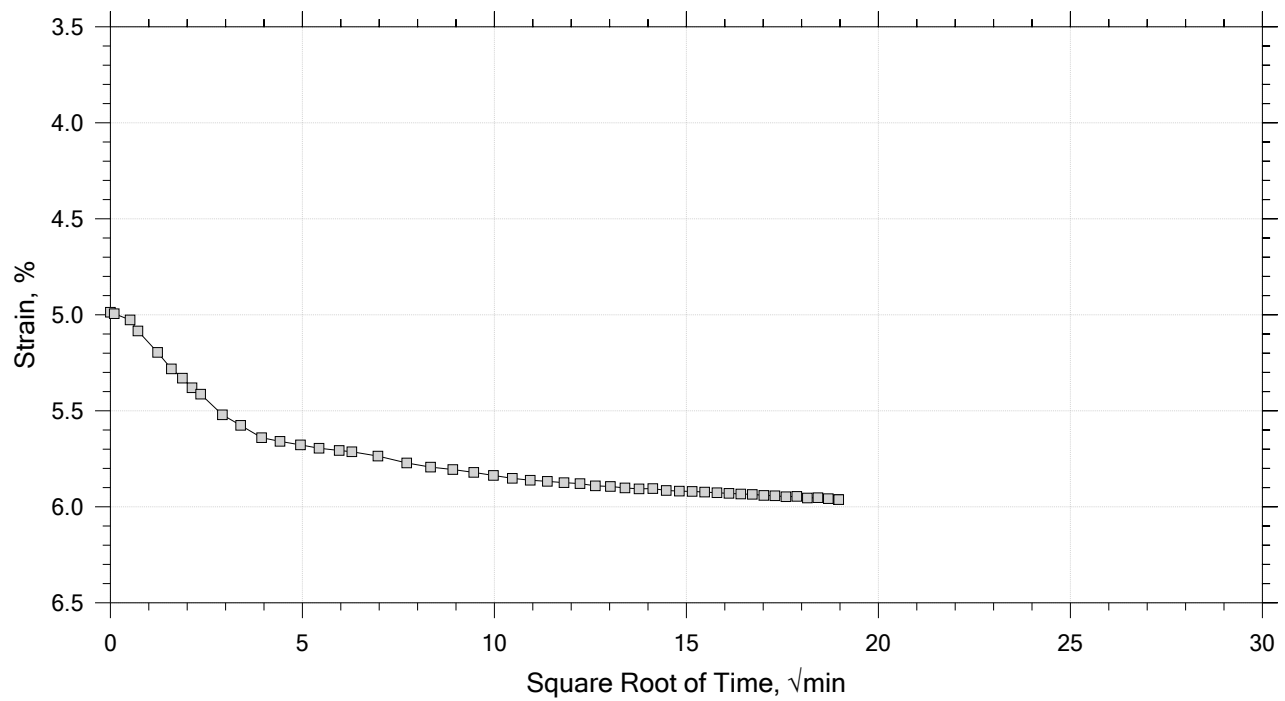
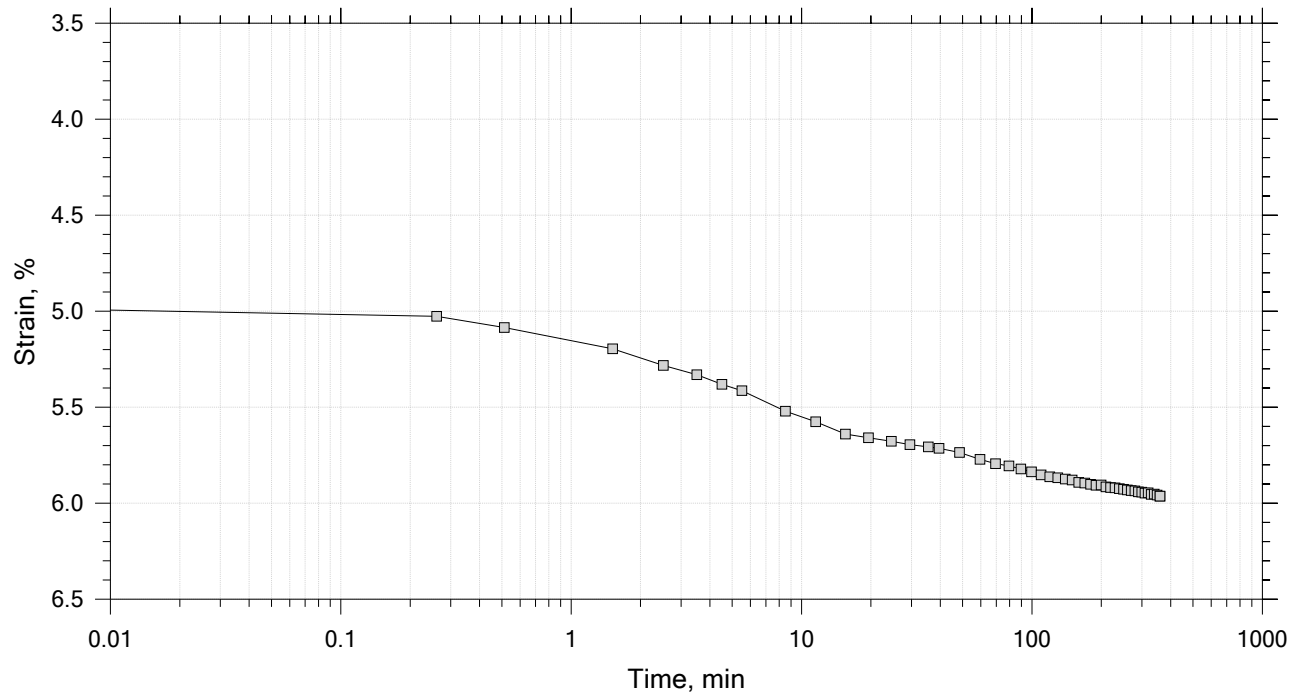
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-242A	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 03/01/21	Depth: 9-11 ft
	Test No.: IP-10	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-C, Swell Pressure = 0.0659 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 4 of 21

Constant Load Step

Stress: 0.5 tsf



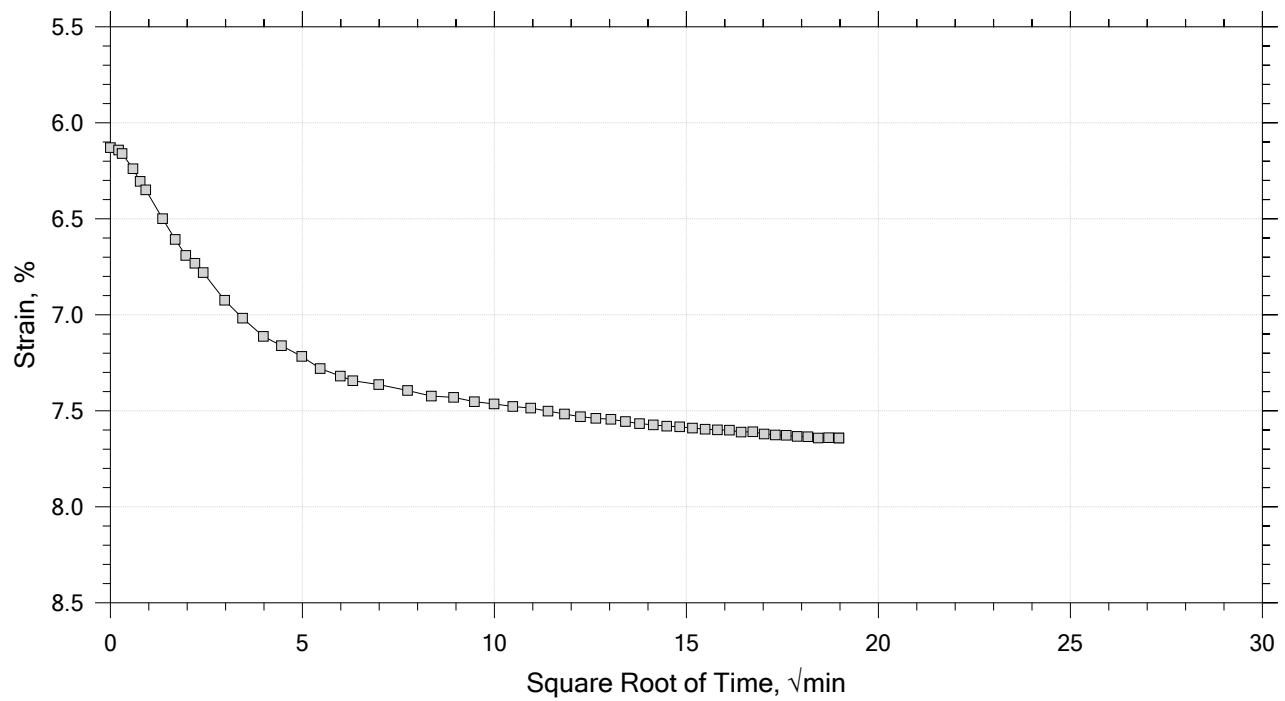
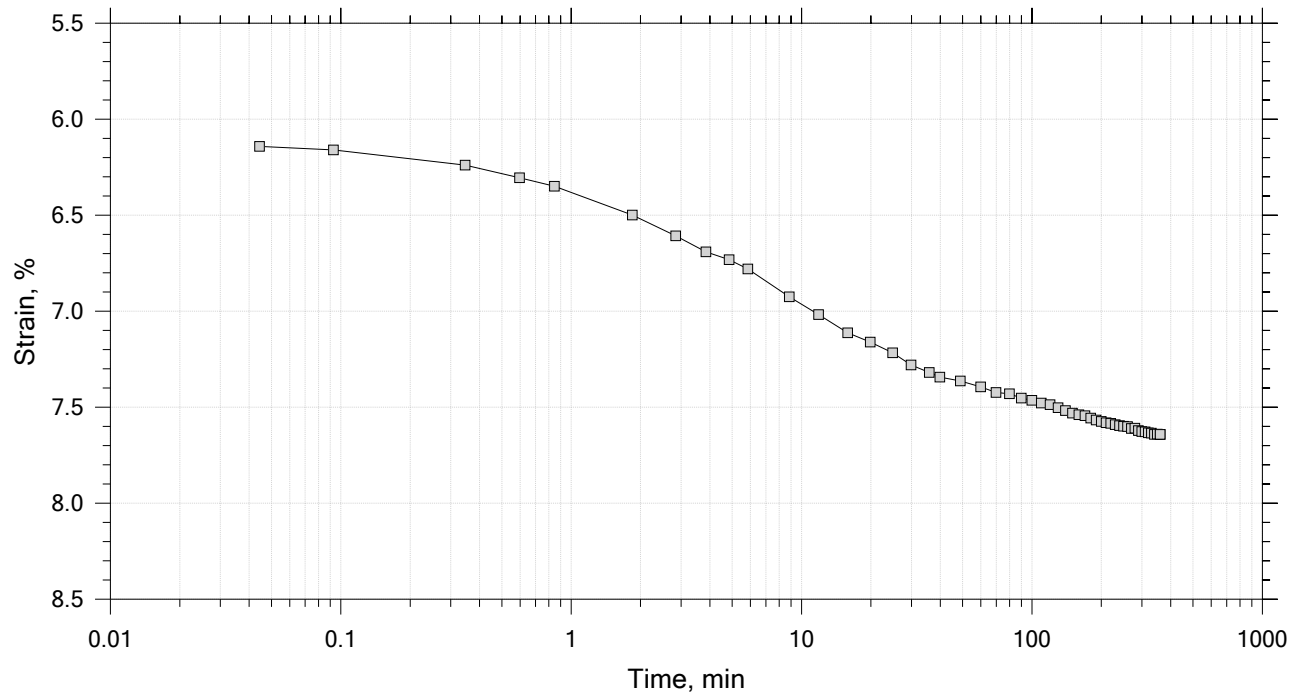
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-242A	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 03/01/21	Depth: 9-11 ft
	Test No.: IP-10	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-C, Swell Pressure = 0.0659 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 5 of 21

Constant Load Step

Stress: 1 tsf



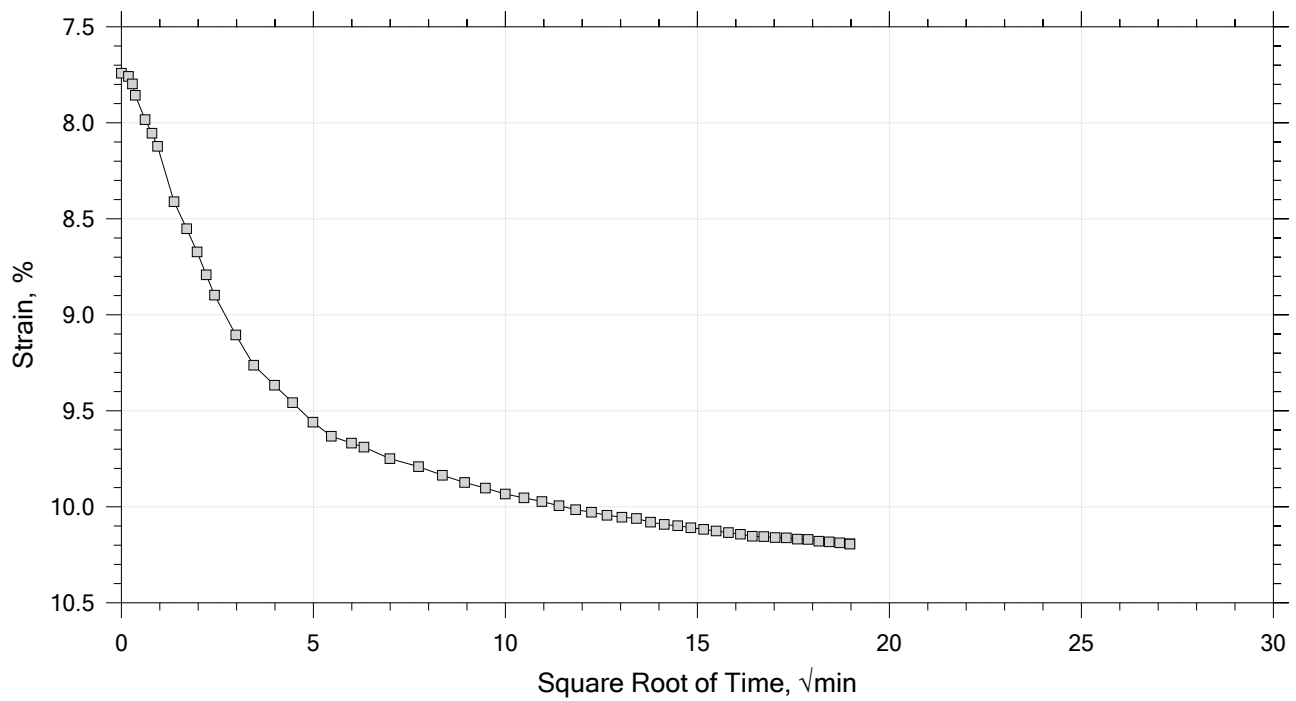
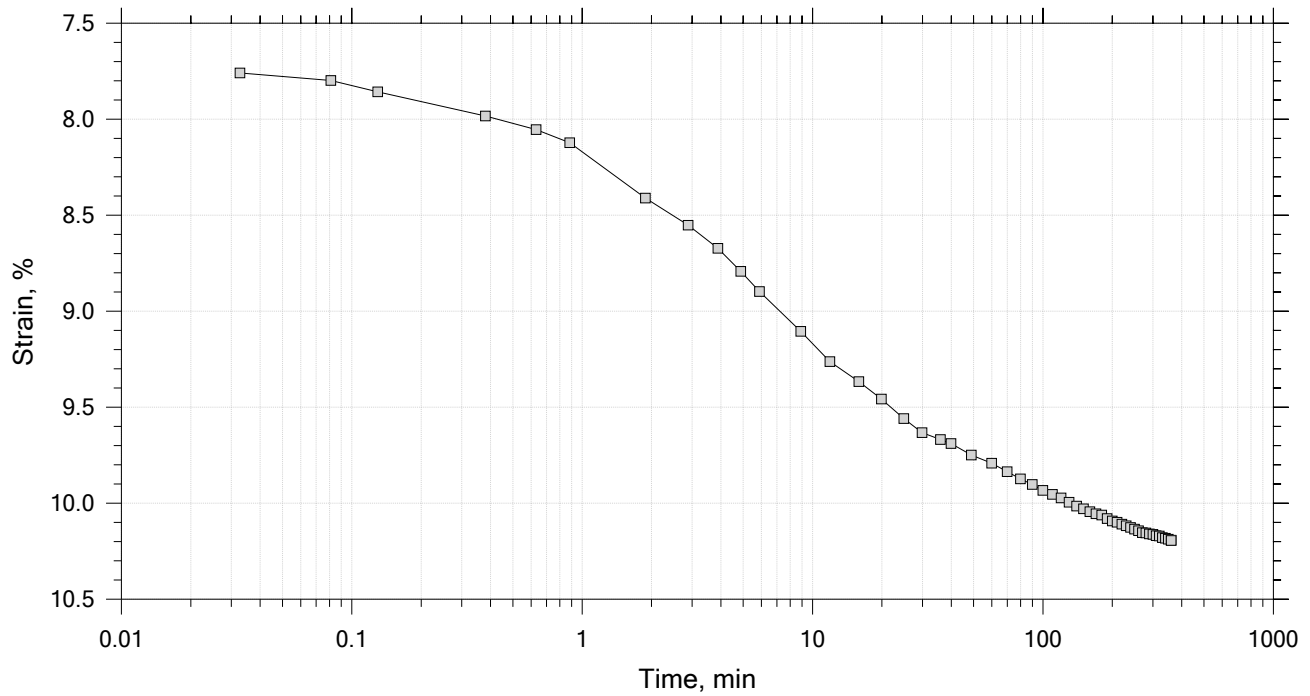
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-242A	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 03/01/21	Depth: 9-11 ft
	Test No.: IP-10	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-C, Swell Pressure = 0.0659 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 6 of 21

Constant Load Step

Stress: 2 tsf



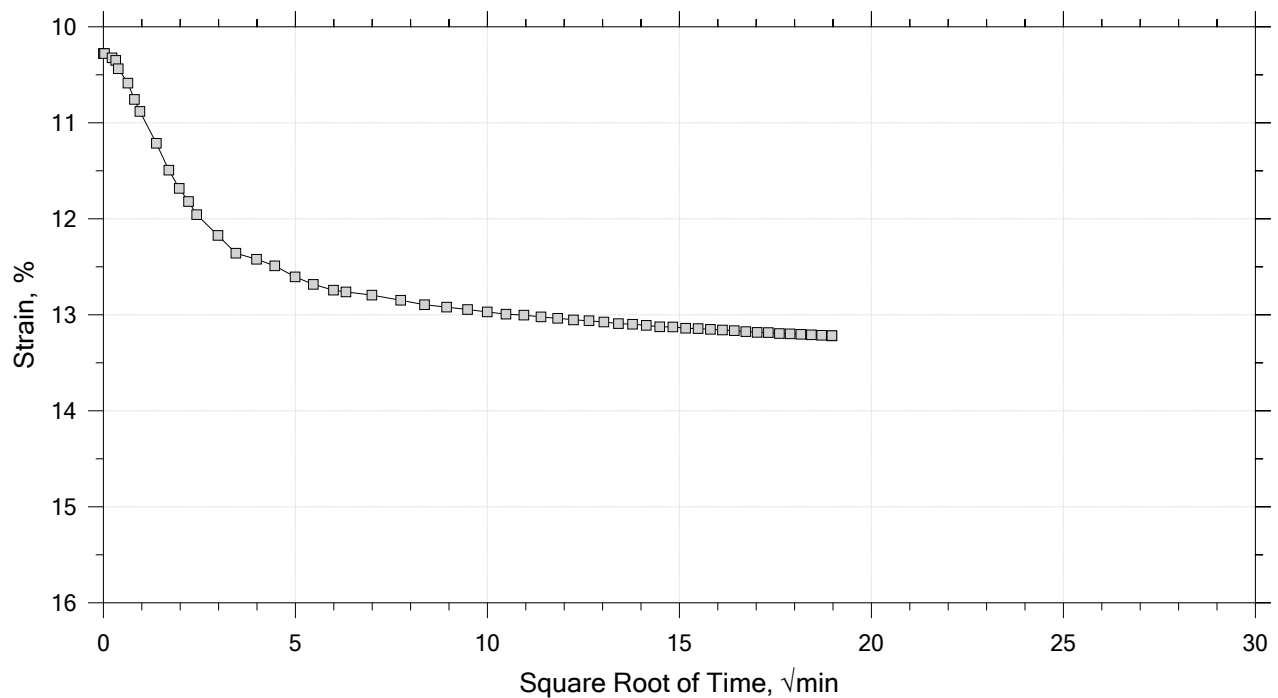
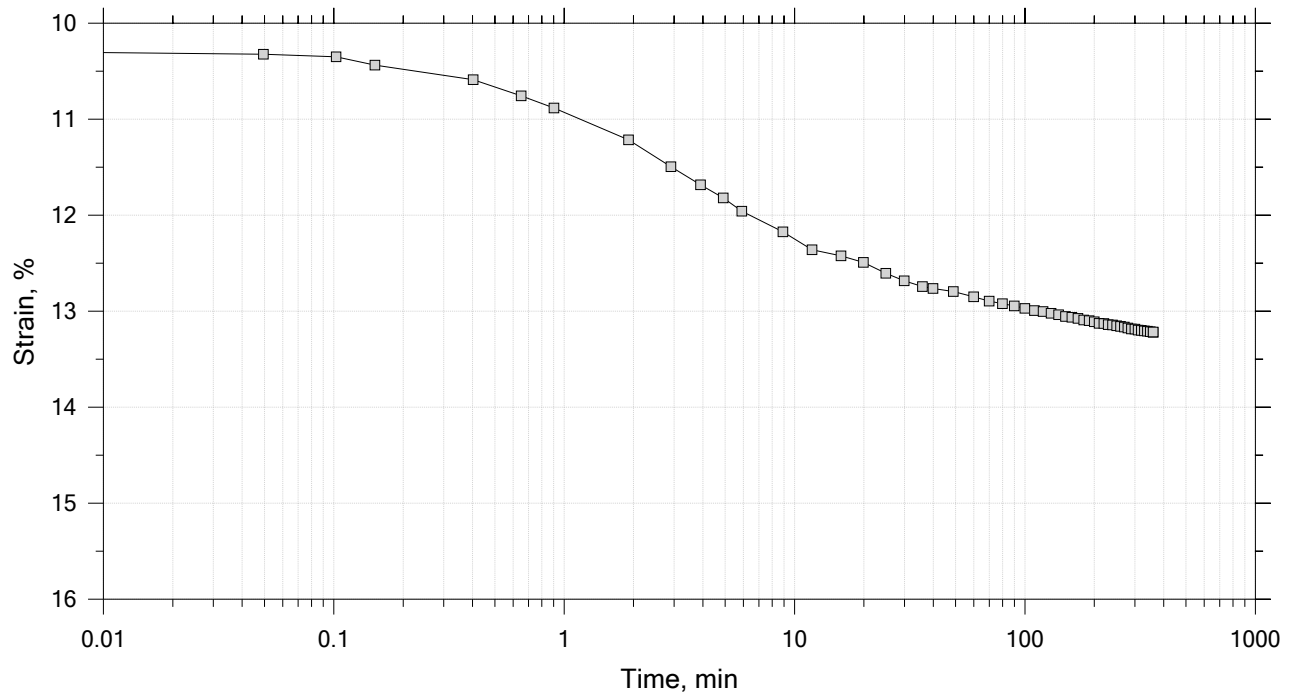
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-242A	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 03/01/21	Depth: 9-11 ft
	Test No.: IP-10	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-C, Swell Pressure = 0.0659 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 7 of 21

Constant Load Step

Stress: 4 tsf



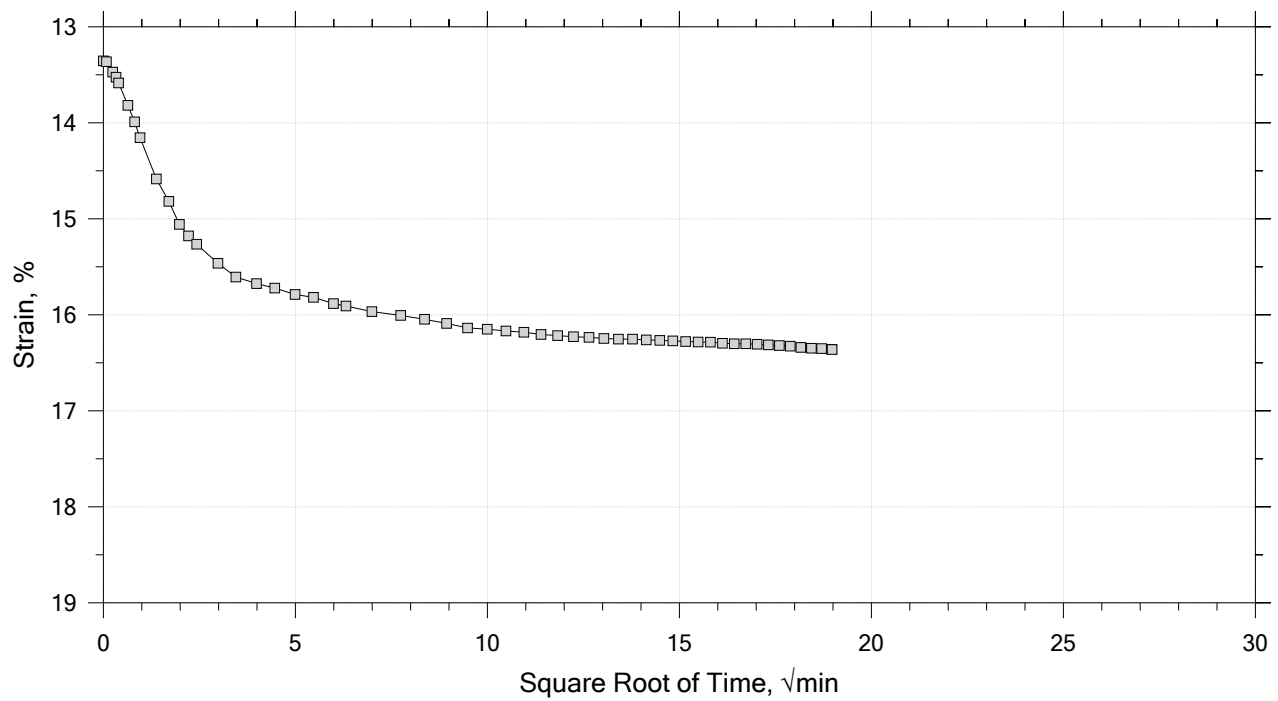
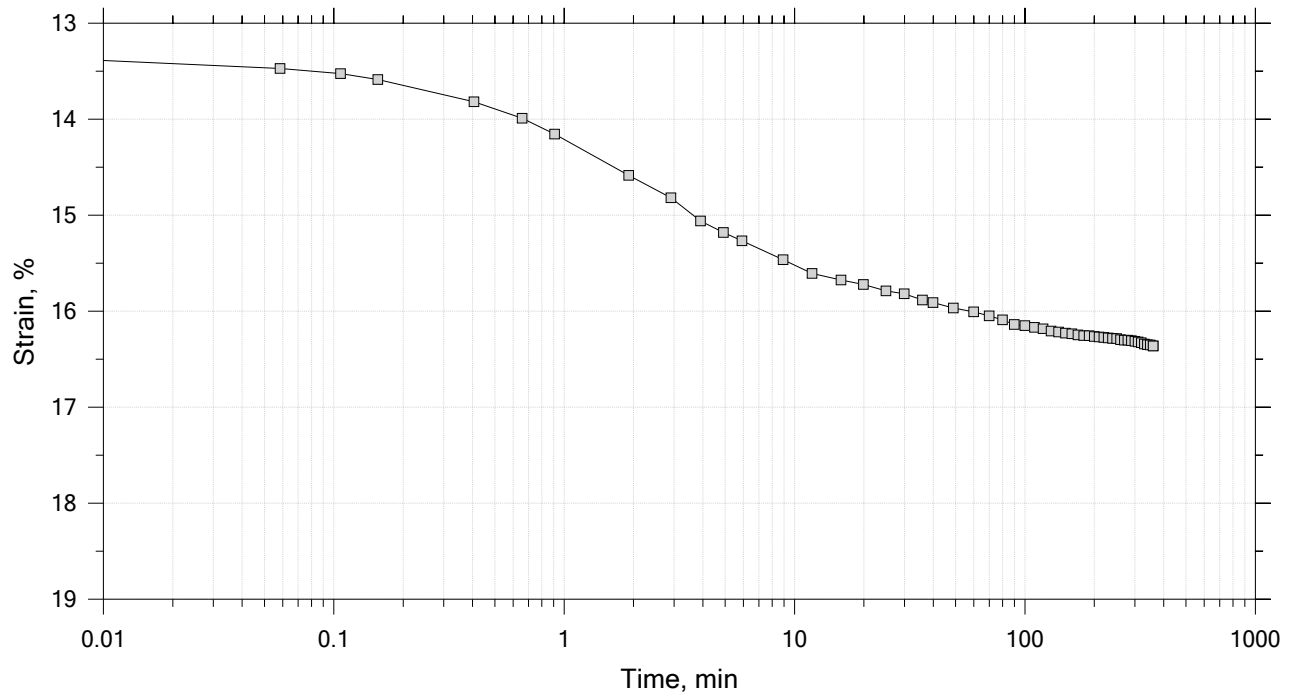
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-242A	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 03/01/21	Depth: 9-11 ft
	Test No.: IP-10	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-C, Swell Pressure = 0.0659 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 8 of 21

Constant Load Step

Stress: 8 tsf



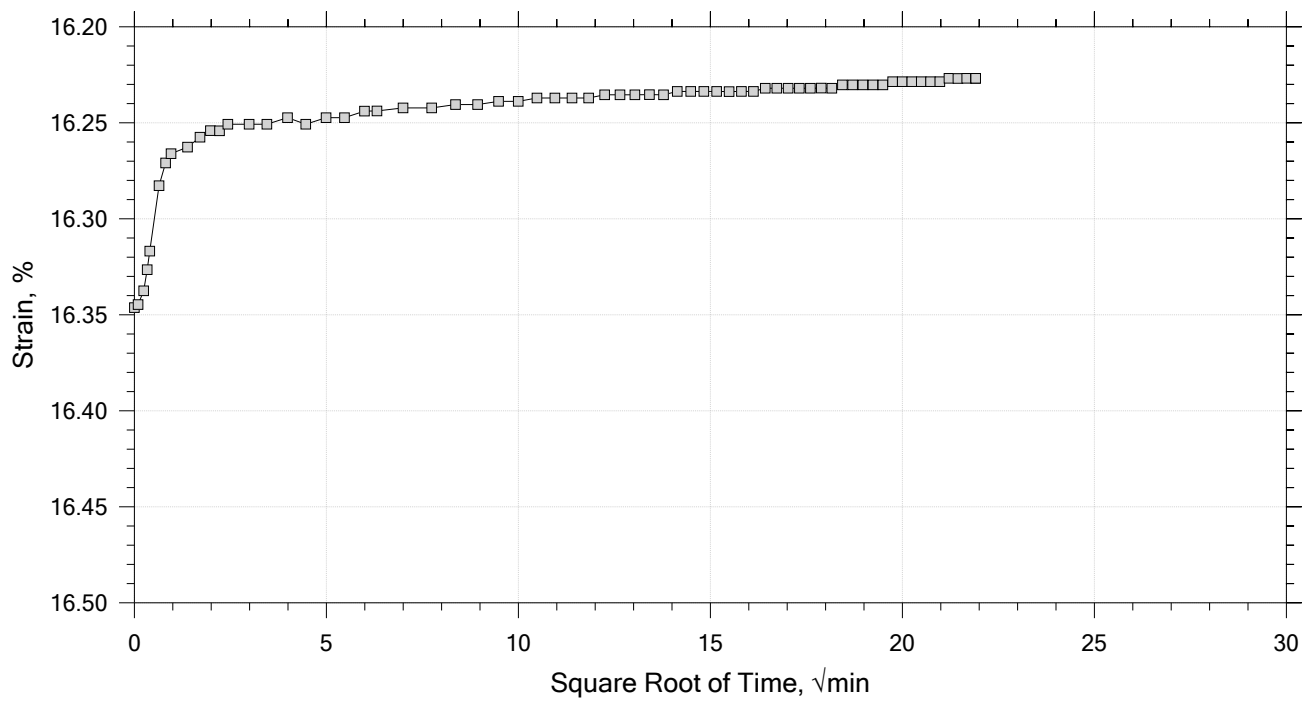
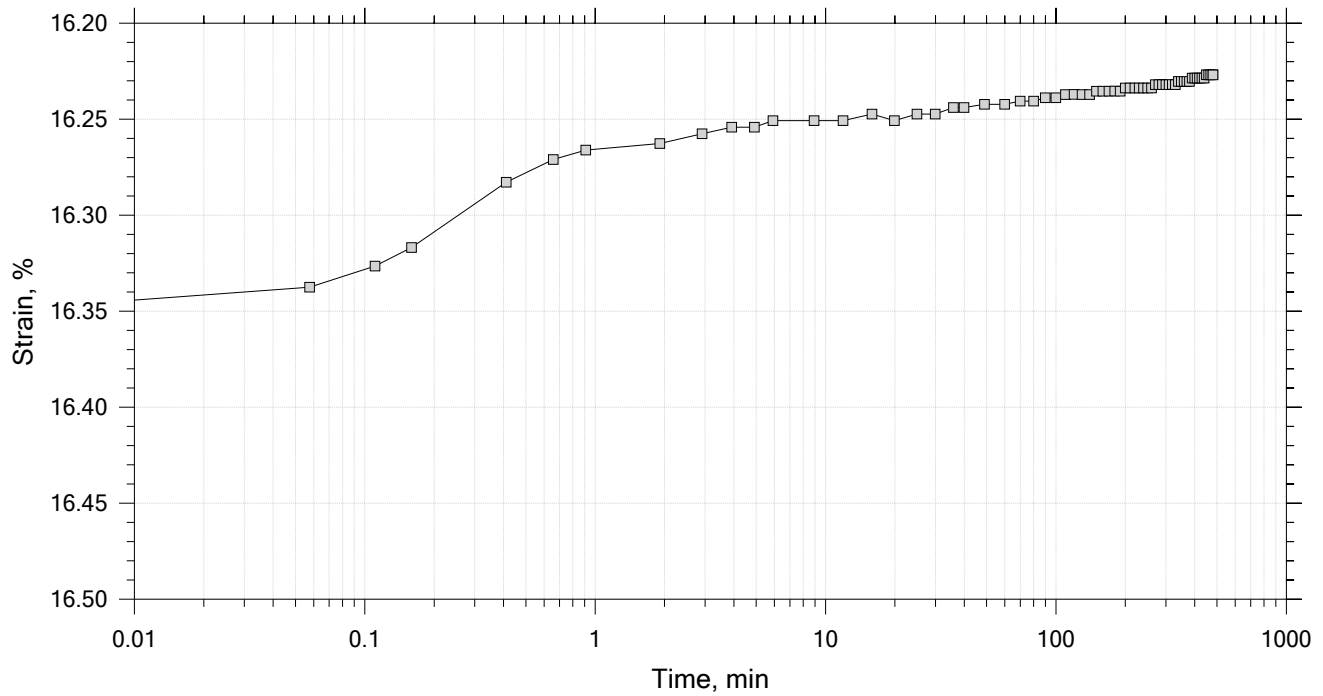
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-242A	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 03/01/21	Depth: 9-11 ft
	Test No.: IP-10	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-C, Swell Pressure = 0.0659 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 9 of 21

Constant Load Step

Stress: 4 tsf



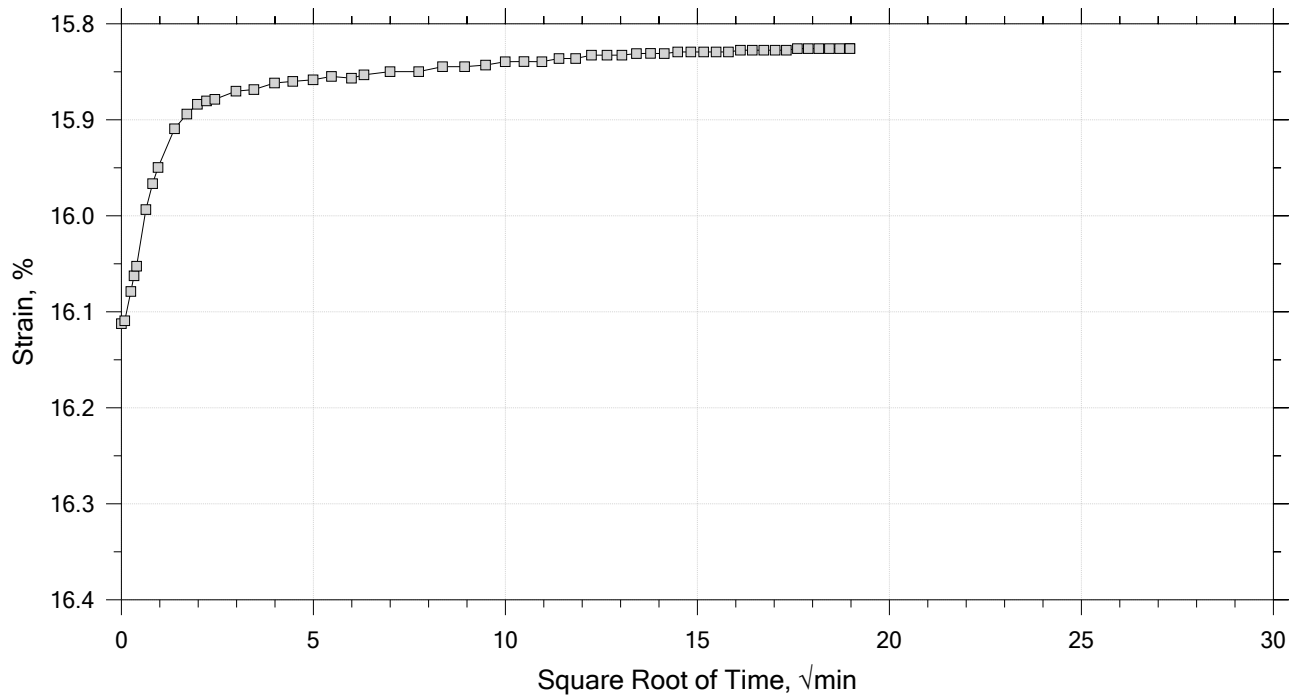
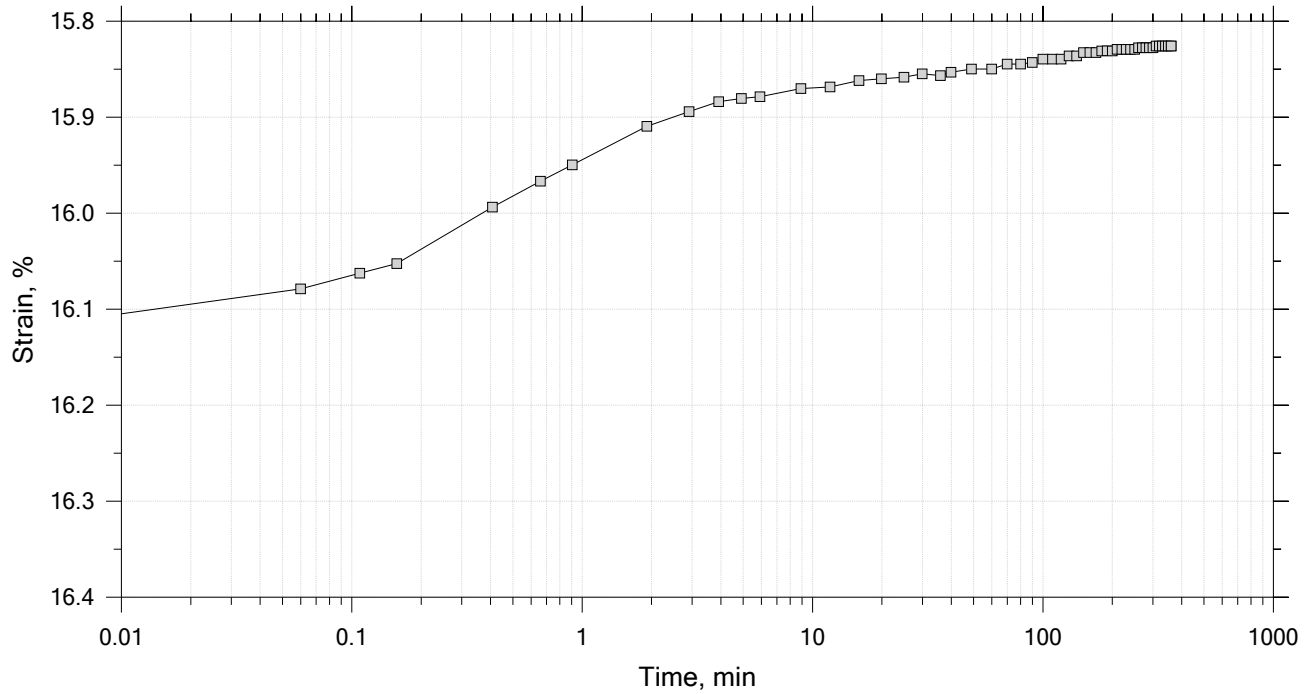
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-242A	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 03/01/21	Depth: 9-11 ft
	Test No.: IP-10	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-C, Swell Pressure = 0.0659 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 10 of 21

Constant Load Step

Stress: 2 tsf



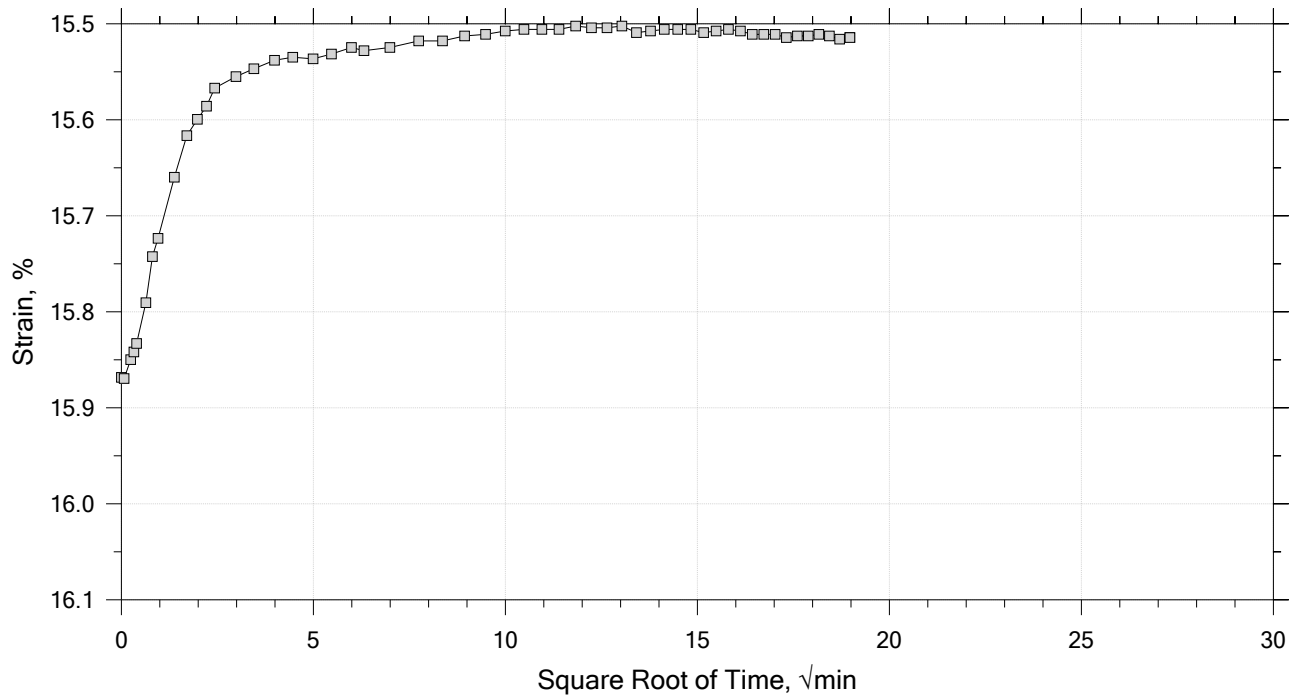
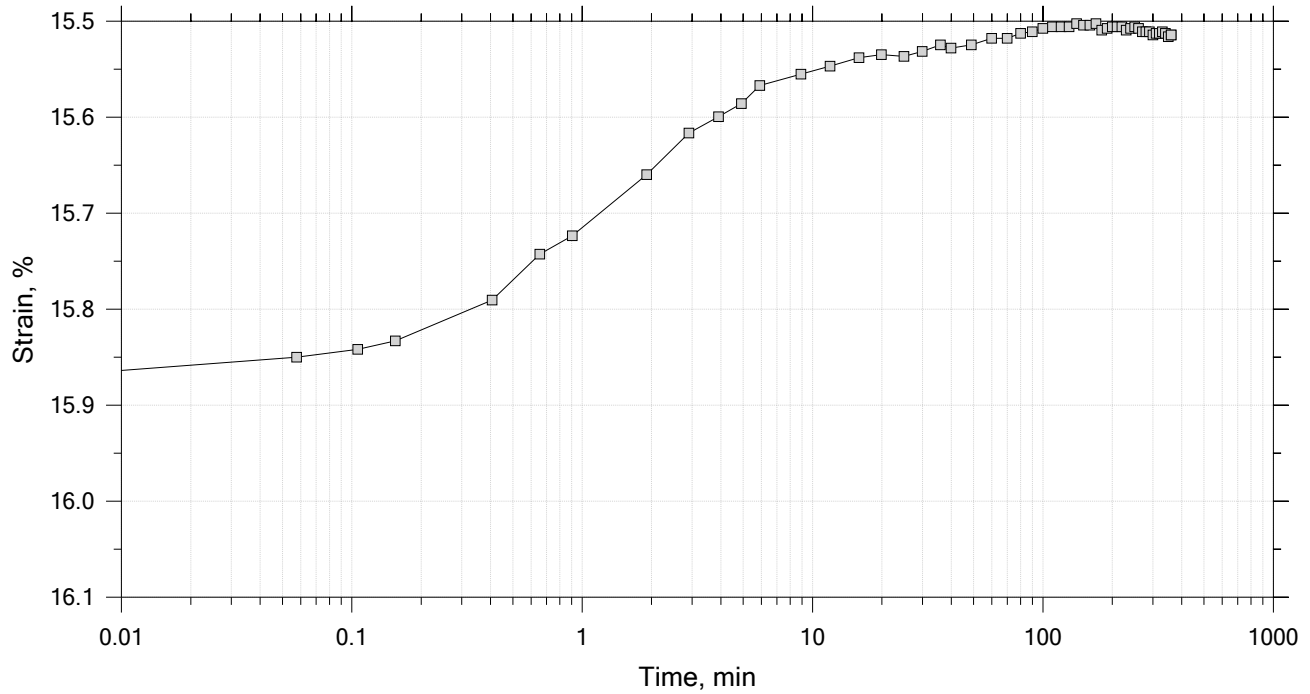
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-242A	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 03/01/21	Depth: 9-11 ft
	Test No.: IP-10	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-C, Swell Pressure = 0.0659 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 11 of 21

Constant Load Step

Stress: 1 tsf



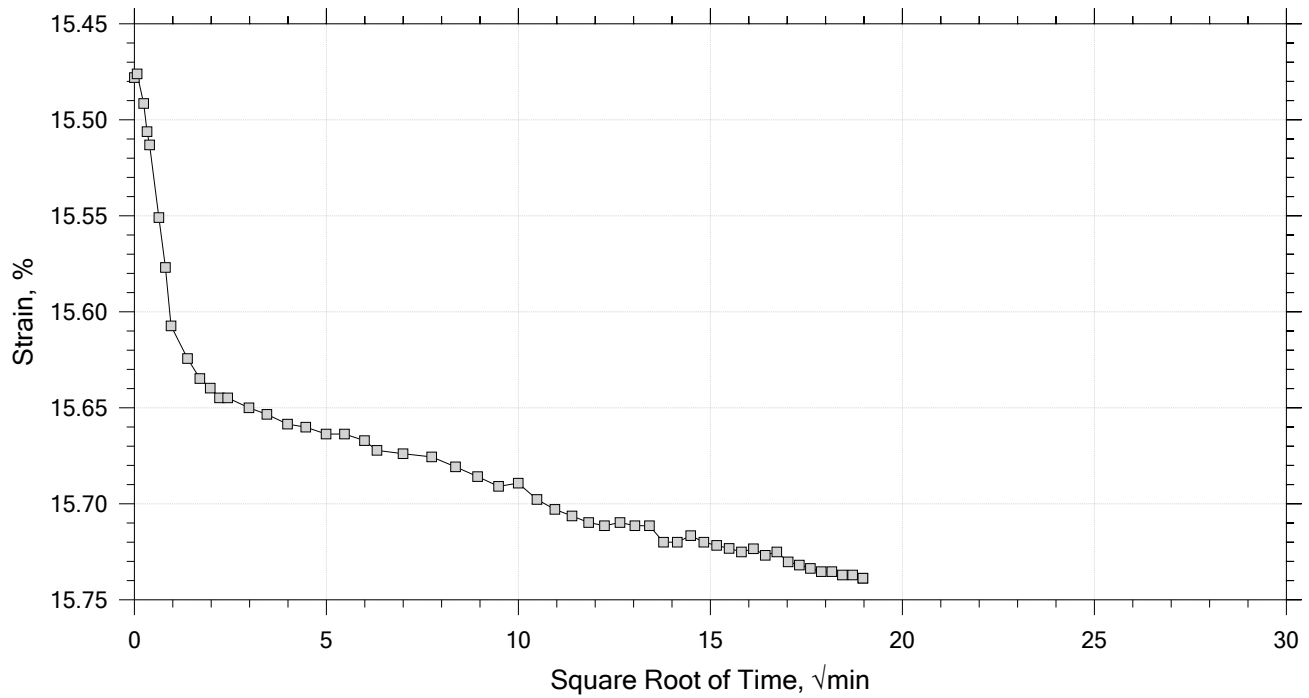
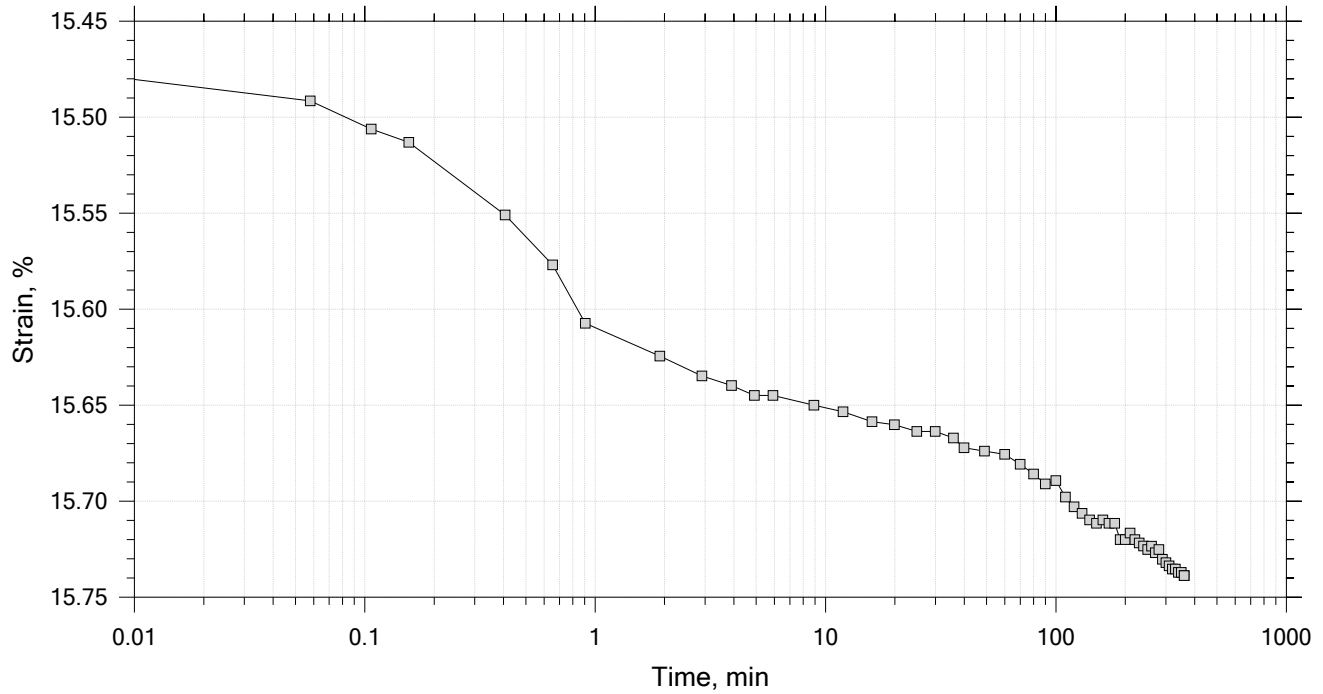
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-242A	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 03/01/21	Depth: 9-11 ft
	Test No.: IP-10	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-C, Swell Pressure = 0.0659 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 12 of 21

Constant Load Step

Stress: 2 tsf



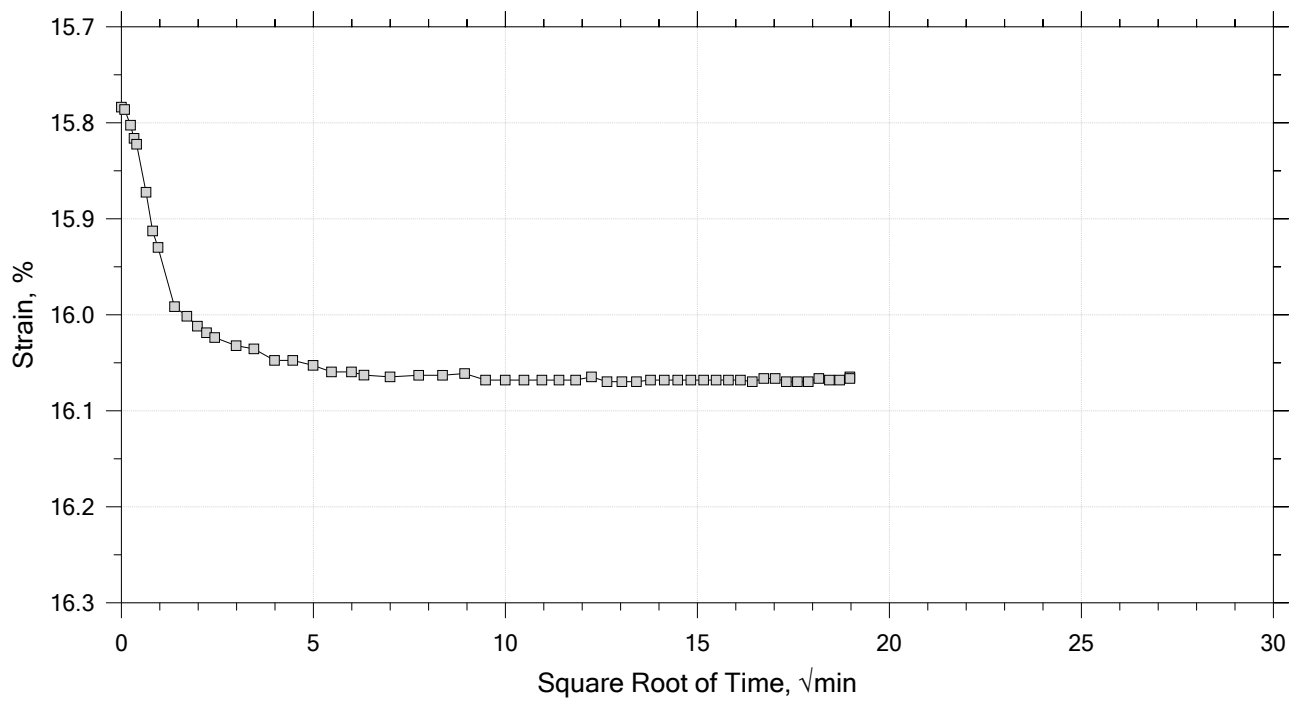
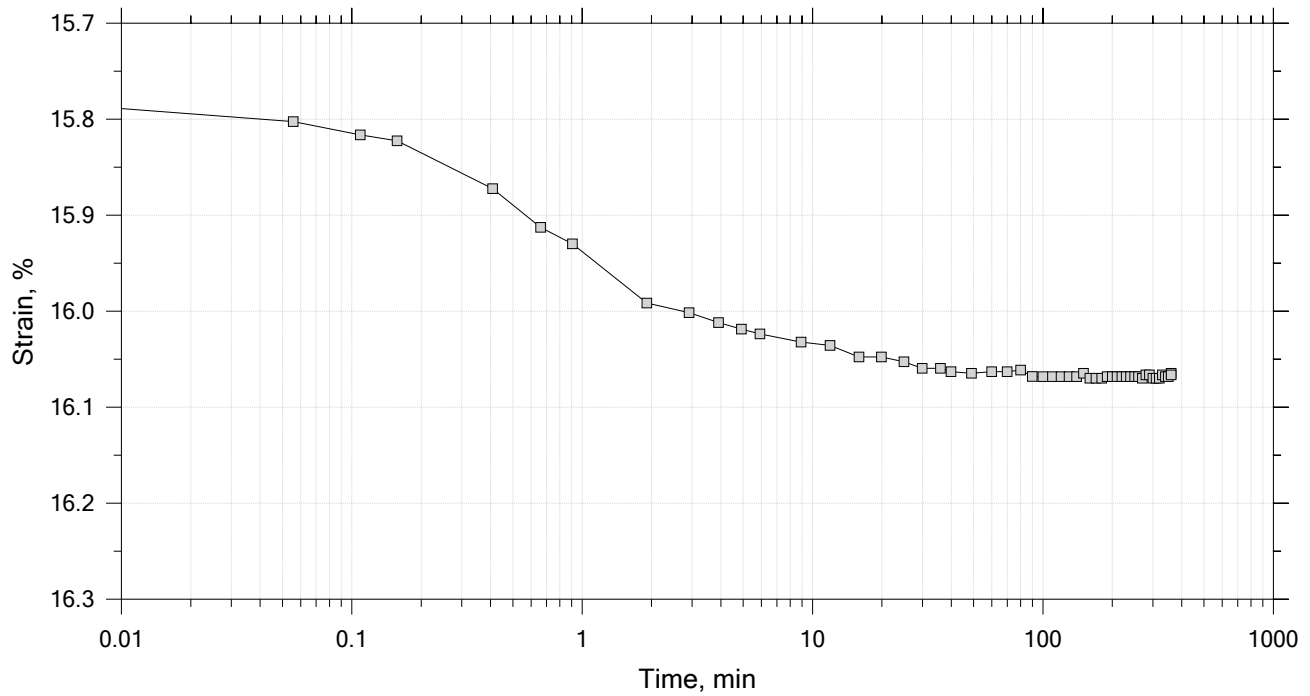
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-242A	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 03/01/21	Depth: 9-11 ft
	Test No.: IP-10	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-C, Swell Pressure = 0.0659 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 13 of 21

Constant Load Step

Stress: 4 tsf



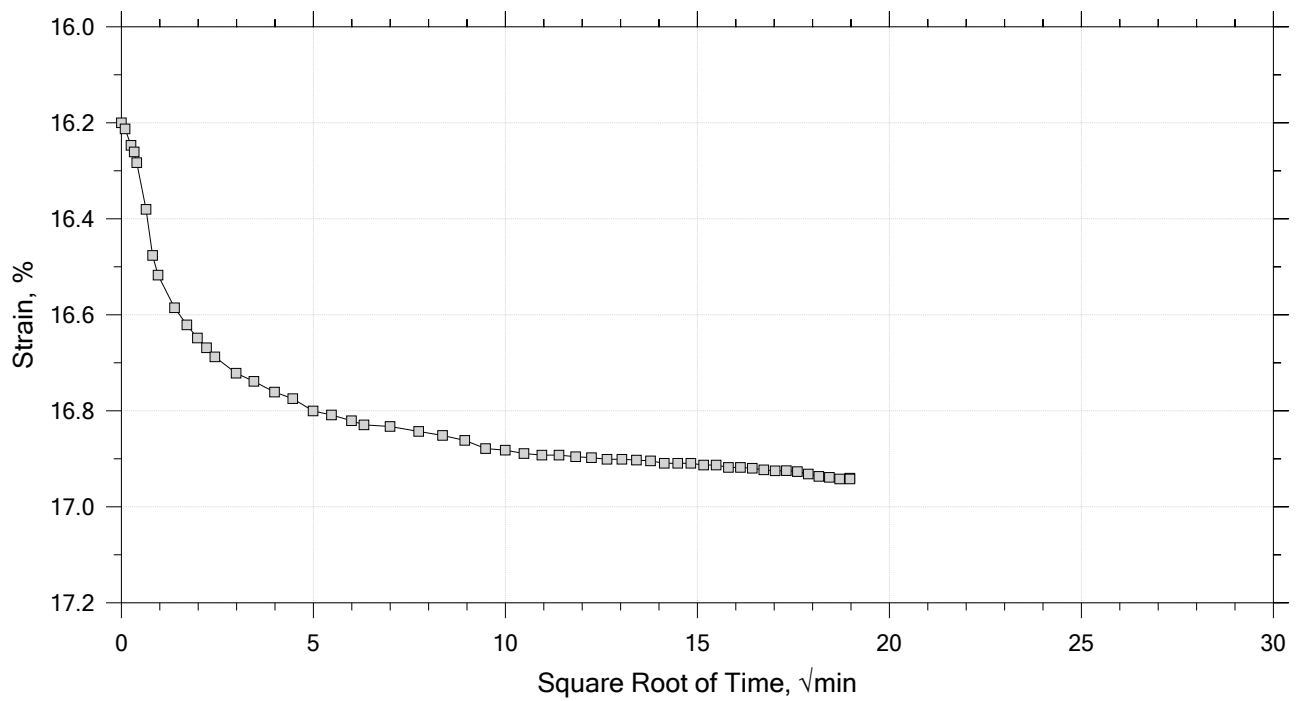
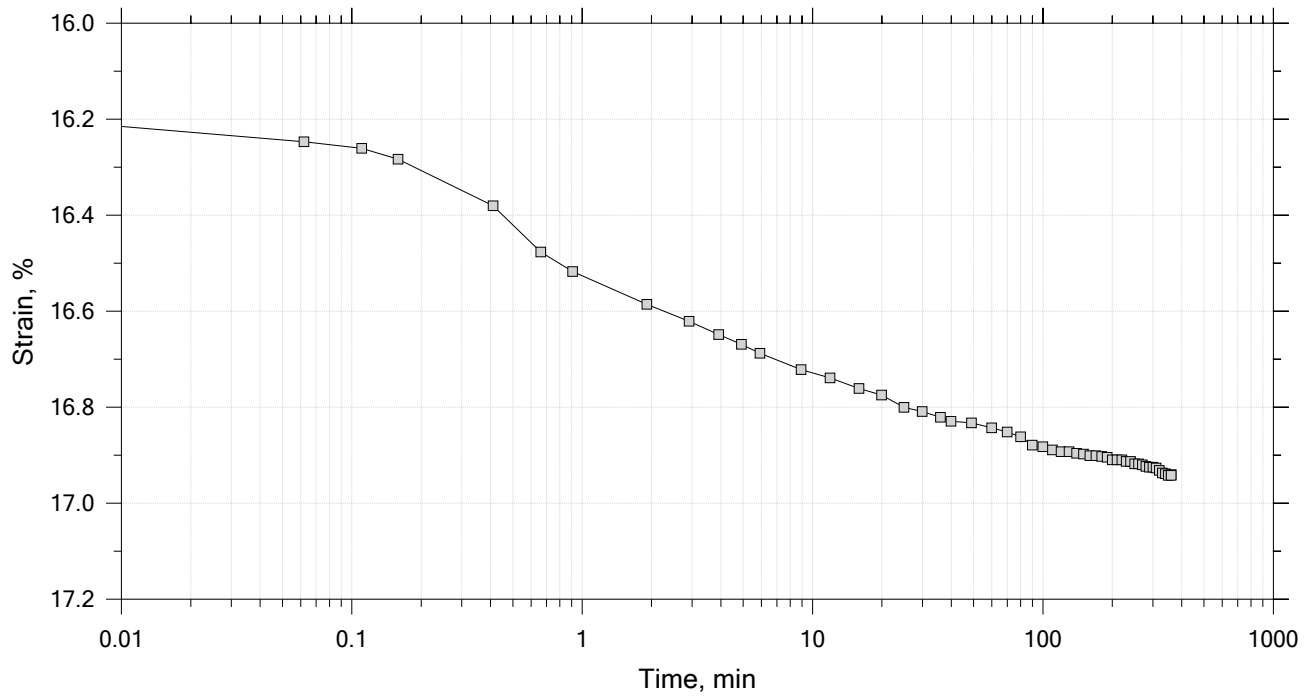
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-242A	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 03/01/21	Depth: 9-11 ft
	Test No.: IP-10	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-C, Swell Pressure = 0.0659 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 14 of 21

Constant Load Step

Stress: 8 tsf



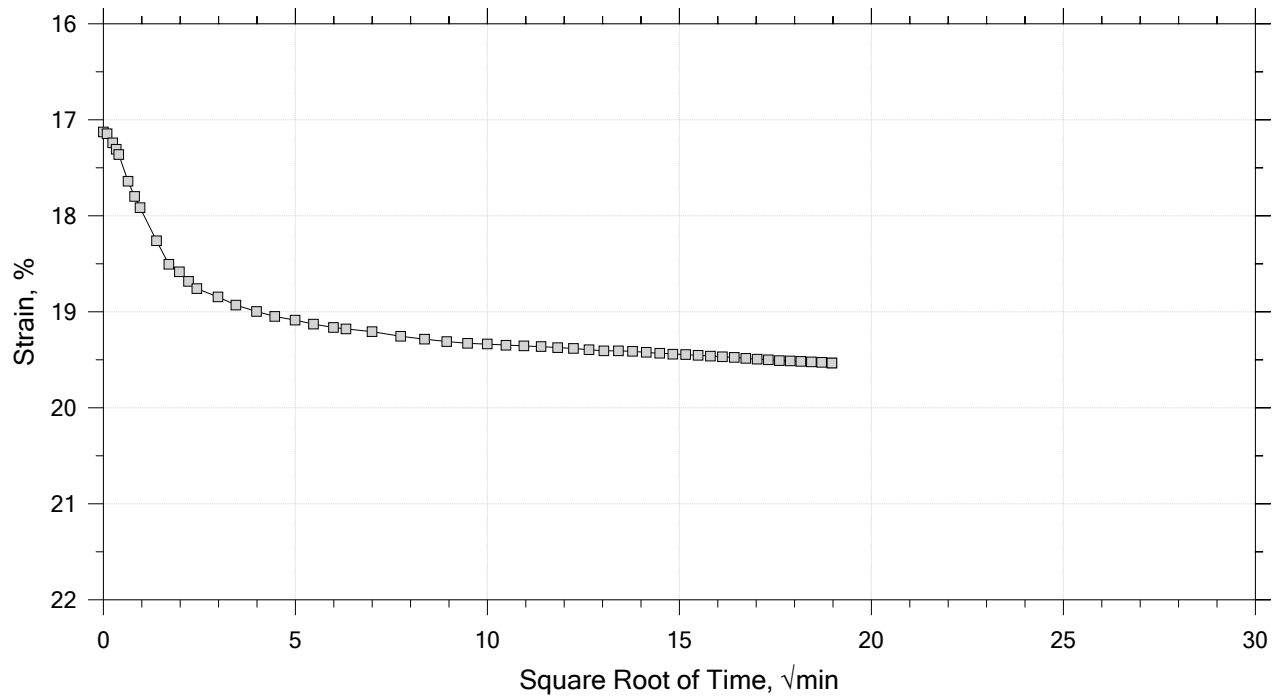
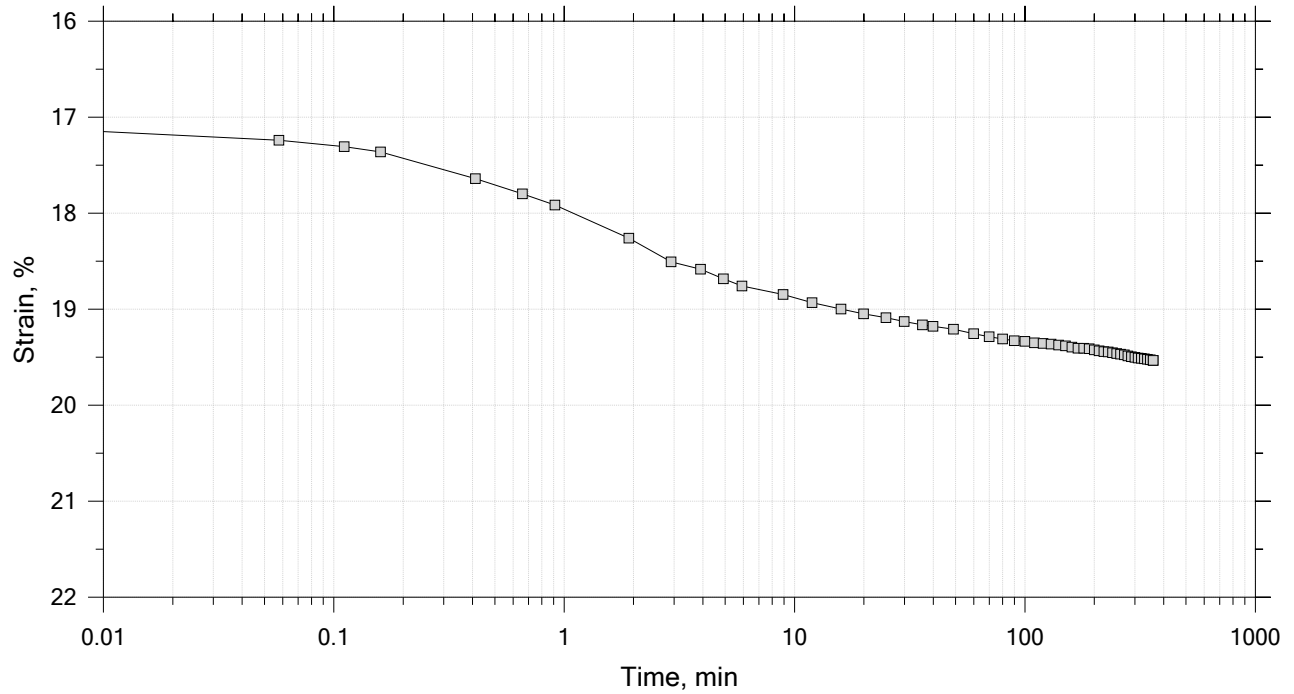
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-242A	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 03/01/21	Depth: 9-11 ft
	Test No.: IP-10	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-C, Swell Pressure = 0.0659 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 15 of 21

Constant Load Step

Stress: 16 tsf



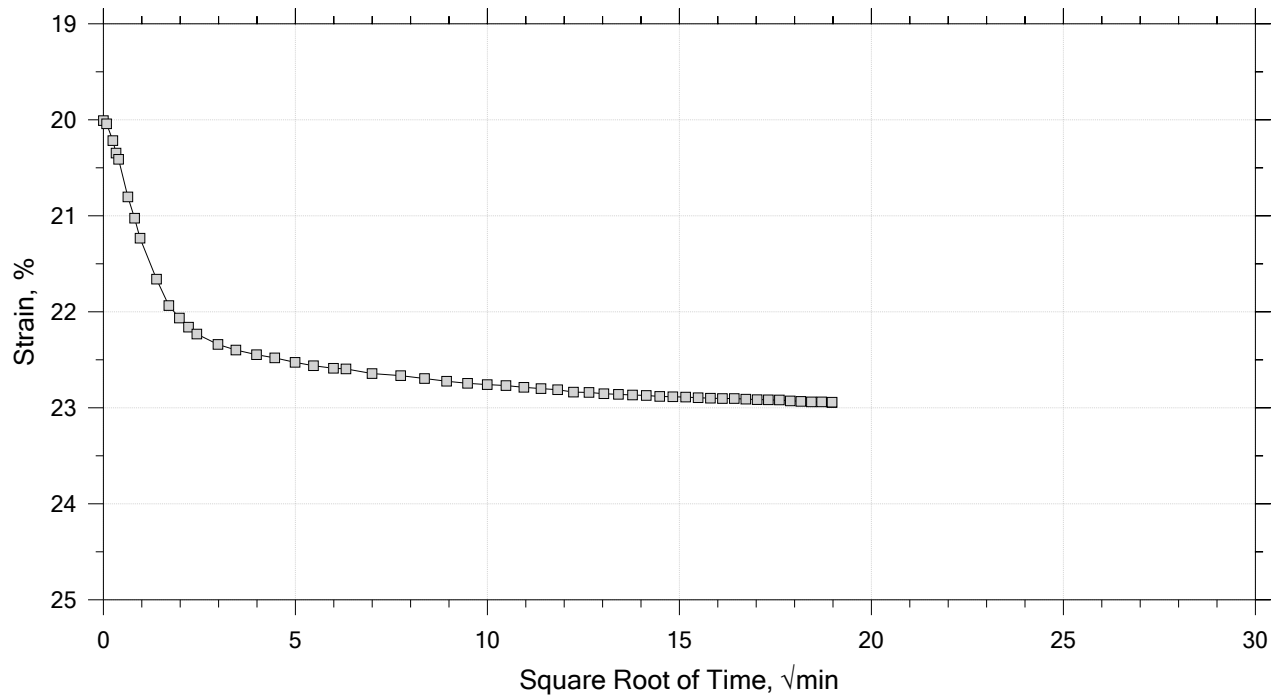
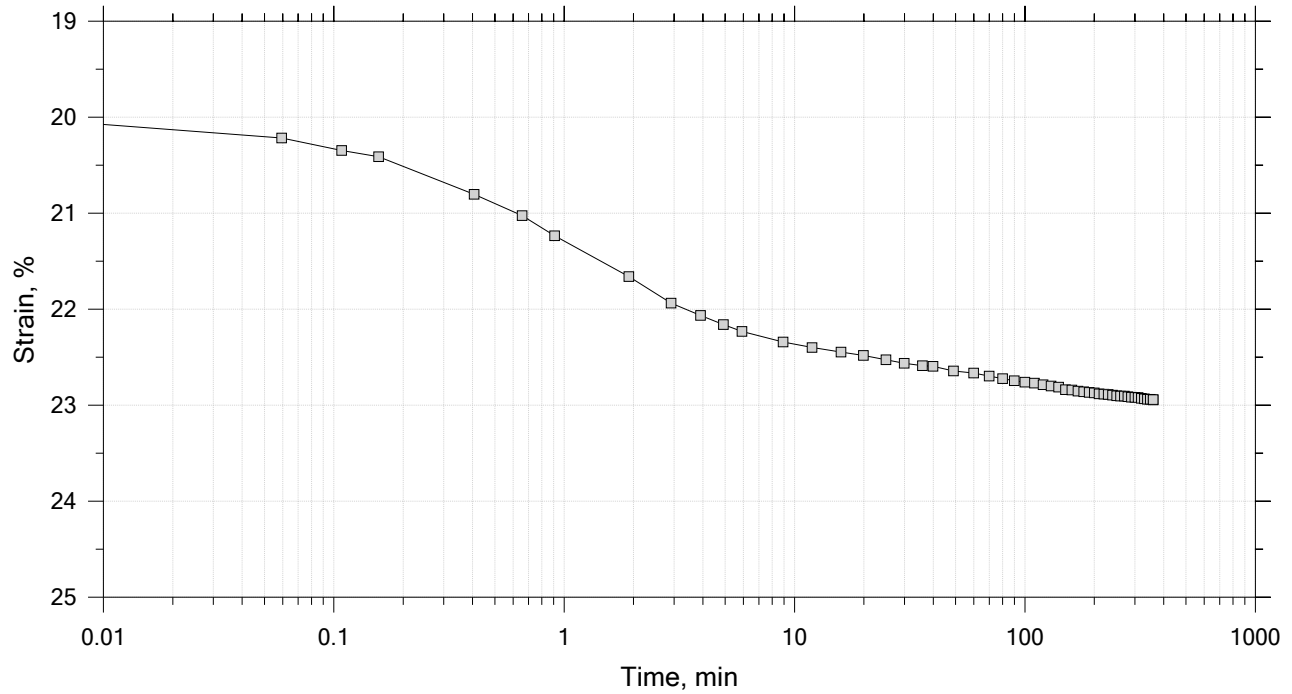
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-242A	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 03/01/21	Depth: 9-11 ft
	Test No.: IP-10	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-C, Swell Pressure = 0.0659 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 16 of 21

Constant Load Step

Stress: 32 tsf



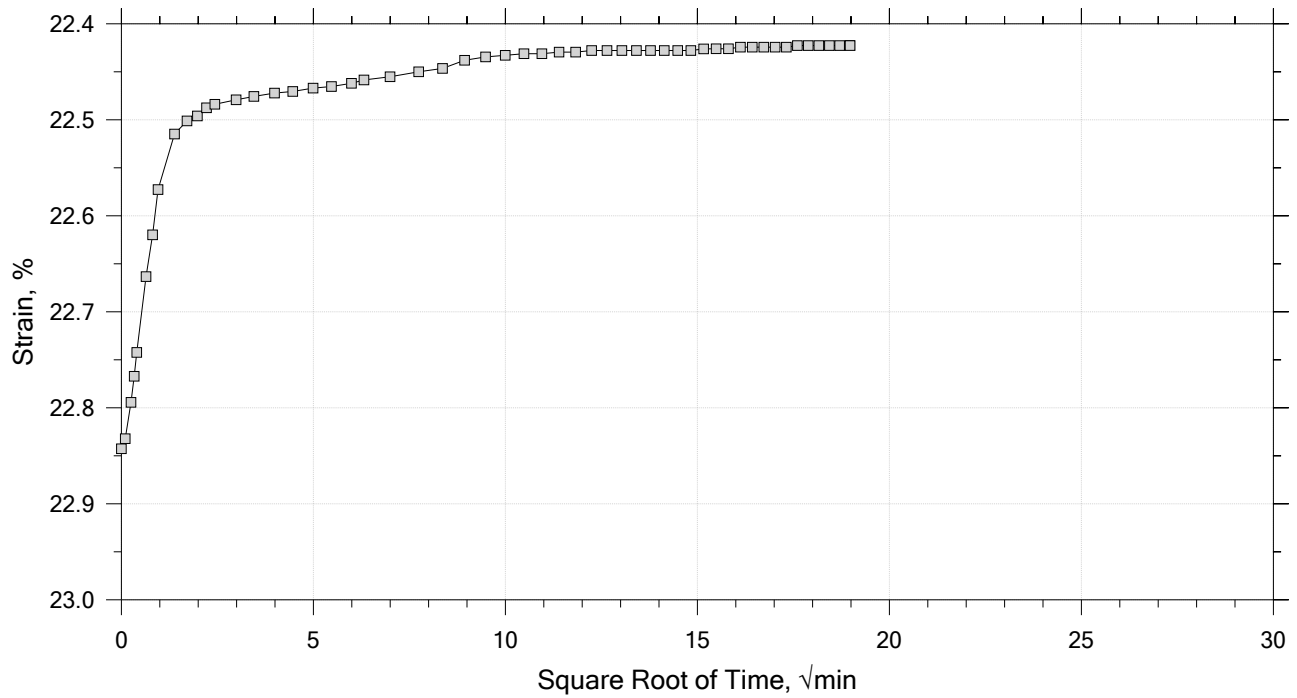
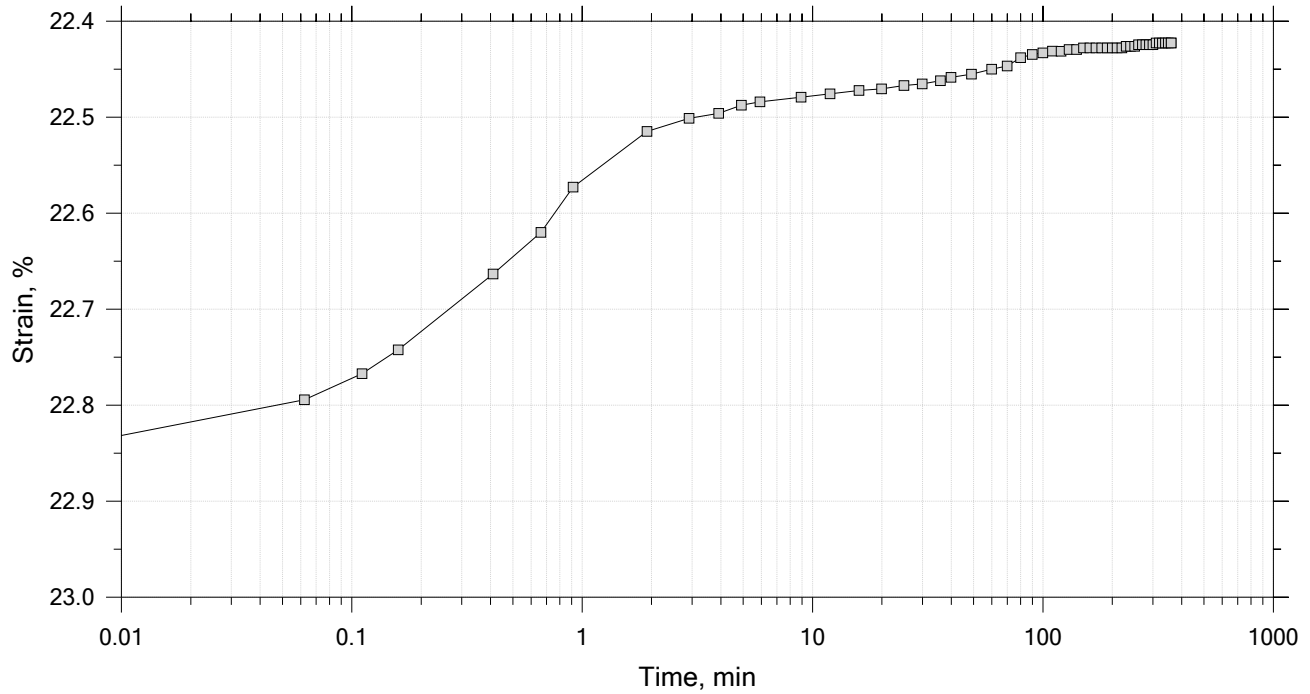
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-242A	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 03/01/21	Depth: 9-11 ft
	Test No.: IP-10	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-C, Swell Pressure = 0.0659 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 17 of 21

Constant Load Step

Stress: 8 tsf



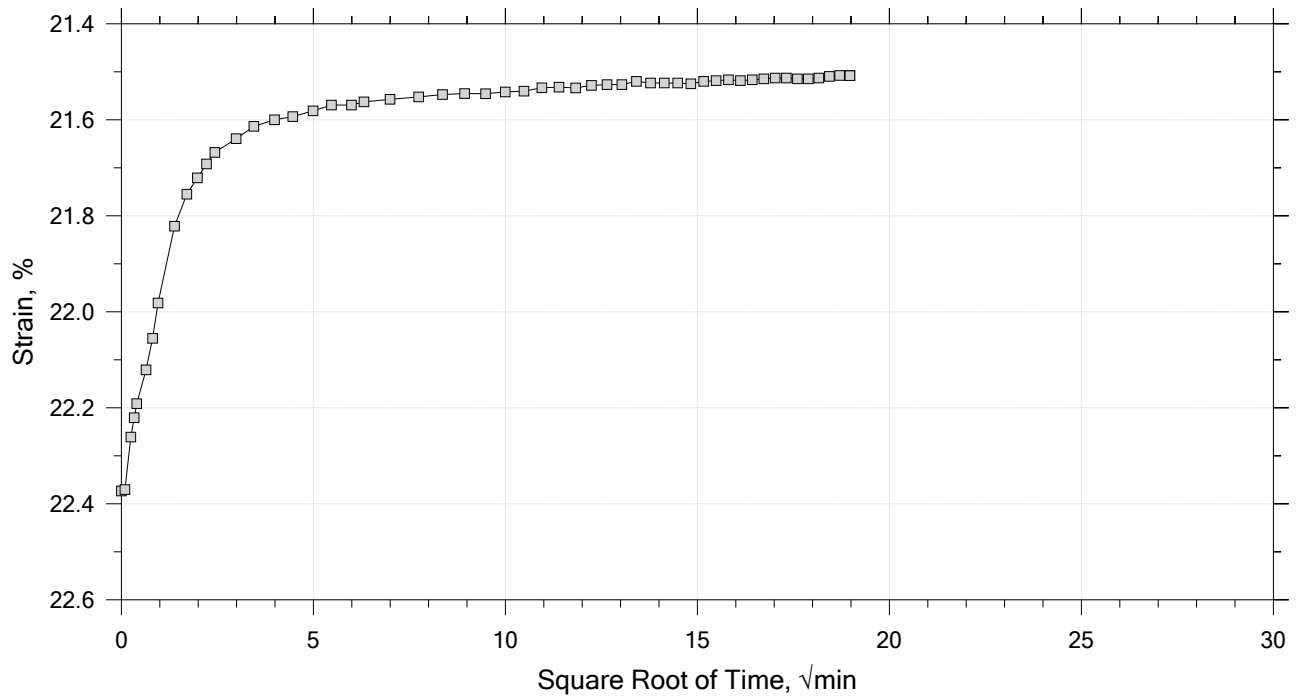
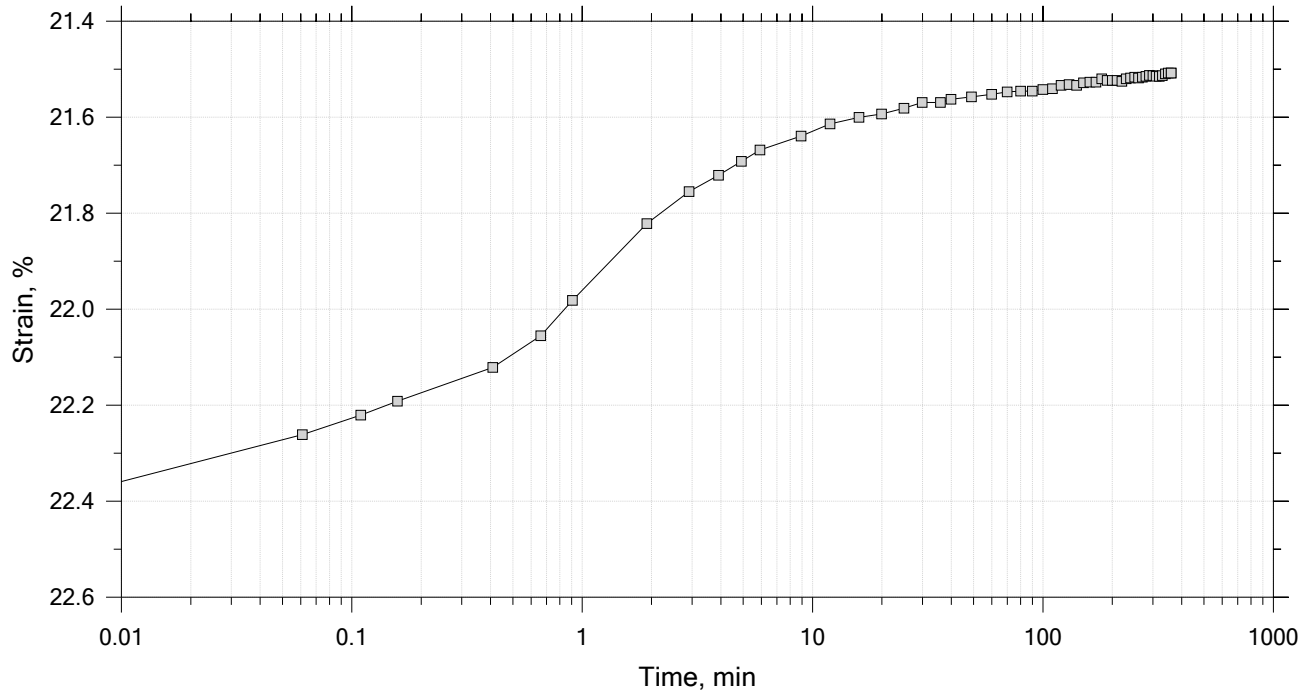
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-242A	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 03/01/21	Depth: 9-11 ft
	Test No.: IP-10	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-C, Swell Pressure = 0.0659 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 18 of 21

Constant Load Step

Stress: 2 tsf



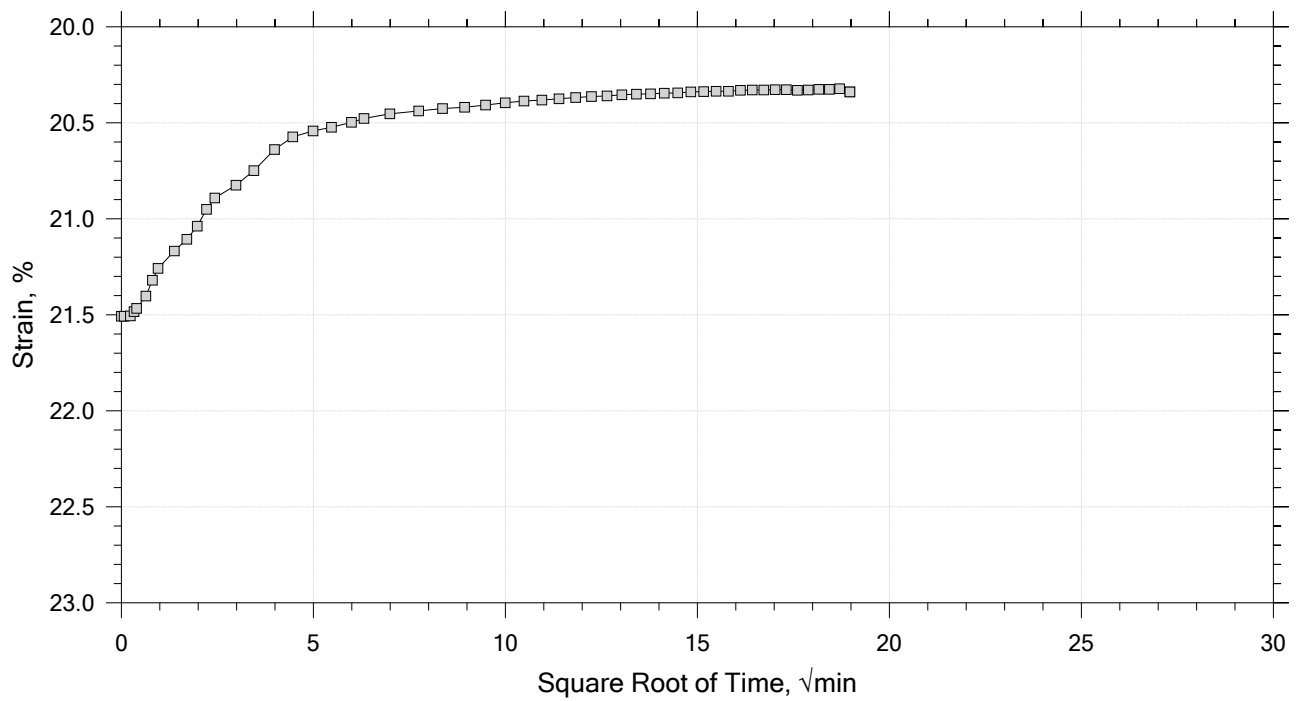
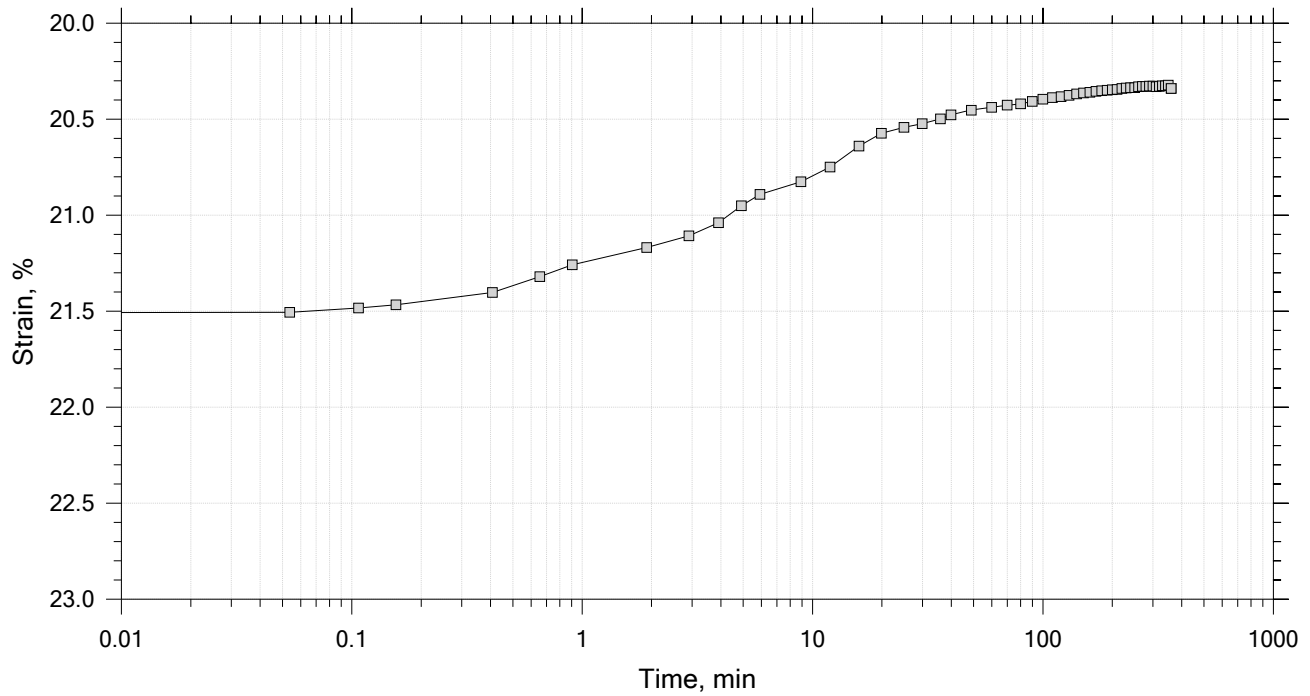
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-242A	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 03/01/21	Depth: 9-11 ft
	Test No.: IP-10	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-C, Swell Pressure = 0.0659 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 19 of 21

Constant Load Step

Stress: 0.5 tsf



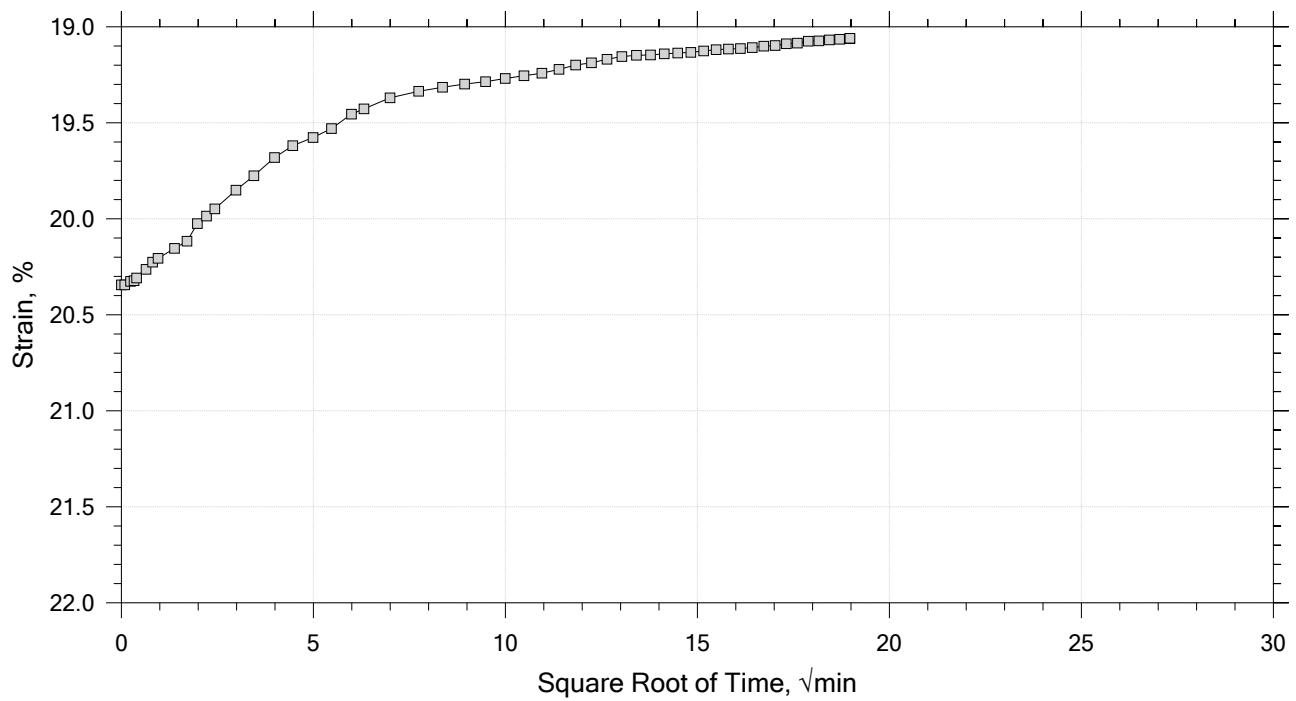
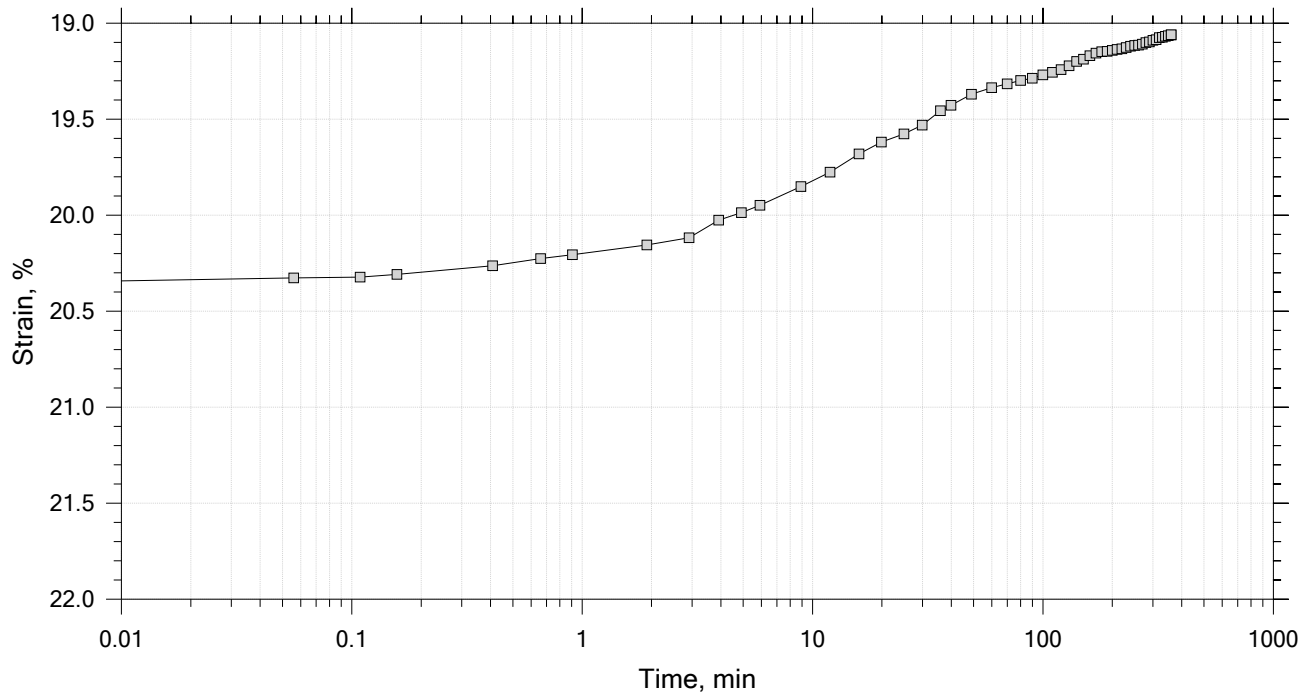
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-242A	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 03/01/21	Depth: 9-11 ft
	Test No.: IP-10	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-C, Swell Pressure = 0.0659 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 20 of 21

Constant Load Step

Stress: 0.125 tsf



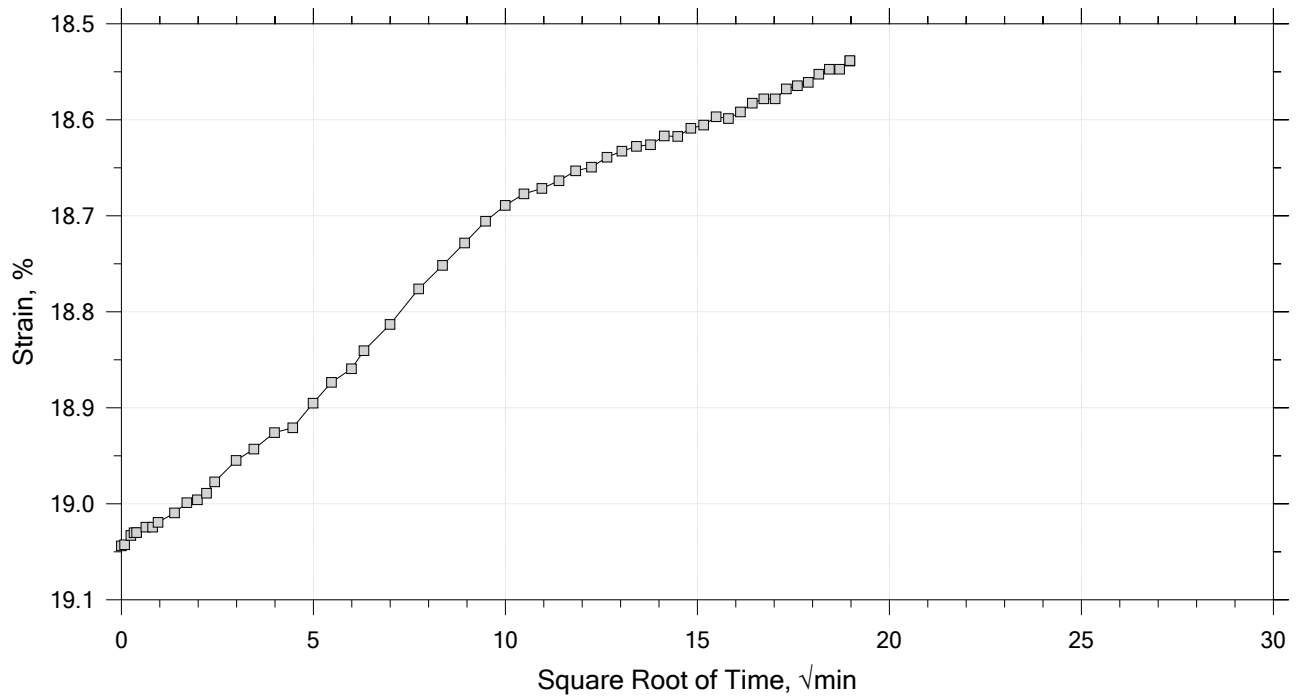
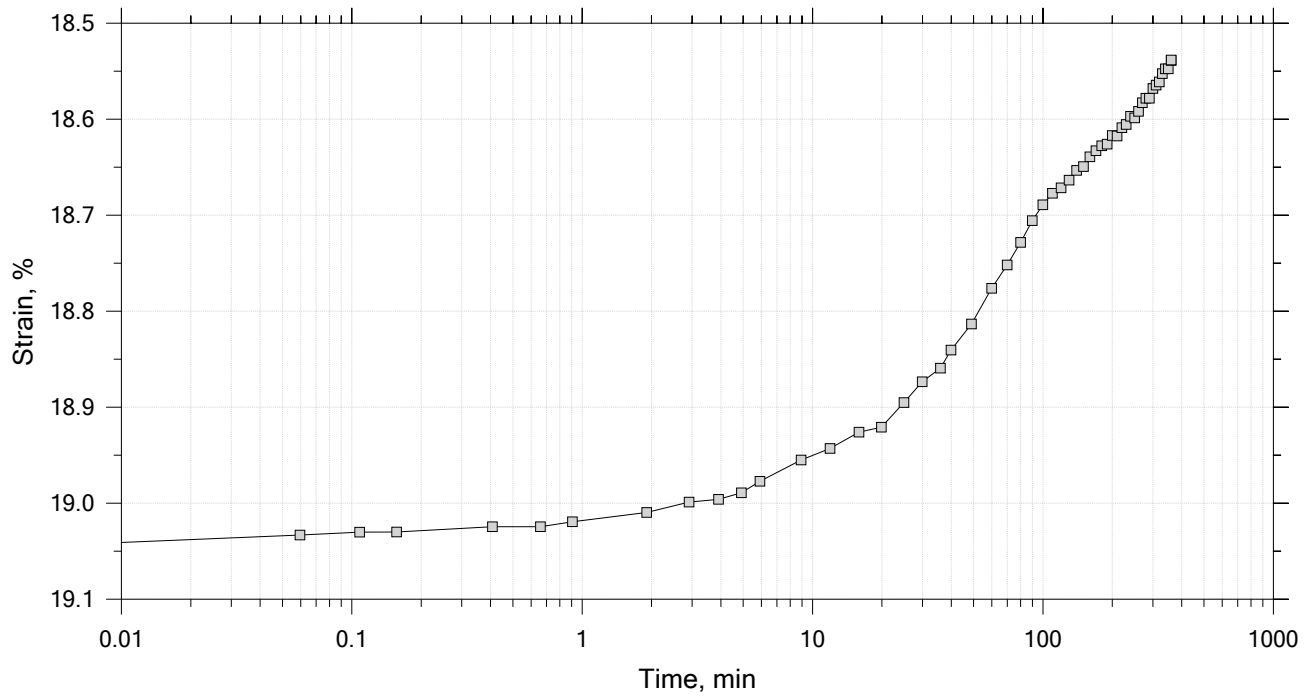
	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-242A	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 03/01/21	Depth: 9-11 ft
	Test No.: IP-10	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-C, Swell Pressure = 0.0659 tsf		


One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 21 of 21

Constant Load Step

Stress: 0.0625 tsf




	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-242A	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 03/01/21	Depth: 9-11 ft
	Test No.: IP-10	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-C, Swell Pressure = 0.0659 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Specimen Diameter: 2.50 in	Estimated Specific Gravity: 2.77	Liquid Limit: 30
Initial Height: 1.00 in	Initial Void Ratio: 0.871	Plastic Limit: 16
Final Height: 0.85 in	Final Void Ratio: 0.59	Plasticity Index: 14

	Before Test Trimmings	Before Test Specimen	After Test Specimen	After Test Trimmings
Container ID	E-1809	RING		e0652
Mass Container, gm	8.13	109.05	109.05	8.36
Mass Container + Wet Soil, gm	227.19	265.13	253.6	152.9
Mass Container + Dry Soil, gm	175.38	228.23	228.23	127.53
Mass Dry Soil, gm	167.25	119.18	119.18	119.17
Water Content, %	30.98	30.96	21.29	21.29
Void Ratio	---	0.87	0.59	---
Degree of Saturation, %	---	98.57	100.00	---
Dry Unit Weight, pcf	---	92.492	108.81	---


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

	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-242A	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 03/01/21	Depth: 9-11 ft
	Test No.: IP-10	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIII-C, Swell Pressure = 0.0659 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Square Root of Time Coefficients

[illegible]

	Project: I-395/Rte 9 Connector (Area 1)	Location: Brewer-Eddington, ME	Project No.: GTX-312665
	Boring No.: HB-BE-242A	Tested By: md	Checked By: mcm
	Sample No.: U1	Test Date: 03/01/21	Depth: 9-11 ft
	Test No.: IP-10	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System LTIll-C, Swell Pressure = 0.0659 tsf		
	Displacement at End of Increment		



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

Client: Haley & Aldrich, Inc. GTX#: 313196
Project Name: I-395/Rte 9 Connector (Area 2) Test Date: 3/17/21
Project Location: Brewer-Eddington, ME

Boring ID: BB-BEB-202
Sample ID: U2
Depth, ft: 15-17

Visual Description: Wet, gray clay

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

Test Condition: Inundated prior to consolidation

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

Parameter	Point 1	Point 2	Point 3	Point 4	Point 5
Test No.	DSS-1				
Initial Moisture Content, %	36.5				
Initial Dry Density, pcf	79.6				
Nominal Rate of Shear Strain, %/hr	5.0				
Vertical Consolidation Stress, psi	5.13				
Final Moisture Content, %	35.9				
Measured Peak Shear Stress, psi	3.09				
Shear Strain at Peak Shear Stress, %	20.0				
Membrane Correction, psi	0.34				
Corrected Peak Shear Stress, psi	2.75				
S_u / σ'_{vc}	0.54				

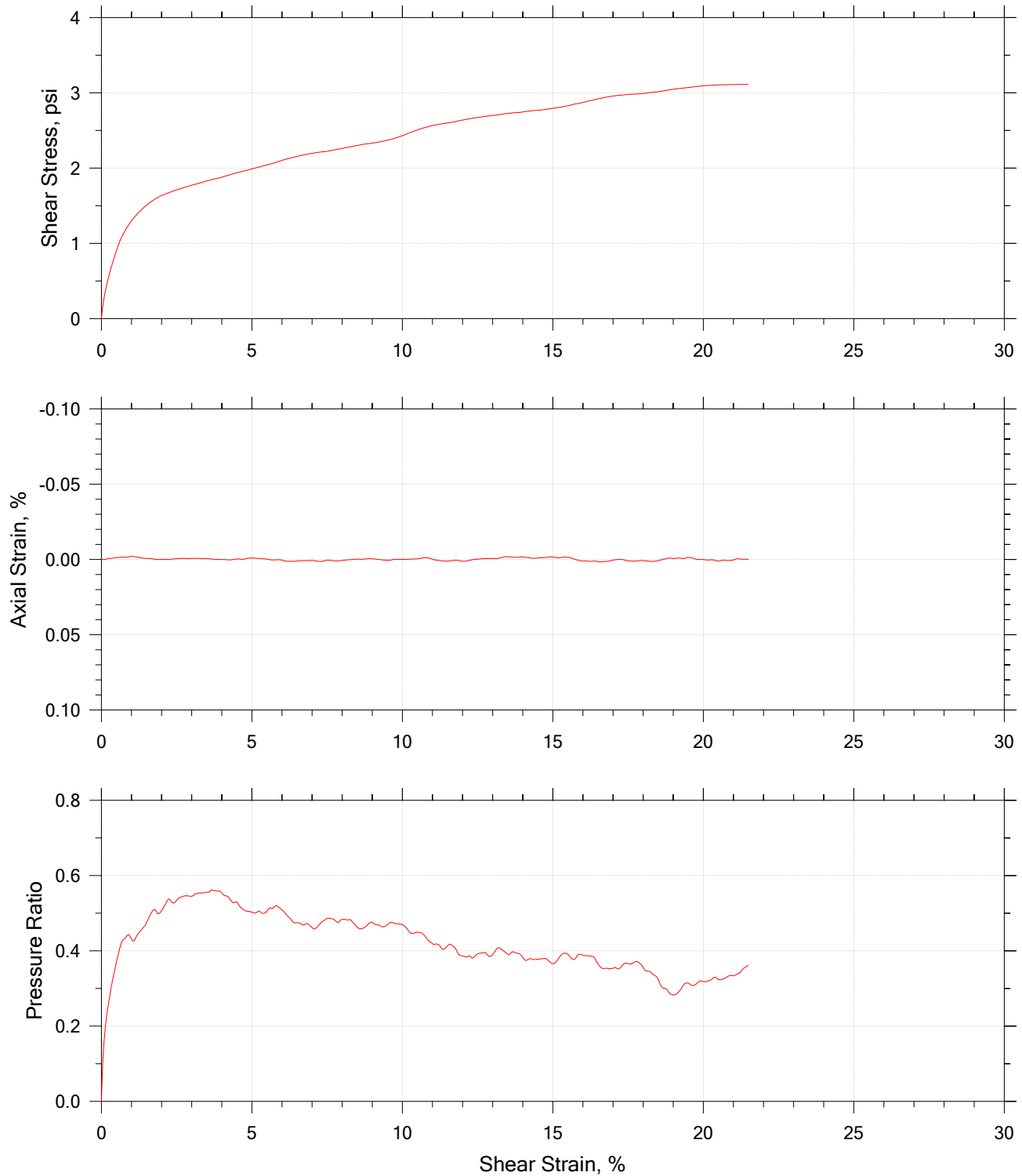
Comments: Failure taken at peak prior to or at 20% strain, per ASTM D6528.


Tested By: md
njh

Checked By:

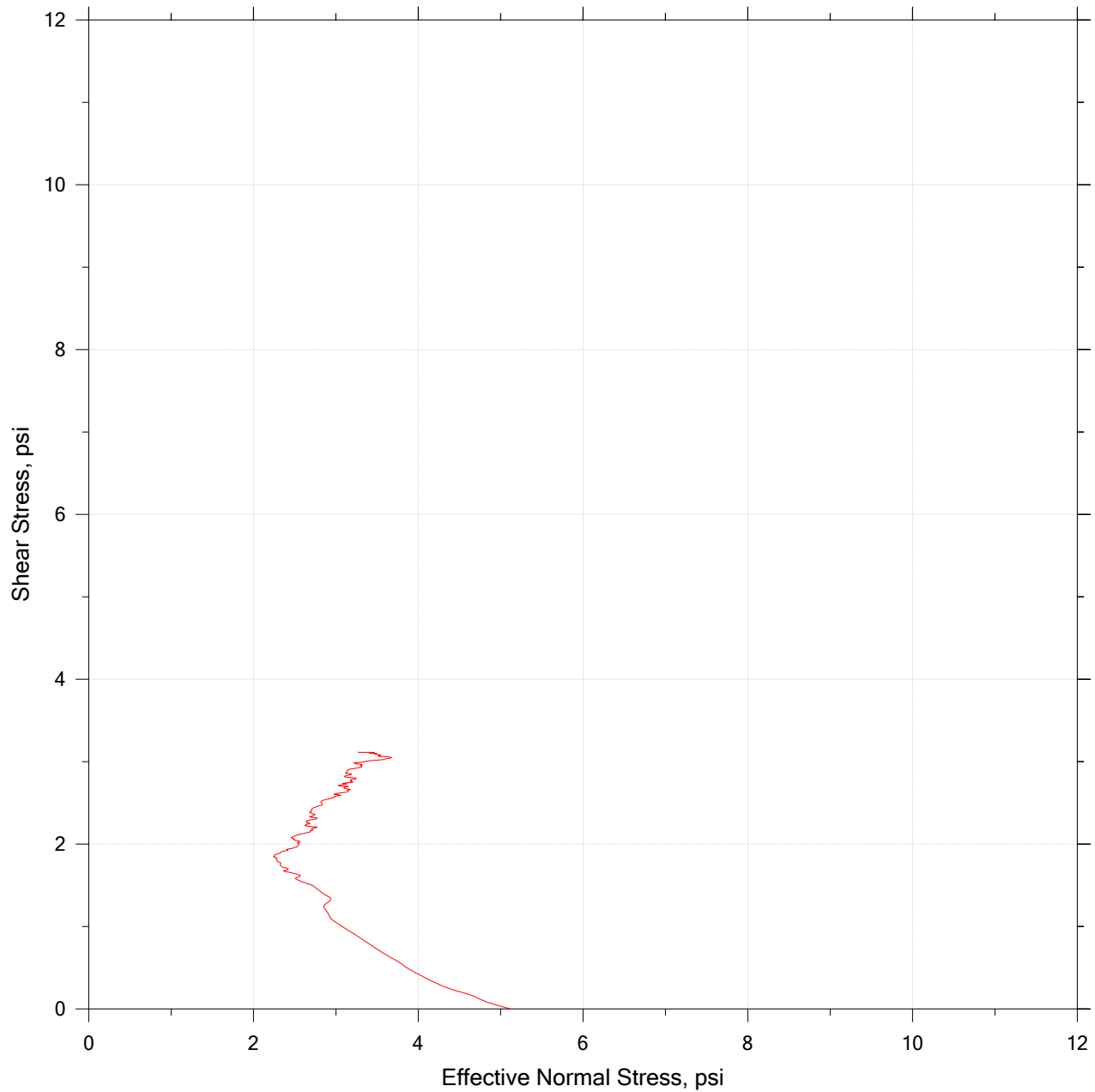
Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.


Direct Simple Shear Test



	Project Name: I-395/Rte 9 Connector (Area 2)	Location: Brewer-Eddington, ME	Project Number: GTX-313196
	Boring Number: BB-BEB-202	Tester: md	Checker: njh
	Sample Number: U2	Test Date: 03/17/21	Depth: 15-17 ft
	Test Number: DSS-1	Preparation: intact	Elevation: ---
	Description: Wet, gray clay		
	Remarks:		

Direct Simple Shear Test



	Project Name: I-395/Rte 9 Connector (Area 2)	Location: Brewer-Eddington, ME	Project Number: GTX-313196
	Boring Number: BB-BEB-202	Tester: md	Checker: njh
	Sample Number: U2	Test Date: 03/17/21	Depth: 15-17 ft
	Test Number: DSS-1	Preparation: intact	Elevation: ---
	Description: Wet, gray clay		
	Remarks:		



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

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

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

Visual Description: Wet, gray clay

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

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

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

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

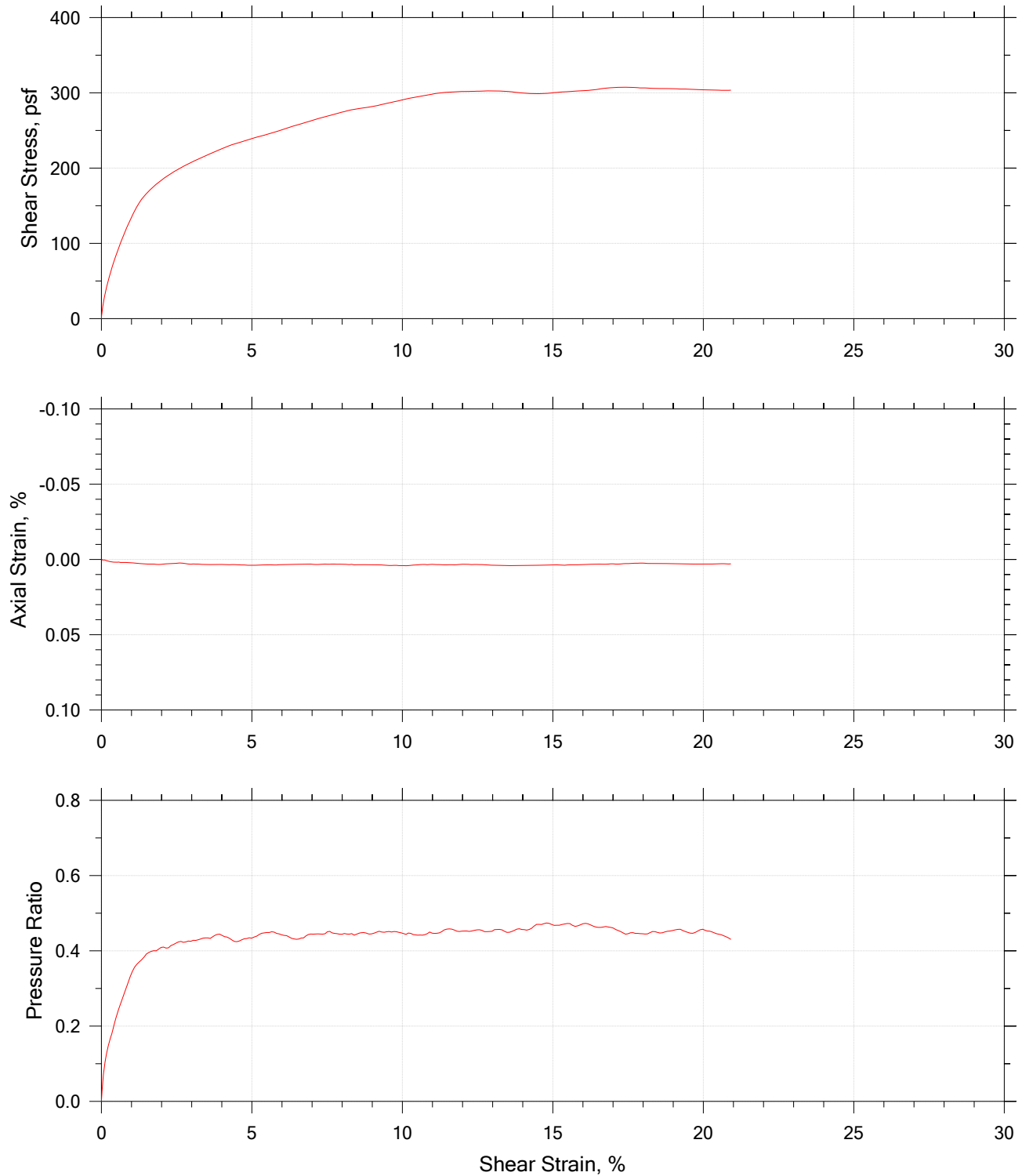
Comments: Failure taken at peak prior to or at 20% strain, per ASTM D6528.


Tested By: md

Checked By: njh

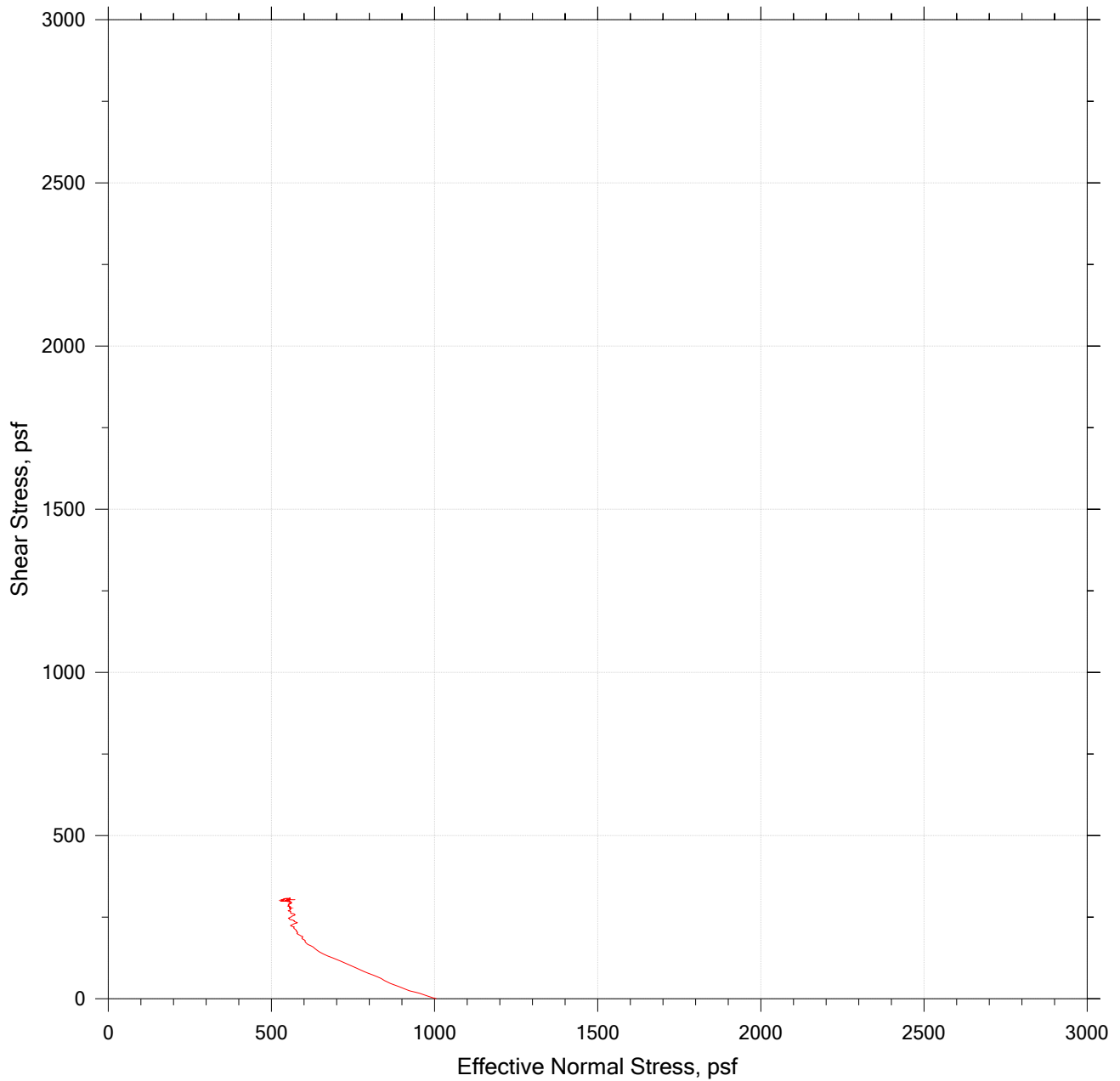
Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.


Direct Simple Shear Test



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

Direct Simple Shear Test



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



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

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

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

Visual Description: Moist, gray clay

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

Test Condition: Inundated prior to consolidating to 626.1 psf.

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

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

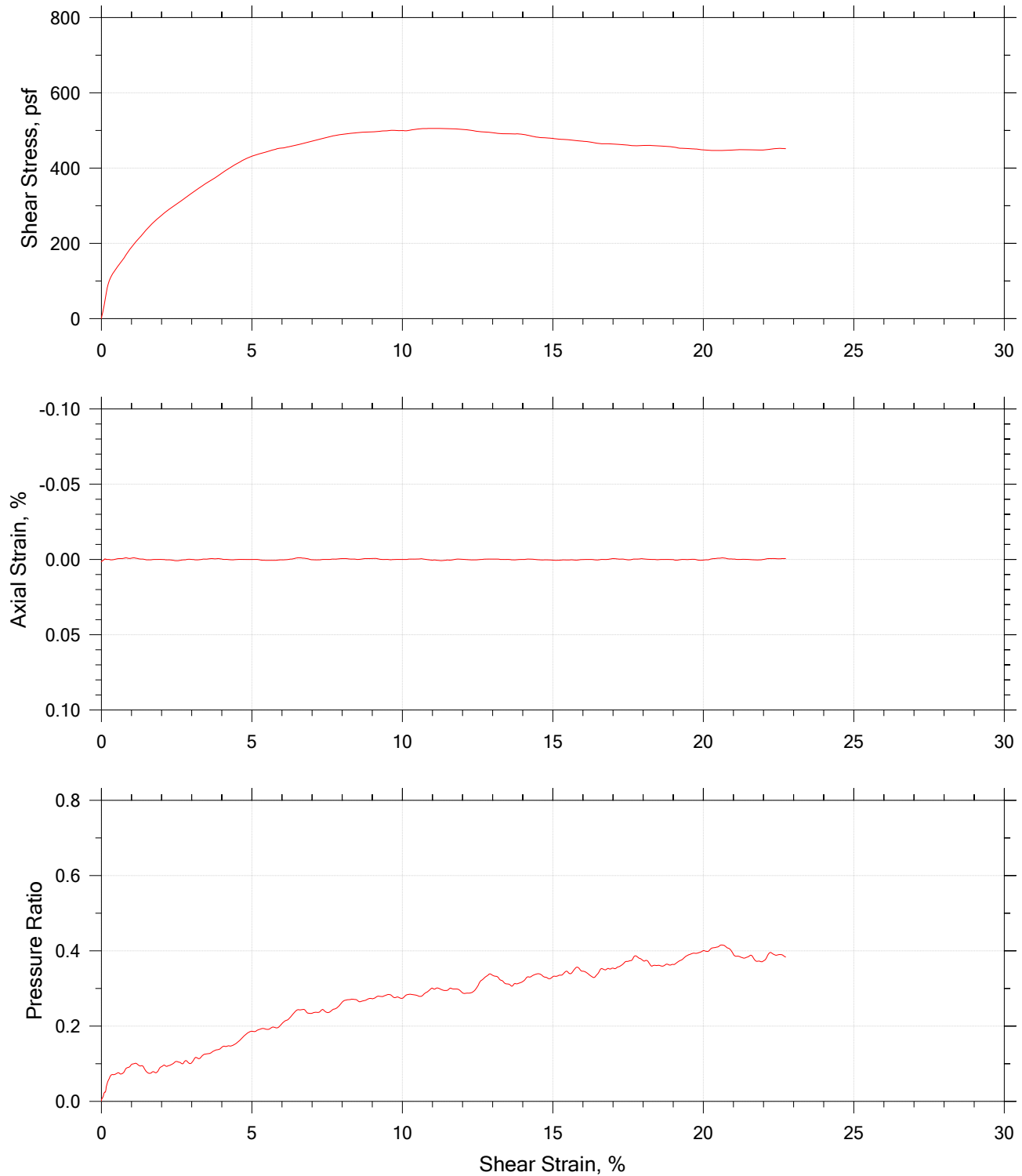
Comments: Failure taken at peak prior to or at 20% strain, per ASTM D6528.


Tested By: md

Checked By: njh

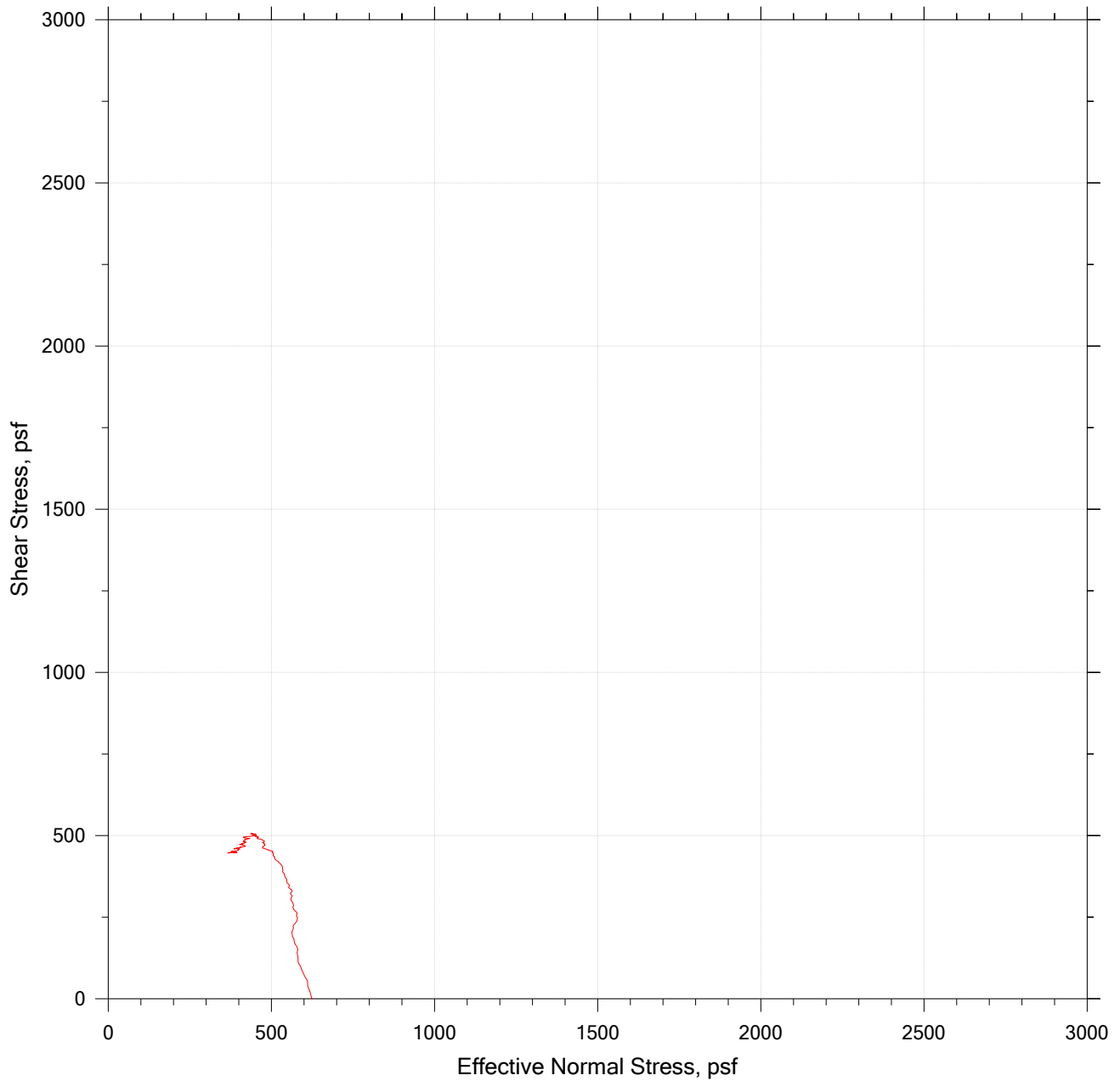
Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.


Direct Simple Shear Test



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

Direct Simple Shear Test



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



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

Client: Haley & Aldrich, Inc. GTX#: 312665
Project Name: I-395/Rte 9 Connector (Area 1) Test Date: 3/10/21
Project Location: Brewer-Eddington, ME

Boring ID: HB-BE-202
Sample ID: U2
Depth, ft: 18-20

Visual Description: Moist, gray clay

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

Test Condition: Inundated prior to consolidating to 1,668.4 psf.

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

Parameter	Point 1	Point 2	Point 3	Point 4	Point 5
Test No.	DSS-4				
Initial Moisture Content, %	39.0				
Initial Dry Density, pcf	74.7				
Nominal Rate of Shear Strain, %/hr	5.0				
Maximum Vertical Consolidation Stress, psf	1,668.4				
Final Moisture Content, %	38.5				
Measured Peak Shear Stress, psf	387.5				
Shear Strain at Peak Shear Stress, %	15.8				
Membrane Correction, psf	55				
Corrected Peak Shear Stress, psf	332.5				
S_u / σ'_{vc}	0.20				

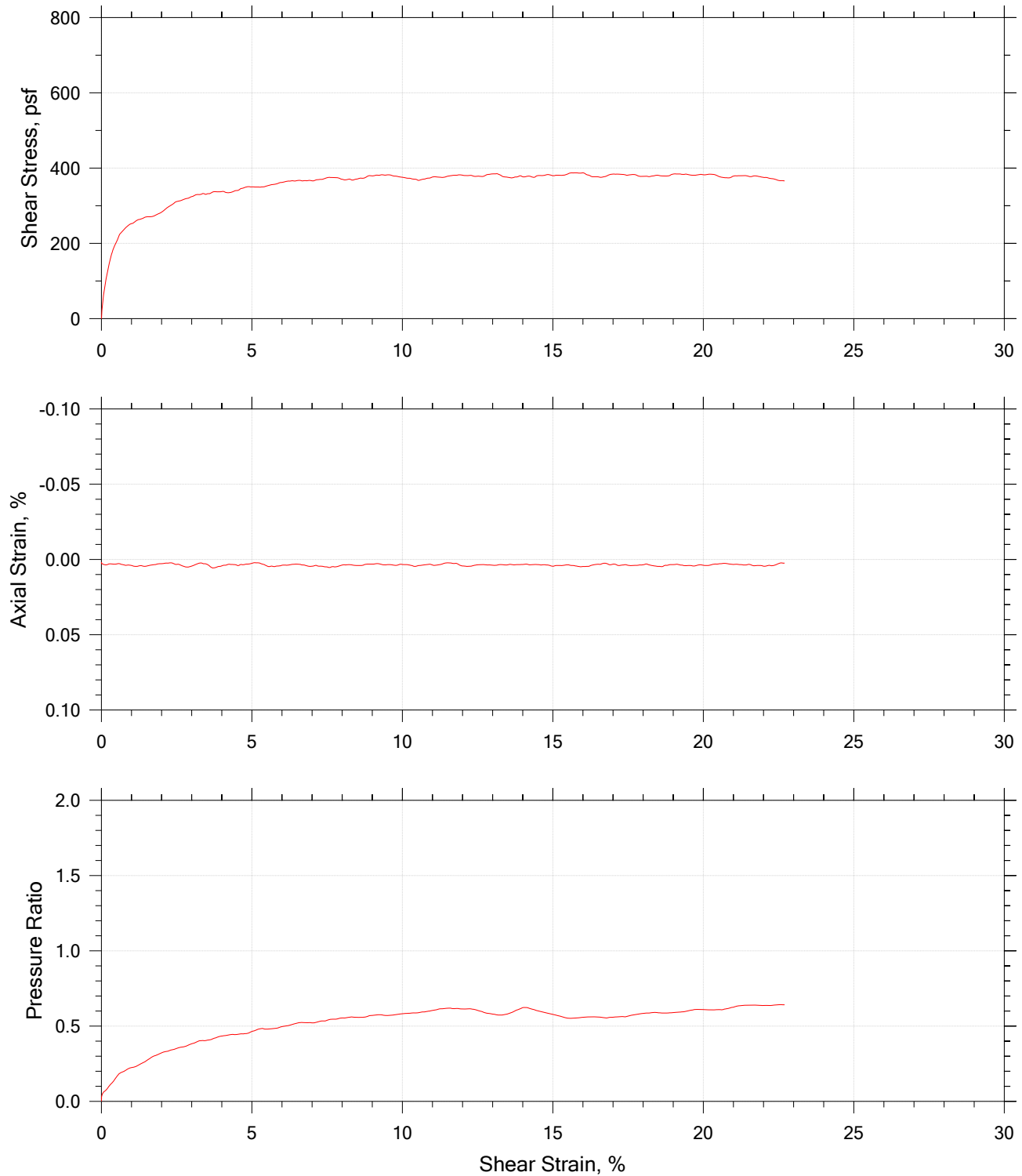
Comments: Failure taken at peak prior to or at 20% strain, per ASTM D6528.


Tested By: md

Checked By: njh

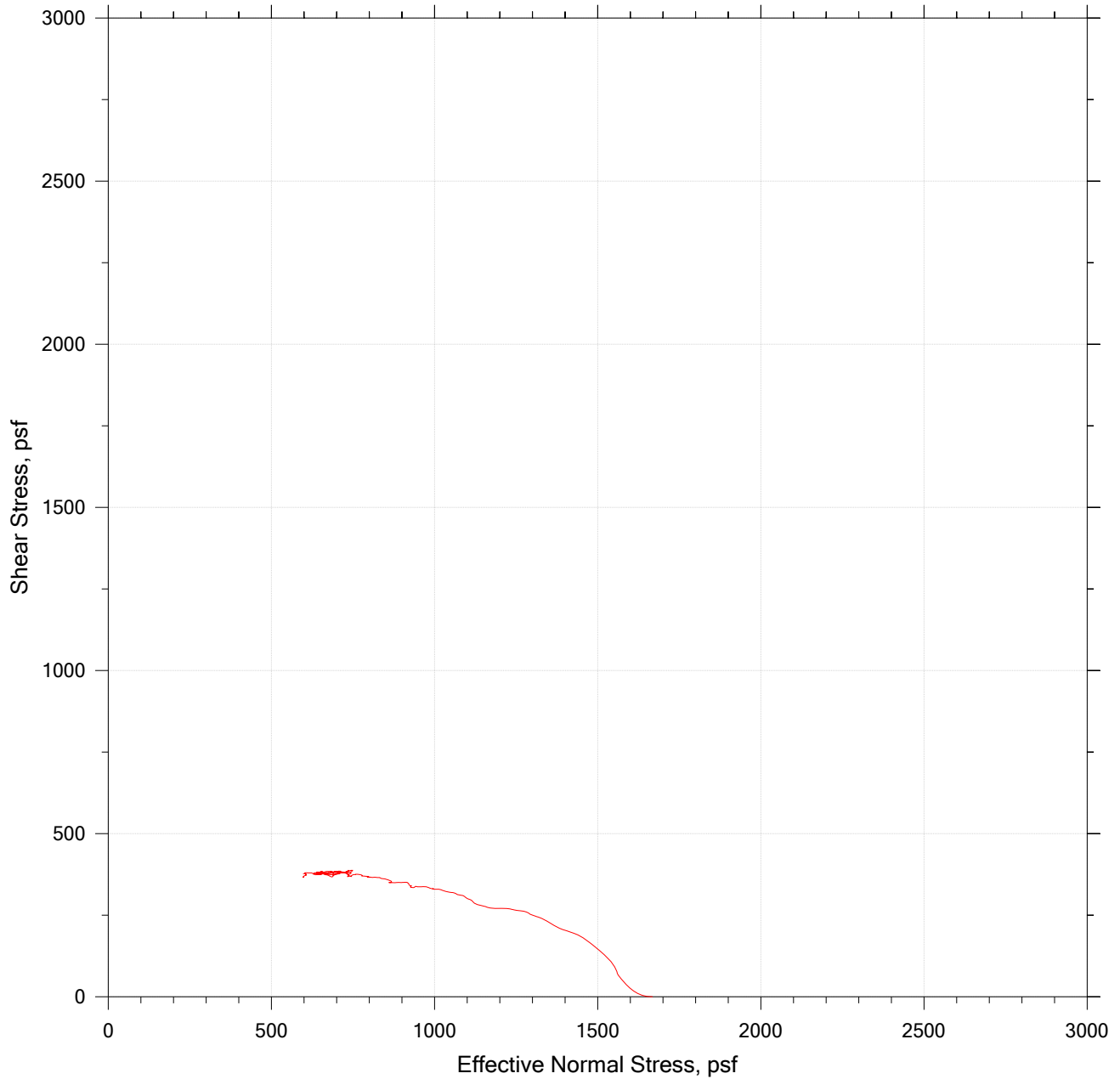
Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.


Direct Simple Shear Test



	Project Name: I-395/Rte 9 Connector	Location: Brewer-Eddington, ME	Project Number: GTX-312665
	Boring Number: HB-BE-202	Tester: md	Checker: njh
	Sample Number: U2	Test Date: 03/10/21	Depth: 18-20 ft
	Test Number: DSS-4	Preparation: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System GG		

Direct Simple Shear Test



	Project Name: I-395/Rte 9 Connector	Location: Brewer-Eddington, ME	Project Number: GTX-312665
	Boring Number: HB-BE-202	Tester: md	Checker: njh
	Sample Number: U2	Test Date: 03/10/21	Depth: 18-20 ft
	Test Number: DSS-4	Preparation: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System GG		



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

Client: Haley & Aldrich, Inc. GTX#: 312665
Project Name: I-395/Rte 9 Connector (Area 1) Test Date: 3/8/21
Project Location: Brewer-Eddington, ME

Boring ID: HB-BE-208
Sample ID: U1
Depth, ft: 10-12

Visual Description: Moist, gray and olive yellow clay

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

Test Condition: Inundated prior to consolidating to 1,056.6 psf.

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

Parameter	Point 1	Point 2	Point 3	Point 4	Point 5
Test No.	DSS-3				
Initial Moisture Content, %	31.8				
Initial Dry Density, pcf	84.0				
Nominal Rate of Shear Strain, %/hr	5.0				
Maximum Vertical Consolidation Stress, psf	1,056.6				
Final Moisture Content, %	32.3				
Measured Peak Shear Stress, psf	398.9				
Shear Strain at Peak Shear Stress, %	20.0				
Membrane Correction, psf	49				
Corrected Peak Shear Stress, psf	349.9				
S_u / σ'_{vc}	0.33				

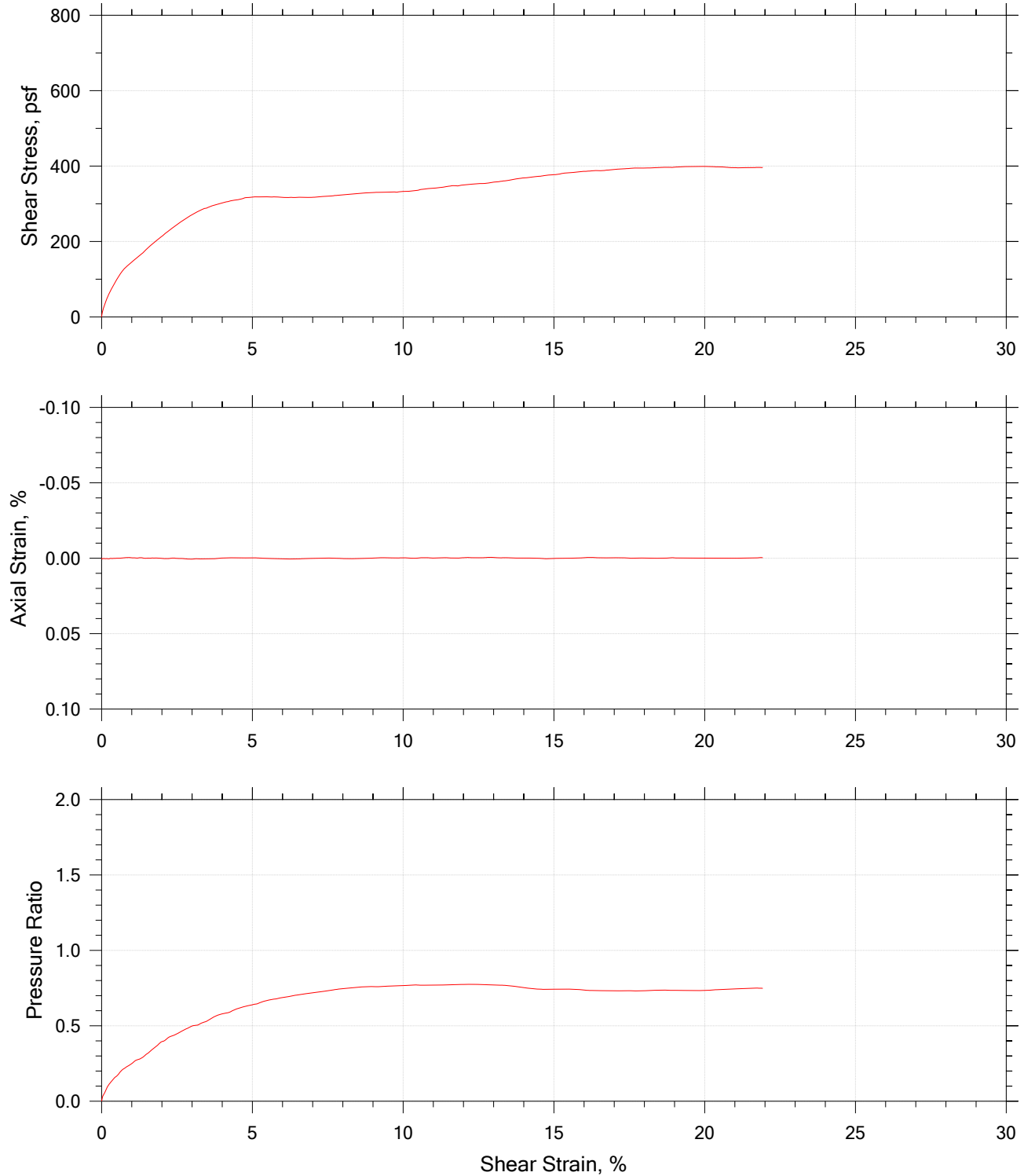
Comments: Failure taken at peak prior to or at 20% strain, per ASTM D6528.


Tested By: md

Checked By: njh

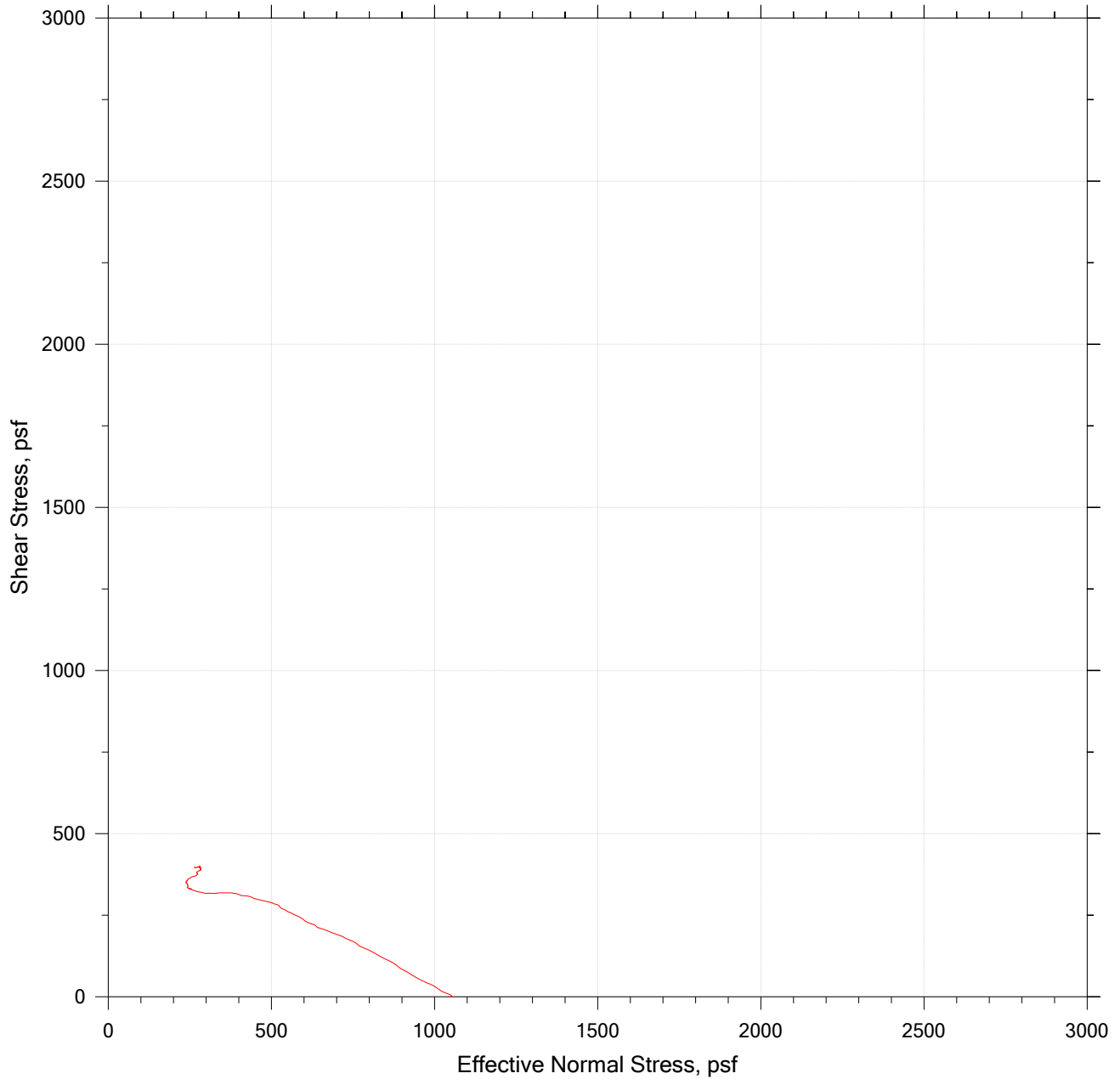
Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.


Direct Simple Shear Test



	Project Name: I-395/Rte 9 Connector	Location: Brewer-Eddington, ME	Project Number: GTX-312665
	Boring Number: HB-BE-208	Tester: md	Checker: njh
	Sample Number: U1	Test Date: 03/08/21	Depth: 10-12 ft
	Test Number: DSS-3	Preparation: intact	Elevation: ---
	Description: Moist, gray and olive yellow clay		
	Remarks: System GG		

Direct Simple Shear Test



	Project Name: I-395/Rte 9 Connector	Location: Brewer-Eddington, ME	Project Number: GTX-312665
	Boring Number: HB-BE-208	Tester: md	Checker: njh
	Sample Number: U1	Test Date: 03/08/21	Depth: 10-12 ft
	Test Number: DSS-3	Preparation: intact	Elevation: ---
	Description: Moist, gray and olive yellow clay		
	Remarks: System GG		



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

Client: Haley & Aldrich, Inc. GTX#: 312665
 Project Name: I-395/Rte 9 Connector (Area 1) Test Date: 3/10/21
 Project Location: Brewer-Eddington, ME

Boring ID: HB-BE-210
 Sample ID: U1
 Depth, ft: 15-17

Visual Description: Moist, gray clay

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

Test Condition: Inundated prior to consolidating to 992.7 psf.

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

Parameter	Point 1	Point 2	Point 3	Point 4	Point 5
Test No.	DSS-6				
Initial Moisture Content, %	33.8				
Initial Dry Density, pcf	82.4				
Nominal Rate of Shear Strain, %/hr	5.0				
Maximum Vertical Consolidation Stress, psf	992.7				
Final Moisture Content, %	32.2				
Measured Peak Shear Stress, psf	499.0				
Shear Strain at Peak Shear Stress, %	10.5				
Membrane Correction, psf	61				
Corrected Peak Shear Stress, psf	438.0				
S_u / σ'_{vc}	0.44				

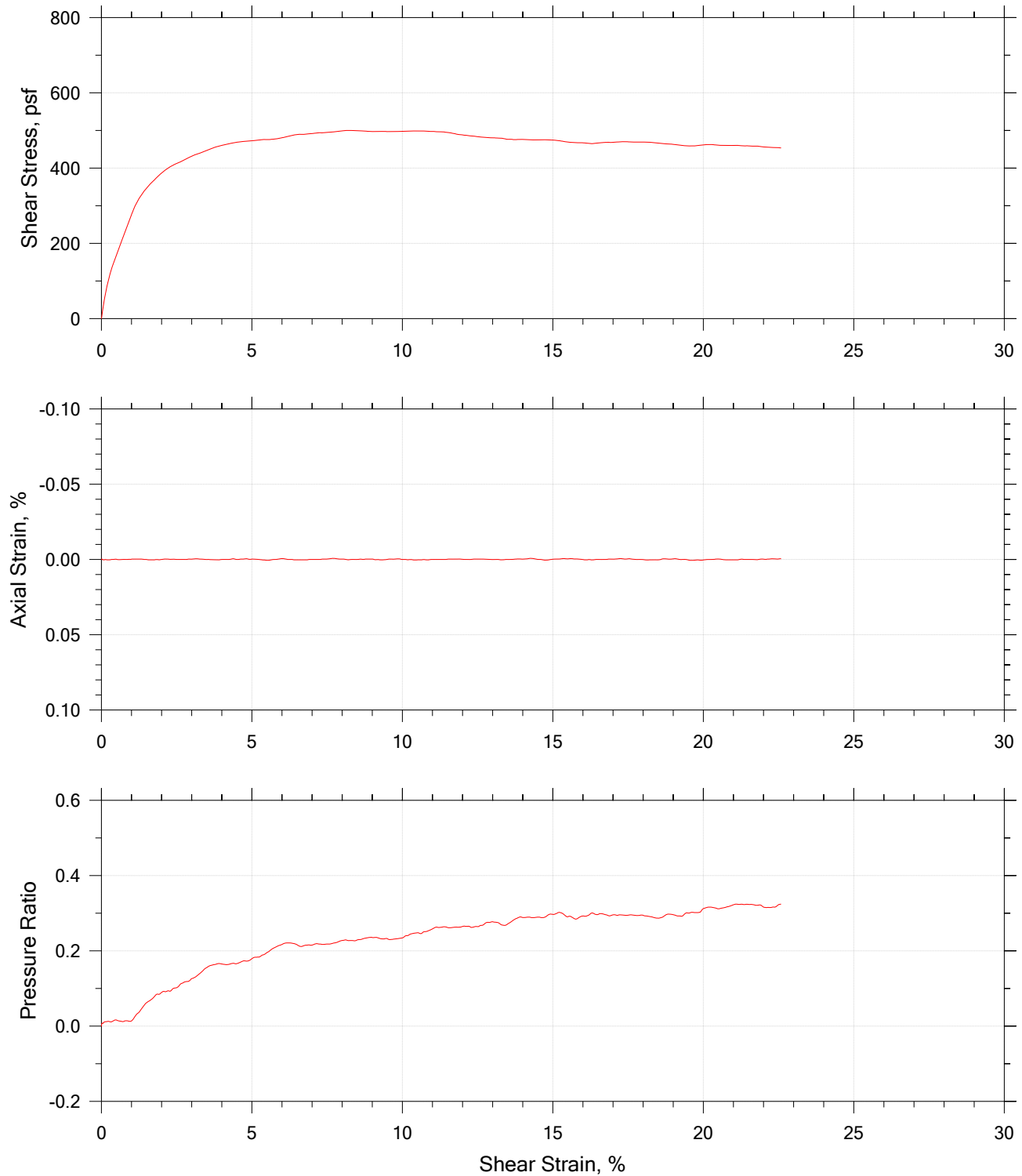
Comments: Failure taken at peak prior to or at 20% strain, per ASTM D6528.


Tested By: md

Checked By: njh

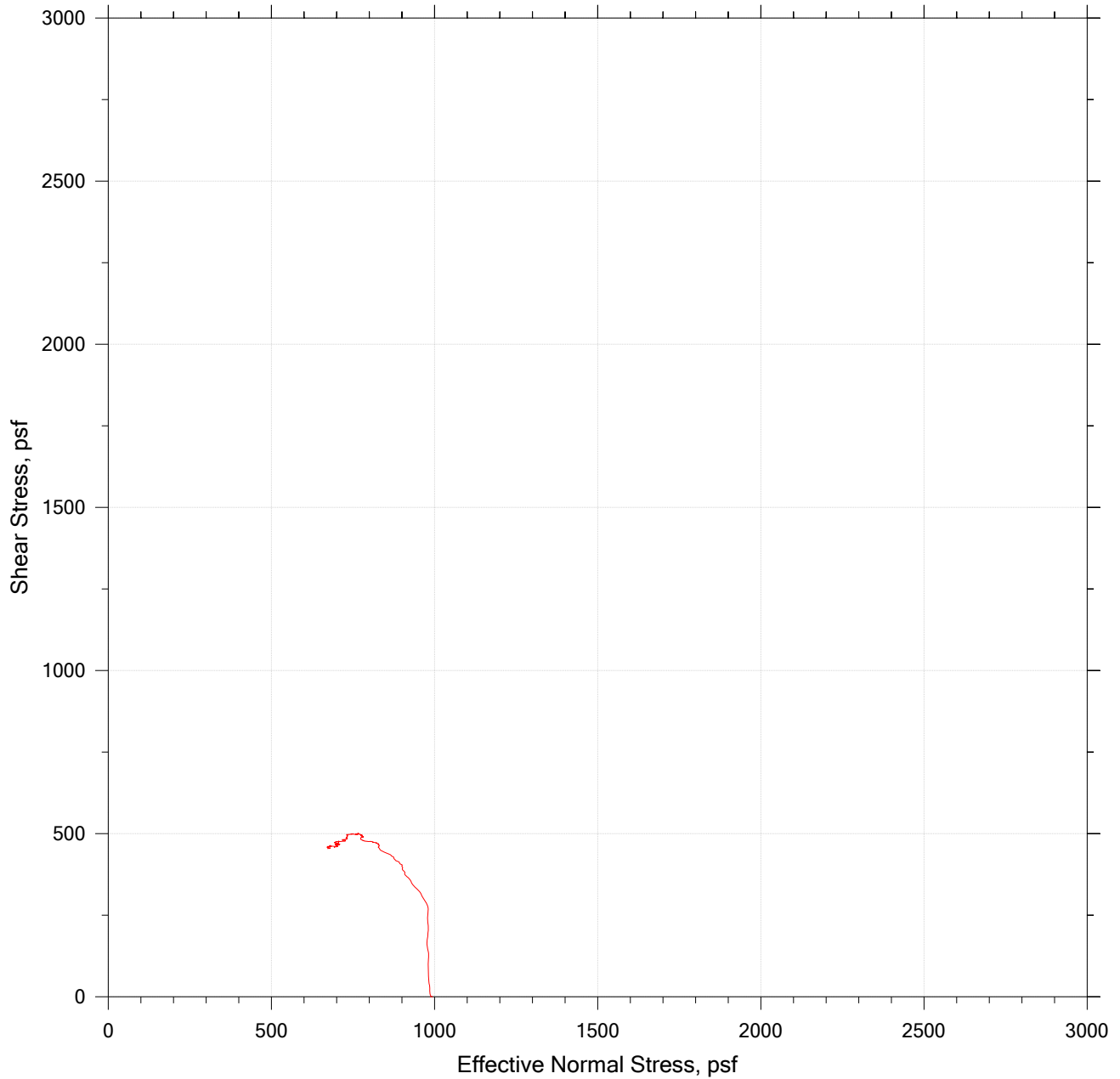
Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.


Direct Simple Shear Test



	Project Name: I-395/Rte 9 Connector	Location: Brewer-Eddington, ME	Project Number: GTX-312665
	Boring Number: HB-BE-210	Tester: md	Checker: njh
	Sample Number: U1	Test Date: 03/10/21	Depth: 15-17 ft
	Test Number: DSS-6	Preparation: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System HH		

Direct Simple Shear Test



	Project Name: I-395/Rte 9 Connector	Location: Brewer-Eddington, ME	Project Number: GTX-312665
	Boring Number: HB-BE-210	Tester: md	Checker: njh
	Sample Number: U1	Test Date: 03/10/21	Depth: 15-17 ft
	Test Number: DSS-6	Preparation: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System HH		



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

Client: Haley & Aldrich, Inc. GTX#: 312665
Project Name: I-395/Rte 9 Connector (Area 1) Test Date: 3/10/21
Project Location: Brewer-Eddington, ME

Boring ID: HB-BE-215
Sample ID: U1
Depth, ft: 10-12

Visual Description: Moist, gray clay

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

Test Condition: Inundated prior to consolidating to 869.4 psf.

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

Parameter	Point 1	Point 2	Point 3	Point 4	Point 5
Test No.	DSS-5				
Initial Moisture Content, %	33.9				
Initial Dry Density, pcf	83.2				
Nominal Rate of Shear Strain, %/hr	5.0				
Maximum Vertical Consolidation Stress, psf	869.4				
Final Moisture Content, %	34.2				
Measured Peak Shear Stress, psf	345.1				
Shear Strain at Peak Shear Stress, %	18.9				
Membrane Correction, psf	52				
Corrected Peak Shear Stress, psf	293.1				
S_u / σ'_{vc}	0.34				

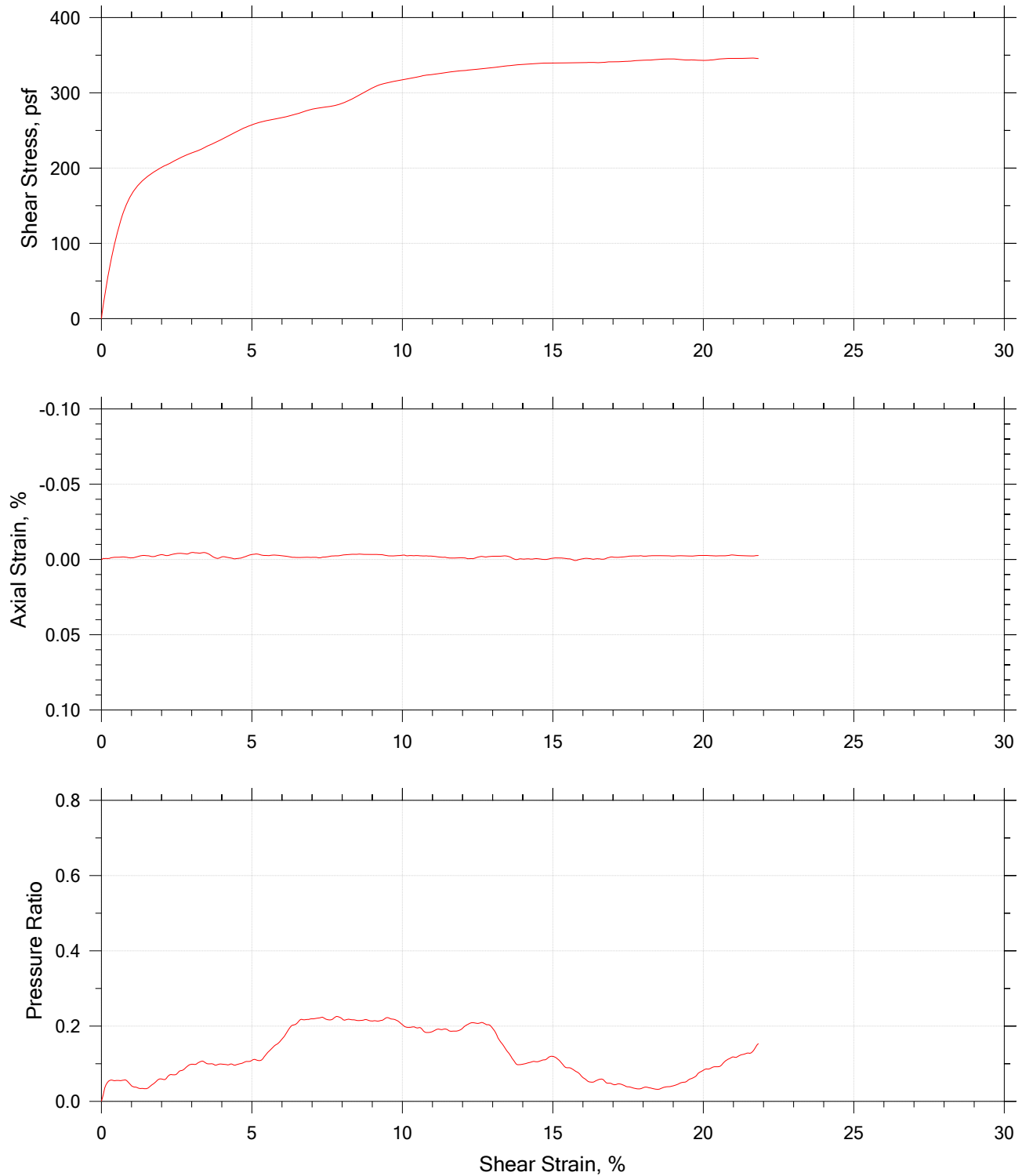
Comments: Failure taken at peak prior to or at 20% strain, per ASTM D6528.


Tested By: md

Checked By: njh

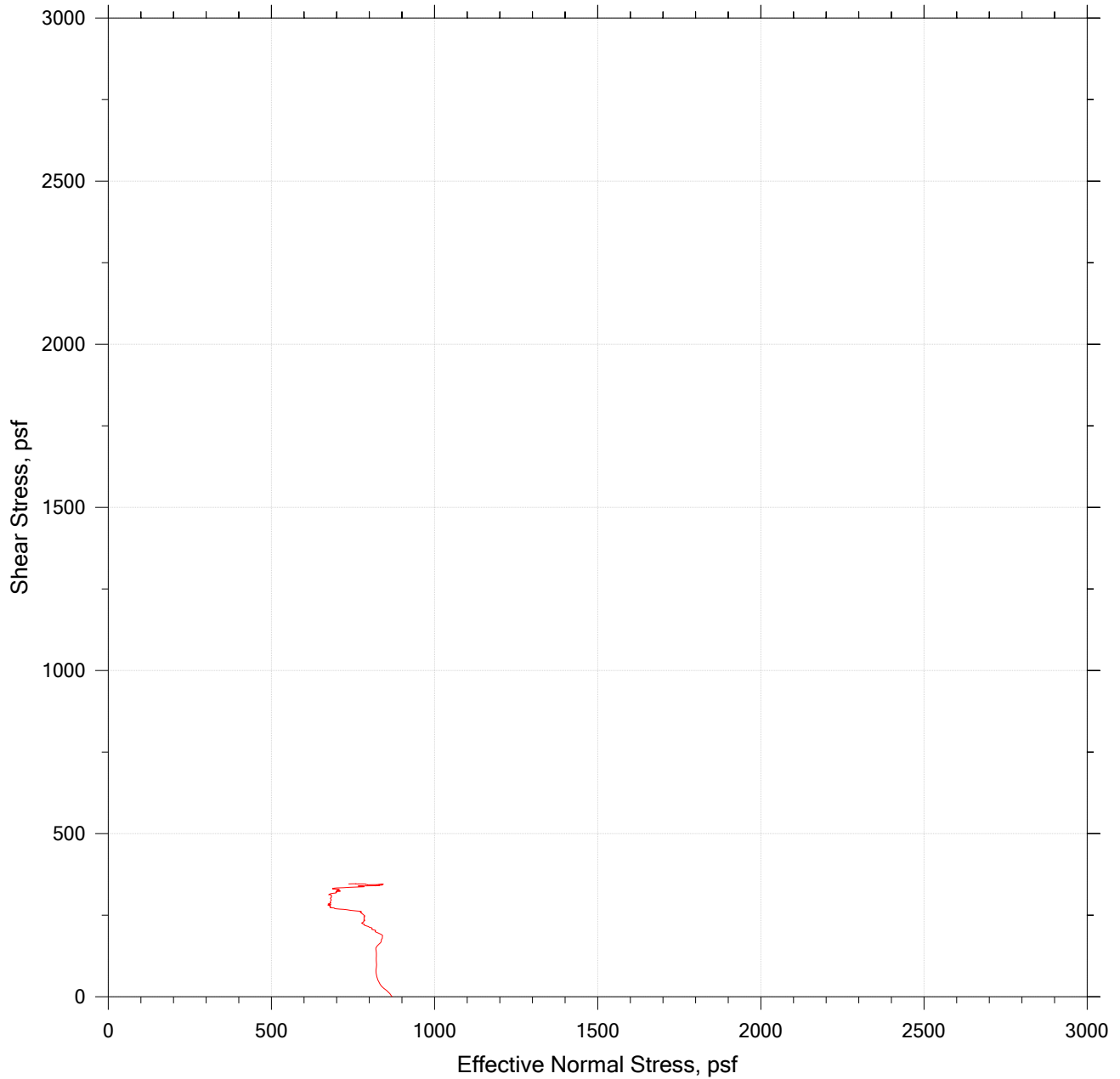
Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.


Direct Simple Shear Test



	Project Name: I-395/Rte 9 Connector	Location: Brewer-Eddington, ME	Project Number: GTX-312665
	Boring Number: HB-BE-215	Tester: md	Checker: njh
	Sample Number: U1	Test Date: 03/10/21	Depth: 10-12 ft
	Test Number: DSS-5	Preparation: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks:		

Direct Simple Shear Test



	Project Name: I-395/Rte 9 Connector	Location: Brewer-Eddington, ME	Project Number: GTX-312665
	Boring Number: HB-BE-215	Tester: md	Checker: njh
	Sample Number: U1	Test Date: 03/10/21	Depth: 10-12 ft
	Test Number: DSS-5	Preparation: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks:		



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

Client: Haley & Aldrich, Inc. GTX#: 313197
Project Name: I-395/Rte 9 Connector (Area 3) Test Date: 3/17/21
Project Location: Brewer-Eddington, ME

Boring ID: HB-BE-223
Sample ID: U1 (19.2")
Depth, ft: 12-14

Visual Description: Wet, dark gray clay

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

Test Condition: Inundated prior to consolidation

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

Parameter	Point 1	Point 2	Point 3	Point 4	Point 5
Test No.	DSS-1				
Initial Moisture Content, %	42.8				
Initial Dry Density, pcf	76.9				
Nominal Rate of Shear Strain, %/hr	5.0				
Vertical Consolidation Stress, psi	4.48				
Final Moisture Content, %	36.4				
Measured Peak Shear Stress, psi	1.90				
Shear Strain at Peak Shear Stress, %	20.0				
Membrane Correction, psi	0.34				
Corrected Peak Shear Stress, psi	1.56				
S_u / σ'_{vc}	0.35				

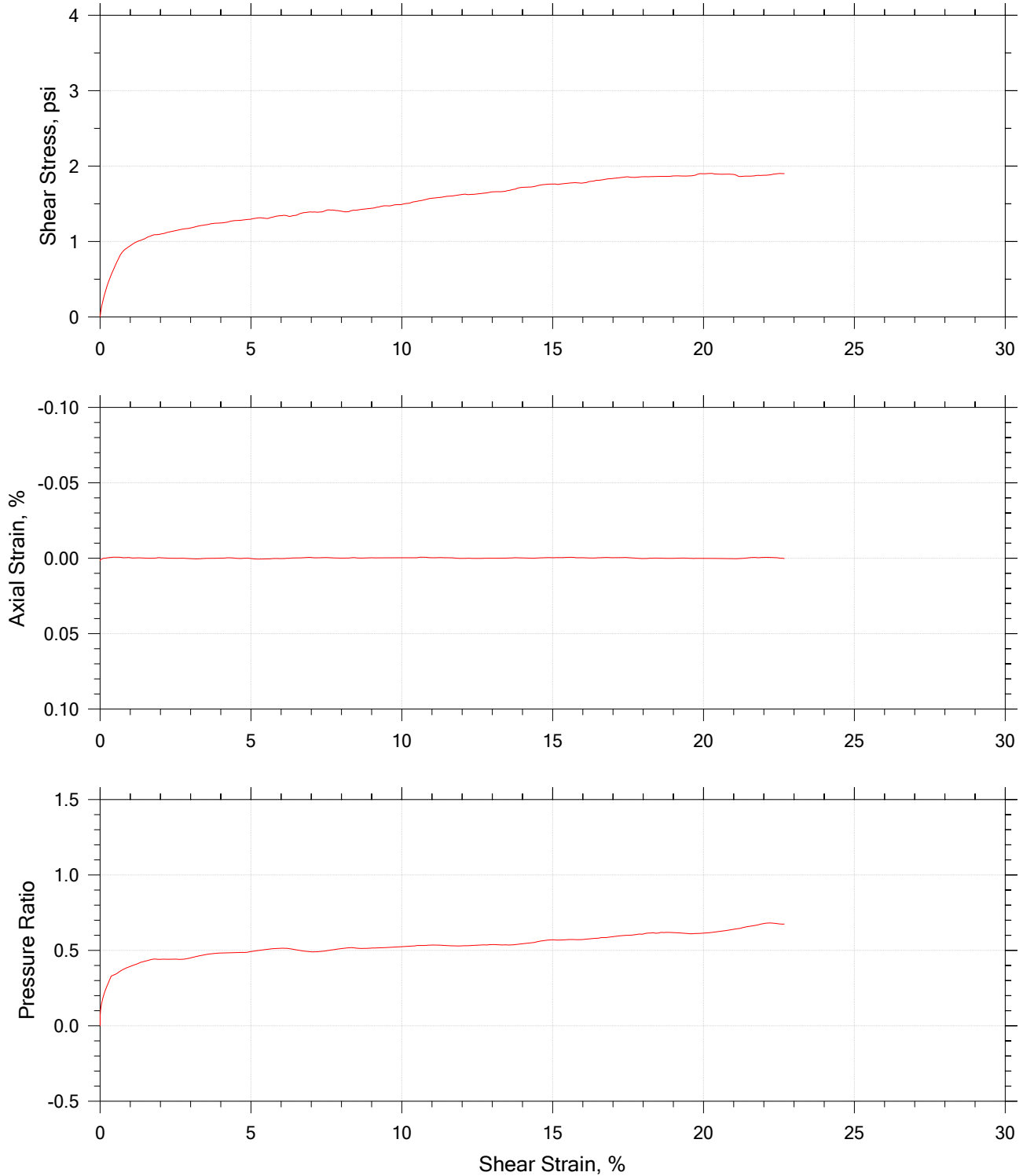
Comments: Failure taken at peak prior to or at 20% strain, per ASTM D6528.


Tested By: md
njh

Checked By:

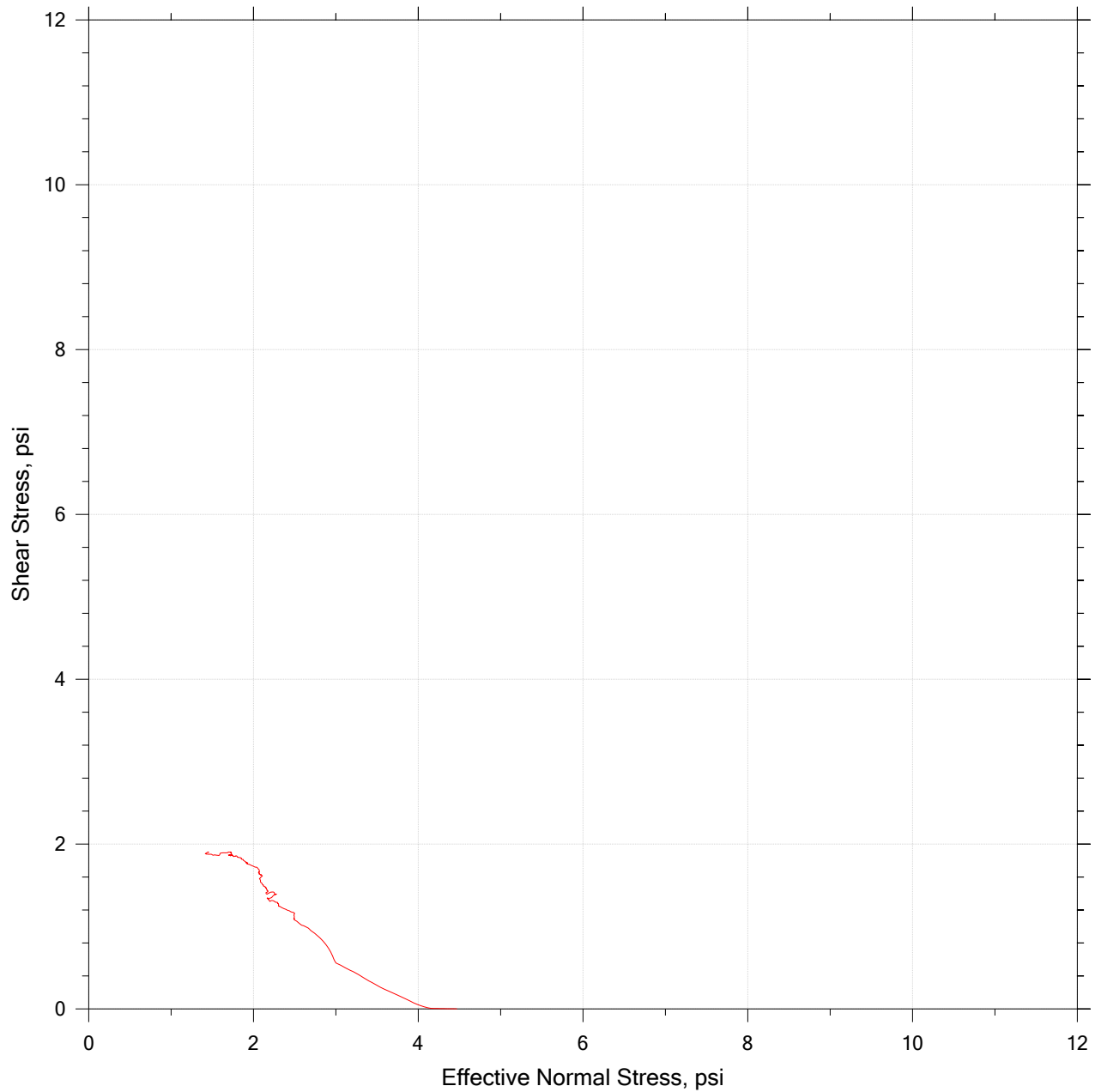
Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.


Direct Simple Shear Test



	Project Name: I-395/Rte 9 Connector (Area 3)	Location: Brewer-Eddington, ME	Project Number: GTX-313197
	Boring Number: HB-BE-223	Tester: md	Checker: njh
	Sample Number: U1(19.2")	Test Date: 03/17/21	Depth: 12-14 ft
	Test Number: DSS-1	Preparation: intact	Elevation: ---
	Description: Wet, dark gray clay		
	Remarks: System GG		

Direct Simple Shear Test



	Project Name: I-395/Rte 9 Connector (Area 3)	Location: Brewer-Eddington, ME	Project Number: GTX-313197
	Boring Number: HB-BE-223	Tester: md	Checker: njh
	Sample Number: U1(19.2")	Test Date: 03/17/21	Depth: 12-14 ft
	Test Number: DSS-1	Preparation: intact	Elevation: ---
	Description: Wet, dark gray clay		
	Remarks: System GG		



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

Client: Haley & Aldrich, Inc. GTX#: 313198
Project Name: I-395/Rte 9 Connector (Area 4) Test Date: 3/17/21
Project Location: Brewer-Eddington, ME

Boring ID: HB-BE-225
Sample ID: U1
Depth, ft: 8-10

Visual Description: Moist, gray clay

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

Test Condition: Inundated prior to consolidation

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

Parameter	Point 1	Point 2	Point 3	Point 4	Point 5
Test No.	DSS-1				
Initial Moisture Content, %	38.1				
Initial Dry Density, pcf	76.8				
Nominal Rate of Shear Strain, %/hr	5.0				
Vertical Consolidation Stress, psi	3.66				
Final Moisture Content, %	40.2				
Measured Peak Shear Stress, psi	1.75				
Shear Strain at Peak Shear Stress, %	9.0				
Membrane Correction, psi	0.43				
Corrected Peak Shear Stress, psi	1.32				
S_u / σ'_{vc}	0.36				

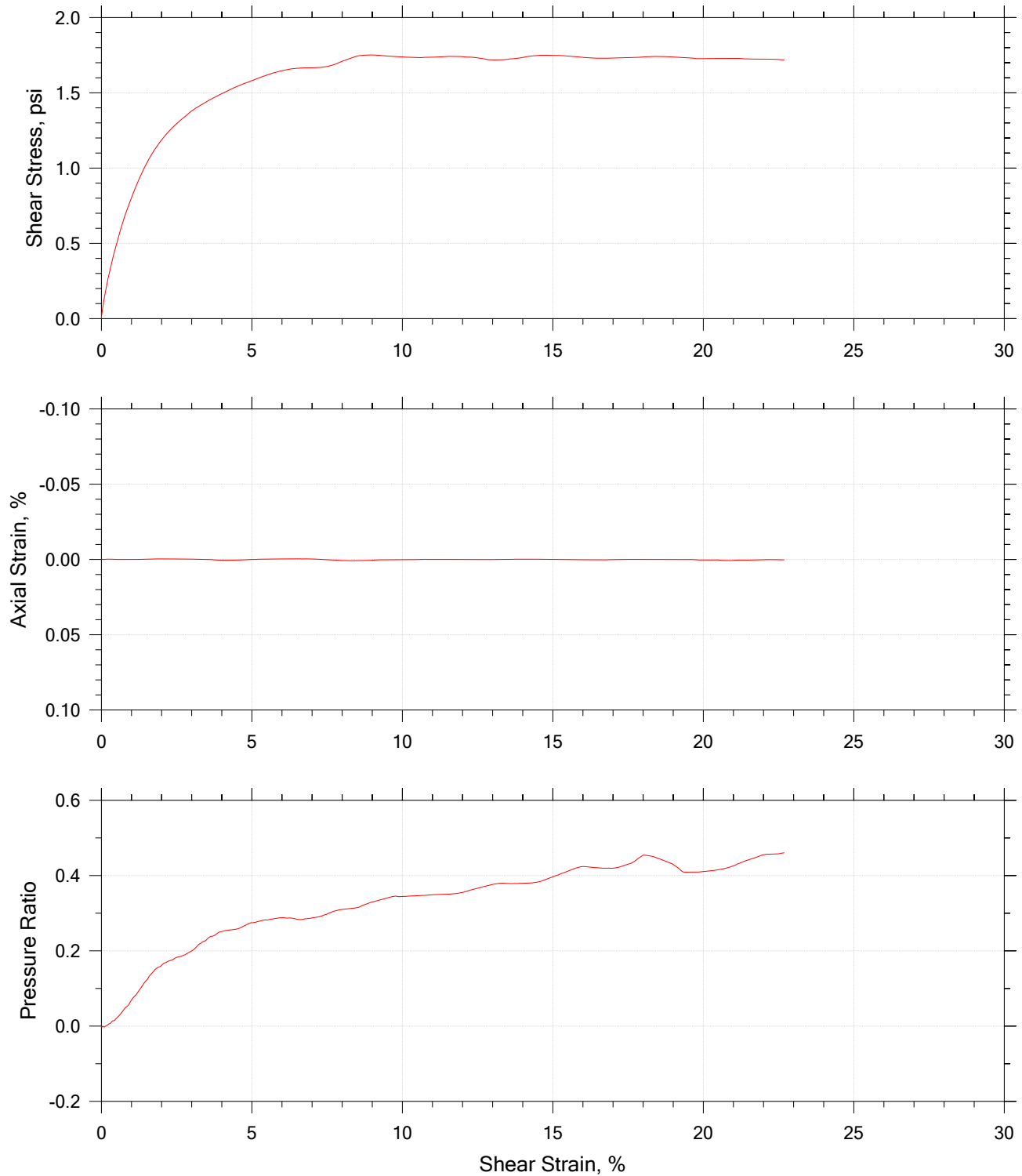
Comments: Failure taken at peak prior to or at 20% strain, per ASTM D6528.


Tested By: md
njh

Checked By:

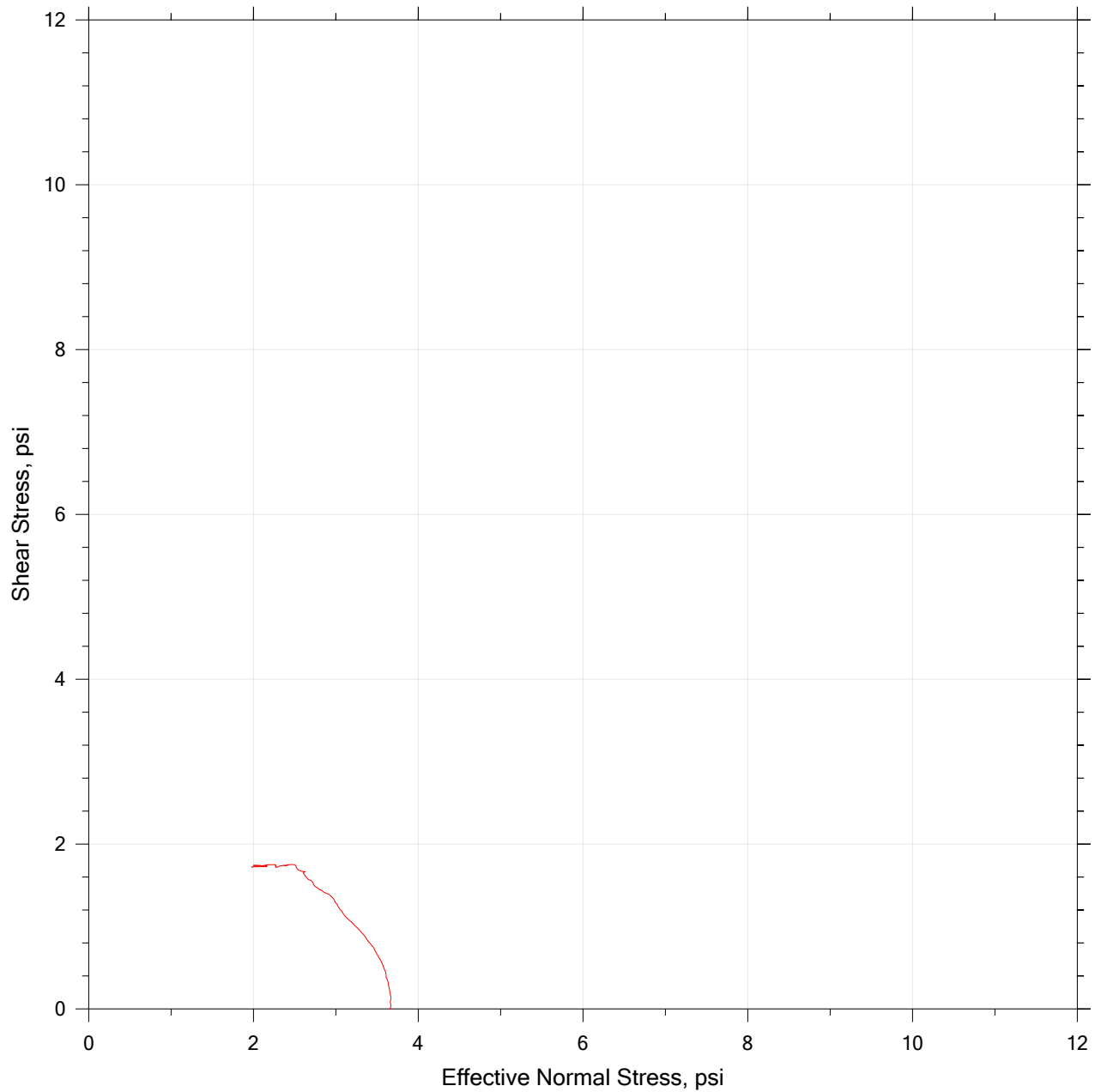
Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.


Direct Simple Shear Test



	Project Name: I-395/Rte 9 Connector (Area 4)	Location: Brewer-Eddington, ME	Project Number: GTX-313198
	Boring Number: HB-BE-225	Tester: md	Checker: njh
	Sample Number: U1	Test Date: 03/17/21	Depth: 8-10 ft
	Test Number: DSS-1	Preparation: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System HH		

Direct Simple Shear Test



	Project Name: I-395/Rte 9 Connector (Area 4)	Location: Brewer-Eddington, ME	Project Number: GTX-313198
	Boring Number: HB-BE-225	Tester: md	Checker: njh
	Sample Number: U1	Test Date: 03/17/21	Depth: 8-10 ft
	Test Number: DSS-1	Preparation: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks: System HH		



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

Client: Haley & Aldrich, Inc. GTX#: 312665
Project Name: I-395/Rte 9 Connector (Area 1) Test Date: 3/8/21
Project Location: Brewer-Eddington, ME

Boring ID: HB-BE-239
Sample ID: U1
Depth, ft: 13-15

Visual Description: Moist, gray clay

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

Test Condition: Inundated prior to consolidating to 1,183.2 psf.

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

Parameter	Point 1	Point 2	Point 3	Point 4	Point 5
Test No.	DSS-2				
Initial Moisture Content, %	36.9				
Initial Dry Density, pcf	77.8				
Nominal Rate of Shear Strain, %/hr	5.0				
Maximum Vertical Consolidation Stress, psf	1,183.2				
Final Moisture Content, %	36.3				
Measured Peak Shear Stress, psf	320.7				
Shear Strain at Peak Shear Stress, %	20.0				
Membrane Correction, psf	49				
Corrected Peak Shear Stress, psf	271.7				
S_u / σ'_{vc}	0.23				

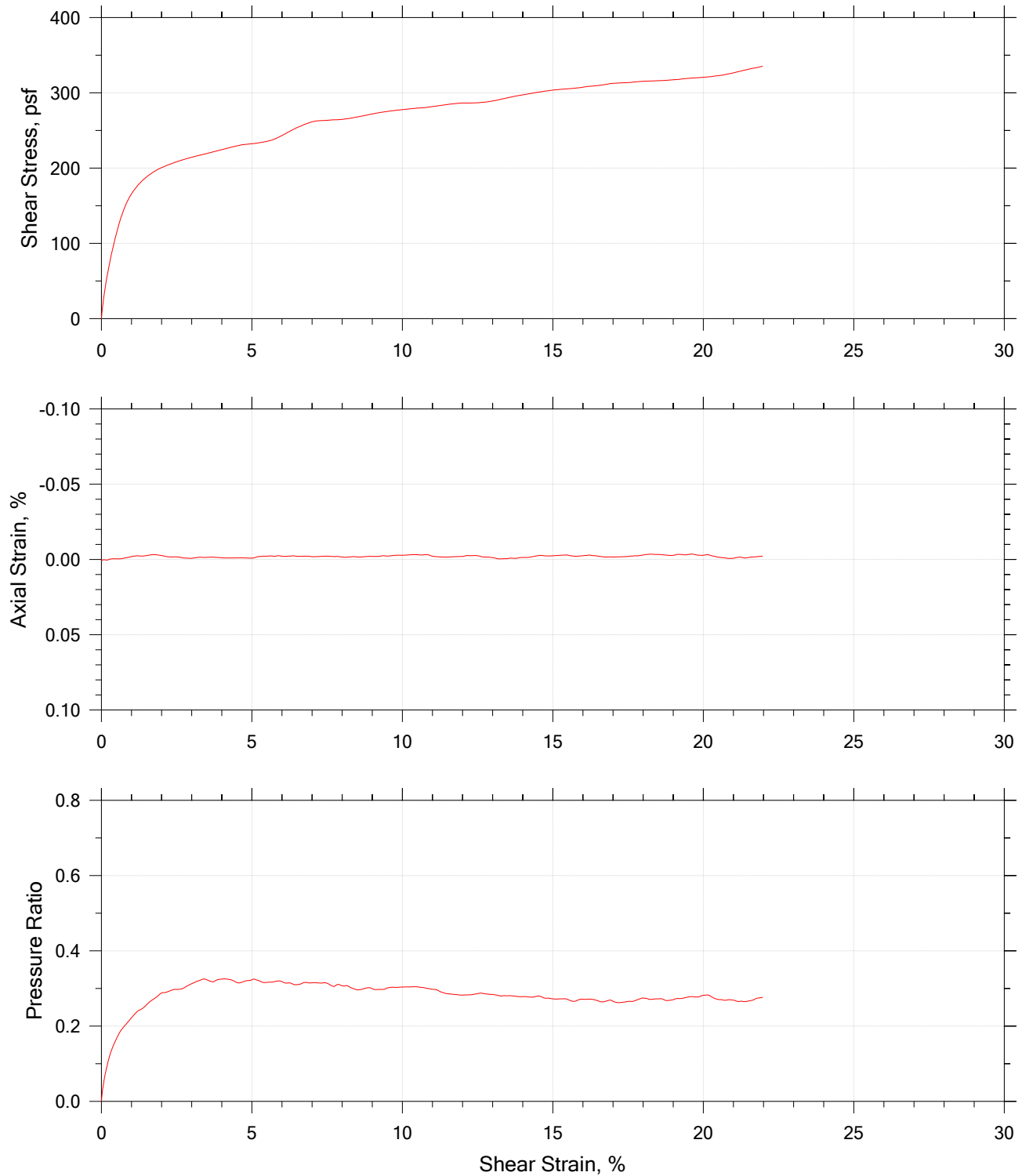
Comments: Failure taken at peak prior to or at 20% strain, per ASTM D6528.


Tested By: md

Checked By: njh

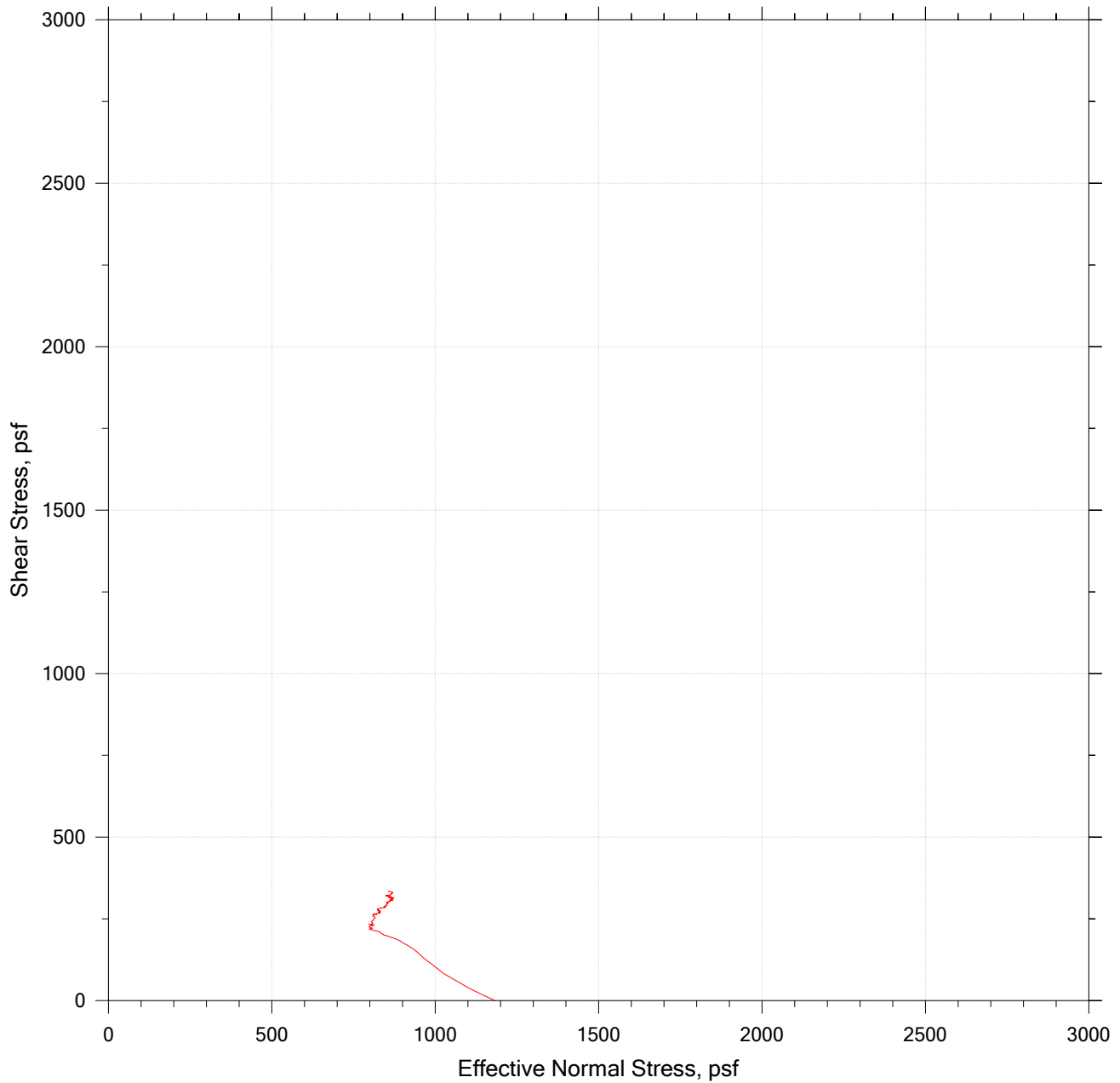
Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.


Direct Simple Shear Test



	Project Name: I-395/Rte 9 Connector	Location: Brewer-Eddington, ME	Project Number: GTX-312665
	Boring Number: HB-BE-239	Tester: md	Checker: njh
	Sample Number: U1	Test Date: 03/08/21	Depth: 13-15 ft
	Test Number: DSS-2	Preparation: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks:		

Direct Simple Shear Test

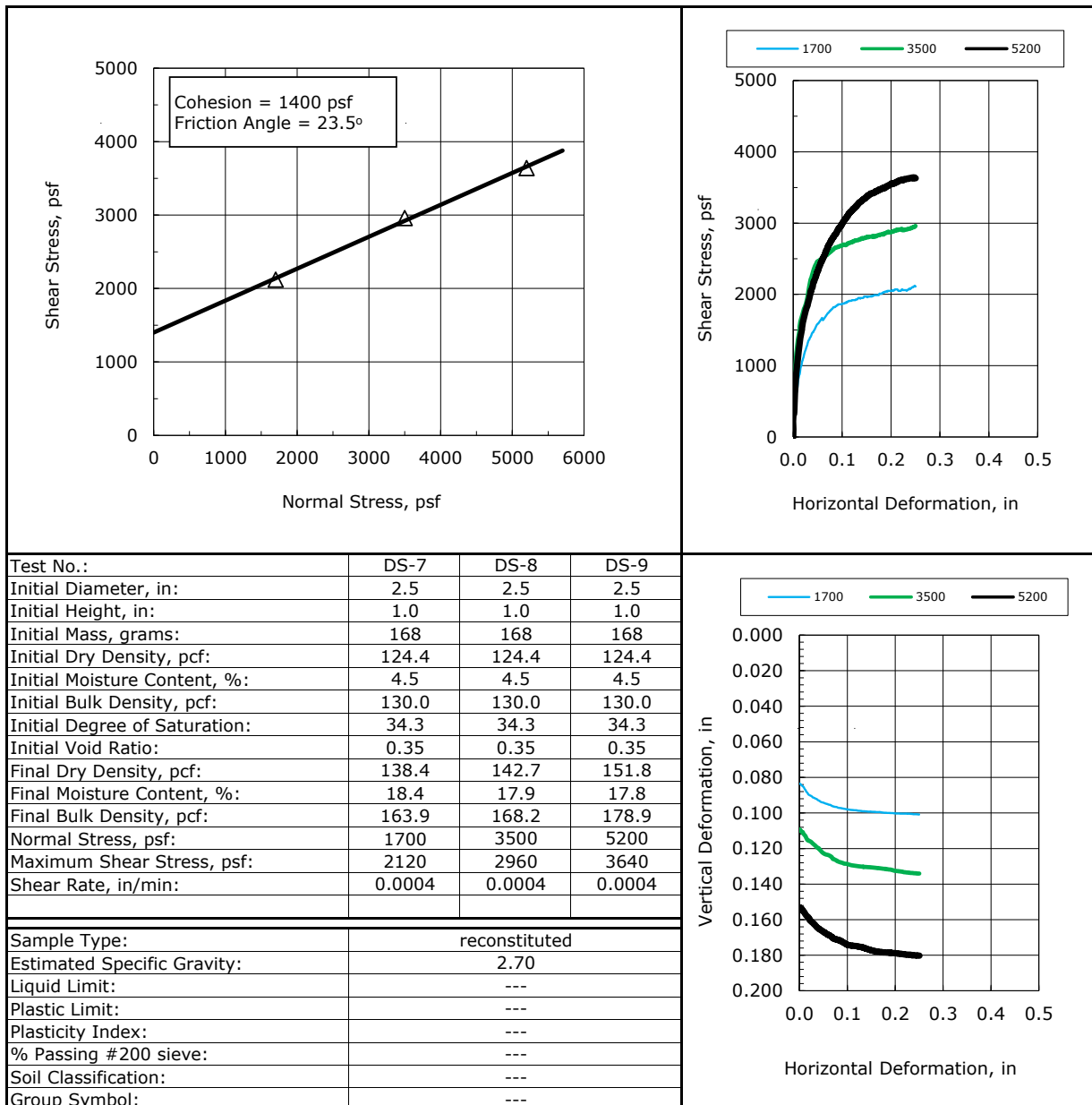


	Project Name: I-395/Rte 9 Connector	Location: Brewer-Eddington, ME	Project Number: GTX-312665
	Boring Number: HB-BE-239	Tester: md	Checker: njh
	Sample Number: U1	Test Date: 03/08/21	Depth: 13-15 ft
	Test Number: DSS-2	Preparation: intact	Elevation: ---
	Description: Moist, gray clay		
	Remarks:		



Client:	Haley & Aldrich, Inc.
Project Name:	I-395/Rte 9 Connector Hwy, Brewer-Eddington
Project Location:	Brewer, ME
GTX #:	313370
Test Date:	04/06/21
Tested By:	mp
Checked By:	njh
Boring ID:	HB-BE-132
Sample ID:	4D, 5D, 6D
Depth, ft:	5-27.5
Visual Description:	Moist, olive gray sandy clay with gravel

Direct Shear Test of Soils Under Consolidated Drained Conditions by ASTM D3080



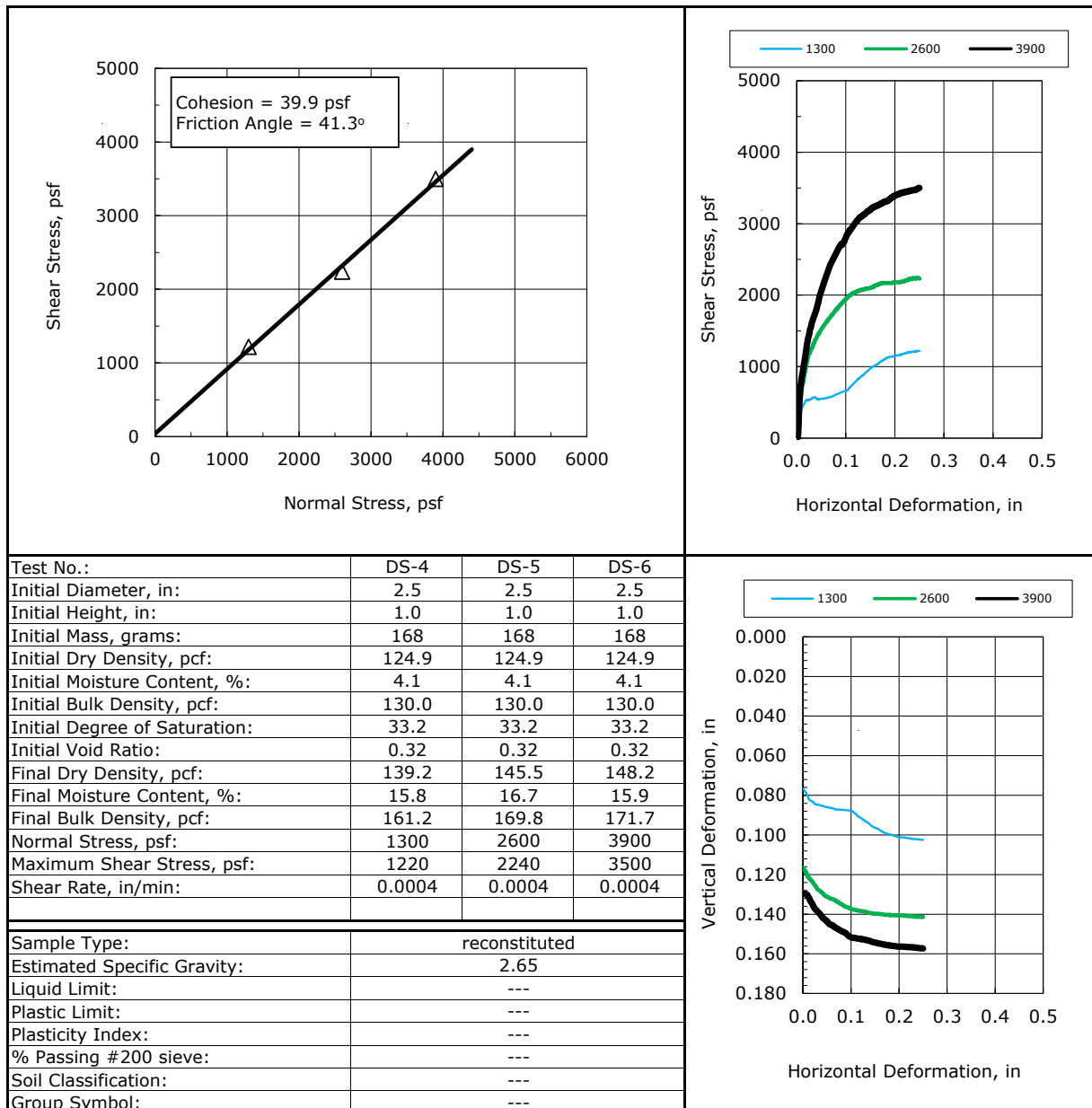
Notes:

- Material greater than #5 sieve screened out of sample prior to testing
- Moisture content obtained before shear from sample trimmings
- Moisture Content determined by ASTM D2216
- Target Compaction: 130 pcf at the as-received moisture content. Values specified by client.
- Values for cohesion and friction angle determined from best-fit straight line to the data for the specific test conditions. Actual strength parameters may vary and should be determined by an engineer for site-specific conditions.
- "---" indicates testing required to determine these values was not requested.



Client:	Haley & Aldrich, Inc.
Project Name:	I-395/Rte 9 Connector Hwy, Brewer-Eddington
Project Location:	Brewer, ME
GTX #:	313370
Test Date:	04/05/21
Tested By:	mp
Checked By:	njh
Boring ID:	HB-BE-164
Sample ID:	5D, 6D, 7D, 8D
Depth, ft:	17-29
Visual Description:	Moist, olive gray sand with clay and gravel

Direct Shear Test of Soils Under Consolidated Drained Conditions by ASTM D3080



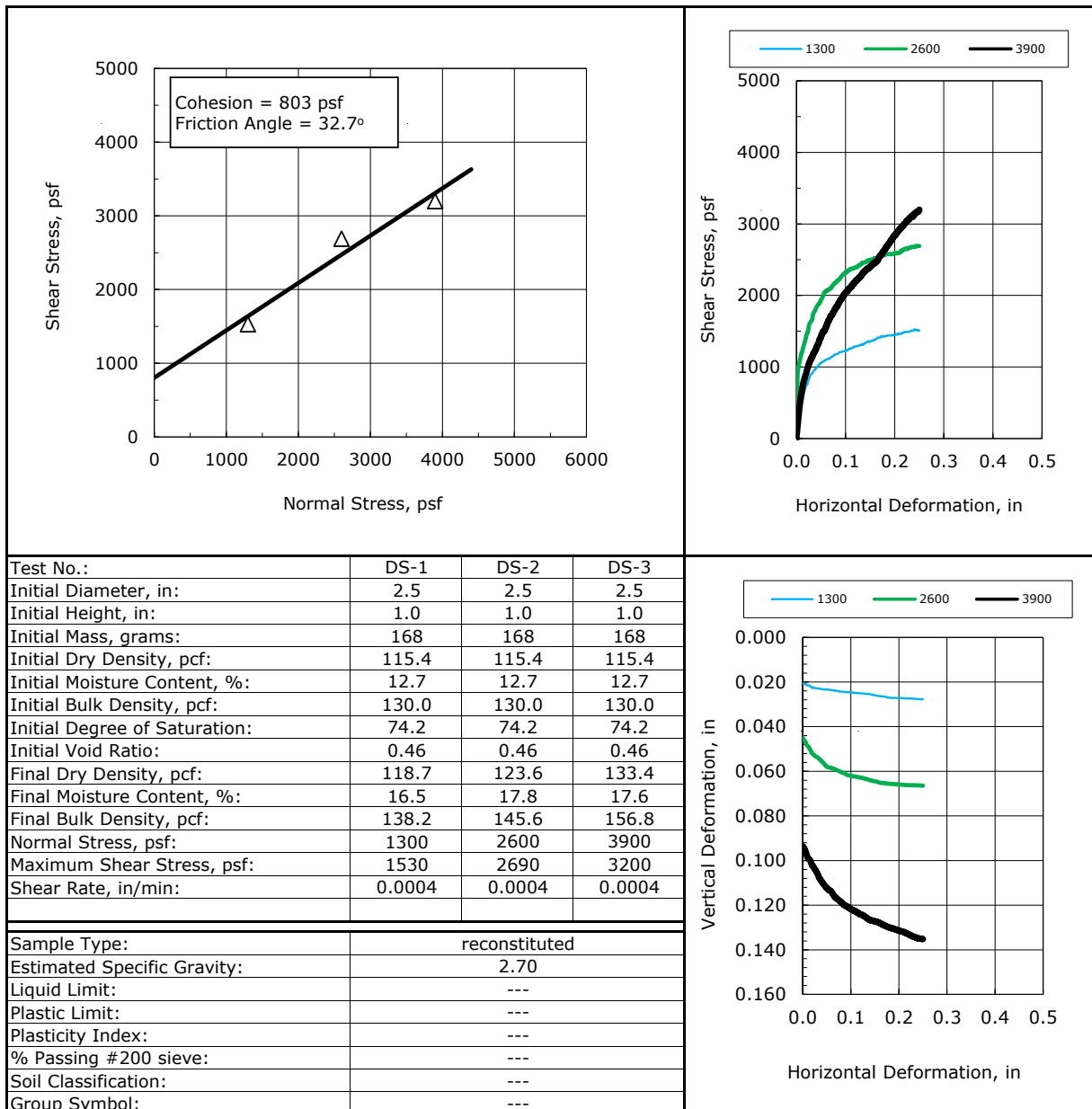
Notes:

- Material greater than #5 sieve screened out of sample prior to testing
- Moisture content obtained before shear from sample trimmings
- Moisture Content determined by ASTM D2216
- Target Compaction: 130 pcf at the as-received moisture content. Values specified by client.
- Values for cohesion and friction angle determined from best-fit straight line to the data for the specific test conditions. Actual strength parameters may vary and should be determined by an engineer for site-specific conditions.
- "---" indicates testing required to determine these values was not requested.



Client:	Haley & Aldrich, Inc.
Project Name:	I-395/Rte 9 Connector Hwy, Brewer-Eddington
Project Location:	Brewer, ME
GTX #:	313370
Test Date:	04/05/21
Tested By:	mp
Checked By:	njh
Boring ID:	HB-BE-218
Sample ID:	2D, 3D, 4D
Depth, ft:	5-7
Visual Description:	Moist, grayish brown sandy silt

Direct Shear Test of Soils Under Consolidated Drained Conditions by ASTM D3080



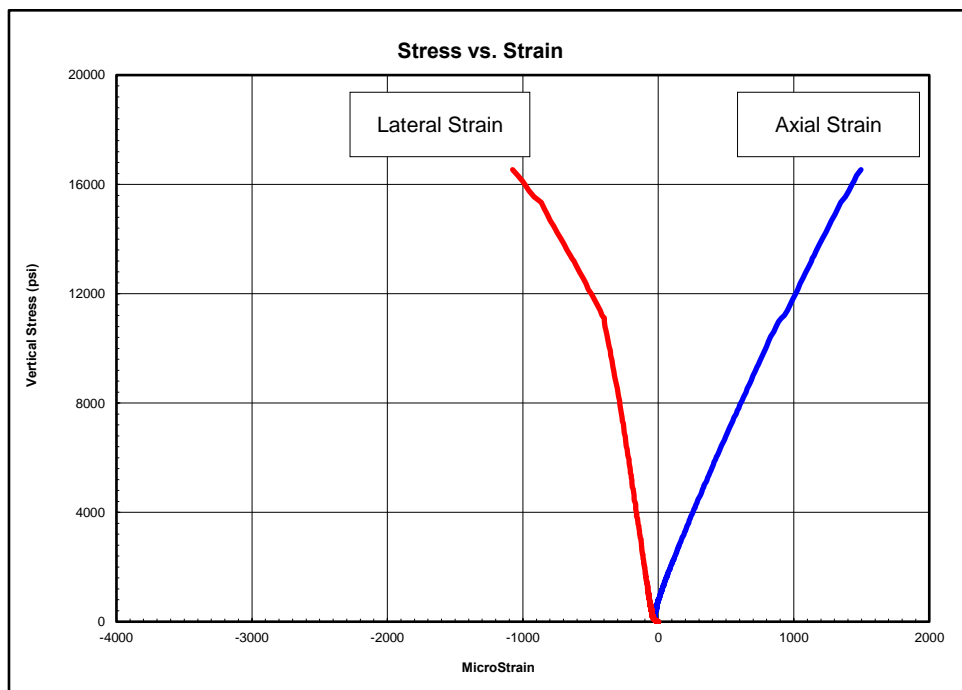
Notes:

- Material greater than #5 sieve screened out of sample prior to testing
- Moisture content obtained before shear from sample trimmings
- Moisture Content determined by ASTM D2216
- Target Compaction: 130 pcf at the as-received moisture content. Values specified by client.
- Values for cohesion and friction angle determined from best-fit straight line to the data for the specific test conditions. Actual strength parameters may vary and should be determined by an engineer for site-specific conditions.
- "---" indicates testing required to determine these values was not requested.



Client:	Haley & Aldrich, Inc.
Project Name:	I-395/Rte 9 Connector Bridge (Eastern Ave)
Project Location:	Brewer, ME
GTX #:	313321
Test Date:	3/25/2021
Tested By:	cmh
Checked By:	jsc
Boring ID:	BB-BEA-201
Sample ID:	R1
Depth, ft:	33-33.7
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: 16,538 psi

The strain values recorded within the third stress range for this test produce values of Poisson's Ratio that exceed maximum values found in rocks.

Stress Range, psi	Young's Modulus, psi	Poisson's Ratio
1700-6100	11,900,000	0.36
6100-10500	11,000,000	0.38
10500-14900	9,580,000	---

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.

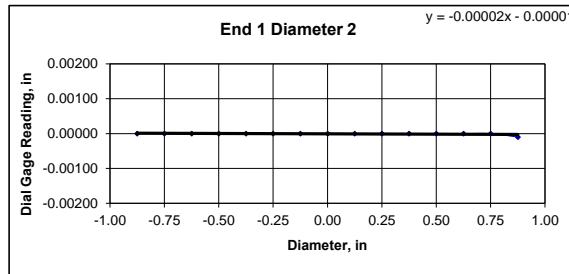
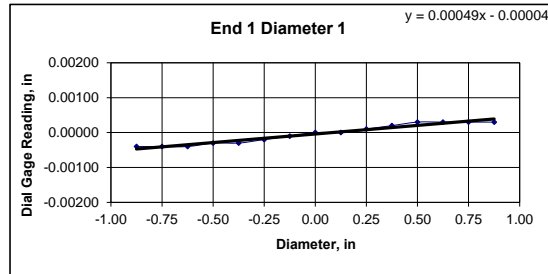


Client:	Haley & Aldrich, Inc.	Test Date:	3/22/2021
Project Name:	I-395/Rte 9 Connector Bridge (Eastern Ave)	Tested By:	cmh
Project Location:	Brewer, ME	Checked By:	smd
GT#:	313321		
Boring ID:	BB-BEA-201		
Sample ID:	R1		
Depth:	33-33.7 ft		
Visual Description:	See photographs		

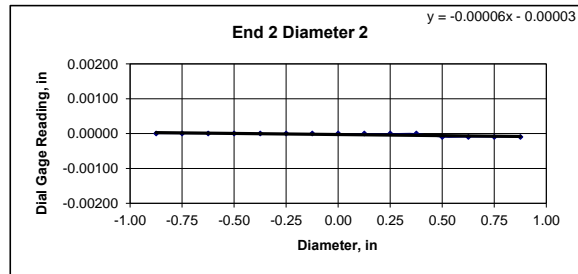
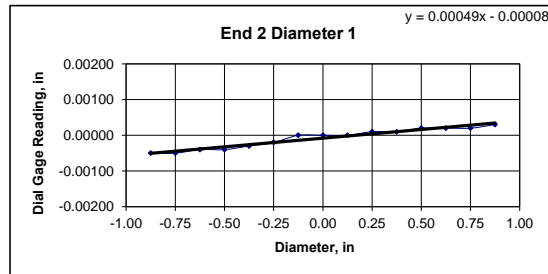
UNIT WEIGHT DETERMINATION AND DIMENSIONAL AND SHAPE TOLERANCES OF ROCK CORE SPECIMENS BY ASTM D4543

BULK DENSITY				DEVIATION FROM STRAIGHTNESS (Procedure S1)	
	1	2	Average	Maximum gap between side of core and reference surface plate: Is the maximum gap ≤ 0.02 in.? YES	
Specimen Length, in:	4.43	4.43	4.43	Maximum difference must be < 0.020 in.	
Specimen Diameter, in:	1.98	1.98	1.98	Straightness Tolerance Met? YES	
Specimen Mass, g:	610.32				
Bulk Density, lb/ft ³ :	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	-0.00040	-0.00040	-0.00040	-0.00030	-0.00030	-0.00020	-0.00010	0.00000	0.00000	0.00010	0.00020	0.00030	0.00030	0.00030	0.00030
Diameter 2, in (rotated 90°)	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
Difference between max and min readings, in:															
0° = 0.00070 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	-0.00050	-0.00050	-0.00040	-0.00040	-0.00030	-0.00020	0.00000	0.00000	0.00000	0.00010	0.00010	0.00020	0.00020	0.00020	0.00030
Diameter 2, in (rotated 90°)	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
Difference between max and min readings, in:															
0° = 0.0008 90° = 0.0001															
Maximum difference must be < 0.0020 in. Difference = ± 0.00040															
Flatness Tolerance Met? YES															



DIAMETER 1	
End 1:	
Slope of Best Fit Line	0.00049
Angle of Best Fit Line:	0.02816
End 2:	
Slope of Best Fit Line	0.00049
Angle of Best Fit Line:	0.02783
Maximum Angular Difference:	0.00033
Parallelism Tolerance Met?	YES
Spherically Seated	



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	0.00006
Angle of Best Fit Line:	0.00360
Maximum Angular Difference:	0.00246
Parallelism Tolerance Met?	YES
Spherically Seated	

PERPENDICULARITY (Procedure P1)						Maximum angle of departure must be $\leq 0.25^\circ$	
END 1	Difference, Maximum and Minimum (in.)	Diameter (in.)	Slope	Angle°	Perpendicularity Tolerance Met?		
Diameter 1, in	0.00070	1.980	0.00035	0.020	YES		
Diameter 2, in (rotated 90°)	0.00010	1.980	0.00005	0.003	YES	Perpendicularity Tolerance Met? YES	
END 2							
Diameter 1, in	0.00080	1.980	0.00040	0.023	YES		
Diameter 2, in (rotated 90°)	0.00010	1.980	0.00005	0.003	YES		

Client:	Haley & Aldrich, Inc.
Project Name:	I-395/Rte 9 Connector Bridge (Eastern Ave)
Project Location:	Brewer, ME
GTX #:	313321
Test Date:	3/26/2021
Tested By:	cmh
Checked By:	smd
Boring ID:	BB-BEA-201
Sample ID:	R1
Depth, ft:	33-33.7



After cutting and grinding

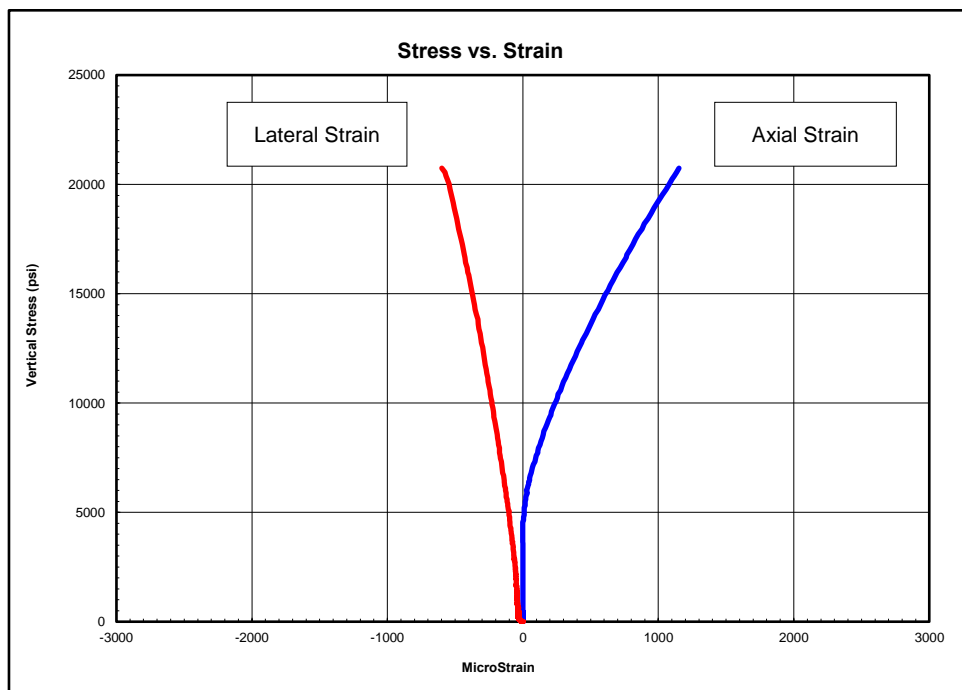


After break



Client:	Haley & Aldrich, Inc.
Project Name:	I-395/Rte 9 Connector Bridge (Eastern Ave)
Project Location:	Brewer, ME
GTX #:	313321
Test Date:	3/25/2021
Tested By:	cmh
Checked By:	jsc
Boring ID:	BB-BEA-202
Sample ID:	R1
Depth, ft:	22.2-22.9
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: 20,742 psi

The strain values recorded within the first stress range for this test produce values of Poisson's Ratio that exceed maximum values found in rocks.

Stress Range, psi	Young's Modulus, psi	Poisson's Ratio
2100-7600	58,200,000	---
7600-13100	15,300,000	0.41
13100-18700	11,600,000	0.38

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.

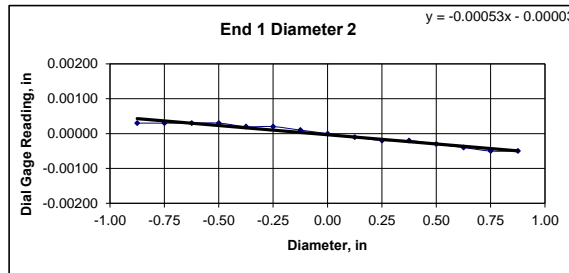
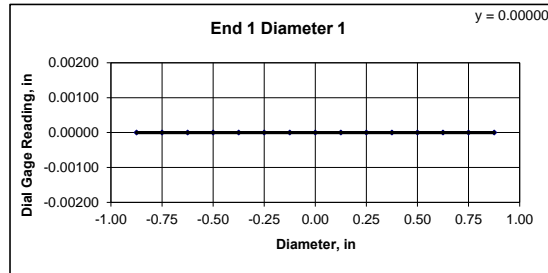


Client:	Haley & Aldrich, Inc.	Test Date:	3/22/2021
Project Name:	I-395/Rte 9 Connector Bridge (Eastern Ave)	Tested By:	cmh
Project Location:	Brewer, ME	Checked By:	smd
GT#:	313321		
Boring ID:	BB-BEA-202		
Sample ID:	R1		
Depth:	22.2-22.9 ft		
Visual Description:	See photographs		

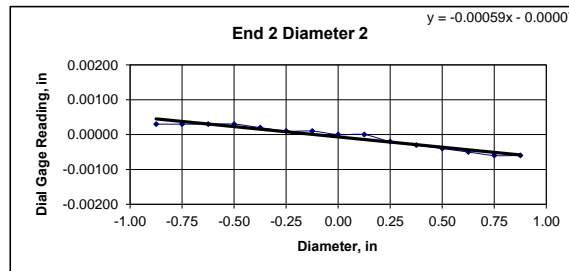
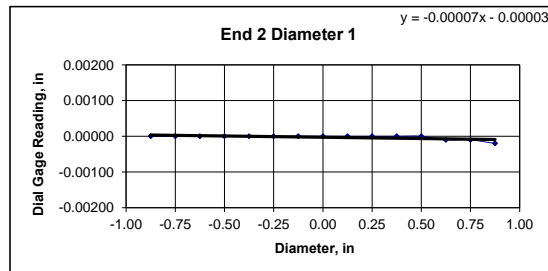
UNIT WEIGHT DETERMINATION AND DIMENSIONAL AND SHAPE TOLERANCES OF ROCK CORE SPECIMENS BY ASTM D4543

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:	4.44	4.45	4.45	Maximum difference must be $<$ 0.020 in. Straightness Tolerance Met? YES	
Specimen Diameter, in:	2.00	2.00	2.00		
Specimen Mass, g:	614.21				
Bulk Density, lb/ft ³	167				
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
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
Diameter 2, in (rotated 90°)	0.00030	0.00030	0.00030	0.00030	0.00020	0.00020	0.00010	0.00000	-0.00010	-0.00020	-0.00020	-0.00030	-0.00040	-0.00050
Difference between max and min readings, in: 0° = 0.00000 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
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	-0.00010	-0.00020
Diameter 2, in (rotated 90°)	0.00030	0.00030	0.00030	0.00030	0.00020	0.00010	0.00010	0.00000	0.00000	-0.00020	-0.00030	-0.00040	-0.00050	-0.00060
Difference between max and min readings, in: 0° = 0.0002 90° = 0.0009 Maximum difference must be $<$ 0.0020 in. Difference = \pm 0.00045 Flatness Tolerance Met? YES														



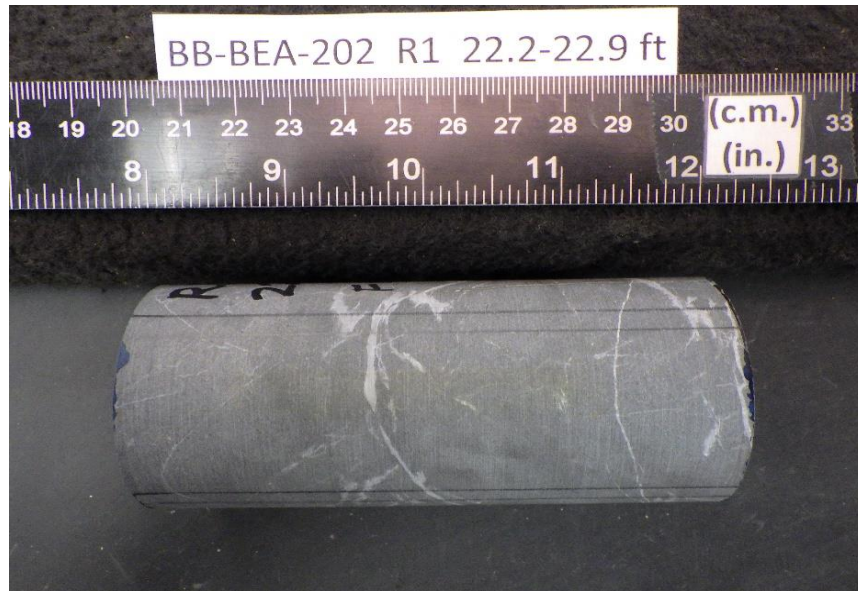
DIAMETER 1			
End 1:	Slope of Best Fit Line	0.00000	
	Angle of Best Fit Line:	0.00000	
End 2:	Slope of Best Fit Line	0.00007	
	Angle of Best Fit Line:	0.00409	
Maximum Angular Difference:		0.00409	
Parallelism Tolerance Met?	Spherically Seated	YES	



DIAMETER 2			
End 1:	Slope of Best Fit Line	0.00053	
	Angle of Best Fit Line:	0.03028	
End 2:	Slope of Best Fit Line	0.00059	
	Angle of Best Fit Line:	0.03389	
Maximum Angular Difference:		0.00360	
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	0.00000	2.000	0.00000	0.000	YES		
Diameter 2, in (rotated 90°)	0.00080	2.000	0.00040	0.023	YES		Perpendicularity Tolerance Met? YES
END 2							
Diameter 1, in	0.00020	2.000	0.00010	0.006	YES		
Diameter 2, in (rotated 90°)	0.00090	2.000	0.00045	0.026	YES		

Client:	Haley & Aldrich, Inc.
Project Name:	I-395/Rte 9 Connector Bridge (Eastern Ave)
Project Location:	Brewer, ME
GTX #:	313321
Test Date:	3/25/2021
Tested By:	cmh
Checked By:	smd
Boring ID:	BB-BEA-202
Sample ID:	R1
Depth, ft:	22.2-22.9



After cutting and grinding

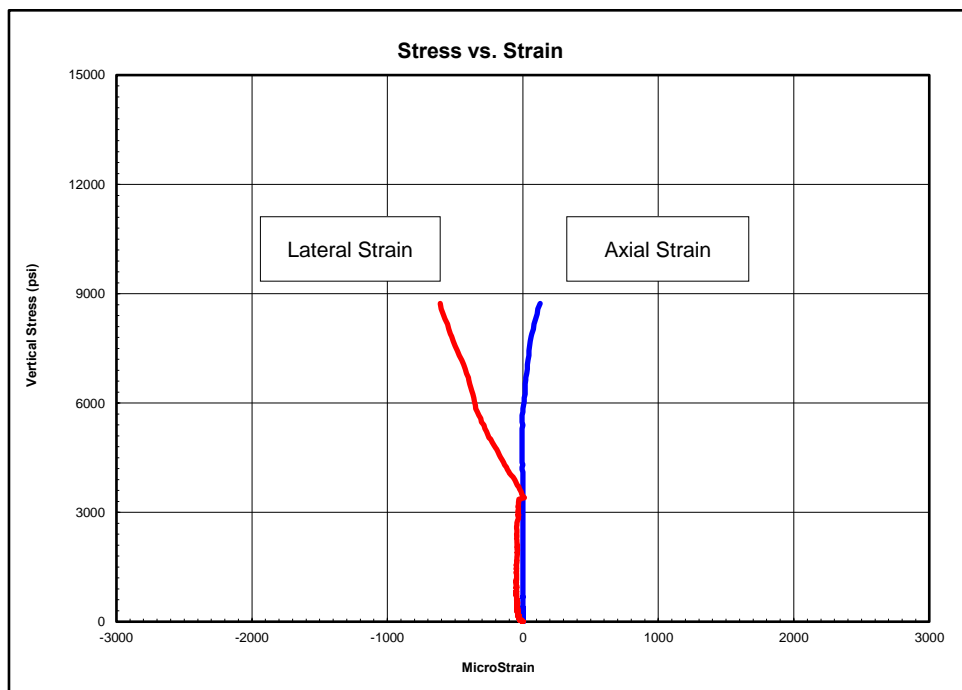


After break



Client:	Haley & Aldrich, Inc.
Project Name:	I-395/Rte 9 Connector Bridge (Eastern Ave)
Project Location:	Brewer, ME
GTX #:	313321
Test Date:	3/25/2021
Tested By:	cmh
Checked By:	jsc
Boring ID:	BB-BEA-203
Sample ID:	R1
Depth, ft:	20.6-21.7
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: 8,733 psi

The strain gauges failed to record meaningful data in order to produce Young's Modulus and Poisson's Ratio for the first and second stress ranges.

Stress Range, psi	Young's Modulus, psi	Poisson's Ratio
900-3200	---	---
3200-5500	---	---
5500-7900	35,100,000	---

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.

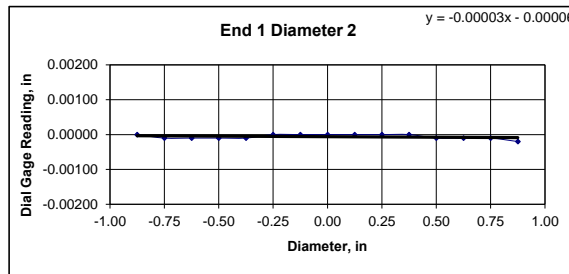
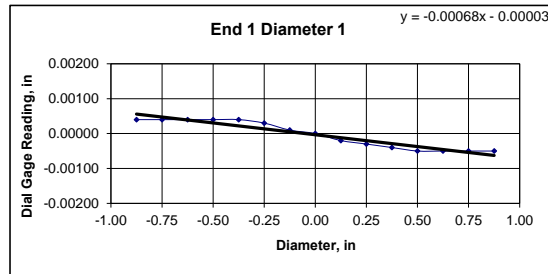


Client:	Haley & Aldrich, Inc.	Test Date:	3/22/2021
Project Name:	I-395/Rte 9 Connector Bridge (Eastern Ave)	Tested By:	cmh
Project Location:	Brewer, ME	Checked By:	smd
GT# #:	313321		
Boring ID:	BB-BEA-203		
Sample ID:	R1		
Depth:	20.6-21.7 ft		
Visual Description:	See photographs		

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.?	
Specimen Length, in:	4.48	4.48	4.48	YES	
Specimen Diameter, in:	1.99	1.99	1.99	Maximum difference must be < 0.020 in.	
Specimen Mass, g:	617.94			Straightness Tolerance Met?	
Bulk Density, lb/ft ³ :	169			YES	
Length to Diameter Ratio:	2.3				
		Minimum Diameter Tolerance Met?	YES		
		Length to Diameter Ratio Tolerance Met?	YES		

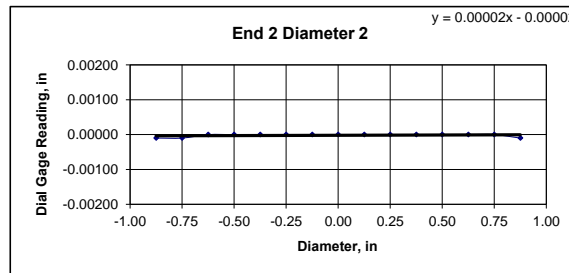
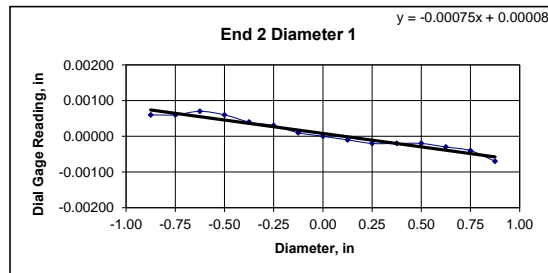
END FLATNESS AND PARALLELISM (Procedure FP1)													
END 1	-0.875	-0.750	-0.625	-0.500	-0.375	-0.250	-0.125	0.000	0.125	0.250	0.375	0.500	0.625
Diameter 1, in	0.00040	0.00040	0.00040	0.00040	0.00040	0.00030	0.00010	0.00000	-0.00020	-0.00030	-0.00040	-0.00050	-0.00050
Diameter 2, in (rotated 90°)	0.00000	-0.00010	-0.00010	-0.00010	-0.00010	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	-0.00010	-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
Diameter 1, in	0.00060	0.00060	0.00070	0.00060	0.00040	0.00030	0.00010	0.00000	-0.00010	-0.00020	-0.00020	-0.00030	-0.00040
Diameter 2, in (rotated 90°)	-0.00010	-0.00010	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	-0.00010
Difference between max and min readings, in:													
0° = 0.0014 90° = 0.0001													
Maximum difference must be < 0.0020 in. Difference = ± 0.00070													
Flatness Tolerance Met? YES													



DIAMETER 1

End 1:	Slope of Best Fit Line	0.00068
	Angle of Best Fit Line:	0.03880
End 2:	Slope of Best Fit Line	0.00075
	Angle of Best Fit Line:	0.04305
Maximum Angular Difference:		0.00426

Parallelism Tolerance Met? YES
Spherically Seated



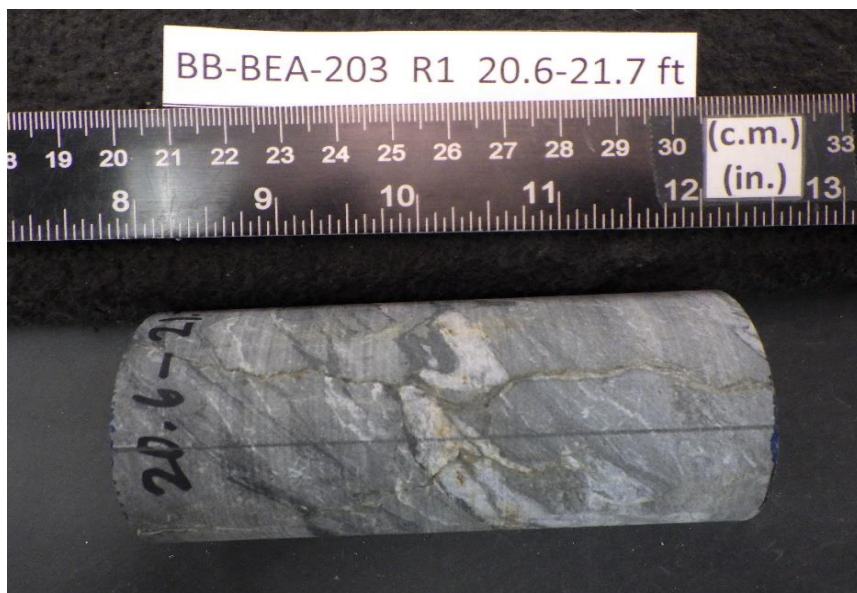
DIAMETER 2

End 1:	Slope of Best Fit Line	0.00003
	Angle of Best Fit Line:	0.00180
End 2:	Slope of Best Fit Line	0.00002
	Angle of Best Fit Line:	0.00098
Maximum Angular Difference:		0.00082

Parallelism Tolerance Met? YES
Spherically Seated

PERPENDICULARITY (Procedure P1)						Maximum angle of departure must be $\leq 0.25^\circ$	
END 1	Difference, Maximum and Minimum (in.)	Diameter (in.)	Slope	Angle°	Perpendicularity Tolerance Met?		
Diameter 1, in	0.00090	1.990	0.00045	0.026	YES		
Diameter 2, in (rotated 90°)	0.00020	1.990	0.00010	0.006	YES	Perpendicularity Tolerance Met? YES	
END 2							
Diameter 1, in	0.00140	1.990	0.00070	0.040	YES		
Diameter 2, in (rotated 90°)	0.00010	1.990	0.00005	0.003	YES		

Client:	Haley & Aldrich, Inc.
Project Name:	I-395/Rte 9 Connector Bridge (Eastern Ave)
Project Location:	Brewer, ME
GTX #:	313321
Test Date:	3/26/2021
Tested By:	cmh
Checked By:	smd
Boring ID:	BB-BEA-203
Sample ID:	R1
Depth, ft:	20.6-21.7



After cutting and grinding

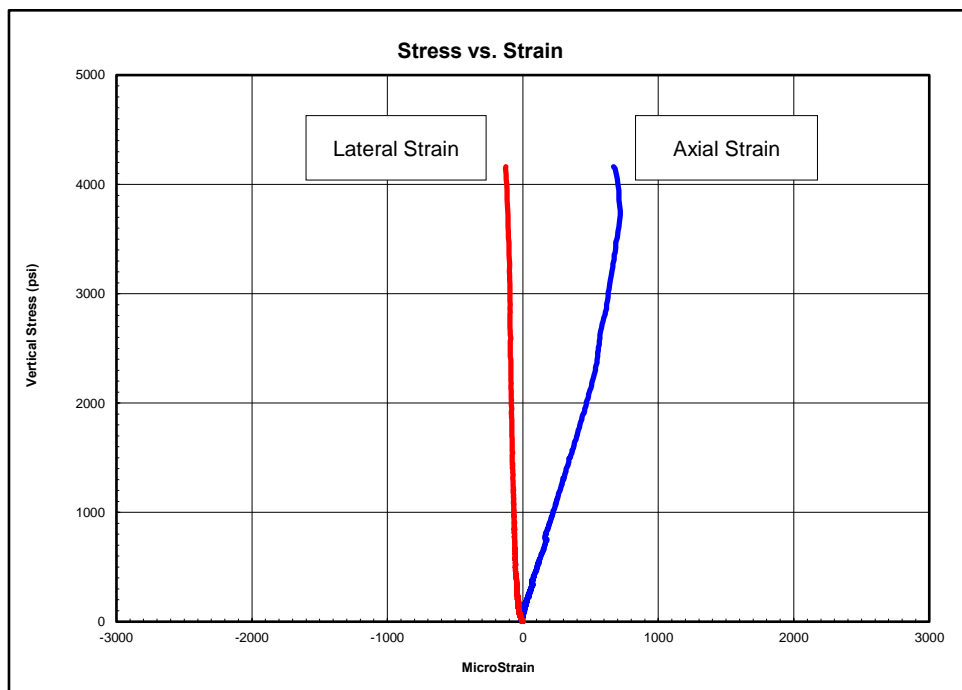


After break



Client:	Haley & Aldrich, Inc.
Project Name:	I-395/Rte 9 Connector Bridge (Eastern Ave)
Project Location:	Brewer, ME
GTX #:	313321
Test Date:	3/25/2021
Tested By:	cmh
Checked By:	jsc
Boring ID:	BB-BEA-204
Sample ID:	R2
Depth, ft:	26.9-27.4
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: 4,162 psi

Stress Range, psi	Young's Modulus, psi	Poisson's Ratio
400-1500	4,160,000	0.10
1500-2600	4,660,000	0.08
2600-3700	7,310,000	0.13

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.

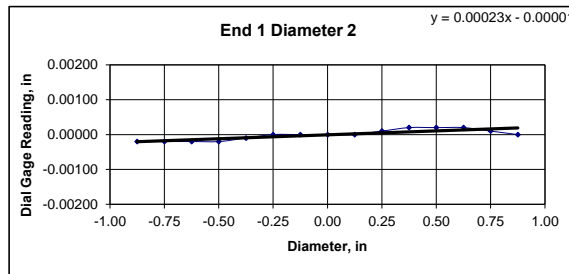
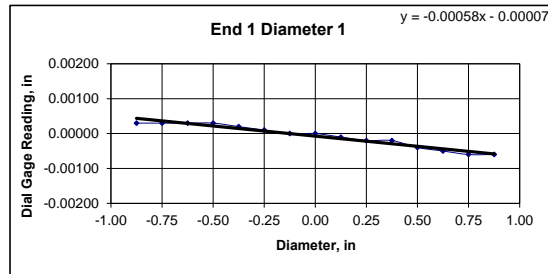


Client:	Haley & Aldrich, Inc.	Test Date:	3/22/2021
Project Name:	I-395/Rte 9 Connector Bridge (Eastern Ave)	Tested By:	cmh
Project Location:	Brewer, ME	Checked By:	smd
GTX #:	313321		
Boring ID:	BB-BEA-204		
Sample ID:	R2		
Depth:	26.9-27.4 ft		
Visual Description:	See photographs		

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:	4.49	4.49	4.49	Maximum difference must be < 0.020 in. Straightness Tolerance Met? YES	
Specimen Diameter, in:	2.00	1.99	2.00		
Specimen Mass, g:	622.38				
Bulk Density, lb/ft ³	169				
Length to Diameter Ratio:	2.3				
		Minimum Diameter Tolerance Met?	YES		
		Length to Diameter Ratio Tolerance Met?	YES		

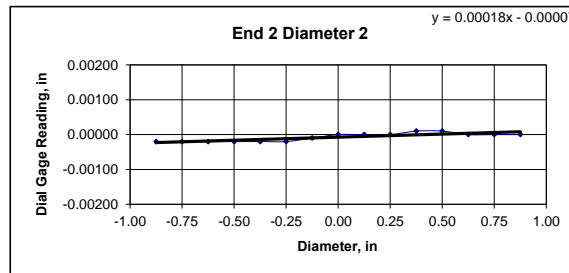
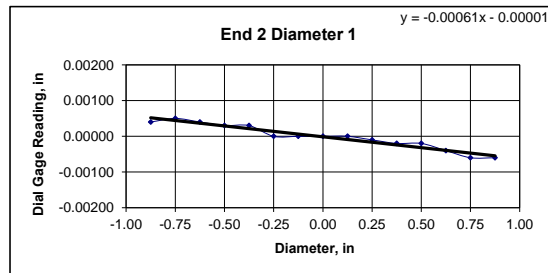
END FLATNESS AND PARALLELISM (Procedure FP1)															
END 1	-0.875	-0.750	-0.625	-0.500	-0.375	-0.250	-0.125	0.000	0.125	0.250	0.375	0.500	0.625	0.750	0.875
Diameter 1, in	0.00030	0.00030	0.00030	0.00030	0.00020	0.00010	0.00000	0.00000	-0.00010	-0.00020	-0.00020	-0.00040	-0.00050	-0.00060	-0.00060
Diameter 2, in (rotated 90°)	-0.00020	-0.00020	-0.00020	-0.00020	-0.00010	0.00000	0.00000	0.00000	0.00000	0.00010	0.00020	0.00020	0.00020	0.00010	0.00000
Difference between max and min readings, in: 0° = 0.00090 90° = 0.00040															
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	0.00050	0.00040	0.00030	0.00030	0.00000	0.00000	0.00000	0.00000	-0.00010	-0.00020	-0.00020	-0.00040	-0.00060	-0.00060
Diameter 2, in (rotated 90°)	-0.00020	-0.00020	-0.00020	-0.00020	-0.00020	-0.00020	-0.00010	0.00000	0.00000	0.00000	0.00010	0.00010	0.00000	0.00000	0.00000
Difference between max and min readings, in: 0° = 0.0011 90° = 0.0003 Maximum difference must be < 0.0020 in. Difference = ± 0.00055															
Flatness Tolerance Met? YES															



DIAMETER 1

End 1:		
Slope of Best Fit Line	0.00058	
Angle of Best Fit Line:	0.03340	
End 2:		
Slope of Best Fit Line	0.00061	
Angle of Best Fit Line:	0.03487	
Maximum Angular Difference:	0.00147	

Parallelism Tolerance Met? YES
Spherically Seated



DIAMETER 2

End 1:		
Slope of Best Fit Line	0.00023	
Angle of Best Fit Line:	0.01293	
End 2:		
Slope of Best Fit Line	0.00018	
Angle of Best Fit Line:	0.01015	
Maximum Angular Difference:	0.00278	

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?	Maximum angle of departure must be $\leq 0.25^\circ$
Diameter 1, in	0.00090		1.995	0.00045	0.026	YES	
Diameter 2, in (rotated 90°)	0.00040		1.995	0.00020	0.011	YES	Perpendicularity Tolerance Met? YES
END 2							
Diameter 1, in	0.00110		1.995	0.00055	0.032	YES	
Diameter 2, in (rotated 90°)	0.00030		1.995	0.00015	0.009	YES	

Client:	Haley & Aldrich, Inc.
Project Name:	I-395/Rte 9 Connector Bridge (Eastern Ave)
Project Location:	Brewer, ME
GTX #:	313321
Test Date:	3/26/2021
Tested By:	cmh
Checked By:	smd
Boring ID:	BB-BEA-204
Sample ID:	R2
Depth, ft:	26.9-27.4



After cutting and grinding

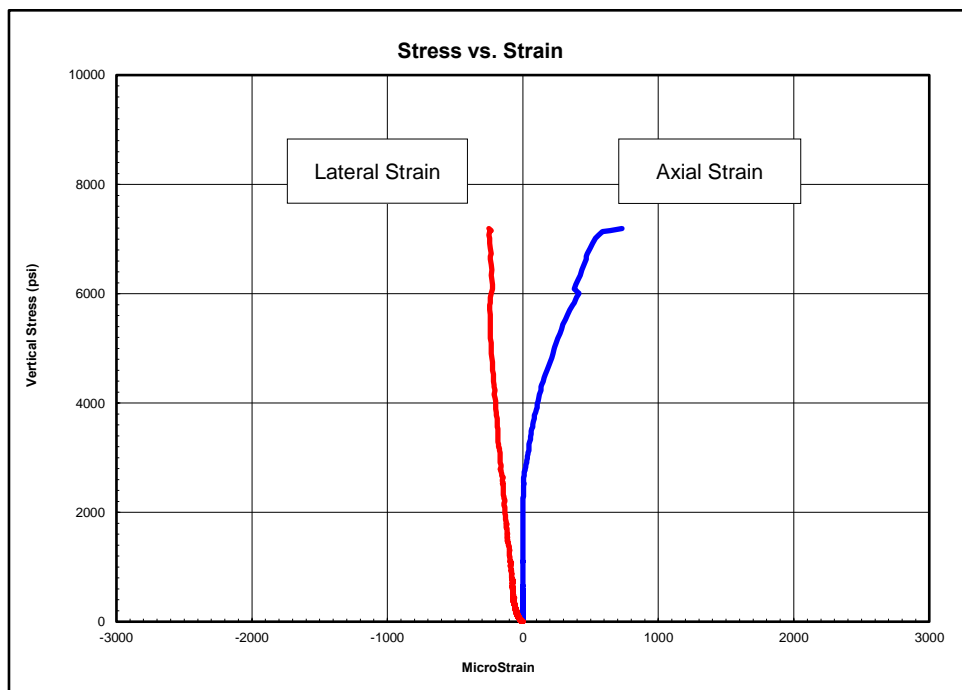


After break



Client:	Haley & Aldrich, Inc.
Project Name:	I-395/Rte 9 Connector Bridge(Cleweyville Rd)
Project Location:	Eddington, ME
GTX #:	313418
Test Date:	4/7/2021
Tested By:	cmh
Checked By:	smd
Boring ID:	BB-ECR-202
Sample ID:	R3
Depth, ft:	23.64-24.02
Sample Type:	rock core
Sample Description:	See photographs Intact material and discontinuity failure

Compressive Strength and Elastic Moduli of Rock by ASTM D7012 - Method D



Peak Compressive Stress: 7,193 psi

Young's Modulus and Poisson's Ratio could not be determined within the first stress range. The strain values recorded within the third stress range produce values of Poisson's Ratio that exceed maximum values found in rocks.

Stress Range, psi	Young's Modulus, psi	Poisson's Ratio
700-2600	---	---
2600-4600	12,300,000	0.43
4600-6500	6,700,000	---

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.

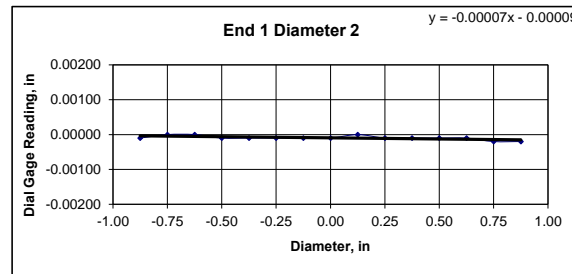
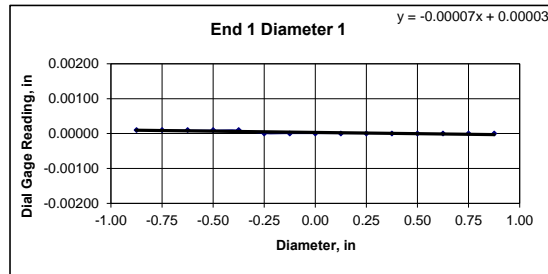


Client:	Haley & Aldrich, Inc.	Test Date:	4/1/2021
Project Name:	I-395/Rte 9 Connector Bridge (Clewesville Rd)	Tested By:	cmh
Project Location:	Eddington, ME	Checked By:	smd
GTX #:	313418		
Boring ID:	BB-ECR-202		
Sample ID:	R3		
Depth:	23.64-24.02 ft		
Visual Description:	See photographs		

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.?	
Specimen Length, in:	4.59	4.59	4.59	NO	
Specimen Diameter, in:	1.99	1.99	1.99	Maximum difference must be < 0.020 in.	
Specimen Mass, g:	642.08			Straightness Tolerance Met?	
Bulk Density, lb/ft ³ :	171			NO	
Length to Diameter Ratio:	2.3			Minimum Diameter Tolerance Met?	
				YES	
				Length to Diameter Ratio Tolerance Met?	
				YES	

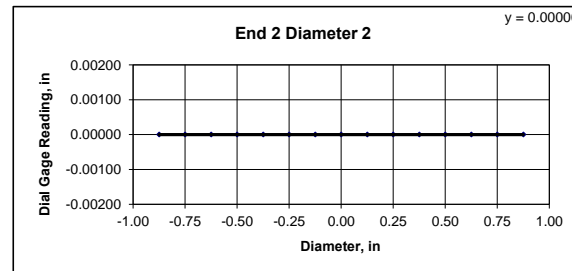
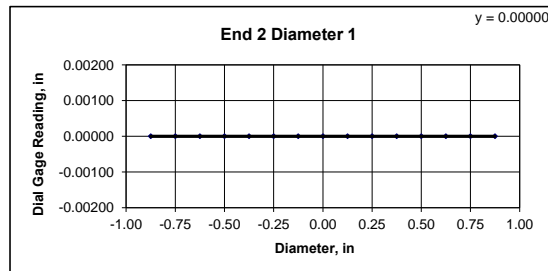
END FLATNESS AND PARALLELISM (Procedure FP1)														
END 1	-0.875	-0.750	-0.625	-0.500	-0.375	-0.250	-0.125	0.000	0.125	0.250	0.375	0.500	0.625	0.750
Diameter 1, in	0.00010	0.00010	0.00010	0.00010	0.00010	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Diameter 2, in (rotated 90°)	-0.00010	0.00000	0.00000	-0.00010	-0.00010	-0.00010	-0.00010	-0.00010	0.00000	-0.00010	-0.00010	-0.00010	-0.00020	-0.00020
Difference between max and min readings, in:														
0° = 0.00010 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
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
Diameter 2, in (rotated 90°)	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
Difference between max and min readings, in:														
0° = 0 90° = 0														
Maximum difference must be < 0.0020 in. Difference = ± 0.00010														
Flatness Tolerance Met?														
YES														



DIAMETER 1

End 1:		
Slope of Best Fit Line	0.00007	
Angle of Best Fit Line:	0.00409	
End 2:		
Slope of Best Fit Line	0.00000	
Angle of Best Fit Line:	0.00000	
Maximum Angular Difference:	0.00409	

Parallelism Tolerance Met? YES
Spherically Seated



DIAMETER 2

End 1:		
Slope of Best Fit Line	0.00007	
Angle of Best Fit Line:	0.00377	
End 2:		
Slope of Best Fit Line	0.00000	
Angle of Best Fit Line:	0.00000	
Maximum Angular Difference:	0.00377	

Parallelism Tolerance Met? YES
Spherically Seated

PERPENDICULARITY (Procedure P1)						Maximum angle of departure must be $\leq 0.25^\circ$	
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°)	0.00020	1.990	0.00010	0.006	YES	Perpendicularity Tolerance Met?	
						YES	
END 2							
Diameter 1, in	0.00000	1.990	0.00000	0.000	YES		
Diameter 2, in (rotated 90°)	0.00000	1.990	0.00000	0.000	YES		

Client:	Haley & Aldrich, Inc.
Project Name:	I-395/Rte 9 Connector Bridge (Cleweyville Rd)
Project Location:	Eddington, ME
GTX #:	313418
Test Date:	4/7/2021
Tested By:	cmh
Checked By:	smd
Boring ID:	BB-ECR-202
Sample ID:	R3
Depth, ft:	23.64-24.02



After cutting and grinding

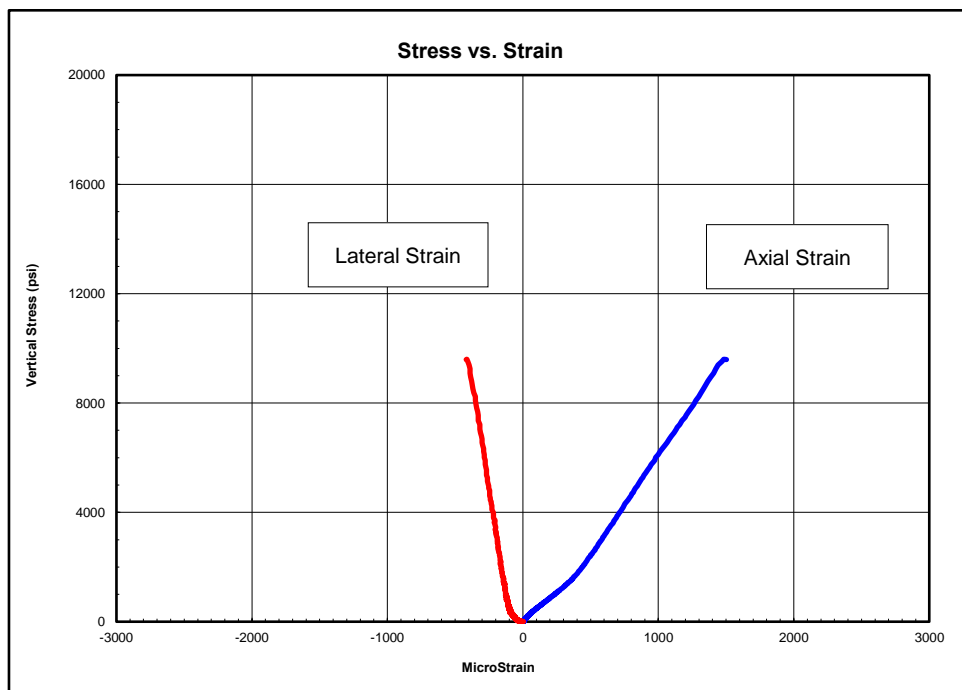


After break



Client:	Haley & Aldrich, Inc.
Project Name:	I-395/Rte 9 Connector Bridge(Cleweyville Rd)
Project Location:	Eddington, ME
GTX #:	313418
Test Date:	4/7/2021
Tested By:	cmh
Checked By:	jsc
Boring ID:	BB-ECR-203
Sample ID:	R2
Depth, ft:	17.97-18.35
Sample Type:	rock core
Sample Description:	See photographs Intact material and discontinuity failure

Compressive Strength and Elastic Moduli of Rock by ASTM D7012 - Method D



Peak Compressive Stress: 9,759 psi

Stress Range, psi	Young's Modulus, psi	Poisson's Ratio
1000-3600	5,990,000	0.19
3600-6200	7,470,000	0.24
6200-8800	7,170,000	0.25

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.

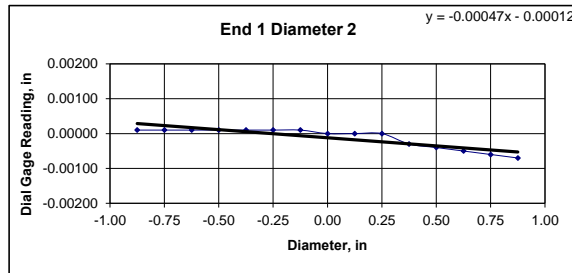
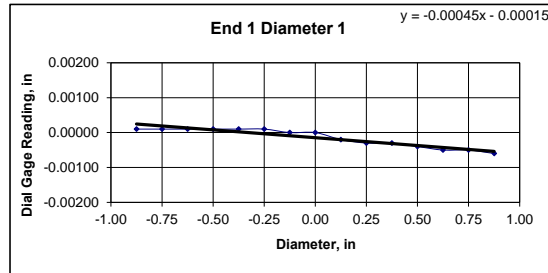


Client:	Haley & Aldrich, Inc.	Test Date:	4/2/2021
Project Name:	I-395/Rte 9 Connector Bridge (Clewesville Rd)	Tested By:	cmh
Project Location:	Eddington, ME	Checked By:	smd
GTX #:	313418		
Boring ID:	BB-ECR-203		
Sample ID:	R2		
Depth:	17.97-18.35 ft		
Visual Description:	See photographs		

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.?	
Specimen Length, in:	4.48	4.47	4.48	NO	
Specimen Diameter, in:	1.97	1.97	1.97	Maximum difference must be < 0.020 in.	
Specimen Mass, g:	599.91			Straightness Tolerance Met?	
Bulk Density, lb/ft ³ :	167			NO	
Length to Diameter Ratio:	2.3			Minimum Diameter Tolerance Met? YES	
				Length to Diameter Ratio Tolerance Met? YES	

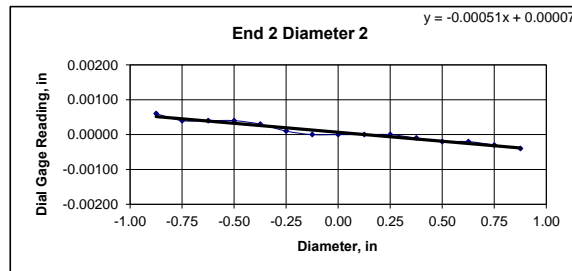
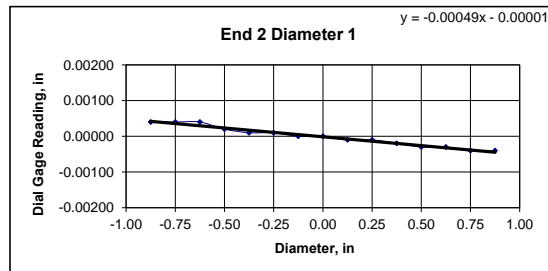
END FLATNESS AND PARALLELISM (Procedure FP1)															
END 1	-0.875	-0.750	-0.625	-0.500	-0.375	-0.250	-0.125	0.000	0.125	0.250	0.375	0.500	0.625	0.750	0.875
Diameter 1, in	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00000	0.00000	-0.00020	-0.00030	-0.00030	-0.00040	-0.00050	-0.00050	-0.00060
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	-0.00030	-0.00040	-0.00050	-0.00060	-0.00070
Difference between max and min readings, in:															
0° = 0.00070 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	0.00040	0.00040	0.00040	0.00020	0.00010	0.00010	0.00000	0.00000	-0.00010	-0.00010	-0.00020	-0.00030	-0.00030	-0.00040	-0.00040
Diameter 2, in (rotated 90°)	0.00060	0.00040	0.00040	0.00040	0.00030	0.00010	0.00000	0.00000	0.00000	0.00000	-0.00010	-0.00020	-0.00020	-0.00030	-0.00040
Difference between max and min readings, in:															
0° = 0.0008 90° = 0.001															
Maximum difference must be < 0.0020 in. Difference = ± 0.00050															
Flatness Tolerance Met? YES															



DIAMETER 1

End 1:	Slope of Best Fit Line	0.00045
	Angle of Best Fit Line:	0.02570
End 2:	Slope of Best Fit Line	0.00049
	Angle of Best Fit Line:	0.02832
Maximum Angular Difference:		0.00262

Parallelism Tolerance Met? YES
Spherically Seated



DIAMETER 2

End 1:	Slope of Best Fit Line	0.00047
	Angle of Best Fit Line:	0.02668
End 2:	Slope of Best Fit Line	0.00051
	Angle of Best Fit Line:	0.02947
Maximum Angular Difference:		0.00278

Parallelism Tolerance Met? YES
Spherically Seated

PERPENDICULARITY (Procedure P1)						Maximum angle of departure must be $\leq 0.25^\circ$	
END 1	Difference, Maximum and Minimum (in.)	Diameter (in.)	Slope	Angle°	Perpendicularity Tolerance Met?		
Diameter 1, in	0.00070	1.970	0.00036	0.020	YES		
Diameter 2, in (rotated 90°)	0.00080	1.970	0.00041	0.023	YES	Perpendicularity Tolerance Met? YES	
END 2							
Diameter 1, in	0.00080	1.970	0.00041	0.023	YES		
Diameter 2, in (rotated 90°)	0.00100	1.970	0.00051	0.029	YES		

Client:	Haley & Aldrich, Inc.
Project Name:	I-395/Rte 9 Connector Bridge (Cleweyville Rd)
Project Location:	Eddington, ME
GTX #:	313418
Test Date:	4/7/2021
Tested By:	cmh
Checked By:	smd
Boring ID:	BB-ECR-203
Sample ID:	R2
Depth, ft:	17.97-18.35



After cutting and grinding

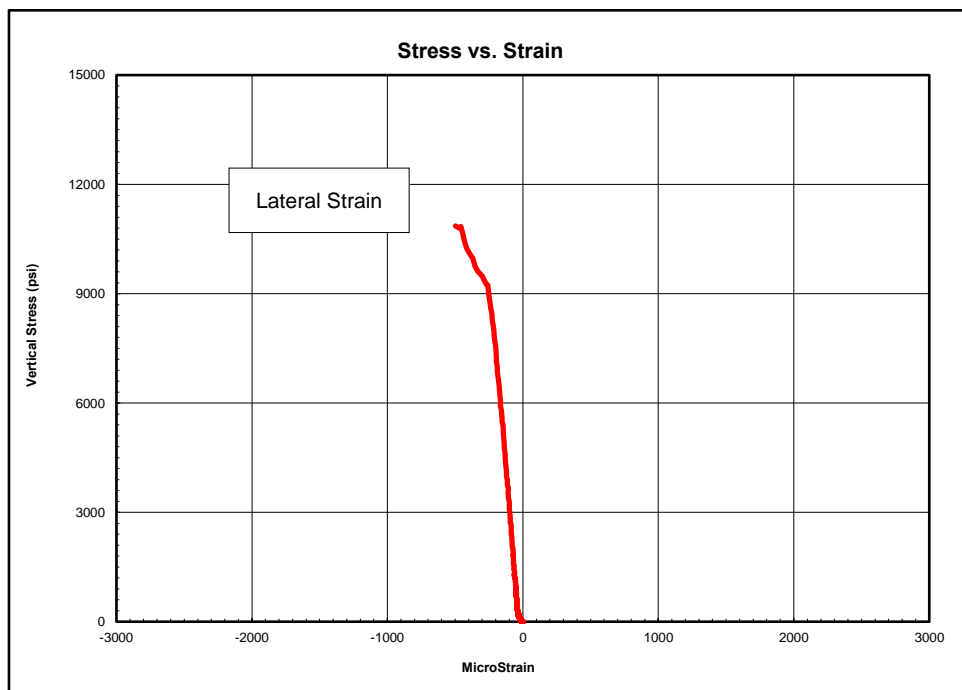


After break



Client:	Haley & Aldrich, Inc.
Project Name:	I-395/Rte 9 Connector Bridge(Cleweyville Rd)
Project Location:	Eddington, ME
GTX #:	313418
Test Date:	4/7/2021
Tested By:	cmh
Checked By:	jsc
Boring ID:	BB-ECR-203A
Sample ID:	R3
Depth, ft:	20.81-21.25
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: 10,859 psi

The axial strain gauges failed to record meaningful data. Young's Modulus and Poisson's Ratio could not be determined.

Stress Range, psi	Young's Modulus, psi	Poisson's Ratio
1100-4000	---	---
4000-6900	---	---
6900-9800	---	---

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.

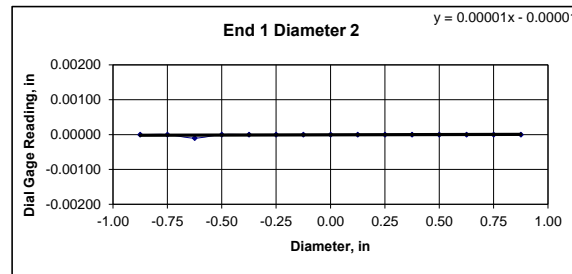
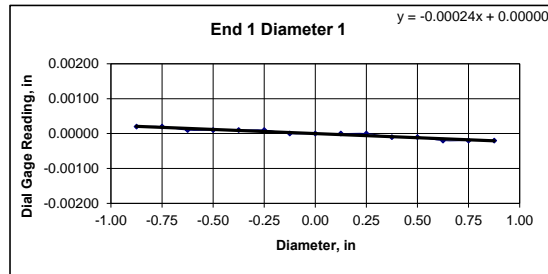


Client:	Haley & Aldrich, Inc.	Test Date:	4/2/2021
Project Name:	I-395/Rte 9 Connector Bridge (Clewesville Rd)	Tested By:	cmh
Project Location:	Eddington, ME	Checked By:	smd
GTX #:	313418		
Boring ID:	BB-ECR-203A		
Sample ID:	R3		
Depth:	20.81-21.25 ft		
Visual Description:	See photographs		

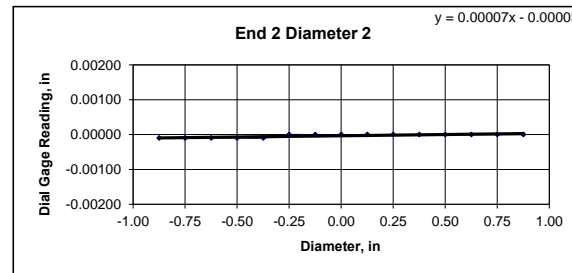
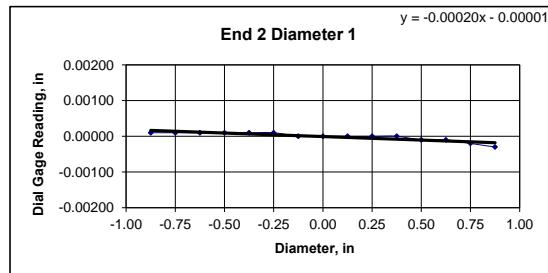
UNIT WEIGHT DETERMINATION AND DIMENSIONAL AND SHAPE TOLERANCES OF ROCK CORE SPECIMENS BY ASTM D4543

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:	5.22	5.21	5.22	Maximum difference must be $<$ 0.020 in. Straightness Tolerance Met? YES	
Specimen Diameter, in:	2.48	2.48	2.48		
Specimen Mass, g:	1133.64				
Bulk Density, lb/ft ³	171				
Length to Diameter Ratio:	2.1				
		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	0.00020	0.00020	0.00010	0.00010	0.00010	0.00010	0.00000	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	-0.00010	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
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	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00000	0.00000	0.00000	0.00000	0.00000	-0.00010	-0.00010	-0.00020	-0.00030
Diameter 2, in (rotated 90°)	-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	0.00000
Difference between max and min readings, in: 0° = 0.0004 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	0.00024
Angle of Best Fit Line:	0.01359
End 2:	
Slope of Best Fit Line	0.00020
Angle of Best Fit Line:	0.01130
Maximum Angular Difference:	0.00229
Parallelism Tolerance Met?	YES
Spherically Seated	



DIAMETER 2	
End 1:	
Slope of Best Fit Line	0.00001
Angle of Best Fit Line:	0.00082
End 2:	
Slope of Best Fit Line	0.00007
Angle of Best Fit Line:	0.00409
Maximum Angular Difference:	0.00327
Parallelism Tolerance Met?	YES
Spherically Seated	

PERPENDICULARITY (Procedure P1)						Maximum angle of departure must be \leq 0.25°	
END 1	(Calculated from End Flatness and Parallelism measurements above)						
	Difference, Maximum and Minimum (in.)	Diameter (in.)	Slope	Angle°	Perpendicularity Tolerance Met?		
Diameter 1, in	0.00040	2.480	0.00016	0.009	YES		
Diameter 2, in (rotated 90°)	0.00010	2.480	0.00004	0.002	YES	Perpendicularity Tolerance Met?	YES
END 2							
Diameter 1, in	0.00040	2.480	0.00016	0.009	YES		
Diameter 2, in (rotated 90°)	0.00010	2.480	0.00004	0.002	YES		



Client:	Haley & Aldrich, Inc.
Project Name:	I-395/Rte 9 Connector Bridge (Cleweyville Rd)
Project Location:	Eddington, ME
GTX #:	313418
Test Date:	4/8/2021
Tested By:	7-Apr
Checked By:	smd
Boring ID:	BB-ECR-203A
Sample ID:	R3
Depth, ft:	20.81-21.25



After cutting and grinding

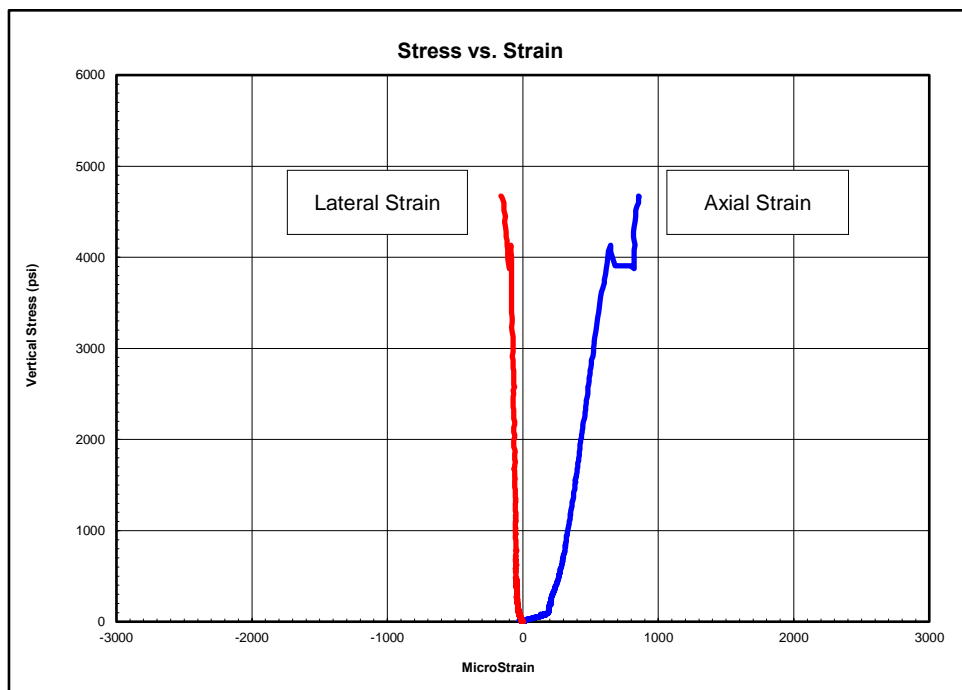


After break



Client:	Haley & Aldrich, Inc.
Project Name:	I-395/Rte 9 Connector Bridge(Cleweyville Rd)
Project Location:	Eddington, ME
GTX #:	313418
Test Date:	4/7/2021
Tested By:	cmh
Checked By:	jsc
Boring ID:	BB-ECR-204A
Sample ID:	R3
Depth, ft:	21.64-22.08
Sample Type:	rock core
Sample Description:	See photographs Intact material and discontinuity failure Best Effort End Preparation

Compressive Strength and Elastic Moduli of Rock by ASTM D7012 - Method D



Peak Compressive Stress: 4,672 psi

Stress Range, psi	Young's Modulus, psi	Poisson's Ratio
500-1700	8,620,000	0.13
1700-3000	10,900,000	0.20
3000-4100	8,980,000	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.

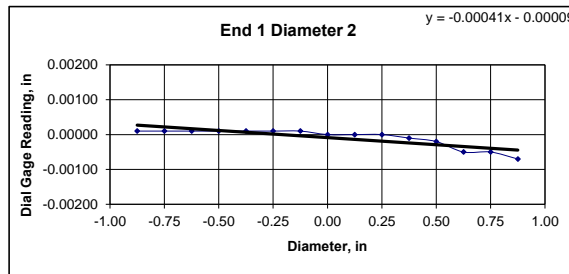
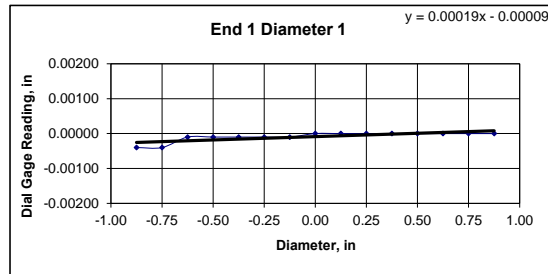


Client:	Haley & Aldrich, Inc.	Test Date:	4/1/2021
Project Name:	I-395/Rte 9 Connector Bridge (Clewesville Rd)	Tested By:	cmh
Project Location:	Eddington, ME	Checked By:	smd
GTX #:	313418		
Boring ID:	BB-ECR-204A		
Sample ID:	R3		
Depth:	21.64-22.08 ft		
Visual Description:	See photographs		

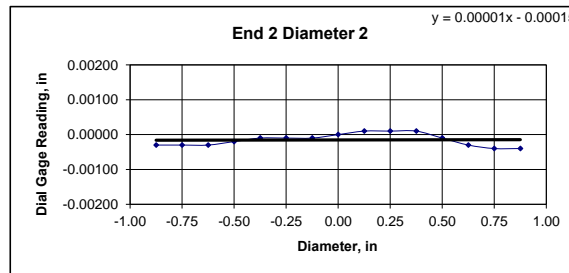
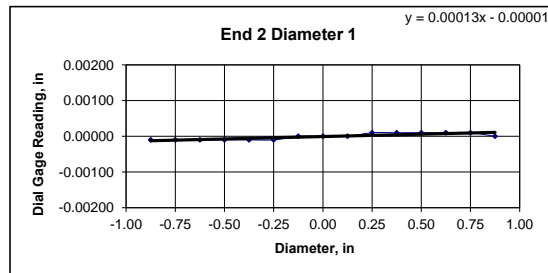
UNIT WEIGHT DETERMINATION AND DIMENSIONAL AND SHAPE TOLERANCES OF ROCK CORE SPECIMENS BY ASTM D4543

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.? NO	
Specimen Length, in:	5.47	5.46	5.47	Maximum difference must be $<$ 0.020 in. Straightness Tolerance Met? NO	
Specimen Diameter, in:	2.49	2.48	2.49		
Specimen Mass, g:	1172.15				
Bulk Density, lb/ft ³	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	0.750
Diameter 1, in	-0.00040	-0.00040	-0.00010	-0.00010	-0.00010	-0.00010	-0.00010	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	0.00010	0.00000	0.00000	0.00000	-0.00010	-0.00020	-0.00050	-0.00070
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
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	0.00010	0.00000
Diameter 2, in (rotated 90°)	-0.00030	-0.00030	-0.00030	-0.00020	-0.00010	-0.00010	-0.00010	0.00000	0.00010	0.00010	0.00010	-0.00010	-0.00030	-0.00040
Difference between max and min readings, in: 0° = 0.0002 90° = 0.0005 Maximum difference must be $<$ 0.0020 in. Difference = \pm 0.00040 Flatness Tolerance Met? YES														



DIAMETER 1	
End 1:	
Slope of Best Fit Line	0.00019
Angle of Best Fit Line:	0.01097
End 2:	
Slope of Best Fit Line	0.00013
Angle of Best Fit Line:	0.00769
Maximum Angular Difference:	0.00327
Parallelism Tolerance Met? Spherically Seated	YES



DIAMETER 2	
End 1:	
Slope of Best Fit Line	0.00041
Angle of Best Fit Line:	0.02341
End 2:	
Slope of Best Fit Line	0.00001
Angle of Best Fit Line:	0.00049
Maximum Angular Difference:	0.02292
Parallelism Tolerance Met? Spherically Seated	NO

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	0.00040	2.485	0.00016	0.009	YES	Perpendicularity Tolerance Met? YES
Diameter 2, in (rotated 90°)	0.00080	2.485	0.00032	0.018	YES	
END 2						
Diameter 1, in	0.00020	2.485	0.00008	0.005	YES	
Diameter 2, in (rotated 90°)	0.00050	2.485	0.00020	0.012	YES	

Client:	Haley & Aldrich, Inc.
Project Name:	I-395/Rte 9 Connector Bridge (Cleweyville Rd)
Project Location:	Eddington, ME
GTX #:	313418
Test Date:	4/7/2021
Tested By:	cmh
Checked By:	smd
Boring ID:	BB-ECR-204A
Sample ID:	R3
Depth, ft:	21.64-22.08



After cutting and grinding



After break



Client:	Haley & Aldrich, Inc.	Test Date:	4/1/2021
Project Name:	I-395/Rte 9 Connector Bridge (Cleweyv	Tested By:	cmh
Project Location:	Eddington, ME	Checked By:	smd
GTX #:	313418		
Boring ID:	BB-ECR-204A	Reliable dial gauge measurements could not be performed on this rock type. Tolerance measurements were performed using a machinist straightedge and feeler gauges to ASTM specifications.	
Sample ID:	R3		
Depth (ft):	21.64-22.08		
Visual Description:	See photographs		

BEST EFFORT END FLATNESS TOLERANCES OF ROCK CORE SPECIMENS TO
ASTM D4543

END FLATNESS

END 1

Diameter 1	Is the maximum gap $\leq \pm 0.001$ in.?	YES
Diameter 2 (rotated 90°)	Is the maximum gap $\leq \pm 0.001$ in.?	YES

END 2

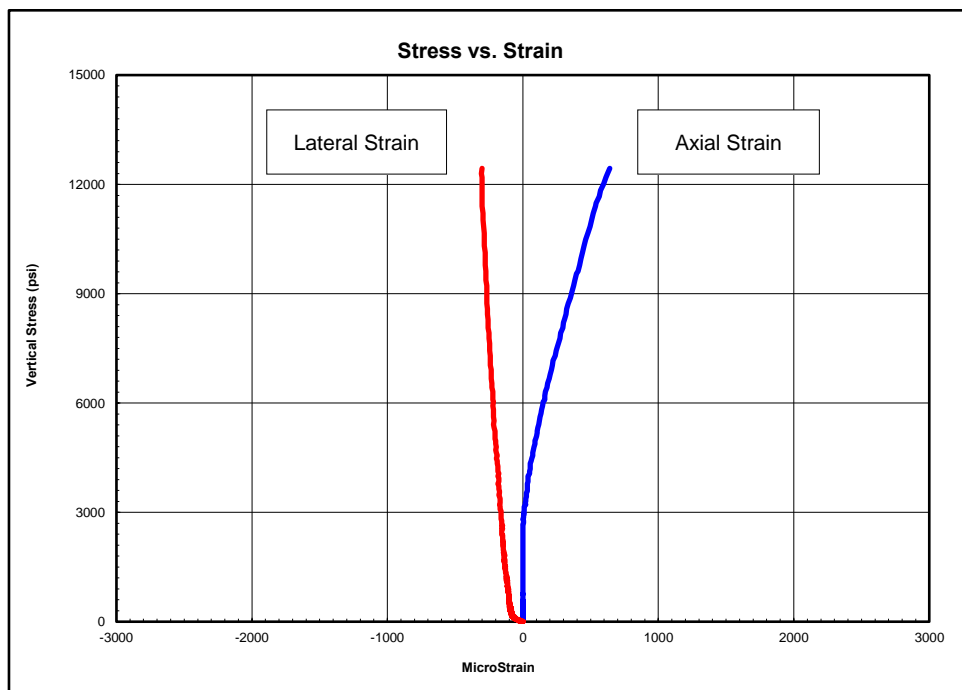
Diameter 1	Is the maximum gap $\leq \pm 0.001$ in.?	YES
Diameter 2 (rotated 90°)	Is the maximum gap $\leq \pm 0.001$ in.?	YES

End Flatness Tolerance Met? YES



Client:	Haley & Aldrich, Inc.
Project Name:	I-395/Rte 9 Connector Bridge(Cleweyville Rd)
Project Location:	Eddington, ME
GTX #:	313418
Test Date:	4/7/2021
Tested By:	cmh
Checked By:	jsc
Boring ID:	BB-ECR-205
Sample ID:	R6
Depth, ft:	24.15-24.53
Sample Type:	rock core
Sample Description:	See photographs Intact material and discontinuity failure

Compressive Strength and Elastic Moduli of Rock by ASTM D7012 - Method D



Peak Compressive Stress: 12,440 psi

The strain values recorded within the first stress range for this test produce values of Poisson's Ratio that exceed maximum values found in rocks.

Stress Range, psi	Young's Modulus, psi	Poisson's Ratio
1200-4600	---	---
4600-7900	15,900,000	0.27
7900-11200	13,700,000	0.17

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.

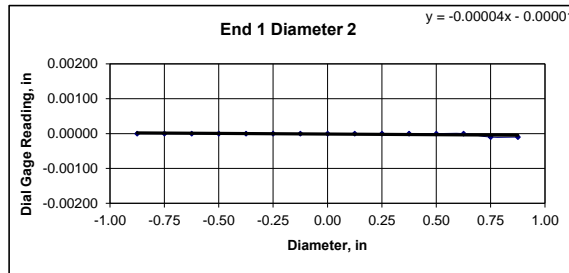
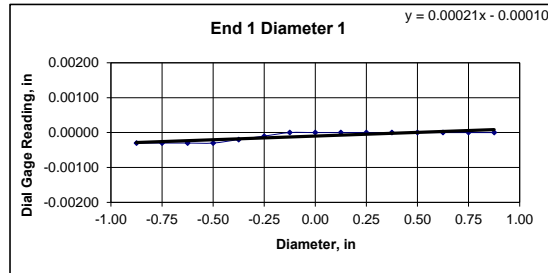


Client:	Haley & Aldrich, Inc.	Test Date:	4/2/2021
Project Name:	I-395/Rte 9 Connector Bridge (Clewesville Rd)	Tested By:	cmh
Project Location:	Eddington, ME	Checked By:	smd
GTX #:	313418		
Boring ID:	BB-ECR-205		
Sample ID:	R6		
Depth:	24.15-24.53 ft		
Visual Description:	See photographs		

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.? NO	
Specimen Length, in:	4.41	4.41	4.41	Maximum difference must be < 0.020 in.	
Specimen Diameter, in:	1.99	1.98	1.99	Straightness Tolerance Met? NO	
Specimen Mass, g:	571.07				
Bulk Density, lb/ft ³ :	159				
Length to Diameter Ratio:	2.2				
		Minimum Diameter Tolerance Met? YES			
		Length to Diameter Ratio Tolerance Met? YES			

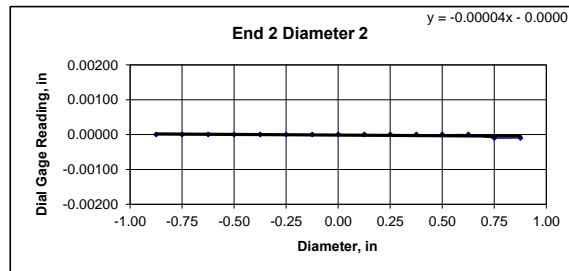
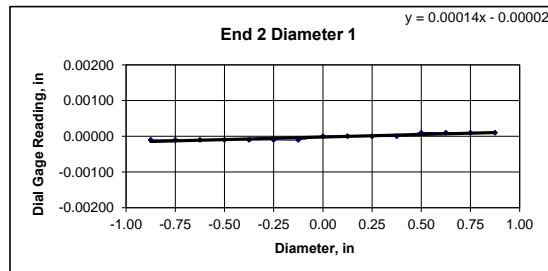
END FLATNESS AND PARALLELISM (Procedure FP1)														
END 1	-0.875	-0.750	-0.625	-0.500	-0.375	-0.250	-0.125	0.000	0.125	0.250	0.375	0.500	0.625	0.750
Diameter 1, in	-0.00030	-0.00030	-0.00030	-0.00030	-0.00020	-0.00010	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Diameter 2, in (rotated 90°)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	-0.00010	-0.00010
Difference between max and min readings, in:														
0° = 0.00030 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
Diameter 1, in	-0.00010	-0.00010	-0.00010	-0.00010	-0.00010	-0.00010	-0.00010	0.00000	0.00000	0.00000	0.00000	0.00010	0.00010	0.00010
Diameter 2, in (rotated 90°)	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	-0.00010
Difference between max and min readings, in:														
0° = 0.0002 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	0.00021
	Angle of Best Fit Line:	0.01211
End 2:	Slope of Best Fit Line	0.00014
	Angle of Best Fit Line:	0.00819
Maximum Angular Difference:		0.00393

Parallelism Tolerance Met? YES
Spherically Seated



DIAMETER 2

End 1:	Slope of Best Fit Line	0.00004
	Angle of Best Fit Line:	0.00213
End 2:	Slope of Best Fit Line	0.00004
	Angle of Best Fit Line:	0.00213
Maximum Angular Difference:		0.00000

Parallelism Tolerance Met? YES
Spherically Seated

PERPENDICULARITY (Procedure P1)						Maximum angle of departure must be $\leq 0.25^\circ$	
END 1	Difference, Maximum and Minimum (in.)	Diameter (in.)	Slope	Angle°	Perpendicularity Tolerance Met?		
Diameter 1, in	0.00030	1.985	0.00015	0.009	YES		
Diameter 2, in (rotated 90°)	0.00010	1.985	0.00005	0.003	YES	Perpendicularity Tolerance Met?	YES
END 2							
Diameter 1, in	0.00020	1.985	0.00010	0.006	YES		
Diameter 2, in (rotated 90°)	0.00010	1.985	0.00005	0.003	YES		

Client:	Haley & Aldrich, Inc.
Project Name:	I-395/Rte 9 Connector Bridge (Cleweyville Rd)
Project Location:	Eddington, ME
GTX #:	313418
Test Date:	4/7/2021
Tested By:	cmh
Checked By:	smd
Boring ID:	BB-ECR-205
Sample ID:	R6
Depth, ft:	24.15-24.53



After cutting and grinding



After break



Client:	Haley & Aldrich, Inc.
Project Name:	I-395/Rte 9 Connector Bridge(Cleweyville Rd)
Project Location:	Eddington, ME
GTX #:	313418
Test Date:	4/7/2021
Tested By:	cmh
Checked By:	jsc
Boring ID:	BB-ECR-206A
Sample ID:	R6
Depth, ft:	47.64-48.08
Sample Type:	rock core
Sample Description:	See photographs Discontinuity failure

Compressive Strength and Elastic Moduli of Rock by ASTM D7012 - Method D

No Graph Available
(see comment below)

Peak Compressive Stress: 4,751 psi

Both lateral and axial strain gauges failed to record meaningful data. Young's Modulus and Poisson's Ratio could not be determined.

Stress Range, psi	Young's Modulus, psi	Poisson's Ratio
500-1700	---	---
1700-3000	---	---
3000-4300	---	---

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.

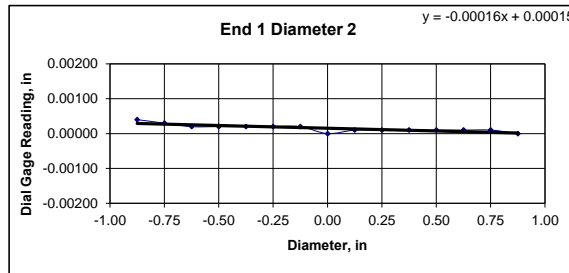
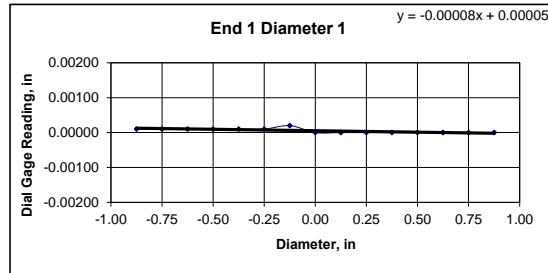


Client:	Haley & Aldrich, Inc.	Test Date:	4/1/2021
Project Name:	I-395/Rte 9 Connector Bridge (Clewesville Rd)	Tested By:	cmh
Project Location:	Eddington, ME	Checked By:	smd
GTX #:	313418		
Boring ID:	BB-ECR-206A		
Sample ID:	R6		
Depth:	47.64-48.08 ft		
Visual Description:	See photographs		

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.? NO	
Specimen Length, in:	5.28	5.29	5.29	Maximum difference must be < 0.020 in. Straightness Tolerance Met? NO	
Specimen Diameter, in:	2.46	2.46	2.46		
Specimen Mass, g:	1162.94				
Bulk Density, lb/ft ³	176				
Length to Diameter Ratio:	2.1				
		Minimum Diameter Tolerance Met?	YES		
		Length to Diameter Ratio Tolerance Met?	YES		

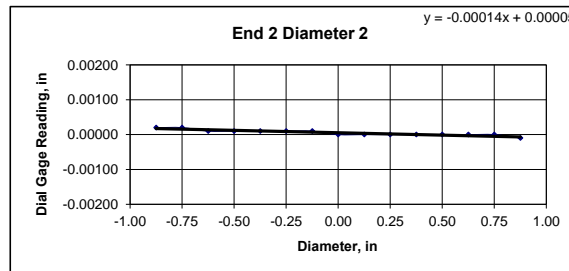
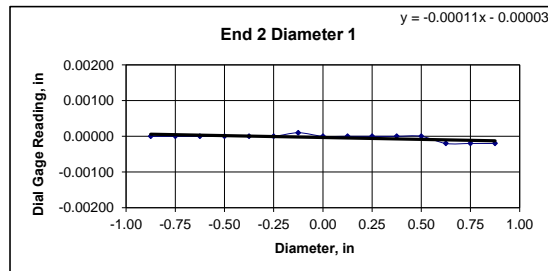
END FLATNESS AND PARALLELISM (Procedure FP1)															
END 1	-0.875	-0.750	-0.625	-0.500	-0.375	-0.250	-0.125	0.000	0.125	0.250	0.375	0.500	0.625	0.750	0.875
Diameter 1, in	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00020	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Diameter 2, in (rotated 90°)	0.00040	0.00030	0.00020	0.00020	0.00020	0.00020	0.00020	0.00000	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00000
Difference between max and min readings, in:															
0° = 0.00020 90° = 0.00040															
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	0.00010	0.00000	0.00000	0.00000	0.00000	0.00000	-0.00020	-0.00020	-0.00020
Diameter 2, in (rotated 90°)	0.00020	0.00020	0.00010	0.00010	0.00010	0.00010	0.00010	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	-0.00010
Difference between max and min readings, in:															
0° = 0.0003 90° = 0.0003															
Maximum difference must be < 0.0020 in. Difference = ± 0.00020															
Flatness Tolerance Met? YES															



DIAMETER 1

End 1:		
Slope of Best Fit Line	0.00008	
Angle of Best Fit Line:	0.00475	
End 2:		
Slope of Best Fit Line	0.00011	
Angle of Best Fit Line:	0.00606	
Maximum Angular Difference:	0.00131	

Parallelism Tolerance Met? YES
Spherically Seated



DIAMETER 2

End 1:		
Slope of Best Fit Line	0.00016	
Angle of Best Fit Line:	0.00900	
End 2:		
Slope of Best Fit Line	0.00014	
Angle of Best Fit Line:	0.00786	
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?	Maximum angle of departure must be $\leq 0.25^\circ$
Diameter 1, in		0.00020	2.460	0.00008	0.005	YES	
Diameter 2, in (rotated 90°)		0.00040	2.460	0.00016	0.009	YES	Perpendicularity Tolerance Met? YES
END 2							
Diameter 1, in		0.00030	2.460	0.00012	0.007	YES	
Diameter 2, in (rotated 90°)		0.00030	2.460	0.00012	0.007	YES	

Client:	Haley & Aldrich, Inc.
Project Name:	I-395/Rte 9 Connector Bridge (Cleweyville Rd)
Project Location:	Eddington, ME
GTX #:	313418
Test Date:	4/7/2021
Tested By:	cmh
Checked By:	smd
Boring ID:	BB-ECR-206A
Sample ID:	R6
Depth, ft:	47.64-48.08



After cutting and grinding

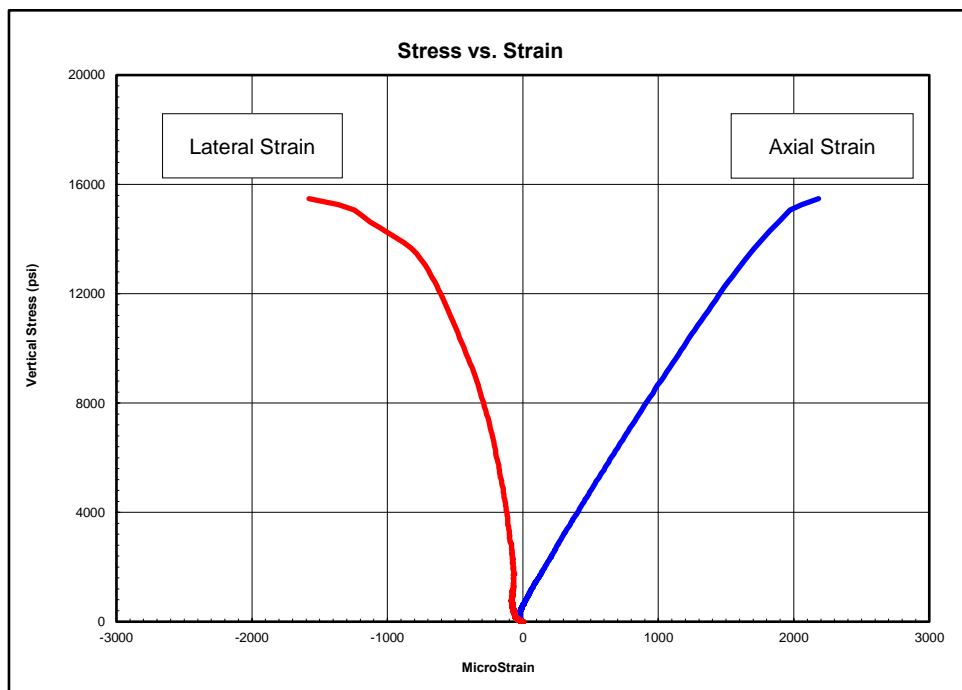


After break



Client:	Haley & Aldrich, Inc.
Project Name:	I-395/Rte 9 Connector Bridge (Lambert Rd)
Project Location:	Eddington, ME
GTX #:	313323
Test Date:	3/26/2021
Tested By:	cmh
Checked By:	jsc
Boring ID:	BB-ELAR-201A
Sample ID:	R2
Depth, ft:	13.2-14.2
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: 15,479 psi

The strain values recorded within the third stress range for this test produce values of Poisson's Ratio that exceed maximum values found in rocks.

Stress Range, psi	Young's Modulus, psi	Poisson's Ratio
1500-5700	8,270,000	0.22
5700-9800	7,640,000	0.43
9800-13900	6,970,000	---

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.

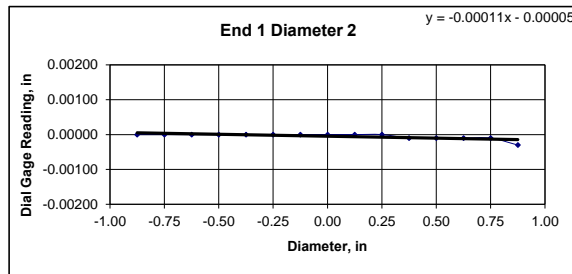
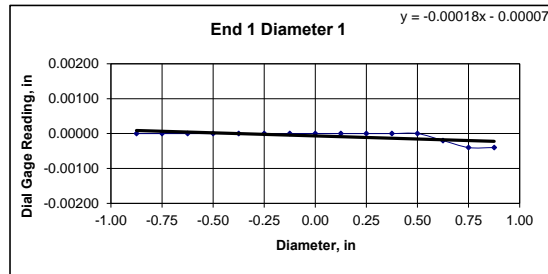


Client:	Haley & Aldrich, Inc.	Test Date:	3/22/2021
Project Name:	I-395/Rte 9 Connector Bridge (Lambert Rd)	Tested By:	cmh
Project Location:	Eddington, ME	Checked By:	smd
GTX #:	313323		
Boring ID:	BB-ELAR-201A		
Sample ID:	R2		
Depth:	13.2-14.2 ft		
Visual Description:	See photographs		

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:	4.41	4.41	4.41	Maximum difference must be < 0.020 in.	
Specimen Diameter, in:	1.99	1.99	1.99	Straightness Tolerance Met? YES	
Specimen Mass, g:	605.35				
Bulk Density, lb/ft ³ :	168				
Length to Diameter Ratio:	2.2	Minimum Diameter Tolerance Met? YES			
		Length to Diameter Ratio Tolerance Met? YES			

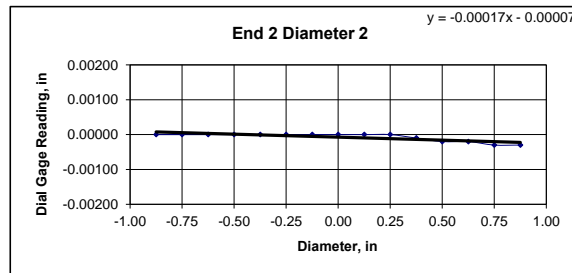
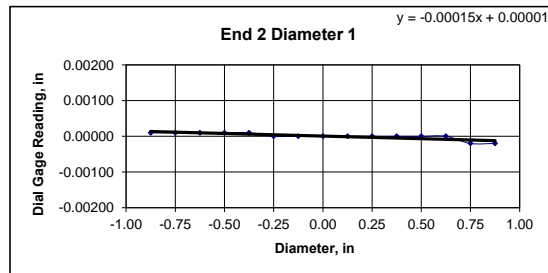
END FLATNESS AND PARALLELISM (Procedure FP1)														
END 1	-0.875	-0.750	-0.625	-0.500	-0.375	-0.250	-0.125	0.000	0.125	0.250	0.375	0.500	0.625	0.750
Diameter 1, in	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	-0.00020	-0.00040
Diameter 2, in (rotated 90°)	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	-0.00030
Difference between max and min readings, in:											0° = 0.00040 90° = 0.00030			
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
Diameter 1, in	0.00010	0.00010	0.00010	0.00010	0.00010	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	-0.00020	-0.00020
Diameter 2, in (rotated 90°)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	-0.00010	-0.00020	-0.00020	-0.00030
Difference between max and min readings, in:											0° = 0.0003 90° = 0.0003			
Maximum difference must be < 0.0020 in.											Difference = ± 0.00020			
											Flatness Tolerance Met? YES			



DIAMETER 1

End 1:	Slope of Best Fit Line	0.00018
	Angle of Best Fit Line:	0.01015
End 2:	Slope of Best Fit Line	0.00015
	Angle of Best Fit Line:	0.00835
Maximum Angular Difference:		0.00180

Parallelism Tolerance Met? YES
Spherically Seated



DIAMETER 2

End 1:	Slope of Best Fit Line	0.00011
	Angle of Best Fit Line:	0.00638
End 2:	Slope of Best Fit Line	0.00017
	Angle of Best Fit Line:	0.00982
Maximum Angular Difference:		0.00344

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?	Maximum angle of departure must be $\leq 0.25^\circ$
Diameter 1, in	0.00040	1.990	0.00020	0.012	YES	
Diameter 2, in (rotated 90°)	0.00030	1.990	0.00015	0.009	YES	Perpendicularity Tolerance Met? YES
END 2						
Diameter 1, in	0.00030	1.990	0.00015	0.009	YES	
Diameter 2, in (rotated 90°)	0.00030	1.990	0.00015	0.009	YES	

Client:	Haley & Aldrich, Inc.
Project Name:	I-395/Rte 9 Connector Bridge (Lambert Rd)
Project Location:	Eddington, ME
GTX #:	313323
Test Date:	3/26/2021
Tested By:	cmh
Checked By:	smd
Boring ID:	BB-ELAR-201A
Sample ID:	R2
Depth, ft:	13.2-14.2



After cutting and grinding

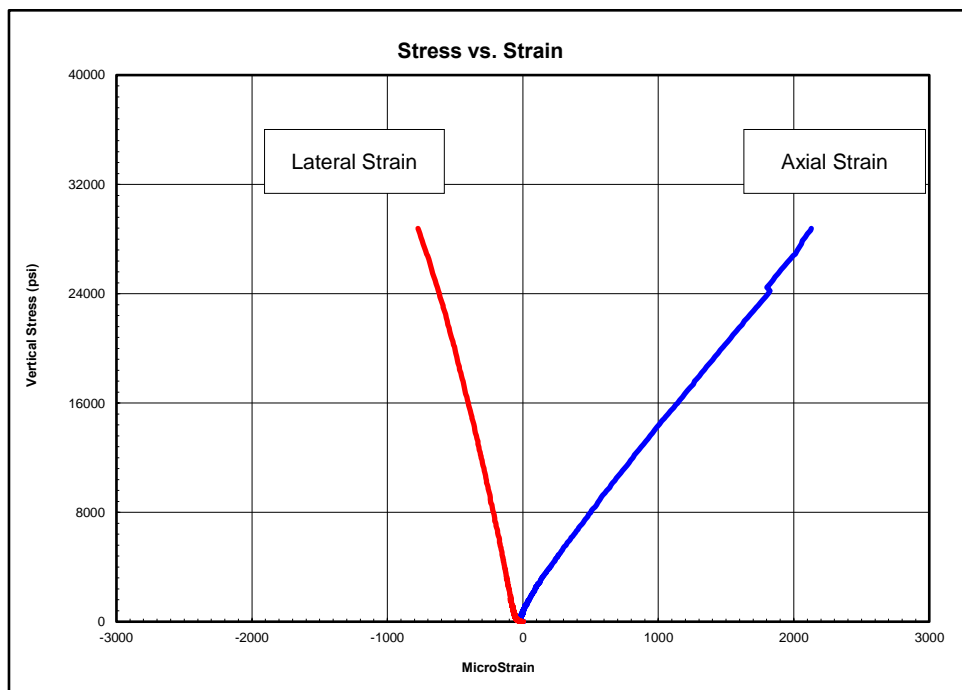


After break



Client:	Haley & Aldrich, Inc.
Project Name:	I-395/Rte 9 Connector Bridge (Lambert Rd)
Project Location:	Eddington, ME
GTX #:	313323
Test Date:	3/26/2021
Tested By:	cmh
Checked By:	jsc
Boring ID:	BB-ELAR-202
Sample ID:	R1
Depth, ft:	10.1-11.0
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: 28,776 psi

Stress Range, psi	Young's Modulus, psi	Poisson's Ratio
2900-10600	13,400,000	0.28
10600-18200	12,200,000	0.30
18200-25900	12,500,000	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.

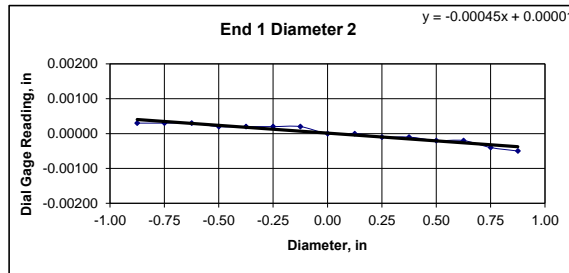
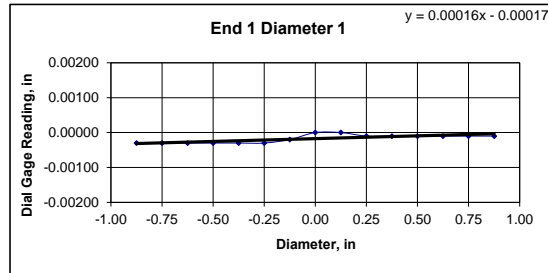


Client:	Haley & Aldrich, Inc.	Test Date:	3/22/2021
Project Name:	I-395/Rte 9 Connector Bridge (Lambert Rd)	Tested By:	cmh
Project Location:	Eddington, ME	Checked By:	smd
GT#:	313323		
Boring ID:	BB-ELAR-202		
Sample ID:	R1		
Depth:	10.1-11.0 ft		
Visual Description:	See photographs		

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:	4.41	4.41	4.41	Maximum difference must be $<$ 0.020 in.	
Specimen Diameter, in:	1.99	1.99	1.99	Straightness Tolerance Met? YES	
Specimen Mass, g:	607.23				
Bulk Density, lb/ft ³ :	168				
Length to Diameter Ratio:	2.2				
		Minimum Diameter Tolerance Met?	YES		
		Length to Diameter Ratio Tolerance Met?	YES		

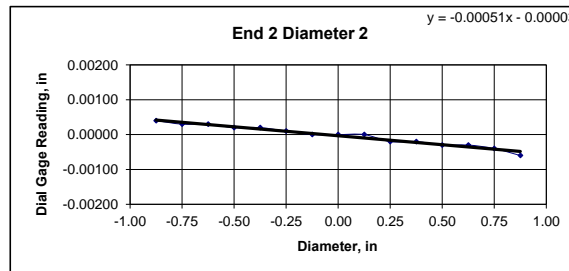
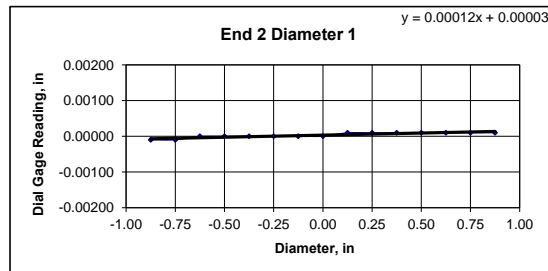
END FLATNESS AND PARALLELISM (Procedure FP1)															
END 1	-0.875	-0.750	-0.625	-0.500	-0.375	-0.250	-0.125	0.000	0.125	0.250	0.375	0.500	0.625	0.750	0.875
Diameter 1, in	-0.00030	-0.00030	-0.00030	-0.00030	-0.00030	-0.00030	-0.00020	0.00000	0.00000	-0.00010	-0.00010	-0.00010	-0.00010	-0.00010	-0.00010
Diameter 2, in (rotated 90°)	0.00030	0.00030	0.00030	0.00020	0.00020	0.00020	0.00020	0.00000	0.00000	-0.00010	-0.00010	-0.00020	-0.00020	-0.00040	-0.00050
Difference between max and min readings, in:															
0° = 0.00030 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	-0.00010	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
Diameter 2, in (rotated 90°)	0.00040	0.00030	0.00030	0.00020	0.00020	0.00010	0.00000	0.00000	0.00000	-0.00020	-0.00020	-0.00030	-0.00030	-0.00040	-0.00060
Difference between max and min readings, in:															
0° = 0.0002 90° = 0.001															
Maximum difference must be < 0.0020 in. Difference = ± 0.00050															
Flatness Tolerance Met? YES															



DIAMETER 1

End 1:	Slope of Best Fit Line	0.00016
	Angle of Best Fit Line:	0.00917
End 2:	Slope of Best Fit Line	0.00012
	Angle of Best Fit Line:	0.00671
Maximum Angular Difference:		0.00246

Parallelism Tolerance Met? YES
Spherically Seated



DIAMETER 2

End 1:	Slope of Best Fit Line	0.00045
	Angle of Best Fit Line:	0.02554
End 2:	Slope of Best Fit Line	0.00051
	Angle of Best Fit Line:	0.02947
Maximum Angular Difference:		0.00393

Parallelism Tolerance Met? YES
Spherically Seated

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	0.00030	1.990	0.00015	0.009	YES		
Diameter 2, in (rotated 90°)	0.00080	1.990	0.00040	0.023	YES	Perpendicularity Tolerance Met? YES	
END 2							
Diameter 1, in	0.00020	1.990	0.00010	0.006	YES		
Diameter 2, in (rotated 90°)	0.00100	1.990	0.00050	0.029	YES		

Client:	Haley & Aldrich, Inc.
Project Name:	I-395/Rte 9 Connector Bridge (Lambert Rd)
Project Location:	Eddington, ME
GTX #:	313323
Test Date:	3/26/2021
Tested By:	cmh
Checked By:	smd
Boring ID:	BB-ELAR-202
Sample ID:	R1
Depth, ft:	10.1-11.0



After cutting and grinding

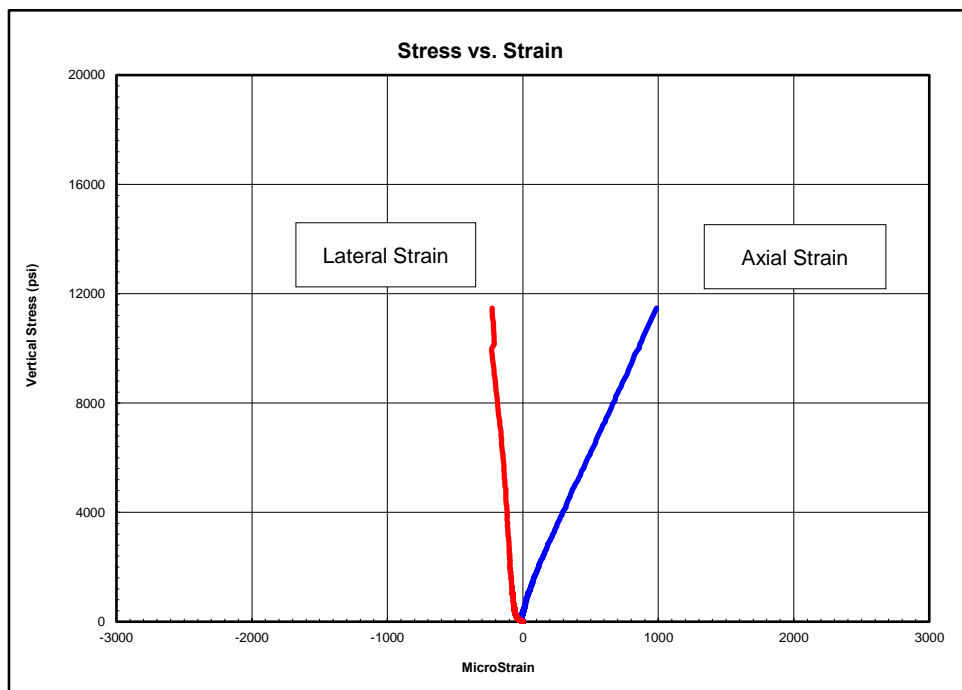


After break



Client:	Haley & Aldrich, Inc.
Project Name:	I-395/Rte 9 Connector Bridge (Lambert Rd)
Project Location:	Eddington, ME
GTX #:	313323
Test Date:	3/26/2021
Tested By:	cmh
Checked By:	jsc
Boring ID:	BB-ELAR-203
Sample ID:	R2
Depth, ft:	5.1-5.6
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: 11,830 psi

Stress Range, psi	Young's Modulus, psi	Poisson's Ratio
1200-4300	11,500,000	0.16
4300-7500	10,600,000	0.18
7500-10600	10,900,000	0.22

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.

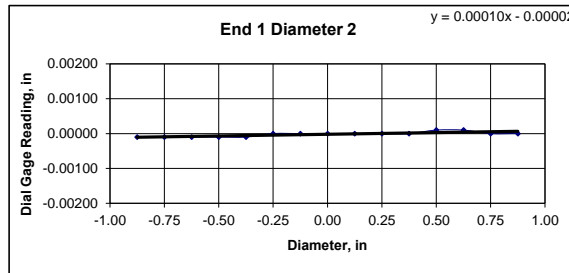
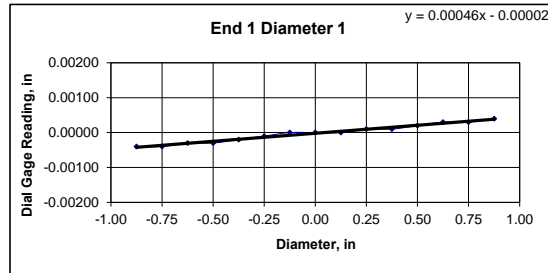


Client:	Haley & Aldrich, Inc.	Test Date:	3/22/2021
Project Name:	I-395/Rte 9 Connector Bridge (Lambert Rd)	Tested By:	cmh
Project Location:	Eddington, ME	Checked By:	smd
GTX #:	313323		
Boring ID:	BB-ELAR-203		
Sample ID:	R2		
Depth:	5.1-5.6 ft		
Visual Description:	See photographs		

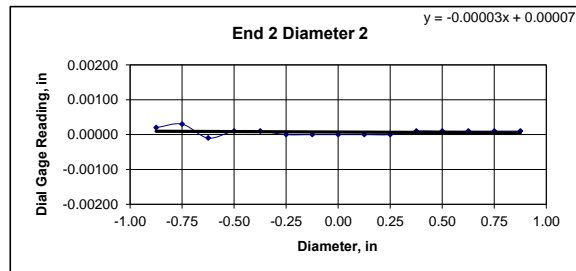
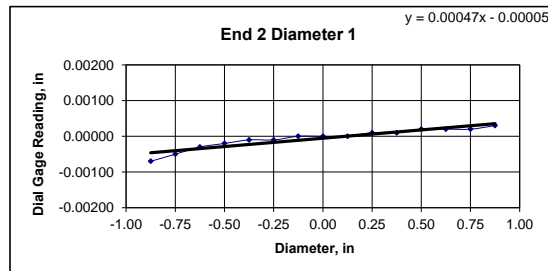
UNIT WEIGHT DETERMINATION AND DIMENSIONAL AND SHAPE TOLERANCES OF ROCK CORE SPECIMENS BY ASTM D4543

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:	4.50	4.50	4.50	Maximum difference must be $<$ 0.020 in.	
Specimen Diameter, in:	1.99	1.98	1.99	Straightness Tolerance Met? YES	
Specimen Mass, g:	618.18				
Bulk Density, lb/ft ³ :	169				
Length to Diameter Ratio:	2.3				
		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	-0.00040	-0.00040	-0.00030	-0.00030	-0.00020	-0.00010	0.00000	0.00000	0.00000	0.00010	0.00010	0.00020	0.00030
Diameter 2, in (rotated 90°)	-0.00010	-0.00010	-0.00010	-0.00010	-0.00010	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00010	0.00000
Difference between max and min readings, in:													
0° = 0.00080 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	-0.00070	-0.00050	-0.00030	-0.00020	-0.00010	-0.00010	0.00000	0.00000	0.00000	0.00010	0.00010	0.00020	0.00030
Diameter 2, in (rotated 90°)	0.00020	0.00030	-0.00010	0.00010	0.00010	0.00000	0.00000	0.00000	0.00000	0.00000	0.00010	0.00010	0.00010
Difference between max and min readings, in:													
0° = 0.001 90° = 0.0004													
Maximum difference must be $<$ 0.0020 in. Difference = \pm 0.00050													
Flatness Tolerance Met? YES													



DIAMETER 1	
End 1:	
Slope of Best Fit Line	0.00046
Angle of Best Fit Line:	0.02636
End 2:	
Slope of Best Fit Line	0.00047
Angle of Best Fit Line:	0.02668
Maximum Angular Difference:	0.00033
Parallelism Tolerance Met?	YES
Spherically Seated	



DIAMETER 2	
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:	0.00147
Maximum Angular Difference:	0.00409
Parallelism Tolerance Met?	YES
Spherically Seated	

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	0.00080	1.985	0.00040	0.023	YES		
Diameter 2, in (rotated 90°)	0.00020	1.985	0.00010	0.006	YES	Perpendicularity Tolerance Met? YES	
END 2							
Diameter 1, in	0.00100	1.985	0.00050	0.029	YES		
Diameter 2, in (rotated 90°)	0.00040	1.985	0.00020	0.012	YES		

Client:	Haley & Aldrich, Inc.
Project Name:	I-395/Rte 9 Connector Bridge (Lambert Rd)
Project Location:	Eddington, ME
GTX #:	313323
Test Date:	3/26/2021
Tested By:	cmh
Checked By:	smd
Boring ID:	BB-ELAR-203
Sample ID:	R2
Depth, ft:	5.1-5.6



After cutting and grinding

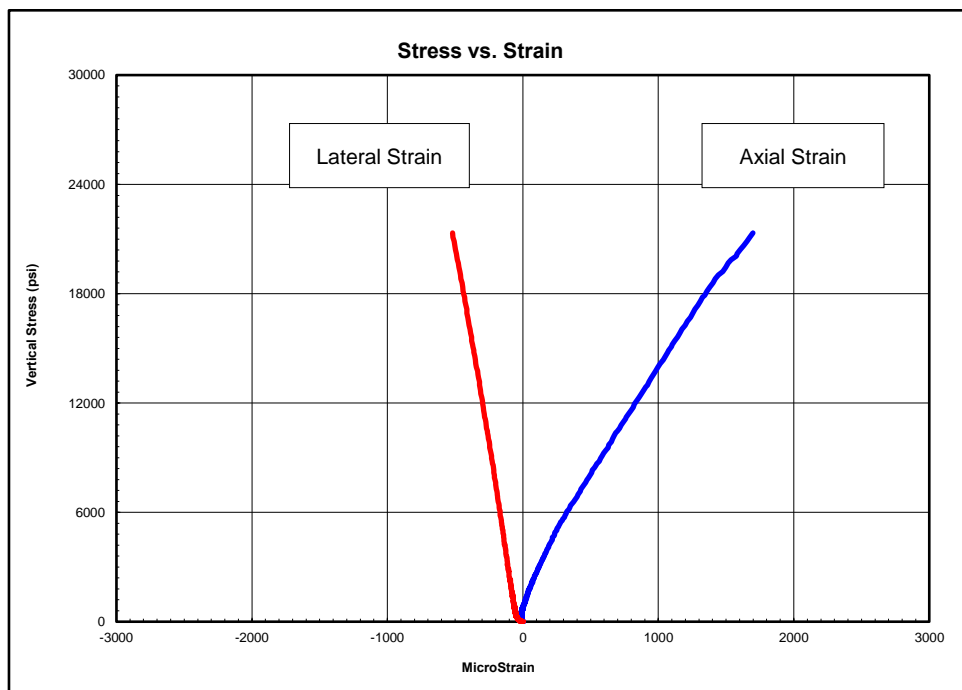


After break



Client:	Haley & Aldrich, Inc.
Project Name:	I-395/Rte 9 Connector Bridge (Lambert Rd)
Project Location:	Eddington, ME
GTX #:	313323
Test Date:	3/26/2021
Tested By:	cmh
Checked By:	jsc
Boring ID:	BB-ELAR-203A
Sample ID:	R3
Depth, ft:	14.7-15.7
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: 21,335 psi

Stress Range, psi	Young's Modulus, psi	Poisson's Ratio
2100-7800	14,200,000	0.28
7800-13500	11,800,000	0.26
13500-19200	11,500,000	0.27

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.

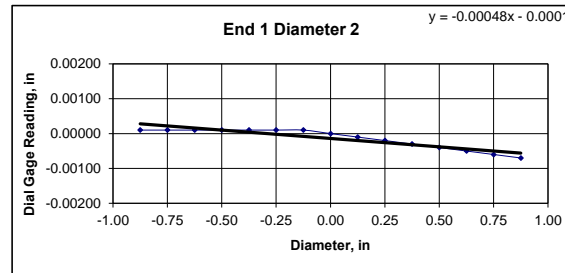
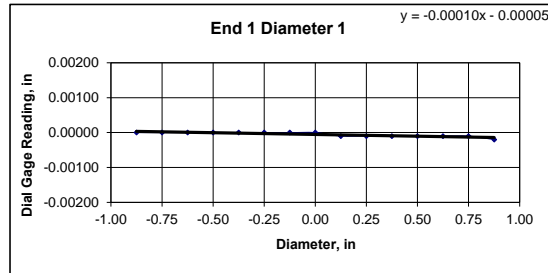


Client:	Haley & Aldrich, Inc.	Test Date:	3/22/2021
Project Name:	I-395/Rte 9 Connector Bridge (Lambert Rd)	Tested By:	cmh
Project Location:	Eddington, ME	Checked By:	smd
GTX #:	313323		
Boring ID:	BB-ELAR-203A		
Sample ID:	R3		
Depth:	14.7-15.7 ft		
Visual Description:	See photographs		

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.?	
Specimen Length, in:	4.45	4.46	4.46	YES	
Specimen Diameter, in:	1.99	1.99	1.99	Maximum difference must be < 0.020 in.	
Specimen Mass, g:	614.29			Straightness Tolerance Met?	
Bulk Density, lb/ft ³ :	169			YES	
Length to Diameter Ratio:	2.2			Minimum Diameter Tolerance Met?	
				YES	
				Length to Diameter Ratio Tolerance Met?	
				YES	

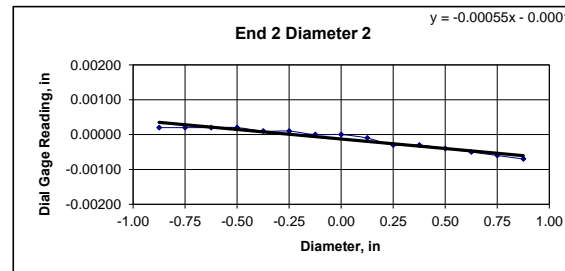
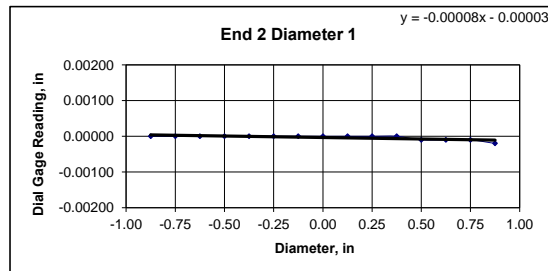
END FLATNESS AND PARALLELISM (Procedure FP1)																	
END 1	-0.875	-0.750	-0.625	-0.500	-0.375	-0.250	-0.125	0.000	0.125	0.250	0.375	0.500	0.625	0.750	0.875		
Diameter 1, in	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	-0.00010	-0.00010	-0.00010	-0.00010	-0.00010	-0.00010	-0.00020		
Diameter 2, in (rotated 90°)	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00000	-0.00010	-0.00020	-0.00030	-0.00040	-0.00050	-0.00060	-0.00070		
Difference between max and min readings, in:																	
	0° =						0.00020								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	0.00000	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	-0.00020		
Diameter 2, in (rotated 90°)	0.00020	0.00020	0.00020	0.00020	0.00010	0.00010	0.00000	0.00000	-0.00010	-0.00030	-0.00030	-0.00040	-0.00050	-0.00060	-0.00070		
Difference between max and min readings, in:																	
	0° =						0.0002								90° =		0.0009
Maximum difference must be < 0.0020 in.																	
Difference = ± 0.00045																	
Flatness Tolerance Met?																	
YES																	



DIAMETER 1

End 1:	Slope of Best Fit Line	0.00010
	Angle of Best Fit Line:	0.00573
End 2:	Slope of Best Fit Line	0.00008
	Angle of Best Fit Line:	0.00475
Maximum Angular Difference:		0.00098

Parallelism Tolerance Met? YES
Spherically Seated



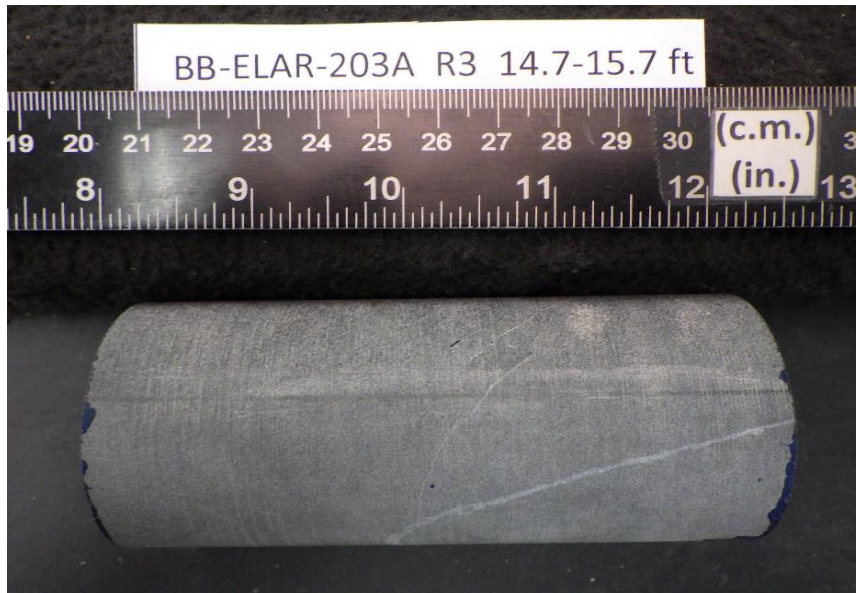
DIAMETER 2

End 1:	Slope of Best Fit Line	0.00048
	Angle of Best Fit Line:	0.02750
End 2:	Slope of Best Fit Line	0.00055
	Angle of Best Fit Line:	0.03127
Maximum Angular Difference:		0.00377

Parallelism Tolerance Met? YES
Spherically Seated

PERPENDICULARITY (Procedure P1)						Maximum angle of departure must be $\leq 0.25^\circ$	
END 1	Difference, Maximum and Minimum (in.)	Diameter (in.)	Slope	Angle°	Perpendicularity Tolerance Met?		
Diameter 1, in	0.00020	1.990	0.00010	0.006	YES		
Diameter 2, in (rotated 90°)	0.00080	1.990	0.00040	0.023	YES	Perpendicularity Tolerance Met?	
						YES	
END 2							
Diameter 1, in	0.00020	1.990	0.00010	0.006	YES		
Diameter 2, in (rotated 90°)	0.00090	1.990	0.00045	0.026	YES		

Client:	Haley & Aldrich, Inc.
Project Name:	I-395/Rte 9 Connector Bridge (Lambert Rd)
Project Location:	Eddington, ME
GTX #:	313323
Test Date:	3/26/2021
Tested By:	cmh
Checked By:	smd
Boring ID:	BB-ELAR-203A
Sample ID:	R3
Depth, ft:	14.7-15.7



After cutting and grinding

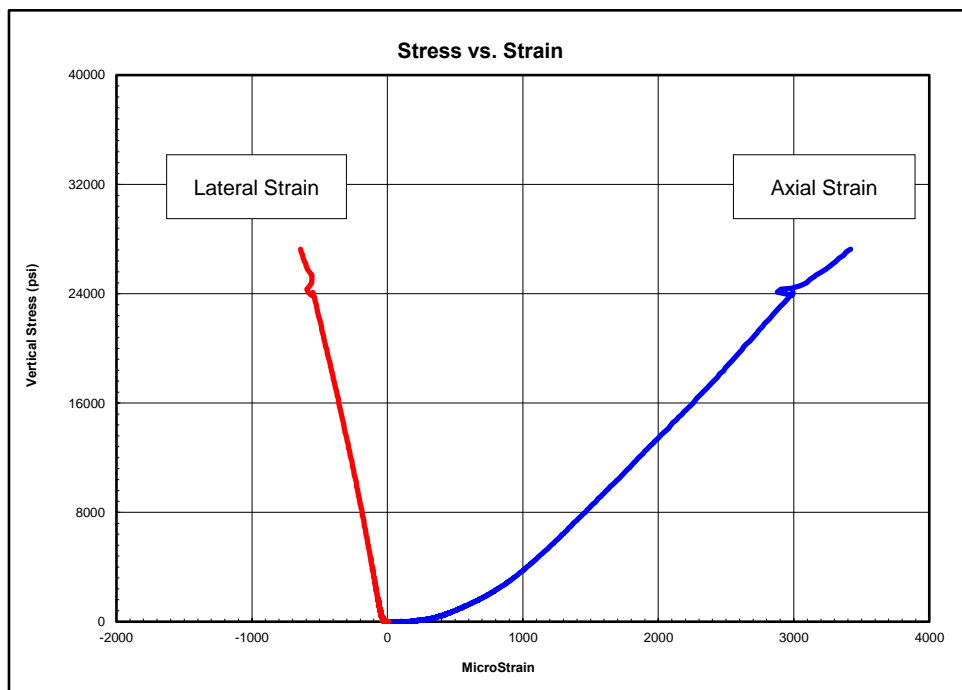


After break



Client:	Haley & Aldrich, Inc.
Project Name:	I-395/Rte 9 Connector Bridge(Levenseller Rd)
Project Location:	Eddington, ME
GTX #:	313322
Test Date:	3/26/2021
Tested By:	cmh
Checked By:	jsc
Boring ID:	BB-ELER-202
Sample ID:	R3
Depth, ft:	26-26.6
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: 27,259 psi

Stress Range, psi	Young's Modulus, psi	Poisson's Ratio
2700-10000	9,200,000	0.17
10000-17300	10,100,000	0.22
17300-24500	11,500,000	0.31

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.

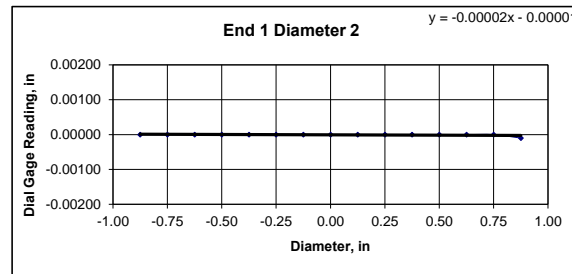
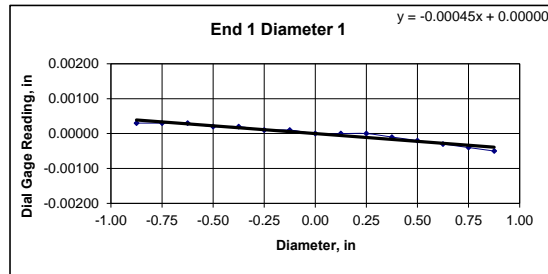


Client:	Haley & Aldrich, Inc.	Test Date:	3/22/2021
Project Name:	I-395/Rte 9 Connector Bridge (Levenseller Rd)	Tested By:	cmh
Project Location:	Eddington, ME	Checked By:	smd
GTX #:	313322		
Boring ID:	BB-ELER-205		
Sample ID:	R1		
Depth:	26-26.6 ft		
Visual Description:	See photographs		

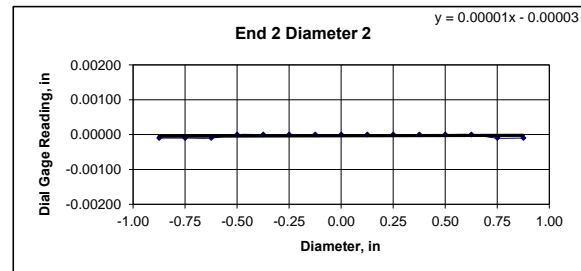
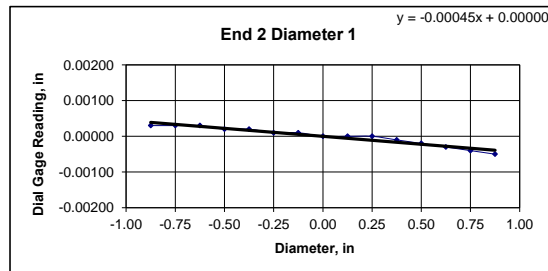
UNIT WEIGHT DETERMINATION AND DIMENSIONAL AND SHAPE TOLERANCES OF ROCK CORE SPECIMENS BY ASTM D4543

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:	4.47	4.47	4.47	Maximum difference must be < 0.020 in. Straightness Tolerance Met? YES	
Specimen Diameter, in:	1.99	1.99	1.99		
Specimen Mass, g:	613.02				
Bulk Density, lb/ft ³	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	0.750	0.875
Diameter 1, in	0.00030	0.00030	0.00030	0.00020	0.00020	0.00010	0.00010	0.00000	0.00000	0.00000	-0.00010	-0.00020	-0.00030	-0.00040	-0.00050
Diameter 2, in (rotated 90°)	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
Difference between max and min readings, in: 0° = 0.00080 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	0.00030	0.00020	0.00020	0.00010	0.00010	0.00000	0.00000	0.00000	-0.00010	-0.00020	-0.00030	-0.00040	-0.00050
Diameter 2, in (rotated 90°)	-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	-0.00010	-0.00010
Difference between max and min readings, in: 0° = 0.0008 90° = 0.0001 Maximum difference must be < 0.0020 in. Difference = ± 0.00040 Flatness Tolerance Met? YES															



DIAMETER 1	
End 1:	
Slope of Best Fit Line	0.00045
Angle of Best Fit Line:	0.02554
End 2:	
Slope of Best Fit Line	0.00045
Angle of Best Fit Line:	0.02554
Maximum Angular Difference:	0.00000
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:	0.00082
Maximum Angular Difference:	0.00033
Parallelism Tolerance Met? Spherically Seated	YES

PERPENDICULARITY (Procedure P1) (Calculated from End Flatness and Parallelism measurements above)						Maximum angle of departure must be $\leq 0.25^\circ$	
END 1	Difference, Maximum and Minimum (in.)	Diameter (in.)	Slope	Angle°	Perpendicularity Tolerance Met?	Perpendicularity Tolerance Met? YES	
Diameter 1, in	0.00080	1.990	0.00040	0.023	YES		
Diameter 2, in (rotated 90°)	0.00010	1.990	0.00005	0.003	YES		
END 2							
Diameter 1, in	0.00080	1.990	0.00040	0.023	YES		
Diameter 2, in (rotated 90°)	0.00010	1.990	0.00005	0.003	YES		

Client:	Haley & Aldrich, Inc.
Project Name:	I-395/Rte 9 Connector Bridge (Levenseller Rd)
Project Location:	Eddington, ME
GTX #:	313322
Test Date:	3/26/2021
Tested By:	cmh
Checked By:	smd
Boring ID:	BB-ELER-202
Sample ID:	R3
Depth, ft:	26-26.6



After cutting and grinding

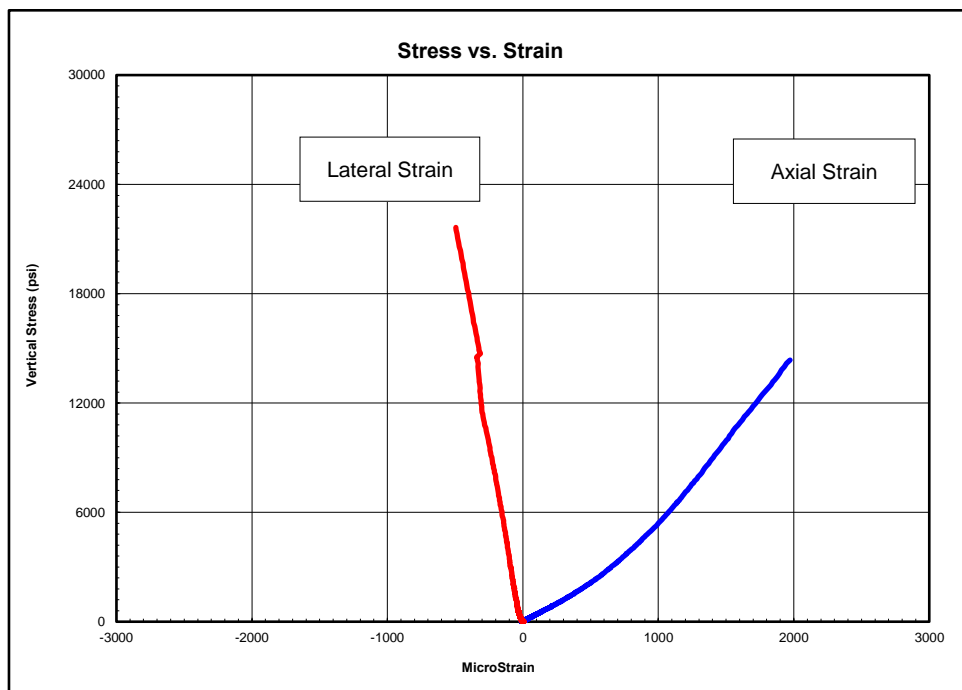


After break



Client:	Haley & Aldrich, Inc.
Project Name:	I-395/Rte 9 Connector Bridge(Levenseller Rd)
Project Location:	Eddington, ME
GTX #:	313322
Test Date:	3/26/2021
Tested By:	cmh
Checked By:	jsc
Boring ID:	BB-ELER-202
Sample ID:	R3
Depth, ft:	28.6-29.5
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: 21,637 psi

The axial strain gauges failed before the peak value was attained. Young's Modulus and Poisson's Ratio could not be determined for the third stress range.

Stress Range, psi	Young's Modulus, psi	Poisson's Ratio
2200-7900	7,200,000	0.16
7900-13700	9,460,000	0.23
13700-19500	---	---

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.

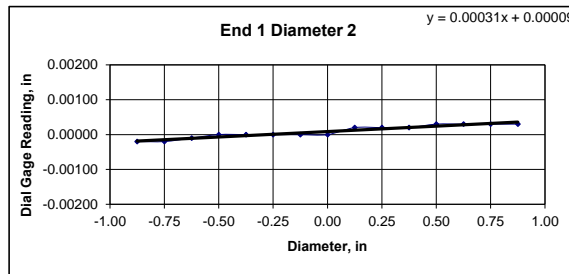
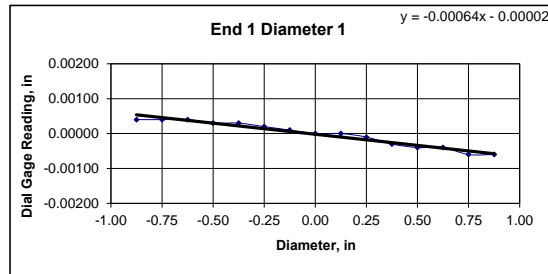


Client:	Haley & Aldrich, Inc.	Test Date:	3/22/2021
Project Name:	I-395/Rte 9 Connector Bridge (Levenseller Rd)	Tested By:	cmh
Project Location:	Eddington, ME	Checked By:	smd
GTX #:	313322		
Boring ID:	BB-ELER-202		
Sample ID:	R3		
Depth:	28.6-29.5 ft		
Visual Description:	See photographs		

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:	4.65	4.65	4.65	Maximum difference must be < 0.020 in.	
Specimen Diameter, in:	1.99	1.99	1.99	Straightness Tolerance Met? YES	
Specimen Mass, g:	623.7				
Bulk Density, lb/ft ³ :	164				
Length to Diameter Ratio:	2.3				
		Minimum Diameter Tolerance Met?	YES		
		Length to Diameter Ratio Tolerance Met?	YES		

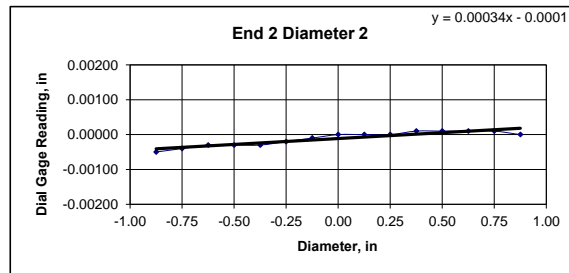
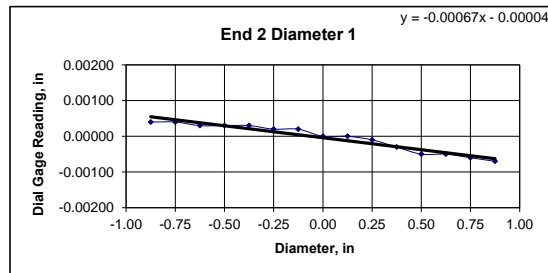
END FLATNESS AND PARALLELISM (Procedure FP1)															
END 1	-0.875	-0.750	-0.625	-0.500	-0.375	-0.250	-0.125	0.000	0.125	0.250	0.375	0.500	0.625	0.750	0.875
Diameter 1, in	0.00040	0.00040	0.00040	0.00030	0.00030	0.00020	0.00010	0.00000	0.00000	-0.00010	-0.00030	-0.00040	-0.00040	-0.00060	-0.00060
Diameter 2, in (rotated 90°)	-0.00020	-0.00020	-0.00010	0.00000	0.00000	0.00000	0.00000	0.00000	0.00020	0.00020	0.00020	0.00030	0.00030	0.00030	0.00030
Difference between max and min readings, in:															
0° = 0.00100 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	0.00040	0.00040	0.00030	0.00030	0.00030	0.00020	0.00020	0.00000	0.00000	-0.00010	-0.00030	-0.00050	-0.00050	-0.00060	-0.00070
Diameter 2, in (rotated 90°)	-0.00050	-0.00040	-0.00030	-0.00030	-0.00030	-0.00020	-0.00010	0.00000	0.00000	0.00000	0.00010	0.00010	0.00010	0.00010	0.00000
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	0.00064	
Angle of Best Fit Line:	0.03651	
End 2:		
Slope of Best Fit Line	0.00067	
Angle of Best Fit Line:	0.03847	
Maximum Angular Difference:	0.00196	

Parallelism Tolerance Met? YES
Spherically Seated



DIAMETER 2

End 1:		
Slope of Best Fit Line	0.00031	
Angle of Best Fit Line:	0.01784	
End 2:		
Slope of Best Fit Line	0.00034	
Angle of Best Fit Line:	0.01932	
Maximum Angular Difference:	0.00147	

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?	Maximum angle of departure must be $\leq 0.25^\circ$
Diameter 1, in		0.00100	1.990	0.00050	0.029	YES	
Diameter 2, in (rotated 90°)		0.00050	1.990	0.00025	0.014	YES	
Perpendicularity Tolerance Met? YES							
END 2							
Diameter 1, in		0.00110	1.990	0.00055	0.032	YES	
Diameter 2, in (rotated 90°)		0.00060	1.990	0.00030	0.017	YES	

Client:	Haley & Aldrich, Inc.
Project Name:	I-395/Rte 9 Connector Bridge (Levenseller Rd)
Project Location:	Eddington, ME
GTX #:	313322
Test Date:	3/26/2021
Tested By:	cmh
Checked By:	smd
Boring ID:	BB-ELER-202
Sample ID:	R3
Depth, ft:	28.6-29.5



After cutting and grinding

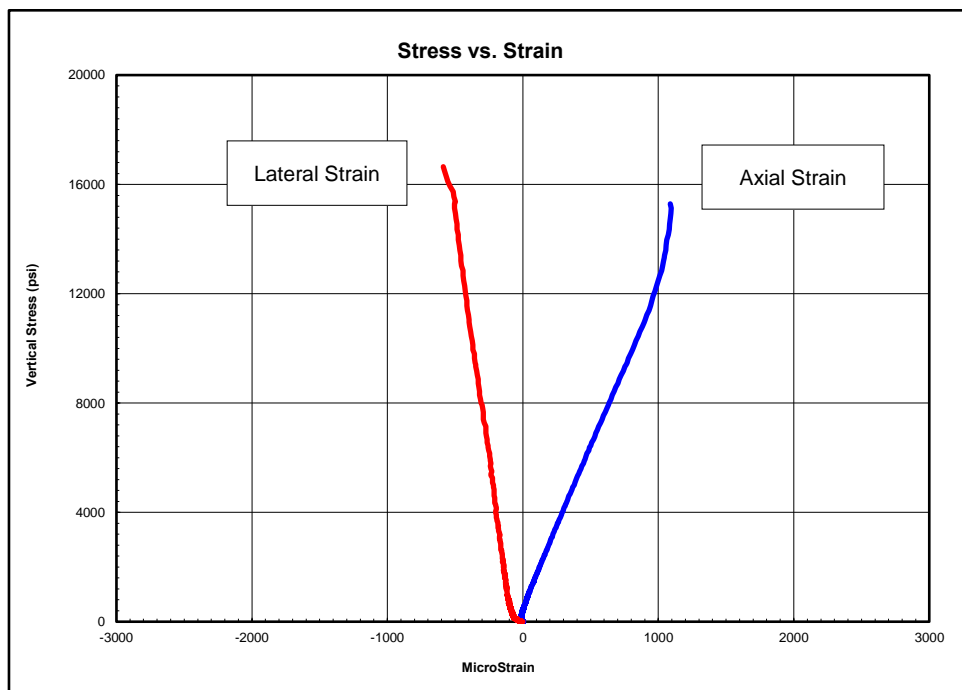


After break



Client:	Haley & Aldrich, Inc.
Project Name:	I-395/Rte 9 Connector Bridge (Levenseller Rd)
Project Location:	Eddington, ME
GTX #:	313322
Test Date:	4/7/2021
Tested By:	cmh
Checked By:	jsc
Boring ID:	BB-ELER-203
Sample ID:	R1
Depth, ft:	15.85-16.23
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: 16,647 psi

Stress Range, psi	Young's Modulus, psi	Poisson's Ratio
1700-6100	11,800,000	0.31
6100-10500	11,400,000	0.35
10500-15000	17,500,000	0.46

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.

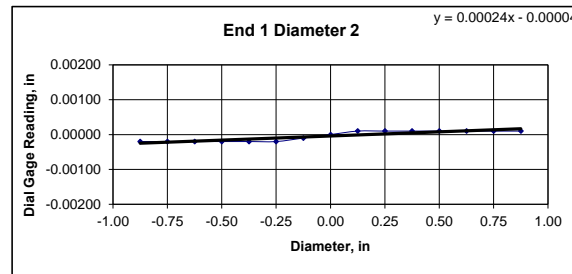
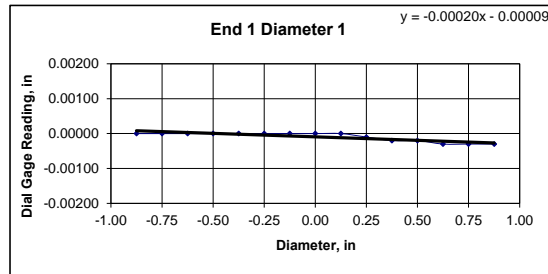


Client:	Haley & Aldrich, Inc.	Test Date:	4/1/2021
Project Name:	I-395/Rte 9 Connector Bridge (Levenseller Rd)	Tested By:	cmh
Project Location:	Eddington, ME	Checked By:	smd
GTX #:	313322		
Boring ID:	BB-ELER-203		
Sample ID:	R1		
Depth:	15.85-16.23 ft		
Visual Description:	See photographs		

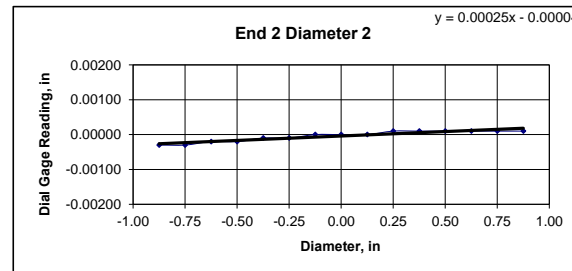
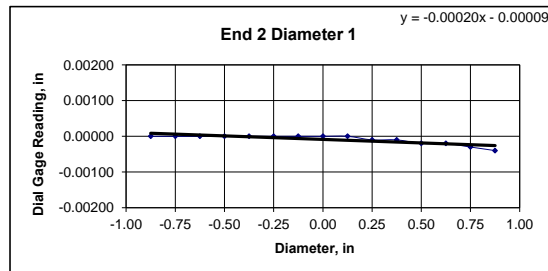
UNIT WEIGHT DETERMINATION AND DIMENSIONAL AND SHAPE TOLERANCES OF ROCK CORE SPECIMENS BY ASTM D4543

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:	4.55	4.55	4.55	Maximum difference must be < 0.020 in. Straightness Tolerance Met? YES	
Specimen Diameter, in:	1.97	1.97	1.97		
Specimen Mass, g:	613.11				
Bulk Density, lb/ft ³	168				
Length to Diameter Ratio:	2.3				
		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	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	-0.00010	-0.00020	-0.00020	-0.00030	-0.00030	-0.00030
Diameter 2, in (rotated 90°)	-0.00020	-0.00020	-0.00020	-0.00020	-0.00020	-0.00020	-0.00010	0.00000	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010
Difference between max and min readings, in: 0° = 0.00030 90° = 0.00030															
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	-0.00010	-0.00010	-0.00020	-0.00020	-0.00030	-0.00040
Diameter 2, in (rotated 90°)	-0.00030	-0.00030	-0.00020	-0.00020	-0.00010	-0.00010	0.00000	0.00000	0.00000	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010
Difference between max and min readings, in: 0° = 0.0004 90° = 0.0004 Maximum difference must be < 0.0020 in. Difference = ± 0.00020															
Flatness Tolerance Met? YES															



DIAMETER 1	
End 1:	
Slope of Best Fit Line	0.00020
Angle of Best Fit Line:	0.01146
End 2:	
Slope of Best Fit Line	0.00020
Angle of Best Fit Line:	0.01130
Maximum Angular Difference:	0.00016
Parallelism Tolerance Met?	YES
Spherically Seated	



DIAMETER 2	
End 1:	
Slope of Best Fit Line	0.00024
Angle of Best Fit Line:	0.01359
End 2:	
Slope of Best Fit Line	0.00025
Angle of Best Fit Line:	0.01457
Maximum Angular Difference:	0.00098
Parallelism Tolerance Met?	YES
Spherically Seated	

PERPENDICULARITY (Procedure P1)						Maximum angle of departure must be $\leq 0.25^\circ$	
END 1	(Calculated from End Flatness and Parallelism measurements above)						
	Difference, Maximum and Minimum (in.)	Diameter (in.)	Slope	Angle°	Perpendicularity Tolerance Met?		
Diameter 1, in	0.00030	1.970	0.00015	0.009	YES		
Diameter 2, in (rotated 90°)	0.00030	1.970	0.00015	0.009	YES		
Perpendicularity Tolerance Met? YES							
END 2							
Diameter 1, in	0.00040	1.970	0.00020	0.012	YES		
Diameter 2, in (rotated 90°)	0.00040	1.970	0.00020	0.012	YES		

Client:	Haley & Aldrich, Inc.
Project Name:	I-395/Rte 9 Connector Bridge (Levenseller Rd)
Project Location:	Eddington, ME
GTX #:	313322
Test Date:	4/7/2021
Tested By:	cmh
Checked By:	smd
Boring ID:	BB-ELER-203
Sample ID:	R1
Depth, ft:	15.85-16.23



After cutting and grinding

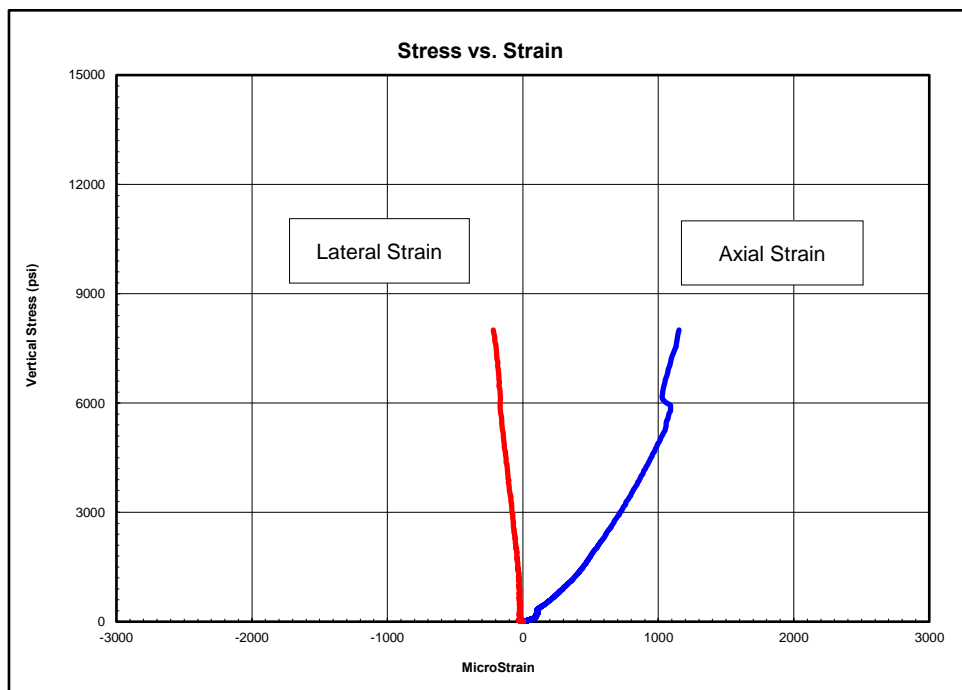


After break



Client:	Haley & Aldrich, Inc.
Project Name:	I-395/Rte 9 Connector Bridge(Levenseller Rd)
Project Location:	Eddington, ME
GTX #:	313322
Test Date:	3/26/2021
Tested By:	cmh
Checked By:	jsc
Boring ID:	BB-ELER-205
Sample ID:	R1
Depth, ft:	15.0-15.9
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: 8,006 psi

The axial strain gauges picked up an initial failure within the specimen and then continued reading until total failure occurred. Young's Modulus and Poisson's Ratio could not be determined for the third stress range.

Stress Range, psi	Young's Modulus, psi	Poisson's Ratio
800-2900	5,400,000	0.16
2900-5100	6,680,000	0.21
5100-7200	---	---

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.

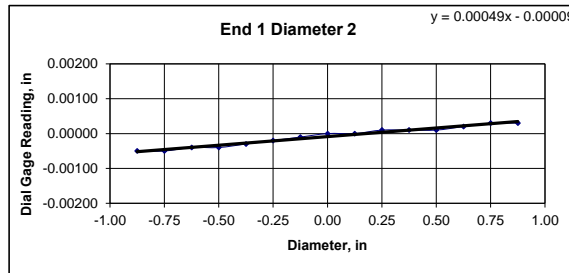
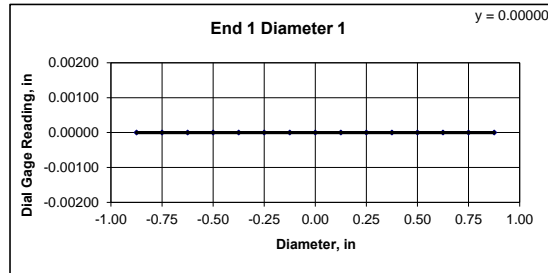


Client:	Haley & Aldrich, Inc.	Test Date:	3/22/2021
Project Name:	I-395/Rte 9 Connector Bridge (Levenseller Rd)	Tested By:	cmh
Project Location:	Eddington, ME	Checked By:	smd
GTx #:	313322		
Boring ID:	BB-ELER-205		
Sample ID:	R1		
Depth:	15.0-15.9 ft		
Visual Description:	See photographs		

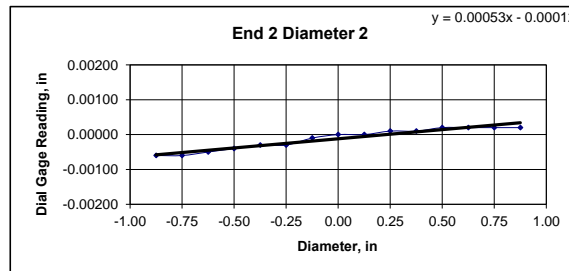
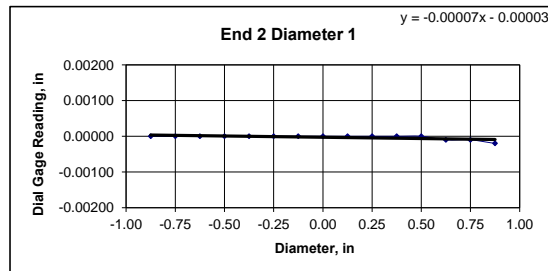
UNIT WEIGHT DETERMINATION AND DIMENSIONAL AND SHAPE TOLERANCES OF ROCK CORE SPECIMENS BY ASTM D4543

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.? NO	
Specimen Length, in:	4.42	4.41	4.42	Maximum difference must be $<$ 0.020 in. Straightness Tolerance Met? NO	
Specimen Diameter, in:	1.98	1.99	1.99		
Specimen Mass, g:	604.15				
Bulk Density, lb/ft ³	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	0.750
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
Diameter 2, in (rotated 90°)	-0.00050	-0.00050	-0.00040	-0.00040	-0.00030	-0.00020	-0.00010	0.00000	0.00000	0.00010	0.00010	0.00010	0.00020	0.00030
Difference between max and min readings, in: 0° = 0.00000 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
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	-0.00010	-0.00020
Diameter 2, in (rotated 90°)	-0.00060	-0.00060	-0.00050	-0.00040	-0.00030	-0.00030	-0.00010	0.00000	0.00000	0.00010	0.00010	0.00020	0.00020	0.00020
Difference between max and min readings, in: 0° = 0.0002 90° = 0.0008 Maximum difference must be $<$ 0.0020 in. Difference = \pm 0.00040 Flatness Tolerance Met? YES														



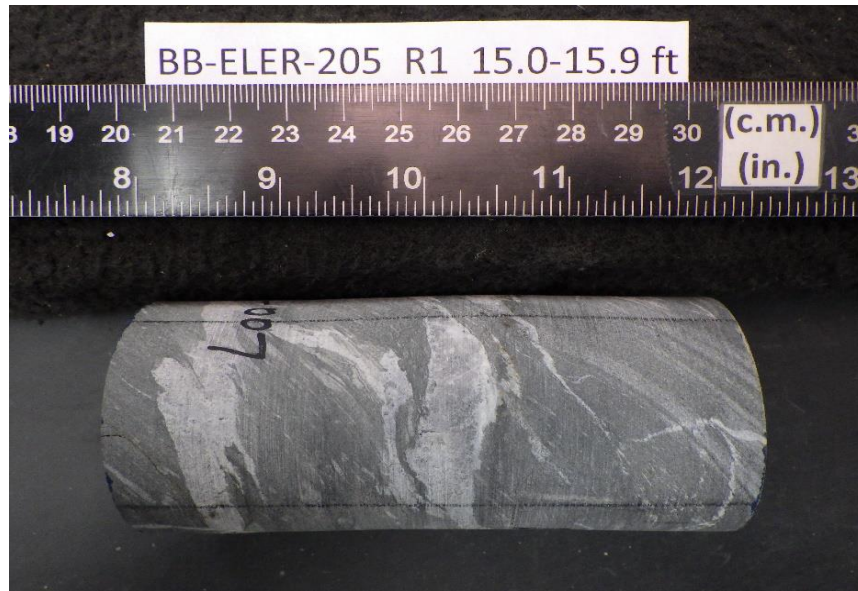
DIAMETER 1	
End 1:	
Slope of Best Fit Line	0.00000
Angle of Best Fit Line:	0.00000
End 2:	
Slope of Best Fit Line	0.00007
Angle of Best Fit Line:	0.00409
Maximum Angular Difference:	0.00409
Parallelism Tolerance Met? Spherically Seated	YES



DIAMETER 2	
End 1:	
Slope of Best Fit Line	0.00049
Angle of Best Fit Line:	0.02832
End 2:	
Slope of Best Fit Line	0.00053
Angle of Best Fit Line:	0.03012
Maximum Angular Difference:	0.00180
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	0.00000	1.985	0.00000	0.000	YES	Perpendicularity Tolerance Met? YES	
Diameter 2, in (rotated 90°)	0.00080	1.985	0.00040	0.023	YES		
END 2							
Diameter 1, in	0.00020	1.985	0.00010	0.006	YES		
Diameter 2, in (rotated 90°)	0.00080	1.985	0.00040	0.023	YES		

Client:	Haley & Aldrich, Inc.
Project Name:	I-395/Rte 9 Connector Bridge (Levenseller Rd)
Project Location:	Eddington, ME
GTX #:	313322
Test Date:	3/26/2021
Tested By:	cmh
Checked By:	smd
Boring ID:	BB-ELER-205
Sample ID:	R1
Depth, ft:	15.0-15.9



After cutting and grinding

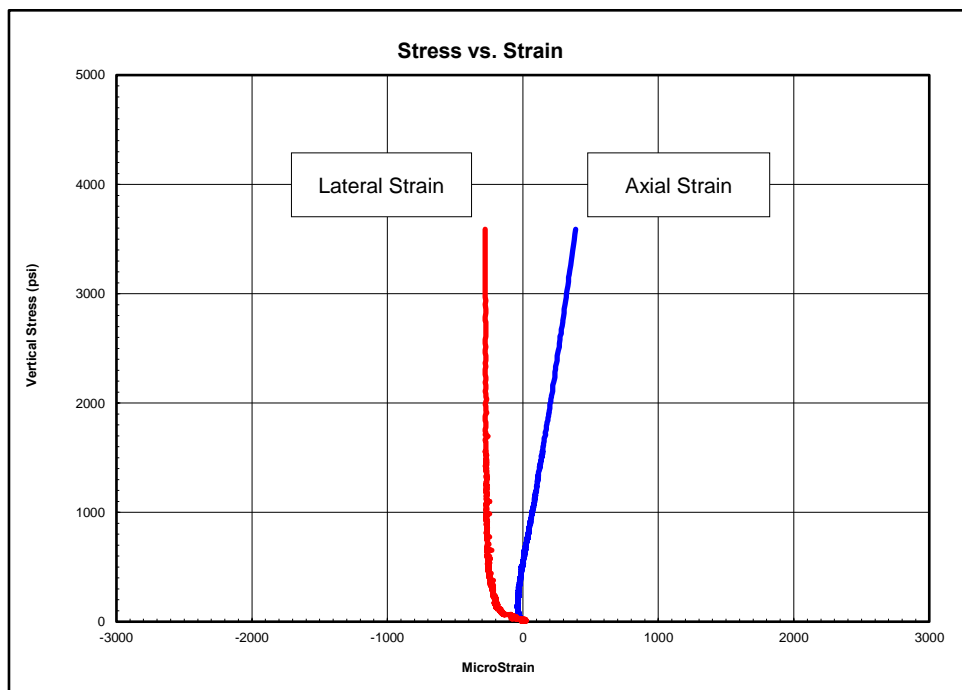


After break



Client:	Haley & Aldrich, Inc.
Project Name:	I-395/Rte 9 Connector Bridge(Levenseller Rd)
Project Location:	Eddington, ME
GTX #:	313322
Test Date:	3/26/2021
Tested By:	cmh
Checked By:	jsc
Boring ID:	BB-ELER-205
Sample ID:	R3
Depth, ft:	20.3-20.7
Sample Type:	rock core
Sample Description:	See photographs Intact material and discontinuity failure

Compressive Strength and Elastic Moduli of Rock by ASTM D7012 - Method D



Peak Compressive Stress: 3,590 psi

Stress Range, psi	Young's Modulus, psi	Poisson's Ratio
400-1300	6,740,000	0.28
1300-2300	7,450,000	0.25
2300-3200	8,440,000	0.27

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.

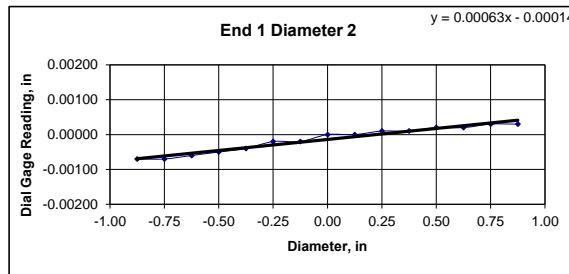
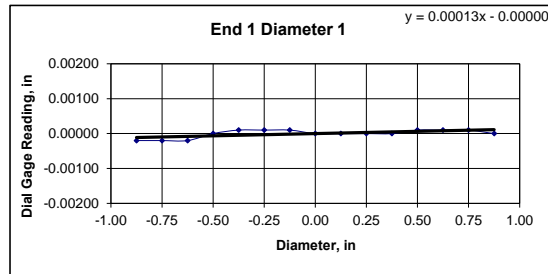


Client:	Haley & Aldrich, Inc.	Test Date:	3/22/2021
Project Name:	I-395/Rte 9 Connector Bridge (Levenseller Rd)	Tested By:	cmh
Project Location:	Eddington, ME	Checked By:	smd
GTX #:	313322		
Boring ID:	BB-ELER-205		
Sample ID:	R3		
Depth:	20.3-20.7 ft		
Visual Description:	See photographs		

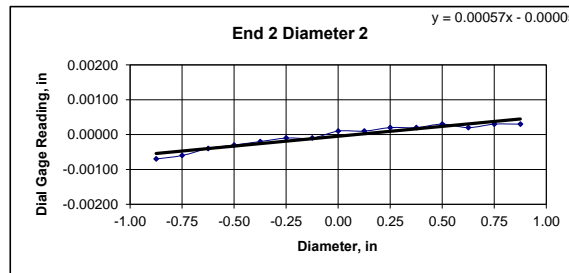
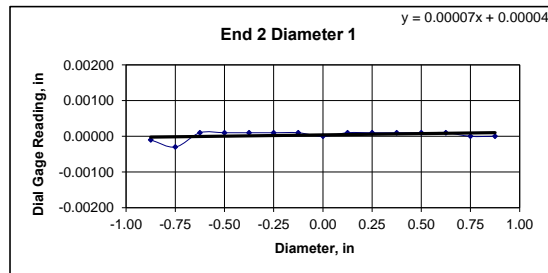
UNIT WEIGHT DETERMINATION AND DIMENSIONAL AND SHAPE TOLERANCES OF ROCK CORE SPECIMENS BY ASTM D4543

BULK DENSITY				DEVIATION FROM STRAIGHTNESS (Procedure S1)	
	1	2	Average	Maximum gap between side of core and reference surface plate: Is the maximum gap ≤ 0.02 in.? YES	
Specimen Length, in:	4.18	4.18	4.18	Maximum difference must be < 0.020 in.	
Specimen Diameter, in:	1.98	1.98	1.98	Straightness Tolerance Met? YES	
Specimen Mass, g:	565.65				
Bulk Density, lb/ft ³ :	167				
Length to Diameter Ratio:	2.1				
		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	-0.00020	-0.00020	-0.00020	0.00000	0.00010	0.00010	0.00010	0.00000	0.00000	0.00000	0.00000	0.00010	0.00010	0.00010	0.00000
Diameter 2, in (rotated 90°)	-0.00070	-0.00070	-0.00060	-0.00050	-0.00040	-0.00020	-0.00020	0.00000	0.00000	0.00010	0.00010	0.00020	0.00020	0.00030	0.00030
Difference between max and min readings, in: 0° = 0.00030 90° = 0.00100															
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	0.00010	0.00010	0.00010	0.00010	0.00010	0.00000	0.00010	0.00010	0.00010	0.00010	0.00010	0.00000	0.00000
Diameter 2, in (rotated 90°)	-0.00070	-0.00060	-0.00040	-0.00030	-0.00020	-0.00010	-0.00010	0.00010	0.00010	0.00020	0.00020	0.00030	0.00020	0.00030	0.00030
Difference between max and min readings, in: 0° = 0.0004 90° = 0.001 Maximum difference must be < 0.0020 in. Difference = ± 0.00050															
Flatness Tolerance Met? YES															



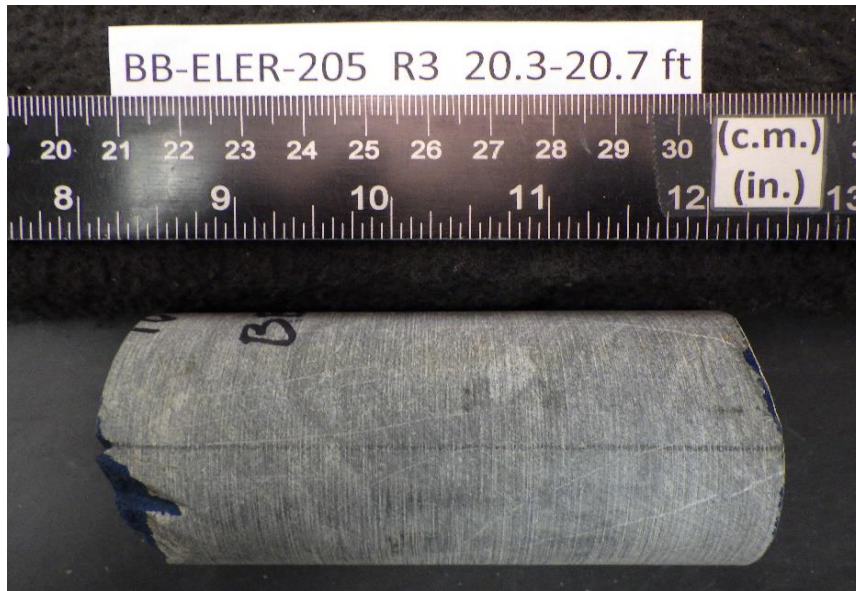
DIAMETER 1	
End 1:	
Slope of Best Fit Line	0.00013
Angle of Best Fit Line:	0.00737
End 2:	
Slope of Best Fit Line	0.00007
Angle of Best Fit Line:	0.00409
Maximum Angular Difference:	0.00327
Parallelism Tolerance Met?	YES
Spherically Seated	



DIAMETER 2	
End 1:	
Slope of Best Fit Line	0.00063
Angle of Best Fit Line:	0.03618
End 2:	
Slope of Best Fit Line	0.00057
Angle of Best Fit Line:	0.03241
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?	Maximum angle of departure must be $\leq 0.25^\circ$
Diameter 1, in	0.00030	1.980	0.00015	0.009	YES	
Diameter 2, in (rotated 90°)	0.00100	1.980	0.00051	0.029	YES	Perpendicularity Tolerance Met? YES
END 2						
Diameter 1, in	0.00040	1.980	0.00020	0.012	YES	
Diameter 2, in (rotated 90°)	0.00100	1.980	0.00051	0.029	YES	

Client:	Haley & Aldrich, Inc.
Project Name:	I-395/Rte 9 Connector Bridge (Levenseller Rd)
Project Location:	Eddington, ME
GTX #:	313322
Test Date:	3/26/2021
Tested By:	cmh
Checked By:	smd
Boring ID:	BB-ELER-205
Sample ID:	R3
Depth, ft:	20.3-20.7



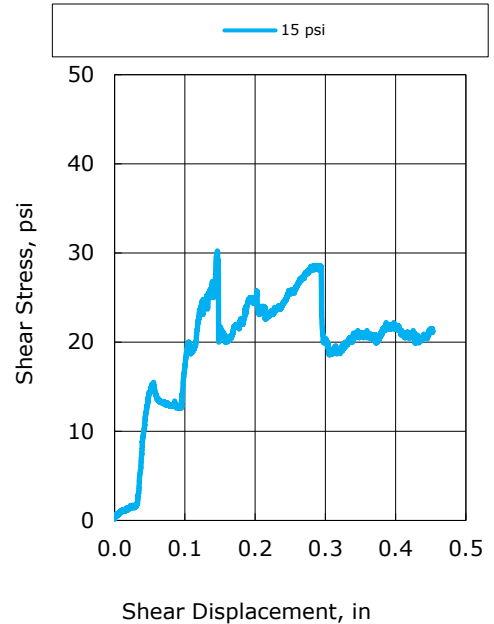
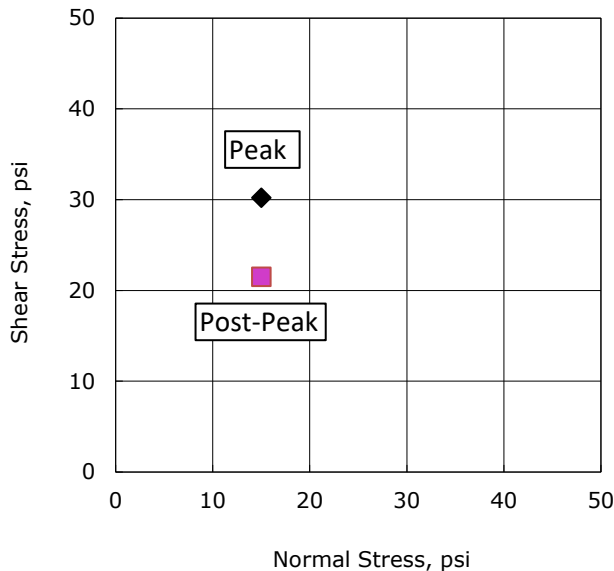
After cutting and grinding



After break

Client:	Haley & Aldrich, Inc
Project Name:	I-395/Rte 9 Connector Bridge (Cleweyville rd)
Project Location:	Eddington, ME
GTX #:	313418
Start Date:	4/12/2021
End Date:	4/12/2021
Tested By:	tlm
Checked By:	jsc
Boring ID:	BB-ECR-204A
Sample ID:	R3
Depth, ft:	22.4
Visual Description:	Rock Core with open joint

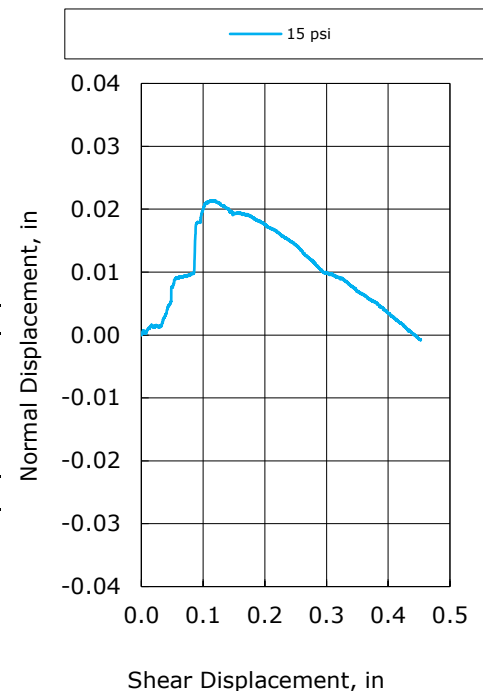
Sliding Friction Test of Rock by ASTM D5607



Test No.:	SF-1
Specimen Diameter, in:	2.49
Specimen Length, in:	3.31
Specimen Mass, grams:	700
Specimen Area, in ² :	4.86
Specimen Bulk Density, pcf	166
Shear Plane Area, in ²	7.59
Normal Stress, psi:	15.0
Peak Shear Stress, psi:	30.2
Post Peak Shear Stress, psi:	21.5
Horiz. Displacement Rate, in/min:	0.005

Peak Friction Angle:	---
Peak Cohesive Intercept, psi:	---
Post-Peak Friction Angle:	---
Post-Peak Cohesive Intercept, psi:	---
JRC Roughness	6-8

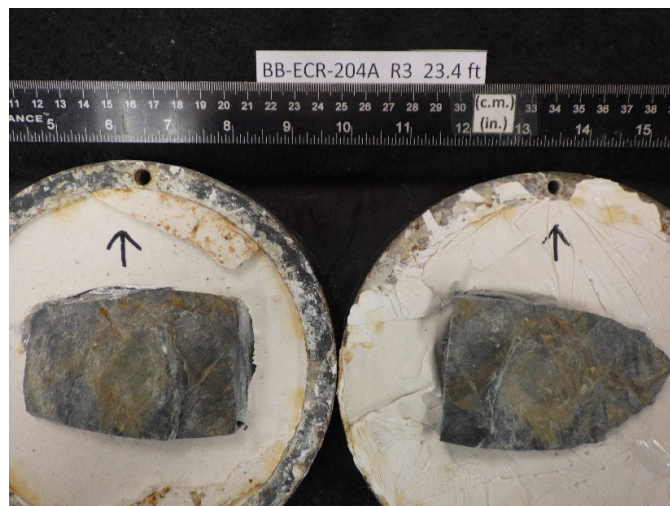
Notes: Specimen cut to length using diamond tipped saw blade.
 Tested at as-received moisture content and density.
 'Hydro-Stone Super X' encapsulating compound used to mount specimen in test rings.
 Actual strength parameters may vary and should be determined by an engineer for site-specific conditions.



Client:	Haley & Aldrich, Inc
Project Name:	I-395/Rte 9 Connector Bridge (Cleweyville rd)
Project Location:	Eddington, ME
GTX #:	313418
Start Date:	4/12/2021
End Date:	4/12/2021
Tested By:	tlm
Checked By:	smd
Boring ID:	BB-ECR-204A
Sample ID:	R3
Depth, ft:	22.4
Visual Description:	Rock Core with open joint



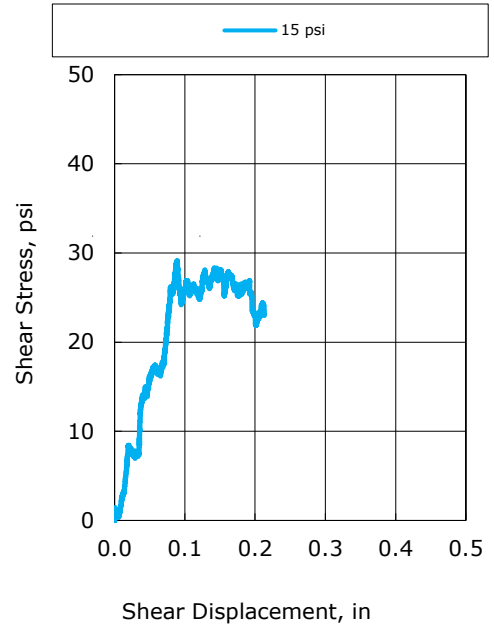
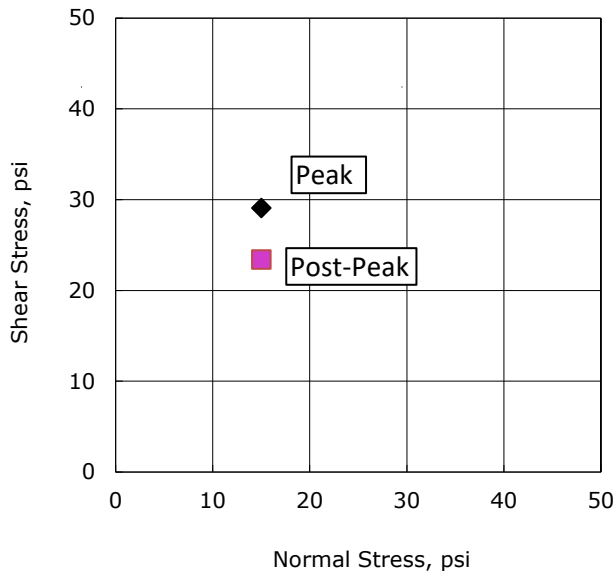
Pre-Test



Post-Test

Client:	Haley & Aldrich, Inc
Project Name:	I-395/Rte 9 Connector Bridge (Levenseller Rd)
Project Location:	Eddington, ME
GTX #:	313322
Start Date:	4/9/2021
End Date:	4/9/2021
Tested By:	tlm
Checked By:	jsc
Boring ID:	BB-ELER-203
Sample ID:	R1
Depth, ft:	16.7
Visual Description:	Rock Core with open joint

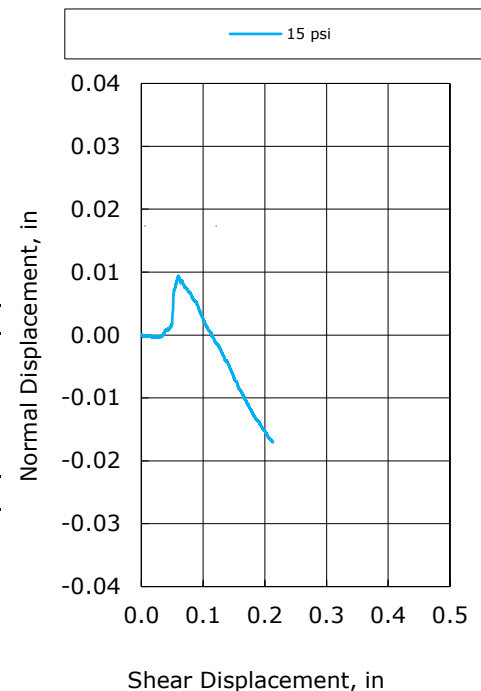
Sliding Friction Test of Rock by ASTM D5607



Test No.:	SF-1
Specimen Diameter, in:	1.97
Specimen Length, in:	2.76
Specimen Mass, grams:	376
Specimen Area, in ² :	3.06
Specimen Bulk Density, pcf	170
Shear Plane Area, in ²	3.90
Normal Stress, psi:	15.0
Peak Shear Stress, psi:	29.1
Post Peak Shear Stress, psi:	23.4
Horiz. Displacement Rate, in/min:	0.005

Peak Friction Angle:	---
Peak Cohesive Intercept, psi:	---
Post-Peak Friction Angle:	---
Post-Peak Cohesive Intercept, psi:	---
JRC Roughness	10-12

Notes: Specimen cut to length using diamond tipped saw blade.
 Tested at as-received moisture content and density.
 'Hydro-Stone Super X' encapsulating compound used to mount specimen in test rings.
 Actual strength parameters may vary and should be determined by an engineer for site-specific conditions.



Client:	Haley & Aldrich, Inc
Project Name:	I-395/Rte 9 Connector Bridge (Levenseller Rd)
Project Location:	Eddington, ME
GTX #:	313322
Start Date:	4/9/2021
End Date:	4/9/2021
Tested By:	tlm
Checked By:	smd
Boring ID:	BB-ELER-203
Sample ID:	R1
Depth, ft:	16.7
Visual Description:	Rock Core with open joint



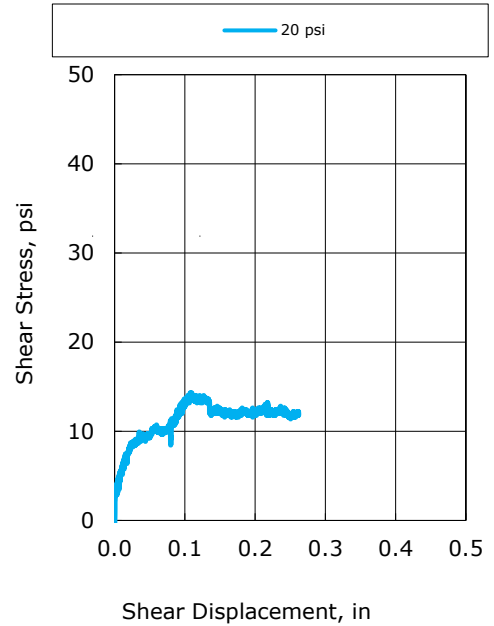
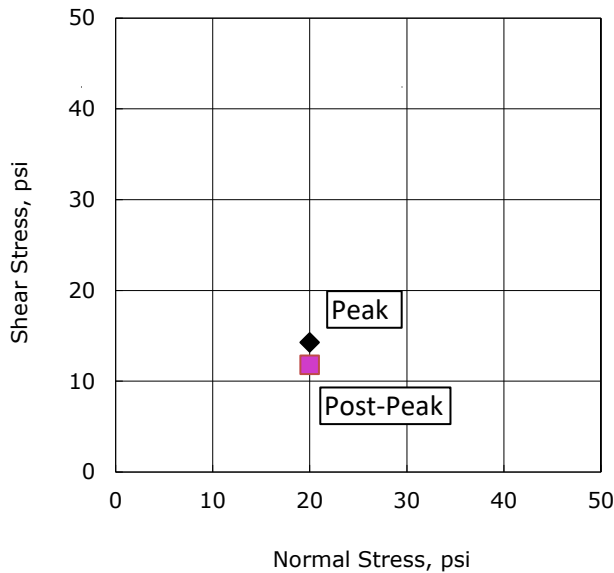
Pre-Test



Post-Test

Client:	Haley & Aldrich, Inc
Project Name:	I-395/Rte 9 Connector Bridge (Levenseller Rd)
Project Location:	Eddington, ME
GTX #:	313322
Start Date:	4/9/2021
End Date:	4/9/2021
Tested By:	tlm
Checked By:	jsc
Boring ID:	BB-ELER-205
Sample ID:	R4
Depth, ft:	24.1
Visual Description:	Rock Core with open joint

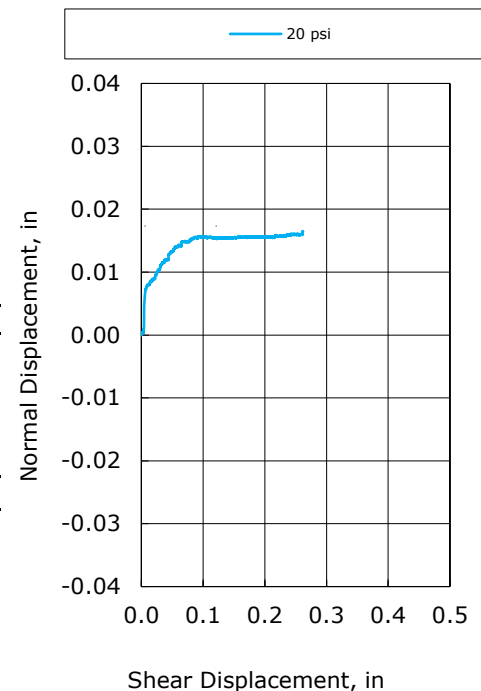
Sliding Friction Test of Rock by ASTM D5607



Test No.:	SF-2
Specimen Diameter, in:	1.97
Specimen Length, in:	2.74
Specimen Mass, grams:	319
Specimen Area, in ² :	3.03
Specimen Bulk Density, pcf	146
Shear Plane Area, in ²	3.62
Normal Stress, psi:	20.0
Peak Shear Stress, psi:	14.3
Post Peak Shear Stress, psi:	11.8
Horiz. Displacement Rate, in/min:	0.005

Peak Friction Angle:	---
Peak Cohesive Intercept, psi:	---
Post-Peak Friction Angle:	---
Post-Peak Cohesive Intercept, psi:	---
JRC Roughness	4-6

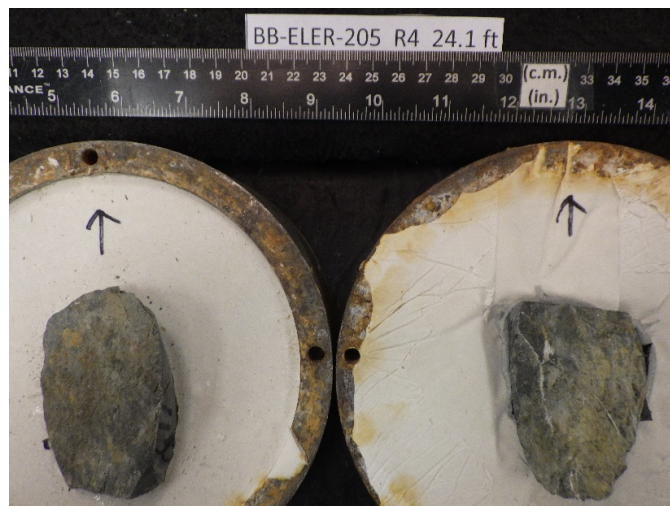
Notes: Specimen cut to length using diamond tipped saw blade.
 Tested at as-received moisture content and density.
 'Hydro-Stone Super X' encapsulating compound used to mount specimen in test rings.
 Actual strength parameters may vary and should be determined by an engineer for site-specific conditions.



Client:	Haley & Aldrich, Inc
Project Name:	I-395/Rte 9 Connector Bridge (Levenseller Rd)
Project Location:	Eddington, ME
GTX #:	313322
Start Date:	4/9/2021
End Date:	4/9/2021
Tested By:	tlm
Checked By:	smd
Boring ID:	BB-ELER-205
Sample ID:	R4
Depth, ft:	24.1
Visual Description:	Rock Core with open joint



Pre-Test

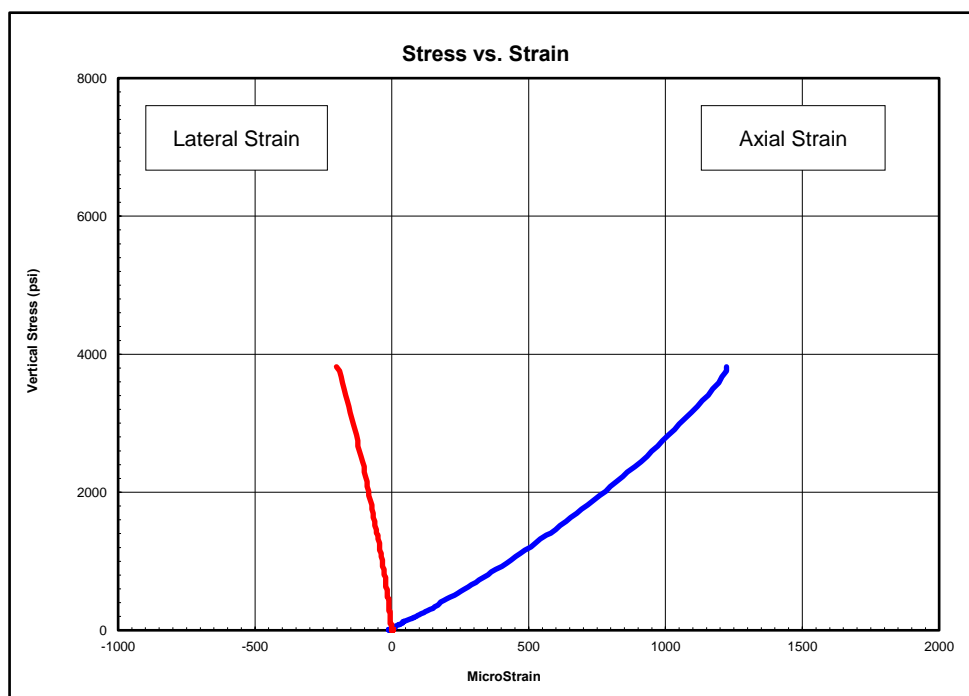


Post-Test



Client:	Haley & Aldrich, Inc.
Project Name:	Rt 9/I-395 Eastern Ave Bridge
Project Location:	Brewer and Eddington, ME
GTX #:	308855
Test Date:	10/1/2018
Tested By:	tlm
Checked By:	jsc
Boring ID:	BB-BEA-101
Sample ID:	R1
Depth, ft:	28.7-29.6
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: 3,818 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
400-1400	2,510,000	0.11
1400-2400	3,130,000	0.16
2400-3400	3,940,000	0.25

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.

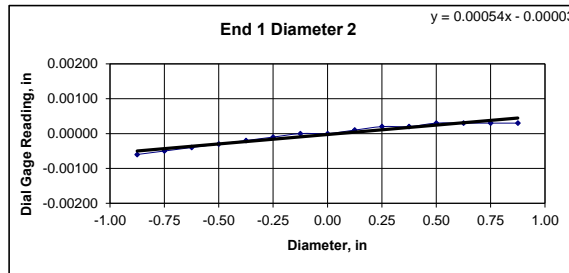
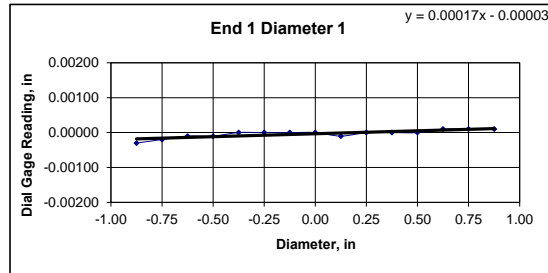


Client:	Haley & Aldrich, Inc.	Test Date:	9/27/2018
Project Name:	Rt 9/1-395 Eastern Ave Bridge	Tested By:	tlm
Project Location:	Brewer and Eddington, ME	Checked By:	jsc
GTX #:	308855		
Boring ID:	BB-BEA-101		
Sample ID:	R1		
Depth:	28.7-29.6 ft		
Visual Description:	See photographs		

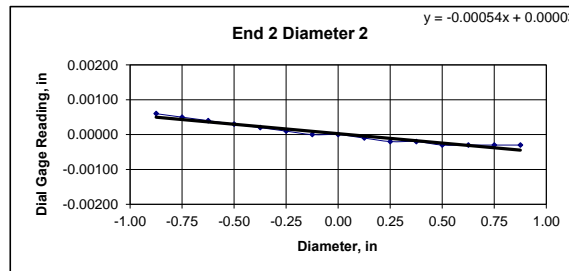
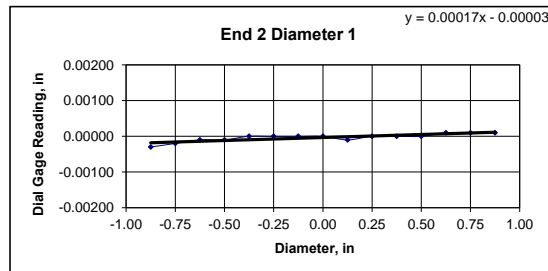
UNIT WEIGHT DETERMINATION AND DIMENSIONAL AND SHAPE TOLERANCES OF ROCK CORE SPECIMENS BY ASTM D4543

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.? NO	
Specimen Length, in:	4.09	4.09	4.09	Maximum difference must be $<$ 0.020 in. Straightness Tolerance Met? NO	
Specimen Diameter, in:	1.98	1.98	1.98		
Specimen Mass, g:	557.54				
Bulk Density, lb/ft ³	168				
Length to Diameter Ratio:	2.1				
		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
Diameter 1, in	-0.00030	-0.00020	-0.00010	-0.00010	0.00000	0.00000	0.00000	0.00000	-0.00010	0.00000	0.00000	0.00000	0.00010	0.00010
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	0.00020	0.00030	0.00030	0.00030
Difference between max and min readings, in: 0° = 0.00040 90° = 0.00090														
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
Diameter 1, in	-0.00030	-0.00020	-0.00010	-0.00010	0.00000	0.00000	0.00000	0.00000	-0.00010	0.00000	0.00000	0.00000	0.00010	0.00010
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	-0.00020	-0.00030	-0.00030	-0.00030
Difference between max and min readings, in: 0° = 0.0004 90° = 0.0009 Maximum difference must be $<$ 0.0020 in. Difference = \pm 0.00045 Flatness Tolerance Met? YES														



DIAMETER 1	
End 1:	
Slope of Best Fit Line	0.00017
Angle of Best Fit Line:	0.00966
End 2:	
Slope of Best Fit Line	0.00017
Angle of Best Fit Line:	0.00966
Maximum Angular Difference:	0.00000
Parallelism Tolerance Met?	YES
Spherically Seated	



DIAMETER 2	
End 1:	
Slope of Best Fit Line	0.00054
Angle of Best Fit Line:	0.03094
End 2:	
Slope of Best Fit Line	0.00054
Angle of Best Fit Line:	0.03094
Maximum Angular Difference:	0.00000
Parallelism Tolerance Met?	YES
Spherically Seated	

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	0.00040	1.980	0.00020	0.012	YES	Perpendicularity Tolerance Met? YES	
Diameter 2, in (rotated 90°)	0.00090	1.980	0.00045	0.026	YES		
END 2							
Diameter 1, in	0.00040	1.980	0.00020	0.012	YES		
Diameter 2, in (rotated 90°)	0.00090	1.980	0.00045	0.026	YES		

Client:	Haley & Aldrich, Inc.
Project Name:	Rt 9/I-395 Eastern Ave Bridge
Project Location:	Brewer and Eddington, ME
GTX #:	308855
Test Date:	9/28/2018
Tested By:	cmh
Checked By:	jsc
Boring ID:	BB-BEA-101
Sample ID:	R1
Depth, ft:	28.7-29.6



After cutting and grinding

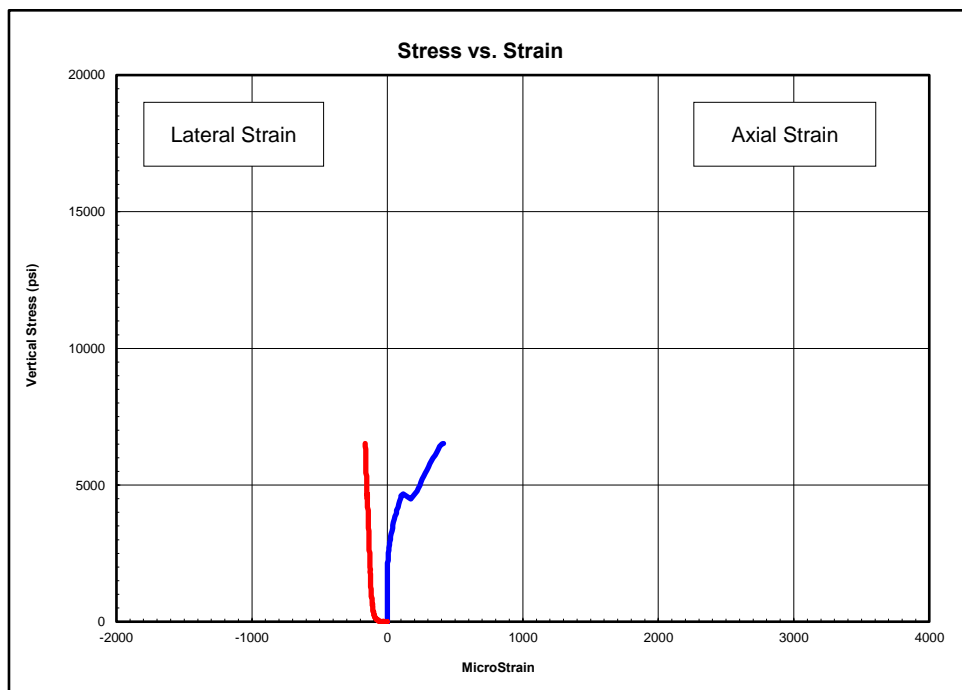


After break



Client:	Haley & Aldrich, Inc.
Project Name:	Rt 9/I-395 Eastern Ave Bridge
Project Location:	Brewer and Eddington, ME
GTX #:	308855
Test Date:	10/1/2018
Tested By:	tlm
Checked By:	jsc
Boring ID:	BB-BEA-101
Sample ID:	R2
Depth, ft:	31.6-32.2
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: 6,520 psi

Stress Range, psi	Young's Modulus, psi	Poisson's Ratio
700-2400	---	---
2400-4100	25,400,000	0.21
4100-5900	5,680,000	0.05

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.

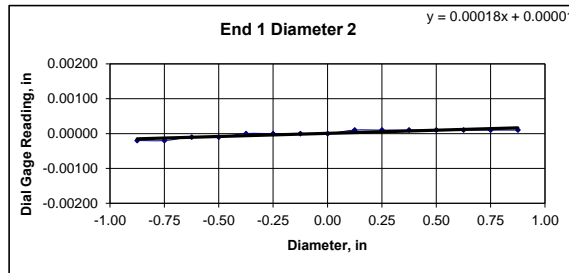
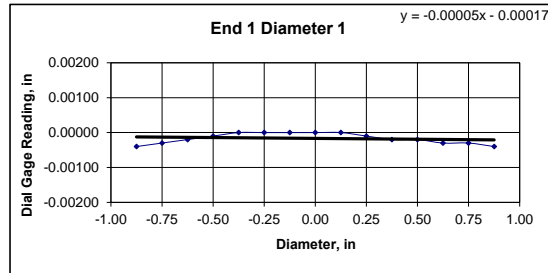


Client:	Haley & Aldrich, Inc.	Test Date:	9/27/2018
Project Name:	Rt 9/1-395 Eastern Ave Bridge	Tested By:	tlm
Project Location:	Brewer and Eddington, ME	Checked By:	jsc
GTx #:	308855		
Boring ID:	BB-BEA-101		
Sample ID:	R2		
Depth:	31.6-32.2 ft		
Visual Description:	See photographs		

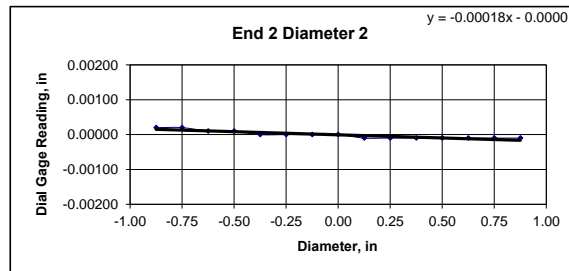
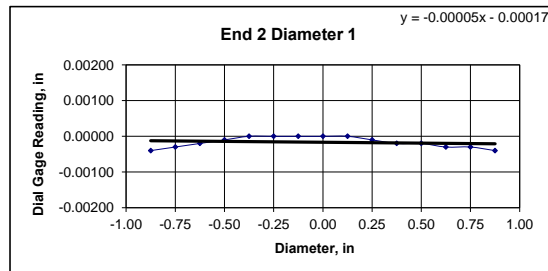
UNIT WEIGHT DETERMINATION AND DIMENSIONAL AND SHAPE TOLERANCES OF ROCK CORE SPECIMENS BY ASTM D4543

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.? NO	
Specimen Length, in:	4.33	4.34	4.34	Maximum difference must be < 0.020 in. Straightness Tolerance Met? NO	
Specimen Diameter, in:	1.98	1.99	1.99		
Specimen Mass, g:	593.79				
Bulk Density, lb/ft ³	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	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	-0.00020	-0.00030	-0.00030	-0.00040
Diameter 2, in (rotated 90°)	-0.00020	-0.00020	-0.00010	-0.00010	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° = 0.00040 90° = 0.00030															
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	0.00000	-0.00010	-0.00020	-0.00020	-0.00030	-0.00030	-0.00040
Diameter 2, in (rotated 90°)	0.00020	0.00020	0.00010	0.00010	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° = 0.0004 90° = 0.0003 Maximum difference must be < 0.0020 in. Difference = \pm 0.00020 Flatness Tolerance Met? YES															



DIAMETER 1	
End 1:	
Slope of Best Fit Line	0.00005
Angle of Best Fit Line:	0.00278
End 2:	
Slope of Best Fit Line	0.00005
Angle of Best Fit Line:	0.00278
Maximum Angular Difference:	0.00000
Parallelism Tolerance Met? Spherically Seated	YES



DIAMETER 2	
End 1:	
Slope of Best Fit Line	0.00018
Angle of Best Fit Line:	0.01031
End 2:	
Slope of Best Fit Line	0.00018
Angle of Best Fit Line:	0.01031
Maximum Angular Difference:	0.00000
Parallelism Tolerance Met? Spherically Seated	YES

PERPENDICULARITY (Procedure P1) (Calculated from End Flatness and Parallelism measurements above)						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	0.00040	1.985	0.00020	0.012	YES	Perpendicularity Tolerance Met? YES	
Diameter 2, in (rotated 90°)	0.00030	1.985	0.00015	0.009	YES		
END 2							
Diameter 1, in	0.00040	1.985	0.00020	0.012	YES		
Diameter 2, in (rotated 90°)	0.00030	1.985	0.00015	0.009	YES		

Client:	Haley & Aldrich, Inc.
Project Name:	Rt 9/I-395 Eastern Ave Bridge
Project Location:	Brewer and Eddington, ME
GTX #:	308855
Test Date:	9/28/2018
Tested By:	cmh
Checked By:	jsc
Boring ID:	BB-BEA-101
Sample ID:	R2
Depth, ft:	31.6-32.2



After cutting and grinding

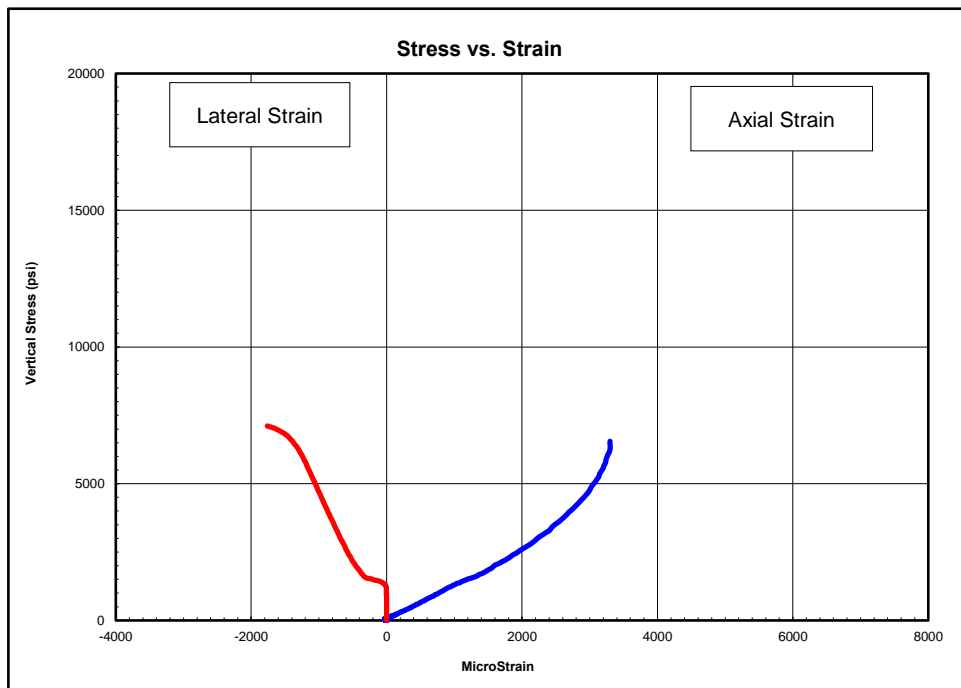


After break



Client:	Haley & Aldrich, Inc.
Project Name:	Rt 9/I-395 Connector
Project Location:	Brewer and Eddington, ME
GTX #:	308853
Test Date:	10/12/2018
Tested By:	tlm
Checked By:	jsc
Boring ID:	BB-BEA-102
Sample ID:	R1
Depth, ft:	22.84-23.20
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: 7,261 psi

Stress Range, psi	Young's Modulus, psi	Poisson's Ratio
700-2700	1,250,000	---
2700-4600	2,160,000	0.41
4600-6500	5,070,000	---

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.

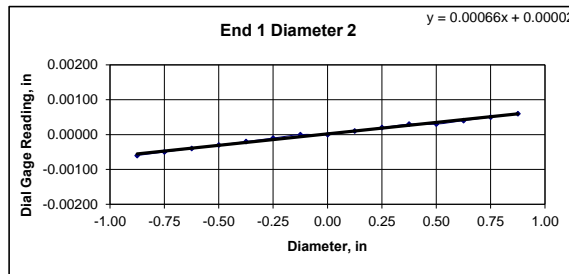
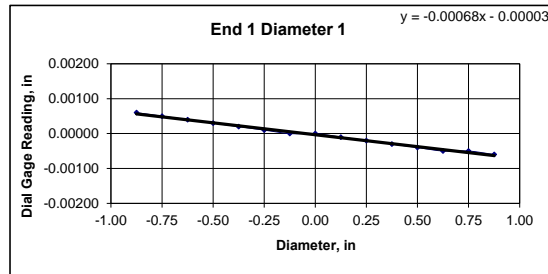


Client:	Haley & Aldrich, Inc.	Test Date:	10/5/2018
Project Name:	Rt 9/1-395 Connector	Tested By:	tlm
Project Location:	Brewer and Eddington, ME	Checked By:	jsc
GTx #:	308853		
Boring ID:	BB-BEA-102		
Sample ID:	R1		
Depth:	22.84-23.20 ft		
Visual Description:	See photographs		

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.? NO	
Specimen Length, in:	4.17	4.18	4.18	Maximum difference must be < 0.020 in. Straightness Tolerance Met? NO	
Specimen Diameter, in:	1.98	1.98	1.98		
Specimen Mass, g:	573.64				
Bulk Density, lb/ft ³	170				
Length to Diameter Ratio:	2.1				
				Minimum Diameter Tolerance Met? YES	
				Length to Diameter Ratio Tolerance Met? YES	

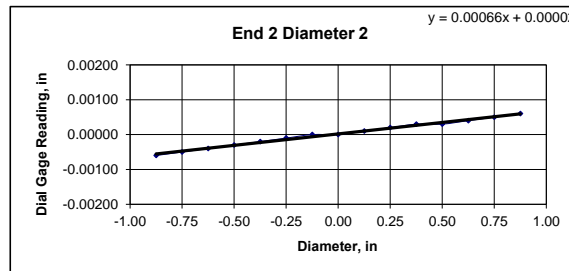
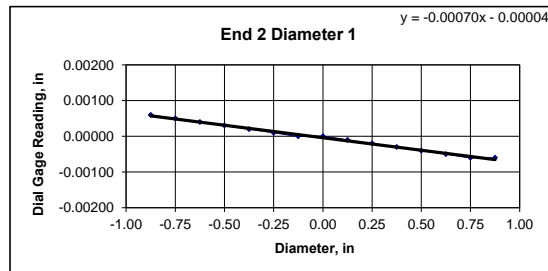
END FLATNESS AND PARALLELISM (Procedure FP1)															
END 1	-0.875	-0.750	-0.625	-0.500	-0.375	-0.250	-0.125	0.000	0.125	0.250	0.375	0.500	0.625	0.750	0.875
Diameter 1, in	0.00060	0.00050	0.00040	0.00030	0.00020	0.00010	0.00000	0.00000	-0.00010	-0.00020	-0.00030	-0.00040	-0.00050	-0.00050	-0.00060
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	0.00030	0.00040	0.00050	0.00060
Difference between max and min readings, in:															
0° = 0.00120 90° = 0.00120															
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	-0.00040	-0.00050	-0.00060	-0.00060
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	0.00030	0.00040	0.00050	0.00060
Difference between max and min readings, in:															
0° = 0.0012 90° = 0.0012															
Maximum difference must be < 0.0020 in. Difference = ± 0.00060															
Flatness Tolerance Met? YES															



DIAMETER 1

End 1:		
Slope of Best Fit Line	0.00068	
Angle of Best Fit Line:	0.03912	
End 2:		
Slope of Best Fit Line	0.00070	
Angle of Best Fit Line:	0.04011	
Maximum Angular Difference:	0.00098	

Parallelism Tolerance Met? YES
Spherically Seated



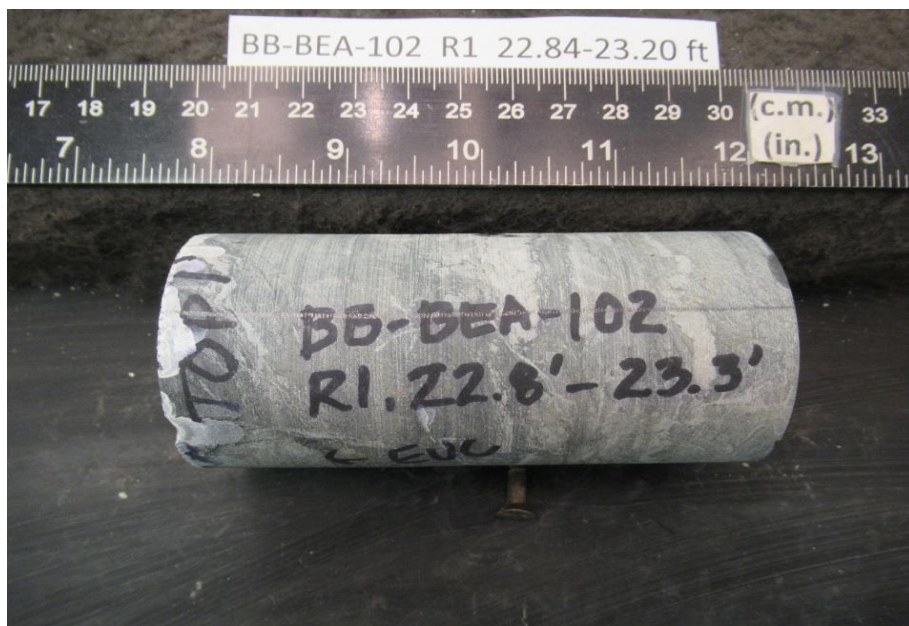
DIAMETER 2

End 1:		
Slope of Best Fit Line	0.00066	
Angle of Best Fit Line:	0.03765	
End 2:		
Slope of Best Fit Line	0.00066	
Angle of Best Fit Line:	0.03765	
Maximum Angular Difference:	0.00000	

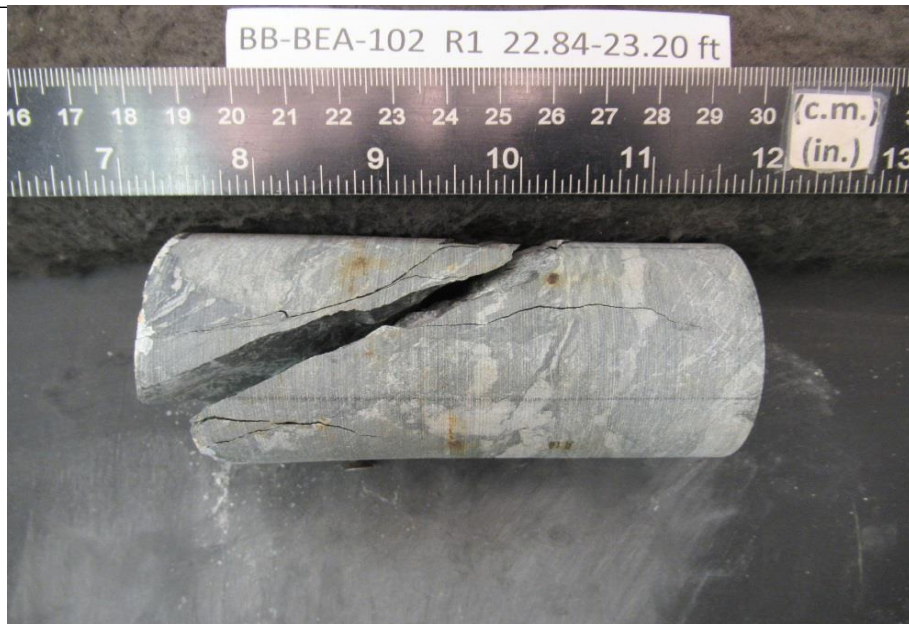
Parallelism Tolerance Met? YES
Spherically Seated

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?	Maximum angle of departure must be $\leq 0.25^\circ$
Diameter 1, in		0.00120	1.980	0.00061	0.035	YES	
Diameter 2, in (rotated 90°)		0.00120	1.980	0.00061	0.035	YES	
Perpendicularity Tolerance Met? YES							
END 2							
Diameter 1, in		0.00120	1.980	0.00061	0.035	YES	
Diameter 2, in (rotated 90°)		0.00120	1.980	0.00061	0.035	YES	

Client:	Haley & Aldrich, Inc.
Project Name:	Rt 9/I-395 Connector
Project Location:	Brewer and Eddington, ME
GTX #:	308853
Test Date:	10/12/2018
Tested By:	cmh
Checked By:	jsc
Boring ID:	BB-BEA-102
Sample ID:	R1
Depth, ft:	22.84-23.20



After cutting and grinding

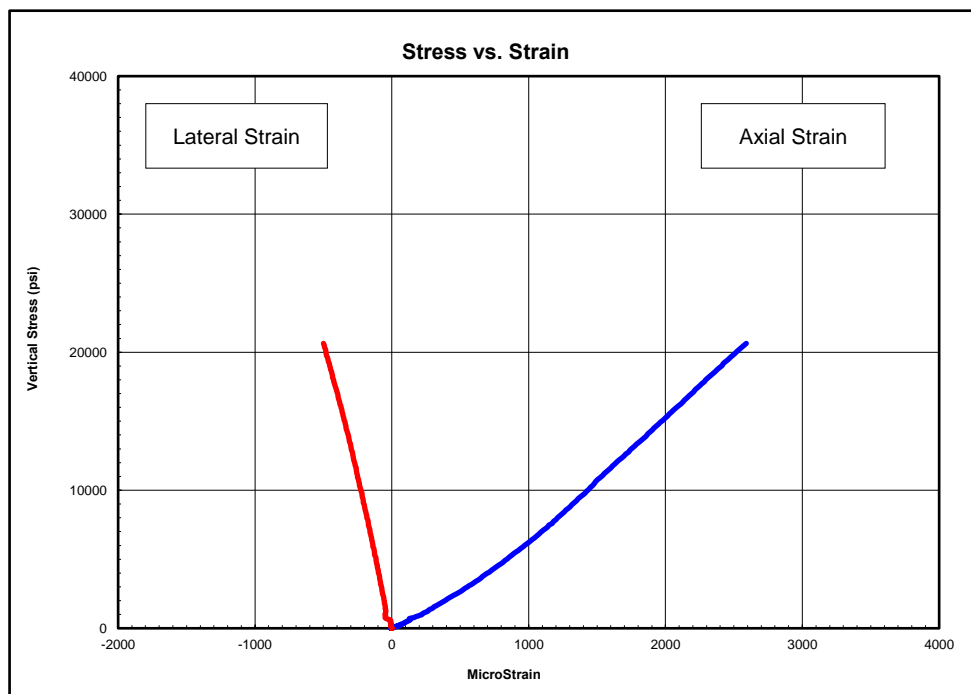


After break



Client:	Haley & Aldrich, Inc.
Project Name:	Rt 9/I-395 Eastern Ave Bridge
Project Location:	Brewer and Eddington, ME
GTX #:	308855
Test Date:	10/1/2018
Tested By:	tlm
Checked By:	jsc
Boring ID:	BB-BEA-102
Sample ID:	R2
Depth, ft:	29.3-30
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: 20,635 psi

Stress Range, psi	Young's Modulus, psi	Poisson's Ratio
2100-7600	7,230,000	0.15
7600-13100	9,330,000	0.21
13100-18600	9,230,000	0.24

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.

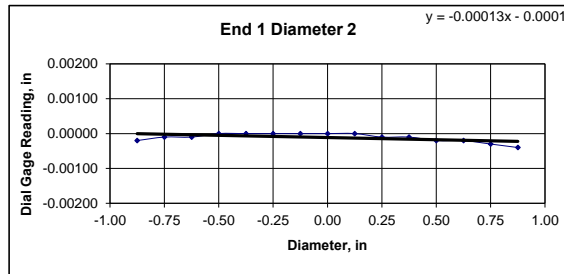
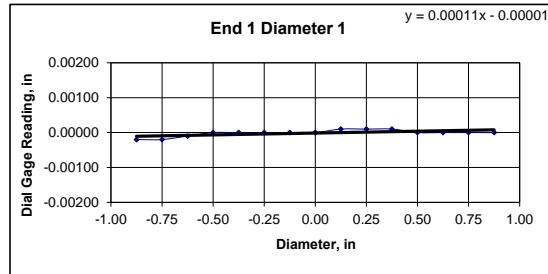


Client:	Haley & Aldrich, Inc.	Test Date:	9/27/2018
Project Name:	Rt 9/1-395 Eastern Ave Bridge	Tested By:	tlm
Project Location:	Brewer and Eddington, ME	Checked By:	jsc
GTx #:	308855		
Boring ID:	BB-BEA-102		
Sample ID:	R2		
Depth:	29.3-30 ft		
Visual Description:	See photographs		

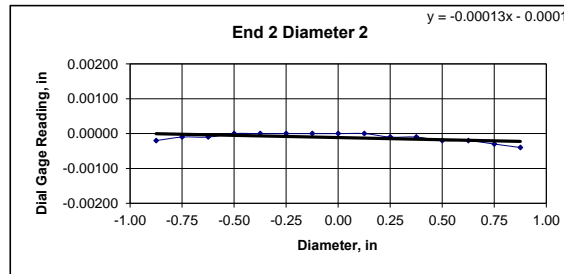
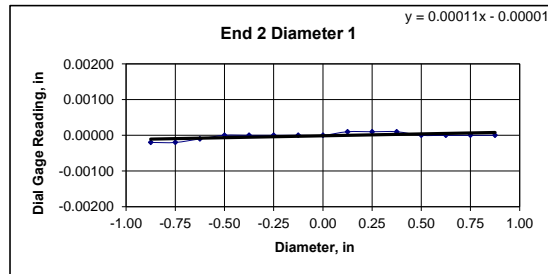
UNIT WEIGHT DETERMINATION AND DIMENSIONAL AND SHAPE TOLERANCES OF ROCK CORE SPECIMENS BY ASTM D4543

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.? NO	
Specimen Length, in:	4.18	4.18	4.18	Maximum difference must be $<$ 0.020 in.	
Specimen Diameter, in:	1.98	1.98	1.98	Straightness Tolerance Met? NO	
Specimen Mass, g:	566.49				
Bulk Density, lb/ft ³ :	167				
Length to Diameter Ratio:	2.1	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	-0.00020	-0.00020	-0.00010	0.00000	0.00000	0.00000	0.00000	0.00000	0.00010	0.00010	0.00010	0.00000	0.00000	0.00000	0.00000
Diameter 2, in (rotated 90°)	-0.00020	-0.00010	-0.00010	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	-0.00010	-0.00010	-0.00020	-0.00020	-0.00030	-0.00040
Difference between max and min readings, in: 0° = 0.00030 90° = 0.00040															
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	-0.00020	-0.00020	-0.00010	0.00000	0.00000	0.00000	0.00000	0.00000	0.00010	0.00010	0.00010	0.00000	0.00000	0.00000	0.00000
Diameter 2, in (rotated 90°)	-0.00020	-0.00010	-0.00010	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	-0.00010	-0.00010	-0.00020	-0.00020	-0.00030	-0.00040
Difference between max and min readings, in: 0° = 0.0003 90° = 0.0004 Maximum difference must be < 0.0020 in. Difference = ± 0.00020															
Flatness Tolerance Met? YES															



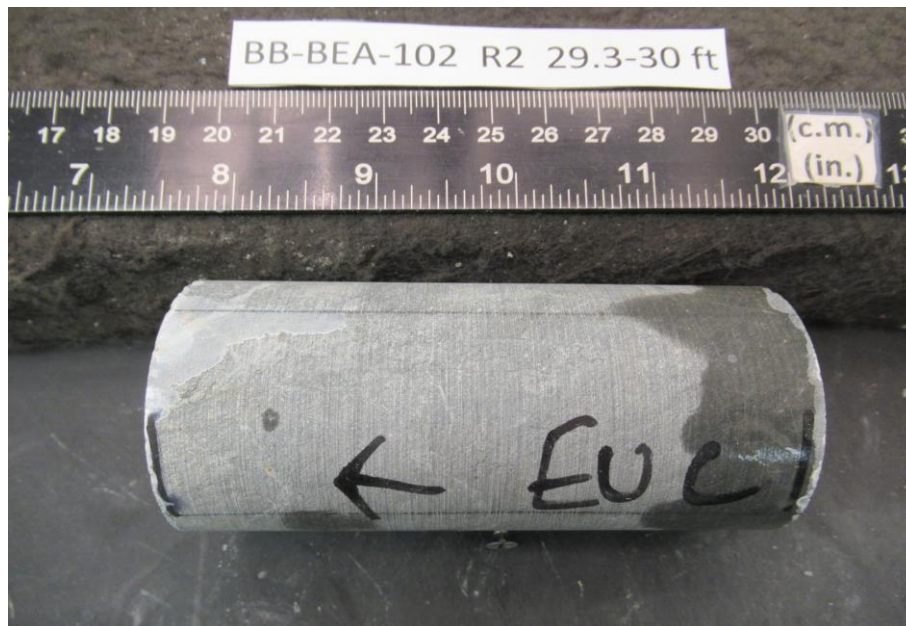
DIAMETER 1	
End 1:	
Slope of Best Fit Line	0.00011
Angle of Best Fit Line:	0.00606
End 2:	
Slope of Best Fit Line	0.00011
Angle of Best Fit Line:	0.00606
Maximum Angular Difference:	0.00000
Parallelism Tolerance Met? Spherically Seated	YES



DIAMETER 2	
End 1:	
Slope of Best Fit Line	0.00013
Angle of Best Fit Line:	0.00720
End 2:	
Slope of Best Fit Line	0.00013
Angle of Best Fit Line:	0.00720
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	0.00030	1.980	0.00015	0.009	YES		
Diameter 2, in (rotated 90°)	0.00040	1.980	0.00020	0.012	YES	Perpendicularity Tolerance Met? YES	
END 2							
Diameter 1, in	0.00030	1.980	0.00015	0.009	YES		
Diameter 2, in (rotated 90°)	0.00040	1.980	0.00020	0.012	YES		

Client:	Haley & Aldrich, Inc.
Project Name:	Rt 9/I-395 Eastern Ave Bridge
Project Location:	Brewer and Eddington, ME
GTX #:	308855
Test Date:	9/28/2018
Tested By:	cmh
Checked By:	jsc
Boring ID:	BB-BEA-102
Sample ID:	R2
Depth, ft:	29.3-30



After cutting and grinding

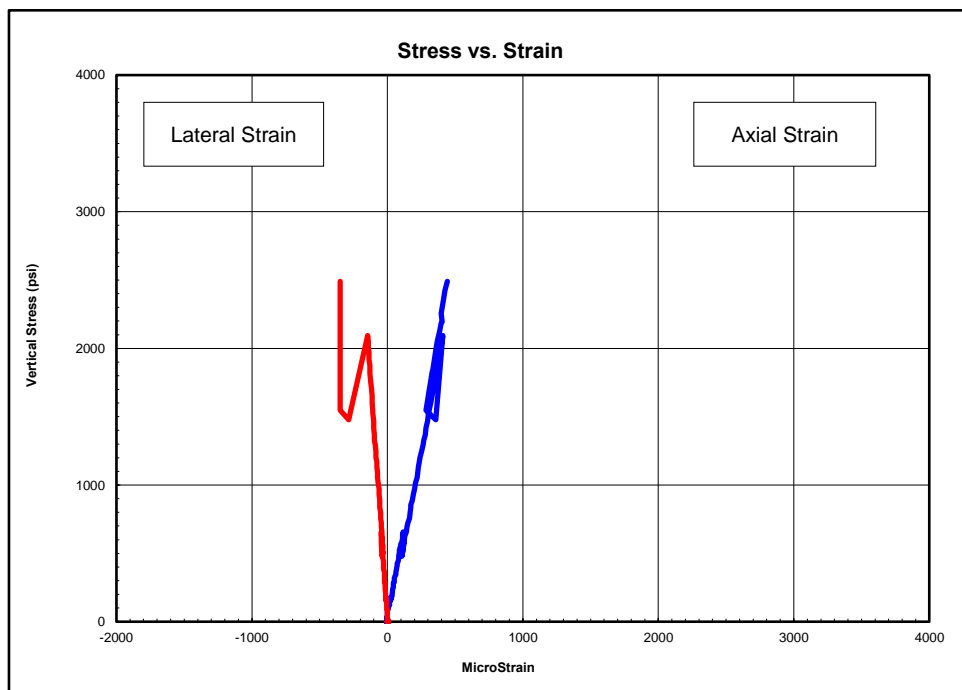


After break



Client:	Haley & Aldrich, Inc.
Project Name:	Rt 9/I-395 Wilson St Bridge
Project Location:	Brewer and Eddington, ME
GTX #:	308858
Test Date:	10/1/2018
Tested By:	tlm
Checked By:	jsc
Boring ID:	BB-BWS-104
Sample ID:	R1
Depth, ft:	41.3-41.9
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: 2,490 psi

The strain gauges picked up an initial failure within the specimen and then continued reading until total failure occurred.

Stress Range, psi	Young's Modulus, psi	Poisson's Ratio
200-900	4,240,000	0.28
900-1600	5,230,000	0.41
1600-2000	5,490,000	0.38

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.

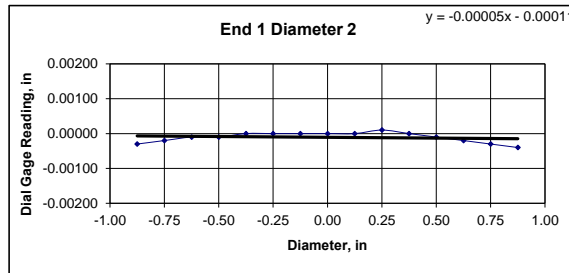
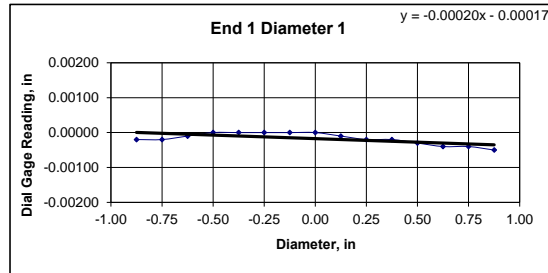


Client:	Haley & Aldrich, Inc.	Test Date:	9/27/2018
Project Name:	Rt 9/1-395 Wilson St Bridge	Tested By:	tlm
Project Location:	Brewer and Eddington, ME	Checked By:	jsc
GTX #:	308858		
Boring ID:	BB-BWS-104		
Sample ID:	R1		
Depth:	41.3-41.9 ft		
Visual Description:	See photographs		

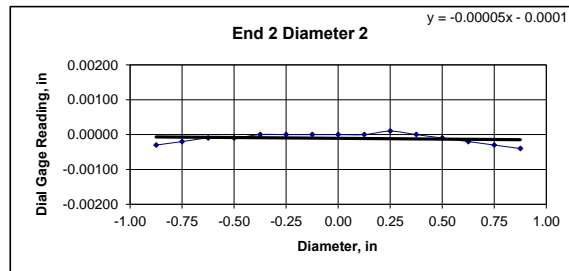
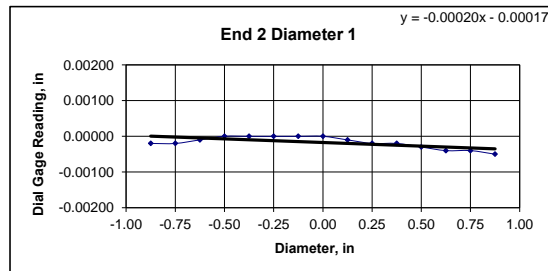
UNIT WEIGHT DETERMINATION AND DIMENSIONAL AND SHAPE TOLERANCES OF ROCK CORE SPECIMENS BY ASTM D4543

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:	4.38	4.38	4.38	Maximum difference must be $<$ 0.020 in.	
Specimen Diameter, in:	1.98	1.98	1.98	Straightness Tolerance Met? YES	
Specimen Mass, g:	594.33				
Bulk Density, lb/ft ³ :	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	0.750
Diameter 1, in	-0.00020	-0.00020	-0.00010	0.00000	0.00000	0.00000	0.00000	0.00000	-0.00010	-0.00020	-0.00020	-0.00030	-0.00040	-0.00050
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	0.00000	-0.00010	-0.00020	-0.00030
Difference between max and min readings, in:														
0° = 0.00050 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
Diameter 1, in	-0.00020	-0.00020	-0.00010	0.00000	0.00000	0.00000	0.00000	0.00000	-0.00010	-0.00020	-0.00020	-0.00030	-0.00040	-0.00050
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	0.00000	-0.00010	-0.00020	-0.00030
Difference between max and min readings, in:														
0° = 0.0005 90° = 0.0005														
Maximum difference must be $<$ 0.0020 in. Difference = \pm 0.00025														
Flatness Tolerance Met? YES														



DIAMETER 1	
End 1:	
Slope of Best Fit Line	0.00020
Angle of Best Fit Line:	0.01162
End 2:	
Slope of Best Fit Line	0.00020
Angle of Best Fit Line:	0.01162
Maximum Angular Difference:	0.00000
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	0.00005
Angle of Best Fit Line:	0.00262
Maximum Angular Difference:	0.00000
Parallelism Tolerance Met?	YES
Spherically Seated	

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°)	0.00050	1.980	0.00025	0.014	YES	Perpendicularity Tolerance Met? YES	
END 2							
Diameter 1, in	0.00050	1.980	0.00025	0.014	YES		
Diameter 2, in (rotated 90°)	0.00050	1.980	0.00025	0.014	YES		

Client:	Haley & Aldrich, Inc.
Project Name:	Rt 9/I-395 Wilson St Bridge
Project Location:	Brewer and Eddington, ME
GTX #:	308858
Test Date:	10/1/2018
Tested By:	cmh
Checked By:	jsc
Boring ID:	BB-BWS-104
Sample ID:	R1
Depth, ft:	41.3-41.9



After cutting and grinding

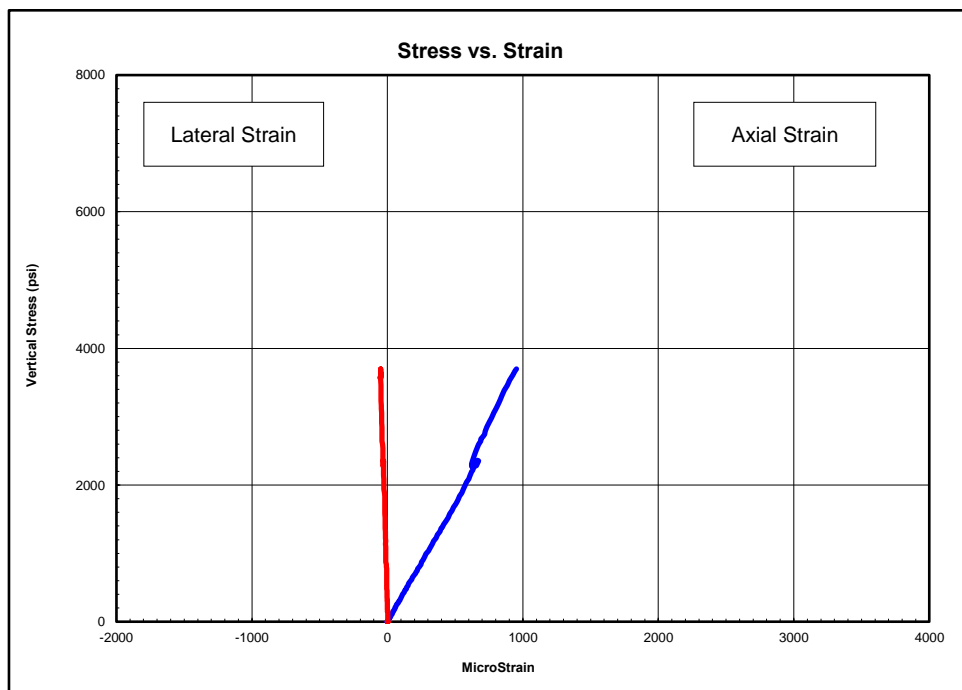


After break



Client:	Haley & Aldrich, Inc.
Project Name:	Rt 9/I-395 Clewleyville Rd Bridge
Project Location:	Brewer and Eddington, ME
GTX #:	308854
Test Date:	10/5/2018
Tested By:	tlm
Checked By:	jsc
Boring ID:	BB-ECR-102
Sample ID:	R6
Depth, ft:	24.3-25.6
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: 6,527 psi

The strain gauges failed before the peak value was attained due to an initial failure within the specimen.

Stress Range, psi	Young's Modulus, psi	Poisson's Ratio
700-2400	3,640,000	0.05
2400-3700	4,110,000	0.06
3700-5900	---	---

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.

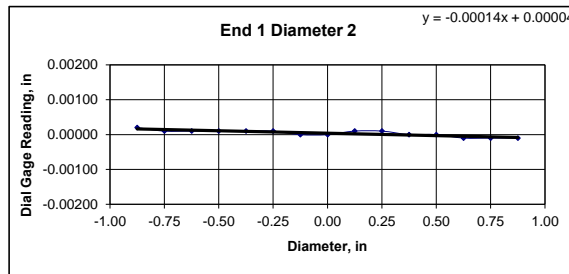
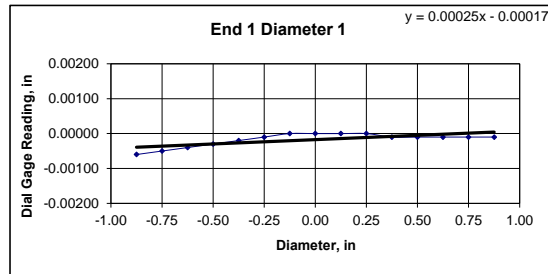


Client:	Haley & Aldrich, Inc.	Test Date:	9/27/2018
Project Name:	Rt 9/1-395 Clewleyville Rd Bridge	Tested By:	tlm
Project Location:	Brewer and Eddington, ME	Checked By:	jsc
GTX #:	308854		
Boring ID:	BB-ECR-102		
Sample ID:	R6		
Depth:	24.3-25.6 ft		
Visual Description:	See photographs		

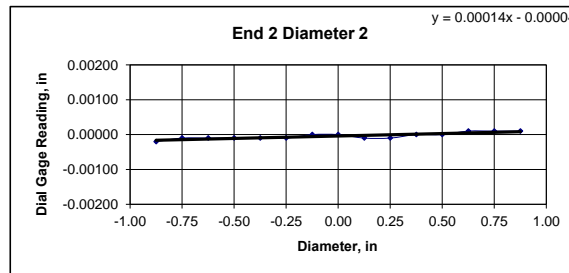
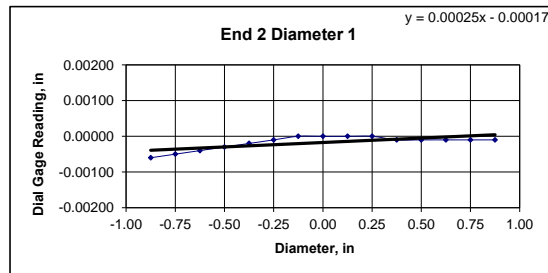
UNIT WEIGHT DETERMINATION AND DIMENSIONAL AND SHAPE TOLERANCES OF ROCK CORE SPECIMENS BY ASTM D4543

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:	4.38	4.38	4.38	Maximum difference must be < 0.020 in. Straightness Tolerance Met? YES	
Specimen Diameter, in:	1.98	1.98	1.98		
Specimen Mass, g:	596.86				
Bulk Density, lb/ft ³ :	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	0.750	0.875
Diameter 1, in	-0.00060	-0.00050	-0.00040	-0.00030	-0.00020	-0.00010	0.00000	0.00000	0.00000	0.00000	-0.00010	-0.00010	-0.00010	-0.00010	-0.00010
Diameter 2, in (rotated 90°)	0.00020	0.00010	0.00010	0.00010	0.00010	0.00010	0.00000	0.00000	0.00010	0.00010	0.00000	0.00000	-0.00010	-0.00010	-0.00010
Difference between max and min readings, in: 0° = 0.00060 90° = 0.00030															
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	0.00000	0.00000	-0.00010	-0.00010	-0.00010	-0.00010	-0.00010
Diameter 2, in (rotated 90°)	-0.00020	-0.00010	-0.00010	-0.00010	-0.00010	-0.00010	0.00000	0.00000	-0.00010	-0.00010	0.00000	0.00000	0.00010	0.00010	0.00010
Difference between max and min readings, in: 0° = 0.0006 90° = 0.0003 Maximum difference must be < 0.0020 in. Difference = ± 0.00030 Flatness Tolerance Met? YES															



DIAMETER 1	
End 1:	
Slope of Best Fit Line	0.00025
Angle of Best Fit Line:	0.01424
End 2:	
Slope of Best Fit Line	0.00025
Angle of Best Fit Line:	0.01424
Maximum Angular Difference:	0.00000
Parallelism Tolerance Met? Spherically Seated	YES



DIAMETER 2	
End 1:	
Slope of Best Fit Line	0.00014
Angle of Best Fit Line:	0.00802
End 2:	
Slope of Best Fit Line	0.00014
Angle of Best Fit Line:	0.00802
Maximum Angular Difference:	0.00000
Parallelism Tolerance Met? Spherically Seated	YES

PERPENDICULARITY (Procedure P1) (Calculated from End Flatness and Parallelism measurements above)						Maximum angle of departure must be $\leq 0.25^\circ$	
END 1	Difference, Maximum and Minimum (in.)	Diameter (in.)	Slope	Angle°	Perpendicularity Tolerance Met?		
Diameter 1, in	0.00060	1.980	0.00030	0.017	YES	Perpendicularity Tolerance Met? YES	
Diameter 2, in (rotated 90°)	0.00030	1.980	0.00015	0.009	YES		
END 2							
Diameter 1, in	0.00060	1.980	0.00030	0.017	YES		
Diameter 2, in (rotated 90°)	0.00030	1.980	0.00015	0.009	YES		

Client:	Haley & Aldrich, Inc.
Project Name:	Rt 9/I-395 Clewleyville Rd Bridge
Project Location:	Brewer and Eddington, ME
GTX #:	308854
Test Date:	10/1/2018
Tested By:	cmh
Checked By:	jsc
Boring ID:	BB-ECR-102
Sample ID:	R6
Depth, ft:	24.3-25.6



After cutting and grinding

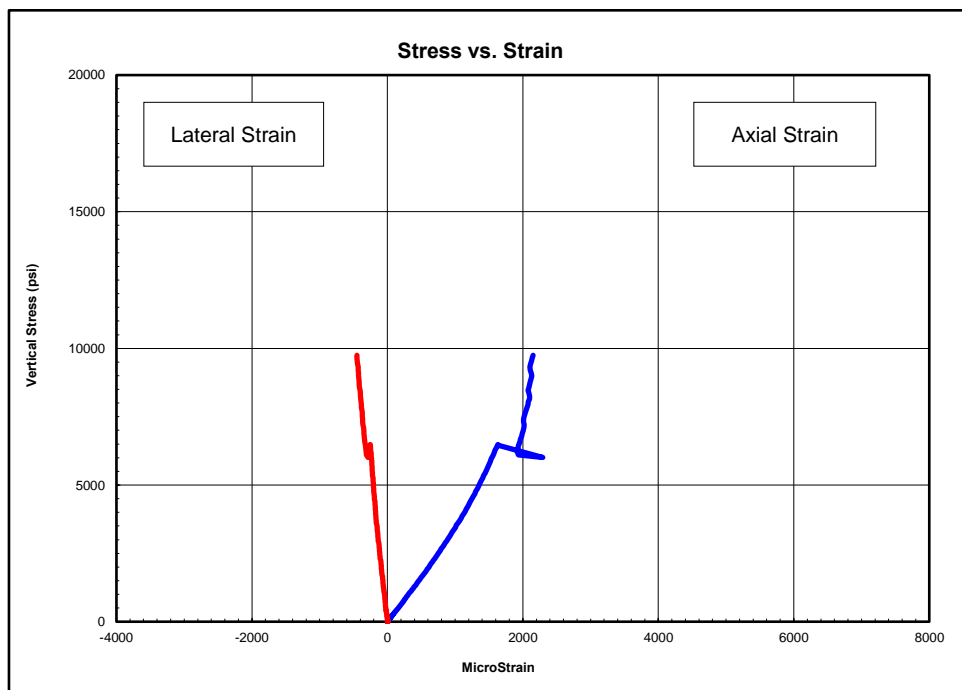


After break



Client:	Haley & Aldrich, Inc.
Project Name:	Rt 9/I-395 Lambert Rd Bridge
Project Location:	Brewer and Eddington, ME
GTX #:	308856
Test Date:	9/28/2018
Tested By:	tlm
Checked By:	jsc
Boring ID:	BB-ELAR-101
Sample ID:	R3
Depth, ft:	8.1-9.3
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: 9,747 psi

The axial strain gauges picked up an initial failure within the specimen and then continued reading until total failure occurred.

Stress Range, psi	Young's Modulus, psi	Poisson's Ratio
1000-3500	3,530,000	0.16
3500-6100	4,740,000	0.15
6100-8700	2,770,000	0.20

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.

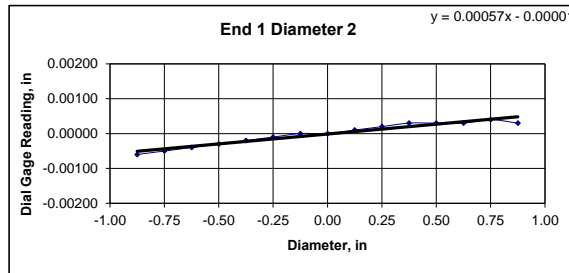
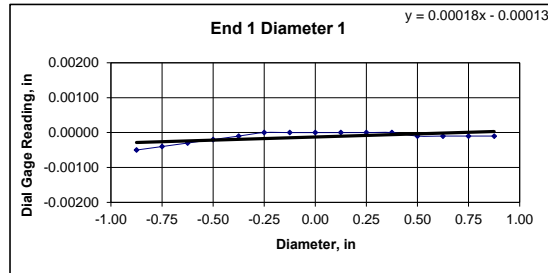


Client:	Haley & Aldrich, Inc.	Test Date:	9/27/2018
Project Name:	Rt 9/1-395 Lambert Rd Bridge	Tested By:	tlm
Project Location:	Brewer and Eddington, ME	Checked By:	jsc
GTX #:	308856		
Boring ID:	BB-ELAR-101		
Sample ID:	R3		
Depth:	8.1-9.3 ft		
Visual Description:	See photographs		

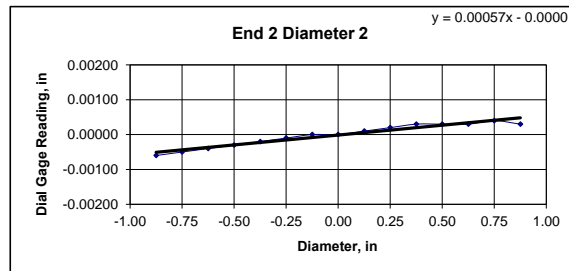
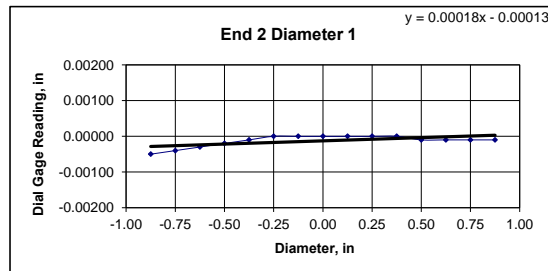
UNIT WEIGHT DETERMINATION AND DIMENSIONAL AND SHAPE TOLERANCES OF ROCK CORE SPECIMENS BY ASTM D4543

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:	4.30	4.30	4.30	Maximum difference must be < 0.020 in.	
Specimen Diameter, in:	1.98	1.98	1.98	Straightness Tolerance Met? YES	
Specimen Mass, g:	586.57				
Bulk Density, lb/ft ³ :	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	0.750	0.875
Diameter 1, in	-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	-0.00010	-0.00010
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	0.00030	0.00030	0.00040	0.00030
Difference between max and min readings, in:															
0° = 0.00050 90° = 0.00100															
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	-0.00050	-0.00040	-0.00030	-0.00020	-0.00010	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	-0.00010	-0.00010	-0.00010	-0.00010
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	0.00030	0.00030	0.00040	0.00030
Difference between max and min readings, in:															
0° = 0.0005 90° = 0.001															
Maximum difference must be < 0.0020 in. Difference = ± 0.00050															
Flatness Tolerance Met? YES															



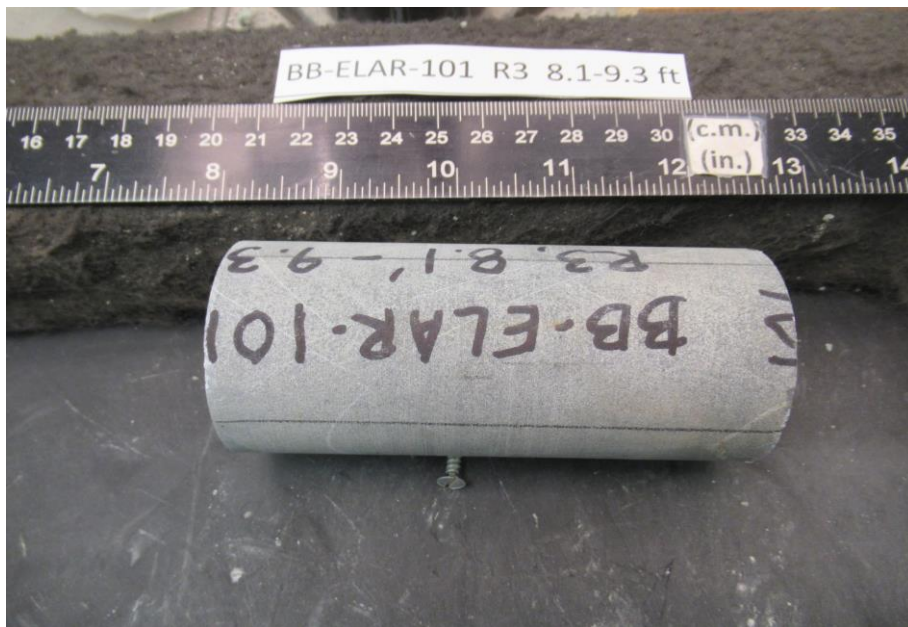
DIAMETER 1	
End 1:	
Slope of Best Fit Line	0.00018
Angle of Best Fit Line:	0.01031
End 2:	
Slope of Best Fit Line	0.00018
Angle of Best Fit Line:	0.01031
Maximum Angular Difference:	0.00000
Parallelism Tolerance Met? Spherically Seated	YES



DIAMETER 2	
End 1:	
Slope of Best Fit Line	0.00057
Angle of Best Fit Line:	0.03241
End 2:	
Slope of Best Fit Line	0.00057
Angle of Best Fit Line:	0.03241
Maximum Angular Difference:	0.00000
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 $\leq 0.25^\circ$	
Diameter 1, in	0.00050	1.980	0.00025	0.014	YES	Perpendicularity Tolerance Met? YES	
Diameter 2, in (rotated 90°)	0.00100	1.980	0.00051	0.029	YES		
END 2							
Diameter 1, in	0.00050	1.980	0.00025	0.014	YES		
Diameter 2, in (rotated 90°)	0.00100	1.980	0.00051	0.029	YES		

Client:	Haley & Aldrich, Inc.
Project Name:	Rt 9/I-395 Lambert Rd Bridge
Project Location:	Brewer and Eddington, ME
GTX #:	308856
Test Date:	9/28/2018
Tested By:	cmh
Checked By:	jsc
Boring ID:	BB-ELAR-101
Sample ID:	R3
Depth, ft:	8.1-9.3



After cutting and grinding

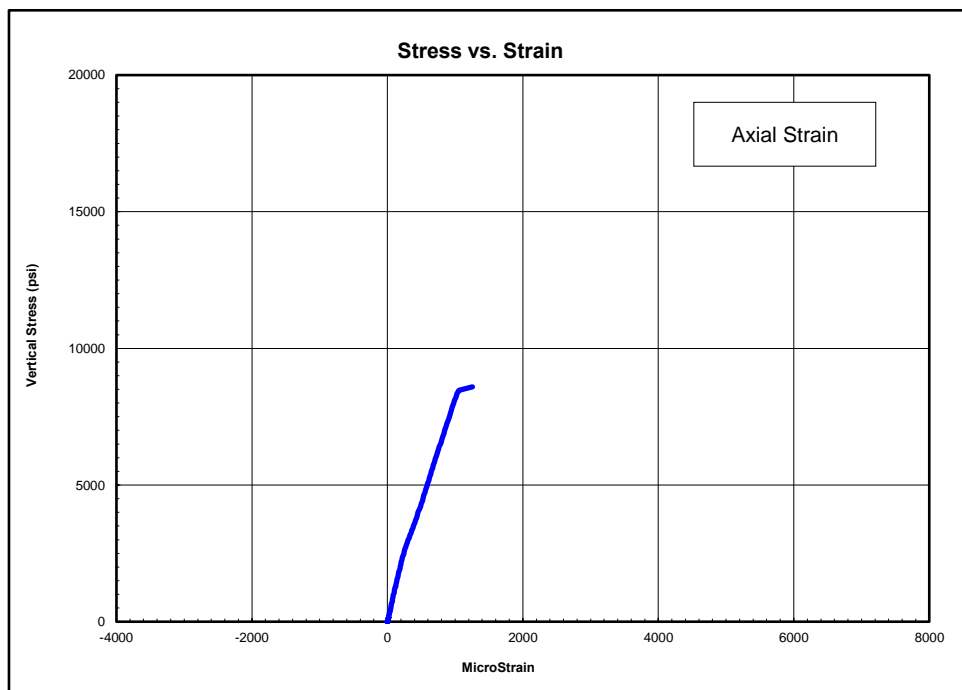


After break



Client:	Haley & Aldrich, Inc.
Project Name:	Rt 9/I-395 Lambert Rd Bridge
Project Location:	Brewer and Eddington, ME
GTX #:	308856
Test Date:	9/28/2018
Tested By:	tlm
Checked By:	jsc
Boring ID:	BB-ELAR-102
Sample ID:	R2
Depth, ft:	10.7-11.7
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: 12,789 psi

Both lateral strain gauge failed to record meaningful data. Poisson's Ratio could not be determined. The axial strain gauges failed before the peak value was attained.

Stress Range, psi	Young's Modulus, psi	Poisson's Ratio
1300-4700	7,720,000	---
4700-8100	7,660,000	---
8100-11500	---	---

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.

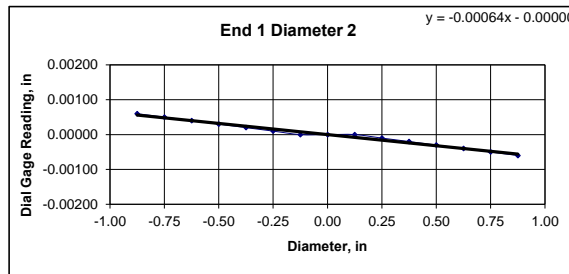
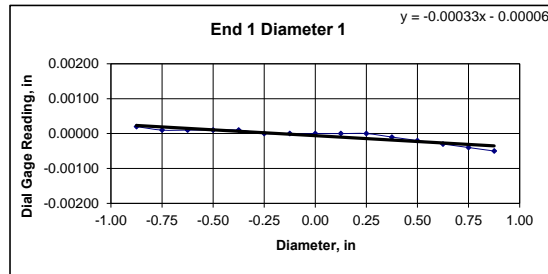


Client:	Haley & Aldrich, Inc.	Test Date:	9/27/2018
Project Name:	Rt 9/1-395 Lambert Rd Bridge	Tested By:	tlm
Project Location:	Brewer and Eddington, ME	Checked By:	jsc
GTX #:	308856		
Boring ID:	BB-ELAR-102		
Sample ID:	R2		
Depth:	10.7-11.7 ft		
Visual Description:	See photographs		

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.?	
Specimen Length, in:	4.34	4.34	4.34	YES	
Specimen Diameter, in:	1.98	1.98	1.98		
Specimen Mass, g:	593.34			Maximum difference must be < 0.020 in.	
Bulk Density, lb/ft ³ :	169			Straightness Tolerance Met?	
Length to Diameter Ratio:	2.2			YES	
		Minimum Diameter Tolerance Met?	YES		
		Length to Diameter Ratio Tolerance Met?	YES		

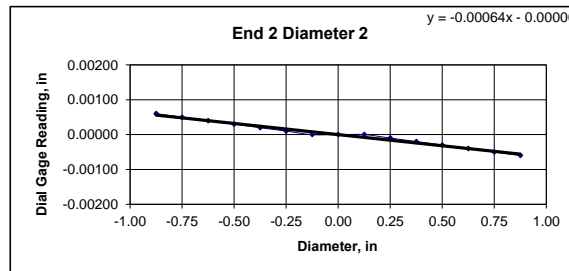
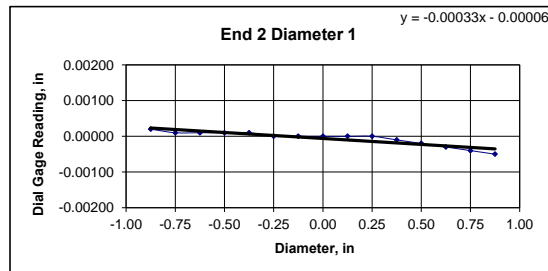
END FLATNESS AND PARALLELISM (Procedure FP1)															
END 1	-0.875	-0.750	-0.625	-0.500	-0.375	-0.250	-0.125	0.000	0.125	0.250	0.375	0.500	0.625	0.750	0.875
Diameter 1, in	0.00020	0.00010	0.00010	0.00010	0.00010	0.00000	0.00000	0.00000	0.00000	0.00000	-0.00010	-0.00020	-0.00030	-0.00040	-0.00050
Diameter 2, in (rotated 90°)	0.00060	0.00050	0.00040	0.00030	0.00020	0.00010	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° = 0.00070 90° = 0.00120															
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	0.00020	0.00010	0.00010	0.00010	0.00010	0.00000	0.00000	0.00000	0.00000	0.00000	-0.00010	-0.00020	-0.00030	-0.00040	-0.00050
Diameter 2, in (rotated 90°)	0.00060	0.00050	0.00040	0.00030	0.00020	0.00010	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° = 0.0007 90° = 0.0012 Maximum difference must be < 0.0020 in. Difference = ± 0.00060															
Flatness Tolerance Met? YES															



DIAMETER 1

End 1:	Slope of Best Fit Line	0.00033
	Angle of Best Fit Line:	0.01915
End 2:	Slope of Best Fit Line	0.00033
	Angle of Best Fit Line:	0.01915
Maximum Angular Difference:		0.00000

Parallelism Tolerance Met? YES
Spherically Seated



DIAMETER 2

End 1:	Slope of Best Fit Line	0.00064
	Angle of Best Fit Line:	0.03667
End 2:	Slope of Best Fit Line	0.00064
	Angle of Best Fit Line:	0.03667
Maximum Angular Difference:		0.00000

Parallelism Tolerance Met? YES
Spherically Seated

PERPENDICULARITY (Procedure P1)						Maximum angle of departure must be $\leq 0.25^\circ$	
END 1	Difference, Maximum and Minimum (in.)	Diameter (in.)	Slope	Angle°	Perpendicularity Tolerance Met?		
Diameter 1, in	0.00070	1.980	0.00035	0.020	YES		
Diameter 2, in (rotated 90°)	0.00120	1.980	0.00061	0.035	YES	Perpendicularity Tolerance Met? YES	
END 2							
Diameter 1, in	0.00070	1.980	0.00035	0.020	YES		
Diameter 2, in (rotated 90°)	0.00120	1.980	0.00061	0.035	YES		

Client:	Haley & Aldrich, Inc.
Project Name:	Rt 9/I-395 Lambert Rd Bridge
Project Location:	Brewer and Eddington, ME
GTX #:	308856
Test Date:	9/28/2018
Tested By:	cmh
Checked By:	jsc
Boring ID:	BB-ELAR-102
Sample ID:	R2
Depth, ft:	10.7-11.7



After cutting and grinding

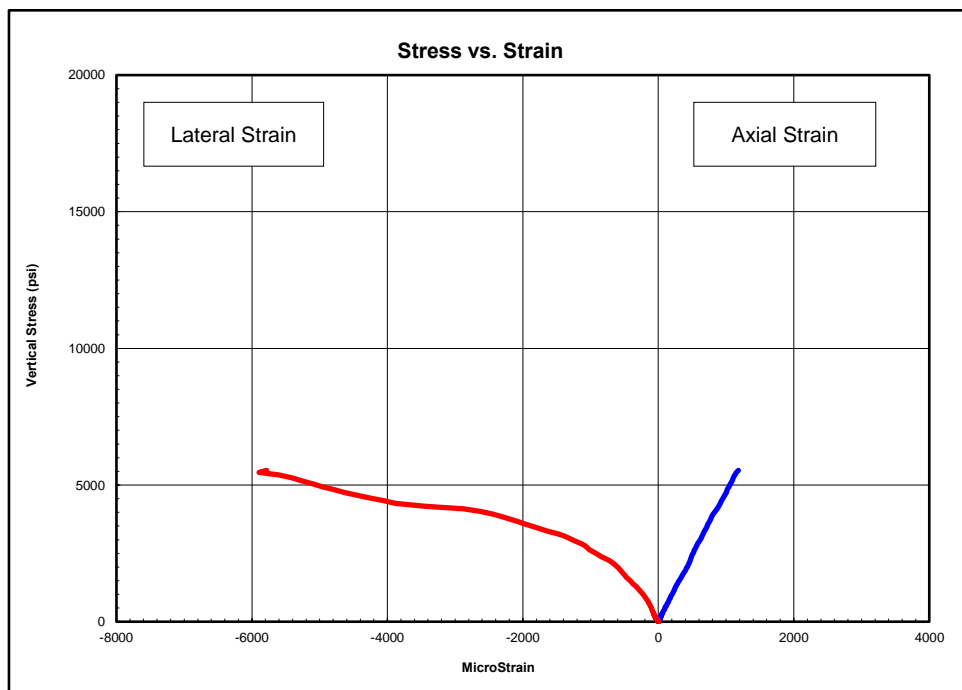


After break



Client:	Haley & Aldrich, Inc.
Project Name:	Rt 9/I-395 Lambert Rd Bridge
Project Location:	Brewer and Eddington, ME
GTX #:	308856
Test Date:	9/28/2018
Tested By:	tlm
Checked By:	jsc
Boring ID:	BB-ELAR-102
Sample ID:	R3
Depth, ft:	14.3-15.3
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: 11,024 psi

The strain values recorded for this test produce values of Poisson's Ratio that exceed maximum values found in rocks. The strain gauges failed before the peak value was attained.

Stress Range, psi	Young's Modulus, psi	Poisson's Ratio
1100-4000	4,870,000	---
4000-5500	4,670,000	---
5500-10000	---	---

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.

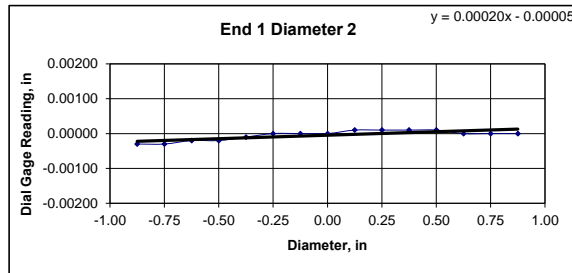
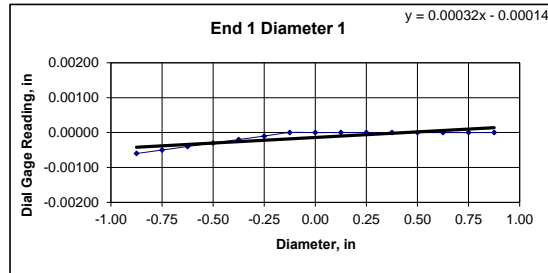


Client:	Haley & Aldrich, Inc.	Test Date:	9/27/2018
Project Name:	Rt 9/1-395 Lambert Rd Bridge	Tested By:	tlm
Project Location:	Brewer and Eddington, ME	Checked By:	jsc
GTX #:	308856		
Boring ID:	BB-ELAR-102		
Sample ID:	R3		
Depth:	14.3-15.3 ft		
Visual Description:	See photographs		

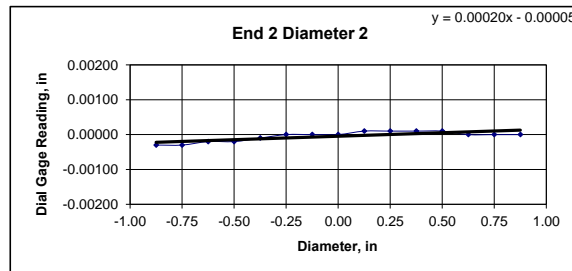
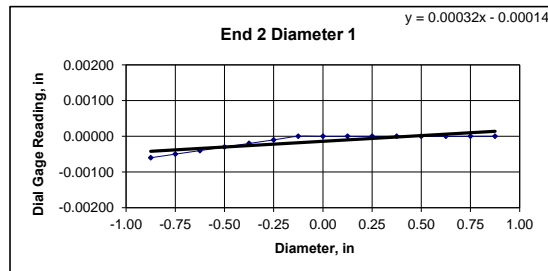
UNIT WEIGHT DETERMINATION AND DIMENSIONAL AND SHAPE TOLERANCES OF ROCK CORE SPECIMENS BY ASTM D4543

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:	4.23	4.22	4.23	Maximum difference must be $<$ 0.020 in. Straightness Tolerance Met? YES	
Specimen Diameter, in:	1.98	1.98	1.98		
Specimen Mass, g:	572.84				
Bulk Density, lb/ft ³	167				
Length to Diameter Ratio:	2.1				
		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
Diameter 1, in	-0.00060	-0.00050	-0.00040	-0.00030	-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°)	-0.00030	-0.00030	-0.00020	-0.00020	-0.00010	0.00000	0.00000	0.00000	0.00010	0.00010	0.00010	0.00010	0.00000	0.00000
Difference between max and min readings, in: 0° = 0.00060 90° = 0.00040														
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
Diameter 1, in	-0.00060	-0.00050	-0.00040	-0.00030	-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°)	-0.00030	-0.00030	-0.00020	-0.00020	-0.00010	0.00000	0.00000	0.00000	0.00010	0.00010	0.00010	0.00010	0.00000	0.00000
Difference between max and min readings, in: 0° = 0.0006 90° = 0.0004 Maximum difference must be $<$ 0.0020 in. Difference = \pm 0.00030 Flatness Tolerance Met? YES														



DIAMETER 1	
End 1:	
Slope of Best Fit Line	0.00032
Angle of Best Fit Line:	0.01833
End 2:	
Slope of Best Fit Line	0.00032
Angle of Best Fit Line:	0.01833
Maximum Angular Difference:	0.00000
Parallelism Tolerance Met?	YES
Spherically Seated	



DIAMETER 2	
End 1:	
Slope of Best Fit Line	0.00020
Angle of Best Fit Line:	0.01146
End 2:	
Slope of Best Fit Line	0.00020
Angle of Best Fit Line:	0.01146
Maximum Angular Difference:	0.00000
Parallelism Tolerance Met?	YES
Spherically Seated	

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?	Perpendicularity Tolerance Met? YES	
Diameter 1, in	0.00060	1.980	0.00030	0.017	YES		
Diameter 2, in (rotated 90°)	0.00040	1.980	0.00020	0.012	YES		
END 2							
Diameter 1, in	0.00060	1.980	0.00030	0.017	YES		
Diameter 2, in (rotated 90°)	0.00040	1.980	0.00020	0.012	YES		

Client:	Haley & Aldrich, Inc.
Project Name:	Rt 9/I-395 Lambert Rd Bridge
Project Location:	Brewer and Eddington, ME
GTX #:	308856
Test Date:	9/28/2018
Tested By:	cmh
Checked By:	jsc
Boring ID:	BB-ELAR-102
Sample ID:	R3
Depth, ft:	14.3-15.3



After cutting and grinding

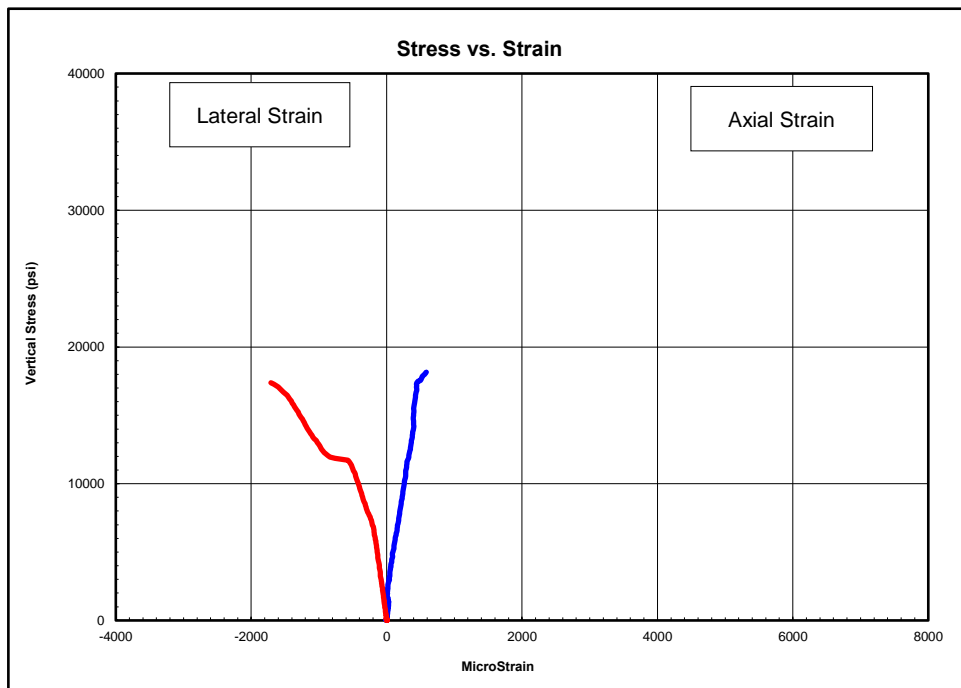


After break



Client:	Haley & Aldrich, Inc.
Project Name:	Rt 9/I-395 Connector
Project Location:	Brewer and Eddington, ME
GTX #:	308853
Test Date:	10/12/2018
Tested By:	tlm
Checked By:	jsc
Boring ID:	BB-ELER-101
Sample ID:	R1
Depth, ft:	16.42-16.79
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: 18,157 psi

The strain values recorded for this test produce values of Poisson's Ratio that exceed maximum values found in rocks.

Stress Range, psi	Young's Modulus, psi	Poisson's Ratio
1800-6700	32,700,000	---
6700-11500	32,600,000	---
11500-16300	40,600,000	---

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.

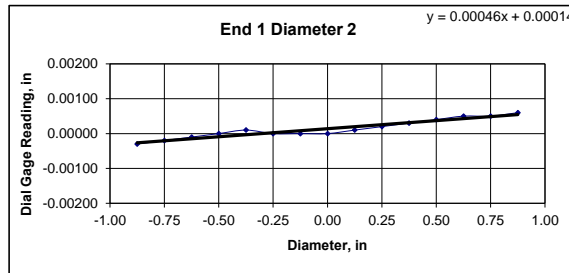
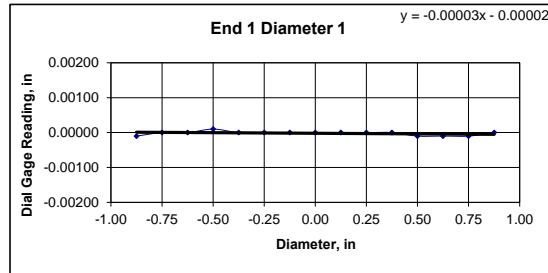


Client:	Haley & Aldrich, Inc.	Test Date:	10/11/2018
Project Name:	Rt 9/1-395 Connector	Tested By:	tlm
Project Location:	Brewer and Eddington, ME	Checked By:	jsc
GTX #:	308853		
Boring ID:	BB-ELER-101		
Sample ID:	R1		
Depth:	16.42-16.79 ft		
Visual Description:	See photographs		

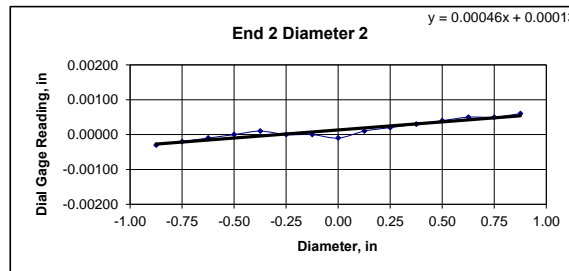
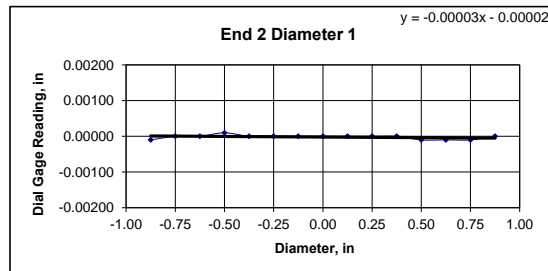
UNIT WEIGHT DETERMINATION AND DIMENSIONAL AND SHAPE TOLERANCES OF ROCK CORE SPECIMENS BY ASTM D4543

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.? NO	
Specimen Length, in:	4.09	4.09	4.09	Maximum difference must be < 0.020 in. Straightness Tolerance Met? NO	
Specimen Diameter, in:	1.98	1.98	1.98		
Specimen Mass, g:	553.49				
Bulk Density, lb/ft ³	167				
Length to Diameter Ratio:	2.1	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	0.00010	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	-0.00010	-0.00010
Diameter 2, in (rotated 90°)	-0.00030	-0.00020	-0.00010	0.00000	0.00010	0.00000	0.00000	0.00000	0.00010	0.00020	0.00030	0.00040	0.00050
Difference between max and min readings, in: 0° = 0.00020 90° = 0.00090													
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	-0.00010	0.00000	0.00000	0.00010	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	-0.00010	-0.00010
Diameter 2, in (rotated 90°)	-0.00030	-0.00020	-0.00010	0.00000	0.00010	0.00000	0.00000	-0.00010	0.00010	0.00020	0.00030	0.00040	0.00050
Difference between max and min readings, in: 0° = 0.0002 90° = 0.0009 Maximum difference must be < 0.0020 in. Difference = ± 0.00045 Flatness Tolerance Met? YES													



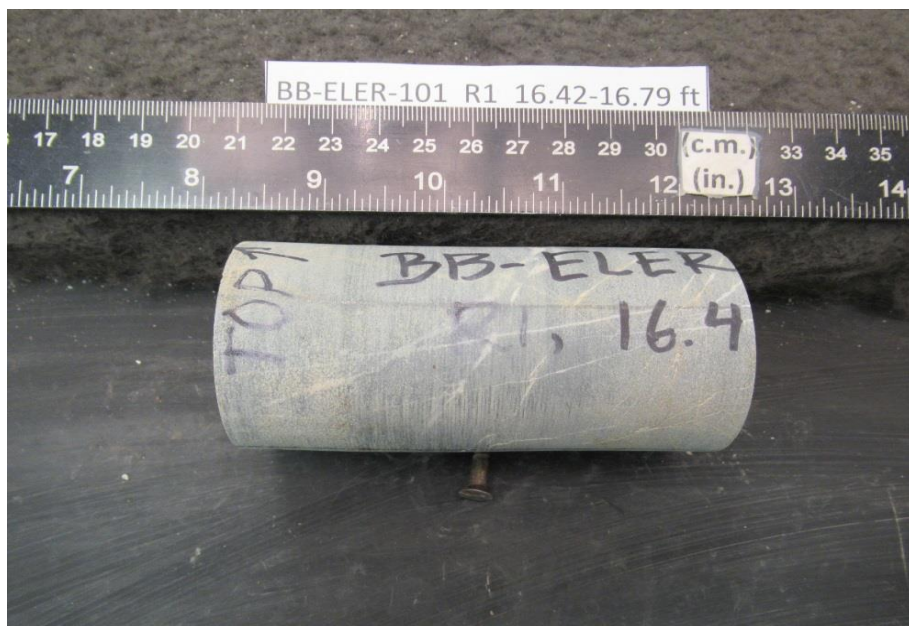
DIAMETER 1	
End 1:	
Slope of Best Fit Line	0.00003
Angle of Best Fit Line:	0.00196
End 2:	
Slope of Best Fit Line	0.00003
Angle of Best Fit Line:	0.00196
Maximum Angular Difference:	0.00000
Parallelism Tolerance Met? Spherically Seated	YES



DIAMETER 2	
End 1:	
Slope of Best Fit Line	0.00046
Angle of Best Fit Line:	0.02652
End 2:	
Slope of Best Fit Line	0.00046
Angle of Best Fit Line:	0.02652
Maximum Angular Difference:	0.00000
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 $\leq 0.25^\circ$
Diameter 1, in	0.00020	1.980	0.00010	0.006	YES	Perpendicularity Tolerance Met? YES	
Diameter 2, in (rotated 90°)	0.00090	1.980	0.00045	0.026	YES		
END 2							
Diameter 1, in	0.00020	1.980	0.00010	0.006	YES	Perpendicularity Tolerance Met? YES	
Diameter 2, in (rotated 90°)	0.00090	1.980	0.00045	0.026	YES		

Client:	Haley & Aldrich, Inc.
Project Name:	Rt 9/I-395 Connector
Project Location:	Brewer and Eddington, ME
GTX #:	308853
Test Date:	10/12/2018
Tested By:	cmh
Checked By:	jsc
Boring ID:	BB-ELER-101
Sample ID:	R1
Depth, ft:	16.42-16.79



After cutting and grinding

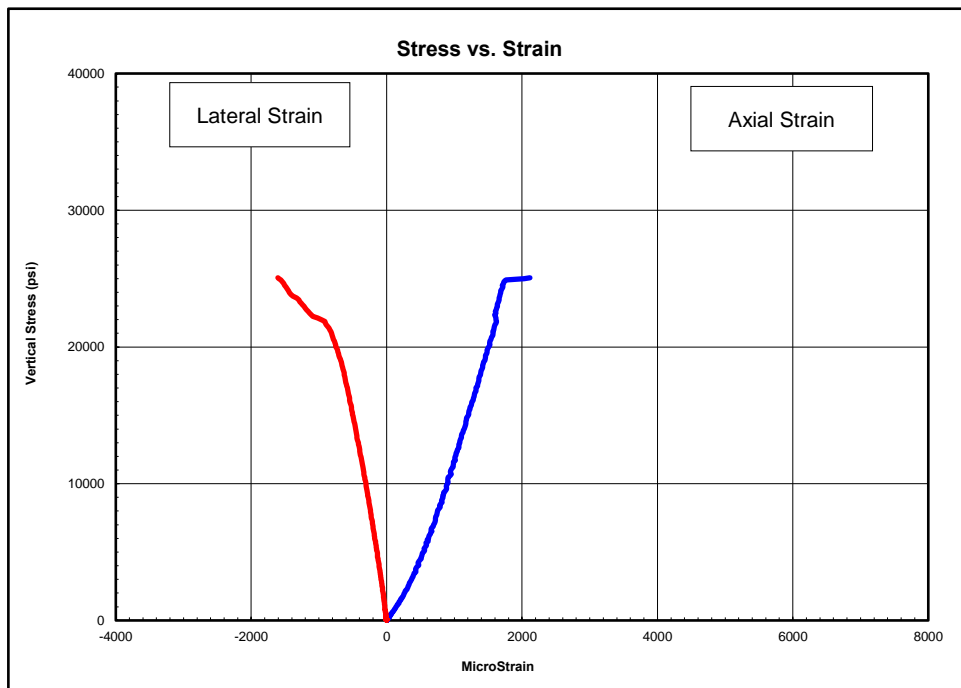


After break



Client:	Haley & Aldrich, Inc.
Project Name:	Rt 9/I-395 Connector
Project Location:	Brewer and Eddington, ME
GTX #:	308853
Test Date:	10/12/2018
Tested By:	tlm
Checked By:	jsc
Boring ID:	BB-ELER-101
Sample ID:	R2
Depth, ft:	21.93-22.30
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: 25,061 psi

Stress Range, psi	Young's Modulus, psi	Poisson's Ratio
2500-9200	12,800,000	0.41
9200-15900	16,200,000	---
15900-22600	17,200,000	---

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.

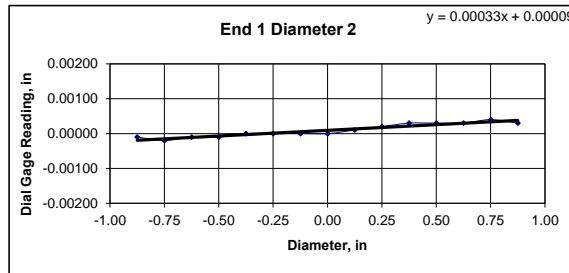
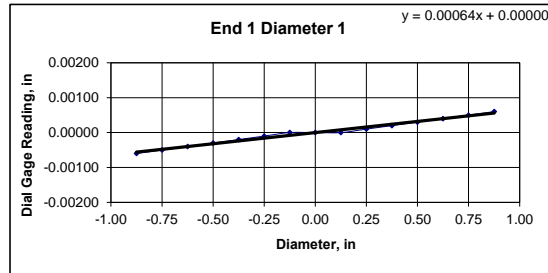


Client:	Haley & Aldrich, Inc.	Test Date:	10/12/2018
Project Name:	Rt 9/1-395 Connector	Tested By:	cmh
Project Location:	Brewer and Eddington, ME	Checked By:	jsc
GTx #:	308853		
Boring ID:	BB-ELER-101		
Sample ID:	R2		
Depth:	21.93-22.30 ft		
Visual Description:	See photographs		

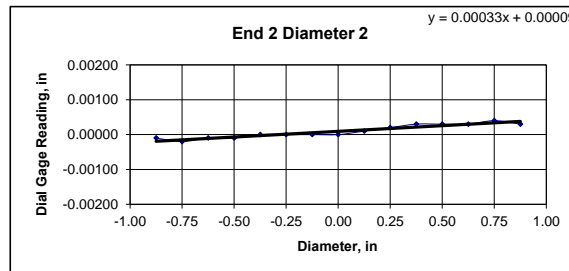
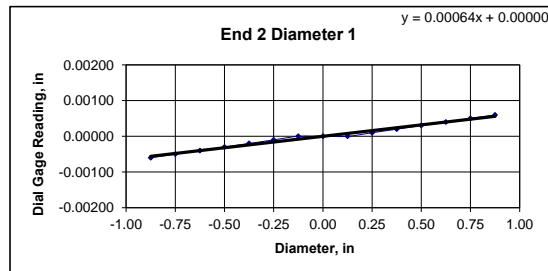
UNIT WEIGHT DETERMINATION AND DIMENSIONAL AND SHAPE TOLERANCES OF ROCK CORE SPECIMENS BY ASTM D4543

BULK DENSITY				DEVIATION FROM STRAIGHTNESS (Procedure S1)	
	1	2	Average	Maximum gap between side of core and reference surface plate: Is the maximum gap ≤ 0.02 in.? YES	
Specimen Length, in:	4.29	4.30	4.30	Maximum difference must be < 0.020 in. Straightness Tolerance Met? YES	
Specimen Diameter, in:	1.98	1.98	1.98		
Specimen Mass, g:	583.84				
Bulk Density, lb/ft ³	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	0.750	0.875
Diameter 1, in	-0.00060	-0.00050	-0.00040	-0.00030	-0.00020	-0.00010	0.00000	0.00000	0.00000	0.00010	0.00020	0.00030	0.00040	0.00050	0.00060
Diameter 2, in (rotated 90°)	-0.00010	-0.00020	-0.00010	-0.00010	0.00000	0.00000	0.00000	0.00000	0.00010	0.00020	0.00030	0.00030	0.00030	0.00040	0.00030
Difference between max and min readings, in: 0° = 0.00120 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	-0.00060	-0.00050	-0.00040	-0.00030	-0.00020	-0.00010	0.00000	0.00000	0.00000	0.00010	0.00020	0.00030	0.00040	0.00050	0.00060
Diameter 2, in (rotated 90°)	-0.00010	-0.00020	-0.00010	-0.00010	0.00000	0.00000	0.00000	0.00000	0.00010	0.00020	0.00030	0.00030	0.00030	0.00040	0.00030
Difference between max and min readings, in: 0° = 0.0012 90° = 0.0006 Maximum difference must be < 0.0020 in. Difference = ± 0.00060 Flatness Tolerance Met? YES															



DIAMETER 1	
End 1:	
Slope of Best Fit Line	0.00064
Angle of Best Fit Line:	0.03667
End 2:	
Slope of Best Fit Line	0.00064
Angle of Best Fit Line:	0.03667
Maximum Angular Difference:	0.00000
Parallelism Tolerance Met? Spherically Seated	YES



DIAMETER 2	
End 1:	
Slope of Best Fit Line	0.00033
Angle of Best Fit Line:	0.01866
End 2:	
Slope of Best Fit Line	0.00033
Angle of Best Fit Line:	0.01866
Maximum Angular Difference:	0.00000
Parallelism Tolerance Met? Spherically Seated	YES

PERPENDICULARITY (Procedure P1) (Calculated from End Flatness and Parallelism measurements above)						Maximum angle of departure must be $\leq 0.25^\circ$	
END 1	Difference, Maximum and Minimum (in.)	Diameter (in.)	Slope	Angle°	Perpendicularity Tolerance Met?	Perpendicularity Tolerance Met? YES	
Diameter 1, in	0.00120	1.980	0.00061	0.035	YES		
Diameter 2, in (rotated 90°)	0.00060	1.980	0.00030	0.017	YES		
END 2							
Diameter 1, in	0.00120	1.980	0.00061	0.035	YES		
Diameter 2, in (rotated 90°)	0.00060	1.980	0.00030	0.017	YES		

Client:	Haley & Aldrich, Inc.
Project Name:	Rt 9/I-395 Connector
Project Location:	Brewer and Eddington, ME
GTX #:	308853
Test Date:	10/12/2018
Tested By:	cmh
Checked By:	jsc
Boring ID:	BB-ELER-101
Sample ID:	R2
Depth, ft:	21.93-22.30



After cutting and grinding

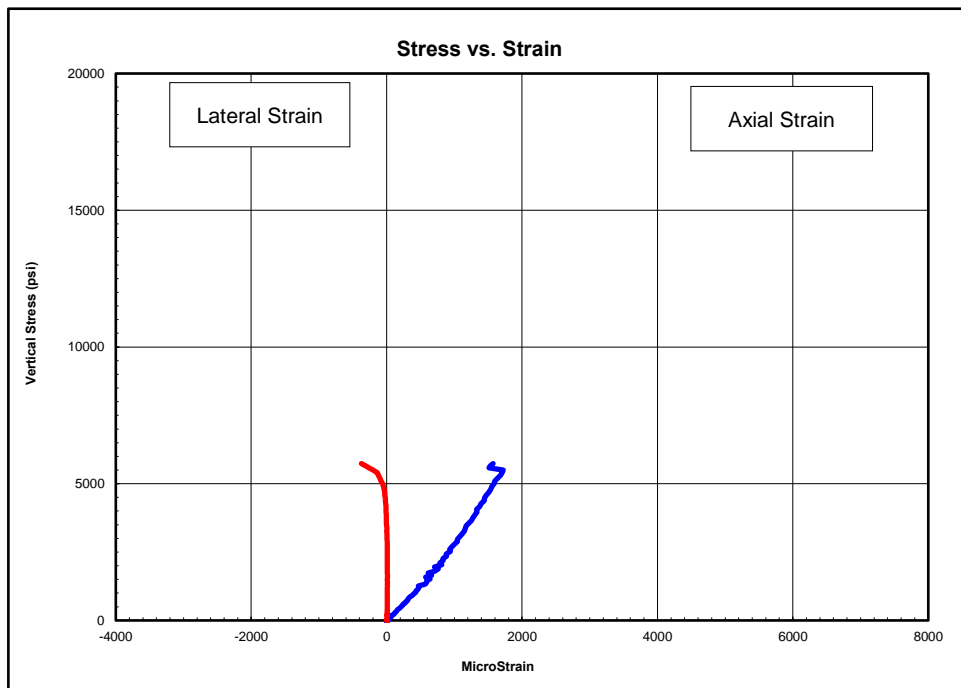


After break



Client:	Haley & Aldrich, Inc.
Project Name:	Rt 9/I-395 Connector
Project Location:	Brewer and Eddington, ME
GTX #:	308853
Test Date:	10/12/2018
Tested By:	tlm
Checked By:	jsc
Boring ID:	BB-ELER-102
Sample ID:	R4
Depth, ft:	27.34-27.70
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: 5,737 psi

Stress Range, psi	Young's Modulus, psi	Poisson's Ratio
600-2100	2,620,000	---
2100-3600	3,400,000	0.04
3600-5200	4,030,000	0.22

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.

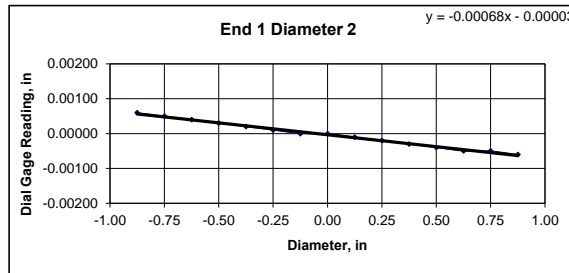
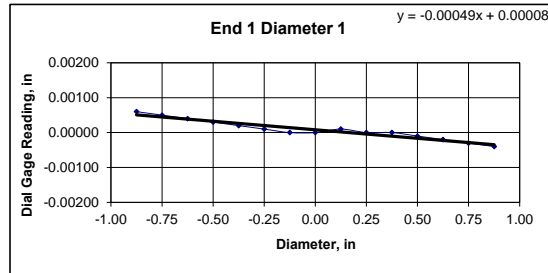


Client:	Haley & Aldrich, Inc.	Test Date:	10/5/2018
Project Name:	Rt 9/1-395 Connector	Tested By:	tlm
Project Location:	Brewer and Eddington, ME	Checked By:	jsc
GTX #:	308853		
Boring ID:	BB-ELER-102		
Sample ID:	R4		
Depth:	27.34-27.70 ft		
Visual Description:	See photographs		

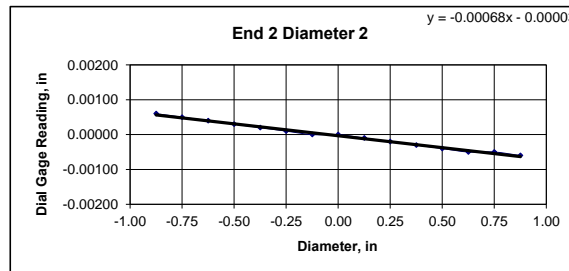
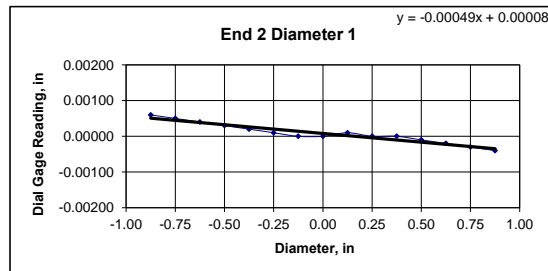
UNIT WEIGHT DETERMINATION AND DIMENSIONAL AND SHAPE TOLERANCES OF ROCK CORE SPECIMENS BY ASTM D4543

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.? NO	
Specimen Length, in:	4.36	4.35	4.36	Maximum difference must be $<$ 0.020 in. Straightness Tolerance Met? NO	
Specimen Diameter, in:	1.98	1.98	1.98		
Specimen Mass, g:	591.83				
Bulk Density, lb/ft ³	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	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	0.00000	0.00000	-0.00010	-0.00020	-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	-0.00050	-0.00060
Difference between max and min readings, in: 0° = 0.00100 90° = 0.00120															
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	0.00000	0.00000	-0.00010	-0.00020	-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	-0.00050	-0.00060
Difference between max and min readings, in: 0° = 0.001 90° = 0.0012 Maximum difference must be < 0.0020 in. Difference = ± 0.00060 Flatness Tolerance Met? YES															



DIAMETER 1	
End 1:	
Slope of Best Fit Line	0.00049
Angle of Best Fit Line:	0.02799
End 2:	
Slope of Best Fit Line	0.00049
Angle of Best Fit Line:	0.02799
Maximum Angular Difference:	0.00000
Parallelism Tolerance Met? Spherically Seated	YES



DIAMETER 2	
End 1:	
Slope of Best Fit Line	0.00068
Angle of Best Fit Line:	0.03912
End 2:	
Slope of Best Fit Line	0.00068
Angle of Best Fit Line:	0.03912
Maximum Angular Difference:	0.00000
Parallelism Tolerance Met? Spherically Seated	YES

PERPENDICULARITY (Procedure P1) (Calculated from End Flatness and Parallelism measurements above)						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	0.00100	1.980	0.00051	0.029	YES	Perpendicularity Tolerance Met? YES	
Diameter 2, in (rotated 90°)	0.00120	1.980	0.00061	0.035	YES		
END 2							
Diameter 1, in	0.00100	1.980	0.00051	0.029	YES		
Diameter 2, in (rotated 90°)	0.00120	1.980	0.00061	0.035	YES		

Client:	Haley & Aldrich, Inc.
Project Name:	Rt 9/I-395 Connector
Project Location:	Brewer and Eddington, ME
GTX #:	308853
Test Date:	10/12/2018
Tested By:	cmh
Checked By:	jsc
Boring ID:	BB-ELER-102
Sample ID:	R4
Depth, ft:	27.34-27.70



After cutting and grinding

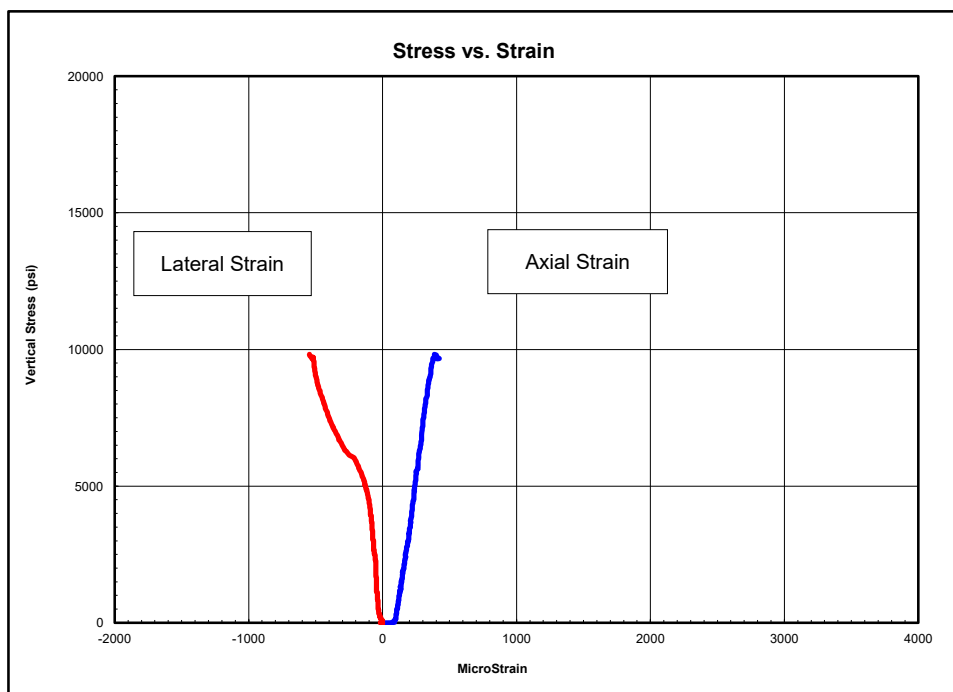


After break



Client:	Haley & Aldrich, Inc.
Project Name:	Rt 9/I-395 Connector
Project Location:	Brewer and Eddington, ME
GTX #:	308853
Test Date:	7/10/2019
Tested By:	jck
Checked By:	jsc
Boring ID:	HB-BE-135
Sample ID:	R3
Depth, ft:	19.08-19.43
Sample Type:	rock core
Sample Description:	See photographs Intact material and discontinuity failure

Compressive Strength and Elastic Moduli of Rock by ASTM D7012 - Method D



Peak Compressive Stress: 9,821 psi

The strain values recorded for this test produce values of Poisson's Ratio that exceed maximum values found in rocks.

Stress Range, psi	Young's Modulus, psi	Poisson's Ratio
1000-3600	31,100,000	0.50
3600-6200	38,800,000	---
6200-8800	38,100,000	---

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.

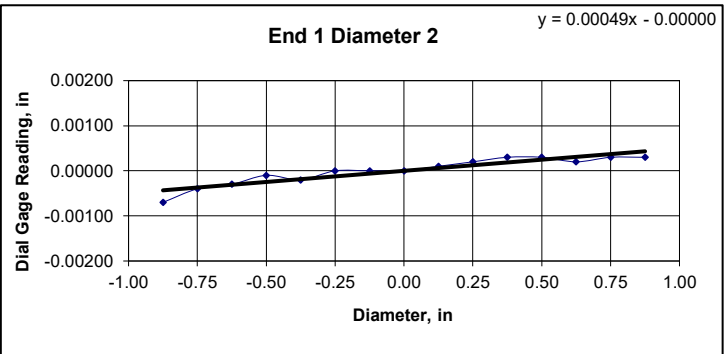
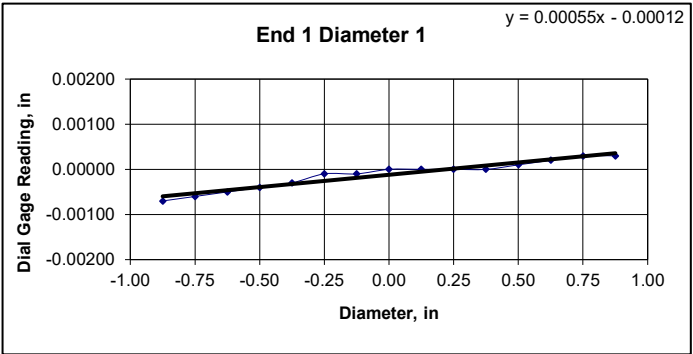


Client:	Haley & Aldrich, Inc.	Test Date:	7/10/2019
Project Name:	Rt 9/I-395 Connector	Tested By:	jck
Project Location:	Brewer and Eddington, ME	Checked By:	smd
GTX #:	308853		
Boring ID:	HB-BE-135		
Sample ID:	R3		
Depth:	19.08-19.43 ft		
Visual Description:	See photographs		

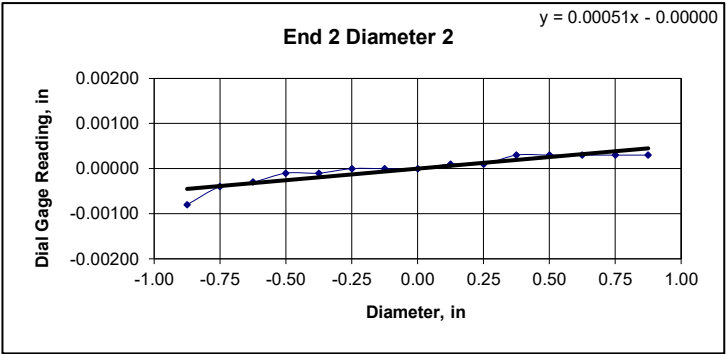
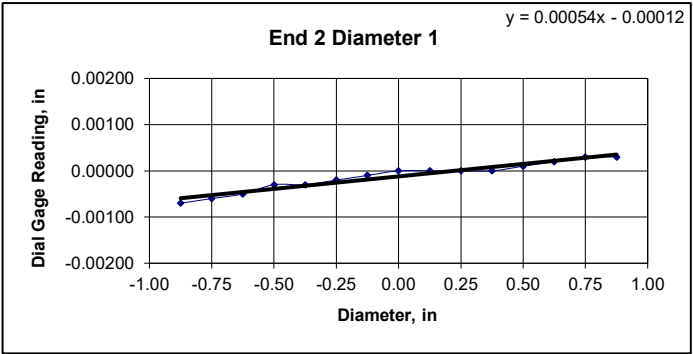
UNIT WEIGHT DETERMINATION AND DIMENSIONAL AND SHAPE TOLERANCES OF ROCK CORE SPECIMENS BY ASTM D4543

BULK DENSITY				DEVIATION FROM STRAIGHTNESS (Procedure S1)	
	1	2	Average	Maximum gap between side of core and reference surface plate:	
Specimen Length, in:	4.07	4.07	4.07	Is the maximum gap \leq 0.02 in.?	
Specimen Diameter, in:	1.99	2.00	2.00	YES	
Specimen Mass, g:	560.77			Maximum difference must be < 0.020 in.	
Bulk Density, lb/ft ³	168			Straightness Tolerance Met?	
Length to Diameter Ratio:	2.0			YES	
		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	-0.00070	-0.00060	-0.00050	-0.00040	-0.00030	-0.00010	-0.00010	0.00000	0.00000	0.00000	0.00000	0.00010	0.00020	0.00030	0.00030
Diameter 2, in (rotated 90°)	-0.00070	-0.00040	-0.00030	-0.00010	-0.00020	0.00000	0.00000	0.00000	0.00010	0.00020	0.00030	0.00030	0.00020	0.00030	0.00030
Difference between max and min readings, in:															
0° = 0.00100 90° = 0.00100															
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	-0.00070	-0.00060	-0.00050	-0.00030	-0.00030	-0.00020	-0.00010	0.00000	0.00000	0.00000	0.00000	0.00010	0.00020	0.00030	0.00030
Diameter 2, in (rotated 90°)	-0.00080	-0.00040	-0.00030	-0.00010	-0.00010	0.00000	0.00000	0.00000	0.00010	0.00010	0.00030	0.00030	0.00030	0.00030	0.00030
Difference between max and min readings, in:															
0° = 0.001 90° = 0.0011															
Maximum difference must be < 0.0020 in. Difference = \pm 0.00055															
Flatness Tolerance Met? YES															



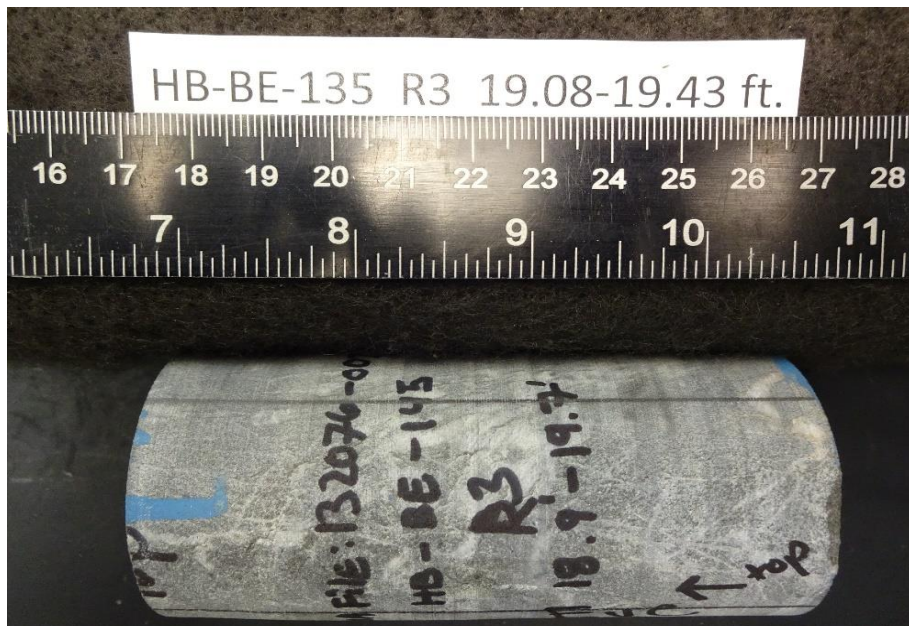
DIAMETER 1		
End 1:		
Slope of Best Fit Line	0.00055	
Angle of Best Fit Line:	0.03127	
End 2:		
Slope of Best Fit Line	0.00054	
Angle of Best Fit Line:	0.03094	
Maximum Angular Difference:	0.00033	
Parallelism Tolerance Met?	YES	
Spherically Seated		



DIAMETER 2		
End 1:		
Slope of Best Fit Line	0.00049	
Angle of Best Fit Line:	0.02832	
End 2:		
Slope of Best Fit Line	0.00051	
Angle of Best Fit Line:	0.02947	
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?	Maximum angle of departure must be \leq 0.25°
Diameter 1, in	0.00100	1.995	0.00050	0.029	YES		
Diameter 2, in (rotated 90°)	0.00100	1.995	0.00050	0.029	YES		
PERPENDICULARITY Tolerance Met?	YES						
END 2							
Diameter 1, in	0.00100	1.995	0.00050	0.029	YES		
Diameter 2, in (rotated 90°)	0.00110	1.995	0.00055	0.032	YES		

Client:	Haley & Aldrich, Inc.
Project Name:	Rt 9/I-395 Connector
Project Location:	Brewer and Eddington, ME
GTX #:	308853
Test Date:	7/10/2019
Tested By:	jck
Checked By:	smd
Boring ID:	HB-BE-135
Sample ID:	R3
Depth, ft:	19.08-19.43



After cutting and grinding



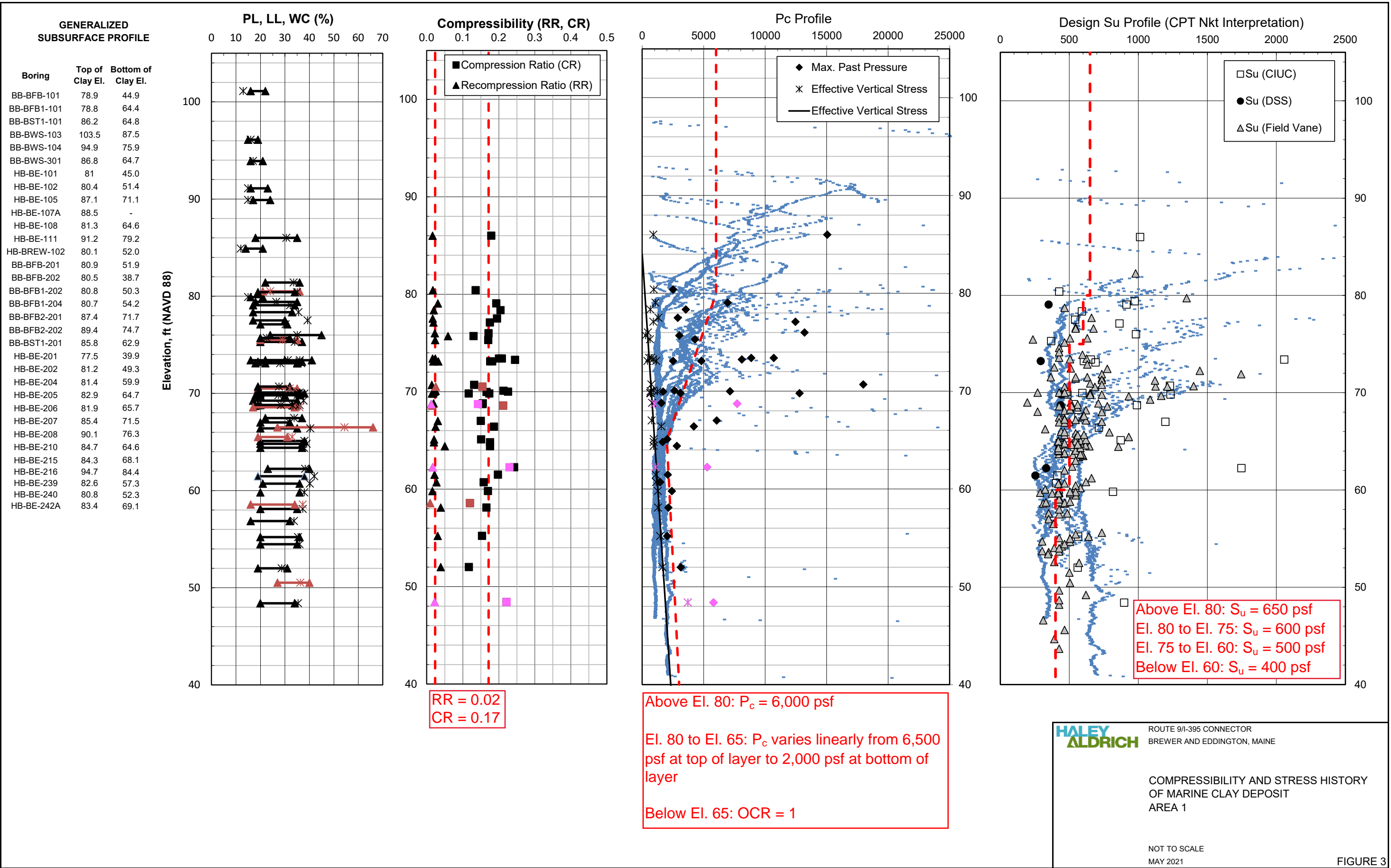
After break

APPENDIX H

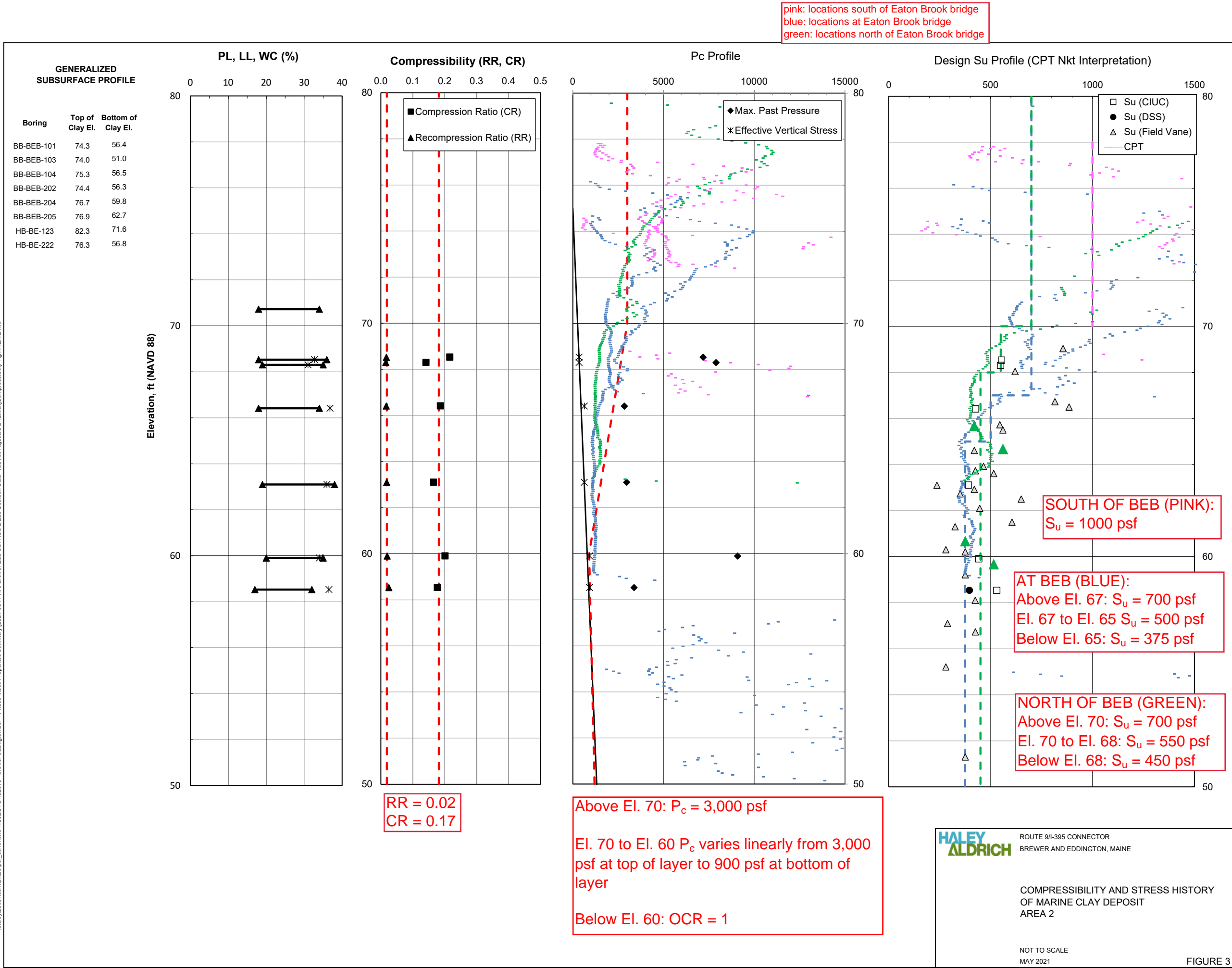
Geotechnical Design Calculations

Soil Properties

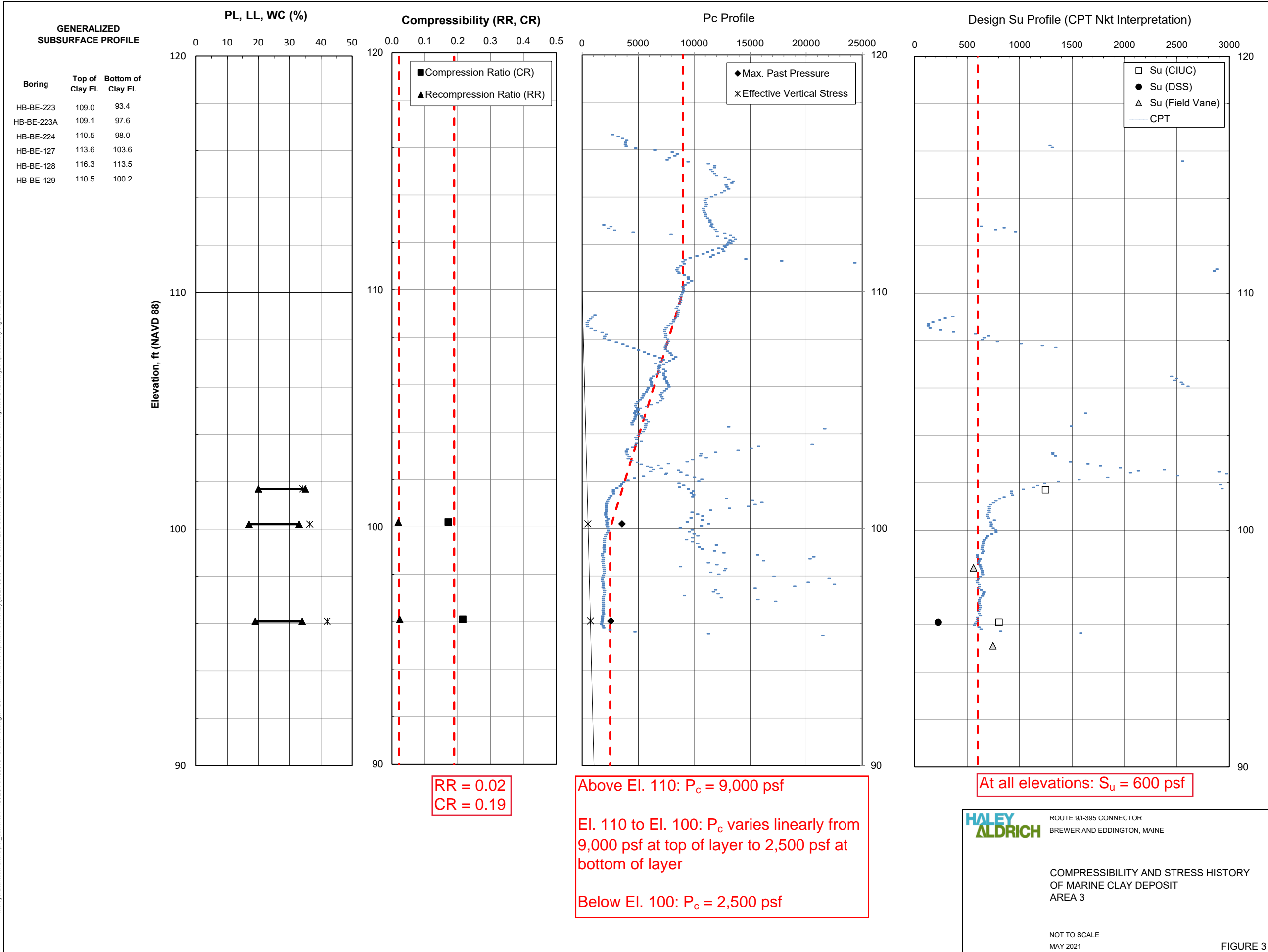
\\haleyaldrich.com\share\proj_common\PROJECTS\132076 - brewer eddington\007 - Phase II\Soil Properties Summary\2021-0507-HAI-Brewer-Edd-Soil Nkt Adjusted-D11.xlsx\Compressibility Fig AREA 1 Nkt



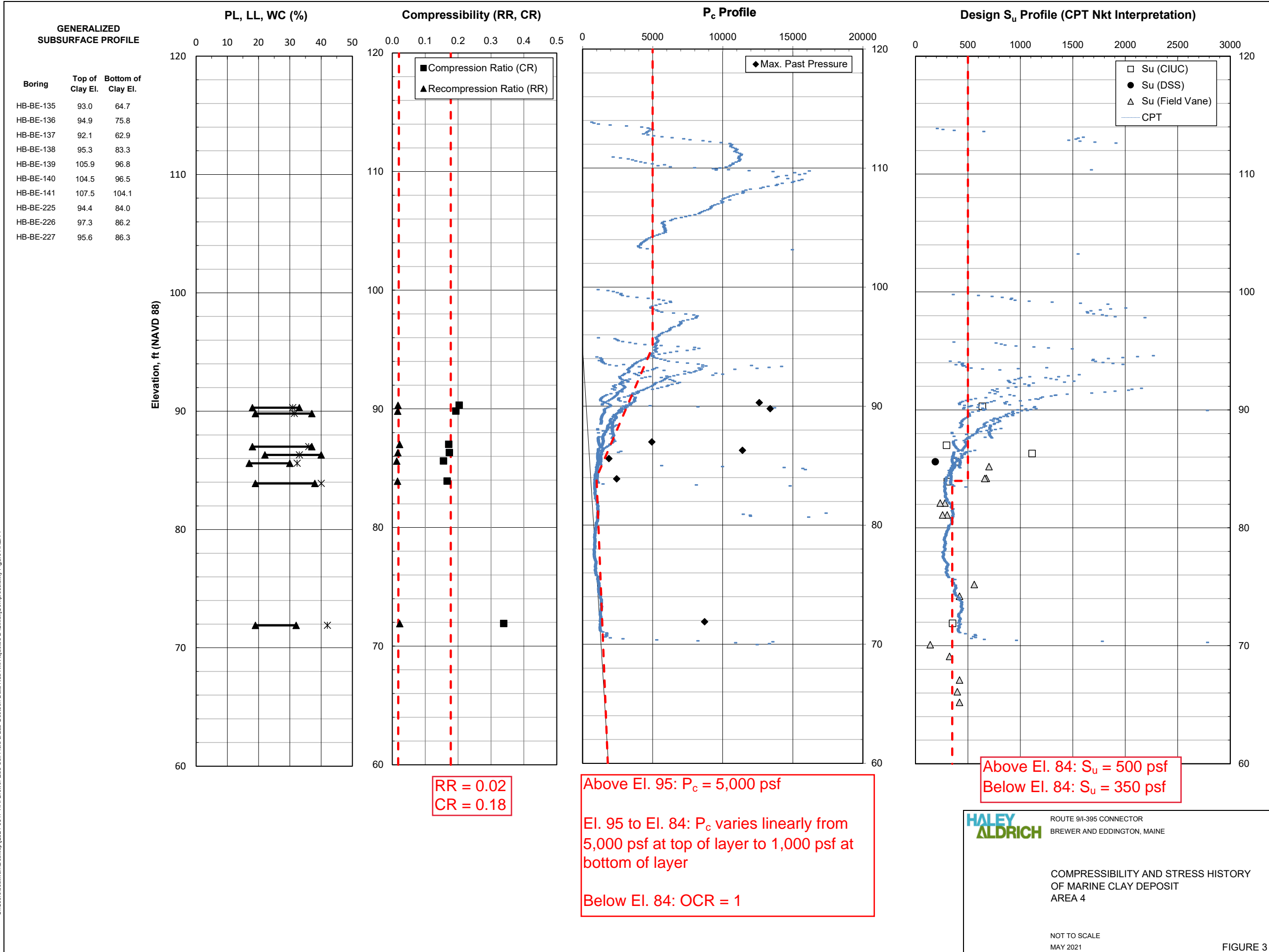
\\haleyaldrich.com\share\por_common\PROJECTS\132076 - Brewer Eddington\007 - Phase 1\Soil Properties Summary\2021-0511-HA-Brewer-Edd-Soil Field & Lab Geotech Data\Ndu Nkt Adjusted\DJ12.xlsx\Compressibility Fig AREA 2 Nkt



\\halayaldrich.com\share\proj_common\PROJECTS\132076 - Brewer Eddington\007 - Phase 1\Soil Properties Summary\2021-05-19-HA-Brewer-Edd-Sol Field & Lab Geotech Data\Ndu Nkt Adjusted\DJ12.xlsx\Compressibility Figure AREA 3



C:\Users\jesullivan\Desktop\2021-05-17-HAL-Brewer-Edd-Sail-Field & Lab-Geotech-Data-Ndx-Nkt-Adjusted-D12.xlsx\Compressibility Figure AREA 4



Client:	Maine Department of Transportation
Project:	I-395/Rt. 9 Connector Highway, Brewer-Eddington, ME
Subject:	Clay Deposit Undrained Shear Strength Gain

PROBLEM STATEMENT & OBJECTIVE

Estimate the undrained shear strength gain ratio for the marine clay deposits (to be applied to slope stability evaluations).

EXECUTIVE SUMMARY

The estimated marine clay undrained strength gain is equal to 21% of the increase in vertical effective stress. The strength gain should be reduced based on the expected average degree of consolidation (e.g., 0.9 for U=90%).

REFERENCES

1. Ladd, C.C., and Foott, R., New Design Procedure for Stability of Soft Clays, Journal of the Geotechnical Engineering Division, Proceedings of the ASCE, Vol. 100, No. GT7, July, 1974.
2. Ladd, C.C., 1.361-1.366 MIT Course Notes, 1999.
3. Holtz, R.D. & Kovacs, W.D., An Introduction to Geotechnical Engineering.
5. 9th Edition, AASHTO LRFD Bridge Design Specifications, 2020.

AVAILABLE INFORMATION

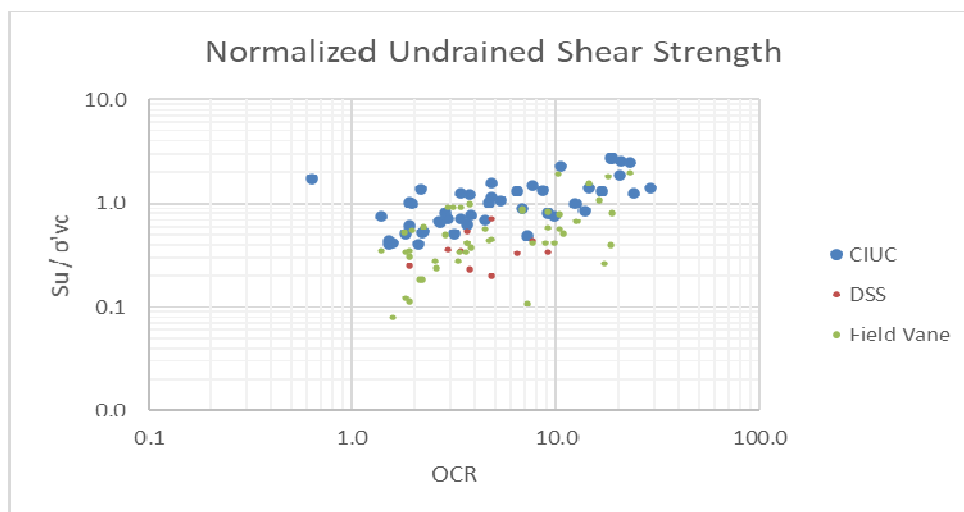
1. Subsurface Data: preliminary and final design phase borings.
2. Laboratory consolidation and undrained shear strength testing (CIUC, DSS) results for the marine clay.
3. Field vane (FV) undrained shear strength testing in the preliminary and final design phase borings.
4. (CPT soundings were not used to evaluate strength gain. They were used to calibrate strength correlation parameters such as Nkt and Ndu).

PROCEDURE

1. For each strength test location (depth or elevation), estimate the following:
 - Vertical effective stress (estimated soil unit weight, groundwater depth or elevation)
 - Preconsolidation pressure (from lab consolidation testing)
 - Calculate the OCR (i.e., ratio between preconsolidation pressure and vertical effective stress)
 - Calculate the ratio between the undrained shear strength and the test effective confining stress (normalized undrained shear strength, S_u/s'_{vc})
2. Plot the S_u/s'_{vc} versus OCR (log-log plot) and calculate the SHANSEP relationship ($S_u/s'_{vc} = S(OCR)^m$) for each "type" of undrained shear strength (e.g., CIUC, DSS, and field vane).
(CIUC-isotropically consolidated undrained triaxial compression; DSS-direct simple shear; FV-field vane)

CALCULATIONS

1. The normalized S_u versus OCR plot for CIUC, DSS, and FV tests are shown below:



The plot shows that the normalized CIUC is generally higher than the DSS and FV.

Client: Maine Department of Transportation

Date: 22JUN2021

Project: I-395/Rt. 9 Connector Highway, Brewer-Eddington, ME

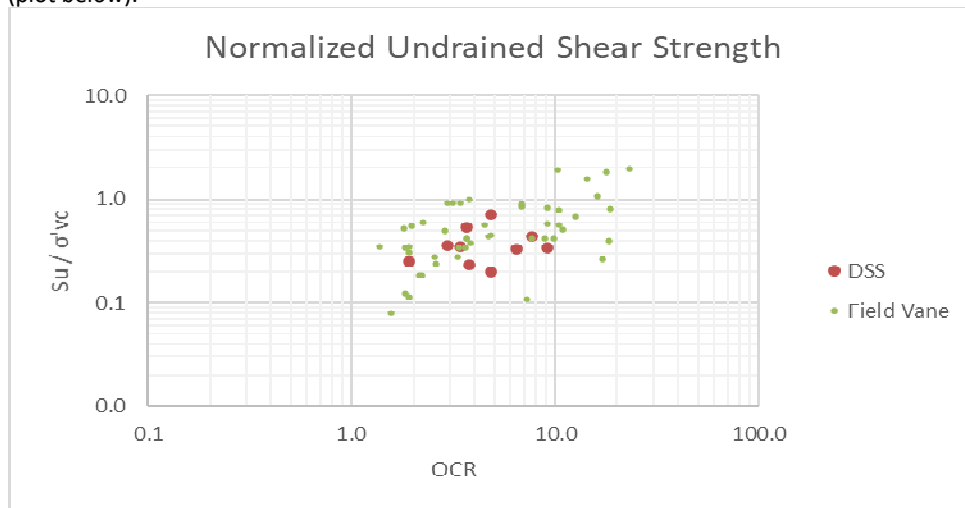
Computed by: JLL

Subject: Clay Deposit Undrained Shear Strength Gain

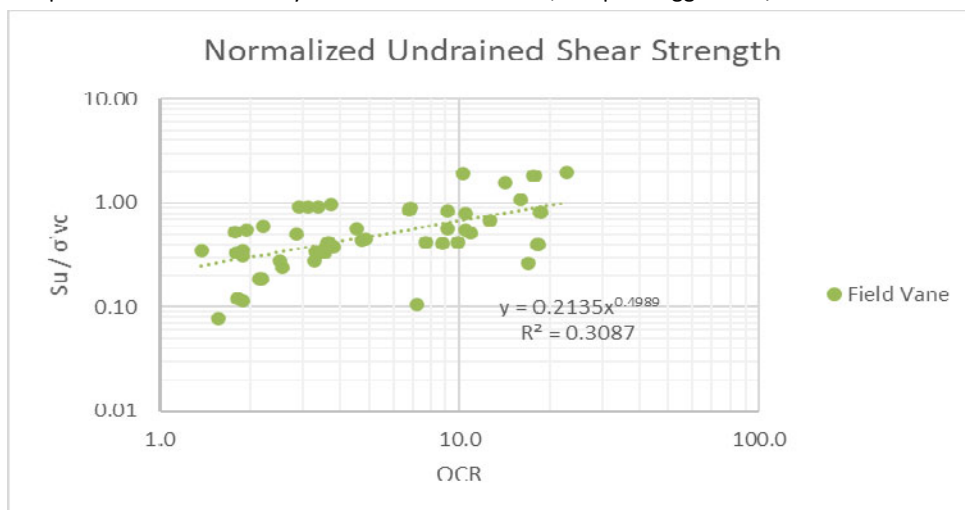
Checked by: EMS

CALCULATIONS (continued...)

2. For stability evaluations using isotropic S_u profiles, one can run DSS tests or run triaxial compression and extension and take the average of the two. In our case, we have DSS test data. In addition, the FV data and DSS data appear similar (plot below).



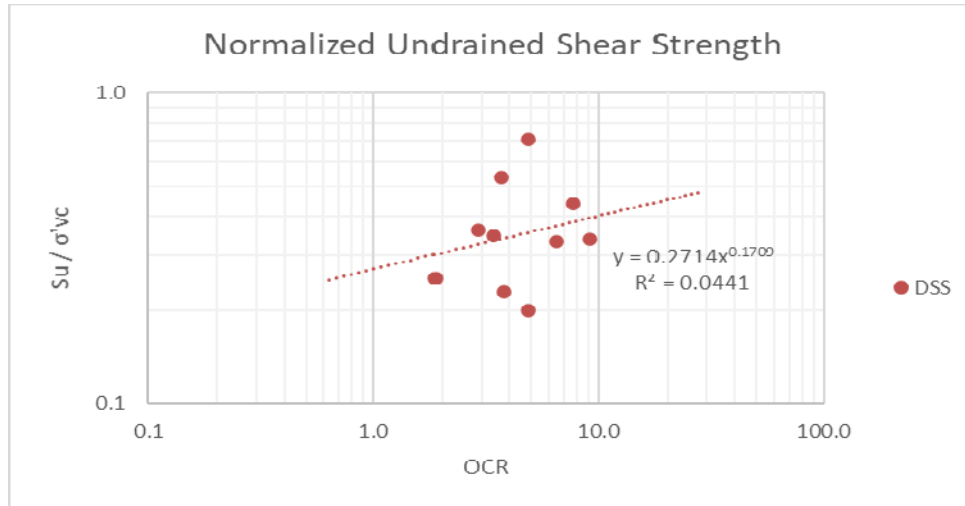
3. Using power functions to fit a line through the FV (to get a SHANSEP type $S_u/s'_{vc} = S(OCR)^m$ equation), we get the plot below. For normally consolidated conditions, the plot suggests $S_u/s'_{vc} = S$ of about 0.21.



Client:	Maine Department of Transportation
Project:	I-395/Rt. 9 Connector Highway, Brewer-Eddington, ME
Subject:	Clay Deposit Undrained Shear Strength Gain


CALCULATIONS (continued...)

4. For the DSS, the plot is shown below. For normally consolidated conditions, the plot suggests $S_u/s'_{vc} = S$ of about 0.27.



5. According to Ladd, the strength increase during staged construction differs for NC and OC clay. For NC clay, use the S value (e.g., 0.21 or 0.27 in our case). For clay that remains OC, use $S(OCR)^m$ which will result in values greater than S depending on the OCR.

For simplicity of application to global stability evaluations, assume strength gain for NC clay. Use an S value of 0.21 and 90% average degree of consolidation under the stress increase due to staged embankment construction. For example, if the construction stage involves 15 ft of normal weight fill, the undrained shear strength gain within the clay will be equal to $15 \text{ ft} \times 125 \text{ pcf} \times 0.21 \times 90\% = 354 \text{ psf}$.

		CALCULATIONS		File No.: 132076-007
				Sheet: 1 of 2
Client:	Maine Department of Transportation			Date: 22JUN2021
Project:	I-395/Rt. 9 Connector Highway, Brewer-Eddington, ME			Computed by: JLL
Subject:	Estimate Site-Specific CPT Parameters Nkt and Ndu for Undrained Shear Strength			Checked by: EMS

PROBLEM STATEMENT & OBJECTIVE
 Estimate CPT correlation factors using data from CPT soundings compared with lab and field testing results from nearby borings.

EXECUTIVE SUMMARY
 The Su FV based Nkt and Ndu values range from 18.6 to 23.1 and 12.5 to 15.4, respectively depending on the likely soil type (e.g., silt & clay, silt, or clay)

REFERENCES

1. Engineering Design Using the Cone Penetration Test (Geotech. Applications Guide) by Conetec, 2017.
2. Correlation of Undrained Shear Strength and CPT Resistance, Remai, Z., 2012, Periodica Polytechnica.

AVAILABLE INFORMATION

1. Subsurface Data: preliminary and final design phase borings.
2. Laboratory consolidation and undrained shear strength (Su) testing (CIUC, DSS) results for the marine clay.
3. Field vane (FV) undrained shear strength testing in the preliminary and final design phase borings.
4. Data from CPT soundings performed at the site (e.g., net qt, du=excess pore pressure measurement, etc.).

PROCEDURE

1. For each CPT location, determine the nearest boring where FV, CIUC, or DSS Su strength testing was performed.
2. For each Su test within each nearby boring, match the Su test depth with the CPT net qt and excess pore pressure measurement (du) from the nearest CPT sounding.
3. Once completed, we get data pairs of Su and net qt or du from the CPT and boring combinations.
4. The Nkt and Ndu parameters are calculated from the best fit line through the plots of the data pairs.
5. We focused on the Su from FV tests because the design Su for global stability was based on FV. Therefore, the Nkt and Ndu values reported here are for Su FV.
6. CPT readings were also filtered in several ways such as Friction Ratio, Ic and IcRW to eliminate non-silt and clay readings from the evaluations.
7. There were limited DSS data so the Nkt and Ndu were not calculated for Su DSS. The Su CIUC data were (expectedly) higher than the FV and DSS data, Nkt and Ndu values were not calculated for CIUC.

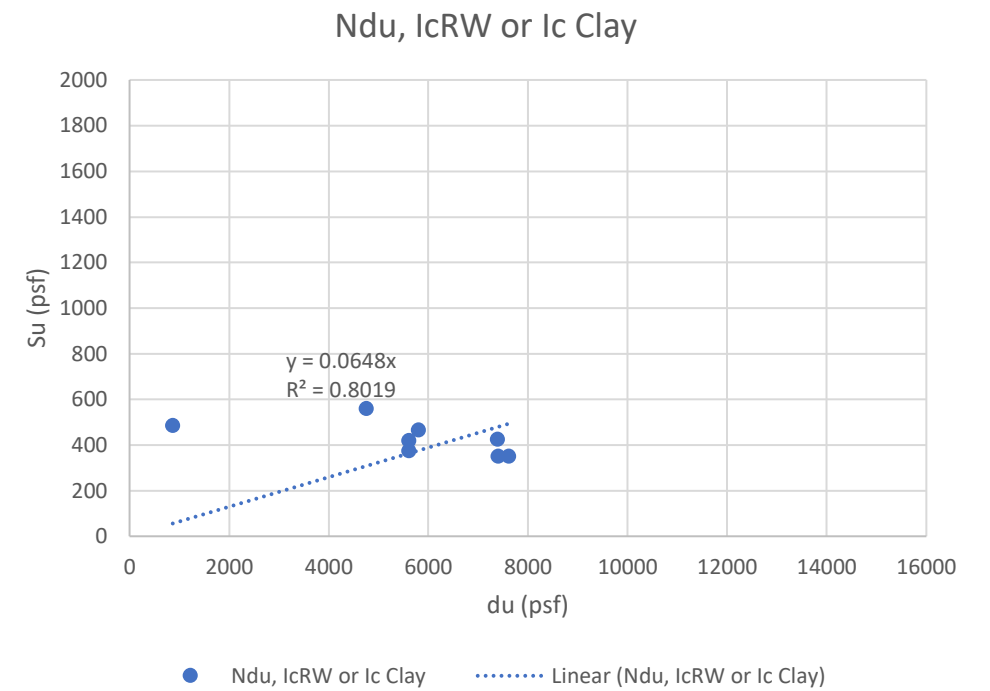
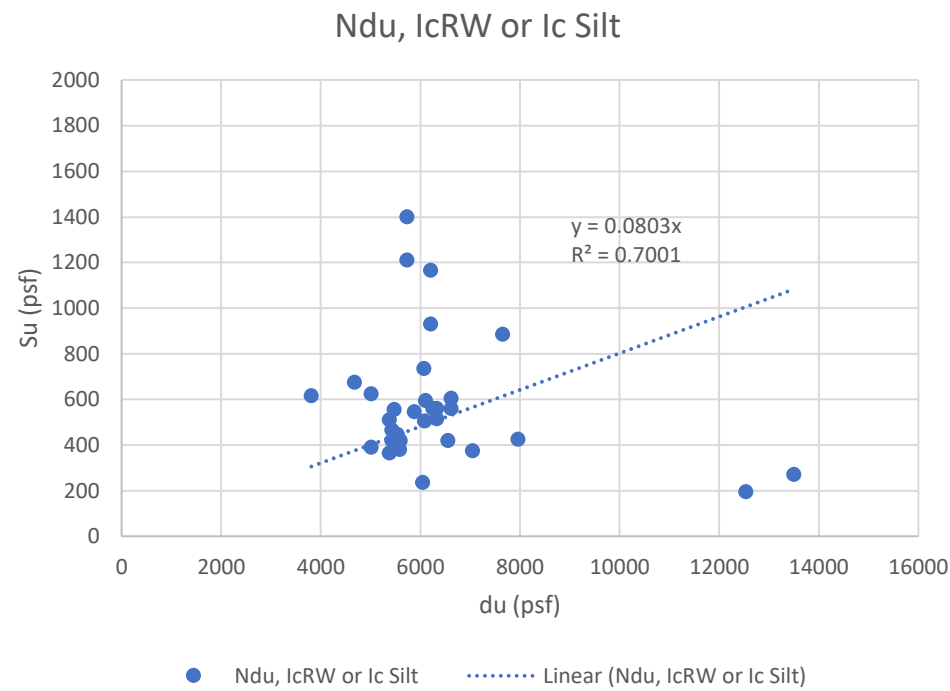
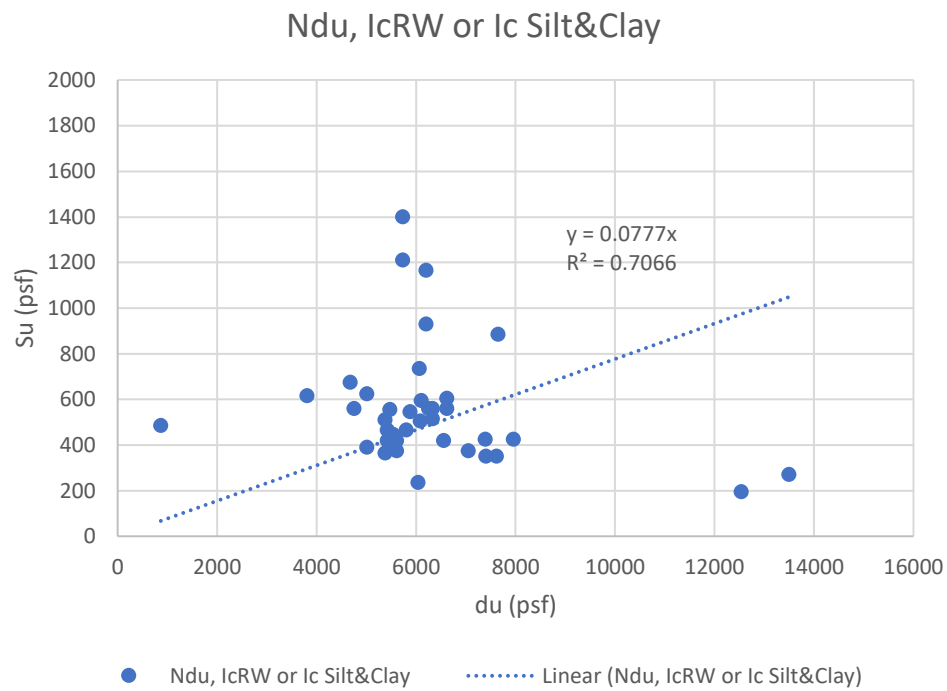
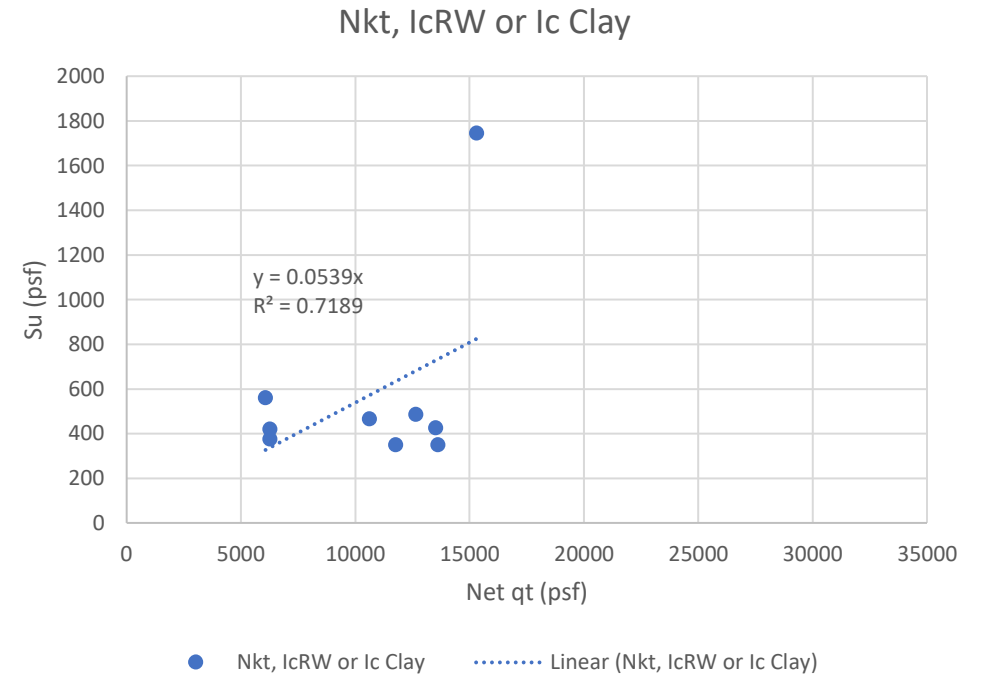
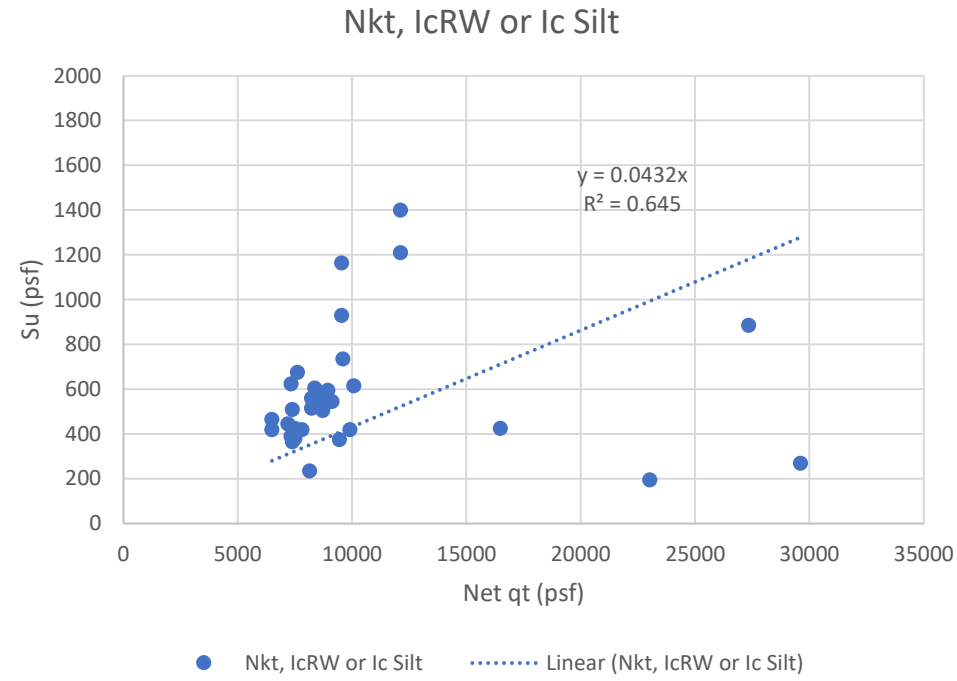
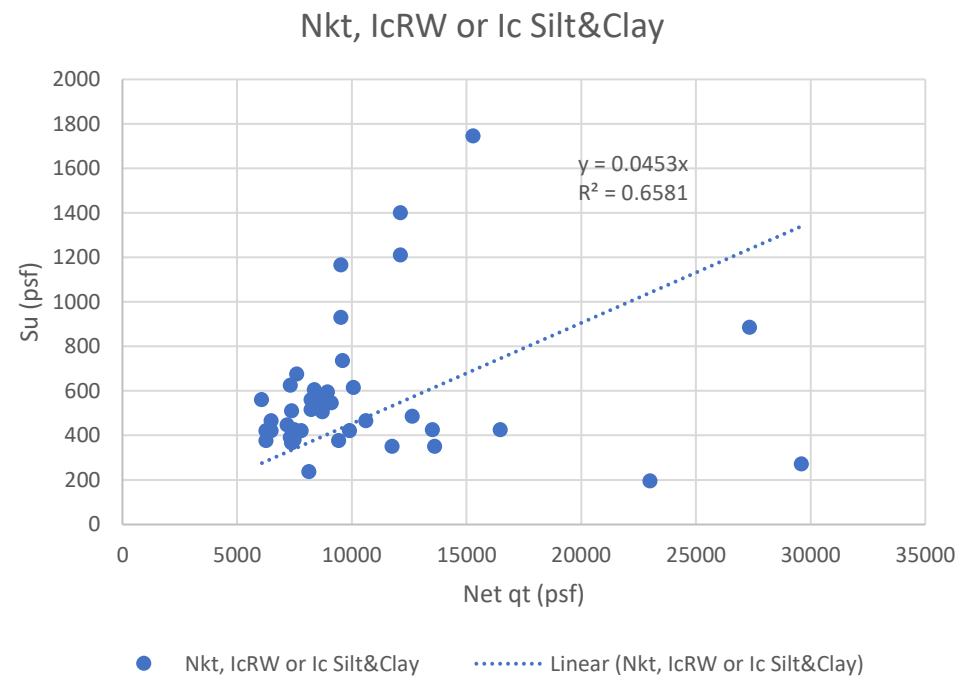
RESULTS

1. The calculated Nkt and Ndu values for **Su FV** are summarized below:

Descr.	Nkt	R^2 Nkt	Ndu	R^2 Ndu
Ic Silt & Clay	22.1	0.658	12.9	0.707
Ic Silt	23.1	0.645	12.5	0.700
Ic Clay	18.6	0.719	15.4	0.802

Notes:

For comparison, the default ConeTec values are Nkt=12.5 and Ndu=6.0.
 The best-fit line intercept was set to zero.
 R^2 is the coefficient of determination for the best-fit line.
 (see next page for data plots and best-fit lines).



Notes:

In the plots, the trendline are for $y = \text{Field Vane Su}$ and $x = \text{Net qt OR du}$.
The slopes shown are either $1/\text{Nkt}$ or $1/\text{Ndu}$.

Client: Maine Department of Transportation
Computed by: JLL

Checked by: EMS
Sheet: 2 of 2



File No.: 132076-007
Date: 22JUN2021

Project: I-395/Rt. 9 Connector Highway, Brewer-Eddington, ME
Subject: Estimate Site-Specific CPT Parameters Nkt and Ndu for Undrained Shear Strength

Seismic Site Class

Client:	Maine Department of Transportation
Project:	I-395/Rt. 9 Connector Highway, Brewer-Eddington, ME
Subject:	Seismic Site Class Evaluations Using Shear Wave Velocity

PROBLEM STATEMENT & OBJECTIVE

Determine seismic site class based on results of shear wave velocity (Vs) field testing.

EXECUTIVE SUMMARY

Based on the Vs data gathered and the soil and rock conditions and depths observed in borings along the proposed highway alignment, the seismic site class varies from Site Class C to D.

REFERENCES

1. 2020 AASHTO LRFD Bridge Design Specifications.

AVAILABLE INFORMATION

1. Shear Wave Velocity Testing (pVs) Rt 9/I-395 Connector for Brewer & Eddington, ME, by Hager-Richter, January 2021.
2. SCPT Vs data from ConeTec Field Report for Brewer Wilson to MEDOT, 11 March 2013.
3. SCPT Vs data from ConeTec Presentation of Site Investigation Reports, I-395 & Rt 9 Connector, Brewer-Eddington, ME, 20 November 2020.

EVALUATIONS

1. The pVs testing in January 2021 was conducted in the southern end of the project (Area 1). Soundings were performed along 5 lines resulting in 5 Vs profiles. Vs of the overburden soils and bedrock were measured, stratigraphy and depth to different layers was based on nearby borings.

The calculated Vs100 for each test line and corresponding site class are summarized below:

Area	Location	Vs100 (ft/s)	Site Class
1	Test Line 1	1155	D
1	Test Line 2	1038	D
1	Test Line 3	1562	C
1	Test Line 4	1680	C
1	Test Line 5	1775	C

2. The SCPT soundings were only able to penetrate the upper soils before hitting refusal and were therefore unable to measure Vs in the denser glacial deposits and bedrock. Given that glacial deposits and rock are generally encountered less than 100 ft below ground surface, their higher Vs (especially bedrock) should be considered in the Vs100 calculations at the SCPT locations. Based on information from borings nearest the pVs soundings, we conclude the following Vs values as likely to correspond to bedrock Vs.

Location	Likely Bed-rock Vs (ft/s)
Test Line 1	2865
Test Line 2	2341
Test Line 3	2794
Test Line 4	2943
Test Line 5	2204-3504
Average	2775

3. Seismic site class was first evaluated at each SCPT sounding with the deepest Vs sounding at each location applied all the way to a depth of 100 ft. For example, if the deepest Vs sounding was 1400 ft/s at 30 ft and refusal was encountered shortly thereafter, a Vs of 1400 ft/s is applied to the remaining 70 ft (i.e., to get to 100 ft) in the site class evaluation for that SCPT location. However, boring explorations indicate that rock is relatively shallow and applying an appropriate rock Vs (Average from pVs) to the remainder of each SCPT profile is reasonable for site class evaluations.

The site class results for each SCPT location is shown on the next page for the two assumptions described above (i.e., without bedrock Vs and with bedrock Vs=Average bedrock Vs from pVs soundings).

Client: Maine Department of Transportation

Project: I-395/Rt. 9 Connector Highway, Brewer-Eddington, ME

Subject: Seismic Site Class Evaluations Using Shear Wave Velocity

Univ. of Maine SCPT Data

Area		Approx. Refusal (ft)	Vs100 (ft/s)	Site Class	Vs100 with Bedrock (ft/s)	Site Class w/ Bedrock
1	SCPT-01	29	594	E	1064	D
1	SCPT-04	24	472	E	696	D
1	SCPT-05	29	581	E	1037	D
1	SCPT-06	27	523	E	1109	D

Based on the above results, Site Class D is appropriate if presence of rock below about 30 ft is considered.

The same process is applied to H&A SCPT soundings below:

H&A SCPT Data

Area		Approx. Refusal (ft)	Vs100 (ft/s)	Site Class	Vs100 with Bedrock (ft/s)	Site Class w/ Bedrock
2	HA SCPT-101	7	615	D	-	-
2	HA SCPT-101B	19	606	D	816	D
2	HA SCPT-102	31	884	D	1187	D
1	HA SCPT-103	34	415	E	954	D
1	HA SCPT-104	17	515	E	1574	C

Considering that bedrock is generally encountered significantly shallower than 100 ft below ground surface in the borings, bedrock Vs should be included in the Vs100 calculations. Given that, the site class using SCPT soundings (with pVs bedrock Vs) is either D or C depending on assumed depth to rock.

Seismic Parameters vs Site Class

Site Class	A _s (g)	S _{DS} (g)	S _{D1} (g)	SDC
C	0.080	0.173	0.074	A
D	0.107	0.231	0.105	A

SDC - Seismic Design Category

The pVs and SCPT Vs data were compared with the stratigraphy observed at the closest borings and correspondence between Vs and soil/material was evaluated based on depth of soundings versus split spoon samples. The table below shows the Vs to material correspondence resulting from this evaluation.

Vs Data Interpretation by Material

Material	Number of Data	Min. Vs (ft/s)	Ave. Vs (ft/s)	Max. Vs (ft/s)	St. Dev. Vs (ft/s)	Ave. Vs+1SD (ft/s)	Ave. Vs-1SD (ft/s)
Marine Clay or Silt	71	212	469	691	88	557	381
Glacial Till	9	682	929	1125	146	1075	783
Bedrock	6	2204	2775	3504	465	3240	2310


CONCLUSIONS

Based on the Vs data gathered and the soil and rock conditions and depths observed in borings along the proposed highway alignment, the seismic site class varies from Site Class C to D.

For either Site Class C or D, the Seismic Design Category is A.

Global stability and liquefaction evaluations were conducted assuming the A_s for Site Class D (more conservative of the two site classes).

Liquefaction

		CALCULATIONS		File No.: 132076-007
				Sheet: 1 of 2
Client:	Maine Department of Transportation			Date: 22JUN2021
Project:	I-395/Rt. 9 Connector Highway, Brewer-Eddington, ME			Computed by: JLL
Subject:	Seismic Liquefaction - Minimum Required SPT N-Values			Checked by: EMS

PROBLEM STATEMENT & OBJECTIVE

Determine the minimum required SPT N-values to resist seismic liquefaction and compare them to observed values in the marine silt.

EXECUTIVE SUMMARY

The min. required SPT N values for FS=1.1 against liquefaction range from 3.5 to 4.5 blows/ft. Given the observed SPT N values, high fines content and presence of clay in the samples, liquefaction is unlikely under the design event.

REFERENCES

1. 9th Edition, AASHTO LRFD Bridge Design Specifications, 2020.
2. Youd et al., 2001, Liquefaction Resistance of Soils: Summary Report from the 1996 NCEER and 1998 NCEER/NSF Workshops on Evaluation of Liquefaction Resistance of Soils.
3. Performance & Use of the Standard Penetration Test in Geotechnical Engineering Practice, CGPR Report, 1998.

AVAILABLE INFORMATION

1. Subsurface Data: preliminary and final design phase borings (SPT N values and soil sample descriptions).
2. Laboratory grain size distribution results (fines content).

ASSUMPTIONS

1. Evaluation only applies to cohesionless soils at the site (e.g., silts). Assume sand-like behavior.
2. Original ground surface considered (grade raise due to embankments not considered, conservative for liquefaction).
3. Seismic Site Class D, $A_s = FPG \cdot PGA = 0.107g$, $M = 6.0$ (some areas in the project are Site Class C so this is conservative).
4. Minimum required FS = 1.1 against liquefaction.
5. Water at ground surface (i.e., completely submerged conditions).
6. Assumed fines content = 5% to back-calculate min. SPT N required (low fines content soils are more susceptible to liquefaction, likely conservative for the silts at the site which are likely to have higher fines content).
7. Original (level) ground surface considered (no raise in grade due to embankments, conservative for liquefaction of the shallower material).
8. Energy correction is based on 90.7% transferred energy, so the energy correction factor (CE) is $90.7/60 = 1.51$.
9. Borehole diameter is 4 inches.
10. Evaluation was performed to a depth of 40 ft below original ground surface.

CALCULATIONS & RESULTS

1. The cyclic stress ratio adjusted for magnitude ($CSR_{M7.5} = CSR/MSF$ using Youd et al., 2001) for the depth considered ranges from 0.07 to 0.08. Where the $MSF = 1.77$ for the magnitude considered.
2. For FS=1.1, the cyclic resistance ratio (CRR) needs to be 1.1 times 0.07 to 0.08 (i.e., CRR required=0.08 to 0.09).
3. From this CRR range, the back-calculated min. required SPT N values range from 3.5 to 4.5 blows/ft.
4. In all the borings, 23 marine deposit samples from depths of up to 31 ft in 18 borings were observed to have SPT N values less than 10 blows/ft (ranging from 3 to 7 blows/ft). Only four of those samples from four different borings had SPT N less than or equal to 4 blows/ft. Given the high fines content and the presence of clay in three of the four samples, and the fact that the samples are spread over four borings out of many total borings, it is our opinion that widespread liquefaction and seismic settlement are unlikely under the design event.

Phase I - Low N

Boring	Station	Sample	Depth (ft)	N-uncor.	N60	Description
BB-BEB-102	140+38.9	3D	16	6	9	Sandy SILT (ML)
BB-BFA1-101	92+18	3D	6	6	9	SILT (ML)
BB-BFB-101	54+61.2	2D	3	4	6	Clayey SILT (ML)
BB-ELAR-101	197+79.6	2D	3	4	6	Sandy SILT (ML)
BB-ELER-101	237+34.7	2D	3	7	11	SILT (ML)
HB-BE-104	58+06.9	2D	6	6	9	Clayey SILT (ML)
HB-BE-108	58+96.1	2D	6	5	8	Clayey SILT (ML)
HB-BE-109	62+43.7	2D	6.5	6	9	Clayey SILT (ML)
HB-BE-109	62+43.7	3D	8	5	8	Clayey SILT (ML)
HB-BE-123	144+06.5	2D	6	6	9	Clayey SILT (ML)
HB-BE-124	146+99.2	2D	6	7	11	Clayey SILT (ML)
HB-BE-150	229+89.9	2D	3	5	8	fine to coarse SAND, little silt, trace gravel
HB-BE-150	229+89.9	3D	5	5	8	fine to coarse SAND, little silt, little gravel
HB-BE-163	301+11.9	2D	6	5	8	SILT (ML)
HB-BE-166	312+94.8	2D	6	5	6	Sandy SILT (ML)

Phase II - Low N, assigned gradation

Boring	Station	Sample	Depth (ft)	N-uncor.	N60	USCS Description	% Fines
HB-BE-212	65+49.2	7D	31	7	10	Sandy GRAVEL, little silt, trace fine sand (GP)	11.5
HB-BE-328	52+43.7	3D	11	6	9	Fine to coarse SAND, trace silt (SP)	no test - 1" recovery, wash sample

Phase II - Low N, assigned Atterberg

Boring	Station	Sample	Depth (ft)	N-uncor.	N60	USCS Description	LL	PL	PI
BB-BEB-202	140+27.6	4D	21	5	7	SILT (CL-ML)	16	11	5
HB-BE-201	52+00.4	6D	26	7	10	CLAY (CH)	52	27	25
HB-BE-223A	166+87.5	2D	6	6	9	Silty CLAY (CL)	35	19	16
HB-BE-224	168+24.6	2D	6	4	6	Silty CLAY (CL)	34	18	16
HB-BE-224A	168+82.3	2D	6	7	10	Silty CLAY (CL)	39	19	20
HB-BE-328	52+43.7	5D	21	3	4	Clayey SILT (CL-ML)	22	15	7

Notes:
Depths are to sample mid-depth.
N-uncorr and N60 are blows/ft.

Global Embankment Stability – Area 1

Client: Maine Department of Transportation

Date: 6-May-2021

Project: I-395/Route 9 Connector - WIN 18915.00

Computed by: SSM

Subject: Global Stability - Area 1

Checked by: EMS

PROBLEM STATEMENT AND OBJECTIVE

Calculate the global stability minimum factor of safety at critical sections along the proposed highway alignment.

REFERENCES

1. AASHTO LRFD Bridge Design Specifications, 7th Edition, 2014.
2. Slide version 7.0 by RocScience.
3. Maine DOT Bridge Design Guide, 2003, with 2014 updates.

AVAILABLE INFORMATION

1. Plan set titled, "Brewer-Eddington I-395/Route 9 Connector, Cross Sections," by MaineDOT dated 25 February 2020.
2. Plan set titled, "I-395/Route 9 Connector, Interpretive Subsurface Profile," by MaineDOT dated 2 October 2019.

ASSUMPTIONS

1. Soil profiles will be modeled to match settlement calculation models, as summarized below.
2. Used seismic site class D: $A_s/2 = 0.107/2 = 0.05$ g
3. A 250 psf traffic surcharge will be modeled.

SOIL PROPERTIES

Material	Unit Weight (pcf)	Friction Angle (degrees)	Undrained Shear Strength (psf)
New Fill	125	32	0
Marine Deposit	115	varies ¹	
Glacial Till	130	36	0
Bedrock	infinite strength		

Notes:

1. Soil properties for Existing Fill and Marine Deposit vary based on location. See individual soil profiles for details.

Client: Maine Department of Transportation

Date: 6-May-2021

Project: I-395/Route 9 Connector - WIN 18915.00

Computed by: SSM

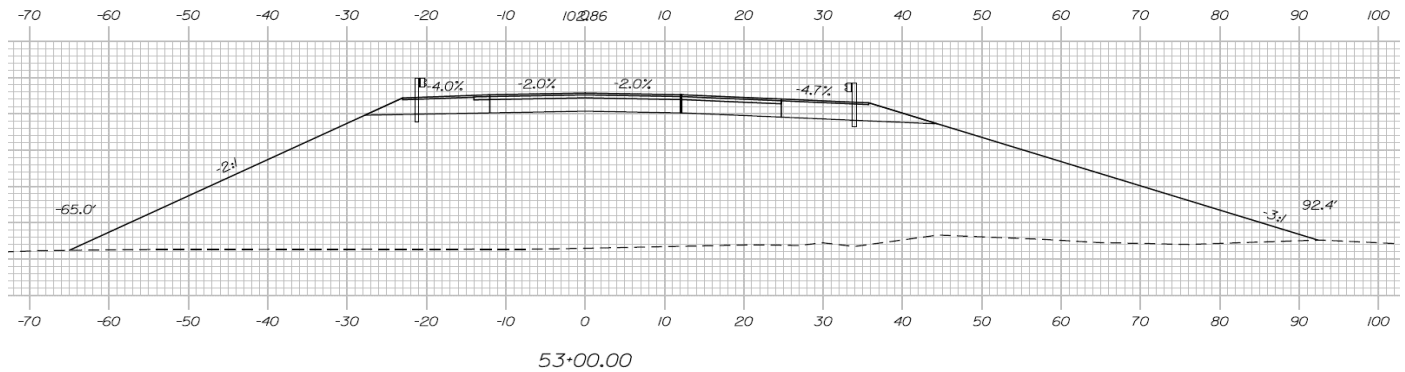
Subject: Global Stability - Area 1

Checked by: EMS

STA 53+25 GEOMETRY

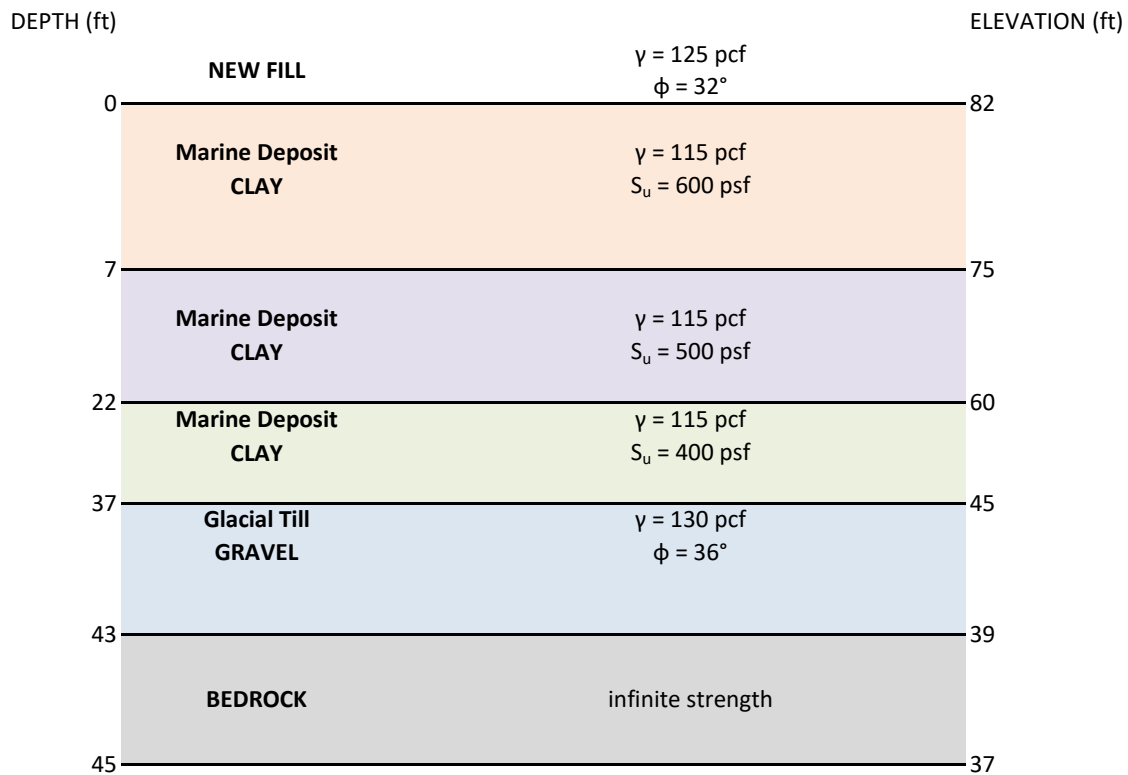
Fill height = 21 ft

Ground surface at center = El. 82


STA 53+25 SOIL PROFILE AND PROPERTIES (not to scale)

Based on boring HB-BE-101

Groundwater depth = 3 ft (based on observation well HB-BE-101, last read 2 June 2020)



Client: Maine Department of Transportation

Date: 6-May-2021

Project: I-395/Route 9 Connector - WIN 18915.00

Computed by: SSM

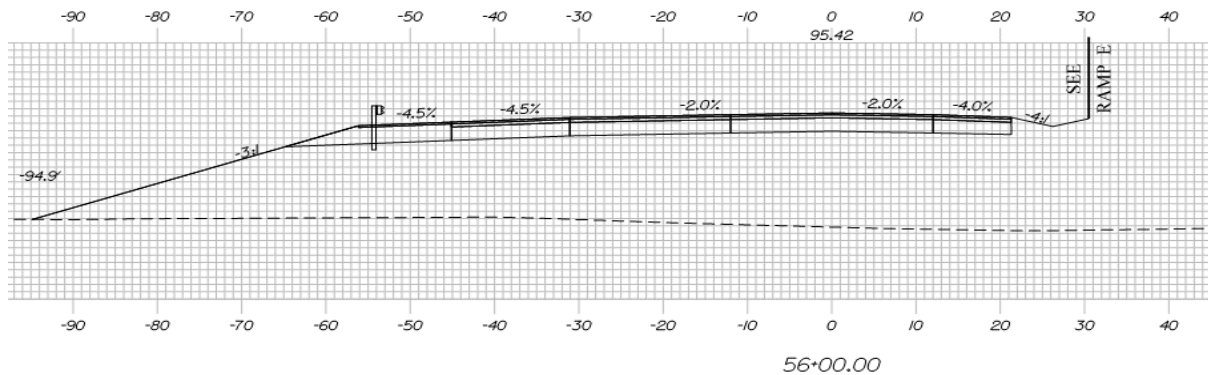
Subject: Global Stability - Area 1

Checked by: EMS

STA 56+00 GEOMETRY

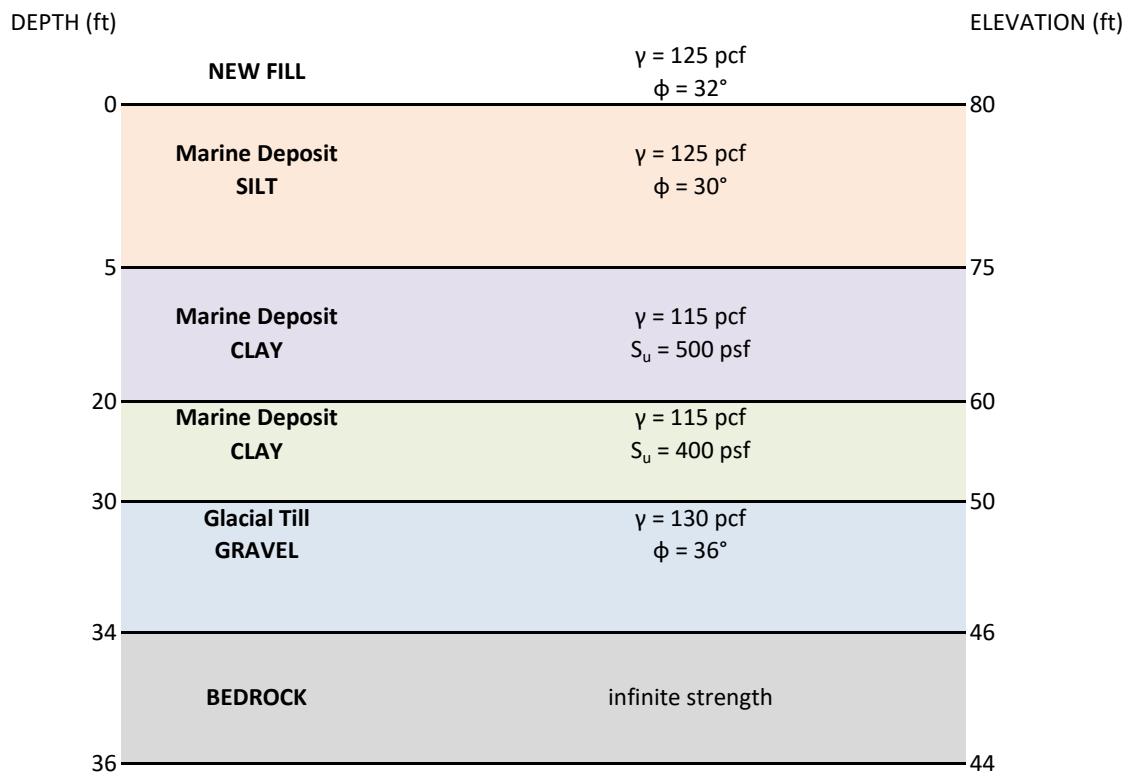
Fill height = 15.5 ft

Ground surface at center = El. 80


STA 56+00 SOIL PROFILE AND PROPERTIES (not to scale)

Based on boring HB-BE-102

Groundwater depth = 2.2 ft



Client: Maine Department of Transportation

Date: 6-May-2021

Project: I-395/Route 9 Connector - WIN 18915.00

Computed by: SSM

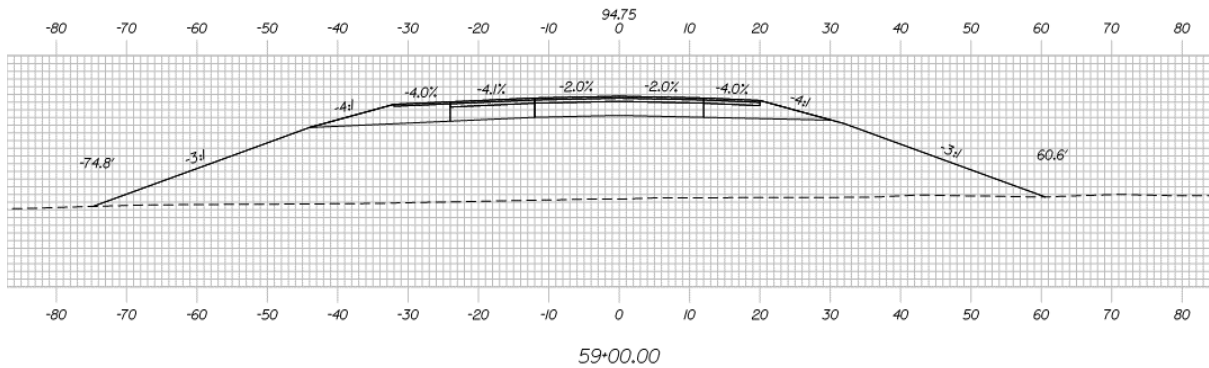
Subject: Global Stability - Area 1

Checked by: EMS

STA 59+00 GEOMETRY

Fill height = 13 ft

Ground surface at center = El. 81

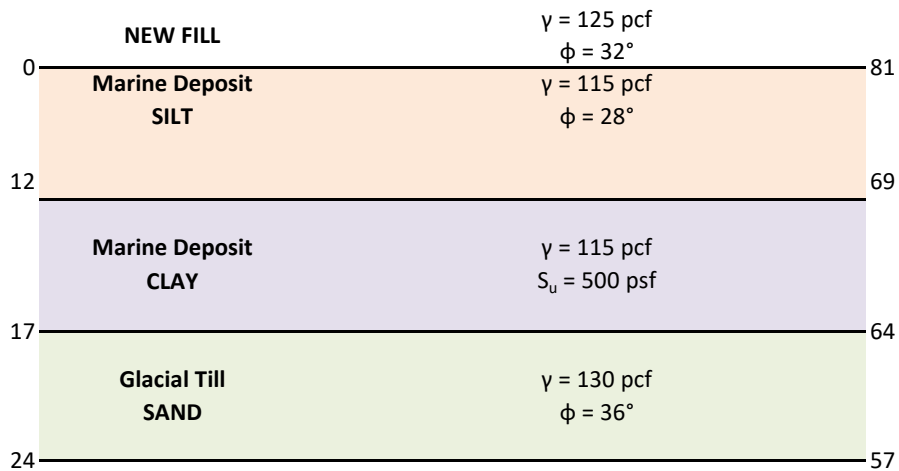

STA 59+00 SOIL PROFILE AND PROPERTIES (not to scale)

Based on boring HB-BE-108

Groundwater depth = 0.9 ft

DEPTH (ft)

ELEVATION (ft)



Client: Maine Department of Transportation

Date: 6-May-2021

Project: I-395/Route 9 Connector - WIN 18915.00

Computed by: SSM

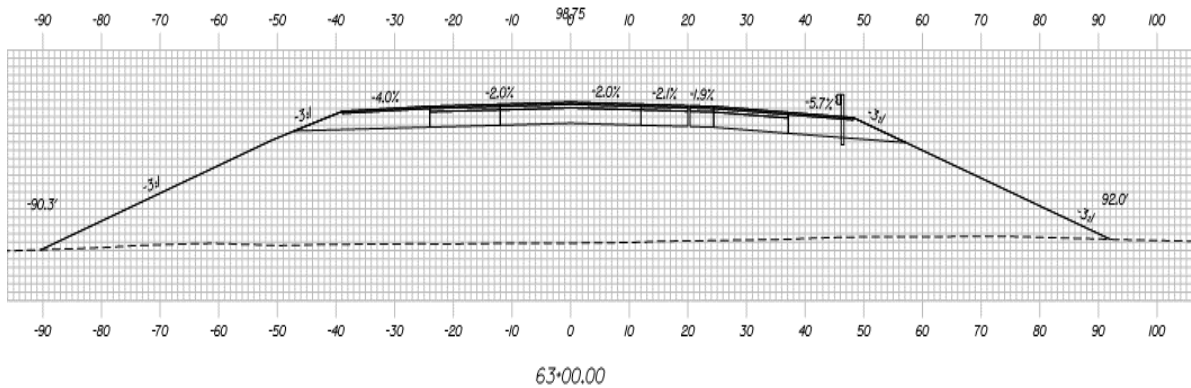
Subject: Global Stability - Area 1

Checked by: EMS

STA 63+00 GEOMETRY

Fill height = 16.5 ft

Ground surface at center = El. 82


STA 63+00 SOIL PROFILE AND PROPERTIES (not to scale)

Based on boring BB-BFB1-201, BB-BFB1-203 and BB-BFB1-202

Groundwater depth = (0, 0.5 and 0.2) ft based on boring (BB-BFB1-201, BB-BFB1-203 and BB-BFB1-202)

Boring BB-BFB1-201 (distance from the center= 63.2 LT)

DEPTH (ft)

ELEVATION (ft)

NEW FILL		$\gamma = 125 \text{ pcf}$ $\phi = 32^\circ$	
0	Marine Deposit CLAY	$\gamma = 115 \text{ pcf}$ $S_u = 600 \text{ psf}$	82
7	Marine Deposit CLAY	$\gamma = 115 \text{ pcf}$ $S_u = 500 \text{ psf}$	75
16	Glacial Till SAND	$\gamma = 130 \text{ pcf}$ $\phi = 36^\circ$	66
23	BEDROCK	infinite strength	59
34			48

Client: Maine Department of Transportation

Date: 6-May-2021

Project: I-395/Route 9 Connector - WIN 18915.00

Computed by: SSM

Subject: Global Stability - Area 1

Checked by: EMS

STA 63+00 Continued
Boring BB-BFB1-203 (distance from the center= 0.6 LT)

DEPTH (ft)		ELEVATION (ft)
0	NEW FILL $\gamma = 125 \text{ pcf}$ $\phi = 32^\circ$	82
5	Marine Deposit SILT $\gamma = 125 \text{ pcf}$ $\phi = 28^\circ$	77
7	Marine Deposit CLAY $\gamma = 115 \text{ pcf}$ $S_u = 600 \text{ psf}$	75
22	Marine Deposit CLAY $\gamma = 115 \text{ pcf}$ $S_u = 500 \text{ psf}$	60
24	Marine Deposit CLAY $\gamma = 115 \text{ pcf}$ $S_u = 400 \text{ psf}$	58
25	Glacial Till GRAVEL $\gamma = 130 \text{ pcf}$ $\phi = 36^\circ$	57
35	BEDROCK infinite strength	47

Boring BB-BFB1-202 (distance from the center= 63.1 RT)

DEPTH (ft)		ELEVATION (ft)
0	NEW FILL $\gamma = 125 \text{ pcf}$ $\phi = 32^\circ$	82
7	Marine Deposit CLAY $\gamma = 115 \text{ pcf}$ $S_u = 600 \text{ psf}$	75
22	Marine Deposit CLAY $\gamma = 115 \text{ pcf}$ $S_u = 500 \text{ psf}$	60
31	Marine Deposit CLAY $\gamma = 115 \text{ pcf}$ $S_u = 400 \text{ psf}$	51
34	Glacial Till GRAVEL $\gamma = 130 \text{ pcf}$ $\phi = 36^\circ$	48
45	BEDROCK infinite strength	37

Client: Maine Department of Transportation

Date: 6-May-2021

Project: I-395/Route 9 Connector - WIN 18915.00

Computed by: SSM

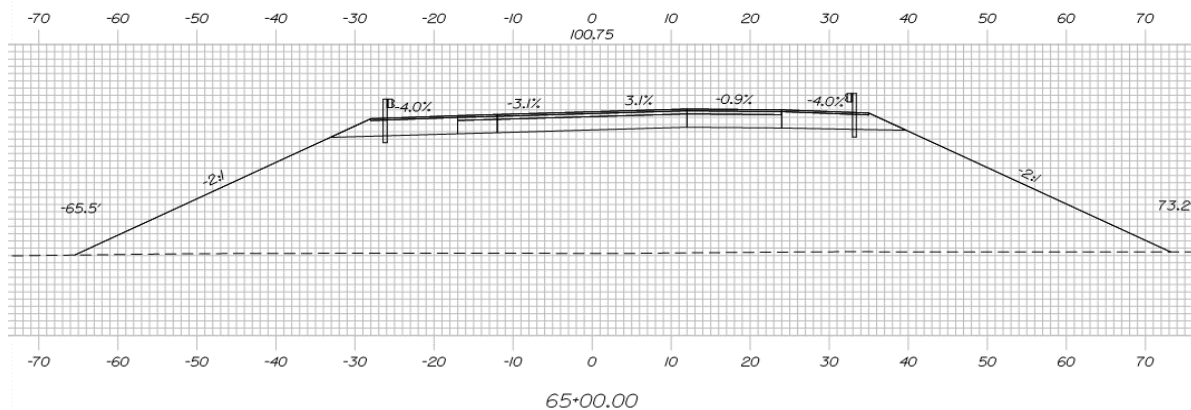
Subject: Global Stability - Area 1

Checked by: EMS

STA 65+00 GEOMETRY

Fill height = 19.5 ft

Ground surface at center = El. 81


STA 65+00 SOIL PROFILE AND PROPERTIES (not to scale)

Based on boring HB-BE-212

Groundwater depth = 1.75 ft

DEPTH (ft)

ELEVATION (ft)

	NEW FILL	$\gamma = 125 \text{ pcf}$ $\phi = 32^\circ$	
0	Marine Deposit SILT	$\gamma = 115 \text{ pcf}$ $\phi = 30^\circ$	81
5	Marine Deposit CLAY	$\gamma = 115 \text{ pcf}$ $S_u = 500 \text{ psf}$	76
21	Marine Deposit CLAY	$\gamma = 115 \text{ pcf}$ $S_u = 400 \text{ psf}$	60
24	Glacial Till GRAVEL	$\gamma = 130 \text{ pcf}$ $\phi = 36^\circ$	57
32			49

Client: Maine Department of Transportation

Date: 6-May-2021

Project: I-395/Route 9 Connector - WIN 18915.00

Computed by: SSM

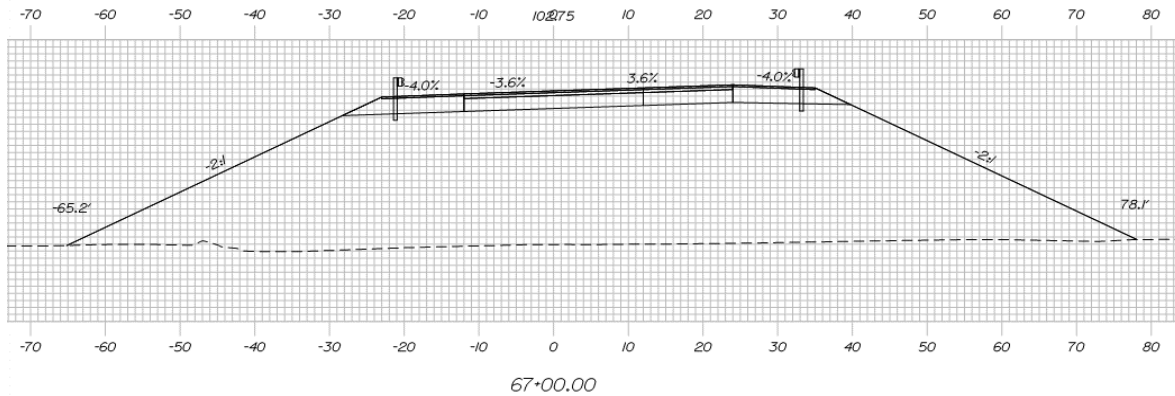
Subject: Global Stability - Area 1

Checked by: EMS

STA 67+00 GEOMETRY

Fill height = 21.5 ft

Ground surface at center = El. 81


STA 67+00 SOIL PROFILE AND PROPERTIES (not to scale)

Based on boring HB-BE-213, BB-BFB1-101 and HB-BE-214

Groundwater depth = (3.5, 0.8 and 1.4) ft based on boring (HB-BE-213, BB-BFB1-101 and HB-BE-214)

Boring HB-BE-213

(distance from the center= 74.3 LT)

DEPTH (ft)

ELEVATION (ft)

NEW FILL		$\gamma = 125 \text{ pcf}$ $\phi = 32^\circ$	
0	Marine Deposit	$\gamma = 115 \text{ pcf}$	81
	CLAY	$S_u = 600 \text{ psf}$	
6			75
	Marine Deposit	$\gamma = 115 \text{ pcf}$	
	CLAY	$S_u = 500 \text{ psf}$	
20			61
	Marine Deposit	$\gamma = 115 \text{ pcf}$	
	SILT	$\phi = 30^\circ$	
22			59
	Glacial Till	$\gamma = 130 \text{ pcf}$	
	SAND	$\phi = 36^\circ$	
28			53

Client: Maine Department of Transportation

Date: 6-May-2021

Project: I-395/Route 9 Connector - WIN 18915.00

Computed by: SSM

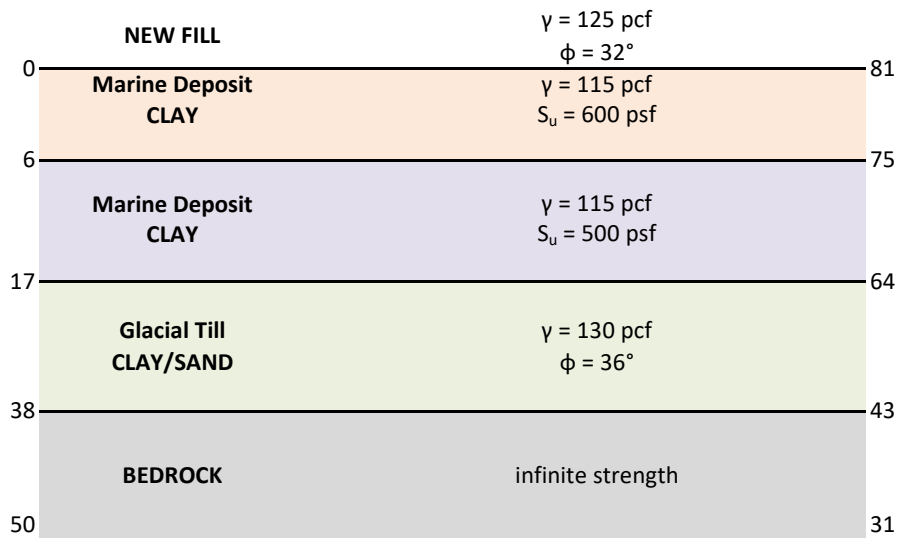
Subject: Global Stability - Area 1

Checked by: EMS

STA 67+00 Continued
Boring BB-BFB1-101 (distance from the center= 6.4 LT)

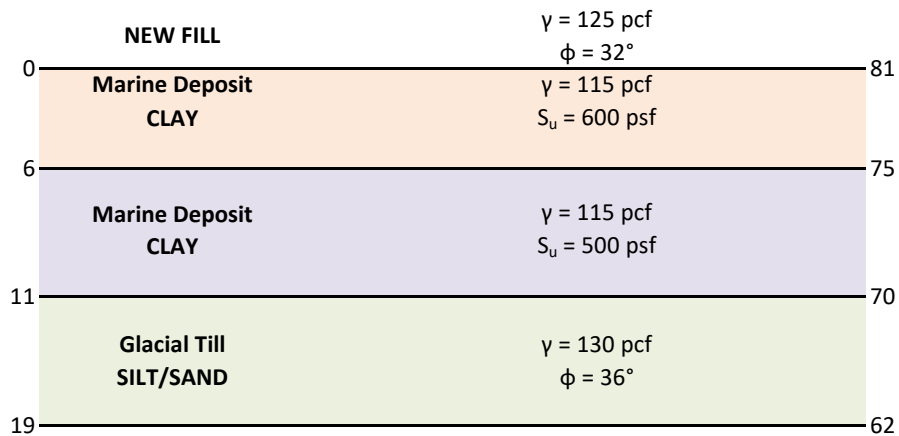
DEPTH (ft)

ELEVATION (ft)


Boring HB-BE-214 (distance from the center= 71.8 RT)

DEPTH (ft)

ELEVATION (ft)



Client: Maine Department of Transportation

Date: 6-May-2021

Project: I-395/Route 9 Connector - WIN 18915.00

Computed by: SSM

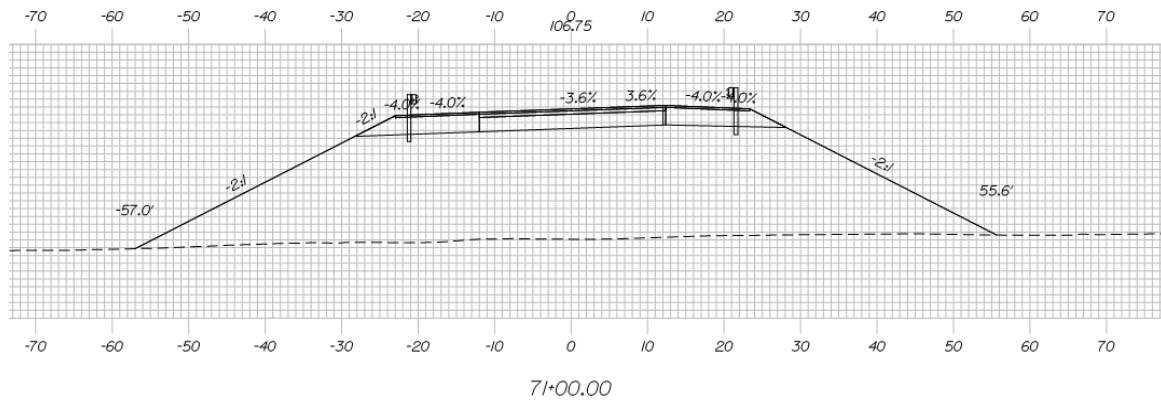
Subject: Global Stability - Area 1

Checked by: EMS

STA 71+00 GEOMETRY

Fill height = 17 ft

Ground surface at center = El. 90


STA 71+00 SOIL PROFILE AND PROPERTIES (not to scale)

Based on boring HB-BE-111

Groundwater depth = 5 ft

DEPTH (ft)		ELEVATION (ft)
0	NEW FILL $\gamma = 125 \text{ pcf}$ $\phi = 32^\circ$	90
5	Marine Deposit SILT $\gamma = 115 \text{ pcf}$ $\phi = 28^\circ$	85
10	Marine Deposit CLAY $\gamma = 115 \text{ pcf}$ $S_u = 650 \text{ psf}$	80
12	Marine Deposit CLAY $\gamma = 115 \text{ pcf}$ $S_u = 600 \text{ psf}$	78
20	Glacial Till SAND $\gamma = 130 \text{ pcf}$ $\phi = 36^\circ$	70

Client: Maine Department of Transportation

Date: 6-May-2021

Project: I-395/Route 9 Connector - WIN 18915.00

Computed by: SSM

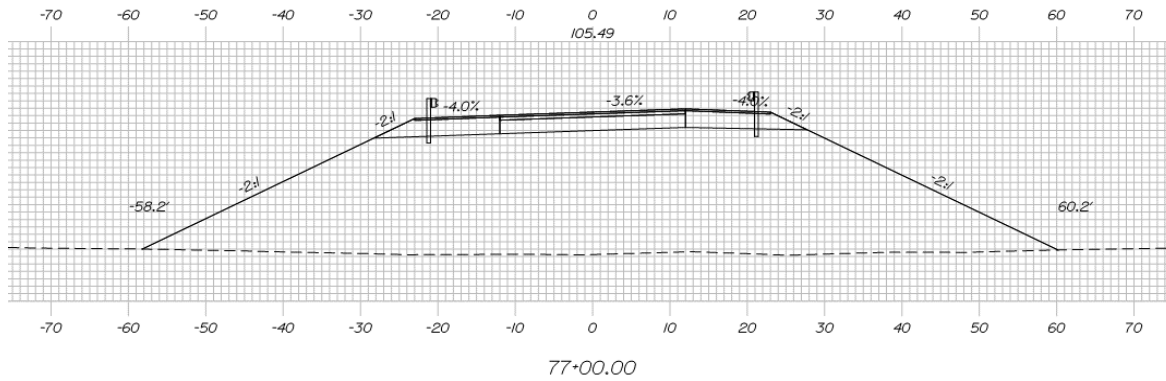
Subject: Global Stability - Area 1

Checked by: EMS

STA 77+00 GEOMETRY

Fill height = 19 ft

Ground surface at center = El. 86


STA 77+00 SOIL PROFILE AND PROPERTIES (not to scale)

Based on boring BB-BST1-201

Groundwater depth = 5 ft

DEPTH (ft)

ELEVATION (ft)

	NEW FILL	$\gamma = 125 \text{ pcf}$ $\phi = 32^\circ$	
0	Marine Deposit CLAY	$\gamma = 115 \text{ pcf}$ $S_u = 650 \text{ psf}$	86
6	Marine Deposit CLAY	$\gamma = 115 \text{ pcf}$ $S_u = 600 \text{ psf}$	80
11	Marine Deposit CLAY	$\gamma = 130 \text{ pcf}$ $S_u = 500 \text{ psf}$	75
23	Glacial Till SAND	$\gamma = 130 \text{ pcf}$ $\phi = 36^\circ$	63
32	BEDROCK	infinite strength	54
42			44

Client: Maine Department of Transportation

Date: 6-May-2021

Project: I-395/Route 9 Connector - WIN 18915.00

Computed by: SSM

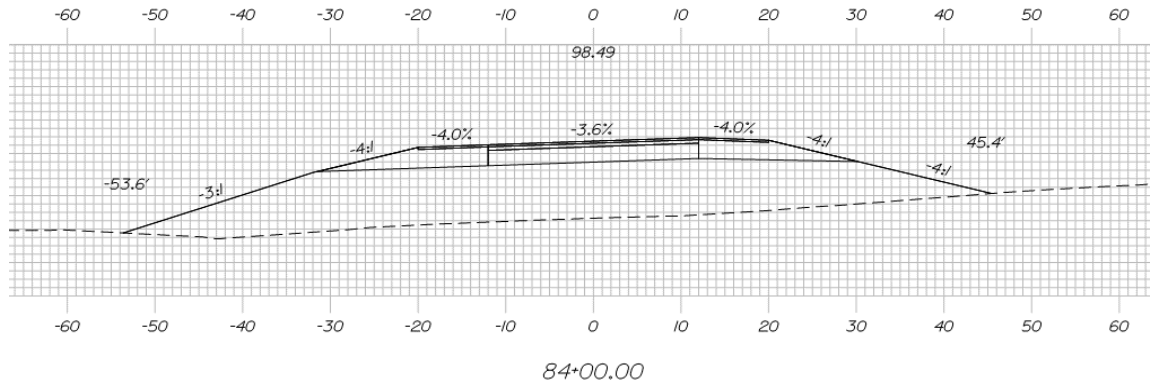
Subject: Global Stability - Area 1

Checked by: EMS

STA 84+00 GEOMETRY

Fill height = 9 ft

Ground surface at center = El. 89


STA 84+00 SOIL PROFILE AND PROPERTIES (not to scale)

Based on boring BB-BFB2-201, BB-BFB2-101 and BB-BFB2-202

Groundwater depth = (3.3, 3.3 and 0.5) ft based on boring (BB-BFB2-201, BB-BFB2-101 and BB-BFB2-202)

Boring BB-BFB2-201 (distance from the center= 38.6 LT)

DEPTH (ft)

ELEVATION (ft)

NEW FILL		$\gamma = 125 \text{ pcf}$ $\phi = 32^\circ$	
0	Marine Deposit CLAY	$\gamma = 115 \text{ pcf}$ $S_u = 650 \text{ psf}$	89
9	Marine Deposit CLAY	$\gamma = 115 \text{ pcf}$ $S_u = 600 \text{ psf}$	80
14	Marine Deposit CLAY	$\gamma = 115 \text{ pcf}$ $S_u = 500 \text{ psf}$	75
16	Glacial Till SILT/SAND	$\gamma = 130 \text{ pcf}$ $\phi = 36^\circ$	73
34	BEDROCK	infinite strength	55
44			45

Client: Maine Department of Transportation
Project: I-395/Route 9 Connector - WIN 18915.00
Subject: Global Stability - Area 1

STA 84+00 Continued
Boring BB-BFB2-101 (distance from the center= 17.9 LT)

DEPTH (ft)		ELEVATION (ft)
0	NEW FILL $\gamma = 125 \text{ pcf}$ $\phi = 32^\circ$	89
5	Marine Deposit SILT $\gamma = 115 \text{ pcf}$ $\phi = 30^\circ$	84
9	Marine Deposit CLAY $\gamma = 115 \text{ pcf}$ $S_u = 650 \text{ psf}$	80
14	Marine Deposit CLAY $\gamma = 115 \text{ pcf}$ $S_u = 600 \text{ psf}$	75
20	Marine Deposit CLAY $\gamma = 115 \text{ pcf}$ $S_u = 500 \text{ psf}$	69
31	Glacial Till SAND $\gamma = 130 \text{ pcf}$ $\phi = 36^\circ$	58
42	BEDROCK infinite strength	47

Boring BB-BFB2-202 (distance from the center= 35.2 RT)

DEPTH (ft)		ELEVATION (ft)
0	NEW FILL $\gamma = 125 \text{ pcf}$ $\phi = 32^\circ$	89
9	Marine Deposit CLAY $\gamma = 115 \text{ pcf}$ $S_u = 650 \text{ psf}$	80
15	Marine Deposit CLAY $\gamma = 115 \text{ pcf}$ $S_u = 600 \text{ psf}$	74
26	Glacial Till SILT/SAND $\gamma = 130 \text{ pcf}$ $\phi = 36^\circ$	63
35	BEDROCK infinite strength	54

Client: Maine Department of Transportation

Date: 6-May-2021

Project: I-395/Route 9 Connector - WIN 18915.00

Computed by: SSM

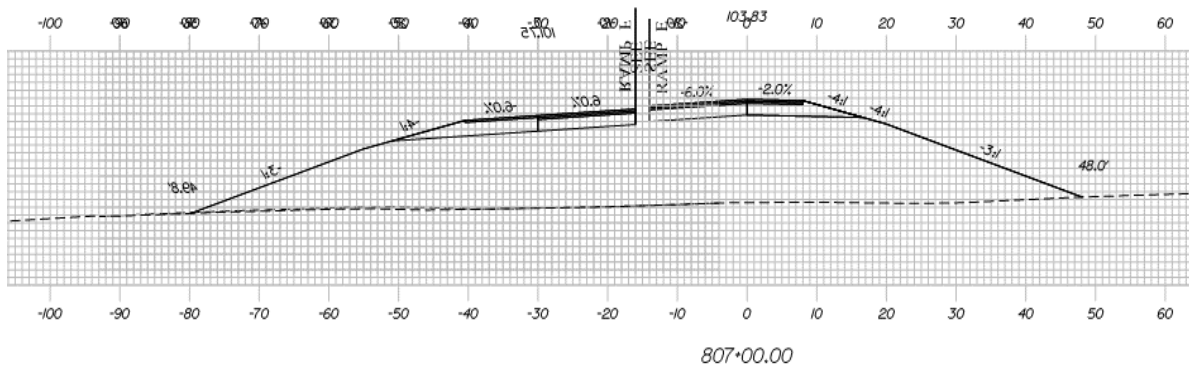
Subject: Global Stability - Area 1

Checked by: EMS

STA 710+00 and 807+00 GEOMETRY

Fill height = 13.5 ft

Ground surface at center = El. 90


STA 710+00 SOIL PROFILE AND PROPERTIES (not to scale)

Based on boring HB-BE-208

Groundwater depth = 7 ft

DEPTH (ft)

ELEVATION (ft)

	NEW FILL	$\gamma = 125 \text{ pcf}$ $\phi = 32^\circ$	
0	Marine Deposit CLAY	$\gamma = 115 \text{ pcf}$ $S_u = 650 \text{ psf}$	90
10	Marine Deposit CLAY	$\gamma = 115 \text{ pcf}$ $S_u = 600 \text{ psf}$	80
14	Glacial Till SAND/GRAVEL	$\gamma = 130 \text{ pcf}$ $\phi = 36^\circ$	76
21			69

Client: Maine Department of Transportation

Date: 6-May-2021

Project: I-395/Route 9 Connector - WIN 18915.00

Computed by: SSM

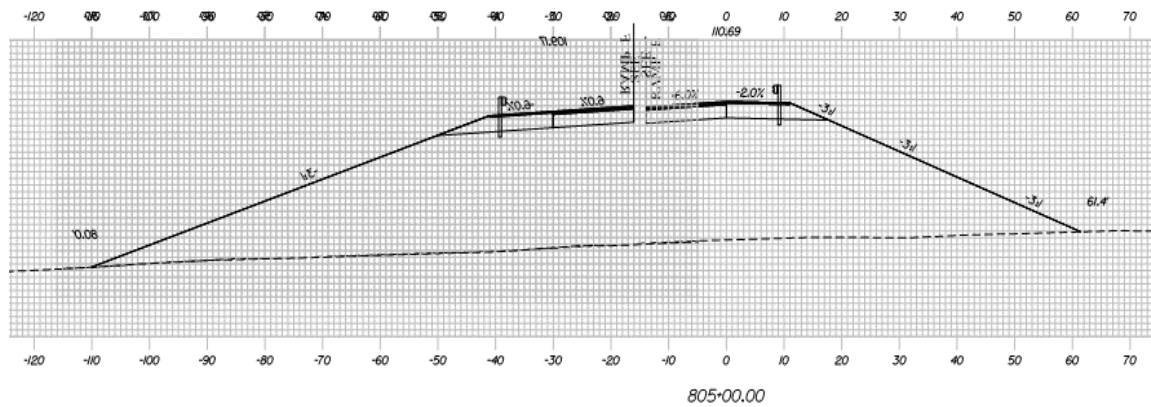
Subject: Global Stability - Area 1

Checked by: EMS

STA 712+00 and 805+00 GEOMETRY

Fill height = 21 ft

Ground surface at center = El. 90


STA 712+00 and 805+00 SOIL PROFILE AND PROPERTIES (not to scale)

Based on boring HB-BE-105

Groundwater depth = 4.4 ft

DEPTH (ft)

ELEVATION (ft)

	NEW FILL	$\gamma = 125 \text{ pcf}$ $\phi = 32^\circ$	
0	Marine Deposit SILT	$\gamma = 115 \text{ pcf}$ $\phi = 30^\circ$	90
8	Marine Deposit CLAY	$\gamma = 115 \text{ pcf}$ $S_u = 600 \text{ psf}$	82
15	Marine Deposit CLAY	$\gamma = 115 \text{ pcf}$ $S_u = 500 \text{ psf}$	75
17	Glacial Till SAND	$\gamma = 130 \text{ pcf}$ $\phi = 36^\circ$	73
21	BEDROCK	infinite strength	69
23			67

Client: Maine Department of Transportation

Date: 6-May-2021

Project: I-395/Route 9 Connector - WIN 18915.00

Computed by: SSM

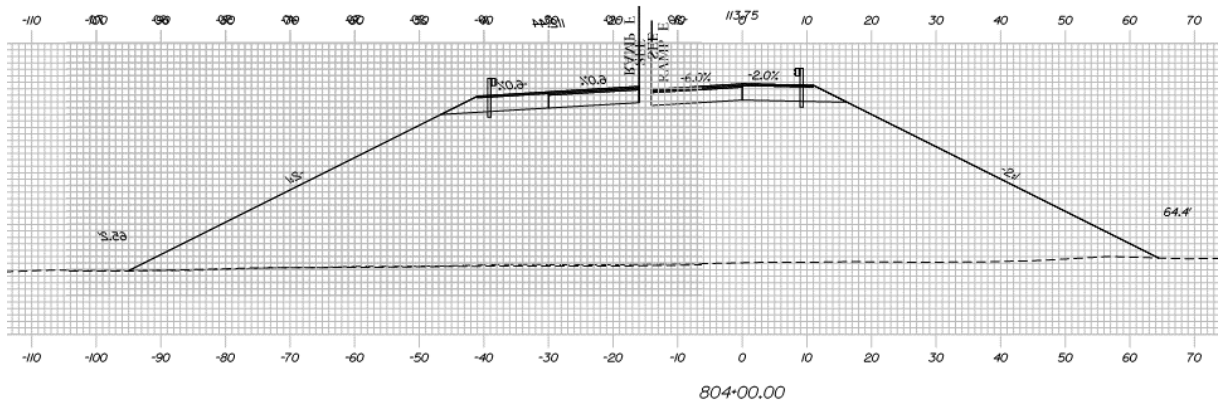
Subject: Global Stability - Area 1

Checked by: EMS

STA 713+00 and 804+00 GEOMETRY

Fill height = 28 ft

Ground surface at center = El. 86


STA 713+00 and 804+00 SOIL PROFILE AND PROPERTIES (not to scale)

Based on boring HB-BE-209, HB-BE-210 and HB-BE-211

Groundwater depth = (0.7, 1.3 and 2) ft based on boring (HB-BE-209, HB-BE-210 and HB-BE-211)

Boring HB-BE-209 (distance from the center= 121.3 RT)

DEPTH (ft)

ELEVATION (ft)

	NEW FILL	$\gamma = 125 \text{ pcf}$ $\phi = 32^\circ$	
0	Marine Deposit CLAY	$\gamma = 115 \text{ pcf}$ $S_u = 650 \text{ psf}$	86
6	Marine Deposit CLAY	$\gamma = 115 \text{ pcf}$ $S_u = 600 \text{ psf}$	80
11	Marine Deposit CLAY	$\gamma = 115 \text{ pcf}$ $S_u = 500 \text{ psf}$	75
16	Glacial Till SILT/GRAVEL	$\gamma = 130 \text{ pcf}$ $\phi = 36^\circ$	70
21	BEDROCK	infinite strength	65
23			63

Client: Maine Department of Transportation

Project: I-395/Route 9 Connector - WIN 18915.00

Subject: Global Stability - Area 1

Date: 6-May-2021

Computed by: SSM

Checked by: EMS

STA 713+00 and 804+00 Continued
Boring HB-BE-210 (distance from the center= 19.8 LT)

DEPTH (ft)

ELEVATION (ft)

0	NEW FILL	$\gamma = 125 \text{ pcf}$ $\phi = 32^\circ$	86
6	Marine Deposit CLAY	$\gamma = 115 \text{ pcf}$ $S_u = 650 \text{ psf}$	80
11	Marine Deposit CLAY	$\gamma = 115 \text{ pcf}$ $S_u = 600 \text{ psf}$	75
20	Marine Deposit CLAY	$\gamma = 115 \text{ pcf}$ $S_u = 500 \text{ psf}$	66
23	Glacial Till SAND	$\gamma = 130 \text{ pcf}$ $\phi = 36^\circ$	63
25	BEDROCK	infinite strength	61

Boring HB-BE-211 (distance from the center= 89.7 RT)

DEPTH (ft)

ELEVATION (ft)

0	NEW FILL	$\gamma = 125 \text{ pcf}$ $\phi = 32^\circ$	86
5	Marine Deposit SILT	$\gamma = 115 \text{ pcf}$ $\phi = 28^\circ$	81
11	Marine Deposit CLAY	$\gamma = 115 \text{ pcf}$ $S_u = 600 \text{ psf}$	75
14	Marine Deposit CLAY	$\gamma = 115 \text{ pcf}$ $S_u = 500 \text{ psf}$	72
35	Glacial Till SAND	$\gamma = 130 \text{ pcf}$ $\phi = 36^\circ$	51

Client: Maine Department of Transportation

Date: 6-May-2021

Project: I-395/Route 9 Connector - WIN 18915.00

Computed by: SSM

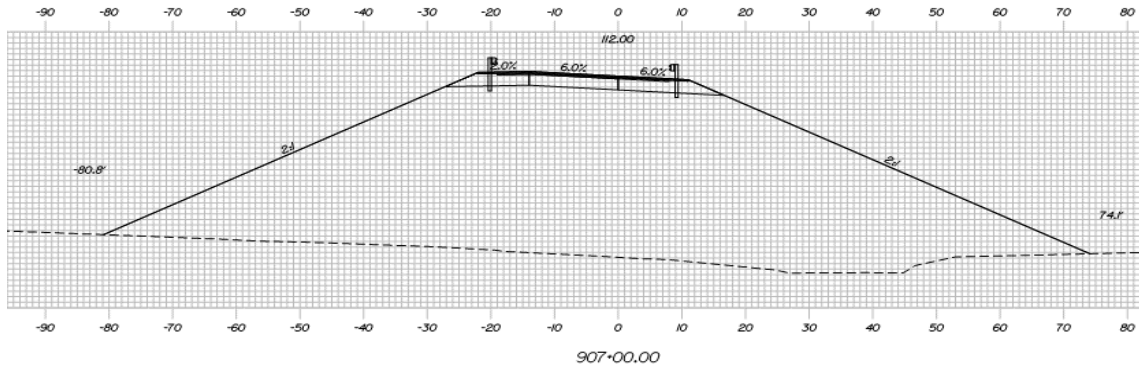
Subject: Global Stability - Area 1

Checked by: EMS

STA 907+00 GEOMETRY

Fill height = 34 ft

Ground surface at center = El. 79


STA 907+00 SOIL PROFILE AND PROPERTIES (not to scale)

Based on boring HB-BE-202, HB-BE-239 and HB-BE-203

Groundwater depth = (0, 6.6 and 0) ft based on boring (HB-BE-202, HB-BE-239 and HB-BE-203)

Boring HB-BE-202

(distance from the center= 81.5 LT)

DEPTH (ft)

ELEVATION (ft)

NEW FILL		$\gamma = 125 \text{ pcf}$ $\phi = 32^\circ$	
0	Marine Deposit CLAY	$\gamma = 115 \text{ pcf}$ $S_u = 600 \text{ psf}$	79
4	Marine Deposit CLAY	$\gamma = 115 \text{ pcf}$ $S_u = 500 \text{ psf}$	75
19	Marine Deposit CLAY	$\gamma = 115 \text{ pcf}$ $S_u = 400 \text{ psf}$	60
31	Glacial Till GRAVEL	$\gamma = 130 \text{ pcf}$ $\phi = 36^\circ$	48
33	BEDROCK	infinite strength	46
37			42

Client: Maine Department of Transportation
Project: I-395/Route 9 Connector - WIN 18915.00
Subject: Global Stability - Area 1

STA 907+00 Continued
Boring HB-BE-239 (distance from the center= 2.2 LT)

DEPTH (ft)

ELEVATION (ft)

	NEW FILL	$\gamma = 125 \text{ pcf}$ $\phi = 32^\circ$	
0	Marine Deposit CLAY	$\gamma = 125 \text{ pcf}$ $S_u = 600 \text{ psf}$	79
4	Marine Deposit CLAY	$\gamma = 115 \text{ pcf}$ $S_u = 500 \text{ psf}$	75
19	Marine Deposit CLAY	$\gamma = 115 \text{ pcf}$ $S_u = 400 \text{ psf}$	60
25	BEDROCK	infinite strength	54
30			49

Boring HB-BE-203 (distance from the center= 66.2 RT)

DEPTH (ft)

ELEVATION (ft)

	NEW FILL	$\gamma = 125 \text{ pcf}$ $\phi = 32^\circ$	
0	Marine Deposit CLAY	$\gamma = 115 \text{ pcf}$ $S_u = 600 \text{ psf}$	79
4	Marine Deposit CLAY	$\gamma = 115 \text{ pcf}$ $S_u = 500 \text{ psf}$	75
19	Marine Deposit CLAY	$\gamma = 115 \text{ pcf}$ $S_u = 400 \text{ psf}$	60
23	Glacial Till SAND	$\gamma = 130 \text{ pcf}$ $\phi = 36^\circ$	56
29			50

Client: Maine Department of Transportation

Project: I-395/Route 9 Connector - WIN 18915.00

Computed by: SSM

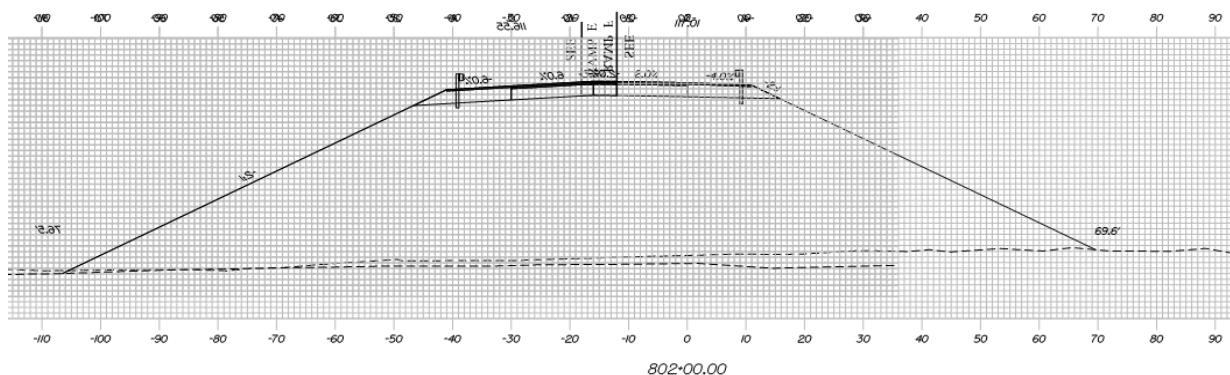
Subject: Global Stability - Area 1

Checked by: EMS

STA 714+50 and 802+00 GEOMETRY

Fill height = 31 ft

Ground surface at center = El. 86


STA 802+00 SOIL PROFILE AND PROPERTIES (not to scale)

Based on boring HB-BE-243

Groundwater depth = 2.7 ft based on boring HB-BE-243

Boring HB-BE-209

DEPTH (ft)

ELEVATION (ft)

NEW FILL		$\gamma = 125 \text{ pcf}$ $\phi = 32^\circ$	
0	Marine Deposit CLAY	$\gamma = 115 \text{ pcf}$ $S_u = 650 \text{ psf}$	86
6	Marine Deposit CLAY	$\gamma = 115 \text{ pcf}$ $S_u = 600 \text{ psf}$	80
11	Marine Deposit CLAY	$\gamma = 115 \text{ pcf}$ $S_u = 500 \text{ psf}$	75
25	Glacial Till GRAVEL	$\gamma = 130 \text{ pcf}$ $\phi = 36^\circ$	61
27	BEDROCK	infinite strength	59
30			56

Temporary Condition

Client: Maine Department of Transportation

Project: I-395/Route 9 Connector - WIN 18915.00

Subject: Global Stability - Area 1

RESULTS AND CONCLUSIONS - TEMPORARY CONDITION

Left to Right (F.S=1.15)

Station	Height of Embankment	Maximum Temporary First Stage Fill Height	Factor of Safety (Spencer Method)	Factor of Safety (Bishop Simplified Method)	Factor of Safety (GLE/Morgenstern-Price Method)
Sta. 53+25	21	18	1.18	1.18	1.19
Sta. 56+00	15.5	17.5*	1.23	1.23	1.23
Sta. 59+00	13	13	1.90	1.90	1.88
Sta. 63+00	16.5	16.5	1.3	1.31	1.31
Sta. 65+00	19.5	19	1.19	1.15	1.18
Sta. 67+00	21.5	21.5	1.2	1.22	1.2
Sta. 71+00	17	17	1.71	1.73	1.70
Sta. 77+00	19	19	1.24	1.25	1.25
Sta. 84+00	9	9	3.53	3.54	3.54
Sta. 710+00	13.5	13.5	2.25	2.27	2.26
Sta. 712+00	21	21	1.60	1.59	1.58
Sta. 713+00	28	22	1.18	1.18	1.17
Sta. 907+00	34	20	1.16	1.16	1.17
Sta. 802+00	31	21	1.19	1.20	1.20

Right to Left (F.S=1.15)

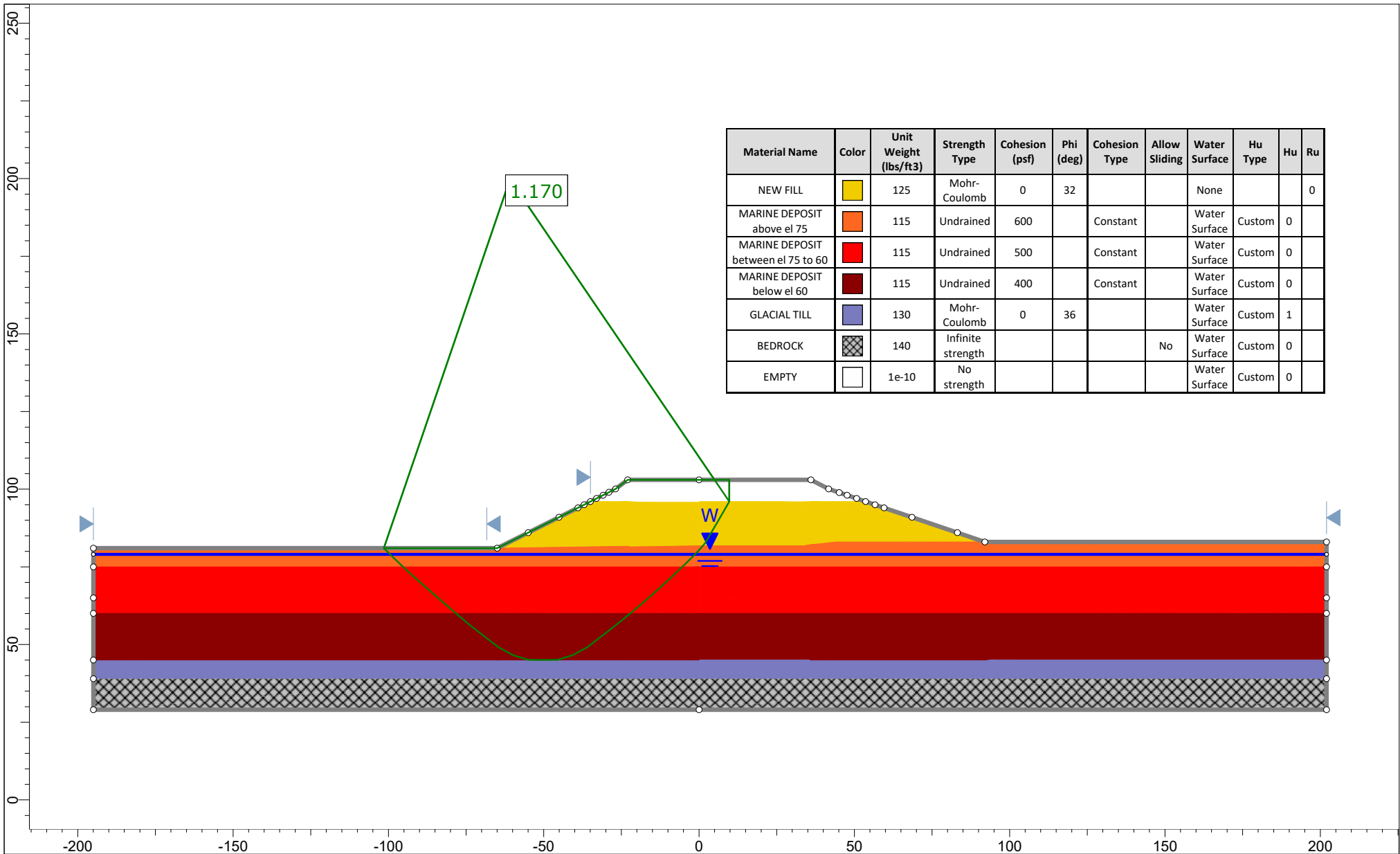
Station	Height of Embankment	Maximum Temporary First Stage Fill Height	Factor of Safety (Spencer Method)	Factor of Safety (Bishop Simplified Method)	Factor of Safety (GLE/Morgenstern-Price Method)
Sta. 53+25	21	16	1.15	1.15	1.16
Sta. 56+00	15.5	17.5*	1.29	1.28	1.28
Sta. 59+00	13	13	1.72	1.73	1.71
Sta. 63+00	16.5	16.5	1.52	1.54	1.53
Sta. 65+00	19.5	18	1.21	1.17	1.20
Sta. 67+00	21.5	20	1.16	1.17	1.17
Sta. 71+00	17	17	1.59	1.63	1.59
Sta. 77+00	19	19	1.26	1.27	1.27
Sta. 84+00	9	9	2.34	2.36	2.35
Sta. 710+00	13.5	13.5	2.26	2.29	2.28
Sta. 712+00	21	21	1.42	1.46	1.42
Sta. 713+00	28	20	1.19	1.20	1.19
Sta. 907+00	34	24	1.17	1.17	1.17

Non-circular (F.S=1.15)

Station	Height of Embankment	Maximum Temporary First Stage Fill Height	Factor of Safety (Spencer Method)	Factor of Safety (GLE/Morgenstern-Price Method)
Sta. 53+25	21	14 (R to L)	1.17	1.19
Sta. 65+00	19.5	17 (R to L)	1.15	1.16
Sta. 67+00	21.5	19 (R to L)	1.18	1.19
Sta. 713+00	28	20 (R to L)	1.16	1.17
Sta. 907+00	34	19 (L to R)	1.17	1.18
Sta. 802+00	31	20 (L to R)	1.19	1.21

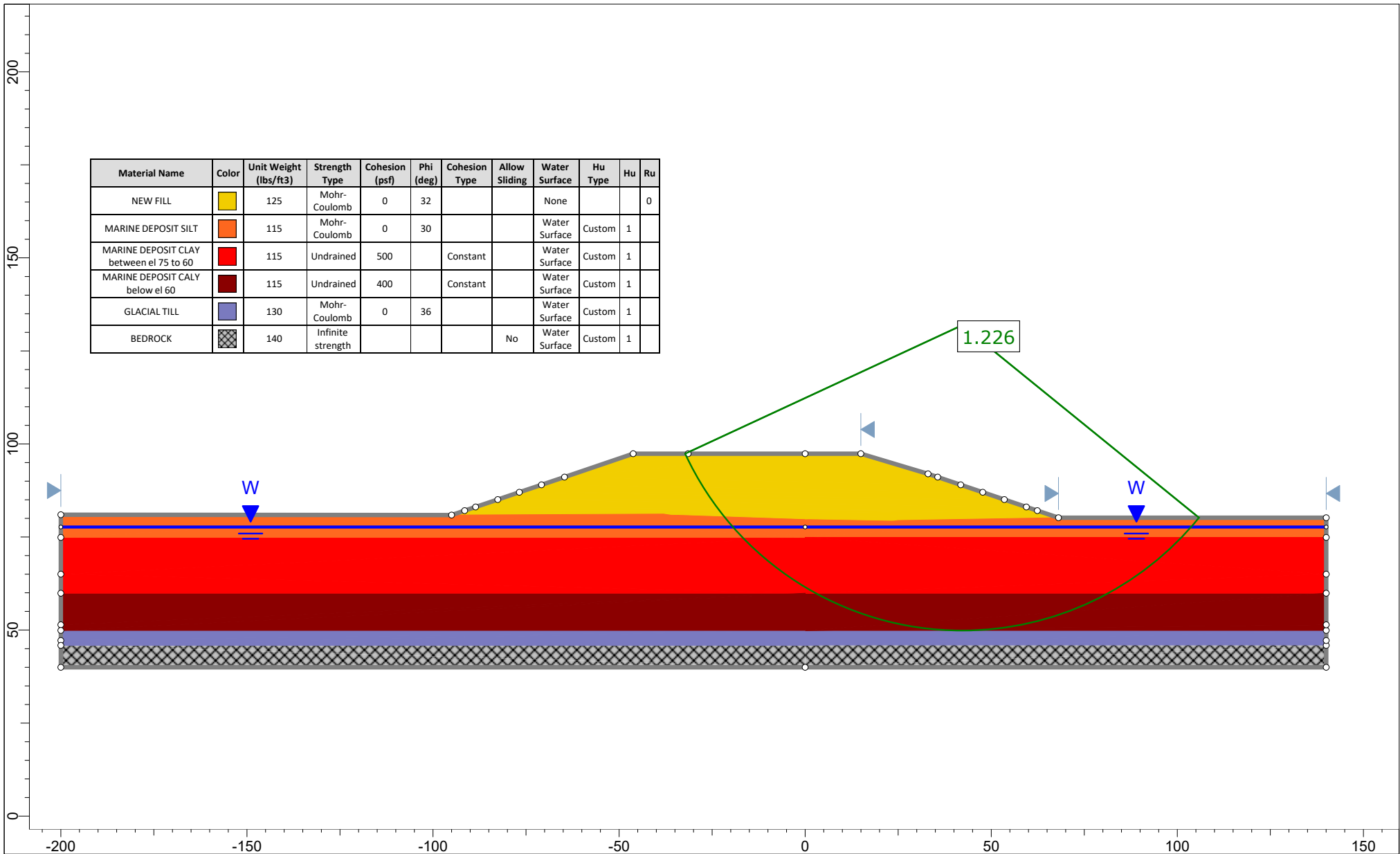
* Note: A 2 ft surcharge was added at station 56+00.







Sta. 53+25



Project				SLIDE - An Interactive Slope Stability Program			
Group		Temporary Case - Sta. 53+25			Scenario		
Drawn By		SSM			Company		
Date		5/27/2020, 3:54:29 PM			File Name		
					2021-0511- Sta 53+25- Right to Left-non-circular-F.S 1.15-D1.slmd		

Sta. 56+00



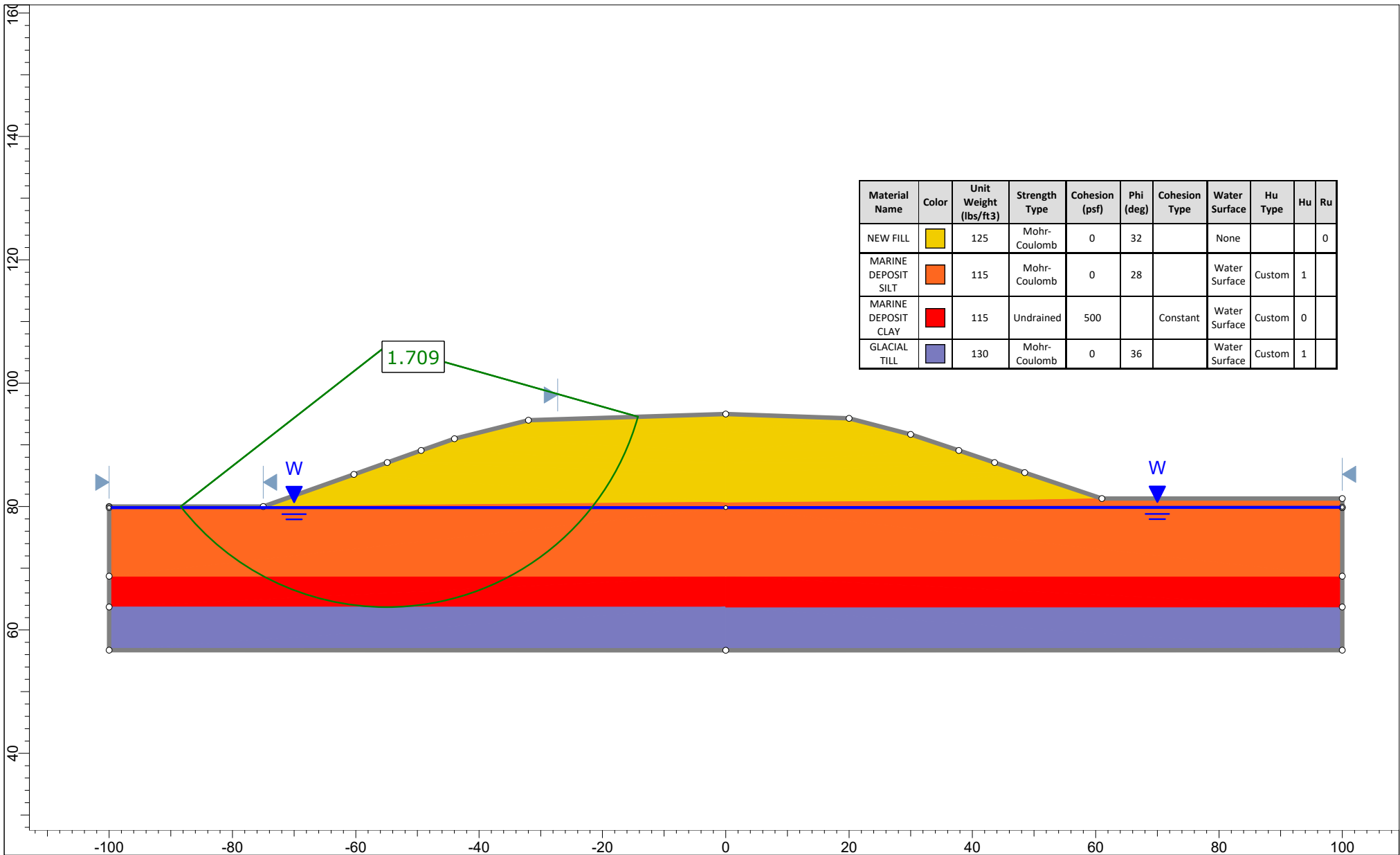
Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Cohesion Type	Allow Sliding	Water Surface	Hu Type	Hu	Ru
NEW FILL		125	Mohr-Coulomb	0	32			None			0
MARINE DEPOSIT SILT		115	Mohr-Coulomb	0	30			Water Surface	Custom	1	
MARINE DEPOSIT CLAY between el 75 to 60		115	Undrained	500		Constant		Water Surface	Custom	1	
MARINE DEPOSIT CALY below el 60		115	Undrained	400		Constant		Water Surface	Custom	1	
GLACIAL TILL		130	Mohr-Coulomb	0	36			Water Surface	Custom	1	
BEDROCK		140	Infinite strength				No	Water Surface	Custom	1	



SLIDEINTERPRET 9.004

Project		SLIDE - An Interactive Slope Stability Program	
Group	Temporary Case - Sta. 56+00	Scenario	Master Scenario
Drawn By	SSM	Company	
Date	8/25/2020, 8:27:33 AM	File Name	2021-0603-STA 56+00-Left to Right-D1.slmd

Sta. 59+00

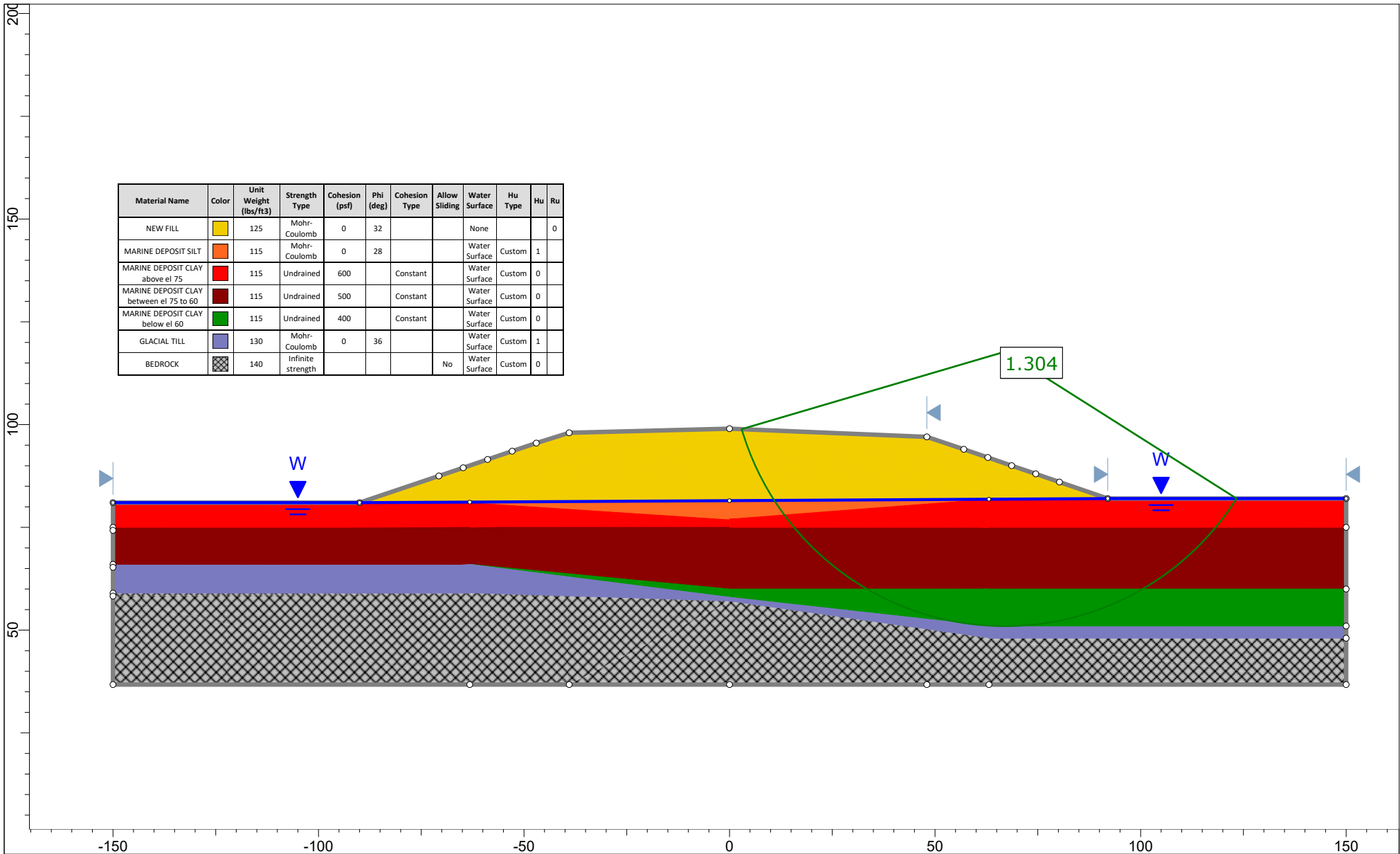









Material Name	Color	Unit Weight (lbs/ft ³)	Strength Type	Cohesion (psf)	Phi (deg)	Cohesion Type	Water Surface	Hu Type	Hu	Ru
NEW FILL		125	Mohr-Coulomb	0	32		None			0
MARINE DEPOSIT SILT		115	Mohr-Coulomb	0	28		Water Surface	Custom	1	
MARINE DEPOSIT CLAY		115	Undrained	500		Constant	Water Surface	Custom	0	
GLACIAL TILL		130	Mohr-Coulomb	0	36		Water Surface	Custom	1	




Project				SLIDE - An Interactive Slope Stability Program			
Group		Temporary Case		Scenario		Master Scenario	
Drawn By		SSM		Company			
Date		5/5/2021, 3:55:25 PM		File Name		2021-0505-Sta 59+00- Right to Left.slmd	

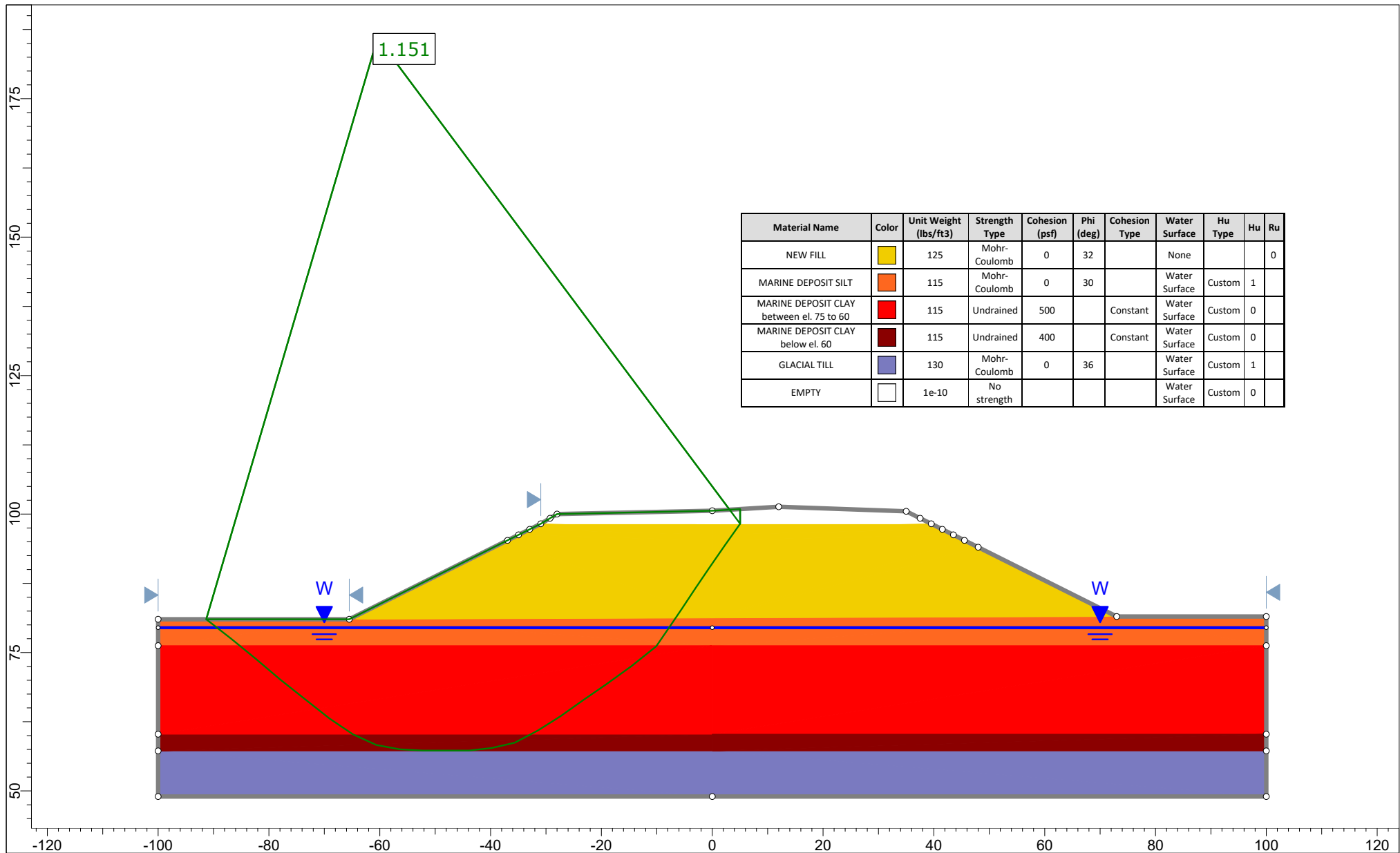
Sta. 63+00



Material Name	Color	Unit Weight (lbs/ft ³)	Strength Type	Cohesion (psf)	Phi (deg)	Cohesion Type	Allow Sliding	Water Surface	Hu Type	Hu	Ru
NEW FILL		125	Mohr-Coulomb	0	32			None			0
MARINE DEPOSIT SILT		115	Mohr-Coulomb	0	28			Water Surface	Custom	1	
MARINE DEPOSIT CLAY above el 75		115	Undrained	600		Constant		Water Surface	Custom	0	
MARINE DEPOSIT CLAY between el 75 to 60		115	Undrained	500		Constant		Water Surface	Custom	0	
MARINE DEPOSIT CLAY below el 60		115	Undrained	400		Constant		Water Surface	Custom	0	
GLACIAL TILL		130	Mohr-Coulomb	0	36			Water Surface	Custom	1	
BEDROCK		140	Infinite strength				No	Water Surface	Custom	0	

	Project		SLIDE - An Interactive Slope Stability Program	
	Group		Temporary Case	Scenario
	Drawn By		SSM	Company
	Date		5/5/2021, 4:59:04 PM	File Name
				2021-0505-Sta 63+00- Left to Right-Elev..slmd

Sta. 65+00



Project

SLIDE - An Interactive Slope Stability Program

Group

Temporary Case-Sta. 65+00

Scenario

Master Scenario

Drawn By

SSM

Company

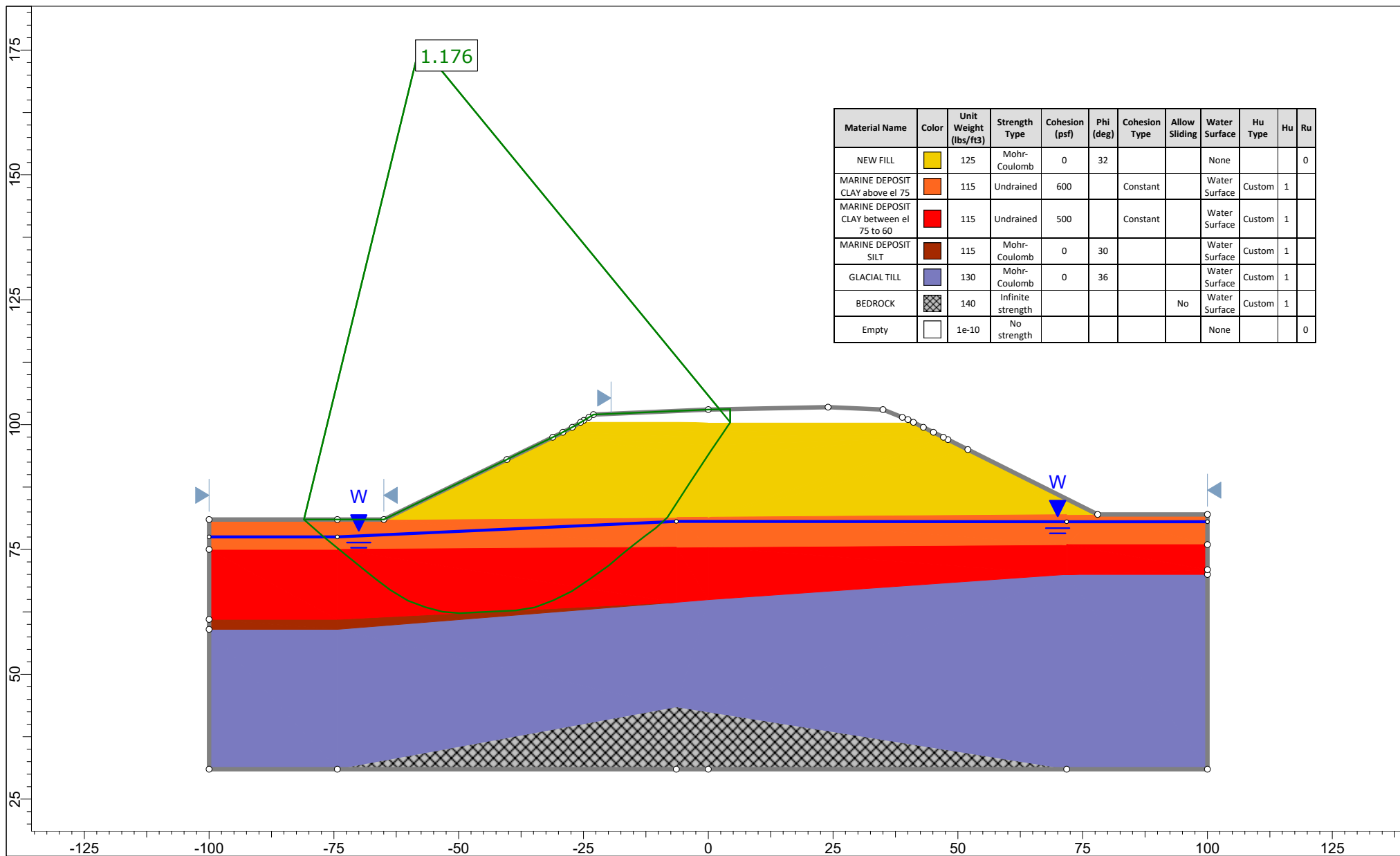
Date

5/6/2021, 6:45:43 PM

File Name

2021-0506-Sta 65+00- Right to Left-non-circular-F.S 1.15.slmd

Sta. 67+00



Material Name	Color	Unit Weight (lbs/ft³)	Strength Type	Cohesion (psf)	Phi (deg)	Cohesion Type	Allow Sliding	Water Surface	Hu Type	Hu	Ru
NEW FILL		125	Mohr-Coulomb	0	32			None			0
MARINE DEPOSIT CLAY above el 75		115	Undrained	600		Constant		Water Surface	Custom	1	
MARINE DEPOSIT CLAY between el 75 to 60		115	Undrained	500		Constant		Water Surface	Custom	1	
MARINE DEPOSIT SILT		115	Mohr-Coulomb	0	30			Water Surface	Custom	1	
GLACIAL TILL		130	Mohr-Coulomb	0	36			Water Surface	Custom	1	
BEDROCK		140	Infinite strength				No	Water Surface	Custom	1	
Empty		1e-10	No strength					None			0



Project

SLIDE - An Interactive Slope Stability Program

Group

Temporary Case-67+00

Scenario

Master Scenario

Drawn By

SSM

Company

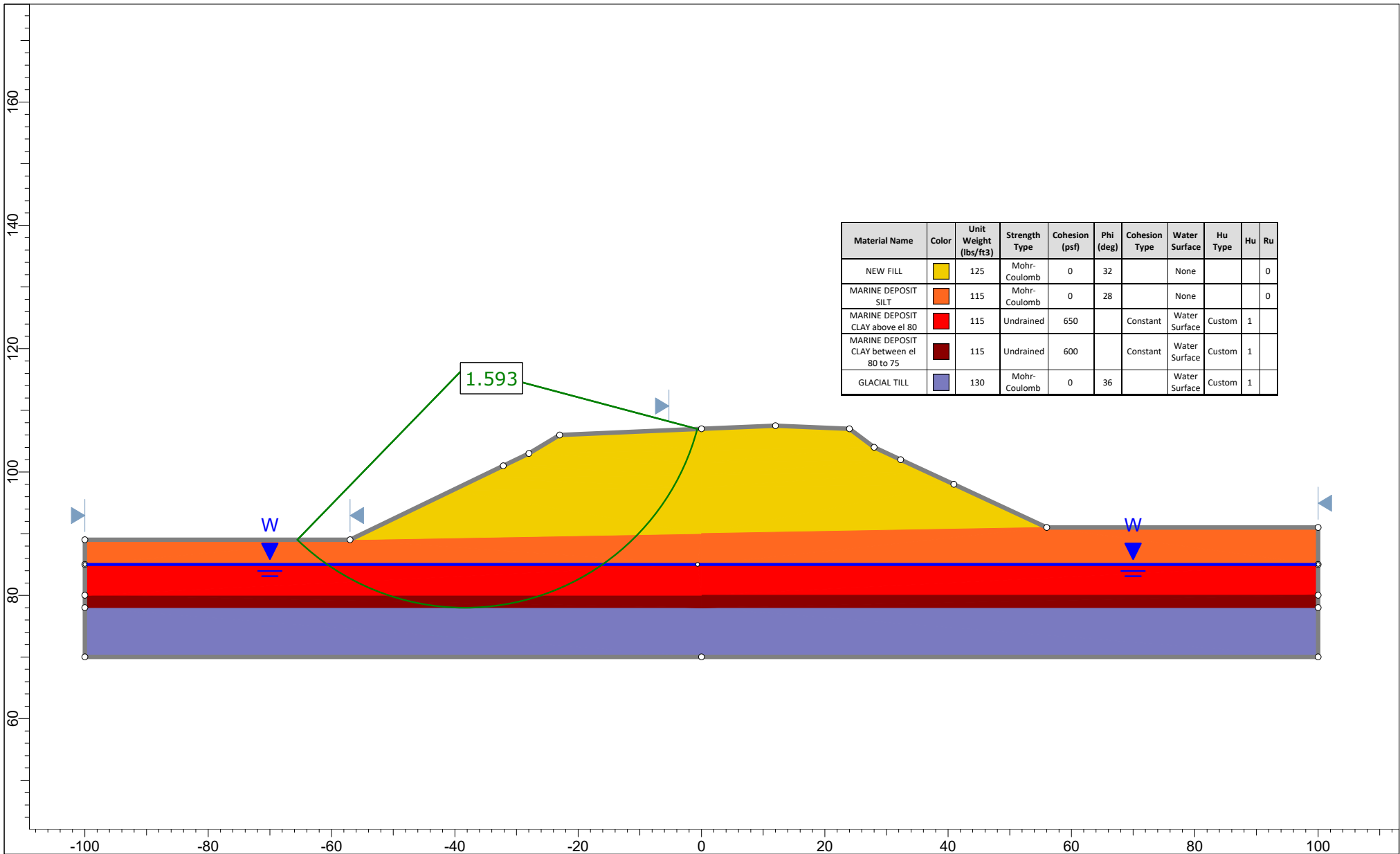
Date

5/10/2021, 10:41:57 AM


File Name

2021-0510-Sta 67+00- Right to Left-Elev.-non-circular-F.S 1.15.slmd

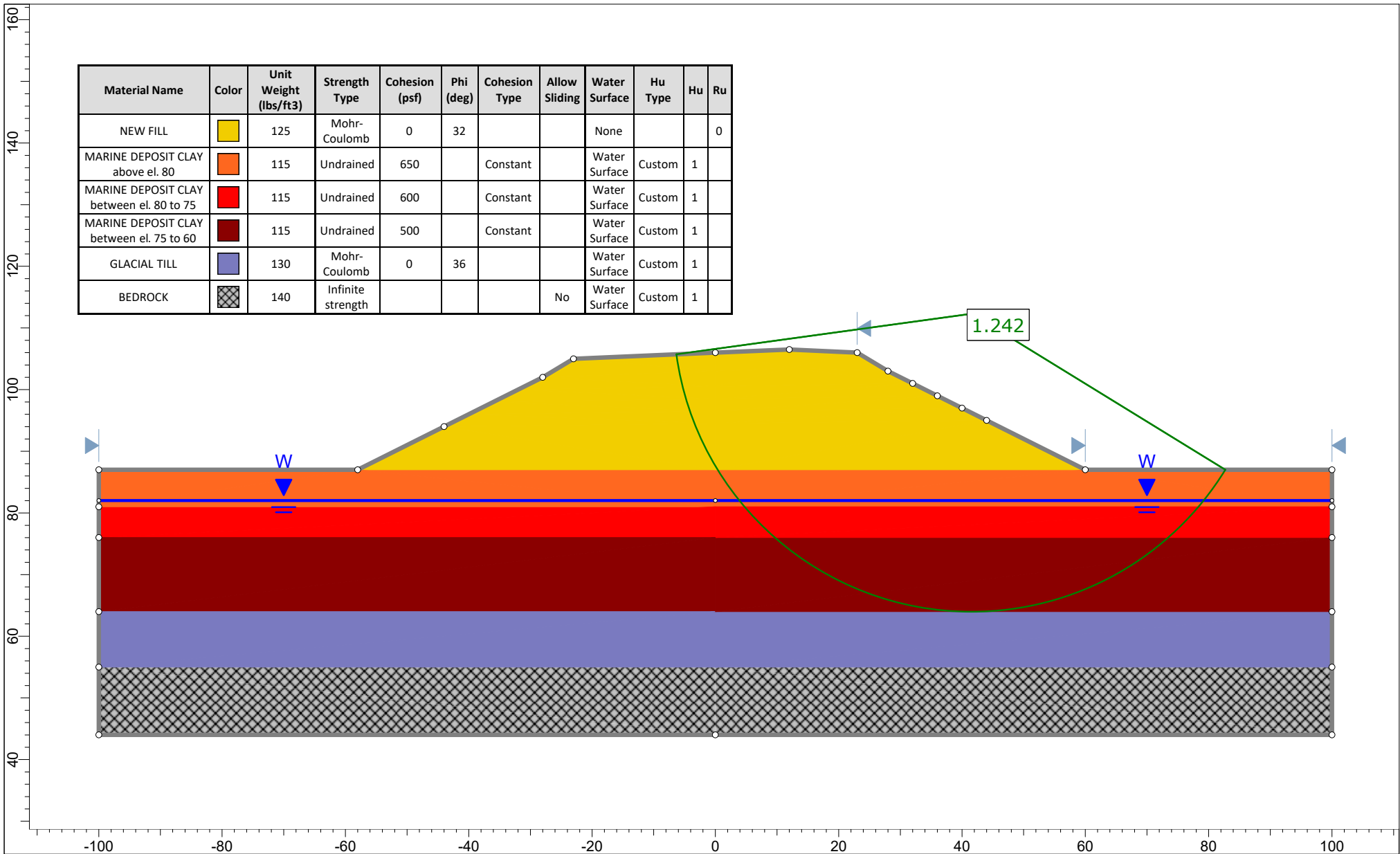
Sta. 71+00










Material Name	Color	Unit Weight (lbs/ft ³)	Strength Type	Cohesion (psf)	Phi (deg)	Cohesion Type	Water Surface	Hu Type	Hu	Ru
NEW FILL		125	Mohr-Coulomb	0	32		None			0
MARINE DEPOSIT SILT		115	Mohr-Coulomb	0	28		None			0
MARINE DEPOSIT CLAY above el 80		115	Undrained	650		Constant	Water Surface	Custom	1	
MARINE DEPOSIT CLAY between el 80 to 75		115	Undrained	600		Constant	Water Surface	Custom	1	
GLACIAL TILL		130	Mohr-Coulomb	0	36		Water Surface	Custom	1	

	Project		SLIDE - An Interactive Slope Stability Program	
	Group	Temporary Case-Sta. 71+00	Scenario	Master Scenario
	Drawn By	SSM	Company	
	Date	5/6/2021, 1:16:22 PM	File Name	2021-0506-Sta 71+00- Right to Left.slmd
	SLIDEINTERPRET 9.004			

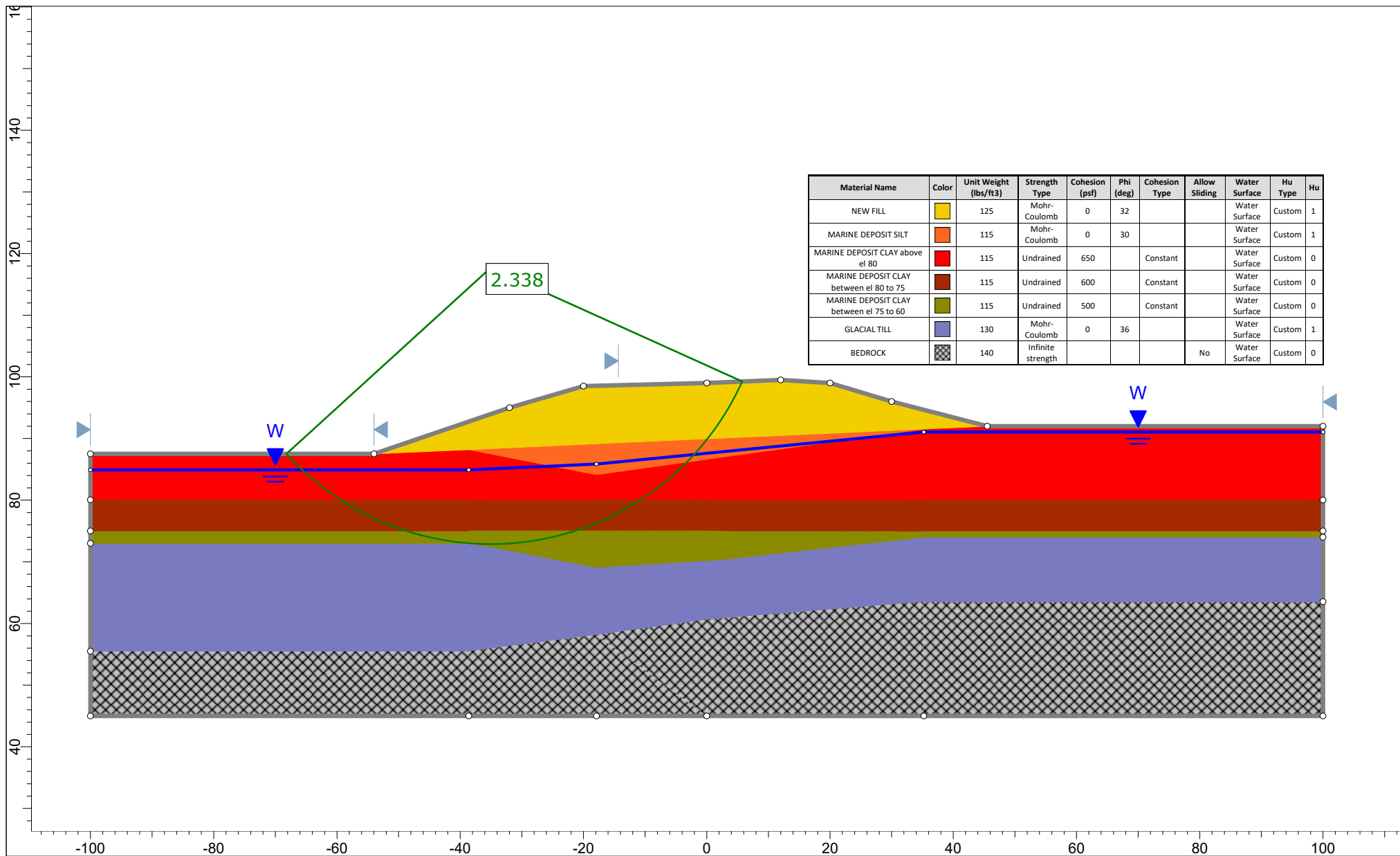
Sta. 77+00










Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Cohesion Type	Allow Sliding	Water Surface	Hu Type	Hu	Ru
NEW FILL		125	Mohr-Coulomb	0	32			None			0
MARINE DEPOSIT CLAY above el. 80		115	Undrained	650		Constant		Water Surface	Custom	1	
MARINE DEPOSIT CLAY between el. 80 to 75		115	Undrained	600		Constant		Water Surface	Custom	1	
MARINE DEPOSIT CLAY between el. 75 to 60		115	Undrained	500		Constant		Water Surface	Custom	1	
GLACIAL TILL		130	Mohr-Coulomb	0	36			Water Surface	Custom	1	
BEDROCK		140	Infinite strength				No	Water Surface	Custom	1	

	Project		SLIDE - An Interactive Slope Stability Program	
	Group		Temporary Case-77+00	Scenario
	Drawn By		SSM	Company
	Date		5/6/2021, 5:11:16 PM	File Name
				2021-0506-Sta 77+00- Left to Right.slmd

Sta. 84+00



Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Cohesion Type	Allow Sliding	Water Surface	Hu Type	Hu
NEW FILL		125	Mohr-Coulomb	0	32			Water Surface	Custom	1
MARINE DEPOSIT SILT		115	Mohr-Coulomb	0	30			Water Surface	Custom	1
MARINE DEPOSIT CLAY above el 80		115	Undrained	650		Constant		Water Surface	Custom	0
MARINE DEPOSIT CLAY between el 80 to 75		115	Undrained	600		Constant		Water Surface	Custom	0
MARINE DEPOSIT CLAY between el 75 to 60		115	Undrained	500		Constant		Water Surface	Custom	0
GLACIAL TILL		130	Mohr-Coulomb	0	36			Water Surface	Custom	1
BEDROCK		140	Infinite strength				No	Water Surface	Custom	0



SLIDEINTERPRET 9.004

Project		SLIDE - An Interactive Slope Stability Program	
Group	Temporary Case-Sta. 84+00	Scenario	Master Scenario
Drawn By	SSM	Company	
Date	5/10/2021, 1:04:20 PM	File Name	2021-0510-Sta 84+00- Right to Left- Elev.slmd

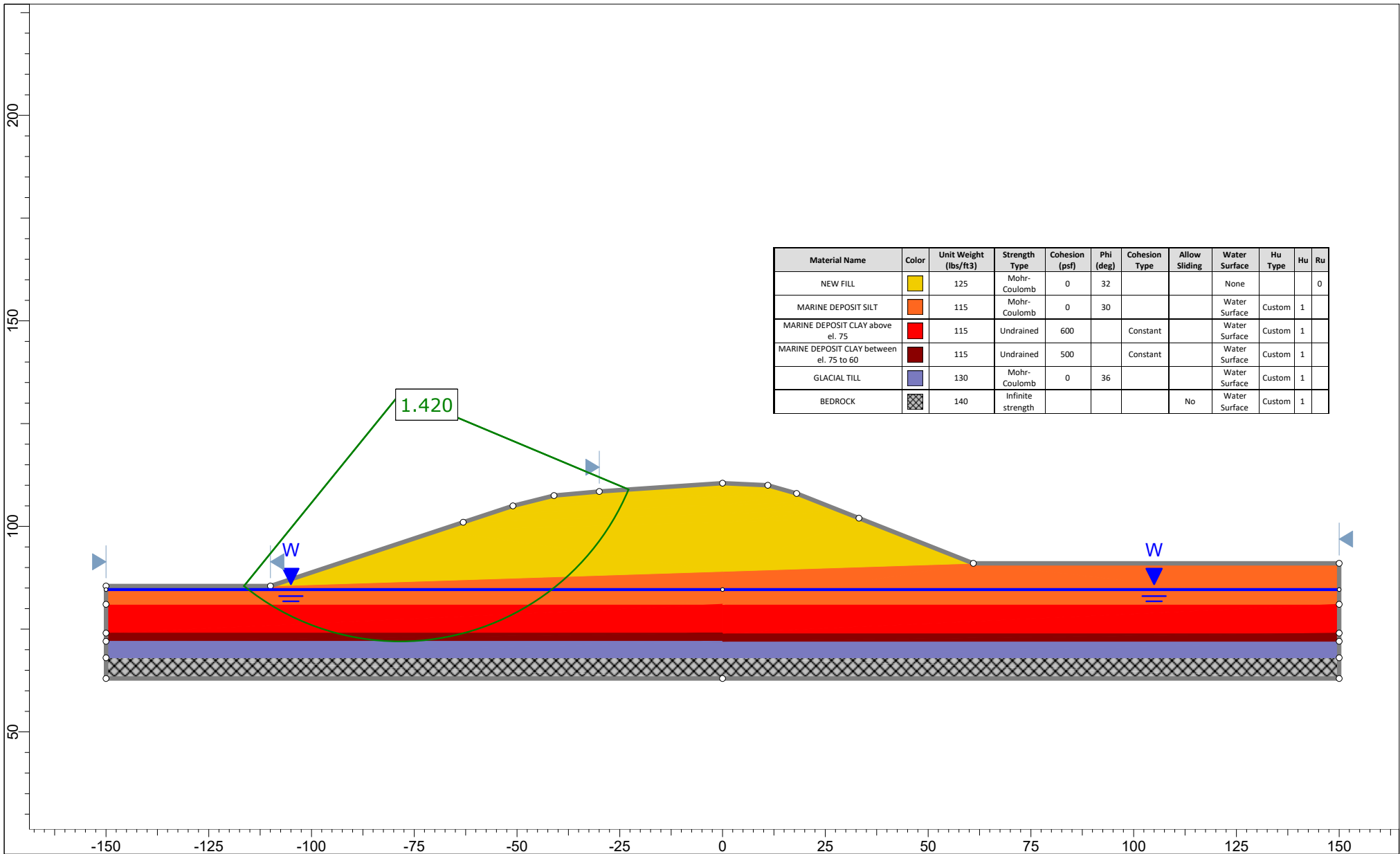
Sta. 710+00 & 807+00

Material Name	Color	Unit Weight (lbs/ft ³)	Strength Type	Cohesion (psf)	Phi (deg)	Cohesion Type	Water Surface	Hu Type	Hu	Ru
NEW FILL	■	125	Mohr-Coulomb	0	32		None			0
MARINE DEPOSIT CLAY above el. 80	■	115	Undrained	650		Constant	Water Surface	Custom	0	
MARINE DEPOSIT CLAY between el. 80 to 75	■	115	Undrained	600		Constant	Water Surface	Custom	0	
GLACIAL TILL	■	130	Mohr-Coulomb	0	36		Water Surface	Custom	1	

SLIDEINTERPRET 9.004

^e 2021-0507-Sta 710+00 and 807+00-Left to Right.slmd

Sta. 712+00 & 805+00



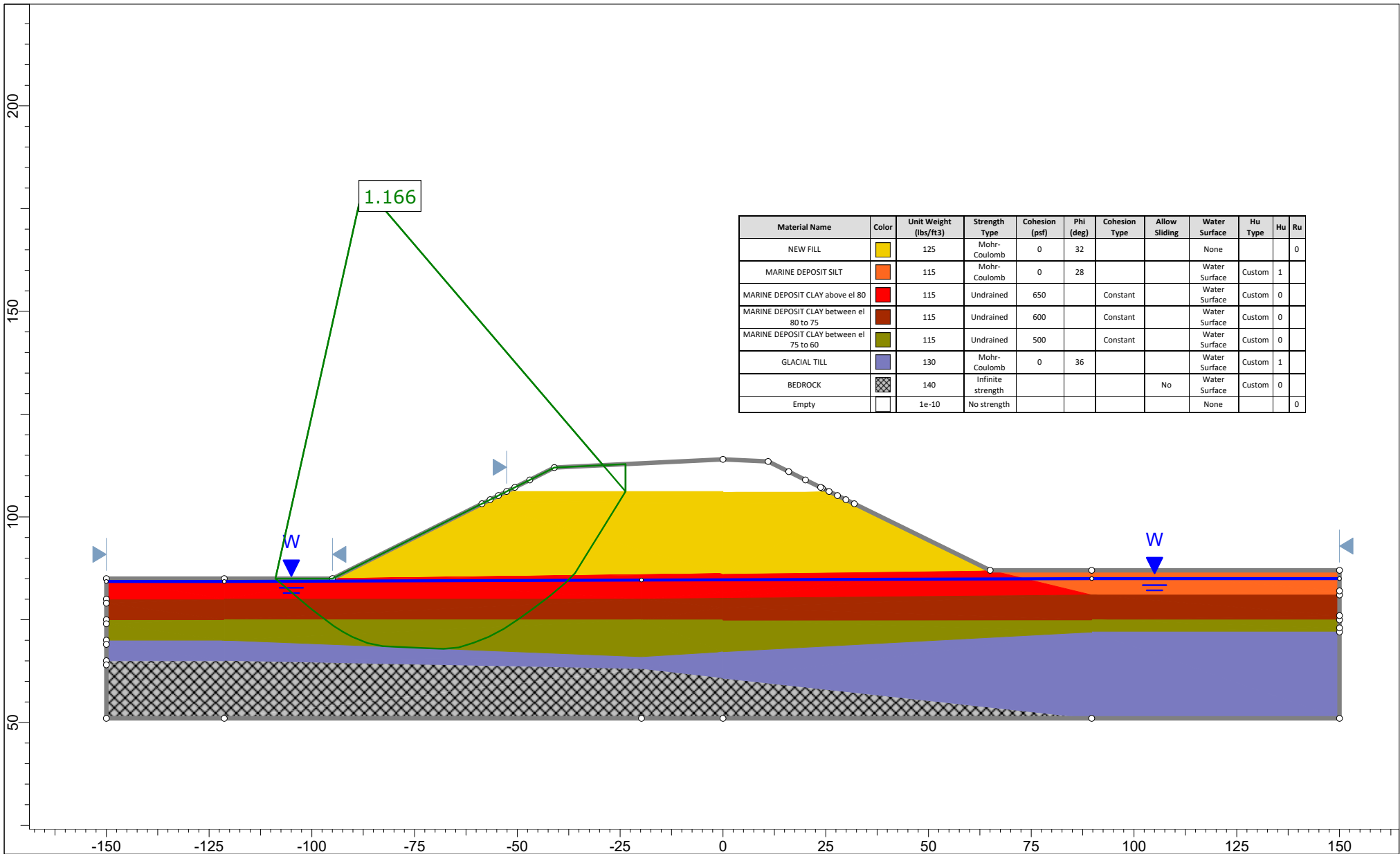
Material Name	Color	Unit Weight (lbs/ft ³)	Strength Type	Cohesion (psf)	Phi (deg)	Cohesion Type	Allow Sliding	Water Surface	Hu Type	Hu	Ru
NEW FILL		125	Mohr-Coulomb	0	32			None			0
MARINE DEPOSIT SILT		115	Mohr-Coulomb	0	30			Water Surface	Custom	1	
MARINE DEPOSIT CLAY above el. 75		115	Undrained	600		Constant		Water Surface	Custom	1	
MARINE DEPOSIT CLAY between el. 75 to 60		115	Undrained	500		Constant		Water Surface	Custom	1	
GLACIAL TILL		130	Mohr-Coulomb	0	36			Water Surface	Custom	1	
BEDROCK		140	Infinite strength				No	Water Surface	Custom	1	




SLIDEINTERPRET 9.004

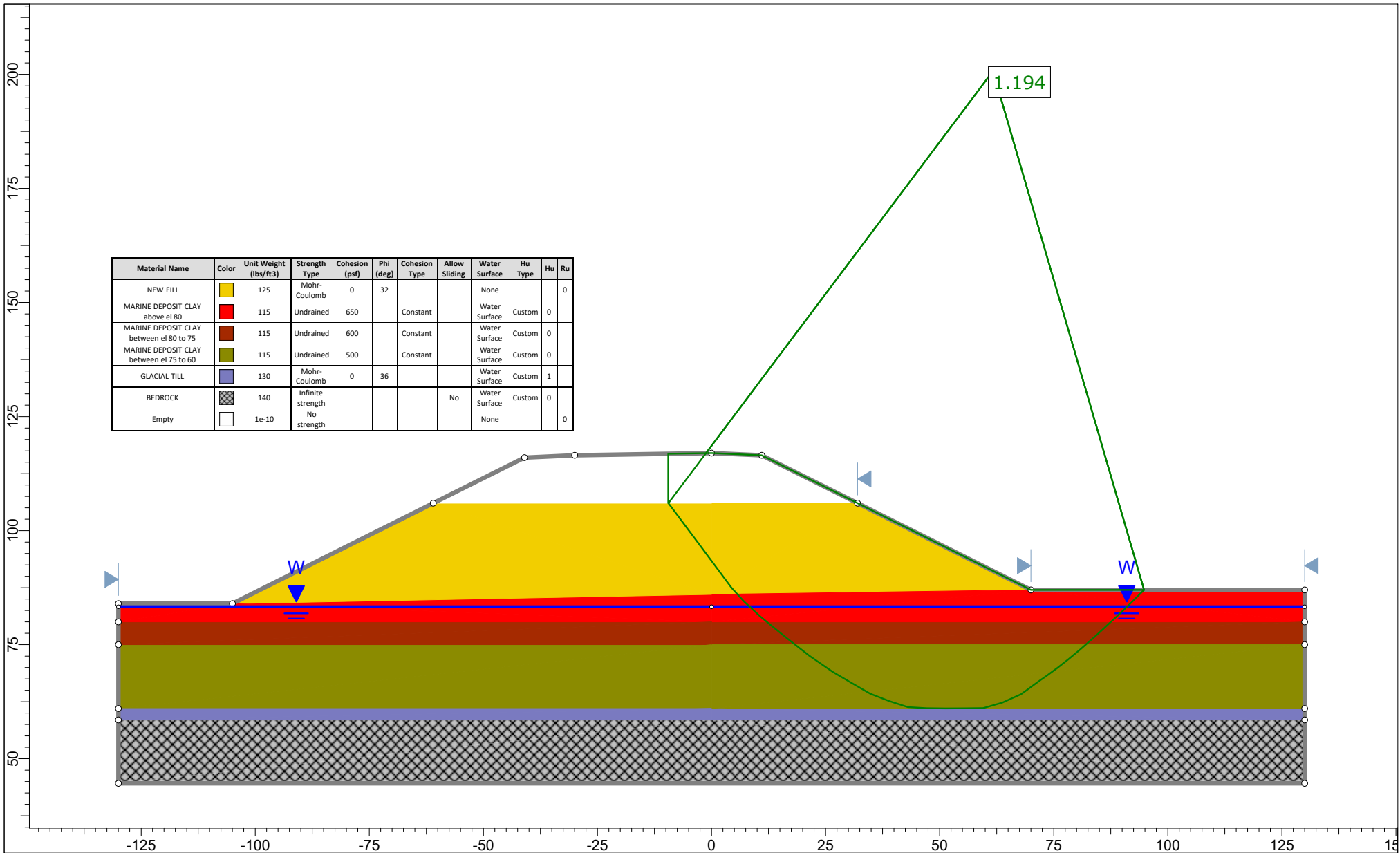
Project			SLIDE - An Interactive Slope Stability Program		
Group		Temporary Case- Sta. 712+00 & 805+00		Scenario	
Drawn By		SSM		Company	
Date		5/7/2021, 11:27:35 AM		File Name	
				2021-0507-Sta 712+00 and 805+00- Right to Left.slmd	

Sta. 713+00 & 804+00



	Project		SLIDE - An Interactive Slope Stability Program	
	Group	Temporary Case- Sta. 713+00 & 804+00	Scenario	Master Scenario
	Drawn By	SSM	Company	
	Date	5/11/2021, 8:57:57 AM	File Name	2021-0511-Sta 713+00 & 804+00- Right to Left-Elev.-non-circular-F.S 1.15 slmd
	SLIDEINTERPRET 9.004			

Sta. 714+50 & 802+00



Project

SLIDE - An Interactive Slope Stability Program

Group

Temporary Case-Sta. 714+50 & 802+00

Scenario

Master Scenario

Drawn By

SSM

Company

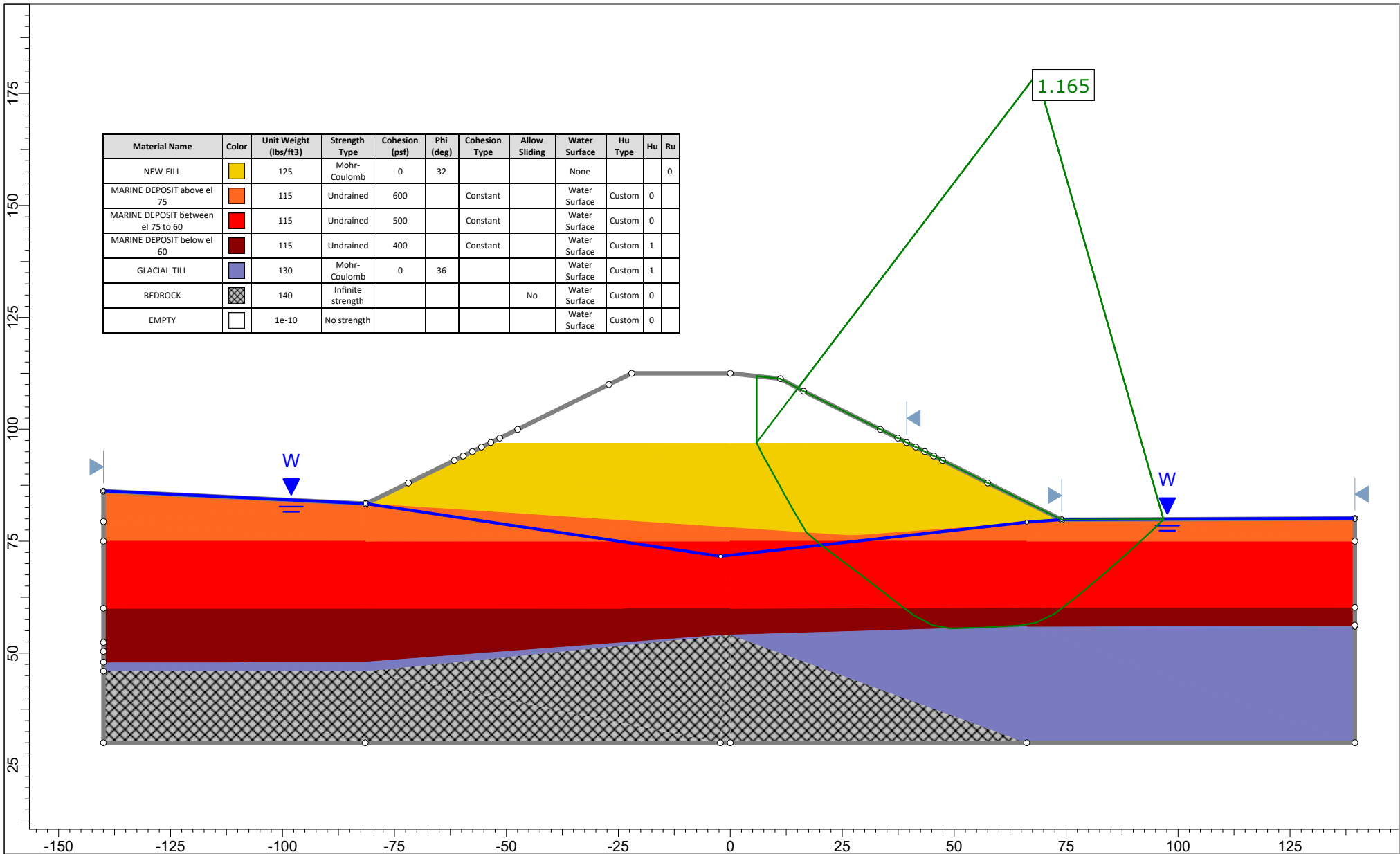
Date

5/11/2021, 8:57:57 AM


File Name

2021-0607-Sta 802+00- Left to Right- non circular.slmd

Sta. 907+00



Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Cohesion Type	Allow Sliding	Water Surface	Hu Type	Hu	Ru
NEW FILL		125	Mohr-Coulomb	0	32			None			0
MARINE DEPOSIT above el 75		115	Undrained	600		Constant		Water Surface	Custom	0	
MARINE DEPOSIT between el 75 to 60		115	Undrained	500		Constant		Water Surface	Custom	0	
MARINE DEPOSIT below el 60		115	Undrained	400		Constant		Water Surface	Custom	1	
GLACIAL TILL		130	Mohr-Coulomb	0	36			Water Surface	Custom	1	
BEDROCK		140	Infinite strength				No	Water Surface	Custom	0	
EMPTY		1e-10	No strength					Water Surface	Custom	0	

	Project		SLIDE - An Interactive Slope Stability Program	
	Group	Temporary Case- Sta. 907+00	Scenario	Master Scenario
	Drawn By	SSM	Company	
	Date	8/25/2020, 8:27:33 AM	File Name	2021-0511-STA 907+00-Left to Right -Elev.-non-circular-F.S 1.15.slmd
	SLIDEINTERPRET 9.004			

Permanent Condition

Client: Maine Department of Transportation

Date: 6-May-2021

Project: I-395/Route 9 Connector - WIN 18915.00

Computed by: SSM

Subject: Global Stability - Area 1

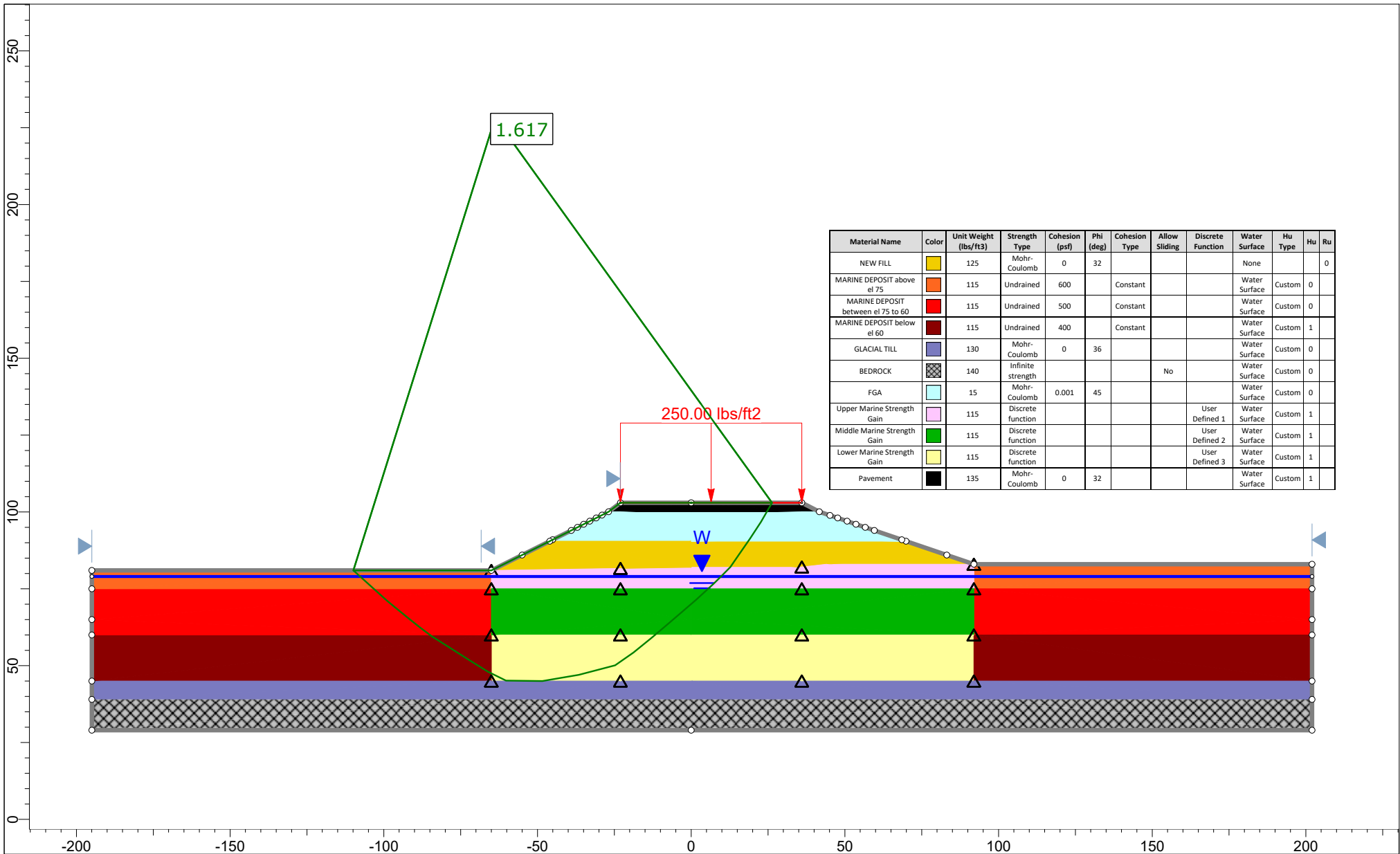
Checked by: EMS

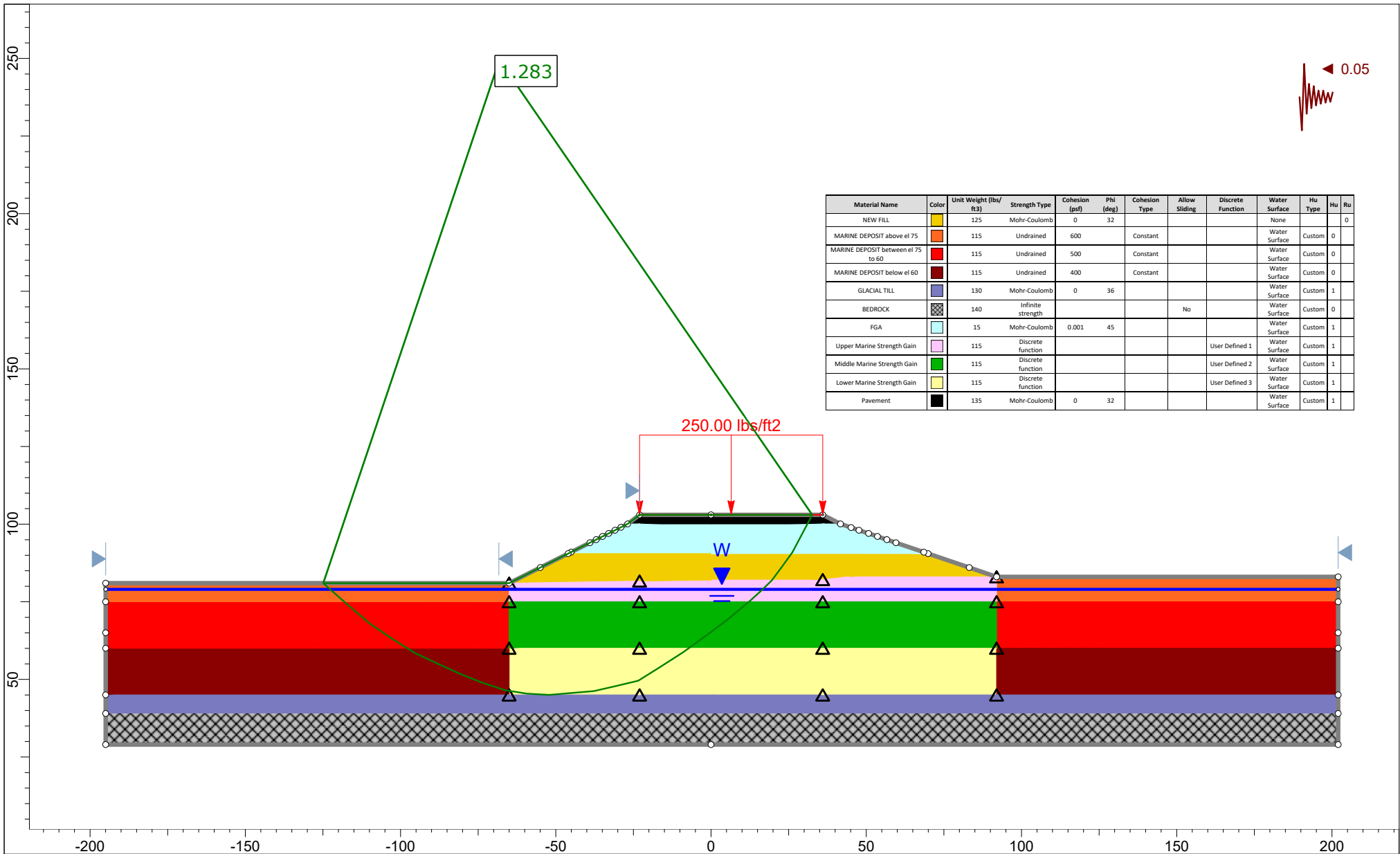
RESULTS AND CONCLUSIONS - PERMANENT CONDITION

Non-circular (F.S=1.3 static / F.S=1.0 seismic)


Station	Height of Embankment	No. of Stages	New Weight Fill Thickness (ft)	Lightweight Fill Thickness (ft)	Pavement Thickness (ft)	Stages	Factor of Safety (Spencer Method)	Factor of Safety (GLE/Morgenstern-Price Method)
Sta. 53+25	Double	21.0	8.5	9.5	3.0	Final Condition + Loading	1.62	1.64
						Site Class D Pseudo-Static,	1.28	1.29
Sta. 56+00	Single	17.5	17.5	—	3.0	Final Condition + Loading	1.47	1.48
						Site Class D Pseudo-Static,	1.19	1.20
Sta. 63+00	Single	16.5	16.5	—	3.0	Final Condition + Loading	1.55	1.58
						Site Class D Pseudo-Static,	1.26	1.27
Sta. 77+00	Double	19.0	12.0	4.5	3.0	Final Condition + Loading	1.79	1.82
						Site Class D Pseudo-Static,	1.52	1.54
Sta. 712+00	Single	21.0	21.0	—	3.0	Final Condition + Loading	1.74	1.75
						Site Class D Pseudo-Static,	1.49	1.49
Sta. 713+00	Double	28.0	20.0	5.0	3.0	Final Condition + Loading	1.34	1.34
						Site Class D Pseudo-Static,	1.16	1.17
Sta. 907+00	Double	34.0	15.0	16.0	3.0	Final Condition + Loading	1.56	1.56
						Site Class D Pseudo-Static,	1.29	1.29

Sta. 53+25





Material Name	Color	Unit Weight (lbs/ft³)	Strength Type	Cohesion (psf)	Phi (deg)	Cohesion Type	Allow Sliding	Discrete Function	Water Surface	Hu Type	Hu	Ru
NEW FILL		125	Mohr-Coulomb	0	32				None		0	0
MARINE DEPOSIT above el 75		115	Undrained	600		Constant			Water Surface	Custom	0	
MARINE DEPOSIT between el 75 to 60		115	Undrained	500		Constant			Water Surface	Custom	0	
MARINE DEPOSIT below el 60		115	Undrained	400		Constant			Water Surface	Custom	0	
GLACIAL TILL		130	Mohr-Coulomb	0	36				Water Surface	Custom	1	
BEDROCK		140	Infinite strength				No		Water Surface	Custom	0	
FGA		15	Mohr-Coulomb	0.001	45				Water Surface	Custom	1	
Upper Marine Strength Gain		115	Discrete function					User Defined 1	Water Surface	Custom	1	
Middle Marine Strength Gain		115	Discrete function					User Defined 2	Water Surface	Custom	1	
Lower Marine Strength Gain		115	Discrete function					User Defined 3	Water Surface	Custom	1	
Pavement		135	Mohr-Coulomb	0	32				Water Surface	Custom	1	



Project

SLIDE - An Interactive Slope Stability Program

Group

Final Case - Sta. 53+25

Scenario

Site Class D Pseudo-Static, 0.05g

Drawn By

EMS

Company

Date

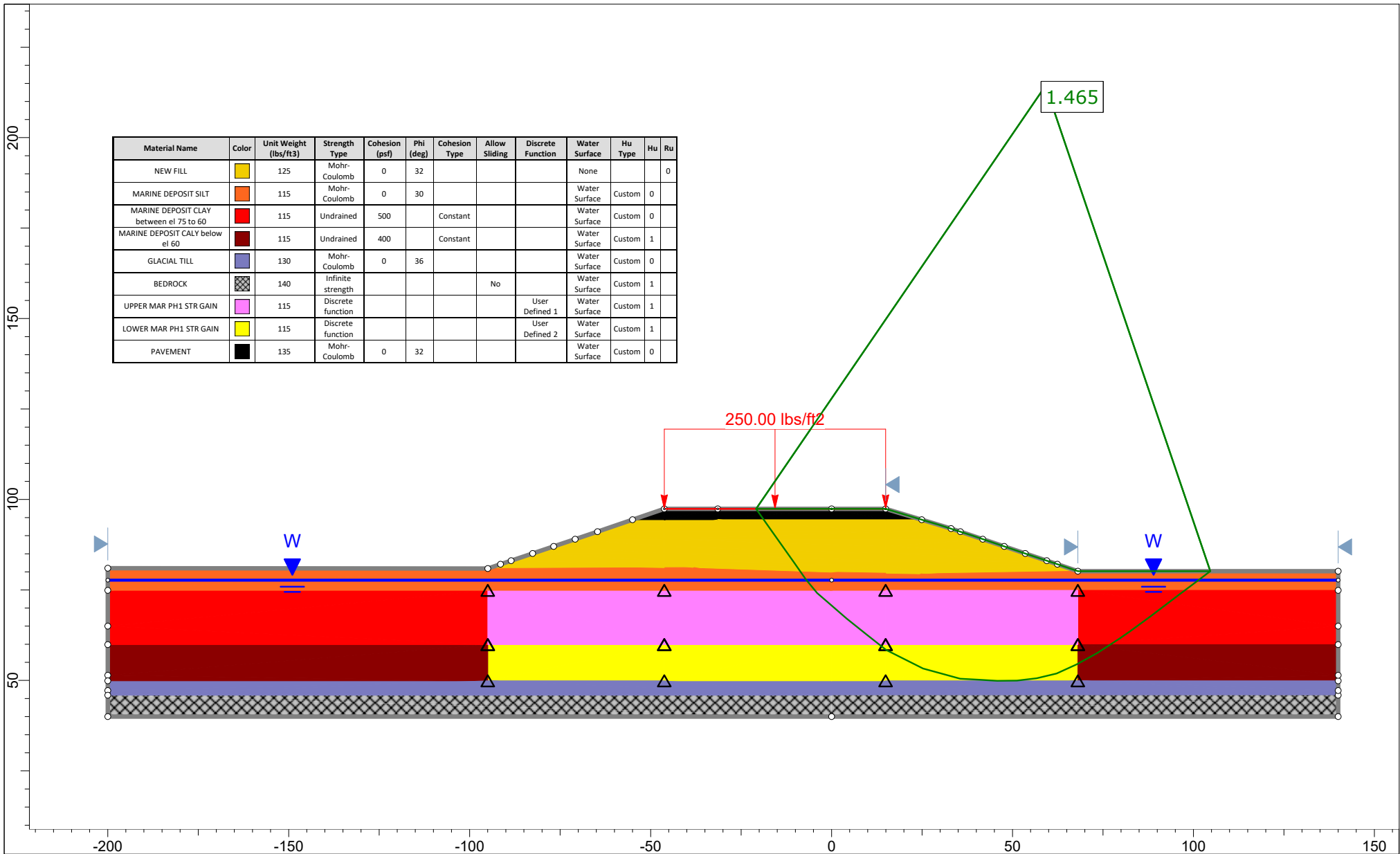
5/27/2020, 3:54:29 PM

File Name


2021-0609- Sta 53+25- Right to Left-non-circular-F.S 1.15-D1.slmd

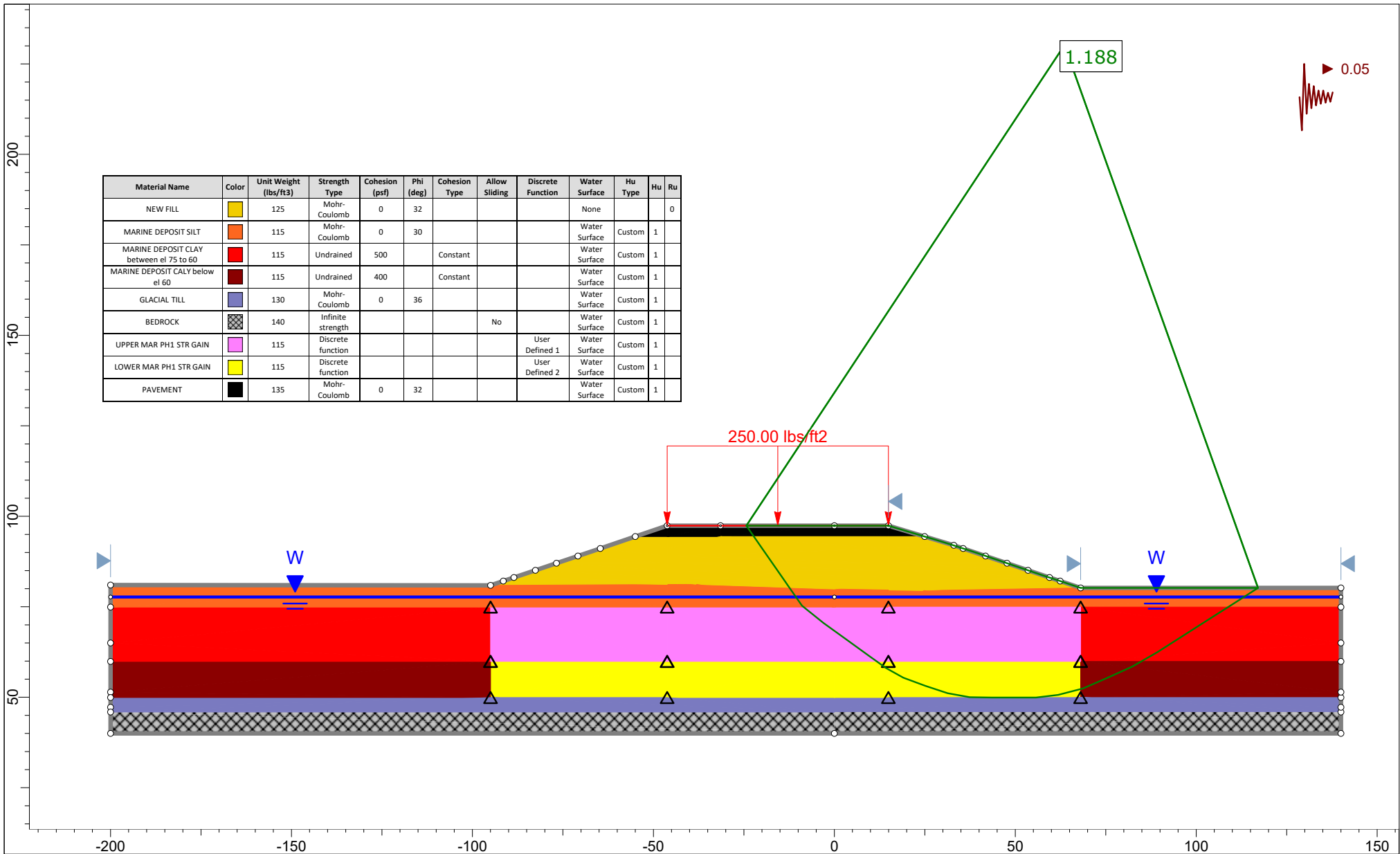
SLIDEINTERPRET 9.004


Sta. 56+00



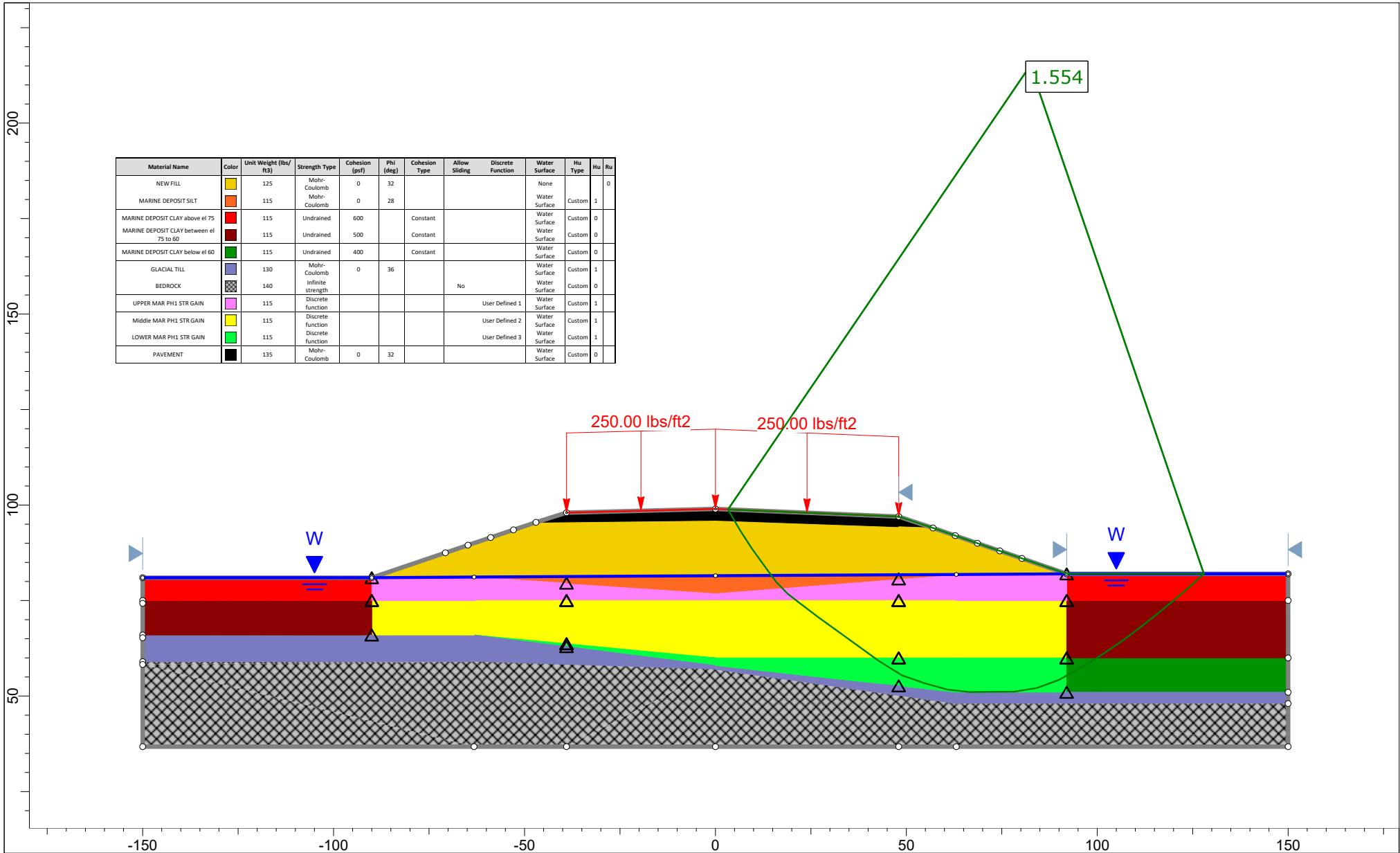
Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Cohesion Type	Allow Sliding	Discrete Function	Water Surface	Hu Type	Hu	Ru
NEW FILL		125	Mohr-Coulomb	0	32				None			0
MARINE DEPOSIT SILT		115	Mohr-Coulomb	0	30				Water Surface	Custom	0	
MARINE DEPOSIT CLAY between el 75 to 60		115	Undrained	500		Constant			Water Surface	Custom	0	
MARINE DEPOSIT CALY below el 60		115	Undrained	400		Constant			Water Surface	Custom	1	
GLACIAL TILL		130	Mohr-Coulomb	0	36				Water Surface	Custom	0	
BEDROCK		140	Infinite strength				No		Water Surface	Custom	1	
UPPER MAR PH1 STR GAIN		115	Discrete function					User Defined 1	Water Surface	Custom	1	
LOWER MAR PH1 STR GAIN		115	Discrete function					User Defined 2	Water Surface	Custom	1	
PAVEMENT		135	Mohr-Coulomb	0	32				Water Surface	Custom	0	


	Project		SLIDE - An Interactive Slope Stability Program		
	Group		Final Case - Sta. 56+00	Scenario	Overexc and NWF to Final+250psf Surch
	Drawn By		SSM	Company	
	Date		8/25/2020, 8:27:33 AM	File Name	2021-0609-STA 56+00-Left to Right-non circular-Permanent results-D1 slmd
	SLIDEINTERPRET 9.004				

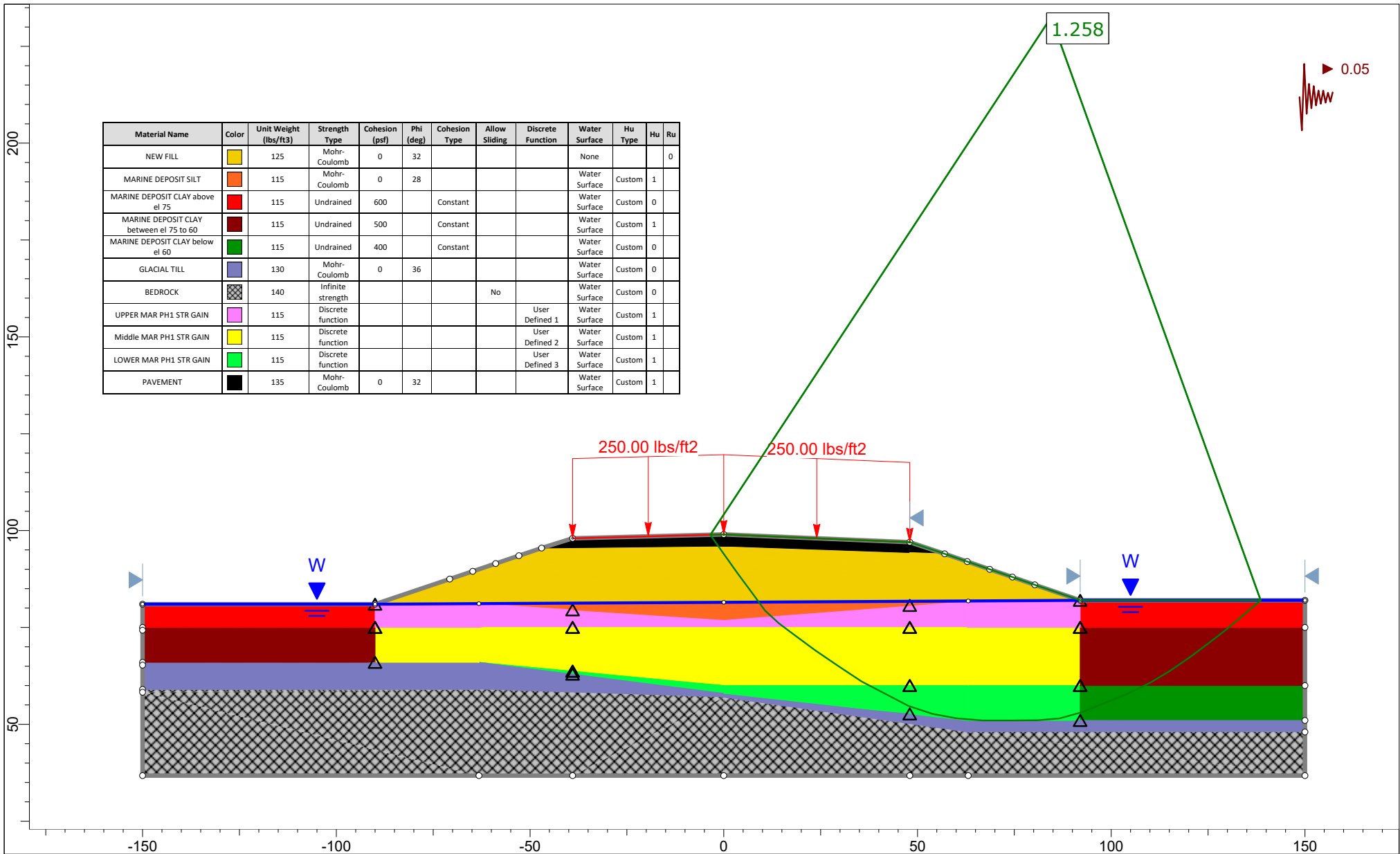



	Project		SLIDE - An Interactive Slope Stability Program	
	Group	Final Case - Sta. 56+00	Scenario	Site Class D Pseudo-Static, 0.05g
	Drawn By	SSM	Company	
	Date	8/25/2020, 8:27:33 AM	File Name	2021-0609-STA 56+00-Left to Right-non circular-Permanent results-D1.slm

Sta. 63+00



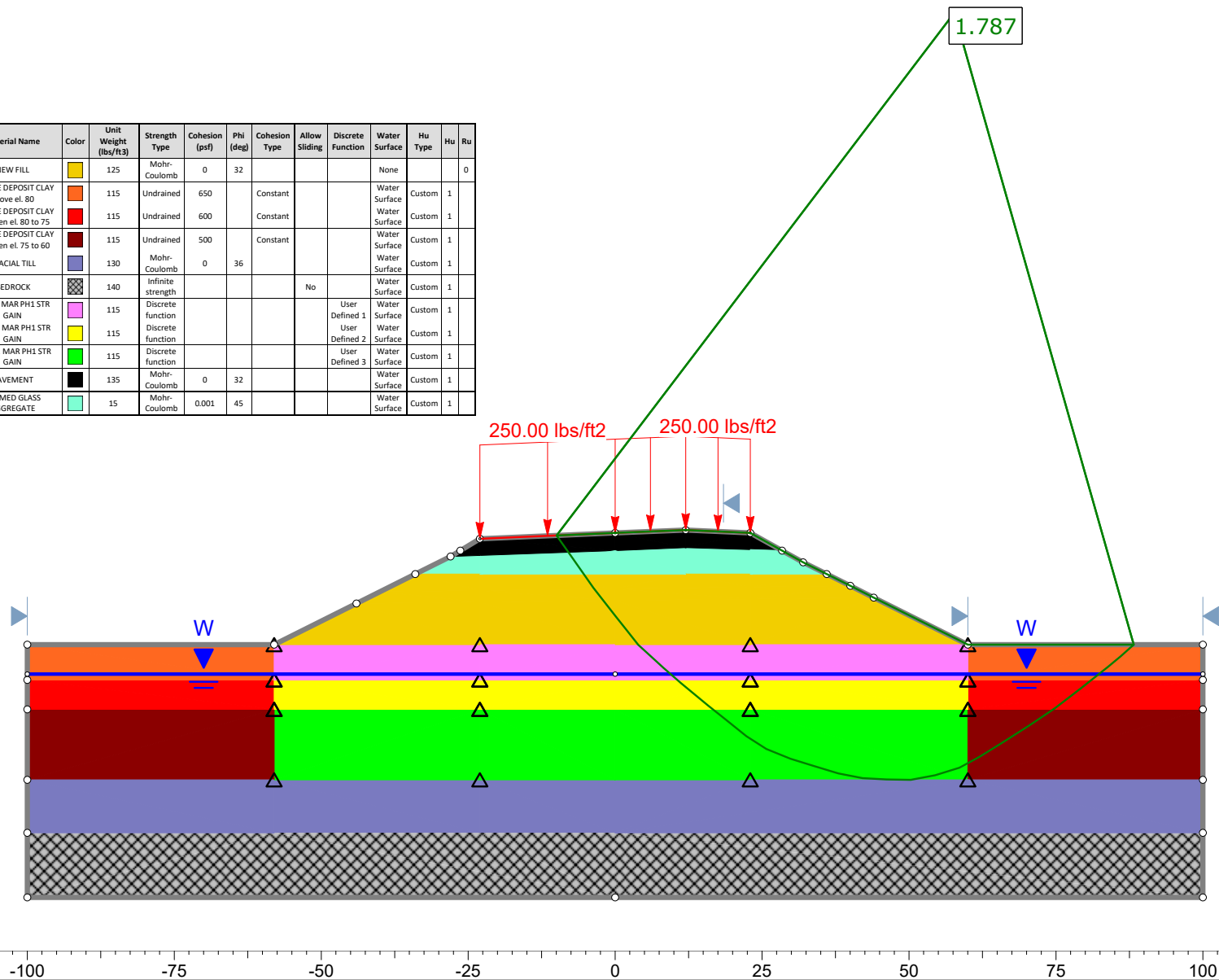
 <small>SLIDEINTERPRET 9.004</small>	Project		SLIDE - An Interactive Slope Stability Program			
	Group		Final Case - Sta. 63+00	Scenario	Overexc and NWF to Final+250psf Surch	
	Drawn By		SSM		Company	
	Date		5/5/2021, 4:59:04 PM		File Name	4021-0505-Sta 63+00- Left to Right-Elev.-non-circular-Permanent results.slm



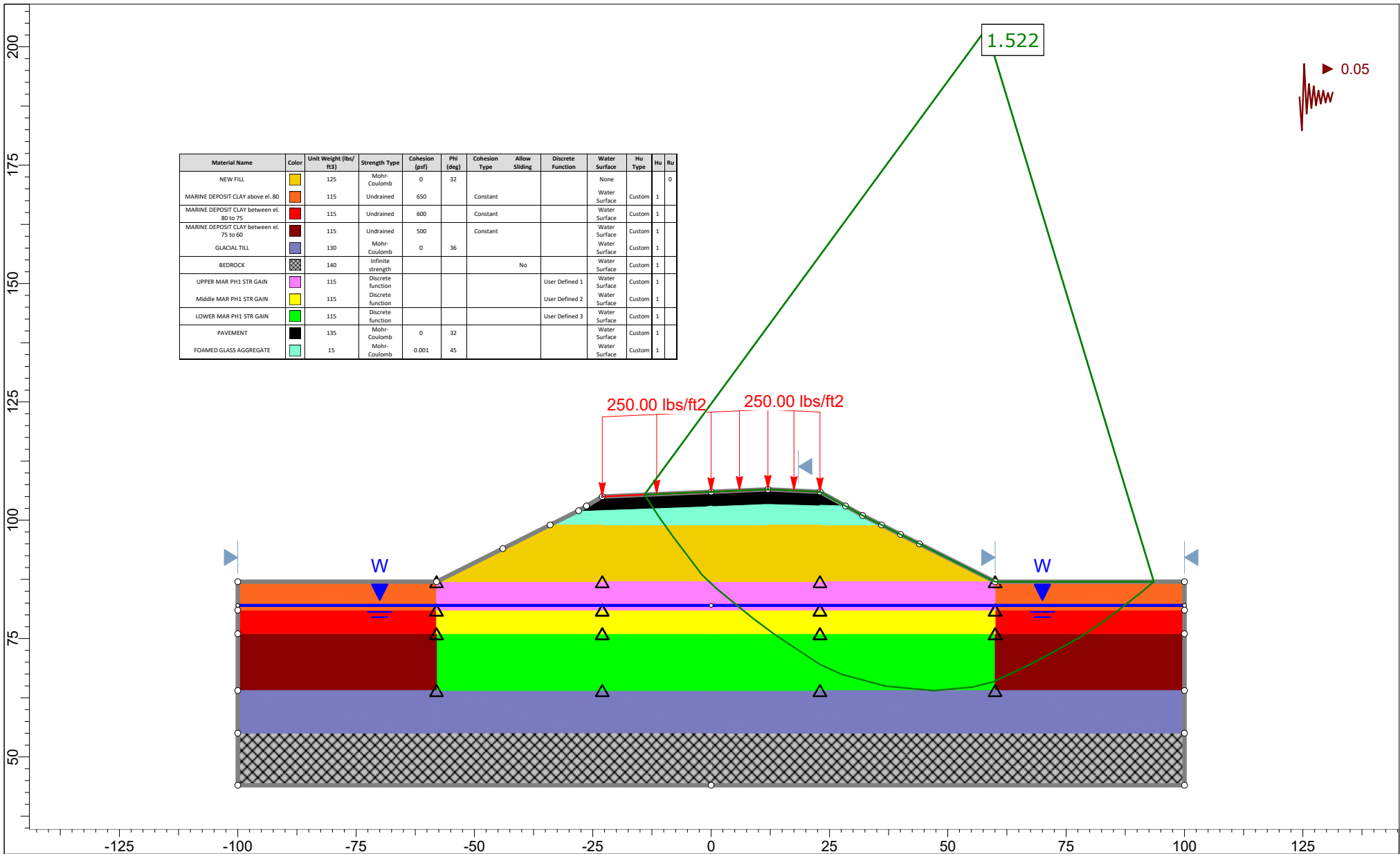
	Project		SLIDE - An Interactive Slope Stability Program	
	Group	Final Case - Sta. 63+00	Scenario	Site Class D Pseudo-Static, 0.05g
	Drawn By	SSM	Company	
	Date	5/5/2021, 4:59:04 PM	File Name	4071-0505-Sta 63+00- Left to Right-Elev.-non-circular-Permanent results.slm

Sta. 77+00

Material Name	Color	Unit Weight (lb/ft ³)	Strength Type	Cohesion (psf)	Phi (deg)	Cohesion Type	Allow Sliding	Discrete Function	Water Surface	Hu Type	Hu	Ru
NEW FILL		125	Mohr-Coulomb	0	32				None			0
MARINE DEPOSIT CLAY above el. 80		115	Undrained	650		Constant			Water Surface	Custom	1	
MARINE DEPOSIT CLAY between el. 80 to 75		115	Undrained	600		Constant			Water Surface	Custom	1	
MARINE DEPOSIT CLAY between el. 75 to 60		115	Undrained	500		Constant			Water Surface	Custom	1	
GLACIAL TILL		130	Mohr-Coulomb	0	36				Water Surface	Custom	1	
BEDROCK		140	Infinite strength				No		Water Surface	Custom	1	
UPPER MAR PH1 STR GAIN		115	Discrete function					User Defined 1	Water Surface	Custom	1	
Middle MAR PH1 STR GAIN		115	Discrete function					User Defined 2	Water Surface	Custom	1	
LOWER MAR PH1 STR GAIN		115	Discrete function					User Defined 3	Water Surface	Custom	1	
PAVEMENT		135	Mohr-Coulomb	0	32				Water Surface	Custom	1	
FOAMED GLASS AGGREGATE		15	Mohr-Coulomb	0.001	45				Water Surface	Custom	1	

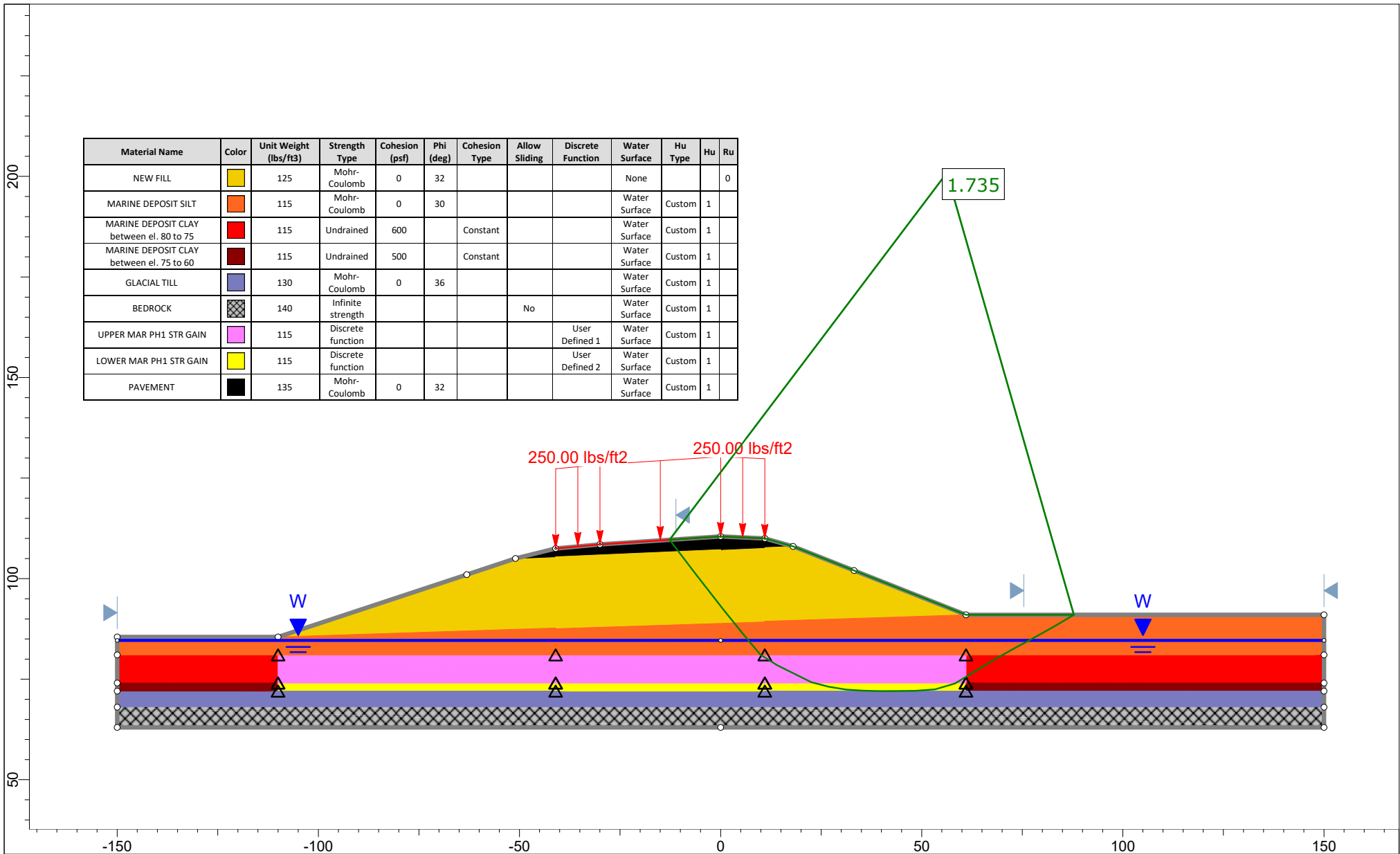



Project	SLIDE - An Interactive Slope Stability Program	
Group	Final Case - Sta. 77+00	Scenario Overexc and NWF to Final+250psf Surch
Drawn By	SSM	Company
Date	5/6/2021, 5:11:16 PM	File Name 2021-0506-Sta 77+00- Left to Right -non-circular-Permanent results slmd

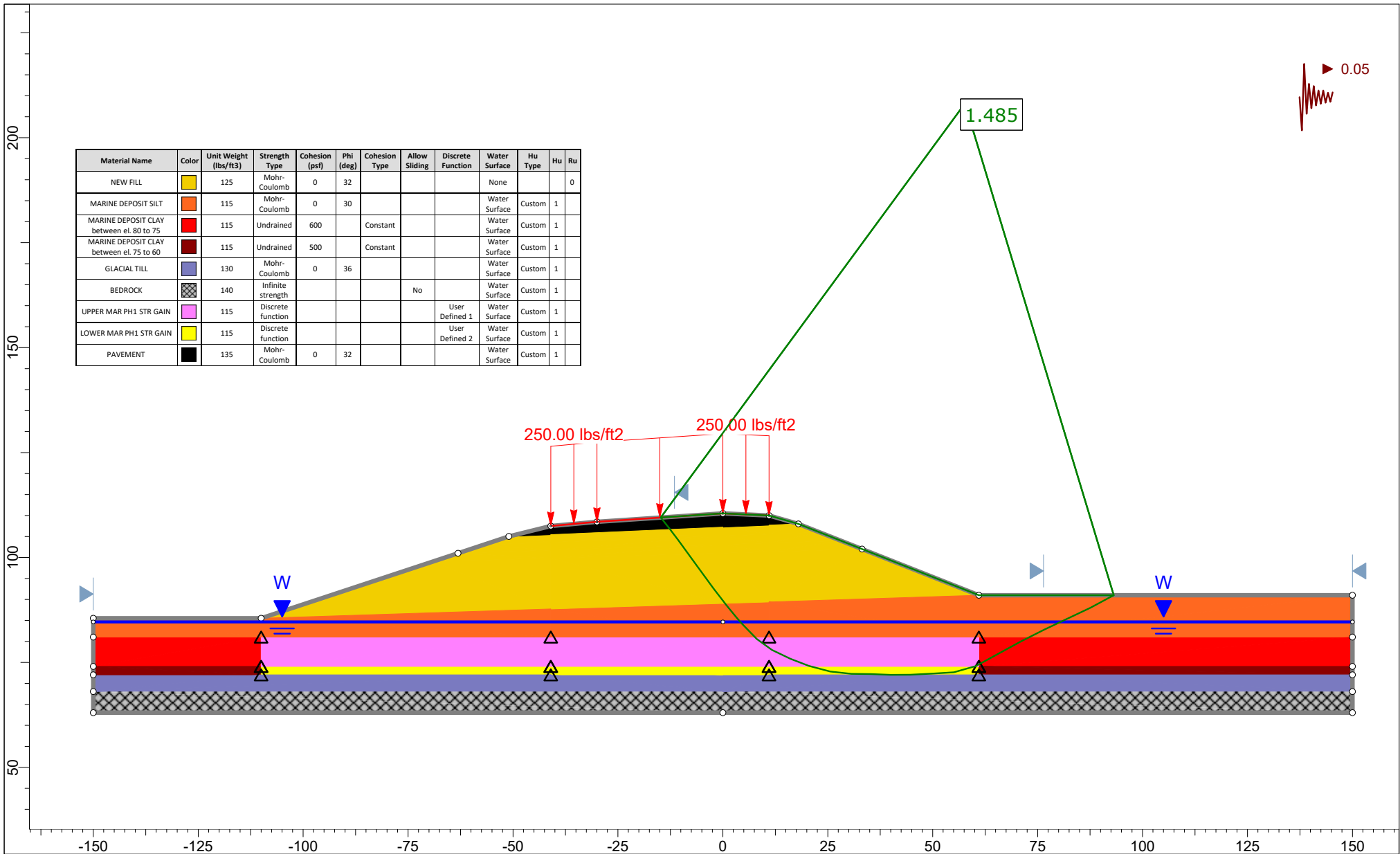


	Project		SLIDE - An Interactive Slope Stability Program	
	Group	Final Case - Sta. 77+00	Scenario	Site Class D Pseudo-Static, 0.05g
	Drawn By	SSM	Company	
	Date	5/6/2021, 5:11:16 PM	File Name	2021-0506-Sta 77+00- Left to Right -non-circular-Permanent results.slm
	SLIDEINTERPRET 9.004			


Sta. 712+00 & 805+00



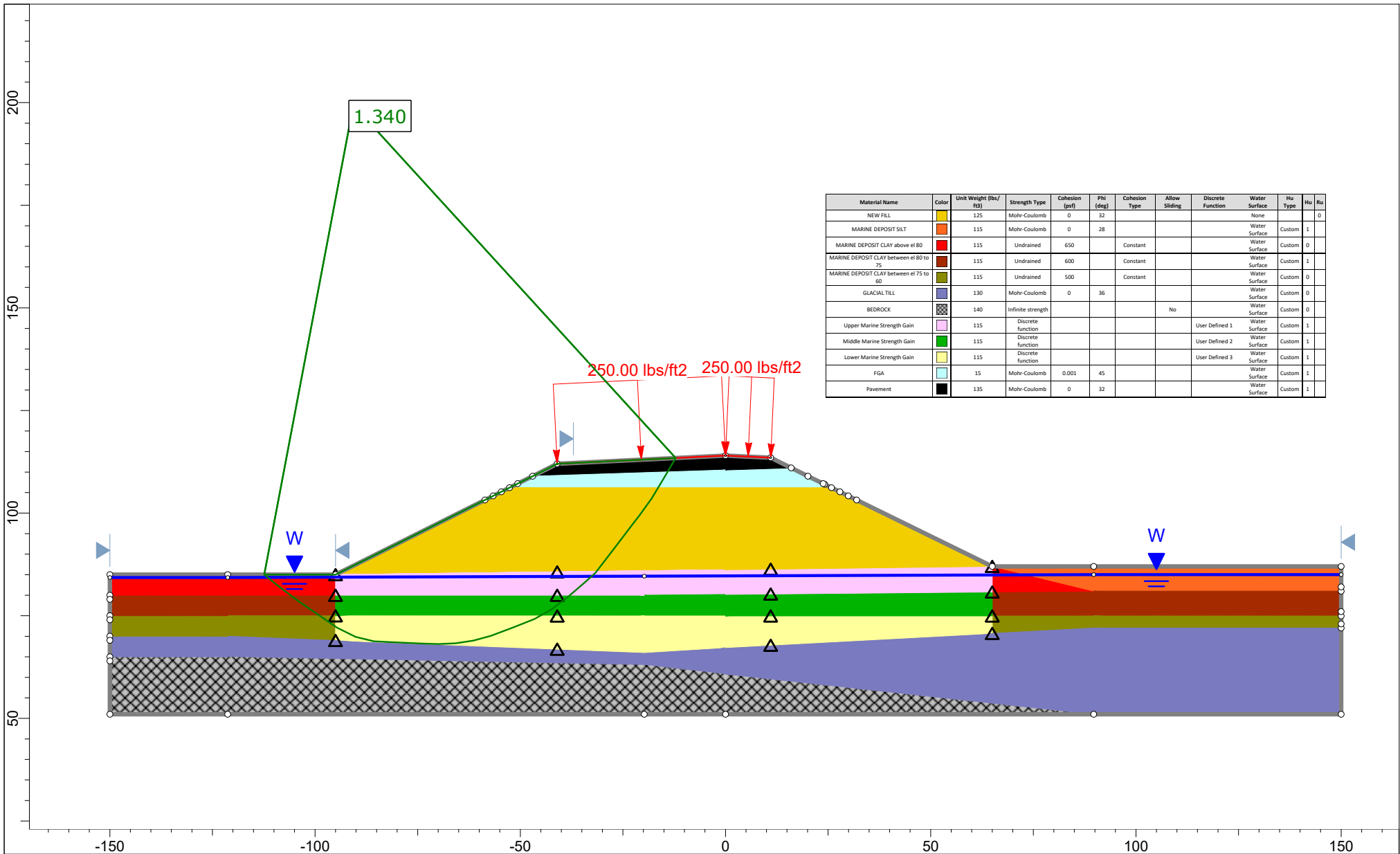
 SLIDEINTERPRET 9.004	Project		SLIDE - An Interactive Slope Stability Program			
	Group		Final Case - Sta. 712+00 & 805+00	Scenario	Overexc and NWF to Final+250psf Surch	
	Drawn By		SSM		Company	
	Date		5/7/2021, 11:27:35 AM		File Name	2021-0507-Sta 712+00 and 805+00- Left to Right -non-circular-Permanent Results.sldm



Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Cohesion Type	Allow Sliding	Discrete Function	Water Surface	Hu Type	Hu	Ru
NEW FILL		125	Mohr-Coulomb	0	32				None			0
MARINE DEPOSIT SILT		115	Mohr-Coulomb	0	30				Water Surface	Custom	1	
MARINE DEPOSIT CLAY between el. 80 to 75		115	Undrained	600		Constant			Water Surface	Custom	1	
MARINE DEPOSIT CLAY between el. 75 to 60		115	Undrained	500		Constant			Water Surface	Custom	1	
GLACIAL TILL		130	Mohr-Coulomb	0	36				Water Surface	Custom	1	
BEDROCK		140	Infinite strength				No		Water Surface	Custom	1	
UPPER MAR PH1 STR GAIN		115	Discrete function					User Defined 1	Water Surface	Custom	1	
LOWER MAR PH1 STR GAIN		115	Discrete function					User Defined 2	Water Surface	Custom	1	
PAVEMENT		135	Mohr-Coulomb	0	32				Water Surface	Custom	1	

	Project		SLIDE - An Interactive Slope Stability Program	
	Group	Final Case - Sta. 712+00 & 805+00	Scenario	Site Class D Pseudo-Static, 0.05g
	Drawn By	SSM	Company	
	Date	5/7/2021, 11:27:35 AM	File Name	2021-0507-Sta 712+00 and 805+00- Left to Right -non-circular-Permanent Results.sldm
	SLIDEINTERPRET 9.004			

Sta. 713+00 & 804+00



Project

SLIDE - An Interactive Slope Stability Program

Group

Final Case-Sta. 713+00 & 804+00

Drawn By

SSM

Date

5/11/2021, 8:57:57 AM

Scenario

LWF, Surcharge

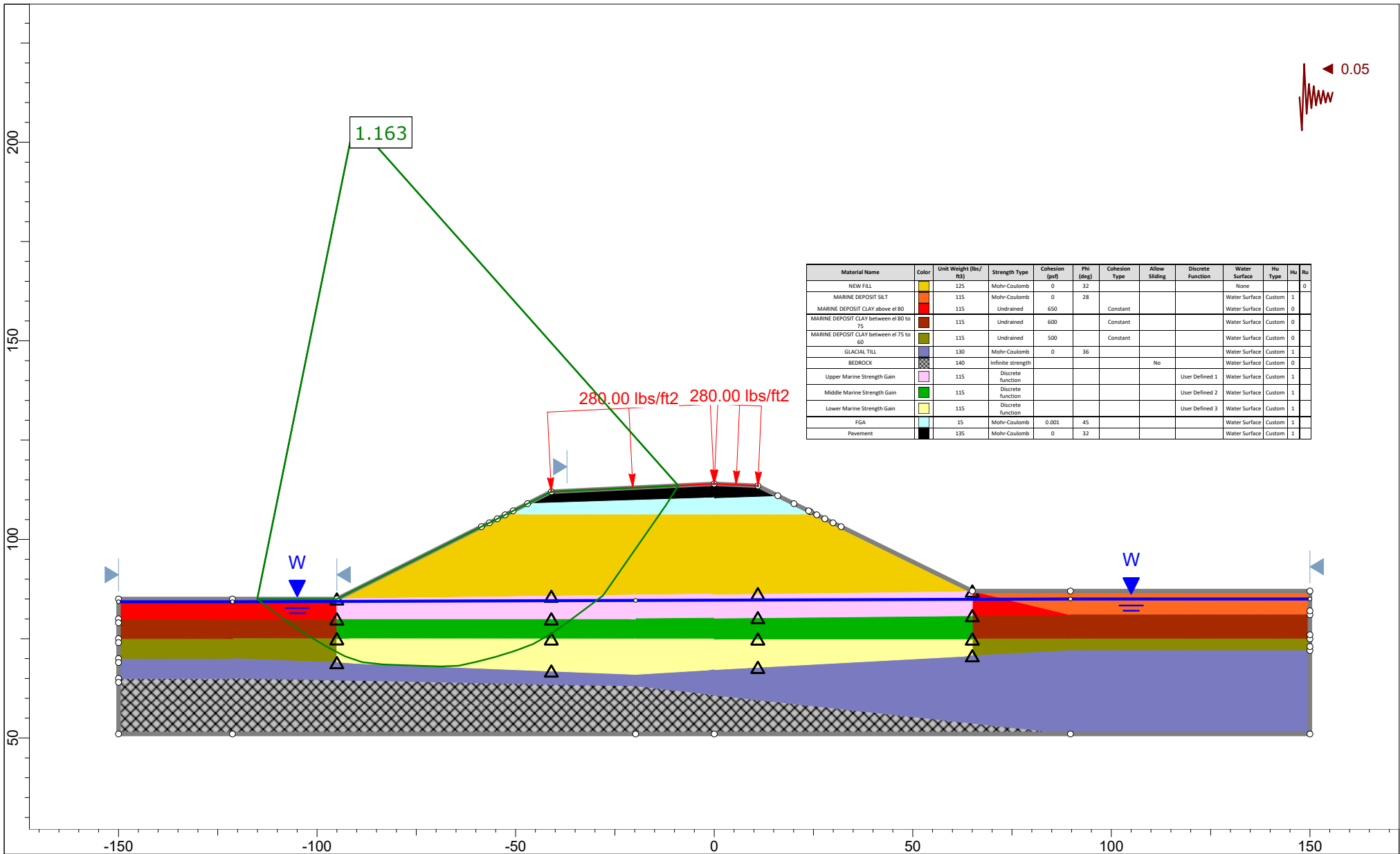
Company

2021-0609-Sta 713+00 & 804+00- Right to Left-Elev.-non-circular-F.S

File Name

1 15 slm

SLIDEINTERPRET 9.004



Material Name	Color	Unit Weight (lb/ft ³)	Strength Type	Cohesion (psf)	Phi (deg)	Cohesion Type	Allow Sliding	Discrete Function	Water Surface	Hu Type	Hu	Ru
NEW FILL	Yellow	125	Mohr-Coulomb	0	32				None		0	
MARINE DEPOSIT SILT	Red	115	Mohr-Coulomb	0	28				Water Surface	Custom	1	
MARINE DEPOSIT CLAY above el 80	Brown	115	Undrained	650		Constant			Water Surface	Custom	0	
MARINE DEPOSIT CLAY between el 80 to 75	Olive Green	115	Undrained	600		Constant			Water Surface	Custom	0	
MARINE DEPOSIT CLAY between el 75 to 60	Light Green	115	Undrained	500		Constant			Water Surface	Custom	0	
GLACIAL TILL	Blue	130	Mohr-Coulomb	0	36				Water Surface	Custom	1	
BEDROCK	Hatched	140	Infinite strength				No		Water Surface	Custom	0	
Upper Marine Strength Gain	Pink	115	Discrete function					User Defined 1	Water Surface	Custom	1	
Middle Marine Strength Gain	Green	115	Discrete function					User Defined 2	Water Surface	Custom	1	
Lower Marine Strength Gain	Yellow	115	Discrete function					User Defined 3	Water Surface	Custom	1	
FGA	Light Blue	15	Mohr-Coulomb	0.001	45				Water Surface	Custom	1	
Pavement	Black	135	Mohr-Coulomb	0	32				Water Surface	Custom	1	

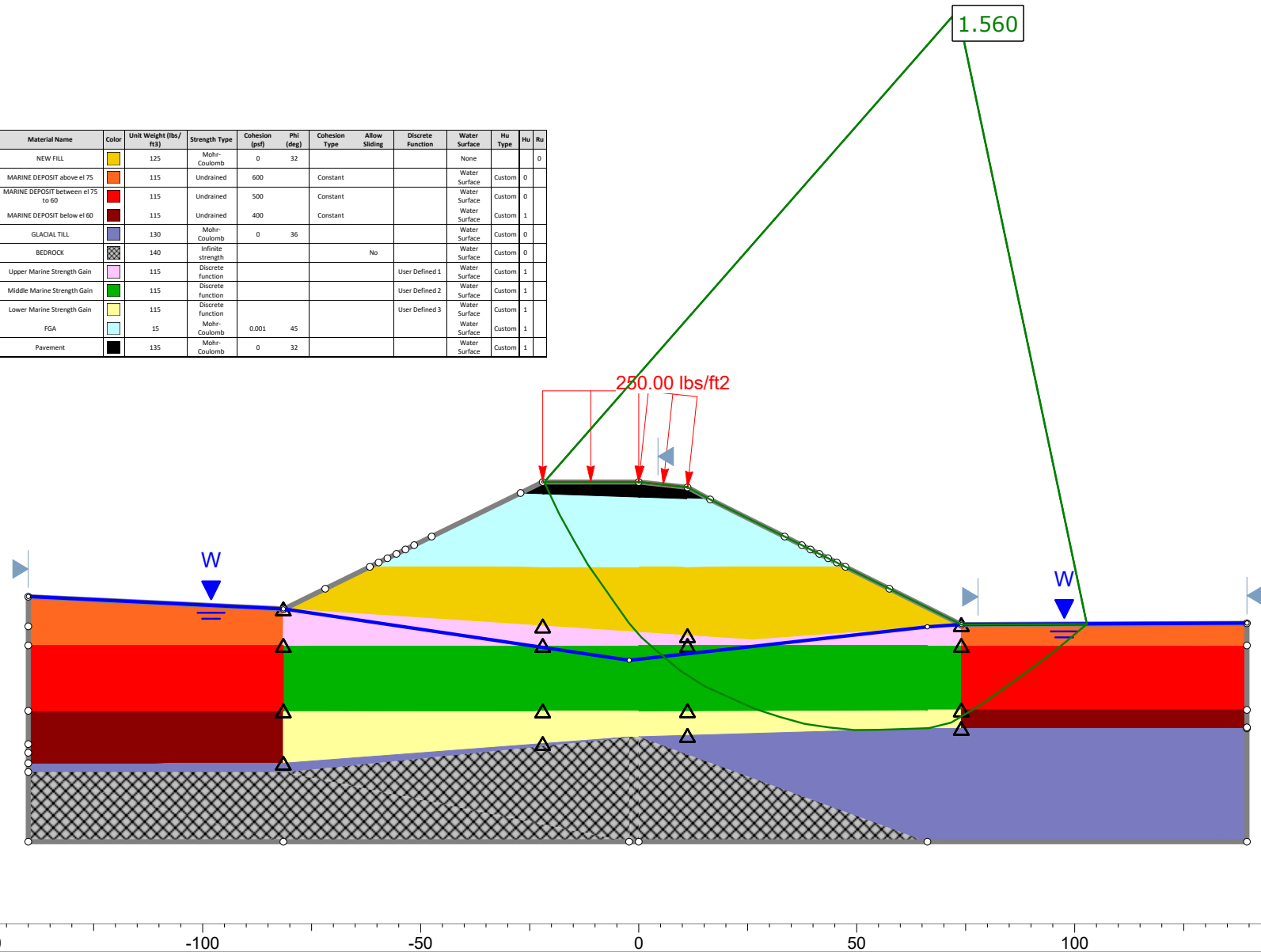


Project	SLIDE - An Interactive Slope Stability Program	
Group	Final Case-Sta. 713+00 & 804+00	Scenario Site Class D Pseudo-Static, 0.05g
Drawn By	SSM	Company
Date	5/11/2021, 8:57:57 AM	2021-06-09-Sta 713+00 & 804+00- Right to Left-Elev.-non-circular-F.S 1.15 slmd

Sta. 907+00

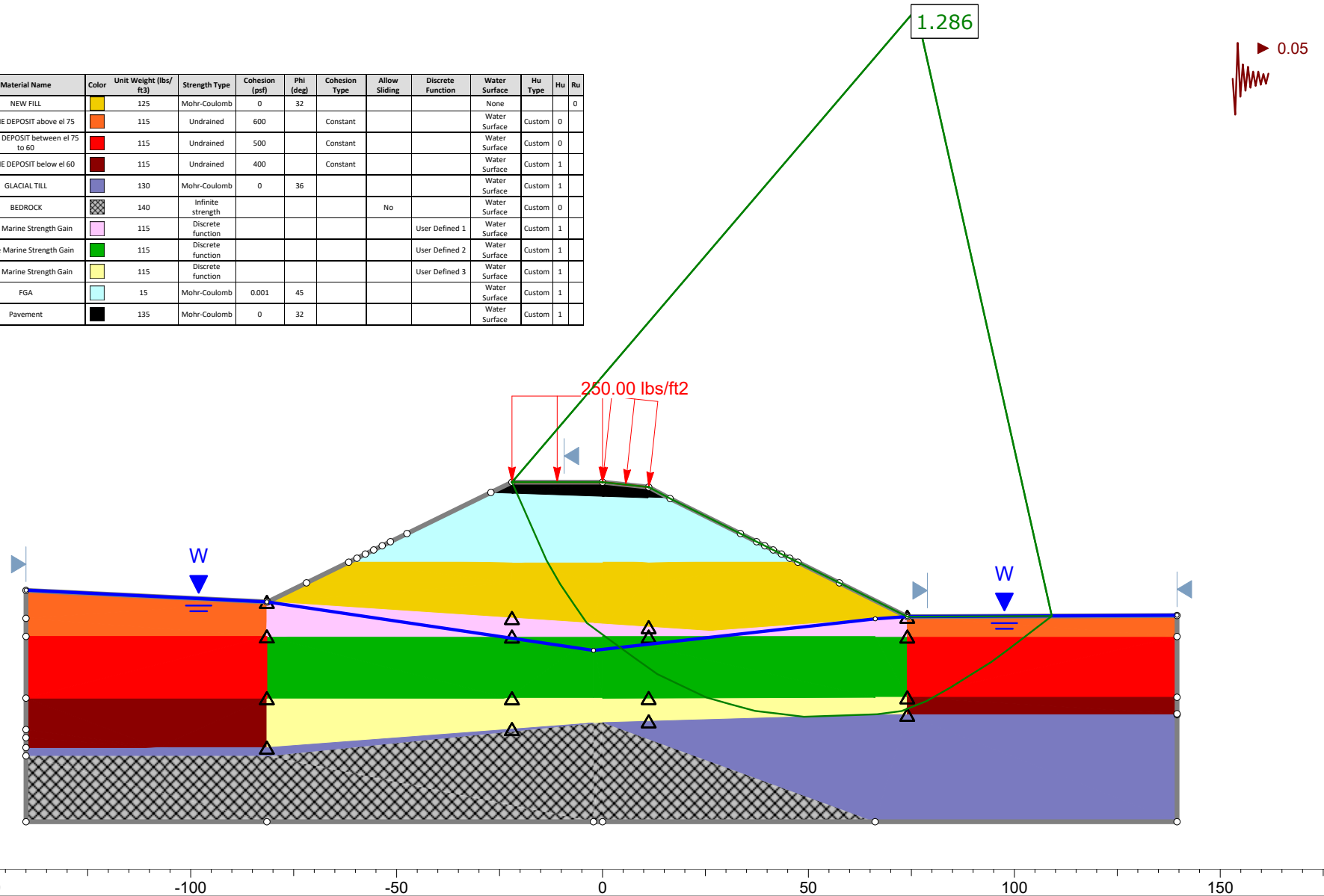
Sta. 907+00

Material Name	Color	Unit Weight (lbs/ft ³)	Strength Type	Cohesion (psf)	Phi (deg)	Cohesion Type	Allow Sliding	Discrete Function	Water Surface	Hu Type	Hu	Hu
NEW FILL		125	Mohr-Coulomb	0	32				None			0
MARINE DEPOSIT above el 75		115	Undrained	600		Constant			Water Surface	Custom	0	
MARINE DEPOSIT between el 75 to 60		115	Undrained	500		Constant			Water Surface	Custom	0	
MARINE DEPOSIT below el 60		115	Undrained	400		Constant			Water Surface	Custom	1	
GLACIAL TILL		130	Mohr-Coulomb	0	36				Water Surface	Custom	0	
BEDROCK		140	Infinite strength				No		Water Surface	Custom	0	
Upper Marine Strength Gain		115	Discrete function					User Defined 1	Water Surface	Custom	1	
Middle Marine Strength Gain		115	Discrete function					User Defined 2	Water Surface	Custom	1	
Lower Marine Strength Gain		115	Discrete function					User Defined 3	Water Surface	Custom	1	
FGA		15	Mohr-Coulomb	0.001	45				Water Surface	Custom	1	
Pavement		135	Mohr-Coulomb	0	32				Water Surface	Custom	1	



Project	SLIDE - An Interactive Slope Stability Program	
Group	Final Case-Sta. 907+00	Scenario
Drawn By	EMS	Company
Date	8/25/2020, 8:27:33 AM	File Name
		2021-0609-STA 907+00-Left to Right -Elev.-non-circular-F.S 1.15.slmd

Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Cohesion Type	Allow Sliding	Discrete Function	Water Surface	Hu Type	Hu	Ru
NEW FILL		125	Mohr-Coulomb	0	32				None			0
MARINE DEPOSIT above el 75		115	Undrained	600		Constant			Water Surface	Custom	0	
MARINE DEPOSIT between el 75 to 60		115	Undrained	500		Constant			Water Surface	Custom	0	
MARINE DEPOSIT below el 60		115	Undrained	400		Constant			Water Surface	Custom	1	
GLACIAL TILL		130	Mohr-Coulomb	0	36				Water Surface	Custom	1	
BEDROCK		140	Infinite strength				No		Water Surface	Custom	0	
Upper Marine Strength Gain		115	Discrete function					User Defined 1	Water Surface	Custom	1	
Middle Marine Strength Gain		115	Discrete function					User Defined 2	Water Surface	Custom	1	
Lower Marine Strength Gain		115	Discrete function					User Defined 3	Water Surface	Custom	1	
FGA		15	Mohr-Coulomb	0.001	45				Water Surface	Custom	1	
Pavement		135	Mohr-Coulomb	0	32				Water Surface	Custom	1	



Project	SLIDE - An Interactive Slope Stability Program	
Group	Final Case-Sta. 907+00	Scenario Site Class D Pseudo-Static, 0.05g
Drawn By	EMS	Company
Date	8/25/2020, 8:27:33 AM	File Name 2021-0609-STA 907+00-Left to Right -Elev.-non-circular-F.S 1.15.slmd

Global Embankment Stability – Area 2

Area 2 - Transverse

Client: Maine Department of Transportation

Date: 27-May-2021

Project: I-395/Route 9 Connector - WIN 18915.00

Computed by: SSM

Subject: Global Stability - Area 2 Transverse

Checked by: EMS

PROBLEM STATEMENT AND OBJECTIVE

Calculate the global stability minimum factor of safety at critical sections along the proposed highway alignment.

REFERENCES

1. AASHTO LRFD Bridge Design Specifications, 7th Edition, 2014.
2. Slide version 7.0 by RocScience.
3. Maine DOT Bridge Design Guide, 2003, with 2014 updates.

AVAILABLE INFORMATION

1. Plan set titled, "Brewer-Eddington I-395/Route 9 Connector, Cross Sections," by MaineDOT dated 25 February 2020.
2. Plan set titled, "I-395/Route 9 Connector, Interpretive Subsurface Profile," by MaineDOT dated 2 October 2019.

ASSUMPTIONS

Soil profiles will be modeled to match settlement calculation models, as summarized below.

SOIL PROPERTIES

Material	Unit Weight (pcf)	Friction Angle (degrees)	Undrained Shear Strength (psf)
New Fill	125	32	0
Marine Deposit	115	varies ¹	
Glacial Till	130	36	0
Bedrock	infinite strength		

Notes:

1. Soil properties for Existing Fill and Marine Deposit vary based on location. See individual soil profiles for details.

Client: Maine Department of Transportation

Date: 27-May-2021

Project: I-395/Route 9 Connector - WIN 18915.00

Computed by: SSM

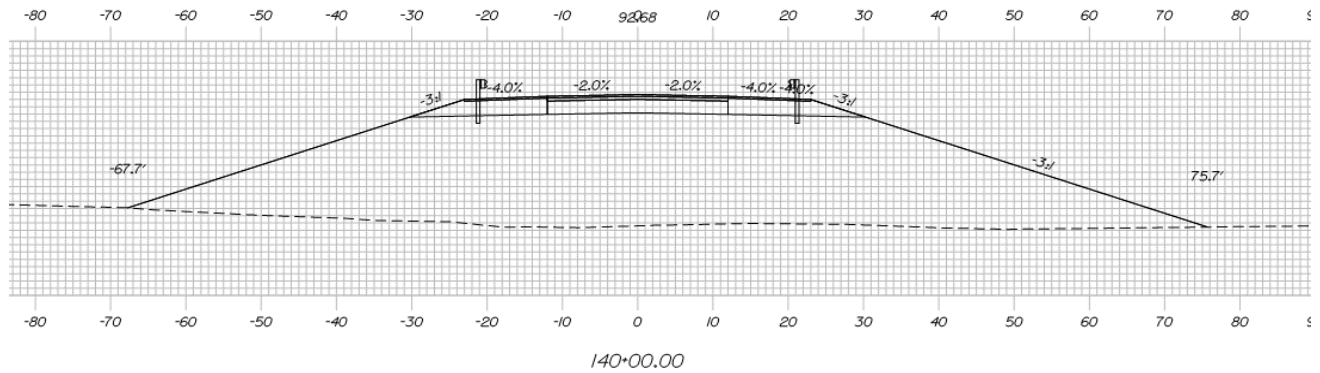
Subject: Global Stability - Area 2 Transverse

Checked by: EMS

STA 140+00 GEOMETRY

Fill height = 18 ft

Ground surface at center = El. 74.5


STA 140+00 SOIL PROFILE AND PROPERTIES (not to scale)

Based on boring BB-BEB-102, BB-BEB-101, BB-BEB-202, BB-BEB-103

Groundwater depth = ground surface (based on boring BB-BEB-102, BB-BEB-101, BB-BEB-202 and BB-BEB-103)

Boring BB-BEB-102 (distance from the center= 101.9 LT)

DEPTH (ft)		ELEVATION (ft)
0	NEW FILL $\gamma = 125 \text{ pcf}$ $\phi = 32^\circ$	74.5
7.5	Marine Deposit CLAY $\gamma = 115 \text{ pcf}$ $S_u = 700 \text{ psf}$	67
9.5	Marine Deposit CLAY $\gamma = 115 \text{ pcf}$ $S_u = 500 \text{ psf}$	65
15	Marine Deposit CLAY $\gamma = 115 \text{ pcf}$ $S_u = 375 \text{ psf}$	59.5
27	Glacial Till SILT/SAND $\gamma = 130 \text{ pcf}$ $\phi = 36^\circ$	47.5

Client: Maine Department of Transportation

Date: 27-May-2021

Project: I-395/Route 9 Connector - WIN 18915.00

Computed by: SSM

Subject: Global Stability - Area 2 Transverse

Checked by: EMS

STA 140+00 Continued

Boring BB-BEB-101 (distance from the center= 0.6 RT)

DEPTH (ft)		ELEVATION (ft)
0	NEW FILL $\gamma = 125 \text{ pcf}$ $\phi = 32^\circ$	74.5
7.5	Marine Deposit CLAY $\gamma = 115 \text{ pcf}$ $S_u = 700 \text{ psf}$	67
9.5	Marine Deposit CLAY $\gamma = 115 \text{ pcf}$ $S_u = 375 \text{ psf}$	65
18	Glacial Till SILT/SAND $\gamma = 130 \text{ pcf}$ $\phi = 36^\circ$	56.5
37	BEDROCK infinite strength	37.5
52		22.5

Boring BB-BEB-202 (distance from the center= 19.5 RT)

DEPTH (ft)		ELEVATION (ft)
0	NEW FILL $\gamma = 125 \text{ pcf}$ $\phi = 32^\circ$	74.5
7.5	Marine Deposit CLAY $\gamma = 115 \text{ pcf}$ $S_u = 700 \text{ psf}$	67
9.5	Marine Deposit CLAY $\gamma = 115 \text{ pcf}$ $S_u = 375 \text{ psf}$	57.5
18	Glacial Till SILT/SAND $\gamma = 130 \text{ pcf}$ $\phi = 36^\circ$	56.5
50	BEDROCK infinite strength	24.5
69		5.5

Client: Maine Department of Transportation

Date: 27-May-2021

Project: I-395/Route 9 Connector - WIN 18915.00

Computed by: SSM

Subject: Global Stability - Area 2 Transverse

Checked by: EMS

STA 140+00 Continued

Boring BB-BEB-103 (distance from the center= 97.9 RT)

DEPTH (ft)		ELEVATION (ft)
0	NEW FILL $\gamma = 125 \text{ pcf}$ $\phi = 32^\circ$	74.5
7.5	Marine Deposit CLAY $\gamma = 115 \text{ pcf}$ $S_u = 700 \text{ psf}$	67
9.5	Marine Deposit CLAY $\gamma = 115 \text{ pcf}$ $S_u = 500 \text{ psf}$	65
23	Marine Deposit CLAY $\gamma = 115 \text{ pcf}$ $S_u = 375 \text{ psf}$	51.5
50	Glacial Till SILT/SAND $\gamma = 130 \text{ pcf}$ $\phi = 36^\circ$	24.5

Client: Maine Department of Transportation

Date: 27-May-2021

Project: I-395/Route 9 Connector - WIN 18915.00

Computed by: SSM

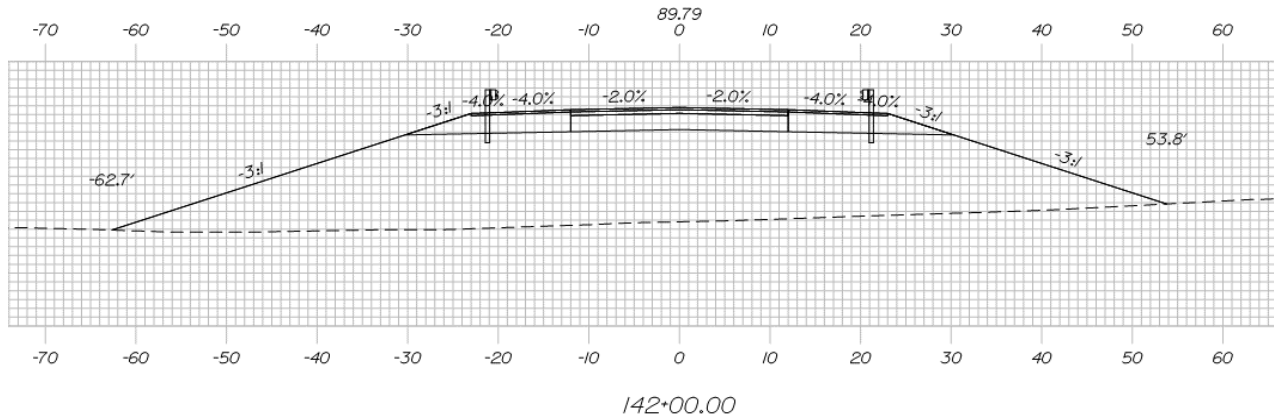
Subject: Global Stability - Area 2 Transverse

Checked by: 0

STA 142+00 GEOMETRY

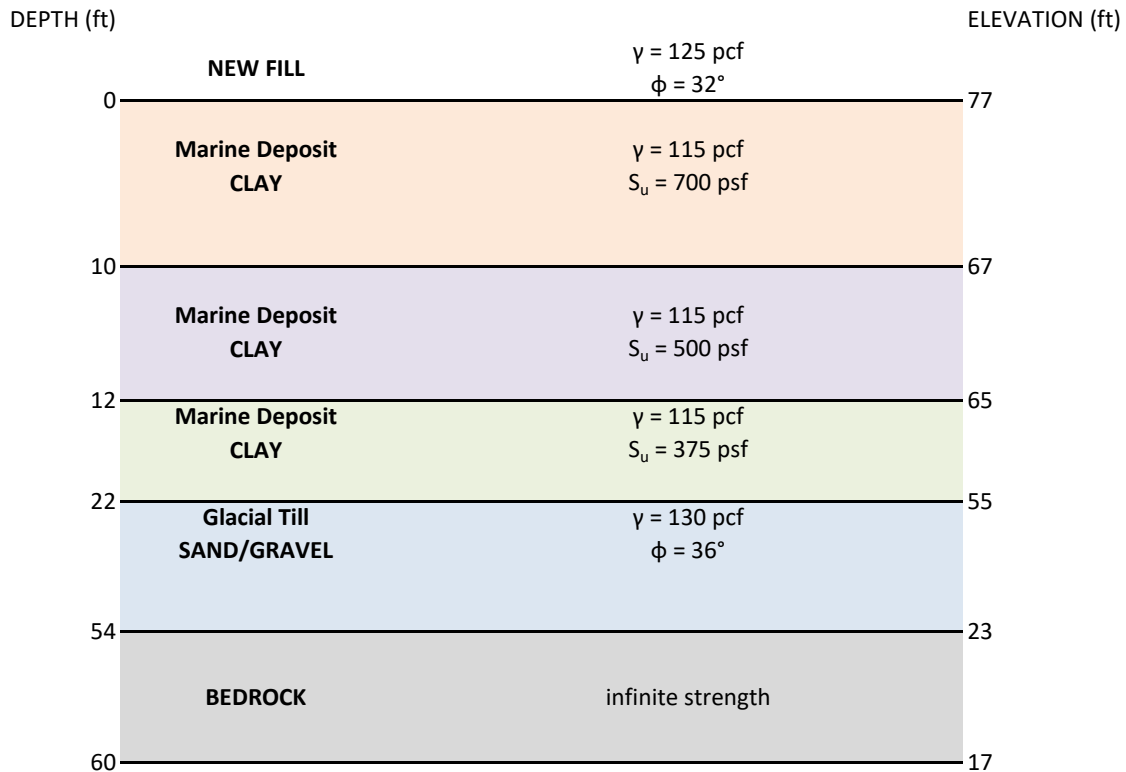
Fill height = 14 ft

Ground surface at center = El. 77.0


STA 142+00 SOIL PROFILE AND PROPERTIES (not to scale)

Based on boring BB-BEB-203, BB-BEB-104, BB-BEB-204/204A and BB-BEB-205

Groundwater depth = at ground surface (based on boring BB-BEB-203, BB-BEB-104, BB-BEB-204/204A and BB-BEB-205)

Boring BB-BEB-203


Client: Maine Department of Transportation

Date: 27-May-2021

Project: I-395/Route 9 Connector - WIN 18915.00

Computed by: SSM

Subject: Global Stability - Area 2 Transverse

Checked by: EMS

STA 142+00 Continued

Boring BB-BEB-104

DEPTH (ft)		ELEVATION (ft)
0	NEW FILL $\gamma = 125 \text{ pcf}$ $\phi = 32^\circ$	77
5	Marine Deposit SILT $\gamma = 115 \text{ pcf}$ $\phi = 28^\circ$	72
10	Marine Deposit CLAY $\gamma = 115 \text{ pcf}$ $S_u = 700 \text{ psf}$	67
12	Marine Deposit CLAY $\gamma = 115 \text{ pcf}$ $S_u = 500 \text{ psf}$	65
19	Marine Deposit CLAY $\gamma = 115 \text{ pcf}$ $S_u = 375 \text{ psf}$	58
60	Glacial Till SAND/GRAVEL $\gamma = 130 \text{ pcf}$ $\phi = 36^\circ$	17
71	BEDROCK infinite strength	6

Boring BB-BEB-204/204A

DEPTH (ft)		ELEVATION (ft)
0	NEW FILL $\gamma = 125 \text{ pcf}$ $\phi = 32^\circ$	77
10	Marine Deposit CLAY $\gamma = 115 \text{ pcf}$ $S_u = 700 \text{ psf}$	67
12	Marine Deposit CLAY $\gamma = 115 \text{ pcf}$ $S_u = 500 \text{ psf}$	65
17	Marine Deposit CLAY $\gamma = 115 \text{ pcf}$ $S_u = 375 \text{ psf}$	60
70	Glacial Till SAND/GRAVEL $\gamma = 130 \text{ pcf}$ $\phi = 36^\circ$	7
90	BEDROCK infinite strength	-13

Client: Maine Department of Transportation

Date: 27-May-2021

Project: I-395/Route 9 Connector - WIN 18915.00

Computed by: SSM

Subject: Global Stability - Area 2 Transverse

Checked by: EMS

STA 142+00 Continued

Boring BB-BEB-205

DEPTH (ft)		ELEVATION (ft)
0	NEW FILL $\gamma = 125 \text{ pcf}$ $\phi = 32^\circ$	77
10	Marine Deposit CLAY $\gamma = 115 \text{ pcf}$ $S_u = 700 \text{ psf}$	67
12	Marine Deposit CLAY $\gamma = 115 \text{ pcf}$ $S_u = 500 \text{ psf}$	65
15	Marine Deposit CLAY $\gamma = 115 \text{ pcf}$ $S_u = 375 \text{ psf}$	62
71	Glacial Till SAND/GRAVEL $\gamma = 130 \text{ pcf}$ $\phi = 36^\circ$	6
75	BEDROCK infinite strength	2

Temporary Condition

Client:	Maine Department of Transportation
Project:	I-395/Route 9 Connector - WIN 18915.00
Subject:	Global Stability - Area 2 Transverse

RESULTS AND CONCLUSIONS - TEMPORARY CONDITION

Left to Right (F.S=1.15)

Station	Height of Embankment	Maximum Temporary First Stage Fill Height	Factor of Safety (Spencer Method)	Factor of Safety (Bishop Simplified Method)	Factor of Safety (GLE/Morgenstern-Price Method)
Sta. 140+00	18	18	1.28	1.29	1.29
Sta. 142+00	14	14	1.98	2.00	1.99

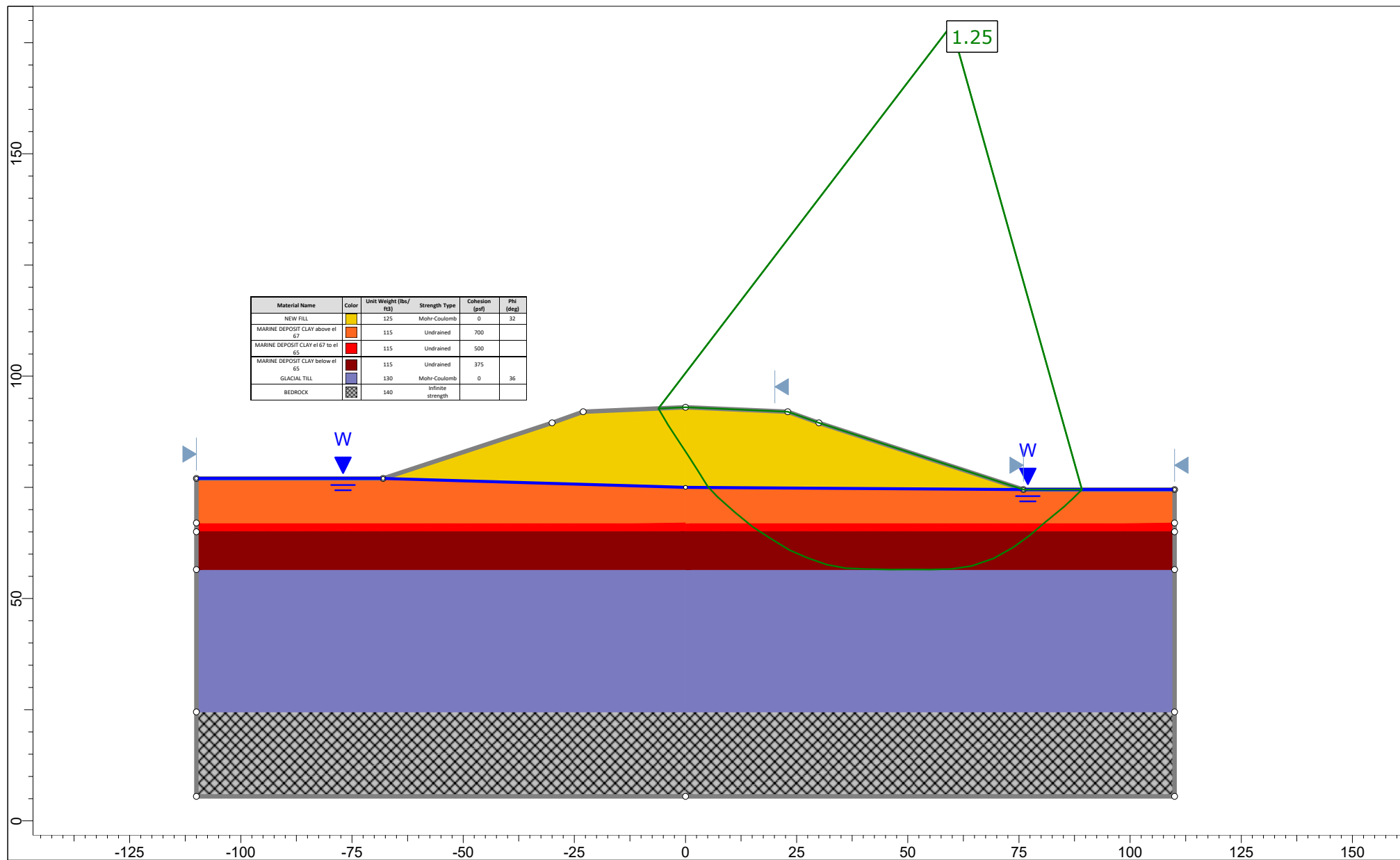
Right to Left (F.S=1.15)

Station	Height of Embankment	Maximum Temporary First Stage Fill Height	Factor of Safety (Spencer Method)	Factor of Safety (Bishop Simplified Method)	Factor of Safety (GLE/Morgenstern-Price Method)
Sta. 140+00	18	18	1.44	1.45	1.45
Sta. 142+00	14	14	1.47	1.48	1.48

Non-circular (F.S=1.15)

Station	Height of Embankment	Maximum Temporary First Stage Fill Height	Factor of Safety (Spencer Method)	Factor of Safety (GLE/Morgenstern-Price Method)
Sta. 140+00	18	18	1.25	1.26
Sta. 142+00	14	14	1.44	1.45

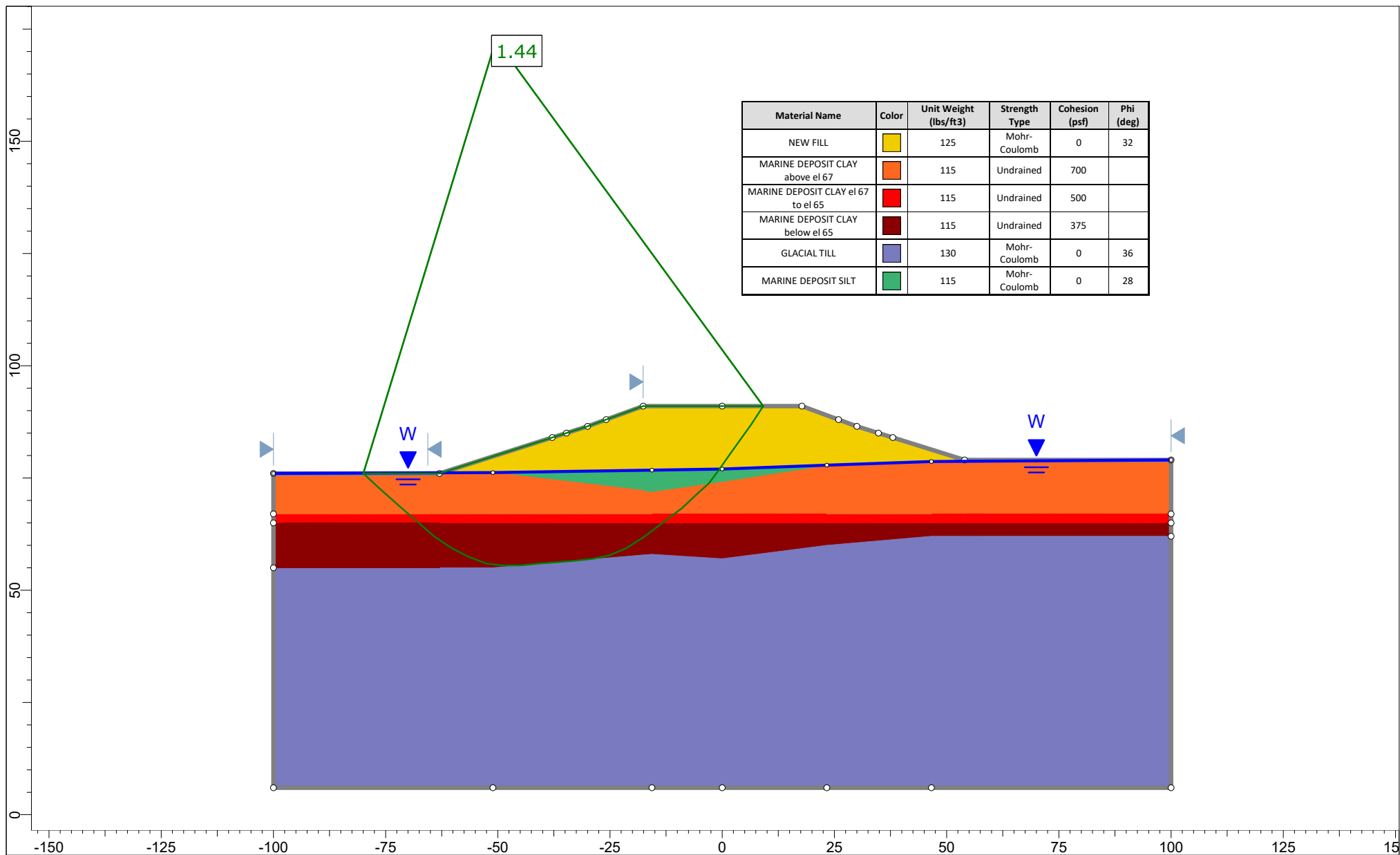
Sta. 140+00



SLIDEINTERPRET 9.008

Project		SLIDE - An Interactive Slope Stability Program	
Group	Temporary Case	Scenario	Master Scenario
Drawn By		Company	
Date	5/20/2021, 10:16:23 AM	File Name	2021-0527- Sta 140+00- Left to Right-non circular-F.S1.15-D1.slmd

Sta. 142+00



SLIDEINTERPRET 9.008

Project	SLIDE - An Interactive Slope Stability Program		
Group	Temporary Case	Scenario	Master Scenario
Drawn By		Company	
Date	5/20/2021, 10:16:23 AM	File Name	2021-0615- Sta 142+00- Right to Left-non circular-F.S1.15-D3.slmd

Permanent Condition

Client: Maine Department of Transportation

Date: 27-May-2021

Project: I-395/Route 9 Connector - WIN 18915.00

Computed by: SSM

Subject: Global Stability - Area 2 Transverse

Checked by: EMS

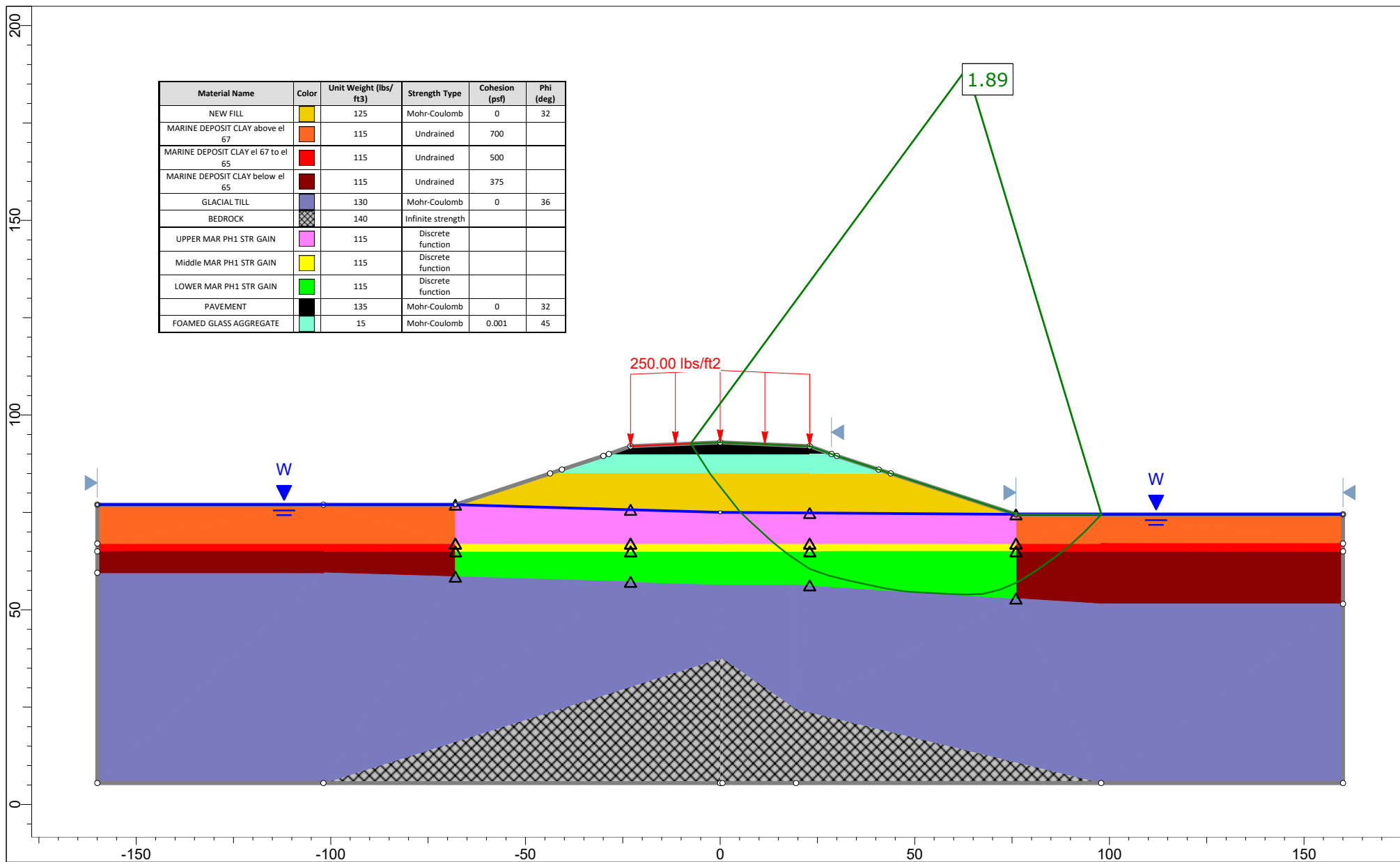
RESULTS AND CONCLUSIONS - PERMANENT CONDITION

Non-circular (F.S=1.3) - Transverse

Station	Height of Embankment	New Weight Fill Thickness (ft)	Lightweight Fill Thickness (ft)	Pavement Thickness (ft)	Stages	Factor of Safety (Spencer Method)	Factor of Safety (GLE/Morgenstern-Price Method)
Sta. 140+00	18	10	5	3.0	Final Condition + Loading	1.89	1.89
					Site Class D Pseudo-Static, 0.05g	1.53	1.53
Sta. 142+00	14	7	4	3.0	Final Condition + Loading	2.10	2.11
					Site Class D Pseudo-Static, 0.05g	1.68	1.69

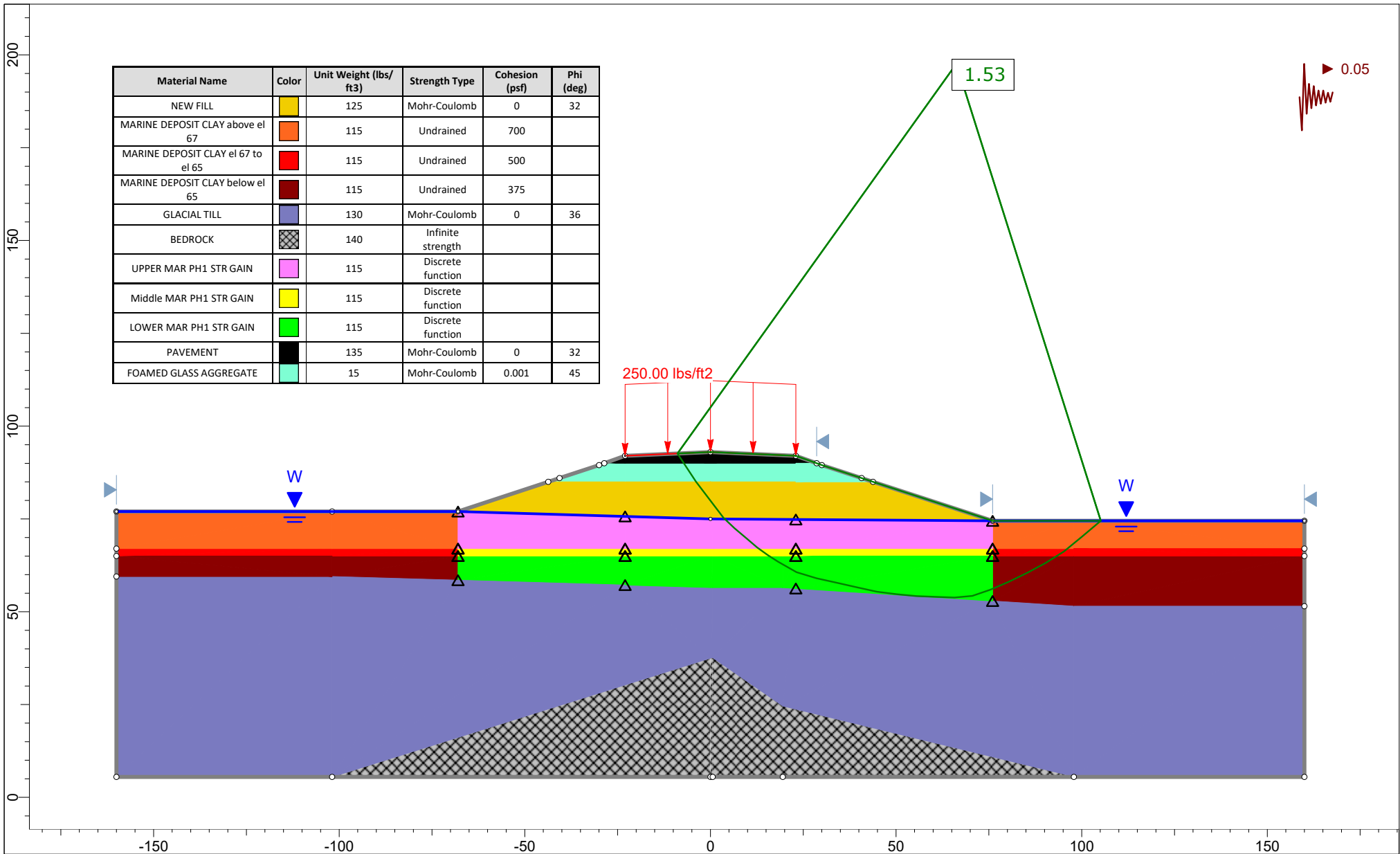
Sta. 140+00


Material Name	Color	Unit Weight (lbs/ft ³)	Strength Type	Cohesion (psf)	Phi (deg)
NEW FILL		125	Mohr-Coulomb	0	32
MARINE DEPOSIT CLAY above el 67		115	Undrained	700	
MARINE DEPOSIT CLAY el 67 to el 65		115	Undrained	500	
MARINE DEPOSIT CLAY below el 65		115	Undrained	375	
GLACIAL TILL		130	Mohr-Coulomb	0	36
BEDROCK		140	Infinite strength		
UPPER MAR PH1 STR GAIN		115	Discrete function		
Middle MAR PH1 STR GAIN		115	Discrete function		
LOWER MAR PH1 STR GAIN		115	Discrete function		
PAVEMENT		135	Mohr-Coulomb	0	32
FOAMED GLASS AGGREGATE		15	Mohr-Coulomb	0.001	45



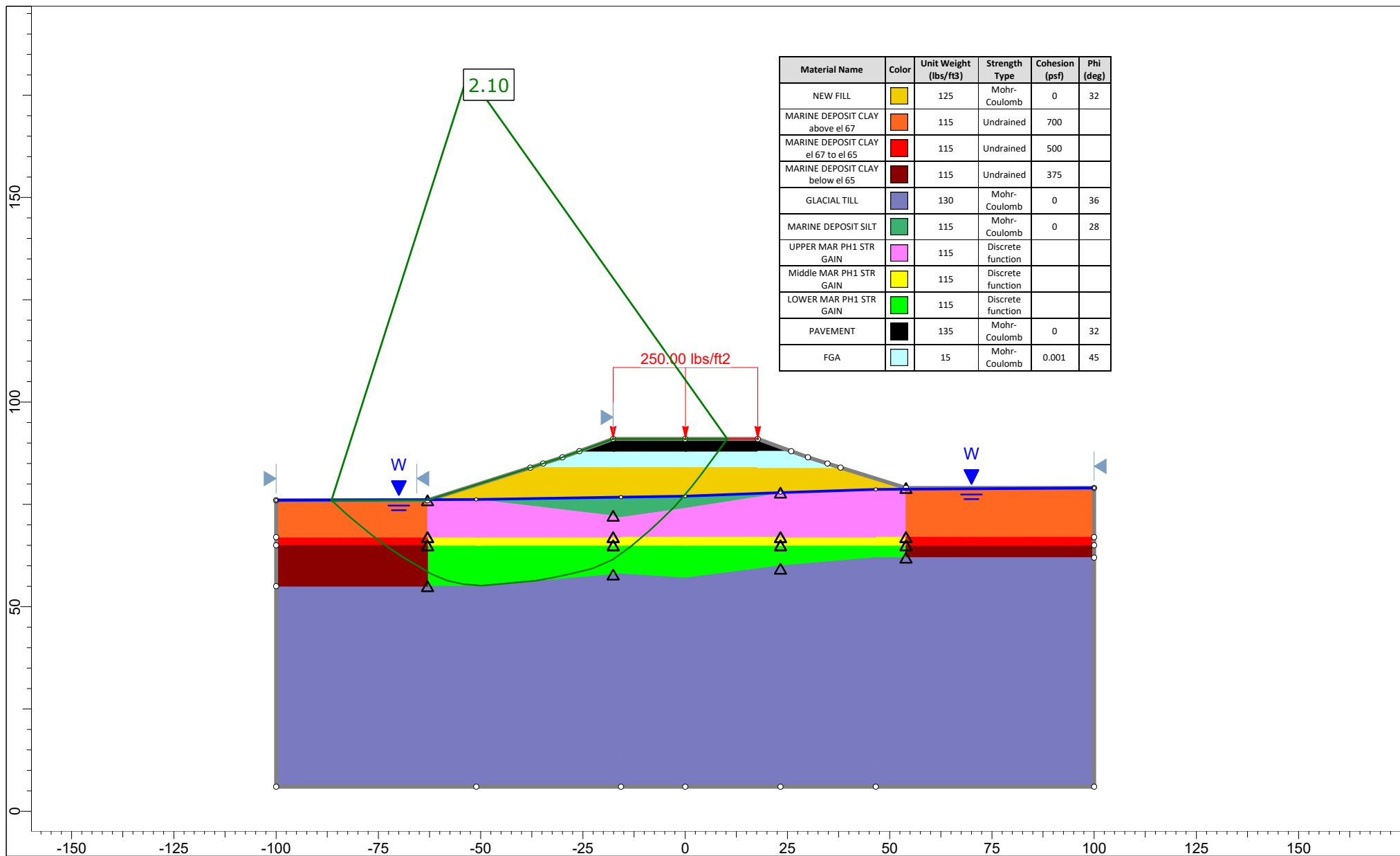
SLIDEINTERPRET 9.008

Project	SLIDE - An Interactive Slope Stability Program		
Group	Permanent Case	Scenario	Overexc and NWF to Final+250psf Surch
Drawn By		Company	
Date	5/20/2021, 10:16:23 AM	File Name	2021-0527- Sta 140+00- Left to Right-non circular-F.S1.15-D1.slmd



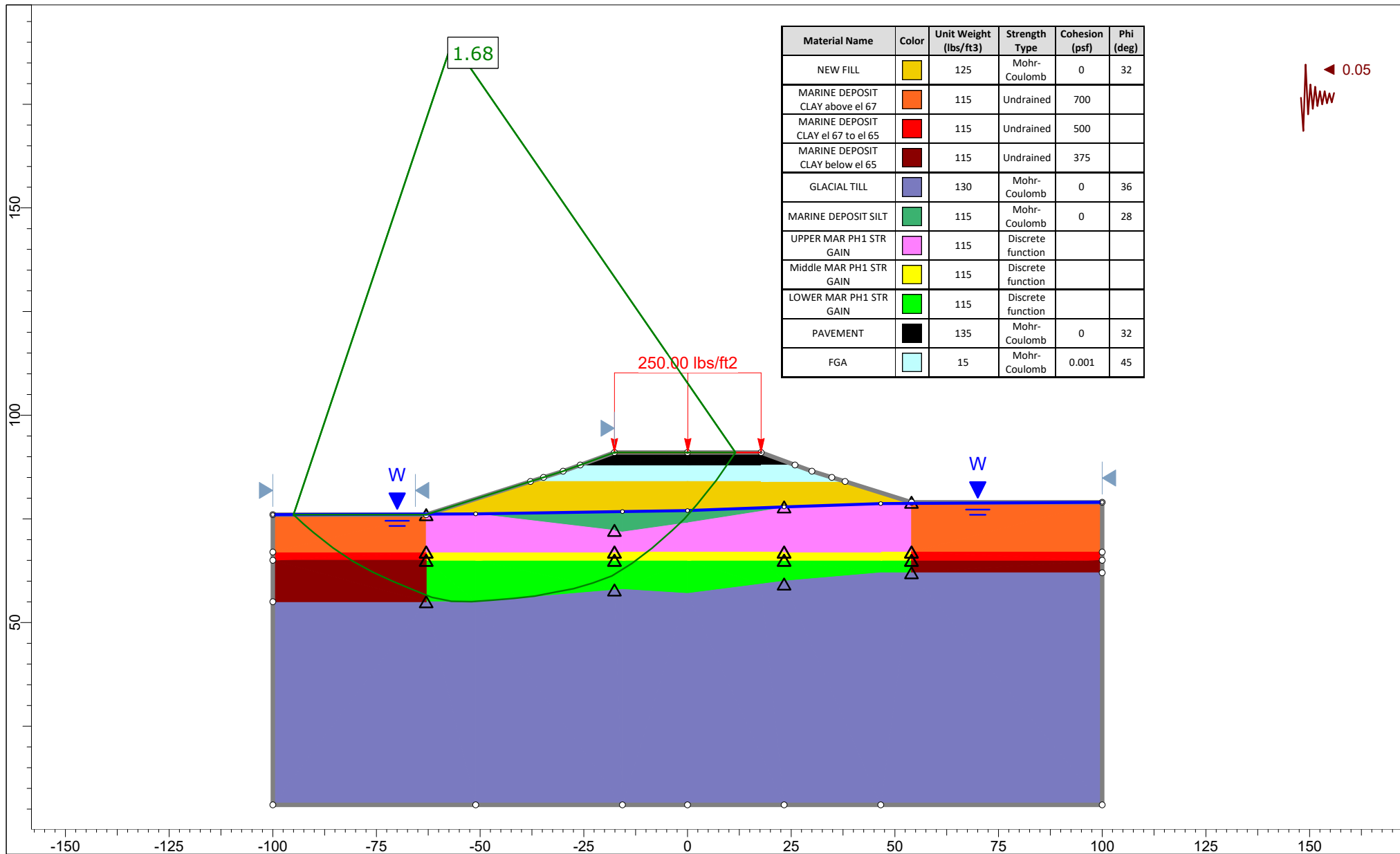
	Project			SLIDE - An Interactive Slope Stability Program	
	Group		Permanent Case	Scenario	
	Drawn By			Company	
	Date		5/20/2021, 10:16:23 AM	File Name	
				2021-0527- Sta 140+00- Left to Right-non circular-F.S1.15-D1.slmd	

Sta. 142+00



SLIDEINTERPRET 9.008

Project	SLIDE - An Interactive Slope Stability Program	
Group	Permanent Case	Scenario Overexc and NWF to Final+250psf Surch
Drawn By		Company
Date	5/20/2021, 10:16:23 AM	File Name 2021-0615- Sta 142+00- Right to Left-non circular-F.S1.15-D3.slmd



SLIDEINTERPRET 9.008

Project			SLIDE - An Interactive Slope Stability Program		
Group		Permanent Case		Scenario	
				Site Class D Pseudo-Static, 0.05g	
Drawn By				Company	
Date		5/20/2021, 10:16:23 AM		File Name	
				2021-0615- Sta 142+00- Right to Left-non circular-F.S1.15-D3.slmd	

Area 2 - Longitudinal

Client: Maine Department of Transportation

Date: 20-May-2021

Project: I-395/Route 9 Connector - WIN 18915.00

Computed by: SSM

Subject: Global Stability - Area 2 Longitudinal

Checked by: EMS

PROBLEM STATEMENT AND OBJECTIVE

Calculate the global stability minimum factor of safety at critical sections along the proposed highway alignment.

REFERENCES

1. AASHTO LRFD Bridge Design Specifications, 7th Edition, 2014.
2. Slide version 7.0 by RocScience.
3. Maine DOT Bridge Design Guide, 2003, with 2014 updates.

AVAILABLE INFORMATION

1. Plan set titled, "Brewer-Eddington I-395/Route 9 Connector, Cross Sections," by MaineDOT dated 25 February 2020.
2. Plan set titled, "I-395/Route 9 Connector, Interpretive Subsurface Profile," by MaineDOT dated 2 October 2019.

ASSUMPTIONS

1. Soil profiles will be modeled to match settlement calculation models, as summarized below.
2. Used seismic site class D: $A_s/2 = 0.107/2 = 0.05 g$
3. A 250 psf traffic surcharge will be modeled.

SOIL PROPERTIES

Material	Unit Weight (pcf)	Friction Angle (degrees)	Undrained Shear Strength (psf)
New Fill	125	32	0
Marine Deposit	115	varies1	
Glacial Till	130	36	0
Bedrock	infinite strength		

Notes:

1. Soil properties for Existing Fill and Marine Deposit vary based on location. See individual soil profiles for details.

Client: Maine Department of Transportation

Date: 20-May-2021

Project: I-395/Route 9 Connector - WIN 18915.00

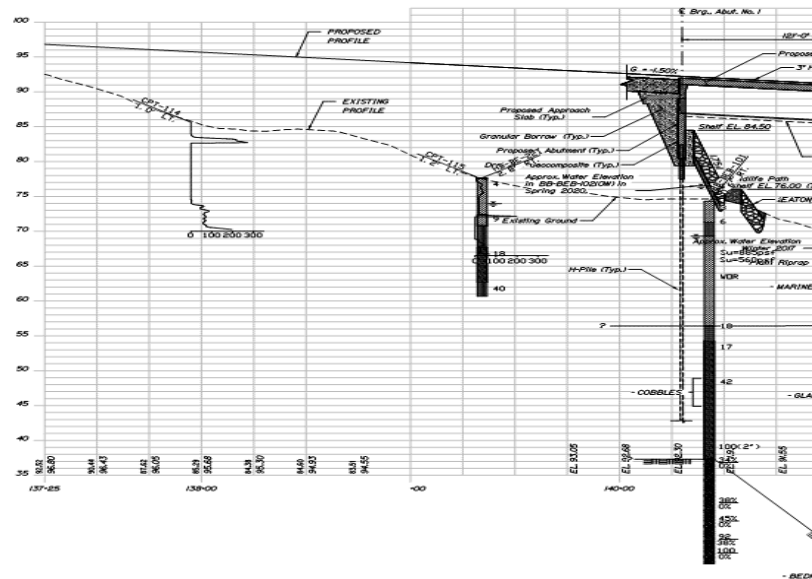
Computed by: SSM

Subject: Global Stability - Area 2 Longitudinal

Checked by: EMS

Abutment No. 1 (South) Geometry

Fill height = 17.5 ft

**SOIL PROFILE AND PROPERTIES (not to scale)**

Based on boring BB-BEB-101 and HB-BE-221

Groundwater Elev. = 74.5 ft

Boring BB-BEB-101

DEPTH (ft)			ELEVATION (ft)
0	NEW FILL	$\gamma = 125 \text{ pcf}$ $\phi = 32^\circ$	74.3
7.3	Marine Deposit CLAY	$\gamma = 115 \text{ pcf}$ $S_u = 700 \text{ psf}$	67
9.3	Marine Deposit CLAY	$\gamma = 115 \text{ pcf}$ $S_u = 500 \text{ psf}$	65
18	Marine Deposit CLAY	$\gamma = 115 \text{ pcf}$ $S_u = 375 \text{ psf}$	56.3
37	Glacial Till GRAVEL	$\gamma = 130 \text{ pcf}$ $\phi = 36^\circ$	37.3
52	BEDROCK	infinite strength	22.3

Client: Maine Department of Transportation

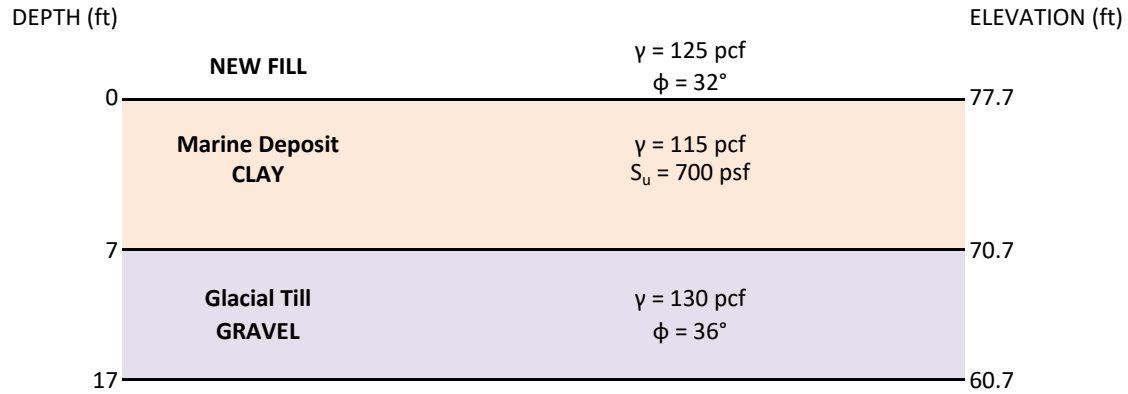
Date: 20-May-2021

Project: I-395/Route 9 Connector - WIN 18915.00

Computed by: SSM

Subject: Global Stability - Area 2 Longitudinal

Checked by: EMS

Abutment No. 1 Geometry - continued**Boring HB-BE-221**

Client: Maine Department of Transportation

Date: 20-May-2021

Project: I-395/Route 9 Connector - WIN 18915.00

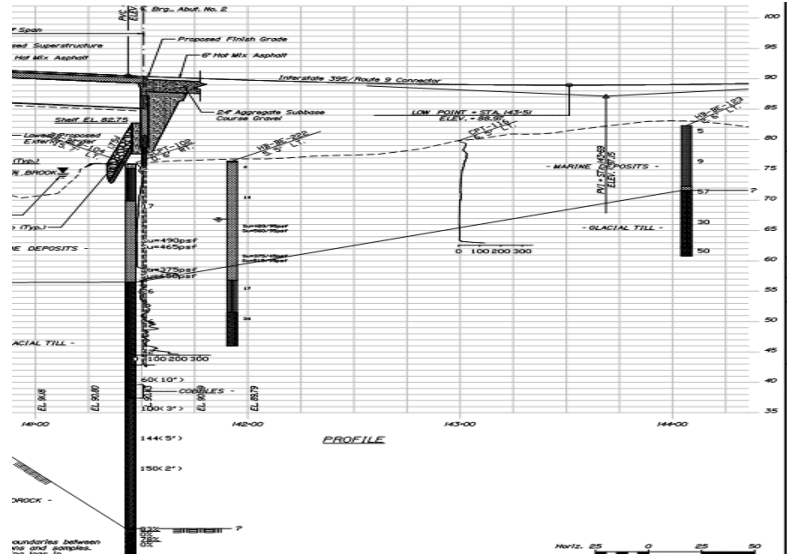
Computed by: SSM

Subject: Global Stability - Area 2 Longitudinal

Checked by: EMS

Abutment No. 2 (North) Geometry

Fill height = 14.0 ft

**SOIL PROFILE AND PROPERTIES (not to scale)**

Based on boring BB-BEB-104, HB-BE-222, HB-BE-123

Groundwater Elev. = 74.5 ft

Boring BB-BEB-104

DEPTH (ft)

ELEVATION (ft)

DEPTH (ft)	SOIL TYPE	PROPERTIES	ELEVATION (ft)
0	NEW FILL	$\gamma = 125 \text{ pcf}$ $\phi = 32^\circ$	76
0 to 5	Marine Deposit SILT	$\gamma = 115 \text{ pcf}$ $\phi = 28^\circ$	71
5 to 9	Marine Deposit CLAY	$\gamma = 115 \text{ pcf}$ $S_u = 700 \text{ psf}$	67
9 to 11	Marine Deposit CLAY	$\gamma = 115 \text{ pcf}$ $S_u = 500 \text{ psf}$	65
11 to 19.5	Marine Deposit CLAY	$\gamma = 115 \text{ pcf}$ $S_u = 375 \text{ psf}$	56.5
19.5 to 60	Glacial Till SILT/GRAVEL	$\gamma = 130 \text{ pcf}$ $\phi = 36^\circ$	16
60 to 71	BEDROCK	infinite strength	5

Client: Maine Department of Transportation

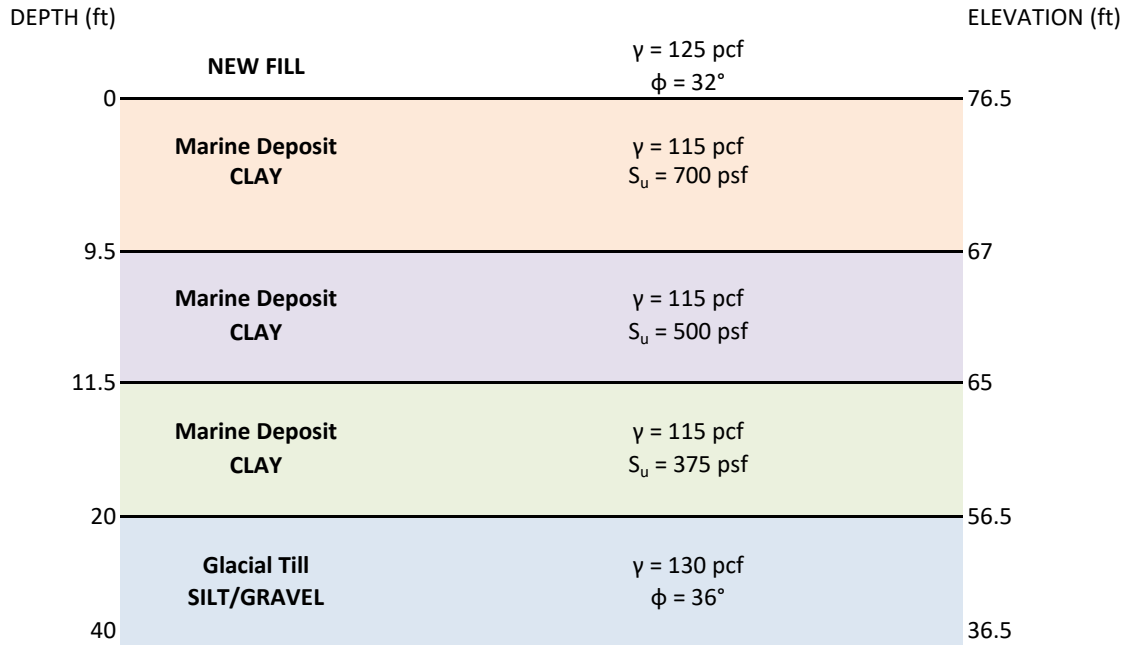
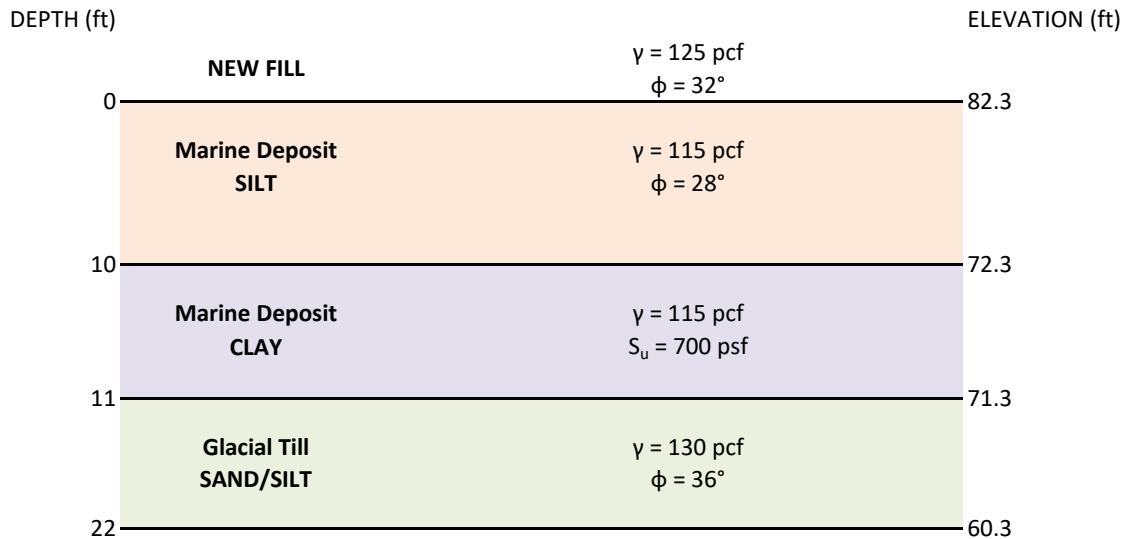
Date: 20-May-2021

Project: I-395/Route 9 Connector - WIN 18915.00

Computed by: SSM

Subject: Global Stability - Area 2 Longitudinal

Checked by: EMS

Abutment No. 2 Geometry - continued
Boring HB-BE-222

Boring HB-BE-123


Temporary Condition

Client: Maine Department of Transportation

Date: 20-May-2021

Project: I-395/Route 9 Connector - WIN 18915.00

Computed by: SSM

Subject: Global Stability - Area 2 Longitudinal

Checked by: EMS








RESULTS AND CONCLUSIONS - TEMPORARY CONDITION**Circular (F.S=1.15)**

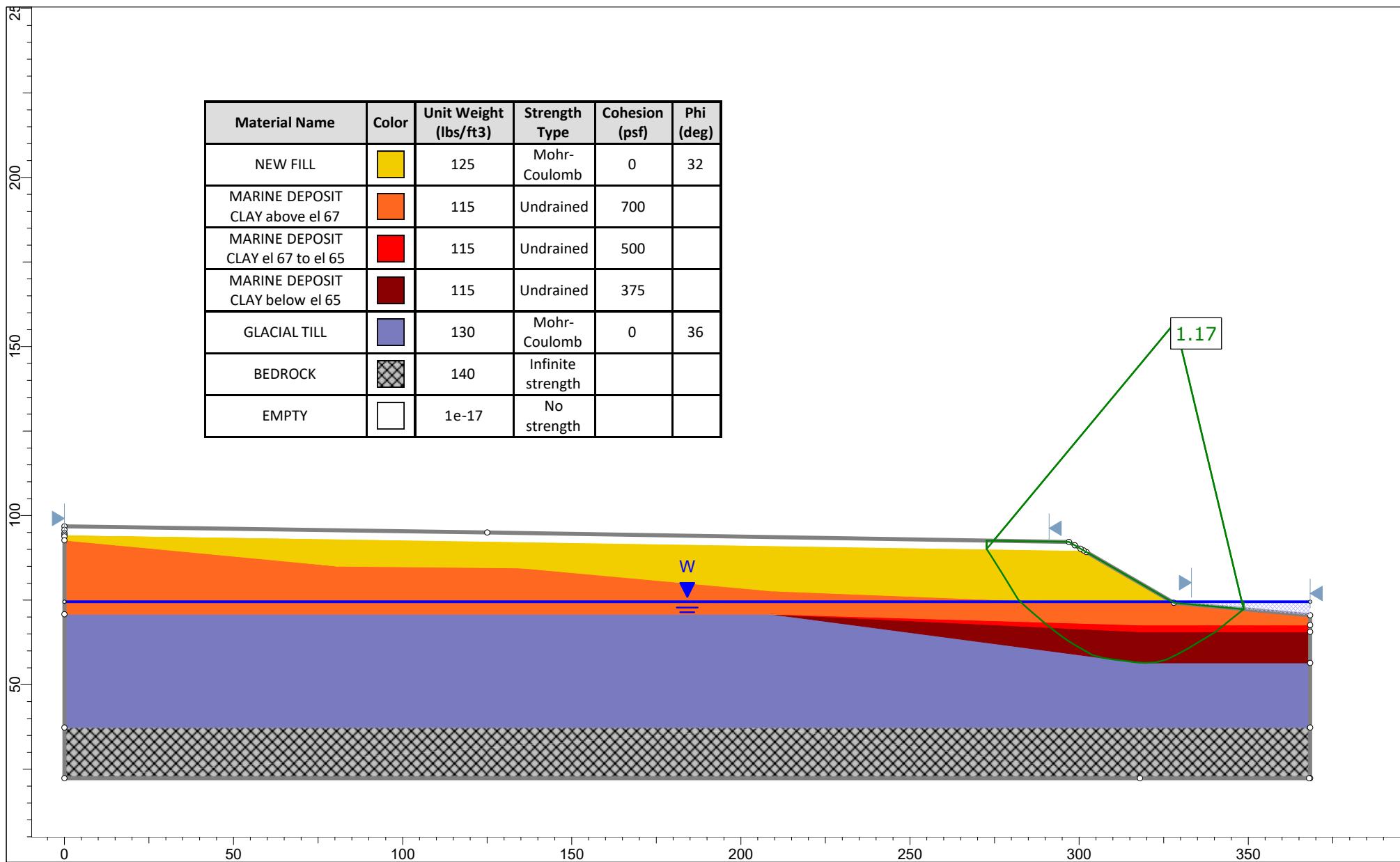
Station	Height of Embankment	Maximum Temporary First Stage Fill Height	Factor of Safety (Spencer Method)	Factor of Safety (Bishop Simplified Method)	Factor of Safety (GLE/Morgenstern-Price Method)
Abutment No. 1 (S)	17.5	15.5	1.16	1.17	1.16
Abutment No. 2 (N)	14	14	1.18	1.19	1.18

Non-Circular (F.S=1.15)

Station	Height of Embankment	Maximum Temporary First Stage Fill Height	Factor of Safety (Spencer Method)	Factor of Safety (GLE/Morgenstern-Price Method)
Abutment No. 1 (S)	17.5	15	1.17	1.18
Abutment No. 2 (N)	14	14	1.16	1.17

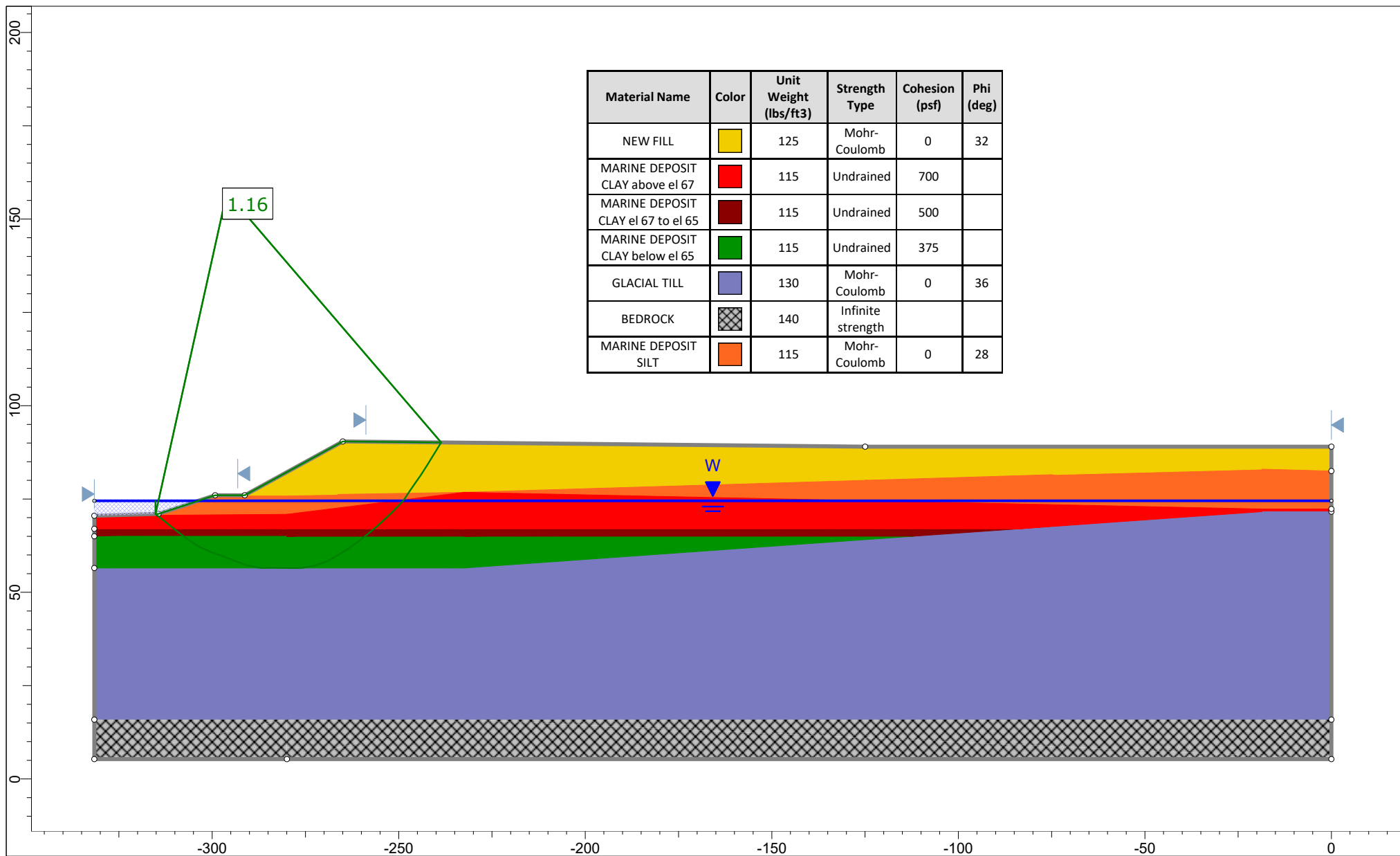
Abutment No. 1 (South)

Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)
NEW FILL		125	Mohr-Coulomb	0	32
MARINE DEPOSIT CLAY above el 67		115	Undrained	700	
MARINE DEPOSIT CLAY el 67 to el 65		115	Undrained	500	
MARINE DEPOSIT CLAY below el 65		115	Undrained	375	
GLACIAL TILL		130	Mohr-Coulomb	0	36
BEDROCK		140	Infinite strength		
EMPTY		1e-17	No strength		



Project			
SLIDE - An Interactive Slope Stability Program			
Group	Temporary Case		Scenario
			Master Scenario
Drawn By			Company
Date	5/20/2021, 10:16:23 AM		File Name
			2021-0520- Brg., Abut. No.I (South)- Left to Right-non-circular-F S1 15-D1 slmd

Abutment No. 2 (North)



Project				SLIDE - An Interactive Slope Stability Program			
Group		Temporary Case			Scenario		
Drawn By					Company		
Date		5/20/2021, 10:16:23 AM			File Name		
					2021-0611- Brg., Abut. No.2 (North)-Right to Left-non circular-		
					E S1 15-D1 slmd		

Permanent Condition

Client: Maine Department of Transportation

Date: 20-May-2021

Project: I-395/Route 9 Connector - WIN 18915.00

Computed by: SSM

Subject: Global Stability - Area 2 Longitudinal

Checked by: EMS

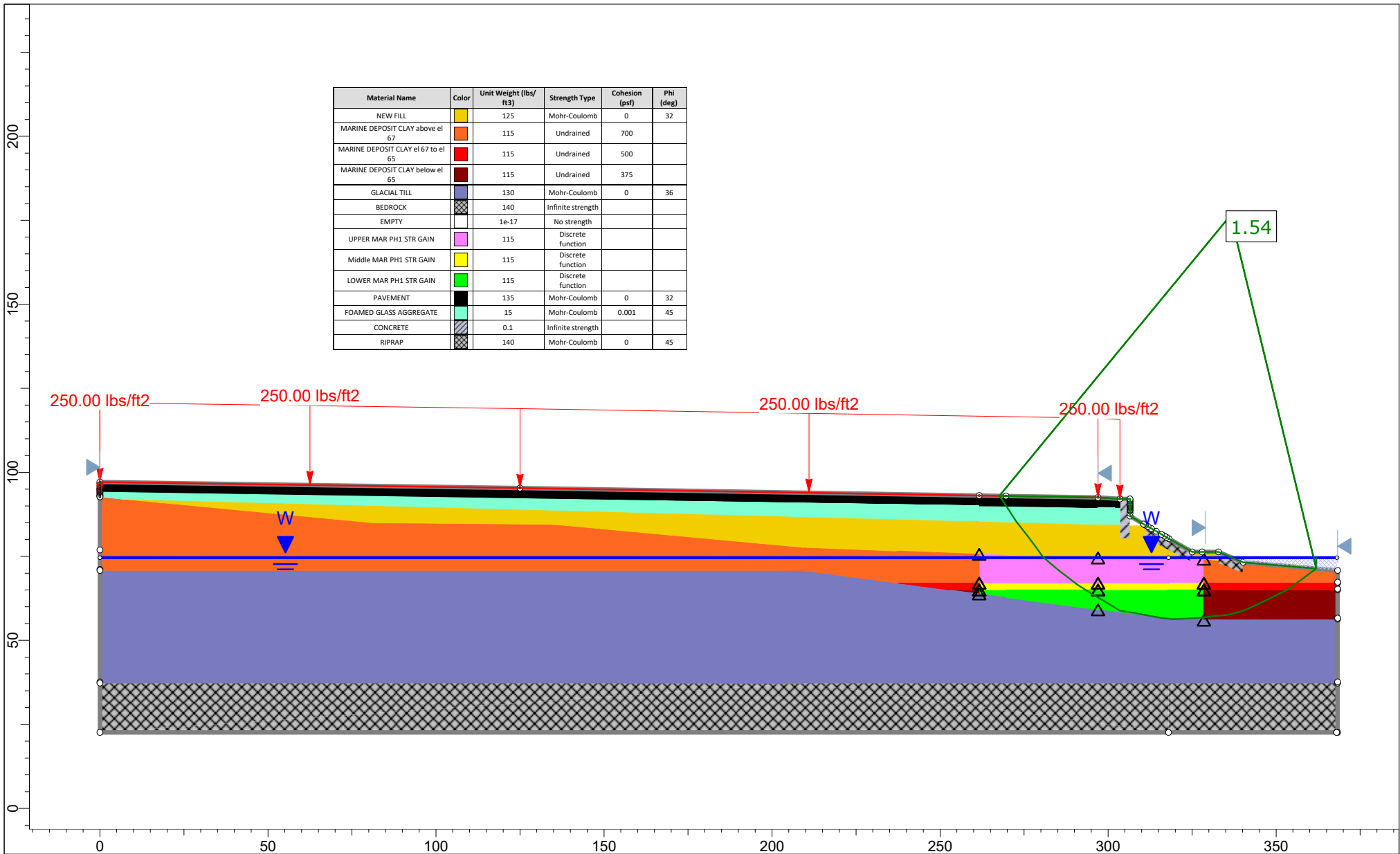
RESULTS AND CONCLUSIONS - PERMANENT CONDITION


Non-Circular (F.S=1.5) - Longitudinal

Station	Height of Embankment	New Weight Fill Thickness (ft)	Lightweight Fill Thickness (ft)	Pavement Thickness (ft)	Stages	Factor of Safety (Spencer Method)	Factor of Safety (GLE/Morgenstern-Price Method)
Abutment No. 1 (South)	18	10	5	3	Final Condition + Loading	1.54	1.55
					Site Class D Pseudo-Static, 0.05g	1.27	1.26
Abutment No. 2 (North)	14	7	4	3	Final Condition + Loading	1.60	1.60
					Site Class D Pseudo-Static, 0.05g	1.37	1.38

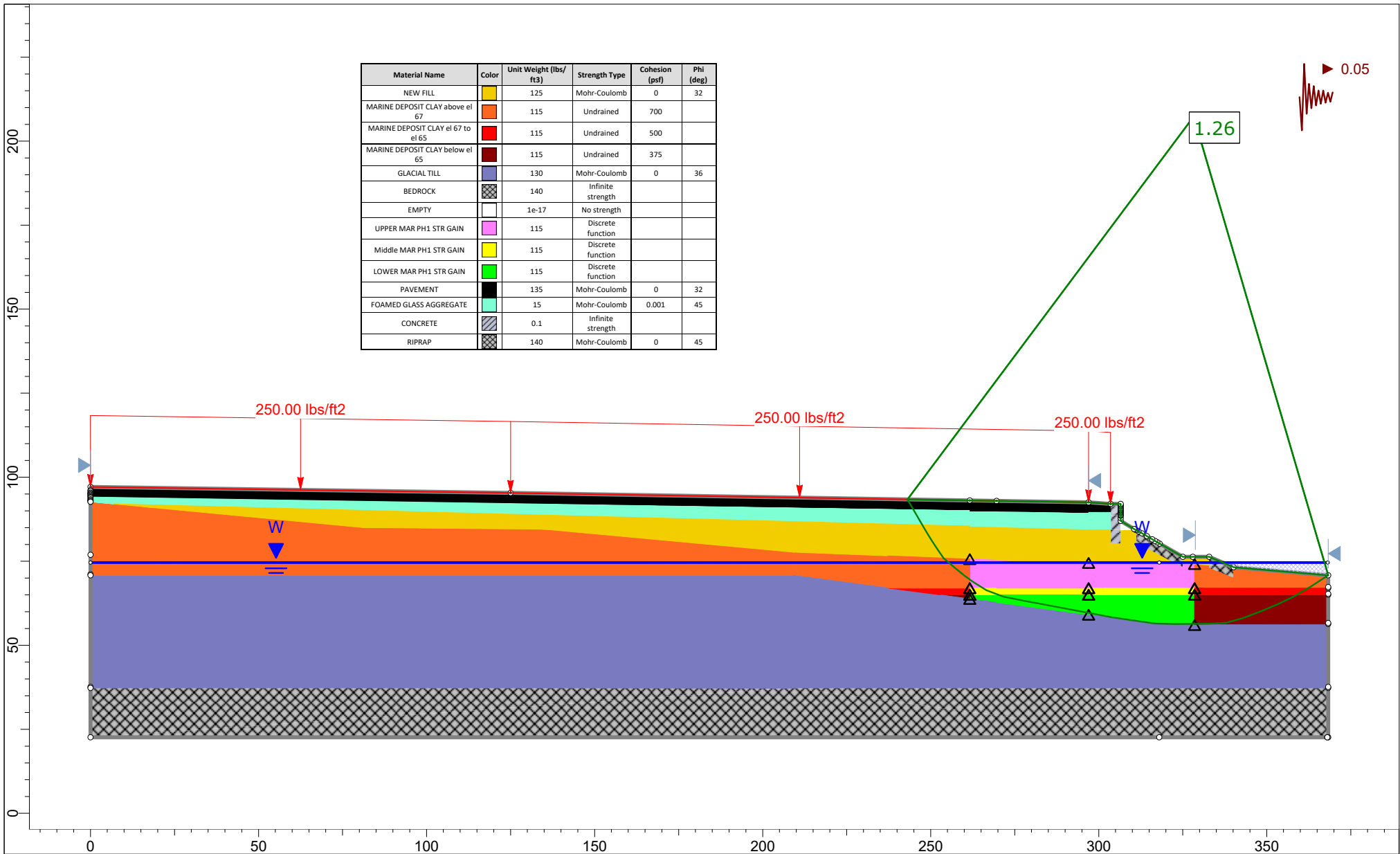
Abutment No. 1 (South)

Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)
NEW FILL		125	Mohr-Coulomb	0	32
MARINE DEPOSIT CLAY above el 67		115	Undrained	700	
MARINE DEPOSIT CLAY el 67 to el 65		115	Undrained	500	
MARINE DEPOSIT CLAY below el 65		115	Undrained	375	
GLACIAL TILL		130	Mohr-Coulomb	0	36
BEDROCK		140	Infinite strength		
EMPTY		1e-17	No strength		
UPPER MAR PH1 STR GAIN		115	Discrete function		
Middle MAR PH1 STR GAIN		115	Discrete function		
LOWER MAR PH1 STR GAIN		115	Discrete function		
PAVEMENT		135	Mohr-Coulomb	0	32
FOAMED GLASS AGGREGATE		15	Mohr-Coulomb	0.001	45
CONCRETE		0.1	Infinite strength		
RIPRAP		140	Mohr-Coulomb	0	45



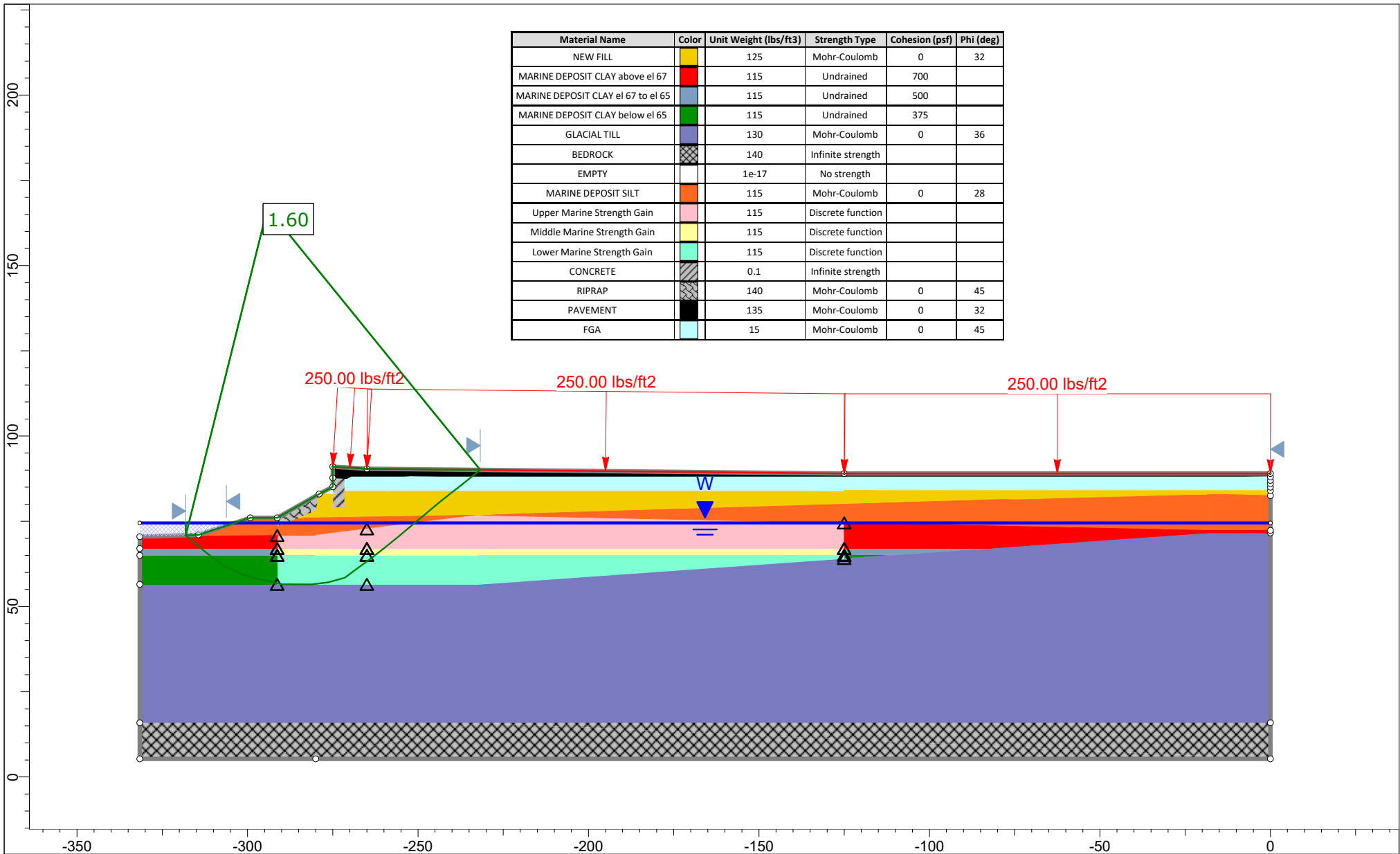
 <small>SLIDEINTERPRET 9.008</small>	<i>Project</i> SLIDE - An Interactive Slope Stability Program	
	<i>Group</i> Permanent Case	<i>Scenario</i> Overexc and NWF to Final+250psf Surch
	<i>Drawn By</i>	<i>Company</i>
	<i>Date</i> 5/20/2021, 10:16:23 AM	<i>File Name</i> 2021-0520-Abut. No.1- Left to Right-non-circular-F.S1.15-D1.slmd


Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)
NEW FILL		125	Mohr-Coulomb	0	32
MARINE DEPOSIT CLAY above el 67		115	Undrained	700	
MARINE DEPOSIT CLAY el 67 to el 65		115	Undrained	500	
MARINE DEPOSIT CLAY below el 65		115	Undrained	375	
GLACIAL TILL		130	Mohr-Coulomb	0	36
BEDROCK		140	Infinite strength		
EMPTY		1e-17	No strength		
UPPER MAR PH1 STR GAIN		115	Discrete function		
Middle MAR PH1 STR GAIN		115	Discrete function		
LOWER MAR PH1 STR GAIN		115	Discrete function		
PAVEMENT		135	Mohr-Coulomb	0	32
FOAMED GLASS AGGREGATE		15	Mohr-Coulomb	0.001	45
CONCRETE		0.1	Infinite strength		
RIPRAP		140	Mohr-Coulomb	0	45

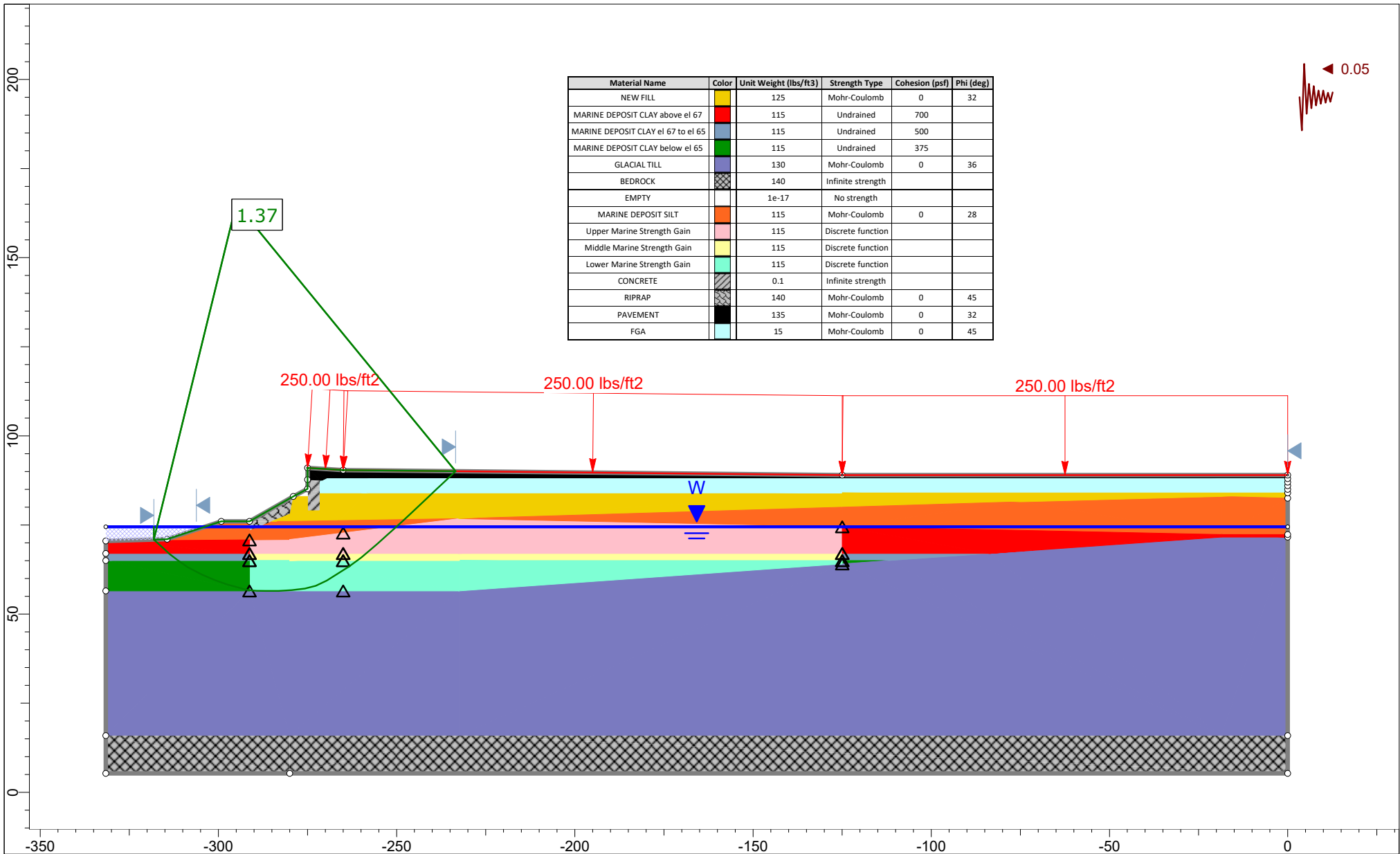



Project			
SLIDE - An Interactive Slope Stability Program			
Group	Permanent Case	Scenario	Site Class D Pseudo-Static, 0.05g
Drawn By		Company	
Date	5/20/2021, 10:16:23 AM	File Name	2021-0520-Abut. No.1- Left to Right-non-circular-F.S1.15-D1.slmd

Abutment No. 2 (North)



	Project		SLIDE - An Interactive Slope Stability Program	
	Group		Group 2	Scenario Loading and Abutment Construction
	Drawn By			Company
	Date		5/20/2021, 10:16:23 AM	File Name
			4021-0616- Brg., Abut. No.2 (North)-Right to Left-non circular- E S1 15-D5 slmd	



	Project		SLIDE - An Interactive Slope Stability Program	
	Group	Permanent Case	Scenario	Seismic Site Class D 0.05g
	Drawn By		Company	
	Date	5/20/2021, 10:16:23 AM	File Name	2021-0616- Brg., Abut. No.2 (North)-Right to Left-non circular- E S1 15-D5 slmd

Global Embankment Stability – Area 3

Client: Maine Department of Transportation

Date: 17-May-2021

Project: I-395/Route 9 Connector - WIN 18915.00

Computed by: SSM

Subject: Global Stability - Area 3

Checked by: EMS

PROBLEM STATEMENT AND OBJECTIVE

Calculate the global stability minimum factor of safety at critical sections along the proposed highway alignment.

REFERENCES

1. AASHTO LRFD Bridge Design Specifications, 7th Edition, 2014.
2. Slide version 7.0 by RocScience.
3. Maine DOT Bridge Design Guide, 2003, with 2014 updates.

AVAILABLE INFORMATION

1. Plan set titled, "Brewer-Eddington I-395/Route 9 Connector, Cross Sections," by MaineDOT dated 25 February 2020.
2. Plan set titled, "I-395/Route 9 Connector, Interpretive Subsurface Profile," by MaineDOT dated 2 October 2019.

ASSUMPTIONS

1. Soil profiles will be modeled to match settlement calculation models, as summarized below.
2. Used seismic site class D: $A_s/2 = 0.107/2 = 0.05$ g
3. A 250 psf traffic surcharge will be modeled.

SOIL PROPERTIES

Material	Unit Weight (pcf)	Friction Angle (degrees)	Undrained Shear Strength (psf)
New Fill	125	32	0
Marine Deposit	115	—	600
Glacial Till	130	36	0
Bedrock	infinite strength		

Notes:

1. Soil properties for Existing Fill and Marine Deposit vary based on location. See individual soil profiles for details.

Client: Maine Department of Transportation

Date: 17-May-2021

Project: I-395/Route 9 Connector - WIN 18915.00

Computed by: SSM

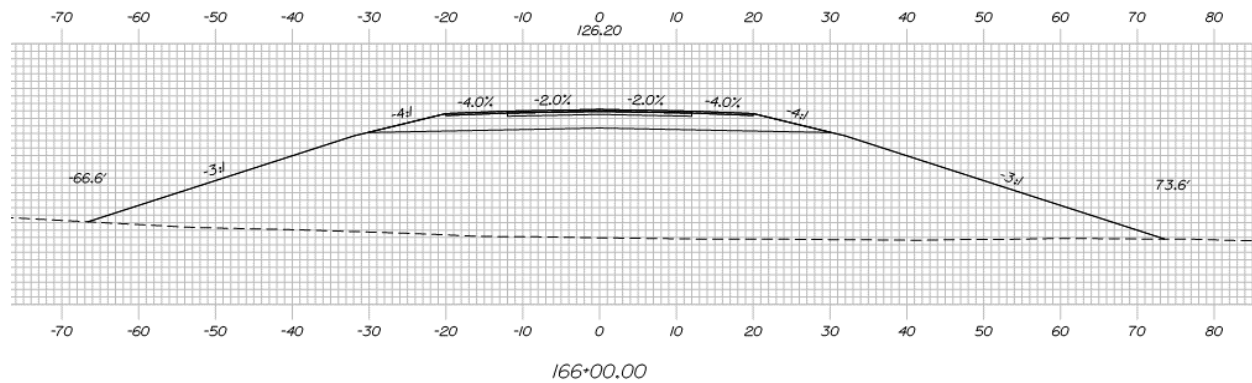
Subject: Global Stability - Area 3

Checked by: EMS

STA 166+00 GEOMETRY

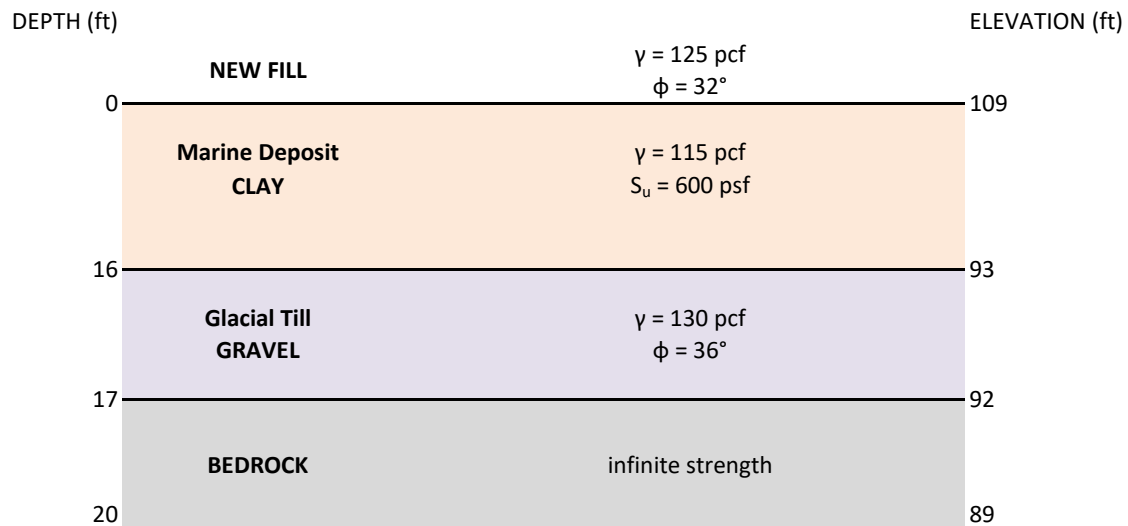
Fill height = 17 ft

Ground surface at center = El. 109


STA 166+00 SOIL PROFILE AND PROPERTIES (not to scale)

Based on boring HB-BE-223

Groundwater depth = 0.1 ft



Temporary Condition

Client: Maine Department of Transportation

Date: 17-May-2021

Project: I-395/Route 9 Connector - WIN 18915.00

Computed by: SSM

Subject: Global Stability - Area 3

Checked by: EMS

RESULTS AND CONCLUSIONS - TEMPORARY CONDITION

Left to Right (F.S=1.15)

Station	Height of Embankment	Maximum Temporary First Stage Fill Height	Factor of Safety (Spencer Method)	Factor of Safety (Bishop Simplified Method)	Factor of Safety (GLE/Morgenstern-Price Method)
Sta. 166+00	17	17	1.74	1.76	1.75
Sta. 167+50	20	20	1.69	1.72	1.69





Right to Left (F.S=1.15)

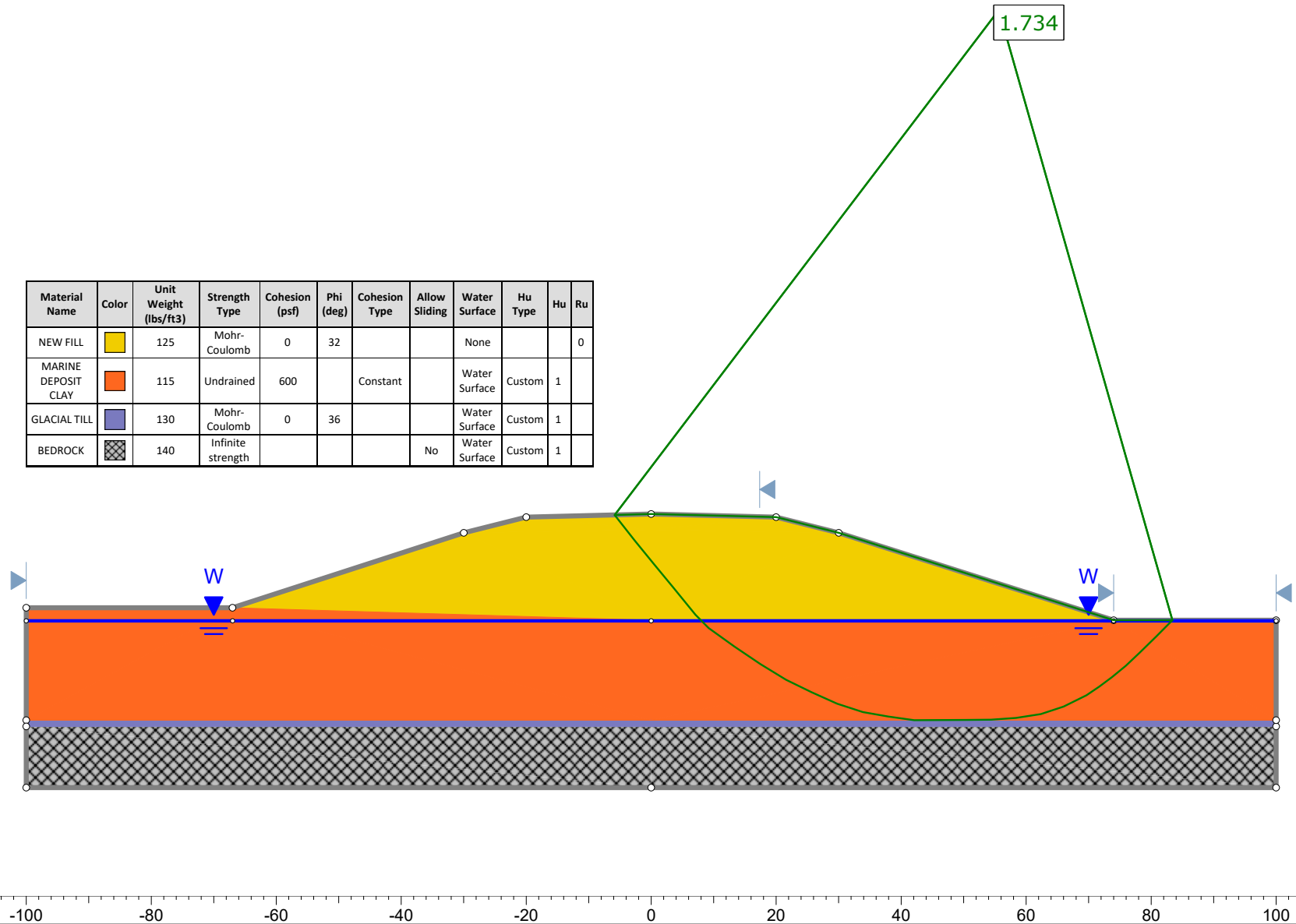
Station	Height of Embankment	Maximum Temporary First Stage Fill Height	Factor of Safety (Spencer Method)	Factor of Safety (Bishop Simplified Method)	Factor of Safety (GLE/Morgenstern-Price Method)
Sta. 166+00	17	17	1.89	1.9	1.9
Sta. 167+50	20	20	1.63	1.66	1.64

Non-circular (F.S=1.15)

Station	Height of Embankment	Maximum Temporary First Stage Fill Height	Factor of Safety (Spencer Method)	Factor of Safety (GLE/Morgenstern-Price Method)
Sta. 166+00	17 (L to R)	17 (L to R)	1.72	1.73
Sta. 167+50	20 (R to L)	20 (R to L)	1.61	1.61

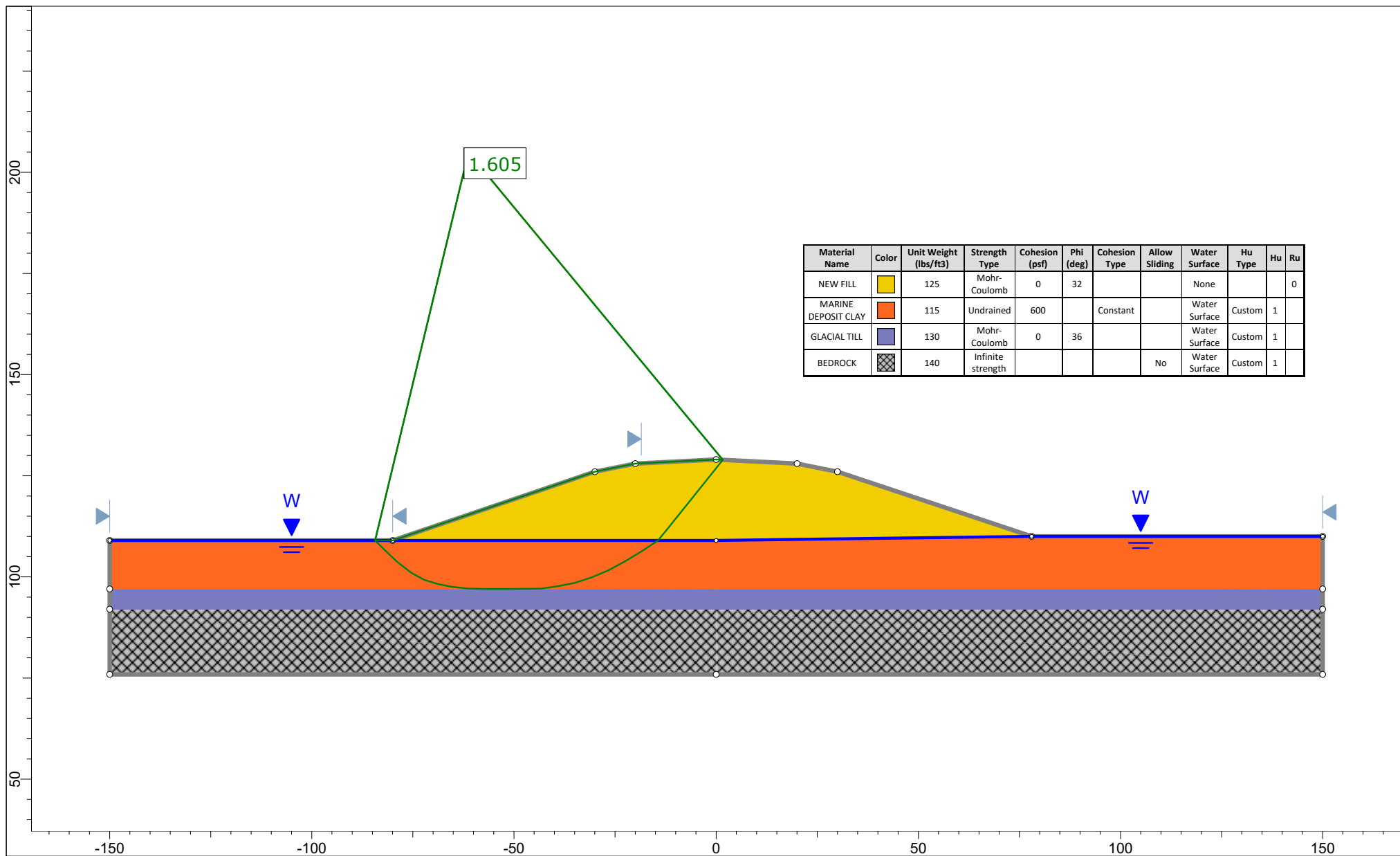
Sta. 166+00





Material Name	Color	Unit Weight (lbs/ft ³)	Strength Type	Cohesion (psf)	Phi (deg)	Cohesion Type	Allow Sliding	Water Surface	Hu Type	Hu	Ru
NEW FILL		125	Mohr-Coulomb	0	32			None			0
MARINE DEPOSIT CLAY		115	Undrained	600		Constant		Water Surface	Custom	1	
GLACIAL TILL		130	Mohr-Coulomb	0	36			Water Surface	Custom	1	
BEDROCK		140	Infinite strength				No	Water Surface	Custom	1	



Project	SLIDE - An Interactive Slope Stability Program	
Group	Temporary Case - Sta. 166+00	Scenario
Drawn By	SSM	Company
Date	5/18/2021, 8:29:46 AM	File Name
		2021-0518-STA 166+00-Left to Right-non-circular-D1.slmd

Sta. 167+50



Material Name	Color	Unit Weight (lbs/ft ³)	Strength Type	Cohesion (psf)	Phi (deg)	Cohesion Type	Allow Sliding	Water Surface	Hu Type	Hu	Ru
NEW FILL		125	Mohr-Coulomb	0	32			None			0
MARINE DEPOSIT CLAY		115	Undrained	600		Constant		Water Surface	Custom	1	
GLACIAL TILL		130	Mohr-Coulomb	0	36			Water Surface	Custom	1	
BEDROCK		140	Infinite strength				No	Water Surface	Custom	1	



SLIDEINTERPRET 9.004

Project		SLIDE - An Interactive Slope Stability Program	
Group	Temporary Case - Sta. 167+50	Scenario	Master Scenario
Drawn By	SSM	Company	
Date	5/18/2021, 8:29:46 AM	File Name	2021-0518-STA 167+50-Right to Left-non-circular-D1.slmd

Permanent Condition

Client: Maine Department of Transportation

Date: 17-May-2021

Project: I-395/Route 9 Connector - WIN 18915.00

Computed by: SSM

Subject: Global Stability - Area 3

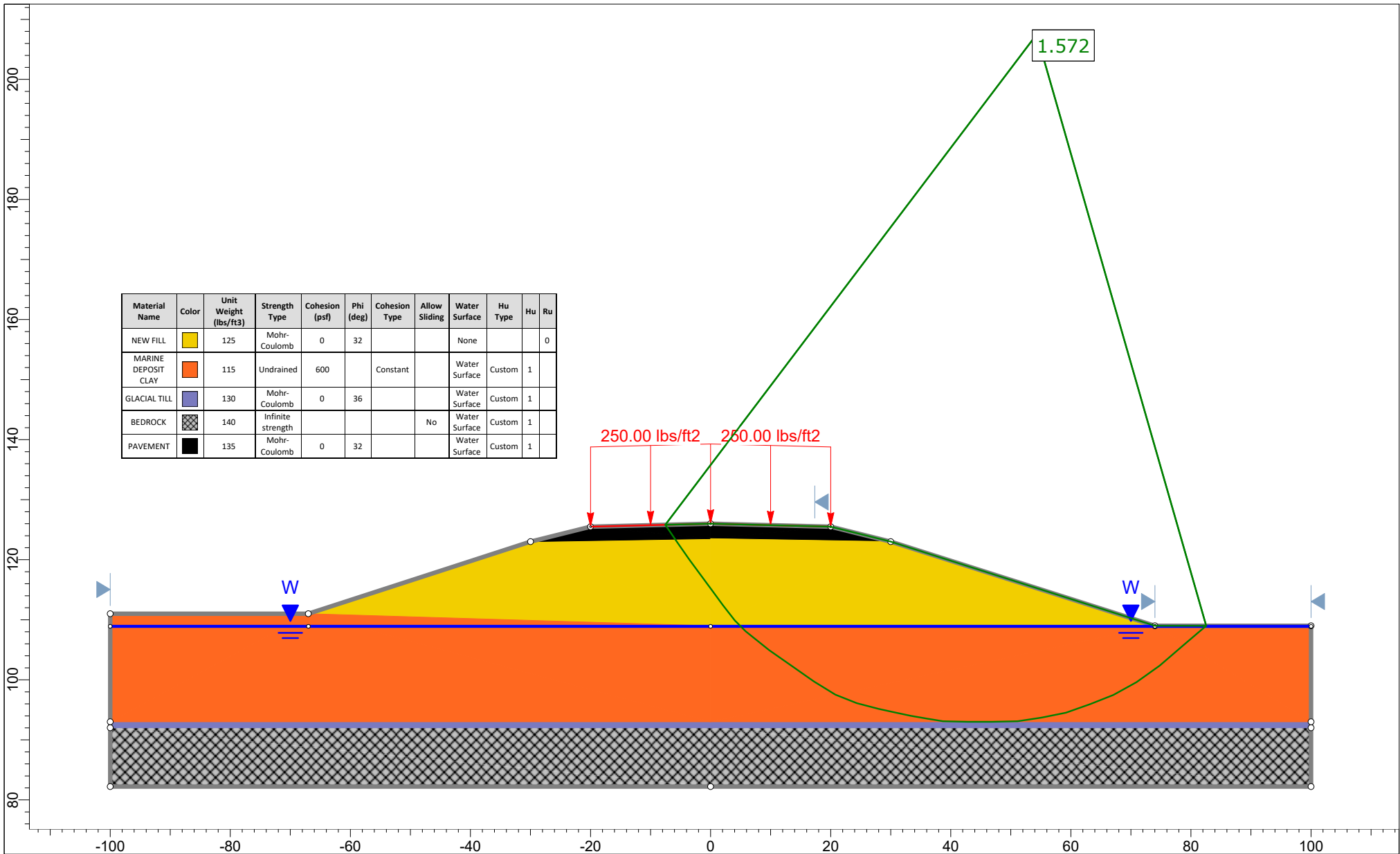
Checked by: EMS

RESULTS AND CONCLUSIONS - PERMANENT CONDITION

Non-circular (F.S=1.3)

Station	Height of Embankment	New Weight Fill Thickness (ft)	Lightweight Fill Thickness (ft)	Pavement Thickness (ft)	Stages	Factor of Safety (Spencer Method)	Factor of Safety (GLE/Morgenstern-Price Method)
Sta. 166+00	17	14	—	3.0	Final Condition + Loading	1.57	1.57
					Site Class D Pseudo-Static, 0.05g	1.31	1.31
Sta. 167+50	20	17	—	3.0	Final Condition + Loading	1.49	1.49
					Site Class D Pseudo-Static, 0.05g	1.26	1.25

Sta. 166+00



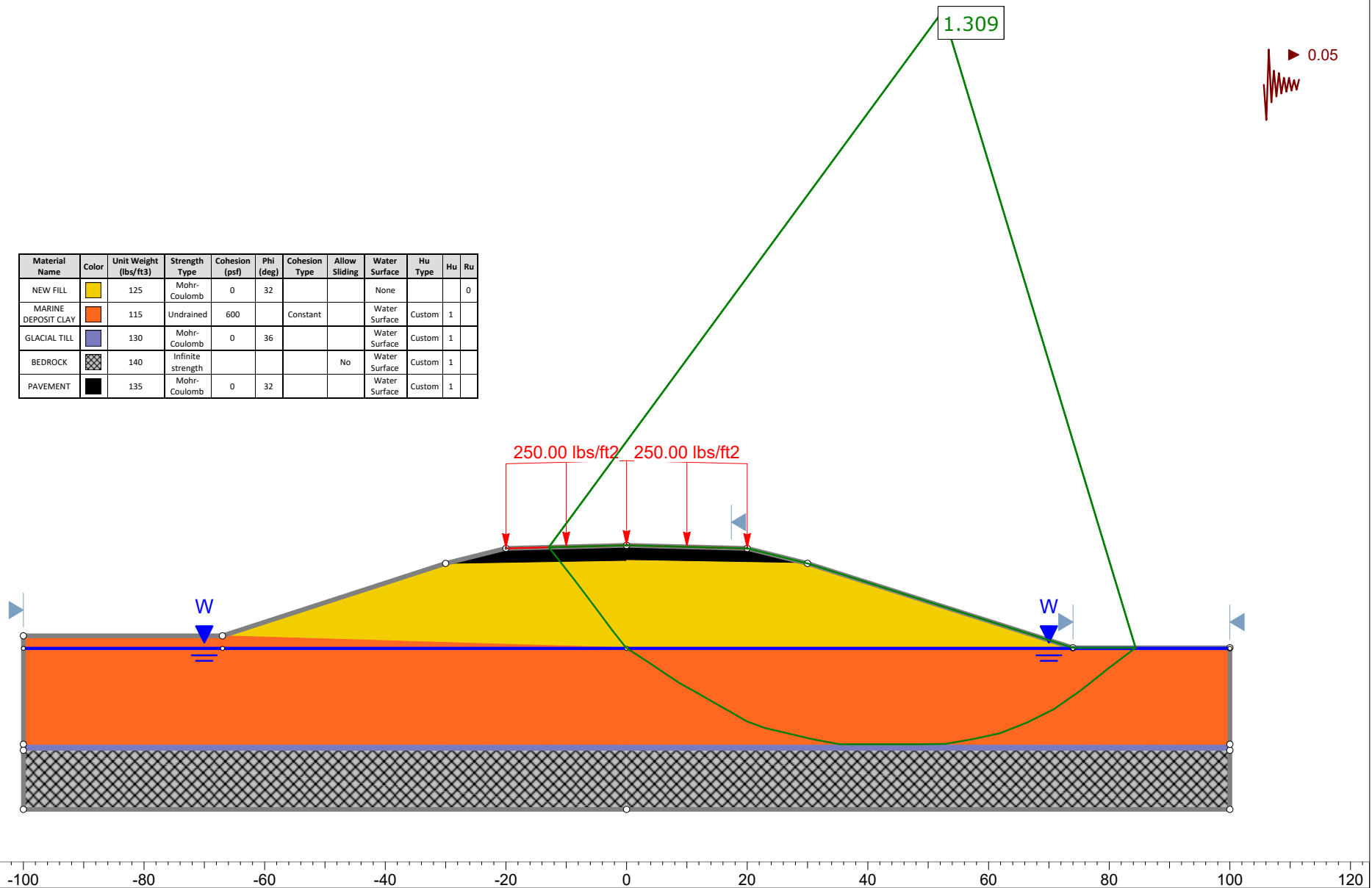
Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Cohesion Type	Allow Sliding	Water Surface	Hu Type	Hu	Ru
NEW FILL		125	Mohr-Coulomb	0	32			None			0
MARINE DEPOSIT CLAY		115	Undrained	600		Constant		Water Surface	Custom	1	
GLACIAL TILL		130	Mohr-Coulomb	0	36			Water Surface	Custom	1	
BEDROCK		140	Infinite strength				No	Water Surface	Custom	1	
PAVEMENT		135	Mohr-Coulomb	0	32			Water Surface	Custom	1	



SLIDEINTERPRET 9.004

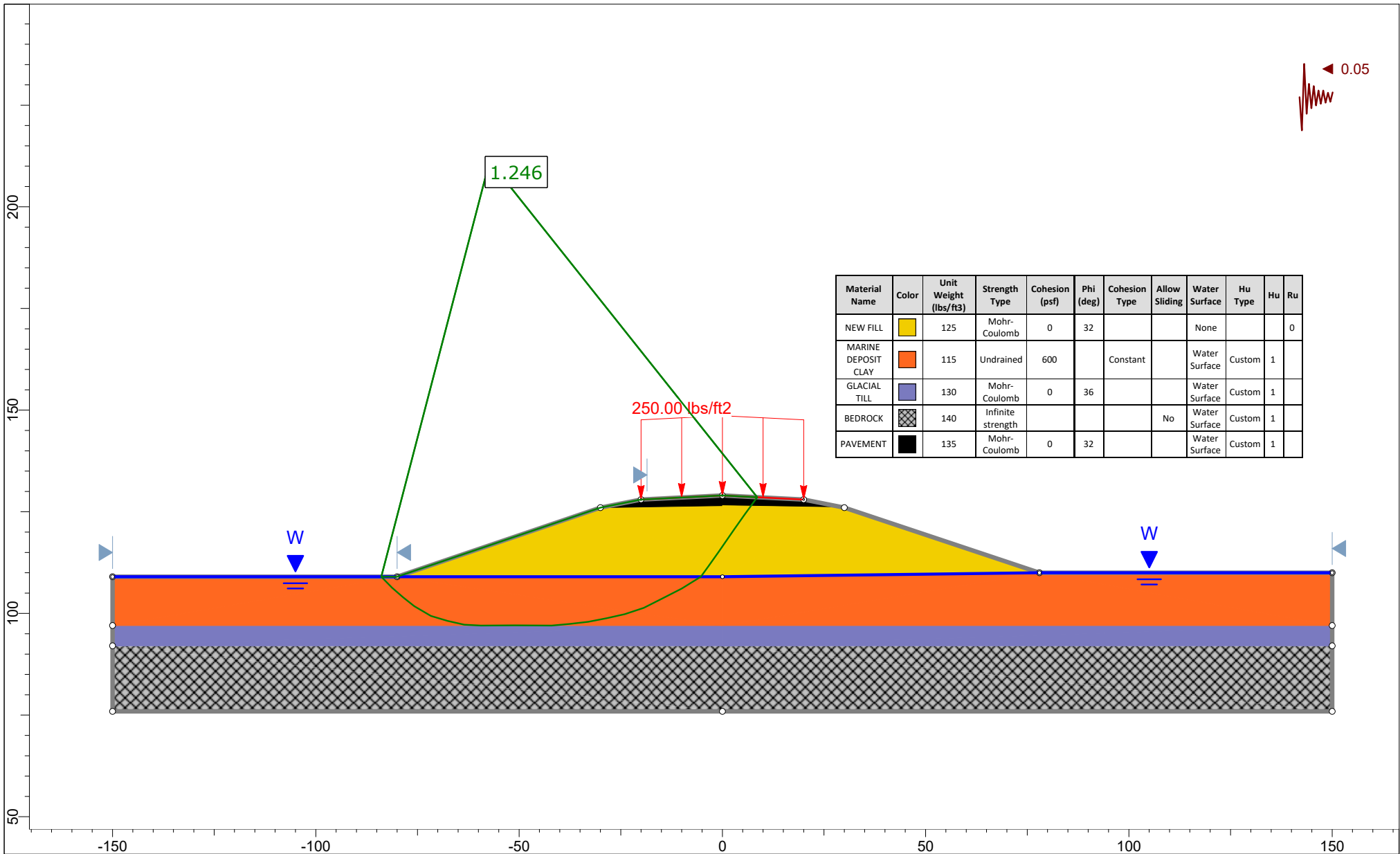
Project			SLIDE - An Interactive Slope Stability Program		
Group		Final Case - Sta. 166+00		Scenario	
Drawn By		SSM		Company	
Date		5/18/2021, 8:29:46 AM		File Name	
				2021-0707-STA 166+00-Left to Right-non-circular-D1.slmd	


Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Cohesion Type	Allow Sliding	Water Surface	Hu Type	Hu	Ru
NEW FILL		125	Mohr-Coulomb	0	32			None			0
MARINE DEPOSIT CLAY		115	Undrained	600		Constant		Water Surface	Custom	1	
GLACIAL TILL		130	Mohr-Coulomb	0	36			Water Surface	Custom	1	
BEDROCK		140	Infinite strength				No	Water Surface	Custom	1	
PAVEMENT		135	Mohr-Coulomb	0	32			Water Surface	Custom	1	



Project			SLIDE - An Interactive Slope Stability Program		
Group		Final Case - Sta. 166+00		Scenario	
Drawn By		SSM		Company	
Date		5/18/2021, 8:29:46 AM		File Name	
				2021-0707-STA 166+00-Left to Right-non-circular-D1.slmd	

Sta. 167+50



 SLIDEINTERPRET 9.004	Project		SLIDE - An Interactive Slope Stability Program		
	Group		Final Case - Sta. 167+50	Scenario	Site Class D Pseudo-Static, 0.05g
	Drawn By		SSM	Company	
	Date		5/18/2021, 8:29:46 AM	File Name	
				2021-0707-STA 167+50-Right to Left-non-circular-D1.slmd	

Global Embankment Stability – Area 4

Client: Maine Department of Transportation

Date: 1-Jun-2021

Project: I-395/Route 9 Connector - WIN 18915.00

Computed by: SSM

Subject: Global Stability - Area 4

Checked by: EMS

PROBLEM STATEMENT AND OBJECTIVE

Calculate the global stability minimum factor of safety at critical sections along the proposed highway alignment.

REFERENCES

1. AASHTO LRFD Bridge Design Specifications, 7th Edition, 2014.
2. Slide version 7.0 by RocScience.
3. Maine DOT Bridge Design Guide, 2003, with 2014 updates.

AVAILABLE INFORMATION

1. Plan set titled, "Brewer-Eddington I-395/Route 9 Connector, Cross Sections," by MaineDOT dated 25 February 2020.
2. Plan set titled, "I-395/Route 9 Connector, Interpretive Subsurface Profile," by MaineDOT dated 2 October 2019.

ASSUMPTIONS

1. Soil profiles will be modeled to match settlement calculation models, as summarized below.
2. Used seismic site class D: $A_s/2 = 0.107/2 = 0.05$ g
3. A 250 psf traffic surcharge will be modeled.

SOIL PROPERTIES

Material	Unit Weight (pcf)	Friction Angle (degrees)	Undrained Shear Strength (psf)
New Fill	125	32	0
Marine Deposit	115	varies ¹	
Glacial Till	130	36	0
Bedrock	infinite strength		

Notes:

1. Soil properties for Existing Fill and Marine Deposit vary based on location. See individual soil profiles for details.

Client: Maine Department of Transportation

Date: 1-Jun-2021

Project: I-395/Route 9 Connector - WIN 18915.00

Computed by: SSM

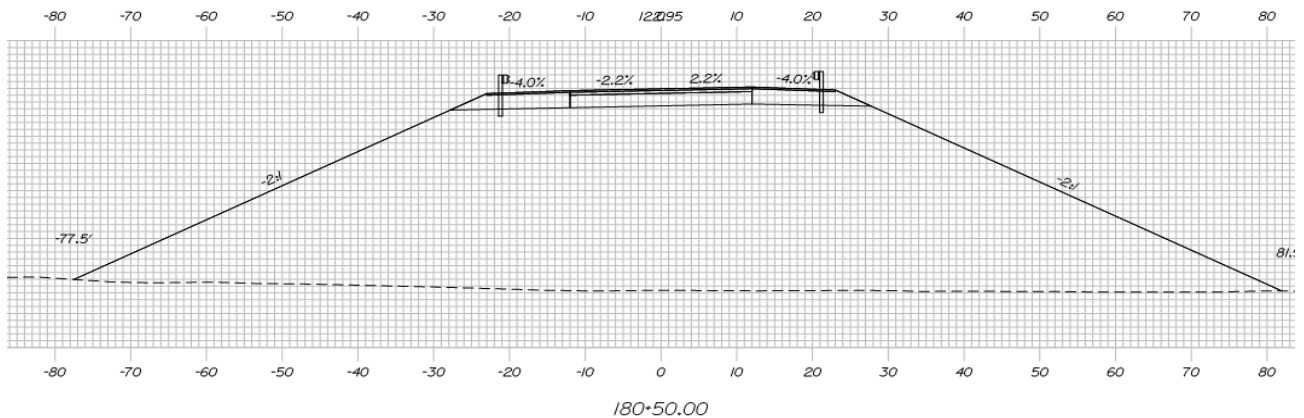
Subject: Global Stability - Area 4

Checked by: EMS

STA 180+00 GEOMETRY

Fill height = 30.0 ft

Ground surface at center = El. 93


STA 180+00 SOIL PROFILE AND PROPERTIES (not to scale)

Based on boring HB-BE-136, HB-BE-135 and HB-BE-137

Groundwater depth = at ground surface based on boring (HB-BE-136, HB-BE-135 and HB-BE-137)

Boring HB-BE-136

(distance from the center= 105.2 LT)

DEPTH (ft)

ELEVATION (ft)

NEW FILL		$\gamma = 125 \text{ pcf}$ $\phi = 32^\circ$	
0	Marine Deposit SILT	$\gamma = 115 \text{ pcf}$ $\phi = 28^\circ$	93
5	Marine Deposit CLAY	$\gamma = 115 \text{ pcf}$ $S_u = 500 \text{ psf}$	88
9	Marine Deposit CLAY	$\gamma = 115 \text{ pcf}$ $S_u = 350 \text{ psf}$	84
19	Glacial Till SAND	$\gamma = 130 \text{ pcf}$ $\phi = 36^\circ$	74
27			66

Client: Maine Department of Transportation

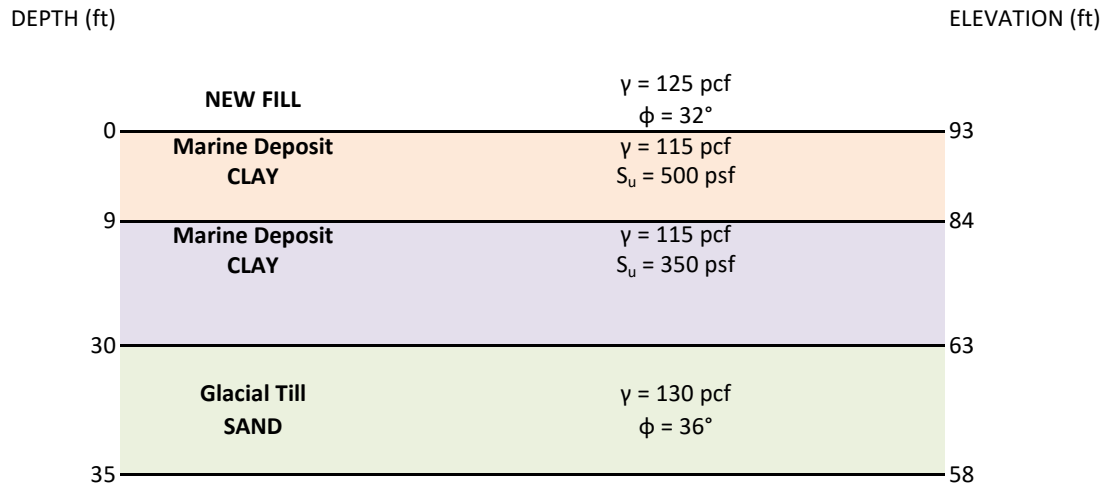
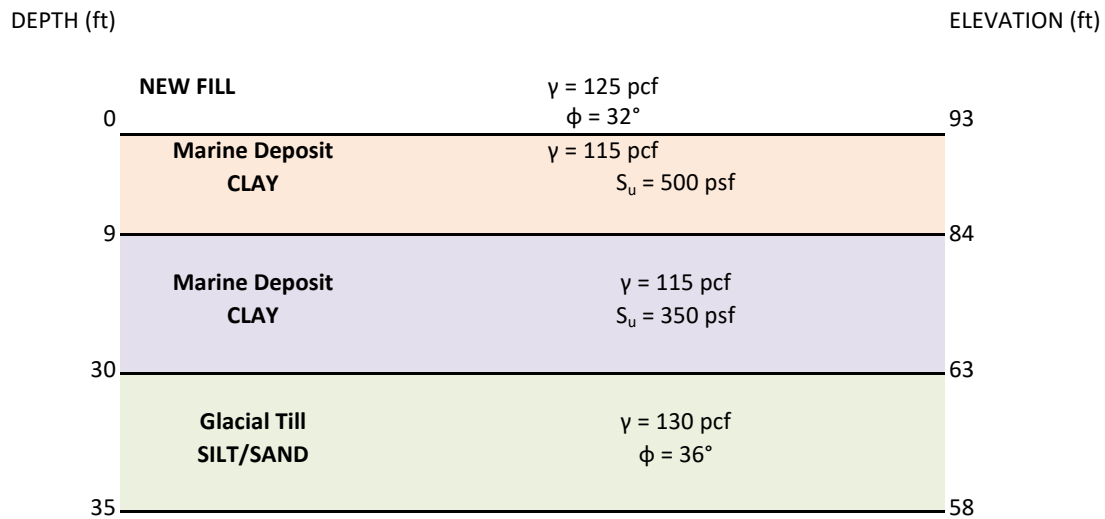
Date: 1-Jun-2021

Project: I-395/Route 9 Connector - WIN 18915.00

Computed by: SSM

Subject: Global Stability - Area 4

Checked by: EMS

STA 180+00 Continued
Boring HB-BE-135 (distance from the center= 3.1 RT)

Boring HB-BE-137 (distance from the center= 100.6 RT)


Client: Maine Department of Transportation

Date: 1-Jun-2021

Project: I-395/Route 9 Connector - WIN 18915.00

Computed by: SSM

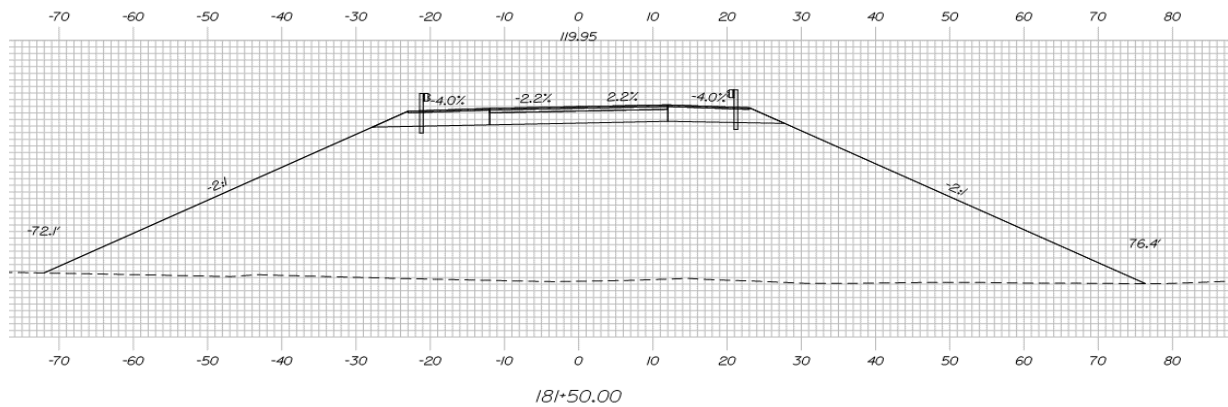
Subject: Global Stability - Area 4

Checked by: EMS

STA 181+50 GEOMETRY

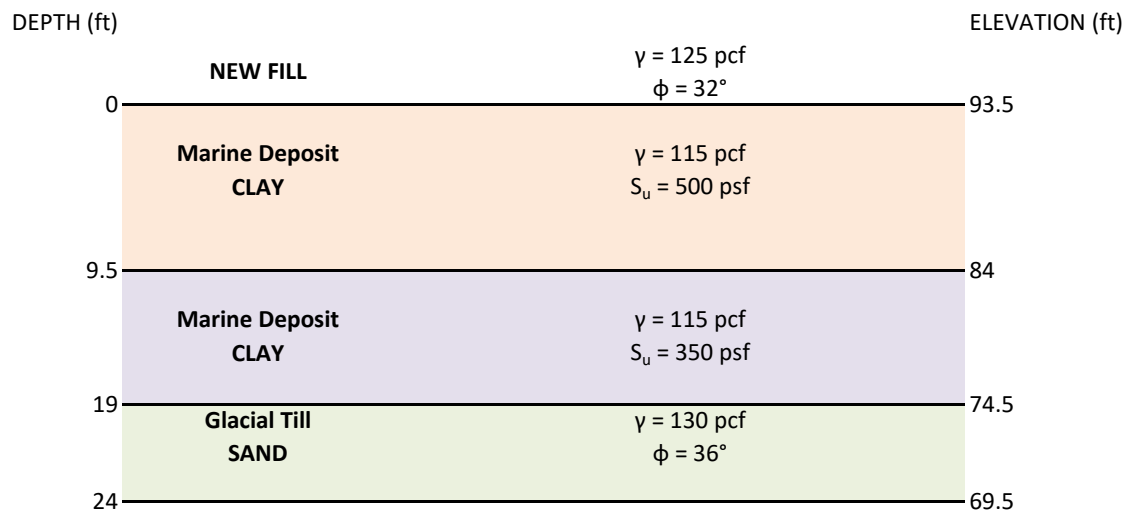
Fill height = 26.5 ft

Ground surface at center = El. 93.5


STA 181+50 SOIL PROFILE AND PROPERTIES (not to scale)

Based on the average between boring HB-BE-135 and HB-BE-225

Groundwater depth = at ground surface



Client: Maine Department of Transportation

Date: 1-Jun-2021

Project: I-395/Route 9 Connector - WIN 18915.00

Computed by: SSM

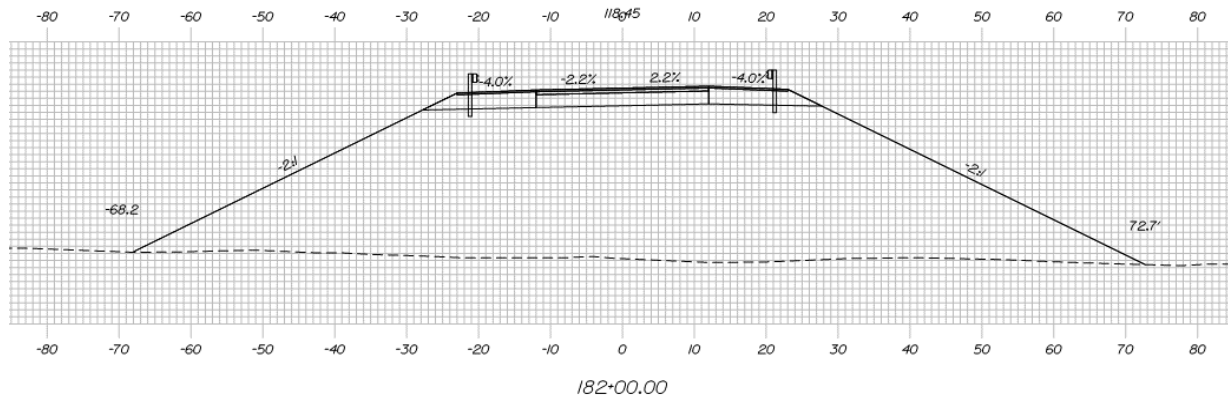
Subject: Global Stability - Area 4

Checked by: EMS

STA 182+00 GEOMETRY

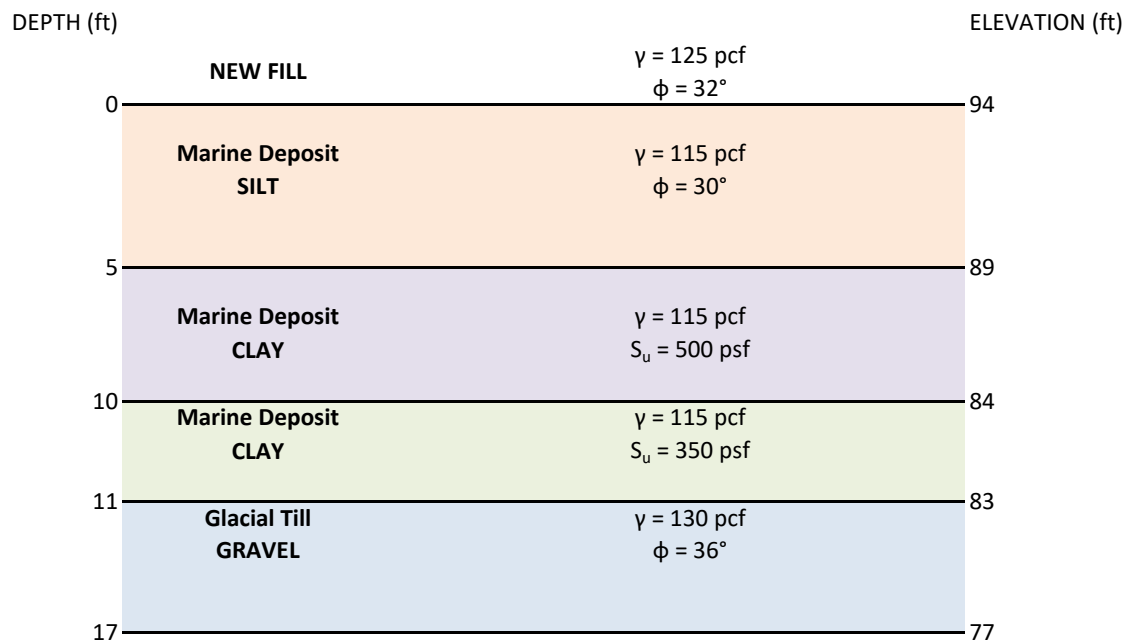
Fill height = 24.5 ft

Ground surface at center = El. 94


STA 182+00 SOIL PROFILE AND PROPERTIES (not to scale)

Based on boring HB-BE-225

Groundwater depth = 2 ft (based on boring HB-BE-225)



Client: Maine Department of Transportation

Date: 1-Jun-2021

Project: I-395/Route 9 Connector - WIN 18915.00

Computed by: SSM

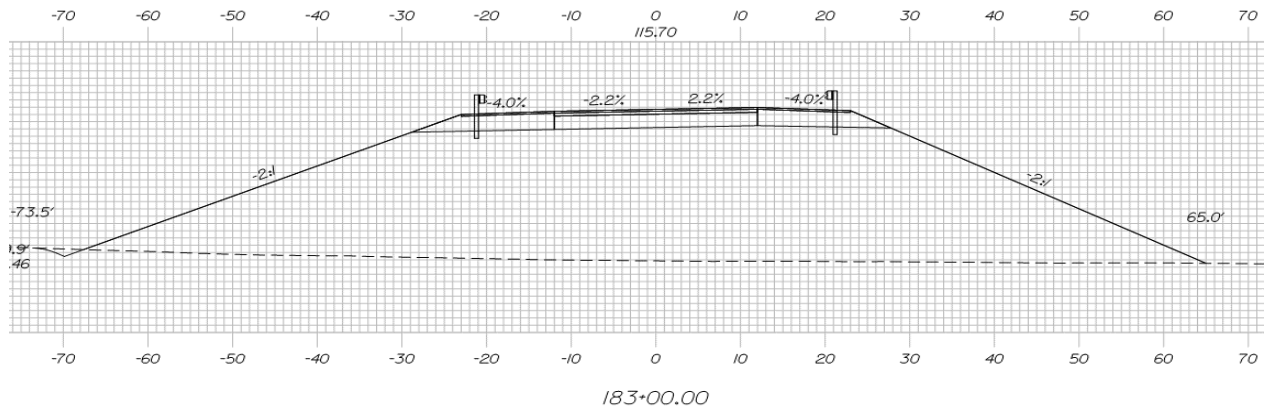
Subject: Global Stability - Area 4

Checked by: EMS

STA 183+00 GEOMETRY

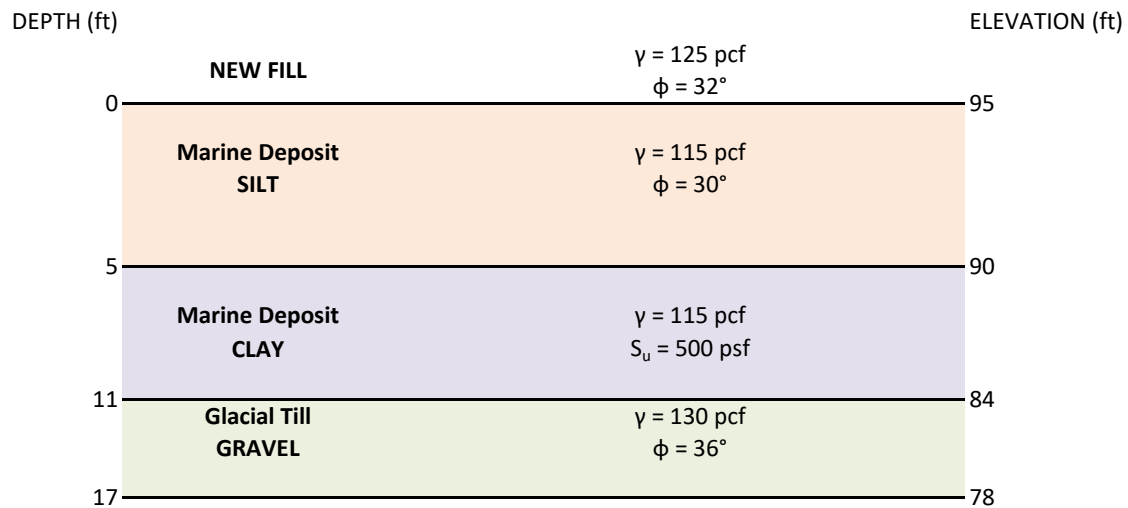
Fill height = 21 ft

Ground surface at center = El. 95


STA 183+00 SOIL PROFILE AND PROPERTIES (not to scale)

Based on boring HB-BE-225

Groundwater depth = 2 ft (based on boring HB-BE-225)



Client: Maine Department of Transportation

Date: 1-Jun-2021

Project: I-395/Route 9 Connector - WIN 18915.00

Computed by: SSM

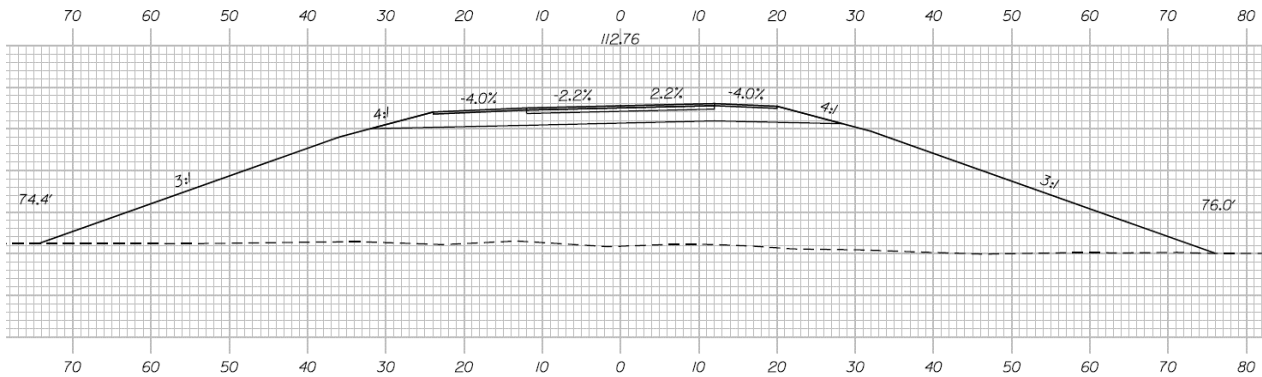
Subject: Global Stability - Area 4

Checked by: EMS

STA 185+00 GEOMETRY

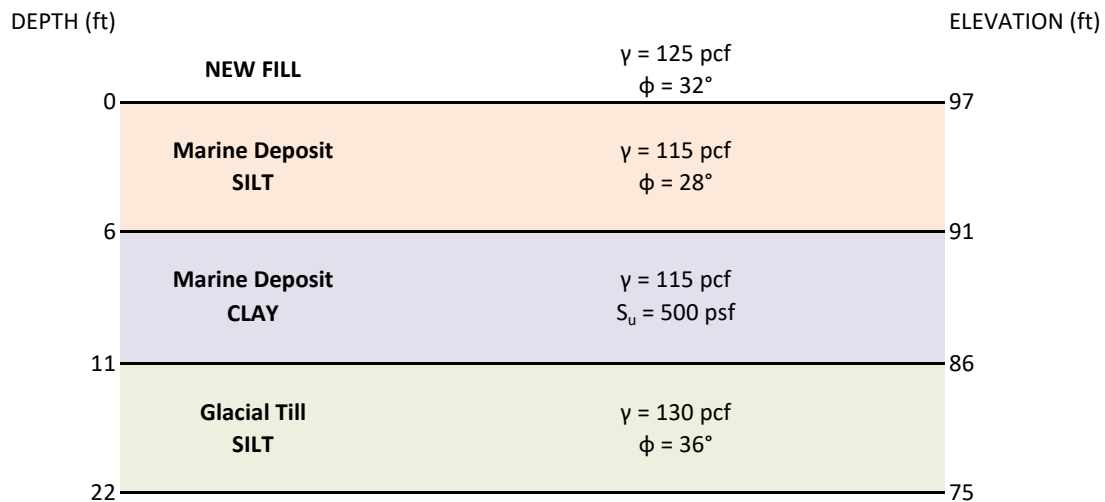
Fill height = 17 ft

Ground surface at center = El. 96


STA 185+00 SOIL PROFILE AND PROPERTIES (not to scale)

Based on borings HB-BE-226, HB-BE-138, HB-BE-227

Groundwater depth = 3.5 ft (based on boring HB-BE-226)

Boring HB-BE-226 (distance from the center= 72 ft LT)


Client: Maine Department of Transportation

Date: 1-Jun-2021

Project: I-395/Route 9 Connector - WIN 18915.00

Computed by: SSM

Subject: Global Stability - Area 4

Checked by: EMS

STA 185+00 Continued
Boring HB-BE-138 (distance from the center= 2 ft RT)

DEPTH (ft)		ELEVATION (ft)
0	NEW FILL $\gamma = 125 \text{ pcf}$ $\phi = 32^\circ$	95
2	Marine Deposit SILT $\gamma = 115 \text{ pcf}$ $\phi = 28^\circ$	93
11	Marine Deposit CLAY $\gamma = 115 \text{ pcf}$ $S_u = 500 \text{ psf}$	84
12	Marine Deposit CLAY $\gamma = 115 \text{ pcf}$ $S_u = 350 \text{ psf}$	83
17	Glacial Till SILT $\gamma = 130 \text{ pcf}$ $\phi = 36^\circ$	78

Boring HB-BE-227 (distance from the center= 64 ft RT)

DEPTH (ft)		ELEVATION (ft)
0	NEW FILL $\gamma = 125 \text{ pcf}$ $\phi = 32^\circ$	96
5	Marine Deposit SILT $\gamma = 115 \text{ pcf}$ $\phi = 28^\circ$	91
10	Marine Deposit CLAY $\gamma = 115 \text{ pcf}$ $S_u = 500 \text{ psf}$	86
17	Glacial Till GRAVEL $\gamma = 130 \text{ pcf}$ $\phi = 36^\circ$	79

Temporary Condition

Client: Maine Department of Transportation

Date: 1-Jun-2021

Project: I-395/Route 9 Connector - WIN 18915.00

Computed by: SSM

Subject: Global Stability - Area 4

Checked by: EMS

RESULTS AND CONCLUSIONS - TEMPORARY CONDITION

Left to Right (F.S=1.15)

Station	Height of Embankment	Maximum Temporary First Stage Fill Height	Factor of Safety (Spencer Method)	Factor of Safety (Bishop Simplified Method)	Factor of Safety (GLE/Morgenstern-Price Method)
Sta. 180+50	30	14	1.18	1.18	1.18
Sta. 181+50	26.5	12.5	1.34	1.34	1.34
Sta. 182+00	24.5	23	1.17	1.19	1.15
Sta. 183+00	21	21	1.30	1.32	1.28
Sta. 185+00	17	17	1.57	1.61	1.57






Right to Left (F.S=1.15)

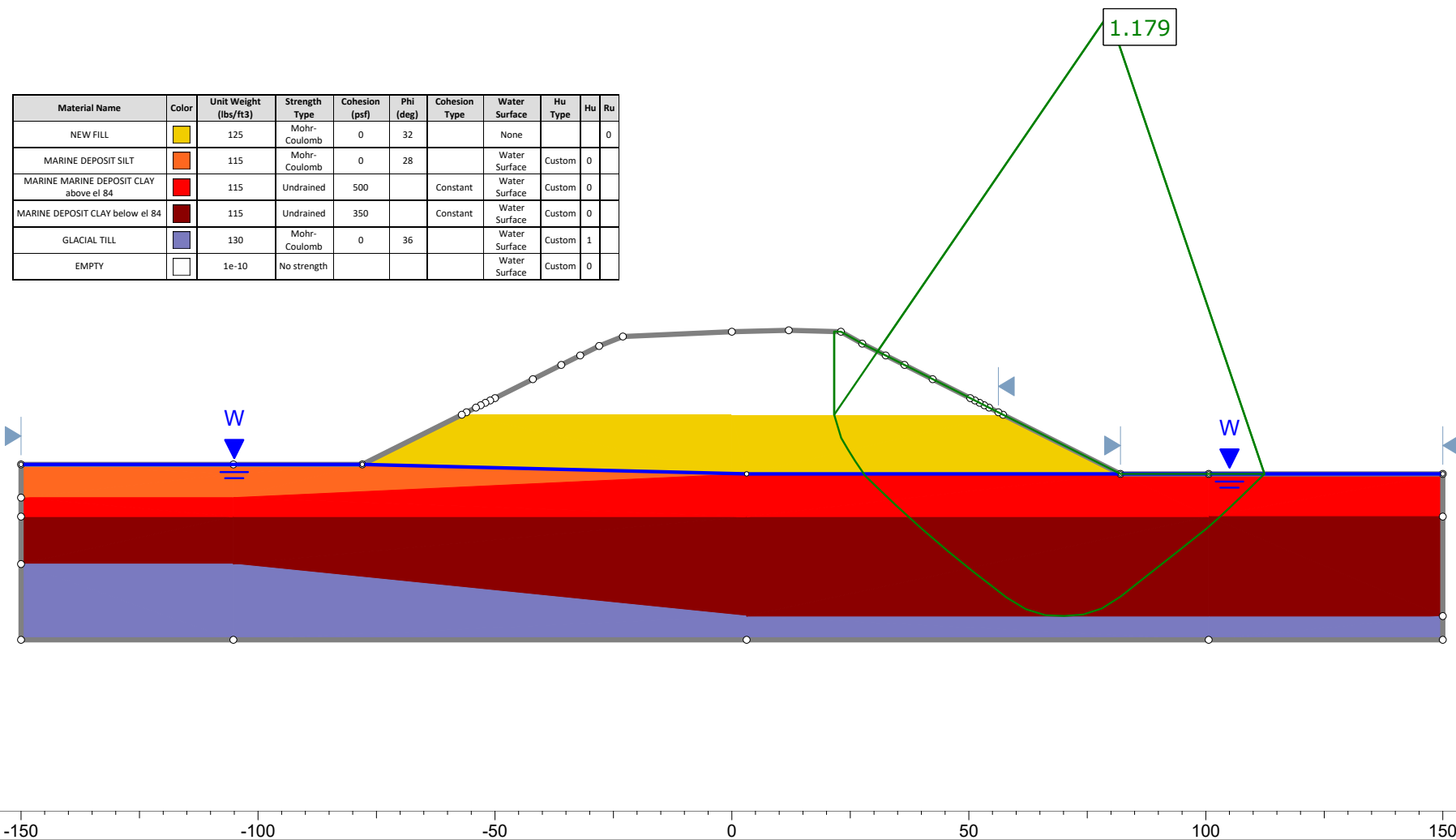
Station	Height of Embankment	Maximum Temporary First Stage Fill Height	Factor of Safety (Spencer Method)	Factor of Safety (Bishop Simplified Method)	Factor of Safety (GLE/Morgenstern-Price Method)
Sta. 180+50	30	17	1.18	1.16	1.17
Sta. 181+50	26.5	12.5	1.59	1.58	1.58
Sta. 182+00	24.5	24.5	1.21	1.22	1.18
Sta. 183+00	21	21	1.51	1.53	1.49
Sta. 185+00	17	17	1.62	1.64	1.61

Non-circular (F.S=1.15)

Station	Height of Embankment	Maximum Temporary First Stage Fill Height	Factor of Safety (Spencer Method)	Factor of Safety (GLE/Morgenstern-Price Method)
Sta. 180+50	30	12.5	1.18	1.20
Sta. 181+50	26.5	12.5	1.27	1.27
Sta. 182+00	24.5	19	1.16	1.15
Sta. 183+00	21	21	1.23	1.22
Sta. 185+00	17	17	1.51	1.51

Sta. 180+50

Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Cohesion Type	Water Surface	Hu Type	Hu	Ru
NEW FILL		125	Mohr-Coulomb	0	32		None			0
MARINE DEPOSIT SILT		115	Mohr-Coulomb	0	28		Water Surface	Custom	0	
MARINE DEPOSIT CLAY above el 84		115	Undrained	500		Constant	Water Surface	Custom	0	
MARINE DEPOSIT CLAY below el 84		115	Undrained	350		Constant	Water Surface	Custom	0	
GLACIAL TILL		130	Mohr-Coulomb	0	36		Water Surface	Custom	1	
EMPTY		1e-10	No strength				Water Surface	Custom	0	



Project

SLIDE - An Interactive Slope Stability Program

Group

Temporary Case - Sta. 180+50

Scenario

Master Scenario

Drawn By

SSM

Company

Date







5/20/2021, 10:16:23 AM

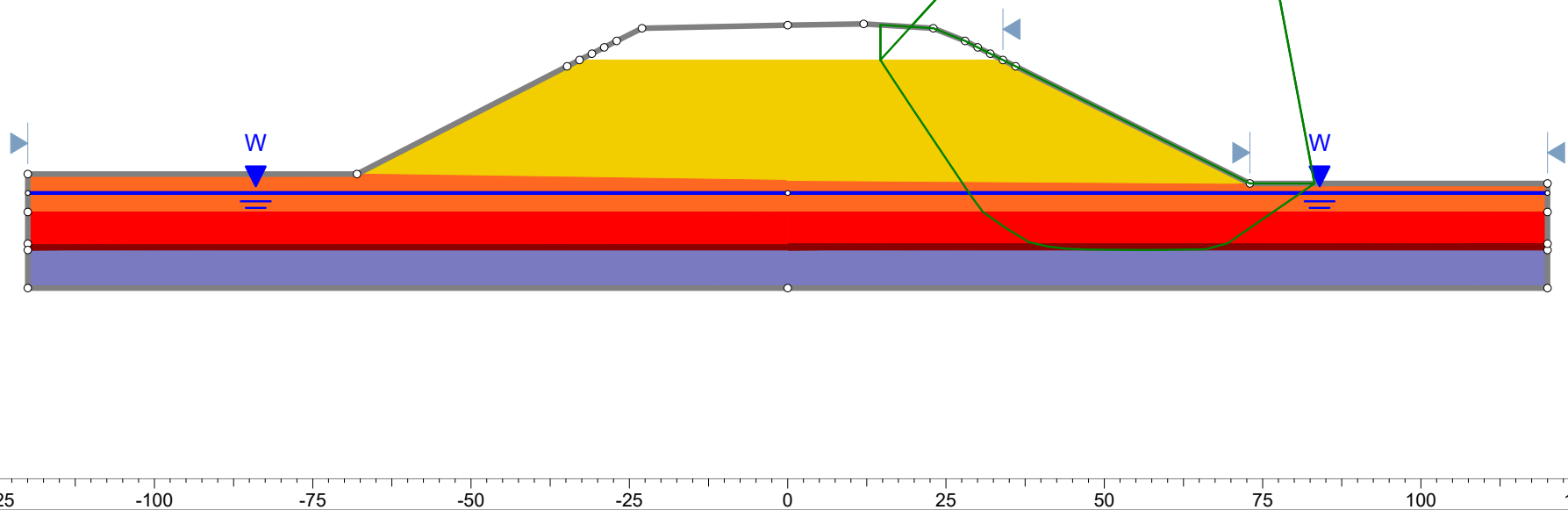
File Name

2021-0601- Sta 180+50- Left to Right- F.S1.15-non circular-D1.slmd

Sta. 181+50





Sta. 182+00

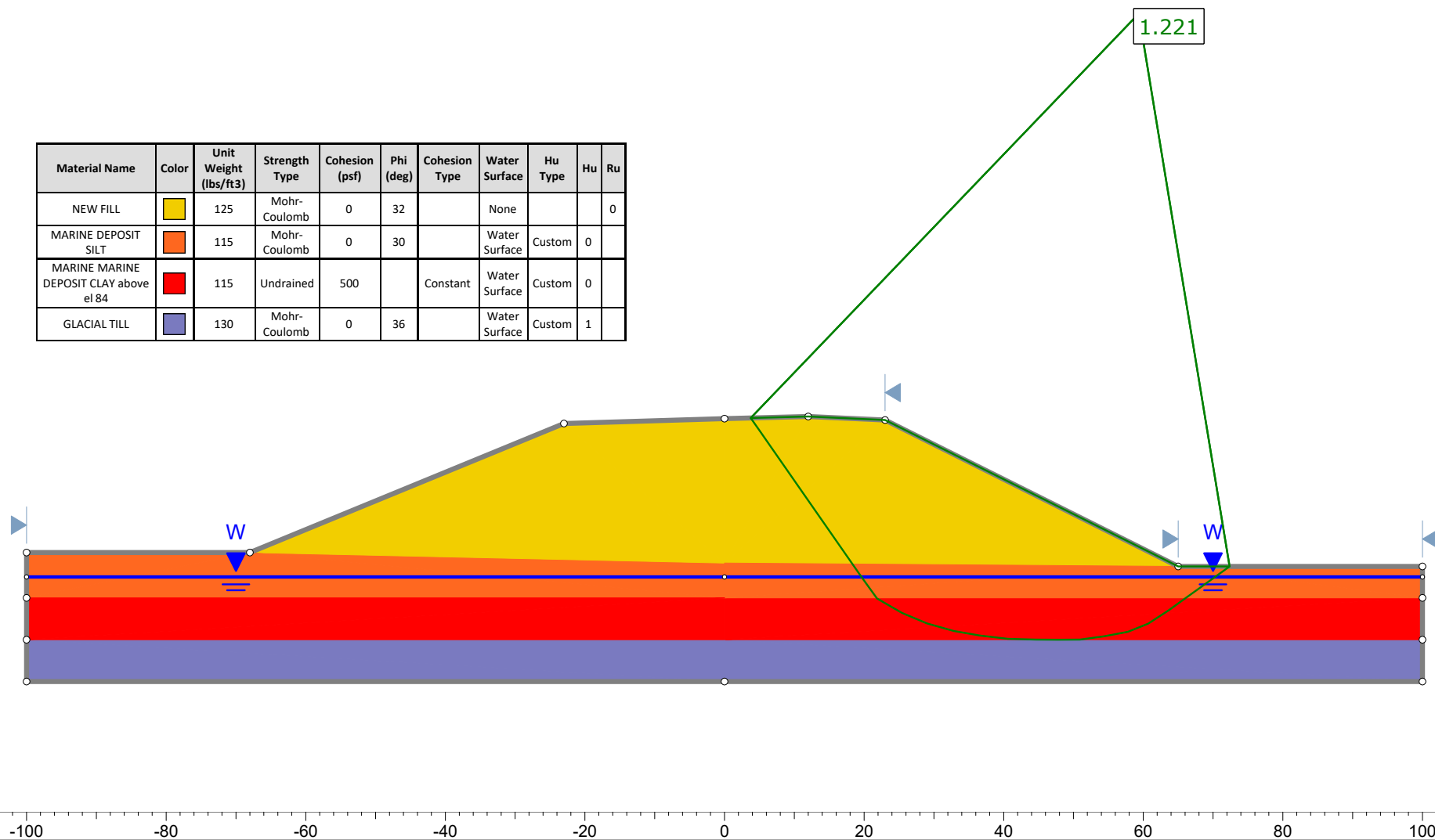
Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Cohesion Type	Water Surface	Hu Type	Hu	Ru
NEW FILL		125	Mohr-Coulomb	0	32		None			0
MARINE DEPOSIT SILT		115	Mohr-Coulomb	0	30		Water Surface	Custom	0	
MARINE MARINE DEPOSIT CLAY above el 84		115	Undrained	500		Constant	Water Surface	Custom	0	
MARINE DEPOSIT CLAY below el 84		115	Undrained	350		Constant	Water Surface	Custom	0	
GLACIAL TILL		130	Mohr-Coulomb	0	36		Water Surface	Custom	1	
EMPTY		1e-10	No strength				Water Surface	Custom	0	



Project	SLIDE - An Interactive Slope Stability Program	
Group	Temporary Case - Sta. 182+00	Scenario
Drawn By	SSM	Company
Date	5/20/2021, 10:16:23 AM	File Name
		2021-0601- Sta 182+00- Left to Right- F.S1.15-non circular--D1.slmd

Sta. 183+00

Material Name	Color	Unit Weight (lbs/ft ³)	Strength Type	Cohesion (psf)	Phi (deg)	Cohesion Type	Water Surface	Hu Type	Hu	Ru
NEW FILL		125	Mohr-Coulomb	0	32		None			0
MARINE DEPOSIT SILT		115	Mohr-Coulomb	0	30		Water Surface	Custom	0	
MARINE MARINE DEPOSIT CLAY above el 84		115	Undrained	500		Constant	Water Surface	Custom	0	
GLACIAL TILL		130	Mohr-Coulomb	0	36		Water Surface	Custom	1	



SLIDEINTERPRET 9.004

Project	SLIDE - An Interactive Slope Stability Program	
Group	Temporary Case - 183+00	Scenario Master Scenario
Drawn By	SSM	Company
Date	5/20/2021, 10:16:23 AM	File Name 2021-0615- Sta 183+00- Left to Right- F.S1.15-non circular-D1.slmd

Sta. 180+50

Permanent Condition

Client: Maine Department of Transportation

Date: 1-Jun-2021

Project: I-395/Route 9 Connector - WIN 18915.00

Computed by: SSM

Subject: Global Stability - Area 4

Checked by: EMS

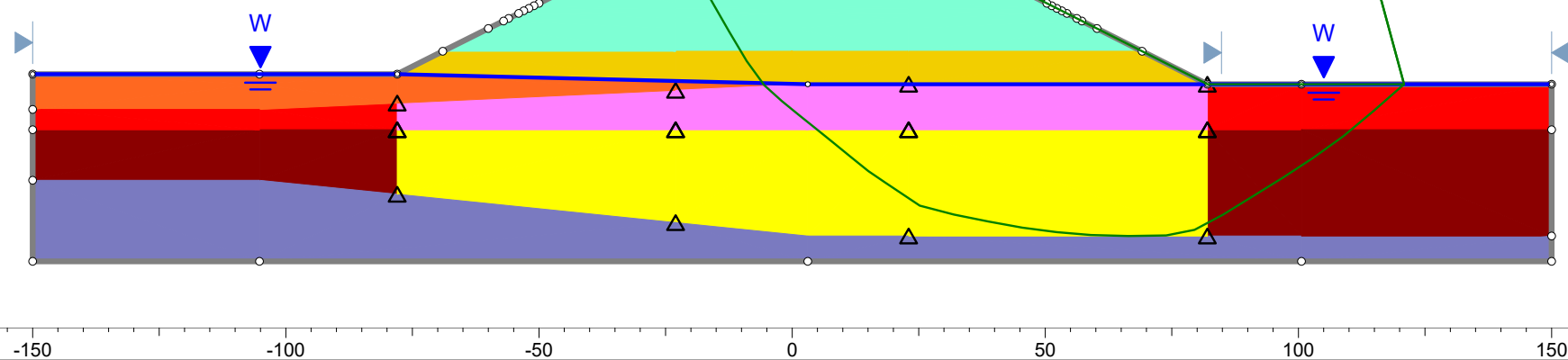
RESULTS AND CONCLUSIONS - PERMANENT CONDITION

Non-circular (F.S=1.3) - Transverse

Station	Height of Embankment	New Weight Fill Thickness (ft)	Lightweight Fill Thickness (ft)	Pavement Thickness (ft)	Stages	Factor of Safety (Spencer Method)	Factor of Safety (GLE/Morgenstern-Price Method)
Sta. 180+50	30	6.5	20.5	3.0	Final Condition + Loading	1.71	1.72
					Site Class D Pseudo-Static, 0.05g	1.29	1.30
Sta. 181+50	26.5	10	13.5	3.0	Final Condition + Loading	1.50	1.59
					Site Class D Pseudo-Static, 0.05g	1.23	1.24
Sta. 182+00	24.5	18	3.5	3.0	Final Condition + Loading	1.34	1.33
					Site Class D Pseudo-Static, 0.05g	1.18	1.16
Sta. 183+00	21	18	—	3.0	Final Condition + Loading	1.47	1.45
					Site Class D Pseudo-Static, 0.05g	1.30	1.28

Sta. 180+50

Material Name	Color	Unit Weight (lbs/ft ³)	Strength Type	Cohesion (psf)	Phi (deg)	Cohesion Type	Discrete Function	Water Surface	Hu Type	Hu	Ru
NEW FILL		125	Mohr-Coulomb	0	32			None			0
MARINE DEPOSIT SILT		115	Mohr-Coulomb	0	28			Water Surface	Custom	0	
MARINE MARINE DEPOSIT CLAY above el 84		115	Undrained	500		Constant		Water Surface	Custom	0	
MARINE DEPOSIT CLAY below el 84		115	Undrained	350		Constant		Water Surface	Custom	0	
GLACIAL TILL		130	Mohr-Coulomb	0	36			Water Surface	Custom	1	
UPPER MAR PH1 STR GAIN		115	Discrete function				User Defined 1	Water Surface	Custom	1	
LOWER MAR PH1 STR GAIN		115	Discrete function				User Defined 2	Water Surface	Custom	1	
PAVEMENT		135	Mohr-Coulomb	0	32			Water Surface	Custom	1	
FOAMED GLASS AGGREGATE		15	Mohr-Coulomb	0.001	45			Water Surface	Custom	1	



Project

SLIDE - An Interactive Slope Stability Program

Group

Final Case - Sta. 180+50

Scenario

Overexc and NWF to Final+250psf Surch

Drawn By

SSM

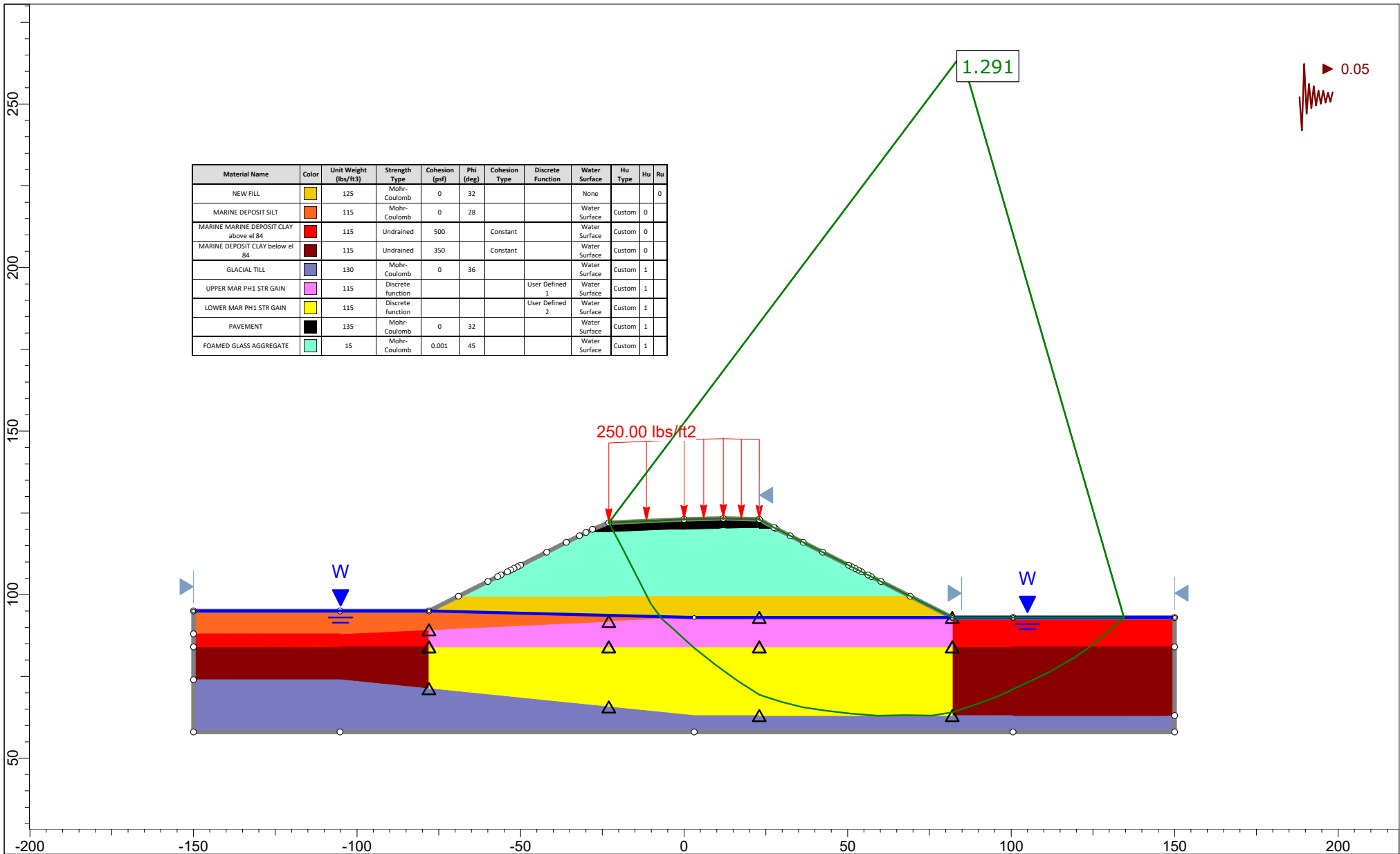
Company


Date

5/20/2021, 10:16:23 AM

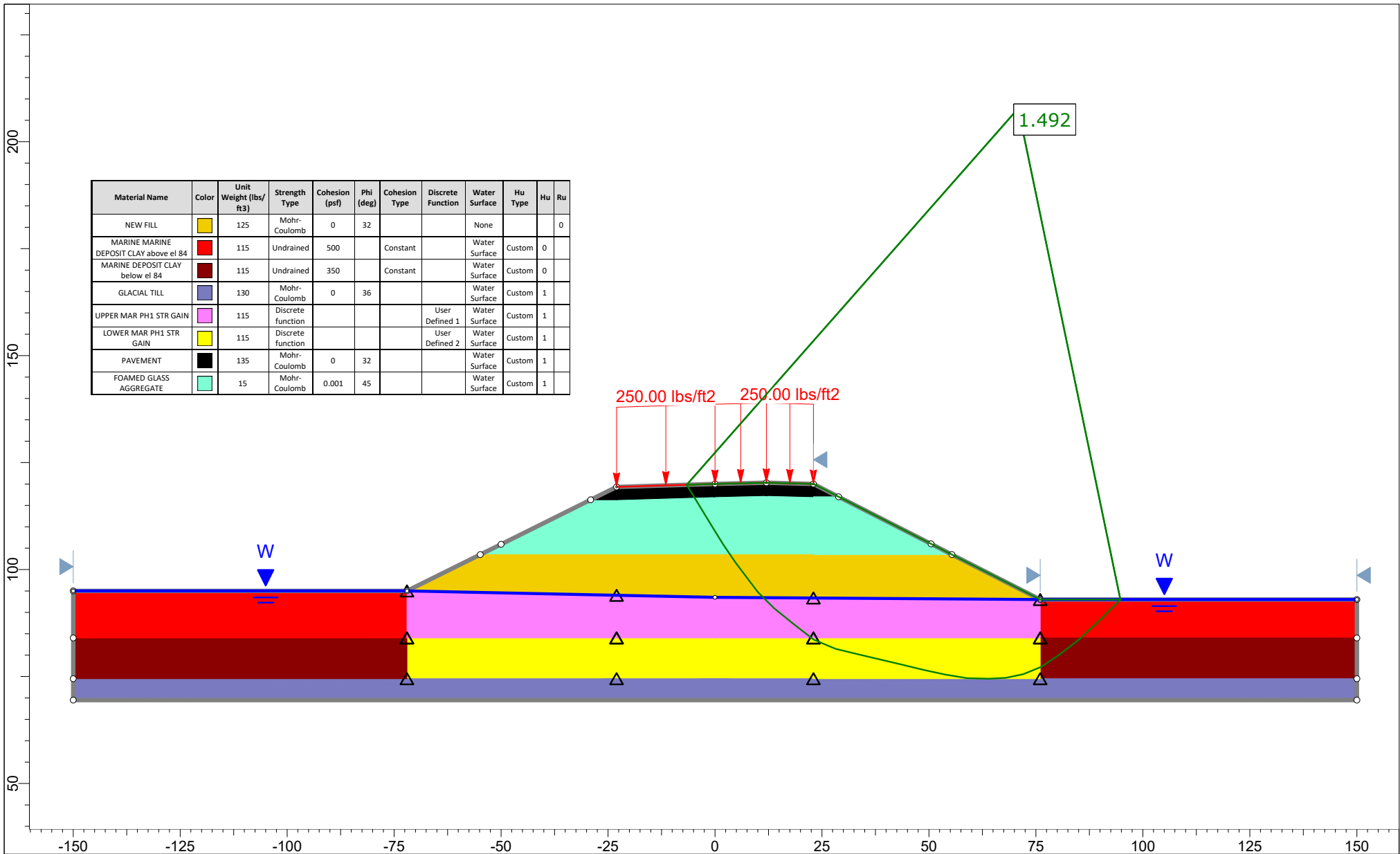
File Name

2021-0614- Sta 180+50- Left to Right- F.S1.15-non circular-20.5ft
LWE-D1.sld

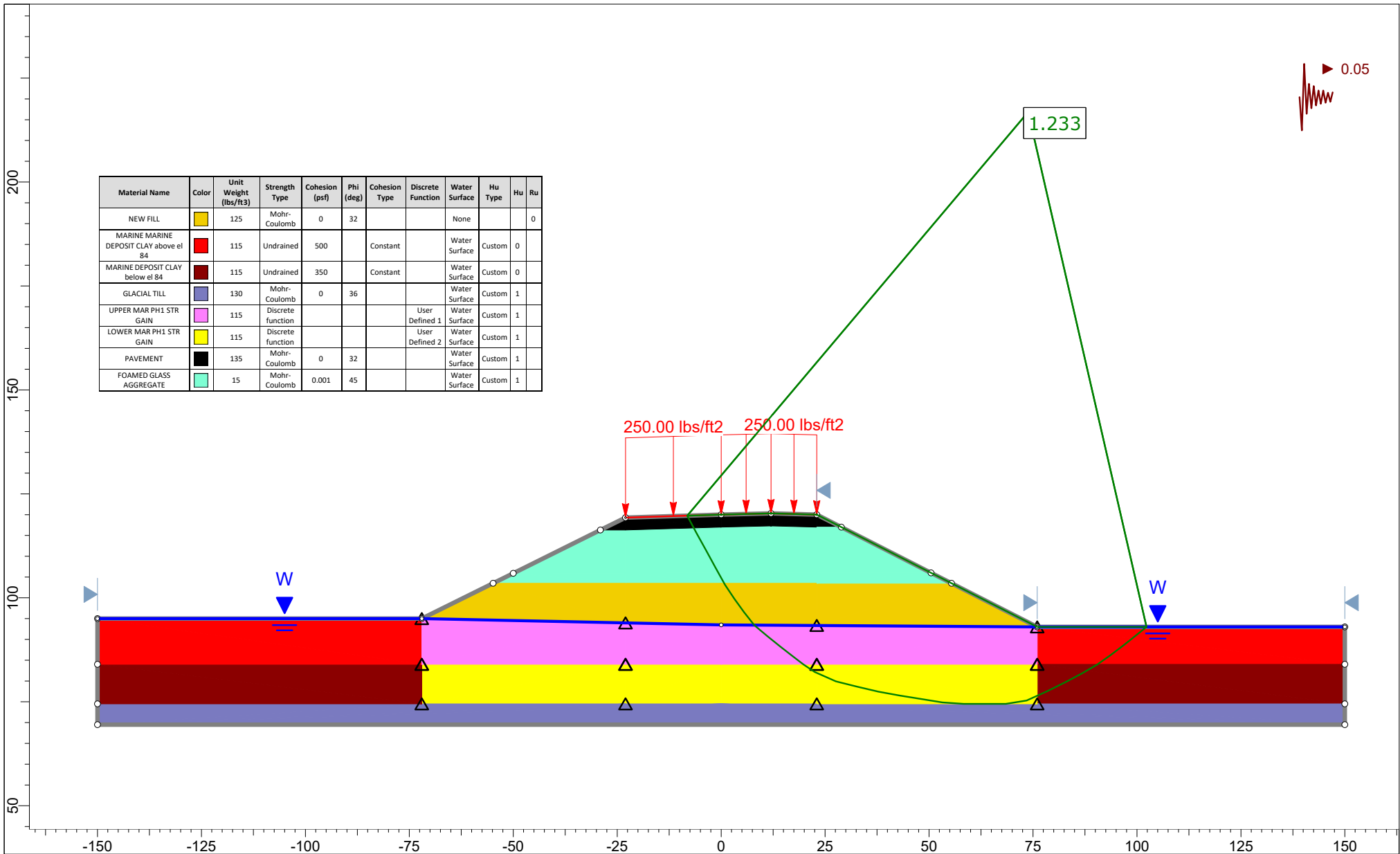



	Project		SLIDE - An Interactive Slope Stability Program	
	Group	Final Case - Sta. 180+50	Scenario	Site Class D Pseudo-Static, 0.05g
	Drawn By	SSM	Company	
	Date	5/20/2021, 10:16:23 AM	File Name	0021-0614- Sta 180+50- Left to Right- F.S1.15-non circular-20.5ft LWF-D1.sld
	SLIDEINTERPRET 9.004			

Sta. 181+50



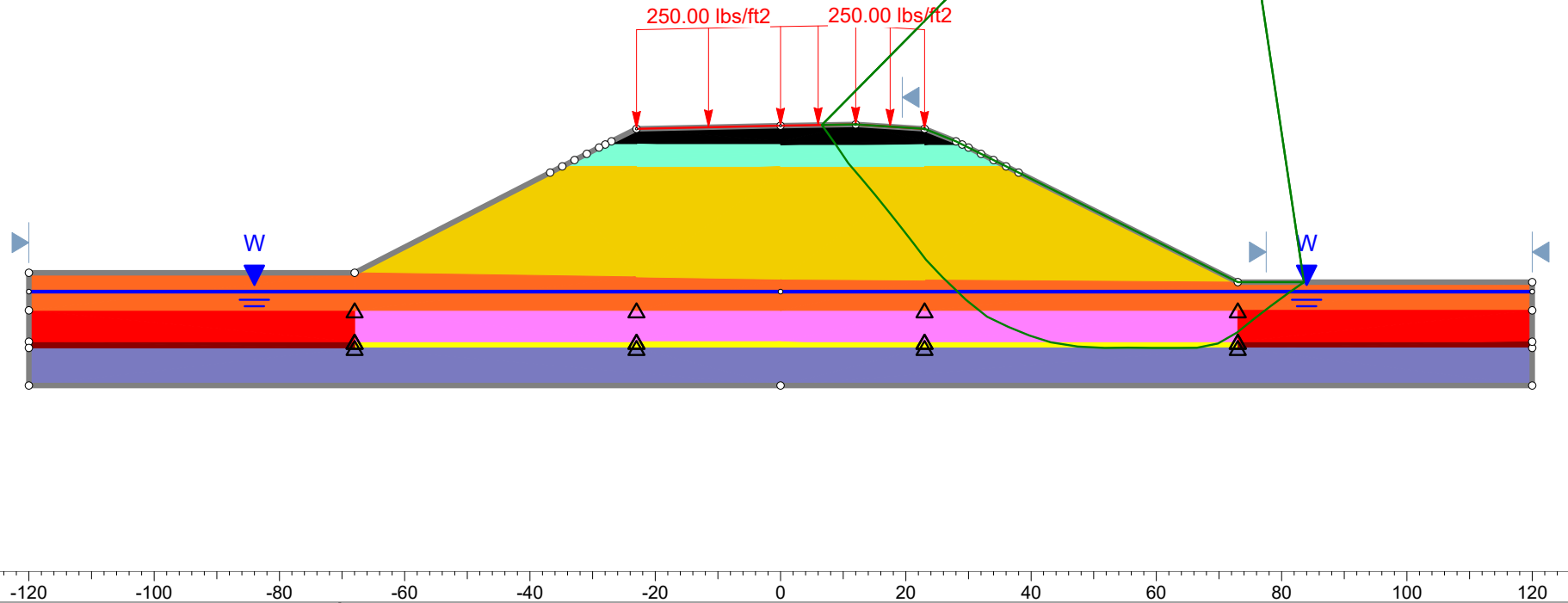
Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Cohesion Type	Discrete Function	Water Surface	Hu Type	Hu	Ru
NEW FILL		125	Mohr-Coulomb	0	32			None			0
MARINE MARINE DEPOSIT CLAY above el 84		115	Undrained	500		Constant		Water Surface	Custom	0	
MARINE DEPOSIT CLAY below el 84		115	Undrained	350		Constant		Water Surface	Custom	0	
GLACIAL TILL		130	Mohr-Coulomb	0	36			Water Surface	Custom	1	
UPPER MAR PH1 STR GAIN		115	Discrete function				User Defined 1	Water Surface	Custom	1	
LOWER MAR PH1 STR GAIN		115	Discrete function				User Defined 2	Water Surface	Custom	1	
PAVEMENT		135	Mohr-Coulomb	0	32			Water Surface	Custom	1	
FOAMED GLASS AGGREGATE		15	Mohr-Coulomb	0.001	45			Water Surface	Custom	1	



	Project		
	SLIDE - An Interactive Slope Stability Program		
	Group	Final Case - Sta. 181+50	Scenario Site Class D Pseudo-Static, 0.05g
	Drawn By	SSM	Company
	Date	5/20/2021, 10:16:23 AM	File Name 2021-0616- Sta 181+50- Left to Right- F.S1.15-non circular-D1.slmd

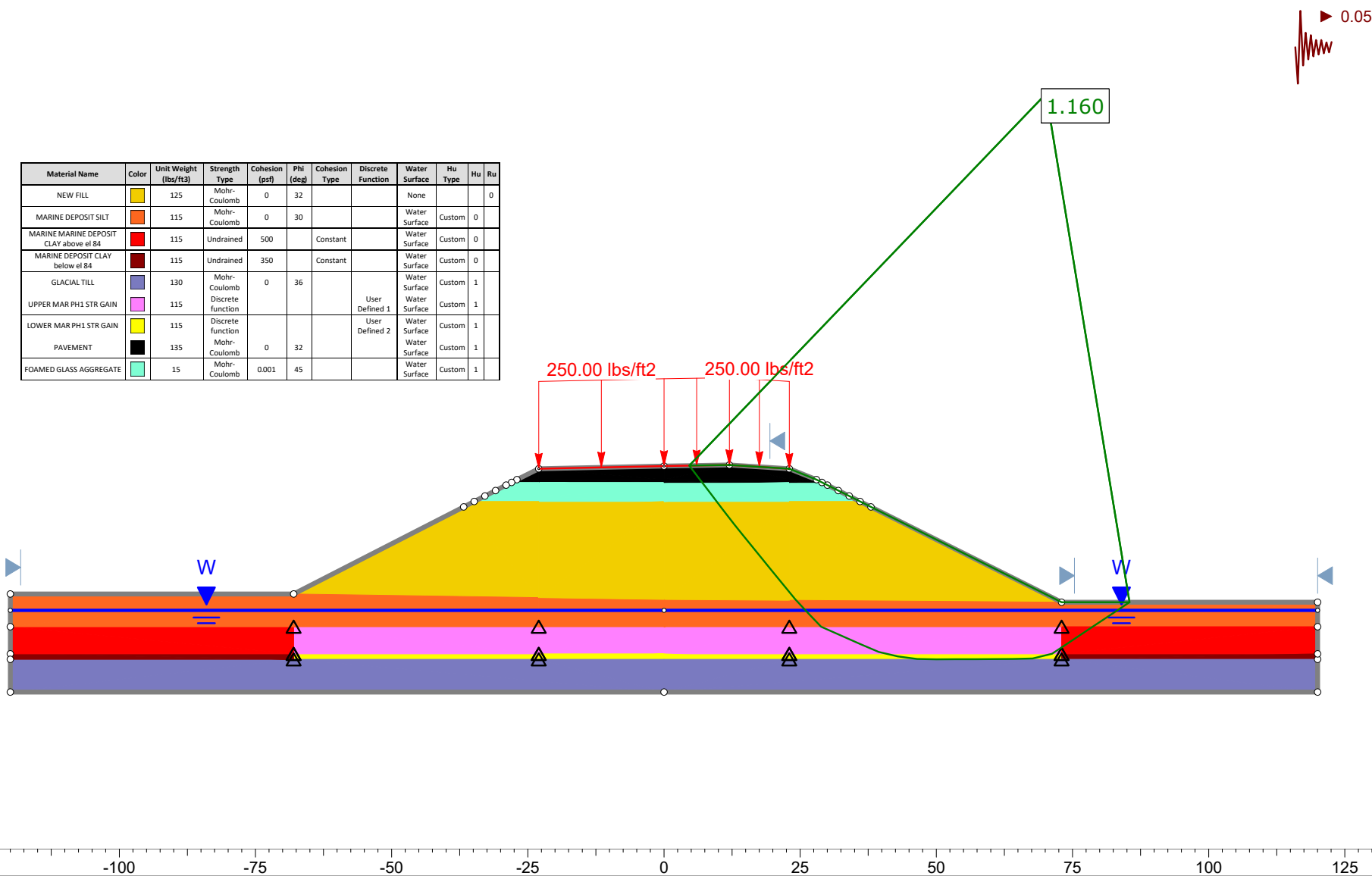
Sta. 182+00

Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Cohesion Type	Discrete Function	Water Surface	Hu Type	Hu	Ru
NEW FILL		125	Mohr-Coulomb	0	32			None			0
MARINE DEPOSIT SILT		115	Mohr-Coulomb	0	30			Water Surface	Custom	0	
MARINE MARINE DEPOSIT CLAY above el 84		115	Undrained	500		Constant		Water Surface	Custom	0	
MARINE DEPOSIT CLAY below el 84		115	Undrained	350		Constant		Water Surface	Custom	0	
GLACIAL TILL		130	Mohr-Coulomb	0	36			Water Surface	Custom	1	
UPPER MAR PH1 STR GAIN		115	Discrete function				User Defined 1	Water Surface	Custom	1	
LOWER MAR PH1 STR GAIN		115	Discrete function				User Defined 2	Water Surface	Custom	1	
PAVEMENT		135	Mohr-Coulomb	0	32			Water Surface	Custom	1	
FOAMED GLASS AGGREGATE		15	Mohr-Coulomb	0.001	45			Water Surface	Custom	1	



Project	SLIDE - An Interactive Slope Stability Program	
Group	Final Case - 182+00	Scenario Overexc and NWF to Final+250psf Surch
Drawn By	SSM	Company
Date	5/20/2021, 10:16:23 AM	File Name 2021-0614- Sta 182+00- Left to Right- F.S1.15-non circular--D1.slmd

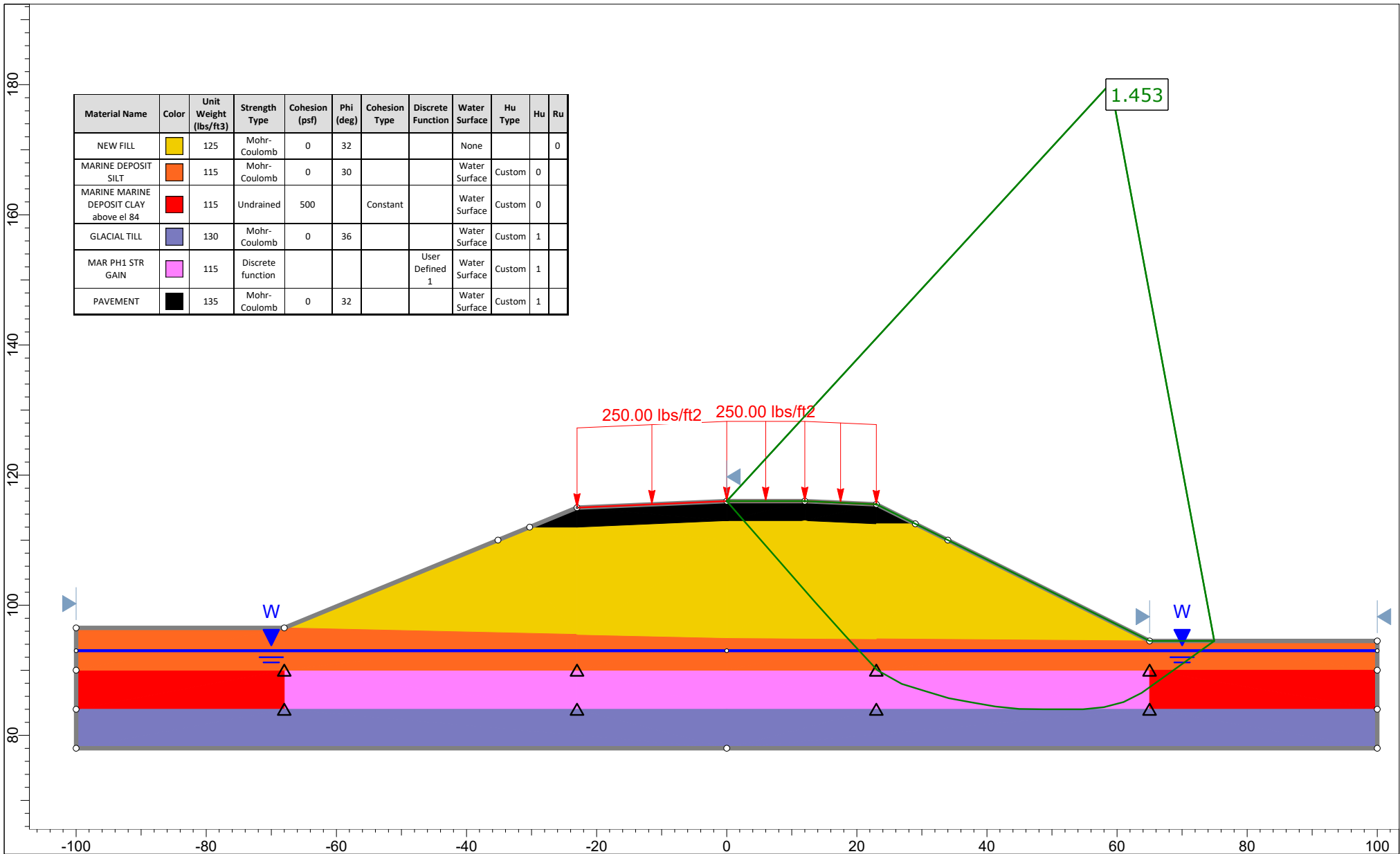
Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Cohesion Type	Discrete Function	Water Surface	Hu Type	Hu	Ru
NEW FILL		125	Mohr-Coulomb	0	32			None			0
MARINE DEPOSIT SILT		115	Mohr-Coulomb	0	30			Water Surface	Custom	0	
MARINE MARINE DEPOSIT CLAY above el 84		115	Undrained	500		Constant		Water Surface	Custom	0	
MARINE DEPOSIT CLAY below el 84		115	Undrained	350		Constant		Water Surface	Custom	0	
GLACIAL TILL		130	Mohr-Coulomb	0	36			Water Surface	Custom	1	
UPPER MAR PH1 STR GAIN		115	Discrete function				User Defined 1	Water Surface	Custom	1	
LOWER MAR PH1 STR GAIN		115	Discrete function				User Defined 2	Water Surface	Custom	1	
PAVEMENT		135	Mohr-Coulomb	0	32			Water Surface	Custom	1	
FOAMED GLASS AGGREGATE		15	Mohr-Coulomb	0.001	45			Water Surface	Custom	1	



SLIDEINTERPRET 9.004

Project	SLIDE - An Interactive Slope Stability Program	
Group	Final Case - 182+00	Scenario Site Class D Pseudo-Static, 0.05g
Drawn By	SSM	Company
Date	5/20/2021, 10:16:23 AM	File Name 2021-0614- Sta 182+00- Left to Right- F.S1.15-non circular--D1.slm

Sta. 183+00

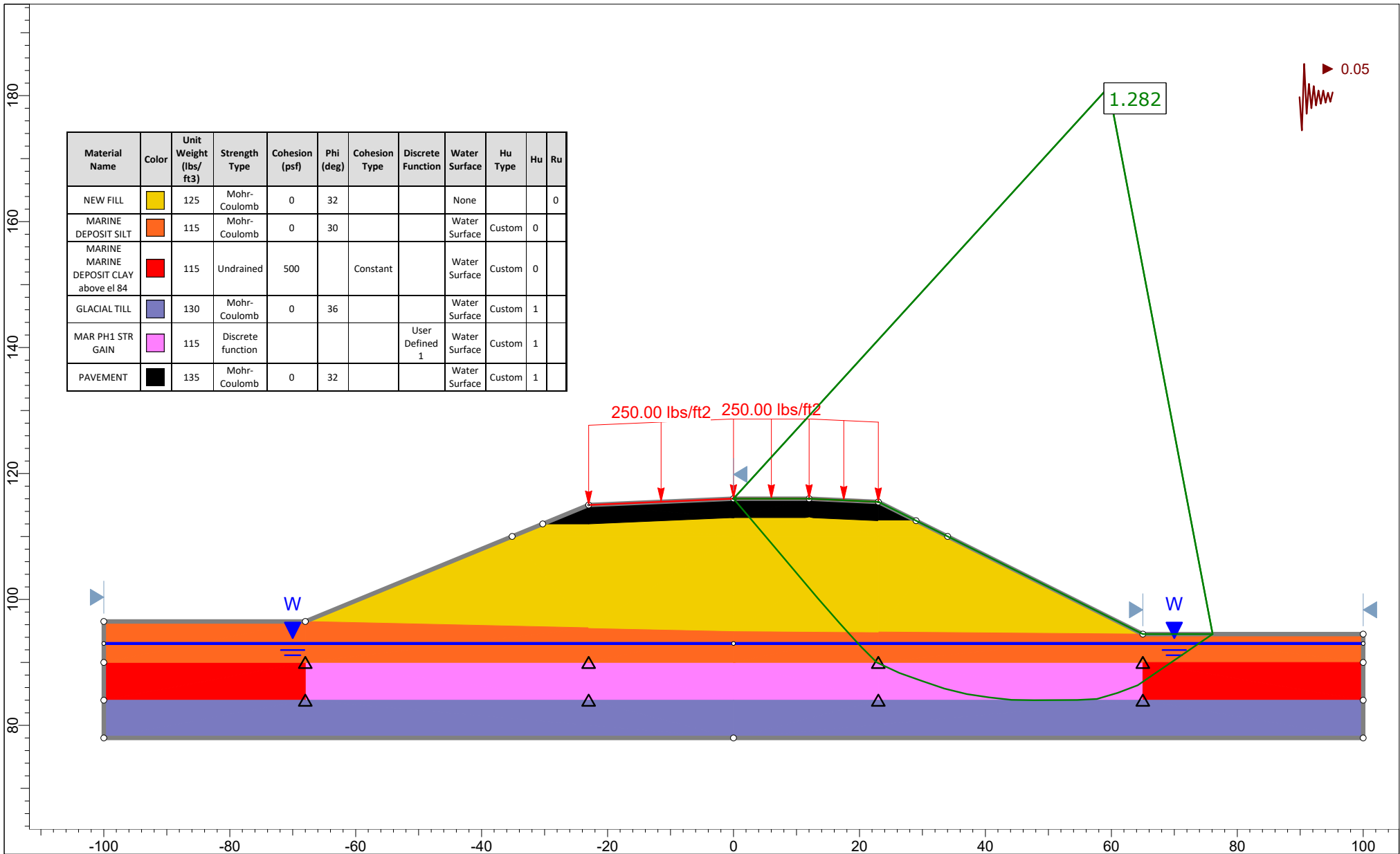



Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Cohesion Type	Discrete Function	Water Surface	Hu Type	Hu	Ru
NEW FILL		125	Mohr-Coulomb	0	32			None			0
MARINE DEPOSIT SILT		115	Mohr-Coulomb	0	30			Water Surface	Custom	0	
MARINE MARINE DEPOSIT CLAY above el 84		115	Undrained	500		Constant		Water Surface	Custom	0	
GLACIAL TILL		130	Mohr-Coulomb	0	36			Water Surface	Custom	1	
MAR PH1 STR GAIN		115	Discrete function				User Defined 1	Water Surface	Custom	1	
PAVEMENT		135	Mohr-Coulomb	0	32			Water Surface	Custom	1	




SLIDEINTERPRET 9.004

Project			SLIDE - An Interactive Slope Stability Program		
Group		Final Case - 183+00	Scenario		
Drawn By		SSM	Company		
Date		5/20/2021, 10:16:23 AM	File Name		
			2021-0615- Sta 183+00- Left to Right- F.S1.15-non circular-D1.slmd		



 <small>SLIDEINTERPRET 9.004</small>	Project		SLIDE - An Interactive Slope Stability Program		
	Group		Final Case - 183+00	Scenario	Site Class D Pseudo-Static, 0.05g
	Drawn By		SSM		Company
	Date		5/20/2021, 10:16:23 AM		File Name
					2021-0615- Sta 183+00- Left to Right- F.S1.15-non circular-D1.slmd

Settlement – Area 1 through 4

		CALCULATIONS		File No.: 132076-007
				Sheet: 1 of 8
Client:	Maine Department of Transportation			Date: 16SEP2021
Project:	I-395/Rt. 9 Connector Highway, Brewer-Eddington, ME			Computed by: JLL
Subject:	Embankment Construction Settlement Evaluations			Checked by: EMS

PROBLEM STATEMENT & OBJECTIVE
 Evaluate primary consolidation and secondary settlements in staged construction of embankments to meet post-construction settlement criteria.

EXECUTIVE SUMMARY
 Construction staging, pre-excavation depths, lightweight fill thickness required were calculated based on the settlement criteria. Results are presented in the pages that follow.

REFERENCES

1. 9th Edition, AASHTO LRFD Bridge Design Specifications, 2020.
2. Holtz, R.D. & Kovacs, W.D., An Introduction to Geotechnical Engineering.

AVAILABLE INFORMATION

1. Subsurface Data: preliminary and final design phase borings.
2. Laboratory consolidation test results for the marine clay (compressibility and stress history/preconsolidation pressure).
3. (CPT soundings were not used to evaluate stress history and compressibility. They were used to calibrate CPT parameters against lab data).
4. Settlement criteria for highway (embankment), bridge, and culvert structures.
5. Maximum stable stage heights also based on global stability evaluations performed by Haley & Aldrich.

ASSUMPTIONS

1. Elevations are in feet, NAVD88 Datum.
2. The project was divided into 4 areas with the following compressibility parameters and stress history:

Area	Approx. Stations		CR	RR	C α ϵ	Preconsolidation Pressure, p' _c Profile/Stress History (psf)
1	50+50	83+00	0.17	0.02	0.004	6000-2000 above El. 65, NC below El. 65
2	137+00	143+00	0.17	0.02	0.004	3000-900 above El. 60, NC below El. 60
3	159+00	170+00	0.19	0.02	0.004	9000-2500 above El. 100, 2500-NC below El. 65
4	179+00	186+00	0.18	0.02	0.004	5000-1000 above El. 84, NC below El. 84

Notes:

CR = strain-based compressibility for virgin compression, $CR = C_c / (1 + e_0)$ from lab consolidation test data.
 RR = strain-based compressibility for recompression, $RR = C_r / (1 + e_0)$ from lab consolidation test data.
 C α ϵ = strain-based coefficient of secondary compression, from lab consolidation test data.
 p'_c = preconsolidation pressure or maximum past pressure, NC - normally-consolidated, OCR=1.
 Settlement calculated at select stations along alignment using nearest boring soil conditions. Water depth/elevation taken from water level readings at nearest boring, if not available, completely submerged conditions were assumed.

3. For areas where prefabricated vertical drains (PVD or wick drains) will be used, separate calculations performed by Haley & Aldrich indicate that 5 ft wick drain spacing and $ch/cv=2$ reaches 90% average degree of consolidation in 7.4 months. Where secondary clay compression is calculated, end of primary consolidation and start of secondary compression was assumed to start at about 7.4 months.
4. For areas where wick drains are NOT used, single drainage conditions are assumed and the secondary compression is assumed to start from the time it takes to 90% average degree of consolidation (t_{90}). This consol. time varies with clay thickness since there are no wick drains. For t_{90} , the dimensionless time factor $T=0.848$ (uniform stress increase).
5. The following post-construction settlement criteria were considered depending on the embankment location:
 Highway Embankment and Highway Culvert Settlement Criteria:
 less than or equal to 4 inches in the first 20 yrs.
 additional settlement less than or equal to 4 inches from 20 yrs. to 75 yrs.
 Bridge Settlement Criteria:
 less than or equal to 2 inches in the first 5 yrs.
 additional settlement less than or equal to 2 inches from 5 yrs. to 20 yrs.
 additional settlement less than or equal to 2 inches from 20 yrs. to 75 yrs.
 (Box) Culvert Settlement Criteria:
 less than or equal to 2 inches in the first 100 yrs.
6. Settlement was calculated under the estimated maximum height of embankment at stations analyzed (i.e., where the stress increase is maximum). Stress increase in the clay assumed uniform with depth (i.e., surcharge condition).
7. Traffic surcharge was not considered in the settlement evaluations.
8. Where lightweight fill (LWF) is required to meet the settlement criteria, LWF assumed total unit weight is 15 pcf.
9. Pavement section is assumed to be 3 ft thick with unit weight of 135 pcf.

RESULTS

AREA 1 - Highway Settlement Criteria, Wick Drains Required, LWF may be Required

Station No.	CPT or Boring ID	GS El. (ft)	GW El. (ft)	Clay Thickness (ft)	Full Emb. Ht. (ft)	Stage 1 Emb. Ht. (ft)	Initial Excav. Depth from Ground Surf. (ft)	Required LWF Thickness (ft)	Post-Constr. Settlement 0-20 yrs (in.)	Post-Constr. Settlement 20-75 yrs (in.)
59+00	HB-BE-108	81.8	80.9	17.2	13.2	11.2	-	0	2.0	0.5
59+00	HB-BE-204	81.5	80.4	21.6	12.9	10.9	-	0	3.1	0.6
59+00	HB-BE-205	83.1	80.4	18.4	12.7	10.7	-	0	2.1	0.5
63+00	BB-BFB1-202	80.8	80.6	30.5	16.7	16.7	-	0.25	4.0	0.8
63+00	HB-BE-109	84.4	80.8	15.5	16.7	16.7	-	0	1.4	0.4
65+50	HB-BE-212	81.6	79.85	23.8	19.5	17	-	0	3.9	0.5
68+00	BB-BFB1-101	80.8	80	16.4	21.9	19	-	0	2.3	0.4
712+00	HB-BE-105	88.1	83.7	17	21	19	-	0	1.7	0.6
712+00	HB-BE-208	90.1	83	13.8	21	19	-	0	1.4	0.7
712+00	HB-BE-210	84.7	83.4	20.1	21	19	-	0	2.5	0.5
713+50	HB-BE-210	84.7	83.4	20.1	31.3	20	-	3.5	4.0	0.6
907+00	HB-BE-239	82.6	82.6	25.3	33.1	19	-	14	4.0	0.7
907+00	HB-BE-202	81.2	81.2	31.4	33.1	19	-	16.75	4.0	0.9
907+00	HB-BE-203	80.6	80.6	22.8	33.1	19	-	13.25	4.0	0.6

Notes:

Highway Settlement Criteria:

less than or equal to 4 inches in the first 20 yrs.

additional settlement less than or equal to 4 inches from 20 yrs. to 75 yrs.

Wick drains required at these stations due to staged embankment construction (i.e., to reduce consolidation wait time).

Some stations have multiple nearest borings or CPT soundings.

Stage 1 embankment height may be controlled by global stability.

AREA 1 - Bridge Settlement Criteria, Wick Drains Required, LWF may be Required

Station No.	CPT or Boring ID	GS El. (ft)	GW El. (ft)	Clay Thickness (ft)	Full Emb. Ht. (ft)	Stage 1 Emb. Ht. (ft)	Initial Excav. Depth from Ground Surf. (ft)	Required LWF Thickness (ft)	Post-Constr. Settlement 0-5 yrs (in.)	Post-Constr. Settlement 5-20 yrs (in.)	Post-Constr. Settlement 20-75 yrs (in.)
53+00	HB-BE-101	82	82	37	21.4	14	-	10.75	2.0	1.1	1.0
53+00	BB-BFB-101	79.4	79.4	34.5	21.4	14	-	10.75	1.9	1.0	1.0
53+00	BB-BFB-202	80.5	80.4	41.8	21.4	14	-	11	2.0	1.2	1.2
56+50	HB-BE-204	81.5	80.4	30	15.5	17.5	-	0	1.9	0.9	0.8

Notes:

Bridge Settlement Criteria:

less than or equal to 2 inches in the first 5 yrs.

additional settlement less than or equal to 2 inches from 5 yrs. to 20 yrs.

additional settlement less than or equal to 2 inches from 20 yrs. to 75 yrs.

Wick drains required at these stations due to staged embankment construction (i.e., to reduce consolidation wait time).

Some stations have multiple nearest borings or CPT soundings.

Stage 1 embankment height may be controlled by global stability. Some sections may require stage 1 heights greater than final.

Client: Maine Department of Transportation

Computed by: JLL

Checked by: EMS

Sheet: 2 of 8



File No.: 132076-007

Date: 16SEP2021

Project: I-395/Rt. 9 Connector Highway, Brewer-Eddington, ME

Subject: Embankment Construction Settlement Evaluations

RESULTS

AREA 1 - Culvert Settlement Criteria, No Wick Drains, Excavation & LWF Required									Embank. Centerline	Embank. Toe
Station No.	CPT or Boring ID	GS El. (ft)	GW El. (ft)	Clay Thickness (ft)	Full Emb. Ht. (ft)	Stage 1 Emb. Ht. (ft)	Initial Excav. Depth from Ground Surf. (ft)	Required LWF Thickness (ft)	Post-Constr. Settlement 0-100 yrs (in.)	Post-Constr. Settlement 0-100 yrs (in.)
64+00	BB-BFB1-201	80.7	80.7	15.8	19.3	19.3	2.25	18.6	2.0	0.0
64+00	BB-BFB1-202	80.8	80.8	30.5	19.3	19.3	5.75	22.1	2.0	-0.9
64+00	BB-BFB1-203	80.6	80.6	23.7	19.3	19.3	5.25	21.6	2.0	-0.6

Notes:

Culvert Settlement Criteria:

less than or equal to 2 inches in the first 100 yrs.

Required excavation depth is depth of excavation below existing ground surface needed to meet post-construction settlement criteria.

LWF is placed from bottom of excavation to bottom of pavement section, LWF is required to meet post-construction settlement criteria.

Wick drains are not required at these sections.

Some stations have multiple nearest borings or CPT soundings.

AREA 1 - Culvert Settlement Criteria, Wick Drains Required, LWF Required									Embank. Centerline	Embank. Toe
Station No.	CPT or Boring ID	GS El. (ft)	GW El. (ft)	Clay Thickness (ft)	Full Emb. Ht. (ft)	Stage 1 Emb. Ht. (ft)	Initial Excav. Depth from Ground Surf. (ft)	Required LWF Thickness (ft)	Post-Constr. Settlement 0-100 yrs (in.)	Post-Constr. Settlement 0-100 yrs (in.)
77+00	BB-BST1-201	86	86	23.1	19.2	19.2	-	5	2.0	1.3

Notes:

Culvert Settlement Criteria:

less than or equal to 2 inches in the first 100 yrs.

Wick drains required at these stations due to staged embankment construction (i.e., to reduce consolidation wait time).

AREA 1 - Highway Culvert Settlement Criteria, No Wick Drains, Excavation & LWF Requirements									Embank. Centerline	Embank. Centerline	Embank. Toe	Embank. Toe
Station No.	CPT or Boring ID	GS El. (ft)	GW El. (ft)	Clay Thickness (ft)	Full Emb. Ht. (ft)	Stage 1 Emb. Ht. (ft)	Initial Excav. Depth from Ground Surf. (ft)	Required LWF Thickness (ft)	Post-Constr. Settlement 0-20 yrs (in.)	Post-Constr. Settlement 20-75 yrs (in.)	Post-Constr. Settlement 0-20 yrs (in.)	Post-Constr. Settlement 20-75 yrs (in.)
66+75	BB-BFB1-101	80.8	80.8	20	21.5	21.5	0.75	19.3	4.0	0.5	0.1	0.5
66+75	HB-BE-213	81.1	81.1	21.7	21.5	21.5	1.4	19.9	4.0	0.6	-0.4	0.6
66+75	HB-BE-214	82.3	82.3	11.3	21.5	21.5	0	18.5	2.3	0.3	0.6	0.3
66+75	HB-BE-204	81	81	26.8	21.5	21.5	3	21.5	4.0	0.7	-1.1	0.7
84+50	BB-BFB2-201	87.4	87.4	15.7	11	11	0	0.0	3.5	0.4	0.9	0.4
84+50	BB-BFB2-101	89.1	89.1	20	11	11	0	0.0	3.8	0.6	0.9	0.6
84+50	BB-BFB2-202	89.4	89.4	14.7	11	11	0	0.0	3.4	0.4	0.9	0.4

Notes:

Highway Settlement Criteria:

less than or equal to 4 inches in the first 20 yrs.

additional settlement less than or equal to 4 inches from 20 yrs. to 75 yrs.

Required excavation depth is depth of excavation below existing ground surface needed to meet post-construction settlement criteria.

LWF is placed from bottom of excavation to bottom of pavement section, LWF is required to meet post-construction settlement criteria.

Wick drains are not required at these sections.

Some stations have multiple nearest borings or CPT soundings.

Client: Maine Department of Transportation

Computed by: JLL

Checked by: EMS

Sheet: 3 of 8



File No.: 132076-007

Date: 16SEP2021

Project: I-395/Rt. 9 Connector Highway, Brewer-Eddington, ME

Subject: Embankment Construction Settlement Evaluations

RESULTS

EMBANKMENT AREA 1 - Highway Settlement Criteria, Wick Drains Required

Station No.	CPT or Boring ID	ASSUMED GS El. (ft)	GW El. (ft)	Clay Thickness (ft)	Full Emb. Ht. (ft)	Stage 1 Emb. Ht. (ft)	Initial Excav. Depth from Ground Surf. (ft)	Required LWF Thickness (ft)	Post-Constr. Settlement 0-20 yrs (in.)	Post-Constr. Settlement 20-75 yrs (in.)
52+00	HB-BE-201	98	98	26	8	8	-	0	2.4	0.7
52+00	HB-BE-202	98	98	31.4	8	8	-	0	2.9	0.9
52+00	HB-BE-328	98	97.3	17	8	8	-	0	1.4	0.5
801+00	BB-BWS-301	100	88.5	22.1	15.5	13.5	-	0	2.5	0.6
801+00	HB-BE-242	100	83.5	13.9	15.5	13.5	-	0	1.4	0.4
801+00	HB-BE-242A	100	83.4	14.3	15.5	13.5	-	0	1.5	0.4
801+00	HB-BE-243	100	83.1	25	15.5	13.5	-	0	2.4	0.7
908+50	HB-BE-239	115	76	25.3	11.5	11.5	-	0	2.3	0.7
908+50	HB-BE-202	115	81.2	31.4	11.5	11.5	-	0	2.9	0.9
908+50	HB-BE-203	115	80.6	22.8	11.5	11.5	-	0	2.1	0.6

Notes:

Highway Settlement Criteria:

- less than or equal to 4 inches in the first 20 yrs.
- additional settlement less than or equal to 4 inches from 20 yrs. to 75 yrs.

Wick drains required at these stations due to staged embankment construction (i.e., to reduce consolidation wait time).

Some stations have multiple nearest borings or CPT soundings.

Stage 1 embankment height may be controlled by global stability.

Ground surface at these stations were taken from the contour plans of ground surface elevation, the nearest CPT or boring ground surface is likely different from the assumed value.

AREA 1 - Highway Settlement Criteria, No Wick Drains

Station No.	CPT or Boring ID	ASSUMED GS El. (ft)	GW El. (ft)	Clay Thickness (ft)	Full Emb. Ht. (ft)	Stage 1 Emb. Ht. (ft)	Initial Excav. Depth from Ground Surf. (ft)	Required LWF Thickness (ft)	Post-Constr. Settlement 0-20 yrs (in.)	Post-Constr. Settlement 20-75 yrs (in.)
82+50	CPT-113	88	88	20	12	12	-	-	4.0	0.6
717+50	HB-BE-241	100	81.4	15	15	15	-	-	2.9	0.4

Notes:

Highway Settlement Criteria:

- less than or equal to 4 inches in the first 20 yrs.
- additional settlement less than or equal to 4 inches from 20 yrs. to 75 yrs.

Wick drains are not required at these sections.

Some stations have multiple nearest borings or CPT soundings.

Stage 1 embankment height may be controlled by global stability.

Ground surface at Station 717+50 was assumed (i.e., not same as that observed at boring indicated).

Client: Maine Department of Transportation

Computed by: JLL

Checked by: EMS

Sheet: 4 of 8



File No.: 132076-007

Date: 16SEP2021

Project: I-395/Rt. 9 Connector Highway, Brewer-Eddington, ME

Subject: Embankment Construction Settlement Evaluations

RESULTS

AREA 2 - Highway Settlement Criteria, Wick Drains Required

Station No.	CPT or Boring ID	GS El. (ft)	GW El. (ft)	Clay Thickness (ft)	Full Emb. Ht. (ft)	Stage 1 Emb. Ht. (ft)	Initial Excav. Depth from Ground Surf. (ft)	Required LWF Thickness (ft)	Post-Constr. Settlement 0-20 yrs (in.)	Post-Constr. Settlement 20-75 yrs (in.)
140+00	BB-BEB-202	74.5	74.5	18.2	18	15	-	-	3.8	0.5
143+00	CPT-116	75	75	16.7	10.1	10.1	-	-	1.7	0.5

Notes:

Highway Settlement Criteria:

- less than or equal to 4 inches in the first 20 yrs.
- additional settlement less than or equal to 4 inches from 20 yrs. to 75 yrs.

Wick drains required at these stations due to staged embankment construction (i.e., to reduce consolidation wait time).

Stage 1 embankment height may be controlled by global stability.

AREA 2 - Highway Settlement Criteria, No Wick Drains

Station No.	CPT or Boring ID	GS El. (ft)	GW El. (ft)	Clay Thickness (ft)	Full Emb. Ht. (ft)	Stage 1 Emb. Ht. (ft)	Initial Excav. Depth from Ground Surf. (ft)	Required LWF Thickness (ft)	Post-Constr. Settlement 0-20 yrs (in.)	Post-Constr. Settlement 20-75 yrs (in.)
138+00	CPT-115	85	85	15.3	10.4	10.4	-	-	3.3	0.4
144+00	-	83	83	10.7	6.2	6.2			2.3	0.3

Notes:

Highway Settlement Criteria:

- less than or equal to 4 inches in the first 20 yrs.
- additional settlement less than or equal to 4 inches from 20 yrs. to 75 yrs.

Wick drains are not required at these sections.

Client: Maine Department of Transportation

Computed by: JLL

Checked by: EMS

Sheet: 5 of 8



File No.: 132076-007

Date: 16SEP2021

Project: I-395/Rt. 9 Connector Highway, Brewer-Eddington, ME

Subject: Embankment Construction Settlement Evaluations

RESULTS

AREA 2 - Bridge Settlement Criteria, Wick Drains Required, LWF may be Required

Station No.	CPT or Boring ID	GS El. (ft)	GW El. (ft)	Clay Thickness (ft)	Full Emb. Ht. (ft)	Stage 1 Emb. Ht. (ft)	Initial Excav. Depth from Ground Surf. (ft)	Required LWF Thickness (ft)	Post-Constr. Settlement 0-5 yrs (in.)	Post-Constr. Settlement 5-20 yrs (in.)	Post-Constr. Settlement 20-75 yrs (in.)
140+00	BB-BEB-202	74.5	74.5	18.2	18	15	-	5	1.2	0.5	0.5
141+75	HB-BE-222	76.5	76.5	19.7	14	14	-	4	0.2	0.6	0.5
142+00	HB-BE-222	76.5	76.5	19.7	14	14	-	0	1.9	0.6	0.5
143+00	CPT-116	75	75	16.7	10.1	10.1	-	0	1.4	0.5	0.5

Notes:

Bridge Settlement Criteria:

- less than or equal to 2 inches in the first 5 yrs.
- additional settlement less than or equal to 2 inches from 5 yrs. to 20 yrs.
- additional settlement less than or equal to 2 inches from 20 yrs. to 75 yrs.

Wick drains required at these stations due to staged embankment construction (i.e., to reduce consolidation wait time).

Stage 1 embankment height may be controlled by global stability.

Client: Maine Department of Transportation

Computed by: JLL

Checked by: EMS

Sheet: 6 of 8



File No.: 132076-007

Date: 16SEP2021

Project: I-395/Rt. 9 Connector Highway, Brewer-Eddington, ME

Subject: Embankment Construction Settlement Evaluations

RESULTS

AREA 3 - Highway and Highway Culvert Settlement Criteria, No Wick Drains

Station No.	CPT or Boring ID	GS El. (ft)	GW El. (ft)	Clay Thickness (ft)	Full Emb. Ht. (ft)	Stage 1 Emb. Ht. (ft)	Initial Excav. Depth from Ground Surf. (ft)	Required LWF Thickness (ft)	Post-Constr. Settlement 0-20 yrs (in.)	Post-Constr. Settlement 20-75 yrs (in.)
166+00	HB-BE-223A	109	108.9	15.7	17.4	17.4	-	-	4.5	0.4
167+50	HB-BE-223A	109	109	11.6	20.4	20.4	-	-	4.1	0.3

Notes: (see note below)

Highway and Highway Culver Settlement Criteria:

- less than or equal to 4 inches in the first 20 yrs.
- additional settlement less than or equal to 4 inches from 20 yrs. to 75 yrs.

The estimated post-construction settlement from 0-20 yrs. exceeds 4 inches (4.1 to 4.5 inches), MaineDOT finds this acceptable for these locations (discussion with MaineDOT in May 2021).

Conventional construction can be used here.

Wick drains are not required at these sections.

Client: Maine Department of Transportation

Computed by: JLL

Checked by: EMS

Sheet: 7 of 8



File No.: 132076-007

Date: 16SEP2021

Project: I-395/Rt. 9 Connector Highway, Brewer-Eddington, ME

Subject: Embankment Construction Settlement Evaluations

RESULTS

AREA 4 - Highway Settlement Criteria, Wick Drains Required, LWF may be Required

Station No.	CPT or Boring ID	GS El. (ft)	GW El. (ft)	Clay Thickness (ft)	Full Emb. Ht. (ft)	Stage 1 Emb. Ht. (ft)	Initial Excav. Depth from Ground Surf. (ft)	Required LWF Thickness (ft)	Post-Constr. Settlement 0-20 yrs (in.)	Post-Constr. Settlement 20-75 yrs (in.)
180+50	HB-BE-135	93	93	28.3	30	12.5	-	20.5	4.0	0.8
181+50		93.5	93.5	19	26	12.5	-	13.5	4.0	0.5
182+00	HB-BE-138	94.2	94.2	11	25.1	19	-	4	2.1	0.3
183+50	CPT-124	96	96	12	18	16	-	0	1.8	0.3
185+00	HB-BE-138	96	96	12	17	15	-	0	1.8	0.3

Notes:

Highway Settlement Criteria:

less than or equal to 4 inches in the first 20 yrs.

additional settlement less than or equal to 4 inches from 20 yrs. to 75 yrs.

Wick drains required at these stations due to staged embankment construction (i.e., to reduce consolidation wait time).

Some stations have multiple nearest borings or CPT soundings.

Stage 1 embankment height may be controlled by global stability.

AREA 4 - Highway Settlement Criteria, No Wick Drains

Station No.	CPT or Boring ID	GS El. (ft)	GW El. (ft)	Clay Thickness (ft)	Full Emb. Ht. (ft)	Stage 1 Emb. Ht. (ft)	Initial Excav. Depth from Ground Surf. (ft)	Required LWF Thickness (ft)	Post-Constr. Settlement 0-20 yrs (in.)	Post-Constr. Settlement 20-75 yrs (in.)
186+00	-	97	97	11.15	16.3	16.3	-	-	3.6	0.3
187+00	-	100	100	10.3	13.7	13.7	-	-	3.0	0.3

Notes:

Highway Settlement Criteria:

less than or equal to 4 inches in the first 20 yrs.

additional settlement less than or equal to 4 inches from 20 yrs. to 75 yrs.

Wick drains are not required at these sections.

Client: Maine Department of Transportation

Computed by: JLL

Checked by: EMS

Sheet: 8 of 8



File No.: 132076-007

Date: 16SEP2021

Project: I-395/Rt. 9 Connector Highway, Brewer-Eddington, ME

Subject: Embankment Construction Settlement Evaluations

Client:	Maine Department of Transportation
Project:	I-395/Rt. 9 Connector Highway, Brewer-Eddington, ME
Subject:	Prefabricated Vertical Drain (PVD)/Wick Drain Consolidation Time

PROBLEM STATEMENT & OBJECTIVE

Estimate the wick drain consolidation time and spacing.

EXECUTIVE SUMMARY

A wick drain spacing of 5 ft is required to achieve 90% average degree of consolidation in 9 months for the marine clays in the project.

REFERENCES

1. 9th Edition, AASHTO LRFD Bridge Design Specifications, 2020.
2. Prefabricated Vertical Drains, FHWA Report No. FHWA/RD-86/168, Aug. 1986.
3. Yeung, A.T., 1997, Design Curves for Prefabricated Vertical Drains, Journal of Geotechnical and Geoenvironmental Engineering, Vol. 123, No. 8.
4. Saye, S.R., 2001, Assessment of Soil Disturbance by the Installation of Displacement Sand Drains and Prefabricated Vertical Drains, in Symposium on Soil Behavior and Soft Ground Construction Honoring Charles Ladd, 2001.

AVAILABLE INFORMATION

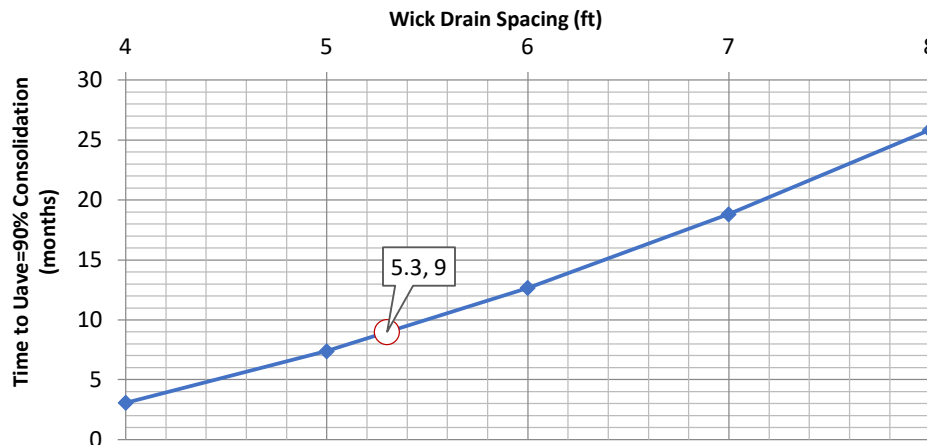
1. Subsurface Data: preliminary and final design phase borings.
2. Laboratory consolidation test results for the marine clay (vertical coefficient of consolidation, c_v).
3. CPT pore pressure dissipation test results (horizontal coefficient of consolidation, c_h).

ASSUMPTIONS

1. PVDs are required to accelerate clay strength gain and settlement under staged construction to help with global stability and reduce post-construction settlement of embankments and structures. Construction stages for strength gain and settlement (preload) cannot exceed 9 months and must achieve at least 90% average degree of consolidation.
2. The vertical coefficient of consolidation (c_v) from laboratory consolidation tests on marine clay ranges from approx. 5×10^{-7} ft²/s to 9×10^{-6} ft²/s (15.8 to 284 ft²/year).
3. The horizontal coefficient of consolidation (c_h) from CPT pore pressure dissipation tests ranges from 113.2 to 396.3 ft²/year.
4. Based on the above results, c_h can be much greater than c_v (i.e., horizontal or radial consolidation can be much faster than vertical consolidation). However, for this analysis, we assumed $c_v = 15.8$ ft²/year and a $c_h/c_v = 2$.
5. Each PVD has dimensions of approx. 4 inches by 0.16 inch. PVDs are arranged in plan in a triangular pattern.
6. Mandrel equivalent diameter ranging from 0.25 ft to 0.5 ft (dependent on mandrel and end anchor).
7. Smear zone diameter 6.5 times mandrel equivalent diameter (Saye, 2001).
8. Soil horizontal permeability to smear zone horizontal permeability ratio assumed equal to 1.5.
9. PVDs /wick drains penetrate the entire thickness of the clay layer.

CALCULATIONS & RESULTS

Using the parameter values summarized above in the design procedure outlined in Yeung (1997), and requiring an average degree of consolidation of 90%, we get the following t_{90} versus wick drain spacing (triangular pattern). For a 9 month-long preload, the spacing required would be 5.3 ft. Suggest a wick drain spacing of 5 ft instead.



**Global Embankment Stability –
Fill over Stiff Cohesive Soils and Granular Soils**

Client: Maine Department of Transportation

Date: 28-Jun-2021

Project: I-395/Route 9 Connector - WIN 18915.00

Computed by: EMS

Subject: Global Stability Fill Areas

Checked by: JAD

PROBLEM STATEMENT AND OBJECTIVE

Calculate the global stability minimum factor of safety at select fill locations along the proposed highway alignment.

REFERENCES

1. AASHTO LRFD Bridge Design Specifications, 7th Edition, 2014.
2. Slide version 7.0 by RocScience.
3. Maine DOT Bridge Design Guide, 2003, with 2014 updates.

AVAILABLE INFORMATION

1. Plan set titled, "Brewer-Eddington I-395/Route 9 Connector, Cross Sections," by MaineDOT dated 3 March 2021.
2. Plan set titled, "Brewer-Eddington I-395/Route 9 Connector" by MaineDOT dated 5 March 2021.

ASSUMPTIONS

1. Soil profiles will be modeled to match settlement calculation models, as summarized below.
2. Seismic cases will have a seismic force of $A_s/2$ based on the seismic site class calculations .
Site Class C: $A_s/2 = 0.08/2 = 0.04$ g
Site Class D: $A_s/2 = 0.107/2 = 0.05$ g
Site Class E: $A_s/2 = 0.167/2 = 0.08$ g
3. A 250 psf traffic surcharge will be modeled.

SOIL PROPERTIES

Material	Unit Weight (pcf)	Friction Angle (degrees)	Undrained Shear Strength (psf)
New Fill	125	32	0
Topsoil	110	30	0
Existing Fill	120	varies ¹	0
Marine Deposit	115	varies ¹	
Glacial Till	130	36	0
Weathered Bedrock	140	36	0
Bedrock	infinite strength		

Notes:

1. Soil properties for Existing Fill and Marine Deposit vary based on location. See individual soil profiles for details.

Client: Maine Department of Transportation

Date: 28-Jun-2021

Project: I-395/Route 9 Connector - WIN 18915.00

Computed by: EMS

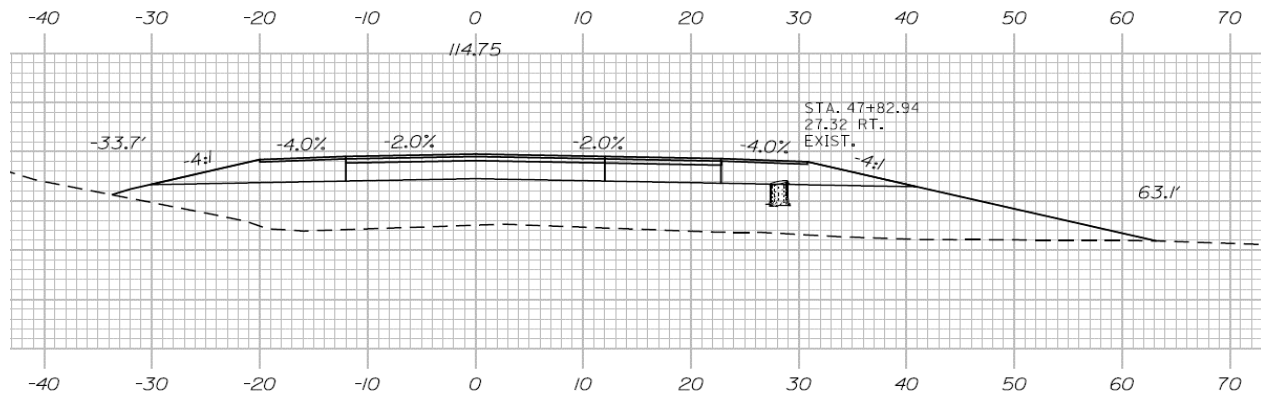
Subject: Global Stability Fill Areas

Checked by: JAD

STA 48+25 GEOMETRY

Fill height = 8 ft

Ground surface at center = El. 107


STA 48+25 SOIL PROFILE AND PROPERTIES (not to scale)

Based on boring BB-BWS-103

Groundwater depth = 4 ft

DEPTH (ft)		ELEVATION (ft)
0	NEW FILL	
	$\gamma = 125 \text{ pcf}$ $\phi = 32^\circ$	
0	Existing Fill	107
	$\gamma = 120 \text{ pcf}$ $\phi = 30^\circ$	
4	SAND	
	$\gamma = 115 \text{ pcf}$ $\phi = 33^\circ$	
20	Marine Deposit	103
	SILT	
	$\gamma = 130 \text{ pcf}$ $\phi = 36^\circ$	
34	Glacial Till	87
	SILT	
34		73
44	BEDROCK	
	infinite strength	
		63

STA 48+25 SEISMIC INFO

Site Class D (see seismic site class calcs)

 $A_s/2 = 0.107/2 = 0.05$

Client: Maine Department of Transportation

Date: 28-Jun-2021

Project: I-395/Route 9 Connector - WIN 18915.00

Computed by: EMS

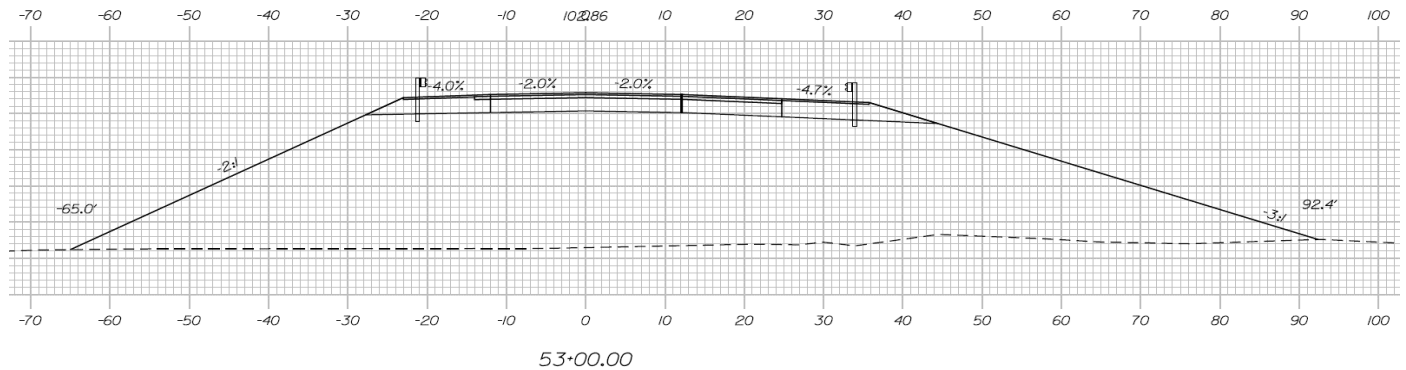
Subject: Global Stability Fill Areas

Checked by: JAD

STA 53+25 GEOMETRY

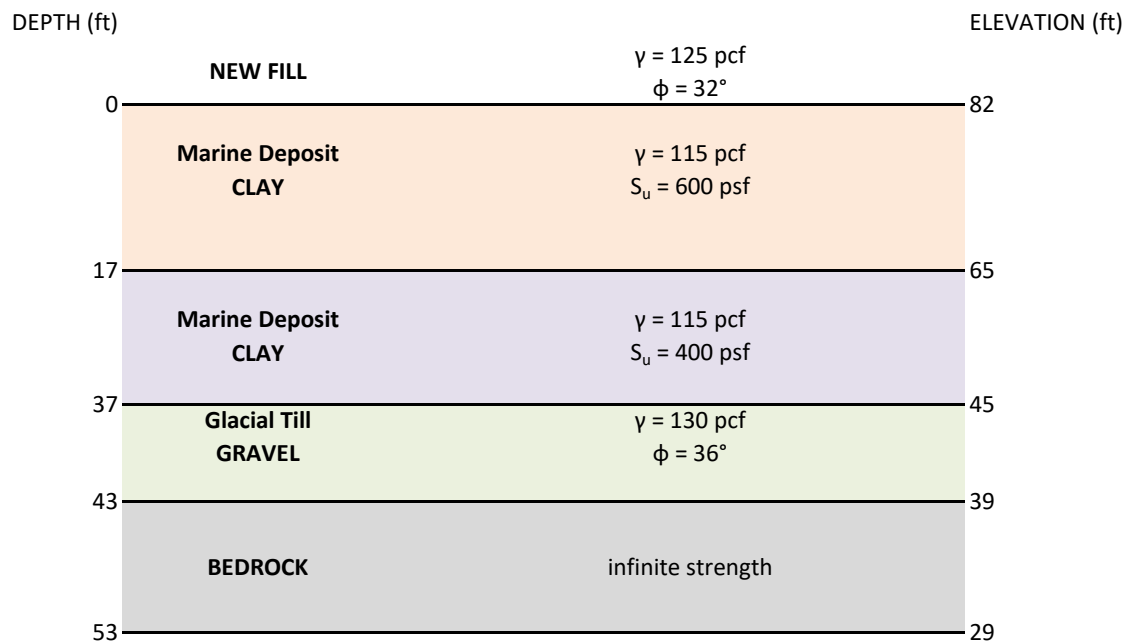
Fill height = 21 ft

Ground surface at center = El. 82


STA 53+25 SOIL PROFILE AND PROPERTIES (not to scale)

Based on boring HB-BE-101

Groundwater depth = 3 ft (based on observation well HB-BE-101, last read 2 June 2020)


STA 53+25 SEISMIC INFO

Site Class E (see seismic site class calcs)

 $A_s/2 = 0.167/2 = 0.08$

Client: Maine Department of Transportation

Date: 28-Jun-2021

Project: I-395/Route 9 Connector - WIN 18915.00

Computed by: EMS

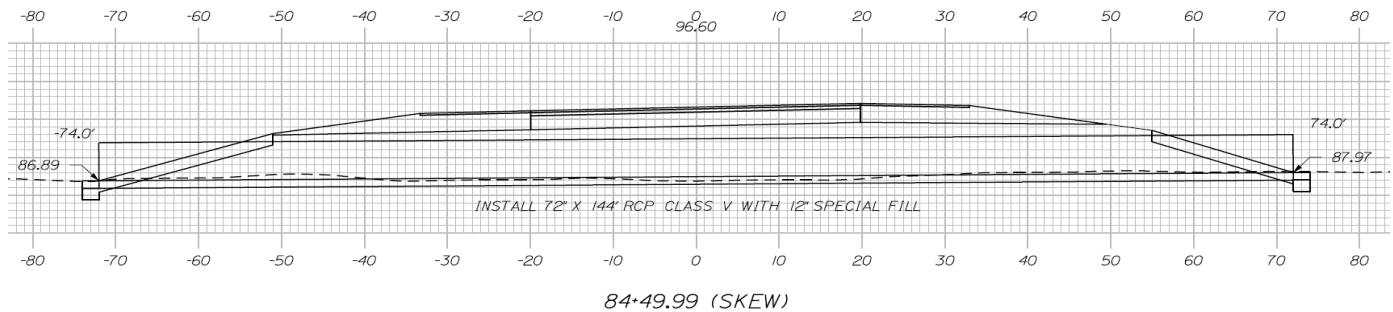
Subject: Global Stability Fill Areas

Checked by: JAD

STA 84+50 GEOMETRY

Fill height = 10 ft

Ground surface at center = El. 87


STA 84+50 SOIL PROFILE AND PROPERTIES (not to scale)

Based on boring BB-BFB2-101

Groundwater depth = 3 ft

DEPTH (ft)			ELEVATION (ft)
0	NEW FILL	$\gamma = 125 \text{ pcf}$ $\phi = 32^\circ$	89
5	Marine Deposit SILT	$\gamma = 115 \text{ pcf}$ $\phi = 30^\circ$	84
17	Marine Deposit CLAY	$\gamma = 115 \text{ pcf}$ $S_u = 950 \text{ psf}$	72
20	Marine Deposit SAND	$\gamma = 115 \text{ pcf}$ $\phi = 30^\circ$	69
31	Glacial Till SAND	$\gamma = 130 \text{ pcf}$ $\phi = 36^\circ$	58
41	BEDROCK	infinite strength	48

STA 84+50 SEISMIC INFO

Site Class E (see seismic site class calcs)

 $A_s/2 = 0.167/2 = 0.08$

Client: Maine Department of Transportation

Date: 28-Jun-2021

Project: I-395/Route 9 Connector - WIN 18915.00

Computed by: EMS

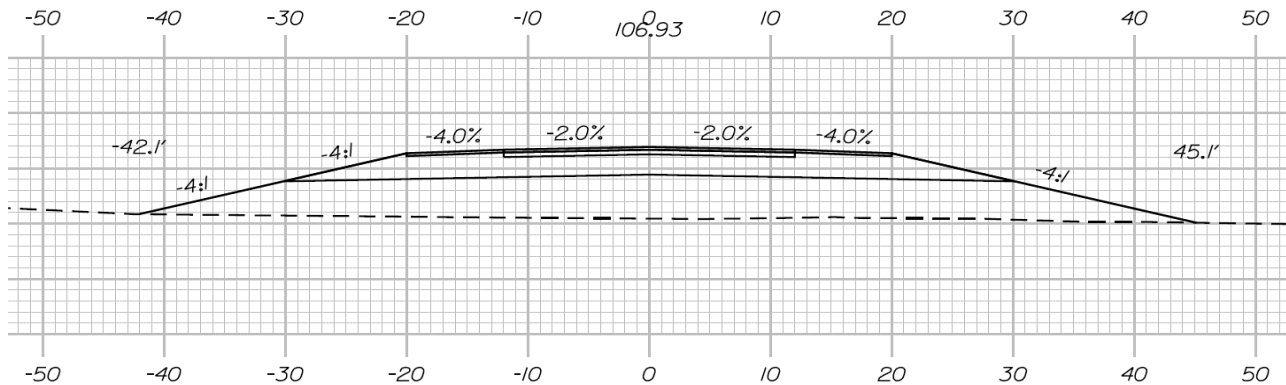
Subject: Global Stability Fill Areas

Checked by: JAD

STA 130+50 GEOMETRY

Fill height = 6 ft

Ground surface at center = El. 100

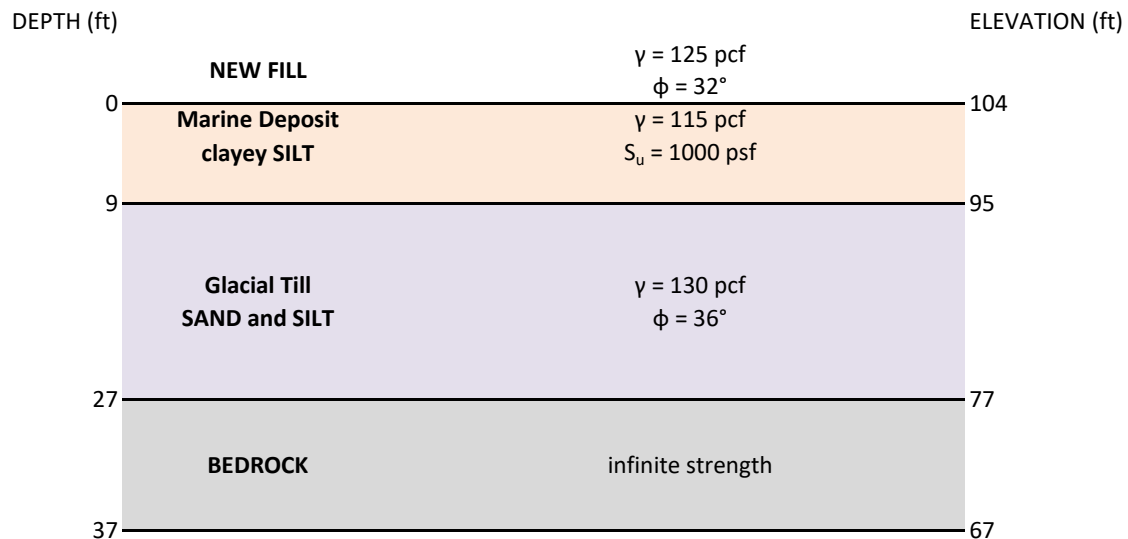


130+50.00

STA 130+50 SOIL PROFILE AND PROPERTIES (not to scale)

Based on boring HB-BE-122

Groundwater depth = 7 ft


STA 130+50 SEISMIC INFO

Site Class D (see seismic site class calcs)

 $A_s/2 = 0.107/2 = 0.05$

Client: Maine Department of Transportation

Date: 28-Jun-2021

Project: I-395/Route 9 Connector - WIN 18915.00

Computed by: EMS

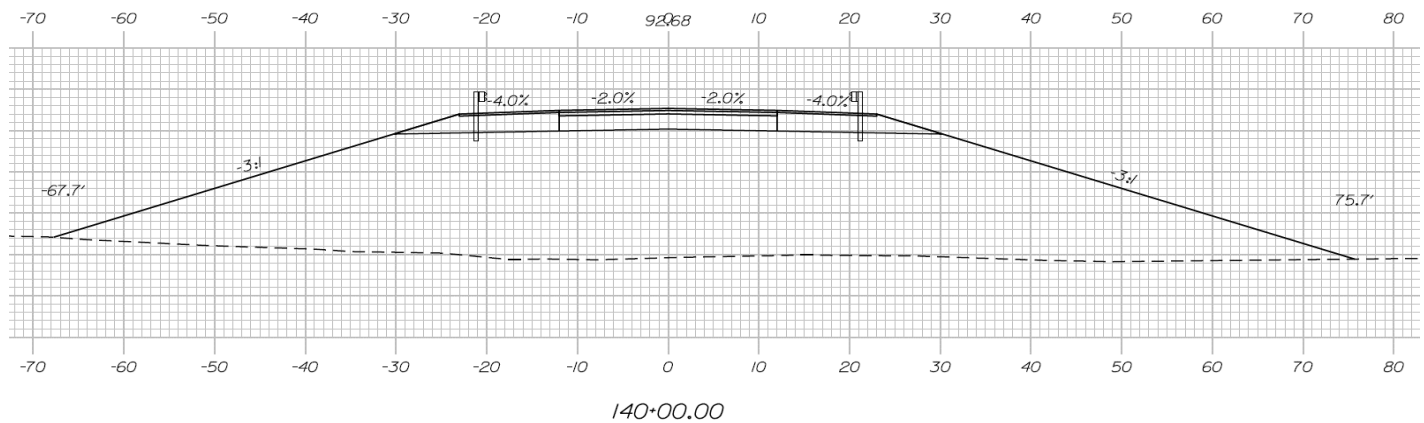
Subject: Global Stability Fill Areas

Checked by: JAD

STA 140+00 GEOMETRY

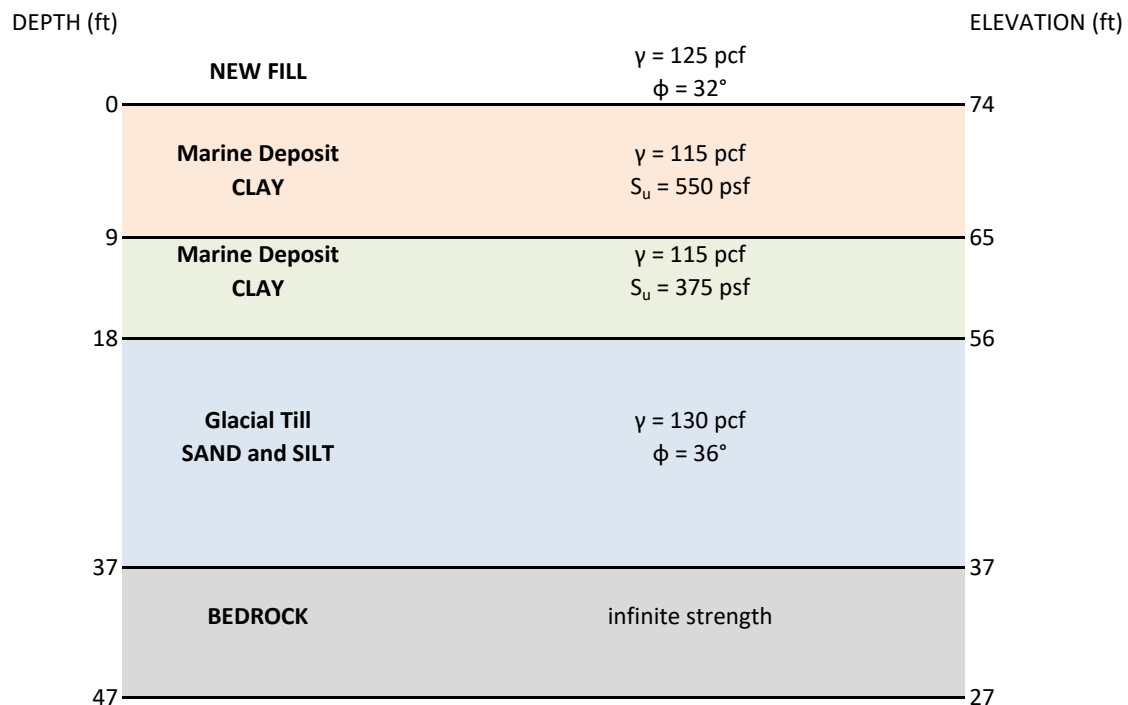
Fill height = 18 ft

Ground surface at center = El. 75


STA 140+00 SOIL PROFILE AND PROPERTIES (not to scale)

Based on boring BB-BEB-101

Groundwater at ground surface


STA 140+00 SEISMIC INFO

Site Class E (see seismic site class calcs)

 $A_s/2 = 0.167/2 = 0.08$

Client: Maine Department of Transportation

Date: 28-Jun-2021

Project: I-395/Route 9 Connector - WIN 18915.00

Computed by: EMS

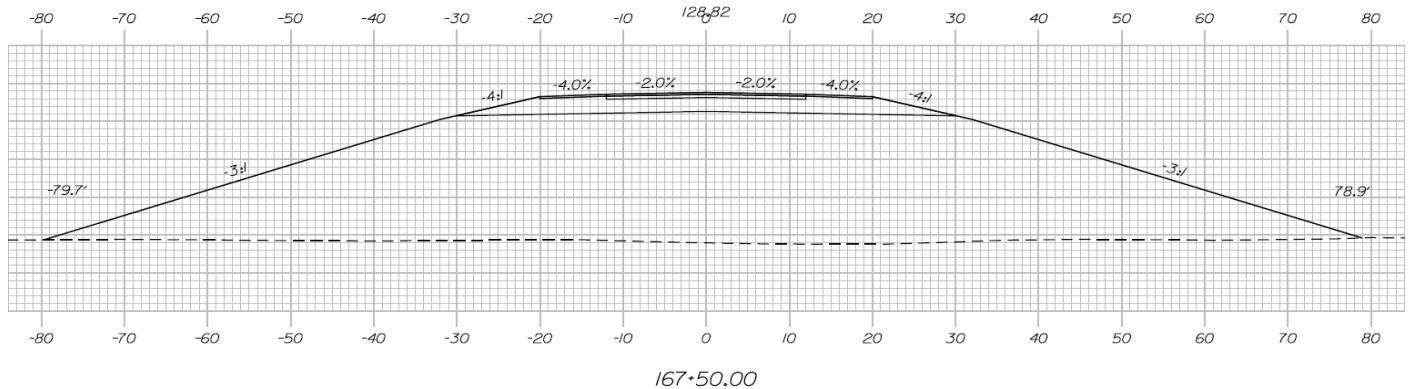
Subject: Global Stability Fill Areas

Checked by: JAD

STA 167+50 GEOMETRY

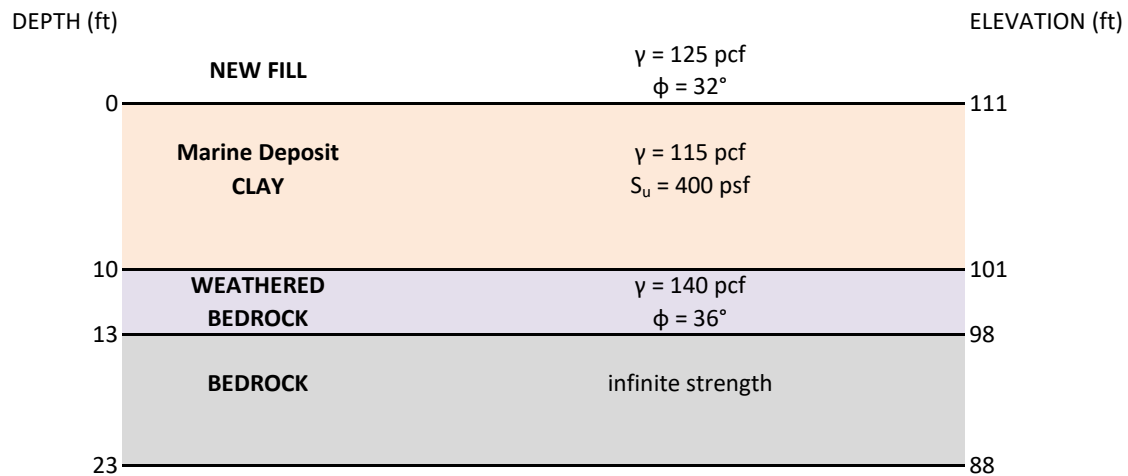
Fill height = 20 ft

Ground surface at center = El. 109


STA 167+50 SOIL PROFILE AND PROPERTIES (not to scale)

Based on boring HB-BE-129

Groundwater depth = 3.5 ft


STA 167+50 SEISMIC INFO

Site Class E (see seismic site class calcs)

 $A_s/2 = 0.167/2 = 0.08$

Client: Maine Department of Transportation

Date: 28-Jun-2021

Project: I-395/Route 9 Connector - WIN 18915.00

Computed by: EMS

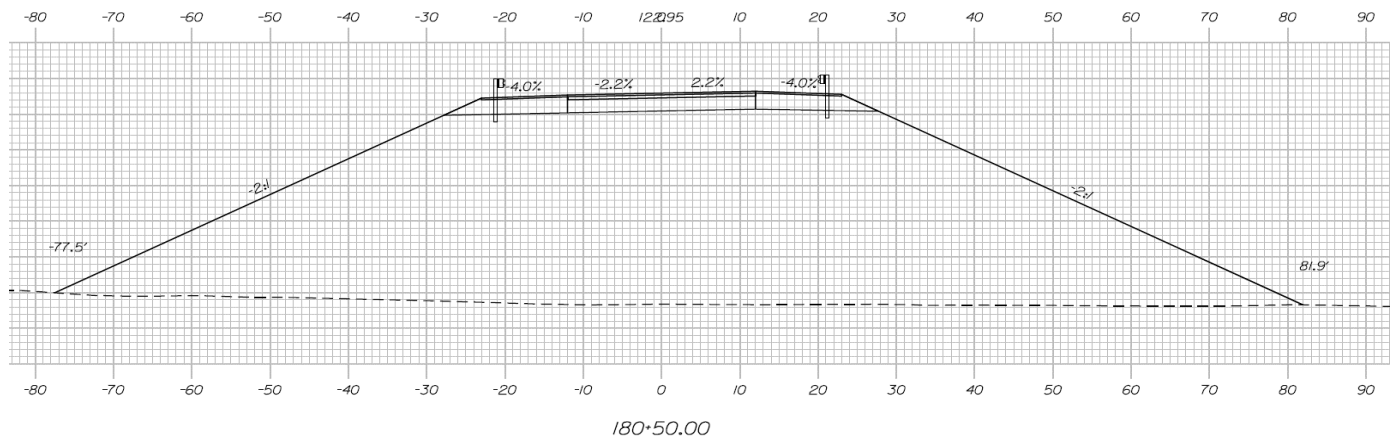
Subject: Global Stability Fill Areas

Checked by: JAD

STA 180+50 GEOMETRY

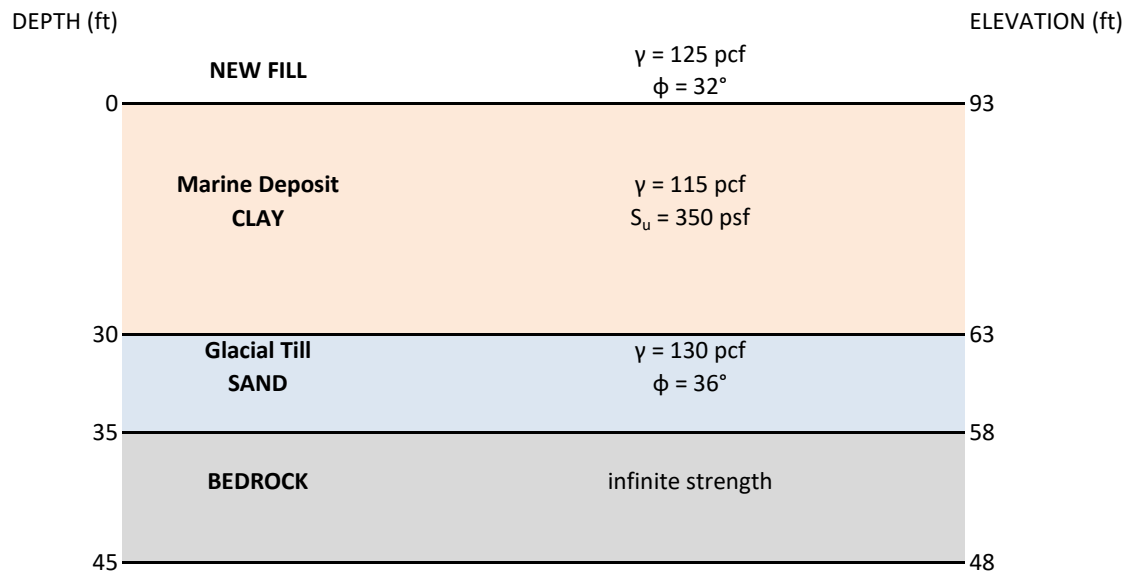
Fill height = 29 ft

Ground surface at center = El. 93


STA 180+50 SOIL PROFILE AND PROPERTIES (not to scale)

Based on boring HB-BE-135

Groundwater at ground surface


STA 180+50 SEISMIC INFO

Site Class E (see seismic site class calcs)

 $As/2 = 0.167/2 = 0.08$

Client: Maine Department of Transportation

Date: 28-Jun-2021

Project: I-395/Route 9 Connector - WIN 18915.00

Computed by: EMS

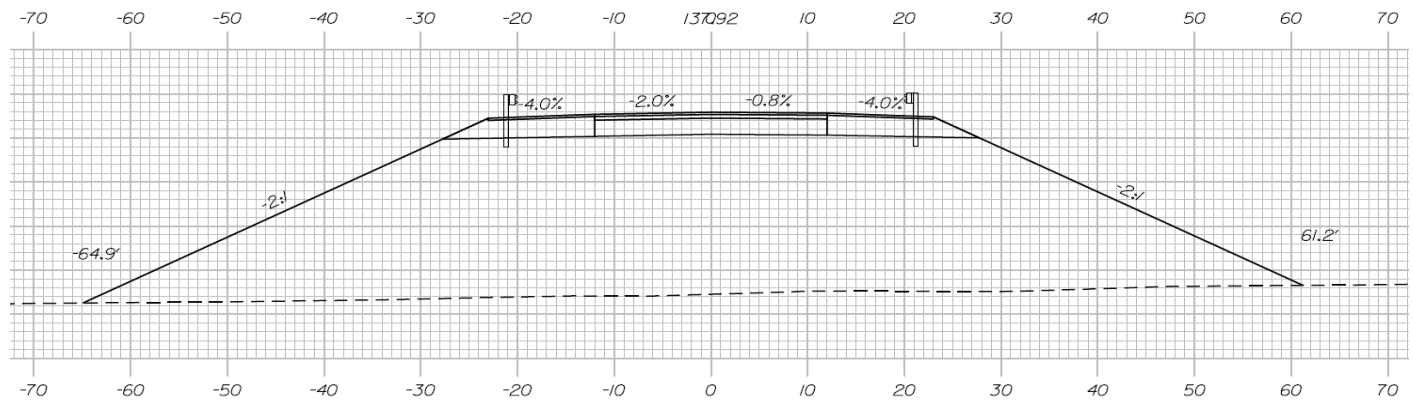
Subject: Global Stability Fill Areas

Checked by: JAD

STA 195+50 GEOMETRY

Fill height = 21 ft

Ground surface at center = El. 117

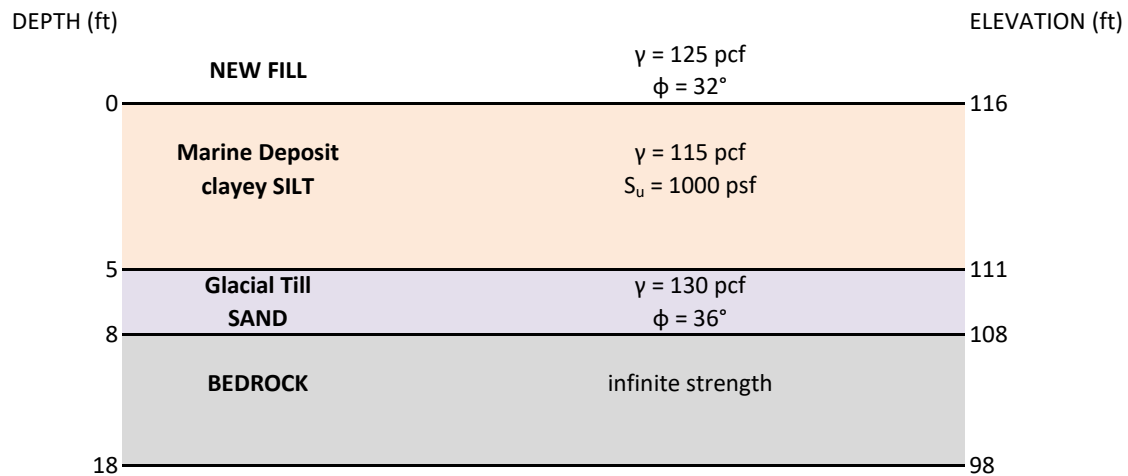


195+50.00

STA 195+50 SOIL PROFILE AND PROPERTIES (not to scale)

Based on boring HB-BE-142

Groundwater depth = 9 ft


STA 195+50 SEISMIC INFO

Site Class D (see seismic site class calcs)

 $A_s/2 = 0.107/2 = 0.05$

Client: Maine Department of Transportation

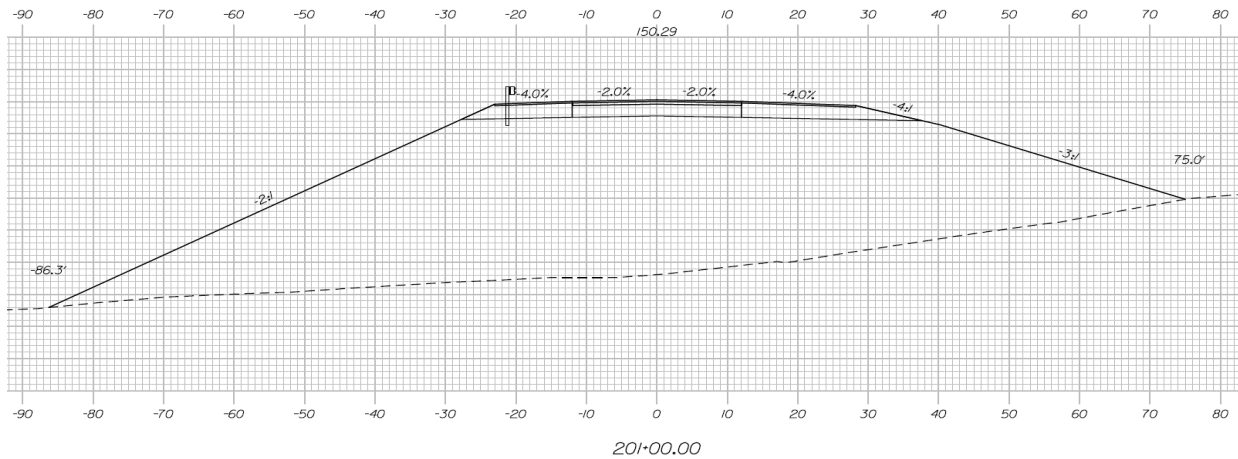
Project: I-395/Route 9 Connector - WIN 18915.00

Subject: Global Stability Fill Areas

STA 201+00 GEOMETRY

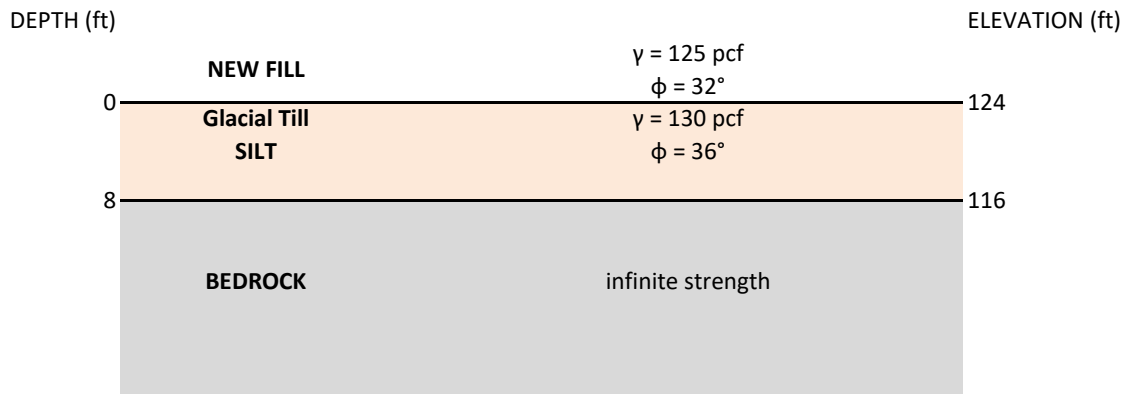
Fill height = 27 ft

Ground surface at center = El. 123


STA 201+00 SOIL PROFILE AND PROPERTIES (not to scale)

Based on boring BB-ELAR-203A

Groundwater depth = 2.5 ft


STA 201+00 SEISMIC INFO

Site Class C (see seismic site class calcs)

 $A_s/2 = 0.08/2 = 0.04$

Client: Maine Department of Transportation

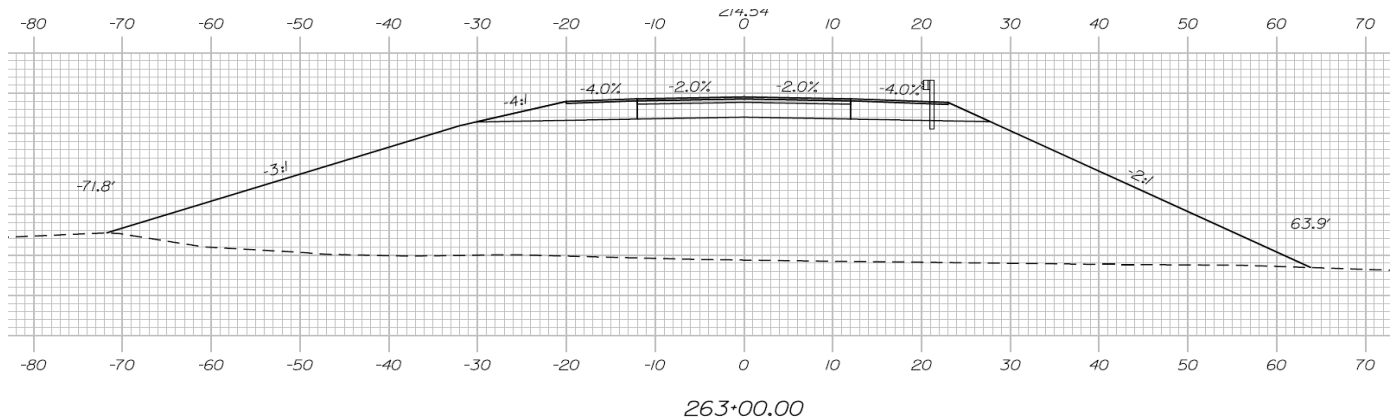
Project: I-395/Route 9 Connector - WIN 18915.00

Subject: Global Stability Fill Areas

STA 262+75 GEOMETRY

Fill height = 21 ft

**Note: Sections cut every 50 ft. Use Sta. 263+00 for model geometry. Ground surface at center = El. 194*


STA 262+75 SOIL PROFILE AND PROPERTIES (not to scale)

Based on boring HB-BE-157

Groundwater depth = 2 ft

DEPTH (ft)		ELEVATION (ft)
0	NEW FILL	201
	$\gamma = 125 \text{ pcf}$ $\phi = 32^\circ$	
3	Glacial Till	198
	SILT	
	$\gamma = 130 \text{ pcf}$ $\phi = 36^\circ$	
15	WEATHERED BEDROCK	186
	$\gamma = 140 \text{ pcf}$ $\phi = 36^\circ$	
25	BEDROCK	176
	infinite strength	

STA 262+75 SEISMIC INFO

Site Class C (see seismic site class calcs)

 $A_s/2 = 0.08/2 = 0.04$

Client: Maine Department of Transportation

Date: 28-Jun-2021

Project: I-395/Route 9 Connector - WIN 18915.00

Computed by: EMS

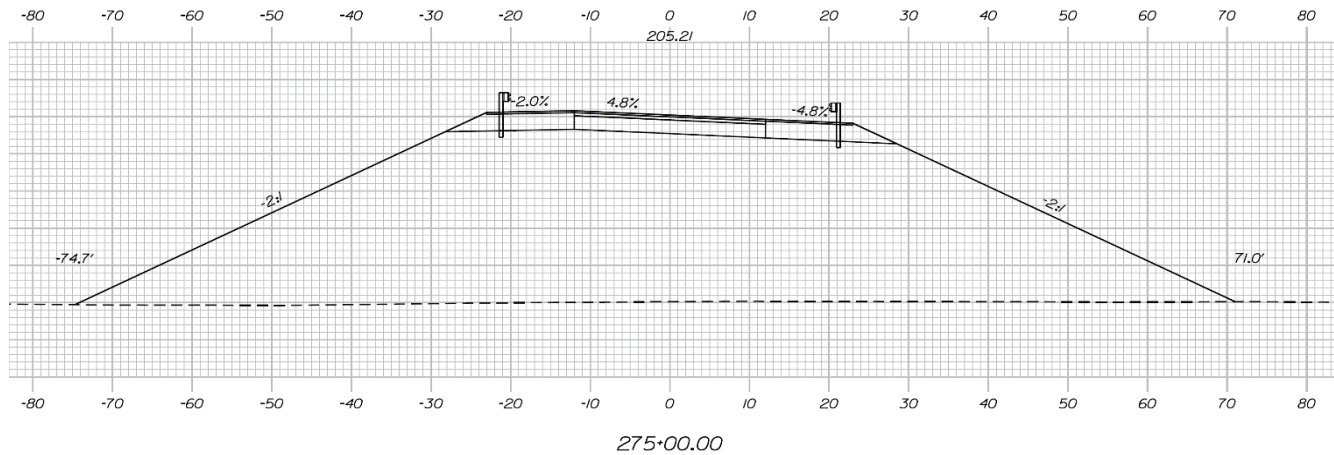
Subject: Global Stability Fill Areas

Checked by: JAD

STA 275+00 GEOMETRY

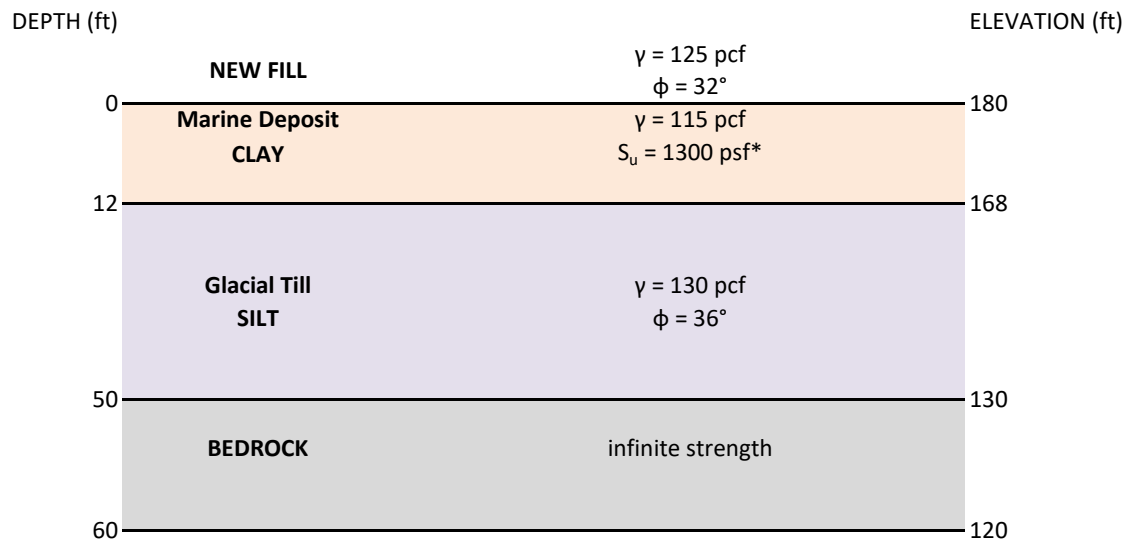
Fill height = 25 ft

Ground surface at center = El. 180


STA 275+00 SOIL PROFILE AND PROPERTIES (not to scale)

Based on boring BB-EEBT2-101, BB-EEBT2-202

Groundwater at ground surface (based on visually observed wet soil samples)


* Note: S_u value for Marine Deposit CLAY based on field vane results, due to poor tube sample quality at BB-EEBT2-101.

STA 275+00 SEISMIC INFO

Site Class E (see seismic site class calcs)

 $A_s/2 = 0.16/2 = 0.08$

Client: Maine Department of Transportation

Date: 28-Jun-2021

Project: I-395/Route 9 Connector - WIN 18915.00

Computed by: EMS

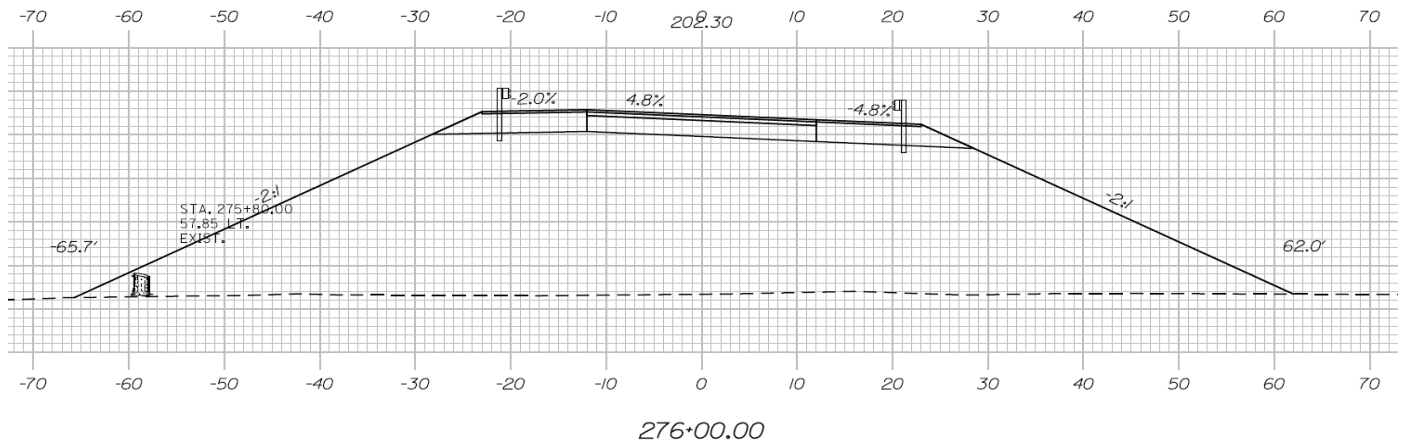
Subject: Global Stability Fill Areas

Checked by: JAD

STA 275+75 GEOMETRY

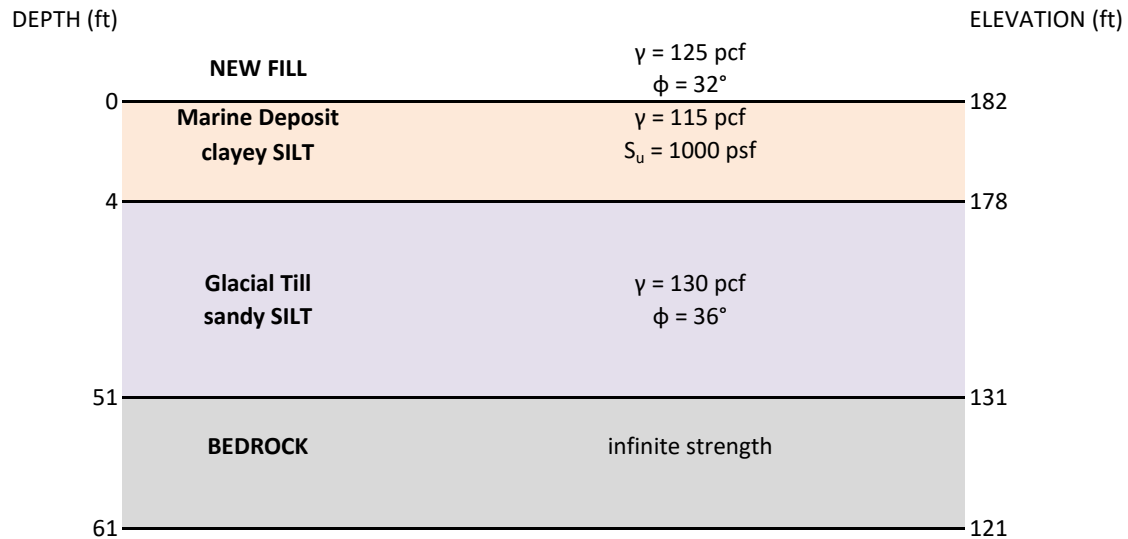
Fill height = 21 ft

**Note: Sections cut every 50 ft. Use Sta. 276+00 for model geometry. Ground surface at center = El. 181*


STA 275+75 SOIL PROFILE AND PROPERTIES (not to scale)

Based on boring BB-EWC2-101

Groundwater at ground surface (based on visually observed wet soil samples)


STA 275+75 SEISMIC INFO

Site Class D (see seismic site class calcs)

$$A_s/2 = 0.107/2 = 0.05$$

Client: Maine Department of Transportation

Date: 28-Jun-2021

Project: I-395/Route 9 Connector - WIN 18915.00

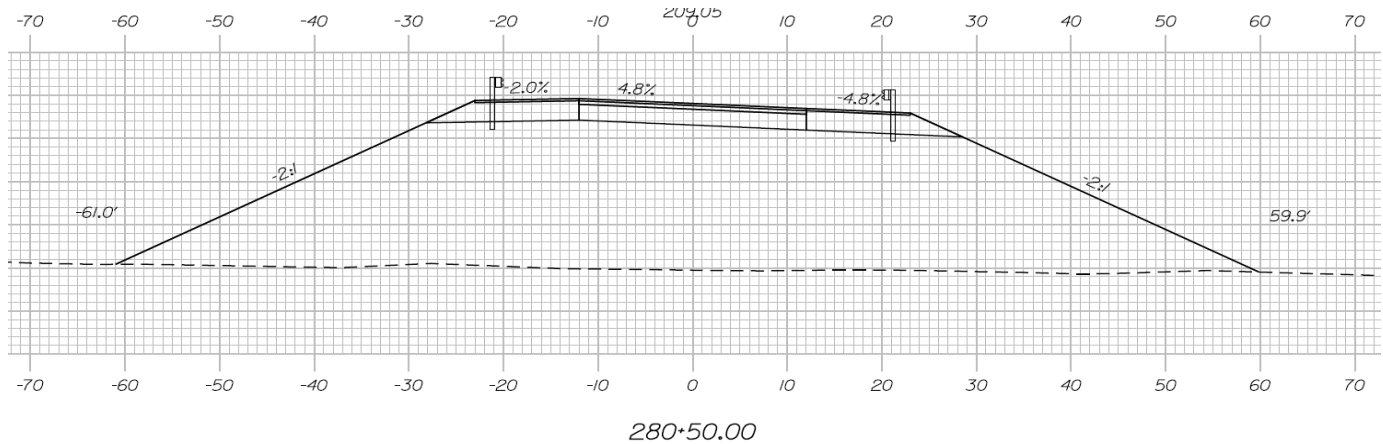
Computed by: EMS

Subject: Global Stability Fill Areas

Checked by: JAD

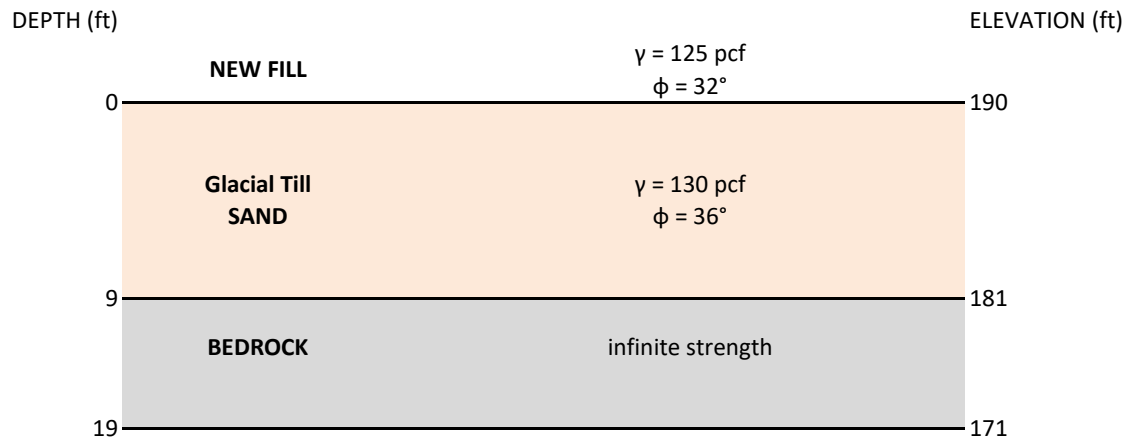
STA 280+75 GEOMETRY

Fill height = 19 ft

**Note: Sections cut every 50 ft. Use Sta. 280+50 for model geometry. Ground surface at center = El. 190*

STA 280+75 SOIL PROFILE AND PROPERTIES (not to scale)

Based on boring HB-BE-160

Groundwater at ground surface (based on visually observed wet soil samples)


STA 280+75 SEISMIC INFO

Site Class D (see seismic site class calcs)

 $A_s/2 = 0.107/2 = 0.05$

Client: Maine Department of Transportation

Date: 28-Jun-2021

Project: I-395/Route 9 Connector - WIN 18915.00

Computed by: EMS

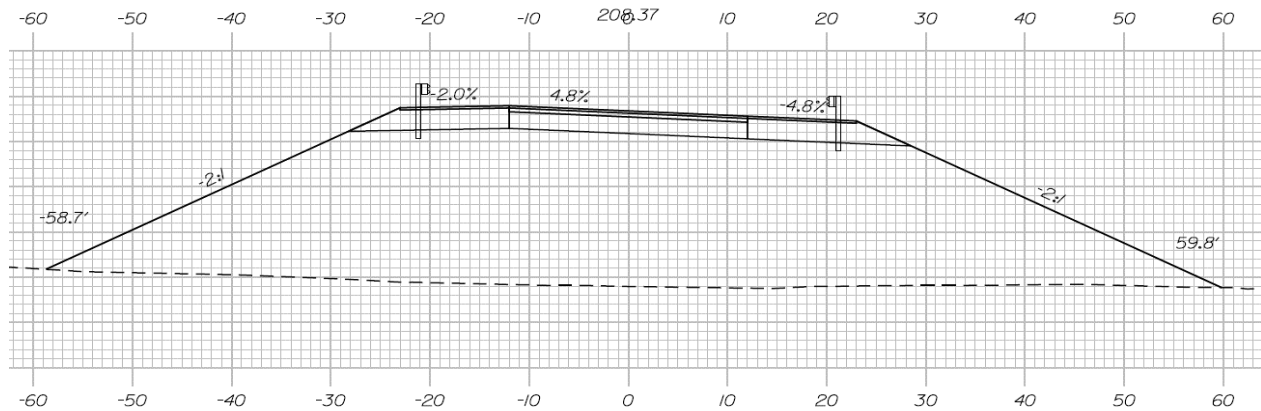
Subject: Global Stability Fill Areas

Checked by: JAD

STA 289+00 GEOMETRY

Fill height = 19 ft

Ground surface at center = El. 189



289+00.00

STA 289+00 SOIL PROFILE AND PROPERTIES (not to scale)

Based on boring BB-EWC-101

Groundwater at ground surface

DEPTH (ft)		ELEVATION (ft)
0	NEW FILL	
	$\gamma = 125 \text{ pcf}$	
	$\phi = 32^\circ$	
0	Marine Deposit	191
	clayey SILT	
	$\gamma = 115 \text{ pcf}$	
	$S_u = 1000 \text{ psf}$	
4		187
	Glacial Till	
	SILT	
	$\gamma = 130 \text{ pcf}$	
	$\phi = 36^\circ$	
10		181
	BEDROCK	
	infinite strength	
20		171

STA 289+00 SEISMIC INFO

Site Class D (see seismic site class calcs)

 $A_s/2 = 0.107/2 = 0.05$

Client: Maine Department of Transportation

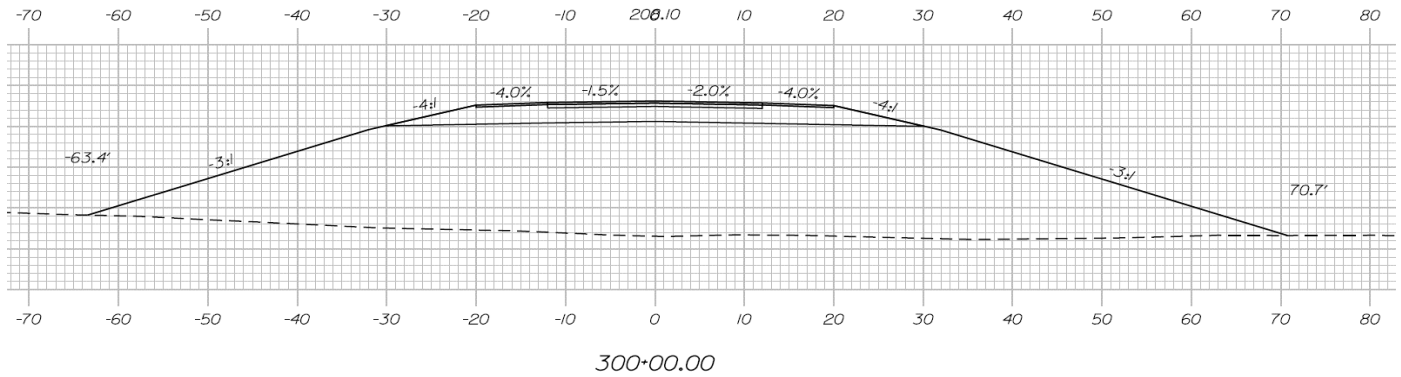
Project: I-395/Route 9 Connector - WIN 18915.00

Subject: Global Stability Fill Areas

STA 299+75 GEOMETRY

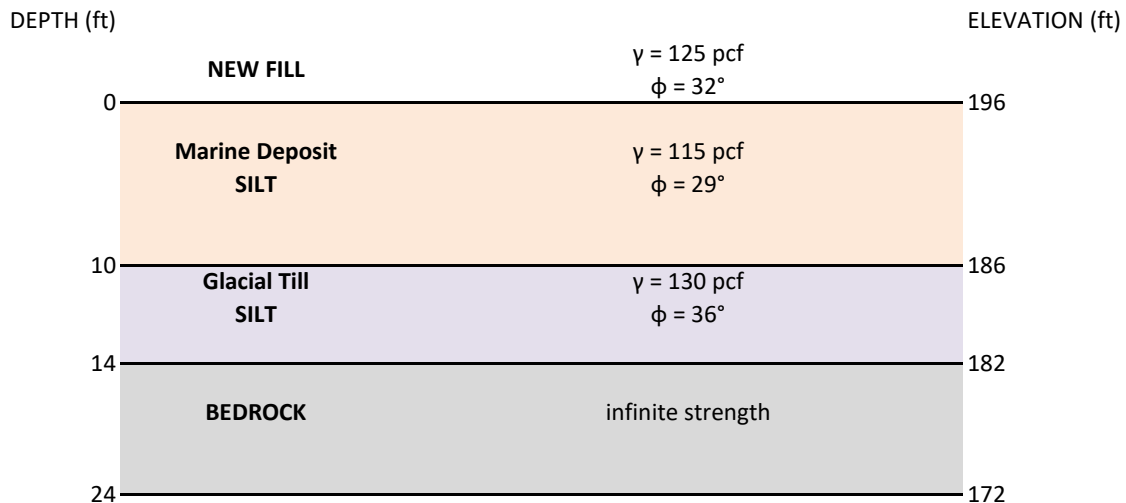
Fill height = 16 ft

**Note: Sections cut every 50 ft. Use Sta. 300+00 for model geometry. Ground surface at center = El. 191*


STA 299+75 SOIL PROFILE AND PROPERTIES (not to scale)

Based on boring HB-BE-163

Groundwater depth = 4 ft


STA 299+75 SEISMIC INFO

Site Class C (see seismic site class calcs)

 $A_s/2 = 0.08/2 = 0.04$

Client: Maine Department of Transportation

Date: 28-Jun-2021

Project: I-395/Route 9 Connector - WIN 18915.00

Computed by: EMS

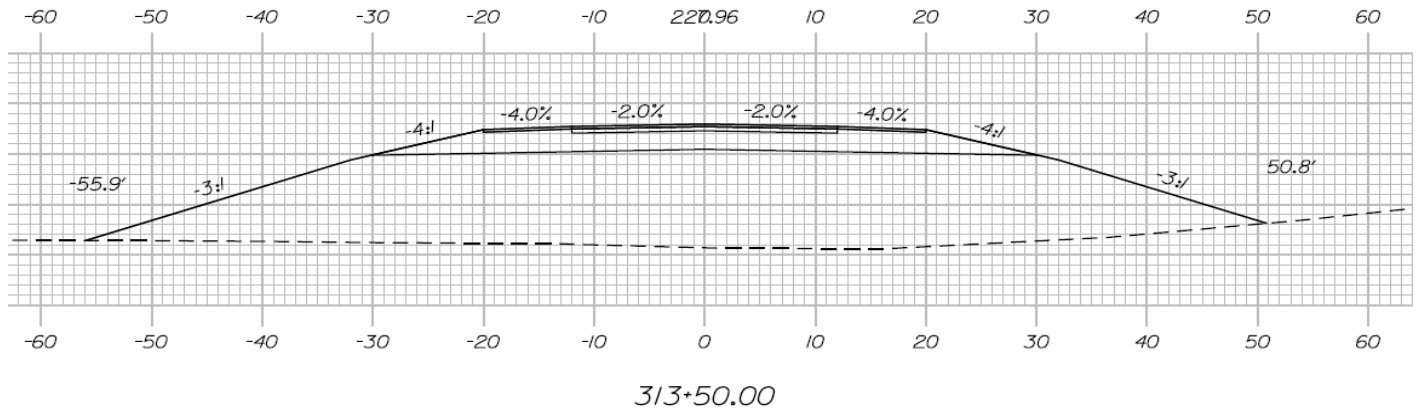
Subject: Global Stability Fill Areas

Checked by: JAD

STA 313+25 GEOMETRY

Fill height = 13 ft

**Note: Sections cut every 50 ft. Use Sta. 313+50 for model geometry. Ground surface at center = El. 216*


STA 313+25 SOIL PROFILE AND PROPERTIES (not to scale)

Based on boring HB-BE-166

Groundwater depth = 8 ft (based on boring HB-BE-165)

DEPTH (ft)		ELEVATION (ft)
0	NEW FILL $\gamma = 125 \text{ pcf}$ $\phi = 32^\circ$	216
5	Marine Deposit SAND $\gamma = 115 \text{ pcf}$ $\phi = 30^\circ$	211
10	Marine Deposit sandy SILT $\gamma = 115 \text{ pcf}$ $\phi = 29^\circ$	206
22	Glacial Till SAND $\gamma = 130 \text{ pcf}$ $\phi = 36^\circ$	194
32	BEDROCK infinite strength	184

STA 313+25 SEISMIC INFO

Site Class E (see seismic site class calcs)

 $A_s/2 = 0.167/2 = 0.08$

Client: Maine Department of Transportation

Date: 28-Jun-2021

Project: I-395/Route 9 Connector - WIN 18915.00

Computed by: EMS

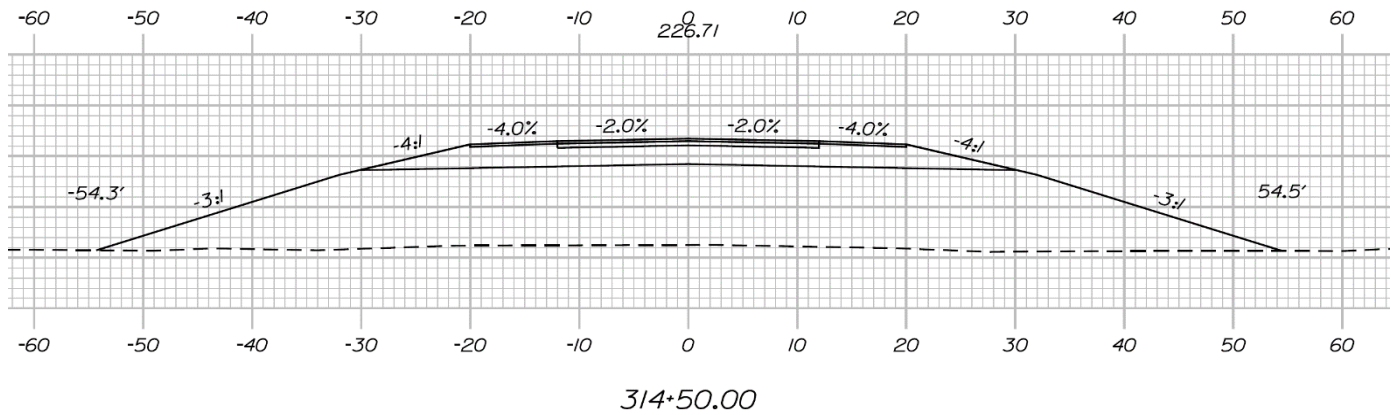
Subject: Global Stability Fill Areas

Checked by: JAD

STA 314+50 GEOMETRY

Fill height = 12 ft

Ground surface at center = El. 216


STA 314+50 SOIL PROFILE AND PROPERTIES (not to scale)

Based on boring HB-BE-166

Groundwater depth = at ground surface (based on boring HB-BE-166)

DEPTH (ft)		ELEVATION (ft)
0	NEW FILL	216
	$\gamma = 125 \text{ pcf}$ $\phi = 32^\circ$	
5	Marine Deposit SAND	211
	$\gamma = 115 \text{ pcf}$ $\phi = 30^\circ$	
10	Marine Deposit sandy SILT	206
	$\gamma = 115 \text{ pcf}$ $\phi = 28^\circ$	
22	Glacial Till SAND	194
	$\gamma = 130 \text{ pcf}$ $\phi = 36^\circ$	
32	BEDROCK	184
	infinite strength	

STA 314+50 SEISMIC INFO

Site Class E (see seismic site class calcs)

 $A_s/2 = 0.16/2 = 0.08$

Client: Maine Department of Transportation

Date: 28-Jun-2021

Project: I-395/Route 9 Connector - WIN 18915.00

Computed by: EMS

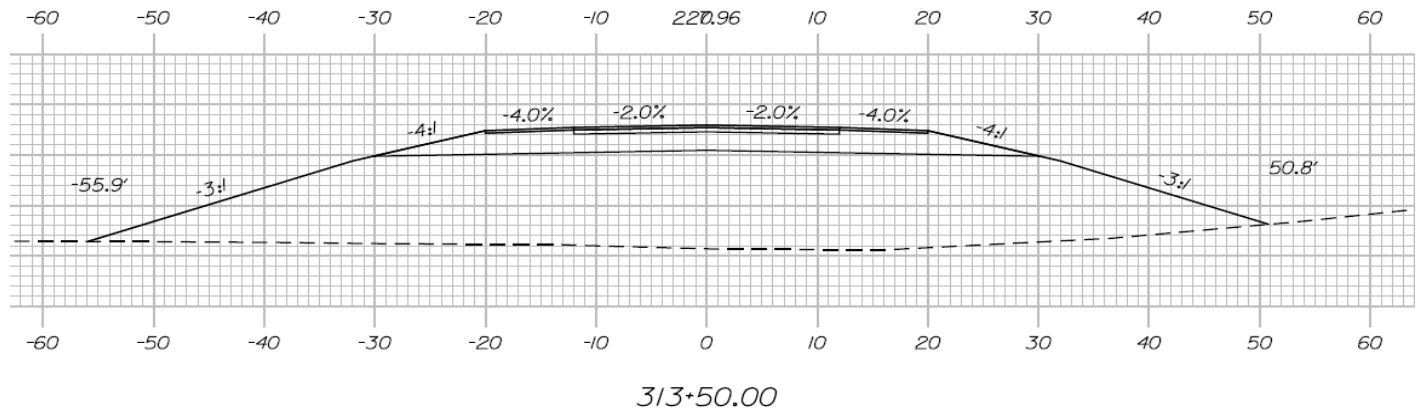
Subject: Global Stability Fill Areas

Checked by: JAD

STA 330+00 GEOMETRY

Fill height = 13 ft

**Note: Sections cut every 50 ft. Use Sta. 313+50 for model geometry. Ground surface at center = El. 191*


STA 330+00 SOIL PROFILE AND PROPERTIES (not to scale)

Based on boring HB-BE-169

Groundwater depth = 6 ft

DEPTH (ft)		ELEVATION (ft)
0	NEW FILL	
	$\gamma = 125 \text{ pcf}$ $\phi = 32^\circ$	
0	Topsoil	186
4	SILT	
	$\gamma = 110 \text{ pcf}$ $\phi = 30^\circ$	
4	Marine Deposit	182
6	clayey SILT	
	$\gamma = 115 \text{ pcf}$ $S_u = 1000 \text{ psf}$	
6		180
	Glacial Till	
	SAND	
	$\gamma = 130 \text{ pcf}$ $\phi = 36^\circ$	
17		169
	BEDROCK	
	infinite strength	
27		159

STA 330+00 SEISMIC INFO

Site Class D (see seismic site class calcs)

 $A_s/2 = 0.107/2 = 0.05$

Client: Maine Department of Transportation

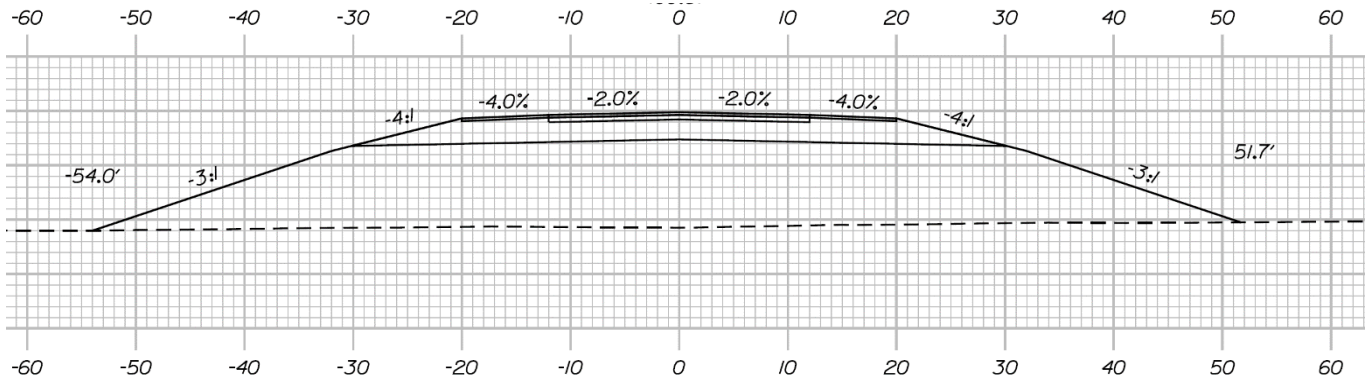
Project: I-395/Route 9 Connector - WIN 18915.00

Subject: Global Stability Fill Areas

STA 330+50 GEOMETRY

Fill height = 11 ft

Ground surface at center = El. 189



330+50.00

STA 330+50 SOIL PROFILE AND PROPERTIES (not to scale)

Based on boring HB-BE-169

Groundwater depth = 8.5 ft

DEPTH (ft)		ELEVATION (ft)
0	NEW FILL $\gamma = 125 \text{ pcf}$ $\phi = 32^\circ$	189
6	Topsoil $\gamma = 110 \text{ pcf}$ $\phi = 30^\circ$	183
9	Marine Deposit clayey SILT $\gamma = 115 \text{ pcf}$ $\phi = 30^\circ$	180
19	Glacial Till SAND $\gamma = 130 \text{ pcf}$ $\phi = 36^\circ$	170
29	BEDROCK infinite strength	160

STA 330+50 SEISMIC INFO

Site Class D (see seismic site class calcs)

 $A_s/2 = 0.107/2 = 0.05$

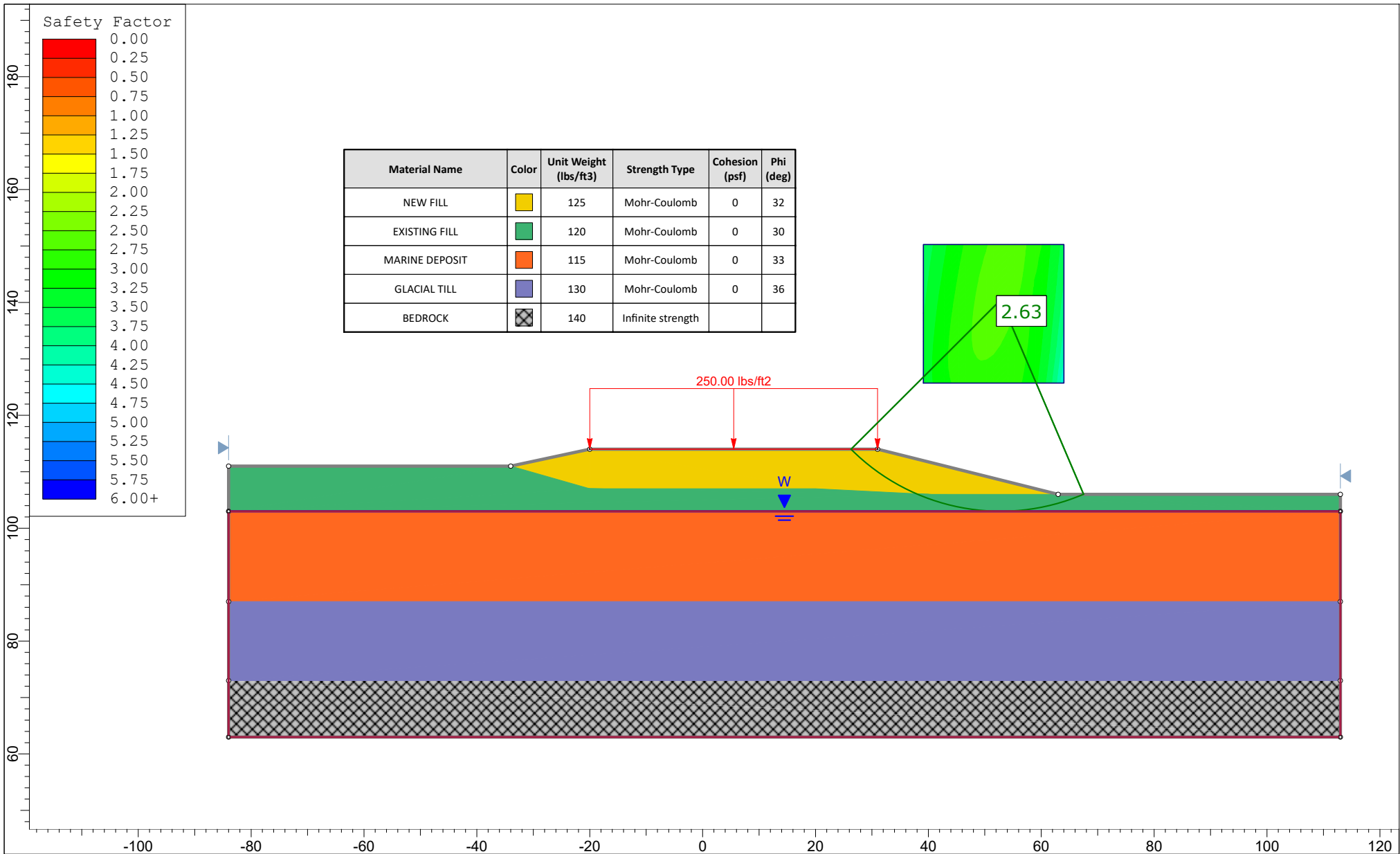
Client:	Maine Department of Transportation
Project:	I-395/Route 9 Connector - WIN 18915.00
Subject:	Global Stability Fill Areas


RESULTS AND CONCLUSIONS

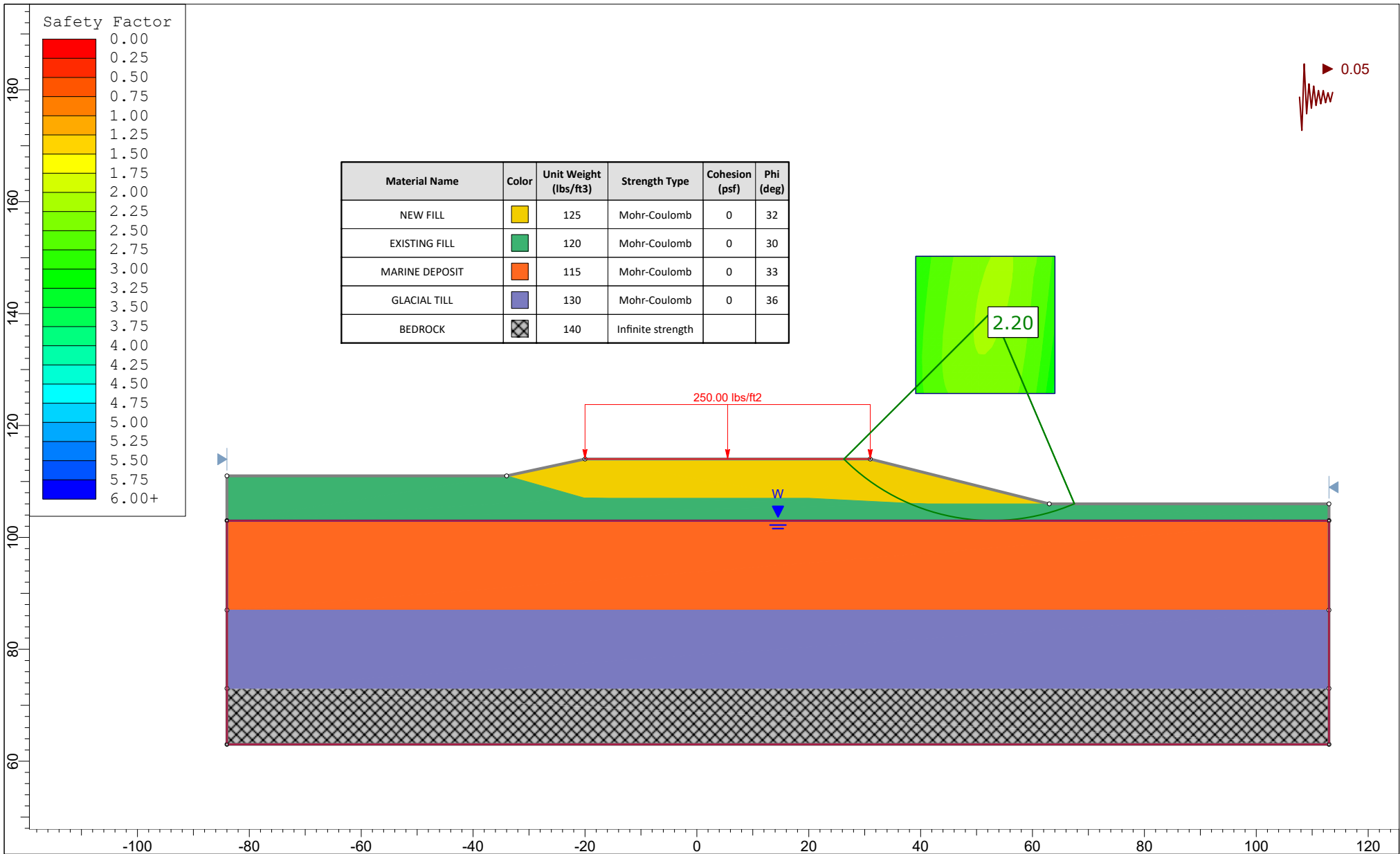
		Factor of Safety (Spencer Method)
		Transverse
Sta. 48+25	Static	2.63
	Seismic	2.20
Sta. 53+25	Static	0.88
	Seismic	0.65
Sta. 84+50	Static	2.55
	Seismic	1.94
Sta. 130+50	Static	2.49
	Seismic	2.10
Sta. 140+00	Static	1.15
	Seismic	0.86
Sta. 145+00	Static	1.89
	Seismic	1.52
Sta. 167+50	Static	1.34
	Seismic	1.03
Sta. 180+50	Static	0.55
	Seismic	0.43
Sta. 195+50	Static	1.70
	Seismic	1.52
Sta. 201+00	Static	1.43
	Seismic	1.31
Sta. 262+75	Static	1.41
	Seismic	1.29
Sta. 275+00	Static	1.42
	Seismic	1.19
Sta. 275+75	Static	1.35
	Seismic	1.20
Sta. 280+75	Static	1.38
	Seismic	1.23
Sta. 289+00	Static	1.31
	Seismic	1.17
Sta. 299+75	Static	2.03
	Seismic	1.79
Sta. 313+25	Static	1.92
	Seismic	1.53
Sta. 314+50	Static	1.39
	Seismic	1.15
Sta. 330+00	Static	2.19
	Seismic	1.85
Sta. 330+50	Static	1.97
	Seismic	1.69

The minimum required factor of safety as specified by both AASHTO LRFD and the MaineDOT BDG for embankments under static conditions which do not support structures is 1.3. The minimum required factor of safety for embankments subjected to pseudo-static seismic loading is 1.0.

Sta. 48+25

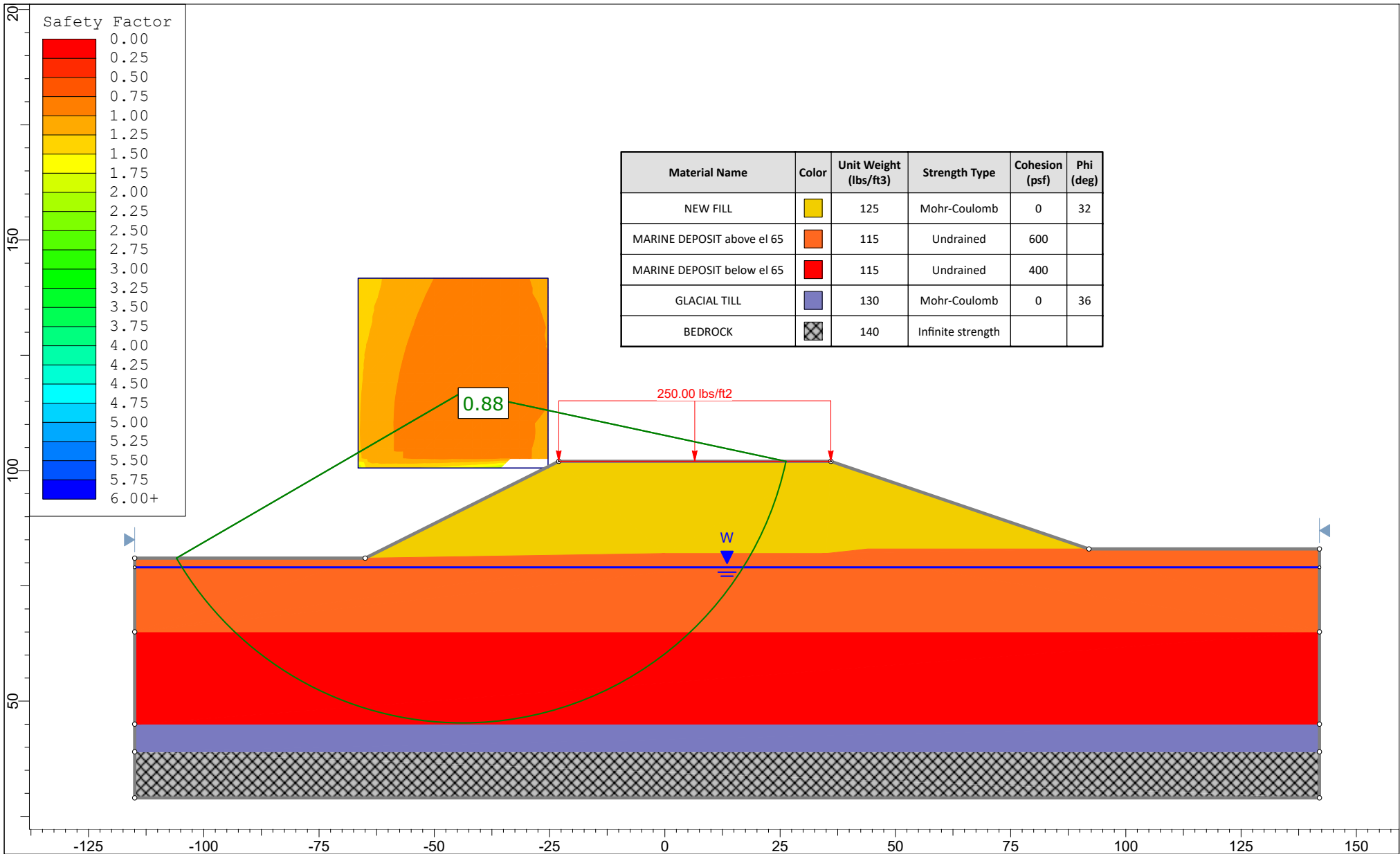


	Project			SLIDE - An Interactive Slope Stability Program	
	Analysis Description			Sta. 48+25	
	Drawn By		EMS	Scale	1:283
	Date		5/27/2020, 3:54:29 PM		Company
					File Name
SLIDEINTERPRET 8.018				2020-0603-Sta 4825 Stability.slim	

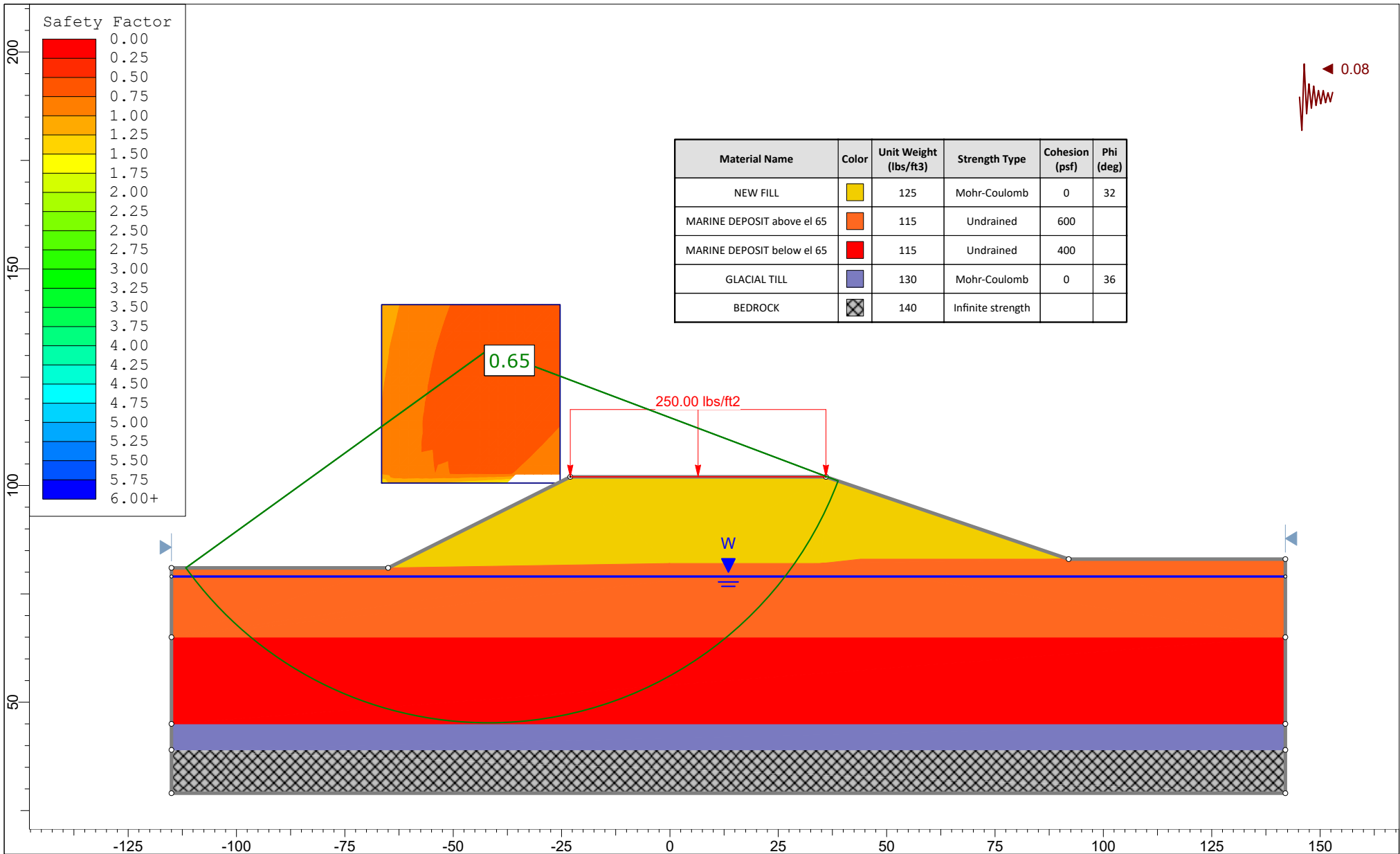



	Project		
	SLIDE - An Interactive Slope Stability Program		
	Analysis Description		
	Sta. 48+25		
Drawn By	EMS	Scale	1:285
Date	5/27/2020, 3:54:29 PM	Company	2020-0603-Sta 4825 Stability-seismic.slim

Sta. 53+25

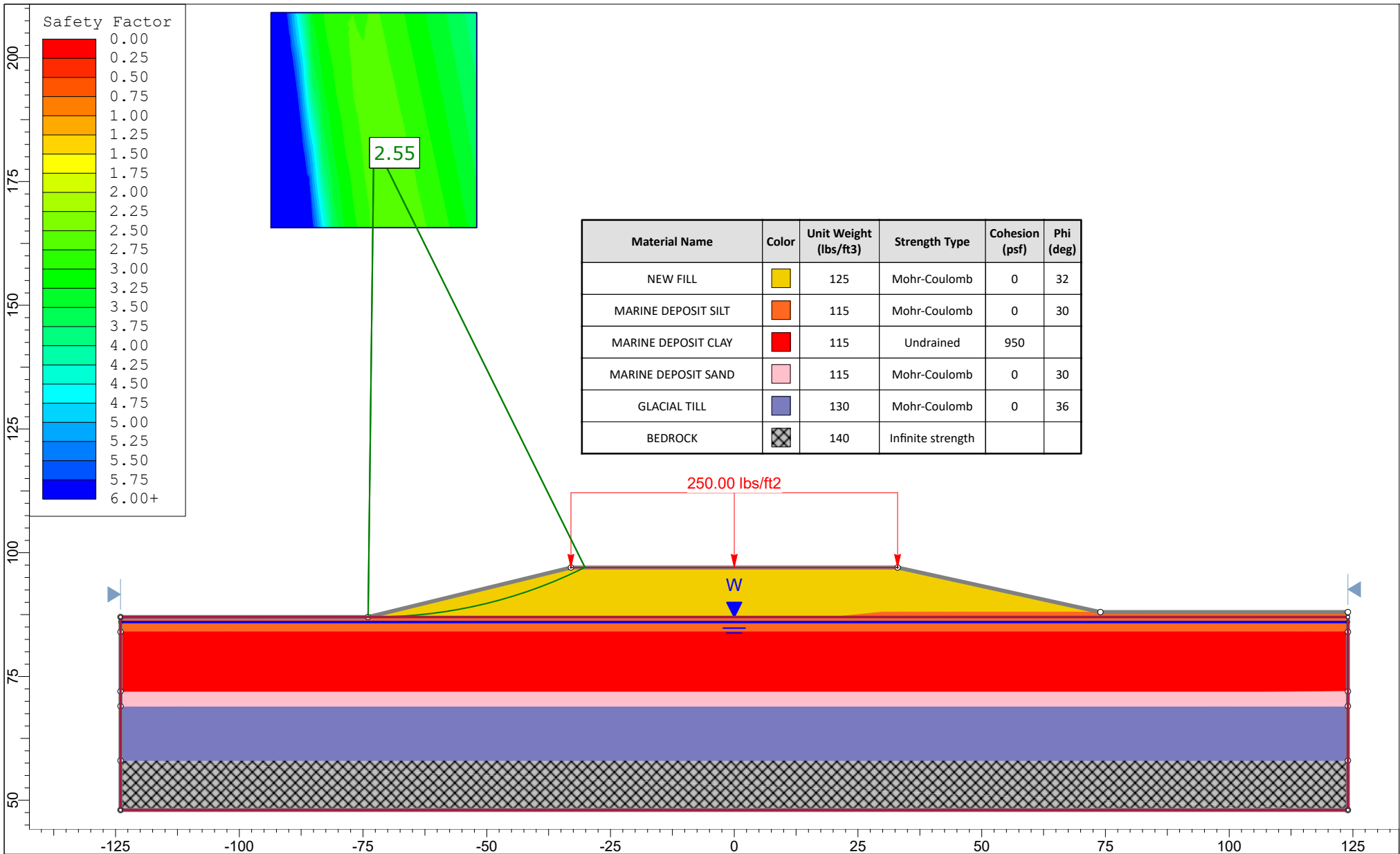


	Project			SLIDE - An Interactive Slope Stability Program	
	Analysis Description			Sta. 53+25	
	Drawn By	EMS	Scale	1:346	Company
	Date	5/27/2020, 3:54:29 PM		File Name	
			2020-0610-Sta 5325 Stability.slim		

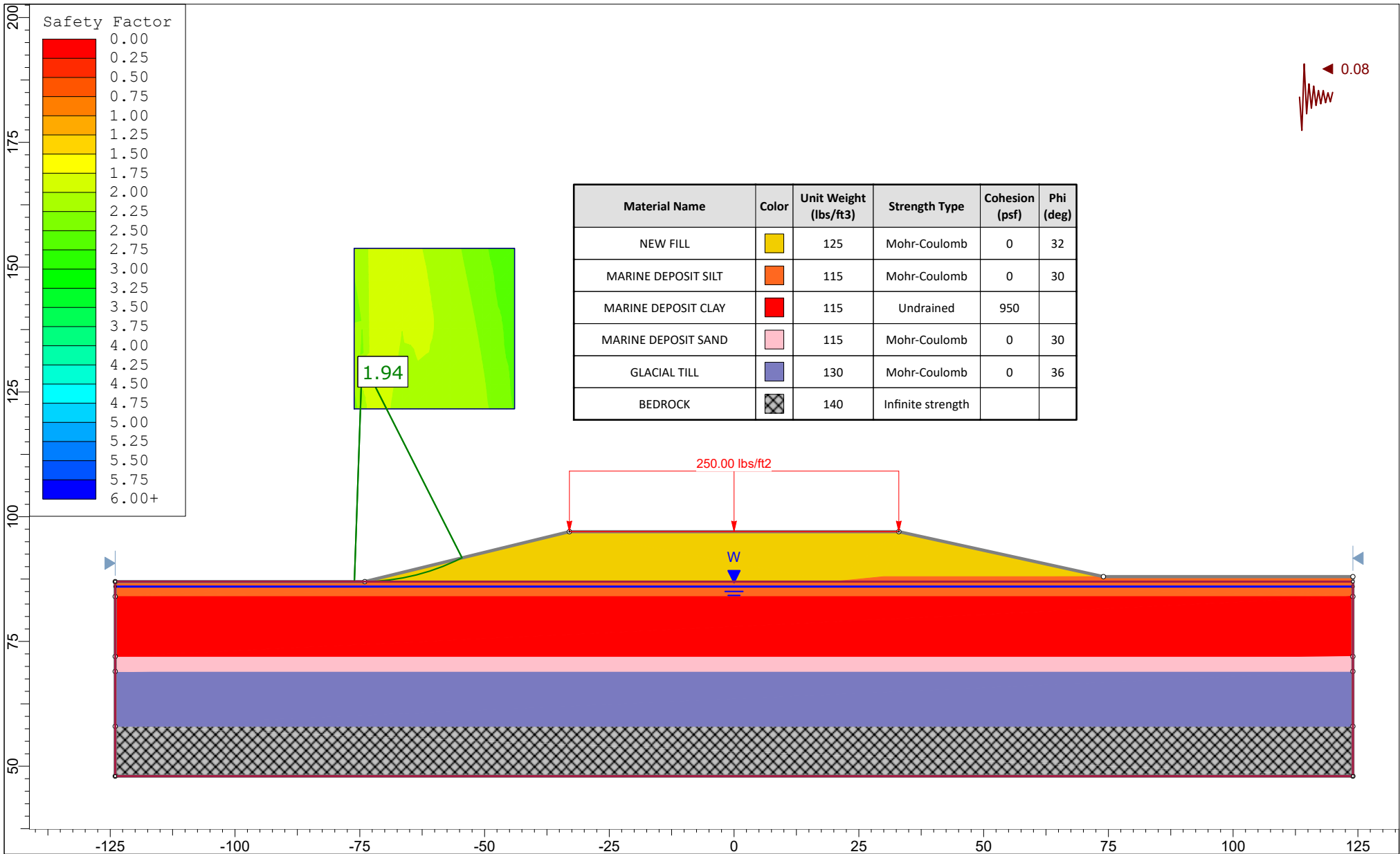


	Project			SLIDE - An Interactive Slope Stability Program	
	Analysis Description			Sta. 53+25	
	Drawn By		EMS	Scale	1:368
	Date		5/27/2020, 3:54:29 PM		Company
	SLIDEINTERPRET 8.018		File Name		2020-0610-Sta 5325 Stability-seismic.slim

Sta. 84+50

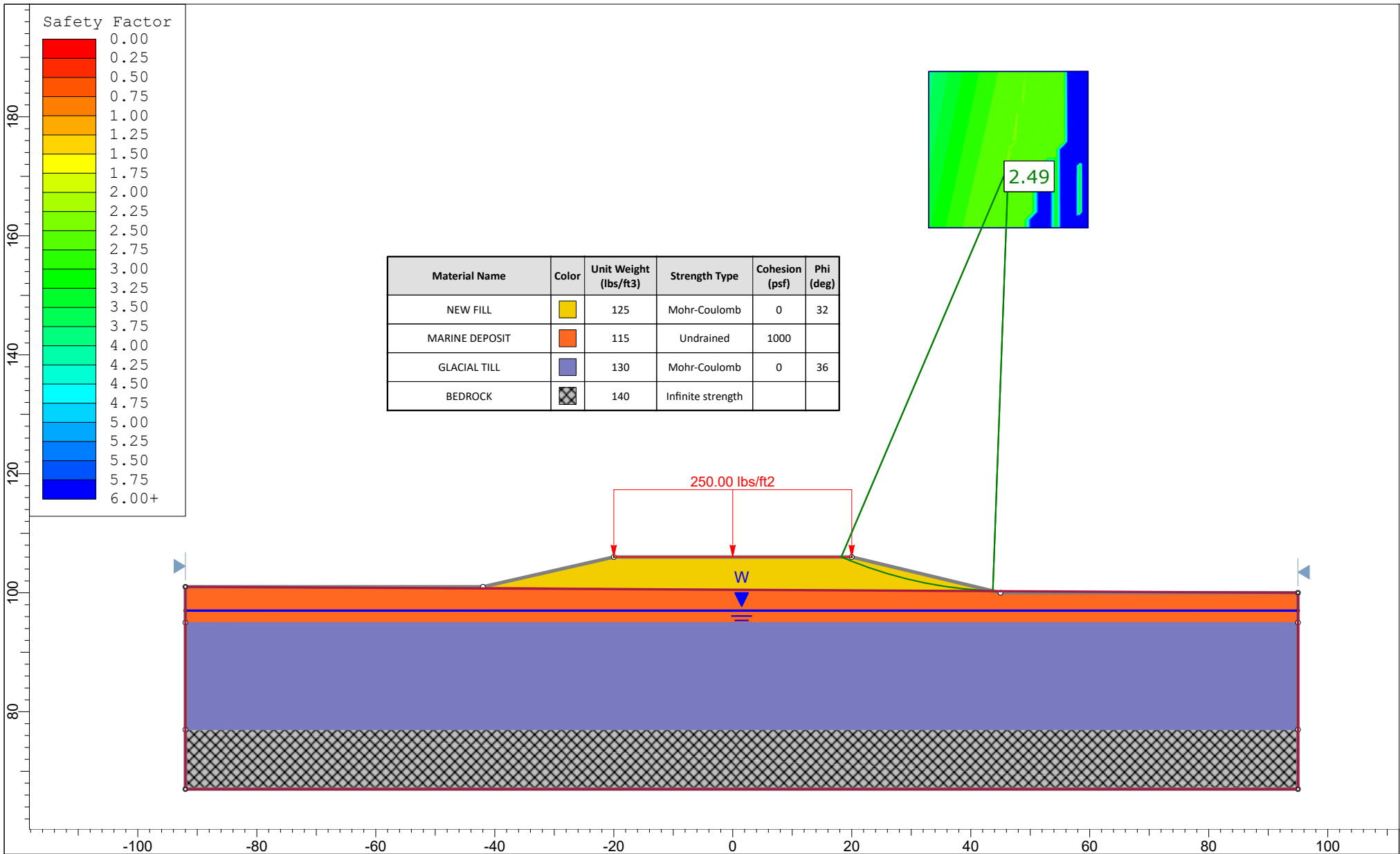


	Project		
	SLIDE - An Interactive Slope Stability Program		
	Analysis Description		
	Sta. 84+50		
	Drawn By	EMS	Scale
Date	5/27/2020, 3:54:29 PM	Company	2020-0610-Sta 8450 Stability.slim

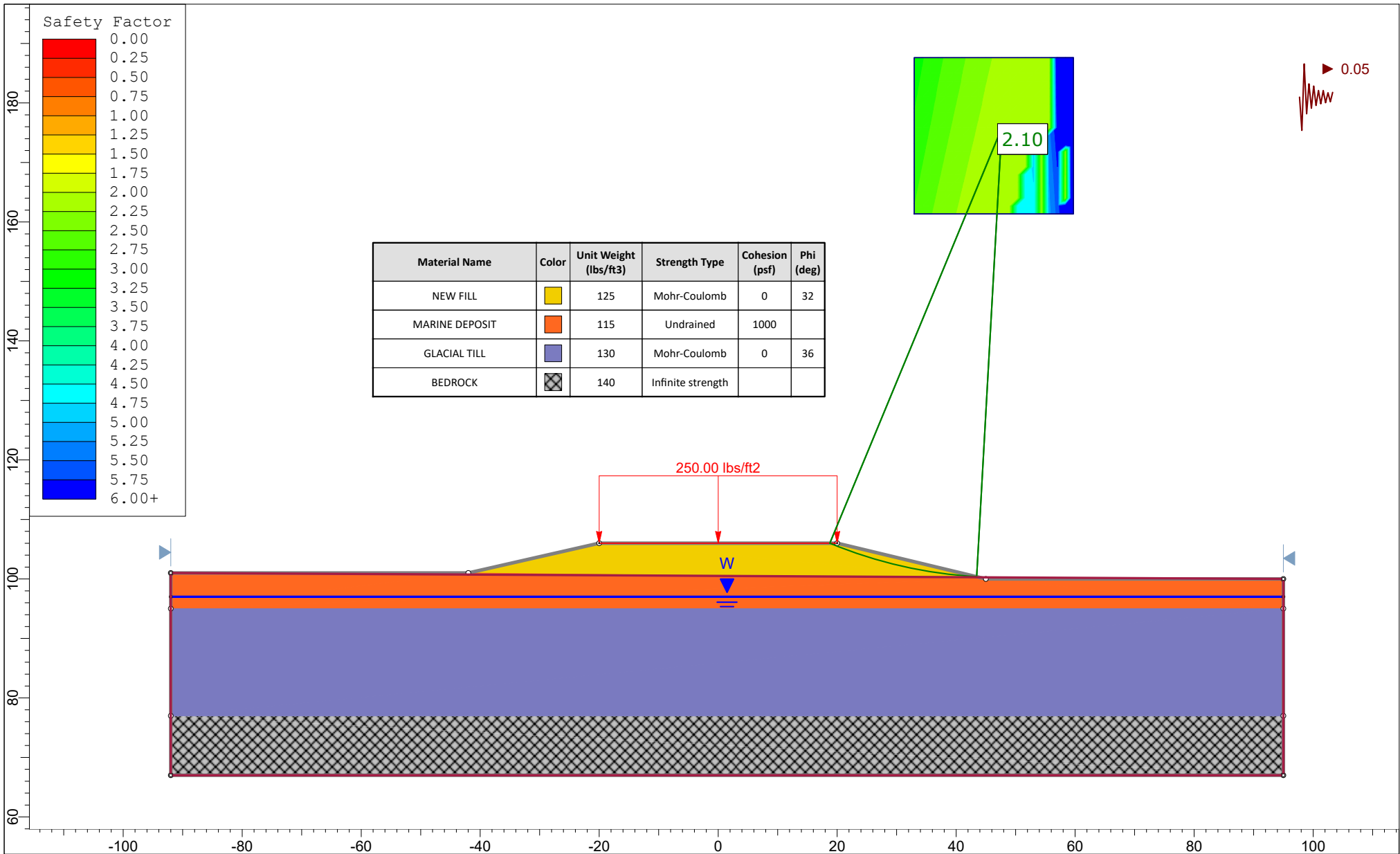


	Project		
	SLIDE - An Interactive Slope Stability Program		
	Analysis Description		
	Sta. 84+50		
Drawn By	EMS	Scale	1:319
Date	5/27/2020, 3:54:29 PM		Company
File Name	2020-0610-Sta 8450 Stability-seismic.slim		

Sta. 130+50

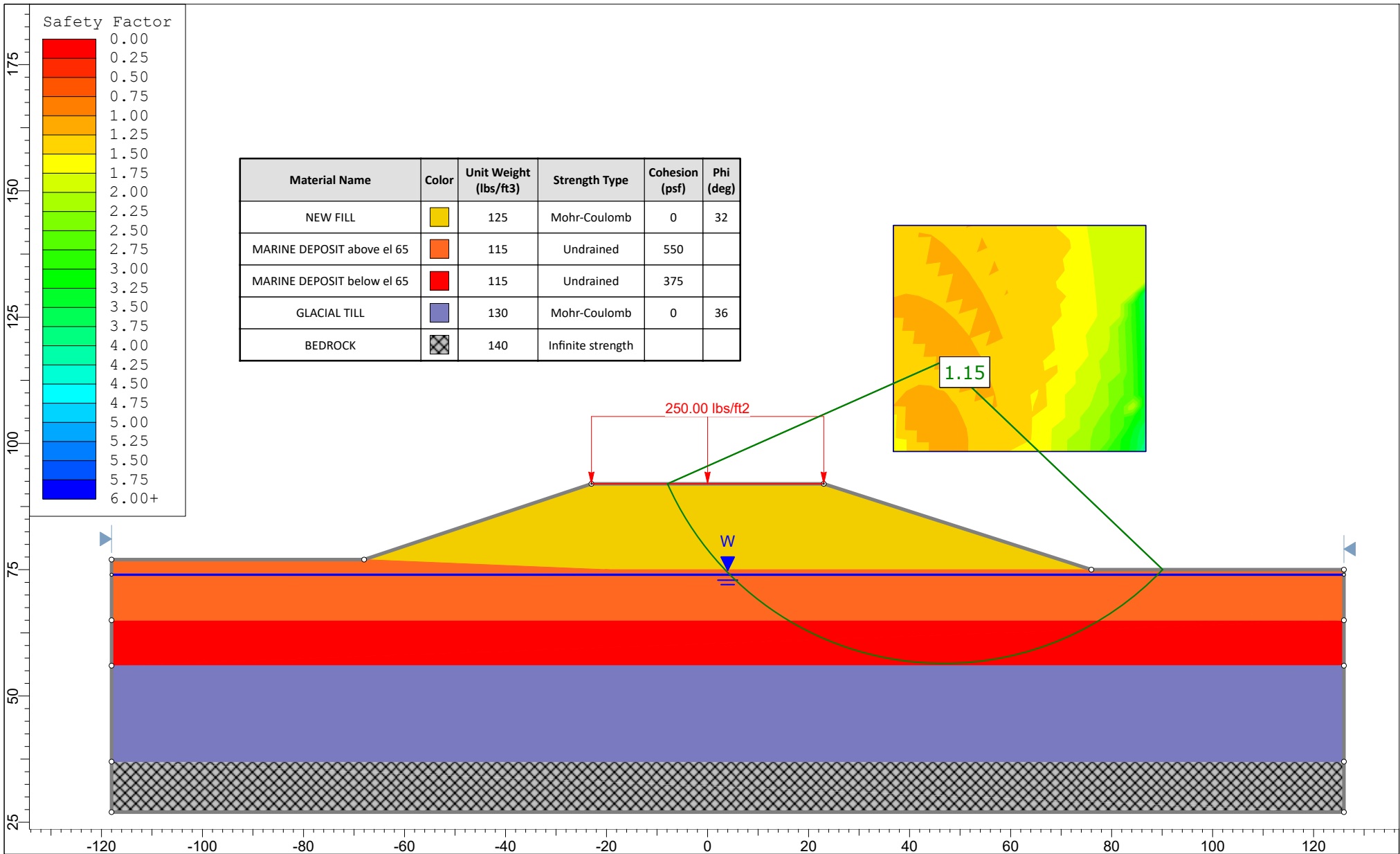


	Project SLIDE - An Interactive Slope Stability Program		
	Analysis Description Sta. 130+50		
	Drawn By EMS	Scale 1:268	Company
	Date 5/27/2020, 3:54:29 PM	File Name 2020-0610-Sta 13050 Stability.slim	

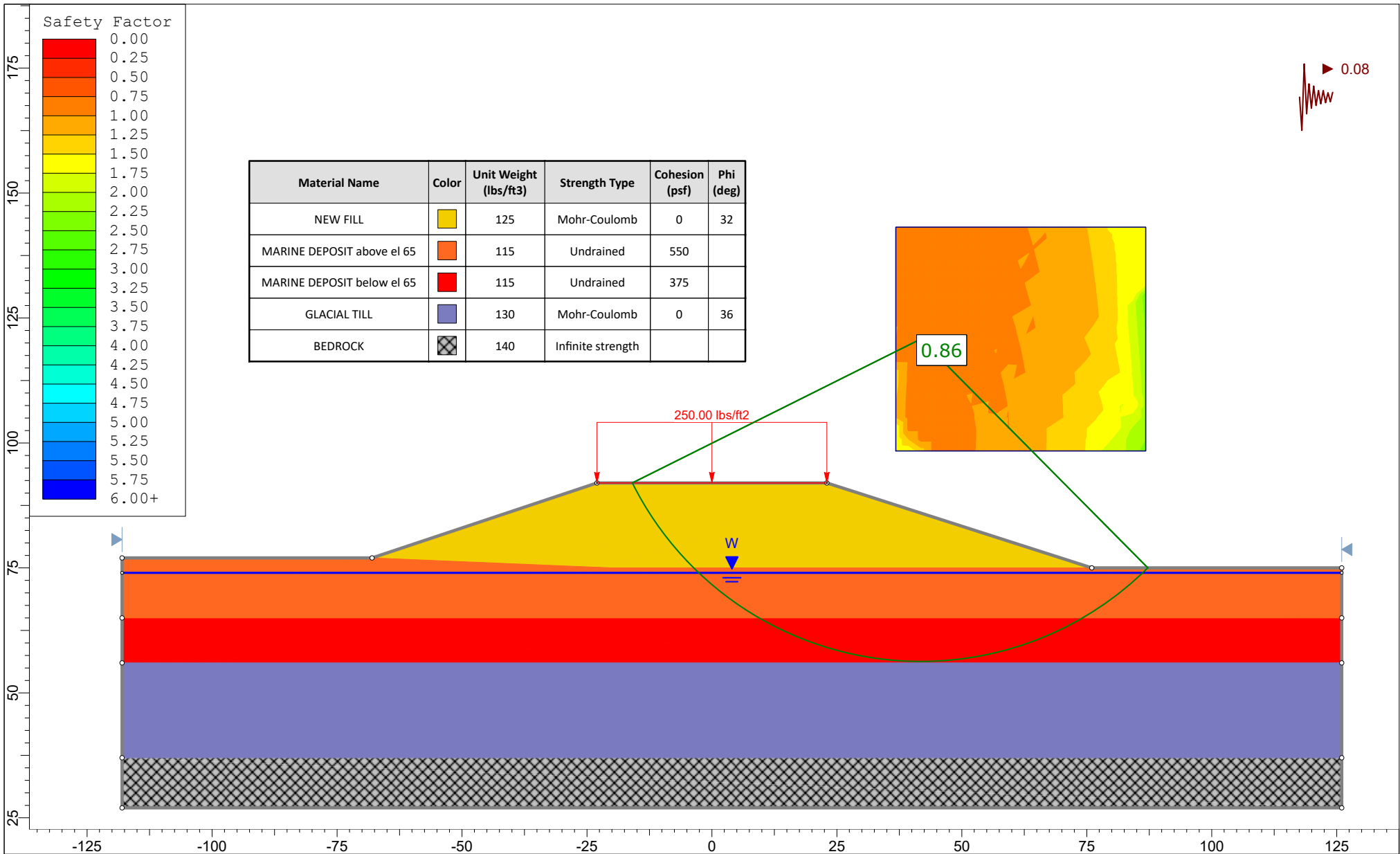


	Project		
	SLIDE - An Interactive Slope Stability Program		
	Analysis Description		
	Sta. 130+50		
Drawn By	EMS	Scale	1:268
Date	5/27/2020, 3:54:29 PM		Company
			File Name
			2020-0610-Sta 13050 Stability-seismic.slim

Sta. 140+00

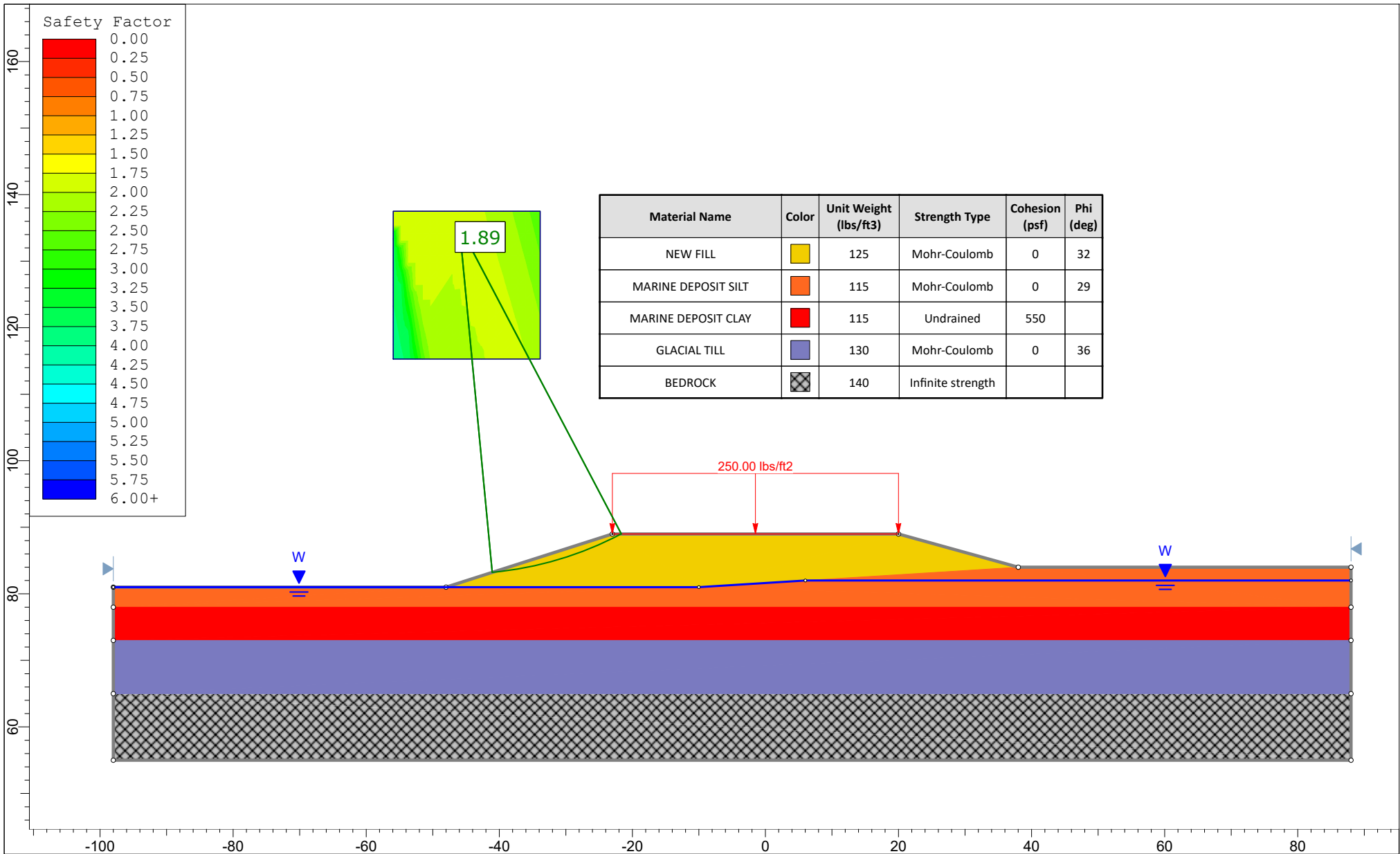


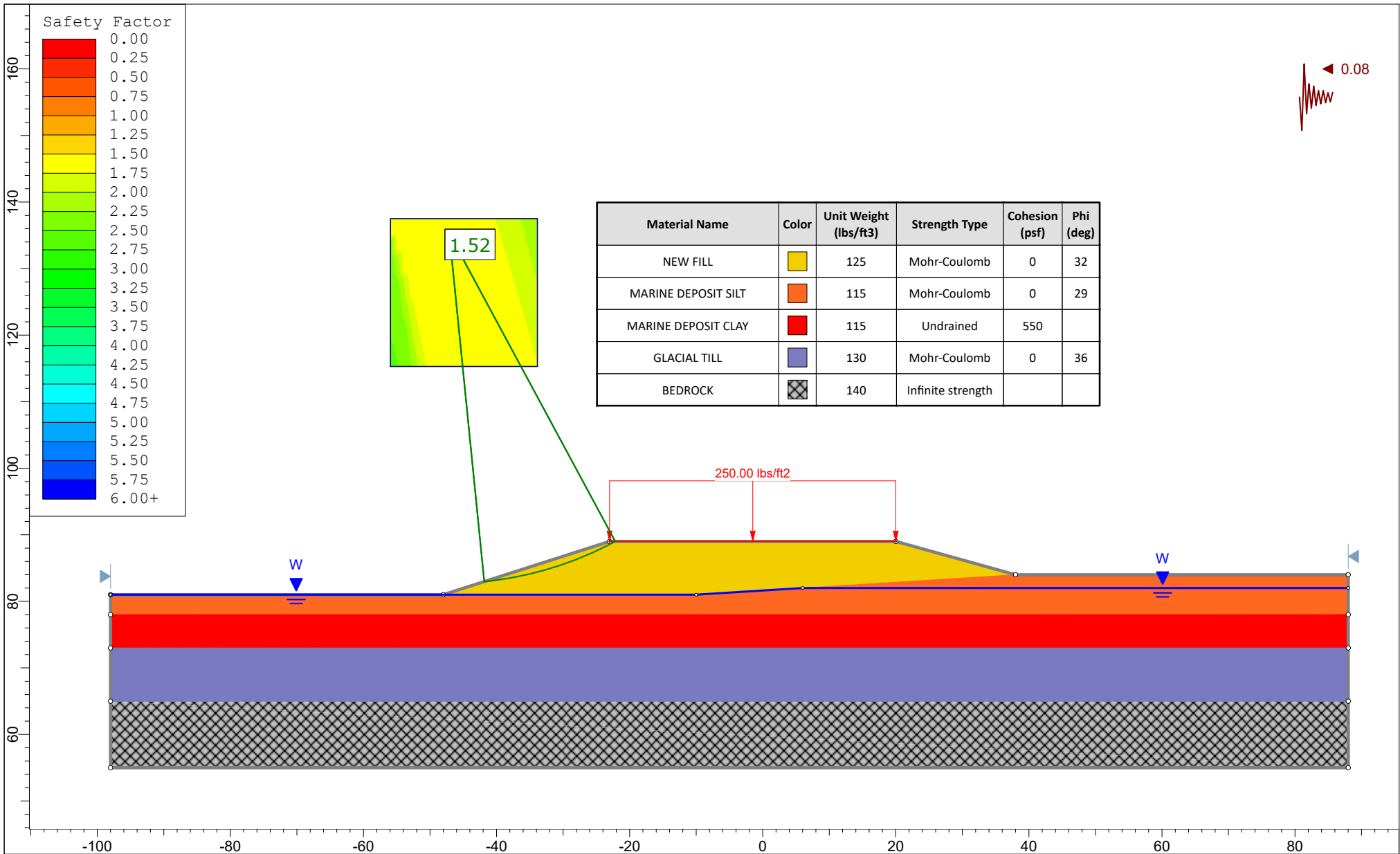
	Project		
	SLIDE - An Interactive Slope Stability Program		
	Analysis Description		
	Sta. 140+00		
Drawn By	EMS	Scale	1:316
Date	5/27/2020, 3:54:29 PM		Company
SLIDEINTERPRET 8.018			File Name
		2020-0603-Sta 14000 Stability.slim	



	Project		
	SLIDE - An Interactive Slope Stability Program		
	Analysis Description		
	Sta. 140+00		
Drawn By	EMS	Scale	1:319
Date	5/27/2020, 3:54:29 PM		Company
File Name	2020-0603-Sta 14000 Stability-seismic.slim		

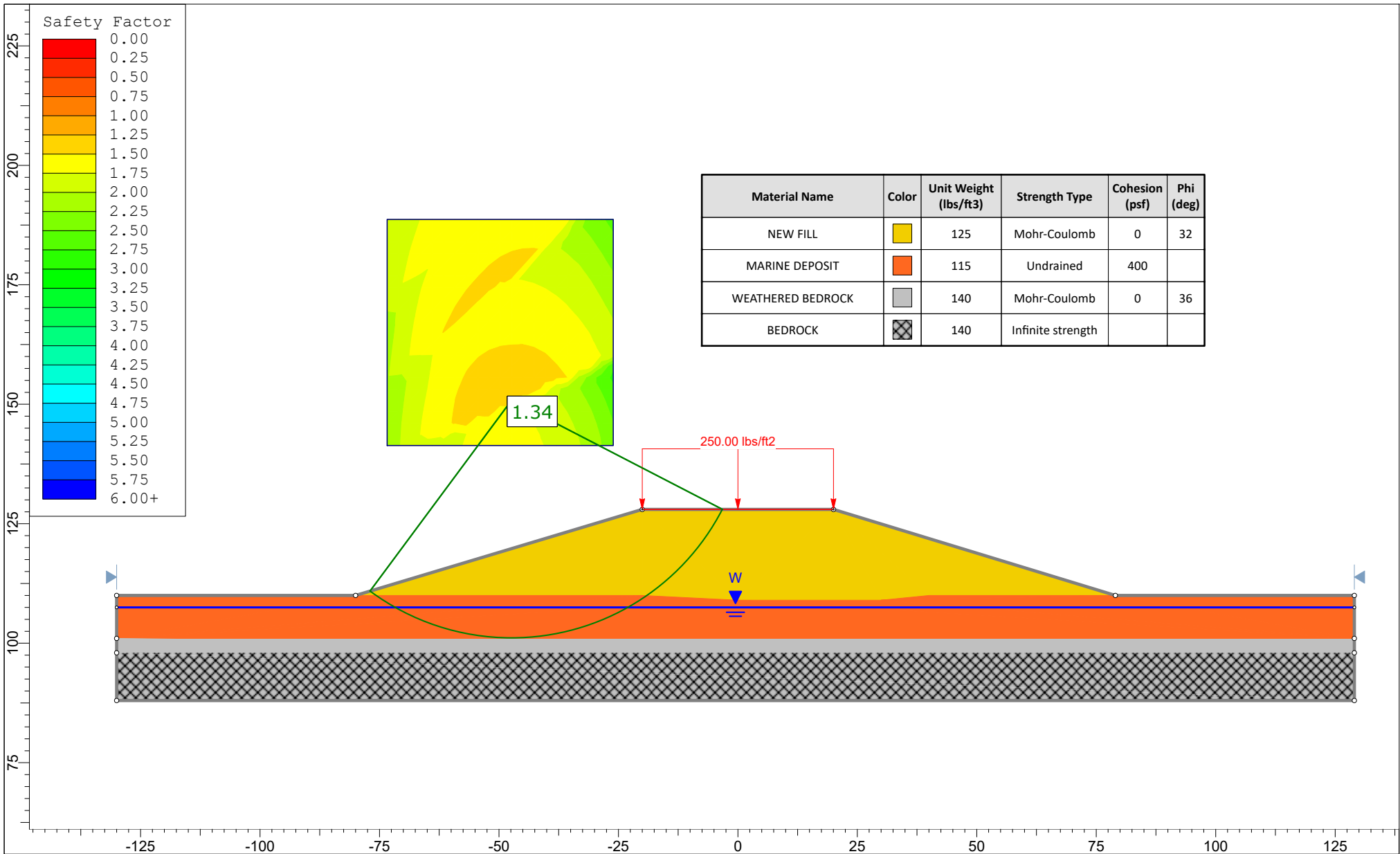
Sta. 145+00





Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)
NEW FILL		125	Mohr-Coulomb	0	32
MARINE DEPOSIT SILT		115	Mohr-Coulomb	0	29
MARINE DEPOSIT CLAY		115	Undrained	550	
GLACIAL TILL		130	Mohr-Coulomb	0	36
BEDROCK		140	Infinite strength		

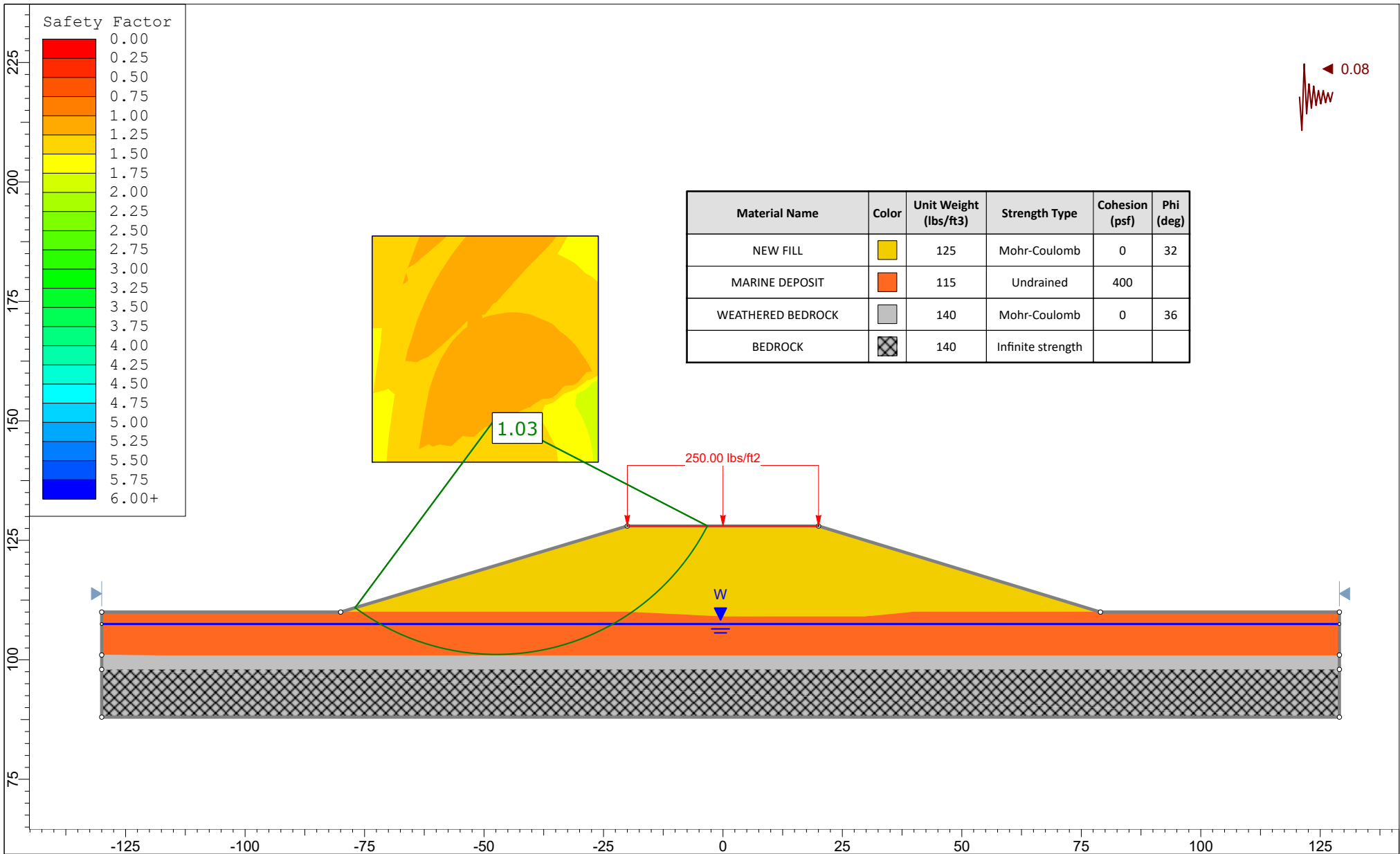
Sta. 167+50



rocscience

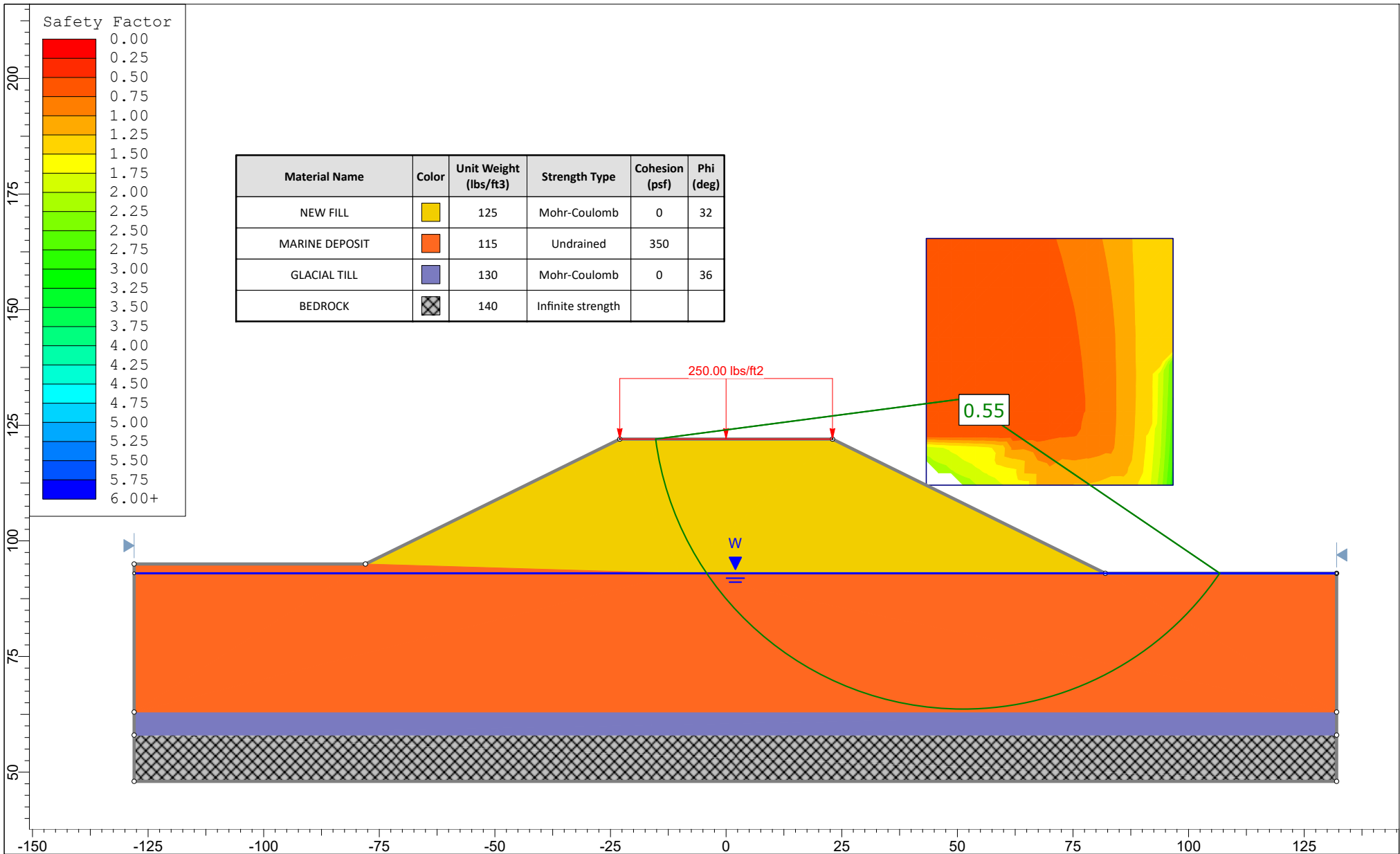
SLIDEINTERPRET 8.018

Project			SLIDE - An Interactive Slope Stability Program		
Analysis Description			Sta. 167+50		
Drawn By	EMS	Scale	1:334	Company	
Date	5/27/2020, 3:54:29 PM			File Name	2020-0603-Sta 16750 Stability.slim

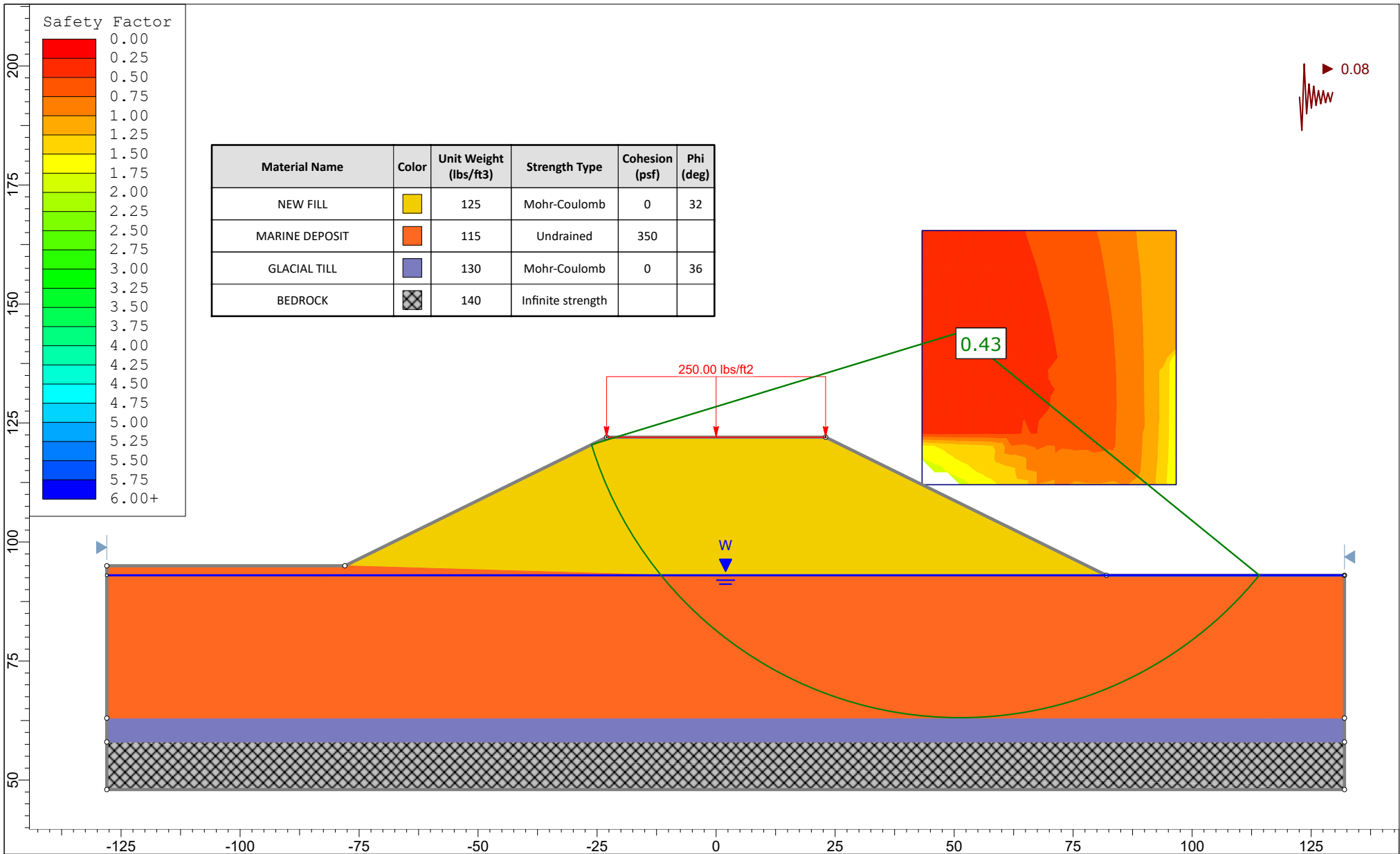



	Project		
	SLIDE - An Interactive Slope Stability Program		
	Analysis Description		
	Sta. 167+50		
Drawn By	EMS	Scale	1:334
Date	5/27/2020, 3:54:29 PM	Company	
File Name	2020-0603-Sta 16750 Stability-seismic.slim		

Sta. 180+50

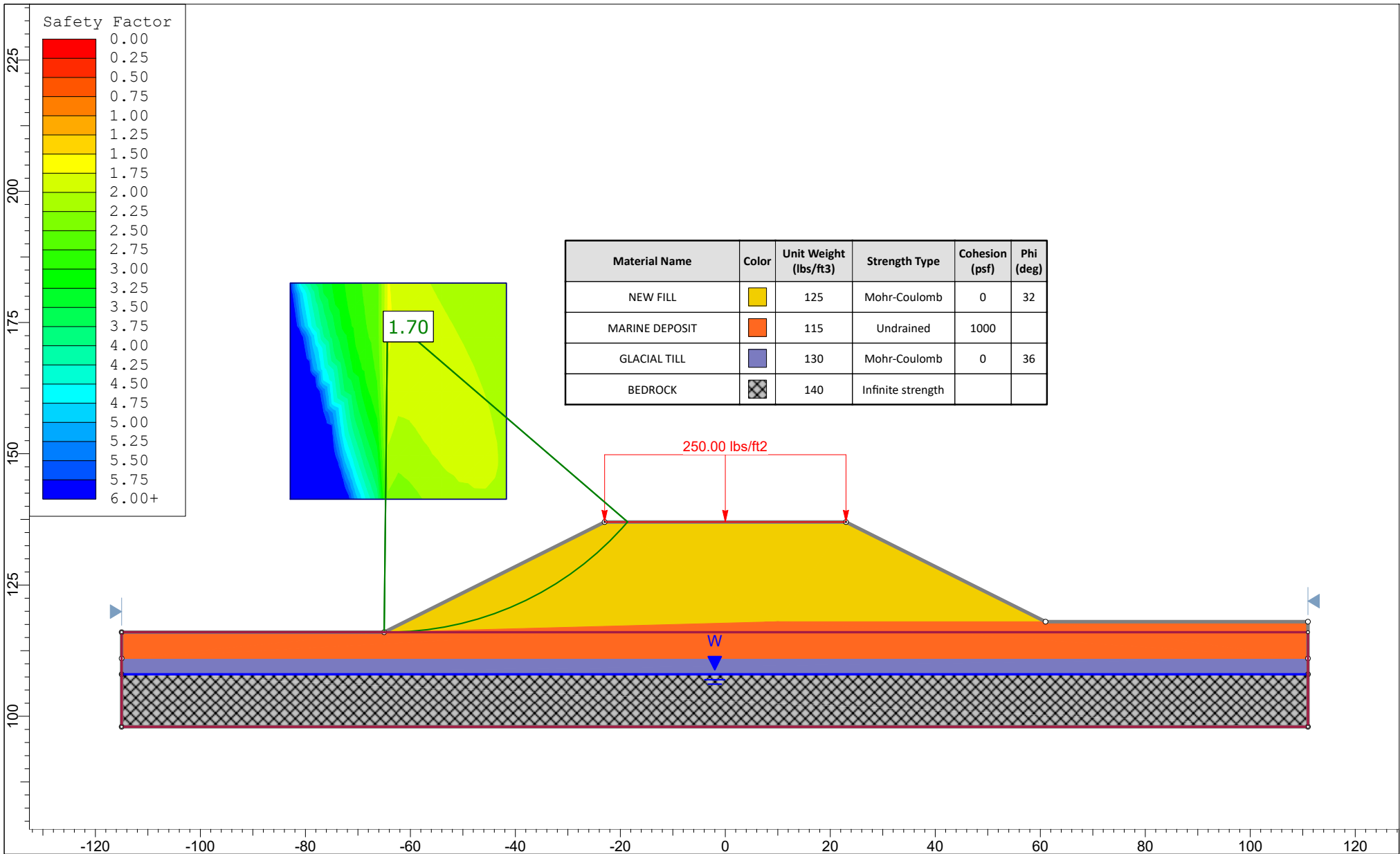



	Project		
	SLIDE - An Interactive Slope Stability Program		
	Analysis Description		
	Sta. 180+50		
Drawn By	EMS	Scale	1:345
Date	5/27/2020, 3:54:29 PM		Company
File Name	2020-0603-Sta 18050 Stability.slim		

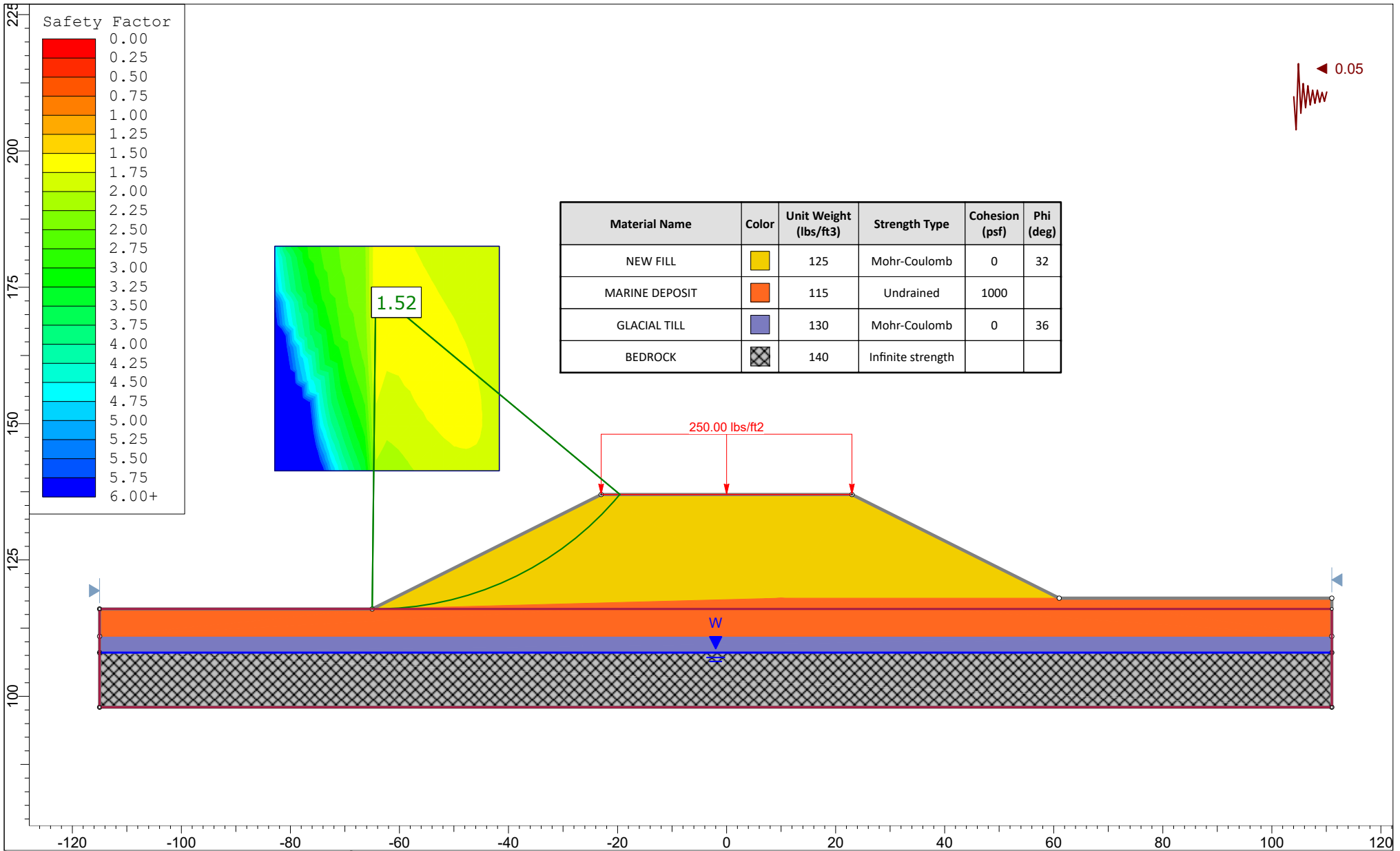


	Project			SLIDE - An Interactive Slope Stability Program	
	Analysis Description			Sta. 180+50	
	Drawn By		EMS	Scale	1:335
	Date		5/27/2020, 3:54:29 PM	Company	
				File Name	2020-0603-Sta 18050 Stability-seismic.slim

Sta. 195+50

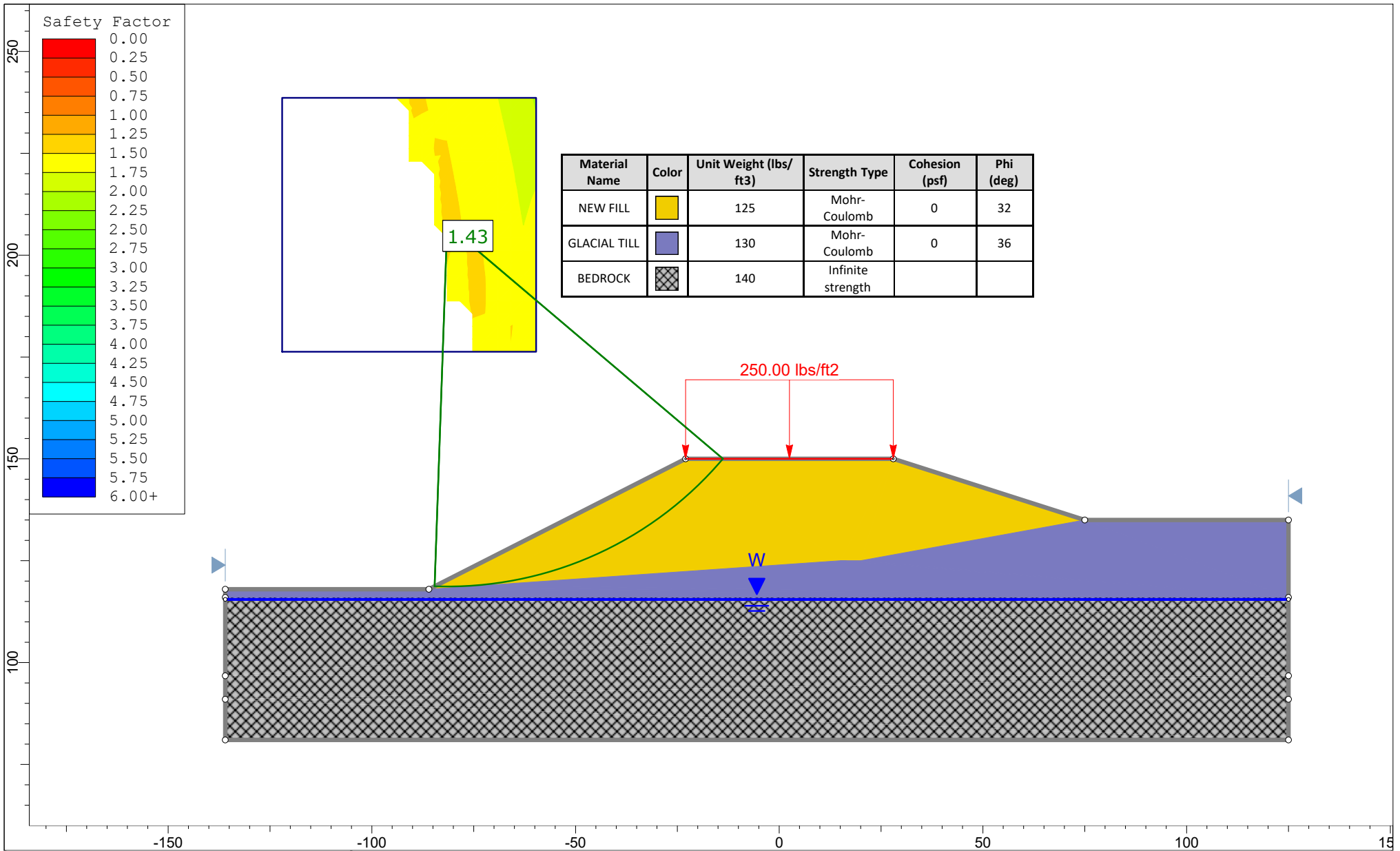


	Project			SLIDE - An Interactive Slope Stability Program	
	Analysis Description			Sta. 195+50	
	Drawn By		EMS	Scale	1:304
	Date		5/27/2020, 3:54:29 PM		Company
					File Name

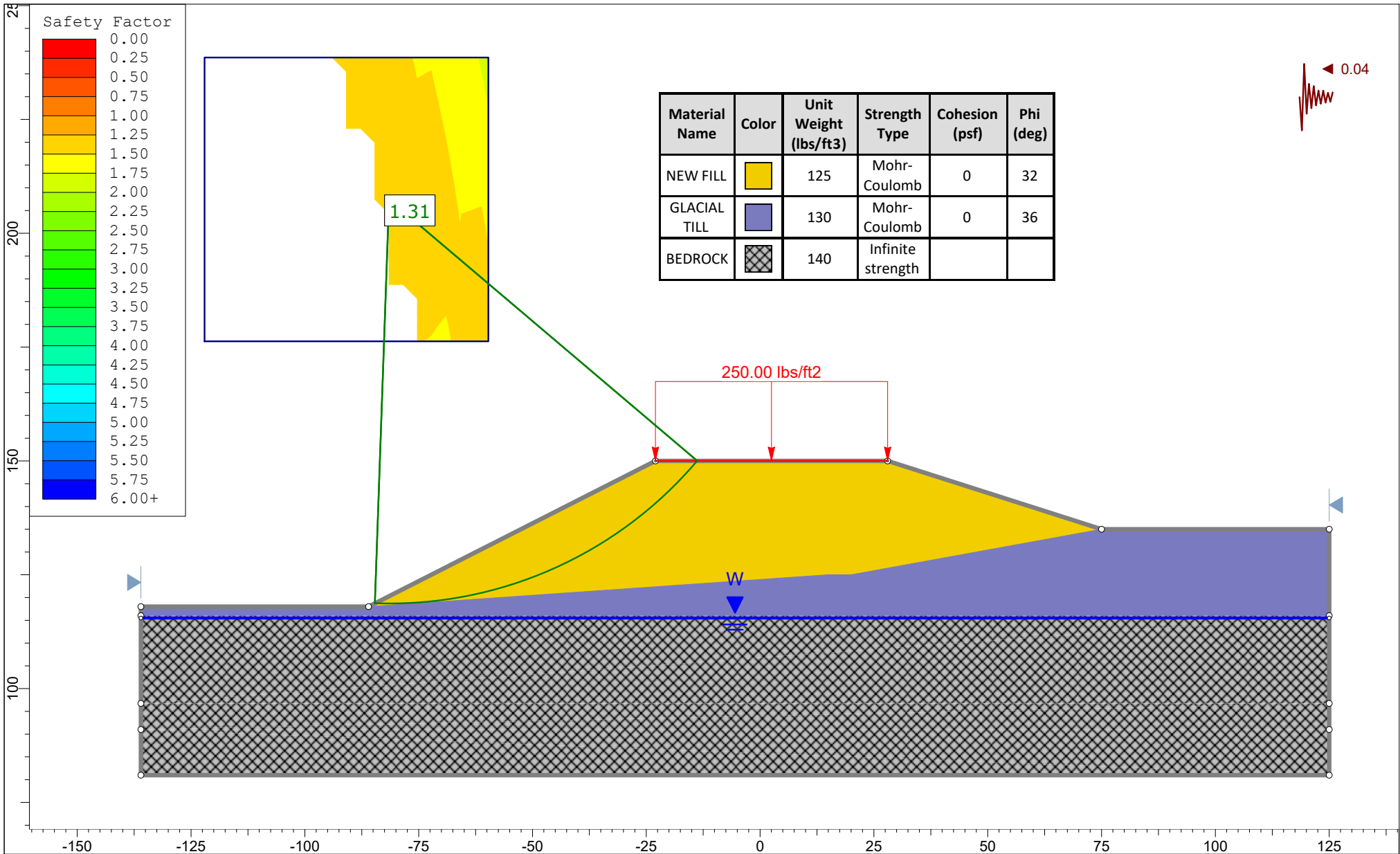


	Project		
	SLIDE - An Interactive Slope Stability Program		
	Analysis Description		
	Sta. 195+50		
Drawn By	EMS	Scale	1:291
Date	5/27/2020, 3:54:29 PM	Company	
File Name	2020-0603-Sta 19550 Stability-seismic.slim		

Sta. 201+00

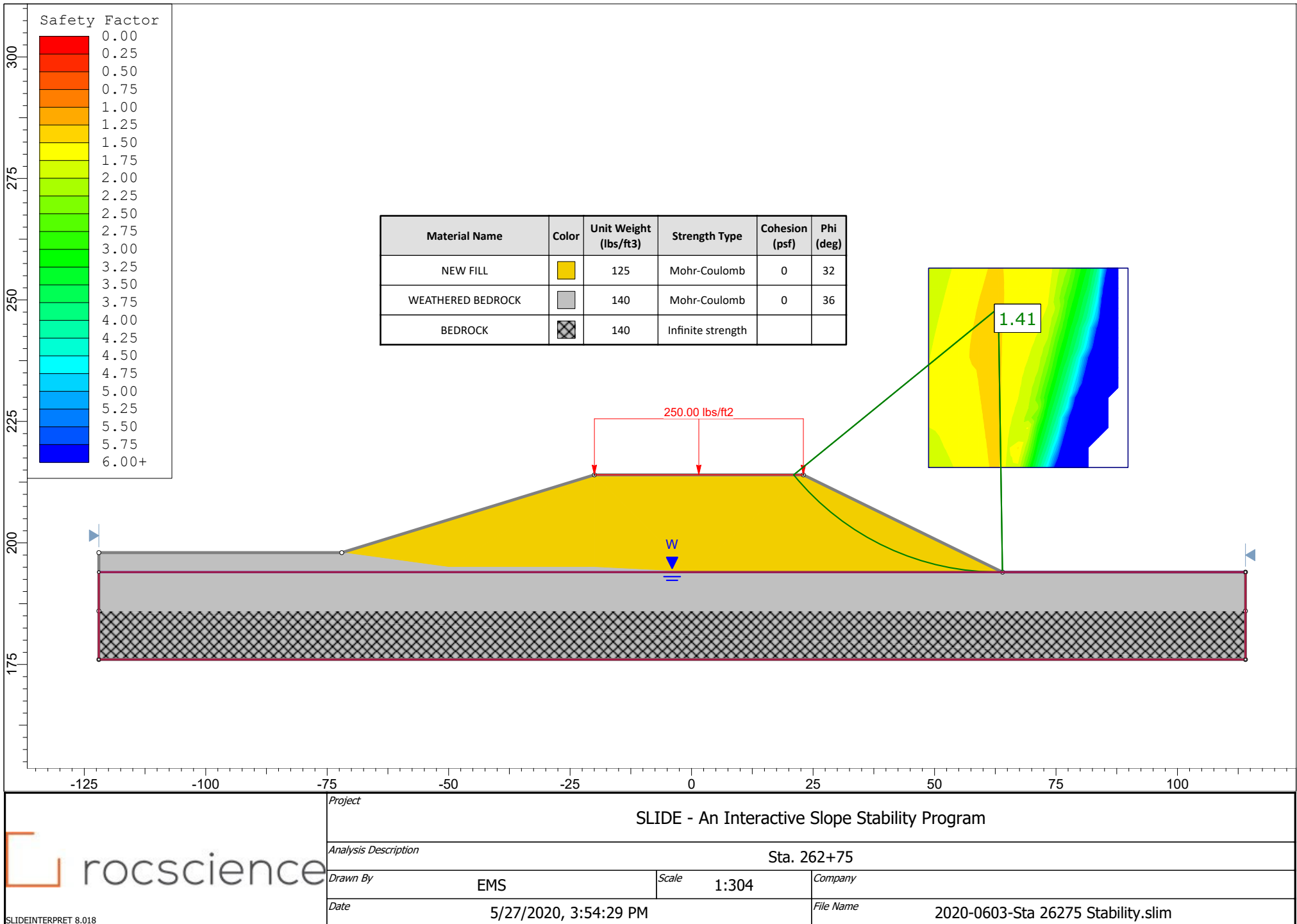


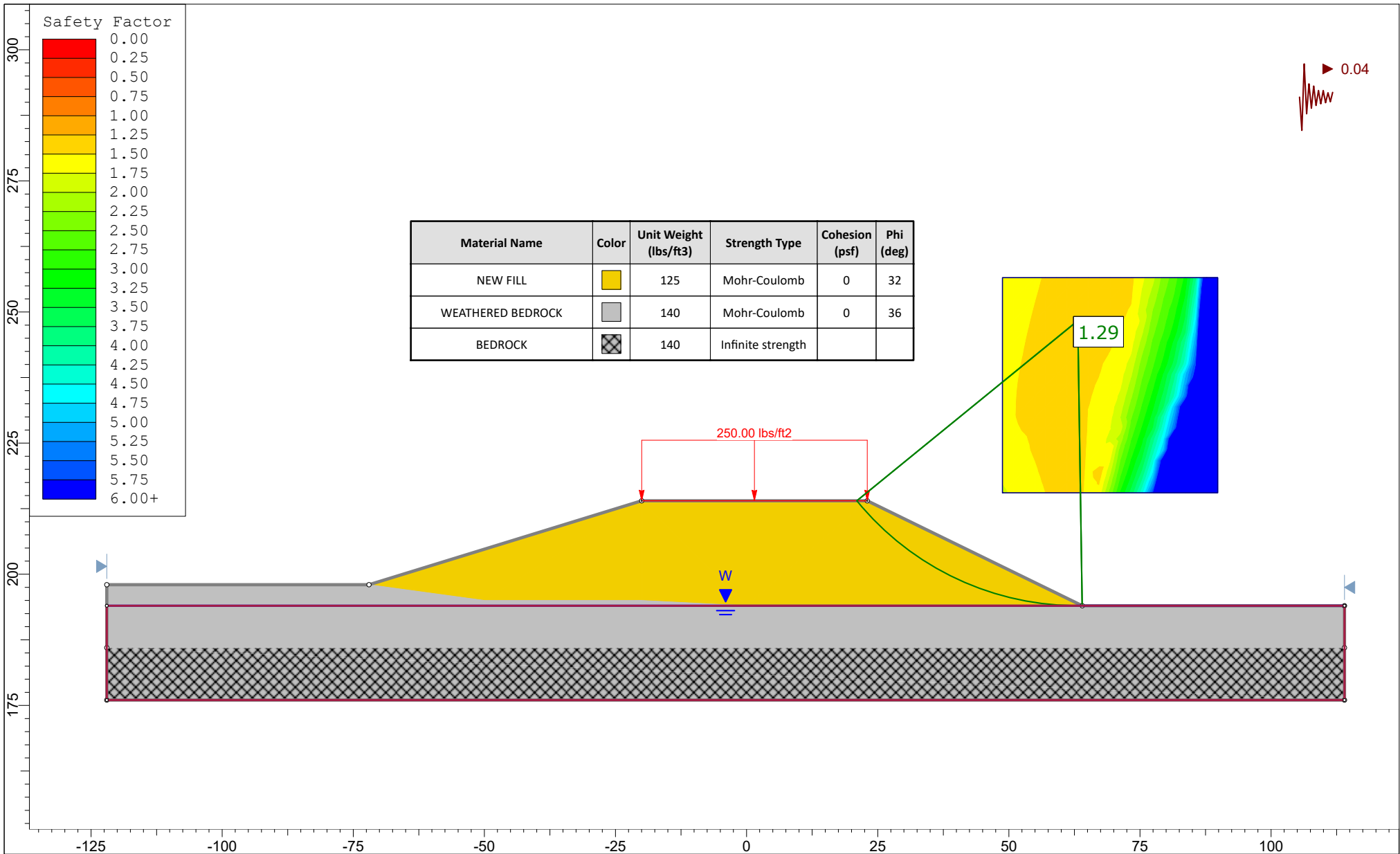
Project		I-395 Brewer-Eddington Connector	
Group	2021-0702-Sta 201+00 Stability-D2.slim	Scenario	2021-0702-Sta 201+00 Stability-D2.slim
Drawn By	EMS-JAD	Company	Haley & Aldrich, Inc.
Date	5/27/2020, 3:54:29 PM	File Name	2021-0702-Sta 201+00 Stability-D2.slim




Project			I-395 Brewer-Eddington Connector		
Group		2021-0702-Sta 201+00 Stability-D2-seismic.slim		Scenario	
2021-0702-Sta 201+00 Stability-D2-seismic.slim				2021-0702-Sta 201+00 Stability-D2-seismic.slim	
Drawn By		EMS-JAD		Company	
				Haley & Aldrich, Inc.	
Date		5/27/2020, 3:54:29 PM		File Name	
				2021-0702-Sta 201+00 Stability-D2-seismic.slim	

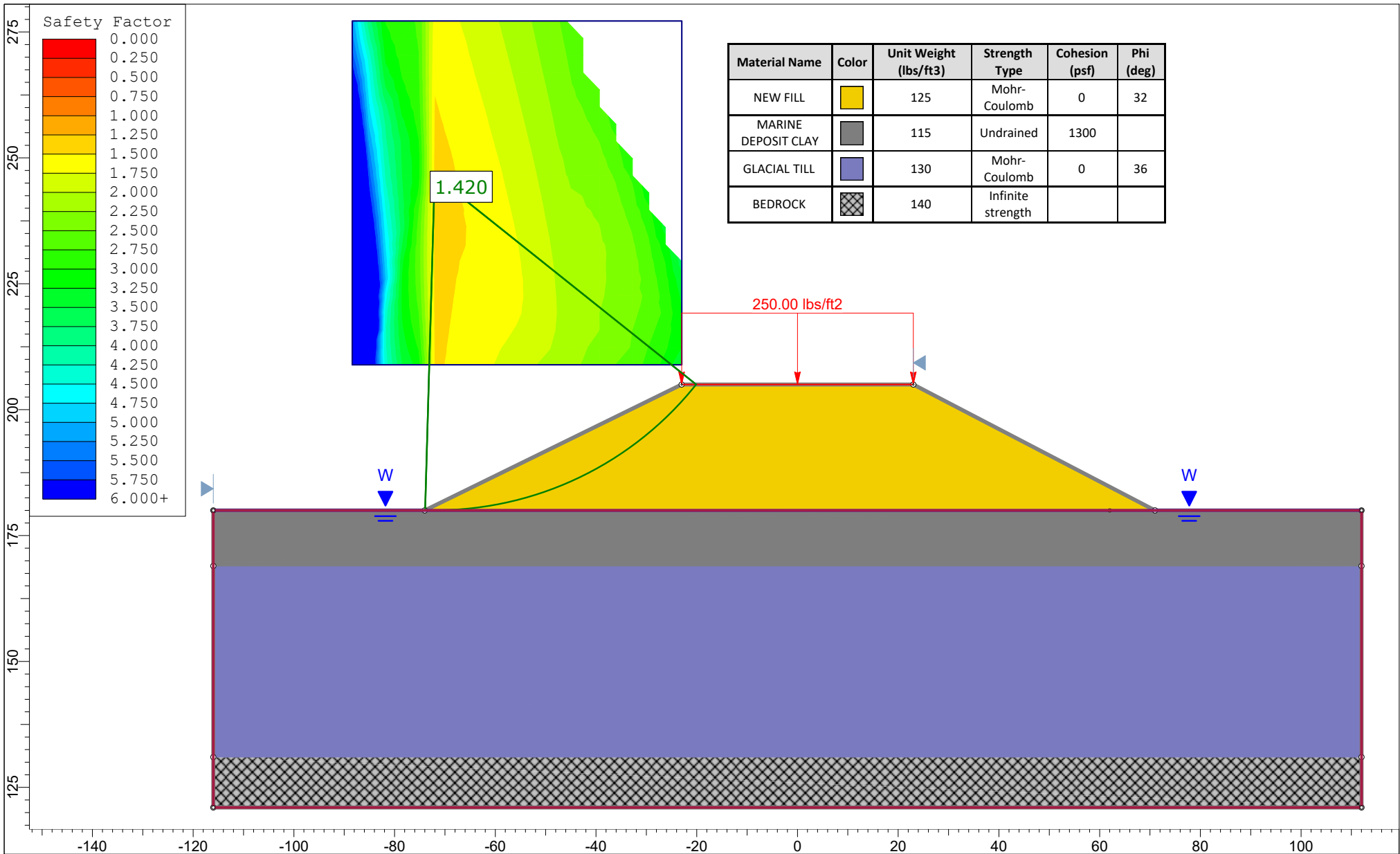
Sta. 262+75




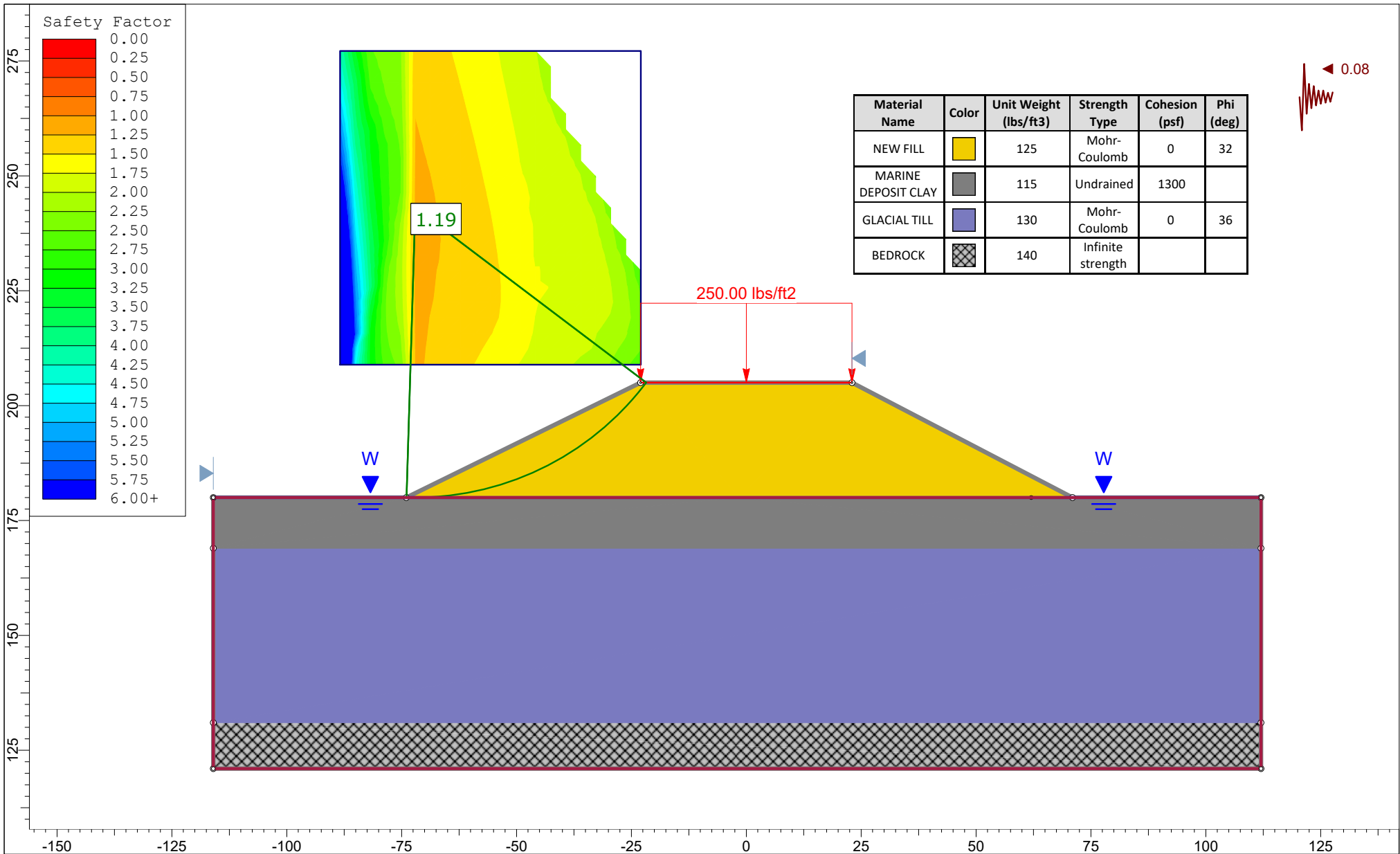



	Project			SLIDE - An Interactive Slope Stability Program	
	Analysis Description			Sta. 262+75	
	Drawn By		EMS	Scale	1:304
	Date		5/27/2020, 3:54:29 PM		Company
					File Name

Sta. 275+00

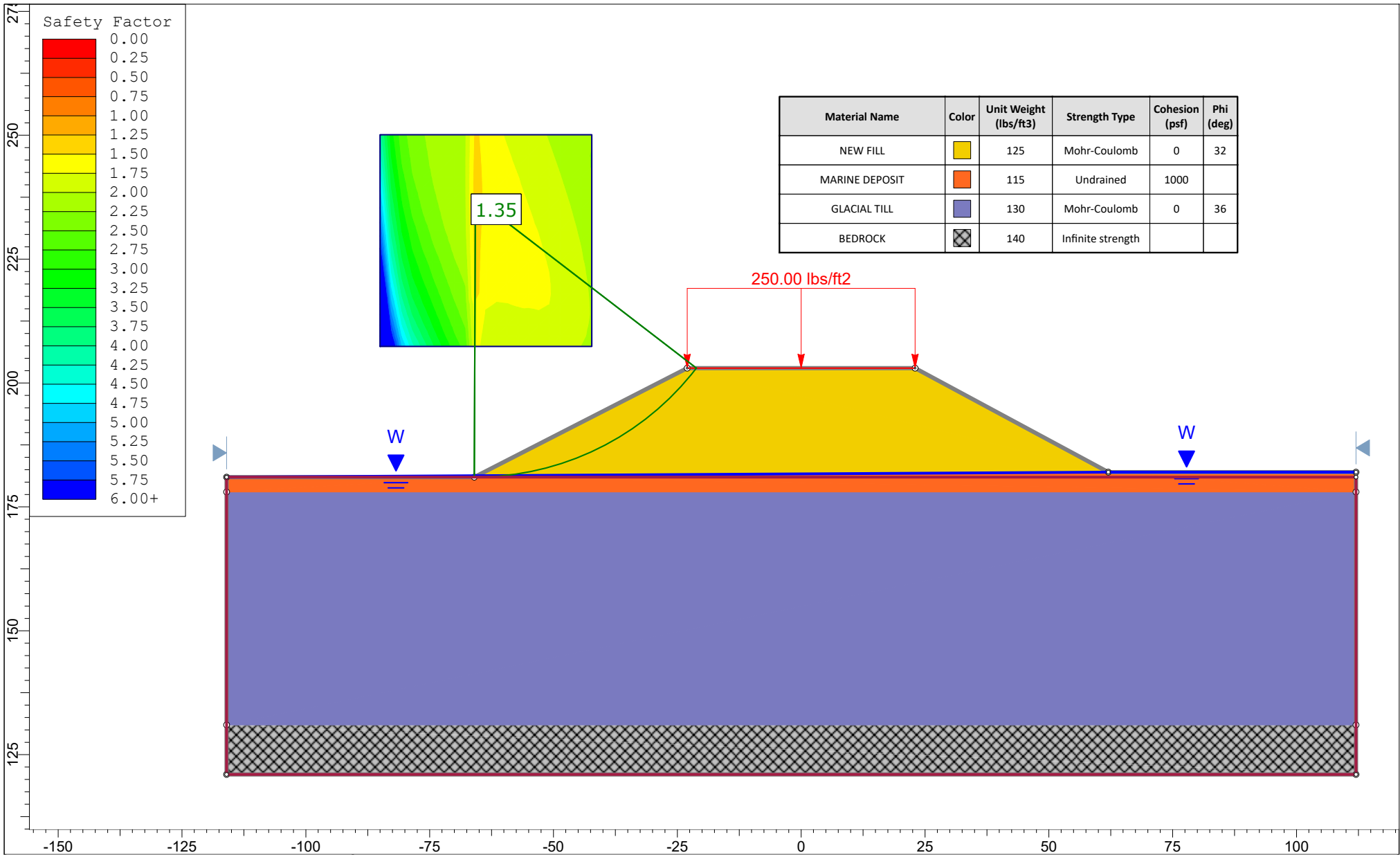



	Project		I-395 Brewer-Eddington Connector	
	Group	2021-0706-Sta 275+00 Stability-D2.slim	Scenario	2021-0706-Sta 275+00 Stability-D2.slim
	Drawn By	EMS/JAD	Company	Haley & Aldrich, Inc.
	Date	5/27/2020, 3:54:29 PM	File Name	2021-0706-Sta 275+00 Stability-D2.slim
	SLIDEINTERPRET 9.008			

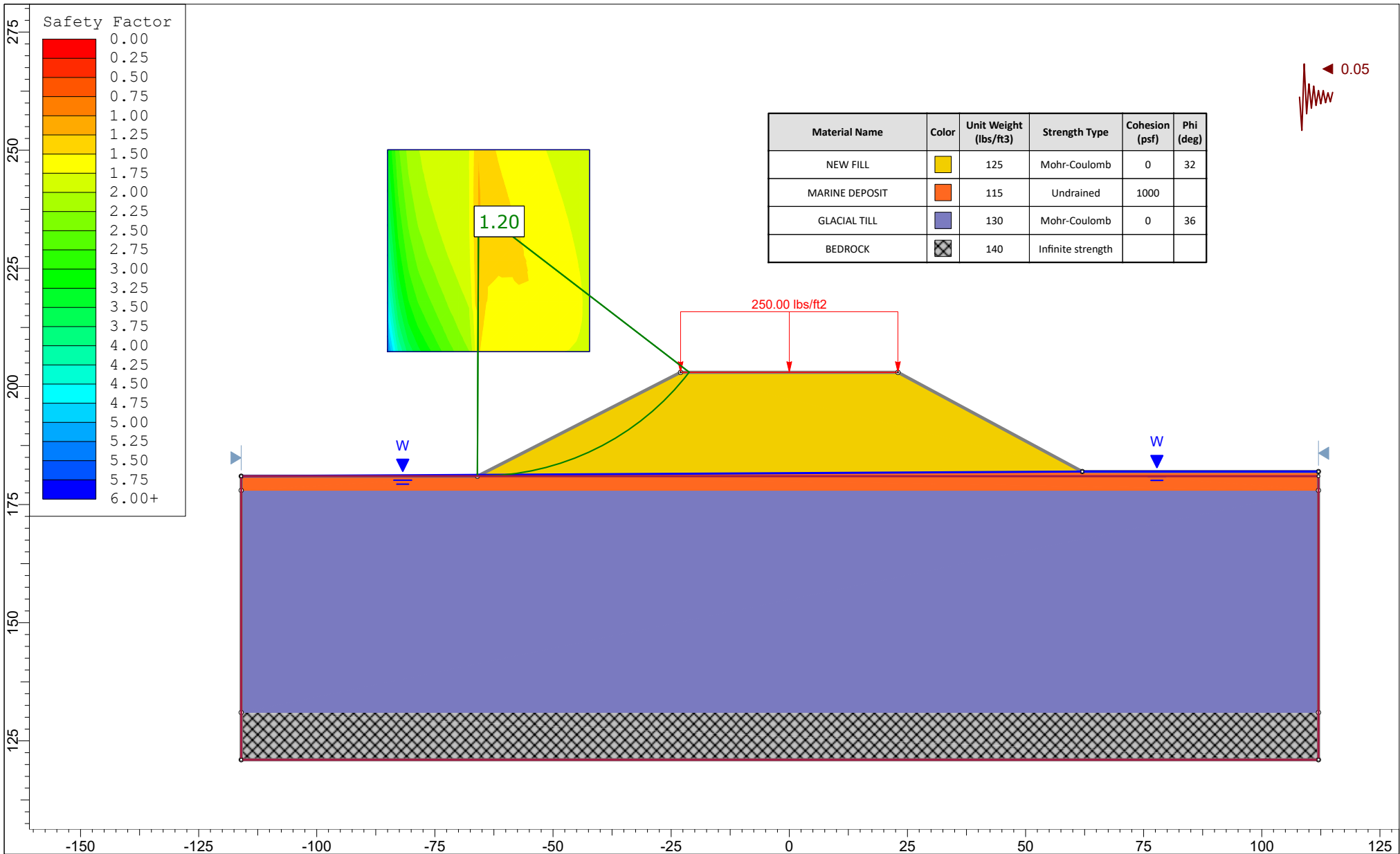



	Project		I-395 Brewer-Eddington Connector	
	Group	2021-0706-Sta 275+00 Stability-D2-seismic.slim	Scenario	2021-0706-Sta 275+00 Stability-D2-seismic.slim
	Drawn By	EMS/JAD	Company	Haley & Aldrich, Inc.
	Date	5/27/2020, 3:54:29 PM	File Name	2021-0706-Sta 275+00 Stability-D2-seismic.slim
	SLIDEINTERPRET 9.008			

Sta. 275+75

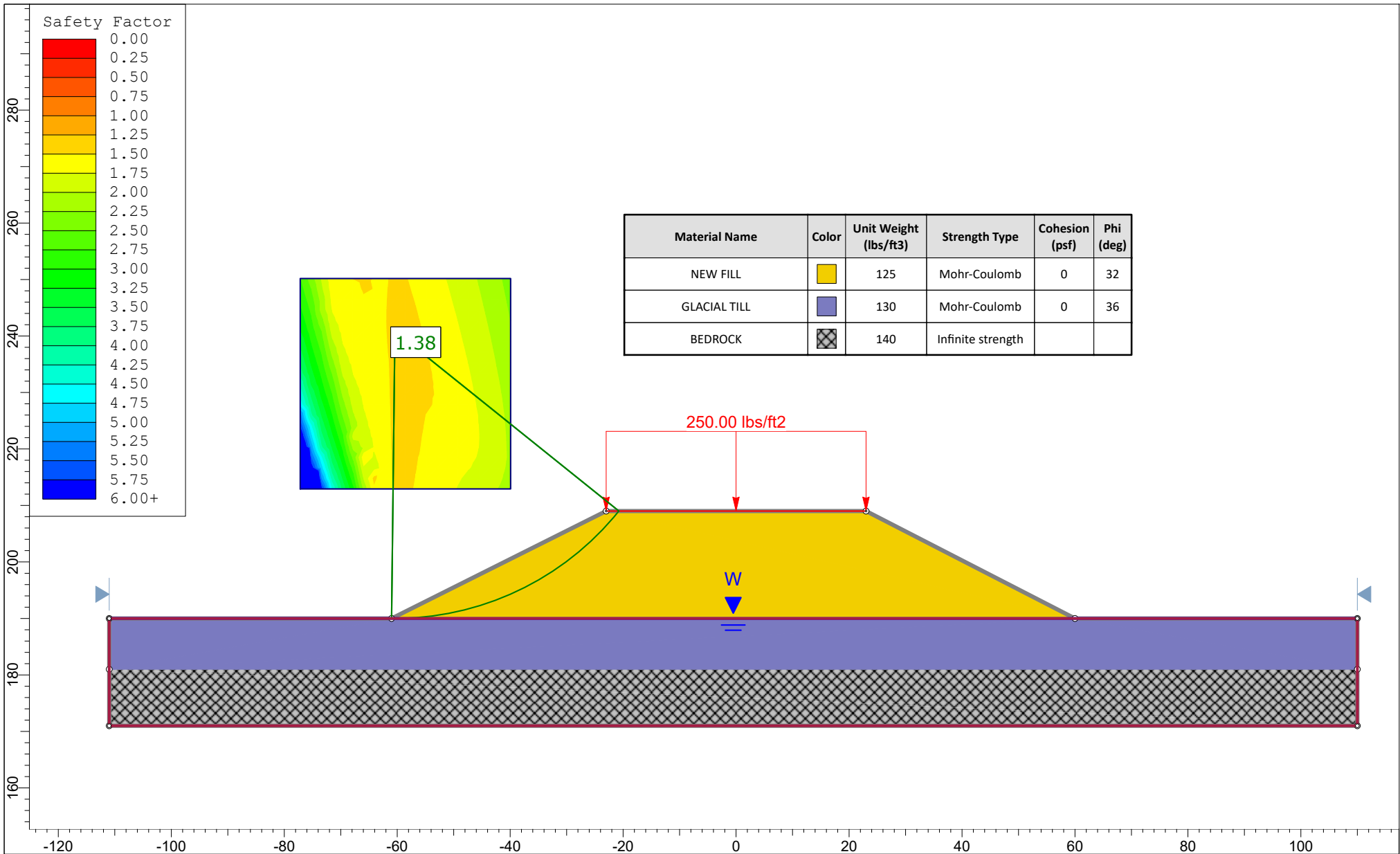



	Project			SLIDE - An Interactive Slope Stability Program	
	Analysis Description			Sta. 275+75	
	Drawn By		EMS	Scale	1:322
	Date		5/27/2020, 3:54:29 PM		Company
					File Name
SLIDEINTERPRET 8.018				2020-0603-Sta 27575 Stability.slim	

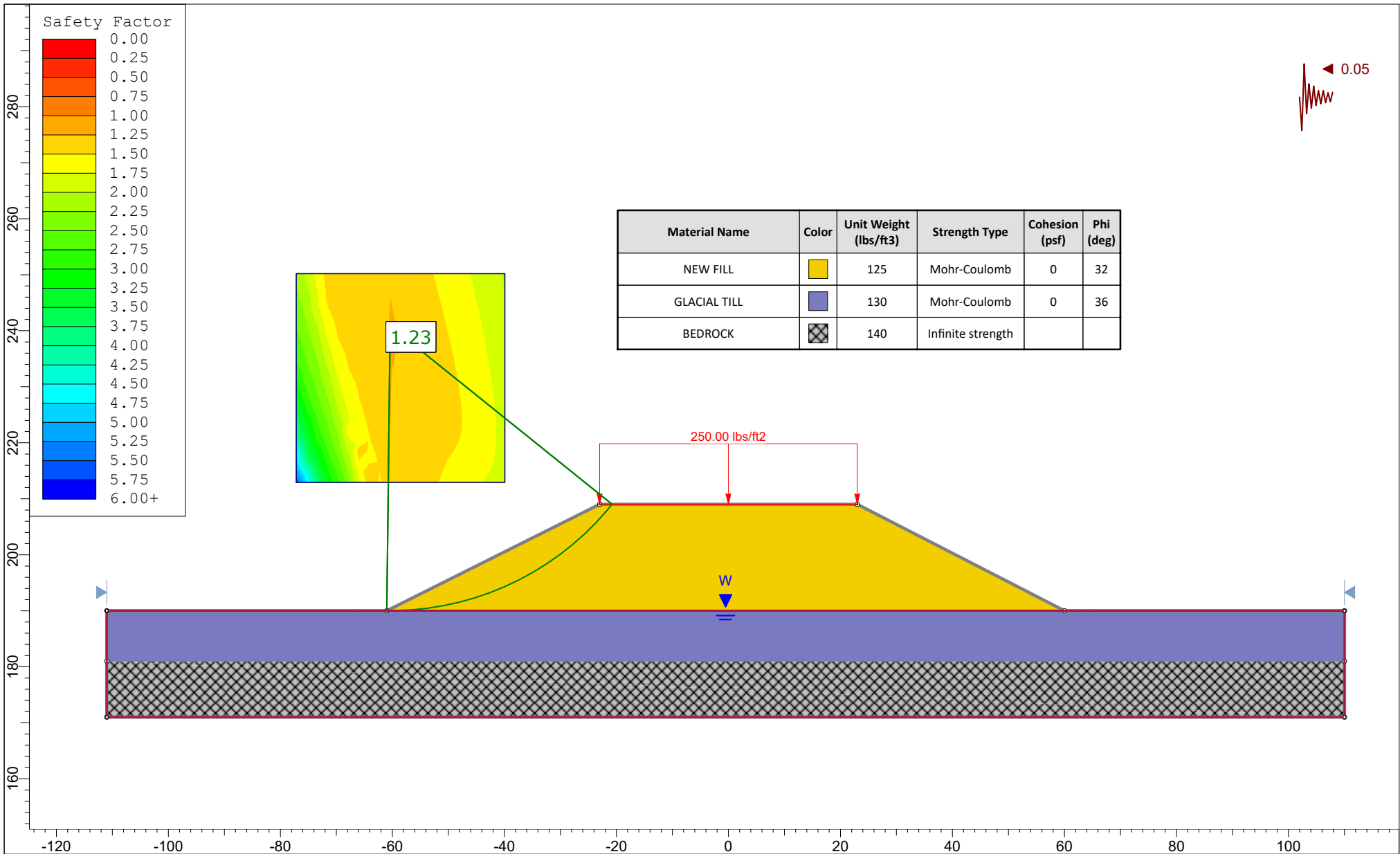



 <small>SLIDEINTERPRET 8.018</small>	<i>Project</i> SLIDE - An Interactive Slope Stability Program		
	<i>Analysis Description</i> Sta. 275+75		
	<i>Drawn By</i> EMS	<i>Scale</i> 1:337	<i>Company</i>
	<i>Date</i> 5/27/2020, 3:54:29 PM		<i>File Name</i> 2020-0603-Sta 27575 Stability-seismic.slim

Sta. 280+75

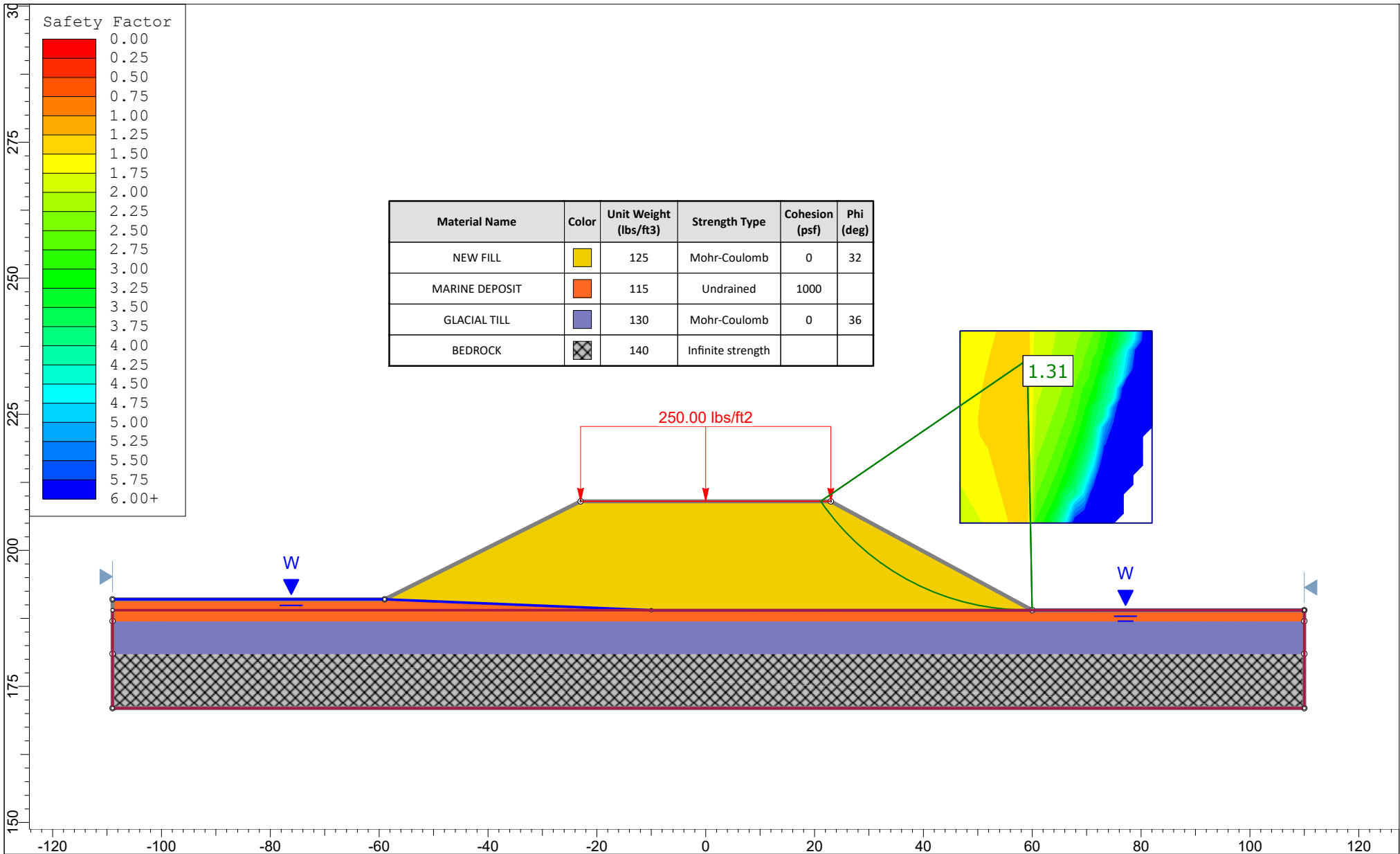


	Project			SLIDE - An Interactive Slope Stability Program	
	Analysis Description			Sta. 280+75	
	Drawn By		EMS	Scale	1:282
	Date		5/27/2020, 3:54:29 PM		Company
					File Name

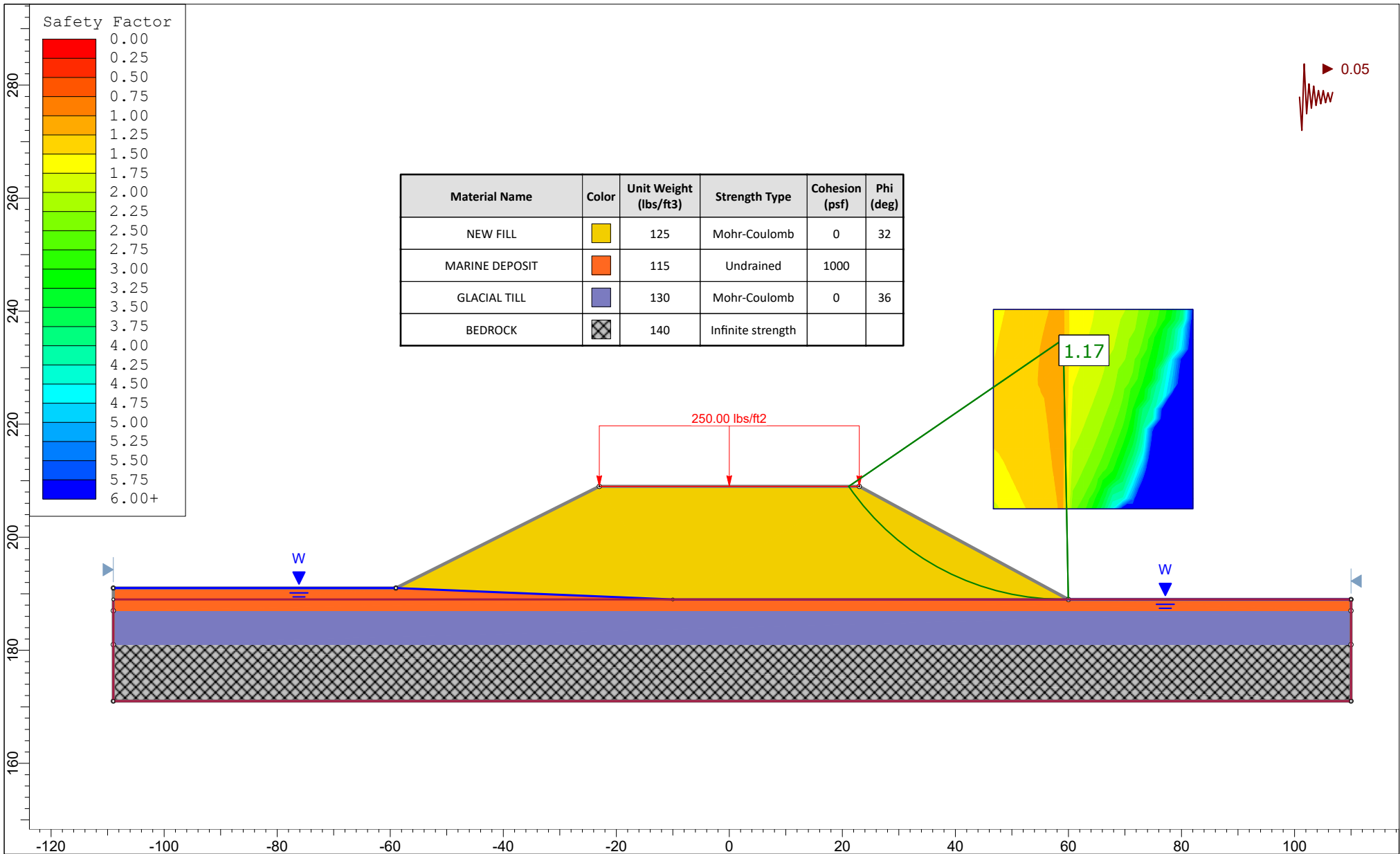


 <small>SLIDEINTERPRET 8.018</small>	<i>Project</i> SLIDE - An Interactive Slope Stability Program		
	<i>Analysis Description</i> Sta. 280+75		
	<i>Drawn By</i> EMS	<i>Scale</i> 1:285	<i>Company</i>
	<i>Date</i> 5/27/2020, 3:54:29 PM		<i>File Name</i> 2020-0603-Sta 28075 Stability-seismic.slim

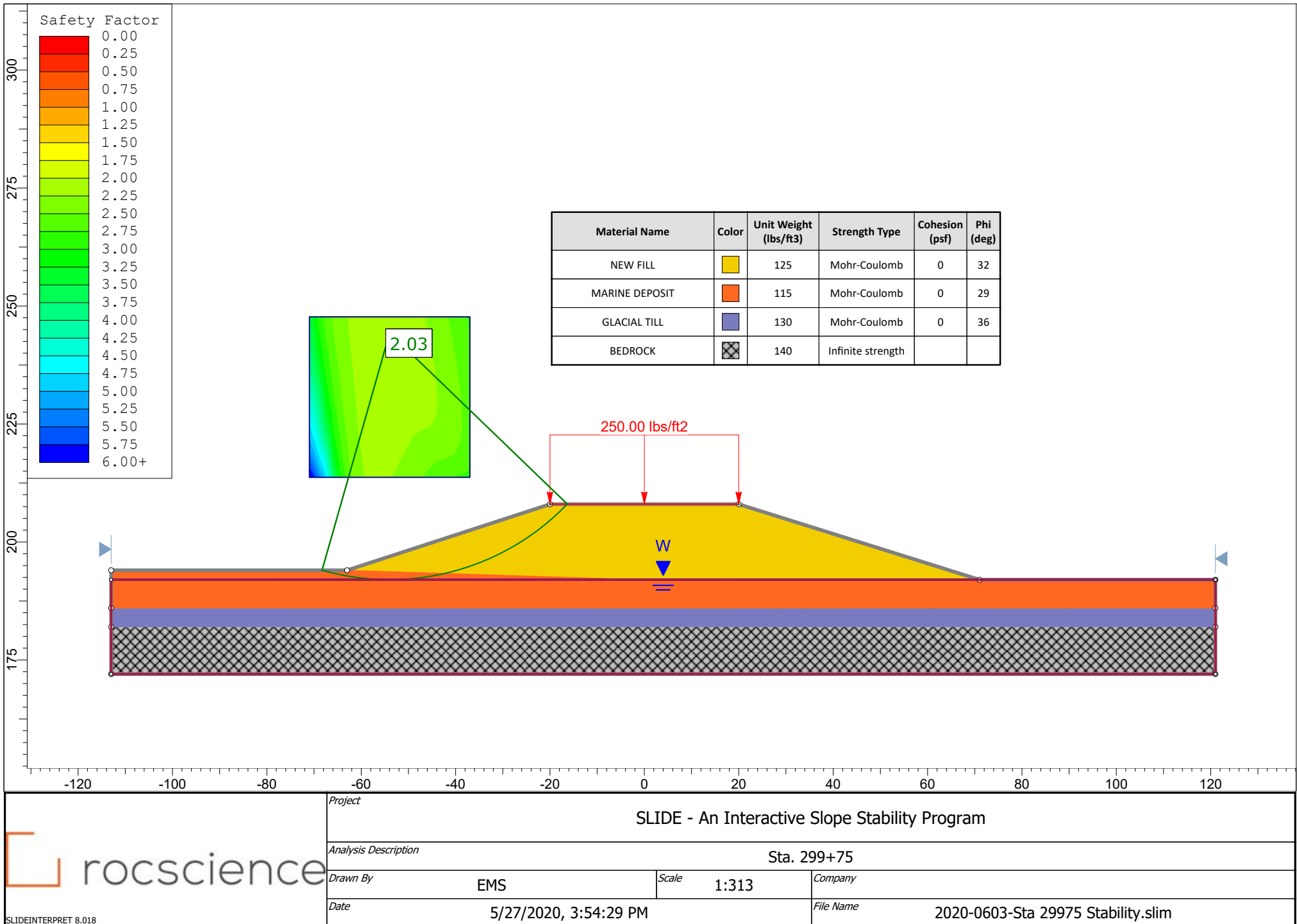
Sta. 289+00

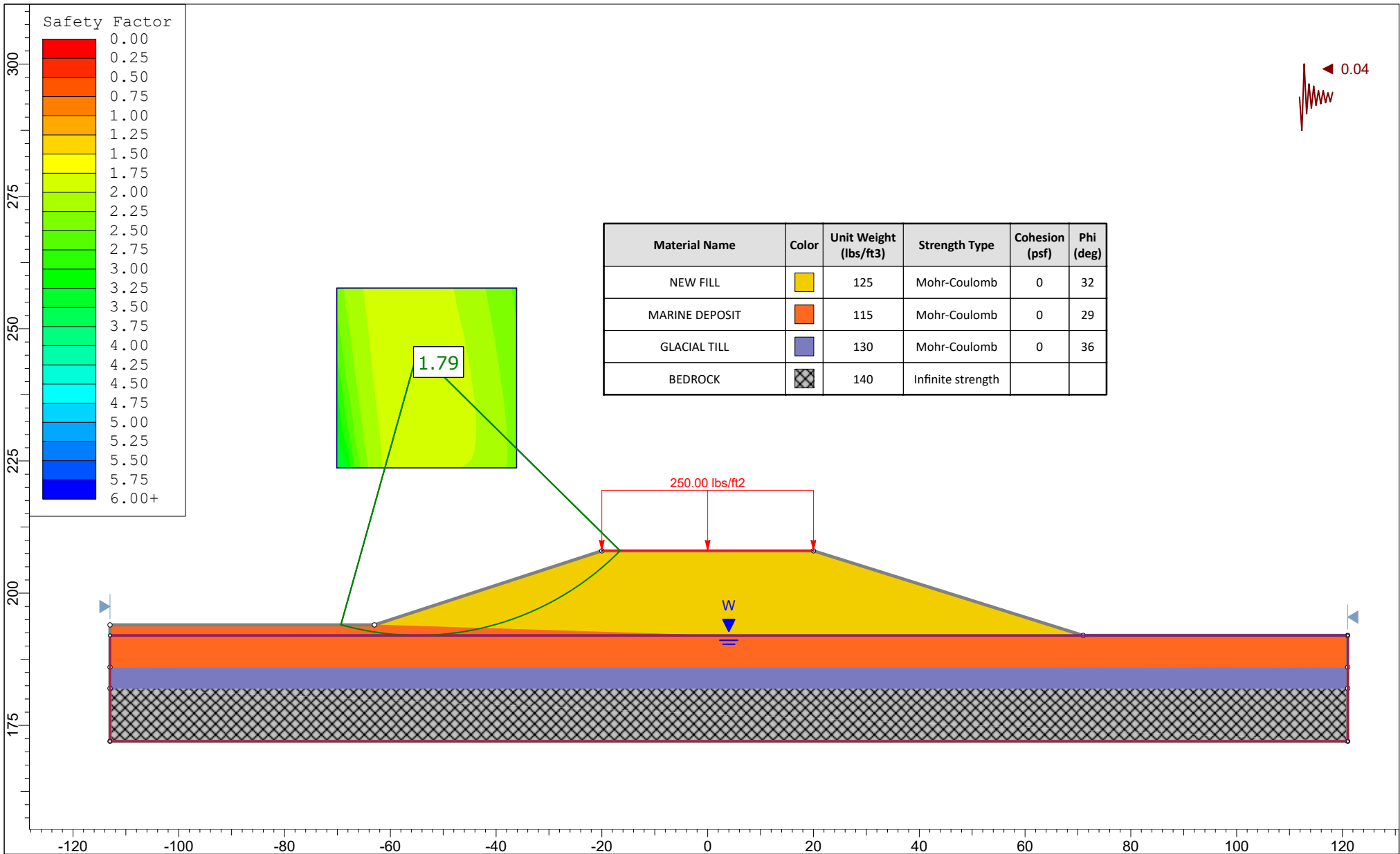


	Project SLIDE - An Interactive Slope Stability Program		
	Analysis Description Sta. 289+00		
	Drawn By EMS	Scale 1:293	Company
	Date 5/27/2020, 3:54:29 PM		File Name 2020-0603-Sta 28900 Stability.slim



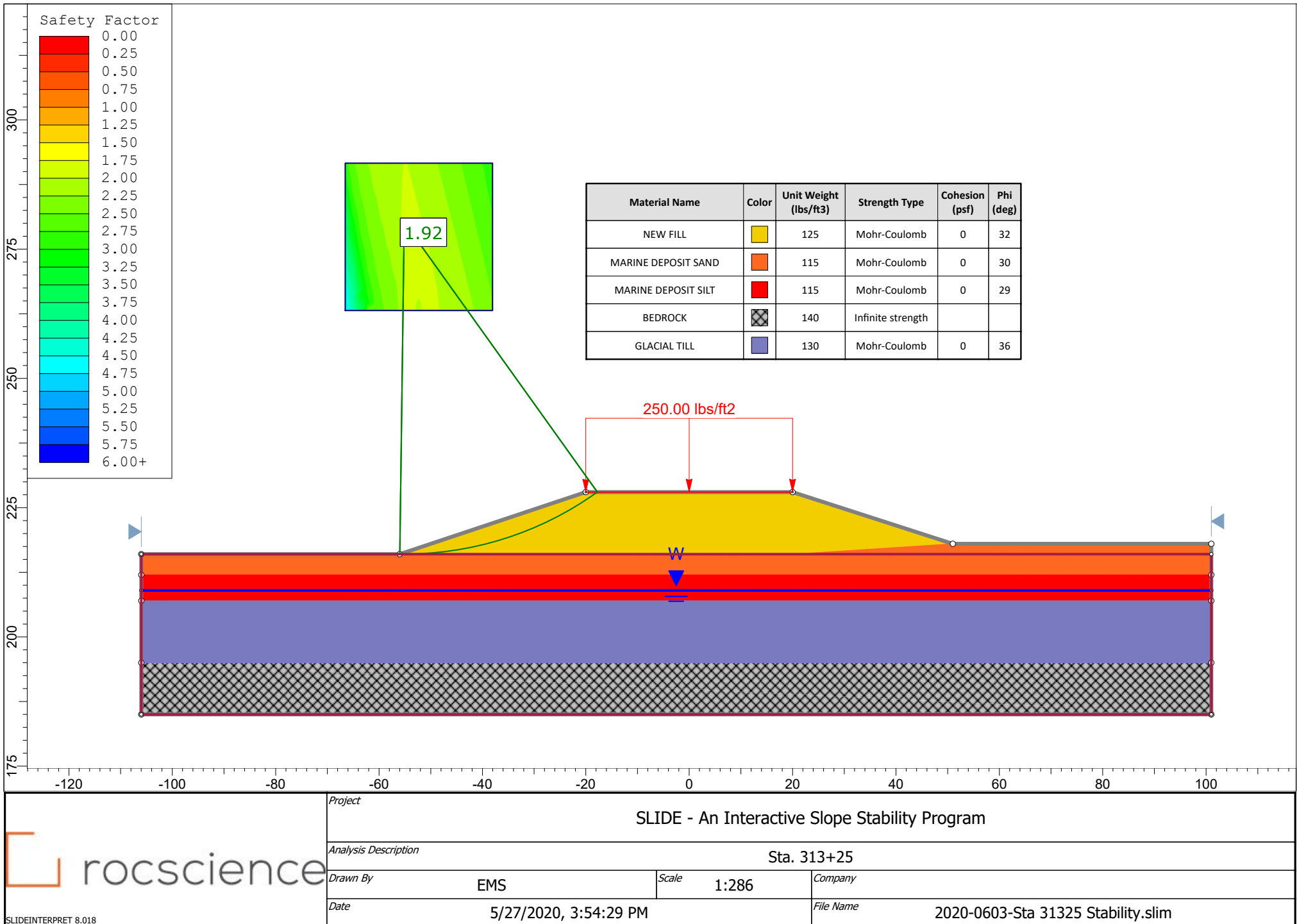
Sta. 299+75

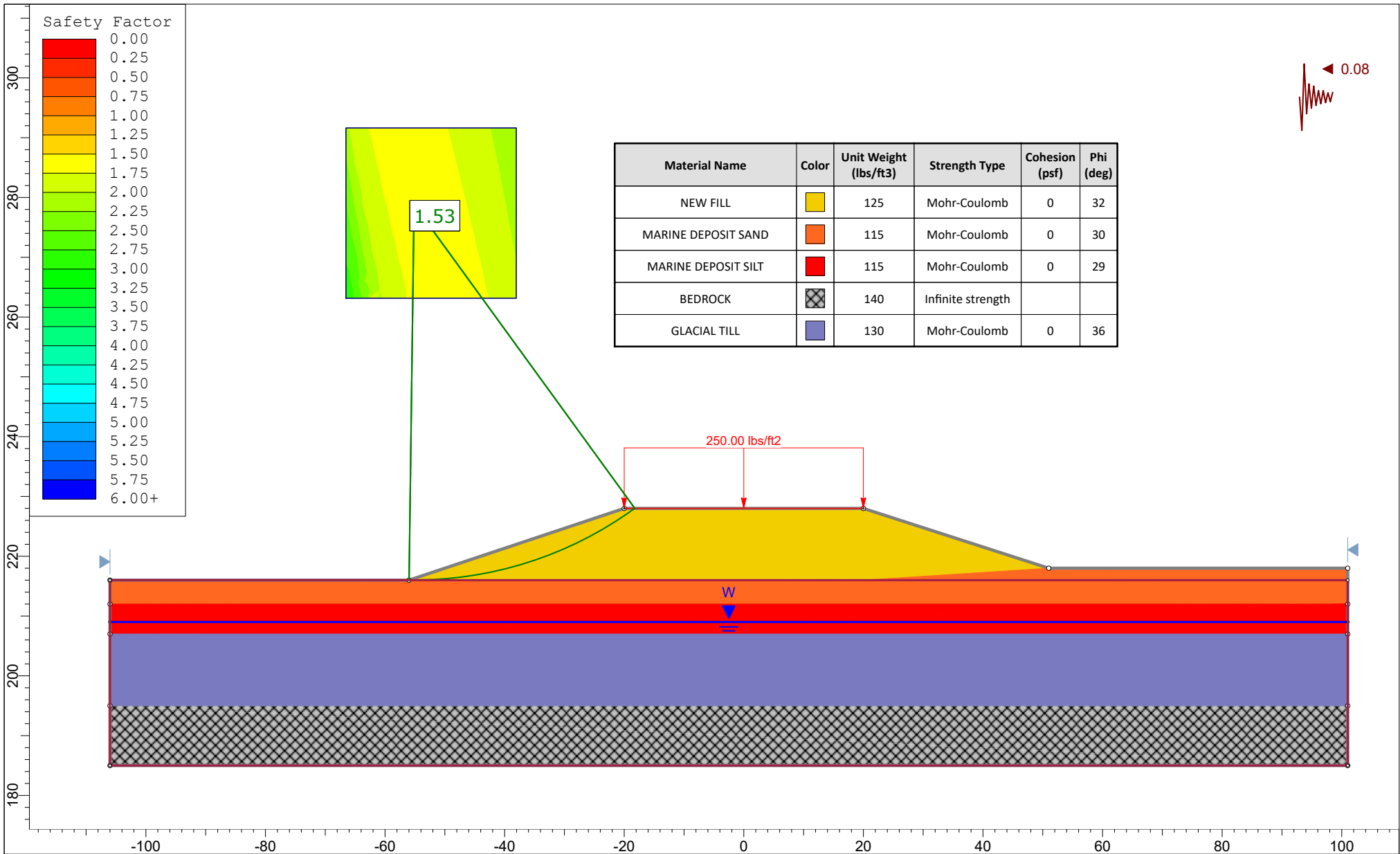




	Project		
	SLIDE - An Interactive Slope Stability Program		
	Analysis Description		
	Sta. 299+75		
Drawn By	EMS	Scale	1:301
Date	5/27/2020, 3:54:29 PM	Company	2020-0603-Sta 29975 Stability-seismic.slim

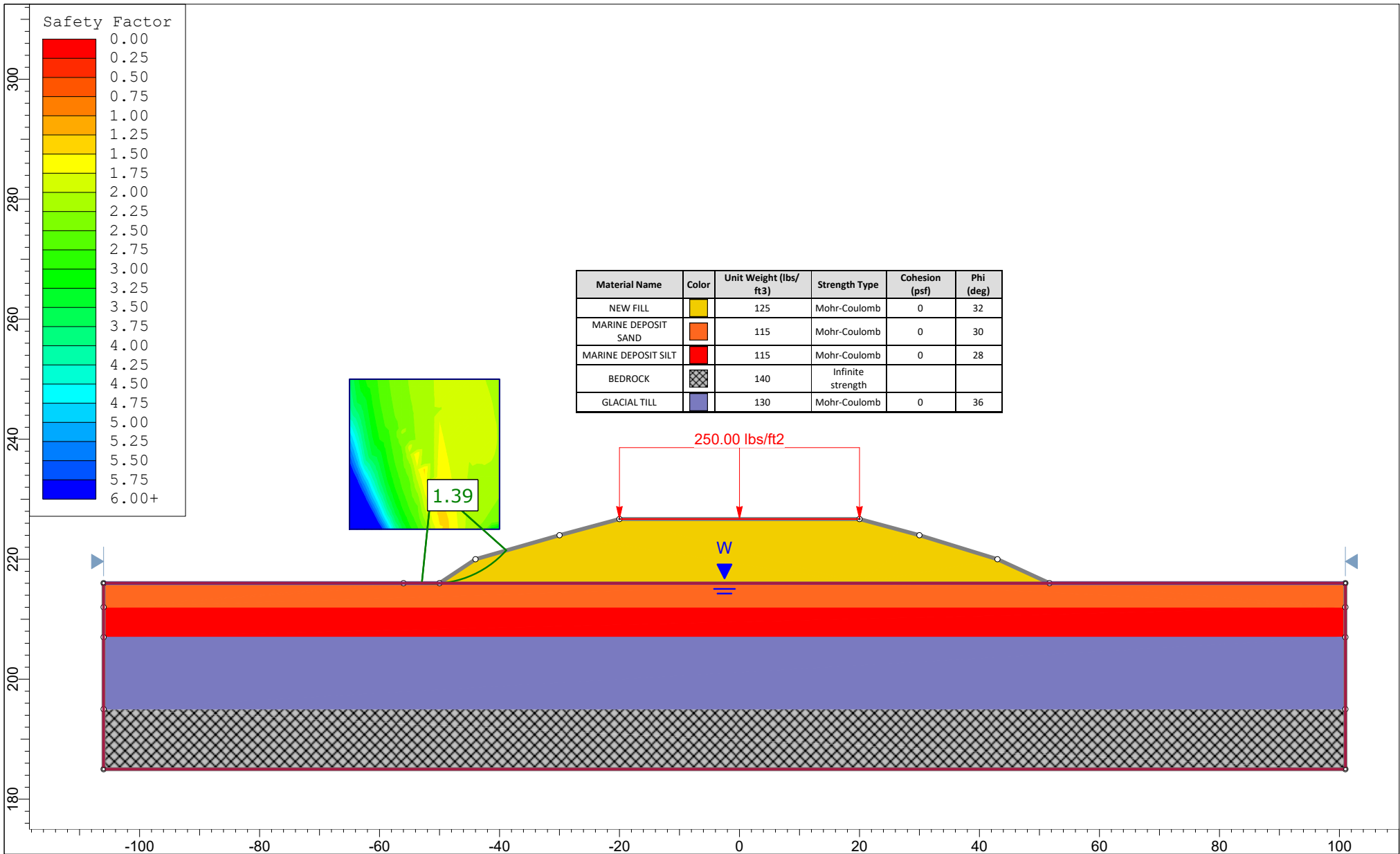
Sta. 313+25



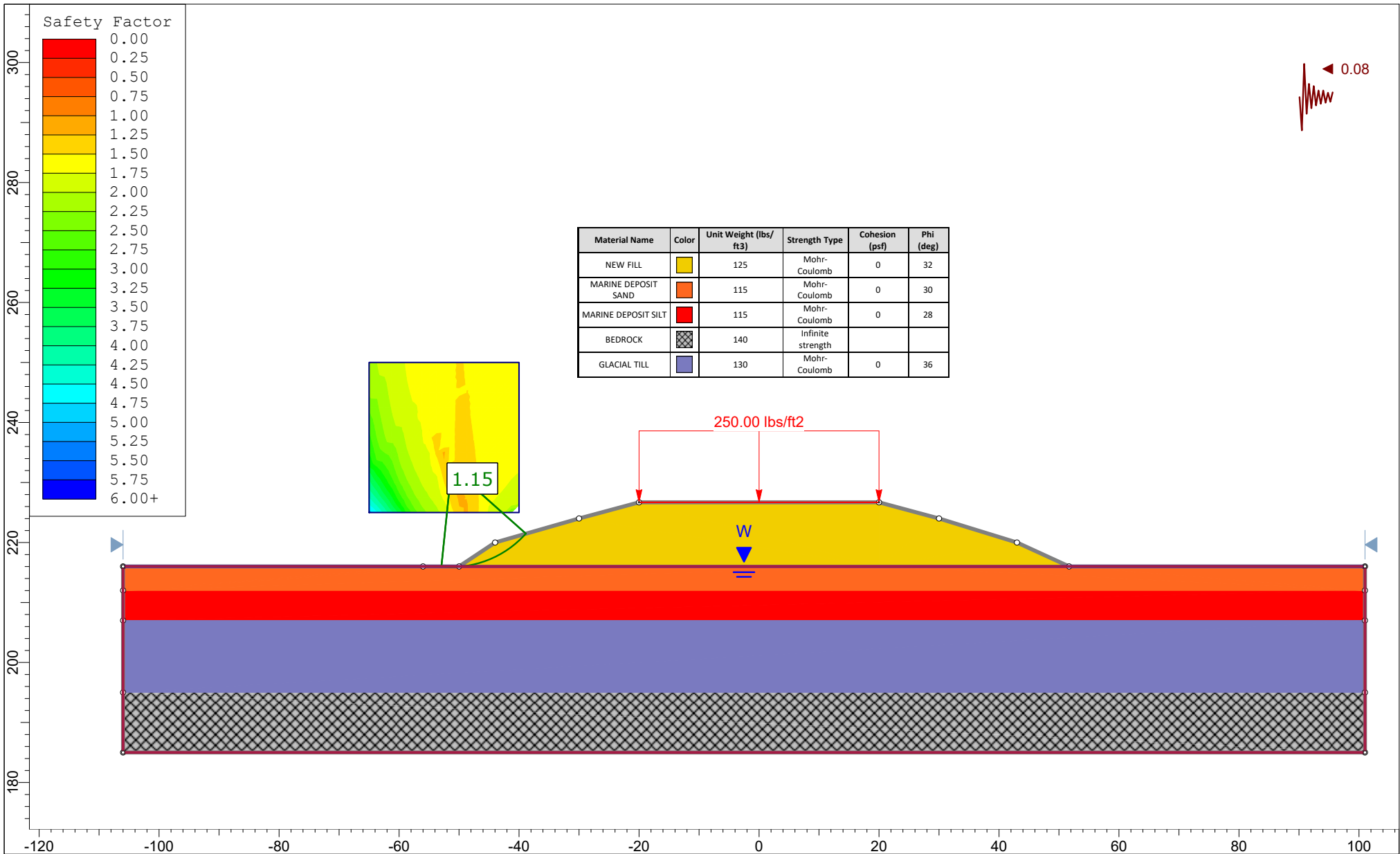


	Project		
	SLIDE - An Interactive Slope Stability Program		
	Analysis Description		
	Sta. 313+25		
Drawn By	EMS	Scale	1:267
Date	5/27/2020, 3:54:29 PM		Company
SLIDEINTERPRET 8.018			File Name
		2020-0603-Sta 31325 Stability-seismic.slim	

Sta. 314+50

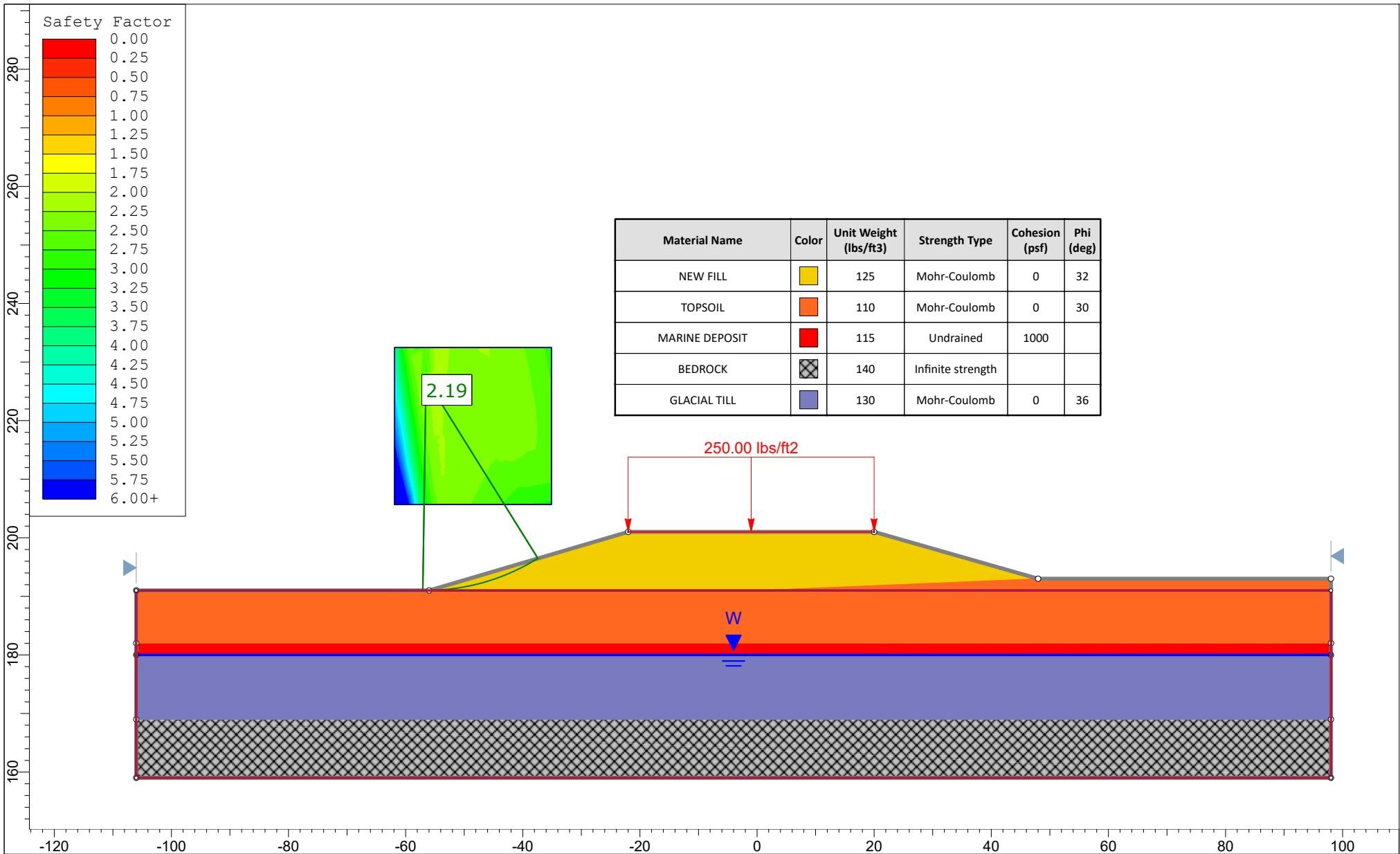



Project			I-395 Brewer-Eddington Connector	
Group	2021-0603-Sta 314+50 Stability-Seismic.slim		Scenario	2021-0603-Sta 314+50 Stability-Seismic.slim
Drawn By	EMS/JAD		Company	Haley & Aldrich, Inc.
Date	5/27/2020, 3:54:29 PM		File Name	2021-0603-Sta 314+50 Stability-Seismic.slim

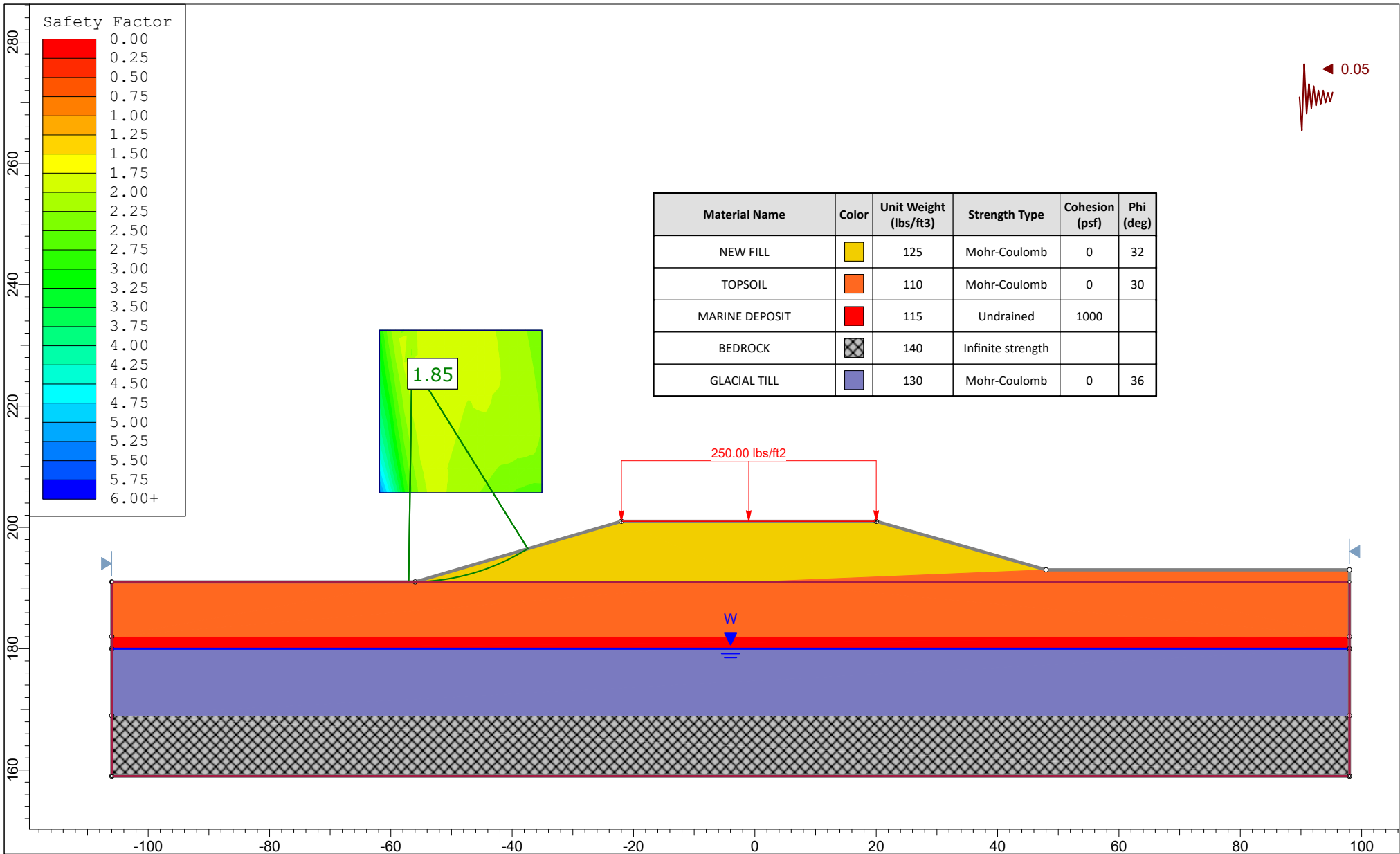


	Project		I-395 Brewer-Eddington Connector	
	Group	2021-0603-Sta 314+50 Stability.slim	Scenario	2021-0603-Sta 314+50 Stability.slim
	Drawn By	EMS/JAD	Company	Haley & Aldrich, Inc.
	Date	5/27/2020, 3:54:29 PM	File Name	2021-0603-Sta 314+50 Stability.slim
	SLIDEINTERPRET 9.008			

Sta. 330+00

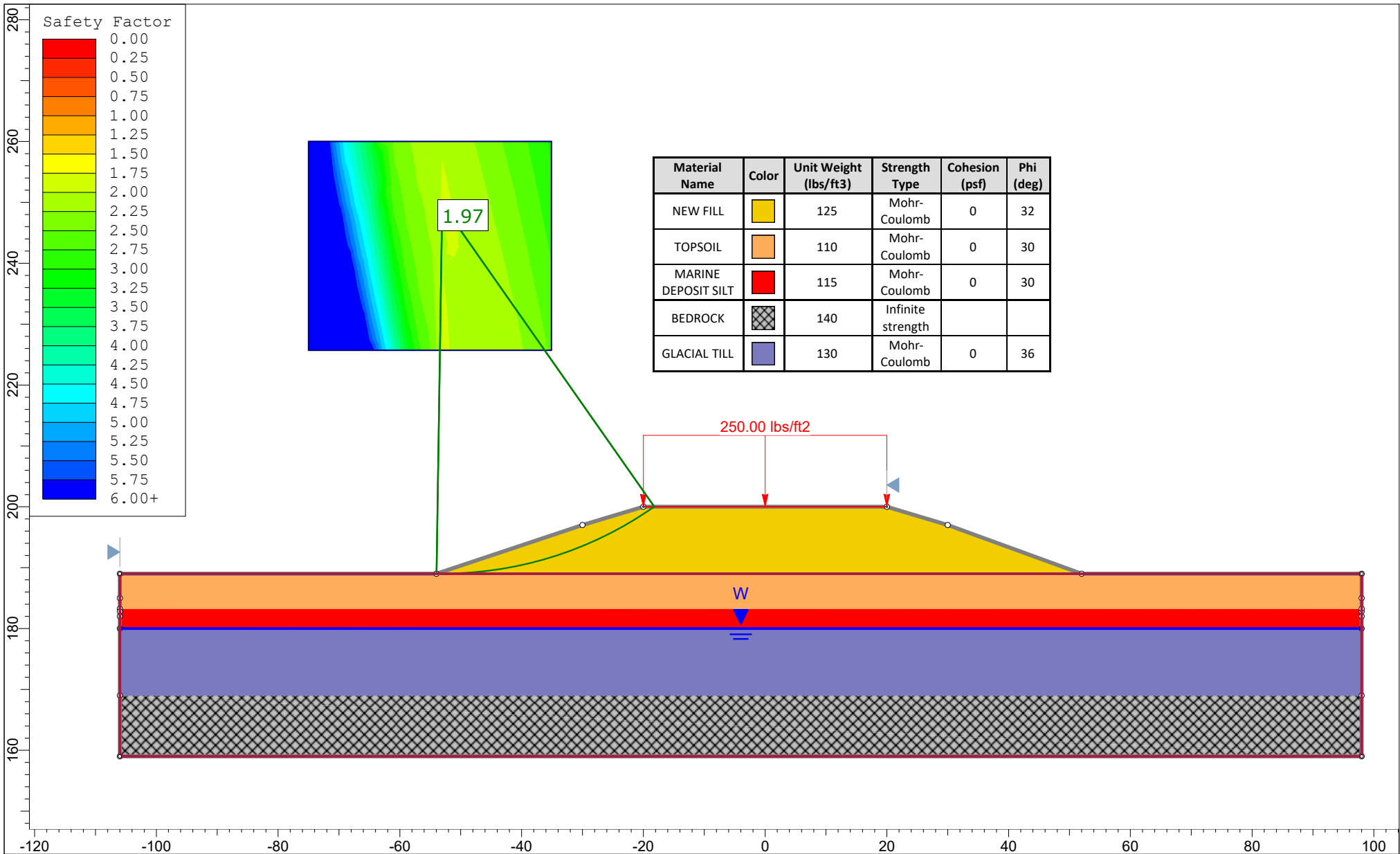



	Project			Sta. 330+00	
	Analysis Description				
	Drawn By	EMS	Scale	1:272	Company
	Date	5/27/2020, 3:54:29 PM		File Name	
SLIDEINTERPRET 8.018					2020-0603-Sta 33000 Stability.slim

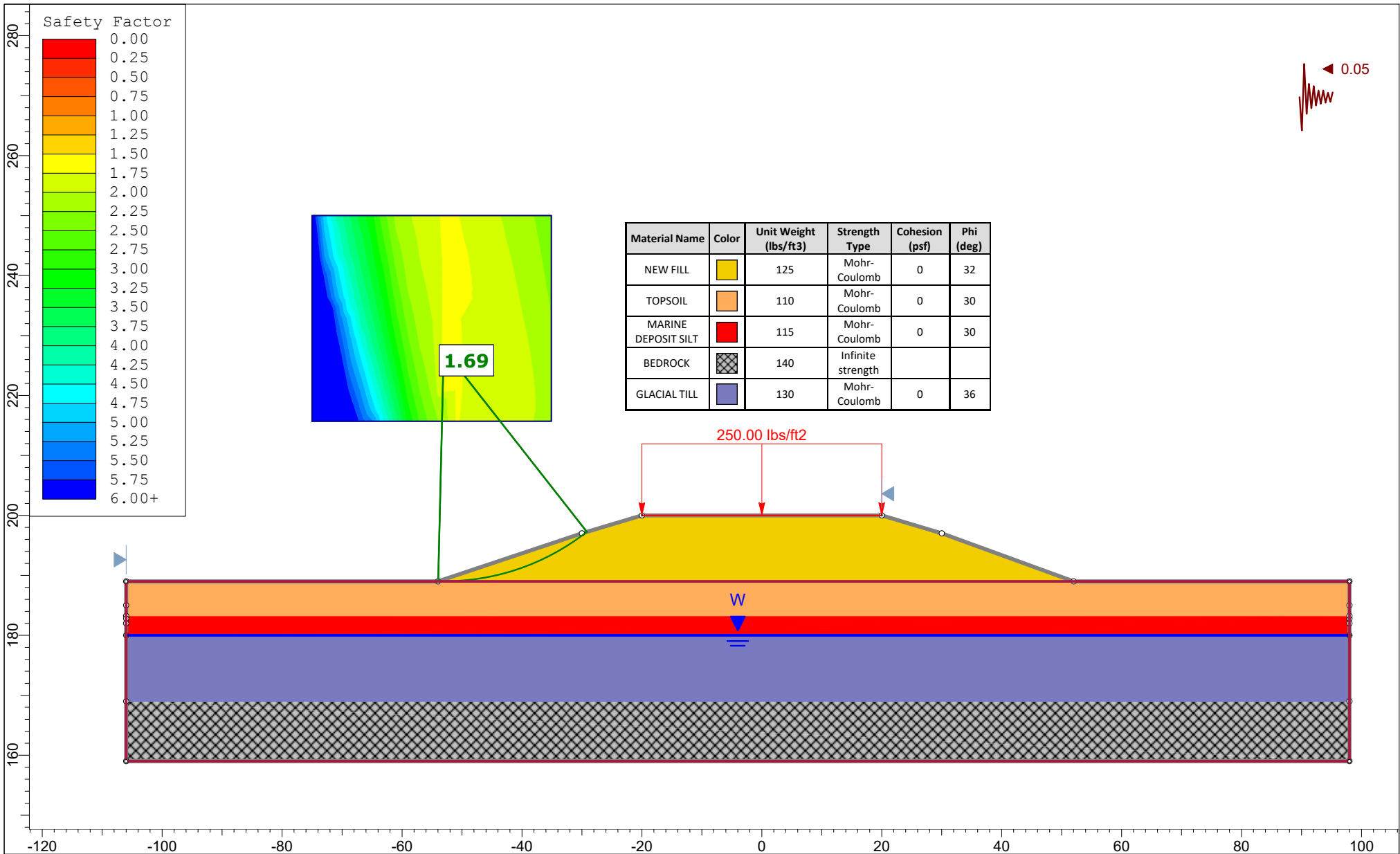


	Project		
	SLIDE - An Interactive Slope Stability Program		
	Analysis Description		
	Sta. 330+00		
Drawn By	EMS	Scale	1:263
Date	5/27/2020, 3:54:29 PM		Company
SLIDEINTERPRET 8.018			File Name
		2020-0603-Sta 33000 Stability-seismic.slim	

Sta. 330+50



	Project		I-395 Brewer-Eddington Connector	
	Group	2021-0603-Sta 330+50 Stability.slim	Scenario	2021-0603-Sta 330+50 Stability.slim
	Drawn By	EMS/JAD	Company	Haley & Aldrich, Inc.
	Date	5/27/2020, 3:54:29 PM	File Name	2021-0603-Sta 330+50 Stability.slim
	SLIDEINTERPRET 9.008			



Project

I-395 Brewer-Eddington Connector

Group

2021-0603-Sta 330+50 Stability-Seismic.slim

Scenario

2021-0603-Sta 330+50 Stability-Seismic.slim

Drawn By

EMS/JAD

Company

Haley & Aldrich, Inc.

Date

5/27/2020, 3:54:29 PM

File Name

2021-0603-Sta 330+50 Stability-Seismic.slim

Settlement - Fill over Stiff Cohesive Soils and Granular Soils

Client: Maine Department of Transportation

Date: 21-Jun-2021

Project: I-395/Route 9 Connector - WIN 18915.00

Computed by: EMS

Subject: Highway Settlement

Checked by: JAD

PROBLEM STATEMENT & OBJECTIVE

Calculate the settlement at critical sections along the proposed highway alignment.

REFERENCES

1. Settle3D version 4.0 by RocScience.

AVAILABLE INFORMATION

1. Current boring logs as noted below.
2. Plan set titled, "Brewer-Eddington I-395/Route 9 Connector, Cross Sections," by MaineDOT dated 3 March 2021.
3. Plan set titled, "Brewer-Eddington I-395/Route 9 Connector" by MaineDOT dated 5 March 2021.

ASSUMPTIONS

1. New embankment fill is modeled extending 100 ft on either side of the selected critical sections.
2. Borings used to determine soil profiles, groundwater depths, and fill heights vary and are noted below.
3. New fill unit weight is 125 pcf.
4. Groundwater is modeled based on nearby boring groundwater readings.
5. Elastic soil moduli estimated after AASHTO 2004 with 2006 interims.
6. Consolidation properties based on laboratory testing performed on borings drilled in the vicinity of the proposed critical sections, and on past experience with Marine Deposit clay properties.
7. Settlement was analyzed using the Westergaard stress computation method.

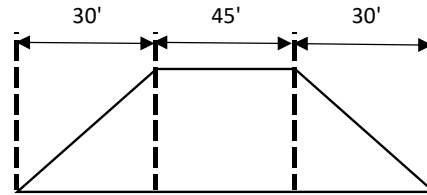
Client: Maine Department of Transportation

Project: I-395/Route 9 Connector - WIN 18915.00

Subject: Highway Settlement

STA 48+25 GEOMETRY

Station	Max. Embankment Height (ft)	Load Magnitude (ksf)
47+25	2	0.250
47+75	5	0.625
48+25	8	1.000
48+50	0	0.000

Section View:


Fill over stiff cohesive material

Ground surface at center of cross section = El. 107

STA 48+25 SOIL PROFILE AND PROPERTIES (not to scale)

Based on boring BB-BWS-103

Groundwater depth = 4 ft

DEPTH (ft)		ELEVATION (ft)
0	Fill	107
	SAND	
	$\gamma = 120$ pcf	
	$E = 600$ ksf	
4	Marine Deposit	103
	SILT	
	$\gamma = 115$ pcf	
	$E = 225$ ksf	
20		87
	Glacial Till	
	SILT	
	$\gamma = 130$ pcf	
	$E = 400$ ksf	
34		73

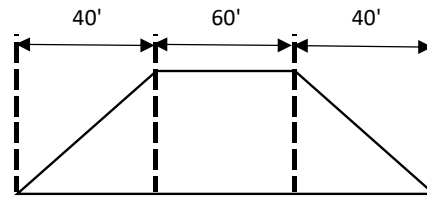
Client: Maine Department of Transportation

Project: I-395/Route 9 Connector - WIN 18915.00

Subject: Highway Settlement

STA 53+25 GEOMETRY

Station	Max. Embankment Height (ft)	Load Magnitude (ksf)
52+25	8	1.000
52+75	19	2.375
53+25	21	2.625
53+75	19	2.375
54+25	18	2.250

Section View:


Fill over compressible cohesive material
Ground surface at center of cross section = El. 82

STA 53+25 SOIL PROFILE AND PROPERTIES (not to scale)

Based on boring HB-BE-101

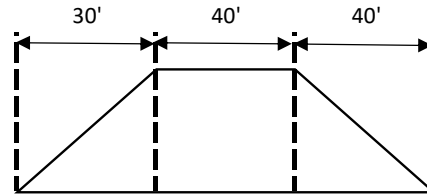
Groundwater depth = 3 ft (based on observation well HB-BE-101, last read 2 June 2020)

DEPTH (ft)				ELEVATION (ft)
0				82
	Marine Deposit CLAY	$\gamma = 115 \text{ pcf}$ $P_c = 4.975 \text{ ksf (top)}$ $P_c = 2 \text{ ksf (bottom)}$	$CR = 0.17$ $RR = 0.03$	$C_v = 3 \times 10^{-6} \text{ ft}^2/\text{s}$ $c_{\alpha E} = 0.004$
17				65
	Marine Deposit CLAY	$\gamma = 115 \text{ pcf}$ $OCR = 1$	$CR = 0.17$ $RR = 0.03$	$C_v = 3 \times 10^{-6} \text{ ft}^2/\text{s}$ $c_{\alpha E} = 0.004$
37				45
	Glacial Till GRAVEL	$\gamma = 130 \text{ pcf}$ $E = 4000 \text{ ksf}$		
43				39

Client: Maine Department of Transportation
Project: I-395/Route 9 Connector - WIN 18915.00
Subject: Highway Settlement

STA 84+50 GEOMETRY

Station	Max. Embankment Height (ft)	Load Magnitude (ksf)
83+50	7	0.875
84+00	7	0.875
84+50	10	1.250
85+00	7	0.875
85+50	6	0.750

Section View:


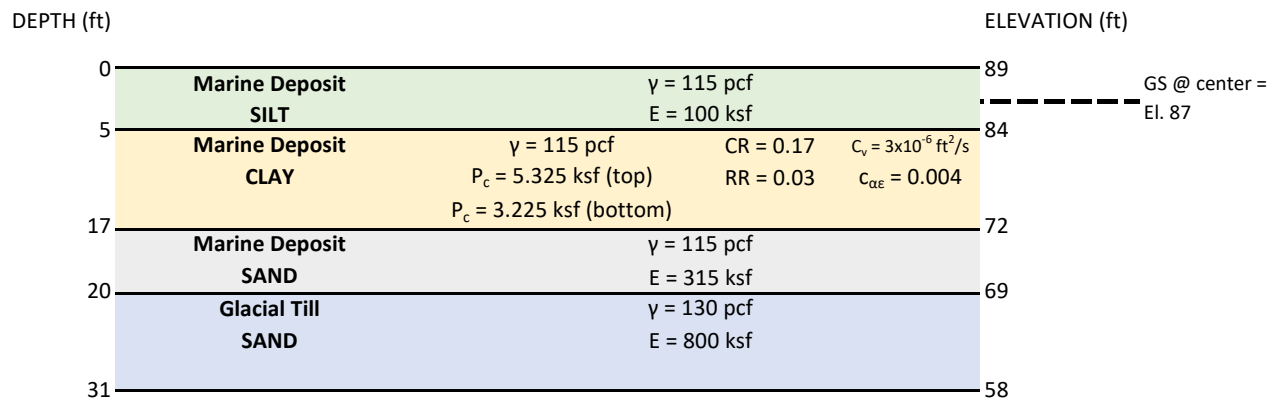
Fill over stiff cohesive material

Ground surface at center of cross section = El. 87

STA 84+50 SOIL PROFILE AND PROPERTIES (not to scale)

Based on boring BB-BFB2-101

Groundwater depth = 3 ft



Client: Maine Department of Transportation

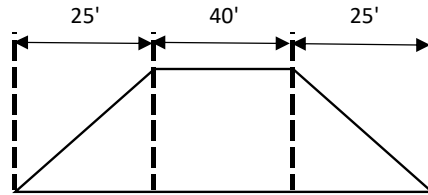
Project: I-395/Route 9 Connector - WIN 18915.00

Subject: Highway Settlement

STA 130+50 GEOMETRY

Station	Max. Embankment Height (ft)	Load Magnitude (ksf)
129+50	6	0.750
130+00	6	0.750
130+50	6	0.750
131+00	6	0.750
131+50	4	0.500

Section View:



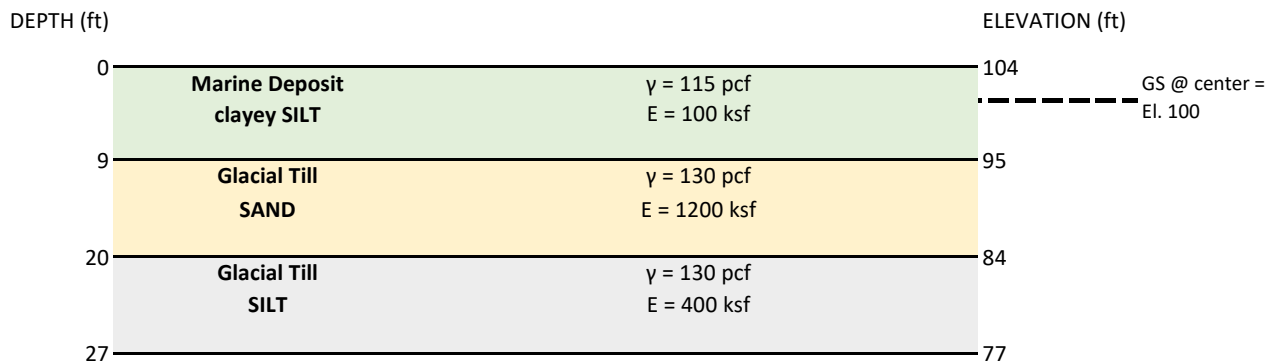
Fill over stiff cohesive material

Ground surface at center of cross section = El. 100

STA 130+50 SOIL PROFILE AND PROPERTIES (not to scale)

Based on boring HB-BE-122

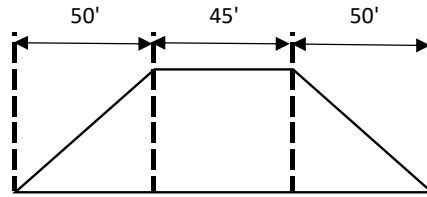
Groundwater depth = 7 ft



Client: Maine Department of Transportation
Project: I-395/Route 9 Connector - WIN 18915.00
Subject: Highway Settlement

STA 140+00 GEOMETRY

Station	Max. Embankment Height (ft)	Load Magnitude (ksf)
139+00	13	1.625
139+50	17	2.125
140+00	18	2.250
140+30	18	2.250
EATON BROOK BRIDGE @ STA 140+30		

Section View:


Fill over compressible cohesive material
Ground surface at center of cross section = El. 75

STA 140+00 SOIL PROFILE AND PROPERTIES (not to scale)

Based on boring BB-BEB-101
Groundwater at ground surface

DEPTH (ft)				ELEVATION (ft)	GS @ center = El. 75
0	Marine Deposit	$\gamma = 115 \text{ pcf}$	CR = 0.15	$C_v = 1 \times 10^{-6} \text{ ft}^2/\text{s}$	74
	CLAY	$P_c = 4 \text{ ksf}$	RR = 0.02	$C_{\alpha E} = 0.005$	
4	Marine Deposit	$\gamma = 115 \text{ pcf}$	CR = 0.15	$C_v = 1 \times 10^{-6} \text{ ft}^2/\text{s}$	70
	CLAY	$P_c = 4 \text{ ksf (top)}$	RR = 0.02	$C_{\alpha E} = 0.005$	
		$P_c = 0.9 \text{ ksf (bottom)}$			
14	Marine Deposit	$\gamma = 115 \text{ pcf}$	CR = 0.15	$C_v = 1 \times 10^{-6} \text{ ft}^2/\text{s}$	60
	CLAY	OCR = 1.0	RR = 0.02	$C_{\alpha E} = 0.005$	
18	Glacial Till	$\gamma = 130 \text{ pcf}$			56
	SILT	E = 400 ksf			
25					49
	Glacial Till	$\gamma = 130 \text{ pcf}$			
	SAND	E = 1500 ksf			
37					37

Client: Maine Department of Transportation

Date: 21-Jun-2021

Project: I-395/Route 9 Connector - WIN 18915.00

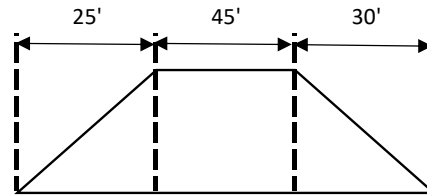
Computed by: EMS

Subject: Highway Settlement

Checked by: JAD

STA 145+00 GEOMETRY

Station	Max. Embankment Height (ft)	Load Magnitude (ksf)
144+00	6	0.750
144+50	7	0.875
145+00	8	1.000
145+50	7	0.875
146+00	8	1.000

Section View:


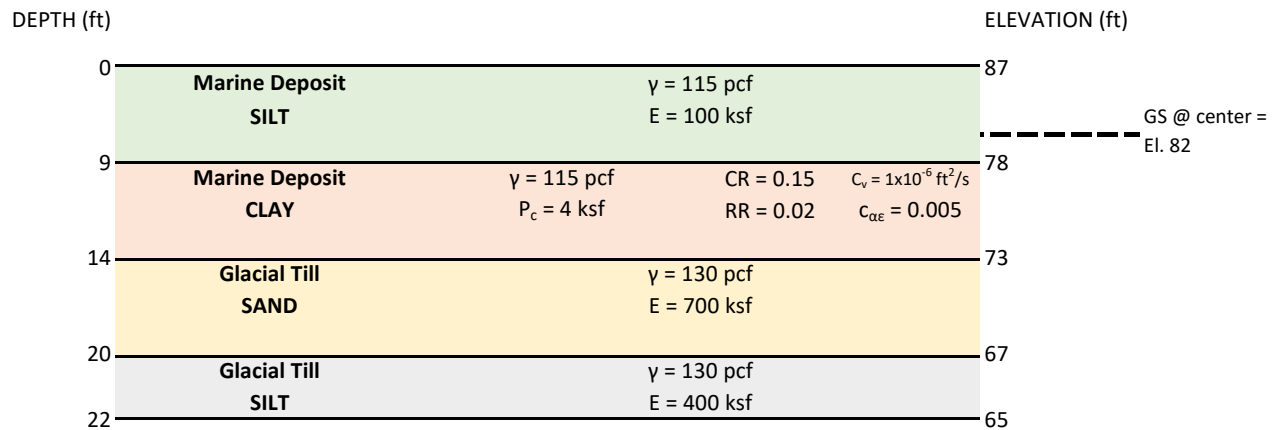
Fill over stiff cohesive material

Ground surface at center of cross section = El. 82

STA 145+00 SOIL PROFILE AND PROPERTIES (not to scale)

Based on boring HB-BE-124

Groundwater depth = 5 ft



Client: Maine Department of Transportation

Date: 21-Jun-2021

Project: I-395/Route 9 Connector - WIN 18915.00

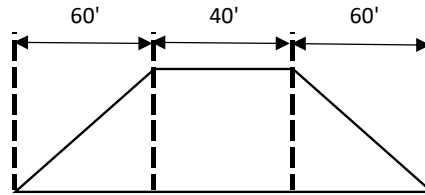
Computed by: EMS

Subject: Highway Settlement

Checked by: JAD

STA 167+50 GEOMETRY

Station	Max. Embankment Height (ft)	Load Magnitude (ksf)
166+50	18	2.250
167+00	19	2.375
167+50	20	2.500
168+00	20	2.500
168+50	19	2.375

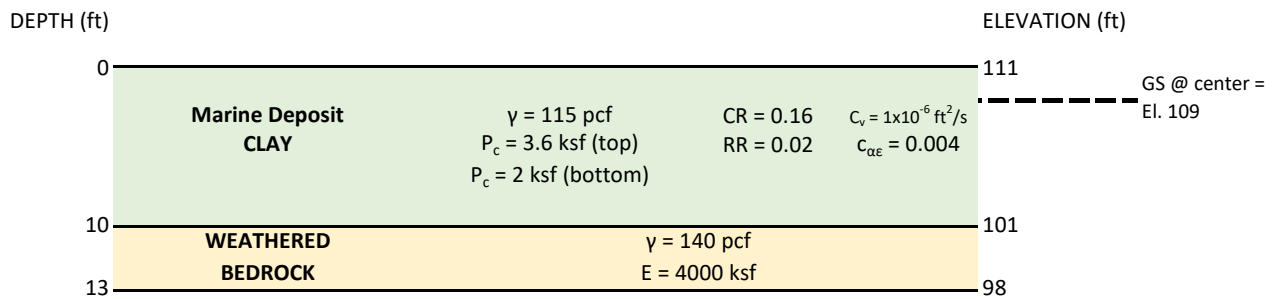
Section View:


Fill over compressible cohesive material
Ground surface at center of cross section = El. 109

STA 167+50 SOIL PROFILE AND PROPERTIES (not to scale)

Based on boring HB-BE-129

Groundwater depth = 4 ft



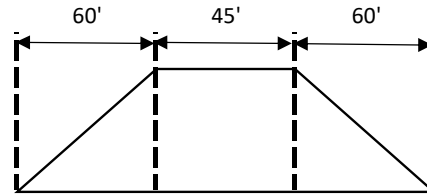
Client: Maine Department of Transportation

Project: I-395/Route 9 Connector - WIN 18915.00

Subject: Highway Settlement

STA 180+50 GEOMETRY

Station	Max. Embankment Height (ft)	Load Magnitude (ksf)
179+50	18	2.250
180+00	26	3.250
180+50	29	3.625
181+00	28	3.500
181+50	27	3.375

Section View:


Fill over compressible cohesive material
Ground surface at center of cross section = El. 93

STA 180+50 SOIL PROFILE AND PROPERTIES (not to scale)

Based on boring HB-BE-135

Groundwater at ground surface

DEPTH (ft)				ELEVATION (ft)
0				93
	Marine Deposit CLAY	$\gamma = 115 \text{ pcf}$ $P_c = 3.755 \text{ ksf (top)}$ $P_c = 1.3 \text{ ksf (bottom)}$	$CR = 0.16$ $RR = 0.02$	$C_v = 2 \times 10^{-6} \text{ ft}^2/\text{s}$ $c_{\alpha E} = 0.004$
20				73
	Marine Deposit CLAY	$\gamma = 115 \text{ pcf}$ $OCR = 1.0$	$CR = 0.16$ $RR = 0.02$	$C_v = 2 \times 10^{-6} \text{ ft}^2/\text{s}$ $c_{\alpha E} = 0.004$
30				63
	Glacial Till SAND	$\gamma = 130 \text{ pcf}$ $E = 800 \text{ ksf}$		
35				58

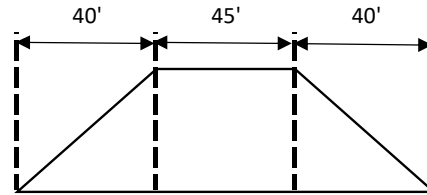
Client: Maine Department of Transportation

Project: I-395/Route 9 Connector - WIN 18915.00

Subject: Highway Settlement

STA 195+50 GEOMETRY

Station	Max. Embankment Height (ft)	Load Magnitude (ksf)
194+50	19	2.375
195+00	20	2.500
195+50	21	2.625
196+00	22	2.750
196+50	23	2.875

Section View:


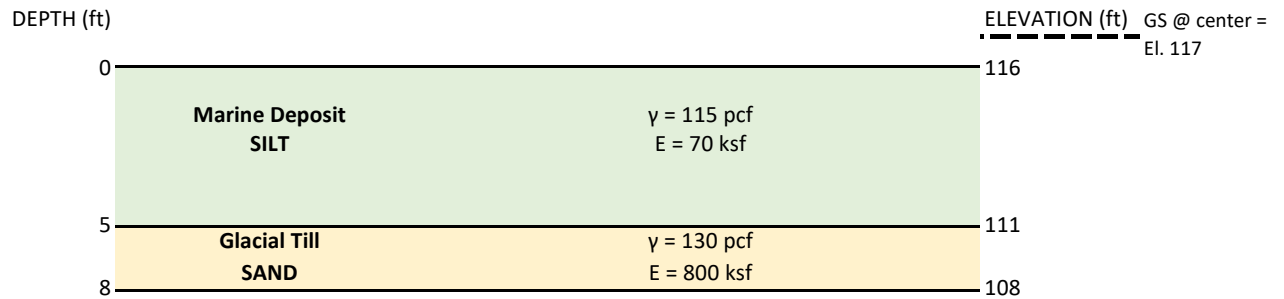
Fill over stiff cohesive material

Ground surface at center of cross section = El. 117

STA 195+50 SOIL PROFILE AND PROPERTIES (not to scale)

Based on boring HB-BE-142

Groundwater depth = 9 ft



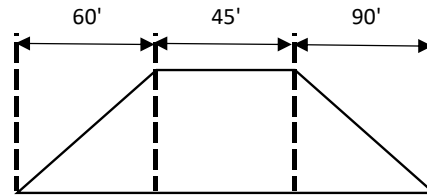
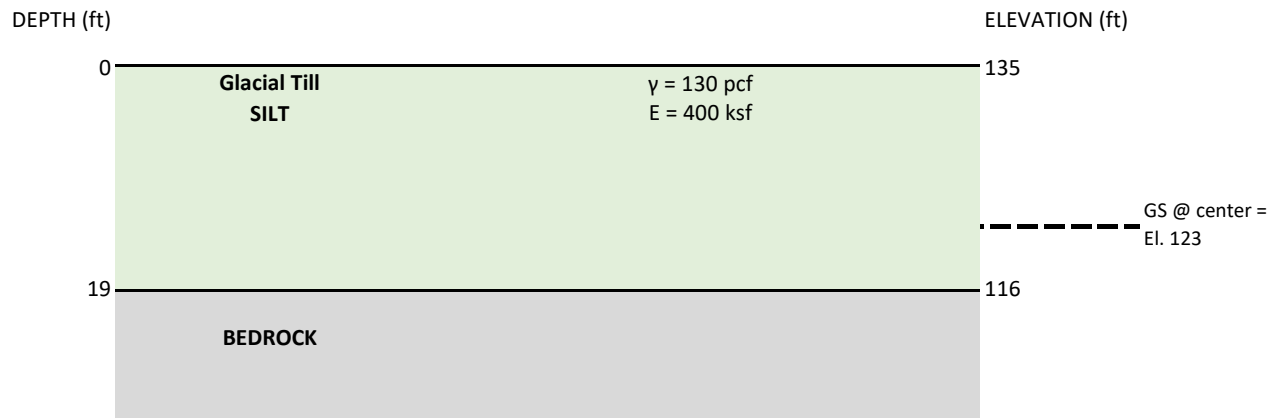
Client: Maine Department of Transportation

Project: I-395/Route 9 Connector - WIN 18915.00

Subject: Highway Settlement

STA 201+00 GEOMETRY

Station	Max. Embankment Height (ft)	Load Magnitude (ksf)
200+00	26	3.250
200+50	26	3.250
201+00	28	3.500
201+50	25	3.125
202+00	26	3.250

Section View:

Fill over granular material
Ground surface at center of cross section = El. 123
STA 201+00 SOIL PROFILE AND PROPERTIES (not to scale)
Based on boring BB-ELAR-203A
Groundwater depth = 2.5 ft


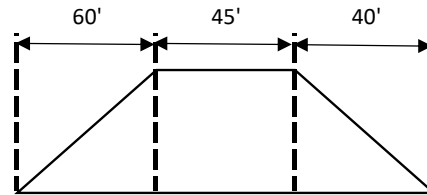
Client: Maine Department of Transportation

Project: I-395/Route 9 Connector - WIN 18915.00

Subject: Highway Settlement

STA 262+75 GEOMETRY

Station	Max. Embankment Height (ft)	Load Magnitude (ksf)
261+75	19	2.375
262+25	20	2.500
262+75	21	2.625
263+25	20	2.500
263+75	20	2.500

Section View:


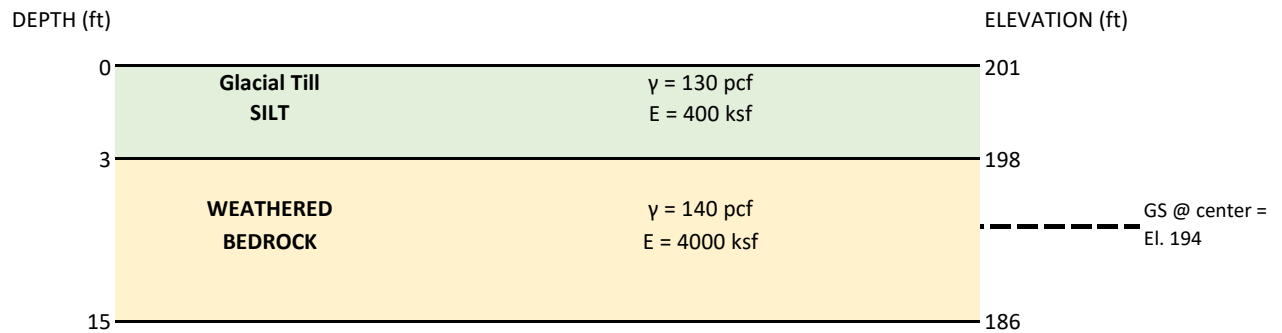
Fill over granular material

Ground surface at center of cross section = El. 194

STA 262+75 SOIL PROFILE AND PROPERTIES (not to scale)

Based on boring HB-BE-157

Groundwater depth = 2 ft



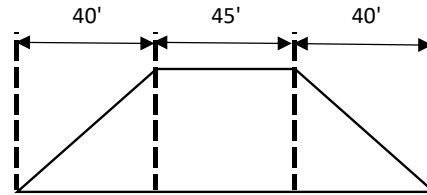
Client: Maine Department of Transportation

Project: I-395/Route 9 Connector - WIN 18915.00

Subject: Highway Settlement

STA 275+00 GEOMETRY

Station	Max. Embankment Height (ft)	Load Magnitude (ksf)
274+00	24	3.000
274+50	25	3.125
275+00	25	3.125
275+50	25	3.125
276+00	25	3.125

Section View:


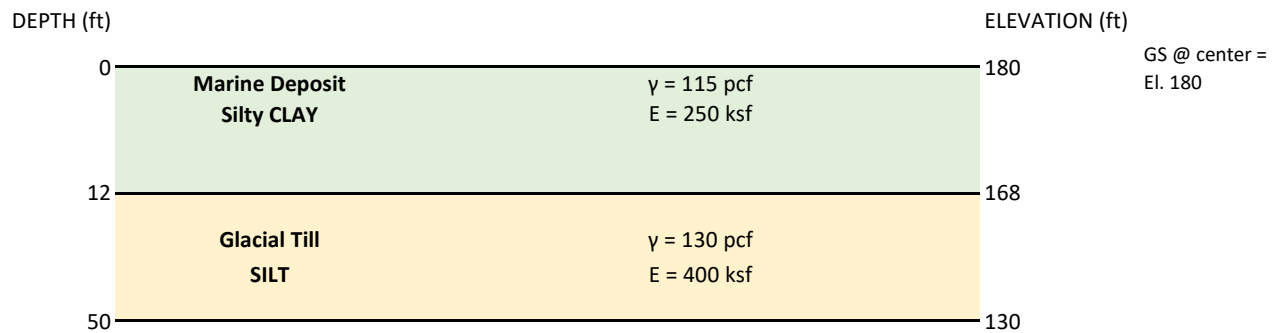
Fill over stiff cohesive material

Ground surface at center of cross section = El. 180

STA 275+00 SOIL PROFILE AND PROPERTIES (not to scale)

Based on borings BB-EEBT2-101, BB-EEBT2-202

Groundwater at ground surface



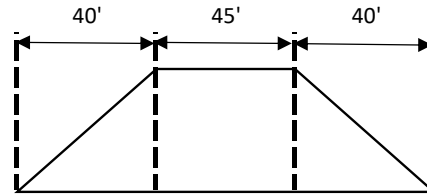
Client: Maine Department of Transportation

Project: I-395/Route 9 Connector - WIN 18915.00

Subject: Highway Settlement

STA 275+75 GEOMETRY

Station	Max. Embankment Height (ft)	Load Magnitude (ksf)
274+75	21	2.625
275+25	21	2.625
275+75	21	2.625
276+25	20	2.500
276+75	19	2.375

Section View:


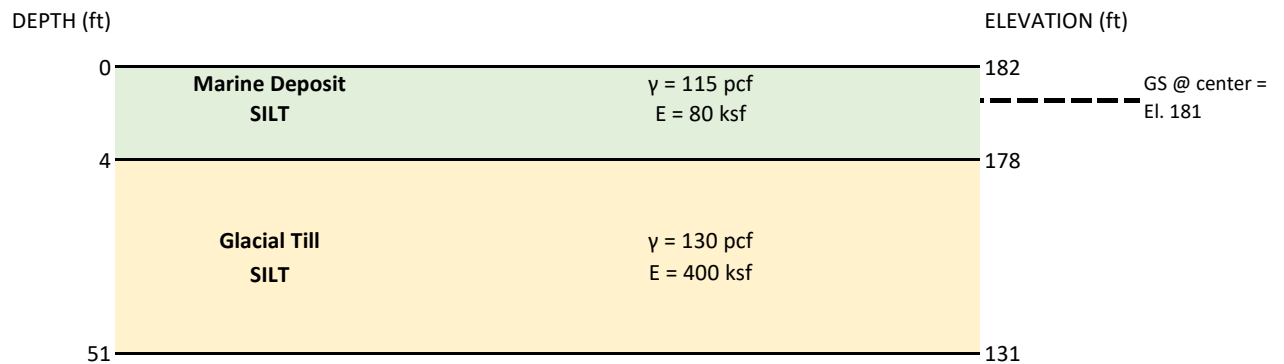
Fill over stiff cohesive material

Ground surface at center of cross section = El. 181

STA 275+75 SOIL PROFILE AND PROPERTIES (not to scale)

Based on boring BB-EWC2-101

Groundwater at ground surface (based on visually observed wet soil samples)



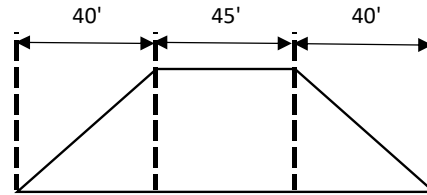
Client: Maine Department of Transportation

Project: I-395/Route 9 Connector - WIN 18915.00

Subject: Highway Settlement

STA 280+75 GEOMETRY

Station	Max. Embankment Height (ft)	Load Magnitude (ksf)
279+75	18	2.250
280+25	19	2.375
280+75	19	2.375
281+25	19	2.375
281+75	16	2.000

Section View:


Fill over granular material

Ground surface at center of cross section = El. 190

STA 280+75 SOIL PROFILE AND PROPERTIES (not to scale)

Based on boring HB-BE-160

Groundwater at ground surface (based on visually observed wet soil samples)

DEPTH (ft)		ELEVATION (ft)
0	Glacial Till SILT $\gamma = 130$ pcf $E = 400$ ksf	190
5	Glacial Till SAND $\gamma = 130$ pcf $E = 1000$ ksf	185
9		181

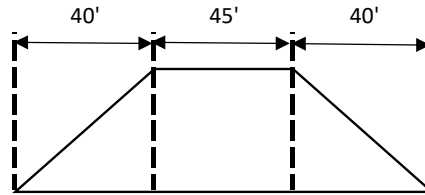
Client: Maine Department of Transportation

Project: I-395/Route 9 Connector - WIN 18915.00

Subject: Highway Settlement

STA 289+00 GEOMETRY

Station	Max. Embankment Height (ft)	Load Magnitude (ksf)
288+00	19	2.375
288+50	18	2.250
289+00	19	2.375
289+50	17	2.125
290+00	15	1.875

Section View:


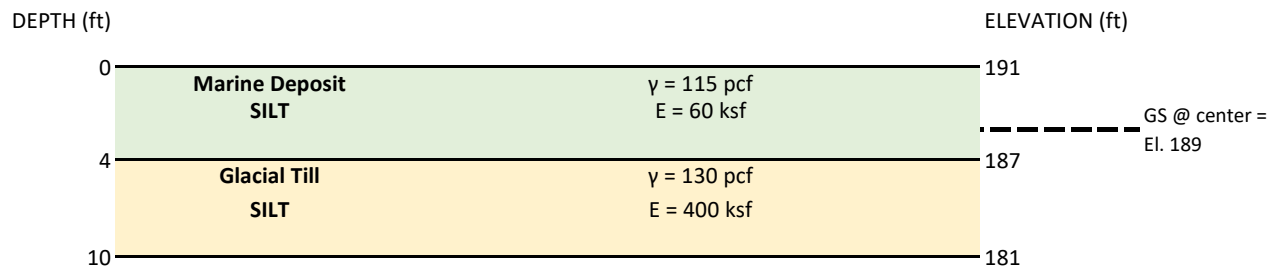
Fill over stiff cohesive material

Ground surface at center of cross section = El. 189

STA 289+00 SOIL PROFILE AND PROPERTIES (not to scale)

Based on boring BB-EWC-101

Groundwater at ground surface



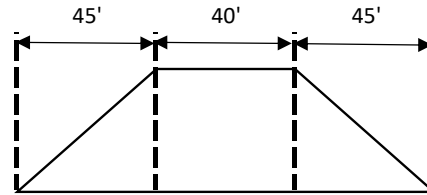
Client: Maine Department of Transportation

Project: I-395/Route 9 Connector - WIN 18915.00

Subject: Highway Settlement

STA 299+75 GEOMETRY

Station	Max. Embankment Height (ft)	Load Magnitude (ksf)
298+75	14	1.750
299+25	15	1.875
299+75	16	2.000
300+25	16	2.000
300+75	16	2.000

Section View:


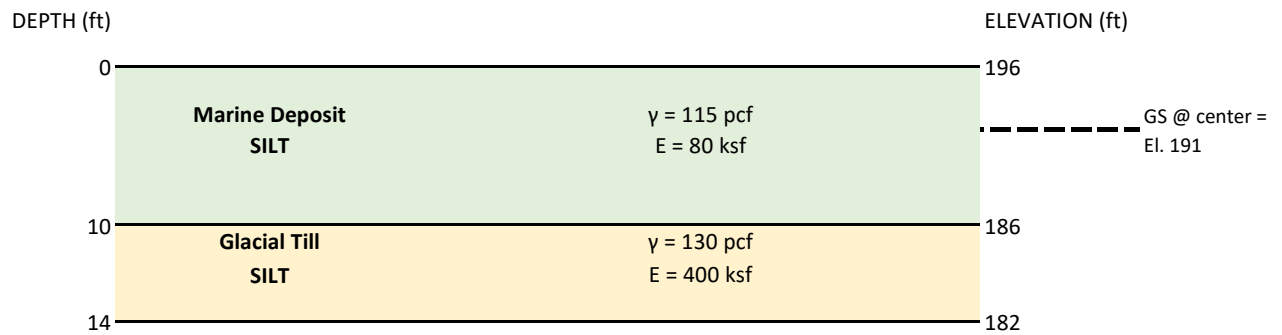
Fill over granular material

Ground surface at center of cross section = El. 191

STA 299+75 SOIL PROFILE AND PROPERTIES (not to scale)

Based on boring HB-BE-163

Groundwater depth = 4 ft



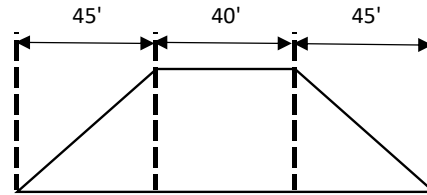
Client: Maine Department of Transportation

Project: I-395/Route 9 Connector - WIN 18915.00

Subject: Highway Settlement

STA 313+25 GEOMETRY

Station	Max. Embankment Height (ft)	Load Magnitude (ksf)
312+25	6	0.750
312+75	11	1.375
313+25	13	1.625
313+75	12	1.500
314+25	11	1.375

Section View:


Fill over granular material

Ground surface at center of cross section = El. 216

STA 313+25 SOIL PROFILE AND PROPERTIES (not to scale)

Based on boring HB-BE-166

Groundwater depth = 8 ft (based on boring HB-BE-165)

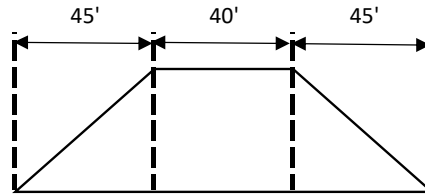
DEPTH (ft)		ELEVATION (ft)
0	Marine Deposit SAND $\gamma = 115$ pcf $E = 250$ ksf	216
5	Marine Deposit sandy SILT $\gamma = 115$ pcf $E = 75$ ksf	211
10	Glacial Till SAND $\gamma = 130$ pcf $E = 400$ ksf	206
22		194

Client: Maine Department of Transportation
 Project: I-395/Route 9 Connector - WIN 18915.00
 Subject: Highway Settlement

STA 314+50 GEOMETRY

Station	Max. Embankment Height (ft)	Load Magnitude (ksf)
313+50	12	1.500
314+00	11	1.375
314+50	12	1.500
315+00	11	1.375
315+50	10	1.250

Section View:



Fill over granular material
Ground surface at center of cross section = El. 216

STA 314+50 SOIL PROFILE AND PROPERTIES (not to scale)

Based on boring HB-BE-166
Groundwater at ground surface

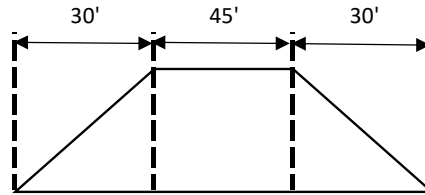
DEPTH (ft)		ELEVATION (ft)
0	Marine Deposit SAND $\gamma = 115 \text{ pcf}$ $E = 250 \text{ ksf}$	216
5	Marine Deposit SILT $\gamma = 115 \text{ pcf}$ $E = 75 \text{ ksf}$	211
10	Glacial Till SAND $\gamma = 130 \text{ pcf}$ $E = 400 \text{ ksf}$	206
22		194

Client:	Maine Department of Transportation
Project:	I-395/Route 9 Connector - WIN 18915.00
Subject:	Highway Settlement

STA 330+00 GEOMETRY

Station	Max. Embankment Height (ft)	Load Magnitude (ksf)
329+00	5	0.625
329+50	9	1.125
330+00	10	1.250
330+50	11	1.375
331+00	10	1.250

Section View:



Fill over granular material
Ground surface at center of cross section = El. 191

STA 330+00 SOIL PROFILE AND PROPERTIES (not to scale)

Based on boring HB-BE-169
Groundwater depth = 6 ft

DEPTH (ft)		ELEVATION (ft)	GS @ center = El. 191
0	Topsoil	186	
	SILT		
4	Marine Deposit	182	
	SILT		
6		180	
	Glacial Till		
	SAND		
17		169	

Client: Maine Department of Transportation

Date: 21-Jun-2021

Project: I-395/Route 9 Connector - WIN 18915.00

Computed by: EMS

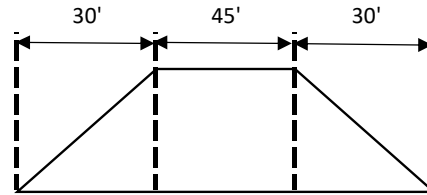
Subject: Highway Settlement

Checked by: JAD

STA 330+50 GEOMETRY

Station	Max. Embankment Height (ft)	Load Magnitude (ksf)
329+50	9	1.125
330+00	10	1.250
330+50	11	1.375
331+00	10	1.250
331+50	9	1.125

Section View:



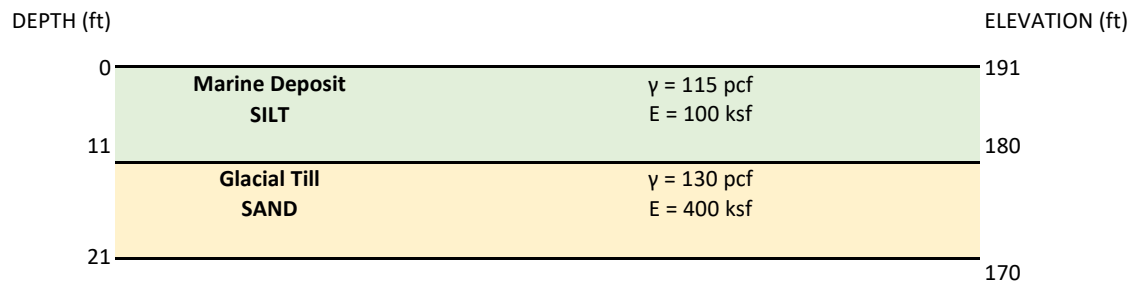
Fill over granular material

Ground surface at center of cross section = El. 191

STA 330+50 SOIL PROFILE AND PROPERTIES (not to scale)

Based on boring HB-BE-169

Groundwater depth = 8 ft



Client: Maine Department of Transportation

Date: 21-Jun-2021

Project: I-395/Route 9 Connector - WIN 18915.00

Computed by: EMS

Subject: Highway Settlement

Checked by: JAD

SUMMARY OF RESULTS

Station	Elastic Settlement (in.)	Primary Consolidation Settlement (in.)	Secondary Consolidation Settlement (in.)	Total Settlement (in.)
48+25	0.8	0.0	0.0	0.8
53+25	0.0	17.9	1.9	19.8
84+50	0.6	1.8	1.3	3.7
130+50	0.6	0.0	0.0	0.6
140+00	0.4	7.8	1.9	10.1
145+00	0.6	0.4	0.7	1.7
167+50	0.0	2.3	0.4	2.7
180+50	0.2	19.0	2.0	21.2
195+50	2.8	0.0	0.0	2.8
201+00	1.7	0.0	0.0	1.7
262+75	0.1	0.0	0.0	0.1
275+00	3.9	0.0	0.0	3.9
275+75	3.5	0.0	0.0	3.5
280+75	0.4	0.0	0.0	0.4
289+00	1.3	0.0	0.0	1.3
299+75	1.7	0.0	0.0	1.7
313+25	1.9	0.0	0.0	1.9
314+50	1.8	0.0	0.0	1.8
330+00	1.5	0.0	0.0	1.5
330+50	2.0	0.0	0.0	2.0

Sta. 48+25

Settle3D Analysis Information

I-395 Route 9 Connector - WIN 18915.00

Project Settings

Document Name	2020-0604-Sta 4825 Settlement.s3z
Project Title	I-395 Route 9 Connector - WIN 18915.00
Analysis	Sta. 48+25
Author	EMS
Date Created	5/22/2020, 8:16:09 AM
Stress Computation Method	Westergaard
Time-dependent Consolidation Analysis	
Time Units	months
Permeability Units	feet/second
Minimum settlement ratio for subgrade modulus	0.9

Use average properties to calculate layered stresses

Improve consolidation accuracy

Ignore negative effective stresses in settlement calculations

Stage Settings

Stage #	Name	Time [months]
1	Initial	0
2	75 Years	900

Results

Time taken to compute: 0.229665 seconds

Stage: Initial = 0 mon

Data Type	Minimum	Maximum
Total Settlement [in]	0	0.793794
Total Consolidation Settlement [in]	0	0
Virgin Consolidation Settlement [in]	0	0
Recompression Consolidation Settlement [in]	0	0
Immediate Settlement [in]	0	0.793794
Secondary Settlement [in]	0	0
Loading Stress ZZ [ksf]	-1.64282e-011	0.98125
Loading Stress XX [ksf]	0	0
Loading Stress YY [ksf]	0	0
Effective Stress ZZ [ksf]	-1.64282e-011	2.58595
Effective Stress XX [ksf]	0	2.268
Effective Stress YY [ksf]	0	2.268
Total Stress ZZ [ksf]	-1.64282e-011	4.45795
Total Stress XX [ksf]	0	4.14
Total Stress YY [ksf]	0	4.14
Modulus of Subgrade Reaction (Total) [ksf/ft]	-1.33729e-009	14.9874
Modulus of Subgrade Reaction (Immediate) [ksf/ft]	-1.33729e-009	14.9874
Modulus of Subgrade Reaction (Consolidation) [ksf/ft]	0	0
Total Strain	2.69276e-006	0.0037546
Pore Water Pressure [ksf]	0	1.872
Excess Pore Water Pressure [ksf]	0	0
Degree of Consolidation [%]	0	0
Pre-consolidation Stress [ksf]	0.546275	4.94525
Over-consolidation Ratio	1	770.809
Void Ratio	0	0
Permeability [ft/s]	0	0
Coefficient of Consolidation [ft ² /s]	0	0
Hydroconsolidation Settlement [in]	0	0
Average Degree of Consolidation [%]	0	0
Undrained Shear Strength	0	0.0469688

Stage: 75 Years = 900 mon

Data Type	Minimum	Maximum
Total Settlement [in]	0	0.793794
Total Consolidation Settlement [in]	0	0
Virgin Consolidation Settlement [in]	0	0
Recompression Consolidation Settlement [in]	0	0
Immediate Settlement [in]	0	0.793794
Secondary Settlement [in]	0	0
Loading Stress ZZ [ksf]	-1.64282e-011	0.98125
Loading Stress XX [ksf]	0	0
Loading Stress YY [ksf]	0	0
Effective Stress ZZ [ksf]	-1.64282e-011	2.58595
Effective Stress XX [ksf]	0	2.268
Effective Stress YY [ksf]	0	2.268
Total Stress ZZ [ksf]	-1.64282e-011	4.45795
Total Stress XX [ksf]	0	4.14
Total Stress YY [ksf]	0	4.14
Modulus of Subgrade Reaction (Total) [ksf/ft]	-1.33729e-009	14.9874
Modulus of Subgrade Reaction (Immediate) [ksf/ft]	-1.33729e-009	14.9874
Modulus of Subgrade Reaction (Consolidation) [ksf/ft]	0	0
Total Strain	2.69276e-006	0.0037546
Pore Water Pressure [ksf]	0	1.872
Excess Pore Water Pressure [ksf]	0	0
Degree of Consolidation [%]	0	0
Pre-consolidation Stress [ksf]	0.546275	4.94525
Over-consolidation Ratio	1	770.809
Void Ratio	0	0
Permeability [ft/s]	0	0
Coefficient of Consolidation [ft ² /s]	0	0
Hydroconsolidation Settlement [in]	0	0
Average Degree of Consolidation [%]	0	0
Undrained Shear Strength	0	0.0469688

Loads

1. Rectangular Load: "Rectangular Load 1"

Length 50 ft
 Width 30 ft
 Rotation angle 0 degrees
 Load Type Flexible
 Area of Load 1500 ft²
 Depth 0 ft
 Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
0	5	0
50	5	0
50	35	0.625
0	35	0.25

2. Rectangular Load: "Rectangular Load 2"

Length 50 ft
 Width 45 ft
 Rotation angle 0 degrees
 Load Type Flexible
 Area of Load 2250 ft²
 Depth 0 ft
 Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
-1.06581e-014	35	0.25
50	35	0.625
50	80	0.625
-1.06581e-014	80	0.25

3. Rectangular Load: "Rectangular Load 3"

Length 50 ft
 Width 30 ft
 Rotation angle 0 degrees
 Load Type Flexible
 Area of Load 1500 ft²
 Depth 0 ft
 Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
1.06581e-014	80	0.25
50	80	0.625
50	110	0
1.06581e-014	110	0

4. Rectangular Load: "Rectangular Load 4"

Length 50 ft
 Width 30 ft
 Rotation angle 0 degrees
 Load Type Flexible
 Area of Load 1500 ft²
 Depth 0 ft
 Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
50	5	0
100	5	0
100	35	1
50	35	0.625

5. Rectangular Load: "Rectangular Load 5"

Length 50 ft
 Width 45 ft
 Rotation angle 0 degrees
 Load Type Flexible
 Area of Load 2250 ft²
 Depth 0 ft
 Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
50	35	0.625
100	35	1
100	80	1
50	80	0.625

6. Rectangular Load: "Rectangular Load 6"

Length 50 ft
Width 30 ft
Rotation angle 0 degrees
Load Type Flexible
Area of Load 1500 ft²
Depth 0 ft
Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
50	80	0.625
100	80	1
100	110	0
50	110	0

7. Rectangular Load: "Rectangular Load 7"

Length 50 ft
Width 30 ft
Rotation angle 0 degrees
Load Type Flexible
Area of Load 1500 ft²
Depth 0 ft
Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
100	5	0
150	5	0
150	35	0
100	35	1

8. Rectangular Load: "Rectangular Load 8"

Length 50 ft
Width 45 ft
Rotation angle 0 degrees
Load Type Flexible
Area of Load 2250 ft²
Depth 0 ft
Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
100	35	1
150	35	0
150	80	0
100	80	1

9. Rectangular Load: "Rectangular Load 9"

Length 50 ft
 Width 30 ft
 Rotation angle 0 degrees
 Load Type Flexible
 Area of Load 1500 ft²
 Depth 0 ft
 Installation Stage Initial = 0 mon

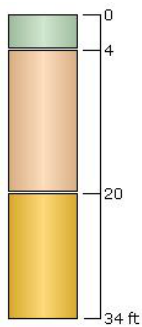
Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
100	80	1
150	80	0
150	110	0
100	110	0




Soil Layers

Ground Surface Drained: Yes

Layer #	Type	Thickness [ft]	Depth [ft]	Drained at Bottom
1	Fill SAND	4	0	No
2	Marine Deposit SILT	16	4	Yes
3	Glacial Till SILT	14	20	No



Soil Properties

Property	Fill SAND	Marine Deposit SILT	Glacial Till SILT
Color			
Unit Weight [kips/ft ³]	0.12	0.115	0.13
Saturated Unit Weight [kips/ft ³]	0.12	0.115	0.13
K0	1	1	1
Immediate Settlement	Enabled	Enabled	Enabled
Es [ksf]	600	225	400
E _{sur} [ksf]	600	225	400
B-bar	-	-	-
Undrained Su A [kips/ft ²]	0	0	0
Undrained Su S	0.2	0.2	0.2
Undrained Su m	0.8	0.8	0.8
Piezo Line ID	1	1	1

Groundwater

Groundwater method Piezometric Lines
Water Unit Weight 0.0624 kips/ft³

Piezometric Line Entities

ID	Depth (ft)
1	4 ft


Query Lines

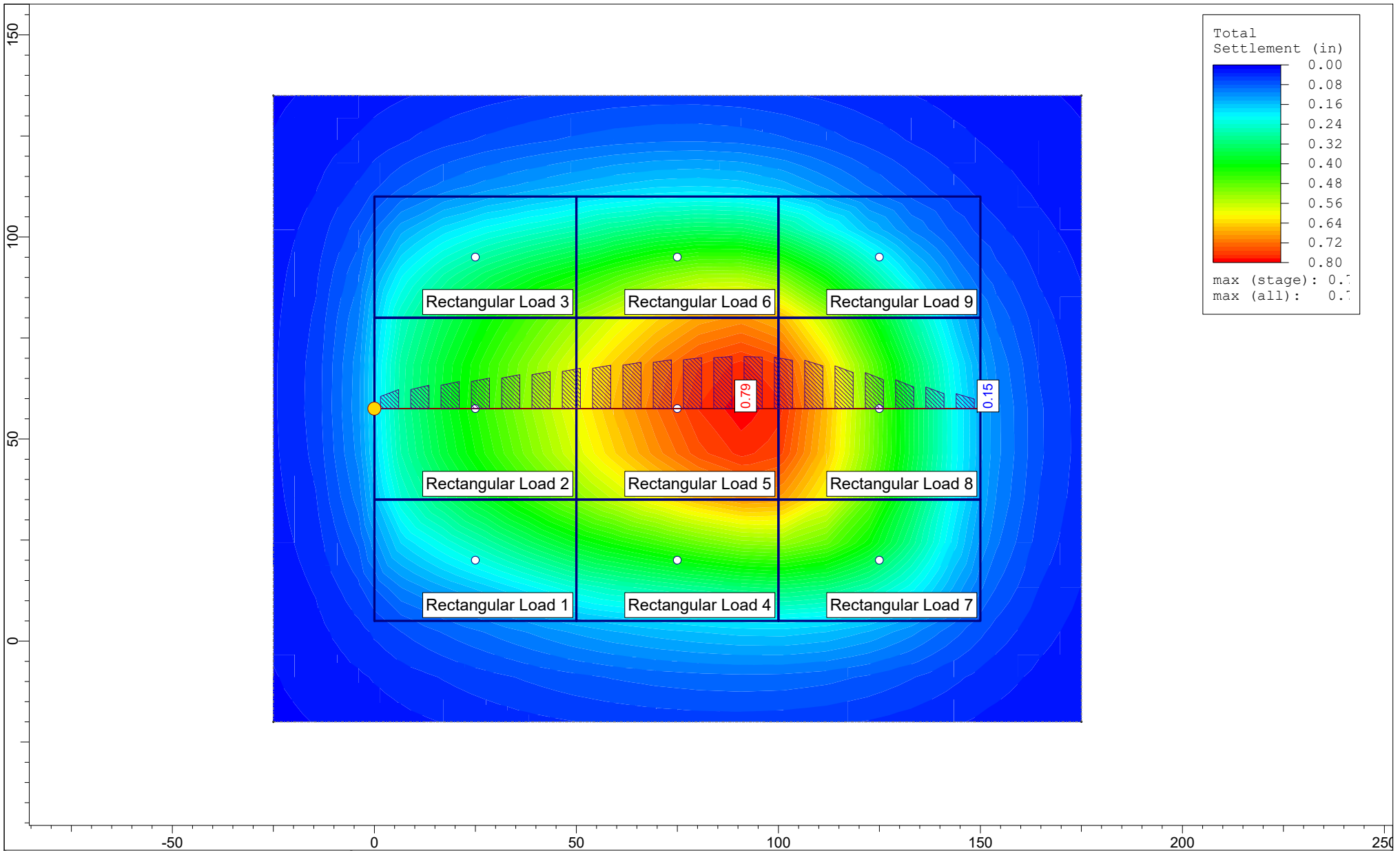
Line #	Query Line Name	Start Location	End Location	Horizontal Divisions	Vertical Divisions
1	Query Line 1	0, 57.5	150, 57.5	20	Auto: 47

Time Points

Point #	(X,Y) Location	Depth	Goal Type	Goal	Time Until Goal
1	134.794, 63.106	0 ft	Degree of Consolidation	95%	-1 mon

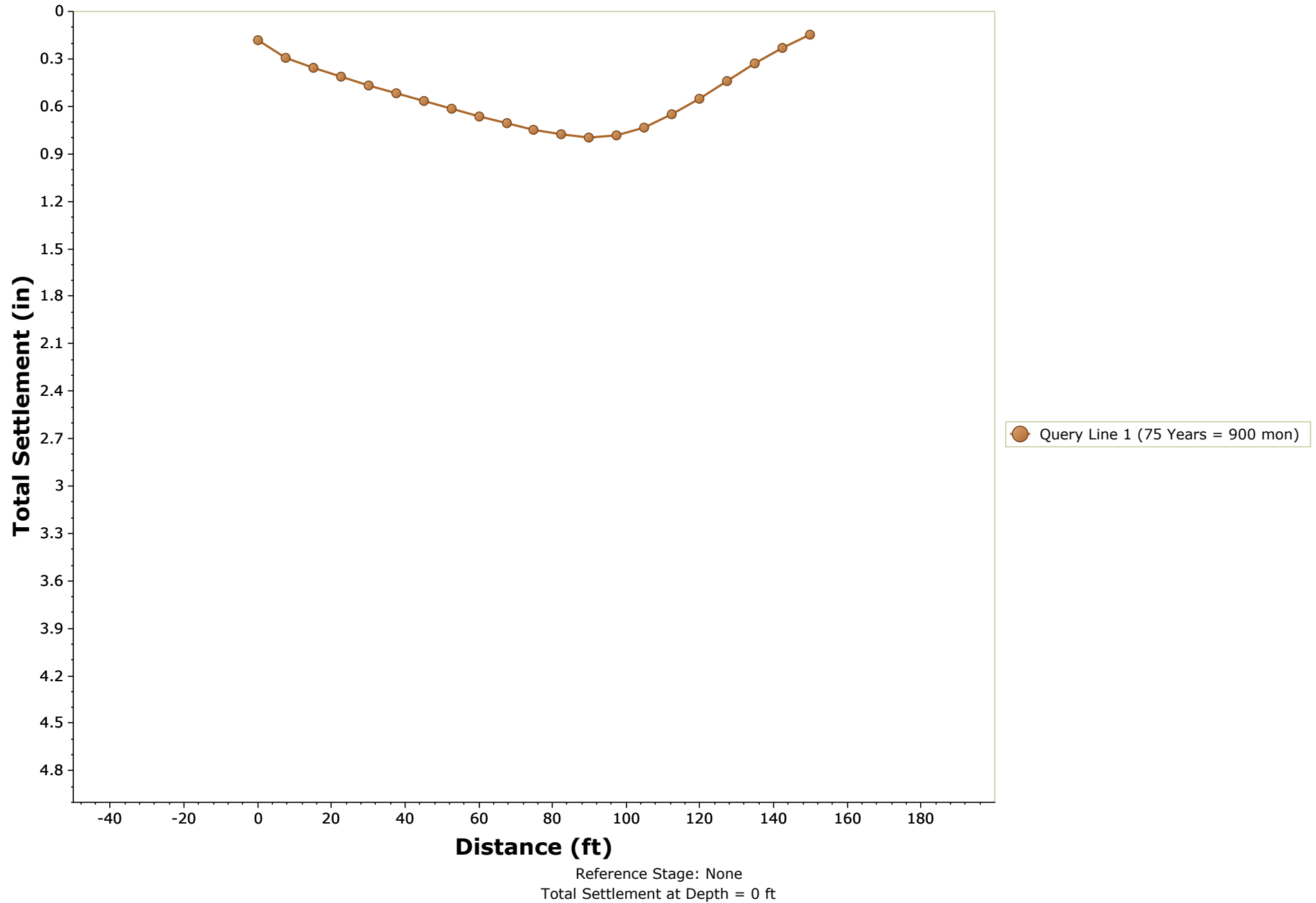


	Project		I-395 Route 9 Connector - WIN 18915.00	
	Analysis Description		Sta. 48+25	
	Drawn By		EMS	Company
	Date		5/22/2020, 8:16:09 AM	File Name
SETTLE3D 4.010		2020-0604-Sta 4825 Settlement.s3z		



Project	I-395 Route 9 Connector - WIN 18915.00		
Analysis Description	Sta. 48+25		
Drawn By	EMS	Company	
Date	5/22/2020, 8:16:09 AM	File Name	2020-0604-Sta 4825 Settlement.s3z

Distance vs. Total Settlement



Sta. 53+25

Settle3 Analysis Information

I-395 Route 9 Connector - WIN 18915.00

Project Settings

Document Name	2020-0618-Sta 5325 Settlement-D2.s3z
Project Title	I-395 Route 9 Connector - WIN 18915.00
Analysis	Sta. 53+25
Author	EMS
Date Created	5/22/2020, 8:16:09 AM
Stress Computation Method	Westergaard
Time-dependent Consolidation Analysis	
Time Units	months
Permeability Units	feet/second
Minimum settlement ratio for subgrade modulus	0.9

Use average properties to calculate layered stresses

Improve consolidation accuracy

Ignore negative effective stresses in settlement calculations

Stage Settings

Stage #	Name	Time [months]
1	Initial	0
2	95% Consolidation	54
3	75 Years	900

Results

Time taken to compute: 0.654463 seconds

Stage: Initial = 0 mon

Data Type	Minimum	Maximum
Total Settlement [in]	0	1.41234
Total Consolidation Settlement [in]	0	1.38978
Virgin Consolidation Settlement [in]	0	0
Recompression Consolidation Settlement [in]	0	1.38978
Immediate Settlement [in]	0	0.0226945
Secondary Settlement [in]	0	0
Loading Stress ZZ [ksf]	0.493652	2.625
Loading Stress XX [ksf]	0	0
Loading Stress YY [ksf]	0	0
Effective Stress ZZ [ksf]	0.345	2.8073
Effective Stress XX [ksf]	0	2.539
Effective Stress YY [ksf]	0	2.539
Total Stress ZZ [ksf]	0.5	6.22673
Total Stress XX [ksf]	0	6.22673
Total Stress YY [ksf]	0	6.22673
Modulus of Subgrade Reaction (Total) [ksf/ft]	0	22.3035
Modulus of Subgrade Reaction (Immediate) [ksf/ft]	0	1791.26
Modulus of Subgrade Reaction (Consolidation) [ksf/ft]	0	22.6655
Total Strain	0	0.0655153
Pore Water Pressure [ksf]	0	3.68773
Excess Pore Water Pressure [ksf]	0	2.48356
Degree of Consolidation [%]	0	10.1925
Pre-consolidation Stress [ksf]	1.08377	4.94875
Over-consolidation Ratio	1	12.8211
Void Ratio	-0.0655153	4.33947e-018
Permeability [ft/s]	0	1.4155e-007
Coefficient of Consolidation [ft^2/s]	0	3e-006
Hydroconsolidation Settlement [in]	0	0
Average Degree of Consolidation [%]	0	0
Undrained Shear Strength	-5.55112e-017	0

Stage: 95% Consolidation = 54 mon

Data Type	Minimum	Maximum
Total Settlement [in]	0	16.9351
Total Consolidation Settlement [in]	0	16.9124
Virgin Consolidation Settlement [in]	0	12.5234
Recompression Consolidation Settlement [in]	0	4.40287
Immediate Settlement [in]	0	0.0226945
Secondary Settlement [in]	0	0
Loading Stress ZZ [ksf]	0.493652	2.625
Loading Stress XX [ksf]	0	0
Loading Stress YY [ksf]	0	0
Effective Stress ZZ [ksf]	0.5	3.73073
Effective Stress XX [ksf]	0	3.73073
Effective Stress YY [ksf]	0	3.73073
Total Stress ZZ [ksf]	0.5	6.22673
Total Stress XX [ksf]	0	6.22673
Total Stress YY [ksf]	0	6.22673
Modulus of Subgrade Reaction (Total) [ksf/ft]	0	2.08644
Modulus of Subgrade Reaction (Immediate) [ksf/ft]	0	1791.26
Modulus of Subgrade Reaction (Consolidation) [ksf/ft]	0	2.08904
Total Strain	0.000123486	0.0707251
Pore Water Pressure [ksf]	0	2.496
Excess Pore Water Pressure [ksf]	0	0.19468
Degree of Consolidation [%]	0	99.983
Pre-consolidation Stress [ksf]	1.63513	4.94875
Over-consolidation Ratio	1	9.45764
Void Ratio	-0.0707251	0
Permeability [ft/s]	0	1.4155e-007
Coefficient of Consolidation [ft^2/s]	0	3e-006
Hydroconsolidation Settlement [in]	0	0
Average Degree of Consolidation [%]	0	96.549
Undrained Shear Strength	0	0.117285

Stage: 75 Years = 900 mon

Data Type	Minimum	Maximum
Total Settlement [in]	0	19.8202
Total Consolidation Settlement [in]	0	17.9352
Virgin Consolidation Settlement [in]	0	13.5024
Recompression Consolidation Settlement [in]	0	4.4465
Immediate Settlement [in]	0	0.0226945
Secondary Settlement [in]	0	1.93119
Loading Stress ZZ [ksf]	0.493652	2.625
Loading Stress XX [ksf]	0	0
Loading Stress YY [ksf]	0	0
Effective Stress ZZ [ksf]	0.5	3.73073
Effective Stress XX [ksf]	0	3.73073
Effective Stress YY [ksf]	0	3.73073
Total Stress ZZ [ksf]	0.5	6.22673
Total Stress XX [ksf]	0	6.22673
Total Stress YY [ksf]	0	6.22673
Modulus of Subgrade Reaction (Total) [ksf/ft]	0	1.72804
Modulus of Subgrade Reaction (Immediate) [ksf/ft]	0	1791.26
Modulus of Subgrade Reaction (Consolidation) [ksf/ft]	0	1.97845
Total Strain	0.000123486	0.0799642
Pore Water Pressure [ksf]	0	2.496
Excess Pore Water Pressure [ksf]	-0.00389821	0.00380316
Degree of Consolidation [%]	0	100
Pre-consolidation Stress [ksf]	1.68333	4.94875
Over-consolidation Ratio	1	9.45764
Void Ratio	-0.0799642	0
Permeability [ft/s]	0	1.4155e-007
Coefficient of Consolidation [ft ² /s]	0	3e-006
Hydroconsolidation Settlement [in]	0	0
Average Degree of Consolidation [%]	0	100
Undrained Shear Strength	0	0.124483

Loads

1. Rectangular Load: "Rectangular Load 1"

Length 50 ft
 Width 40 ft
 Rotation angle 0 degrees
 Load Type Flexible
 Area of Load 2000 ft²
 Depth 0 ft
 Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
3.55271e-015	0	0
50	0	0
50	40	2.375
3.55271e-015	40	1

2. Rectangular Load: "Rectangular Load 2"

Length 50 ft
Width 60 ft
Rotation angle 0 degrees
Load Type Flexible
Area of Load 3000 ft²
Depth 0 ft
Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
0	40	1
50	40	2.375
50	100	2.375
0	100	1

3. Rectangular Load: "Rectangular Load 3"

Length 50 ft
Width 40 ft
Rotation angle 0 degrees
Load Type Flexible
Area of Load 2000 ft²
Depth 0 ft
Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
3.55271e-015	100	1
50	100	2.375
50	140	0
3.55271e-015	140	0

4. Rectangular Load: "Rectangular Load 4"

Length 50 ft
Width 40 ft
Rotation angle 0 degrees
Load Type Flexible
Area of Load 2000 ft²
Depth 0 ft
Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
50	-3.55271e-015	0
100	-3.55271e-015	0
100	40	2.625
50	40	2.375

5. Rectangular Load: "Rectangular Load 5"

Length 50 ft
Width 60 ft
Rotation angle 0 degrees
Load Type Flexible
Area of Load 3000 ft²
Depth 0 ft
Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
50	40	2.375
100	40	2.625
100	100	2.625
50	100	2.375

6. Rectangular Load: "Rectangular Load 6"

Length 50 ft
Width 40 ft
Rotation angle 0 degrees
Load Type Flexible
Area of Load 2000 ft²
Depth 0 ft
Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
50	100	2.375
100	100	2.625
100	140	0
50	140	0

7. Rectangular Load: "Rectangular Load 7"

Length 50 ft
Width 40 ft
Rotation angle 0 degrees
Load Type Flexible
Area of Load 2000 ft²
Depth 0 ft
Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
100	0	0
150	0	0
150	40	2.375
100	40	2.625

8. Rectangular Load: "Rectangular Load 10"

Length 50 ft
Width 40 ft
Rotation angle 0 degrees
Load Type Flexible
Area of Load 2000 ft²
Depth 0 ft
Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
150	3.55271e-015	0
200	3.55271e-015	0
200	40	2.25
150	40	2.375

9. Rectangular Load: "Rectangular Load 8"

Length 50 ft
Width 60 ft
Rotation angle 0 degrees
Load Type Flexible
Area of Load 3000 ft²
Depth 0 ft
Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
100	40	2.625
150	40	2.375
150	100	2.375
100	100	2.625

10. Rectangular Load: "Rectangular Load 9"

Length 50 ft
Width 40 ft
Rotation angle 0 degrees
Load Type Flexible
Area of Load 2000 ft²
Depth 0 ft
Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
100	100	2.625
150	100	2.375
150	140	0
100	140	0

11. Rectangular Load: "Rectangular Load 11"

Length 50 ft
Width 60 ft
Rotation angle 0 degrees
Load Type Flexible
Area of Load 3000 ft²
Depth 0 ft
Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
150	40	2.375
200	40	2.25
200	100	2.25
150	100	2.375

12. Rectangular Load: "Rectangular Load 12"

Length 50 ft
Width 40 ft
Rotation angle 0 degrees
Load Type Flexible
Area of Load 2000 ft²
Depth 0 ft
Installation Stage Initial = 0 mon

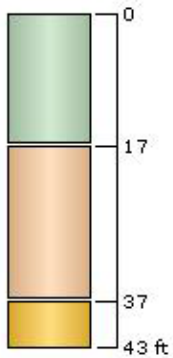
Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
150	100	2.375
200	100	2.25
200	140	0
150	140	0




Soil Layers

Ground Surface Drained: Yes

Layer #	Type	Thickness [ft]	Depth [ft]	Drained at Bottom
1	Marine Deposit CLAY above el 65	17	0	No
2	Marine Deposit CLAY below el 65	20	17	Yes
3	Glacial Till GRAVEL	6	37	No



Soil Properties

Property	Marine Deposit CLAY above el 65	Marine Deposit CLAY below el 65	Glacial Till GRAVEL
Color			
Unit Weight [kips/ft ³]	0.115	0.115	0.13
Saturated Unit Weight [kips/ft ³]	0.115	0.115	0.13
K0	1	1	1
Immediate Settlement	Disabled	Disabled	Enabled
Es [ksf]	-	-	4000
Esur [ksf]	-	-	4000
Primary Consolidation	Enabled	Enabled	Disabled
Material Type	Non-Linear	Non-Linear	
Cce	0.17	0.17	-
Cre	0.03	0.03	-
e0	0	0	-
Pc [ksf] top	4.975	-	-
Pc [ksf] bottom	2	-	-
OCR	-	1	-
Cv [ft ² /s]	3e-006	3e-006	-
Cvr [ft ² /s]	3e-006	3e-006	-
B-bar	1	1	-
Secondary Consolidation	Standard	Standard	Disabled
Cae	0.004	0.004	-
Care	0.004	0.004	-
Undrained Su A [kips/ft ²]	0	0	0
Undrained Su S	0.2	0.2	0.2
Undrained Su m	0.8	0.8	0.8
Piezo Line ID	1	1	1

Groundwater

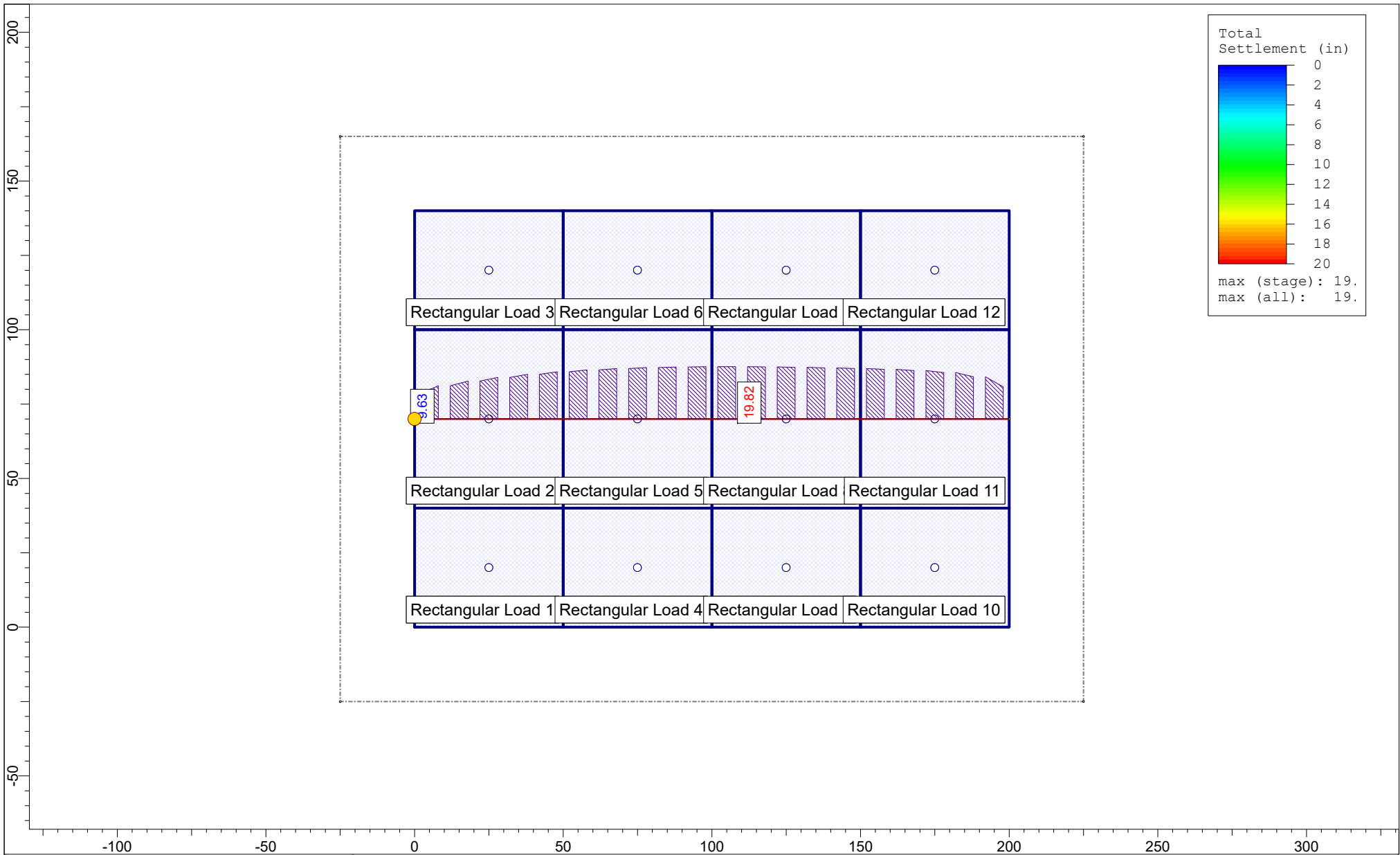
Groundwater method Piezometric Lines
 Water Unit Weight 0.0624 kips/ft³


Piezometric Line Entities

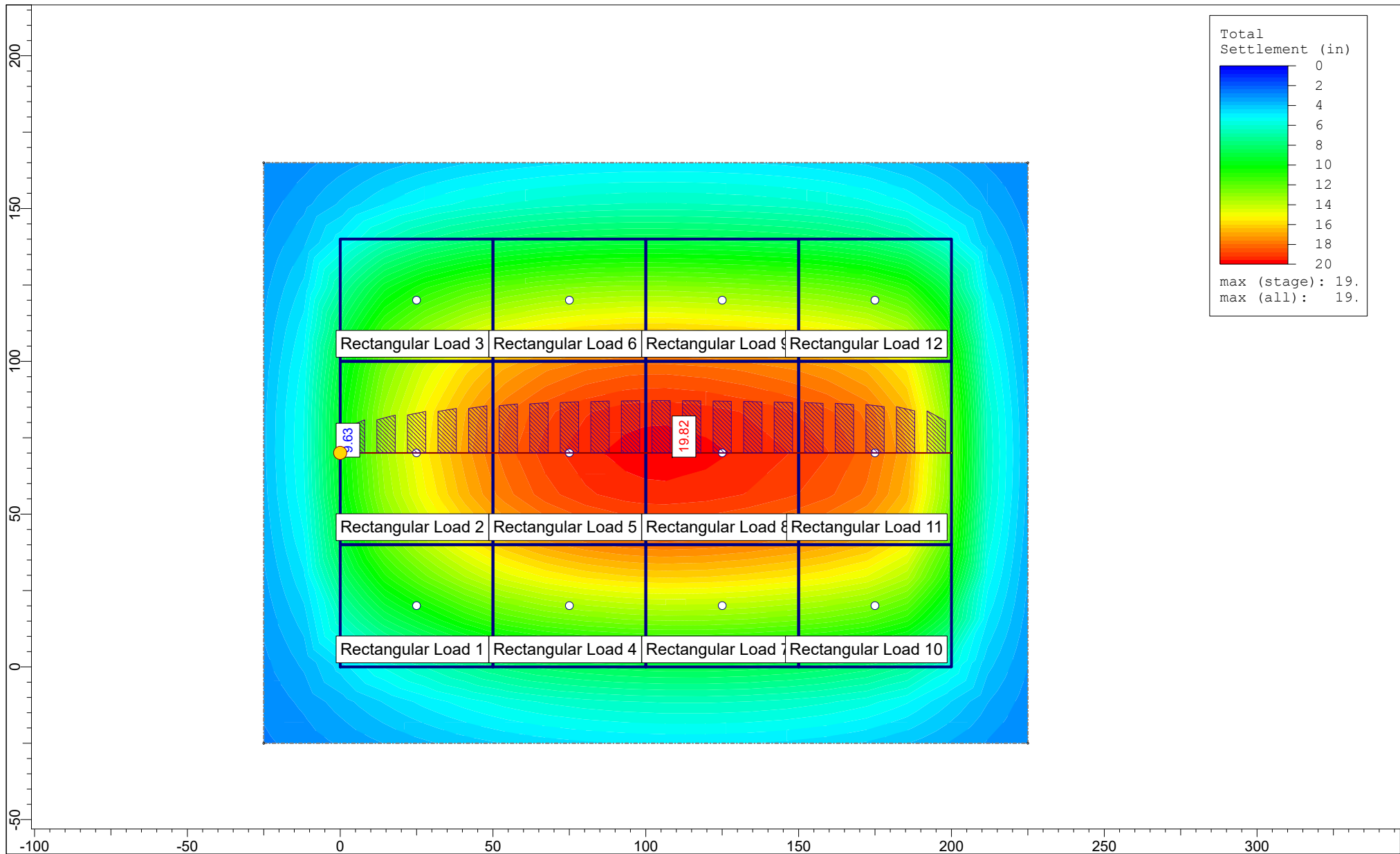
ID	Depth (ft)
1	3 ft

Query Lines

Line #	Query Line Name	Start Location	End Location	Horizontal Divisions	Vertical Divisions
1	Query Line 1	0, 70	200, 70	20	Auto: 53

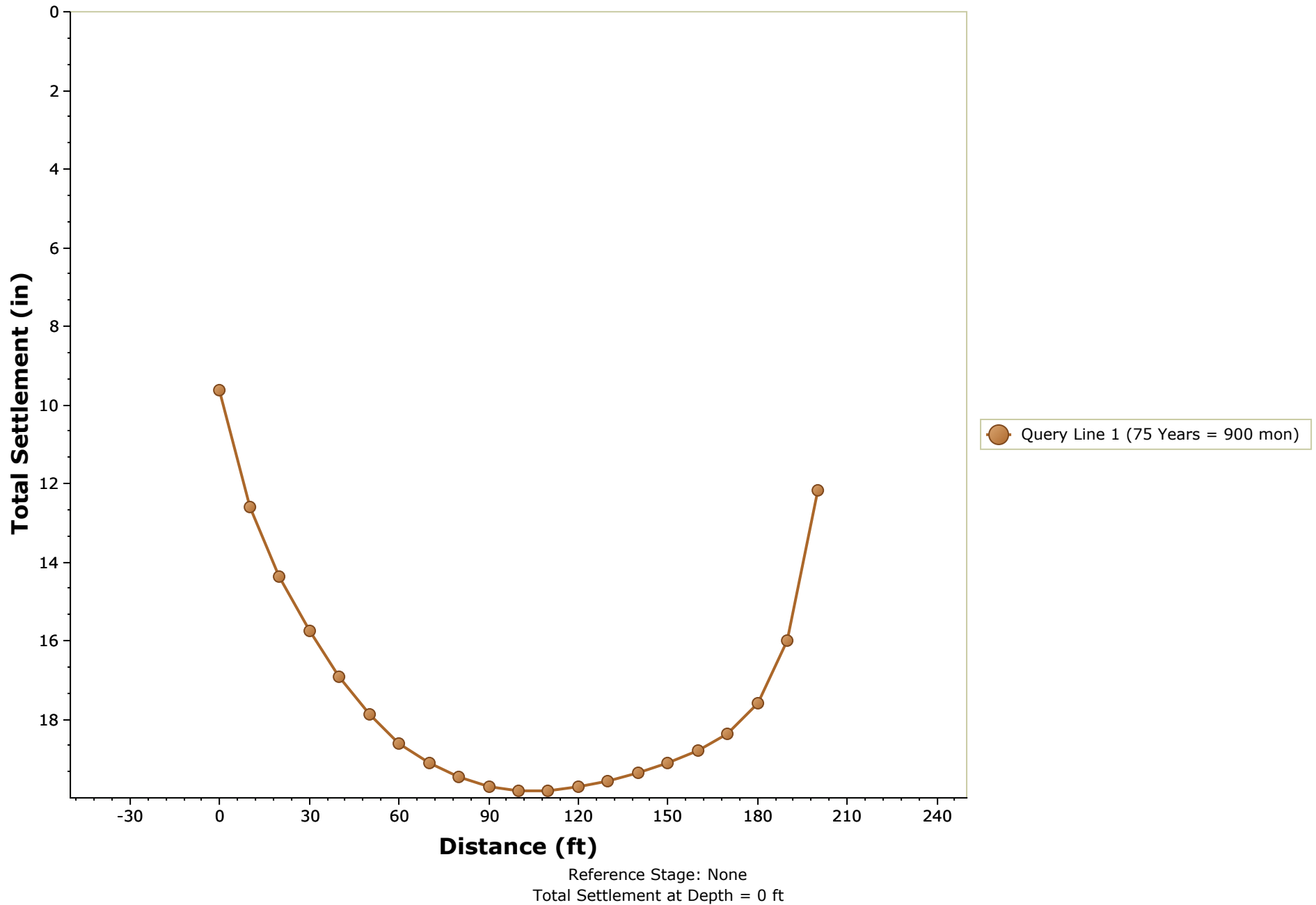


	Project		I-395 Route 9 Connector - WIN 18915.00	
	Analysis Description		Sta. 53+25	
	Drawn By		EMS	Company
	Date		5/22/2020, 8:16:09 AM	File Name
SETTLE3 5.002		2020-0618-Sta 5325 Settlement-D2.s3z		



Project	I-395 Route 9 Connector - WIN 18915.00		
Analysis Description	Sta. 53+25		
Drawn By	EMS	Company	
Date	5/22/2020, 8:16:09 AM	File Name	2020-0618-Sta 5325 Settlement-D2.s3z

Distance vs. Total Settlement



Sta. 84+50

Settle3D Analysis Information

I-395 Route 9 Connector - WIN 18915.00

Project Settings

Document Name	2020-0604-Sta 8450 Settlement-D2.s3z
Project Title	I-395 Route 9 Connector - WIN 18915.00
Analysis	Sta. 84+50
Author	EMS
Date Created	5/22/2020, 8:16:09 AM
Stress Computation Method	Westergaard
Time-dependent Consolidation Analysis	
Time Units	months
Permeability Units	feet/second
Minimum settlement ratio for subgrade modulus	0.9

Use average properties to calculate layered stresses

Improve consolidation accuracy

Ignore negative effective stresses in settlement calculations

Stage Settings

Stage #	Name	Time [months]
1	Initial	0
2	95% Consolidation	4
3	75 Years	900

Results

Time taken to compute: 0.516913 seconds

Stage: Initial = 0 mon

Data Type	Minimum	Maximum
Total Settlement [in]	0	0.629184
Total Consolidation Settlement [in]	0	0
Virgin Consolidation Settlement [in]	0	0
Recompression Consolidation Settlement [in]	0	0
Immediate Settlement [in]	0	0.629184
Secondary Settlement [in]	0	0
Loading Stress ZZ [ksf]	0.230651	1.25
Loading Stress XX [ksf]	0	0
Loading Stress YY [ksf]	0	0
Effective Stress ZZ [ksf]	0.345	1.8776
Effective Stress XX [ksf]	0	1.8776
Effective Stress YY [ksf]	0	1.8776
Total Stress ZZ [ksf]	0.375	4.07308
Total Stress XX [ksf]	0	4.07308
Total Stress YY [ksf]	0	4.07308
Modulus of Subgrade Reaction (Total) [ksf/ft]	0	26.1909
Modulus of Subgrade Reaction (Immediate) [ksf/ft]	0	26.1909
Modulus of Subgrade Reaction (Consolidation) [ksf/ft]	0	0
Total Strain	0	0.0124835
Pore Water Pressure [ksf]	0	2.19548
Excess Pore Water Pressure [ksf]	0	1.14005
Degree of Consolidation [%]	0	0
Pre-consolidation Stress [ksf]	0.979751	5.32028
Over-consolidation Ratio	1	15.358
Void Ratio	-2.89298e-018	2.89298e-018
Permeability [ft/s]	0	7.04853e-009
Coefficient of Consolidation [ft ² /s]	0	3e-006
Hydroconsolidation Settlement [in]	0	0
Average Degree of Consolidation [%]	0	0
Undrained Shear Strength	0	0

Stage: 95% Consolidation = 4 mon

Data Type	Minimum	Maximum
Total Settlement [in]	0	2.31132
Total Consolidation Settlement [in]	0	1.68213
Virgin Consolidation Settlement [in]	0	0
Recompression Consolidation Settlement [in]	0	1.68213
Immediate Settlement [in]	0	0.629184
Secondary Settlement [in]	0	0
Loading Stress ZZ [ksf]	0.230651	1.25
Loading Stress XX [ksf]	0	0
Loading Stress YY [ksf]	0	0
Effective Stress ZZ [ksf]	0.375	2.45068
Effective Stress XX [ksf]	0	2.45068
Effective Stress YY [ksf]	0	2.45068
Total Stress ZZ [ksf]	0.375	4.07308
Total Stress XX [ksf]	0	4.07308
Total Stress YY [ksf]	0	4.07308
Modulus of Subgrade Reaction (Total) [ksf/ft]	0	6.8267
Modulus of Subgrade Reaction (Immediate) [ksf/ft]	0	26.1909
Modulus of Subgrade Reaction (Consolidation) [ksf/ft]	0	8.91726
Total Strain	0.00028837	0.0189638
Pore Water Pressure [ksf]	0	1.6224
Excess Pore Water Pressure [ksf]	0	0.124716
Degree of Consolidation [%]	0	99.9577
Pre-consolidation Stress [ksf]	1.27665	5.32028
Over-consolidation Ratio	1	13.0684
Void Ratio	-0.0189937	0
Permeability [ft/s]	0	7.04853e-009
Coefficient of Consolidation [ft ² /s]	0	3e-006
Hydroconsolidation Settlement [in]	0	0
Average Degree of Consolidation [%]	0	92.0504
Undrained Shear Strength	0	0.0470685

Stage: 75 Years = 900 mon

Data Type	Minimum	Maximum
Total Settlement [in]	0	3.69632
Total Consolidation Settlement [in]	0	1.77187
Virgin Consolidation Settlement [in]	0	0
Recompression Consolidation Settlement [in]	0	1.77187
Immediate Settlement [in]	0	0.629184
Secondary Settlement [in]	0	1.29632
Loading Stress ZZ [ksf]	0.230651	1.25
Loading Stress XX [ksf]	0	0
Loading Stress YY [ksf]	0	0
Effective Stress ZZ [ksf]	0.375	2.45068
Effective Stress XX [ksf]	0	2.45068
Effective Stress YY [ksf]	0	2.45068
Total Stress ZZ [ksf]	0.375	4.07308
Total Stress XX [ksf]	0	4.07308
Total Stress YY [ksf]	0	4.07308
Modulus of Subgrade Reaction (Total) [ksf/ft]	0	4.12953
Modulus of Subgrade Reaction (Immediate) [ksf/ft]	0	26.1909
Modulus of Subgrade Reaction (Consolidation) [ksf/ft]	0	8.46565
Total Strain	0.00028837	0.0283414
Pore Water Pressure [ksf]	0	1.6224
Excess Pore Water Pressure [ksf]	-4.22035e-018	5.25799e-018
Degree of Consolidation [%]	0	100
Pre-consolidation Stress [ksf]	1.27665	5.32028
Over-consolidation Ratio	1	13.0684
Void Ratio	-0.0283683	0
Permeability [ft/s]	0	7.04853e-009
Coefficient of Consolidation [ft ² /s]	0	3e-006
Hydroconsolidation Settlement [in]	0	0
Average Degree of Consolidation [%]	0	100
Undrained Shear Strength	0	0.0470685

Loads

1. Rectangular Load: "Rectangular Load 1"

Length 50 ft
 Width 30 ft
 Rotation angle 0 degrees
 Load Type Flexible
 Area of Load 1500 ft²
 Depth 0 ft
 Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
0	5	0
50	5	0
50	35	0.875
0	35	0.875

2. Rectangular Load: "Rectangular Load 2"

Length 50 ft
 Width 40 ft
 Rotation angle 0 degrees
 Load Type Flexible
 Area of Load 2000 ft²
 Depth 0 ft
 Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
5.32907e-014	35	0.875
50	35	0.875
50	75	0.875
5.32907e-014	75	0.875

3. Rectangular Load: "Rectangular Load 3"

Length 50 ft
 Width 40 ft
 Rotation angle 0 degrees
 Load Type Flexible
 Area of Load 2000 ft²
 Depth 0 ft
 Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
1.42109e-014	75	0.875
50	75	0.875
50	115	0
1.42109e-014	115	0

4. Rectangular Load: "Rectangular Load 4"

Length 50 ft
 Width 30 ft
 Rotation angle 0 degrees
 Load Type Flexible
 Area of Load 1500 ft²
 Depth 0 ft
 Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
50	5	0
100	5	0
100	35	1.25
50	35	0.875

5. Rectangular Load: "Rectangular Load 5"

Length 50 ft
 Width 40 ft
 Rotation angle 0 degrees
 Load Type Flexible
 Area of Load 2000 ft²
 Depth 0 ft
 Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
50	35	0.875
100	35	1.25
100	75	1.25
50	75	0.875

6. Rectangular Load: "Rectangular Load 6"

Length 50 ft
Width 40 ft
Rotation angle 0 degrees
Load Type Flexible
Area of Load 2000 ft²
Depth 0 ft
Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
50	75	0.875
100	75	1.25
100	115	0
50	115	0

7. Rectangular Load: "Rectangular Load 7"

Length 50 ft
Width 30 ft
Rotation angle 0 degrees
Load Type Flexible
Area of Load 1500 ft²
Depth 0 ft
Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
100	5	0
150	5	0
150	35	0.875
100	35	1.25

8. Rectangular Load: "Rectangular Load 8"

Length 50 ft
Width 40 ft
Rotation angle 0 degrees
Load Type Flexible
Area of Load 2000 ft²
Depth 0 ft
Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
100	35	1.25
150	35	0.875
150	75	0.875
100	75	1.25

9. Rectangular Load: "Rectangular Load 9"

Length 50 ft
Width 40 ft
Rotation angle 0 degrees
Load Type Flexible
Area of Load 2000 ft²
Depth 0 ft
Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
100	75	1.25
150	75	0.875
150	115	0
100	115	0

10. Rectangular Load: "Rectangular Load 10"

Length 50 ft
Width 30 ft
Rotation angle 0 degrees
Load Type Flexible
Area of Load 1500 ft²
Depth 0 ft
Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
150	5	0
200	5	0
200	35	0.75
150	35	0.875

11. Rectangular Load: "Rectangular Load 11"

Length 50 ft
Width 40 ft
Rotation angle 0 degrees
Load Type Flexible
Area of Load 2000 ft²
Depth 0 ft
Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
150	35	0.875
200	35	0.75
200	75	0.75
150	75	0.875

12. Rectangular Load: "Rectangular Load 12"

Length 50 ft
Width 40 ft
Rotation angle 0 degrees
Load Type Flexible
Area of Load 2000 ft²
Depth 0 ft
Installation Stage Initial = 0 mon

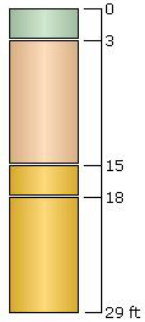
Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
150	75	0.875
200	75	0.75
200	115	0
150	115	0





Soil Layers

Ground Surface Drained: Yes

Layer #	Type	Thickness [ft]	Depth [ft]	Drained at Bottom
1	Marine Deposit SILT	3	0	No
2	Marine Deposit CLAY	12	3	Yes
3	Marine Deposit SAND	3	15	Yes
4	Glacial Till SAND	11	18	No



Soil Properties

Property	Marine Deposit SILT	Marine Deposit CLAY	Marine Deposit SAND	Glacial Till SAND
Color				
Unit Weight [kips/ft ³]	0.115	0.115	0.115	0.13
Saturated Unit Weight [kips/ft ³]	0.115	0.115	0.115	0.13
K0	1	1	1	1
Immediate Settlement	Enabled	Disabled	Enabled	Enabled
Es [ksf]	100	-	315	800
Esur [ksf]	100	-	315	800
Primary Consolidation	Disabled	Enabled	Disabled	Disabled
Material Type		Non-Linear		
Cce	-	0.17	-	-
Cre	-	0.03	-	-
e0	-	0	-	-
Pc [ksf] top	-	5.325	-	-
Pc [ksf] bottom	-	3.225	-	-
Cv [ft ² /s]	-	3e-006	-	-
Cvr [ft ² /s]	-	3e-006	-	-
B-bar	-	1	-	-
Secondary Consolidation	Disabled	Standard	Disabled	Disabled
Cae	-	0.004	-	-
Care	-	0.004	-	-
Undrained Su A [kips/ft ²]	0	0	0	0
Undrained Su S	0.2	0.2	0.2	0.2
Undrained Su m	0.8	0.8	0.8	0.8
Piezo Line ID	1	1	1	1

Groundwater

Groundwater method Piezometric Lines
 Water Unit Weight 0.0624 kips/ft³

Piezometric Line Entities

ID	Depth (ft)
1	3 ft

Query Lines

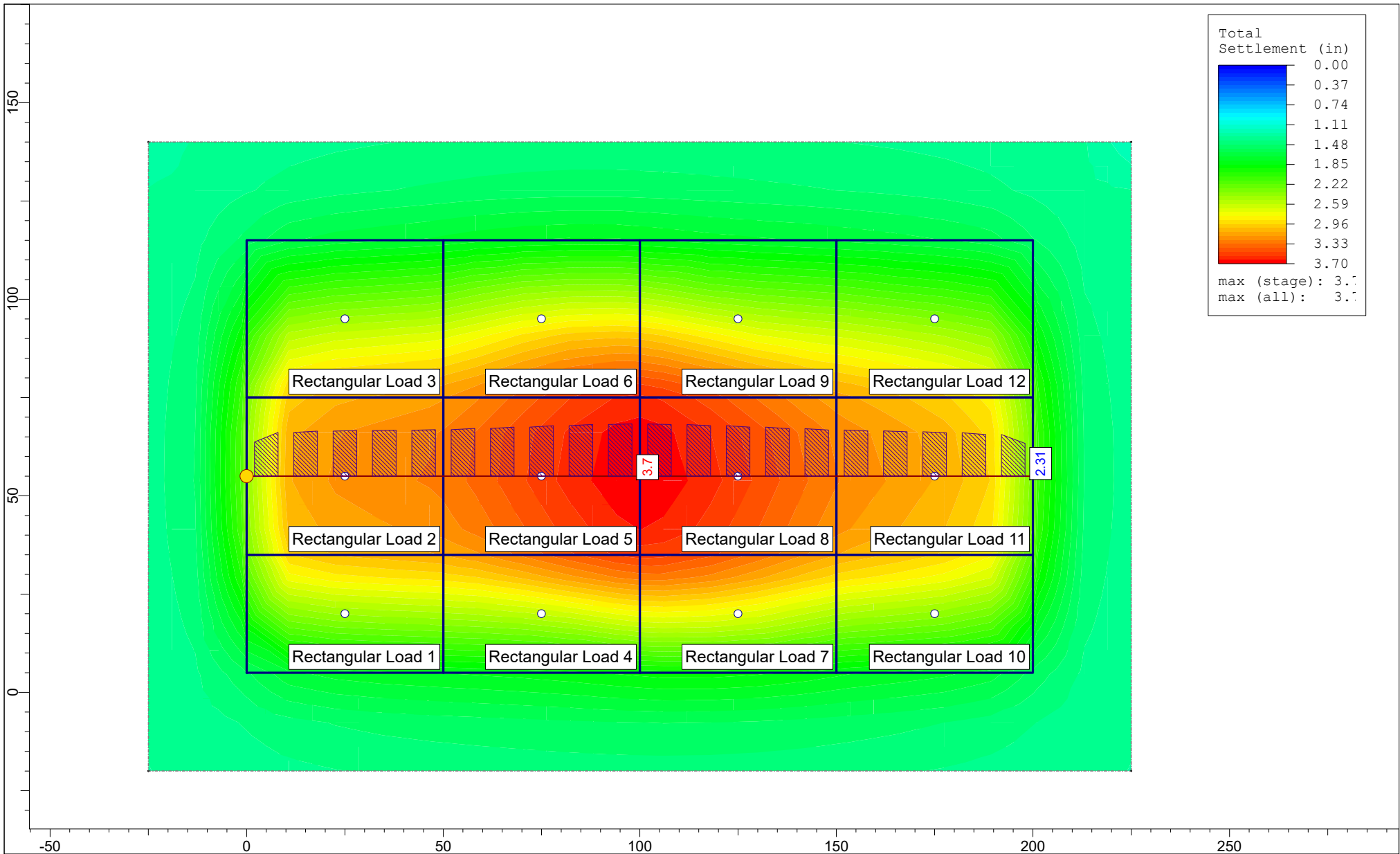
Line #	Query Line Name	Start Location	End Location	Horizontal Divisions	Vertical Divisions
1	Query Line 1	0, 55	200, 55	20	Auto: 57


Time Points

Point #	(X,Y) Location	Depth	Goal Type	Goal	Time Until Goal
1	134.794, 63.106	0 ft	Degree of Consolidation	95%	4.08367 mon

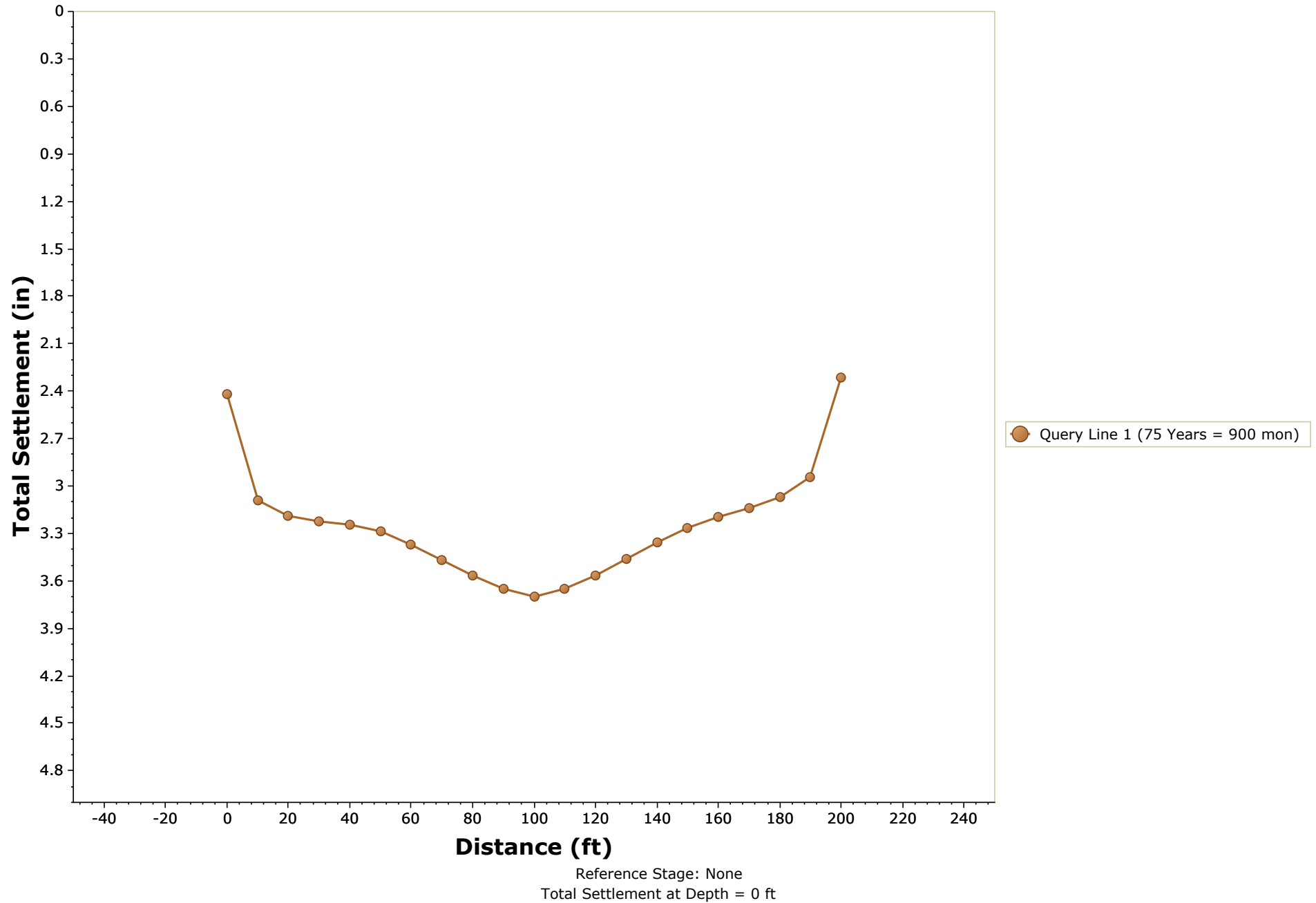


Project	I-395 Route 9 Connector - WIN 18915.00		
Analysis Description	Sta. 84+50		
Drawn By	EMS	Company	
Date	5/22/2020, 8:16:09 AM	File Name	2020-0604-Sta 8450 Settlement-D2.s3z



	Project			I-395 Route 9 Connector - WIN 18915.00
	Analysis Description			Sta. 84+50
	Drawn By		EMS	Company
	Date		5/22/2020, 8:16:09 AM	File Name
				2020-0604-Sta 8450 Settlement-D2.s3z

Distance vs. Total Settlement



Sta. 130+50

Settle3D Analysis Information

I-395 Route 9 Connector - WIN 18915.00

Project Settings

Document Name	2020-0604-Sta 13050 Settlement.s3z
Project Title	I-395 Route 9 Connector - WIN 18915.00
Analysis	Sta. 130+50
Author	EMS
Date Created	5/22/2020, 8:16:09 AM
Stress Computation Method	Westergaard
Time-dependent Consolidation Analysis	
Time Units	months
Permeability Units	feet/second
Minimum settlement ratio for subgrade modulus	0.9

Use average properties to calculate layered stresses

Improve consolidation accuracy

Ignore negative effective stresses in settlement calculations

Stage Settings

Stage #	Name	Time [months]
1	Initial	0
2	75 Years	900

Results

Time taken to compute: 0.0782432 seconds

Stage: Initial = 0 mon

Data Type	Minimum	Maximum
Total Settlement [in]	0	0.5915
Total Consolidation Settlement [in]	0	0
Virgin Consolidation Settlement [in]	0	0
Recompression Consolidation Settlement [in]	0	0
Immediate Settlement [in]	0	0.5915
Secondary Settlement [in]	0	0
Loading Stress ZZ [ksf]	0.179012	0.750019
Loading Stress XX [ksf]	1.31624e-008	0.1875
Loading Stress YY [ksf]	1.31624e-008	0.1875
Effective Stress ZZ [ksf]	0.25	2.16275
Effective Stress XX [ksf]	1.31624e-008	1.84076
Effective Stress YY [ksf]	1.31624e-008	1.84076
Total Stress ZZ [ksf]	0.25	3.34835
Total Stress XX [ksf]	1.31624e-008	3.02636
Total Stress YY [ksf]	1.31624e-008	3.02636
Modulus of Subgrade Reaction (Total) [ksf/ft]	0	17.2289
Modulus of Subgrade Reaction (Immediate) [ksf/ft]	0	17.2289
Modulus of Subgrade Reaction (Consolidation) [ksf/ft]	0	0
Total Strain	0.000170206	0.00749379
Pore Water Pressure [ksf]	0	1.1856
Excess Pore Water Pressure [ksf]	0	0
Degree of Consolidation [%]	0	0
Pre-consolidation Stress [ksf]	0.75719	4.9512
Over-consolidation Ratio	1	19.4317
Void Ratio	0	0
Permeability [ft/s]	0	0
Coefficient of Consolidation [ft^2/s]	0	0
Hydroconsolidation Settlement [in]	0	0
Average Degree of Consolidation [%]	0	0
Undrained Shear Strength	0	0.0388315

Stage: 75 Years = 900 mon

Data Type	Minimum	Maximum
Total Settlement [in]	0	0.5915
Total Consolidation Settlement [in]	0	0
Virgin Consolidation Settlement [in]	0	0
Recompression Consolidation Settlement [in]	0	0
Immediate Settlement [in]	0	0.5915
Secondary Settlement [in]	0	0
Loading Stress ZZ [ksf]	0.179012	0.750019
Loading Stress XX [ksf]	1.31624e-008	0.1875
Loading Stress YY [ksf]	1.31624e-008	0.1875
Effective Stress ZZ [ksf]	0.25	2.16275
Effective Stress XX [ksf]	1.31624e-008	1.84076
Effective Stress YY [ksf]	1.31624e-008	1.84076
Total Stress ZZ [ksf]	0.25	3.34835
Total Stress XX [ksf]	1.31624e-008	3.02636
Total Stress YY [ksf]	1.31624e-008	3.02636
Modulus of Subgrade Reaction (Total) [ksf/ft]	0	17.2289
Modulus of Subgrade Reaction (Immediate) [ksf/ft]	0	17.2289
Modulus of Subgrade Reaction (Consolidation) [ksf/ft]	0	0
Total Strain	0.000170206	0.00749379
Pore Water Pressure [ksf]	0	1.1856
Excess Pore Water Pressure [ksf]	0	0
Degree of Consolidation [%]	0	0
Pre-consolidation Stress [ksf]	0.75719	4.9512
Over-consolidation Ratio	1	19.4317
Void Ratio	0	0
Permeability [ft/s]	0	0
Coefficient of Consolidation [ft ² /s]	0	0
Hydroconsolidation Settlement [in]	0	0
Average Degree of Consolidation [%]	0	0
Undrained Shear Strength	0	0.0388315

Loads

1. Rectangular Load: "Rectangular Load 1"

Length	150 ft
Width	25 ft
Rotation angle	0 degrees
Load Type	Flexible
Area of Load	3750 ft ²
Depth	0 ft
Installation Stage	Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
4.26326e-014	1.77636e-015	0
150	1.77636e-015	0
150	25	0.75
4.26326e-014	25	0.75

2. Rectangular Load: "Rectangular Load 2"

Length	150 ft
Width	40 ft
Rotation angle	0 degrees
Load Type	Flexible
Area of Load	6000 ft ²
Load	0.75 ksf
Depth	0 ft
Installation Stage	Initial = 0 mon

Coordinates

X [ft]	Y [ft]
8.52651e-014	25
150	25
150	65
8.52651e-014	65

3. Rectangular Load: "Rectangular Load 3"

Length 150 ft
 Width 25 ft
 Rotation angle 0 degrees
 Load Type Flexible
 Area of Load 3750 ft²
 Depth 0 ft
 Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
8.52651e-014	65	0.75
150	65	0.75
150	90	0
8.52651e-014	90	0

4. Rectangular Load: "Rectangular Load 10"

Length 50 ft
 Width 25 ft
 Rotation angle 0 degrees
 Load Type Flexible
 Area of Load 1250 ft²
 Depth 0 ft
 Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
150	0	0
200	0	0
200	25	0.5
150	25	0.75

5. Rectangular Load: "Rectangular Load 11"

Length 50 ft
 Width 40 ft
 Rotation angle 0 degrees
 Load Type Flexible
 Area of Load 2000 ft²
 Depth 0 ft
 Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
150	25	0.75
200	25	0.5
200	65	0.5
150	65	0.75

6. Rectangular Load: "Rectangular Load 12"

Length 50 ft
 Width 25 ft
 Rotation angle 0 degrees
 Load Type Flexible
 Area of Load 1250 ft²
 Depth 0 ft
 Installation Stage Initial = 0 mon

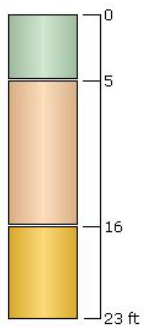
Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
150	65	0.75
200	65	0.5
200	90	0
150	90	0




Soil Layers

Ground Surface Drained: Yes

Layer #	Type	Thickness [ft]	Depth [ft]	Drained at Bottom
1	Marine Deposit SILT	5	0	Yes
2	Glacial Till SAND	11	5	Yes
3	Glacial Till SILT	7	16	No



Soil Properties

Property	Marine Deposit SILT	Glacial Till SAND	Glacial Till SILT
Color			
Unit Weight [kips/ft ³]	0.115	0.13	0.13
Saturated Unit Weight [kips/ft ³]	0.115	0.13	0.13
K0	1	1	1
Immediate Settlement	Enabled	Enabled	Enabled
Es [ksf]	100	1200	400
E _{sur} [ksf]	100	1200	400
B-bar	-	-	-
Undrained Su A [kips/ft ²]	0	0	0
Undrained Su S	0.2	0.2	0.2
Undrained Su m	0.8	0.8	0.8
Piezo Line ID	1	1	1

Groundwater

Groundwater method Piezometric Lines
Water Unit Weight 0.0624 kips/ft³

Piezometric Line Entities

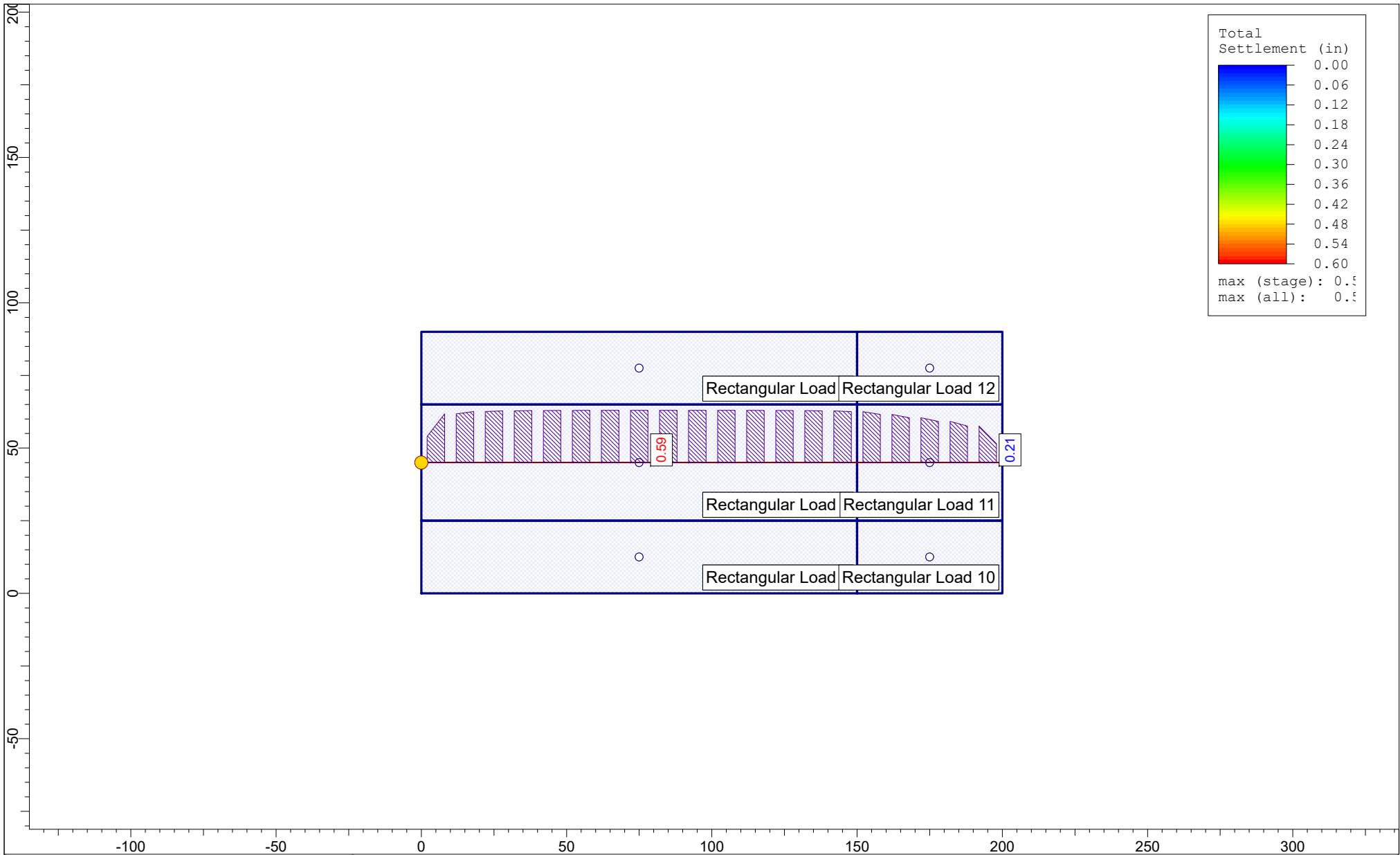
ID	Depth (ft)
1	7 ft


Query Lines

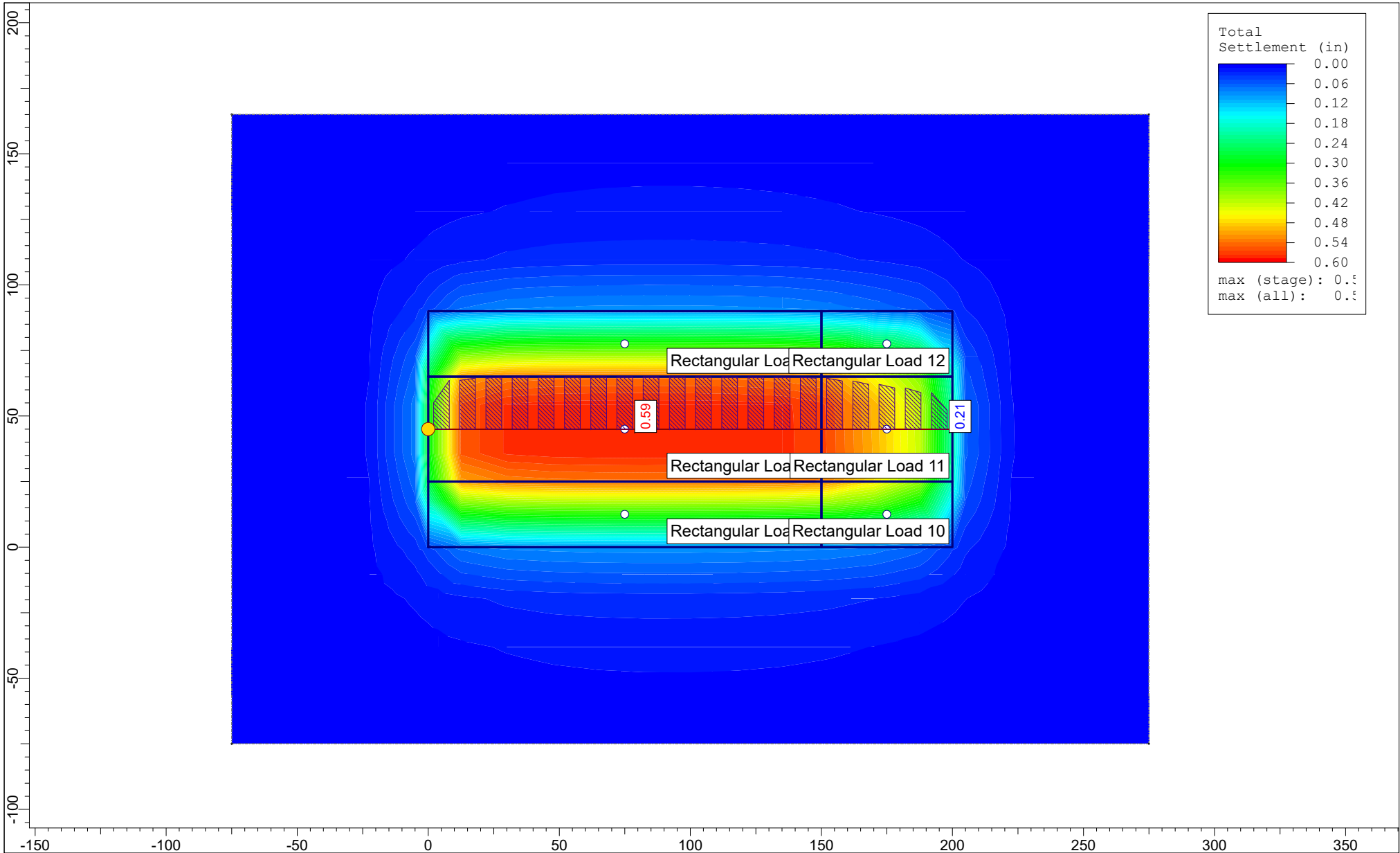
Line #	Query Line Name	Start Location	End Location	Horizontal Divisions	Vertical Divisions
1	Query Line 1	0, 45	200, 45	20	Auto: 53

Time Points

Point #	(X,Y) Location	Depth	Goal Type	Goal	Time Until Goal
1	134.794, 63.106	0 ft	Degree of Consolidation	95%	-1 mon



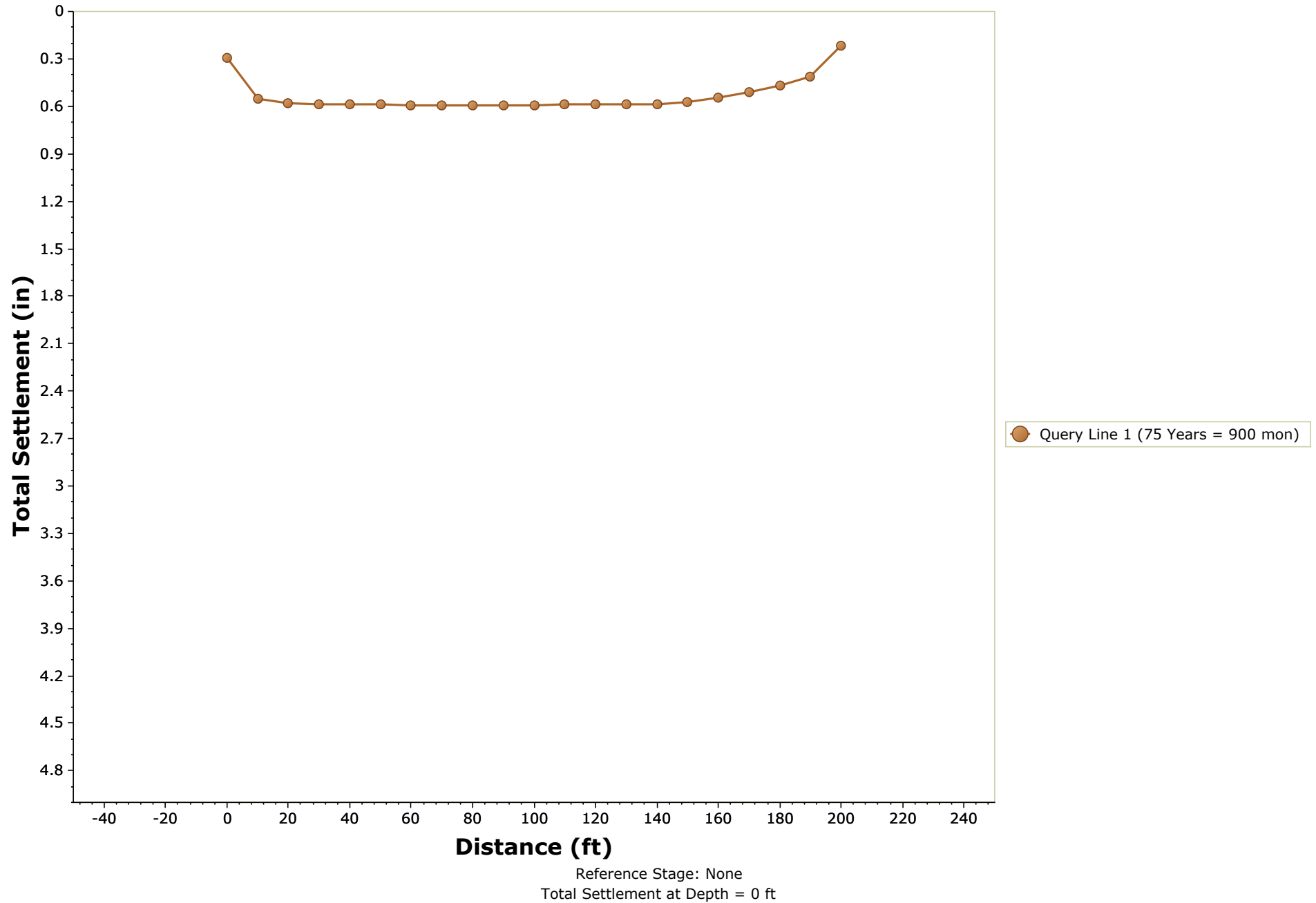
	Project		I-395 Route 9 Connector - WIN 18915.00	
	Analysis Description		Sta. 130+50	
	Drawn By		EMS	Company
	Date		5/22/2020, 8:16:09 AM	File Name
			2020-0604-Sta 13050 Settlement.s3z	



SETTLE3D 4.010

Project	I-395 Route 9 Connector - WIN 18915.00		
Analysis Description	Sta. 130+50		
Drawn By	EMS	Company	
Date	5/22/2020, 8:16:09 AM	File Name	2020-0604-Sta 13050 Settlement.s3z

Distance vs. Total Settlement



Sta. 140+00

Settle3D Analysis Information

I-395 Route 9 Connector - WIN 18915.00

Project Settings

Document Name 2020-0604-Sta 14000 Settlement.s3z
 Project Title I-395 Route 9 Connector - WIN 18915.00
 Analysis Sta. 140+00
 Author EMS
 Date Created 5/22/2020, 8:16:09 AM
 Stress Computation Method Westergaard
 Time-dependent Consolidation Analysis
 Time Units months
 Permeability Units feet/second
 Minimum settlement ratio for subgrade modulus 0.9

Use average properties to calculate layered stresses

Improve consolidation accuracy

Ignore negative effective stresses in settlement calculations

Stage Settings

Stage #	Name	Time [months]
1	Initial	0
2	95% Consolidation	17
3	75 Years	900

Results

Time taken to compute: 0.638985 seconds

Stage: Initial = 0 mon

Data Type	Minimum	Maximum
Total Settlement [in]	0	0.419567
Total Consolidation Settlement [in]	0	0
Virgin Consolidation Settlement [in]	0	0
Recompression Consolidation Settlement [in]	0	0
Immediate Settlement [in]	0	0.419567
Secondary Settlement [in]	0	0
Loading Stress ZZ [ksf]	0.51387	2.25
Loading Stress XX [ksf]	0	0
Loading Stress YY [ksf]	0	0
Effective Stress ZZ [ksf]	0	2.2838
Effective Stress XX [ksf]	0	2.2838
Effective Stress YY [ksf]	0	2.2838
Total Stress ZZ [ksf]	0.8125	5.71533
Total Stress XX [ksf]	0.8125	5.71533
Total Stress YY [ksf]	0.8125	5.71533
Modulus of Subgrade Reaction (Total) [ksf/ft]	0	90.3638
Modulus of Subgrade Reaction (Immediate) [ksf/ft]	0	90.3638
Modulus of Subgrade Reaction (Consolidation) [ksf/ft]	0	0
Total Strain	0	0.00387472
Pore Water Pressure [ksf]	0.8125	3.43153
Excess Pore Water Pressure [ksf]	0.51387	2.25
Degree of Consolidation [%]	0	0
Pre-consolidation Stress [ksf]	0.793734	4
Over-consolidation Ratio	1	1520.91
Void Ratio	-6.75029e-017	2.98942e-016
Permeability [ft/s]	0	2.06315e-007
Coefficient of Consolidation [ft ² /s]	0	1e-006
Hydroconsolidation Settlement [in]	0	0
Average Degree of Consolidation [%]	0	0
Undrained Shear Strength	-5.55112e-017	2.77556e-017

Stage: 95% Consolidation = 17 mon

Data Type	Minimum	Maximum
Total Settlement [in]	0	7.73376
Total Consolidation Settlement [in]	0	7.31617
Virgin Consolidation Settlement [in]	0	4.33129
Recompression Consolidation Settlement [in]	-0.000276344	2.98778
Immediate Settlement [in]	0	0.419567
Secondary Settlement [in]	0	0
Loading Stress ZZ [ksf]	0.51387	2.25
Loading Stress XX [ksf]	0	0
Loading Stress YY [ksf]	0	0
Effective Stress ZZ [ksf]	0.8125	3.34413
Effective Stress XX [ksf]	0.8125	3.34413
Effective Stress YY [ksf]	0.8125	3.34413
Total Stress ZZ [ksf]	0.8125	5.71533
Total Stress XX [ksf]	0.8125	5.71533
Total Stress YY [ksf]	0.8125	5.71533
Modulus of Subgrade Reaction (Total) [ksf/ft]	0	4.20489
Modulus of Subgrade Reaction (Immediate) [ksf/ft]	0	90.3638
Modulus of Subgrade Reaction (Consolidation) [ksf/ft]	0	4.41434
Total Strain	0.000342639	0.0699573
Pore Water Pressure [ksf]	0	2.3712
Excess Pore Water Pressure [ksf]	0	0.276441
Degree of Consolidation [%]	0	99.9427
Pre-consolidation Stress [ksf]	1.39843	4
Over-consolidation Ratio	1	4.90478
Void Ratio	-0.0699573	0
Permeability [ft/s]	0	2.06315e-007
Coefficient of Consolidation [ft ² /s]	0	1e-006
Hydroconsolidation Settlement [in]	0	0
Average Degree of Consolidation [%]	0	97.9482
Undrained Shear Strength	0	0.118139

Stage: 75 Years = 900 mon

Data Type	Minimum	Maximum
Total Settlement [in]	0	10.0959
Total Consolidation Settlement [in]	0	7.86447
Virgin Consolidation Settlement [in]	0	4.82487
Recompression Consolidation Settlement [in]	-0.000101827	3.04235
Immediate Settlement [in]	0	0.419567
Secondary Settlement [in]	0	1.90109
Loading Stress ZZ [ksf]	0.51387	2.25
Loading Stress XX [ksf]	0	0
Loading Stress YY [ksf]	0	0
Effective Stress ZZ [ksf]	0.8125	3.34413
Effective Stress XX [ksf]	0.8125	3.34413
Effective Stress YY [ksf]	0.8125	3.34413
Total Stress ZZ [ksf]	0.8125	5.71533
Total Stress XX [ksf]	0.8125	5.71533
Total Stress YY [ksf]	0.8125	5.71533
Modulus of Subgrade Reaction (Total) [ksf/ft]	0	3.12715
Modulus of Subgrade Reaction (Immediate) [ksf/ft]	0	90.3638
Modulus of Subgrade Reaction (Consolidation) [ksf/ft]	0	4.1624
Total Strain	0.000342639	0.0816182
Pore Water Pressure [ksf]	0	2.3712
Excess Pore Water Pressure [ksf]	-0.024719	0.0285097
Degree of Consolidation [%]	0	100
Pre-consolidation Stress [ksf]	1.45441	4
Over-consolidation Ratio	1	4.90472
Void Ratio	-0.0816182	0
Permeability [ft/s]	0	2.06315e-007
Coefficient of Consolidation [ft ² /s]	0	1e-006
Hydroconsolidation Settlement [in]	0	0
Average Degree of Consolidation [%]	0	100
Undrained Shear Strength	0	0.129389

Loads

1. Rectangular Load: "Rectangular Load 1"

Length 50 ft
 Width 50 ft
 Rotation angle 0 degrees
 Load Type Flexible
 Area of Load 2500 ft²
 Depth 0 ft
 Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
7.10543e-015	0	0
50	0	0
50	50	2.125
7.10543e-015	50	1.625

2. Rectangular Load: "Rectangular Load 2"

Length 50 ft
 Width 45 ft
 Rotation angle 0 degrees
 Load Type Flexible
 Area of Load 2250 ft²
 Depth 0 ft
 Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
-7.10543e-015	50	1.625
50	50	2.125
50	95	2.125
-7.10543e-015	95	1.625

3. Rectangular Load: "Rectangular Load 3"

Length 50 ft
 Width 50 ft
 Rotation angle 0 degrees
 Load Type Flexible
 Area of Load 2500 ft²
 Depth 0 ft
 Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
-7.10543e-015	95	1.625
50	95	2.125
50	145	0
-7.10543e-015	145	0

4. Rectangular Load: "Rectangular Load 4"

Length 50 ft
 Width 50 ft
 Rotation angle 0 degrees
 Load Type Flexible
 Area of Load 2500 ft²
 Depth 0 ft
 Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
50	0	0
100	0	0
100	50	2.25
50	50	2.125

5. Rectangular Load: "Rectangular Load 5"

Length 50 ft
 Width 45 ft
 Rotation angle 0 degrees
 Load Type Flexible
 Area of Load 2250 ft²
 Depth 0 ft
 Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
50	50	2.125
100	50	2.25
100	95	2.25
50	95	2.125

6. Rectangular Load: "Rectangular Load 6"

Length 50 ft
Width 50 ft
Rotation angle 0 degrees
Load Type Flexible
Area of Load 2500 ft²
Depth 0 ft
Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
50	95	2.125
100	95	2.25
100	145	0
50	145	0

7. Rectangular Load: "Rectangular Load 7"

Length 30 ft
Width 50 ft
Rotation angle 0 degrees
Load Type Flexible
Area of Load 1500 ft²
Depth 0 ft
Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
100	3.55271e-015	0
130	3.55271e-015	0
130	50	2.25
100	50	2.25

8. Rectangular Load: "Rectangular Load 8"

Length 30 ft
Width 45 ft
Rotation angle 0 degrees
Load Type Flexible
Area of Load 1350 ft²
Depth 0 ft
Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
100	50	2.25
130	50	2.25
130	95	2.25
100	95	2.25

9. Rectangular Load: "Rectangular Load 9"

Length 30 ft
 Width 50 ft
 Rotation angle 0 degrees
 Load Type Flexible
 Area of Load 1500 ft²
 Depth 0 ft
 Installation Stage Initial = 0 mon

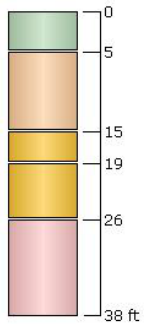
Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
100	95	2.25
130	95	2.25
130	145	0
100	145	0





Soil Layers


Ground Surface Drained: Yes

Layer #	Type	Thickness [ft]	Depth [ft]	Drained at Bottom
1	Marine Deposit CLAY above el 70	5	0	No
2	Marine Deposit CLAY el 70 to el 60	10	5	No
3	Marine Deposit CLAY below el 60	4	15	Yes
4	Glacial Till SILT	7	19	Yes
5	Glacial Till SAND	12	26	No



Soil Properties

Property	Marine Deposit CLAY above el 70	Marine Deposit CLAY el 70 to el 60	Marine Deposit CLAY below el 60	Glacial Till SILT
Color				
Unit Weight [kips/ft ³]	0.115	0.115	0.115	0.13
Saturated Unit Weight [kips/ft ³]	0.115	0.115	0.115	0.13
K0	1	1	1	1
Immediate Settlement	Disabled	Disabled	Disabled	Enabled
Es [ksf]	-	-	-	400
Esur [ksf]	-	-	-	400
Primary Consolidation	Enabled	Enabled	Enabled	Disabled
Material Type	Non-Linear	Non-Linear	Non-Linear	
Cce	0.15	0.15	0.15	-
Cre	0.02	0.02	0.02	-
e0	0	0	0	-
Pc [ksf] top	4	4	-	-
Pc [ksf] bottom	-	0.9	-	-
OCR	-	-	1	-
Cv [ft ² /s]	1e-006	1e-006	1e-006	-
Cvr [ft ² /s]	1e-006	1e-006	1e-006	-
B-bar	1	1	1	-
Secondary Consolidation	Standard	Standard	Standard	Disabled
Cae	0.005	0.005	0.005	-
Care	0.005	0.005	0.005	-
Undrained Su A [kips/ft ²]	0	0	0	0
Undrained Su S	0.2	0.2	0.2	0.2
Undrained Su m	0.8	0.8	0.8	0.8
Piezo Line ID	1	1	1	1

Property	Glacial Till SAND
Color	
Unit Weight [kips/ft ³]	0.13
Saturated Unit Weight [kips/ft ³]	0.13
K0	1
Immediate Settlement	Enabled
Es [ksf]	1500
Esur [ksf]	1500
B-bar	-
Undrained Su A [kips/ft ²]	0
Undrained Su S	0.2
Undrained Su m	0.8
Piezo Line ID	1

Groundwater

Groundwater method Piezometric Lines
Water Unit Weight 0.0624 kips/ft³

Piezometric Line Entities

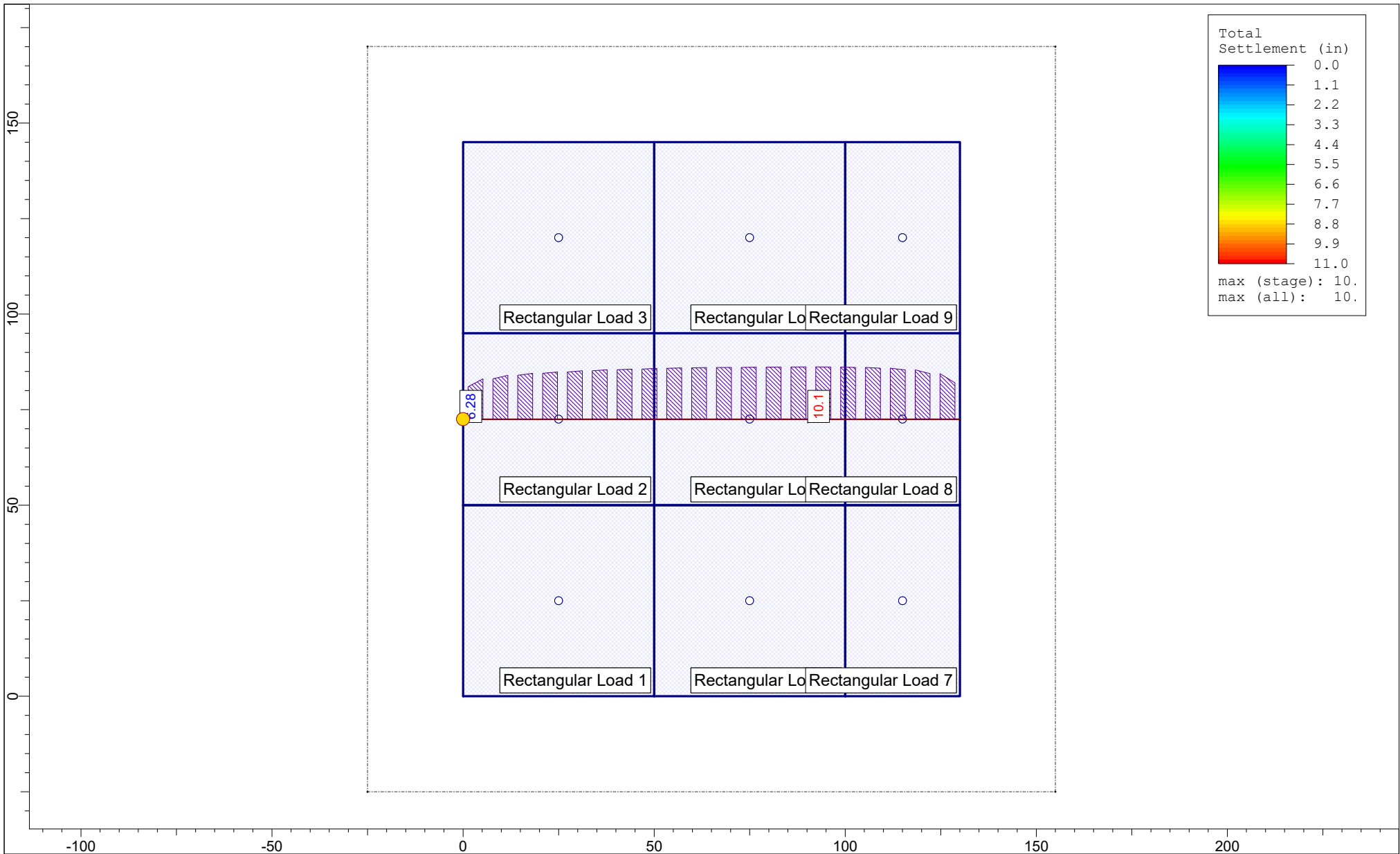
ID	Depth (ft)
1	0 ft


Query Lines

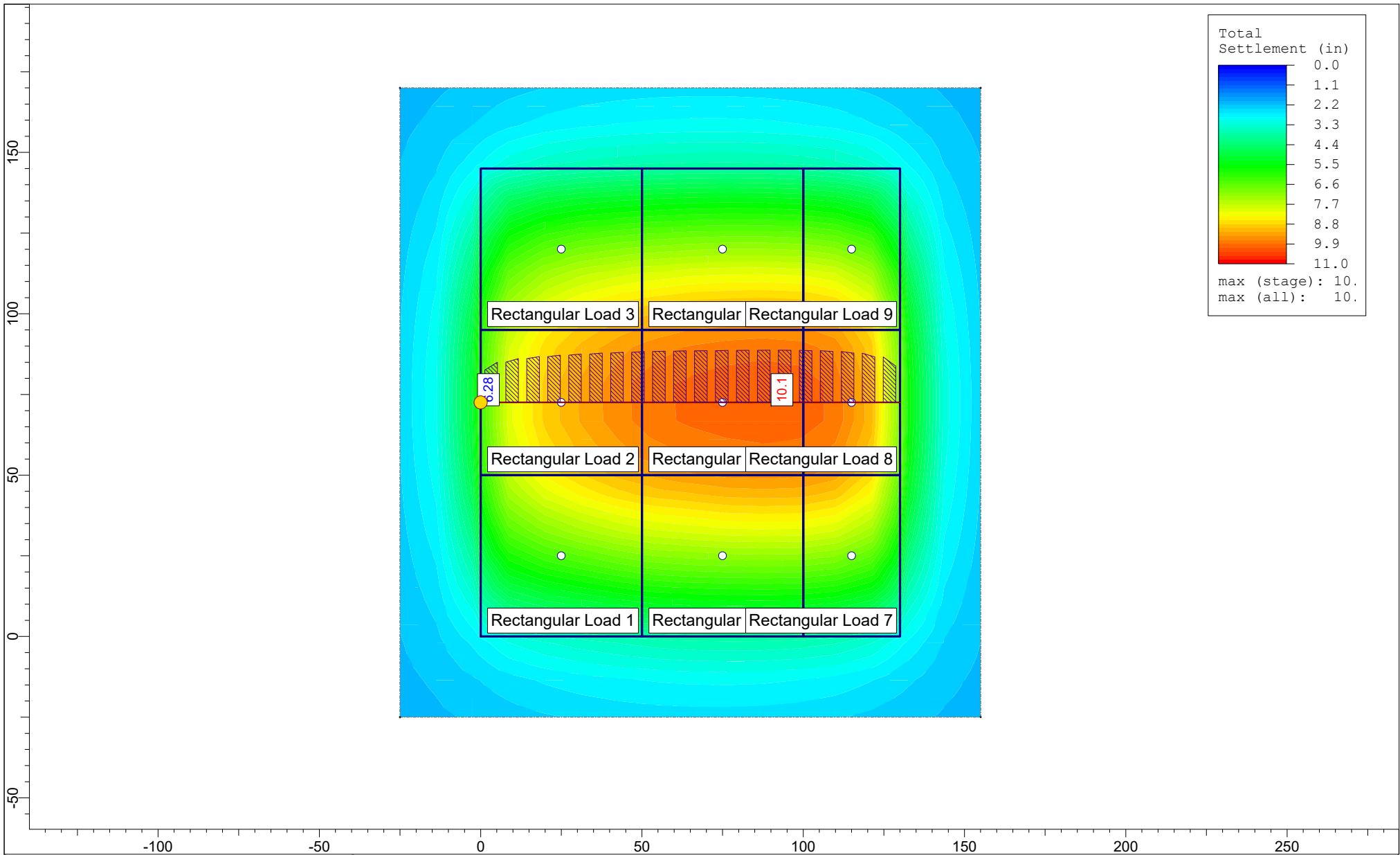
Line #	Query Line Name	Start Location	End Location	Horizontal Divisions	Vertical Divisions
1	Query Line 1	0, 72.5	130, 72.5	20	Auto: 67


Time Points

Point #	(X,Y) Location	Depth	Goal Type	Goal	Time Until Goal
1	79.954, 81.9	0 ft	Degree of Consolidation	95%	17.267 mon

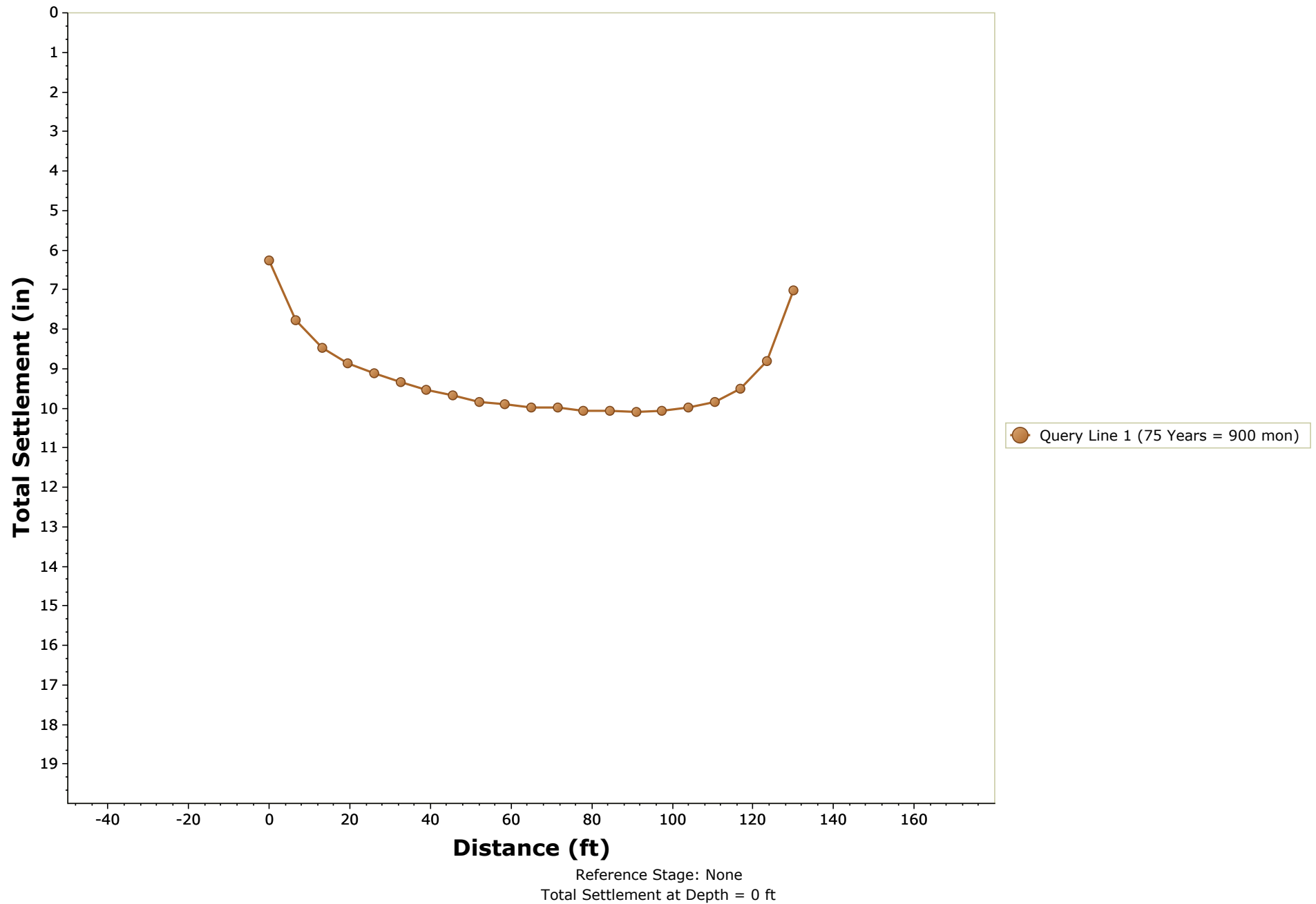


	Project		I-395 Route 9 Connector - WIN 18915.00
	Analysis Description		Sta. 140+00
	Drawn By	EMS	Company
	Date	5/22/2020, 8:16:09 AM	File Name 2020-0604-Sta 14000 Settlement.s3z



	Project		I-395 Route 9 Connector - WIN 18915.00
	Analysis Description		Sta. 140+00
	Drawn By	EMS	Company
	Date	5/22/2020, 8:16:09 AM	File Name 2020-0604-Sta 14000 Settlement.s3z

Distance vs. Total Settlement



Sta. 145+00

Settle3D Analysis Information

I-395 Route 9 Connector - WIN 18915.00

Project Settings

Document Name 2020-0604-Sta 14500 Settlement.s3z
 Project Title I-395 Route 9 Connector - WIN 18915.00
 Analysis Sta. 145+00
 Author EMS
 Date Created 5/22/2020, 8:16:09 AM
 Stress Computation Method Westergaard
 Time-dependent Consolidation Analysis
 Time Units months
 Permeability Units feet/second
 Minimum settlement ratio for subgrade modulus 0.9

Use average properties to calculate layered stresses

Improve consolidation accuracy

Ignore negative effective stresses in settlement calculations

Stage Settings

Stage #	Name	Time [months]
1	Initial	0
2	95% Consolidation	1
3	75 Years	900

Results

Time taken to compute: 0.584936 seconds

Stage: Initial = 0 mon

Data Type	Minimum	Maximum
Total Settlement [in]	0	0.678289
Total Consolidation Settlement [in]	0	0.101419
Virgin Consolidation Settlement [in]	0	0
Recompression Consolidation Settlement [in]	0	0.101419
Immediate Settlement [in]	0	0.57687
Secondary Settlement [in]	0	0
Loading Stress ZZ [ksf]	0.283514	1
Loading Stress XX [ksf]	0	0
Loading Stress YY [ksf]	0	0
Effective Stress ZZ [ksf]	0.375	1.45524
Effective Stress XX [ksf]	0	1.3262
Effective Stress YY [ksf]	0	1.3262
Total Stress ZZ [ksf]	0.375	2.74706
Total Stress XX [ksf]	0	2.74706
Total Stress YY [ksf]	0	2.74706
Modulus of Subgrade Reaction (Total) [ksf/ft]	0	19.5813
Modulus of Subgrade Reaction (Immediate) [ksf/ft]	0	23.4371
Modulus of Subgrade Reaction (Consolidation) [ksf/ft]	0	120.53
Total Strain	0	0.00999871
Pore Water Pressure [ksf]	0	1.42086
Excess Pore Water Pressure [ksf]	0	0.889701
Degree of Consolidation [%]	0	23.3269
Pre-consolidation Stress [ksf]	0.786313	4
Over-consolidation Ratio	1	8.51967
Void Ratio	-0.0094027	1.92865e-018
Permeability [ft/s]	0	1.15098e-009
Coefficient of Consolidation [ft ² /s]	0	1e-006
Hydroconsolidation Settlement [in]	0	0
Average Degree of Consolidation [%]	0	0
Undrained Shear Strength	-5.55112e-017	0

Stage: 95% Consolidation = 1 mon

Data Type	Minimum	Maximum
Total Settlement [in]	0	0.984084
Total Consolidation Settlement [in]	0	0.407214
Virgin Consolidation Settlement [in]	0	0
Recompression Consolidation Settlement [in]	0	0.407214
Immediate Settlement [in]	0	0.57687
Secondary Settlement [in]	0	0
Loading Stress ZZ [ksf]	0.283514	1
Loading Stress XX [ksf]	0	0
Loading Stress YY [ksf]	0	0
Effective Stress ZZ [ksf]	0.375	1.99826
Effective Stress XX [ksf]	0	1.99826
Effective Stress YY [ksf]	0	1.99826
Total Stress ZZ [ksf]	0.375	2.74706
Total Stress XX [ksf]	0	2.74706
Total Stress YY [ksf]	0	2.74706
Modulus of Subgrade Reaction (Total) [ksf/ft]	0	13.4708
Modulus of Subgrade Reaction (Immediate) [ksf/ft]	0	23.4371
Modulus of Subgrade Reaction (Consolidation) [ksf/ft]	0	30.6024
Total Strain	0.000420759	0.00999871
Pore Water Pressure [ksf]	0	0.7488
Excess Pore Water Pressure [ksf]	0	0.212659
Degree of Consolidation [%]	0	99.9382
Pre-consolidation Stress [ksf]	1.11464	4
Over-consolidation Ratio	1	8.51967
Void Ratio	-0.0094027	0
Permeability [ft/s]	0	1.15098e-009
Coefficient of Consolidation [ft ² /s]	0	1e-006
Hydroconsolidation Settlement [in]	0	0
Average Degree of Consolidation [%]	0	84.5855
Undrained Shear Strength	0	0.0584079

Stage: 75 Years = 900 mon

Data Type	Minimum	Maximum
Total Settlement [in]	0	1.67547
Total Consolidation Settlement [in]	0	0.444772
Virgin Consolidation Settlement [in]	0	0
Recompression Consolidation Settlement [in]	0	0.444772
Immediate Settlement [in]	0	0.57687
Secondary Settlement [in]	0	0.653827
Loading Stress ZZ [ksf]	0.283514	1
Loading Stress XX [ksf]	0	0
Loading Stress YY [ksf]	0	0
Effective Stress ZZ [ksf]	0.375	1.99826
Effective Stress XX [ksf]	0	1.99826
Effective Stress YY [ksf]	0	1.99826
Total Stress ZZ [ksf]	0.375	2.74706
Total Stress XX [ksf]	0	2.74706
Total Stress YY [ksf]	0	2.74706
Modulus of Subgrade Reaction (Total) [ksf/ft]	0	7.64379
Modulus of Subgrade Reaction (Immediate) [ksf/ft]	0	23.4371
Modulus of Subgrade Reaction (Consolidation) [ksf/ft]	0	27.9801
Total Strain	0.000420759	0.0228472
Pore Water Pressure [ksf]	0	0.7488
Excess Pore Water Pressure [ksf]	-3.80997e-018	3.1846e-018
Degree of Consolidation [%]	0	100
Pre-consolidation Stress [ksf]	1.11464	4
Over-consolidation Ratio	1	8.51967
Void Ratio	-0.0228472	0
Permeability [ft/s]	0	1.15098e-009
Coefficient of Consolidation [ft ² /s]	0	1e-006
Hydroconsolidation Settlement [in]	0	0
Average Degree of Consolidation [%]	0	100
Undrained Shear Strength	0	0.0584079

Loads

1. Rectangular Load: "Rectangular Load 1"

Length 50 ft
 Width 25 ft
 Rotation angle 0 degrees
 Load Type Flexible
 Area of Load 1250 ft²
 Depth 0 ft
 Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
0	7.5	0
50	7.5	0
50	32.5	0.875
0	32.5	0.75

2. Rectangular Load: "Rectangular Load 2"

Length 50 ft
 Width 45 ft
 Rotation angle 0 degrees
 Load Type Flexible
 Area of Load 2250 ft²
 Depth 0 ft
 Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
-3.55271e-015	32.5	0.75
50	32.5	0.875
50	77.5	0.875
-3.55271e-015	77.5	0.75

3. Rectangular Load: "Rectangular Load 3"

Length 50 ft
 Width 30 ft
 Rotation angle 0 degrees
 Load Type Flexible
 Area of Load 1500 ft²
 Depth 0 ft
 Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
0	77.5	0.75
50	77.5	0.875
50	107.5	0
0	107.5	0

4. Rectangular Load: "Rectangular Load 4"

Length 50 ft
 Width 25 ft
 Rotation angle 0 degrees
 Load Type Flexible
 Area of Load 1250 ft²
 Depth 0 ft
 Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
50	7.5	0
100	7.5	0
100	32.5	1
50	32.5	0.875

5. Rectangular Load: "Rectangular Load 5"

Length 50 ft
 Width 45 ft
 Rotation angle 0 degrees
 Load Type Flexible
 Area of Load 2250 ft²
 Depth 0 ft
 Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
50	32.5	0.875
100	32.5	1
100	77.5	1
50	77.5	0.875

6. Rectangular Load: "Rectangular Load 6"

Length 50 ft
Width 30 ft
Rotation angle 0 degrees
Load Type Flexible
Area of Load 1500 ft²
Depth 0 ft
Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
50	77.5	0.875
100	77.5	1
100	107.5	0
50	107.5	0

7. Rectangular Load: "Rectangular Load 7"

Length 50 ft
Width 25 ft
Rotation angle 0 degrees
Load Type Flexible
Area of Load 1250 ft²
Depth 0 ft
Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
100	7.5	0
150	7.5	0
150	32.5	0.875
100	32.5	1

8. Rectangular Load: "Rectangular Load 10"

Length 50 ft
Width 25 ft
Rotation angle 0 degrees
Load Type Flexible
Area of Load 1250 ft²
Depth 0 ft
Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
150	7.5	0
200	7.5	0
200	32.5	1
150	32.5	0.875

9. Rectangular Load: "Rectangular Load 8"

Length 50 ft
Width 45 ft
Rotation angle 0 degrees
Load Type Flexible
Area of Load 2250 ft²
Depth 0 ft
Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
100	32.5	1
150	32.5	0.875
150	77.5	0.875
100	77.5	1

10. Rectangular Load: "Rectangular Load 9"

Length 50 ft
Width 30 ft
Rotation angle 0 degrees
Load Type Flexible
Area of Load 1500 ft²
Depth 0 ft
Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
100	77.5	1
150	77.5	0.875
150	107.5	0
100	107.5	0

11. Rectangular Load: "Rectangular Load 11"

Length 50 ft
Width 45 ft
Rotation angle 0 degrees
Load Type Flexible
Area of Load 2250 ft²
Depth 0 ft
Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
150	32.5	0.875
200	32.5	1
200	77.5	1
150	77.5	0.875

12. Rectangular Load: "Rectangular Load 12"

Length 50 ft
Width 30 ft
Rotation angle 0 degrees
Load Type Flexible
Area of Load 1500 ft²
Depth 0 ft
Installation Stage Initial = 0 mon

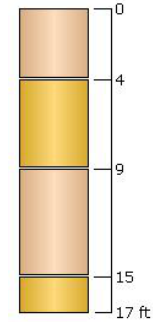
Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
150	77.5	0.875
200	77.5	1
200	107.5	0
150	107.5	0





Soil Layers

Ground Surface Drained: Yes

Layer #	Type	Thickness [ft]	Depth [ft]	Drained at Bottom
1	Marine Deposit SILT	4	0	No
2	Marine Deposit CLAY	5	4	Yes
3	Glacial Till SAND	6	9	Yes
4	Glacial Till SILT	2	15	No



Soil Properties

Property	Marine Deposit SILT	Marine Deposit CLAY	Glacial Till SAND	Glacial Till SILT
Color				
Unit Weight [kips/ft³]	0.115	0.115	0.13	0.13
Saturated Unit Weight [kips/ft³]	0.115	0.115	0.13	0.13
K0	1	1	1	1
Immediate Settlement	Enabled	Disabled	Enabled	Enabled
Es [ksf]	100	-	700	400
Esur [ksf]	100	-	700	400
Primary Consolidation	Disabled	Enabled	Disabled	Disabled
Material Type		Non-Linear		
Cce	-	0.15	-	-
Cre	-	0.02	-	-
e0	-	0	-	-
Pc [ksf]	-	4	-	-
Cv [ft²/s]	-	1e-006	-	-
Cvr [ft²/s]	-	1e-006	-	-
B-bar	-	1	-	-
Secondary Consolidation	Disabled	Standard	Disabled	Disabled
Cae	-	0.005	-	-
Care	-	0.005	-	-
Undrained Su A [kips/ft²]	0	0	0	0
Undrained Su S	0.2	0.2	0.2	0.2
Undrained Su m	0.8	0.8	0.8	0.8
Piezo Line ID	1	1	1	1

Groundwater

Groundwater method Piezometric Lines

Water Unit Weight 0.0624 kips/ft³

Piezometric Line Entities

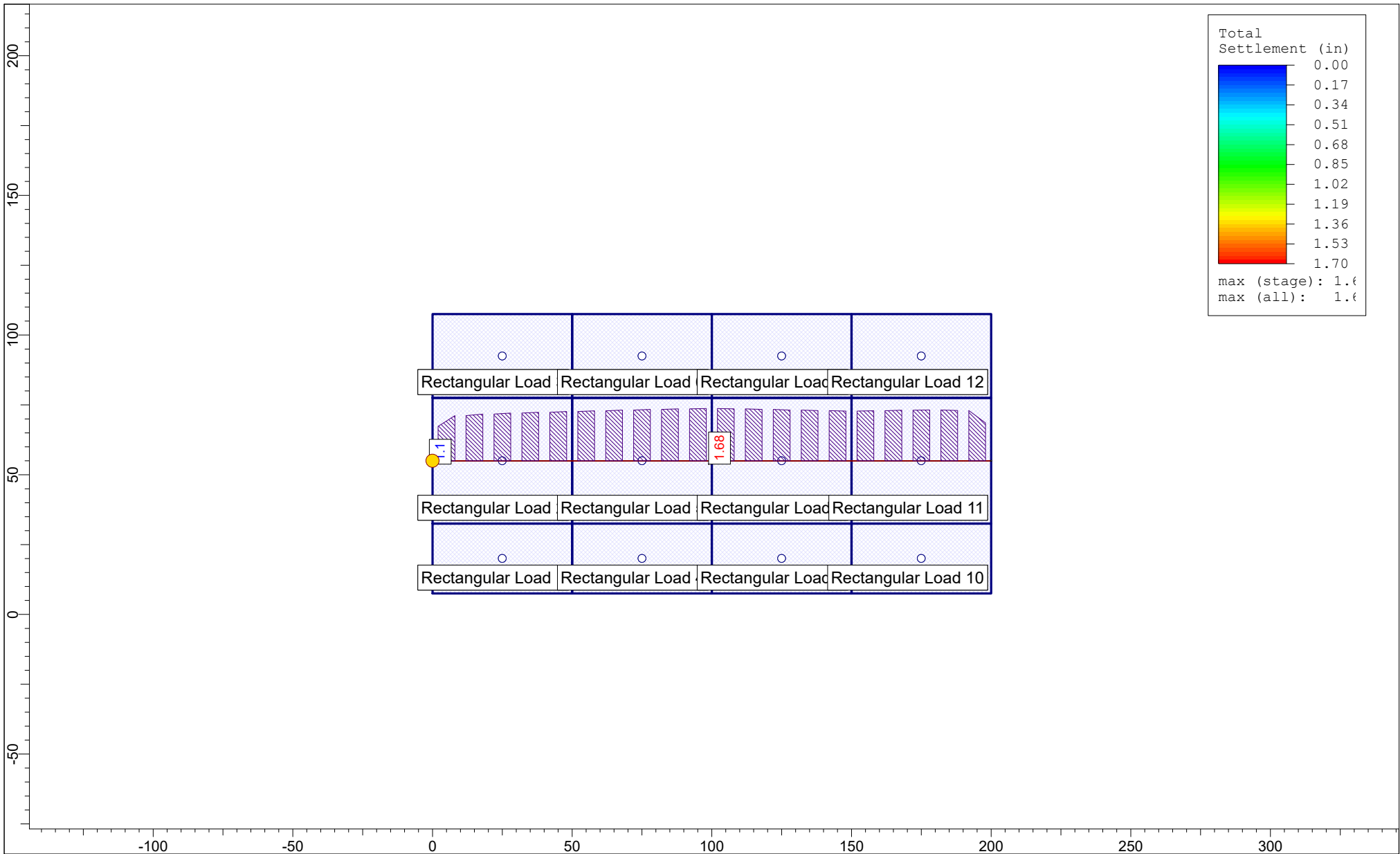
ID	Depth (ft)
1	5 ft


Query Lines

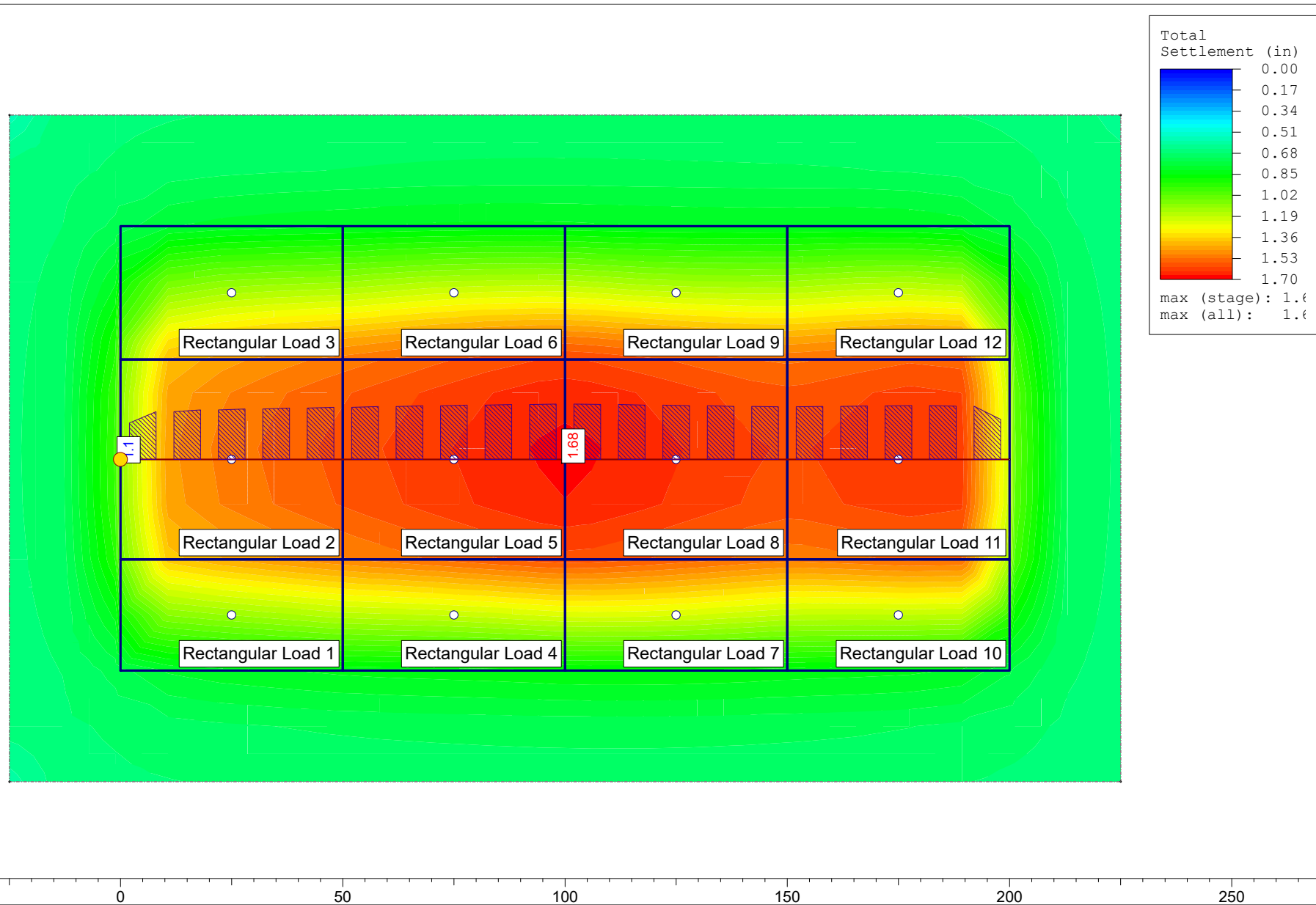
Line #	Query Line Name	Start Location	End Location	Horizontal Divisions	Vertical Divisions
1	Query Line 1	0, 55	200, 55	20	Auto: 71

Time Points

Point #	(X,Y) Location	Depth	Goal Type	Goal	Time Until Goal
1	134.794, 63.106	0 ft	Degree of Consolidation	95%	1.31418 mon

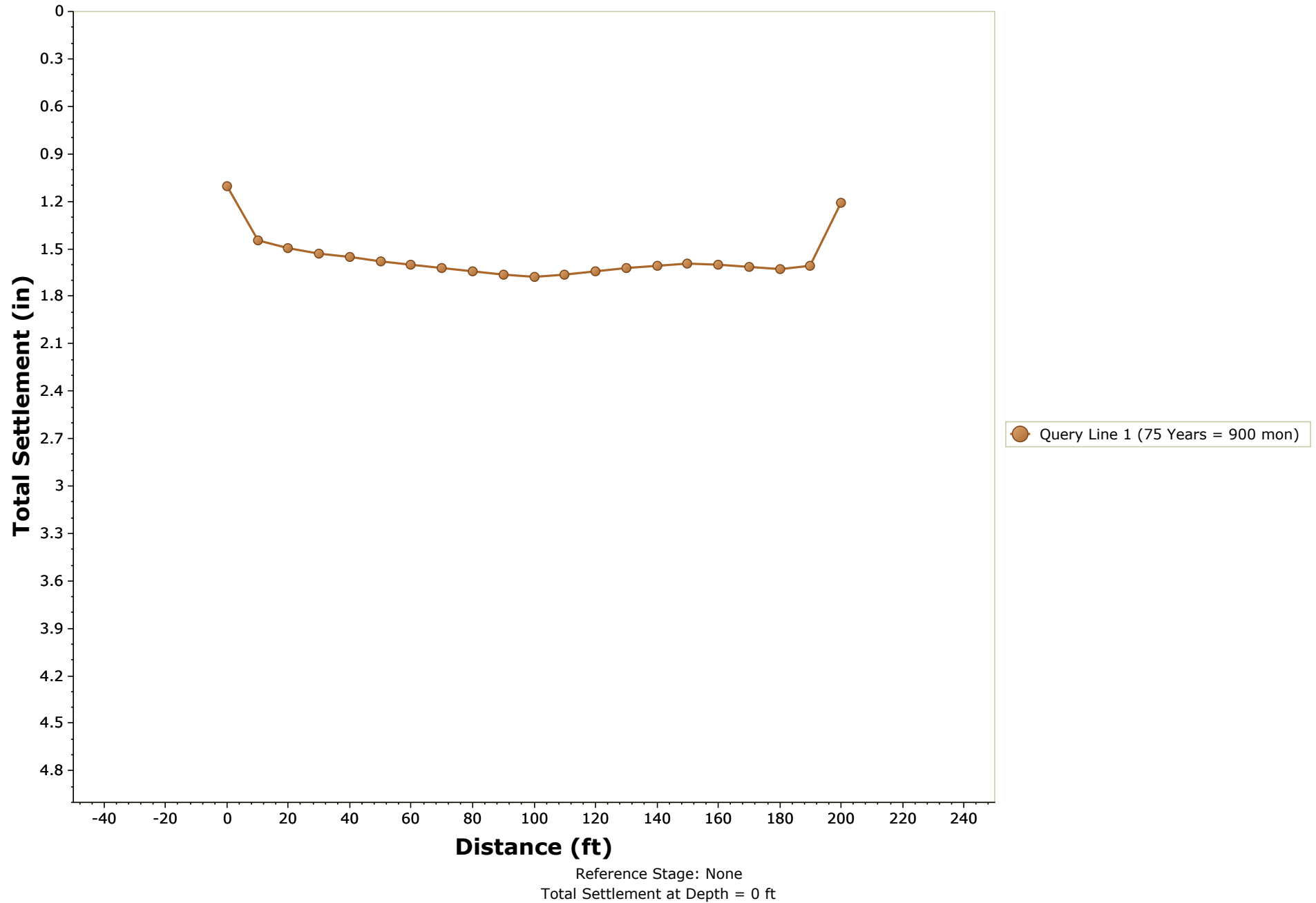


	Project		I-395 Route 9 Connector - WIN 18915.00	
	Analysis Description		Sta. 145+00	
	Drawn By		EMS	Company
	Date		5/22/2020, 8:16:09 AM	File Name
SETTLE3D 4.010		2020-0604-Sta 14500 Settlement.s3z		



Project		I-395 Route 9 Connector - WIN 18915.00	
Analysis Description		Sta. 145+00	
Drawn By	EMS	Company	
Date	5/22/2020, 8:16:09 AM	File Name	2020-0604-Sta 14500 Settlement.s3z

Distance vs. Total Settlement



Sta. 167+50

Settle3 Analysis Information

I-395 Route 9 Connector - WIN 18915.00

Project Settings

Document Name	2020-0618-Sta 16750 Settlement-D2.s3z
Project Title	I-395 Route 9 Connector - WIN 18915.00
Analysis	Sta. 167+50
Author	EMS
Date Created	5/22/2020, 8:16:09 AM
Stress Computation Method	Westergaard
Time-dependent Consolidation Analysis	
Time Units	months
Permeability Units	feet/second
Minimum settlement ratio for subgrade modulus	0.9

Use average properties to calculate layered stresses

Improve consolidation accuracy

Ignore negative effective stresses in settlement calculations

Stage Settings

Stage #	Name	Time [months]
1	Initial	0
2	95% Consolidation	4
3	75 Years	900

Results

Time taken to compute: 0.507987 seconds

Stage: Initial = 0 mon

Data Type	Minimum	Maximum
Total Settlement [in]	0	1.16231
Total Consolidation Settlement [in]	0	1.14301
Virgin Consolidation Settlement [in]	0	1.53201e-005
Recompression Consolidation Settlement [in]	0	1.14299
Immediate Settlement [in]	0	0.0192982
Secondary Settlement [in]	0	0
Loading Stress ZZ [ksf]	0.966047	2.5
Loading Stress XX [ksf]	0	0
Loading Stress YY [ksf]	0	0
Effective Stress ZZ [ksf]	0.46	2.80756
Effective Stress XX [ksf]	0	0.9032
Effective Stress YY [ksf]	0	0.9032
Total Stress ZZ [ksf]	1.125	3.43007
Total Stress XX [ksf]	0	3.43007
Total Stress YY [ksf]	0	3.43007
Modulus of Subgrade Reaction (Total) [ksf/ft]	0	27.0751
Modulus of Subgrade Reaction (Immediate) [ksf/ft]	0	1763.16
Modulus of Subgrade Reaction (Consolidation) [ksf/ft]	0	27.5512
Total Strain	0	0.0747047
Pore Water Pressure [ksf]	0	2.52687
Excess Pore Water Pressure [ksf]	0	2.34818
Degree of Consolidation [%]	0	66.089
Pre-consolidation Stress [ksf]	0.670924	3.5992
Over-consolidation Ratio	1	6.07679
Void Ratio	-0.0747047	2.89298e-018
Permeability [ft/s]	0	1.17958e-006
Coefficient of Consolidation [ft^2/s]	0	1e-006
Hydroconsolidation Settlement [in]	0	0
Average Degree of Consolidation [%]	0	0
Undrained Shear Strength	0	0.170721

Stage: 95% Consolidation = 4 mon

Data Type	Minimum	Maximum
Total Settlement [in]	0	2.04682
Total Consolidation Settlement [in]	0	2.02771
Virgin Consolidation Settlement [in]	0	0.285027
Recompression Consolidation Settlement [in]	0	1.74647
Immediate Settlement [in]	0	0.0192982
Secondary Settlement [in]	0	0
Loading Stress ZZ [ksf]	0.966047	2.5
Loading Stress XX [ksf]	0	0
Loading Stress YY [ksf]	0	0
Effective Stress ZZ [ksf]	1.125	2.83042
Effective Stress XX [ksf]	0	2.83042
Effective Stress YY [ksf]	0	2.83042
Total Stress ZZ [ksf]	1.125	3.43007
Total Stress XX [ksf]	0	3.43007
Total Stress YY [ksf]	0	3.43007
Modulus of Subgrade Reaction (Total) [ksf/ft]	0	17.7907
Modulus of Subgrade Reaction (Immediate) [ksf/ft]	0	1763.16
Modulus of Subgrade Reaction (Consolidation) [ksf/ft]	0	17.9731
Total Strain	0.000241523	0.0747047
Pore Water Pressure [ksf]	-0.0167445	1.0692
Excess Pore Water Pressure [ksf]	-0.0217365	0.632822
Degree of Consolidation [%]	0	97.3105
Pre-consolidation Stress [ksf]	1.47079	3.5992
Over-consolidation Ratio	1	3.19809
Void Ratio	-0.0747047	0
Permeability [ft/s]	0	1.17958e-006
Coefficient of Consolidation [ft ² /s]	0	1e-006
Hydroconsolidation Settlement [in]	0	0
Average Degree of Consolidation [%]	0	90.0033
Undrained Shear Strength	0	0.170721

Stage: 75 Years = 900 mon

Data Type	Minimum	Maximum
Total Settlement [in]	0	2.75399
Total Consolidation Settlement [in]	0	2.32166
Virgin Consolidation Settlement [in]	0	0.574859
Recompression Consolidation Settlement [in]	0	1.7468
Immediate Settlement [in]	0	0.0192982
Secondary Settlement [in]	0	0.42392
Loading Stress ZZ [ksf]	0.966047	2.5
Loading Stress XX [ksf]	0	0
Loading Stress YY [ksf]	0	0
Effective Stress ZZ [ksf]	1.125	2.99305
Effective Stress XX [ksf]	0	2.99305
Effective Stress YY [ksf]	0	2.99305
Total Stress ZZ [ksf]	1.125	3.43007
Total Stress XX [ksf]	0	3.43007
Total Stress YY [ksf]	0	3.43007
Modulus of Subgrade Reaction (Total) [ksf/ft]	0	13.1671
Modulus of Subgrade Reaction (Immediate) [ksf/ft]	0	1763.16
Modulus of Subgrade Reaction (Consolidation) [ksf/ft]	0	15.3079
Total Strain	0.000241523	0.0747047
Pore Water Pressure [ksf]	-0.00853779	0.4371
Excess Pore Water Pressure [ksf]	-0.0110338	0.0129556
Degree of Consolidation [%]	0	100
Pre-consolidation Stress [ksf]	1.6809	3.5992
Over-consolidation Ratio	1	3.19809
Void Ratio	-0.0747047	0
Permeability [ft/s]	0	1.17958e-006
Coefficient of Consolidation [ft^2/s]	0	1e-006
Hydroconsolidation Settlement [in]	0	0
Average Degree of Consolidation [%]	0	100
Undrained Shear Strength	0	0.170721

Loads

1. Rectangular Load: "Rectangular Load 1"

Length 50 ft
 Width 60 ft
 Rotation angle 0 degrees
 Load Type Flexible
 Area of Load 3000 ft²
 Depth 0 ft
 Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
0	-10	0
50	-10	0
50	50	2.375
0	50	2.25

2. Rectangular Load: "Rectangular Load 2"

Length 50 ft
Width 40 ft
Rotation angle 0 degrees
Load Type Flexible
Area of Load 2000 ft²
Depth 0 ft
Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
0	50	2.25
50	50	2.375
50	90	2.375
0	90	2.25

3. Rectangular Load: "Rectangular Load 3"

Length 50 ft
Width 60 ft
Rotation angle 0 degrees
Load Type Flexible
Area of Load 3000 ft²
Depth 0 ft
Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
-3.55271e-015	90	2.25
50	90	2.375
50	150	0
-3.55271e-015	150	0

4. Rectangular Load: "Rectangular Load 4"

Length 50 ft
Width 60 ft
Rotation angle 0 degrees
Load Type Flexible
Area of Load 3000 ft²
Depth 0 ft
Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
50	-10	0
100	-10	0
100	50	2.5
50	50	2.375

5. Rectangular Load: "Rectangular Load 5"

Length 50 ft
Width 40 ft
Rotation angle 0 degrees
Load Type Flexible
Area of Load 2000 ft²
Depth 0 ft
Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
50	50	2.375
100	50	2.5
100	90	2.5
50	90	2.375

6. Rectangular Load: "Rectangular Load 6"

Length 50 ft
Width 60 ft
Rotation angle 0 degrees
Load Type Flexible
Area of Load 3000 ft²
Depth 0 ft
Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
50	90	2.375
100	90	2.5
100	150	0
50	150	0

7. Rectangular Load: "Rectangular Load 7"

Length 50 ft
Width 60 ft
Rotation angle 0 degrees
Load Type Flexible
Area of Load 3000 ft²
Depth 0 ft
Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
100	-10	0
150	-10	0
150	50	2.5
100	50	2.5

8. Rectangular Load: "Rectangular Load 10"

Length 50 ft
Width 60 ft
Rotation angle 0 degrees
Load Type Flexible
Area of Load 3000 ft²
Depth 0 ft
Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
150	-10	0
200	-10	0
200	50	2.375
150	50	2.5

9. Rectangular Load: "Rectangular Load 8"

Length 50 ft
Width 40 ft
Rotation angle 0 degrees
Load Type Flexible
Area of Load 2000 ft²
Depth 0 ft
Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
100	50	2.5
150	50	2.5
150	90	2.5
100	90	2.5

10. Rectangular Load: "Rectangular Load 9"

Length 50 ft
Width 60 ft
Rotation angle 0 degrees
Load Type Flexible
Area of Load 3000 ft²
Depth 0 ft
Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
100	90	2.5
150	90	2.5
150	150	0
100	150	0

11. Rectangular Load: "Rectangular Load 11"

Length 50 ft
 Width 40 ft
 Rotation angle 0 degrees
 Load Type Flexible
 Area of Load 2000 ft²
 Depth 0 ft
 Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
150	50	2.5
200	50	2.375
200	90	2.375
150	90	2.5

12. Rectangular Load: "Rectangular Load 12"

Length 50 ft
 Width 60 ft
 Rotation angle 0 degrees
 Load Type Flexible
 Area of Load 3000 ft²
 Depth 0 ft
 Installation Stage Initial = 0 mon

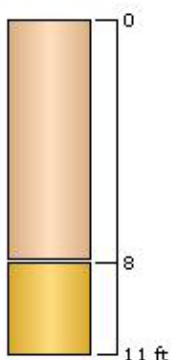
Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
150	90	2.5
200	90	2.375
200	150	0
150	150	0



Soil Layers

Ground Surface Drained: Yes

Layer #	Type	Thickness [ft]	Depth [ft]	Drained at Bottom
1	Marine Deposit CLAY	8	0	No
2	WEATHERED BEDROCK	3	8	No



Soil Properties

Property	Marine Deposit CLAY	WEATHERED BEDROCK
Color		
Unit Weight [kips/ft ³]	0.115	0.14
Saturated Unit Weight [kips/ft ³]	0.115	0.14
K0	1	1
Immediate Settlement	Disabled	Enabled
Es [ksf]	-	4000
Esur [ksf]	-	4000
Primary Consolidation	Enabled	Disabled
Material Type	Non-Linear	
Cce	0.16	-
Cre	0.02	-
e0	0	-
Pc [ksf] top	3.6	-
bottom	2	-
Cv [ft ² /s]	1e-006	-
Cvr [ft ² /s]	1e-006	-
B-bar	1	-
Secondary Consolidation	Standard	Disabled
Cae	0.004	-
Care	0.004	-
Undrained Su A [kips/ft ²]	0	0
Undrained Su S	0.2	0.2
Undrained Su m	0.8	0.8
Piezo Line ID	1	1

Groundwater

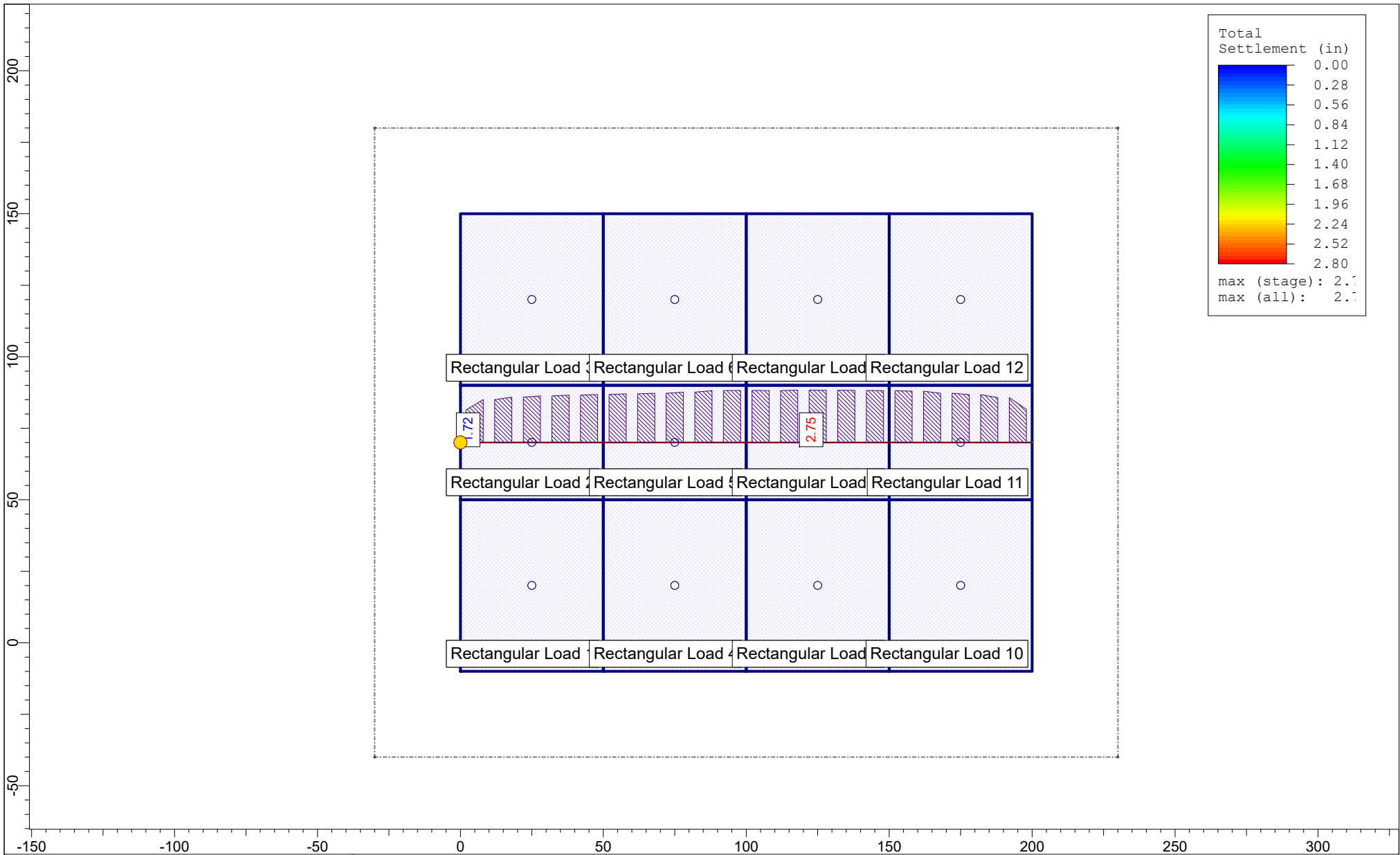
Groundwater method Piezometric Lines
Water Unit Weight 0.0624 kips/ft³


Piezometric Line Entities

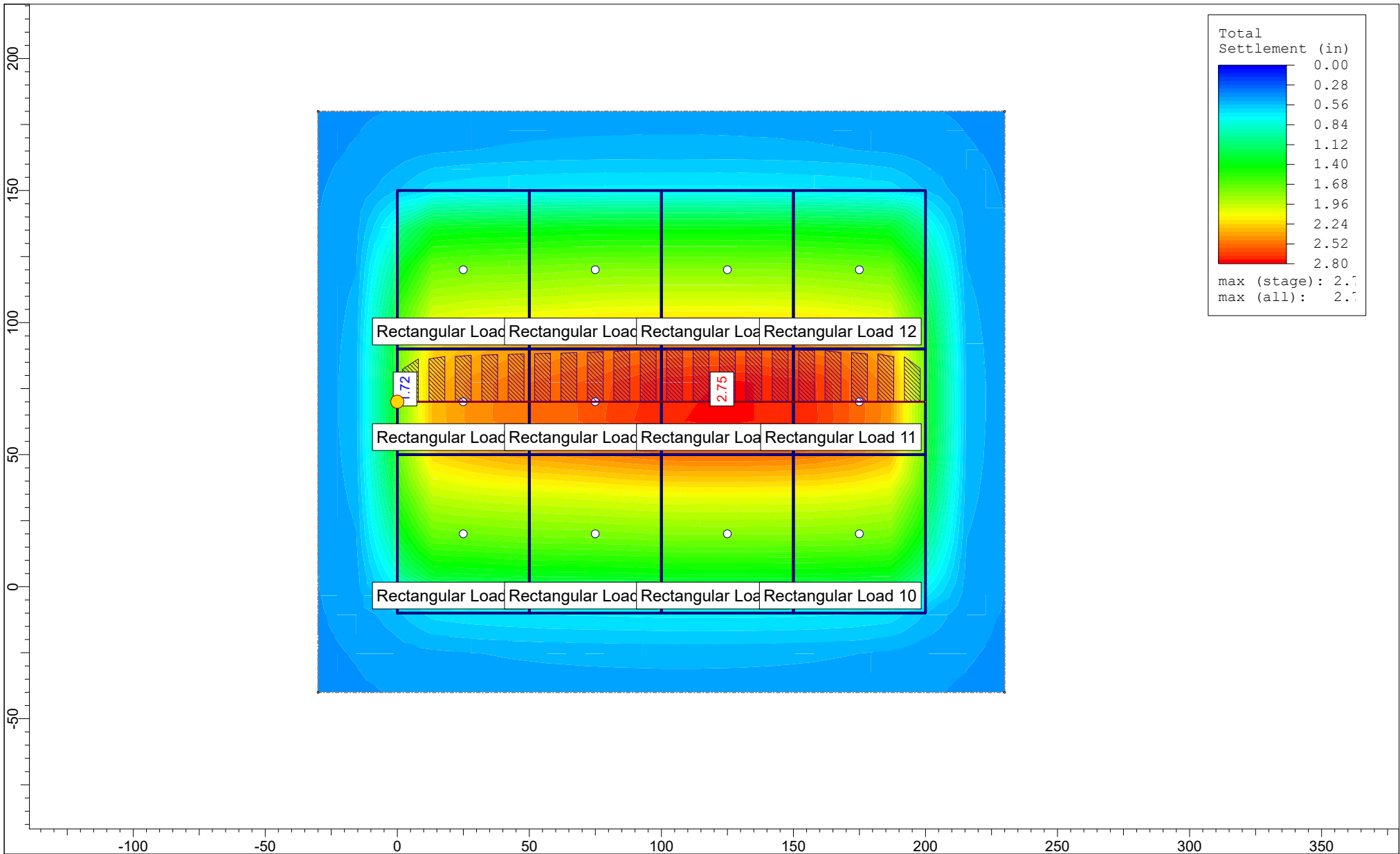
ID	Depth (ft)
1	4 ft

Query Lines

Line #	Query Line Name	Start Location	End Location	Horizontal Divisions	Vertical Divisions
1	Query Line 1	0, 70	200, 70	20	Auto: 55

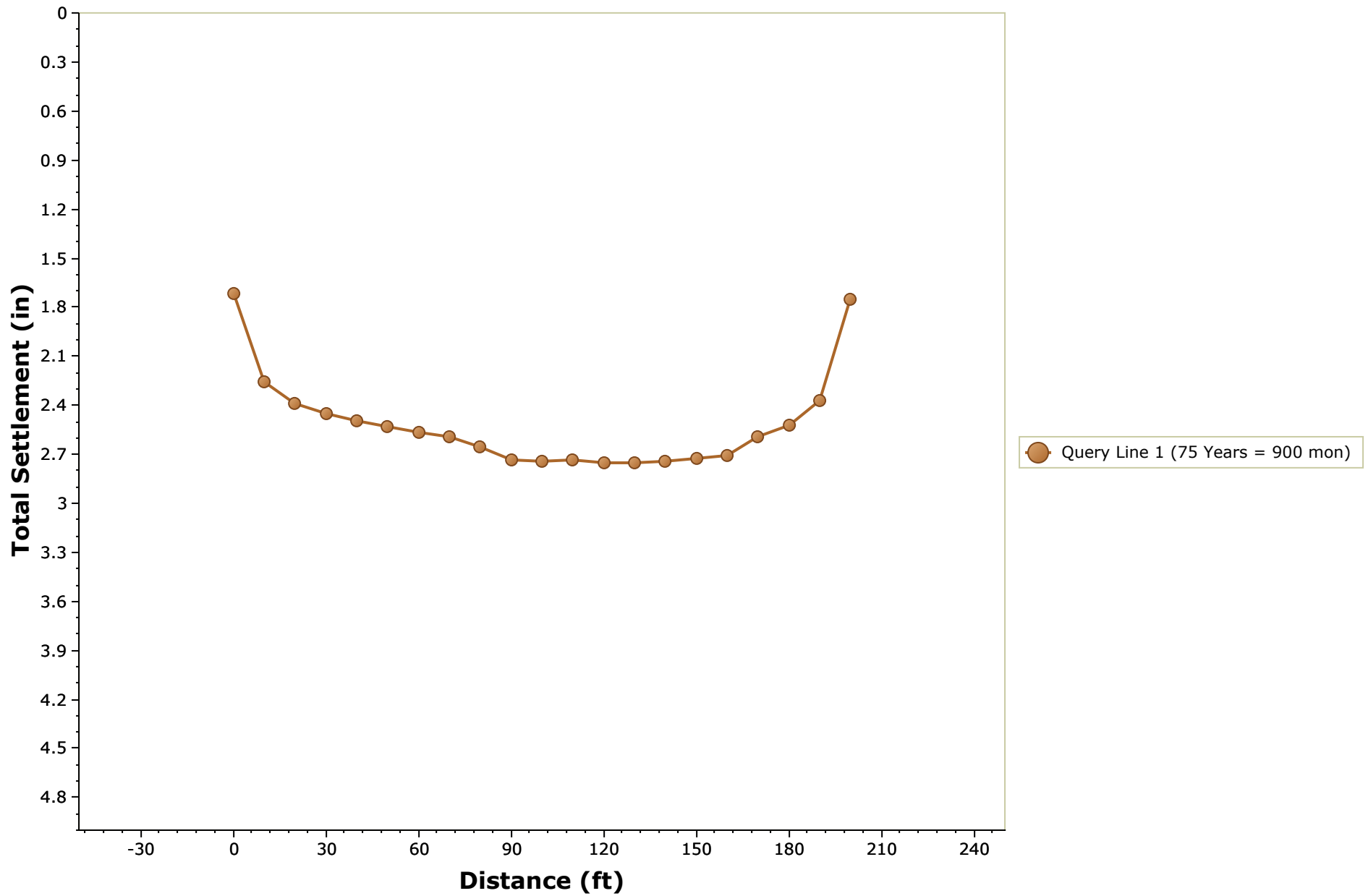


	Project		I-395 Route 9 Connector - WIN 18915.00	
	Analysis Description		Sta. 167+50	
	Drawn By		EMS	Company
	Date		5/22/2020, 8:16:09 AM	File Name
			2020-0618-Sta 16750 Settlement-D2.s3z	



Project	I-395 Route 9 Connector - WIN 18915.00		
Analysis Description	Sta. 167+50		
Drawn By	EMS	Company	
Date	5/22/2020, 8:16:09 AM	File Name	2020-0618-Sta 16750 Settlement-D2.s3z

Distance vs. Total Settlement



Reference Stage: None
 Total Settlement at Depth = 0 ft

Sta. 180+50

Settle3D Analysis Information

I-395 Route 9 Connector - WIN 18915.00

Project Settings

Document Name 2020-0604-Sta 18050 Settlement.s3z
 Project Title I-395 Route 9 Connector - WIN 18915.00
 Analysis Sta. 180+50
 Author EMS
 Date Created 5/22/2020, 8:16:09 AM
 Stress Computation Method Westergaard
 Time-dependent Consolidation Analysis
 Time Units months
 Permeability Units feet/second
 Minimum settlement ratio for subgrade modulus 0.9

Use average properties to calculate layered stresses

Improve consolidation accuracy

Ignore negative effective stresses in settlement calculations

Stage Settings

Stage #	Name	Time [months]
1	Initial	0
2	95% Consolidation	27
3	75 Years	900

Results

Time taken to compute: 0.620519 seconds

Stage: Initial = 0 mon

Data Type	Minimum	Maximum
Total Settlement [in]	0	0.155583
Total Consolidation Settlement [in]	0	0
Virgin Consolidation Settlement [in]	0	0
Recompression Consolidation Settlement [in]	0	0
Immediate Settlement [in]	0	0.155583
Secondary Settlement [in]	0	0
Loading Stress ZZ [ksf]	0.845288	3.625
Loading Stress XX [ksf]	0	0
Loading Stress YY [ksf]	0	0
Effective Stress ZZ [ksf]	0	1.916
Effective Stress XX [ksf]	0	1.916
Effective Stress YY [ksf]	0	1.916
Total Stress ZZ [ksf]	1.125	6.08535
Total Stress XX [ksf]	1.125	6.08535
Total Stress YY [ksf]	1.125	6.08535
Modulus of Subgrade Reaction (Total) [ksf/ft]	0	372.205
Modulus of Subgrade Reaction (Immediate) [ksf/ft]	0	372.205
Modulus of Subgrade Reaction (Consolidation) [ksf/ft]	0	0
Total Strain	0	0.00270242
Pore Water Pressure [ksf]	1.125	4.16935
Excess Pore Water Pressure [ksf]	0.845288	3.625
Degree of Consolidation [%]	0	0
Pre-consolidation Stress [ksf]	1.05318	3.75255
Over-consolidation Ratio	1	3567.06
Void Ratio	-4.37805e-016	6.89494e-017
Permeability [ft/s]	0	1.03158e-006
Coefficient of Consolidation [ft ² /s]	0	2e-006
Hydroconsolidation Settlement [in]	0	0
Average Degree of Consolidation [%]	0	0
Undrained Shear Strength	-5.55112e-017	0

Stage: 95% Consolidation = 27 mon

Data Type	Minimum	Maximum
Total Settlement [in]	0	17.6528
Total Consolidation Settlement [in]	0	17.4975
Virgin Consolidation Settlement [in]	0	13.6947
Recompression Consolidation Settlement [in]	0	3.80339
Immediate Settlement [in]	0	0.155583
Secondary Settlement [in]	0	0
Loading Stress ZZ [ksf]	0.845288	3.625
Loading Stress XX [ksf]	0	0
Loading Stress YY [ksf]	0	0
Effective Stress ZZ [ksf]	1.125	3.90135
Effective Stress XX [ksf]	1.125	3.90135
Effective Stress YY [ksf]	1.125	3.90135
Total Stress ZZ [ksf]	1.125	6.08535
Total Stress XX [ksf]	1.125	6.08535
Total Stress YY [ksf]	1.125	6.08535
Modulus of Subgrade Reaction (Total) [ksf/ft]	0	3.23267
Modulus of Subgrade Reaction (Immediate) [ksf/ft]	0	372.205
Modulus of Subgrade Reaction (Consolidation) [ksf/ft]	0	3.26268
Total Strain	0.00105723	0.0784178
Pore Water Pressure [ksf]	0	2.184
Excess Pore Water Pressure [ksf]	0	0.614825
Degree of Consolidation [%]	0	99.9829
Pre-consolidation Stress [ksf]	1.80301	3.8997
Over-consolidation Ratio	1	3.33062
Void Ratio	-0.0784178	0
Permeability [ft/s]	0	1.03158e-006
Coefficient of Consolidation [ft ² /s]	0	2e-006
Hydroconsolidation Settlement [in]	0	0
Average Degree of Consolidation [%]	0	92.2231
Undrained Shear Strength	0	0.429565

Stage: 75 Years = 900 mon

Data Type	Minimum	Maximum
Total Settlement [in]	0	21.2425
Total Consolidation Settlement [in]	0	19.0467
Virgin Consolidation Settlement [in]	0	15.2437
Recompression Consolidation Settlement [in]	-0.000275685	3.80336
Immediate Settlement [in]	0	0.155583
Secondary Settlement [in]	0	2.04048
Loading Stress ZZ [ksf]	0.845288	3.625
Loading Stress XX [ksf]	0	0
Loading Stress YY [ksf]	0	0
Effective Stress ZZ [ksf]	1.125	3.90135
Effective Stress XX [ksf]	1.125	3.90135
Effective Stress YY [ksf]	1.125	3.90135
Total Stress ZZ [ksf]	1.125	6.08535
Total Stress XX [ksf]	1.125	6.08535
Total Stress YY [ksf]	1.125	6.08535
Modulus of Subgrade Reaction (Total) [ksf/ft]	0	2.40983
Modulus of Subgrade Reaction (Immediate) [ksf/ft]	0	372.205
Modulus of Subgrade Reaction (Consolidation) [ksf/ft]	0	2.70623
Total Strain	0.00105723	0.0914057
Pore Water Pressure [ksf]	0	2.184
Excess Pore Water Pressure [ksf]	-0.0514396	0.0348191
Degree of Consolidation [%]	0	100
Pre-consolidation Stress [ksf]	1.90452	3.8997
Over-consolidation Ratio	1	3.33062
Void Ratio	-0.0914057	0
Permeability [ft/s]	0	1.03158e-006
Coefficient of Consolidation [ft ² /s]	0	2e-006
Hydroconsolidation Settlement [in]	0	0
Average Degree of Consolidation [%]	0	100
Undrained Shear Strength	0	0.430463

Loads

1. Rectangular Load: "Rectangular Load 1"

Length 50 ft
 Width 60 ft
 Rotation angle 0 degrees
 Load Type Flexible
 Area of Load 3000 ft²
 Depth 0 ft
 Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
0	-10	0
50	-10	0
50	50	3.25
0	50	2.25

2. Rectangular Load: "Rectangular Load 2"

Length 50 ft
 Width 45 ft
 Rotation angle 0 degrees
 Load Type Flexible
 Area of Load 2250 ft²
 Depth 0 ft
 Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
0	50	2.25
50	50	3.25
50	95	3.25
0	95	2.25

3. Rectangular Load: "Rectangular Load 3"

Length 50 ft
 Width 60 ft
 Rotation angle 0 degrees
 Load Type Flexible
 Area of Load 3000 ft²
 Depth 0 ft
 Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
3.55271e-015	95	2.25
50	95	3.25
50	155	0
3.55271e-015	155	0

4. Rectangular Load: "Rectangular Load 4"

Length 50 ft
 Width 60 ft
 Rotation angle 0 degrees
 Load Type Flexible
 Area of Load 3000 ft²
 Depth 0 ft
 Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
50	-10	0
100	-10	0
100	50	3.625
50	50	3.25

5. Rectangular Load: "Rectangular Load 5"

Length 50 ft
 Width 45 ft
 Rotation angle 0 degrees
 Load Type Flexible
 Area of Load 2250 ft²
 Depth 0 ft
 Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
50	50	3.25
100	50	3.625
100	95	3.625
50	95	3.25

6. Rectangular Load: "Rectangular Load 6"

Length 50 ft
Width 60 ft
Rotation angle 0 degrees
Load Type Flexible
Area of Load 3000 ft²
Depth 0 ft
Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
50	95	3.25
100	95	3.625
100	155	0
50	155	0

7. Rectangular Load: "Rectangular Load 7"

Length 50 ft
Width 60 ft
Rotation angle 0 degrees
Load Type Flexible
Area of Load 3000 ft²
Depth 0 ft
Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
100	-10	0
150	-10	0
150	50	3.5
100	50	3.625

8. Rectangular Load: "Rectangular Load 10"

Length 50 ft
Width 60 ft
Rotation angle 0 degrees
Load Type Flexible
Area of Load 3000 ft²
Depth 0 ft
Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
150	-10	0
200	-10	0
200	50	3.375
150	50	3.5

9. Rectangular Load: "Rectangular Load 8"

Length 50 ft
Width 45 ft
Rotation angle 0 degrees
Load Type Flexible
Area of Load 2250 ft²
Depth 0 ft
Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
100	50	3.625
150	50	3.5
150	95	3.5
100	95	3.625

10. Rectangular Load: "Rectangular Load 9"

Length 50 ft
 Width 60 ft
 Rotation angle 0 degrees
 Load Type Flexible
 Area of Load 3000 ft²
 Depth 0 ft
 Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
100	95	3.625
150	95	3.5
150	155	0
100	155	0

11. Rectangular Load: "Rectangular Load 11"

Length 50 ft
 Width 45 ft
 Rotation angle 0 degrees
 Load Type Flexible
 Area of Load 2250 ft²
 Depth 0 ft
 Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
150	50	3.5
200	50	3.375
200	95	3.375
150	95	3.5

12. Rectangular Load: "Rectangular Load 12"

Length 50 ft
 Width 60 ft
 Rotation angle 0 degrees
 Load Type Flexible
 Area of Load 3000 ft²
 Depth 0 ft
 Installation Stage Initial = 0 mon

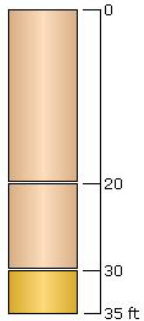
Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
150	95	3.5
200	95	3.375
200	155	0
150	155	0




Soil Layers

Ground Surface Drained: Yes

Layer #	Type	Thickness [ft]	Depth [ft]	Drained at Bottom
1	Marine Deposit CLAY above el 73	20	0	No
2	Marine Deposit CLAY el 73 to el 63	10	20	Yes
3	Glacial Till SAND	5	30	No



Soil Properties

Property	Marine Deposit CLAY above el 73	Glacial Till SAND	Marine Deposit CLAY el 73 to el 63
Color			
Unit Weight [kips/ft ³]	0.115	0.13	0.115
Saturated Unit Weight [kips/ft ³]	0.115	0.13	0.115
K0	1	1	1
Immediate Settlement	Disabled	Enabled	Disabled
Es [ksf]	-	800	-
E _{sur} [ksf]	-	800	-
Primary Consolidation	Enabled	Disabled	Enabled
Material Type	Non-Linear		Non-Linear
C _{ce}	0.16	-	0.16
C _{re}	0.02	-	0.02
e ₀	0	-	0
P _c [ksf] top	3.755	-	-
P _c [ksf] bottom	1.3	-	-
OCR	-	-	1
C _v [ft ² /s]	2e-006	-	2e-006
C _{vr} [ft ² /s]	2e-006	-	2e-006
B-bar	1	-	1
Secondary Consolidation	Standard	Disabled	Standard
C _{ae}	0.004	-	0.004
C _{are}	0.004	-	0.004
Undrained Su A [kips/ft ²]	0	0	0
Undrained Su S	0.2	0.2	0.2
Undrained Su m	0.8	0.8	0.8
Piezo Line ID	1	1	1

Groundwater

Groundwater method Piezometric Lines
 Water Unit Weight 0.0624 kips/ft³

Piezometric Line Entities

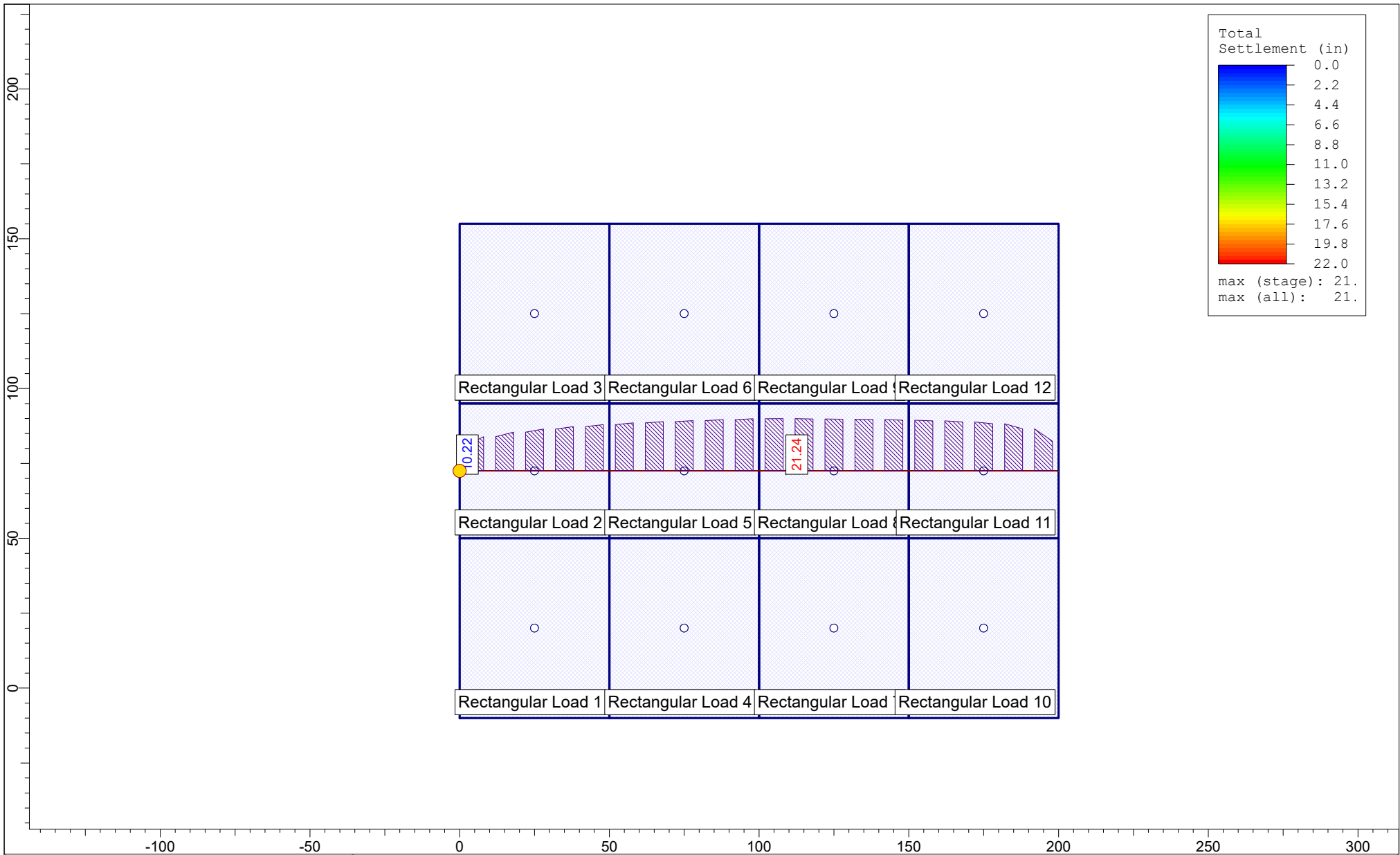
ID	Depth (ft)
1	0 ft


Query Lines

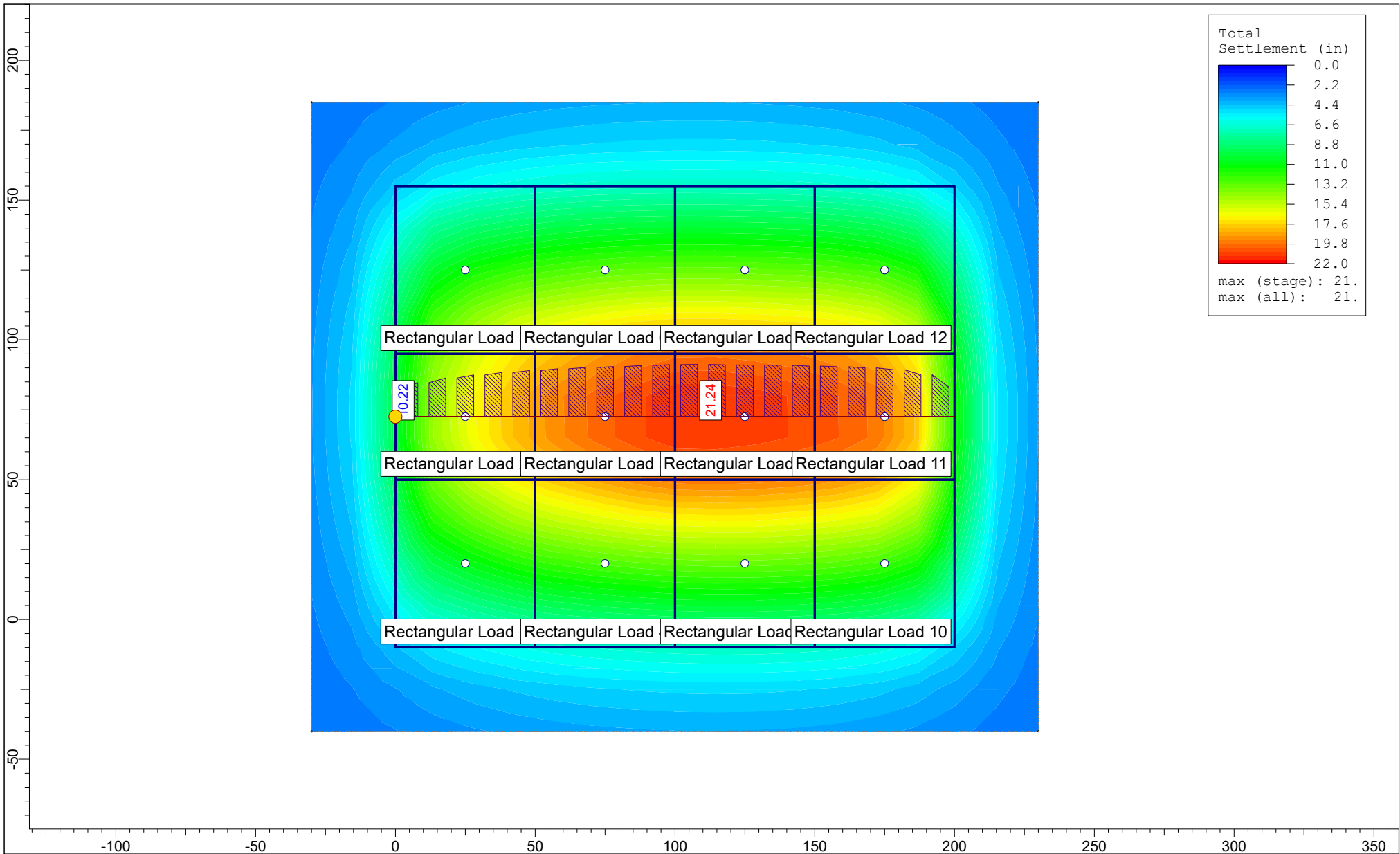
Line #	Query Line Name	Start Location	End Location	Horizontal Divisions	Vertical Divisions
1	Query Line 1	0, 72.5	200, 72.5	20	Auto: 47

Time Points

Point #	(X,Y) Location	Depth	Goal Type	Goal	Time Until Goal
1	134.794, 63.106	0 ft	Degree of Consolidation	95%	27.5002 mon



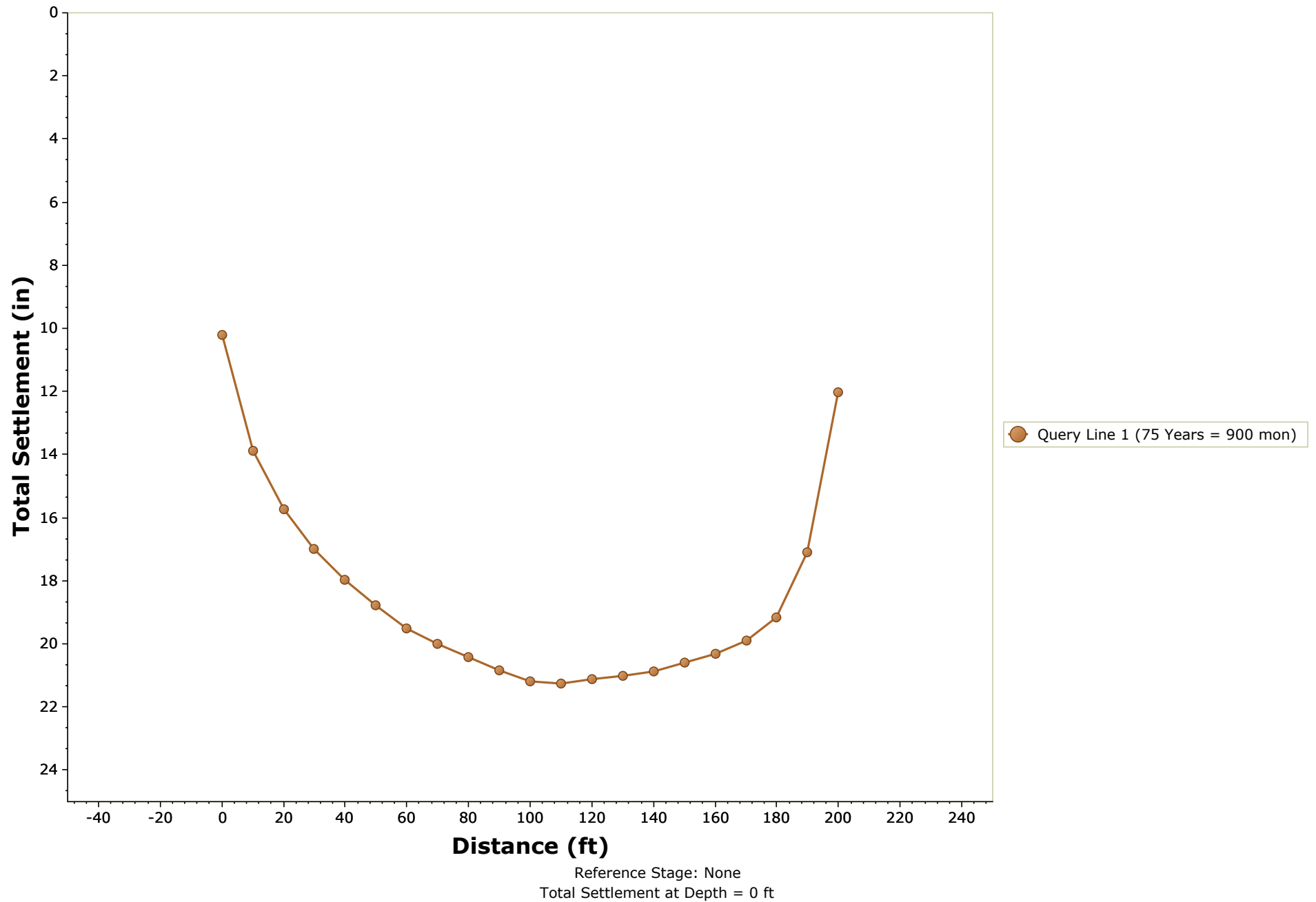
	Project			I-395 Route 9 Connector - WIN 18915.00	
	Analysis Description			Sta. 180+50	
	Drawn By			EMS	Company
	Date			5/22/2020, 8:16:09 AM	File Name
				2020-0604-Sta 18050 Settlement.s3z	



SETTLE3D 4.010

Project		I-395 Route 9 Connector - WIN 18915.00	
Analysis Description		Sta. 180+50	
Drawn By		EMS	Company
Date		5/22/2020, 8:16:09 AM	File Name
		2020-0604-Sta 18050 Settlement.s3z	

Distance vs. Total Settlement



Sta. 195+50

Settle3D Analysis Information

I-395 Route 9 Connector - WIN 18915.00

Project Settings

Document Name	2020-0604-Sta 19550 Settlement.s3z
Project Title	I-395 Route 9 Connector - WIN 18915.00
Analysis	Sta. 195+50
Author	EMS
Date Created	5/22/2020, 8:16:09 AM
Stress Computation Method	Westergaard
Time-dependent Consolidation Analysis	
Time Units	months
Permeability Units	feet/second
Minimum settlement ratio for subgrade modulus	0.9

Use average properties to calculate layered stresses

Improve consolidation accuracy

Ignore negative effective stresses in settlement calculations

Stage Settings

Stage #	Name	Time [months]
1	Initial	0
2	75 Years	900

Results

Time taken to compute: 2.90755 seconds

Stage: Initial = 0 mon

Data Type	Minimum	Maximum
Total Settlement [in]	0	2.83379
Total Consolidation Settlement [in]	0	0
Virgin Consolidation Settlement [in]	0	0
Recompression Consolidation Settlement [in]	0	0
Immediate Settlement [in]	0	2.83379
Secondary Settlement [in]	0	0
Loading Stress ZZ [ksf]	-1.82191e-005	2.85
Loading Stress XX [ksf]	0	0
Loading Stress YY [ksf]	0	0
Effective Stress ZZ [ksf]	-1.82191e-005	3.42763
Effective Stress XX [ksf]	0	1.08
Effective Stress YY [ksf]	0	1.08
Total Stress ZZ [ksf]	-1.82191e-005	3.42763
Total Stress XX [ksf]	0	1.08
Total Stress YY [ksf]	0	1.08
Modulus of Subgrade Reaction (Total) [ksf/ft]	-0.000292297	13.4186
Modulus of Subgrade Reaction (Immediate) [ksf/ft]	-0.000292297	13.4186
Modulus of Subgrade Reaction (Consolidation) [ksf/ft]	0	0
Total Strain	1.45435e-007	0.0407107
Pore Water Pressure [ksf]	0	0
Excess Pore Water Pressure [ksf]	0	0
Degree of Consolidation [%]	0	0
Pre-consolidation Stress [ksf]	0.711163	4.97351
Over-consolidation Ratio	1	14002.8
Void Ratio	0	0
Permeability [ft/s]	0	0
Coefficient of Consolidation [ft ² /s]	0	0
Hydroconsolidation Settlement [in]	0	0
Average Degree of Consolidation [%]	0	0
Undrained Shear Strength	0	0.194144

Stage: 75 Years = 900 mon

Data Type	Minimum	Maximum
Total Settlement [in]	0	2.83379
Total Consolidation Settlement [in]	0	0
Virgin Consolidation Settlement [in]	0	0
Recompression Consolidation Settlement [in]	0	0
Immediate Settlement [in]	0	2.83379
Secondary Settlement [in]	0	0
Loading Stress ZZ [ksf]	-1.82191e-005	2.85
Loading Stress XX [ksf]	0	0
Loading Stress YY [ksf]	0	0
Effective Stress ZZ [ksf]	-1.82191e-005	3.42763
Effective Stress XX [ksf]	0	1.08
Effective Stress YY [ksf]	0	1.08
Total Stress ZZ [ksf]	-1.82191e-005	3.42763
Total Stress XX [ksf]	0	1.08
Total Stress YY [ksf]	0	1.08
Modulus of Subgrade Reaction (Total) [ksf/ft]	-0.000292297	13.4186
Modulus of Subgrade Reaction (Immediate) [ksf/ft]	-0.000292297	13.4186
Modulus of Subgrade Reaction (Consolidation) [ksf/ft]	0	0
Total Strain	1.45435e-007	0.0407107
Pore Water Pressure [ksf]	0	0
Excess Pore Water Pressure [ksf]	0	0
Degree of Consolidation [%]	0	0
Pre-consolidation Stress [ksf]	0.711163	4.97351
Over-consolidation Ratio	1	14002.8
Void Ratio	0	0
Permeability [ft/s]	0	0
Coefficient of Consolidation [ft ² /s]	0	0
Hydroconsolidation Settlement [in]	0	0
Average Degree of Consolidation [%]	0	0
Undrained Shear Strength	0	0.194144

Loads

1. Rectangular Load: "Rectangular Load 1"

Length 50 ft
 Width 40 ft
 Rotation angle 0 degrees
 Load Type Flexible
 Area of Load 2000 ft²
 Depth 0 ft
 Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
0	0	0
50	0	0
50	40	2.5
0	40	2.375

2. Rectangular Load: "Rectangular Load 2"

Length 50 ft
 Width 45 ft
 Rotation angle 0 degrees
 Load Type Flexible
 Area of Load 2250 ft²
 Depth 0 ft
 Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
0	40	2.375
50	40	2.5
50	85	2.5
0	85	2.375

3. Rectangular Load: "Rectangular Load 3"

Length 50 ft
Width 40 ft
Rotation angle 0 degrees
Load Type Flexible
Area of Load 2000 ft²
Depth 0 ft
Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
0	85	2.375
50	85	2.5
50	125	0
0	125	0

4. Rectangular Load: "Rectangular Load 4"

Length 50 ft
Width 40 ft
Rotation angle 0 degrees
Load Type Flexible
Area of Load 2000 ft²
Depth 0 ft
Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
50	3.55271e-015	0
100	3.55271e-015	0
100	40	2.625
50	40	2.5

5. Rectangular Load: "Rectangular Load 5"

Length 50 ft
Width 45 ft
Rotation angle 0 degrees
Load Type Flexible
Area of Load 2250 ft²
Depth 0 ft
Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
50	40	2.5
100	40	2.625
100	85	2.625
50	85	2.5

6. Rectangular Load: "Rectangular Load 6"

Length 50 ft
Width 40 ft
Rotation angle 0 degrees
Load Type Flexible
Area of Load 2000 ft²
Depth 0 ft
Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
50	85	2.5
100	85	2.625
100	125	0
50	125	0

7. Rectangular Load: "Rectangular Load 7"

Length 50 ft
Width 40 ft
Rotation angle 0 degrees
Load Type Flexible
Area of Load 2000 ft²
Depth 0 ft
Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
100	0	0
150	0	0
150	40	2.75
100	40	2.625

8. Rectangular Load: "Rectangular Load 8"

Length 50 ft
Width 45 ft
Rotation angle 0 degrees
Load Type Flexible
Area of Load 2250 ft²
Depth 0 ft
Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
100	40	2.625
150	40	2.75
150	85	2.75
100	85	2.625

9. Rectangular Load: "Rectangular Load 9"

Length 50 ft
Width 40 ft
Rotation angle 0 degrees
Load Type Flexible
Area of Load 2000 ft²
Depth 0 ft
Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
100	85	2.625
150	85	2.75
150	125	0
100	125	0

10. Rectangular Load: "Rectangular Load 10"

Length 50 ft
 Width 40 ft
 Rotation angle 0 degrees
 Load Type Flexible
 Area of Load 2000 ft²
 Depth 0 ft
 Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
150	0	0
200	0	0
200	40	2.875
150	40	2.75

11. Rectangular Load: "Rectangular Load 11"

Length 50 ft
 Width 45 ft
 Rotation angle 0 degrees
 Load Type Flexible
 Area of Load 2250 ft²
 Depth 0 ft
 Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
150	40	2.75
200	40	2.875
200	85	2.875
150	85	2.75

12. Rectangular Load: "Rectangular Load 12"

Length 50 ft
 Width 40 ft
 Rotation angle 0 degrees
 Load Type Flexible
 Area of Load 2000 ft²
 Depth 0 ft
 Installation Stage Initial = 0 mon

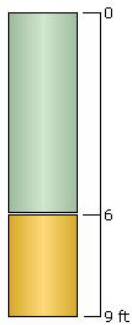
Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
150	85	2.75
200	85	2.875
200	125	0
150	125	0



Soil Layers

Ground Surface Drained: Yes

Layer #	Type	Thickness [ft]	Depth [ft]	Drained at Bottom
1	Marine Deposit SILT	6	0	Yes
2	Glacial Till SAND	3	6	No



Soil Properties

Property	Marine Deposit SILT	Glacial Till SAND
Color		
Unit Weight [kips/ft ³]	0.115	0.13
Saturated Unit Weight [kips/ft ³]	0.115	0.13
K0	1	1
Immediate Settlement	Enabled	Enabled
Es [ksf]	70	800
Esur [ksf]	70	800
B-bar	-	-
Undrained Su A [kips/ft ²]	0	0
Undrained Su S	0.2	0.2
Undrained Su m	0.8	0.8
Piezo Line ID	1	1

Groundwater

Groundwater method Piezometric Lines

Water Unit Weight 0.0624 kips/ft³

Piezometric Line Entities

ID	Depth (ft)
1	9 ft

Query Lines

Line #	Query Line Name	Start Location	End Location	Horizontal Divisions	Vertical Divisions
1	Query Line 1	0, 62.5	200, 62.5	20	Auto: 49

Field Point Grid

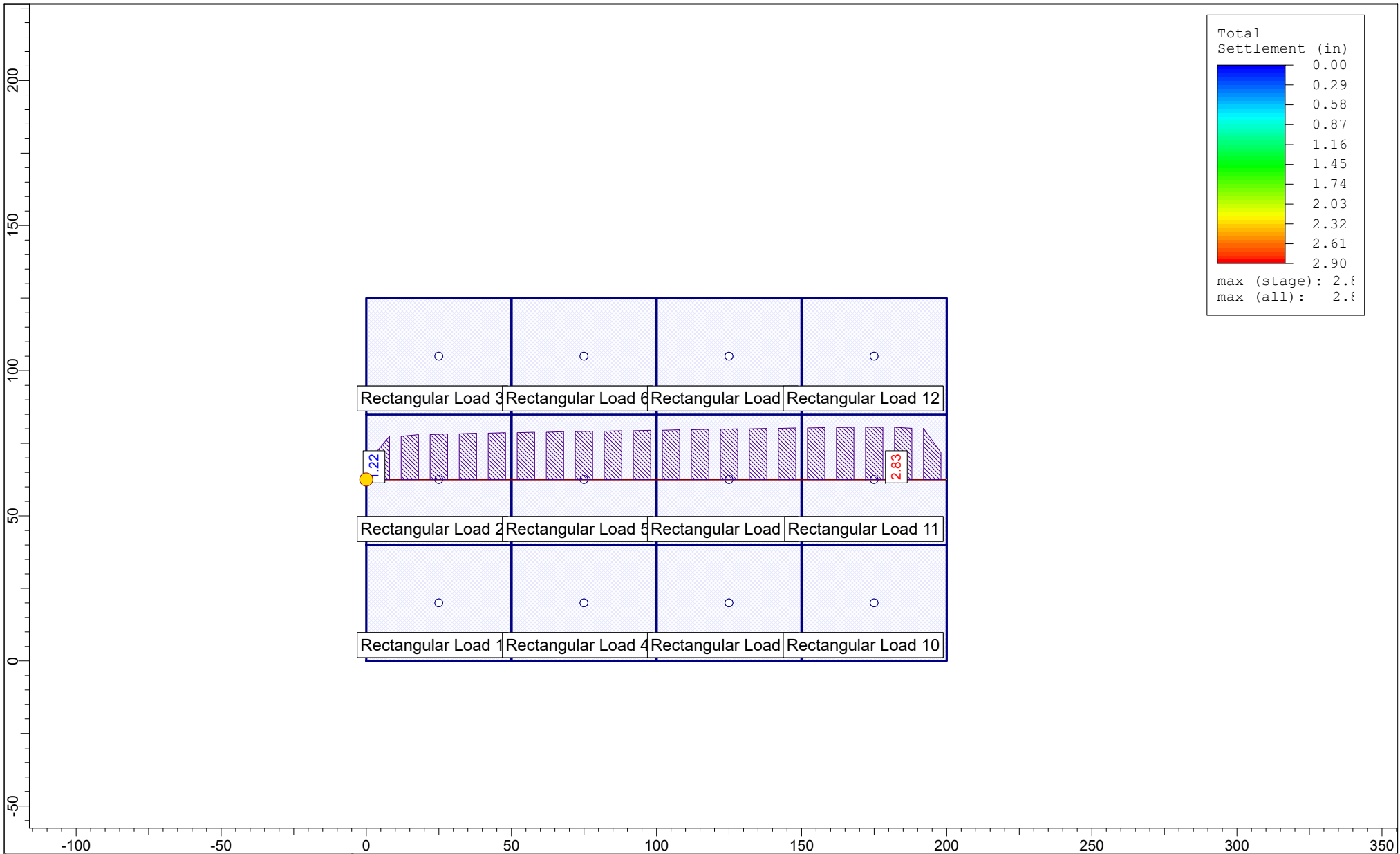
Number of points 442
Expansion Factor 2


Grid Coordinates

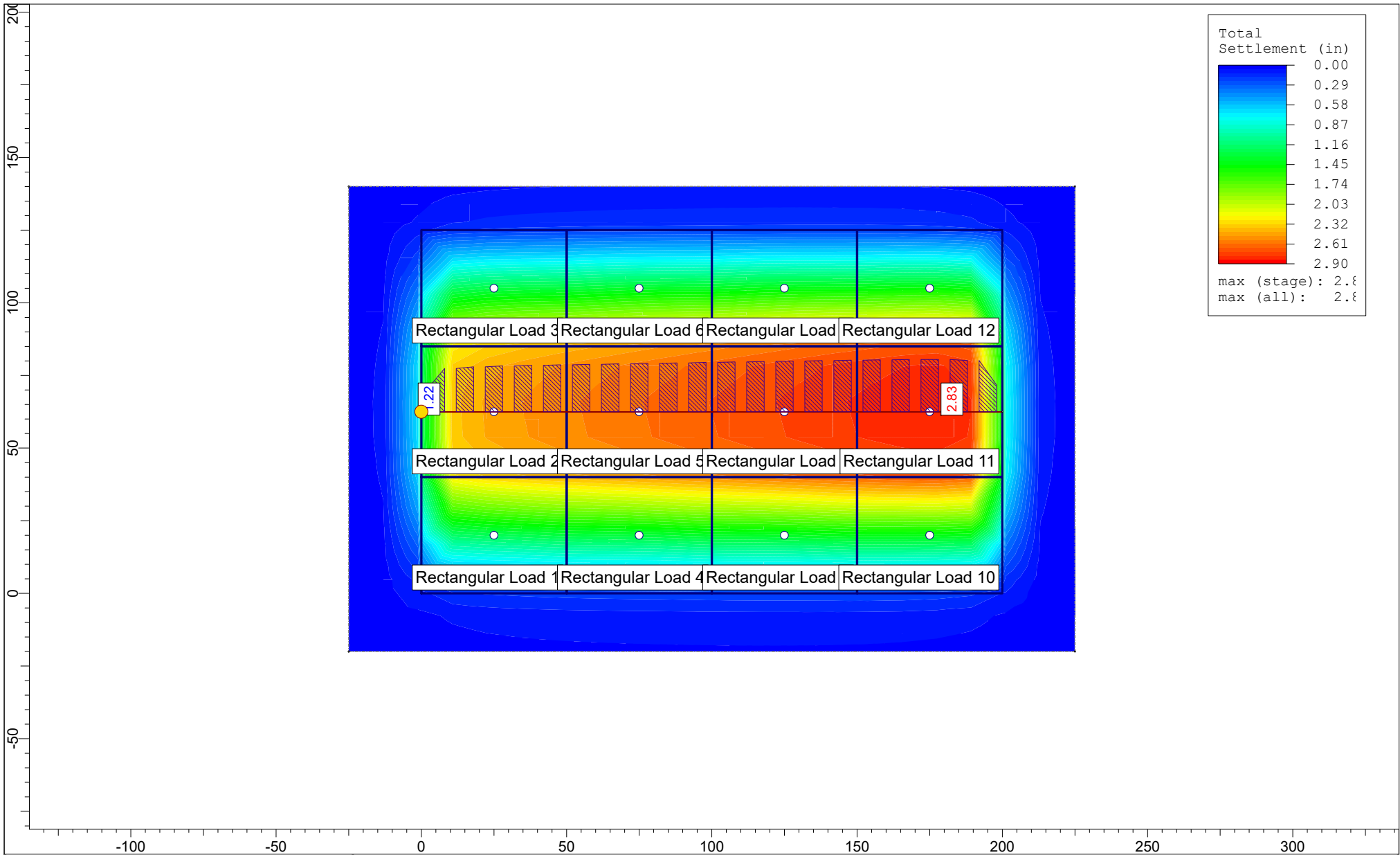
X [ft]	Y [ft]
225	150
225	-25
-25	-25
-25	150


Time Points

Point #	(X,Y) Location	Depth	Goal Type	Goal	Time Until Goal
1	134.794, 63.106	0 ft	Degree of Consolidation	95%	-1 mon

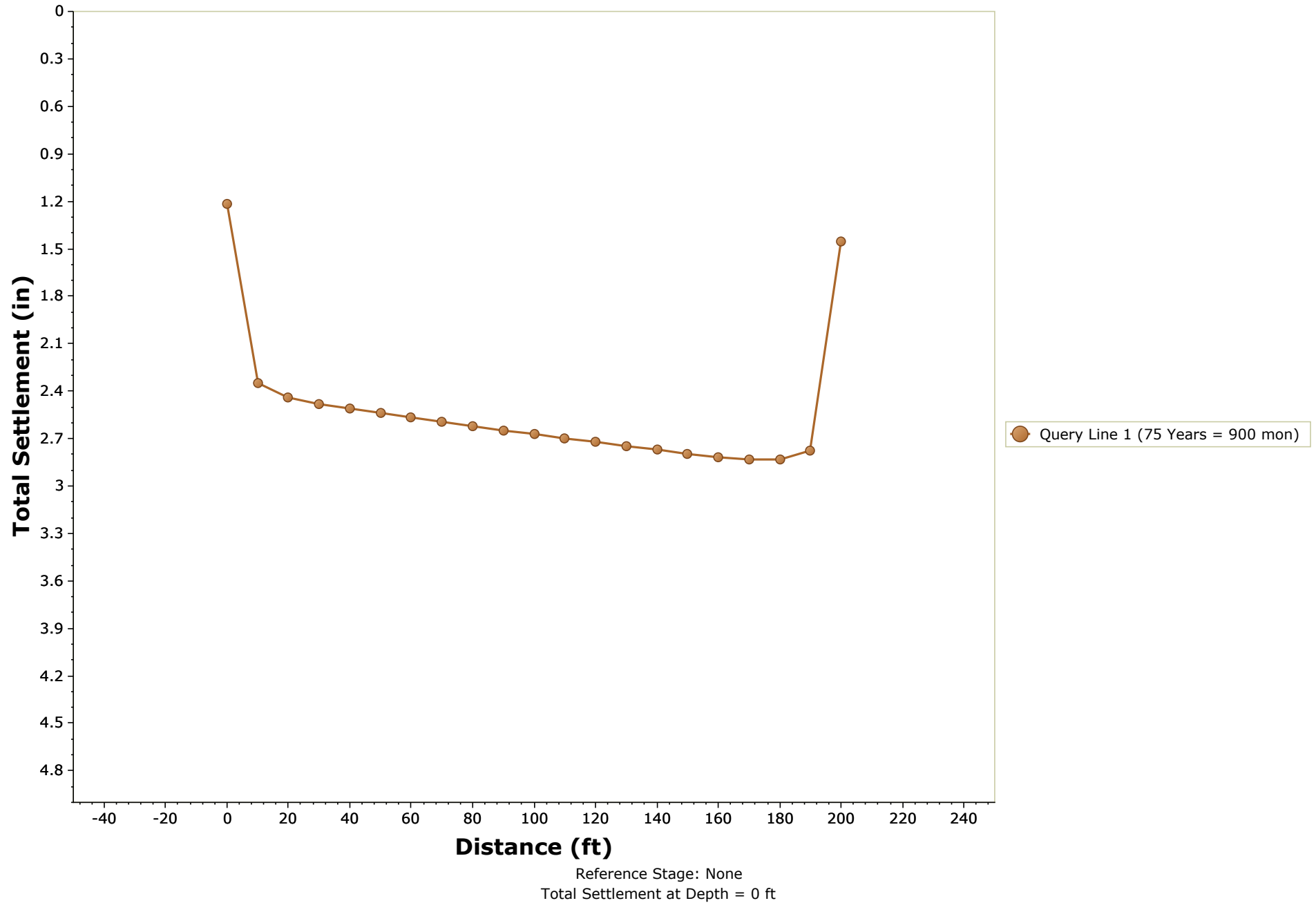


	Project		I-395 Route 9 Connector - WIN 18915.00
	Analysis Description		Sta. 195+50
	Drawn By	EMS	Company
	Date	5/22/2020, 8:16:09 AM	File Name 2020-0604-Sta 19550 Settlement.s3z



	Project			I-395 Route 9 Connector - WIN 18915.00
	Analysis Description			Sta. 195+50
	Drawn By		EMS	Company
	Date		5/22/2020, 8:16:09 AM	File Name
SETTLE3D 4.010		2020-0604-Sta 19550 Settlement.s3z		

Distance vs. Total Settlement



Sta. 201+00

Settle3 Analysis Information

I-395 Route 9 Connector - WIN 18915.00

Project Settings

Document Name 2021-0706-Sta 201+00 Settlement-D2.s3z
Project Title I-395 Route 9 Connector - WIN 18915.00
Analysis Sta. 201+00
Author EMS
Date Created 5/22/2020, 8:16:09 AM
Stress Computation Method Westergaard
Time-dependent Consolidation Analysis
Time Units months
Permeability Units feet/second
Minimum settlement ratio for subgrade modulus 0.9

Use average properties to calculate layered stresses

Improve consolidation accuracy

Ignore negative effective stresses in settlement calculations

Stage Settings

Stage #	Name	Time [months]
1	Initial	0
2	75 Years	900

Results

Time taken to compute: 2.29836 seconds

Stage: Initial = 0 mon

Data Type	Minimum	Maximum
Total Settlement [in]	0	1.646
Total Consolidation Settlement [in]	0	0
Virgin Consolidation Settlement [in]	0	0
Recompression Consolidation Settlement [in]	0	0
Immediate Settlement [in]	0	1.646
Secondary Settlement [in]	0	0
Loading Stress ZZ [ksf]	-7.30433e-005	3.37502
Loading Stress XX [ksf]	0	0
Loading Stress YY [ksf]	0	0
Effective Stress ZZ [ksf]	-7.30433e-005	3.88415
Effective Stress XX [ksf]	0	1.4404
Effective Stress YY [ksf]	0	1.4404
Total Stress ZZ [ksf]	-7.30433e-005	4.91375
Total Stress XX [ksf]	0	2.47
Total Stress YY [ksf]	0	2.47
Modulus of Subgrade Reaction (Total) [ksf/ft]	-0.00414811	29.6355
Modulus of Subgrade Reaction (Immediate) [ksf/ft]	-0.00414811	29.6355
Modulus of Subgrade Reaction (Consolidation) [ksf/ft]	0	0
Total Strain	1.83226e-007	0.00843417
Pore Water Pressure [ksf]	0	1.0296
Excess Pore Water Pressure [ksf]	0	0
Degree of Consolidation [%]	0	0
Pre-consolidation Stress [ksf]	0.00332329	3.88393
Over-consolidation Ratio	1	1
Void Ratio	0	0
Permeability [ft/s]	0	0
Coefficient of Consolidation [ft^2/s]	0	0
Hydroconsolidation Settlement [in]	0	0
Average Degree of Consolidation [%]	0	0
Undrained Shear Strength	0	0.063218

Stage: 75 Years = 900 mon

Data Type	Minimum	Maximum
Total Settlement [in]	0	1.646
Total Consolidation Settlement [in]	0	0
Virgin Consolidation Settlement [in]	0	0
Recompression Consolidation Settlement [in]	0	0
Immediate Settlement [in]	0	1.646
Secondary Settlement [in]	0	0
Loading Stress ZZ [ksf]	-7.30433e-005	3.37502
Loading Stress XX [ksf]	0	0
Loading Stress YY [ksf]	0	0
Effective Stress ZZ [ksf]	-7.30433e-005	3.88415
Effective Stress XX [ksf]	0	1.4404
Effective Stress YY [ksf]	0	1.4404
Total Stress ZZ [ksf]	-7.30433e-005	4.91375
Total Stress XX [ksf]	0	2.47
Total Stress YY [ksf]	0	2.47
Modulus of Subgrade Reaction (Total) [ksf/ft]	-0.00414811	29.6355
Modulus of Subgrade Reaction (Immediate) [ksf/ft]	-0.00414811	29.6355
Modulus of Subgrade Reaction (Consolidation) [ksf/ft]	0	0
Total Strain	1.83226e-007	0.00843417
Pore Water Pressure [ksf]	0	1.0296
Excess Pore Water Pressure [ksf]	0	0
Degree of Consolidation [%]	0	0
Pre-consolidation Stress [ksf]	0.00332329	3.88393
Over-consolidation Ratio	1	1
Void Ratio	0	0
Permeability [ft/s]	0	0
Coefficient of Consolidation [ft^2/s]	0	0
Hydroconsolidation Settlement [in]	0	0
Average Degree of Consolidation [%]	0	0
Undrained Shear Strength	0	0.063218

Loads

1. Rectangular Load: "Sta 200+00 to 200+50"

Length 50 ft
 Width 46 ft
 Rotation angle 0 degrees
 Load Type Flexible
 Area of Load 2300 ft²
 Depth 0 ft
 Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
0	0.5	0
50	0.5	0
50	46.5	3.375
0	46.5	3

2. Rectangular Load: "Roadway 1"

Length 50 ft
Width 52 ft
Rotation angle 0 degrees
Load Type Flexible
Area of Load 2600 ft²
Depth 0 ft
Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
0	46.5	3
50	46.5	3.375
50	98.5	3.375
0	98.5	3.375

3. Rectangular Load: "Sta 200+00 to 200+50"

Length 50 ft
Width 62 ft
Rotation angle 0 degrees
Load Type Flexible
Area of Load 3100 ft²
Depth 0 ft
Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
-3.55271e-015	98.5	3.375
50	98.5	3.375
50	160.5	0
-3.55271e-015	160.5	0

4. Rectangular Load: "Sta 200+50 to 201+00"

Length 50 ft
Width 46 ft
Rotation angle 0 degrees
Load Type Flexible
Area of Load 2300 ft²
Depth 0 ft
Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
50	0.5	0
100	0.5	0
100	46.5	2.875
50	46.5	3.375

5. Rectangular Load: "Roadway 2"

Length 50 ft
Width 52 ft
Rotation angle 0 degrees
Load Type Flexible
Area of Load 2600 ft²
Depth 0 ft
Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
50	46.5	3.375
100	46.5	2.875
100	98.5	3.375
50	98.5	3.375

6. Rectangular Load: "Sta 200+50 to 201+00"

Length 50 ft
Width 62 ft
Rotation angle 0 degrees
Load Type Flexible
Area of Load 3100 ft²
Depth 0 ft
Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
50	98.5	3.375
100	98.5	3.375
100	160.5	0
50	160.5	0

7. Rectangular Load: "Sta 201+00 to 201+50"

Length 50 ft
Width 46 ft
Rotation angle 0 degrees
Load Type Flexible
Area of Load 2300 ft²
Depth 0 ft
Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
100	0.5	0
150	0.5	0
150	46.5	2.75
100	46.5	2.875

8. Rectangular Load: "Roadway 3"

Length 50 ft
Width 52 ft
Rotation angle 0 degrees
Load Type Flexible
Area of Load 2600 ft²
Depth 0 ft
Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
100	46.5	2.875
150	46.5	2.75
150	98.5	3.375
100	98.5	3.375

9. Rectangular Load: "Sta 201+00 to 201+50"

Length 50 ft
Width 62 ft
Rotation angle 0 degrees
Load Type Flexible
Area of Load 3100 ft²
Depth 0 ft
Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
100	98.5	3.375
150	98.5	3.375
150	160.5	0
100	160.5	0

10. Rectangular Load: "Sta 201+50 to 202+00"

Length 50 ft
Width 46 ft
Rotation angle 0 degrees
Load Type Flexible
Area of Load 2300 ft²
Depth 0 ft
Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
150	0.5	0
200	0.5	0
200	46.5	2.875
150	46.5	2.75

11. Rectangular Load: "Roadway 4"

Length 50 ft
 Width 52 ft
 Rotation angle 0 degrees
 Load Type Flexible
 Area of Load 2600 ft²
 Depth 0 ft
 Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
150	46.5	2.75
200	46.5	2.875
200	98.5	3.375
150	98.5	3.375

12. Rectangular Load: "Sta 201+50 to 202+00"

Length 50 ft
 Width 62 ft
 Rotation angle 0 degrees
 Load Type Flexible
 Area of Load 3100 ft²
 Depth 0 ft
 Installation Stage Initial = 0 mon

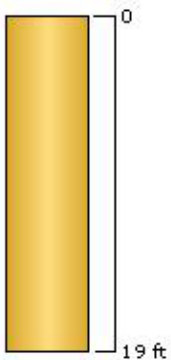
Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
150	98.5	3.375
200	98.5	3.375
200	160.5	0
150	160.5	0


Soil Layers

Ground Surface Drained: Yes

Layer #	Type	Thickness [ft]	Depth [ft]	Drained at Bottom
1	Glacial Till SILT	19	0	No



Soil Properties

Property	Glacial Till	SILT
Color		
Unit Weight [kips/ft ³]		0.13
Saturated Unit Weight [kips/ft ³]		0.13
K0		1
Immediate Settlement		Enabled
Es [ksf]		400
E _{sur} [ksf]		400
B-bar		-
Undrained Su A [kips/ft ²]		0
Undrained Su S		0.2
Undrained Su m		0.8
Piezo Line ID		1

Groundwater

Groundwater method Piezometric Lines
Water Unit Weight 0.0624 kips/ft³

Piezometric Line Entities

ID	Depth (ft)
1	2.5 ft

Query Lines

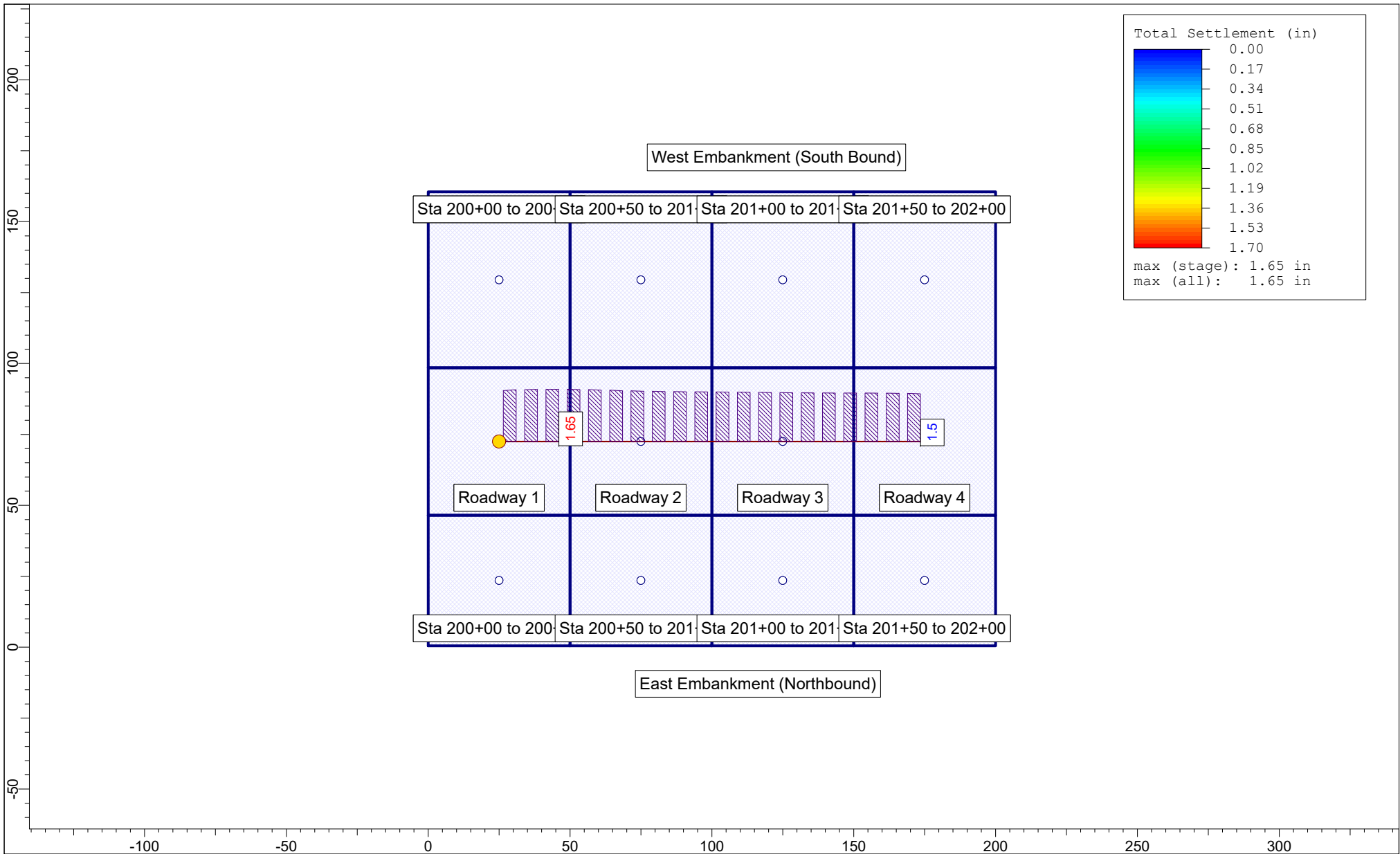
Line #	Query Line Name	Start Location	End Location	Horizontal Divisions	Vertical Divisions
1	Query Line 1	25, 72.5	175, 72.5	20	Auto: 41


Field Point Grid

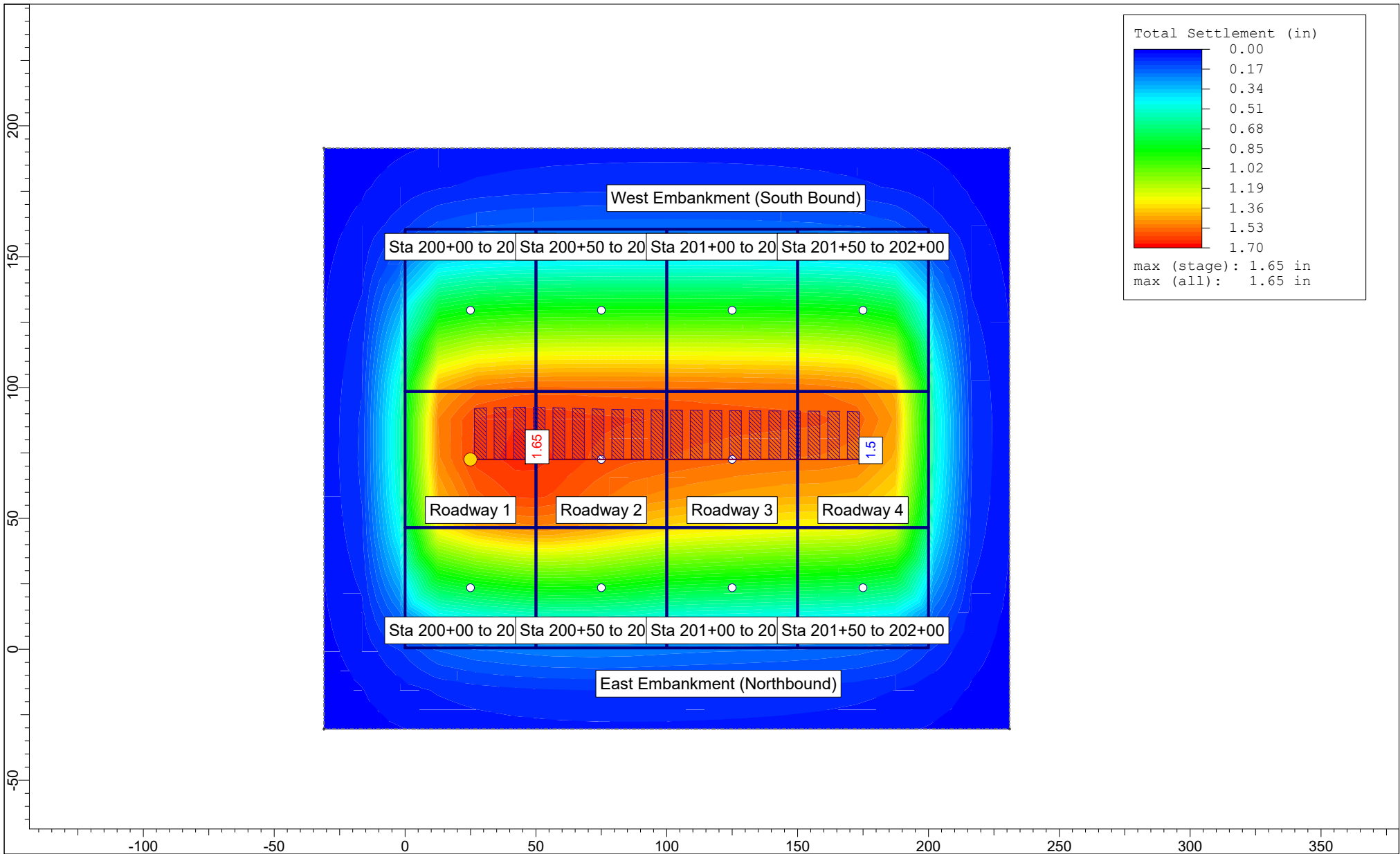
Number of points 412
Expansion Factor 2


Grid Coordinates

X [ft]	Y [ft]
231	191.5
231	-30.5
-31	-30.5
-31	191.5

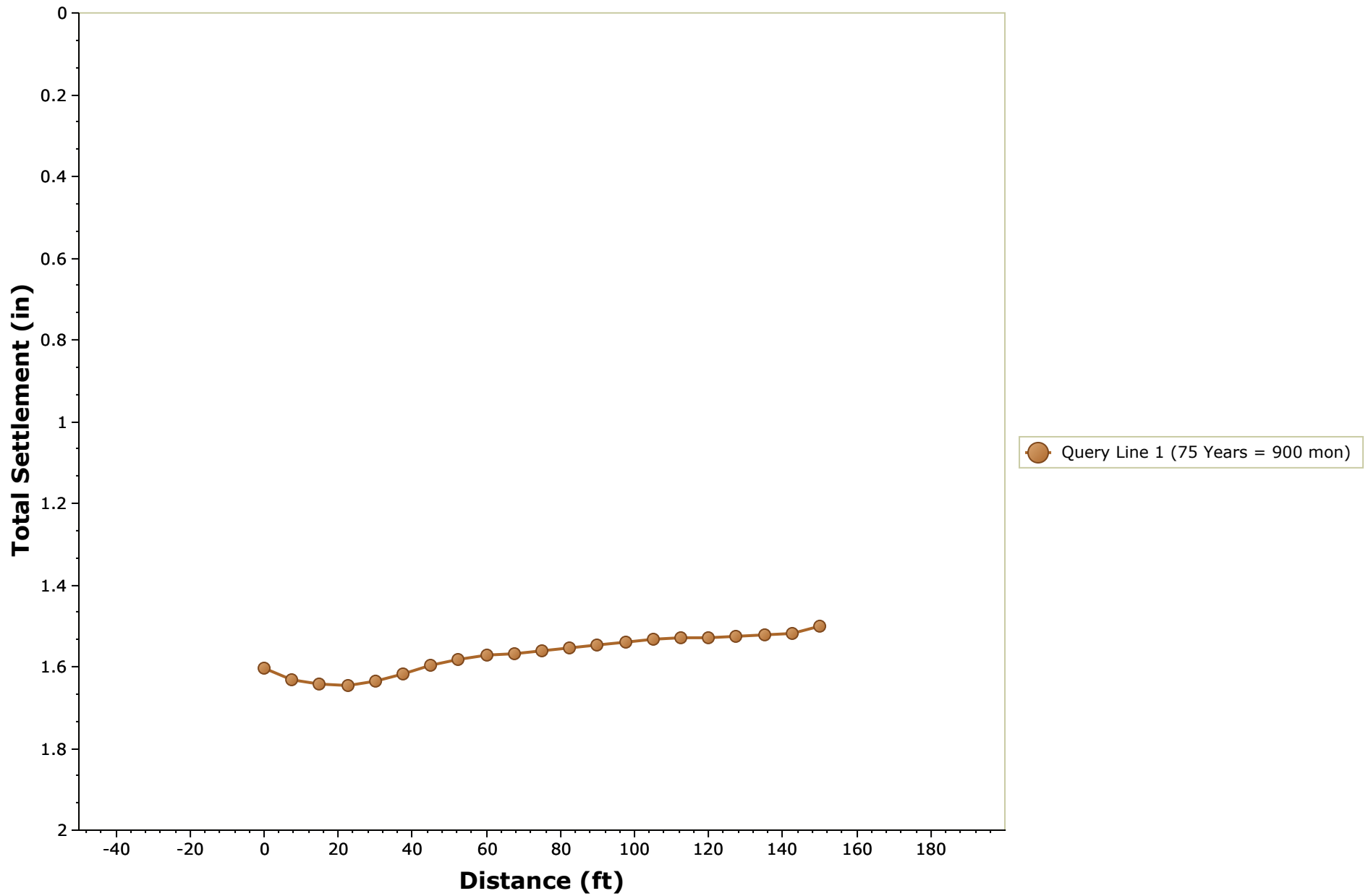


	Project		I-395 Route 9 Connector - WIN 18915.00
	Analysis Description		Sta. 201+00
	Drawn By	EMS	Company
	Date	5/22/2020, 8:16:09 AM	File Name
			2021-0706-Sta 201+00 Settlement-D2.s3z



	Project		I-395 Route 9 Connector - WIN 18915.00	
	Analysis Description		Sta. 201+00	
	Drawn By		EMS	Company
	Date		5/22/2020, 8:16:09 AM	File Name
			2021-0706-Sta 201+00 Settlement-D2.s3z	

Distance vs. Total Settlement



Reference Stage: None
 Total Settlement at Depth = 0 ft

Sta. 262+75

Settle3D Analysis Information

I-395 Route 9 Connector - WIN 18915.00

Project Settings

Document Name	2020-0604-Sta 26275 Settlement.s3z
Project Title	I-395 Route 9 Connector - WIN 18915.00
Analysis	Sta. 262+75
Author	EMS
Date Created	5/22/2020, 8:16:09 AM
Stress Computation Method	Westergaard
Time-dependent Consolidation Analysis	
Time Units	months
Permeability Units	feet/second
Minimum settlement ratio for subgrade modulus	0.9

Use average properties to calculate layered stresses

Improve consolidation accuracy

Ignore negative effective stresses in settlement calculations

Stage Settings

Stage #	Name	Time [months]
1	Initial	0
2	75 Years	900

Results

Time taken to compute: 0.302257 seconds

Stage: Initial = 0 mon

Data Type	Minimum	Maximum
Total Settlement [in]	0	0.0588123
Total Consolidation Settlement [in]	0	0
Virgin Consolidation Settlement [in]	0	0
Recompression Consolidation Settlement [in]	0	0
Immediate Settlement [in]	0	0.0588123
Secondary Settlement [in]	0	0
Loading Stress ZZ [ksf]	1.06207	2.625
Loading Stress XX [ksf]	0	0
Loading Stress YY [ksf]	0	0
Effective Stress ZZ [ksf]	1.1875	3.02944
Effective Stress XX [ksf]	0	0.7456
Effective Stress YY [ksf]	0	0.7456
Total Stress ZZ [ksf]	1.1875	3.40384
Total Stress XX [ksf]	0	1.12
Total Stress YY [ksf]	0	1.12
Modulus of Subgrade Reaction (Total) [ksf/ft]	0	602.324
Modulus of Subgrade Reaction (Immediate) [ksf/ft]	0	602.324
Modulus of Subgrade Reaction (Consolidation) [ksf/ft]	0	0
Total Strain	0.000265528	0.000656223
Pore Water Pressure [ksf]	0	0.3744
Excess Pore Water Pressure [ksf]	0	0
Degree of Consolidation [%]	0	0
Pre-consolidation Stress [ksf]	1.18776	3.02933
Over-consolidation Ratio	1	1
Void Ratio	0	0
Permeability [ft/s]	0	0
Coefficient of Consolidation [ft ² /s]	0	0
Hydroconsolidation Settlement [in]	0	0
Average Degree of Consolidation [%]	0	0
Undrained Shear Strength	0	0.0482619

Stage: 75 Years = 900 mon

Data Type	Minimum	Maximum
Total Settlement [in]	0	0.0588123
Total Consolidation Settlement [in]	0	0
Virgin Consolidation Settlement [in]	0	0
Recompression Consolidation Settlement [in]	0	0
Immediate Settlement [in]	0	0.0588123
Secondary Settlement [in]	0	0
Loading Stress ZZ [ksf]	1.06207	2.625
Loading Stress XX [ksf]	0	0
Loading Stress YY [ksf]	0	0
Effective Stress ZZ [ksf]	1.1875	3.02944
Effective Stress XX [ksf]	0	0.7456
Effective Stress YY [ksf]	0	0.7456
Total Stress ZZ [ksf]	1.1875	3.40384
Total Stress XX [ksf]	0	1.12
Total Stress YY [ksf]	0	1.12
Modulus of Subgrade Reaction (Total) [ksf/ft]	0	602.324
Modulus of Subgrade Reaction (Immediate) [ksf/ft]	0	602.324
Modulus of Subgrade Reaction (Consolidation) [ksf/ft]	0	0
Total Strain	0.000265528	0.000656223
Pore Water Pressure [ksf]	0	0.3744
Excess Pore Water Pressure [ksf]	0	0
Degree of Consolidation [%]	0	0
Pre-consolidation Stress [ksf]	1.18776	3.02933
Over-consolidation Ratio	1	1
Void Ratio	0	0
Permeability [ft/s]	0	0
Coefficient of Consolidation [ft ² /s]	0	0
Hydroconsolidation Settlement [in]	0	0
Average Degree of Consolidation [%]	0	0
Undrained Shear Strength	0	0.0482619

Loads

1. Rectangular Load: "Rectangular Load 1"

Length 50 ft
 Width 60 ft
 Rotation angle 0 degrees
 Load Type Flexible
 Area of Load 3000 ft²
 Depth 0 ft
 Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
0	-10	0
50	-10	0
50	50	2.5
0	50	2.375

2. Rectangular Load: "Rectangular Load 2"

Length 50 ft
 Width 45 ft
 Rotation angle 0 degrees
 Load Type Flexible
 Area of Load 2250 ft²
 Depth 0 ft
 Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
0	50	2.375
50	50	2.5
50	95	2.5
0	95	2.375

3. Rectangular Load: "Rectangular Load 3"

Length 50 ft
 Width 40 ft
 Rotation angle 0 degrees
 Load Type Flexible
 Area of Load 2000 ft²
 Depth 0 ft
 Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
0	95	2.375
50	95	2.5
50	135	0
0	135	0

4. Rectangular Load: "Rectangular Load 4"

Length 50 ft
 Width 60 ft
 Rotation angle 0 degrees
 Load Type Flexible
 Area of Load 3000 ft²
 Depth 0 ft
 Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
50	-10	0
100	-10	0
100	50	2.625
50	50	2.5

5. Rectangular Load: "Rectangular Load 5"

Length 50 ft
 Width 45 ft
 Rotation angle 0 degrees
 Load Type Flexible
 Area of Load 2250 ft²
 Depth 0 ft
 Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
50	50	2.5
100	50	2.625
100	95	2.625
50	95	2.5

6. Rectangular Load: "Rectangular Load 6"

Length 50 ft
Width 40 ft
Rotation angle 0 degrees
Load Type Flexible
Area of Load 2000 ft²
Depth 0 ft
Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
50	95	2.5
100	95	2.625
100	135	0
50	135	0

7. Rectangular Load: "Rectangular Load 7"

Length 50 ft
Width 60 ft
Rotation angle 0 degrees
Load Type Flexible
Area of Load 3000 ft²
Depth 0 ft
Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
100	-10	0
150	-10	0
150	50	2.5
100	50	2.625

8. Rectangular Load: "Rectangular Load 8"

Length 50 ft
Width 45 ft
Rotation angle 0 degrees
Load Type Flexible
Area of Load 2250 ft²
Depth 0 ft
Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
100	50	2.625
150	50	2.5
150	95	2.5
100	95	2.625

9. Rectangular Load: "Rectangular Load 9"

Length 50 ft
Width 40 ft
Rotation angle 0 degrees
Load Type Flexible
Area of Load 2000 ft²
Depth 0 ft
Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
100	95	2.625
150	95	2.5
150	135	0
100	135	0

10. Rectangular Load: "Rectangular Load 10"

Length 50 ft
 Width 60 ft
 Rotation angle 0 degrees
 Load Type Flexible
 Area of Load 3000 ft²
 Depth 0 ft
 Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
150	-10	0
200	-10	0
200	50	2.5
150	50	2.5

11. Rectangular Load: "Rectangular Load 11"

Length 50 ft
 Width 45 ft
 Rotation angle 0 degrees
 Load Type Flexible
 Area of Load 2250 ft²
 Depth 0 ft
 Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
150	50	2.5
200	50	2.5
200	95	2.5
150	95	2.5

12. Rectangular Load: "Rectangular Load 12"

Length 50 ft
 Width 40 ft
 Rotation angle 0 degrees
 Load Type Flexible
 Area of Load 2000 ft²
 Depth 0 ft
 Installation Stage Initial = 0 mon

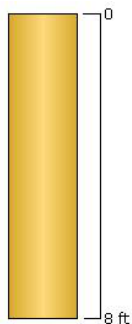
Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
150	95	2.5
200	95	2.5
200	135	0
150	135	0


Soil Layers

Ground Surface Drained: Yes

Layer #	Type	Thickness [ft]	Depth [ft]	Drained at Bottom
1	WEATHERED BEDROCK	8	0	No



Soil Properties

Property	WEATHERED BEDROCK
Color	
Unit Weight [kips/ft ³]	0.14
Saturated Unit Weight [kips/ft ³]	0.14
K0	1
Immediate Settlement	Enabled
Es [ksf]	4000
Esur [ksf]	4000
B-bar	-
Undrained Su A [kips/ft ²]	0
Undrained Su S	0.2
Undrained Su m	0.8
Piezo Line ID	1

Groundwater

Groundwater method Piezometric Lines

Water Unit Weight 0.0624 kips/ft³

Piezometric Line Entities

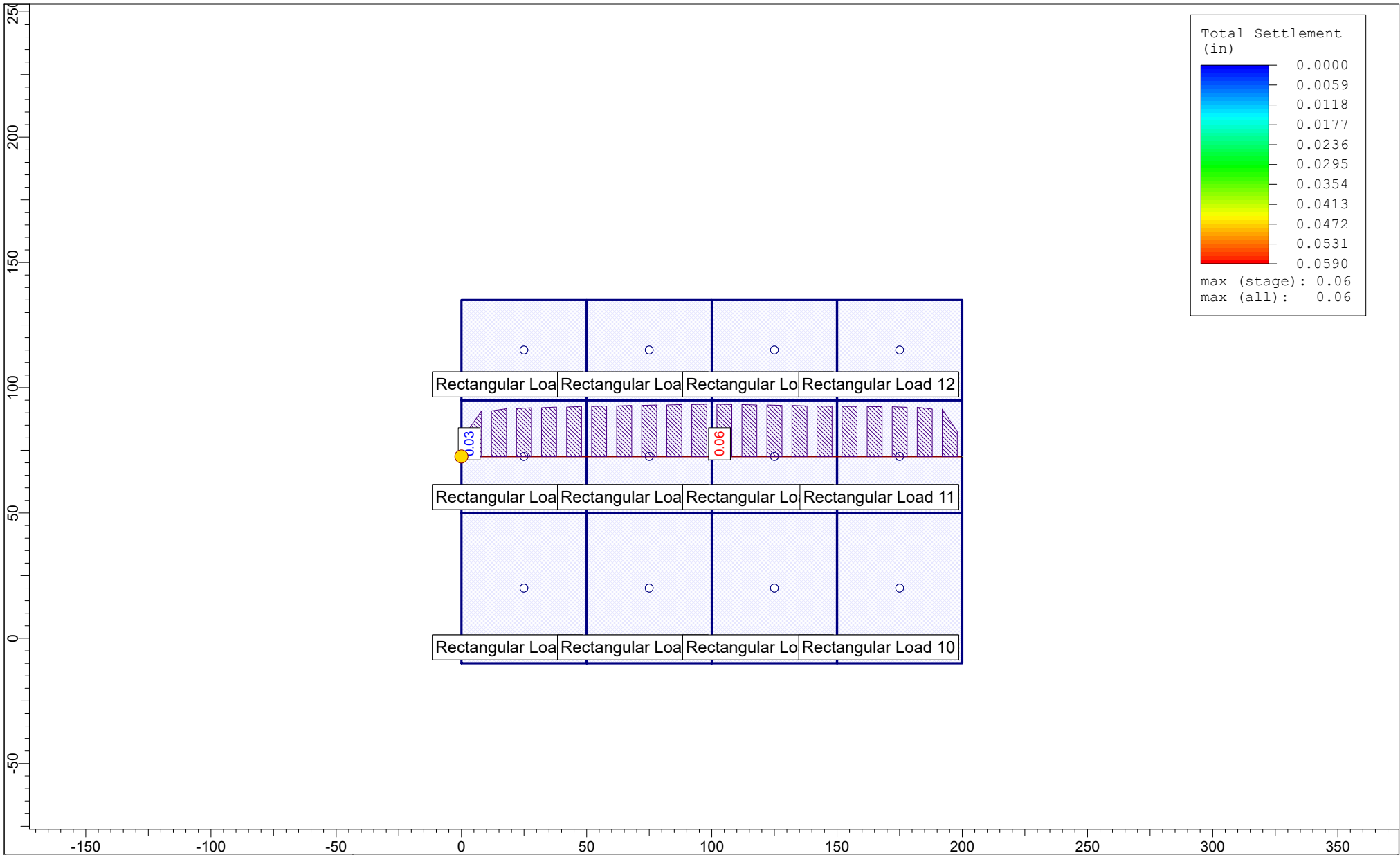
ID	Depth (ft)
1	2 ft

Query Lines

Line #	Query Line Name	Start Location	End Location	Horizontal Divisions	Vertical Divisions
1	Query Line 1	0, 72.5	200, 72.5	20	Auto: 49

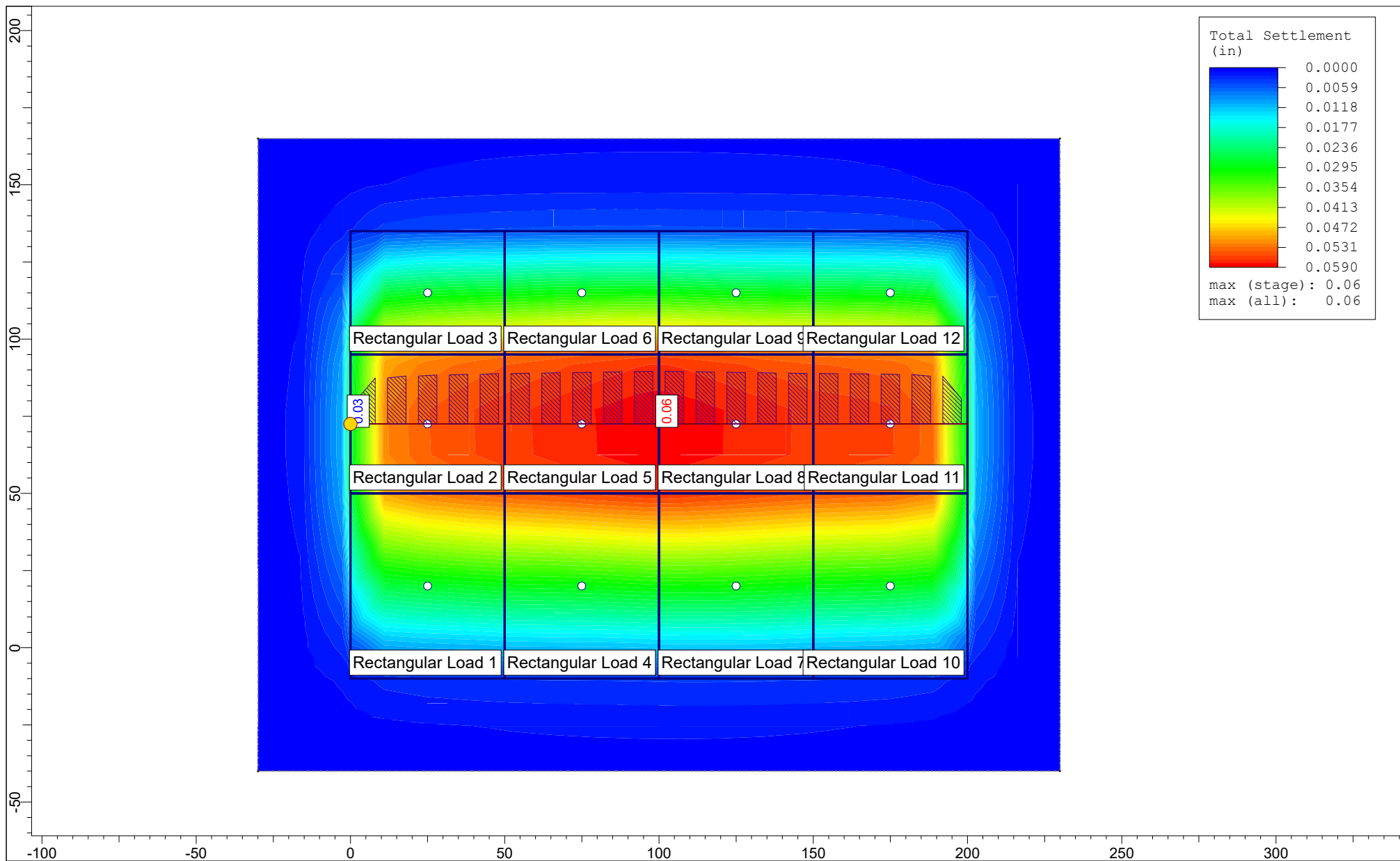
Time Points

Point #	(X,Y) Location	Depth	Goal Type	Goal	Time Until Goal
1	134.794, 63.106	0 ft	Degree of Consolidation	95%	-1 mon



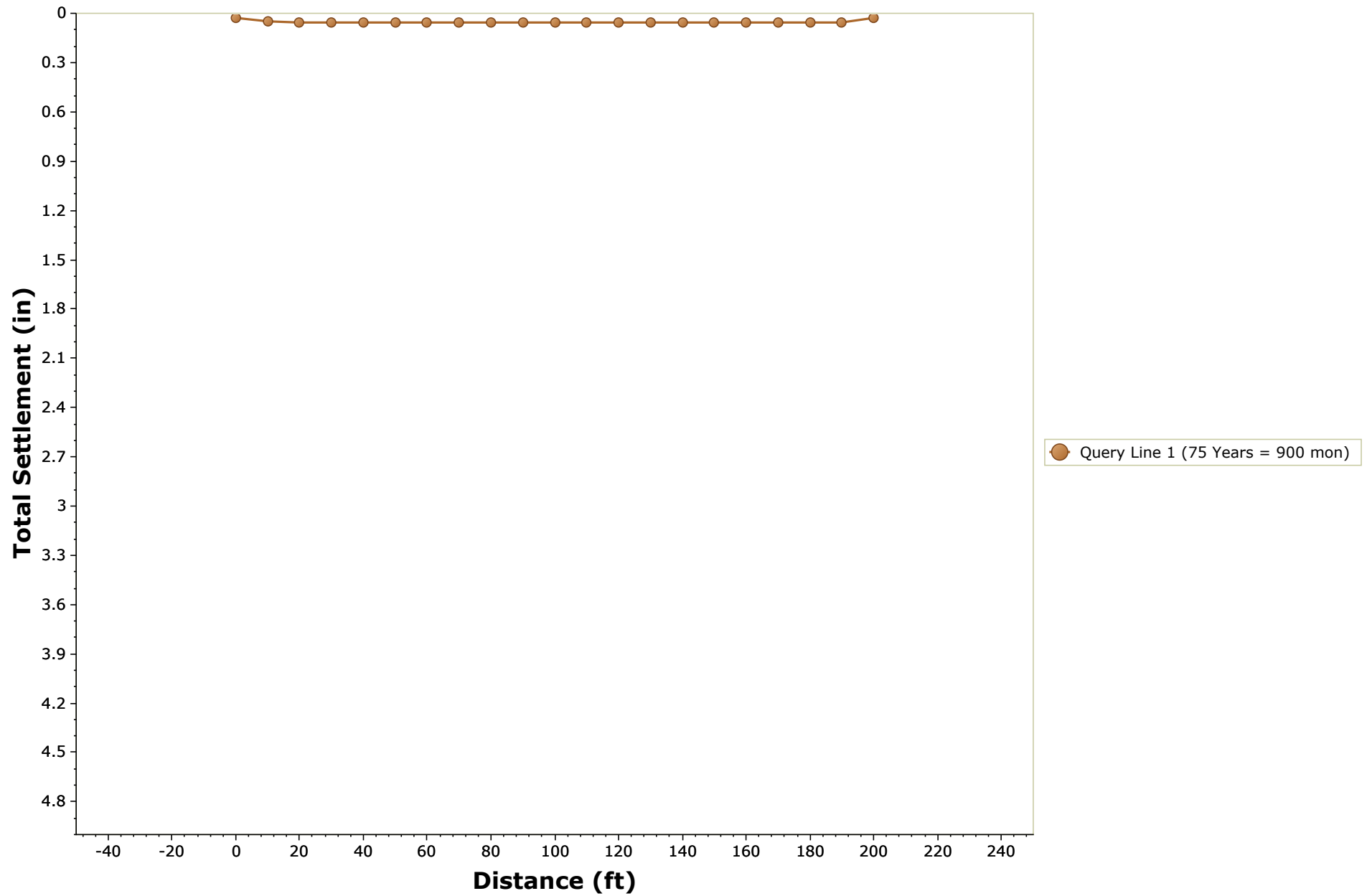
SETTLE3D 4.010

Project	I-395 Route 9 Connector - WIN 18915.00		
Analysis Description	Sta. 262+75		
Drawn By	EMS	Company	
Date	5/22/2020, 8:16:09 AM	File Name	2020-0604-Sta 26275 Settlement.s3z



Project	I-395 Route 9 Connector - WIN 18915.00		
Analysis Description	Sta. 262+75		
Drawn By	EMS	Company	
Date	5/22/2020, 8:16:09 AM	File Name	2020-0604-Sta 26275 Settlement.s3z

Distance vs. Total Settlement



Reference Stage: None
 Total Settlement at Depth = 0 ft

Sta. 275+00

Settle3 Analysis Information

I-395 Route 9 Connector - WIN 18915.00

Project Settings

Document Name 2021-0706-Sta 275+00 Settlement-D2.s3z
Project Title I-395 Route 9 Connector - WIN 18915.00
Analysis Sta. 275+50
Author JAD
Date Created 5/22/2020, 8:16:09 AM
Stress Computation Method Westergaard
Time-dependent Consolidation Analysis
Time Units months
Permeability Units feet/second
Minimum settlement ratio for subgrade modulus 0.9

Use average properties to calculate layered stresses

Improve consolidation accuracy

Ignore negative effective stresses in settlement calculations

Stage Settings

Stage #	Name	Time [months]
1	Initial	0
2	75 Years	900

Results

Time taken to compute: 0.315279 seconds

Stage: Initial = 0 mon

Data Type	Minimum	Maximum
Total Settlement [in]	0	3.884
Total Consolidation Settlement [in]	0	0
Virgin Consolidation Settlement [in]	0	0
Recompression Consolidation Settlement [in]	0	0
Immediate Settlement [in]	0	3.884
Secondary Settlement [in]	0	0
Loading Stress ZZ [ksf]	1.1486	3.1875
Loading Stress XX [ksf]	0	0
Loading Stress YY [ksf]	0	0
Effective Stress ZZ [ksf]	3.15801	4.57985
Effective Stress XX [ksf]	0	3.2
Effective Stress YY [ksf]	0	3.2
Total Stress ZZ [ksf]	3.1875	7.69985
Total Stress XX [ksf]	0	6.32
Total Stress YY [ksf]	0	6.32
Modulus of Subgrade Reaction (Total) [ksf/ft]	0	11.0362
Modulus of Subgrade Reaction (Immediate) [ksf/ft]	0	11.0362
Modulus of Subgrade Reaction (Consolidation) [ksf/ft]	0	0
Total Strain	0.00287254	0.0127485
Pore Water Pressure [ksf]	0	3.12
Excess Pore Water Pressure [ksf]	0	0
Degree of Consolidation [%]	0	0
Pre-consolidation Stress [ksf]	3.1588	11.1471
Over-consolidation Ratio	1	3.52959
Void Ratio	0	0
Permeability [ft/s]	0	0
Coefficient of Consolidation [ft ² /s]	0	0
Hydroconsolidation Settlement [in]	0	0
Average Degree of Consolidation [%]	0	0
Undrained Shear Strength	0	0.29385

Stage: 75 Years = 900 mon

Data Type	Minimum	Maximum
Total Settlement [in]	0	3.884
Total Consolidation Settlement [in]	0	0
Virgin Consolidation Settlement [in]	0	0
Recompression Consolidation Settlement [in]	0	0
Immediate Settlement [in]	0	3.884
Secondary Settlement [in]	0	0
Loading Stress ZZ [ksf]	1.1486	3.1875
Loading Stress XX [ksf]	0	0
Loading Stress YY [ksf]	0	0
Effective Stress ZZ [ksf]	3.15801	4.57985
Effective Stress XX [ksf]	0	3.2
Effective Stress YY [ksf]	0	3.2
Total Stress ZZ [ksf]	3.1875	7.69985
Total Stress XX [ksf]	0	6.32
Total Stress YY [ksf]	0	6.32
Modulus of Subgrade Reaction (Total) [ksf/ft]	0	11.0362
Modulus of Subgrade Reaction (Immediate) [ksf/ft]	0	11.0362
Modulus of Subgrade Reaction (Consolidation) [ksf/ft]	0	0
Total Strain	0.00287254	0.0127485
Pore Water Pressure [ksf]	0	3.12
Excess Pore Water Pressure [ksf]	0	0
Degree of Consolidation [%]	0	0
Pre-consolidation Stress [ksf]	3.1588	11.1471
Over-consolidation Ratio	1	3.52959
Void Ratio	0	0
Permeability [ft/s]	0	0
Coefficient of Consolidation [ft ² /s]	0	0
Hydroconsolidation Settlement [in]	0	0
Average Degree of Consolidation [%]	0	0
Undrained Shear Strength	0	0.29385

Loads

1. Rectangular Load: "Sta 274+00 to 274+50"

Length 50 ft
 Width 48 ft
 Rotation angle 0 degrees
 Load Type Flexible
 Area of Load 2400 ft²
 Depth 0 ft
 Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
0	1.5	0
50	1.5	0
50	49.5	3
0	49.5	3.375

2. Rectangular Load: "Roadway 1"

Length 50 ft
Width 46 ft
Rotation angle 0 degrees
Load Type Flexible
Area of Load 2300 ft²
Depth 0 ft
Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
0	49.5	3.375
50	49.5	3
50	95.5	3.375
0	95.5	3.375

3. Rectangular Load: "Sta 274+00 to 274+50"

Length 50 ft
Width 52 ft
Rotation angle 0 degrees
Load Type Flexible
Area of Load 2600 ft²
Depth 0 ft
Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
0	95.5	3.375
50	95.5	3.375
50	147.5	0
0	147.5	0

4. Rectangular Load: "Sta 274+50 to 275+00"

Length 50 ft
Width 48 ft
Rotation angle 0 degrees
Load Type Flexible
Area of Load 2400 ft²
Depth 0 ft
Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
50	1.5	0
100	1.5	0
100	49.5	3
50	49.5	3

5. Rectangular Load: "Roadway 2"

Length 50 ft
Width 46 ft
Rotation angle 0 degrees
Load Type Flexible
Area of Load 2300 ft²
Depth 0 ft
Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
50	49.5	3
100	49.5	3
100	95.5	3.375
50	95.5	3.375

6. Rectangular Load: "Sta 274+50 to 275+00"

Length 50 ft
Width 52 ft
Rotation angle 0 degrees
Load Type Flexible
Area of Load 2600 ft²
Depth 0 ft
Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
50	95.5	3.375
100	95.5	3.375
100	147.5	0
50	147.5	0

7. Rectangular Load: "Sta 275+00 to 275+50"

Length 50 ft
Width 48 ft
Rotation angle 0 degrees
Load Type Flexible
Area of Load 2400 ft²
Depth 0 ft
Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
100	1.5	0
150	1.5	0
150	49.5	3
100	49.5	3

8. Rectangular Load: "Roadway 3"

Length 50 ft
Width 46 ft
Rotation angle 0 degrees
Load Type Flexible
Area of Load 2300 ft²
Depth 0 ft
Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
100	49.5	3
150	49.5	3
150	95.5	3.375
100	95.5	3.375

9. Rectangular Load: "Sta 275+00 to 275+50"

Length 50 ft
Width 52 ft
Rotation angle 0 degrees
Load Type Flexible
Area of Load 2600 ft²
Depth 0 ft
Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
100	95.5	3.375
150	95.5	3.375
150	147.5	0
100	147.5	0

10. Rectangular Load: "Sta 275+50 to 276+00"

Length 50 ft
Width 48 ft
Rotation angle 0 degrees
Load Type Flexible
Area of Load 2400 ft²
Depth 0 ft
Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
150	1.5	0
200	1.5	0
200	49.5	3
150	49.5	3

11. Rectangular Load: "Roadway 4"

Length 50 ft
 Width 46 ft
 Rotation angle 0 degrees
 Load Type Flexible
 Area of Load 2300 ft²
 Depth 0 ft
 Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
150	49.5	3
200	49.5	3
200	95.5	3.375
150	95.5	3.375

12. Rectangular Load: "Sta 275+50 to 276+00"

Length 50 ft
 Width 52 ft
 Rotation angle 0 degrees
 Load Type Flexible
 Area of Load 2600 ft²
 Depth 0 ft
 Installation Stage Initial = 0 mon

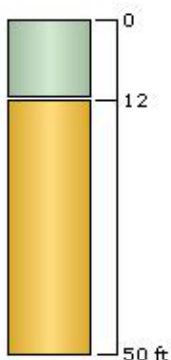
Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
150	95.5	3.375
200	95.5	3.375
200	147.5	0
150	147.5	0



Soil Layers

Ground Surface Drained: Yes

Layer #	Type	Thickness [ft]	Depth [ft]	Drained at Bottom
1	Soft Silty Clay	12	0	No
2	Glacial Till SILT	38	12	No



Soil Properties

Property	Soft Silty Clay	Glacial Till SILT
Color		
Unit Weight [kips/ft ³]	0.115	0.13
Saturated Unit Weight [kips/ft ³]	0.115	0.13
K0	1	1
Immediate Settlement	Enabled	Enabled
Es [ksf]	250	400
E _{sur} [ksf]	250	400
B-bar	-	-
Undrained Su A [kips/ft ²]	0	0
Undrained Su S	0.2	0.2
Undrained Su m	0.8	0.8
Piezo Line ID	1	1

Groundwater

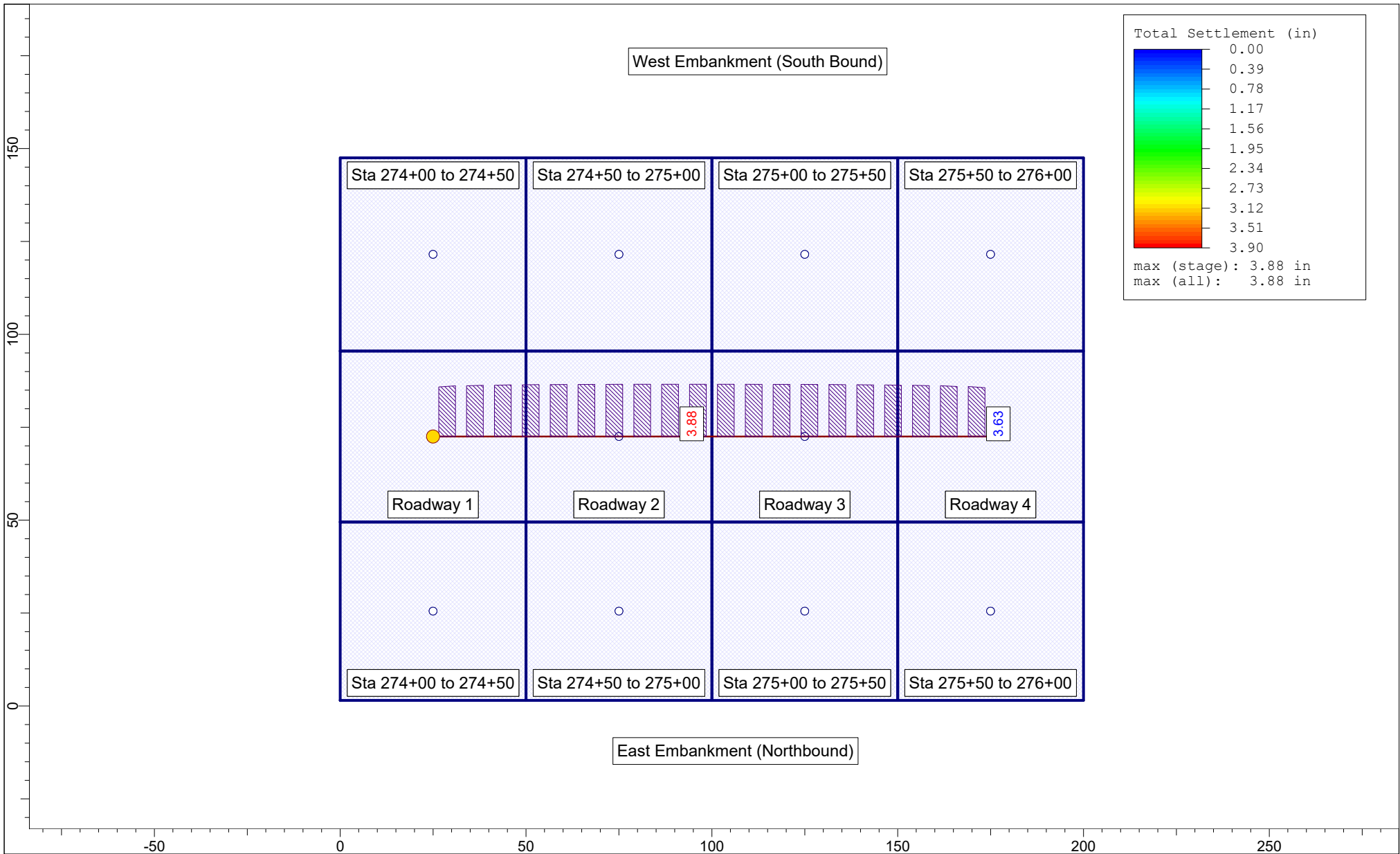
Groundwater method Piezometric Lines
 Water Unit Weight 0.0624 kips/ft³


Piezometric Line Entities

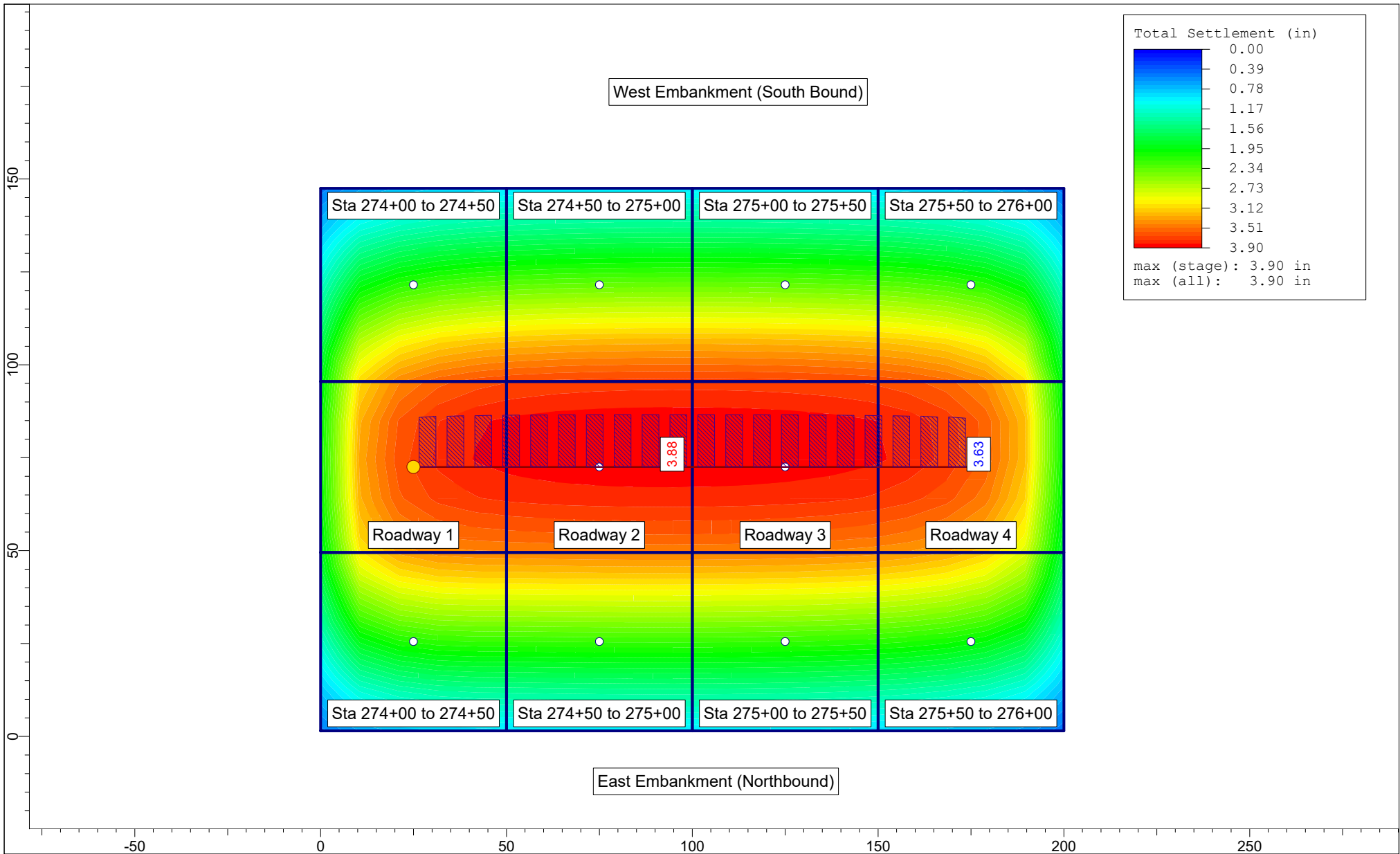
ID	Depth (ft)
1	0 ft


Query Lines

Line #	Query Line Name	Start Location	End Location	Horizontal Divisions	Vertical Divisions
1	Query Line 1	25, 72.5	175, 72.5	20	Auto: 49

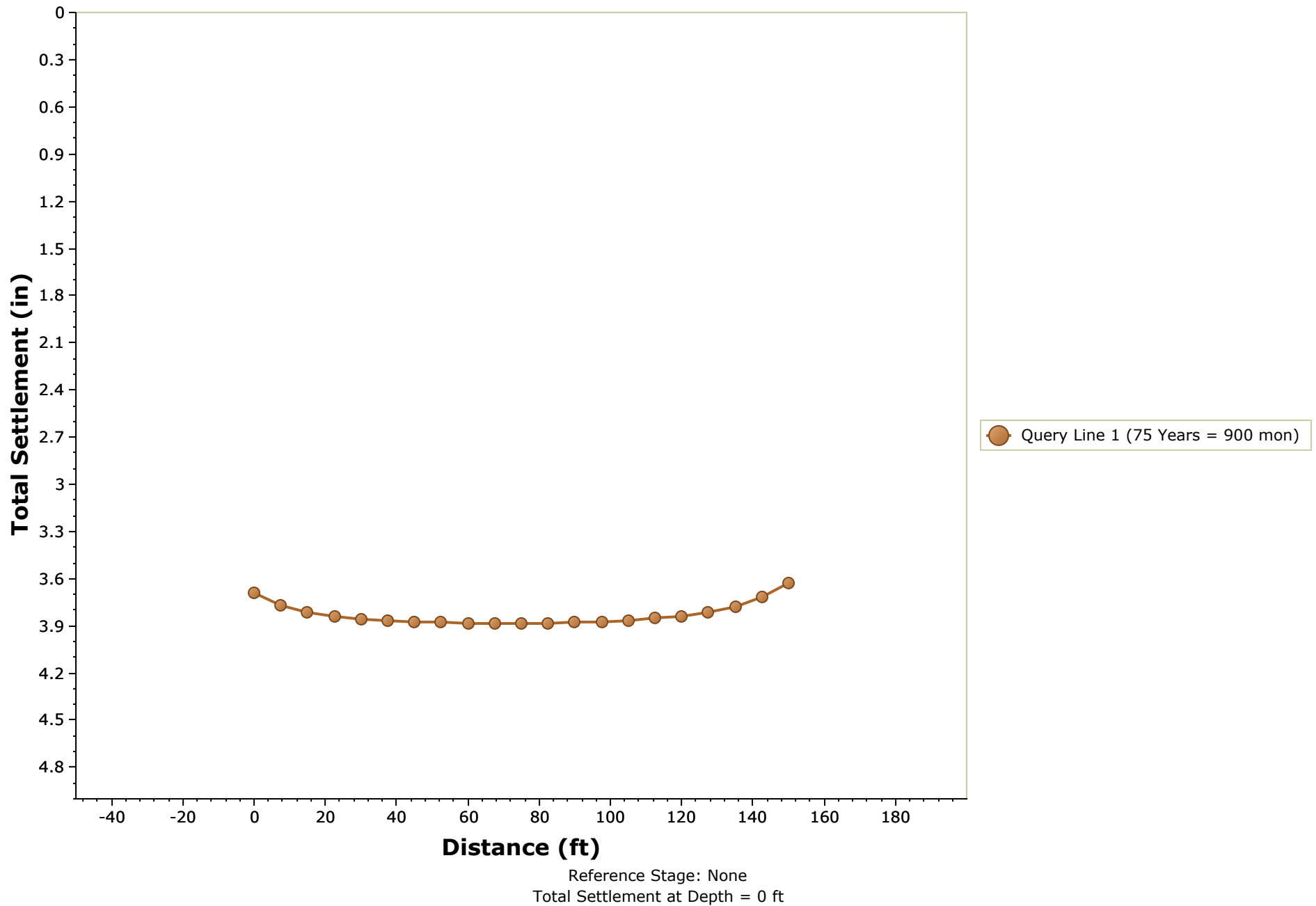


	Project		I-395 Route 9 Connector - WIN 18915.00
	Analysis Description		Sta. 275+00
	Drawn By	JAD	Company
	Date	5/22/2020, 8:16:09 AM	File Name 2021-0706-Sta 275+00 Settlement-D2.s3z



	Project			I-395 Route 9 Connector - WIN 18915.00	
	Analysis Description			Sta. 275+00	
	Drawn By			JAD	Company
	Date			5/22/2020, 8:16:09 AM	File Name
				2021-0706-Sta 275+00 Settlement-D2.s3z	

Distance vs. Total Settlement



Sta. 275+75

Settle3D Analysis Information

I-395 Route 9 Connector - WIN 18915.00

Project Settings

Document Name	2020-0604-Sta 27575 Settlement.s3z
Project Title	I-395 Route 9 Connector - WIN 18915.00
Analysis	Sta. 275+75
Author	EMS
Date Created	5/22/2020, 8:16:09 AM
Stress Computation Method	Westergaard
Time-dependent Consolidation Analysis	
Time Units	months
Permeability Units	feet/second
Minimum settlement ratio for subgrade modulus	0.9

Use average properties to calculate layered stresses

Improve consolidation accuracy

Ignore negative effective stresses in settlement calculations

Stage Settings

Stage #	Name	Time [months]
1	Initial	0
2	75 Years	900

Results

Time taken to compute: 0.0830299 seconds

Stage: Initial = 0 mon

Data Type	Minimum	Maximum
Total Settlement [in]	0	3.47846
Total Consolidation Settlement [in]	0	0
Virgin Consolidation Settlement [in]	0	0
Recompression Consolidation Settlement [in]	0	0
Immediate Settlement [in]	0	3.47846
Secondary Settlement [in]	0	0
Loading Stress ZZ [ksf]	0.505951	2.625
Loading Stress XX [ksf]	0	0
Loading Stress YY [ksf]	0	0
Effective Stress ZZ [ksf]	1.1875	4.91131
Effective Stress XX [ksf]	0	3.8966
Effective Stress YY [ksf]	0	3.8966
Total Stress ZZ [ksf]	1.1875	7.46971
Total Stress XX [ksf]	0	6.455
Total Stress YY [ksf]	0	6.455
Modulus of Subgrade Reaction (Total) [ksf/ft]	0	11.2983
Modulus of Subgrade Reaction (Immediate) [ksf/ft]	0	11.2983
Modulus of Subgrade Reaction (Consolidation) [ksf/ft]	0	0
Total Strain	0.0012653	0.0327311
Pore Water Pressure [ksf]	0	2.5584
Excess Pore Water Pressure [ksf]	0	0
Degree of Consolidation [%]	0	0
Pre-consolidation Stress [ksf]	1.49822	4.91031
Over-consolidation Ratio	1	4.01338
Void Ratio	0	0
Permeability [ft/s]	0	0
Coefficient of Consolidation [ft ² /s]	0	0
Hydroconsolidation Settlement [in]	0	0
Average Degree of Consolidation [%]	0	0
Undrained Shear Strength	0	0.220664

Stage: 75 Years = 900 mon

Data Type	Minimum	Maximum
Total Settlement [in]	0	3.47846
Total Consolidation Settlement [in]	0	0
Virgin Consolidation Settlement [in]	0	0
Recompression Consolidation Settlement [in]	0	0
Immediate Settlement [in]	0	3.47846
Secondary Settlement [in]	0	0
Loading Stress ZZ [ksf]	0.505951	2.625
Loading Stress XX [ksf]	0	0
Loading Stress YY [ksf]	0	0
Effective Stress ZZ [ksf]	1.1875	4.91131
Effective Stress XX [ksf]	0	3.8966
Effective Stress YY [ksf]	0	3.8966
Total Stress ZZ [ksf]	1.1875	7.46971
Total Stress XX [ksf]	0	6.455
Total Stress YY [ksf]	0	6.455
Modulus of Subgrade Reaction (Total) [ksf/ft]	0	11.2983
Modulus of Subgrade Reaction (Immediate) [ksf/ft]	0	11.2983
Modulus of Subgrade Reaction (Consolidation) [ksf/ft]	0	0
Total Strain	0.0012653	0.0327311
Pore Water Pressure [ksf]	0	2.5584
Excess Pore Water Pressure [ksf]	0	0
Degree of Consolidation [%]	0	0
Pre-consolidation Stress [ksf]	1.49822	4.91031
Over-consolidation Ratio	1	4.01338
Void Ratio	0	0
Permeability [ft/s]	0	0
Coefficient of Consolidation [ft ² /s]	0	0
Hydroconsolidation Settlement [in]	0	0
Average Degree of Consolidation [%]	0	0
Undrained Shear Strength	0	0.220664

Loads

1. Rectangular Load: "Rectangular Load 1"

Length 50 ft
 Width 40 ft
 Rotation angle 0 degrees
 Load Type Flexible
 Area of Load 2000 ft²
 Depth 0 ft
 Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
0	0	0
50	0	0
50	40	2.625
0	40	2.625

2. Rectangular Load: "Rectangular Load 2"

Length 50 ft
 Width 45 ft
 Rotation angle 0 degrees
 Load Type Flexible
 Area of Load 2250 ft²
 Depth 0 ft
 Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
0	40	2.625
50	40	2.625
50	85	2.625
0	85	2.625

3. Rectangular Load: "Rectangular Load 3"

Length 50 ft
 Width 40 ft
 Rotation angle 0 degrees
 Load Type Flexible
 Area of Load 2000 ft²
 Depth 0 ft
 Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
0	85	2.625
50	85	2.625
50	125	0
0	125	0

4. Rectangular Load: "Rectangular Load 4"

Length 50 ft
 Width 40 ft
 Rotation angle 0 degrees
 Load Type Flexible
 Area of Load 2000 ft²
 Depth 0 ft
 Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
50	3.55271e-015	0
100	3.55271e-015	0
100	40	2.625
50	40	2.625

5. Rectangular Load: "Rectangular Load 5"

Length 50 ft
 Width 45 ft
 Rotation angle 0 degrees
 Load Type Flexible
 Area of Load 2250 ft²
 Depth 0 ft
 Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
50	40	2.625
100	40	2.625
100	85	2.625
50	85	2.625

6. Rectangular Load: "Rectangular Load 6"

Length 50 ft
Width 40 ft
Rotation angle 0 degrees
Load Type Flexible
Area of Load 2000 ft²
Depth 0 ft
Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
50	85	2.625
100	85	2.625
100	125	0
50	125	0

7. Rectangular Load: "Rectangular Load 7"

Length 50 ft
Width 40 ft
Rotation angle 0 degrees
Load Type Flexible
Area of Load 2000 ft²
Depth 0 ft
Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
100	0	0
150	0	0
150	40	2.5
100	40	2.625

8. Rectangular Load: "Rectangular Load 8"

Length 50 ft
Width 45 ft
Rotation angle 0 degrees
Load Type Flexible
Area of Load 2250 ft²
Depth 0 ft
Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
100	40	2.625
150	40	2.5
150	85	2.5
100	85	2.625

9. Rectangular Load: "Rectangular Load 9"

Length 50 ft
Width 40 ft
Rotation angle 0 degrees
Load Type Flexible
Area of Load 2000 ft²
Depth 0 ft
Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
100	85	2.625
150	85	2.5
150	125	0
100	125	0

10. Rectangular Load: "Rectangular Load 10"

Length 50 ft
 Width 40 ft
 Rotation angle 0 degrees
 Load Type Flexible
 Area of Load 2000 ft²
 Depth 0 ft
 Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
150	-3.55271e-015	0
200	-3.55271e-015	0
200	40	2.375
150	40	2.5

11. Rectangular Load: "Rectangular Load 11"

Length 50 ft
 Width 45 ft
 Rotation angle 0 degrees
 Load Type Flexible
 Area of Load 2250 ft²
 Depth 0 ft
 Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
150	40	2.5
200	40	2.375
200	85	2.375
150	85	2.5

12. Rectangular Load: "Rectangular Load 12"

Length 50 ft
 Width 40 ft
 Rotation angle 0 degrees
 Load Type Flexible
 Area of Load 2000 ft²
 Depth 0 ft
 Installation Stage Initial = 0 mon

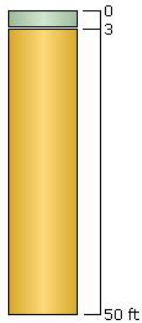
Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
150	85	2.5
200	85	2.375
200	125	0
150	125	0



Soil Layers

Ground Surface Drained: Yes

Layer #	Type	Thickness [ft]	Depth [ft]	Drained at Bottom
1	Marine Deposit SILT	3	0	Yes
2	Glacial Till SILT	47	3	No



Soil Properties

Property	Marine Deposit SILT	Glacial Till SILT
Color		
Unit Weight [kips/ft ³]	0.115	0.13
Saturated Unit Weight [kips/ft ³]	0.115	0.13
K0	1	1
Immediate Settlement	Enabled	Enabled
Es [ksf]	80	400
Esur [ksf]	80	400
B-bar	-	-
Undrained Su A [kips/ft ²]	0	0
Undrained Su S	0.2	0.2
Undrained Su m	0.8	0.8
Piezo Line ID	1	1

Groundwater

Groundwater method Piezometric Lines

Water Unit Weight 0.0624 kips/ft³

Piezometric Line Entities

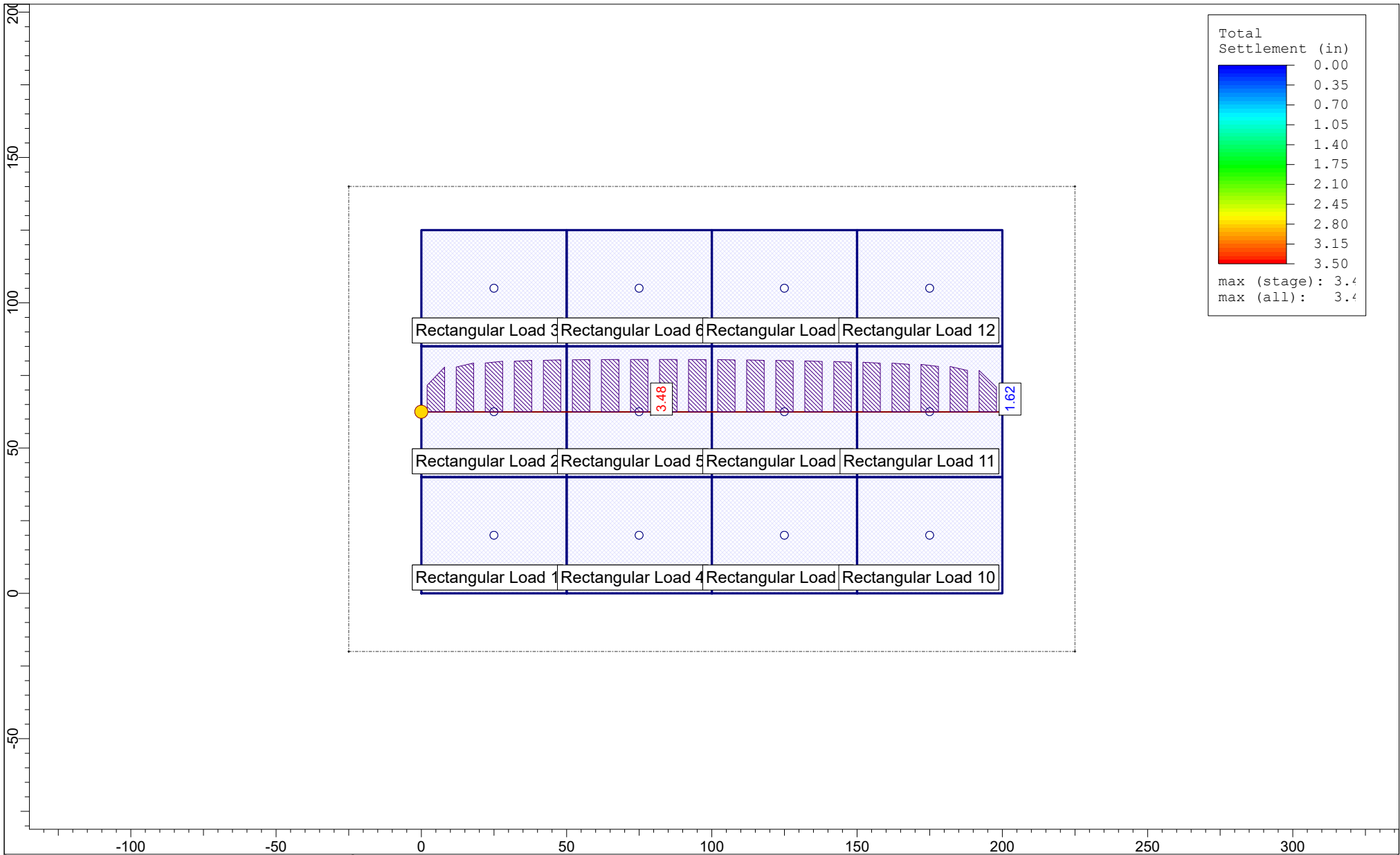
ID	Depth (ft)
1	0 ft


Query Lines

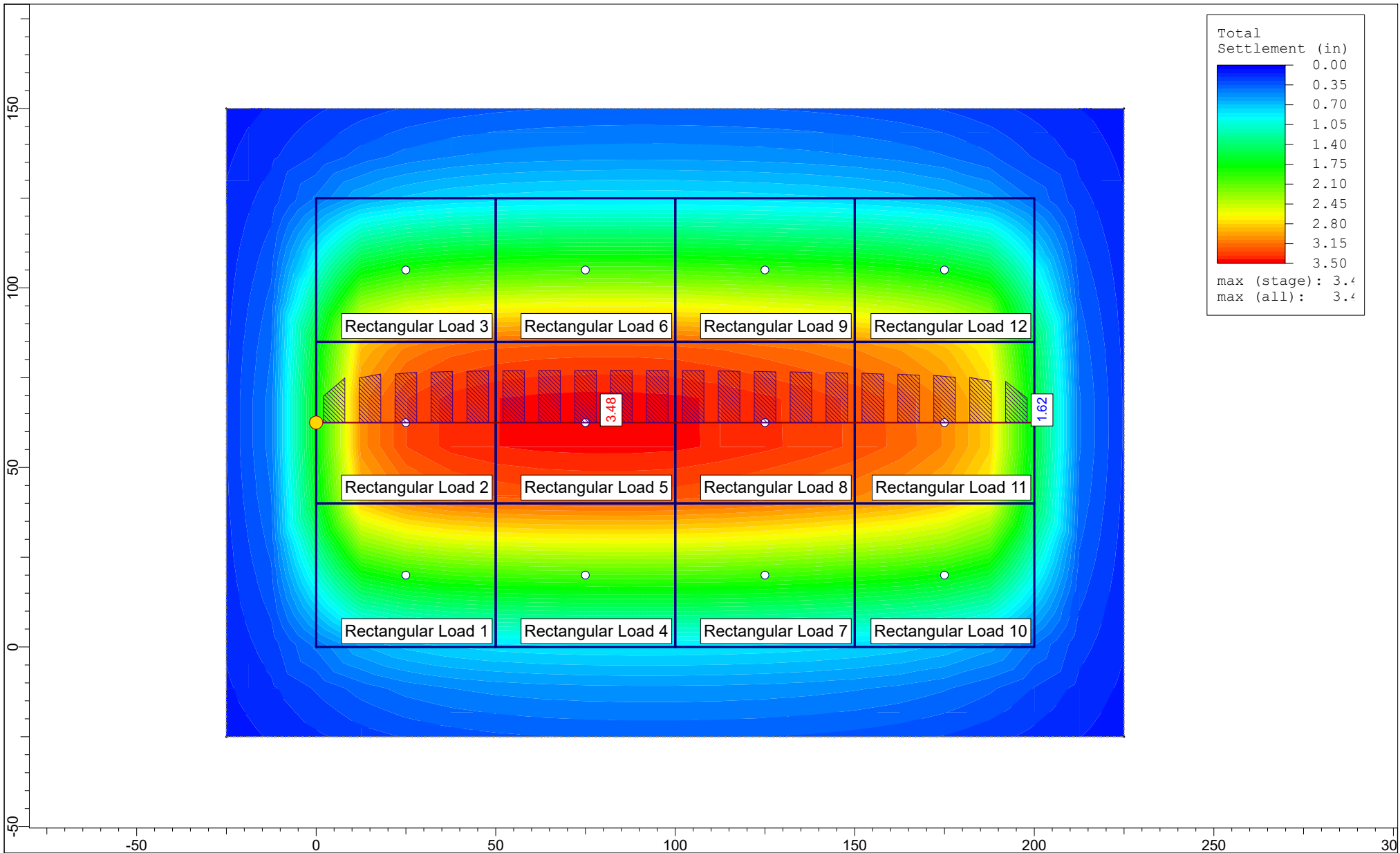
Line #	Query Line Name	Start Location	End Location	Horizontal Divisions	Vertical Divisions
1	Query Line 1	0, 62.5	200, 62.5	20	Auto: 47

Time Points

Point #	(X,Y) Location	Depth	Goal Type	Goal	Time Until Goal
1	134.794, 63.106	0 ft	Degree of Consolidation	95%	-1 mon



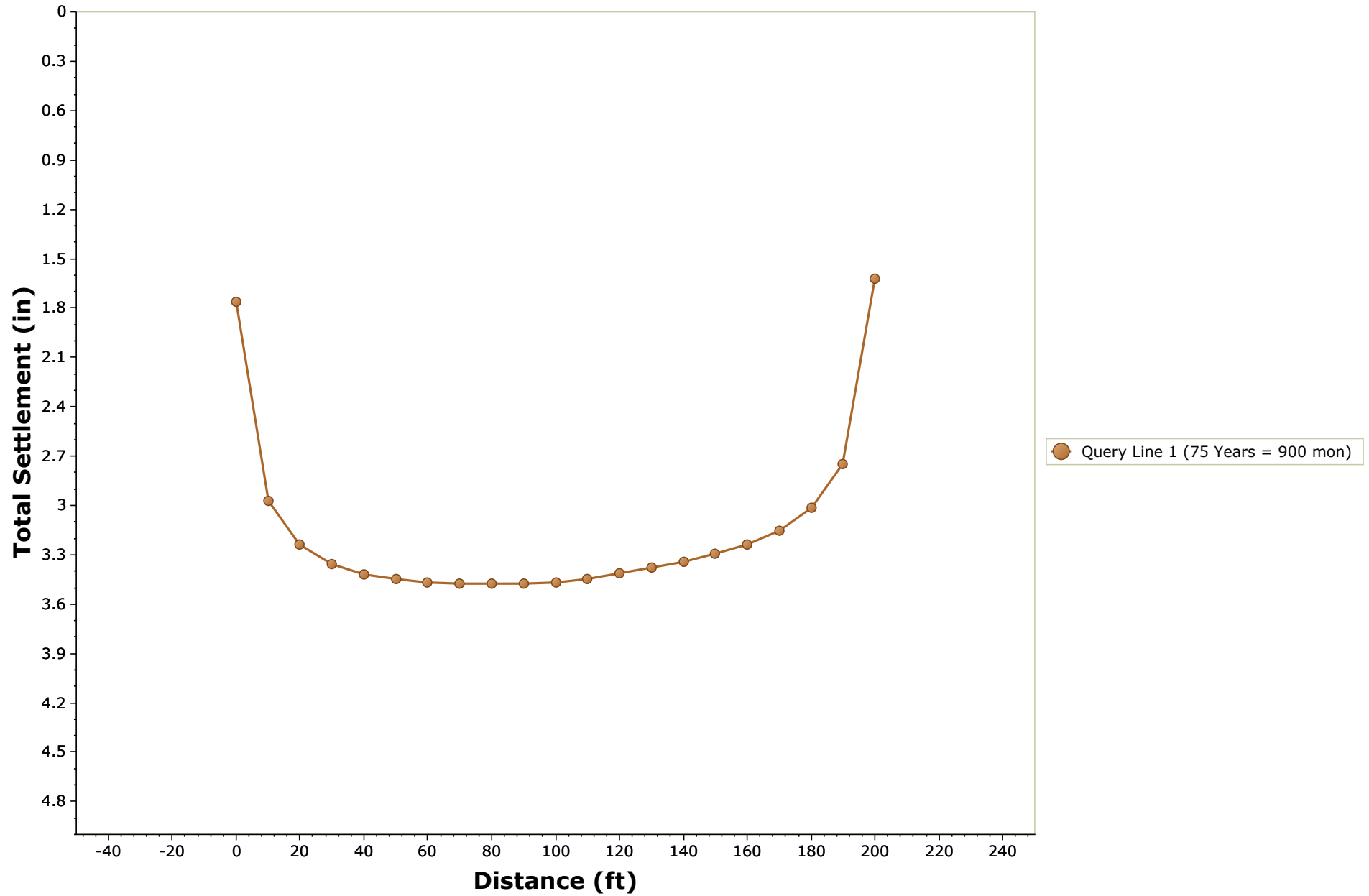
	Project			I-395 Route 9 Connector - WIN 18915.00	
	Analysis Description			Sta. 275+75	
	Drawn By			EMS	Company
	Date			5/22/2020, 8:16:09 AM	File Name
SETTLE3D 4.010			2020-0604-Sta 27575 Settlement.s3z		



SETTLE3D 4.010

Project	I-395 Route 9 Connector - WIN 18915.00		
Analysis Description	Sta. 275+75		
Drawn By	EMS	Company	
Date	5/22/2020, 8:16:09 AM	File Name	2020-0604-Sta 27575 Settlement.s3z

Distance vs. Total Settlement



Reference Stage: None
 Total Settlement at Depth = 0 ft

Sta. 280+75

Settle3D Analysis Information

I-395 Route 9 Connector - WIN 18915.00

Project Settings

Document Name	2020-0604-Sta 28075 Settlement.s3z
Project Title	I-395 Route 9 Connector - WIN 18915.00
Analysis	Sta. 280+75
Author	EMS
Date Created	5/22/2020, 8:16:09 AM
Stress Computation Method	Westergaard
Time-dependent Consolidation Analysis	
Time Units	months
Permeability Units	feet/second
Minimum settlement ratio for subgrade modulus	0.9

Use average properties to calculate layered stresses

Improve consolidation accuracy

Ignore negative effective stresses in settlement calculations

Stage Settings

Stage #	Name	Time [months]
1	Initial	0
2	75 Years	900

Results

Time taken to compute: 0.0854135 seconds

Stage: Initial = 0 mon

Data Type	Minimum	Maximum
Total Settlement [in]	0	0.442549
Total Consolidation Settlement [in]	0	0
Virgin Consolidation Settlement [in]	0	0
Recompression Consolidation Settlement [in]	0	0
Immediate Settlement [in]	0	0.442549
Secondary Settlement [in]	0	0
Loading Stress ZZ [ksf]	0.898108	2.375
Loading Stress XX [ksf]	0	0
Loading Stress YY [ksf]	0	0
Effective Stress ZZ [ksf]	1	2.63576
Effective Stress XX [ksf]	0	0.6084
Effective Stress YY [ksf]	0	0.6084
Total Stress ZZ [ksf]	1	3.19736
Total Stress XX [ksf]	0	1.17
Total Stress YY [ksf]	0	1.17
Modulus of Subgrade Reaction (Total) [ksf/ft]	0	72.4258
Modulus of Subgrade Reaction (Immediate) [ksf/ft]	0	72.4258
Modulus of Subgrade Reaction (Consolidation) [ksf/ft]	0	0
Total Strain	0.00089816	0.00593701
Pore Water Pressure [ksf]	0	0.5616
Excess Pore Water Pressure [ksf]	0	0
Degree of Consolidation [%]	0	0
Pre-consolidation Stress [ksf]	1.28788	4.97202
Over-consolidation Ratio	1	4.97024
Void Ratio	0	0
Permeability [ft/s]	0	0
Coefficient of Consolidation [ft ² /s]	0	0
Hydroconsolidation Settlement [in]	0	0
Average Degree of Consolidation [%]	0	0
Undrained Shear Strength	0	0.181955

Stage: 75 Years = 900 mon

Data Type	Minimum	Maximum
Total Settlement [in]	0	0.442549
Total Consolidation Settlement [in]	0	0
Virgin Consolidation Settlement [in]	0	0
Recompression Consolidation Settlement [in]	0	0
Immediate Settlement [in]	0	0.442549
Secondary Settlement [in]	0	0
Loading Stress ZZ [ksf]	0.898108	2.375
Loading Stress XX [ksf]	0	0
Loading Stress YY [ksf]	0	0
Effective Stress ZZ [ksf]	1	2.63576
Effective Stress XX [ksf]	0	0.6084
Effective Stress YY [ksf]	0	0.6084
Total Stress ZZ [ksf]	1	3.19736
Total Stress XX [ksf]	0	1.17
Total Stress YY [ksf]	0	1.17
Modulus of Subgrade Reaction (Total) [ksf/ft]	0	72.4258
Modulus of Subgrade Reaction (Immediate) [ksf/ft]	0	72.4258
Modulus of Subgrade Reaction (Consolidation) [ksf/ft]	0	0
Total Strain	0.00089816	0.00593701
Pore Water Pressure [ksf]	0	0.5616
Excess Pore Water Pressure [ksf]	0	0
Degree of Consolidation [%]	0	0
Pre-consolidation Stress [ksf]	1.28788	4.97202
Over-consolidation Ratio	1	4.97024
Void Ratio	0	0
Permeability [ft/s]	0	0
Coefficient of Consolidation [ft ² /s]	0	0
Hydroconsolidation Settlement [in]	0	0
Average Degree of Consolidation [%]	0	0
Undrained Shear Strength	0	0.181955

Loads

1. Rectangular Load: "Rectangular Load 1"

Length 50 ft
 Width 40 ft
 Rotation angle 0 degrees
 Load Type Flexible
 Area of Load 2000 ft²
 Depth 0 ft
 Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
0	0	0
50	0	0
50	40	2.375
0	40	2.25

2. Rectangular Load: "Rectangular Load 2"

Length 50 ft
 Width 45 ft
 Rotation angle 0 degrees
 Load Type Flexible
 Area of Load 2250 ft²
 Depth 0 ft
 Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
0	40	2.25
50	40	2.375
50	85	2.375
0	85	2.25

3. Rectangular Load: "Rectangular Load 3"

Length 50 ft
 Width 40 ft
 Rotation angle 0 degrees
 Load Type Flexible
 Area of Load 2000 ft²
 Depth 0 ft
 Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
0	85	2.25
50	85	2.375
50	125	0
0	125	0

4. Rectangular Load: "Rectangular Load 4"

Length 50 ft
 Width 40 ft
 Rotation angle 0 degrees
 Load Type Flexible
 Area of Load 2000 ft²
 Depth 0 ft
 Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
50	3.55271e-015	0
100	3.55271e-015	0
100	40	2.375
50	40	2.375

5. Rectangular Load: "Rectangular Load 5"

Length 50 ft
 Width 45 ft
 Rotation angle 0 degrees
 Load Type Flexible
 Area of Load 2250 ft²
 Depth 0 ft
 Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
50	40	2.375
100	40	2.375
100	85	2.375
50	85	2.375

6. Rectangular Load: "Rectangular Load 6"

Length 50 ft
Width 40 ft
Rotation angle 0 degrees
Load Type Flexible
Area of Load 2000 ft²
Depth 0 ft
Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
50	85	2.375
100	85	2.375
100	125	0
50	125	0

7. Rectangular Load: "Rectangular Load 7"

Length 50 ft
Width 40 ft
Rotation angle 0 degrees
Load Type Flexible
Area of Load 2000 ft²
Depth 0 ft
Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
100	0	0
150	0	0
150	40	2.375
100	40	2.375

8. Rectangular Load: "Rectangular Load 8"

Length 50 ft
Width 45 ft
Rotation angle 0 degrees
Load Type Flexible
Area of Load 2250 ft²
Depth 0 ft
Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
100	40	2.375
150	40	2.375
150	85	2.375
100	85	2.375

9. Rectangular Load: "Rectangular Load 9"

Length 50 ft
Width 40 ft
Rotation angle 0 degrees
Load Type Flexible
Area of Load 2000 ft²
Depth 0 ft
Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
100	85	2.375
150	85	2.375
150	125	0
100	125	0

10. Rectangular Load: "Rectangular Load 10"

Length 50 ft
 Width 40 ft
 Rotation angle 0 degrees
 Load Type Flexible
 Area of Load 2000 ft²
 Depth 0 ft
 Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
150	0	0
200	0	0
200	40	2
150	40	2.375

11. Rectangular Load: "Rectangular Load 11"

Length 50 ft
 Width 45 ft
 Rotation angle 0 degrees
 Load Type Flexible
 Area of Load 2250 ft²
 Depth 0 ft
 Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
150	40	2.375
200	40	2
200	85	2
150	85	2.375

12. Rectangular Load: "Rectangular Load 12"

Length 50 ft
 Width 40 ft
 Rotation angle 0 degrees
 Load Type Flexible
 Area of Load 2000 ft²
 Depth 0 ft
 Installation Stage Initial = 0 mon

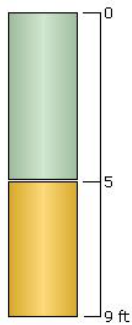
Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
150	85	2.375
200	85	2
200	125	0
150	125	0



Soil Layers

Ground Surface Drained: Yes

Layer #	Type	Thickness [ft]	Depth [ft]	Drained at Bottom
1	Glacial Till SILT	5	0	Yes
2	Glacial Till SAND	4	5	No



Soil Properties

Property	Glacial Till SILT	Glacial Till SAND
Color		
Unit Weight [kips/ft ³]	0.13	0.13
Saturated Unit Weight [kips/ft ³]	0.13	0.13
K0	1	1
Immediate Settlement	Enabled	Enabled
Es [ksf]	400	1000
Esur [ksf]	400	1000
B-bar	-	-
Undrained Su A [kips/ft ²]	0	0
Undrained Su S	0.2	0.2
Undrained Su m	0.8	0.8
Piezo Line ID	1	1

Groundwater

Groundwater method Piezometric Lines

Water Unit Weight 0.0624 kips/ft³

Piezometric Line Entities

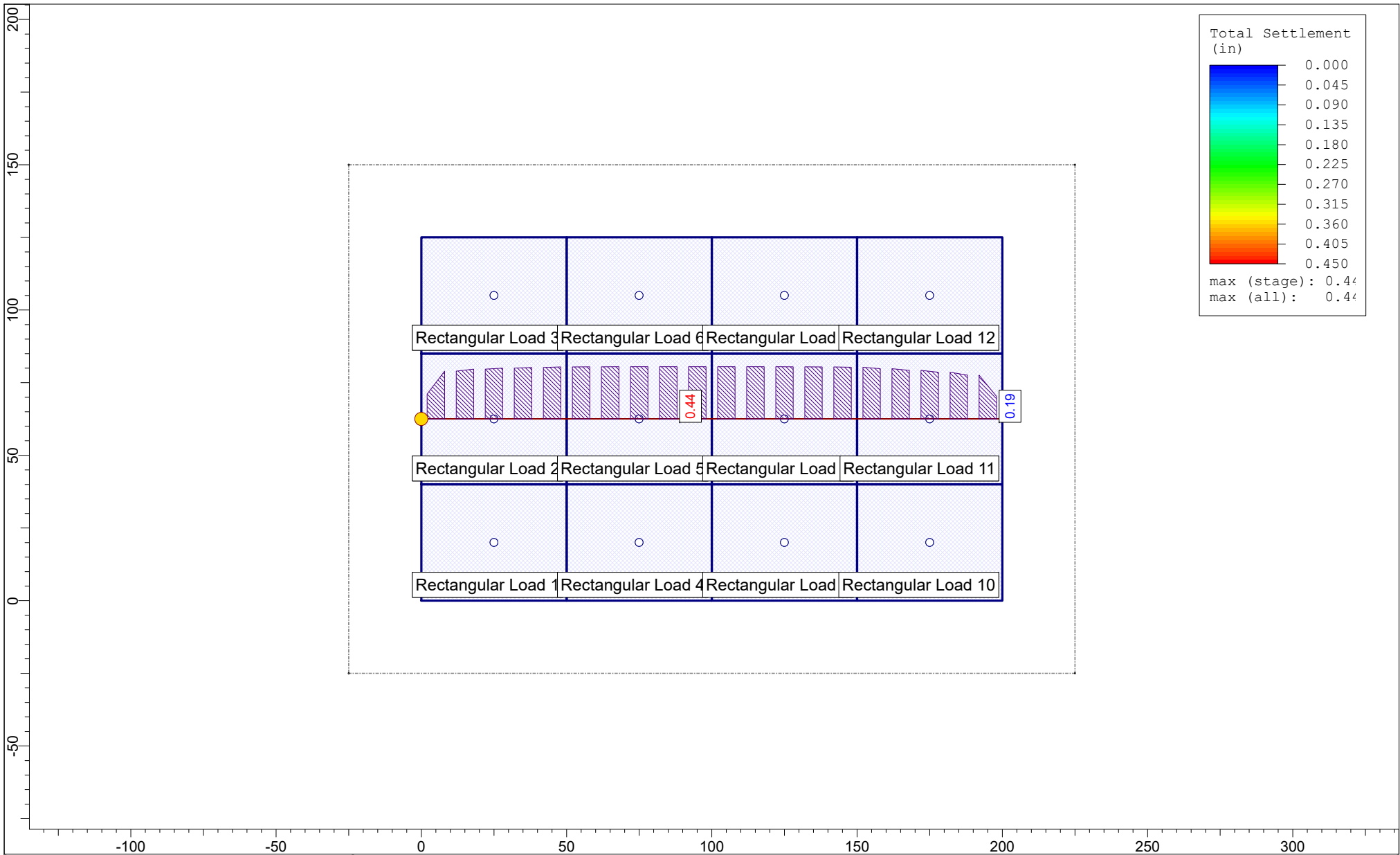
ID	Depth (ft)
1	0 ft

Query Lines

Line #	Query Line Name	Start Location	End Location	Horizontal Divisions	Vertical Divisions
1	Query Line 1	0, 62.5	200, 62.5	20	Auto: 37

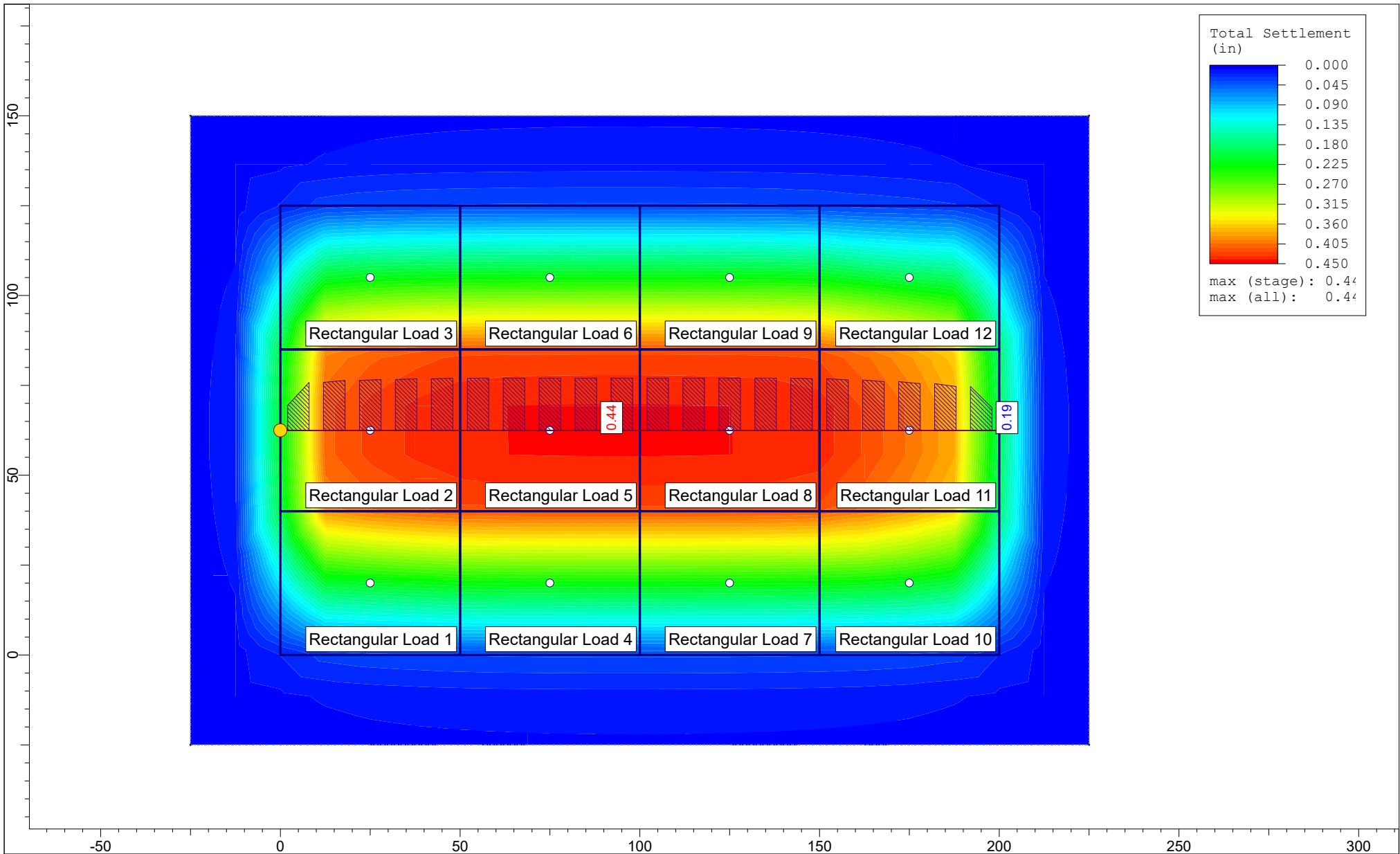
Time Points

Point #	(X,Y) Location	Depth	Goal Type	Goal	Time Until Goal
1	134.794, 63.106	0 ft	Degree of Consolidation	95%	-1 mon



SETTLE3D 4.010

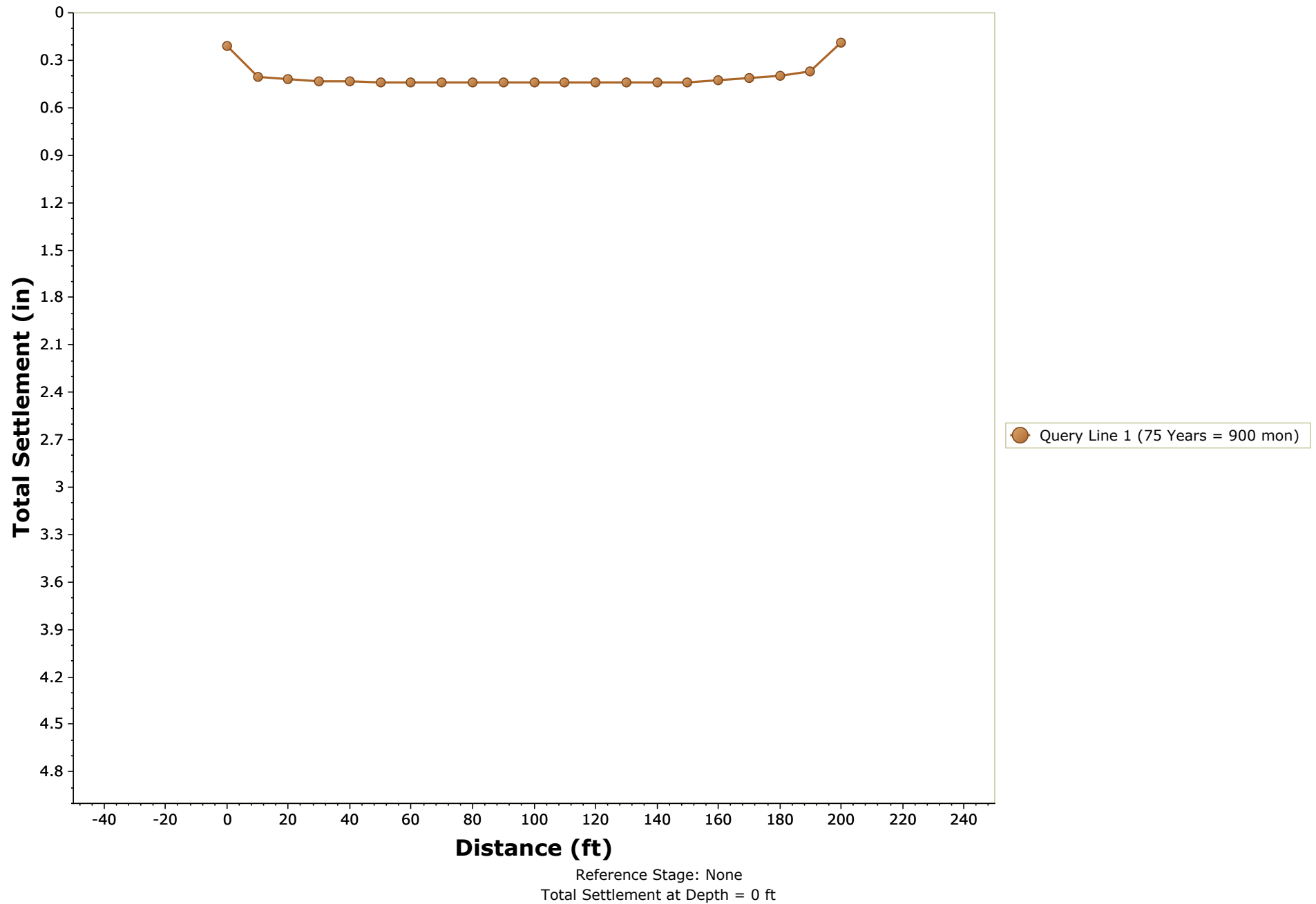
Project		I-395 Route 9 Connector - WIN 18915.00	
Analysis Description		Sta. 280+75	
Drawn By		EMS	Company
Date		5/22/2020, 8:16:09 AM	File Name
		2020-0604-Sta 28075 Settlement.s3z	



SETTLE3D 4.010

Project	I-395 Route 9 Connector - WIN 18915.00		
Analysis Description	Sta. 280+75		
Drawn By	EMS	Company	
Date	5/22/2020, 8:16:09 AM	File Name	2020-0604-Sta 28075 Settlement.s3z

Distance vs. Total Settlement



Sta. 289+00

Settle3D Analysis Information

I-395 Route 9 Connector - WIN 18915.00

Project Settings

Document Name	2020-0604-Sta 28900 Settlement.s3z
Project Title	I-395 Route 9 Connector - WIN 18915.00
Analysis	Sta. 289+00
Author	EMS
Date Created	5/22/2020, 8:16:09 AM
Stress Computation Method	Westergaard
Time-dependent Consolidation Analysis	
Time Units	months
Permeability Units	feet/second
Minimum settlement ratio for subgrade modulus	0.9

Use average properties to calculate layered stresses

Improve consolidation accuracy

Ignore negative effective stresses in settlement calculations

Stage Settings

Stage #	Name	Time [months]
1	Initial	0
2	75 Years	900

Results

Time taken to compute: 0.0996983 seconds

Stage: Initial = 0 mon

Data Type	Minimum	Maximum
Total Settlement [in]	0	1.31855
Total Consolidation Settlement [in]	0	0
Virgin Consolidation Settlement [in]	0	0
Recompression Consolidation Settlement [in]	0	0
Immediate Settlement [in]	0	1.31855
Secondary Settlement [in]	0	0
Loading Stress ZZ [ksf]	0.846193	2.375
Loading Stress XX [ksf]	0	0
Loading Stress YY [ksf]	0	0
Effective Stress ZZ [ksf]	0.9375	2.54144
Effective Stress XX [ksf]	0	0.5108
Effective Stress YY [ksf]	0	0.5108
Total Stress ZZ [ksf]	0.9375	3.04064
Total Stress XX [ksf]	0	1.01
Total Stress YY [ksf]	0	1.01
Modulus of Subgrade Reaction (Total) [ksf/ft]	0	23.7305
Modulus of Subgrade Reaction (Immediate) [ksf/ft]	0	23.7305
Modulus of Subgrade Reaction (Consolidation) [ksf/ft]	0	0
Total Strain	0.00211558	0.0395813
Pore Water Pressure [ksf]	0	0.4992
Excess Pore Water Pressure [ksf]	0	0
Degree of Consolidation [%]	0	0
Pre-consolidation Stress [ksf]	1.02419	4.97202
Over-consolidation Ratio	1	5.3029
Void Ratio	0	0
Permeability [ft/s]	0	0
Coefficient of Consolidation [ft ² /s]	0	0
Hydroconsolidation Settlement [in]	0	0
Average Degree of Consolidation [%]	0	0
Undrained Shear Strength	0	0.247246

Stage: 75 Years = 900 mon

Data Type	Minimum	Maximum
Total Settlement [in]	0	1.31855
Total Consolidation Settlement [in]	0	0
Virgin Consolidation Settlement [in]	0	0
Recompression Consolidation Settlement [in]	0	0
Immediate Settlement [in]	0	1.31855
Secondary Settlement [in]	0	0
Loading Stress ZZ [ksf]	0.846193	2.375
Loading Stress XX [ksf]	0	0
Loading Stress YY [ksf]	0	0
Effective Stress ZZ [ksf]	0.9375	2.54144
Effective Stress XX [ksf]	0	0.5108
Effective Stress YY [ksf]	0	0.5108
Total Stress ZZ [ksf]	0.9375	3.04064
Total Stress XX [ksf]	0	1.01
Total Stress YY [ksf]	0	1.01
Modulus of Subgrade Reaction (Total) [ksf/ft]	0	23.7305
Modulus of Subgrade Reaction (Immediate) [ksf/ft]	0	23.7305
Modulus of Subgrade Reaction (Consolidation) [ksf/ft]	0	0
Total Strain	0.00211558	0.0395813
Pore Water Pressure [ksf]	0	0.4992
Excess Pore Water Pressure [ksf]	0	0
Degree of Consolidation [%]	0	0
Pre-consolidation Stress [ksf]	1.02419	4.97202
Over-consolidation Ratio	1	5.3029
Void Ratio	0	0
Permeability [ft/s]	0	0
Coefficient of Consolidation [ft ² /s]	0	0
Hydroconsolidation Settlement [in]	0	0
Average Degree of Consolidation [%]	0	0
Undrained Shear Strength	0	0.247246

Loads

1. Rectangular Load: "Rectangular Load 1"

Length 50 ft
 Width 40 ft
 Rotation angle 0 degrees
 Load Type Flexible
 Area of Load 2000 ft²
 Depth 0 ft
 Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
0	0	0
50	0	0
50	40	2.25
0	40	2.375

2. Rectangular Load: "Rectangular Load 2"

Length 50 ft
 Width 45 ft
 Rotation angle 0 degrees
 Load Type Flexible
 Area of Load 2250 ft²
 Depth 0 ft
 Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
0	40	2.375
50	40	2.25
50	85	2.25
0	85	2.375

3. Rectangular Load: "Rectangular Load 3"

Length 50 ft
 Width 40 ft
 Rotation angle 0 degrees
 Load Type Flexible
 Area of Load 2000 ft²
 Depth 0 ft
 Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
0	85	2.375
50	85	2.25
50	125	0
0	125	0

4. Rectangular Load: "Rectangular Load 4"

Length 50 ft
 Width 40 ft
 Rotation angle 0 degrees
 Load Type Flexible
 Area of Load 2000 ft²
 Depth 0 ft
 Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
50	3.55271e-015	0
100	3.55271e-015	0
100	40	2.375
50	40	2.25

5. Rectangular Load: "Rectangular Load 5"

Length 50 ft
 Width 45 ft
 Rotation angle 0 degrees
 Load Type Flexible
 Area of Load 2250 ft²
 Depth 0 ft
 Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
50	40	2.25
100	40	2.375
100	85	2.375
50	85	2.25

6. Rectangular Load: "Rectangular Load 6"

Length 50 ft
 Width 40 ft
 Rotation angle 0 degrees
 Load Type Flexible
 Area of Load 2000 ft²
 Depth 0 ft
 Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
50	85	2.25
100	85	2.375
100	125	0
50	125	0

7. Rectangular Load: "Rectangular Load 7"

Length 50 ft
 Width 40 ft
 Rotation angle 0 degrees
 Load Type Flexible
 Area of Load 2000 ft²
 Depth 0 ft
 Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
100	0	0
150	0	0
150	40	2.125
100	40	2.375

8. Rectangular Load: "Rectangular Load 8"

Length 50 ft
 Width 45 ft
 Rotation angle 0 degrees
 Load Type Flexible
 Area of Load 2250 ft²
 Depth 0 ft
 Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
100	40	2.375
150	40	2.125
150	85	2.125
100	85	2.375

9. Rectangular Load: "Rectangular Load 9"

Length 50 ft
 Width 40 ft
 Rotation angle 0 degrees
 Load Type Flexible
 Area of Load 2000 ft²
 Depth 0 ft
 Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
100	85	2.375
150	85	2.125
150	125	0
100	125	0

10. Rectangular Load: "Rectangular Load 10"

Length 50 ft
Width 40 ft
Rotation angle 0 degrees
Load Type Flexible
Area of Load 2000 ft²
Depth 0 ft
Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
150	0	0
200	0	0
200	40	1.875
150	40	2.125

11. Rectangular Load: "Rectangular Load 11"

Length 50 ft
Width 45 ft
Rotation angle 0 degrees
Load Type Flexible
Area of Load 2250 ft²
Depth 0 ft
Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
150	40	2.125
200	40	1.875
200	85	1.875
150	85	2.125

12. Rectangular Load: "Rectangular Load 12"

Length 50 ft
Width 40 ft
Rotation angle 0 degrees
Load Type Flexible
Area of Load 2000 ft²
Depth 0 ft
Installation Stage Initial = 0 mon

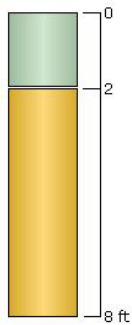
Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
150	85	2.125
200	85	1.875
200	125	0
150	125	0



Soil Layers

Ground Surface Drained: Yes

Layer #	Type	Thickness [ft]	Depth [ft]	Drained at Bottom
1	Marine Deposit SILT	2	0	Yes
2	Glacial Till SILT	6	2	No



Soil Properties

Property	Marine Deposit SILT	Glacial Till SILT
Color		
Unit Weight [kips/ft ³]	0.115	0.13
Saturated Unit Weight [kips/ft ³]	0.115	0.13
K0	1	1
Immediate Settlement	Enabled	Enabled
Es [ksf]	60	400
Esur [ksf]	60	400
B-bar	-	-
Undrained Su A [kips/ft ²]	0	0
Undrained Su S	0.2	0.2
Undrained Su m	0.8	0.8
Piezo Line ID	1	1

Groundwater

Groundwater method Piezometric Lines

Water Unit Weight 0.0624 kips/ft³

Piezometric Line Entities

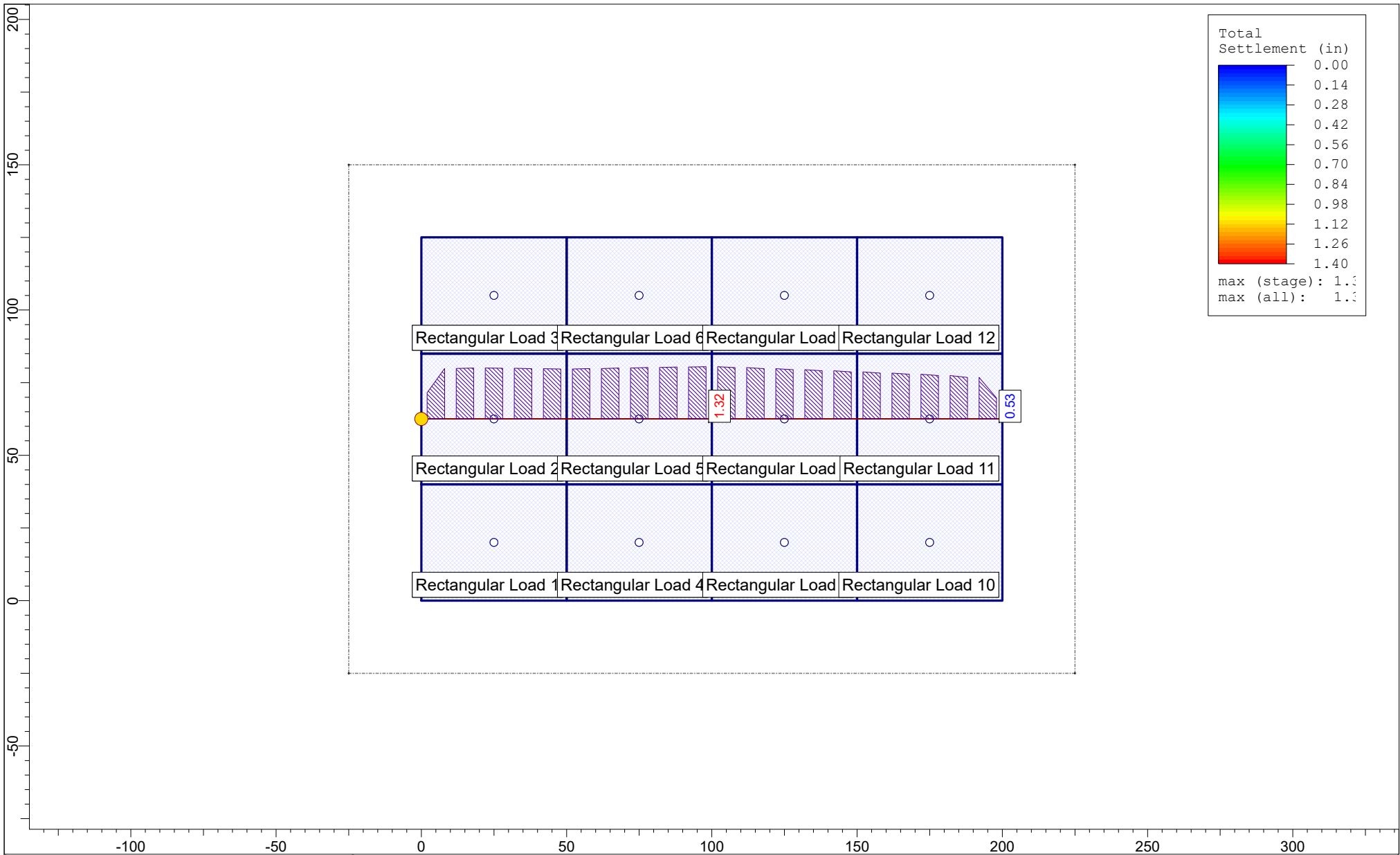
ID	Depth (ft)
1	0 ft


Query Lines

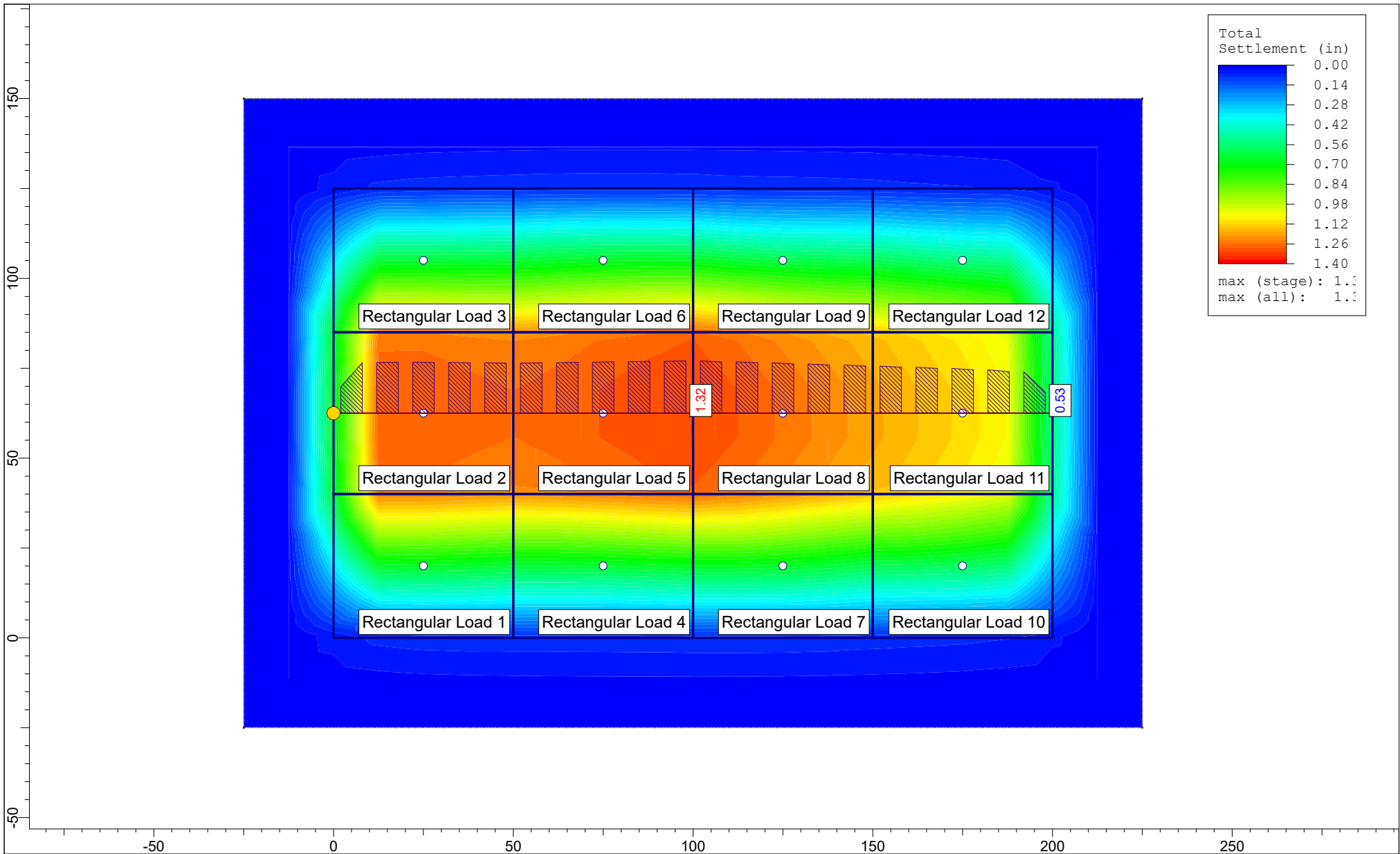
Line #	Query Line Name	Start Location	End Location	Horizontal Divisions	Vertical Divisions
1	Query Line 1	0, 62.5	200, 62.5	20	Auto: 49


Time Points

Point #	(X,Y) Location	Depth	Goal Type	Goal	Time Until Goal
1	134.794, 63.106	0 ft	Degree of Consolidation	95%	-1 mon

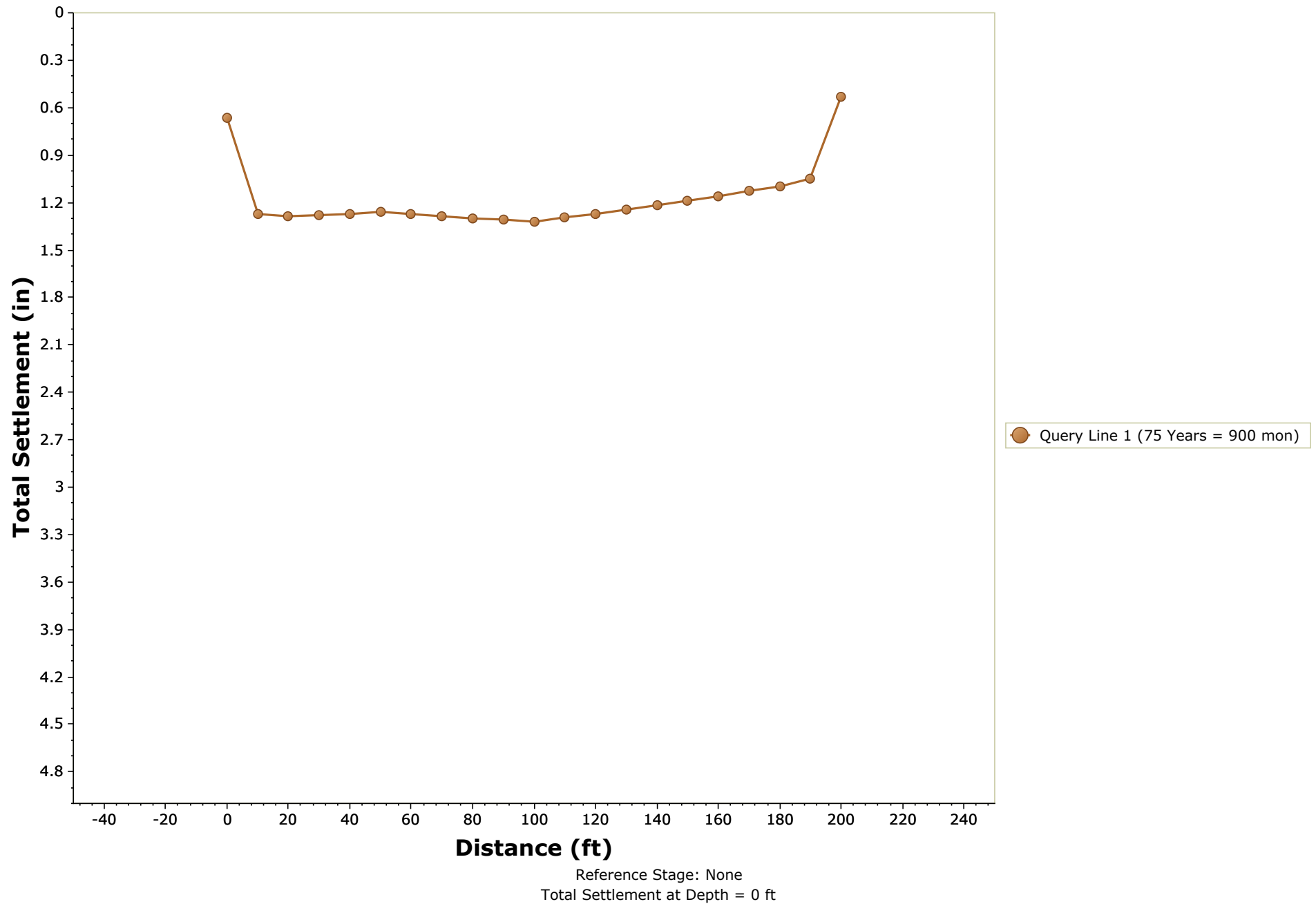


	Project			I-395 Route 9 Connector - WIN 18915.00	
	Analysis Description			Sta. 289+00	
	Drawn By			EMS	Company
	Date			5/22/2020, 8:16:09 AM	File Name
				2020-0604-Sta 28900 Settlement.s3z	



	Project		I-395 Route 9 Connector - WIN 18915.00	
	Analysis Description		Sta. 289+00	
	Drawn By		EMS	Company
	Date		5/22/2020, 8:16:09 AM	File Name
SETTLE3D 4.010		2020-0604-Sta 28900 Settlement.s3z		

Distance vs. Total Settlement



Sta. 299+75

Settle3D Analysis Information

I-395 Route 9 Connector - WIN 18915.00

Project Settings

Document Name	2020-0604-Sta 29975 Settlement.s3z
Project Title	I-395 Route 9 Connector - WIN 18915.00
Analysis	Sta. 299+75
Author	EMS
Date Created	5/22/2020, 8:16:09 AM
Stress Computation Method	Westergaard
Time-dependent Consolidation Analysis	
Time Units	months
Permeability Units	feet/second
Minimum settlement ratio for subgrade modulus	0.9

Use average properties to calculate layered stresses

Improve consolidation accuracy

Ignore negative effective stresses in settlement calculations

Stage Settings

Stage #	Name	Time [months]
1	Initial	0
2	75 Years	900

Results

Time taken to compute: 2.29513 seconds

Stage: Initial = 0 mon

Data Type	Minimum	Maximum
Total Settlement [in]	0	1.64822
Total Consolidation Settlement [in]	0	0
Virgin Consolidation Settlement [in]	0	0
Recompression Consolidation Settlement [in]	0	0
Immediate Settlement [in]	0	1.64822
Secondary Settlement [in]	0	0
Loading Stress ZZ [ksf]	-3.38221e-009	2
Loading Stress XX [ksf]	0	0
Loading Stress YY [ksf]	0	0
Effective Stress ZZ [ksf]	-3.38221e-009	2.48212
Effective Stress XX [ksf]	0	0.783
Effective Stress YY [ksf]	0	0.783
Total Stress ZZ [ksf]	-3.38221e-009	2.79412
Total Stress XX [ksf]	0	1.095
Total Stress YY [ksf]	0	1.095
Modulus of Subgrade Reaction (Total) [ksf/ft]	-1.03818e-006	16.6019
Modulus of Subgrade Reaction (Immediate) [ksf/ft]	-1.03818e-006	16.6019
Modulus of Subgrade Reaction (Consolidation) [ksf/ft]	0	0
Total Strain	1.10649e-007	0.0249983
Pore Water Pressure [ksf]	0	0.312
Excess Pore Water Pressure [ksf]	0	0
Degree of Consolidation [%]	0	0
Pre-consolidation Stress [ksf]	0.524262	4.97262
Over-consolidation Ratio	1	10606
Void Ratio	0	0
Permeability [ft/s]	0	0
Coefficient of Consolidation [ft ² /s]	0	0
Hydroconsolidation Settlement [in]	0	0
Average Degree of Consolidation [%]	0	0
Undrained Shear Strength	0	0.124141

Stage: 75 Years = 900 mon

Data Type	Minimum	Maximum
Total Settlement [in]	0	1.64822
Total Consolidation Settlement [in]	0	0
Virgin Consolidation Settlement [in]	0	0
Recompression Consolidation Settlement [in]	0	0
Immediate Settlement [in]	0	1.64822
Secondary Settlement [in]	0	0
Loading Stress ZZ [ksf]	-3.38221e-009	2
Loading Stress XX [ksf]	0	0
Loading Stress YY [ksf]	0	0
Effective Stress ZZ [ksf]	-3.38221e-009	2.48212
Effective Stress XX [ksf]	0	0.783
Effective Stress YY [ksf]	0	0.783
Total Stress ZZ [ksf]	-3.38221e-009	2.79412
Total Stress XX [ksf]	0	1.095
Total Stress YY [ksf]	0	1.095
Modulus of Subgrade Reaction (Total) [ksf/ft]	-1.03818e-006	16.6019
Modulus of Subgrade Reaction (Immediate) [ksf/ft]	-1.03818e-006	16.6019
Modulus of Subgrade Reaction (Consolidation) [ksf/ft]	0	0
Total Strain	1.10649e-007	0.0249983
Pore Water Pressure [ksf]	0	0.312
Excess Pore Water Pressure [ksf]	0	0
Degree of Consolidation [%]	0	0
Pre-consolidation Stress [ksf]	0.524262	4.97262
Over-consolidation Ratio	1	10606
Void Ratio	0	0
Permeability [ft/s]	0	0
Coefficient of Consolidation [ft ² /s]	0	0
Hydroconsolidation Settlement [in]	0	0
Average Degree of Consolidation [%]	0	0
Undrained Shear Strength	0	0.124141

Loads

1. Rectangular Load: "Rectangular Load 1"

Length 50 ft
 Width 45 ft
 Rotation angle 0 degrees
 Load Type Flexible
 Area of Load 2250 ft²
 Depth 0 ft
 Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
-3.55271e-015	-3.55271e-015	0
50	-3.55271e-015	0
50	45	1.875
-3.55271e-015	45	1.75

2. Rectangular Load: "Rectangular Load 2"

Length 50 ft
 Width 40 ft
 Rotation angle 0 degrees
 Load Type Flexible
 Area of Load 2000 ft²
 Depth 0 ft
 Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
0	45	1.75
50	45	1.875
50	85	1.875
0	85	1.75

3. Rectangular Load: "Rectangular Load 3"

Length 50 ft
 Width 45 ft
 Rotation angle 0 degrees
 Load Type Flexible
 Area of Load 2250 ft²
 Depth 0 ft
 Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
0	85	1.75
50	85	1.875
50	130	0
0	130	0

4. Rectangular Load: "Rectangular Load 4"

Length 50 ft
 Width 45 ft
 Rotation angle 0 degrees
 Load Type Flexible
 Area of Load 2250 ft²
 Depth 0 ft
 Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
50	-7.10543e-015	0
100	-7.10543e-015	0
100	45	2
50	45	1.875

5. Rectangular Load: "Rectangular Load 5"

Length 50 ft
 Width 40 ft
 Rotation angle 0 degrees
 Load Type Flexible
 Area of Load 2000 ft²
 Depth 0 ft
 Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
50	45	1.875
100	45	2
100	85	2
50	85	1.875

6. Rectangular Load: "Rectangular Load 6"

Length 50 ft
 Width 45 ft
 Rotation angle 0 degrees
 Load Type Flexible
 Area of Load 2250 ft²
 Depth 0 ft
 Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
50	85	1.875
100	85	2
100	130	0
50	130	0

7. Rectangular Load: "Rectangular Load 7"

Length 50 ft
 Width 45 ft
 Rotation angle 0 degrees
 Load Type Flexible
 Area of Load 2250 ft²
 Depth 0 ft
 Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
100	3.55271e-015	0
150	3.55271e-015	0
150	45	2
100	45	2

8. Rectangular Load: "Rectangular Load 8"

Length 50 ft
 Width 40 ft
 Rotation angle 0 degrees
 Load Type Flexible
 Area of Load 2000 ft²
 Depth 0 ft
 Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
100	45	2
150	45	2
150	85	2
100	85	2

9. Rectangular Load: "Rectangular Load 9"

Length 50 ft
 Width 45 ft
 Rotation angle 0 degrees
 Load Type Flexible
 Area of Load 2250 ft²
 Depth 0 ft
 Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
100	85	2
150	85	2
150	130	0
100	130	0

10. Rectangular Load: "Rectangular Load 10"

Length 50 ft
 Width 45 ft
 Rotation angle 0 degrees
 Load Type Flexible
 Area of Load 2250 ft²
 Depth 0 ft
 Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
150	0	0
200	0	0
200	45	2
150	45	2

11. Rectangular Load: "Rectangular Load 11"

Length 50 ft
 Width 40 ft
 Rotation angle 0 degrees
 Load Type Flexible
 Area of Load 2000 ft²
 Depth 0 ft
 Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
150	45	2
200	45	2
200	85	2
150	85	2

12. Rectangular Load: "Rectangular Load 12"

Length 50 ft
 Width 45 ft
 Rotation angle 0 degrees
 Load Type Flexible
 Area of Load 2250 ft²
 Depth 0 ft
 Installation Stage Initial = 0 mon

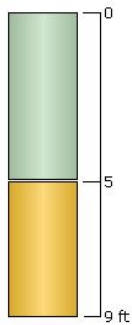
Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
150	85	2
200	85	2
200	130	0
150	130	0



Soil Layers

Ground Surface Drained: Yes

Layer #	Type	Thickness [ft]	Depth [ft]	Drained at Bottom
1	Marine Deposit SILT	5	0	Yes
2	Glacial Till SILT	4	5	No



Soil Properties

Property	Marine Deposit SILT	Glacial Till SILT
Color		
Unit Weight [kips/ft ³]	0.115	0.13
Saturated Unit Weight [kips/ft ³]	0.115	0.13
K0	1	1
Immediate Settlement	Enabled	Enabled
Es [ksf]	80	400
Esur [ksf]	80	400
B-bar	-	-
Undrained Su A [kips/ft ²]	0	0
Undrained Su S	0.2	0.2
Undrained Su m	0.8	0.8
Piezo Line ID	1	1

Groundwater

Groundwater method Piezometric Lines

Water Unit Weight 0.0624 kips/ft³

Piezometric Line Entities

ID	Depth (ft)
1	4 ft

Query Lines

Line #	Query Line Name	Start Location	End Location	Horizontal Divisions	Vertical Divisions
1	Query Line 1	0, 65	200, 65	20	Auto: 47

Field Point Grid

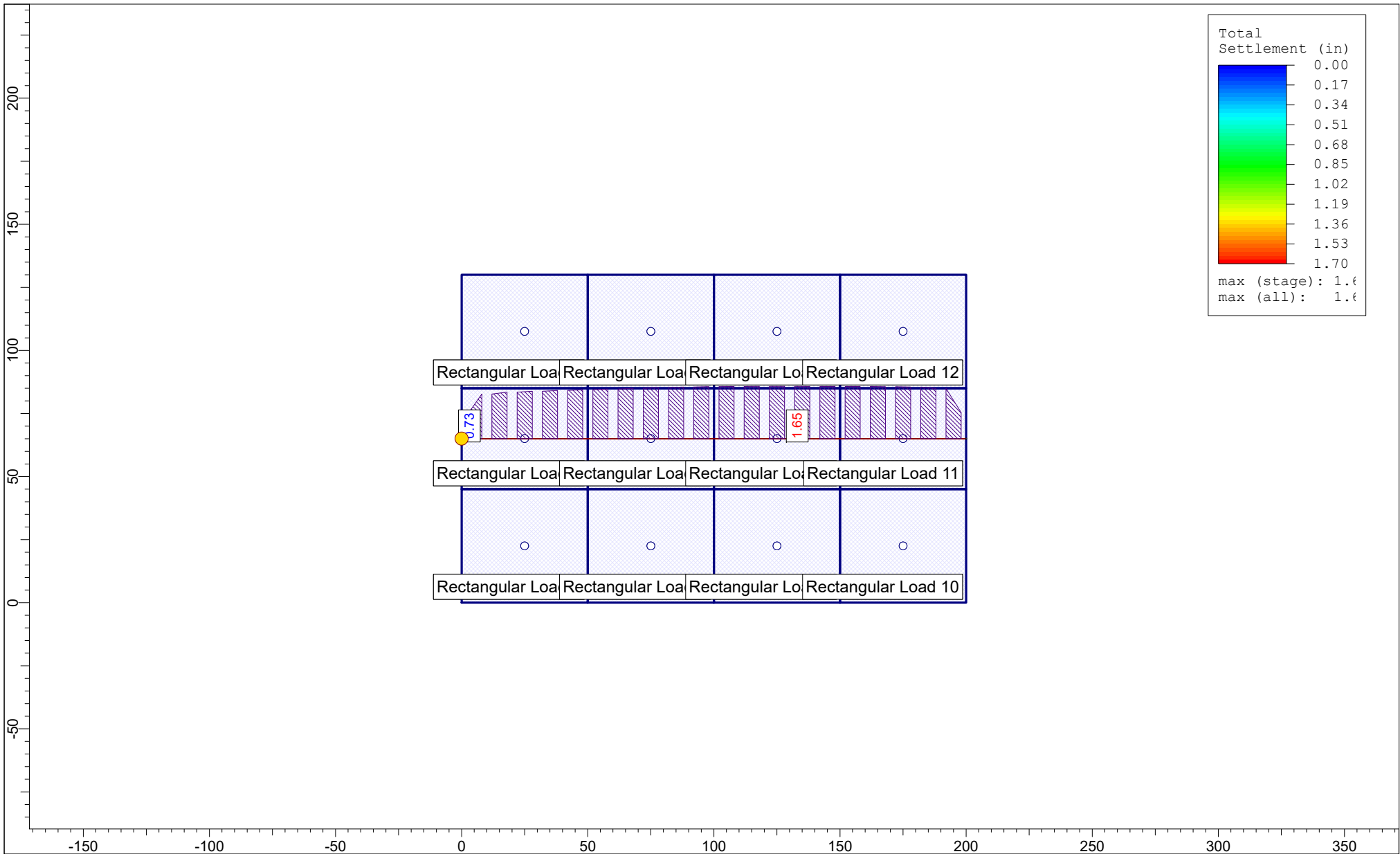
Number of points 362
Expansion Factor 2


Grid Coordinates

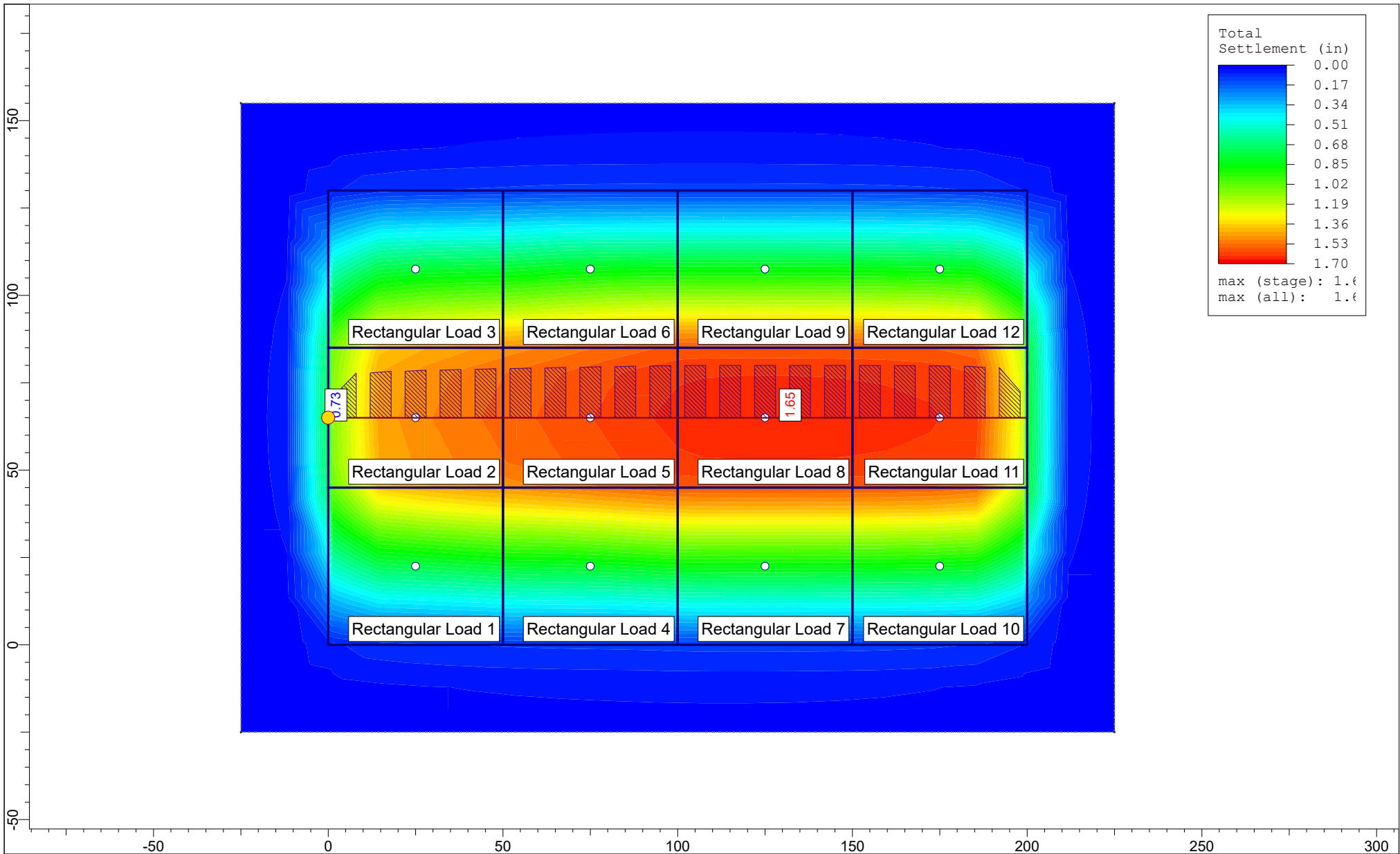
X [ft]	Y [ft]
225	155
225	-25
-25	-25
-25	155

Time Points

Point #	(X,Y) Location	Depth	Goal Type	Goal	Time Until Goal
1	134.794, 63.106	0 ft	Degree of Consolidation	95%	-1 mon



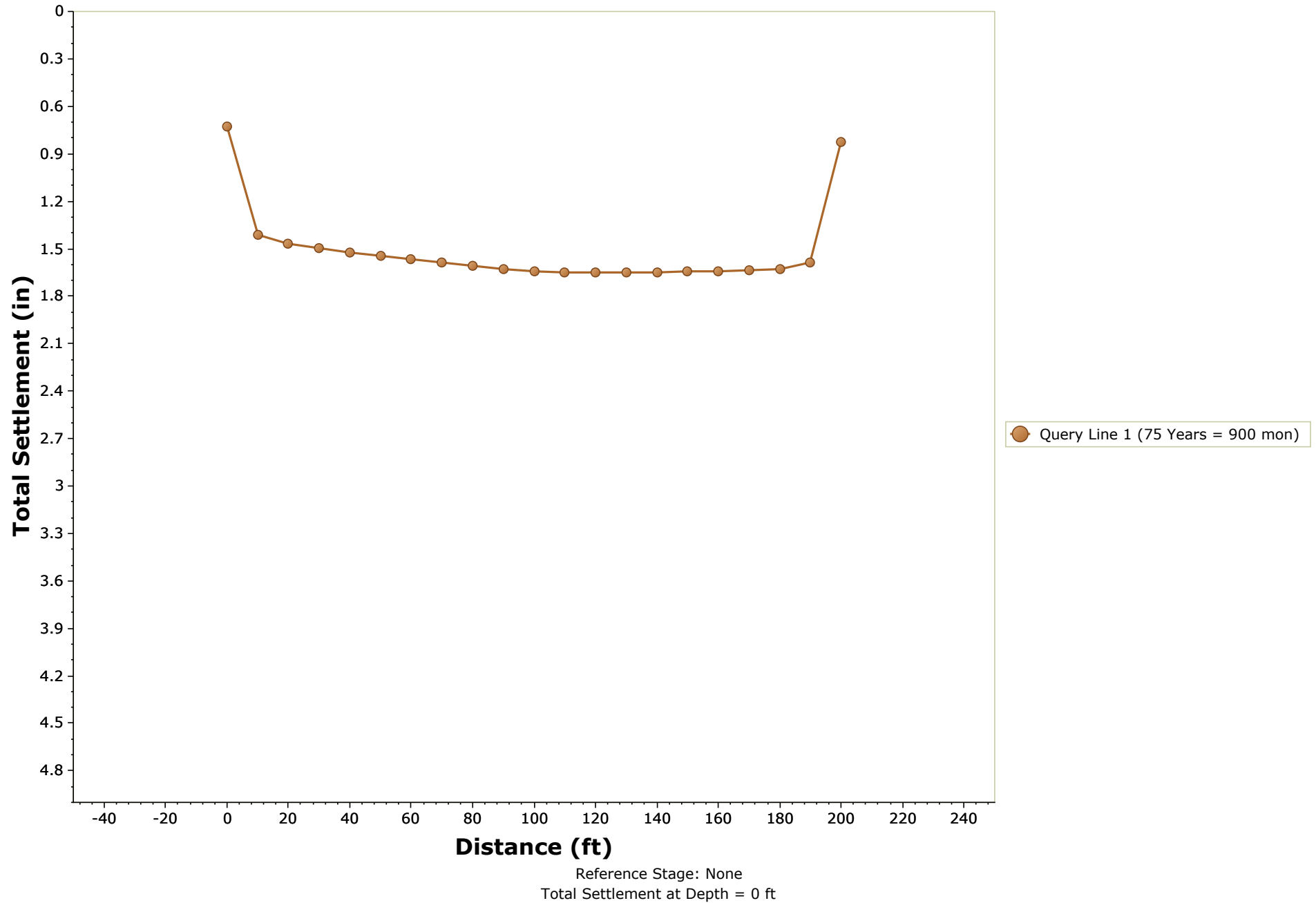
	Project			I-395 Route 9 Connector - WIN 18915.00
	Analysis Description			Sta. 299+75
	Drawn By		EMS	Company
	Date		5/22/2020, 8:16:09 AM	File Name
				2020-0604-Sta 29975 Settlement.s3z



SETTLE3D 4.010

Project	I-395 Route 9 Connector - WIN 18915.00		
Analysis Description	Sta. 299+75		
Drawn By	EMS	Company	
Date	5/22/2020, 8:16:09 AM	File Name	2020-0604-Sta 29975 Settlement.s3z

Distance vs. Total Settlement



Sta. 313+25

Settle3D Analysis Information

I-395 Route 9 Connector - WIN 18915.00

Project Settings

Document Name 2020-0610-Sta 31325 Settlement.s3z
 Project Title I-395 Route 9 Connector - WIN 18915.00
 Analysis Sta. 313+25
 Author EMS
 Date Created 5/22/2020, 8:16:09 AM
 Stress Computation Method Westergaard
 Time-dependent Consolidation Analysis
 Time Units months
 Permeability Units feet/second
 Minimum settlement ratio for subgrade modulus 0.9

Use average properties to calculate layered stresses

Improve consolidation accuracy

Ignore negative effective stresses in settlement calculations

Stage Settings

Stage #	Name	Time [months]
1	Initial	0
2	75 Years	900

Results

Time taken to compute: 0.291012 seconds

Stage: Initial = 0 mon

Data Type	Minimum	Maximum
Total Settlement [in]	0	1.89033
Total Consolidation Settlement [in]	0	0
Virgin Consolidation Settlement [in]	0	0
Recompression Consolidation Settlement [in]	0	0
Immediate Settlement [in]	0	1.89033
Secondary Settlement [in]	0	0
Loading Stress ZZ [ksf]	0.347121	1.625
Loading Stress XX [ksf]	0	0
Loading Stress YY [ksf]	0	0
Effective Stress ZZ [ksf]	0.375	2.85055
Effective Stress XX [ksf]	0	1.8364
Effective Stress YY [ksf]	0	1.8364
Total Stress ZZ [ksf]	0.375	3.72415
Total Stress XX [ksf]	0	2.71
Total Stress YY [ksf]	0	2.71
Modulus of Subgrade Reaction (Total) [ksf/ft]	0	11.3518
Modulus of Subgrade Reaction (Immediate) [ksf/ft]	0	11.3518
Modulus of Subgrade Reaction (Consolidation) [ksf/ft]	0	0
Total Strain	0.000867918	0.0194051
Pore Water Pressure [ksf]	0	0.8736
Excess Pore Water Pressure [ksf]	0	0
Degree of Consolidation [%]	0	0
Pre-consolidation Stress [ksf]	0.976618	4.97202
Over-consolidation Ratio	1	13.2335
Void Ratio	0	0
Permeability [ft/s]	0	0
Coefficient of Consolidation [ft ² /s]	0	0
Hydroconsolidation Settlement [in]	0	0
Average Degree of Consolidation [%]	0	0
Undrained Shear Strength	0	0.0913116

Stage: 75 Years = 900 mon

Data Type	Minimum	Maximum
Total Settlement [in]	0	1.89033
Total Consolidation Settlement [in]	0	0
Virgin Consolidation Settlement [in]	0	0
Recompression Consolidation Settlement [in]	0	0
Immediate Settlement [in]	0	1.89033
Secondary Settlement [in]	0	0
Loading Stress ZZ [ksf]	0.347121	1.625
Loading Stress XX [ksf]	0	0
Loading Stress YY [ksf]	0	0
Effective Stress ZZ [ksf]	0.375	2.85055
Effective Stress XX [ksf]	0	1.8364
Effective Stress YY [ksf]	0	1.8364
Total Stress ZZ [ksf]	0.375	3.72415
Total Stress XX [ksf]	0	2.71
Total Stress YY [ksf]	0	2.71
Modulus of Subgrade Reaction (Total) [ksf/ft]	0	11.3518
Modulus of Subgrade Reaction (Immediate) [ksf/ft]	0	11.3518
Modulus of Subgrade Reaction (Consolidation) [ksf/ft]	0	0
Total Strain	0.000867918	0.0194051
Pore Water Pressure [ksf]	0	0.8736
Excess Pore Water Pressure [ksf]	0	0
Degree of Consolidation [%]	0	0
Pre-consolidation Stress [ksf]	0.976618	4.97202
Over-consolidation Ratio	1	13.2335
Void Ratio	0	0
Permeability [ft/s]	0	0
Coefficient of Consolidation [ft ² /s]	0	0
Hydroconsolidation Settlement [in]	0	0
Average Degree of Consolidation [%]	0	0
Undrained Shear Strength	0	0.0913116

Loads

1. Rectangular Load: "Rectangular Load 1"

Length 50 ft
 Width 45 ft
 Rotation angle 0 degrees
 Load Type Flexible
 Area of Load 2250 ft²
 Depth 0 ft
 Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
0	0	0
50	0	0
50	45	1.375
0	45	0.75

2. Rectangular Load: "Rectangular Load 2"

Length 50 ft
 Width 40 ft
 Rotation angle 0 degrees
 Load Type Flexible
 Area of Load 2000 ft²
 Depth 0 ft
 Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
0	45	0.75
50	45	1.375
50	85	1.375
0	85	0.75

3. Rectangular Load: "Rectangular Load 3"

Length 50 ft
 Width 45 ft
 Rotation angle 0 degrees
 Load Type Flexible
 Area of Load 2250 ft²
 Depth 0 ft
 Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
0	85	0.75
50	85	1.375
50	130	0
0	130	0

4. Rectangular Load: "Rectangular Load 4"

Length 50 ft
 Width 45 ft
 Rotation angle 0 degrees
 Load Type Flexible
 Area of Load 2250 ft²
 Depth 0 ft
 Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
50	-7.10543e-015	0
100	-7.10543e-015	0
100	45	1.625
50	45	1.375

5. Rectangular Load: "Rectangular Load 5"

Length 50 ft
 Width 40 ft
 Rotation angle 0 degrees
 Load Type Flexible
 Area of Load 2000 ft²
 Depth 0 ft
 Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
50	45	1.375
100	45	1.625
100	85	1.625
50	85	1.375

6. Rectangular Load: "Rectangular Load 6"

Length 50 ft
Width 45 ft
Rotation angle 0 degrees
Load Type Flexible
Area of Load 2250 ft²
Depth 0 ft
Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
50	85	1.375
100	85	1.625
100	130	0
50	130	0

7. Rectangular Load: "Rectangular Load 7"

Length 50 ft
Width 45 ft
Rotation angle 0 degrees
Load Type Flexible
Area of Load 2250 ft²
Depth 0 ft
Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
100	0	0
150	0	0
150	45	1.5
100	45	1.625

8. Rectangular Load: "Rectangular Load 8"

Length 50 ft
Width 40 ft
Rotation angle 0 degrees
Load Type Flexible
Area of Load 2000 ft²
Depth 0 ft
Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
100	45	1.625
150	45	1.5
150	85	1.5
100	85	1.625

9. Rectangular Load: "Rectangular Load 9"

Length 50 ft
Width 45 ft
Rotation angle 0 degrees
Load Type Flexible
Area of Load 2250 ft²
Depth 0 ft
Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
100	85	1.625
150	85	1.5
150	130	0
100	130	0

10. Rectangular Load: "Rectangular Load 10"

Length 50 ft
 Width 45 ft
 Rotation angle 0 degrees
 Load Type Flexible
 Area of Load 2250 ft²
 Depth 0 ft
 Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
150	0	0
200	0	0
200	45	1.375
150	45	1.5

11. Rectangular Load: "Rectangular Load 11"

Length 50 ft
 Width 40 ft
 Rotation angle 0 degrees
 Load Type Flexible
 Area of Load 2000 ft²
 Depth 0 ft
 Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
150	45	1.5
200	45	1.375
200	85	1.375
150	85	1.5

12. Rectangular Load: "Rectangular Load 12"

Length 50 ft
 Width 45 ft
 Rotation angle 0 degrees
 Load Type Flexible
 Area of Load 2250 ft²
 Depth 0 ft
 Installation Stage Initial = 0 mon

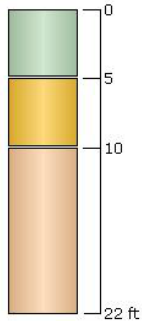
Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
150	85	1.5
200	85	1.375
200	130	0
150	130	0




Soil Layers

Ground Surface Drained: Yes

Layer #	Type	Thickness [ft]	Depth [ft]	Drained at Bottom
1	Marine Deposit SAND	5	0	No
2	Marine Deposit SILT	5	5	Yes
3	Glacial Till SAND	12	10	No



Soil Properties

Property	Marine Deposit SAND	Marine Deposit SILT	Glacial Till SAND
Color			
Unit Weight [kips/ft ³]	0.115	0.115	0.13
Saturated Unit Weight [kips/ft ³]	0.115	0.115	0.13
K0	1	1	1
Immediate Settlement	Enabled	Enabled	Enabled
Es [ksf]	250	75	400
E _{sur} [ksf]	250	75	400
B-bar	-	-	-
Undrained Su A [kips/ft ²]	0	0	0
Undrained Su S	0.2	0.2	0.2
Undrained Su m	0.8	0.8	0.8
Piezo Line ID	1	1	1

Groundwater

Groundwater method Piezometric Lines
 Water Unit Weight 0.0624 kips/ft³

Piezometric Line Entities

ID	Depth (ft)
1	8 ft


Query Lines

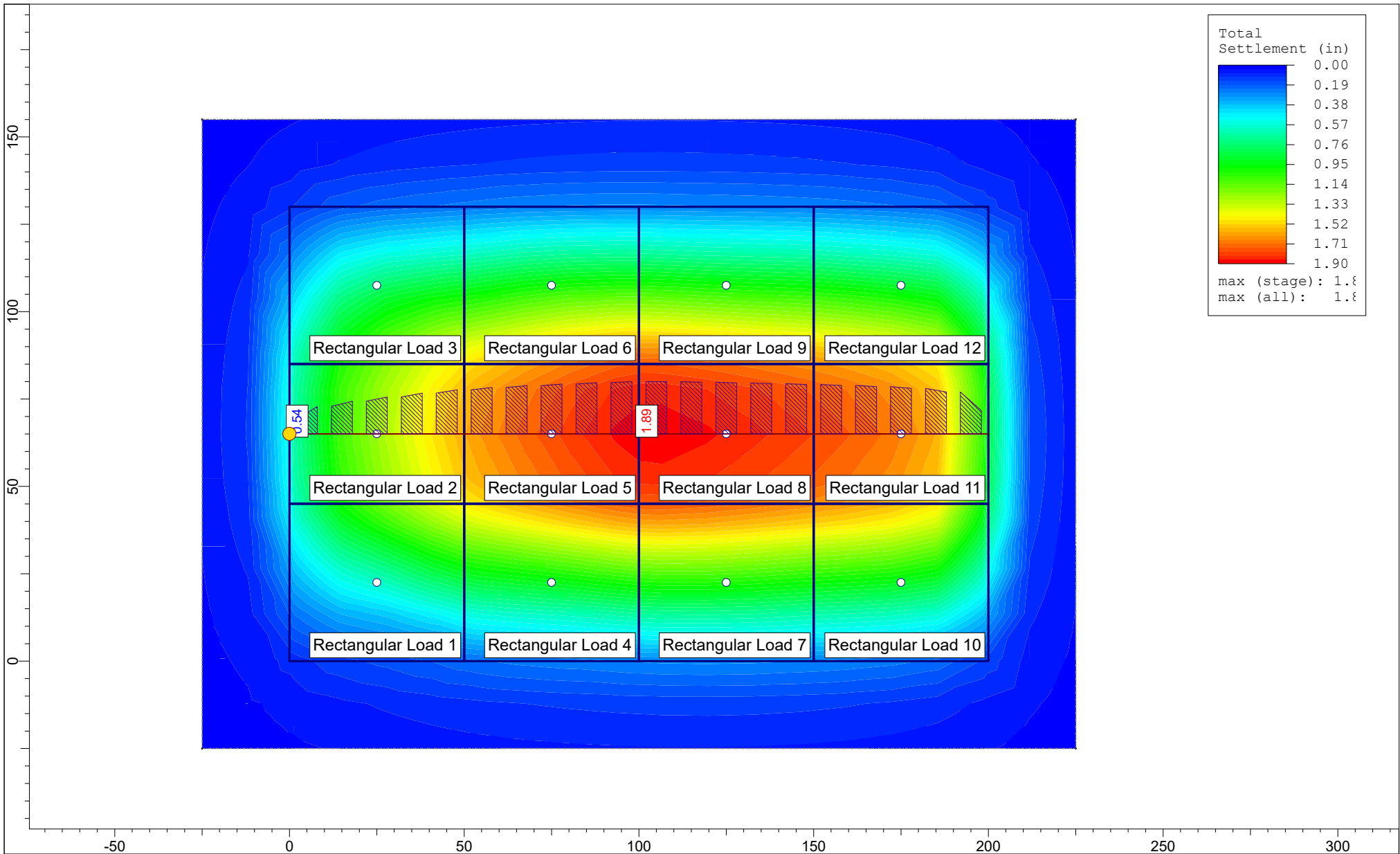
Line #	Query Line Name	Start Location	End Location	Horizontal Divisions	Vertical Divisions
1	Query Line 1	0, 65	200, 65	20	Auto: 53


Time Points

Point #	(X,Y) Location	Depth	Goal Type	Goal	Time Until Goal
1	134.794, 63.106	0 ft	Degree of Consolidation	95%	-1 mon

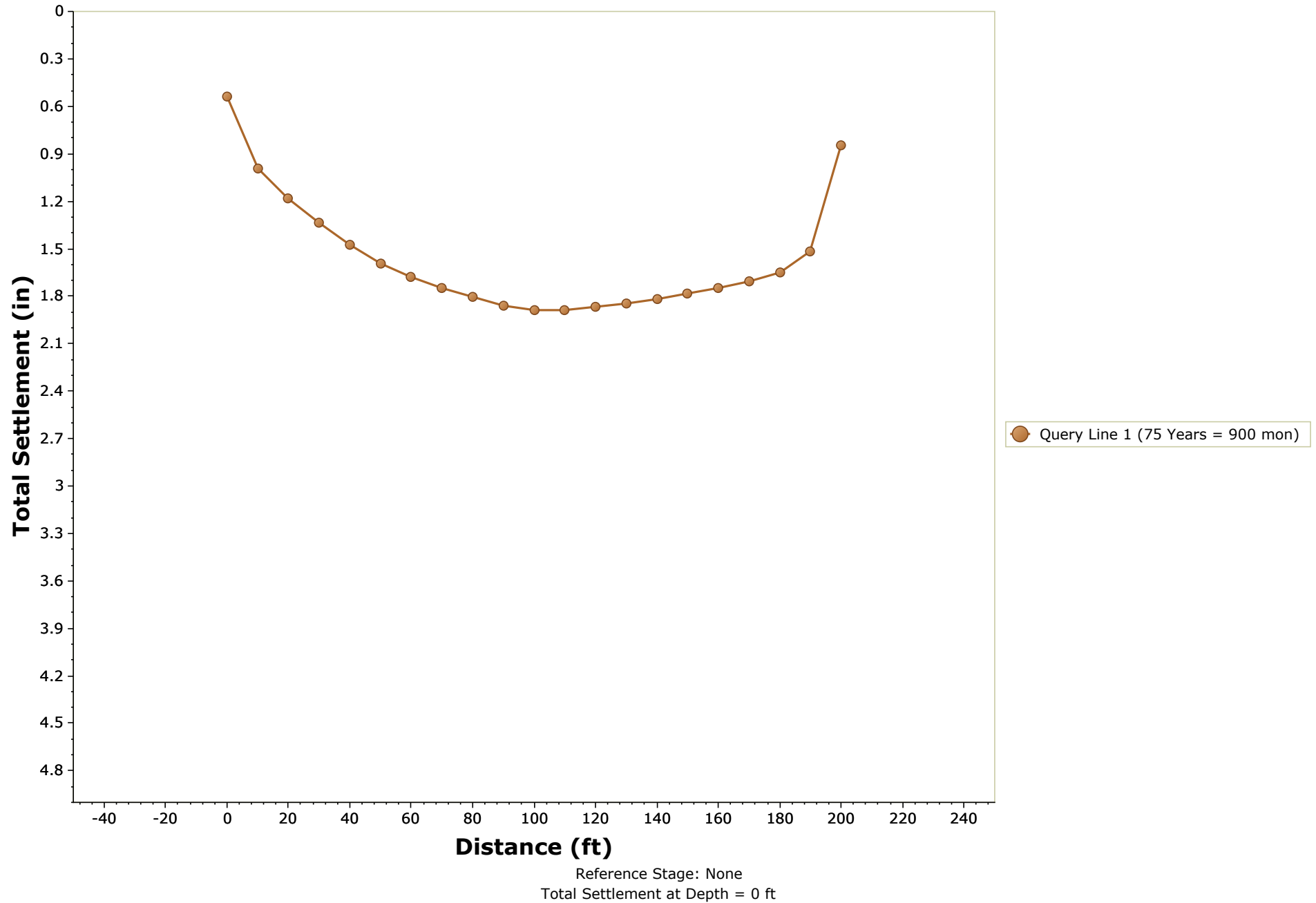


	Project		I-395 Route 9 Connector - WIN 18915.00
	Analysis Description		Sta. 313+25
	Drawn By	EMS	Company
	Date	5/22/2020, 8:16:09 AM	File Name 2020-0610-Sta 31325 Settlement.s3z



	Project			I-395 Route 9 Connector - WIN 18915.00
	Analysis Description			Sta. 313+25
	Drawn By		EMS	Company
	Date		5/22/2020, 8:16:09 AM	File Name
SETTLE3D 4.010		2020-0610-Sta 31325 Settlement.s3z		

Distance vs. Total Settlement



Sta. 314+50

Settle3 Analysis Information

I-395 Route 9 Connector - WIN 18915.00

Project Settings

Document Name	2021-0601-Sta 314+50 Settlement.s3z
Project Title	I-395 Route 9 Connector - WIN 18915.00
Analysis	Sta. 313+25
Author	EMS
Date Created	5/22/2020, 8:16:09 AM
Stress Computation Method	Westergaard
Time-dependent Consolidation Analysis	
Time Units	months
Permeability Units	feet/second
Minimum settlement ratio for subgrade modulus	0.9

Use average properties to calculate layered stresses

Improve consolidation accuracy

Ignore negative effective stresses in settlement calculations

Stage Settings

Stage #	Name	Time [months]
1	Initial	0
2	75 Years	900

Results

Time taken to compute: 0 seconds

Stage: Initial = 0 mon

Data Type	Minimum	Maximum
Total Settlement [in]	0	1.7482
Total Consolidation Settlement [in]	0	0
Virgin Consolidation Settlement [in]	0	0
Recompression Consolidation Settlement [in]	0	0
Immediate Settlement [in]	0	1.7482
Secondary Settlement [in]	0	0
Loading Stress ZZ [ksf]	-4.0263e-010	1.50002
Loading Stress XX [ksf]	0	0
Loading Stress YY [ksf]	0	0
Effective Stress ZZ [ksf]	-4.0263e-010	2.75331
Effective Stress XX [ksf]	0	1.8364
Effective Stress YY [ksf]	0	1.8364
Total Stress ZZ [ksf]	-4.0263e-010	3.62691
Total Stress XX [ksf]	0	2.71
Total Stress YY [ksf]	0	2.71
Modulus of Subgrade Reaction (Total) [ksf/ft]	-1.914e-008	12.6139
Modulus of Subgrade Reaction (Immediate) [ksf/ft]	-1.914e-008	12.6139
Modulus of Subgrade Reaction (Consolidation) [ksf/ft]	0	0
Total Strain	8.9962e-007	0.0180127
Pore Water Pressure [ksf]	0	0.8736
Excess Pore Water Pressure [ksf]	0	0
Degree of Consolidation [%]	0	0
Pre-consolidation Stress [ksf]	0.652563	4.97202
Over-consolidation Ratio	1	6215.77
Void Ratio	0	0
Permeability [ft/s]	0	0
Coefficient of Consolidation [ft ² /s]	0	0
Hydroconsolidation Settlement [in]	0	0
Average Degree of Consolidation [%]	0	0
Undrained Shear Strength	0	0.0600878

Stage: 75 Years = 900 mon

Data Type	Minimum	Maximum
Total Settlement [in]	0	1.7482
Total Consolidation Settlement [in]	0	0
Virgin Consolidation Settlement [in]	0	0
Recompression Consolidation Settlement [in]	0	0
Immediate Settlement [in]	0	1.7482
Secondary Settlement [in]	0	0
Loading Stress ZZ [ksf]	-4.0263e-010	1.50002
Loading Stress XX [ksf]	0	0
Loading Stress YY [ksf]	0	0
Effective Stress ZZ [ksf]	-4.0263e-010	2.75331
Effective Stress XX [ksf]	0	1.8364
Effective Stress YY [ksf]	0	1.8364
Total Stress ZZ [ksf]	-4.0263e-010	3.62691
Total Stress XX [ksf]	0	2.71
Total Stress YY [ksf]	0	2.71
Modulus of Subgrade Reaction (Total) [ksf/ft]	-1.914e-008	12.6139
Modulus of Subgrade Reaction (Immediate) [ksf/ft]	-1.914e-008	12.6139
Modulus of Subgrade Reaction (Consolidation) [ksf/ft]	0	0
Total Strain	8.9962e-007	0.0180127
Pore Water Pressure [ksf]	0	0.8736
Excess Pore Water Pressure [ksf]	0	0
Degree of Consolidation [%]	0	0
Pre-consolidation Stress [ksf]	0.652563	4.97202
Over-consolidation Ratio	1	6215.77
Void Ratio	0	0
Permeability [ft/s]	0	0
Coefficient of Consolidation [ft ² /s]	0	0
Hydroconsolidation Settlement [in]	0	0
Average Degree of Consolidation [%]	0	0
Undrained Shear Strength	0	0.0600878

Loads

1. Rectangular Load: "Sta 313+50 to 314+00"

Length 50 ft
 Width 35 ft
 Rotation angle 0 degrees
 Load Type Flexible
 Area of Load 1750 ft²
 Depth 0 ft
 Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
0	10	0
50	10	0
50	45	1.5
0	45	1.5

2. Rectangular Load: "Roadway 1"

Length 50 ft
 Width 40 ft
 Rotation angle 0 degrees
 Load Type Flexible
 Area of Load 2000 ft²
 Depth 0 ft
 Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
0	45	1.5
50	45	1.5
50	85	1.5
0	85	1.5

3. Rectangular Load: "Sta 313+50 to 314+00"

Length 50 ft
 Width 35 ft
 Rotation angle 0 degrees
 Load Type Flexible
 Area of Load 1750 ft²
 Depth 0 ft
 Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
-3.55271e-015	85	1.5
50	85	1.5
50	120	0
-3.55271e-015	120	0

4. Rectangular Load: "Sta 314+00 to 314+50"

Length 50 ft
 Width 35 ft
 Rotation angle 0 degrees
 Load Type Flexible
 Area of Load 1750 ft²
 Depth 0 ft
 Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
50	10	0
100	10	0
100	45	1.375
50	45	1.5

5. Rectangular Load: "Roadway 2"

Length 50 ft
 Width 40 ft
 Rotation angle 0 degrees
 Load Type Flexible
 Area of Load 2000 ft²
 Depth 0 ft
 Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
50	45	1.5
100	45	1.375
100	85	1.375
50	85	1.5

6. Rectangular Load: "Sta 314+00 to 314+50"

Length 50 ft
 Width 35 ft
 Rotation angle 0 degrees
 Load Type Flexible
 Area of Load 1750 ft²
 Depth 0 ft
 Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
50	85	1.5
100	85	1.375
100	120	0
50	120	0

7. Rectangular Load: "Sta 314+50 to 315+00"

Length 50 ft
 Width 35 ft
 Rotation angle 0 degrees
 Load Type Flexible
 Area of Load 1750 ft²
 Depth 0 ft
 Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
100	10	0
150	10	0
150	45	1.25
100	45	1.375

8. Rectangular Load: "Roadway 3"

Length 50 ft
 Width 40 ft
 Rotation angle 0 degrees
 Load Type Flexible
 Area of Load 2000 ft²
 Depth 0 ft
 Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
100	45	1.375
150	45	1.25
150	85	1.25
100	85	1.375

9. Rectangular Load: "Sta 314+50 to 315+00"

Length 50 ft
 Width 35 ft
 Rotation angle 0 degrees
 Load Type Flexible
 Area of Load 1750 ft²
 Depth 0 ft
 Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
100	85	1.375
150	85	1.25
150	120	0
100	120	0

10. Rectangular Load: "Sta 315+00 to 315+50"

Length 50 ft
 Width 35 ft
 Rotation angle 0 degrees
 Load Type Flexible
 Area of Load 1750 ft²
 Depth 0 ft
 Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
150	10	0
200	10	0
200	45	1.125
150	45	1.25

11. Rectangular Load: "Roadway 4"

Length 50 ft
 Width 40 ft
 Rotation angle 0 degrees
 Load Type Flexible
 Area of Load 2000 ft²
 Depth 0 ft
 Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
150	45	1.25
200	45	1.125
200	85	1.125
150	85	1.25

12. Rectangular Load: "Sta 315+00 to 315+50"

Length 50 ft
 Width 35 ft
 Rotation angle 0 degrees
 Load Type Flexible
 Area of Load 1750 ft²
 Depth 0 ft
 Installation Stage Initial = 0 mon

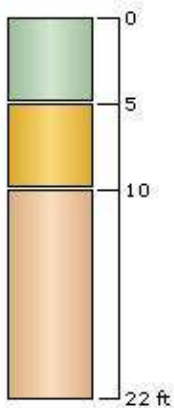
Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
150	85	1.25
200	85	1.125
200	120	0
150	120	0




Soil Layers

Ground Surface Drained: Yes

Layer #	Type	Thickness [ft]	Depth [ft]	Drained at Bottom
1	Marine Deposit SAND	5	0	No
2	Marine Deposit SILT	5	5	Yes
3	Glacial Till SAND	12	10	No



Soil Properties

Property	Marine Deposit SAND	Marine Deposit SILT	Glacial Till SAND
Color			
Unit Weight [kips/ft ³]	0.115	0.115	0.13
Saturated Unit Weight [kips/ft ³]	0.115	0.115	0.13
K0	1	1	1
Immediate Settlement	Enabled	Enabled	Enabled
Es [ksf]	250	75	400
Esur [ksf]	250	75	400
B-bar	-	-	-
Undrained Su A [kips/ft ²]	0	0	0
Undrained Su S	0.2	0.2	0.2
Undrained Su m	0.8	0.8	0.8
Piezo Line ID	1	1	1

Groundwater

Groundwater method Piezometric Lines

Water Unit Weight 0.0624 kips/ft³

Piezometric Line Entities

ID	Depth (ft)
1	8 ft

Query Lines

Line #	Query Line Name	Start Location	End Location	Horizontal Divisions	Vertical Divisions
1	Query Line 1	25, 65	175, 65	20	Auto: 53

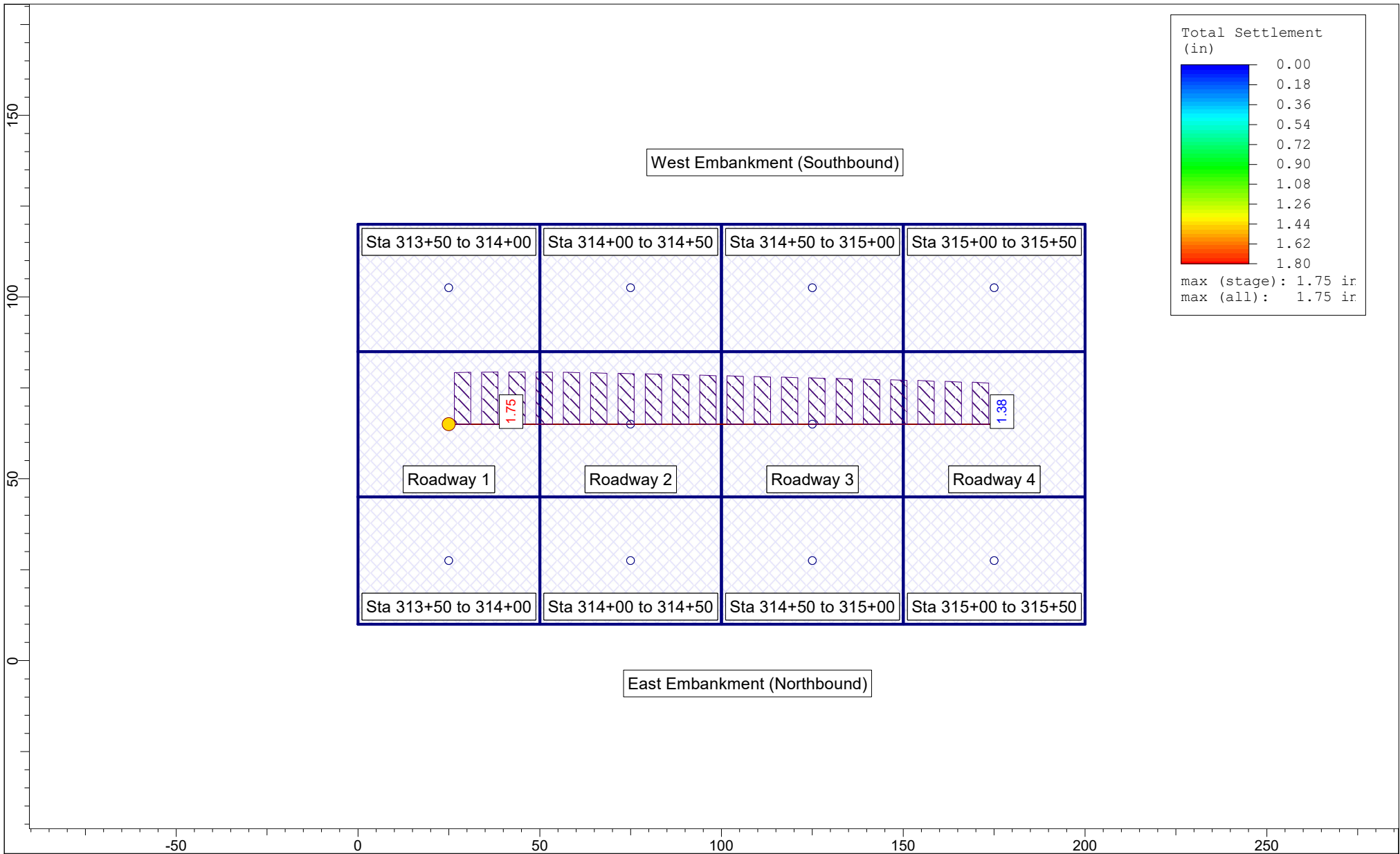
Field Point Grid


Number of points 375

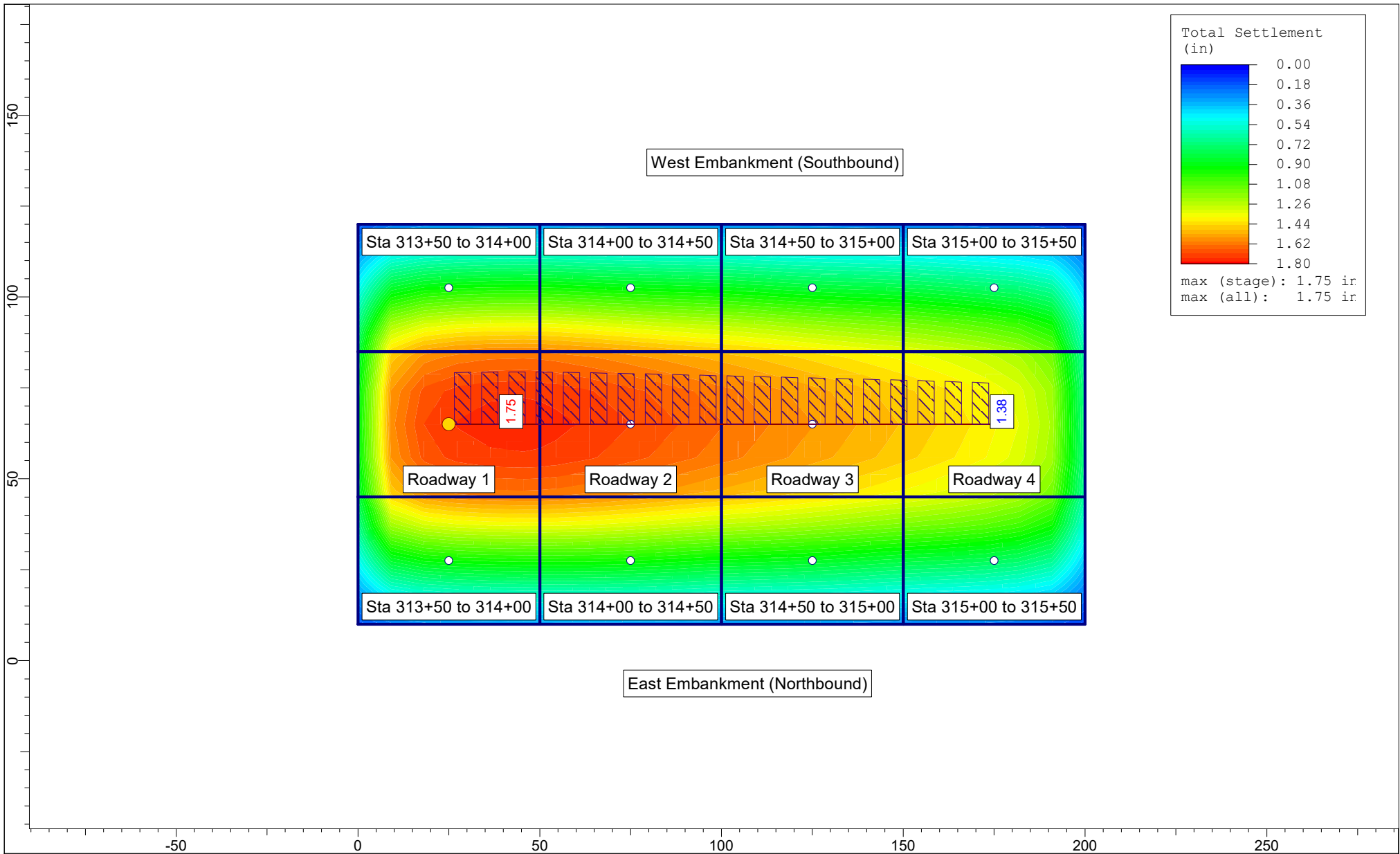
Expansion Factor 2


Grid Coordinates

X [ft]	Y [ft]
225	145
225	-15
-25	-15
-25	145

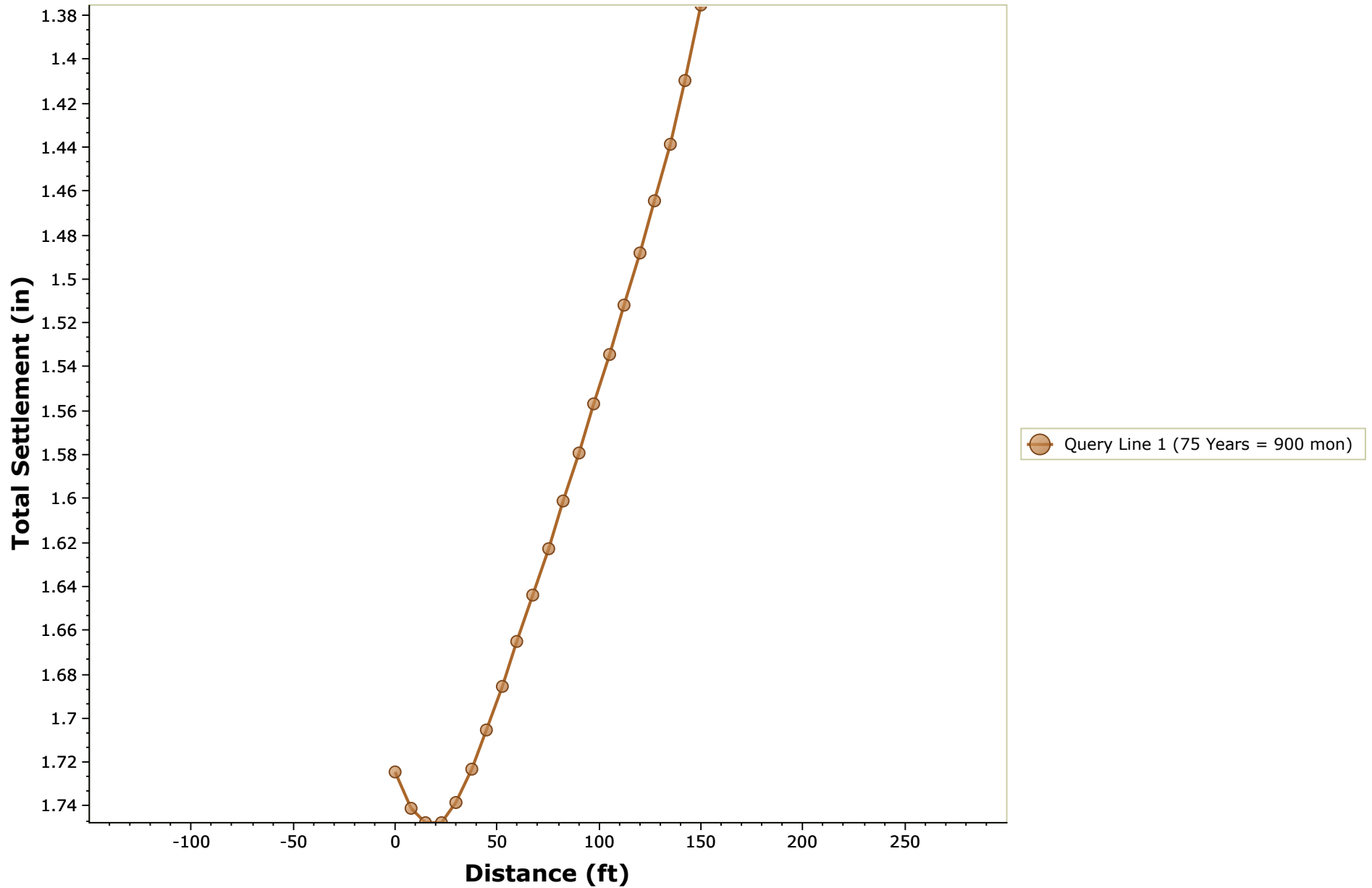


	Project		I-395 Route 9 Connector - WIN 18915.00	
	Analysis Description		Sta. 313+25	
	Drawn By		EMS	Company
	Date		5/22/2020, 8:16:09 AM	File Name
			2021-0601-Sta 314+50 Settlement.s3z	



	Project		I-395 Route 9 Connector - WIN 18915.00	
	Analysis Description		Sta. 313+25	
	Drawn By		EMS	Company
	Date		5/22/2020, 8:16:09 AM	File Name
			2021-0601-Sta 314+50 Settlement.s3z	

Distance vs. Total Settlement



Reference Stage: None
Total Settlement at Depth = 0 ft

Sta. 330+00

Settle3D Analysis Information

I-395 Route 9 Connector - WIN 18915.00

Project Settings

Document Name	2020-0604-Sta 33000 Settlement.s3z
Project Title	I-395 Route 9 Connector - WIN 18915.00
Analysis	Sta. 330+00
Author	EMS
Date Created	5/22/2020, 8:16:09 AM
Stress Computation Method	Westergaard
Time-dependent Consolidation Analysis	
Time Units	months
Permeability Units	feet/second
Minimum settlement ratio for subgrade modulus	0.9

Use average properties to calculate layered stresses

Improve consolidation accuracy

Ignore negative effective stresses in settlement calculations

Stage Settings

Stage #	Name	Time [months]
1	Initial	0
2	75 Years	900

Results

Time taken to compute: 2.92167 seconds

Stage: Initial = 0 mon

Data Type	Minimum	Maximum
Total Settlement [in]	0	1.52008
Total Consolidation Settlement [in]	0	0
Virgin Consolidation Settlement [in]	0	0
Recompression Consolidation Settlement [in]	0	0
Immediate Settlement [in]	0	1.52008
Secondary Settlement [in]	0	0
Loading Stress ZZ [ksf]	-2.78695e-007	1.375
Loading Stress XX [ksf]	0	0
Loading Stress YY [ksf]	0	0
Effective Stress ZZ [ksf]	-2.78695e-007	2.48078
Effective Stress XX [ksf]	0	1.6516
Effective Stress YY [ksf]	0	1.6516
Total Stress ZZ [ksf]	-2.78695e-007	3.47918
Total Stress XX [ksf]	0	2.65
Total Stress YY [ksf]	0	2.65
Modulus of Subgrade Reaction (Total) [ksf/ft]	-3.83231e-005	17.0278
Modulus of Subgrade Reaction (Immediate) [ksf/ft]	-3.83231e-005	17.0278
Modulus of Subgrade Reaction (Consolidation) [ksf/ft]	0	0
Total Strain	4.84034e-008	0.0124979
Pore Water Pressure [ksf]	0	0.9984
Excess Pore Water Pressure [ksf]	0	0
Degree of Consolidation [%]	0	0
Pre-consolidation Stress [ksf]	0.821437	4.97302
Over-consolidation Ratio	1	7474.57
Void Ratio	0	0
Permeability [ft/s]	0	0
Coefficient of Consolidation [ft ² /s]	0	0
Hydroconsolidation Settlement [in]	0	0
Average Degree of Consolidation [%]	0	0
Undrained Shear Strength	0	0.048156

Stage: 75 Years = 900 mon

Data Type	Minimum	Maximum
Total Settlement [in]	0	1.52008
Total Consolidation Settlement [in]	0	0
Virgin Consolidation Settlement [in]	0	0
Recompression Consolidation Settlement [in]	0	0
Immediate Settlement [in]	0	1.52008
Secondary Settlement [in]	0	0
Loading Stress ZZ [ksf]	-2.78695e-007	1.375
Loading Stress XX [ksf]	0	0
Loading Stress YY [ksf]	0	0
Effective Stress ZZ [ksf]	-2.78695e-007	2.48078
Effective Stress XX [ksf]	0	1.6516
Effective Stress YY [ksf]	0	1.6516
Total Stress ZZ [ksf]	-2.78695e-007	3.47918
Total Stress XX [ksf]	0	2.65
Total Stress YY [ksf]	0	2.65
Modulus of Subgrade Reaction (Total) [ksf/ft]	-3.83231e-005	17.0278
Modulus of Subgrade Reaction (Immediate) [ksf/ft]	-3.83231e-005	17.0278
Modulus of Subgrade Reaction (Consolidation) [ksf/ft]	0	0
Total Strain	4.84034e-008	0.0124979
Pore Water Pressure [ksf]	0	0.9984
Excess Pore Water Pressure [ksf]	0	0
Degree of Consolidation [%]	0	0
Pre-consolidation Stress [ksf]	0.821437	4.97302
Over-consolidation Ratio	1	7474.57
Void Ratio	0	0
Permeability [ft/s]	0	0
Coefficient of Consolidation [ft ² /s]	0	0
Hydroconsolidation Settlement [in]	0	0
Average Degree of Consolidation [%]	0	0
Undrained Shear Strength	0	0.048156

Loads

1. Rectangular Load: "Rectangular Load 1"

Length 50 ft
 Width 30 ft
 Rotation angle 0 degrees
 Load Type Flexible
 Area of Load 1500 ft²
 Depth 0 ft
 Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
0	0	0
50	0	0
50	30	1.125
0	30	0.625

2. Rectangular Load: "Rectangular Load 2"

Length 50 ft
 Width 45 ft
 Rotation angle 0 degrees
 Load Type Flexible
 Area of Load 2250 ft²
 Depth 0 ft
 Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
3.55271e-015	30	0.625
50	30	1.125
50	75	1.125
3.55271e-015	75	0.625

3. Rectangular Load: "Rectangular Load 3"

Length 50 ft
 Width 30 ft
 Rotation angle 0 degrees
 Load Type Flexible
 Area of Load 1500 ft²
 Depth 0 ft
 Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
0	75	0.625
50	75	1.125
50	105	0
0	105	0

4. Rectangular Load: "Rectangular Load 4"

Length 50 ft
 Width 30 ft
 Rotation angle 0 degrees
 Load Type Flexible
 Area of Load 1500 ft²
 Depth 0 ft
 Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
50	0	0
100	0	0
100	30	1.25
50	30	1.125

5. Rectangular Load: "Rectangular Load 5"

Length 50 ft
 Width 45 ft
 Rotation angle 0 degrees
 Load Type Flexible
 Area of Load 2250 ft²
 Depth 0 ft
 Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
50	30	1.125
100	30	1.25
100	75	1.25
50	75	1.125

6. Rectangular Load: "Rectangular Load 6"

Length 50 ft
Width 30 ft
Rotation angle 0 degrees
Load Type Flexible
Area of Load 1500 ft²
Depth 0 ft
Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
50	75	1.125
100	75	1.25
100	105	0
50	105	0

7. Rectangular Load: "Rectangular Load 7"

Length 50 ft
Width 30 ft
Rotation angle 0 degrees
Load Type Flexible
Area of Load 1500 ft²
Depth 0 ft
Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
100	-5.32907e-015	0
150	-5.32907e-015	0
150	30	1.375
100	30	1.25

8. Rectangular Load: "Rectangular Load 8"

Length 50 ft
Width 45 ft
Rotation angle 0 degrees
Load Type Flexible
Area of Load 2250 ft²
Depth 0 ft
Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
100	30	1.25
150	30	1.375
150	75	1.375
100	75	1.25

9. Rectangular Load: "Rectangular Load 9"

Length 50 ft
Width 30 ft
Rotation angle 0 degrees
Load Type Flexible
Area of Load 1500 ft²
Depth 0 ft
Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
100	75	1.25
150	75	1.375
150	105	0
100	105	0

10. Rectangular Load: "Rectangular Load 10"

Length 50 ft
 Width 30 ft
 Rotation angle 0 degrees
 Load Type Flexible
 Area of Load 1500 ft²
 Depth 0 ft
 Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
150	0	0
200	0	0
200	30	1.25
150	30	1.375

11. Rectangular Load: "Rectangular Load 11"

Length 50 ft
 Width 45 ft
 Rotation angle 0 degrees
 Load Type Flexible
 Area of Load 2250 ft²
 Depth 0 ft
 Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
150	30	1.375
200	30	1.25
200	75	1.25
150	75	1.375

12. Rectangular Load: "Rectangular Load 12"

Length 50 ft
 Width 30 ft
 Rotation angle 0 degrees
 Load Type Flexible
 Area of Load 1500 ft²
 Depth 0 ft
 Installation Stage Initial = 0 mon

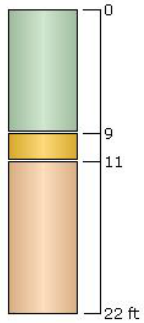
Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
150	75	1.375
200	75	1.25
200	105	0
150	105	0




Soil Layers

Ground Surface Drained: Yes

Layer #	Type	Thickness [ft]	Depth [ft]	Drained at Bottom
1	Topsoil SILT	9	0	Yes
2	Marine Deposit SILT	2	9	Yes
3	Glacial Till SAND	11	11	No



Soil Properties

Property	Topsoil SILT	Marine Deposit SILT	Glacial Till SAND
Color			
Unit Weight [kips/ft ³]	0.11	0.115	0.13
Saturated Unit Weight [kips/ft ³]	0.11	0.115	0.13
K0	1	1	1
Immediate Settlement	Enabled	Enabled	Enabled
Es [ksf]	110	120	1600
E _{sur} [ksf]	110	120	1600
B-bar	-	-	-
Undrained Su A [kips/ft ²]	0	0	0
Undrained Su S	0.2	0.2	0.2
Undrained Su m	0.8	0.8	0.8
Piezo Line ID	1	1	1

Groundwater

Groundwater method Piezometric Lines
 Water Unit Weight 0.0624 kips/ft³

Piezometric Line Entities

ID	Depth (ft)
1	6 ft

Query Lines

Line #	Query Line Name	Start Location	End Location	Horizontal Divisions	Vertical Divisions
1	Query Line 1	0, 52.5	200, 52.5	20	Auto: 53

Field Point Grid

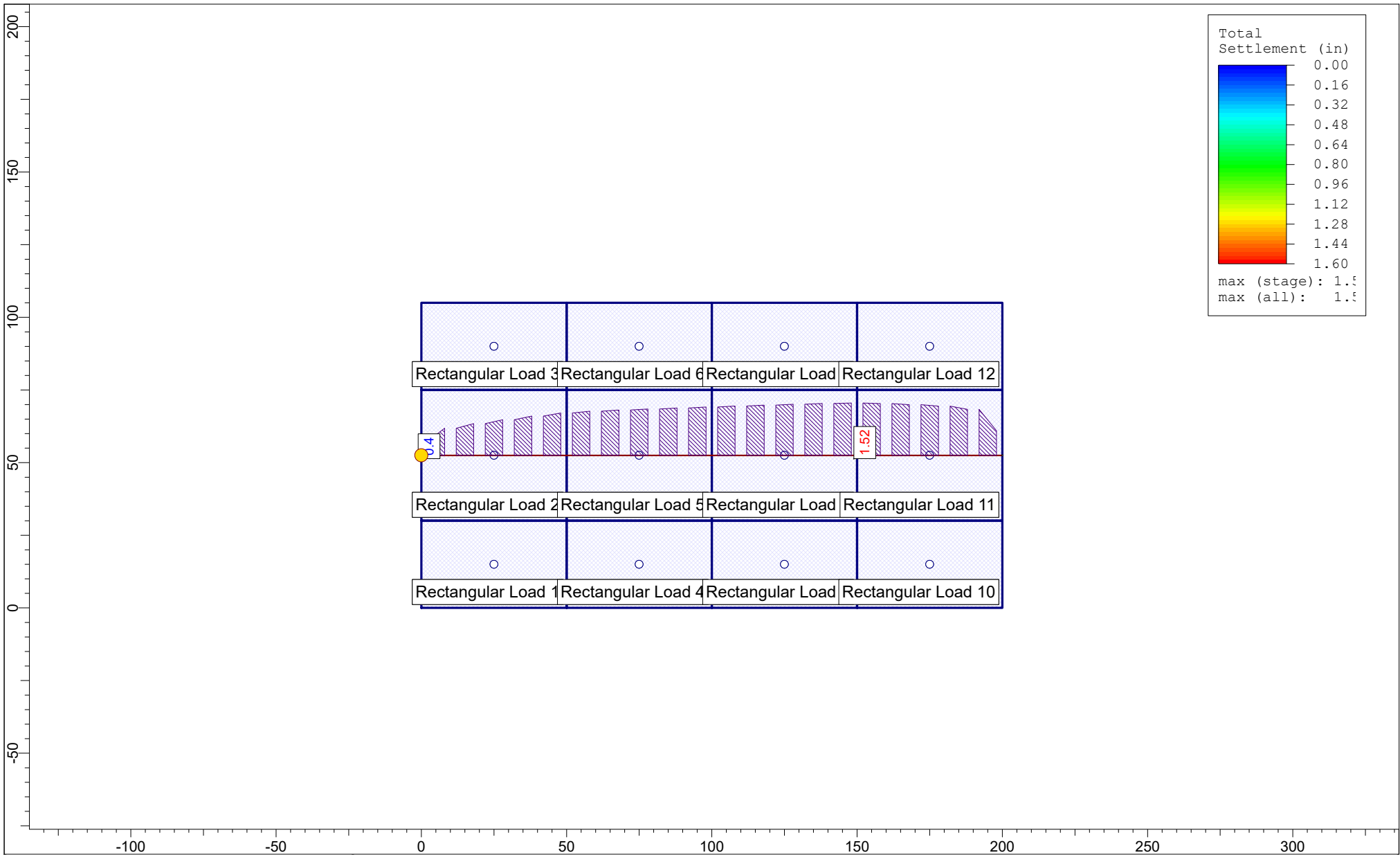
Number of points 429
Expansion Factor 2


Grid Coordinates

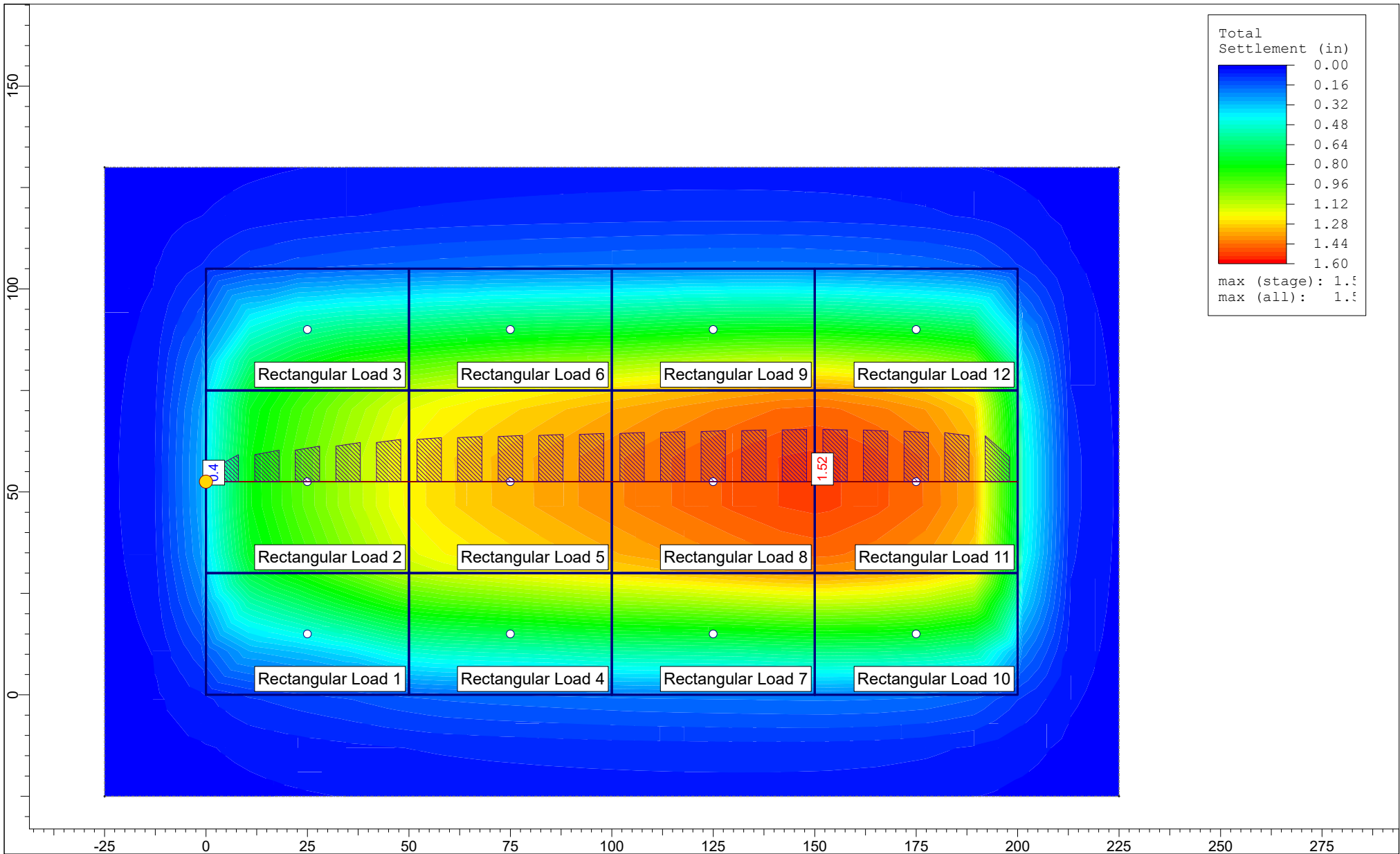
X [ft]	Y [ft]
225	155
225	-25
-25	-25
-25	155

Time Points

Point #	(X,Y) Location	Depth	Goal Type	Goal	Time Until Goal
1	134.794, 63.106	0 ft	Degree of Consolidation	95%	-1 mon

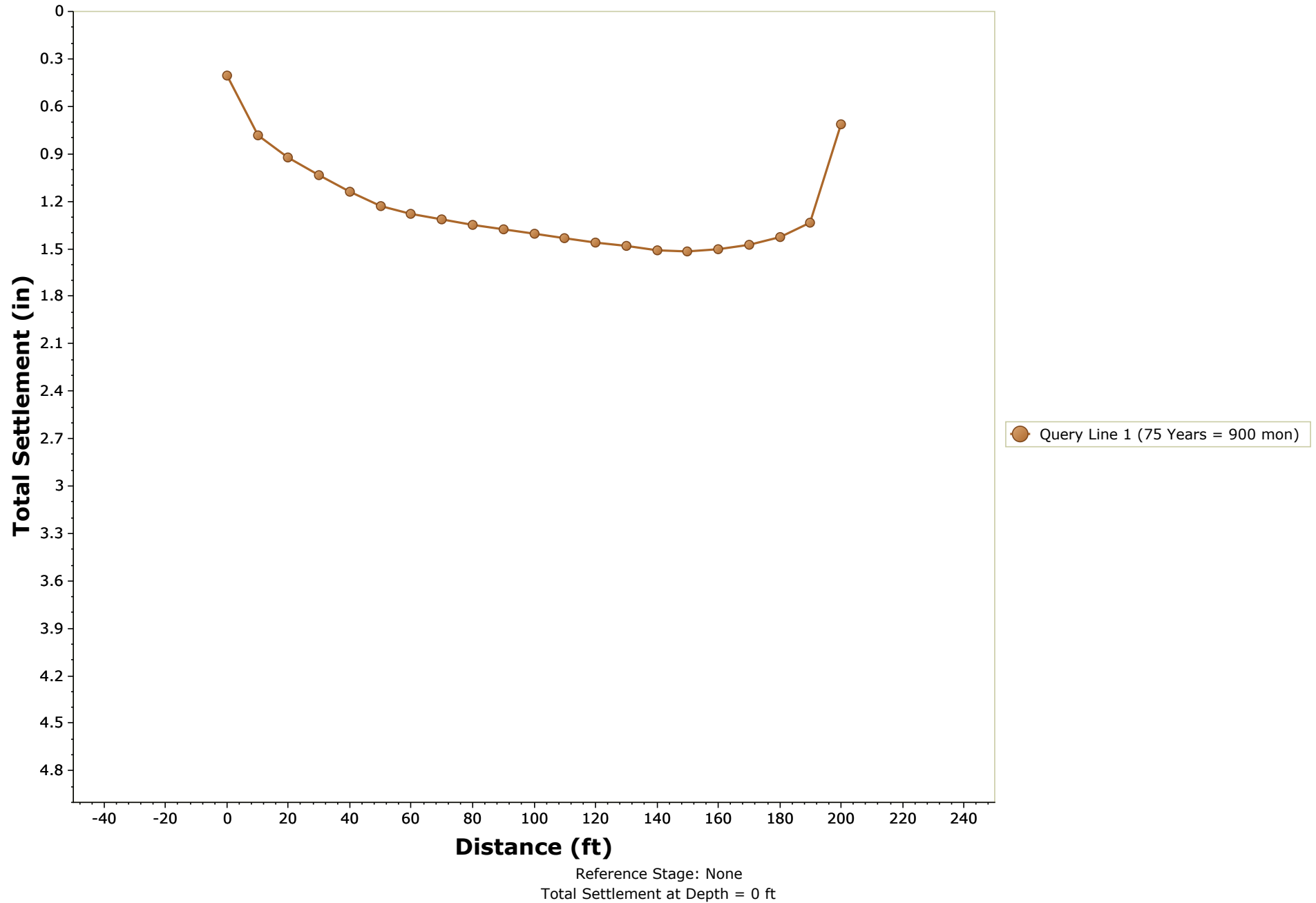


	Project		
	I-395 Route 9 Connector - WIN 18915.00		
	Analysis Description		
	Sta. 330+00		
Date	Drawn By		Company
	EMS		
Date		File Name	
5/22/2020, 8:16:09 AM		2020-0604-Sta 33000 Settlement.s3z	



Project	I-395 Route 9 Connector - WIN 18915.00		
Analysis Description	Sta. 330+00		
Drawn By	EMS	Company	
Date	5/22/2020, 8:16:09 AM	File Name	2020-0604-Sta 33000 Settlement.s3z

Distance vs. Total Settlement



Sta. 330+50

Settle3 Analysis Information

I-395 Route 9 Connector - WIN 18915.00

Project Settings

Document Name 2021-0706-Sta 330+50 Settlement-D2.s3z
Project Title I-395 Route 9 Connector - WIN 18915.00
Analysis Sta. 313+25
Author EMS
Date Created 5/22/2020, 8:16:09 AM
Stress Computation Method Westergaard
Time-dependent Consolidation Analysis
Time Units months
Permeability Units feet/second
Minimum settlement ratio for subgrade modulus 0.9

Use average properties to calculate layered stresses

Improve consolidation accuracy

Ignore negative effective stresses in settlement calculations

Stage Settings

Stage #	Name	Time [months]
1	Initial	0
2	75 Years	900

Results

Time taken to compute: 0.334222 seconds

Stage: Initial = 0 mon

Data Type	Minimum	Maximum
Total Settlement [in]	0	1.98565
Total Consolidation Settlement [in]	0	0
Virgin Consolidation Settlement [in]	0	0
Recompression Consolidation Settlement [in]	0	0
Immediate Settlement [in]	0	1.98565
Secondary Settlement [in]	0	0
Loading Stress ZZ [ksf]	0.510353	1.25
Loading Stress XX [ksf]	0	0
Loading Stress YY [ksf]	0	0
Effective Stress ZZ [ksf]	1.0625	3.12165
Effective Stress XX [ksf]	0	2.4974
Effective Stress YY [ksf]	0	2.4974
Total Stress ZZ [ksf]	1.0625	4.61925
Total Stress XX [ksf]	0	3.995
Total Stress YY [ksf]	0	3.995
Modulus of Subgrade Reaction (Total) [ksf/ft]	0	8.22076
Modulus of Subgrade Reaction (Immediate) [ksf/ft]	0	8.22076
Modulus of Subgrade Reaction (Consolidation) [ksf/ft]	0	0
Total Strain	0.00127621	0.0124981
Pore Water Pressure [ksf]	0	1.4976
Excess Pore Water Pressure [ksf]	0	0
Degree of Consolidation [%]	0	0
Pre-consolidation Stress [ksf]	1.06332	3.12109
Over-consolidation Ratio	1	1
Void Ratio	0	0
Permeability [ft/s]	0	0
Coefficient of Consolidation [ft ² /s]	0	0
Hydroconsolidation Settlement [in]	0	0
Average Degree of Consolidation [%]	0	0
Undrained Shear Strength	0	0.0306097

Stage: 75 Years = 900 mon

Data Type	Minimum	Maximum
Total Settlement [in]	0	1.98565
Total Consolidation Settlement [in]	0	0
Virgin Consolidation Settlement [in]	0	0
Recompression Consolidation Settlement [in]	0	0
Immediate Settlement [in]	0	1.98565
Secondary Settlement [in]	0	0
Loading Stress ZZ [ksf]	0.510353	1.25
Loading Stress XX [ksf]	0	0
Loading Stress YY [ksf]	0	0
Effective Stress ZZ [ksf]	1.0625	3.12165
Effective Stress XX [ksf]	0	2.4974
Effective Stress YY [ksf]	0	2.4974
Total Stress ZZ [ksf]	1.0625	4.61925
Total Stress XX [ksf]	0	3.995
Total Stress YY [ksf]	0	3.995
Modulus of Subgrade Reaction (Total) [ksf/ft]	0	8.22076
Modulus of Subgrade Reaction (Immediate) [ksf/ft]	0	8.22076
Modulus of Subgrade Reaction (Consolidation) [ksf/ft]	0	0
Total Strain	0.00127621	0.0124981
Pore Water Pressure [ksf]	0	1.4976
Excess Pore Water Pressure [ksf]	0	0
Degree of Consolidation [%]	0	0
Pre-consolidation Stress [ksf]	1.06332	3.12109
Over-consolidation Ratio	1	1
Void Ratio	0	0
Permeability [ft/s]	0	0
Coefficient of Consolidation [ft ² /s]	0	0
Hydroconsolidation Settlement [in]	0	0
Average Degree of Consolidation [%]	0	0
Undrained Shear Strength	0	0.0306097

Loads

1. Rectangular Load: "Sta 329+50 to 330+00"

Length	50 ft
Width	32 ft
Rotation angle	0 degrees
Load Type	Flexible
Area of Load	1600 ft ²
Depth	0 ft
Installation Stage	Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
3.55271e-015	12	0
50	12	0
50	44	1.125
3.55271e-015	44	1

2. Rectangular Load: "Roadway 1"

Length 50 ft
Width 42 ft
Rotation angle 0 degrees
Load Type Flexible
Area of Load 2100 ft²
Depth 0 ft
Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
0	44	1
50	44	1.125
50	86	1.25
0	86	1

3. Rectangular Load: "Sta 329+50 to 330+00"

Length 50 ft
Width 34 ft
Rotation angle 0 degrees
Load Type Flexible
Area of Load 1700 ft²
Depth 0 ft
Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
1.06581e-014	86	1
50	86	1.25
50	120	0
1.06581e-014	120	0

4. Rectangular Load: "Sta 330+00 to 330+50"

Length 50 ft
Width 32 ft
Rotation angle 0 degrees
Load Type Flexible
Area of Load 1600 ft²
Depth 0 ft
Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
50	12	0
100	12	0
100	44	1.25
50	44	1.125

5. Rectangular Load: "Roadway 2"

Length 50 ft
Width 42 ft
Rotation angle 0 degrees
Load Type Flexible
Area of Load 2100 ft²
Depth 0 ft
Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
50	44	1.125
100	44	1.25
100	86	1.25
50	86	1.25

6. Rectangular Load: "Sta 330+00 to 330+50"

Length 50 ft
Width 34 ft
Rotation angle 0 degrees
Load Type Flexible
Area of Load 1700 ft²
Depth 0 ft
Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
50	86	1.25
100	86	1.25
100	120	0
50	120	0

7. Rectangular Load: "Sta 330+50 to 331+00"

Length 50 ft
Width 32 ft
Rotation angle 0 degrees
Load Type Flexible
Area of Load 1600 ft²
Depth 0 ft
Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
100	12	0
150	12	0
150	44	1.25
100	44	1.25

8. Rectangular Load: "Roadway 3"

Length 50 ft
Width 42 ft
Rotation angle 0 degrees
Load Type Flexible
Area of Load 2100 ft²
Depth 0 ft
Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
100	44	1.25
150	44	1.25
150	86	1.25
100	86	1.25

9. Rectangular Load: "Sta 330+50 to 331+00"

Length 50 ft
Width 34 ft
Rotation angle 0 degrees
Load Type Flexible
Area of Load 1700 ft²
Depth 0 ft
Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
100	86	1.25
150	86	1.25
150	120	0
100	120	0

10. Rectangular Load: "Sta 331+00 to 331+50"

Length 50 ft
Width 32 ft
Rotation angle 0 degrees
Load Type Flexible
Area of Load 1600 ft²
Depth 0 ft
Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
150	12	0
200	12	0
200	44	1
150	44	1.25

11. Rectangular Load: "Roadway 4"

Length 50 ft
Width 42 ft
Rotation angle 0 degrees
Load Type Flexible
Area of Load 2100 ft²
Depth 0 ft
Installation Stage Initial = 0 mon

Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
150	44	1.25
200	44	1
200	86	1.125
150	86	1.25

12. Rectangular Load: "Sta 331+00 to 331+50"

Length 50 ft
Width 34 ft
Rotation angle 0 degrees
Load Type Flexible
Area of Load 1700 ft²
Depth 0 ft
Installation Stage Initial = 0 mon

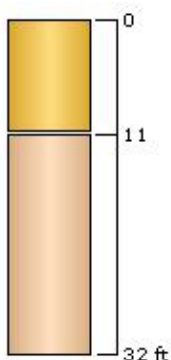
Coordinates and Load

X [ft]	Y [ft]	Load Magnitude [ksf]
150	86	1.25
200	86	1.125
200	120	0
150	120	0



Soil Layers

Ground Surface Drained: Yes

Layer #	Type	Thickness [ft]	Depth [ft]	Drained at Bottom
1	Marine Deposit SILT	11	0	Yes
2	Glacial Till SAND	21	11	No



Soil Properties

Property	Marine Deposit SILT	Glacial Till SAND
Color		
Unit Weight [kips/ft ³]	0.115	0.13
Saturated Unit Weight [kips/ft ³]	0.115	0.13
K0	1	1
Immediate Settlement	Enabled	Enabled
Es [ksf]	100	400
E _{sur} [ksf]	100	400
B-bar	-	-
Undrained Su A [kips/ft ²]	0	0
Undrained Su S	0.2	0.2
Undrained Su m	0.8	0.8
Piezo Line ID	1	1

Groundwater

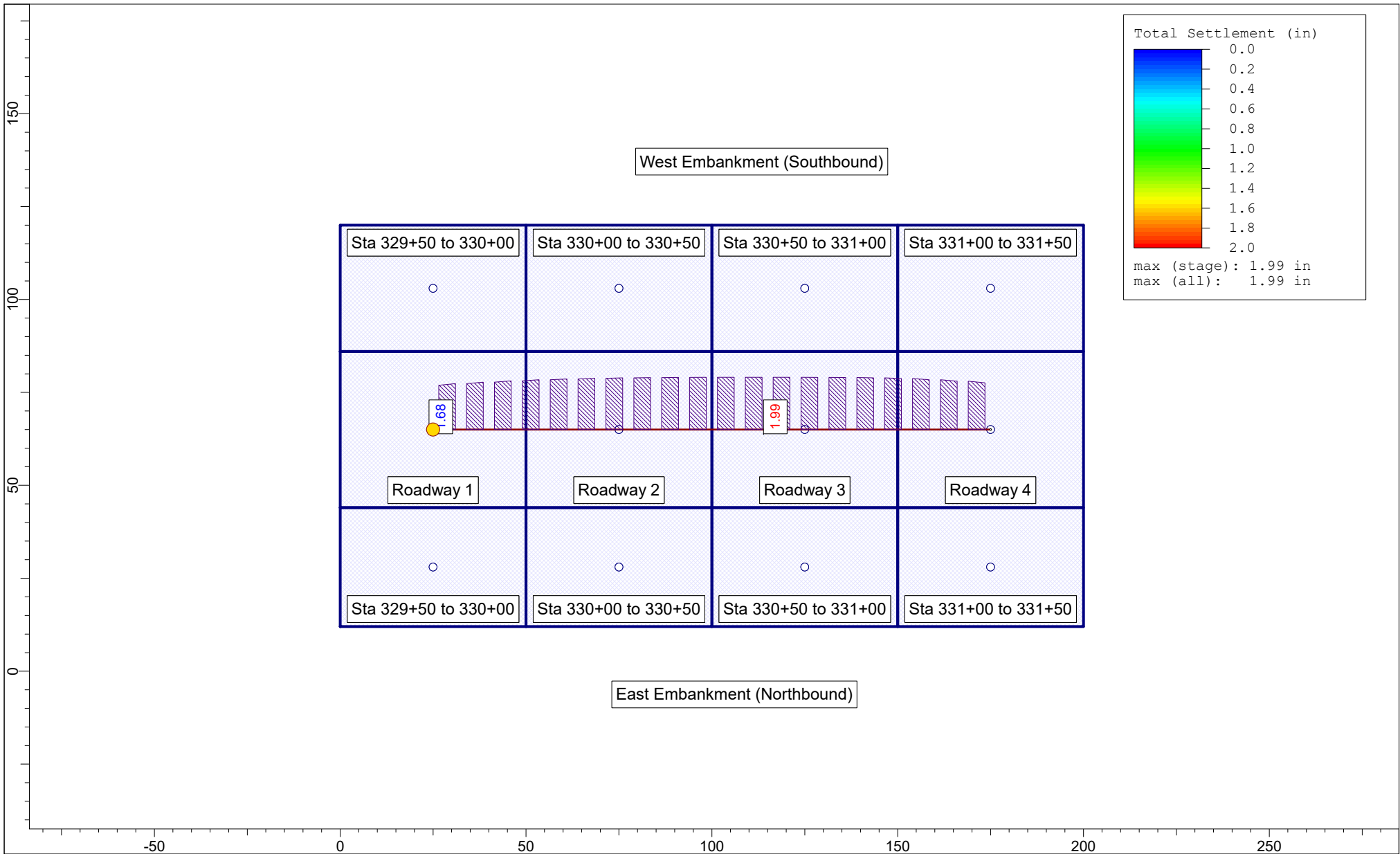
Groundwater method Piezometric Lines
Water Unit Weight 0.0624 kips/ft³


Piezometric Line Entities

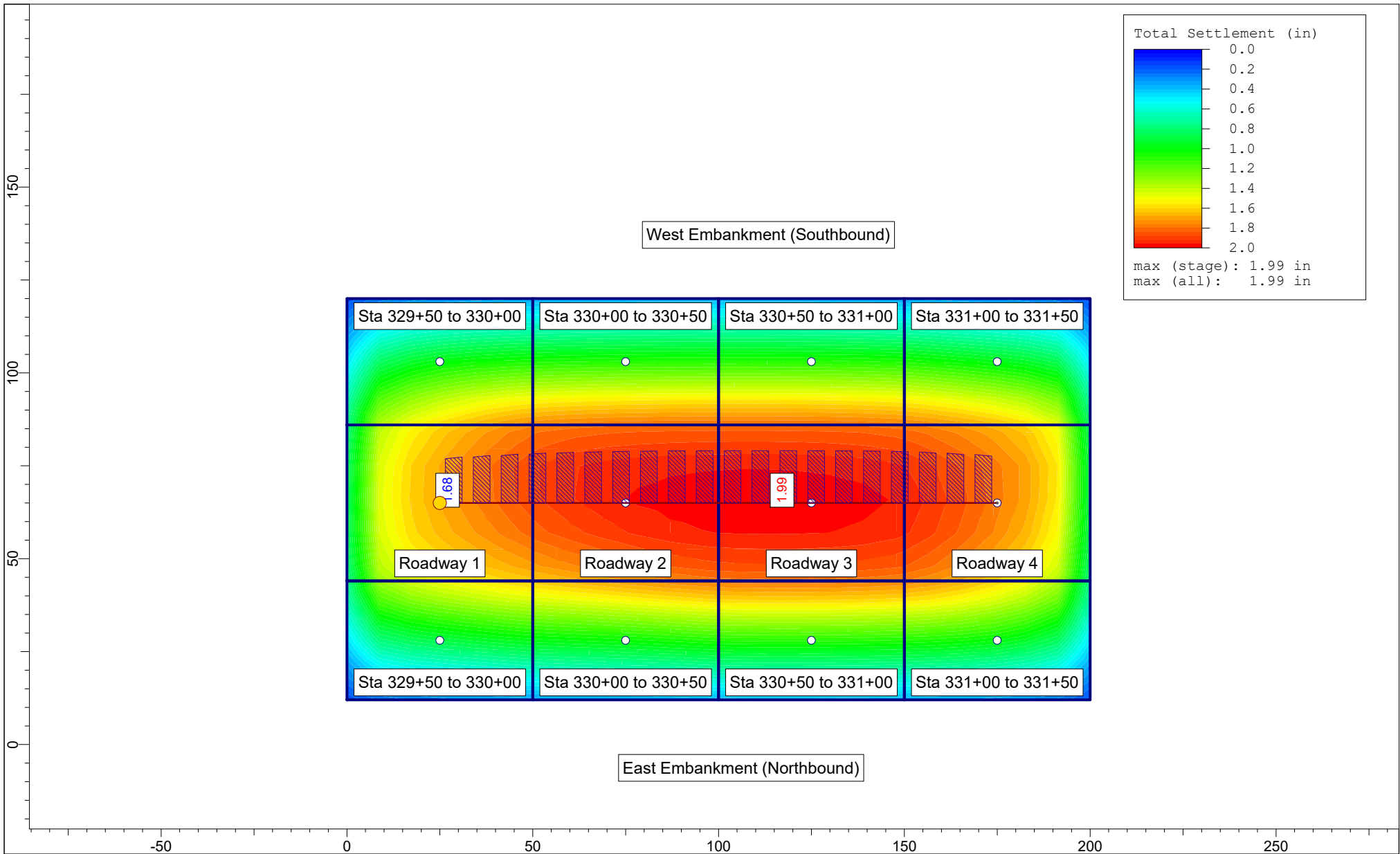
ID	Depth (ft)
1	8 ft


Query Lines

Line #	Query Line Name	Start Location	End Location	Horizontal Divisions	Vertical Divisions
1	Query Line 1	25, 65	175, 65	20	Auto: 55

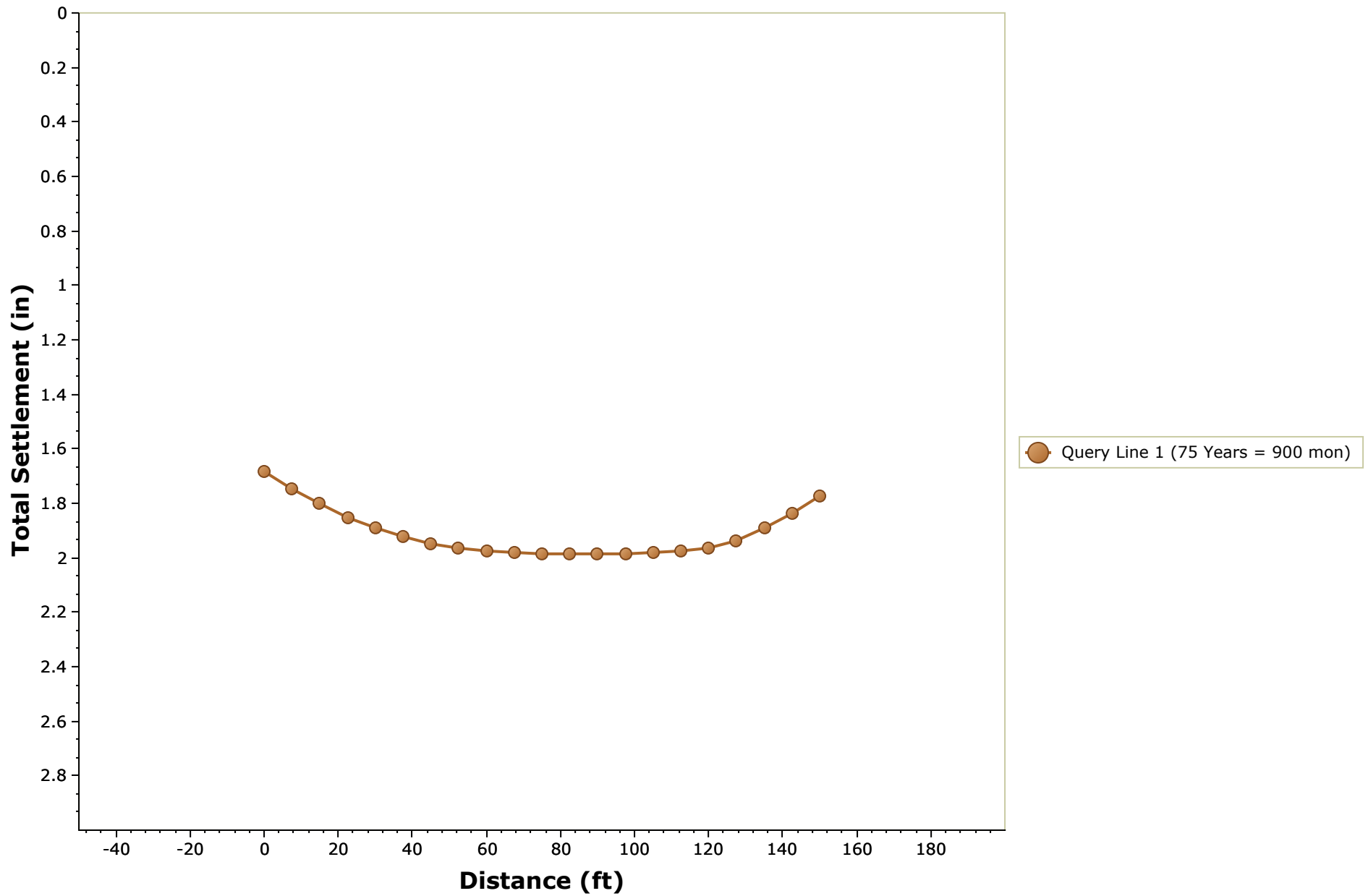


	Project		I-395 Route 9 Connector - WIN 18915.00
	Analysis Description		Sta. 313+25
	Drawn By	EMS	Company
	Date	5/22/2020, 8:16:09 AM	File Name 2021-0706-Sta 330+50 Settlement-D2.s3z



	Project		
	I-395 Route 9 Connector - WIN 18915.00		
	Analysis Description		
	Sta. 313+25		
	Drawn By	EMS	Company
Date		5/22/2020, 8:16:09 AM	File Name
			2021-0706-Sta 330+50 Settlement-D2.s3z

Distance vs. Total Settlement



Reference Stage: None
 Total Settlement at Depth = 0 ft

Global Embankment Stability – Excavations in Granular Soils

Client: Maine Department of Transportation

Project: I-395/Route 9 Connector - WIN 18915.00

Subject: Global Stability-Cut Areas

PROBLEM STATEMENT AND OBJECTIVE

Calculate the global stability minimum factor of safety at cut sections along the proposed highway alignment.

REFERENCES

1. AASHTO LRFD Bridge Design Specifications, 9th Edition, 2020.
2. Slide version 7.0 by RocScience.
3. Maine DOT Bridge Design Guide, 2003, with 2014 updates.

AVAILABLE INFORMATION

1. Plan set titled, "Brewer-Eddington I-395/Route 9 Connector, Cross Sections," by MaineDOT dated 3 March 2021.
2. Plan set titled, "Brewer-Eddington I-395/Route 9 Connector" by MaineDOT dated 5 March 2021.

ASSUMPTIONS

1. Soil profiles will be modeled to match settlement calculation models, as summarized below.
2. Seismic cases will have a seismic force of $A_s/2$ based on the seismic site class calculations .
 Site Class C: $A_s/2 = 0.08/2 = 0.04$ g
 Site Class D: $A_s/2 = 0.107/2 = 0.05$ g
 Site Class E: $A_s/2 = 0.167/2 = 0.08$ g
3. A 250 psf traffic surcharge will be modeled.

SOIL PROPERTIES

Material	Unit Weight (pcf)	Friction Angle (degrees)	Undrained Shear Strength (psf)
Existing Fill	120	varies ¹	0
Marine Deposit	115	varies ¹	
Glacial Till	130	varies ²	
Bedrock	infinite strength		

Notes:

1. Soil properties for Existing Fill and Marine Deposit vary based on location. See individual soil profiles for details.
2. Soil properties for Glacial Till deposit based on direct shear tests, where available.
 Direct shear test results are as follows:

Boring	Sample	Depth (ft)	Description	Friction Angle (degrees)	Cohesion (psf)
HB-BE-132	4D, 5D, 6D	5 - 27.5	SAND (Glacial Till)	23.5	1400
HB-BE-164	5D, 6D, 7D, 8D	17 - 29	SAND (Glacial Till)	41.3	40
HB-BE-218	2D, 3D, 4D	5 - 17	SILT (Glacial Till)	32.7	803

Where direct shear tests were not applicable, a friction angle of 36° and undrained shear strength of 0 psf were used.

Client: Maine Department of Transportation

Project: I-395/Route 9 Connector - WIN 18915.00

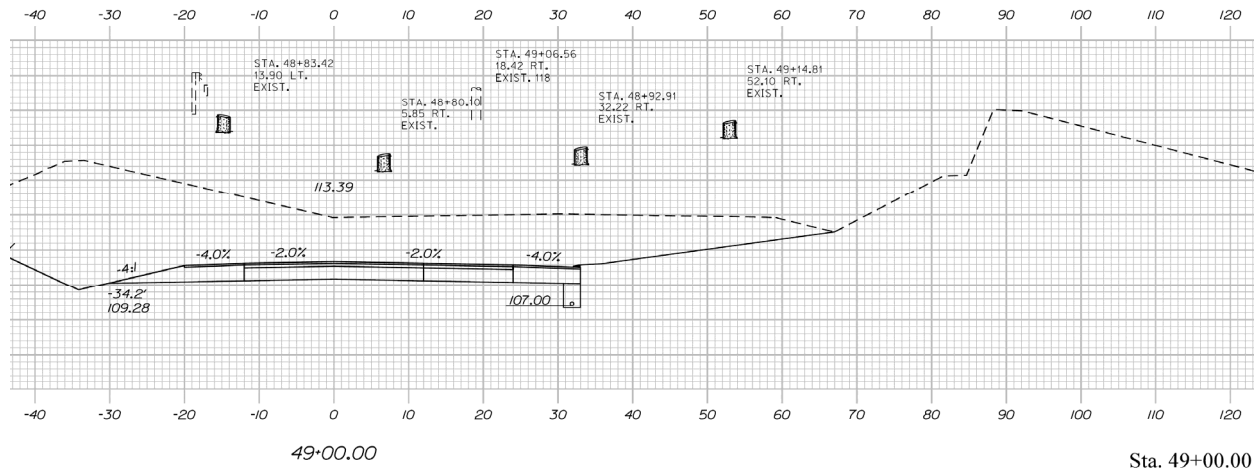
Computed by: JAD

Subject: Global Stability-Cut Areas

Checked by: EMS

STA 49+00 GEOMETRY

Maximum Cut Depth = 27 ft

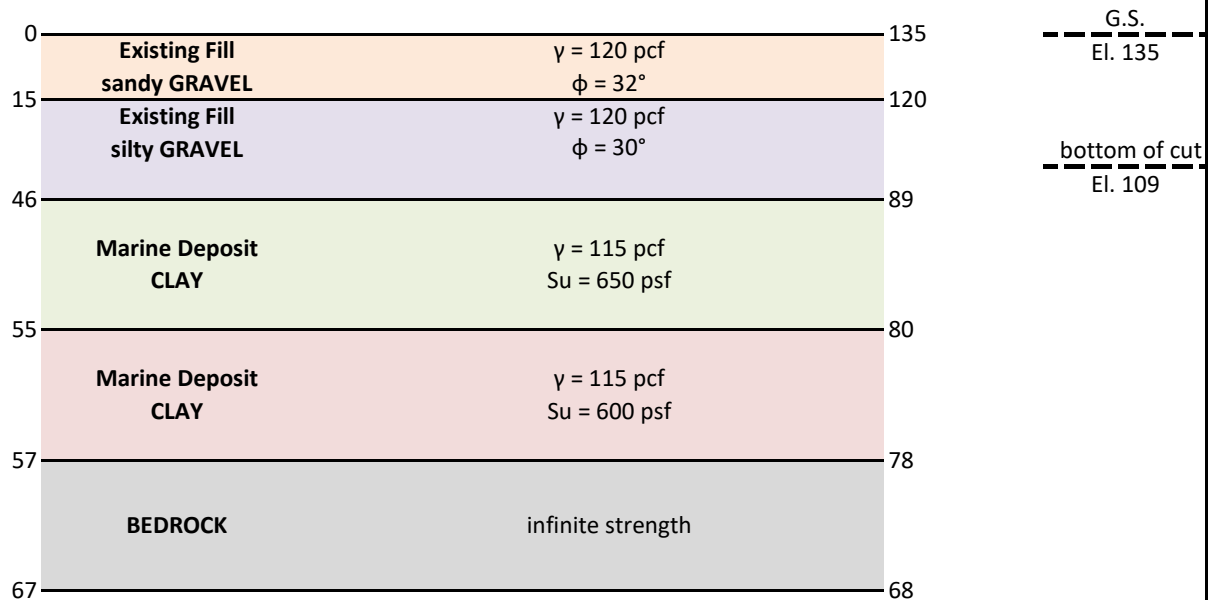
**STA 49+00 SOIL PROFILE AND PROPERTIES (not to scale)**

Based on boring BB-BWS-205

Groundwater El. = 111 ft (based on BB-BWS-102 OW)

DEPTH (ft)

ELEVATION (ft)

**STA 49+00 SEISMIC INFO**

Site Class D (see seismic site class calcs)

$$A_s/2 = 0.107/2 = 0.05$$

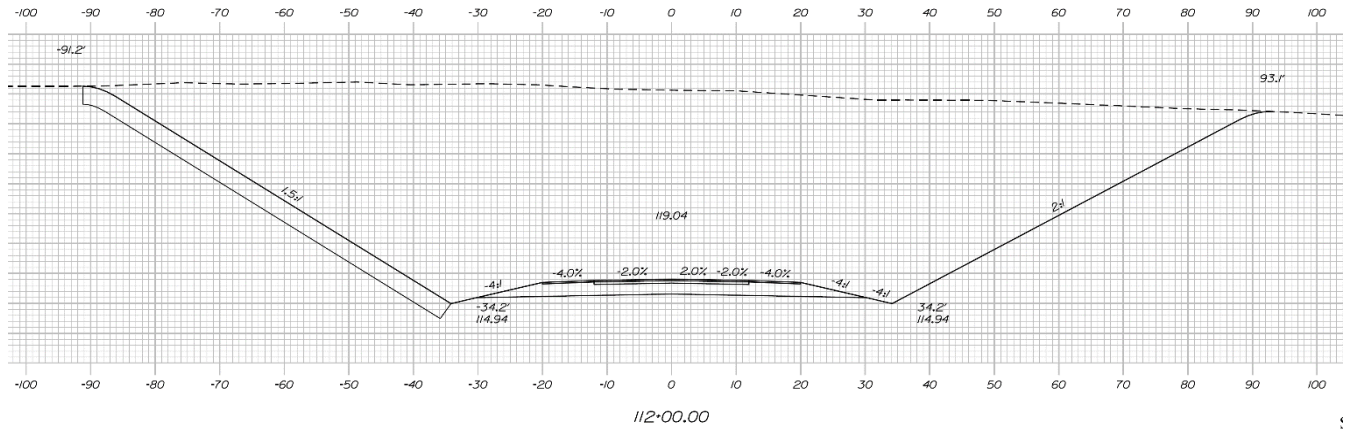
Client: Maine Department of Transportation

Project: I-395/Route 9 Connector - WIN 18915.00

Subject: Global Stability-Cut Areas

STA 112+00 GEOMETRY

Maximum Cut Depth = 32 ft

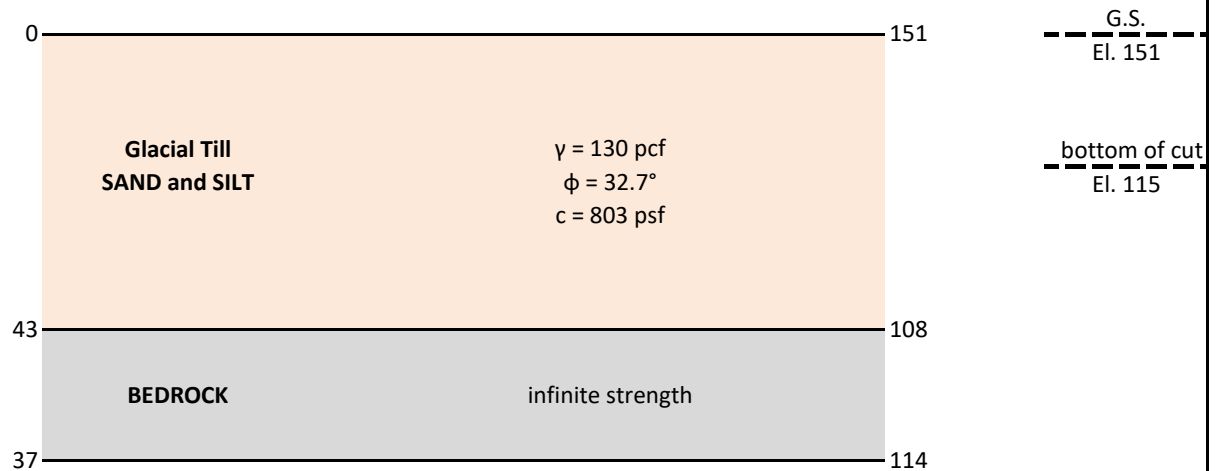

STA 112+00 SOIL PROFILE AND PROPERTIES (not to scale)

Based on borings HB-BE-117, HB-BE-118, HB-BE-119

Groundwater El. = ground surface

DEPTH (ft)

ELEVATION (ft)


STA 112+00 SEISMIC INFO

Site Class D (see seismic site class calcs)

 $As/2 = 0.107/2 = 0.05$

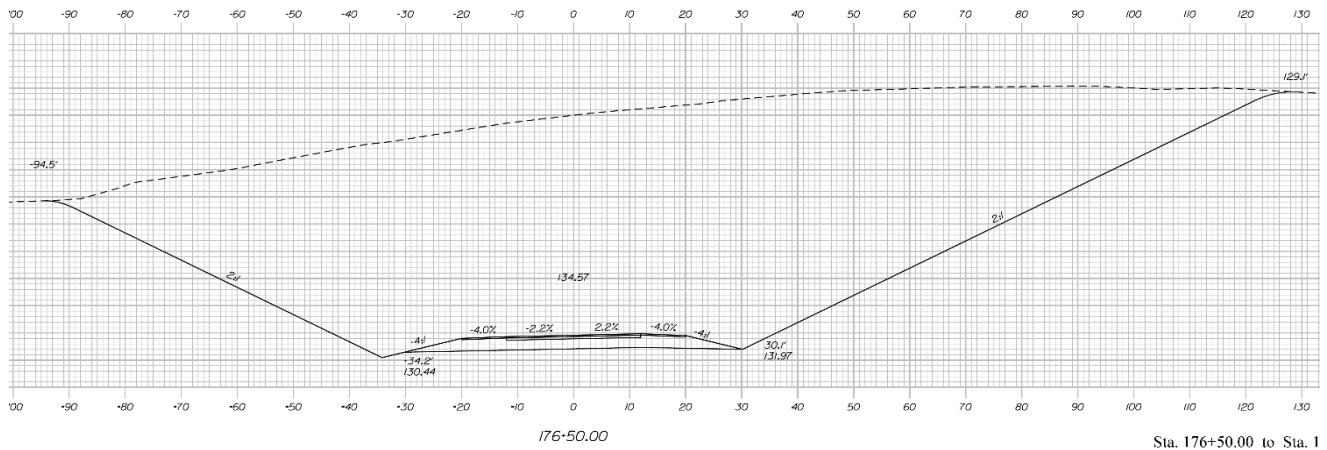
Client: Maine Department of Transportation

Project: I-395/Route 9 Connector - WIN 18915.00

Subject: Global Stability-Cut Areas

STA 176+50 GEOMETRY

Maximum Cut Depth = 41 ft

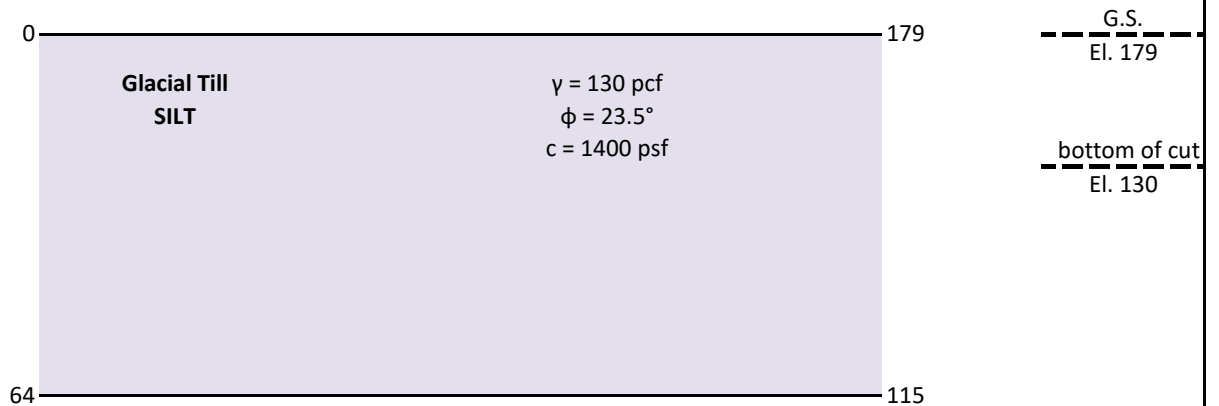

STA 176+50 SOIL PROFILE AND PROPERTIES (not to scale)

Based on boring HB-BE-131

Groundwater El. = 156 ft (based on HB-BE-131 and HB-BE-133)

DEPTH (ft)

ELEVATION (ft)


STA 176+50 SEISMIC INFO

Site Class D (see seismic site class calcs)

 $A_s/2 = 0.107/2 = 0.05$

Client: Maine Department of Transportation

Project: I-395/Route 9 Connector - WIN 18915.00

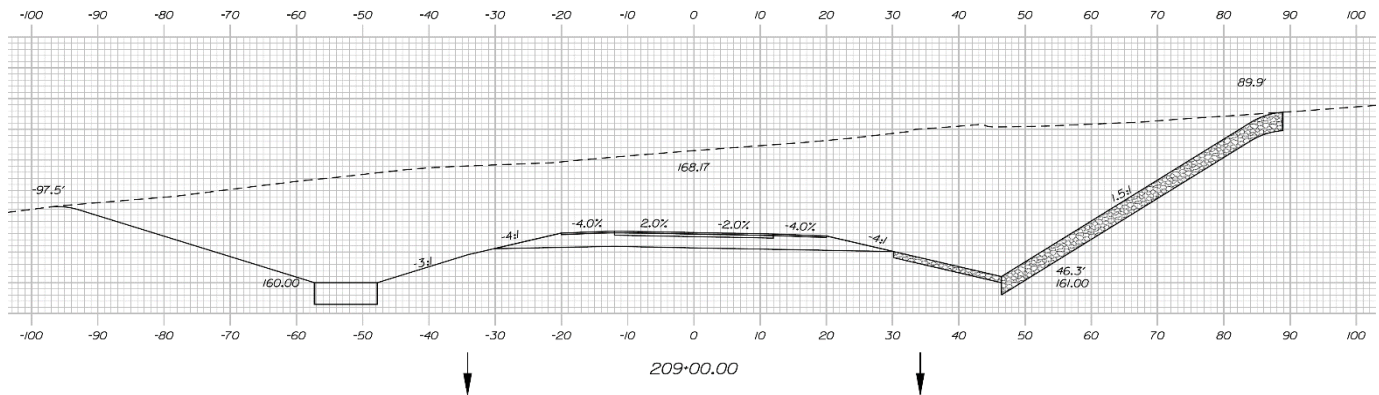
Computed by: JAD

Subject: Global Stability-Cut Areas

Checked by: EMS

STA 209+00 GEOMETRY

Maximum Cut Depth = 14 ft

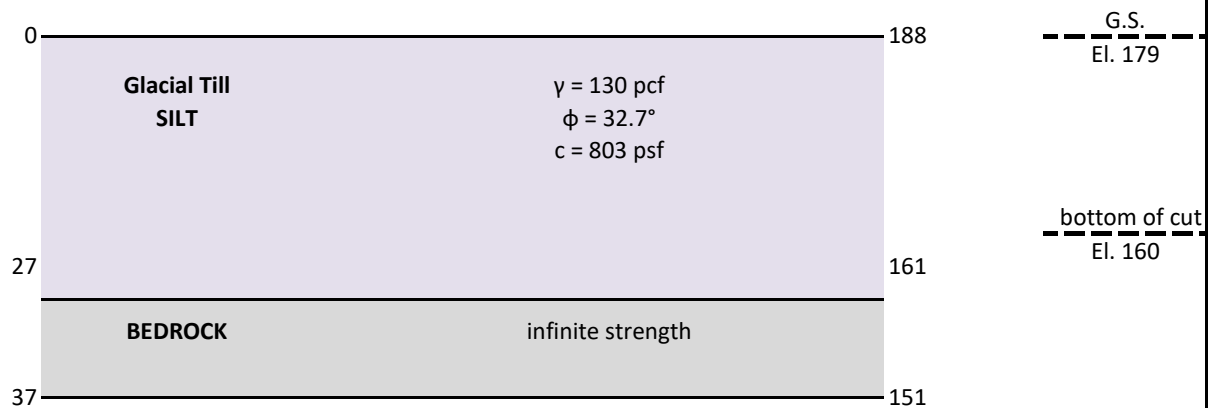
**STA 209+00 SOIL PROFILE AND PROPERTIES (not to scale)**

Based on boring HB-BE-228

Groundwater El. = 187 ft (based on BB-ECR-102 OW)

DEPTH (ft)

ELEVATION (ft)

**STA 209+00 SEISMIC INFO**

Site Class D (see seismic site class calcs)

 $A_s/2 = 0.107/2 = 0.05$

Client: Maine Department of Transportation

Date: 27-May-2020

Project: I-395/Route 9 Connector - WIN 18915.00

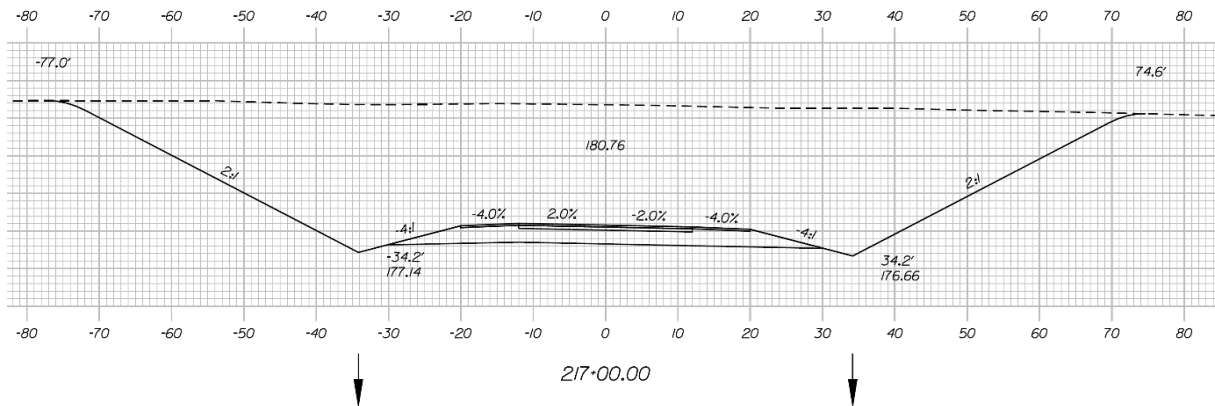
Computed by: JAD

Subject: Global Stability-Cut Areas

Checked by: EMS

STA 217+00 GEOMETRY

Maximum Cut Depth = 16 ft


STA 217+00 SOIL PROFILE AND PROPERTIES (not to scale)

Based on boring HB-BE-148

Groundwater El. = 184 ft (based on HB-BE-148)

DEPTH (ft)

ELEVATION (ft)

0	Glacial Till SILT	$\gamma = 130$ pcf $\phi = 32.7^\circ$ $c = 803$ psf	197	--- G.S. --- El. 197
17	Glacial Till silty CLAY	$\gamma = 130$ pcf $\phi = 36^\circ$	180	
21			176	--- bottom of cut --- El. 177
31	BEDROCK	infinite strength	166	

STA 217+00 SEISMIC INFO

Site Class C (see seismic site class calcs)

 $A_s/2 = 0.08/2 = 0.04$

Client: Maine Department of Transportation

Date: 27-May-2020

Project: I-395/Route 9 Connector - WIN 18915.00

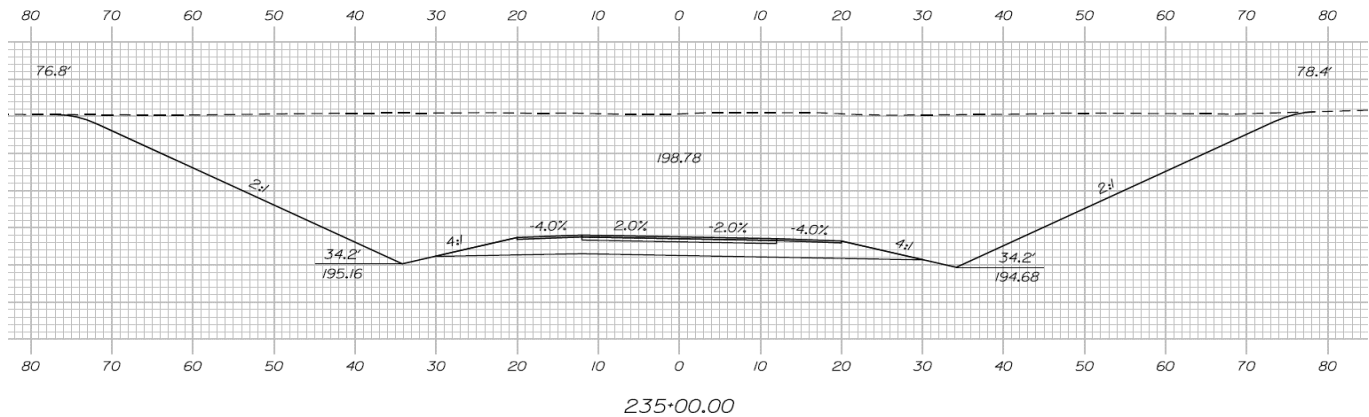
Computed by: JAD

Subject: Global Stability-Cut Areas

Checked by: EMS

STA 235+00 GEOMETRY

Maximum Cut Depth = 16 ft


STA 235+00 SOIL PROFILE AND PROPERTIES (not to scale)

Based on boring HB-BE-151

Groundwater El. = ground surface (based on BB-ELER-201)

DEPTH (ft)

ELEVATION (ft)

0	Glacial Till SILT	$\gamma = 130$ pcf $\phi = 32.7^\circ$ $c = 803$ psf	215	G.S. El. 221
15	Glacial Till silty CLAY	$\gamma = 130$ pcf $\phi = 36^\circ$	200	
17	Glacial Till SAND	$\gamma = 130$ pcf $\phi = 36^\circ$	198	bottom of cut El. 197
23	BEDROCK	infinite strength	192	
39			176	

STA 235+00 SEISMIC INFO

Site Class D (see seismic site class calcs)

$$A_s/2 = 0.107/2 = 0.05$$

Client: Maine Department of Transportation

Date: 27-May-2020

Project: I-395/Route 9 Connector - WIN 18915.00

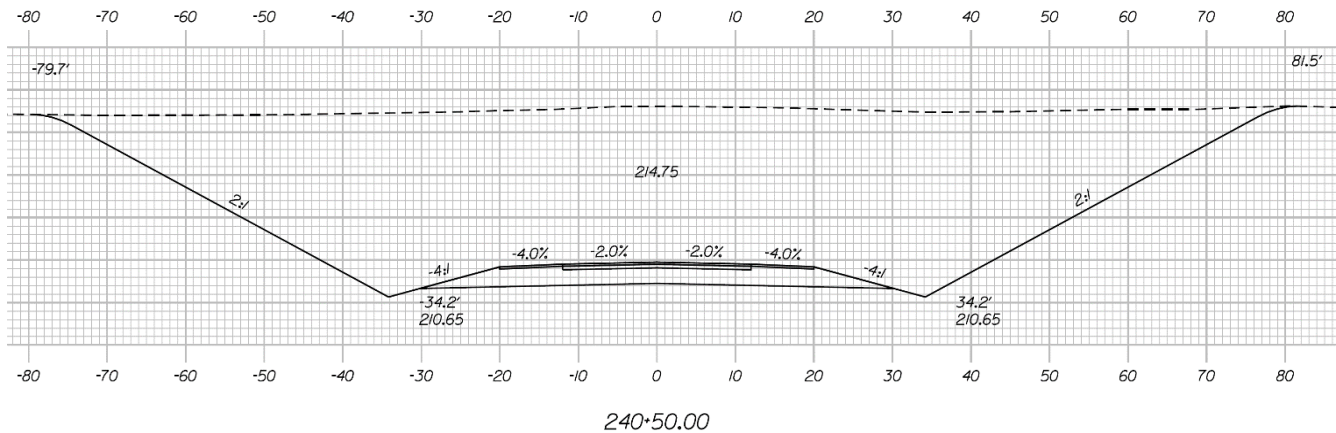
Computed by: JAD

Subject: Global Stability-Cut Areas

Checked by: EMS

STA 240+50 GEOMETRY

Maximum Cut Depth = 18 ft

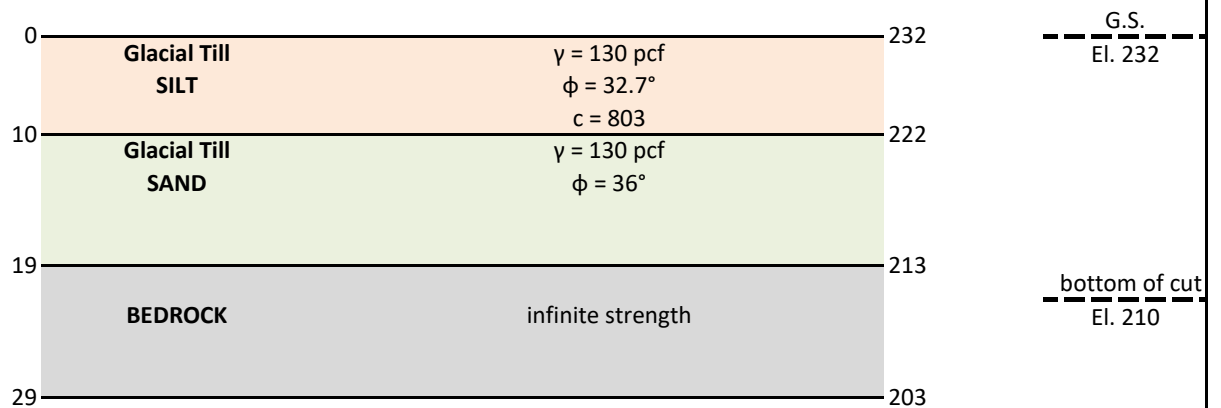

STA 240+50 SOIL PROFILE AND PROPERTIES (not to scale)

Based on boring HB-BE-152

Groundwater El. = 222 ft (based on BB-ELER-101 OW)

DEPTH (ft)

ELEVATION (ft)


STA 240+50 SEISMIC INFO

Site Class D (see seismic site class calcs)

 $A_s/2 = 0.107/2 = 0.05$

Client: Maine Department of Transportation

Project: I-395/Route 9 Connector - WIN 18915.00

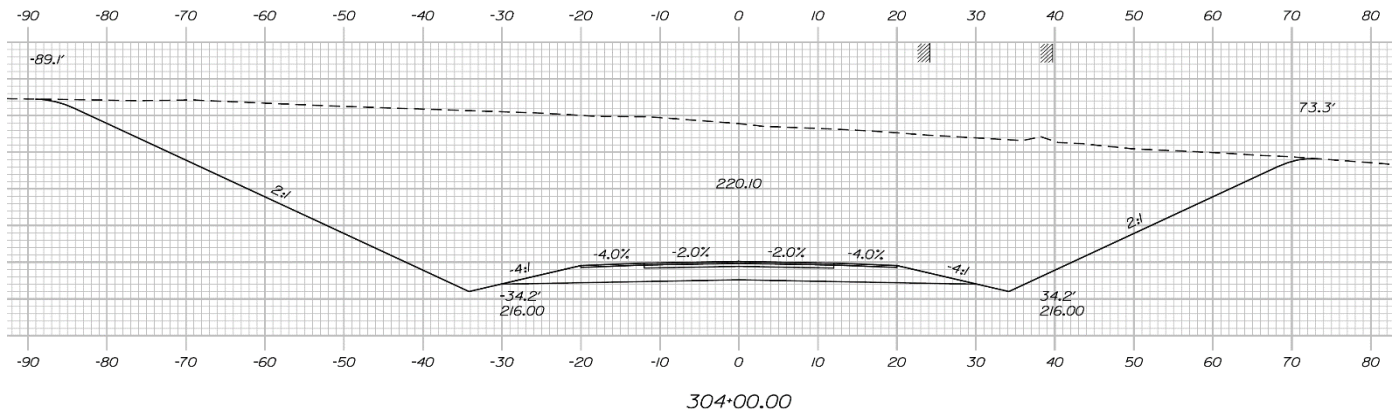
Computed by: JAD

Subject: Global Stability-Cut Areas

Checked by: EMS

STA 304+00 GEOMETRY

Maximum Cut Depth = 19 ft

**STA 304+00 SOIL PROFILE AND PROPERTIES (not to scale)**

Based on boring HB-BE-165

Groundwater El. = 238 ft (based on HB-BE-165)

DEPTH (ft)

ELEVATION (ft)

0	Glacial Till SILT	$\gamma = 130$ pcf $\phi = 36^\circ$	242	--- G.S. --- El. 242
7	Glacial Till SAND	$\gamma = 130$ pcf $\phi = 41.3^\circ$ $c = 39.9$ psf	235	
12	Glacial Till SILT	$\gamma = 130$ pcf $\phi = 36^\circ$	230	
20	Glacial Till SAND	$\gamma = 130$ pcf $\phi = 41.3^\circ$ $c = 39.9$ psf	222	
37			205	--- bottom of cut --- El. 215

STA 304+00 SEISMIC INFO

Site Class C (see seismic site class calcs)

 $A_s/2 = 0.08/2 = 0.04$

Client: Maine Department of Transportation

Date: 27-May-2020

Project: I-395/Route 9 Connector - WIN 18915.00

Computed by: JAD

Subject: Global Stability-Cut Areas

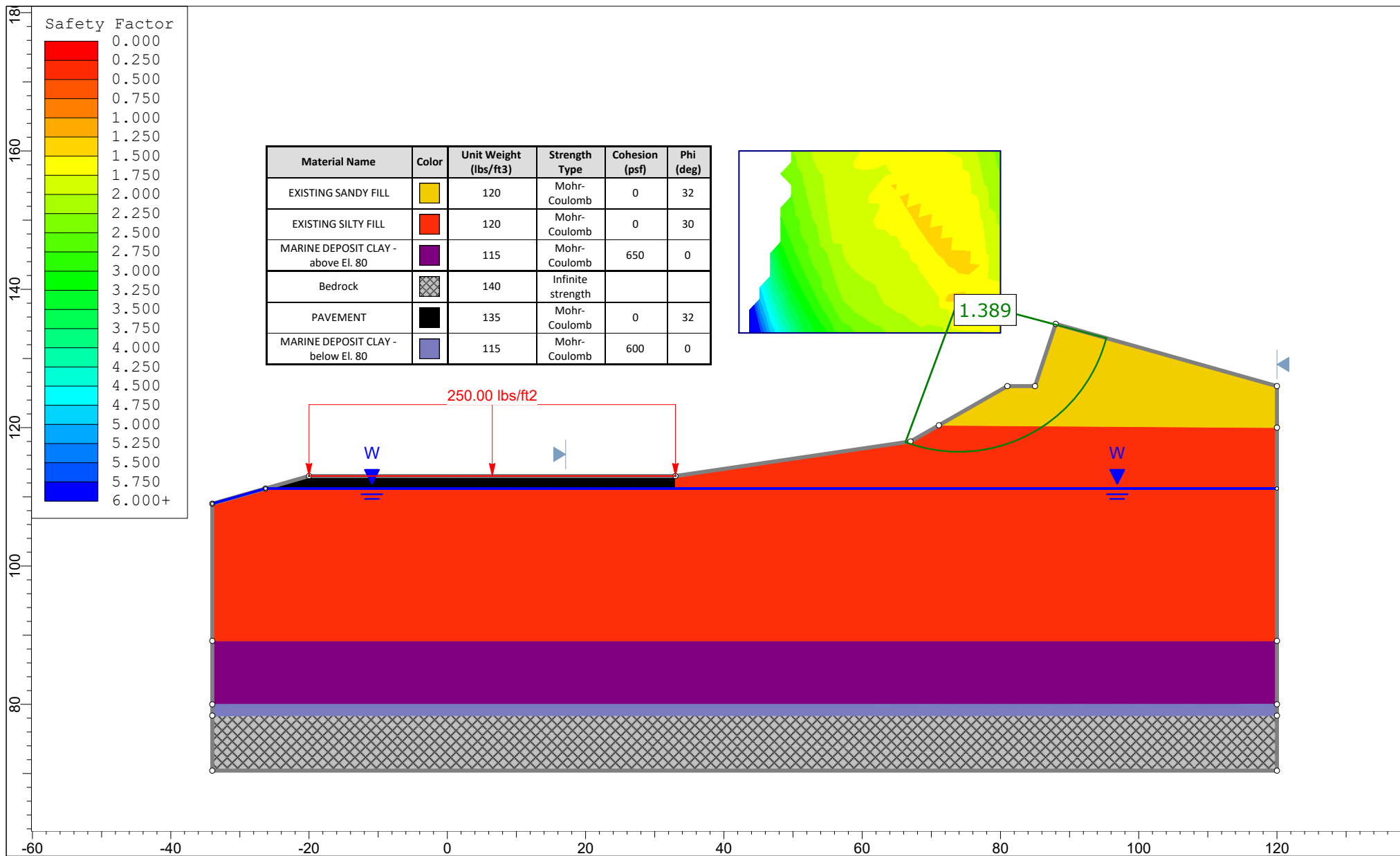
Checked by: EMS

RESULTS AND CONCLUSIONS

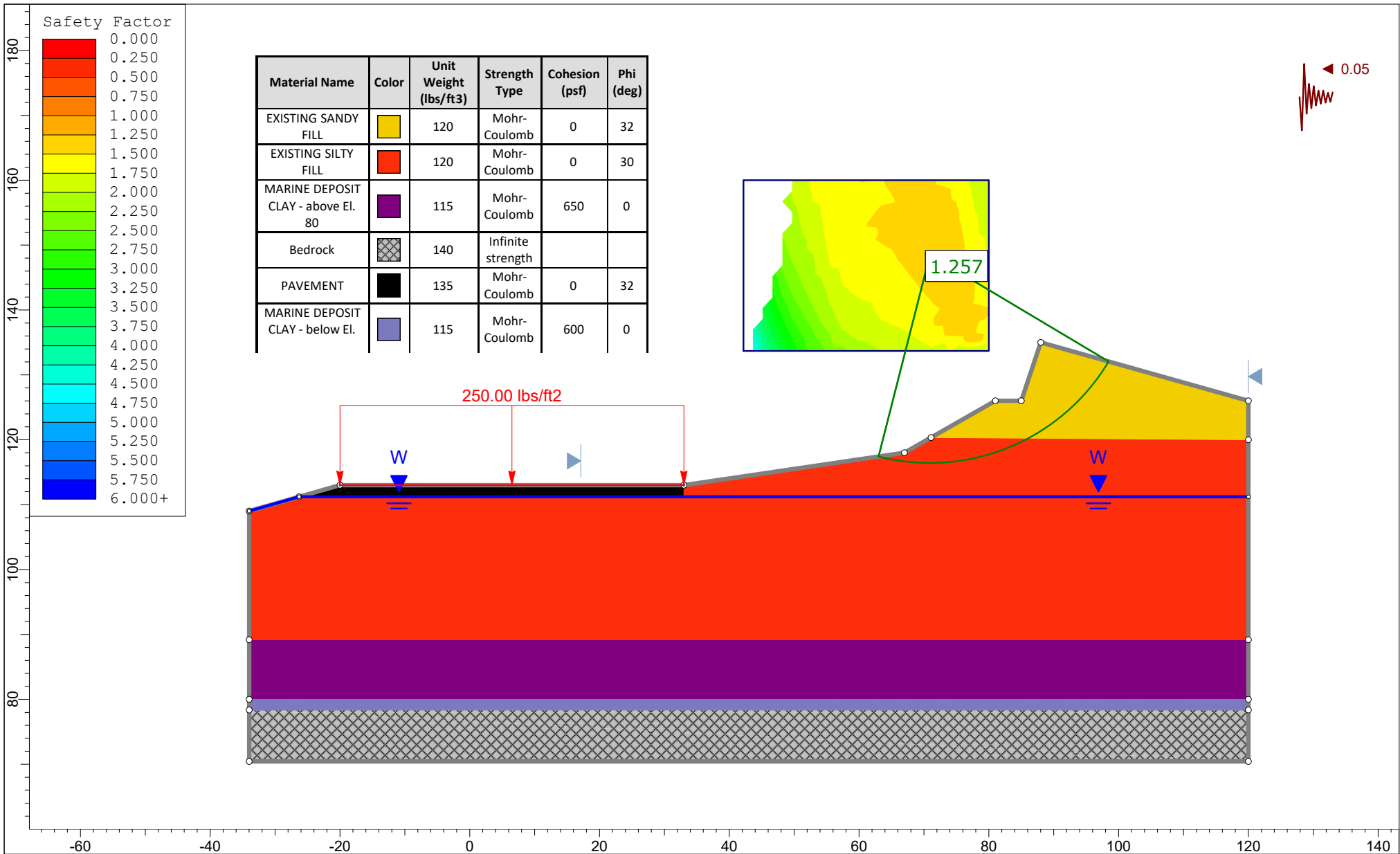
		Factor of Safety (Spencer Method)
		Transverse
Sta. 49+00	Static	1.39
	Seismic	1.26
Sta. 112+00	Static	2.28
	Seismic	2.05
Sta. 176+50	Static	2.74
	Seismic	2.45
Sta. 209+00	Static	1.28
	Seismic	1.15
Sta. 217+00	Static	1.54
	Seismic	1.39
Sta. 235+00	Static	1.97
	Seismic	1.71
Sta. 240+50	Static	1.51
	Seismic	1.35
Sta. 304+00	Static	1.73
	Seismic	1.57

The minimum required factor of safety as specified by both AASHTO LRFD and the MaineDOT BDG for embankments under static conditions which do not support structures is 1.3. The minimum required factor of safety for embankments subjected to pseudo-static seismic loading is 1.0.

Sta. 49+00

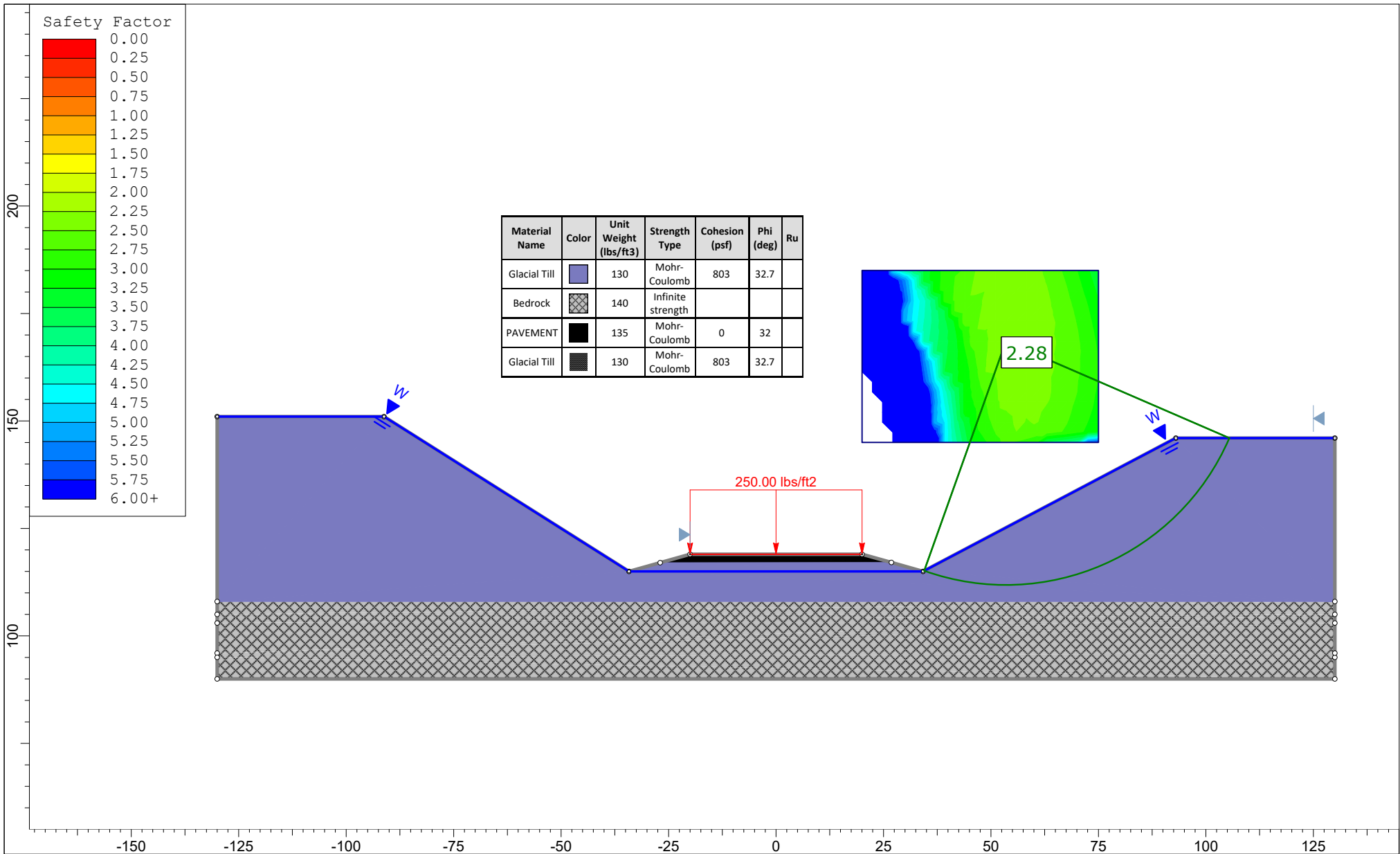



Project			I-395 Brewer-Eddington Connector		
Group		2021-0702-Sta 49+00 Stability.slim		Scenario	
2021-0702-Sta 49+00 Stability.slim				2021-0702-Sta 49+00 Stability.slim	
Drawn By		JAD		Company	
				Haley & Aldrich, Inc.	
Date		6/14/2021, 7:41:45 AM		File Name	
				2021-0702-Sta 49+00 Stability.slim	

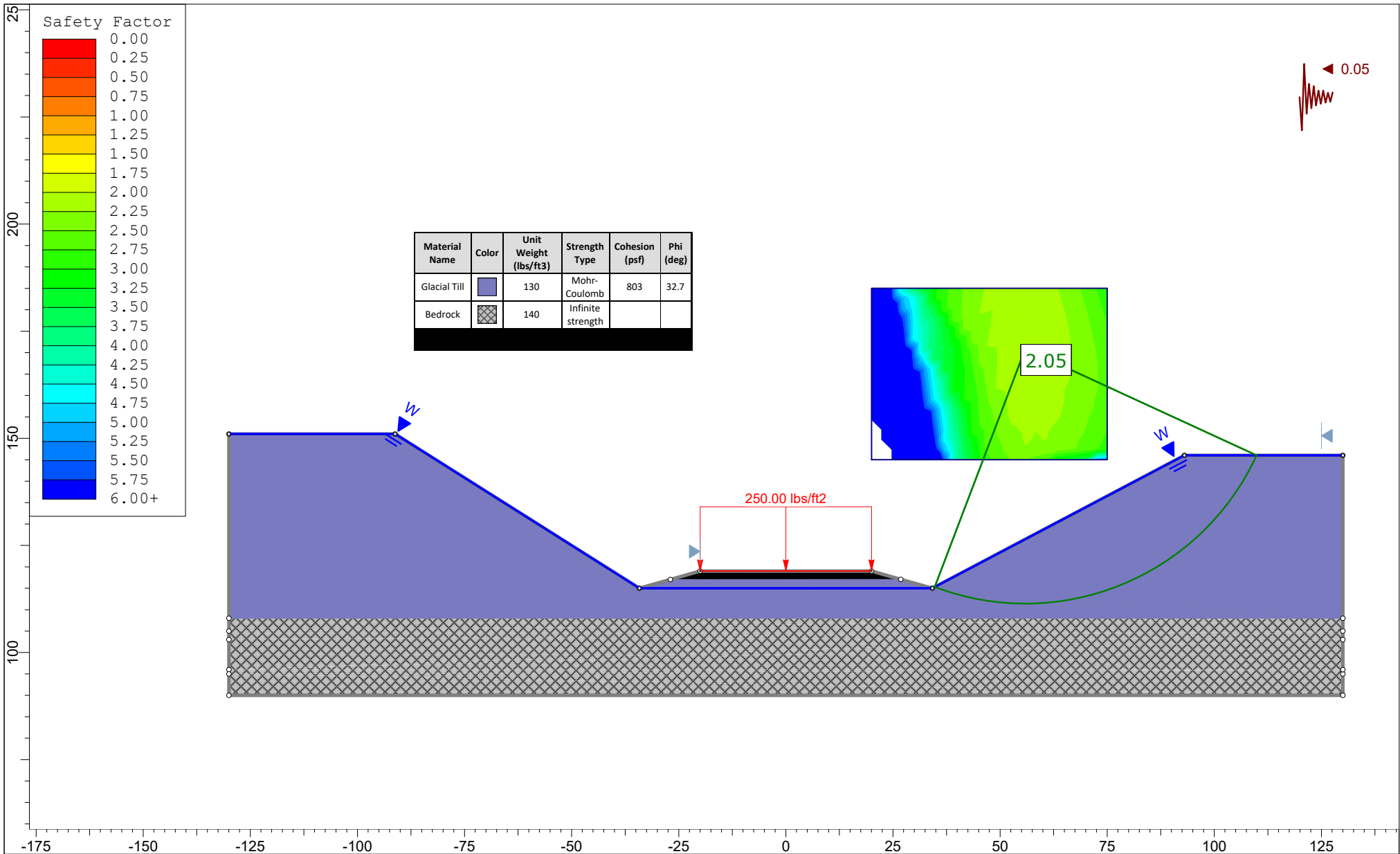


Project			I-395 Brewer-Eddington Connector		
Group		2021-0702-Sta 49+00 Stability-seismic.slim		Scenario	
				2021-0702-Sta 49+00 Stability-seismic.slim	
Drawn By		JAD		Company	
				Haley & Aldrich, Inc.	
Date		6/14/2021, 7:41:45 AM		File Name	
				2021-0702-Sta 49+00 Stability-seismic.slim	

Sta. 112+00

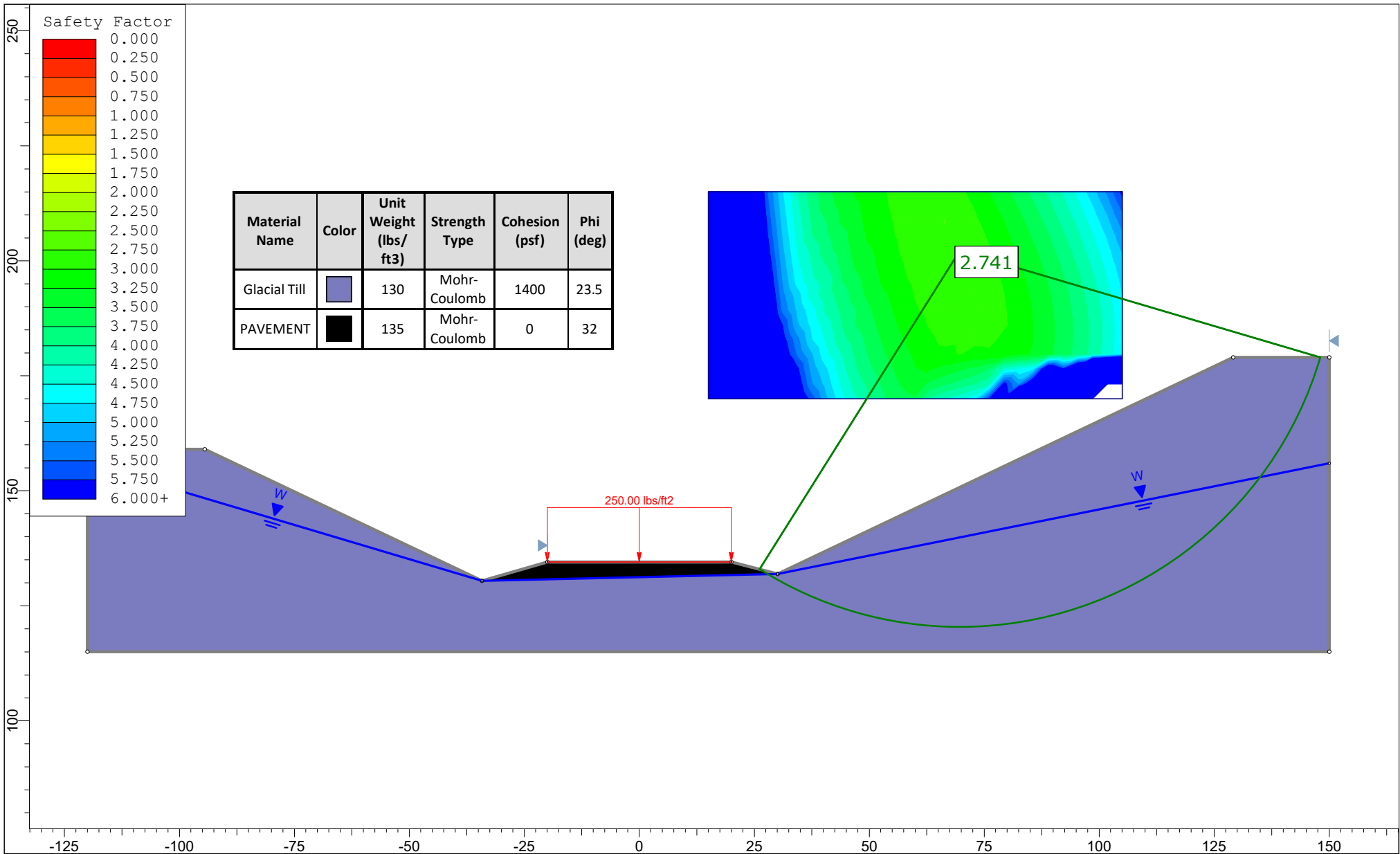


	Project		I-395 Brewer-Eddington Connector	
	Group	2021-0702-Sta 112+00 Stability.slim	Scenario	2021-0702-Sta 112+00 Stability.slim
	Drawn By	JAD	Company	Haley & Aldrich, Inc.
	Date	6/14/2021, 8:23:52 AM	File Name	2021-0702-Sta 112+00 Stability.slim
	SLIDEINTERPRET 9.008			

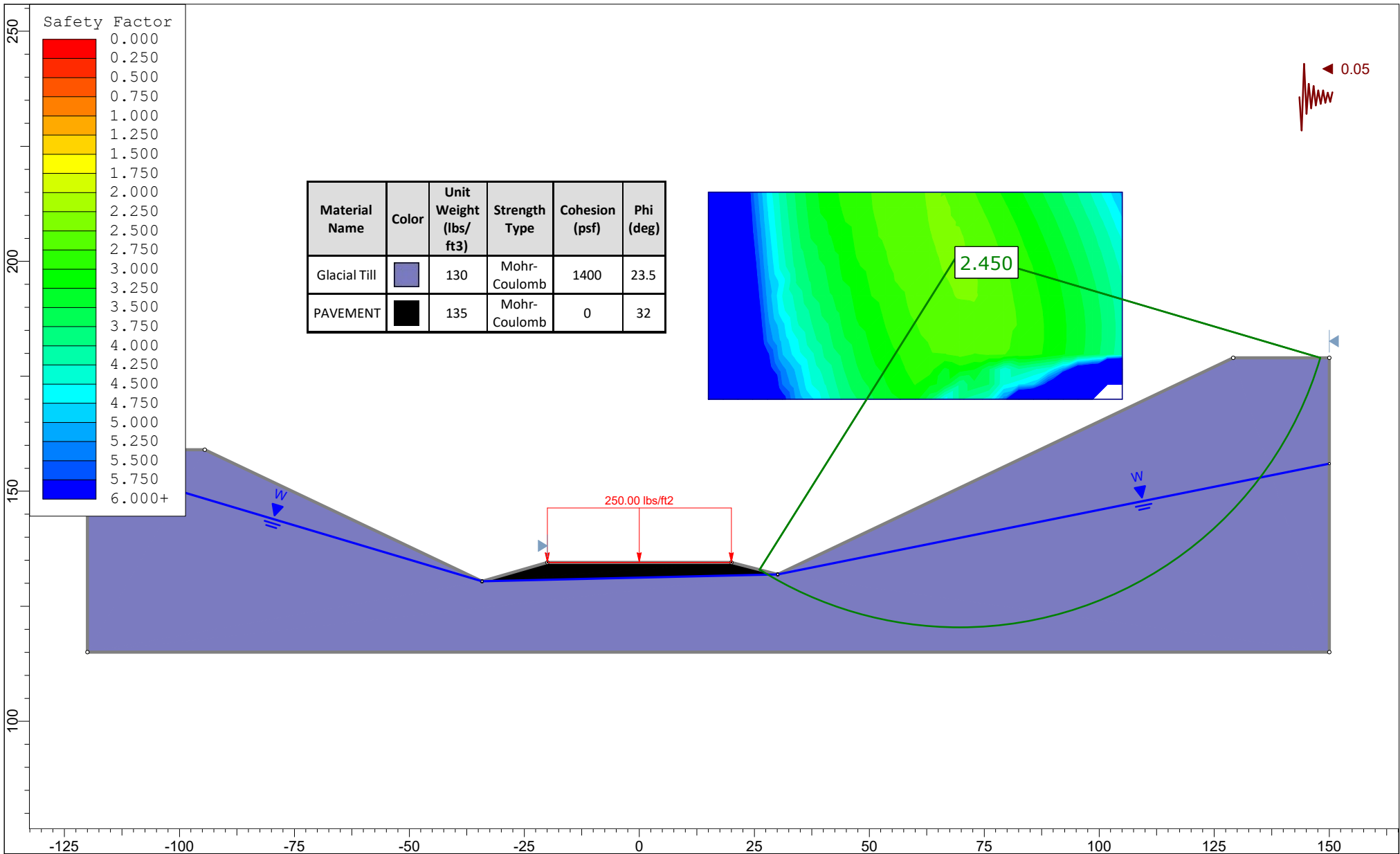


	Project		I-395 Brewer-Eddington Connector	
	Group	2021-0702-Sta 112+00 Stability-seismic.slim	Scenario	2021-0702-Sta 112+00 Stability-seismic.slim
	Drawn By	JAD	Company	Haley & Aldrich, Inc.
	Date	6/14/2021, 8:23:52 AM	File Name	2021-0702-Sta 112+00 Stability-seismic.slim

Sta. 176+50

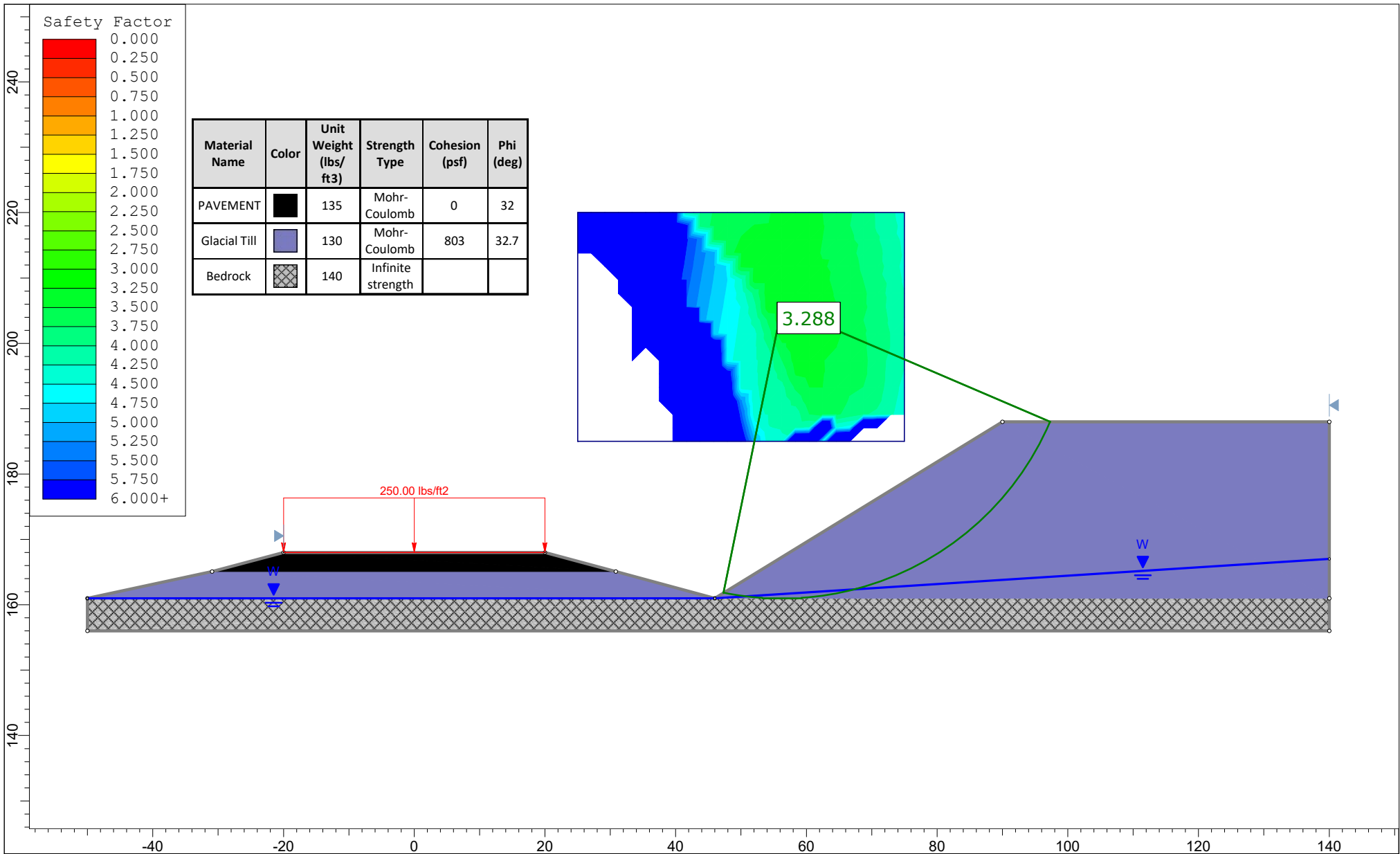


Project			I-395 Brewer-Eddington Connector		
Group			2021-0603-Sta 176+50 Stability.slim	Scenario	
Drawn By			JAD	Company	
Date			6/14/2021, 8:40:55 AM	File Name	
				2021-0603-Sta 176+50 Stability.slim	

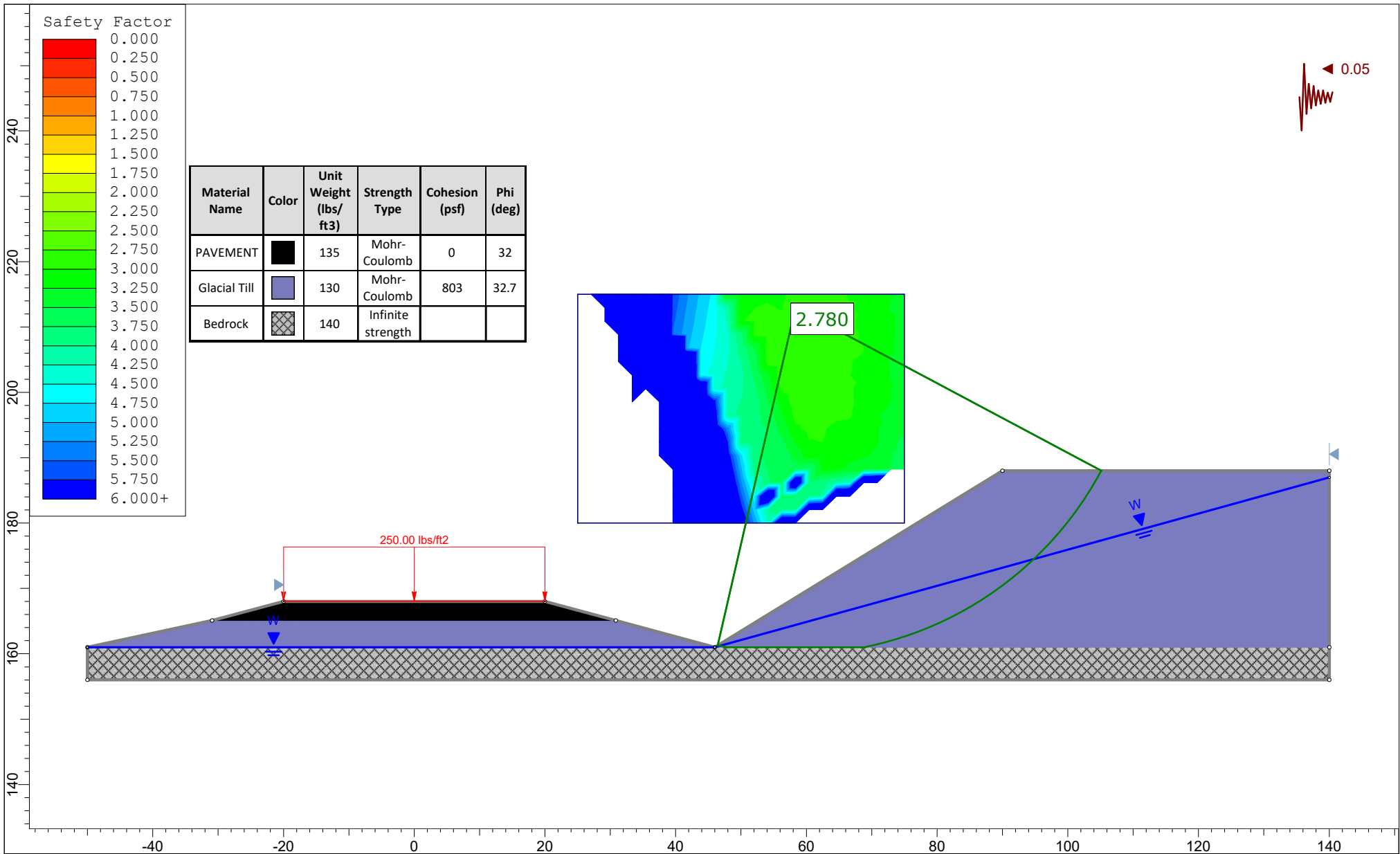


Project		I-395 Brewer-Eddington Connector	
Group	2021-0603-Sta 176+50 Stability-Seismic.slim	Scenario	2021-0603-Sta 176+50 Stability-Seismic.slim
Drawn By	JAD	Company	Haley & Aldrich, Inc.
Date	6/14/2021, 8:40:55 AM	File Name	2021-0603-Sta 176+50 Stability-Seismic.slim

Sta. 209+00

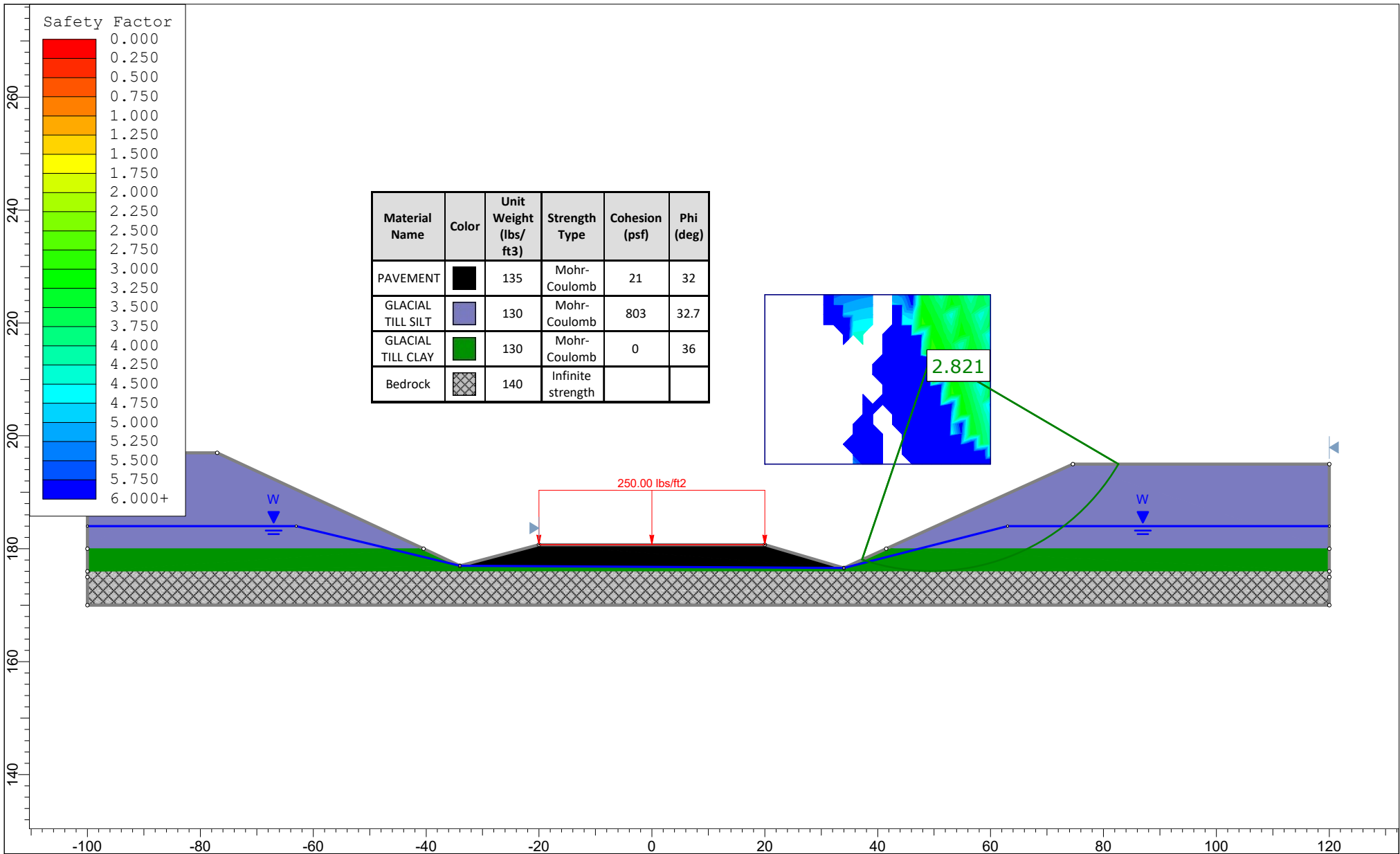


Project			
I-395 Brewer-Eddington Connector			
Group	2021-0603-Sta 209+00 Stability.slim		Scenario
			2021-0603-Sta 209+00 Stability.slim
Drawn By	JAD		Company
			Haley & Aldrich, Inc.
Date	6/14/2021, 10:13:18 AM		File Name
			2021-0603-Sta 209+00 Stability.slim

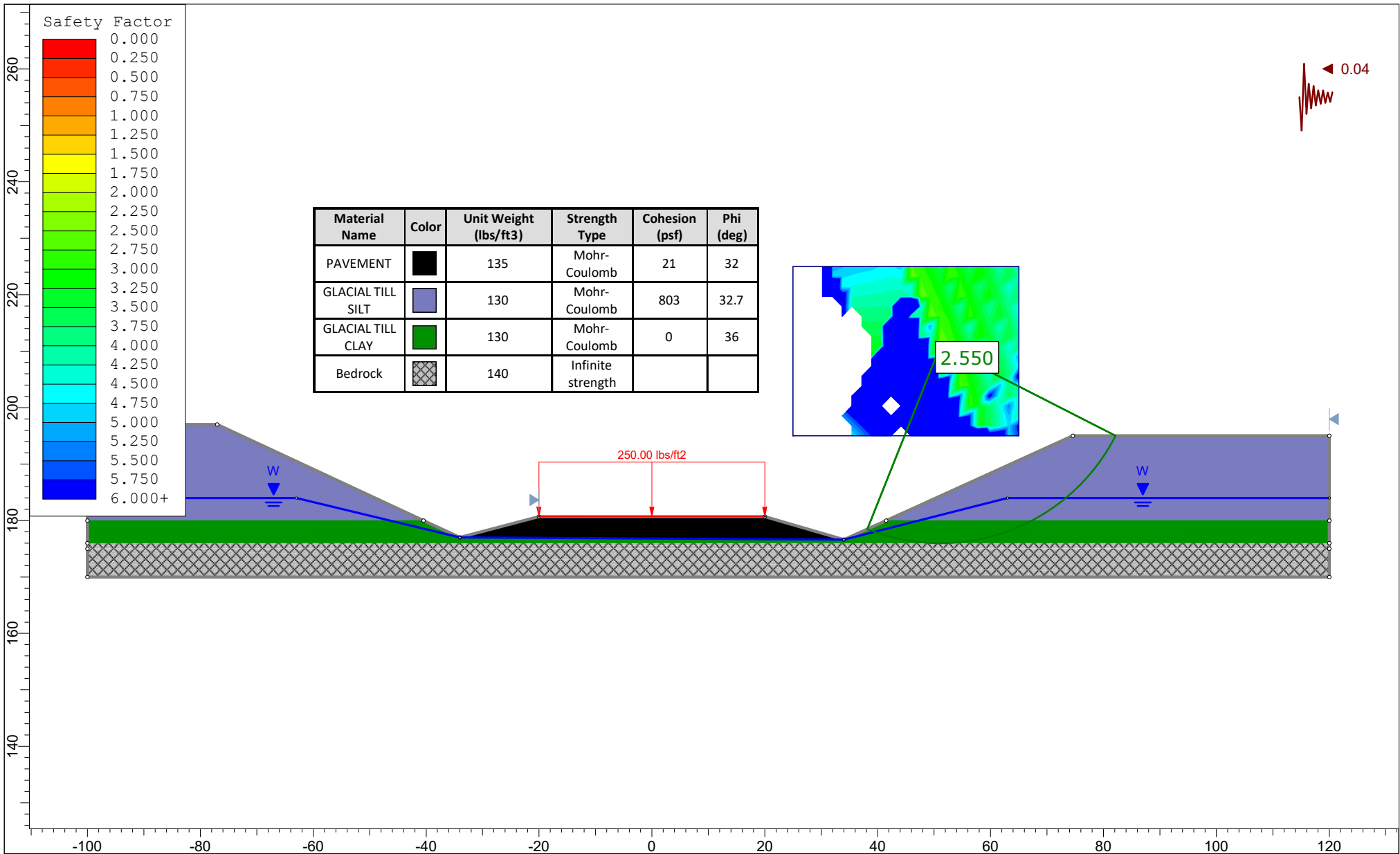


Project			I-395 Brewer-Eddington Connector	
Group	2021-0603-Sta 209+00 Stability-Seismic.slim		Scenario	2021-0603-Sta 209+00 Stability-Seismic.slim
Drawn By	JAD		Company	Haley & Aldrich, Inc.
Date	6/14/2021, 10:13:18 AM		File Name	2021-0603-Sta 209+00 Stability-Seismic.slim

Sta. 217+00

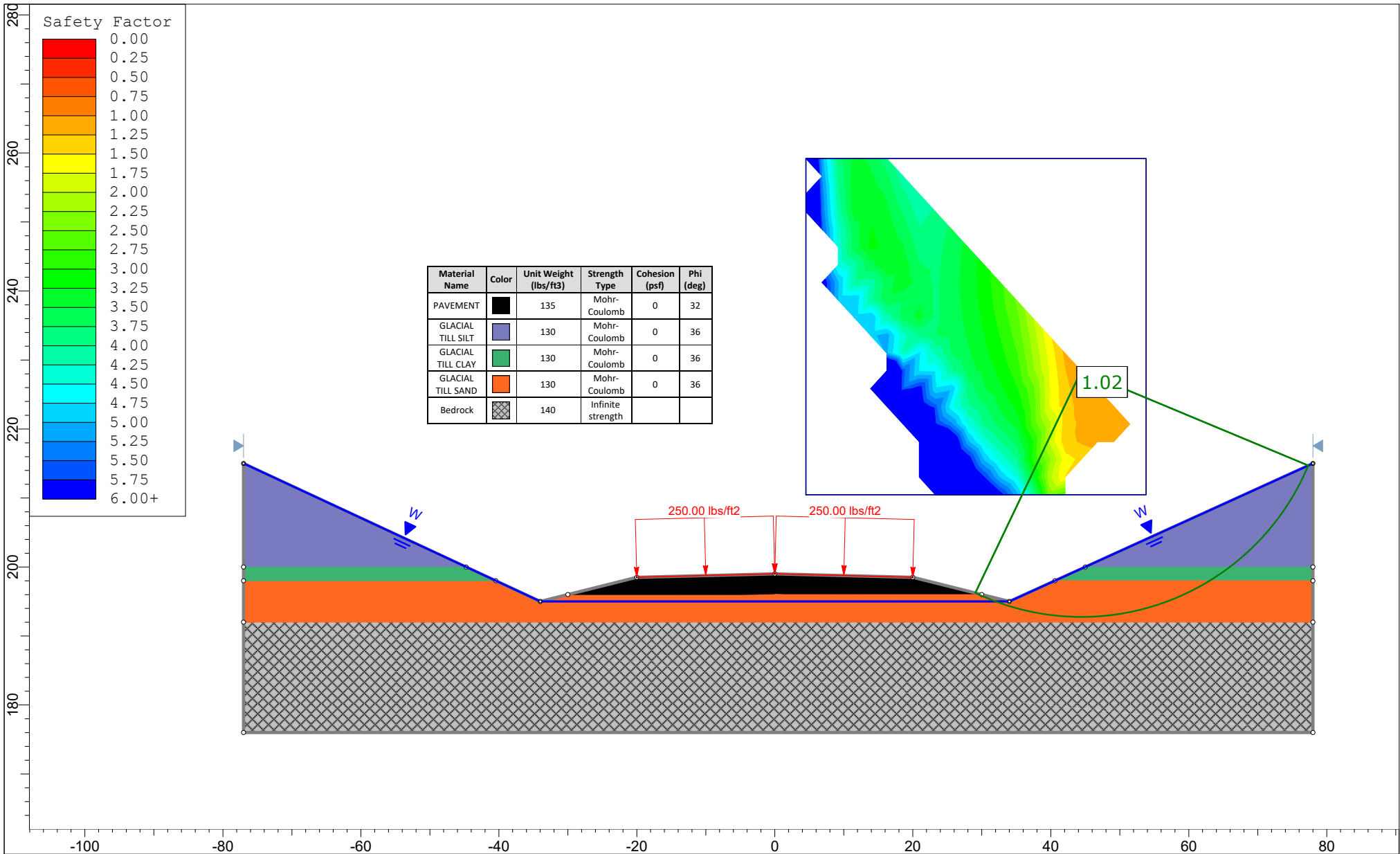



Project			I-395 Brewer-Eddington Connector		
Group		2021-0603-Sta 217+00 Stability.slim		Scenario	
				2021-0603-Sta 217+00 Stability.slim	
Drawn By		JAD		Company	
				Haley & Aldrich, Inc.	
Date		6/14/2021, 10:22:54 AM		File Name	
				2021-0603-Sta 217+00 Stability.slim	

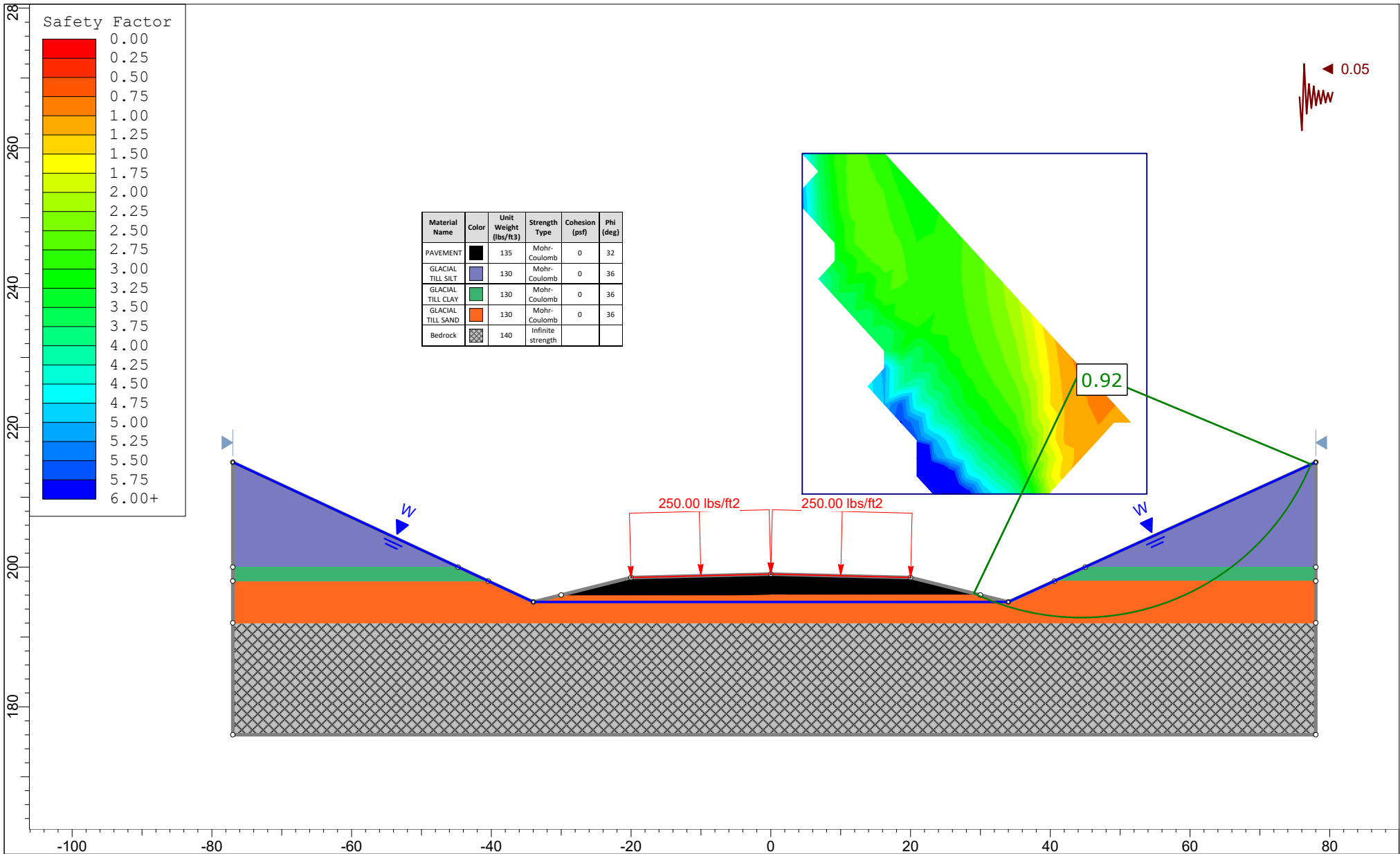


Project			I-395 Brewer-Eddington Connector		
Group		2021-0603-Sta 217+00 Stability-Seismic.slim		Scenario	
				2021-0603-Sta 217+00 Stability-Seismic.slim	
Drawn By		JAD		Company	
				Haley & Aldrich, Inc.	
Date		6/14/2021, 10:22:54 AM		File Name	
				2021-0603-Sta 217+00 Stability-Seismic.slim	

Sta. 235+00

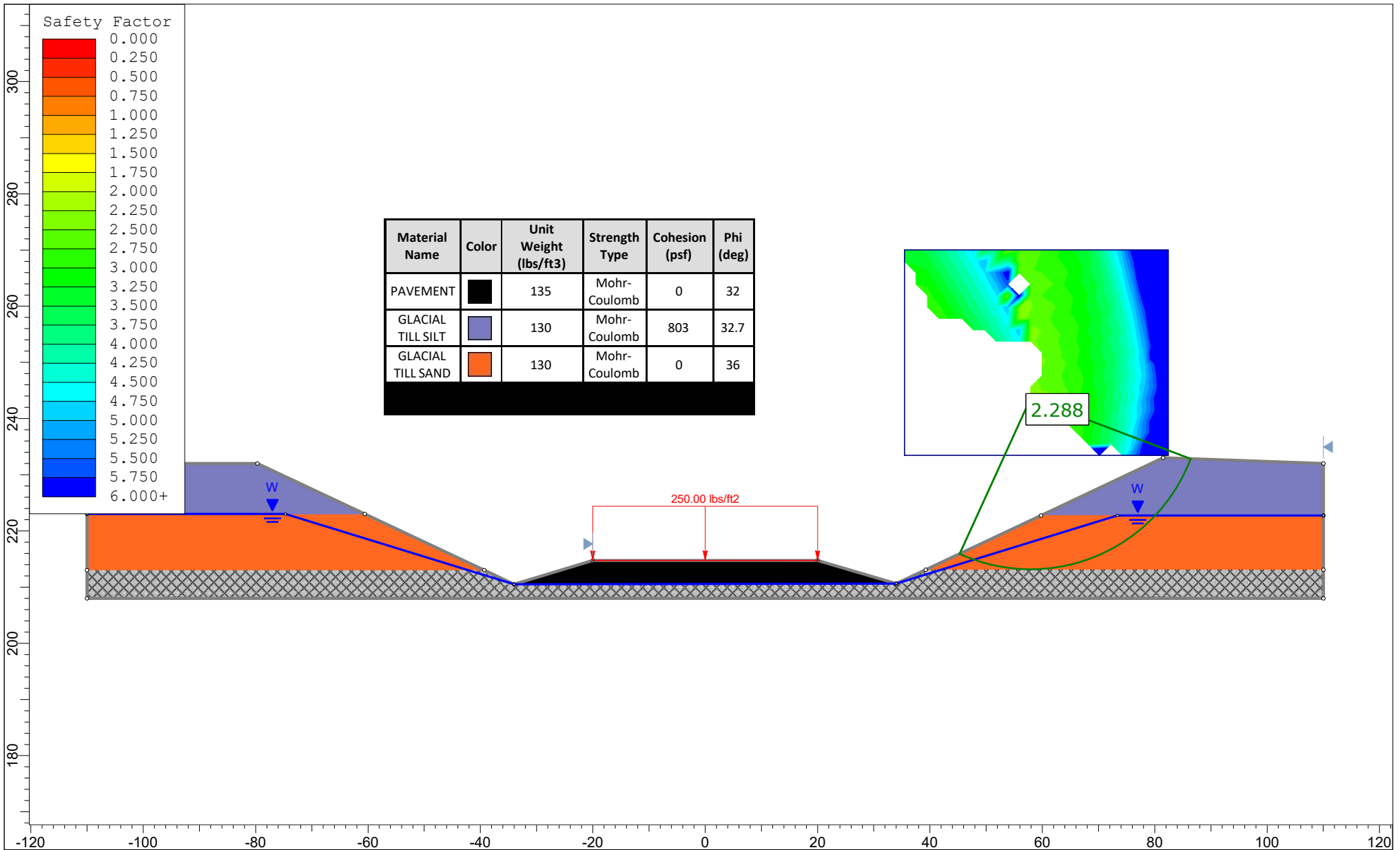


	Project		I-395 Brewer-Eddington Connector	
	Group	2021-0702-Sta 235+00 Stability.slim	Scenario	2021-0702-Sta 235+00 Stability.slim
	Drawn By	JAD	Company	Haley & Aldrich, Inc.
	Date	6/14/2021, 10:43:50 AM	File Name	2021-0702-Sta 235+00 Stability.slim
	SLIDEINTERPRET 9.008			

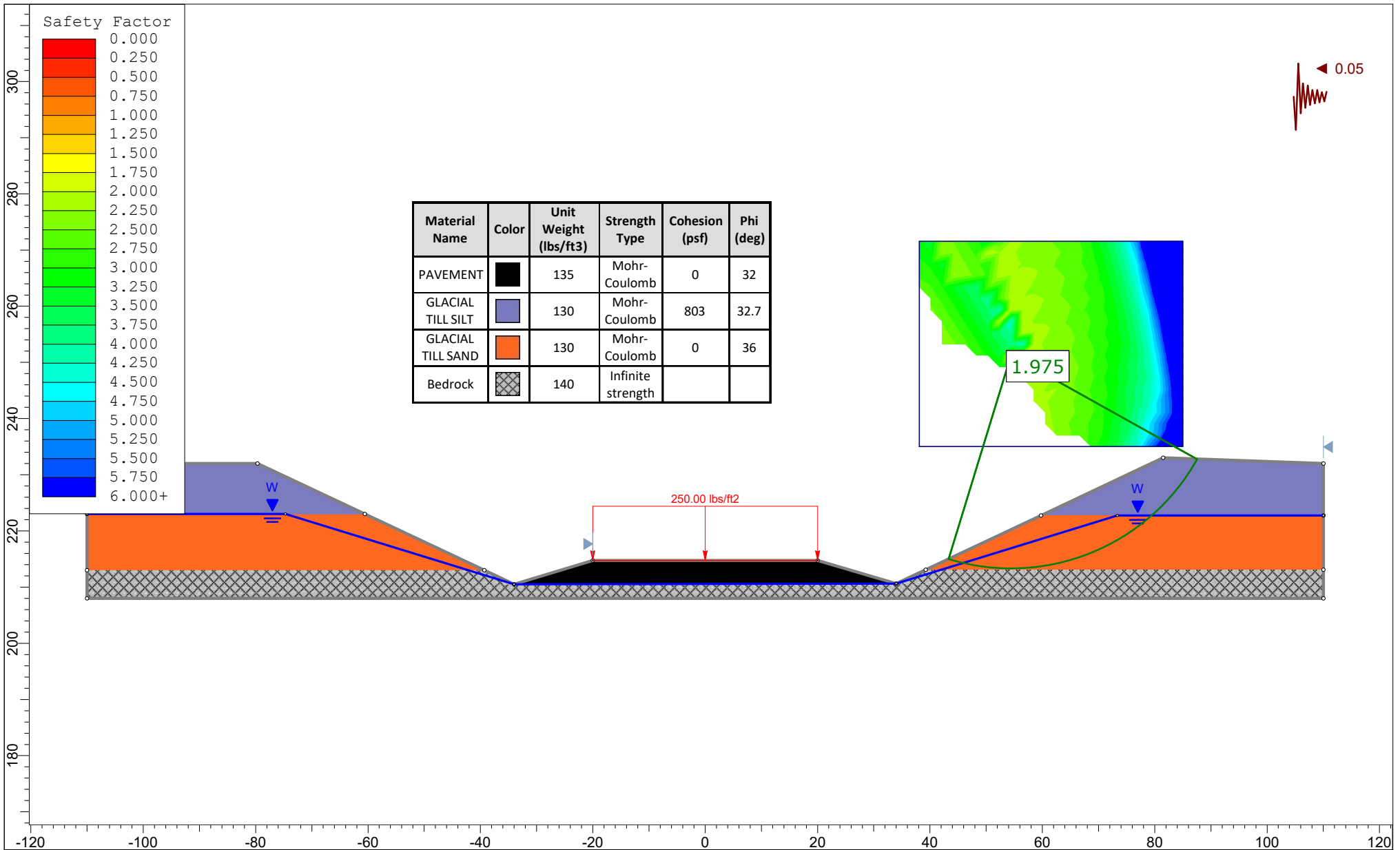


Project			I-395 Brewer-Eddington Connector		
Group		2021-0702-Sta 235+00 Stability-seismic.slim		Scenario	
				2021-0702-Sta 235+00 Stability-seismic.slim	
Drawn By		JAD		Company	
				Haley & Aldrich, Inc.	
Date		6/14/2021, 10:43:50 AM		File Name	
				2021-0702-Sta 235+00 Stability-seismic.slim	

Sta. 240+50

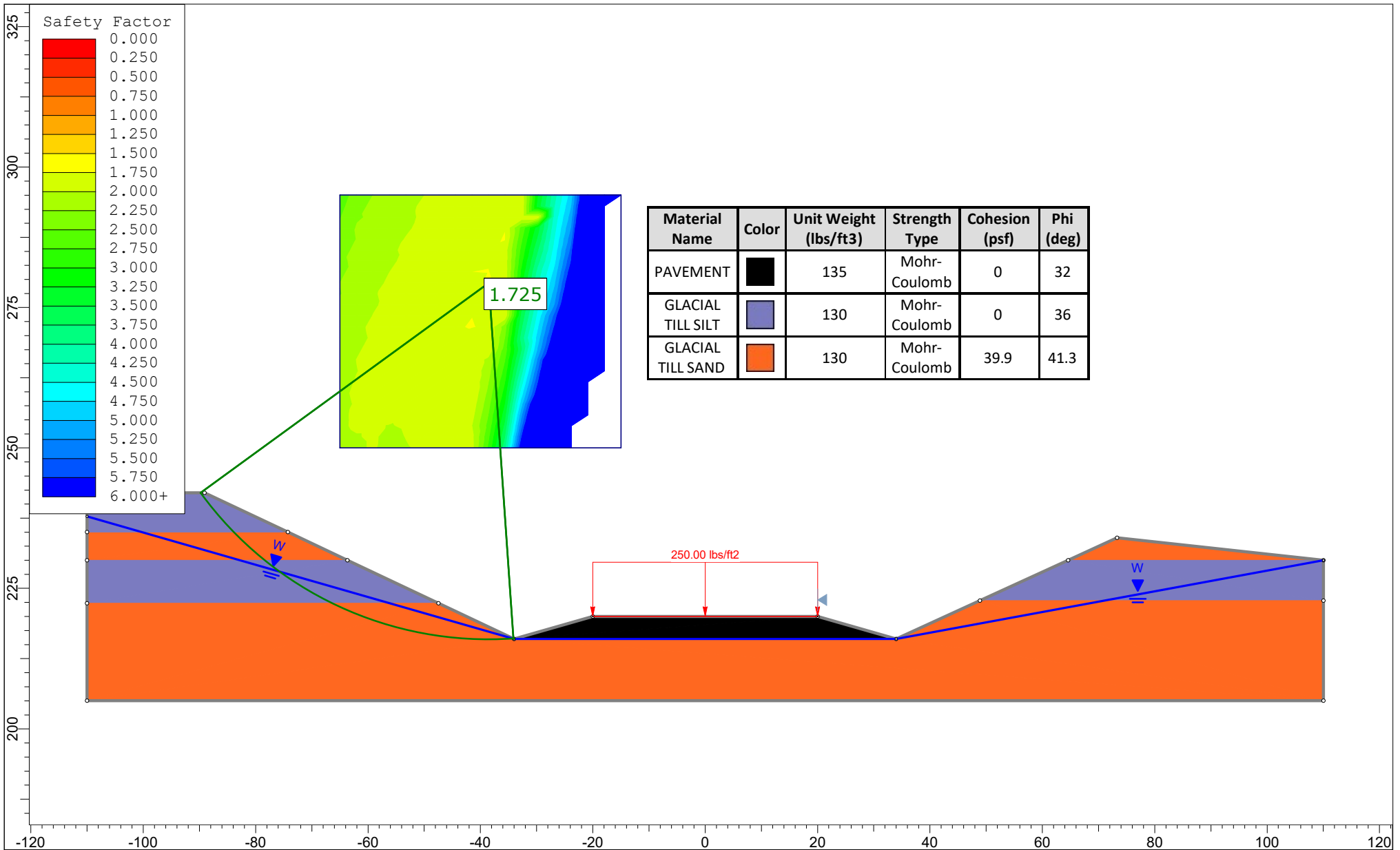


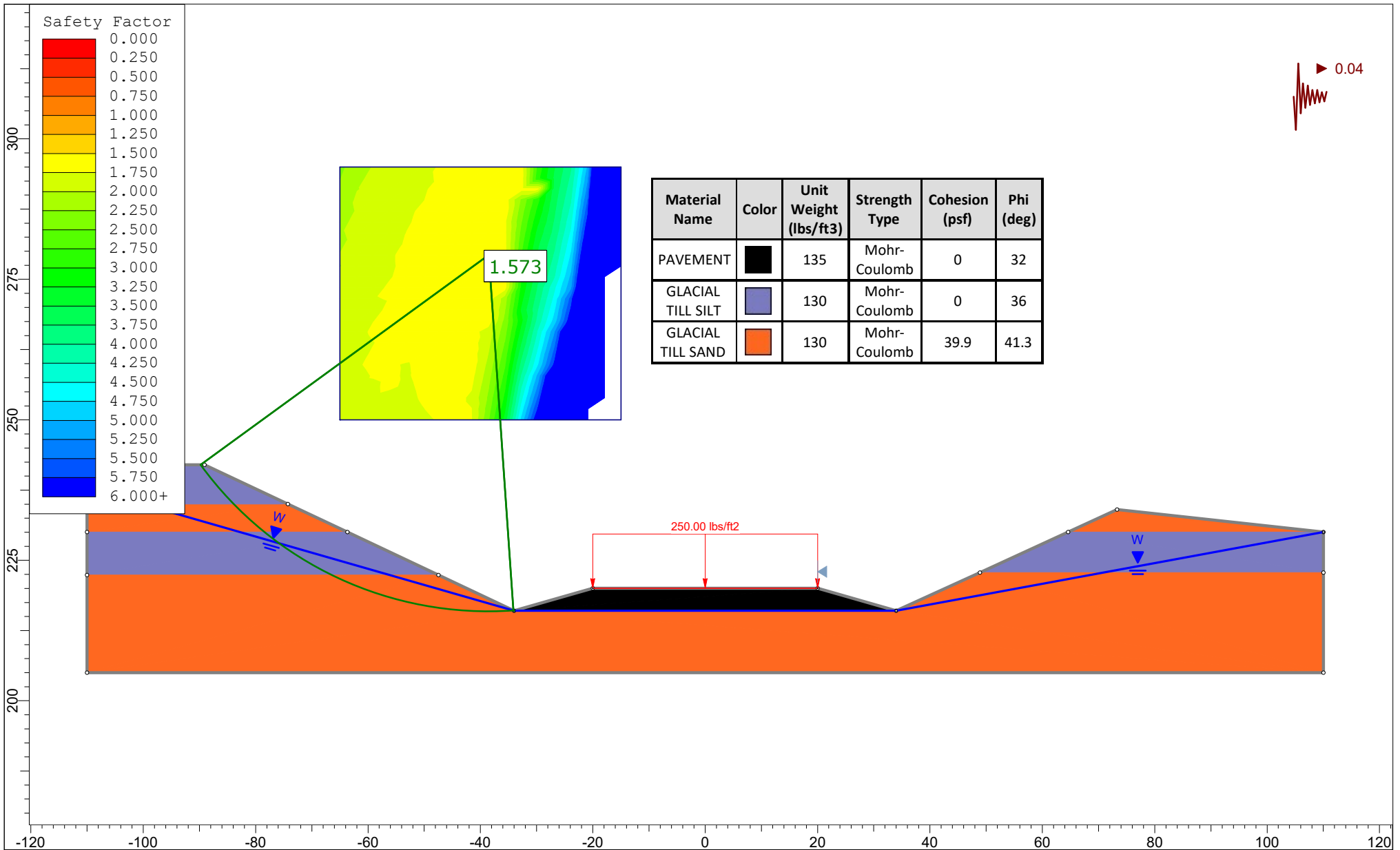
	Project		I-395 Brewer-Eddington Connector	
	Group	2021-0603-Sta 240+50 Stability.slim	Scenario	2021-0603-Sta 240+50 Stability.slim
	Drawn By	JAD	Company	Haley & Aldrich, Inc.
	Date	6/14/2021, 11:27:42 AM	File Name	2021-0603-Sta 240+50 Stability.slim
	SLIDEINTERPRET 9.004			



Project			I-395 Brewer-Eddington Connector		
Group		2021-0603-Sta 240+50 Stability-Seismic.slim		Scenario	
				2021-0603-Sta 240+50 Stability-Seismic.slim	
Drawn By		JAD		Company	
				Haley & Aldrich, Inc.	
Date		6/14/2021, 11:27:42 AM		File Name	
				2021-0603-Sta 240+50 Stability-Seismic.slim	

Sta. 304+00





Project

I-395 Brewer-Eddington Connector

Group

2021-0603-Sta 304+00 Stability-Seismic.slim

Scenario

2021-0603-Sta 304+00 Stability-Seismic.slim

Drawn By

JAD

Company

Haley & Aldrich, Inc.

Date

6/14/2021, 11:37:34 AM

File Name

2021-0603-Sta 304+00 Stability-Seismic.slim

Rockfall Analysis



CALCULATIONS

File No.: 132076-004

Sheet: 1 of

Client: Maine Department of Transportation

Date: 1-Jul-2021

Project: Brewer-Eddington Phase II

Computed by: S. Pepe

Subject: Rockfall Modeling for Clewleyville and Levenseller Road Cuts

Checked by:

PROBLEM STATEMENT & OBJECTIVE

Brewer-Eddington Phase II proposes two road cuts in bedrock below Clewleyville and Levenseller Roads. To evaluate potential rockfall events and required catchment ditch design, H&A generated rockfall trajectory models to address discrete rock block failures using the Rocfall software program by RocScience®. Outputs were analyzed and assessed based on the goal of 95 percent retention as defined by FHWA guidelines, which were developed for rockfall mitigation projects adjacent to federal highways. Both Clewleyville and Levenseller road cuts had a model run from both sides of the cut at the highest location possible, producing four total models and reports.

REFERENCES

1. RocScience Rocfall Verification Manual
2. Clewleyville and Levenseller Cross Section Drawings Provided by Maine DOT
3. Boring Logs from Locations
4. DIPS Stereonet Analysis

ASSUMPTIONS

1. Material properties of slope surfaces selected based on what was observed in field during subsurface investigation.
2. Material properties of rock blocks (including size, unit weight, and geometry) selected based on what was observed in the field during subsurface investigations and laboratory results.
3. Initial conditions of the rock slope are static- loose rock blocks falling without an impetus or initial velocity.
4. Seeder locations selected based on slope areas with highest potential energies.
5. No vegetation damping on exposed slope surfaces to reduce rock block velocities.
6. Dynamic and rolling frictional coefficients vary based on estimated friction angle of surfaces and material type.
7. Catchment ditch geometry includes 14 foot length (as per Maine DOT) and a 75 degree cut face angle.

INPUT PARAMETERS

1. See Table 1 for parameters used in the Clewleyville road cut models.
2. See Table 2 for parameters used in the Levenseller road cut models.

RESULTS AND CONCLUSIONS

1. All four models achieved 100 percent retention, greater than the 95 percent goal. The proposed road cuts and catchment areas are sufficient for containing any potential rock fall material.

ATTACHMENTS

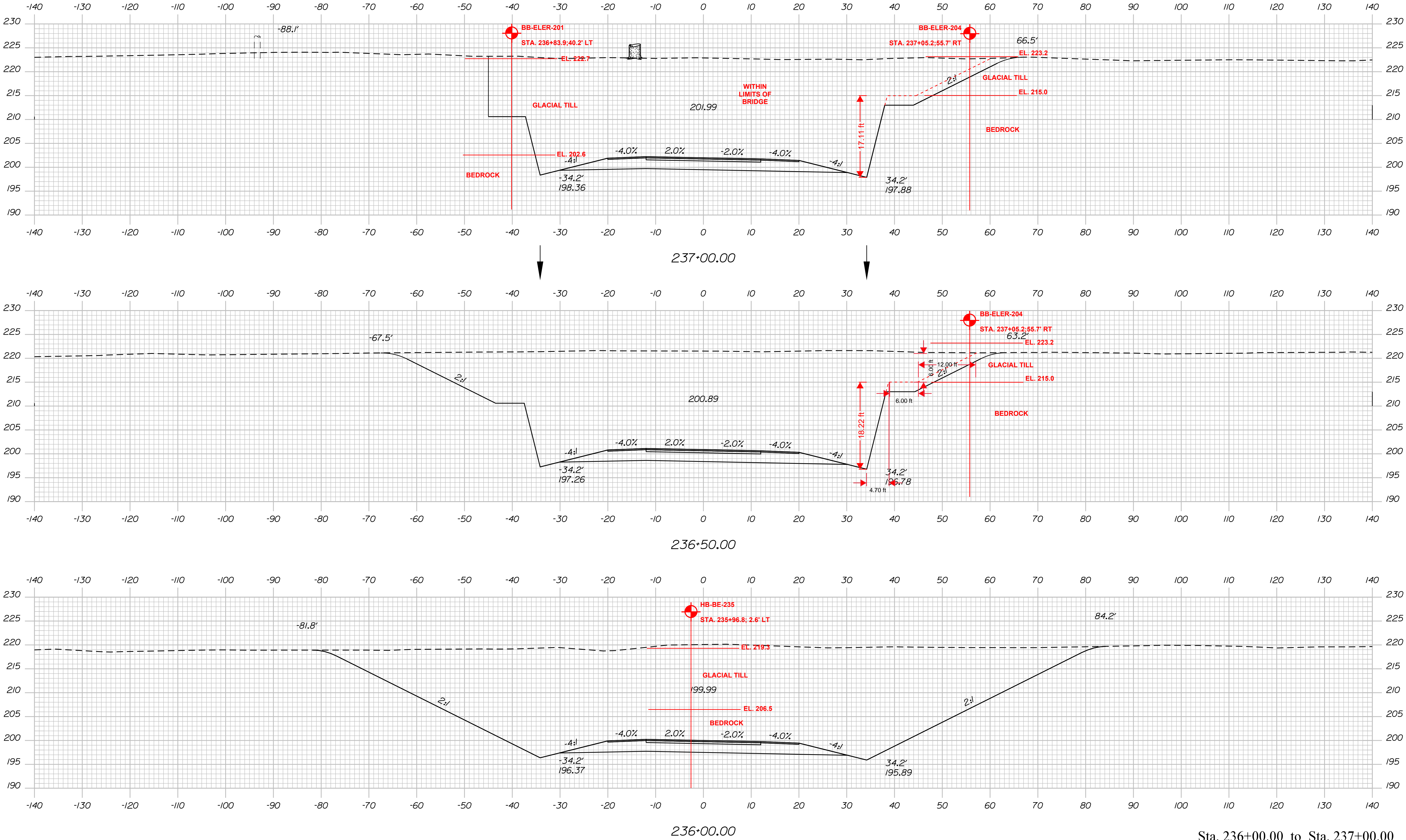
1. Clewleyville Rocfall Profiles, Endpoints, and Reports for Station 212+00 (left and right side of road)
2. Levenseller Rocfall Profiles, Endpoints, and Reports for Stations 236+50 and 238+00

Date: 3/3/2021

Username: common

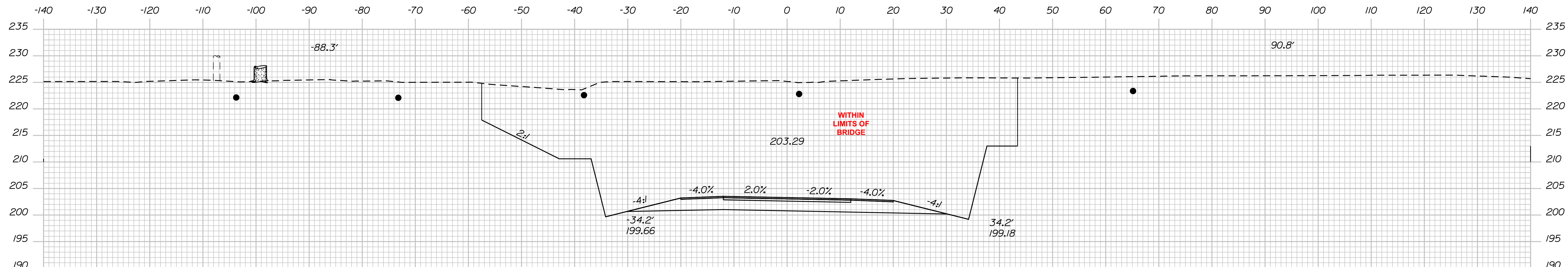
Division: BRIDGE

Filename: ... \160_XSECT_236+00_119.dgn



Sta. 236+00.00 to Sta. 237+00.00

STATE OF MAINE	
DEPARTMENT OF TRANSPORTATION	
STP-1891(500)	
WIN 018915.00	
CROSS SECTIONS	
SHEET NUMBER	
160	
OF 20	



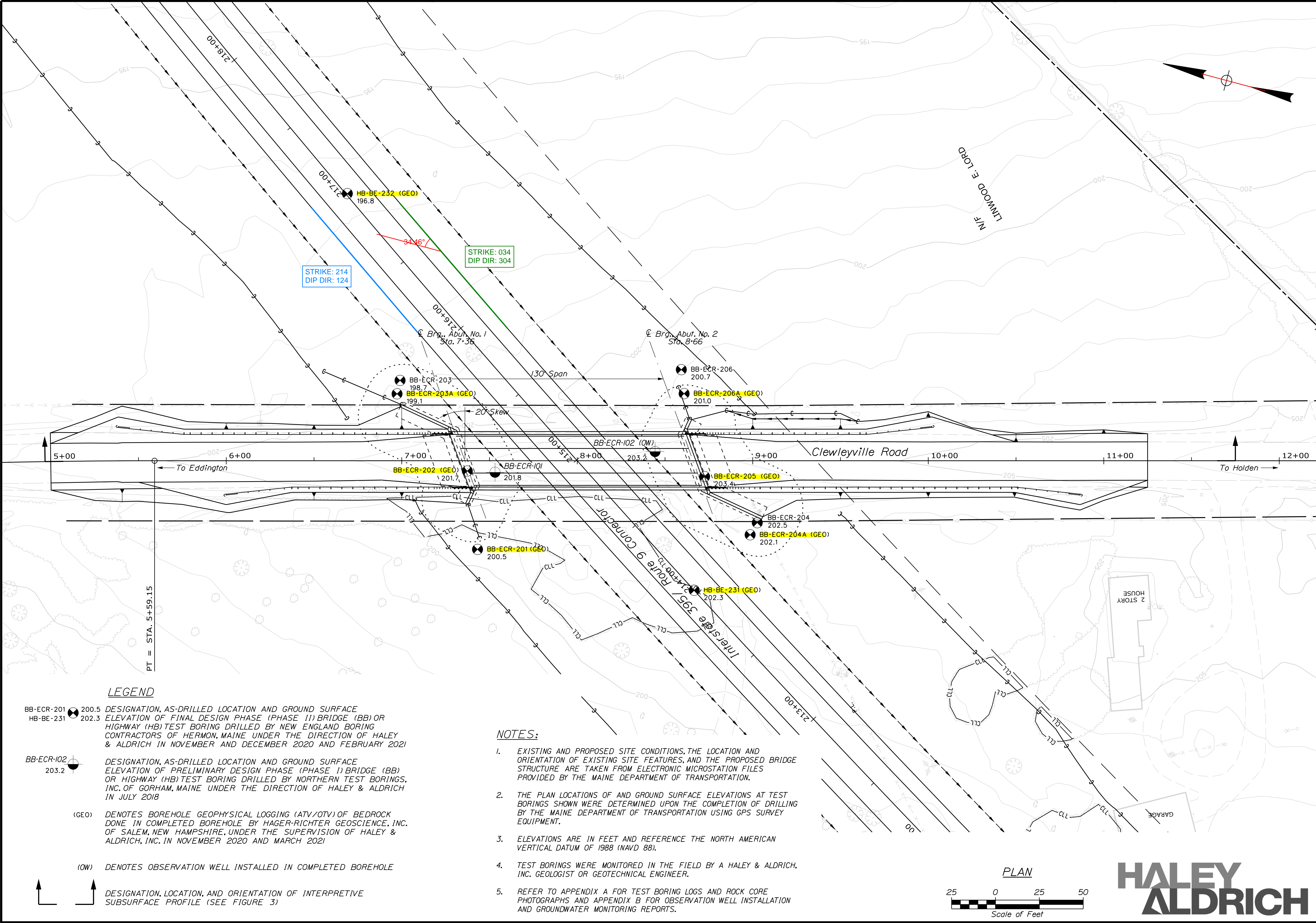
Sta. 237+50.00 to Sta. 238+50.00

Date:4/7/2021

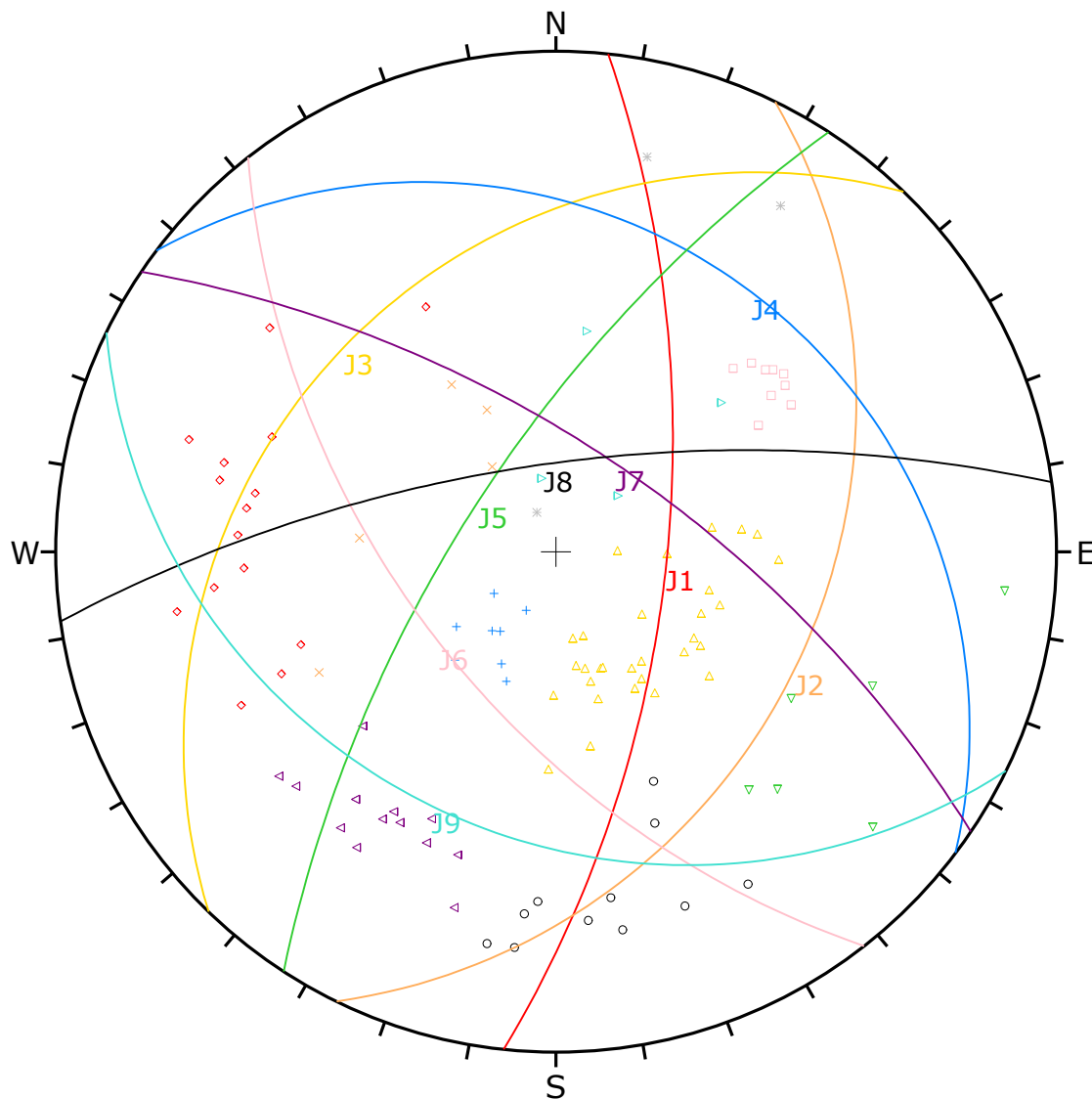
Username:

Division:

Filename: ... \052_Plan_ClewlyvilleRoad.dgn



STATE OF MAINE		DEPARTMENT OF TRANSPORTATION	
STP-1891(500)		SIGNATURE	
BRIDGE NO. 018915.00		P.E. NUMBER	
WIN		DATE	
BRIDGE PLANS		FIELD CHANGES	
I-395 - ROUTE 9 CONNECTOR		PROJ. MANAGER	BY
CLEWLEYVILLE ROAD BRIDGE		CHECKED-REVIEWED	DATE
BREWER-EDDINGTON PENOBSCOT COUNTY		DESIGNED-DRAWN	3-25-20
SITE AND SUBSURFACE		DESIGNED-DRAWN	4-7-21
EXPLORATION LOCATION PLAN		REVISIONS 1	
		REVISIONS 2	
		REVISIONS 3	
		REVISIONS 4	
		FIELD CHANGES	
FIGURE			
2			
OF 3			

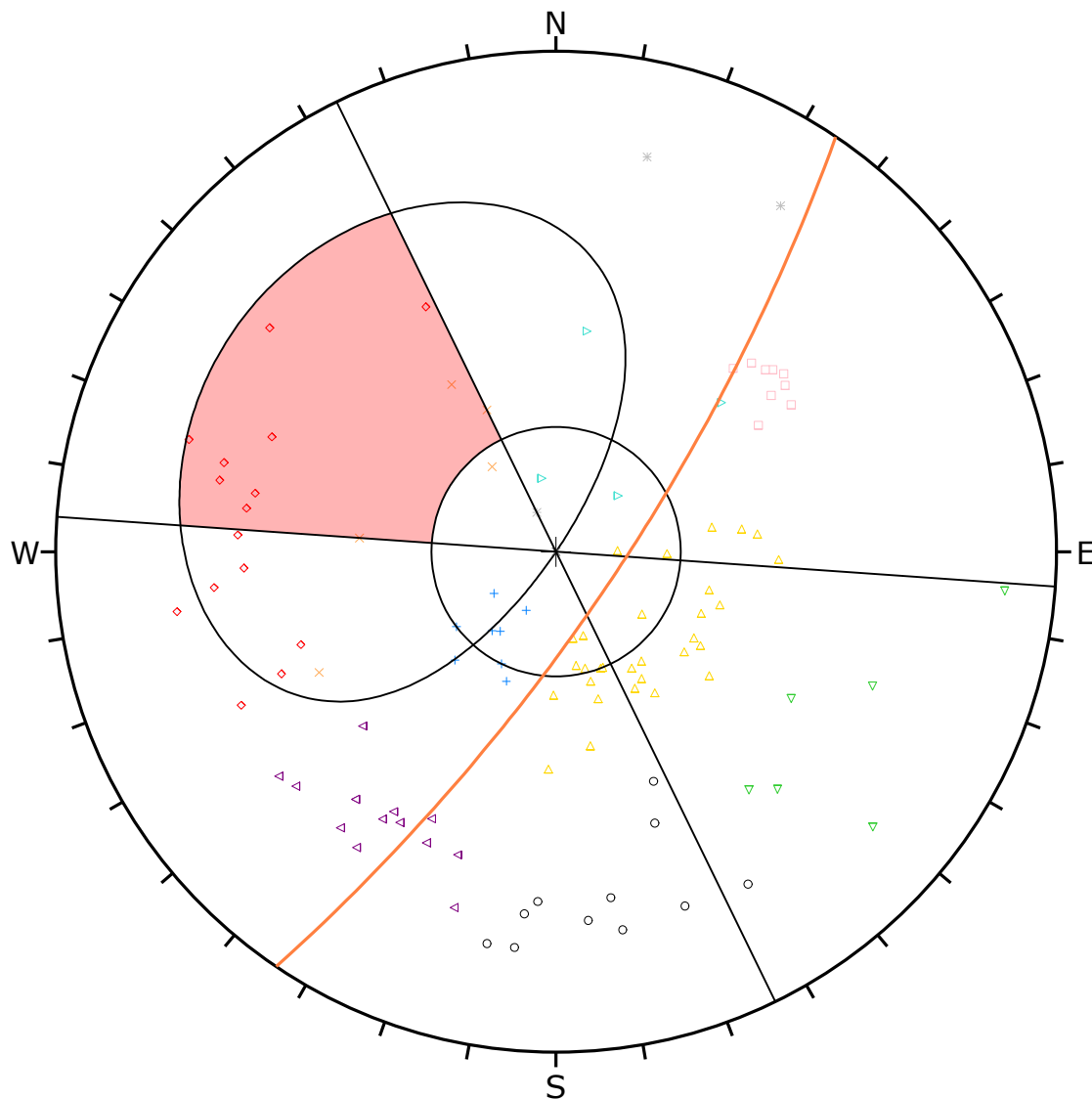


Symbol	FEATURE	Quantity
◇	J1	15
×	J2	5
△	J3	30
+	J4	8
▽	J5	6
□	J6	9
◁	J7	14
○	J8	11
▷	J9	4
*	U	3

	Color	Dip	Dip Direction	Label
Mean Set Planes				
1m	Red	65	96	J1
2m	Orange	34	116	J2
3m	Yellow	29	314	J3
4m	Blue	24	37	J4
5m	Green	69	303	J5
6m	Pink	57	232	J6
7m	Purple	66	34	J7
8m	Black	70	352	J8
9m	Cyan	31	206	J9

Plot Mode	Pole Vectors
Vector Count	105 (105 Entries)
Hemisphere	Lower
Projection	Equal Angle

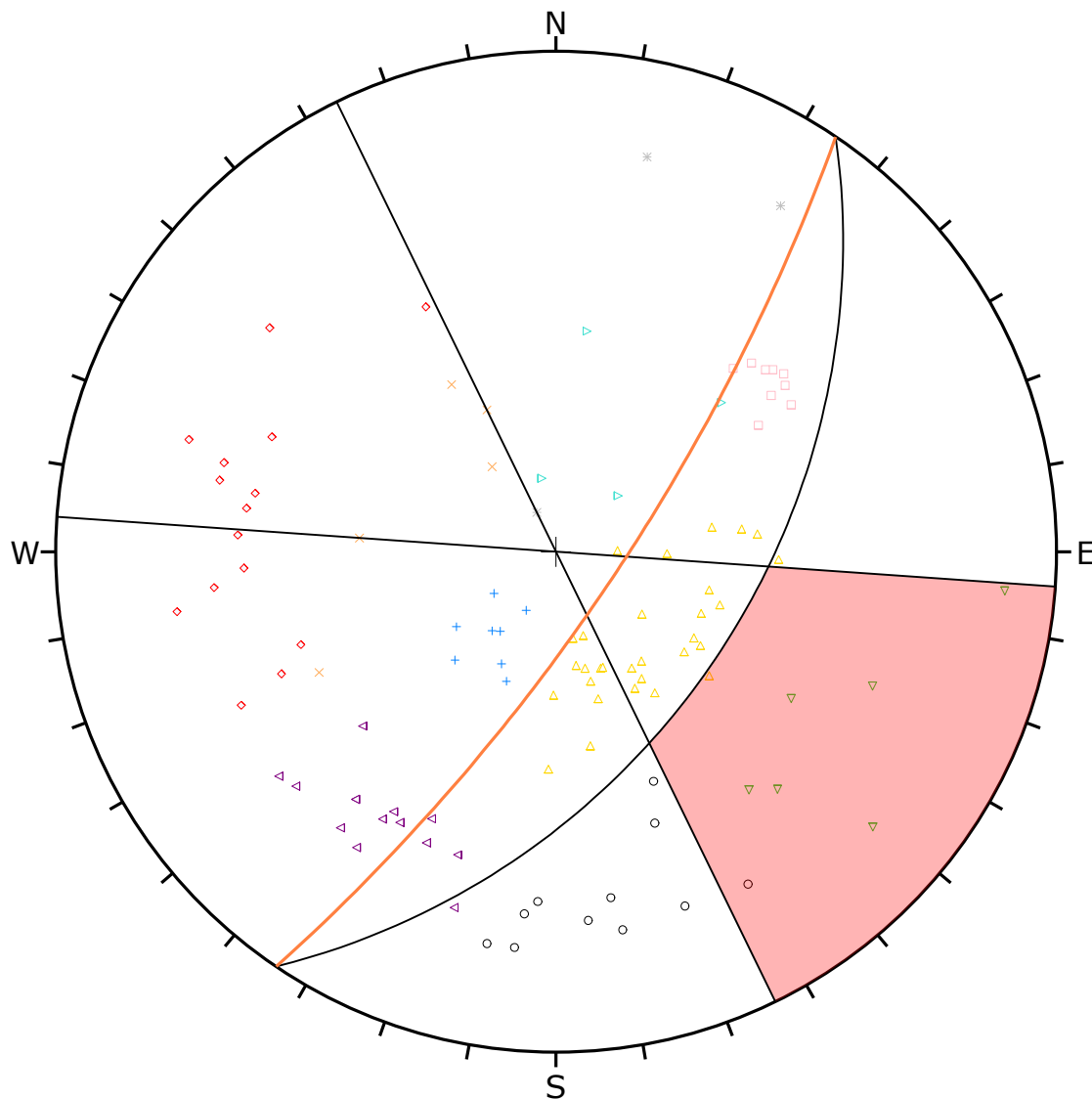
Project	Brewer-Eddington I-395/Route 9 Connector		
Analysis Description	Clewleyville Road BH Logging (Approach Borings)		
Drawn By	J. Rawlins	Company	Haley & Aldrich, Inc.
Date	June 2021	File Name	2021-0513_Clewleyville Approach borings.dips8



Symbol	FEATURE	Quantity
◇	J1	15
×	J2	5
△	J3	30
+	J4	8
▽	J5	6
□	J6	9
◀	J7	14
○	J8	11
◀	J9	4
*	U	3

Kinematic Analysis	Planar Sliding		
Slope Dip	76		
Slope Dip Direction	124		
Friction Angle	28°		
Lateral Limits	30°		
	Critical	Total	%
Planar Sliding (All)	11	105	10.48%
Planar Sliding (Set 1: J1)	8	15	53.33%
Planar Sliding (Set 2: J2)	3	5	60.00%
Plot Mode	Pole Vectors		
Vector Count	105 (105 Entries)		
Hemisphere	Lower		
Projection	Equal Angle		

<i>Project</i>	Brewer-Eddington I-395/Route 9 Connector		
<i>Analysis Description</i>	Clewleyville Road BH Logging (Approach Borings) - Planar Sliding		
<i>Drawn By</i>	J. Rawlins	<i>Company</i>	Haley & Aldrich, Inc.
<i>Date</i>	June 2021	<i>File Name</i>	2021-0513_Clewleyville Approach borings.dips8



Symbol	FEATURE	Quantity
◇	J1	15
×	J2	5
△	J3	30
+	J4	8
▽	J5	6
□	J6	9
△	J7	14
○	J8	11
△	J9	4
*	U	3

Kinematic Analysis	Flexural Toppling
Slope Dip	76
Slope Dip Direction	124
Friction Angle	28°
Lateral Limits	30°

	Critical	Total	%
Flexural Toppling (All)	8	105	7.62%
Flexural Toppling (Set 3: J3)	1	30	3.33%
Flexural Toppling (Set 5: J5)	6	6	100.00%
Flexural Toppling (Set 8: J8)	1	11	9.09%

Plot Mode	Pole Vectors
Vector Count	105 (105 Entries)
Hemisphere	Lower
Projection	Equal Angle

Project

Brewer-Eddington I-395/Route 9 Connector

Analysis Description

Clewleyville Road BH Logging (Approach Borings) - Toppling

Drawn By

J. Rawlins

Company

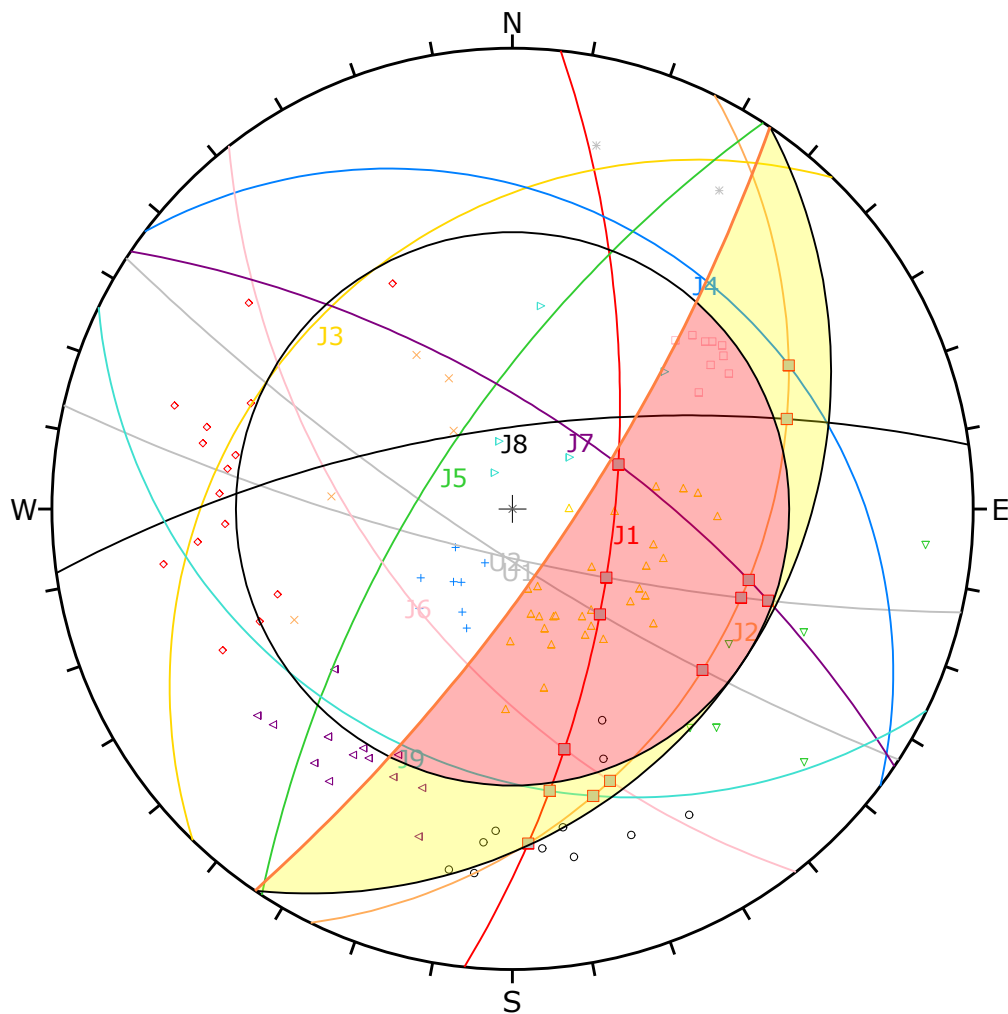
Haley & Aldrich, Inc.

Date

June 2021

File Name

2021-0513_Clewleyville Approach borings.dips8



Symbol	FEATURE	Quantity
◇	J1	15
×	J2	5
△	J3	30
+	J4	8
▽	J5	6
□	J6	9
◁	J7	14
○	J8	11
▷	J9	5
*	U	2
Symbol	Feature	
■	Critical Intersection	

Kinematic Analysis	Wedge Sliding		
Slope Dip	76		
Slope Dip Direction	124		
Friction Angle	28°		
	Critical	Total	%
Wedge Sliding	14	55	25.45%

	Color	Dip	Dip Direction	Label
User Planes				
1	■	78	193	U1
2	■	79	213	U2
Mean Set Planes				
1m	■	65	96	J1
2m	■	34	116	J2
3m	■	29	314	J3
4m	■	24	37	J4
5m	■	69	303	J5
6m	■	57	232	J6
7m	■	66	34	J7
8m	■	70	352	J8
9m	■	31	206	J9

Plot Mode	Pole Vectors
Vector Count	105 (105 Entries)
Intersection Mode	User and Mean Set Planes
Intersections Count	55
Hemisphere	Lower
Projection	Equal Angle

Project

Brewer-Eddington I-395/Route 9 Connector

Analysis Description

Clewleyville Road BH Logging (Approach Borings) - Wedge Sliding

Drawn By

J. Rawlins

Company

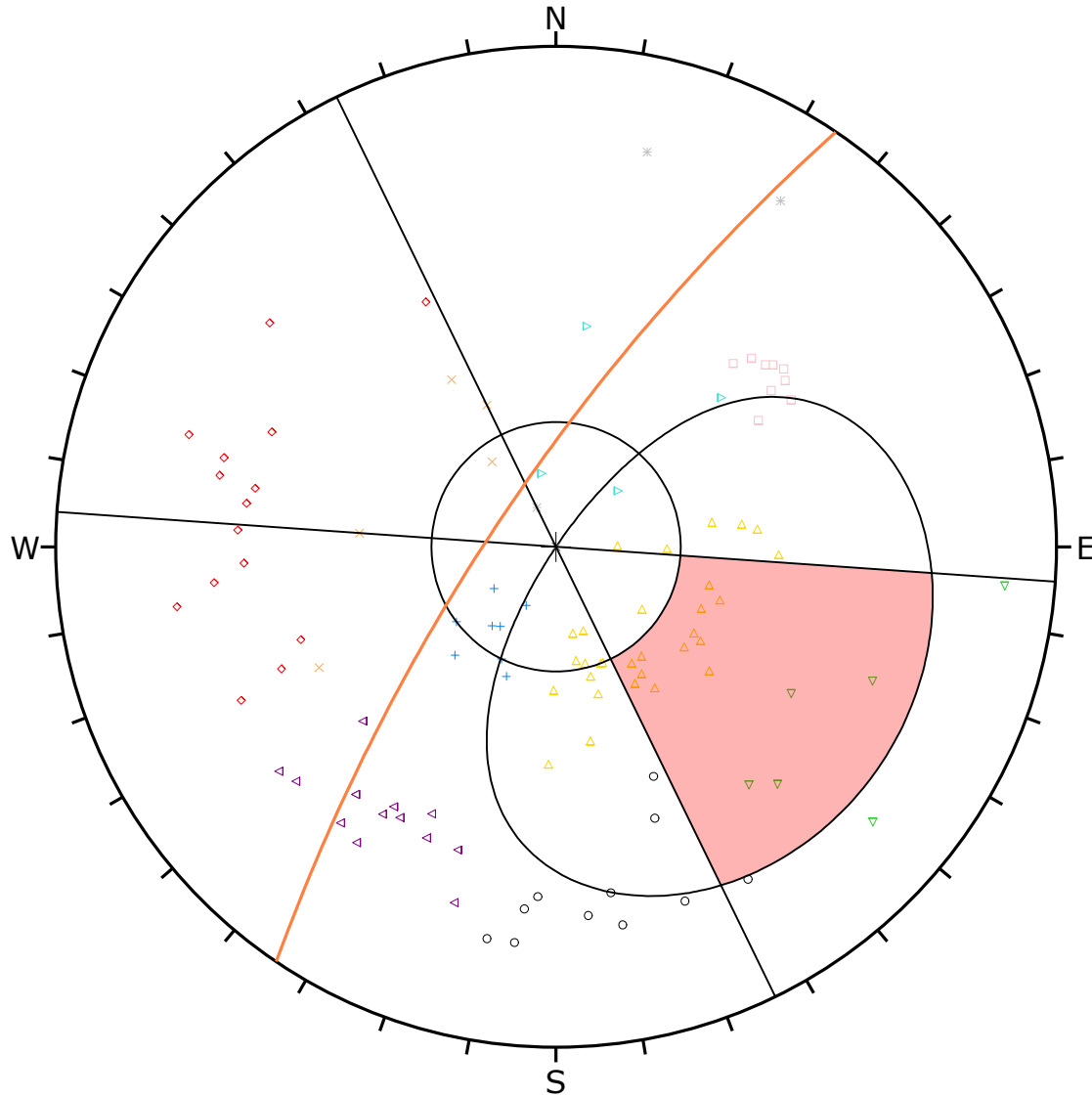
Haley & Aldrich, Inc.

Date

June 2021

File Name

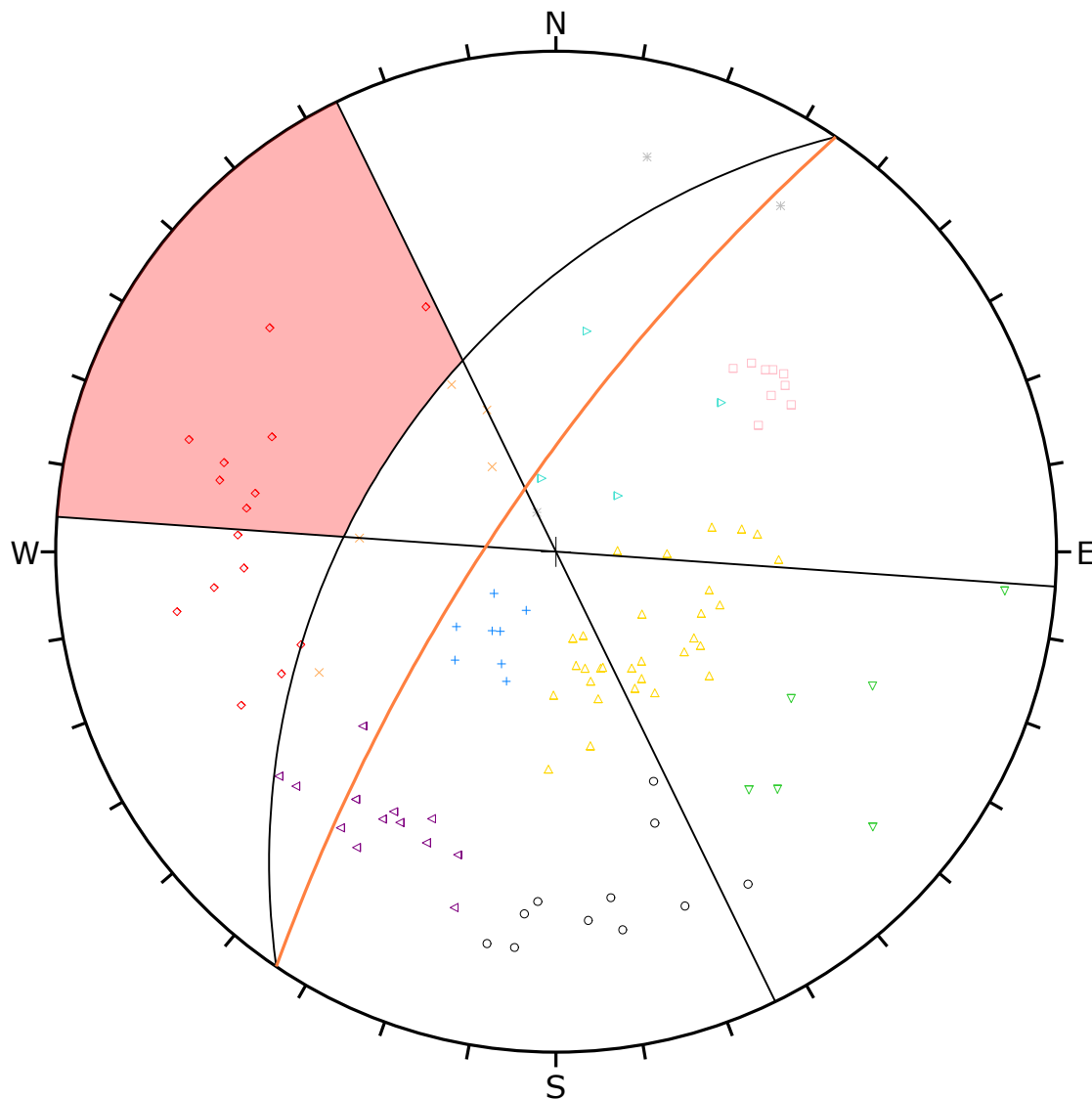
2021-0517_Clewleyville approach_wedge.dips8



Symbol	FEATURE	Quantity
◇	J1	15
×	J2	5
△	J3	30
+	J4	8
▽	J5	6
□	J6	9
◁	J7	14
○	J8	11
▷	J9	4
*	U	3

Kinematic Analysis	Planar Sliding		
Slope Dip	76		
Slope Dip Direction	304		
Friction Angle	28°		
Lateral Limits	30°		
	Critical	Total	%
Planar Sliding (All)	16	105	15.24%
Planar Sliding (Set 3: J3)	12	30	40.00%
Planar Sliding (Set 5: J5)	4	6	66.67%
Plot Mode	Pole Vectors		
Vector Count	105 (105 Entries)		
Hemisphere	Lower		
Projection	Equal Angle		

<i>Project</i>	Brewer-Eddington I-395/Route 9 Connector		
<i>Analysis Description</i>	Clewleyville Road BH Logging (Approach Borings) - Planar Sliding		
<i>Drawn By</i>	J. Rawlins	<i>Company</i>	Haley & Aldrich, Inc.
<i>Date</i>	June 2021	<i>File Name</i>	2021-0513_Clewleyville Approach borings.dips8



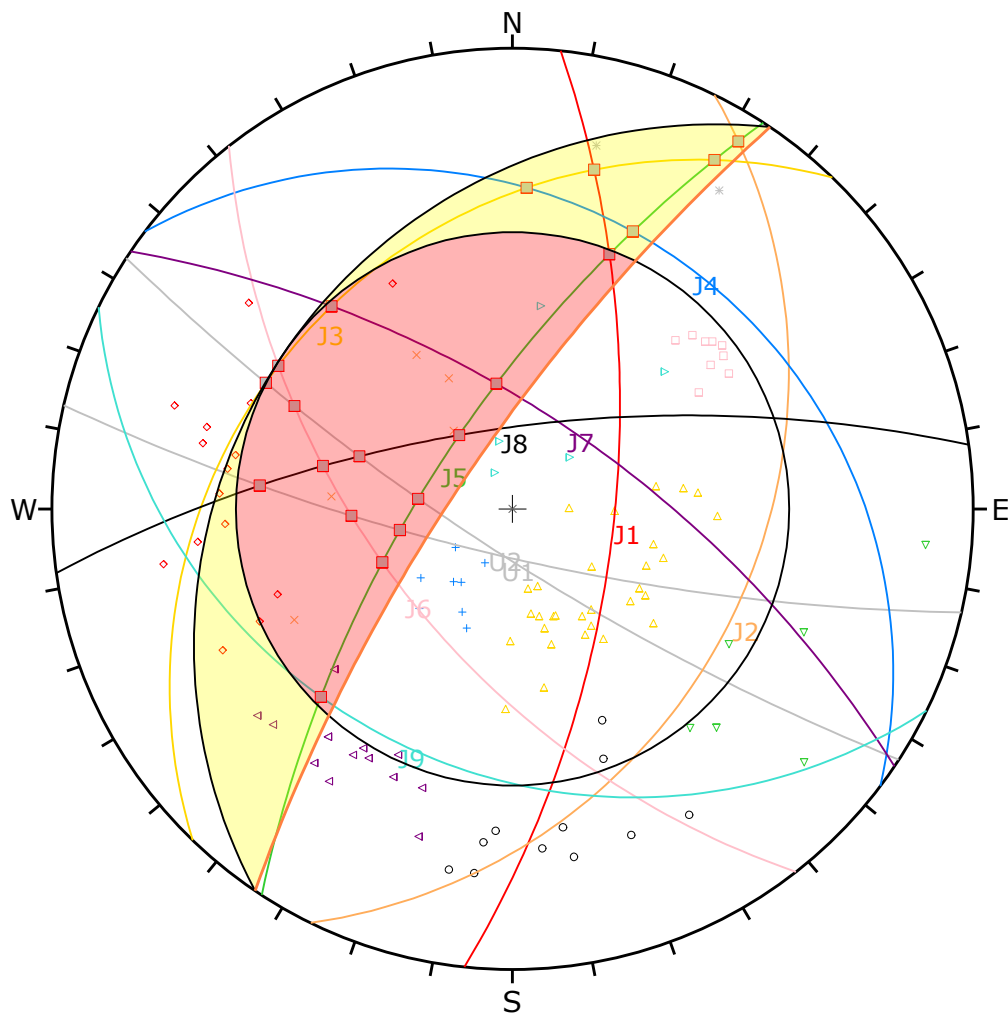
Symbol	FEATURE	Quantity
◇	J1	15
×	J2	5
△	J3	30
+	J4	8
▽	J5	6
□	J6	9
▵	J7	14
○	J8	11
▴	J9	4
*	U	3

Kinematic Analysis	Flexural Toppling
Slope Dip	76
Slope Dip Direction	304
Friction Angle	28°
Lateral Limits	30°

	Critical	Total	%
Flexural Toppling (All)	8	105	7.62%
Flexural Toppling (Set 1: J1)	8	15	53.33%

Plot Mode	Pole Vectors
Vector Count	105 (105 Entries)
Hemisphere	Lower
Projection	Equal Angle

Project	Brewer-Eddington I-395/Route 9 Connector		
Analysis Description	Clewleyville Road BH Logging (Approach Borings) - Toppling		
Drawn By	J. Rawlins	Company	Haley & Aldrich, Inc.
Date	June 2021	File Name	2021-0513_Clewleyville Approach borings.dips8



Symbol	FEATURE	Quantity
◇	J1	15
×	J2	5
△	J3	30
+	J4	8
▽	J5	6
□	J6	9
◁	J7	14
○	J8	11
▷	J9	5
*	U	2
Symbol	Feature	
■	Critical Intersection	

Kinematic Analysis	Wedge Sliding		
Slope Dip	76		
Slope Dip Direction	304		
Friction Angle	28°		
	Critical	Total	%
Wedge Sliding	20	55	36.36%

	Color	Dip	Dip Direction	Label
User Planes				
1	■	78	193	U1
2	■	79	213	U2
Mean Set Planes				
1m	■	65	96	J1
2m	■	34	116	J2
3m	■	29	314	J3
4m	■	24	37	J4
5m	■	69	303	J5
6m	■	57	232	J6
7m	■	66	34	J7
8m	■	70	352	J8
9m	■	31	206	J9

Plot Mode	Pole Vectors
Vector Count	105 (105 Entries)
Intersection Mode	User and Mean Set Planes
Intersections Count	55
Hemisphere	Lower
Projection	Equal Angle

Project

Brewer-Eddington I-395/Route 9 Connector

Analysis Description

Clewleyville Road BH Logging (Approach Borings) - Wedge Sliding

Drawn By

J. Rawlins

Company

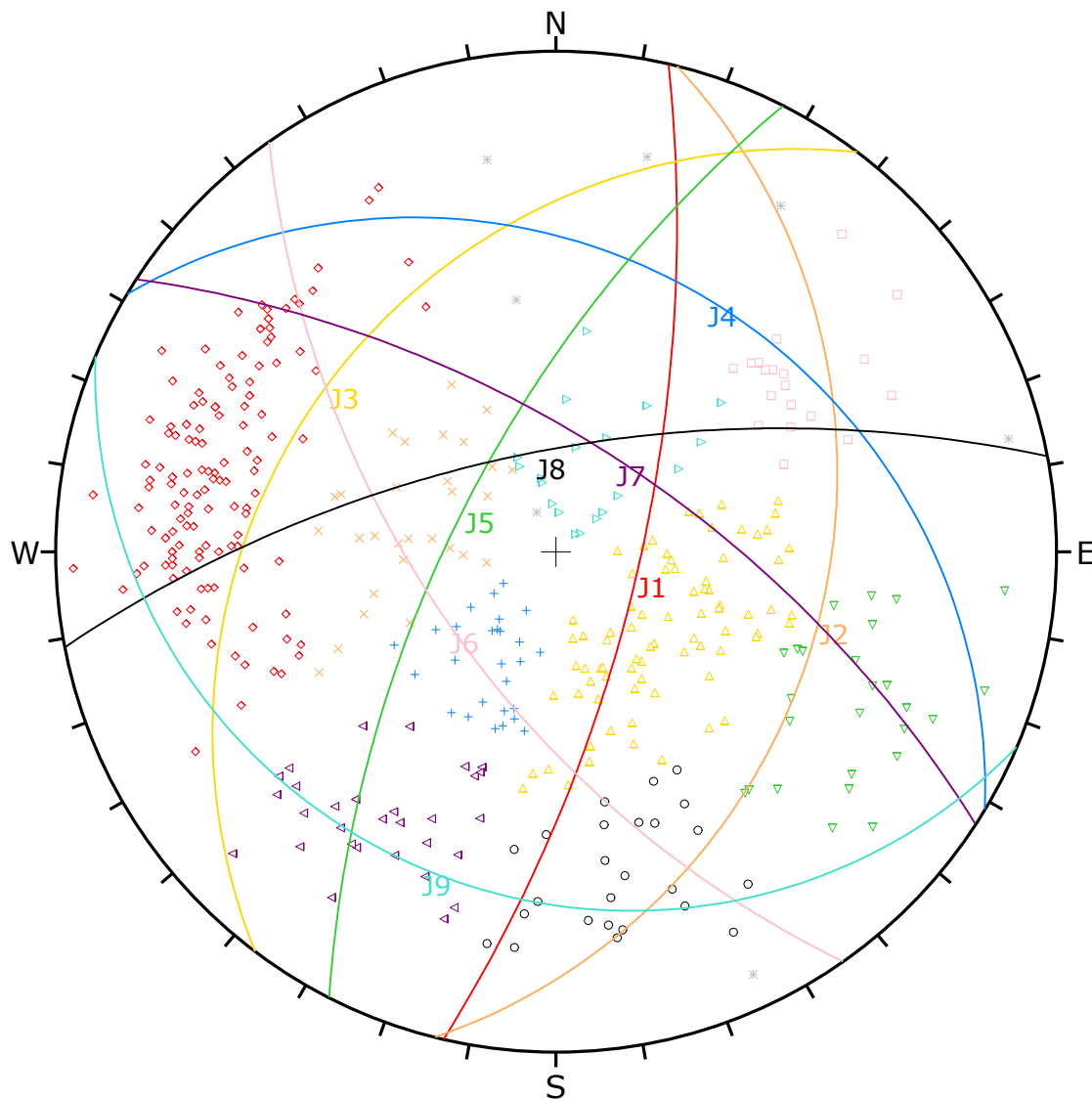
Haley & Aldrich, Inc.

Date

June 2021

File Name

2021-0517_Clewleyville approach_wedge.dips8



Symbol	FEATURE	Quantity
◇	J1	133
×	J2	29
△	J3	77
+	J4	27
▽	J5	26
□	J6	19
◁	J7	31
○	J8	25
▷	J9	19
*	U	7

	Color	Dip	Dip Direction	Label
Mean Set Planes				
1m	Red	71	103	J1
2m	Orange	33	104	J2
3m	Yellow	31	307	J3
4m	Blue	29	31	J4
5m	Green	67	297	J5
6m	Pink	61	235	J6
7m	Purple	65	33	J7
8m	Black	67	349	J8
9m	Cyan	21	203	J9

Plot Mode	Pole Vectors
Vector Count	393 (393 Entries)
Hemisphere	Lower
Projection	Equal Angle

Project

Brewer-Eddington I-395/Route 9 Connector

Analysis Description

Clewleyville Road BH Logging

Drawn By

J. Rawlins

Company

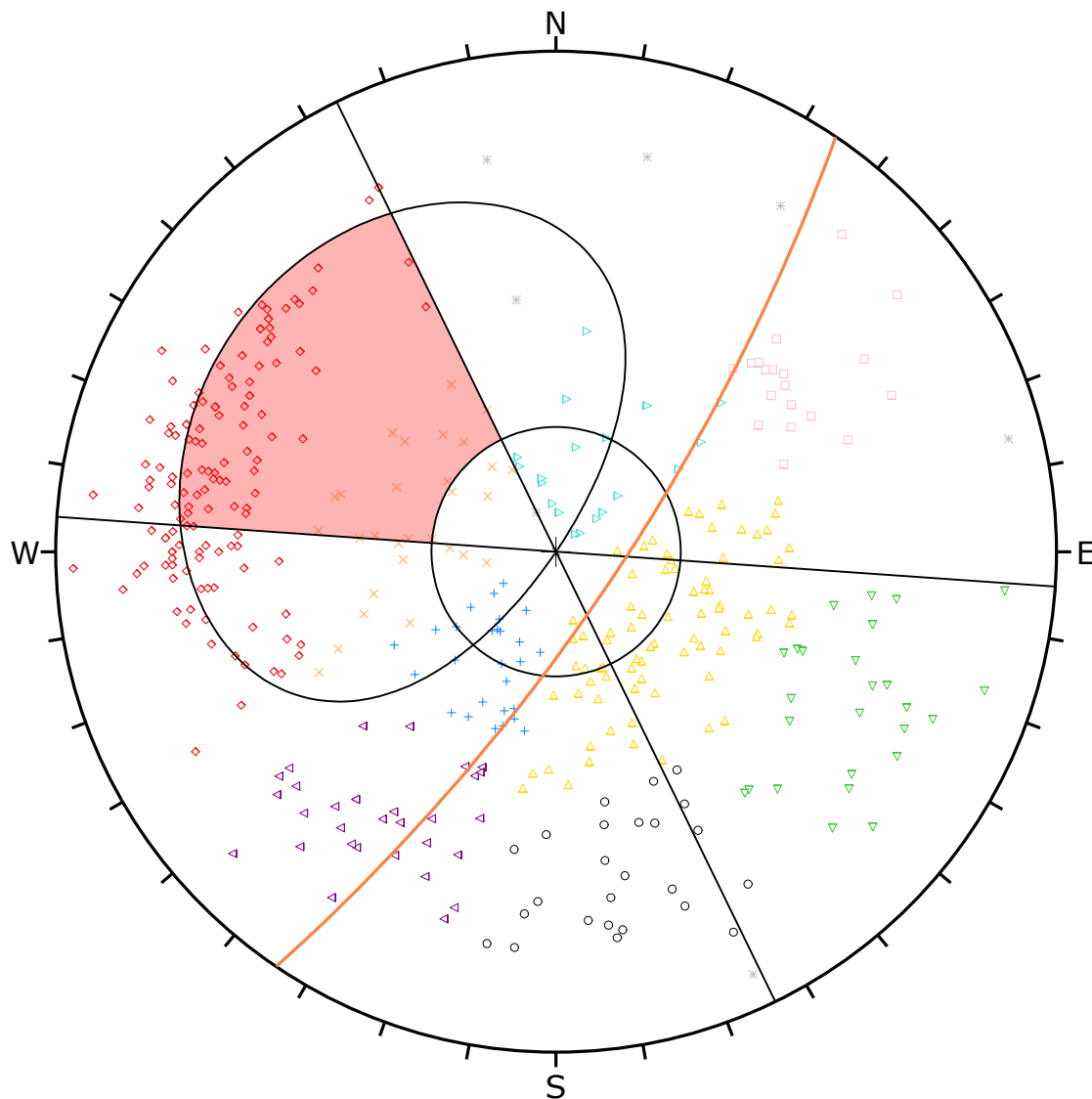
Haley & Aldrich, Inc.

Date

June 2021

File Name

2021-0409_Clewleyville borings.dips8



Symbol	FEATURE	Quantity
◇	J1	133
×	J2	29
△	J3	77
+	J4	27
▽	J5	26
□	J6	19
△	J7	31
○	J8	25
▽	J9	19
*	U	7

Kinematic Analysis	Planar Sliding		
Slope Dip	76		
Slope Dip Direction	124		
Friction Angle	28°		
Lateral Limits	30°		
	Critical	Total	%
Planar Sliding (All)	81	393	20.61%
Planar Sliding (Set 1: J1)	66	133	49.62%
Planar Sliding (Set 2: J2)	15	29	51.72%

Plot Mode	Pole Vectors
Vector Count	393 (393 Entries)
Hemisphere	Lower
Projection	Equal Angle

Project

Brewer-Eddington I-395/Route 9 Connector

Analysis Description

Clewleyville Road BH Logging - Planar Sliding

Drawn By

J. Rawlins

Company

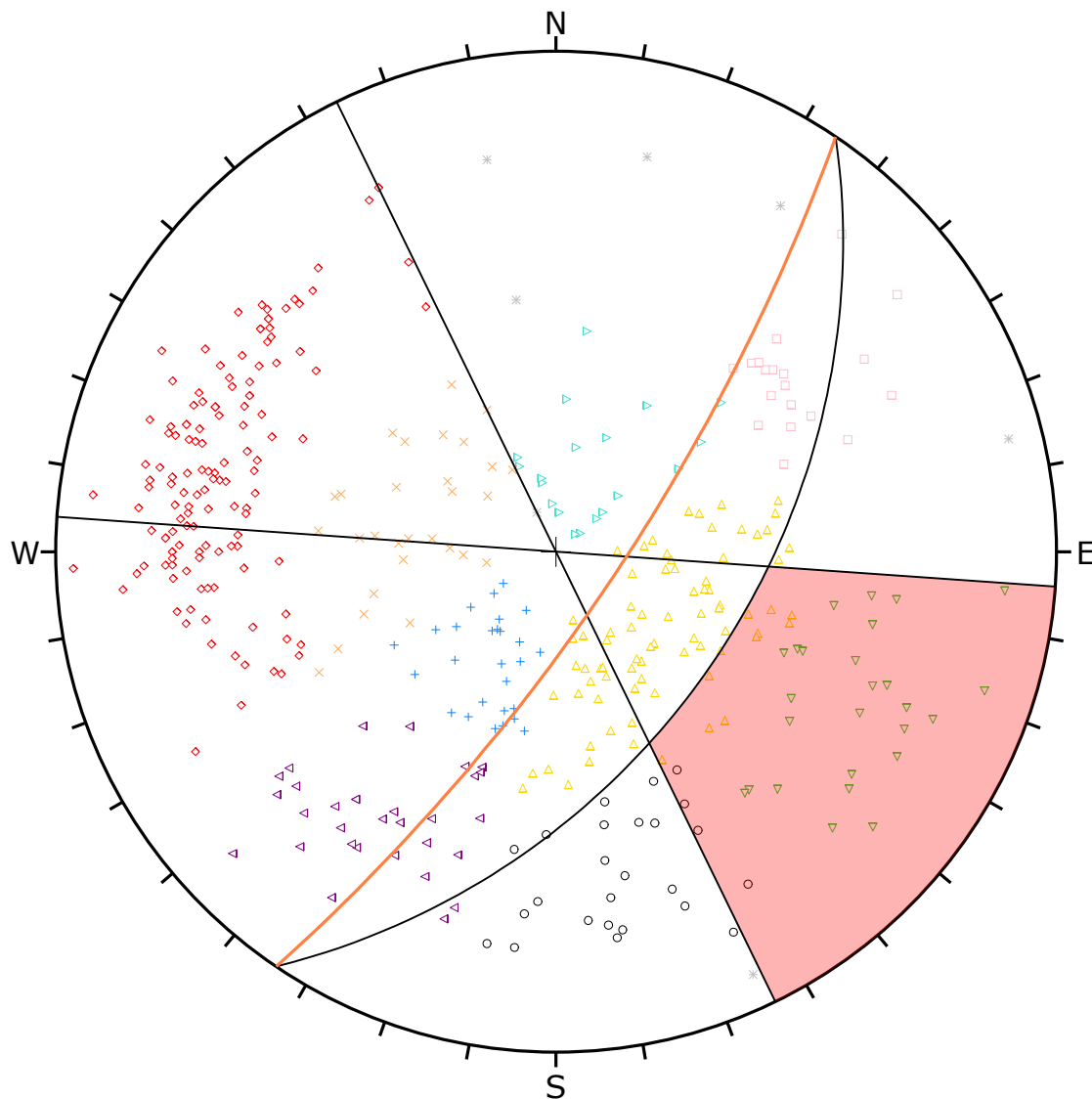
Haley & Aldrich, Inc.

Date

June 2021

File Name

2021-0409_Clewleyville borings.dips8



Symbol	FEATURE	Quantity
◇	J1	133
×	J2	29
△	J3	77
+	J4	27
▽	J5	26
□	J6	19
△	J7	31
○	J8	25
△	J9	19
*	U	7

Kinematic Analysis	Flexural Toppling
Slope Dip	76
Slope Dip Direction	124
Friction Angle	28°
Lateral Limits	30°

	Critical	Total	%
Flexural Toppling (All)	40	393	10.18%
Flexural Toppling (Set 3: J3)	8	75	10.67%
Flexural Toppling (Set 5: J5)	28	28	100.00%
Flexural Toppling (Set 8: J8)	4	25	16.00%

Plot Mode	Pole Vectors
Vector Count	393 (393 Entries)
Hemisphere	Lower
Projection	Equal Angle

Project

Brewer-Eddington I-395/Route 9 Connector

Analysis Description

Clewleyville Road BH Logging - Toppling

Drawn By

J. Rawlins

Company

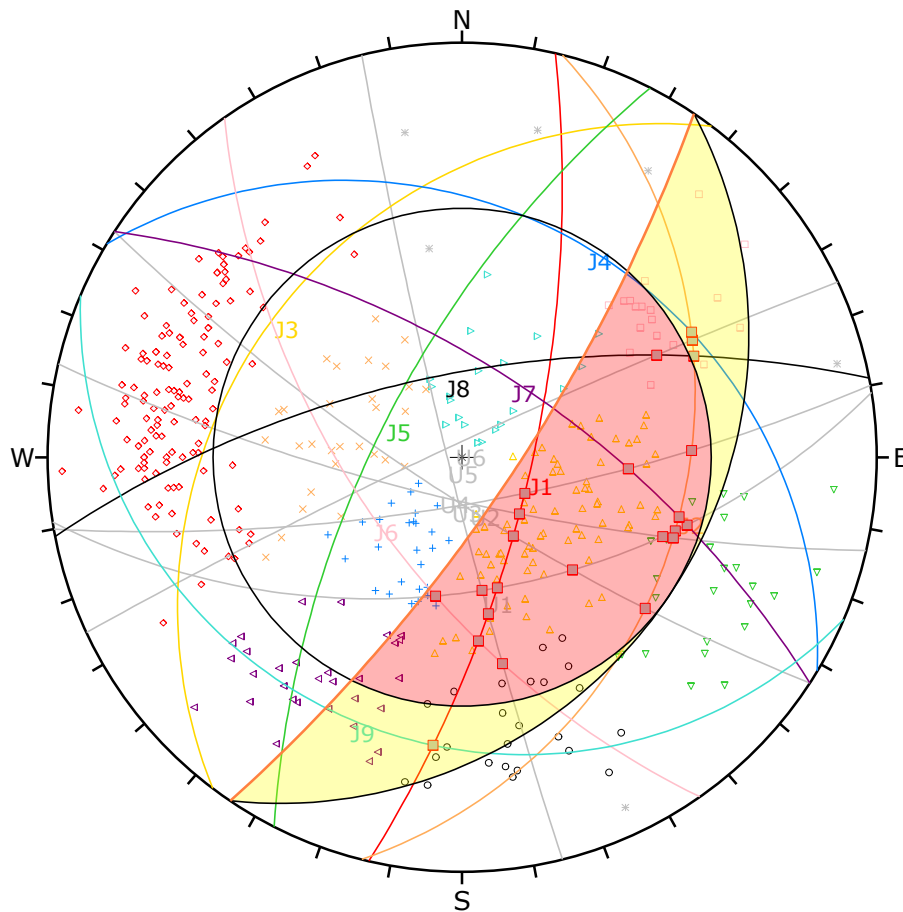
Haley & Aldrich, Inc.

Date

June 2021

File Name

2021-0409_Clewleyville borings.dips8



Symbol	FEATURE	Quantity
◇	J1	133
×	J2	29
△	J3	77
+	J4	27
▽	J5	26
□	J6	19
◀	J7	31
○	J8	25
▶	J9	20
*	U	6

Symbol	Feature
■	Critical Intersection

Kinematic Analysis	Wedge Sliding		
Slope Dip	76		
Slope Dip Direction	124		
Friction Angle	28°		
	Critical	Total	%
Wedge Sliding	23	105	21.90%

	Color	Dip	Dip Direction	Label
User Planes				
1	■	54	171	U1
2	■	77	170	U2
3	■	78	193	U3
4	■	79	213	U4
5	■	86	256	U5
6	■	86	335	U6
Mean Set Planes				
1m	■	71	103	J1
2m	■	33	104	J2
3m	■	31	307	J3
4m	■	29	31	J4
5m	■	67	297	J5
6m	■	61	235	J6
7m	■	65	33	J7
8m	■	67	349	J8
9m	■	21	203	J9

Plot Mode	Pole Vectors
Vector Count	393 (393 Entries)
Intersection Mode	User and Mean Set Planes
Intersections Count	105
Hemisphere	Lower
Projection	Equal Angle

Project

Brewer-Eddington I-395/Route 9 Connector

Analysis Description

Clewleyville Road BH Logging - Wedge Sliding

Drawn By

J. Rawlins

Company

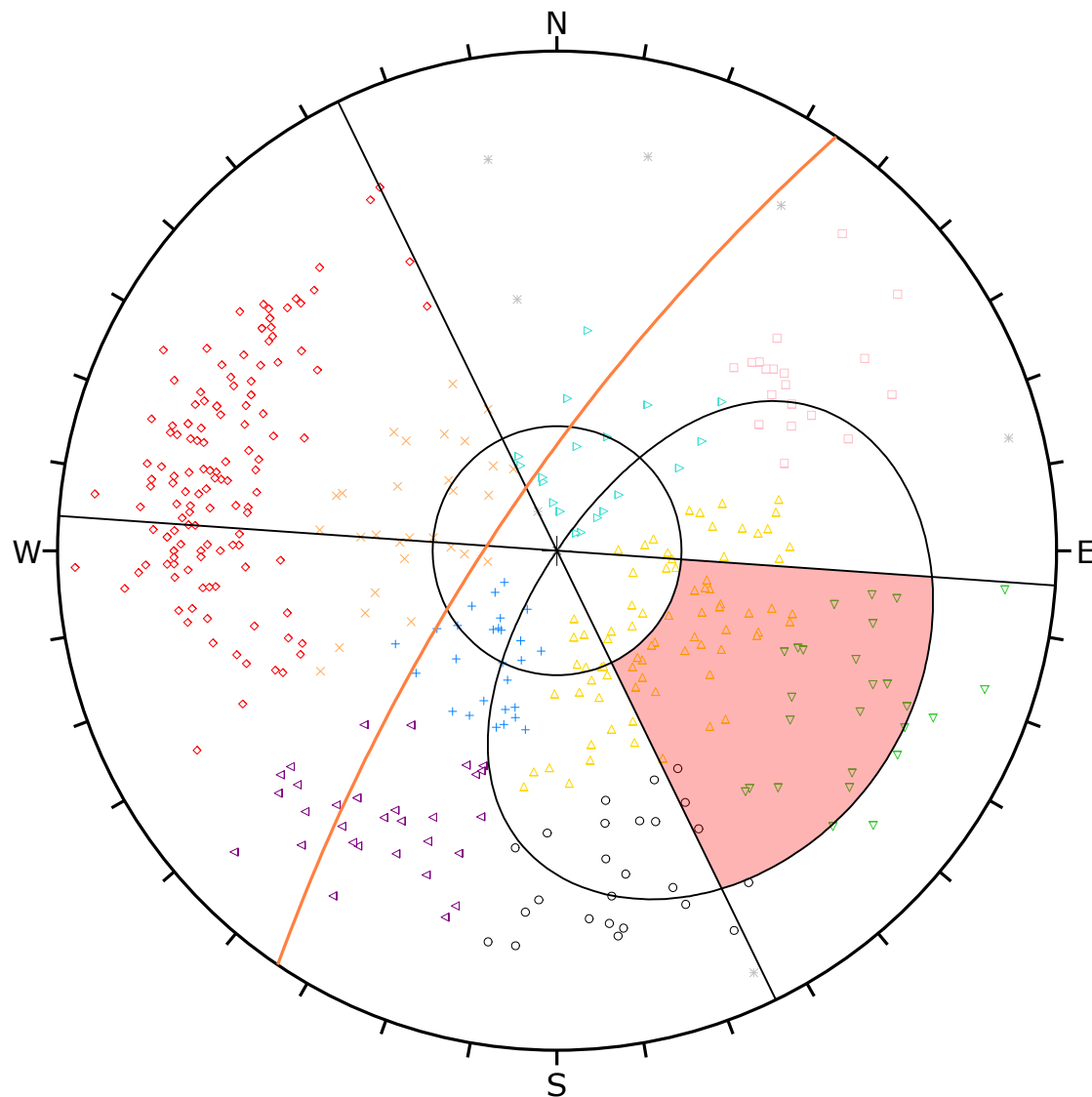
Haley & Aldrich, Inc.

Date

June 2021

File Name

2021-0409_Clewleyville borings_wedge.dips8



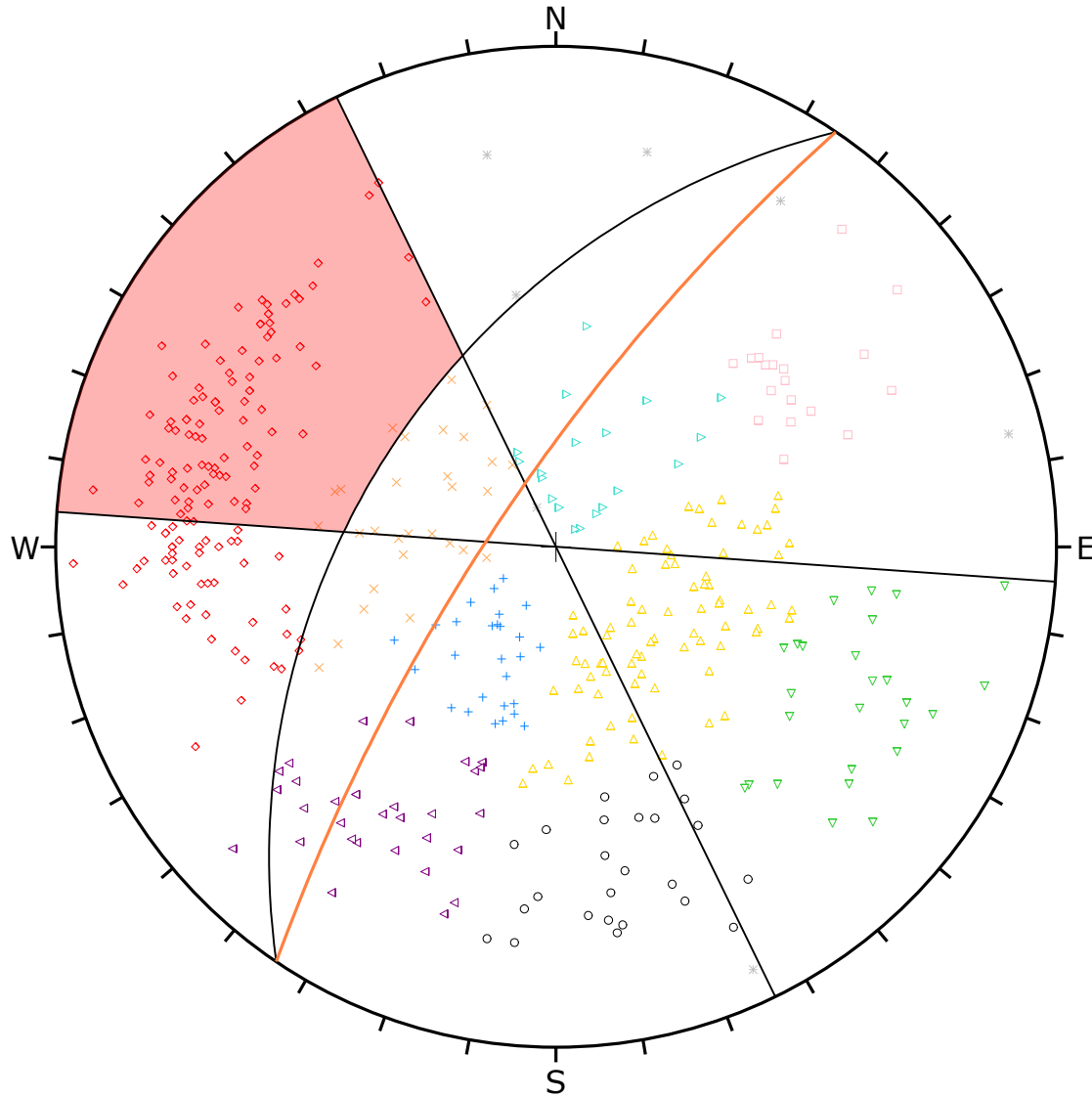
Symbol	FEATURE	Quantity
◇	J1	133
×	J2	29
△	J3	77
+	J4	27
▽	J5	26
□	J6	19
△	J7	31
○	J8	25
△	J9	19
*	U	7

Kinematic Analysis	Planar Sliding
Slope Dip	76
Slope Dip Direction	304
Friction Angle	28°
Lateral Limits	30°

	Critical	Total	%
Planar Sliding (All)	53	393	13.49%
Planar Sliding (Set 3: J3)	29	75	38.67%
Planar Sliding (Set 5: J5)	21	28	75.00%
Planar Sliding (Set 8: J8)	3	25	12.00%

Plot Mode	Pole Vectors
Vector Count	393 (393 Entries)
Hemisphere	Lower
Projection	Equal Angle

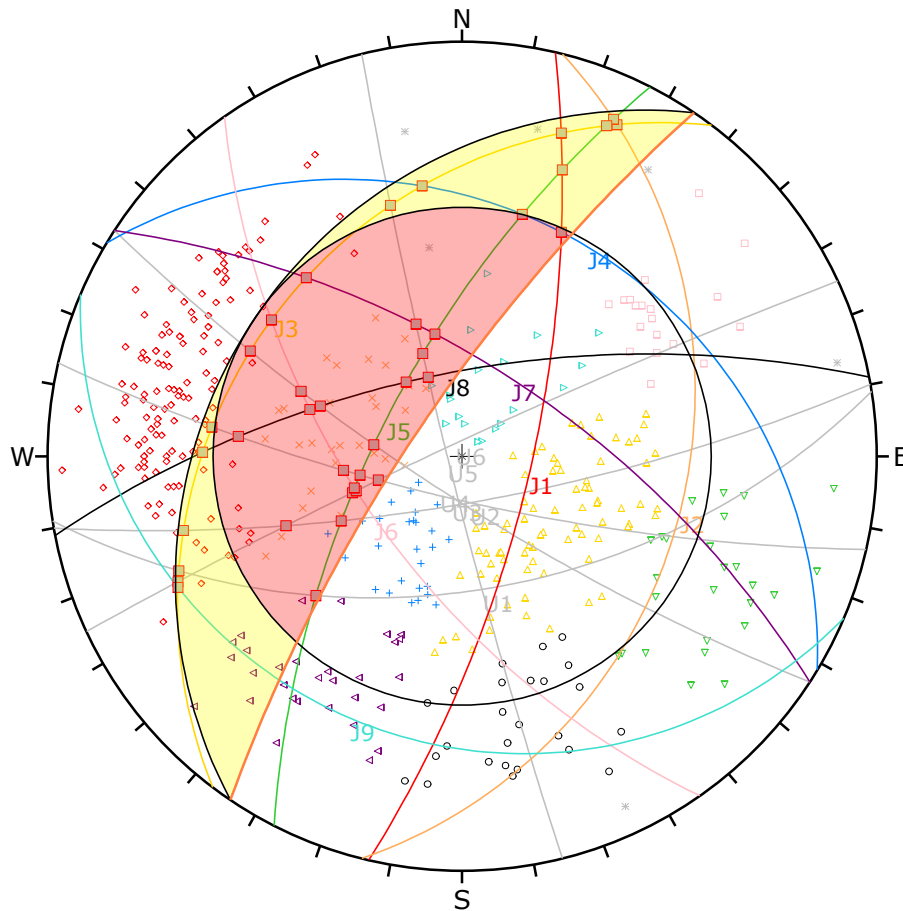
Project	Brewer-Eddington I-395/Route 9 Connector		
Analysis Description	Clewleyville Road BH Logging - Planar Sliding		
Drawn By	J. Rawlins	Company	Haley & Aldrich, Inc.
Date	June 2021	File Name	2021-0409_Clewleyville borings.dips8



Symbol	FEATURE	Quantity
◇	J1	133
×	J2	29
△	J3	77
+	J4	27
▽	J5	26
□	J6	19
△	J7	31
○	J8	25
△	J9	19
*	U	7

Kinematic Analysis	Flexural Toppling		
Slope Dip	76		
Slope Dip Direction	304		
Friction Angle	28°		
Lateral Limits	30°		
	Critical	Total	%
Flexural Toppling (All)	93	393	23.66%
Flexural Toppling (Set 1: J1)	89	133	66.92%
Flexural Toppling (Set 2: J2)	4	29	13.79%
Plot Mode	Pole Vectors		
Vector Count	393 (393 Entries)		
Hemisphere	Lower		
Projection	Equal Angle		

<i>Project</i>	Brewer-Eddington I-395/Route 9 Connector		
<i>Analysis Description</i>	Clewleyville Road BH Logging - Toppling		
<i>Drawn By</i>	J. Rawlins	<i>Company</i>	Haley & Aldrich, Inc.
<i>Date</i>	June 2021	<i>File Name</i>	2021-0409_Clewleyville borings.dips8



Symbol	FEATURE	Quantity
◇	J1	133
×	J2	29
△	J3	77
+	J4	27
▽	J5	26
□	J6	19
△	J7	31
○	J8	25
▽	J9	20
*	U	6

Symbol	Feature
□	Critical Intersection

Kinematic Analysis	Wedge Sliding		
Slope Dip	76		
Slope Dip Direction	304		
Friction Angle	28°		
	Critical	Total	%
Wedge Sliding	37	105	35.24%

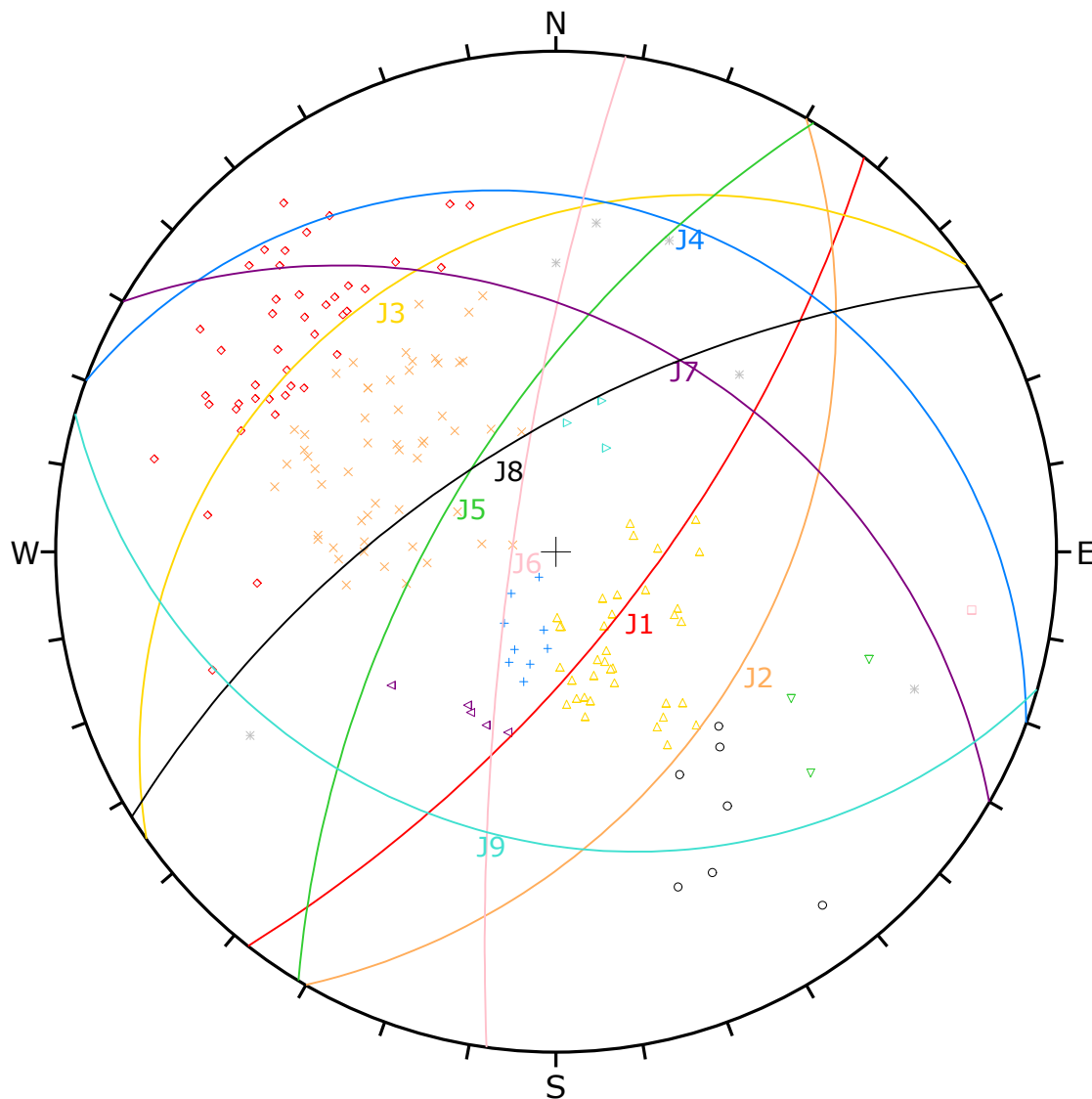
	Color	Dip	Dip Direction	Label
User Planes				
1	■	54	171	U1
2	■	77	170	U2
3	■	78	193	U3
4	■	79	213	U4
5	■	86	256	U5
6	■	86	335	U6
Mean Set Planes				
1m	■	71	103	J1
2m	■	33	104	J2
3m	■	31	307	J3
4m	■	29	31	J4
5m	■	67	297	J5
6m	■	61	235	J6
7m	■	65	33	J7
8m	■	67	349	J8
9m	■	21	203	J9

Plot Mode	Pole Vectors
Vector Count	393 (393 Entries)
Intersection Mode	User and Mean Set Planes
Intersections Count	105
Hemisphere	Lower
Projection	Equal Angle

<i>Project</i>	Brewer-Eddington I-395/Route 9 Connector		
<i>Analysis Description</i>	Clewleyville Road BH Logging - Wedge Sliding		
<i>Drawn By</i>	J. Rawlins	<i>Company</i>	Haley & Aldrich, Inc.
<i>Date</i>	June 2021	<i>File Name</i>	2021-0409_Clewleyville borings_wedge.dips8



OF 3										2										SHEET NUMBER																																																	
I-395 - ROUTE 9 CONNECTOR ROUTE 9 BREWER-EDDINGTON PENOBSCOT COUNTY																														PROJ. MANAGER DESIGN-DETAILED CHECKED-REVIEWED DESIGN2-DETAILED2 DESIGN3-DETAILED3										M. WIGHT E. FORCE E. FORCE W. CHAD *****										BY K. POST W. CHAD *****										DATE 3-31-20									
SITE AND SUBSURFACE EXPLORATION LOCATION PLAN																														REVISIONS 1 REVISIONS 2 REVISIONS 3 REVISIONS 4 FIELD CHANGES										P.E. NUMBER DATE										SIGNATURE																			

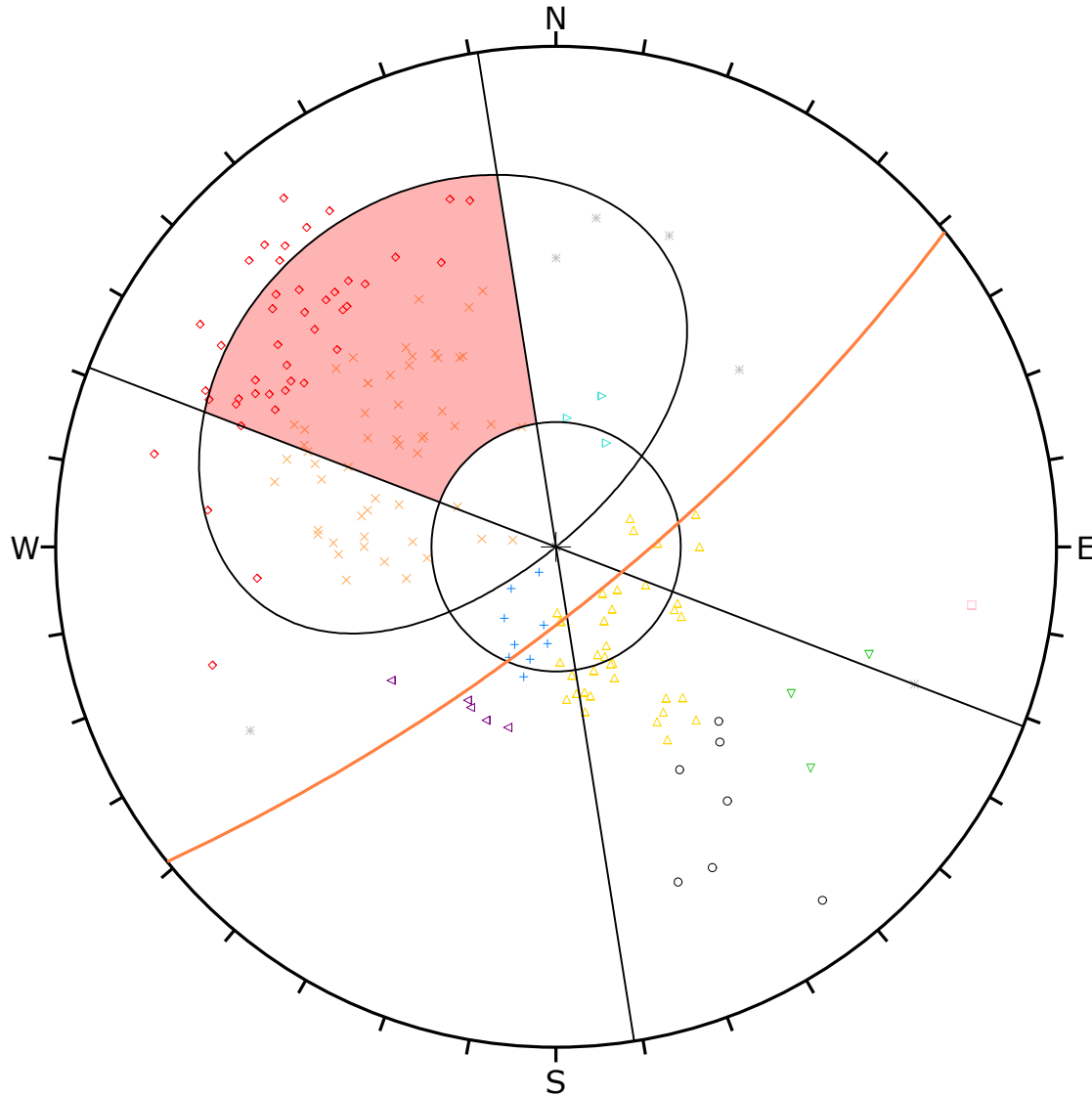


Symbol	FEATURE	Quantity
◇	J1	43
×	J2	54
△	J3	36
+	J4	9
▽	J5	3
□	J6	1
◀	J7	5
○	J8	7
▶	J9	3
*	U	6

	Color	Dip	Dip Direction	Label
Mean Set Planes				
1m	Red	70	128	J1
2m	Orange	43	120	J2
3m	Yellow	26	325	J3
4m	Blue	20	20	J4
5m	Green	64	301	J5
6m	Pink	80	278	J6
7m	Purple	41	30	J7
8m	Black	64	328	J8
9m	Cyan	30	196	J9

Plot Mode	Pole Vectors
Vector Count	167 (167 Entries)
Hemisphere	Lower
Projection	Equal Angle

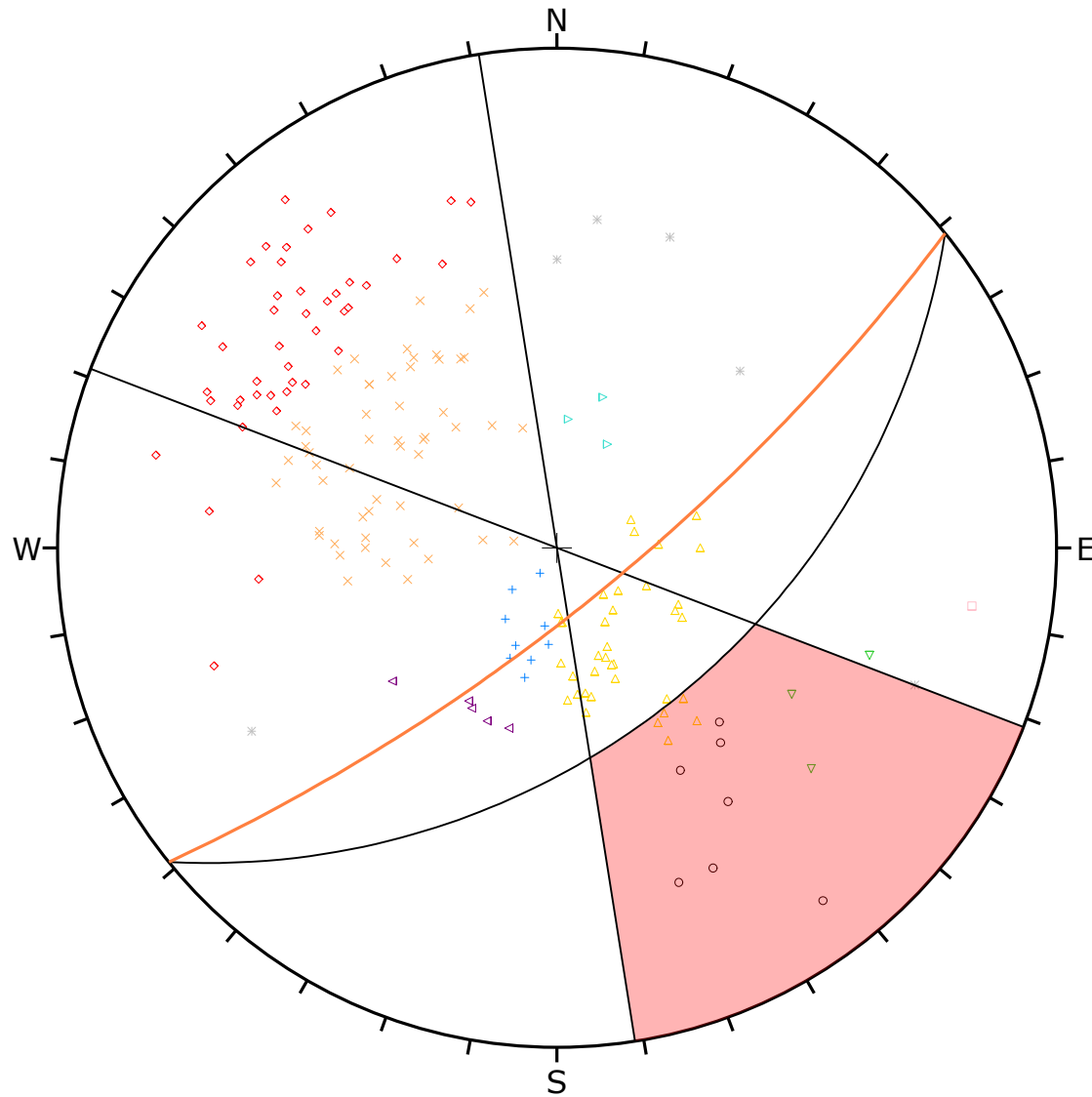
Project	Brewer-Eddington I-395/Route 9 Connector		
Analysis Description	Levenseller Road BH Logging (Approach Borings)		
Drawn By	J. Rawlins	Company	Haley & Aldrich, Inc.
Date	June 2021	File Name	2021-0513_Levenseller Approach borings.dips8



Symbol	FEATURE	Quantity
◇	J1	43
×	J2	54
△	J3	36
+	J4	9
▽	J5	3
□	J6	1
◁	J7	5
○	J8	7
▷	J9	3
*	U	6

Kinematic Analysis	Planar Sliding		
Slope Dip	76		
Slope Dip Direction	141		
Friction Angle	28°		
Lateral Limits	30°		
	Critical	Total	%
Planar Sliding (All)	61	167	36.53%
Planar Sliding (Set 1: J1)	29	43	67.44%
Planar Sliding (Set 2: J2)	32	54	59.26%
Plot Mode	Pole Vectors		
Vector Count	167 (167 Entries)		
Hemisphere	Lower		
Projection	Equal Angle		

<i>Project</i>	Brewer-Eddington I-395/Route 9 Connector		
<i>Analysis Description</i>	Levenseller Road BH Logging (Approach Borings) - Planar Sliding		
<i>Drawn By</i>	J. Rawlins	<i>Company</i>	Haley & Aldrich, Inc.
<i>Date</i>	June 2021	<i>File Name</i>	2021-0513_Levenseller Approach borings.dips8



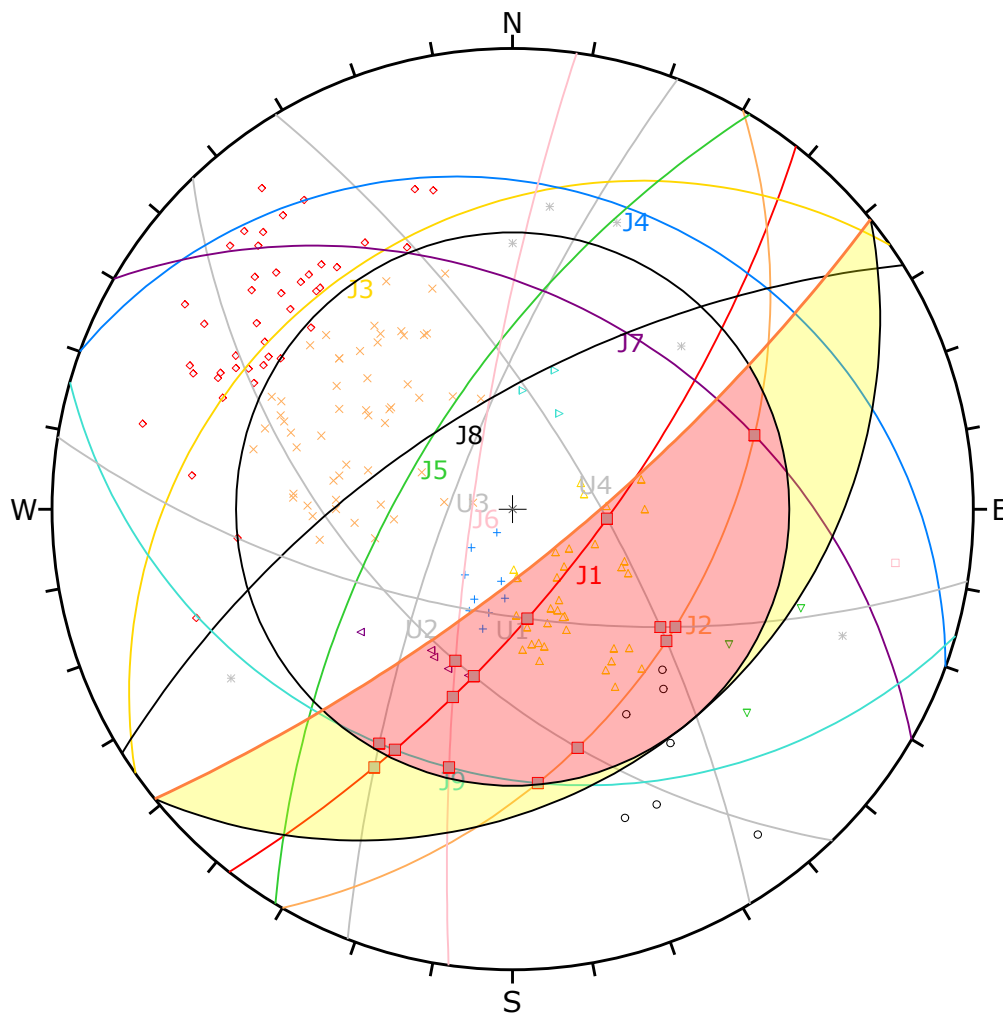
Symbol	FEATURE	Quantity
◇	J1	43
×	J2	54
△	J3	36
+	J4	9
▽	J5	3
□	J6	1
◁	J7	5
○	J8	7
▷	J9	3
*	U	6

Kinematic Analysis	Flexural Toppling
Slope Dip	76
Slope Dip Direction	141
Friction Angle	28°
Lateral Limits	30°

	Critical	Total	%
Flexural Toppling (All)	15	167	8.98%
Flexural Toppling (Set 3: J3)	5	36	13.89%
Flexural Toppling (Set 5: J5)	2	3	66.67%
Flexural Toppling (Set 8: J8)	7	7	100.00%

Plot Mode	Pole Vectors
Vector Count	167 (167 Entries)
Hemisphere	Lower
Projection	Equal Angle

Project	Brewer-Eddington I-395/Route 9 Connector		
Analysis Description	Levenseller Road BH Logging (Approach Borings) - Toppling		
Drawn By	J. Rawlins	Company	Haley & Aldrich, Inc.
Date	June 2021	File Name	2021-0513_Levenseller Approach borings.dips8



Symbol	FEATURE	Quantity
◇	J1	43
×	J2	54
△	J3	36
+	J4	9
▽	J5	3
□	J6	1
◁	J7	5
○	J8	7
▷	J9	3
*	U	6

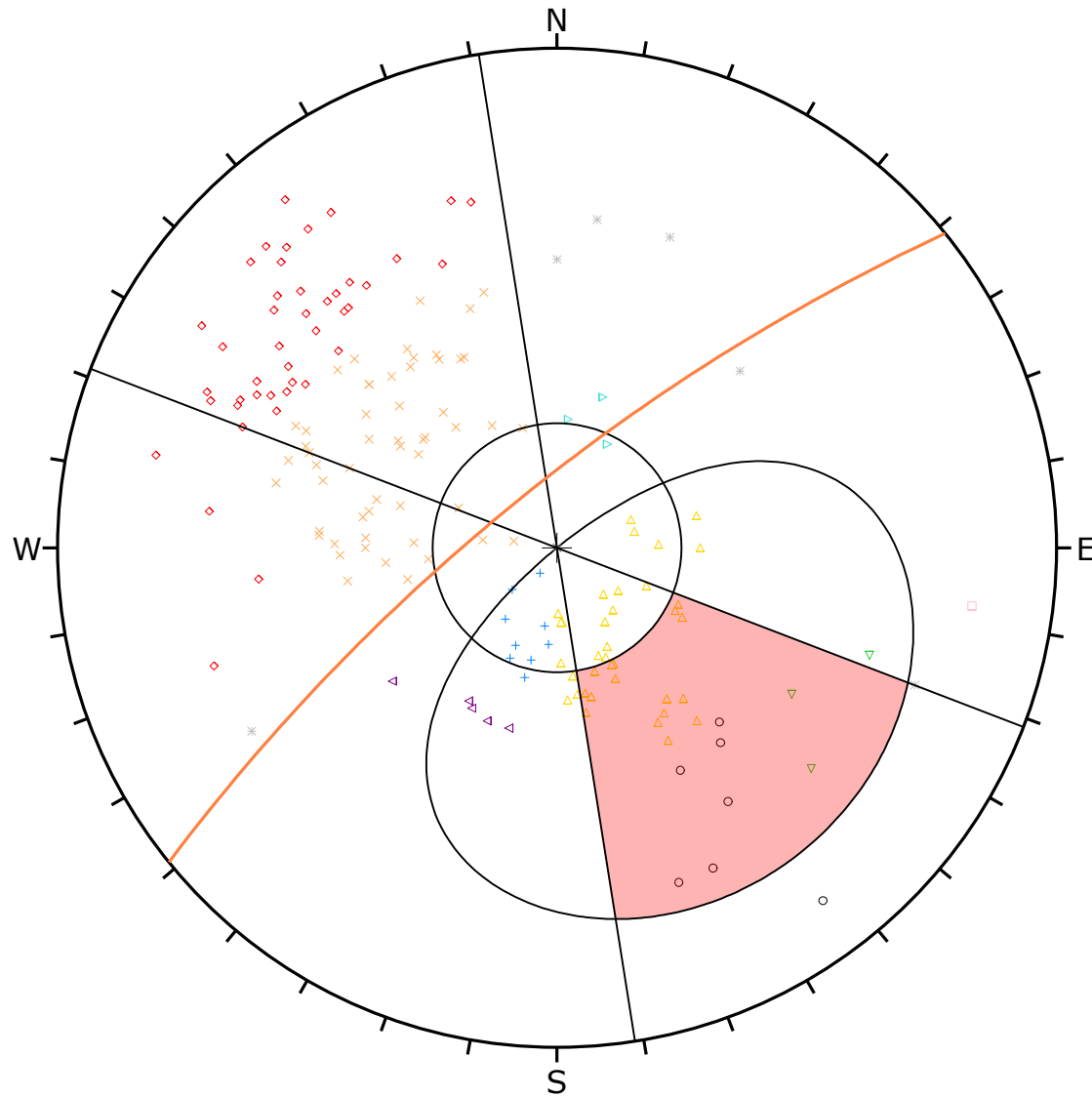
Symbol	Feature
■	Critical Intersection

Kinematic Analysis	Wedge Sliding		
Slope Dip	76		
Slope Dip Direction	141		
Friction Angle	28°		
	Critical	Total	%
Wedge Sliding	15	78	19.23%

	Color	Dip	Dip Direction	Label
User Planes				
1	■	54	226	U2
2	■	75	291	U3
3	■	71	59	U4
Mean Set Planes				
1m	■	70	128	J1
2m	■	43	120	J2
3m	■	26	325	J3
4m	■	20	20	J4
5m	■	64	301	J5
6m	■	80	278	J6
7m	■	41	30	J7
8m	■	64	328	J8
9m	■	30	196	J9
10m	■	64	189	U1

Plot Mode	Pole Vectors
Vector Count	167 (167 Entries)
Intersection Mode	User and Mean Set Planes
Intersections Count	78
Hemisphere	Lower
Projection	Equal Angle

<i>Project</i>	Brewer-Eddington I-395/Route 9 Connector		
<i>Analysis Description</i>	Levenseller Road BH Logging (Approach Borings) - Wedge Sliding		
<i>Drawn By</i>	J. Rawlins	<i>Company</i>	Haley & Aldrich, Inc.
<i>Date</i>	June 2021	<i>File Name</i>	2021-0517_Levenseller approach_wedge.dips8



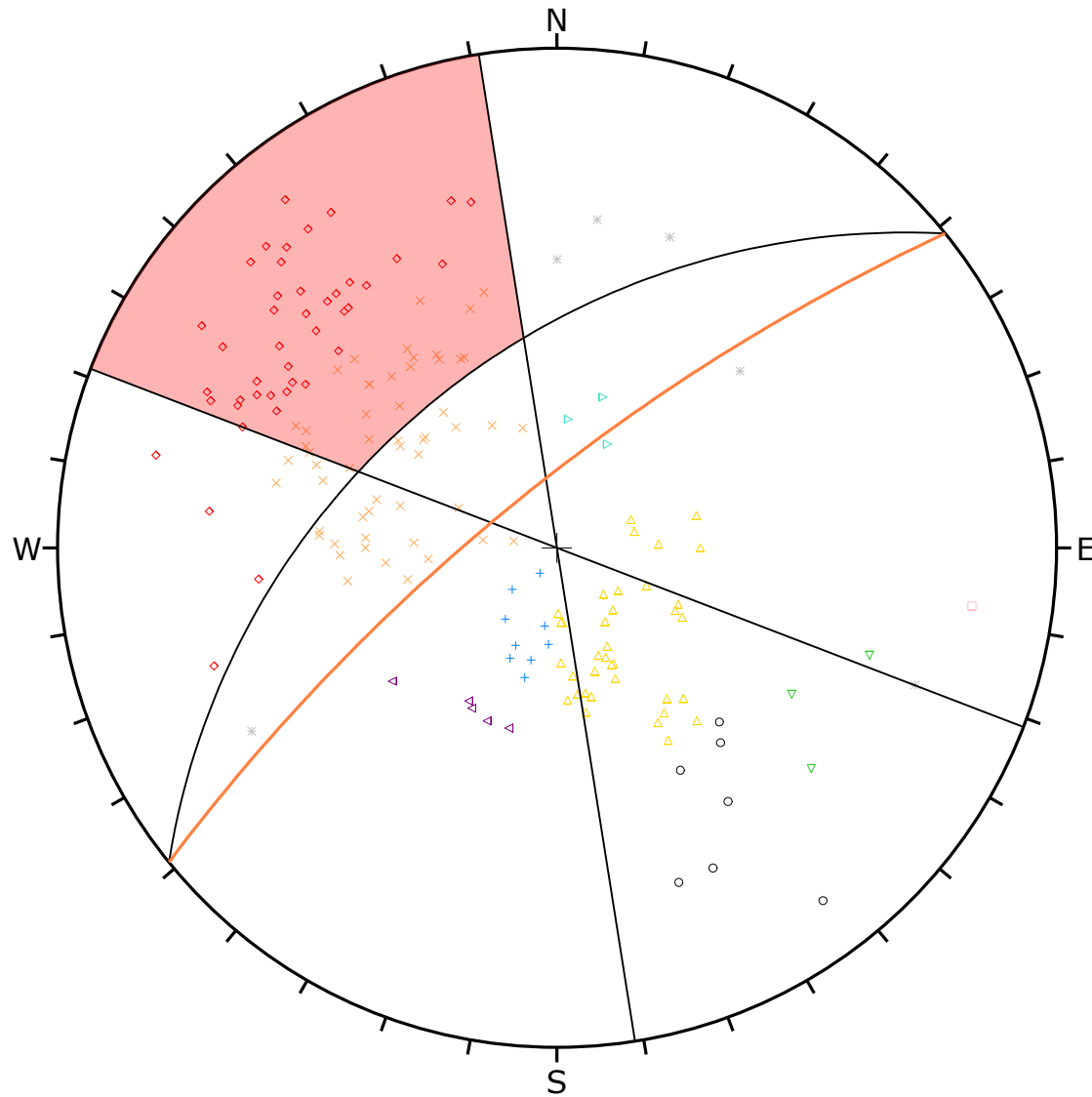
Symbol	FEATURE	Quantity
◇	J1	43
×	J2	54
△	J3	36
+	J4	9
▽	J5	3
□	J6	1
◁	J7	5
○	J8	7
▷	J9	3
*	U	6

Kinematic Analysis	Planar Sliding
Slope Dip	76
Slope Dip Direction	321
Friction Angle	28°
Lateral Limits	30°

	Critical	Total	%
Planar Sliding (All)	24	167	14.37%
Planar Sliding (Set 3: J3)	16	36	44.44%
Planar Sliding (Set 5: J5)	2	3	66.67%
Planar Sliding (Set 8: J8)	6	7	85.71%

Plot Mode	Pole Vectors
Vector Count	167 (167 Entries)
Hemisphere	Lower
Projection	Equal Angle

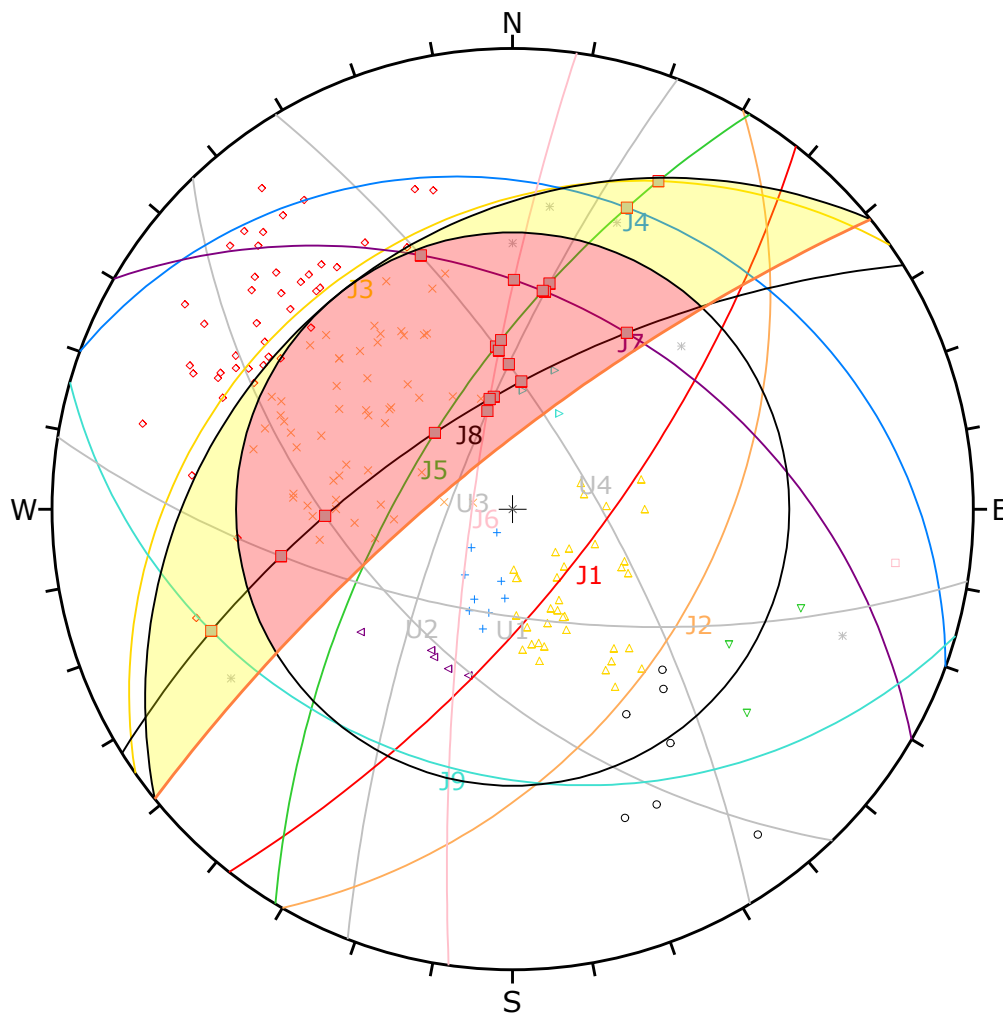
Project	Brewer-Eddington I-395/Route 9 Connector		
Analysis Description	Levenseller Road BH Logging (Approach Borings) - Planar Sliding		
Drawn By	J. Rawlins	Company	Haley & Aldrich, Inc.
Date	June 2021	File Name	2021-0513_Levenseller Approach borings.dips8



Symbol	FEATURE	Quantity
◇	J1	43
×	J2	54
△	J3	36
+	J4	9
▽	J5	3
□	J6	1
◀	J7	5
○	J8	7
▶	J9	3
*	U	6

Kinematic Analysis	Flexural Toppling		
Slope Dip	76		
Slope Dip Direction	321		
Friction Angle	28°		
Lateral Limits	30°		
	Critical	Total	%
Flexural Toppling (All)	62	167	37.13%
Flexural Toppling (Set 1: J1)	39	43	90.70%
Flexural Toppling (Set 2: J2)	23	54	42.59%
Plot Mode	Pole Vectors		
Vector Count	167 (167 Entries)		
Hemisphere	Lower		
Projection	Equal Angle		

<i>Project</i>	Brewer-Eddington I-395/Route 9 Connector		
<i>Analysis Description</i>	Levenseller Road BH Logging (Approach Borings) - Toppling		
<i>Drawn By</i>	J. Rawlins	<i>Company</i>	Haley & Aldrich, Inc.
<i>Date</i>	June 2021	<i>File Name</i>	2021-0513_Levenseller Approach borings.dips8



Symbol	FEATURE	Quantity
◇	J1	43
×	J2	54
△	J3	36
+	J4	9
▽	J5	3
□	J6	1
◁	J7	5
○	J8	7
▷	J9	3
*	U	6

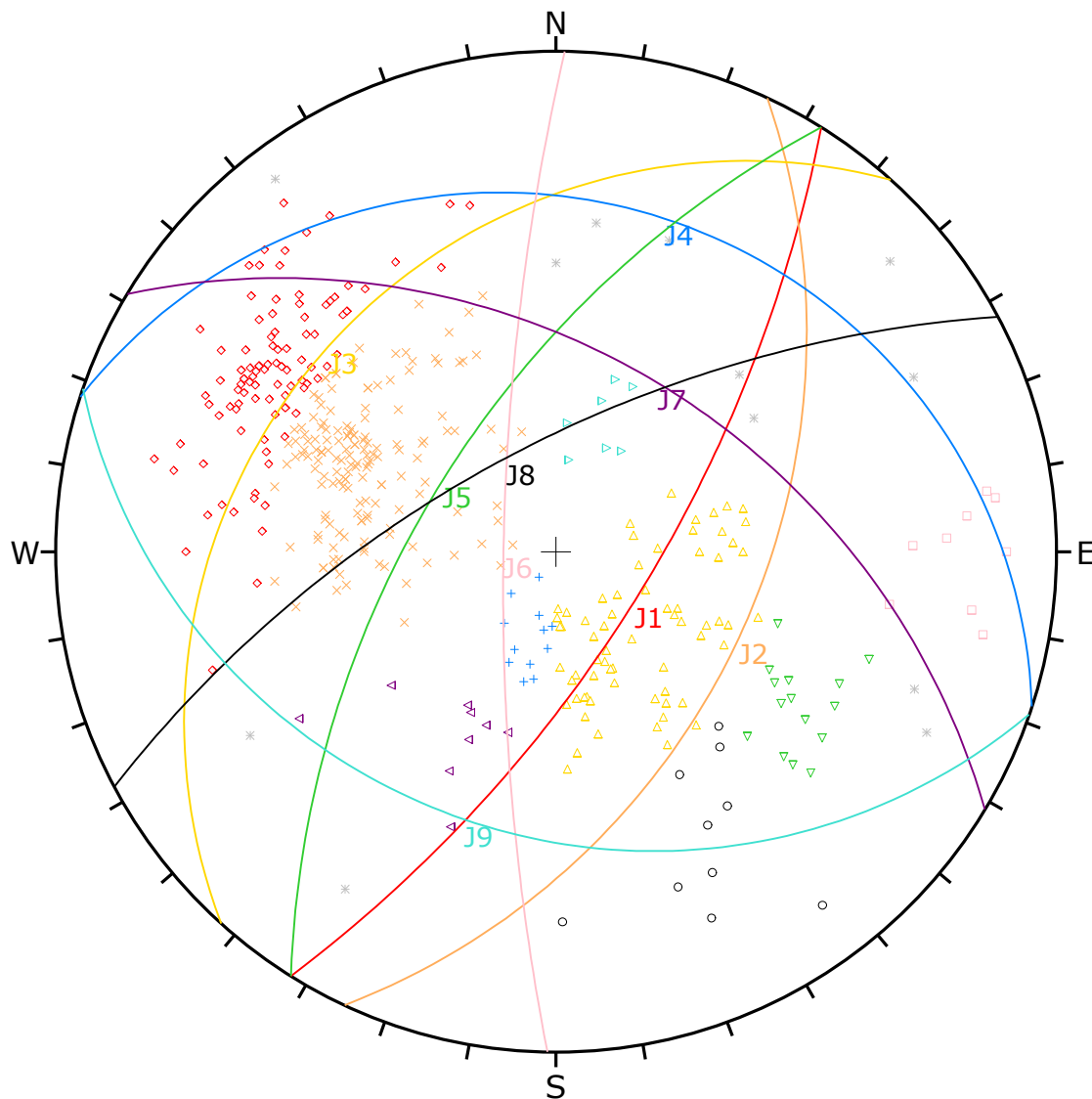
Symbol	Feature
■	Critical Intersection

Kinematic Analysis	Wedge Sliding		
Slope Dip	76		
Slope Dip Direction	321		
Friction Angle	28°		
	Critical	Total	%
Wedge Sliding	20	78	25.64%

	Color	Dip	Dip Direction	Label
User Planes				
1	■	54	226	U2
2	■	75	291	U3
3	■	71	59	U4
Mean Set Planes				
1m	■	70	128	J1
2m	■	43	120	J2
3m	■	26	325	J3
4m	■	20	20	J4
5m	■	64	301	J5
6m	■	80	278	J6
7m	■	41	30	J7
8m	■	64	328	J8
9m	■	30	196	J9
10m	■	64	189	U1

Plot Mode	Pole Vectors
Vector Count	167 (167 Entries)
Intersection Mode	User and Mean Set Planes
Intersections Count	78
Hemisphere	Lower
Projection	Equal Angle

<i>Project</i>	Brewer-Eddington I-395/Route 9 Connector		
<i>Analysis Description</i>	Levenseller Road BH Logging (Approach Borings) - Wedge Sliding		
<i>Drawn By</i>	J. Rawlins	<i>Company</i>	Haley & Aldrich, Inc.
<i>Date</i>	June 2021	<i>File Name</i>	2021-0517_Levenseller approach_wedge.dips8



Symbol	FEATURE	Quantity
◇	J1	101
×	J2	158
△	J3	67
+	J4	12
▽	J5	15
□	J6	9
◀	J7	9
○	J8	10
▶	J9	7
*	U	12

	Color	Dip	Dip Direction	Label
Mean Set Planes				
1m	Red	69	122	J1
2m	Orange	46	115	J2
3m	Yellow	27	312	J3
4m	Blue	20	18	J4
5m	Green	60	302	J5
6m	Pink	78	271	J6
7m	Purple	47	31	J7
8m	Black	66	332	J8
9m	Cyan	31	199	J9

Plot Mode	Pole Vectors
Vector Count	400 (400 Entries)
Hemisphere	Lower
Projection	Equal Angle

Project

Brewer-Eddington I-395/Route 9 Connector

Analysis Description

Levenseller Road BH Logging

Drawn By

J. Rawlins

Company

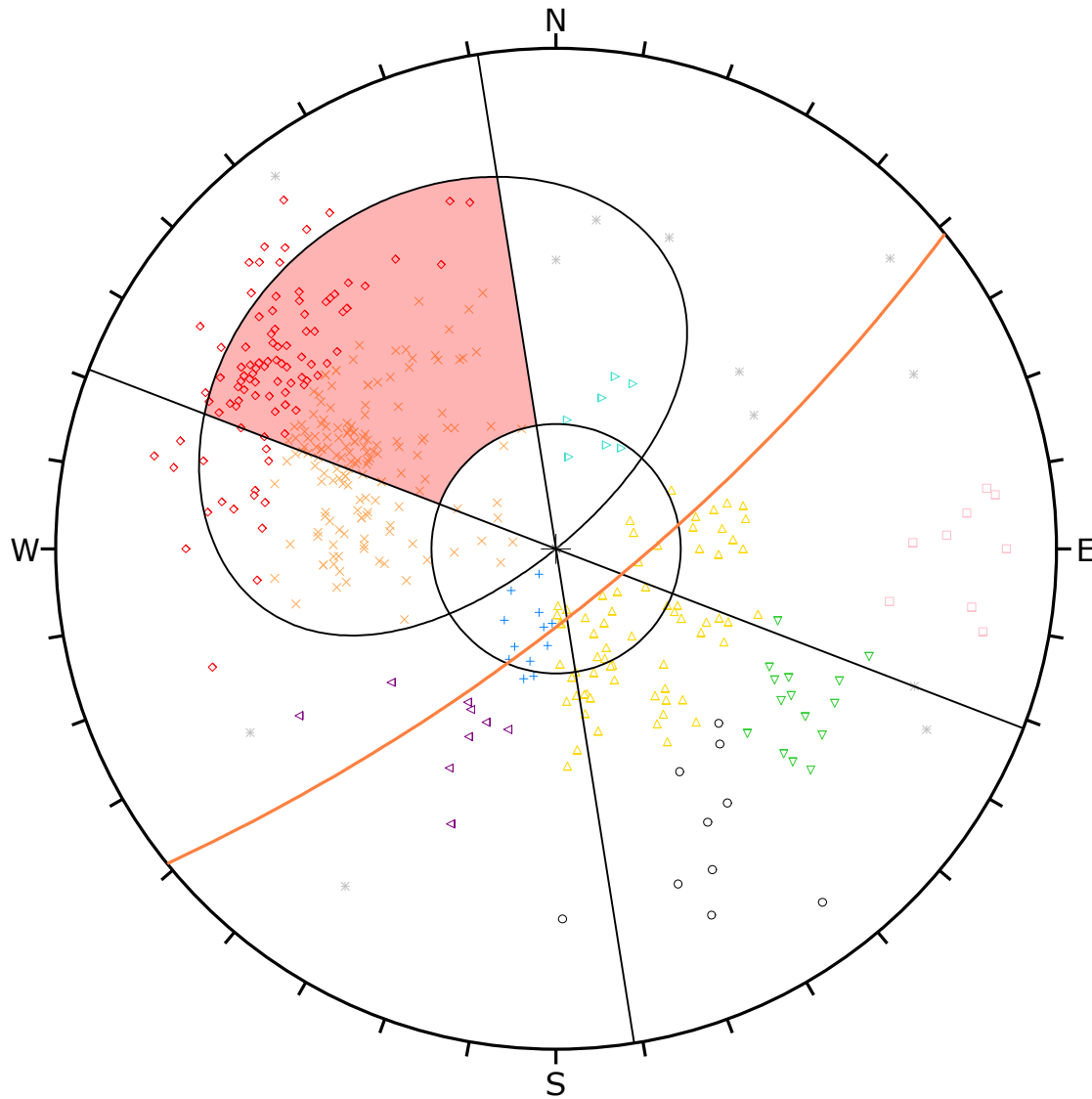
Haley & Aldrich, Inc.

Date

June 2021

File Name

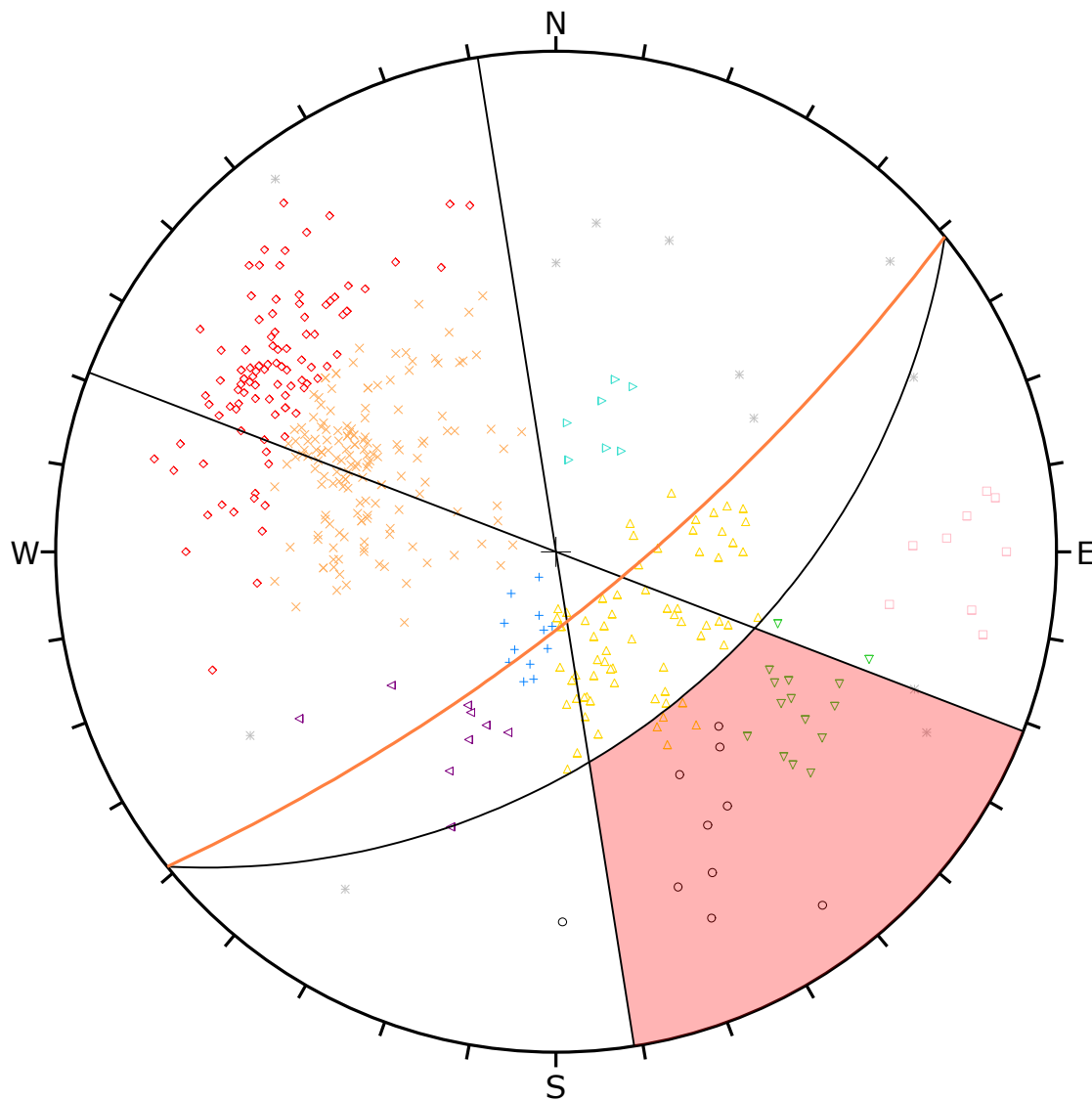
2021-0409_Levenseller borings.dips8



Symbol	FEATURE	Quantity
◇	J1	101
×	J2	158
△	J3	67
+	J4	12
▽	J5	15
□	J6	9
◀	J7	9
○	J8	10
▶	J9	7
*	U	12

Kinematic Analysis	Planar Sliding		
Slope Dip	76		
Slope Dip Direction	141		
Friction Angle	28°		
Lateral Limits	30°		
	Critical	Total	%
Planar Sliding (All)	171	400	42.75%
Planar Sliding (Set 1: J1)	73	101	72.28%
Planar Sliding (Set 2: J2)	98	158	62.03%
Plot Mode	Pole Vectors		
Vector Count	400 (400 Entries)		
Hemisphere	Lower		
Projection	Equal Angle		

<i>Project</i>	Brewer-Eddington I-395/Route 9 Connector		
<i>Analysis Description</i>	Levenseller Road BH Logging - Planar Sliding		
<i>Drawn By</i>	J. Rawlins	<i>Company</i>	Haley & Aldrich, Inc.
<i>Date</i>	June 2021	<i>File Name</i>	2021-0409_Levenseller borings.dips8



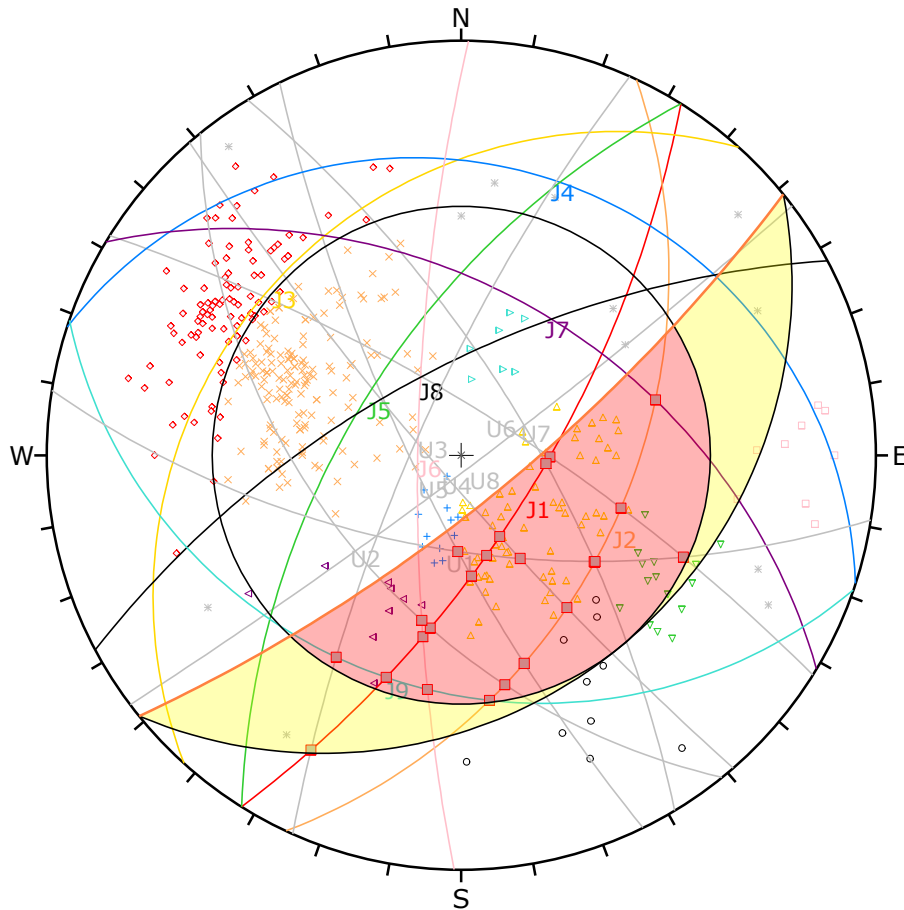
Symbol	FEATURE	Quantity
◇	J1	101
×	J2	158
△	J3	67
+	J4	12
▽	J5	15
□	J6	9
◁	J7	9
○	J8	10
▷	J9	7
*	U	12

Kinematic Analysis	Flexural Toppling
Slope Dip	76
Slope Dip Direction	141
Friction Angle	28°
Lateral Limits	30°

	Critical	Total	%
Flexural Toppling (All)	29	400	7.25%
Flexural Toppling (Set 3: J3)	5	67	7.46%
Flexural Toppling (Set 5: J5)	13	15	86.67%
Flexural Toppling (Set 8: J8)	9	10	90.00%

Plot Mode	Pole Vectors
Vector Count	400 (400 Entries)
Hemisphere	Lower
Projection	Equal Angle

Project	Brewer-Eddington I-395/Route 9 Connector		
Analysis Description	Levenseller Road BH Logging - Toppling		
Drawn By	J. Rawlins	Company	Haley & Aldrich, Inc.
Date	June 2021	File Name	2021-0409_Levenseller borings.dips8



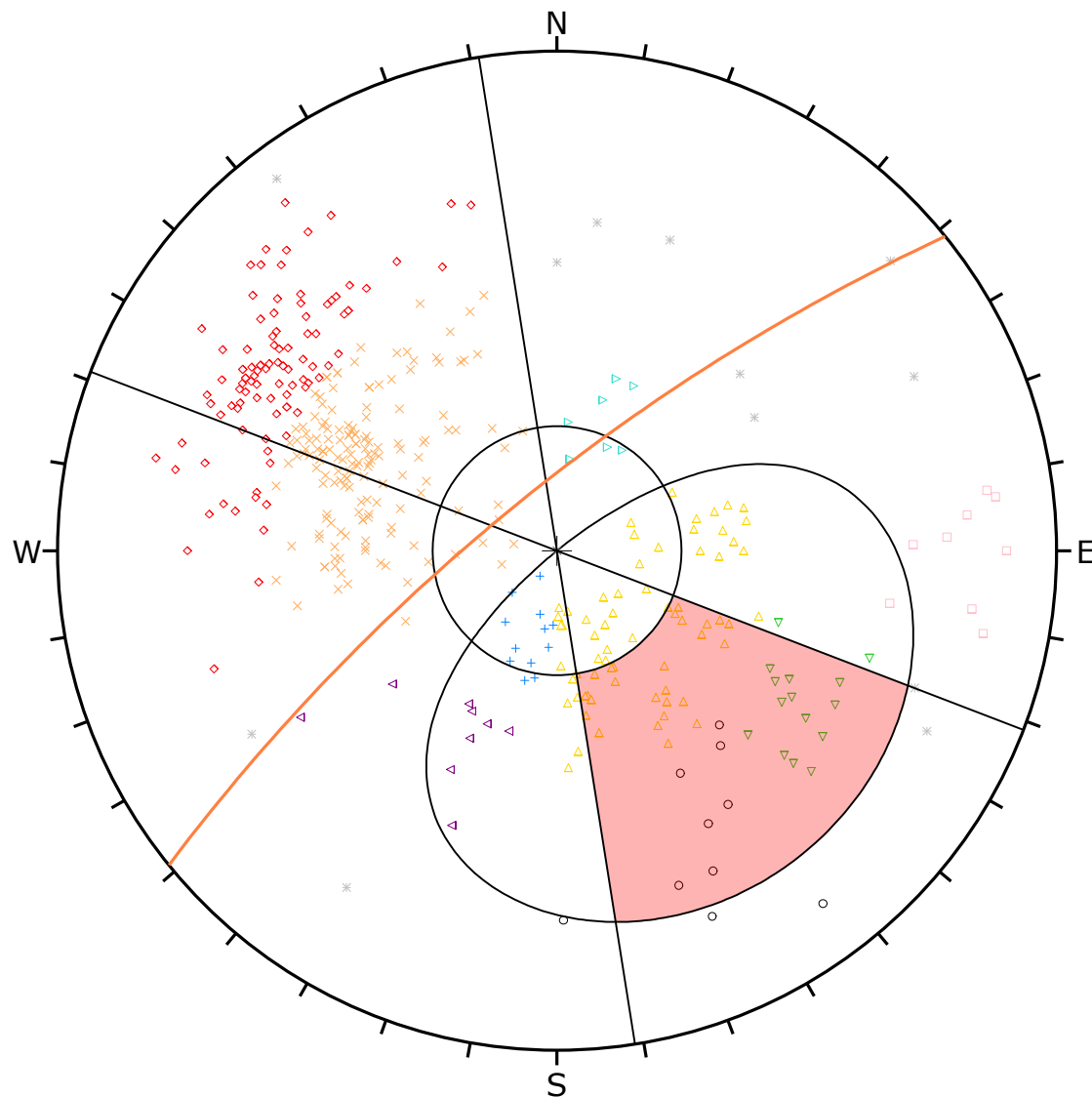
Symbol	FEATURE	Quantity
◇	J1	101
×	J2	158
△	J3	67
+	J4	12
▽	J5	15
□	J6	9
◁	J7	9
○	J8	10
▷	J9	7
*	U	12
Symbol	Feature	
■	Critical Intersection	

Kinematic Analysis	Wedge Sliding		
Slope Dip	76		
Slope Dip Direction	141		
Friction Angle	28°		
	Critical	Total	%
Wedge Sliding	24	136	17.65%

	Color	Dip	Dip Direction	Label
User Planes				
1	■	83	229	U4
2	■	77	244	U5
3	■	77	32	U6
4	■	71	59	U7
5	■	86	143	U8
Mean Set Planes				
1m	■	69	122	J1
2m	■	46	115	J2
3m	■	27	312	J3
4m	■	20	18	J4
5m	■	60	302	J5
6m	■	78	271	J6
7m	■	47	31	J7
8m	■	66	332	J8
9m	■	31	199	J9
10m	■	64	189	U1
11m	■	52	231	U2
12m	■	77	294	U3

Plot Mode	Pole Vectors
Vector Count	400 (400 Entries)
Intersection Mode	User and Mean Set Planes
Intersections Count	136
Hemisphere	Lower
Projection	Equal Angle

<i>Project</i>	Brewer-Eddington I-395/Route 9 Connector		
<i>Analysis Description</i>	Levenseller Road BH Logging - Wedge Sliding		
<i>Drawn By</i>	J. Rawlins	<i>Company</i>	Haley & Aldrich, Inc.
<i>Date</i>	June 2021	<i>File Name</i>	2021-0409_Levenseller borings_wedge.dips8



Symbol	FEATURE	Quantity
◇	J1	101
×	J2	158
△	J3	67
+	J4	12
▽	J5	15
□	J6	9
◀	J7	9
○	J8	10
▶	J9	7
*	U	12

Kinematic Analysis	Planar Sliding
Slope Dip	76
Slope Dip Direction	321
Friction Angle	28°
Lateral Limits	30°

	Critical	Total	%
Planar Sliding (All)	48	400	12.00%
Planar Sliding (Set 3: J3)	28	67	41.79%
Planar Sliding (Set 5: J5)	13	15	86.67%
Planar Sliding (Set 8: J8)	7	10	70.00%

Plot Mode	Pole Vectors
Vector Count	400 (400 Entries)
Hemisphere	Lower
Projection	Equal Angle

Project

Brewer-Eddington I-395/Route 9 Connector

Analysis Description

Levenseller Road BH Logging - Planar Sliding

Drawn By

J. Rawlins

Company

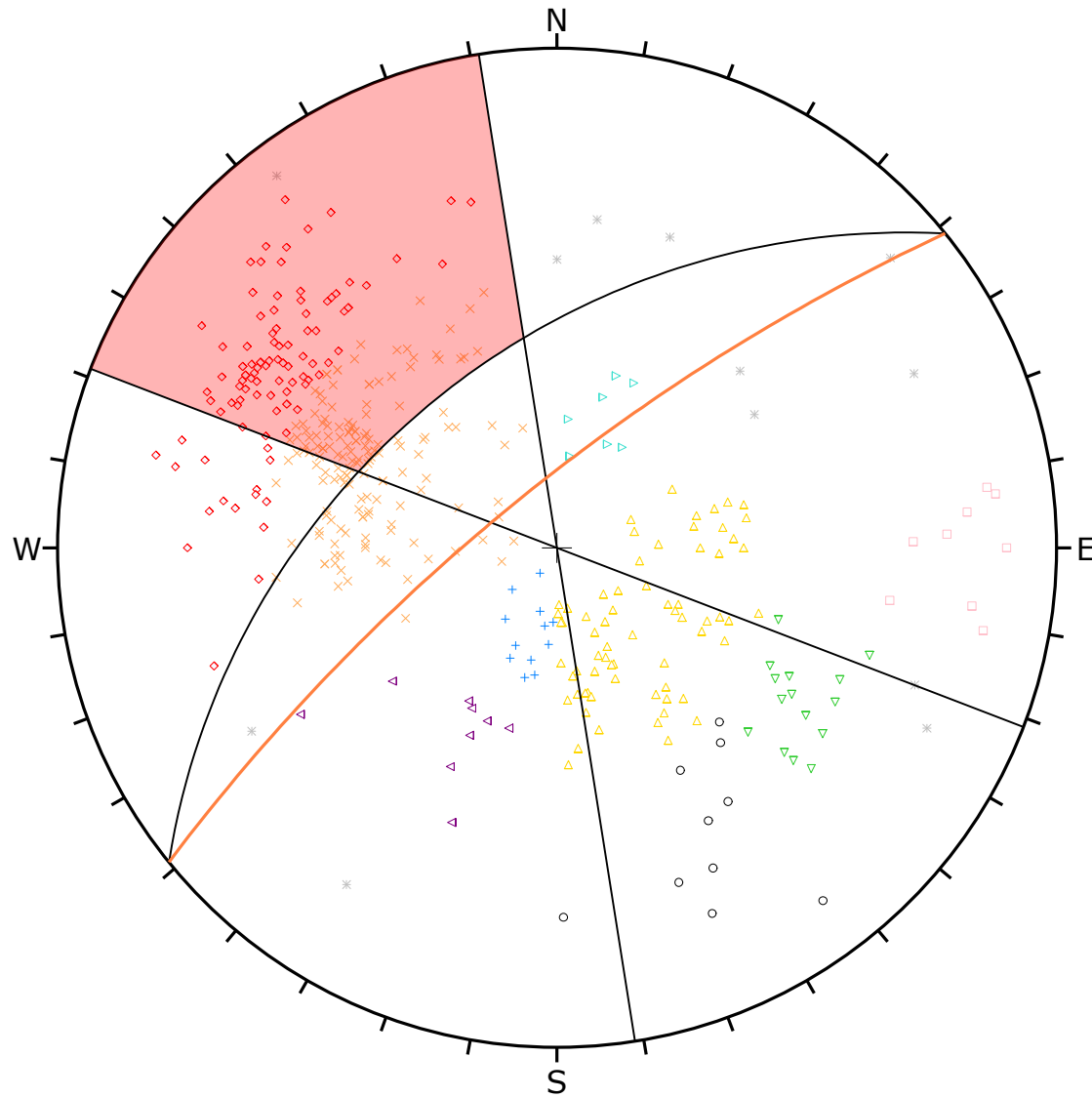
Haley & Aldrich, Inc.

Date

June 2021

File Name

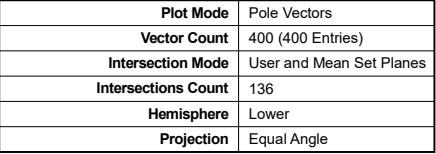
2021-0409_Levenseller borings.dips8



Symbol	FEATURE	Quantity
◇	J1	101
×	J2	158
△	J3	67
+	J4	12
▽	J5	15
□	J6	9
◁	J7	9
○	J8	10
▷	J9	7
*	U	12

Kinematic Analysis		Flexural Toppling		
Slope Dip		76		
Slope Dip Direction		321		
Friction Angle		28°		
Lateral Limits		30°		
		Critical	Total	%
Flexural Toppling (All)		165	400	41.25%
Flexural Toppling (Set 1: J1)		85	101	84.16%
Flexural Toppling (Set 2: J2)		79	158	50.00%
Plot Mode		Pole Vectors		
Vector Count		400 (400 Entries)		
Hemisphere		Lower		
Projection		Equal Angle		

	Project		Brewer-Eddington I-395/Route 9 Connector	
	Analysis Description		Levenseller Road BH Logging - Toppling	
	Drawn By	J. Rawlins	Company	Haley & Aldrich, Inc.
	Date	June 2021	File Name	2021-0409_Levenseller borings.dips8



EVALUATIONS; TABLE 1

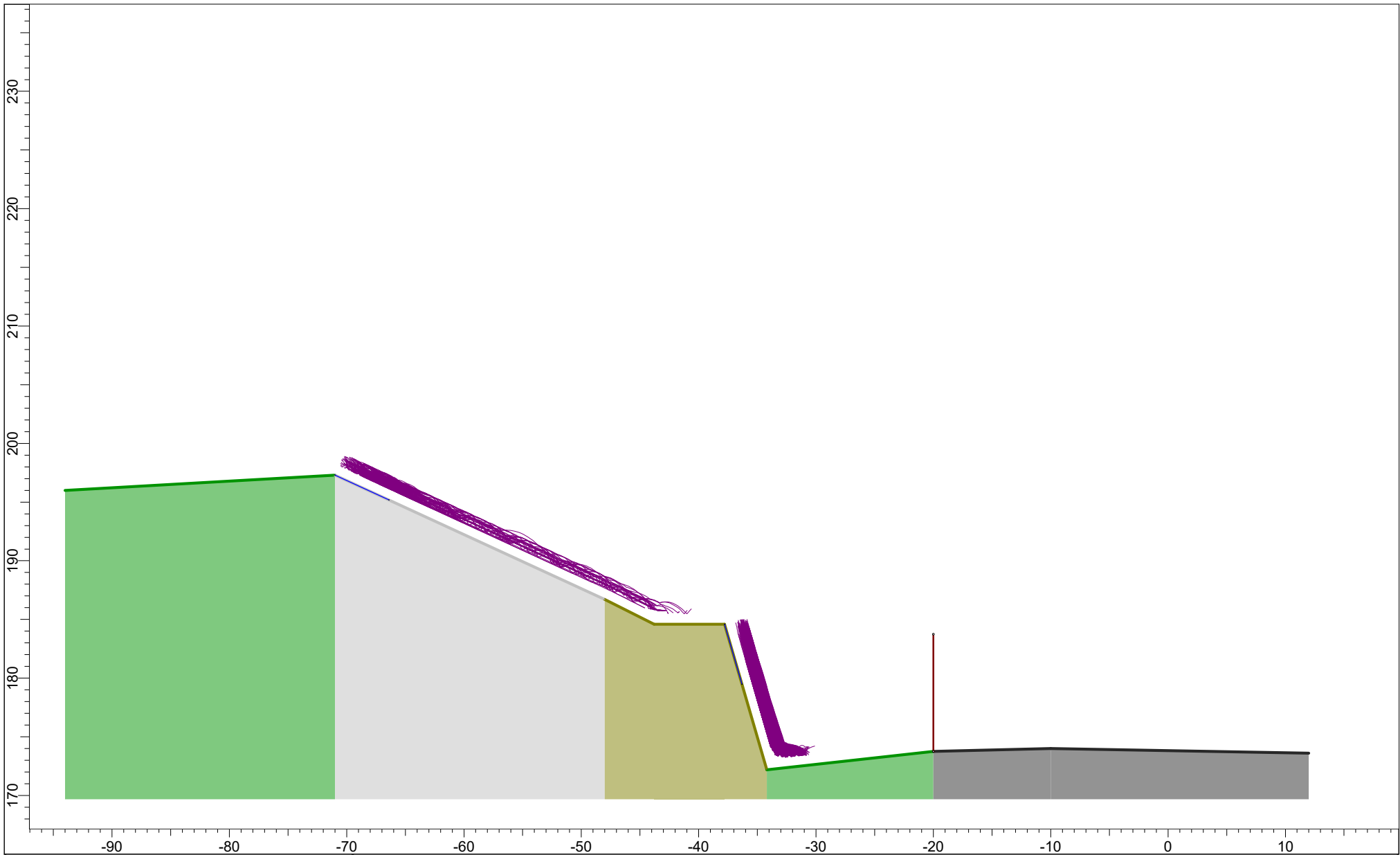
The parameters are used in the Clewleyville road cut models are given in the following table:


Parameter	Field Observations	Selected Values
Rock Shape	Metasandstone observed in borings	Squares, Rectangles, and Ellipses
Rock Diameter	Largest blocks estimated to be 4 ft x 3 ft based on joint spacing measured during downhole geophysics.	4 ft x 3 ft x 1 ft
Rock Density	No measured values. Average value for Metasandstone selected based on published data.	155 pounds per cubic foot (pcf)
Dynamic Friction Coefficient	Based on the estimated friction angle of surfaces (= tangent of friction angle)	0.55 to 0.62
Rolling Friction Coefficient	Varies based on material type, estimated based on published values (in general, harder materials have lower rolling friction coefficients).	0.1 to 0.7
Normal Coefficient of Restitution	Metasandstone outcrop (0.35), Soil with vegetation, boulders, and outcrops (0.32), Soil with vegetation (0.3), Asphalt roadway (0.4)	0.3 to 0.4

EVALUATIONS; TABLE 2

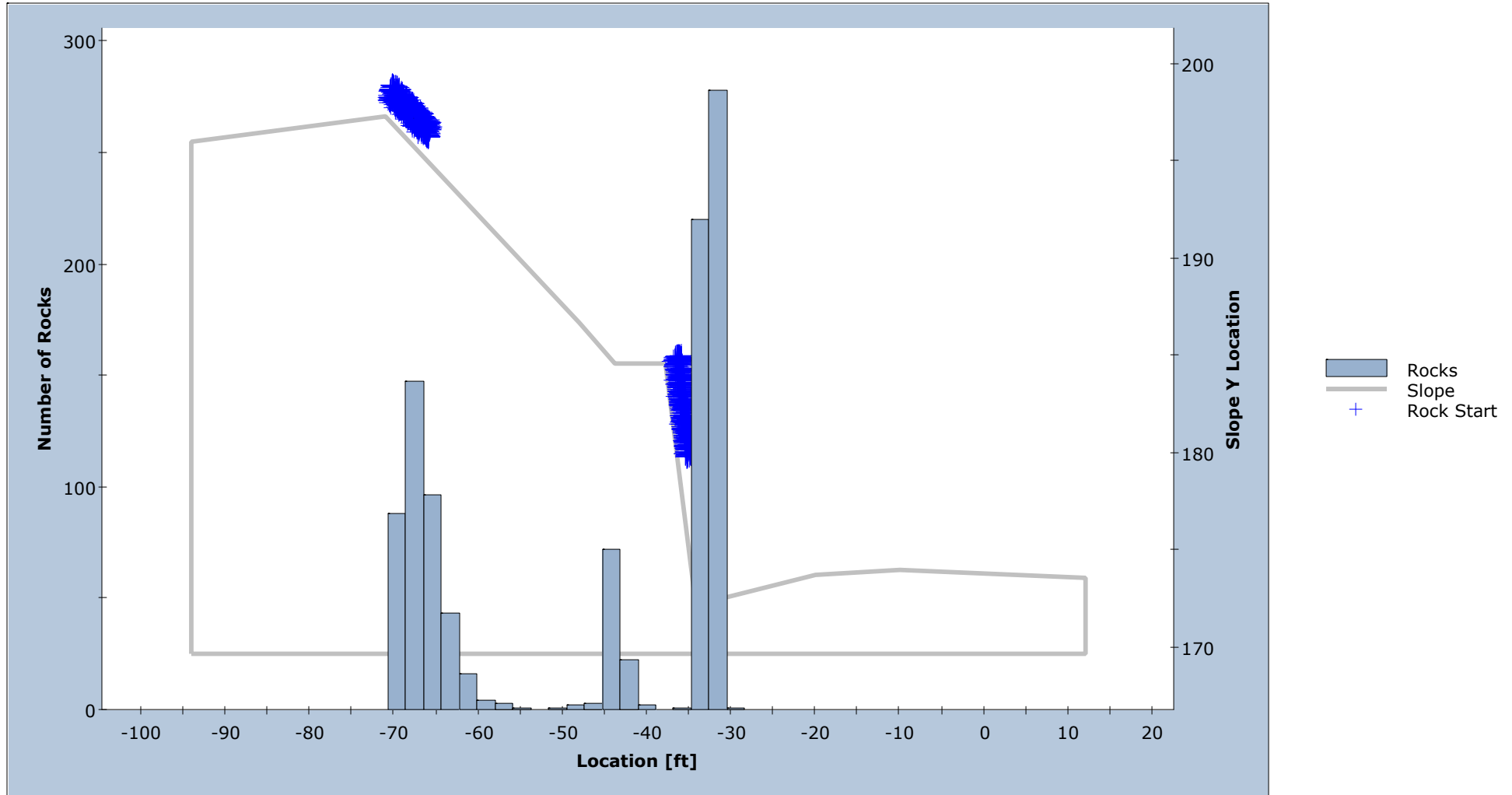
The parameters are used in the Levenseller road cut models are given in the following table:

Parameter	Field Observations	Selected Values
Rock Shape	Siltstone observed in borings	Squares, Rectangles, and Ellipses
Rock Diameter	Largest blocks estimated to be 11 ft x 1 ft based on joint spacing measured during downhole geophysics.	11 ft x 1 ft x 1 ft
Rock Density	No measured values. Average value for Siltstone selected based on published data.	135 pounds per cubic foot (pcf)
Dynamic Friction Coefficient	Based on the estimated friction angle of surfaces (= tangent of friction angle)	0.55 to 0.62
Rolling Friction Coefficient	Varies based on material type, estimated based on published values (in general, harder materials have lower rolling friction coefficients).	0.1 to 0.7
Normal Coefficient of Restitution	Siltstone outcrop (0.35), Soil with vegetation, boulders, and outcrops (0.32), Soil with vegetation (0.3), Asphalt roadway (0.4)	0.3 to 0.4



	Project		Brewer Eddington Rockfall Mitigation	
	Analysis Description		Clewleyville Proposed Conditions: Sta. 212+00_Left	
	Drawn By	S. Pepe	Company	Haley & Aldrich, Inc.
	Date	June 2021	File Name	132076-007_Clewleyville_212+00_left-Proposed.fal8

Distribution of Rock Path End Locations



Total number of rock paths: 1000



<i>Project</i>		Brewer Eddington Rockfall Mitigation	
<i>Analysis Description</i>		Clewleyville Proposed Conditions: Sta. 212+00_Left	
<i>Drawn By</i>	S. Pepe	<i>Company</i>	Haley & Aldrich, Inc.
<i>Date</i>	June 2021	<i>File Name</i>	132076-007_Clewleyville_212+00_left-Proposed.fal8

Table of Contents

- Project Summary 2
- Project Settings 3
 - General Settings 3
 - Engine Conditions 3
 - Random Number Generation 3
- Slope Geometry 4
- Slope Material Assignment 5
- Material Properties 6
 - Bedrock - Metasandstone 6
 - Talus 6
 - Asphalt 6
 - Colluvium 6
- Seeders 8
 - Seeder 1 8
 - Seeder 2 8
- Rock Types 9
 - Metasandstone - 4x3x1 9
- Collectors 10
- Summary Results 11

132076-007_Clewleyville_212+00_left-Proposed

Brewer Eddington Rockfall Mitigation

Project Summary

File Name	132076-007_Clewleyville_212+00_left-Proposed.fal8
File Version	8.013
Project Title	Brewer Eddington Rockfall Mitigation
Analysis	Clewleyville Proposed Conditions: Sta. 212+00_Left
Author	S. Pepe
Company	Haley & Aldrich, Inc.
Date Created	June 2021

Comments

132076-007

Project Settings

General Settings

Engine	Rigid Body
Units	Imperial Foot-Pounds (ft, lb, ft-lb)
Rock throw mode	1000 rocks thrown overall
Use tangential CRSP damping	Yes

Engine Conditions

Maximum time per rock (s)	5
Maximum steps per rock	20000
Normal velocity cutoff (ft/s)	0.33
Stopped velocity cutoff (ft/s)	0.33
Maximum timestep (s)	0.01
Switch velocity (ft/s)	-3.3e-09

Random Number Generation

Sampling method	Monte-Carlo
Random seed	Pseudo-random seed: 12345234

Slope Geometry

Vertex	X	Y	X Std.Dev.	Y Std.Dev.
1	-94	196		
2	-71	197.3		
3	-48	186.7		
4	-43.8	184.6		
5	-37.8	184.6		
6	-34.2	172.2		
7	-20	173.75		
8	-10	174		
9	12	173.6		


Slope Material Assignment

Material	From Vertex	To Vertex
Colluvium	1	2
Talus	2	3
Bedrock - Metasandstone	3	6
Colluvium	6	7
Asphalt	7	9

Material Properties

Bedrock - Metasandstone

"Bedrock - Metasandstone" Properties


Color					
	Mean	Distribution	Std.Dev.	Rel. Min	Rel. Max
Normal Restitution	0.35	Normal	0.04	0.12	0.12
Tangential Restitution	0.85	Normal	0.04	0.12	0.12
Dynamic Friction	0.58	Normal	0.04	0.12	0.12
Rolling Friction	0.2	Normal	0.02	0.06	0.06

"Bedrock - Metasandstone" Advanced Properties

Forest and Vegetation Damping	Disabled
Scarring	Disabled
Viscoplastic Damping	Disabled

Talus

"Talus" Properties


Color					
	Mean	Distribution	Std.Dev.	Rel. Min	Rel. Max
Normal Restitution	0.32	Normal	0.04	0.12	0.12
Tangential Restitution	0.8	Normal	0.04	0.12	0.12
Dynamic Friction	0.55	Normal	0.04	0.12	0.12
Rolling Friction	0.3	Normal	0.04	0.12	0.12

"Talus" Advanced Properties

Forest and Vegetation Damping	Disabled
Scarring	Disabled
Viscoplastic Damping	Disabled

Asphalt

"Asphalt" Properties


Color					
	Mean	Distribution	Std.Dev.	Rel. Min	Rel. Max
Normal Restitution	0.4	Normal	0.04	0.12	0.12
Tangential Restitution	0.9	Normal	0.03	0.09	0.09
Dynamic Friction	0.58	Normal	0.04	0.12	0.12
Rolling Friction	0.1	Normal	0.01	0.03	0.03

"Asphalt" Advanced Properties

Forest and Vegetation Damping	Disabled
Scarring	Disabled
Viscoplastic Damping	Disabled

Colluvium

"Colluvium" Properties

Color					
	Mean	Distribution	Std.Dev.	Rel. Min	Rel. Max
Normal Restitution	0.3	None			
Tangential Restitution	0.8	None			
Dynamic Friction	0.62	None			
Rolling Friction	0.7	None			

"Colluvium" Advanced Properties

Forest and Vegetation Damping	Disabled
Scarring	Disabled
Viscoplastic Damping	Disabled

Seeders

Seeder 1

Seeder Properties

Name	Seeder 1
Location	(-37.8, 184.6), (-36.3142, 179.482)

Rocks to Throw

Number of Rocks	Set in Project Settings
Rock Types	Metasandstone - 4x3x1

Initial Conditions

	Mean	Distribution	Std.Dev.	Rel. Min	Rel. Max
Horizontal Velocity (ft/s)	0	None			
Vertical Velocity (ft/s)	0	None			
Rotational Velocity (deg/s)	0	None			
Initial Rotation (deg/s)	0	Uniform		0	360

Seeder 2

Seeder Properties

Name	Seeder 2
Location	(-71, 197.3), (-66.392, 195.176)

Rocks to Throw

Number of Rocks	Set in Project Settings
Rock Types	Metasandstone - 4x3x1


Initial Conditions

	Mean	Distribution	Std.Dev.	Rel. Min	Rel. Max
Horizontal Velocity (ft/s)	0	None			
Vertical Velocity (ft/s)	0	None			
Rotational Velocity (deg/s)	0	None			
Initial Rotation (deg/s)	0	Uniform		0	360

Rock Types

Metasandstone - 4x3x1

Properties

Name	Metasandstone - 4x3x1				
Color					
Smooth Shapes	Square,	Super Ellipse^6 (2:3),		Super Ellipse^6 (1:2)	
Polygons	Polygon Square,	Polygon Rectangle (2:3),		Polygon Rectangle (1:2)	
	Mean	Distribution	Std.Dev.	Rel. Min	Rel. Max
Mass (lb)	1620	Normal	0	0	0
Density (lb/ft3)	155	Normal	0	0	0

Collectors

Record paths' first impacts only? No

Collector 1

Name Collector 1

Location (-20, 173.75) to (-20, 183.75)

Summary Results

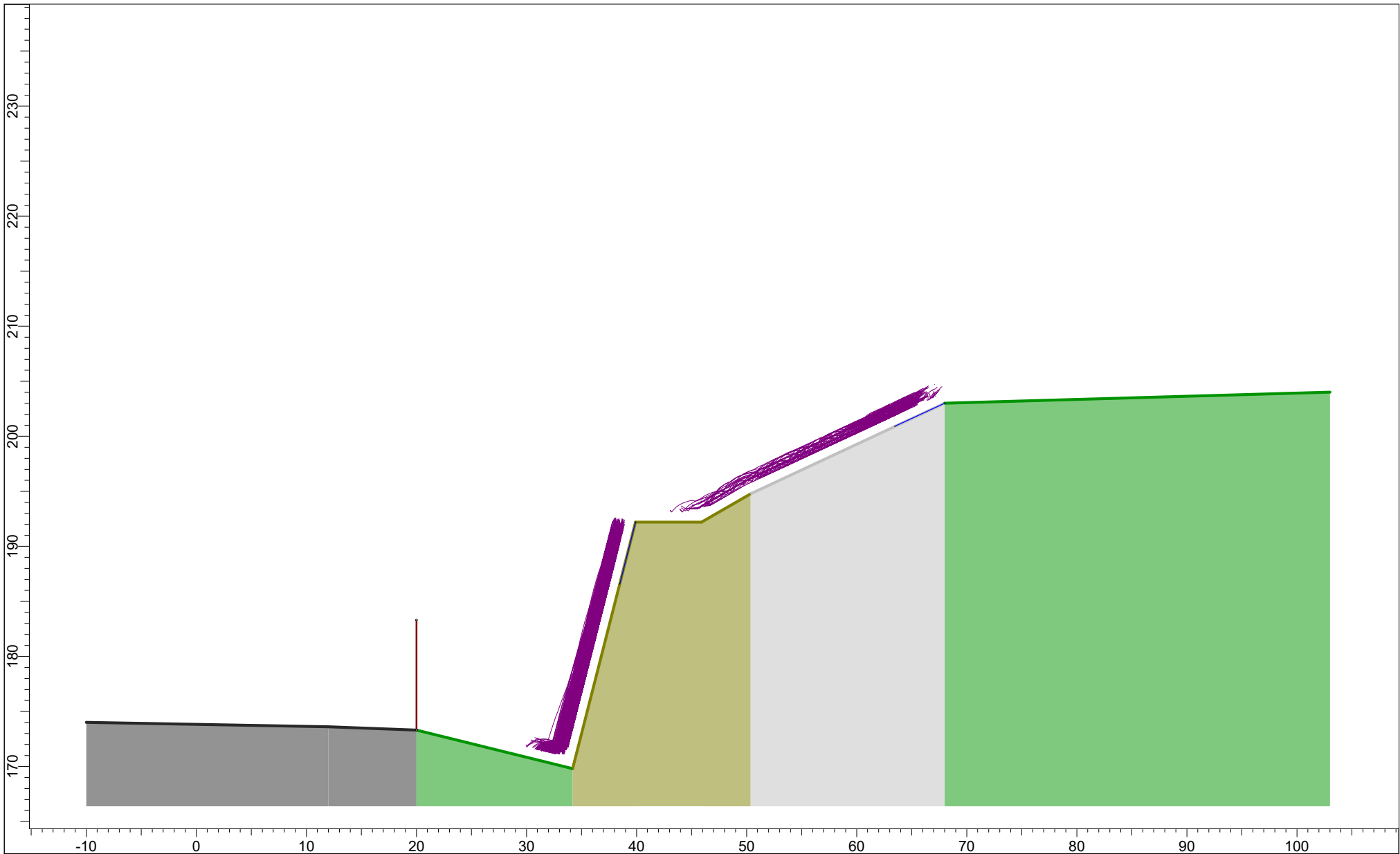
Run Properties


Simulation Time (s)	11.38		
Envelope data:			
	Max	Mean	95%
Envelope Bounce Height (ft)	15.75	4.667	6.565
Envelope Total Kinetic Energy (ft-lb)	1.301e+04	7633	1.301e+04
Envelope Translational Kinetic Energy (ft-lb)	1.3e+04	7572	1.3e+04
Envelope Rotational Kinetic Energy (ft-lb)	1112	655.6	1112
Envelope Translational Kinetic Velocity (ft/s)	22.72	17.03	22.72
Envelope Rotational Kinetic Velocity (rad/s)	7.753	4.583	7.753

Stopping Reason

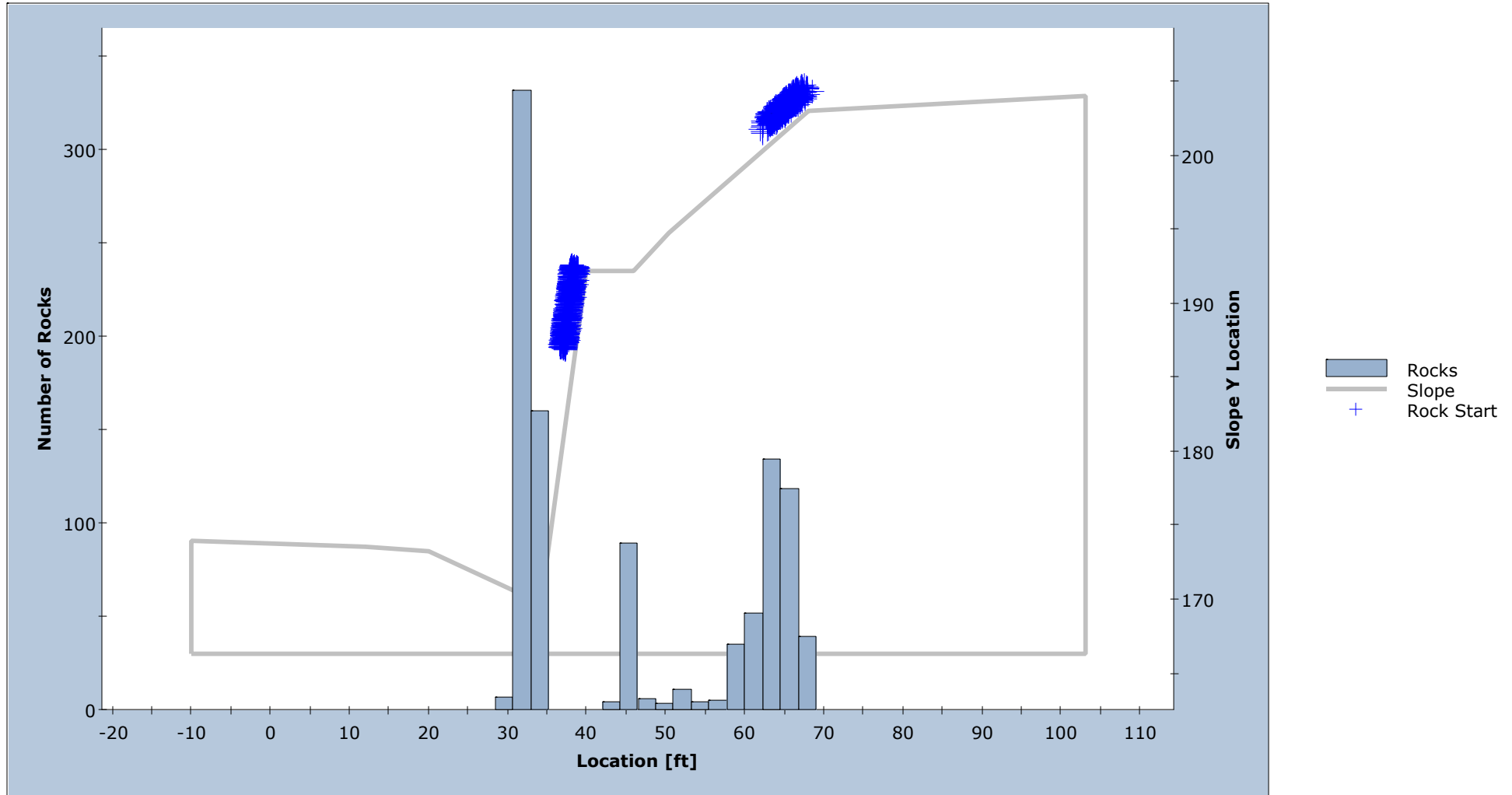
CONTINUE	0
Invalid Start Location	0
Invalid Slope Geometry	0
Invalid bad crest loss definition	0
Invalid relative size between rock and slope	0
Max Compute Time	1
Max Steps	13
Edge Model	0
Stopped	986
Stopped (wedged)	0
Stopped (chattering)	0
Hit Barrier	0
Hit Berm with infinite capacity	0
No collision found	0
Bad Collision Geometry (location before)	0
Rock is freefalling onto a spike or a trough	0
END_ERROR_UNKNOWN	0
END_ERROR_POSITIVE_GAP	0
Bad collision calculation	0
Bad Collision Geometry (0 intersection)	0
Bad Collision Geometry (location after)	0
Bad Collision Geometry (missing intersection)	0
Error during results reading	0
Total Rocks	1000

Collector(s) Impact Results



 rocscience	Project			Brewer Eddington Rockfall Mitigation	
	Analysis Description			Clewleyville Proposed Conditions: Sta. 212+00_Right	
	Drawn By		S. Pepe	Company	Haley & Aldrich, Inc.
	Date		June 2021	File Name	132076-007_Clewleyville_212+00_right-Proposed.fal8
	ROCFALL 8.013				

Distribution of Rock Path End Locations



Total number of rock paths: 999



<i>Project</i>		Brewer Eddington Rockfall Mitigation	
<i>Analysis Description</i>		Clewleyville Proposed Conditions: Sta. 212+00_Right	
<i>Drawn By</i>	S. Pepe	<i>Company</i>	Haley & Aldrich, Inc.
<i>Date</i>	June 2021	<i>File Name</i>	132076-007_Clewleyville_212+00_right-Proposed.fal8

Table of Contents

- Project Summary 2
- Project Settings 3
 - General Settings 3
 - Engine Conditions 3
 - Random Number Generation 3
- Slope Geometry 4
- Slope Material Assignment 5
- Material Properties 6
 - Bedrock - Metasandstone 6
 - Talus 6
 - Asphalt 6
 - Colluvium 6
- Seeders 8
 - Seeder 1 8
 - Seeder 2 8
- Rock Types 9
 - Metasandstone - 4x3x1 9
- Collectors 10
- Summary Results 11

132076-007_Clewleyville_212+00_right-Proposed

Brewer Eddington Rockfall Mitigation

Project Summary

File Name	132076-007_Clewleyville_212+00_right-Proposed.fal8
File Version	8.013
Project Title	Brewer Eddington Rockfall Mitigation
Analysis	Clewleyville Proposed Conditions: Sta. 212+00_Right
Author	S. Pepe
Company	Haley & Aldrich, Inc.
Date Created	June 2021

Comments

132076-007

Project Settings

General Settings

Engine	Rigid Body
Units	Imperial Foot-Pounds (ft, lb, ft-lb)
Rock throw mode	1000 rocks thrown overall
Use tangential CRSP damping	Yes

Engine Conditions

Maximum time per rock (s)	5
Maximum steps per rock	20000
Normal velocity cutoff (ft/s)	0.33
Stopped velocity cutoff (ft/s)	0.33
Maximum timestep (s)	0.01
Switch velocity (ft/s)	-3.3e-09

Random Number Generation

Sampling method	Monte-Carlo
Random seed	Pseudo-random seed: 12345234

Slope Geometry

Vertex	X	Y	X Std.Dev.	Y Std.Dev.
1	-10	174		
2	12	173.6		
3	20	173.3		
4	34.2	169.8		
5	39.9	192.2		
6	45.9	192.2		
7	50.362	194.776		
8	68	203		
9	103	204		


Slope Material Assignment

Material	From Vertex	To Vertex
Asphalt	1	3
Colluvium	3	4
Bedrock - Metasandstone	4	7
Talus	7	8
Colluvium	8	9

Material Properties

Bedrock - Metasandstone

"Bedrock - Metasandstone" Properties


Color					
	Mean	Distribution	Std.Dev.	Rel. Min	Rel. Max
Normal Restitution	0.35	Normal	0.04	0.12	0.12
Tangential Restitution	0.85	Normal	0.04	0.12	0.12
Dynamic Friction	0.58	Normal	0.04	0.12	0.12
Rolling Friction	0.2	Normal	0.02	0.06	0.06

"Bedrock - Metasandstone" Advanced Properties

Forest and Vegetation Damping	Disabled
Scarring	Disabled
Viscoplastic Damping	Disabled

Talus

"Talus" Properties


Color					
	Mean	Distribution	Std.Dev.	Rel. Min	Rel. Max
Normal Restitution	0.32	Normal	0.04	0.12	0.12
Tangential Restitution	0.8	Normal	0.04	0.12	0.12
Dynamic Friction	0.55	Normal	0.04	0.12	0.12
Rolling Friction	0.3	Normal	0.04	0.12	0.12

"Talus" Advanced Properties

Forest and Vegetation Damping	Disabled
Scarring	Disabled
Viscoplastic Damping	Disabled

Asphalt

"Asphalt" Properties


Color					
	Mean	Distribution	Std.Dev.	Rel. Min	Rel. Max
Normal Restitution	0.4	Normal	0.04	0.12	0.12
Tangential Restitution	0.9	Normal	0.03	0.09	0.09
Dynamic Friction	0.58	Normal	0.04	0.12	0.12
Rolling Friction	0.1	Normal	0.01	0.03	0.03

"Asphalt" Advanced Properties

Forest and Vegetation Damping	Disabled
Scarring	Disabled
Viscoplastic Damping	Disabled

Colluvium

"Colluvium" Properties

Color					
	Mean	Distribution	Std.Dev.	Rel. Min	Rel. Max
Normal Restitution	0.3	None			
Tangential Restitution	0.8	None			
Dynamic Friction	0.62	None			
Rolling Friction	0.7	None			

"Colluvium" Advanced Properties

Forest and Vegetation Damping	Disabled
Scarring	Disabled
Viscoplastic Damping	Disabled

Seeders

Seeder 1

Seeder Properties

Name	Seeder 1
Location	(39.9, 192.2), (38.4694, 186.578)

Rocks to Throw

Number of Rocks	Set in Project Settings
Rock Types	Metasandstone - 4x3x1

Initial Conditions

	Mean	Distribution	Std.Dev.	Rel. Min	Rel. Max
Horizontal Velocity (ft/s)	0	None			
Vertical Velocity (ft/s)	0	None			
Rotational Velocity (deg/s)	0	None			
Initial Rotation (deg/s)	0	Uniform		0	360

Seeder 2

Seeder Properties

Name	Seeder 2
Location	(68, 203), (63.466, 200.909)

Rocks to Throw

Number of Rocks	Set in Project Settings
Rock Types	Metasandstone - 4x3x1


Initial Conditions

	Mean	Distribution	Std.Dev.	Rel. Min	Rel. Max
Horizontal Velocity (ft/s)	0	None			
Vertical Velocity (ft/s)	0	None			
Rotational Velocity (deg/s)	0	None			
Initial Rotation (deg/s)	0	Uniform		0	360

Rock Types

Metasandstone - 4x3x1

Properties

Name	Metasandstone - 4x3x1				
Color					
Smooth Shapes	Square,	Super Ellipse^6 (2:3),		Super Ellipse^6 (1:2)	
Polygons	Polygon Square,	Polygon Rectangle (2:3),		Polygon Rectangle (1:2)	
	Mean	Distribution	Std.Dev.	Rel. Min	Rel. Max
Mass (lb)	1860	Normal	0	0	0
Density (lb/ft3)	155	Normal	0	0	0

Collectors

Record paths' first impacts only? No

Collector 1

Name Collector 1

Location (20, 173.3) to (20, 183.3)

Summary Results

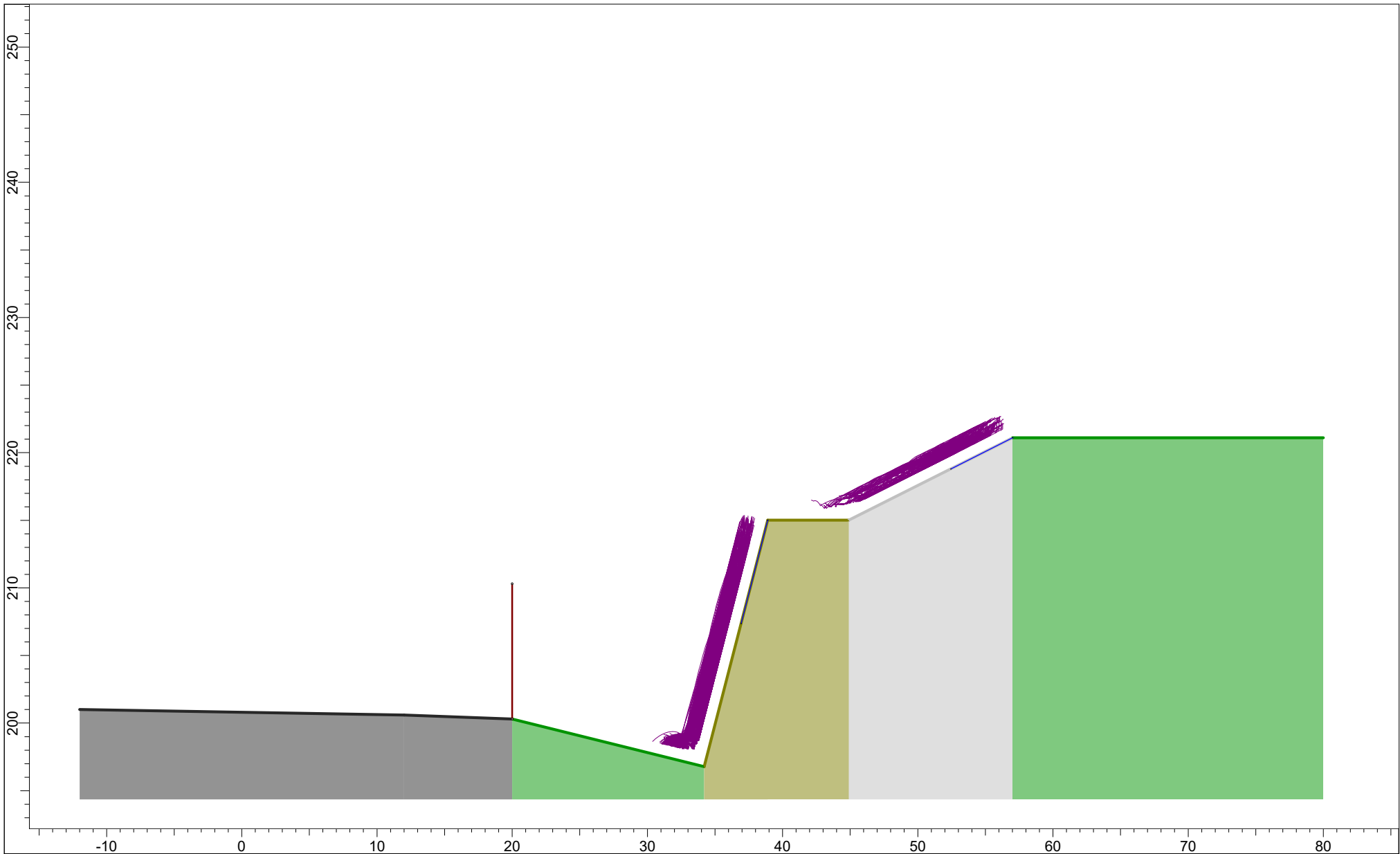
Run Properties


Simulation Time (s)	32.48		
Envelope data:			
	Max	Mean	95%
Envelope Bounce Height (ft)	19.77	5.566	7.957
Envelope Total Kinetic Energy (ft-lb)	3.11e+04	2.255e+04	3.11e+04
Envelope Translational Kinetic Energy (ft-lb)	3.106e+04	2.249e+04	3.106e+04
Envelope Rotational Kinetic Energy (ft-lb)	2169	884.9	2169
Envelope Translational Kinetic Velocity (ft/s)	32.78	27.71	32.78
Envelope Rotational Kinetic Velocity (rad/s)	7.671	4.029	7.671

Stopping Reason

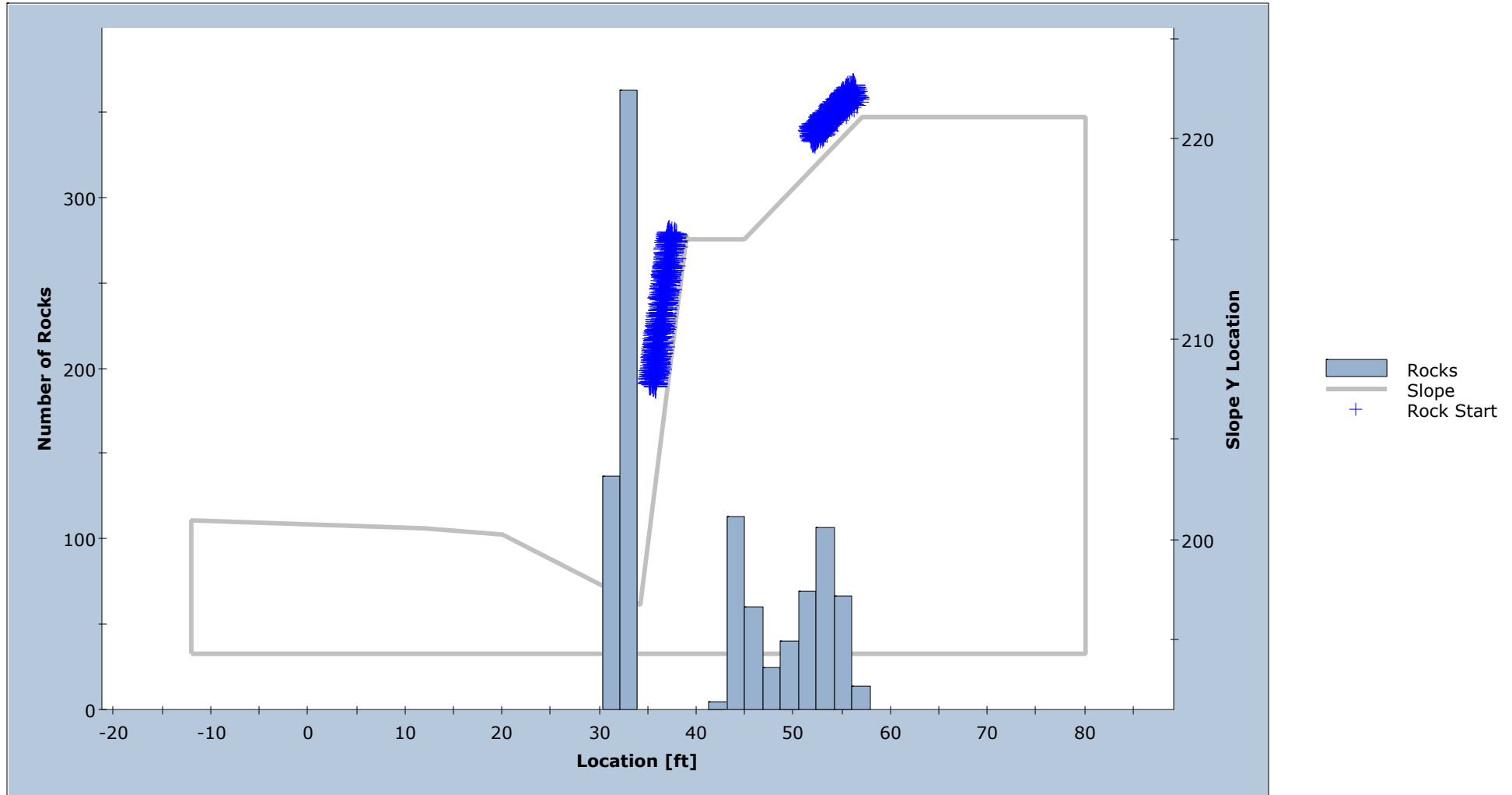
CONTINUE	0
Invalid Start Location	0
Invalid Slope Geometry	0
Invalid bad crest loss definition	0
Invalid relative size between rock and slope	0
Max Compute Time	11
Max Steps	15
Edge Model	0
Stopped	973
Stopped (wedged)	0
Stopped (chattering)	0
Hit Barrier	0
Hit Berm with infinite capacity	0
No collision found	0
Bad Collision Geometry (location before)	1
Rock is freefalling onto a spike or a trough	0
END_ERROR_UNKNOWN	0
END_ERROR_POSITIVE_GAP	0
Bad collision calculation	0
Bad Collision Geometry (0 intersection)	0
Bad Collision Geometry (location after)	0
Bad Collision Geometry (missing intersection)	0
Error during results reading	0
Total Rocks	1000

Collector(s) Impact Results



 rocscience <small>ROCFALL 8.013</small>	<i>Project</i>			Brewer Eddington Rockfall Mitigation	
	<i>Analysis Description</i>			Levenseller Proposed Conditions: Sta. 236+50	
	<i>Drawn By</i>		S. Pepe	<i>Company</i>	Haley & Aldrich, Inc.
	<i>Date</i>		May 2021	<i>File Name</i>	132076-007_Levenseller_236+50-Proposed.fal8

Distribution of Rock Path End Locations



Total number of rock paths: 1000



Project	Brewer Eddington Rockfall Mitigation		
Analysis Description	Levenseller Proposed Conditions: Sta. 236+50		
Drawn By	S. Pepe	Company	Haley & Aldrich, Inc.
Date	May 2021	File Name	132076-007_Levenseller_236+50-Proposed.fal8

Table of Contents

- Project Summary 2
- Project Settings 3
 - General Settings 3
 - Engine Conditions 3
 - Random Number Generation 3
- Slope Geometry 4
- Slope Material Assignment 5
- Material Properties 6
 - Bedrock - Siltstone 6
 - Talus 6
 - Asphalt 6
 - Colluvium 6
- Seeders 8
 - Seeder 1 8
 - Seeder 2 8
- Rock Types 9
 - Siltstone - 11x1x1 9
- Collectors 10
- Summary Results 11

132076-007_Levenseller_236+50-Proposed

Brewer Eddington Rockfall Mitigation

Project Summary

File Name	132076-007_Levenseller_236+50-Proposed.fal8
File Version	8.013
Project Title	Brewer Eddington Rockfall Mitigation
Analysis	Levenseller Proposed Conditions: Sta. 236+50
Author	S. Pepe
Company	Haley & Aldrich, Inc.
Date Created	May 2021

Comments

132076-007

Project Settings

General Settings

Engine	Rigid Body
Units	Imperial Foot-Pounds (ft, lb, ft-lb)
Rock throw mode	1000 rocks thrown overall
Use tangential CRSP damping	Yes

Engine Conditions

Maximum time per rock (s)	5
Maximum steps per rock	20000
Normal velocity cutoff (ft/s)	0.33
Stopped velocity cutoff (ft/s)	0.33
Maximum timestep (s)	0.01
Switch velocity (ft/s)	-3.3e-09

Random Number Generation

Sampling method	Monte-Carlo
Random seed	Pseudo-random seed: 12345234

Slope Geometry

Vertex	X	Y	X Std.Dev.	Y Std.Dev.
1	-12	201		
2	12	200.6		
3	20	200.3		
4	34.2	196.78		
5	38.9	215		
6	44.9	215		
7	57.02	221.1		
8	80	221.1		


Slope Material Assignment

Material	From Vertex	To Vertex
Asphalt	1	3
Colluvium	3	4
Bedrock - Siltstone	4	6
Talus	6	7
Colluvium	7	8

Material Properties

Bedrock - Siltstone

"Bedrock - Siltstone" Properties


Color					
	Mean	Distribution	Std.Dev.	Rel. Min	Rel. Max
Normal Restitution	0.35	Normal	0.04	0.12	0.12
Tangential Restitution	0.85	Normal	0.04	0.12	0.12
Dynamic Friction	0.58	Normal	0.04	0.12	0.12
Rolling Friction	0.2	Normal	0.02	0.06	0.06

"Bedrock - Siltstone" Advanced Properties

Forest and Vegetation Damping	Disabled
Scarring	Disabled
Viscoplastic Damping	Disabled

Talus

"Talus" Properties


Color					
	Mean	Distribution	Std.Dev.	Rel. Min	Rel. Max
Normal Restitution	0.32	Normal	0.04	0.12	0.12
Tangential Restitution	0.8	Normal	0.04	0.12	0.12
Dynamic Friction	0.55	Normal	0.04	0.12	0.12
Rolling Friction	0.3	Normal	0.04	0.12	0.12

"Talus" Advanced Properties

Forest and Vegetation Damping	Disabled
Scarring	Disabled
Viscoplastic Damping	Disabled

Asphalt

"Asphalt" Properties


Color					
	Mean	Distribution	Std.Dev.	Rel. Min	Rel. Max
Normal Restitution	0.4	Normal	0.04	0.12	0.12
Tangential Restitution	0.9	Normal	0.03	0.09	0.09
Dynamic Friction	0.58	Normal	0.04	0.12	0.12
Rolling Friction	0.1	Normal	0.01	0.03	0.03

"Asphalt" Advanced Properties

Forest and Vegetation Damping	Disabled
Scarring	Disabled
Viscoplastic Damping	Disabled

Colluvium

"Colluvium" Properties

Color					
	Mean	Distribution	Std.Dev.	Rel. Min	Rel. Max
Normal Restitution	0.3	None			
Tangential Restitution	0.8	None			
Dynamic Friction	0.62	None			
Rolling Friction	0.7	None			

"Colluvium" Advanced Properties

Forest and Vegetation Damping	Disabled
Scarring	Disabled
Viscoplastic Damping	Disabled

Seeders

Seeder 1

Seeder Properties

Name	Seeder 1
Location	(38.9, 215), (36.9282, 207.356)

Rocks to Throw

Number of Rocks	Set in Project Settings
Rock Types	Siltstone - 11x1x1

Initial Conditions

	Mean	Distribution	Std.Dev.	Rel. Min	Rel. Max
Horizontal Velocity (ft/s)	0	None			
Vertical Velocity (ft/s)	0	None			
Rotational Velocity (deg/s)	0	None			
Initial Rotation (deg/s)	0	Uniform		0	360

Seeder 2

Seeder Properties

Name	Seeder 2
Location	(57.02, 221.1), (52.4446, 218.797)

Rocks to Throw

Number of Rocks	Set in Project Settings
Rock Types	Siltstone - 11x1x1


Initial Conditions

	Mean	Distribution	Std.Dev.	Rel. Min	Rel. Max
Horizontal Velocity (ft/s)	0	None			
Vertical Velocity (ft/s)	0	None			
Rotational Velocity (deg/s)	0	None			
Initial Rotation (deg/s)	0	Uniform		0	360

Rock Types

Siltstone - 11x1x1

Properties

Name	Siltstone - 11x1x1				
Color					
Smooth Shapes	Square,	Super Ellipse^6 (2:3),		Super Ellipse^6 (1:2)	
Polygons	Polygon Square,	Polygon Rectangle (2:3),		Polygon Rectangle (1:2)	
	Mean	Distribution	Std.Dev.	Rel. Min	Rel. Max
Mass (lb)	1485	Normal	0	0	0
Density (lb/ft3)	135	Normal	0	0	0

Collectors

Record paths' first impacts only? No

Collector 1

Name Collector 1

Location (20, 200.3) to (20, 210.3)

Summary Results

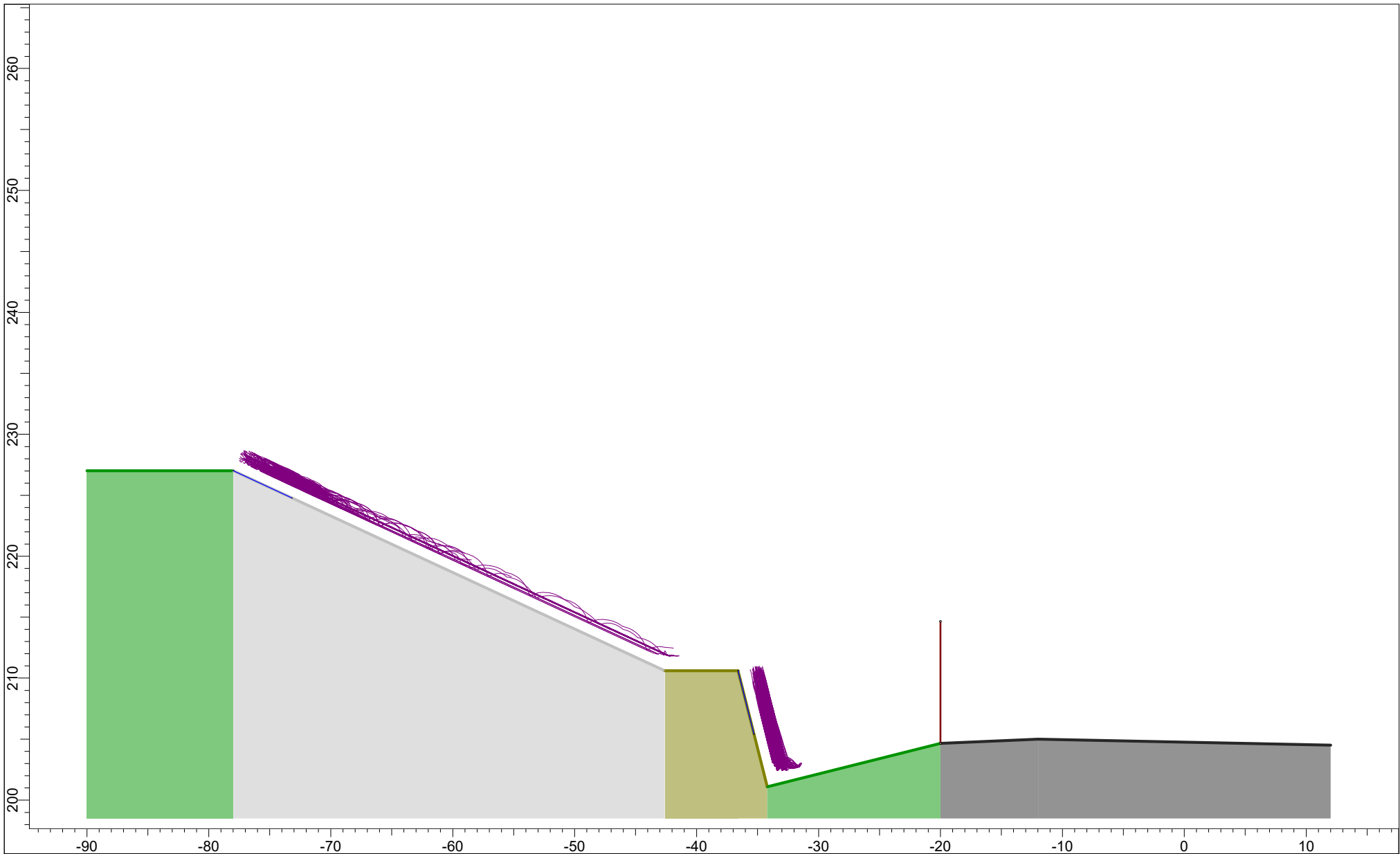
Run Properties


Simulation Time (s)	22.68		
Envelope data:			
	Max	Mean	95%
Envelope Bounce Height (ft)	9.622	5.325	7.584
Envelope Total Kinetic Energy (ft-lb)	1.915e+04	1.217e+04	1.915e+04
Envelope Translational Kinetic Energy (ft-lb)	1.915e+04	1.212e+04	1.915e+04
Envelope Rotational Kinetic Energy (ft-lb)	1219	564.5	1219
Envelope Translational Kinetic Velocity (ft/s)	28.81	22.6	28.81
Envelope Rotational Kinetic Velocity (rad/s)	6.742	4.655	6.742

Stopping Reason

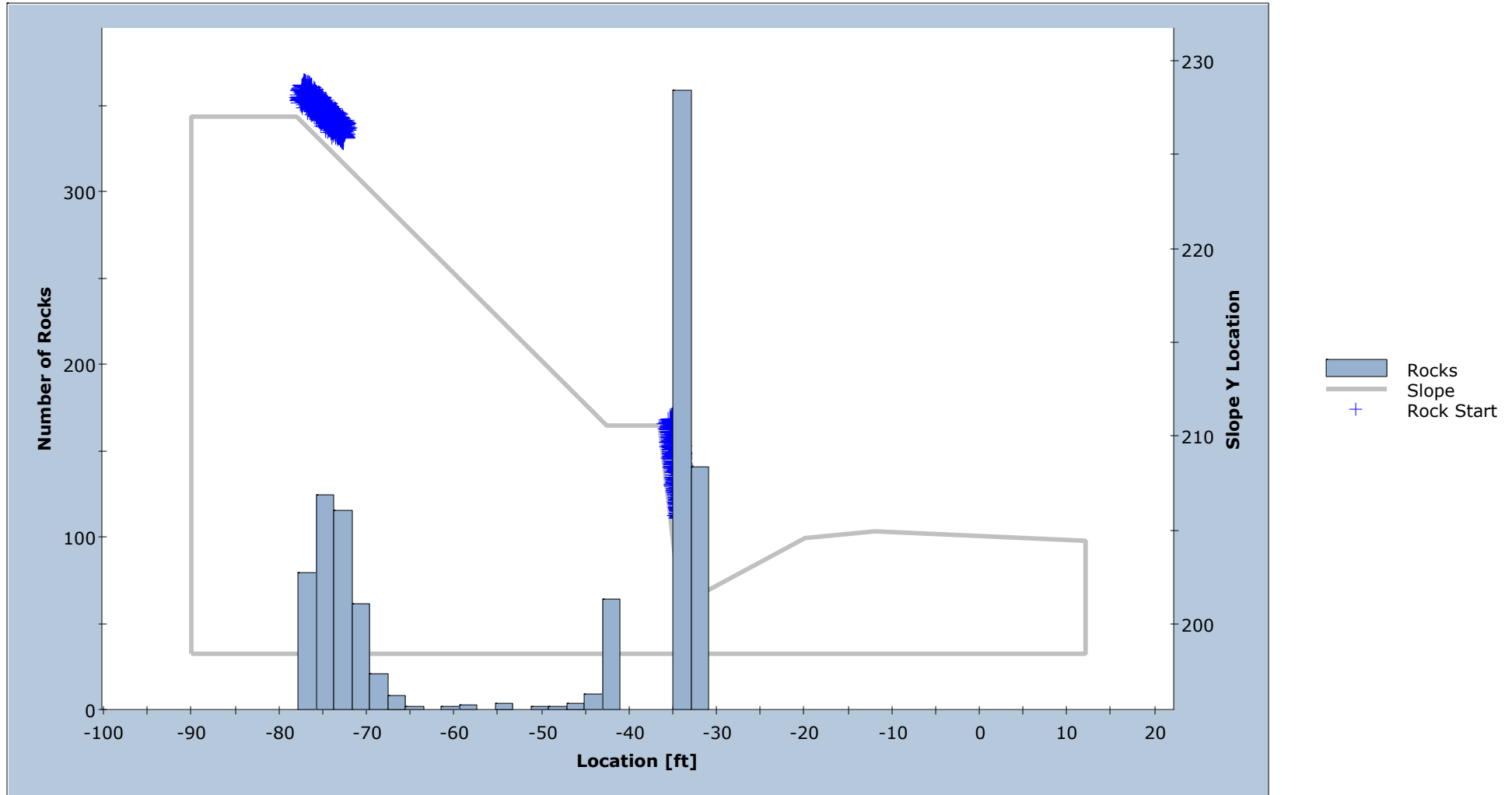
CONTINUE	0
Invalid Start Location	0
Invalid Slope Geometry	0
Invalid bad crest loss definition	0
Invalid relative size between rock and slope	0
Max Compute Time	8
Max Steps	6
Edge Model	0
Stopped	986
Stopped (wedged)	0
Stopped (chattering)	0
Hit Barrier	0
Hit Berm with infinite capacity	0
No collision found	0
Bad Collision Geometry (location before)	0
Rock is freefalling onto a spike or a trough	0
END_ERROR_UNKNOWN	0
END_ERROR_POSITIVE_GAP	0
Bad collision calculation	0
Bad Collision Geometry (0 intersection)	0
Bad Collision Geometry (location after)	0
Bad Collision Geometry (missing intersection)	0
Error during results reading	0
Total Rocks	1000

Collector(s) Impact Results



	Project			Brewer Eddington Rockfall Mitigation	
	Analysis Description			Levenseller Proposed Conditions: Sta. 238+00	
	Drawn By		S. Pepe	Company	Haley & Aldrich, Inc.
	Date		May 2021	File Name	132076-007_Levenseller_238+00-Proposed.fal8

Distribution of Rock Path End Locations



Total number of rock paths: 1000



Project		Brewer Eddington Rockfall Mitigation	
Analysis Description		Levenseller Proposed Conditions: Sta. 238+00	
Drawn By	S. Pepe	Company	Haley & Aldrich, Inc.
Date	May 2021	File Name	132076-007_Levenseller_238+00-Proposed.fal8

Table of Contents

- Project Summary 2
- Project Settings 3
 - General Settings 3
 - Engine Conditions 3
 - Random Number Generation 3
- Slope Geometry 4
- Slope Material Assignment 5
- Material Properties 6
 - Bedrock - Siltstone 6
 - Talus 6
 - Asphalt 6
 - Colluvium 6
- Seeders 8
 - Seeder 1 8
 - Seeder 2 8
- Rock Types 9
 - Siltstone - 11x1x1 9
- Collectors 10
- Summary Results 11

132076-007_Levenseller_238+00-Proposed

Brewer Eddington Rockfall Mitigation

Project Summary

File Name	132076-007_Levenseller_238+00-Proposed.fal8
File Version	8.013
Project Title	Brewer Eddington Rockfall Mitigation
Analysis	Levenseller Proposed Conditions: Sta. 238+00
Author	S. Pepe
Company	Haley & Aldrich, Inc.
Date Created	May 2021

Comments

132076-007

Project Settings

General Settings

Engine	Rigid Body
Units	Imperial Foot-Pounds (ft, lb, ft-lb)
Rock throw mode	1000 rocks thrown overall
Use tangential CRSP damping	Yes

Engine Conditions

Maximum time per rock (s)	5
Maximum steps per rock	20000
Normal velocity cutoff (ft/s)	0.33
Stopped velocity cutoff (ft/s)	0.33
Maximum timestep (s)	0.01
Switch velocity (ft/s)	-3.3e-09

Random Number Generation

Sampling method	Monte-Carlo
Random seed	Pseudo-random seed: 12345234

Slope Geometry

Vertex	X	Y	X Std.Dev.	Y Std.Dev.
1	-90	227		
2	-78	227		
3	-42.61	210.61		
4	-36.61	210.61		
5	-34.2	201.09		
6	-20	204.65		
7	-12	205		
8	12	204.5		


Slope Material Assignment

Material	From Vertex	To Vertex
Colluvium	1	2
Talus	2	3
Bedrock - Siltstone	3	5
Colluvium	5	6
Asphalt	6	8

Material Properties

Bedrock - Siltstone

"Bedrock - Siltstone" Properties


Color					
	Mean	Distribution	Std.Dev.	Rel. Min	Rel. Max
Normal Restitution	0.35	Normal	0.04	0.12	0.12
Tangential Restitution	0.85	Normal	0.04	0.12	0.12
Dynamic Friction	0.58	Normal	0.04	0.12	0.12
Rolling Friction	0.2	Normal	0.02	0.06	0.06

"Bedrock - Siltstone" Advanced Properties

Forest and Vegetation Damping	Disabled
Scarring	Disabled
Viscoplastic Damping	Disabled

Talus

"Talus" Properties


Color					
	Mean	Distribution	Std.Dev.	Rel. Min	Rel. Max
Normal Restitution	0.32	Normal	0.04	0.12	0.12
Tangential Restitution	0.8	Normal	0.04	0.12	0.12
Dynamic Friction	0.55	Normal	0.04	0.12	0.12
Rolling Friction	0.3	Normal	0.04	0.12	0.12

"Talus" Advanced Properties

Forest and Vegetation Damping	Disabled
Scarring	Disabled
Viscoplastic Damping	Disabled

Asphalt

"Asphalt" Properties


Color					
	Mean	Distribution	Std.Dev.	Rel. Min	Rel. Max
Normal Restitution	0.4	Normal	0.04	0.12	0.12
Tangential Restitution	0.9	Normal	0.03	0.09	0.09
Dynamic Friction	0.58	Normal	0.04	0.12	0.12
Rolling Friction	0.1	Normal	0.01	0.03	0.03

"Asphalt" Advanced Properties

Forest and Vegetation Damping	Disabled
Scarring	Disabled
Viscoplastic Damping	Disabled

Colluvium

"Colluvium" Properties

Color					
	Mean	Distribution	Std.Dev.	Rel. Min	Rel. Max
Normal Restitution	0.3	None			
Tangential Restitution	0.8	None			
Dynamic Friction	0.62	None			
Rolling Friction	0.7	None			

"Colluvium" Advanced Properties

Forest and Vegetation Damping	Disabled
Scarring	Disabled
Viscoplastic Damping	Disabled

Seeders

Seeder 1

Seeder Properties

Name	Seeder 1
Location	(-36.61, 210.61), (-35.2892, 205.393)

Rocks to Throw

Number of Rocks	Set in Project Settings
Rock Types	Siltstone - 11x1x1

Initial Conditions

	Mean	Distribution	Std.Dev.	Rel. Min	Rel. Max
Horizontal Velocity (ft/s)	0	None			
Vertical Velocity (ft/s)	0	None			
Rotational Velocity (deg/s)	0	None			
Initial Rotation (deg/s)	0	Uniform		0	360

Seeder 2

Seeder Properties

Name	Seeder 2
Location	(-78, 227), (-73.1867, 224.771)

Rocks to Throw

Number of Rocks	Set in Project Settings
Rock Types	Siltstone - 11x1x1


Initial Conditions

	Mean	Distribution	Std.Dev.	Rel. Min	Rel. Max
Horizontal Velocity (ft/s)	0	None			
Vertical Velocity (ft/s)	0	None			
Rotational Velocity (deg/s)	0	None			
Initial Rotation (deg/s)	0	Uniform		0	360

Rock Types

Siltstone - 11x1x1

Properties

Name	Siltstone - 11x1x1				
Color					
Smooth Shapes	Square,	Super Ellipse^6 (2:3),	Super Ellipse^6 (1:2)		
Polygons	Polygon Square,	Polygon Rectangle (2:3),	Polygon Rectangle (1:2)		
	Mean	Distribution	Std.Dev.	Rel. Min	Rel. Max
Mass (lb)	1620	Normal	0	0	0
Density (lb/ft3)	135	Normal	0	0	0

Collectors

Record paths' first impacts only? No

Collector 1

Name Collector 1

Location (-20, 204.65) to (-20, 214.65)

Summary Results

Run Properties

Simulation Time (s)	10.36		
Envelope data:			
	Max	Mean	95%
Envelope Bounce Height (ft)	15.39	5.533	7.795
Envelope Total Kinetic Energy (ft-lb)	9206	4151	9206
Envelope Translational Kinetic Energy (ft-lb)	9120	4105	9120
Envelope Rotational Kinetic Energy (ft-lb)	738.5	469.1	738.5
Envelope Translational Kinetic Velocity (ft/s)	19.03	12.14	19.03
Envelope Rotational Kinetic Velocity (rad/s)	4.692	2.672	4.692

Stopping Reason

CONTINUE	0
Invalid Start Location	0
Invalid Slope Geometry	0
Invalid bad crest loss definition	0
Invalid relative size between rock and slope	0
Max Compute Time	2
Max Steps	29
Edge Model	0
Stopped	969
Stopped (wedged)	0
Stopped (chattering)	0
Hit Barrier	0
Hit Berm with infinite capacity	0
No collision found	0
Bad Collision Geometry (location before)	0
Rock is freefalling onto a spike or a trough	0
END_ERROR_UNKNOWN	0
END_ERROR_POSITIVE_GAP	0
Bad collision calculation	0
Bad Collision Geometry (0 intersection)	0
Bad Collision Geometry (location after)	0
Bad Collision Geometry (missing intersection)	0
Error during results reading	0
Total Rocks	1000

Collector(s) Impact Results

Culverts

Client Maine Department of Transportation

Date 7-Jul-21

Project I-395/Route 9 Connector - WIN 18915.00

Computed by JAD

Subject Bearing Resistance Calculations - Culvert Sta. 66+75

Checked by EMS

PROBLEM STATEMENT & OBJECTIVE

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

REFERENCES

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

AVAILABLE INFORMATION

1. Plan set titled, "Brewer-Eddington I-395/Route 9 Connector, Cross Sections," by MaineDOT dated 3 March 2021.
2. Plan set titled, "Brewer-Eddington I-395/Route 9 Connector" by MaineDOT dated 5 March 2021.

ASSUMPTIONS

1. No eccentricity in either direction.
2. Subsurface conditions based on boring BB-BFB1-204.
3. Footing will bear on Marine Deposit (CLAY).

PROCEDURE FOR STRENGTH LIMIT STATE

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

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

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

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

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

q_n = nominal strength limit state bearing resistance (ksf)

RF = resistance factor from Table 10.5.5.2.2-1

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

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

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

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

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

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

D_f = footing embedment depth (ft)

D_w = depth of water below ground surface (ft)

B = footing width (ft)

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

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

L = footing length (ft)

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

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

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

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

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

i_c, i_q, i_γ = load inclination factors

Client Maine Department of Transportation

Date 7-Jul-21

Project I-395/Route 9 Connector - WIN 18915.00

Computed by JAD

Subject Bearing Resistance Calculations - Culvert Sta. 66+75

Checked by EMS

CALCULATION FOR STRENGTH LIMIT STATE

B =	8	ft
e _B =	0	ft
B' =	8.0	ft
L =	152	ft
e _L =	0	ft
L' =	152	ft
c =	0.425	ksf
γ =	115	pcf
φ =	0	degrees
D _w	30	ft
D _f	25	ft
N _f = f(φ)	1.00	
C _{wq}	1.0	
C _{wγ}	0.71	
N _c	5.1	
S _c	1.01	
i _c	1	
N _{cm}	5.2	
N _q	1	
S _q	1.00	
d _q	1	
i _q	1	
N _{qm}	1.0	
N _γ	0.0	
S _γ	1.00	
i _γ	1	
N _{γm}	0.0	
q _n	5.1	ksf
RF	0.45	
q _R	2.3	ksf

Client Maine Department of Transportation

Project I-395/Route 9 Connector - WIN 18915.00

Subject Bearing Resistance Calculations - Culvert Sta. 66+75

Date 7-Jul-21

Computed by JAD

Checked by EMS

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

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

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

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

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

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

Client Maine Department of Transportation

Date 1-Jul-21

Project I-395/Route 9 Connector - WIN 18915.00

Computed by JAD

Subject Bearing Resistance Calculations - Culvert Sta. 84+50

Checked by EMS

PROBLEM STATEMENT & OBJECTIVE

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

REFERENCES

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

AVAILABLE INFORMATION

1. Plan set titled, "Brewer-Eddington I-395/Route 9 Connector, Cross Sections," by MaineDOT dated 3 March 2021.
2. Plan set titled, "Brewer-Eddington I-395/Route 9 Connector" by MaineDOT dated 5 March 2021.

ASSUMPTIONS

1. No eccentricity in either direction.
2. Subsurface conditions based on boring BB-BFB2-202. Soil strength was determined from laboratory tests on samples from BB-BFB2-201.
3. Footing will bear on Marine Deposit (CLAY).

PROCEDURE FOR STRENGTH LIMIT STATE

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

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

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

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

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

q_n = nominal strength limit state bearing resistance (ksf)

RF = resistance factor from Table 10.5.5.2.2-1

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

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

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

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

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

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

D_f = footing embedment depth (ft)

D_w = depth of water below ground surface (ft)

B = footing width (ft)

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

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

L = footing length (ft)

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

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

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

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

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

i_c, i_q, i_γ = load inclination factors

Client Maine Department of Transportation

Date 1-Jul-21

Project I-395/Route 9 Connector - WIN 18915.00

Computed by JAD

Subject Bearing Resistance Calculations - Culvert Sta. 84+50

Checked by EMS

CALCULATION FOR STRENGTH LIMIT STATE

B =	6	ft
e _B =	0	ft
B' =	6.0	ft
L =	112	ft
e _L =	0	ft
L' =	112	ft
c =	0.425	ksf
γ =	115	pcf
φ =	0	degrees
D _w	20	ft
D _f	11	ft
N _f = f(φ)	1.00	
C _{wq}	1.0	
C _{wγ}	1.00	
N _c	5.1	
S _c	1.01	
i _c	1	
N _{cm}	5.2	
N _q	1	
S _q	1.00	
d _q	1	
i _q	1	
N _{qm}	1.0	
N _γ	0.0	
S _γ	1.00	
i _γ	1	
N _{γm}	0.0	
q _n	3.5	ksf
RF	0.45	
q _R	1.6	ksf

Client Maine Department of Transportation

Project I-395/Route 9 Connector - WIN 18915.00

Subject Bearing Resistance Calculations - Culvert Sta. 84+50

Date 1-Jul-21

Computed by JAD

Checked by EMS

SERVICE LIMIT STATE BASED ON PRESUMPTIVE BEARING RESISTANCES IN AASHTO LRFD:
10.6.2.5—Bearing Resistance at the Service Limit State
10.6.2.5.1—Presumptive Values for Bearing Resistance C10.6.2.5.1

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

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

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

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

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

Client Maine Department of Transportation

Date 28-May-20

Project I-395/Route 9 Connector - WIN 18915.00

Computed by EMS

Subject Bearing Resistance Calculations - Culvert Sta. 133+80

Checked by JAD

PROBLEM STATEMENT & OBJECTIVE

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

REFERENCES

1. AASHTO LRFD Bridge Design Specifications, 8th Edition, 2017.

AVAILABLE INFORMATION

1. Plan set titled "Brewer-Eddington, I-395 - Route 9 Connector, Plans", dated 25 February 2020.
2. Plan set titled "Brewer-Eddington, I-395 - Route 9 Connector, Cross Sections", dated 25 February 2020.

ASSUMPTIONS

1. No eccentricity in either direction.
2. Subsurface conditions based on boring BB-BEB1-101. Soil strength was estimated using field vane shear and laboratory data from borings BB-BEB-101, BB-BEB-102, BB-BEB-103, and BB-BEB-104.
3. Footing will bear on Marine Deposit (silty CLAY).

PROCEDURE FOR STRENGTH LIMIT STATE

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

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

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

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

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

q_n = nominal strength limit state bearing resistance (ksf)

RF = resistance factor from Table 10.5.5.2.2-1

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

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

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

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

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

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

D_f = footing embedment depth (ft)

D_w = depth of water below ground surface (ft)

B = footing width (ft)

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

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

L = footing length (ft)

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

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

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

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

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

i_c, i_q, i_γ = load inclination factors

Client Maine Department of Transportation

Date 28-May-20

Project I-395/Route 9 Connector - WIN 18915.00

Computed by EMS

Subject Bearing Resistance Calculations - Culvert Sta. 133+80

Checked by JAD

CALCULATION FOR STRENGTH LIMIT STATE

B =	6	ft
e _B =	0	ft
B' =	6.0	ft
L =	112	ft
e _L =	0	ft
L' =	112	ft
c =	0.55	ksf
γ =	115	pcf
φ =	0	degrees
D _w	26	ft
D _f	10	ft
N _f = f(φ)	1.00	
C _{wq}	1.0	
C _{wγ}	1.00	
N _c	5.1	
S _c	1.01	
i _c	1	
N _{cm}	5.2	
N _q	1	
S _q	1.00	
d _q	1	
i _q	1	
N _{qm}	1.0	
N _γ	0.0	
S _γ	1.00	
i _γ	1	
N _{γm}	0.0	
q _n	4.0	ksf
RF	0.45	
q _R	1.8	ksf

Client Maine Department of Transportation
Project I-395/Route 9 Connector - WIN 18915.00
Subject Bearing Resistance Calculations - Culvert Sta. 133+80

SERVICE LIMIT STATE BASED ON PRESUMPTIVE BEARING RESISTANCES IN AASHTO LRFD:
10.6.2.5—Bearing Resistance at the Service Limit State
10.6.2.5.1—Presumptive Values for Bearing Resistance C10.6.2.5.1

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

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

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

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

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



Sheet 4 of 4

Date	28-May-20
------	-----------

Computed by	EMS
-------------	-----

Checked by JAD

Strength Limit State

Service Limit State

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

Client: Maine Department of Transportation

Date: 12-Jul-2021

Project: Route 9 / I-395 Connector

Computed by: JAD

Subject: Highway Culverts Settlement

Checked by: EMS

PROBLEM STATEMENT & OBJECTIVE

Calculate the settlement for two highway culverts along proposed Route 9 / I-395 Connector.

REFERENCES

1. Settle3D version 4.0 by RocScience.

AVAILABLE INFORMATION

1. Current boring logs as noted below.
2. Plan set titled, "Brewer-Eddington I-395/Route 9 Connector, Cross Sections," by MaineDOT dated 3 March 2021.
3. Plan set titled, "Brewer-Eddington I-395/Route 9 Connector" by MaineDOT dated 5 March 2021.

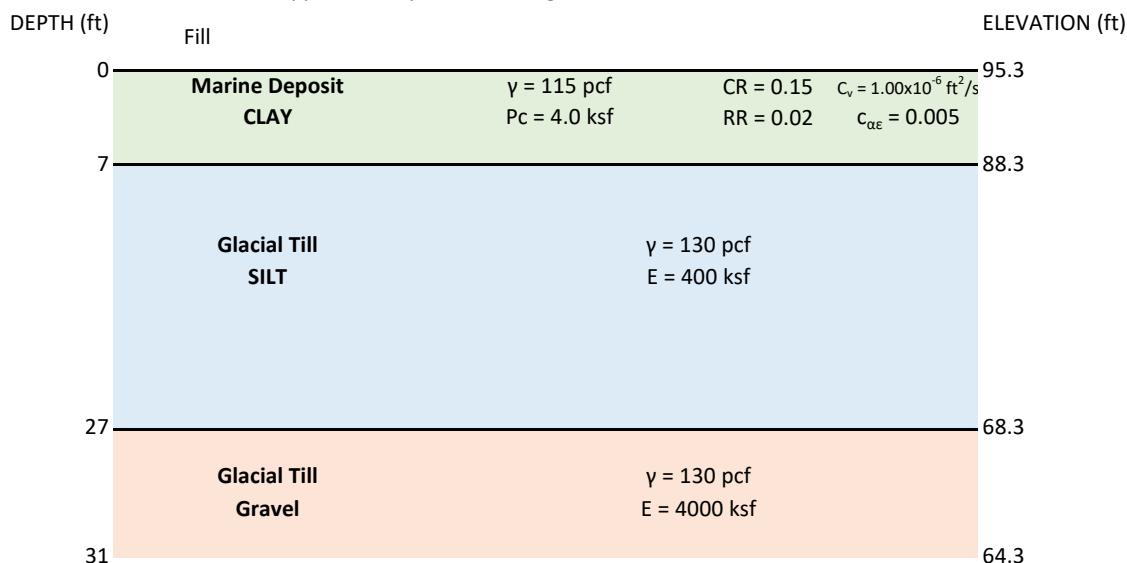
ASSUMPTIONS

1. Borings used to determine soil profiles and groundwater depths vary and are noted below.
2. Fill height varies and is noted below.
3. New fill unit weight is assumed to be 125 pcf.
4. Existing soil unit weight is assumed to be 115 to 120 pcf in the Marine Deposit and 130 psf in the Glacial Till.
5. Elastic soil moduli estimated after AASHTO 2004 with 2006 interims.
6. Consolidation properties based on laboratory testing performed on borings drilled in the vicinity of the proposed culverts,
- 7 and on past experience with Marine Deposit clay properties.
- 8 Settlement was analyzed using the Westergaard stress computation method.

SOIL PROFILES AND PROPERTIES (not to scale)

1. Sta. 133+80

Based on boring BB-BEBT1-101
Assumed max fill height = 6.6 ft → $\gamma = 0.825 \text{ksf}$
Depth to Groundwater = 6.6 ft (based on BB-BEBT1-101)
Ground surface at proposed fill area = El. 95.3 ft
Culvert Invert at approximately 4.3 ft below ground surface



Client: Maine Department of Transportation

Date: 12-Jul-2021

Project: Route 9 / I-395 Connector

Computed by: JAD

Subject: Highway Culverts Settlement

Checked by: EMS

SUMMARY OF RESULTS

Station	Time to 95% Consol. (months)	Estimated Settlement at Center of Embankment			
		Elastic Settlement (in.)	Primary Consolidation Settlement (in.)	Secondary Consolidation Settlement (in.)	Total Settlement (in.)
66+75	Refer to Area 1 settlement calculation package.				
84+50	Refer to Area 1 settlement calculation package.				
133+86	< 1	0.5	1.0	0.0	1.5

Station	Time to 95% Consol. (months)	Estimated Settlement at Edge of Embankment			
		Elastic Settlement (in.)	Primary Consolidation Settlement (in.)	Secondary Consolidation Settlement (in.)	Total Settlement (in.)
66+75	Refer to Area 1 settlement calculation package.				
84+50	Refer to Area 1 settlement calculation package.				
133+86	< 1	0.3	0.7	0.0	1.0

Excavated Soil Reuse

Client:	Maine Department of Transportation
Project:	I-395/Route 9 Connector - WIN 18915.00
Subject:	Soil Reuse in Cut Sections

PROBLEM STATEMENT AND OBJECTIVE

Evaluate potential for soil reuse in cuts in granular soil.

AVAILABLE INFORMATION

- 1 Laboratory testing on Phase I and II test borings, refer to Appendix D.

SOIL REUSE CONSIDERATIONS

Approximate Location	Boring	Sample No	Percent Fines
Sta. 48+00 to Sta. 50+50	BB-BWS-103	3D	52
		4D	81
		5D	88
	HB-BE-327	None	N/A
	BB-BWS-203	None	N/A
	BB-BWS-204	3D	11
		7D	13
		8D	22
		10D	1
		11D	45
		12D	81
	BB-BWS-205	2D	8
		4D	17
		5D	32
		6D	30
		10D	55

Client: Maine Department of Transportation
 Project: I-395/Route 9 Connector - WIN 18915.00
 Subject: Soil Reuse in Cut Sections

SOIL REUSE CONSIDERATIONS, CONT.

Approximate Location	Boring	Sample No	Percent Fines
Sta. 99+00 to Sta. 116+00	HB-BE-114	None	N/A
	HB-BE-115	2D	37
		3D	27
		6D	36
		8D	35
	HB-BE-116	3D	51
		4D	23
		5D	42
		6D	35
		8D	53
	HB-BE-217	2D	17
		3D	40
		4D	22
		5D	37
	HB-BE-218	2D	65
		3D	57
		4D	61
		5D	34
	BB-BEA-201	None	N/A
	BB-BEA-202	None	N/A
	BB-BEA-203	None	N/A
	BB-BEA-204	None	N/A
Sta. 170+00 to Sta. 179+00	BB-BEA-101	3D	39
		4D	28
		5D	43
	BB-BEA-102	4D	58
		5D	48
	HB-BE-117	4D	51
		8D	64
	HB-BE-118	None	N/A
	HB-BE-119	None	N/A
	HB-BE-120	4D	30
	HB-BE-130	None	N/A
	HB-BE-131	5D	69
		9D	64
	HB-BE-132	3D	66
		7D	68
		12D	68
	HB-BE-133	3D	55
		5D	72
		7D	69
	HB-BE-134	None	N/A

Client:	Maine Department of Transportation
Project:	I-395/Route 9 Connector - WIN 18915.00
Subject:	Soil Reuse in Cut Sections

SOIL REUSE CONSIDERATIONS, CONT.

Approximate Location	Boring	Sample No	Percent Fines
Sta. 206+50 to Sta. 222+50	HB-BE-228	2D	62
		3D	48
	HB-BE-144	2D	50
		3D	64
	HB-BE-229	2D	62
	HB-BE-230	2D	62
	HB-BE-145	3D	40
	HB-BE-146	None	N/A
	HB-BE-147	None	N/A
	HB-BE-231	2D	50
	BB-ECR-201	None	N/A
	BB-ECR-202	None	N/A
	BB-ECR-203	None	N/A
	BB-ECR-203A	None	N/A
	BB-ECR-204	None	N/A
	BB-ECR-204A	None	N/A
	BB-ECR-205	None	N/A
	BB-ECR-206	None	N/A
	BB-ECR-206A	None	N/A
	BB-ECR-101	3D	72
		4D	63
	BB-ECR-102	3D	59
	HB-BE-232	3D	51
	HB-BE-148	2D	56
		5D	62
		6D	61
	HB-BE-149	None	N/A

Client:	Maine Department of Transportation
Project:	I-395/Route 9 Connector - WIN 18915.00
Subject:	Soil Reuse in Cut Sections

SOIL REUSE CONSIDERATIONS, CONT.

Approximate Location	Boring	Sample No	Percent Fines
Sta. 229+00 to Sta. 246+50	HB-BE-150	None	N/A
	HB-BE-234	4D	30
		5D	12
	HB-BE-151	2D	67
		3D	67
		4D	61
		5D	56
		6D+7D	12
	HB-BE-235	2D	65
	BB-ELER-201	None	N/A
	BB-ELER-202	3D	68
	BB-ELER-203	2D	60
	BB-ELER-204	None	N/A
	BB-ELER-205	3D	64
	BB-ELER-206	None	N/A
	BB-ELER-206A	None	N/A
	BB-ELER-101	3D	61
	BB-ELER-102	3D	65
		4D	55
	HB-BE-236	3D	34
Sta. 302+50 to Sta. 311+50	HB-BE-237	2D	49
	HB-BE-152	2D	62
		5D	27
	HB-BE-153	1D	17
Sta. 319+50 to Sta. 326+00	HB-BE-164	2D	69
		3D	52
	HB-BE-165	2D	64
		5D	64
	HB-BE-168	2D	66
		4D	38
	HB-BE-342	None	N/A
	HB-BE-344	None	N/A