APPENDIX C

A P P E N D I X C

Laboratory Tests

Moisture Content (ASTM D2216) and Unit Weight (ASTM D2937) determinations were performed on selected samples as an aid in the classification and evaluation of soil properties. The test results are presented on the Logs of Borings at the appropriate sample depths.

Twenty-One Atterberg Limits tests (ASTM D4318) were performed on selected soil samples to evaluate the liquid and plastic limits to aid in soil classifications. The test results are summarized on the Logs of Borings at the appropriate sample depths. Graphic presentations of the test results are provided on Plates C-1 through C-3.

Nine Sieve Analysis tests (ASTM C117 & C136) were performed on selected soil samples to evaluate the gradation characteristics of the soils and to aid in soil classification. Graphic presentations of the grain size distributions are provided on Plates C-4 and C-5.

Four one-inch Ring Swell tests were performed on remolded samples to evaluate the swelling potential of the near-surface soils. The test results are summarized on Plate C-6.

One Unconfined Compression test (ASTM D2166) was performed on a selected in-situ sample to evaluate the unconfined compression strength of the on-site soil. The test result is shown on the Logs of Borings at the appropriate sample depth. The stress-strain curve of the unconfined compression test is presented on Plate C-7.

Twenty-seven Unconsolidated Undrained Triaxial Compression tests (ASTM D2850) were performed on selected soil samples to evaluate the undrained shear strength of the in-situ soils. The approximate in-situ effective overburden pressure was used as the applied confining pressure for the relatively “undisturbed” soil sample. The test results and the stress-strain curves are presented on Plates C-8 through C-34.

Fifteen Direct Shear tests (ASTM D3080) were performed on selected samples to evaluate the shear strength characteristics of the material tested. The test results are presented on Plates C-35 through C-49.

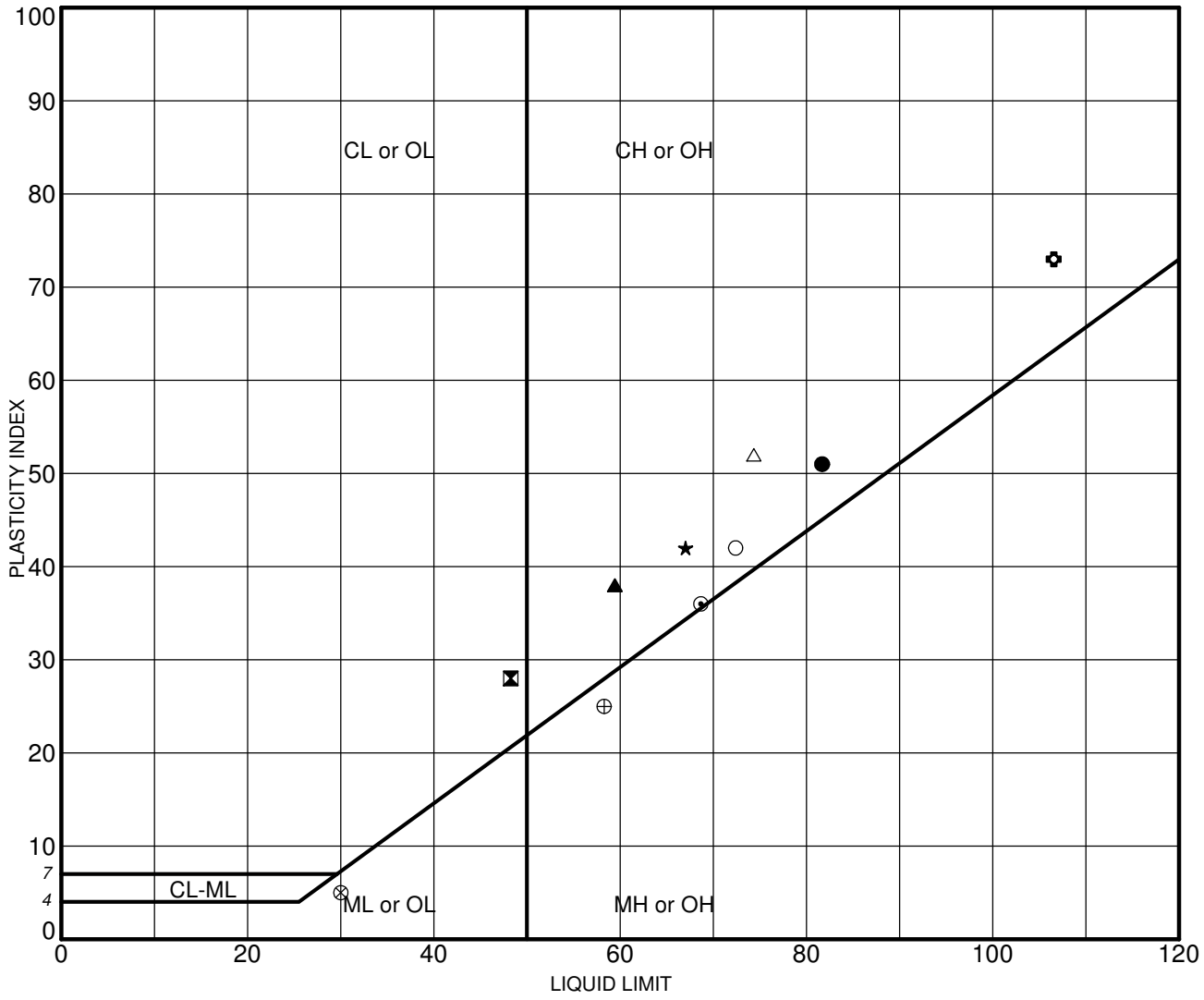
Forty-Eight Uniaxial Compressive Strength tests (ASTM D7012) were performed on selected rock cores to evaluate their unconfined compressive strength of the rock materials encountered. Test results are presented on Plates C-50 and C-51.

Two sets of Corrosion Tests, including pH (ASTM G51), Minimum Resistivity (ASTM G57), Chloride Content (EPA 300.0), and Sulfate Content (EPA 300.0) tests were performed by our office and Eurofins TestAmerica Laboratories, Inc. on selected soil samples obtained from our field exploration. The test results are summarized on Plate C-52.

Five Modified Proctor compaction tests (ASTM D1557) were performed on bulk samples of the near-surface soils to evaluate the dry density and moisture content relationships. The test results are presented on Plates C-53 through C-57.

Four laboratory California Bearing Ratio tests (ASTM D1883) were performed on bulk samples of the near-surface soils to evaluate the pavement support characteristics of the soils. The test results are presented on Plates C-58 through C-61.

Five laboratory Resistance (R) Value tests (ASTM D2844) were performed by Ninyo & Moore on selected bulk samples of the near-surface soils to evaluate the pavement support characteristics of the soils. The test results are presented on Plates C-62 through C-66.



	Sample	Depth (ft)	LL	PL	PI	Description
●	B-2	5.0-6.5	82	31	51	Brownish gray with multi-color mottling silty clay (CH)
⊠	B-3	1.0-2.5	48	20	28	Brown with multi-color mottling sandy clay (CL) with traces of gravel
▲	B-5	2.5-4.0	59	21	38	Brown silty clay (CH) with some gravel
★	B-6	2.5-4.0	67	25	42	Brown and gray silty clay (CH) with some gravel
⊙	B-6	76.0-77.5	69	33	36	Brown silty clay (CH) with some sand and a little gravel
✿	B-6	91.0-92.5	107	34	73	Brown with multi-color mottling silty clay with some sand
○	B-7	65.5-66.6	72	30	42	Brown silty clay with some sand and a little gravel
△	B-8	2.5-4.0	74	22	52	Brownish gray silty clay (CH) with some sand and gravel
⊗	B-8	10.5-12.0	30	25	5	Brown sandy silt (ML) with some gravel
⊕	B-8	65.5-67.0	58	33	25	Brown clayey silt (MH) with some sand and traces of gravel

NP = NON-PLASTIC

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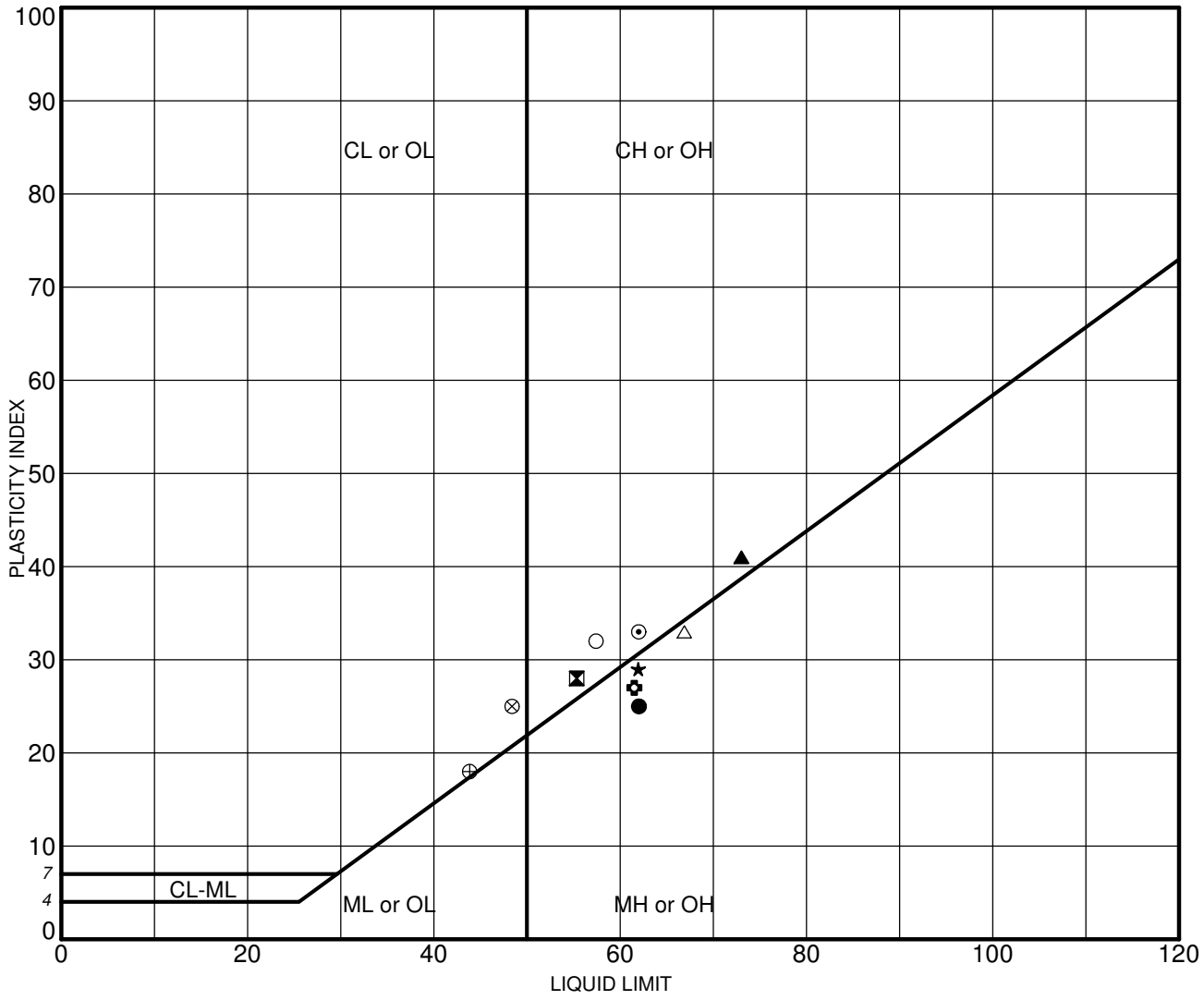
ATTERBERG LIMITS TEST RESULTS - ASTM D4318

INTERSTATE ROUTE H-1 (EB) IMPROVEMENTS
OLA LANE OVERPASS TO
KALIHI STREET INTERCHANGE
HONOLULU, OAHU, HAWAII

Plate
C - 1

G ATTERBERG PI-100 LL-120 8049-00.GPJ GEOLABS.GDT 5/3/21



	Sample	Depth (ft)	LL	PL	PI	Description
●	B-9	5.0-6.5	62	37	25	Orangish gray clayey silt (MH) with some sand and gravel
⊠	B-11	60.5-62.0	55	27	28	Reddish brown silty clay (CH) with some sand
▲	B-11	80.5-82.0	73	32	41	Brown with multi-color mottling silty clay with some sand
★	B-12	51.0-52.5	62	33	29	Dark brown clayey silt (MH)
⊙	B-12	71.0-72.5	62	29	33	Brown with traces of gray silty clay (CH) with traces of sand
✿	B-12	91.0-92.5	62	35	27	Brown with some gray clayey silt (MH) with some sand and gravel
○	B-13	1.0-2.1	57	25	32	Brown silty clay (CH) with a little sand and gravel
△	B-13	66.0-67.5	67	34	33	Brown with multi-color mottling clayey silt (MH) with some sand and traces of gravel
⊗	B-15	1.5-2.4	48	23	25	Brown and gray sandy clay (CL) with some gravel
⊕	B-15	31.5-33.0	44	26	18	Reddish brown clayey silt (ML) with some sand and a little gravel

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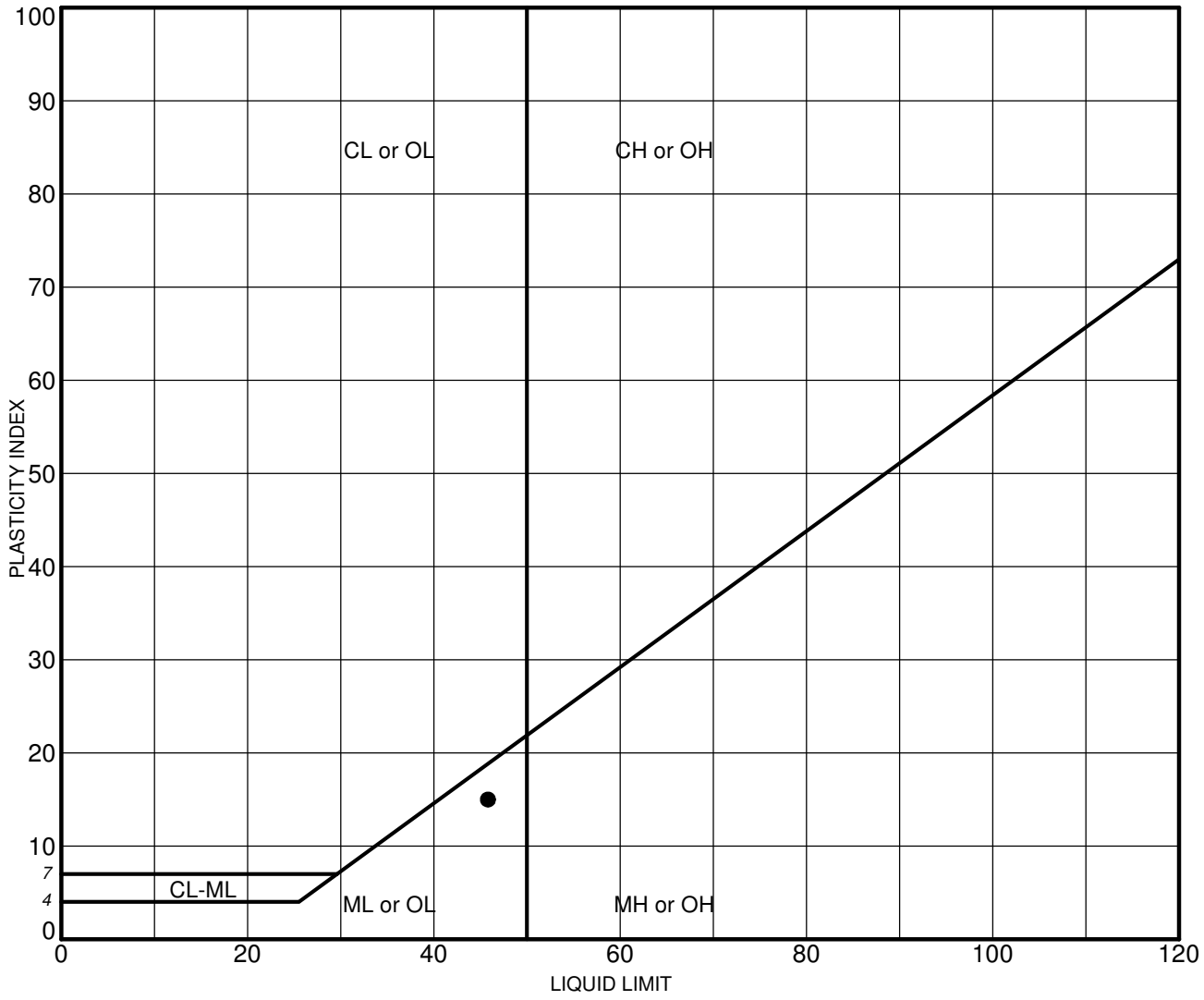
ATTERBERG LIMITS TEST RESULTS - ASTM D4318

INTERSTATE ROUTE H-1 (EB) IMPROVEMENTS
OLA LANE OVERPASS TO
KALIHI STREET INTERCHANGE
HONOLULU, OAHU, HAWAII

Plate
C - 2

G ATTERBERG PI-100 LL-120 8049-00.GPJ GEOLABS.GDT 5/3/21



	Sample	Depth (ft)	LL	PL	PI	Description
●	B-16	2.5-3.5	46	31	15	Brown sandy silt (ML) with some gravel

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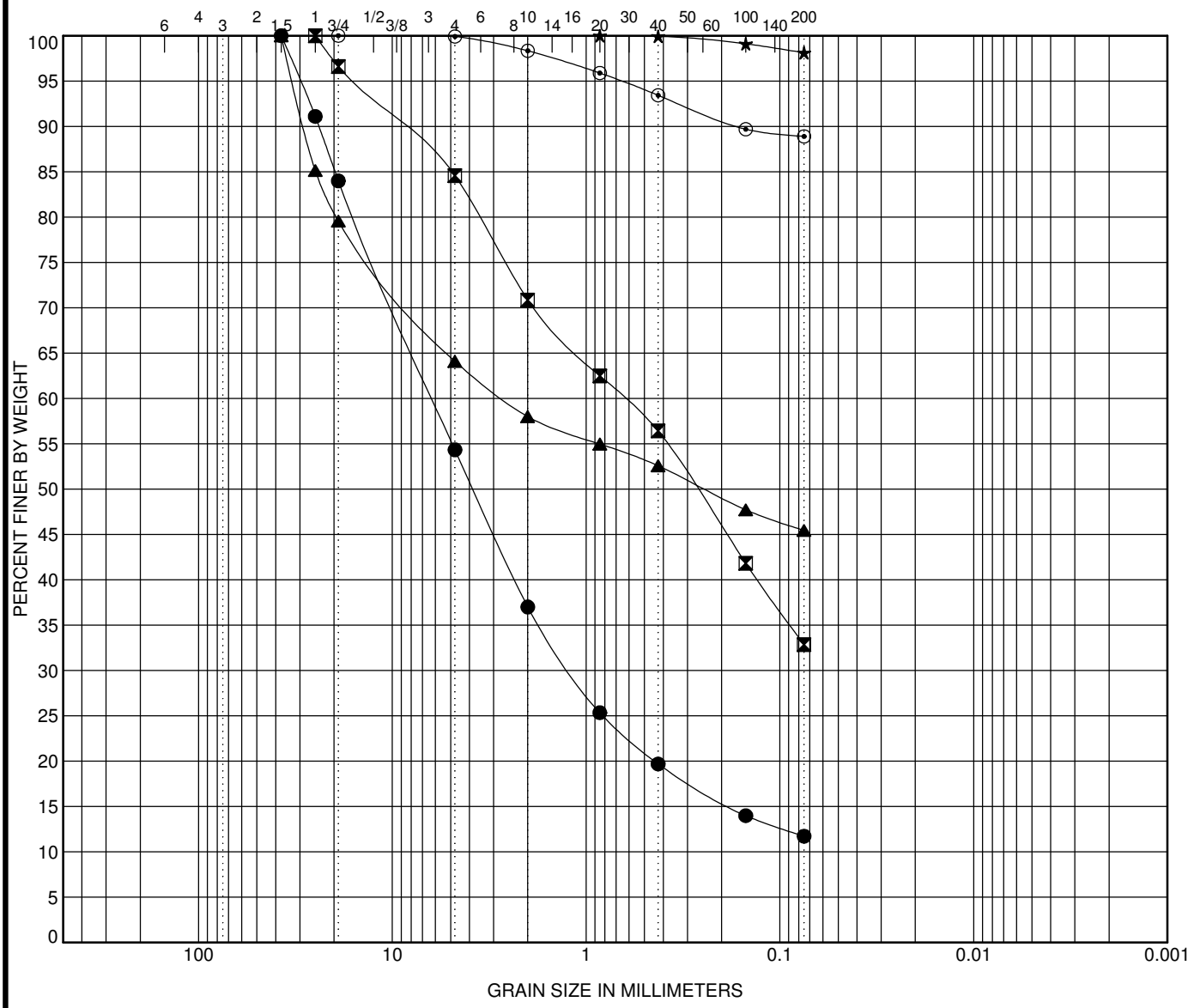
ATTERBERG LIMITS TEST RESULTS - ASTM D4318

INTERSTATE ROUTE H-1 (EB) IMPROVEMENTS
OLA LANE OVERPASS TO
KALIHI STREET INTERCHANGE
HONOLULU, OAHU, HAWAII

Plate
C - 3

G ATTERBERG PI-100 LL-120 8049-00.GPJ GEOLABS.GDT 5/3/21



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Sample	Depth (ft)	Description	LL	PL	PI	Cc	Cu
●	B-1	1.0-2.5	Brownish gray sandy gravel (GP-GM) with a little silt				5.2	139.8
⊠	B-4	2.5-3.8	Brown and gray silty sand (SM) with some gravel					
▲	B-5	11.0-12.5	Brown and gray silty gravel (GM) with some sand					
★	B-11	100.5-102.0	Brown with multi-color mottling silt (ML) with traces of sand					
⊙	B-12	101.0-102.5	Brown with some gray silt (ML) with a little sand and traces of gravel					

	Sample	Depth (ft)	D100 (mm)	D60 (mm)	D30 (mm)	D10 (mm)	%Gravel	%Sand	%Fine
●	B-1	1.0-2.5	37.5	6.192	1.197		45.7	42.6	11.7
⊠	B-4	2.5-3.8	25	0.64			15.4	51.7	32.8
▲	B-5	11.0-12.5	37.5	2.659			35.9	18.7	45.4
★	B-11	100.5-102.0	0.85				0.0	1.9	98.1
⊙	B-12	101.0-102.5	19				0.1	11.0	88.9

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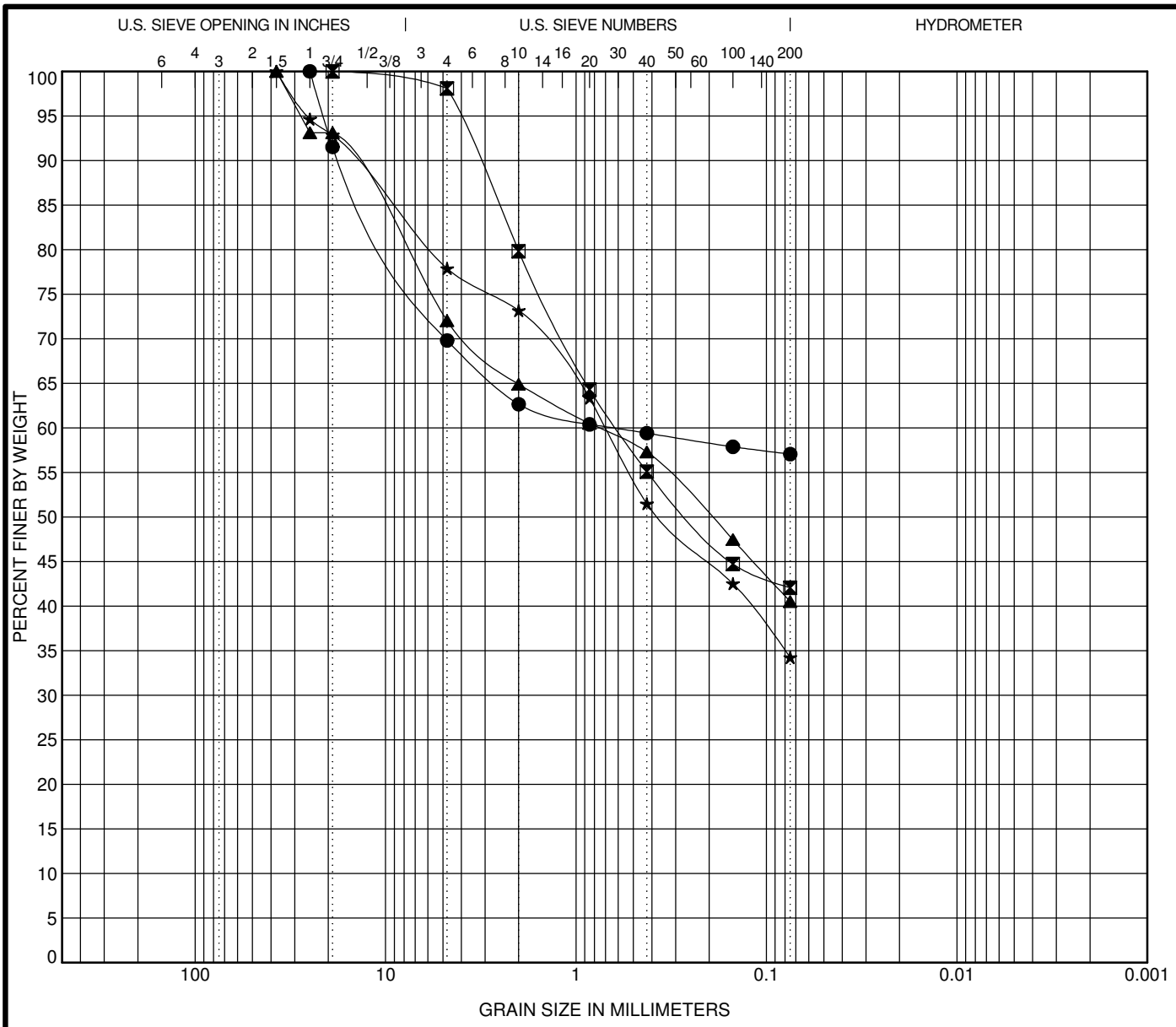
GRAIN SIZE DISTRIBUTION - ASTM D6913

INTERSTATE ROUTE H-1 (EB) IMPROVEMENTS
OLA LANE OVERPASS TO
KALIHI STREET INTERCHANGE
HONOLULU, OAHU, HAWAII

Plate
C - 4

G_GRAIN_SIZE_MOD 8049-00.GPJ GEOLABS.GDT 5/3/21



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Sample	Depth (ft)	Description	LL	PL	PI	Cc	Cu
●	B-13	36.0-37.5	Brown gravelly silt (ML) with some sand					
⊠	B-13	116.0-117.5	Brown with gray mottling silty sand (SM) with traces of gravel					
▲	B-101	2.5-4.0	Brown silty sand (SM) with some gravel					
★	B-101A	15.0-16.5	Brown silty sand (SM) with some gravel					

	Sample	Depth (ft)	D100 (mm)	D60 (mm)	D30 (mm)	D10 (mm)	%Gravel	%Sand	%Fine
●	B-13	36.0-37.5	25	0.646			30.2	12.8	57.1
⊠	B-13	116.0-117.5	19	0.615			1.9	56.0	42.1
▲	B-101	2.5-4.0	37.5	0.763			28.0	31.5	40.5
★	B-101A	15.0-16.5	37.5	0.699			22.1	43.6	34.2

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GRAIN SIZE DISTRIBUTION - ASTM D6913

INTERSTATE ROUTE H-1 (EB) IMPROVEMENTS
OLA LANE OVERPASS TO
KALIHI STREET INTERCHANGE
HONOLULU, OAHU, HAWAII

Plate
C - 5

G_GRAIN_SIZE_MOD 8049-00.GPJ GEOLABS.GDT 5/3/21

Location	Depth	Soil Description	Dry Density	Moisture Contents			Ring Swell
				Initial	Air-Dried	Final	
	(feet)		(pcf)	(%)	(%)	(%)	(%)
B-2**	2.5 - 4.0	Brownish gray with multi-color mottling silty clay with traces of gravel	85.2	37.6	29.6	40.5	0.1
B-5**	11.0 - 12.5	Brown and gray silty gravel (GM) with some sand	78.6	41.6	32.2	45.5	1.7
B-9**	5.0 - 6.5	Orangish gray clayey silt (MH) with some sand and gravel	76.6	44.1	30.7	49.5	3.4
B-16**	1.0 - 2.5	Brown sandy silt with some gravel	95.0	25.5	17.0	28.8	2.1

NOTE: Samples tested were either relatively undisturbed or remolded in 2.4-inch diameter by 1-inch high rings. They were air-dried overnight and then saturated for 24 hours under a surcharge pressure of 55 psf.

* Relatively Undisturbed
** Remolded

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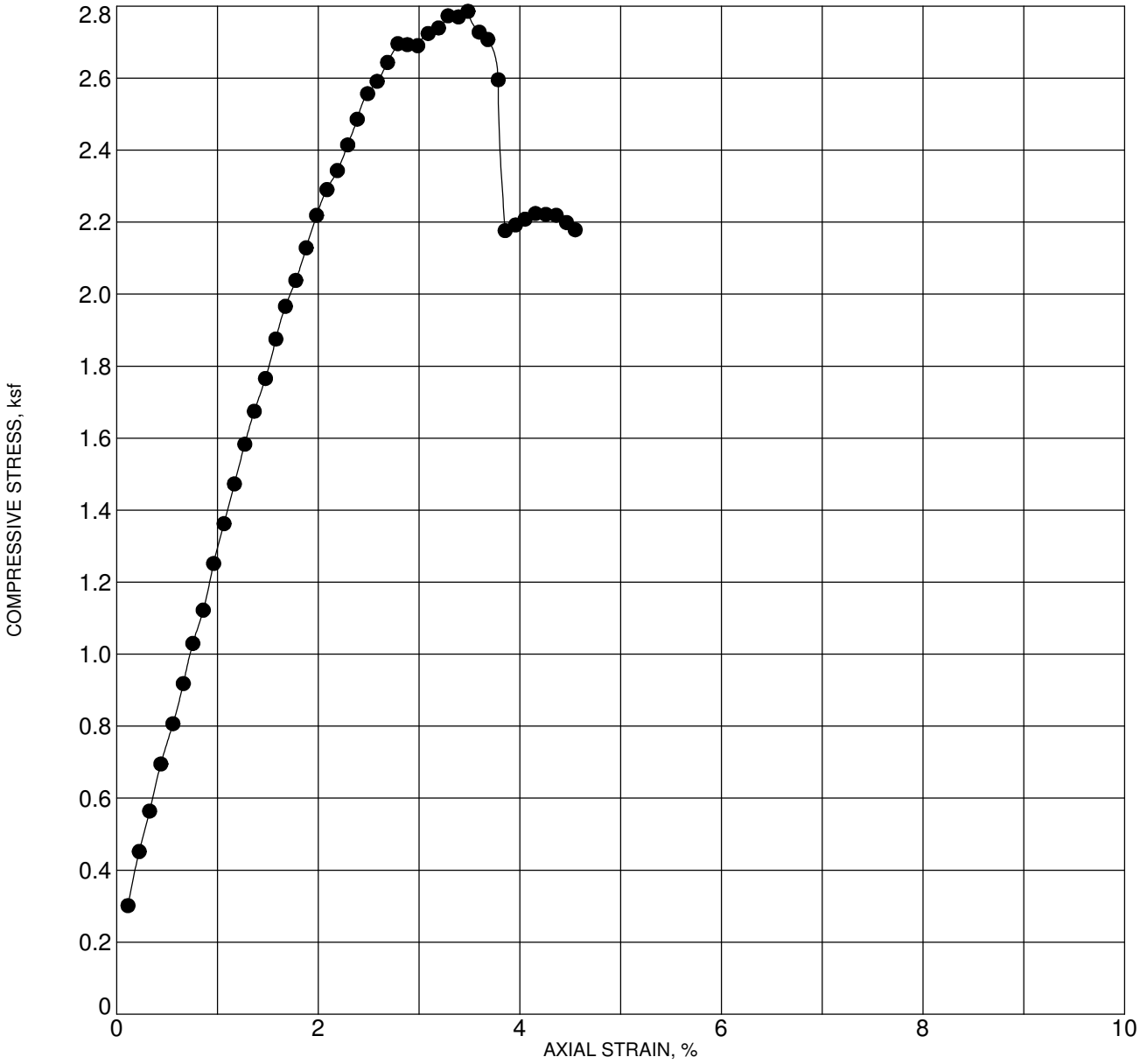
SUMMARY OF RING SWELL TESTS

INTERSTATE ROUTE H-1 (EB) IMPROVEMENTS
OLA LANE OVERPASS TO
KALIHI STREET INTERCHANGE
HONOLULU, OAHU, HAWAII

Plate
C - 6

G_RING_SWELL_TEST_8049-00.GPJ GEOLABS.GDT 5/3/21



Unconfined Compressive Strength (ksf):	2.79
Axial Strain at Failure (%):	3.5
Strain Rate (% / minute):	1.00

Location: B-12
Depth: 121.0 - 122.5 feet
Description: Gray clayey silt with a little fine sand
Test Date: 1/7/2021

Dry Density (pcf)	64.9	Sample Diameter (inches)	2.400
Moisture (%)	62.3	Sample Height (inches)	5.130

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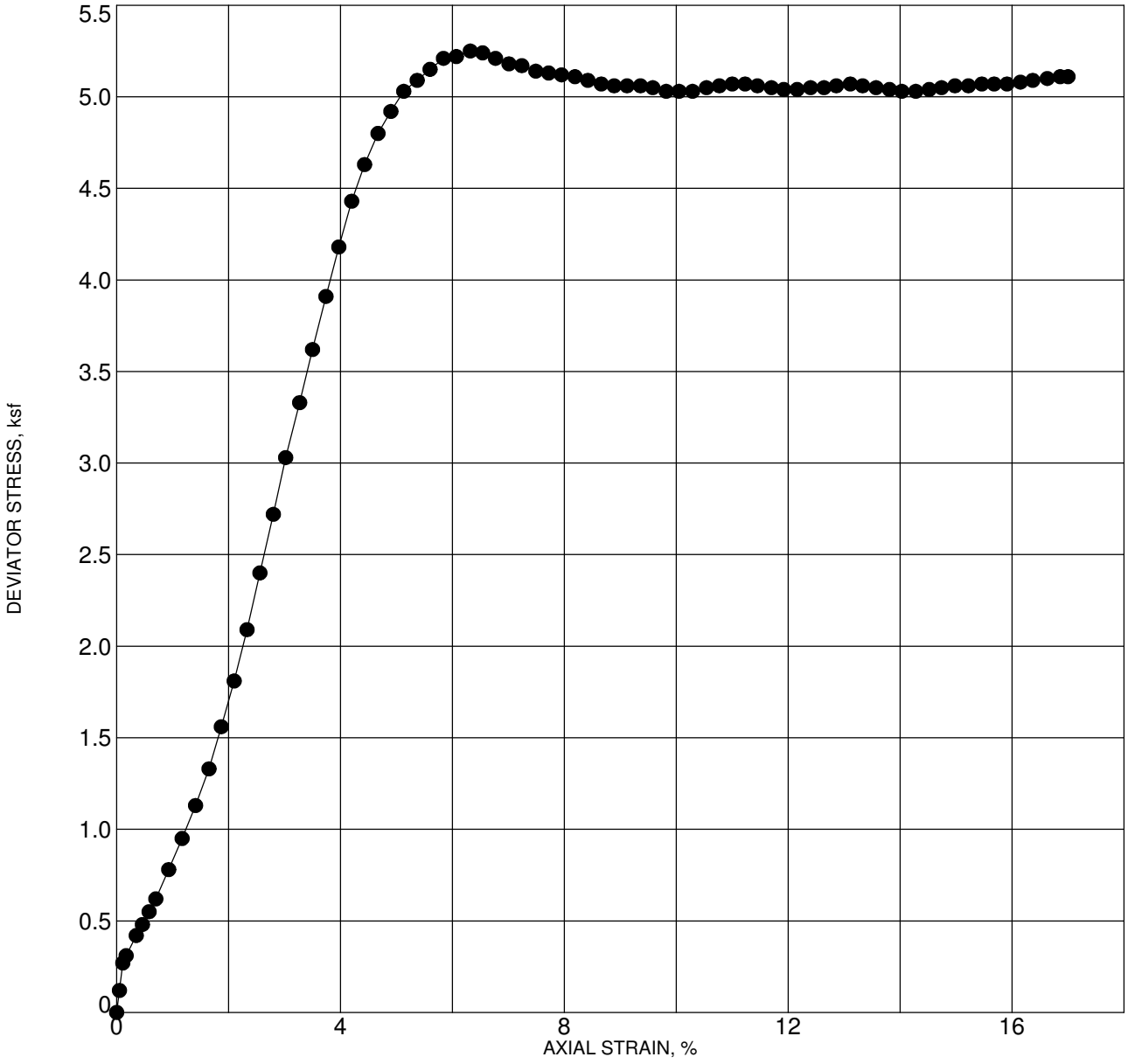
UNCONFINED COMPRESSION TEST - ASTM D2166

INTERSTATE ROUTE H-1 (EB) IMPROVEMENTS
OLA LANE OVERPASS TO
KALIHI STREET INTERCHANGE
HONOLULU, OAHU, HAWAII

Plate
C - 7

G_UC 8049-00.GPJ GEOLABS.GDT 5/3/21



Max. Deviator Stress (ksf):	5.3
Confining Stress (ksf):	0.5

Location: B-3
Depth: 5.0 - 6.5 feet
Description: Brown with multi-color mottling sandy clay with traces of gravel
Test Date: 12/30/2020

Dry Density (pcf)	91.1	Sample Diameter (inches)	2.400
Moisture (%)	32.1	Sample Height (inches)	5.130
Axial Strain at Failure (%)	6.3	Strain Rate (% / minute)	0.70

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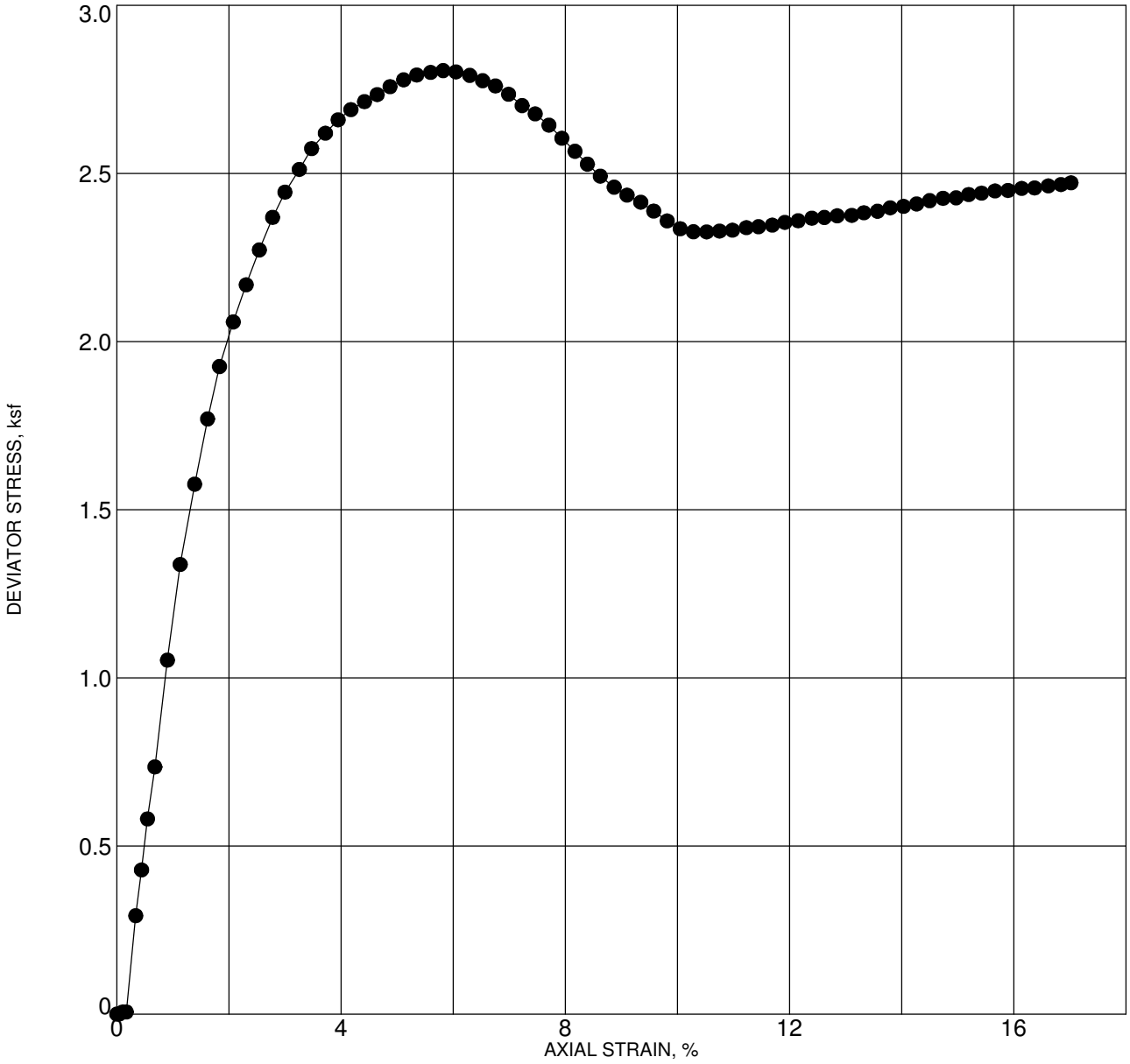
TRIAXIAL UU COMPRESSION TEST - ASTM D2850

INTERSTATE ROUTE H-1 (EB) IMPROVEMENTS
OLA LANE OVERPASS TO
KALIHI STREET INTERCHANGE
HONOLULU, OAHU, HAWAII

Plate
C - 8

G_TXUU_8049-00.GPJ GEOLABS.GDT 5/3/21



Max. Deviator Stress (ksf):	2.8
Confining Stress (ksf):	0.5

Location: B-6
Depth: 5.0 - 6.5 feet
Description: Brown and gray silty clay with some gravel
Test Date: 1/6/2021

Dry Density (pcf)	84.6	Sample Diameter (inches)	2.403
Moisture (%)	30.6	Sample Height (inches)	5.100
Axial Strain at Failure (%)	5.8	Strain Rate (% / minute)	0.70

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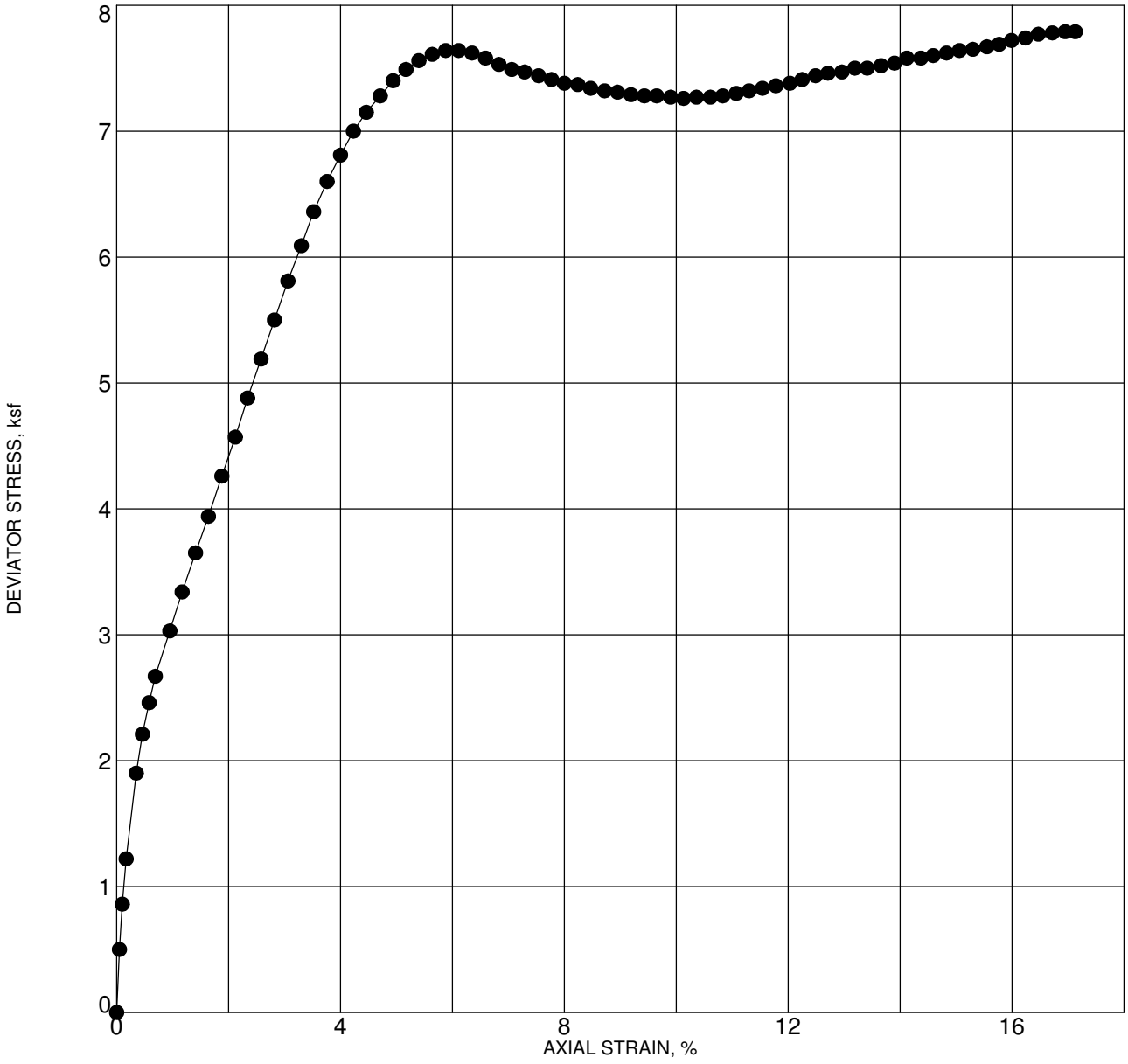
TRIAXIAL UU COMPRESSION TEST - ASTM D2850

INTERSTATE ROUTE H-1 (EB) IMPROVEMENTS
OLA LANE OVERPASS TO
KALIHI STREET INTERCHANGE
HONOLULU, OAHU, HAWAII

Plate
C - 9

G_TXUU_8049-00.GPJ GEOLABS.GDT 5/3/21



Max. Deviator Stress (ksf):	7.6
Confining Stress (ksf):	9.7

Location: B-6
Depth: 71.0 - 72.3 feet
Description: Brown silty clay with some sand and a little gravel
Test Date: 12/29/2020

Dry Density (pcf)	86.4	Sample Diameter (inches)	2.410
Moisture (%)	33.9	Sample Height (inches)	5.170
Axial Strain at Failure (%)	14.8	Strain Rate (% / minute)	0.71

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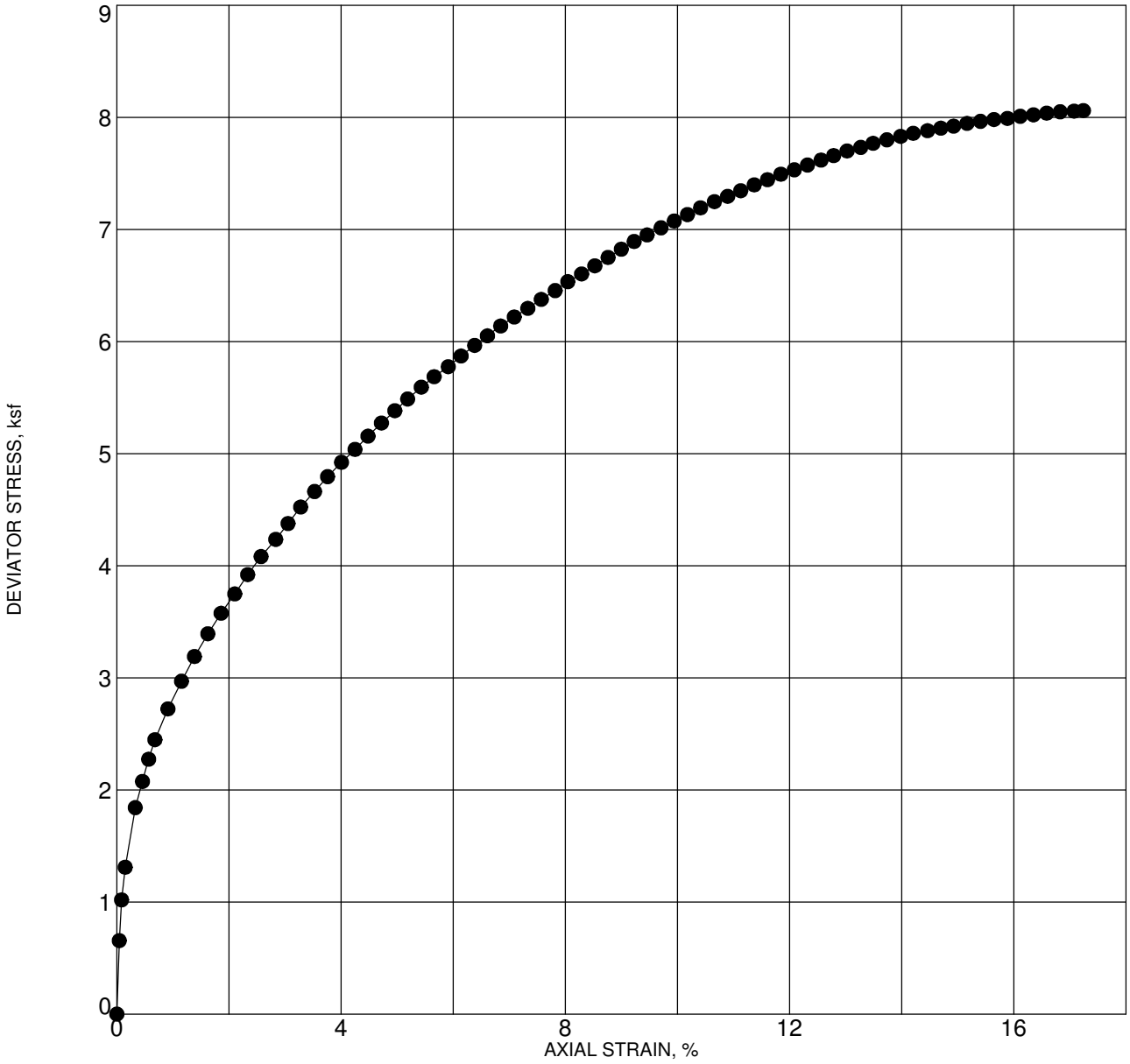
TRIAXIAL UU COMPRESSION TEST - ASTM D2850

INTERSTATE ROUTE H-1 (EB) IMPROVEMENTS
OLA LANE OVERPASS TO
KALIHI STREET INTERCHANGE
HONOLULU, OAHU, HAWAII

Plate
C - 10

G_TXUU 8049-00.GPJ GEOLABS.GDT 5/3/21



Max. Deviator Stress (ksf):	7.9
Confining Stress (ksf):	10.7

Location: B-6
Depth: 81.0 - 82.5 feet
Description: Brown with multi-color mottling silty clay with some sand
Test Date: 1/7/2021

Dry Density (pcf)	68.4	Sample Diameter (inches)	2.407
Moisture (%)	55.0	Sample Height (inches)	5.167
Axial Strain at Failure (%)	14.9	Strain Rate (% / minute)	0.71

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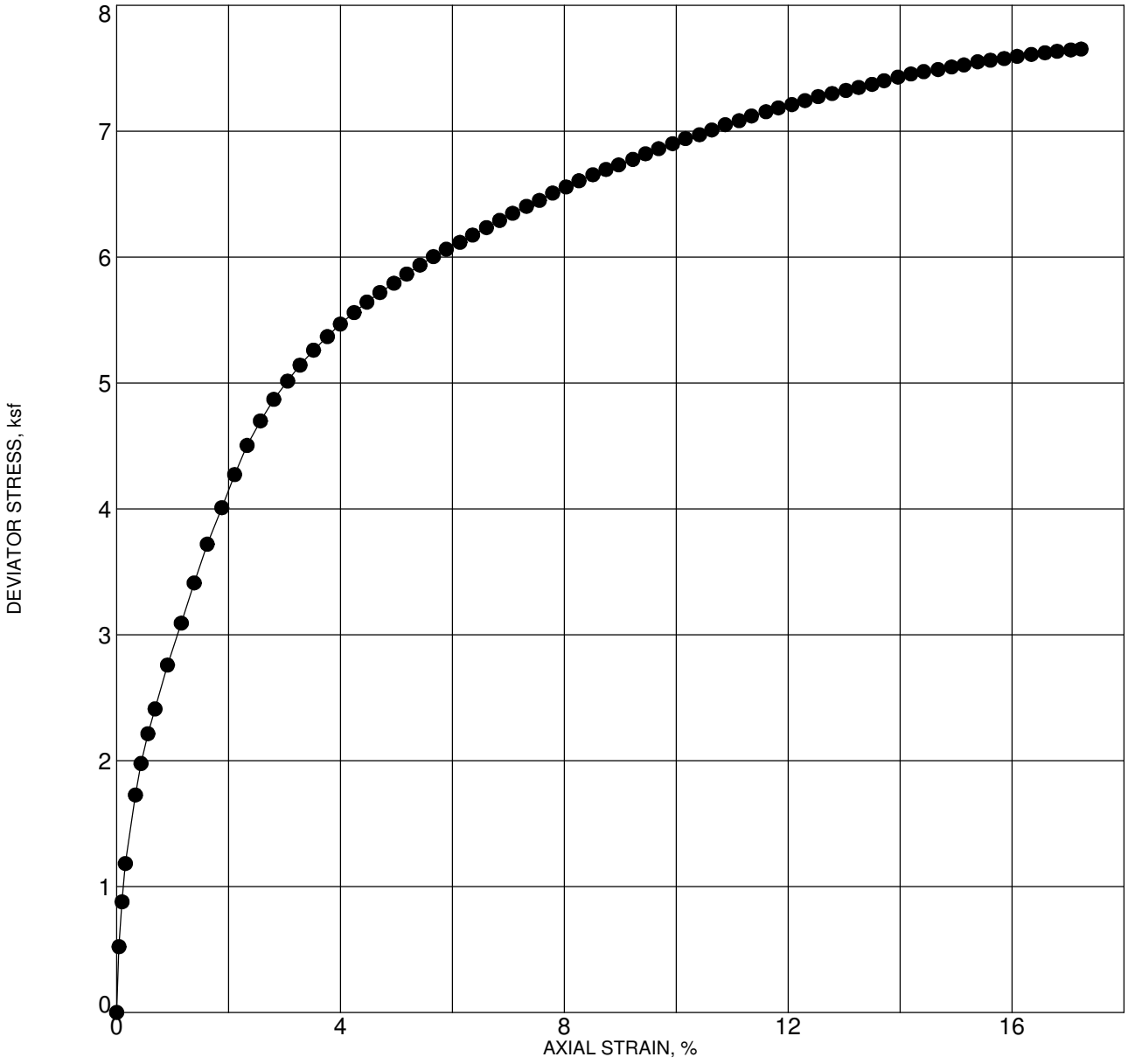
TRIAXIAL UU COMPRESSION TEST - ASTM D2850

INTERSTATE ROUTE H-1 (EB) IMPROVEMENTS
OLA LANE OVERPASS TO
KALIHI STREET INTERCHANGE
HONOLULU, OAHU, HAWAII

Plate
C - 11

G_TXUU 8049-00.GPJ GEOLABS.GDT 5/3/21



Max. Deviator Stress (ksf):	7.5
Confining Stress (ksf):	11.7

Location: B-6
Depth: 91.0 - 92.5 feet
Description: Brown with multi-color mottling silty clay with some sand
Test Date: 1/6/2021

Dry Density (pcf)	64.8	Sample Diameter (inches)	2.407
Moisture (%)	58.3	Sample Height (inches)	5.133
Axial Strain at Failure (%)	14.9	Strain Rate (% / minute)	0.71

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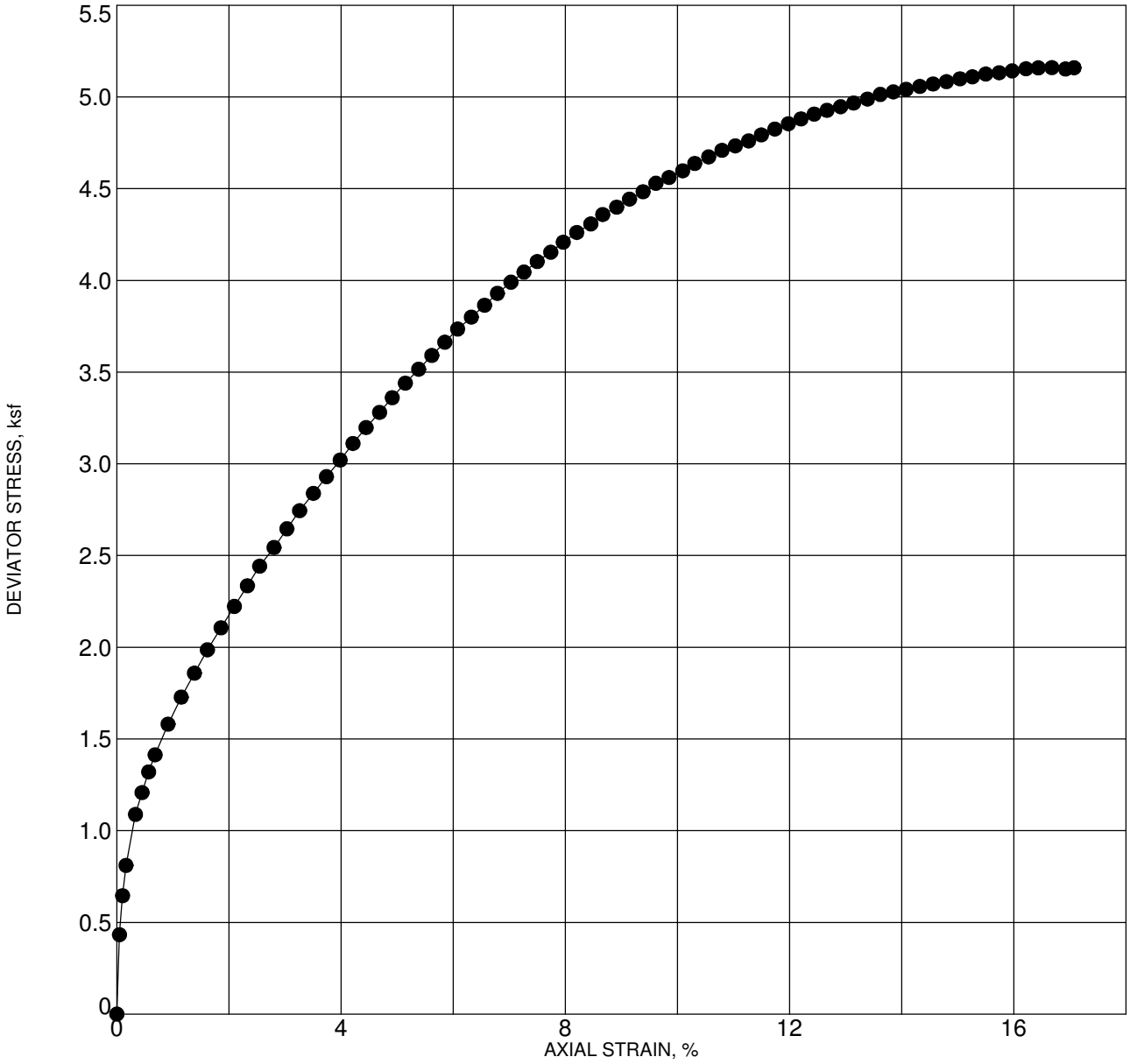
TRIAXIAL UU COMPRESSION TEST - ASTM D2850

INTERSTATE ROUTE H-1 (EB) IMPROVEMENTS
OLA LANE OVERPASS TO
KALIHI STREET INTERCHANGE
HONOLULU, OAHU, HAWAII

Plate
C - 12

G_TXUU 8049-00.GPJ GEOLABS.GDT 5/3/21



Max. Deviator Stress (ksf):	5.1
Confining Stress (ksf):	13.7

Location: B-6
Depth: 111.0 - 112.5 feet
Description: Brown with multi-color mottling silty clay with some sand
Test Date: 1/6/2021

Dry Density (pcf)	65.6	Sample Diameter (inches)	2.407
Moisture (%)	57.2	Sample Height (inches)	5.133
Axial Strain at Failure (%)	15.0	Strain Rate (% / minute)	0.71

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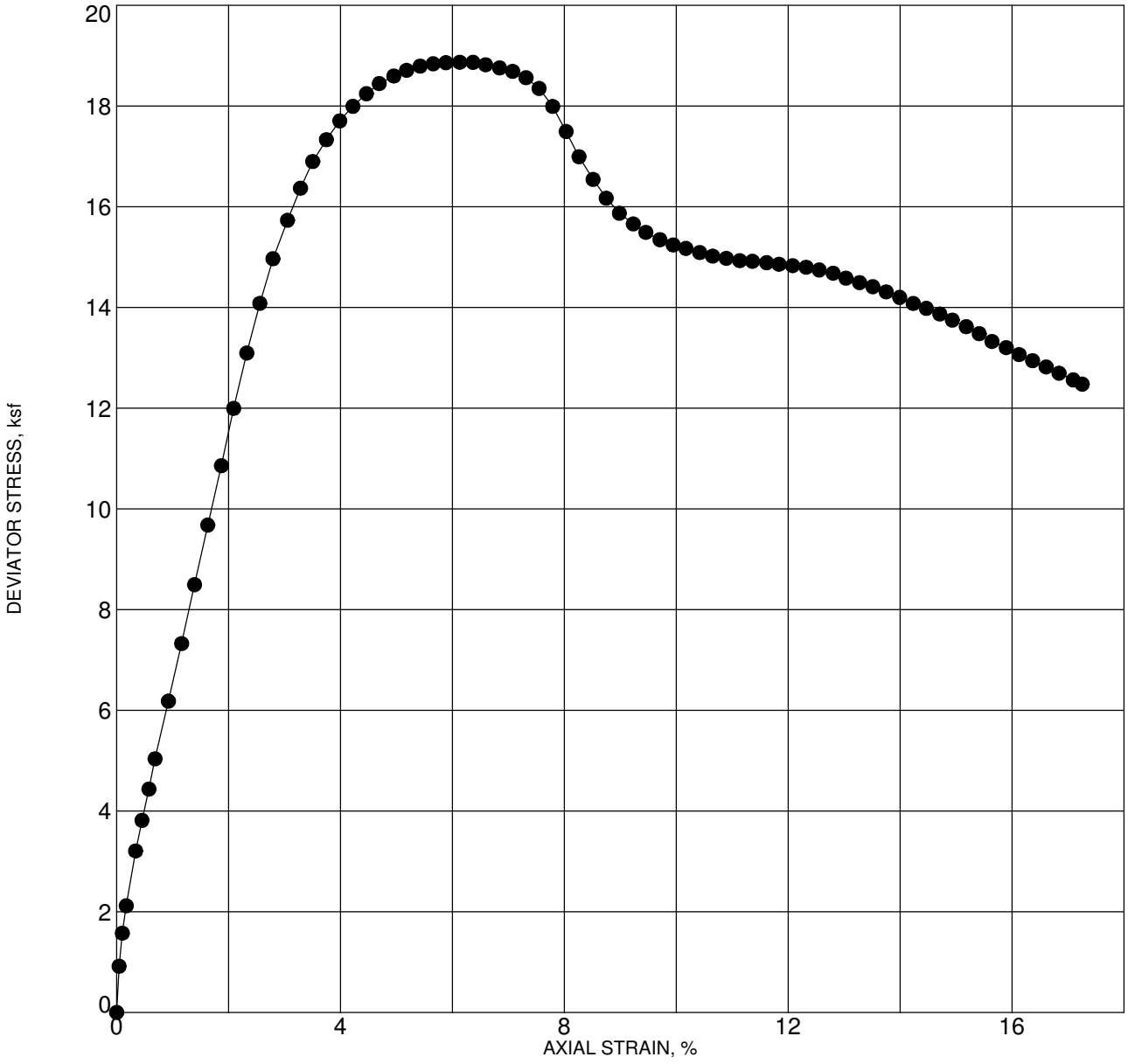
TRIAXIAL UU COMPRESSION TEST - ASTM D2850

INTERSTATE ROUTE H-1 (EB) IMPROVEMENTS
OLA LANE OVERPASS TO
KALIHI STREET INTERCHANGE
HONOLULU, OAHU, HAWAII

Plate
C - 13

G_TXUU 8049-00.GPJ GEOLABS.GDT 5/3/21



Max. Deviator Stress (ksf):	18.9
Confining Stress (ksf):	9.3

Location: B-7
Depth: 65.5 - 66.6 feet
Description: Brown silty clay with some sand and a little gravel
Test Date: 1/7/2021

Dry Density (pcf)	71.3	Sample Diameter (inches)	2.407
Moisture (%)	50.2	Sample Height (inches)	5.167
Axial Strain at Failure (%)	6.4	Strain Rate (% / minute)	0.71

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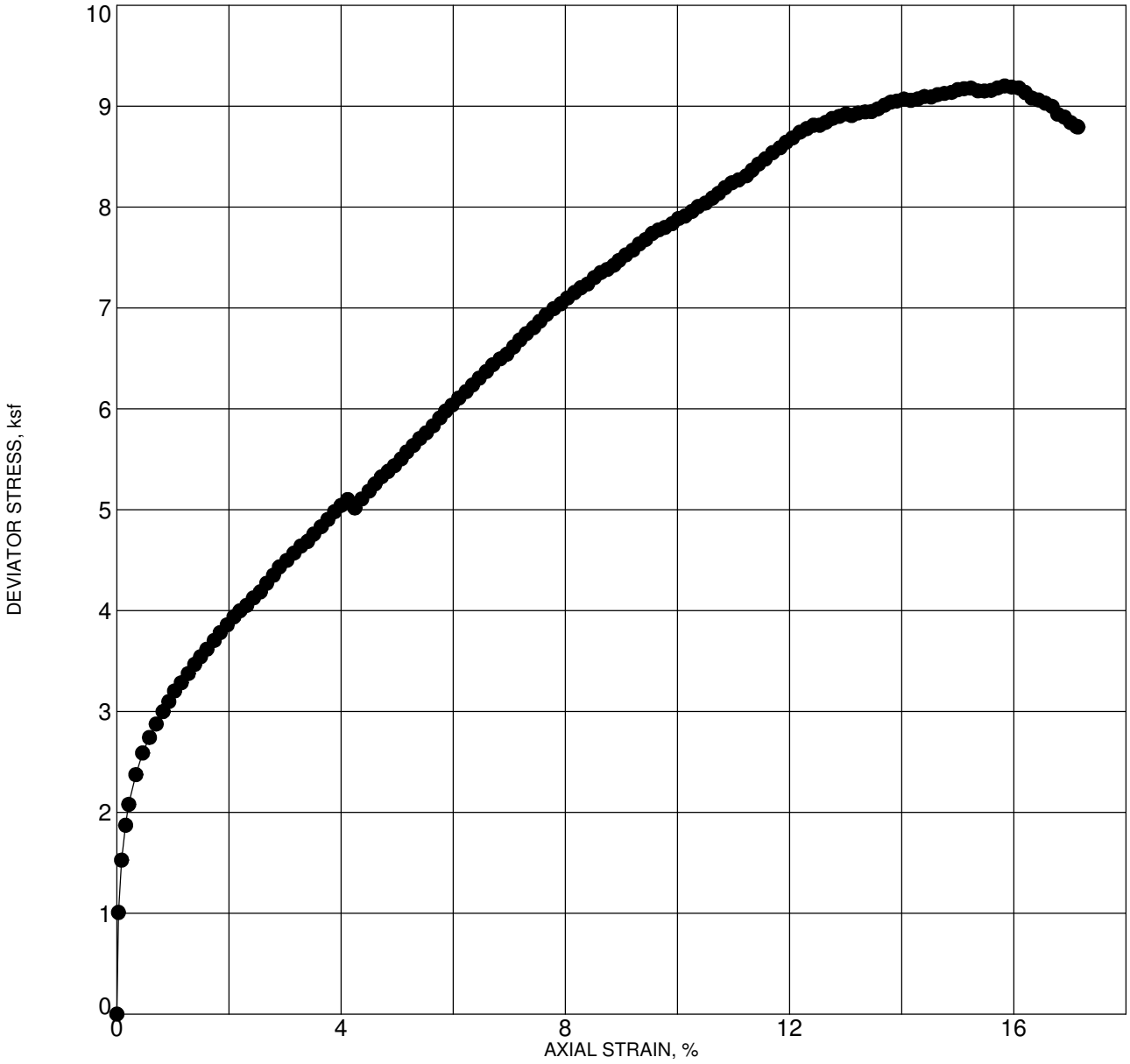
TRIAXIAL UU COMPRESSION TEST - ASTM D2850

INTERSTATE ROUTE H-1 (EB) IMPROVEMENTS
OLA LANE OVERPASS TO
KALIHI STREET INTERCHANGE
HONOLULU, OAHU, HAWAII

Plate
C - 14

G_TXUU 8049-00.GPJ GEOLABS.GDT 5/3/21



Max. Deviator Stress (ksf):	9.2
Confining Stress (ksf):	10.3

Location: B-7
Depth: 75.5 - 77.0 feet
Description: Brown silty clay with some sand and a little gravel
Test Date: 1/20/2021

Dry Density (pcf)	77.0	Sample Diameter (inches)	2.407
Moisture (%)	39.2	Sample Height (inches)	5.133
Axial Strain at Failure (%)	15.0	Strain Rate (% / minute)	0.70

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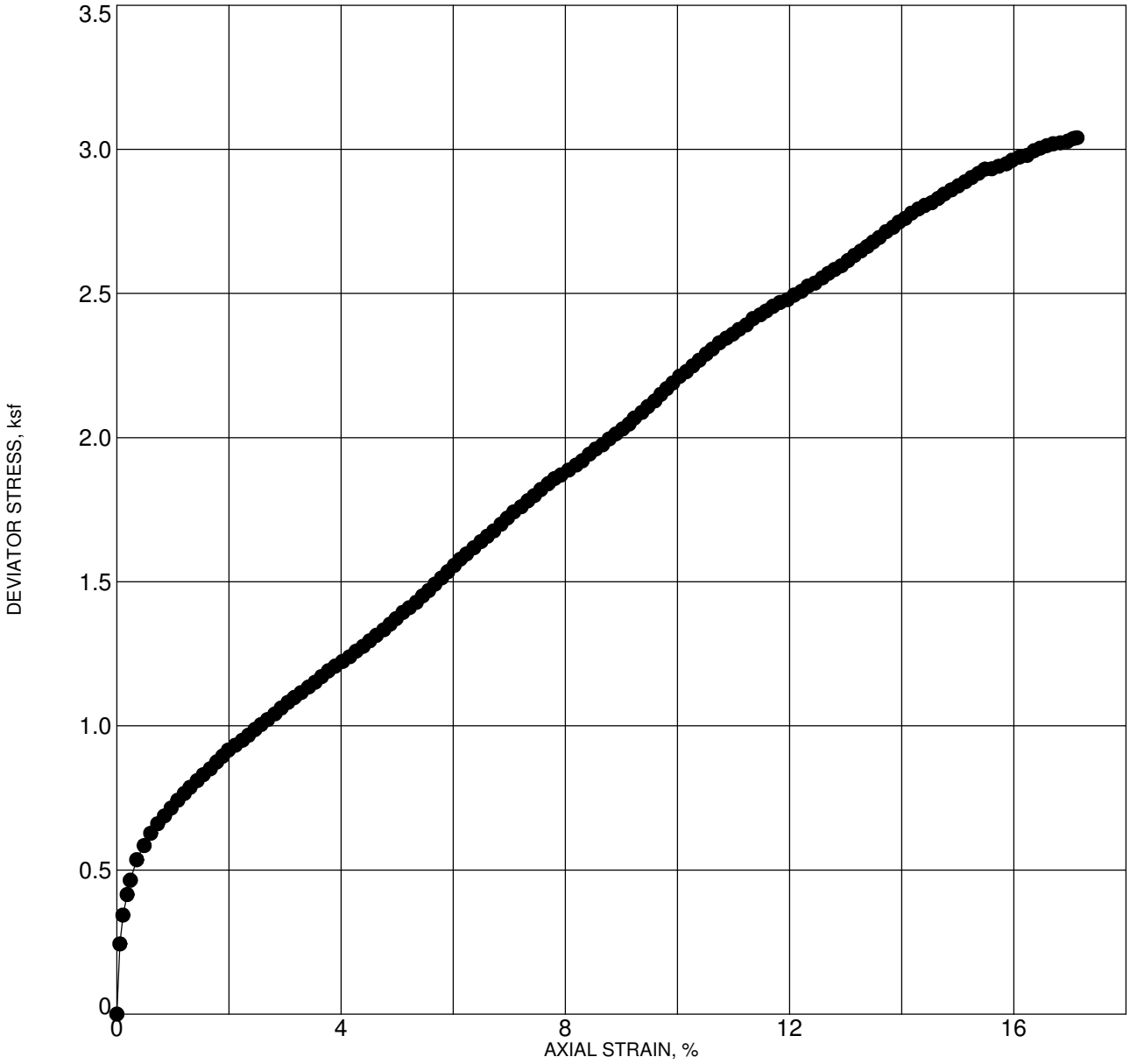
TRIAXIAL UU COMPRESSION TEST - ASTM D2850

INTERSTATE ROUTE H-1 (EB) IMPROVEMENTS
OLA LANE OVERPASS TO
KALIHI STREET INTERCHANGE
HONOLULU, OAHU, HAWAII

Plate
C - 15

G_TXUU 8049-00.GPJ GEOLABS.GDT 5/3/21



Max. Deviator Stress (ksf):	2.9
Confining Stress (ksf):	12.3

Location: B-7
Depth: 95.5 - 97.0 feet
Description: Brown clayey silt with traces of sand
Test Date: 1/20/2021

Dry Density (pcf)	67.9	Sample Diameter (inches)	2.407
Moisture (%)	52.2	Sample Height (inches)	5.067
Axial Strain at Failure (%)	15.0	Strain Rate (% / minute)	0.70

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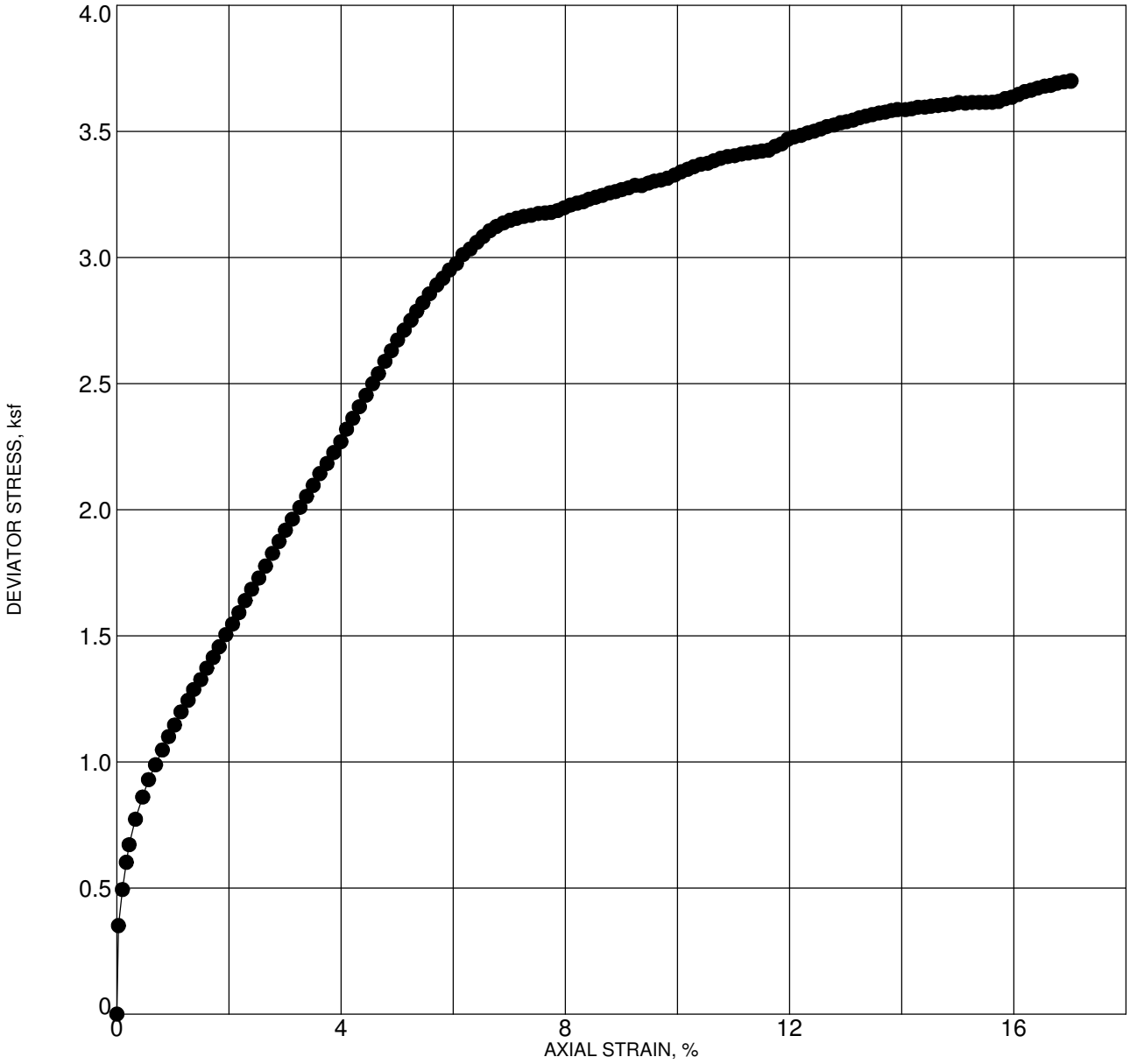
W.O. 8049-00 & 10(B)

TRIAXIAL UU COMPRESSION TEST - ASTM D2850

INTERSTATE ROUTE H-1 (EB) IMPROVEMENTS
OLA LANE OVERPASS TO
KALIHI STREET INTERCHANGE
HONOLULU, OAHU, HAWAII

Plate
C - 16

G_TXUU 8049-00.GPJ GEOLABS.GDT 5/3/21



Max. Deviator Stress (ksf):	3.6
Confining Stress (ksf):	14.3

Location: B-7
Depth: 115.5 - 117.0 feet
Description: Brown clayey silt with traces of sand
Test Date: 1/19/2021

Dry Density (pcf)	74.8	Sample Diameter (inches)	2.407
Moisture (%)	55.0	Sample Height (inches)	5.167
Axial Strain at Failure (%)	15.0	Strain Rate (% / minute)	0.70

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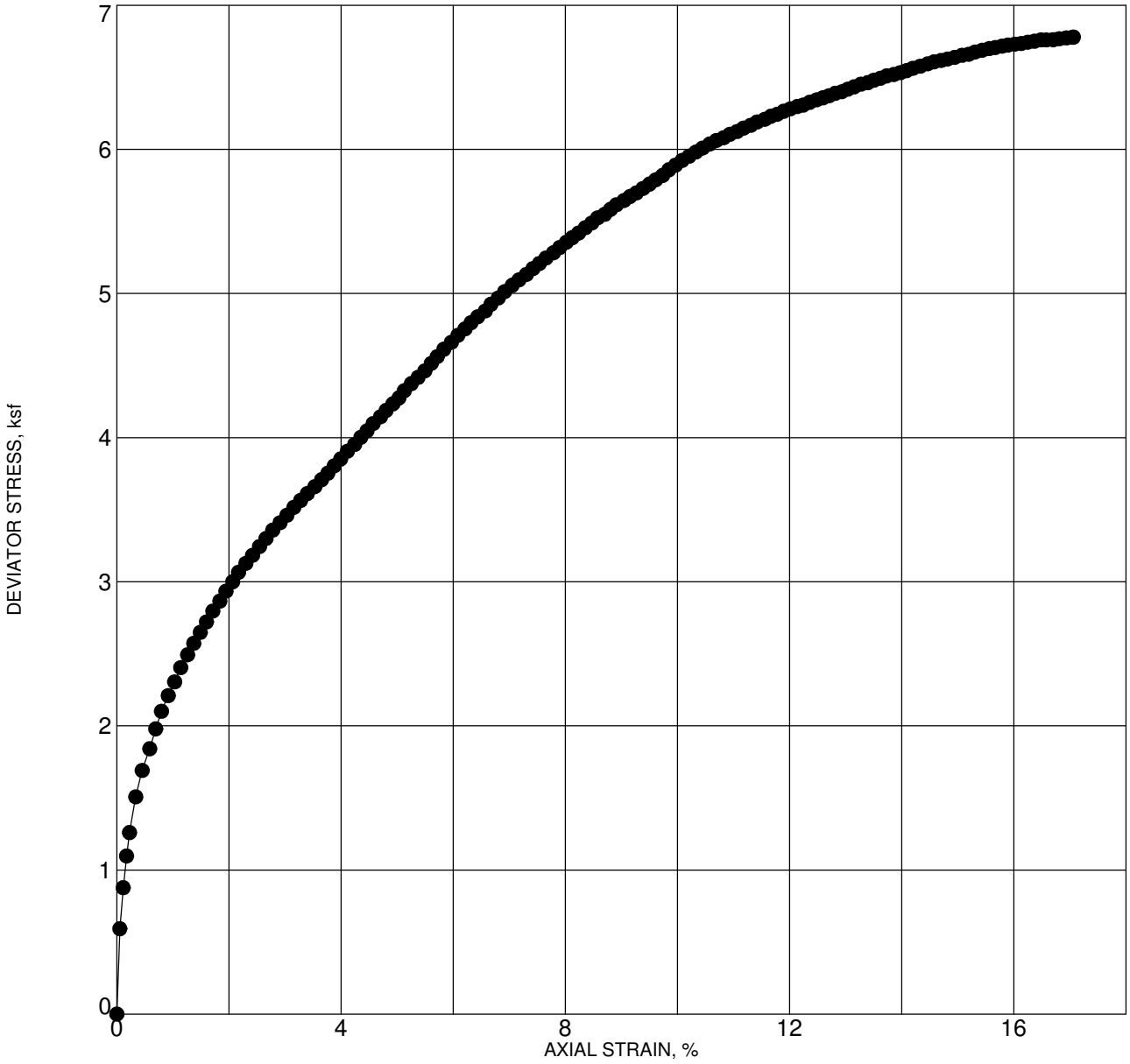
TRIAXIAL UU COMPRESSION TEST - ASTM D2850

INTERSTATE ROUTE H-1 (EB) IMPROVEMENTS
OLA LANE OVERPASS TO
KALIHI STREET INTERCHANGE
HONOLULU, OAHU, HAWAII

Plate
C - 17

G_TXUU 8049-00.GPJ GEOLABS.GDT 5/3/21



Max. Deviator Stress (ksf):	6.6
Confining Stress (ksf):	9.4

Location: B-8
Depth: 70.5 - 72.0 feet
Description: Brown with dark gray mottling clayey silt with some sand and traces of gravel
Test Date: 1/20/2021

Dry Density (pcf)	72.5	Sample Diameter (inches)	2.407
Moisture (%)	50.7	Sample Height (inches)	5.133
Axial Strain at Failure (%)	14.9	Strain Rate (% / minute)	0.70

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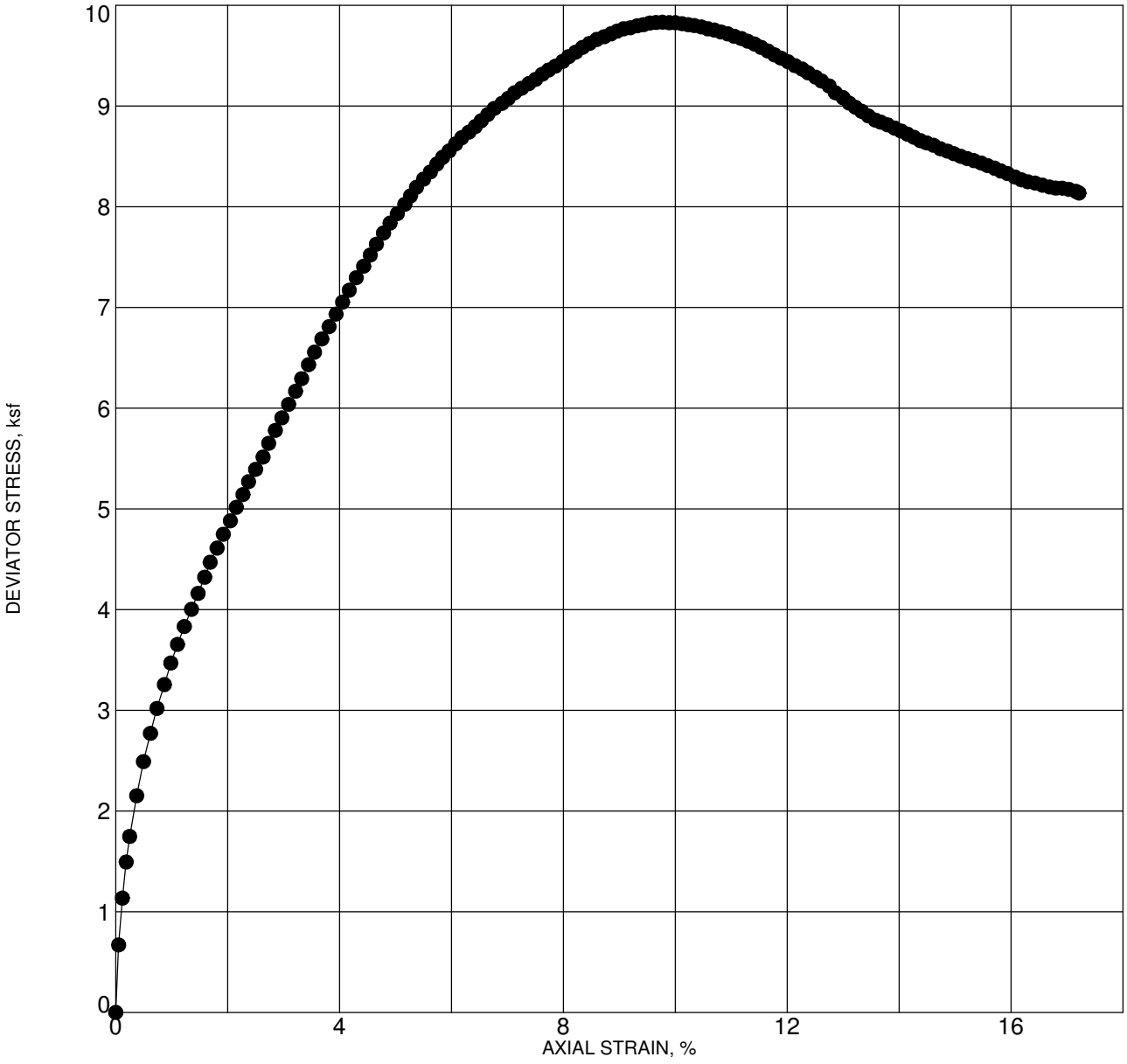
TRIAXIAL UU COMPRESSION TEST - ASTM D2850

INTERSTATE ROUTE H-1 (EB) IMPROVEMENTS
OLA LANE OVERPASS TO
KALIHI STREET INTERCHANGE
HONOLULU, OAHU, HAWAII

Plate
C - 18

G_TXUU 8049-00.GPJ GEOLABS.GDT 5/3/21



Max. Deviator Stress (ksf):	9.8
Confining Stress (ksf):	11.4

Location: B-8
Depth: 90.5 - 92.0 feet
Description: Brown with multi-color mottling sandy clay with some gravel
Test Date: 1/20/2021

Dry Density (pcf)	74.8	Sample Diameter (inches)	2.403
Moisture (%)	44.9	Sample Height (inches)	5.133
Axial Strain at Failure (%)	10.0	Strain Rate (% / minute)	0.70

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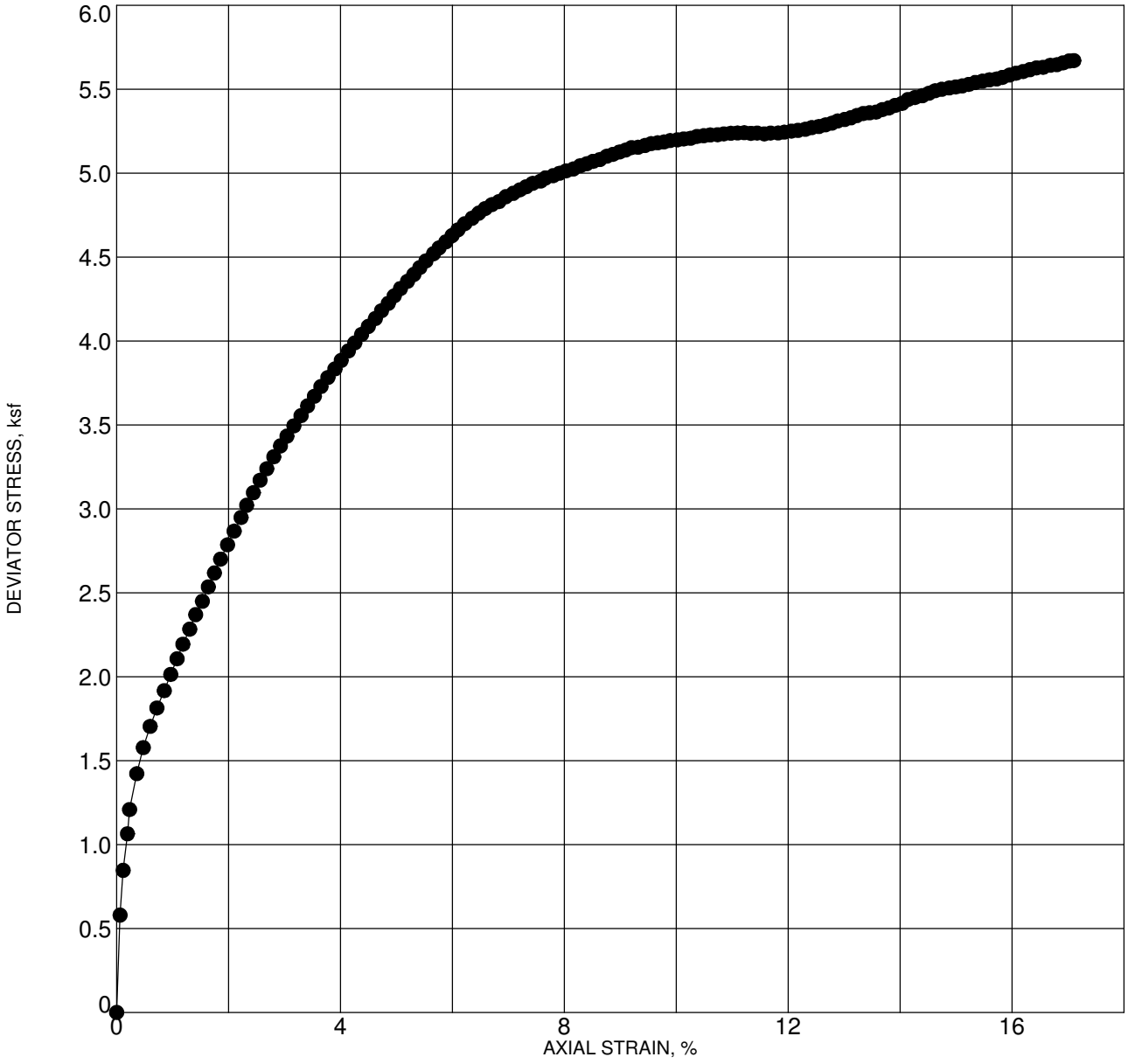
TRIAXIAL UU COMPRESSION TEST - ASTM D2850

INTERSTATE ROUTE H-1 (EB) IMPROVEMENTS
OLA LANE OVERPASS TO
KALIHI STREET INTERCHANGE
HONOLULU, OAHU, HAWAII

Plate
C - 19

G_TXUU 8049-00.GPJ GEOLABS.GDT 5/3/21



Max. Deviator Stress (ksf):	5.5
Confining Stress (ksf):	12.9

Location: B-8
Depth: 105.5 - 107.0 feet
Description: Brown with multi-color mottling sandy clay with some gravel
Test Date: 1/20/2021

Dry Density (pcf)	72.3	Sample Diameter (inches)	2.407
Moisture (%)	51.2	Sample Height (inches)	5.133
Axial Strain at Failure (%)	15.0	Strain Rate (% / minute)	0.71

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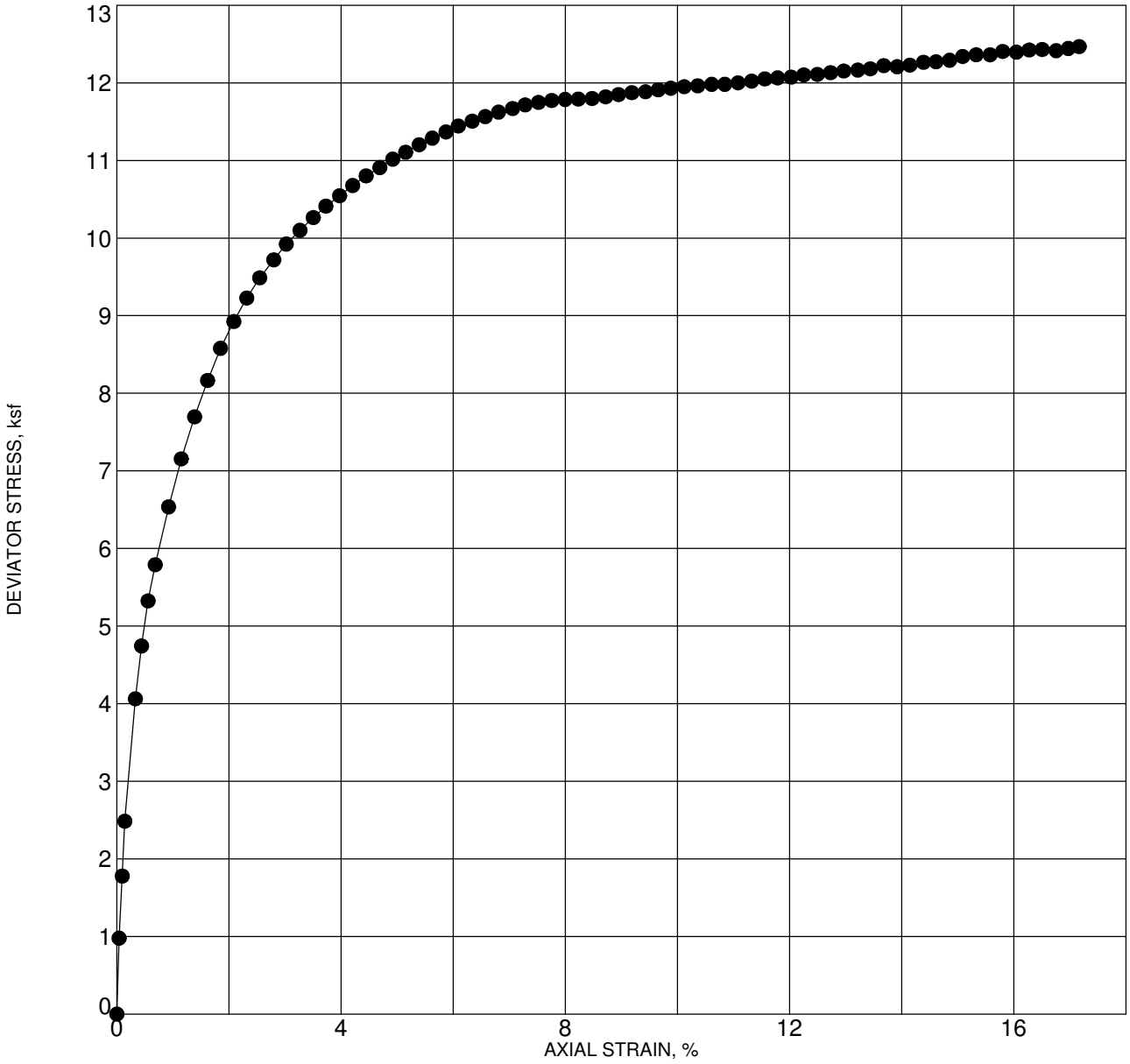
TRIAXIAL UU COMPRESSION TEST - ASTM D2850

INTERSTATE ROUTE H-1 (EB) IMPROVEMENTS
OLA LANE OVERPASS TO
KALIHI STREET INTERCHANGE
HONOLULU, OAHU, HAWAII

Plate
C - 20

G_TXUU 8049-00.GPJ GEOLABS.GDT 5/3/21



Max. Deviator Stress (ksf):	12.3
Confining Stress (ksf):	8.8

Location: B-11
Depth: 60.5 - 62.0 feet
Description: Reddish brown silty clay (CH) with some sand
Test Date: 1/7/2021

Dry Density (pcf)	89.7	Sample Diameter (inches)	2.403
Moisture (%)	32.1	Sample Height (inches)	5.167
Axial Strain at Failure (%)	14.9	Strain Rate (% / minute)	0.71

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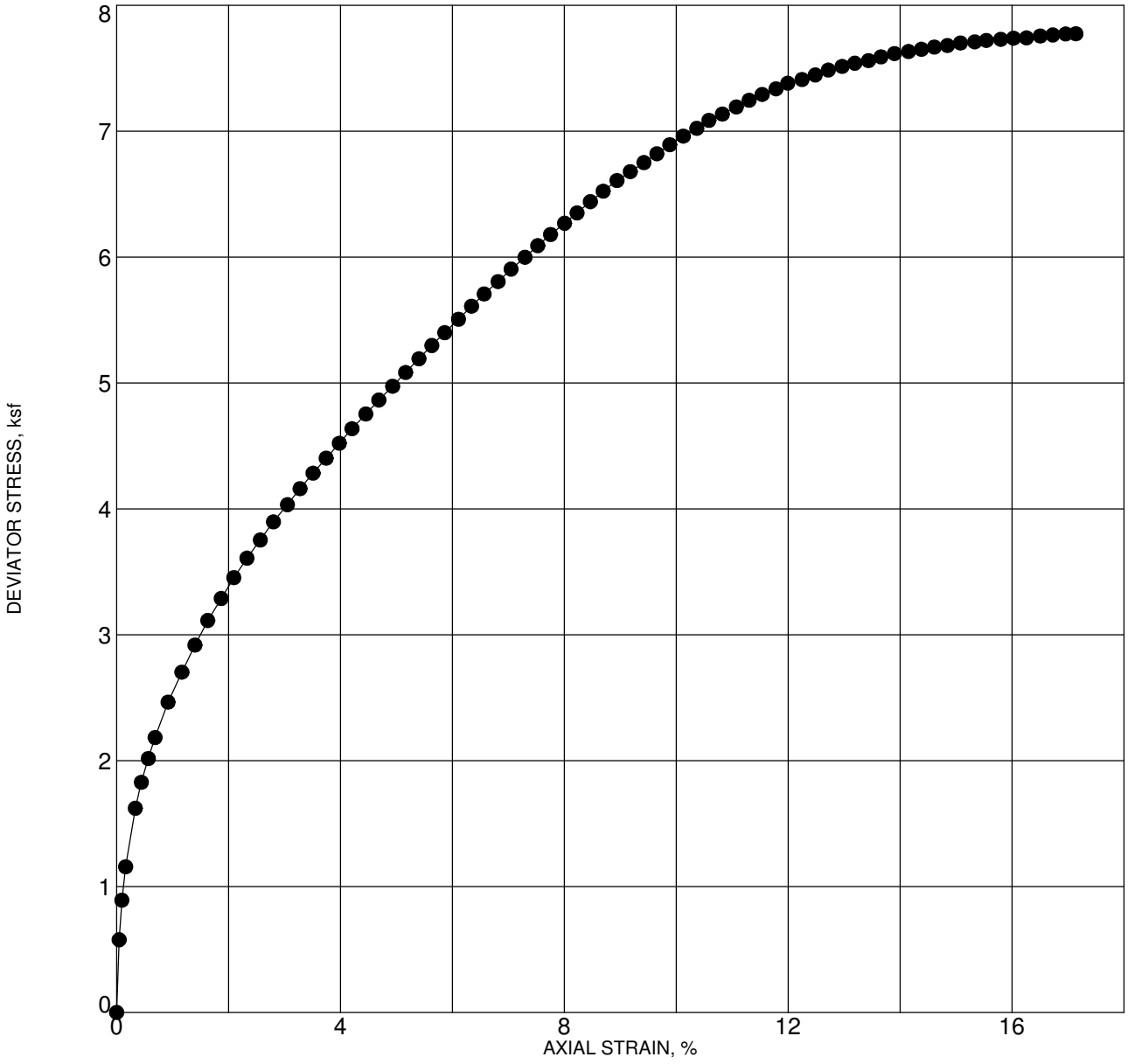
TRIAXIAL UU COMPRESSION TEST - ASTM D2850

INTERSTATE ROUTE H-1 (EB) IMPROVEMENTS
OLA LANE OVERPASS TO
KALIHI STREET INTERCHANGE
HONOLULU, OAHU, HAWAII

Plate
C - 21

G_TXUU 8049-00.GPJ GEOLABS.GDT 5/3/21



Max. Deviator Stress (ksf):	7.7
Confining Stress (ksf):	9.8

Location: B-11
Depth: 70.5 - 72.0 feet
Description: Brown with multi-color mottling silty clay with some sand
Test Date: 1/21/2021

Dry Density (pcf)	66.0	Sample Diameter (inches)	2.407
Moisture (%)	57.7	Sample Height (inches)	5.167
Axial Strain at Failure (%)	14.8	Strain Rate (% / minute)	0.71

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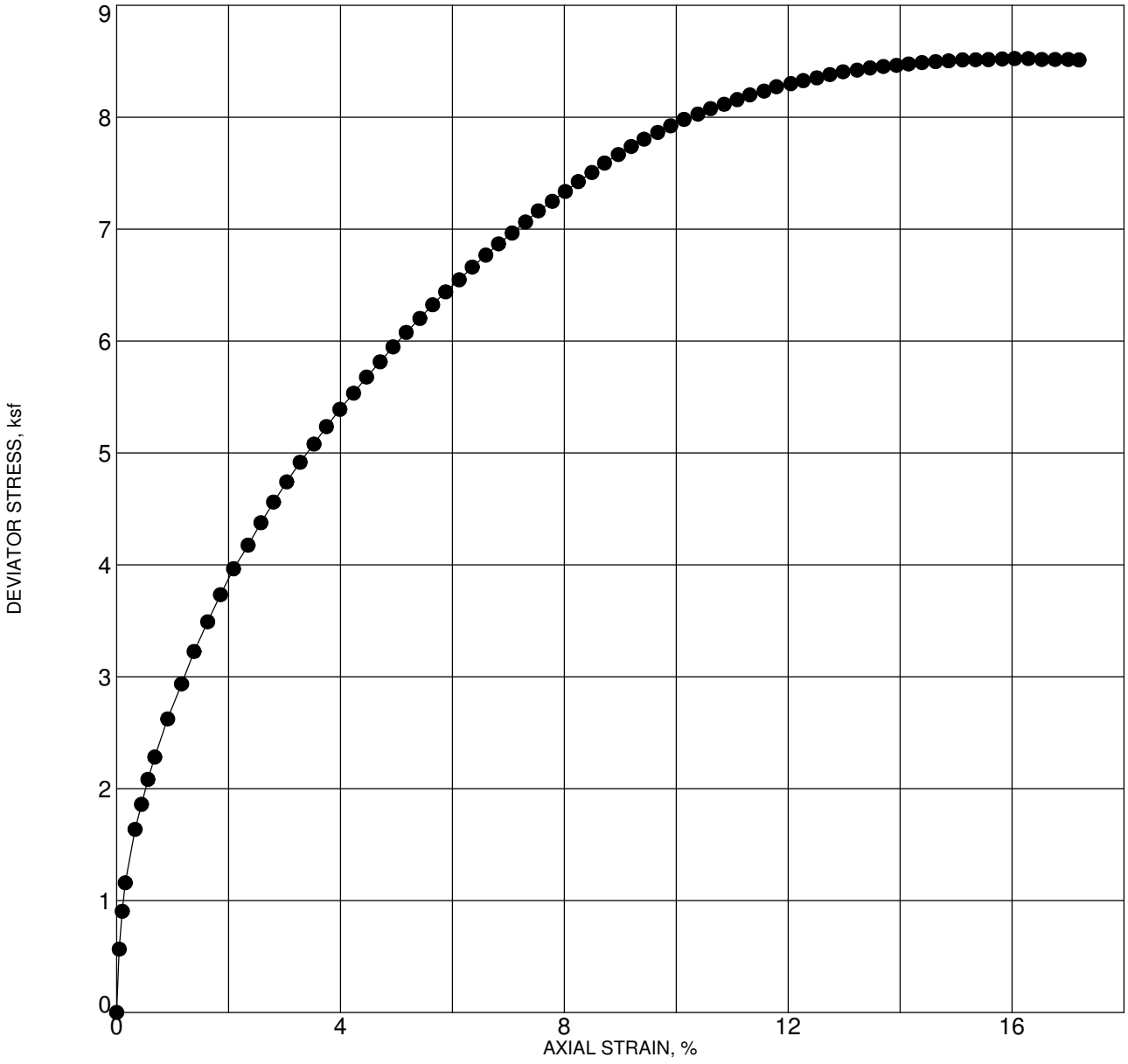
TRIAXIAL UU COMPRESSION TEST - ASTM D2850

INTERSTATE ROUTE H-1 (EB) IMPROVEMENTS
OLA LANE OVERPASS TO
KALIHI STREET INTERCHANGE
HONOLULU, OAHU, HAWAII

Plate
C - 22

G_TXUU 8049-00.GPJ GEOLABS.GDT 5/3/21



Max. Deviator Stress (ksf):	8.5
Confining Stress (ksf):	11.8

Location: B-11
Depth: 90.5 - 92.0 feet
Description: Brown with multi-color mottling silty clay with some sand
Test Date: 1/21/2021

Dry Density (pcf)	71.1	Sample Diameter (inches)	2.407
Moisture (%)	50.3	Sample Height (inches)	5.067
Axial Strain at Failure (%)	14.9	Strain Rate (% / minute)	0.71

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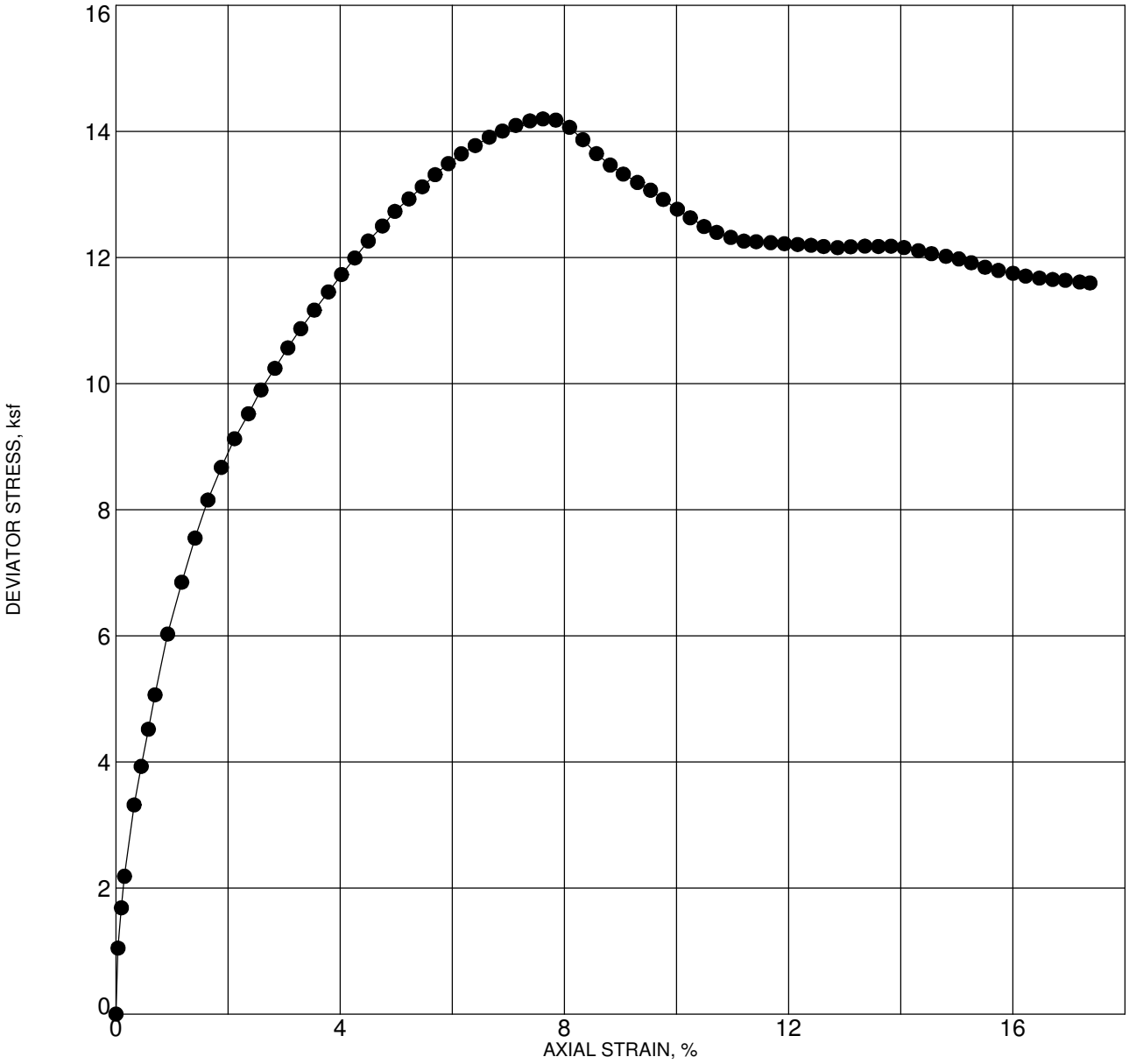
INTERSTATE ROUTE H-1 (EB) IMPROVEMENTS
OLA LANE OVERPASS TO
KALIHI STREET INTERCHANGE
HONOLULU, OAHU, HAWAII

Plate
C - 23

G_TXUU 8049-00.GPJ GEOLABS.GDT 5/3/21



Max. Deviator Stress (ksf):	14.2
Confining Stress (ksf):	12.8

Location: B-11
Depth: 100.5 - 102.0 feet
Description: Brown with multi-color mottling silt (ML) with traces of sand
Test Date: 1/7/2021

Dry Density (pcf)	76.0	Sample Diameter (inches)	2.407
Moisture (%)	45.5	Sample Height (inches)	5.133
Axial Strain at Failure (%)	7.6	Strain Rate (% / minute)	0.72

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INTERSTATE ROUTE H-1 (EB) IMPROVEMENTS
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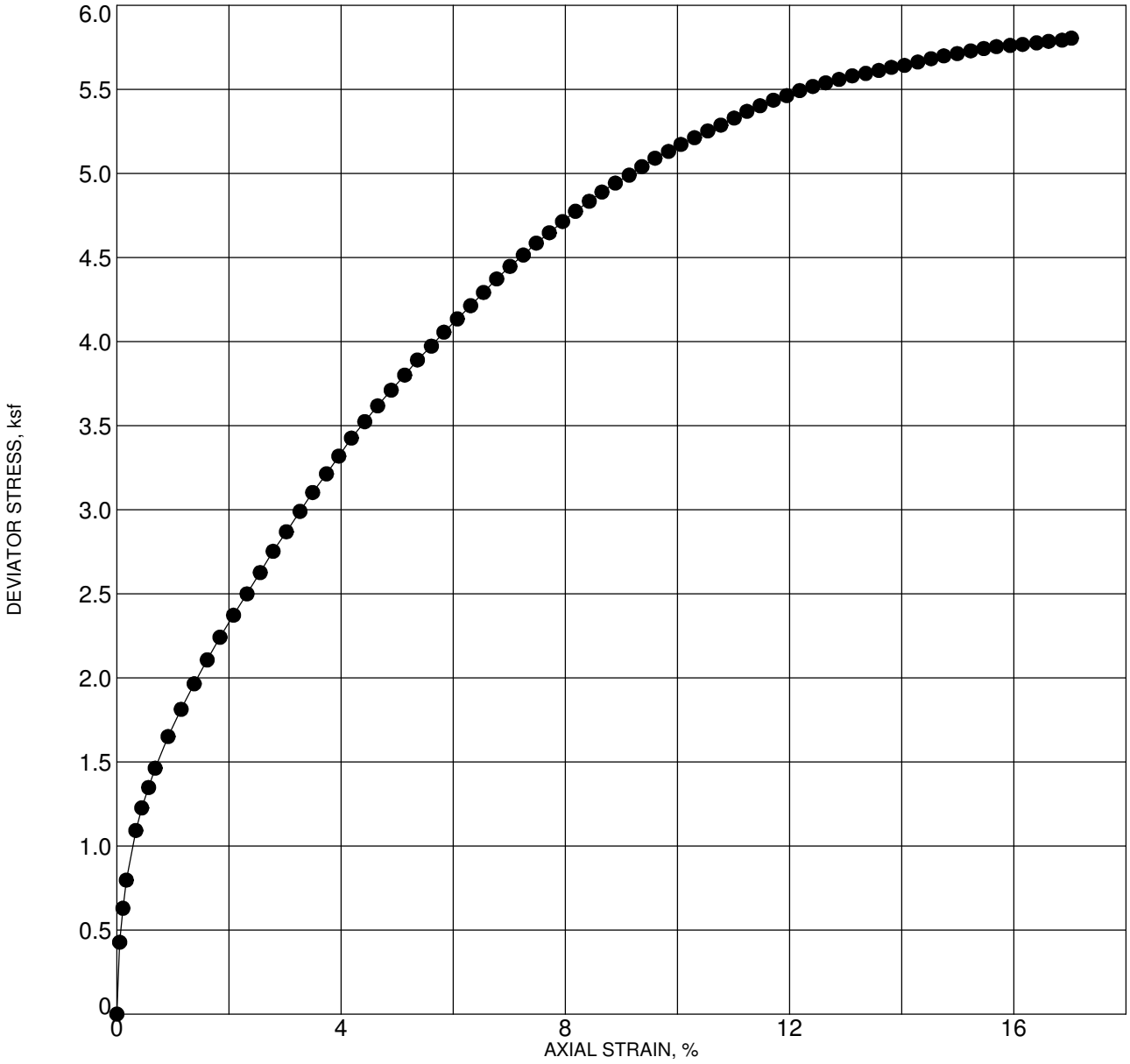
KALIHI STREET INTERCHANGE
HONOLULU, OAHU, HAWAII

Plate
C - 24

G_TXUU 8049-00.GPJ GEOLABS.GDT 5/3/21



Max. Deviator Stress (ksf):	5.7
Confining Stress (ksf):	7.2

Location: B-12
Depth: 51.0 - 52.5 feet
Description: Dark brown clayey silt (MH)
Test Date: 1/12/2021

Dry Density (pcf)	69.0	Sample Diameter (inches)	2.413
Moisture (%)	54.4	Sample Height (inches)	5.133
Axial Strain at Failure (%)	15.0	Strain Rate (% / minute)	0.70

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TRIAXIAL UU COMPRESSION TEST - ASTM D2850

INTERSTATE ROUTE H-1 (EB) IMPROVEMENTS
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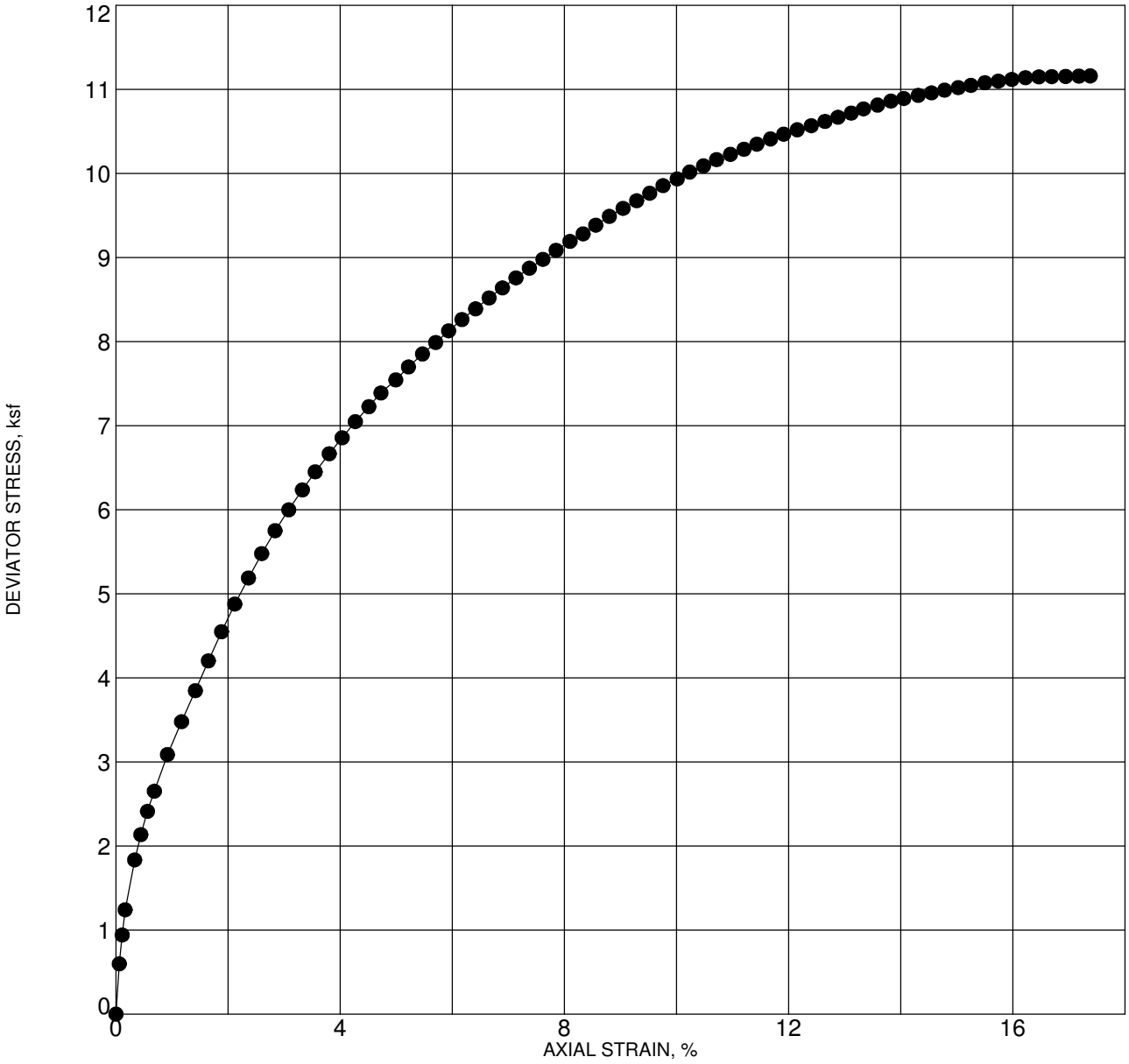
KALIHI STREET INTERCHANGE
HONOLULU, OAHU, HAWAII

Plate
C - 25

G_TXUU 8049-00.GPJ GEOLABS.GDT 5/3/21



Max. Deviator Stress (ksf):	11.0
Confining Stress (ksf):	8.2

Location: B-12
Depth: 61.0 - 62.5 feet
Description: Dark brown clayey silt
Test Date: 1/21/2021

Dry Density (pcf)	68.6	Sample Diameter (inches)	2.407
Moisture (%)	53.2	Sample Height (inches)	5.133
Axial Strain at Failure (%)	15.0	Strain Rate (% / minute)	0.72

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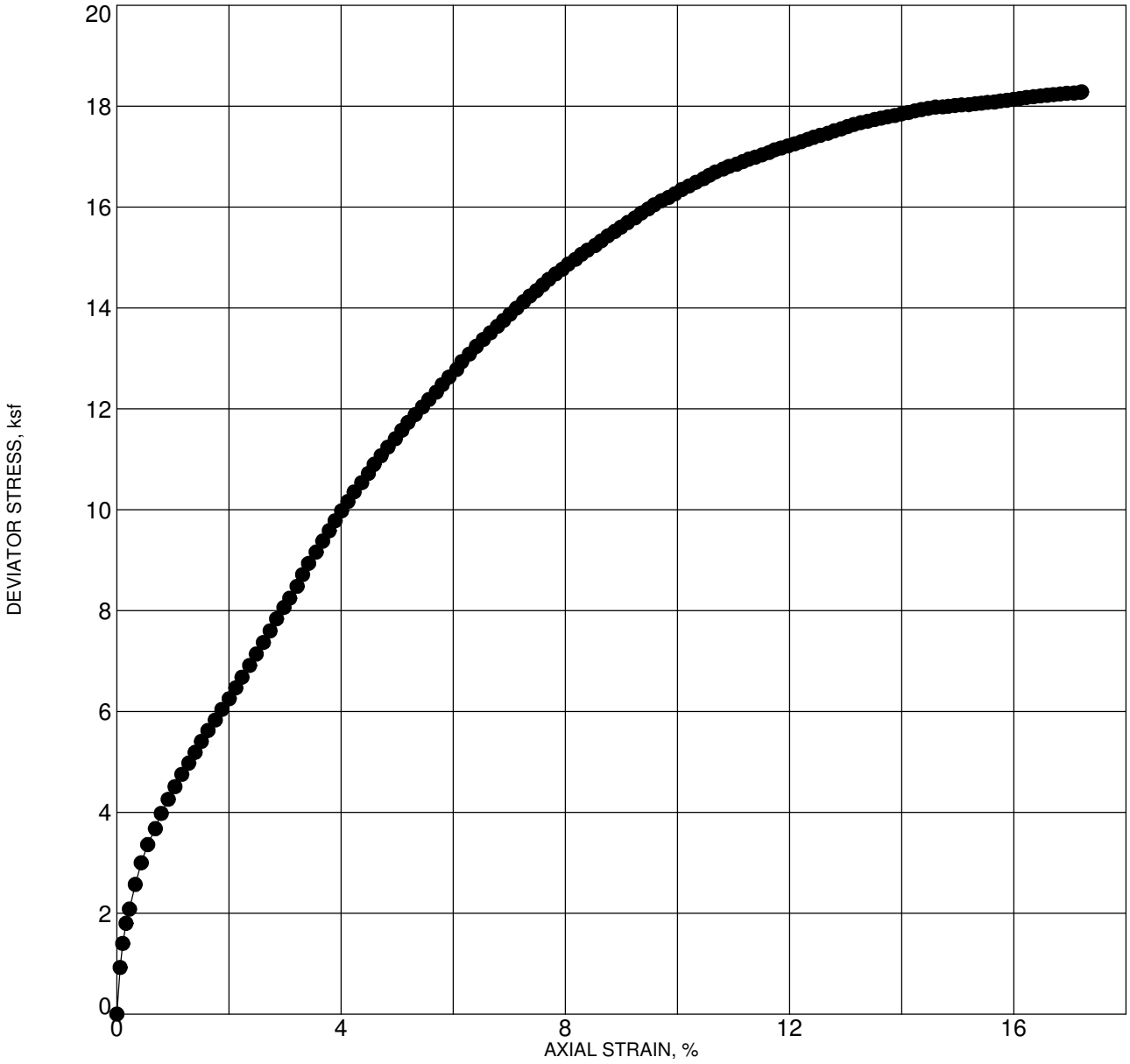
TRIAXIAL UU COMPRESSION TEST - ASTM D2850

INTERSTATE ROUTE H-1 (EB) IMPROVEMENTS
OLA LANE OVERPASS TO
KALIHI STREET INTERCHANGE
HONOLULU, OAHU, HAWAII

Plate
C - 26

G_TXUU 8049-00.GPJ GEOLABS.GDT 5/3/21



Max. Deviator Stress (ksf):	18.0
Confining Stress (ksf):	9.2

Location: B-12
Depth: 71.0 - 72.5 feet
Description: Brown with traces of gray silty clay (CH) with traces of sand
Test Date: 1/19/2021

Dry Density (pcf)	81.4	Sample Diameter (inches)	2.403
Moisture (%)	40.0	Sample Height (inches)	5.133
Axial Strain at Failure (%)	15.0	Strain Rate (% / minute)	0.70

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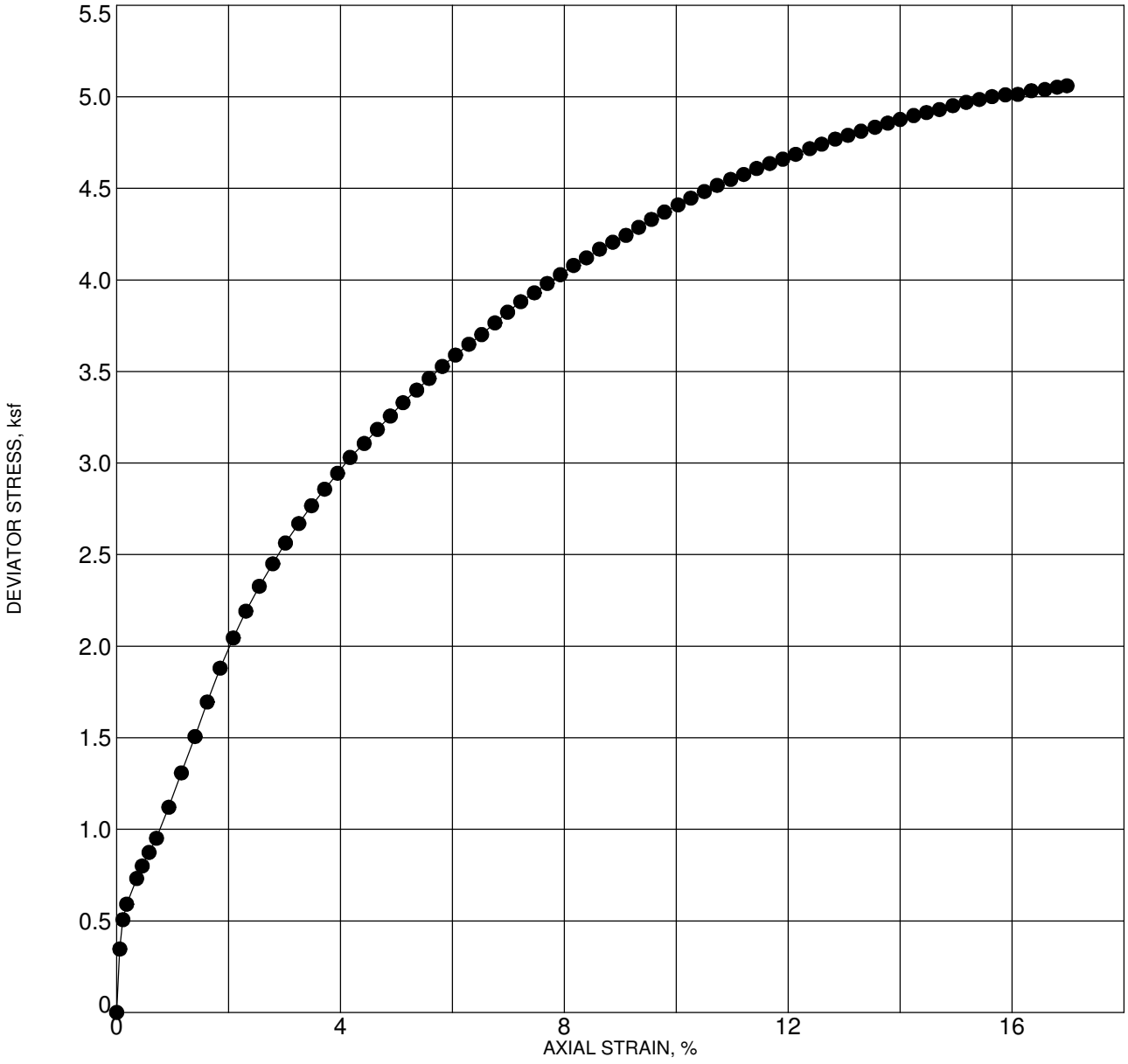
TRIAXIAL UU COMPRESSION TEST - ASTM D2850

INTERSTATE ROUTE H-1 (EB) IMPROVEMENTS
OLA LANE OVERPASS TO
KALIHI STREET INTERCHANGE
HONOLULU, OAHU, HAWAII

Plate
C - 27

G_TXUU 8049-00.GPJ GEOLABS.GDT 5/3/21



Max. Deviator Stress (ksf):	5.0
Confining Stress (ksf):	11.2

Location: B-12
Depth: 91.0 - 92.5 feet
Description: Brown with some gray clayey silt (MH) with some sand and gravel
Test Date: 1/14/2021

Dry Density (pcf)	68.8	Sample Diameter (inches)	2.403
Moisture (%)	54.6	Sample Height (inches)	5.067
Axial Strain at Failure (%)	14.9	Strain Rate (% / minute)	0.70

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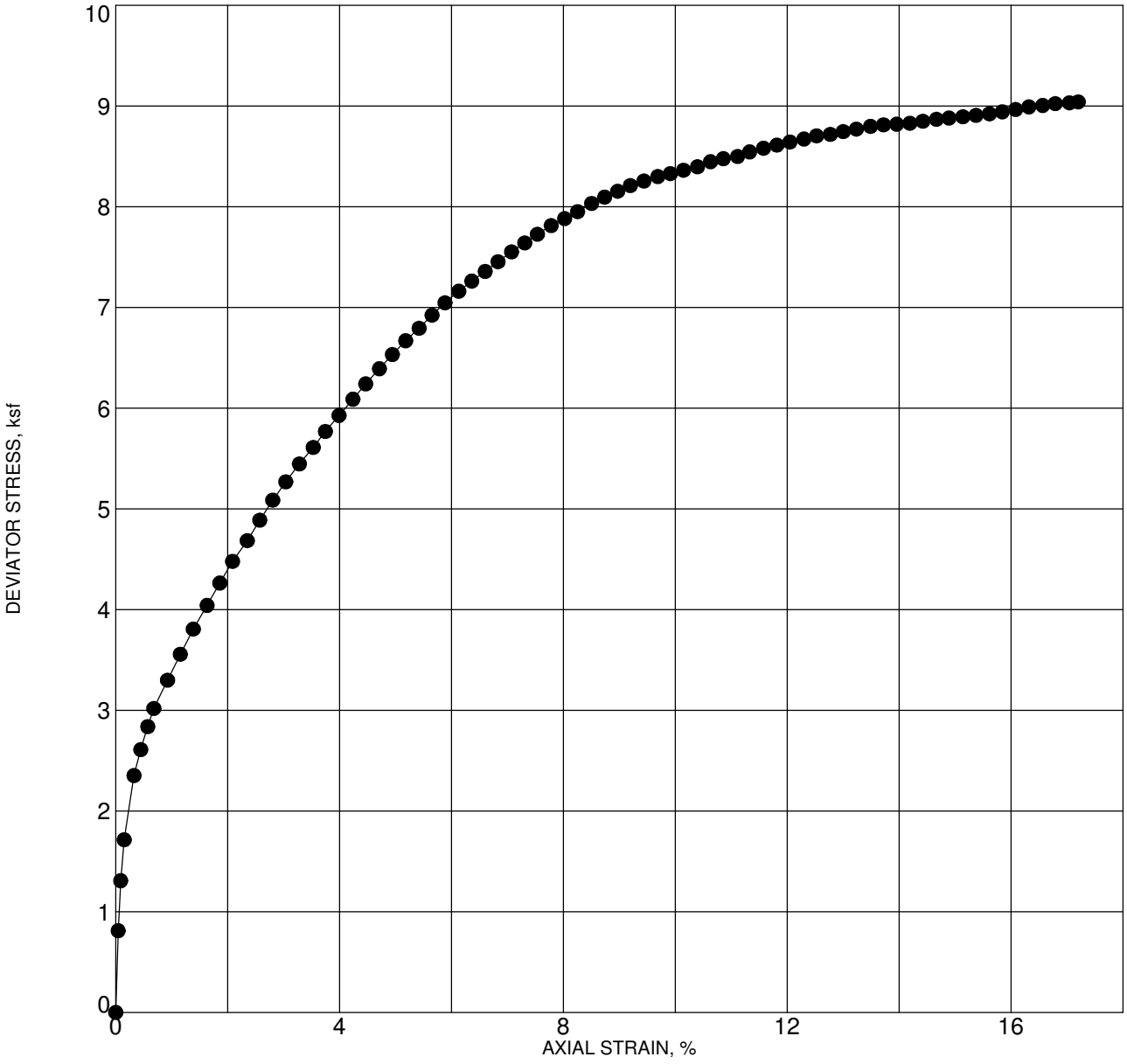
TRIAXIAL UU COMPRESSION TEST - ASTM D2850

INTERSTATE ROUTE H-1 (EB) IMPROVEMENTS
OLA LANE OVERPASS TO
KALIHI STREET INTERCHANGE
HONOLULU, OAHU, HAWAII

Plate
C - 28

G_TXUU 8049-00.GPJ GEOLABS.GDT 5/3/21



Max. Deviator Stress (ksf):	8.9
Confining Stress (ksf):	12.2

Location: B-12
Depth: 101.0 - 102.5 feet
Description: Brown with some gray silt (ML) with a little sand and traces of gravel
Test Date: 1/13/2021

Dry Density (pcf)	72.8	Sample Diameter (inches)	2.407
Moisture (%)	50.6	Sample Height (inches)	5.133
Axial Strain at Failure (%)	14.9	Strain Rate (% / minute)	0.71

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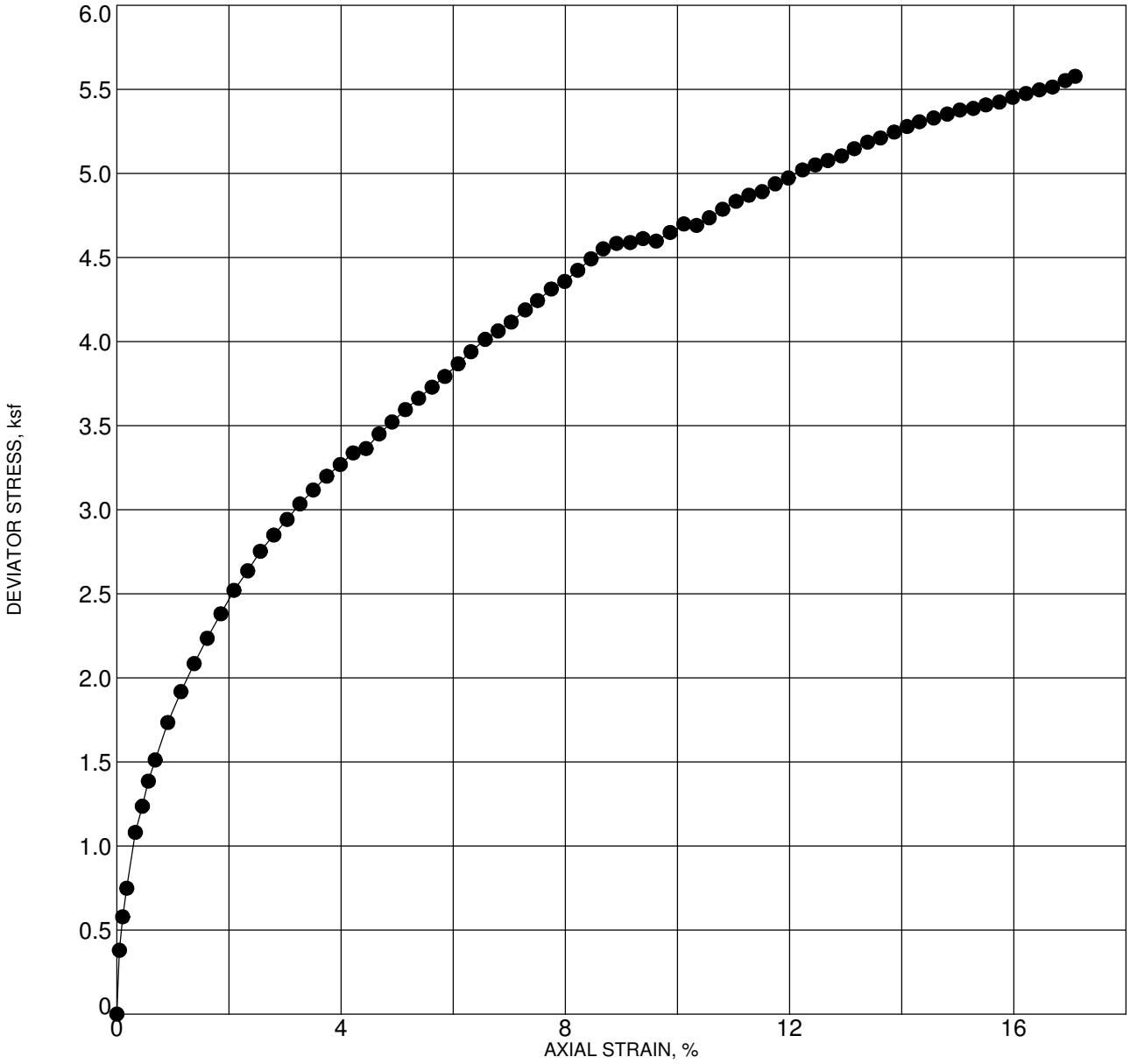
TRIAXIAL UU COMPRESSION TEST - ASTM D2850

INTERSTATE ROUTE H-1 (EB) IMPROVEMENTS
OLA LANE OVERPASS TO
KALIHI STREET INTERCHANGE
HONOLULU, OAHU, HAWAII

Plate
C - 29

G_TXUU 8049-00.GPJ GEOLABS.GDT 5/3/21



Max. Deviator Stress (ksf):	5.4
Confining Stress (ksf):	4.9

Location: B-13
Depth: 36.0 - 37.5 feet
Description: Brown gravelly silt (ML) with some sand
Test Date: 1/13/2021

Dry Density (pcf)	73.1	Sample Diameter (inches)	2.403
Moisture (%)	52.1	Sample Height (inches)	5.067
Axial Strain at Failure (%)	15.0	Strain Rate (% / minute)	0.71

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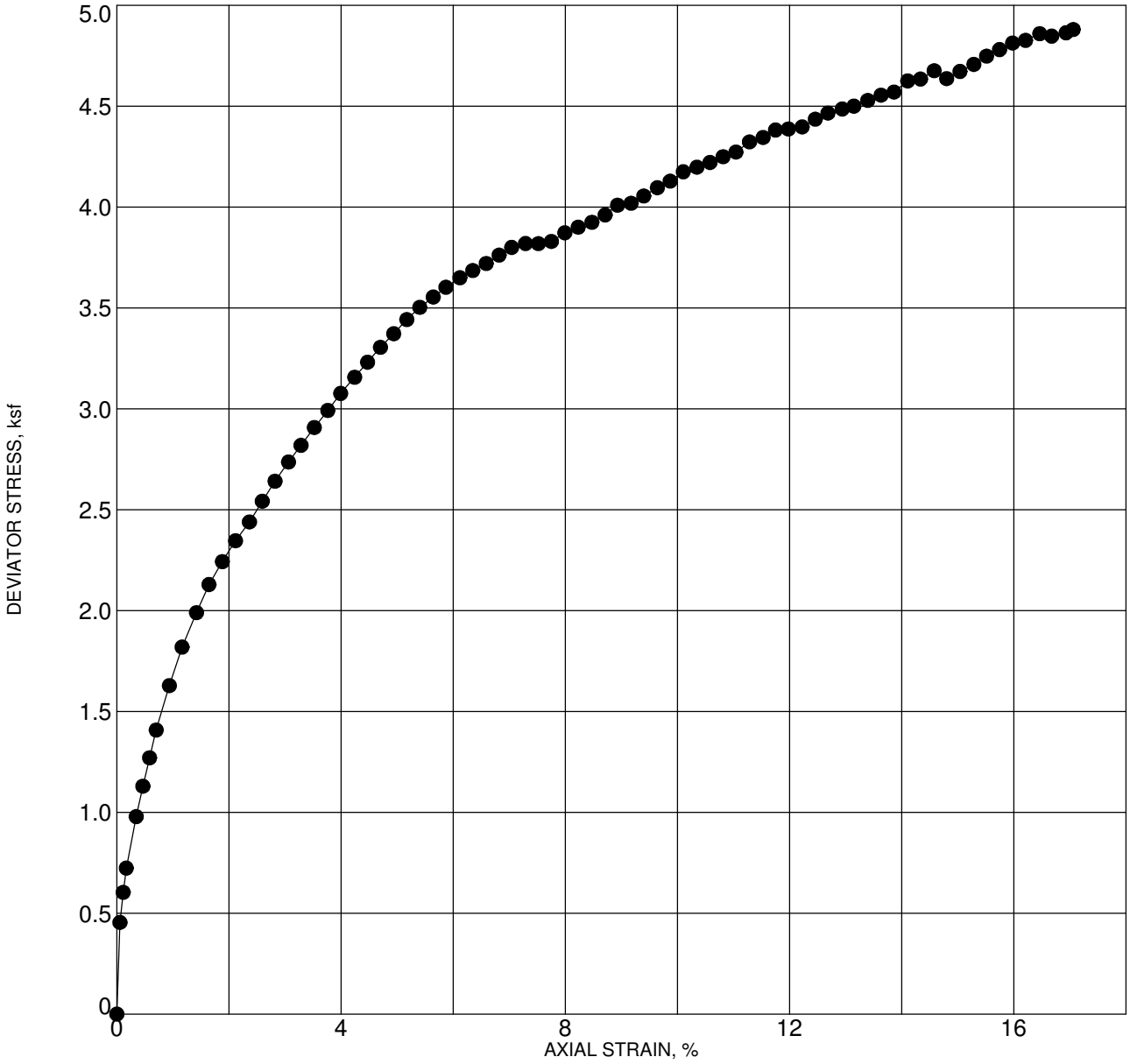
TRIAXIAL UU COMPRESSION TEST - ASTM D2850

INTERSTATE ROUTE H-1 (EB) IMPROVEMENTS
OLA LANE OVERPASS TO
KALIHI STREET INTERCHANGE
HONOLULU, OAHU, HAWAII

Plate
C - 30

G_TXUU_8049-00.GPJ GEOLABS.GDT 5/3/21



Max. Deviator Stress (ksf):	4.7
Confining Stress (ksf):	7.9

Location: B-13
Depth: 66.0 - 67.5 feet
Description: Brown with multi-color mottling clayey silt (MH) with some sand and traces of gravel
Test Date: 1/14/2021

Dry Density (pcf)	77.9	Sample Diameter (inches)	2.403
Moisture (%)	47.8	Sample Height (inches)	5.133
Axial Strain at Failure (%)	15.0	Strain Rate (% / minute)	0.70

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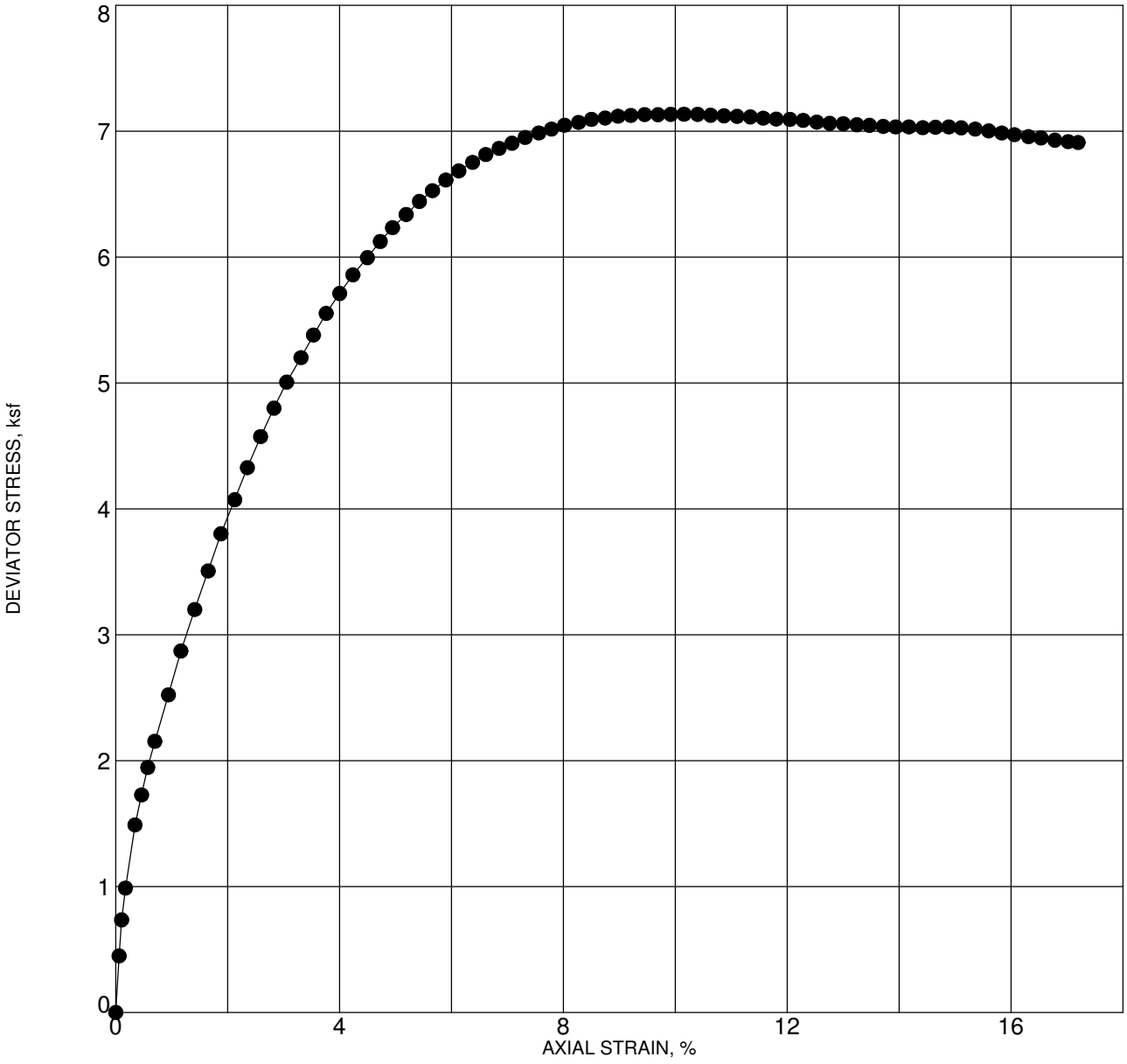
INTERSTATE ROUTE H-1 (EB) IMPROVEMENTS
OLA LANE OVERPASS TO
KALIHI STREET INTERCHANGE
HONOLULU, OAHU, HAWAII

Plate
C - 31

G_TXUU 8049-00.GPJ GEOLABS.GDT 5/3/21



Max. Deviator Stress (ksf):	7.1
Confining Stress (ksf):	9.9

Location: B-13
Depth: 86.0 - 87.5 feet
Description: Brown with multi-color mottling clayey silt with some sand and traces of gravel
Test Date: 1/21/2021

Dry Density (pcf)	63.8	Sample Diameter (inches)	2.403
Moisture (%)	60.8	Sample Height (inches)	5.133
Axial Strain at Failure (%)	10.6	Strain Rate (% / minute)	0.71

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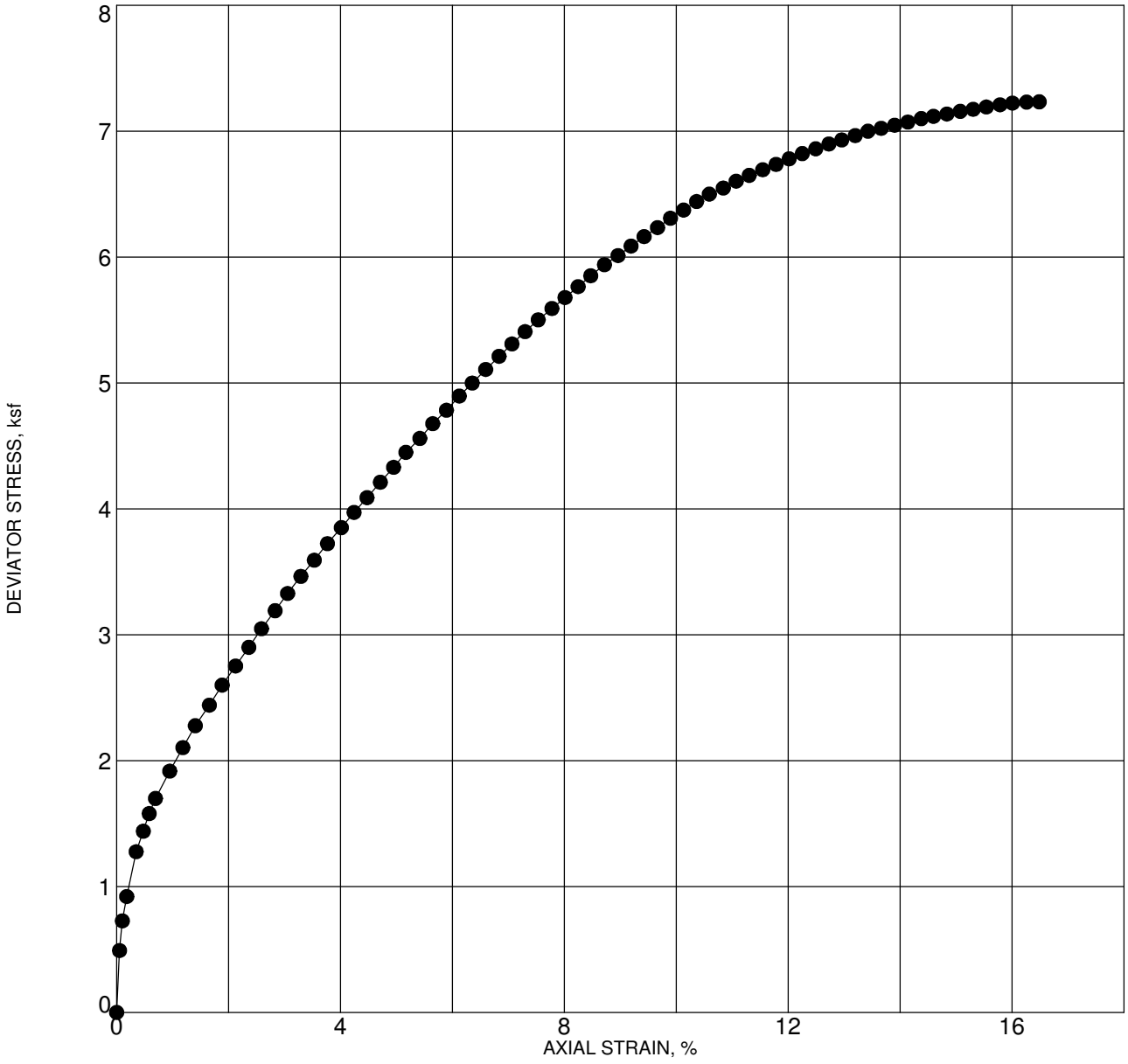
INTERSTATE ROUTE H-1 (EB) IMPROVEMENTS
OLA LANE OVERPASS TO
KALIHI STREET INTERCHANGE
HONOLULU, OAHU, HAWAII

Plate
C - 32

G_TXUU 8049-00.GPJ GEOLABS.GDT 5/3/21



Max. Deviator Stress (ksf):	7.1
Confining Stress (ksf):	10.9

Location: B-13
Depth: 96.0 - 97.5 feet
Description: Brown with multi-color mottling clayey silt with some sand and traces of gravel
Test Date: 1/21/2021

Dry Density (pcf)	68.0	Sample Diameter (inches)	2.403
Moisture (%)	56.7	Sample Height (inches)	5.067
Axial Strain at Failure (%)	14.8	Strain Rate (% / minute)	0.71

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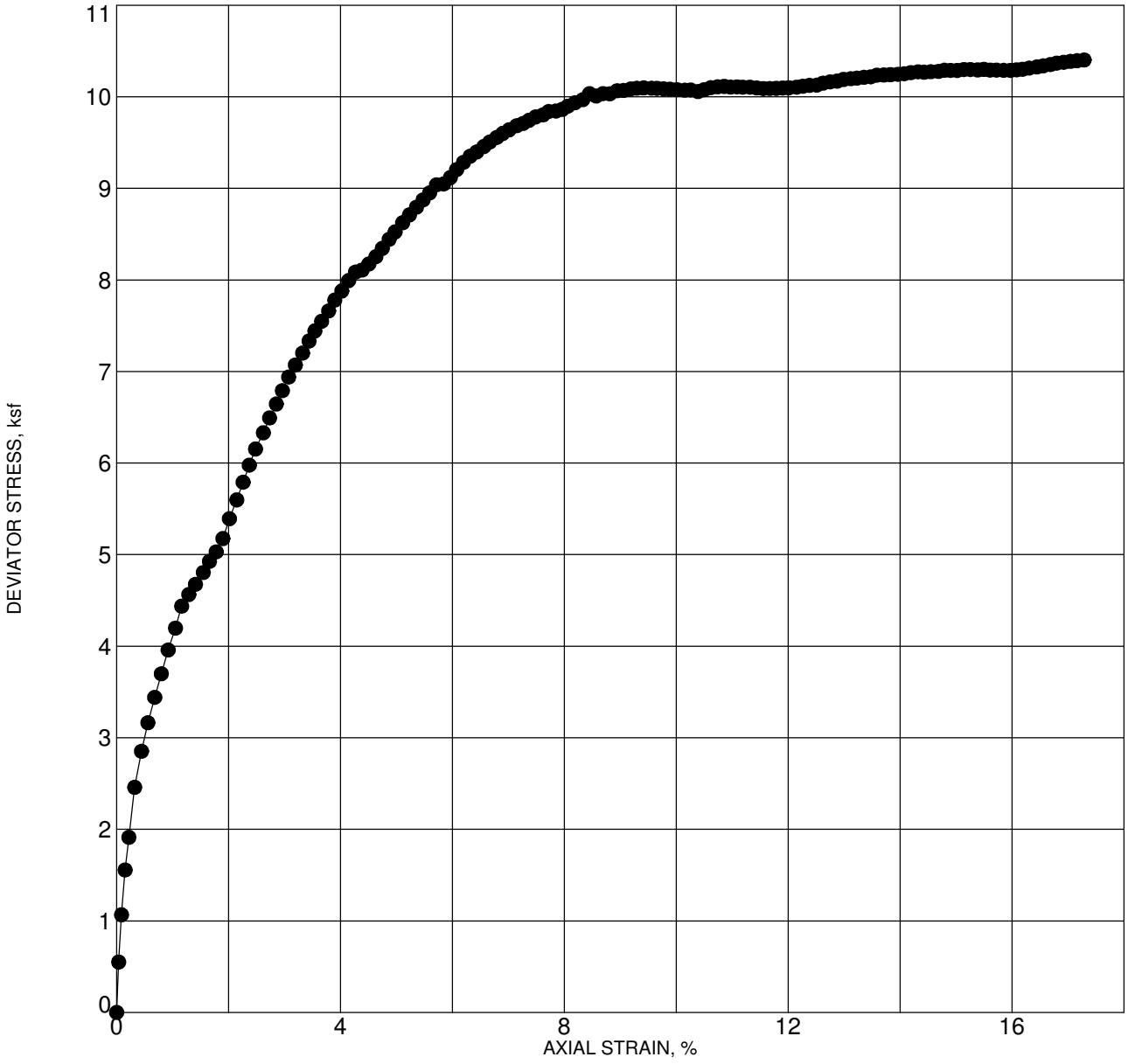
TRIAXIAL UU COMPRESSION TEST - ASTM D2850

INTERSTATE ROUTE H-1 (EB) IMPROVEMENTS
OLA LANE OVERPASS TO
KALIHI STREET INTERCHANGE
HONOLULU, OAHU, HAWAII

Plate
C - 33

G_TXUU 8049-00.GPJ GEOLABS.GDT 5/3/21



Max. Deviator Stress (ksf):	10.3
Confining Stress (ksf):	12.9

Location: B-13
Depth: 116.0 - 117.5 feet
Description: Brown with gray mottling silty sand (SM) with traces of gravel
Test Date: 1/19/2021

Dry Density (pcf)	83.5	Sample Diameter (inches)	2.407
Moisture (%)	36.7	Sample Height (inches)	5.067
Axial Strain at Failure (%)	15.0	Strain Rate (% / minute)	0.71

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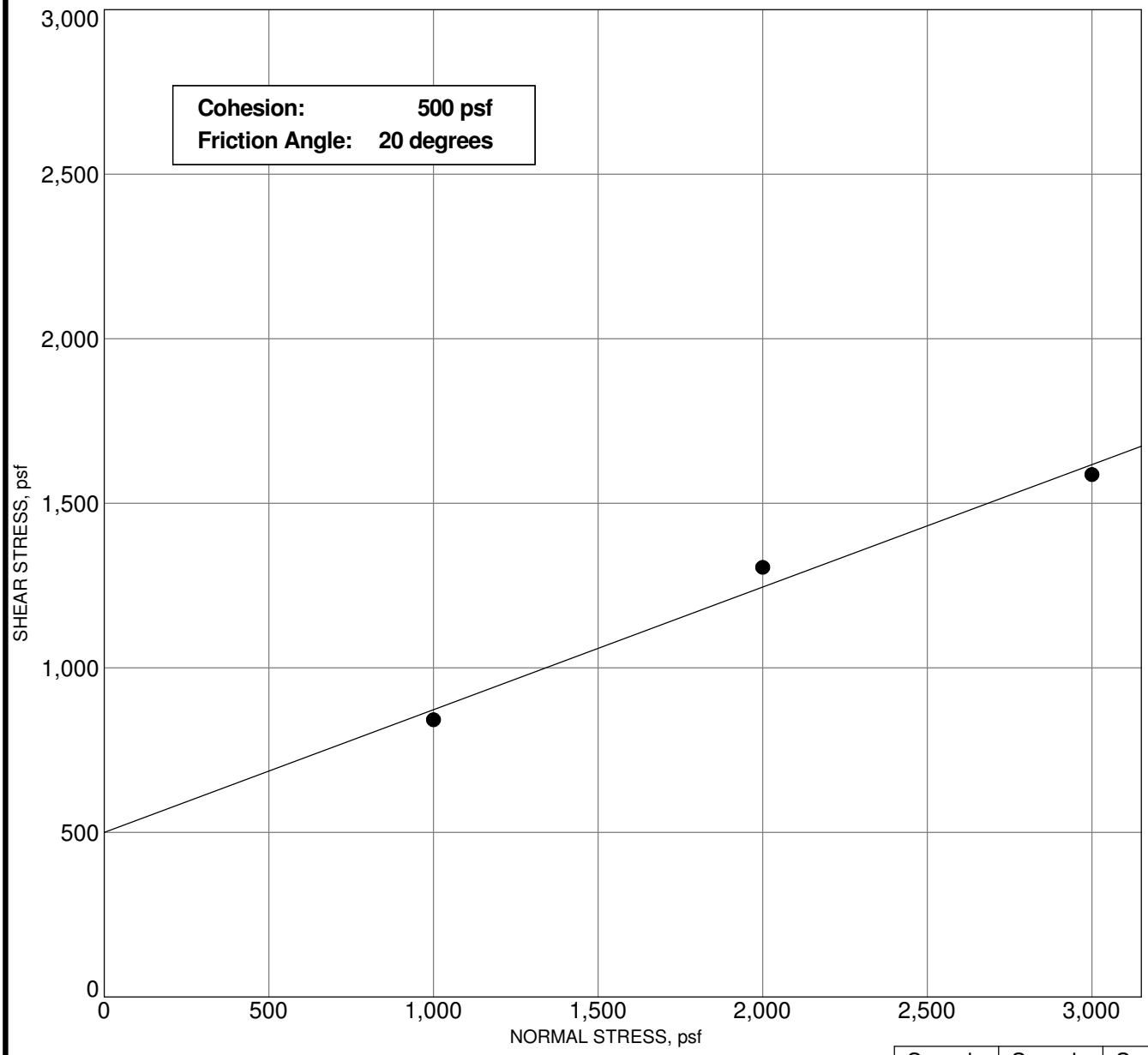
INTERSTATE ROUTE H-1 (EB) IMPROVEMENTS
OLA LANE OVERPASS TO
KALIHI STREET INTERCHANGE
HONOLULU, OAHU, HAWAII

Plate
C - 34

G_TXUU 8049-00.GPJ GEOLABS.GDT 5/3/21



		Sample #1	Sample #2	Sample #3
INITIAL	Moisture Content, %	13.8	16.8	15.5
	Dry Density, pcf	92.1	90.9	93.7
	Height, inches	1.00	1.00	1.00
FINAL	Moisture Content, %	29.2	26.3	24.9
	Dry Density, pcf	89.3	92.1	94.5
	Height, inches	1.031	0.986	0.991
	Diameter, inches	2.42	2.42	2.42
	Deformation Rate, inch/minute	0.0024	0.0024	0.0025
	Normal Stress, psf	**1000**	**2000**	**3000**
	Peak Shear Stress, psf	**842**	**1305**	**1587**
	Shear Displacement, inches	0.43	0.42	0.42

Sample: B-3
Depth: 1.0 - 2.5 feet
Description: Brown with multi-color mottling sandy clay (CL) with traces of gravel

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GEOTECHNICAL ENGINEERING

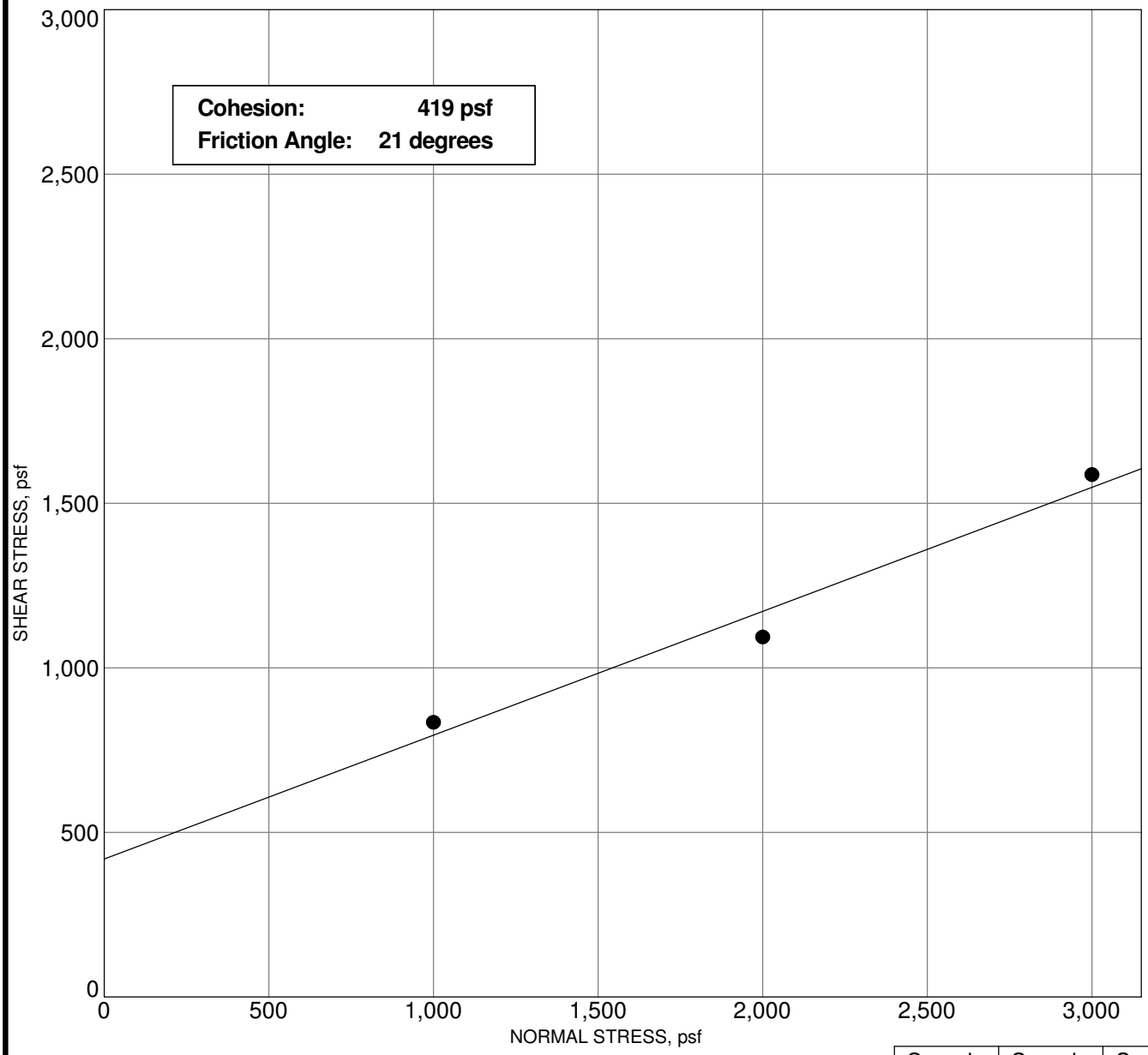
W.O. 8049-00 & 10(B)

DIRECT SHEAR TEST - ASTM D3080

INTERSTATE ROUTE H-1 (EB) IMPROVEMENTS
OLA LANE OVERPASS TO
KALIHI STREET INTERCHANGE
HONOLULU, OAHU, HAWAII

Plate
C - 35

G_DIRECT_SHEAR_8049-00.GPJ_GEOLABS.GDT 5/3/21



		Sample #1	Sample #2	Sample #3
INITIAL	Moisture Content, %	24.6	24.8	25.9
	Dry Density, pcf	70.7	69.2	70.7
	Height, inches	1.00	1.00	1.00
FINAL	Moisture Content, %	42.7	41.3	39.0
	Dry Density, pcf	69.2	70.8	72.5
	Height, inches	1.022	0.977	0.975
	Diameter, inches	2.42	2.42	2.42
	Deformation Rate, inch/minute	0.0024	0.0023	0.0023
	Normal Stress, psf	**1000**	**2000**	**3000**
	Peak Shear Stress, psf	**835**	**1094**	**1587**
	Shear Displacement, inches	0.43	0.42	0.41

Sample: B-5
Depth: 1.0 - 2.5 feet
Description: Brown silty clay with some gravel

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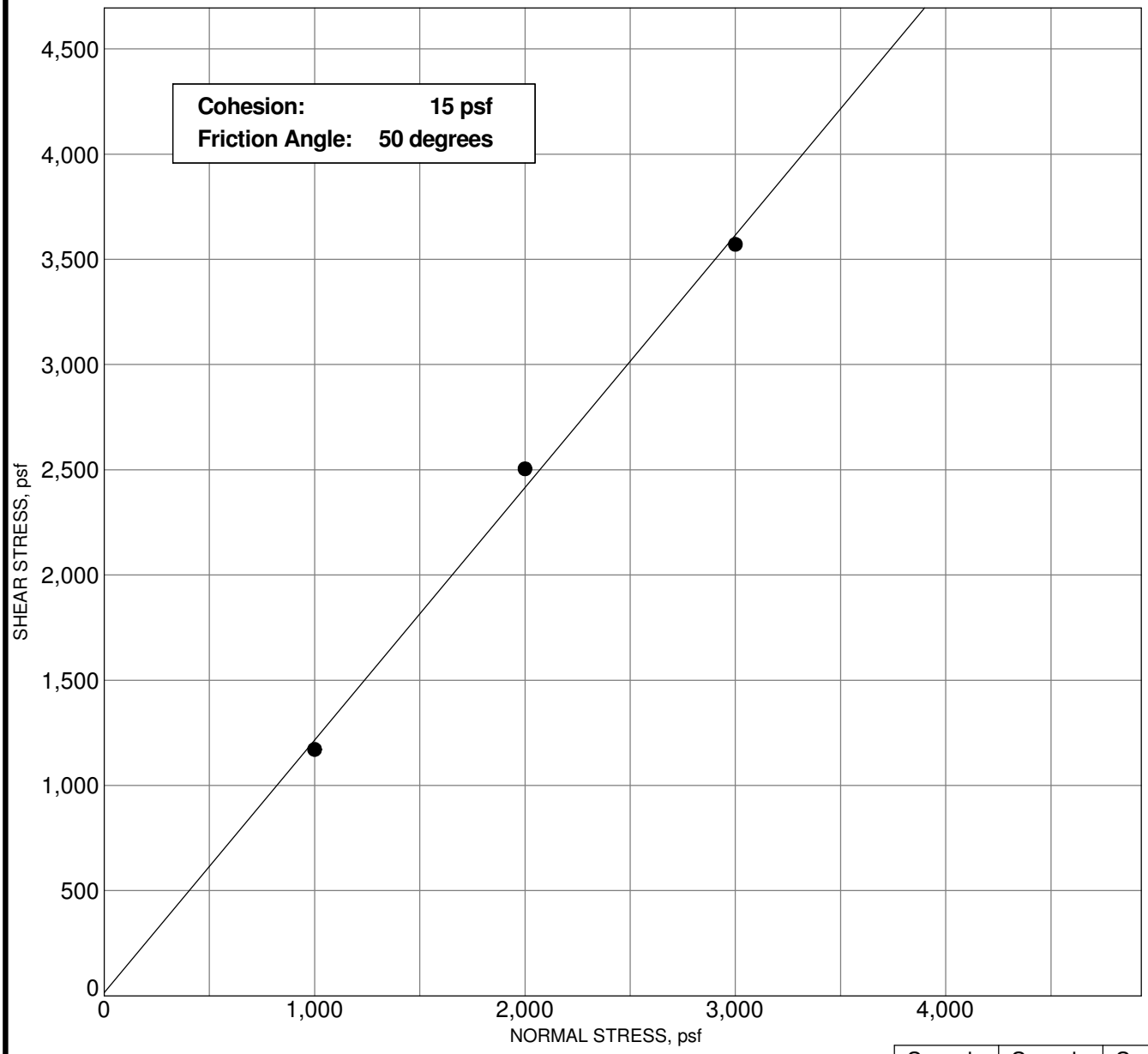
DIRECT SHEAR TEST - ASTM D3080

INTERSTATE ROUTE H-1 (EB) IMPROVEMENTS
OLA LANE OVERPASS TO
KALIHI STREET INTERCHANGE
HONOLULU, OAHU, HAWAII

Plate
C - 36

G_DIRECT_SHEAR_8049-00.GPJ GEOLABS.GDT 5/3/21



		Sample #1	Sample #2	Sample #3
INITIAL	Moisture Content, %	23.0	25.8	23.9
	Dry Density, pcf	83.7	83.4	87.3
	Height, inches	1.00	1.00	1.00
FINAL	Moisture Content, %	32.1	31.7	29.0
	Dry Density, pcf	81.8	85.8	89.5
	Height, inches	1.022	0.972	0.975
	Diameter, inches	2.42	2.42	2.42
	Deformation Rate, inch/minute	0.0025	0.0014	0.0012
	Normal Stress, psf	**1000**	**2000**	**3000**
	Peak Shear Stress, psf	**1171**	**2505**	**3571**
	Shear Displacement, inches	0.43	0.37	0.36

Sample: B-6
Depth: 1.0 - 2.5 feet
Description: Brown and gray silty clay with some gravel

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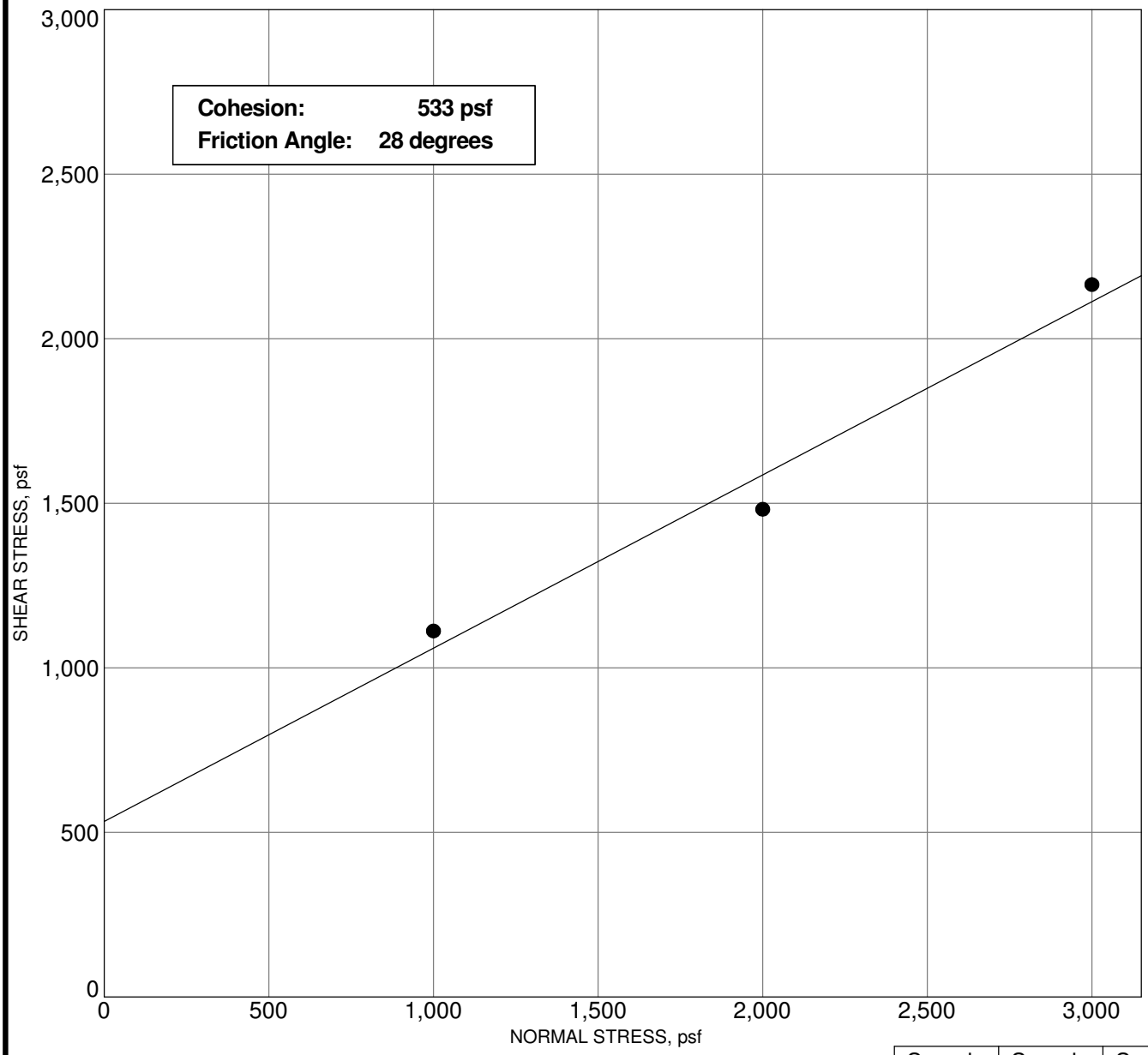
DIRECT SHEAR TEST - ASTM D3080

INTERSTATE ROUTE H-1 (EB) IMPROVEMENTS
OLA LANE OVERPASS TO
KALIHI STREET INTERCHANGE
HONOLULU, OAHU, HAWAII

Plate
C - 37

G_DIRECT_SHEAR_8049-00.GPJ GEOLABS.GDT 5/3/21



		Sample #1	Sample #2	Sample #3
INITIAL	Moisture Content, %	43.3	46.5	49.5
	Dry Density, pcf	68.7	66.9	65.8
	Height, inches	1.00	1.00	1.00
FINAL	Moisture Content, %	57.1	56.9	56.2
	Dry Density, pcf	67.9	68.3	66.8
	Height, inches	1.011	0.980	0.984
	Diameter, inches	2.42	2.42	2.42
	Deformation Rate, inch/minute	0.0024	0.0021	0.0023
	Normal Stress, psf	**1000**	**2000**	**3000**
	Peak Shear Stress, psf	**1112**	**1482**	**2164**
	Shear Displacement, inches	0.43	0.41	0.42

Sample: B-6
Depth: 101.0 - 102.5 feet
Description: Brown with multi-color mottling silty clay with some sand

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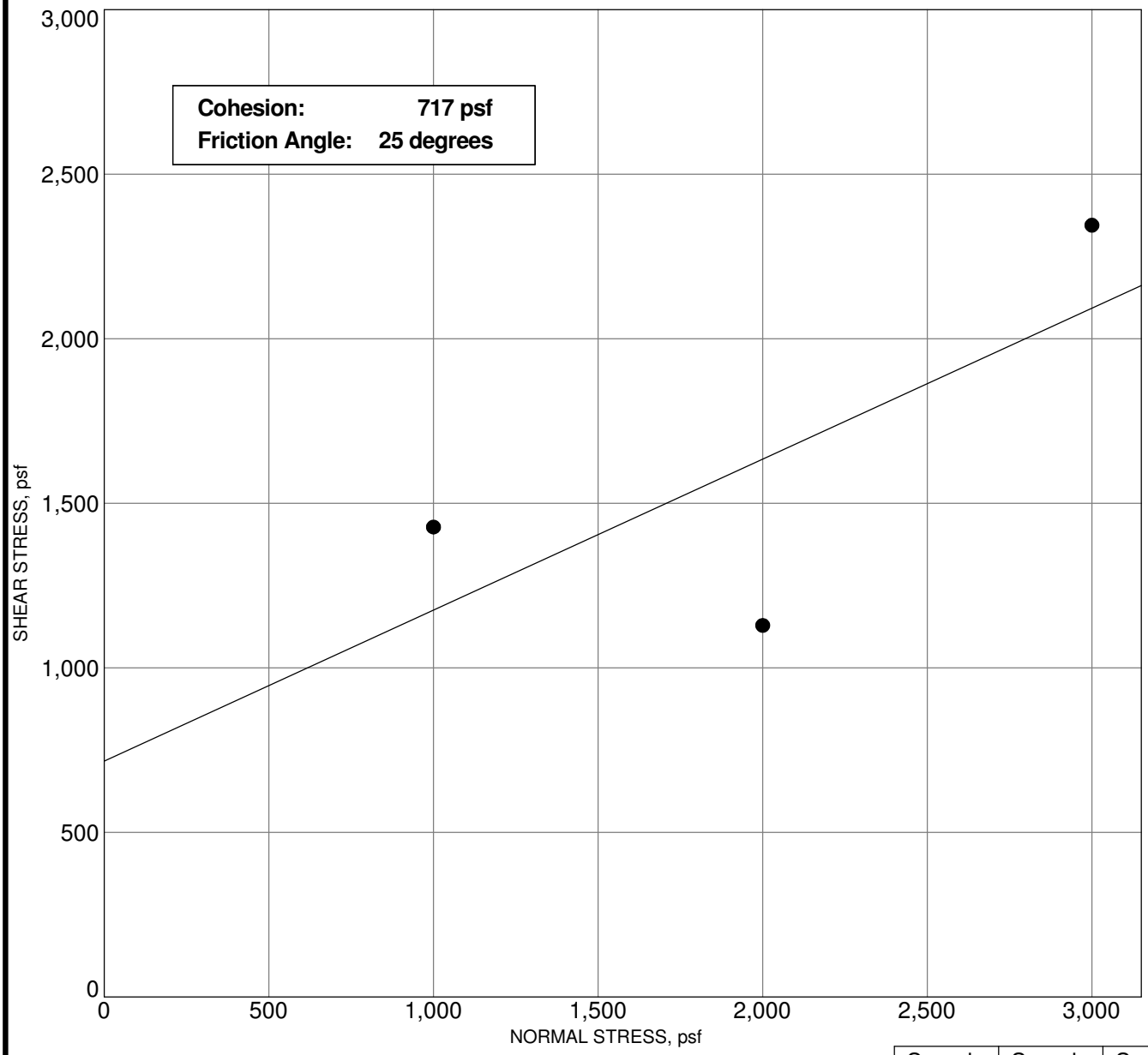
W.O. 8049-00 & 10(B)

DIRECT SHEAR TEST - ASTM D3080

INTERSTATE ROUTE H-1 (EB) IMPROVEMENTS
OLA LANE OVERPASS TO
KALIHI STREET INTERCHANGE
HONOLULU, OAHU, HAWAII

Plate
C - 38

G_DIRECT_SHEAR_8049-00.GPJ GEOLABS.GDT 5/3/21



		Sample #1	Sample #2	Sample #3
INITIAL	Moisture Content, %	42.1	42.3	46.5
	Dry Density, pcf	68.0	69.7	70.1
	Height, inches	1.00	1.00	1.00
FINAL	Moisture Content, %	56.3	53.5	53.5
	Dry Density, pcf	67.3	70.6	71.6
	Height, inches	1.010	0.986	0.979
	Diameter, inches	2.42	2.42	2.42
	Deformation Rate, inch/minute	0.0024	0.0022	0.0021
	Normal Stress, psf	**1000**	**2000**	**3000**
	Peak Shear Stress, psf	**1428**	**1129**	**2345**
	Shear Displacement, inches	0.43	0.42	0.40

Sample: B-7
Depth: 85.5 - 87.0 feet
Description: Brown silty clay with some sand and a little gravel

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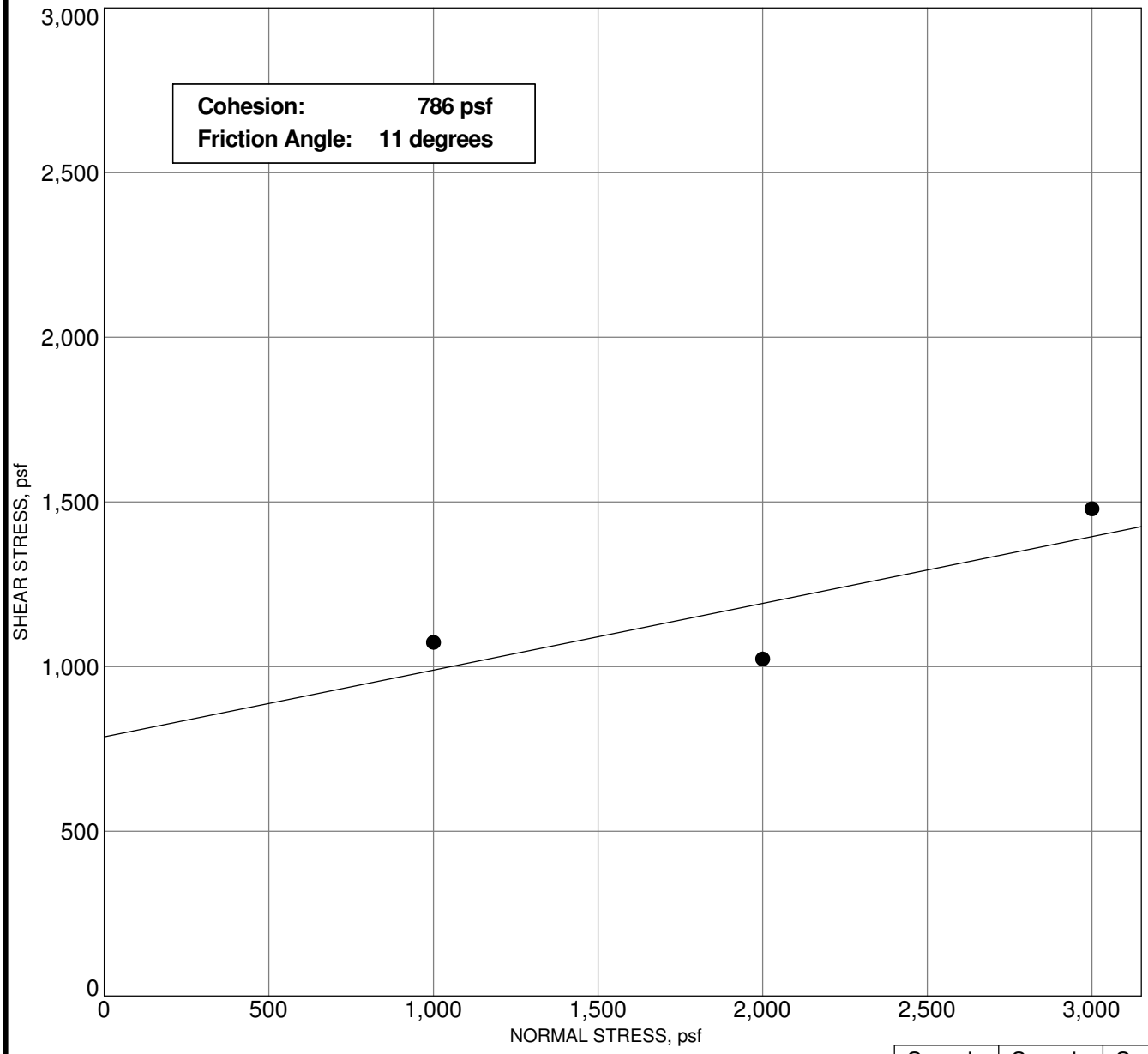
DIRECT SHEAR TEST - ASTM D3080

INTERSTATE ROUTE H-1 (EB) IMPROVEMENTS
OLA LANE OVERPASS TO
KALIHI STREET INTERCHANGE
HONOLULU, OAHU, HAWAII

Plate
C - 39

G_DIRECT_SHEAR_8049-00.GPJ_GEOLABS.GDT 5/3/21



		Sample #1	Sample #2	Sample #3
INITIAL	Moisture Content, %	52.8	55.9	55.8
	Dry Density, pcf	65.1	64.1	66.3
	Height, inches	1.00	1.00	1.00
FINAL	Moisture Content, %	62.1	58.5	58.3
	Dry Density, pcf	64.5	65.9	67.2
	Height, inches	1.010	0.972	0.985
	Diameter, inches	2.42	2.42	2.42
	Deformation Rate, inch/minute	0.0024	0.0022	0.0024
	Normal Stress, psf	**1000**	**2000**	**3000**
	Peak Shear Stress, psf	**1073**	**1023**	**1479**
	Shear Displacement, inches	0.43	0.41	0.42

Sample: B-7
Depth: 105.5 - 107.0 feet
Description: Brown clayey silt with traces of sand

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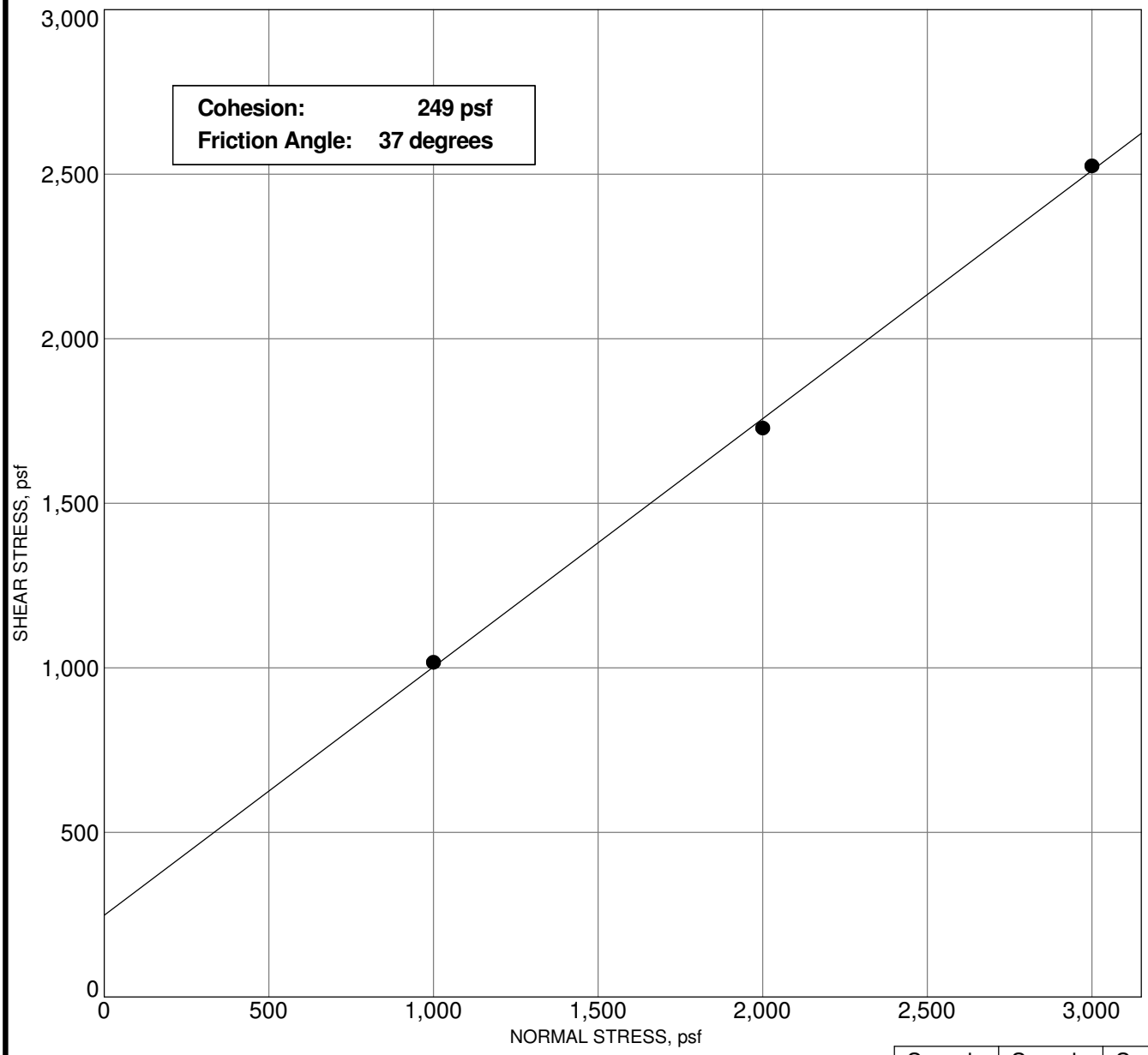
W.O. 8049-00 & 10(B)

DIRECT SHEAR TEST - ASTM D3080

INTERSTATE ROUTE H-1 (EB) IMPROVEMENTS
OLA LANE OVERPASS TO
KALIHI STREET INTERCHANGE
HONOLULU, OAHU, HAWAII

Plate
C - 40

G_DIRECT_SHEAR_8049-00.GPJ GEOLABS.GDT 5/3/21



		Sample #1	Sample #2	Sample #3
INITIAL	Moisture Content, %	12.7	12.4	12.0
	Dry Density, pcf	98.6	98.4	100.7
	Height, inches	1.00	1.00	1.00
FINAL	Moisture Content, %	22.1	21.7	20.5
	Dry Density, pcf	96.6	100.4	101.3
	Height, inches	1.020	0.980	0.994
	Diameter, inches	2.42	2.42	2.42
	Deformation Rate, inch/minute	0.0025	0.0022	0.0023
	Normal Stress, psf	**1000**	**2000**	**3000**
	Peak Shear Stress, psf	**1017**	**1729**	**2525**
	Shear Displacement, inches	0.43	0.41	0.41

Sample: B-8
Depth: 1.0 - 2.5 feet
Description: Brownish gray silty sand with some gravel

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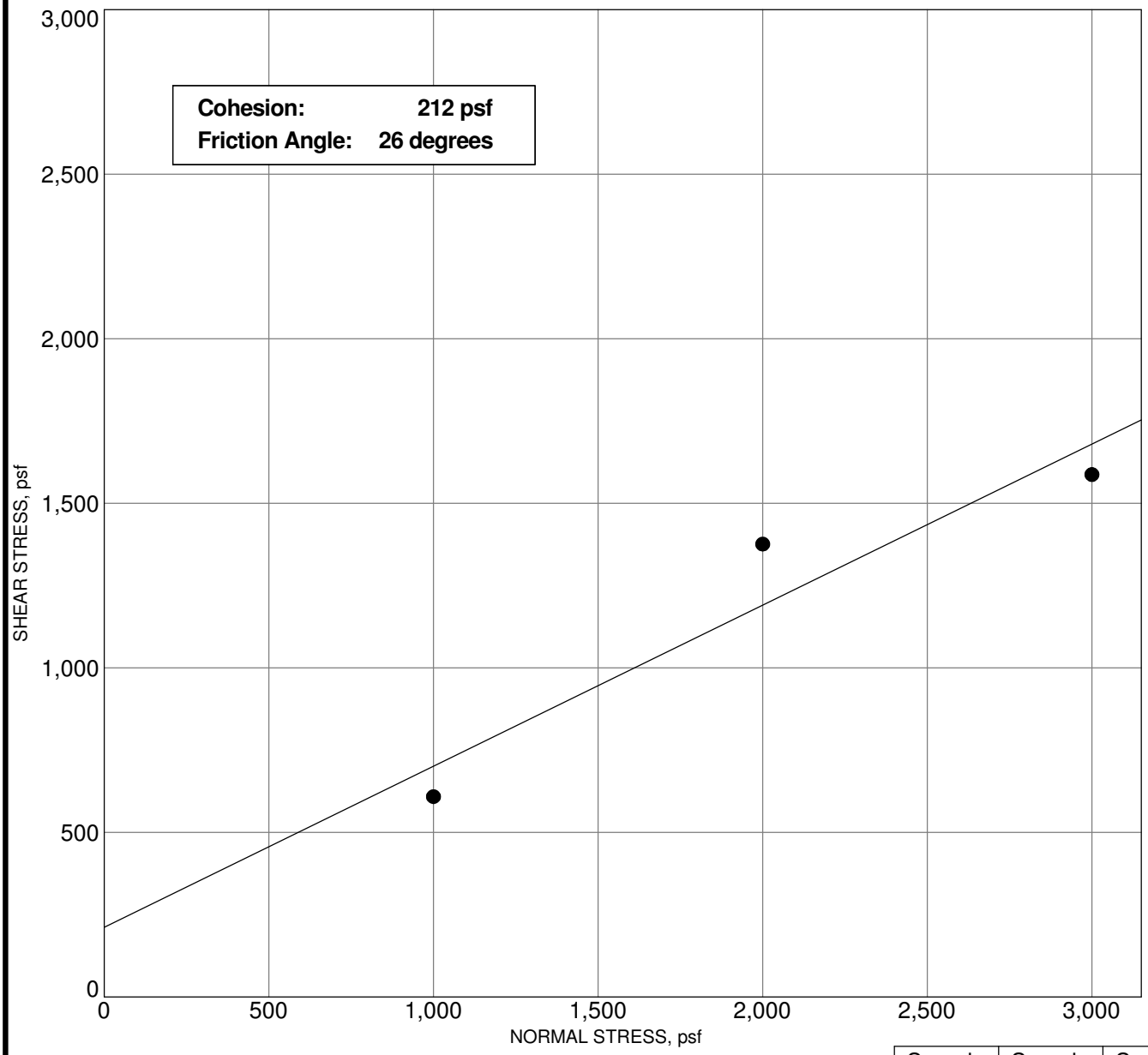
DIRECT SHEAR TEST - ASTM D3080

INTERSTATE ROUTE H-1 (EB) IMPROVEMENTS
OLA LANE OVERPASS TO
KALIHI STREET INTERCHANGE
HONOLULU, OAHU, HAWAII

Plate
C - 41

G_DIRECT_SHEAR_8049-00.GPJ_GEOLABS.GDT 5/3/21



		Sample #1	Sample #2	Sample #3
INITIAL	Moisture Content, %	46.4	53.5	53.1
	Dry Density, pcf	67.6	65.4	64.9
	Height, inches	1.00	1.00	1.00
FINAL	Moisture Content, %	60.4	58.2	54.0
	Dry Density, pcf	67.6	66.0	66.5
	Height, inches	1.001	0.992	0.977
	Diameter, inches	2.42	2.42	2.42
	Deformation Rate, inch/minute	0.0024	0.0022	0.0023
	Normal Stress, psf	**1000**	**2000**	**3000**
	Peak Shear Stress, psf	**609**	**1376**	**1587**
	Shear Displacement, inches	0.43	0.42	0.42

Sample: B-8
Depth: 100.5 - 102.0 feet
Description: Brown with multi-color mottling sandy clay with some gravel

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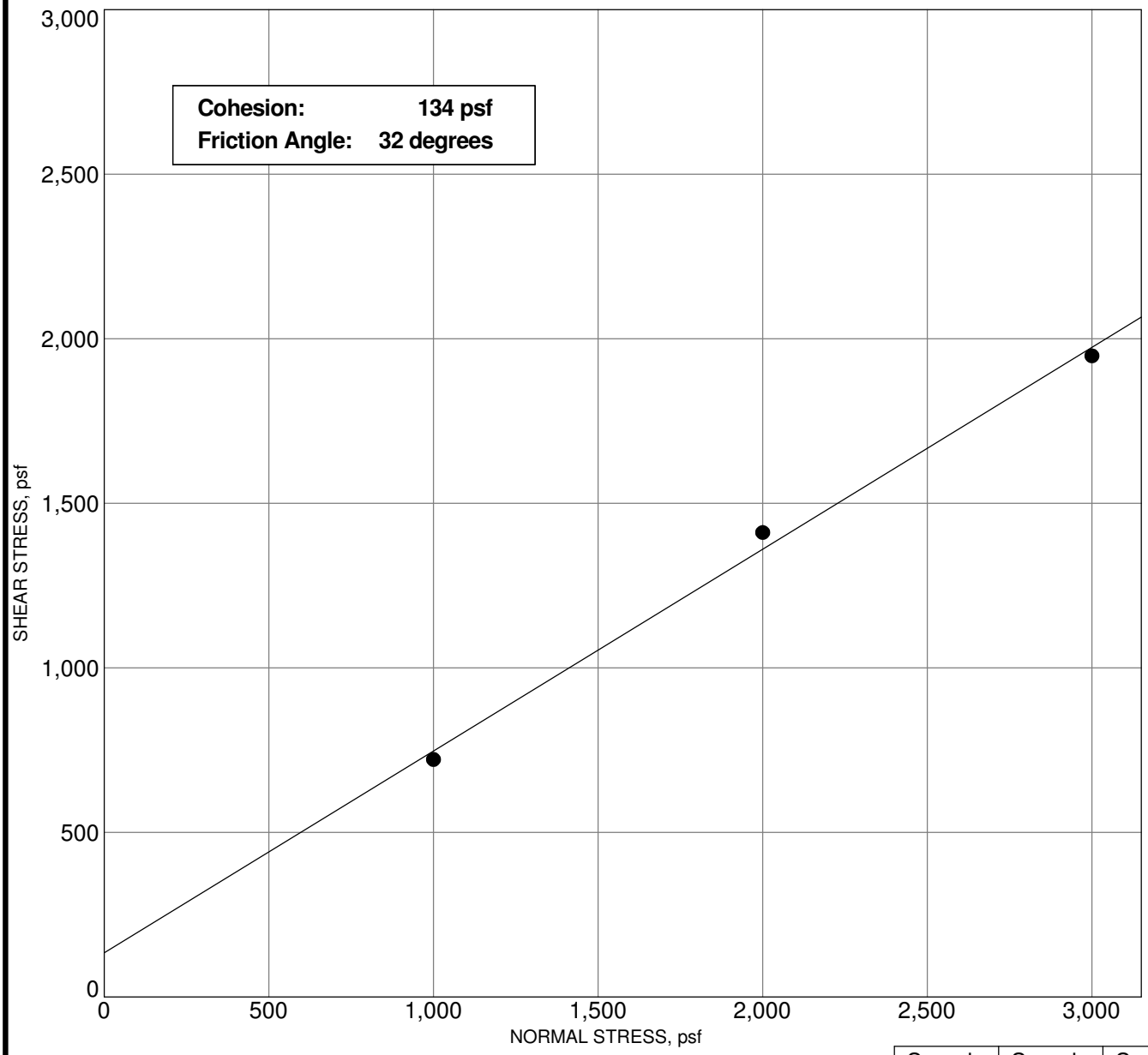
W.O. 8049-00 & 10(B)

DIRECT SHEAR TEST - ASTM D3080

INTERSTATE ROUTE H-1 (EB) IMPROVEMENTS
OLA LANE OVERPASS TO
KALIHI STREET INTERCHANGE
HONOLULU, OAHU, HAWAII

Plate
C - 42

G_DIRECT_SHEAR_8049-00.GPJ GEOLABS.GDT 5/3/21



		Sample #1	Sample #2	Sample #3
INITIAL	Moisture Content, %	46.2	40.3	45.1
	Dry Density, pcf	69.0	72.0	69.8
	Height, inches	1.00	1.00	1.00
FINAL	Moisture Content, %	57.5	52.0	54.4
	Dry Density, pcf	69.8	74.0	71.3
	Height, inches	0.988	0.973	0.980
	Diameter, inches	2.42	2.42	2.42
	Deformation Rate, inch/minute	0.0023	0.0021	0.0022
	Normal Stress, psf	**1000**	**2000**	**3000**
	Peak Shear Stress, psf	**721**	**1411**	**1948**
	Shear Displacement, inches	0.42	0.41	0.42

Sample: B-8
Depth: 115.5 - 117.0 feet
Description: Brown with multi-color mottling silty clay with a little sand

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W.O. 8049-00 & 10(B)

DIRECT SHEAR TEST - ASTM D3080

INTERSTATE ROUTE H-1 (EB) IMPROVEMENTS
OLA LANE OVERPASS TO
KALIHI STREET INTERCHANGE
HONOLULU, OAHU, HAWAII

Plate
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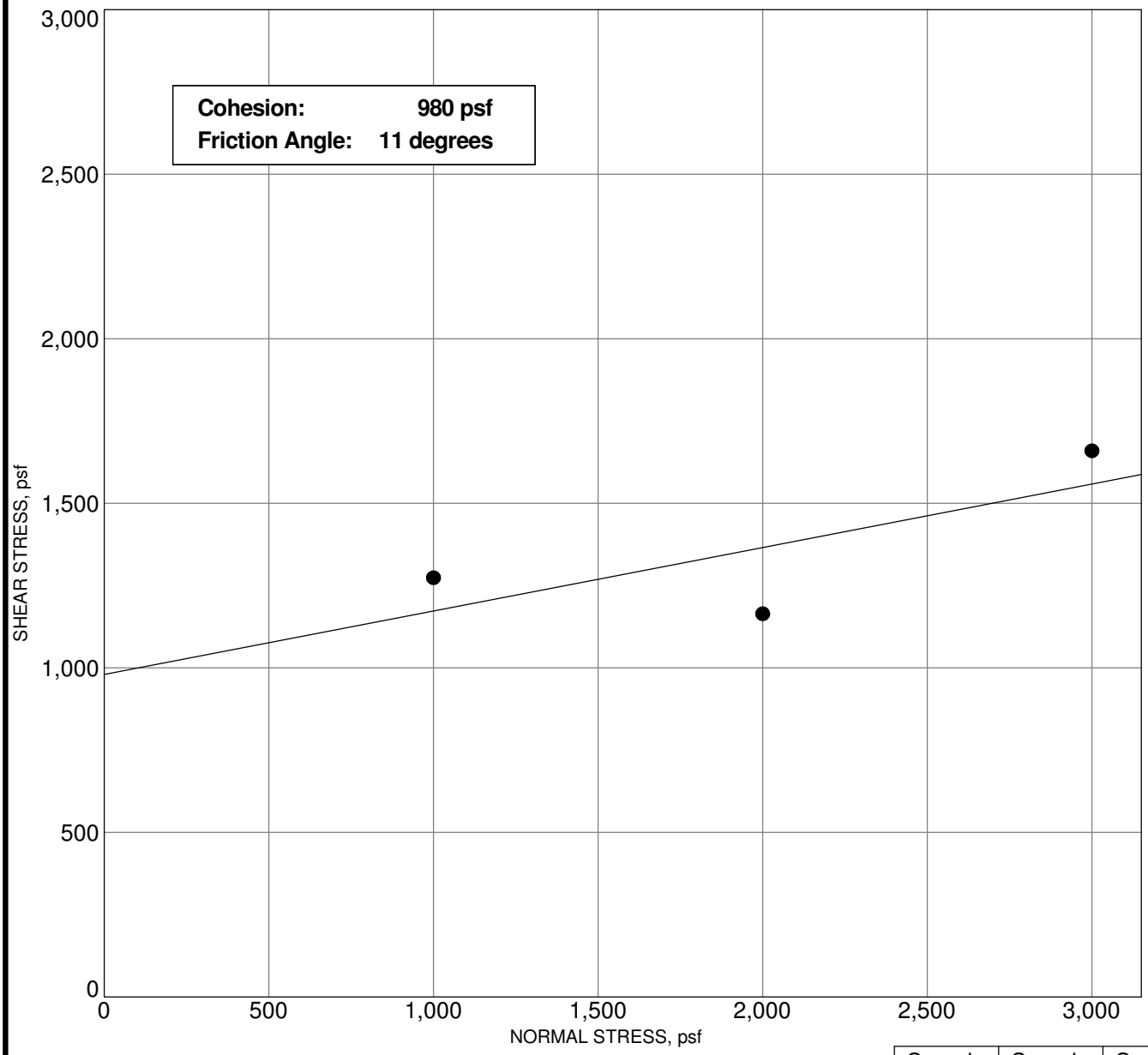
G_DIRECT_SHEAR_8049-00.GPJ_GEOLABS.GDT 5/3/21



		Sample #1	Sample #2	Sample #3
INITIAL	Moisture Content, %	44.7	46.1	48.3
	Dry Density, pcf	65.8	66.8	67.2
	Height, inches	1.00	1.00	1.00
FINAL	Moisture Content, %	60.5	56.1	56.5
	Dry Density, pcf	65.0	68.2	69.0
	Height, inches	1.013	0.980	0.974
	Diameter, inches	2.42	2.42	2.42
	Deformation Rate, inch/minute	0.0025	0.0021	0.0021
	Normal Stress, psf	**1000**	**2000**	**3000**
	Peak Shear Stress, psf	**1274**	**1164**	**1659**
	Shear Displacement, inches	0.43	0.41	0.41

Sample: B-11
Depth: 80.5 - 82.0 feet
Description: Brown with multi-color mottling silty clay with some sand and fine gravel

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DIRECT SHEAR TEST - ASTM D3080

INTERSTATE ROUTE H-1 (EB) IMPROVEMENTS
OLA LANE OVERPASS TO
KALIHI STREET INTERCHANGE
HONOLULU, OAHU, HAWAII

Plate
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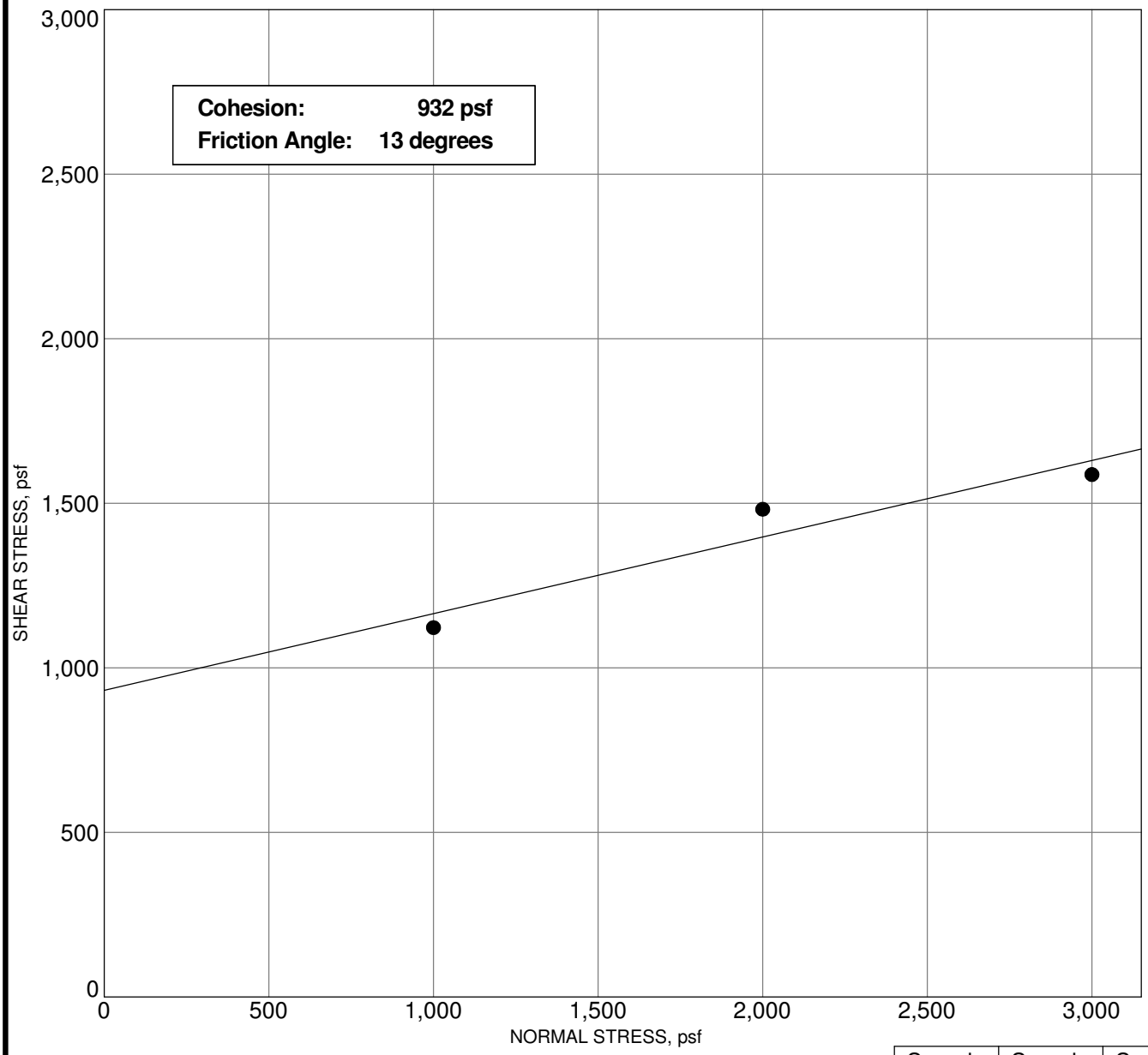
G_DIRECT_SHEAR_8049-00.GPJ_GEOLABS.GDT 5/3/21



		Sample #1	Sample #2	Sample #3
INITIAL	Moisture Content, %	53.8	54.1	53.6
	Dry Density, pcf	63.4	64.8	66.0
	Height, inches	1.00	1.00	1.00
FINAL	Moisture Content, %	64.8	59.5	57.5
	Dry Density, pcf	62.9	65.5	67.1
	Height, inches	1.008	0.989	0.984
	Diameter, inches	2.42	2.42	2.42
	Deformation Rate, inch/minute	0.0024	0.0022	0.0024
	Normal Stress, psf	**1000**	**2000**	**3000**
	Peak Shear Stress, psf	**1122**	**1482**	**1587**
	Shear Displacement, inches	0.43	0.42	0.43

Sample: B-11
Depth: 120.5 - 122.0 feet
Description: Brown with multi-color mottling silt with traces of sand

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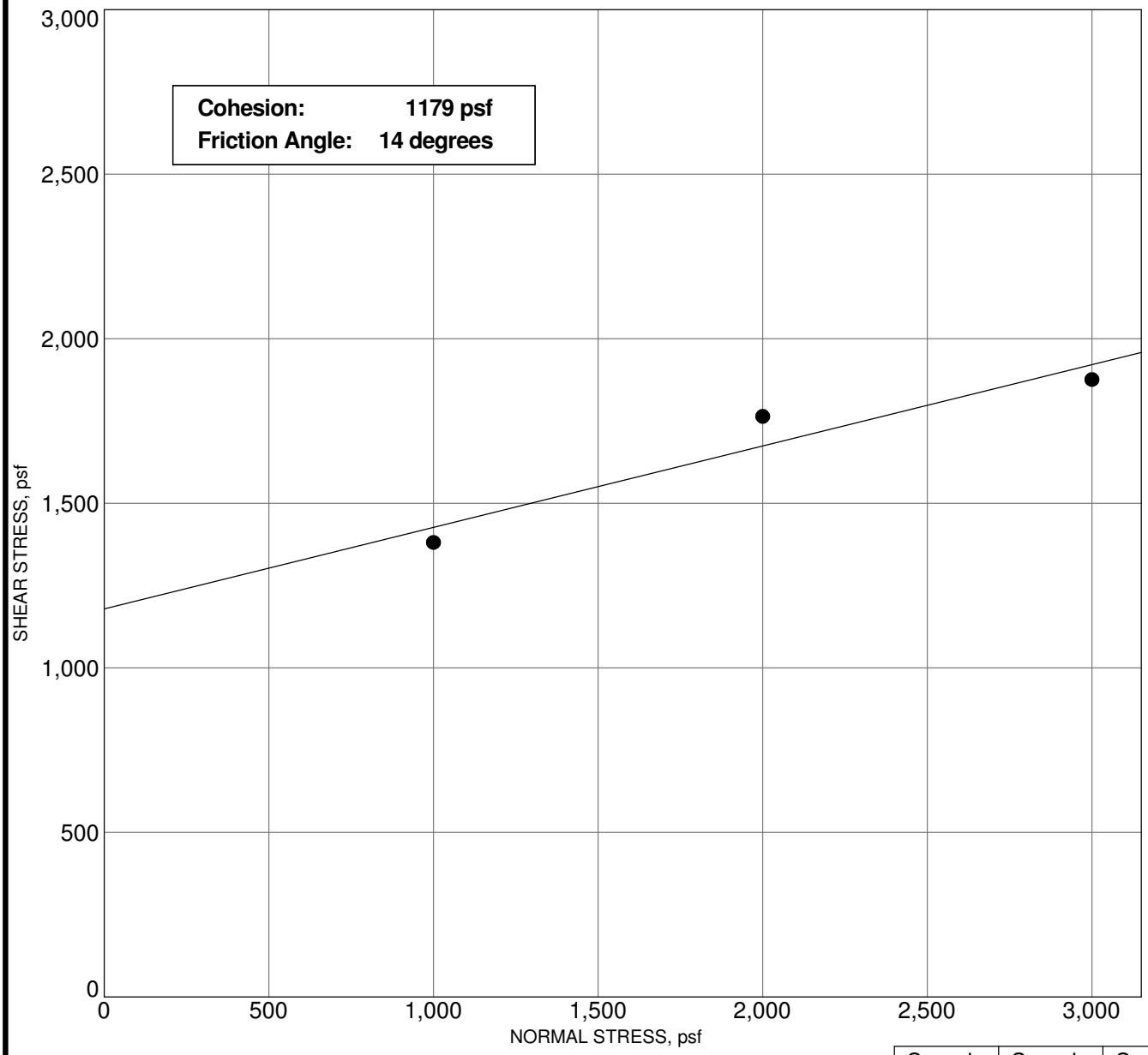
DIRECT SHEAR TEST - ASTM D3080

INTERSTATE ROUTE H-1 (EB) IMPROVEMENTS
OLA LANE OVERPASS TO
KALIHI STREET INTERCHANGE
HONOLULU, OAHU, HAWAII

Plate
C - 45

G_DIRECT_SHEAR_8049-00.GPJ_GEOLABS.GDT 5/3/21



		Sample #1	Sample #2	Sample #3
INITIAL	Moisture Content, %	54.7	52.5	54.7
	Dry Density, pcf	66.9	68.3	66.9
	Height, inches	1.00	1.00	1.00
FINAL	Moisture Content, %	59.7	53.9	54.6
	Dry Density, pcf	68.3	68.4	68.0
	Height, inches	0.980	1.000	0.980
	Diameter, inches	2.42	2.42	2.42
	Deformation Rate, inch/minute	0.0025	0.0021	0.0022
	Normal Stress, psf	**1000**	**2000**	**3000**
	Peak Shear Stress, psf	**1381**	**1764**	**1876**
	Shear Displacement, inches	0.43	0.41	0.42

Sample: B-12
Depth: 111.0 - 112.5 feet
Description: Brown with some gray silt with a little sand and traces of gravel

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DIRECT SHEAR TEST - ASTM D3080

INTERSTATE ROUTE H-1 (EB) IMPROVEMENTS
OLA LANE OVERPASS TO
KALIHI STREET INTERCHANGE
HONOLULU, OAHU, HAWAII

Plate
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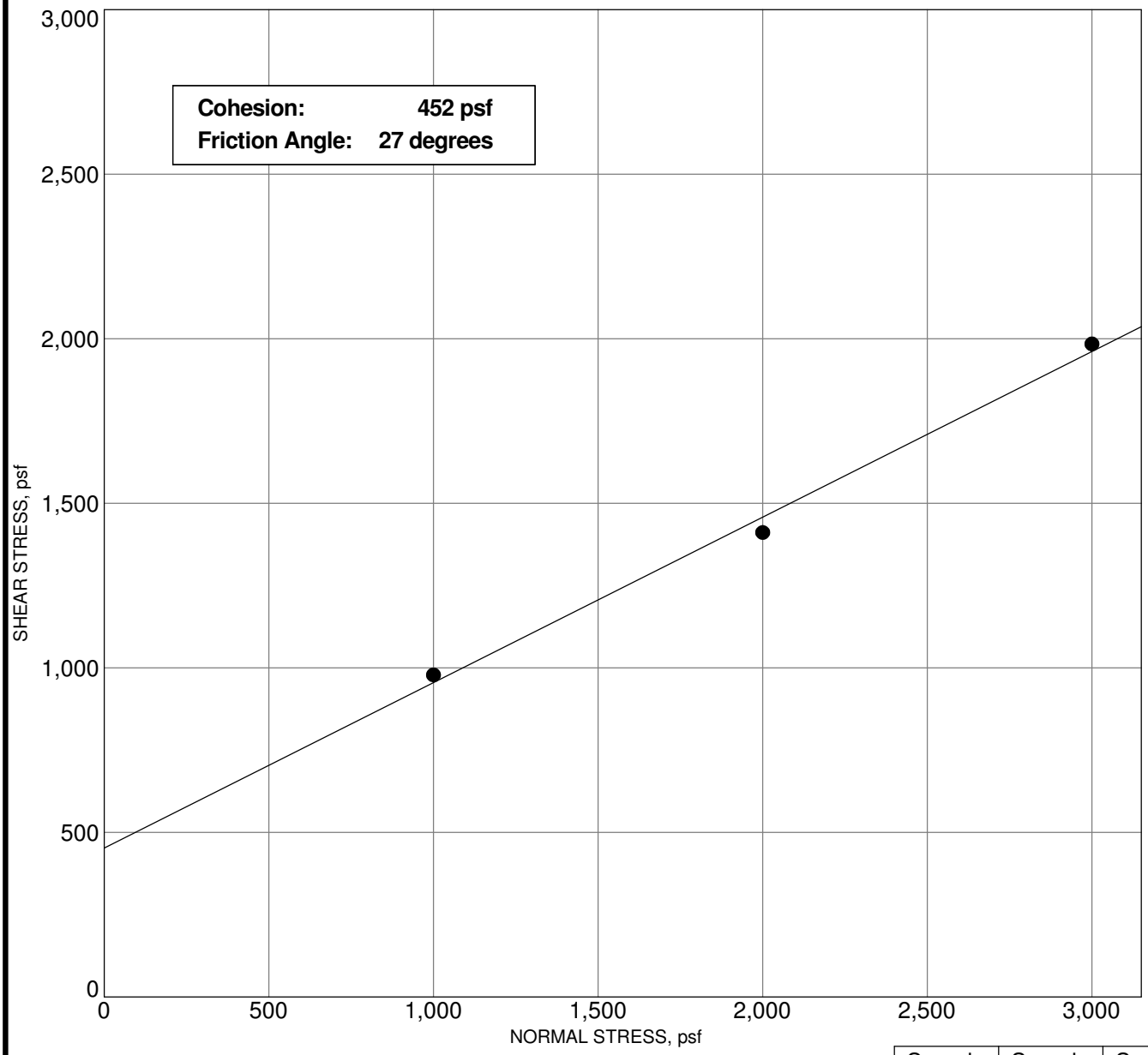
G_DIRECT_SHEAR_8049-00.GPJ_GEOLABS.GDT 5/3/21



		Sample #1	Sample #2	Sample #3
INITIAL	Moisture Content, %	10.7	12.4	13.4
	Dry Density, pcf	75.9	74.3	78.3
	Height, inches	1.00	1.00	1.00
FINAL	Moisture Content, %	36.3	35.2	33.3
	Dry Density, pcf	74.5	76.5	80.4
	Height, inches	1.019	0.971	0.973
	Diameter, inches	2.42	2.42	2.42
	Deformation Rate, inch/minute	0.0025	0.0022	0.0023
	Normal Stress, psf	**1000**	**2000**	**3000**
	Peak Shear Stress, psf	**978**	**1411**	**1984**
	Shear Displacement, inches	0.43	0.41	0.41

Sample: B-13
Depth: 1.0 - 2.1 feet
Description: Brown silty clay (CH) with a little sand and gravel

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INTERSTATE ROUTE H-1 (EB) IMPROVEMENTS
OLA LANE OVERPASS TO
KALIHI STREET INTERCHANGE
HONOLULU, OAHU, HAWAII

Plate
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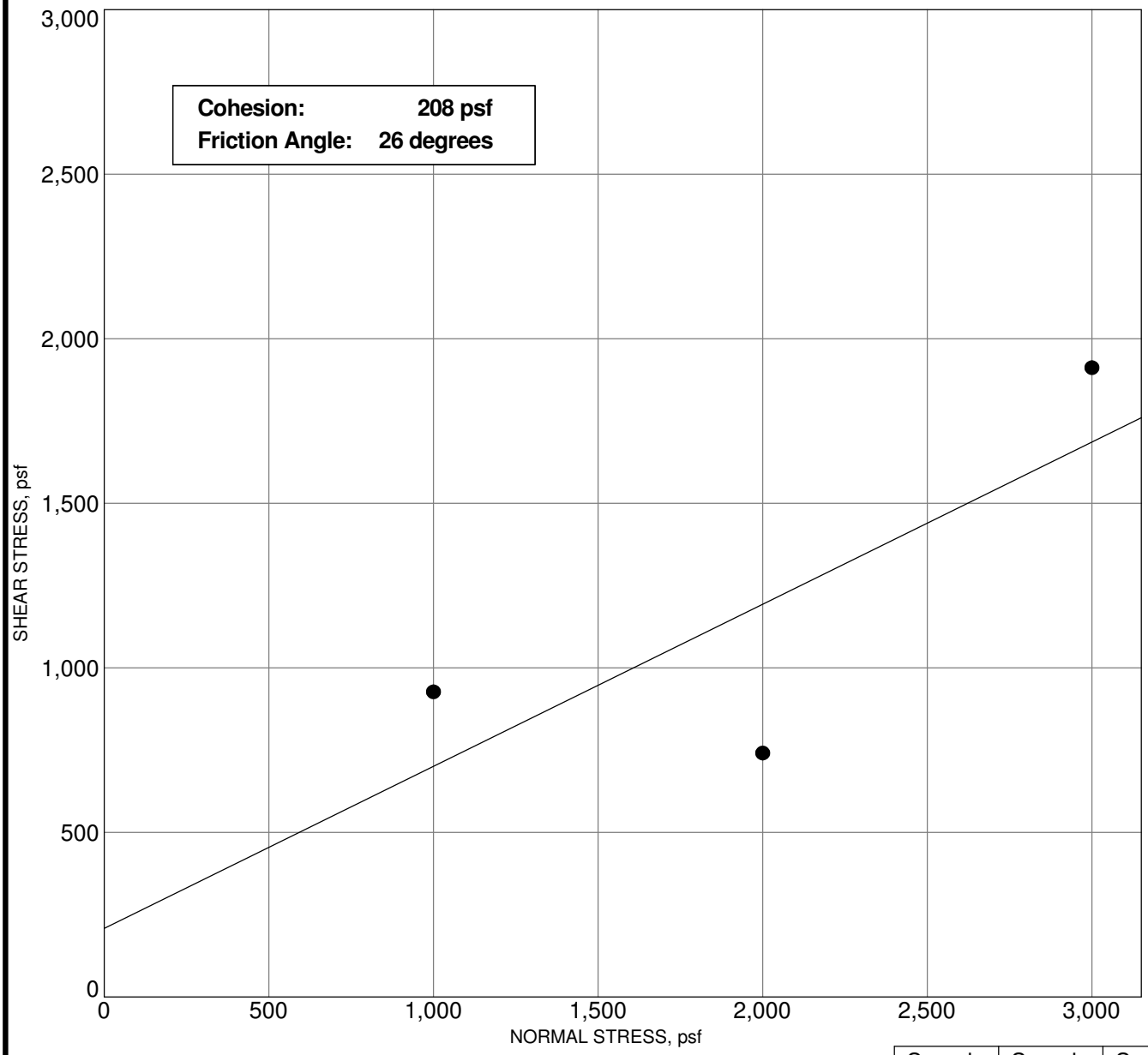
G_DIRECT_SHEAR_8049-00.GPJ_GEOLABS.GDT 5/3/21



		Sample #1	Sample #2	Sample #3
INITIAL	Moisture Content, %	50.7	55.6	57.4
	Dry Density, pcf	67.4	64.8	65.7
	Height, inches	1.00	1.00	1.00
FINAL	Moisture Content, %	56.0	58.7	57.6
	Dry Density, pcf	66.4	65.2	66.6
	Height, inches	1.020	0.990	0.990
	Diameter, inches	2.42	2.42	2.42
	Deformation Rate, inch/minute	0.0024	0.0023	0.0022
	Normal Stress, psf	**1000**	**2000**	**3000**
	Peak Shear Stress, psf	**927**	**741**	**1912**
	Shear Displacement, inches	0.43	0.42	0.41

Sample: B-13
Depth: 76.0 - 77.5 feet
Description: Brown with multi-color mottling clayey silt with some sand and traces of gravel

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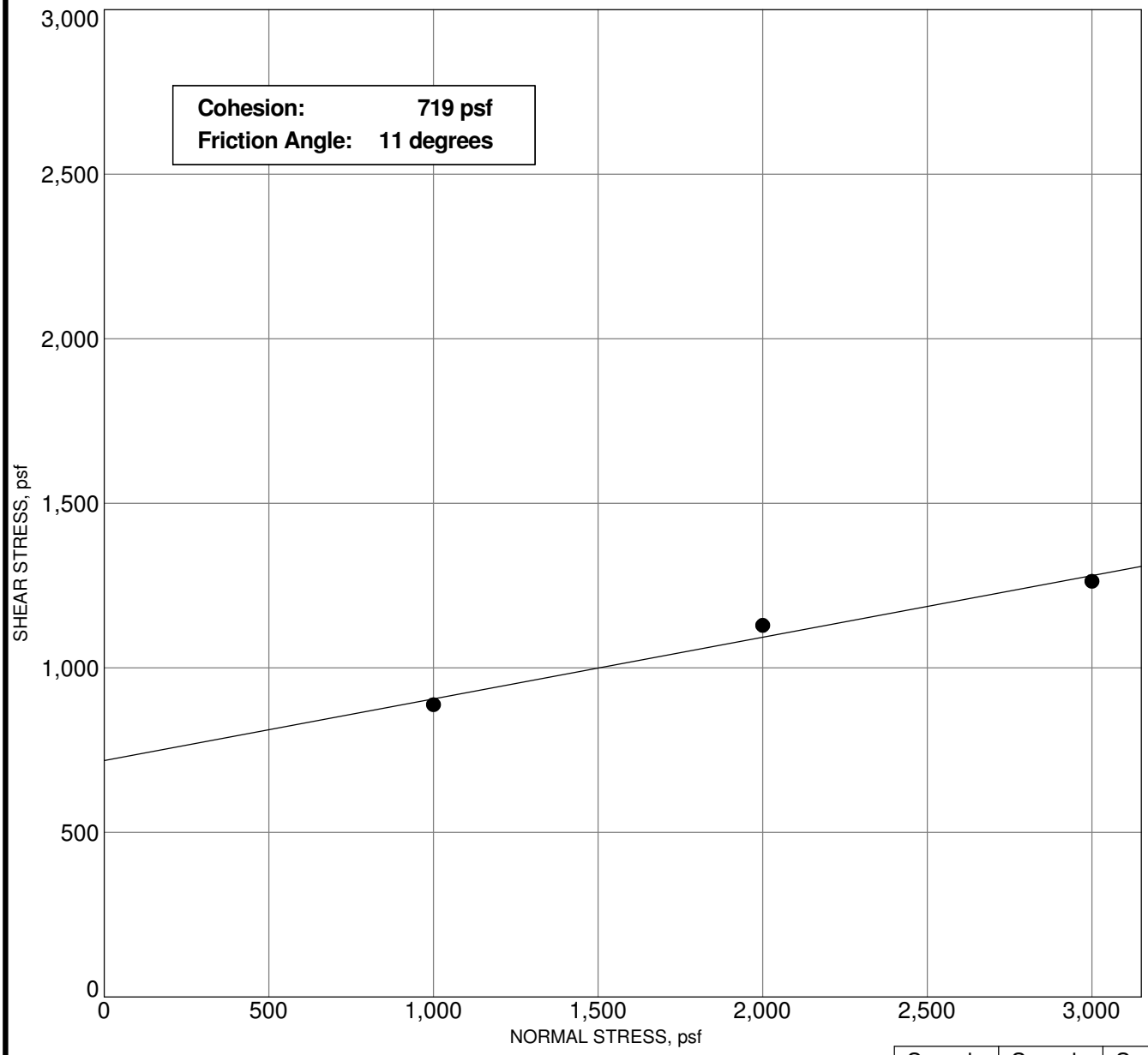
DIRECT SHEAR TEST - ASTM D3080

INTERSTATE ROUTE H-1 (EB) IMPROVEMENTS
OLA LANE OVERPASS TO
KALIHI STREET INTERCHANGE
HONOLULU, OAHU, HAWAII

Plate
C - 48

G_DIRECT_SHEAR_8049-00.GPJ GEOLABS.GDT 5/3/21



		Sample #1	Sample #2	Sample #3
INITIAL	Moisture Content, %	17.0	15.0	15.4
	Dry Density, pcf	68.0	71.1	71.6
	Height, inches	1.00	1.00	1.00
FINAL	Moisture Content, %	42.0	34.5	33.6
	Dry Density, pcf	72.4	73.8	73.5
	Height, inches	0.940	0.960	0.970
	Diameter, inches	2.42	2.42	2.42
	Deformation Rate, inch/minute	0.0025	0.0023	0.0024
	Normal Stress, psf	**1000**	**2000**	**3000**
	Peak Shear Stress, psf	**888**	**1129**	**1263**
	Shear Displacement, inches	0.43	0.41	0.42

Sample: B-101
Depth: 1.0 - 2.5 feet
Description: Brown silty sand with some gravel

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DIRECT SHEAR TEST - ASTM D3080

INTERSTATE ROUTE H-1 (EB) IMPROVEMENTS
OLA LANE OVERPASS TO
KALIHI STREET INTERCHANGE
HONOLULU, OAHU, HAWAII

Plate
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G_DIRECT_SHEAR_8049-00.GPJ GEOLABS.GDT 5/3/21

Location	Depth	Length	Diameter	Length/ Diameter Ratio	Density	Load	Compressive Strength
	(feet)	(inches)	(inches)		(pcf)	(lbs)	(psi)
B-3	7 - 11	7.000	3.300	2.12	182.8	220,000	25,720
B-3	11 - 16	6.900	3.300	2.09	162.7	74,590	8,720
B-3	21 - 26	7.100	3.300	2.15	173.4	145,450	17,010
B-3	31 - 36	7.100	3.260	2.18	178.8	71,390	8,550
B-5	16 - 21	7.100	3.270	2.17	173.7	56,160	6,690
B-5	21 - 26	7.100	3.260	2.18	168.3	84,450	10,120
B-5	31 - 36	7.090	3.300	2.15	172.6	137,320	16,060
B-6	16 - 21	7.100	3.260	2.18	183.1	212,320	25,440
B-6	21 - 26	7.100	3.300	2.15	176.6	71,840	8,400
B-6	36 - 41	6.980	3.270	2.13	182.5	112,990	13,450
B-6	46 - 51	7.100	3.300	2.15	178.9	102,140	11,940
B-6	56 - 61	7.100	3.300	2.15	176.9	128,870	15,070
B-7	5.5 - 10.5	7.080	3.260	2.17	181.4	139,160	16,670
B-7	10.5 - 15.5	7.070	3.260	2.17	179.7	113,540	13,600
B-7	15.5 - 20.5	7.130	3.260	2.19	176.9	86,650	10,380
B-7	25.5 - 30.5	7.100	3.260	2.18	178.8	83,440	10,000
B-7	35.5 - 40.5	7.100	3.260	2.18	178.6	77,880	9,330
B-7	45.5 - 40.5	7.050	3.260	2.16	183.5	128,540	15,400
B-8	15.5 - 20.5	6.630	3.260	2.03	180.9	137,850	16,520
B-8	20.5 - 25.5	7.100	3.260	2.18	179.9	119,830	14,360
B-8	25.5 - 30.5	7.020	3.270	2.15	183.1	158,500	18,870
B-8	35.5 - 40.5	7.130	3.260	2.19	183.8	127,960	15,330
B-8	45.5 - 50.5	7.150	3.260	2.19	184.2	111,990	13,420
B-8	55.5 - 60.5	7.040	3.270	2.15	185.6	171,170	20,380
B-10	6.5 - 11.5	7.090	3.260	2.17	175.0	48,880	5,860
B-10	16.5 - 21.5	7.100	3.260	2.18	162.9	40,010	4,790
B-10	26.5 - 31.5	7.100	3.260	2.18	185.9	158,650	19,010

ASTM D7012 (METHOD C)

Note: Samples were not prepared in accordance with ASTM D4543. Therefore, results reported may differ from results obtained from a test speciment that meets the requirements of Practice D4543

GEOLABS, INC.

GEOTECHNICAL ENGINEERING

W.O. 8049-00 & 10(B)

UNIAXIAL COMPRESSIVE STRENGTH TEST

INTERSTATE ROUTE H-1 (EB) IMPROVEMENTS
OLA LANE OVERPASS TO
KALIHI STREET INTERCHANGE
HONOLULU, OAHU, HAWAII

Plate
C - 50

Location	Depth	Length	Diameter	Length/ Diameter Ratio	Density	Load	Compressive Strength
	(feet)	(inches)	(inches)		(pcf)	(lbs)	(psi)
B-10	36.5 - 41.5	7.090	3.260	2.17	182.2	143,050	17,140
B-11	5.5 - 10.5	7.100	3.300	2.15	155.3	54,160	6,330
B-11	15.5 - 20.5	7.000	3.230	2.17	181.3	117,490	14,340
B-11	25.5 - 30.5	7.100	3.200	2.22	188.2	155,590	19,350
B-11	35.5 - 40.5	7.100	3.230	2.20	187.5	154,720	18,880
B-11	45.5 - 50.5	7.070	3.230	2.19	188.7	138,210	16,870
B-12	6 - 11	7.070	3.350	2.11	171.5	154,720	17,550
B-12	16 - 21	7.080	3.260	2.17	185.6	154,210	18,480
B-12	26 - 31	7.070	3.320	2.13	175.6	153,130	17,690
B-12	36 - 41	7.090	3.260	2.17	185.7	151,980	18,210
B-13	6 - 11	7.160	3.250	2.20	129.1	13,530	1,630
B-13	11 - 16	7.100	3.260	2.18	158.7	62,750	7,520
B-13	16 - 21	7.110	3.260	2.18	188.1	216,490	25,940
B-13	26 - 31	7.140	3.260	2.19	166.3	56,310	6,750
B-13	41 - 46	7.050	3.260	2.16	188.0	180,260	21,600
B-13	46 - 51	7.010	3.260	2.15	183.9	153,540	18,390
B-15	6.5 - 11.5	5.100	2.450	2.08	179.7	85,320	18,100
B-15	11.5 - 16.5	5.070	2.440	2.08	185.4	138,610	29,640
B-15	21.5 - 26.5	5.110	2.440	2.09	185.6	151,240	32,340
B-101	16.25 - 21	5.000	2.400	2.08	163.0	42,640	9,430
B-101	26 - 31	5.000	2.410	2.07	185.9	129,650	28,420

ASTM D7012 (METHOD C)

Note: Samples were not prepared in accordance with ASTM D4543. Therefore, results reported may differ from results obtained from a test speciment that meets the requirements of Practice D4543

Location	Depth (feet)	pH Value	Minimum Resistivity (ohm-cm)	Chloride Content (mg/kg)	Sulfate Content (mg/kg)
B-8	5.0 - 6.5	7.97*	1600*	ND	ND
B-12	2.0 - 3.4	8.34*	1100*	ND	38

TEST METHODS (by Eurofins TestAmerica Laboratories, Inc.)

pH Value	Method 9045C
Minimum Resistivity	SM 2510B
Chloride Content	EPA 300.0
Sulfate Content	EPA 300.0

TEST METHODS (by Geolabs, Inc.)*

pH Value	ASTM G51
Minimum Resistivity	ASTM G57
Chloride Content	N/A
Sulfate Content	N/A

ND: Not Detected Within Reporting Limits

GEOLABS, INC.
GEOTECHNICAL ENGINEERING

W.O. 8049-00 & 10(B)

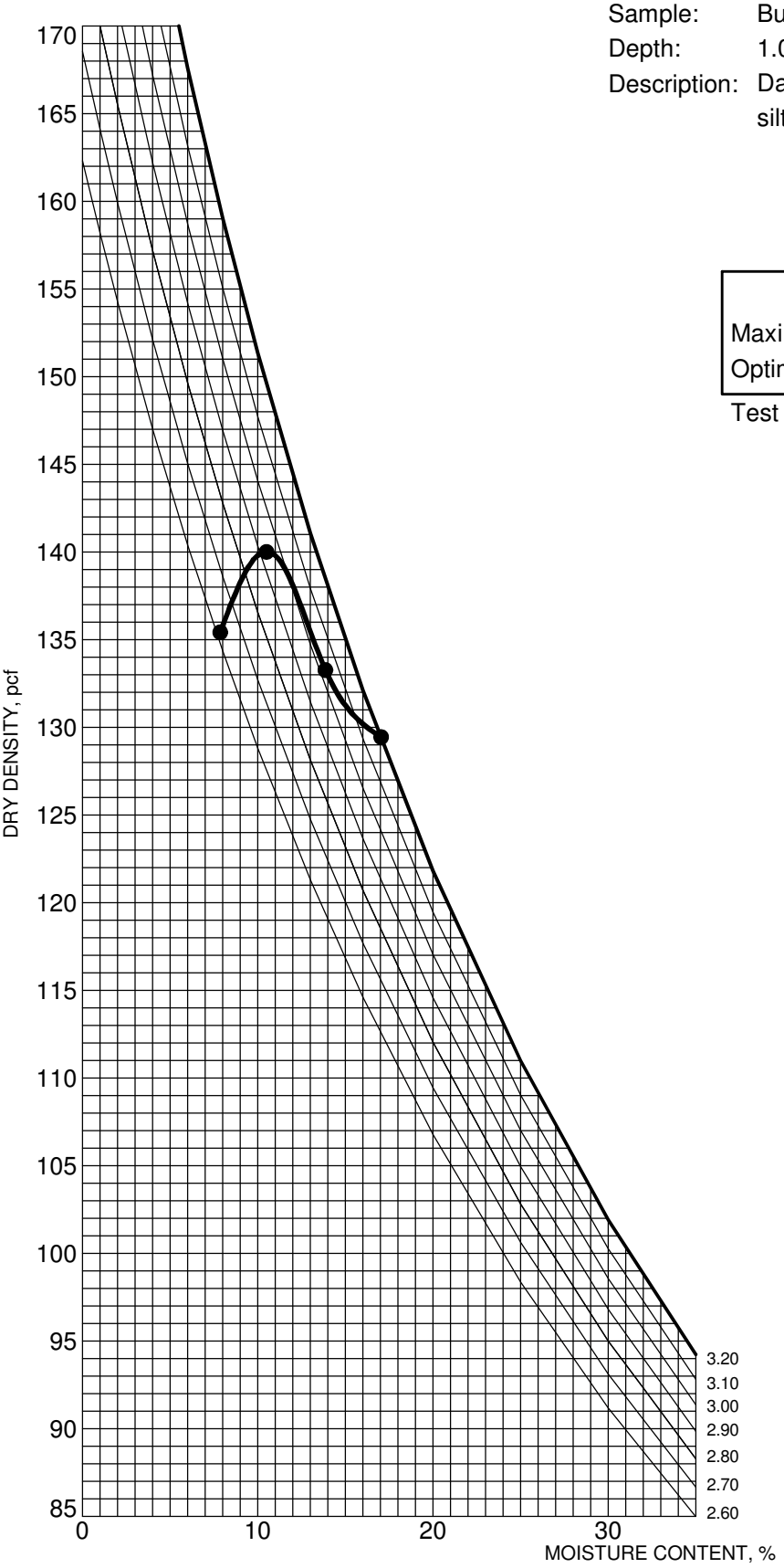
SUMMARY OF CORROSIVITY TESTS

INTERSTATE ROUTE H-1 (EB) IMPROVEMENTS
OLA LANE OVERPASS TO
KALIHI STREET INTERCHANGE
HONOLULU, OAHU, HAWAII

Plate
C - 52

G_SUMMARY_OF_CORROSIVITY_TESTS_8049-00.GPJ_GEOLABS.GDT 5/3/21

Sample: Bulk-1
Depth: 1.0 - 4.0 feet
Description: Dark grayish brown sandy gravel with a little silt



TEST RESULTS

Maximum Dry Density:	140.0 pcf
Optimum Moisture Content:	10.5 %

Test Date: January 25, 2021

G_COMPACTION85 8049-00.GPJ GEOLABS.GDT 5/3/21

GEOLABS, INC.
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W.O. 8049-00 & 10(B)

MOISTURE-DENSITY RELATIONSHIP - ASTM D1557 C

INTERSTATE ROUTE H-1 (EB) IMPROVEMENTS
OLA LANE OVERPASS TO
KALIHI STREET INTERCHANGE
HONOLULU, OAHU, HAWAII

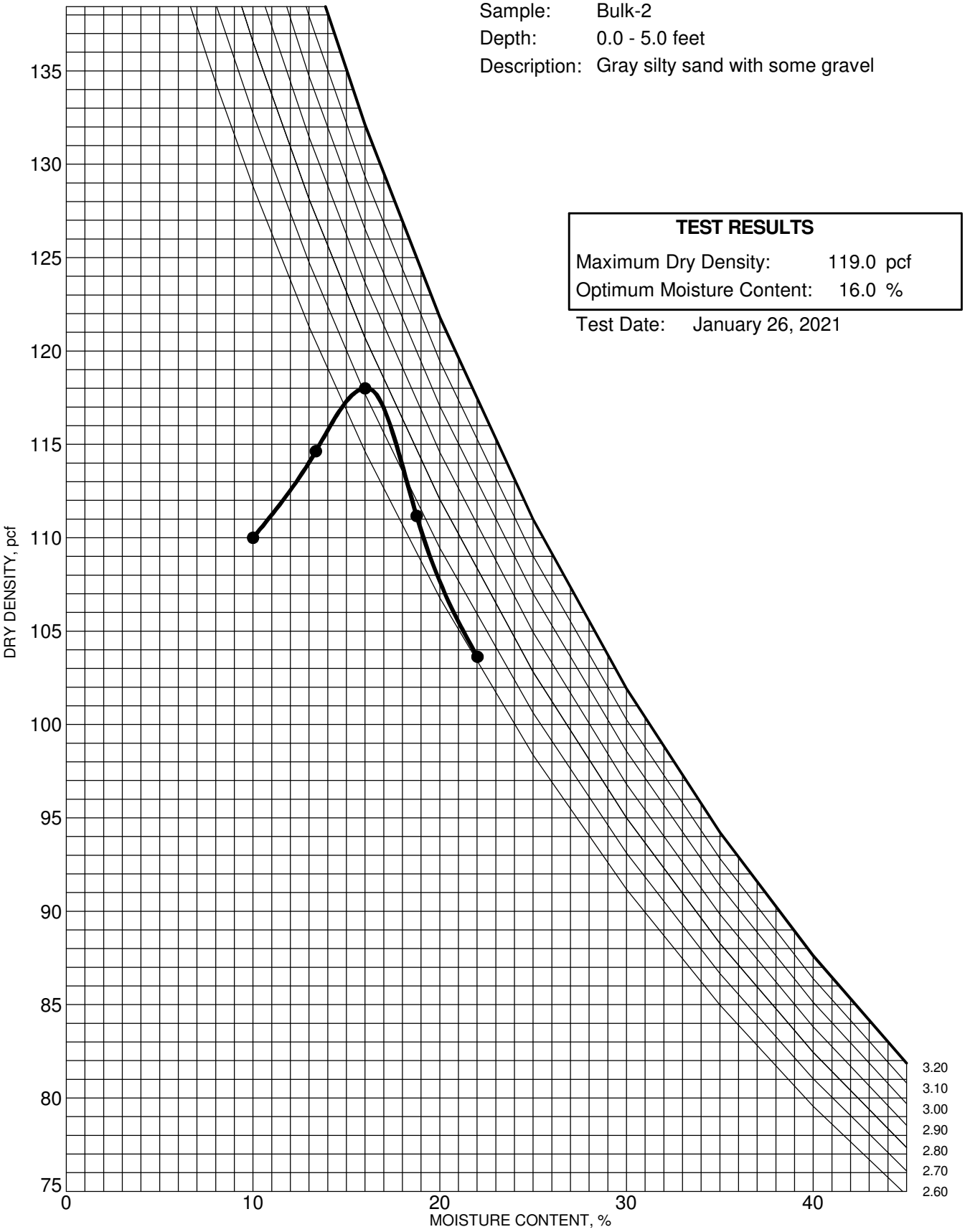
Plate
C - 53

Sample: Bulk-2
Depth: 0.0 - 5.0 feet
Description: Gray silty sand with some gravel

TEST RESULTS

Maximum Dry Density:	119.0 pcf
Optimum Moisture Content:	16.0 %

Test Date: January 26, 2021



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W.O. 8049-00 & 10(B)

MOISTURE-DENSITY RELATIONSHIP - ASTM D1557 B

INTERSTATE ROUTE H-1 (EB) IMPROVEMENTS
OLA LANE OVERPASS TO
KALIHI STREET INTERCHANGE
HONOLULU, OAHU, HAWAII

Plate
C - 54

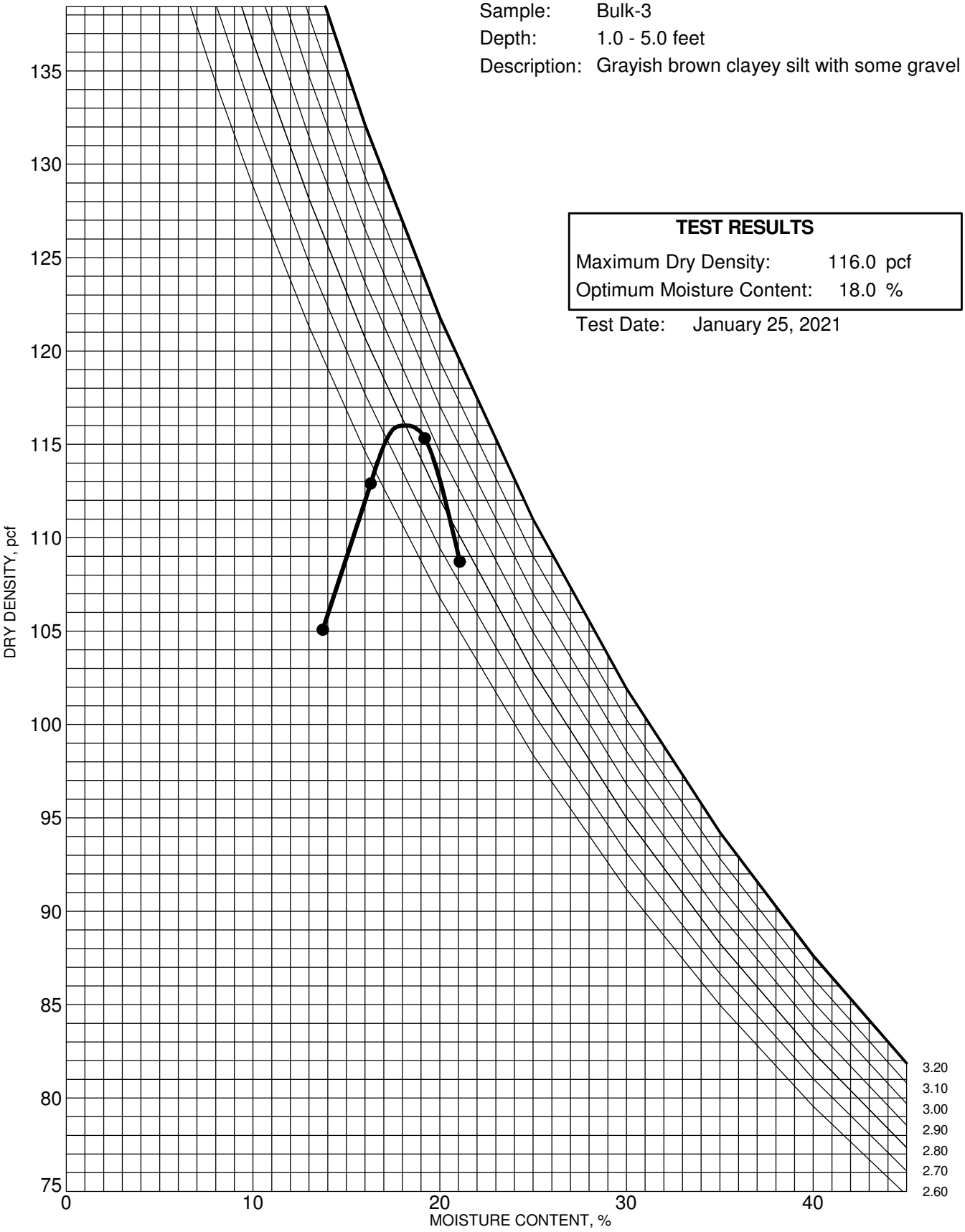
G_COMPACTION 8049-00.GPJ GEOLABS.GDT 5/3/21

Sample: Bulk-3
Depth: 1.0 - 5.0 feet
Description: Grayish brown clayey silt with some gravel

TEST RESULTS

Maximum Dry Density:	116.0 pcf
Optimum Moisture Content:	18.0 %

Test Date: January 25, 2021



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W.O. 8049-00 & 10(B)

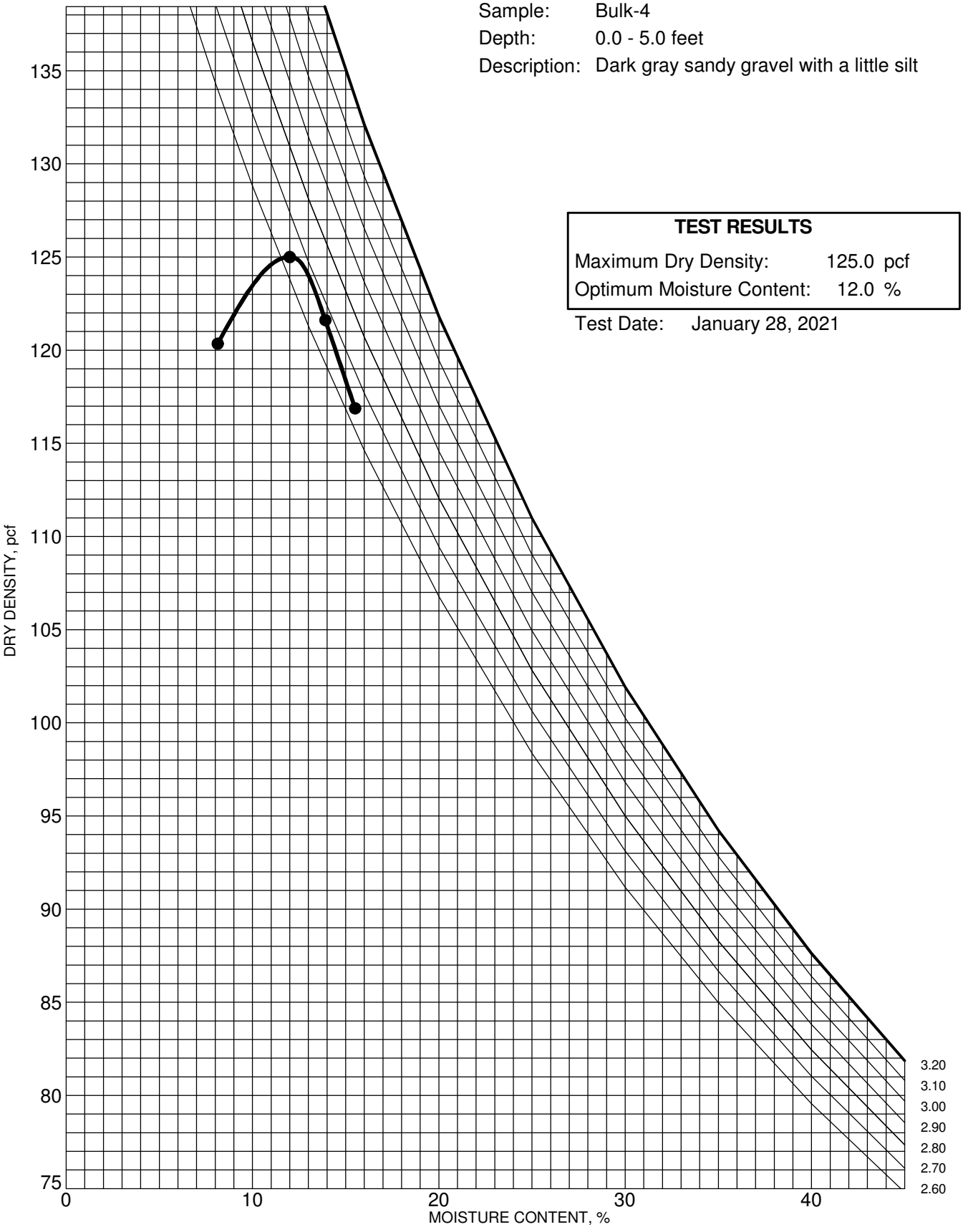
MOISTURE-DENSITY RELATIONSHIP - ASTM D1557 C

INTERSTATE ROUTE H-1 (EB) IMPROVEMENTS
OLA LANE OVERPASS TO
KALIHI STREET INTERCHANGE
HONOLULU, OAHU, HAWAII

Plate
C - 55

G_COMPACTION 8049-00.GPJ GEOLABS.GDT 5/3/21

Sample: Bulk-4
Depth: 0.0 - 5.0 feet
Description: Dark gray sandy gravel with a little silt



TEST RESULTS

Maximum Dry Density:	125.0 pcf
Optimum Moisture Content:	12.0 %

Test Date: January 28, 2021

GEOLABS, INC.
GEOTECHNICAL ENGINEERING

W.O. 8049-00 & 10(B)

MOISTURE-DENSITY RELATIONSHIP - ASTM D1557 B

INTERSTATE ROUTE H-1 (EB) IMPROVEMENTS
OLA LANE OVERPASS TO
KALIHI STREET INTERCHANGE
HONOLULU, OAHU, HAWAII

Plate
C - 56

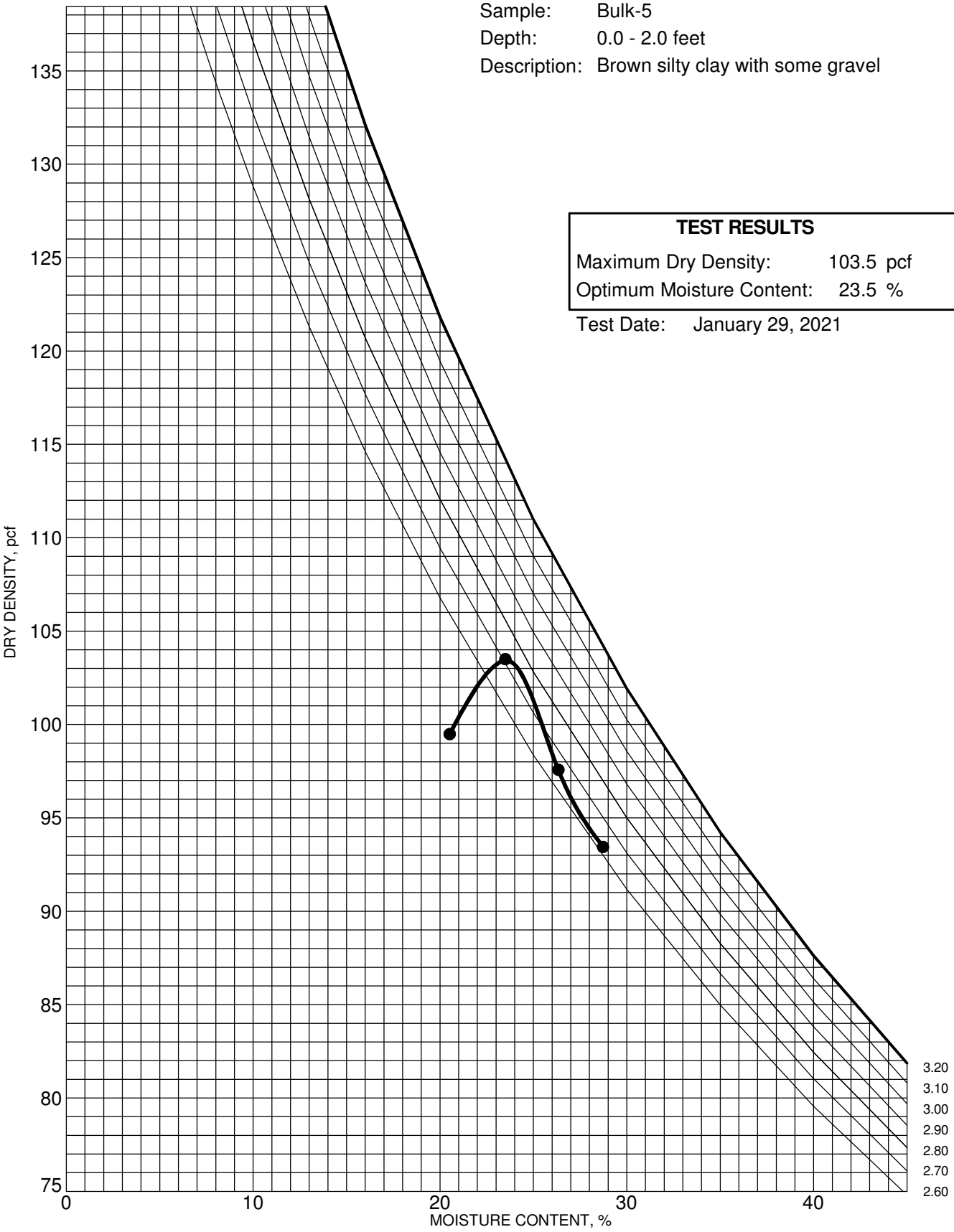
G_COMPACTION 8049-00.GPJ GEOLABS.GDT 5/3/21

Sample: Bulk-5
Depth: 0.0 - 2.0 feet
Description: Brown silty clay with some gravel

TEST RESULTS

Maximum Dry Density:	103.5 pcf
Optimum Moisture Content:	23.5 %

Test Date: January 29, 2021



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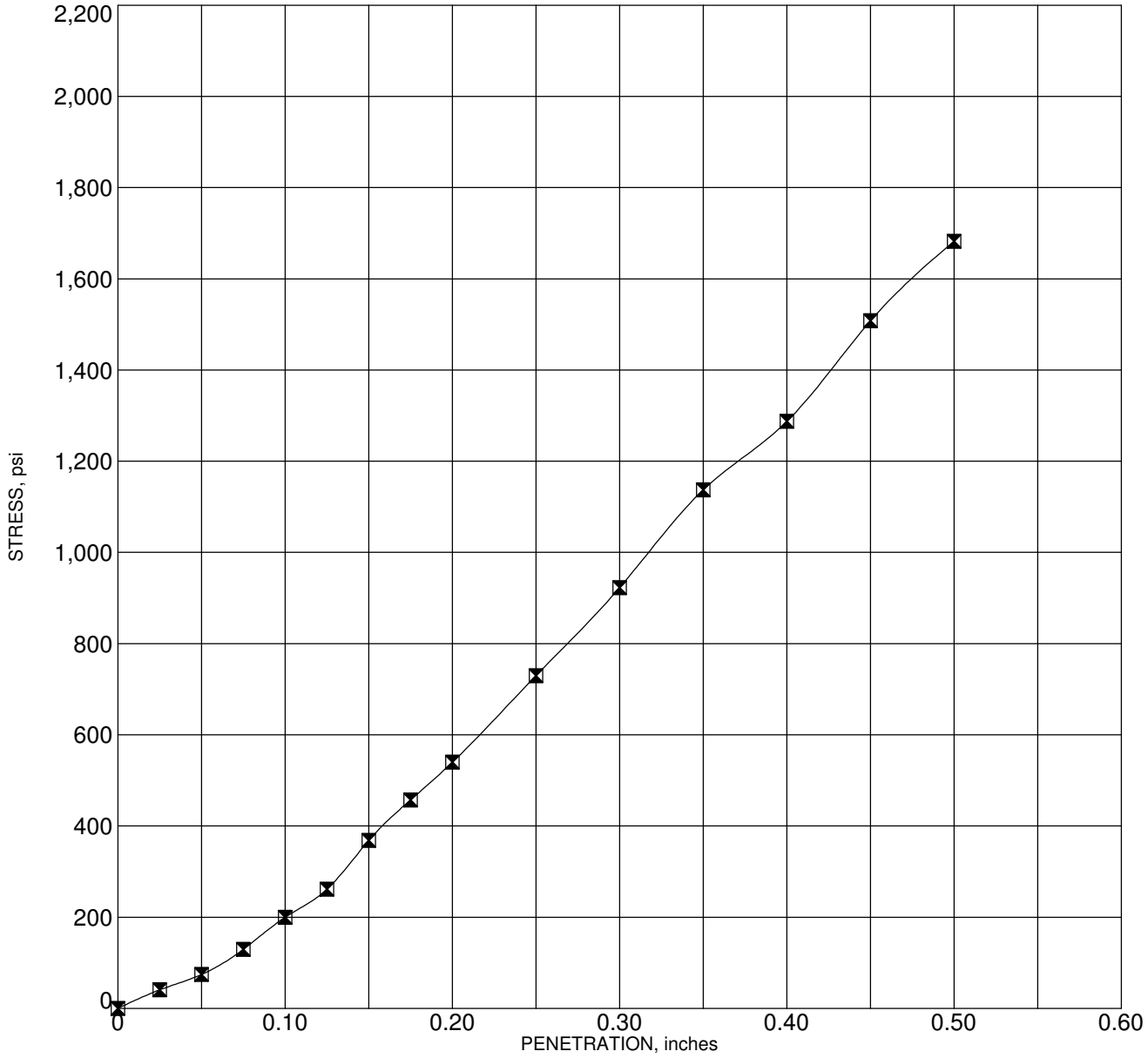
W.O. 8049-00 & 10(B)

MOISTURE-DENSITY RELATIONSHIP - ASTM D1557 B

INTERSTATE ROUTE H-1 (EB) IMPROVEMENTS
OLA LANE OVERPASS TO
KALIHI STREET INTERCHANGE
HONOLULU, OAHU, HAWAII

Plate
C - 57

G_COMPACTION 8049-00.GPJ GEOLABS.GDT 5/3/21



Corr. CBR @ 0.1"	20.0
Corr. CBR @ 0.2"	36.0
Swell (%)	0.00

Sample: Bulk-1
Depth: 1.0 - 4.0 feet
Description: Dark grayish brown sandy gravel with a little silt

Molding Dry Density (pcf)	138.5	Hammer Wt. (lbs)	10
Molding Moisture (%)	9.7	Hammer Drop (inches)	18
Days Soaked	4	No. of Blows	56
Aggregate	3/4 inch minus	No. of Layers	5

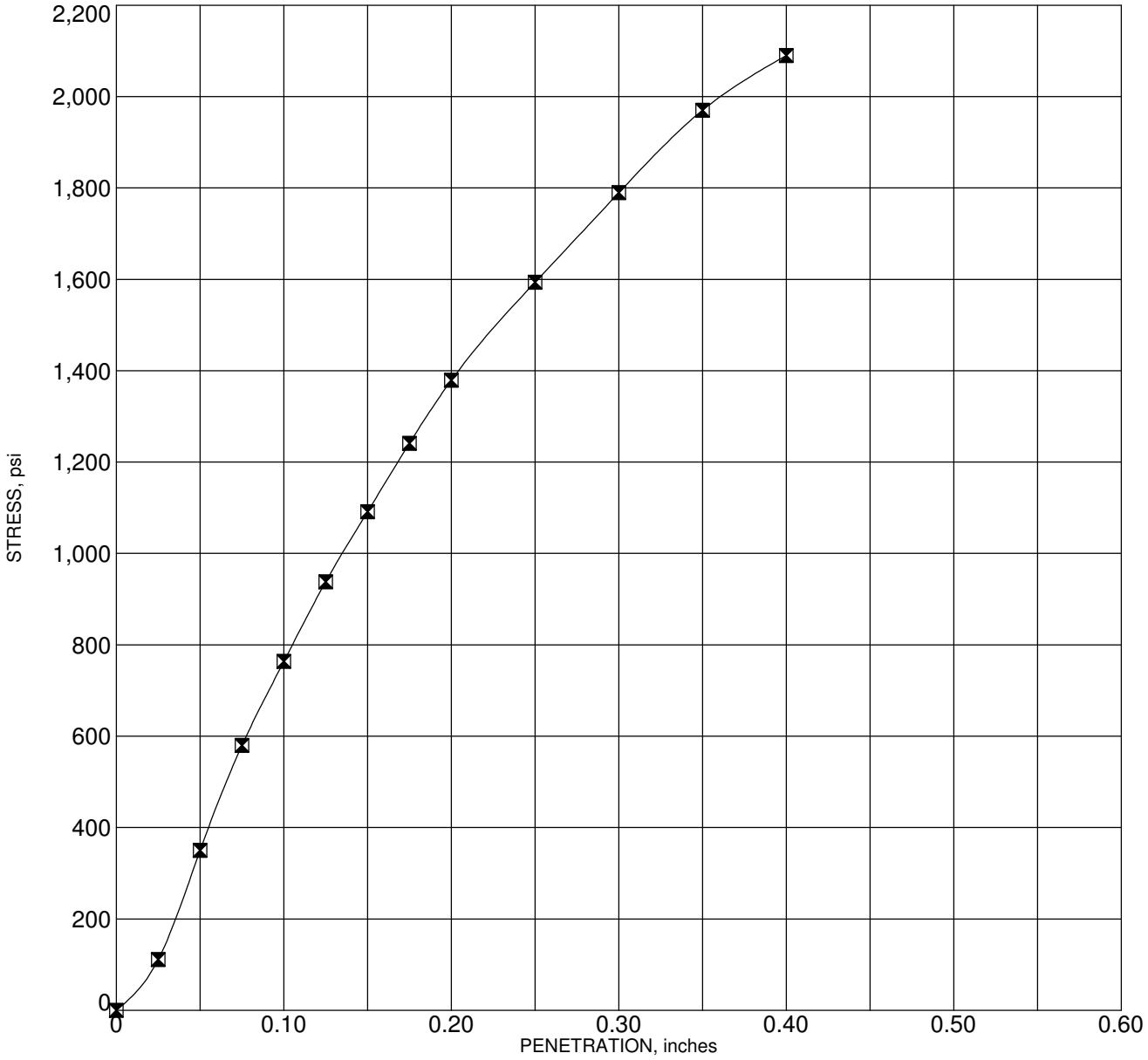
GEOLABS, INC.
GEOTECHNICAL ENGINEERING
W.O. 8049-00 & 10(B)

CALIFORNIA BEARING RATIO - ASTM D1883

INTERSTATE ROUTE H-1 (EB) IMPROVEMENTS
OLA LANE OVERPASS TO
KALIHI STREET INTERCHANGE
HONOLULU, OAHU, HAWAII

Plate
C - 58

G_CBR_8049-00.GPJ GEOLABS.GDT 5/3/21



Corr. CBR @ 0.1"	85.7
Corr. CBR @ 0.2"	95.8
Swell (%)	0.02

Sample: Bulk-2
Depth: 0.0 - 5.0 feet
Description: Gray silty sand with some gravel

Molding Dry Density (pcf)	119.5	Hammer Wt. (lbs)	10
Molding Moisture (%)	15.8	Hammer Drop (inches)	18
Days Soaked	4	No. of Blows	56
Aggregate	3/4 inch minus	No. of Layers	5

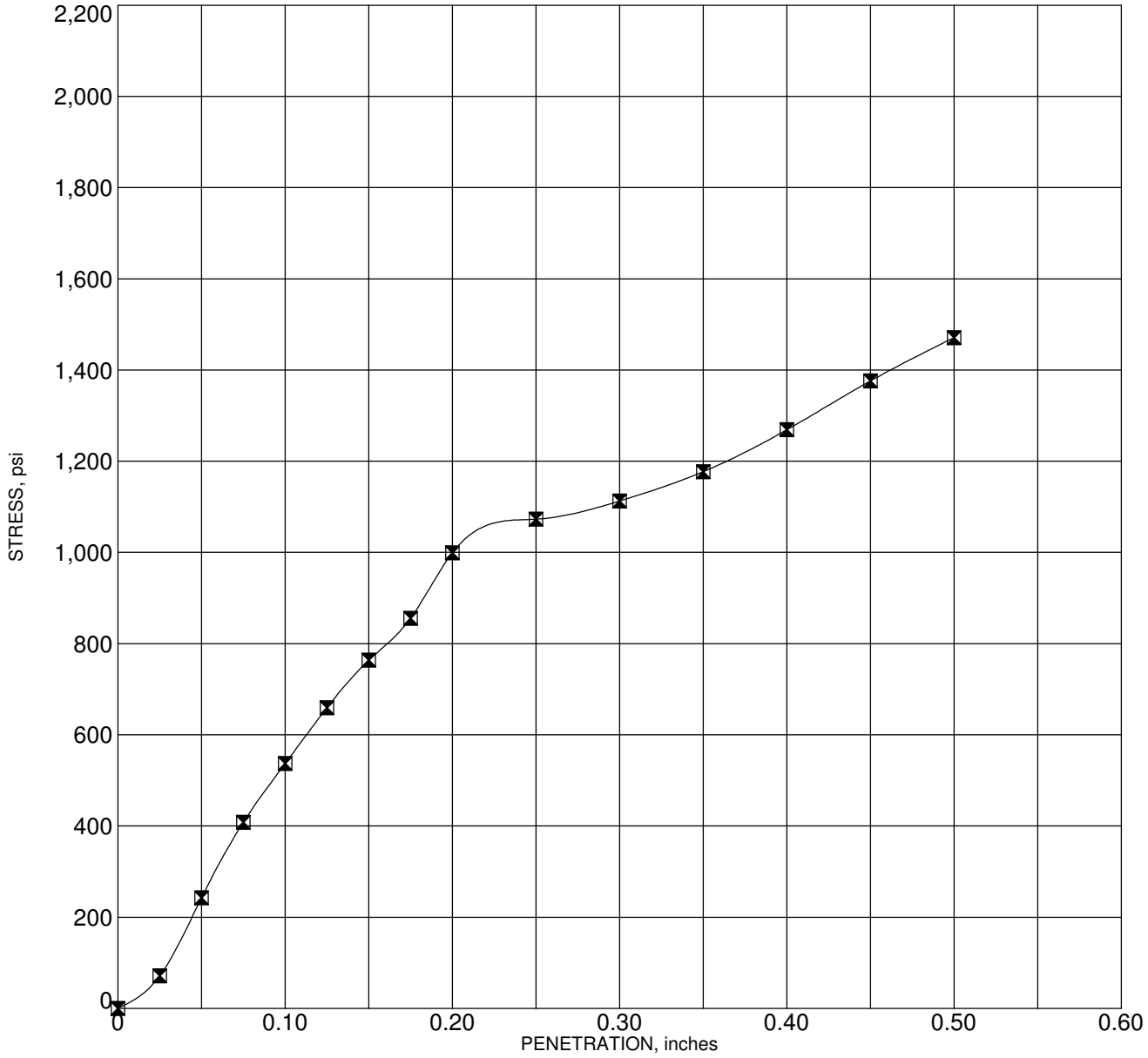
GEOLABS, INC.
GEOTECHNICAL ENGINEERING
W.O. 8049-00 & 10(B)

CALIFORNIA BEARING RATIO - ASTM D1883

INTERSTATE ROUTE H-1 (EB) IMPROVEMENTS
OLA LANE OVERPASS TO
KALIHI STREET INTERCHANGE
HONOLULU, OAHU, HAWAII

Plate
C - 59

G_CBR_8049-00.GPJ GEOLABS.GDT 5/3/21



Corr. CBR @ 0.1"	60.8
Corr. CBR @ 0.2"	68.1
Swell (%)	0.07

Sample: Bulk-3
Depth: 1.0 - 5.0 feet
Description: Grayish brown clayey silt with some gravel

Molding Dry Density (pcf)	110.6	Hammer Wt. (lbs)	10
Molding Moisture (%)	19.7	Hammer Drop (inches)	18
Days Soaked	5	No. of Blows	56
Aggregate	3/4 inch minus	No. of Layers	5

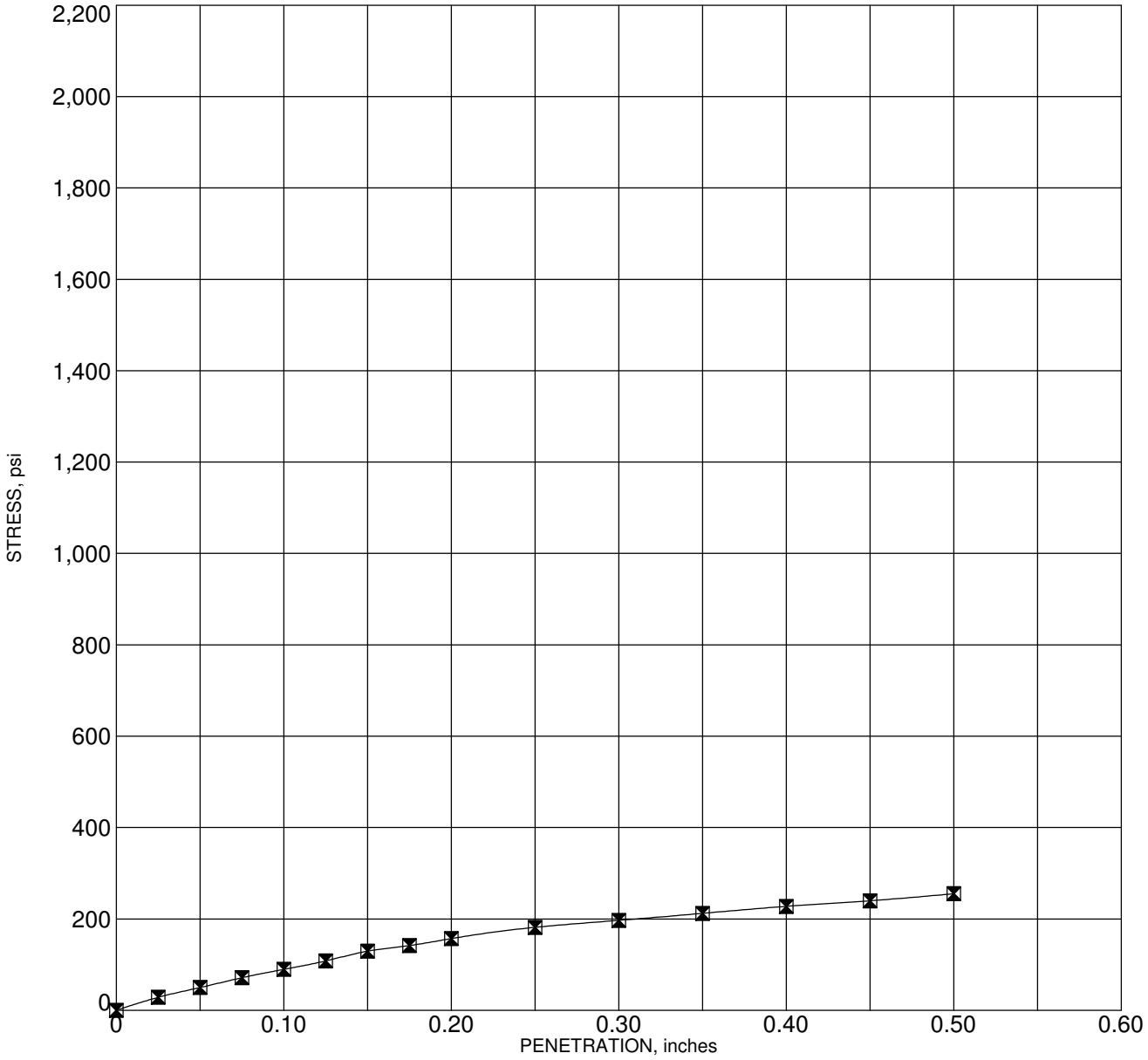
GEOLABS, INC.
GEOTECHNICAL ENGINEERING
W.O. 8049-00 & 10(B)

CALIFORNIA BEARING RATIO - ASTM D1883

INTERSTATE ROUTE H-1 (EB) IMPROVEMENTS
OLA LANE OVERPASS TO
KALIHI STREET INTERCHANGE
HONOLULU, OAHU, HAWAII

Plate
C - 60

G_CBR_8049-00.GPJ GEOLABS.GDT 5/3/21



Corr. CBR @ 0.1"	9.0
Corr. CBR @ 0.2"	10.5
Swell (%)	1.46

Sample: Bulk-5
Depth: 0.0 - 2.0 feet
Description: Brown silty clay with some gravel

Molding Dry Density (pcf)	98.2	Hammer Wt. (lbs)	10
Molding Moisture (%)	27.2	Hammer Drop (inches)	18
Days Soaked	6	No. of Blows	56
Aggregate	3/4 inch minus	No. of Layers	5

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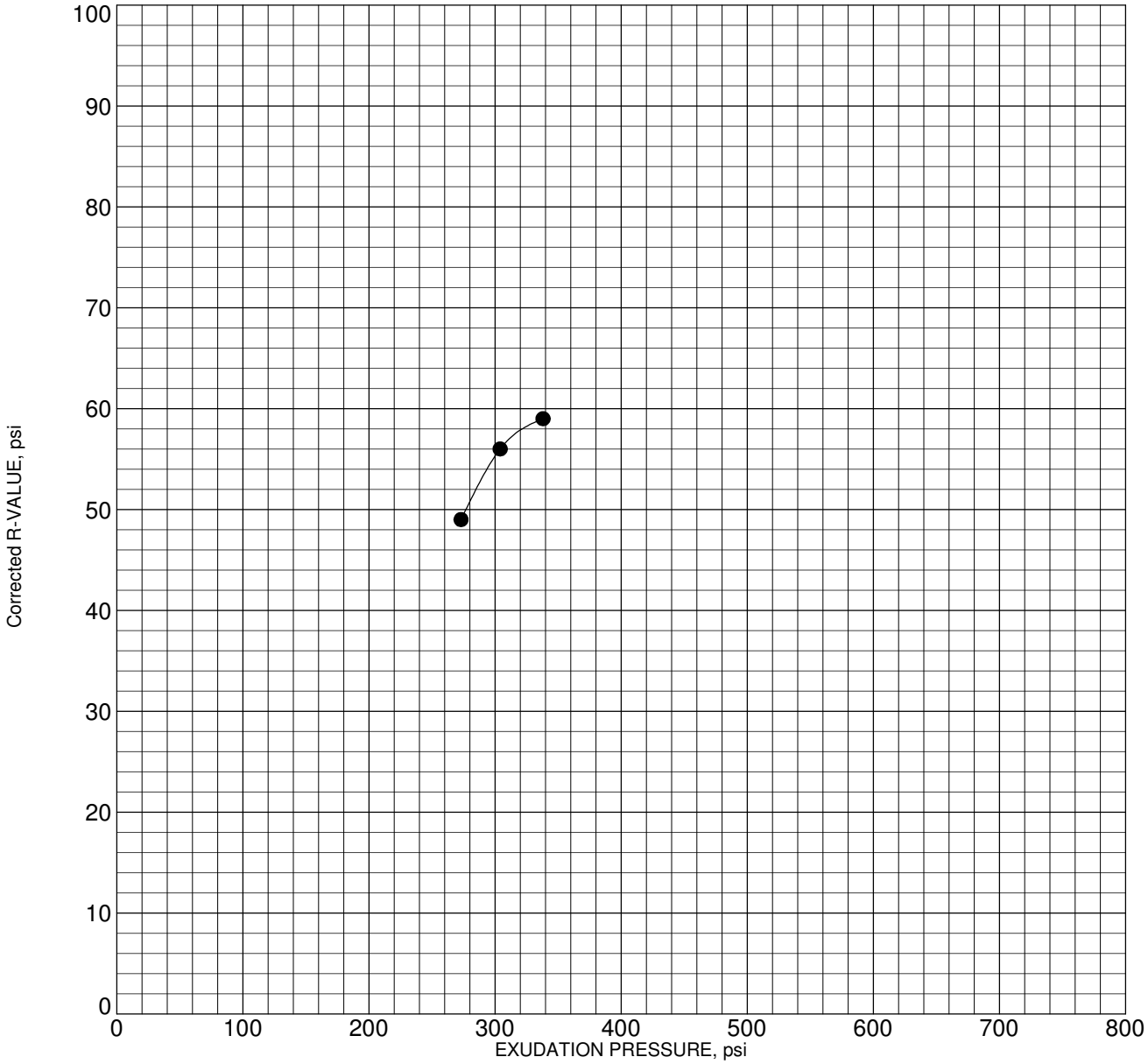
W.O. 8049-00 & 10(B)

CALIFORNIA BEARING RATIO - ASTM D1883

INTERSTATE ROUTE H-1 (EB) IMPROVEMENTS
OLA LANE OVERPASS TO
KALIHI STREET INTERCHANGE
HONOLULU, OAHU, HAWAII

Plate
C - 61

G_CBR_8049-00.GPJ GEOLABS.GDT 5/3/21



Sample: Bulk-1

Depth: 1.0 - 4.0 feet

Description: Dark grayish brown sandy gravel with a little silt

R-Value at 300 psi Exudation Pressure:	**55**

R-Value Test Performed by Ninyo & Moore

No.	Compaction Pressure	Density	Moisture Content	Horizontal Pressure @160 psi	Sample Height	Exudation Pressure	R-Value	Corrected R-Value
	(psi)	(pcf)	(%)	(psi)	(in)	(psi)		
1	200	120.5	21.1	48	2.44	338	59	59
2	225	118.9	21.6	51	2.46	304	56	56
3	250	117.9	22.1	62	2.45	273	49	49

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GEOTECHNICAL ENGINEERING

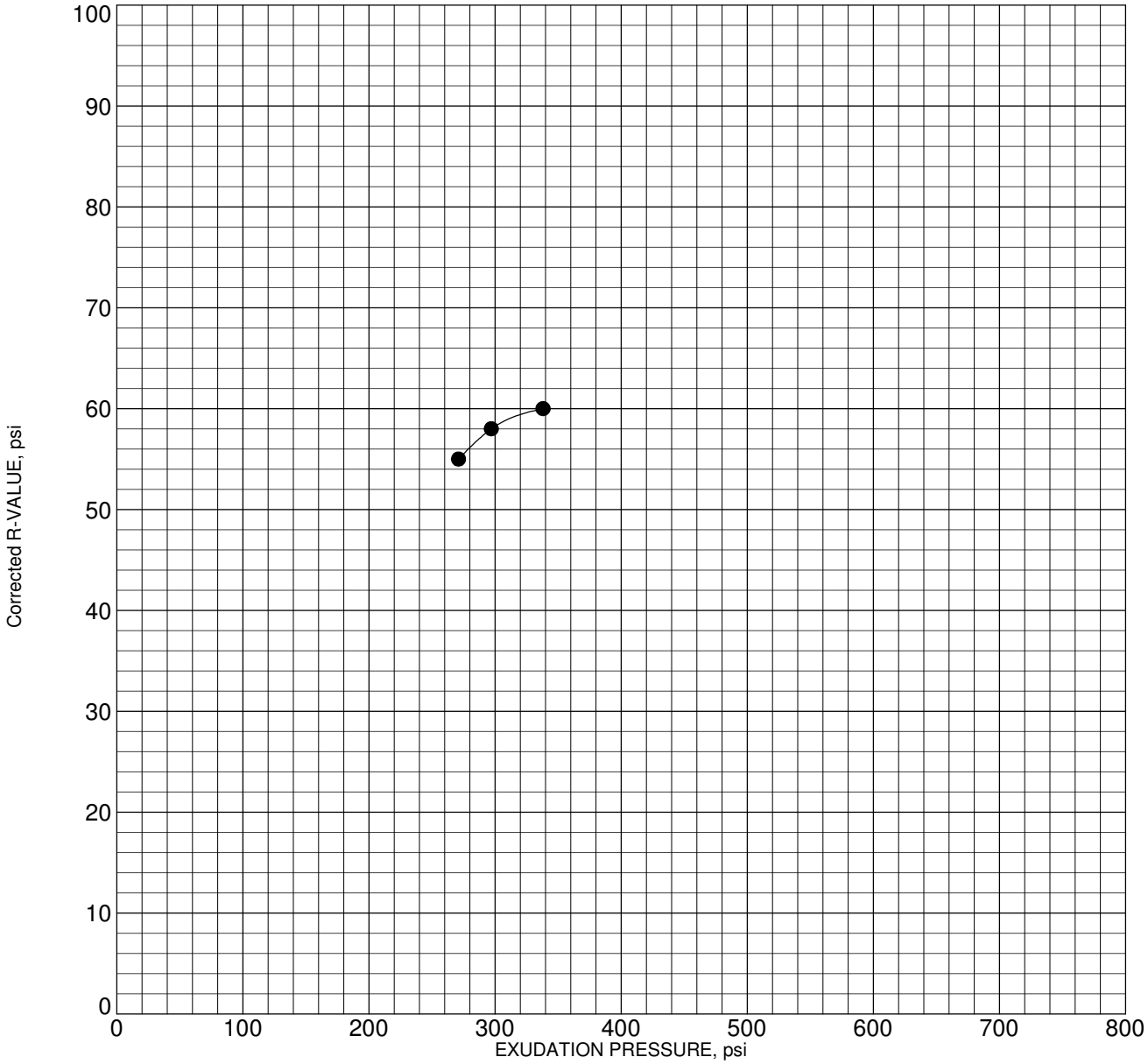
W.O. 8049-00 & 10(B)

R-VALUE AND EXPANSION PRESSURE - ASTM D2844

INTERSTATE ROUTE H-1 (EB) IMPROVEMENTS
OLA LANE OVERPASS TO
KALIHI STREET INTERCHANGE
HONOLULU, OAHU, HAWAII

Plate
C - 62

R-VALUE TEST-NINYO&MOORE 8049-00.GPJ GEOLABS.GDT 5/3/21



Sample: Bulk-2

Depth: 1.0 - 5.0 feet

Description:

R-Value at 300 psi Exudation Pressure:	**58**

R-Value Test Performed by Ninyo & Moore

No.	Compaction Pressure	Density	Moisture Content	Horizontal Pressure @160 psi	Sample Height	Exudation Pressure	R-Value	Corrected R-Value
	(psi)	(pcf)	(%)	(psi)	(in)	(psi)		
1	125	111.6	17.5	42	2.48	338	60	60
2	150	110.4	18.0	45	2.46	297	58	58
3	175	108.7	18.5	48	2.51	271	55	55

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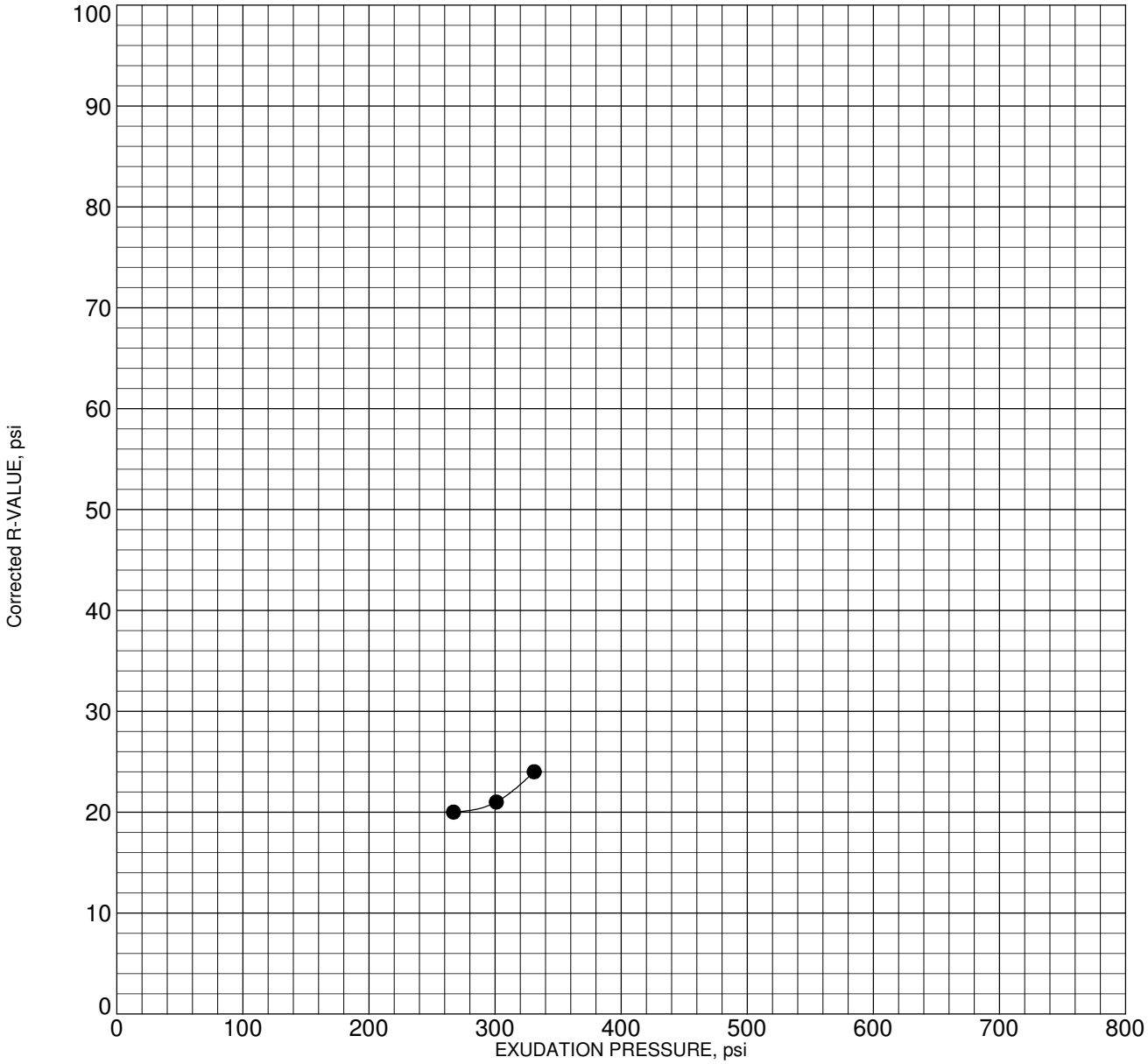
W.O. 8049-00 & 10(B)

R-VALUE AND EXPANSION PRESSURE - ASTM D2844

INTERSTATE ROUTE H-1 (EB) IMPROVEMENTS
OLA LANE OVERPASS TO
KALIHI STREET INTERCHANGE
HONOLULU, OAHU, HAWAII

Plate
C - 63

R-VALUE TEST-NINYO&MOORE 8049-00.GPJ GEOLABS.GDT 5/3/21



Sample: Bulk-3

Depth: 1.0 - 5.0 feet

Description: Grayish brown clayey silt with some gravel

R-Value at 300 psi Exudation Pressure:	**21**

R-Value Test Performed by Ninyo & Moore

No.	Compaction Pressure	Density	Moisture Content	Horizontal Pressure @160 psi	Sample Height	Exudation Pressure	R-Value	Corrected R-Value
	(psi)	(pcf)	(%)	(psi)	(in)	(psi)		
1	50	109.0	19.7	102	2.58	331	24	24
2	50	107.7	20.2	106	2.55	301	21	21
3	50	106.9	20.7	109	2.54	267	20	20

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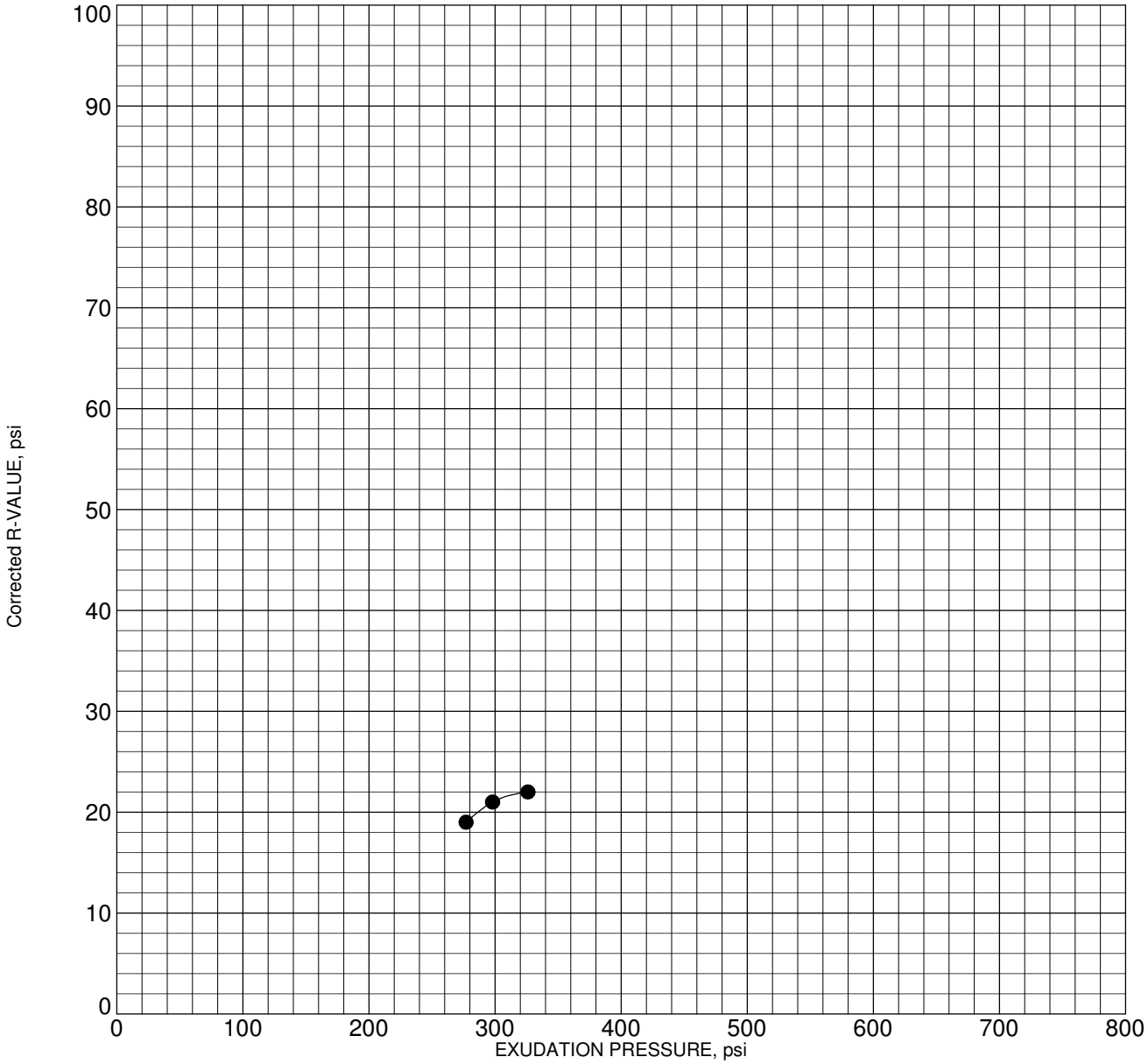
W.O. 8049-00 & 10(B)

R-VALUE AND EXPANSION PRESSURE - ASTM D2844

INTERSTATE ROUTE H-1 (EB) IMPROVEMENTS
OLA LANE OVERPASS TO
KALIHI STREET INTERCHANGE
HONOLULU, OAHU, HAWAII

Plate
C - 64

R-VALUE TEST-NINYO&MOORE 8049-00.GPJ GEOLABS.GDT 5/3/21



Sample: Bulk-4
Depth: 1.0 - 5.0 feet
Description:

R-Value at 300 psi Exudation Pressure:	**21**

R-Value Test Performed by Ninyo & Moore

No.	Compaction Pressure	Density	Moisture Content	Horizontal Pressure @160 psi	Sample Height	Exudation Pressure	R-Value	Corrected R-Value
	(psi)	(pcf)	(%)	(psi)	(in)	(psi)		
1	50	99.9	18.9	109	2.56	326	22	22
2	50	98.5	19.4	111	2.55	298	21	21
3	50	98.3	19.9	115	2.54	277	19	19

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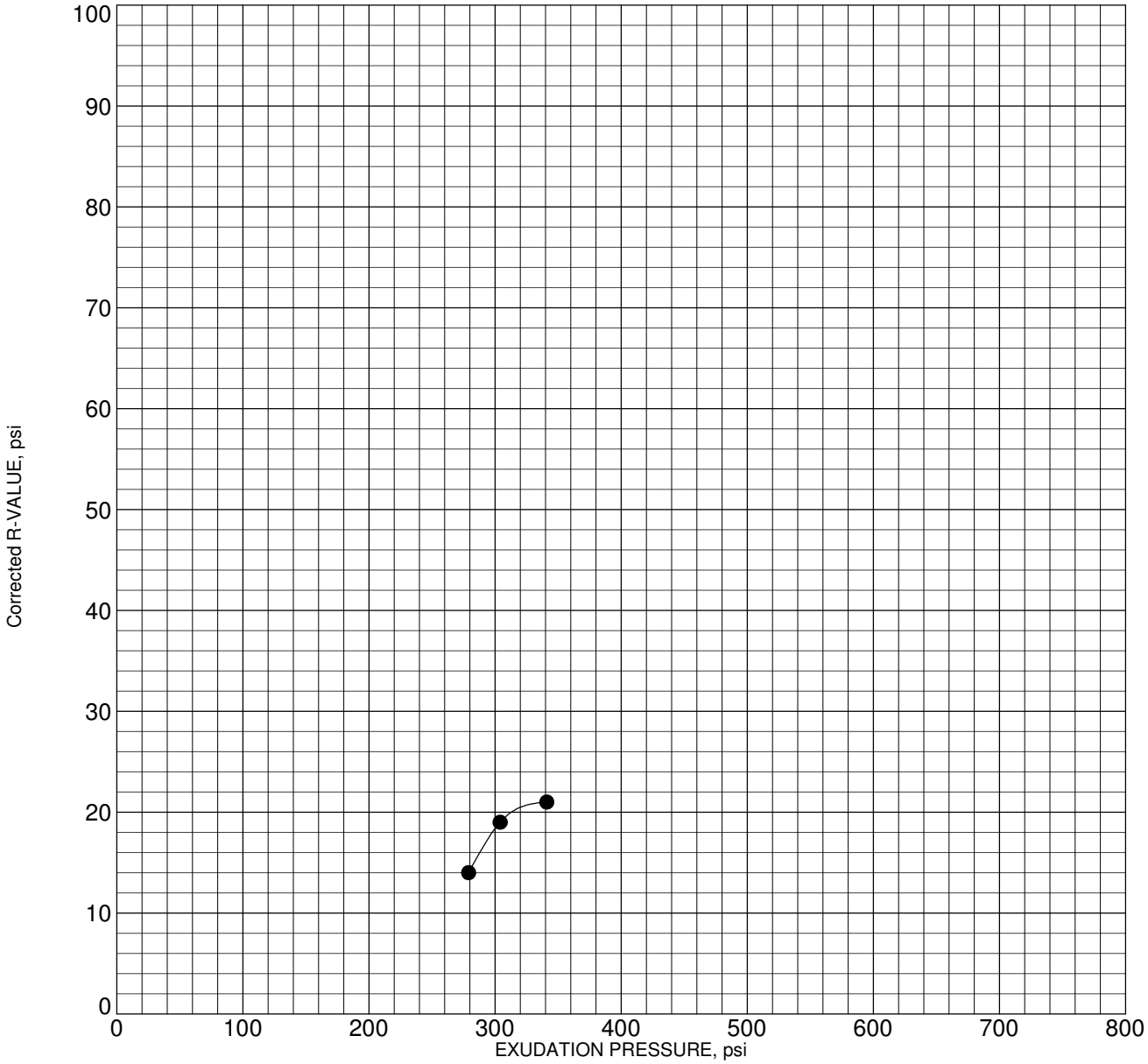
GEOTECHNICAL ENGINEERING
W.O. 8049-00 & 10(B)

R-VALUE AND EXPANSION PRESSURE - ASTM D2844

INTERSTATE ROUTE H-1 (EB) IMPROVEMENTS
OLA LANE OVERPASS TO
KALIHI STREET INTERCHANGE
HONOLULU, OAHU, HAWAII

Plate
C - 65

R-VALUE TEST-NINYO&MOORE 8049-00.GPJ GEOLABS.GDT 5/3/21



Sample: Bulk-5

Depth: 0.0 - 2.0 feet

Description: Brown silty clay with some gravel

R-Value at 300 psi Exudation Pressure:	**18**

R-Value Test Performed by Ninyo & Moore

No.	Compaction Pressure	Density	Moisture Content	Horizontal Pressure @160 psi	Sample Height	Exudation Pressure	R-Value	Corrected R-Value
	(psi)	(pcf)	(%)	(psi)	(in)	(psi)		
1	50	100.1	30.2	105	2.51	341	21	21
2	50	99.9	30.7	107	2.54	304	19	19
3	50	97.1	31.2	119	2.55	279	14	14

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GEOTECHNICAL ENGINEERING

W.O. 8049-00 & 10(B)

R-VALUE AND EXPANSION PRESSURE - ASTM D2844

INTERSTATE ROUTE H-1 (EB) IMPROVEMENTS
OLA LANE OVERPASS TO
KALIHI STREET INTERCHANGE
HONOLULU, OAHU, HAWAII

Plate
C - 66

R-VALUE TEST-NINYO&MOORE 8049-00.GPJ GEOLABS.GDT 5/3/21