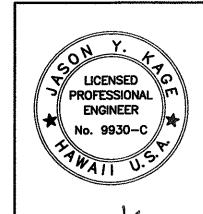
	FED. ROAD DIST. NO.	STATE	FEDERAL — AID PROJ. NO.		SHEET NO.	TOTAL SHEETS
	HAWAII	HAW.	BR-0270(18)	2006	8	31
,						

					BS, IN			WALAC	RETROFIT OF AKONI PULE HIGHWAY HIA BRIDGE AND AAMAKAO BRIDGE	
***				licai	Engine			NOI	RTH KOHALA, ISLAND OF HAWAII	
Other Tests	oisture ontent (%	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample Graphic DUSCS	Approximate Ground Surface Elevation (feet MSL): 441.90 *	
Ö	<u> </u>	≥ۤ۵	ပိုင္ဆို	RC	- R R 전	Pc (ts	۵	S D CH	Description Dark brown SILTY CLAY with some gravel and	Programment Const.
	28	69	61		15/.3' Ref. 34	0.5	5·		cobbles, medium stiff, moist (fill) Gray with orange and brown mottling BASALTIC BOULDERS AND COBBLES in a brown clayey silt matrix, very dense (fill)	
	J		67		04			18		
			67							
			50		20/.0' Ref.		10			
			60		10/.0' Ref.		15			
			28				20	MH	Dark reddish brown with multi-color mottling CLAYEY SILT, medium stiff, moist to very moist (saprolite)	Recognition
	63		67		14		25			
	43		21		45		30			
	64		14		10	2.5	35			
	66		71		12		40		grades to gray with yellow and brown mottling, sto very stiff grades to brown and gray with yellow mottling	:iff
	71		93	71	14		45			
				, 1			50-	ななな	Gray with yellow and brown mottling vesicular BASALT, slightly fractured, moderately weather (weathered basalt formation)	∍d —
Date Star					5, 2002	maren amaren a			Water Level: ▼ Not Encountered	
Date Con Logged E			Nover Y. Ch	·	7, 2002				Drill Rig: MOBILE B-53	
Total Dep		(65 fee 4959-	et		***************************************		***************************************	Drilling Method: 4" Auger & HQ Coring Driving Energy: 140 lb. wt., 30 in. drop	

G	GEOLA eotechnica	•		1	LAO	RETROFIT OF AKONI PULE HIGHWAY HIA BRIDGE AND AAMAKAO BRIDGE RTH KOHALA, ISLAND OF HAWAII 1
Other Tests Moisture Content (%)	Weight (pcf) Core Recovery (%) RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet) Sample Graphic	nscs	(Continued from previous plate) Description
56 No 10 No	S K K K K K K K K K	15/.0' Ref. 20/.0' Ref.	3.5	3 5 60 65 70 75 80 95 95 95 95 95 95 95 95		grades to closely to moderately fractured, moderately to highly weathered, hard to medium hard Gray with yellow and brown mottling vesicular BASALT, closely fractured, highly weathered, soft (weathered basalt formation) grades to extremely weathered, breaks down to silty clay with sand, very stiff Gray with yellow mottling vesicular BASALT, slightly fractured, moderately to slightly weathered, hard (basalt formation) Boring terminated at 65 feet * Elevations estimated from Elevation Plan provided by Sato & Associates, Inc. on August 20, 2002.
Date Started: Date Completed	Novembe : Novembe	***************************************	1	00		Water Level: Not Encountered
Logged By: Total Depth:	Y. Chiba 65 feet					Drill Rig: MOBILE B-53 Drilling Method: 4" Auger & HQ Coring
Work Order:	4959-00					Driving Energy: 140 lb. wt., 30 in. drop

<u>Note:</u>

For Boring Locations See Sheet 13.



STATE OF HAWAII

DEPARTMENT OF TRANSPORTATION

HIGHWAYS DIVISION

BORING LOGS - 1

WALAOHIA & AAMAKAO BRIDGES

AKONI PULE HIGHWAY, SEISMIC RETROFIT

OF WALAOHIA AND AAMAKAO BRIDGES

FAIP No. BR-0270(18)

Date: May 2006

SHEET No. 1 OF 3 SHEETS

04/30/08
EXPIRATION DATE OF THE LICENSE

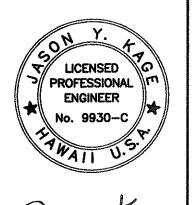
ED. ROAD	STATE	FEDERAL — AID	FISCAL	SHEET	TOTAL
DIST. NO.		PROJ. NO.	YEAR	NO.	SHEETS
HAWAII	HAW.	BR-0270(18)	2006	9	31

			ABS, IN		3		LAO	RETROFIT OF AKONI PULE HIGHWAY HIA BRIDGE AND AAMAKAO BRIDGE RTH KOHALA, ISLAND OF HAWAII Log of Boring 2
Other Tests Moisture		Recovery (%)			Depth (feet)—	Sample Graphic		Approximate Ground Surface Elevation (feet MSL): 441.80 *
0 ≥ 3 41 46	73	عَ هُوْ ا	14	P. (#	<u> </u>	S	CH	Tannish brown with multi-color mottling SILTY CLAY with some gravel and root/rootlets, very stiff, moist (fill)
			12		5-	X	МН	Yellowish tan with multi-color mottling CLAYEY SILT with highly weathered gravel, very stiff, damp (fill)
28		00	30/.3' Ref.		10- - -			Yellowish tan highly weathered BASALTIC BOULDERS AND COBBLES in a clayey silt matrix, very dense (fill) Gray dense BASALTIC BOULDERS AND COBBLES in a clayey silt matrix (fill)
		67			15- - -			
		10			20- - - -		GC	Grayish brown with multi-color mottling CLAYEY GRAVEL AND SAND, medium dense, very moist
47		48	25		25- - -	00000000000000000000000000000000000000		(saprolite)
47		50 3	26		30-	A Control of the Cont		
		58 C			35- 	をないたーバーバー		Gray vesicular BASALT, slightly fractured, moderately weathered, hard (basalt formation)
56			27	4	40	经济公众		Brown with multi-color mottling BASALT, highly to extremely weathered, medium hard (saprolite)
69		00	19	4	45-	でなるない	The second secon	grades to extremely weathered, friable, breaks down to silty friable sand, medium dense
Date Started:		52 14 ovemb	er 5, 2002		50-			Water Level: ▼ Not Encountered
Date Comple	ted: No	ovemb	er 5, 2002				~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	Not Encountered
Logged By: Total Depth:	~~~~~	Chiba						Drill Rig: MOBILE B-53 Drilling Method: 4" Auger & HQ Coring
Work Order:	49	959-00						Driving Energy: 140 lb. wt., 30 in. drop

	- 1	Geof	techi	nical	3S, IN Engine			SEISMIC RETROFIT OF AKONI PULE HIGHWAY WALAOHIA BRIDGE AND AAMAKAO BRIDGE NORTH KOHALA, ISLAND OF HAWAII 2				
Other Tests	sture	Dry Unit Weight (pcf)	e overy (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample Graphic	SS	(Continued from previous plate)		
o#	S S S S	Ve	Core	RQ	Res (blo	Poc (tsf)	Dep	San Gra	USCS	Description		
			60	22	15/.0' Ref.					Gray with brown and black mottling vesicular to dense BASALT, closely fractured, highly to moderately weathered, hard to medium hard (basalt formation)		
	50				65		55		SM	Brown and gray with multi-color mottling SILTY SAND AND GRAVEL, dense, very moist (saprolite)		
	00		0.5							(oapronto)		
			95	55	15/.0'		60			Gray with white and brown mottling vesicular to dense BASALT, closely fractured, highly to moderately weathered, hard to medium hard (basalt formation)		
			90	52	Ref.					(basait ioimation)		
				MINISTER MANAGEMENT OF THE STREET			65					
		**************************************)		PROGRAMMAN AND AND AND AND AND AND AND AND AND A				Boring terminated at 66 feet		
THE PARTY OF THE P						Angelia de Antonio de	70					
		sannten manadoko-piozazian mikitorik					70	Ţ				
eurysmynn y mountaismusentais												
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							75					
ON MANAGEMENT AND						and the second programme is a second programme in the second programme in the second programme is a second programme in the second programme in the second programme is a second programme in the second programme in the second programme is a second programme in the second programme in the second programme is a second programme in the second programme in the second programme is a second programme in the second programme in the second programme in the second programme is a second programme in the second programme in the second programme is a second programme in the second programme in the second programme is a second programme in the second programme in the second programme is a second programme in the second programme in the second programme is a second programme in the second programme in the second programme is a second programme in the second programme in the second programme is a second programme in the second programme in the second programme is a second programme in the second programme in the second programme is a second programme in the second programme in the second programme is a second programme in the second programme in the second programme is a second programme in the second programme in the second programme is a second programme in the second programme in the second programme is a second programme in the second programme in the second programme is a second programme in the second programme in the second programme is a second programme in the second programme	80					
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							90		:			
PERSONAL PROPERTY AND ADVANCES												
Administration of the Control of the												
							95					
Training a supplementary and the second						Annual programme and annual sections.		- And				
Date Star	ted:		Nove	mber	5, 2002		00			Water Level: Not Encountered		
Date Con		ed:		mber	5, 2002					Drill Rig: MOBILE B-53		
Logged B Total Dep		*********	66 fe							Drilling Method: 4" Auger & HQ Coring		
Work Ord			4959-	-00						Driving Energy: 140 lb. wt., 30 in. drop		

<u>Vote:</u>

For Boring Locations See Sheet 13.



STATE OF HAWAII

DEPARTMENT OF TRANSPORTATION

HIGHWAYS DIVISION

BORING LOGS - 2

WALAOHIA & AAMAKAO BRIDGES

AKONI PULE HIGHWAY, SEISMIC RETROFIT

OF WALAOHIA AND AAMAKAO BRIDGES

FAIP No. BR-0270(18)

Scale: NONE Date: May 2006

SHEET No. 2 OF 3 SHEETS

04/30/08
EXPIRATION DATE OF THE LICENSE

					3S, IN				ALAC	RETROFIT OF AKONI PULE HIGHWAY OHIA BRIDGE AND AAMAKAO BRIDGE RTH KOHALA, ISLAND OF HAWAII Log of Boring
Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample Graphic		Approximate Ground Surface Elevation (feet MSL): 394 * Description
	22	74)	Budden	37	>4.5 1.5			MH	Brown with orange mottling CLAYEY SILT with sand, cobbles and root/rootlets, hard, damp (colluvium) grades to tannish brown with organics
	52	62			36	>4.5	5		МН	Dark gray with yellow and brown mottling CLAYEY SILT with root/rootlets, very hard, damp (saprolite)
					38		10	XXXX		Reddish brown with black and dark brown mottling vesicular BASALT, highly to extremely weathered, friable, breaks down to clayey silt, stiff (weathered basalt formation)
			35	30	10/.0' Ref.		15	×o _×	A. C.	Gray vesicular BASALT, closely fractured, moderately weathered, hard (basalt formation) CLINKER
			70	63			20	一人の人の人の人		grades with orange and white mottling vesicular, closely to moderately fractured, moderately weathered, hard
			100	100			25	ハーハーハーハーハーハー		grades with white mottling, slightly fractured, moderately to slightly weathered
							30-			Boring terminated at 27 feet
							35	1		
							40			
							45			
GPJ GEOLABS.GDT 1077/03	-4-4	понивания			0.000		50-			
Date Sta	nplete	ed:	Nove	mber	6, 2002 7, 2002	THE CONTRACT OF THE CONTRACT O				Water Level: ▼ Not Encountered
Logged E Total De	***************************************	***************************************	Y. Ch 27 fee							Drill Rig: CONCORE Drilling Method: 4" Auger & NX Coring
Work Ord	der:	4	<u> 4959-</u>	00						Driving Energy: 140 lb. wt., 30 in. drop

Boring Log Legend

UNIFIED SOIL CLASSIFICATION SYSTEM (USCS)

	MAJOR DIVISION	S	US	cs	TYPICAL DESCRIPTIONS		
	GRAVELS	CLEAN GRAVELS	0000	GW	WELL-GRADED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES		
COARSE- GRAINED	GRAVELS	LESS THAN 5% FINES	000	GP	POORLY-GRADED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES		
SOILS	MORE THAN 50% OF COARSE	GRAVELS WITH FINES	000	GM	SILTY GRAVELS, GRAVEL-SAND-SILT MIXTURES		
	FRACTION RETAINED ON NO. 4 SIEVE	MORE THAN 12% FINES		GC	CLAYEY GRAVELS, GRAVEL-SAND-CLAY MIXTURES		
	CANDO	CLEAN SANDS	0	SW	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES		
MORE THAN 50% OF MATERIAL	SANDS	LESS THAN 5% FINES		SP	POORLY-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES		
RETAINED ON NO. 200 SIEVE	50% OR MORE OF COARSE FRACTION PASSING	SANDS WITH FINES		SM	SILTY SANDS, SAND-SILT MIXTURES		
	THROUGH NO. 4 SIEVE	MORE THAN 12% FINES		SC	CLAYEY SANDS, SAND-CLAY MIXTURES		
	OH TO			ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SAND OR CLAYEY SILTS WITH SLIGHT PLASTICITY		
FINE- GRAINED SOILS	SILTS AND CLAYS	LIQUID LIMIT LESS THAN 50		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		
#00/ OB 1105# 0=				МН	INORGANIC SILT, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS		
50% OR MORE OF MATERIAL PASSING THROUGH NO. 200	SILTS AND CLAYS	LIQUID LIMIT 50 OR MORE		СН	INORGANIC CLAYS OF HIGH PLASTICITY		
SIEVE				ОН	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS		
ŀ	HIGHLY ORGANIC SOI	LS	7 77 7 7 77 77	PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS		

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS

LEGEND

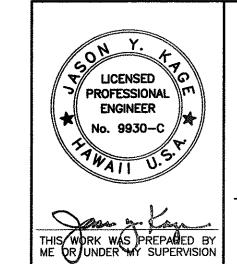
	2-INCH O.D. STANDARD PENETRATION TEST	LL	LIQUID LIMIT
	3-INCH O.D. MODIFIED CALIFORNIA SAMPLE	Pl	PLASTICITY INDEX
S	SHELBY TUBE SAMPLE	TV	TORVANE SHEAR (tsf)
G	GRAB SAMPLE	PEN	POCKET PENETROMETER (tsf)
	CORE SAMPLE	UC	UNCONFINED COMPRESSION (psi)
		$\bar{\Sigma}$	WATER LEVEL OBSERVED IN BORING

GEOTECHNICAL NOTES

- 1. A geotechnical engineering report entitled "Geotechnical Engineering Exploration, Seismic Retrofit of Akoni Pule Highway, Walaohia Bridge and Aamakao Bridge, North Kohala, Island of Hawaii" dated October 2003 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.
- 2. For boring locations, see Sheet 13.
- 3. 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.
- 4. 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.
- 5. 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.

<u>Note:</u>

For Boring Locations See Sheet 13.



EXPIRATION DATE OF THE LICENSE

STATE OF HAWAII

DEPARTMENT OF TRANSPORTATION

HIGHWAYS DIVISION

BORING LOGS - 3

FED. ROAD DIST. NO. STATE FEDERAL - AID FISCAL SHEET TOTAL PROJ. NO. YEAR NO. SHEETS

HAWAII HAW. BR-0270(18) 2006 10

WALAOHIA & AAMAKAO BRIDGES

AKONI PULE HIGHWAY, SEISMIC RETROFIT
OF WALAOHIA AND AAMAKAO BRIDGES
FAIP No. BR-0270(18)

Scale: NONE Date: May 2006
SHEET No. 3 OF 3 SHEETS

AKONIPULEMMY BORINGLOGS.DWG R:\AkoniPuleHwy\SHT.dwg NO.: 02022-00 ATE:

ORIGINAL SURVEY PLOTTED BY—
PLAN DRAWN BY
NOTE BOOK DESIGNED BY
QUANTITIES BY
CHECKED BY
CHECKED BY

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