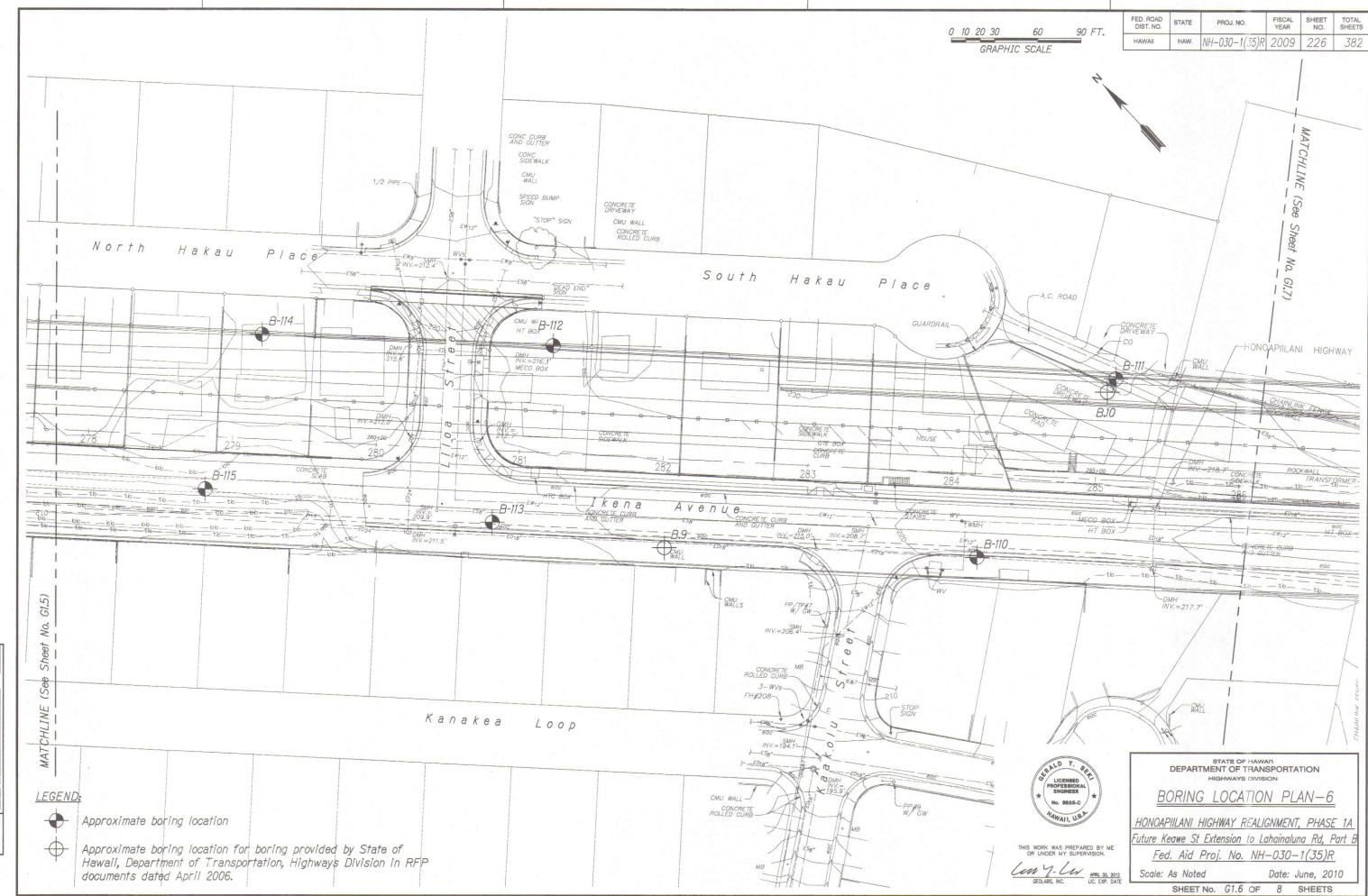
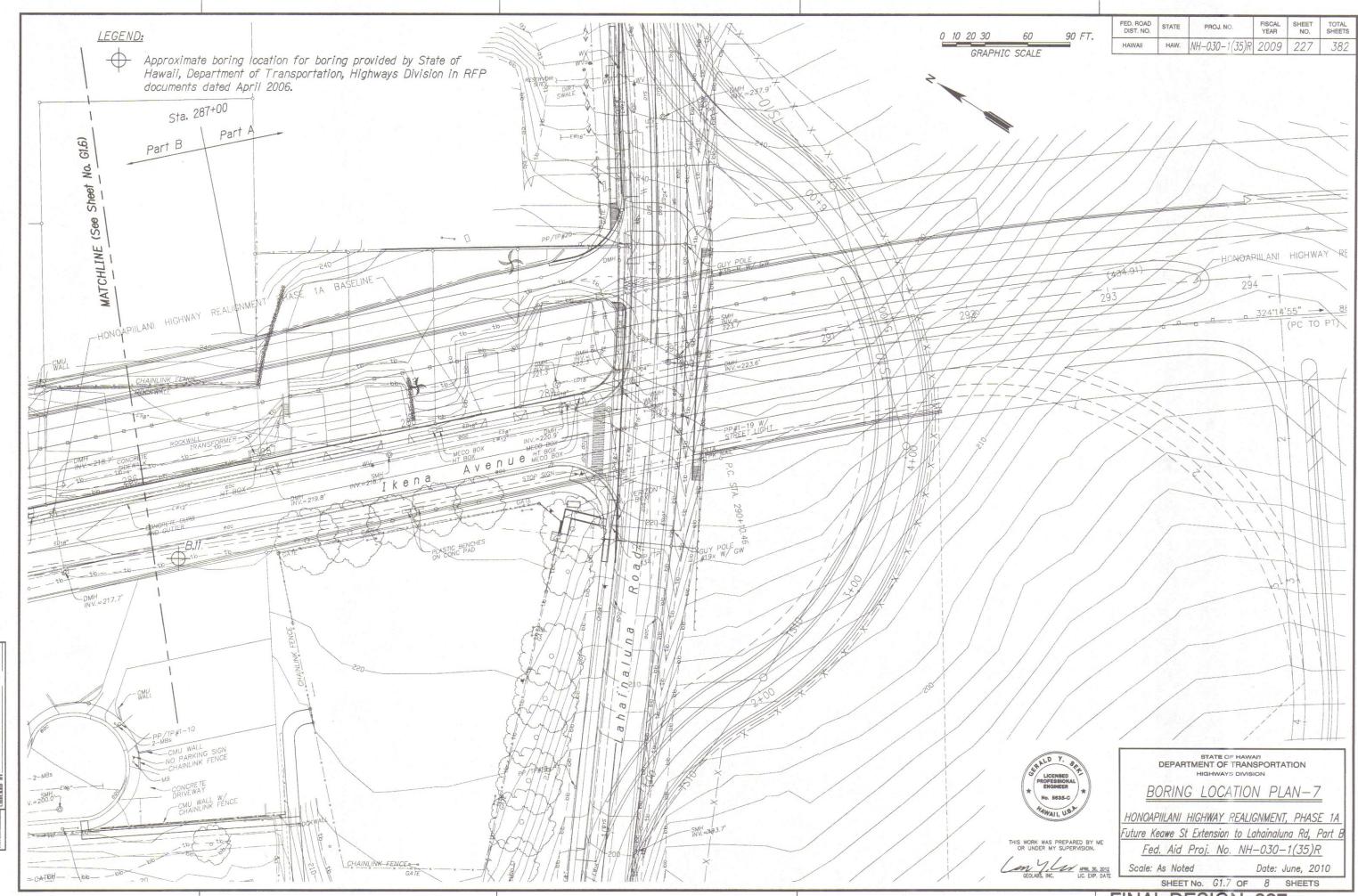


SURVEY PLOYTED
DRAWN BY
TRACED BY
QUANTITIES BY
CHECKED BY

ORIGINAL PLAN NOTE BOOK







GEOLABS, INC.

Geotechnical Engineering

# Soil Log Legend

#### UNIFIED SOIL CLASSIFICATION SYSTEM (USCS)

	MAJOR DIVISION	S	US	CS	TYPICAL DESCRIPTIONS
	ODAVEL C	CLEAN GRAVELS	0000	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
SOILS	MORE THAN 50% OF COARSE	GRAVELS WITH FINES	0000	GM	SILTY GRAVELS, GRAVEL-SAND-SILT MIXTURES
	FRACTION RETAINED ON NO. 4 SIEVE	MORE THAN 12% FINES	9 6 6 b	GC	CLAYEY GRAVELS, GRAVEL-SAND-CLAY MIXTURES
	CANDO	CLEAN SANDS	0	sw	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
MORE THAN 50% OF MATERIAL RETAINED ON NO. 200 SIEVE	SANDS	LESS THAN 5% FINES		SP	POORLY-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
	50% OR MORE OF COARSE FRACTION PASSING	SANDS WITH FINES		SM	SILTY SANDS, SAND-SILT MIXTURES
	THROUGH NO. 4 SIEVE	MORE THAN 12% FINES		SC	CLAYEY SANDS, SAND-CLAY MIXTURES
	011 70	2 -		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
				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	323			ОН	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
н	GHLY ORGANIC SO	OILS	7 77 7	PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS

(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

LI LIQUID LIMIT (NP=NON-PLASTIC)

PLASTICITY INDEX (NP=NON-PLASTIC)

TORVANE SHEAR (tsf)

POCKET PENETROMETER (tsf) UNCONFINED COMPRESSION (psi)

UNCONSOLIDATED UNDRAINED

TRIAXIAL COMPRESSION (ksf)

Plate

A-0.1



GEOLABS, INC.

Geotechnical Engineering

## Rock Log Legend

#### **ROCK DESCRIPTIONS**

1	BASALT		FINGER CORAL
9	BOULDERS		LIMESTONE
Δ Δ Δ	BRECCIA		SANDSTONE
× ,	CLINKER	× × × × × × × × × × × × × × × ×	SILTSTONE
000	COBBLES		TUFF
* *	CORAL		VOID/CAVITY

#### **ROCK DESCRIPTION SYSTEM**

#### **ROCK FRACTURE CHARACTERISTICS**

The following terms describe general fracture spacing of a rock:

Massive:

Slightly Fractured:

Greater than 24 inches apart 12 to 24 inches apart

Moderately Fractured:

6 to 12 inches apart

Closely Fractured:

3 to 6 inches apart

Severely Fractured:

Less than 3 inches apart

### DEGREE OF WEATHERING

The following terms describe the chemical weathering of a rock:

Unweathered:

Rock shows no sign of discoloration or loss of strength

Slightly Weathered:

Slight discoloration inwards from open fractures.

Moderately Weathered:

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

Highly Weathered:

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

Extremely Weathered:

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

Very Hard:

Medium Hard:

Soft:

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 rock volcanic rock

Hard:

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

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

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

Plate A-0.2

### GEOTECHNICAL NOTES

- 1. A geotechnical engineering report entitled "Geotechnical Engineering Exploration, Honoapiilani Highway Realignment, Phase 1A, Part B, Future Keawe Street Extension to Lahainaluna Road, Federal Aid Project No. NH-030-1(35)R, Lahaina, Maui, Hawaii" dated June 15, 2010 has been prepared by Geolabs, Inc. A copy of the report is on file at the office of the Engineer for review by the Contractor.
- 2. For boring locations, see Sheet Nos. G1.1 through
- 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.
- 5. The data given is for general information only. Bidders shall examine the site and the boring data and draw their own conclusions therefrom as to the character of materials to be encountered. The Engineer will not assume responsibility for variations of subsoil quality or conditions other than at the boring locations shown and at the time the borings were taken.



STATE OF HAWAIT DEPARTMENT OF TRANSPORTATION

BORING LOG LEGEND AND NOTES

HONOAPIILANI HIGHWAY REALIGNMENT. PHASE 1A Future Keawe St Extension to Lahainaluna Rd, Part B

Fed. Aid Proj. No. NH-030-1(35)R Scale: As Noted

Date: June, 2010

SHEET No. G2.0 OF 34 SHEETS



FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS	
HAWAII	HAW.	NH-030-1(35)R	2009	229	382	•

Str.		Geo	techi	nical	Engine	ering	1			LAHAINA, MAUI, HAWAII 110
Other Tests	sture tent (%)	Unit 3ht (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample Graphic	S	Approximate Ground Surface Elevation (feet MSL): 221 *
Othe	Nois	Neig Neig	Seco	SQL	Seni Resi blov	cock tsf)	Sept	Sam	uscs	Description
	1	U >	OE	<u> </u>		40	<u></u>	0,00	GP-	3-inch ASPHALTIC CONCRETE
	20	-			22		1	166	GM	Gray SANDY GRAVEL, dense, damp (fill)
							-			
UC=			96	75			5-	一行	IVII	Brown SILTY CLAY with sand and gravel, very
10000			45	7			٠-	100		stiff, moist (fill)
			45	1			- 1	200		Gray vesicular BASALT, moderately fractured,
							-	20		slightly weathered, hard (basalt formation)
							10-	20		Red and gray COBBLES AND GRAVEL
UC=			100	90			- 1	一气		(BASALTIC), dense (clinker)
5690							-	位		Gray vesicular BASALT, slightly fractured, slightly
							15-	竹		weathered, hard (basalt formation)
			400	07			13	1/2		Comment BAGALT BUILD COLOR BUILD
			100	97			-	写		Gray massive BASALT, slightly fractured, slightly
	2 2						- 1	1/-		weathered, hard (basalt formation)
							20-	17-1		
			55	20			1	39.4		Red and gray COBBLES AND GRAVEL
							1	Pood		(BASALTIC), dense (clinker)
							25	200		( control
			00	70			25-	000		
			93	78			-	17-		Gray vesicular BASALT, slightly to moderately
							1	1		fractured, moderately weathered, hard (basalt
							30-	17.1		formation)
										Boring terminated at 31 feet
							1			* Elevations estimated from Topographic Survey
							35-			Plan downloaded from Wilson Okamoto
										Corporation's ftp site on 7/28/08.
							-			Corporation's hip site on 1/20/00.
							40-			
							40			
							-			
							1			
			-				45-			
							1			
							-			
							FO			
							50-			
							1			
10.00							55-			
							1			
							1			
-05							60-			
3 - 2.0		-					001			
	- 1					1	-			
							1			
							65-			
							1			
							-			
							70			
							70-			
							-			
							75			
Date Sta			April 1				75_			Water Level:   ■ Not Encountered
Date Cor			April '		07					B.W.B.
Logged E			F. Me		-					Drill Rig: MOBILE B-53
Total De			31 fee		0					Drilling Method: 4" Auger & HQ Coring
Work Ord	der:		5401-	00&1	U					Driving Energy: 140 lb. wt., 30 in. drop

PHASE 1A, PART B

GEOLABS, INC.

Log of Boring

					3S, IN			Н	ONO	PAPIILANI HIGHWAY REALIGNMENT, PHASE 1A, PART B LAHAINA, MAUI, HAWAII 11	ng
Other Tests	isture	Dry Unit Weight (pcf)	e covery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample Graphic	cs	Approximate Ground Surface Elevation (feet MSL): 237 *	
₹	% O O	We	Cor	RO	Res (blc	Poc (tsf	Dep	Sar	nscs	Description	
								H	МН	4-inch CONCRETE	
	14				35			No.		Brown CLAYEY SILT, very stiff, moist (fill)	
				_			5-	1/-		Grayish brown BASALT, severely fractured, hig weathered, soft (saprolite)	hl
	-		313 100					- 13		Gray vugular BASALT, moderately fractured,	-
			100	00			-	1		slightly weathered, hard to very hard (basalt	
UC=							10-			formation)	
15500			83	0				- 法	1 020	Brownish gray vugular BASALT with some clink	e
			00	·			-	1		severely fractured, moderately weathered,	
							15-	济		medium hard to hard (basalt formation)	
			100	60				一沿			
							1	三		Gray vugular BASALT, moderately fractured,	
UC=							20-			slightly weathered, hard to very hard (basalt	
8370			97	40	3 -		-	答		formation)	
								這			
							25-	道			
			100	73			1	图		grades to dense	
UC=							20	度			
19200							30-	3			
							1			Boring terminated at 31.5 feet	
							35-				
							-				
							7				
							40-				
	110						]				
		-					-				
							45-				
							1		2		
							1				
							50-				
		. ***							120		
							1				
2				4.4			55-				
							-				
							60				
	- 14						60-				
	= =						1				
							65				
							-				
							-		Ē.		
							70-				
							. ]				
							-				
Data Ct	dad.		\ m x <sup>2</sup> 1 4	0 00	107		751			White Level or Net Engranded	_
Date Star Date Con			April 1 April 1			-				Water Level:   Not Encountered	
Logged E	By:	5	S. Lat	ronic			- 11/2	. 4		Drill Rig: MOBILE B-53	
Total Dep	oth:		31.5 fe	eet 00&1		(2)				Drilling Method: 4" Auger & HQ Coring Driving Energy: 140 lb. wt., 30 in. drop	



THIS WORK WAS PREPARED BY I

GEOLARS INC. LIC EXP. DA

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BORING LOGS - 1

HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A
Future Keawe St Extension to Lahainaluna Rd, Part B
Fed. Aid Proj. No. NH-030-1(35)R

Scale: As Noted

Date: June, 2010

SHEET No. G2.1 OF 34 SHEETS

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-030-1(35)R	2009	230	382

The state of the s	GEOLABS, INC.							Н	ONO	HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A, PART B					
Str. Carl	_				Engine	eering	1			LAHAINA, MAUI, HAWAII	112				
Other Tests	sture	Dry Unit Weight (pcf)	e overy (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample	SS	Approximate Ground Surface Elevation (feet MSL): 221 *					
Oth	Mois	Dry	Core	ROI	Res (blo	Poc (tsf)	Dep	San	HM	Description					
								- 13	МН	Brown CLAYEY SILT with gravel and cob	bles,				
	13				59					hard, damp (fill)					
	18				27		5			grades to very stiff majet					
	10				21			H		grades to very stiff, moist					
	14				18		10-								
							15	H	МН	Brown CLAYEY SILT, very stiff, moist (re	sidual				
UC=			100	100			10			Gray dense BASALT, slightly fractured,					
30000			00	73				位		unweathered, very hard (basalt formation	1)				
00000							20-	100		Grayish brown COBBLES AND GRAVEL	with				
			42	22				Poor		sand, dense (clinker)	AAICEI				
								700							
UC=							25			Gray vugular BASALT, moderately fracture slightly weathered, hard to very hard (bas	red,				
11900			81	29				常		formation)	oall				
							30-								
					2					Boring terminated at 30 feet					
							35								
							-								
							40-								
							40								
							45-								
					100										
							50-								
							-								
			8				55-								
							_								
							-			B.E. 1977 B. 1877 B. 1977 B. 1					
							60-								
							-								
							65-								
							00-								
							-								
							70-								
							-								
			8				-								
Date Sta	rted:		April	18, 20	007		75-			Water Level:   ■ Not Encountered					
Date Cor	nplete	ed:	April	18, 20	07										
Logged E			S. La	tronic						Drill Rig: MOBILE B-53 Drilling Method: 4" Auger & HQ Coring	to a large to the same property				
Work Ord				00&1	0					Driving Energy: 140 lb. wt., 30 in. drop					

GEOLABS, INC.

Log of Boring

HONOAPIILANI HIGHWAY REALIGNMENT,

	- 1	Geot	techi	nical	BS, IN	eering	9	IONO	PAPIILANI HIGHWAY REALIGNMENT, PHASE 1A, PART B LAHAINA, MAUI, HAWAII	Log of Boring 113
Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	ore ecovery (%	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet) Sample Granhic	USCS	Approximate Ground Surface Elevation (feet MSL): 217 * Description	
0	22 28	۵۶	Öœ	8	22	P. (13)	5	GP GM MH	3-inch ASPHALTIC CONCRETE Gray SANDY GRAVEL, dense, damp (fill)	
	37	80			11		10			
	27		60	7	30/1"		15		grades to very stiff to hard Gray BASALT, severely fractured, modera weathered, medium hard (basalt formatio	ately
			10	0			20-	No.	Gray and reddish brown COBBLES AND (BASALTIC), dense (clinker)	
			73	22			25- 8	n noise	Brown COBBLES AND GRAVEL (BASAL dense (clinker) Gray vugular BASALT, moderately fractur	
							35		slightly weathered, hard (basalt formation Boring terminated at 31 feet	
							40			
							45			
							50			
							55			
							60-			
							70			
Date Star	rted:		April 1	11, 20	007		75		Water Level:   Not Encountered	
Date Con Logged B	nplete	ed: /		11, 20					Drill Rig: MOBILE B-53	- 1



STATE OF HAWAI'I DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION

BORING LOGS - 2

HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A Future Keawe St Extension to Lahainaluna Rd, Part B

Fed. Aid Proj. No. NH-030-1(35)R

Scale: As Noted Date: June, 2010 SHEET No. G2.2 OF 34 SHEETS

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-030-1(35)R	2009	231	382

	GEOLABS, INC. Geotechnical Engineering							H	IONO	APIILANI HIGHW PHASE 1A, LAHAINA, MA		Log of Boring
Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample	nscs	Appro	eximate Ground Surface ation (feet MSL): 221 *	
Ŏ	<u>≥0</u>	٥٨	2 %	R	15	<u>R</u> \$		S	MH	stiff, moist (fill)	AY with sand and gravel	, very
	11		48	0	47		10-				oles ASALT, severely fracture (highly weathered basal	
			40	0	20/0" Ref.		15	10000000000000000000000000000000000000				
			53	0	15/0" Ref.		20	· · · · · · · · · · · · · · · · · · ·				
			68	0			25	作為各種		Brownish gray B	ASALT, severely fracture	d,
			42	0			30	10000000000000000000000000000000000000		slightly weathers with partially wel	ed, medium hard (basalt f lded clinkers)	ormation
			-		5		35			borning terminate	eu at 31.5 leet	
					in a second		40					
							45					
							50					
							55					
							65					
							70-					
	4 - 3		A 71	0.00	107		75-					
ate Star ate Con	nplete	ed: /	April 1 April 1	6, 20	07						Not Encountered	
ogged B			S. Lat 31.5 f								MOBILE B-53 4" Auger & HQ Coring	
Nork Ord			5401-		0					Driving Energy:	140 lb. wt., 30 in. drop	

					BS, IN			П	ONO	PHASE 1A		Log o Borin
S	1									LAHAINA, MA		115
Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample Graphic	CS	Appr Ele	roximate Ground Surface vation (feet MSL): 213 *	
ð	8	٤٥		RC	38	Po (ts)	De	Sa Sa Sa Sa	SOSO	Brown and gray dense, damp (f	Description / SILTY GRAVEL (BASAL	TIC),
			38	0			5-	一经		Brown and gray	r BASALT, severely fractued, hard (basalt formation	
			20	0	13/0" Ref.			· · · · · · · · · · · · · · · · · · ·		Light gray vesic	cular BASALT, severely fra nighly weathered, medium	actured,
			0	0			10-			naid (basait ioi	mation)	
	7		35	0	12/0" Ref.		15-	<b>以</b>				
			35	27			20-	你没		Light gray vesic	cular BASALT, moderately red, moderately weathere	to de bord
			35	12			25	(大) (大)		(basalt formation	ed, moderatery weathere on)	u, naru
							30	次-次-			sely to severely fractured	
							25			Boring terminat	ted at 31 feet	
							35-					
							40					
							45-					
							50					
							55					
							60					
							65					
							70-					
							75					
ate Star		ed: /	April 7 April 7	7, 200 7, 200	7					Water Level:	Not Encountered	
ogged E	Зу:	[	D. Sjo 31 fee	lund						Drill Rig:	MOBILE B-53	
otal Dep	der:			00&1			2.5			Drilling Method: Driving Energy:	4" Auger & HQ Coring 140 lb. wt., 30 in. drop	



THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BORING LOGS - 3

HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A Future Keawe St Extension to Lahainaluna Rd, Part B Fed. Aid Proj. No. NH-030-1(35)R

Scale: As Noted

Date: June, 2010

SHEET NO. G2.3 OF 34 SHEETS
FINAL DESIGN 231

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-030-1(35)R	2009	232	382

		GEC Geotech		BS, IN I Engine			Н	ONO	APIILANI HIGHWAY REALIGNMENT, PHASE 1A, PART B LAHAINA, MAUI, HAWAII	Log of Boring
Other Tests	Moisture Content (%)	Dry Unit Weight (pcf) Core	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample Graphic	SS	Approximate Ground Surface Elevation (feet MSL): 224 *	
d <del>t</del>	Moi	Wei	RO	Res (blo	Poc (tsf)	Dep	San	nscs	Description	
		12						МН	4-inch CONCRETE	
	20	67	0	50/2" Ref.			000		Brown SILTY CLAY, stiff, moist (fill) Brownish gray COBBLES AND GRAVEL	AND
		01		T.OI.		5	100		BOULDER with sand, very dense, damp	AND
UC=		72	0				1 80		(fill/colluvium)	
21400									Brownish gray BASALT, severely fracture	d high
						10			weathered, hard (highly weathered basalt	t)
		50	0							
						15	一方			
		40	0			10	上位			
		40	0							
						20				
		60	10	20/0"			1			
				Ref.						
						25	国			
		47	12		25					
						30				
UC= 12100						30	1.23		Paring terminated at 21 5 feet	
12100									Boring terminated at 31.5 feet	
						35				
						40				
						40				
						45				
100				-						
						50				
				-		55-				
						60				
						G.F.				
						65				
						70-				
Date Sta	rted:	April	16, 2	007		75-			Water Level:   ■ Not Encountered	
Date Cor	mplete	d: April	16, 2	007						
Logged Formal Total De		S. La 31.5	atronic feet	:		-			Drill Rig: MOBILE B-53 Drilling Method: 4" Auger & HQ Coring	
Work Or	der		-00&1	10					Driving Energy: 140 lb. wt., 30 in. drop	-

					BS, IN		9	Н	IONO	PAPIILANI HIGHWAY REALIGNMENT, PHASE 1A, PART B LAHAINA, MAUI, HAWAII  LAHAINA, MAUI, HAWAII
Other Tests	isture ntent (%)	/ Unit	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	mple	SOSO MH GM	
₹	SO	N N	Co.	RO	Re. (blc	Poc (tsf	De	Sar	NS NS	Description
					13/0" Ref.			- 95	MH GM	Brown CLAYEY SILT, stiff, moist (fill) Dark brown and gray SILTY GRAVEL (BASALTIC with cobbles, dense, moist (fill/colluvium)
	5		100 23	0	30/2" Ref.		5			Light gray vesicular BASALT, severely fractured, moderately weathered, medium hard to hard (basalt formation)
			20	0			10-	(水)		(basait formation)
	1		49	0	19/2" Ref.		15	<b>公公公公</b>		
			93	93			20		,	Light gray slightly vesicular BASALT, massive,
							25-			slightly weathered, very hard (basalt formation)
			43	10			30-	孩		Light gray vesicular BASALT, moderately to severely fractured, moderately weathered, hard (basalt formation)
										Boring terminated at 31 feet
							35			
							40			
							45			
							50			
							55			
							60			
							65			
							70-			
							75-			
Date Star			April 7							Water Level:   ■ Not Encountered
Date Con Logged E			April 7							Drill Rig: MOBILE B-53
Total Dep			31 fee		49 × 50		neid w	-		Drilling Method: 4" Auger & HQ Coring
Work Ord				-00&1	0			2.39	E 5 - 119	Driving Energy: 140 lb. wt., 30 in. drop



GEOLABS, INC. LIC. EXP. DATE

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION

BORING LOGS - 4

HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A Future Keawe St Extension to Lahainaluna Rd, Part B Fed. Aid Proj. No. NH-030-1(35)R

Date: June, 2010

SHEET No. G2.4 OF 34 SHEETS

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-030-1(35)R	2009	233	382

					BS, IN Engine			Н	ONO	APIILANI HIGH\ PHASE 1A LAHAINA, MA		Log of Boring
Other Tests	Moisture Content (%)			RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample Graphic	S	Appr	roximate Ground Surface vation (feet MSL): 220 *	
Oth	Moi	Dry	Core	ROI	Pen Res (blo	Poc (tsf)	Dep	San	uscs		Description	
	13	101		0	57/6" +50/4" Ref. 50/6"	>4.5	5	X	MH	damp (fill/colluv	LAY with gravel and cobb vium) severely fractured, mode ed, medium hard to hard	rately to
			22	0	Ref. 20/0" Ref. 20/0"		10			formation)	eu, medium naru to naru	(Dasait
	22		25	0	Ref. 50/2" Ref.		15	▼ 注 注 注				
	11		37	0	60/6" Ref.		20					
			22	0	20/0" Ref.		25					
	2		36	0	50/5" Ref.		30	トルイン・シーン				
			67	23			35			Boring termina	ted at 36 feet	
							40	-				
	12						45					
							50	-				
							55					
							60					
							65					
							70					
							75	1				-
Date Sta			April					7. 1000		Water Level:	Not Encountered	
	mplet		April								1100U E D 50	
Date Cor Logged I			S. La	tronic	;					Drill Rig:	MOBILE B-53	

					BS, IN		Н	IONO	APIILANI HIGHWAY REALIGNMENT, PHASE 1A, PART B LAHAINA, MAUI, HAWAII  LAHAINA, MAUI, HAWAII
Other Tests		Dry Unit Weight (pcf)			Penetration Resistance (blows/foot)	et	Sample	H	Approximate Ground Surface Elevation (feet MSL): 221 *  Description
			83 63	0	20/0" Ref. 20/0" Ref.	5	100 g 70 g 000	MH	Brown CLAYEY SILT with gravel and cobbles, very stiff, damp (fill) Brownish gray COBBLES AND GRAVEL (BASALTIC) with occasional boulders, very dense, dry (fill/colluvium)
	39		40	0	50/4" Ref.	10		SP	Reddish brown CEMENTED SAND with silt and gravel, very dense (weathered clinker)
			68	40	20/0" Ref.	15			Brownish gray BASALT, severely fractured, moderately weathered, medium hard to hard (basalt formation)
UC= 280			92	52		25	1000000		Gray vugular BASALT, moderately fractured, slightly weathered, hard to very hard (basalt formation)  Brownish gray and red BASALT, closely fractured,
			95	28		30	できた。		highly weathered, medium hard (basalt formation with welded clinker) Gray vugular BASALT, closely fractured,
UC= 8050			65	40		35	1-11-10		unweathered to slightly weathered, hard to very hard (basalt formation)  Grayish brown and red GRAVEL AND COBBLES, medium dense (clinker)
UC=			70	53		40	- 1.7.7.7 S	GP	Gray vugular BASALT, moderately fractured, unweathered, hard to very hard (basalt formation) Grayish brown GRAVEL with some cobbles, dense
6550			27	0		45		Gr	(clinker)
			66	17	20/0" Ref.	50	000		Gray dense BASALT, closely fractured, unweathered, very hard (basalt formation)
			73	0		55	7.7.7.80		grades to severely fractured  Brownish gray and red COBBLES AND GRAVEL
			48	0		60	70000		with some sand, medium dense to dense (clinker)
UC=			85	48		65	109%-X-		Gray dense BASALT, moderately fractured, unweathered, hard to very hard (basalt formation)
2900			45	8		70	30		Brownish gray COBBLES AND GRAVEL with some sand, medium dense to dense (clinker)
			100			75	は		
Date Sta Date Co Logged I	mplet	ed:	April April S. La	5, 20	07				Water Level:   Not Encountered  Drill Rig: MOBILE B-53
Total De			101.5 5401	feet					Drilling Method: 4" Auger & HQ Coring Driving Energy: 140 lb. wt., 30 in. drop



STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BORING LOGS - 5

HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A Future Keawe St Extension to Lahainaluna Rd, Part B Fed. Aid Proj. No. NH-030-1(35)R

Date: June, 2010

SHEET No. G2.5 OF 34 SHEETS

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-030-1(35)R	2009	234	382

The state of the s	GEOLABS, INC.					IC.	PHASE 1A. PART B						
A STATE OF THE STA	(	Geot	echi	nical	Engine	ering				LAHAINA, MAUI, HAWAII	119		
sts	(%)	(Joc	(%)		ion ce ot)	en.	et)						
Other Tests	Moisture Content (%)	hit (	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample Graphic	S	(Continued from previous plate)			
othe	ont	Veig	ore	COD	ene	sf)	ept	am	nscs	Description			
0	20		OK	OZ.	TES	T E		000	)	Gray coarsely vesicular BASALT, modera	itely		
			65	17			00	1000		fractured, unweathered, hard to very hard formation)	d (basal		
			92	15			80			Brownish gray GRAVEL AND COBBLES, (clinker) Gray vugular BASALT, closely fractured,	dense		
			53	38			85	160		unweathered, very hard (basalt formation	)		
			55	30			90	- 508		Grayish brown GRAVEL AND COBBLES, dense (clinker)	mediur		
			25	0				000000					
			68	35			95	1000					
							100			Gray vesicular BASALT, moderately fracti slightly to moderately weathered, medium hard (basalt formation)	ured, n hard to		
							105			Boring terminated at 101.5 feet			
							110						
							115						
							120						
							125						
							130						
							135						
								-					
							140	-					
							145						
							150	-					
Date Sta Date Cor			April April				150			Water Level:   ■ Not Encountered			
Logged E	Зу:		S. La	tronic		12 - S				Drill Rig: MOBILE B-53			
Total De	pth:		101.5	feet -00&1						Drilling Method: 4" Auger & HQ Coring Driving Energy: 140 lb. wt., 30 in. drop			

					BS, IN Engine			H	ONO	APIILANI HIGHWAY REALIGNMENT, PHASE 1A, PART B LAHAINA, MAUI, HAWAII	Log of Boring
Other Tests	isture	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample	H	Approximate Ground Surface Elevation (feet MSL): 218 *	
\$	800	Ne S	Cor	RO	Re (blc	Poor (tsf	Del	Sar	ns	Description	
	17				25/1" Ref.				МН	Brown CLAYEY SILT with gravel and cobboulder, very stiff to hard, damp (fill/collu	
	6		07	40	50/4"		5			D	
			87	46	Ref.	3.40		1	SP	Brownish gray BASALT, moderately fract moderately weathered, hard (basalt form	
	-						10		01	Gray and reddish brown CEMENTED SA	ND AND
UC=			22	0				H		GRAVEL, medium hard to hard (welded	
7500								16		C. DAGALT	atura d
		1100					15			Gray BASALT, moderately to severely fra moderately weathered, hard (basalt form	
			80	51	50/5"			i i		moderatery weathered, hard (basait form	ation)
UC=					Ref.		20	- 2			
2800			0.5	00			20	- 5	SP	Reddish brown CEMENTED SAND AND	
			65	20						GRAVEL, medium hard (welded clinker) Gray BASALT, moderately to severely fra	etured
UC=							25		-	moderately weathered, hard (basalt form	
7930			60	32				H			,
			00	-							
							30				
			75	30				H			
							0.5		1		
							35	1	-		
			68	0							
							40				
			50	0				H			
			00								
							45				
UC=	-		65	30				15		Gray vugular BASALT with clinker layers,	
7220	- 1						F0			moderately fractured, slightly weathered,	hard
				00			50			(basalt formation)	
			57	22				16			
							55		1		
		1,50	73	37				H	1	Considerate DACALT alassis fronts	
		4	, 0	31				10		Gray dense BASALT, closely fractured, unweathered, very hard (basalt formation	1)
							60	13		dimediated, very flate (basalt formation	9
			58	20				15			
							0-			B. I.I. ABAUM AND AARS TO	4-
							65	100	9	Brownish gray GRAVEL AND COBBLES (clinker)	dense
			30	0				1 70	1	(Cilikel)	
							70	80	200		
	- 61	5. 5	27	0	20/0"			He	9		
			37	0	Ref.			- Ros	P		
Date Ot-	unter al.		A mail	2 200	77		75		Υ	Water Level:     Not Encountered	
Date Sta Date Co			April April							Water Level:   Not Encountered	11
Logged	Ву:		S. La	tronic						Drill Rig: MOBILE B-53	
Total De Work Or			101.5 5401		10			7		Drilling Method: 4" Auger & 4" Casing, HQ Cor Driving Energy: 140 lb. wt., 30 in. drop	ing
JOIK UI	uer:		2407	-UU&1	U					Driving Energy. 140 lb. Wt., 30 ln. drop	



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

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BORING LOGS - 6

HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A Future Keawe St Extension to Lahainaluna Rd, Part B Fed. Aid Proj. No. NH-030-1(35)R

Scale: As Noted

As Noted Date: June, 2010
SHEET No. G2.6 OF 34 SHEETS

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-030-1(35)R	2009	235	382

					Engine			PHASE 1A, PART B LAHAINA, MAUI, HAWAII						
ssts	%	Dry Unit Weight (pcf)	(%)	_	tion nce nce	Jen.	eet)							
Other Tests	sture	Unit 3ht (	very	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample Graphic	S	(Co	ontinued from previous plate)			
Othe	Mois	Neig	Sore	ROL	Resi (blov	Pocl (tsf)	Dep	Sarr	USCS		Description			
								1 68						
			52	0				100						
							80-	1		Gray scoriaceo	us BASALT, severely fr	actured,		
1200			97	58				H <sub>(X)</sub>		unweathered, I	hard (basalt formation)			
			91	50						Over deves we	mulas DACALT madasat	alı.		
							85	图		fractured unwe	gular BASALT, moderat eathered, very hard (bas	eiy		
			93	47				上沒		formation)	odarorod, rory ridia (od	Juli 1		
								12						
							90-			1 1 2 1 2 1 2 1 1				
-			60	33				80			GRAVEL AND COBBLE	ES, dense		
							95	1,0		(clinker)	icular to scoriaceous BA	CALT		
			07	0			30	增		severely fractu	red, unweathered, hard	(basalt		
			67	0						formation)	roa, armounioroa, nara	(500011		
							100							
										Boring termina	ted at 101.5 feet			
							105							
										4 4 1				
							140							
							110-			1 2 2				
							115-							
					=		120-							
							-							
							105							
		-					125							
							-							
							130-							
							135-							
							140-							
										0 - 117				
							145-							
							170							
							150-							
Date Sta			April 3							Water Level:	Not Encountered			
Date Cor Logged E			April 4 S. La							Drill Rig:	MOBILE B-53			
Total Dep	oth:		101.5	feet						Drilling Method:	4" Auger & 4" Casing, HQ (	Coring		
Work Ord	der:		5401-	00&1	0					Driving Energy:	140 lb. wt., 30 in. drop			

HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A, PART B

GEOLABS, INC.

Log of Boring

		Geo	techi	nical	BS, IN Engine		,	П	ONO	APIILANI HIGHWAY REALIGNMENT, PHASE 1A, PART B LAHAINA, MAUI, HAWAII  12'	
Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample Graphic	MSCS	Approximate Ground Surface Elevation (feet MSL): 216 * Description	
0	8		OR	œ	15	T S		N	SM	Brown SILTY SAND with gravels and cobbles ar boulder, medium dense, damp (fill/colluvium)	nd
			7	0	40/4"		5	三次公众		Brownish gray BASALT, severely fractured, moderately to highly weathered, medium hard to soft (basalt formation)	o
			43	28							
			35	0			15-	以次次次 2000年		Gray BASALT, closely fractured, moderately to slightly weathered, hard (basalt formation)	
UC= 7940			97	53			25	经验		Gray vesicular BASALT, slightly fractured, slightly weathered, hard (basalt formation)	ly
1340			72	58			30				
UC= 4440			83	78			35	000	GP	Red and gray GRAVEL (BASALTIC), dense (clinker) Gray vugular BASALT, slightly fractured, slightly	
			82	72				水水水		weathered, hard (basalt formation)	
			30	0			40-			Red and gray vesicular BASALT, severely fractured, moderately weathered, medium hard (basalt formation)	
			40	33			50-	N. 75.55		Gray vesicular BASALT, moderately fractured, slightly weathered, hard (basalt formation)	
UC= 5290			100	93			55	10000000000000000000000000000000000000		Gray vugular BASALT, slightly fractured, slightly weathered, hard (basalt formation)	
UC= 21600			97	75			60	- K-K-K-K			
			70	45			65	17.77.77.		Red and gray vesicular BASALT, severely	
			75	20			70-	是法法		fractured, highly weathered, soft to medium hard (basalt formation)	j
			73	53			75-			Gray vugular BASALT, moderately fractured, unweathered, hard to very hard (basalt formation	n)
Date Sta			April '				10			Water Level:   Not Encountered	
Date Col Logged I			April ' F. Me		007 S. Latro	nic				Drill Rig: MOBILE B-53	
Total De			102 fe		0					Drilling Method: 4" Auger & HQ Coring	
Work Or	uer.		5401-	UUAT	U		1			Driving Energy: 140 lb. wt., 30 in. drop	



GEOLABS, INC. APRIL 30, 2012

GEOLABS, INC. LIC. EXP. DATE

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BORING LOGS - 7

HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A Future Keawe St Extension to Lahainaluna Rd, Part B

Fed. Aid Proj. No. NH-030-1(35)R

Scale: As Noted Date: June, 2010 SHEET No. G2.7 OF 34 SHEETS

	FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
ŀ	HAWAII	HAW.	NH-030-1(35)R	2009	236	382

					BS, IN Engine			H	ONO	APIILANI HIGHV PHASE 1A LAHAINA, MA		Log of Boring 121
\$ 1										LATAINA, IVIA	NOI, HAVVAII	121
Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	(%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	0.0				
Je	istu	J. Chi	cove	RQD (%)	sist	cke	pth	Sample Graphic	nscs	(Co	ntinued from previous plate)	
#0	W <sub>o</sub> i Coi	We Ne	Cor	RO	Re:	Po (tsf	De	Sa	ns		Description	
							-	谷				
			43	8			80-	368		Brownish gray C sand, dense (cl	COBBLES AND GRAVEL inker)	. with
			62	32			-	00000				
			60	25			85			Gray dense vug fractured, unwe formation)	ular BASALT, moderately athered, very hard (basa	y It
			33	0			90-	<b>多</b>		Reddish brown s fractured, mode	scoriaceous BASALT, se erately to highly weathere pasalt formation)	verely d, soft to
							95	7.		(		
			55	0			100					
										Boring terminat	ed at 102 feet	
							105					
						1	110-					
						1	115-					
						1	20-					
							125					
							25-					
						1	30-					
						1	35					
			- 1			1	40-					
						- Ton	45					
						1	50-					
Date Star			April '	12, 20	07		20/20/			Water Level:	Not Encountered	
Date Con		ed:	April	16, 20	007 S. Latror	nic				Drill Rig:	MOBILE B-53	
Logged E Total Dep			102 fe	eet	J. Lation	110				Drilling Method:	4" Auger & HQ Coring	
Work Ord			5401	00&1	0					Driving Energy:	140 lb. wt., 30 in. drop	

					BS, IN Engine		,	Н	IONO	APIILANI HIGHWAY REALIGNMENT, PHASE 1A, PART B LAHAINA, MAUI, HAWAII	Log of Boring
Other Tests	isture ntent (%)	Dry Unit Weight (pcf)	covery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample	HM	Approximate Ground Surface Elevation (feet MSL): 214 *	
ŧ	\$0	₽ Ve N	Cor	RO	Pel (bld	Po (tsf	De	Sal	Sn	Description	
	1				50/5"				МН	Tan-brown CLAYEY SILT with sand and gra and cobbles, dense, dry (fill/colluvium)	avel
	35		67 22	0	30/1"		10			Gray BASALT, severely fractured, highly weathered, soft to medium hard (highly weathered)	athered
UC= 6740	2		40	25	30/1"		15				
			52	18			20	华汉公公		Grayish brown vesicular BASALT, severely closely fractured, moderately weathered, moderate to hard (basalt formation)	
			67	47			25	10000000000000000000000000000000000000		Gray vesicular BASALT, severely to modera fractured, moderately weathered, hard (basiformation)	itely alt
UC= 18700			70	15			30	000	GP	Red and gray GRAVEL (BASALTIC), dense (clinker)	
			63	15			35	000		Gray vesicular BASALT, severely to modera fractured, moderately weathered, hard (basi formation)	
			88	48			40			Gray vesicular BASALT, moderately fracture moderately weathered, hard (basalt formation)	
			100	52			45			Grayish brown vesicular BASALT, moderate severely fractured, moderately weathered, h (basalt formation)	
			100	55						grades to moderately fractured	
			100	68			50	沙沙安		Gray BASALT, massive, slightly weathered,	hard
UC= 16000			52	52			55	作为论		(basalt formation)	naru
			32	0			60	10 X X X		Reddish gray vesicular BASALT, severely	
							65	作公外		fractured, moderately weathered, medium h (basalt formation)	ard
			100	78			70	松沙沙		Gray vesicular BASALT, moderately fracture slightly weathered, hard (basalt formation)	ed,
			93	47			75	となる。			
Date Sta	mplete	ed: /	April April	12, 20			15:			Water Level:  Not Encountered  Drill Rig: MOBILE B-53	
Logged I			F. Me 101.5							Drill Rig: MOBILE B-53 Drilling Method: 4" Auger & HQ Coring	
Work Or				00&1	0					Driving Energy: 140 lb. wt., 30 in. drop	



STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BORING LOGS - 8

HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A Future Keawe St Extension to Lahainaluna Rd, Part B

Fed. Aid Proj. No. NH-030-1(35)R

Scale: As Noted

Date: June, 2010 SHEET No. G2.8 OF 34 SHEETS

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-030-1(35)R	2009	237	382

					BS, IN		,	Н	ONO	APIILANI HIGH PHASE 1A LAHAINA, M	WAY REALIGNMENT, A, PART B AUI. HAWAII	Log of Boring
sts	8	C	%)		ion (ce	en.	et)	П				
Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample Graphic	S	(Co	ontinued from previous plate)	
Othe	Aois	Jry (	Sore	SQD	Sesi Sesi	ock (st)	)ept	Sam	nscs	(0)	Description	
U	20	>			TIE-	H.E.		0)		Brown BASALT	with cinder, moderately	fractured
			30	20			80			moderately we formation with	athered, medium hard (ba	asalt
			100	62			80	茶浴		Gray vesicular slightly weathe	BASALT, moderately frac red, hard (basalt formatio	ctured, on)
							85					
			20	0				000	GP		GRAVEL (BASALTIC), de	nse
							00	000		(clinker)		
			E2	0			90-	1000				
			53	0				000				
							95	000				
			83	65				000				1
							100-	位		Gray vesicular	BASALT, slightly fracture d (basalt formation)	d, slightly
								15			ted at 101.5 feet	
										Donnig termina	iod at 101.0 lect	
							105					
			1									
							110-					
							115-					
							-					
							120-					
							-					
							125-					
							-					
							-					
							130-					
							-					
							135-					
							-					
							140					
							140-					
							-					
						1	145					
							150-					
Date Sta			April							Water Level:    ▼	Not Encountered	-
Date Cor Logged 6	Ву:		April F. Me	eyer	JU /					Drill Rig:	MOBILE B-53	
Total De	pth:		101.5	feet	0					Drilling Method:	4" Auger & HQ Coring	
	pth:			feet	0							

		Geot	techi		BS, IN Engine	ering		HONC	PAPIILANI HIGHWAY REALIGNMENT, PHASE 1A, PART B LAHAINA, MAUI, HAWAII  LAHAINA, MAUI, HAWAII  123
Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	H USCS	Approximate Ground Surface Elevation (feet MSL): 213 * Description
	7 29		67 50	0 0	50/4" Ref. 20/0" Ref. 50/4" Ref.		10	SP	Brown CLAYEY SILT with gravel and cobbles, very stiff to hard, damp (fill/colluvium) Brownish gray COBBLES AND BOULDERS (BASALTIC) with sand, very dense, damp (fill/colluvium) Gray and reddish brown CEMENTED SAND AN GRAVEL, medium hard to hard (welded clinker)
UC= 9940			88	60 70	20/0" Ref.		20-		Gray BASALT, moderately fractured, moderately weathered, hard (basalt formation)  Gray vugular BASALT, slightly fractured,
UC= 9340			63	18			25	1888	unweathered, very hard (basalt formation)  Grayish brown COBBLES AND GRAVEL, mediu dense to dense (clinker)
							30-		Gray dense BASALT, closely fractured, slightly weathered, hard to very hard (basalt formation) Boring terminated at 31.5 feet
							40-		
							45		
							55-		
							60-		
							65		
							70		
Date Sta			April 5	, 200	7		13		Water Level:   ■ Not Encountered
Date Cor		ed: /	April 6	, 200	7				
Logged E			3. Lat 31.5 fe						Drill Rig: MOBILE B-53 Drilling Method: 4" Auger & HQ Coring
Total Dep	<b>1177.</b>								



STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BORING LOGS - 9

HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A Future Keawe St Extension to Lahainaluna Rd, Part B Fed. Aid Proj. No. NH-030-1(35)R

Scale: As Noted

Date: June, 2010

SHEET No. G2.9 OF 34 SHEETS

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-030-1(35)R	2009	238	382

949	GEOLABS, INC.  Geotechnical Engineering  HONOAPIILANI HIGHWAY REALIGNMENT PHASE 1A, PART B LAHAINA, MAUI, HAWAII				A, PART B	Log of Boring						
Other Tests	Moisture Content (%)		Core Recovery (%)		Penetration Resistance (blows/foot)		et	Sample	S	Аррі	roximate Ground Surface vation (feet MSL): 233 *	
Othe	Mois	Dry	Core	ROL	Res (blov	Poc (tsf)	Dep	Sarr	H		Description	
									МН	soil)	/ SILT, very stiff, damp (re	
UC=	8		100 93	67 67	62/6" Ref.		5	不是			gular BASALT, moderately eathered to slightly weather mation)	
16300 UC=				0,			10			Gray vugular B	ASALT, moderately fractu	red,
8650	10		100	17	0.5.(0)		15			Reddish brown	red, hard (basalt formation CEMENTED VOLCANIC ed, moderately weathered, olcanic tuff)	ASH,
	19		74	0	65/6" Ref.		20	7.67.47.33		Brown to gray E	BASALT, severely fracture nighly weathered, soft to n	ed, nedium
			73	8			25	沙沙				
							30-	1 3/2		Boring termina	ted at 27 feet	
							30					
							35					
							40					
	2						45					
							50					
							55					
							60					
							65					
							70-					
							75-					2
Date Star			April 2				10-			Water Level:	Not Encountered	
Date Con Logged B			April 2 S. Lat	tronic						Drill Rig:	MOBILE B-53	
Total Dep Work Ord			27 fee 5401-		^					Drilling Method: Driving Energy:	4" Auger & HQ Coring 140 lb. wt., 30 in. drop	

	- 1	Geot	echi	nical	BS, IN Engine		,	HONO	APIILANI HIGHWAY REALIGNMENT, PHASE 1A, PART B LAHAINA, MAUI, HAWAII	Log of Boring
Other Tests	oisture	Dry Unit Weight (pcf)	ore scovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample Graphic MUSCS	Approximate Ground Surface Elevation (feet MSL): 225 *	
ō	ŽŬ	٥٤	28	N.	9 % G	Pc (ts	Ď	Ø Ø S MH	Description Brown CLAYEY SILT, very stiff, damp (re	sidual
			69	58				08	soil)	
							5		Brownish gray COBBLES AND GRAVEL sand, very dense (clinker)	With
			85	65				200	Gray vugular BASALT, moderately fracture	
							10		slightly weathered, hard to very hard (bas formation)	salt
			67	0			10		Grayish brown COBBLES AND GRAVEL	with
	8 8	N. 12		x - 1 - 1					sand, dense (clinker) Gray vugular BASALT, moderately fractui	red
UC=			50	0			15		unweathered, hard to very hard (basalt for	rmation)
10000			30	U					Reddish brown CEMENTED VOLCANIC AND CLINKER, closely fractured, modera	
							20		weathered, medium hard (volcanic tuff)	atery
	45		86	0	105			<u> </u>		
			00	Ů			25	000	Reddish brown COBBLES AND GRAVEL sand, dense (clinker)	with
UC=			65	20				急	Brownish gray vugular BASALT, closely fi	
330							30-	- 2	moderately to highly weathered, soft to m hard (basalt formation)	iedium
			50	0			30	一位		
									Reddish brown CEMENTED ASH AND C closely fractured, moderately to highly we	
			10	0			35	1,72	soft to medium hard (volcanic tuff)	
			40	8				验	Brownish gray vugular BASALT, closely to severely fractured, moderately to highly	)
							40-	(2)	weathered, soft to medium hard (basalt for	ormation)
			83	50				2. 32	Gray dense vugular BASALT, slightly frac	tured.
UC= 5540							45-	於	unweathered, very hard (basalt formation	
	2.7		60	27				位		
								300	Brownish gray COBBLES AND GRAVEL and silt, dense (partially welded clinker)	with sand
			97	55			50-	700		
								新	Gray vugular BASALT, slightly to moderate fractured, unweathered, very hard (basalt	
110-			100	00			55-	13	formation)	
UC= 6520			100	90				身		
							60-	震		
			83	53						
							65-	1		
			30	0			-	H of	Brownish gray COBBLES AND GRAVEL sand, dense (clinker)	with
							70	200		
			53	23			70-	0000		
								980		
Date Sta	rted.		April	19, 20	007		75-		Water Level:   Not Encountered	
Date Cor	mplet	ed: /	April 1	19, 20	07					
Logged E Total Dep			3. Lat 94 fee	ronic et					Drill Rig: MOBILE B-53 Drilling Method: 4" Auger & HQ Coring	
Work Ord	der:		5401-	00&1	0				Driving Energy: 140 lb. wt., 30 in. drop	



STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BORING LOGS - 10

HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A Future Keawe St Extension to Lahainaluna Rd, Part B

Fed. Aid Proj. No. NH-030-1(35)R

Scale: As Noted Date: June, 2010

SHEET No. 2.10 OF 34 SHEETS



FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-030-1(35)R	2009	239	382

Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample Graphic	nscs	(Continued from previous plate)  Description
			95	73			_			Gray vugular BASALT, slightly to moderately fractured, unweathered, very hard (basalt formation)
			52	10			80	2/2/2		Gray vesicular BASALT, closely fractured, slightly weathered, hard (pahoehoe basalt formation)
			60	22			85	) 68 ) 64		Reddish brown CEMENTED ASH AND CINDER, severely fractured, moderately weathered,
			0	0			90	八八八 • • • • • • • • • • • • • • • • • •		medium hard (volcanic tuff) Brownish gray COBBLES AND GRAVEL with sand, dense (clinker) Gray vugular BASALT, unweathered, hard to very
							95	000		hard (basalt formation) Grayish brown GRAVEL AND COBBLES with sand, medium dense (clinker)
							100			Boring terminated at 94 feet
							105			
							110			
							115			
							120			
							125			
							130		=	
							135			
							140			
							145			
							150-			
Date Star			April 1							Water Level:   Not Encountered
Date Cor Logged E			April 1 S. Lat							Drill Rig: MOBILE B-53
Total Dep		(	94 fee	et						Drilling Method: 4" Auger & HQ Coring
Work Ord	der:		5401-	00&1	0					Driving Energy: 140 lb. wt., 30 in. drop

GEOLABS, INC.

Geotechnical Engineering

Log of Boring

125

HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A, PART B LAHAINA, MAUI, HAWAII

					BS, IN Engine		,	HONO	APIILANI HIGHWAY REALIGNMENT, PHASE 1A, PART B LAHAINA, MAUI, HAWAII	Log of Boring
Other Tests	Moisture Content (%)				Penetration Resistance (blows/foot)		Depth (feet)	Sample Graphic USCS	Approximate Ground Surface Elevation (feet MSL): 226 *	120
Oth	Moi	Dry	Core	ROI	Res (blo	Poc (tsf)	Dep	Sample Graphi USCS	Description	
								- MH		esidual
UC= 4800			72	72			5		soil) Gray vugular BASALT, moderately fractuunweathered, very hard (basalt formation	
			70	40				H. (2)		
UC= 8300							10	100	Brownish gray COBBLES AND GRAVEL sand, dense (clinker)	
UC=			78	43				1 (3)	Gray vugular BASALT, moderately fractu	
9760							15		slightly weathered, hard (basalt formation Reddish brown CEMENTED VOLCANIC	
	32		75	0	60/4" Ref.		13		AND CINDER, closely fractured, slightly moderately weathered, medium hard to l	to
	15.5				Rei.		20		(volcanic tuff)	
			72	8					Brownish gray BASALT, severely fracture moderately to highly weathered, soft to n	
							25		hard (basalt formation)	
UC=			100	53				: 協	Gray vugular BASALT, moderately fractu slightly weathered, hard (basalt formation	
3800							30	- 12	slightly weathered, flaid (basait formation	1)
			57	0			30			
			50	10			35		Reddish brown CEMENTED VOLCANIC severely fractured, highly weathered, sof	
	90.							189	medium hard (volcanic tuff)	
			68	40			40		Brownish gray vugular BASALT, closely f moderately weathered, hard (basalt form	
UC= 9260							45		Grayish brown COBBLES AND GRAVEL sand, dense (clinker)	with
			48	23			50-	000	Gray vugular BASALT, moderately fractu unweathered, very hard (basalt formation	1)
			55	0			30	700	Grayish brown COBBLES AND GRAVEL sand, dense (clinker)	with
							55-	000		
			98	30				· X	Gray dense BASALT, moderately fracture unweathered, very hard (basalt formation	ed, 1)
							60	图		
UC= 9370			97	83			0.7	交交	grades to slightly fractured	
			38	0			65	200 000 000 000 000	Brownish gray COBBLES AND GRAVEL	with
							70	700	sand, dense (clinker)	
			57	0				0000		
Date Sta	rted.		April 2	20.20	007		75-	Pall	Water Level:   Not Encountered	
Date Cor	mplete	ed: /	April 2	23, 20	007					
ogged E			S. Lat 101.5						Drill Rig: MOBILE B-53	
Total De			5401-		0				Drilling Method: 4" Auger & HQ Coring Driving Energy: 140 lb. wt., 30 in. drop	- N



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STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BORING LOGS - 11

HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A Future Keawe St Extension to Lahainaluna Rd, Part B Fed. Aid Proj. No. NH-030-1(35)R

Scale: As Noted

Date: June, 2010

SHEET No. G2.11 OF 34 SHEETS

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-030-1(35)R	2009	240	382

					S, IN Engine		,	Н	ONC	APIILANI HIGHWAY REALIGNMENT, PHASE 1A, PART B LAHAINA, MAUI, HAWAII  LAHAINA, MAUI, HAWAII
Other Tests		Dry Unit Weight (pcf)			Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	et	Sample Graphic	USCS	(Continued from previous plate)
ö	≚ů	۵۶	S &	- R	P S G	Po (ts	De	Sa	30	Description Gray vugular BASALT, closely fractured,
			77	0						unweathered, hard to very hard (basalt formation
			57	13			80-	100		Brownish gray COBBLES AND GRAVEL with sa and silt, medium dense (clinker)
			58	43			85	) o		Reddish brown CEMENTED VOLCANIC ASH, severely fractured, moderately to highly weathered, soft to medium hard (volcanic tuff)
							90	- 1. 18 C		Brownish gray COBBLES AND GRAVEL with sand, dense (clinker) Gray dense BASALT, moderately fractured,
			57	22			95			unweathered, very hard (basalt formation) Yellowish to reddish brown BASALT, severely fractured, highly weathered, soft (highly weather
			98	33			100	からない		basalt) Gray vesicular BASALT, moderately fractured, slightly weathered, hard, (basalt formation)
							105			Boring terminated at 101.5 feet
							110	-		
							110			
							115			
							120	-		
							125	-		
							130			
							135			
							140			
	1						145			
								1 1		I S S S S S S S S S S S S S S S S S S S
							150	-		
Date Sta				20, 20			150			Water Level:   ■ Not Encountered
Date Sta Date Co Logged Total De	mple By:		April S. La	20, 20 23, 20 atronic	007		150	-		Water Level: ▼ Not Encountered  Drill Rig: MOBILE B-53 Drilling Method: 4" Auger & HQ Coring

		GEOLABS, INC. Geotechnical Engineering							ONO	APIILANI HIGHWAY REALIGNMENT, PHASE 1A, PART B LAHAINA, MAUI, HAWAII	Log of Boring
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): 223 * Description	
ō	ΣŬ	٥٤	<u>0</u> &	ě.	25.5	P (\$	<u> </u>	S	MH	Brown CLAYEY SILT, very stiff, damp (re	esidual
UC= 2720	11		72	55	50/5" Ref.		5-	が経済		soil) Gray BASALT, severely fractured, moder highly weathered, medium hard (basalt for the control of the contr	ormation)
UC= 10500			80	45			10-			Gray vugular BASALT, slightly fractured, weathered, hard to very hard (basalt form Gray vugular BASALT, moderately fractu slightly weathered, hard (basalt formation	nation) red,
UC= 11600			52	38			15-	次次		Reddish brown CEMENTED VOLCANIC	
	35		84	0	50/4" Ref.		20			severely fractured, moderately weathered medium hard (volcanic tuff)	
UU= 11.8 KSF	37	74	77	0			25		ML	Brown SANDY SILT with traces of decompravel, hard, damp (residual soil/saprolite	
NOF			75	8			30-				
UU= 10.3 KSF	49	59	93	10			35	N. W.		Reddish brown CEMENTED VOLCANIC severely fractured, moderately to highly weathered, medium hard (volcanic tuff) Grayish brown BASALT, closely fractured	
			67	7			40-	がなる		weathered, soft to medium hard (basalt f	
			87	27			45-	(大)		grades to hard  Gray vugular BASALT, closely fractured,	eliahtly
			47	0				次次次		weathered, hard (basalt formation)	Silgituy
			68	52			50-	96		Grayish brown COBBLES AND GRAVEL sand, medium dense (clinker)	with
UC= 2890							55			Gray coarsely vesicular to vugular BASAl moderately fractured, unweathered, hard hard (basalt formation)	
			77	27			60	7-77-		Brownish gray COBBLES AND GRAVEL	with
			47	0			65	0000		sand, medium dense to dense (clinker)	
			40	0			70-	90000			
			38	0			75-	1000			
Date Sta			April April							Water Level:   Not Encountered	
Date Co Logged			S. La							Drill Rig: MOBILE B-53	
Total De			97.5	feet -00&1				. 14		Drilling Method: 4" Auger & HQ Coring Driving Energy: 140 lb. wt., 30 in. drop	



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STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BORING LOGS - 12

HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A Future Keawe St Extension to Lahainaluna Rd, Part B Fed. Aid Proj. No. NH—030—1(35)R

Scale: As Noted

As Noted Date: June, 2010 SHEET No. G2.12 OF 34 SHEETS



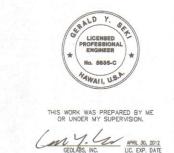
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-030-1(35)R	2009	241	382

GEOLABS, INC.  Geotechnical Engineering							HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A, PART B							
See 1	1							,		LAHAINA, MA	AUI, HAWAII	127		
Other Tests	oisture	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample Graphic	nscs	(Co	entinued from previous plate)			
ŏ	žΰ	کَکَ	S &	N.	22.0	Pc (ts	۵ ۵	N G	š		Description			
			100	28			80-	-7.7.		unweathered, v	ASALT, moderately fractivery hard (basalt formation	n)		
			40	0			-	次 公 公			resicular BASALT, closely tly weathered, hard (basa			
			57	0			85-	- // Poo d		Grayish brown weathered, sof	BASALT, severely fracture the community of the community	t)		
							90	<b>以</b> -以-以		sand, medium Gray dense BA	SALT, severely fractured	,		
			67	8			95	7.7%		unweathered, v	very hard (basalt formatio	n)		
							1	1,7_			ted at 97.5 feet			
							100							
							-							
							105			1000				
							-							
							140							
							110-							
							115-							
							-							
							120							
							1							
							125-							
							1							
							130-							
							1							
							125							
							135-							
						1	140-							
							-							
						1	145							
							]							
							150							
Date Sta	-		April 2				M.M.			Water Level:	Not Encountered			
Date Cor Logged B	Ву:		April 2 S. Lat	ronic						Drill Rig:	MOBILE B-53			
Total De			97.5 f							Drilling Method:	4" Auger & HQ Coring			

GEOLABS, INC.

Log of Boring

		Geo	techi	nical	BS, IN Engine			H	ONO	APIILANI HIGHWAY REALIGNMENT, PHASE 1A, PART B LAHAINA, MAUI, HAWAII	Log of Boring 128			
Other Tests	oisture ontent (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	aphic aphic	Kuscs	Approximate Ground Surface Elevation (feet MSL): 222 *				
ŏ	Šŏ	۵۶	30	0	20/0"	Po (ts	De	Sa Y	MH	soil)				
			30	U	Ref.		5	1-90 % C		Brownish gray vugular BASALT, severely fractured, slightly to moderately weathers (basalt formation)	ed, hard			
UC= 12600	7		68	41	30/1" Ref.		10-	0° 1/2 - 1/2		Grayish brown COBBLES AND GRAVEL with sand, dense (clinker) Gray coarsely vesicular to vugular BASALT,				
UC= 5940		7.	57	33			15	<b>1000</b>		moderately fractured, slightly weathered, (basalt formation)  Reddish brown CEMENTED VOLCANIC				
UU=	26	85	95	7			20-			slightly fractured, moderately weathered, hard (volcanic tuff)	medium			
16.6 KSF			65	0			25	で対象が		Brown to gray BASALT, severely fractured moderately to highly weathered, soft to make the hard (highly weathered basalt)	a, nedium			
110-			65	43			30	1966年						
UC= 5120			50	10			35	1000		Gray scoriaceous BASALT, closely fractu slightly weathered, medium hard (basalt formation)				
			40	0			40	<b>企</b> 经公众		Gray vugular BASALT, severely fractured moderately weathered, medium hard to h (basalt formation)				
			33	0			45-	各		O	- 15 I- Al-			
			54	14	30/0" Ref.		50-	<b>各名名</b>		Gray vugular BASALT, closely fractured, sweathered, very hard (basalt formation)	slightly			
			73	8			55-	7.7.7.7.		grades with clinkers				
			63	15			60-	100 0 000 000 000 000 000 000 000 000 0		Brownish gray COBBLES AND GRAVEL sand, medium dense (clinker)	with			
UC=			50	8			65-	77-77-78		Gray dense BASALT, closely fractured, unweathered, very hard (basalt formation				
5220			87	25				26 Co. 8		Brownish gray COBBLES AND GRAVEL sand, dense (clinker)	vviti1			
			65	28			70-	を変め		Gray coarsely vesicular to vugular BASAL closely fractured, unweathered, hard (bas formation)				
Date Sta Date Cor			April 2	24, 20			75-	Lhel		Water Level:   ■ Not Encountered				
Logged E Total De	Ву:		S. Lat	ronic						Drill Rig: MOBILE B-53 Drilling Method: 4" Auger & HQ Coring				



STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BORING LOGS - 13

HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A Future Keawe St Extension to Lahainaluna Rd, Part B Fed. Aid Proj. No. NH-030-1(35)R

Scale: As Noted

Date: June, 2010

SHEET No. G2.13 OF 34 SHEETS

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-030-1(35)R	2009	242	382

Sta Sall	Geotechnical Engineering					ering	9 LAHAINA, MAUI, HAWAII						
Other Tests	Moisture Content (%)	Unit tht (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample Graphic	S	(Continued from previous plate)			
Othe	Mois	Neig Neig	Sore	ROD	Sesi Sesi blov	Pock tsf)	Dept	Sam	uscs	Description			
0	20				ш. ш. С	40				Brownish gray COBBLES AND GRAVEL with sand, dense (clinker)			
			60	37			80	1 /- / / So		Gray dense BASALT, moderately fractured, unweathered, very hard (basalt formation) Brownish gray COBBLES AND GRAVEL with			
			67	13			85			sand, medium dense (clinker) Orange-brown CEMENTED VOLCANIC ASH, severely fractured, highly weathered, soft			
			48	10			90	200		(volcanic tuff) Gray vugular BASALT, closely fractured,			
			100	63				000		unweathered, hard to very hard (basalt formation Brownish gray COBBLES AND GRAVEL with sand, dense (clinker)			
			00	00			95			Gray dense BASALT, moderately fractured, unweathered, very hard (basalt formation)			
			92	92			100			grades with some clinkers  Boring terminated at 100 feet			
							105						
							110						
							115						
							120						
							125						
							130						
							135						
					-		140						
							145						
							150-		\$0.				
Date Sta				24, 20 25, 20		-				Water Level:   ■ Not Encountered			
ogged l	Ву:	5	S. Lat	ronic						Drill Rig: MOBILE B-53			
Total De			100 fe		0					Drilling Method: 4" Auger & HQ Coring			
Work Or	uer.		0401-	00&1	U	-			-	Driving Energy: 140 lb. wt., 30 in. drop			

PHASE 1A, PART B

GEOLABS, INC.

Log of Boring

					BS, IN Engine			Н	ONO	APIILANI HIGHWAY REALIGNMENT, PHASE 1A, PART B LAHAINA, MAUI, HAWAII  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	SS	Approximate Ground Surface Elevation (feet MSL): 234 *
Oth	Mois	Dry	Core	RQI	Res (blo	Poc (tsf)	Dep	San	HUSCS	Description
		- 1						- 12	МН	Brown CLAYEY SILT, very stiff, damp (residual
			58	8				TE		soil) Brownish gray to gray scoriaceous to vugular
							5	位		BASALT, closely fractured, slightly to moderate
			l. 1					100		weathered, medium hard to hard (basalt
			58	0				DODE		formation)
							10-	000		Brownish gray COBBLES AND GRAVEL with
			1.48					济		sand, medium dense to dense (clinker)
UC=			63	38				一连		Gray dense, vugular BASALT, moderately
4340		1.0					15-	泽		fractured, unweathered, very hard (basalt formation)
								一个		Gray scoriaceous BASALT, severely fractured,
			75	33						slightly weathered, medium hard (basalt
							20-	行	3	formation)
			00				2 .	1	1	Gray finely vesicular to vugular BASALT,
			93	75		8		一行		moderately fractured, unweathered, hard (basalt
				338			25	一位		formation) Gray dense BASALT, slightly fractured,
				7. 7				177		unweathered, very hard (basalt formation)
		11.0								grades with clinkers
							30			Boring terminated at 27.5 feet
							40- 45- 50- 55- 60- 65- 70-			
							75-			
Date Star Date Com				27, 20 27, 20						Water Level:   ■ Not Encountered
Logged B			S. La	tronic						Drill Rig: MOBILE B-53
Total Dep	th:		27.5 f		•					Drilling Method: 4" Auger & HQ Coring
Work Ord	er:		5401-	00&1	0					Driving Energy: 140 lb. wt., 30 in. drop



THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

GEOLABS, INC. APRIL 30, 2012

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BORING LOGS - 14

HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A
Future Keawe St Extension to Lahainaluna Rd, Part B

Fed. Aid Proj. No. NH-030-1(35)R

Scale: As Noted

Date: June, 2010

SHEET No. G2.14 OF 34 SHEETS

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-030-1(35)R	2009	243	382

	GEOLABS, INC. Geotechnical Engineering							Н	ONO	OAPIILANI HIGHWAY REALIGNMENT, PHASE 1A, PART B LAHAINA, MAUI, HAWAII				
Other Tests	Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample	Huscs	Approximate Ground Surface Elevation (feet MSL): 248 * Description				
O \$ UC= 7570			54 55 47 73 50	0 0 37 0 30	P R R (the second secon	d (t)	5 10 15 20 25 30 35 40 45 50 65 70		O MH	Brown CLAYEY SILT, very stiff, damp (ressoil) Gray vugular BASALT, closely fractured, sweathered, hard (basalt formation) Grayish brown BASALT, severely fractured weathered, soft (highly weathered basalt) Gray vugular BASALT, closely fractured, sweathered, hard (basalt formation) Grayish brown COBBLES AND GRAVEL, dense (clinker) Brownish gray vugular BASALT, closely fraslightly weathered, hard (basalt formation) Gray scoriaceous BASALT, severely fractured slightly weathered, soft to medium hard (basalt formation) Gray vugular BASALT, moderately fractured slightly weathered, hard (basalt formation) Gray scoriaceous BASALT, severely fractured slightly weathered, soft to medium hard (basalt formation) Brownish gray COBBLES AND GRAVEL very sand, dense (clinker) Gray dense, vugular BASALT, moderately fractured, unweathered, very hard (basalt formation) Boring terminated at 32.5 feet	d, highly d, highly slightly mediun actured ) ured, rd ed, ) ured, with			
Date Starte			April 2				75			Water Level:   ■ Not Encountered				
Date Comp Logged By	<i>/</i> :	5	April 2 S. Lat	tronic						Drill Rig: MOBILE B-53				
	Fotal Depth:         32.5 feet           Work Order:         5401-00&10							Drilling Method: 4" Auger & HQ Coring						

Approximate Ground Surface Elevation (feet MSL): 229 *  Description  17		GEOLABS, INC.  Geotechnical Engineering								ONO	DNOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A, PART B LAHAINA, MAUI, HAWAII					
Heddish prown and gray CLAYEY SIL I with som gravel, hard, damp (residual sol)  Gray vesicular BASALT, moderately fractured, moderately weathered, medium hard  100 77  UC= 15490 UC= 8870  100 77  UC= 7620  72 28  20 CL Orangish brown CEMENTED SANDY CLAY, hard moderately weathered clinker)  55 12 0 30  51 2 0 58  52 21 58  55 12 0 30  30 15 6 6 7 6 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample	NSCS	Approximate Ground Surface Elevation (feet MSL): 229 * Description					
15490   UC=   8870		17			33	50/3"		5		MH	gravel, hard, damp (residual soil) Gray vesicular BASALT, moderately fractured,					
UC= 100	15490 UC=							10			highly weathered, medium hard					
L=41 33 12 0 30 25	UC=							15	10000000000000000000000000000000000000		Gray vesicular to vugular BASALT, slightly fractured to massive, slightly weathered, hard					
PI=16    12   0   30   30   30   30   30   30   30				72	28			20		CL	Orangish brown CEMENTED SANDY CLAY, hard moist (weathered clinker)					
grades to very hard  51		33		12	0	30		25								
Solution   Solution		55		12	0	30		30								
grades to vugular Gray vesicular to vugular BASALT, moderately fractured, moderately weathered, medium hard to hard Red and gray GRAVEL (BASALTIC) with sand, dense (clinker)  100 43  80 15  100 67  100 67  100 52  100 52  Tolumber 9, 2008  Date Started: September 9, 2008  Date Started: September 9, 2008  Date Started: September 9, 2008  Date Completed: October 10, 2008  Water Level:  Not Encountered		51		52	21	58		35			Gray vesicular BASALT, moderately fractured,					
22				85	0			40			grades to vugular					
dense (clinker)  100 43  100 43  100 67  100 67  100 67  100 100  100 52  Date Started: September 9, 2008  Date Completed: October 10, 2008  100 43  100 43  100 43  100 43  100 67  Gray vesicular to vugular BASALT, moderately fractured, moderately weathered, medium hard  Gray vesicular BASALT, slightly fractured, slightly weathered, hard  Gray vesicular to vugular BASALT, slightly fractured to massive, slightly weathered, hard  Reddish gray BASALT, closely fractured, highly weathered, soft (basalt formation/clinker?)  Water Level:  Not Encountered				30	0			45		,	fractured, moderately weathered, medium hard to hard					
grades to reddish gray  Gray vesicular BASALT, slightly fractured, slightly weathered, hard Gray vesicular to vugular BASALT, slightly fractured to massive, slightly weathered, hard  100 52  Reddish gray BASALT, closely fractured, highly weathered, soft (basalt formation/clinker?)  Reddish gray BASALT, closely fractured, highly weathered, soft (basalt formation/clinker?)  Water Level:  Not Encountered		22		100	43	47		50	0000		dense (clinker) Gray vesicular to vugular BASALT, moderately					
Gray vesicular BASALT, slightly fractured, slightly weathered, hard Gray vesicular to vugular BASALT, slightly fractured to massive, slightly weathered, hard  100 52  Reddish gray BASALT, closely fractured, highly weathered, soft (basalt formation/clinker?)  Date Started: September 9, 2008 Date Completed: October 10, 2008  Water Level:   Not Encountered				80	15			55			madarda, moderatory would be a financial mark					
100 100  100 52  100 52  Reddish gray BASALT, closely fractured, highly weathered, highly weathered, soft (basalt formation/clinker?)  Date Started: September 9, 2008 Date Completed: October 10, 2008  Water Level:   Not Encountered				100	67			60	法法		Gray vesicular BASALT, slightly fractured, slightly weathered, hard					
Reddish gray BASALT, closely fractured, highly weathered, soft (basalt formation/clinker?)  Date Started: September 9, 2008 Date Completed: October 10, 2008  Water Level:   Not Encountered				100	100			65	1,2,2,5		Gray vesicular to vugular BASALT, slightly fractured to massive, slightly weathered, hard					
weathered, soft (basalt formation/clinker?)  Date Started: September 9, 2008 Date Completed: October 10, 2008  Water Level:   Not Encountered				100	52			70	校公安		Poddish gray PASALT closely freetured highly					
Date Completed: October 10, 2008								75-	竹花		weathered, soft (basalt formation/clinker?)					
									1	- 38	Water Level:   ■ Not Encountered					
Logged By: D. Finch   Drill Rig: MOBILE B-53	Logged E		-	_	-	, 2008					Drill Rig: MOBILE B-53					
Total Depth: 100 feet Drilling Method: 4" Auger & HQ Coring																



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GEOLABS, INC. LIC. EXP. DA

STATE OF HAWAPI
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BORING LOGS - 15

HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A Future Keawe St Extension to Lahainaluna Rd, Part B Fed. Aid Proj. No. NH-030-1(35)R

Scale: As Noted

Date: June, 2010

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-030-1(35)R	2009	244	382

Nork Or			5401-		0	5.4				Driving Energy:	140 lb. wt., 30 in. drop	
Logged Total De			D. Fir	-						Drill Rig: Drilling Method:	MOBILE B-53 4" Auger & HQ Coring	
Date Co		ed:	Octob	er 10	, 2008					15.015	1100011 5 5 5 5	
Date Sta	rted:		Septe	mber	9, 2008		100			Water Level:	Not Encountered	
							150-					
							145					
							140					
					•		135					
							130-					
							125					
							120-					
							115-					
							110-					
							105					
			100	100			100	沙沙		Boring termina	ted at 100 feet	
			100	50			95	花花法		Gray vesicular to slightly fracture	to vugular BASALT, mode d, slightly weathered, hai	erately t
			30	0			90	经济法				
			77	0			85	10000000000000000000000000000000000000		Gray vesicular	to vugular BASALT, close erately weathered, mediu	ely m hard
			77	0			80	17.1000		Reddish gray C (BASALTIC), d	COBBLES AND GRAVEL	
			92	33						Gray vugular B	ASALT, closely to modera erately weathered, mediu	ately m hard
Othe	Mois	Dry Weig	Core	RQD	Pene Resi (blov	Pock (tsf)	Dept	Sample Graphic	nscs		Description	
Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	ple	S.	(Co	ontinued from previous plate)	11 21
				nical	Engine					LAHAINA, MA		201
					BS, IN			1.1	ONO	PHASE 1A		Boring

***					BS, IN Engine			Н	ONO	APIILANI HIGHWAY REALIGNMENT, PHASE 1A, PART B LAHAINA, MAUI, HAWAII  LOG of Boring 202
Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet).	Sample Graphic	SOSUC	Approximate Ground Surface Elevation (feet MSL): 227 * Description
LL=44 PI=19	13	98	100		66 42/6" Ref.		5		GW	Reddish brown and gray SILTY CLAY with some gravel, hard, dry to moist (residual soil) Reddish brown and gray GRAVEL (BASALTIC) with some silt, very dense, dry to moist (extremely weathered basalt formation) Gray vugular BASALT, moderately fractured, moderately weathered, medium hard
			70	50						Reddish brown and gray vesicular to vugular BASALT, closely fractured, moderately to highly weathered, hard
UC= 7940			7	0			15		ML	Gray vesicular to vugular BASALT, moderately fractured, slightly weathered, hard Orangish brown CEMENTED SANDY SILT/ASH, hard, moist (weathered clinker)
	35		8	0	50/6" Ref.		25			
	50		48	0	52		30			grades to gray and purple vesicular, moderately weathered, medium hard
			70	0			35	山沙沙沙		Gray vesicular to vugular BASALT, moderately fractured, moderately weathered, medium hard
JC=880			70	18			40	1.7.7.7.7.7.7.7.7.7.7.7.7.7.7.7.7.7.7.7	GP	Paddish gravivasioular CRAVEL (PACALTIC)
			73	30				00000	GF	Reddish gray vesicular GRAVEL (BASALTIC), dense (clinker)  Gray vugular BASALT, closely to moderately
UC= 3770 UC= 8870			100	12			45	<b>火火火火</b>		fractured, slightly weathered, hard
			100	0			55	ななな		Gray vugular BASALT, closely to severely fractured, slightly weathered, hard
			100	27			60	000	GP	Reddish brown and gray GRAVEL (BASALTIC) with sand, dense (clinker) Gray vesicular BASALT, moderately fractured,
			100	78			65	ななる		moderately weathered, medium hard grades to vugular
UC= 4840			75	33				が次		
			87	42			70	00000	GP	Gray and red GRAVEL (BASALTIC), dense (clinker) Gray vesicular to vugular BASALT, moderately
Date Sta	rted.		Septe	mber	8, 2008		75-	1,2		fractured, moderately weathered, medium hard  Water Level:   Not Encountered
Date Cor	mplete	ed:	Septe	mber	9, 2008					Drill Rig: MOBILE B-53
	ogged By: D. Finch otal Depth: 102 feet				-			Drilling Method: 4" Auger & HQ Coring		



STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BORING LOGS - 16

HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A Future Keawe St Extension to Lahainaluna Rd, Part B Fed. Aid Proj. No. NH-030-1(35)R

Scale: As Noted

Date: June, 2010 SHEET No. G2.16 OF 34 SHEETS



÷	FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
	HAWAII	HAW.	NH-030-1(35)R	2009	245	382

1	GEOLABS, INC.  Geotechnical Engineering					IC.	. PHASE 1A, PART B							
ALL THE				nical						LAHAINA, MAUI, HAWAII 202				
Other Tests	Moisture Content (%)	ry Unit /eight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample Graphic	nscs	(Continued from previous plate)  Description				
0	ΣŬ	23	ŭ Ž	K	250	9 £	<u> </u>	S D	Š	Description				
			50	0			80-	工化化化		Gray vesicular BASALT, closely fractured, highly weathered, soft				
			100				85-	· 注注注		Gray vesicular to vugular BASALT, moderately fractured, moderately weathered, medium hard				
			40	8			90-	2000		Gray and reddish brown GRAVEL AND COBBLES (BASALTIC), dense (clinker)				
					95	· · · · · · · · · · · · · · · · · · ·		Gray vugular BASALT, moderately to slightly fractured, moderately to slightly weathered, medium hard to hard						
			30	0			100-	00000	GP	Gray and red vesicular GRAVEL (BASALTIC), dense (clinker)				
							105			Boring terminated at 102 feet				
						annerson de la company de la c	110-							
		,					115-							
							120-							
							125							
							130-							
							135							
						1	140							
							145							
							150							
Date Sta					8, 2008					Water Level:   Not Encountered				
Date Co Logged I			Septe D. Fin		9, 2008					Drill Rig: MOBILE B-53				
Total De	pth:		102 fe	et						Drilling Method: 4" Auger & HQ Coring				
Work On	der:		5401-	00&1	0					Driving Energy: 140 lb. wt., 30 in. drop				

GEOLABS, INC.

Log of Boring

					BS, IN Engine			Н	ONC	APIILANI HIGHWAY REALIGNMENT, PHASE 1A, PART B LAHAINA, MAUI, HAWAII	ring
Other Tests	Moisture Content (%)	rry Unit Veight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample Graphic	HM	Approximate Ground Surface Elevation (feet MSL): 225 * Description	
UC= 8370 UC=	21 11 10	88	100 87		30/6" Ref. 19 22/6" +22/0" Ref.	2.3	5		MH	Reddish brown CLAYEY SILT with some grave very stiff to hard, damp (residual soil) Brownish gray SILTY SAND with some gravel, medium dense, damp (saprolite) Reddish gray GRAVEL with some sand and sild dense to very dense, damp (extremely weather basalt) Gray vesicular BASALT, moderately fractured, moderately weathered, medium hard Gray highly vesicular BASALT, massive,	t,
8200 UC= 12440			52	35			15	<b>公全公</b> 公		moderately weathered, hard  Gray vesicular to vugular BASALT, moderately fractured, slightly weathered, medium hard	
			40	0			25		SM	Reddish brown SILTY SAND with little gravel, dense, damp (weathered clinker)	
LL=0 PI=0	47		33	0	43		30				
	36		86 63	17	20		35	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\		grades to medium dense Gray vesicular BASALT, closely fractured, moderately weathered, medium hard	
			50	0		1	40	14.14.14.14.14.14.14.14.14.14.14.14.14.1			
			63	8			50				
			52	0			55	100 C		Gray and red GRAVEL AND COBBLES (BASALTIC) with some sand, dense (clinker)	
			100	80			60-	たなど		Gray vesicular to vugular BASALT, moderately slightly fractured, moderately to slightly weathered, hard to very hard	to
			100	70			65	NAME OF THE PERSON OF THE PERS			
			50	0			70-	000000	GP	Reddish gray to gray GRAVEL (BASALTIC), ve dense, damp (clinker)	ry
			48	0			75	0000			
Date Star	nplete	ed:	Septe	mber	10, 2008 15, 2008		10			Water Level:   Not Encountered	
Logged E Total Dep			D. Fin							Drill Rig: MOBILE B-53 Drilling Method: 4" Auger & HQ Coring	
Work Ord				00&1	0					Driving Energy: 140 lb. wt., 30 in. drop	



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STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BORING LOGS - 17

HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A Future Keawe St Extension to Lahainaluna Rd, Part B Fed. Aid Proj. No. NH-030-1(35)R

Scale: As Noted D

Date: June, 2010

SHEET No. G2.17 OF 34 SHEETS

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-030-1(35)R	2009	246	382

N. S.		GEOLABS, INC.						PHASE 1A PARTB						
272		Geo	techr	nical	Engine	ering	g		LAHAINA, M		203			
Other Tests	sture	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet).	Sample Graphic USCS	(Co	ontinued from previous plate)				
Oth	Mois	Dry	Core	Rai	Res (blo	Poc (tsf)	Dep	Sample Sample Graphic	75.2	Description				
			43	0	20/0" Ref.		80	GP						
			100	47			85		Gray vugular B slightly weather	ASALT, moderately fractured, medium hard to hard	ured, I			
			40	0			90	Ø- GP	dense, damp (	brown GRAVEL (BASAL clinker) BASALT, closely fracture				
			100	20			95	· 公公公	weathered, me Gray vesicular					
			100	47			100	· 分分分	Gray vugular B fractured, sligh	ASALT, moderately to clo tly weathered, hard	sely			
							100		Boring termina	ted at 100 feet				
							105							
							110							
					č		115							
							120							
							125							
					8		130							
							135							
							140							
							145							
							150-							
					40 0000	2	-		Water Level:	Not Encountered				
Date Sta					10, 2008				VValer Level. 4	Not Encoditioned				
Date Sta Date Cor Logged E Total De	mplete By:	ed:		mber ch	15, 2008				Drill Rig: Drilling Method:	MOBILE B-53 4" Auger & HQ Coring				

GEOLABS, INC.

Log of Boring

HONOAPIILANI HIGHWAY REALIGNMENT,

		Geot			BS, IN			Н	ONC	DAPIILANI HIGHWAY REALIGNMENT, PHASE 1A, PART B 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): 224 *
	≥ິວ	23	S &		Re (b)	Po (ts)	De	Sa	S	Description
UC= 7910	12		44	21	16/6"		5	N.X.X.X.X.X.X.X.X.X.X.X.X.X.X.X.X.X.X.X		Gray vesicular to vugular BASALT, moderately fractured, slightly weathered, medium hard Gray and red GRAVEL (BASALTIC) with little sand, silt, and clay, very dense, moist (clinker)
UC= 7960			93 50	87 22	+50/3" Ref.			· · · · · · ·	GP	Gray vugular BASALT, slightly fractured, slightly weathered, medium hard
			32	8			10	000	O,	Gray and brown GRAVEL (BASALTIC), dense (clinker)
			02	Ü			15	00000		
UC=	12		30	26	50/0" Ref.		20	00000	GP	Gray vugular BASALT, closely fractured, slightly weathered, medium hard Gray GRAVEL (BASALTIC) with little sand, very
3990			7	0			25		SM	weathered, medium hard
	45		93	0	60					Reddish brown SILTY SAND, very dense, moist (weathered clinker)
			27	0			30	000	GP SM	Gray and brown GRAVEL (BASALTIC), dense (clinker)
				Š			35		0,	Gray and brown SILTY SAND with some gravel, medium dense, moist (weathered clinker)
	51		5	0	20		40			
	39		82	9	50/3" Ref.		45	-   		Gray BASALT, severely to closely fractured, slightly weathered, medium hard to hard 6-inch VOID
UC= 1610			65	32			50	36.65		Gray vugular BASALT, closely to moderately fractured, slightly weathered, medium hard to ha grades to severely to closely fractured
2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2			65	20			55	000	GP	Reddish brown and gray GRAVEL (BASALTIC), dense (clinker)
UC= 3450			100	90				()		Gray vesicular BASALT, closely fractured, slight to moderately weathered, medium hard Gray vesicular BASALT, slightly fractured, slightly
			85	55			60-	分分分		weathered, hard Gray vugular BASALT, slightly fractured, slightly weathered, hard
UC= 6320			10	0			65	000	GP	Gray BASALT, closely fractured, slightly weathered, medium hard
			10	0			70	000		Reddish brown GRAVEL (BASALTIC), dense (clinker)
			67	17			75-	000		
Date Sta	rted:				19, 2008		14	7	- Aller - win	Water Level:   Not Encountered
Date Cor	-				23, 2008	3				Dall Disc.
Logged E Total De		*******	D. Fin 102 fe	-						Drill Rig: MOBILE B-53 Drilling Method: 4" Auger & HQ Coring
· viai De	VIII.	-		00&1					2.7	Driving Energy: 140 lb. wt., 30 in. drop



STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION

BORING LOGS - 18

HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A Future Keawe St Extension to Lahainaluna Rd, Part B Fed. Aid Proj. No. NH-030-1(35)R

Scale: As Noted

Date: June, 2010

SHEET No. G2.18 OF 34 SHEETS

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-030-1(35)R	2009	247	382

					3S, IN Engine			Н	ONC	APIILANI HIGHWAY REALIGNMENT, PHASE 1A, PART B 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	USCS	(Continued from previous plate)
UC=	ŏŏ	۵۶	87	27	Re (b)		80-	5 次次次	Š	Description Gray vesicular BASALT, moderately fractured, slightly weathered, medium hard grades to severely to closely fractured, moderately weathered, medium hard
3940			73	13			85	100000000000000000000000000000000000000		grades to closely to moderately fractured Gray vesicular to vugular BASALT, closely to moderately fractured, slightly weathered, hard grades to severely to closely fractured, slightly to
			53 100	13			90			moderately weathered, medium hard grades to vugular grades to highly vesicular  Gray BASALT, closely to moderately fractured,
			100				95			grades to slightly fractured grades to closely fractured
							00			grades to slightly fractured  Boring terminated at 102 feet
						05				
							10			
			A				20	-		
						1:	25			
					_	1:	30			
						1:	35			
						1.	40			
						1	45	-		
Date Star	ted:		Septe	mber	r 19, 2008		50	1		Water Level:   Not Encountered
Date Con Logged B	Date Completed:         September 23, 2008           Logged By:         D. Finch           Total Depth:         102 feet									Drill Rig: MOBILE B-53 Drilling Method: 4" Auger & HQ Coring Driving Energy: 140 lb. wt., 30 in. drop

					BS, IN Engine			П	ONC	APIILANI HIGHWAY REALIGNMENT, PHASE 1A, PART B LAHAINA, MAUI, HAWAII	Boring 205
Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	ket Pen.	Depth (feet)	Sample Graphic	SS	Approximate Ground Surface Elevation (feet MSL): 223 *	
Othe	Mois	Dry	Core	ROL	Res (blov	Pocket (tsf)	Dep	Sarr	HM	Description	
	15	75	21	0	32/6" Ref.	2.3	5	× × ×	MH	Reddish brown CLAYEY SILT with some of very stiff to hard, damp (residual soil) Gray and brown GRAVEL AND COBBLES (BASALTIC), dense to very dense, damp	3
	11				21		3	× × ×	9	grades to medium dense	(CIII IKE
			24	0			10	- X × × × × × × × ×	4		
UC= 8990	14		100	56	50/3" Ref.		15			Gray vesicular BASALT, moderately fractu slightly weathered, medium hard to hard Gray vesicular BASALT, severely to closel	
UC= 9010			30	30			20		SM	fractured, slightly weathered, medium hard Gray vesicular BASALT, moderately fractu	ď
	31				70		20			slightly weathered, hard Reddish brown SILTY SAND, very dense, (weathered clinker)	damp
	24		31	0	E0/0!		25	0000	GP	Gray GRAVEL (BASALTIC) with some sar dense, damp (clinker)	nd,
	21		56	19	50/3" Ref.		30	0000		Gray vugular BASALT, closely fractured,	
			100	43			35	大汉之		moderately weathered, medium hard	
UC= 3170			42	0			40	000000000000000000000000000000000000000	GP	Reddish brown and gray GRAVEL (BASAL dense to very dense, damp (clinker)	LTIC),
	10		100	33	50/3" Ref.		45	200		Gray vugular BASALT, closely to moderate fractured, slightly weathered, medium hard	
			100	38			50	公沙沙			
			42	0			55	00000	GP	Reddish gray and gray GRAVEL (BASALT dense (clinker)	TC),
			82	8			00	1000		Gray vesicular BASALT, closely fractured, weathered, medium hard	
			80	58			60	· 八二六	GP	Gray and brown GRAVEL (BASALTIC), de (clinker) Gray vesicular BASALT, closely fractured,	
							65	る社会		weathered, medium hard Gray vugular BASALT, slightly to moderate	ely
			100	60			70	(公)		fractured, slightly weathered, medium hard	d
			100	48			75-	から			
Date Sta					15, 2008					Water Level:   Not Encountered	11 2 11
Date Cor Logged B			Septe D. Fir		16, 2008	0				Drill Rig: MOBILE B-53	
	oth:	-	100 fe	-						Drilling Method: 4" Auger & HQ Coring	



STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BORING LOGS - 19

HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A Future Keawe St Extension to Lahainaluna Rd, Part B Fed. Aid Proj. No. NH-030-1(35)R

Scale: As Noted Date: June, 2010
SHEET No. G2.19 OF 34 SHEETS

Date: June, 2010

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-030-1(35)R	2009	248	382

					BS, IN Engine			Н	IONO	APIILANI HIGH PHASE 14 LAHAINA, M		Log of Boring 205
Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample	nscs	(Co	ontinued from previous plate)  Description	
			53	27			00	000000	GP		(BASALTIC), dense (clink	
			77	45			80-	表決		Gray vesicular moderately fra hard	to vugular BASALT, close ctured, slightly weathered	ly to , medium
			58	20			85-	000	GP	medium dense	resicular GRAVEL (BASA) to dense (clinker)	
						!	90-	作为		to moderately to medium hard to	to slightly vugular BASAL ractured, slightly weather o hard	ed,
			100	52		4	95	が決決				
			87	47		1	00	000	GP	Red and gray (	BRAVEL (BASALTIC), der	nse
						1 (	05			Boring termina	ted at 100 feet	
						1	10-					
						1	15-					
						12	20-					
						12	25-					
						13	30-					
						13	35					
						14	10-					
						14	45-					
2-1- 61	4-7		0.4		45 0000		50			Make	Not Francisco	
Date Star Date Con					15, 2008 16, 2008					Water Level:	Not Encountered	
Logged B Total Dep	y:		D. Fin	ch						Drill Rig:	MOBILE B-53	
	th.		100 fe	et						Drilling Method:	4" Auger & HQ Coring	

(A)					3S, IN Engine		,			DAPIILANI HIGHWAY REALIGNMENT, PHASE 1A, PART B LAHAINA. MAUI. HAWAII
N.									_	
Other Tests	Moisture Content (%)	t (pc	Core Recovery (%)	(%	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	0	)	Approximate Ground Surface
Je	istu	J. di	e cove	RQD (%)	sist	ckel	pth	Sample	USCS	Elevation (feet MSL): 222 *
₹	≥°	28	08	RC	B B B	Po (tsl	De	Sa	Sn	Description
LL=55	18	74			32/6"				МН	Reddish brown CLAYEY SILT with some gravel, very stiff to hard, damp (residual soil)
PI=23					Ref.				SM	Brownish gray SILTY SAND with some gravel,
	12	97			11		5			loose to medium dense, damp (extremely
	12	0,	100	0	10/6" +50/3"			Too	GP	weathered basalt))
			55	0	Ref.			- 000	3	Brownish gray and gray GRAVEL (BASALTIC),
			-42				10	- 000	3	dense (clinker)
			65	17				1000		
			03	17			15	- 00	3	
UC=							15	- 2		Gray vesicular BASALT, closely to moderately
3960			80	45				- 60	- GP	fractured, slightly to moderately weathered,
UC=							20	1 1/2	CD	medium hard
15490								15	-	Red and gray GRAVEL (BASALTIC), dense (clinker)
			70	0	941 <sup>65</sup> V				SM	Gray vesicular BASALT, slightly fractured, slightly
							25			weathered, medium hard
L=NP	25				50			U		Red and gray GRAVEL (BASALTIC), dense
PI=NP	35		71	0	58		00			(clinker) Gray vesicular BASALT, closely fractured, slightly
			, ,				30	- 1		weathered medium hard
UC=			47	23				0	- GP	Reddish brown SILTY SAND, very dense
2920							35	- 00.	GP	(weathered clinker)
							00	- 00	9	Gray and red GRAVEL (BASALTIC), dense
	33		61	0	50/3"			100		(clinker) Gray vesicular BASALT, slightly fractured, slightly
					Ref.		40	- 00	GP	
			00	^				-100		grades to closely fractured
			62	0			4.5	000		Gray GRAVEL (BASALTIC), very dense (weathered clinker)
							45	100		grades with some sand
			77	37				H		Gray GRAVEL (BASALTIC), dense (clinker)
							50			Gray vugular BASALT, closely to severely
UC=							00		1	fractured, slightly to moderately weathered,
16200			83	17				1		medium hard grades to closely to moderately fractured
							55	000	GP	Reddish gray GRAVEL (BASALTIC), dense
								- 000	GP	(clinker)
			87	32				1		Pinkish gray vugular BASALT, closely fractured,
UC=							60			slightly weathered, medium hard
20640			40	10				1000	GP	Reddish gray GRAVEL (BASALTIC), dense (clinker)
			70	10			65	000		Gray vugular BASALT, closely to moderately
							00	- 00		fractured, slightly to moderately weathered,
			100	43				书总		medium hard
							70-	1		Gray GRAVEL (BASALTIC), dense (clinker) Gray vesicular to vugular BASALT, closely
								1		fractured, slightly weathered, medium hard
			33	0				000	GP	
Date Sta	rted.		Sente	mher	18, 2008		75	1100	1	Water Level:   ■ Not Encountered
Date Cor		ed: 3	Septe	mber	19, 2008					THE ENGLISHED THE ENGLISHED
Logged E Total De			D. Fin 101.5							Drill Rig: MOBILE B-53 Drilling Method: 4" Auger & HQ Coring
י טימו דים	der:			00&1	^		_			Driving Energy: 140 lb. wt., 30 in. drop





STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BORING LOGS - 20

HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A Future Keawe St Extension to Lahainaluna Rd, Part B Fed. Aid Proj. No. NH-030-1(35)R

Scale: As Noted

SHEET No. G2.20 OF 34 SHEETS

Date: June, 2010



FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-030-1(35)R	2009	249	382

					Linginio			_		LAHAINA, MAUI, HAWAII
Other Tests	8	Dry Unit Weight (pcf)	Core Recovery (%)	_	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)			
-	ture	ht (	very	RQD (%)	star star skfc	et	h (fi	Sample Graphic	S	(Continued from previous plate)
the	oist	y L	ore scov	20	ene	ck Ck	epti	ami	USCS	
ō	Žΰ	25	S &	N.	<u> </u>	(ts	۵	S O	Š	Description (PACA) TIC)
								000	GP	Gray vesicular GRAVEL (BASALTIC), dense
			73	12				HA	П	(clinker)
							00	12		Gray vesicular BASALT, closely to moderately
							80	1		fractured, slightly weathered, medium hard to have
			100	FO			-	1		Crownian BACALT alasah ta asal da
			100	58				一位		Gray vugular BASALT, closely to moderately
100							85-	百		fractured, slightly weathered, medium hard
							-	17		
			80	40				000	GP	Red and gray GRAVEL (BASALTIC), dense, date
							90-	00		(clinker)
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		200						竹		Gray vesicular to vugular BASALT, moderately
50 m			100	70			-	一位		fractured, slightly weathered, medium hard
					72.		95-	均		grades to vugular, closely fractured
-7.							00	竹		grades to moderately fractured
			80	42				H		grades to slightly fractured
			00	42				行		grades to vesicular, slightly to moderately
							100-	0,1	GP	fractured
By 50							-			Purplish gray GRAVEL (BASALTIC), dense, dan
										(clinker)
							105-			Gray vesicular BASALT, closely fractured, slight
							_			weathered, medium hard
							-			Boring terminated at 101.5 feet
							110-			
			-				_			
							-			
							115-			
	100						115			
	ile is									
1.0										
	ing.						120-			
							-			
							125-			
							1			
							-			
							130-			
							-			
							1			
							135-			
							133			
							-			
							]			
							140-			
	0 1 s									
							]			
							145-			
							-			
	3 -						1			
							150			
ate Star	ted:		Septe	mber	18, 2008	3	00-			Water Level:   Not Encountered
ate Con	plete	ed:	Septe	mber	19, 2008					
ogged B			D. Fin							Drill Rig: MOBILE B-53
otal Dep			101.5		0					Drilling Method: 4" Auger & HQ Coring
Vork Ord			5401-		0					Driving Energy: 140 lb. wt., 30 in. drop

Log of Boring

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HONOAPIILANI HIGHWAY REALIGNMENT,

PHASE 1A, PART B

LAHAINA, MAUI, HAWAII

GEOLABS, INC.

Geotechnical Engineering

					3S, IN			H	ONO	APIILANI HIGHWAY REALIGNMENT, Boring PHASE 1A, PART B
St.				nical	Engine					LAHAINA, MAUI, HAWAII 207
Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample	nscs	Approximate Ground Surface Elevation (feet MSL): 218.5 *
5	Coo	We	Cor	RO	Res (blo	Poc (tsf)	Dep	Gra	ns	Description
	14	79			50/5" Ref.	4.0			MH	Reddish brown CLAYEY SILT with some sand ar gravel, very stiff to hard, damp (residual soil) Grayish brown SILTY SAND with some gravel,
	3		79	0	23		5	#12  分	SIVI	medium dense, damp (saprolite)  Gray vugular BASALT, closely fractured, slightly
			75	32			10-	行法		weathered, medium hard grades to vesicular to vugular
UC= 17140			78	55			10	的行		Gray vesicular to vugular BASALT, slightly fractured, slightly weathered, medium hard
UC= 8690							15	经经		grades to vesicular, closely fractured
UC= 17710			40	35					SM	grades to vugular, slightly fractured  Reddish brown SILTY SAND, medium dense,
	33		45	•	50/5"		20-		OIVI	moist (weathered clinker)
			18	8	Ref.		25			
			63	15				00000	GP	Gray GRAVEL (BASALTIC), dense (clinker)
UC= 2930			40	7			30-	0 11-11		Gray slightly vugular BASALT, closely to moderately fractured, slightly weathered, medium
				47			35	交级		hard Gray slightly vugular BASALT, severely to closely
			55	17			40	次次		fractured, moderately weathered, medium hard
UC= 10530			100	77			45	2000年		Gray vugular BASALT, slightly to moderately fractured, slightly weathered, medium hard
			100	73			1	作品		
UC=							50-			
15710			88	28			55-	000	GP	Red and gray GRAVEL (BASALTIC), dense (clinker)
			72	32			-	000	GP	Gray vugular BASALT, closely to moderately fractured, slightly weathered, medium hard
							60-	000		Gray GRAVEL (BASALTIC), dense (clinker) Gray vugular BASALT, moderately fractured,
		1	100	73			65-	行行		slightly weathered, medium hard to hard
			100	65			1	公公		
							70-	ランジン		
			50	13			75	000	GP	Gray GRAVEL (BASALTIC), dense (clinker)
Date Star					16, 2008					Water Level:   Not Encountered
Date Con Logged B			Septe D. Fin		18, 2008					Drill Rig: MOBILE B-53
33-4 -	oth:	1	111							- I I I I I I I I I I I I I I I I I I I



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GEOLABS, INC. LIC. EX

STATE OF HAWAIT
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BORING LOGS - 21

HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A Future Keawe St Extension to Lahainaluna Rd, Part B Fed. Aid Proj. No. NH—030—1(35)R

 Fed. Aid Proj. No. NH-030-1(35)R

 Scale: As Noted
 Date: June, 2010

SHEET No. G2.21 OF 34 SHEETS

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-030-1(35)R	2009	250	382

1					Linginic	-				LAHAINA, MA	(0), 11/(11/(11/	201
Other Tests	(%)	Dry Unit Weight (pcf)	Core Recovery (%)		Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)					
<u>e</u>	at t	it it	ery	%)	tan tan	4	(fe	<u>e</u> .e				
Jer	isti	J. P	iove e	Q	sist	cke	pth	d de	uscs	(Co	entinued from previous plate)	
\$	SO	We	Cor	RQD (%)	Pel Rei (blc	Po (tsf	Del	Sample Graphic	US		Description	
							-	000		0	ACALT made at the f	ahi ina d
			100	68			-	Hir			ASALT, moderately frac	
	1		100	00				14			red, medium hard to ha	ira
							80-	12.		grades to close	ly fractured	
							-	133				
			52	12				000	GP	Pod and arou C	DAVEL (DACALTIC)	doneo
	-						-	00	GF		RAVEL (BASALTIC), (	TELISE
							85-	4		(weathered clin	ikei)	
		8					1	上镇			icular BASALT, closely	
	-		97	33			-	15			ctured, slightly weather	ed, mediun
							00	137		hard		
							90-	1,7-1		grades to slight	ly fractured	
2 - 3			400	47			-	HX		grades to close		
			100	4/			-	131			•	
5		- 1					95-	Y.		grades to mode	rately fractured	
							90	管				
			100	10			-	HIT				
	1 5		100	40			-	000	GP	Gray and red G	RAVEL (BASALTIC), d	ense
							100-	°p.	011	(clinker)	(2.10/12/10),	
								- 7.7	SIVI	Poddich brown	SILTY SAND, very der	neo dome
							1	1			SILIT SAND, Very der	ise, uamp
							1			(clinker)		
							105-				ASALT, closely to mode	
							-			fractured, slight	tly to moderately weath	ered,
		1			-					medium hard		
										Boring termina	ted at 102 feet	
							110-			Donnig torrinia	100 01 102 1001	
		1					-					
							-					
							115-					
							110					
							-			E 7 21 12		
							-					
							120-					
							-					
							1					
							1					
							125-					
							-					
							-					
							130-					
	1.5											
- 11			1 2				-					
							125					
							135-			0 0 2		
							-					
							-			35. 8.3		
							140-					
		-					140					
							-					
					12.							
							145-					
							170					
							-					
5,000												
لتنييا							150-					
Date Sta					r 16, 2008					Water Level:	Not Encountered	8
Date Cor					r 18, 2008	3					MODUE D. FO	
ogged E			D. Fir							Drill Rig:	MOBILE B-53	
	pth:		102 fe	eet -00&1	0					Drilling Method: Driving Energy:	4" Auger & HQ Coring 140 lb. wt., 30 in. drop	
Total De										1 I This rise of Land Post of	TAIL IN WAY 30 in dron	

Log of Boring

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HONOAPIILANI HIGHWAY REALIGNMENT,

PHASE 1A, PART B

LAHAINA, MAUI, HAWAII

GEOLABS, INC.

Geotechnical Engineering

		Geot	techi	nical	3S, IN Engine		,	Н	ONO	APIILANI HIGH PHASE 1A LAHAINA, MA		Log of Boring
Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet).	Sample Graphic	nscs	Éle	roximate Ground Surface vation (feet MSL): 223 * Description	
UC= 5260 UC= 12370	12	Dr. WW	38 92 100	13 20 55 100 38	30/3" Ref. 30/0" Ref.	Po (1s)	5 10 15 20 25 30 35 40 55 60	10000000000000000000000000000000000000	GP GP	hard, damp (re Gray vesicular closely fracture hard Brown and gray dense (clinker) Gray vesicular closely fracture hard grades to mode grades to close Gray vesicular weathered, ver Gray-brown GR (clinker) Gray vesicular fractured, slight	CLAYEY SILT with little g sidual soil) to vugular BASALT, sever d, moderately weathered v vesicular GRAVEL (BAS to vugular BASALT, sever d, moderately weathered erately fractured ly to severely fractured BASALT, massive, slightly	rely to , medium SALTIC), rely to , medium
							65 70					
Date Sta	-	1-	Septe	ember	26, 2008	3	75			Water Level:	Not Encountered	
Date Cor Logged B			Septe D. Fir		29, 2008	3		100		Drill Rig:	MOBILE B-53	
Logged L			31.5 f							Drilling Method:	4" Auger & HQ Coring	



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GEOLABS, INC. LIC. EXP. DA

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BORING LOGS - 22

HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A Future Keawe St Extension to Lahainaluna Rd, Part B Fed. Aid Proj. No. NH-030-1(35)R

Scale: As Noted

Date: June, 2010

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-030-1(35)R	2009	251	382

	Geotechnical Engineering								A, PART B AUI, HAWAII	209	
ests							eet)			roximate Ground Surface	200
Other Tests	ა Moisture ა Content (%)	Co Dry Unit	Core Recovery (%)	RQD (%)	Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample Graphic USCS		evation (feet MSL): 227 *	
Oth	No O	We	Cor	RO	Res (blo	Poor (tsf.)	Del	Sample Graphi USCS		Description	
	13	95	65		36/6" +47/5"			MH	Reddish brown damp (residua	CLAYEY SILT with sand, I soil)	, hard,
					Ref.					BASALT, moderately frac	tured,
							5	OF GP		athered, medium hard to	
			47	25				行	Red-brown GR	AVEL, medium dense (cli	nker)
							40	一位	moderately we	BASALT, moderately frac	turea,
	_				00/4"		10-	O GP		with some sand, very den	ise
UC=	7		96	68	30/4" Ref.			泽	(clinker)	•	
9550					IXCI.		15-	一台		BASALT, moderately frac	
UC=			90	52				GP GP		red, medium hard to hard	
8710			00	02				°0- GP		dense (clinker) moderately fractured, slig	htly
							20-	12		edium hard to hard	illy
			80	20				核		and gray GRAVEL, dense	e (clinker
							25	闭	D.	Saulas DACALT alasahi ta	
				40			25	協		sicular BASALT, closely to tly to moderately weather	
			50	13				12	medium hard	a, to moderatory weather	· ,
	in I						30-	沙			
								5	Boring termina	ted at 31.5 feet	
							-		Donning tonning	100 01 01 1001	
							35-				
						- 1					
							40-				
							45-				
							-				
							50-				
							-				
							55-				
							-				
							_				
							60-				
							65-				
							00				
							-		20 12		
							70-				
							-				
							1				
Date Star	rted:		Septe	mber	29, 2008	3	75-		Water Level:	Not Encountered	
Date Con	nplete	ed:	Septe	mber	29, 2008						
ogged E			N. Mit 31.5 f						Drill Rig: Drilling Method:	MOBILE B-53 HQ Coring	
Work Ord			5401-		Ω				Driving Energy:	140 lb. wt., 30 in. drop	

GEOLABS, INC.

					BS, IN Engine			Н	ONC	APIILANI HIGHWAY REALIGNMENT, PHASE 1A, PART B LAHAINA, MAUI, HAWAII  LAHAINA, MAUI, HAWAII
Other Tests	Moisture GContent (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample	HM	Approximate Ground Surface
	15	90	50 100	7	45		5	X T X X X X X X	МН	Red-brown CLAYEY SILT with sand, hard, damp (residual soil)  Brown-gray vesicular BASALT, severely fracture moderately weathered, medium hard
UC= 7180			100	58			10	47.22.22		
			25	10			20-	000	GP	Red GRAVEL with some sand, dense (clinker)
	23		0	0	23		25	000	SW	Red SAND with some gravel, medium dense, moist (clinker)
	19		0	0	26		30			
	19				27		35	\'.		Boring terminated at 33 feet
							40			
							45			
							50-			
							55			
							60			
							65			
							70-			
Date Star Date Cor Logged E	nplete	ed: S		mber	29, 2008 29, 2008		75-			Water Level:   Not Encountered  Drill Rig: MOBILE B-53
Total Dep Work Ord	oth:	3	33 fee 5401-0	t	0				1000	Drilling Method: HQ Coring Driving Energy: 140 lb. wt., 30 in. drop



STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BORING LOGS - 23

HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A Future Keawe St Extension to Lahainaluna Rd, Part B

Fed. Aid Proj. No. NH-030-1(35)R

Scale: As Noted SHEET No. G2.23 OF 34 SHEETS

Date: June, 2010

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-030-1(35)R	2009	252	382

Other Tests	Woisture Content (%)	ODy Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample Graphic	nscs	Approximate Ground Surface Elevation (feet MSL): 227.5 * Description
0	3	93	OK	2	69	<u>₽</u> #		SO	MH	Red-brown CLAYEY SILT with sand, hard, damp
	5		70		16/3"				GM	(residual soil)
			72	44	Ref.			- h		Gray-brown SILTY GRAVEL with sand, very
UC=					-		5-			dense, damp (extremely weathered basalt)
5880			63	22			-	157		Brown-gray vesicular BASALT, moderately
			03	22				行		fractured, slightly weathered, medium hard to ha
UC=			48	27	11		10-	位		Red-brown-gray BASALT, closely to moderately fractured, slightly weathered, hard to medium ha
7910			40	21				800	GP	Red-gray GRAVEL, dense (clinker)
1310							15-	000		
					40/01			000		
			30	23	10/0"			000		grades to brown-gray
- 3 n= 1					Ref.		20-	00		
								1	100	Gray vesicular BASALT, moderately fractured,
					10/0"					slightly weathered, hard
					Ref.		25			Boring terminated at 22 feet
							30-			
	1			7			35-			
0,4							20.			
							10			
							40-			
	12.0						4-			
							45			
							-			
							50-			
							-			
	1									
							55-			
							60-			
				10			-			
							65-			
							-			
							70-			
	7.									
							75-			
Date Sta			Septe	mber	29, 2008	3	10			Water Level:   ■ Not Encountered
Date Cor		ed:	Septe	mber	29, 2008	3				B. II B.
Logged E			N. Mit							Drill Rig: MOBILE B-53 Drilling Method: HQ Coring
Total De	otn: der:		22 ree 5401-							Driving Energy: 140 lb. wt., 30 in. drop

GEOLABS, INC.

Geotechnical Engineering

Log of Boring

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HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A, PART B

LAHAINA, MAUI, HAWAII

					3S, IN Engine			Н	ONO	APIILANI HIGHWAY REALIGNMENT, PHASE 1A, PART B LAHAINA. MAUI. HAWAII  212
N.										
Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample	SS	Approximate Ground Surface Elevation (feet MSL): 223.5 *
5	S S	We	Cor	S S	Res (blc	Poc (tsf	Del	Sar	uscs	Description
UC= 6820	13	90	85 77	38 23	34/6" +50/4" Ref.		5		MH SW	Red-brown CLAYEY SILT with sand and some gravel, hard, damp (residual soil) Gray-brown-red GRAVELLY SAND with silt, very dense, damp (extremely weathered basalt) Gray highly vesicular BASALT, moderately fractured, slightly weathered, medium hard to har
100							10-	拉		grades to closely fractured
								收		
			87	55			15-	表表		grades to moderately fractured
UC=			90	25				- 2		
8360			30	20			00	行		grades to closely fractured
			-	,			20-	公公		Gray vesicular BASALT, moderately to closely
			55	47						fractured, slightly weathered, medium hard to har VOID
							25-			VOID
			80	22				HE		
							30-	赏		grades to closely fractured
								14,		Boring terminated at 31.5 feet
							35-			
							-			
							40-			
							45-			
							1			
							50-			
							-			
							55-			
							33			
							60-			
							-			
		1 v					65-			
							-			
							70-			
							- }			
							75			
Date Sta					30, 2008					Water Level:   ■ Not Encountered
Logged E	Зу:		N. Mit	tchell	30, 2000			in the		Drill Rig: MOBILE B-53
Total De	pth:		31.5 f	eet	10 Sec. 1					Drilling Method: HQ Coring Driving Energy: 140 lb. wt., 30 in. drop



THIS WORK WAS PREPARED BY ME

CEOLABS, INC. LIC. EXP. DATE

STATE OF HAWAPI
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BORING LOGS - 24

HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A Future Keawe St Extension to Lahainaluna Rd, Part B Fed. Aid Proj. No. NH-030-1(35)R

Scale: As Note

Date: June, 2010

SHEET No. G2.24 OF 34 SHEETS

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-030-1(35)R	2009	253	382

S S	1		6			-				LAHAMA, MAOI, HAVAM
Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration GRESISTANCE (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample	HUSCS	Approximate Ground Surface Elevation (feet MSL): 226 *
10	Sol	We	Cor	RO	Res (blc	Pod (tsf	Del	Sal	US	Description
	8	94			35		-	X day	IVIH	Red-brown CLAYEY SILT with sand and gravel,
			58	53			1	da	GM	dense, damp (residual soil)
								FQ.		Light gray SILTY GRAVEL with sand, very dense
							5-	顺		damp (extremely weathered basalt)
UC=			100	78			-	刊到		Gray vesicular BASALT, moderately fractured,
6380			100	10			1	领		slightly weathered, medium hard to hard
0000							10-	寬		
UC=			00	40			1	顶		
10000			63	40			1	質		
							15-	1/2		VOID
							-	1		VOID
UC=			57	13			1	000	GP	Gray GRAVEL (BASALTIC), dense (clinker)
7310							20-	000	AVE-6207	
							-	1		Gray vesicular BASALT, closely fractured, slightly
	5 1		97	73			1	"	11	to moderately weathered, hard
							05	1		grades to moderately to slightly fractured
	1						25-	於		grades to inoderately to slightly fractured
			50	30			-	15		
							1	1		
							30-	17		
							1	Ц		Boring terminated at 31 feet
							1			
							35-			
							-			
							40-			
					1		-			
							]			
							45-			
							40			
							]			
							50-			
							+			
							1			
							55-			
		- 1					-			
							60-			
							-			
							65			
							00-			
							-			
							70			
							70-			
							+			
							1			
Data Ct	when al.		Ca-4-	mak =	20, 2000		75			Water Level:   Not Encountered
Date Sta Date Cor					30, 2008		W	-		Water Level:   Not Encountered
Logged E			N. Mit		20, 2000					Drill Rig: MOBILE B-53
Total De			31 fee							Drilling Method: HQ Coring
Work Or			5401-							Driving Energy: 140 lb. wt., 30 in. drop

HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A, PART B LAHAINA, MAUI, HAWAII

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GEOLABS, INC.

Geotechnical Engineering

	1	Geot	techi		BS, IN		,	H	ONO	APIILANI HIGH PHASE 14 LAHAINA, M		Log of Boring 214
Other Tests Moisture	Content (%)	O Dry Unit	Core Recovery (%)	RQD (%)	Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample Graphic	nscs		roximate Ground Surface evation (feet MSL): 211 * Description	
1	114 113	0 95	67 80 83 53	33 30 50 28	37 58	d)	10- 15- 20- 25- 30- 40- 45- 50- 65- 70-	9	o MH GM	hard, damp (re Light gray SILT damp (extreme Gray vesicular fractured, sligh VOID grades to mode Red GRAVEL ( Gray vesicular weathered, har	AYEY SILT with sand and esidual soil)  Y GRAVEL with sand, verely weathered basalt)  BASALT, moderately to could be a supported by the sand of the san	ry dense losely ed, hard
							75					
Date Starte Date Comp Logged By:	olete	d: \$		mber	30, 2008					Water Level:   Drill Rig:	Not Encountered  MOBILE B-53	



STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION

BORING LOGS - 25

HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A Future Keawe St Extension to Lahainaluna Rd, Part B Fed. Aid Proj. No. NH-030-1(35)R

Scale: As Noted Date: June, 2010 SHEET No. G2.25 OF 34 SHEETS

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-030-1(35)R	2009	254	382

Other Tests	Moisture © Content (%)	O Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet) Sample Graphic	Huscs		roximate Ground Surface vation (feet MSL): 204.5 *
0	20	20	OK	Ř	280	<u>P</u>	000	NI S	Pod brown CI	Description  AYEY SILT with sand and few
	12	30			54					amp (residual soil)
	12		56	47	54		- 11	SM	Light grov CII 7	TY SAND with gravel, very dense,
			50	7/		11	5-		damn (extrem	ely weathered basalt)
			83	50			¥ H = =			BASALT, moderately fractured,
			00	50			1 15	-	slightly weather	brod bard
							10-00	GP	VOID	ried, flaid
				00			10-			CDAVEL (DACALTIC) dance
			57	28			- 33		(clinker)	GRAVEL (BASALTIC), dense
							133			BASALT with clinker layers, closel
UC=							15-		fractured click	the weathered hard
14430			53	17			1133		nactured, Siigh	tly weathered, hard
							1 3			
							20-			
									Boring termina	ited at 21 feet
							1		Donnig termina	1100 01 21 1661
							25			
							25-			
			_ =				-			
							]			
							30-			
							1			
		11					-			
							35-			
							-			
							1			
							10			
							40-			
							111			
							45			
						1				
							1			
							50-			
							1			
						1	4			
							55-			
							-			
							1			
							00			
							60-			
							+			
	- 11						65-			
							1			
							-			
							70-			
							, 0			
							1			
							75			
Date Star	ted.		Sente	mher	30, 2008		75		Water Level:	Not Encountered
Date Con					30, 2008				vater Level. 4	Hot Ellooditieled
ogged B	By:	1	V. Mit	chell					Drill Rig:	MOBILE B-53
Total Dep			21 fee	t 00&10					Drilling Method:	HQ Coring
Work Ord									Driving Energy:	140 lb. wt., 30 in. drop

GEOLABS, INC.

Geotechnical Engineering

Log of Boring

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HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A, PART B

LAHAINA, MAUI, HAWAII

					BS, IN Engine		,	H	ONC	APIILANI HIGH PHASE 14 LAHAINA, M	WAY REALIGNMENT, A, PART B AUI, HAWAII	Log of Boring 216
Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RaD (%)	Penetration Resistance	Pocket Pen. (tsf)	Depth (feet)	Sample Graphic	SOSAM	App	roximate Ground Surface vation (feet MSL): 218 *	
0	4	106	27	6	15/1" Ref.	<u>a</u> #		S S S S S S S S S S S S S S S S S S S	GM	dense, damp (	TY GRAVEL with sand, vextremely weathered base BASALT, severely fracture	alt)
	11		93	84	20/3"		5-	000	GP	moderately we VOID	athered, medium hard  very dense, damp to moi	
UC= 8370			73	67	Ref.		10-	公公公		(clinker) Gray vesicular	BASALT, slightly fractured	
UC=			100	33			15-	18. E.		weathered, har grades to mode	arately to slightly fractured	
4660			100	33			20	交交交		grades to mode	erately fractured	
							25-			Boring termina	ted at 21.5 feet	11 2 12 X
							30-					
							35-					
							40-					
							45					
							50-					
							55					
							60-					
							65					
1 2 2							70-					
							75					F 10/02
Date Star	nplete	ed: S	Septe	mber	30, 2008 30, 2008		13			Water Level: ♀	Not Encountered	
Logged B			1. Mit							Drill Rig: Drilling Method:	MOBILE B-53 HQ Coring	



STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION

BORING LOGS - 26

HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A Future Keawe St Extension to Lahainaluna Rd, Part B Fed. Aid Proj. No. NH-030-1(35)R

Scale: As Noted . Date: June, 2010

SHEET No. G2.26 OF 34 SHEETS

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO,	TOTAL SHEETS
HAWAII	HAW.	NH-030-1(35)R	2009	255	382

Other Tests	sture tent (%)	Unit ght (pcf	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample Graphic	SS	App	roximate Ground Surface vation (feet MSL): 199 *	
Oth	Mois	Dry	Core	SQL	Res Ses blov	Poc (tsf)	Dep	Sarr	HUSCS		Description	
	7				64			T	MH		AYEY SILT with some san	d, hard t
								90	GM	very hard, dam	p (residual soil)	
			100	100			_	op o			Y GRAVEL with sand, ver	
UC=			100	100			5	1位		damp to moist	(extremely weathered bas	salt)
5070			73	63				书意		Cravinasianlan	DACALT aliability for above	الماسالية
							10	- 19.		weathered, har	BASALT, slightly fractured	a, slightly
UC=							10	13		grades to mode	erately fractured	
4610			100	80				H		gradoo to mode	ratory radianca	
JC=940								- 12				
							15					
			50	7				+ 33	9	grades to sever	rely fractured	
			-				00	×o×	GP		(BASALTIC) (clinker)	
							20	1			BASALT, severely fracture	ed,
										moderately we	athered, medium hard	
							0.5	-		Boring termina		
							25	1				
								1				
							30	1				
							30					
							35					
							30	+				
							40					
							10					
							45					
100												
							50-					
							55					
							60					
								1				
							65					
							1					
							70					
146							70-					
							75-					
Date Star			Octob						-	Water Level:	Not Encountered	
Date Com Logged B			Octob N. Mit		2008					Drill Rig:	MOBILE B-53	
Total Dep			22 fee							Drilling Method:	HQ Coring	
Work Ord			5401-		n					Driving Energy:	140 lb. wt., 30 in. drop	

PHASE 1A, PART B

LAHAINA, MAUI, HAWAII

GEOLABS, INC.

Geotechnical Engineering

Log of Boring

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					BS, IN			Н	ONC	PHASE 1		Log of Boring 218
Other Tests	→ Moisture ⇔ Content (%)		Core Recovery (%)		Penetration Resistance (blows/foot)	- 111	Depth (feet)	Sample Graphic	uscs		roximate Ground Surface evation (feet MSL): 219 *	
UC= 2890	13	Dry	7 81 60	0 41 20	51	Poor (tsf)	5 10 15	######################################	MH GM	(residual soil) Light gray SILT damp (extreme Gray vesicular fractured, sligh Reddish brown dense (clinker) Gray vesicular	BASALT, closely fractured dium hard to hard	ry dense, rately ALTIC),
							25					
							35					
							40					
							45					
							50					
		**					55					
							60					
							65					
							70-					
							75-			T 144 / T 1		
Date Sta Date Cor Logged I	mplete	ed:	Octob Octob N. Mit	er 6,	2008					Water Level:   Drill Rig:  Drilling Method:	MOBILE B-53 HQ Coring & 4" Solid-Stem Au	



STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BORING LOGS - 27

HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A Future Keawe St Extension to Lahainaluna Rd, Part B Fed. Aid Proj. No. NH-030-1(35)R

Scale: As Noted Date: June, 2010

SHEET No. G2.27 OF 34 SHEETS

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAH	HAW.	NH-030-1(35)R	2009	256	382

***					l Engine		9		PHASE 1A, PART B LAHAINA, MAUI, HAWAII 219
Other Tests	oisture ontent (%)	y Unit eight (pcf)	Core Recovery (%)	(%) QC	enetration esistance lows/foot)	Pocket Pen. (tsf)	Depth (feet)	ample aphic SCS	Approximate Ground Surface Elevation (feet MSL): 222 *
UC= 3490	Moisture Content (%)	Dry Unit	41 80 65 62 40 41 60 7	(%) GDN 0 20 23 27 17 8 30 0	Penetration Salary Sala	Pocket P (tsf)	9) HtdeQ 5 10 15 20 25 30 35 40 45 50 60 65 60 65	GP GP GP	
							70-		
Date Star			Octob		2008 2008		10		Water Level:   ▼ Not Encountered
Logged E Total Der	By:		V. Mit	chell					Drill Rig: MOBILE B-53 Drilling Method: HQ Coring
Work Ord			5401-	-	0				Driving Energy: 140 lb. wt., 30 in. drop

HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A, PART B

GEOLABS, INC.

Log of Boring

					BS, IN			Н	ONC	DAPIILANI HIGHWAY REALIGNMENT, PHASE 1A, PART B LAHAINA, MAUI, HAWAII  LAHAINA, MAUI, HAWAII
Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample	H	Approximate Ground Surface Elevation (feet MSL): 203.5 * Description
UC= 6820	6		74 50 80	<ul><li>54</li><li>10</li><li>13</li></ul>	46		10-	なるのであっていた「ハインハーンハーンハーンハーンハーンハーンハーンハーンハーンハーンハーンハーンハーン	GM	Red-brown CLAYEY SILT with sand, hard, damp (residual soil) Light gray SILTY GRAVEL with sand, very dense damp (extremely weathered basalt) Gray vesicular BASALT, moderately fractured, moderately to slightly weathered, hard grades to severely fractured
			33	0			20	× × × × × × × × × × × × × × × × × × ×	GP	Gray GRAVEL (BASALTIC), dense (clinker)
UC= 24860	8		100		30/3" Ref.		25	x x x x x x x x x x x x x x x x x x x	GP	Gray vesicular BASALT, closely fractured, moderately to slightly weathered, medium hard Gray-brown GRAVEL (BASALTIC), dense (clinke
			43 60	0 23	20/0"		30-	× × × × / × / × / × / × / × / × / × / ×	GP	Gray vesicular BASALT, closely fractured, moderately to slightly weathered, medium hard Gray-brown GRAVEL (BASALTIC), dense (clinke
			60	23	Ref.		35-	x x x x x x x x x x x x x x x x x x x	GP	Gray vesicular BASALT, closely fractured, moderately to slightly weathered, medium hard Gray-brown GRAVEL (BASALTIC), dense (clinke
							45			Boring terminated at 38 feet
							50-			
							55			
							60			
							65			
							70-			
	ted.	(	Octob	er 7,	2008					Water Level:   Not Encountered
Date Star										
Date Com	plete		Octob		2008					D.W.D.
	nplete y:	1	Octob V. Mit 38 fee	chell	2008					Drill Rig: MOBILE B-53 Drilling Method: HQ Coring



STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BORING LOGS - 28

HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A Future Keawe St Extension to Lahainaluna Rd, Part B

Fed. Aid Proj. No. NH-030-1(35)R

Scale: As Noted

Date: June, 2010

SHEET No. G2.28 OF 34 SHEETS

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-030-1(35)R	2009	257	382

Other Tests	oisture ontent (%	Dry Unit Weight (pcf)	ore scovery (9	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet) Sample Straphic		roximate Ground Surface evation (feet MSL): 187 *
ō	ΣŬ	2 ق	N N	N.	9,50	Pr (ts	<u>a</u> 8 5	Cray brown Of	Description RAVEL, very dense, damp
					20/1"		N. /1		
	8				Ref.		GI GI	Gray BOULDE	R (BASALTIC)
UC=	0		80	40	26		5 1	Light gray-brow	vn SILTY GRAVEL with sand,
3740			00	40			1/-		e, damp (extremely weathered
3/40			80	42			1	basalt)	
UC=							- (2)	Gray vesicular	BASALT, closely to moderately
3950							10-1公	fractured, sligh	tly weathered, hard
0000			80	60			44,23		
			00	00			1 2	0.00	
UC=							15-		
3550							1 %		
			100	60			- 35		
							20-		
							20		
			98	40			153	Gray vesicular	BASALT, moderately fractured,
								slightly weathe	red. hard
UC=							25-		
820			60	22			14		
			60	33			- 1 [3]		
							30-		
							10		
			100	80			- 1	grades to all-bi	by fractured
JC=							35-	grades to slight	ly fractured
550							- Ki		
								Boring termina	ted at 37 feet
							40	3	
							40-		
		1					1		
							45-		
							1		
							-		
							50-		
							111		
							55		
						ĺ	55-		
		-				- 1	-		
							1		
							60-		
		-					111		
							+		
							65		
								0 = 1	
							111		
							70		
							70-		
							4		
							1		
ate Star	tod:		Octob	er 7, 2	2008		75	Water Level:	Not Encountered
ate Star				er 7, 2				vvater Level: ⊈	NOT Encountered
ogged B			V. Mit					Drill Rig:	MOBILE B-53
otal Dep	oth:	3	37 fee	et				Drilling Method:	HQ Coring & 4" Solid-Stem Auger
Vork Ord			404	00&10	1			Driving Energy:	140 lb. wt., 30 in. drop

Log of Boring

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HONOAPIILANI HIGHWAY REALIGNMENT,

PHASE 1A, PART B

LAHAINA, MAUI, HAWAII

GEOLABS, INC.

Geotechnical Engineering

UC= 24870  32 0  67 40  UC= 30700  UC= 29210  67 40  UC= 29210  68 40  100 93			Geot	ech	nical	BS, IN		9	Н	ONO	APIILANI HIGHWAY REALIGNMENT, PHASE 1A, PART B LAHAINA, MAUI, HAWAII  LAHAINA, MAUI, HAWAII
Carry   Carr	ther Tests	loisture ontent (%)	ry Unit /eight (pcf)	ore ecovery (%)	QD (%)	enetration esistance olows/foot)	ocket Pen. sf)	epth (feet).	ample raphic	scs	Élevation (feet MSL): 153 *
Date Started: October 7, 2008  Date Completed: October 7, 2008  Water Level:   Not Encountered  Not Encountered	UC= 6810 UC= 25140 UC= 24870 UC= 30700	<sub>Op</sub> Moisti Conte		67 57 85 90 32 67	31 23 43 67 0	Penet (blows	Pocke (tsf)	10-15-20-25-30-35-40-55-60-65-60-65-65-60-65-65-60-65-65-60-65-60-65-65-60-65-65-60-60-65-60-60-65-60-60-65-60-60-65-60-60-65-60-60-65-60-60-65-60-60-65-60-60-65-60-60-65-60-60-65-60-60-60-60-60-60-60-60-60-60-60-60-60-	Samp Samp Samp Samp Samp Samp Samp Samp	GP	Description Red-brown CLAYEY SILT with some sand, very stiff, damp (residual soil) Gray-brown SILTY GRAVEL with sand, very dense, damp (extremely weathered basalt) Gray vesicular BASALT, closely fractured, moderately to slightly weathered, hard  Gray GRAVEL (BASALTIC), dense (clinker)  Gray vesicular BASALT, closely fractured, moderately to slightly weathered, hard Gray GRAVEL (BASALTIC), dense (clinker) Gray GRAVEL (BASALTIC), dense (clinker) Gray vesicular BASALT, moderately fractured, slightly weathered, hard Gray vesicular BASALT, massive to slightly fractured, slightly weathered, hard
Date Completed: October 7, 2008								1			
	Date Com	plete	d: C	Octob	er 7,						Water Level:   Not Encountered  Drill Rig: MOBILE B-53



STATE OF HAWAPI
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BORING LOGS - 29

HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A Future Keawe St Extension to Lahainaluna Rd, Part B Fed. Aid Proj. No. NH-030-1(35)R

Scale: As Noted Date: June, 2010

SHEET No. G2.29 OF 34 SHEETS

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-030-1(35)R	2009	258	382

250		Geot	techi	nical	Engine	ering			LAHAINA, M		223
Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	very (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)- Sample Graphic	S	App	roximate Ground Surfacevation (feet MSL): 137	ce *
Othe	Mois	Neig	Core	ROD	Resi	Pock (tsf)	Sam	H		Description	
	20 20	73	04		33 52	>4.5	X	МН	Reddish brown hard, damp (re	CLAYEY SILT with littl	e gravel,
UC= 21380	3		58 93	33	20/0" Ref. 30/3" Ref.		10-		Gray vesicular fractured, mod	BASALT, severely to cl erately weathered, med	osely lium hard
21000			100	43	1101.		計		grades to mode	erately fractured	
UC= 24280			95	69			15-		grades to sever	rely to closely fractured	
UC= 9600							20		grades to slight Boring termina	re-	12 11 1
9000							-	93	Doming torrining		
							25	ā.			
							30-	22			
							35				
							40-				
							45				
							50-				
							55				
	i ii isila						60-				
							65				
							70				
							75				11 E1
Date Sta					26, 2008		7.5		Water Level:	Not Encountered	
Date Cor Logged E			Septe D. Fin		26, 2008				Drill Rig:	MOBILE B-53	
Total Dep	pth:		20 fee	et					Drilling Method:	4" Auger & HQ Coring	
Work Ord	der:		5401-	00&1	0				Driving Energy:	140 lb. wt., 30 in. drop	

GEOLABS, INC.

Log of Boring

HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A, PART B

					BS, IN Engine			Н	ONO	OAPIILANI HIGHWAY REALIGNMENT, PHASE 1A, PART B LAHAINA, MAUI, HAWAII  LOG of Boring 224			
Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)-	Sample Graphic	HM	App Ele	roximate Ground Surface vation (feet MSL): 111 *  Description		
UC= 19050	10		30 100 77 13	7	ad 32	Po (ts	55- 10- 15- 20- 25- 30- 35- 40- 45- 50- 60- 65-		SM	and little sand, Gray vugular B fractured, mod Reddish brown dense, moist (d Gray and brown damp (gp]) Gray vesicular moderately frac medium hard Gray vesicular moderately we	CLAYEY SILT with some hard, damp (residual soil) ASALT, severely to closely erately weathered, medium SILTY SAND with some golinker) on GRAVEL (BASALTIC), do to vugular BASALT, closely trued, moderately weather athered, medium hard on GRAVEL (BASALTIC), do GRAVEL (BASALTIC)	y m hard gravel, lense, ly to ered,	
							75-						
Date Sta					25, 2008					Water Level:	Not Encountered		
Logged E			D. Fin		25, 2008					Drill Rig:	MOBILE B-53		
Total De			21 fee							Drilling Method:	4" Auger & HQ Coring		
Date Cor Logged E	nplete By:	ed:	Septe D. Fin	mber ch	25, 2008 25, 2008		70 - 75			Drill Rig:	MOBILE B-53		



STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BORING LOGS - 30

HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A Future Keawe St Extension to Lahainaluna Rd, Part B Fed. Aid Proj. No. NH-030-1(35)R

Scale: As Noted Date: June, 2010

SHEET No. G2.30 OF 34 SHEETS

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-030-1(35)R	2009	259	382

Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample Graphic	S	Appr Ele	roximate Ground Surface evation (feet MSL): 94 *
Othe	Mois	Neig	Sore	SQL	Pen Resi blov	Poch tsf)	Jepi	Sam	H	3.00	Description
			011	-				M	MH		CLAYEY SILT with little sand and
	4	85	00	0	30/6"				1	gravel, hard to	very hard, damp (residual soil)
	-		39	0	+50/3"			00	GP		sh brown GRAVEL (BASALTIC),
					Ref.		5	00		dense (extreme	ely weathered basalt)
			00	-7 [-	20/0"			00		Gray vanioular I	BASALT, moderately fractured,
UC=			93	75	Ref.			位		moderately wer	athered, medium hard to hard
9380					T(C).		10-	10		moderately wer	athered, mediam hard to hard
			00	00				1/-	00		
			63	20				00	GP		n GRAVEL (BASALTIC), dense,
							15-	00		damp (clinker)	
							- 1	1			to vugular BASALT, closely to
			100	57				17-		moderately frac	ctured, moderately weathered,
UC=							20-	1		medium hard	ala la alamaha famahan d
3710							20	1		grades to sever	ely to closely fractured
										Boring terminal	ted at 22 feet
							25				
							20				
							30-		- 12		
							30				
							25				
							35				
4											
6,20											
							40-				
							-				
							45-				
							-				
							50-				
										8 1 1	
							55-				
							-				
							60-				
							65-				
							-				
							70-				
							10-				
							75				
Date Sta	rted:		Septe	mber	25, 2008	3	75-			Water Level:	Not Encountered
Date Cor	mplete	ed:	Septe	mber	25, 2008						The state of the s
Logged E			D. Fir							Drill Rig: Drilling Method:	MOBILE B-53 4" Auger & HQ Coring
Total De				25							

HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A, PART B LAHAINA, MAUI, HAWAII

GEOLABS, INC.

Geotechnical Engineering

Log of Boring

225

NEW YORK		G	EO	LAE	BS, IN	IC.		Н	ONC	PAPIILANI HIGHWAY REALIGNMENT, Log of Boring
The state of					Engine	eering				PHASE 1A, PART B LAHAINA, MAUI, HAWAII 226
Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet).	Sample Graphic	SS	Approximate Ground Surface Elevation (feet MSL): 81 *
Oth	Moi	Dry	Core	Rai	Res (blo	Poc (tsf)	Dep	San	ML	Description
LL=45 PI=16	12	88			38	4.5		X	ML	Reddish brown CLAYEY SILT with little sand and gravel, hard, damp (residual soil)
	8		74 65	35	50/3" Ref.		5	孩		Gray vesicular BASALT, closely fractured, moderately weathered, medium hard
UC=			03	33						grades to moderately fractured, slightly weathered
8530							10-	000	GP	Gray and brown GRAVEL (BASALTIC), dense
			37	13				000		(clinker)
							15-	000		C PACALT PLUI
			67	47	20/0" Ref.					Gray vesicular BASALT, slightly to moderately fractured, slightly weathered, medium hard to har
					ixer.		20-	000	GP	Gray GRAVEL (BASALTIC), dense (clinker)
								00		Boring terminated at 21.5 feet
							25			
							30-			
							-			
							35-			
							40-			
							_			
							A.E.			
							45-			
							50-			
							-			
							55			
.11							60			
							65-			
							70			
Data Ot-	mber al :		Cert	ma h	25 200		75-			Water Level:   Not Encountered
Date Sta	mplete	ed:	Septe	mber	25, 2008 25, 2008					
Logged I			D. Fir 21.5 f							Drill Rig: MOBILE B-53 Drilling Method: HQ Coring & 4" Auger
Work Or			5401-		0					Driving Energy: 140 lb. wt., 30 in. drop



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GEOLABS, INC. LIC. EXP. DA

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BORING LOGS - 31

HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A Future Keawe St Extension to Lahainaluna Rd, Part B Fed. Aid Proj. No. NH-030-1(35)R

Scale: As Noted

Date: June, 2010

SHEET No. G2.31 OF 34 SHEETS

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-030-1(35)R	2009	260	382

		Geo	tech		3S, IN			Н	ONO	APIILANI HIGHWAY REALIGNMENT, PHASE 1A, PART B LAHAINA, MAUI, HAWAII  LAHAINA, MAUI, HAWAII
Other Tests	Moisture Content (%)	Dry Unit	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample	Soso	Approximate Ground Surface Elevation (feet MSL): 54 * Description
Ö	ΣŬ	٥۶	89	83	2 €	Pe	5	S 2	GP	Brown-gray GRAVEL with sand, medium dense, damp (fill) Gray vesicular BASALT, slightly fractured, slightly weathered, very hard
UC= 6060			67	30			40	1000	GP	Gray GRAVEL (BASALTIC), dense (clinker)
UC= 3550		-	100	93			10	100 X		Gray vesicular BASALT, slightly fractured, slightly weathered, very hard
UC= 2290			48	40			15	1000	CB	Crow brown CDAVEL (DASALTIC) modium donor
					15/0"		20	0000	GP	Gray-brown GRAVEL (BASALTIC), medium dense (clinker) Gray vesicular BASALT, moderately fractured,
			15		15/0		25			Slightly weathered, hard Boring terminated at 22 feet
					-	8	30			
							35			
							40			
							45			
					ε		50			
							55			
							60			
							65			
							70			
Date Of			Osts	7	2009		75-			Water Level:   Not Encountered
Date Sta Date Co Logged	mplet By:	ed:	Octol N. Mi	per 7, tchell	2008					Drill Rig: MOBILE B-53
Total De Work Or			22 fe 5401		0					Drilling Method: HQ Coring & 4" Solid-Stem Auger Driving Energy: 140 lb. wt., 30 in. drop

				BS, IN I Engine		1	HONO	APIILANI HIGHWAY REALIGNMENT, PHASE 1A, PART B LAHAINA, MAUI, HAWAII	Log of Boring
Other Tests	Moisture Content (%)	Dry Unit Weight (pcf) Core	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample Graphic USCS	Approximate Ground Surface Elevation (feet MSL): 220 *	
O#	Mo	Co Ve	RO	Res (blo	Poor (tsf	Der	Sar Gra	Description	
		38	0	20/0" Ref. 20/0" Ref.		5	MH GM	Reddish brown CLAYEY SILT with some stiff, damp (residual soil) Gray and brown GRAVEL AND COBBLE (BASALTIC), dense (extremely weathered)	S
		30	0	1.0		10			
	13	10	0 10	50/3" Ref.			- GM	Brown SILTY SAND with some gravel, do very dense, moist	ense to
UC= 15700		67	27			15	SM GP		
		72	12			20	000	Gray GRAVEL, COBBLES, AND BOULD (BASALTIC), dense (extremely weathers	ER
			12			25			
UC=		73	20			30	000		
26610 UC= 5770		65	17	- 2					
		78	18			35	000	Gray vesicular to vugular BASALT, close	ly to
						40	1 × × × × × × × × × × × × × × × × × × ×	moderately fractured, moderately weather medium hard Gray GRAVEL AND COBBLES (BASALT	
		75	0			45	*** *** ***	dense (clinker) Gray vesicular BASALT, closely to severe	ely
		40	0		,	50	GP	fractured, moderately weathered, medium Gray and brown GRAVEL (BASALTIC), of damp (clinker)	
UC= 23300		97	62	20/0" Ref.		55		Gray slightly vesicular BASALT, slightly to moderately fractured, slightly weathered, grades to closely fractured	1
20000		10	7			60		grades to closely to severely fractured	
		10	48				16		
UC= 28910		15	0			65	GP	grades to moderately fractured, hard grades to closely fractured Gray GRAVEL (BASALTIC), dense (clink	er)
						70	000		
	27	10	41	50/3" Ref.		75	SM N	Reddish brown SILTY SAND with some of dense to very dense, moist (clinker)	gravel,
Date Sta				r 23, 200				Water Level:   Not Encountered	
Date Cor Logged B			inch	r 24, 200	0			Drill Rig: MOBILE B-53	
Total De		The second secon	feet	10				Drilling Method: 4" Auger & HQ Coring Driving Energy: 140 lb. wt., 30 in. drop	



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STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BORING LOGS - 32

HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A Future Keawe St Extension to Lahainaluna Rd, Part B Fed. Aid Proj. No. NH-030-1(35)R

Scale: As No

Date: June, 2010

SHEET NO. G2.32 OF 34 SHEETS

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-030-1(35)R	2009	261	382

-										LATAINA, MA	(01, 17, (07, (1)	301
Other Tests	8	Dry Unit Weight (pcf)	Core Recovery (%)	_	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)					
H	ure	h ii	rery	RQD (%)	trat stan s/fc	et F	٦ (أ	Sample	(0	100	entinued from previous plate)	
her	oist	y	6 cov	20	ssis	t) Ck	ptt	apl	USCS	(Co		
ŏ	≥ັບິ	DE	Se	R	Re Be	Po (ts	De	Sa	n		Description	
UC=			92	45			-	益		slightly to mode	BASALT, severely fract erately weathered, med	ium hard
6660							80	法法		Gray and purple	ly to moderately fracture highly vesicular BASA	LT, closely
			100	0				一般		medium hard to	ractured, moderately wo hard BASALT, closely to sev	
							85-	竹				erely
			50	0			-	沒		grades to slight	lly weathered, hard ly vugular	
							90-	000	GP	Gray and reddis	sh brown GRAVEL (BA	SALTIC).
			90	0			90	000		dense (clinker)	(=-	
			80	0				20		Gray vesicular B	BASALT with clinker lay	ers, closel
							95-	区			tured, moderately weat	
			95	38			-	1			BASALT, closely to mod	derately
							100	公公			erately weathered, med	
										Boring terminat	ted at 102 feet	10.
							105-					
							-					
							110-					
							-					
							115-					
							1157					
							-					
							120-					
							=					
							125-					
							-					
							130-					
							=					
							135					
							1					
						=	1					
							140-					
							-					
							145					
							]					
							150					
Date Sta					23, 2008					Water Level:	Not Encountered	i e
Date Cor Logged I			Septe D. Fir		24, 2008	5				Drill Rig:	MOBILE B-53	
Total De			102 fe							Drilling Method:	4" Auger & HQ Coring	
Work Or				-00&1							140 lb. wt., 30 in. drop	

HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A, PART B LAHAINA, MAUI, HAWAII

GEOLABS, INC.
Geotechnical Engineering

Log of Boring

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STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BORING LOGS - 33

HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A
Future Keawe St Extension to Lahainaluna Rd, Part B

Fed. Aid Proj. No. NH-030-1(35)R

Scale: As Noted Date

Date: June, 2010

SHEET No. G2.33 OF 34 SHEETS

NAL DESIGN 261

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-030-1(35)R	2009	262	382

## GEOTECHNICAL NOTES

- 1. Kahoma Stream Bridge Structure Foundations
  - A. Bearing material: Medium hard to hard basalt formation or dense clinker
- B. Bearing value (extreme event limit state) = 45,000 psf (North Abutment)
- C. Bearing value (extreme event limit state) = 60,000 psf (South Abutment)
- D. Bearing value (strength limit state) = 20,000 psf (North Abutment)
- E. Bearing value (strength limit state) = 27,000 psf (South Abutment)
- F. Bearing value (service limit state) = 15,000 psf (North Abutment)
- G. Bearing value (service limit state) = 20,000 psf (South Abutment)
- H. Coefficient of friction (extreme event limit state) = 0.55
- I. Coefficient of friction (strength limit state) = 0.44
- J. Vertical abutment spring = 150 pci (North Abutment)
- K. Vertical abutment spring = 200 pci (South Abutment)

## 2. Lateral Earth Pressures

- A. Static active pressure = 30 pcf equivalent fluid pressure
- B. Static at-rest pressure = 50 pcf equivalent fluid pressure
- C. Dynamic pressure (restrained) = 16H 2 pounds per linear foot acting at mid-height of wall
- D. Dynamic pressure (un-restrained) = 4.5H2 pounds per linear foot acting at mid-height of wall

## 3. Foundation Probing And Grouting

- A. Drill probe hole for every 100 square feet of foundation area or at 10 feet on centers along the abutment footings.
- B. Drill probe holes at least 3 inches in diameter and extending to a depth of at least 15 feet below bottom of footing elevation.
- C. Fill probe holes with fine aggregate masonry grout mixture with slump range of 6 to 9 inches or pumpable controlled low strength material (CLSM).
- D. Because of the potential for encountering large cavities and/or voids at the site, the probe drill shall be made available on-site until the probing and grouting operations are complete. Additional probe holes may be required.



APRIL 30, 2012 LIC, EXP. DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION

GEOTECHNICAL NOTES

HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A Tuture Keawe St Extension to Lahainaluna Rd, Part B Fed. Aid Proj. No. NH-030-1(35)R

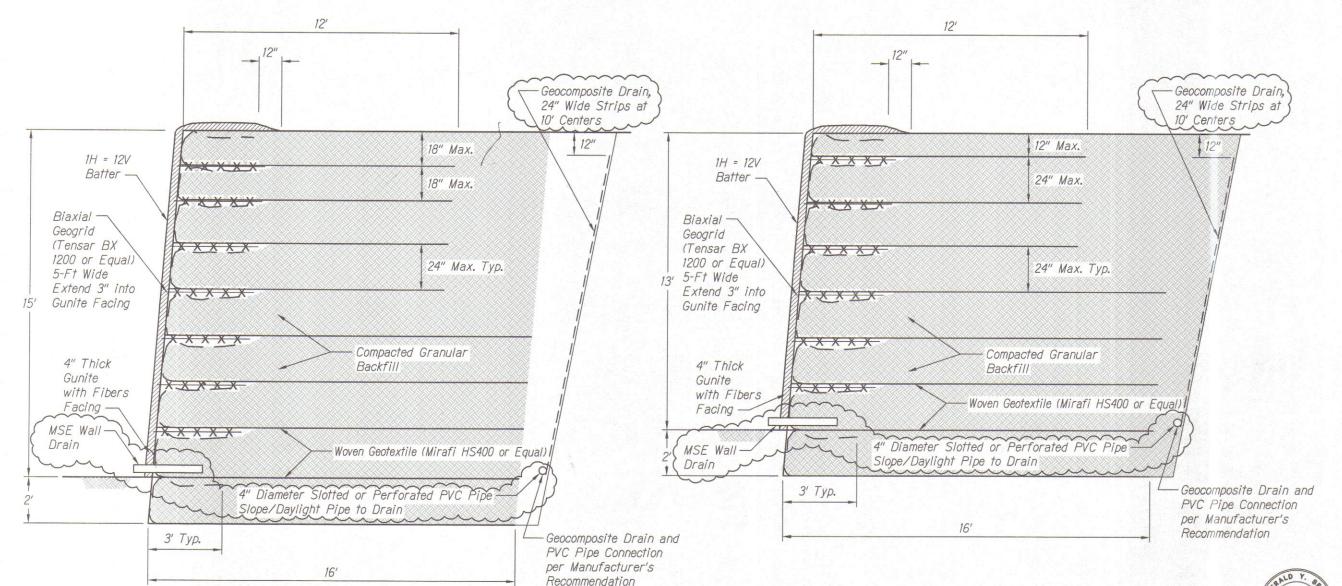
Scale: As Noted

Date: June, 2010

SHEET No. G-3.0 OF 1 SHEETS

FINAL DESIGN 262

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-030-1(35)R	2009	263	382



TYPICAL MSE WALL SECTION

SECTION A TO B

Scale: 1"=2"

TYPICAL MSE WALL SECTION

SECTION B TO C

Scale: 1"=2"

LICENSED PROFESSIONAL ENGINEER No. 5835-C

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

EOLABS, INC. LIC. EXP

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TYPICAL MSE WALL SECTION -

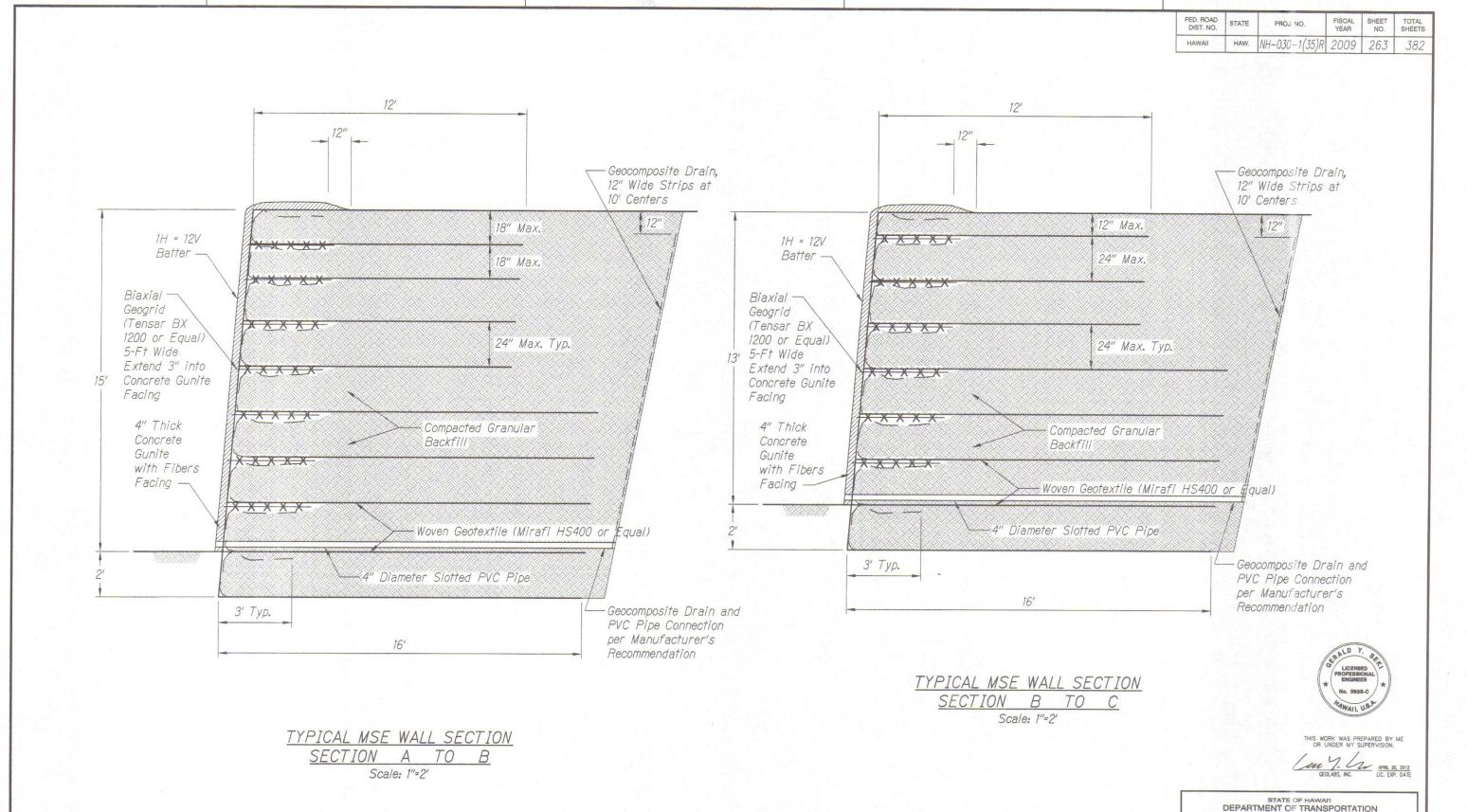
HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A Future Keawe St Extension to Lahainaluna Rd, Part E Fed. Aid Proj. No. NH-030-1(35)R

Scale: As Noted

Date: June, 2010

SHEET No. G4.1 OF 8 SHEETS

GEO.REV.2010.12.23 263



SHEET No. G4.1 OF 8 SHEETS

Date: June, 2010

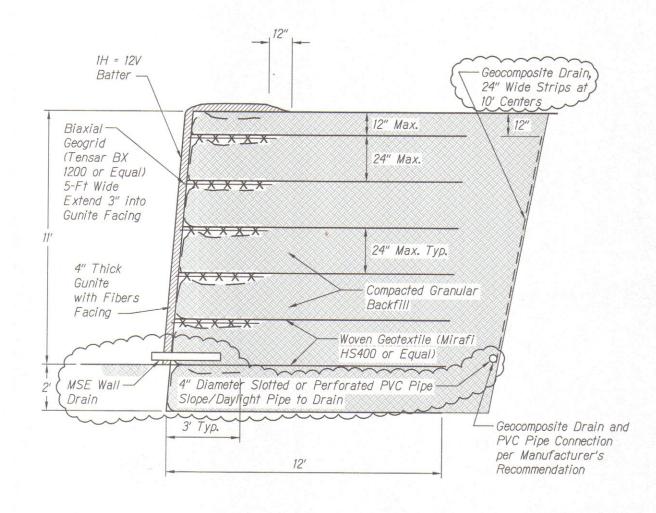
TYPICAL MSE WALL SECTION -

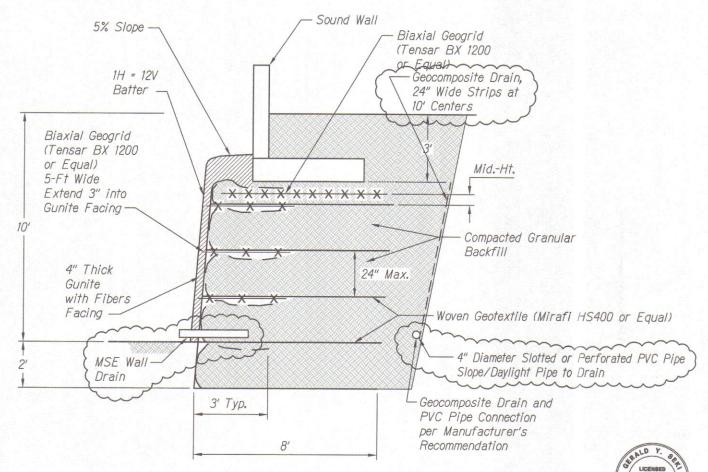
HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A Future Keawe St Extension to Lahainaluna Rd, Part B Fed. Aid Proj. No. NH-030-1(35)R

FINAL DESIGN 263 rev

Scale: As Noted

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-030-1(35)R	2009	264	382





TYPICAL MSE WALL SECTION

SECTION C TO D

Scale: 1"-2'

TYPICAL MSE WALL SECTION
SECTION D TO E
Scale: 1"=2'

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

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TYPICAL MSE WALL SECTION - 2

HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A Future Keawe St Extension to Lahainaluna Rd, Part E Fed. Aid Proj. No. NH-030-1(35)R

Scale: As Noted

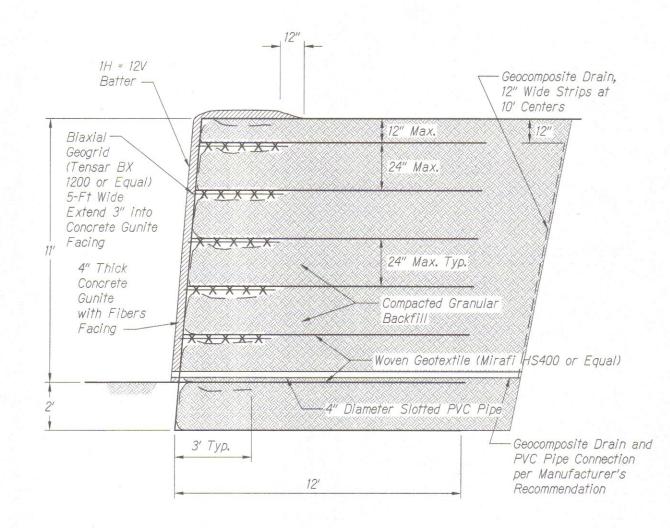
Date: June, 2010

SHEET No. G4.2 OF 8 SHEETS

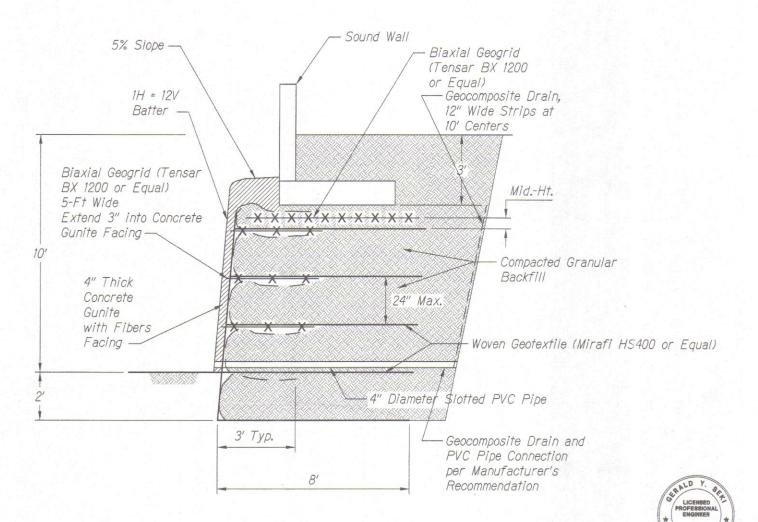
GEO.REV.2010.12.23 264



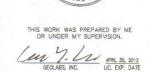
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-030-1(35)R	2009	264	382



TYPICAL MSE WALL SECTION SECTION C TO D Scale: 1"=2"



TYPICAL MSE WALL SECTION SECTION D TO E Scale: 1"=2'



STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION

TYPICAL MSE WALL SECTION - 2

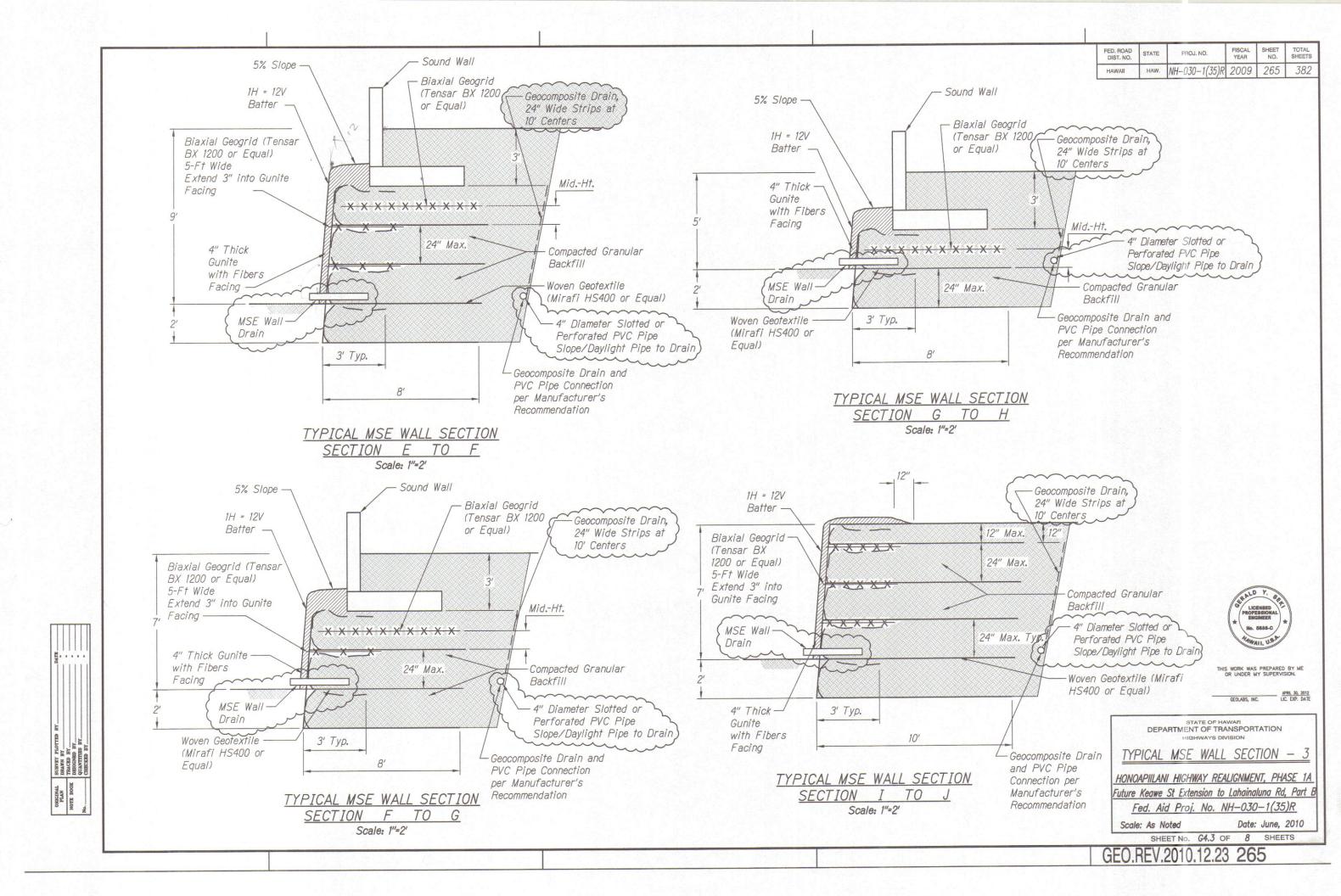
HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A Future Keawe St Extension to Lahainaluna Rd, Part B Fed. Aid Proj. No. NH-030-1(35)R

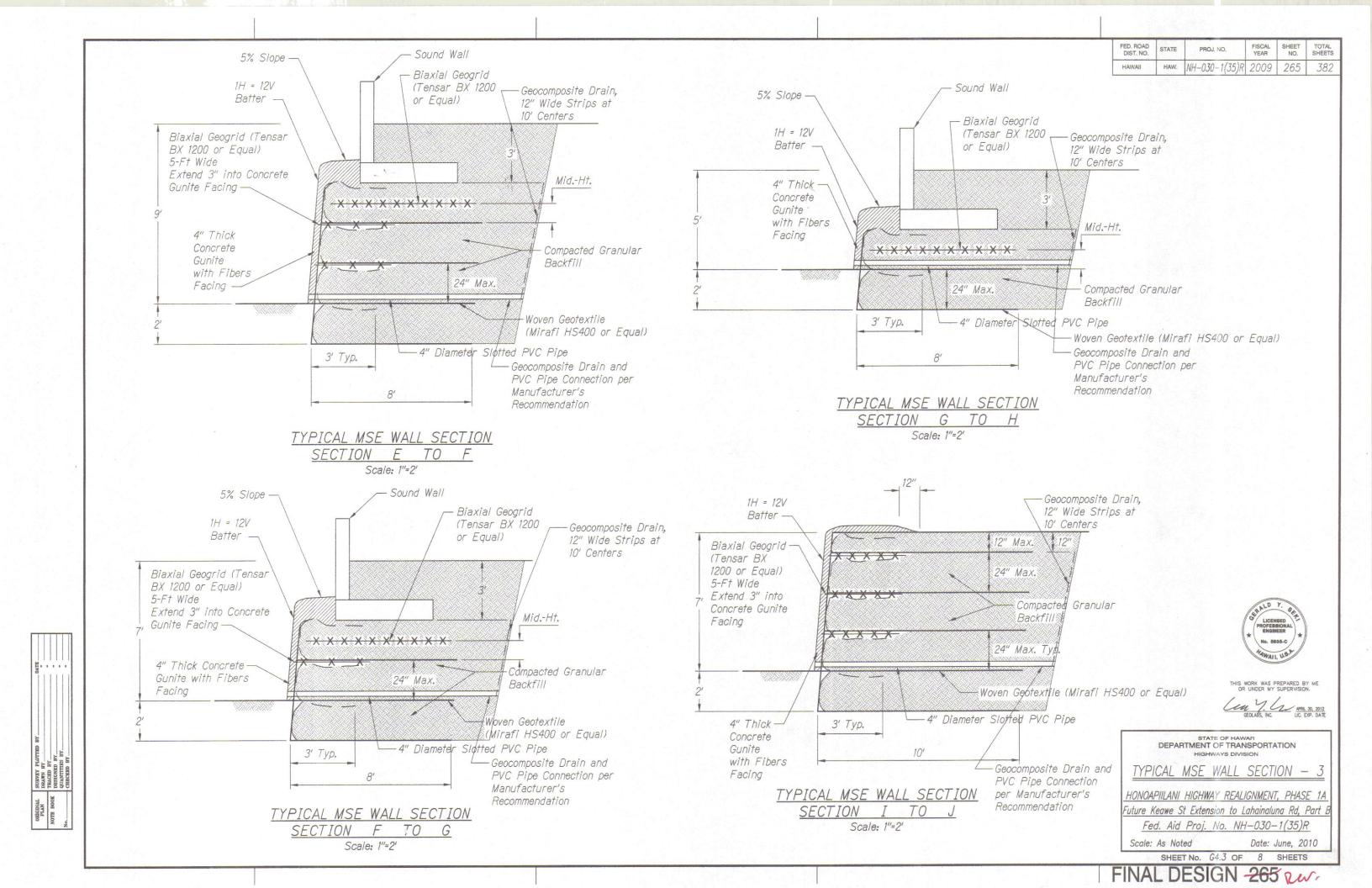
Scale: As Noted

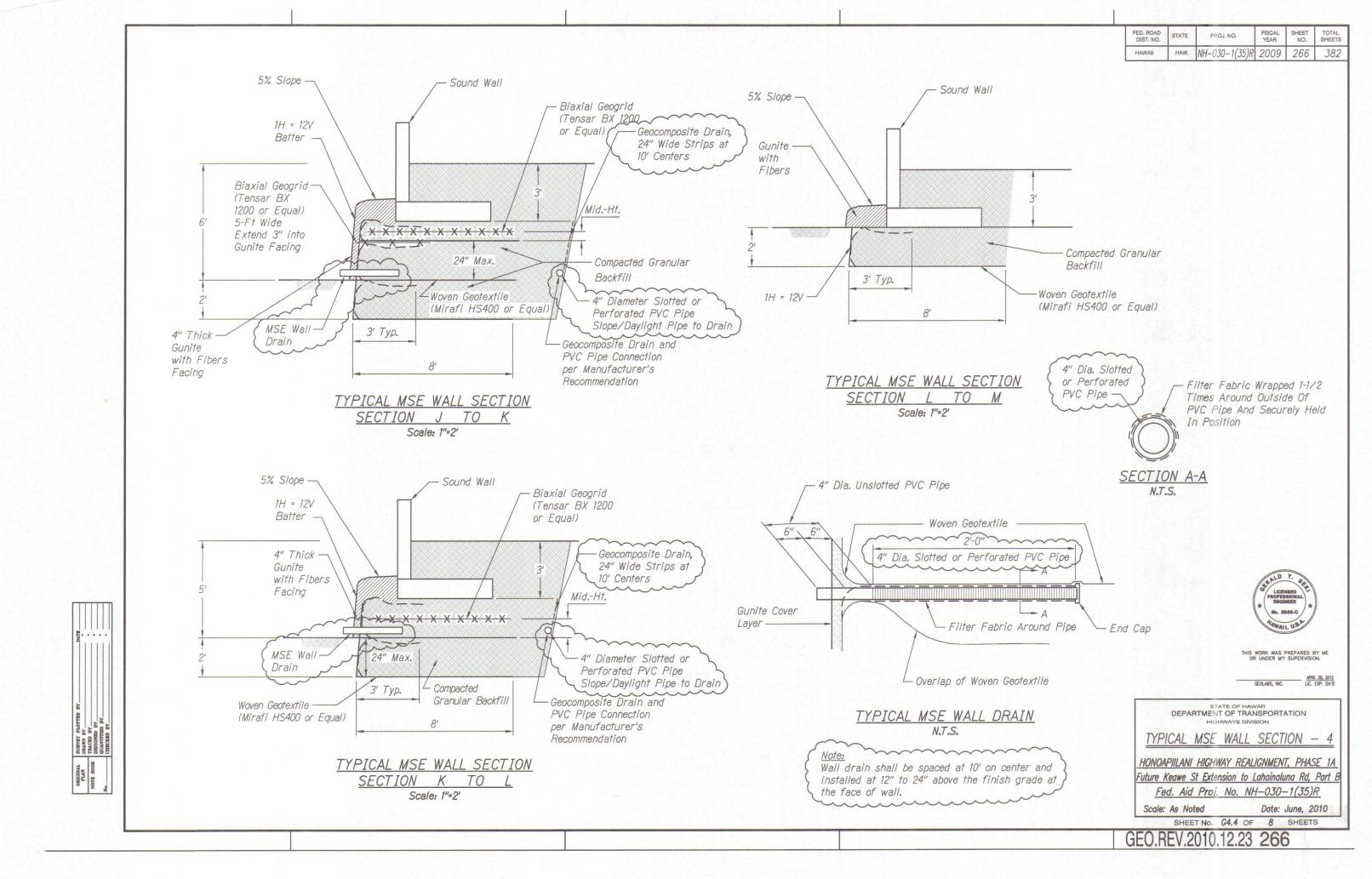
Date: June, 2010

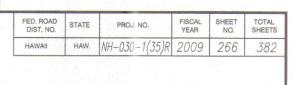
SHEET No. G4.2 OF 8 SHEETS

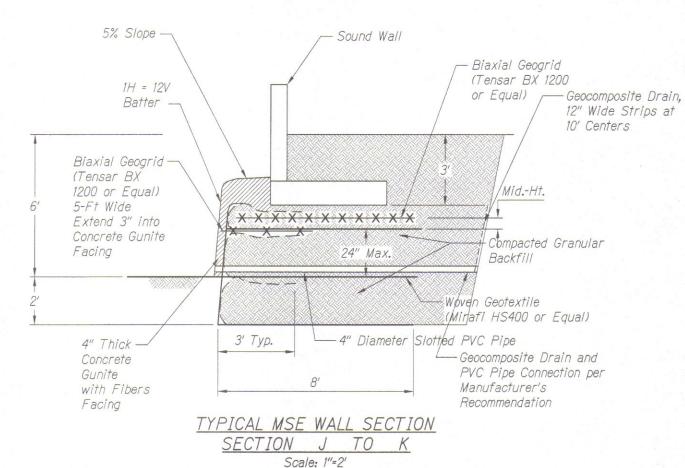


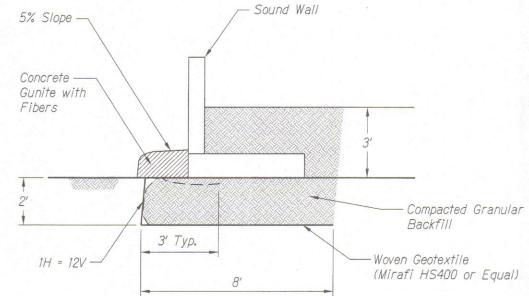


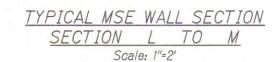




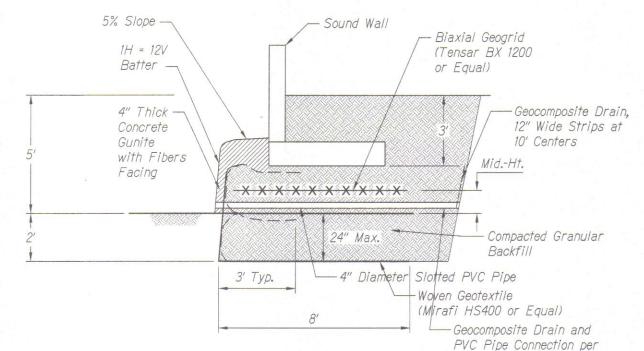








4" Dia. Slotted
PVC Pipe — Filter Fabric Wrapped 1-1/2
Times Around Outside Of
PVC Pipe And Securely Held
In Position



TYPICAL MSE WALL SECTION

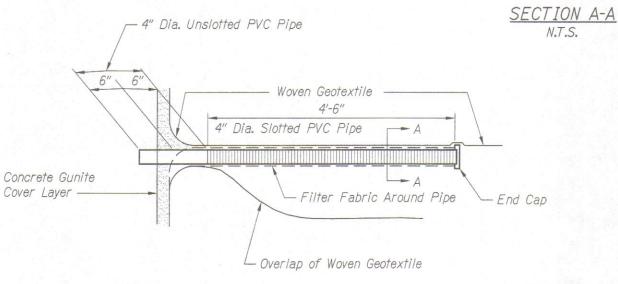
Scale: 1"=2"

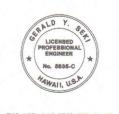
SECTION K TO

Manufacturer's

Recommendation

SURVEY
DEAWN B
TRACED
DESIGNED
QUANTITY
CHECKED





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

## TYPICAL MSE WALL DRAIN N.T.S.

Note: Wall drain shall be spaced at 8' on center and installed at 12" to 24" above the finish grade at the face of wall. STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TYPICAL MSE WALL SECTION - 4

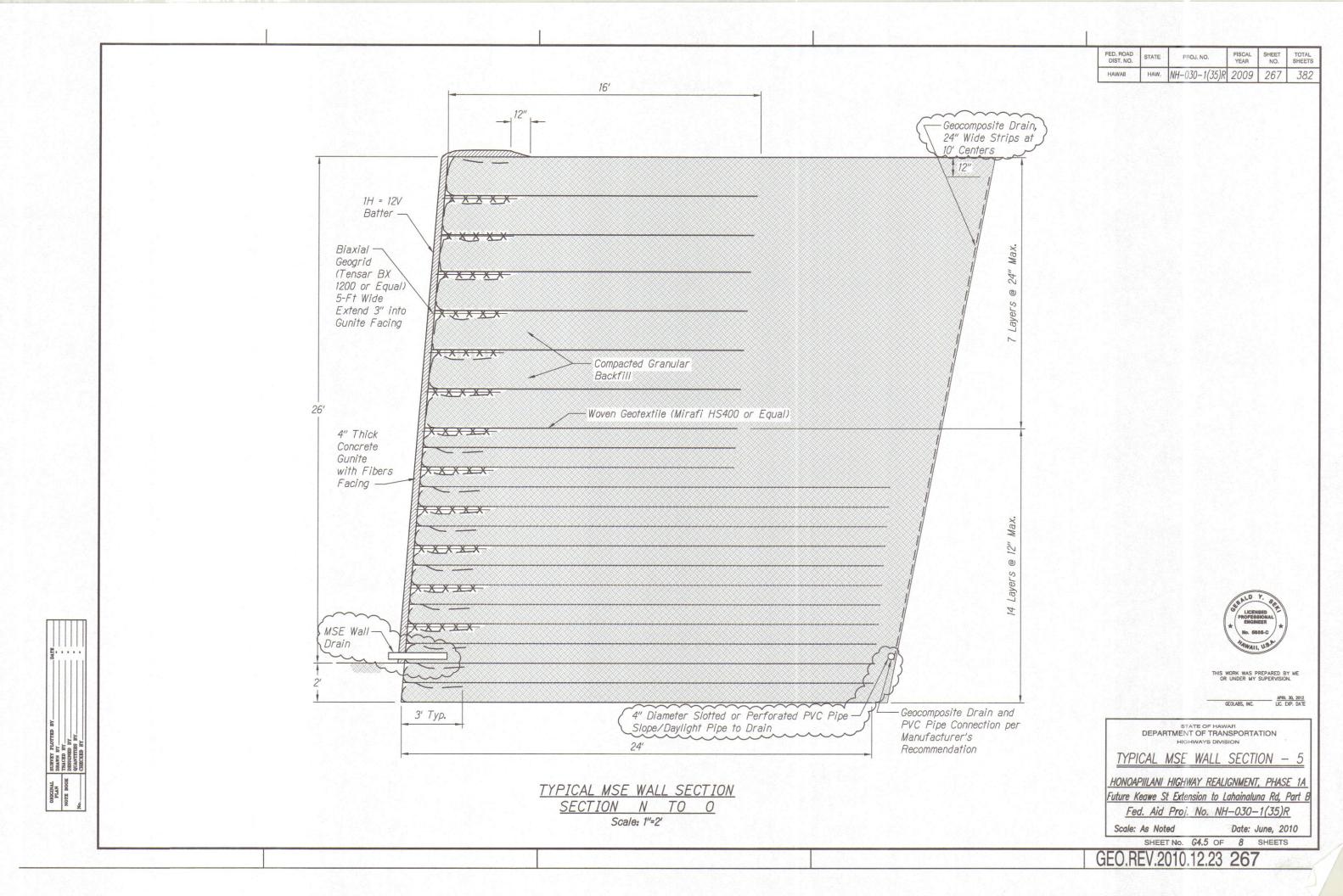
HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A Future Keawe St Extension to Lahainaluna Rd, Part B Fed. Aid Proj. No. NH-030-1(35)R

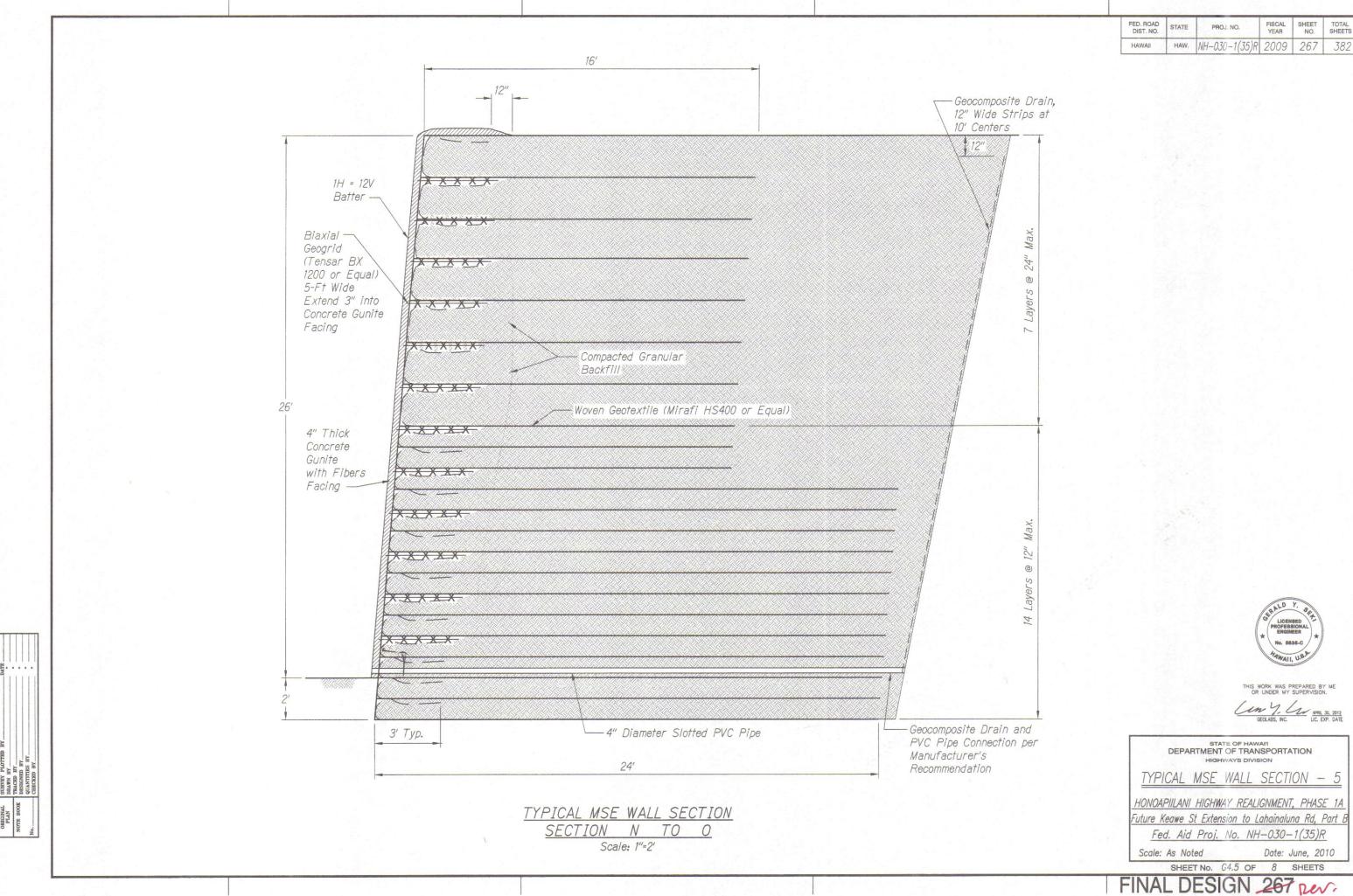
Scale: As Noted

Date: June, 2010

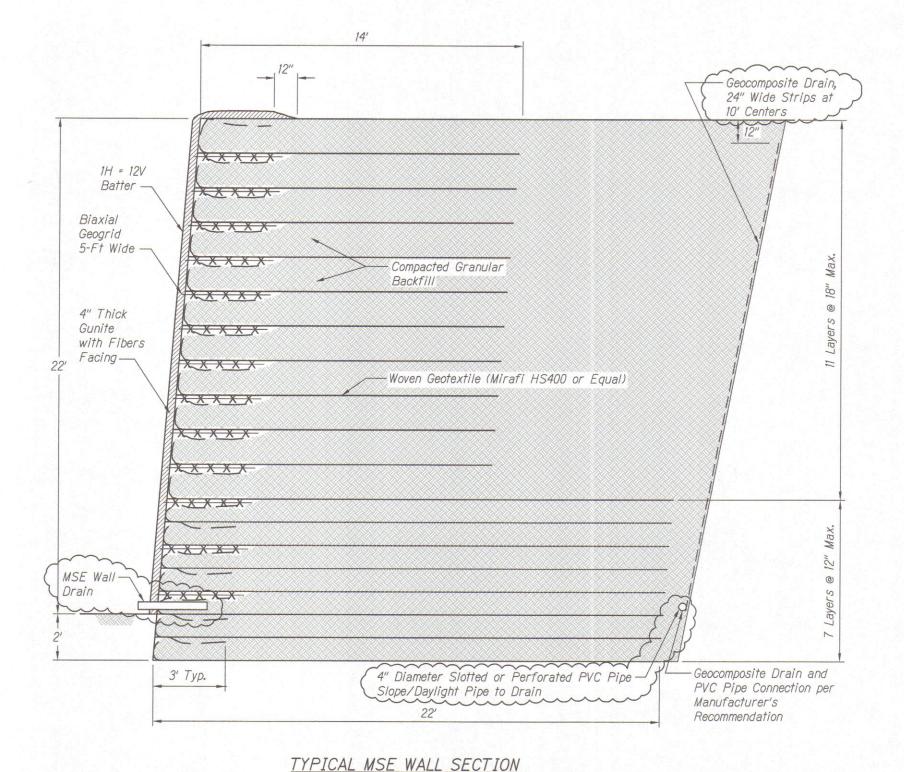
SHEET No. G4.4 OF 8 SHEETS

FINAL DESIGN 266 per





FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-030-1(35)R	2009	268	382



SECTION P TO Q
Scale: 1"=2'



THIS WORK WAS PREPARED BY

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

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TYPICAL MSE WALL SECTION - 6

HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A Future Keawe St Extension to Lahainaluna Rd, Part B Fed. Aid Proj. No. NH-030-1(35)R

Scale: As Noted

As Noted Date: June, 2010
SHEET No. G4.6 OF 8 SHEETS

GEO.REV.2010.12.23 268

NAM. SURSERY PLOTTED BY. DATE.

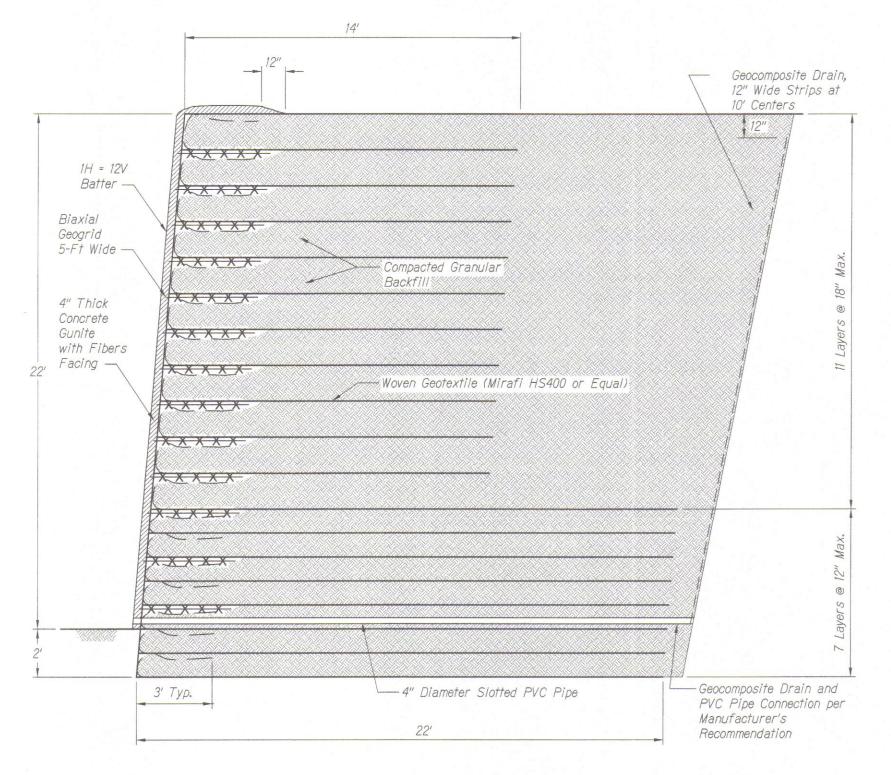
UNA DIABAN BY.

DOOR THAKED BY.

CHORAGORED BY.

CHORAGORED BY.

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-030-1(35)R	2009	268	382



TYPICAL MSE WALL SECTION SECTION P TO Q Scale: 1"=2"



STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION

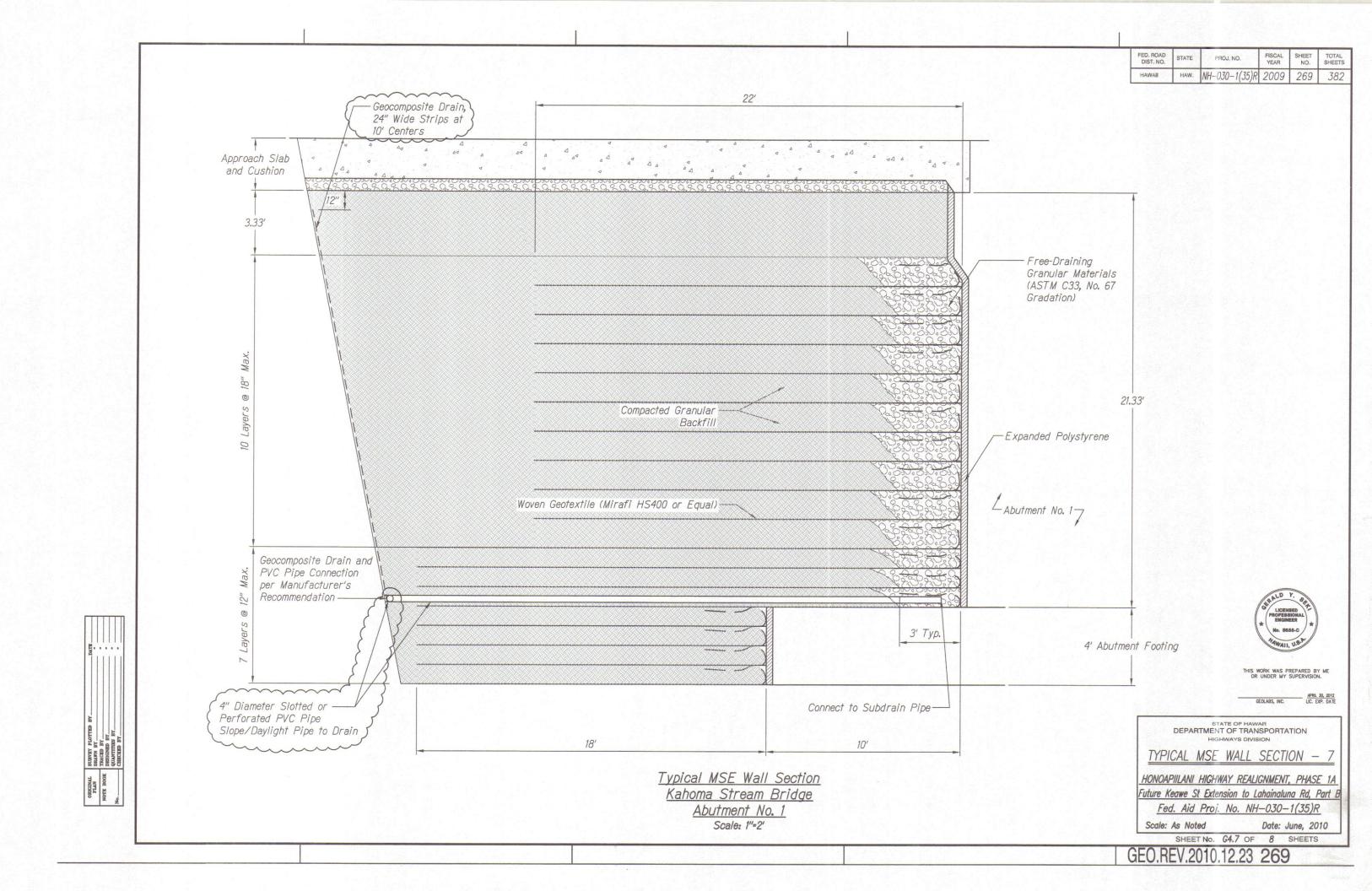
TYPICAL MSE WALL SECTION - 6

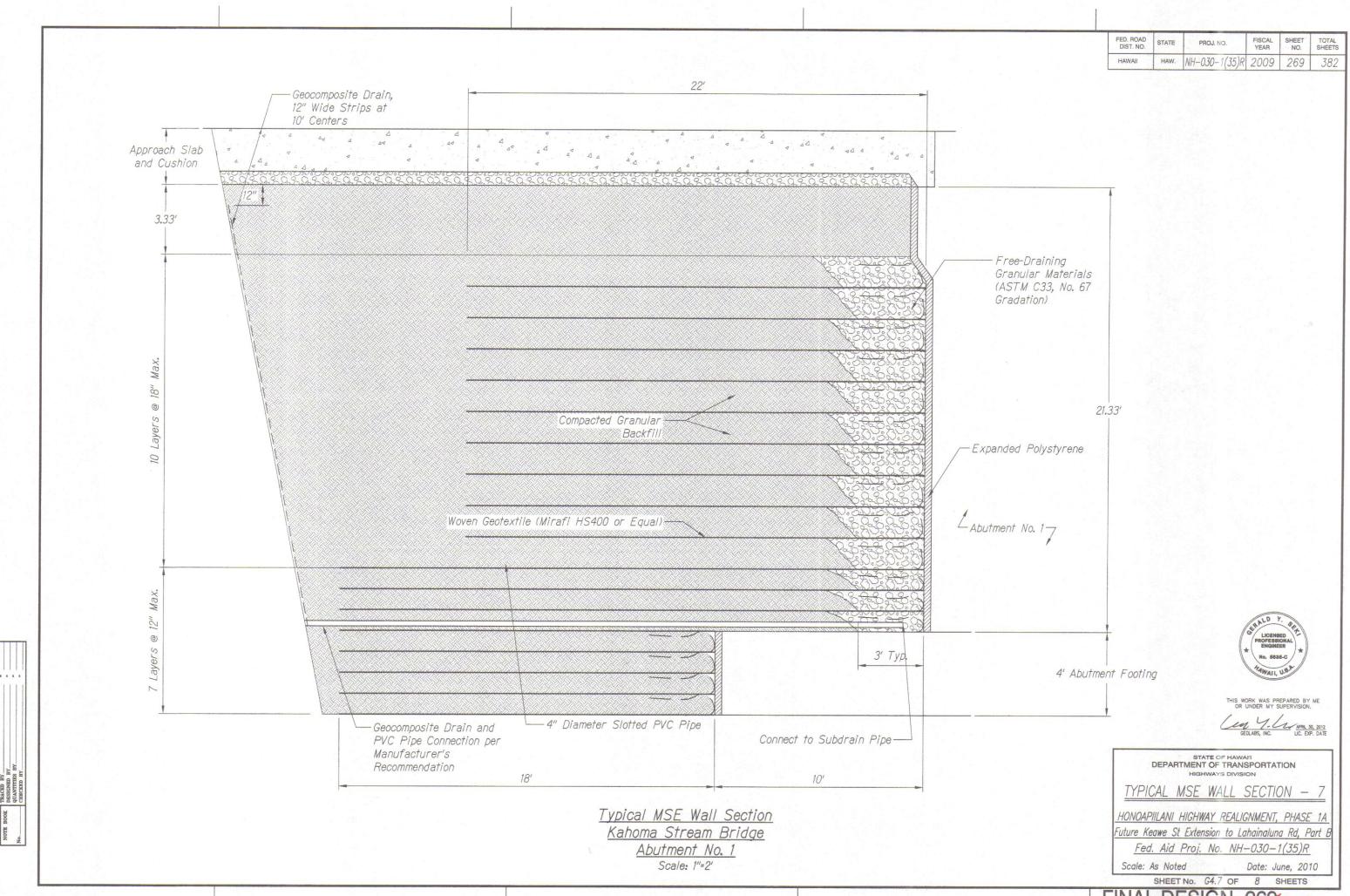
HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A Future Keawe St Extension to Lahainaluna Rd, Part Fed. Aid Proj. No. NH-030-1(35)R

Scale: As Noted

Date: June, 2010

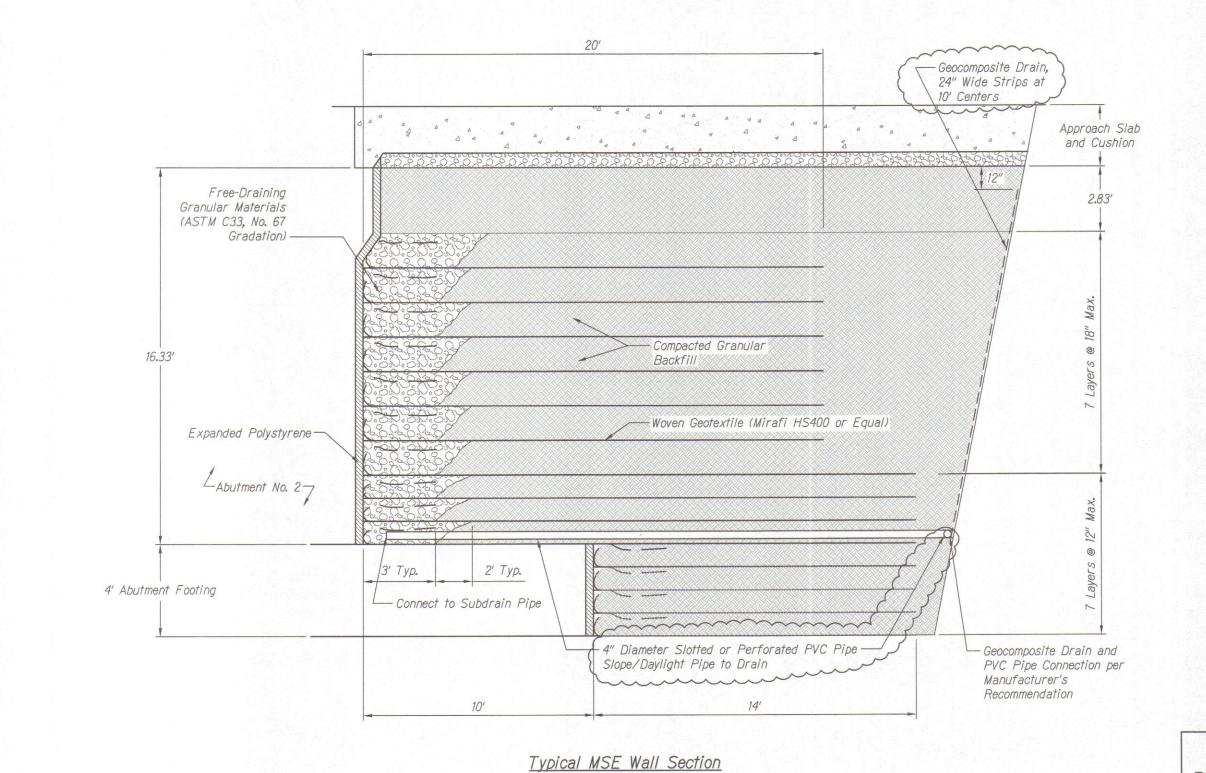
SHEET No. G4.6 OF 8 SHEETS





FINAL DESIGN 269 RM

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-030-1(35)R	2009	270	382



Kahoma Stream Bridge Abutment No. 2

Scale: 1"=2"



THIS WORK WAS PREPARED BY

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

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TYPICAL MSE WALL SECTION - 8

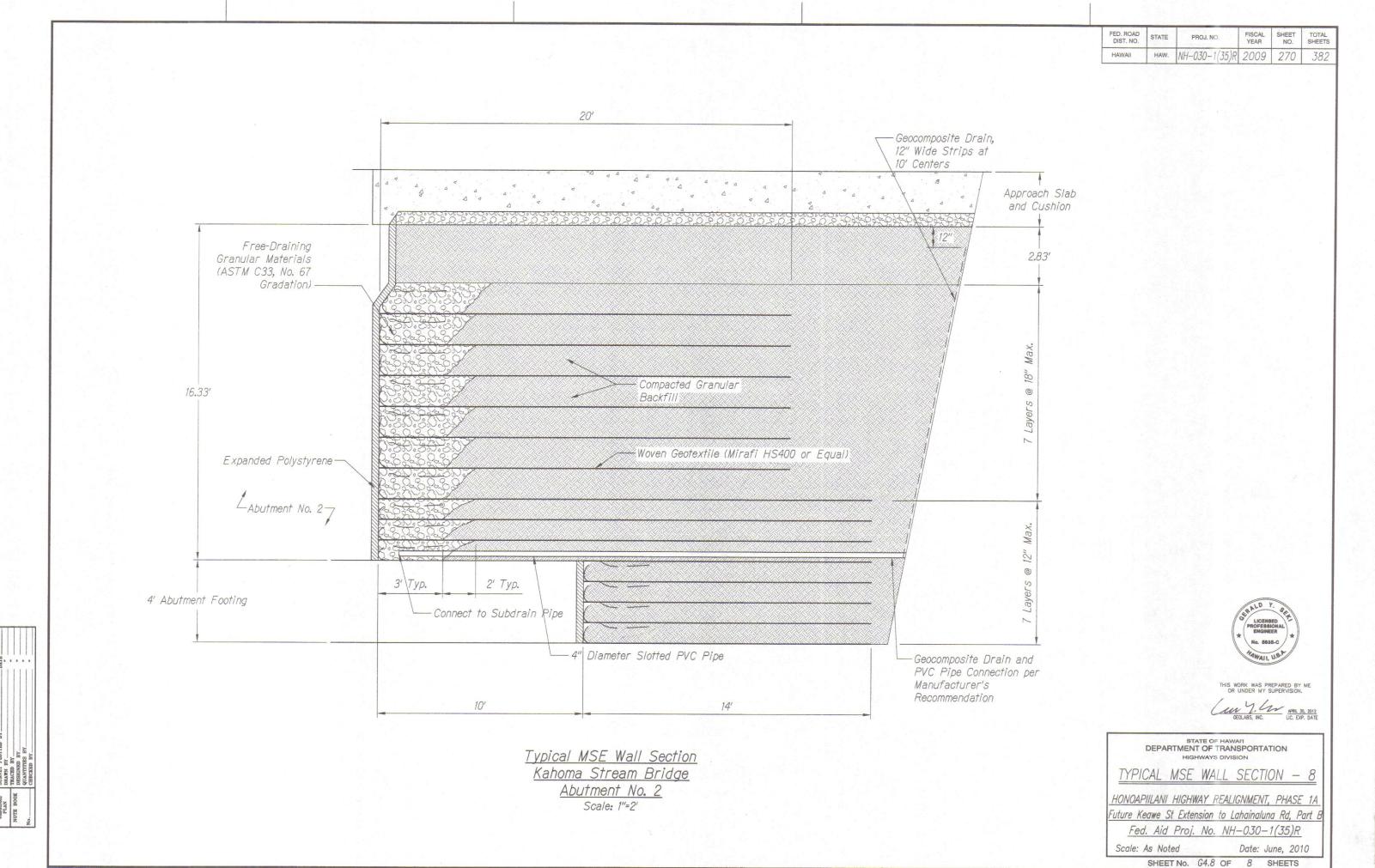
HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A Future Keawe St Extension to Lahainaluna Rd, Part B Fed. Aid Proj. No. NH-030-1(35)R

Scale: As Noted

Date: June, 2010

SHEET No. G4.8 OF 8 SHEETS

GEO.REV.2010.12.23 270



FINAL DESIGN 270 RW