

### **Summary of Borings**

#### Kaumualii Highway Widening Island of Kauai, Hawaii

	Approx.	Approx.			Approx.	
Boring	Station	Offset from	Ground	Boring	Depth to	Structure and
No.	No.	Centerline	Elevation	Depth	Groundwater	Remarks
		(feet)	(feet MSL)	(feet)	(feet)	

						and the second
B-125	293+85	55L	+336	21.0	N.E.	Puhi Road Intersection
						4'x4' Box Culvert
B-126	307+25	75R	+307	51.5	9.5	12-Foot Fill
<u> </u>						8'x6' Box Culvert
B-127	310+50	75L	+315	51.0	14.0	12-Foot Fill
						8'x6' Box Culvert
B-128	311+05	60R	+302	51.5	9.0	12-Foot Fill
B-129	314+20	25R	+314	21.0	17.8	24-Inch Culvert
B-130	318+90	25R	+319	21.0	N.E.	Nuhoe Street Intersection
B-131	325+60	20R	+311	21.0	N.E.	
B-132	336+65	35R	+293	21.0	N.E.	
B-133	343+80	30R	+276	21.0	N.E.	Kalepa Street Intersection
B-134	351+60	40R	+258	21.0	N.E.	Nawiliwili Road Intersection
B-135	363+05	10L	+228	41.0	31. <u>5</u>	15-Foot Cut
B-136	364+55	10L	+205	26.5	14.5	18-Inch Culvert
B-137	367+50	95L	+223	31.0	N.E.	25-Foot Cut
						24-Inch Culvert
B-138	371+55	45L	+167	41.5	17.5	13-Foot Fill
						Lihue Mill Bridge
B-139	372+55	5R	+173	85.0	23.5	Abutment
B-140	373+70	45L	+147	100.5	8.1	Lihue Mill Bridge Pier
B-141	374+00	15L	+147	101.0	7.5	Lihue Mill Bridge Pier
						Lihue Mill Bridge Sidewalk
B-142	374+50	60R	+147	100.5	5.2	Structure
B-143	374+75	35L	+145	100.5	13.8	Lihue Mill Bridge Pier
B-144	375+05	15L	+145	102.0	11.6	Lihue Mill Bridge Pier
						Lihue Mill Bridge
B-145	376+10	10L	+161	80.0	25.5	Abutment
B-146	378+40	40L	+155	51.5	14.0	Lihue Mill Cane Carrier
	Hoomana					Hoomana Road
B-147	Rd 3+00	35R	<b>+</b> 195	40.5	10.4	30-foot cut

Note: 1) C.L. - centerline

<sup>2) 10</sup> Left - Boring offset 10 feet to the left of the centerline

<sup>3) 20</sup> Right - Boring offset 20 feet to the right of the centerline

<sup>4)</sup> The Station Numbers and Centerline Offsets are based on plans provided by ParEn, Inc., dba Park Engineering on February 8, 2005

<sup>5)</sup> N.E. - Not Encountered

### **Summary of Bulk Sample Locations**

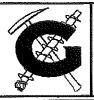
# Kaumualii Highway Widening Island of Kauai, Hawaii

Bulk	Approximate	Approximate	Near
Sample	Station	Centerline	Boring
No.	No.	Offset	No.
101	213+70	30L	B-101
102	232+95	5L	B-105
103	246-40	55L	B-108
104	255+10	15L	B-111
105	271+25	25L	B-116
106	281+65	40L	B-122
107	310+50	75L	B-127
108	325+60	20R	B-131
109	343+80	30R	B-133
110	367+50	95L	B-137
111	375+50	10R	B-140
	Hoomana Rd		
112	3+00	35R	B-147

Note:

- 1) CL: centerline
- 2) 10 Left: Boring offset 10 feet to the left of the centerline
- 3) 10 Right; Boring offset 10 feet to the right of the centerline Alignment A of Preliminary Plans provided by ParEn, Inc., dba

Park Engineering on February 8, 2005



Geotechnical Engineering

### Log Legend

### **UNIFIED SOIL CLASSIFICATION SYSTEM (USCS)**

	MAJOR DIVISION	S	us	cs	TYPICAL DESCRIPTIONS
	GRAVELS	CLEAN GRAVELS		GW	WELL-GRADED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES
COARSE-	GRAVELS	LESS THAN 5% FINES	000	GP	POORLY-GRADED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES
GRAINED SOILS	MORE THAN 50% OF COARSE	GRAVELS WITH FINES	2000	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
	CUTO			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
00,20				OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
50% OR MORE OF				МН	INORGANIC SILT, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS
MATERIAL PASSING THROUGH NO. 200	SILTS AND CLAYS	LIQUID LIMIT 50 OR MORE		СН	INORGANIC CLAYS OF HIGH PLASTICITY
SIEVE	1			ОН	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
HI	GHLY ORGANIC SO	DILS	7 77 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



(3-INCH) O.D. MODIFIED CALIFORNIA SAMPLE



SHELBY TUBE SAMPLE



CORE SAMPLE



LL LIQUID LIMIT

PLASTICITY INDEX

TV TORVANE SHEAR (tsf)

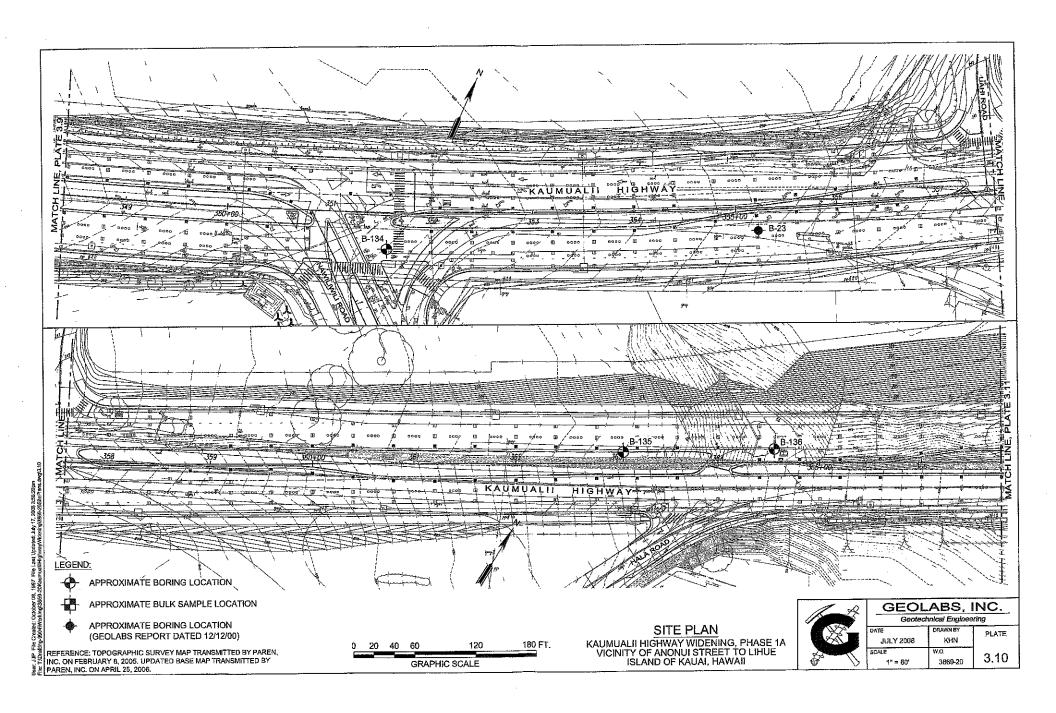
PEN POCKET PENETROMETER (tsf)

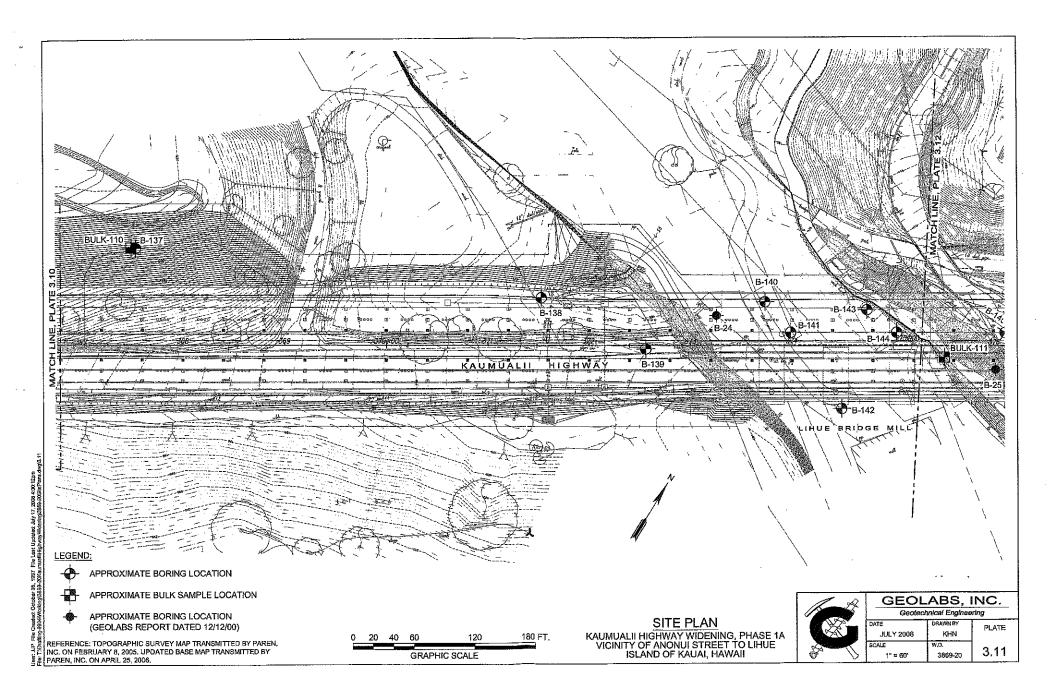
UC UNCONFINED COMPRESSION (psi)

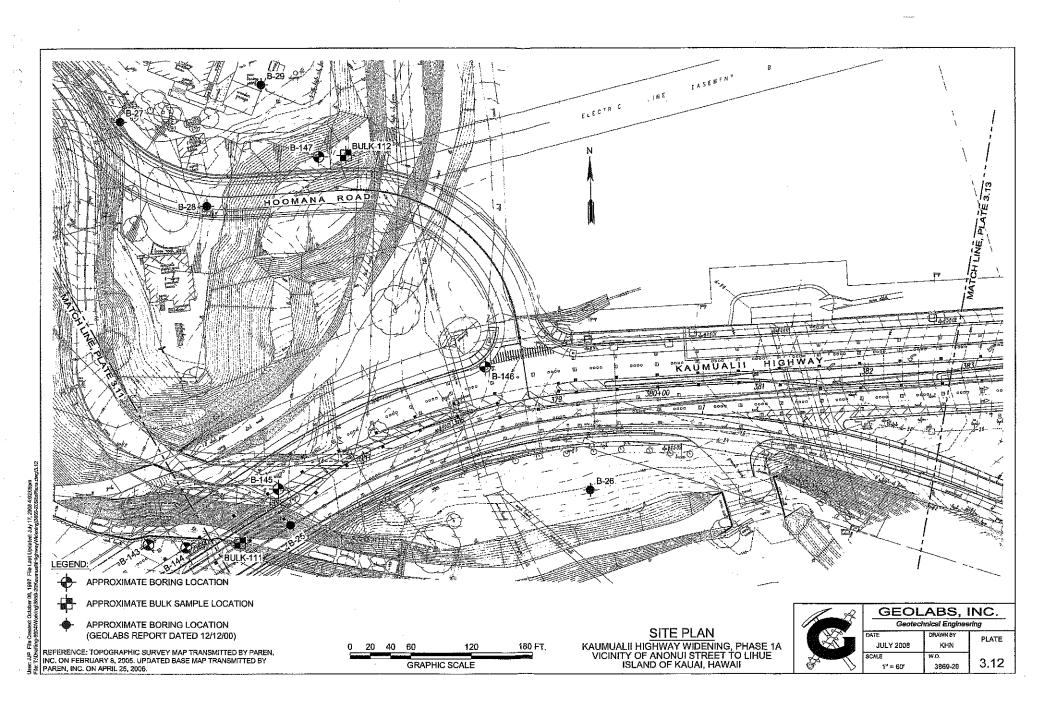
WATER LEVEL OBSERVED IN BORING  $\nabla$ 

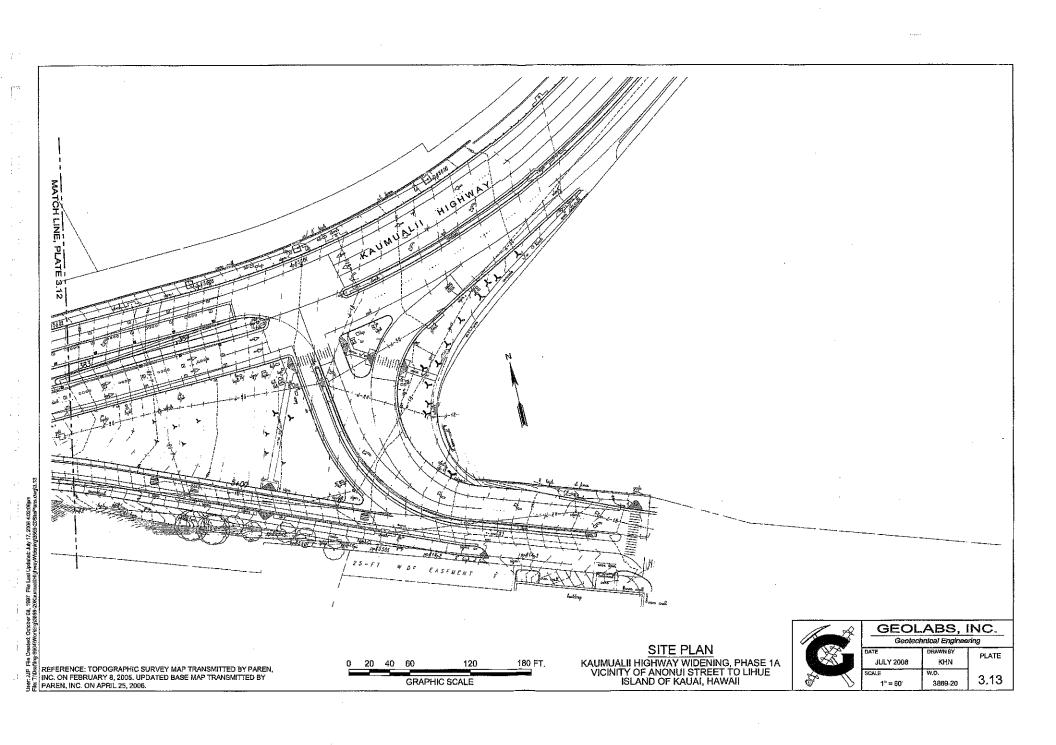
Plate

Α









### **Approximate Boring Locations**

#### Kaumualii Highway Widening Lihue to West of Maluhia Road Island of Kauai, Hawaii

	Approximate	Approximate		Approximate
Boring	Station	Offset from	Boring	Depth to
<u>No.</u>	<u>No.</u>	<u>Centerline</u>	<u>Depth</u>	Groundwater
		(feet)	(feet)	(feet)
B-1	0+40	20 Left	21.5	-
B-2	18+25	60 Right	100.0	9.2
B-3	27+00	200 Left	80.0	4.5
B-4	42+30	70 Left	40.1	12.5
B-5	51+90	10 Left	19.5	-
B-6	58+20	20 Left	99.5	7.2
B-7	70+10	70 Left	21.5	
B-8	81+10	40 Left	79,5	14.2
B-9	92+10	80 Left	50.8	-
B-10	99+50	80 Left	36.5	-
B-11	112+10	30 Left	21.5	-
B-12	132+20	90 Left	98.0	28.3
B-13	139+10	20 Left	51.5	11.0
B-14	149+30	20 Left	21.5	-
B-15	157+40	20 Left	51.5	. <b>-</b>
B-16	163+30	20 Left	39.0	<del>-</del> '
B-17	190+50	C.L.	21.5	
B-18	218+60	10 Left	21.5	- '
B-19	246+40	70 Right	82.0	27.3
B-20	272+30	10 Right	51.5	19.5
B-21	299+60	C.L.	21.5	-
B-22	331+20	20 Right	21.5	<u> </u>
B-23	355+20	20 Right	21.5	<del></del>
B-24	373+30	30 Left	102.5	8.2
B-25	376+00	20 Right	100.0	9.2
B-26	379+30	100 Right	45.0	11.5
B-27			51.5	es .
B-28			51.5	
B-29			51.5	<b>E</b>

Note:

- 1) C.L. Centerline
- 2) 10 Left Boring offset 10 feet to the left of the centerline
- 3) 20 Right Boring offset 20 feet to the right of the centerline
- 4) The Station Numbers and Centerline Offsets are based on plans provided by ParEn, Inc. dba Park Engineering on December 11, 2000

(u:\00reports\3869-.st2.boring&bulk....xls)



Work Order:

3869-20

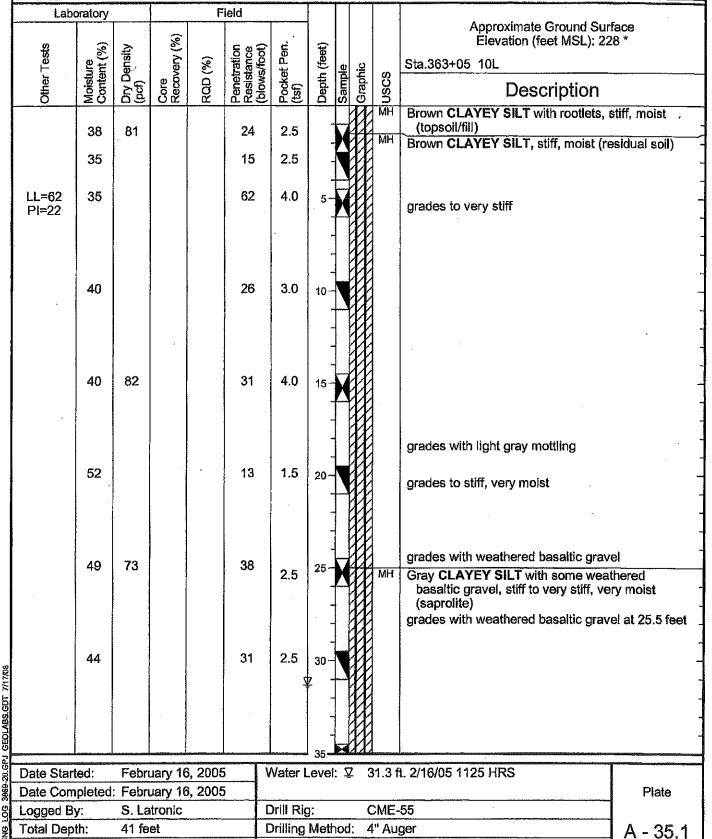
### GEOLABS, INC.

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#### KAUMUALII HIGHWAY WIDENING ISLAND OF KAUAI, HAWAII

Log of Boring

135



**Driving Energy:** 

140 lb. wt., 30 in. drop



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#### KAUMUALII HIGHWAY WIDENING ISLAND OF KAUAI, HAWAII

Log of Boring

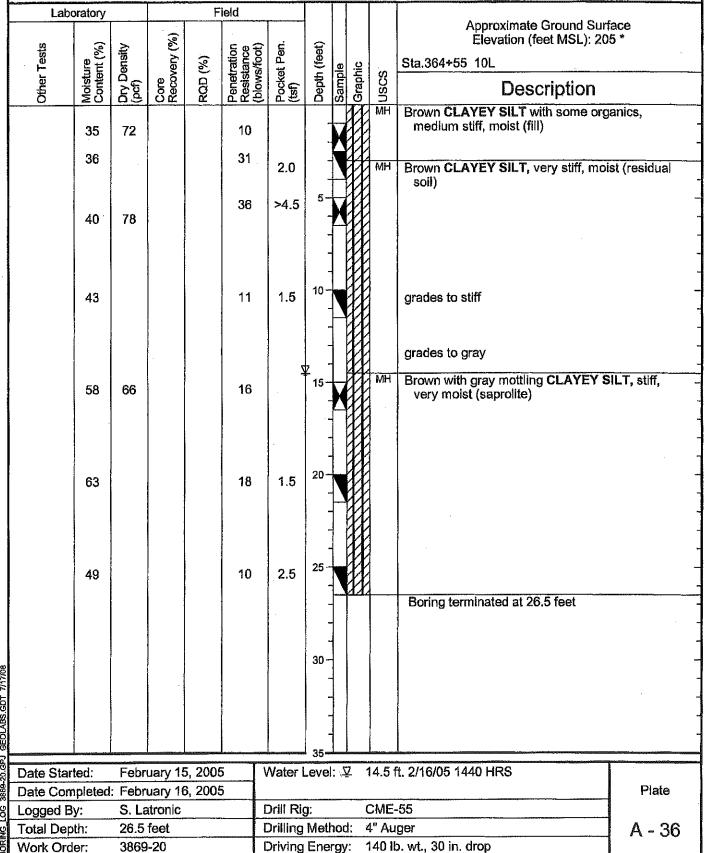
**************************************	$\nabla$											
Labo	ratory			F	ield							
Other Tests	Moisture Content (%)	Dry Density (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample	Graphic	₹ USCS	(Continued from previous plate	·)
- 0	<u>≥0</u> 52	73	OIL	LE.	34	1.5	<del>   -</del>		й	MH		·
		, 3					-				grades to medium stiff	
	59				10	1.5	40 –		111			-
							-	<b>\</b>	14		Boring terminated at 41 feet	
		:					-	1				
							45 – 45 –		•			
							_					
· :							50-					- -
							~					
							55-					-
							-					
							<b>6</b> 0 -					
			-				-					•
							65 –		į		٠.	· .
				;			-					- -
							70-					
Date Start Date Com			uary 16 uary 16			Vater I	_evel	: <u>V</u>	3	1.3 f	t. 2/16/05 1125 HRS	Plate
Logged By		S. La	tronic		[	Orill Rig	-55					
Total Dept		41 fe				Drilling Method: 4" Auger A - 35						
Date Started: February 16, 2005  Date Completed: February 16, 2005  Logged By: S. Latronic Drill Rig: Total Depth: 41 feet Drilling Meth Work Order: 3869-20 Driving Ener										40 it	o. wt., 30 in. drop	



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#### KAUMUALII HIGHWAY WIDENING ISLAND OF KAUAI, HAWAII

Log of Boring





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#### KAUMUALII HIGHWAY WIDENING ISLAND OF KAUAI, HAWAII

Log of Boring

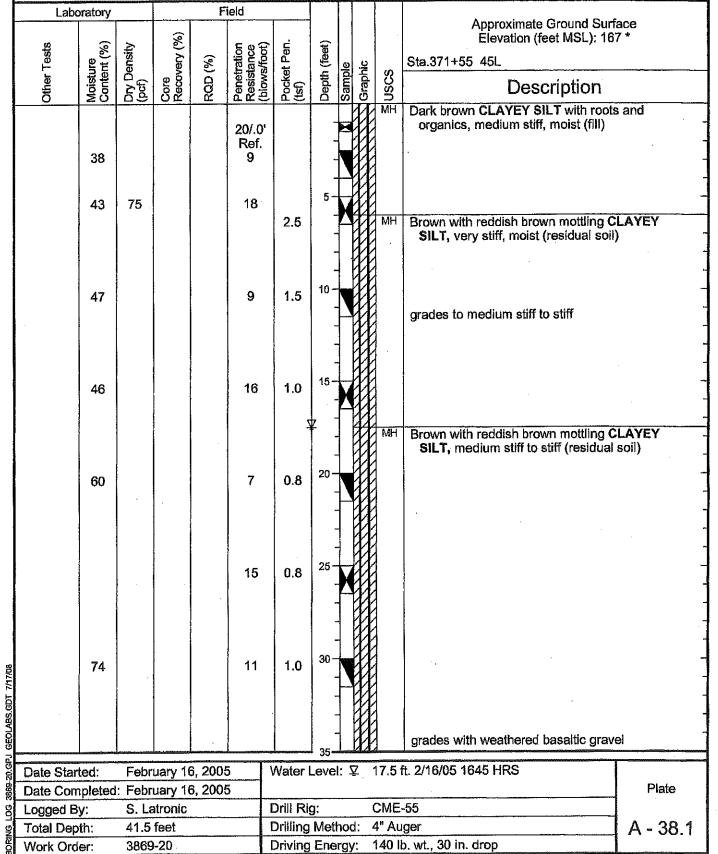
	Labo	ratory	77		F	ield							
				(9)				_				Approximate Ground Surface Elevation (feet MSL): 223 *	
	ests	e t (%)	Density f)	3ry (9	(%	ation foot)	Pen	feet		G		Sta.367+50 95L	
	Other Tests	Moisture Content (%)	Dry Del (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample	Graphic	sosn	Description	
ļ	U	<b>Z</b> U	<u> </u>	OH.	<u> </u>		ш. )		Ĭ	Ň	МH	Brown CLAYEY SILT, stiff, moist (fill)	
		42	65			16	>4.5	-	H	1			
l		34				40	>4.5		4		MH	Brown CLAYEY SILT, very stiff, moist (residual soil)	
			,					-				· ·	1
	LL=66 PI=34	35	88			88	>4.5	5-	M	W			
								_		$\mathscr{H}$			11
ļ								-		W		grades with weathered basaltic gravel	
į		26				17	2.0	-		$\mathscr{U}$	İ	3	
		36				17	Z.U	10		$\mathcal{X}$		grades to stiff to very stiff	_
								_		$\mathscr{U}$		, S. L.	-
								-		$\mathcal{X}$		·	-
		42	70			24	4.0	- سد		$\mathscr{U}$			-
		42	70			24	4.0	15-	M	$\mathscr{X}$			
						•		-		W			j
								-		$\mathscr{M}$		grades with gray mottling	-
	·	51				11	1.5	-		$\mathcal{M}$	1		
		31				''	1.5	20 -			1	grades to stiff, very moist	_
								-		$\mathcal{X}$			_
						,		-		$\mathscr{U}$			-
		31	84			81	>4.5	25-	H	1	MH	Brown with gray mottling CLAYEY SILT, very	
		Ų,	0-			"	7.0	25-	Δ	$\mathscr{U}$	1	stiff, moist (saprolite) grades more saprolitic at 24 feet	
								-		W	1	3-2-2	_
j								_	-	$\mathscr{H}$			-
		33				45	>4.5	30 -					-
17,708	:	99				10		30-				Reduction to defeat	
77. TQ								_				Boring terminated at 31 feet	,
ABS.G								_					-
GEOLABS.GDT 7/17/08								35=		_			
-20.GP:	Date Star	ted:	Febr	uary 16	3. 200	5   1	Water I		: S	Z I	Vot E	incountered	
3869-21	Date Com												
500	Logged B	y:	S. La	tronic		1	Orill Rig				CME		
BORING	Total Dep	······································	31 fe				Orilling				4" AL	<u> </u>	
	Work Ord	er:	3869	7-ZU	<del>(11211111)112111</del> 525		Driving	⊏11 <b>0</b>	ıyy		!4U	b. wt., 30 in. drop	



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#### KAUMUALII HIGHWAY WIDENING ISLAND OF KAUAI, HAWAII

Log of Boring





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#### KAUMUALII HIGHWAY WIDENING ISLAND OF KAUAI, HAWAII

Log of Boring

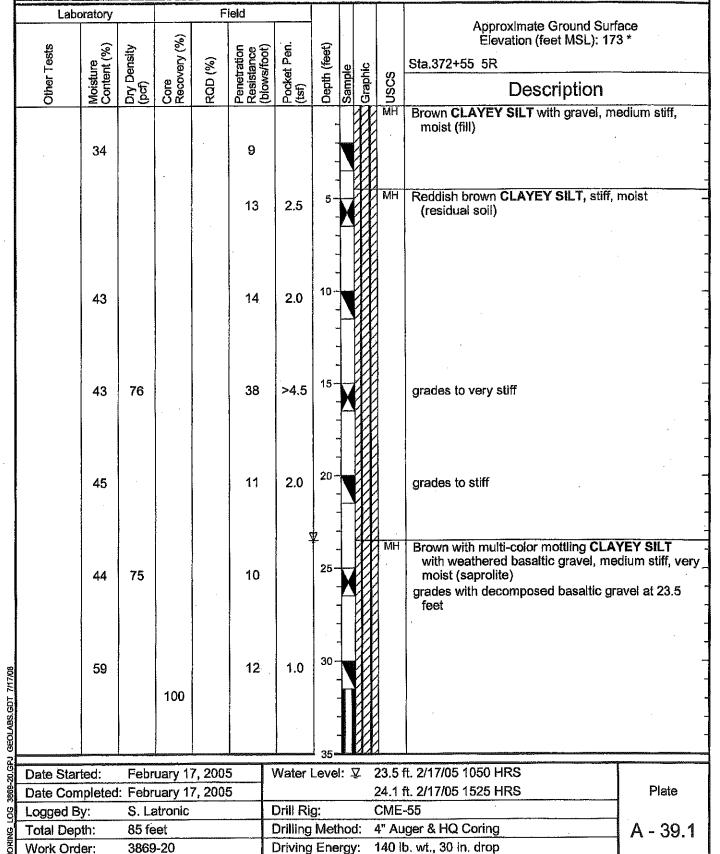
								7								
Labo	oratory			F	ield						·					
Other Tests	Moisture Content (%)	Dry Density (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. Gr (tsf)	Depth (feet)	ole .	hic	w	(Continued from previous pla	te)				
E E	Aoist	<u>g</u> ₹	Sore	QD.	Pene Resis blow	ock (sf)	Sept	Sample	Graphic	nscs	Description					
U	63	64	OE	LE.	28	1,5	-	X		MH	grades to stiff to very stiff					
	68				32	1.0	40-	V			Boring terminated at 41.5 feet	-				
							-				Boring terminated at 41.5 leet					
:		:					45	-				-				
							-	<b>J</b>	-							
							50 -		;		•	-				
						The second secon	55-					-				
		The state of the s	-				60-				,					
							-									
	,	-					65 -	- - -		-		<del>-</del>				
Date Star Date Com Logged B Total Dep Work Ord							70=									
Date Star			uary 16			Vater I	Leve	l: Σ	7 1	7.51	t, 2/16/05 1645 HRS					
Date Con				3, 2005		S. 21 5.				OME:	FF	Plate				
Logged B	· · · · · · · · · · · · · · · · · · ·	S. La 41.5	tronic			Orill Rig Orilling	The state of the s	A 200								
Total Dep										" Au 40 II		A - 38.2				
VYOUN	· · ·	Work Order: 3869-20								Driving Energy: 140 lb. wt., 30 in. drop						



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#### KAUMUALII HIGHWAY WIDENING ISLAND OF KAUAI, HAWAII

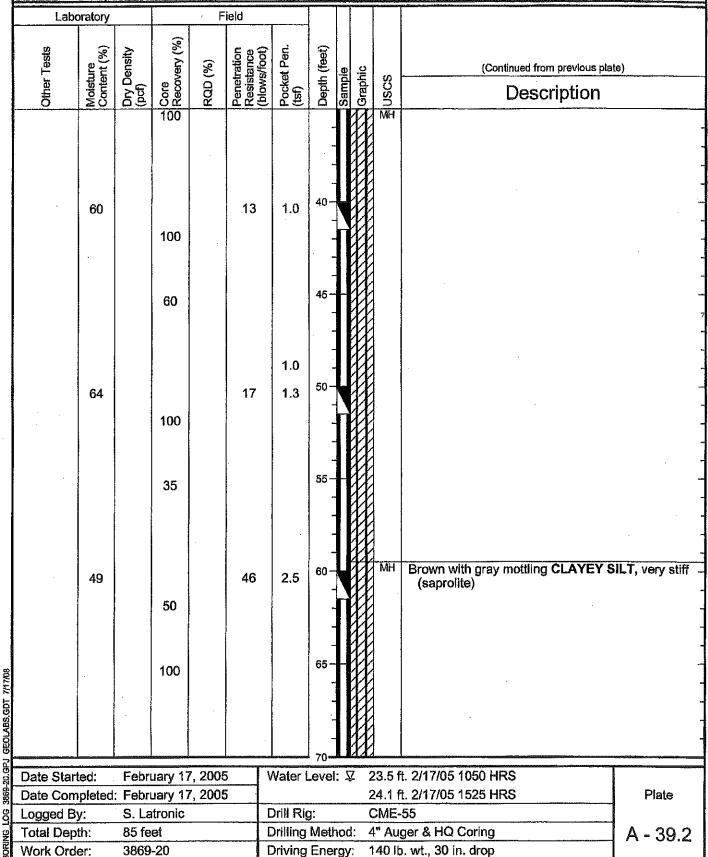
Log of Boring





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KAUMUALII HIGHWAY WIDENING ISLAND OF KAUAI, HAWAII Log of Boring





#### KAUMUALII HIGHWAY WIDENING ISLAND OF KAUAI, HAWAII

Log of Boring

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	Labo	oratory			F	ield							
	Other Tests	on Moisture Confent (%)	Dry Density (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample	Graphic	uscs	(Continued from previous plate)  Description	
-	δ	ŽŬ 50	<u> </u>	QĶ	Ř	34	<u>а</u> #	۵	S	9	Ö		
	Ō	M 50	d) (Q	100	0 0	a) 34	d (1)	75		9 12 - 12 - 12 - 12 - 12 - 12 - 12 - 12	<u> </u>	Brown/gray BASALT, severely fractured, extremely weathered, soft (basalt formation)  grades to soft to medium hard  Boring terminated at 85 feet	
3869-20.GPJ GEOLABS.GDT 7/17/06								100 -					
<u>5</u>			200				Ĺ	105-	<u></u>	<u> </u>			
3869-20.6	ate Star Date Com	pleted	: Febr			5	Vater I	ft. 2/17/05 1050 HRS ft. 2/17/05 1525 HRS Plate					
8 L	ogged B			atronic			Orill Rig				CME		
	otal Dep		85 fe		······································		Orilling					ger & HQ Coring A - 39.3	
ğ V	Vork Ord	er:	3869	-20		] [	Driving Energy: 140 lb. wt., 30 in. drop						



KAUMUALII HIGHWAY WIDENING ISLAND OF KAUAI, HAWAII Log of Boring

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	Labo	oratory			F	ield				*********	1		
	l'ests	re rt (%)	nsity	Core Recovery (%)	(%	ation ance /foot)	Pen.	(feet)	0	υ		Approximate Ground Surface Elevation (feet MSL): 147 * Sta.373+70 45L	
•	Other Tests	Moisture Content (%)	Dry Density (pcf)	Core	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample	Graphic	nscs	Description	_
										Ň	MH	Brown CLAYEY SILT with gravel, stiff, moist (fill)	Τ,
		27				15	2.0	_				;	
		37				8	1.0	5	X			grades to medium stiff	
		61	63			3	0.0	7 -	X		CH-	grades to soft  Dark brown to gray <b>ORGANIC CLAY</b> with gravel,	1 1 1
						_		-			CH- OH	very soft (alluvium)	1
		54				2	:	- 15-	1			grades with less gravel	
								-					1
		102	45		,	4		-	X				
								20			SM	Brownish gray SILTY SAND, loose (alluvium)	
		56			,	12	1.5	-	Y		МН	Grayish brown <b>CLAYEY SILT</b> with sand, stiff to very stiff (saprolite)	
		52	75		-	29	2.0	25 - - -	V				1
T 7/17/08				,			:	30-	^			grades with weathered gravel	
J GEOLABS.GDT 7/17/08		50				18	2.3	35	Y				
-20.GPJ	Date Start	ed:	Septe	ember	21, 20	04 V	Vater L		Ž			/21/04 1010 HRS	1
3869	Date Com	····			22, 20		=	9/22/04 1415 HRS Plate					
991	Logged By		S. La 100.5				rill Rig				ME-		Manthalia
SORING	Total Dept		Drilling Method: 4" Auger, 3" Casing & HQ Coring  Driving Energy: 140 lb. wt., 30 in. drop										
ᄶ	AND VIOLA	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	<u> </u>	HINIIA	느니다	IJУ.	, I	TU IL	r, wil, 30 H. UIUP				



KAUMUALII HIGHWAY WIDENING ISLAND OF KAUAI, HAWAII Log of Boring

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Labo	ratory			F	ield				***		
Other Tests	Moisture Content (%)	Dry Density (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample	Graphic	sosn	(Continued from previous plate)  Description
	41	79			28		40	X		МН	
	55				28		45 –				
	46		100 40	58 17	50/.5' Ref.		- - - 50 –				Gray vugular BASALT, moderately fractured, slightly weathered, hard to very hard (basalt formation)  Brownish gray vesicular BASALT, closely
			95	48	20/.0' Ref.		55 - -				fractured, highly weathered, soft to medium had (basalt formation)
		and the state of t	90	48			60 <del>-</del> -		いいいい		weathered, medium hard to hard  Gray dense BASALT, slightly fractured, slightly weathered, hard to very hard (basalt formation)
			100	88			65 - - -		シーバーバー		
Date Start			ember ember			Water I	-evel	<u>Z</u> :			/21/04 1010 HRS 9/22/04 1415 HRS Plate
Logged By Total Dept Work Orde	/: :h:		tronic feet	CV		Drill Riq Drilling Driving	Meth		; 4	ME-	



KAUMUALII HIGHWAY WIDENING ISLAND OF KAUAI, HAWAII Log of Boring

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Labo	oratory		(A	F	ield						
		nsity	Core Recovery (%)	(%)	ation ince foot)	Pen.	feet)	_		:	(Continued from previous plate)
Other Tests	Moisture Content (%)	Dry Density (pcf)	Sore Recove	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample	Graphic	USCS	Description
			83	70			- - - 75-				Reddish brown and gray <b>BASALT</b> , severely fractured, highly weathered, soft (basalt
			85	0		3.5	80-		いたいた		formation)
			52	7			85 -		かがある		
			100	45			90-				grades to medium hard  Brownish gray vesicular BASALT, moderately
			100	100			95 -				fractured, moderately weathered, medium hard (basalt formation)  Gray dense BASALT, massive, slightly weathered, very hard (basalt formation)
T 7/17/08				-			100 -				Boring terminated at 100.5 feet
Date Star Date Con Logged B Total Dep Work Ord							105-				
Date Star			ember ember		04	Vater I		l: :	{	3.1 ft.	0/21/04 1010 HRS . 9/22/04 1415 HRS Plate
S Logged B Total Dep Work Ord	th:		atronic 5 feet 1-20			Orill Rig Orilling Oriving	Met		d: 4		-55 ger, 3" Casing & HQ Coring A - 40.3 b. wt., 30 in. drop



KAUMUALII HIGHWAY WIDENING ISLAND OF KAUAI, HAWAII Log of Boring

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	Labo	ratory			F	ield			П		<del></del>	
	Other Tests	Moisture Content (%)	Dry Density (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample	Graphic	SS	Approximate Ground Surface Elevation (feet MSL): 147 * Sta,374+00 15L
	o ∰	Cogi	Dry (pcf.	Core	RQI	Res (blo	Poc (tsf)	Dep	San	Gra	nscs	Description
		31	93			45	3.5		X		MH	Brown CLAYEY SILT with gravel, very stiff, moist (fill)
		30				9		5- 5-				grades with sand, medium stiff
		34				4	Z	7 - 10 -	X		MH-	grades to soft  Dark brown to gray CLAYEY ORGANIC SILT,
	11 –55	64	65			4	0.1	- - 15-			MH- OH	very soft (alluvium)
	LL=55 PI=17	04	00			4	<b>0.</b> 1	- - -	X			-
		81				2	0.3	20 - -	1			grades with some gravel
		57	66			13	1.0	25	X		МН	Reddish brown CLAYEY SILT with sand and gravel, medium stiff to stiff (saprolite)
T 7/17/08	LL=67 Pl=31	64				8	1.0	30 - -	V		A TOTAL CONTRACTOR OF THE PARTY	
BORING LOG 3869-20.GPJ GEOLABS.GDT 7117/08								- - 35				grades with weathered gravel
3-20.G	Date Start			ember			Vater L	evel	: Σ			9/22/04 1425 HRS
386	Date Com	-			23, 20		- (۱۳ ۱۳ ۱۳ ۱۳ ۱۳ ۱۳ ۱۳ ۱۳ ۱۳ ۱۳ ۱۳ ۱۳ ۱۳ ۱					9/23/04 1310 HRS Plate
200	Logged By Total Dept		S. La 101 f	tronic eet			Orill Rig Orilling				CME-	
SERVE SE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SER	Work Orde		3869				Oriving					ger, 3" Casing & HQ Coring A - 41.1  D. wt., 30 in. drop
ő.	FIUIT VIUE		<u> </u>		- Otto - Control				31		<del> </del>	- nary are the same per



KAUMUALII HIGHWAY WIDENING ISLAND OF KAUAI, HAWAII Log of Boring

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ľ	Labo	ratory	· · · · · · · · · · · · · · · · · · ·		F	ield				eri Tiran Perusika		
	Other Tests	Moisture Content (%)	Dry Density G (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample	Graphic	nscs	(Continued from previous plate)  Description
		47	75			35	4.0	-	M		MH	grades to stiff to very stiff
		46			:	17	1.5	40 -				
		38	·	53	0	50/.3' Ref.		45 -		\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\		Grayish brown BASALT, severely fractured, highly to extremely weathered, soft (basalt formation)
				73	7			50 -		7.5.7.5.7.5.7.5.7		grades to medium hard
				67	30		nesser,	55 -		100 NO. NO.		Gray vugular <b>BASALT</b> , moderately fractured, slightly to moderately weathered, hard (basalt formation)
				100	88	The state of the s		60 -		1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1		Gray dense <b>BASALT</b> , slightly fractured, slightly weathered, very hard (basalt formation)
3869-20.GPJ GEOLABS.GDT 7/17/08		10 10 10 10 10 10 10		100	100		A manufacture of the state of t	65 -				grades to massive
3		· · · · · · · · · · · · · · · · · · ·			Andrews Theorem			70-	П	'_		
69-20.G	Date Start			ember ember			Water I	.eve	I: Z			9/22/04 1425 HRS 9/23/04 1310 HRS Plate
	Logged By		Drill Rig	<b>]</b> :			CME					
BORING LOG		.ogged By: S. Latronic Total Depth: 101 feet							hoc			ger, 3" Casing & HQ Coring A - 41.2
BOR	Work Ord		3869				Driving					o. wt., 30 in. drop



Geotechnical Engineering ISLAND OF KAUA

KAUMUALII HIGHWAY WIDENING ISLAND OF KAUAI, HAWAII Log of Boring

Labo	oratory	<del></del>		F	ield	ı						
Other Tests	Moisture Content (%)	Dry Density (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample	Graphic	USCS	(Continued from previous plate	)
PO.	MC Co	Dr. (pc	ිසි 58 50 85 92	22 0 7 58	Pe Re R (1)	Po (ts:	75	es	<b>10</b> \\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	SN	Reddish brown and gray BASALT, se fractured, highly to extremely weather (basalt formation)  grades to medium hard  Brownish gray vugular BASALT, mod slightly fractured, slightly to moderate weathered, medium hard to hard (bate formation)  Gray dense BASALT, massive, slightly weathered, very hard (basalt formation)	erately to ely sait
Date Start			ember ember			Vater I	105- eve	. Z			9/22/04 1425 HRS 9/23/04 1310 HRS	Plate
Logged By	<b>/</b> :		tronic		(	Orill Rig Orilling		100		ME-		A - 41.3
Work Orde		3869				Oriving	***************************************				p. wt., 30 in. drop	/\ _ TI*



Geotechnical Engineering

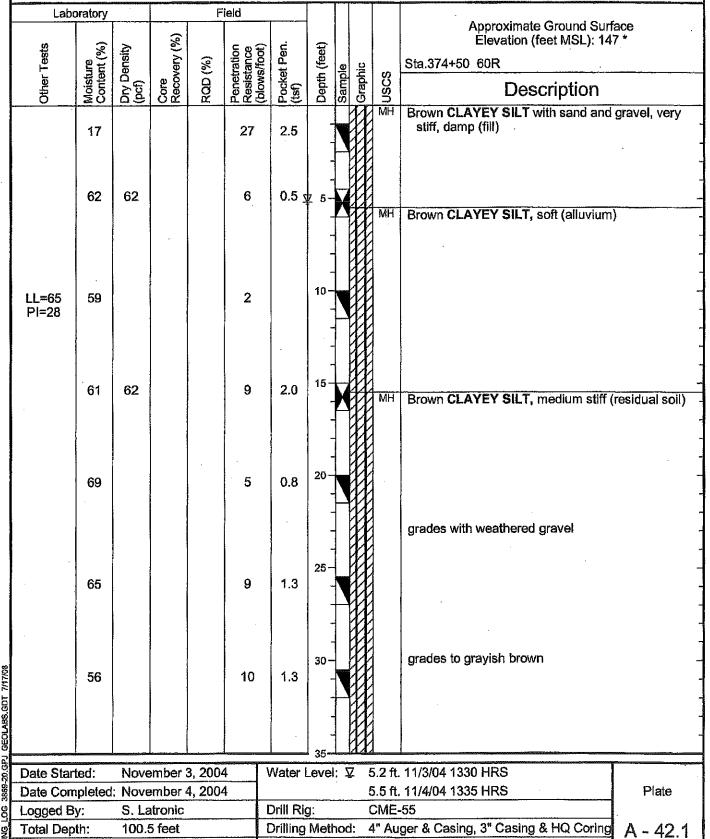
3869-20

Work Order:

#### KAUMUALII HIGHWAY WIDENING ISLAND OF KAUAI, HAWAII

Log of Boring

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**Driving Energy:** 

140 lb. wt., 30 in. drop



Geotechnical Engineering

#### KAUMUALII HIGHWAY WIDENING ISLAND OF KAUAI, HAWAII

Log of Boring

	Labo	oratory			F	ield						
	Other Tests	Moisture Content (%)	Dry Density (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample	Graphic	nscs	(Continued from previous plate)  Description
		59	<u> </u>	011	<u>leles</u>	18	1.5	- 보		Ĭ	MH	
									V		МH	Brownish gray CLAYEY SILT with sand and
		66				6		40 -	1			weathered basalt, medium stiff (saprolite)
			·					- 45-				
	·	,		30	0	15/.0' Ref.				\\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\		Grayish brown BASALT, severely fractured, highly to extremely weathered, soft (basalt formation)
		52				12	1.0	50 -				
				19	0			-				- -
		41		100	53	50/.4' Ref.		55 -		,, , , , , , , , , , , , , , , , , , ,		Gray dense BASALT, moderately fractured, slightly weathered, hard to very hard (basalt
					· .		,	- 60 -		77-74		formation)
				100	75		-	- -		-/-/-		grades to slightly fractured
.GU1 (/1//08	,			100	60			65 - -		\\\-\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\		
3869-20,GPJ GEOLABS.GDT 7/17/08								70-				
69-20.G		Date Started: November 3, 2004 Date Completed: November 4, 2004						_eve	l: ∑			11/3/04 1330 HRS 11/4/04 1335 HRS Plate
	Logged By	y:	S. La	itronic		1	Drill Rig			C	ME-	55
BURING LOG	Total Dep		100.5 3869	feet			Orilling Oriving					ger & Casing, 3" Casing & HQ Coring A - 42.2 p. wt., 30 in. drop
í	Work Ord	CI.	<b>5005</b>	- <b>∠</b> U		Į L	אוואווי	4-115	yy.		ツレル	J. WE., OV DE UTOP



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## GEOLABS, INC.

KAUMUALII HIGHWAY WIDENING ISLAND OF KAUAI, HAWAII Log of Boring

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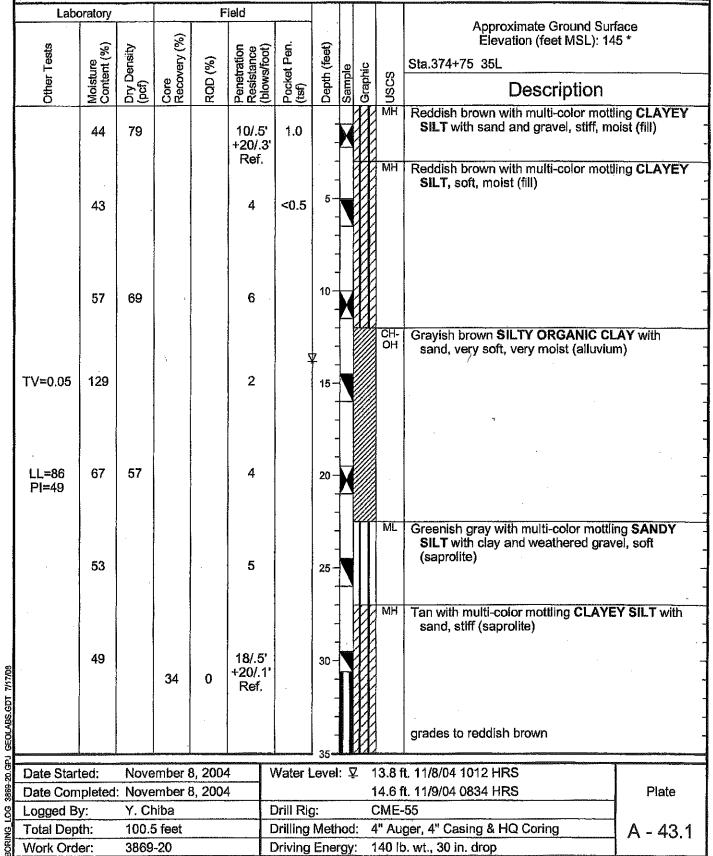
Laboratory		Field	1	***						
Other Tests Moisture Content (%)	Ury Density (pcf) Core Recovery (%)	RQD (%)	Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample	Graphic	USCS	(Continued from previous plate)  Description	
Other	7 (100) 100 100 100 100 100 100 100 100 100	0 13 87 100 87	Resis (bíow	Pock (1sf)	10eO 75 80 85 90 95 1	ames T	シーン・ファーン・ファーン・ファーン・ファーン・ファーン・ファーン・ファーン・ファ	osn est	Grayish brown BASALT, severely fractured highly to extremely weathered, soft (basal formation)  grades to medium hard  Grayish dense BASALT, slightly fractured, slightly weathered, hard to very hard (basa formation)  grades to vugular, massive	
Date Completed: I Logged By:	November 3 November 4 S. Latronic	3, 2004	D	/ater L	j:		5 C	5.5 ft. CME-	55	late
;	100.5 feet 3869-20			rilling riving					ger & Casing, 3" Casing & HQ Coring A -  . wt., 30 in. drop	42.3



Geotechnical Engineering

#### KAUMUALII HIGHWAY WIDENING ISLAND OF KAUAI, HAWAII

Log of Boring





Geotechnical Engineering

#### KAUMUALII HIGHWAY WIDENING ISLAND OF KAUAI, HAWAII

Log of Boring

ı	Labo	ratory		,	F	ield				Ī		·
				(9)			•	_				·
	Other Tests	Moisture Content (%)	Dry Density (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (fect)	ple	je Sie	S	(Continued from previous plate)
	Office	Mois	Dry ( (pcf)	Core	ROD	Pene Resi	Pock (tsf)	Dept	Sample	Graphic	nscs	Description
		55		36	0	15		-			МН	
		56		7.	0	10		40				- - -
		45				33		45				- -
	:			62	0			-				grades to brown, very stiff
				53	0			50 -				
				87	42			55 -		ンノーンノーン		Gray vesicular BASALT, moderately fractured, highly weathered, medium hard (basait formation)
				100	90			60 - - -		-//-/-//-//		grades to slightly fractured, moderately weathered, very hard
T 7/17/08	-			60	27			65 -		- / / / /		-
3869-20.GPJ GEOLABS.GDT 7/17/08			Alexander (September 1988)					- 70		``-\`		Brownish tan with multi-color mottling BASALT, severely fractured, highly to extremely weathered, soft (basalt formation)
20.05 GP	Date Start	ed:	Nove	mber 8	3, 2004	1 V	Vater L	.evel	; ∑	1	3.8 f	t. 11/8/04 1012 HRS
3869	Date Com	pleted:	Nove	mber 8	3, 2004	1				1	4.6 f	t. 11/9/04 0834 HRS Plate
	Logged By		Y. Ch				Drill Rig				ME-	
BORING LOG	Total Dept		100.5			Prilling					ger, 4" Casing & HQ Coring A - 43.2	
ğ	Work Orde	∍r:	3869	-20		] [	Driving	Ene	rgy:	1	40 lt	o. wt., 30 in. drop



KAUMUALII HIGHWAY WIDENING ISLAND OF KAUAI, HAWAII Geotechnical Engineering

Log of Boring

	Labo	ratory			F	leid						449000000000000000000000000000000000000	
,,				(%)			-	(					
) j		nt (%	ensity	ery (	(%)	ratior rance /foot	t Per	(feet	æ	ic		(Continued from previous plate)	
Other Tests		Moisture Content (%)	Dry Density (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample	Graphic	nscs	Description	
	,	20	10	50	0		40		Ĥ	) \ \ \		grades to orangish brown	
							-	-		`,',			-
								-		, , , , ,			
								- 75 -					<del>-</del>
				100	0			- 73	H	,		grades to reddish brown	_
								-					-
								-					, -
								80 -	H	,,,			_
				97	13			-	П			grades to closely fractured, medium hard	
					,			-	Ħ	-/.			_
								-					_
				65	50			85 -	H	77		Dark gray with multi-color mottling BASALT, moderately fractured, moderately weathers	, ∍d.
				00	30			-	11			hard (basalt formation)	_
									H	\ \ \ \			_
								90 -	П	, - <u>, .</u>			·. <u>-</u>
				100	100			90-	Н			grades to slightly fractured	
								-	H				-
			ļ					-					-
			İ					95-	H	<u>/</u>			_
				100	93			-	П				-
						i		_					-
								-		, , ,		grades to slightly weathered, very hard	-
80/								100-	U	~		Boring terminated at 100.5 feet	
7//7								_		`		Bornig terminated at 100.0 feet	7
ABS.GE								-				-	-
GEOU								105					
20.GPJ GEOLABS.GDT 7/17/08  Table de la collaboración de la collab	Date Started: November 8, 2004					ı Iv	Vater L	eve	2:	Z 1	3.8 f	t. 11/8/04 1012 HRS	
g Date	Com	pleted:	: Nove	mber 8		1						The Assessment of the Assessme	ate
	gged By: Y. Chiba tal Depth: 100.5 feet						Orill Rig Orilling		100		ME-	The state of the s	122
=	Orde		3869				riving					o. wt., 30 in. drop	43.3



KAUMUALII HIGHWAY WIDENING ISLAND OF KAUAI, HAWAII Log of Boring

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Labo	ratory			F	ield						
	_		<u>@</u>				_				Approximate Ground Surface Elevation (feet MSL): 145 *
Fests	re rt (%	insity	) (Je	(%	atior ance /foot	Per	(feet	9	Ü		Sta.375+05 15L
Other Tests	Moisture Content (%)	Dry Density (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample	Graphic	USCS	Description
	20	ш 🗸	<u> </u>	<u> </u>	<u> </u>	<u> </u>		0,	ĬŽ.	МН	Brown CLAYEY SILT with gravel, very stiff, moist
	31				24	2.5			$\mathcal{U}$		(fill)
							-				
	31	89			25	2.0	-	V	H		·
							5-				grades with sand
							-	-			
	72				3			1		]	grades to soft, very moist
						0.1	10-			CH- OH	Dark brown to gray SILTY ORGANIC CLAY, soft, very moist (alluvium)
						7	<u> </u>				VERY MOSE (and vidin)
							-				
LL=189					6	0.1	15-	X			
PI=96											·
											·
								1			
	69				3	0.3	20 -				
								1			
											· ·
	64	62			6		25 -	X	77	МН	Brown CLAYEY SILT with gravel, soft to medium
									$\parallel$	1	stiff (alluvium)
					ì				H	]	·
	A**7				EO/EI				$\mathcal{H}$		grades with boulder and cobbles
	47		50	0	50/.5' Ref.		30-	Ŋ	H		grades with bodider and cobbles
									11	1	
			57	7					77	МН	Grayish brown CLAYEY SILT with sand and gravel, very stiff to hard (saprolite)
				•					$\mathcal{U}$		gravor, vory our to have (coprome)
Date Star				~~ ^-			35-	Ш.	- -	44.5	T. O/00/04 4005 LIDS
Date Star Date Com		29, 20 30, 20		Water I	_eve	1: -	<u>Y</u>	11.6	ft. 9/29/04 1035 HRS Plate		
			atronic	00, 20		Drill Rig	g:			CME	
Logged B Total Dep Work Ord		102 1	eet			Drilling	Met				ger, 3" Casing & HQ Coring A - 44.1
Work Ord	er:	3869	-20			Driving	Ene	rg <sub>)</sub>	/:	140 I	b. wt., 30 in. drop



ISLAND OF KAUAI, HAWA
Geotechnical Engineering

KAUMUALII HIGHWAY WIDENING ISLAND OF KAUAI, HAWAII Log of Boring

Laboratory		i		F	ield							
Other Tests	Moisture Content (%)	Dry Density (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample	Graphic	uscs	(Continued from previous plate)  Description	<u></u>
·			68	0			- - - 40 -			МН		
	i salam i sala		33	0			45-			٠		
	40		100	33 45	92		50 -		**************************************		Gray vugular <b>BASALT</b> , moderately fractured, slightly to moderately weathered, medium hard hard (basalt formation)	to -
	issing		95	65			55 -		N-N-N-N-		grades to very hard	-
			100	93			60 -		22222		grades to slightly fractured, slightly weathered	- - -
			65	13			65 -		からからなし		Grayish brown <b>BASALT</b> , severely fractured, moderately to highly weathered, soft to medium hard (basalt formation)	
Date Starte	ate Started: September 29, 2004 ate Completed: September 30, 2004					Vater I	eve	1: 3	Z 1	1.6 f	t. 9/29/04 1035 HRS Plate	
Logged By: Total Depth Work Order	: 1:		tronic eet	ου, 20	] ]	Drill Rig Drilling Driving	Met	_	1: 4		<u> </u>	2



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#### KAUMUALII HIGHWAY WIDENING ISLAND OF KAUAI, HAWAII

Log of Boring

Labora	torv			F	ield							
	, ,											
Other Tests	Content (%)	Dry Density (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample	Graphic	ş	(Continued from previous plat	е)
Office	Conf	gd	Rec	ROL	Pen Resi (blov	Pocl (tsf)	Dep	Sar	Gra	nscs	Description	
			70	7			-		12-12-12-1		grades to extremely weathered, soft	
			80	15			75 - - - 80		(1-14-14-14)		grades to highly weathered, soft to m	edium hard
			100	42			-	-	- 12.75.		Brownish gray BASALT, moderately slightly to moderately weathered, h formation)	fractured, ard (basalt
100			100	73			85 - - -					
			100	100			90 <del>-</del> -		<b>公公</b> 公		grades to slightly fractured, very hard	i
						-	95 -		スペスト			
			100	82			- - 100-		ハーバーバー			
Date Started							105=		· 注`		Boring terminated at 102 feet	
Date Started Date Compl		Septe			04	Vater l		: :			1. 9/29/04 1035 HRS	Plate
Logged By:			tronic			Drill Rig				OME-	**************************************	
Total Depth: Work Order		102 f				Drilling					ger, 3" Casing & HQ Coring	A - 44.3
Work Order:	:	3869	-20			Driving	Ene	rgy	<b>/:</b>	40 II	o. wt., 30 in. drop	



KAUMUALII HIGHWAY WIDENING ISLAND OF KAUAI, HAWAII Log of Boring

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	Labo	ratory			F	eld		-				
	Other Tests	Moisture Content (%)	Dry Density (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample	Graphic	≅ USCS	Approximate Ground Surface Elevation (feet MSL): 161 * Sta.376+10 10L  Description
		23				48	2.0	-	V		MH	Brown CLAYEY SILT with gravel, very stiff, moist (fill)
		41	75			1 <b>1</b>	1.5	5- -	X			grades to stiff, very moist
		39				11		10-				
		50	62			22	1.0	.15 -	X		MH	Brown with gray mottling CLAYEY SILT, stiff, moist (residual soil)
		57				10	0.8	20-				grades to medium stiff, very moist
		64	60			15	1.0	25-	X			grades more saprolitic
GEOLABS.GDT 7/17/08		62				16	8.0	30-			МН	Brown CLAYEY SILT with sand and weathered basaltic gravel, medium stiff (saprolite)
PJ GEOLAB			•					35-				
	e Start			uary 10			Water I	_eve	l: Ż			ft. 2/10/05 1045 HRS
	e Com			uary 10 atronic	J, 2008		Drill Rig	٦.	·		25.5 CME	ft. 2/11/05 1200 HRS Plate
	al Depi		80 fe		o <u>20</u>		Drilling		hod			iger, 3" Casing & HQ Coring A - 45.1
<b>≟</b>	rk Orde		3869				Driving					b. wt., 30 in. drop



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#### KAUMUALII HIGHWAY WIDENING ISLAND OF KAUAI, HAWAII

Log of Boring

F	Laboratory				F	ield						The Part of the Pa	
ŀ		, a.a.,		1									
	Other Tests	Moisture Content (%)	Dry Density (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	O Pocket Pen, or (tsf)	Depth (feet)	ple	hic	S	(Continued from previous plate)	
į	Othe	Mois	Dry ( (pcf)	Core	ROD	Pen Resi (blov	Poct (tsf)	Dep	Sample	Graphic	nscs	Description	
		50	74	50		31	0.5	-	X		МН	Brown CLAYEY SILT, stiff (saprolite)	-
		49		44		23	2.5	40-					
		47				92	3.0	45 <del>-</del>				grades to very stiff	` <b>-</b>
		55		5		30	2.0	- - 50 –					- - - -
				50				- -					-
				63	13			55				Brownish gray vesicular BASALT, close fractured, slightly to moderately weather	ely
				75	27			60 — -		-11-11-11		medium hard to hard (basalt formation)	ered, 1) -
SDT 7/17/08		,		62	20			65 <del>-</del>		-75-75-75-			
3869-20,GPJ GEOLABS.GDT 7/17/08								70-		,,,,		Grayish brown BASALT, severely fractu extremely weathered, soft (basalt form	ured, nation)
9-20,GP	Date Starl			Vater L	.evel	. Д			L 2/10/05 1045 HRS				
	Date Com			- احتر الاس	91				L 2/11/05 1200 HRS	Plate			
907	Logged By Total Dept			Orill Rig Orilling		אמו		ME-		1 150			
BORING	Work Orde		80 fe 3869				Oriving					o. wt., 30 in. drop	۱ - 45.2



KAUMUALII HIGHWAY WIDENING ISLAND OF KAUAI, HAWAII Log of Boring

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ł	Laboratory			Field								
				~								
	ests	Moisture Content (%)	Dry Density (pcf)	O Core L Recovery (%)	<u>.</u>	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)				(Canthrough Franciscus alata)
	Other Tests	sture		o Ve	%) 🖸	netra sistar ws/f	, ket	# <del></del>	Sample	Graphic	nscs	(Continued from previous plate)
	Off	Ç Ğ	( <u>0</u> 0	S S	O RQD (%)	P. R. S. S.	Poc (tsf	Det	Sar	Gra	Š	Description
				67	0				П			
1								-	H	<b>&gt;</b>		
Ì								-	H	, ,		
								75 <i>-</i> -				·
				100	45		·	-		>.		Gray dense BASALT, moderately fractured, slightly weathered, hard to very hard (basalt
								-	$\  \ $	    - 		formation)
									П			
									11	,'-		
								80 -	Γ			Boring terminated at 80 feet
								,				
				-				-	1			
1								85 -				
								-				
								-				
Ì								-				
								90 -				
									]			
												1
									1			
					,			95 -	1			
1								•				
		!										·
								100 -				,
7/17/0					!				1			
<u>.</u>								-				
SABS	:							] .				
뜅	ining the books and the construction of the co		***************************************					105-	1			
-20.GF	Date Started: February 10, 2005						Water Level: ☑ 26.5 ft. 2/10/05 1045 HRS					
3869	Date Completed: February 10, 2005						25.5 ft. 2/11/05 1200 HRS Plate					
9	Logged By: S. Latronic  Total Depth: 80 feet						Drill Rig: CME-55  Drilling Method: 4" Auger, 3" Casing & HQ Coring A - 45.3					
BORING LOG 3859-20.GPJ GEOLABS.GDT 7/17/08	Work Ord		3869-20				Drilling Method: 4" Auger, 3" Casing & HQ Coring  A - 45.3  Driving Energy: 140 lb. wt., 30 in. drop					
The result of the state of the												



Work Order:

3869-20

## GEOLABS, INC.

KAUMUALII HIGHWAY WIDENING ISLAND OF KAUAI, HAWAII Log of Boring

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Geotechnical Engineering

ļ	Laho	oratory			F	ield	*******					
					<u>-</u>							Approximate Ground Surface Elevation (feet MSL): 155 *
	sts	Moisture Content (%)	sity	Core Recovery (%)		Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	eet)				
	Other Tests	sture	Den (	e over	RQD (%)	etral istar ws/fe	te l	Depth (feet)	Sample	Graphic	တ္ပ	Sta.378+40 40L
	Oth	Mois	Dry Density (pcf)	Cor	RQI	Res (bloy	Poc (tsf)	Dep	San	Gra	nscs	Description
										W	MH	Brown CLAYEY SILT with gravel, stiff to very stiff, moist (fill)
		15	104			24	1.5		М	W		-
		18				38	4.0		7	$\mathscr{W}$		-
										$\mathcal{U}$		1
		42	78			18	2.5	5-	М	$\mathcal{X}$		
								-		W		
									-	XX		
ı								-		$\mathscr{U}$		
		49				2	0.3	10-	1	$\mathcal{U}$	MH/	Dark gray CLAYEY ORGANIC SILT, soft, very
										W	OH OH	moist (alluvium)
										$\mathscr{U}$		
							Z	<u>.</u>	-	XX		
	LL=60	47	77			12	0.0	15-	V	$\mathscr{U}$		
	P!=29								Δ	$\mathcal{W}$	1	
									]			
										$\mathcal{U}$	МН	Brown CLAYEY SILT, stiff (residual soil)
		45				19	3.0	20-		$\mathcal{H}$		
				ļ				-	7	$\mathcal{U}$	1	
						İ						]
										$\mathcal{U}$		,
		60	66			18	2.0	25 -		$\mathcal{W}$	]	-
		63	00			10	2.0		M			
									1	W	1	grades with weathered basaltic gravei
										W	]	<b></b>
		1						30-		$\mathcal{M}$	1	]
17/08		58				13	1.0	30 -	1	W	1	-
77. 70	ŧ			İ					<del> </del>			
BS.G									-	W	1	-
GEOL										1	1	
3869-20.GPJ GEOLABS.GDT 7/17/08	Date Star	tod.	Eabr	uary 1	2 200	<u> </u>	Mator!	35=	۱۰ ۲	7 ·	1 <i>1</i> f+	2/18/05 0920 HRS
169-20	Date Star Date Com					Water Level: ☑ 14 ft.					Plate	
LOG 38	Logged B			atronic		Drill Rig	g;	-55				
RING 10	Total Dep		51.5				Drilling		hod	1: 4	4" Au	iger & 3" Casing A - 46.1
7												

Driving Energy: 140 lb. wt., 30 in. drop

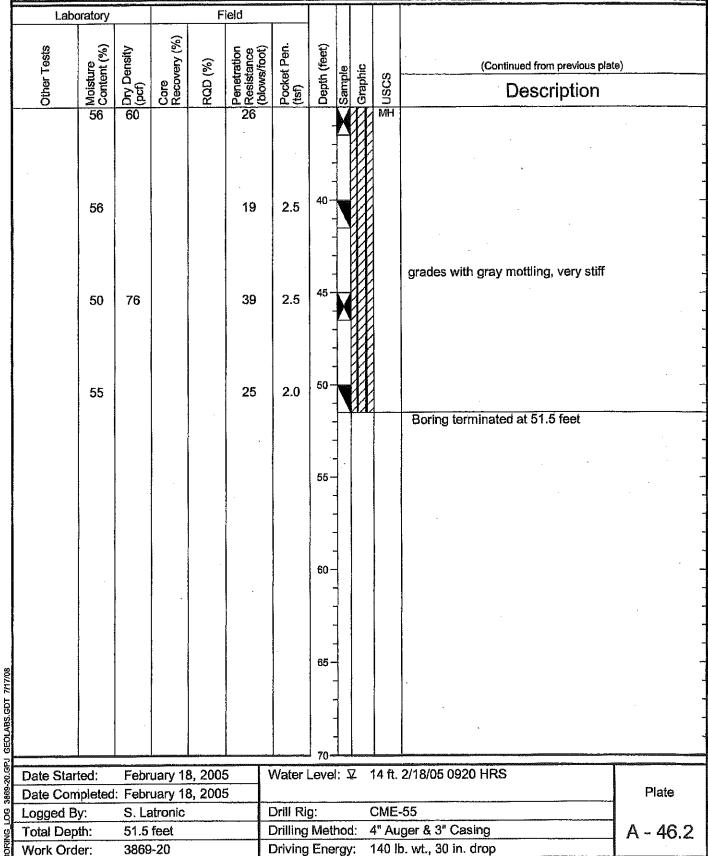


## GEOLABS, INC.

KAUMUALII HIGHWAY WIDENING ISLAND OF KAUAI, HAWAII Log of Boring

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### Geotechnical Engineering





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### KAUMUALII HIGHWAY WIDENING ISLAND OF KAUAI, HAWAII

Log of Boring

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I	Labo	ratory			Fi	ield						
Ī	ýa.	(9)	·y.	(%)		= a <b>(</b> 2	Ė	÷				Approximate Ground Surface Elevation (feet MSL): 195 *
	Test	ure	ensit	very (	(%)	tratio stance s/foo	et Pe	Depth (feet)	Je Je	글	w	Sta.3+00 35R (Hoomana Road)
	Other Tests	Moisture Content (%)	Dry Density (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depti	Sample	Graphic	₹ uscs	Description
ľ								-			НМ	Brown CLAYEY SILT with rootlets, very stiff, moist (fill)
		29	72			25	2.5	_	X	$\mathcal{U}$		
				:				_			МН	Brown CLAYEY SILT, very stiff to hard, moist (residual soil)
i		35				33	>4.5	5-	1	W		(residual soll)
								-	-	$\mathcal{H}$		
										$\mathcal{H}$		grades with gray mottling
		32	83			82	>4.5 <u>Y</u>	10-	X			perched groundwater ?
		57				32	2.0	15-	1	4	МН	Reddish brown CLAYEY SILT, very stiff to hard
								,	ľ			(residual soil)
						E						
		38	79			50/.3	>4.5		X			
1						Ref.		20 -				
		42				62	2.5	]				
İ		72	•			02	2.0	25-				-
											MH	Grayish brown CLAYEY SILT, stiff (residual soil)
												Gray on storm, Carra Toran, Contract Con,
		67				11	1.0	30 -				
GEOLABS.GDT 7/17/08		,										
BS.GD1												
GEOLA	LL=73	51	69			26	2.0	25.	H			grades to very stiff
20.GPJ	Date Started: September 1, 2004						Water I	Leve	l: <u>S</u>	Z ʻ	10.4	ft. 9/2/04 1120 HRS
3869-20.	Date Completed: September 2, 2004						Dry ft. 9/10/04 1110 HRS F					
907 9	Logged By: S. Latronic  Total Depth: 40.5 feet						Drill Rig: CONCORE  Drilling Method: 3" Casing, 3" Drag Bit A - 47					
BORING	Work Order: 3869-20						Drilling Method: 3" Casing, 3" Drag Bit  Driving Energy: 140 lb. wt., 30 in. drop  A - 47.1					



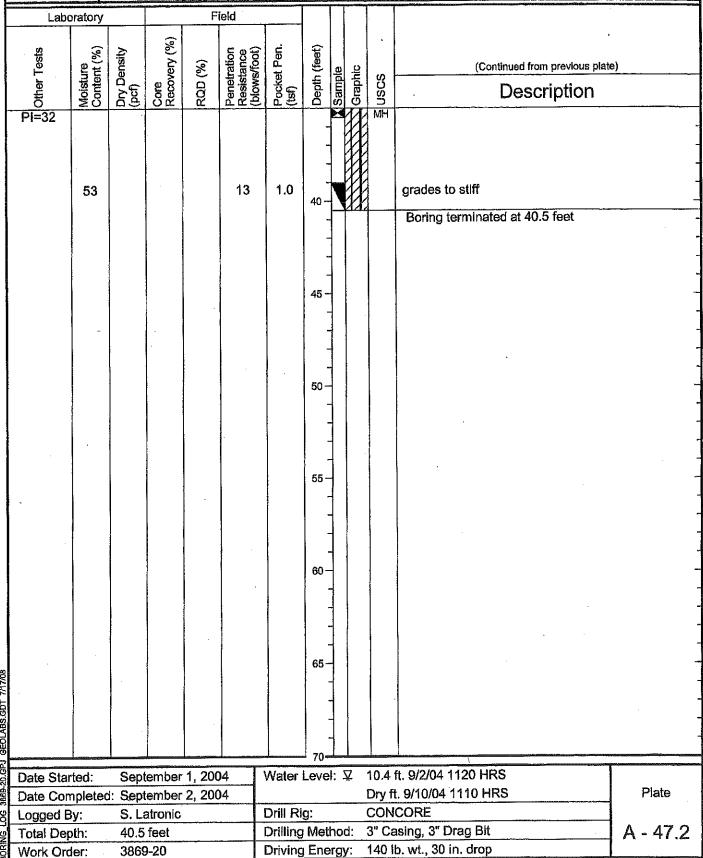
## GEOLABS, INC.

# Geotechnical Engineering ISLAND OF KAUAI, HAWAII

KAUMUALII HIGHWAY WIDENING

Log of Boring

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## APPENDIX B

Logs of Borings from Previous Exploration

	Dat	e Starte	ed:	4	/10/98				rill Rig: Mobile B-80 rilling Method: 4" Auger, HQ Coring	_
		-			/13/98				mining pretricts. 4 Auges, 119 Conting	
					. Chen			D	riving Energy: 140 lb. wt., 30 in. drop	_
•	Tota	al Dept	h:	1	02.5 fee	<u>t</u>	<u></u>			_
9.00		IELD		BORAT		***************************************	····			
Jepth, ft					Compress. Strength ksf	Other	Data	Pen, tsf	DESCRIPTION  Approximate Surface Elevation (ft): 148*	
<u> </u>	S	፲፫		EOX	OWA		Δ	<u> </u>		
	X	49	74	24					Brown and yellow CLAYEY SILT (ML) with sand and gravel, very stiff, damp (fill) Tannish brown SANDY SILT (ML), very stiff,	_
	V	15	76	35				1.5	damp	
5 -	X	11	<b>7</b> 9	29				0.8	Reddish brown CLAYEY SILT (MH), soft to medium stiff, moist to very moist	
10-	1	7	68	¥ 52					Dark gray ORGANIC SILTY CLAY	
	-								Dark gray ORGANIC SILTY CLAY (CH/OH), soft	
15 -	<b>X</b>	3	46	115			t			
20-	X	10	72	52					Gray and brown CLAYEY SILT (MH) with gravel, soft to medium stiff	
25 -	- - - -	57	71	54				1.5	Yellowish brown SANDY SILT (ML) with gravel, stiff	
30-	1									
ง∪ ¯	<b>X</b>	17	68	53				2.2	grades to grayish brown with clay	
35	1			<u> </u>			<del>,</del>			
geo l		GE(		BS	, IN	C.		i i	OG OF BORING 24  UMUALII HIGHWAY WIDENING	
WA	13 L/	Ged ORDER			gineerin 0 KH		Dec 00	내	UE TO WEST OF MALUHIA ROAD  A-24  AND OF KAUAI, HAWAII	В

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	F	IELD	LAE	ORAT	ORY			Π	
4		e . ‡	Э¥.	₽ <del>+</del>	th:		\$ \$		DESCRIPTION
Depth,	Sample	Penetra Resist. Blows/4	* is:	istu Iter	Compress. Strength Ksf	Other Data		-	
<u> </u>	Saj	9 9 9 9 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	29.5	ទទួក	ទូមួន	Othe: Date	Pen,	1	(Continued from previous plate)
	M	40	73	50			2.6		Gray to reddish brown SANDY SILT (ML) with clay and gravel, very stiff
	]								
40-	T	37		47			1.6		·
	H	-							
	1								
45 -		50		49			3.5		
,	K	50		-					
,	Н					RUN 1		Ш	
50						REC=67% RQD=0%		1	Brown vugular BASALT, severely fractured, highly to extremely weathered, soft with seams of clay (weathered basalt formation)
JU	┨┠							<b> </b> }-	seams of clay (weathered basalt formation)
	H			Ϋ́r		RUN 2		\\\- \\-	
	$\ \ $					REC=47% RQD=0%		/·	
55 -						1140-076		[ ]	
	┨	٠				DUNG		<b>[</b> ]-	
						RUN 3 REC=72%		<b> </b> }_	
60-	┪┃					RQD=25%		5	Gray vesicular BASALT, moderately
	$\prod$	•						1	Gray vesicular BASALT, moderately fractured, moderately weathered, medium hard (basalt formation)
	$\prod$					RUN 4 REC=98%		仑	Gray dense BASALT, slightly fractured,
65 -	11		·			RQD=85%		冷	slightly weathered, hard (basalt formation)
								冷	
	H					RUN 5			
70-	1					REC=100% RQD=100%		1	
70	┨┃							}-	
	$\coprod$					RUN 6		H	
						REC=97% RQD=60%		ľ	
75 <i>-</i>			<u></u>	1			<del>1</del>	. <del> -</del>	
-	AF						LC	)G	OF BORING 24 PLATE
		GE(					- 1		JALII HIGHWAY WIDENING
		Geo	otechni	cal En	gineerli	ng ————————————————————————————————————			TO WEST OF MALUHIA ROAD A-24.2
WO	RK	ORDEF	NO.	3869-0	0 KI	N Dec 00	ISL	ANI	D OF KAUAI, HAWAII

	F	TELD		ORAT						
Jepth, ft	Sample	Penetra. Resist. Blows/ft	Jaity	isture itent	Compress. Strength ksf	Other	ซ	- to to		DESCRIPTION
Der	San	98.92 98.22		ទី១ភ	Str Ks4	Other	<u> </u>	Pe -	(0	Continued from previous plate)
80				•		RUN 7 REC=98 RQD=48			たったいた	Gray and tan vugular BASALT, closely to severely fractured, highly weathered, soft to medium hard (basalt formation) grades to moderately fractured
85 -						RUN 8 REC=10 RQD=50	1		たいない	Gray vesicular BASALT, slightly fractured, moderately to slightly weathered, medium hard (basalt formation)
90—				A CONTRACTOR OF THE CONTRACTOR		RUN 9 REC=10 RQD=92			とうない	hard (basalt formation) grades to dark gray —
95 -		·				RUN 10 REC=10 RQD=10	00%			Gray vesicular BASALT, slightly fractured to massive, moderately weathered, hard
100				-		RUN 11 REC=10 RQD=90			行行の	grades to slightly weathered
105 -										Boring terminated at 102.5 feet  Groundwater level at:  Depth Hours Date  8.2 ft. 0800 4/13/98
110	1 t									<del>-</del>
115 -	1									
		GE	DLA	BS	, IN	IC.				OF BORING 24 ALII HIGHWAY WIDENING
VAIO			otechn	ical En	gineeri		: 00	Lih	IUE T	TO WEST OF MALUHIA ROAD  OF KAUAI, HAWAII
1 V T B	* # R.F	اسافاه احد	, 186/2	~~~~~~	~ = ¢!					

		e Starte				a de la companya de l	_ D	rill Rig:	Mobile B-80 4" Auger, HQ Coring	
		e Comp						_		
		iged By					— D	riving Energy:	140 lb. wt., 30 in. drop	
	Tot	al Dept	h:	1	00.0 fee	<u> </u>	<del></del>			
	F	IELD	LAE	ORAT	ORY					
Depth, ft	ple	Penetra. Resist. Blows/ft	si ty	sture Itent	Compress. Strength ksf	9 e	1 tst	-	DESCRIPTION	
Dep	Samp	28.8 28.0 20.0	200	50×	Str sf	Other Dafa	Pen,	1	e Surface Elevation (ft): 146*	
	X	34	76	43			4.0	Reddish t (MH), ver	prown and gray CLAYEY Si y stiff, very moist	ILT
	N	19	76	42		:	1.5	grades to	stiff	
5 -	X	12	67	48			1.2	grades w	ith gravel	
10		6	<u>5</u>	Z 56		·				-
	<b>X</b>	ь	59	96				Dark gray (CH/OH)	ORGANIC SILTY CLAY , soft	
15 -	X	3	48	90				Greenish	gray SILTY CLAY (CH), so	ft .
20	- -S	**	56	77		TV=0.13 tsf LL=86 PI=49				
25 -	X	8	61	61			1.0	Davis and	CUTY OLAY (CU) with no	ad and
	4							KAK	y SILTY CLAY (CH) with sa oft to medium stiff	
30	<b>1</b>	14	83	46				highly we (weather	ugular BASALT, severely fra eathered, soft with pockets ed basalt formation)	of clay
35 -	1	to di Madri	<u></u>		<u> </u>			1.5.1	aggreen annu - na - Alle (1988 Malada - 1974)	······································
geol		LJKHN.O\KKN.		D C	j a	ır	LC	G OF BORI	NG 25	PLATE
	<u> </u>	G E (			, I IN gineerii		Ш		MALUHIA ROAD	A-25.1
WO	RK	ORDEF	NO.	3869-0	O KI	N Dec 00	ISL	AND OF KAUAI,	HAWAII	

	F	IELD	LAE	ORAT	ORY	· · ·			
th, ft	o le	Penetra. Resist. Blows/ft	s 1 ty	sture tent	Compress. Strength ksf	۲	ิณ	# # # *	DESCRIPTION
Depth,	Sampl	Pen Res Blo		50% F 20%	St Tst	Other	Data	Pen,	
- - - 40	X	56	77	46		RUN 1 REC= RQD=	75%		Brown vugular BASALT, severely fractured, highly weathered, soft with pockets of clay (weathered basalt formation)
<del>40</del> -						RUN 2 REC = RQD =	85%		Dark gray vesicular BASALT, closely fractured, moderately weathered, medium hard (basalt formation)
45 -	H					RUN 3	3		
50						REC= RQD=			Brown vesicular BASALT, severely fractured, highly weathered, medium hard with a pocket of clay (weathered basalt formation)
-						RUN 4 REC = RQD = RUN 4	=93% =93% 5		Gray vesicular to dense BASALT, moderately fractured, moderately weathered, medium hard (basalt formation)
55 -			1000 T			RQD=	6 =100%		grades to slightly weathered
60-	· · · · · · · · · · · · · · · · · · ·					RUN ' REC = RQD =	=100%		grades to dense, massive, slightly fractured, hard
65 -	,					RUN: REC: RQD:	=80%		Brown vesicular BASALT, severely
70						RUN REC= RQD=	=90%		fractured, highly weathered, soft to medium hard (weathered basalt formation)
75 -		3				<del> </del>	······································	<u>. I</u>	
		GE(	ΔΙΟ	BS	. IN	IC.		1	OG OF BORING 25 PLATE
					gineerii		<u></u>	1	AUMUALII HIGHWAY WIDENING IHUE TO WEST OF MALUHIA ROAD A-25.2
wo	WORK ORDER NO. 3869-00 KHN Dec 00							ISI	SLAND OF KAUAI, HAWAII

***************************************	-	IELD		BORAT		· , ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	l'i	
Depth, ft	Sample	Penetra. Resist. Blows/ft	¥ msity ∓	i sture intent	mpress. rength	Other Data	Pen, tsf	DESCRIPTION  (Continued from providing plots)
ä	Sa	<u> 도</u> 및 및	무무의	운읍×	ទះ	<del>5</del> 5	4	(Continued from previous plate)
						RUN 10 REC=90% RQD=0%		Brown vesicular BASALT, severely fractured, highly weathered, soft to medium hard (weathered basalt formation)
80-	1					RUN 11 REC=100% RQD=0%		
85 -						RUN 12 REC=77%	-	Gray vugular BASALT, moderately to closely fractured, moderately weathered, medium hard (basalt formation)
90-						RQD=20%		
	,		·			RUN 13 REC=100% RQD=93%		grades to vesicular, slightly fractured, slightly weathered, medium hard
95 -						RUN 14 REC=89% RQD=63%		
100-								Boring terminated at 100 feet Groundwater level at:
105 -	1							Depth Hours Date 9.2 ft. 1000 4/10/98
	-							
110-								
115 -								
			~ F &			10	LC	OG OF BORING 25 PLATE
		G E C			, IN gineeri	<del></del>		NUMUALII HIGHWAY WIDENING
		ORDEF			-	HN Dec 00		HUE TO WEST OF MALUHIA ROAD  A-25.3  LAND OF KAUAI, HAWAII
AAC	1117		r BA ₽₽.	<u></u>	→ I/I	*** E*********************************		

					<u>/12/98</u>			_ P	'ill Rig:	Mobile B-80 4" Auger	
		_			/12/98			 		7 Augei	
	-	ged By			. Chen		:	D	riving Energy:	140 lb. wt., 30 in. drop	
<u> </u>	Tota	al Depti	h:	4	5.0 feet			<del></del>		Annual Control of the	
	F	IELD	LAE	BORAT	ORY				,		
Depth, ft	Sample	enetra. ≳sist. ows⁄ft	Dry Density Pof	oisture ontent	Compress. Strength ksf	Other	Data	Pen, tsf	Annyoviumate	DESCRIPTION  Surface Elevation (ft): 147*	:
<u> </u>	Š	28.5 20.0	<u> </u>	₹Q×	ភ្ល លួក្ខ	5	Ö	<u> </u>			
	X	<b>7</b> 6	89	12				3.9	<b>∤</b> ∤∤ very stiff, da	YEY SILT (MH-ML) with ( amp	gravel,
•	V	42	75	44				>4.5	grades to re	eddish brown, moist	
5 -	X	47	69	39				>4.5			•
10-	<b>X</b>	<b>22</b>	67	45 7				3.2	grades to v	very moist	
15 -	- - - - -	22	62	54				2.0		·	
20-	<b>X</b>	16	63	54				1.5	Brown CLA sand, stiff	YEY SILT (MH-ML) with	fine
25 -	<b>X</b>	17	66	53				0.8			·
30-	<u> </u>	14	66	57				1.5	grades to t	annish brown	
35 -											
geoli	ں ہے	) krai *0/ ktar. Ł							G OF BORIN	C 26	PLATE
					, IN		-	KAI	IG OF BORIN IMUALII HIGHWAY JE TO WEST OF N	WIDENING	A-26.

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	FI	ELD		ORAT					
Depth, ft	Sample	Penetra. Resist. Blows/ft	ry ensity ef	oisture ontent	Compress. Strength ksf	Other	Data a	Pen, †sf	DESCRIPTION  (Continued from previous plate)
Ö	<u>'</u>	25	<u>රීරීරී</u> 64	<u> </u>	క రు రు	<u>`</u>	<u> </u>	1.0	
40-		86	80	42					Brown CLAYEY SILT (MH-ML) with fine sand and basalt fragments, stiff  Brown and gray BASALT, hard
				·					
45		40/.0' Ref.							Boring terminated at 45 feet Groundwater level at: Depth Hours Date 11.5 ft. 1130 5/13/98
50-				į					- T1.5 IL. 1100 3/10/30
55									
60-									
65 -									
70-							·		
75 —									
		G E (	) L A	BS	, I N	VC.			OG OF BORING 26 AUMUALII HIGHWAY WIDENING
			otechn	ical En	gineeri	ng	ec 00	내	HUE TO WEST OF MALUHIA ROAD  A-26.2  SLAND OF KAUAI, HAWAII

	Dat	e Starte	ed:	7	/26/99	, , , , , , , , , , , , , , , , , , , ,		rill Rig: Mobile B-53 rilling Method: 4" Auger
	Dat	e Comp	oleted:	7	<u>/26/99</u>			minig Metriou: 4 Augar
	-	ged By			'. Chiba		C	riving Energy: 140 lb. wt., 30 ln. drop
	Tot	al Depti	h:	5	<u>1.5 feet</u>			
		FIELD	LA	ORAT	ORY			
Depth, ft	a d	etra. iist. us/ft	isity	sture itent	Compress. Strength ksf		† † \$ £	DESCRIPTION
Dep.	Samp	Penetr Resist Blows		ទីពួក	Sta	Other Data	Pen,	Approximate Surface Elevation (ft): 208.2*
	X	41	99	31			4.0	Reddish brown mottled with brown CLAYEY SILT (MH), very stiff, damp (fill)
5 -	X	52/.5' +45/.3' Ref.	79	37		LL=80 Pl=41	>4.5	grades to brown mottled with brownish orange, very hard (residual)
10-		39	105	32	:		4.0	Brownish orange mottled with brown CLAYEY SILT (MH), very stiff, damp
15 -	-X	32	72	39		LL=68 PI=30	4.0	grades to grayish brown with multi-color mottling
20-	-	52	78	44			3.5	grades to moist
25 -		58	77	48	A A A A A A A A A A A A A A A A A A A		>4.5	grades to reddish brown, very hard
30-	. X	66	68	69	adalah darah darah darah darah darah darah darah darah darah darah darah darah darah darah darah darah darah d		3.0	Bright reddish brown SILTY CLAY (CH), very hard, damp to moist
35 -								grades to brownish orange, damp
geol		L]KH.B\KH.F	200	ъе	I A	10	LC	G OF BORING 27 PLATE
			otechn	ical En	gineerir	ng	LH	IMUALII HIGHWAY WIDENING  UE TO WEST OF MALUHIA ROAD  A-27.1  AND OF KAUAI, HAWAII
WO	RK	ORDER	NO.	3869-0	o Kł	N Dec 00	146	N1

	F	IELD		BORAT					
նeբtհ, f†	ple	metra. Sist. Sus/ft	si ty	sture	Compress. Strength ksf	Other	ū	, †S†	DESCRIPTION
밁	Samp	Peneti Resis Blous	Dry Dens Pcf	동합사	S tra	#-0	Data at	Pen,	(Continued from previous plate)
40	K	64 18	76 87	43 62				1.0	Brownish orange SILTY CLAY (CH), very hard, damp  Reddish brown with multi-color mottling CLAYEY SILT (MH), stiff, moist to very moist
45 -	X	31	64	58				1.0	
50	- X	29	81	64				3.0	grades to dark grayish brown with multi-color mottling with friable sand that breaks down to clayey silt (MH) by fingers, wet  Boring terminated at 51.5 feet
55 -									Groundwater not encountered
60-	1 1 1								
<b>65</b> -									
70	-	-							
75 -							· · · · · · · · · · · · · · · · · · ·		
		GE (	<b>AN</b>		, I N			КА	OG OF BORING 27  UMUALII HIGHWAY WIDENING
wo	RK	ORDEI			·		ec 00		A-27.2  AND OF KAUAI, HAWAII

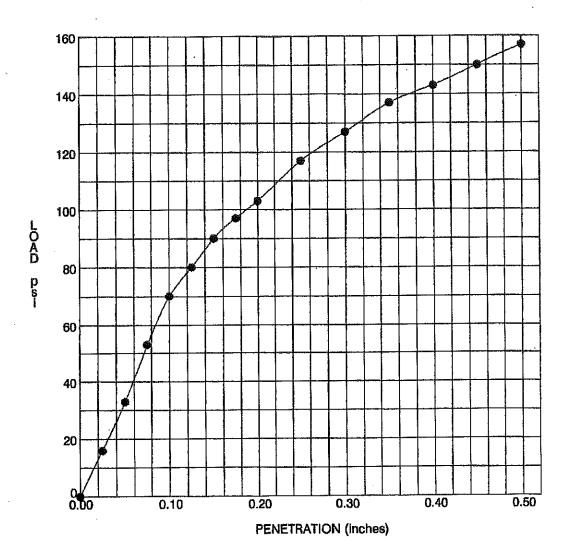
		te Starte					<u></u>	D	rill Ri Irillina	ig: 	Mobile B-53 4" Auger	<del></del>
		te Com			′ <u>/27/99</u> ′. Chiba					-		
	_	gged By al Dept			1.5 feet			— C	riving	g Energy: _	140 lb. wt., 30 in. drop	
		FIELD		ORAT								
<u> </u>			<del>                                     </del>		1			CQ.			DESCRIPTION	
	æ	tra st. s/f	<u> </u>	다 다 다	res ngt	Ĺ		†Sf				
Depth,	Sample	Penetra. Resist. Blows/ft	Dens Port	Mois Cont	Compress. Strength ksf	0ther	Data a	Pen,		• •	ate Surface Elevation (ft): 208.8	
	X	15	57	34				>4.5		Brown C rootlets,	CLAYEY SILT (MH) with roots stiff, damp	s/ :
										grades t	to very hard	-
5												_
"	H	40/.3' Ref.	101	34				>4.5			•	•
ļ		110			:	-						
	1											`-
10-		78	82	34		LL=8	30	>4.5		grades t	to orangish brown mottled w	ith tan —
	1		\ \frac{\sigma_{\sigma}}{\sigma}			PI=3		"			•	
	1	·									,	-
	-											_
15	V	74	104	40				>4.5				
	H									Brownis	sh gray with multi-color mottli Y SILT (MH), very hard, mois	ing .+
	-									CLATE	i one (with), very hard, mois	-
	1					1				grades i	to very stiff	<u></u>
20-	X	32						2.5		g, aaoo	to voly usin	
												-
	-											-
25									Ш	grades	to very hard	_
2.0	X	88	100	42				>4.5				
												•
30-		E4 / 21	85	40				>4.5		Reddish	n brown SILTY CLAY (CH), v	ery
	M	51/.5' +30/.3		40				<b>/</b> 4.5		hard, m	olst	•
	1	Ref.										•
	]									acher	to brownish orange	
35	Ш.		1	<u> </u>	1	<u> </u>	· · · · · · · · · · · · · · · · · · ·		IKN	grades	to Diominon Clando	W3.44.
geo	2	[F]KHM*B/KHN*	F		·		entrantia de la constanta de l	· · · · · ·				
		GE(	<b>ΣΕΔ</b>	BS	. IN	IC.		1			ING 28	PLATE
					gineerii		····	1			WAY WIDENING	قدسم معمدي
		~~~			ي <del>ن</del> و			1			OF MALUHIA ROAD	A-28.1
WC	RK	ORDEF	NO.	3869-0	0 KI	AN C	)ec 00	ISLAND OF KAUAI, HAWAII				

, land annual 2, 2, 2, 2	F	IELD	LAE	BORAT	ORY				
h, fr	9 0	tra. st. 15/ft	i ty	Moisture Content %	Compress. Strength ksf	Ĺ,	ਵਾਂ	4	DESCRIPTION
Depth,	Samp	Peneti Resis Blous	Ory Dens Pof	Son %	Comp Str Kstr	Other	Oata	Pen	(Continued from previous plate)
	X	80	105	41			-	4.0	Brownish orange SILTY CLAY (CH), very hard, moist
40-	24	18	59	64				0.5	Brownish gray with multi-color mottling CLAYEY SILT (MH), stiff, moist
45 -		20	89	56				1,5	grades to reddish brown with multi-color mottling
50-		29	70	49		· ·		1.5	Boring terminated at 51.5 feet
55 -									Groundwater not encountered
60-									
65 <sup>-</sup>	1								
70-	, ,								
75 -	1								
		GEC	) L A	BS		IC.		1	OG OF BORING 28
52200	GEOLABS, INC.  Geotechnical Engineering  WORK ORDER NO. 3869-00 KHN Dec 00								UMUALII HIGHWAY WIDENING IUE TO WEST OF MALUHIA ROAD A-28.2 AND OF KAUAI, HAWAII
WU	MN	UNUEF	INC.	300Y-U	u N	HN D	ec 00		

		te Start						rill Rig: rilling Method:	Mobile B-53 4" Auger	ndavine Zida	
		te Com gged By	-		7/28/99 1. Chiba		<del></del>		140 lb. wt., 30 ln. drop		
		tal Dept		-	1.5 feet			a mergy -	ind to. we., do in. drop		
		FIELD		3ORAT		**************************************			nd Vettig nagles-influence de commence commence en en en en en en en en en en en en en	00-000	
h, #	9	tra. st. is/ft	i tu	ture	Compress. Strength ksf	الم الم	+8+		DESCRIPTION		
Dep th,	Samp	Penetr Resist Blows/		Son X	Comp Stre Ksf	Other Data	Pen,		ate Surface Elevation (ft): 212*		
		11	64	37			3.5	[ ]	SPHALT CONCRETE own SILTY SAND (SM), med	lium	
	1		"	-				\dense, d	lamp	1 '	
								Brown S	ILTY CLAY (CH), stiff, damp		
5	$\forall$	41	101	40	,		4.0			-	
	1						ì			,	
	-							grades to	o mottled with orange		
4.0	1										
10-	-)(	28	81	37			>4.5				
	-					:		Tannish	brown mottled with grayish	brown	
	1	<u> </u>						and orar damp	brown mottled with grayishinge CLAYEY SILT (MH), ver	y stiff,	
15		22	76	38			4.0	Marine	, ·	-	
	1	22	/0				4.0				
	]										
20-	K	35	75	42			2.5	grades t	o tannish gray with multi-co , damp to moist	lor	
			·					mouning,	, damp to moist		
•	1				}						
25											
25	X	43	89	43		LL=69 PI=30	3.5				
	-										
	1										
30-		31	77	45			4.0	grades t mottling	o dark brown with multi-col	or	
	1	}						1111		***************************************	
	]		İ	1			;	Reddish hard, mo	brown SILTY CLAY (CH), v	ery	
	+								·	•	
35	سلس	range er me		·	<u> </u>	<u>. ,</u>	**************************************				
geo	<u> </u>	(C) KHN, D\KHRI.					LC	G OF BOR	ING 29	PLATE	
				<del></del>	<u>, IN</u>		1	UMUALII HIGHW			
		Geo	otechn	ical En	gineerit	ng	LIH	UE TO WEST O	F MALUHIA ROAD	A-29.1	
WC	)RK	ORDEF	NO.	3869-0	0 KI	1N Dec 00	ISLAND OF KAUAI, HAWAII				

	F	IELD	LAE	ORAT	ORY				
, <del>,</del> ,	<u>a</u>	etra.   st.  s/ft	⊅n +-	sture	Compress. Strength ksf	Å	ø.	+8+	DESCRIPTION
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	X	78	84	41				>4.5	Reddish brown SILTY CLAY (CH), very hard, moist
40	<b>M</b>	48	69	47				3.0	
45 -		30	91	56				2.0	Gray with multi-color mottling CLAYEY SILT (MH), very stiff, moist
									(MH), Very Stitt, Moist
50-	X	40	66	55				0.5	Boring terminated at 51.5 feet
						,			Groundwater not encountered
55 -	-					-			
60-									-
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65 -	-								
70-	-								
							-		
75 -	1 ]		1		1	f	Sie Glackie Channel Annabangoring	.1	
GEOLABS, INC.								1	OG OF BORING 29  UMUALII HIGHWAY WIDENING
					gineerir		·	LIH	UE TO WEST OF MALUHIA ROAD A-29.2
WO	RK	ORDER	NO.	3869-0	o Ki	IN D	ec 00	I ISL	AND OF KAUAI, HAWAII

1



LOCATION:

Bulk 10

DEPTH (FEET): Surface DESCRIPTION: Tannish

Tannish brown CLAYEY SILT (MH)

with some gravel

MOLDING MOISTURE (%):

27.3 90.2

MOLDING DRY DENSITY (p.c.f.): CBR @ 0.1" PENETRATION:

7.0

DAYS SOAKED: 3.0 SWELL (%): 0.86

3

PROJECT:

KAUMUALII HIGHWAY WIDENING LIHUE TO WEST OF MALUHIA ROAD ISLAND OF KAUAI, HAWAII AGGREGATE 3/4 inch minus

HAMMER WT. 10 lbs.

HAMMER DROP 18 inches

NO. OF BLOWS 10 NO. OF LAYERS 5

CORRECTED CBR @ 0.1 "
PENETRATION: 70 x 100/1000 = 7.0

CBR TEST

GEOLABS, INC.
Geotechnical Engineering

DATE
Dec 00

3869-00

PLATE B - 47

PLATE D-47

	PERMANENT BMP CHECKLIST	was the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and the same and t						
ojeci Name:								
	HISOU COMP.							
		Project Route/Wilepost						
wenise Date:								
	Exemptions (check	all that apply)						
	Projects that do not generate 1 acre or more of new permanent impervious							
surfa Proje	est returns the area to pre-development ru	noff conditions.						
	ect is a utility project (chack applicable type							
	peline Conduit Traffic Sig	· -						
Proje	ects that are not continuous or involve sevi	eral locations which may collectively						
	rate 1 acre or more of new permanent impers frait do not exchange runoff into any v							
4 14076	corp may and the parameter \$50 and and in the court &							
If :	none of the above is checked, the proje	ct must provide permanent BMPs						
	Water Quality	Control:						
Miniter result	ty volume required:	cubic feet						
same dans	th aminosin Lesinismos							
thi-ine mask	des annie mant permaninimale	eshic test						
	ly volume provided:	क्रमें जीवर						
Water quali Type of BM		व्यक्रीट हिन्दी						
Type of BM Affach on :	P used: a separate sheet a detailed description	of the Permanent BMPs to be						
Type of BM Affach on :	P used:	of the Permanent BMPs to be						
Type of BM Affach on :	P used: a separate sheet a detailed description ed into the design and the appropriate	of the Permanent BMPs to be maintenance requirements.						
Type of BM Affach on :	P used: a separate sheet a detailed description	of the Permanent BMPs to be maintenance requirements.						
Type of BM Attach on a incorporate	P used:  a separate sheet a detailed description ed into the design and the appropriate  Water Quality (  Where appli	of the Permanent BMPs to be maintenance requirements.						
Type of BM Attach on a	P used:  a separate sheet a detailed description ed into the design and the appropriate  Water Quality (  Where appli	of the Permanent BMPs to be maintenance requirements.						
Type of BM Affach on incorporate	P used:  a separate sheet a detailed description ed into the design and the appropriate  Water Quality  (Where appli e Runoff:	of the Permanent BMPs to be maintenance requirements. Control: cable) cubic feet per second						
Type of BM Affach on incorporate	P used:  a separate sheet a detailed description ed into the design and the appropriate  Water Quality (  Where appli	of the Permanent BMPs to be maintenance requirements.  Control: cable)  cubic feet per second outlic feet per second						
Type of BM Affach on incorporate	P used:  a separate sheet a detailed description ed into the design and the appropriate  Water Quality  (Where appli e Runoff:  10-year: 25-year	of the Permanent EMPs to be maintenance requirements.  Control: cable)  cubic feet per second cubic feet per second cubic feet per second						
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Type of BM Affach on a incorporate Existing Site	P used: a separate sheet a detailed description ed into the design and the appropriate Water Quality (Where appli e Runoff:  10-year: 25-year 100-year:	of the Permanent EMPs to be maintenance requirements.  Control: cable)  cubic feet per second cubic feet per second cubic feet per second						
Type of BM Affach on incorporate	P used: a separate sheet a detailed description ed into the design and the appropriate Water Quality (Where appli e Runoff:  10-year: 25-year 100-year:	of the Permanent EMPs to be maintenance requirements.  Control: cable)  cubic feet per second cubic feet per second cubic feet per second						
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Type of BM Affach on a incorporate Existing Site	P used: a separate sheet a detailed description ed into the design and the appropriate  Water Quality (Where appli e Runoff:  10-year: 25-year 100-year: 100-year:	of the Permanent BMPs to be maintenance requirements.  Control: cable)  cubic feet per second cubic feet per second cubic feet per second cubic feet per second cubic feet per second cubic feet per second cubic feet per second cubic feet per second cubic feet per second cubic feet per second cubic feet per second						
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Type of BM Affach on a incorporate Existing Site	P used: a separate sheet a detailed description ed into the design and the appropriate  Water Quality (Where appli e Runoff:  10-year: 25-year: 50-year: 25-year: 25-year: 100-year: 100-year:	of the Permanent BMPs to be maintenance requirements.  Control: cable)  cubic feet per second cubic feet per second cubic feet per second cubic feet per second cubic feet per second cubic feet per second cubic feet per second cubic feet per second cubic feet per second cubic feet per second cubic feet per second						

Figure 1-1

# STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAY DESIGN SECTION

### RELEASE FORM FOR HIGHWAY PLANS, DATA & CADD FILES

(CADD Files are ONLY in Microstation Format)

INSTRUCTIONS : Complete Part I ONLY.

RESS:  DESTED BY (NAME):  A REQUESTED (Name of Highway & Location  OSE (STATEMENT ON USE OF PLANS AND		<b>.</b>		
JESTED BY (NAME):  REQUESTED (Name of Highway & Location		<b>.</b>		
REQUESTED (Name of Highway & Location				
		LES) :		
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S OFFICE : DESIGN PROJ. MGR.	•	CADD	OFC.:	
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### CONFLICT OF INTEREST (COI) DISCLOSURE FORM

Potential organizational conflict must be disclosed by proposers to the project owner as stated in 23 CFR 636.116. This form is to be completed by the General Contractor and all of its engineering, environmental, or architectural consultants hired for this project.

The Federal Highway Administration has defined "organizational conflict of interest" in 23 CFR Section 636.116 as follows:

Organizational COI means that because of other activities or relationships with other persons, a person is unable to render impartial assistance or advice to the owner, or the person's objectivity in performing the contract work is or might be otherwise impaired, or a person has an unfair competitive advantage.

These regulations also apply to "improper business practices and personal conflicts of interest" of the project owner's selection team members. 23 CFR Section 636.117 indicates that Federal Acquisition Regulations will apply to the state's selection team members in absence of relevant state laws and procedures. These regulations require government business to be "above reproach," conducted "with complete impartiality and with preferential treatment for none" and with "the highest degree of public trust and an impeccable standard of conduct" to avoid "even the appearance of a conflict of interest."

The identification, assessment, and management of real or potential COI is a joint task between HDOT and the private sector. It requires both parties to work together in an atmosphere of candor and accountability.

HDOT's determination will be based on a number of factors including;

- 1. Situational facts description of the situation and all known facts specific to the actual or potential COI;
- Type of work specific product or service involved;
- 3. Relationship to Management specific interactions with HDOT's decision managers;
- 4. Timing and availability of project or service.

It is important to understand that specific facts disclosed in any COI situation will be unique to that situation. Therefore, the decisions and conclusions reached in one situation may or may not be directly applicable to another.

If an organizational COI is determined to exist, The State of Hawaii, Department of Transportation, Highways Division may, at its sole discretion, disqualify the proposer from further participation in the procurement, cancel this procurement, or if award has already occurred, canceled the contract. If the proposer was aware of an organizational COI prior to

award of the contract and did not disclose the conflict or potential conflict to HDOT, HDOT may terminate the contract for default.

Some examples of conflict of interest as seen by HDOT are:

### Conflict

### Category Description

- 1. An employee of the Contractor, who has a spouse or immediate relative that is a key Department personnel working on the project;
- Any employee of the Contractor's engineering or environmental consultant who
  has a spouse or immediate relative that is a key Department personnel working
  on the project;
- Any firm who assisted HDOT or HDOT's agent in preparing various Requests for Proposal (RFP) documents, and where that same firm is also partnering on the Proposer's team for the project.

Applicable RFP documents includes but is not limited to:

- A. Technical Provisions;
- B. Plan Sheets:
- C. Special Provisions;
- D. Geotechnical Borings; and
- E. Any environmental document where specific recommendations or mitigation items are required as part of the project scope.
- 4. Any firm who is currently defending HDOT against a lawsuit, claim, informal claim, or notice of claim, by a contractor or subcontractor, and where that same firm is also partnering with the same contractor for this project. Also, any firm who is currently providing post design or construction management services to HDOT on a project where his Design-Build partner is the contractor.

### **HDOT Key Project Personnel List:**

Michael Hinazumi, Kauai District, Assistant District Engineer Jamie Ho, Construction & Maintenance Branch, Engineering Program Manager Stanford Iwamoto, Kauai District, Project Manager Raymond McCormick, Kauai District, District Engineer

Failure to submit a complete <u>Conflict of Interest Disclosure Form</u> by the contractor and all of its engineering, environmental, or architectural consultants will automatically designate the proposer as non-responsive to this solicitation.

Failure to disclose conflict of interest information and any unsatisfactory performance of the contract as a result of the conflict, as perceived by HDOT, may result in commencement of debarment or suspension action defined in Section 103D-702, Hawaii Revised Statutes and Section 3-126, Hawaii Administrative Rules.

#### **PARTI**

Date:	·
Contractor, Engineering, Environmental, or Arc	chitectural firm name:
x	
Would any of the four conflict categories show employee or employees of your firm?	n on page 2 be applicable to your business or any
[ ] – NO If your answer is "no", endorse this form in the this form.	signature line provided below and skip Part II of
[ ]-YES If your answer is "yes", continue to Part II of th	•
conflict of interest to HDOT, and that no principle representatives of this firm that may have busing	considered as a conflict of interest or potential pals, officers, agents, employees, or ness or personal relationships with any other considered as a conflict of interest or potential and all work or services to be performed as a
Date	Name and Title (please print)
	Signature
PART II	
Applicable Conflict Category (1 to 5):	

Name(s) of Employee (if applicable and/or specific to one individual or individuals):
Provide details of the potential conflict. Include project name, project owner and current
applicable contract(s), litigation or claim amount, employee or business relationship with respect
to conflict, and other information as applicable (attach other sheets as necessary):
( and the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of
·
,
Proposed action by Contractor or its Engineering, Environmental, or Architectural form to
mitigate conflict or potential conflict (attach other sheets as necessary). If HDOT has
determined that a conflict exists and HDOT accepts the proposed mitigative action by the
Contractor in this block, the Qualifications proposal will be scored using the information
contained in the mitigation proposal.
I certify that information provided in Part II is true and correct and to the best of my knowledge.
Towns and amorniation provided in rait in is true and confect and to the best of my knowledge.

Date	Name and Title (Please Print)
	Signature
consultant(s) is/are adequate to mitig	by the Contractor or its professional service gate the conflict. by the Contractor or its professional service
Date	

Attach this completed form as a tabbed Appendix to the QUALIFICATIONS PROPOSAL. This will not count against the QUALIFICATIONS PROPOSAL 100 page limitation.