

APPENDIX A

Field Exploration

We explored the subsurface conditions at the project site by drilling and sampling 16 borings, designated as Boring Nos. 1 through 16, extending to depths of about 10 to 122.5 feet below the existing ground surface. In addition, two borings, designated as Boring Nos. 101 and 101A, were drilled on the north side of the Gulick Avenue Overpass near the proposed footing location of the temporary pedestrian bridge. Five bulk samples of the near-surface soils, designated as Bulk-1 through Bulk-5, were obtained to evaluate the moisture-density relationship and pavement support characteristics of the near-surface soils. The approximate boring and bulk sample locations are shown on the Overall Site Plan, Plate 2, and the Site Plans, Plates 3.1 and 3.2. The borings were drilled using a truck-mounted drill rig equipped with continuous flight augers and coring tools.

Our geologists classified the materials encountered in the borings by visual and textural examination in the field in general accordance with ASTM D2488, Standard Practice for Description and Identification of Soils, and monitored the drilling operations on a near-continuous (full-time) basis. These classifications were further reviewed visually and by testing in the laboratory. Soils were classified in general accordance with ASTM D2487, Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System), as shown on the Soil Log Legend, Plate A-0.1. Deviations made to the soil classification in accordance with ASTM D2487 are described on the Soil Classification Log Key, Plate A-0.2. Graphic representations of the materials encountered are presented on the Logs of Borings, Plates A-1 through A-18.

Relatively "undisturbed" soil samples were obtained 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, some samples were obtained from the drilled borings 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. The penetration resistance shown on the Logs of Borings indicates 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.

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.

Core samples of the rock materials encountered at the project site were obtained by using diamond core drilling techniques in general accordance with ASTM D2113, Diamond Core Drilling for Site Investigation. Core drilling is a rotary drilling method that uses a hollow bit to cut into the rock formation. The rock material left in the hollow core of the bit is mechanically recovered for examination and description. Rock cores were described in general accordance with the Rock Description System, as shown on the Rock Log Legend, Plate A-0.3. The Rock Description System is based on the publication "Suggested Methods for the Quantitative Description of Discontinuities in Rock Masses" by the International Society for Rock Mechanics (March 1977).

Recovery (REC) may be used as a subjective guide to the interpretation of the relative quality of rock masses, where appropriate. Recovery is defined as the actual length of material recovered from a coring attempt versus the length of the core attempt. For example, if 3.7 feet of material is recovered from a 5.0-foot core run, the recovery would be 74 percent and would be shown on the Logs of orings as REC = 74%.

The Rock Quality Designation (RQD) is also a subjective guide to the relative quality of rock masses. RQD is defined as the percentage of the core run in rock that is sound material in excess of 4 inches in length without any discontinuities, discounting any drilling, mechanical, and handling induced fractures or breaks. If 2.5 feet of sound material is recovered from a 5.0-foot core run in rock, the RQD would be 50 percent and would be shown on the Logs of Borings as RQD = 50%. Generally, the following is used to describe the relative quality of the rock based on the "Practical Handbook of Physical Properties of Rocks and Minerals" by Robert S. Carmichael (1989).

Rock Quality	RQD
	(%)
Very Poor	0 – 25
Poor	25 – 50
Fair	50 – 75
Good	75 – 90
Excellent	90 – 100

The excavation characteristic of a rock mass is a function of the relative hardness of the rock, its relative quality, brittleness, and fissile characteristics. A dense rock formation with a high RQD value would be very difficult to excavate and probably would require more arduous methods of excavation.



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Soil Log Legend

UNIFIED SOIL CLASSIFICATION SYSTEM (USCS)

	MAJOR DIVISION	IS	US	CS	TYPICAL DESCRIPTIONS
	GRAVELS	CLEAN GRAVELS	0000	GW	WELL-GRADED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES
COARSE- GRAINED	GRAVELS	LESS THAN 5% FINES	000	GP	POORLY-GRADED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES
SOILS	MORE THAN 50% OF COARSE 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	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
	SILTS			ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY
FINE- GRAINED SOILS	AND CLAYS	LIQUID LIMIT LESS THAN 50		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
				МН	INORGANIC SILT, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS
50% OR MORE OF MATERIAL PASSING THROUGH NO. 200 SIEVE	SILTS AND CLAYS	LIQUID LIMIT 50 OR MORE		СН	INORGANIC CLAYS OF HIGH PLASTICITY
5.2.12	©			ОН	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
HI	GHLY ORGANIC SO	DILS		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

GRAB SAMPLE

SHELBY TUBE SAMPLE



CORE SAMPLE



 $ar{m{\Lambda}}$

WATER LEVEL OBSERVED IN BORING AT TIME OF

WATER LEVEL OBSERVED IN BORING OVERNIGHT

DRILLING

Ţ WATER LEVEL OBSERVED IN BORING AFTER DRILLING LL LIQUID LIMIT (NP=NON-PLASTIC)

PLASTICITY INDEX (NP=NON-PLASTIC) ы

 TV TORVANE SHEAR (tsf)

UC **UNCONFINED COMPRESSION** OR UNIAXIAL COMPRESSIVE STRENGTH

UNCONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION (ksf)

Plate

A-0.1



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Soil Classification Log Key

(with deviations from ASTM D2488)

GEOLABS, INC. CLASSIFICATION*

GRANULAR SOIL (- #200 <50%)

COHESIVE SOIL (- #200 ≥50%)

- PRIMARY constituents are composed of the largest percent of the soil mass. Primary constituents are capitalized and bold (i.e., GRAVEL, SAND)
- SECONDARY constituents are composed of a mass consists of 12 percent or more fines content, a cohesive constituent is used (SILTY or CLAYEY); otherwise, a granular constituent is used (GRAVELLY or **SANDY**) provided that the secondary constituent consists of 20 percent or more of the soil mass. Secondary constituents are capitalized and bold (i.e., SANDY GRAVEL, CLAYEY SAND) and precede the primary constituent.
- percentage less than the primary constituent. If the soil
- accessory descriptions compose of the following: with some: >12%

with a little: 5 - 12% with traces of: <5%

accessory descriptions are lower cased and follow the

Primary and Secondary Constituents (i.e., SILTY GRAVEL with a little sand)

- **PRIMARY** constituents are based on plasticity. Primary constituents are capitalized and bold (i.e., CLAY, SILT)
- SECONDARY constituents are composed of a percentage less than the primary constituent, but more than 20 percent of the soil mass. Secondary constituents are capitalized and bold (i.e., SANDY CLAY, SILTY CLAY, CLAYEY SILT) and precede the primary constituent.
- accessory descriptions compose of the following:

with some: >12% with a little: 5 - 12% with traces of: <5%

accessory descriptions are lower cased and follow the

Primary and Secondary Constituents (i.e., SILTY CLAY with some sand)

EXAMPLE: Soil Containing 60% Gravel, 25% Sand, 15% Fines. Described as: SILTY GRAVEL with some sand

RELATIVE DENSITY / CONSISTENCY

	Granular Soils		Cohesive Soils							
N-Value (E SPT	Blows/Foot) MCS	Relative Density	N-Value (E SPT	Blows/Foot) MCS	PP Readings (tsf)	Consistency				
0 - 4	0 - 7	Very Loose	0 - 2	0 - 4		Very Soft				
4 - 10	7 - 18	Loose	2 - 4	4 - 7	< 0.5	Soft				
10 - 30	18 - 55	Medium Dense	4 - 8	7 - 15	0.5 - 1.0	Medium Stiff				
30 - 50	55 - 91	Dense	8 - 15	15 - 27	1.0 - 2.0	Stiff				
> 50	> 91	Very Dense	15 - 30	27 - 55	2.0 - 4.0	Very Stiff				
			> 30	> 55	> 4.0	Hard				

MOISTURE CONTENT DEFINITIONS

Dry: Absence of moisture, dry to the touch Moist: Damp but no visible water

Wet: Visible free water

CLASS LOG KEY 8049-00.GPJ GEOLABS.GDT 1/27/21

ABBREVIATIONS

WOH: Weight of Hammer WOR: Weight of Drill Rods SPT: Standard Penetration Test Split-Spoon Sampler

MCS: Modified California Sampler

PP: **Pocket Penetrometer**

GRAIN SIZE DEFINITION

Description	Sieve Number and / or Size
Boulders	> 12 inches (305-mm)
Cobbles	3 to 12 inches (75-mm to 305-mm)
Gravel	3-inch to #4 (75-mm to 4.75-mm)
Coarse Gravel	3-inch to 3/4-inch (75-mm to 19-mm)
Fine Gravel	3/4-inch to #4 (19-mm to 4.75-mm)
Sand	#4 to #200 (4.75-mm to 0.075-mm)
Coarse Sand	#4 to #10 (4.75-mm to 2-mm)
Medium Sand	#10 to #40 (2-mm to 0.425-mm)
Fine Sand	#40 to #200 (0.425-mm to 0.075-mm)

Plate

A-0.2

*Soil descriptions are based on ASTM D2488-09a, Visual-Manual Procedure, with the above modifications by Geolabs, Inc. to the Unified Soil Classification System (USCS).



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Rock Log Legend

ROCK DESCRIPTIONS

	BASALT		CONGLOMERATE
99	BOULDERS		LIMESTONE
	BRECCIA		SANDSTONE
× × × × ×	CLINKER	× × × × × × × × × × × × × × ×	SILTSTONE
	OODDLLO		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 6 to 12 inches apart **Moderately Fractured: 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-0.3

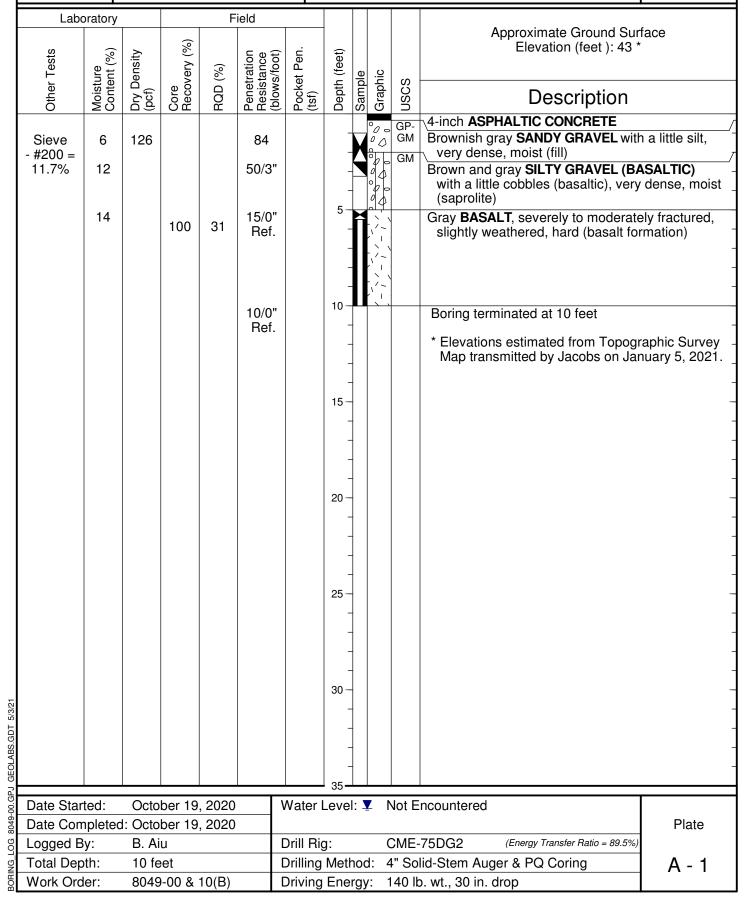
OG LEGEND FOR ROCK 8049-00.GPJ GEOLABS.GDT 1/27/21



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INTERSTATE ROUTE H-1 (EB) IMPROVEMENTS OLA LANE OVERPASS TO KALIHI STREET INTERCHANGE HONOLULU, OAHU, HAWAII

Log of Boring





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Log of Boring

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ŀ	Labo	oratory			F	ield						Approximate Ground Surface	
	Other Tests	Moisture Content (%)	Dry Density (pcf)	Core Recovery (%)	(%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	le le	ic	"	Approximate Ground Surface Elevation (feet): 48 *	
	Other	Moist Conte	Dry D (pcf)	Core Reco	RQD (%)	Penet Resis (blows	Pocke (tsf)	Depth	Sample	Graphic	nscs	Description	
		23	106			38		-		000	GP	4-inch ASPHALTIC CONCRETE Brownish gray SANDY GRAVEL, moist (fill)	_/
		37				6		-	~		CH	Brown and gray GRAVELLY CLAY with some sand, very stiff, moist (fill)	
	LL=82	35	92			26		5 -	M			Brownish gray with multi-color mottling SILTY CLAY with traces of gravel (basaltic), medium stiff, moist (saprolite) grades to stiff at 5 feet	
	PI=51							-				grades to still at 5 leet]
		41				76		10 -				grades to hard	-
								-	\\			Boring terminated at 11.5 feet	=
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								15 -					-
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JT 5/3/21								-					}
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3049-00.GI	Date Star			ber 19 ber 19		\	Water L	eve	l: 🔻	<u> </u>	lot E	ncountered Plate	
300.	Logged B		B. Ai				Drill Rig	j :			ME-	75DG2 (Energy Transfer Ratio = 89.5%)	
NGL	Total Dep	th:	11.5	feet			Orilling	Meth	100	l: 4	" So	lid-Stem Auger & PQ Coring A - 2	- [
BOR	Work Ord	er:	8049	-00 &	10(B)		Driving	Ene	rgy	: 1	40 lk	o. wt., 30 in. drop	



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INTERSTATE ROUTE H-1 (EB) IMPROVEMENTS OLA LANE OVERPASS TO KALIHI STREET INTERCHANGE HONOLULU, OAHU, HAWAII

Log of Boring

Labo	oratory			F	ield							╗
ests	e t (%)	ısity	ıry (%)	(%)	ttion nce foot)	Pen.	feet)				Approximate Ground Surface Elevation (feet): 51 *	
Other Tests	Moisture Content (%)	Dry Density (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample	Graphic	nscs	Description	\exists
									00 -	GP	4-inch ASPHALTIC CONCRETE	\neg
LL=48 PI=28	13	111			53		-	X		CL	Brownish gray SANDY GRAVEL , dense, moist (fill)	
Direct Shear	28				59		-				Brown with multi-color mottling SANDY CLAY with traces of gravel (basaltic), very stiff, moist (saprolite)	1
TXUU S _u =2.6 ksf	27	94			119		5 - -	X			grades to hard	-
UC= 25720 psi			94	63			-				Gray BASALT , closely to moderately fractured, slightly weathered, hard (basalt formation)	_
							10 -					1
UC= 8720 psi			100	100			-	Ħ	\ \ \ \ \ \ \ \			1
							-					-
			100	67			15 - -		-/-		grades to severely to slightly fractured	-
							-		\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\			1
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UC= 17010 psi			95	78			-				grades to closely to slightly fractured	1
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			100	100			-	H			grades to massive	
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3/21			100	75			30 -	Ц				-
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S Logged B	Logged By: B. Aiu					Drill Rig					75DG2 (Energy Transfer Ratio = 89.5%)	
Total Dep		41 fe				Drilling					lid-Stem Auger & PQ Coring A - 3.1	
∰ Work Ord	er:	8049	-00 &	10(B)		Driving	Ene	rgy	: 1	40 lk	o. wt., 30 in. drop	



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Log of Boring

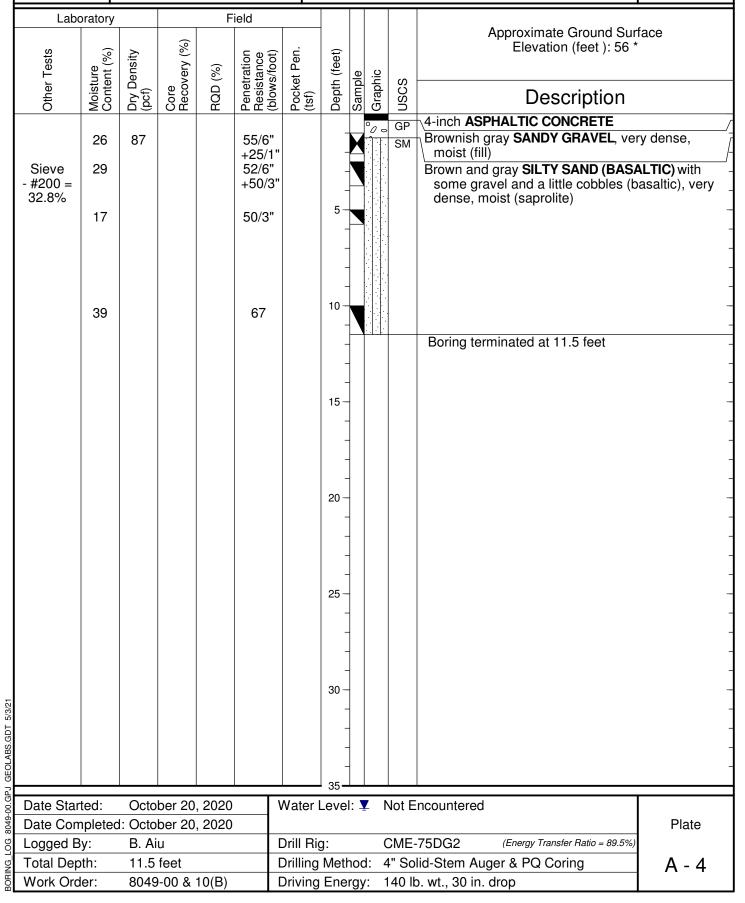
	Labo	oratory			F	ield						
	Other Tests	Moisture Content (%)	Dry Density (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample	Graphic	nscs	(Continued from previous plate) Description
				97	90			- - - 40 -				Boring terminated at 41 feet
								- 45 - - -	-			- - - -
								50 — - - -	-			- - - -
								55				- - - -
//3/21								- - - 65 -	-			- - - - -
BORING_LOG 8049-00.GPJ GEOLABS.GDT 5/3/21	Date Star	ted:	Octo	ber 19	, 2020	v	Vater l	-70 -	l: \	<u> </u>	lot E	ncountered
BORING_LOG 8049-	Date Corr Logged B Total Dep Work Ord	y: th:	B. Ai 41 fe	u			Drill Rig Drilling Driving	Meth		d: 4	" So	Plate 75DG2 (Energy Transfer Ratio = 89.5%) id-Stem Auger & PQ Coring b. wt., 30 in. drop



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Log of Boring





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Log of Boring

Г	Labo	ratory			F	ield							
	ω.		_	(%)		5		(:				Approximate Ground Surface Elevation (feet): 56 *	ce
	Tests	ıre nt (%	Density f)	ery ((%)	ratior ance /foot	t Per	(feet	Ф	ic		,	
	Other Tests	Moisture Content (%)	Dry De (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample	Graphic	nscs	Description	
										°0 0	GP	4-inch ASPHALTIC CONCRETE	
	Direct Shear	21	93			23		_	H		СН	Brownish gray SANDY GRAVEL , moist Brown SILTY CLAY with some gravel,	
	LL=59 PI=38	21				29		-	1			very stiff, moist (fill)	
		28		0		35/2"		5 -				grades with cobbles	-
		20		33		00/2		-	H			grades with cobbies	-
								-					-
								_			GM	Brown and gray SILTY GRAVEL (BAS	
								10 -	П			with some sand (basaltic) and a little (basaltic), dense, moist (saprolite)	copples –
	Sieve	36				40		-	Ų				-
-	#200 =	00				10		-					-
	45.4%			100	0			-	П				-
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	UC=			97	78			-	Ħ	`\'		grades to moderately fractured	1
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049-00	Date Com						valer L	_0 v 0		- 1	101 L	noodinorod	Plate
90	Logged B		B. Ai				Drill Rig	g:			ME-	75DG2 (Energy Transfer Ratio = 89.5%)	
	Total Dep		41 fe				Drilling					lid-Stem Auger & PQ Coring	A - 5.1
	Work Ord	er:	8049	-00 &	10(B)] [Driving	Ene	rgy	: 1	40 lk	o. wt., 30 in. drop	



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INTERSTATE ROUTE H-1 (EB) IMPROVEMENTS OLA LANE OVERPASS TO KALIHI STREET INTERCHANGE HONOLULU, OAHU, HAWAII

Log of Boring

F													
ŀ	Labo	ratory			-	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 plat	re)
BORING_LOG 8049-00.GPJ GEOLABS.GDT 5/3/21	Ō	M. CC	d)	100	100	94 (a) (b)) Pc	40 — 45 — 55 — 60 — 65 — 65 — 65 — 65 — 65 — 6	38	D-//-//-	ST CONTRACTOR OF THE CONTRACTO	Boring terminated at 41 feet	
-00.GPJ (Date Start	ted:	Octo	ber 20	, 2020	\ \	Vater I	₇₀ - _evel	: 4	<u> </u>	lot E	ncountered	
8049-	Date Com		: Octo	ber 21									Plate
.0g	Logged B		B. Ai				Drill Rig				ME-	75DG2 (Energy Transfer Ratio = 89.5%)	
NG	Total Dep		41 fe				Drilling					lid-Stem Auger & PQ Coring	A - 5.2
BOR	Work Ord	er:	8049	-00 &	10(B)		Driving	Ene	rgy	: 1	40 lk	o. wt., 30 in. drop	



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INTERSTATE ROUTE H-1 (EB) IMPROVEMENTS OLA LANE OVERPASS TO KALIHI STREET INTERCHANGE HONOLULU, OAHU, HAWAII

Log of Boring

												-	
	Labo	ratory			<u> </u>	ield						Approximate Ground Surfac	
Other Tests		Moisture Content (%)	Dry Density (pcf)	Core Recovery (%)	(%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	<u>e</u>	iic		Elevation (feet): 55.5 *	je –
Other		Moist Conte	Dry De (pcf)	Core Recov	RQD (%)	Penet Resist (blows	Pocke (tsf)	Depth	Sample	Graphic	nscs	Description	
										000	GP	4-inch ASPHALTIC CONCRETE	
Dire She LL= Pl=	ear 67	18 18	80			128 22		-	X		CH	Brownish gray SANDY GRAVEL , moist Brown and gray SILTY CLAY with som (basaltic) and a little cobbles (basaltic very stiff, moist (fill)	e gravel
TXU S _u =1.4		27	87			14		5 - - -	X			grades to medium stiff	-
		39				12		- 10 - - -			CH	Brown with multi-color mottling SILTY (a little sand and gravel (basaltic), stiff (alluvium)	
				100	0			- 15 -		//// -`;`		Gray BASALT, severely fractured, unw	- veathered, -
UC 25440				98	98			- - -		,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		hard (basalt formation) grades to massive	-
UC 8400				93	93			20 - - - -				grades to slightly fractured	- - - - -
				100	62			25 - - -		- / / - / / - / / -			- - - -
/3/21				100	100			30 -				grades to closely fractured	- - -
Date Logg Logg Total Work				100	100			- - - 35 -		\\\-\\\-\\\		grades to massive	- - -
nate	Start	eq.	Octo	ber 21	2020	Ιν	Water I	<u>-</u> υυ-	- T	7 N	J∩t ∩	bserved	
Date				ber 26		-+	vvaiti l	_0 v 0		- 1	101 0	.5501700	Plate
S Logo	ged B	•	B. Ai		, _020	- 	Drill Rig			(ME-	75DG2 (Energy Transfer Ratio = 89.5%)	αισ
g Total	Total Depth: 122.5 feet						Drilling		าดด				A - 6.1
Work	k Ord		Driving Energy: 140 lb. wt., 30 in. drop										



Geotechnical Engineering

INTERSTATE ROUTE H-1 (EB) IMPROVEMENTS OLA LANE OVERPASS TO KALIHI STREET INTERCHANGE HONOLULU, OAHU, HAWAII

Log of Boring

Labo	Laboratory Field				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			
UC= 13450 psi			100	100			40 -							
UC= 11940 psi			100	100			45 - - - -	-	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \					
			100	100			50	-	/ - / / - / / - / /					
UC= 15070 psi			100	100			55 -	\ \ \ - \ \ \ \ - \ \ \ \ \ \ \ \ \						
			100	100			60 -		- / - / - /					
			50	13			65		`!-`!-	СН	Brown SILTY CLAY with some sand an gravel (basaltic), hard, moist (older al			
Date Start	ted:	Octo	ber 21	, 2020	Ιν	Vater I	Leve	l: <u>▼</u>		lot O	bserved			
Date Com									•			Plate		
Logged B	y:	B. Ai	u			Drill Riç					75DG2 (Energy Transfer Ratio = 89.5%)			
Total Dep			5 feet			Drilling						A - 6.2		
Work Ord	er:	8049	-00 &	10(B)		Driving	Ene	rgy:	1	40 lk	o. wt., 30 in. drop			



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INTERSTATE ROUTE H-1 (EB) IMPROVEMENTS OLA LANE OVERPASS TO KALIHI STREET INTERCHANGE HONOLULU, OAHU, HAWAII

Log of Boring

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	nscs	(Continued from previous plat	e)
TXUU S _u =3.8 ksf	34	86	62		30/6" +50/3"	3.8	- - -	X		CH		-
LL=69 PI=36	51		0		24		75 – - - -			СН	grades to very stiff Brown with multi-color mottling SILT	
TXUU S _u =4.0 ksf	52	70	0		26	3.3	80 — - - -	X			some sand, stiff, moist (older alluvi	um) - - - - -
	55		0		18		85 — - - -				grades to very stiff	- - - - - -
LL=107 PI=73 TXUU S _u =3.8 ksf	59	65	0		29	3.5	90	X				- - - - -
	50		0		13		95 — - - -				grades to stiff	- - - - - -
Date Start Date Com Logged B Total Dep Work Ord	56	69	0		21	3.3	100 — - - - -	X				- - - - - -
OBD C					<u> </u>		105-		(////			
Date Star			ber 21			Water I	_eve	l: 4	<u> </u>	Not C	Observed	Plate
S Logged B		B. Ai		, 2020		Drill Rig	a:		(ME-	75DG2 (Energy Transfer Ratio = 89.5%)	ומוט
g Total Dep	-		5 feet			Drilling		100			lid-Stem Auger & PQ Coring	A - 6.3
Work Ord	er:	8049	-00 &	10(B)		Driving	Ene	rgy	/: 1	40 lk	o. wt., 30 in. drop	



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INTERSTATE ROUTE H-1 (EB) IMPROVEMENTS OLA LANE OVERPASS TO KALIHI STREET INTERCHANGE HONOLULU, OAHU, HAWAII

Log of Boring

Ī	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	P USCS	(Continued from previous plat	e)
	O	59	<u> </u>	0	<u> </u>	18	<u>т</u>		S	0	CH	grades to very stiff	-
	TXUU S _u =2.5 ksf	59	65	0		27	2.3	- 110 - - -	X				- - - -
		58		45		19		115 - - -				grades with a little sand	-
		52	74	10		31		- 120 - -	X				- - -
								- 125 - -	-			Boring terminated at 122.5 feet	- - -
								- 130 -	-				- - -
21								- - - 135 –	-				- - - -
BORING_LOG 8049-00.GPJ GEOLABS.GDT 5/3/21								- - - 140 -	-				- - -
9-00.GP.	Date Start			ber 21			Vater I		l: 4	<u> </u>	lot O	bserved	
G 804(Date Com Logged B		: Octo B. Ai		, 2020		Drill Rig	٦.			MF-	75DG2 (Energy Transfer Ratio = 89.5%)	Plate
NG_LO	Total Dep			5 feet			Drilling		100			id-Stem Auger & PQ Coring	A - 6.4
BOR	Work Ord	er:	8049	-00 &	10(B)		Driving	Ene	rgy	<i>r</i> : 1	40 lb	o. wt., 30 in. drop	



Geotechnical Engineering

INTERSTATE ROUTE H-1 (EB) IMPROVEMENTS OLA LANE OVERPASS TO KALIHI STREET INTERCHANGE HONOLULU, OAHU, HAWAII

Log of Boring

Approximate Ground Surface Elevation (feet): 41.5 *	Labe				Г	اماما	•						
UC= 13600 psi	Labo	Talory				leia		-				Approximate Ground Sur	face
UC= 100 100 100 100 100 100 100 100 100 10	sts	(%)	sity	(%) A		ion ice oot)	en.	eet)				Elevation (feet): 41.5	*
UC= 100 100 100 100 100 100 100 100 100 10	T TE	sture	Den	over	%) (etrat istar vs/fc	ket F	th (fe	ple	ohic	တ္သ		
UC= 100 100 100 100 100 100 100 100 100 10	Othe	Mois	Dry (pcf)	Core	RQI	Pen Resi	Pocl (tsf)	Dep	Sar	Grap	OSC	Description	
UC= 100 70 12/0" Ref. 100 70 12/0" Ref. UC= 13600 psi UC= 100 100 100 UC= 10380 psi UC= 1000 100 100 UC= 1000 100 100 100 100 100 100 100 100 10													
UC= 16670 psi UC= 16670 psi UC= 13600 psi UC= 100 100 100 100 UC= 10080 psi UC= 1000 100 100 100 UC= 10080 psi UC= 10080 psi UC= 10090 psi UC= 10		1				65			M			COBBLES (BASALTIC), dense, moi	st (fill)
UC= 13600 psi		54				9			+		СН	Yellowish brown SII TY CI AY with s	ome sand
UC= 16670 psi								-					-
100 70 Ref. Slightly weathered, very hard (basalt formation) Slightly weathered, very hard (basalt forma						12/0"		5-				Gray BASALT, severely to moderate	elv fractured.
UC= 13600 psi				100	70			-	Ш	\ \ _		slightly weathered, very hard (bas	alt formation)
UC= 13600 psi	10070 por							-	П	-/-			1
UC= 13600 psi									Ш]
UC= 13600 psi								10-	Ш	, ,			_
UC= 10380 psi UC= 1000 100 150				100	100				Н	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \		grades to closely to moderately frac	tured -
UC= 10380 psi UC= 1000 100	13600 psi							-	Н	```			-
UC= 10380 psi UC= 1000 100								-	Н	-,',			-
UC= 10380 psi UC= 1000 100								-	Ш	, ,			-
100 100 100	LIC-			100	100			15-	Н	\'		grades to massive	-
UC= 1000 psi				100	100					``.		grades to massive]
UC= 1000 psi									Ш	· \			_
UC= 1000 psi								-	Ш	, ,			-
UC= 10000 psi								20 -	Ш	` ' '			-
UC= 10000 psi				100	100			-	Н	`\'			-
UC= 10000 psi								-	11	-,'-			1
UC= 10000 psi									П]
UC= 10000 psi								25-		, ,			
30 —				100	100				Н	\\ \ _			-
	10000 psi							-	Н				-
								-	Н				-
								-	Н	, ,			-
Date Started: November 16, 2020 Date Completed: November 19, 2020 Logged By: M. Hassani / B. Aiu Drill Rig: CME-75DG2 (Energy Transfer Ratio = 89.5%) Total Depth: 122 feet Drilling Method: 4" Solid-Stem Auger & PQ Coring Work Order: 8049-00 & 10(B) Driving Energy: 140 lb. wt., 30 in. drop	-			100	100			30 -	Н				-
Date Started: November 16, 2020 Water Level: ▼ Not Observed Date Completed: November 19, 2020 Logged By: M. Hassani / B. Aiu Drill Rig: CME-75DG2 (Energy Transfer Ratio = 89.5%) Total Depth: 122 feet Drilling Method: 4" Solid-Stem Auger & PQ Coring Work Order: 8049-00 & 10(B) Driving Energy: 140 lb. wt., 30 in. drop				100	100				П	,,,]
Date Started: November 16, 2020 Water Level: ▼ Not Observed Date Completed: November 19, 2020 Logged By: M. Hassani / B. Aiu Drill Rig: CME-75DG2 (Energy Transfer Ratio = 89.5%) Total Depth: 122 feet Drilling Method: 4" Solid-Stem Auger & PQ Coring Work Order: 8049-00 & 10(B) Driving Energy: 140 lb. wt., 30 in. drop													
Date Started: November 16, 2020 Water Level: ▼ Not Observed Date Completed: November 19, 2020 Plate Logged By: M. Hassani / B. Aiu Drill Rig: CME-75DG2 (Energy Transfer Ratio = 89.5%) Total Depth: 122 feet Drilling Method: 4" Solid-Stem Auger & PQ Coring Work Order: 8049-00 & 10(B) Driving Energy: 140 lb. wt., 30 in. drop	Š							-		, ,			-
Date Started:November 16, 2020Water Level:✓ Not ObservedDate Completed:November 19, 2020PlateLogged By:M. Hassani / B. AiuDrill Rig:CME-75DG2(Energy Transfer Ratio = 89.5%)Total Depth:122 feetDrilling Method:4" Solid-Stem Auger & PQ CoringWork Order:8049-00 & 10(B)Driving Energy:140 lb. wt., 30 in. drop	Date Star Date Com Logged B Total Dep Work Ord	Data Charladi Navershiri 40 0000						35-	Ш	```			
Date Completed: November 19, 2020 Logged By: M. Hassani / B. Aiu Drill Rig: CME-75DG2 (Energy Transfer Ratio = 89.5%) Total Depth: 122 feet Drilling Method: 4" Solid-Stem Auger & PQ Coring Work Order: 8049-00 & 10(B) Driving Energy: 140 lb. wt., 30 in. drop	Date Star						Water I	Leve	l: <mark>4</mark>	<u> </u>	lot C	bserved	
Total Depth: 122 feet Drilling Method: 4" Solid-Stem Auger & PQ Coring A - 7.1 Work Order: 8049-00 & 10(B) Driving Energy: 140 lb. wt., 30 in. drop	Date Com						יים וויים	~.			>N 4 F	7EDCO (Energy Transfer Datie 20 50)	Plate
Work Order: 8049-00 & 10(B) Driving Energy: 140 lb. wt., 30 in. drop	Logged B	00 ,						-	hor				
	Work Ord				10(B)								^\ - /.



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INTERSTATE ROUTE H-1 (EB) IMPROVEMENTS OLA LANE OVERPASS TO KALIHI STREET INTERCHANGE HONOLULU, OAHU, 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 pla	te)
UC= 9330 psi			100	100			-		-//-//			-
			100	100			 40 - -					
UC= 15400 psi			100	100			45 - - - -					-
			42	100			50 — - -		- / / / /	СН	Reddish brown BASALT , moderatel highly weathered, medium hard (b formation) Brown SILTY CLAY with some sand	asalt -
	35	91	31		49	>4.5	55 — - - - -	X			and a little gravel (basaltic), very s (older alluvium)	
	44		10		33		-60 - - - -				grades to hard	
LL=72 PI=42 TXUU S_=9.4 ksf Date Star Date Con Logged B Total Dep	48	73	13		61/6" +25/1"	>4.5	65 - - - - 70	X				- - - -
ဗို Date Star			ember			Nater I	_eve	l: <u>\</u>	<u> </u>	lot C	bserved	
Date Con						D-211 D1				N 4	75000 (5 7 6 2 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	Plate
S Logged B Total Dep		M. H 122 f	assani	/ B. Ai		Orill Rio Orilling		101			75DG2 (Energy Transfer Ratio = 89.5%) Iid-Stem Auger & PQ Coring	, , ,
Work Ord			-00 &	10(B)		Oriving					o. wt., 30 in. drop	A - 7.2



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Geotechnical Engineering

INTERSTATE ROUTE H-1 (EB) IMPROVEMENTS OLA LANE OVERPÁSS TO KALIHI STREET INTERCHANGE HONOLULU, OAHU, HAWAII

Log of Boring

Laho	oratory			F	ield						•	
Labo	ratory			ı	leiu							
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	
			ОШ	Щ		ше				CH	·	
	53				16		_				grades to very stiff	•
TXUU S _u =4.6 ksf	48	72	0		47		- 75 - - -	\ \ \ \			grades with some gravel	- - -
	49		98		17		80					- - -
Direct Shear	53	73	71		26	2.0	85 - - - -	X			grades to stiff	- - - -
	56		21		24		90 -			SP- SC	Brown with dark brown GRAVELLY SAND was little clay, medium dense, moist (older allu	
TXUU S _u =1.4 ksf	52	71	12		23	1.8	95 			МН	Brown CLAYEY SILT with traces of sand (coralline), stiff, moist (older alluvium)	- - -
GEOLABS.GDT 5/3/21	56		86		15		100				grades to stiff to very stiff	- - -
r d							105 -					
g Date Stan			ember			Nater	Leve	l: 🔽	Ν	lot O	bserved	1-1-
Date Com			ember assani			Drill Ri	a.			:N/=	75DG2 (Energy Transfer Ratio = 89.5%)	late
S Logged B S Total Dep		122 t		/ D. A		Drilling		hod.				7.3
g Total Dep Work Ord			9-00 &	10(B)		Driving					b. wt., 30 in. drop	1.0
<u> </u>		33.0		- (-)		9		3)			,	



Geotechnical Engineering

INTERSTATE ROUTE H-1 (EB) IMPROVEMENTS OLA LANE OVERPASS TO KALIHI STREET INTERCHANGE HONOLULU, OAHU, 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 plat	e)
Direct Shear	57	71	71		14	1.5	-	X		MH	grades to medium stiff	- - -
	52		0		10		110 - - -				grades to stiff	- - - -
TXUU S _u =1.8 ksf	36	84	100		27	1.8	- 115 - -	X				- - -
	53				12		- 120 - -				Boring terminated at 122 feet	- - -
							- 125 - -					- - - -
							- - 130 - -					- - -
3/21							- - 135 –					- - - -
Date Star Date Con Logged B Total Dep Work Orc							- - 140 -					- - -
Date Star			ember ember			Vater I	Leve	l: <u>▼</u>	١	Not C	bserved	Plate
Logged B Total Dep Work Ord	y: oth:	M. H	assani	/ B. Ai	iu [Orill Rig Orilling Oriving	Metl		4	" So	75DG2 (Energy Transfer Ratio = 89.5%) id-Stem Auger & PQ Coring b. wt., 30 in. drop	A - 7.4



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INTERSTATE ROUTE H-1 (EB) IMPROVEMENTS OLA LANE OVERPASS TO KALIHI STREET INTERCHANGE HONOLULU, OAHU, HAWAII

Log of Boring

Labo	oratory			Fi	ield							
W	(0	,	(%		5	_:	· ·				Approximate Ground Surface Elevation (feet): 55 *	
Test	ıre nt (%	ənsity	ery ((%	ance //foot	t Per	(feet	Ф	<u>.</u> 2		, ,	
Other Tests	Moisture Content (%)	Dry Density (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample	Graphic	sosn	Description	
										SM	6-inch ASPHALTIC CONCRETE	
Direct Shear	9	104			36		_	H		СН	Brownish gray SILTY SAND with some gravel, moist (fill)	A
LL=74 PI=52	19				18		-	1			Brown SILTY CLAY with some sand and gravel, very stiff, moist (fill)	
	15	80	33		24		5 - - -	X			grades with more gravel, stiff	-
							10 -			ML	Brown SANDY SILT with some gravel and cobbles, hard, moist (alluvium)	
LL=30 PI=5	28		45		34		- - -				grades with some sand (coralline)	- - -
UC= 16520 psi			100	77	20/0" Ref.		- 15 - - -				Gray BASALT , moderately fractured, slightly weathered, very hard (basalt formation)	-
UC= 14360 psi			100	100			20 - -				grades to massive, unweathered	
UC= 18870 psi			100	100			- 25 - -					
Date Star Date Com Logged B Total Dep Work Ord			100	100			30 - - -					
GEOLAE							- 35 -		·			_
Date Star	ted:	Octo	ber 28	. 2020		Nater L		l: 3		Not C	bserved	
Date Com											Plate	
Logged B	y:	B. Ai	u / M. l	Hassaı	ni [Drill Rig	j :		(CME-	75DG2 (Energy Transfer Ratio = 89.5%)	
Total Dep		1221				Drilling					lid-Stem Auger & PQ Coring A - 8.1	
Work Ord	er:	8049	-00 &	10(B)] [Driving	Ene	rgy	: 1	40 lk	o. wt., 30 in. drop	



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INTERSTATE ROUTE H-1 (EB) IMPROVEMENTS OLA LANE OVERPASS TO KALIHI STREET INTERCHANGE HONOLULU, OAHU, HAWAII

Log of Boring

	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	nscs	(Continued from previous plate	e)
	UC= 15330 psi			100	100			- - - 40 -		-//-//-//-//-			- - - -
	UC= 13420 psi			100	100			- - 45 - -					- - - -
				100	100			50 - - -				grades to slightly fractured	- - - - -
	UC= 20380 psi			100	90			55 - - - - -		/ - / / - / / - / / -			- - - -
				72	100			60 - - - -	-		МН	Brown with dark gray mottling CLAYE some sand and traces of gravel, ve (older alluvium)	- E Y SILT with - ry stiff, moist _ -
BORING_LOG 8049-00.GPJ GEOLABS.GDT 5/3/21	LL=58 PI=25	46		62		19		65 - - - - 70					- - - -
-00.GP	Date Start			ber 28			Nater I	_eve	l: \	<u> </u>	lot C	bserved	
8049	Date Com			2 .: II D.				\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	75D00 (France 7 (B // 20 50))	Plate			
g Loc	Logged B		B. Ai 122 f		Orill Rig Orilling		101			75DG2 (Energy Transfer Ratio = 89.5%) lid-Stem Auger & PQ Coring	A - 8.2		
BORIN	Work Ord			-00 &	10(B)		Driving					b. wt., 30 in. drop	A - 0.2



Total Depth:

Work Order:

122 feet

8049-00 & 10(B)

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INTERSTATE ROUTE H-1 (EB) IMPROVEMENTS OLA LANE OVERPASS TO KALIHI STREET INTERCHANGE HONOLULU, OAHU, HAWAII

Log of Boring

8

A - 8.3

r	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
5	TXUU 5 _u =3.3 ksf	52	71	86		40	2.0	-	X		MH	
		54		0		20		75 - - - -				grades with no gravel and less sand
		51	73	13		71/6" +25/1	>4.5	80 - - - -	X		CL	Brown with multi-color mottling SANDY CLAY with some gravel (basaltic), hard, moist (older alluvium)
		55		19		10		85 - - - -	\ 			grades to stiff locally
S	TXUU 5 _u =4.9 ksf	41	78	26		58	4.5	90 - - - -	X			_
		56		26		23		95 - - - -	\ 			grades to very stiff
LOG 8049-00.GPJ GEOLABS.GDT 5/3/21	Direct Shear	57	69	14		28	4.5	- 100 - - - -	X			_
PJ GE								105-	<u> </u>			
049-00.G	Date Star Date Com			ber 28 ember :			Water I	eve	l: 👤		Not C	Observed Plate
LOG 8	Logged B			u / M. I			Drill Rig	g:		(CME-	75DG2 (Energy Transfer Ratio = 89.5%)

Drilling Method: 4" Solid-Stem Auger & PQ Coring

140 lb. wt., 30 in. drop

Driving Energy:



Geotechnical Engineering

INTERSTATE ROUTE H-1 (EB) IMPROVEMENTS OLA LANE OVERPASS TO KALIHI STREET INTERCHANGE HONOLULU, OAHU, 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	റ uscs	(Continued from previous plate) Description	
TXUU S _u =2.8 ksf	45	75	19		40	4.5	-	X				-
	50				16		- 110 - -			CH	Brown with multi-color mottling SILTY CLAY v a little sand, very stiff, moist (older alluvium)	vith , - -
			19				- - 115 -	-				- - -
Direct Shear	52	73	24		26	3.5	-	X A			grades to stiff	- -
	50				15		120 - - -				grades to stiff to very stiff	- - -
							- 125 -				Boring terminated at 122 feet	- - -
							-					- - -
							130 -					- - -
1,075							135 -					- - -
Date Star Date Com Logged B Total Dep Work Ord							- - 140					- - -
Date Star			ber 28			Vater I		l: <u>\</u>	<u> </u>	lot O	bserved	
Date Com Logged B			ember : u / M. I			Drill Riç	u.			MF-	Plat 75DG2 (Energy Transfer Ratio = 89.5%)	е
Total Dep	th:	122 1	feet			Drilling	Metl		d: 4	" So	id-Stem Auger & PQ Coring A - 8	3.4
Work Ord	er:	8049	-00 &	10(B)		Driving	∟ne	rgy	/: 1	40 lk	o. wt., 30 in. drop	



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INTERSTATE ROUTE H-1 (EB) IMPROVEMENTS OLA LANE OVERPASS TO KALIHI STREET INTERCHANGE HONOLULU, OAHU, HAWAII

Log of Boring

Approximate Ground Surface Elevation (feet): 53 * Approximate Ground Surface Elevation (feet): 53 * Description 7-inch ASPHALTIC CONCRETE Dark gray with light gray motiling SILTY SAND William Surface Street Surface Su													
Elevation (feet): 53 * Description 7-inch ASPHALTIC CONCRETE Dark gray with light gray mottling SILTY SAND with some gravel, dense to very dense, moist (fill) Orangish gray CLAYEY SILT with some sand and gravel, very slift, moist (saprolite) grades with more gravel Gray BASALT, moderately weathered, medium hard to hard (basalt formation) Boring terminated at 10 feet	Labo	oratory			F	ield							
LL=62 Pl=25 36 88 43 4.0 5				(%)								Approximate Ground Surface	
LL=62 Pl=25 36 88 43 4.0 5	sts	(%)	sity	6) >		og (ce	en.	et)				Lievation (leet). 55	
LL=62 Pl=25 36 88 43 4.0 5	l μ.	art e	ens	ver	8	trat tan stan s/fc	늅	(fe	e	λic	m		
LL=62 Pl=25 36 88 43 4.0 5	l de	oist	Ç G-7	ore	g	esis esis	% €	eptł	amp	rapl	SC	Description	
LL=62 Pl=25 36 88 43 4.0 5	0	ΣŬ	⊡ੰ⊕	ΟŒ	ŭ	<u> </u>	₫ ≝	۵	ű	Ŋ	Š	-	
LL=62 Pl=25 36 88 43 43 4.0 with some gravel, dense to very dense, moist (fill) Orangish gray CLAYEY SILT with some sand and gravel, very stiff, moist (saprolite) grades with more gravel Gray BASALT, moderately weathered, medium hard to hard (basalt formation) Boring terminated at 10 feet		00						-			SM		
LL=62 Pl=25 36 88 43 43 4.0 5		23				57		_				with some availal depos to your depos mode	
LL=62 Pl=25 36 88 43 4.0 4.0 5								_		W	MH		` /_
LL=62 Pl=25 36 88 43 4.0 25/0" Gray BASALT, moderately weathered, medium hard to hard (basalt formation) Boring terminated at 10 feet								_]	W		Orangish gray CLAYEY SILT with some sand	
LL=62 Pl=25								5-		W		and gravel, very stiff, moist (saprolite)	
25/0" Ref. 25/0" Ref. 30- Gray BASALT. moderately weathered, medium hard to hard (basalt formation) Boring terminated at 10 feet		36	88			43			M	W		grades with more gravel	
25/0" Ref. 10	PI=25						4.0			W		grades with more graver	
25/0" Ref. 10								-] [M			
25/0" Ref. Boring terminated at 10 feet								-	1	2 11 2 1		Gray BASALT, moderately weathered, mediun	า
25/0" Ref. 15 - 20 - 25 - 30 - 30 -								-	1	\ <u>'</u>		hard to hard (basalt formation)	_
Ref. - - - - - - - - -								10 -				Boring terminated at 10 feet	
						Ref.		-	1				-
								-	1				-
								-	1				-
								-	1				-
								15 -	1				_
								-	$\mid \mid$				-
								-	1				-
								-	-				-
								-					_
								20 -					_
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								25 -					
								_	1				
								-	1				Ī
								-	1				_
Date Started: October 26, 2020 Water Level: Date Completed: October 26, 2020 Logged By: M. Hassani Drill Rig: CME-75DG2 (Energy Transfer Ratio = 89.5%) Total Depth: 10 feet Drilling Method: 4" Solid-Stem Auger & PQ Coring Work Order: 8049-00 & 10(B) Driving Energy: 140 lb. wt., 30 in. drop	_							30 -	1				-
Date Started: October 26, 2020 Date Completed: October 26, 2020 Logged By: M. Hassani Total Depth: 10 feet Water Level: Not Encountered Plate Plate CME-75DG2 (Energy Transfer Ratio = 89.5%) Total Depth: 10 feet Drilling Method: 4" Solid-Stem Auger & PQ Coring Work Order: 8049-00 & 10(B) Driving Energy: 140 lb. wt., 30 in. drop	i i							-	1				-
Date Started: October 26, 2020 Water Level: Date Completed: October 26, 2020 Logged By: M. Hassani Drill Rig: CME-75DG2 (Energy Transfer Ratio = 89.5%) Total Depth: 10 feet Drilling Method: 4" Solid-Stem Auger & PQ Coring Work Order: 8049-00 & 10(B) Driving Energy: 140 lb. wt., 30 in. drop	8							-	1				-
Date Started: October 26, 2020 Water Level: Date Completed: October 26, 2020 Logged By: M. Hassani Drill Rig: CME-75DG2 (Energy Transfer Ratio = 89.5%) Total Depth: 10 feet Drilling Method: 4" Solid-Stem Auger & PQ Coring Work Order: 8049-00 & 10(B) Driving Energy: 140 lb. wt., 30 in. drop								-	1				-
Date Started:October 26, 2020Water Level: ∑Not EncounteredDate Completed:October 26, 2020PlateLogged By:M. HassaniDrill Rig:CME-75DG2 (Energy Transfer Ratio = 89.5%)Total Depth:10 feetDrilling Method:4" Solid-Stem Auger & PQ CoringWork Order:8049-00 & 10(B)Driving Energy:140 lb. wt., 30 in. drop								-	1				-
Date Started:October 26, 2020Water Level: ∑Not EncounteredDate Completed: October 26, 2020PlateLogged By:M. HassaniDrill Rig:CME-75DG2(Energy Transfer Ratio = 89.5%)Total Depth:10 feetDrilling Method:4" Solid-Stem Auger & PQ CoringWork Order:8049-00 & 10(B)Driving Energy:140 lb. wt., 30 in. drop	Date Star Date Com Logged B Total Dep Work Ord												
Date Completed: October 26, 2020 Logged By: M. Hassani Drill Rig: CME-75DG2 (Energy Transfer Ratio = 89.5%) Total Depth: 10 feet Drilling Method: 4" Solid-Stem Auger & PQ Coring Work Order: 8049-00 & 10(B) Driving Energy: 140 lb. wt., 30 in. drop	Date Star	ted:	Octo	ber 26	, 2020	\	Nater I	Leve	l: Ž	<u>Z</u> 1	Not E		
Logged By:M. HassaniDrill Rig:CME-75DG2(Energy Transfer Ratio = 89.5%)Total Depth:10 feetDrilling Method:4" Solid-Stem Auger & PQ CoringWork Order:8049-00 & 10(B)Driving Energy:140 lb. wt., 30 in. drop	Date Con	npleted											•
Total Depth: 10 feet Drilling Method: 4" Solid-Stem Auger & PQ Coring Work Order: 8049-00 & 10(B) Driving Energy: 140 lb. wt., 30 in. drop	Logged B	By:	M. H	assani			Orill Rig	g:		(CME-	-75DG2 (Energy Transfer Ratio = 89.5%)	
Work Order: 8049-00 & 10(B) Driving Energy: 140 lb. wt., 30 in. drop	Total Dep	oth:	10 fe	et			Drilling	Metl	noc	d:	l" So	lid-Stem Auger & PQ Coring A - 9	9
	Work Ord	ler:	8049	-00 &	10(B)		Driving	Ene	rgy	/: 1	40 lk		



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Log of Boring

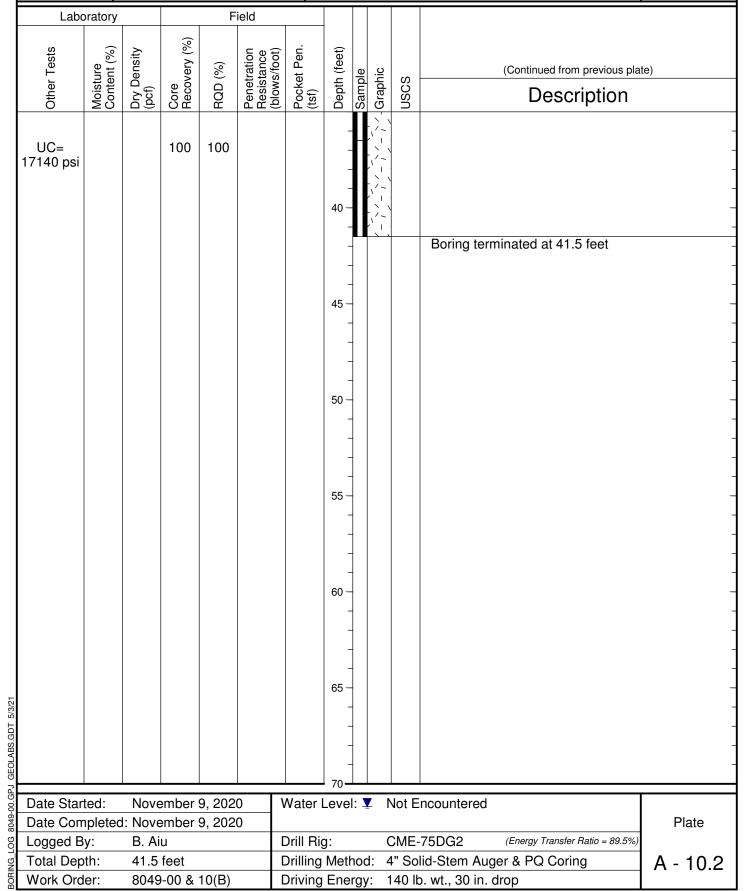
Labo	ratory			F	ield							
Tests	Moisture Content (%)	nsity	Core Recovery (%)	(%)	ation ance /foot)	t Pen.	(feet)	Ф	ပ		Approximate Ground Surface Elevation (feet): 52 *	
Other Tests	Moistu Sonter	Dry Density (pcf)	Sore Recov	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample	Graphic	nscs	Description	
	20	96			40/2"					SM ML	4-inch ASPHALTIC CONCRETE Gray SILTY SAND (BASALTIC) with som	
	20	90					-		\prod	IVIL	gravel (basaltic), moist (fill)	lπ
			100	25	25/1"		- - 5-				Brown and gray SANDY SILT with some (basaltic), hard, moist (fill) grades with some cobbles	_
UC= 5860 psi			100	97			- -				Gray BASALT , moderately fractured, slig weathered, hard (basalt formation)	ghtly - -
3000 psi							- - 10 -		· \			- -
			95	95			-		/ - / - /			- - -
							- 15 -					- -
UC= 4790 psi			100	100			-				grades to massive	- -
							20 - -					- -
			100	100			-					-
UC=			100	100			25 - -					- - -
19010 psi							30 -		- \			- - -
Date Start Date Com Logged B Total Dep Work Ord			100	100			- - -					- - -
5							35-		·/-\			
Date Start	ate Started: November 9, 2020				0 V	Nater L	_eve	l: J	<u> </u>	lot E	ncountered	
Date Com				9, 202		- · · · · ·						Plate
Logged B Total Dep		B. Ai 41.5				Orill Rig Orilling		hor			75DG2 (Energy Transfer Ratio = 89.5%) Iid-Stem Auger & PQ Coring A	- 10.1
Work Ord			-00 &	10(B)		Driving					b. wt., 30 in. drop	10.1



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INTERSTATE ROUTE H-1 (EB) IMPROVEMENTS OLA LANE OVERPASS TO KALIHI STREET INTERCHANGE HONOLULU, OAHU, HAWAII

Log of Boring





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INTERSTATE ROUTE H-1 (EB) IMPROVEMENTS OLA LANE OVERPASS TO KALIHI STREET INTERCHANGE HONOLULU, OAHU, HAWAII

Log of Boring

Other Tests Moisture Content (%) Dry Density (pcf) Core Recovery (%) Sample Graphic USCS Abproximate Ground Surface (blows/foot) Core Resistance (blows/foot) Core Resistance (blows/foot) Description Approximate Ground Surface Elevation (feet): 70 *	
The light of the l	
Grayish brown SILTY GRAVEL (BASALTIC) w some sand (basaltic), moist (fill)	ith _
UC= 6330 psi Gray vesicular BASALT, slightly fractured, moderately weathered, hard (basalt formation)	on) - - -
97 58 grades to severely to slightly fractured	-
UC= 14340 psi 98 40 grades to severely fractured, medium hard	-
	- - -
UC= 19350 psi 97 97 97 97 100 100 100 100 10	- , -
Date Started: June 25, 2020 Date Completed: June 26, 2020 Logged By: B. Aiu Drill Rig: CME-75DG2 (Energy Transfer Ratio = 89.5%) Total Depth: 122 feet Drilling Method: 4" Solid-Stem Auger & PQ Coring Work Order: 8049-00 & 10(B) Driving Energy: 140 lb. wt., 30 in. drop	-
Date Started: June 25, 2020 Water Level: ¥ Not Observed	
Date Completed: June 26, 2020 Plate	Э
Logged By: B. Aiu Drill Rig: CME-75DG2 (Energy Transfer Ratio = 89.5%) Total Donth: 122 foot Drilling Method: 4" Solid Stom August 8 DO Coring	, ,
Total Depth: 122 feet Drilling Method: 4" Solid-Stem Auger & PQ Coring A - 1 - Work Order: 8049-00 & 10(B) Driving Energy: 140 lb. wt., 30 in. drop	1.1



Work Order:

8049-00 & 10(B)

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INTERSTATE ROUTE H-1 (EB) IMPROVEMENTS OLA LANE OVERPASS TO KALIHI STREET INTERCHANGE HONOLULU, OAHU, 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	nscs	(Continued from previous plat	te)
UC= 18880 psi			98	98			-		-//-//			-
			100	100			40 - - - -					- - - -
UC= 16870 psi			97	80			45 - - - -					- - - -
			100	90			50 - - -		-//-//-//-			- - -
			47	0			- 55 - -	-		СН	grades to severely fractured, highly soft to medium hard Reddish brown SILTY CLAY with so	_
LL=55 PI=28 TXUU S _u =6.1 ksf	29	92	0		84	>4.5	60 -	 			hard, moist (older alluvium)	· -
Date Star Date Com Logged B	48		0		33		65			СН	Brown with multi-color mottling SILT some sand, hard, moist (older alluv	
5							70-					
Date Star			25, 20			Water I	Leve	: -	<u> </u>	Not C	bserved	Diete
Date Com Logged B		I: June B. Ai		J2U	+	Drill Rig	٦.			CME-	75DG2 (Energy Transfer Ratio = 89.5%)	Plate
Total Dep		122 1						ho			lid-Stem Auger & PQ Coring	A - 11.2
Total Dep			000	10/B)							wt 20 in drop	/\ . _

Driving Energy:

140 lb. wt., 30 in. drop



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INTERSTATE ROUTE H-1 (EB) IMPROVEMENTS OLA LANE OVERPASS TO KALIHI STREET INTERCHANGE HONOLULU, OAHU, HAWAII

Log of Boring

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	nscs	(Continued from previous plate	2)
TXUU S _u =3.8 ksf	57	67	0		31	3.0	- - -	X		CH	grades to very stiff	- - -
	59		67		20		75 - - -					- - -
LL=73 PI=41 Direct Shear	54	71	55		28	3.8	80 - -	X			grades with fine gravel	- - - -
	45		71		23		85 - - - -					- - - -
TXUU S _u =4.3 ksf	50	73	0		34	2.5	90	X				- - - -
	49		60		25		95 – - -			M		-
TXUU S _u =7.1 ksf - #200 = 98.1% Date Start Date Com Logged B Total Dep Work Ord	43	78	62		37		- 100 - - - -	X		ML	Brown with multi-color mottling SILT (with traces of sand, very stiff, moist alluvium)	
Date Star	ted:	June	25, 20	20	Ιν	Nater I	105 – _eve	l: Ş		lot O	bserved	
Date Com	Date Completed: June 26, 2020											Plate
്ട്ട് Logged B ച്ച Total Den	Logged By: B. Aiu Total Depth: 122 feet						g: Meth	100			75DG2 (Energy Transfer Ratio = 89.5%) lid-Stem Auger & PQ Coring	A - 11.3
Work Ord			-00 &	10(B)		Driving					o. wt., 30 in. drop	/\ 11.0



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INTERSTATE ROUTE H-1 (EB) IMPROVEMENTS OLA LANE OVERPASS TO KALIHI STREET INTERCHANGE HONOLULU, OAHU, HAWAII

Log of Boring

Ī	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	nscs	(Continued from previous plate) Description	
	Direct	60 52 47	70	71 71 52	LL _	8 31 39					ML	grades to stiff locally grades to hard locally	
BORING_LOG 8049-00.GPJ GEOLABS.GDT 5/3/21	Shear							125				Boring terminated at 122 feet	
3 8049-00.G	Date Star	pleted	l: June				Vater I		l: <u>Ā</u>			bserved Plate	
BORING_LO	Logged B Total Dep Work Ord	th:	B. Ai 122 f 8049		10(B)		Drill Rio Drilling Driving	Metl		: 4	l" So	75DG2 (Energy Transfer Ratio = 89.5%) id-Stem Auger & PQ Coring b. wt., 30 in. drop A - 11.	4



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INTERSTATE ROUTE H-1 (EB) IMPROVEMENTS OLA LANE OVERPASS TO KALIHI STREET INTERCHANGE HONOLULU, OAHU, HAWAII

Log of Boring

	Labo	ratory			F	ield						
	Other Tests	Moisture Content (%)	Dry Density (pcf)	Core Recovery (%)	(%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	ele	jic	.0	Approximate Ground Surface Elevation (feet): 51 *
	Other	Moist Conte	Dry D (pcf)	Core Reco	RQD (%)	Penet Resis (blows	Pocke (tsf)	Depth	Sample	Graphic	sosn	Description
1										0	GW	8-inch ASPHALTIC CONCRETE
		18				7/6"		-		000	SW	Gray SANDY GRAVEL (BASALTIC) , moist (base course)
						+50/5'	"	-			СН	Grayish brown GRAVELLY SAND (BASALTIC) , medium dense, moist (fill)
		7				25/1"		5-				Brown with some gray SILTY CLAY with some cobbles (basaltic), hard, moist (fill)
	UC= 17550 psi			83 100	0 38	25 / 1		-				Gray COBBLES AND BOULDERS (BASALTIC) with a little clay, very dense, moist (weathered basalt)
								10 -				Gray vugular BASALT , severely to moderately fractured, unweathered, very hard (a'a basalt)
				100	82			-				- -
								-	11			grades to dense and slightly fractured
								15-	H			_
	UC= 18480 psi			100	100			-	$\ \ $	·		grades to massive
								- -		``		- -
				100	100			20 -	Ш			_
				100	100			-		\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \		-
								-		,,,,		- -
	UC=			100	100			25 - -	Ш	\ -\^-\		- -
	17690 psi			100	100			-				_
							7	<u></u>	$\ \ $. \		-
5/3/21				100	100			30 -	H			- -
BS.GDT								-				- -
BORING_LOG 8049-00.GPJ GEOLABS.GDT 5/3/21								35 -		· · · ·		-
9.G -	Date Start	ted:	Octo	ber 27	, 2020		Water L		l: Z	<u> </u>	29.6 f	t. 10/29/2020 2140 HRS
3049-(Date Com										9.5 f	
۳ <u>۲</u>	Logged B	•		tronic			Drill Rig	j :		(CME-	75DG2 (Energy Transfer Ratio = 89.5%)
N N N	Total Dep	th:	122.5	5 feet			Drilling	Metl	noc	d:	l" So	lid-Stem Auger & PQ Coring A - 12.1
BOR	Work Ord	er:	8049	-00 &	10(B)		Driving	Ene	rgy	/: 1	40 lk	o. wt., 30 in. drop



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Log of Boring

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	nscs	(Continued from previous plate) Description
UC= 18210 psi			95	58			- - - 40 -	-	- / / - / / - / / - / /		grades to moderately fractured
			5	0			- - -	-		МН	Reddish brown CLAYEY SILT , hard (older alluvium)
	49		52		62		45 - - - -				- - -
LL=62 PI=29 TXUU S _u =2.9 ksf	55	69	29		29	>4.5	50 - - -	X		ML	Dark brown CLAYEY SILT , very stiff (older alluvium)
Ü	54		69		19		55 - - - -				grades with sandy silt
TXUU S _u =5.5 ksf	51	70	71		28	>4.5	60 - - - -	X			
Date Start Date Com Logged B Total Dep Work Ord	53		55		17		65 -			СН	Brown with traces of gray SILTY CLAY with traces of fine sand, very stiff (older alluvium)
Date Start	ted:	Octo	ber 27	, 2020		Nater I	_eve		<u> </u>	29.6 f	
Date Com	•	: Octo	ber 30						<u>Z</u> 1	9.5 f	1 late
Logged B Total Dep Work Ord	th:	122.5	tronic 5 feet -00 &	10(B)	ı	Orill Rig Orilling Oriving	Metl		d: 4	l" So	75DG2 (Energy Transfer Ratio = 89.5%) lid-Stem Auger & PQ Coring D. wt., 30 in. drop A - 12.2



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INTERSTATE ROUTE H-1 (EB) IMPROVEMENTS OLA LANE OVERPASS TO KALIHI STREET INTERCHANGE HONOLULU, OAHU, HAWAII

Log of Boring

Labo	ratory			Fi	eld						
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
LL=62 PI=33 TXUU S _u =9.0 ksf	38	83	83		57	>4.5	- - -	X		CH	grades with silty clay pockets locally, hard
	57		71		10		75 – - - -	\ 			grades to stiff
	56	70	64		29	2.5	80 - - -	X			grades to very stiff
	50		64		16		85 - - -	\ \ 			grades with sandy silt locally
LL=62 PI=27 TXUU S _u =2.5 ksf	53	71	38		20	2.0	90 -	X		МН	Brown with some gray CLAYEY SILT with some sand and rounded basalt gravel, stiff (older alluvium)
	55		67		19		95 - - - -	\ \		МН	Brown with some gray CLAYEY SILT with traces of fine sand, very stiff (older alluvium)
TXUU S _u =4.4 ksf Sieve -#200 = 88.9% Date Start Date Com Logged By Total Dept	47	75	67		44		- 100 - - - -	X		ML	Brown with some gray SILT (BASALTIC) with a little sand and traces of gravel, very stiff (older alluvium) grades more gravelly locally
Date Start			ber 27,			Water I	105 - _eve	l: <u>Z</u>		9.6 f 9.5 f	t. 10/29/2020 2140 HRS
Date Com Logged By	Date Completed: October 30, 2020 Logged By: S. Latronic					Drill Rig] :				t. 10/30/2020 0015 HRS Plate 75DG2 (Energy Transfer Ratio = 89.5%)
Total Dep	th:	122.5	5 feet -00 &	10(B)		Drilling Driving	Meth		d: 4	" So	lid-Stem Auger & PQ Coring b. wt., 30 in. drop



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Log of Boring

Second S	Labo	oratory			F	ield							
Direct Shear 50 75 43 43 43 43 43 43 43 43 43 43 43 43 43	Other Tests	Moisture Content (%)	Dry Density (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample	Graphic	nscs		
UC=2.8 ksf ML Gray CLAYEY SILT with a little sand (basaltic), stiff, moist (older alluvium) ML Gray CLAYEY SILT with a little fine sand, very stiff, moist (estuarine deposit) Boring terminated at 122.5 feet		57		83		19		- - - 1110 - - -			ML	grades slightly cemented locally	
UC=2.8 ksf 62 65 30 >4.5 Boring terminated at 122.5 feet		65		88		13		115				SILT with a little sand (basaltic), stiff, moist (older alluvium) Gray CLAYEY SILT with a little fine sand, very	/
		62	65			30	>4.5	120 - - - -	X				
								-	-				
135 –								-	-				
Date Started: October 27, 2020 Water Level: ▼ 29.6 ft. 10/29/2020 2140 HRS Date Completed: October 30, 2020 ▼ 19.5 ft. 10/30/2020 0015 HRS Plate							Water	Leve				. 40/00/0000 004F LIDO	
Date Completed. October 30, 2020		•			, 2020		Drill Ri	g:				I lat	е
Logged By: S. Latronic Drill Rig: CME-75DG2 (Energy Transfer Ratio = 89.5%) Total Depth: 122.5 feet Drilling Method: 4" Solid-Stem Auger & PQ Coring Work Order: 8049-00 & 10(B) Driving Energy: 140 lb. wt., 30 in. drop					10/D\								2.4



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INTERSTATE ROUTE H-1 (EB) IMPROVEMENTS OLA LANE OVERPASS TO KALIHI STREET INTERCHANGE HONOLULU, OAHU, HAWAII

Log of Boring

Γ	Labo	ratory			F	ield							
	ø	<u></u>	>	(%)		- · ·	.ر	<u> </u>				Approximate Ground Surface Elevation (feet): 69 *	
	Test	ure nt (%	Density f)	'ery ((%)	ratior tance s/foot	it Per	(feel	<u>e</u>	ic		, ,	
	Other Tests	Moisture Content (%)	Dry De (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample	Graphic	nscs	Description	
	LL=57 PI=32 Direct Shear	11 32	92			15/6" +50/1" 20		- - -	X		CH	Brown SILTY CLAY with a little sand (basaltic) and gravel (basaltic), very stiff to hard, moist	(fill) - - - -
	UC= 1630 psi			88 73	0 47	50/4"		5 - - -	×			Brown and gray BRECCIA , closely fractured, moderately weathered, medium hard to hard (welded clinker)	- - -
								10 -				grades to moderately fractured	-
	UC= 7520 psi			90	70			-		4/_/\		Gray BASALT , slightly fractured, slightly weathered, very hard (basalt formation)	-
2	UC= 25940 psi			100	100			15 - - -	-			grades to massive grades to unweathered	- - - -
				100	72			20 -					- - - -
	UC= 6750 psi			88	73			25 - -				grades with pockets of brown silty clay locally	- - -
	·							30 -		(- / (- /)	NAI	grades to slightly fractured	-
30RING_LOG 8049-00.GPJ GEOLABS.GDT 5/3/21				17				-			ML	Brown GRAVELLY SILT with some sand (basaltic), stiff, moist (older alluvium)	- - - -
	D . C:				10.55		• • •	35 -					
749-00.	Date Start			ember			Vater I	_eve	l: 4	<u> </u>	Not O	bserved Plate	
) 	Date Completed: November 11, 2020 Logged By: B. Aiu						Drill Rig	j :			ME-	75DG2 (Energy Transfer Ratio = 89.5%)	
2 2 1	Total Depth: 122.5 feet						Drilling Method: 4" Solid-Stem Auger & PQ Coring A - 1						3.1 l
5	Work Ord	er:	8049	-00 &	10(B)		Driving	Ene	rgy	/: 1	40 lk	o. wt., 30 in. drop	



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INTERSTATE ROUTE H-1 (EB) IMPROVEMENTS OLA LANE OVERPASS TO KALIHI STREET INTERCHANGE HONOLULU, OAHU, HAWAII

Log of Boring

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	nscs	(Continued from previous pla	te)
TXUU S _u =2.7 ksf Sieve - #200 = 57.1%	52	73	60		16		- - - 40 -	X		ML	grades with some cobbles	- - - -
UC= 21600 psi			100	100	10/0" Ref.		- - -				Gray BASALT , massive, unweather (basalt formation)	ed, very hard
UC= 18390 psi			100	100			45 - - -		-//-//-//-			- - - -
			87	69			50 — - -					-
	34	88	100		26		- 55 - - -			СН	Reddish brown SILTY CLAY with so gravel (basaltic), stiff, moist (older	
	47		100		12		60 -			MH	Brown with multi-color mottling CLA with some sand and traces of grav stiff, moist (older alluvium)	YEY SILT rel (basaltic),
12/5/5 LL=67	42	82	71		34	1.3	- - 65 -				grades to very stiff	- - - -
LL=67 PI=33 TXUU S _u =2.3 ksf Date Start Date Com Logged B Total Dep Work Ord	42	02	36		34	1.3	- - - - 70 -	X			grades to very stiff	- - -
Date Start			mber			Water L	_eve	l: 🛂		Not O	bserved	5
ଞ୍ଜ Date Com ଓ Logged B		: Nove B. Ai		11, 20		Drill Rig	٦.			:ME-	75DG2 (Energy Transfer Ratio = 89.5%)	Plate
ے Logged B چ Total Dep			u 5 feet			Drilling		าดด			lid-Stem Auger & PQ Coring	A - 13.2
Work Ord			-00 &	10(B)		Driving					o. wt., 30 in. drop	/\ 10.2



Total Depth:

Work Order:

122.5 feet

8049-00 & 10(B)

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INTERSTATE ROUTE H-1 (EB) IMPROVEMENTS OLA LANE OVERPASS TO KALIHI STREET INTERCHANGE HONOLULU, OAHU, HAWAII

Log of Boring

13

A - 13.3

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	te)
	65		36	ш.	14	H ()	- - -		MH	grades to stiff	- - -
Direct Shear	58	61	36		14	3.0	75 – - - -	X		grades to medium stiff	- - -
	47		21		17		80 — - - -			grades to very stiff	- - - -
TXUU S _u =3.6 ksf	61	64	31		20	2.0	85 — - - -	X		grades to stiff	- - - -
	53		10		12		90				- - - -
TXUU S _u =3.6 ksf	57	68	0		20	2.0	95 — - - -	X			- - - -
Date Start Date Com	52		26		9		100 — - - -				- - - -
\$							105-				_
Date Start Date Com	pleted	l: Nove				Water I	_eve			bserved	Plate
Logged B	y:	B. Ai	u			Drill Rig	g:	(CME-	75DG2 (Energy Transfer Ratio = 89.5%)	

Drilling Method:

Driving Energy:

4" Solid-Stem Auger & PQ Coring

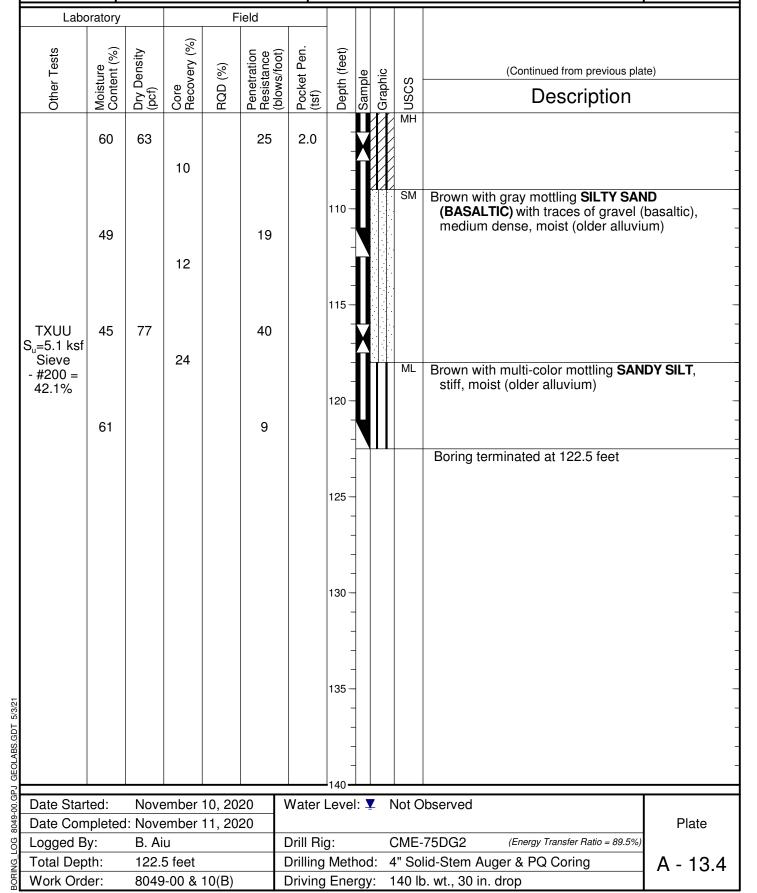
140 lb. wt., 30 in. drop



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INTERSTATE ROUTE H-1 (EB) IMPROVEMENTS OLA LANE OVERPASS TO KALIHI STREET INTERCHANGE HONOLULU, OAHU, HAWAII

Log of Boring

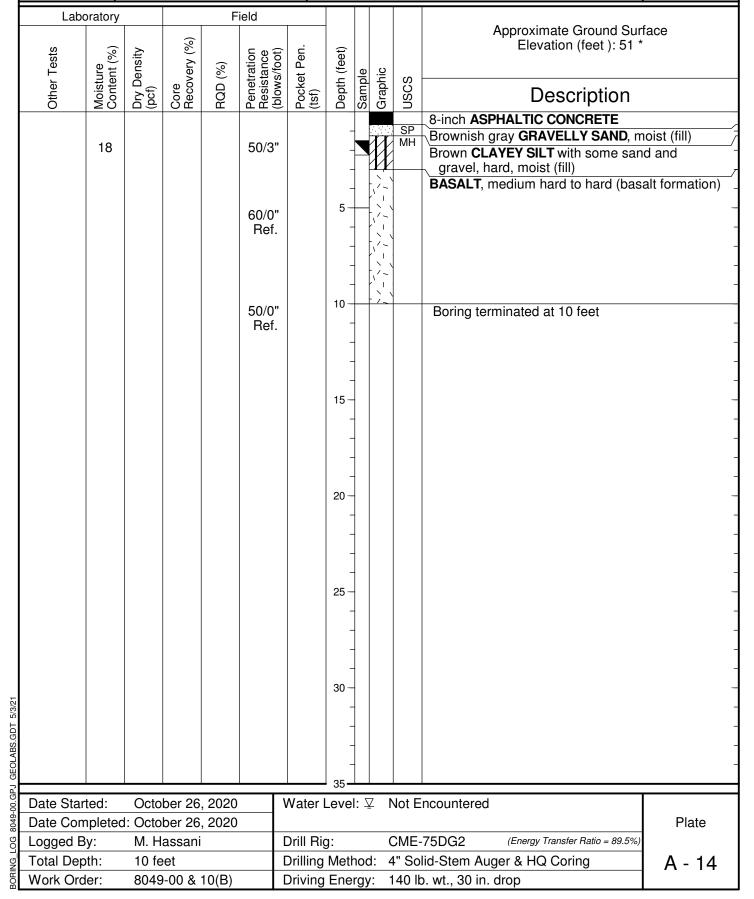




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INTERSTATE ROUTE H-1 (EB) IMPROVEMENTS OLA LANE OVERPASS TO KALIHI STREET INTERCHANGE HONOLULU, OAHU, HAWAII

Log of Boring





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INTERSTATE ROUTE H-1 (EB) IMPROVEMENTS OLA LANE OVERPASS TO KALIHI STREET INTERCHANGE HONOLULU, OAHU, HAWAII

Log of Boring

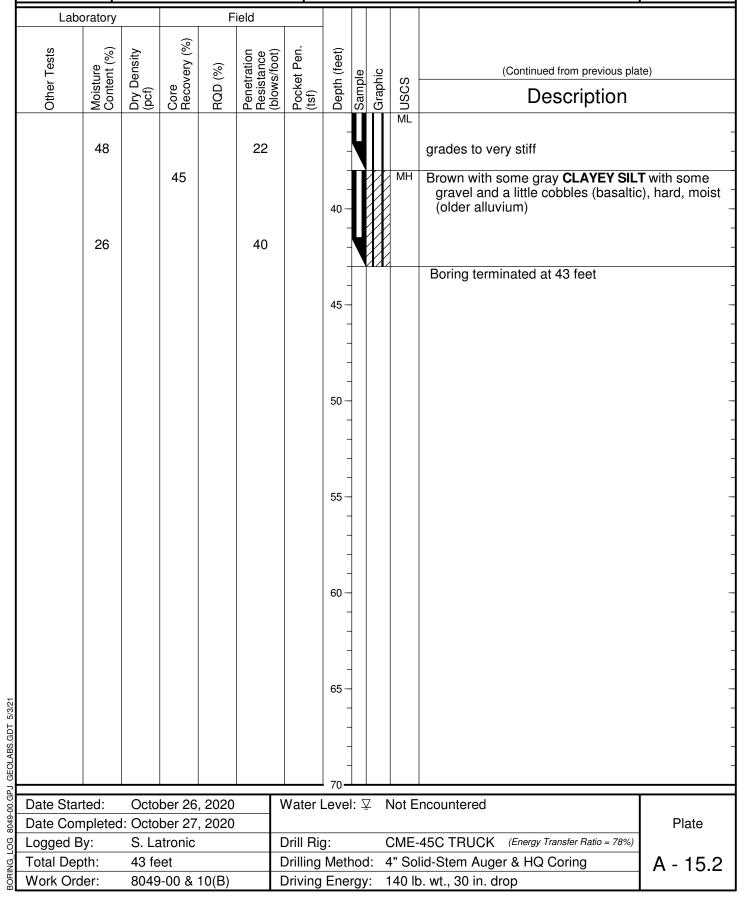
Laboratory Field Approximate Ground Surface	
Approximate Ground Surface	
Elevation (feet): 52 *	
Other Tea Moisture Content (Core (pcf) Core Resistanc (blows/fo (rsf) USCS USCS USCS	
LL=48 PI=25	el J
UC= 18100 psi 100 63 100 63 100 63 100 63 100 100 100 100 100 100 100 100 100 10	/ _ _ _
UC= 29640 psi	- - -
100 83 grades to slightly fractured locally	- - -
UC= 32340 psi	- - -
85 42	- - -
Date Started: October 26, 2020 Date Completed: October 27, 2020 Logged By: S. Latronic Total Depth: 43 feet Work Order: 8049-00 & 10(B) Date Started: Date Clayery Sill with some sand and a little gravel, hard, moist (older alluvium) - - -
35	
Date Started: October 26, 2020 Water Level: □ Not Encountered	
Date Completed: October 27, 2020	
Logged By: S. Latronic Drill Rig: CME-45C TRUCK (Energy Transfer Ratio = 78%)	
Total Depth: 43 feet Drilling Method: 4" Solid-Stem Auger & HQ Coring A - 15	5.1
Work Order: 8049-00 & 10(B) Driving Energy: 140 lb. wt., 30 in. drop	



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INTERSTATE ROUTE H-1 (EB) IMPROVEMENTS OLA LANE OVERPASS TO KALIHI STREET INTERCHANGE HONOLULU, OAHU, HAWAII

Log of Boring





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INTERSTATE ROUTE H-1 (EB) IMPROVEMENTS OLA LANE OVERPASS TO KALIHI STREET INTERCHANGE HONOLULU, OAHU, HAWAII

Log of Boring

Laboratory		Field										
		ısity	ry (%)	(9)	ttion nce oot)	Pen.	feet)				Approximate Ground Surfac Elevation (feet): 56 *	е
Other Tests	Moisture Content (%)	Dry Density (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample	Graphic	nscs	Description	
LL=46 PI=15	20 31	104 (Jpd) 104	Core Reco	RQD	wold) 42 4/6" +25/0" Ref. 10/0" Ref.	Y Pock (tsf)	10 - 15 - 15 - 15 - 15 - 15 - 15 - 15 -	Samp	Graph Graph	SOSN M L	Description 6-inch ASPHALTIC CONCRETE Dark gray SILTY SAND with some grav (fill) Brown SANDY SILT with some gravel (medium stiff to stiff, moist (fill) CONCRETE Light gray BASALT, slightly fractured to unweathered to slightly weathered, has formation) Boring terminated at 10 feet	angular), - o massive, -
Date Star Date Con Logged E Total Dep Work Ord							- - - -					- - -
Data Star	Data Startad: October 20, 2020						35-	· \	7 N	lot E	ncountered	
Date Started: October 29, 2020 Date Completed: October 29, 2020						Water Level: Not Encountered						Plate
Logged By: M. Hassani						Drill Rig	75DG2 (Energy Transfer Ratio = 89.5%)	-				
Total Depth: 10 feet						Drilling Method: 4" Solid-Stem Auger & HQ Coring A - 1						
Work Order: 8049-00 & 10(B)					1 1	Driving Energy: 140 lb. wt., 30 in. drop						



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INTERSTATE ROUTE H-1 (EB) IMPROVEMENTS OLA LANE OVERPASS TO KALIHI STREET INTERCHANGE HONOLULU, OAHU, HAWAII

Log of Boring

Laboratory				F	ield			\Box					
		>.	(%)		⊑ m ∓	-i	ţ)				Approximate Ground Surface Elevation (feet): 72 *		
Test	ure nt (%	Density)	ery	(%)	ratio tance s/foo	t Pen	(fee	<u>e</u>	<u>:</u>				
Other Tests	Moisture Content (%)	Dry Do (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket I (tsf)	Depth (feet)	Sample	Graphic	nscs	Description		
Direct	16	74			27		_			SM	Brown SILTY SAND with some gravel, medium dense, moist (fill)	_	
Shear		74					-	X			33.133,	-	
Sieve - #200 =	22				25		-					-	
40.5%			67	58			5-) A 4		Gray COBBLES AND BOULDERS (fill)		
								Ш			Gray CONCRETE, very hard (fill) VOID	/_	
							-				VOID	-	
	13		0		50/3"		- 10 -	Π	0 0	SW	Brown GRAVELLY SAND with a little silt, very dense, moist (fill)		
	12				50/3"		-	Ų	0		. ,	-	
	12		70	70	30/3		- -		4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4		Gray CONCRETE , very hard (fill)	-	
	1.4				50/3"		15 - -	U	0	SW	Brown with tan GRAVELLY SAND , very dense, moist (fill)	_	
UC= 9430 psi	14		82 18	30/3		-		- / / - / /		Grayish brown BASALT , severely to closely fractured, moderately weathered, medium hard (basalt formation)	d _ -		
							20 -	Н				-	
			72	15			- - -		1//-//		Yellowish brown BASALT , severely fractured, highly to extremely weathered, soft to medium hard (basalt formation)		
UC=			97	73			25 – -				Grayish brown BASALT , closely fractured, moderately weathered, medium hard (basalt formation)		
28420 psi			97	73			- -				Gray BASALT, moderately fractured, slightly weathered to unweathered, very hard (basalt formation)		
							30 -	Н	-/-			_	
							-				Boring terminated at 31 feet		
							-					-	
Date Start Date Com Logged B Total Dep Work Ord							- 2F-						
Date Started: January 19, 2021						Water Level: ▼ Not Encountered					ncountered		
Date Completed: January 19, 2021													
Logged By: Steven Leong						Drill Rig: CME-45C TRUCK (Energy Transfer Ratio = 78%)							
Total Depth: 31 feet						Drilling Method: 4" Solid-Stem Auger & HQ Coring						7	
Work Order: 8049-00 & 10(B)						Driving Energy: 140 lb. wt., 30 in. drop							



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INTERSTATE ROUTE H-1 (EB) IMPROVEMENTS OLA LANE OVERPASS TO KALIHI STREET INTERCHANGE HONOLULU, OAHU, HAWAII

Log of Boring

101A

