

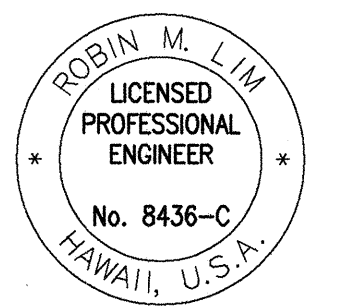
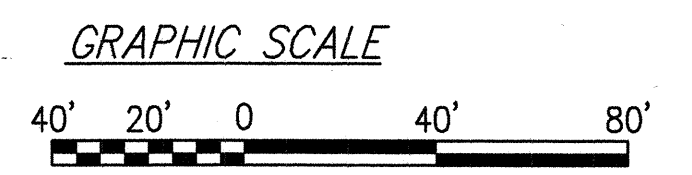
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAWAII	ER-12(2)	2001	80	145



LEGEND:
 B-7 APPROXIMATE BORING LOCATION AND NUMBER

PLAN - BORING LOCATION
 Scale: 1"=40'

ORIGINAL PLAN	DATE
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 GEOLABS, INC.

STATE OF HAWAII
 DEPARTMENT OF TRANSPORTATION
 HIGHWAYS DIVISION

BORING LOCATION PLAN

MAMALAHOA HIGHWAY
EMERGENCY REPLACEMENT OF
FORD CROSSING

Federal Aid Project No. ER-12(2)
 Scale: As Noted Date: Feb. 2001

SHEET No. AG1 OF 9 SHEETS

Boring 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
	3-INCH O.D. MODIFIED CALIFORNIA SAMPLE	PI	PLASTICITY INDEX
	SHELBY TUBE SAMPLE	TV	TORVANE SHEAR (tsf)
	GRAB SAMPLE	PEN	POCKET PENETROMETER (tsf)
	CORE SAMPLE		WATER LEVEL OBSERVED IN BORING

GEOTECHNICAL NOTES

- A geotechnical engineering report entitled "Geotechnical Engineering Exploration, Mamalahoa Highway, Emergency Replacement of Ford Crossing, District of Kau, Island of Hawaii" dated February 2001 has been prepared by Geolabs, Inc. A copy of the report is on file at the office of the Engineer for review by the Contractor.
- For boring locations, see Sheet AG1.
- 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 subsoil 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 subsoil quality or conditions other than at the boring locations shown and at the time the borings were taken.

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
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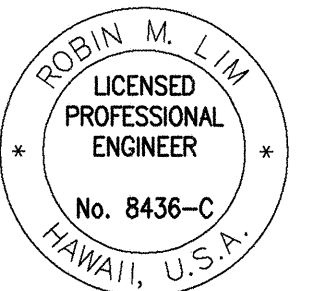
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
LEGEND AND NOTES
MAMALAHOA HIGHWAY
EMERGENCY REPLACEMENT OF
FORD CROSSING
Federal Aid Project No. ER-12(2)
Scale: As Noted *Date: Feb. 2001*

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAWAII	ER-12(2)	2001	82	145

GEOLABS, INC. Geotechnical Engineering							EMERGENCY REPLACEMENT OF FORD CROSSING DISTRICT OF KAU, ISLAND OF HAWAII					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 (feet MSL): 1304 *			
										Description			
UC=1.7 ksi	87		64	49	4		0		MH	Gray vesicular BASALT, closely fractured, slightly weathered, medium hard to hard (pahoeohoe basalt formation) grades to moderately fractured at 2 feet			
		5		Orangish brown CLAYEY SILT with some sand and traces of gravel, soft, wet (pahala ash)									
		10		Gray mottled with some red strongly vesicular BASALT, closely to moderately fractured, slightly weathered, medium hard to hard (pahoeohoe basalt formation)									
		15											
		20		Reddish gray strongly vesicular BASALT, closely fractured, moderately weathered, medium hard (clinker)									
		25		Gray strongly vesicular BASALT, closely fractured, slightly weathered, hard (pahoeohoe basalt formation)									
		30		Reddish gray scoriaceous BASALT, severely fractured, moderately weathered, medium hard (clinker)									
		35		Gray vesicular BASALT, moderately fractured, slightly weathered, hard (pahoeohoe basalt formation) grades to slightly fractured, unweathered at 31.5 feet									
		40		Gray scoriaceous BASALT, moderately fractured, slightly weathered to unweathered, medium hard (pahoeohoe basalt formation)									
		41.5		Gray vugular BASALT, moderately to slightly fractured, unweathered, hard (basalt formation)									
										Boring terminated at 41.5 feet			
										* Elevations estimated from "Roadway and Channel Grading Plan", dated January 2001 by Mitsunaga & Associates, Inc.			
Date Started: December 27, 2000										Water Level: z			
Date Completed: December 27, 2000										Not Encountered			
Logged By: G. Barut										Drill Rig: MOBILE B-53			
Total Depth: 41.5 feet										Drilling Method: 4" Solid-Stem Auger & HQ Coring			
Work Order: 4627-00										Driving Energy: 140 lb. wt., 30 in. drop			

GEOLABS, INC. Geotechnical Engineering										EMERGENCY REPLACEMENT OF FORD CROSSING DISTRICT OF KAU, ISLAND OF HAWAII										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 (feet MSL): 1304.5 *											
										Description											
UC=2.4 ksi			90	39						12-inch CONCRETE											
										Gray vesicular BASALT, closely fractured, slightly weathered, hard (pahoeohoe basalt formation)											
							5			Gray strongly vesicular BASALT, closely fractured, slightly weathered, hard (basalt formation) grades to closely to moderately fractured at 4.5 feet grades to moderately fractured											
			63	25					MH	Orangish brown to brown CLAYEY SILT with traces of gravel, soft to medium stiff, very moist (pahala ash)											
							10			Reddish gray scoriaceous BASALT, severely fractured, moderately weathered, medium hard (pahoeohoe basalt formation)											
			90	73						Gray scoriaceous BASALT, slightly to moderately fractured, slightly weathered, hard (pahoeohoe basalt formation)											
							15			Gray mottled red strongly vesicular BASALT, closely fractured, slightly weathered, medium hard (pahoeohoe basalt formation)											
			90	65						Gray strongly vesicular BASALT, closely to severely fractured, slightly weathered, medium hard (pahoeohoe basalt formation)											
							20			Reddish gray scoriaceous BASALT, severely fractured, slightly weathered, medium hard (clinker)											
			63	13						Gray strongly vesicular BASALT, closely to moderately fractured, slightly weathered, soft to medium hard (basalt formation)											
							25			Gray vesicular BASALT, moderately fractured, slightly weathered, medium hard (pahoeohoe basalt formation)											
			89	45						Reddish brown scoriaceous BASALT, severely fractured, slightly weathered, medium hard (clinker)											
							30			Gray vugular BASALT, closely to moderately fractured, unweathered, very hard (a'a basalt formation)											
			90	40						Boring terminated at 40 feet											
							35														
						40															
						45															
						50															
Date Started: December 27, 2000										Water Level: z											
Date Completed: December 27, 2000										Not Encountered											
Logged By: G. Barut										Drill Rig: MOBILE B-53											
Total Depth: 40 feet										Drilling Method: 4" Solid-Stem Auger & HQ Coring											
Work Order: 4627-00										Driving Energy: 140 lb. wt., 30 in. drop											

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
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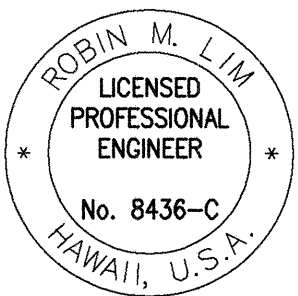
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
BORING LOGS
MAMALAHOA HIGHWAY
EMERGENCY REPLACEMENT OF
FORD CROSSING
Federal Aid Project No. ER-12(2)
Scale: As Noted Date: Feb. 2001
SHEET No. AG3 OF 9 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAWAII	ER-12(2)	2001	84	145

GEOLABS, INC. Geotechnical Engineering		EMERGENCY REPLACEMENT OF FORD CROSSING DISTRICT OF KAU, ISLAND OF HAWAII										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 (feet MSL): 1304 *		
Description												
UC=2.1 ksi			22	0					SM	Brown SILTY SAND with basalt gravel and cobbles, medium dense, dry (fill)		
										Gray and brown vesicular BASALT, closely fractured, slightly weathered, medium hard (pahoe-hoe basalt formation)		
							5		MH	Orangish brown CLAYEY SILT, medium stiff, very moist (pahala ash)		
			100	67	10/.0'	Ref.				Gray strongly vesicular BASALT, moderately fractured, slightly weathered, hard (pahoe-hoe basalt formation)		
							10			grades to closely fractured		
			100	85								
							15			grades to moderately fractured		
			100	77								
							20			Reddish gray strongly vesicular BASALT, closely fractured, slightly weathered, medium hard (pahoe-hoe basalt formation)		
			100	77						Gray vugular BASALT, slightly to moderately fractured, unweathered to slightly weathered, very hard (pahoe-hoe basalt formation)		
							25			grades to vesicular at 23.5 feet		
			100	82						Reddish brown scoriaceous BASALT, severely fractured, moderately weathered, medium hard (pahoe-hoe basalt formation)		
							30			Gray strongly vesicular BASALT, slightly to moderately fractured, slightly weathered, hard (pahoe-hoe basalt formation)		
			100	90								
							35					
			98	60								
							40			Reddish gray strongly vesicular BASALT, severely fractured, slightly weathered, medium hard (pahoe-hoe basalt formation)		
										Gray vesicular BASALT, moderately fractured, slightly weathered, hard (pahoe-hoe basalt formation)		
							45			Boring terminated at 41.5 feet		
							50					
Date Started: December 26, 2000		Water Level: z										
Date Completed: December 26, 2000		Not Encountered										
Logged By: G. Barut		Drill Rig: MOBILE B-53										
Total Depth: 41.5 feet		Drilling Method: 4" Solid-Stem Auger & HQ Coring										
Work Order: 4627-00		Driving Energy: 140 lb. wt., 30 in. drop										

GEOLABS, INC. Geotechnical Engineering		EMERGENCY REPLACEMENT OF FORD CROSSING DISTRICT OF KAU, ISLAND OF HAWAII										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 (feet MSL): 1304.5 *		
Description												
			60	48	50/.0'				ML	Dark brown SANDY SILT (fill)		
										Gray strongly vesicular BASALT, moderately fractured, slightly weathered, hard (pahoe-hoe basalt formation)		
							5		MH	Orange-brown CLAYEY SILT (pahala ash)		
			80	23						Gray strongly vesicular BASALT, closely fractured, slightly weathered, medium hard to hard (pahoe-hoe basalt formation)		
							10			grades to moderately fractured at 9 feet		
			100	50								
							15			Gray strongly vesicular BASALT, moderately fractured, slightly weathered, medium hard to hard (pahoe-hoe basalt formation)		
			100	93								
							20			Gray strongly vesicular BASALT, closely to moderately fractured, moderately weathered, hard to very hard (pahoe-hoe basalt formation)		
			100	57								
							25			Brown and gray scoriaceous BASALT, severely fractured, slightly weathered, medium hard (pahoe-hoe basalt formation)		
			83	47						Gray vesicular BASALT, moderately fractured, slightly weathered, hard (pahoe-hoe basalt formation)		
							30			grades to closely fractured at 27.5 feet		
			100	90						Gray vesicular BASALT, moderately fractured, slightly weathered, hard to very hard (pahoe-hoe basalt formation)		
							35					
			100	100								
							40			Boring terminated at 41 feet		
							45					
							50					
Date Started: January 2, 2001		Water Level: z										
Date Completed: January 2, 2001		Not Encountered										
Logged By: K. Gronseth		Drill Rig: MOBILE B-53										
Total Depth: 41 feet		Drilling Method: 4" Solid-Stem Auger & HQ Coring										
Work Order: 4627-00		Driving Energy: 140 lb. wt., 30 in. drop										

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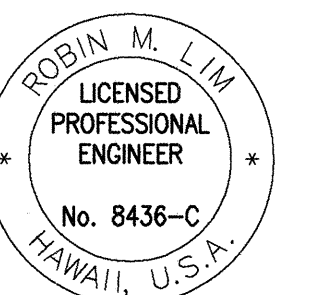
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
BORING LOGS
MAMALAHOA HIGHWAY
EMERGENCY REPLACEMENT OF
FORD CROSSING
Federal Aid Project No. ER-12(2)
Scale: As Noted Date: Feb. 2001
SHEET No. AG5 OF 9 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAWAII	ER-12(2)	2001	85	145

	GEOLABS, INC. Geotechnical Engineering							EMERGENCY REPLACEMENT OF FORD CROSSING DISTRICT OF KAU, ISLAND OF HAWAII					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 (feet MSL): 1304.5 *				
										Description				
UC=2.4 ksi	24				24				MH	Orangish brown CLAYEY SILT with some basalt gravel, stiff, very moist (alluvium)				
			73	47		5		Brownish gray scoriaceous BASALT, moderately fractured, slightly weathered, soft to medium hard (pahoe-hoe basalt formation)						
			100	97				Gray vesicular BASALT, moderately fractured, slightly weathered, very hard (pahoe-hoe basalt formation)						
			100	90		10		Gray vugular BASALT, slightly fractured, slightly weathered, very hard (pahoe-hoe basalt formation)						
			100	88		15		grades to closely fractured, hard						
			100	82		20		grades to slightly fractured, hard to very hard						
			97	80		25		Reddish brown scoriaceous BASALT, closely fractured, slightly weathered, medium hard (pahoe-hoe basalt formation)						
			92	92		30		Gray vesicular BASALT, moderately fractured, slightly weathered, hard (pahoe-hoe basalt formation) grades to slightly fractured, very hard						
			100	65		35								
						40		Reddish gray scoriaceous BASALT, closely fractured, slightly weathered, soft to medium hard (pahoe-hoe basalt formation)						
									Boring terminated at 41 feet					
							45							
							50							
Date Started: December 26, 2000									Water Level: ∅					
Date Completed: December 26, 2000									Not Encountered					
Logged By: G. Barut									Drill Rig: MOBILE B-53					
Total Depth: 41 feet									Drilling Method: 4" Solid-Stem Auger & HQ Coring					
Work Order: 4627-00									Driving Energy: 140 lb. wt., 30 in. drop					

		GEOLABS, INC. Geotechnical Engineering				EMERGENCY REPLACEMENT OF FORD CROSSING DISTRICT OF KAU, ISLAND OF HAWAII				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 (feet MSL): 1304.5 *			
										Description			
	11		18	0	50/.3'				ML	Dark brown SANDY SILT with gravel, hard, very moist (alluvium)			
	70				4/.5' +50/.3'		5		MH	Gray strongly vesicular BASALT, severely fractured, slightly weathered, medium hard (pahoe-hoe basalt formation)			
											Orangish brown CLAYEY SILT, medium stiff, very moist (pahala ash)		
			90	25				10			Gray strongly vesicular BASALT, closely to severely fractured, slightly weathered, medium hard (pahoe-hoe basalt formation)		
			100	38							Gray vesicular BASALT, slightly fractured, unweathered, hard (pahoe-hoe basalt formation)		
											Brown and gray scoriaceous BASALT, closely fractured, slightly weathered, medium hard (pahoe-hoe basalt formation)		
			100	33				15				Gray vesicular BASALT, closely to moderately fractured, slightly weathered, hard (basalt formation)	
			100	38								Brown and gray scoriaceous BASALT, closely fractured, slightly weathered, medium hard (pahoe-hoe basalt formation)	
												Gray vesicular BASALT, closely to moderately fractured, slightly weathered, medium hard to hard (pahoe-hoe basalt formation)	
			100	50				25					
			100	60			30			Reddish brown scoriaceous BASALT, closely to severely fractured, slightly weathered, medium hard (pahoe-hoe basalt formation)			
										Gray vesicular BASALT, closely to moderately fractured, slightly weathered, hard to very hard (pahoe-hoe basalt formation)			
			83	53			35						
							40			grades to closely fractured, medium hard to hard			
										Boring terminated at 41 feet			
							45						
							50						
Date Started: January 2, 2001							Water Level: ±						
Date Completed: January 2, 2001							Not Encountered						
Logged By: K. Gronseth							Drill Rig: MOBILE B-53						
Total Depth: 41 feet							Drilling Method: 4" Solid-Stem Auger & HQ Coring						
Work Order: 4627-00							Driving Energy: 140 lb. wt., 30 in. drop						

ORIGINAL PLAN	SURVEY PLOTTED BY _____ DATE _____
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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BORING LOGS

MAMALAHOA HIGHWAY
EMERGENCY REPLACEMENT OF
FORD CROSSING

Federal Aid Project No. ER-12(2)

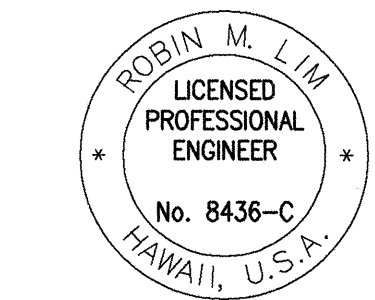
Scale: As Noted Date: Feb. 2001

SHEET No. **AG6** OF **9** SHEETS

		GEOLABS, INC. Geotechnical Engineering						EMERGENCY REPLACEMENT OF FORD CROSSING DISTRICT OF KAU, ISLAND OF HAWAII					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 (feet MSL): 1315 *			
											Description			
UC=3.6 ksi	41	61			15	4.0		✱		ML	Orangish brown fine CLAYEY SILT, stiff, damp (pahala ash)			
	45	65			18	4.3		✱			grades to dark brown, moist			
	30	63	100	33	30/.4'	4.3	5	✱		GM	Brown fine SANDY SILT with basalt gravel, very stiff (pahala ash)			
							10				Gray vesicular BASALT, closely to moderately fractured, slightly weathered, hard (pahoe hoe basalt formation)			
			93	28			15				Gray vugular BASALT, closely fractured, slightly weathered, very hard (pahoe hoe basalt formation) grades to vesicular, closely to moderately fractured, hard at 13 feet grades to severely fractured at 14.5 feet Boring terminated at 16 feet			
							20							
							25							
							30							
							35							
							40							
							45							
							50							
Date Started: January 22, 2001										Water Level: ∓				
Date Completed: January 22, 2001										Not Encountered				
Logged By: K. Gronseth										Drill Rig: MOBILE B-53				
Total Depth: 16 feet										Drilling Method: 4" Solid-Stem Auger & HQ Coring				
Work Order: 4627-00										Driving Energy: 140 lb. wt., 30 in. drop				

		GEOLABS, INC. Geotechnical Engineering						EMERGENCY REPLACEMENT OF FORD CROSSING DISTRICT OF KAU, ISLAND OF HAWAII				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 (feet MSL): 1312 *			
										Description			
UC=1.3 ksi	26	64			27				ML	Brown SANDY SILT with basalt gravel, very stiff, moist (alluvium)			
	90	38			10	3.0			ML	Orange-brown CLAYEY SILT, stiff, moist (pahala ash)			
	39	68			8	4.3	5						
	37		100	38	30/.3'		10		GM	Brown mottled orange CLAYEY SILT with sand and some basalt gravel, hard, moist (pahala ash)			
							15				Gray and red strongly vesicular BASALT, closely to moderately fractured, slightly weathered, medium hard (pahoe hoe basalt formation)		
							15.3			Boring terminated at 15.3 feet			
							20						
							25						
							30						
							35						
							40						
							45						
							50						
Date Started: January 24, 2001									Water Level: z				
Date Completed: January 24, 2001									Not Encountered				
Logged By: K. Gronseth									Drill Rig: CONCORE				
Total Depth: 15.3 feet									Drilling Method: 4" Solid-Stem Auger & NQ Coring				
Work Order: 4627-00									Driving Energy: 140 lb. wt., 30 in. drop				

SURVEY PLOTTED BY	DATE
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ORIGINAL PLAN	
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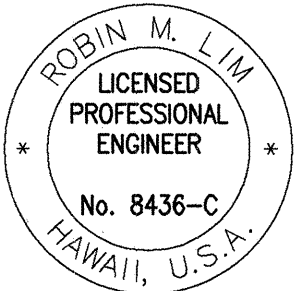
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DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
BORING LOGS
MAMALAHOA HIGHWAY
EMERGENCY REPLACEMENT OF
FORD CROSSING
Federal Aid Project No. ER-12(2)
Scale: As Noted Date: Feb. 2001
SHEET No. AG7 OF 9 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAWAII	ER-12(2)	2001	87	145

GEOLABS, INC. Geotechnical Engineering		EMERGENCY REPLACEMENT OF FORD CROSSING DISTRICT OF KAU, ISLAND OF HAWAII										Log of Boring 11	
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 (feet MSL): 1312 *		
	Description												
	73	45			5	2.5				ML	Orange-brown CLAYEY SILT, soft, very moist (pahala ash)		
	66	53			13	3.3							
	27	70			36/.9' Ref.	>4.5	5						
			90	53							Brownish gray vesicular BASALT, closely to moderately fractured, slightly weathered, medium hard (pahoe-hoe basalt formation)		
							10						
			100	45							Gray vesicular BASALT, closely to moderately fractured, slightly weathered, medium hard (pahoe-hoe basalt formation)		
							15						
											Boring terminated at 16.5 feet		
							20						
							25						
							30						
							35						
							40						
							45						
							50						
Date Started: January 23, 2001												Water Level: z	
Date Completed: January 23, 2001												Not Encountered	
Logged By: K. Gronseth												Drill Rig: MOBILE B-53	
Total Depth: 16.5 feet												Drilling Method: 4" Solid-Stem Auger & HQ Coring	
Work Order: 4627-00												Driving Energy: 140 lb. wt., 30 in. drop	

GEOLABS, INC. Geotechnical Engineering		EMERGENCY REPLACEMENT OF FORD CROSSING DISTRICT OF KAU, ISLAND OF HAWAII										Log of Boring 12	
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 (feet MSL): 1304 *		
	Description												
				100	80						Gray vesicular BASALT, slightly fractured, slightly weathered, hard (pahoe-hoe basalt formation)		
				100	85		5				grades to very hard		
				100	60		10				Gray vesicular BASALT, moderately fractured, slightly weathered, hard (pahoe-hoe basalt formation) grades to closely fractured, medium hard at 10 feet grades to vugular, slightly fractured, very hard at 12 feet		
							15				Grayish red BASALT, closely fractured, slightly weathered, medium hard (pahoe-hoe basalt formation) Boring terminated at 15 feet		
							20						
							25						
							30						
							35						
							40						
							45						
							50						
Date Started: January 25, 2001												Water Level: z	
Date Completed: January 25, 2001												Not Encountered	
Logged By: K. Gronseth												Drill Rig: CONCORE	
Total Depth: 15 feet												Drilling Method: NQ Coring	
Work Order: 4627-00												Driving Energy: 140 lb. wt., 30 in. drop	

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
NOTE BOOK	DRAWN BY	
	DESIGNED BY	
	QUANTITIES BY	
	CHECKED BY	
No.		



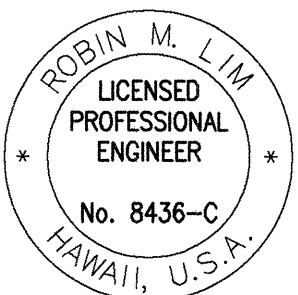
THIS WORK WAS PREPARED BY
ME OR UNDER MY SUPERVISION
Robin M. Lim
GEOLABS, INC.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
BORING LOGS
MAMALAHOA HIGHWAY
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SHEET No. AG8 OF 9 SHEETS

GEOLABS, INC. Geotechnical Engineering		EMERGENCY REPLACEMENT OF FORD CROSSING DISTRICT OF KAU, ISLAND OF HAWAII										Log of Boring 13	
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 (feet MSL): 1296 *			
										Description			
UC=2.4 ksi			83	77							Gray vesicular BASALT, moderately fractured, slightly weathered, hard (pahoe-hoe basalt formation)		
			83 60	77 38			5			MH	Orangish brown CLAYEY SILT, soft, moist (pahala ash)		
UC=4.2 ksi			95	26			10				Reddish gray and gray BASALT, closely to severely fractured, slightly weathered, medium hard (pahoe-hoe basalt formation)		
							15				Boring terminated at 15.5 feet		
							20						
							25						
							30						
							35						
							40						
							45						
							50						
Date Started: January 23, 2001										Water Level: z			
Date Completed: January 23, 2001										Not Encountered			
Logged By: K. Gronseth										Drill Rig: CONCORE			
Total Depth: 15.5 feet										Drilling Method: 4" Solid-Stem Auger & NQ Coring			
Work Order: 4627-00										Driving Energy: 140 lb. wt., 30 in. drop			

GEOLABS, INC. Geotechnical Engineering		EMERGENCY REPLACEMENT OF FORD CROSSING DISTRICT OF KAU, ISLAND OF HAWAII										Log of Boring 14	
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 (feet MSL): 1297 *			
										Description			
UC=3.1 ksi			100	51							Gray vesicular BASALT, moderately fractured, slightly weathered, medium hard to hard (pahoe-hoe basalt formation)		
			93	0			5			MH	Reddish gray vesicular BASALT, closely fractured, slightly weathered, medium hard (pahoe-hoe basalt formation) Orangish brown CLAYEY SILT, soft, moist (pahala ash)		
UC=4.2 ksi			60	40			10				Gray vesicular BASALT, moderately fractured, slightly weathered, hard (pahoe-hoe basalt formation)		
							15				Boring terminated at 15.5 feet		
							20						
							25						
							30						
							35						
							40						
							45						
							50						
Date Started: January 23, 2001										Water Level: z			
Date Completed: January 23, 2001										Not Encountered			
Logged By: K. Gronseth										Drill Rig: MOBILE B-53			
Total Depth: 15.5 feet										Drilling Method: 4" Solid-Stem Auger & HQ Coring			
Work Order: 4627-00										Driving Energy: 140 lb. wt., 30 in. drop			

ORIGINAL PLAN NOTE BOOK No.	SURVEY PLOTTED BY	DATE
	DRAWN BY	
	DESIGNED BY	
	CHECKED BY	



THIS WORK WAS PREPARED BY
ME OR UNDER MY SUPERVISION
[Signature]
GEOLABS, INC.

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SHEET No. AG9 OF 9 SHEETS