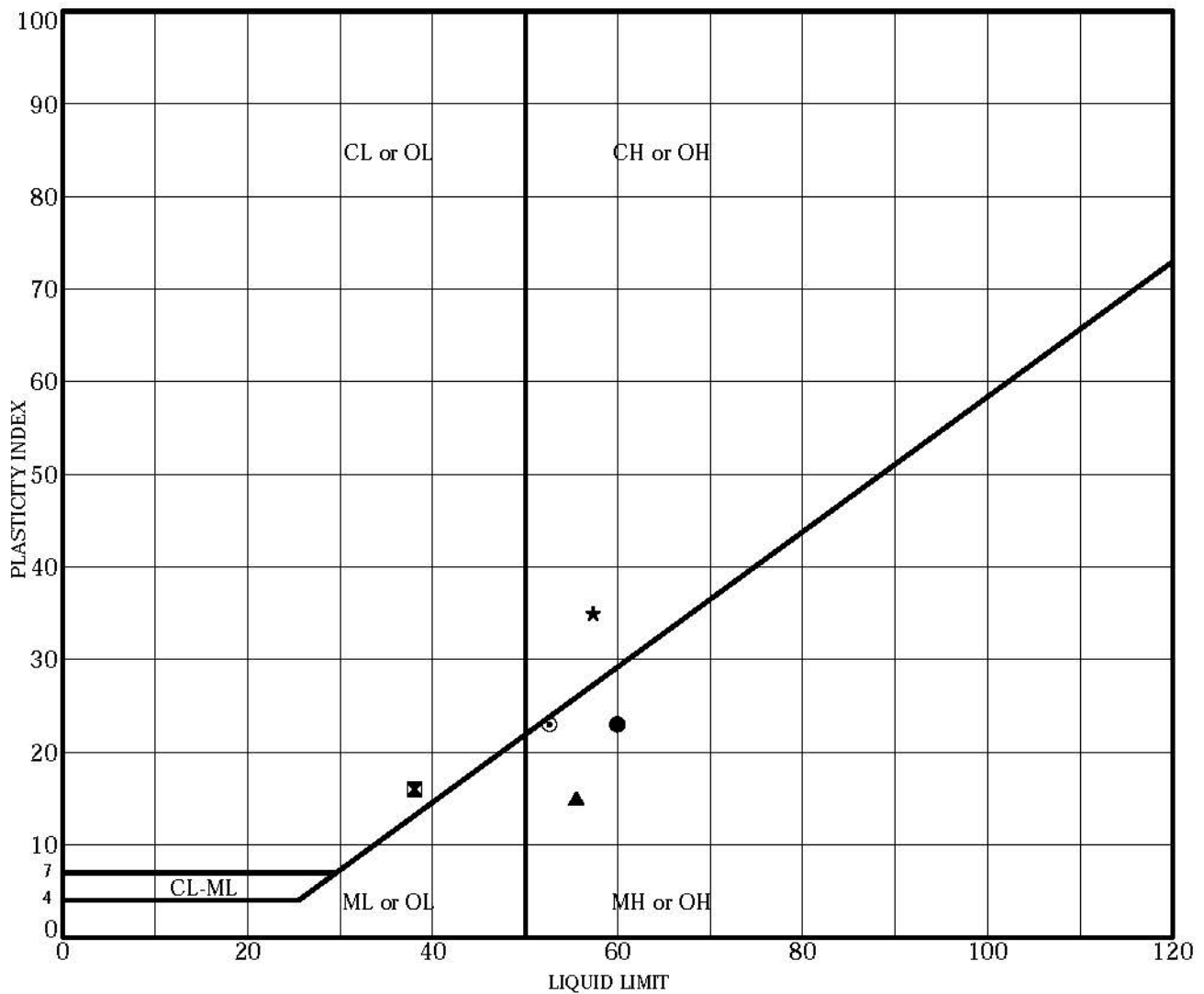




	Sample	Depth (ft)	LL	PL	PI	Description
●	B-105	5.0-6.5	60	37	23	Brown with multi-color mottling clayey silt (MH)
⊠	B-107	15.0-16.5	38	22	16	Brown with gray mottling silty clay (CL)
▲	B-108	10.0-11.5	56	41	15	Brown with gray mottling clayey silt (MH)
★	B-110	2.3-3.8	57	22	35	Dark gray & orangish tan silty clay (CH) with some gravel
◎	C-113	5.7-7.2	53	30	23	Dark brownish red clayey silt (MH) with some gravel

NP = NON-PLASTIC

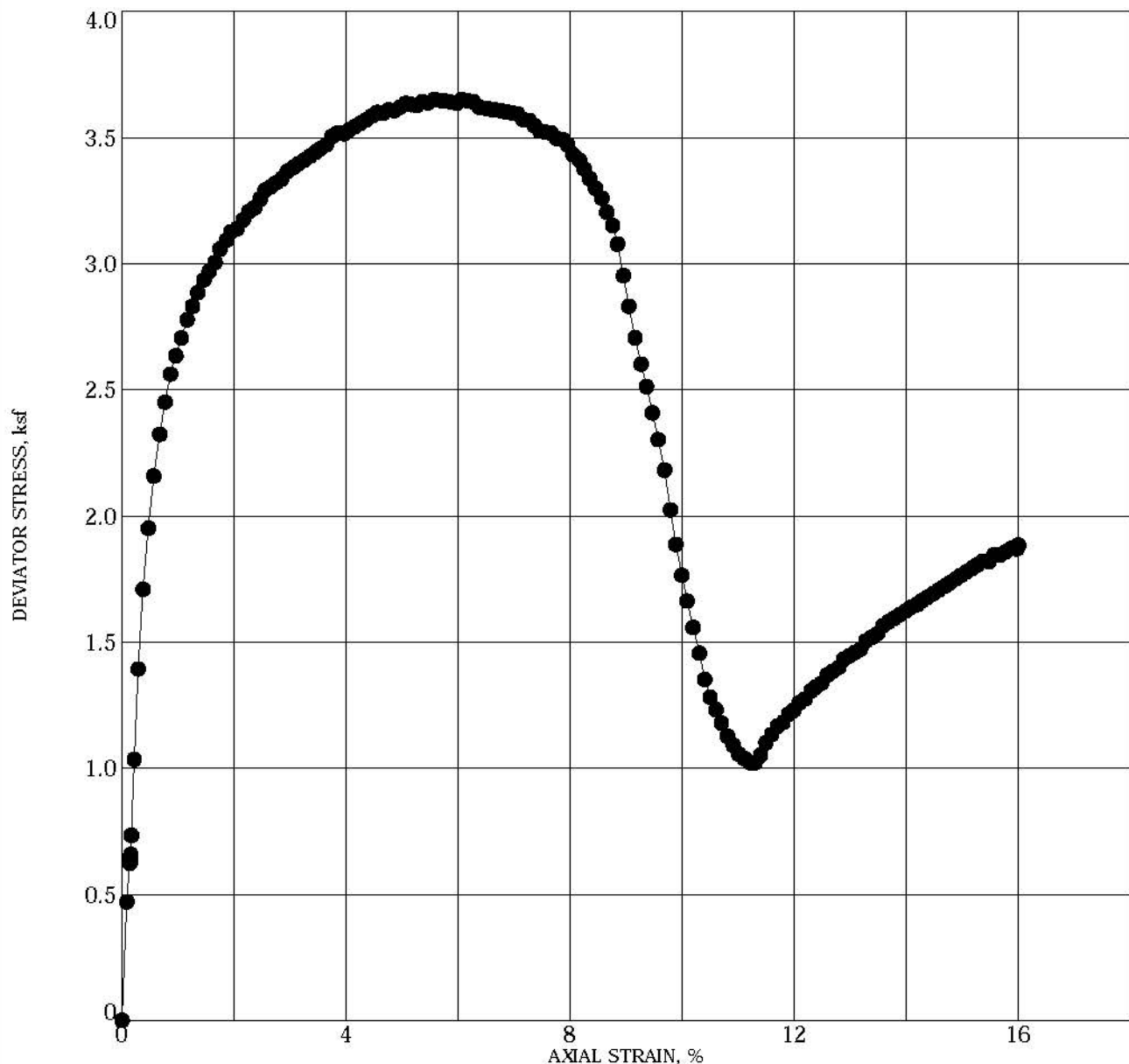


GEOLABS, INC.
 GEOTECHNICAL ENGINEERING
 W.O. 6782-00(B)

ATTERBERG LIMITS TEST RESULTS - ASTM D4318

PALI HIGHWAY RESURFACING
 VINEYARD BOULEVARD TO WAKANAKA STREET
 HONOLULU, OAHU, HAWAII

Plate
C - 1



Max. Deviator Stress (ksf): 3.7

Confining Stress (ksf): 0.6

Location: B-104

Depth: 5.0 - 6.5 feet

Description: Brown with gray mottling silty clay

Test Date: 2/13/2019

Dry Density (pcf)	88.4	Sample Diameter (inches)	2.400
Moisture (%)	31.8	Sample Height (inches)	5.037
Axial Strain at Failure (%)	6.2	Strain Rate (% / minute)	1.00



GEOLABS, INC.

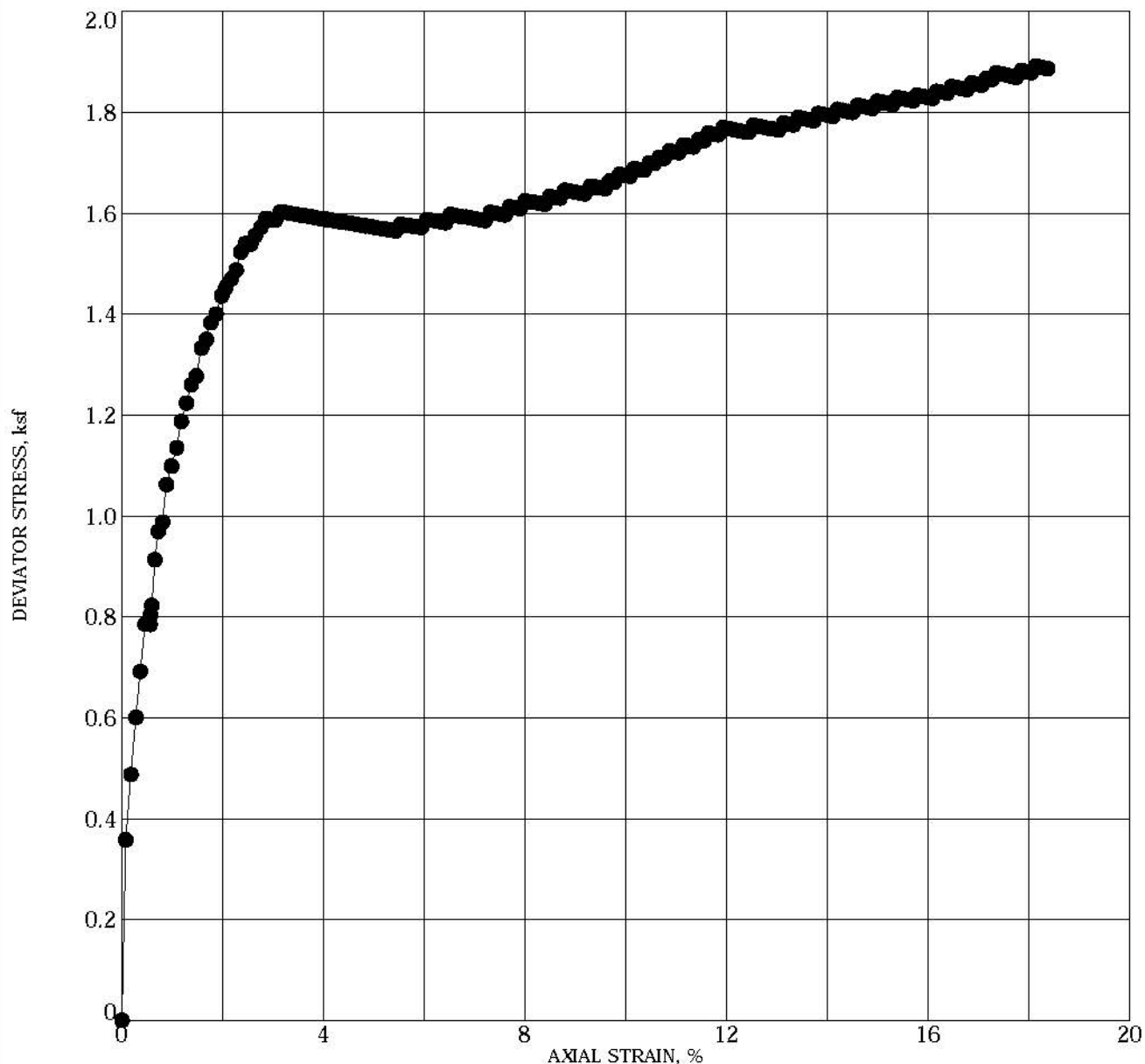
GEOTECHNICAL ENGINEERING

W.O. 6782-00(B)

TRIAXIAL UU COMPRESSION TEST - ASTM D2850

PALI HIGHWAY RESURFACING
VINEYARD BOULEVARD TO WAKANAKA STREET
HONOLULU, OAHU, HAWAII

Plate
C - 2



Max. Deviator Stress (ksf): 1.8

Confining Stress (ksf): 0.6

Location: B-105

Depth: 5.0 - 6.5 feet

Description: Brown with multi-color mottling clayey silt (MH)

Test Date: 2/13/2019

Dry Density (pcf)	60.8	Sample Diameter (inches)	2.400
Moisture (%)	48.2	Sample Height (inches)	5.177
Axial Strain at Failure (%)	15.0	Strain Rate (% / minute)	0.99



GEOLABS, INC.

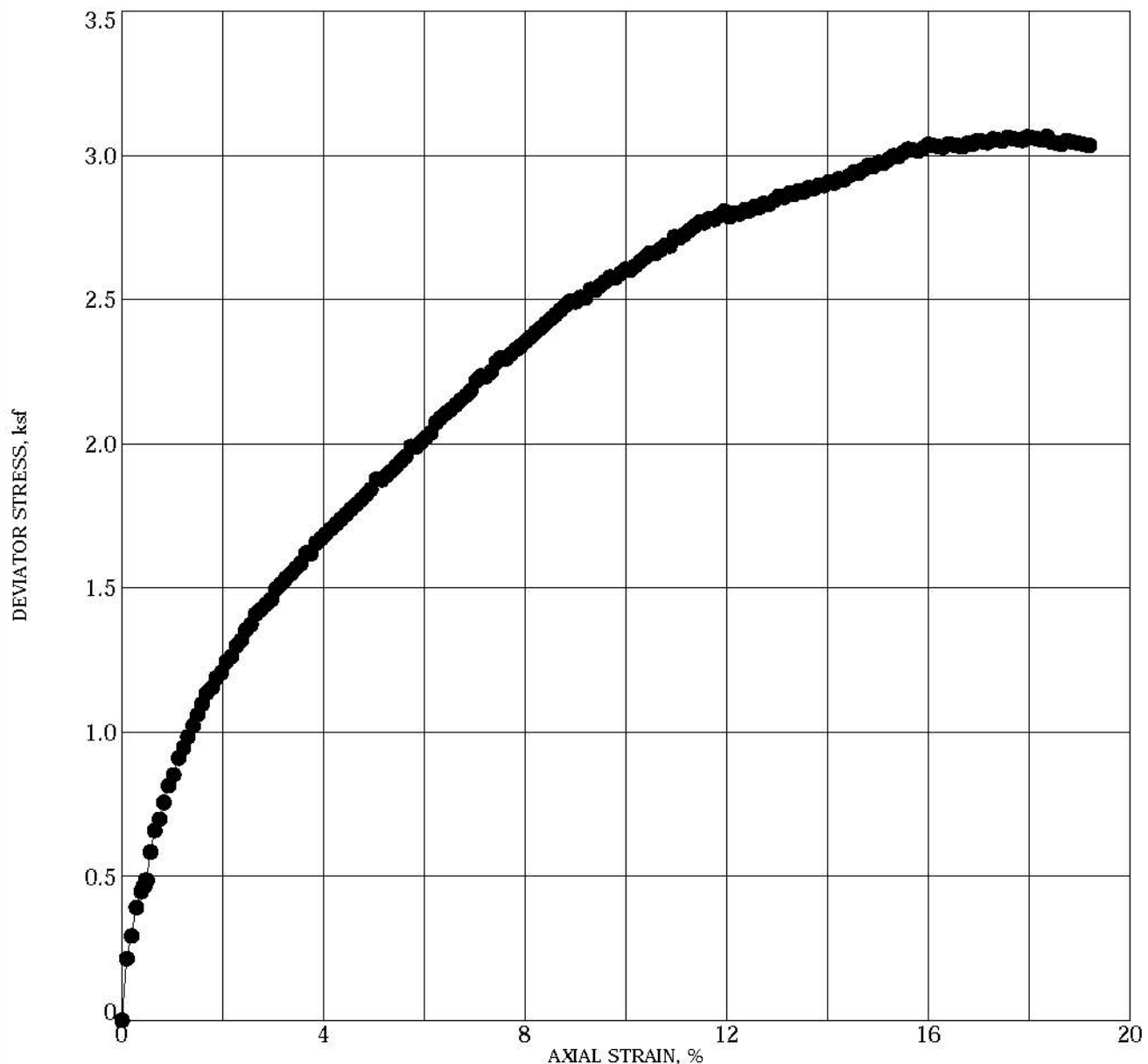
GEOTECHNICAL ENGINEERING

W.O. 6782-00(B)

TRIAXIAL UU COMPRESSION TEST - ASTM D2850

PALI HIGHWAY RESURFACING
VINEYARD BOULEVARD TO WAKANAKA STREET
HONOLULU, OAHU, HAWAII

Plate
C - 3



Max. Deviator Stress (ksf): 3.0

Confining Stress (ksf): 1.7

Location: B-107

Depth: 15.0 - 16.5 feet

Description: Brown with gray mottling silty clay (CL)

Test Date: 2/7/2019

Dry Density (pcf)	71.1	Sample Diameter (inches)	2.333
Moisture (%)	56.5	Sample Height (inches)	5.033
Axial Strain at Failure (%)	15.0	Strain Rate (% / minute)	0.99



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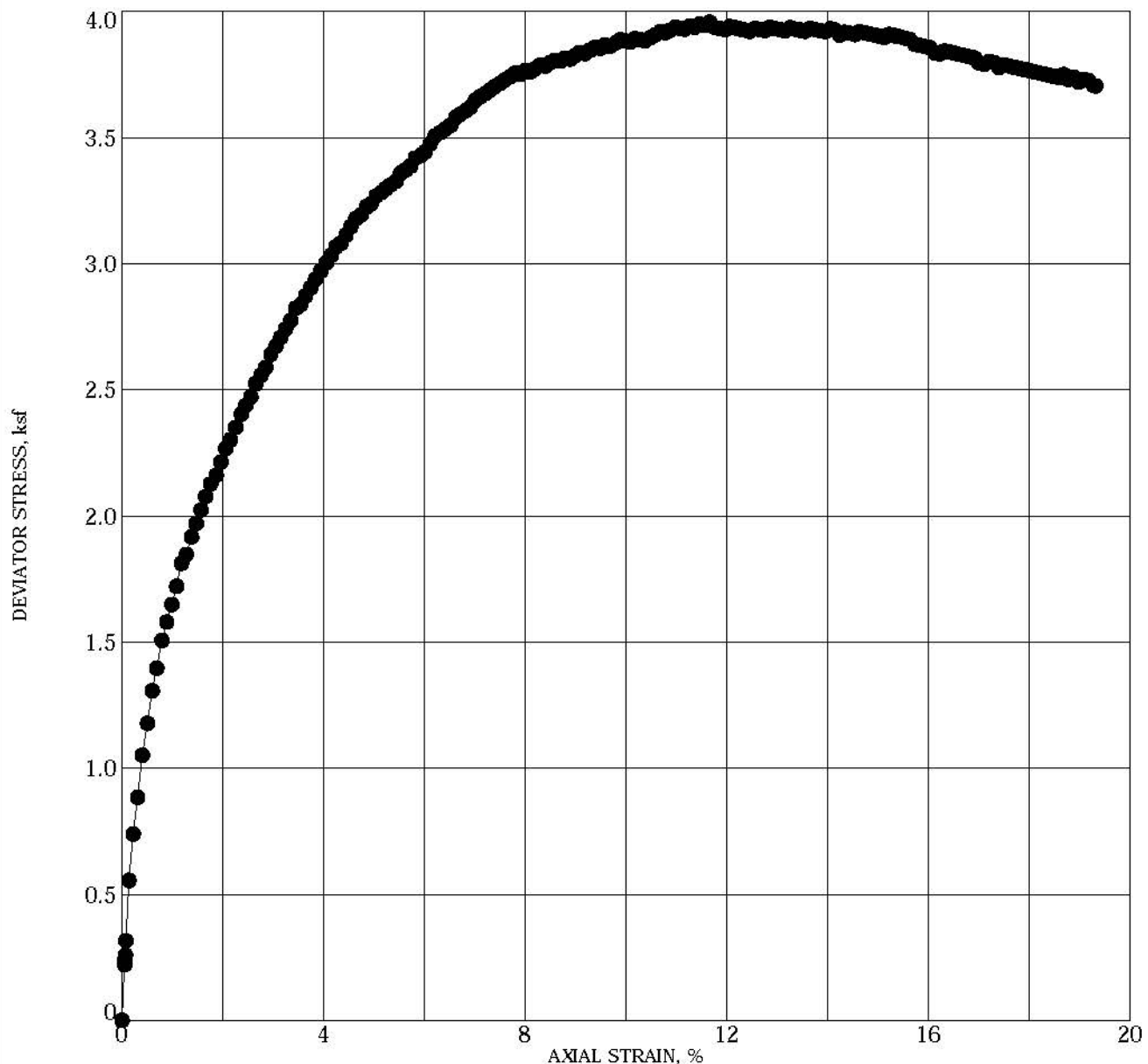
GEOTECHNICAL ENGINEERING

W.O. 6782-00(B)

TRIAXIAL UU COMPRESSION TEST - ASTM D2850

PALI HIGHWAY RESURFACING
VINEYARD BOULEVARD TO WAKANAKA STREET
HONOLULU, OAHU, HAWAII

Plate
C - 4



Max. Deviator Stress (ksf): 3.9

Confining Stress (ksf): 1.7

Location: B-108

Depth: 15.0 - 16.5 feet

Description: Brown with gray mottling clayey silt

Test Date: 2/7/2019

Dry Density (pcf)	66.8	Sample Diameter (inches)	2.400
Moisture (%)	54.4	Sample Height (inches)	5.067
Axial Strain at Failure (%)	15.0	Strain Rate (% / minute)	0.99



GEOLABS, INC.

GEOTECHNICAL ENGINEERING

W.O. 6782-00(B)

TRIAXIAL UU COMPRESSION TEST - ASTM D2850

PALI HIGHWAY RESURFACING
VINEYARD BOULEVARD TO WAKANAKA STREET
HONOLULU, OAHU, HAWAII

Plate
C - 5

Location	Depth (feet)	pH Value	Minimum Resistivity (ohm-cm)	Chloride Content (mg/kg)	Sulfate Content (mg/kg)
B-104	15.0 - 16.5	7.02*	3000*	25	200
B-107	5.0 - 6.5	7.87*	3000*	10	92

TEST METHODS (by TestAmerica Laboratories, Inc.)

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

ND: Not Detected Within Reporting Limits

TEST METHODS (by Geolabs, Inc.)*

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

**GEOLABS, INC.**

GEOTECHNICAL ENGINEERING

W.O. 6782-00(B)

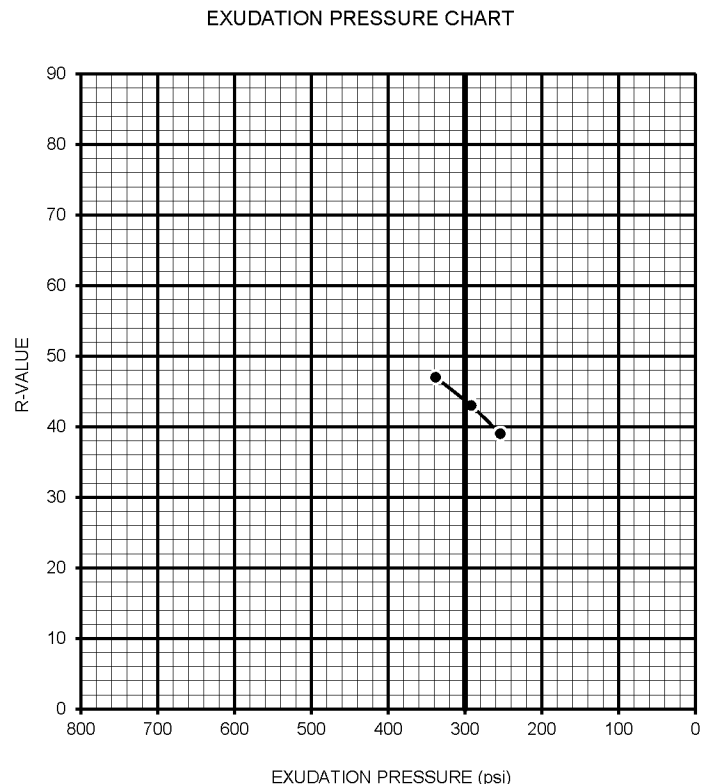
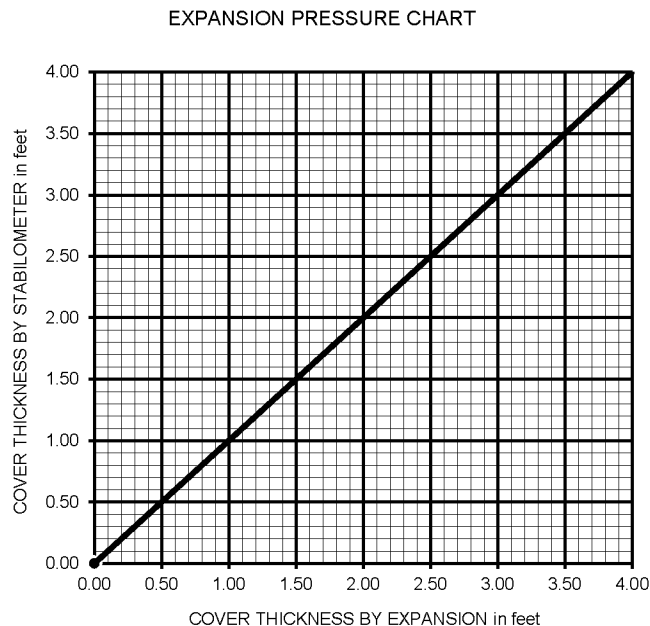
SUMMARY OF CORROSIVITY TESTS

PALI HIGHWAY RESURFACING
VINEYARD BOULEVARD TO WAKANAKA STREET
HONOLULU, OAHU, HAWAII

Plate
C - 6

PROJECT NAME:	GEOLABS	PROJECT NUMBER:	108026001
SAMPLE DESCRIPTION:	Silty SAND	TECHNICIAN:	APT
JOB NO. & SAMPLE LOC.:	6782-0013	SAMPLE NUMBER:	90862
SAMPLE LOCATION:	BULK #101		

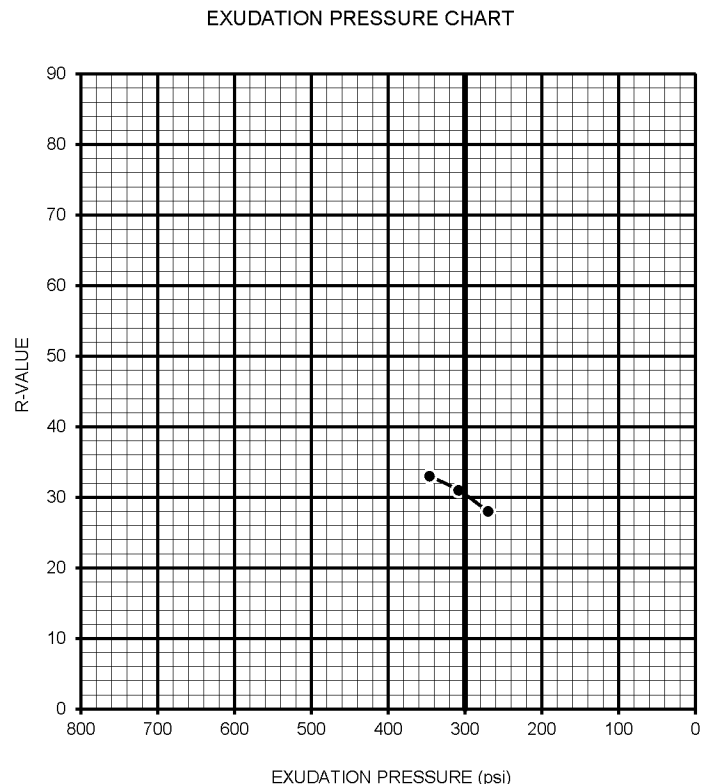
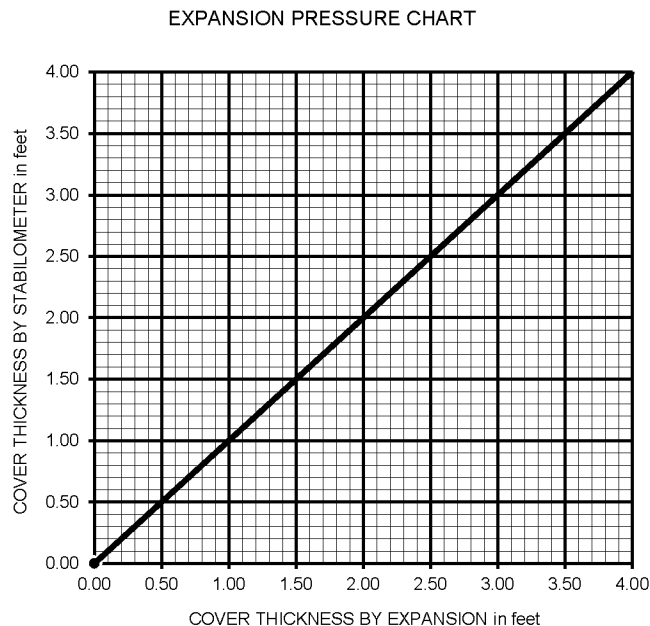
TEST SPECIMEN	a	b	c
MOISTURE AT COMPACTION %	16.3	16.8	17.3
HEIGHT OF SAMPLE, Inches	2.46	2.51	2.44
DRY DENSITY, pcf	120.6	119.7	117.0
COMPACTOR AIR PRESSURE, psi	150	125	100
EXUDATION PRESSURE, psi	338	292	254
EXPANSION, Inches x 10exp-4	0	0	0
STABILITY Ph 2,000 lbs (160 psi)	63	69	75
TURNS DISPLACEMENT	4.39	4.43	4.45
R-VALUE UNCORRECTED	47	43	39
R-VALUE CORRECTED	47	43	39
R-VALUE BY EXUDATION	44		
DESIGN CALCULATION DATA	a	b	c
GRAVEL EQUIVALENT NEEDED ft.	0.00	0.00	0.00
TRAFFIC INDEX	0.0		
STABILOMETER THICKNESS, ft.	#DIV/0!	#DIV/0!	#DIV/0!
EXPANSION PRESSURE THICKNESS, ft.	0.00	0.00	0.00



R-VALUE BY EXPANSION:	N/A
R-VALUE BY EXUDATION:	44
EQUILIBRIUM R-VALUE:	44

PROJECT NAME: GEOLABS PROJECT NUMBER: 108026001
 SAMPLE DESCRIPTION: Clayey SAND With Gravel TECHNICIAN: APT
 JOB NO. & SAMPLE LOC.: 6782-0013 SAMPLE NUMBER: 90863
 SAMPLE LOCATION: BULK #102

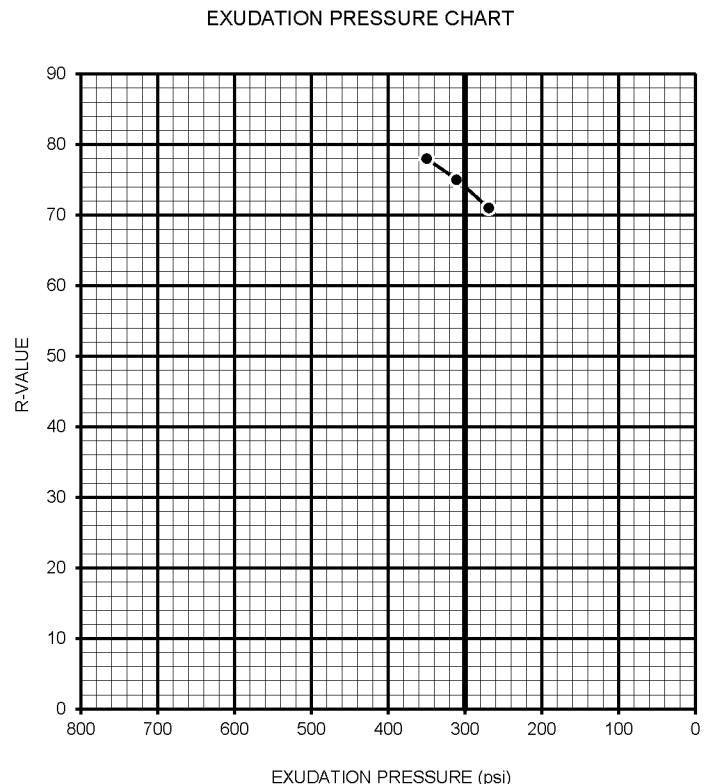
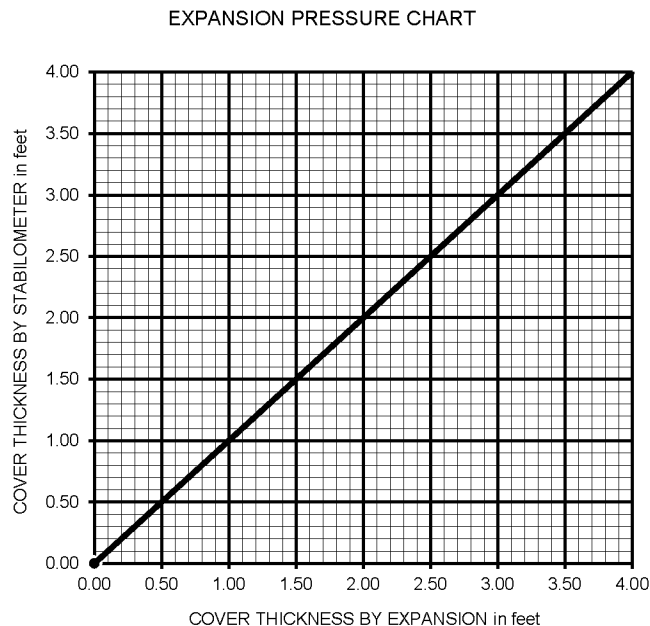
TEST SPECIMEN	a	b	c
MOISTURE AT COMPACTION %	19.5	20.0	20.5
HEIGHT OF SAMPLE, Inches	2.48	2.51	2.54
DRY DENSITY, pcf	113.7	111.7	109.2
COMPACTOR AIR PRESSURE, psi	100	75	50
EXUDATION PRESSURE, psi	346	308	270
EXPANSION, Inches x 10exp-4	0	0	0
STABILITY Ph 2,000 lbs (160 psi)	89	92	96
TURNS DISPLACEMENT	4.05	4.16	4.22
R-VALUE UNCORRECTED	33	31	28
R-VALUE CORRECTED	33	31	28
R-VALUE BY EXUDATION	30		
DESIGN CALCULATION DATA	a	b	c
GRAVEL EQUIVALENT NEEDED ft.	0.00	0.00	0.00
TRAFFIC INDEX	0.0		
STABILOMETER THICKNESS, ft.	#DIV/0!	#DIV/0!	#DIV/0!
EXPANSION PRESSURE THICKNESS, ft.	0.00	0.00	0.00



R-VALUE BY EXPANSION: N/A
 R-VALUE BY EXUDATION: 30
 EQUILIBRIUM R-VALUE: 30

PROJECT NAME:	GEOLABS	PROJECT NUMBER:	108026001
SAMPLE DESCRIPTION:	Silty SAND (DG)	TECHNICIAN:	APT
JOB NO. & SAMPLE LOC.:	6782-0013	SAMPLE NUMBER:	90864
SAMPLE LOCATION:	BULK #103		

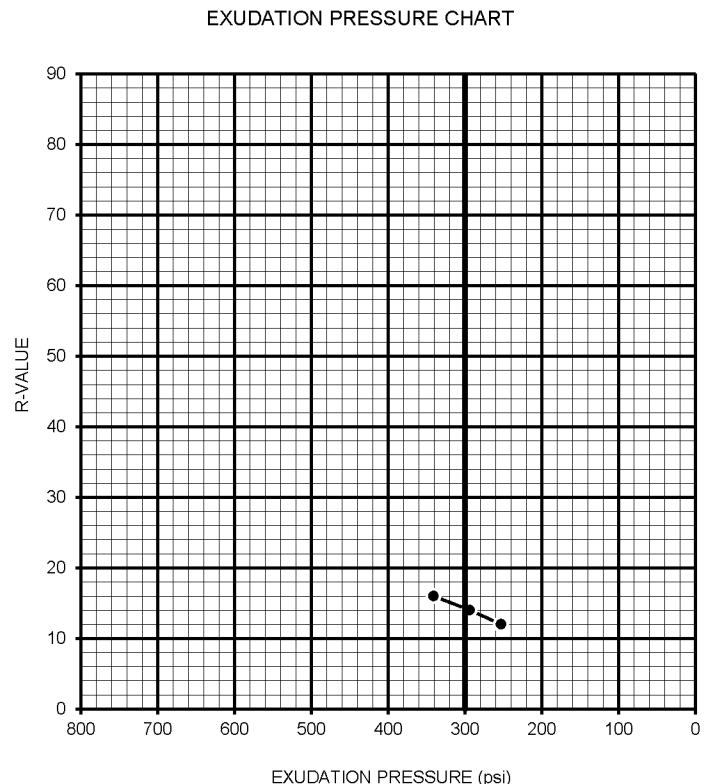
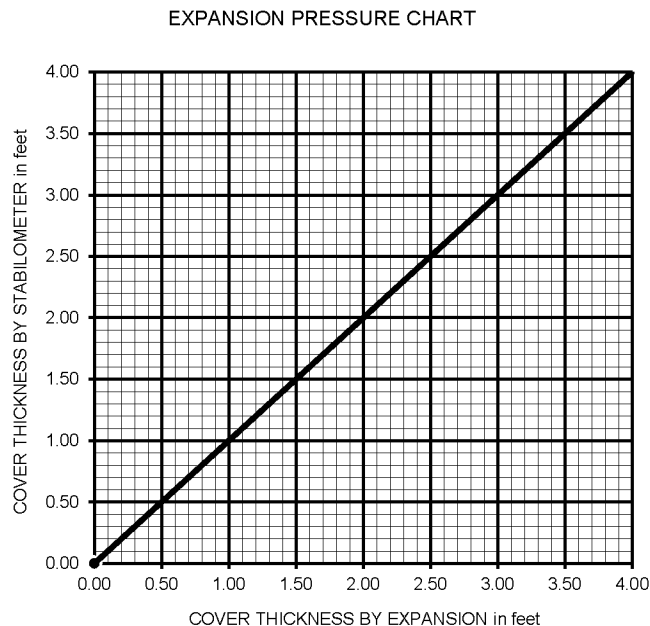
TEST SPECIMEN	a	b	c
MOISTURE AT COMPACTION %	9.2	9.7	10.2
HEIGHT OF SAMPLE, Inches	2.53	2.55	2.56
DRY DENSITY, pcf	130.5	129.7	127.3
COMPACTOR AIR PRESSURE, psi	250	225	200
EXUDATION PRESSURE, psi	350	311	269
EXPANSION, Inches x 10exp-4	0	0	0
STABILITY Ph 2,000 lbs (160 psi)	23	26	30
TURNS DISPLACEMENT	4.21	4.24	4.32
R-VALUE UNCORRECTED	78	75	71
R-VALUE CORRECTED	78	75	71
R-VALUE BY EXUDATION	74		
DESIGN CALCULATION DATA	a	b	c
GRAVEL EQUIVALENT NEEDED ft.	0.00	0.00	0.00
TRAFFIC INDEX	0.0		
STABILOMETER THICKNESS, ft.	#DIV/0!	#DIV/0!	#DIV/0!
EXPANSION PRESSURE THICKNESS, ft.	0.00	0.00	0.00



R-VALUE BY EXPANSION:	N/A
R-VALUE BY EXUDATION:	74
EQUILIBRIUM R-VALUE:	74

PROJECT NAME: GEOLABS PROJECT NUMBER: 108026001
 SAMPLE DESCRIPTION: Sandy CLAY w Gravel TECHNICIAN: APT
 JOB NO. & SAMPLE LOC.: 6782-0013 SAMPLE NUMBER: 90865
 SAMPLE LOCATION: BULK #104

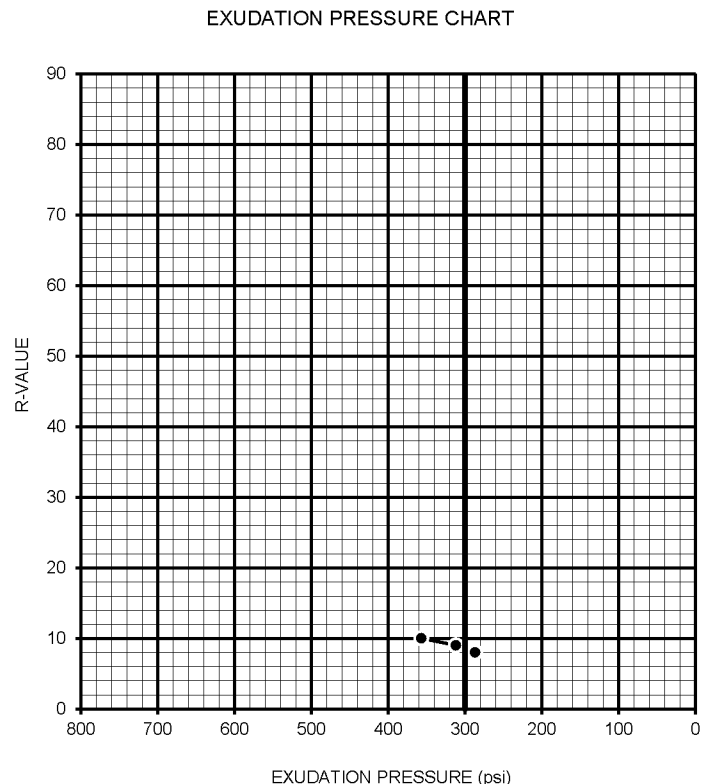
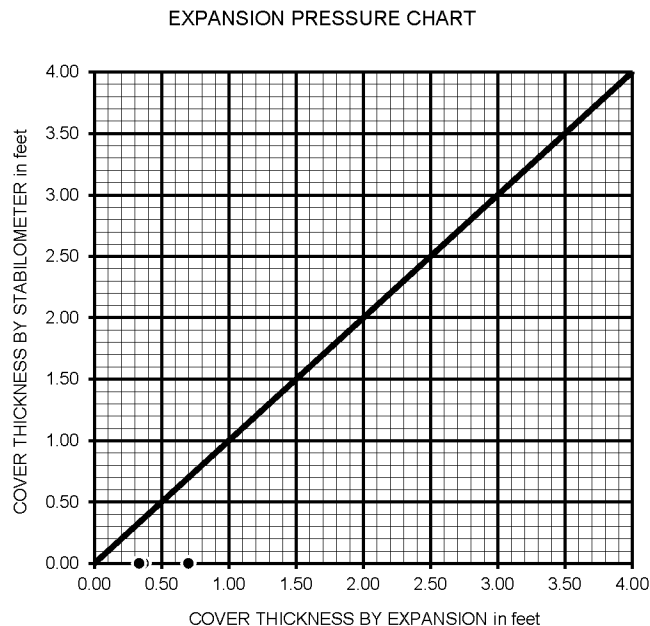
TEST SPECIMEN	a	b	c
MOISTURE AT COMPACTION %	30.6	31.1	31.6
HEIGHT OF SAMPLE, Inches	2.45	2.44	2.49
DRY DENSITY, pcf	103.2	103.0	102.5
COMPACTOR AIR PRESSURE, psi	50	50	50
EXUDATION PRESSURE, psi	341	294	253
EXPANSION, Inches x 10exp-4	0	0	0
STABILITY Ph 2,000 lbs (160 psi)	117	120	126
TURNS DISPLACEMENT	4.93	5.00	5.03
R-VALUE UNCORRECTED	16	14	12
R-VALUE CORRECTED	16	14	12
R-VALUE BY EXUDATION	14		
DESIGN CALCULATION DATA	a	b	c
GRAVEL EQUIVALENT NEEDED ft.	0.00	0.00	0.00
TRAFFIC INDEX	0.0		
STABILOMETER THICKNESS, ft.	#DIV/0!	#DIV/0!	#DIV/0!
EXPANSION PRESSURE THICKNESS, ft.	0.00	0.00	0.00



R-VALUE BY EXPANSION: N/A
 R-VALUE BY EXUDATION: 14
 EQUILIBRIUM R-VALUE: 14

PROJECT NAME:	GEOLABS	PROJECT NUMBER:	108026001
SAMPLE DESCRIPTION:	Sandy CLAY	TECHNICIAN:	APT
JOB NO. & SAMPLE LOC.:	6782-0013	SAMPLE NUMBER:	90866
SAMPLE LOCATION:	BULK #105		

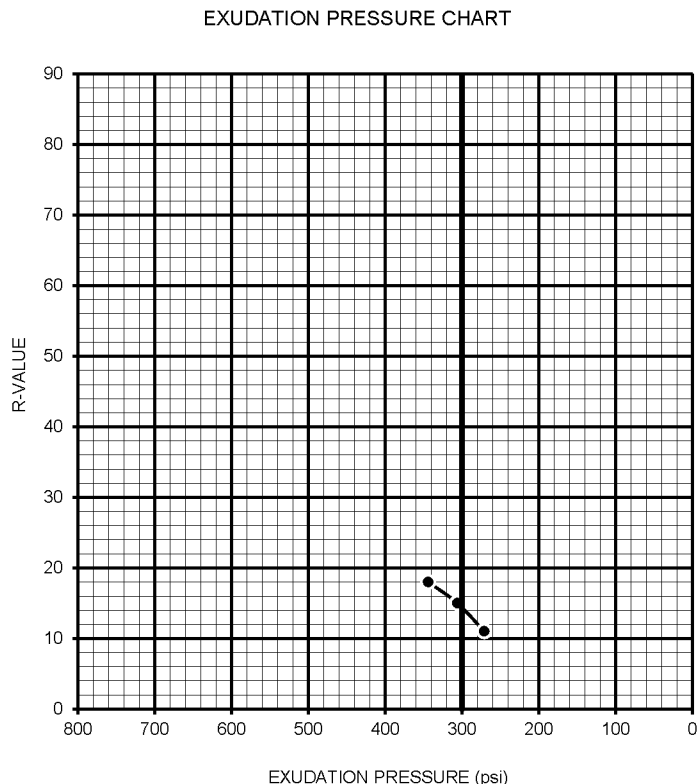
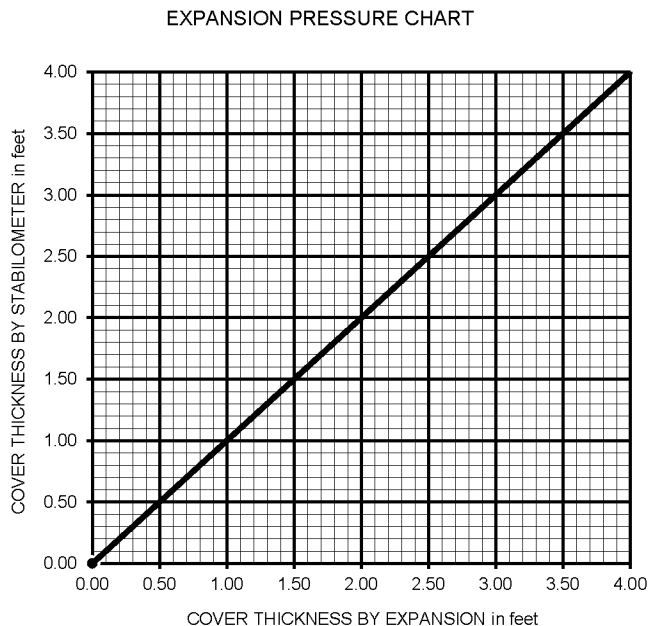
TEST SPECIMEN	a	b	c
MOISTURE AT COMPACTION %	37.0	37.4	37.9
HEIGHT OF SAMPLE, Inches	2.44	2.51	2.50
DRY DENSITY, pcf	91.9	87.3	83.4
COMPACTOR AIR PRESSURE, psi	50	50	50
EXUDATION PRESSURE, psi	357	312	287
EXPANSION, Inches x 10exp-4	21	11	10
STABILITY Ph 2,000 lbs (160 psi)	131	133	136
TURNS DISPLACEMENT	4.92	4.93	5.00
R-VALUE UNCORRECTED	10	9	8
R-VALUE CORRECTED	10	9	8
R-VALUE BY EXUDATION	9		
DESIGN CALCULATION DATA	a	b	c
GRAVEL EQUIVALENT NEEDED ft.	0.00	0.00	0.00
TRAFFIC INDEX	0.0		
STABILOMETER THICKNESS, ft.	#DIV/0!	#DIV/0!	#DIV/0!
EXPANSION PRESSURE THICKNESS, ft.	0.70	0.37	0.33



R-VALUE BY EXPANSION:	N/A
R-VALUE BY EXUDATION:	9
EQUILIBRIUM R-VALUE:	9

PROJECT NAME: GEOLABS PROJECT NUMBER: 108026001
 SAMPLE DESCRIPTION: Sandy CLAY With Gravel TECHNICIAN: APT
 JOB NO. & SAMPLE LOC.: 6782-0013 SAMPLE NUMBER: 90867
 SAMPLE LOCATION: BULK #106

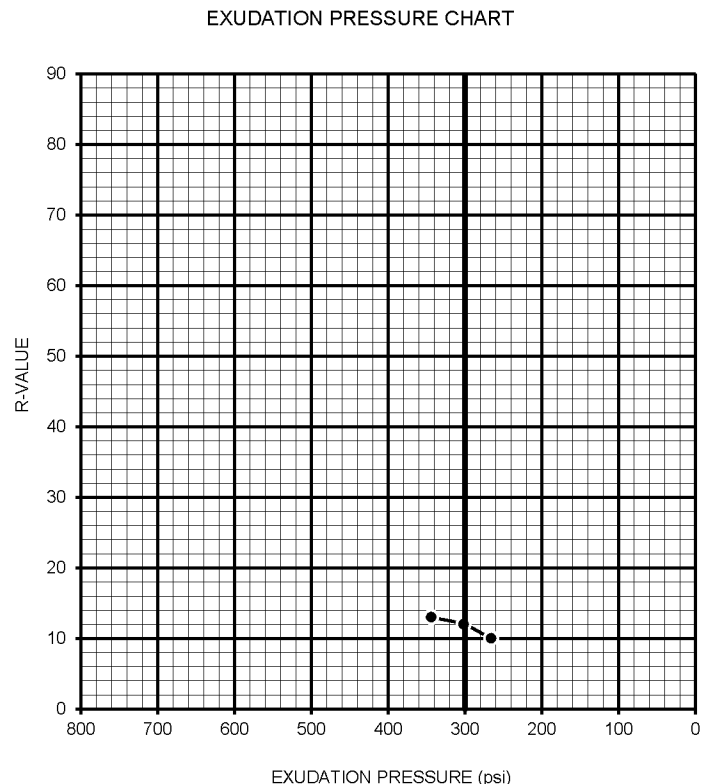
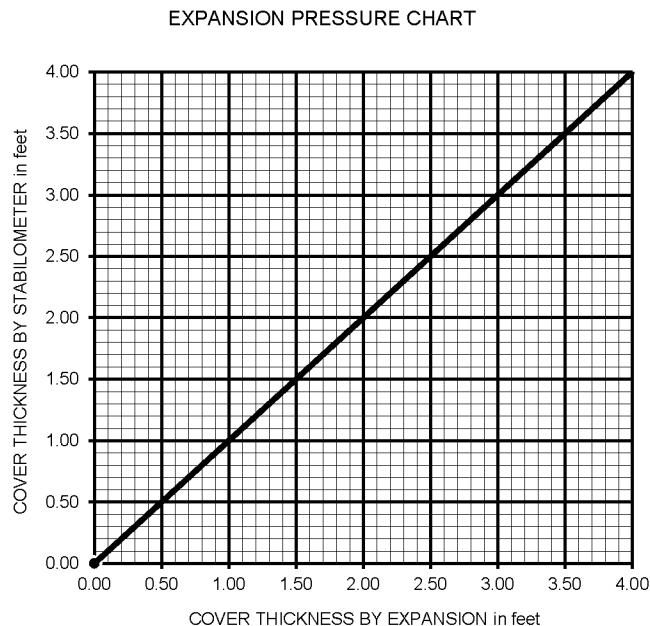
TEST SPECIMEN	a	b	c
MOISTURE AT COMPACTION %	37.2	37.7	38.2
HEIGHT OF SAMPLE, Inches	2.44	2.48	2.56
DRY DENSITY, pcf	81.0	78.8	77.3
COMPACTOR AIR PRESSURE, psi	50	50	50
EXUDATION PRESSURE, psi	344	306	271
EXPANSION, Inches x 10exp-4	0	0	0
STABILITY Ph 2,000 lbs (160 psi)	115	121	129
TURNS DISPLACEMENT	4.57	4.66	4.68
R-VALUE UNCORRECTED	18	15	11
R-VALUE CORRECTED	18	15	11
R-VALUE BY EXUDATION	14		
DESIGN CALCULATION DATA	a	b	c
GRAVEL EQUIVALENT NEEDED ft.	0.00	0.00	0.00
TRAFFIC INDEX	0.0		
STABILOMETER THICKNESS, ft.	#DIV/0!	#DIV/0!	#DIV/0!
EXPANSION PRESSURE THICKNESS, ft.	0.00	0.00	0.00



R-VALUE BY EXPANSION: N/A
 R-VALUE BY EXUDATION: 14
 EQUILIBRIUM R-VALUE: 14

PROJECT NAME:	GEOLABS	PROJECT NUMBER:	108026001
SAMPLE DESCRIPTION:	Sandy CLAY	TECHNICIAN:	APT
JOB NO. & SAMPLE LOC.:	6782-0013	SAMPLE NUMBER:	90868
SAMPLE LOCATION:	BULK #107		

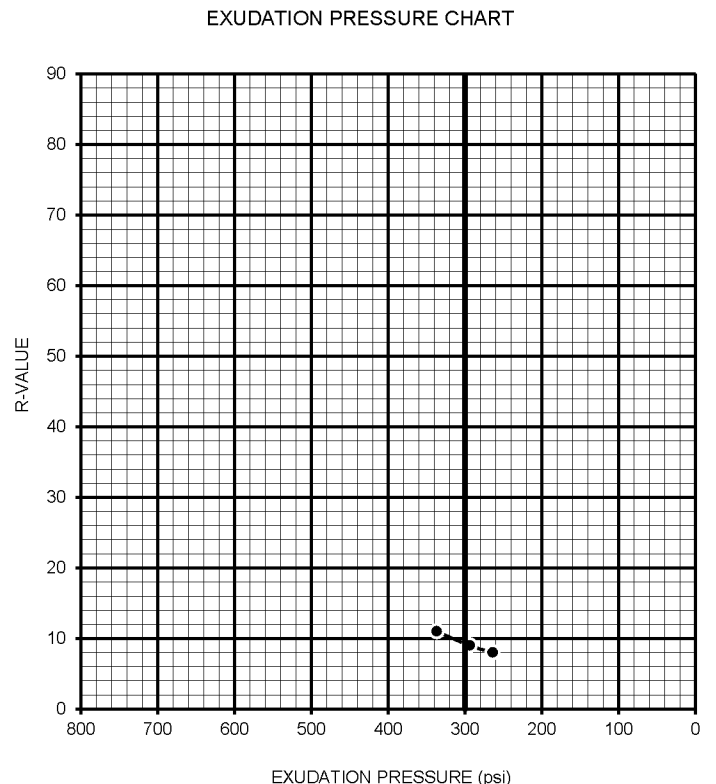
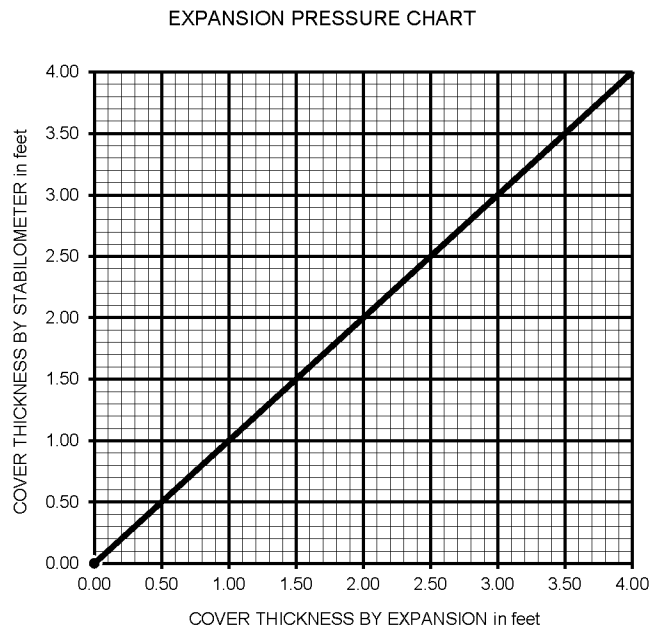
TEST SPECIMEN	a	b	c
MOISTURE AT COMPACTION %	39.7	40.2	40.7
HEIGHT OF SAMPLE, Inches	2.45	2.50	2.55
DRY DENSITY, pcf	84.4	83.6	83.5
COMPACTOR AIR PRESSURE, psi	50	50	50
EXUDATION PRESSURE, psi	344	302	266
EXPANSION, Inches x 10exp-4	0	0	0
STABILITY Ph 2,000 lbs (160 psi)	124	126	130
TURNS DISPLACEMENT	4.89	5.06	5.13
R-VALUE UNCORRECTED	13	12	10
R-VALUE CORRECTED	13	12	10
R-VALUE BY EXUDATION	12		
DESIGN CALCULATION DATA	a	b	c
GRAVEL EQUIVALENT NEEDED ft.	0.00	0.00	0.00
TRAFFIC INDEX	0.0		
STABILOMETER THICKNESS, ft.	#DIV/0!	#DIV/0!	#DIV/0!
EXPANSION PRESSURE THICKNESS, ft.	0.00	0.00	0.00



R-VALUE BY EXPANSION:	N/A
R-VALUE BY EXUDATION:	12
EQUILIBRIUM R-VALUE:	12

PROJECT NAME:	GEOLABS	PROJECT NUMBER:	108026001
SAMPLE DESCRIPTION:	Sandy CLAY	TECHNICIAN:	APT
JOB NO. & SAMPLE LOC.:	6782-0013	SAMPLE NUMBER:	90869
SAMPLE LOCATION:	BULK #108		

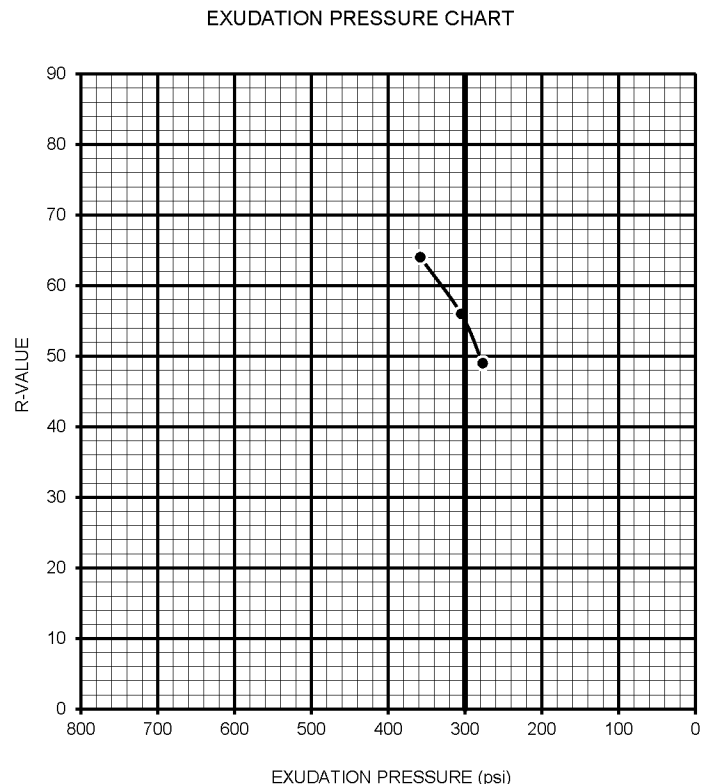
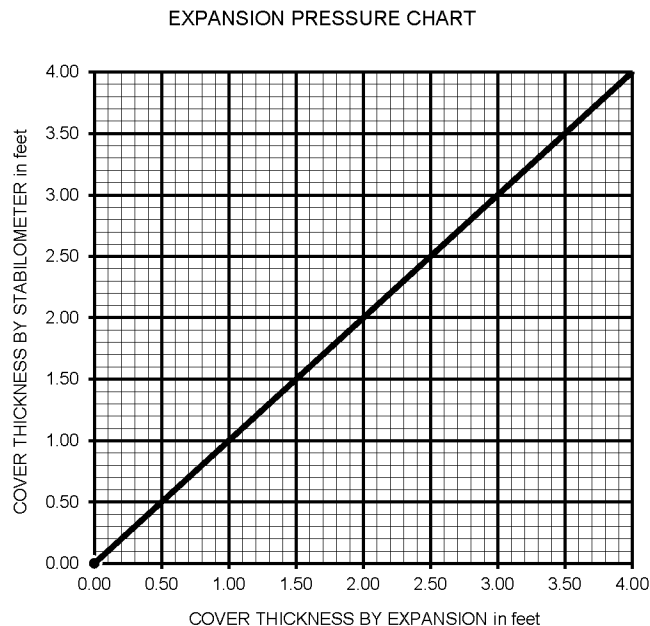
TEST SPECIMEN	a	b	c
MOISTURE AT COMPACTION %	38.5	39.0	39.5
HEIGHT OF SAMPLE, Inches	2.44	2.51	2.56
DRY DENSITY, pcf	87.4	86.2	86.0
COMPACTOR AIR PRESSURE, psi	50	50	50
EXUDATION PRESSURE, psi	337	294	264
EXPANSION, Inches x 10exp-4	0	0	0
STABILITY Ph 2,000 lbs (160 psi)	130	136	138
TURNS DISPLACEMENT	4.65	4.66	4.69
R-VALUE UNCORRECTED	11	9	8
R-VALUE CORRECTED	11	9	8
R-VALUE BY EXUDATION	9		
DESIGN CALCULATION DATA	a	b	c
GRAVEL EQUIVALENT NEEDED ft.	0.00	0.00	0.00
TRAFFIC INDEX	0.0		
STABILOMETER THICKNESS, ft.	#DIV/0!	#DIV/0!	#DIV/0!
EXPANSION PRESSURE THICKNESS, ft.	0.00	0.00	0.00



R-VALUE BY EXPANSION:	N/A
R-VALUE BY EXUDATION:	9
EQUILIBRIUM R-VALUE:	9

PROJECT NAME: GEOLABS PROJECT NUMBER: 108026001
 SAMPLE DESCRIPTION: Silty SAND w Gravel TECHNICIAN: APT
 JOB NO. & SAMPLE LOC.: 6782-0013 SAMPLE NUMBER: 90870
 SAMPLE LOCATION: BULK #109

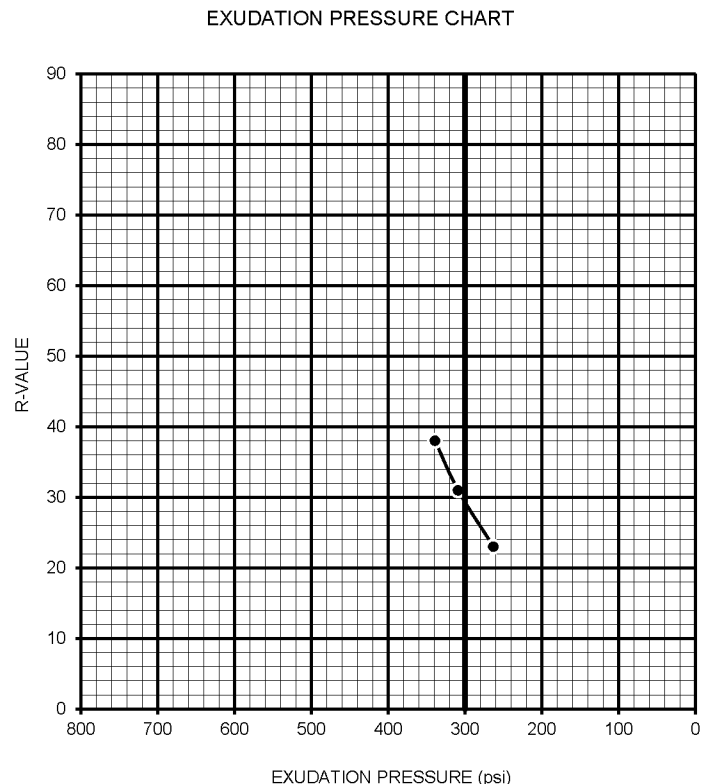
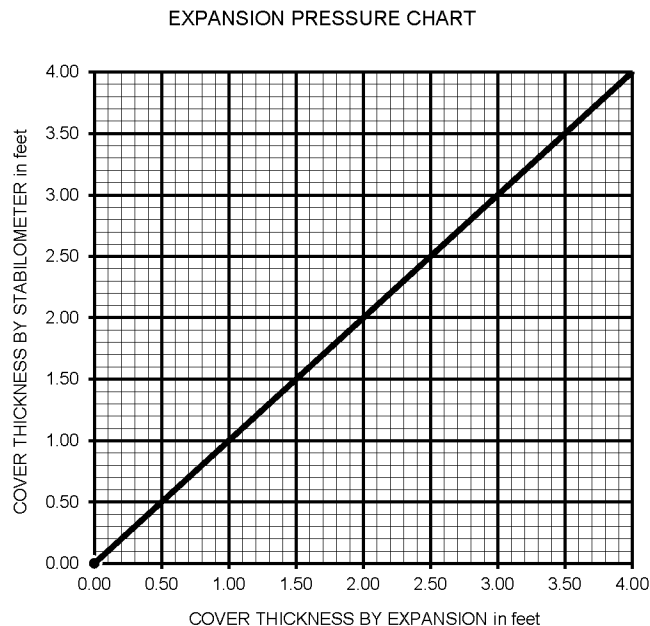
TEST SPECIMEN	a	b	c
MOISTURE AT COMPACTION %	11.8	12.3	12.8
HEIGHT OF SAMPLE, Inches	2.48	2.51	2.49
DRY DENSITY, pcf	126.9	125.9	125.1
COMPACTOR AIR PRESSURE, psi	150	125	100
EXUDATION PRESSURE, psi	358	305	277
EXPANSION, Inches x 10exp-4	0	0	0
STABILITY Ph 2,000 lbs (160 psi)	41	51	61
TURNS DISPLACEMENT	4.09	4.16	4.19
R-VALUE UNCORRECTED	64	56	49
R-VALUE CORRECTED	64	56	49
R-VALUE BY EXUDATION	55		
DESIGN CALCULATION DATA	a	b	c
GRAVEL EQUIVALENT NEEDED ft.	0.00	0.00	0.00
TRAFFIC INDEX	0.0		
STABILOMETER THICKNESS, ft.	#DIV/0!	#DIV/0!	#DIV/0!
EXPANSION PRESSURE THICKNESS, ft.	0.00	0.00	0.00



R-VALUE BY EXPANSION: N/A
 R-VALUE BY EXUDATION: 55
 EQUILIBRIUM R-VALUE: 55

PROJECT NAME:	GEOLABS	PROJECT NUMBER:	108026001
SAMPLE DESCRIPTION:	Silty SAND w Gravel	TECHNICIAN:	APT
JOB NO. & SAMPLE LOC.:	6782-0013	SAMPLE NUMBER:	90871
SAMPLE LOCATION:	BULK #110		

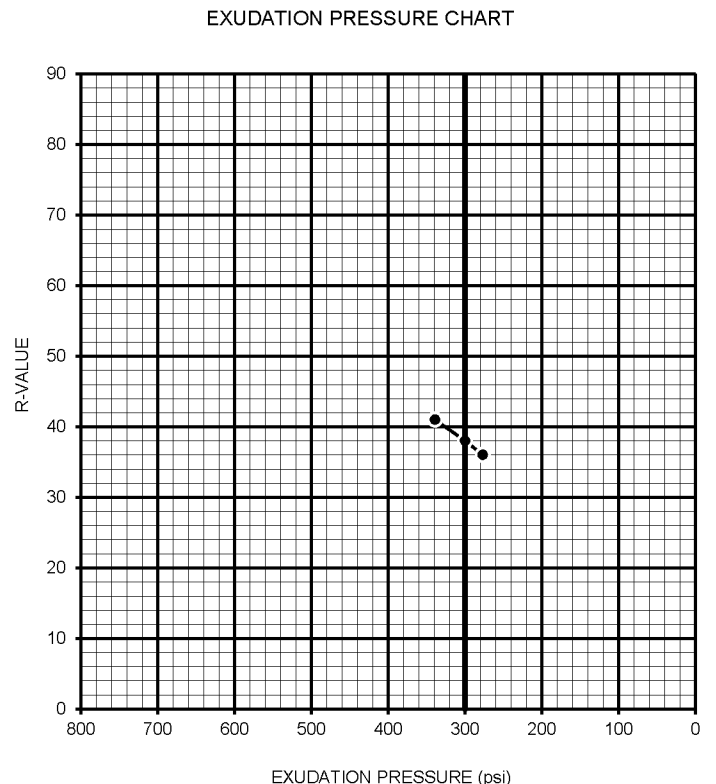
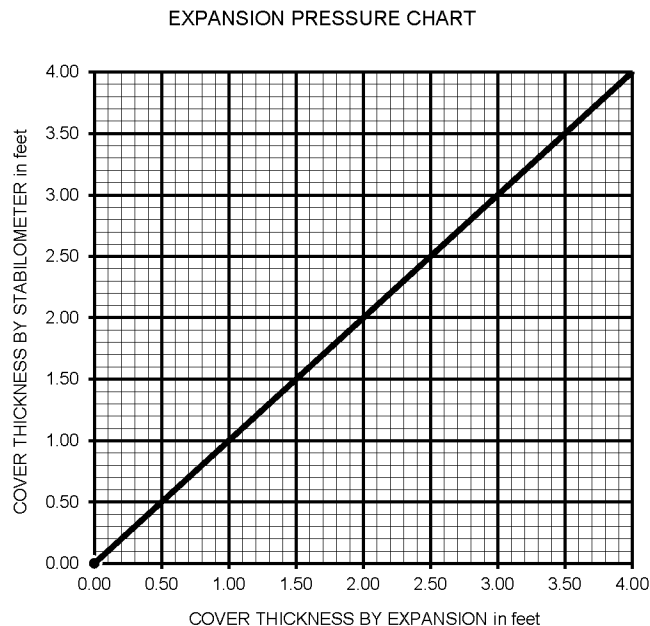
TEST SPECIMEN	a	b	c
MOISTURE AT COMPACTION %	12.8	13.3	13.8
HEIGHT OF SAMPLE, Inches	2.46	2.49	2.43
DRY DENSITY, pcf	125.2	123.1	122.5
COMPACTOR AIR PRESSURE, psi	50	50	50
EXUDATION PRESSURE, psi	339	309	263
EXPANSION, Inches x 10exp-4	0	0	0
STABILITY Ph 2,000 lbs (160 psi)	80	91	106
TURNS DISPLACEMENT	4.03	4.13	4.22
R-VALUE UNCORRECTED	38	31	23
R-VALUE CORRECTED	38	31	23
R-VALUE BY EXUDATION	29		
DESIGN CALCULATION DATA	a	b	c
GRAVEL EQUIVALENT NEEDED ft.	0.00	0.00	0.00
TRAFFIC INDEX	0.0		
STABILOMETER THICKNESS, ft.	#DIV/0!	#DIV/0!	#DIV/0!
EXPANSION PRESSURE THICKNESS, ft.	0.00	0.00	0.00



R-VALUE BY EXPANSION:	N/A
R-VALUE BY EXUDATION:	29
EQUILIBRIUM R-VALUE:	29

PROJECT NAME: GEOLABS PROJECT NUMBER: 108026001
 SAMPLE DESCRIPTION: Silty SAND w Gravel TECHNICIAN: APT
 JOB NO. & SAMPLE LOC.: 6782-0013 SAMPLE NUMBER: 90872
 SAMPLE LOCATION: BULK #111

TEST SPECIMEN	a	b	c
MOISTURE AT COMPACTION %	13.8	14.3	14.8
HEIGHT OF SAMPLE, Inches	2.44	2.53	2.49
DRY DENSITY, pcf	122.1	116.7	114.7
COMPACTOR AIR PRESSURE, psi	100	100	100
EXUDATION PRESSURE, psi	339	300	277
EXPANSION, Inches x 10exp-4	0	0	0
STABILITY Ph 2,000 lbs (160 psi)	75	80	83
TURNS DISPLACEMENT	4.09	4.16	4.21
R-VALUE UNCORRECTED	41	38	36
R-VALUE CORRECTED	41	38	36
R-VALUE BY EXUDATION	38		
DESIGN CALCULATION DATA	a	b	c
GRAVEL EQUIVALENT NEEDED ft.	0.00	0.00	0.00
TRAFFIC INDEX	0.0		
STABILOMETER THICKNESS, ft.	#DIV/0!	#DIV/0!	#DIV/0!
EXPANSION PRESSURE THICKNESS, ft.	0.00	0.00	0.00



R-VALUE BY EXPANSION: N/A
 R-VALUE BY EXUDATION: 38
 EQUILIBRIUM R-VALUE: 38