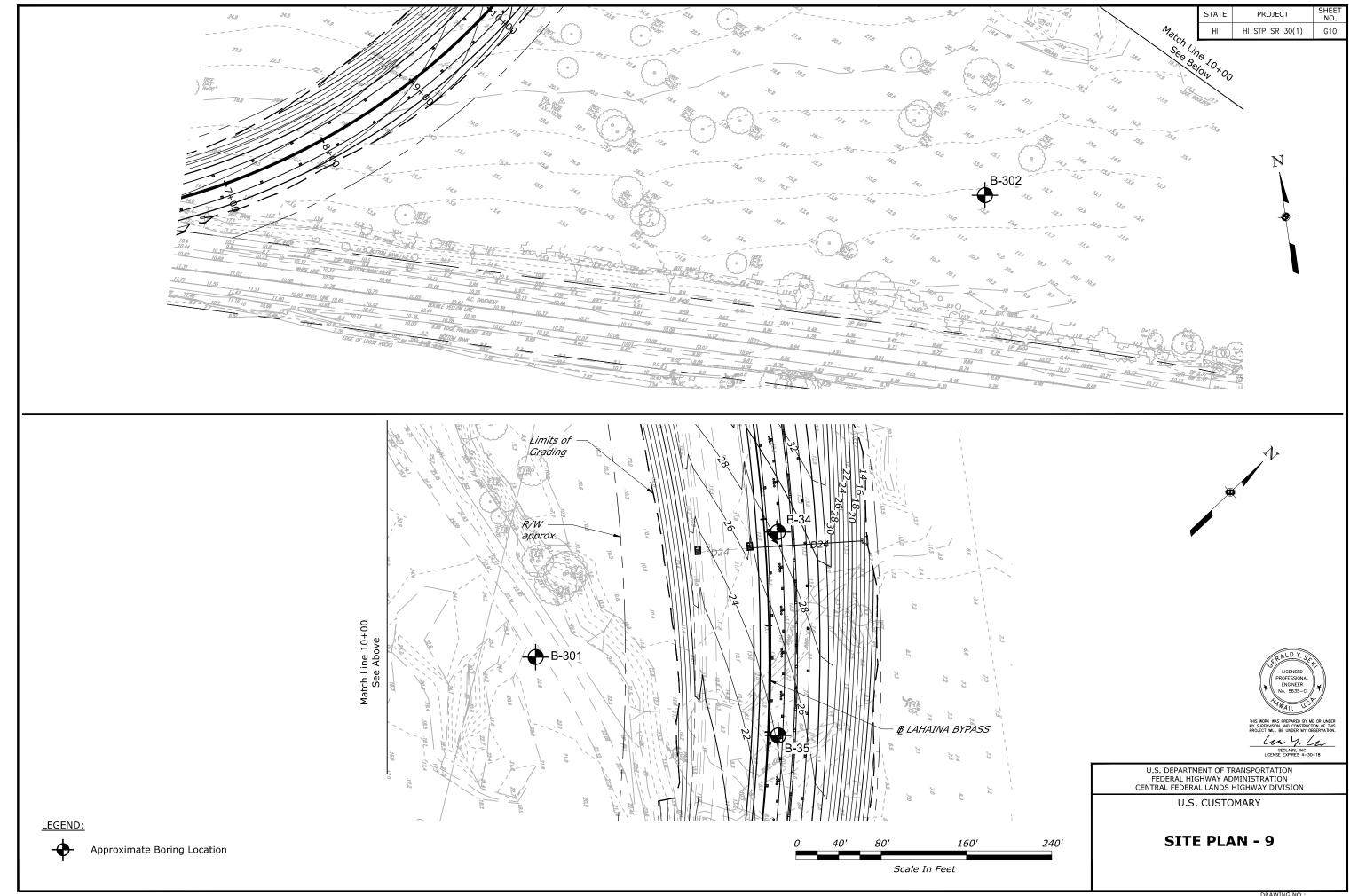


Scale In Feet



TATE	PROJECT	SHEET NO.
HI	HI STP SR 30(1)	G11



GEOLABS, INC.

Geotechnical Engineering

Soil Log Legend

UNIFIED SOIL CLASSIFICATION SYSTEM (USCS)

I	MAJOR DIVISION	IS	US	cs	TYPICAL DESCRIPTIONS
	GRAVELS	CLEAN GRAVELS	0 0 0	GW	WELL-GRADED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES
COARSE-	GRAVELS	LESS THAN 5% FINES	000	GP	POORLY-GRADED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES
GRAINED SOILS	MORE THAN 50% OF COARSE	GRAVELS WITH FINES		GM	SILTY GRAVELS, GRAVEL-SAND-SILT MIXTURES
	FRACTION RETAINED ON NO. 4 SIEVE	MORE THAN 12% FINES		GC	CLAYEY GRAVELS, GRAVEL-SAND-CLAY MIXTURES
	CANIDO	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
	011.70			ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY
FINE- GRAINED SOILS	SILTS AND CLAYS	LIQUID LIMIT LESS THAN 50		CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
33.23			4 44 4	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
OIL V L	32			ОН	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
HI	GHLY ORGANIC S	DILS	፣ 77 7 77 77	PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS

LEGEND (2-INCH) O.D. STANDARD PENETRATION TEST (3-INCH) O.D. MODIFIED CALIFORNIA SAMPLE SHELBY TUBE SAMPLE

GRAB SAMPLE CORE SAMPLE

WATER LEVEL OBSERVED IN BORING AT TIME OF DRILLING WATER LEVEL OBSERVED IN BORING AFTER DRILLING WATER LEVEL OBSERVED IN BORING OVERNIGHT

LL LIQUID LIMIT (NP=NON-PLASTIC)

PLASTICITY INDEX (NP=NON-PLASTIC)

TORVANE SHEAR (tsf)

UNCONFINED COMPRESSION OR UNIAXIAL COMPRESSIVE STRENGTH

TXUU UNCONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION (ksf)

Plate A-0.1

GEOLABS, INC.

Soil Classification Log Key (with deviations from ASTM D2488)

GEOLABS, INC. CLASSIFICATION*

GRANULAR 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 SECONDARY constituents are composed of a percentage less than the primary constituent. If the soil 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

 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)

COHESIVE SOIL (-#200 ≥50%)

 SECONDARY constituents are composed of a percentage less than the primary constituent, but more than 20 percentage in the primary constituent, but more than 20 percentage in the percentage of the percentage in the percentage of the percentag of the soil mass. Secondary constituents are capitalized and bold (i.e., SANDY CLAY, SILTY CLAY, CLAYEY SILT and precede the primary constituents.

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	N-Value (Blows/Foot) SPT MCS		N-Value (E SPT	Nows/Foot)	PP Readings (tsf)	Consistency			
	0 - 4	0 - 7	Density Very Loose	0 - 2	0 - 4	(10.7)	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			
ı				> 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, usually soil is below water table

*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)

ABBREVIATIONS

WOH: Weight of Hammer WOR: Weight of Drill Rods

SPT: Standard Penetration Test Split-Spoon Sampler

MCS: Modified California Sampler

GRAIN SIZE DEFINITION

Sieve Number and / or Size
> 12 inches (305-mm)
3 to 12 inches (75-mm to 305-mm)
3-inch to #4 (75-mm to 4.75-mm)
3-inch to 3/4-inch (75-mm to 19-mm)
3/4-inch to #4 (19-mm to 4.75-mm)
#4 to #200 (4.75-mm to 0.075-mm)
#4 to #10 (4.75-mm to 2-mm)
#10 to #40 (2-mm to 0.425-mm)
#40 to #200 (0.425-mm to 0.075-mm)

Plate A-0.2

GEOLABS, INC.

Geotechnical Engineering

Rock Log Legend

ROCK DESCRIPTIONS

沙	BASALT		FINGER CORAL
99	BOULDERS		LIMESTONE
ΔΔ ΔΔ ΔΔ	BRECCIA		SANDSTONE
× × × ,	CLINKER	× × × × × × × × × × × × × × × × × × ×	SILTSTONE
ૻ૽ૼઌ૽ૢૼૢૢૻ૽ૼૺ ૢૢૢૢૢૢૢૢૢૢ૽૾ૺૡ	COBBLES		TUFF
) 00 0 0 0 0 0 0 0 0 0	CORAL		VOID/CAVITY

ROCK DESCRIPTION SYSTEM

ROCK FRACTURE CHARACTERISTICS

The following terms describe general fracture spacing of a rock Greater than 24 inches apart Slightly Fractured: 12 to 24 inches apart

DEGREE OF WEATHERING

Unweathered: Rock shows no sign of discoloration or loss of strength Slight discoloration inwards from open fractures Slightly Weathered

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

Most minerals decomposed with some corestones present in residual soil mass. Can be broken by hand. Saprolite. Mineral residue completely decomposed to soil but fabric and structure preserved

HARDNESS

Very Soft:

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

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

Specimen breaks with some difficulty after several hammer blows. Example: Vesicular, vugular, coarse-grained rock 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: Protous rock such as clinker, cinder, and coral reef

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

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

A-0.3

U.S. DEPARTMENT OF TRANSPORTATION FEDERAL HIGHWAY ADMINISTRATION CENTRAL FEDERAL LANDS HIGHWAY DIVISION

U.S. CUSTOMARY

BORING LOG LEGENDS & NOTES

GEOTECHNICAL NOTES:

- 1. A geotechnical engineering exploration report entitled "Geotechnical Engineering Exploration, Lahaina Bypass Phase 1B - 2, Lahaina, Maui, Hawaii" dated May 23, 2017 has been prepared by Geolabs, Inc.
- 2. For boring locations, see Sheets G1 thru G10.
- 3. The information presented in the logs of borings depict the subsurface conditions encountered at that specified location and at the time of the field exploration only. Variations of subsoil conditions from those depicted in the logs of borings may occur between and beyond the borings.
- 4. The penetration resistance shown on the logs of borings indicate the number of blows required for the specific sampler type used. The blow counts may need to be factored to obtain the Standard Penetration Test (SPT) blow counts.

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Geotechnical Engineering									LAHAINA BYPASS PHASE 1B - 2 LAHAINA, MAUI, HAWAII LOG of Boring 1			
Other Tests	oisture Intent (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample Graphic	nscs	Approximate Ground Surface Elevation (feet MSL): 134.09 *		
₹	<u> </u>	٦ ×	ပ္ပန္	<u>8</u>	Re (b)	Po (tsi	<u> </u>	SS	Si	Description		
	17	107			92			X 000	GP	Gray SANDY GRAVEL with traces of silt, very dense, moist (fill)		
							5		ML	Gray COBBLY BOULDERS (BASALTIC), very dense, moist (fill)		
	83			15/0" Ref.		10-			Brown SANDY SILT with some cobbles and boulders (basaltic), hard, moist (alluvium)			
			98				15-	QQ		Gray COBBLES AND BOULDERS in a sandy silt matrix, very dense, moist (alluvium)		
	8				68			٧Ď				
									Boring terminated at 18 feet			
							25			* Elevations provided by Controlpoint Surveying, Inc. on October 6, 2016.		
							30			; ;		
				Latitude: 20.859848950248° N Longitude: 156.660767122399° W								
Date Sta										Water Level: ¥ Not Encountered		
Date Co	_				28, 201	ь				Drill Rig: CME-75DG1 (Energy Transfer Ratio = 80.3%)		
	Logged By: B. Aiu Total Depth: 18 feet											
Total De Work Or			18 ree 7378-							Drilling Method: 4" Solid Stem Auger & HQ Coring Driving Energy: 140 lb. wt., 30 in. drop		
VVOIK OI	uei.		1310	.00						Driving Energy. 140 lb. wt., 30 lit. drop		

			Geot	echr	nical	3S, IN Engine	ering		LAHAINA BYPASS PHASE 1B - 2 LAHAINA, MAUI, HAWAII 3					
	Other Tests	isture intent (%)	y Unit eight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample Graphic	nscs	Approximate Ground Surface Elevation (feet MSL): 125.41 *			
	‡	೪೮	N _C	Col	RC	Re (big	Po (tst	De	Sign	SN	Description			
, , , , , , , , , , , , , , , , , , , 	Sieve - #200 = 39.9% LL=43 PI=16	7 8	100 76			39 36 29	4.5	5-	X	SM ML	Brown SILTY SAND with a little gravel and cobbles, medium dense, dry (fill) grades to dense , Grayish brown SANDY SILT with some decomposed gravel and cobbles, very stiff, dry (alluvium)			
	FI-10	1		76		50/3"		10-	00 00 00 00 00 00 00 00 00 00 00 00 00		Brownish gray GRAVELLY COBBLES (BASALTIC) with clayey silt seams, very dense, damp (alluvium)			
- -				59		50/2"		20-]			
-				63		50/4"		25-						
GDT 12/8/16				55				30-			Boring terminated at 31.2 feet			
00.GPJ GEOLABS.						50/2"		35-	-		Latitude: 20.8579670056261° N Longitude: 156.659390998646° W			
7378-	Date Sta	rted:		Augus	st 29,	2016		50			Water Level: ¥ Not Encountered			
T HALF	Date Cor					2016								
9 9	Logged E			D. Gr		inger					Drill Rig: CME-75DG1 (Energy Transfer Ratio = 80.3%)			
J DNI	Total De			31.2 f							Drilling Method: 4" Solid Stem Auger & PQ Coring			
BOR .	Work Or	der:		7378-	.00						Driving Energy: 140 lb. wt., 30 in. drop			

		Geot	echr	nical	BS, IN Engine				L	AHAINA BYPASS PHASE 1B - 2 LAHAINA, MAUI, HAWAII 2
Other Tests	isture ∩tent (%)	Dry Unit Weight (pcf)	e sovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Jepth (feet)	<u>Sample</u> Graphic	nscs	Approximate Ground Surface Elevation (feet MSL): 139.38 *
₹ :	<u>₽ō</u>	Dry We	Cor	RQ	Per Re (blc	Poor (tsf	Del	Sal	SN	Description
	11	100			55				GP	Gray SANDY GRAVEL, dense, moist (fill) Gray COBBLY BOULDERS (BASALTIC), very
	16		85		55/5"		5-		МН	dense, moist (fill) Brown SANDY SILT with some cobbles and
			80		15/0" Ref.		10- 15-			boulders (basaltic), hard, moist (alluvium)
	17				20/0" Ref.		20			Boring terminated at 16.5 feet
BS.GDT 128/16							30			
00.GPJ GEOLA							35			Latitude: 20.858957020497° N Longitude: 156.660079969408° W
Date Star					r 28, 201					Water Level: ♀ Not Encountered
Date Com Logged B			Septe B. Aiu		r 28, 201	6				Drill Rig: CME-75DG1 (Energy Transfer Ratio = 80.3%)
Total Dep			16.5 f							Drilling Method: 4" Solid Stem Auger & HQ Coring
Work Ord			7378-	-00						Driving Energy: 140 lb. wt., 30 in. drop

Approximate Ground Surface Elevation (feet MSL): 130.37 * Approximate Ground Surface Elevation (feet MSL): 130.37 * Description Description				Geot	echr		BS, IN Engine	eering	1		L	AHAINA BYPASS PHASE 1B - 2 LAHAINA, MAUI, HAWAII	Log of Boring 4
A 69 54 50/3"		ner Tests	isture ntent (%)	/ Unit eight (pcf)	re covery (%)	(%) Q	netration sistance ows/foot)	cket Pen.	pth (feet)	mple aphic	cs	Elevation (feet MSL): 130.37 *	
ML Brown SANDY SILT with some gravel and cobbles, hard, dry (alluvium)		₽	Mo Co	Dry	Cor Rec	RQ	Pel Bel	Po (tsf	De	Sal	SN		
grades with reddish brown clayey silt seams 11			4				50/3"		5		ML		
Brownish gray GRAVELLY COBBLES (BASALTIC) with some boulders (basaltic), very dense, damp (alluvium) grades with sandy silt seams at 14 feet 57 50/4" Date Started: August 30, 2016 Date Completed: August 30, 2016 Logged By: D. Gremminger Total Depth: 31.3 feet Drill Rig: CME-75DG1 (Energy Transfer Ratio = 80.3%) Drilling Method: 4" Solid Stem Auguer & PQ Coring					67				10 ⁻			grades with reddish brown clayey silt sea	ms :
Solid Started: August 30, 2016 Date Completed: August 30,							50/2"		15 [.]			(BASALTIC) with some boulders (basaltic	c), very
53 30 30 30 30 30 30 30					67								
50/4" Latitude: 20.857123751558° N Longitude: 156.658783945459° W Date Started: August 30, 2016 Water Level: ▼ Not Encountered Not Encountered Logged By: D. Gremminger Drill Rig: CME-75DG1 (Energy Transfer Ratio = 80.3%) Total Depth: 31.3 feet Drilling Method: 4" Solid Stem Auger & PQ Coring	JT 12/8/16				53							Raring terminated at 31.3 foot	1
Date Completed: August 30, 2016 Logged By: D. Gremminger Drill Rig: CME-75DG1 (Energy Transfer Ratio = 80.3%) Total Depth: 31.3 feet Drilling Method: 4" Solid Stem Auger & PQ Coring	00.GPJ GEOLABS.GI						50/4"					Latitude: 20.857123751558° N	
Logged By: D. Gremminger Drill Rig: CME-75DG1 (Energy Transfer Ratio = 80.3%) Total Depth: 31.3 feet Drilling Method: 4" Solid Stem Auger & PQ Coring	F 7378											Water Level: Not Encountered	
Total Depth: 31.3 feet Drilling Method: 4" Solid Stem Auger & PQ Coring	DOT HA											Drill Pig: CME 75DC1 /Fnom/Trans	efer Ratio = 80 3%
	907 6						ingei						- 1
	BORING												



U.S. CUSTOMARY

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Ξ	HI STP SR 30(1)	G13

					3S, IN Engine				L	AHAINA BYPAS LAHAINA, MA		Log of Boring
Other Tests	Moisture Content (%)	cf)	(%)	RQD (%)	•	Pocket Pen. (tsf)	Depth (feet)	Sample Graphic	nscs		oximate Ground Surface tion (feet MSL): 160.66 *	l v
Ott	မှိ	Dry	S S	RC	Pe Re (bld	8 E	De	Sa Gr	SN		Description	
	4	79	13		65/4"		5-		ML	cobbles, hard, o Brownish gray C	SILT with some gravel an dry (fill) COBBLY BOULDERS wit sand seams, very dense	h some
			48		50/2"						all voids at 2 feet	, ary (IIII)
UC=			52				10-	ONO				-
610 psi			55				15					
UC= 3240 psi	36		23		55/6"		20 25	1. 200 C. 200			GRAVELLY COBBLES wi andy silt seams, very den	
UC= 1420 psi			42		50/1"		23	0000				
•	16				50/4"		30-	1			ed at 31.8 feet 60490835644° N 657865112182° W	
Data Ota		1	A	1 24	2046		35	ш				
Date Sta					2016					Water Level: ▼	Not Encountered	
Logged I										Drill Ria:	CME-75DG1 (Energy Trai	nsfer Ratio = 80.3%
Total De			31 8 f							Drilling Method:	4" Solid Stem Auger & PQ Co	
Work Or			7378-	00						Driving Energy:	140 lb. wt., 30 in. drop	<u> </u>

			Geot	echr	nical	3S, IN Engine				L	AHAINA BYPASS PHASE 1B - 2 LAHAINA, MAUI, HAWAII 6A
	Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	re covery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Graphic	nscs	Approximate Ground Surface Elevation (feet MSL): 129.57 *
		Mo Co	Dry	Cor	RG	Re (bkg	Po (tsf	De	5	SN	Description
	Direct Shear	20	87			18	3.0	<u> </u>		SM ML	Reddish brown SILTY SAND with some gravel, medium dense, moist (fill) Brown SANDY SILT with some cobbles and
	UC= 13480			97		15/0" Ref.		5			boulders (basaltic), hard, moist (alluvium)
	psi	21		15		15/0" Ref.		10			
				51		26/6" +35/1"		15			
	UC= 4720 psi Consol.	31		49		50/5"		20			
-	OUNSOI.			47		15/0" Ref.		25 -			- - -
1	3DT 12M	9				52/6"		30			Boring terminated at 31.1 feet
-	0.GPJ GEOLABS.C	9				+30/1"		35			Latitude: 20.8553387543424° N Longitude: 156.657246702818° W
1	Date Sta	rted:		Septe	embei	28, 2010	3				Water Level: 又 Not Encountered
4	Date Cor	_				28, 2010	<u> </u>				
%)	Logged I			B. Aiu							Drill Rig: CME-75DG1 (Energy Transfer Ratio = 80.3%)
4	Total De Work Or			31.1 f 7378-							Drilling Method: 4" Solid Stem Auger & HQ Coring Driving Energy: 140 lb. wt., 30 in. drop
J	S AAOLK OIL	u c i.		1310	-00						Driving Energy. 140 lb. wt., 30 lil. drop

		Geot	echr		BS, IN Engine	eering			L	AHAINA BYPASS PHASE 1B - 2 LAHAINA, MAUI, HAWAII 6
Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	<u>Sample</u> Graphic	nscs	Approximate Ground Surface Elevation (feet MSL): 127.24 *
1 \$	ΩΩ	Dry We	Cor	80	P. R. B. P. B.	Po ts	De	Sal	SN	Description
Direct Shear Sieve	14 8	69			10/6" +50/2" 38		1	X	SM	Brown SILTY SAND with some gravel, very stiff to hard, dry (alluvium)
- #200 = 29.9% UC= 5820 psi			100 37		50/1"		5 - 10-		SW- SM	Brownish gray GRAVELLY SAND with a little silt, very dense, dry (alluvium) grades with cobbles and boulders
	9		38		70		15-			
	5	93	70		50/4"		20-	×.		
			75				25-	- 9		
128/16			97				30-	-		
ABS.GDT					F0/0"		307	∐ '		Boring terminated at 31.7 feet
OGPJ GEOLY					50/2"		35			Latitude: 20.855145° N Longitude: 156.657514° W
Date Start					2016					Water Level: Not Encountered
Date Com					2016					Drill Rig: CMF-75DG1 (Energy Transfer Ratio = 80.3%
Logged By Total Dept			D. Gr 31.7 f		inger					Drill Rig: CME-75DG1 (Energy Transfer Ratio = 80.3%) Drilling Method: 4" Solid Stem Auger & PQ Coring
Work Orde			7378-							Driving Energy: 140 lb. wt., 30 in. drop

					3S, IN Engine				L	AHAINA BYPASS PHASE 1B - 2 LAHAINA, MAUI, HAWAII	Log of Boring 7
Other Tests	Content (%)	Weight (pcf)	Core Recovery (%)	3QD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample Graphic	nscs	Approximate Ground Surface Elevation (feet MSL): 127.71 *	
	<u> </u>	2 8	<u>8</u> 8	RC	88절	Po Ist	De	Sign	NS	Description	
Direct 1 Shear 1 Sieve	14 (98	18		48 24/6" +50/4" 65/6"	4.5	5-	X	SM	Brown SILTY SAND with a little gravel and cobbles, medium dense to very dense, dry (alluvium)	-
UC= 5970 psi	4		95 14 41 52		50/3" 50/2" 50/2"		15- 20- 25-			Brownish gray GRAVELLY COBBLES with boulders and sandy silt seams, very dense (alluvium)	
SDT 12							30-	7		Boring terminated at 31.1 feet	-
00.6PJ GEOLABS					50/1"		35.			Latitude: 20.855019° N Longitude: 156.657394° W	-
Date Starte	ed:	F	∖ugus	st 31,	2016		00			Water Level: ▼ Not Encountered	
Date Comp					⁻ 1, 2016						
Logged By). Gre		inger					Drill Rig: CME-75DG1 (Energy Transfer	
Total Depti			31.1 f							Drilling Method: 4" Solid Stem Auger & PQ Coring	9
₩Ork Orde	er:	7	⁷ 378-	00						Driving Energy: 140 lb. wt., 30 in. drop	



U.S. CUSTOMARY

STATE	PROJECT	SHEET NO.
Ξ	HI STP SR 30(1)	G14

					BS, IN Engine				L	AHAINA BYPASS PHASE 1B - 2 LAHAINA, MAUI, HAWAII 7A
Other Tests	loisture ontent (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample Graphic	nscs	Approximate Ground Surface Elevation (feet MSL): 127.7 * Description
LL=49 PI=8 UC= 460 psi	15 26 38	<u>ā</u> <u>8</u> 117	37 7 25	<u>ŭ</u>	66 55/5" 72 15/0" Ref.	>4.5	5· 10·		ML ML	Reddish brown SANDY SILT with some gravel, medium stiff, moist (fill) Brown SANDY SILT with some cobbles and boulders (basaltic), hard, moist (alluvium)
			53 67		15/0" Ref. 15/0" Ref.		20· 25· 30·			Dowing townsing to do at 20 foot
					15/0" Ref.		35.	-		Boring terminated at 30 feet Latitude: 20.8552360837836° N Longitude: 156.657166888107° W
Date Sta Date Co Logged I Total De Work Or	mplet By: pth:	ed:		embei i et	· 28, 201 · 28, 201					Water Level: Not Encountered Drill Rig: CME-75DG1 (Energy Transfer Ratio = 80.3%) Drilling Method: 4" Casing & HQ Coring Driving Energy: 140 lb. wt., 30 in. drop

		,				3S, IN Engine				L	AHAINA BYPASS PHASE 1B - 2 LAHAINA, MAUI, HAWAII	Log of Boring 9
	Other Tests	Moisture Content (%)	g Dry Unit NWeight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample Graphic	nscs	Approximate Ground Surface Elevation (feet MSL): 109.05 *	
-	Oth	δο So	Dry	Cor	R	Peg (bg)	Poc (tsf	Dep	Sal	ΩŠ	Description	
	•	11	62	56		17		5-		ML	Brown SANDY SILT with some gravel and cobbles, hard, dry (alluvium)	-
		4		40		50/5"		10-				1
		17		38		66		15-				1
				66		50/1"		20			grades with boulders]
DT 12/8/16						50/2"		25			Boring terminated at 21.2 feet	
00.GPJ GEOLABS.G								35-			Latitude: 20.8536190702349° N Longitude: 156.655950853303° W	
LF 7378	Date Sta					1, 2016					Water Level: ♀ Not Encountered	
DOT HA	Date Cor Logged I	_		Septe D. Gr		2, 2016					Drill Rig: CME-75DG1 (Energy Trans	sfer Ratio = 80.3%)
507	Total De			21.2 f		ingei					Drilling Method: 4" Solid Stem Auger & PQ Cor	· · · · · · · · · · · · · · · · · · ·
BORING	Work Or			7378-							Driving Energy: 140 lb. wt., 30 in. drop	J

					3S, IN Engine	eering			L	AHAINA BYPASS PHASE 1B - 2 LAHAINA, MAUI, HAWAII 8
Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample Graphic	nscs	Approximate Ground Surface Elevation (feet MSL): 124.32 *
Ott	°S S	Dry	Col	2	<u> </u>	Po (tst	De	Sig	Sn	Description
	11	73	54		34		5	X	ML	Brown SANDY SILT with some gravel and cobbles, hard, dry (alluvium)
			14		50/3"		10-			; ;
	26		26		48		4.5		8	grades with some clay and boulders Brownish gray GRAVELLY COBBLES with sandy
			60		50/2"		15·	% % % % % %		silt seams, very dense, dry (alluvium)
	10		27		56/6"		20			
	7	78	42		50/5"		25	100 000 000 000 000		
	9				28/6" +50/2"		30	8	8	Boring terminated at 32.2 feet Latitude: 20.8544758238176° N
							35			Longitude: 156.656679968931° W -
Date Sta					r 1, 2016					Water Level: Not Encountered
Date Co Logged			Septe D. Gr		r 1, 2016 inger					Drill Rig: CME-75DG1 (Energy Transfer Ratio = 80.3%)
Total De			32.2 f		ıı ıycı					Drilling Method: 4" Solid Stem Auger & PQ Coring
Work Or			7378-							Driving Energy: 140 lb. wt., 30 in. drop

					3S, IN Engine		1		L	AHAINA BYPASS PHASE 1B - 2 LAHAINA, MAUI, HAWAII 10
Other Tests	oisture ontent (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Jepth (feet)	Sample Graphic	SOSN	Approximate Ground Surface Elevation (feet MSL): 101.52 *
ō	<u>Šŏ</u>	≥۵	S &	ĸ	<u> </u>	P. St	ے	ЙŌ	Š	Description
LL=47 PI=17	11	76			40				ML	Brown SANDY SILT with some gravel and cobbles, hard, dry (alluvium)
	20		22 26		51		5-			grades with a little clay
			52		50/2"		10- 15-) % %		Brownish gray GRAVELLY COBBLES with some boulders, very dense, dry (alluvium)
			57				20-			
					50/2"		25-			Boring terminated at 21.2 feet
							30-			-
							35-			Latitude: 20.8527819358355° N Longitude: 156.655195009952° W
Date Sta	rted:		Septe	mbei	· 6, 2016		JJ			Water Level: ♀ Not Encountered
Date Co	nplet	ed:	Septe	mbei	⁻ 6, 2016					
Logged I	Зу:		D. Gr		inger					Drill Rig: CME-75DG1 (Energy Transfer Ratio = 80.3%)
Total De			21.2 f							Drilling Method: 4" Solid Stem Auger & PQ Coring
Work Or	der:		7378-	00						Driving Energy: 140 lb. wt., 30 in. drop



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STATE	PROJECT	SHEET NO.
Ξ	HI STP SR 30(1)	G15

		Geot	echr		3S, IN Engine	ering			L	AHAINA BYPAS LAHAINA, MA	S PHASE 1B - 2 AUI, HAWAII		Log of Boring 11
Other Tests	loisture ontent (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample Graphic	nscs		oximate Ground station (feet MSL): Description		
Sieve - #200 = 47.8%	5 18	75	100 29 76	<u>«</u>	50/3" 18 50/2" 47 50/1" 50/1"	d (t	5 10 15 20 25 30		SM	cobbles, very d grades to medit grades to very d Gray GRAVELL	AND with traces of ense, dry (alluvium dense den at 21.1 feet	m) n some bou	- - - <i>I</i>
							35	<u> </u>		Longitude: 156			-
Date Sta					r 6, 2016 r 6, 2016					Water Level: ¥	Not Encountered		
Logged	By:		D. Gr	emmi						Drill Rig:	CME-75DG1	(Energy Transfer	
Total De			21.1 f							Drilling Method:	4" Solid Stem Auge		3
Work Or	der:		7378-	00						Driving Energy:	140 lb. wt., 30 in. dr	op	

	1				3S, IN Engine		ı		L	AHAINA BYPASS PHASE 1B - 2 LAHAINA, MAUI, HAWAII L3
Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample Graphic	nscs	Approximate Ground Surface Elevation (feet MSL): 82.85 *
₹	lgō	문항	Cor	R	Per Res (blc	Poor (tsf	De	Sign	l S	Description
	11	72					5-		ML	Brown SANDY SILT with some gravel and cobbles, very stiff, dry (alluvium)
	6		46		59		Ŭ:	7		grades to hard
			40				10-			grades with a little boulders
	34		55		70					
			37		50/1"		15-			
	13				50/2"		20-	Щ		Boring terminated at 21.7 feet
S.GDT 12/8/16							25			
O.GPJ GEOLAB							35-			Latitude: 20.8505820806505° N Longitude: 156.652985011749° W
Date S	arted:		Septe	mbei	7, 2016		30-			Water Level: ♀ Not Encountered
Date C					7, 2016					
Logged			D. Gr		nger					Drill Rig: CME-75DG1 (Energy Transfer Ratio = 80.3%)
Total D			21.7 f							Drilling Method: 4" Solid Stem Auger & PQ Coring
∰ Work C	raer:		7378-	UU						Driving Energy: 140 lb. wt., 30 in. drop

		Geot	echr		3S, IN Engine	ering			L	AHAINA BYPASS PHASE 1B - 2 LAHAINA, MAUI, HAWAII 12
Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	e covery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	<u>Sample</u> Graphic	SOSO	Approximate Ground Surface Elevation (feet MSL): 83.99 *
₹	₽Ō	₹Ş	Cor	R S	B R 등 등	Poc (tsf	Del	Sal	ΩS	Description
Direct Shear	14	65			26				CL	Brown SANDY CLAY with some gravel and cobbles, stiff, dry (alluvium)
LL=30	8				16		5-			grades to very stiff
PI=8 UC=			67				10			Brownish gray GRAVELLY COBBLES with some boulders and clayey silt seams, very dense, dry
9000 psi			76		50/1"		10-	200 200 200 200 200 200 200 200 200 200		(alluvium)
UC= 3030 psi					50/4"		15	0503		
3030 psi			98		50/1"			$\frac{Q}{QQ}$		Gray BOULDERS (BASALTIC), very dense, dry (alluvium)
							20-			Boring terminated at 20 feet
							25			
							30-			Latitude: 20.850906° N Longitude: 156.653247° W
Date Sta	rted:		Septe	mbei	r 7, 2016		<u> </u>			Water Level: Not Encountered
Date Co					r 7, 2016					
Logged I			D. Gr		inger					Drill Rig: CME-75DG1 (Energy Transfer Ratio = 80.3
Total De			20 fee							Drilling Method: 4" Solid Stem Auger & PQ Coring
Work Or	der:		7378-	UÜ						Driving Energy: 140 lb. wt., 30 in. drop

		Geo	echr		BS, IN Engine	ering			L	AHAINA BYPASS PHASE 1B - 2 LAHAINA, MAUI, HAWAII	Log of Boring 14
Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Jepth (feet)	Sample Graphic	sosn	Approximate Ground Surface Elevation (feet MSL): 90.91 *	
₹	ا§ق	돈총	Rec	8	[골중골	Poc (tsf	Del	Sal	ΩS	Description	
	4	69	62 41		50/3"		5		ML	Brown SANDY SILT with some gravel, ha (fill) Gray COBBLY BOULDERS with some gr pockets of sandy silt, very dense, dry (fill	avel and]
	26		40 14		50/2"		15		SM ML	Grayish brown SILTY SAND with some grobbles, very dense, dry (alluvium) Brown GRAVELLY SILT with some cobbl boulders, very stiff, damp (alluvium)	Ā
GDT 12816	32				24		202530			Boring terminated at 22.5 feet	
0.GPJ GEOLABS.G							35			Latitude: 20.8500960706713° N Longitude: 156.652501084388° W	-
Date St	arted:		Septe	mbe	r 7, 2016					Water Level: ✓ Not Encountered	
Date Co					r 7, 2016						
2 Logged			D. Gr		inger					2111111191	sfer Ratio = 80.3%)
Total De			22.5 f							Drilling Method: 4" Solid Stem Auger & PQ Cor	ring
∰ Work O	rder:		7378-	UU						Driving Energy: 140 lb. wt., 30 in. drop	



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STATE	PROJECT	SHEET NO.
Н	HI STP SR 30(1)	G16

		Geot	echr	nical	BS, IN Engine				L	AHAINA BYPASS PHASE 1B - 2 LAHAINA, MAUI, HAWAII Log of Boring 15		
Other Tests	oisture ontent (%)	Dry Unit Weight (pcf)	ore scovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample Graphic	nscs	Approximate Ground Surface Elevation (feet MSL): 78.36 *		
<u> </u>	ŽΫ	ŽΧ	28	<u>~</u>	<u>ਕੂਲ</u> ਹ	ਲੂ ≅	_ <u>Ğ</u> _	Ϊ́Ο̈́	ļ Š	Description		
Direct Shear	12	69			69			ΔII	ML	Grayish brown SANDY SILT with some gravel and cobbles, hard, dry (alluvium)		
Sileai							-					
	6				36		5-	HII				
			71		50		-					
							-					
			24		50/1"		10-	HII				
							-					
							٠.	74.5	SM	Brown SILTY SAND with a little gravel, medium		
Sieve	43				26		15-		JOIVI	dense, damp (alluvium)		
#200 =			14				-]			
42.4%							20-		}			
	28				50		20.	NII	1	grades to very dense		
							-			Boring terminated at 21.5 feet		
							25-					
							-					
							30-					
							-			Latitude: 20.8498392102154° N		
							:			Longitude: 156.652260080906° W		
Date Sta	rted.		Sente	mbe	7, 2016		35-			Water Level: Not Encountered		
Date Co					7, 2016					Trace Indiana Indiana		
Logged I	Ву:		D. Gr	emmi						Drill Rig: CME-75DG1 (Energy Transfer Ratio = 80.3		
Total De			21.5 f							Drilling Method: 4" Solid Stem Auger & PQ Coring		
Work Or	der:		7378-	-00						Driving Energy: 140 lb. wt., 30 in. drop		

		Geot	echr		3S, IN Engine	eering	ı		L	AHAINA BYPASS PHASE 1B - 2 LAHAINA, MAUI, HAWAII	Log of Boring 17
Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample Graphic	nscs	Approximate Ground Surface Elevation (feet MSL): 81.64 *	
l	Qo Co	Dry	Cor Rec	R	Per BS Se	Poor (tsf	Del	Sal	NS I	Description	
Direct Shear	21	64			32			M	ML	Brown SANDY SILT with some gravel and cobbles, very stiff, dry (alluvium)	d -
	4				78		5-			grades to hard	1
			78						SM		
							10-			cobbles, medium dense, damp (alluvium) - [
	19		38		14]
			30				15-				
	21		12		50/3"			H		grades to very dense	1
			12								1
	10				64		20-	V۱			- 1
	10				07					Boring terminated at 22.5 feet	 j
							25			-	
φ								1			1
DT 12/8/1							30-				-
OLABS.G								11		 Latitude: 20.848301° N	=
3.0PJ GE							35-			Longitude: 156.651062° W	
Date Sta	rted:		Septe	mbei	r 9, 2016		33.			Water Level: Not Encountered	
티	Date Completed: September 9, 2016						D III D'	-fD-1100-00()			
	Logged By: D. Gremminger Total Depth: 22.5 feet							Drill Rig: CME-75DG1 (Energy Tran Drilling Method: 4" Solid Stem Auger & PQ Con	sfer Ratio = 80.3%) ring		
7	Work Order: 7378-00							Driving Energy: 140 lb. wt., 30 in. drop	iiig		

		Geot	echr	nical	3S, IN Engine	eering			L	AHAINA BYPASS PHASE 1B - 2 LAHAINA, MAUI, HAWAII Log of Boring 16		
Other Tests	Moisture Content (%)	/ Unit ight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	cket Pen.	Depth (feet)	Sample Graphic	nscs	Approximate Ground Surface Elevation (feet MSL): 86.99 *		
l	[©] S	Dry We	Cor	B	Per (blc	Poc l	Del	Sal	l S	Description		
	8				80		_		ML ML	Brown SANDY SILT with a little cobbles a gravel, hard, moist (fill) Brown SANDY SILT with some cobbles a	1	
	17		25 12		20/0" Ref. 43		5-			boulders (basaltic), hard, moist (alluvium)	
	28		21		65		10-				-	
	13		44		60/5"		15-			Brown SILTY COBBLES AND BOULDER (BASALTIC) with some sand, dense, mo (alluvium)	-	
	9				15/0" Ref.		20-			Boring terminated at 21 feet		
					Kei.		25- -				- - -	
							30-				-	
							35 -			Latitude: 20.8489518317475° N Longitude: 156.651570091363° W	-	
Date Sta					r 12, 201	6				Water Level: Not Encountered		
Date Co					r 12, 201	6				Drill Ria: CME-75DG1 (Energy Tran	nsfer Ratio = 80.3%)	
Logged Total De			B. Aiu 21 fee							Drill Rig: CME-75DG1 (Energy Tran Drilling Method: 4" Solid Stem Auger & PQ Co		
Work Or			7378-							Driving Energy: 140 lb. wt., 30 in. drop	ilig	

		Geot			BS, IN Engine	ering	ı		L	AHAINA BYPASS PHASE 1B - 2 LAHAINA, MAUI, HAWAII 18			
Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration 9 Resistance (blows/foot)	Pocket Pen. (tsf)	Jepth (feet)	Sample Graphic	nscs		oximate Ground Sation (feet MSL):		
₽	Mo Co	Ve	Cor Rec	RG	Pel Bel	Po (tsf	De	Sal	SN		Description		
	9 27	86	25		26 27		5-	X	ML	Brown SANDY S cobbles, stiff, dr grades with boul grades to very s	lders	ravel and	
			55 42		50/1"		10-			grades to hard			-
	13		29		50/4"		15- 20-						1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
T 128816	12				50/5"		25-			Boring terminat	ed at 21.4 feet		
O.GPJ GEOLABS.GD							35-			Latitude: 20.847 Longitude: 156.6	′2391246573° N 650368864784° \	N	-
Date Sta					r 8, 2016		30			Water Level: ▼	Not Encountered		目
Date Co					r 9, 2016					Drill Rig:	CME-75DG1	(Energy Transfer Ratio = 80	0.2%
Logged Total De			D. Gr 21.4 f		ırıgeı					Drilling Method:	4" Solid Stem Auge		2.3 /0)
Work Or			7378-							Driving Energy:	140 lb. wt., 30 in. dr		\dashv



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STATE	PROJECT	SHEET NO.
н	HI STP SR 30(1)	G17

		Geot	echr	nical	3S, IN Engine				L	LAHAINA BYPASS PHASE 1B - 2 LAHAINA, MAUI, HAWAII		
Other Tests	Moisture Content (%)	Ory Unit Neight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample Graphic	nscs	Approximate Ground Surface Elevation (feet MSL): 81.14 * Description		
	6 21	95	100 15 21	ш.	74 50/1" 45		5-		ML	Brown SANDY SILT with some gravel and cobbles, hard, dry (alluvium) Grayish brown SILTY SAND with some gravel and cobbles, dense, dry (alluvium)		
9.50			34		50/1"		20- 25-			grades with boulders, very dense Boring terminated at 21.1 feet		
OGPJ GEOLABS.GDT 12:							30			Latitude: 20.846229° N Longitude: 156.649902° W		
Date Sta Date Co Logged Total De	mplet 3y: pth:	ed:	Septe D Gr 21 1 I	embei emm feet	r 8, 2016 r 8, 2016 inger		30			Water Level: ▼ Not Encountered Drill Rig: CME-75DG1 (Energy Transfer Ratio = 80.3%) Drilling Method: 4" Solid Stem Auger & PQ Coring		
Work Or	der:		7378-	-00						Driving Energy: 140 lb. wt., 30 in. drop		

			GEOLABS, INC. Geotechnical Engineerin					ı		L	AHAINA BYPASS PHASE 1B - 2 LAHAINA, MAUI, HAWAII 21
	Other Tests	isture ntent (%)	Dry Unit Weight (pcf)	e sovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	<u>Sample</u> Graphic	sosn	Approximate Ground Surface Elevation (feet MSL): 84.87 *
	₹	₽ō	We	Cor	R	Per Sign	Po(tsf	De	Sal	l S	Description
	UC= 1420 psi	19	69	45		29		5 - 10-	X	ML	Brown SANDY SILT with some gravel and cobbles, hard, dry (alluvium) grades to very stiff
		17		50		50/4"		15-			grades with some boulders, moderately cemented, hard
SOLABS.GDT 12/8/16		10				50/5"		20- 25- 30-			Boring terminated at 16.4 feet
O.GPJ G								35-			Longitude: 156.649258° W
7378.00	Date Sta	rted:		Septe	mbe	r 8, 2016		35			Water Level: Not Encountered
T HALF	Date Co					r 8, 2016					1
100 DOI		Logged By: D. Gremminger									Drill Rig: CME-75DG1 (Energy Transfer Ratio = 80.3%)
ONG FC	Total Depth: 16.4 feet									Drilling Method: 4" Solid Stem Auger & PQ Coring	
BOR	vvork Or	Work Order: 7378-00									Driving Energy: 140 lb. wt., 30 in. drop

Approximate Ground Surface Elevation (feet MSL): 80.74 * Description Approximate Ground Surface Elevation (feet MSL): 80.74 * Description Description Brown SANDY SILT with some gravel and cobbles, stiff, dry (alluvium) grades with some boulders grades to hard 10 38 50/4" 15 50/1" ML Grayish brown SANDY SILT with some gravel and cobbles, very dense, dry (alluvium) Grayish brown SANDY SILT with some gravel and cobbles, very stiff, damp (alluvium) Boring terminated at 22.5 feet Date Started: September 8, 2016 Date Completed: September 8, 2016			GEOLABS, INC. Geotechnical Engineerin							L	AHAINA BYPASS PHASE 1B - 2 LAHAINA, MAUI, HAWAII	Log of Boring 20
11 90 21 44 44 44 44 44 44 44	her Tests	oisture Intent (%)	y Unit eight (pcf)	re covery (%)	(%) Q	netration sistance ows/foot)	cket Pen. f)	pth (feet)	mple aphic	scs	Elevation (feet MSL): 80.74 *	
11 90 21 44 44 44 44 44 44 44	₹	≗೦	్ద్త	Re	RC	Page 2	l (Es	De	Sa	S		
15 50/1" 16 ML Grayish brown SANDY SILT with some gravel and cobbles, very stiff, damp (alluvium) 17 24 Boring terminated at 22.5 feet 25 Latitude: 20.845168° N Longitude: 156.649564° W Date Started: September 8, 2016 Date Completed: September 8, 2016 Logged By: D. Gremminger Drill Rig: CME-75DG1 (Energy Transfer Ratio = 80.3%)		10	90	44 38		50/4"			X, , , , , , , , , , , , , , , , , , ,	ML	cobbles, stiff, dry (alluvium) grades with some boulders grades to hard	
Date Started: September 8, 2016 Water Level: Date Completed: September 8, 2016 Logged By: D. Gremminger Drill Rig: CME-75DG1 (Energy Transfer Ratio = 80.3%)	сер, сесоллез срот травте	17		15				20 25 30		ML	very dense, dry (alluvium) Grayish brown SANDY SILT with some g cobbles, very stiff, damp (alluvium) Boring terminated at 22.5 feet Latitude: 20.845168° N	1
Date Completed: September 8, 2016 Logged By: D. Gremminger Drill Rig: CME-75DG1 (Energy Transfer Ratio = 80.3%)	Date Sta	rted:		Sente	mbe	8 2016		35			I Water Level: Not Encountered	
Logged By: D. Gremminger Drill Rig: CME-75DG1 (Energy Transfer Ratio = 80.3%)	ti.										Water Level. 4 Not Encountered	
Tatal Daruhi 00 5 5 at Della Mathada 48 0 5 5 0 0 0	-										Drill Rig: CME-75DG1 (Energy Tran	sfer Ratio = 80.3%)
	Total De										Drilling Method: 4" Solid Stem Auger & PQ Cor	ring
Work Order: 7378-00 Driving Energy: 140 lb. wt., 30 in. drop	Work Or	der:		7378-	-00	-					Driving Energy: 140 lb. wt., 30 in. drop	

			Geot	echr		3S, IN Engine	eering	ı		LAHAINA BYPASS PHASE 1B - 2 LAHAINA, MAUI, HAWAII				
	Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample Graphic	nscs	Approximate Ground Surface Elevation (feet MSL): 82.3 *			
L	₹	≗೭	짇>	Col	R	<u>a</u> 8 <u>a</u>	Po (tsf	De	Sag	SN	Description			
1		16	97			29	4.5		M	МН	Brown CLAYEY SILT, very stiff, damp (fill	· .		
		11		11		50/4"		5 [.]		ML	Brown SILT with some gravel and cobbles dry (alluvium)	s, hard,		
1		37		52		7/6" +50/4"				SM	Brownish gray SILTY SAND with some gr	avel and		
		18		52		43/6"		15 ⁻			cobbles, very dense, damp (alluvium)	-		
ABS.GDT 12/8/16						+50/4"		20: 25: 30:			Boring terminated at 17.3 feet	-		
00.GPJ GEOLAE								35			Latitude: 20.843136° N Longitude: 156.64883° W			
LF 7378		Date Started: September 8, 20							Water Level: ▼ Not Encountered					
MH TO		Date Completed: September 8, 2016						Daill Dies CME 75DC4	ofor Potio = 90 20/					
0 D	Logged By: D. Gremminger Total Depth: 17.3 feet							Drill Rig: CME-75DG1 (Energy Trans Drilling Method: 4" Solid Stem Auger & PQ Cor	ina					
ORING	Work Order: 7378-00							Driving Energy: 140 lb. wt., 30 in. drop	ilig					
			7370-00								,,			



U.S. CUSTOMARY

STATE	PROJECT	SHEET NO.
Ξ	HI STP SR 30(1)	G18

					3S, IN Engine				L	AHAINA BYPASS PHASE 1B - 2 LAHAINA, MAUI, HAWAII 23
Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Sore Recovery (%)	RQD (%)	Penetration GResistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample Graphic	nscs	Approximate Ground Surface Elevation (feet MSL): 79.46 * Description
LL=50 PI=25 Direct Shear UC= 6900 psi	<u>×0</u> 15	<u>72</u>	92 70 97	Ľ	15/0" Ref. 15/0" Ref. 15/0" Ref. 15/0"	(t)	5- 10- 15- 20-		CL	Brown SANDY CLAY with a little gravel, very stiff, moist (fill) Brown SANDY CLAY with some cobbles and boulders (basaltic), hard, moist (alluvium) Gray COBBLY BOULDERS (BASALTIC) with some gravel, dense, moist (alluvium)
Date Sta	rted:		Septe	embei	15/0" Ref.	6	25- 30- 35-			Boring terminated at 21 feet Latitude: 20.8411572064328° N Longitude: 156.648143519591° W Water Level: Not Encountered
Date Cor			Septe B. Aiu		12, 201	6				Drill Rig: CME-75DG1 (Energy Transfer Ratio = 80.3%)
Logged E Total Dep			21 fee							Drilling Method: 4" Solid Stem Auger & PQ Coring
Work Ord			7378-							Driving Energy: 140 lb. wt., 30 in. drop

	otechnical	BS, INC. Engineering			LAHAINA BYPASS PHASE 1B - 2 LAHAINA, MAUI, HAWAII LOG of Boring 25					
Other Tests Moisture Content (%) Dry Unit	Weight (pc) Core Recovery (%) RQD (%)	Resistance (blows/foot) Pocket Pen. (tsf)	Depth (feet)	Sample Graphic	USCS	Approximate Ground Surface Elevation (feet MSL): 84.27 *				
₹ \£8 £;		[\$ \frac{1}{2} \fr	De l	N Sa	ns	Description				
Direct 14 72 Shear 7	58 73 55	15/0" Ref. 50/5" 25/1" 15/0" Ref.	5- 10- 15-		ML	Brown SANDY SILT with some cobbles and boulders (basaltic), very stiff, moist (alluvium) Gray GRAVELLY COBBLES AND BOULDERS (BASALTIC) with a little silty sand, very dense, moist (alluvium)				
166 television results			25- 30-	X		Boring terminated at 21.8 feet Latitude: 20.8395018300536° N Longitude: 156.647309932669° W	-			
Date Started:	Septembe		<u> </u>			Water Level: ¥ Not Encountered				
Date Completed:	Septembe					THE ENGLISHE				
Logged By:	B. Aiu	, <u> </u>				Drill Rig: CME-75DG1 (Energy Transfer Ratio =	80.3%)			
Total Depth:	21.8 feet					Drilling Method: 4" Solid Stem Auger & PQ Coring				
र्ष्ट्र Work Order:	7378-00					Driving Energy: 140 lb. wt., 30 in. drop				

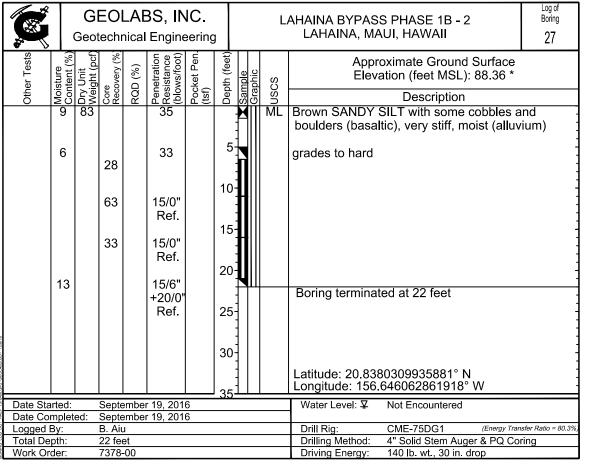
		Geo	echr	nical	3S, IN Engine	ering			L	AHAINA BYPASS PHASE 1B - 2 LAHAINA, MAUI, HAWAII 24	g
Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	e covery (%	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample Graphic	nscs	Approximate Ground Surface Elevation (feet MSL): 88.51 *	
₹	800	\ Ve O	Cor	R	Reg (blc	Poc (tsf	Del	Sign	l S	Description	
-	11	78			13/6" +50/3"		<u> </u>		ML	Brown SANDY SILT with some cobbles and boulders (basaltic), very stiff, moist (alluvium)	
	33		58		15/0"		5	₩ 8		Gray COBBLES AND BOULDERS (BASALTIC) with a little silty clay, dense, moist (alluvium)	<u>, </u>
			98		Ref. 51		10-	8		grades to very dense	
			57		15/0" Ref.			Q		grades to very derise	
			43		15/0" Ref.		15	0 Q			-
					15/0"		20	18		Boring terminated at 21 feet	-
					Ref.		25				-
							30-				- - -
							35			Latitude: 20.8404830276189° N Longitude: 156.647871247501° W	
Date Sta	arted:		Septe	mbe	r 13, 201	6	<i>აა</i> .			Water Level: Not Encountered	
Date Co	mple	ted:	Septe	mbe	r 13, 201						
Logged			B. Aiı							Drill Rig: CME-75DG1 (Energy Transfer Ratio =	80.3%
Total De			21 fee							Drilling Method: 4" Solid Stem Auger & PQ Coring	
Work O	der:		7378-	.00						Driving Energy: 140 lb. wt., 30 in. drop	

		Geot	echr		3S, IN Engine	ering			L	AHAINA BYPAS LAHAINA, MA			Log of Boring 26
Other Tests	oisture Intent (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Jepth (feet)	Sample Graphic	nscs		oximate Ground S ation (feet MSL): 8		
₹	<u>ഉ</u>	₽,≥	ပ္ပန္	8	<u>8 8 9</u>	Po (tsi	De	S	SO:		Description		
	10	100	67 45 61 63		15/0" Ref. 15/0" Ref. 46/6" +42/4"		5- 10- 15- 20-		ML	boulders (basal Gray GRAVELL	SILT with some co tic), very stiff, mo Y COBBLES ANI th a little silty sand)	ist (a ll uvii D BOULD	um) DERS
S.GDT 12/8/16					30/6" +40/4"		25 30			Boring terminat	ed at 22.3 feet		
0.GPJ GEOLAB							35				36350546203° N 646647152641° N	V	- - -
Date Sta	rted:				· 13, 201		<u> </u>			Water Level: V	Not Encountered		
Date Co					· 13, 201	6							
Logged I			B. Aiu							Drill Rig:	CME-75DG1	, 0,	er Ratio = 80.3%)
Total De			22.3 f							Drilling Method:	4" Solid Stem Auger		ng
work Or	der:		7378-	00						Driving Energy:	140 lb. wt., 30 in. dr	эр	



U.S. CUSTOMARY

STATE	PROJECT	SHEET NO.
Ξ	HI STP SR 30(1)	G19



			Geot	echr	nical	3S, IN Engine				L	AHAINA BYPASS LAHAINA, MA		Log of Boring 29
	Other Tests	isture ntent (%)	Dry Unit Weight (pcf)	e :overy (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample Graphic	nscs		oximate Ground S etion (feet MSL): 8	
1	₽	Wo Co	Ve	Cor	R	Per Res (blc	Poo (tsf	De		l S		Description	
		5	103	92		56/6" +20/0" Ref. 20/0" Ref.		5		ML		SILT with some co tic), hard, moist (a	
2	UC= 2620 psi	12		75 25		15/0" Ref. 20/0" Ref. 80		10- 15- 20-					
0.GPJ GEOLABS.GDT 12/8/16						8		25 30			Boring terminate Latitude: 20.836 Longitude: 156.6	863° N	
7378.0	Date Sta	rted:		Septe	mbei	20, 201	 6	<u> </u>			Water Level: Value Valu	Not Encountered	
HALF	Date Cor					20, 201					1		
G DOT	Logged E	Зу:		B. Aiu	Į						Drill Rig:	CME-75DG1	(Energy Transfer Ratio = 80.3%
NG LO	Total De			21.5 f							Drilling Method:	4" Solid Stem Auger	
BOR	Work Or	der:		7378-	-00						Driving Energy:	140 lb. wt., 30 in. dro	pp

9 0 50 50/5" 5 moist (alluvium) grades to very dense 10 Q Gray GRAVELLY COBBLES AND BOULDERS			Geot	echr	nical	BS, IN Engine	eering			L	AHAINA BYPASS PHASE 1B - 2 LAHAINA, MAUI, HAWAII 28
9 0 50 50 58 26 25 45 75 45 Ref. MIL Brown SANDY SILT (CORALLINE) with some cobbles and boulders (basaltic), medium dense moist (alluvium) grades to very dense Gray GRAVELLY COBBLES AND BOULDERS (BASALTIC) with a little silty sand, dense, mois (alluvium) Boring terminated at 21 feet	er Tests	sture ntent (%)	Unit ight (pcf)	e overy (%)	(%) Q	netration sistance ws/foot)	ket Pen.	oth (feet)	nple phic	SS	
9 0 50 50/5"	₹	Moi	Ne.	Sor	20	무 등 등	[£] \)ek	Sar	l Š	Description
26 25 45 58 75 Gray GRAVELLY COBBLES AND BOULDERS (BASALTIC) with a little silty sand, dense, mois (alluvium) Boring terminated at 21 feet		17	79	0		22		5		ML	cobbles and boulders (basaltic), medium dense, moist (alluvium)
25 45 75 (BASALTIC) with a little silty sand, dense, mois (alluvium) 15/0" Ref. Boring terminated at 21 feet		26		26		58					Gray GRAVELLY COBBLES AND BOULDERS
15/0" Boring terminated at 21 feet Ref.		25		45		75			No		(BASALTIC) with a little silty sand, dense, moist (alluvium)
30-								25			Boring terminated at 21 feet
Latitude: 20.8374228694624° N Longitude: 156.645299454742° W								35	-		
Date Started: September 13, 2016 Water Level: ▼ Not Encountered											Water Level: Not Encountered
Date Completed: September 14, 2016 Logged By: B, Aiu Drill Rig: CME-75DG1 (Energy Transfer Ratio =						r 14, 201	6				Drill Rig: CMF-75DG1 (Energy Transfer Ratio = 80
Logged By: B. Aiu Drill Rig: CME-75DG1 (Energy Transfer Ratio = Total Depth: 21 feet Drilling Method: 4" Solid Stem Auger & PQ Coring											
Work Order: 7378-00 Driving Energy: 140 lb. wt., 30 in. drop											

		eot	echr		3S, IN Engine		1		L	AHAINA BYPASS PHASE 1B - 2 LAHAINA, MAUI, HAWAII Bog of Bog in
Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	overy (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample Graphic	nscs	Approximate Ground Surface Elevation (feet MSL): 73.76 *
\$ \$\frac{1}{2}\$	ဋိပြု	ર્ટ્સ	Red	RO	Pel Re (blc	Po (tsf	De	Sal	SN	Description
					15/0" Ref.			-	ML	Brown SANDY SILT with some cobbles and boulders (basaltic), very stiff, moist (alluvium)
	15		100		27		5			
			98		15/0" Ref.		10			grades to hard
			74		60/5"		15			
					20/0"		20]] 		Boring terminated at 21 feet
					Ref.		25			
ABS.GDT 12@16							30	1		
-00.6PJ GEOL							35	<u> </u>		Latitude: 20.8365929306252° N Longitude: 156.643959139053° W
Date Start					20, 201					Water Level: ▼ Not Encountered
Date Com Logged By			Septe 3. Aiu		20, 201	b				Drill Rig: CME-75DG1 (Energy Transfer Ratio = 80.3%)
Total Dept			21 fee							Drilling Method: 4" Solid Stem Auger & PQ Coring
Work Orde			7378-							Driving Energy: 140 lb. wt., 30 in. drop



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STATE	PROJECT	SHEET NO.
Ξ	HI STP SR 30(1)	G20

					3S, IN Engine				L	AHAINA BYPAS LAHAINA, MA	S PHASE 1B - 2 AUI, HAWAII		Log of Boring 31
Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample Graphic	nscs		oximate Ground ation (feet MSL): Description		
Direct Shear	11	69	57 37	<u> </u>	15/0" Ref. 20/0" Ref. 52		5- 10- 15- 20-		МL	boulders (basa	SILT with some of tice), stiff, moist (a		id .
Date Sto					15/0" Ref.		25- 30- 35-				ted at 21 feet 61423628331° N 643012473773° Not Encountered	W	
Logged Total De Work Or	pth:		B. Aiu 21 fee 7378	et						Drill Rig: Drilling Method: Driving Energy:	CME-75DG1 4" Solid Stem Auge 140 lb. wt., 30 in. d	er & PQ Cori	er Ratio = 80.3% ng

	(BS, IN Engine		3		L	AHAINA BYPASS PHASE 1B - 2 LAHAINA, MAUI, HAWAII	Log of Boring 33
Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample Graphic	nscs	Approximate Ground Surface Elevation (feet MSL): 11.81 *	
₹ :	Mo	Dry We	Cor Rec	g	Per (한영	Poc (tsf	Dep	Sar	NS	Description	
	5 48	98			34 15		5.	X	MH	Brown SANDY SILT with some cobbles ar boulders (basaltic), very stiff, moist (alluvidate)	
	15		48		56		10·			grades to hard	
			60		15/0" Ref.		15 [.]				1
			53		15/0" Ref.		20				- - -
9/16			37		15/0" Ref.		25 ⁻				- - - -
00.GPJ GEOLABS.GDT 12			93	42	15/0" Ref.		30			Gray vugular BASALT, closely to moderate fractured, slightly weathered, hard (basalt formation)	
Date Star					r 21, 201		-00			Water Level: Not Measured**	
Date Com					r 21, 201	6				Drill Rig: CME-75DG1 (Energy Transi	fer Ratio = 80.3%)
Logged B Total Dep			<u>Β. Αίι</u> 40 fee							Drill Rig: CME-75DG1 (Energy Transt Drilling Method: 4" Solid Stem Auger & HQ Cori	
Work Ord			7378-							Driving Energy: 140 lb. wt., 30 in. drop	''9

		Geot	techr	nical	3S, IN Engine	eering			L	AHAINA BYPASS PHASE 1B - 2 LAHAINA, MAUI, HAWAII 32
Other Tests	isture ntent (%)	/ Unit eight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Jepth (feet)	Sample Granhic	USCS	Approximate Ground Surface Elevation (feet MSL): 44.36 *
₹	∣ુકેં	V _e	Cor	R	Pag Sp	Poc (tsf	De	Sal	S	Description
	21	78	46		28 20/0" Ref. 72		5	17 	ML	Brown SANDY SILT with some cobbles and boulders (basaltic), very stiff, moist (alluvium) grades to hard
	14		53		45/5"		10-			
			42		20/0" Ref.		15-			
			23		15/0" Ref.		20-			
			70		20/0" Ref.		25			D
					15/0" Ref.		30	- []		Boring terminated at 30.5 feet Latitude: 20.835692° N Longitude: 156.642148° W
Date Sta	arted:		Septe	embe	r 21, 201	6	<i>აა</i>			Water Level: ▼ Not Encountered
Date Co		ed:	Septe	embe	r 21, 201					
Logged			B. Aiu							Drill Rig: CME-75DG1 (Energy Transfer Ratio = 80.3
Total De			30.5 t							Driving Energy: 140 lb, wt 30 in, drop
Work Or	der:		7378-	-00						Driving Energy: 140 lb. wt., 30 in. drop

	Geo	techi		3S, IN Engine				L	LAHAINA BYPASS PHASE 1B - 2 LAHAINA, MAUI, HAWAII 33			
Other Tests	Content (%) Dry Unit	Core Recovery (%)	9 RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample Graphic	nscs	(Co	ntinued from previous pla Description	te)	
ORD ORDONAISSON 1287%		60	50	15/0" Ref.		40- 45- 50- 55- 60- 65-			wash drilling m	ed at 40 feet asure groundwater d	ue to rotary	
Date Starte				r 21, 201 r 21, 201		70-			Water Level: ¥	Not Measured**		
Logged By		B. Aiı							Drill Rig:	CME-75DG1 (En	ergy Transfer Ratio = 80.3%)	
Total Dept		40 fe							Drilling Method:	4" Solid Stem Auger & F	HQ Coring	
Work Orde		7378							Driving Energy:	140 lb. wt., 30 in. drop	y	



U.S. CUSTOMARY

STATE	PROJECT	SHEET NO.
Н	HI STP SR 30(1)	G21

					BS, IN Engine				L	AHAINA BYPASS PHASE 1B - 2 LAHAINA, MAUI, HAWAII LAHAINA, MAUI, HAWAII
Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration OResistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample Graphic	nscs	Approximate Ground Surface Elevation (feet MSL): 12.36 * Description
LL=44	12	78		_	20		 5		ML	Brown SANDY SILT with a little gravel, stiff, moist (alluvium) Dark gray SANDY SILT, stiff, moist (marsh deposit)
PI=13 Consol.	29	96	0		14		10·		SP- SM	
Sieve - #200 = 6.2%	34		0		18		15 [.]			D. CANDYOUT ''
5.275	17				26		20		MH	Brown SANDY SILT with some cobbles and gravel, very stiff, moist (alluvium) Boring terminated at 21.5 feet
							25· 30·			**Unable to measure groundwater due to rotary wash drilling methods.
							35			Latitude: 20.8350666183328° N Longitude: 156.641015790034° W
Date Sta Date Cor					r 21, 201 r 22, 201		00			Water Level: ♀ Not Measured**
Logged E Total De Work Ore	pth:		B. Aiu 21 5 f 7378-	eet						Drill Rig: CME-75DG1 (Energy Trensfer Ratio = 80.3%) Drilling Method: 4" Solid Stem Auger & PQ Coring Driving Energy: 140 lb. wt., 30 in. drop

		Geot	echr	nical	3S, IN Engine	ering			L	AHAINA BYPASS PHASE 1B - 2 LAHAINA, MAUI, HAWAII 36	
Other Tests	isture ntent (%)	Dry Unit Weight (pcf)	e covery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample Graphic	nscs	Approximate Ground Surface Elevation (feet MSL): 10.82 *	
₹	₽õ	We	Rec	R	Per Res (blc	Poo (tsf	Del	Sign	NS I	Description	- 1
					46			X	SM	Grayish brown SILTY SAND with some cobbles and boulders, medium dense, moist (alluvium)	
			18		15/0" Ref.		5 -		МН	grades to very dense Dark gray CLAYEY SILT with some sand, soft, moist (marsh deposit)	_{-1}
			0		5		10-			moist (maish deposit)	-
Sieve - #200 =	53		0		5		15-				1
69.0%	43				10		20		SM	Gray and tan SILTY SAND (CORALLINE) with a	-
							25			little gravel (coralline), medium dense, moist (nearshore deposit)	_[
.GDT 12/8/16							30-			Boring terminated at 22.5 feet **Unable to measure groundwater due to rotary wash drilling methods.	}
00.GPJ GEOLABS							35-			Latitude: 20.8338235427244° N Longitude: 156.639915007102° W	
и,	Date Started: September 20, 2016						50			Water Level: Not Measured**	٦
-	Date Completed: September 20, 2016									D III B	
	Logged By: B. Aiu Total Depth: 22.5 feet									Drill Rig: CME-75DG1 (Energy Transfer Ratio = 80.3 Drilling Method: 4" Solid Stem Auger & HQ Coring	3%)
Work Or										Driving Energy: 140 lb. wt., 30 in. drop	\dashv

		Geot	echr	nical	3S, IN Engine		,		L	AHAINA BYPAS LAHAINA, MA			Log of Boring 35
Other Tests	isture ntent (%)	Dry Unit Weight (pcf)	e covery (%)	RQD (%)	Penetration	Pocket Pen. (tsf)	Depth (feet)	Sample Graphic	nscs		oximate Ground station (feet MSL):		
₹	ુંે	Dry	Cor	RQ	Reg (blc	Poc (tsf	Del	Sal	l S		Description		
LL=71 PI=32	42	42			3	1.0			МН	Dark brown CLA deposit)	AYEY SILT, very	soft, mois	st (marsh
Consol.	52	74	0		9		5			grades to mediu	ım stiff		
Consol.	29	107	0		16		10		SP		GRAVELLY SAN		aces of
Sieve - #200 = 4.4%			0		8		15			silt, loose, mois	t (lagoonal depos	sit)	
	20	115			47		20		en.	aliaht arov CLAX	/EY SAND with s	omo grav	rol .
]	Sivi	dense, moist (n	earshore deposit		·ei,
							2530]		Boring terminat **Unable to mea wash drilling me	asure groundwate	er due to	rotary
							35				17043601268° N 640609923925° V	W	
Date Star					r 21, 201 r 21, 201		33			Water Level: ▼	Not Measured**		
Logged E			B. Aiu		1 2 1, 201					Drill Rig:	CME-75DG1	(Energy Trans	fer Ratio = 80.3
Total Dep			21.5 f 7378	eet						Drilling Method: Driving Energy:	4" Solid Stem Auge	r & HQ Cor	

					3S, IN Engine		,		L.	AHAINA BYPASS PHASE 1B - 2 LAHAINA, MAUI, HAWAII	Boring BA
Other Tests	sture ntent (%)	Dry Unit Weight (pcf)	e overy (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample Graphic	SC	Approximate Ground Surface Elevation (feet MSL): 10.82 *	
₩	Moi Cor	Wey	Cor	S.	Per Res (blo	Poc (tsf)	Deg	Sar	nscs	Description	
									SM	Grayish brown SILTY SAND with some co and boulders, medium dense, moist (allu	
			0		11		5	ř	ML	Dark gray SANDY SILT with a little cobble medium stiff, moist (marsh deposit)	es,
LL=31 PI=6	31	93	0		6		10	11 X		grades to soft	
Consol. LL=42 PI=10	41	81	0		15	2.3	15	Ä		grades to medium stiff	
Consol. Sieve - #200 =					8		20		ML	Gray and tan SILT (CORALLINE) with a li and gravel (coralline), medium stiff, moist (nearshore deposit)	
85.8%							30]		Boring terminated at 22.5 feet **Unable to measure groundwater due to wash drilling methods.	rotary :
00.GPJ GEOLABS							35	-		Latitude: 20.833768° N Longitude: 156.639878° W	-
Date Sta					26, 201					Water Level: ♀ Not Measured**	
Date Cor Logged I			Septe B. Aiu		26, 201	0				Drill Rig: CME-75DG1 (Energy Trans	sfer Ratio = 80.3%)
Total De	Total Depth: 22.5 feet									Drilling Method: 4" Solid Stem Auger & PQ Cor	
ह्य Work Or	der:		7378-	00						Driving Energy: 140 lb. wt., 30 in. drop	



U.S. CUSTOMARY

STATE	PROJECT	SHEET NO.
Н	HI STP SR 30(1)	G22

					3S, IN Engine	eering			L	LAHAINA BYPASS PHASE 1B - 2 LAHAINA, MAUI, HAWAII LOg of Boring 37				
Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	ore scovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	<u>Sample</u> Graphic	nscs	Approximate Ground Surface Elevation (feet MSL): 18.65 *				
Sieve - #200 = 13.6%	3 4	<u>a</u> 61	20	R	53 24	>4.5	l	Š X	SM	Description 1-inch ASPHALTIC CONCRETE Brownish gray SILTY SAND, medium dense, mois (base course) Reddish brown SILTY SAND with some gravel and cobbles, very stiff, moist (alluvium)				
	19 33		29		19 22	Ž	10- Z15-	0,000	GP	Dark gray SANDY GRAVEL (BASALTIC) with some cobbles and boulders, medium dense, mois				
	7		33		20		20 -	000000000000000000000000000000000000000		to wet (weathered basalt)				
			60		20/0" Ref. 21		30-	0 1 1 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	GP	Gray vesicular BASALT, severely to closely fractured, moderately weathered, medium hard (basalt formation) Dark gray SANDY GRAVEL (BASALTIC), medium dense (clinker)				
Date Sta Date Con Logged I Total De Work Or	mplet By: pth:	ed:		mbei i et	- 26, 201 - 26, 201		35-	1 1		Water Level: 15.3 ft. 09/26/2016 1121 HRS				

					3S, IN Engine	ering			L	LAHAINA BYPASS PHASE 1B - 2 LAHAINA, MAUI, HAWAII 38				
Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample Graphic	nscs	Approximate Ground Surface Elevation (feet MSL): 21.59 *				
₽	_{ခိ} ပိ	V _e	Cor Rec	RG	Pel Re (blc	Po (tsf	De	Sal	sn	Description				
	17	101			16			X	SM SM	Grayish brown SILTY SAND with some groups (cobbles, medium dense, moist (alluvium)				
	8		24		26		5			Grayish brown SILTY SAND with some grobbles, medium dense, moist (alluvium)	ravel and			
Sieve - #200 =	17		29		23	1	10 ⁻	À						
27.1%	26		29		42	*	215 [.] 20 [.]			grades to very dense]			
	24				34		20	X			-			
us.opt 12/8/16							25· 30·			Boring terminated at 22.5 feet	-			
NO SEON]		Latitude: 20.8326721215111° N Longitude: 156.639306220563° W]			
Date Sta	rtod.		Santo	mho	· 26, 201	<u></u>	35	ш		I Water Level: ¥ 15.3 ft. 09/26/2016 1303 HR\$	2			
Date Co					26, 201					13.3 IL. 03/20/2010 1303 FR	·			
Logged	_		B. Aiu		20, 201					Drill Rig: CME-75DG1 (Energy Trans	sfer Ratio = 80.3%)			
Total De			22.5 1							Drilling Method: 4" Solid Stem Auger & PQ Cor	ring			
Work Or	der:		7378-	00						Driving Energy: 140 lb. wt., 30 in. drop				

		eot	echr		3S, IN Engine	eering				L	AHAINA BYPASS PHASE 1B - 2 LAHAINA, MAUI, HAWAII 37
Other Tests	Content (%)	y Unit eight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample	aphic	USCS	(Continued from previous plate)
j j	ဋိ႙	≥ֿ≤ֿ	<u>೧</u> ೯	씸	<u> </u>	<u> </u>	<u>مّ</u>	Š	ত	ñ	Description
							40				Boring terminated at 33 feet
							45]			
							50 55]			
28 r 6							60				
GPJ GEOLABS.GDT 12/8/16							65				Latitude: 20.8331990807044° N
Date Start	ed.	_	Senta	mher	26, 201	<u></u>	70		_		Water Level: ¥ 15.3 ft. 09/26/2016 1121 HRS
Date Start					26, 201						VValor 2010. 4 10.5 (t. 08/20/2010 112111N3
Logged By			B. Ait		_0, _01	-					Drill Rig: CME-75DG1 (Energy Transfer Ratio = 80.3%)
Total Dept	Total Depth: 33 feet										Drilling Method: 4" Solid Stem Auger & PQ Coring
Work Orde	Vork Order: 7378-00										Driving Energy: 140 lb. wt., 30 in. drop

	1				3S, IN				L	AHAINA BYPASS PHASE 1B - 2 LAHAINA, MAUI, HAWAII 39
Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Jepth (feet)	Sample Graphic	SOSN	Approximate Ground Surface Elevation (feet MSL): 15.75 *
Į ŏ	3	<u>გ</u> 97	Re	Ϫ	<u> </u>	Pc (ts	۵	X G	SM	Description Light brown SILTY SAND with a little gravel, medium dense, moist (alluvium)
	13		71		18		5- 10-			Grayish brown COBBLY BOULDERS with some silty sand, medium dense, moist (alluvium)
	9 14 15 ¥ 13 114 28/6"									grades to very dense
ijari6										Boring terminated at 17.6 feet
00.GPJ GEOLABS.GDT							30			Latitude: 20.8321664809354° N Longitude: 156.639044406351° W
Date St					r 27, 201		JJ			Water Level: ¥ 12.3 ft. 09/27/2016 1025 HRS
Date Co Logged			Septe B. Aiu		r 27, 201	6				Drill Rig: CME-75DG1 (Energy Transfer Ratio = 80.3%)
Total De			17.6 f							Drilling Method: 4" Solid Stem Auger & PQ Coring
Work O	rder:		7378-	-00						Driving Energy: 140 lb. wt., 30 in. drop



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Н	HI STP SR 30(1)	G23	

					3S, IN			LAHAINA BYPASS PHASE 1B - 2 LAHAINA, MAUI, HAWAII LOg of Boring 40				
Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample Graphic	nscs	Approximate Ground Surface Elevation (feet MSL): 14.95 * Description		
Sieve - #200 = 34.1%	15		5		30 25 16 50/5"	Ŋ	5 10 15 20 25 30		SM	I1-inch ASPHALTIC CONCRETE Brownish gray SILTY SAND with a little gravel, medium dense, moist (fill) Brown SILTY SAND with some gravel, medium dense, moist (alluvium) Reddish brown SANDY SILT with some gravel and cobbles, stiff, moist to wet (alluvium) grades to hard Boring terminated at 17.4 feet Latitude: 20.8316585265188° N Longitude: 156.638743886244° W		
Date State Date Co Logged Total De Work Or	mplet By: pth:	ed:		embe u feet	r 27, 201 r 27, 201		<u></u>			Water Level: 11.5 ft. 09/27/2016 0911 HRS Drill Rig: CME-75DG1 (Energy Transfer Ratio = 80.3%) Drilling Method: 4" Solid Stem Auger & PQ Coring Driving Energy: 140 lb. wt., 30 in. drop		

			Geot	echr		BS, IN Engine			LAHAINA BYPASS PHASE 1B - 2 LAHAINA, MAUI, HAWAII				
	Other Tests	isture ntent (%)	/ Unit ight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample Graphic	nscs	Approximate Ground Surface Elevation (feet MSL): 70.97 *		
-	₹	₽Ō	Dry	Cor	R	[문문] (한 문학	Po(tsf	De	Sign	l S	Description		
Ī						11				ML	Brown SANDY SILT with traces of gravel stiff, dry (fill)	, medium -	
				27		11/6" +50/5"		5-		SM	Grayish brown SILTY SAND with some g cobbles, very dense, moist (alluvium)	:	
				21		+50/5		10	9		Gray COBBLY BOULDERS (BASALTIC) some sand, very dense, moist (alluvium)	with :	
		10		41		15/0" Ref.		15-	1 2 2 2				
						15/0" Ref.		20			Boring terminated at 17 feet	-	
								25-				1	
BS.GDT 12/8/16								30				1	
00 GPJ GEOL								35-			Latitude: 20.8418848727481° N Longitude: 156.648892042103° W		
F 7378	Date Sta			Septe	mbe	r 27, 201	6	00			Water Level: ♀ Not Encountered		
T HAL	Date Co					r 27, 201	6						
00 DO	Logged I			<u>Β. Αίι</u>							Brill rag.	sfer Ratio = 80.3%)	
SING	Total De			17 fee							Drilling Method: 4" Solid Stem Auger & PQ Col	ring	
BOR	Work Order: 7378-00									Driving Energy: 140 lb. wt., 30 in. drop			

		GEOLABS, INC. Geotechnical Engineering						LAHAINA BYPASS PHASE 1B - 2 LAHAINA, MAUI, HAWAII LOg of Boring 101			
Other Tests	isture ntent (%)	Dry Unit Weight (pcf)	e covery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample	USCS	Approximate Ground Surface Elevation (feet MSL): 89.51 *	
₹	₽Ō	ĕŞ	Cor	RQ	Per Spig	Po(tst	Del	Sal	S S	Description	
	5	100			48/6" +50/4"		-	X	ML	Brown SANDY SILT with a little gravel and cobbles, hard, dry (alluvium) grades with some boulders	-
			11		40		10	Ì	SM	Brown SILTY SAND with some gravel and cobbles, dense, dry (alluvium)	: - -
Sieve -#200 =	· - · Labita			grades to very dense Boring terminated at 13.5 feet							
21.3%							15-			Doming terminated at 10.0 leet	- - - -
							20-				- - -
							25				- - -
							30	}			_
							35			Latitude: 20.851463° N Longitude: 156.65357° W	-
Date Sta					r 6, 2016					Water Level: ▼ Not Encountered	
Date Co					r 6, 2016					D 111 D1	
Logged I			D. Gr		ınger					21 3 3 3 3 3 3 3	er Ratio = 80.3%
Total De Work Or			13.5 t 7378							Drivling Method: 4" Solid Stem Auger & PQ Corin Driving Energy: 140 lb. wt., 30 in. drop	ng
VVOIR OI	GGI.		, 0, 0	00						1 Driving Energy. 140 lb. wt., 00 lil. drop	

		GEOLABS, INC. Geotechnical Engineering							LAHAINA BYPASS PHASE 1B - 2 LAHAINA, MAUI, HAWAII					
Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	re covery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample Graphic	nscs	Approximate Ground Surface Elevation (feet MSL): 8.36 *				
ť	<u> </u>	کۆت	0 g	Z.	동물호	Po (ts		ဖြစ်	👸	Description				
LL=47 PI=19	31	90	0		3		5		ML ML	Dark brown SANDY SILT with a little grave medium stiff, moist (fill) Dark gray SANDY SILT, soft to medium set (marsh deposit)				
Sieve - #200 = 17.3%	40 34	93	0		2		10 ⁻		SM	loose (lagoonal deposit) Boring terminated at 16.5 feet				
							20· 25· 30·			**Unable to measure groundwater due to wash drilling methods.	rotary			
							35 [,]			Latitude: 20.8344943665944° N Longitude: 156.63987962665° W				
Date Star					r 20, 201					Water Level: Not Measured**				
Date Con	_				r 20, 201	6				D 11 B: 0ME 75D04 7				
Logged E			B. Aiu							2	sfer Ratio = 80.3			
Total Dep	otn: der:		<u>16.5 f</u> 7378-							Drilling Method: 4" Solid Stem Auger & PQ Cor Driving Energy: 140 lb. wt., 30 in. drop	ing			



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A A	Т		-01	Λ.	20 18	<u></u>	Т			Log of				
		GEOLABS, INC. Geotechnical Engineering						LAHAINA BYPASS PHASE 1B - 2 LAHAINA, MAUI, HAWAII 301						
8	V									301				
Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	very (%	RQD (%)	Penetration Resistance (blows/foot)	cet Pen	th (feet)	Sample	ျှ	Approximate Ground Surface Elevation (feet MSL): 23 **				
Othe	Mois	Ory Weig	Sore	RQE	Resi (blo)	Pocket F (tsf)	Depth (Sar	SOSO	Description				
	6	106			37/6"				H ML	1-inch ASPHALTIC CONCRETE				
	5				+45/1" 13				SM	Reddish brown SANDY SILT with some gravel, medium stiff, moist (fill)				
Sieve - #200 =	7	94			69		5 -	X		Reddish brown SILTY SAND with some gravel, a				
28.8%							10			little cobbles, and boulders, medium dense to dense, moist (recent alluvium)				
	10				35		10-	N	014					
									SM	Brownish gray SILTY SAND, loose, moist (nearshore deposit)				
Sieve	20	96			16	\ \	15-			(nearshore deposit)				
- #200 =														
21.9%	27	103			17		20-							
		100			''									
	36				6		25-							
	50									Boring terminated at 26.5 feet				
7 12/8/16							30-]		** Elevations estimated from Topographic Survey Map				
ABS.GD1							30	1		transmitted by Wilson Okamoto, Inc. on November 1, 2016.				
SPJ GEOL										Latitude: 20.8343900789539° N Longitude: 156.641225897774° W				
Date Sta	rted.		Nove	mher	16, 2016	<u> </u>	35-			Water Level: ▼ 14.8 ft. 11/16/2016 1141 HRS				
Date Co					16, 2016					14.016. 11/10/2010 114111110				
Logged I			Β. Aiι							Drill Rig: CME-75DG1 (Energy Transfer Ratio = 80.3				
Total De			26.5 f							Drilling Method: 4" Solid Stem Auger & PQ Coring				
work Or	der:		7378-	-00					Driving Energy: 140 lb. wt., 30 in. drop					

	GEOLABS, INC. Geotechnical Engineering								L	AHAINA BYPASS PHASE 1B - 2 LAHAINA, MAUI, HAWAII Bog of Boring 302
Other Tests	Moisture Content (%)	Unit ight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample Graphic	sosn CL	Approximate Ground Surface Elevation (feet MSL): 13.5 **
₹	800	ĕ.Z	Sec. 5	8	[호움질]	Poc (tsf	Del	Sar	l s	Description
LL=42 PI=19	25	83			17				CL	Reddish brown SANDY CLAY, stiff, moist (fill)
Sieve -#200 = 58.0%	19 30	77			17 6		5		ML	Brownish gray SANDY SILT, very stiff, moist (nearshore deposit) grades to soft
LL=38 PI=11	41				6	¥	10			grades to medium stiff
Sieve - #200 = 58.2% Sieve	26	106			45		15		SP- SM	Whitish tan SAND (CORALLINE) with a little silt, medium dense (beach sand)
- #200 = 6.2%	25				52		20			grades to very dense
							25 30]		Boring terminated at 21.5 feet
							35	<u> </u>		Latitude: 20.8337582944844° N Longitude: 156.641990216532° W
Date Sta	rted:				16, 2016	6	J			Water Level: 10.5 ft. 11/16/2016 1326 HRS
Date Cor					16, 2016	6			Ţ,	
Logged E			B. Aiu							Drill Rig: CME-75DG1 (Energy Transfer Ratio = 80.3
Total Dep Work Ord			21.5 f 7378-							Drilling Method: 4" Solid Stem Auger & PQ Coring Driving Energy: 140 lb. wt., 30 in. drop
VVOIR OIL	JOI.		, 5, 6	00						Driving Energy: 170 ib. Wt., 00 iii. Grop

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