

GEOLABS, INC.

Geotechnical Engineering

Log Legend

### UNIFIED SOIL CLASSIFICATION SYSTEM (USCS)

	MAJOR DIVISIONS	3	USC	cs	TYPICAL DESCRIPTIONS
	CDAVELS	CLEAN GRAVELS		GW	WELL-GRADED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES
COARSE-	GRAVELS	LESS THAN 5% FINES		GP	POORLY-GRADED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES
GRAINED SOILS	MORE THAN 50% OF COARSE FRACTION	GRAVELS WITH FINES		GM	SILTY GRAVELS, GRAVEL-SAND-SILT MIXTURES
	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 RETAINED ON NO. 200 SIEVE	SANDS	LESS THAN 5% FINES		SP	POORLY-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
	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
	OU TO			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
			\(\frac{1}{2}\)	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
50% OR MORE OF MATERIAL PASSING FHROUGH 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
Н	IGHLY ORGANIC SO	ILS	1, 11, 1	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
S	SHELBY TUBE SAMPLE
G	GRAB SAMPLE
	CORE SAMPLE

LL LIQUID LIMIT PLASTICITY INDEX TORVANE SHEAR (tsf)

POCKET PENETROMETER (tsf) UNCONFINED COMPRESSION (psi)

WATER LEVEL OBSERVED IN BORING

A

### **GEOTECHNICAL NOTES**

- A geotechnical engineering report entitled "Geotechnical Engineering Exploration, Kuhio Highway Widening, Vicinity of Leho Drive to Kuamoo Road, Lydgate to Kapaa Bike/Pedestrian Path, Project No. CMAQ-0700(49), Kapaa, Kauai, Hawaii" dated May 12, 2008 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 253.
- 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.
- 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.



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STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION

# BORING LOG LEGENDS & NOTES

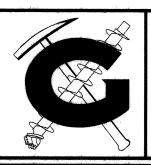
KUHIO HIGHWAY, SHORT TERM IMPROVEMENTS Wailua Cane Haul Bridge Widening

Project No. BR-056-1(51)

Date: MAY 2008

SHEET No. BL-2 OF BL-15 SHEETS

, , ,	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR		TOTAL SHEETS
	HAWAII	HAW.	BR-056-1(51)	2008	255	284



GEOLABS, INC.

Geotechnical Engineering

5625-00

Work Order:

KUHIO HIGHWAY WIDENING
VICINITY OF LEHO DRIVE TO KUAMOO ROAD
LYDGATE TO KAPAA BIKE/PEDESTRIAN PATH
PROJECT NO. CMAQ-0700(49)
KAPAA, KAUAI, HAWAII

Log of

Boring

GEOLABS, INC.

Geotechnical Engineering

KUHIO HIGHWAY WIDENING
VICINITY OF LEHO DRIVE TO KUAMOO ROAD
LYDGATE TO KAPAA BIKE/PEDESTRIAN PATH
PROJECT NO. CMAQ-0700(49)
KAPAA, KAUAI, HAWAII

Log of Boring

2

Lat	boratory			F	Field						
Other Tests	Moisture Content (%)	Dry Density (pcf)	Core Recovery (%)	(%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	ole	hic	S	Approximate Ground Surface Elevation (feet MSL): 43.5 *
Othe	Moist	Dry [ (pcf)	Core	RQD (%)	Pene Resis (blow	Pock (tsf)	Dept	Sample	Graphic	nscs	Description
									and an incident	***************************************	8-inch ASPHALTIC CONCRETE
	5	111			56		-				Dark orangish brown and white GRAVEL (CORALLINE) with sand and traces of silt, dense, damp (fill)
	33				9	<1.0	_		0000		
	30	76			8	2.0	_			СН	Dark brown and gray SILTY CLAY with moderately to highly weathered gravel (basaltic), stiff, moist
					[		5 -	1	<i>(////</i>	SW	Tan SAND, loose, moist (beach deposit)
					!		_		<u> </u>		Boring terminated at 5.5 feet
							_	_			* Elevations estimated from Site Plan transmitted by Paren, Inc. dba Park Engineering on 11/9/06.
							10 —				
							_				
								-			
					ļ						
					ļ		15 —				
							_				
							_		-		
							-				
Date Star	rted:	June	17, 200	 06		Water L	20 <b>–</b> evel:			Not Er	ncountered
	ate Completed: June 17, 2006				T VValei Level. 👱					Plate	
Logged B	ју:	D. Sj	olund		С	Orill Rig	<b>J</b> :		(	CME-	55
Total Depth: 5.5 feet		Ε	Drilling Method: 4" Solid-Ste					id-Stem Auger A - 1			
Work Ord	ork Order: 5625-00			Г	Orivina I	Ener	uv.	1	40 lh	. wt., 30 in, drop	

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

Lab	Laboratory			F	ield						Approximate Cround Surface
[ests	re ıt (%)	nsity	Core Recovery (%)	(%	ation ince foot)	Pen.	(feet)	4	U		Approximate Ground Surface Elevation (feet MSL): 35.5 *
Other Tests	Moisture Content (%)	Dry Density (pcf)	Sore	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample	Graphic	nscs	Description
	20		OIL	<u>LL</u>	шис	ш.		0)	O	ر ب	8-inch ASPHALTIC CONCRETE
	3				25/.3'		_	0	0 -	GW	Tan and white GRAVEL (CORALLINE) with sand
					Ref.				00		and silt, very dense to dense, damp (fill)
	14				22		_	0	00		
							_			СН	Dark reddish brown and gray SILTY CLAY with
	12	81			53	>4.5	_	19	0 6	GC	moderately to highly weathered gravel (basaltic), very stiff, moist (fill)
							-	100			Dark reddish brown and gray CLAYEY GRAVEL
							5-				(BASALTIC), dense, moist (fill)  Boring terminated at 5 feet
						·	_				
							_				
							-	-			
							10 —				
							_				
							_	-			
							<del></del>				
							15 —				
							-90-0-0				
							20 –				
	Pate Started: June 17, 2006			V	Vater L	evel:	Ā	N	ot Er	ncountered	
Date Com Logged By	ogged By: D. Sjolund			<u> </u>	Orill Rig	Plate					
Total Dept		5 feet	<del></del>			Orilling I		od:			d-Stem Auger A - 2
Work Orde	er:	5625	-00			)riving	Energ	gy:	14	40 lb.	. wt., 30 in. drop



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SIGNATURE EXPIRATION DATE OF THE LICENS
GEÖLABS, INC.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

**BORING LOGS - 1** 

KUHIO HIGHWAY, SHORT TERM IMPROVEMENTS

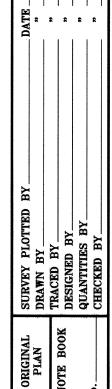
Wailua Cane Haul Bridge Widening

Project No. BR-056-1(51)

Scale: None

Date: MAY 2008

SHEET No. BL-3 OF BL-15 SHEETS



FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR		TOTAL SHEETS
HAWAII	HAW.	BR-056-1(51)	2008	256	284



GEOLABS, INC.

Geotechnical Engineering

KUHIO HIGHWAY WIDENING VICINITY OF LEHO DRIVE TO KUAMOO ROAD LYDGATE TO KAPAA BIKE/PEDESTRIAN PATH PROJECT NO. CMAQ-0700(49) KAPAA, KAUAI, HAWAII`

Log of Boring

2A

				A CONTRACTOR OF THE PARTY OF TH												
Lab	oratory			F	ield											
Other Tests	Moisture Content (%)	Dry Density (pcf)	Core Recovery (%)	(%)	Penetration Resistance (blows/foot)	et Pen.	Depth (feet)	<u>e</u> :		Approximate Ground Surface Elevation (feet MSL): 27 *						
Other	Moist Conte	Dry D (pcf)	Core	RQD (%)	Penel Resis (blow	Pocket I (tsf)	Depth	Sample	NSCS	Description						
										6-inch ASPHALTIC CONCRETE						
	6	105			42		-	000	GW	Orangish tan and white SILTY GRAVEL (CORALLINE) with sand, dense, damp (fill)						
	29	,			35	>4.5	-		СН	Brown SILTY CLAY, very stiff to hard, moist (fill)						
	11				19/0		5 -	000	GP	Light gray and brown vesicular BOULDERS AND COBBLES (BASALTIC), very dense, damp (fill)						
			,		18/.2' Ref.					Boring terminated at 5.2 feet						
							10-									
							15									
Date Start	ed:	Octol	per 25,	2006	IV	Vater L		$\overline{\underline{\nabla}}$	Not Er	ncountered						
Date Com	pleted:	Octob	oer 25,	2006						Plate						
Logged By	/:	D. Sje	olund			Orill Rig	•		CME-	55						
Total Dept	<del></del>	5.2 fe		***************************************		Orilling I	Meth	od:	4" Soli	id-Stem Auger A - 3						
Work Orde	Nork Order: 5625-00			Oriving I	Energ											

	GEOLABS, IN  Geotechnical Engineer  Laboratory Field								O HIGHWAY WIDENING LEHO DRIVE TO KUAMOO ROAD KAPAA BIKE/PEDESTRIAN PATH ECT NO. CMAQ-0700(49) APAA, KAUAI, HAWAII	Log of Boring			
Labora	itory			F	ield								
Other Tests	Moisture Content (%)	Dry Density (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen.	Depth (feet)	. <u>a</u>	Pic Sign	S	Approximate Ground Surface Elevation (feet MSL): 19.5 *		
Othe Spie	Mois Cont	Ory [	Sore	ROD	Pene Resignation	Sock	Sept	Sample	Graphic	nscs	Description		
			<u> </u>					- O.			6-inch ASPHALTIC CONCRETE	arra yaqonan dalam adalam sa maqimu a saqon andi man adalam sa ayan basa sayon asanan adalam asanan adalam sa a	
	7				55				0	SW	Orangish tan and white SILTY SAND (CORALLINE) with gravel, very dens	e, damp (fill)	
	36	75			16	3.0	)			СН	Reddish brown SILTY CLAY with trace stiff, moist (residual soil)	es of sand,	
	34				29	>4.5	5 5				grades to very stiff		
								-	<b>V</b> ////		Boring terminated at 6.5 feet		
GEOLABS.GDT 12/13/06							10	-					
3			water and the state of the stat	· ·			_ 20			:			
ପ୍ତ Date Started:	Date Started: October 25, 2006				Τv	Vater	Leve	l:	V N	Not E	ncountered		
8	Date Completed: October 26, 2006						÷ .	I	· · · · · · · · · · · · · · · · · · ·	Plate			
		D. Sjo				Orill R	Ria:			ME-	55	1	
Total Double	makana mindi sa muyangaya sa sa gasa				***************************************		g Met	nod			id-Stem Auger	<b>1</b>	
Work Order:										A - 4			
ă VVOIR OIGEI.	the state of the same of the s	JUZU.	625-00 I D				Driving Energy: 140 lb. wt., 30 in. drop						



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GEOLABS, INC.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BORING LOGS - 2

KUHIO HIGHWAY, SHORT TERM IMPROVEMENTS Wailua Cane Haul Bridge Widening

Project No. BR-056-1(51) Scale: None Date: MAY 2008

SHEET No. BL-4 OF BL-15 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR		TOTAL SHEETS
HAWAII	HAW.	BR-056-1(51)	2008	257	284



Work Order:

5625-00

## GEOLABS, INC.

Geotechnical Engineering

KUHIO HIGHWAY WIDENING VICINITY OF LEHO DRIVE TO KUAMOO ROAD LYDGATE TO KAPAA BIKE/PEDESTRIAN PATH PROJECT NO. CMAQ-0700(49) KAPAA, KAUAI, HAWAII`

Log of Boring

4

Labo	ratory	<del></del>		F	ield	T					Approximate Cround Surface	
Other Tests	Moisture Content (%)	Dry Density (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample	Graphic	nscs	Approximate Ground Surface Elevation (feet MSL): 18 *  Description	
						***************************************				dianania in antara di manana di	10-inch ASPHALTIC CONCRETE	
	3 11				10/.0' Ref. 19		-		0	SM	Light gray and brown SILTY GRAVEL (BASALTI with sand, very dense, damp (fill)  Orangish tan and white SILTY SAND with traces gravel (coralline), medium dense, moist (fill)	
UC= 30000			68	35	13/.0' Ref.		5-				Light gray slightly vesicular BOULDERS AND COBBLES (BASALTIC), slightly weathered, ve hard (fill)	ry
UC= 22000			52	33			10 -					
UC= 15000			67	53			15 - -					
UC= 20000			70	70		7	20 - -	-			Light gray slightly vesicular BASALT, massive to closely fractured, slightly to moderately weathered, very hard to hard (basalt formation)	
			100	85			25 - -					
			60	20			30				Gray to grayish brown vesicular BASALT, moderately to severely fractured, moderately to highly weathered, hard to medium hard (basalt formation)	
Date Starte		· · · · · · · · · · · · · · · · · · ·	per 23,			Water L	35 <b>-</b> .evel:		Z <b>1</b>	8.5 ft	. 10/24/06 1538 HRS	
Date Completed: October 24, 2006  Logged By: D. Sjolund Dril					Drill Rig: CME-55						te	
				Drilling Method: 4" Solid-Stem Auger & HQ Coring A - 5						<b>5</b> 1		
Work Order: 5625-00 Driving Energy: 140 lb. wt 30							J. I					

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

					INC.			IIO HIGHWAY WIDENING LEHO DRIVE TO KUAMOO ROAD KAPAA BIKE/PEDESTRIAN PATH JECT NO. CMAQ-0700(49) APAA, KAUAI, HAWAII	Log o Boring			
Labo	oratory			The state of the s	ield			Marie Marie Cons	and control of			
Other Tests	Moisture Content (%)	Dry Density (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen.	Depth (feet)	Sample	Graphic	nscs	(Continued from previous plate)  Description	e)
	12		20	29	18/.2'		40 -				grades to severely fractured	
					Ref.		-				Brownish gray vesicular BASALT, close severely fractured, moderately weath (basalt formation)	
			43	13			45	4				
							50	-			Boring terminated at 50 feet	
	·						55 - - - - 60					
							65 -	4				
Date Starte			per 23, per 24,			Water	70 <b>–</b>		Z 1	8.5	ft. 10/24/06 1538 HRS	Plate
Total Dept	Logged By: D. Sjolund  Total Depth: 50 feet  Work Order: 5625-00				aptente algentata ini amenini ili manana per peggana di		Rig: g Methog g Energ	<del></del>	4	" Sc	-55 olid-Stem Auger & HQ Coring b. wt., 30 in. drop	A - 5



GEOLABS, INC.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

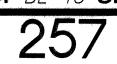
**BORING LOGS - 3** 

KUHIO HIGHWAY, SHORT TERM IMPROVEMENTS Wailua Cane Haul Bridge Widening

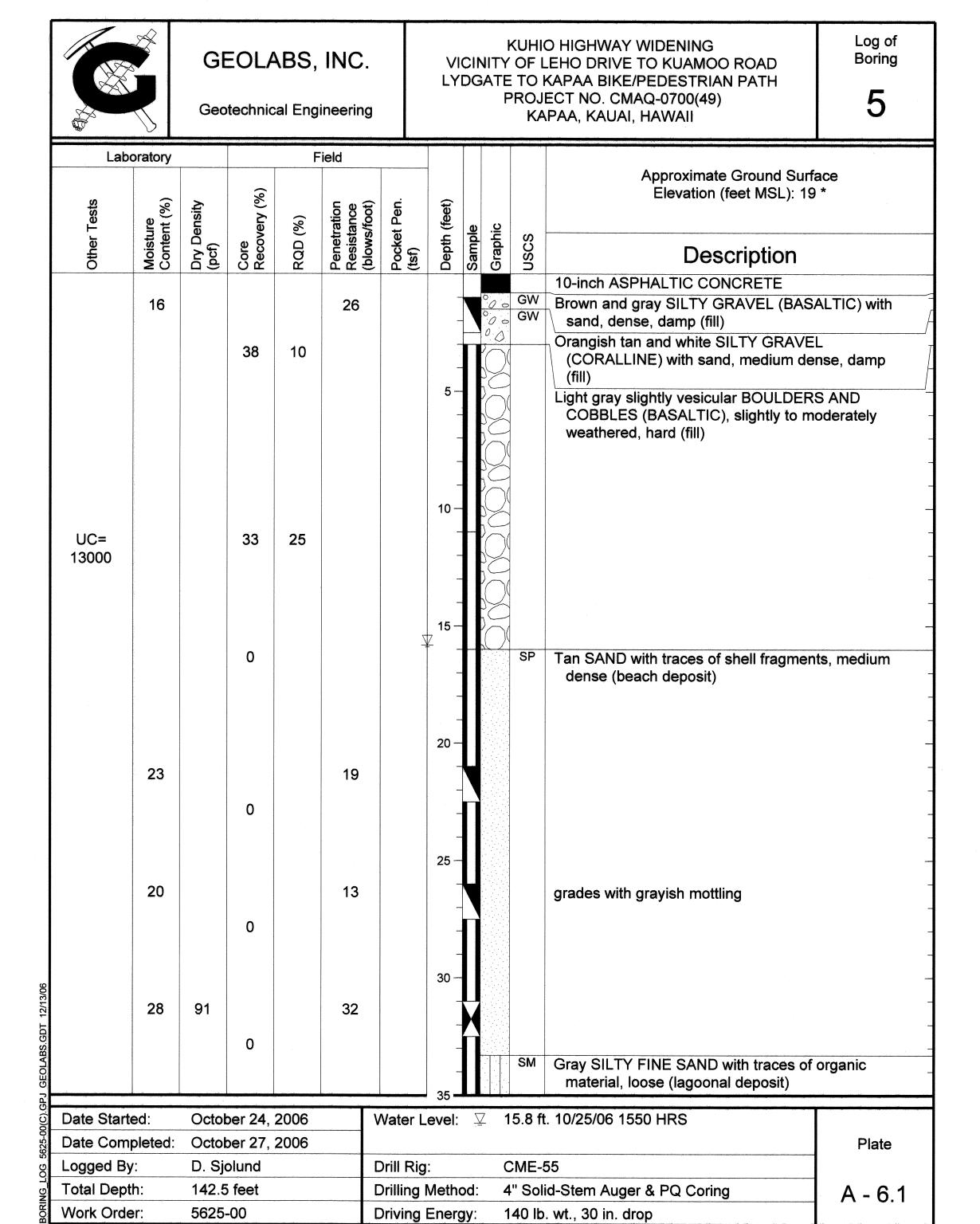
Project No. BR-056-1(51)

Scale: None Date: MAY 2008

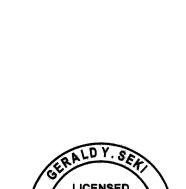
SHEET No. BL-5 OF BL-15 SHEETS



FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	· '	TOTAL SHEETS
HAWAII	HAW.	BR-056-1(51)	2008	258	284



					INC.		VI LY	Log of Boring				
Lab	oratory			F	ield							In the second
Other Tests	Moisture Content (%)	Dry Density (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen.	Depth (feet)	Sample	Graphic	nscs	(Continued from previous pla	te)
	36		0		8		-			SM		
LL=39 PI=4	49 56	65	0		6	<0.3	3 40 -	X		ML	Gray fine SANDY SILT, medium stiff (l deposit)	agoonal
			0		7	0.5	45 - - -				grades with traces of gravel (coralline) material	and organic
UU= 1.5 KSF	28 50	71	0		6		50 -	X				
			0		27		55 - -			SM	Light gray SILTY SAND with traces of (coralline), medium dense (lagoonal	_
	29	88	0		50/.5' Ref.		60	X			grades to very dense	
	44		0		4	0.3	65 -			ML	Light gray fine SANDY SILT with trace (coralline), soft (lagoonal deposit)	s of gravel
Date Start Date Com	pleted:	Octol	per 24, 2				70 -	<u> </u>		entro e se proprese e ses inversos entre entre esta esta esta esta esta esta esta est	t. 10/25/06 1550 HRS	Plate
Logged By Total Dept Work Orde	h:		olund 5 feet -00				ig: g Meth g Ener	<del></del>	4	CME-55 4" Solid-Stem Auger & PQ Coring 140 lb. wt., 30 in. drop		A - 6.



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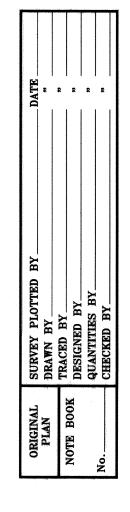
STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION

**BORING LOGS - 4** 

KUHIO HIGHWAY, SHORT TERM IMPROVEMENTS Wailua Cane Haul Bridge Widening

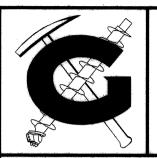
Project No. BR-056-1(51)

Scale: None Date: MAY 2008 SHEET No. BL-6 OF BL-15 SHEETS



The second secon	FED. ROAD DIST, NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR		TOTAL SHEETS
	HAWAII	HAW.	BR-056-1(51)	2008	259	284

Log of Boring



GEOLABS, INC.

Geotechnical Engineering

KUHIO HIGHWAY WIDENING
VICINITY OF LEHO DRIVE TO KUAMOO ROAD
LYDGATE TO KAPAA BIKE/PEDESTRIAN PATH
PROJECT NO. CMAQ-0700(49)
KAPAA, KAUAI, HAWAII

Log of Boring

GEOLABS, INC.

5

Labo	oratory	T		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
	69	63	0		8	0.5	-	X		ML	grades to medium stiff
	55		0		4	<0.3	75  				grades to soft
	53	68	0		11	0.8	80 -	X			grades to stiff
	54		0		4	0.3	85			ML- MH	Brownish gray CLAYEY SILT, soft (lagoonal deposit)
	59	67	0		11	0.8	90	X			grades to stiff
	67		0		6	0.5	95				grades to medium stiff
	68	59	0		12	0.5	100	X		MH	grades to stiff
Date Starte Date Comp	oleted:	Octob	per 24, per 27,	<del>,</del>		Water L			XX Ž	4	:. 10/25/06 1550 HRS Plate
Logged By Total Depth Work Orde	h:	D. Sjo 142.5 5625-	<del></del>			Orill Rig Orilling I Oriving	Metho				

			al Engineeri			ATE TO PROJ	LEHO DRIVE TO KUAMOO ROAD KAPAA BIKE/PEDESTRIAN PATH JECT NO. CMAQ-0700(49) APAA, KAUAI, HAWAII	5	
Laborato	ory		Field						
Other Tests Moisture	Content (%) Dry Density (pcf)	Core Recovery (%)	RQD (%) Penetration Resistance	(blows/foot) Pocket Pen.	(tst) Depth (feet) Sample	Graphic USCS	(Continued from previous possible)  Description		
60		0	5			MH	Brownish gray CLAYEY SILT, soft (I deposit)	agoonal	
UU= 48 1.8 KSF	8 70	0	14	1 0.8	5				
LL=61 63 PI=29	3	0	8	3.0	115 — 3		grades to medium stiff	•	
54	4 66	0	10	0.5	120 -		grades to soft		
75	9	0	21	3.0	125 —		grades to medium stiff		
77	7 52	0	28	3 1.0	130 —				
66	6	0	25	5 0.8	135 — 3 —				
Date Started:	· · · · · · · · · · · · · · · · · · ·	ber 24, 2 ber 27, 2		Wate	r Level:	Z 15.8 f	t. 10/25/06 1550 HRS	Plate	
Logged By: Total Depth: Work Order:	D. S	olund 5 feet			Rig: ng Method: ng Energy:				

KUHIO HIGHWAY WIDENING

VICINITY OF LEHO DRIVE TO KUAMOO ROAD



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SIGNATURE EXPIRATION DATE OF THE LICENSE GEOLABS, INC.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

**BORING LOGS - 5** 

KUHIO HIGHWAY, SHORT TERM IMPROVEMENTS

Wailua Cane Haul Bridge Widening

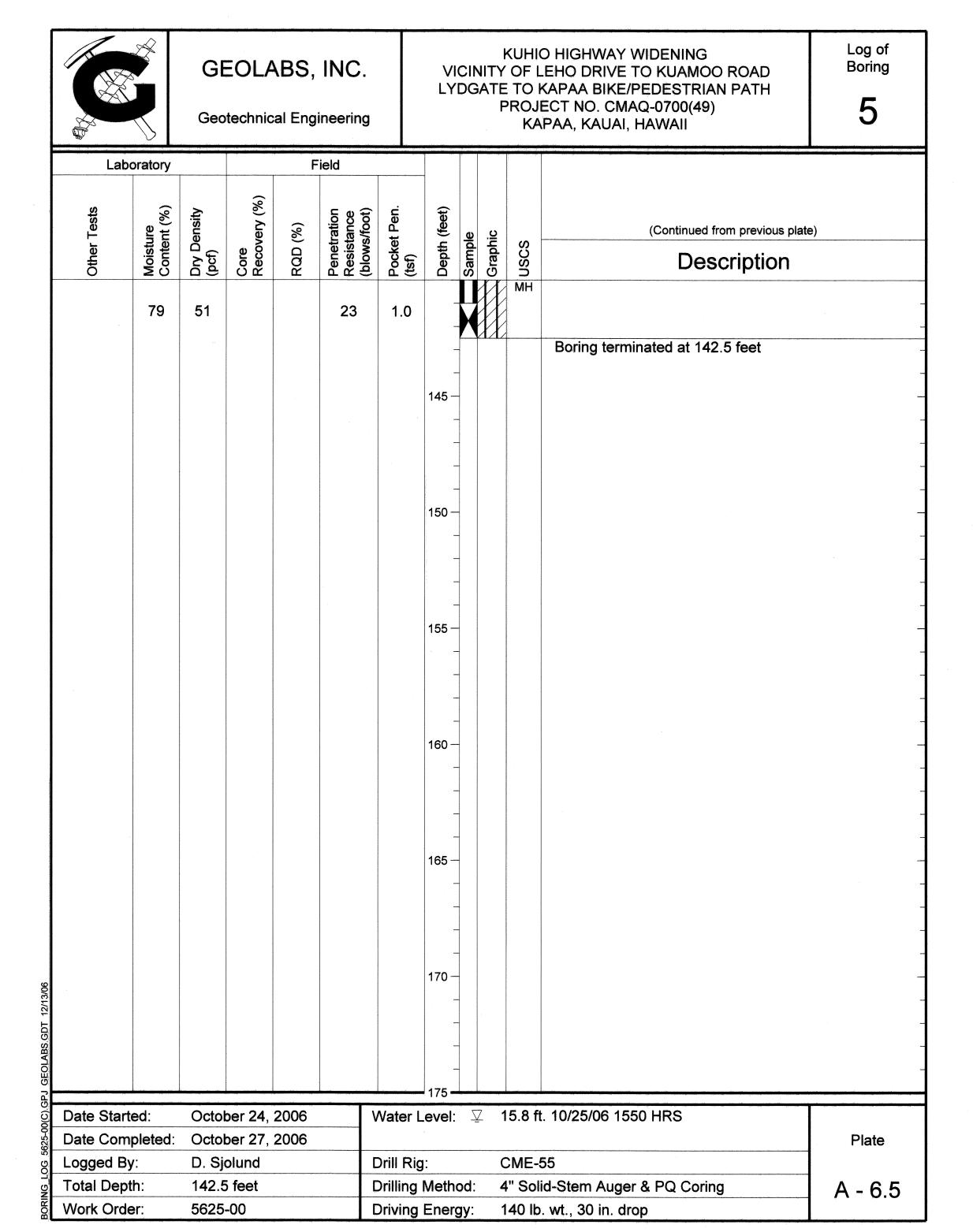
Project No. BR-056-1(51)

Scale: None Date: MAY 2008

SHEET No. BL-7 OF BL-15 SHEETS

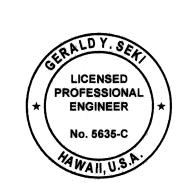
259

Section of the sectio	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.			TOTAL SHEETS
	HAWAII	HAW.	BR-056-1(51)	2008	260	284



					INC.				NITY SATE	OF L TO I ROJ	O HIGHWAY WIDENING LEHO DRIVE TO KUAMOO ROAD KAPAA BIKE/PEDESTRIAN PATH ECT NO. CMAQ-0700(49) LPAA, KAUAI, HAWAII	Boring
Labora	atory	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		F	ield	and the second second second						
Other Tests	Moisture Content (%)	Density f)	Core Recovery (%)	(%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	e e	lic		Approximate Ground Surf Elevation (feet MSL): 16	
Other	Moist Conte	Dry D (pcf)	Core	RQD (%)	Penel Resis (blow	Pocke (tsf)	Dept	Sample		nscs	Description 4-inch ASPHALTIC CONCRETE	ana agama dalam da dalam ana atau ang manda mana da da ayang sa agam man
	31				25		-		000000	GW	Tan and white SILTY GRAVEL (CORA sand, dense, damp (fill)	LLINE) with
	35	72			13	2.5	-			СН	Reddish brown SILTY CLAY with trace stiff, moist (fill)	s of sand,
	34				7	1.5	5 -				grades to medium stiff	
											Boring terminated at 6.5 feet	
							10 -	-				
							-					
							15 -					
							-					
		ia wangan	العديد المساور									· ·
Date Started	d:	Octob	per 26,	2006	Τv	Vater	<del></del>	Ž	Z N	lot E	ncountered	
Date Comple			per 26,			~·~·	· ·	=	_	Plate		
Logged By:			olund		10	Orill Ri	g:		C	CME-55		
Total Depth:	•	6.5 fe	et			Drilling	Meth	od:	4			A - 7
Work Order:		5625	-00			Driving	Ener	gy:	1	40 lb	. wt., 30 in. drop	1

KUHIO HIGHWAY WIDENING



THIS WORK WAS PREPARED E



STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

**BORING LOGS - 6** 

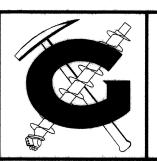
KUHIO HIGHWAY, SHORT TERM IMPROVEMENTS

Wailua Cane Haul Bridge Widening

Project No. BR-056-1(51)
Scale: None Date: MAY 2008

SHEET No. BL-8 OF BL-15 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR		TOTAL SHEETS
HAWAII	HAW.	BR-056-1(51)	2008	261	284



Laboratory

GEOLABS, INC.

Geotechnical Engineering

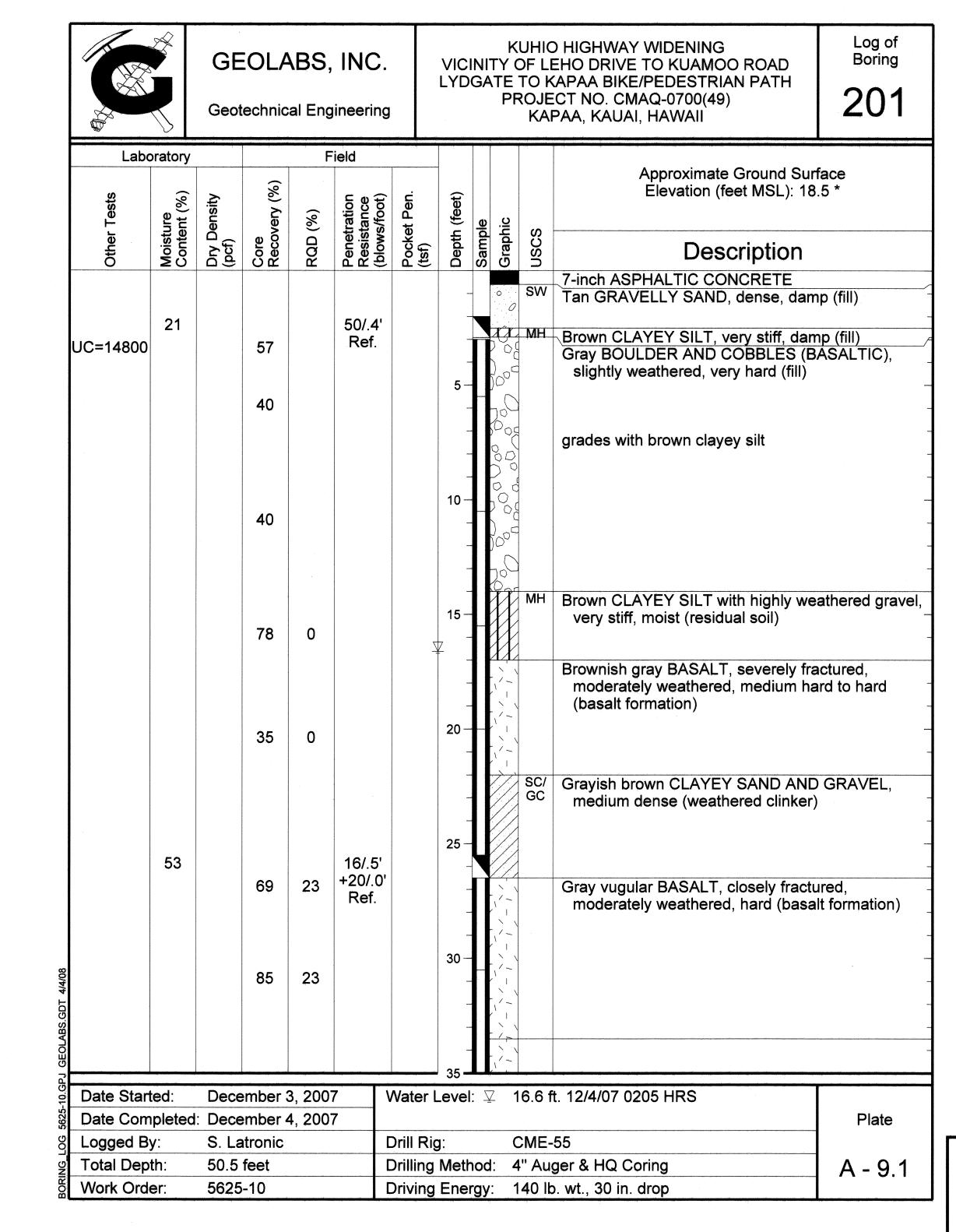
Field

KUHIO HIGHWAY WIDENING
VICINITY OF LEHO DRIVE TO KUAMOO ROAD
LYDGATE TO KAPAA BIKE/PEDESTRIAN PATH
PROJECT NO. CMAQ-0700(49)
KAPAA, KAUAI, HAWAII

Log of Boring

7

	, atory									; ;	Approximate Ground Surface
(A)			(%			نے					Elevation (feet MSL): 13 *
Other Tests	Moisture Content (%)	Dry Density (pcf)	Core Recovery (%)	(%	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)		0		
Fer	istur nten	, De	re Sove	RQD (%)	netra sista ws/	) ket	) the	Sample	Graphic	SS	
Ö	M <sub>o</sub>	Dry (pc	Co	RQ	Per Res (blo	Poc (tsf,	Det	Sar	Ga	USCS	Description
		-									6-inch ASPHALTIC CONCRETE
	4				07		-		000	GW	
	4				37				00		dense, damp (fill)
							_	<b>. T</b>	000		
	5	92			32		·		00	SP	Tan SAND, medium dense, damp (beach deposit)
								H			
							_	/\			
	7				10		5-				
	•										
							-	1		i i	
							_		6		Boring terminated at 6.5 feet
	·						_				
						ı					
								-			
							10 –		and de management of the second		
							_				
							-				
							_				
			·				_	-			
							15 –				
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									A COLUMN TO THE		
							_		1000		
							_				
		All and the second					20 -				
Date Starte		×	per 26,	2006	V	Vater L	evel:	$\overline{\nabla}$	N	lot Er	ncountered
Date Comp	<del></del>	<del></del>	per 26,	2006		**************************************	and the selection of the second		http://www.governeedisch	dan an air air ann an an air an air an air an air an air a	Plate
Logged By:		D. Sjo				Orill Rig		<del>. yayoo aasaa ka aa aasaa</del>	·	ME-	
Total Depth		6.5 fe				Orilling I			·	<del></del>	id-Stem Auger A - 8
Work Order	ſ:	5625-	-00		Ç	Oriving I	Ener	gy:	1	40 lb	o. wt., 30 in. drop





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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

**BORING LOGS - 7** 

KUHIO HIGHWAY, SHORT TERM IMPROVEMENTS
Wailua Cane Haul Bridge Widening

Project No. BR-056-1(51)

Scale: None Date: MAY 2008

SHEET No. BL-9 OF BL-15 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR		TOTAL SHEETS
HAWAII	HAW.	BR-056-1(51)	2008	262	284



Work Order:

5625-10

GEOLABS, INC.

KUHIO HIGHWAY WIDENING VICINITY OF LEHO DRIVE TO KUAMOO ROAD LYDGATE TO KAPAA BIKE/PEDESTRIAN PATH PROJECT NO. CMAQ-0700(49)

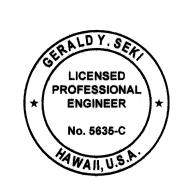
Log of Boring

201

		Geot	echnic	al Eng	jineering				PF	ECT NO. CMAQ-0700(49) PAA, KAUAI, HAWAII	201	
Lab	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 pl	ate)
GPJ GEOLABS.GDT 4/4/08  C=1600			<ul><li>58</li><li>87</li></ul>	7 17			40 45 50 60 70				Brownish gray vesicular BASALT, of fractured, moderately to highly we medium hard (basalt formation)  grades to hard locally  Boring terminated at 50.5 feet  * Elevations estimated from Stransmitted by ParEn, Inc. DBA Engineering on 11/9/06.	eathered, soft to
Date Star		<del></del>	mber 3			Vater l	_evel	: Ž	<u> </u>	6.6 f	t. 12/4/07 0205 HRS	
~	ate Completed: December 4, 2007					Plate						
ଧ୍ର Logged B			tronic	wasiida waxaa ahaa ahaa ahaa ahaa ahaa ahaa ah	····	Orill Rig		optgementinkomm		ME-	different contraction of the second contract	
Total Dep		50.5	feet						<del></del>	·	ger & HQ Coring	A - 9.2
Work Ord	er:	5625	-10	——		)rivina	Ener	rav	: 1	40 lh	o. wt., 30 in, drop	]

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

				•	INC.			KUHIO HIGHWAY WIDENING VICINITY OF LEHO DRIVE TO KUAMOO ROAD LYDGATE TO KAPAA BIKE/PEDESTRIAN PATH PROJECT NO. CMAQ-0700(49) KAPAA, KAUAI, HAWAII			
Labo	ratory			F	ield					Approximate Ground Su	face
Other Tests	Moisture Content (%)	Dry Density (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	ret Pen.	(tsr) Depth (feet)	ple	ဖု	Elevation (feet MSL): 19	
Othe	Mois Cont	Dry I (pcf)	Core	RQD	Pene Resi (blov	Pocket 6	(tSt) Dept	Sample Graphic	nscs	Description	
										13-inch ASPHALTIC CONCRETE	
								- 0	SW	Tan GRAVELLY SAND, dense, dar	np (fill)
			42 55				5 -			Gray BOULDERS AND COBBLES with traces of clayey silt, slightly w hard (fill)	
UC=11000			42				10 -			grades with some voids	
			48				15 -			grades with tan sand	
			32	0			20 -			Grayish brown BASALT, severely fr	actured, high
			0	0			25			weathered, soft (highly weathered	basalt)
	24				41	`	30 -			Brownish gray vesicular BASALT, s	everely
			75	0			35 -			fractured, moderately weathered, (basalt formation)	
Date Start			mber 4		<del></del>	Wate	r Leve	l: <u>\</u>	16.71	ft. 12/6/07 0105 HRS	Plate
Logged By			tronic	J, ZUU		Drill Rig: CME-55			Fiate		
Total Dept	***************************************	50.8		مېرىمىيە ئاڭ دە دېلى ئەسىمىيىيىسىلىرىدىد		<del></del>			A - 10.		
Work Orde		5625		and the second s	<del></del>	Driving Energy: 140 lb. wt., 30 in. drop			$\int \int \frac{1}{1} \int $		



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DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

**BORING LOGS - 8** 

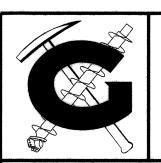
KUHIO HIGHWAY, SHORT TERM IMPROVEMENTS Wailua Cane Haul Bridge Widening Project No. BR-056-1(51)

Scale: None Date: MAY 2008

SHEET No. BL-10 OF BL-15 SHEETS

262

- Commenter of the last of the	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR		TOTAL SHEETS
	HAWAII	HAW.	BR-056-1(51)	2008	263	284



Laboratory

GEOLABS, INC.

Geotechnical Engineering

Field

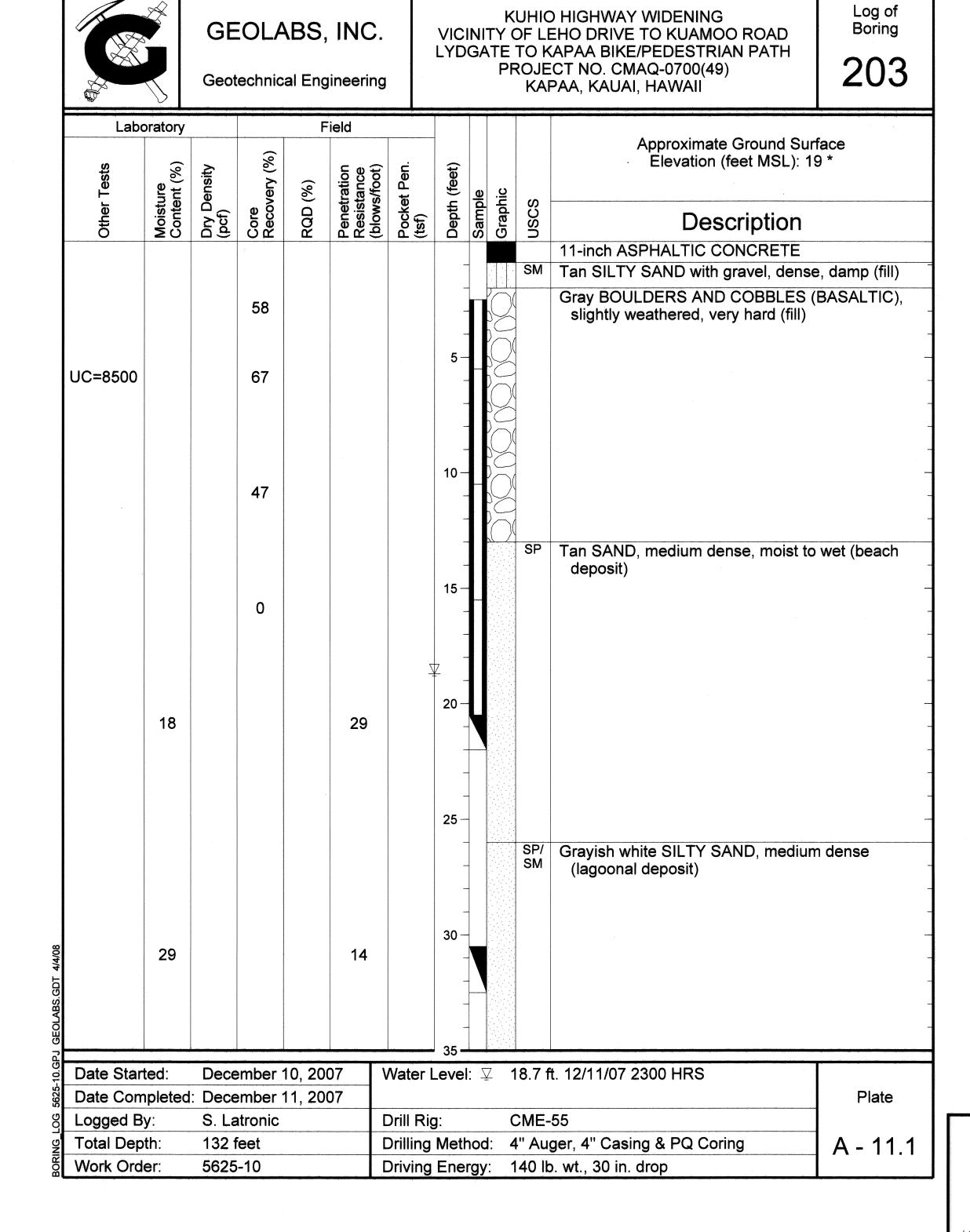
KUHIO HIGHWAY WIDENING
VICINITY OF LEHO DRIVE TO KUAMOO ROAD
LYDGATE TO KAPAA BIKE/PEDESTRIAN PATH
PROJECT NO. CMAQ-0700(49)
KAPAA, KAUAI, HAWAII

(Continued from previous plate)

Log of Boring

202

Other	Moist Conte	Dry Do (pcf)	Core Recov	RQD	Penet Resist (blows	Pocke (tsf)	Depth	Samp	Graph	nscs	Description	
			63	0			-	- 				
			15	0			40				Brown BASALT, severely fractured, h	nighly
	66				14		45 -				weathered, soft (basalt formation)	
			25	11			- - 50 -		/ - / - / /			
	23				50/.3' Ref.		-		` \		Brownish gray BASALT, closely fract moderately weathered, hard (basal Boring terminated at 50.8 feet	
							55 — -					
							60 -					
							- - -					
							65 — - -					
							70 -					
Date Star		<del></del>	ember (	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		<i>N</i> ater l	_evel	: <u>\</u>	1	6.7 f	t. 12/6/07 0105 HRS	Plate
Date Completed: December 6, 2007  Logged By: S. Latronic					Orill Rig	<b>]</b> :		С	ME-	55	1 1410	
Total Depth: 50.8 feet					Orilling					ger & HQ Coring	A - 10.	
Work Ord	er:	5625	-10			Driving	Ene	rgy:	1	40 lk	. wt., 30 in. drop	and an experience of the second secon





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SIGNATURE EXPIRATION DATE OF THE LICENSE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

**BORING LOGS - 9** 

KUHIO HIGHWAY, SHORT TERM IMPROVEMENTS

Wailua Cane Haul Bridge Widening

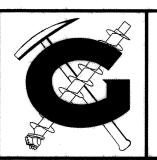
Project No. BR-056-1(51)

Project No. BR-056-1(51)
Scale: None Date: MAY 2008

SHEET No. BL-11 OF BL-15 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.		)	TOTAL SHEETS
HAWAII	HAW.	BR-056-1(51)	2008	264	284

Log of Boring



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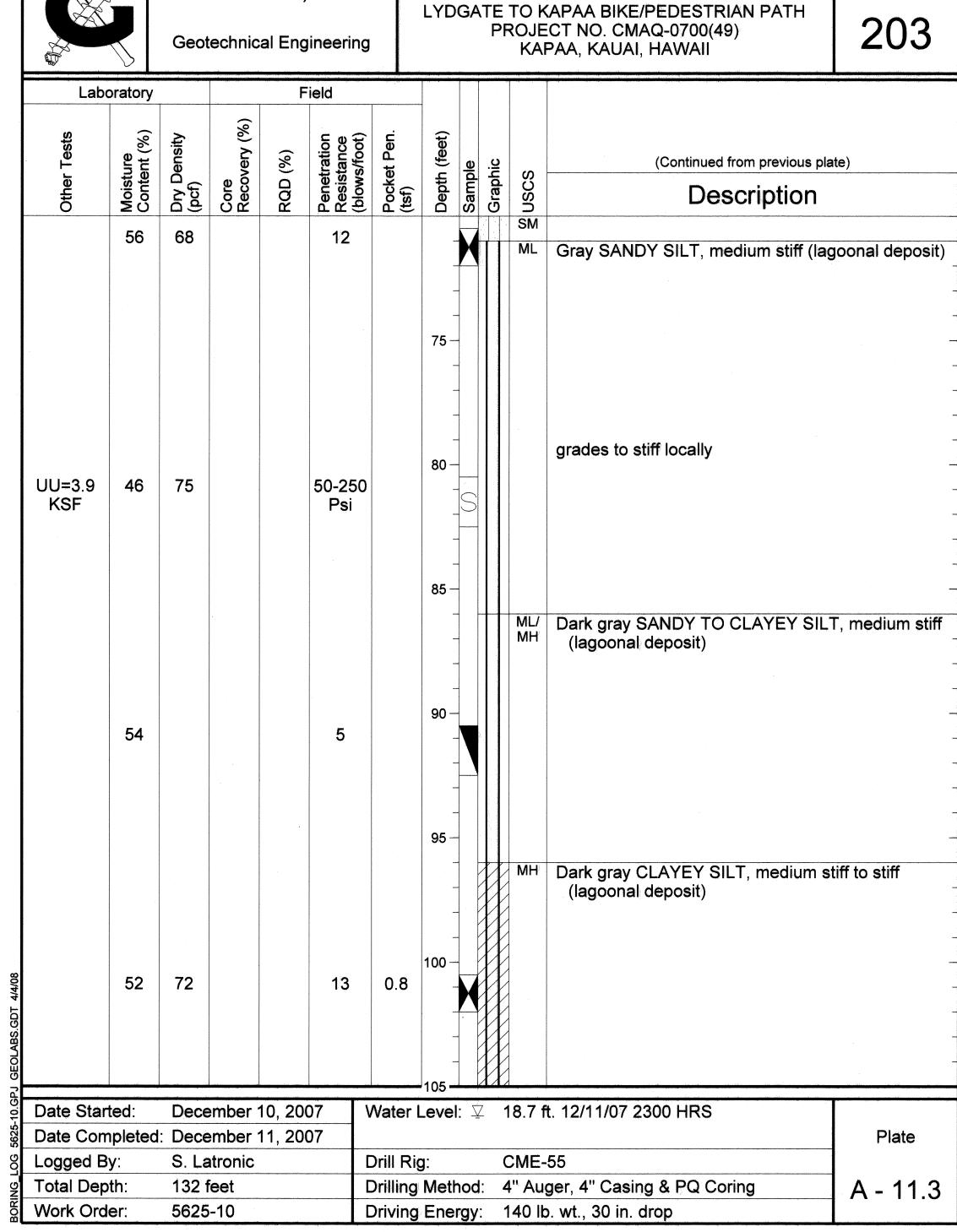
VICINITY OF LEHO DRIVE TO KUAMOO ROAD LYDGATE TO KAPAA BIKE/PEDESTRIAN PATH Geotechnical Engineering

$\overline{}$			1,	J	TV-	\	<b>1</b> /1	DII				ノロ	<b>3</b> I		IMI	<b>∖</b>   [
	F	⊃F	C	)J	EC	T	NC	). C	M	4(	<b>)-</b> (	7	00	(49	<b>3</b> )	
			4	_			4		JAI,					•	,	

**KUHIO HIGHWAY WIDENING** 

Log of Boring	
203	
	=

Date Started: December 10, 2007 Water Level: ☑ 18.7 ft. 12/11/07 2300 HRS Date Completed: December 11, 2007 Logged By: S. Latronic Drill Rig: CME-55	Laborato	Laboratory Field									
34 49  Date Started: December 10, 2007   Date Completed: December 11, 2007   Date Completed: December 11, 2007   Date Completed: December 11, 2007   Logged By: S. Latronic   Drill Rig: CME-55   CME-55	Other Tests Moisture	Content (%) Dry Density (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample	Graphic	nscs	
SM Dark gray SILTY FINE SAND with traces of coralline gravel, loose to medium dense (lagonal deposit)  ML Gray fine SANDY SILT, soft to medium stiff (lagonal deposit)  SM Light gray SILTY FINE SAND, dense (lagonal deposit)							40 -			SP/ SM	grades with organics
ML Gray fine SANDY SILT, soft to medium stiff (lagoonal deposit)  SM Light gray SILTY FINE SAND, dense (lagoonal deposit)  SM Light gray SILTY FINE SAND, dense (lagoonal deposit)  Date Started: December 10, 2007 Date Completed: December 11, 2007 Date Started: December 11, 2007 Date Completed: December 11, 2007 Date Started: December 11, 2007 Date Completed: December 11, 2007 Date Started: December 11, 2007							- - -			SM	coralline gravel, loose to medium dense
34   49   60	48	3 68			12	0.5	- - 55 - -	X		ML	
Date Started: December 10, 2007 Water Level: ☑ 18.7 ft. 12/11/07 2300 HRS Date Completed: December 11, 2007 Plate Logged By: S. Latronic Drill Rig: CME-55	4/4/08	4			49		- - -			SM	
Logged By: S. Latronic Drill Rig: CME-55	Date Started:				***************************************	Vater l	, , , , , , , , , , , , , , , , , , , ,		7	8.7 f	t. 12/11/07 2300 HRS
Total Depth: 132 feet Drilling Method: 4" Auger, 4" Casing & PQ Coring A - 11.2  Work Order: 5625-10 Driving Energy: 140 lb. wt., 30 in. drop	Logged By: S. Latronic										



GEOLABS, INC.

KUHIO HIGHWAY WIDENING

VICINITY OF LEHO DRIVE TO KUAMOO ROAD



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STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION

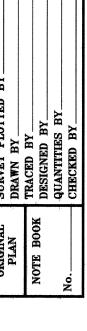
BORING LOGS - 10

KUHIO HIGHWAY, SHORT TERM IMPROVEMENTS Wailua Cane Haul Bridge Widening

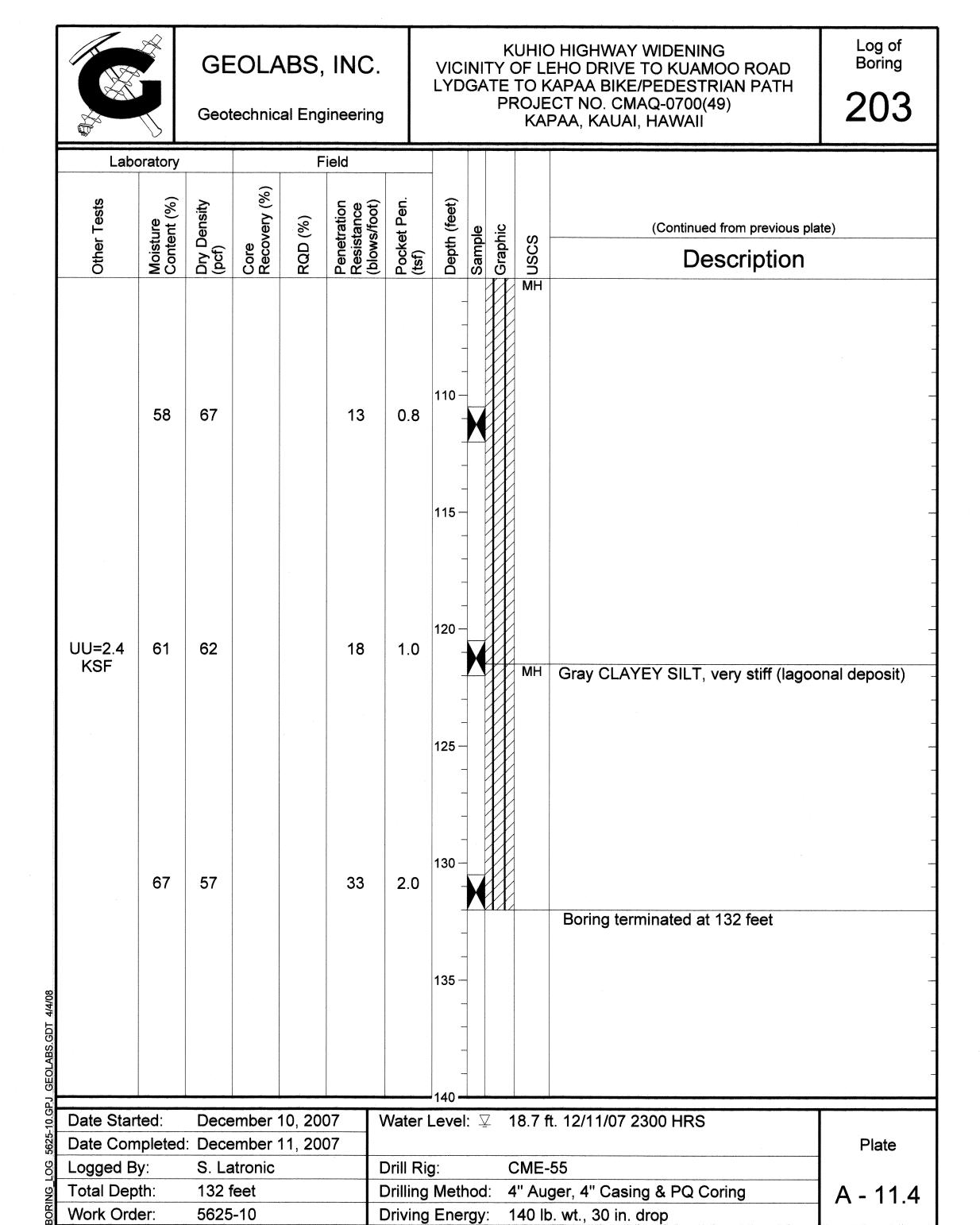
Project No. BR-056-1(51)

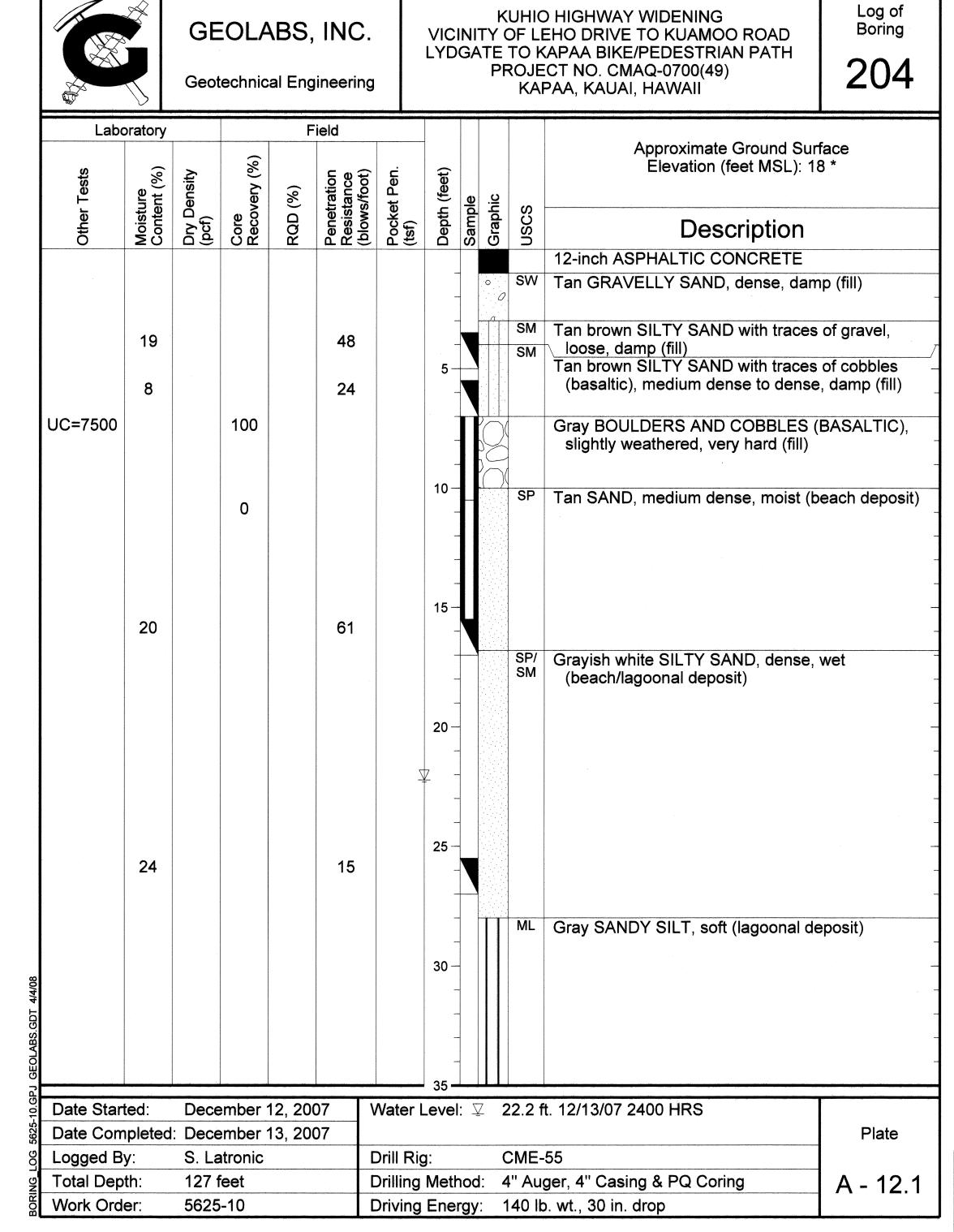
Scale: None Date: MAY 2008

SHEET No. BL-12 OF BL-15 SHEETS



FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR		TOTAL SHEETS
HAWAII	HAW.	BR-056-1(51)	2008	265	284





KUHIO HIGHWAY WIDENING



STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION

**BORING LOGS - 11** 

KUHIO HIGHWAY, SHORT TERM IMPROVEMENTS Wailua Cane Haul Bridge Widening

Project No. BR-056-1(51)

Scale: None Date: MAY 2008 SHEET No. BL-13 OF BL-15 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR		TOTAL SHEETS
HAWAII	HAW.	BR-056-1(51)	2008	266	284



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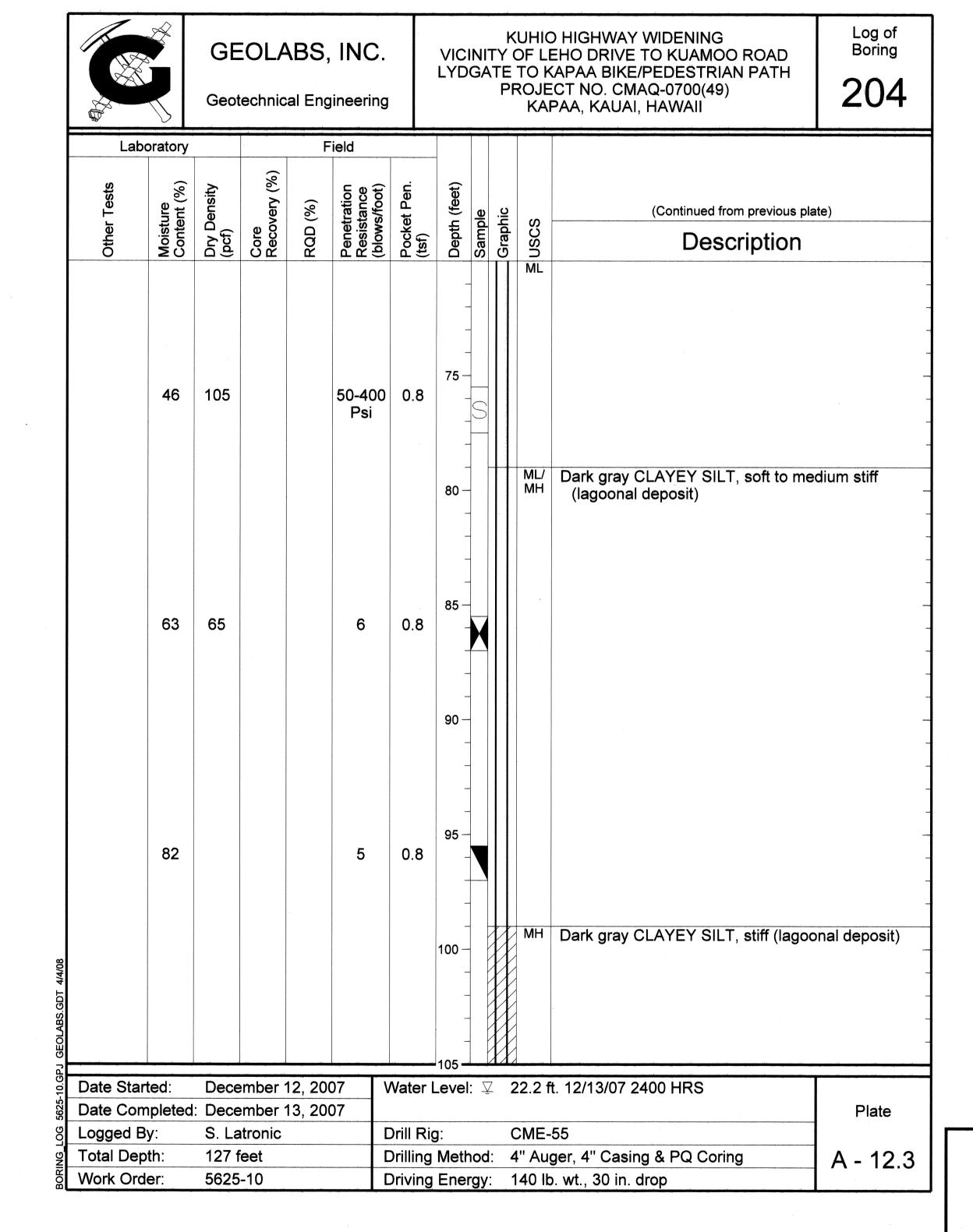
Geotechnical Engineering

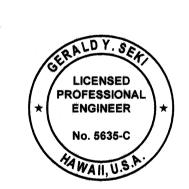
KUHIO HIGHWAY WIDENING VICINITY OF LEHO DRIVE TO KUAMOO ROAD LYDGATE TO KAPAA BIKE/PEDESTRIAN PATH PROJECT NO. CMAQ-0700(49) KAPAA, KAUAI, HAWAII

Log of Boring

204

l abc	oratory	Harding to the state of the sta		F	ield	(7)				And the second s		
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	
er en	42				8	0.1		1		ML		
							40					
	62	64			11		45 — — —					
							50				grades with light gray fine sand locally	
	29	96			125		55 — - - - - 60 —	X		SM	Light gray SILTY SAND, very dense (lagoonal deposit)	
			v				-				grades to loose	
							65 —				grades with traces of gravel (coralline)	
	46				9					ML	Gray SANDY SILT, medium stiff (lagoonal depo	
Date Start	ed:	Door	mhor 1	12 200	77 1 1	Vatar !	70 -	. 🗁		2 2 5	+ 12/12/07 2400 UDS	
Date Start	***************************************		mber 1		***************************************	vater L	_evel	. <u>¥</u>	2	2.2 1	t. 12/13/07 2400 HRS	
Date Completed: December 13, 2007  Logged By: S. Latronic						Drill Rig: CME-55						
Total Depth: 127 feet						Drilling Method: 4" Auger, 4" Casing & PQ Coring  A - 12.2						
Total Dep	C1 1.					/	MICH	IUU.	-4		der, 4 Casing & EQ Conno I A 17	



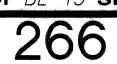


STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION

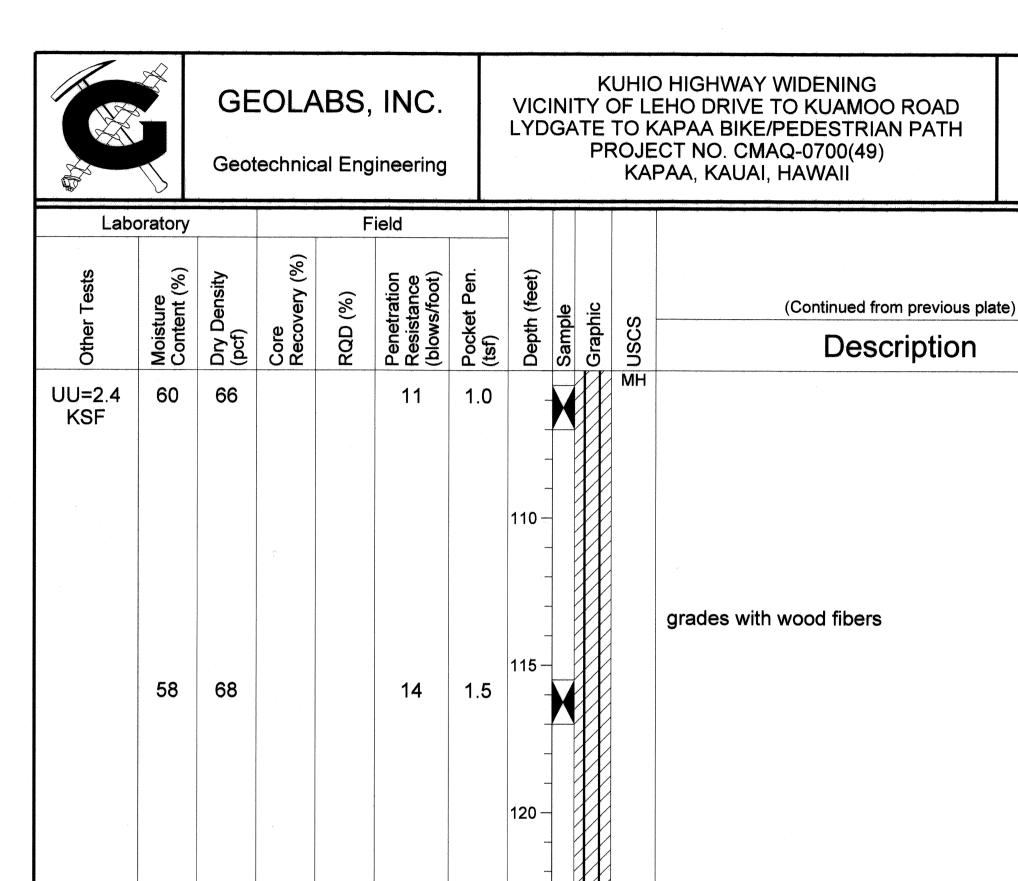
**BORING LOGS - 12** 

KUHIO HIGHWAY, SHORT TERM IMPROVEMENTS Wailua Cane Haul Bridge Widening Project No. BR-056-1(51)

Scale: None Date: MAY 2008 SHEET No. BL-14 OF BL-15 SHEETS



FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR		TOTAL SHEETS		
HAWAII	HAW.	BR-056-1(51)	2008	267	284		



22 2.0

130 -

Log of Boring

204

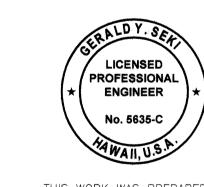
Water Level: 

22.2 ft. 12/13/07 2400 HRS December 12, 2007 Date Started: Date Completed: December 13, 2007 Plate Drill Rig: CME-55 Logged By: S. Latronic Drilling Method: 4" Auger, 4" Casing & PQ Coring Total Depth: 127 feet A - 12.4 5625-10 Work Order: Driving Energy: 140 lb. wt., 30 in. drop

grades to very stiff

MH Gray CLAYEY SILT, stiff to very stiff (lagoonal

Boring terminated at 127 feet



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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

**BORING LOGS - 13** 

KUHIO HIGHWAY, SHORT TERM IMPROVEMENTS

Wailua Cane Haul Bridge Widening

Project No. BR-056-1(51)

Scale: None Date: MAY 2008

SHEET No. BL-15 OF BL-15 SHEETS