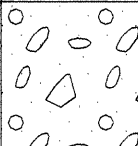

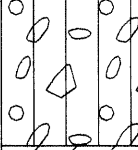
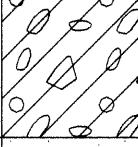
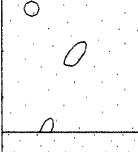
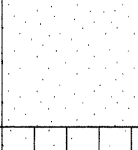
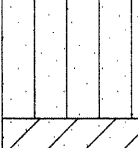
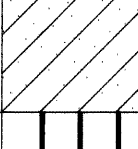
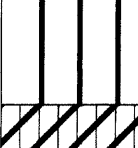
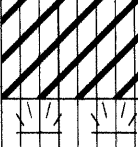
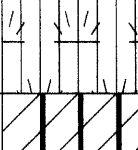
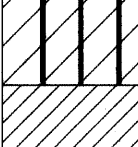
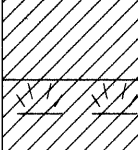
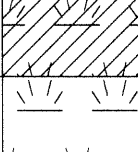
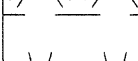


Boring Log Legend

UNIFIED SOIL CLASSIFICATION SYSTEM (USCS)

MAJOR DIVISIONS			USCS		TYPICAL DESCRIPTIONS
COARSE-GRAINED SOILS	GRAVELS	CLEAN GRAVELS		GW	WELL-GRADED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES
		LESS THAN 5% FINES		GP	POORLY-GRADED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES
	MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	GRAVELS WITH FINES		GM	SILTY GRAVELS, GRAVEL-SAND-SILT MIXTURES
		MORE THAN 12% FINES		GC	CLAYEY GRAVELS, GRAVEL-SAND-CLAY MIXTURES
MORE THAN 50% OF MATERIAL RETAINED ON NO. 200 SIEVE	SANDS	CLEAN SANDS		SW	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
		LESS THAN 5% FINES		SP	POORLY-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
	50% OR MORE OF COARSE FRACTION PASSING THROUGH NO. 4 SIEVE	SANDS WITH FINES		SM	SILTY SANDS, SAND-SILT MIXTURES
		MORE THAN 12% FINES		SC	CLAYEY SANDS, SAND-CLAY MIXTURES
FINE-GRAINED SOILS	SILTS AND CLAYS	LIQUID LIMIT LESS THAN 50		ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY
				CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
				OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
	50% OR MORE OF MATERIAL PASSING THROUGH NO. 200 SIEVE	SILTS AND CLAYS	LIQUID LIMIT 50 OR MORE		MH
				CH	INORGANIC CLAYS OF HIGH PLASTICITY
				OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
HIGHLY ORGANIC SOILS				PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS

LEGEND

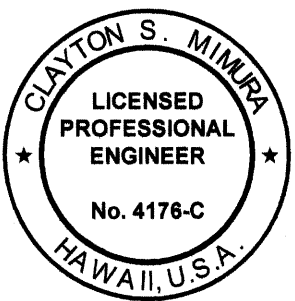


2-INCH O.D. STANDARD PENETRATION TEST
3-INCH O.D. MODIFIED CALIFORNIA SAMPLE
SHELBY TUBE SAMPLE
GRAB SAMPLE
CORE SAMPLE

LL LIQUID LIMIT
PI PLASTICITY INDEX
TV TORVANE SHEAR (tsf)
PEN POCKET PENETROMETER (tsf)
UC UNCONFINED COMPRESSION (psi)
▽ WATER LEVEL OBSERVED IN BORING

GEOTECHNICAL NOTES

- A geotechnical engineering report entitled "Geotechnical Engineering Exploration, Castle Hills Access Road, Drainage Improvements, Project No. HWY-0-04-98, Kaneohe, Oahu, Hawaii" dated April 29, 2009 has been prepared by Geolabs, Inc. A copy of the report is on file at the office of the Engineer for review by the Contractor.
- For boring locations, see Sheet 11.
- The information presented in the logs of borings depict the subsurface conditions encountered at that specified location and at the time of the field exploration only. Variations of subsoil conditions from those depicted in the logs of borings may occur between and beyond the borings.
- The penetration resistance shown on the logs of borings indicate the number of blows required for the specific sampler type used. The blow counts may need to be factored to obtain the Standard Penetration Test (SPT) blow counts.
- The data given is for general information only. Bidders shall examine the site and the boring data and draw their own conclusions therefrom as to the character of materials to be encountered. The Engineer will not assume responsibility for variations of subsoil quality or conditions other than at the boring locations shown and at the time the borings were taken.



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Clayton S. Minner
GEOLABS, INC. APRIL 30, 2012
LIC. EXP. DATE












STATE OF HAWAII
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HIGHWAYS DIVISION


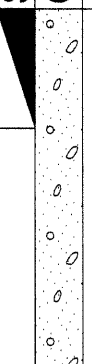

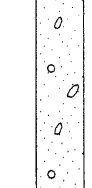
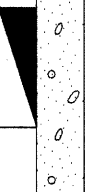
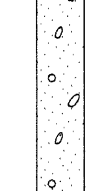

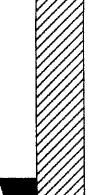
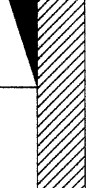

LOG LEGEND & NOTES

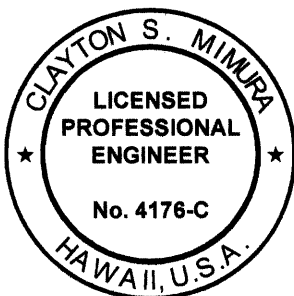
CASTLE HILLS ACCESS ROAD
Drainage Improvements, Phase 2
FEDERAL-AID PROJECT NO. STP-0300(125)

Scale: As Shown Date: December 2011

SHEET No. G.1 OF G.4 SHEETS

		GEOLABS, INC.					CASTLE HILLS ACCESS ROAD DRAINAGE IMPROVEMENTS PROJECT NO. HWY-0-04-98 Kaneohe, Oahu, Hawaii					Log of Boring 1	
Geotechnical Engineering													
Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample Graphic	USCS	Approximate Ground Surface Elevation (feet MSL): 182 *			
										Description			
LL=99 PI=63	41	55			25				MH	Brown CLAYEY SILT with traces of highly weathered gravel and sand (basaltic), medium stiff, moist (fill)			
	47				8								
	110	38			2	0.0	5		OH	Grayish brown CLAY with traces of roots and organic matter, very soft (peat)			
	125				2		10						
	226	22			3		15						
	53				4		20		SM	Dark gray SILTY SAND with some weathered gravel (basaltic), loose (alluvium)			
	25				12		25			grades to loose to medium dense			
53				11		30		SW	Dark gray SAND with traces of weathered gravel (basaltic), loose to medium dense (alluvium)				
							35						
Date Started: July 9, 2001							Water Level:  6.3 ft. 07/09/2001 1310 HRS						
Date Completed: July 11, 2001													
Logged By: E. Shinsato							Drill Rig: CONCORE						
Total Depth: 81.5 feet							Drilling Method: 4" Auger & 4" Casing						
Work Order: 4515-00							Driving Energy: 140 lb. wt., 30 in. drop						

		GEOLABS, INC. Geotechnical Engineering					CASTLE HILLS ACCESS ROAD DRAINAGE IMPROVEMENTS PROJECT NO. HWY-0-04-98 Kaneohe, Oahu, Hawaii					Log of Boring 1	
Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample Graphic	USCS	(Continued from previous plate)			
	70				8				SW	grades to orange-brown with black and gray mottling with some sub-rounded gravel, loose			
	32				12		40			grades to dark grayish brown, loose to medium dense			
	42				8		45			grades to orange-grayish brown			
LL=107 PI=72	37	75			13	0.8	50		CH	Orange-grayish brown CLAY with traces of highly weathered gravel and fine sand (basaltic), medium stiff (residual soil)			
	95				13	0.8	55			grades to orange-brown with black and gray mottling, stiff			
	75	54			48		60		SW-SM	Grayish brown with red mottling SAND with silt and highly weathered gravel (basaltic), medium dense (residual soil)			
	78				15		65			grades to orange-brown with gray seams			
							70						
Date Started: July 9, 2001							Water Level:  6.3 ft. 07/09/2001 1310 HRS						
Date Completed: July 11, 2001													
Logged By: E. Shinsato							Drill Rig: CONCORE						
Total Depth: 81.5 feet							Drilling Method: 4" Auger & 4" Casing						
Work Order: 4515-00							Driving Energy: 140 lb. wt., 30 in. drop						



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Clayton S. Minter
GEOLABS, INC. APRIL 30, 2012
LIC. EXP. DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION



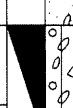


BORING LOGS - 1











CASTLE HILLS ACCESS ROAD
Drainage Improvements, Phase 2
FEDERAL-AID PROJECT NO. STP-0300(125)

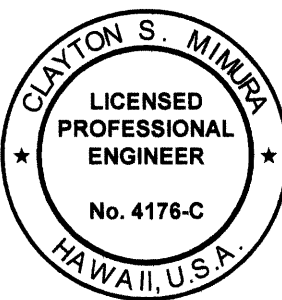
Scale: As Shown Date: December 2011

SHEET No. G.2 OF G.4 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-0300(125)	2011	30	55

		GEOLABS, INC. Geotechnical Engineering					CASTLE HILLS ACCESS ROAD DRAINAGE IMPROVEMENTS PROJECT NO. HWY-0-04-98 KANEOHE, OAHU, HAWAII					Log of Boring 1	
Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen (tsf)	Depth (feet)	Sample Graphic	USCS	(Continued from previous plate)			
										Description			
	53	69			23				SW-SM				
	21				35		75		GM	Grayish brown with orange-brown seams SILTY GRAVEL (BASALTIC), medium dense to dense			
	48	77			64		80			Boring terminated at 81.5 feet			
										* Elevations estimated from Topographic Map provided by ParEn, Inc. dated May 25, 2005.			
							85						
							90						
							95						
							100						
							105						
Date Started: July 9, 2001							Water Level:  6.3 ft. 07/09/2001 1310 HRS						
Date Completed: July 11, 2001													
Logged By: E. Shinsato							Drill Rig: CONCORE						
Total Depth: 81.5 feet							Drilling Method: 4" Auger & 4" Casing						
Work Order: 4515-00							Driving Energy: 140 lb. wt., 30 in. drop						

		GEOLABS, INC.				CASTLE HILLS ACCESS ROAD DRAINAGE IMPROVEMENTS PROJECT NO. HWY-0-04-98 KANE OHE, OAHU, HAWAII					Log of Boring 2				
Geotechnical Engineering															
Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample Graphic	USCS	Approximate Ground Surface Elevation (feet MSL): 173 *					
										Description					
LL=99 PI=63	40	75			8	0.8			MH	Brown CLAYEY SILT with some gravel and sand, soft, moist					
	51				8				CH	Brown with multi-color mottling CLAY with gravel and traces of roots, slight organic odor, soft to medium stiff, very moist					
	46	68			20	1.0	5								
	123				3		10		SM	Dark grayish brown SILTY SAND with gravel and organic matter, very loose (peat)					
	42	68			5		15		GM	Dark grayish brown SILTY GRAVEL AND SAND with some organic matter, very loose					
	67				1		20		SM	Grayish brown SILTY SAND AND GRAVEL with clay seams and traces of organic matter, very loose (alluvium)					
	46	72			15		25			grades to orange-grayish brown, medium dense					
	38				25		30								
								35							
Date Started: July 12, 2001								Water Level:  Not Available							
Date Completed: July 16, 2001															
Logged By: E. Shinsato								Drill Rig: CONCORE							
Total Depth: 70.3 feet								Drilling Method: 4" Auger & 4" Casing							
Work Order: 4515-00								Driving Energy: 140 lb. wt., 30 in. drop							



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Clayton S. Mima
GEOLABS, INC. APRIL 30, 2012
LIC. EXP. DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION










BORING LOGS - 2




CASTLE HILLS ACCESS ROAD
Drainage Improvements, Phase 2
FEDERAL-AID PROJECT NO. STP-0300(125)

Scale: As Shown Date: December 2011

SHEET No. G.3 OF G.4 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-0300(125)	2011	31	55

		GEOLABS, INC. Geotechnical Engineering					CASTLE HILLS ACCESS ROAD DRAINAGE IMPROVEMENTS PROJECT NO. HWY-0-04-98 KANEEOHE, OAHU, HAWAII					Log of Boring 2
Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen (tsf)	Depth (feet)	Sample Graphic	USCS	(Continued from previous plate)		
										Description		
LL=69 PI=37	19	97			81				SM	grades to dense		
	41				35		40					
	69	57			10		45		CH	Grayish brown with multi-color mottling CLAY with sand and gravel, soft to medium stiff (saprolite)		
	103				7		50		SM	Orange-grayish brown SILTY SAND with some sub-rounded gravel and traces of clay seams, loose		
	76	54			34		55			grades to medium dense		
	59				67		60			grades to dense to very dense grades with some cobbles and boulders, very dense		
	38				60/5" Ref.		65					
							70					
Date Started: July 12, 2001							Water Level:  Not Available					
Date Completed: July 16, 2001												
Logged By: E. Shinsato							Drill Rig: CONCORE					
Total Depth: 70.3 feet							Drilling Method: 4" Auger & 4" Casing					
Work Order: 4515-00							Driving Energy: 140 lb. wt., 30 in. drop					

		GEOLABS, INC. Geotechnical Engineering					CASTLE HILLS ACCESS ROAD DRAINAGE IMPROVEMENTS PROJECT NO. HWY-0-04-98 KANEHOE, OAHU, HAWAII					Log of Boring 2	
Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample Graphic	USCS	(Continued from previous plate)			
										Description			
					50/3" Ref.					Boring terminated at 70.3 feet			
							75						
							80						
							85						
							90						
							95						
							100						
							105						
Date Started: July 12, 2001								Water Level:  Not Available					
Date Completed: July 16, 2001													
Logged By: E. Shinsato								Drill Rig: CONCORE					
Total Depth: 70.3 feet								Drilling Method: 4" Auger & 4" Casing					
Work Order: 4515-00								Driving Energy: 140 lb. wt., 30 in. drop					

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



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GEOLABS, INC. APRIL 30, 2012
LIC. EXP. DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BORING LOGS - 3

CASTLE HILLS ACCESS ROAD
Drainage Improvements, Phase 2
FEDERAL-AID PROJECT NO. STP-0300(125)

Scale: As Shown Date: December 2011

SHEET No. G.4 OF G.4 SHEETS