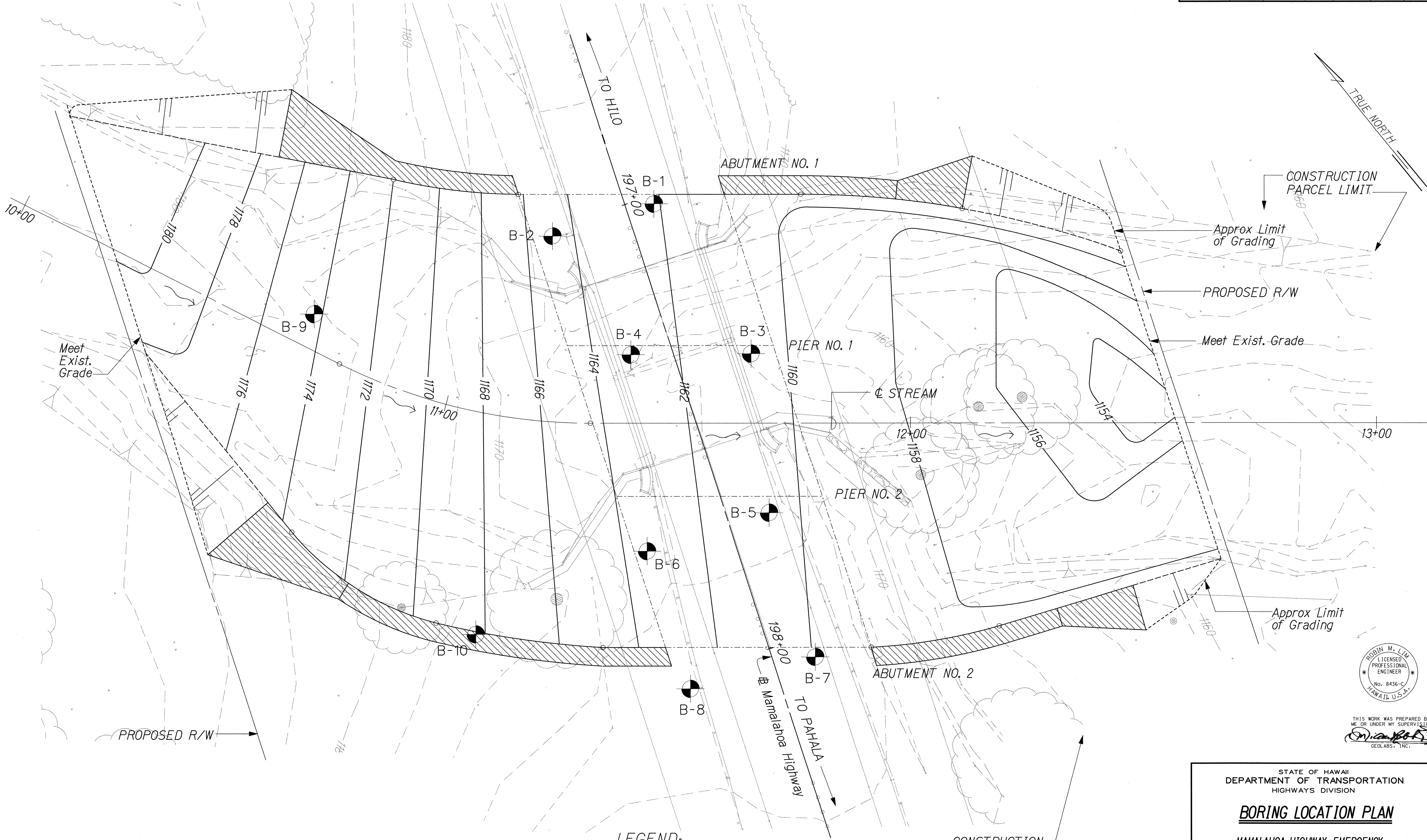


FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	ER-12(2)	2001	138	145



ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
NOTE BOOK	DRAWN BY	
	DESIGNED BY	
	CHECKED BY	

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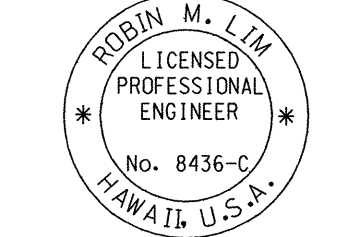
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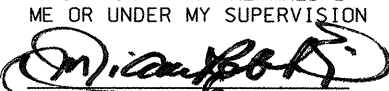
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BORING LOCATION PLAN

MAMALAHOA HIGHWAY, EMERGENCY
REPLACEMENT OF KALAALA STREAM BRIDGE
FEDERAL-AID PROJECT NO. ER-12(2), PAHALA, HAWAII
Scale: 1" = 10' Date: FEBRUARY 20, 2001

SHEET No. 601 OF 8 SHEETS

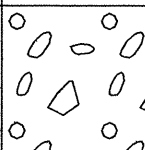
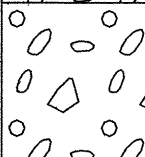
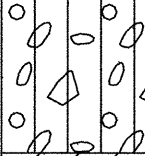
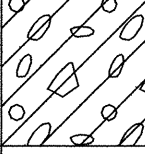
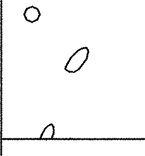
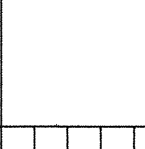
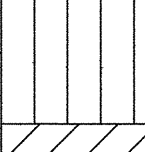
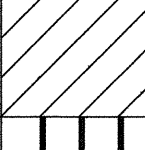
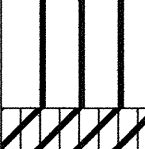
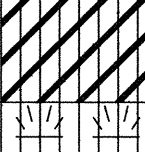

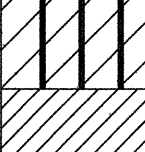
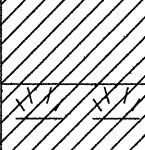

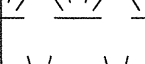


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FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	ER-12(2)	2001	139	145

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		
MORE THAN 50% OF MATERIAL RETAINED ON NO. 200 SIEVE	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		
				MH	INORGANIC SILT, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS		
50% OR MORE OF MATERIAL PASSING THROUGH NO. 200 SIEVE	SILTS AND CLAYS	LIQUID LIMIT 50 OR MORE		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

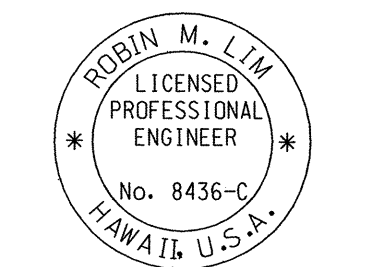
NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS

GEOTECHNICAL NOTES:

- A geotechnical engineering report entitled "Geotechnical Engineering Exploration, Mamalahoa Highway, Emergency Replacement of Kaalaala Stream Bridge, 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 BG1.
- 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.

LEGEND:

- 2-INCH O.D. STANDARD PENETRATION TEST
- 3-INCH O.D. MODIFIED CALIFORNIA SAMPLE
- SHELBY TUBE SAMPLE
- GRAB SAMPLE
- CORE SAMPLE
- LL LIQUID LIMIT
- PI PLASTICITY INDEX
- TV TORVANE SHEAR (tsf)
- PEN POCKET PENETROMETER (tsf)
- WATER LEVEL OBSERVED IN BORING



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Robin M. Lim
GEOLABS, INC.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

LEGEND & NOTES

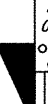
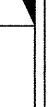

MAMALAHOA HIGHWAY, EMERGENCY
REPLACEMENT OF KAALAALA STREAM BRIDGE
FEDERAL-AID PROJECT NO. ER-12(2), PAHALA, HAWAII

Scale: None Date: FEBRUARY 20, 2001

SHEET No. BG2 OF 8 SHEETS

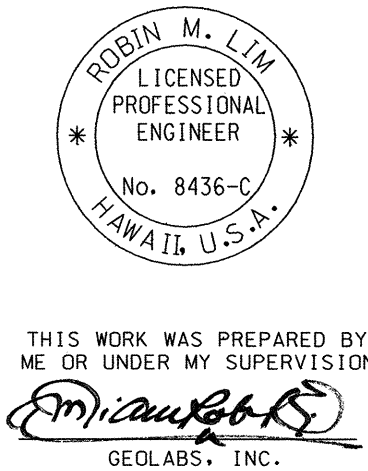
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	ER-12(2)	2001	140	145

		GEOLABS, INC. Geotechnical Engineering				MAMALAHOA HIGHWAY KAALAALA STREAM BRIDGE REPLACEMENT 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): 1176.5 *	
										Description	
			50	20					GM	4-inch ASPHALT CONCRETE	
										Dark gray SILTY BASALT GRAVEL (fill)	
										4-inch CONCRETE	
										Gray BASALT, medium hard to hard (rock fill)	
			100	55			5			Brown and gray scoriaceous BASALT, severely fractured, slightly weathered, medium hard (pahoehoe basalt formation)	
							10			Gray vesicular BASALT, moderately fractured, slightly weathered, hard (pahoehoe basalt formation)	
			100	55						Brown and gray vesicular BASALT, closely fractured, slightly weathered, medium hard to hard (pahoehoe basalt formation)	
							15			Gray vesicular BASALT, moderately fractured, slightly weathered, hard (pahoehoe basalt formation)	
			100	90						grades to slightly fractured, very hard	
			97	37			20				
							25			Gray vesicular BASALT, closely fractured, slightly weathered, hard (pahoehoe basalt formation)	
			80	18						Gray vesicular BASALT, closely to moderately fractured, slightly weathered, hard (pahoehoe basalt formation)	
			100	47			30				
							35				
			100	42							
							40			Reddish brown strongly vesicular BASALT, closely fractured, slightly weathered, medium hard (pahoehoe basalt formation)	
										Gray vesicular BASALT, moderately fractured, slightly weathered, hard (pahoehoe basalt formation)	
							45			Boring terminated at 41.5 feet	
							50				
Date Started: January 8, 2001									Water Level: ∅		
Date Completed: January 8, 2001									Not Encountered		
Logged By: K. Gronseth									Drill Rig: MOBILE B-53		
Total Depth: 41.5 feet									Drilling Method: 4" Solid-Stem Auger & HQ Coring		
Work Order: 4629-00									Driving Energy: 140 lb. wt., 30 in. drop		

		GEOLABS, INC. Geotechnical Engineering					MAMALAHOA HIGHWAY KAALAALA STREAM BRIDGE REPLACEMENT 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): 1176.5 *		
										Description		
UC=3.1 ksi	42				8				GP-GM	Dark gray BASALT GRAVEL with silt, medium dense, moist (fill)		
									ML	Orange-brown SANDY SILT, medium stiff, moist (pahala ash)		
	10		100	67	30/2'		5		GP-GM	Dark gray BASALT GRAVEL with silt, medium dense, damp to slightly moist (clinker)		
										Gray vesicular BASALT, moderately fractured, slightly weathered, hard (pahoehoe basalt formation)		
							10			Reddish brown scoriaceous BASALT, severely fractured, slightly weathered, medium hard (pahoehoe basalt formation)		
										Gray vesicular BASALT, closely to moderately fractured, slightly weathered, hard (pahoehoe basalt formation)		
							15			grades to slightly fractured, hard to very hard		
							20					
										Gray vugular BASALT, moderately fractured, slightly weathered, very hard (pahoehoe basalt formation)		
							25			Gray vesicular BASALT, closely fractured, slightly weathered, hard (pahoehoe basalt formation)		
										Gray vesicular BASALT, moderately fractured, slightly weathered, hard to very hard (pahoehoe basalt formation)		
						30						
						35			Brown and gray scoriaceous BASALT, closely fractured, slightly weathered, medium hard (pahoehoe basalt formation)			
									Gray vugular BASALT, slightly fractured, unweathered, very hard (pahoehoe basalt formation)			
						40			Red and gray vesicular BASALT, severely fractured, moderately weathered, medium hard (pahoehoe basalt formation)			
						45			Gray vugular BASALT, moderately fractured, unweathered, very hard (pahoehoe basalt formation)			
									Boring terminated at 49.5 feet			
Date Started: December 20, 2000								Water Level: ∅				
Date Completed: December 20, 2000								Not Encountered				
Logged By: K. Gronseth								Drill Rig: MOBILE B-53				
Total Depth: 49.5 feet								Drilling Method: 4" Solid-Stem Auger ∅ HQ Coring				
Work Order: 4629-00								Driving Energy: 140 lb. wt., 30 in. drop				

ORIGINAL PLAN	DATE
REVISION	
NOTES	
QUANTITIES	
CHECKED BY	
DATE	

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BORING LOGS

MAMALAHOA HIGHWAY, EMERGENCY
REPLACEMENT OF KAALAALA STREAM BRIDGE
FEDERAL-AID PROJECT NO. ER-12(2), PAHALA, HAWAII

Scale: None Date: FEBRUARY 20, 2001

SHEET No. BG3 OF 8 SHEETS

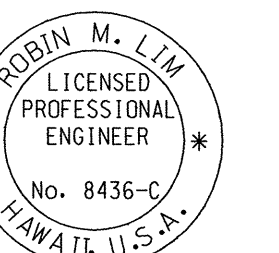
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	ER-12(2)	2001	141	145

		GEOLABS, INC. Geotechnical Engineering				MAMALAHOA HIGHWAY KAALAALA STREAM BRIDGE REPLACEMENT DISTRICT OF KAU, ISLAND OF HAWAII				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 (feet MSL): 1164 *	
										Description	
UC=2.4 ksi			100	100						Gray vesicular BASALT, slightly fractured, unweathered, hard to very hard (pahoehoe basalt formation)	
			100	60						grades to moderately fractured, moderately weathered	
							5			Reddish brown scoriaceous BASALT, closely fractured, slightly weathered, medium hard (pahoehoe basalt formation)	
			100	87						Gray vesicular BASALT, slightly fractured, slightly weathered, hard to very hard (pahoehoe basalt formation)	
			100	61			10			Gray to reddish gray vesicular BASALT, closely to moderately fractured, slightly weathered, hard to very hard (pahoehoe basalt formation)	
							15				
			91	0						Gray to reddish gray vesicular BASALT, closely fractured, slightly weathered, medium hard (pahoehoe basalt formation)	
			100	43							
			100	80			25			Gray vesicular BASALT, moderately fractured, slightly weathered, hard to very hard (pahoehoe basalt formation)	
							30			Gray BASALT, slightly fractured, unweathered, very hard (pahoehoe basalt formation)	
		100	88							Gray vesicular BASALT, slightly to moderately fractured, unweathered, very hard (pahoehoe basalt formation)	
						35				Boring terminated at 36 feet	
						40					
						45					
						50					
Date Started: December 21, 2000 Date Completed: December 21, 2000 Logged By: K. Gronseth Total Depth: 36 feet Work Order: 4629-00									Water Level: ∇ Not Encountered Drill Rig: CONCORE Drilling Method: NQ Coring Driving Energy: 140 lb. wt., 30 in. drop		

		GEOLABS, INC. Geotechnical Engineering				MAMALAHOA HIGHWAY KAALAALA STREAM BRIDGE REPLACEMENT DISTRICT OF KAU, ISLAND OF HAWAII				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 (feet MSL): 1176 *	
										Description	
										5-inch ASPHALT CONCRETE	
										20-inch CONCRETE	
										SPACE BELOW BRIDGE (AIR)	
							5				
			100	87			10			Gray vesicular BASALT, slightly to moderately fractured, slightly weathered, hard (pahoehoe basalt formation)	
			100	80							
							15			Gray vesicular BASALT, slightly fractured, slightly weathered, hard to very hard (pahoehoe basalt formation)	
			100	100			20				
			80	50			25				
							30			Reddish brown vesicular BASALT, severely fractured, moderately weathered, medium hard (pahoehoe basalt formation)	
			50	40			35			Gray vesicular BASALT, moderately fractured, slightly weathered, hard (pahoehoe basalt formation)	
			100	48			40			Gray vugular BASALT, moderately fractured, slightly weathered, hard to very hard (pahoehoe basalt formation)	
			100	28			45			Reddish gray scoriaceous BASALT, closely fractured, slightly weathered, medium hard (pahoehoe basalt formation)	
							50			Boring terminated at 40.6 feet	
Date Started: January 11, 2001 Date Completed: January 11, 2001 Logged By: K. Gronseth Total Depth: 40.6 feet Work Order: 4629-00										Water Level: ∇ Not Encountered Drill Rig: MOBILE B-53 Drilling Method: HQ Coring Driving Energy: 140 lb. wt. 30 in. drop	

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

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OR UNDER MY SUPERVISION

William B. B. B.

GEOLABS, INC.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BORING LOGS

MAMALAHOA HIGHWAY, EMERGENCY
REPLACEMENT OF KAALAALA STREAM BRIDGE
FEDERAL-AID PROJECT NO. ER-12(2), PAHALA, HAWAII

Scale: None Date: FEBRUARY 20, 2001

SHEET No. 664 OF 8 SHEETS

ORIGINAL PLAN

NOTE BOOK

No.

SURVEY LOGGED BY

DRAWN BY

DESIGNED BY

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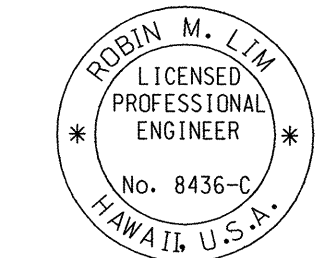
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DATE

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		GEOLABS, INC. Geotechnical Engineering				MAMALAOA HIGHWAY KAALAOA STREAM BRIDGE REPLACEMENT 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): 1175 *		
										Description		
			60	0			0		GM	5-inch ASPHALT CONCRETE		
			Gray SILTY BASALT GRAVEL (fill)									
			Gray BASALT, hard (rock fill)									
			80	20					5	Gray and brown vesicular BASALT, severely fractured, slightly weathered, medium hard (pahoe-hoe basalt formation)		
			100	55						10	Gray vesicular BASALT, slightly fractured, slightly weathered, hard (pahoe-hoe basalt formation)	
			100	93							15	Brownish gray strongly vesicular BASALT, closely fractured, slightly weathered, medium hard (pahoe-hoe basalt formation)
			100	17					20			Gray vesicular BASALT, slightly fractured, slightly weathered, hard (pahoe-hoe basalt formation)
			70	30						25		Gray vesicular BASALT, closely fractured, slightly weathered, hard (pahoe-hoe basalt formation)
			100	20							30	grades to vugular grades to vesicular, moderately fractured, moderately weathered
			100	65					35			Reddish gray to gray vesicular BASALT, closely fractured, slightly weathered, medium hard (pahoe-hoe basalt formation)
Gray vesicular BASALT, slightly to moderately fractured, unweathered, hard (pahoe-hoe basalt formation)												
Boring terminated at 41.5 feet												
							40					
							45					
							50					
Date Started: January 9, 2001									Water Level: ±			
Date Completed: January 9, 2001									Not Encountered			
Logged By: K. Gronseth									Drill Rig: MOBILE B-53			
Total Depth: 41.5 feet									Drilling Method: HQ Coring			
Work Order: 4629-00									Driving Energy: 140 lb. wt., 30 in. drop			

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	ER-12(2)	2001	142	145



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GEOLABS, INC.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION


BORING LOGS

MAMALAHOA HIGHWAY, EMERGENCY
REPLACEMENT OF KAALAALA STREAM BRIDGE
FEDERAL-AID PROJECT NO. ER-12(2), PAHALA, HAWAII

Scale: None Date: FEBRUARY 20, 2001

SHEET No. B65 OF 8 SHEETS




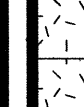
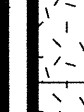

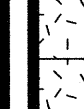


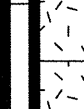


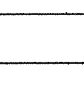
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	ER-12(2)	2001	143	145

		GEOLABS, INC. Geotechnical Engineering					MAMALAHOA HIGHWAY KAALAALA STREAM BRIDGE REPLACEMENT 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): 1174 *		
										Description		
UC=2.9 ksi	11		100	0	20		5			Brown SANDY SILT with gravel, soft to medium stiff, dry to damp (fill)		
										Gray BASALT GRAVEL with silt, medium dense, damp to moist (fill)		
										Gray BASALT ROCK, medium hard to hard (cobble/boulder fill)		
										CONCRETE at 7 and 8 feet		
										Brownish gray strongly vesicular BASALT, closely fractured, slightly weathered, medium hard (pahoehoe basalt formation)		
										Gray vesicular BASALT, moderately fractured, slightly weathered, medium hard (pahoehoe basalt formation)		
										Brownish gray vesicular BASALT, closely fractured, slightly weathered, medium hard (pahoehoe basalt formation)		
										Gray vesicular BASALT, moderately fractured, slightly weathered, hard (pahoehoe basalt formation)		
										Gray vesicular BASALT, closely fractured, slightly weathered, medium hard to hard (pahoehoe basalt formation)		
										Gray vesicular BASALT, moderately fractured, slightly weathered, hard (pahoehoe basalt formation)		
										Brown and gray scoriaceous BASALT, severely fractured, slightly weathered, medium hard (pahoehoe basalt formation)		
										Gray vesicular BASALT, closely to moderately fractured, moderately weathered, medium hard to hard (pahoehoe basalt formation)		

Date Started: December 19, 2000		Water Level: ▽ Not Encountered
Date Completed: December 19, 2000		
Logged By: K. Gronseth		
Total Depth: 51 feet		
Work Order: 4629-00		Drill Rig: MOBILE B-53
		Drilling Method: 4" Solid-Stem Auger ⌀ HQ Coring
		Driving Energy: 140 lb. wt., 30 in. drop

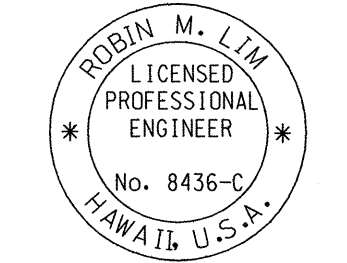
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	ER-12(2)	2001	144	145

GEOLABS, INC. Geotechnical Engineering							MAMALAHOA HIGHWAY KAALAALA STREAM BRIDGE REPLACEMENT 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): 1173.5 *	
										Description	
			40	0					GM	5-inch ASPHALT CONCRETE	
										Gray SILTY BASALT GRAVEL (base material)	
										Dark gray vesicular BASALT, severely fractured, moderately weathered, medium hard (cobble/boulder embankment fill)	
					39		5			Dark gray fine SANDY SILT (pahala ash)	
			100	57					GP-GM	BASALT GRAVEL with silt, dense, damp (alluvium)	
							10			Gray vesicular BASALT, moderately fractured, slightly weathered, hard (pahoe-hoe basalt formation)	
			100	88						Brown and gray vesicular BASALT, severely fractured, slightly weathered, medium hard (pahoe-hoe basalt formation)	
							15			Gray vesicular BASALT, slightly to moderately fractured, slightly weathered, hard (pahoe-hoe basalt formation)	
			100	47						grades to closely fractured	
										grades to slightly fractured	
							20			Brown and gray strongly vesicular BASALT, closely fractured, slightly weathered, medium hard (pahoe-hoe basalt formation)	
			100	53						Gray vugular BASALT, closely to moderately fractured, slightly weathered, hard (pahoe-hoe basalt formation)	
							25			grades to vesicular, slightly fractured, very hard	
			80	50						grades to closely to moderately fractured, moderately weathered	
							30				
			100	52						Brown and gray strongly vesicular BASALT, closely fractured, slightly weathered, medium hard (pahoe-hoe basalt formation)	
							35			Gray vesicular BASALT, closely to moderately fractured, slightly weathered, hard (pahoe-hoe basalt formation)	
			100	57							
							40				
							45			Boring terminated at 41.5 feet	
							50				
Date Started: January 9, 2001							Water Level: \pm				
Date Completed: January 9, 2001							Not Encountered				
Logged By: K. Gronseth							Drill Rig: MOBILE B-53				
Total Depth: 41.5 feet							Drilling Method: HQ Coring				
Work Order: 4629-00							Driving Energy: 140 lb. wt., 30 in. drop				

GEOLABS, INC. Geotechnical Engineering						MAMALAHOA HIGHWAY KAALAALA STREAM BRIDGE REPLACEMENT 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): 1173 *
										Description
	14				66				ML GM	Dark brown SANDY SILT with some clay and gravel (fill) Dark gray SILTY BASALT GRAVEL, medium dense, moist to very moist (fill)
			100	0			5			Gray vesicular BASALT, slightly to moderately fractured, slightly weathered, hard to very hard (pahoe-hoe basalt formation)
			100	100			10			Brown and gray scoriaceous BASALT, closely fractured, slightly weathered, medium hard (pahoe-hoe basalt formation)
				80			15			Gray vugular BASALT, slightly fractured, slightly weathered, very hard (pahoe-hoe basalt formation)
				80			20			Brown and gray vesicular BASALT, severely fractured, slightly weathered, medium hard (pahoe-hoe basalt formation)
			100	70			25			Gray vugular BASALT, slightly to moderately fractured, unweathered, very hard (pahoe-hoe basalt formation)
			97	50			30			Brown and gray vesicular BASALT, closely fractured, slightly weathered, hard (pahoe-hoe basalt formation)
				50			35			Gray strongly vesicular BASALT, moderately fractured, slightly weathered, hard (pahoe-hoe basalt formation)
			100	48			40			grades to closely fractured
			95	17			45			Gray vesicular BASALT, closely fractured, slightly weathered, very hard (pahoe-hoe basalt formation)
										grades to strongly vesicular, medium hard to hard
										grades to vugular, moderately fractured, very hard
			67	14			50			Boring terminated at 50 feet
Date Started: December 18, 2000										Water Level: ±
Date Completed: December 18, 2000										Not Encountered
Logged By: K. Gronseth										Drill Rig: MOBILE B-53
Total Depth: 50 feet										Drilling Method: 4" Solid-Stem Auger ± HQ Coring
Work Order: 4629-00										Driving Energy: 140 lb. wt., 30 in. drop

ORIGINAL PLAN	DATE
DRAWN BY	
DESIGNED BY	
NOTED BY	
CHECKED BY	

J:\KAALAALA\GEOLABS\07BORING.dgn May 2001



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, EMERGENCY
REPLACEMENT OF KAALAALA STREAM BRIDGE
FEDERAL-AID PROJECT NO. ER-12(2), PAHALA, HAWAII
Scale: None Date: FEBRUARY 20, 2001
SHEET No. 867 OF 8 SHEETS

ORIGINAL PLAN

NOTE BOOK

No.

SURVEY DICTATED BY

DRAWN BY

TRACED BY

DESIGNED BY

CHECKED BY

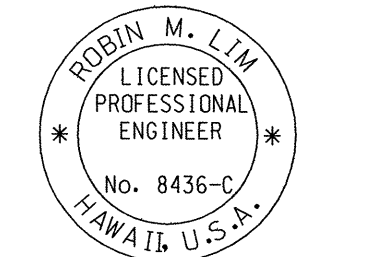
DATE

J6/KAALAAHA/GEOLABS/08BOR10.dgn May 2001

		GEOLABS, INC. Geotechnical Engineering				MAMALAHOA HIGHWAY KAALAALA STREAM BRIDGE REPLACEMENT 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): 1176.5 *	
										Description	
UC=4.4 ksi			100	77						Gray vesicular BASALT, closely to moderately fractured, slightly weathered, hard (pahoe-hoe basalt formation)	
			100	73			5			Reddish brown vesicular BASALT, severely fractured, moderately weathered, medium hard (pahoe-hoe basalt formation)	
			80	55			10			Gray vesicular BASALT, slightly to moderately fractured, slightly weathered, hard to very hard (pahoe-hoe basalt formation)	
			80	25			15			Gray vesicular BASALT, closely to moderately fractured, slightly weathered, hard (pahoe-hoe basalt formation)	
							20			Boring terminated at 20 feet	
							25				
							30				
							35				
							40				
							45				
							50				
Date Started: December 22, 2000									Water Level: \pm		
Date Completed: December 22, 2000									Not Encountered		
Logged By: K. Gronseth									Drill Rig: CONCORE		
Total Depth: 20 feet									Drilling Method: NQ Coring		
Work Order: 4629-00									Driving Energy: 140 lb. wt., 30 in. drop		

		GEOLABS, INC. Geotechnical Engineering				MAMALAHOA HIGHWAY KAALAALA STREAM BRIDGE REPLACEMENT 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): 1177 *	
										Description	
			75	12	23		5		ML SP	Brown SANDY SILT with gravel	
										Gray GRAVELLY BASALT SAND with silt, medium dense, very damp to slightly moist	
										Brown and gray strongly vesicular BASALT, closely fractured, slightly weathered, medium hard (pahoe-hoe basalt formation)	
			100	23			10				
			80	32			15			Gray vesicular BASALT, moderately fractured, slightly weathered, hard (pahoe-hoe basalt formation)	
			83	48			20			Brown and gray vesicular BASALT, closely to moderately fractured, slightly weathered, medium hard to hard (pahoe-hoe basalt formation)	
							25			Boring terminated at 21.5 feet	
							30				
							35				
							40				
							45				
							50				
Date Started: January 10, 2001									Water Level: ♀		
Date Completed: January 10, 2001									Not Encountered		
Logged By: K. Gronseth									Drill Rig: MOBILE B-53		
Total Depth: 21.5 feet									Drilling Method: 4" Solid-Stem Auger & HQ Coring		
Work Order: 4629-00									Driving Energy: 140 lb. wt., 30 in. drop		

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



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Robin M. Lim
GEOLABS, INC.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BORING LOGS

MAMALAHOA HIGHWAY, EMERGENCY
REPLACEMENT OF KAALAALA STREAM BRIDGE
FEDERAL-AID PROJECT NO. ER-12(2), PAHALA, HAWAII

Scale: None Date: FEBRUARY 20, 2001

SHEET No. 888 OF 8 SHEETS