

# FED. ROAD DIST. NO. STATE FED. AID PROJ. NO. FISCAL SHEET TOTAL SHEETS HAWAII HAW. BR-083-1(42) 2009 86 121

## 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		GM	SILTY GRAVELS, GRAVEL-SAND-SILT MIXTURES
	FRACTION RETAINED ON NO. 4 SIEVE	MORE THAN 12% FINES		GC	CLAYEY GRAVELS, GRAVEL-SAND-CLAY MIXTURES
	SANDS	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
	CUITO			ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS 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
			1	OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
				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
<b> </b>	HIGHLY ORGANIC SOI	LS	7 77 7 7 77 7 77 77	PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS

#### <u>LEGEND</u>

2-INCH O.D. STANDARD PENETRATION TEST
3-INCH O.D. MODIFIED CALIFORNIA SAMPLE
SHELBY TUBE SAMPLE
GRAB SAMPLE

CORE SAMPLE

PI PLASTICITY INDEX

TV TORVANE SHEAR (tsf)

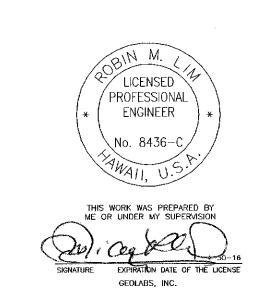
PEN POCKET PENETROMETER (tsf)

UC UNCONFINED COMPRESSION (psi)

WATER LEVEL OBSERVED IN BORING

#### **GEOTECHNICAL NOTES**

- A geotechnical engineering report entitled "Geotechnical Engineering Exploration,
  Kamehameha Highway Replacement of South Punaluu Bridge, Proj. No. BR-083-1(42)
  Punaluu, Oahu, Hawaii" dated April 3, 2006 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 B1.
- 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.



STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

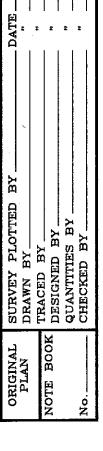
#### BORING LOG LEGEND

KAMEHAMEHA HIGHWAY — REPLACEMENT OF SOUTH PUNALUU STREAM BRIDGE Federal Aid Project No. BR-083-1(42)

Scale: None

Date: May 2009

SHEET No. B2 OF 15 SHEETS

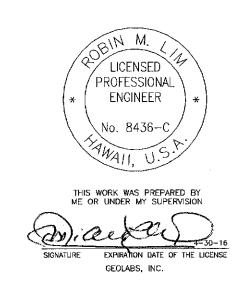


	Content (%		Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pen	ee	1 1 1		Approximate Ground Surface
	11		R <sub>O</sub> Re	( )	ne Sis ⊠	Pocket I (tsf)	Depth (feet)	Sample Graphic	nscs	Elevation" "(feet MSL): 6.1 *
				ᄍ	Re (b)	Po (tsl	De	လ တ	sn	Description
								2 % V	SP	6-inch ASPHALTIC CONCRETE
2		101	·		42/.5' +20/.3' Ref.		¥	X	SF	Tannish brown SAND with some silt and some basaltic gravel, dense, moist (fill)
	21	93			27 21		J	X	SP	Whitish tan coarse SAND with shell fragments and well rounded gravel, medium dense (beach sand)
	13				20/.1' Ref.		10	***		Whitish gray CORAL, breaks down to silty coralline gravel with sand, very dense (coral formation)
1	10				35/.2' Ref.		15			Whitish gray CORAL, breaks down to coarse sand with some silt and coralline gravel, very dense (coral formation)
	11				52	,	20	•		Poring terminated at 21.5 foot
							25			* Elevations estimated from Topographic Plan received from M & E Pacific, Inc. on July 8, 2002.
							30			
							35			
					:		40			
							45			
							50			
Date Starte			June June		·····	_				Water Level: ▼ 4.6 ft. 6/17/02 1046 HRS
Logged By			Y. Ch							Drill Rig: CME-75
Total Dept			21.5 f		<del>.</del>	*				Drilling Method: 6" Hollow-Stem Auger Driving Energy: 140 lb. wt., 30 in. drop

		<del>                                     </del>						<u> </u>			ACUA LIVAY DEDI ACEMENT OF SOUTH Log of	┐┖──
		(				3S, IN Engine		ŀ			MEHA HWY. REPLACEMENT OF SOUTH Boring UU BRIDGE PROJ. NO. BR-083-1 (42) PUNALUU, OAHU, HAWAII 2	
	Other Tests	nsture Intent (%)	y Unit eight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample Graphic	nscs	Approximate Ground Surface Elevation" "(feet MSL): 6.3 *	
	_ ₹	<u>2</u> 8	ΩW	Co Re	RC	Re (b.	Po (ts)	De	Sa	S	Description 6.5-inch ASPHALTIC CONCRETE	
		13	93			32				SP	7-inch CONCRETE Brownish tan SAND with coralline gravel, medium	1
		14				31		,	Z	SC SP	dense, damp (fill)	<b>A</b>
:	·	20	86			50	7	z 5			Grayish brown CLAYEY SAND with some well rounded gravel, medium dense, damp	1
										SP	Brownish tan SAND, dense, damp Whitish gray coarse SAND with some shell	
								,	1	SM	fragments and coralline gravel, dense (beach	
		34				4		10-			sand) Gray SILTY FINE SAND, loose	
		J <del>4</del>				4				SW	Gray GRAVELLY SAND AND SOME SILT, very	]
									. 4		loose to loose (reef detritus)	1
						00/4		15			Grayish white CORAL, breaks down to cemented	1
						30/.1' Ref.			**		coralline sand with some shell fragments, dense	1
			·					•	**		(coral formation)	
								-	- *** ***			1
		6				30/.3' Ref.		20-	**		Boring terminated at 20.8 feet	1
						Kei.		,	1			]
									]			]
:								25	]			]
;												
									1			
								30-			•	
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;								35			·	1
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												}
								40-				1
						:		40				
;								,				
									_			1
						:		45				
10/25/02			·					,				
LABS.GDT												
0.GPJ GEO	Date Star	ted·		June	18 2	002		50-		<u> </u>	Water Level: ▼ 5.1 ft. 6/18/02 0941 HRS	1
OCT 4867-0	Date Com Logged B	plet	ed:	June Y. Ch	18, 2						Drill Rig: CME-75	-
ING FOG E	Total Dep	th:		20.8 1	eet	`					Drilling Method: 5" Auger & PQ Coring	1
BOR	Work Ord	er:		<u> 4867-</u>	·uu(B	)			<del></del>		Driving Energy: 140 lb. wt., 30 in. drop	j

FED. ROAD DIST. NO. STATE FED. AID PROJ. NO. FISCAL SHEET NO. SHEETS

HAWAII HAW. BR-083-1(42) 2009 87 121



STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

## BORING LOGS 1 & 2

KAMEHAMEHA HIGHWAY — REPLACEMENT
OF SOUTH PUNALUU STREAM BRIDGE
Federal Aid Project No. BR-083-1(42)

Scale: None

Date: May 2009

		LABS, IN		1		MEHA HWY. REPLACEMENT OF SOUTH UU BRIDGE PROJ. NO. BR-083-1 (42) PUNALUU, OAHU, HAWAII	Log of Boring
Other Tests	Content (%) Iry Unit Veight (pcf) Core (ecovery (%)	RQD (%) Penetration Resistance blows/foot)	ocket Pen. tsf)	Depth (feet) Sample	ISCS	Approximate Ground Surface Elevation" "(feet MSL): 3.5 *  Description	
	20 07	<u> </u>			SP	Tan CORALLINE SAND with some basalt	ic gravel,

er T	stur	gh:	e over	6) C	etra ista ws//	ket	oth (	phic	SS	Elevation" "(feet MSL): 3.5 *
Oŧĥ	Soil	Dry Wei	Cor	RQI	Pen Res (blo	Poc (tsf)	Dep	San	)SN	Description
	23 25	87			36 29		7	X	SP	Tan CORALLINE SAND with some basaltic grave medium dense, damp (fill/beach sand) grades to tannish brown with some silt, moist

15	114	28	5	5 <b>X</b>	
		8	10	SIV	Gray SILTY FINE CORALLINE SAND with traces of coralline gravel and subrounded basaltic gravel, loose to very loose (lagoonal deposit)
13		32	15		Gray SILTY BASALTIC GRAVEL with some coralline gravel and sand, medium dense (alluvium/lagoonal deposit)
22		21	20	GF	Light gray SANDY CORALLINE GRAVEL with traces of silt, loose to medium dense (reef

detritus)

-	- -
GM	Light gray SILTY CORALLINE GRAVEL with sand, loose (lagoonal deposit)

grades with some cemented sand

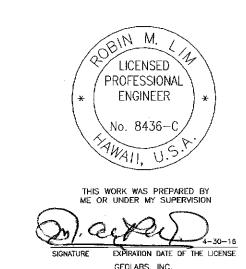
grades to medium dense

		40	
20		40 1 GP	Light gray CORALLINE GRAVEL with some sand
			and shells, loose
		SM	Grayish brown SILTY BASALTIC SAND with
			traces of subrounded basaltic gravel, coralline
		1,5	gravel and shells, very loose (lagoonal/alluvium)
\\\/t \alpha	fl	437	

Date Started: Date Completed:	May 23, 2002 May 24, 2002	Water Level: ¥	2.8 ft. 5/23/02 1500 HRS 2.6 ft. 5/24/02 1523 HRS
Logged By:	E. Shinsato	Drill Rig:	CME-75
Total Depth:	110.2 feet	Drilling Method:	4" Auger & 4" Casing
Work Order:	4867-00(B)	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.	BR-083-1(42)	2009	88	121
g of						

					3S, IN Engine					MEHA HWY. REPLACEMENT OF SOUTH Boring UU BRIDGE PROJ. NO. BR-083-1 (42) PUNALUU, OAHU, HAWAII
Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Jepth (feet)	Sample Graphic	nscs	(Continued from previous plate)  Description
O	34 83	<u> </u>	S R		13	2.0	55		GM MH- ML	Grayish brown SILTY BASALTIC GRAVEL with traces of sand and coralline gravel, loose (alluvium)  Dark brown with orange-brown seams CLAYEY SILT with some highly weathered subrounded basaltic gravel and sand, very stiff (older alluvium)
	54	62			70	4.5	60-		МН	Dark brown with red mottling CLAYEY SILT with highly weathered subrounded basaltic gravel and sand, very stiff (older alluvium)
LL=96 PI=47 LL=96 PI=47	65				21	3.0	65			grades with multi-colored layers
	60	62			86		70	M	SM	Grayish brown to brown with multi-color mottling SILTY BASALTIC SAND with some highly weathered gravel, dense (older alluvium)
	54				35		75	<b>\</b>		One to be a second of AVEV CIL To the conse
	79				17		80		MH	Orange-brown to brown CLAYEY SILT with some highly weathered gravel and sand, very stiff (older alluvium)
	35	82			93		85		GM	Grayish brown with multi-color mottling SILTY BASALTIC GRAVEL with sand, dense (older alluvium) grades with basaltic cobbles and boulders
	13				27/.5' +40/.3' Ref.		90-			grades to very dense
	11				37/.5' +50/.3' Ref.		95	**************************************		
Date Sta			May 2				INO.			Water Level:   2.8 ft. 5/23/02 1500 HRS 2.6 ft. 5/24/02 1523 HRS
Date Cor Logged E			May 2 E. Sh	insat	0					Drill Rig: CME-75
Total De	pth: der:		110.2 4867-							Drilling Method: 4" Auger & 4" Casing Driving Energy: 140 lb. wt., 30 in. drop



STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

#### BORING LOG 3

KAMEHAMEHA HIGHWAY — REPLACEMENT
OF SOUTH PUNALUU STREAM BRIDGE
Federal Aid Project No. BR-083-1(42) Scale: None Date: May 2009

SHEET No. B4 OF 15 SHEETS

88

22 115

49

32

56

13   13   15   15   15   15   15   15			SEOLA otechnica						MEHA HWY. REPLACEMENT OF SOUTH Bori JU BRIDGE PROJ. NO. BR-083-1 (42) PUNALUU, OAHU, HAWAII	ng
Ref. 40/.3' Ref. 50/.2' Ref. Boring terminated at 110.2 feet 120-135-135-140-140-140-140-140-140-140-140-140-140	1	t (%)	(%) (%) (%)	ation ince foot)	Pen.	feet)	(1) (1)			
13	stur			netra sista ws/	ket	oth (	ndi jhdi	၂ ဗွ	(Continued from previous plate)	_
Ref. 40/.3' Ref. 50/.2' Ref. Boring terminated at 110.2 feet 120-135-135-140-140-140-140-140-140-140-140-140-140			W Se Se	Per Res (blo	Poc (tsf)	Dep	Sar Gra	)SN	Description	_
13 40/.3* Ref. 105 Boring terminated at 110.2 feet 125 135 130 135 140 140 140 140 150 150 150 150 150 150 150 150 150 15				52/.5'			13	GM		
Ref. 50/.2° Ref. 110 Boring terminated at 110.2 feet 125 125 130 135 140 140 140 140 140 150 150 150 150 150 150 150 150 150 15		:		Ref.		_				
Ref. 50/.2° Ref. 110 Boring terminated at 110.2 feet 125 125 130 135 140 140 140 140 140 150 150 150 150 150 150 150 150 150 15						-				
Ref. 50/.2° Ref. 110 Boring terminated at 110.2 feet 125 130 140 140						-				
Ref. 50/.2' Ref. 110 Boring terminated at 110.2 feet 120 125 130 135 140 140 140 150 160 160 160 160 160 160 160 160 160 16	1	13		40/.3'		105-				
120- 125- 130- 135-						-		•		
120- 125- 130- 135-	:					-				
115- 120- 125- 130- 135-										
115- 120- 125- 130- 130- 140-				50/01		   10-	34			_
120- 125- 130- 135- 140-		:		l l	,		4		Boring terminated at 110.2 feet	
120- 125- 130- 135-				Kel.			$\left  \cdot \right $			
125-						-				
125-						115	]	,		
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130-						.				
130-							4			
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150		<u> </u>				150-		<u> </u>		
ate Started: May 23, 2002 Water Level:   2.8 ft. 5/23/02 1500 HRS 2.6 ft. 5/24/02 1523 HRS										
egged By: E. Shinsato Drill Rig: CME-75									Drill Rig: CME-75	
otal Depth: 110.2 feet Drilling Method: 4" Auger & 4" Casing Ork Order: 4867-00(B) Driving Energy: 140 lb. wt., 30 in. drop	Depth	th:	110.2 fee	et						

<u>`````</u>	(3)				Engine					PUNALUU, OAHU, HAWAII  Annousing to Crown of Surface
Other Tests	Moisture Content (%	Dry Unit Weight (po	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	oth (fee	Sample Graphic	nscs	Approximate Ground Surface Elevation" "(feet MSL): 7.2 *
<del>g</del>	<u>S</u> S	Dry We	Cor Rec	RQ	Per Res (blo	Poc (tsf)	Det	Sar Gra	Sn	Description
								95 L	GM	6-inch ASPHALTIC CONCRETE 6-inch CONCRETE
	10				10/.1'				ML	Brownish tan SILTY GRAVEL with sand, medium
			13	0	Ref.			18		dense, moist (fill)
							5-	18		Tannish brown SANDY SILT with gravel, dense,
							, J	Q	SP	damp (fill)   COBBLES AND BOULDERS (fill)
					00	7			SF	Tan SAND with some well rounded sand and
	30				22				SM	gravel, medium dense, saturated (alluvium/beach
							10-			(sand) Whitish gray SILTY SAND with some coralline
							<b>,</b> ,			gravel, medium dense (alluvium/beach sand)
					4.4					
	22				11			00	4	Gray GRAVEL with sand and silt, medium dense (alluvium/beach sand)
							15-	0.0		
								000	GP- GM	Light gray GRAVEL with coralline sand and silt, loose to very loose (lagoonal deposit)
	40							000		1003e to very 1003e (lagoorial deposit)
	12				4		•	000	-	
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	40				4				GW- GM	
							40-	0.0	GIVI	very 1005e to 1005e (lagoonal deposit)
							,	00 5	•	l
	41				2		·	000		grades to very loose
	4				-			0.0		
							45	0.0		
								000		
	36				2			0.0		
	30				~	1			SC	
							50		1	
Date Sta	_		June June					<u></u>		Water Level: ▼ 7.2 ft. 6/6/02 1418 HRS
Date Co Logged			<u>June</u> Y. Ch		1UZ		<u> </u>			Drill Rig: CME-75
	epth:		114 f							Drilling Method: 5" Auger & PQ Coring

LICENSED PROFESSIONAL ENGINEER STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION BORING LOGS 3 & 4 KAMEHAMEHA HIGHWAY — REPLACEMENT
OF SOUTH PUNALUU STREAM BRIDGE
Federal Aid Project No. BR-083-1(42)

FISCAL SHEET TOTAL YEAR NO. SHEETS

2009 89 121

FED. AID PROJ. NO.

BR-083-1(42)

FED. ROAD DIST. NO.

Date: May 2009 SHEET No. B5 OF 15 SHEETS

Scale: None

					3S, IN		P		MEHA HWY. REPLACEMENT OF SOUTH Boring
<u> </u>			েভা	noai				<u> </u>	PUNALUU, OAHU, HAWAII 4
Other Tests	Moisture Content (%	Dry Unit Weight (pc	Core Recovery (%	RQD (%)	Penetration Resistance (blows/foot)	Pocket Per (tsf)	Depth (feet Sample	Graphic USCS	(Continued from previous plate)
ō	žŏ	≥َٰ	0 %		<u> </u>	Po (ts		Ū Š SC	Description Gray CLAYEY SAND with shell fragments, very
·	60				1/2'				loose (lagoonal deposit)
							55-	SM	Dark gray SILTY SAND with shell fragments and well rounded gravel, very loose (lagoonal deposit)
	55	69			5		60-		
	66				3		-		
	20	75			22		65-	GM	Dark gray SILTY CORALLINE GRAVEL with sand and shell fragments, medium dense (lagoonal deposit)
	38	75		,	33		70-	3, 3, 3, 3, 3, 3, 3, 3, 3, 3, 3, 3, 3, 3	
	35		10		47		-	GM	Dark gray SILTY BASALTIC GRAVEL with some moderately weathered basaltic cobbles, dense (older alluvium)
	55				25	·	75- - -	SM	Brown with multi-color mottling SILTY SAND with well rounded extremely weathered basaltic grave medium dense (older alluvium)
			0				80- - -		
	50		71		32		85- 85-	GW	grades to dense  Brown with multi-color mottling SANDY BASALTIC GRAVEL AND COBBLES, very dense (older
	42		0		27/.5' +30/.3' Ref.		90-	SM	Dark brown with multi-color mottling SILTY SAND with some well rounded gravel, dense (older alluvium)
	60		83		47		- - 95-		GIIG FIGITI)
	62		48		61				
Date Sta	l ortod:	<u></u>	June	6 20	<u> </u>		100	1:[1]	l Water Level:   7.2 ft. 6/6/02 1418 HRS
Date Sta			June June					<u></u>	
Logged			Y. Ch						Drill Rig: CME-75  Drilling Method: 5" Auger & PO Coring
Total De Work Or			114 fe 4867-		)	<u>.</u>			Drilling Method: 5" Auger & PQ Coring Driving Energy: 140 lb. wt., 30 in. drop

	<del></del>	Geot		nical	Engine				71 <b>1</b> 7 \L	UU BRIDGE PROJ. NO. BR-083-1 (42) PUNALUU, OAHU, HAWAII 4
Other Tests	ıre nt (%)	nit It (pcf	ery (%	(%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	<u>ම</u> .වු		
her	oist.	Dry Unit Weight (p	Core Recovery (	RQD (%)	neti sist	Şe Ç	bth	Sample Graphic	nscs	(Continued from previous plate)
<u></u>	<u>  ≥ 0</u>	۷۵۸	<u> </u>	8	<u>유유급</u>	Po (ts	۵	တ္တိတ္ခ်	3	Description
	39		42		20/.3' Ref.		105	\$\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	GM	Tannish brown with multi-color mottling well rounded SILTY GRAVEL AND COBBLES with sand, highly to extremely weathered, very dense (older alluvium)
	51		83		31			V 2 4 2 4 2 4 2 4 2 4 2 4 2 4 2 4 2 4 2		grades to dense
	47				46		110	340000000		
							115 <sup>-</sup>		1	Boring terminated at 114 feet
							120			
							120			
							125	-		
							130			
							135	-		
							140			
							145			
	<u> </u>			<u></u>			150			
Date St Date Co			June June							Water Level:   7.2 ft. 6/6/02 1418 HRS
ogged			Y. Ch	****	02					Drill Rig: CME-75
Γotal De			114 f		-					Drilling Method: 5" Auger & PQ Coring

LICENSED PROFESSIONAL ENGINEER STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION BORING LOG 4 KAMEHAMEHA HIGHWAY — REPLACEMENT OF SOUTH PUNALUU STREAM BRIDGE Federal Aid Project No. BR-083-1(42) Date: May 2009 Scale: None

FISCAL SHEET TOTAL YEAR NO. SHEETS

2009 90 121

FED. ROAD DIST. NO. STATE

FED. AID PROJ. NO.

BR-083-1(42)

SHEET No. B6 OF 15 SHEETS

					3S, IN Engine					MEHA HWY. REPLACEMENT OF SOUTH Boring LUU BRIDGE PROJ. NO. BR-083-1 (42) PUNALUU, OAHU, HAWAII 5
Other Tests	ture ent (%)	tht (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	<u>ple</u>	S	Approximate Ground Surface
Othe	Moisture Content (	Weig	Core Reco	RQD	Pene Resi: (blow	Pock (tsf)	Dept	Sample	Graphi	Description
					<u>* -                                   </u>		-			2-inch ASPHALTIC CONCRETE
							-	֡֡֞֜֞֜֜֜֜֡֓֓֜֜֜֡֡֡֡֡֓֜֜֡֡֡֡֡֡֡֡֡֡֡֡֡֡	N.7.2.	16-inch CONCRETE (bridge deck) Space below bridge
							5-			
							- - <b>7</b> -		<u></u>	Stream water surface at 7.5 feet
								[	<u> </u>	Mudline at 9.7 feet
	14		0		9		10-	0.00	GV	Dark brown well rounded SANDY GRAVEL with some silt, medium dense (alluvium)
							15- - -	0 40 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	
	12		0		9		20-		000	
							-		SN	Gray SILTY SAND with coralline gravel and shell fragments, very loose (lagoonal deposit)
							25-			drill rods dropped from 23 to 42 feet.
							30-			
							- -			
							35			
				e			40			
	40			·	2		. • •			grades with some clay
	40				1/1'		45 <sup>-</sup>			
					''	:				
							50-			
Date Sta			June June							Water Level:   7.5 ft. 6/4/02 0958 HRS
Logged	Ву:	`	Y. Ch	iba						Drill Rig: CME-75  Drilling Method: 6" Concrete Core & P.O. Coring
Total De Work Or			134.5	<u>teet</u> 00(B	`					Drilling Method: 6" Concrete Core & PQ Coring Driving Energy: 140 lb. wt., 30 in. drop

·					3S, IN Engine					MEHA HWY. REPLACEMENT OF SOUTH UU BRIDGE PROJ. NO. BR-083-1 (42) PUNALUU, OAHU, HAWAII 5
Other Tests	oisture ontent (%)	y Unit eight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample Graphic	nscs	(Continued from previous plate)
ð	Ĭŏ	کَکَ	S Re	R(	<u> </u>	Pc (ts	ے ا	\ <u>\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\</u>	MH	Description Gray CLAYEY SILT with fine sand, shell fragments
TV=0.05	57				1/2'		·		1	and coralline gravel and organic material, very soft (lagoonal deposit)
	39				4		55			
							60			- -
	33				1/1' +1/.5'		0.5			
	59				1/1.5'		65			
							70	-	СН	Dark gray SILTY CLAY with fine sand and shell
TV=0.05	65				1/1.5'		75			fragments, very soft (lagoonal deposit) drill rods dropped from 70 to 75 feet
TV=0.4	68	60			4		80	-		
							85	-		
TV=0.25	66				3		90		СН	Grayish dark brown with bluish gray mottling
	58	62		:	9					SILTY CLAY with well rounded gravel, sand and some organic material, medium stiff (lagoonal deposit)
	73				7		95		СН	Dark gray SILTY CLAY with fine sand, some organic material and shell fragments, medium stiff (lagoonal deposit)
Date Sta	rted:	<u>.                                    </u>	June	<u>4, 20</u>	02		100		<b>4</b>	Water Level:  ▼ 7.5 ft. 6/4/02 0958 HRS
Date Co	mplet		June Y. Ch	6, 20			<del></del>			Drill Rig: CME-75
Logged I Total De			134.5							Drilling Method: 6" Concrete Core & PQ Coring
Work Or			4867-							Driving Energy: 140 lb. wt., 30 in. drop

LICENSED PROFESSIONAL ENGINEER STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION BORING LOG 5

FED. AID PROJ. NO.

BR-083-1(42)

FED. ROAD DIST. NO.

HAWAII

FISCAL SHEET TOTAL YEAR NO. SHEETS

2009 91 121

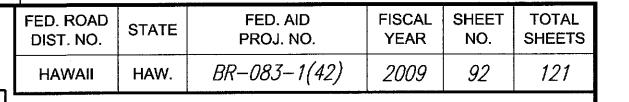
KAMEHAMEHA HIGHWAY — REPLACEMENT
OF SOUTH PUNALUU STREAM BRIDGE
Federal Aid Project No. BR-083-1(42)

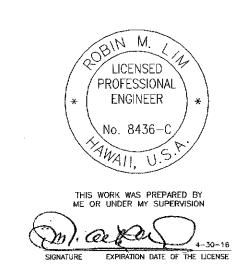
Scale: None

Date: May 2009 SHEET No. B7 OF 15 SHEETS

					3S, IN Engine					MEHA HWY. REPLACEMENT OF SOUTH Boring UU BRIDGE PROJ. NO. BR-083-1 (42) PUNALUU, OAHU, HAWAII 5
Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample Graphic	nscs	(Continued from previous plate)  Description
	78	49			12	2.0	105	X	CL	Bluish gray SANDY CLAY with well rounded sand, organic material, and shell fragments, medium stiff (lagoonal deposit)
	54			·	4		110		SC	subangular basaltic gravel and shell fragments,
	47	38	40		30/.5' +30/.3' Ref.		115			grades with some highly weathered basaltic cobbles
	51		26		51		120			
	52		100		51	·	125		SC	Gray-brown CLAYEY SAND with well rounded sand, gravel and cobbles, very dense (older alluvium)
	68		88		50		130			
	46				53		135			Boring terminated at 134.5 feet
							140			
				·			145			
Date S	arted:		June	4 20	02		150	<u> </u>		Water Level:   7.5 ft. 6/4/02 0958 HRS
Date C	omplet	ed:	June	6, 20		-				
Logged Total D		·	Y. Ch 134.5			_				Drill Rig: CME-75  Drilling Method: 6" Concrete Core & PQ Coring
7	rder:		4867		•					Driving Energy: 140 lb. wt., 30 in. drop

					BS, IN					MEHA HWY. REPLACEMENT OF SOUTH Boring UU BRIDGE PROJ. NO. BR-083-1 (42) PUNALUU, OAHU, HAWAII 6
Other Tests	Moisture Content (%)	, Unit light (pcf)	Core Recovery (%)	(%) Qi	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample Graphic	SS	Approximate Ground Surface Elevation" "(feet MSL): 6.4 *
of to	So So So	∇ Ve	Cor	RQD	Per Re, (blc	Poc (tsf	Del	Sal	SO	Description  Townish because OU TV CAND, and divine decree
•	8	86			10				SM	Tannish brown SILTY SAND, medium dense, moist (fill)
					10		•		<u> </u>	Tan CORALLINE FINE SAND, loose to medium
:	11		:		10					dense, damp (fill)
	0	100			50		5-		SP	grades to tannish brown with some silt and traces of coralline gravel
	8	100	•		59		, .	X	SP	Tannish brown SAND with traces of basaltic and
								-		coralline gravel, medium dense to dense, damp
							•			(beach sand)
							10-			
	20				4		10			grades with some basaltic gravel, loose
										4
	15				14		4 -	M	SM	Dark gray fine SILTY SAND with some coralline
							15			and basaltic gravel, loose (lagoonal deposit)
										<u> </u>
								-		<u>_</u>
	43				10		,			<u>-</u>
· .	.0				'		20			grades with coralline gravel
				*						· -
	40	72								<u>-</u>
	48	73			8		25	X		
	3									<u>_</u>
							,			7
	52				4		30-	N		· · · · · · · · · · · · · · · · · · ·
							·	-		·
										- ·
TV=0.1	52	66			5		35	H		
1 4 -0.1	02	"					33	Δ	SM	Dark gray SILTY FINE SAND, loose to very loose
								4		(lagoonal deposit)
								<b>-</b>		<u></u>
	EO						٠ . ا			· ·
	50				2		40			grades to very loose
		,	1		1					
								-		
	<u> </u>		[		_			- 11		
TV=0.3	55	63			6		45		ML-	Dark gray SANDY SILT with some clay, soft
									MH	(lagoonal deposit)
								]		
				: :				<u> </u>		-
D=1- 01			NA 1	20. 0	<u> </u>	<u> </u>	50			
Date Sta		ed:	May :					···		Water Level: ¥ 6.4 ft. 5/20/02 1051 HRS 5 ft. 5/20/02 1330 HRS
Logged	Зу:		G. Ba	arut						Drill Rig: CME-75
Total De				feet			<u> </u>			Drilling Method: 4" Solid-Stem Auger & 4" Wash Boring Driving Energy: 140 lb. wt., 30 in. drop
Work Or	uer.		4867	-UU(D	1			*****		Driving Energy. 140 ib. Wt., 30 iii. drup





STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

## BORING LOGS 5 & 6

KAMEHAMEHA HIGHWAY — REPLACEMENT OF SOUTH PUNALUU STREAM BRIDGE Federal Aid Project No. BR-083-1(42)

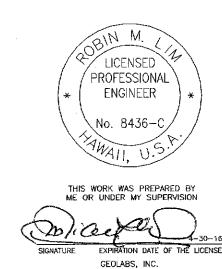
Date: May 2009 Scale: None

SHEET No. B8 OF 15 SHEETS

					3S, IN Engine	eering				MEHA HWY. REPLACEMENT OF SOUTH Boring UU BRIDGE PROJ. NO. BR-083-1 (42) PUNALUU, OAHU, HAWAII 6
Other Tests		Dry Unit Weight (pcf)	Core Recovery (%	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample	SOSO	(Continued from previous plate)  Description
TV=.25	54	66			1/1' +3/.5' 4		55	X	ML-  MH	
	61				5		60			grades with traces of coralline gravel, shell fragments and organic material, soft to medium stiff
V=0.45	64	60			9		65 <sup>-</sup>	<b>X</b>		
	65				7		70			
TV=0.3	61	62			18		75		MH	Dark gray CLAYEY SILT with fine sand, medium stiff (lagoonal deposit)
	65				7		80			grades with traces of coralline gravel
TV=0.3	70	58			19	0.75	85			
	69				12	0.5	90			
TV=0.3	56	68			19		95	X	SM	Dark gray SILTY SAND with traces of gravel, shel fragments and organic material, loose to medium dense (lagoonal deposit)
Date Sta			May 2				100	. 1		Water Level:   6.4 ft. 5/20/02 1051 HRS  5 ft. 5/20/02 1330 HRS
Date Co Logged	Ву:	-	May 2 G. Ba	rut						Drill Rig: CME-75
Total De	pth: der:		<u>181.3</u> 4867-			<u></u>				Drilling Method: 4" Solid-Stem Auger & 4" Wash Boring Driving Energy: 140 lb. wt., 30 in. drop

		Geot	echr	nical ,	Engine	ering		г <b>С</b>	<b>/ 14/~\</b> L'	JU BRIDGE PROJ. NO. BR-083-1 (42) PUNALUU, OAHU, HAWAII  6
Other Tests	Moisture Content (%)	Unit ght (pcf	Core Recovery (%	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen (tsf)	th (feet)	Sample Graphic	SS	(Continued from previous plate)
Ç.	Mois	Vei	Seco	\Z	Ses Ses blo	Pocl tsf)	Depth	Sar	USCS	Description
	53			<b></b>	14				SM	
	72	55			38	1.5	105	X	МН	grades with some basaltic gravel, medium dense Brownish gray CLAYEY SILT with some sand and organic material, medium stiff to stiff (lagoonal deposit)
					46		110			ueposit <i>j</i>
	47	69			33		115		МН	Gray CLAYEY SILT with seams of basaltic gravel and sand and traces of shell fragments, stiff (lagoonal deposit)
	19				25		120	000000000000000000000000000000000000000	GP- GM	Dark gray BASALTIC GRAVEL with some sand and seams of clayey silt, medium dense (lagoonal deposit)
					35/.5' +50/.4' Ref.	i	125	X 0	SM	grades with cobbles Dark gray SILTY SAND with some gravel, dense (lagoonal deposit)
	33				23		130			
	46	81			16		135 <sup>.</sup>	X	SC	grades to medium dense Gray CLAYEY SAND with some gravel, medium dense (lagoonal deposit)
	43				19		140 <sup>.</sup>		X	action (lagoural dopolity
	46	76	93		73	÷	145		SM	grades with traces of highly weathered subrounded basaltic gravel Grayish brown with multi-color mottling SILTY BASALTIC SAND with traces of highly weathered
							150			subrounded basaltic gravel, very dense (older alluvium)
Date St			May 2							Water Level:   6.4 ft. 5/20/02 1051 HRS  5 ft. 5/20/02 1330 HRS
<u> </u>	omolet	ed:	May 2	23, 20	<i>1</i> 02					J II. 0/20/02 1330 111\0
Date Co Logged			G. Ba					_		Drill Rig: CME-75

FED. ROAD<br/>DIST. NO.STATEFED. AID<br/>PROJ. NO.FISCAL<br/>YEARSHEET<br/>NO.TOTAL<br/>SHEETSHAWAIIHAW.BR-083-1(42)200993121



STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BORING LOG 6

KAMEHAMEHA HIGHWAY — REPLACEMENT OF SOUTH PUNALUU STREAM BRIDGE Federal Aid Project No. BR-083-1(42)

Scale: None
SHEET No.

*Date: May 2009 B9* OF 15 SHEETS

					3S, IN					MEHA HWY. REPLACEMENT OF SOUTH Boring UU BRIDGE PROJ. NO. BR-083-1 (42) PUNALUU, OAHU, HAWAII 6
Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample Graphic	nscs	(Continued from previous plate)  Description
			65				 155-	QUQUQUQU		Gray vesicular BASALTIC BOULDERS with some alluvial cobbles and gravel, very dense (older alluvium)
	47		0		58		160-		СН	Grayish brown with multi-color mottling SILTY CLAY with fine basaltic sand and some highly weathered alluvial gravel, very stiff to hard (older alluvium)
	60		24		39		165-			
	53		48		44	•	170-		SC	Grayish brown with multi-color mottling CLAYEY -
	38		50 96		50/.3'	·	175 <i>-</i>		GC	BASALTIC SAND with some highly weathered alluvial gravel, dense (older alluvium)
	55				Ref. 13/.5' +50/.3'		- 180 -			BASALTIC GRAVEL with some silty sand seams, dense to very dense (older alluvium)  Boring terminated at 181.3 feet
							185-			- - -
							190-			
5DT 10/25/02							195-			- -
Date Start			May 2				200-		, , , , ,	Water Level: ¥ 6.4 ft. 5/20/02 1051 HRS 5 ft. 5/20/02 1330 HRS
Date Com Logged By Total Dept Work Orde	y: th:		May 2 G. Ba 181.3 4867-	rut feet						Drill Rig: CME-75 Drilling Method: 4" Solid-Stem Auger & 4" Wash Boring Driving Energy: 140 lb. wt., 30 in. drop

	<u> </u>	Ç	%		Engine		$\dashv$			PUNALUU, OAHU, HAWAII  Approximate Ground Surface
Other Tests	ure ent (	Init ht (p	'ery (	(%)	Penetration Resistance (blows/foot)	Pocket Pen (tsf)	Depth (feet)	): 		Elevation" "(feet MSL): 7.0 *
ther	oist onte	Dry Uni Weight	Core Recovery	RQD (%)	enel esis	ocke sf)	epth	Sample Graphic	USCS	Description
Ò	<u>≥ŏ</u>	≷۵	<u>ŏ</u>	<u>~</u>	ਕੁਲ੍ਹ	<u> </u>	Ď	S O	) j	4-inch ASPHALTIC CONCRETE
	13				30	0.5			SP	6-inch CONCRETE
						0.0			CH	Brownish tan SAND with some basaltic gravel,
								1 🎉	SC	medium dense, damp (fill)
							_	1 0		Dark brown SILTY CLAY with sand and gravel,
;	33	81			24	7	5			stiff, moist (fill)
					:	:		H	4	Tannish brown CLAYEY SAND with some gravel
		:								and traces of silt, medium dense, wet (fill)
			:				10			D. I. OUTVOAND the second at the second
								-	SM	Dark gray SILTY SAND with rounded basaltic
								- 111		gravel, medium dense (alluvium)
	18				16					
	10				10					
							15	1		
								000	GW-	Gray SANDY CORALLINE GRAVEL in a silt
								100	GM	matrix, loose (lagoonal deposit)
	38				8			100		
							20	000	A .	
							20		MH	Grayish brown CLAYEY SILT with fine sand, soft
		:								(lagoonal deposit)
					10					
	62				10				SM	Gray fine SILTY SAND, loose (lagoonal deposit)
							25			
								-		
								- [1]		
	47				3					grades to very loose
	1 1									
		:					30	1		
								1 11		
;				!				1 []]		
	54				5					grades to very loose
							25			
							35			
1										
TV=0.1	52	75			5			M		
							40		, A.	Donk annu Con CANDY OF The Control of the control
								4	ML	Dark gray fine SANDY SILT, very soft (lagoonal
								4		deposit)
TV=0.1	66				1					
ı v –U. I	UU					:	<u>.</u>	1		
							45	-		
								+	SM	Dark gray SILTY FINE SAND, loose (lagoonal
								+		deposit)
TV=0.1	53	72			9					<i> </i>
	-									
	Hed.		June	11 2	003	<u> </u>	<u>' 50</u>			Water Level: ▼ 5.2 ft. 6/12/02 0912 HRS
Data Sto	ricell.				<u> </u>					6.4 ft. 6/13/02 0840 HRS
Date Sta Date Cor		ed:	June	14, 2	002					0.4 it. 0/13/02 0040 / ii. 0
Date Sta Date Cor Logged E Total De	nplet 3y:		June Y. Ch 178.1	iba						Drill Rig: CME-75  Drilling Method: 5" Auger & PQ Coring

LICENSED PROFESSIONAL ENGINEER THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

4-30-16

SIGNATURE EXPIRATION DATE OF THE LICENSE GEOLABS, INC. STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION BORING LOGS 6 & 7 KAMEHAMEHA HIGHWAY — REPLACEMENT OF SOUTH PUNALUU STREAM BRIDGE Federal Aid Project No. BR-083-1(42) Date: May 2009 Scale: None SHEET No. B10 OF 15 SHEETS

FISCAL SHEET TOTAL YEAR NO. SHEETS

FED. AID PROJ. NO.

BR-083-1(42)

FED. ROAD DIST. NO.

TV=0.1 59 TV=0.1 53 6 TV=0.2 63 6 TV=0.35 58 6		Weight (pcf)	RQD (%)	tion nce oot)	Δ.				PUNALUU, OAHU, HAWAII /
TV=0.1 53 6 TV=0.1 63 6 TV=0.15 57 6 TV=0.35 67 65 65	67		RG	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample Graphic	nscs	(Continued from previous plate)  Description
TV=0.1 63 TV=0.2 63 6 TV=0.35 58 6 TV=0.3 67	67			5		- - - 55-		ML	Dark gray fine SANDY SILT, medium stiff (lagoonal deposit)
TV=0.2 63 6  TV=0.15 57  TV=0.35 58 67  65 5		67		14		60-	X		grades to stiff
TV=0.15 57 TV=0.35 58 67 65 5				4		65-			grades to soft
TV=0.35 58 67 65 5	61	61		14		70-	X		grades to stiff
TV=0.3 67 65				6		75-		МН	grades to medium stiff  Dark gray CLAYEY SILT with fine sand with som shell fragments, stiff (lagoonal deposit)
65	63	63		19	0.5	80-	X		
				7	0.5	85-			grades to medium stiff
72	59	59		20	1.0	90-	X		grades to very stiff
				11	<0.5	95-		SM	grades with sand and rounded gravel, stiff  Dark gray SILTY FINE SAND with some clay and well rounded gravel and some organic material,
65				6		100-			loose (lagoonal deposit)
Date Started: Date Completed Logged By: Total Depth:		d: Jun Y. C	e 11, 2 e 14, 2 Chiba .1 feet	002					Water Level: ▼       5.2 ft. 6/12/02 0912 HRS         6.4 ft. 6/13/02 0840 HRS         Drill Rig:       CME-75         Drilling Method:       5" Auger & PQ Coring

					SS, IN Engine					MEHA HWY. REPLACEMENT OF SOUTH Boring JU BRIDGE PROJ. NO. BR-083-1 (42) PUNALUU, OAHU, HAWAII 7
Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample Graphic	nscs	(Continued from previous plate)  Description
	70				8	0.5	105		MH	Dark gray CLAYEY SILT with fine sand, medium stiff (lagoonal deposit)
	65	62			25		110		SM	Dark gray SILTY FINE SAND, medium dense
	67				22	·	115		CVA	grades with well rounded gravel and interbedded with clayey silt lenses
	19		2		50		120	0.00	GW	Dark gray SANDY BASALTIC GRAVEL AND COBBLES, rounded to well rounded, highly weathered, dense (older alluvium)
	26		0		30		125	20 20 20 20 20 20 20 20 20 20 20 20 20 2	SM	Dark gray SILTY SAND with well rounded sand with some highly weathered gravels, medium dense (older alluvium)
	4		7		20/.0' Ref.		130		SP- SM	Brown with multi-color mottling coarse SAND with silt and some well rounded gravel and cobbles, very dense (older alluvium)
	29		0		58		135	\$4684684684		
	17		21		55		140	\$2000000000000000000000000000000000000	GM	Grayish brown SILTY GRAVEL with sand, very dense (older alluvium)  grades with cobbles and boulders, very dense
			17		20/.0' Ref.		145			
	15				74		150·	4% 8 4% 8 4% 8 4% 8 4% 8 4% 8 4% 8 4% 8		
ate State Co ogged	mplet			11, 20 14, 20 iba						Water Level:   5.2 ft. 6/12/02 0912 HRS 6.4 ft. 6/13/02 0840 HRS  Drill Rig: CME-75
ogged otal De			178.1							Drilling Method: 5" Auger & PQ Coring

LICENSED PROFESSIONAL ENGINEER STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION BORING LOG 7 KAMEHAMEHA HIGHWAY — REPLACEMENT
OF SOUTH PUNALUU STREAM BRIDGE
Federal Aid Project No. BR-083-1(42) Date: May 2009 Scale: None

FISCAL SHEET TOTAL YEAR NO. SHEETS

2009 95 121

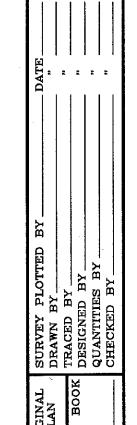
FED. AID PROJ. NO.

BR-083-1(42)

FED. ROAD DIST. NO.

HAWAII

SHEET No. B11 OF 15 SHEETS

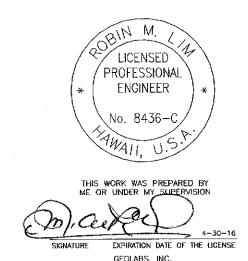


					3S, IN Engine					MEHA HWY. REPLACEMENT OF SOUTH Boring UU BRIDGE PROJ. NO. BR-083-1 (42) PUNALUU, OAHU, HAWAII 7
Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)-	Sample	nscs	(Continued from previous plate)  Description
	11		52 57		10/.0' Ref.		155-		GM	
	24		44		40/.3' Ref.		160			
			65		20/.0' Ref.		165		9	grades with slightly to moderately weathered, dense to vesicular basaltic boulders and cobbles
			83		10/.0' Ref.		170			
			50		10/.0' Ref.		175			grades with highly to moderately weathered grave and cobbles
					30/.1' Ref.		180			Boring terminated at 178.1 feet
						·	185			
							190			
							195			
Date S Date C	omplet	ed:	June June	14, 2			200			Water Level:   5.2 ft. 6/12/02 0912 HRS 6.4 ft. 6/13/02 0840 HRS  Drill Rig: CME-75
Logged Total D			Y. Ch 178.1 4867	feet		<u>.</u>				Drill Rig: CME-75 Drilling Method: 5" Auger & PQ Coring Driving Energy: 140 lb. wt., 30 in. drop

Other Tests	1 0]	<b>大</b>	%		n e t)	n.	(£			A war was dies at a Charles of Charles
_	Moisture Content (	Dry Unit Weight (po	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	pth (fee	Sample Graphic	nscs	Approximate Ground Surface Elevation" "(feet MSL): 6.1 *
₹	၌၀	Dry We	Cor	8	Re (bk	Po (tsf	De	Sal	SO	Description  Circle ACDUALTIC CONCRETE
						÷		_	SP	√6-inch ASPHALTIC CONCRETE  √7-inch CONCRETE
	14	95			40				<u>.</u>	Tannish brown SAND with some gravel and traces
	21				10					of silt, medium dense, damp (fill)
	28	75	:		18	7	, 5		SP	Whitish gray coarse SAND with well rounded sand
	20	10			10	•			) 	and some shell fragments, medium dense,
										saturated (beach sand/alluvium)
								-		
	54				8		10		N ALL	Browniah dark arroy CLAVEV CILT with fine cond
								H	MH	Brownish dark gray CLAYEY SILT with fine sand and traces of shell fragments, soft to medium stiff
								-		(lagoonal deposit)
							4-	1 11	SM	
	15				20		15	1		clay and some basaltic gravel, medium dense
								-		(lagoonal deposit)
		:						-		
							20			
	54				13		20	-		
		:								Boring terminated at 21.5 feet
							25			
				·				-		
								1		
								4		
							30	-		
			:					-		
							٥.	1		
							35			
+								4		
								1		
			l i				40	]		
							70	4		
			!   					1		
								1		
							45	-		
								1		
						[				
Doto Of	0 H = -1-		1,,,,,,	10 0	2002	<u> </u>	50	<u> </u>		Water Level: ▼ 5.4 ft. 6/18/02 1300 HRS
Date Sta		ed:	June June							
Logged Total De			Y. Ch 21.5					··		Drill Rig: CME-75 Drilling Method: 5" Auger & PQ Coring

FED. ROAD DIST. NO. STATE PROJ. NO. FISCAL YEAR NO. SHEET NO. SHEETS

HAWAII HAW. BR-083-1(42) 2009 96 121



STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BORING LOGS 7 & 8

KAMEHAMEHA HIGHWAY — REPLACEMENT
OF SOUTH PUNALUU STREAM BRIDGE
Federal Aid Project No. BR-083-1(42)

Scale: None

Date: May 2009

SHEET No. B12 OF 15 SHEETS

	l	Geot	echr	nical	3S, IN Engine	ering				MEHA HWY. REPLACEMENT OF SOUTH Borin UU BRIDGE PROJ. NO. BR-083-1 (42) PUNALUU, OAHU, HAWAII 9	
Other Tests	oisture ontent (%)	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): 5.6 *	
ō	Σŏ	۵۶	28	Ä	<u> 4 5 5</u>	Pc (ts	Ď	ιχ C	Ď	Description  6.5-inch ASPHALTIC CONCRETE	
	00	00			200	0.5			SM		
	29	86			36	0.5			<u> </u>	Tannish brown SILTY SAND, medium dense,	
	22				29				SP	moist (fill) Brown with orange mottling SILTY CLAY with sa	<u></u>
	33	87			25	7	, 5	X		and some highly weathered basaltic gravel, ver stiff, moist (fill)	У
										Brownish tan SAND, medium dense, moist (bear sand)	ich
	13				8		10-		SM	grades to whitish gray, saturated at 5.5 feet Dark gray SILTY SAND with rounded basaltic gravel, loose (lagoonal deposit)	
									SP-	Dark gray fine SAND with silt and some corallin	e
				:					SM	gravel, very loose (lagoonal deposit)	
	51				3		15 <sup>-</sup>				
								lacksquare			
								.			
					i.						•
	45				1/1'		20				
					+1/.5'					Boring terminated at 21.5 feet	
							25				
							25 <sup>-</sup>				
								1			
							30				
							00				
•											
							35				
								1			
							40	4			
							45				
								]			
								-			
Date Sta	l mad.		June	10 2	UU3		50			Water Level:     5.3 ft. 6/19/02 1020 HRS	_
Date Sta			June June								
.ogged	Ву:		Y. Ch							Drill Rig: CME-75 Drilling Method: 5" Auger	_
<u>otal De</u> Vork Or			<u>21.5 1</u> 4867-		1					Drilling Method: 5" Auger Driving Energy: 140 lb. wt., 30 in. drop	—

<del></del>					Engine			<del> </del>		PUNALUU, OAHU, HAWAII 10
Other Tests	Content (%	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen (tsf)	Depth (feet)	<u>Sample</u> Graphic	SOSO	Approximate Ground Surface Elevation" "(feet MSL): 7.7 *  Description
<u>⊃  ≥</u>	<u>Σ</u> ()	Ω≶	ÖÆ	<u>x</u>	<u> </u>	P (t)	Δ.	S	<u> </u>	2-inch ASPHALTIC CONCRETE
										14-inch CONCRETE (bridge deck) Space below bridge
							-			
							5- -			
						. 3	, .			Water surface at 7.3 feet
							10-	331		Mudline at 9.8 feet
							10	0000	GP	Dark gray well rounded to subrounded GRAVEL with sand, loose (alluvium)
	10				7			0000		
							15-	0000		
								0000		
								0000		
							20-		SM	Gray SILTY SAND with some coralline gravel and shell fragments and clay, very loose (lagoonal
4	44				2/1'					deposit)
					+1/.5'		-			
							25 <sup>-</sup>			
					·					
							30-			
3	31				2					grades to silty fine sand
							35-			
							40-			
4	47				1/1.5'		•			
							45-		ML	Brownish dark gray fine SANDY SILT with clay and shell fragments, very soft (lagoonal deposit)
			ļ					1		
							50-			
ite Starto ite Com			July 5 July 8							Water Level: ▼ 7.3 ft. 7/5/02 0940 HRS
	<b>/</b> :		Y. Ch	iha 🗀						Drill Rig: CME-75

FISCAL SHEET TOTAL YEAR NO. SHEETS FED. ROAD DIST. NO. FED. AID PROJ. NO. BR-083-1(42) 2009 97 121 LICENSED PROFESSIONAL ENGINEER STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

#### BORING LOGS 9 & 10

KAMEHAMEHA HIGHWAY — REPLACEMENT OF SOUTH PUNALUU STREAM BRIDGE Federal Aid Project No. BR-083-1(42) Date: May 2009 Scale: None

SHEET No. B13 OF 15 SHEETS

	1	Geot	echr	nical	3S, IN Engine	ering					MEHA HWY. REPLACEMENT OF SOUTH JU BRIDGE PROJ. NO. BR-083-1 (42) PUNALUU, OAHU, HAWAII 10
Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	ore scovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample	Glapino	000	(Continued from previous plate)
ō	<u> </u>	کٍک	<u>0 %</u>	R	<u> </u>	(t Pc	Ď	S) C	ַּדַ  כ <u>ֿ</u>    M	5 	Description
TV=0.15	58				1/1.5'		55				
TV=0.25	67				1/1'		60				
ı v −∪.∠ö	07				+1/.5'		65	-			
TV=0.2	56	63			11		70	-			grades to medium stiff
							75				
TV=0.2	63				6		80	-			
							85				
	58	56			14		90 95	X	S	M	Brownish dark gray SILTY SAND with well rounded sand and gravel, shell fragments, organ material and coralline gravel, medium dense (lagoonal deposit)
				000			100				Woton   aval. = 7.2 ft 7/5/02 0040 LIDO
Date Sta Date Co			July 5 July 8			<u></u>		···			Water Level: ▼ 7.3 ft. 7/5/02 0940 HRS
Logged l	Зу:		Y. Ch	iba					·		Drill Rig: CME-75
Total De	pth: der:		<u>162.8</u> 4867-								Drilling Method: 6" Concrete Core & PQ Coring Driving Energy: 140 lb. wt., 30 in. drop

ဟ <sup> </sup>		eotئ ⊊	echr	nical	Engine			T	<u> </u>	PUNALUU, OAHU, HAWAII ' 10
Other Tests	Moisture Content (%	Dry Unit Weight (pc	Core Recovery (%	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen (tsf)	Depth (feet)	Sample Graphic	SOSN	(Continued from previous plate)
Ŏ	<u>ĕ</u> ö	Dry We	Se Re	R(	Pe Re	Pc (ts	ď	<u>Ö</u> 	SM	Description
TV=0.3	71				8	<0.5	105		МН	Dark gray CLAYEY SILT with fine sand, organic material and shell fragments, medium stiff (lagoonal deposit)
	59	67			17		110 115	<b>X</b>	SM	Dark gray SILTY COARSE SAND with some clay and shell fragments, medium dense (lagoonal deposit)
							120	-	GW- GM	Bluish dark gray with brown mottling SANDY BASALTIC GRAVEL AND SOME SILT, extremely weathered, subrounded, very dense (older alluvium)
	46		14		62		125			
	73		14		37	2.5	130	-	SM	Brown with gray mottling SILTY SAND, dense (older alluvium)
	70		48		13/.5' +50/.4' Ref.		135 <sup>-</sup>			grades with multi-color mottling with well rounded sand and gravel, and some gray highly weathered basaltic cobbles
	38		25		60/.5' +10/.0' Ref.		140			grades with cobbles and boulders
	50				30/.3' Ref.		145			
	67		76		48		150			
Date Sta		ed.	July 8							Water Level: ¥ 7.3 ft. 7/5/02 0940 HRS
Logged			Y. Ch							Drill Rig: CME-75 Drilling Method: 6" Concrete Core & PQ Coring

FED. ROAD STATE FISCAL SHEET TOTAL YEAR NO. SHEETS FED. AID DIST. NO. PROJ. NO. BR-083-1(42) 2009 98 121 HAWAII HAW.

LICENSED PROFESSIONAL ENGINEER

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BORING LOG 10

KAMEHAMEHA HIGHWAY — REPLACEMENT
OF SOUTH PUNALUU STREAM BRIDGE
Federal Aid Project No. BR-083-1(42)

Scale: None

Date: May 2009 SHEET No. B14 OF 15 SHEETS

	(				BS, IN Engine		ļ			JU BRIDGE PROJ. NO. BR-083-1 (42)	og o oring 10
Other Tests	Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample Graphic	scs	(Continued from previous plate)	
<b>₹ ₹</b>	္မိပိ	Dry We	SÃ	RG	Re (bi	Po (tsi	De	Sa	SDSN M	Description	
.2	40		49		30/.3' Ref.		- - 155-	/			
			50		10/.0' Ref.		- - 160-				
	52			·	30/.3' Ref.		- - 165	Activities of the control of the con		Boring terminated at 162.8 feet	
							- - 170-				
							- - 175- -				
							180- -				
							- - 185- - -				
		•					- 190-				

195

July 5, 2002

Y. Chiba 162.8 feet 4867-00(B)

Date Started:

Work Order:

Date Completed: July 8, 2002
Logged By: Y. Chiba
Total Depth: 162.8 feet

7.3 ft. 7/5/02 0940 HRS

CME-75 6" Concrete Core & PQ Coring 140 lb. wt., 30 in. drop

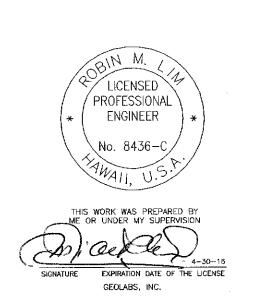
Water Level: ₽

Drilling Method: Driving Energy:

Drill Rig:

Ę. . . . .

FED. ROAD FED. AID FISCAL SHEET TOTAL YEAR NO. SHEETS DIST. NO. PROJ. NO. BR-083-1(42) 2009 99



STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

#### BORING LOG 10

KAMEHAMEHA HIGHWAY — REPLACEMENT OF SOUTH PUNALUU STREAM BRIDGE Federal Aid Project No. BR-083-1(42)

Scale: None

Date: May 2009

SHEET No. B15 OF 15 SHEETS