APPENDIX A

APPENDIX A

Field Exploration

We explored the subsurface conditions by drilling and sampling 10 borings, designated as Boring Nos. 1 through 10. The borings were advanced to maximum depths of about 5 to 46.5 feet below the existing ground surface. We drilled the borings using truck-mounted drill rigs equipped with continuous flight auger tools and coring equipment. The approximate locations of the borings drilled for the project are shown on the Site Plans, Plates 2.1 and 2.2.

The materials encountered in the borings were classified by visual and textural examination in the field by our geologist, who monitored the drilling operations on a near-continuous basis. Soils were classified in general conformance with the Unified Soil Classification System, as shown on the Soil Log Legend, Plate A-0.1. Rock cores were described in general accordance with the Rock Description System, as shown on the Rock Log Legend, Plate A-0.2. Graphic representations of the materials encountered are presented on the Logs of Borings, Plates A-1 through A-10.

Relatively "undisturbed" soil samples were obtained from the borings drilled in general accordance with ASTM D3550, Ring-Lined Barrel Sampling of Soils, by driving a 3-inch OD Modified California sampler with a 140-pound hammer falling 30 inches. In addition, we obtained some samples from the borings drilled in general accordance with ASTM D1586, Penetration Test and Split-Barrel Sampling of Soils, by driving a 2-inch OD standard penetration sampler using the same hammer and drop. The blow counts needed to drive the sampler the second and third 6 inches of an 18-inch drive are shown as the "Penetration Resistance" on the Logs of Borings at the appropriate sample depths.

Pocket penetrometer tests were performed on selected cohesive soil samples in the field. The pocket penetrometer test provides an indication of the unconfined compressive strength of the sample. Results of the pocket penetrometer tests are summarized on the Logs of Borings at the appropriate sample depths.

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Soil Log Legend

UNIFIED SOIL CLASSIFICATION SYSTEM (USCS)

MAJOR DIVISIONS			USCS	TYPICAL DESCRIPTIONS
COARSE-GRAINED SOILS — MORE THAN 50% OF MATERIAL RETAINED ON NO. 200 SIEVE	GRAVELS — MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	CLEAN GRAVELS — LESS THAN 5% FINES	GW	WELL-GRADED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES
			GP	POORLY-GRADED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES
		GRAVELS WITH FINES — MORE THAN 12% FINES	GM	SILTY GRAVELS, GRAVEL-SAND-SILT MIXTURES
			GC	CLAYEY GRAVELS, GRAVEL-SAND-CLAY MIXTURES
	SANDS — 50% OR MORE OF COARSE FRACTION PASSING THROUGH NO. 4 SIEVE	CLEAN SANDS — LESS THAN 5% FINES	SW	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
			SP	POORLY-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
		SANDS WITH FINES — MORE THAN 12% FINES	SM	SILTY SANDS, SAND-SILT MIXTURES
			SC	CLAYEY SANDS, SAND-CLAY MIXTURES
FINE-GRAINED SOILS — 50% OR MORE OF MATERIAL PASSING THROUGH NO. 200 SIEVE	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
	SILTS AND CLAYS — LIQUID LIMIT 50 OR MORE		MH	INORGANIC SILT, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS
			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	LL	LIQUID LIMIT (NP=NON-PLASTIC)
	(3-INCH) O.D. MODIFIED CALIFORNIA SAMPLE	PI	PLASTICITY INDEX (NP=NON-PLASTIC)
S	SHELBY TUBE SAMPLE	TV	TORVANE SHEAR (tsf)
G	GRAB SAMPLE	PEN	POCKET PENETROMETER (tsf)
	CORE SAMPLE	UC	UNCONFINED COMPRESSION (ksf)
▽	WATER LEVEL OBSERVED IN BORING AT TIME OF DRILLING	TXUU	UNCONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION (ksf)
▼	WATER LEVEL OBSERVED IN BORING AFTER DRILLING		
▼	WATER LEVEL OBSERVED IN BORING OVERNIGHT		

Plate

A-0.1

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Rock Log Legend

ROCK DESCRIPTIONS

	BASALT		**FINGER CORAL**
	BOULDERS		**LIMESTONE**
	BRECCIA		**SANDSTONE**
	CLINKER		**SILTSTONE**
	COBBLES		**TUFF**
	CORAL		**VOID/CAVITY**

ROCK DESCRIPTION SYSTEM

ROCK FRACTURE CHARACTERISTICS

The following terms describe general fracture spacing of a rock:

Massive: Greater than 24 inches apart

Slightly Fractured: 12 to 24 inches apart

Moderately Fractured: 6 to 12 inches apart

Closely Fractured: 3 to 6 inches apart

Severely Fractured: Less than 3 inches apart

DEGREE OF WEATHERING

The following terms describe the chemical weathering of a rock:

Unweathered: Rock shows no sign of discoloration or loss of strength.

Slightly Weathered: Slight discoloration inwards from open fractures.

Moderately Weathered: Discoloration throughout and noticeably weakened though not able to break by hand.

Highly Weathered: Most minerals decomposed with some corestones present in residual soil mass. Can be broken by hand.

Extremely Weathered: Saprolite. Mineral residue completely decomposed to soil but fabric and structure preserved.

HARDNESS

The following terms describe the resistance of a rock to indentation or scratching:

Very Hard: Specimen breaks with difficulty after several "pinging" hammer blows.
Example: Dense, fine grain volcanic rock

Hard: Specimen breaks with some difficulty after several hammer blows.
Example: Vesicular, vugular, coarse-grained rock

Medium Hard: Specimen can be broked by one hammer blow. Cannot be scraped by knife. SPT may penetrate by ~25 blows per inch with bounce.
Example: Porous rock such as clinker, cinder, and coral reef

Soft: Can be indented by one hammer blow. Can be scraped or peeled by knife. SPT can penetrate by ~100 blows per foot.
Example: Weathered rock, chalk-like coral reef

Very Soft: Crumbles under hammer blow. Can be peeled and carved by knife. Can be indented by finger pressure.
Example: Saprolite

Plate
A-0.2

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KAPOLEI INTERCHANGE COMPLEX
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Log of Boring

1

Laboratory			Field							
Other Tests	Moisture Content (%)	Dry Density (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample	Graphic	USCS	Description
											Approximate Ground Surface Elevation (feet MSL): 95 *
	9				46					GW	Brownish gray **SANDY GRAVEL (BASALTIC)**, dense, dry (fill)
										GW	Light tannish white **SANDY GRAVEL (CORALLINE)** with traces of silt, very dense, dry (fill)
										GP	
	17	86			25					GC	Gray poorly graded **GRAVEL (BASALTIC)** with traces of sand, dense, dry (fill)
	20				41		5			CH	Grayish brown **CLAYEY GRAVEL (BASALTIC)**, medium dense, moist (fill)
											Brown **CLAY** with some cobbles and a little gravel, hard, moist (fill)
	9	117			66	4.5					
							10			CH	Brown **CLAY**, very stiff to hard, moist (older alluvium)
	23				19					ML	Brown **CLAYEY SILT** with a little sand, stiff to very stiff, dry (older alluvium)
							15				
										CL	Brownish gray **SILTY CLAY**, hard, dry (older alluvium)
	19	101			84	4.5					
							20				
	13				52						
							25			MH	Brown **CLAYEY SILT**, hard, dry (older alluvium)
											Boring terminated at 25 feet
							30				* Elevations estimated from General Site Plan dated January 2015 by Mitsunaga & Associates, Inc.

Date Started:	May 19, 2015	Water Level: ▼	Not Encountered	Plate
Date Completed:	May 19, 2015			
Logged By:	S. Latronic	Drill Rig:	CME-75DR *(Energy Transfer Ratio = 59.3%)*	A - 1
Total Depth:	25 feet	Drilling Method:	4" Solid Stem Auger	
Work Order:	5537-50	Driving Energy:	140 lb. wt., 30 in. drop	

BORING_LOG 5537-50.GPJ GEOLABS.GDT 6/16/15

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Log of Boring

2

Laboratory			Field							
Other Tests	Moisture Content (%)	Dry Density (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample	Graphic	USCS
	18				16					ML / GW / CH
	19	88			43					GW / CH
	21				15		5			
	24	108			45	4.5	10			CH
	26				17		15			
							20			
							25			
							30			

Approximate Ground Surface Elevation (feet MSL): 88 *

Description

Brown **CLAYEY SILT** with some sand, stiff, moist (fill)

Light tannish white **SANDY GRAVEL (CORALLINE)**, medium dense to dense, dry (fill)

Dark grayish brown **CLAY** with some sand (basaltic), stiff, moist (fill)

Grayish brown **SANDY GRAVEL (BASALTIC)** with a little silt, dense, dry (fill)

Brown **CLAY**, stiff, moist (fill)

Brown **CLAY**, very stiff, moist (alluvium)

Boring terminated at 15 feet

Date Started:	May 19, 2015	Water Level: ▼	Not Encountered		Plate
Date Completed:	May 19, 2015				
Logged By:	S. Latronic	Drill Rig:	CME-75DR	*(Energy Transfer Ratio = 59.3%)*	A - 2
Total Depth:	15 feet	Drilling Method:	4" Solid Stem Auger		
Work Order:	5537-50	Driving Energy:	140 lb. wt., 30 in. drop		

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PHASE 3
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Log of Boring

3

Laboratory			Field							
Other Tests	Moisture Content (%)	Dry Density (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample	Graphic	USCS	Description
											Approximate Ground Surface Elevation (feet MSL): 85 *
										ML	Brown **CLAYEY SILT** with a little sand and traces of gravel, stiff, dry (fill)
	5				8					GW	Light tannish white **SANDY GRAVEL (CORALLINE)**, medium dense, dry (fill)
										GW	6-inch **VOID**
	10	87			17						Gray **SANDY GRAVEL (BASALTIC)**, loose to medium dense, dry (fill)
							5			GC	Grayish brown with some white **CLAYEY GRAVEL (BASALTIC)** with a little sand and cobbles, medium dense, moist (fill)
	21				23						Brownish gray **BOULDERS (BASALTIC)**, very dense, dry (fill)
	24				11		10			CH	Brown **CLAY**, stiff to hard, moist (older alluvium)
											grades more silty locally
	26	95			62	4.5	15				
										MH	Brown **CLAYEY SILT**, very stiff, moist (older alluvium)
	32				15		20				
	31				21		25				
											Boring terminated at 26.5 feet
							30				

Date Started:	May 19, 2015	Water Level: ▼	Not Encountered	Plate
Date Completed:	May 19, 2015			
Logged By:	S. Latronic	Drill Rig:	CME-75DR *(Energy Transfer Ratio = 59.3%)*	A - 3
Total Depth:	26.5 feet	Drilling Method:	4" Solid Stem Auger	
Work Order:	5537-50	Driving Energy:	140 lb. wt., 30 in. drop	

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Log of Boring

4

Laboratory			Field							
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): 78 * **Description**
	16	95			33					CH	Brown **CLAY**, stiff, dry to damp (fill)
	19				13					CH	Brown **CLAY**, stiff to hard, damp (older alluvium)
LL=66 PI=50 Consol. UC=7.9 ksf	20	107			71	4.5	5				
	25				17	4.5	10				
											grades more silty locally
LL=54 PI=31 Direct Shear	26	99			39	4.5	15				
	25				31		20				
	41				8		25			ML	Light grayish tan to grayish brown **SANDY SILT** with traces of gravel (coralline), medium stiff, moist (alluvium w/coral debris)
	55				13		30			ML-MH	Brown **CLAYEY SILT**, stiff, moist (older alluvium)
							35				

Date Started:	May 13, 2015	Water Level: ▼	Not Encountered	Plate
Date Completed:	May 13, 2015			
Logged By:	S. Latronic	Drill Rig:	CME-75GY *(Energy Transfer Ratio = 82.3%)*	A - 4.1
Total Depth:	46.5 feet	Drilling Method:	4" Solid Stem Auger	
Work Order:	5537-50	Driving Energy:	140 lb. wt., 30 in. drop	

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PHASE 3
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Log of Boring

4

Laboratory			Field							
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

Moisture Content (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	USCS	Description
55	8	1.5		ML-MH	grades to medium stiff
122	6	1.5	40		
27	51	2.5	45		grades to hard
					Boring terminated at 46.5 feet
			50		
			55		
			60		
			65		
			70		

Date Started:	May 13, 2015	Water Level: ▼	Not Encountered	Plate
Date Completed:	May 13, 2015			
Logged By:	S. Latronic	Drill Rig:	CME-75GY *(Energy Transfer Ratio = 82.3%)*	A - 4.2
Total Depth:	46.5 feet	Drilling Method:	4" Solid Stem Auger	
Work Order:	5537-50	Driving Energy:	140 lb. wt., 30 in. drop	

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PHASE 3
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Log of Boring

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Laboratory			Field				Depth (feet)	Sample	Graphic	USCS	Approximate Ground Surface Elevation (feet MSL): 76 *
Other Tests	Moisture Content (%)	Dry Density (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)					**Description**
										CH	Brown **CLAY**, stiff, dry to damp (fill)
	19	105			36	4.5				CH	Brown **CLAY**, very stiff, damp (older alluvium)
	19				18						
UC=16.4 ksf	22	103			49	4.5	5				
										SM	Tannish white with traces of brown **SILTY SAND (CORALLINE)** with some gravel, medium dense, damp (coralline detritus)
	13				25		10				
											grades more gravelly
	30	71			32		15				
										ML	Grayish brown **SANDY SILT**, very stiff to hard, damp (older alluvium)
										GM	Tannish white with some brown **SILTY GRAVEL (CORALLINE)** with some sand, medium dense, damp (coralline detritus)
	7				15		20				
											grades with brown clayey silt pockets locally
	19	87			42		25				
											Light tannish white **CORAL**, moderately weathered, medium hard (coral formation)
	3				106		30				
										SM	Light tannish white with traces of brown **SILTY SAND (CORALLINE)** with a little gravel, dense, damp (coralline detritus)
							35				

Date Started:	May 14, 2015	Water Level: ▼	Not Encountered	Plate
Date Completed:	May 14, 2015			
Logged By:	S. Latronic	Drill Rig:	CME-75DG2 *(Energy Transfer Ratio = 89.3%)*	A - 5.1
Total Depth:	46.5 feet	Drilling Method:	4" Solid Stem Auger	
Work Order:	5537-50	Driving Energy:	140 lb. wt., 30 in. drop	

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Log of Boring

5

Laboratory			Field							
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

Moisture Content (%)	Penetration Resistance (blows/foot)	Depth (feet)	USCS	Description
6	38	40	SM	
19	12			grades with brown clayey silt pockets locally, medium dense
49	13	45	ML	Brown **CLAYEY SILT**, stiff, moist (older alluvium)
				Boring terminated at 46.5 feet
		50		
		55		
		60		
		65		
		70		

Date Started:	May 14, 2015	Water Level: ▼	Not Encountered	Plate
Date Completed:	May 14, 2015			
Logged By:	S. Latronic	Drill Rig:	CME-75DG2 *(Energy Transfer Ratio = 89.3%)*	A - 5.2
Total Depth:	46.5 feet	Drilling Method:	4" Solid Stem Auger	
Work Order:	5537-50	Driving Energy:	140 lb. wt., 30 in. drop	

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Log of Boring

6

Approximate Ground Surface Elevation (feet MSL): 76 *

Laboratory			Field							
Other Tests	Moisture Content (%)	Dry Density (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample	USCS	Description
	24	101			16	4.0			GP-GM CH	Brownish gray subangular **SILTY GRAVEL (BASALTIC)** with a little sand, dense, damp (fill)
	25				6	1.5			CH	Grayish brown **CLAY**, very stiff, moist (fill)
LL=60 PI=37 Direct Shear	21	96			68	4.5	5		CH	Brown **CLAY**, stiff to hard, damp to moist (older alluvium)
										grades with tan mottling locally
LL=64 PI=42	25				15		10			
										grades more silty locally
UC=3.9 ksf	26	92			48	4.5	15			
									CH	Brown with traces of tannish white **CLAY** with a little sand (coralline), stiff, moist (alluvium w/coral debris)
	30				12		20			
									SM	Light tannish white fine **SILTY SAND (CORALLINE)**, loose, damp (coralline detritus)
	25	59			13		25			
										grades with brown clayey silt seams locally
	21				28		30			grades to medium dense
									ML-MH	Brown **CLAYEY SILT**, stiff, moist (older alluvium)
							35			

Date Started:	May 11, 2015	Water Level: ▼	Not Encountered	Plate
Date Completed:	May 11, 2015			
Logged By:	S. Latronic	Drill Rig:	CME-55D *(Energy Transfer Ratio = 79%)*	A - 6.1
Total Depth:	46.5 feet	Drilling Method:	4" Solid Stem Auger	
Work Order:	5537-50	Driving Energy:	140 lb. wt., 30 in. drop	

BORING_LOG 5537-50.GPJ GEOLABS.GDT 6/16/15

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KAPOLEI INTERCHANGE COMPLEX
PHASE 3
KAPOLEI, OAHU, HAWAII

Log of Boring

6

Laboratory			Field							
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
	71				9	1.5				ML-MH	
	120				11	1.5	40				
	44				25		45				grades to very stiff
											Boring terminated at 46.5 feet
							50				
							55				
							60				
							65				
							70				

Date Started:	May 11, 2015	Water Level: ▼	Not Encountered	Plate
Date Completed:	May 11, 2015			
Logged By:	S. Latronic	Drill Rig:	CME-55D *(Energy Transfer Ratio = 79%)*	A - 6.2
Total Depth:	46.5 feet	Drilling Method:	4" Solid Stem Auger	
Work Order:	5537-50	Driving Energy:	140 lb. wt., 30 in. drop	

BORING_LOG 5537-50.GPJ GEOLABS.GDT 6/16/15

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KAPOLEI INTERCHANGE COMPLEX
PHASE 3
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Log of Boring

7

Laboratory			Field							
Other Tests	Moisture Content (%)	Dry Density (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample	Graphic	USCS	Description
											Approximate Ground Surface Elevation (feet MSL): 86 *
										ML GW	Grayish brown **SANDY SILT** with some gravel, stiff, dry (fill)
	19				12					GW	Light tannish white **SANDY GRAVEL (CORALLINE)** with a little silt, dense, dry (fill)
										CH	Brownish gray **SANDY GRAVEL (BASALTIC)** with traces of clay, medium dense, dry (fill)
	16	84			50/3"					GP	Gray **CLAY** with some gravel (basaltic) and a little sand, very stiff, moist (fill)
	19	87			31		5			CH	Gray poorly graded **GRAVEL (BASALTIC)**, very dense, dry (fill)
											Grayish brown **CLAY** with some sand and a little gravel, very stiff, moist (fill)
	21	98			34	4.5				CH	Gray **BOULDERS (BASALTIC)**, very dense, dry (fill)
							10				Brown **CLAY**, very stiff to stiff, moist (older alluvium)
	26				11						
							15				
										CL	Light brownish gray **SILTY CLAY**, very stiff, dry (older alluvium)
	22	106			44	4.5				MH	Brown **CLAYEY SILT**, very stiff, moist (older alluvium)
							20				
										CH	Brown **CLAY**, very stiff, moist (older alluvium)
	26				24						
							25				Boring terminated at 25 feet
							30				

Date Started:	May 20, 2015	Water Level: ▼	Not Encountered	Plate
Date Completed:	May 20, 2015			
Logged By:	S. Latronic	Drill Rig:	CME-75DR *(Energy Transfer Ratio = 59.3%)*	A - 7
Total Depth:	25 feet	Drilling Method:	4" Solid Stem Auger	
Work Order:	5537-50	Driving Energy:	140 lb. wt., 30 in. drop	

BORING_LOG 5537-50.GPJ GEOLABS.GDT 6/16/15

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Log of Boring

8

Laboratory			Field							
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): 85 * Description
										ML GW	Grayish brown **SANDY SILT** with a little gravel, stiff, dry (fill)
	13				28					SC	Light tannish white **SANDY GRAVEL (CORALLINE)**, dense, dry (fill)
	15	101			55/5"					GW	Light tan with some brown **CLAYEY SAND (CORALLINE)** with some gravel, medium dense, dry (fill)
	16	105			33	4.5	5				Brownish gray **SANDY GRAVEL (BASALTIC)** with traces of clay, dense, dry (fill)
										CH	Brown **CLAY**, hard, moist (older alluvium)
	19	110			66	4.5	10				
	15				50/3"					GW	Grayish brown **SANDY GRAVEL (BASALTIC)**, very dense, dry (weathered basalt)
							15				Boring terminated at 14.25 feet
							20				
							25				
							30				

Date Started:	May 20, 2015	Water Level: ▼	Not Encountered	Plate
Date Completed:	May 20, 2015			
Logged By:	S. Latronic	Drill Rig:	CME-75DR *(Energy Transfer Ratio = 59.3%)*	A - 8
Total Depth:	14.25 feet	Drilling Method:	4" Solid Stem Auger	
Work Order:	5537-50	Driving Energy:	140 lb. wt., 30 in. drop	

BORING_LOG 5537-50.GPJ GEOLABS.GDT 6/16/15

GEOLABS, INC.

Geotechnical Engineering

KAPOLEI INTERCHANGE COMPLEX
PHASE 3
KAPOLEI, OAHU, HAWAII

Log of Boring

9

Laboratory			Field							
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): 78 * **Description**
	15				34					GM	Light tannish white **SILTY GRAVEL (CORALLINE)** with some sand, dense, dry to damp (fill)
	19				18					CH	Brown with some white **SILTY CLAY** with traces of gravel (coralline), very stiff, moist (fill)
LL=56 PI=39	18	100			50	4.5	5			CH	Brown **CLAY**, hard, damp (older alluvium)
	20				57		10			MH	Brown with some tan **CLAYEY SILT** with some sand and a little gravel, hard, damp (alluvium w/coral debris)
LL=NP PI=NP Direct Shear	7	86			25		15			SM	Tan with traces of brown **SILTY SAND** with traces of clay and some gravel (coralline), medium dense, damp (coralline detritus)
	15				7		20			ML	Brown **CLAYEY SILT** with a little gravel (coralline), medium stiff, moist (alluvium w/coral debris)
	3	92			59		25			SM	Tan **SANDSTONE**, closely fractured, slightly to moderately weathered, soft to medium hard (coralline sandstone)
	4				32		30				Tan with traces of brown **SILTY SAND** with a little clay and some gravel (coralline), dense, damp (coralline detritus)
							35				

Date Started:	May 12, 2015	Water Level: ▼	Not Encountered	Plate
Date Completed:	May 12, 2015			
Logged By:	S. Latronic	Drill Rig:	CME-45C TRACK *(Energy Transfer Ratio = 80.7%)*	A - 9.1
Total Depth:	46.5 feet	Drilling Method:	4" Solid Stem Auger	
Work Order:	5537-50	Driving Energy:	140 lb. wt., 30 in. drop	

BORING_LOG 5537-50.GPJ GEOLABS.GDT 6/16/15

GEOLABS, INC.

Geotechnical Engineering

KAPOLEI INTERCHANGE COMPLEX
PHASE 3
KAPOLEI, OAHU, HAWAII

Log of Boring

9

Laboratory			Field							
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

Moisture Content (%)	Penetration Resistance (blows/foot)	Depth (feet)	USCS	Description
8	21		SM	grades to medium dense
14	16	40		
				grades with medium stiff silt pockets locally
22	5	45		grades to loose
				Boring terminated at 46.5 feet
		50		
		55		
		60		
		65		
		70		

Date Started:	May 12, 2015	Water Level: ▼	Not Encountered	Plate
Date Completed:	May 12, 2015			
Logged By:	S. Latronic	Drill Rig:	CME-45C TRACK *(Energy Transfer Ratio = 80.7%)*	A - 9.2
Total Depth:	46.5 feet	Drilling Method:	4" Solid Stem Auger	
Work Order:	5537-50	Driving Energy:	140 lb. wt., 30 in. drop	

BORING_LOG 5537-50.GPJ GEOLABS.GDT 6/16/15

GEOLABS, INC.

Geotechnical Engineering

KAPOLEI INTERCHANGE COMPLEX
PHASE 3
KAPOLEI, OAHU, HAWAII

Log of Boring

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Laboratory			Field								
Other Tests	Moisture Content (%)	Dry Density (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample	Graphic	USCS	Description
											Approximate Ground Surface Elevation (feet MSL): 81 *
	11				27					ML SM	Light brown **SANDY SILT** with a little gravel, stiff, dry (fill)
	11				21						Light tannish white **SILTY SAND (CORALLINE)** with a little gravel, medium dense, dry (coralline detritus)
							5				Boring terminated at 5 feet
							10				
							15				
							20				
							25				
							30				

Date Started:	May 18, 2015	Water Level: ▼	Not Encountered	Plate
Date Completed:	May 18, 2015			
Logged By:	S. Latronic	Drill Rig:	CME-75DR *(Energy Transfer Ratio = 59.3%)*	A - 10
Total Depth:	5 feet	Drilling Method:	4" Solid Stem Auger	
Work Order:	5537-50	Driving Energy:	140 lb. wt., 30 in. drop	

BORING_LOG 5537-50.GPJ GEOLABS.GDT 6/16/15