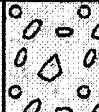












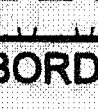
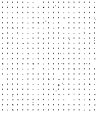


GEOLABS, INC.
Geotechnical Engineering

Soil Log Legend

UNIFIED SOIL CLASSIFICATION SYSTEM (USCS)

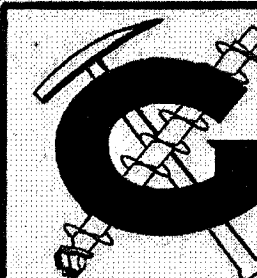
MAJOR DIVISIONS			USCS	TYPICAL DESCRIPTIONS	
COARSE-GRAINED SOILS	GRAVELS	CLEAN GRAVELS		GW	WELL-GRADED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES
		LESS THAN 5% FINES		GP	POORLY-GRADED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES
		GRAVELS WITH FINES		GM	SILTY GRAVELS, GRAVEL-SAND-SILT MIXTURES
		MORE THAN 12% FINES		GC	CLAYEY GRAVELS, GRAVEL-SAND-CLAY MIXTURES
	SANDS	CLEAN SANDS		SW	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
		LESS THAN 5% FINES		SP	POORLY-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
SANDS WITH FINES			SM	SILTY SANDS, SAND-SILT MIXTURES	
MORE THAN 12% FINES			SC	CLAYEY SANDS, SAND-CLAY MIXTURES	
FINE-GRAINED SOILS	SILTS AND CLAYS	LIQUID LIMIT LESS THAN 50		ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY
				CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
				OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS	LIQUID LIMIT 50 OR MORE		MH	INORGANIC SILT, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS
				CH	INORGANIC CLAYS OF HIGH PLASTICITY
				OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
HIGHLY ORGANIC SOILS			PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS	

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS

LEGEND

	(2-INCH) O.D. STANDARD PENETRATION TEST	LL	LIQUID LIMIT (NP=NON-PLASTIC)
	(3-INCH) O.D. MODIFIED CALIFORNIA SAMPLE	PI	PLASTICITY INDEX (NP=NON-PLASTIC)
	SHELBY TUBE SAMPLE	TV	TORVANE SHEAR (tsf)
	GRAB SAMPLE	PEN	POCKET PENETROMETER (tsf)
	CORE SAMPLE	UC	UNCONFINED COMPRESSION (psi)
	WATER LEVEL OBSERVED IN BORING	UU	UNCONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION (ksf)

Plate
A-0.1



GEOLABS, INC.
Geotechnical Engineering

Rock Log Legend

ROCK DESCRIPTIONS

	BASALT		FINGER CORAL
	BOULDERS		LIMESTONE
	BRECCIA		SANDSTONE
	CLINKER		SILTSTONE
	COBBLES		TUFF
	CORAL		VOID/CAVITY

ROCK DESCRIPTION SYSTEM

ROCK FRACTURE CHARACTERISTICS

The following terms describe general fracture spacing of a rock:

Massive:	Greater than 24 inches apart
Slightly Fractured:	12 to 24 inches apart
Moderately Fractured:	6 to 12 inches apart
Closely Fractured:	3 to 6 inches apart
Severely Fractured:	Less than 3 inches apart

DEGREE OF WEATHERING

The following terms describe the chemical weathering of a rock:

Unweathered:	Rock shows no sign of discoloration or loss of strength.
Slightly Weathered:	Slight discoloration inwards from open fractures.
Moderately Weathered:	Discoloration throughout and noticeably weakened though not able to break by hand.
Highly Weathered:	Most minerals decomposed with some corestones present in residual soil mass. Can be broken by hand.
Extremely Weathered:	Saprolite. Mineral residue completely decomposed to soil but fabric and structure preserved.

HARDNESS

The following terms describe the resistance of a rock to indentation or scratching:

Very Hard:	Specimen breaks with difficulty after several "pinging" hammer blows. Example: Dense, fine grain volcanic rock
Hard:	Specimen breaks with some difficulty after several hammer blows. Example: Vesicular, vugular, coarse-grained rock
Medium Hard:	Specimen can be broken by one hammer blow. Cannot be scraped by knife. SPT may penetrate by ~25 blows per inch with bounce. Example: Porous rock such as clinker, cinder, and coral reef
Soft:	Can be indented by one hammer blow. Can be scraped or peeled by knife. SPT can penetrate by ~100 blows per foot. Example: Weathered rock, chalk-like coral reef
Very Soft:	Crumbles under hammer blow. Can be peeled and carved by knife. Can be indented by finger pressure. Example: Saprolite

Plate
A-0.2

FED. ROAD DIST. NO.	STATE	FED. AID PROJECT NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	ER15-(22)	2009	C.O.82	88

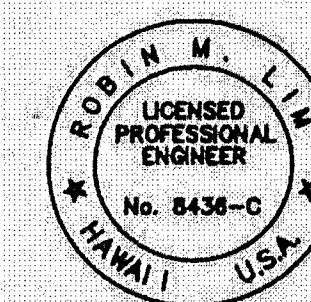
BORING LOCATION

Boring Nos.	Station (approx.)	Offset from Baseline (feet)	Offset Direction (facing up-station)	Site Nos.	Note
1	75+00	5	right	1	
2	74+00	5	left	1	
3	73+00	5	right	1	
4	792+25	5	right	2	
5	789+00	5	left	2	between Site # 2 and # 3
6	788+50	5	right	2	
7	773+90	5	left	3	
8	773+00	5	right	3	
9	14+00	5	left	6	
10	9+60	5	right	6	
11	286+10	50	right	10	
12	285+00	60	right	10	

GEOTECHNICAL NOTES

- The information presented in the logs of borings depict the subsurface conditions encountered at that specified location and at the time of the field exploration only. Variations of subsurface conditions from those depicted in the logs of borings may occur between and beyond the borings.
- The penetration resistance shown on the logs of borings indicate the number of blows required for the specific sampler type used. The blow counts may need to be factored to obtain the Standard Penetration Test (SPT) blow counts.
- The data given is for general information only. Bidders shall examine the site and the boring data and draw their own conclusions therefrom as to the character of materials to be encountered. The Engineer will not assume responsibility for variations of subsurface quality or conditions other than at the boring locations shown and at the time the borings were taken.

DATE	DATE
REVIEWED BY	REVIEWED BY
DESIGNED BY	DESIGNED BY
CHECKED BY	CHECKED BY
NOTED BY	NOTED BY
DATE	DATE



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7/28/10 Added Boring Location Table.

DATE REVISION

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BORING LOGS LEGEND & NOTES

EMERGENCY EARTHQUAKE ROCKFALL REPAIRS

VARIOUS LOCATIONS ON HAWAII, UNIT 4


Federal Aid Project No. ER-15(22)


Scale: As Shown Date: December 2009

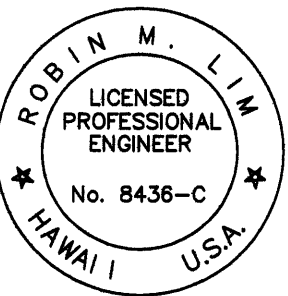
SHEET No. 1 OF 7 SHEETS

C.O.82

FED. ROAD DIST. NO.	STATE	FED. AID PROJECT NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	ER15-(22)	2009	83	88

	GEOLABS, INC. Geotechnical Engineering		EMERGENCY EARTHQK. ROCKFALL REPAIRS VARIOUS LOCATIONS ON HAWAII, UNIT 4 ROUTE 190, MP 12.1 TO 31.2 FEDERAL AID PROJECT NO. ER-15(22)										Log of Boring 1		
	Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample Graphic	USCS	Approximate Ground Surface Elevation : N/A				
											Description				
			18							GW	6-inch ASPHALTIC CONCRETE				
											12-inch BASE COURSE				
	9					32		5			Brownish gray COBBLES AND GRAVEL with sand and silt, medium dense, dry to damp (rock fill)				
			50					10			grades with dense sandy gravel seams				
			22					15							
	11					37		20		GW	Brownish gray GRAVEL with cobbles (basaltic) and little sand, dense, damp (clinker)				
			50					25							
			12					30			Gray dense BASALT, moderately fractured, slightly weathered, hard				
	8			100	70	50/4" Ref.		35			Boring terminated at 31.5 feet				
								40							
								45							
								50							
								55							
								60							
								65							
								70							
								75							
Date Started: May 26, 2009												Water Level: ∇ Not Encountered			
Date Completed: May 26, 2009															
Logged By: S. Latronic												Drill Rig: MOBILE B-53			
Total Depth: 31.5 feet												Drilling Method: 4" Auger & HQ Coring			
Work Order: 6164-00												Driving Energy: 140 lb. wt., 30 in. drop			


	GEOLABS, INC. Geotechnical Engineering		EMERGENCY EARTHQK. ROCKFALL REPAIRS VARIOUS LOCATIONS ON HAWAII, UNIT 4 ROUTE 190, MP 12.1 TO 31.2 FEDERAL AID PROJECT NO. ER-15(22)										Log of Boring 2		
	Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample Graphic	USCS	Approximate Ground Surface Elevation : N/A				
											Description				
										GW	6-inch ASPHALTIC CONCRETE				
											12-inch BASE COURSE				
								5			Brownish gray COBBLES AND GRAVEL with sand, medium dense to dense, damp (rock fill)				
Sieve	7		26			22		10			grades with boulders				
	5		17			32		15							
			50					20			Brownish gray GRAVEL AND COBBLES (BASALTIC), dense, damp (clinker)				
			40					25			Gray vugular BASALT with clinker, severely fractured, slightly weathered, hard				
								30			Boring terminated at 31 feet				
								35							
								40							
								45							
								50							
								55							
								60							
								65							
								70							
								75							
Date Started: May 27, 2009												Water Level: ∇ Not Encountered			
Date Completed: May 27, 2009															
Logged By: S. Latronic												Drill Rig: MOBILE B-53			
Total Depth: 31 feet												Drilling Method: 4" Auger & HQ Coring			
Work Order: 6164-00												Driving Energy: 140 lb. wt., 30 in. drop			




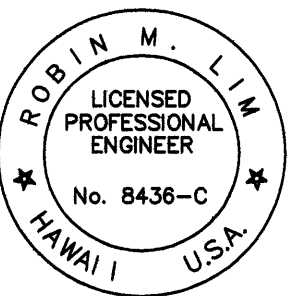
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STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION	
<u>BORING LOGS - 1</u>	
EMERGENCY EARTHQUAKE ROCKFALL REPAIRS VARIOUS LOCATIONS ON HAWAII, UNIT 4 Federal Aid Project No. ER-15(22)	
Scale: As Shown	Date: December 2009
SHEET No. 2 OF 7 SHEETS	

FED. ROAD DIST. NO.	STATE	FED. AID PROJECT NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	ER15-(22)	2009	84	88

		GEOLABS, INC. Geotechnical Engineering		EMERGENCY EARTHQK. ROCKFALL REPAIRS VARIOUS LOCATIONS ON HAWAII, UNIT 4 ROUTE 190, MP 12.1 TO 31.2 FEDERAL AID PROJECT NO. ER-15(22)										Log of Boring 3	
Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample Graphic	USCS	Approximate Ground Surface Elevation : N/A					
										Description					
			31						GW	6-inch ASPHALTIC CONCRETE					
	4						5			12-inch BASE COURSE					
	12				36					Brownish gray GRAVEL AND COBBLES with sand and silt, medium dense to dense, damp (rock fill)					
		100			36		10			grades with boulders, dense, dry					
		78					15			grades with more gravel					
		30			19		20			Brownish gray COBBLES AND GRAVEL (BASALTIC) with sand and traces of silt, medium dense, damp (clinker)					
13			67	11			25			Brownish gray BASALT with clinker, moderately fractured, slightly weathered, hard					
			81	38			30			Boring terminated at 30 feet					
							35								
							40								
							45								
							50								
							55								
							60								
							65								
							70								
							75								
Date Started: May 27, 2009										Water Level: ∇ Not Encountered					
Date Completed: May 27, 2009															
Logged By: S. Latronic										Drill Rig: MOBILE B-53					
Total Depth: 30 feet										Drilling Method: 4" Auger & HQ Coring					
Work Order: 6164-00										Driving Energy: 140 lb. wt., 30 in. drop					

		GEOLABS, INC. Geotechnical Engineering		EMERGENCY EARTHQK. ROCKFALL REPAIRS VARIOUS LOCATIONS ON HAWAII, UNIT 4 ROUTE 190, MP 12.1 TO 31.2 FEDERAL AID PROJECT NO. ER-15(22)										Log of Boring 4	
Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample Graphic	USCS	Approximate Ground Surface Elevation : N/A					
										Description					
			23						GW	6-inch ASPHALTIC CONCRETE					
							5			12-inch BASE COURSE					
										Brownish gray COBBLES AND GRAVEL with sand and traces of silt, medium dense to dense, damp (rock fill)					
Sieve	14		17		34		10		GW-GM	grades with more sand					
	10		100	40	26/6" +20/0" Ref.		15			Grayish brown GRAVEL with sand and silt, dense, damp (fill)					
			18				20		GM	Brownish gray GRAVEL AND COBBLES (BASALTIC) with sand and little silt, dense, damp (clinker)					
	24				49		25			Gray BASALT, moderately fractured, slightly weathered, hard to very hard					
			50				30			Grayish brown SILTY GRAVEL with some cobbles, dense, moist (volcanic ash and clinker)					
			33				35			Brownish gray GRAVEL AND COBBLES (BASALTIC) with sand and silt, dense, damp (clinker)					
					20/0" Ref.		40			Boring terminated at 30 feet					
							45								
							50								
							55								
							60								
							65								
							70								
							75								
Date Started: May 28, 2009										Water Level: ∇ Not Encountered					
Date Completed: May 28, 2009															
Logged By: S. Latronic										Drill Rig: MOBILE B-53					
Total Depth: 30 feet										Drilling Method: 4" Auger & HQ Coring					
Work Order: 6164-00										Driving Energy: 140 lb. wt., 30 in. drop					



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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION


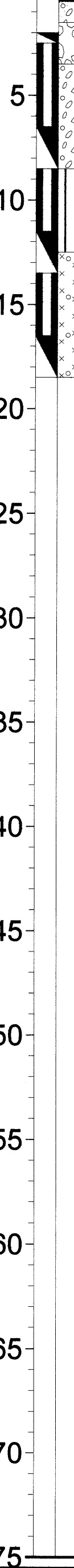
BORING LOGS - 2


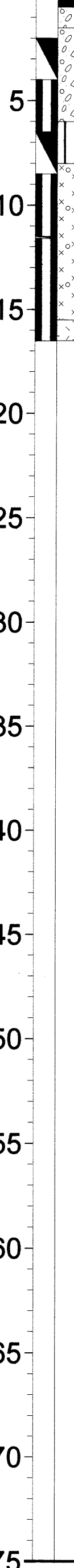
EMERGENCY EARTHQUAKE ROCKFALL REPAIRS
VARIOUS LOCATIONS ON HAWAII, UNIT 4
Federal Aid Project No. ER-15(22)

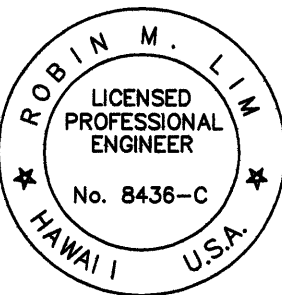
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SHEET No. 3 OF 7 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJECT NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	ER15-(22)	2009	85	88

	GEOLABS, INC. Geotechnical Engineering		EMERGENCY EARTHQK. ROCKFALL REPAIRS VARIOUS LOCATIONS ON HAWAII, UNIT 4 ROUTE 190, MP 12.1 TO 31.2 FEDERAL AID PROJECT NO. ER-15(22)					Log of Boring 5		
	Other Tests	Moisture Content (%) Dry Unit Weight (pcf) Core Recovery (%) RQD (%) Penetration Resistance (blows/foot) Pocket Pen. (tsf)	Depth (feet)	Sample Graphic	USCS	Approximate Ground Surface Elevation : N/A Description				
Sieve	3	21	50/6" Ref.		GW	6-inch ASPHALTIC CONCRETE				
	16		11		GP	12-inch BASE COURSE				
	9	33	19		ML	Brownish gray GRAVEL AND COBBLES with sand and little silt, dense, damp (fill)				
	8	44	25			Grayish brown GRAVEL with sand, loose to medium dense, moist (fill)				
						Brown SILT with gravel, medium stiff, moist (volcanic ash)				
						Brownish gray GRAVEL AND COBBLES (BASALTIC) with sand and silt, medium dense, damp (clinker)				
						Boring terminated at 18.5 feet				
Date Started: May 28, 2009		Water Level: ∇ Not Encountered								
Date Completed: May 28, 2009		Drill Rig: MOBILE B-53								
Logged By: S. Latronic		Drilling Method: 4" Auger & HQ Coring								
Total Depth: 18.5 feet		Driving Energy: 140 lb. wt., 30 in. drop								
Work Order: 6164-00										

	GEOLABS, INC. Geotechnical Engineering		EMERGENCY EARTHQK. ROCKFALL REPAIRS VARIOUS LOCATIONS ON HAWAII, UNIT 4 ROUTE 190, MP 12.1 TO 31.2 FEDERAL AID PROJECT NO. ER-15(22)					Log of Boring 6		
	Other Tests	Moisture Content (%) Dry Unit Weight (pcf) Core Recovery (%) RQD (%) Penetration Resistance (blows/foot) Pocket Pen. (tsf)	Depth (feet)	Sample Graphic	USCS	Approximate Ground Surface Elevation : N/A Description				
Sieve	6	40	32		GW	6-inch ASPHALTIC CONCRETE				
	19		11		GW	12-inch BASE COURSE				
	9	25	25/1" Ref.		ML	Brownish gray SANDY GRAVEL with some cobbles, dense, damp (fill)				
	3	37	12			Brown SILT with gravel, medium stiff, moist (volcanic ash)				
						Brownish gray GRAVEL AND COBBLES (BASALTIC) with sand and little silt, dense, damp (clinker)				
						Gray BASALT, closely fractured, slightly weathered, hard				
						Boring terminated at 16.5 feet				
Date Started: May 28, 2009		Water Level: ∇ Not Encountered								
Date Completed: May 28, 2009		Drill Rig: MOBILE B-53								
Logged By: S. Latronic		Drilling Method: 4" Auger & HQ Coring								
Total Depth: 16.5 feet		Driving Energy: 140 lb. wt., 30 in. drop								
Work Order: 6164-00										



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Robin M. Lim
Geolabs, Inc.


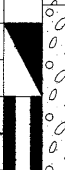


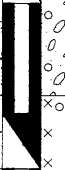

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION


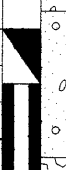


BORING LOGS - 3

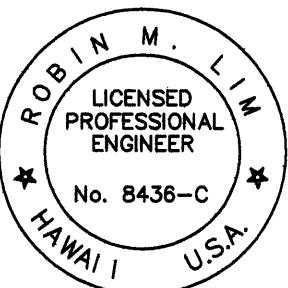
EMERGENCY EARTHQUAKE ROCKFALL REPAIRS
VARIOUS LOCATIONS ON HAWAII, UNIT 4
Federal Aid Project No. ER-15(22)

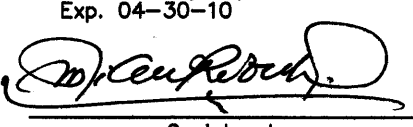
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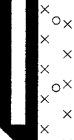
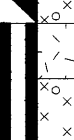
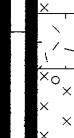



SHEET No. 4 OF 7 SHEETS











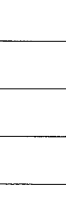


 GEOLABS, INC. Geotechnical Engineering		EMERGENCY EARTHQK. ROCKFALL REPAIRS VARIOUS LOCATIONS ON HAWAII, UNIT 4 ROUTE 190, MP 12.1 TO 31.2 FEDERAL AID PROJECT NO. ER-15(22)							Log of Boring 7		
Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample Graphic	USCS	Approximate Ground Surface Elevation : N/A	
										Description	
	5		43		33		5		GW	6-inch ASPHALTIC CONCRETE	
	8		33		56		10		GW	12-inch BASE COURSE	
	13		19		21		15			Grayish brown SANDY GRAVEL with some cobbles, medium dense to dense, damp (fill)	
	1		28		34		20			Grayish brown GRAVEL (BASALTIC) with sand and silt, dense, damp (clinker)	
	10		50		76		25			Boring terminated at 25 feet	
							30				
							35				
							40				
							45				
							50				
							55				
							60				
							65				
							70				
							75				
Date Started: May 28, 2009									Water Level: ∇ Not Encountered		
Date Completed: May 28, 2009											
Logged By: S. Latronic									Drill Rig: MOBILE B-53		
Total Depth: 25 feet									Drilling Method: 4" Auger & HQ Coring		
Work Order: 6164-00									Driving Energy: 140 lb. wt., 30 in. drop		

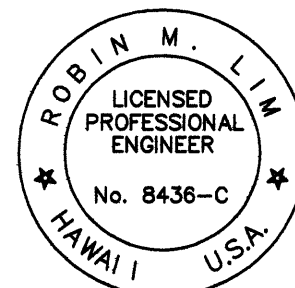
 GEOLABS, INC. Geotechnical Engineering		EMERGENCY EARTHQK. ROCKFALL REPAIRS VARIOUS LOCATIONS ON HAWAII, UNIT 4 ROUTE 190, MP 12.1 TO 31.2 FEDERAL AID PROJECT NO. ER-15(22)						Log of Boring 8			
Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample Graphic	USCS	Approximate Ground Surface Elevation : N/A	
										Description	
Sieve	8		33		51		5		GW	6-inch ASPHALTIC CONCRETE	
Sieve	9		31		23		10		SW-SM	12-inch BASE COURSE	
	11		39		13		15		GW	Grayish brown SAND with gravel and silt, dense, damp (fill)	
	15				50/6" Ref.		20			grades with cobbles	
							25			Brownish gray GRAVEL AND COBBLES with sand, medium dense, damp (fill)	
							30			Brownish gray COBBLES AND GRAVEL (BASALTIC) with sand and traces of silt, medium dense, damp (clinker)	
							35			Boring terminated at 17.5 feet	
							40				
							45				
							50				
							55				
							60				
							65				
							70				
							75				
Date Started: May 29, 2009								Water Level: ∇ Not Encountered			
Date Completed: May 29, 2009											
Logged By: S. Latronic								Drill Rig: MOBILE B-53			
Total Depth: 17.5 feet								Drilling Method: 4" Auger & HQ Coring			
Work Order: 6164-00								Driving Energy: 140 lb. wt., 30 in. drop			



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 GEOLABS, INC. Geotechnical Engineering		EMERGENCY EARTHQK. ROCKFALL REPAIRS VARIOUS LOCATIONS ON HAWAII, UNIT 4 ROUTE 190, MP 12.1 TO 31.2 FEDERAL AID PROJECT NO. ER-15(22)										Log of Boring 9	
Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample	Graphic	USCS	Approximate Ground Surface Elevation : N/A		
											Description		
	6		67		9/6" +20/0" Ref.					GW	6-inch ASPHALTIC CONCRETE		
			11	11-inch BASE COURSE									
			5	Brownish gray BOULDERS AND COBBLES with gravel and traces of sand and silt, medium dense, dry (rock fill)									
			10	Brownish gray GRAVEL AND COBBLES (BASALTIC) with sand, medium dense, damp (clinker)									
			15	Gray vugular BASALT, moderately fractured, unweathered, hard									
	7		58	38	7/6" +20/0" Ref.						Gray vugular BASALT, moderately fractured, unweathered, hard		
			40	10							Brownish gray GRAVEL AND COBBLES (BASALTIC) with sand, medium dense, damp (clinker)		
			20								Gray vugular BASALT, closely fractured, unweathered, hard		
			25								Brownish gray GRAVEL AND COBBLES (BASALTIC), loose to medium dense, damp (clinker)		
			30								Gray vesicular BASALT, moderately fractured, unweathered, hard		
											Boring terminated at 26 feet		
											35		
											40		
											45		
											50		
<div><div>75</div><div></div></div>													
Date Started: May 29, 2009											Water Level:  Not Encountered		
Date Completed: May 29, 2009													
Logged By: S. Latronic													
Total Depth: 26 feet													
Work Order: 6164-00											Drill Rig: MOBILE B-53		
											Drilling Method: 4" Auger & HQ Coring		
											Driving Energy: 140 lb. wt., 30 in. drop		

 GEOLABS, INC. Geotechnical Engineering		EMERGENCY EARTHQK. ROCKFALL REPAIRS VARIOUS LOCATIONS ON HAWAII, UNIT 4 ROUTE 190, MP 12.1 TO 31.2 FEDERAL AID PROJECT NO. ER-15(22)										Log of Boring 10
Other Tests		Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample Graphic	USCS	Approximate Ground Surface Elevation : N/A	
											Description	
Sieve	8		42		31			5		GW	9-inch ASPHALTIC CONCRETE	
	10		61		26			10		GW	9-inch BASE COURSE	
	5		88	40	7/6" +20/0" Ref.			15			Brownish gray to gray GRAVEL with sand and cobbles, medium dense, dry to damp (fill)	
			90	15				20			Gray vesicular to scoriaceous BASALT, moderately fractured, unweathered, hard	
			53	0				25			grades to closely fractured	
								30			grades to severely fractured	
								35			Boring terminated at 26.5 feet	
								40				
								45				
								50				
								55				
								60				
								65				
								70				
								75				
Date Started: June 2, 2009										Water Level:  Not Encountered		
Date Completed: June 2, 2009												
Logged By: S. Latronic										Drill Rig: MOBILE B-53		
Total Depth: 26.5 feet										Drilling Method: 4" Auger & HQ Coring		
Work Order: 6164-00										Driving Energy: 140 lb. wt., 30 in. drop		



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Robin M. Lim
Geolabs, Inc.


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HIGHWAYS DIVISION


BORING LOGS - 5

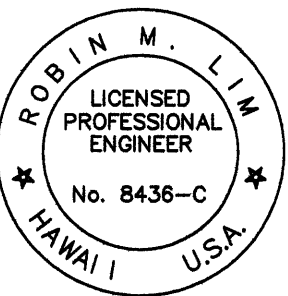
EMERGENCY EARTHQUAKE ROCKFALL REPAIRS
VARIOUS LOCATIONS ON HAWAII, UNIT 4
Federal Aid Project No. ER-15(22)

Scale: As Shown Date: December 2009

SHEET No. 6 OF 7 SHEETS

	GEOLABS, INC.		EMERGENCY EARTHQK. ROCKFALL REPAIRS VARIOUS LOCATIONS ON HAWAII, UNIT 4 ROUTE 190, MP 12.1 TO 31.2 FEDERAL AID PROJECT NO. ER-15(22)										Log of Boring 11						
	Geotechnical Engineering																		
Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample Graphic	USCS	Approximate Ground Surface Elevation : N/A					Description				
	9		33		16				ML	Brown SILT with gravel, stiff, damp (topsoil)					Brownish gray COBBLES AND GRAVEL (BASALTIC), loose to medium dense, damp (clinker)				
	9		44		29		5			grades with scoriaceous cobbles									
	25				15		10			grades with sand									
			100	78			15			Gray dense BASALT, massive, unweathered, very hard									
			100	65			20												
			20	0			25			Brownish gray GRAVEL AND COBBLES (BASALTIC) with sand, loose to medium dense, damp (clinker)									
							26.5			Boring terminated at 26.5 feet									
							30												
							35												
							40												
							45												
							50												
							55												
							60												
							65												
							70												
							75												
Date Started: June 3, 2009										Water Level: <input type="checkbox"/> Not Encountered									
Date Completed: June 3, 2009																			
Logged By: S. Latronic										Drill Rig: MOBILE B-53									
Total Depth: 26.5 feet										Drilling Method: 4" Auger & HQ Coring									
Work Order: 6164-00										Driving Energy: 140 lb. wt., 30 in. drop									

	GEOLABS, INC.		EMERGENCY EARTHQK. ROCKFALL REPAIRS VARIOUS LOCATIONS ON HAWAII, UNIT 4 ROUTE 190, MP 12.1 TO 31.2 FEDERAL AID PROJECT NO. ER-15(22)										Log of Boring 12						
	Geotechnical Engineering																		
Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample Graphic	USCS	Approximate Ground Surface Elevation : N/A					Description				
			17						ML	Brown SILT with gravel, stiff, moist (topsoil)					Brownish gray COBBLES AND GRAVEL (BASALTIC) with sand and traces of silt, loose to medium dense, dry to damp (clinker)				
Sieve	16				9		5												
			47				10												
			70	33			15												
			17				20												
	11		56	0	12		25			Gray vugular BASALT, moderately fractured, unweathered, hard					Brownish gray COBBLES AND GRAVEL (BASALTIC) with sand, loose to medium dense, damp (clinker)				
							30			Gray BASALT, moderately fractured, unweathered, hard					Boring terminated at 26.5 feet				
							35												
							40												
							45												
							50												
							55												
							60												
							65												
							70												
							75												
Date Started: June 2, 2009										Water Level: <input type="checkbox"/> Not Encountered									
Date Completed: June 2, 2009																			
Logged By: S. Latronic										Drill Rig: MOBILE B-53									
Total Depth: 26.5 feet										Drilling Method: 4" Auger & HQ Coring									
Work Order: 6164-00										Driving Energy: 140 lb. wt., 30 in. drop									



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S. Latronic
Geolabs, Inc.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BORING LOGS - 6

EMERGENCY EARTHQUAKE ROCKFALL REPAIRS
VARIOUS LOCATIONS ON HAWAII, UNIT 4
Federal Aid Project No. ER-15(22)

Scale: As Shown Date: December 2009