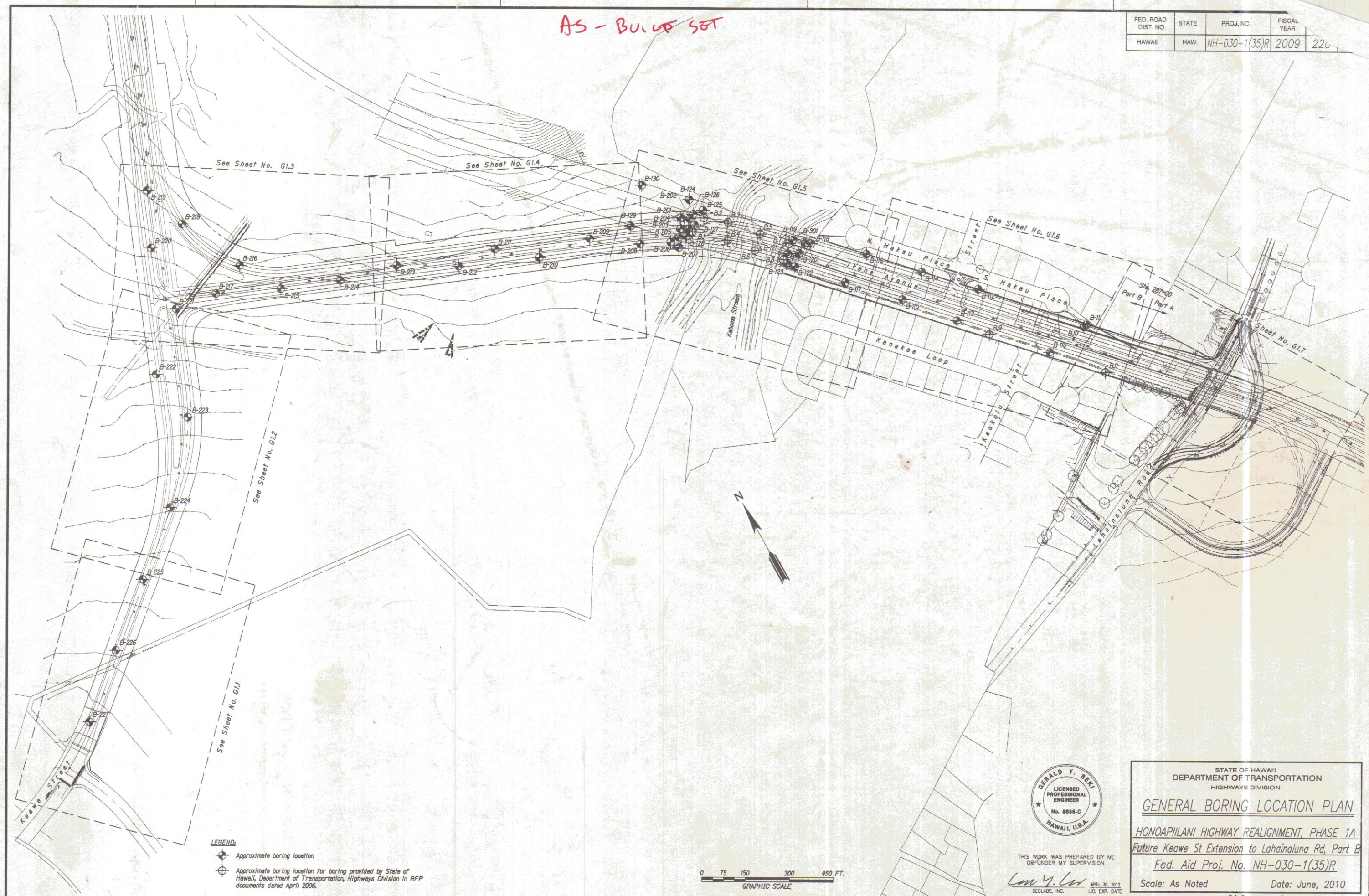


AS - BUILD SET

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	
HAWAII	HAW.	NH-030-1(35)R	2009	220



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

LEGEND:
• Approximate boring location
• Approximate boring location for boring provided by State of Hawaii, Department of Transportation, Highways Division in RFP documents dated April 2006.

0 75 150 300 450 FT.
GRAPHIC SCALE



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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

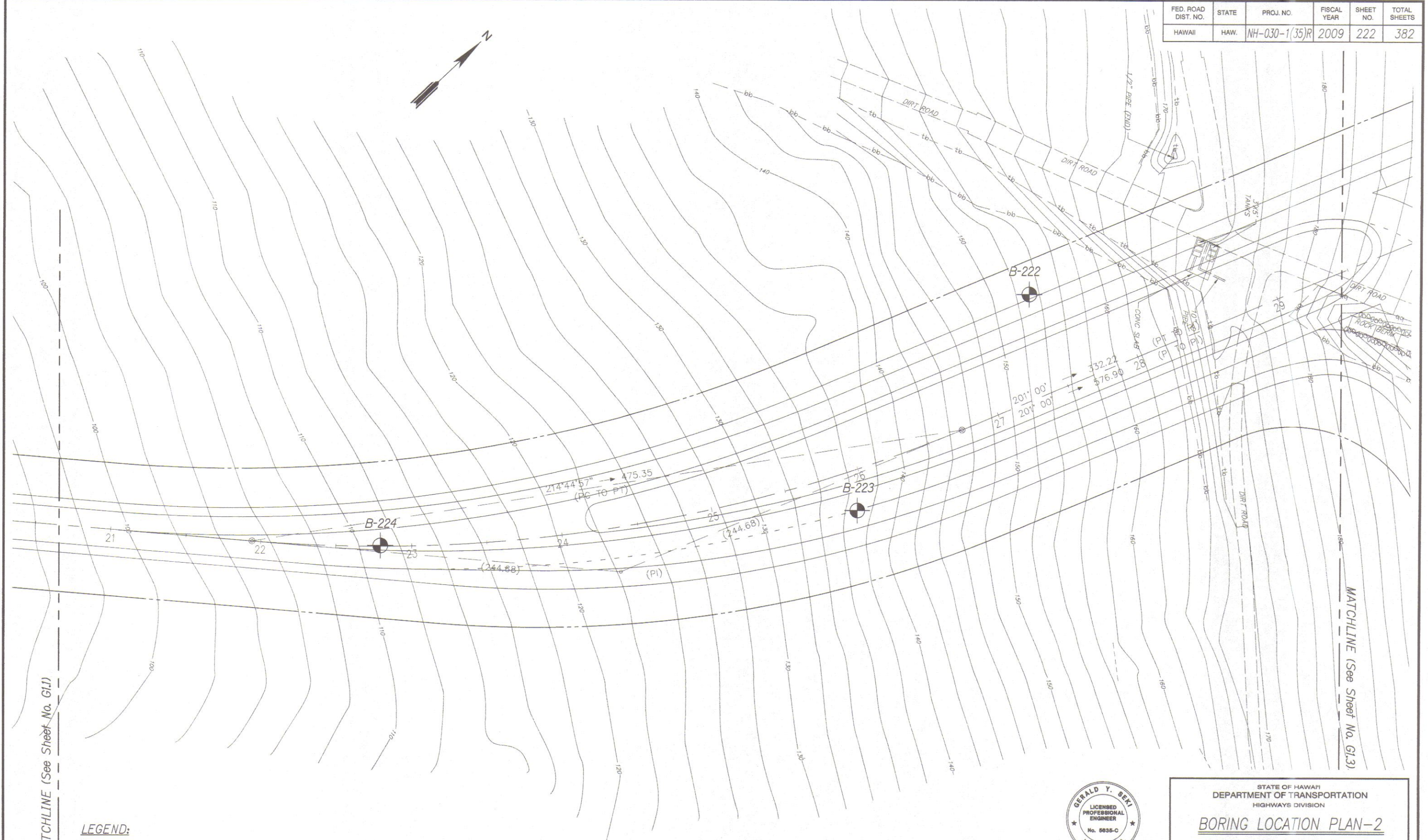
GENERAL BORING LOCATION PLAN

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. G1.0 OF 8 SHEETS

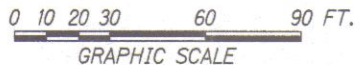
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-030-1(35)R	2009	222	382




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

MATCHLINE (See Sheet No. G1.1)

LEGEND:
 Approximate boring location





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STATE OF HAWAII
 DEPARTMENT OF TRANSPORTATION
 HIGHWAYS DIVISION

BORING LOCATION PLAN-2

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

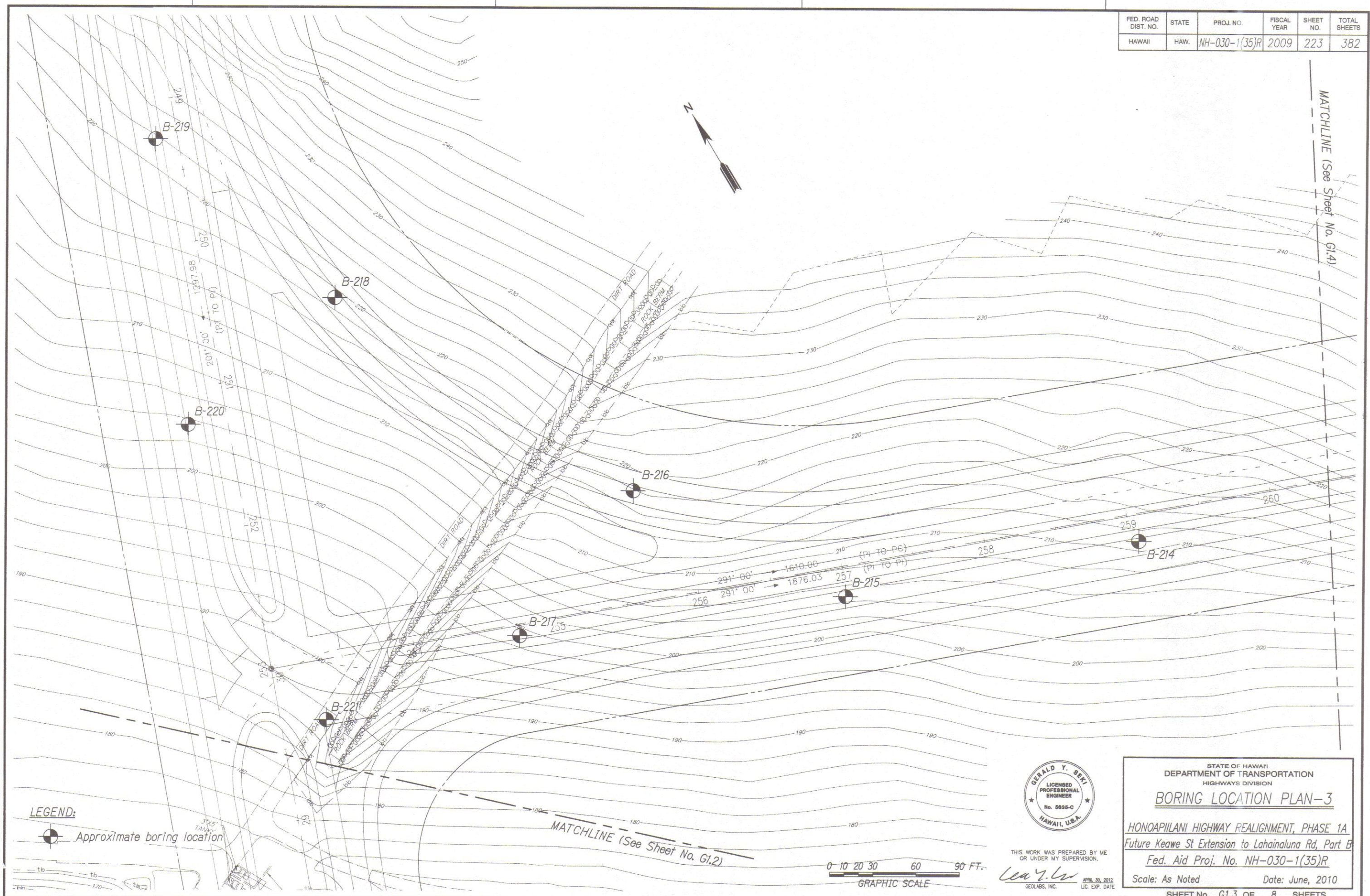
Fed. Aid Proj. No. NH-030-1(35)R

Scale: As Noted Date: June, 2010

SHEET No. G1.2 OF 8 SHEETS

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-030-1(35)R	2009	223	382

MATCHLINE (See Sheet No. G1.4)



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

LEGEND:
 Approximate boring location

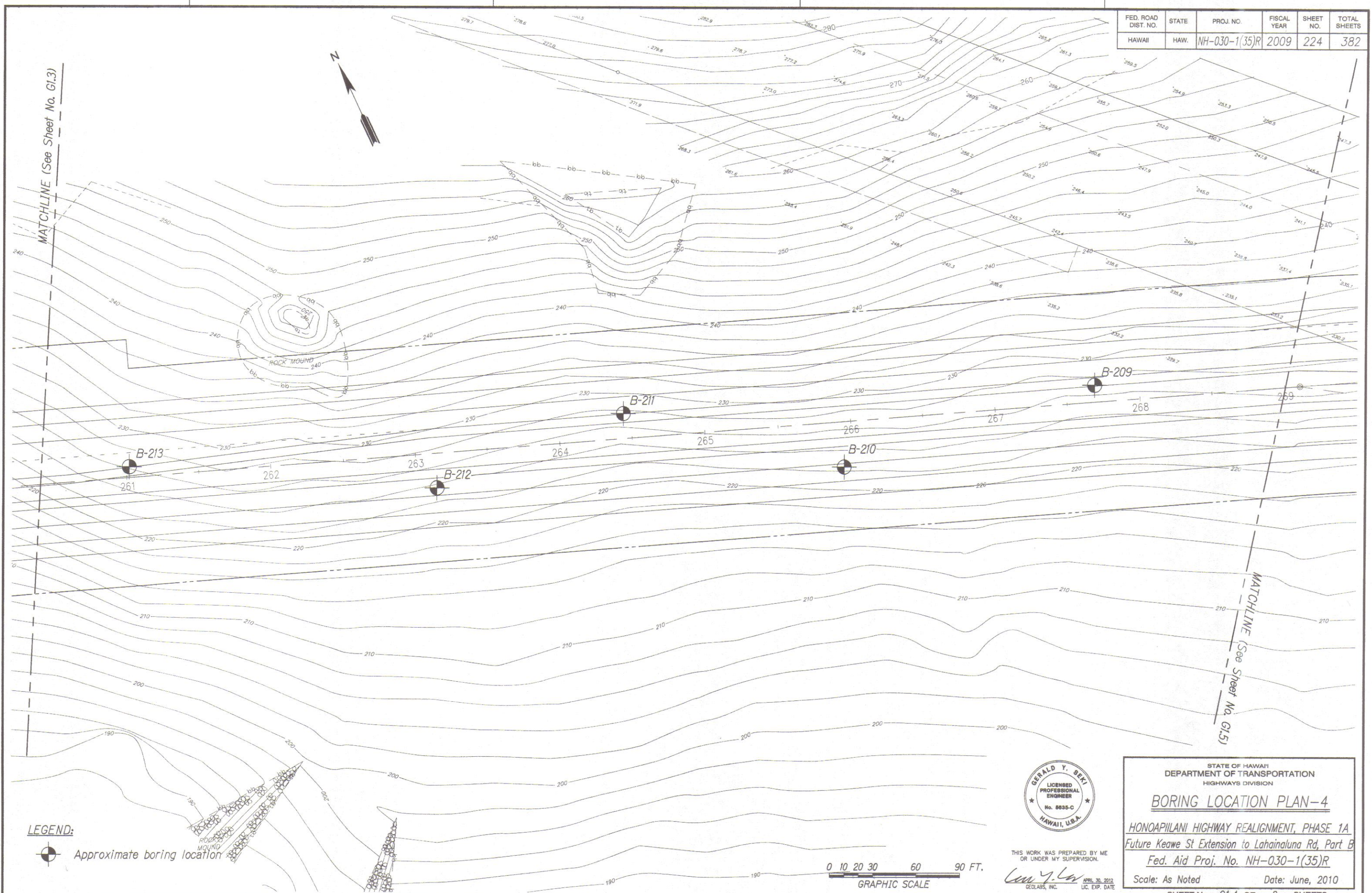


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STATE OF HAWAII
 DEPARTMENT OF TRANSPORTATION
 HIGHWAYS DIVISION
BORING LOCATION PLAN-3
 HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A
 Future Keawe St Extension to Lahainaluna Rd, Part B
 Fed. Aid Proj. No. NH-030-1(35)R
 Scale: As Noted Date: June, 2010
 SHEET No. G1.3 OF 8 SHEETS



FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-030-1(35)R	2009	224	382



DATE	_____
DESIGNED BY	_____
CHECKED BY	_____
NO.	_____

LEGEND:

Approximate boring location



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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BORING LOCATION PLAN-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. G1.4 OF 8 SHEETS

0 10 20 30 60 90 FT.
GRAPHIC SCALE



STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BORING LOCATION PLAN-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 Date: June, 2010

SHEET No. G1.6 OF 8 SHEETS

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Con Y. Lu APRIL 30, 2012
GEO LABS, INC. LIC. EXP. DATE


FINAL DESIGN 226

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

MATCHLINE (See Sheet No. G1.5)

LEGEND:

 Approximate boring location

 Approximate boring location for boring provided by State of Hawaii, Department of Transportation, Highways Division in RFP documents dated April 2006.

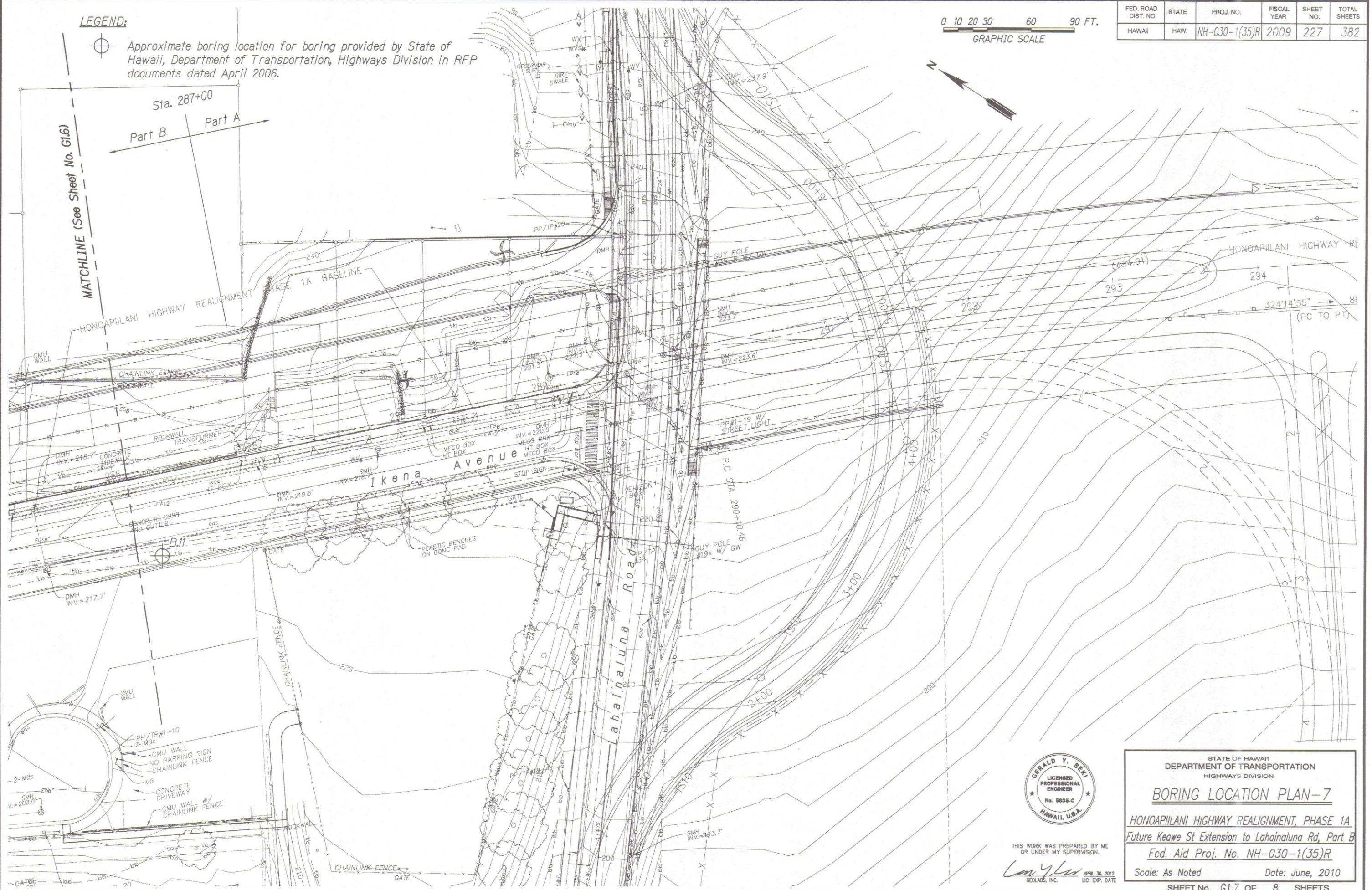
LEGEND:



Approximate boring location for boring provided by State of Hawaii, Department of Transportation, Highways Division in RFP documents dated April 2006.

0 10 20 30 60 90 FT.
GRAPHIC SCALE

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-030-1(35)R	2009	227	382



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



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LIC. EXP. DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BORING LOCATION PLAN-7

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

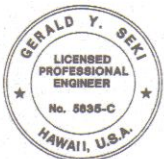
Scale: As Noted Date: June, 2010

SHEET No. G1.7 OF 8 SHEETS

FINAL DESIGN 227

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 G1.7.
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.



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STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION	
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	

		GEOLABS, INC.		Soil Log Legend		
Geotechnical Engineering						
UNIFIED SOIL CLASSIFICATION SYSTEM (USCS)						
MAJOR DIVISIONS			USCS		TYPICAL DESCRIPTIONS	
COARSE-GRAINED SOILS	GRAVELS	CLEAN GRAVELS		GW	WELL-GRADED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES	
		LESS THAN 5% FINES		GP	POORLY-GRADED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES	
		GRAVELS WITH FINES		GM	SILTY GRAVELS, GRAVEL-SAND-SILT MIXTURES	
		MORE THAN 12% FINES		GC	CLAYEY GRAVELS, GRAVEL-SAND-CLAY MIXTURES	
	SANDS	CLEAN SANDS		SW	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES	
		LESS THAN 5% FINES		SP	POORLY-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES	
		SANDS WITH FINES		SM	SILTY SANDS, SAND-SILT MIXTURES	
		MORE THAN 12% FINES		SC	CLAYEY SANDS, SAND-CLAY MIXTURES	
FINE-GRAINED SOILS	SILTS AND CLAYS	LIQUID LIMIT LESS THAN 50		ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY	
				CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS	
				OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY	
	SILTS AND CLAYS	LIQUID LIMIT 50 OR MORE		MH	INORGANIC SILT, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS	
				CH	INORGANIC CLAYS OF HIGH PLASTICITY	
				OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS	
		HIGHLY ORGANIC SOILS			PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS









LEGEND	
	(2-INCH) O.D. STANDARD PENETRATION TEST
	(3-INCH) O.D. MODIFIED CALIFORNIA SAMPLE
	SHELBY TUBE SAMPLE
	GRAB SAMPLE
	CORE SAMPLE
	WATER LEVEL OBSERVED IN BORING
LL	LIQUID LIMIT (NP=NON-PLASTIC)
PI	PLASTICITY INDEX (NP=NON-PLASTIC)
TV	TORVANE SHEAR (tsf)
PEN	POCKET PENETROMETER (tsf)
UC	UNCONFINED COMPRESSION (psi)
UU	UNCONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION (ksf)


Plate
A-0.1

		GEOLABS, INC.		Rock Log Legend	
Geotechnical Engineering					
ROCK DESCRIPTIONS					
	BASALT		FINGER CORAL		
	BOULDERS		LIMESTONE		
	BRECCIA		SANDSTONE		
	CLINKER		SILTSTONE		
	COBBLES		TUFF		
	CORAL		VOID/CAVITY		
ROCK DESCRIPTION SYSTEM					
ROCK FRACTURE CHARACTERISTICS					
The following terms describe general fracture spacing of a rock:					
Massive:	Greater than 24 inches apart				
Slightly Fractured:	12 to 24 inches apart				
Moderately Fractured:	6 to 12 inches apart				
Closely Fractured:	3 to 6 inches apart				
Severely Fractured:	Less than 3 inches apart				
DEGREE OF WEATHERING					
The following terms describe the chemical weathering of a rock:					
Unweathered:	Rock shows no sign of discoloration or loss of strength.				
Slightly Weathered:	Slight discoloration inwards from open fractures.				
Moderately Weathered:	Discoloration throughout and noticeably weakened though not able to break by hand.				
Highly Weathered:	Most minerals decomposed with some corestones present in residual soil mass. Can be broken by hand.				
Extremely Weathered:	Saprolite. Mineral residue completely decomposed to soil but fabric and structure preserved.				
HARDNESS					
The following terms describe the resistance of a rock to indentation or scratching:					
Very Hard:	Specimen breaks with difficulty after several "pinging" hammer blows. Example: Dense, fine grain rock volcanic rock				
Hard:	Specimen breaks with some difficulty after several hammer blows. Example: Vesicular, vugular, coarse-grained rock				
Medium Hard:	Specimen can be broken by one hammer blow. Cannot be scraped by knife. SPT may penetrate by ~25 blows per inch with bounce. Example: Porous rock such as clinker, cinder, and coral reef				
Soft:	Can be indented by one hammer blow. Can be scraped or peeled by knife. SPT can penetrate by ~100 blows per foot. Example: Weathered rock, chalk-like coral reef				
Very Soft:	Crumbles under hammer blow. Can be peeled and carved by knife. Can be indented by finger pressure. Example: Saprolite				

Plate A-0.2

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

GEOLABS, INC.		HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A, PART B LAHAINA, MAUI, HAWAII						Log of Boring 110			
Geotechnical Engineering											
Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample Graphic	USCS	Approximate Ground Surface Elevation (feet MSL): 221 *	
	20				22					Description	
UC= 10000			96	75			5		GP	3-inch ASPHALTIC CONCRETE	
			45	7			GM		Gray SANDY GRAVEL, dense, damp (fill)		
UC= 5690		100	90				5		MH	Brown SILTY CLAY with sand and gravel, very stiff, moist (fill)	
							10				Gray vesicular BASALT, moderately fractured, slightly weathered, hard (basalt formation)
							10				Red and gray COBBLES AND GRAVEL (BASALTIC), dense (clinker)
							15				Gray vesicular BASALT, slightly fractured, slightly weathered, hard (basalt formation)
							20				Gray massive BASALT, slightly fractured, slightly weathered, hard (basalt formation)
							25				Red and gray COBBLES AND GRAVEL (BASALTIC), dense (clinker)
							30				Gray vesicular BASALT, slightly to moderately fractured, moderately weathered, hard (basalt formation)
							31				Boring terminated at 31 feet
* Elevations estimated from Topographic Survey Plan downloaded from Wilson Okamoto Corporation's ftp site on 7/28/08.											
Date Started: April 11, 2007											
Date Completed: April 11, 2007											
Logged By: F. Meyer											
Total Depth: 31 feet											
Work Order: 5401-00&10											
Water Level: \pm Not Encountered											
Drill Rig: MOBILE B-53											
Drilling Method: 4" Auger & HQ Coring											
Driving Energy: 140 lb. wt., 30 in. drop											

GEOLABS, INC. Geotechnical Engineering		HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A, PART B LAHAINA, MAUI, HAWAII					Log of Boring 111				
Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample Graphic	USCS	Approximate Ground Surface Elevation (feet MSL): 237 *	Description
UC= 15500	14				35		0		MH		4-inch CONCRETE
							5				Brown CLAYEY SILT, very stiff, moist (fill)
							10				Grayish brown BASALT, severely fractured, highly weathered, soft (saprolite)
							15				Gray vugular BASALT, moderately fractured, slightly weathered, hard to very hard (basalt formation)
UC= 8370							20				Brownish gray vugular BASALT with some clinker, severely fractured, moderately weathered, medium hard to hard (basalt formation)
							25				Gray vugular BASALT, moderately fractured, slightly weathered, hard to very hard (basalt formation)
UC= 19200							30				grades to dense
							31.5				Boring terminated at 31.5 feet



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STATE OF HAWAII
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

GEOLABS, INC. Geotechnical Engineering		HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A, PART B LAHAINA, MAUI, HAWAII					Log of Boring 112				
Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample Graphic	USCS	Approximate Ground Surface Elevation (feet MSL): 221 *	Description
UC= 30000	13				59				MH		Brown CLAYEY SILT with gravel and cobbles, hard, damp (fill)
	18				27		5				grades to very stiff, moist
	14				18		10				
		100	100				15		MH		Brown CLAYEY SILT, very stiff, moist (residual soil)
		85	73				20				Gray dense BASALT, slightly fractured, unweathered, very hard (basalt formation)
UC= 11900		42	22				25				Grayish brown COBBLES AND GRAVEL with sand, dense (clinker)
		81	29				30				Gray vugular BASALT, moderately fractured, slightly weathered, hard to very hard (basalt formation)
							35				Boring terminated at 30 feet
							40				
							45				
							50				
							55				
							60				
							65				
							70				
							75				
Date Started: April 18, 2007							Water Level: ∅ Not Encountered				
Date Completed: April 18, 2007											
Logged By: S. Latronic							Drill Rig: MOBILE B-53				
Total Depth: 30 feet							Drilling Method: 4" Auger & HQ Coring				
Work Order: 5401-00&10							Driving Energy: 140 lb. wt., 30 in. drop				









GEOLABS, INC. Geotechnical Engineering		HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A, PART B LAHAINA, MAUI, HAWAII					Log of Boring 113				
Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample Graphic	USCS	Approximate Ground Surface Elevation (feet MSL): 217 *	Description
	22				22				GP		3-inch ASPHALTIC CONCRETE
									GM		Gray SANDY GRAVEL, dense, damp (fill)
	28				9		5		MH		Reddish brown and tan-gray SILTY CLAY, very stiff, moist grades to medium stiff
	37	80			11		10				
	27		60	7	30/1"		15				grades to very stiff to hard
											Gray BASALT, severely fractured, moderately weathered, medium hard (basalt formation)
			10	0			20				Gray and reddish brown COBBLES AND GRAVEL (BASALTIC), dense (clinker)
			73	22			25				Brown COBBLES AND GRAVEL (BASALTIC), dense (clinker)
							30				Gray vugular BASALT, moderately fractured, slightly weathered, hard (basalt formation)
											Boring terminated at 31 feet
							35				
							40				
							45				
							50				
							55				
							60				
							65				
							70				
							75				
Date Started: April 11, 2007							Water Level: ∅ Not Encountered				
Date Completed: April 11, 2007											
Logged By: F. Meyer							Drill Rig: MOBILE B-53				
Total Depth: 31 feet							Drilling Method: 4" Auger & HQ Coring				
Work Order: 5401-00&10							Driving Energy: 140 lb. wt., 30 in. drop				




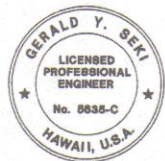
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APRIL 30, 2012
UC. EXP. DATE

STATE OF HAWAII 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

		GEOLABS, INC. Geotechnical Engineering					HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A, PART B LAHAINA, MAUI, HAWAII				Log of Boring 114	
Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample Graphic	USCS	Approximate Ground Surface Elevation (feet MSL): 221 *		
										Description		
	19				15				MH	4-inch CONCRETE		
	11		48	0	47		5			Brown SILTY CLAY with sand and gravel, very stiff, moist (fill) grades with cobbles		
			40	0	20/0" Ref.		10			Brownish gray BASALT, severely fractured, highly weathered, hard (highly weathered basalt)		
			53	0	15/0" Ref.		15					
			68	0			20					
			42	0			25			Brownish gray BASALT, severely fractured, slightly weathered, medium hard (basalt formation with partially welded clinkers)		
							30			Boring terminated at 31.5 feet		
							35					
							40					
							45					
							50					
							55					
							60					
							65					
							70					
							75					
Date Started: April 16, 2007							Water Level: ∅ Not Encountered					
Date Completed: April 16, 2007												
Logged By: S. Latronic							Drill Rig: MOBILE B-53					
Total Depth: 31.5 feet							Drilling Method: 4" Auger & HQ Coring					
Work Order: 5401-00&10							Driving Energy: 140 lb. wt., 30 in. drop					

		GEOLABS, INC. Geotechnical Engineering				HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A, PART B LAHAINA, MAUI, HAWAII				Log of Boring 115	
Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample Graphic	USCS	Approximate Ground Surface Elevation (feet MSL): 213 *	
										Description	
	8		38	0	38				GM	Brown and gray SILTY GRAVEL (BASALTIC), dense, damp (fill)	
			20	0	13/0" Ref.		5			Brown and gray BASALT, severely fractured, highly weathered, hard (basalt formation)	
			0	0			10			Light gray vesicular BASALT, severely fractured, moderately to highly weathered, medium hard to hard (basalt formation)	
	7		35	0	12/0" Ref.		15				
			35	27			20			Light gray vesicular BASALT, moderately to severely fractured, moderately weathered, hard (basalt formation)	
			35	12			25			grades from closely to severely fractured	
							30			Boring terminated at 31 feet	
							35				
							40				
							45				
							50				
							55				
							60				
							65				
							70				
							75				
Date Started: April 7, 2007										Water Level: ∅ Not Encountered	
Date Completed: April 7, 2007											
Logged By: D. Sjolund										Drill Rig: MOBILE B-53	
Total Depth: 31 feet										Drilling Method: 4" Auger & HQ Coring	
Work Order: 5401-00&10										Driving Energy: 140 lb. wt., 30 in. drop	



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OR UNDER MY SUPERVISION.
Gerald Y. Seki
APRIL 30, 2012
GEO LABS, INC. U.C. EXP. DATE

STATE OF HAWAII
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. 62.3 OF 34 SHEETS

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

		GEOLABS, INC. Geotechnical Engineering		HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A, PART B LAHAINA, MAUI, HAWAII										Log of Boring 116	
Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample Graphic	USCS	Approximate Ground Surface Elevation (feet MSL): 224 *					
										Description					
UC= 21400	20		67	0	50/2" Ref.		5		MH	4-inch CONCRETE					
										Brown SILTY CLAY, stiff, moist (fill)					
										Brownish gray COBBLES AND GRAVEL AND BOULDER with sand, very dense, damp (fill/colluvium)					
										Brownish gray BASALT, severely fractured, highly weathered, hard (highly weathered basalt)					
										Boring terminated at 31.5 feet					
UC= 12100					20/0" Ref.		10								
Boring terminated at 31.5 feet															
Date Started: April 16, 2007															
Date Completed: April 16, 2007															
Logged By: S. Latronic															
Total Depth: 31.5 feet															
Work Order: 5401-00&10															
Water Level: z Not Encountered															
Drill Rig: MOBILE B-53															
Drilling Method: 4" Auger & HQ Coring															
Driving Energy: 140 lb. wt., 30 in. drop															



		GEOLABS, INC. Geotechnical Engineering		HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A, PART B LAHAINA, MAUI, HAWAII										Log of Boring 117	
Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample Graphic	USCS	Approximate Ground Surface Elevation (feet MSL): 213 *					
										Description					
		5	100	23	0	13/0" Ref.	5		MH	Brown CLAYEY SILT, stiff, moist (fill)					
										Dark brown and gray SILTY GRAVEL (BASALTIC) with cobbles, dense, moist (fill/colluvium)					
										Light gray vesicular BASALT, severely fractured, moderately weathered, medium hard to hard (basalt formation)					
										Light gray slightly vesicular BASALT, massive, slightly weathered, very hard (basalt formation)					
										Light gray vesicular BASALT, moderately to severely fractured, moderately weathered, hard (basalt formation)					
1		49	93	93	19/2" Ref.	15									
Boring terminated at 31 feet															
Date Started: April 7, 2007															
Date Completed: April 7, 2007															
Logged By: D. Sjolund															
Total Depth: 31 feet															
Work Order: 5401-00&10															
Water Level: z Not Encountered															
Drill Rig: MOBILE B-53															
Drilling Method: 4" Auger & HQ Coring															
Driving Energy: 140 lb. wt., 30 in. drop															



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Gerald Y. Seki
GEOLABS, INC. APRIL 30, 2012
LIC. EXP. DATE

STATE OF HAWAII 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	
Scale: As Noted	Date: June, 2010
SHEET No. 02.4 OF 34 SHEETS	

G		GEOLABS, INC. Geotechnical Engineering					HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A, PART B LAHAINA, MAUI, HAWAII				Log of Boring 118	
Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample Graphic	USCS	Approximate Ground Surface Elevation (feet MSL): 220 *		
										Description		
	13 8	101			57/6" +50/4" Ref.	>4.5			MH	Brown SILTY CLAY with gravel and cobbles, hard, damp (fill/colluvium)		
			24	0	50/6" Ref.		5			Gray BASALT, severely fractured, moderately to highly weathered, medium hard to hard (basalt formation)		
			22	0	20/0" Ref.		10					
	22		25	0	20/0" Ref.		15					
	11		37	0	60/6" Ref.		20					
			22	0	20/0" Ref.		25					
	2		36	0	50/5" Ref.		30					
			67	23			35			Boring terminated at 36 feet		
							40					
							45					
							50					
							55					
							60					
							65					
							70					
							75					
Date Started: April 2, 2007									Water Level: ± Not Encountered			
Date Completed: April 3, 2007												
Logged By: S. Latronic									Drill Rig: MOBILE B-53			
Total Depth: 36 feet									Drilling Method: 4" Auger & HQ Coring			
Work Order: 5401-00&10									Driving Energy: 140 lb. wt., 30 in. drop			

		GEOLABS, INC. Geotechnical Engineering					HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A, PART B LAHAINA, MAUI, HAWAII				Log of Boring 119	
Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample Graphic	USCS	Approximate Ground Surface Elevation (feet MSL): 221 *		
Description												
UC= 280	39		83 63	0 0	20/0" Ref.		5		MH	Brown CLAYEY SILT with gravel and cobbles, very stiff, damp (fill)		
					20/0" Ref.					Brownish gray COBBLES AND GRAVEL (BASALTIC) with occasional boulders, very dense, dry (fill/colluvium)		
					50/4" Ref.		10		SP	Reddish brown CEMENTED SAND with silt and gravel, very dense (weathered clinker)		
					20/0" Ref.		15			Brownish gray BASALT, severely fractured, moderately weathered, medium hard to hard (basalt formation)		
							20			Gray vugular BASALT, moderately fractured, slightly weathered, hard to very hard (basalt formation)		
							25			Brownish gray and red BASALT, closely fractured, highly weathered, medium hard (basalt formation with welded clinker)		
							30			Gray vugular BASALT, closely fractured, unweathered to slightly weathered, hard to very hard (basalt formation)		
							35			Grayish brown and red GRAVEL AND COBBLES medium dense (clinker)		
							40			Gray vugular BASALT, moderately fractured, unweathered, hard to very hard (basalt formation)		
					UC= 8050					65	40	20/0" Ref.
		70	53	50		Gray dense BASALT, closely fractured, unweathered, very hard (basalt formation)						
				55		grades to severely fractured						
		48	0	60		Brownish gray and red COBBLES AND GRAVEL with some sand, medium dense to dense (clinker)						
		85	48	65		Gray dense BASALT, moderately fractured, unweathered, hard to very hard (basalt formation)						
		45	8	70		Brownish gray COBBLES AND GRAVEL with some sand, medium dense to dense (clinker)						
		100	70	75								
UC= 12900												

Date Started: April 4, 2007		Water Level: ∅ Not Encountered	
Date Completed: April 5, 2007			
Logged By: S. Latronic		Drill Rig: MOBILE B-53	
Total Depth: 101.5 feet		Drilling Method: 4" Auger & HQ Coring	
Work Order: 5401-00&10		Driving Energy: 140 lb. wt., 30 in. drop	

PRINTING LOGS BY: 5401-00&10-07 GEOLABS, INC. 55900



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Con Y. Lee APRIL 30, 2012
GEOLABS, INC. LIC. EXP. DATE

STATE OF HAWAII
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

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	234	382

GEOLABS, INC.		HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A, PART B LAHAINA, MAUI, HAWAII							Log of Boring
Geotechnical Engineering									119
Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample Graphic	USCS
(Continued from previous plate)									
Description									
		65	17				78		Gray coarsely vesicular BASALT, moderately fractured, unweathered, hard to very hard (basalt formation)
		92	15				80		Brownish gray GRAVEL AND COBBLES, dense (clinker)
		53	38				85		Gray vugular BASALT, closely fractured, unweathered, very hard (basalt formation)
		25	0				90		Grayish brown GRAVEL AND COBBLES, medium dense (clinker)
		68	35				95		Gray vesicular BASALT, moderately fractured, slightly to moderately weathered, medium hard to hard (basalt formation)
							100		Boring terminated at 101.5 feet
							105		
							110		
							115		
							120		
							125		
							130		
							135		
							140		
							145		
							150		
Date Started: April 4, 2007		Water Level: ∇ Not Encountered							
Date Completed: April 5, 2007									
Logged By: S. Latronic		Drill Rig: MOBILE B-53							
Total Depth: 101.5 feet		Drilling Method: 4" Auger & HQ Coring							
Work Order: 5401-00&10		Driving Energy: 140 lb. wt., 30 in. drop							


GEOLABS, INC.		HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A, PART B LAHAINA, MAUI, HAWAII							Log of Boring
Geotechnical Engineering									120
Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample Graphic	USCS
Approximate Ground Surface Elevation (feet MSL): 218 *									
Description									
	17				25/1" Ref.		5		MH Brown CLAYEY SILT with gravel and cobbles and boulder, very stiff to hard, damp (fill/colluvium)
	6		87	46	50/4" Ref.		5		
							10		SP Brownish gray BASALT, moderately fractured, moderately weathered, hard (basalt formation)
							10		Gray and reddish brown CEMENTED SAND AND GRAVEL, medium hard to hard (welded clinker)
UC= 17500			22	0			15		Gray BASALT, moderately to severely fractured, moderately weathered, hard (basalt formation)
			80	51	50/5" Ref.		20		SP Reddish brown CEMENTED SAND AND GRAVEL, medium hard (welded clinker)
UC= 12800			65	20			25		Gray BASALT, moderately to severely fractured, moderately weathered, hard (basalt formation)
			60	32			30		
			75	30			35		
			68	0			40		
			50	0			45		
UC= 7930			65	30			50		Gray vugular BASALT with clinker layers, moderately fractured, slightly weathered, hard (basalt formation)
			57	22			55		
			73	37			60		Gray dense BASALT, closely fractured, unweathered, very hard (basalt formation)
			58	20			65		
			30	0			70		Brownish gray GRAVEL AND COBBLES, dense (clinker)
			37	0	20/0" Ref.		75		
UC= 7220									
Date Started: April 3, 2007		Water Level: ∇ Not Encountered							
Date Completed: April 4, 2007									
Logged By: S. Latronic		Drill Rig: MOBILE B-53							
Total Depth: 101.5 feet		Drilling Method: 4" Auger & 4" Casing, HQ Coring							
Work Order: 5401-00&10		Driving Energy: 140 lb. wt., 30 in. drop							









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Gerald Y. Seki
GEOLABS, INC. APRIL 30, 2012
LIC. EXP. DATE

STATE OF HAWAII 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 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

		GEOLABS, INC. Geotechnical Engineering					HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A, PART B LAHAINA, MAUI, HAWAII					Log of Boring 120
Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample Graphic	USCS	(Continued from previous plate) Description		
			52	0								
			97	58			80				Gray scoriaceous BASALT, severely fractured, unweathered, hard (basalt formation)	
			93	47			85				Gray dense vugular BASALT, moderately fractured, unweathered, very hard (basalt formation)	
			60	33			90				Brownish gray GRAVEL AND COBBLES, dense (clinker)	
			67	0			95				Gray finely vesicular to scoriaceous BASALT, severely fractured, unweathered, hard (basalt formation)	
							100					
							101.5				Boring terminated at 101.5 feet	
							105					
							110					
							115					
							120					
							125					
							130					
							135					
							140					
							145					
							150					
Date Started: April 3, 2007							Water Level: ∅ Not Encountered					
Date Completed: April 4, 2007												
Logged By: S. Latronic							Drill Rig: MOBILE B-53					
Total Depth: 101.5 feet							Drilling Method: 4" Auger & 4" Casing, HQ Coring					
Work Order: 5401-00&10							Driving Energy: 140 lb. wt., 30 in. drop					

		GEOLABS, INC. Geotechnical Engineering					HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A, PART B LAHAINA, MAUI, HAWAII					Log of Boring 121		
Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)		USCS	Approximate Ground Surface Elevation (feet MSL): 216 *				
										Description				
UC= 7940	8				15	40/4"	5		SM	Brown SILTY SAND with gravels and cobbles and boulder, medium dense, damp (fill/colluvium)				
							10			Brownish gray BASALT, severely fractured, moderately to highly weathered, medium hard to soft (basalt formation)				
							15							
							20			Gray BASALT, closely fractured, moderately to slightly weathered, hard (basalt formation)				
							25			Gray vesicular BASALT, slightly fractured, slightly weathered, hard (basalt formation)				
							30							
							35							
							40							
							45							
							50							
UC= 4440							55		GP	Red and gray GRAVEL (BASALTIC), dense (clinker)				
							60			Gray vugular BASALT, slightly fractured, slightly weathered, hard (basalt formation)				
							65							
							70			Red and gray vesicular BASALT, severely fractured, moderately weathered, medium hard (basalt formation)				
							75			Gray vesicular BASALT, moderately fractured, slightly weathered, hard (basalt formation)				
							80							
							85							
							90							
							95							
							100							
UC= 5290							105			Gray vugular BASALT, slightly fractured, slightly weathered, hard (basalt formation)				
							110							
							115							
							120							
UC= 21600							125			Red and gray vesicular BASALT, severely fractured, highly weathered, soft to medium hard (basalt formation)				
							130							
							135							
							140			Gray vugular BASALT, moderately fractured, unweathered, hard to very hard (basalt formation)				
											Date Started: April 12, 2007		Water Level: ∅ Not Encountered	
											Date Completed: April 16, 2007			
											Logged By: F. Meyer & S. Latronic		Drill Rig: MOBILE B-53	
											Total Depth: 102 feet		Drilling Method: 4" Auger & HQ Coring	
											Work Order: 5401-00&10		Driving Energy: 140 lb. wt., 30 in. drop	



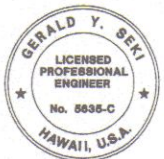
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Gerald Y. Seki
GEOLABS, INC. APRIL 30, 2012
U.C. EXP. DATE

STATE OF HAWAII 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. 62.7 OF 34 SHEETS

GEOLABS, INC.		HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A, PART B LAHAINA, MAUI, HAWAII					Log of Boring	
Geotechnical Engineering							121	
Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Description
								(Continued from previous plate)
		43	8				80	Brownish gray COBBLES AND GRAVEL with sand, dense (clinker)
		62	32				85	
		60	25				90	Gray dense vugular BASALT, moderately fractured, unweathered, very hard (basalt formation)
		33	0				95	Reddish brown scoriaceous BASALT, severely fractured, moderately to highly weathered, soft to medium hard (basalt formation)
		55	0				100	
							105	Boring terminated at 102 feet
							110	
							115	
							120	
							125	
							130	
							135	
							140	
							145	
							150	
Date Started: April 12, 2007		Water Level: ∇ Not Encountered						
Date Completed: April 16, 2007								
Logged By: F. Meyer & S. Latronic		Drill Rig: MOBILE B-53						
Total Depth: 102 feet		Drilling Method: 4" Auger & HQ Coring						
Work Order: 5401-00&10		Driving Energy: 140 lb. wt., 30 in. drop						

GEOLABS, INC.		HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A, PART B LAHAINA, MAUI, HAWAII					Log of Boring	
Geotechnical Engineering							122	
Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Approximate Ground Surface Elevation (feet MSL): 214 *
	1				50/5"		5	MH Tan-brown CLAYEY SILT with sand and gravel and cobbles, dense, dry (fill/colluvium)
	35	67	22	0	30/1"		10	Gray BASALT, severely fractured, highly weathered, soft to medium hard (highly weathered basalt)
UC= 6740	2	40	25	30/1"			15	Grayish brown vesicular BASALT, severely to closely fractured, moderately weathered, medium hard to hard (basalt formation)
		52	18				20	Gray vesicular BASALT, severely to moderately fractured, moderately weathered, hard (basalt formation)
		67	47				25	
UC= 18700		70	15				30	GP Red and gray GRAVEL (BASALTIC), dense (clinker)
		63	15				35	Gray vesicular BASALT, severely to moderately fractured, moderately weathered, hard (basalt formation)
		88	48				40	Gray vesicular BASALT, moderately fractured, moderately weathered, hard (basalt formation)
		100	52				45	Grayish brown vesicular BASALT, moderately to severely fractured, moderately weathered, hard (basalt formation)
		100	55				50	grades to moderately fractured
UC= 16000		100	68				55	Gray BASALT, massive, slightly weathered, hard (basalt formation)
		52	52				60	
		32	0				65	Reddish gray vesicular BASALT, severely fractured, moderately weathered, medium hard (basalt formation)
		100	78				70	Gray vesicular BASALT, moderately fractured, slightly weathered, hard (basalt formation)
		93	47				75	
Date Started: April 12, 2007		Water Level: ∇ Not Encountered						
Date Completed: April 12, 2007								
Logged By: F. Meyer		Drill Rig: MOBILE B-53						
Total Depth: 101.5 feet		Drilling Method: 4" Auger & HQ Coring						
Work Order: 5401-00&10		Driving Energy: 140 lb. wt., 30 in. drop						




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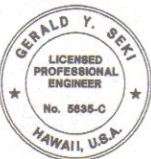
Gerald Y. Seki
APR 30, 2012
GEOLABS, INC. UC EXP. DATE

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

GEOLABS, INC. Geotechnical Engineering		HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A, PART B LAHAINA, MAUI, HAWAII					Log of Boring 122			
Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample Graphic	USCS	(Continued from previous plate) Description
			30	20			80			Brown BASALT with cinder, moderately fractured, moderately weathered, medium hard (basalt formation with cinder)
			100	62			85			Gray vesicular BASALT, moderately fractured, slightly weathered, hard (basalt formation)
			20	0			90		GP	Red and gray GRAVEL (BASALTIC), dense (clinker)
			53	0			95			
			83	65			100			Gray vesicular BASALT, slightly fractured, slightly weathered, hard (basalt formation)
							101.5			Boring terminated at 101.5 feet
							105			
							110			
							115			
							120			
							125			
							130			
							135			
							140			
							145			
							150			
Date Started: April 12, 2007							Water Level: ∅ Not Encountered			
Date Completed: April 12, 2007										
Logged By: F. Meyer							Drill Rig: MOBILE B-53			
Total Depth: 101.5 feet							Drilling Method: 4" Auger & HQ Coring			
Work Order: 5401-00&10							Driving Energy: 140 lb. wt., 30 in. drop			

GEOLABS, INC. Geotechnical Engineering		HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A, PART B LAHAINA, MAUI, HAWAII				Log of Boring 123				
Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample Graphic	USCS	Approximate Ground Surface Elevation (feet MSL): 213 *
UC=9940 UC=9340	7				50/4" Ref.		0		MH	Brown CLAYEY SILT with gravel and cobbles, very stiff to hard, damp (fill/colluvium)
			67 50	0 0	20/0" Ref.		5		SP	Brownish gray COBBLES AND BOULDERS (BASALTIC) with sand, very dense, damp (fill/colluvium)
							10			Gray and reddish brown CEMENTED SAND AND GRAVEL, medium hard to hard (welded clinker)
	29		26	0	50/4" Ref.		15			Gray BASALT, moderately fractured, moderately weathered, hard (basalt formation)
			88	60	20/0" Ref.		20			Gray vugular BASALT, slightly fractured, unweathered, very hard (basalt formation)
			70	70			25			Grayish brown COBBLES AND GRAVEL, medium dense to dense (clinker)
			63	18			30			Gray dense BASALT, closely fractured, slightly weathered, hard to very hard (basalt formation)
							31.5			Boring terminated at 31.5 feet
							35			
							40			
						45				
						50				
						55				
						60				
						65				
						70				
						75				
Date Started: April 5, 2007								Water Level: ∅ Not Encountered		
Date Completed: April 6, 2007										
Logged By: S. Latronic								Drill Rig: MOBILE B-53		
Total Depth: 31.5 feet								Drilling Method: 4" Auger & HQ Coring		
Work Order: 5401-00&10								Driving Energy: 140 lb. wt., 30 in. drop		



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Gerald Y. Seki
APR 30, 2012
UC EXP. DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION


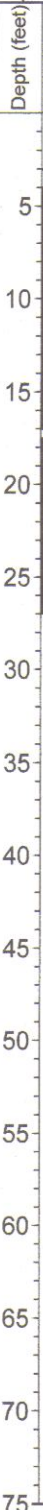
BORING LOGS - 9


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

		GEOLABS, INC.		HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A, PART B LAHAINA, MAUI, HAWAII					Log of Boring 124					
Geotechnical Engineering														
Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample Graphic	USCS	Approximate Ground Surface Elevation (feet MSL): 233 *				
										Description				
UC=16300 UC=8650	8	100	67	62/6" Ref.			MH	Brown CLAYEY SILT, very stiff, damp (residual soil)						
			93					67	Gray dense vugular BASALT, moderately fractured, unweathered to slightly weathered, very hard (basalt formation)					
			100					17	Gray vugular BASALT, moderately fractured, slightly weathered, hard (basalt formation)					
	19	74	0	65/6" Ref.				Reddish brown CEMENTED VOLCANIC ASH, closely fractured, moderately weathered, medium hard to hard (volcanic tuff)						
								Brown to gray BASALT, severely fractured, moderately to highly weathered, soft to medium hard (basalt formation)						
			73	8				Boring terminated at 27 feet						

		GEOLABS, INC. Geotechnical Engineering				HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A, PART B LAHAINA, MAUI, HAWAII				Log of Boring 125	
Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample Graphic	USCS	Approximate Ground Surface Elevation (feet MSL): 225 *	
										Description	
UC= 10000	45		69	58	105		0		MH	Brown CLAYEY SILT, very stiff, damp (residual soil)	
			5	Brownish gray COBBLES AND GRAVEL with sand, very dense (clinker)							
			10	Gray vugular BASALT, moderately fractured, slightly weathered, hard to very hard (basalt formation)							
			15	Grayish brown COBBLES AND GRAVEL with sand, dense (clinker)							
			20	Gray vugular BASALT, moderately fractured, unweathered, hard to very hard (basalt formation)							
UC= 330			25	Reddish brown CEMENTED VOLCANIC ASH AND CLINKER, closely fractured, moderately weathered, medium hard (volcanic tuff)							
			30	Reddish brown COBBLES AND GRAVEL with sand, dense (clinker)							
			35	Brownish gray vugular BASALT, closely fractured, moderately to highly weathered, soft to medium hard (basalt formation)							
			40	Reddish brown CEMENTED ASH AND CINDER, closely fractured, moderately to highly weathered, soft to medium hard (volcanic tuff)							
			45	Brownish gray vugular BASALT, closely to severely fractured, moderately to highly weathered, soft to medium hard (basalt formation)							
UC= 5540	50	Gray dense vugular BASALT, slightly fractured, unweathered, very hard (basalt formation)									
	55	Brownish gray COBBLES AND GRAVEL with sand and silt, dense (partially welded clinker)									
	60	Gray vugular BASALT, slightly to moderately fractured, unweathered, very hard (basalt formation)									
	65	Brownish gray COBBLES AND GRAVEL with sand, dense (clinker)									
	70										
UC= 6520	75										
Date Started: April 19, 2007										Water Level: ∇ Not Encountered	
Date Completed: April 19, 2007											
Logged By: S. Latronic										Drill Rig: MOBILE B-53	
Total Depth: 94 feet										Drilling Method: 4" Auger & HQ Coring	
Work Order: 5401-00&10										Driving Energy: 140 lb. wt., 30 in. drop	



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Gerald Y. Seki
GEOLOGICAL ENGINEER
APRIL 30, 2012
UC EXP. DATE

STATE OF HAWAII 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. 210 OF 34 SHEETS

GEOLABS, INC.		HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A, PART B LAHAINA, MAUI, HAWAII						Log of Boring 125
Geotechnical Engineering								
Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	(Continued from previous plate)
								Description
			95	73				Gray vugular BASALT, slightly to moderately fractured, unweathered, very hard (basalt formation)
			52	10			80	Gray vesicular BASALT, closely fractured, slightly weathered, hard (pahoehoe basalt formation)
			60	22			85	Reddish brown CEMENTED ASH AND CINDER, severely fractured, moderately weathered, medium hard (volcanic tuff)
							90	Brownish gray COBBLES AND GRAVEL with sand, dense (clinker)
			0	0			95	Gray vugular BASALT, unweathered, hard to very hard (basalt formation)
							95	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 Started: April 19, 2007							Water Level: ± Not Encountered	
Date Completed: April 19, 2007								
Logged By: S. Latronic							Drill Rig: MOBILE B-53	
Total Depth: 94 feet							Drilling Method: 4" Auger & HQ Coring	
Work Order: 5401-00&10							Driving Energy: 140 lb. wt., 30 in. drop	

GEOLABS, INC.		HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A, PART B LAHAINA, MAUI, HAWAII						Log of Boring 126		
Geotechnical Engineering										
Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample Graphic	USCS	Approximate Ground Surface Elevation (feet MSL): 226 *
Description										
UC= 4800	32		72	72	60/4" Ref.				MH	Brown CLAYEY SILT, very stiff, damp (residual soil)
			70	40			5		Gray vugular BASALT, moderately fractured, unweathered, very hard (basalt formation)	
UC= 18300							10		Brownish gray COBBLES AND GRAVEL with sand, dense (clinker)	
UC= 9760			78	43					Gray vugular BASALT, moderately fractured, slightly weathered, hard (basalt formation)	
			75	0			15		Reddish brown CEMENTED VOLCANIC ASH AND CINDER, closely fractured, slightly to moderately weathered, medium hard to hard (volcanic tuff)	
			72	8			20		Brownish gray BASALT, severely fractured, moderately to highly weathered, soft to medium hard (basalt formation)	
UC= 3800			100	53			25		Gray vugular BASALT, moderately fractured, slightly weathered, hard (basalt formation)	
			57	0			30			
			50	10			35		Reddish brown CEMENTED VOLCANIC ASH, severely fractured, highly weathered, soft to medium hard (volcanic tuff)	
			68	40			40		Brownish gray vugular BASALT, closely fractured, moderately weathered, hard (basalt formation)	
UC= 9260			48	23			45		Grayish brown COBBLES AND GRAVEL with sand, dense (clinker)	
									Gray vugular BASALT, moderately fractured, unweathered, very hard (basalt formation)	
			55	0			50		Grayish brown COBBLES AND GRAVEL with sand, dense (clinker)	
			98	30			55		Gray dense BASALT, moderately fractured, unweathered, very hard (basalt formation)	
UC= 9370			97	83			60		grades to slightly fractured	
		38	0		65		Brownish gray COBBLES AND GRAVEL with sand, dense (clinker)			
		57	0		70					
					75					
Date Started: April 20, 2007								Water Level: ±		Not Encountered
Date Completed: April 23, 2007								Drill Rig:		MOBILE B-53
Logged By: S. Latronic								Drilling Method:		4" Auger & HQ Coring
Total Depth: 101.5 feet								Driving Energy:		140 lb. wt., 30 in. drop
Work Order: 5401-00&10										



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APRIL 30, 2012
LIC. EXP. DATE

STATE OF HAWAII
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. 62.11 OF 34 SHEETS

GEOLABS, INC.		HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A, PART B LAHAINA, MAUI, HAWAII							Log of Boring 126	
Geotechnical Engineering										
Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample Graphic	USCS	(Continued from previous plate)
										Description
			77	0						Gray vugular BASALT, closely fractured, unweathered, hard to very hard (basalt formation)
			57	13			80			Brownish gray COBBLES AND GRAVEL with sand and silt, medium dense (clinker)
			58	43			85			Reddish brown CEMENTED VOLCANIC ASH, severely fractured, moderately to highly weathered, soft to medium hard (volcanic tuff)
			57	22			90			Brownish gray COBBLES AND GRAVEL with sand, dense (clinker)
			98	33			95			Gray dense BASALT, moderately fractured, unweathered, very hard (basalt formation)
										Yellowish to reddish brown BASALT, severely fractured, highly weathered, soft (highly weathered basalt)
							100			Gray vesicular BASALT, moderately fractured, slightly weathered, hard (basalt formation)
										Boring terminated at 101.5 feet
							105			
							110			
							115			
							120			
							125			
							130			
							135			
							140			
							145			
							150			
Date Started: April 20, 2007							Water Level: \pm Not Encountered			
Date Completed: April 23, 2007										
Logged By: S. Latronic							Drill Rig: MOBILE B-53			
Total Depth: 101.5 feet							Drilling Method: 4" Auger & HQ Coring			
Work Order: 5401-00&10							Driving Energy: 140 lb. wt., 30 in. drop			

GEOLABS, INC.		HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A, PART B LAHAINA, MAUI, HAWAII										Log of Boring
Geotechnical Engineering												127
Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample Graphic	USCS	Approximate Ground Surface Elevation (feet MSL): 223 *		
											Description	
UC= 2720	11		72	55	50/5" Ref.		5		MH	Brown CLAYEY SILT, very stiff, damp (residual soil)		
										Gray BASALT, severely fractured, moderately to highly weathered, medium hard (basalt formation)		
										Gray vugular BASALT, slightly fractured, slightly weathered, hard to very hard (basalt formation)		
UC= 10500			80	45			10			Gray vugular BASALT, moderately fractured, slightly weathered, hard (basalt formation)		
UC= 11600			52	38			15			Reddish brown CEMENTED VOLCANIC ASH, severely fractured, moderately weathered, medium hard (volcanic tuff)		
	35		84	0	50/4" Ref.		20					
UU= 11.8 KSF	37	74	77	0			25		ML	Brown SANDY SILT with traces of decomposed gravel, hard, damp (residual soil/saprolite)		
			75	8			30					
UU= 10.3 KSF	49	59	93	10			35			Reddish brown CEMENTED VOLCANIC ASH, severely fractured, moderately to highly weathered, medium hard (volcanic tuff)		
			67	7			40			Grayish brown BASALT, closely fractured, highly weathered, soft to medium hard (basalt formation)		
			87	27			45			grades to hard		
			47	0			50			Gray vugular BASALT, closely fractured, slightly weathered, hard (basalt formation)		
UC= 2890			68	52			55			Grayish brown COBBLES AND GRAVEL with sand, medium dense (clinker)		
			77	27			60			Gray coarsely vesicular to vugular BASALT, moderately fractured, unweathered, hard to very hard (basalt formation)		
			47	0			65			Brownish gray COBBLES AND GRAVEL with sand, medium dense to dense (clinker)		
			40	0			70					
			38	0			75					
Date Started: April 23, 2007								Water Level: \pm Not Encountered				
Date Completed: April 24, 2007												
Logged By: S. Latronic								Drill Rig: MOBILE B-53				
Total Depth: 97.5 feet								Drilling Method: 4" Auger & HQ Coring				
Work Order: 5401-00&10								Driving Energy: 140 lb. wt., 30 in. drop				



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Gerald Y. Seki
GEO LABS, INC. APRIL 30, 2012 LIC. EXP. DATE

STATE OF HAWAII
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

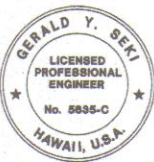
Scale: As Noted Date: June, 2010

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 LAHAINA, MAUI, HAWAII					Log of Boring 127	
Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample Graphic	USCS	(Continued from previous plate)			
										Description			
			100	28			80			Gray vugular BASALT, moderately fractured, unweathered, very hard (basalt formation)			
		40	0				85			Gray coarsely vesicular BASALT, closely fractured, slightly weathered, hard (basalt formation)			
		57	0				90			Grayish brown BASALT, severely fractured, highly weathered, soft (highly weathered basalt)			
		67	8				95			Brownish gray COBBLES AND GRAVEL with sand, medium dense (clinker)			
							97.5			Gray dense BASALT, severely fractured, unweathered, very hard (basalt formation)			
							100			grades with clinkers			
							105			Boring terminated at 97.5 feet			
							110						
							115						
							120						
							125						
							130						
							135						
							140						
							145						
							150						
Date Started: April 23, 2007										Water Level: ± Not Encountered			
Date Completed: April 24, 2007													
Logged By: S. Latronic										Drill Rig: MOBILE B-53			
Total Depth: 97.5 feet										Drilling Method: 4" Auger & HQ Coring			
Work Order: 5401-00&10										Driving Energy: 140 lb. wt., 30 in. drop			

		GEOLABS, INC.				HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A, PART B LAHAINA, MAUI, HAWAII				Log of Boring 128		
Geotechnical Engineering												
Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample Graphic	USCS	Approximate Ground Surface Elevation (feet MSL): 222 *		
										Description		
UC= 12600	7		30	0	20/0" Ref.		5		MH	Brown CLAYEY SILT, very stiff, damp (residual soil)		
			68	41	30/1" Ref.	Brownish gray vugular BASALT, severely fractured, slightly to moderately weathered, hard (basalt formation)						
			57	33	Grayish brown COBBLES AND GRAVEL with sand, dense (clinker)							
UC= 5940			57	33			10			Gray coarsely vesicular to vugular BASALT, moderately fractured, slightly weathered, hard (basalt formation)		
			15	Reddish brown CEMENTED VOLCANIC ASH, slightly fractured, moderately weathered, medium hard (volcanic tuff)								
UU= 16.6 KSF	26	85	95	7			20			Brown to gray BASALT, severely fractured, moderately to highly weathered, soft to medium hard (highly weathered basalt)		
			65	0			30			Gray scoriaceous BASALT, closely fractured, slightly weathered, medium hard (basalt formation)		
			65	43						35	Gray vugular BASALT, severely fractured, moderately weathered, medium hard to hard (basalt formation)	
UC= 5120			50	10			40				Gray vugular BASALT, closely fractured, slightly weathered, very hard (basalt formation)	
			40	0			45			grades with clinkers		
			33	0						50	Brownish gray COBBLES AND GRAVEL with sand, medium dense (clinker)	
UC= 5220			54	14	30/0" Ref.			55				Gray dense BASALT, closely fractured, unweathered, very hard (basalt formation)
			73	8	60			Brownish gray COBBLES AND GRAVEL with sand, dense (clinker)				
			63	15				65		Gray coarsely vesicular to vugular BASALT, closely fractured, unweathered, hard (basalt formation)		
			50	8	70	Gray coarsely vesicular to vugular BASALT, closely fractured, unweathered, hard (basalt formation)						
			87	25		75						
			65	28								
										Date Started: April 24, 2007		
										Date Completed: April 25, 2007		
										Logged By: S. Latronic		
										Total Depth: 100 feet		
										Work Order: 5401-00&10		
										Water Level: ∇ Not Encountered		
										Drill Rig: MOBILE B-53		
										Drilling Method: 4" Auger & HQ Coring		
										Driving Energy: 140 lb. wt., 30 in. drop		



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Gerald Y. Seki
GEOLABS, INC. APRIL 30, 2012
LIC. EXP. DATE

STATE OF HAWAII
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

GEOLABS, INC.		HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A, PART B LAHAINA, MAUI, HAWAII										Log of Boring 128
Geotechnical Engineering												
Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample	Graphic	USCS	(Continued from previous plate)	
											Description	
			60	37			80				Brownish gray COBBLES AND GRAVEL with sand, dense (clinker)	
											Gray dense BASALT, moderately fractured, unweathered, very hard (basalt formation)	
			67	13			85				Brownish gray COBBLES AND GRAVEL with sand, medium dense (clinker)	
											Orange-brown CEMENTED VOLCANIC ASH, severely fractured, highly weathered, soft (volcanic tuff)	
			48	10			90				Gray vugular BASALT, closely fractured, unweathered, hard to very hard (basalt formation)	
			100	63			95				Brownish gray COBBLES AND GRAVEL with sand, dense (clinker)	
											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					
Date Started: April 24, 2007							Water Level: ∇ Not Encountered					
Date Completed: April 25, 2007												
Logged By: S. Latronic							Drill Rig: MOBILE B-53					
Total Depth: 100 feet							Drilling Method: 4" Auger & HQ Coring					
Work Order: 5401-00&10							Driving Energy: 140 lb. wt., 30 in. drop					

GEOLABS, INC.		HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A, PART B LAHAINA, MAUI, HAWAII										Log of Boring
Geotechnical Engineering												129
Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample	Graphic	USCS	Approximate Ground Surface Elevation (feet MSL): 234 *	Description
			58	8			5			MH		Brown CLAYEY SILT, very stiff, damp (residual soil)
												Brownish gray to gray scoriaceous to vugular BASALT, closely fractured, slightly to moderately weathered, medium hard to hard (basalt formation)
			58	0			10					Brownish gray COBBLES AND GRAVEL with sand, medium dense to dense (clinker)
												Gray dense, vugular BASALT, moderately fractured, unweathered, very hard (basalt formation)
			63	38			15					Gray scoriaceous BASALT, severely fractured, slightly weathered, medium hard (basalt formation)
			75	33			20					Gray finely vesicular to vugular BASALT, moderately fractured, unweathered, hard (basalt formation)
												Gray dense BASALT, slightly fractured, unweathered, very hard (basalt formation)
			93	75			25					grades with clinkers
												Boring terminated at 27.5 feet
							30					
							35					
							40					
							45					
							50					
							55					
							60					
							65					
							70					
							75					
Date Started: April 27, 2007		Water Level: ∇ Not Encountered										
Date Completed: April 27, 2007												
Logged By: S. Latronic		Drill Rig: MOBILE B-53										
Total Depth: 27.5 feet		Drilling Method: 4" Auger & HQ Coring										
Work Order: 5401-00&10		Driving Energy: 140 lb. wt., 30 in. drop										



THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.
Gerald Y. Seki
GEOLABS, INC. APRIL 30, 2012 U.C. EXP. DATE

STATE OF HAWAII
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		HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A, PART B LAHAINA, MAUI, HAWAII					Log of Boring 130				
Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample Graphic	USCS	Approximate Ground Surface Elevation (feet MSL): 248 *	Description
UC=7570			54	17			0		MH		Brown CLAYEY SILT, very stiff, damp (residual soil)
							5				Gray vugular BASALT, closely fractured, slightly weathered, hard (basalt formation)
			55	0			10				Grayish brown BASALT, severely fractured, highly weathered, soft (highly weathered basalt)
							10				Gray vugular BASALT, closely fractured, slightly weathered, hard (basalt formation)
			47	0			15				Grayish brown COBBLES AND GRAVEL, medium dense (clinker)
							15				Brownish gray vugular BASALT, closely fractured, slightly weathered, hard (basalt formation)
			73	37			20				Gray scoriaceous BASALT, severely fractured, moderately weathered, soft to medium hard (basalt formation)
			50	0			25				Gray vugular BASALT, moderately fractured, slightly weathered, hard (basalt formation)
							25				Gray scoriaceous BASALT, severely fractured, slightly weathered, soft to medium hard (basalt formation)
			50	30			30				Brownish gray COBBLES AND GRAVEL with sand, dense (clinker)
							35				Gray dense, vugular BASALT, moderately fractured, unweathered, very hard (basalt formation)
							40				Boring terminated at 32.5 feet
						45					
						50					
						55					
						60					
						65					
						70					
						75					
Date Started: April 27, 2007										Water Level: z	Not Encountered
Date Completed: April 27, 2007										Drill Rig:	MOBILE B-53
Logged By: S. Latronic										Drilling Method:	4" Auger & HQ Coring
Total Depth: 32.5 feet										Driving Energy:	140 lb. wt., 30 in. drop
Work Order: 5401-00&10											

GEOLABS, INC. Geotechnical Engineering		HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A, PART B LAHAINA, MAUI, HAWAII					Log of Boring 201									
Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample Graphic	USCS	Approximate Ground Surface Elevation (feet MSL): 229 *						
										Description						
UC=15490 UC=8870 UC=7620 LL=41 PI=16	17		72	33	50/3" Ref.		5		MH	Reddish brown and gray CLAYEY SILT with some gravel, hard, damp (residual soil)						
														Gray vesicular BASALT, moderately fractured, moderately weathered, medium hard		
															Gray highly vesicular BASALT, closely fractured, highly weathered, medium hard	
															Gray vesicular to vugular BASALT, slightly fractured to massive, slightly weathered, hard	
																Orangish brown CEMENTED SANDY CLAY, hard, moist (weathered clinker)
UC=11180	33		12	0	30		25		GP	grades to very hard						
																Gray vesicular BASALT, moderately fractured, moderately weathered, medium hard
																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)
																Gray vesicular to vugular BASALT, moderately fractured, moderately weathered, medium 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
	55		100	43	47		50									
	22		80	15			55									
	51		100	67			60									
	51		100	100			65									
	51		100	52			70									
	51		80	0			75									

Date Started: September 9, 2008		Water Level: z Not Encountered	
Date Completed: October 10, 2008		Drill Rig: MOBILE B-53	
Logged By: D. Finch		Drilling Method: 4" Auger & HQ Coring	
Total Depth: 100 feet		Driving Energy: 140 lb. wt., 30 in. drop	
Work Order: 5401-00&10			



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Gerald Y. Seki
GEOLABS, INC. APRIL 30, 2012
LIC. EXP. DATE

STATE OF HAWAII
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

SHEET No. G2.15 OF 34 SHEETS

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

		GEOLABS, INC.		HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A, PART B LAHAINA, MAUI, HAWAII										Log of Boring 201						
Geotechnical Engineering																				
Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample Graphic	USCS	(Continued from previous plate) Description										
			92	33			80			Gray vugular BASALT, closely to moderately fractured, moderately weathered, medium hard										
			77	0			85			Reddish gray COBBLES AND GRAVEL (BASALTIC), dense (clinker)										
			30	0			90			Gray vesicular to vugular BASALT, closely fractured, moderately weathered, medium hard (basalt formation)										
			100	50			95			Gray vesicular to vugular BASALT, moderately to slightly fractured, slightly weathered, hard										
			100	100			100			Boring terminated at 100 feet										
												105								
												110								
												115								
												120								
												125								
												130								
												135								
												140								
												145								
												150								
Date Started:		September 9, 2008				Water Level:		Not Encountered												
Date Completed:		October 10, 2008				Drill Rig:		MOBILE B-53												
Logged By:		D. Finch				Drilling Method:		4" Auger & HQ Coring												
Total Depth:		100 feet				Driving Energy:		140 lb. wt., 30 in. drop												
Work Order:		5401-00&10																		

ORIGINAL PLAN

NOTE BOOK

No.

SURVEY PLOTTED BY

DRAWN BY

DESIGNED BY

QUANTITIES BY

CHECKED BY


DATE

BORING LOG

5401-00&10

GEOLABS, INC.

5401-00&10

		GEOLABS, INC.		HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A, PART B LAHAINA, MAUI, HAWAII										Log of Boring 202	
Geotechnical Engineering															
Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample Graphic	USCS	Approximate Ground Surface Elevation (feet MSL): 227 *					Description
LL=44 PI=19	13 13	98			66 42/6" Ref.		5		CL	Reddish brown and gray SILTY CLAY with some gravel, hard, dry to moist (residual soil)					
			100	50			5		GW	Reddish brown and gray GRAVEL (BASALTIC) with some silt, very dense, dry to moist (extremely weathered basalt formation)					
			58	0			10			Gray vugular BASALT, moderately fractured, moderately weathered, medium hard					
			70	50			15			Reddish brown and gray vesicular to vugular BASALT, closely fractured, moderately to highly weathered, hard					
UC=7940			7	0			20		ML	Gray vesicular to vugular BASALT, moderately fractured, slightly weathered, hard					
							20			Orangish brown CEMENTED SANDY SILT/ASH, hard, moist (weathered clinker)					
	35		8	0	50/6" Ref.		25			grades to gray and purple vesicular, moderately weathered, medium hard					
	50		48	0			30			Gray vesicular to vugular BASALT, moderately fractured, moderately weathered, medium hard					
UC=880			70	18			35								
			73	30			40		GP	Reddish gray vesicular GRAVEL (BASALTIC), dense (clinker)					
UC=3770 UC=8870			100	12			45			Gray vugular BASALT, closely to moderately fractured, slightly weathered, hard					
			100	0			50			Gray vugular BASALT, closely to severely fractured, slightly weathered, hard					
			100	27			55		GP	Reddish brown and gray GRAVEL (BASALTIC) with sand, dense (clinker)					
			100	78			60			Gray vesicular BASALT, moderately fractured, moderately weathered, medium hard grades to vugular					
UC=4840			75	33			65								
			87	42			70		GP	Gray and red GRAVEL (BASALTIC), dense (clinker)					
							75			Gray vesicular to vugular BASALT, moderately fractured, moderately weathered, medium hard					
Date Started:		September 8, 2008				Water Level:		Not Encountered							
Date Completed:		September 9, 2008				Drill Rig:		MOBILE B-53							
Logged By:		D. Finch				Drilling Method:		4" Auger & HQ Coring							
Total Depth:		102 feet				Driving Energy:		140 lb. wt., 30 in. drop							
Work Order:		5401-00&10													

BORING LOG

5401-00&10

GEOLABS, INC.



5401-00&10



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Gerald Y. Seki
GEOLABS, INC. APRIL 30, 2012
LIC. EXP. DATE


STATE OF HAWAII 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	

		GEOLABS, INC. Geotechnical Engineering					HONOAPIILANI 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	USCS	(Continued from previous plate) Description		
			50	0			80			Gray vesicular BASALT, closely fractured, highly weathered, soft		
			100	53			85			Gray vesicular to vugular BASALT, moderately fractured, moderately weathered, medium hard		
			40	8			90			Gray and reddish brown GRAVEL AND COBBLES (BASALTIC), dense (clinker)		
			100	80			95			Gray vugular BASALT, moderately to slightly fractured, moderately to slightly weathered, medium hard to hard		
			30	0			100		GP	Gray and red vesicular GRAVEL (BASALTIC), dense (clinker)		
							105			Boring terminated at 102 feet		
							110					
							115					
							120					
							125					
							130					
							135					
							140					
							145					
							150					

Date Started: September 8, 2008		Water Level: ± Not Encountered
Date Completed: September 9, 2008		
Logged By: D. Finch		Drill Rig: MOBILE B-53
Total Depth: 102 feet		Drilling Method: 4" Auger & HQ Coring
Work Order: 5401-00&10		Driving Energy: 140 lb. wt., 30 in. drop

BORINGS LOG DOT: 5401-00&10

GEOLABS DOT: 5909

		GEOLABS, INC.		HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A, PART B LAHAINA, MAUI, HAWAII				Log of Boring 203		
Geotechnical Engineering										
Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample	USCS	Approximate Ground Surface Elevation (feet MSL): 225 *
Description										
UC=8370 UC=8200 UC=12440	21	88			30/6" Ref.	2.3	0	MH		Reddish brown CLAYEY SILT with some gravel, very stiff to hard, damp (residual soil)
	11				19		5	SM		Brownish gray SILTY SAND with some gravel, medium dense, damp (saprolite)
	10	96			22/6" +22/0" Ref.		5	GW		Reddish gray GRAVEL with some sand and silt, dense to very dense, damp (extremely weathered basalt)
			100	0			10			Gray vesicular BASALT, moderately fractured, moderately weathered, medium hard
			87	48			15			Gray highly vesicular BASALT, massive, moderately weathered, hard
			98	96			20			Gray vesicular to vugular BASALT, moderately fractured, slightly weathered, medium hard
			52	35			25			
			40	0			30	SM		Reddish brown SILTY SAND with little gravel, dense, damp (weathered clinker)
			33	0		43	35			grades to medium dense
			86	17		20	40			Gray vesicular BASALT, closely fractured, moderately weathered, medium hard
LL=0 PI=0							45			
							50			
							55			Gray and red GRAVEL AND COBBLES (BASALTIC) with some sand, dense (clinker)
							60			Gray vesicular to vugular BASALT, moderately to slightly fractured, moderately to slightly weathered, hard to very hard
							65			
							70	GP		Reddish gray to gray GRAVEL (BASALTIC), very dense, damp (clinker)
							75			



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



STATE OF HAWAII
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 Date: June, 2010

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

		GEOLABS, INC. Geotechnical Engineering						HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A, PART B LAHAINA, MAUI, HAWAII				Log of Boring 204	
Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample Graphic	USCS	(Continued from previous plate)			
										Description			
UC= 3940			87	27			80			Gray vesicular BASALT, moderately fractured, slightly weathered, medium hard grades to severely to closely fractured, moderately weathered, medium hard grades to closely to moderately fractured			
			73	13			85			Gray vesicular to vugular BASALT, closely to moderately fractured, slightly weathered, hard grades to severely to closely fractured, slightly to moderately weathered, medium hard grades to vugular grades to highly vesicular			
			53	13			90			Gray BASALT, closely to moderately fractured, slightly weathered, hard grades to slightly fractured grades to closely fractured grades to slightly fractured			
			100	50			95			Boring terminated at 102 feet			
			100	53			100						
							105						
							110						
							115						
							120						
							125						
							130						
							135						
							140						
							145						
							150						
Date Started: September 19, 2008								Water Level: ± Not Encountered					
Date Completed: September 23, 2008													
Logged By: D. Finch								Drill Rig: MOBILE B-53					
Total Depth: 102 feet								Drilling Method: 4" Auger & HQ Coring					
Work Order: 5401-00&10								Driving Energy: 140 lb. wt., 30 in. drop					

		GEOLABS, INC. Geotechnical Engineering					HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A, PART B LAHAINA, MAUI, HAWAII					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 Graphic	USCS	Approximate Ground Surface Elevation (feet MSL): 223 *			
										Description			
UC=8990	15	75	21	0	32/6" Ref.	2.3	5		MH	Reddish brown CLAYEY SILT with some gravel, very stiff to hard, damp (residual soil)			
	11		24	0	21		10			Gray and brown GRAVEL AND COBBLES (BASALTIC), dense to very dense, damp (clinker) grades to medium dense			
										Gray vesicular BASALT, moderately fractured, slightly weathered, medium hard to hard			
										Gray vesicular BASALT, severely to closely fractured, slightly weathered, medium hard			
UC=9010	14		100	56	50/3" Ref.		15		SM	Gray vesicular BASALT, moderately fractured, slightly weathered, hard			
	31		30	30	70		20			Gray vesicular BASALT, moderately fractured, slightly weathered, hard			
										Reddish brown SILTY SAND, very dense, damp (weathered clinker)			
										Gray GRAVEL (BASALTIC) with some sand, dense, damp (clinker)			
UC=3170	21		56	19	50/3" Ref.		25		GP	Gray GRAVEL (BASALTIC) with some sand, dense, damp (clinker)			
			100	43			30			Gray vugular BASALT, closely fractured, moderately weathered, medium hard			
										Reddish brown and gray GRAVEL (BASALTIC), dense to very dense, damp (clinker)			
										Gray vugular BASALT, closely to moderately fractured, slightly weathered, medium hard			
	10		100	33	50/3" Ref.			40		GP	Reddish brown and gray GRAVEL (BASALTIC), dense to very dense, damp (clinker)		
											Gray vugular BASALT, closely to moderately fractured, slightly weathered, medium hard		
											Reddish gray and gray GRAVEL (BASALTIC), dense (clinker)		
											Gray vesicular BASALT, closely fractured, slightly weathered, medium hard		
			82	8				55		GP	Gray and brown GRAVEL (BASALTIC), dense (clinker)		
											Gray vesicular BASALT, closely fractured, slightly weathered, medium hard		
Gray vesicular BASALT, closely fractured, slightly weathered, medium hard													
Gray vugular BASALT, slightly to moderately fractured, slightly weathered, medium hard													
		100	60				70						
		100	48				75						
Date Started: September 15, 2008							Water Level: ± Not Encountered						
Date Completed: September 16, 2008													
Logged By: D. Finch							Drill Rig: MOBILE B-53						
Total Depth: 100 feet							Drilling Method: 4" Auger & HQ Coring						
Work Order: 5401-00&10							Driving Energy: 140 lb. wt., 30 in. drop						



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Gerald Y. Seki
GEOLABS, INC. APRIL 30, 2012
LIC. EXP. DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BORING LOGS - 19

HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A







Future Keawe St Extension to Lahainaluna Rd, Part B


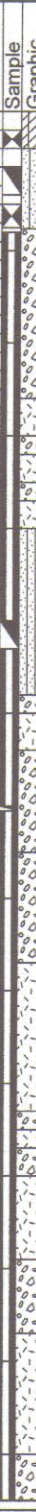
Fed. Aid Proj. No. NH-030-1(35)R

Scale: As Noted Date: June, 2010

SHEET No. G2.19 OF 34 SHEETS

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

		GEOLABS, INC.					HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A, PART B LAHAINA, MAUI, HAWAII					Log of Boring 205	
Geotechnical Engineering													
Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample Graphic	USCS	(Continued from previous plate)			
										Description			
			53	27			80		GP	Gray GRAVEL (BASALTIC), dense (clinker)			
			77	45			85			Gray vesicular to vugular BASALT, closely to moderately fractured, slightly weathered, medium hard			
			58	20			90		GP	Red and gray vesicular GRAVEL (BASALTIC), medium dense to dense (clinker)			
			100	52			95			Gray vesicular to slightly vugular BASALT, closely to moderately fractured, slightly weathered, medium hard to hard			
			87	47			100		GP	Red and gray GRAVEL (BASALTIC), dense (clinker)			
							105			Boring terminated at 100 feet			
							110						
							115						
							120						
							125						
							130						
							135						
							140						
							145						
							150						
Date Started: September 15, 2008							Water Level: ± Not Encountered						
Date Completed: September 16, 2008													
Logged By: D. Finch							Drill Rig: MOBILE B-53						
Total Depth: 100 feet							Drilling Method: 4" Auger & HQ Coring						
Work Order: 5401-00&10							Driving Energy: 140 lb. wt., 30 in. drop						







		GEOLABS, INC. Geotechnical Engineering						HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A, PART B LAHAINA, MAUI, HAWAII					Log of Boring 206	
Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)		USCS	Approximate Ground Surface Elevation (feet MSL): 222 *				
										Description				
LL=55 PI=23	18	74			32/6" Ref.		5		MH	Reddish brown CLAYEY SILT with some gravel, very stiff to hard, damp (residual soil)				
	12	97			11 10/6" +50/3" Ref.		5		SM	Brownish gray SILTY SAND with some gravel, loose to medium dense, damp (extremely weathered basalt))				
UC= 3960			100 55	0 0			10		GP	Brownish gray and gray GRAVEL (BASALTIC), dense (clinker)				
			65	17			15							
			80	45			20		GP	Gray vesicular BASALT, closely to moderately fractured, slightly to moderately weathered, medium hard				
			70	0			25		GP	Red and gray GRAVEL (BASALTIC), dense (clinker)				
UC= 15490							25		SM	Gray vesicular BASALT, slightly fractured, slightly weathered, medium hard				
							25			Red and gray GRAVEL (BASALTIC), dense (clinker)				
LL=NP PI=NP	35		71	0	58		30			Gray vesicular BASALT, closely fractured, slightly weathered, medium hard				
			47	23			30		GP	Reddish brown SILTY SAND, very dense (weathered clinker)				
UC= 2920			61	0	50/3" Ref.		35		GP	Gray and red GRAVEL (BASALTIC), dense (clinker)				
	33		62	0			40		GP	Gray vesicular BASALT, slightly fractured, slightly weathered, medium hard grades to closely fractured				
UC= 16200			77	37			45			Gray GRAVEL (BASALTIC), very dense (weathered clinker) grades with some sand				
			83	17			50			Gray GRAVEL (BASALTIC), dense (clinker)				
							50			Gray vugular BASALT, closely to severely fractured, slightly to moderately weathered, medium hard				
							55		GP	grades to closely to moderately fractured				
UC= 20640			87	32			55		GP	Reddish gray GRAVEL (BASALTIC), dense (clinker)				
			40	10			60			Pinkish gray vugular BASALT, closely fractured, slightly weathered, medium hard				
							60		GP	Reddish gray GRAVEL (BASALTIC), dense (clinker)				
			100	43			65			Gray vugular BASALT, closely to moderately fractured, slightly to moderately weathered, medium hard				
							70			Gray GRAVEL (BASALTIC), dense (clinker)				
			33	0			70		GP	Gray vesicular to vugular BASALT, closely fractured, slightly weathered, medium hard				
							75							
Date Started: September 18, 2008										Water Level: \pm Not Encountered				
Date Completed: September 19, 2008														
Logged By: D. Finch										Drill Rig: MOBILE B-53				
Total Depth: 101.5 feet										Drilling Method: 4" Auger & HQ Coring				
Work Order: 5401-00&10										Driving Energy: 140 lb. wt. 30 in. drop				



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Gerald Y. Seki
GEOLABS, INC. APRIL 30, 2012
LIC. EXP. DATE

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	Date: June, 2010
SHEET No. G2.20 OF 34 SHEETS	

		GEOLABS, INC. Geotechnical Engineering						HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A, PART B LAHAINA, MAUI, HAWAII				Log of Boring 207	
Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample Graphic	USCS	Approximate Ground Surface Elevation (feet MSL): 218.5 *			
Description													
UC= 17140 UC= 8690 UC= 17710	14	79			50/5" Ref. 23	4.0	0		MH	Reddish brown CLAYEY SILT with some sand and gravel, very stiff to hard, damp (residual soil)			
	5		79	0			5		SM	Grayish brown SILTY SAND with some gravel, medium dense, damp (saprolite)			
			75	32						Gray vugular BASALT, closely fractured, slightly weathered, medium hard			
							10			grades to vesicular to vugular			
			78	55						Gray vesicular to vugular BASALT, slightly fractured, slightly weathered, medium hard			
							15			grades to vesicular, closely fractured			
			40	35						grades to vugular, slightly fractured			
		33		18	8	50/5" Ref.		20		SM	Reddish brown SILTY SAND, medium dense, moist (weathered clinker)		
				63	15			25					
								30			Gray GRAVEL (BASALTIC), dense (clinker)		
UC= 2930			40	7						Gray slightly vugular BASALT, closely to moderately fractured, slightly weathered, medium hard			
			55	17			35			Gray slightly vugular BASALT, severely to closely fractured, moderately weathered, medium hard			
UC= 10530			100	77			40						
							45			Gray vugular BASALT, slightly to moderately fractured, slightly weathered, medium hard			
UC= 15710			100	73			50						
			88	28					GP	Red and gray GRAVEL (BASALTIC), dense (clinker)			
			72	32			55			Gray vugular BASALT, closely to moderately fractured, slightly weathered, medium hard			
							60		GP	Gray GRAVEL (BASALTIC), dense (clinker)			
			100	73			65			Gray vugular BASALT, moderately fractured, slightly weathered, medium hard to hard			
			100	65			70						
			50	13			75		GP	Gray GRAVEL (BASALTIC), dense (clinker)			
Date Started: September 16, 2008								Water Level: \pm Not Encountered					
Date Completed: September 18, 2008													
Logged By: D. Finch								Drill Rig: MOBILE B-53					
Total Depth: 102 feet								Drilling Method: 4" Auger & HQ Coring					
Work Order: 5401-00&10								Driving Energy: 140 lb. wt. 30 in. drop					



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STATE OF HAWAII
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

Scale: As Noted Date: June, 2010

SHEET No. G2.21 OF 34 SHEETS

FINAL DESIGN 250

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

GEOLABS, INC. Geotechnical Engineering		HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A, PART B LAHAINA, MAUI, HAWAII				Log of Boring 209					
Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample Graphic	USCS	Approximate Ground Surface Elevation (feet MSL): 227 *	
										Description	
UC= 9550 UC= 8710	7	95	65	42	36/6" +47/5" Ref.	30/4" Ref.	0		MH	Reddish brown CLAYEY SILT with sand, hard, damp (residual soil)	
										Gray vesicular BASALT, moderately fractured, moderately weathered, medium hard to hard	
			47	25					GP	Red-brown GRAVEL, medium dense (clinker)	
										Gray vesicular BASALT, moderately fractured, moderately weathered, hard	
			10	GP					Gray GRAVEL with some sand, very dense (clinker)		
									Gray vesicular BASALT, moderately fractured, slightly weathered, medium hard to hard		
			15	GP					Gray GRAVEL, dense (clinker)		
									Gray BASALT, moderately fractured, slightly weathered, medium hard to hard		
			20	GP					Reddish brown and gray GRAVEL, dense (clinker)		
									Brown-gray vesicular BASALT, closely to severely fractured, slightly to moderately weathered, medium hard		
Boring terminated at 31.5 feet											
35											
40											
45											
50											
55											
60											
65											
70											
75											
Date Started: September 29, 2008								Water Level: ∇ Not Encountered			
Date Completed: September 29, 2008											
Logged By: N. Mitchell								Drill Rig: MOBILE B-53			
Total Depth: 31.5 feet								Drilling Method: HQ Coring			
Work Order: 5401-00&10								Driving Energy: 140 lb. wt., 30 in. drop			








GEOLABS, INC. Geotechnical Engineering		HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A, PART B LAHAINA, MAUI, HAWAII				Log of Boring 210					
Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample Graphic	USCS	Approximate Ground Surface Elevation (feet MSL): 222.5 *	Description
UC=7180	15	90	50	7	45		0		MH		Red-brown CLAYEY SILT with sand, hard, damp (residual soil)
			100	0			5				Brown-gray vesicular BASALT, severely fractured, moderately weathered, medium hard
			100	58			10				
			25	10			15				
							20		GP		Red GRAVEL with some sand, dense (clinker)
	23		0	0	23		25		SW		Red SAND with some gravel, medium dense, moist (clinker)
	19		0	0	26		30				
	19				27		35				
							40				
							45				
Boring terminated at 33 feet											
Date Started: September 29, 2008											
Date Completed: September 29, 2008											
Logged By: N. Mitchell											
Total Depth: 33 feet											
Work Order: 5401-00&10											
Water Level: ∇ Not Encountered											
Drill Rig: MOBILE B-53											
Drilling Method: HQ Coring											
Driving Energy: 140 lb. wt., 30 in. drop											



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GEOLABS, INC. APRIL 30, 2012
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STATE OF HAWAII 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 Date: June, 2010
SHEET No. G2.23 OF 34 SHEETS

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

		GEOLABS, INC. Geotechnical Engineering					HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A, PART B LAHAINA, MAUI, HAWAII			Log of Boring 211	
Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample Graphic	USCS	Approximate Ground Surface Elevation (feet MSL): 227.5 *	
	35	93			69					Description	
UC=5880			72	44	16/3" Ref.		0		MH	Red-brown CLAYEY SILT with sand, hard, damp (residual soil)	
							5		GM	Gray-brown SILTY GRAVEL with sand, very dense, damp (extremely weathered basalt)	
UC=7910			63	22			10			Brown-gray vesicular BASALT, moderately fractured, slightly weathered, medium hard to hard	
							15		GP	Red-brown-gray BASALT, closely to moderately fractured, slightly weathered, hard to medium hard	
			48	27			20			grades to brown-gray	
			30	23	10/0" Ref.		25			Gray vesicular BASALT, moderately fractured, slightly weathered, hard	
					10/0" Ref.		30			Boring terminated at 22 feet	
							35				
							40				
							45				
							50				
							55				
							60				
							65				
							70				
							75				
Date Started: September 29, 2008							Water Level: ∅ Not Encountered				
Date Completed: September 29, 2008											
Logged By: N. Mitchell							Drill Rig: MOBILE B-53				
Total Depth: 22 feet							Drilling Method: HQ Coring				
Work Order: 5401-00&10							Driving Energy: 140 lb. wt., 30 in. drop				

GEOLABS, INC. Geotechnical Engineering		HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A, PART B LAHAINA, MAUI, HAWAII					Log of Boring 212			
Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample Graphic	USCS	Approximate Ground Surface Elevation (feet MSL): 223.5 *
	13	90			34/6" +50/4" Ref.					Description
UC=6820			85	38			0		MH	Red-brown CLAYEY SILT with sand and some gravel, hard, damp (residual soil)
							5		SW	Gray-brown-red GRAVELLY SAND with silt, very dense, damp (extremely weathered basalt)
UC=8360			77	23			10			Gray highly vesicular BASALT, moderately fractured, slightly weathered, medium hard to hard grades to closely fractured
			87	55			15			grades to moderately fractured
			90	25			20			grades to closely fractured
			55	47			25			Gray vesicular BASALT, moderately to closely fractured, slightly weathered, medium hard to hard VOID
			80	22			30			VOID
							35			grades to closely fractured
							31.5			Boring terminated at 31.5 feet
							35			
							40			
							45			
							50			
							55			
							60			
							65			
							70			
							75			
Date Started: September 30, 2008							Water Level: \nexists Not Encountered			
Date Completed: September 30, 2008										
Logged By: N. Mitchell							Drill Rig: MOBILE B-53			
Total Depth: 31.5 feet							Drilling Method: HQ Coring			
Work Order: 5401-00&10							Driving Energy: 140 lb. wt., 30 in. drop			



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GEOLABS, INC. APRIL 30, 2012
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STATE OF HAWAII 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 Noted Date: June, 2010
SHEET No. G2.24 OF 34 SHEETS







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BORING LOGS - 25



Scale: As Noted Date: June, 2010


FINAL DESIGN 253

		GEOLABS, INC. Geotechnical Engineering						HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A, PART B LAHAINA, MAUI, HAWAII				Log of Boring 214	
Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample Graphic	USCS	Approximate Ground Surface Elevation (feet MSL): 211 *			
										Description			
UC= 5340	14 13	95			37 58		0		MH	Red-brown CLAYEY SILT with sand and gravel, hard, damp (residual soil)			
			67	33		5		GM	Light gray SILTY GRAVEL with sand, very dense damp (extremely weathered basalt)				
			80	30		10			Gray vesicular BASALT, moderately to closely fractured, slightly to moderately weathered, hard VOID				
			83	50		15			grades to moderately fractured				
UC= 12350			53	28			20		GP	Red GRAVEL (BASALTIC), dense (clinker)			
										Gray vesicular BASALT, closely fractured, slightly weathered, hard			
										Boring terminated at 22.5 feet			
							25						
							30						
							35						
							40						
							45						
							50						
							55						
							60						
							65						
							70						
							75						

Date Started: September 30, 2008		Water Level: \nexists Not Encountered	
Date Completed: September 30, 2008			
Logged By: N. Mitchell		Drill Rig: MOBILE B-53	
Total Depth: 22.5 feet		Drilling Method: HQ Coring	
Work Order: 5401-00&10		Driving Energy: 140 lb. wt., 30 in. drop	

DRAWING: LGS-DIT-5401-00&10-1-01 GEOLABS-DIT-50999

		GEOLABS, INC.					HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A, PART B LAHAINA, MAUI, HAWAII					Log of Boring 215	
Geotechnical Engineering													
Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample Graphic	USCS	Approximate Ground Surface Elevation (feet MSL): 204.5 *			
UC=14430	18	90			51		0			Description			
	12		56	47	54		2.5		MH	Red-brown CLAYEY SILT with sand and few gravel, hard, damp (residual soil)			
			83	50			5		SM	Light gray SILTY SAND with gravel, very dense, damp (extremely weathered basalt)			
			57	28			10		GP	Gray vesicular BASALT, moderately fractured, slightly weathered, hard			
			53	17			15			VOID			
							20			Reddish gray GRAVEL (BASALTIC), dense (clinker)			
							21			Gray vesicular BASALT with clinker layers, closely fractured, slightly weathered, hard			
							25			Boring terminated at 21 feet			
							30						
							35						
							40						
							45						
							50						
							55						
							60						
							65						
							70						
							75						
Date Started: September 30, 2008							Water Level: z Not Encountered						
Date Completed: September 30, 2008													
Logged By: N. Mitchell							Drill Rig: MOBILE B-53						
Total Depth: 21 feet							Drilling Method: HQ Coring						
Work Order: 5401-00&10							Driving Energy: 140 lb. wt., 30 in. drop						

		GEOLABS, INC. Geotechnical Engineering				HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A, PART B LAHAINA, MAUI, HAWAII				Log of Boring 216	
Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample Graphic	USCS	Approximate Ground Surface Elevation (feet MSL): 218 *	
										Description	
UC=8370	4	106	27	6	15/1" Ref.		0		GM	Gray-brown SILTY GRAVEL with sand, very dense, damp (extremely weathered basalt)	
							5			Gray vesicular BASALT, severely fractured, moderately weathered, medium hard	
	11		93	84	20/3" Ref.		10		GP	VOID	
			73	67			15			Gray GRAVEL, very dense, damp to moist (clinker)	
			100	33			20			Gray vesicular BASALT, slightly fractured, slightly weathered, hard	
UC=4660							21.5			grades to moderately to slightly fractured	
							25			Boring terminated at 21.5 feet	
							30				
							35				
							40				
							45				
							50				
							55				
							60				
							65				
							70				
							75				
Date Started: September 30, 2008						Water Level: z Not Encountered					
Date Completed: September 30, 2008											
Logged By: N. Mitchell						Drill Rig: MOBILE B-53					
Total Depth: 21.5 feet						Drilling Method: HQ Coring					
Work Order: 5401-00&10						Driving Energy: 140 lb. wt., 30 in. drop					

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DRAWN BY	
DESIGNED BY	
CHECKED BY	
NOTE BOOK	
No.	



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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. 62.26 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

		GEOLABS, INC. Geotechnical Engineering					HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A, PART B LAHAINA, MAUI, HAWAII					Log of Boring 217	
Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample Graphic	USCS	Approximate Ground Surface Elevation (feet MSL): 199 *			
UC=5070 UC=4610 UC=940	7		100	100	64		5		MH GM	Description			
							Red-brown CLAYEY SILT with some sand, hard to very hard, damp (residual soil)						
							Light gray SILTY GRAVEL with sand, very dense, damp to moist (extremely weathered basalt)						
							Gray vesicular BASALT, slightly fractured, slightly weathered, hard grades to moderately fractured						
			73	63			10			grades to severely fractured			
			100	80			15			Gray GRAVEL (BASALTIC) (clinker)			
			50	7			20		GP	Gray vesicular BASALT, severely fractured, moderately weathered, medium hard			
							25			Boring terminated at 22 feet			
							30						
							35						
							40						
							45						
							50						
							55						
							60						
							65						
							70						
							75						
Date Started: October 7, 2008							Water Level: ∅ Not Encountered						
Date Completed: October 7, 2008													
Logged By: N. Mitchell							Drill Rig: MOBILE B-53						
Total Depth: 22 feet							Drilling Method: HQ Coring						
Work Order: 5401-00&10							Driving Energy: 140 lb. wt., 30 in. drop						

GEOLABS, INC. Geotechnical Engineering		HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A, PART B LAHAINA, MAUI, HAWAII					Log of Boring 218				
Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample Graphic	USCS	Approximate Ground Surface Elevation (feet MSL): 219 *	Description
UC=2890	13				51		5		MH GM		Red-brown CLAYEY SILT with sand, hard, damp (residual soil)
			7	0			Light gray SILTY GRAVEL with sand, very dense, damp (extremely weathered basalt)				
			81	41	20/1" Ref.		Gray vesicular BASALT, closely to moderately fractured, slightly weathered, hard				
			60	20							
							15		GP		Reddish brown and gray GRAVEL (BASALTIC), dense (clinker)
							20				Gray vesicular BASALT, closely fractured, slightly weathered, medium hard to hard
							22				Boring terminated at 22 feet
							25				
							30				
							35				
							40				
							45				
							50				
							55				
							60				
							65				
							70				
							75				
Date Started: October 6, 2008							Water Level: ∅ Not Encountered				
Date Completed: October 6, 2008											
Logged By: N. Mitchell							Drill Rig: MOBILE B-53				
Total Depth: 22 feet							Drilling Method: HQ Coring & 4" Solid-Stem Auger				
Work Order: 5401-00&10							Driving Energy: 140 lb. wt., 30 in. drop				

SURVEY PLOTTED BY	DATE
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DESIGNED BY	
CHECKED BY	
NO. BOOK	
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STATE OF HAWAII 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	

GEOLABS, INC. Geotechnical Engineering										HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A, PART B LAHAINA, MAUI, HAWAII		Log of Boring 219
Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample Graphic	USCS	Approximate Ground Surface Elevation (feet MSL): 222 *		
UC=3490	11	87			54				ML	Description		
			41	0					GM	Brown SANDY SILT with some gravel, dense, damp (residual soil)		
							5			Light gray SILTY GRAVEL with sand, dense, damp (extremely weathered basalt)		
			80	20			10			Gray vesicular BASALT, closely to severely fractured, slightly to moderately weathered, medium hard to hard		
							15					
			65	23								
			62	27					GP	Brown-gray GRAVEL (BASALTIC), dense (clinker)		
							20			Gray vesicular BASALT, closely to severely fractured, slightly to moderately weathered, medium hard to hard		
			40	17					GP			
							25			Brown-gray GRAVEL (BASALTIC), dense (clinker)		
			41	8					GP	Gray vesicular BASALT, severely fractured, slightly weathered, hard		
							30			Brown-gray GRAVEL (BASALTIC), dense (clinker)		
			60	30					GP	Gray vesicular BASALT, closely fractured, slightly weathered, hard		
							35			Gray vesicular BASALT, closely fractured, slightly weathered, hard		
			7	0					GP	Red-brown and gray GRAVEL (BASALTIC), dense (clinker)		
10							40			Gray vesicular BASALT, slightly fractured, slightly weathered, hard		
							45			Reddish brown and gray GRAVEL (BASALTIC), dense (clinker)		
							50			Boring terminated at 42.2 feet		
							55					
							60					
							65					
							70					
							75					
Date Started: October 3, 2008										Water Level: \pm Not Encountered		
Date Completed: October 6, 2008												
Logged By: N. Mitchell										Drill Rig: MOBILE B-53		
Total Depth: 42.2 feet										Drilling Method: HQ Coring		
Work Order: 5401-00&10										Driving Energy: 140 lb. wt., 30 in. drop		
20/2" Ref.												

GEOLABS, INC. Geotechnical Engineering										HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A, PART B LAHAINA, MAUI, HAWAII		Log of Boring 220
Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample Graphic	USCS	Approximate Ground Surface Elevation (feet MSL): 203.5 *		
UC=6820	6				46				MH	Description		
			74	54					GM	Red-brown CLAYEY SILT with sand, hard, damp (residual soil)		
							5			Light gray SILTY GRAVEL with sand, very dense, damp (extremely weathered basalt)		
							10			Gray vesicular BASALT, moderately fractured, moderately to slightly weathered, hard		
			50	10						grades to severely fractured		
							15					
			80	13								
							20			Gray GRAVEL (BASALTIC), dense (clinker)		
			33	0					GP			
							25			Gray vesicular BASALT, closely fractured, moderately to slightly weathered, medium hard		
UC=24860	8				30/3" Ref.				GP	Gray-brown GRAVEL (BASALTIC), dense (clinker)		
			100	39						Gray vesicular BASALT, closely fractured, moderately to slightly weathered, medium hard		
							30			Gray vesicular BASALT, closely fractured, moderately to slightly weathered, medium hard		
							35			Gray-brown GRAVEL (BASALTIC), dense (clinker)		
			43	0					GP	Gray vesicular BASALT, closely fractured, moderately to slightly weathered, medium hard		
							40			Gray-brown GRAVEL (BASALTIC), dense (clinker)		
			60	23					GP	Gray vesicular BASALT, closely fractured, moderately to slightly weathered, medium hard		
					20/0" Ref.					Gray-brown GRAVEL (BASALTIC), dense (clinker)		
							45			Boring terminated at 38 feet		
							50					
Date Started: October 7, 2008										Water Level: \pm Not Encountered		
Date Completed: October 7, 2008												
Logged By: N. Mitchell										Drill Rig: MOBILE B-53		
Total Depth: 38 feet										Drilling Method: HQ Coring		
Work Order: 5401-00&10										Driving Energy: 140 lb. wt., 30 in. drop		



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Gerald Y. Seki
GEOLABS, INC. APRIL 30, 2012
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STATE OF HAWAII
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

GEOLABS, INC. Geotechnical Engineering		HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A, PART B LAHAINA, MAUI, HAWAII				Log of Boring 221	
Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)
Approximate Ground Surface Elevation (feet MSL): 187 *							
Description							
UC= 3740	8		80	40	20/1" Ref. 26		5
			80	42			10
			80	60			15
			100	60			20
UC= 3950			98	40			25
UC= 3550			60	33			30
UC= 6820			100	80			35
UC= 9550							40
Boring terminated at 37 feet							
Water Level: ∇ Not Encountered							
Drill Rig: MOBILE B-53							
Drilling Method: HQ Coring & 4" Solid-Stem Auger							
Driving Energy: 140 lb. wt., 30 in. drop							

GEOLABS, INC. Geotechnical Engineering		HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A, PART B LAHAINA, MAUI, HAWAII				Log of Boring 222	
Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)
Approximate Ground Surface Elevation (feet MSL): 153 *							
Description							
UC= 6810	6		67	31	63		5
			57	23			10
			85	43			15
			90	67			20
UC= 25140			32	0			25
UC= 24870			67	40			30
UC= 30700			100	93			35
UC= 29210							40
Boring terminated at 37.5 feet							
Water Level: ∇ Not Encountered							
Drill Rig: MOBILE B-53							
Drilling Method: HQ Coring							
Driving Energy: 140 lb. wt., 30 in. drop							



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APRIL 30, 2012
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STATE OF HAWAII
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

FINAL DESIGN 257

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

		GEOLABS, INC. Geotechnical Engineering		HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A, PART B LAHAINA, MAUI, HAWAII				Log of Boring 223		
Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample Graphic	USCS	Approximate Ground Surface Elevation (feet MSL): 137 *
										Description
UC= 21380	20	73			33	>4.5			MH	Reddish brown CLAYEY SILT with little gravel, hard, damp (residual soil)
	20				52					
UC= 24280 UC= 9600	3		58	0	20/0"		5			Gray vesicular BASALT, severely to closely fractured, moderately weathered, medium hard
			93	33	Ref. 30/3"		10			
			100	43	Ref.		15			grades to moderately fractured
			95	69			20			grades to severely to closely fractured grades to slightly fractured
							20			Boring terminated at 20 feet
							25			
							30			
							35			
							40			
							45			
							50			
							55			
							60			
							65			
							70			
							75			
Date Started: September 26, 2008		Water Level: z		Not Encountered						
Date Completed: September 26, 2008		Drill Rig: MOBILE B-53								
Logged By: D. Finch		Drilling Method: 4" Auger & HQ Coring								
Total Depth: 20 feet		Driving Energy: 140 lb. wt., 30 in. drop								
Work Order: 5401-00&10										

		GEOLABS, INC. Geotechnical Engineering		HONOAPIILANI 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	USCS	Approximate Ground Surface Elevation (feet MSL): 111 *
										Description
UC= 19050			30	7					MH	Reddish brown CLAYEY SILT with some gravel and little sand, hard, damp (residual soil)
	10				32		5		SM	Gray vugular BASALT, severely to closely fractured, moderately weathered, medium hard
		100	31				10		GP	Reddish brown SILTY SAND with some gravel, dense, moist (clinker)
		77	0				15			Gray and brown GRAVEL (BASALTIC), dense, damp (gp)
							20			Gray vesicular to vugular BASALT, closely to moderately fractured, moderately weathered, medium hard
		13	0				25			Gray vesicular BASALT, closely fractured, moderately weathered, medium hard
							30			Gray and brown GRAVEL (BASALTIC), dense, damp (clinker)
							35			Boring terminated at 21 feet
							40			
							45			
							50			
							55			
							60			
							65			
							70			
							75			
Date Started: September 25, 2008		Water Level: z		Not Encountered						
Date Completed: September 25, 2008		Drill Rig: MOBILE B-53								
Logged By: D. Finch		Drilling Method: 4" Auger & HQ Coring								
Total Depth: 21 feet		Driving Energy: 140 lb. wt., 30 in. drop								
Work Order: 5401-00&10										

ORIGINAL PLAN	DATE
SURVEY PLOTTED BY	
DESIGNED BY	
NOTED BY	
CHECKED BY	









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Gerald Y. Seki
GEOLABS, INC. APRIL 30, 2012
LIC. EXP. DATE

STATE OF HAWAII 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

GEOLABS, INC. Geotechnical Engineering		HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A, PART B LAHAINA, MAUI, HAWAII						Log of Boring 225								
Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample Graphic	USCS	Approximate Ground Surface Elevation (feet MSL): 94 *	Description					
UC=9380	4	85	39	0	30/6" +50/3" Ref.		5		MH		Reddish brown CLAYEY SILT with little sand and gravel, hard to very hard, damp (residual soil)					
			93	75	20/0" Ref.		10		GP		Gray and reddish brown GRAVEL (BASALTIC), dense (extremely weathered basalt)					
			63	20			15		GP		Gray vesicular BASALT, moderately fractured, moderately weathered, medium hard to hard					
			100	57			20				Gray and brown GRAVEL (BASALTIC), dense, damp (clinker)					
UC=3710							20				Gray vesicular to vugular BASALT, closely to moderately fractured, moderately weathered, medium hard grades to severely to closely fractured					
							Boring terminated at 22 feet									
							25									
							30									
							35									
							40									
							45									
							50									
							55									
							60									
							65									
							70									
							75									
Date Started: September 25, 2008							Water Level: ∅ Not Encountered									
Date Completed: September 25, 2008																
Logged By: D. Finch							Drill Rig: MOBILE B-53									
Total Depth: 22 feet							Drilling Method: 4" Auger & HQ Coring									
Work Order: 5401-00&10							Driving Energy: 140 lb. wt., 30 in. drop									

		GEOLABS, INC. Geotechnical Engineering					HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A, PART B LAHAINA, MAUI, HAWAII					Log of Boring 226	
Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample Graphic	USCS	Approximate Ground Surface Elevation (feet MSL): 81 *			
										Description			
LL=45 PI=16	12 8	88			38	4.5			ML	Reddish brown CLAYEY SILT with little sand and gravel, hard, damp (residual soil)			
			74	28	50/3" Ref.		5			Gray vesicular BASALT, closely fractured, moderately weathered, medium hard grades to moderately fractured, slightly weathered			
UC=8530			65	35			10		GP	Gray and brown GRAVEL (BASALTIC), dense (clinker)			
			37	13		15			Gray vesicular BASALT, slightly to moderately fractured, slightly weathered, medium hard to hard				
			67	47	20/0" Ref.		20		GP	Gray GRAVEL (BASALTIC), dense (clinker)			
Boring terminated at 21.5 feet													
							25						
							30						
							35						
							40						
							45						
							50						
							55						
							60						
							65						
							70						
							75						
Date Started: September 25, 2008							Water Level: ∇ Not Encountered						
Date Completed: September 25, 2008													
Logged By: D. Finch							Drill Rig: MOBILE B-53						
Total Depth: 21.5 feet							Drilling Method: HQ Coring & 4" Auger						
Work Order: 5401-00&10							Driving Energy: 140 lb. wt., 30 in. drop						



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STATE OF HAWAII
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

		GEOLABS, INC. Geotechnical Engineering					HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A, PART B LAHAINA, MAUI, HAWAII					Log of Boring 227	
Other Tests		Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample Graphic	USCS	Approximate Ground Surface Elevation (feet MSL): 54 *		
											Description		
UC= 6060			89	83				5		GP	Brown-gray GRAVEL with sand, medium dense, damp (fill)		
			67	30				Gray vesicular BASALT, slightly fractured, slightly weathered, very hard					
UC= 3550 UC= 2290			100	93				10		GP	Gray GRAVEL (BASALTIC), dense (clinker)		
								Gray vesicular BASALT, slightly fractured, slightly weathered, very hard					
			48	40				15					
								20		GP	Gray-brown GRAVEL (BASALTIC), medium dense (clinker)		
								22			Gray vesicular BASALT, moderately fractured, slightly weathered, hard		
								25			Boring terminated at 22 feet		
								30					
								35					
								40					
								45					
								50					
								55					
								60					
								65					
								70					
								75					
Date Started: October 7, 2008								Water Level: ∇ Not Encountered					
Date Completed: October 7, 2008													
Logged By: N. Mitchell								Drill Rig: MOBILE B-53					
Total Depth: 22 feet								Drilling Method: HQ Coring & 4" Solid-Stem Auger					
Work Order: 5401-00&10								Driving Energy: 140 lb. wt., 30 in. drop					

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

		GEOLABS, INC. Geotechnical Engineering		HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A, PART B LAHAINA, MAUI, HAWAII				Log of Boring 301		
Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample Graphic	USCS	(Continued from previous plate) Description
UC=6660			92	45			80			Gray vesicular BASALT, severely fractured, slightly to moderately weathered, medium hard grades to closely to moderately fractured
			100	0			85			Gray and purple highly vesicular BASALT, closely to moderately fractured, moderately weathered, medium hard to hard
			50	0			90		GP	Gray vesicular BASALT, closely to severely fractured, slightly weathered, hard grades to slightly vugular
			80	0			95			Gray and reddish brown GRAVEL (BASALTIC), dense (clinker)
			95	38			100			Gray vesicular BASALT with clinker layers, closely to severely fractured, moderately weathered, medium hard
							102			Gray vesicular BASALT, closely to moderately fractured, moderately weathered, medium hard
							105			Boring terminated at 102 feet
							110			
							115			
							120			
							125			
							130			
							135			
							140			
							145			
							150			
Date Started: September 23, 2008		Date Completed: September 24, 2008		Water Level: ±		Not Encountered				
Logged By: D. Finch		Drill Rig: MOBILE B-53		Drilling Method: 4" Auger & HQ Coring		Driving Energy: 140 lb. wt., 30 in. drop				
Total Depth: 102 feet		Work Order: 5401-00&10								

SURVEY PLOTTED BY	DATE
DRAWN BY	
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ORIGINAL PLAN	No.
NOTE BOOK	



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GEO LABS, INC. APRIL 30, 2012
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STATE OF HAWAII 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: June, 2010
SHEET No. G2.33 OF 34 SHEETS	

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)

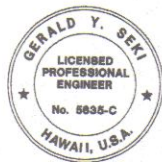
2. Lateral Earth Pressures

- 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) = $4.5H^2$ 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.

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

GEOTECHNICAL NOTES

HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A

Future Keawe St Extension to Lahainaluna Rd, Part B

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

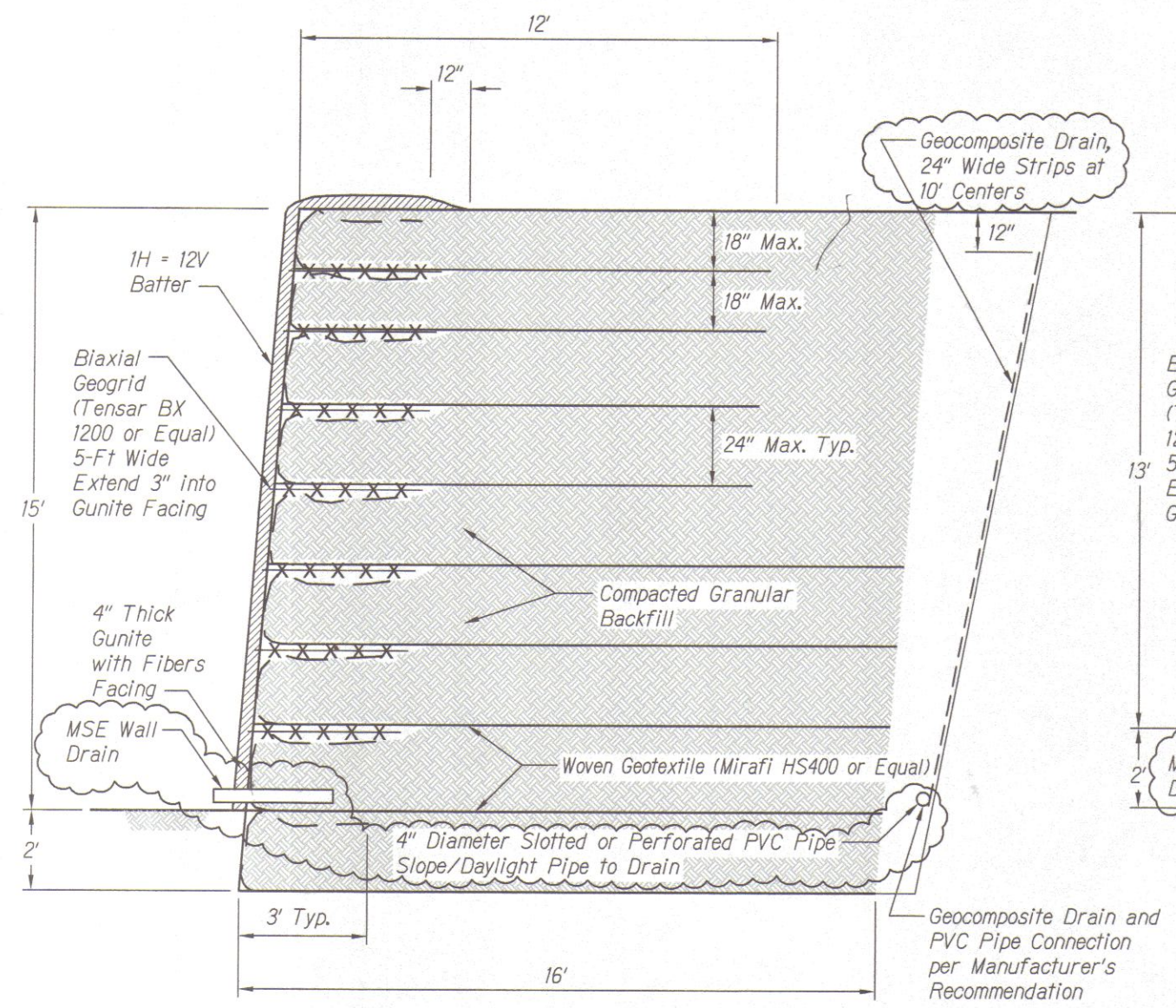
Scale: As Noted

Date: June, 2010

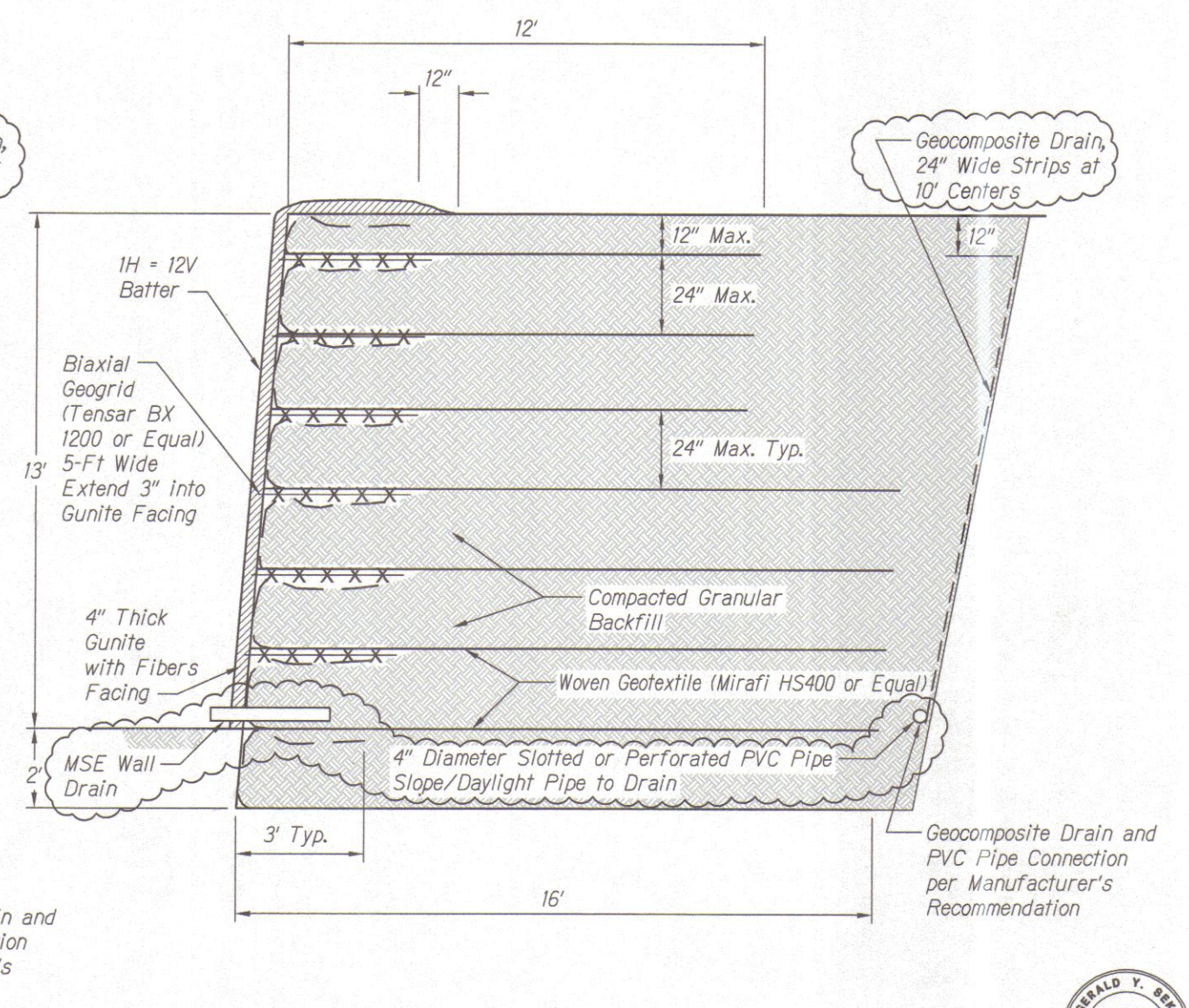
SHEET No. G-3.0 OF 1 SHEETS

FINAL DESIGN 262

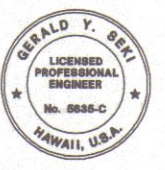
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-030-1(35)R	2009	263	382



**TYPICAL MSE WALL SECTION
SECTION A TO B**
Scale: 1"=2'



**TYPICAL MSE WALL SECTION
SECTION B TO C**
Scale: 1"=2'



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LIC. EXP. DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TYPICAL MSE WALL SECTION - 1

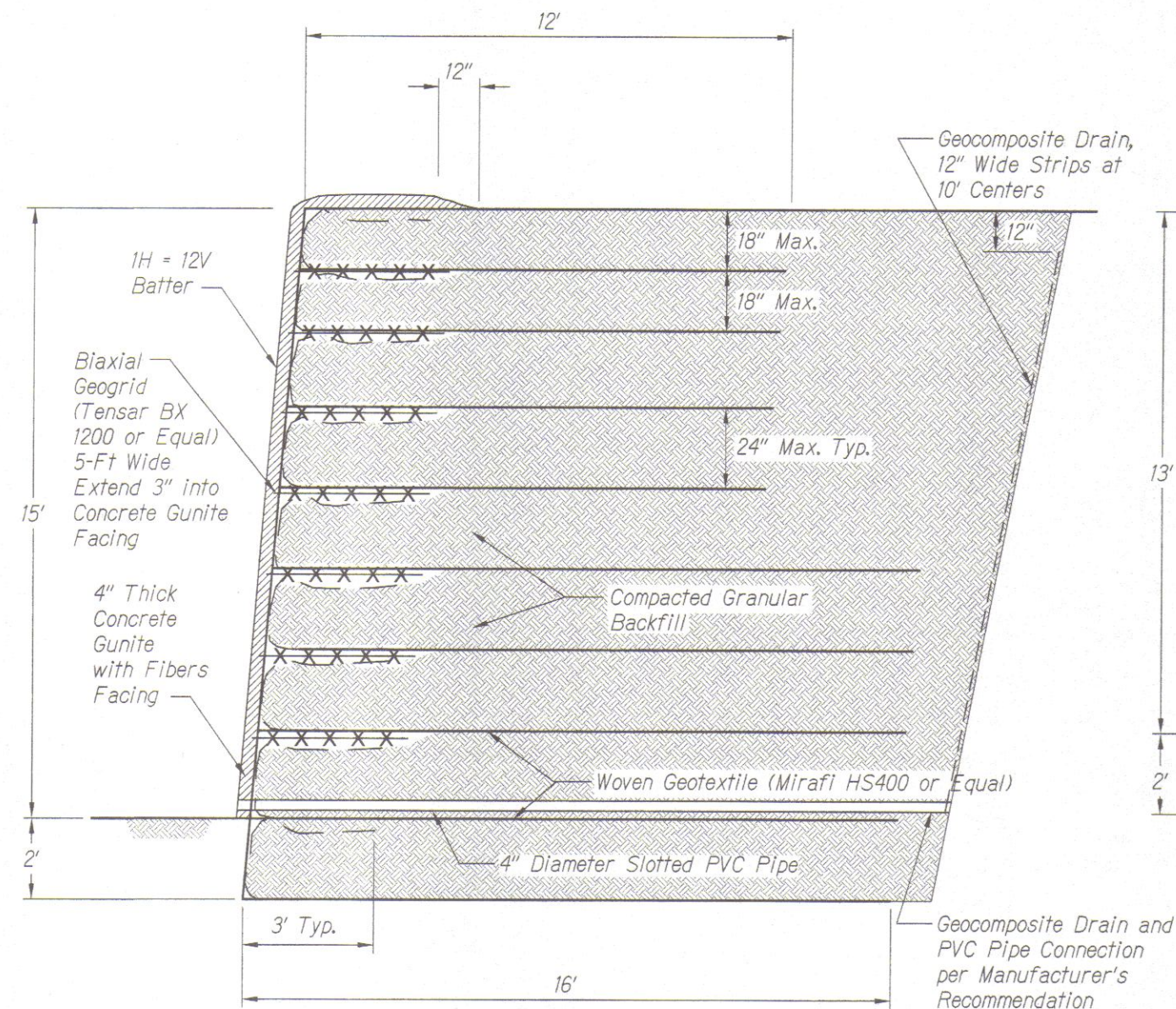
HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A
Future Keawe St Extension to Lahainaluna Rd, Part B
Fed. Aid Proj. No. NH-030-1(35)R

Scale: As Noted Date: June, 2010

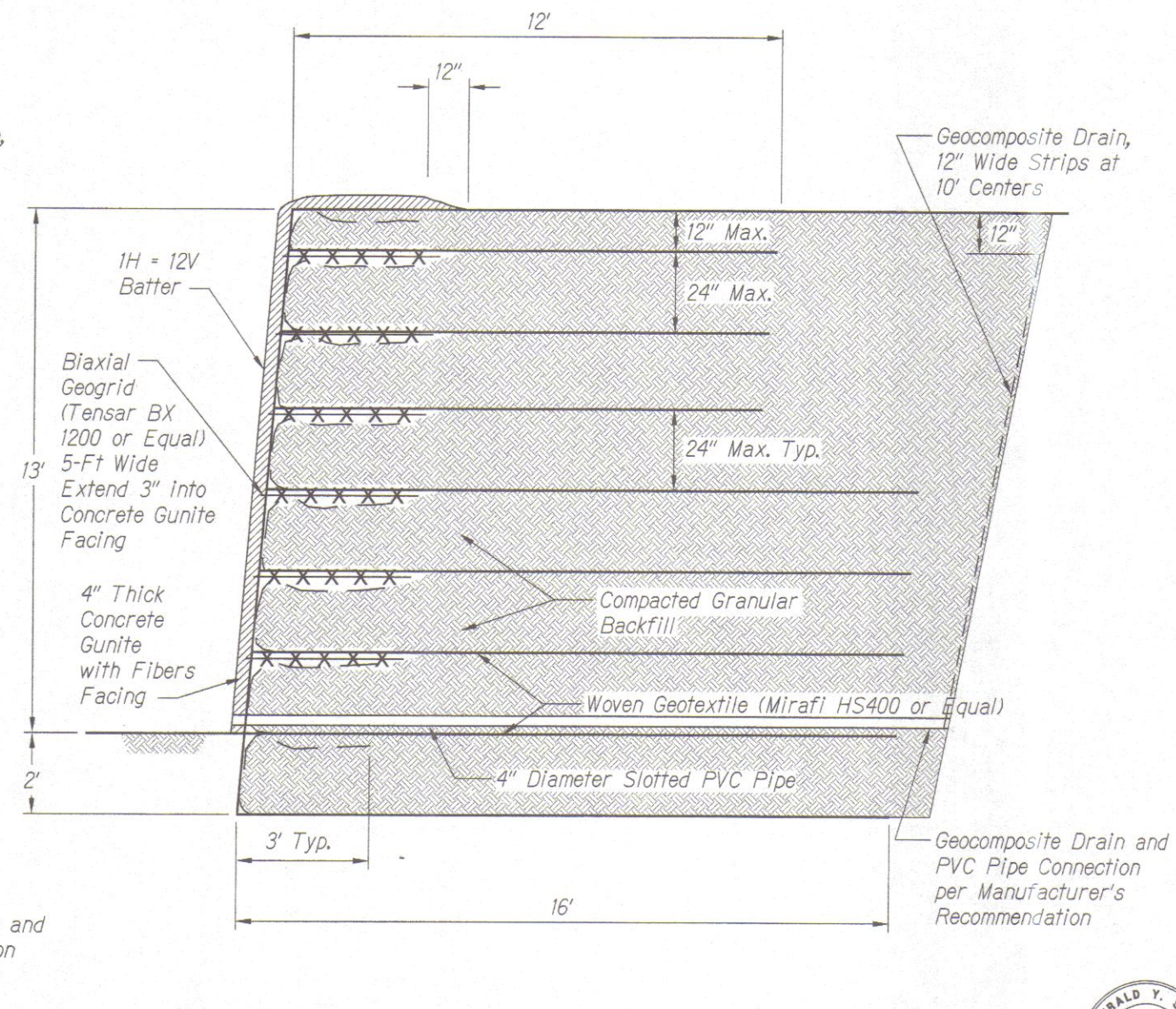
SHEET No. G4.1 OF 8 SHEETS

ORIGINAL PLAN	SURVEY PLATTED BY	DATE
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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'

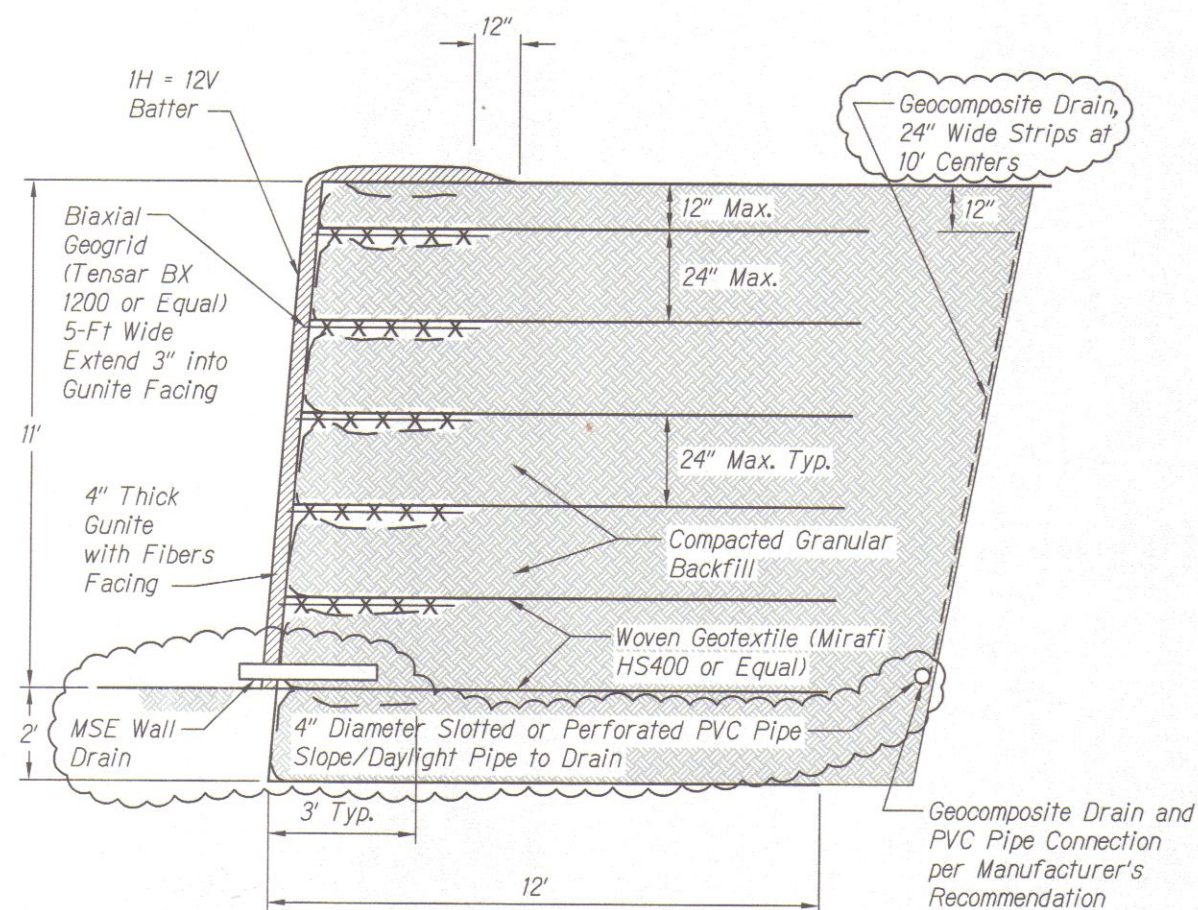


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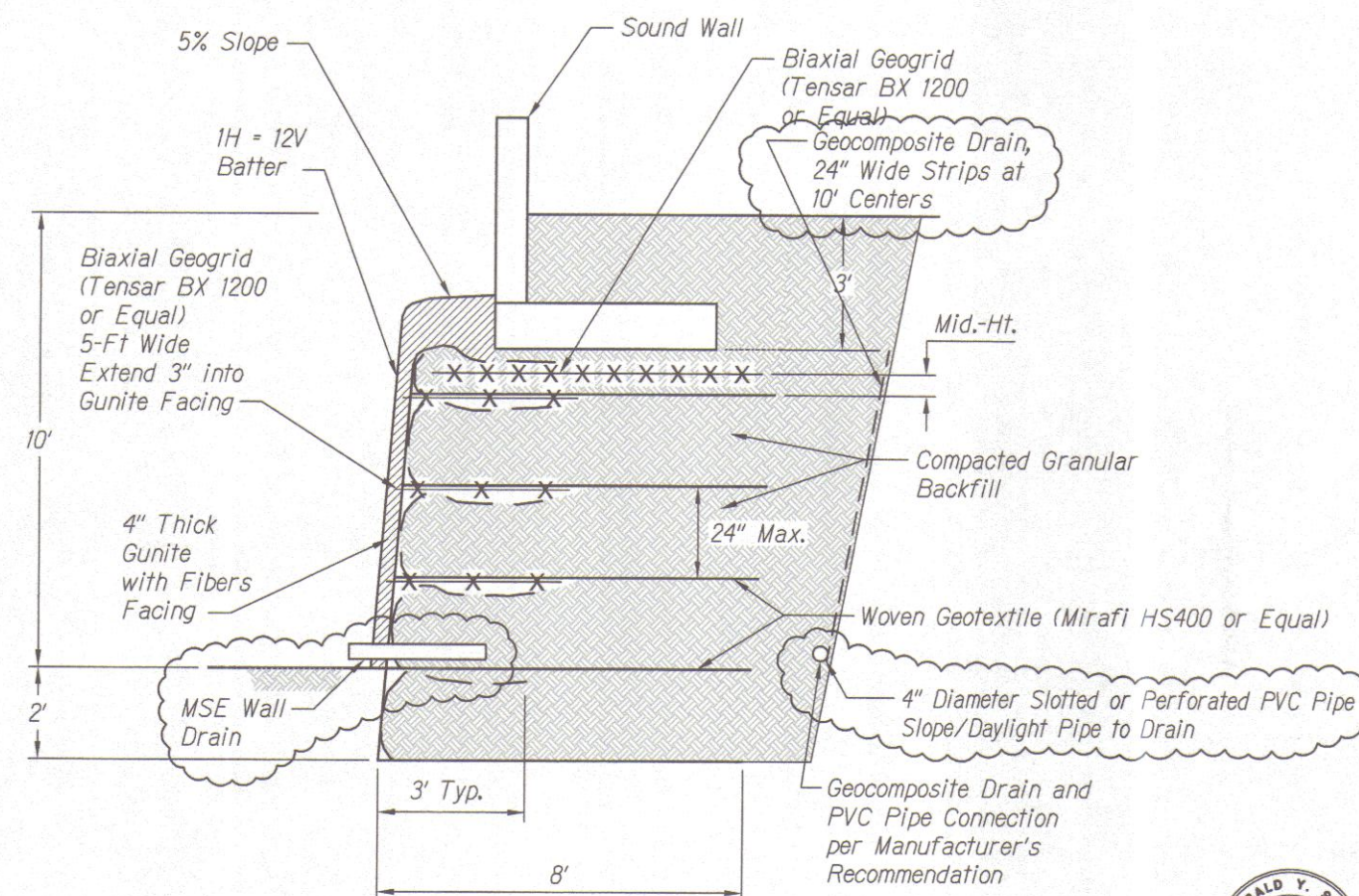
STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION	
TYPICAL MSE WALL SECTION - 1	
HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A Future Keawe St Extension to Lahainaluna Rd, Part B	
Fed. Aid Proj. No. NH-030-1(35)R	
Scale: As Noted	Date: June, 2010
SHEET No. 64.1 OF 8 SHEETS	

SURVEY PLOTTED BY	DATE
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ORIGINAL PLAN	
NOTE BOOK	
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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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APRIL 30, 2012
 LIC. EXP. DATE

STATE OF HAWAII
 DEPARTMENT OF TRANSPORTATION
 HIGHWAYS DIVISION

TYPICAL MSE WALL SECTION - 2

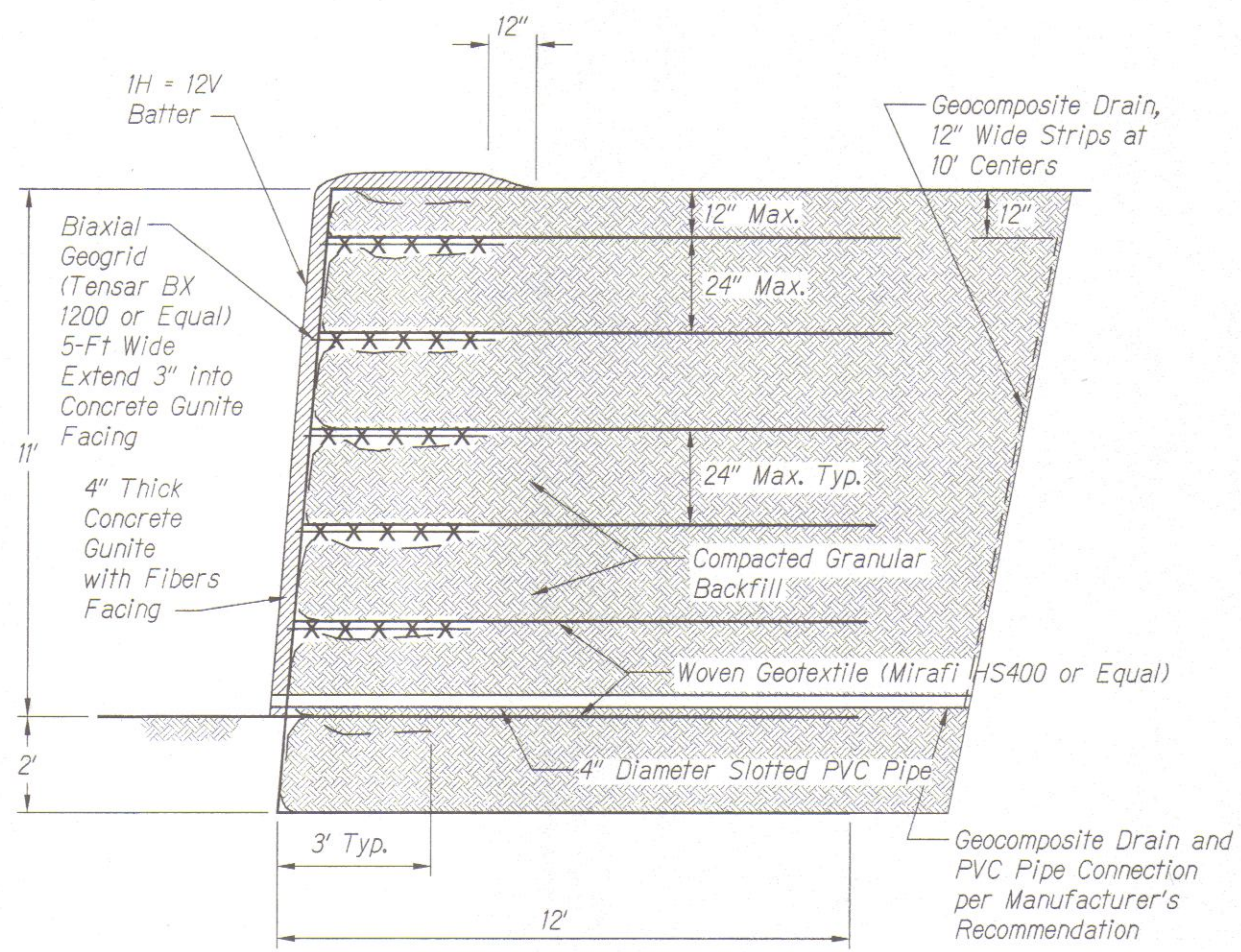
HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A
 Future Keawe St Extension to Lahainaluna Rd, Part B
 Fed. Aid Proj. No. NH-030-1(35)R

Scale: As Noted Date: June, 2010

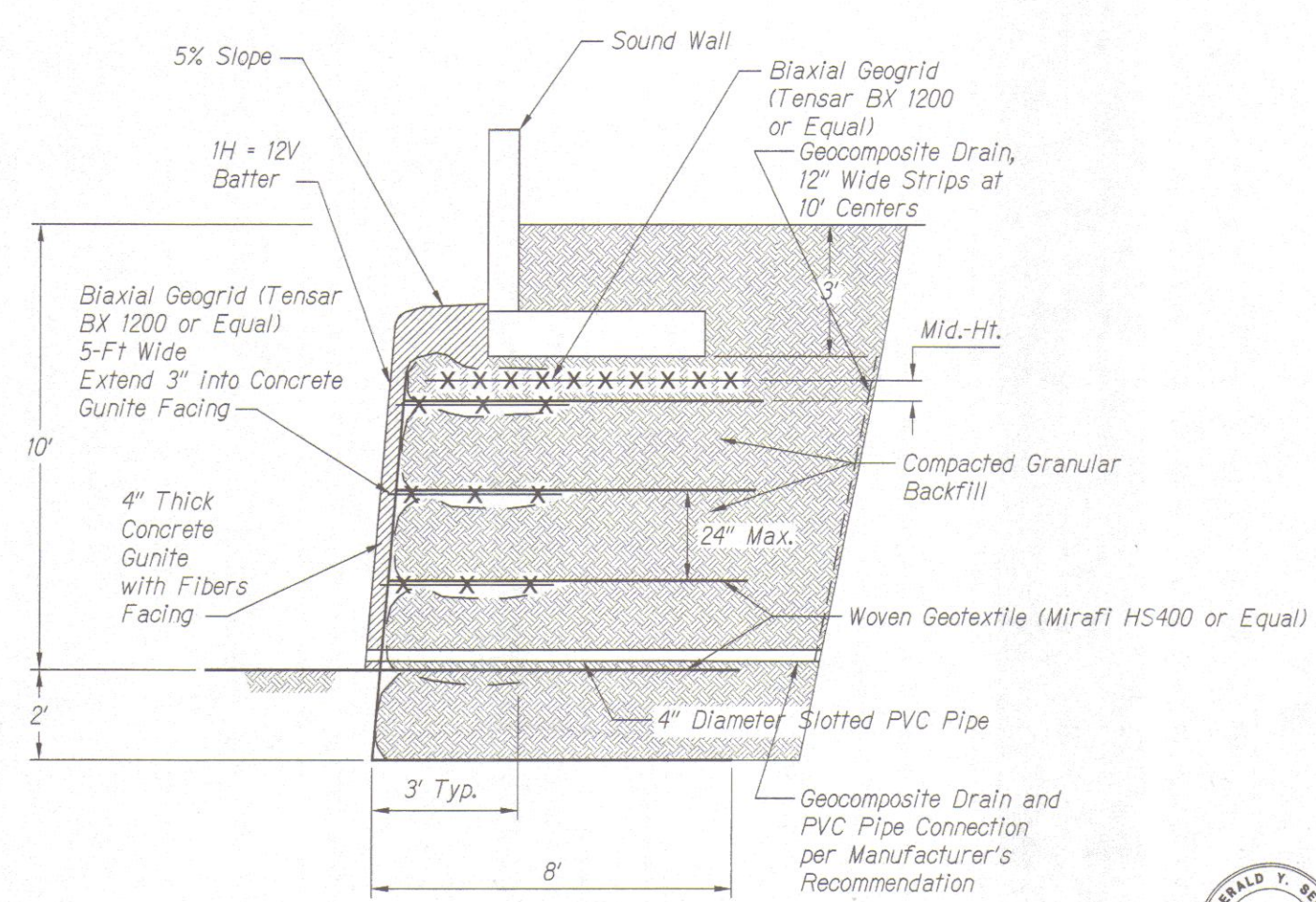
SHEET No. G4.2 OF 8 SHEETS

ORIGINAL PLAN	DATE
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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'

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

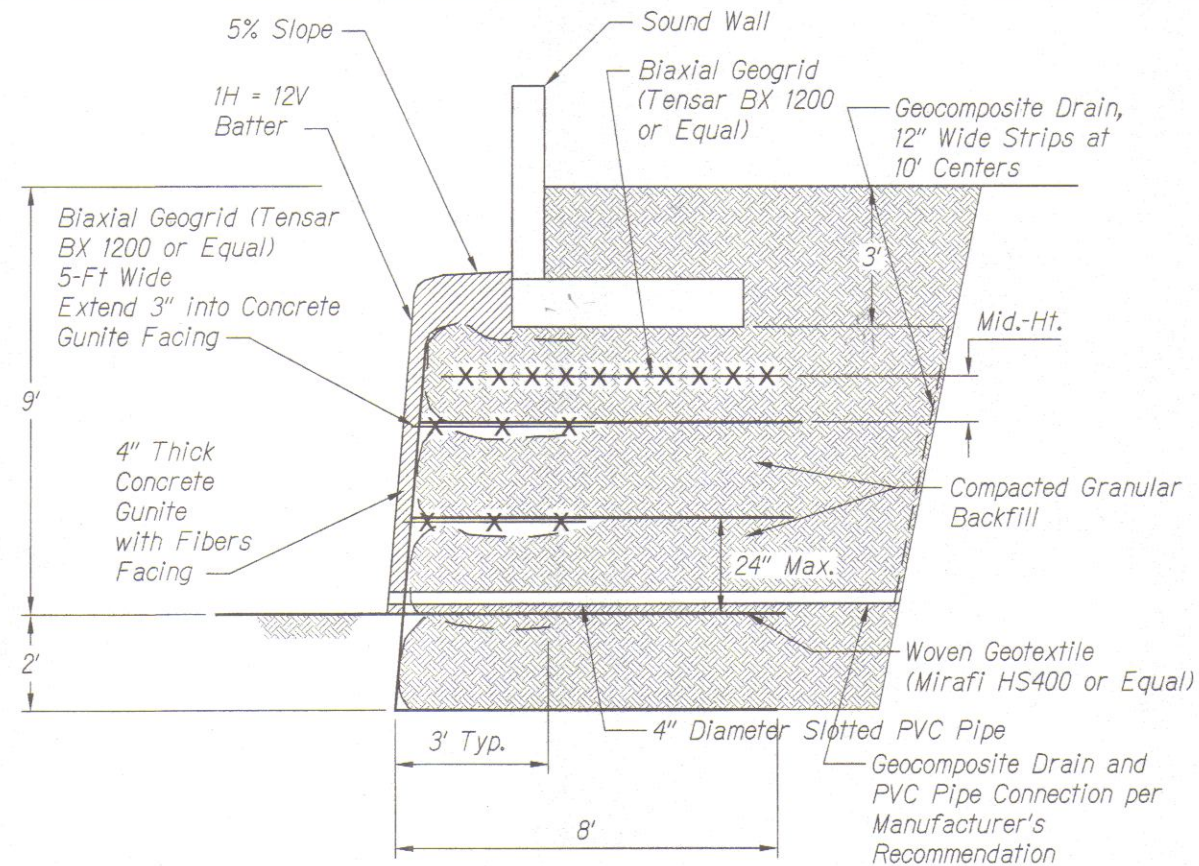


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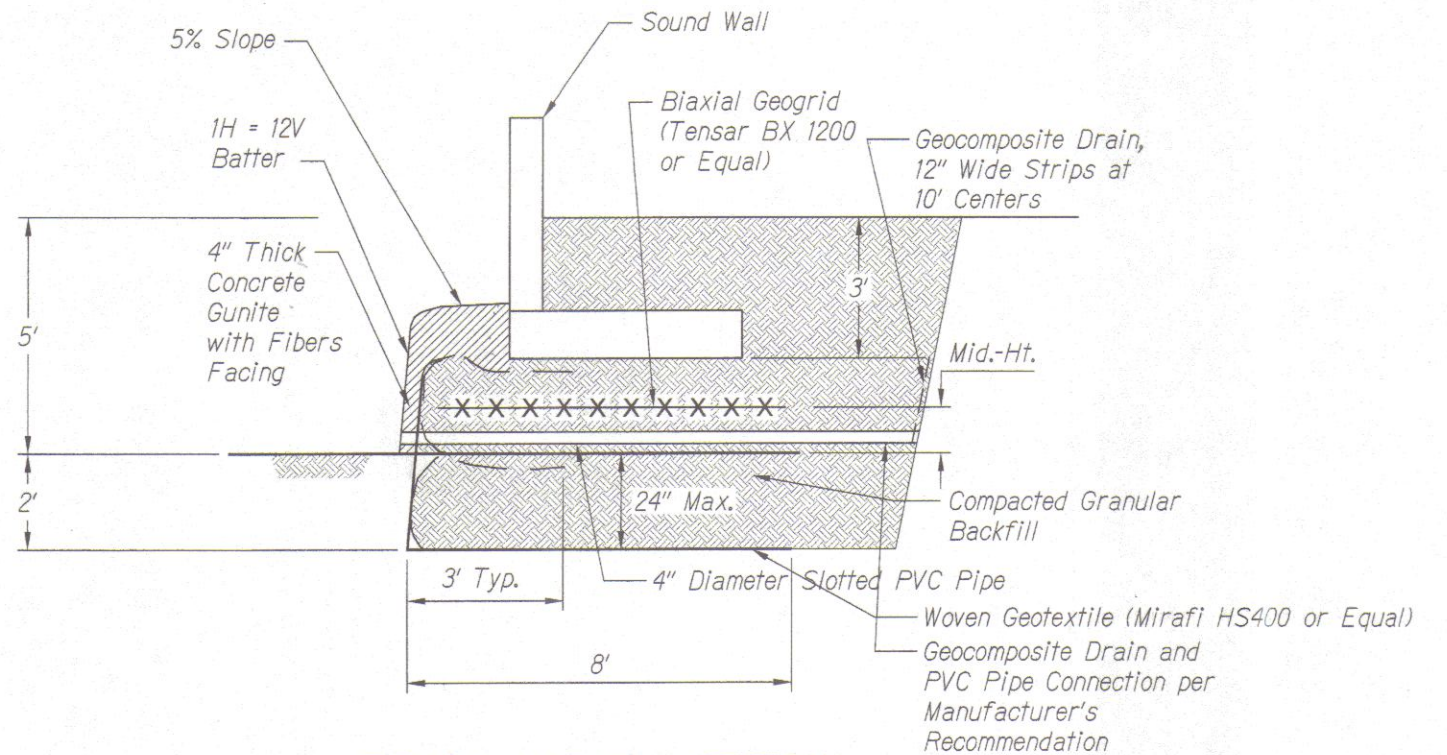
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TYPICAL MSE WALL SECTION - 2
HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A
Future Keawe St Extension to Lahainaluna Rd, Part B
Fed. Aid Proj. No. NH-030-1(35)R
Scale: As Noted Date: June, 2010
SHEET No. G4.2 OF 8 SHEETS

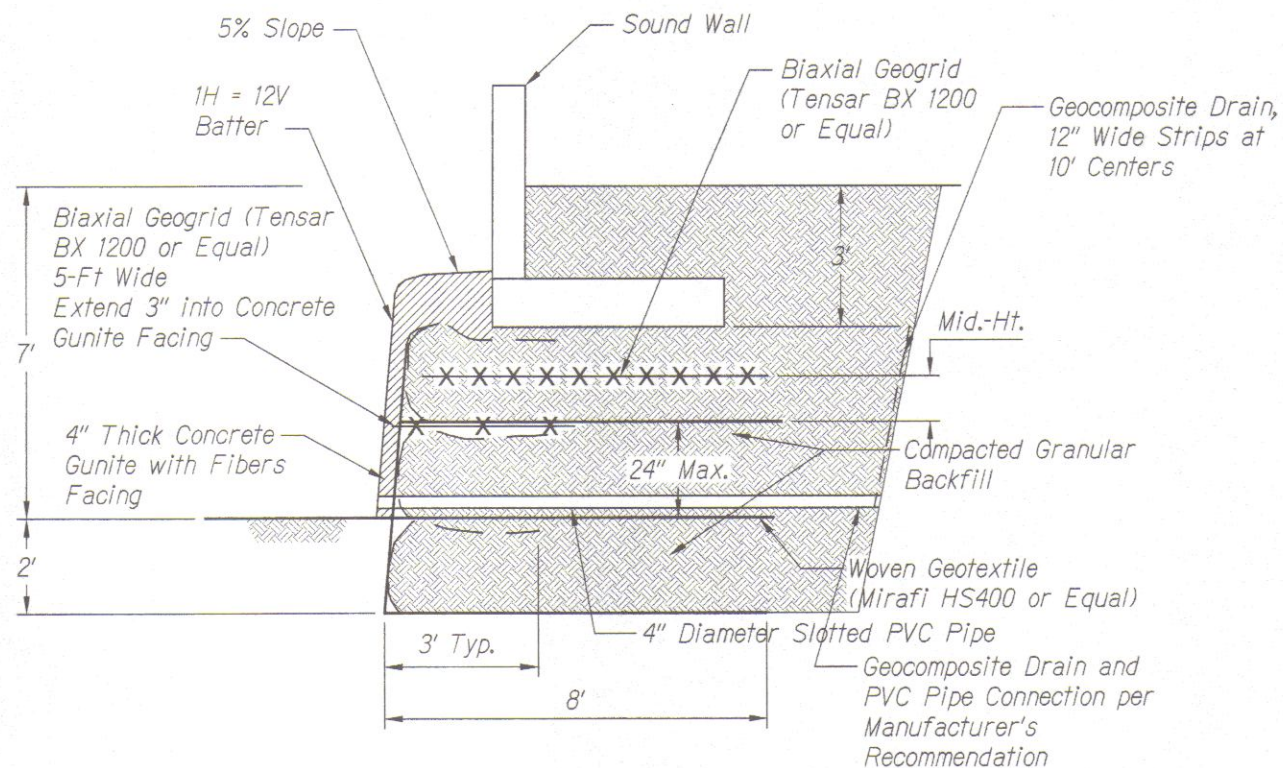
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-030-1(35)R	2009	265	382



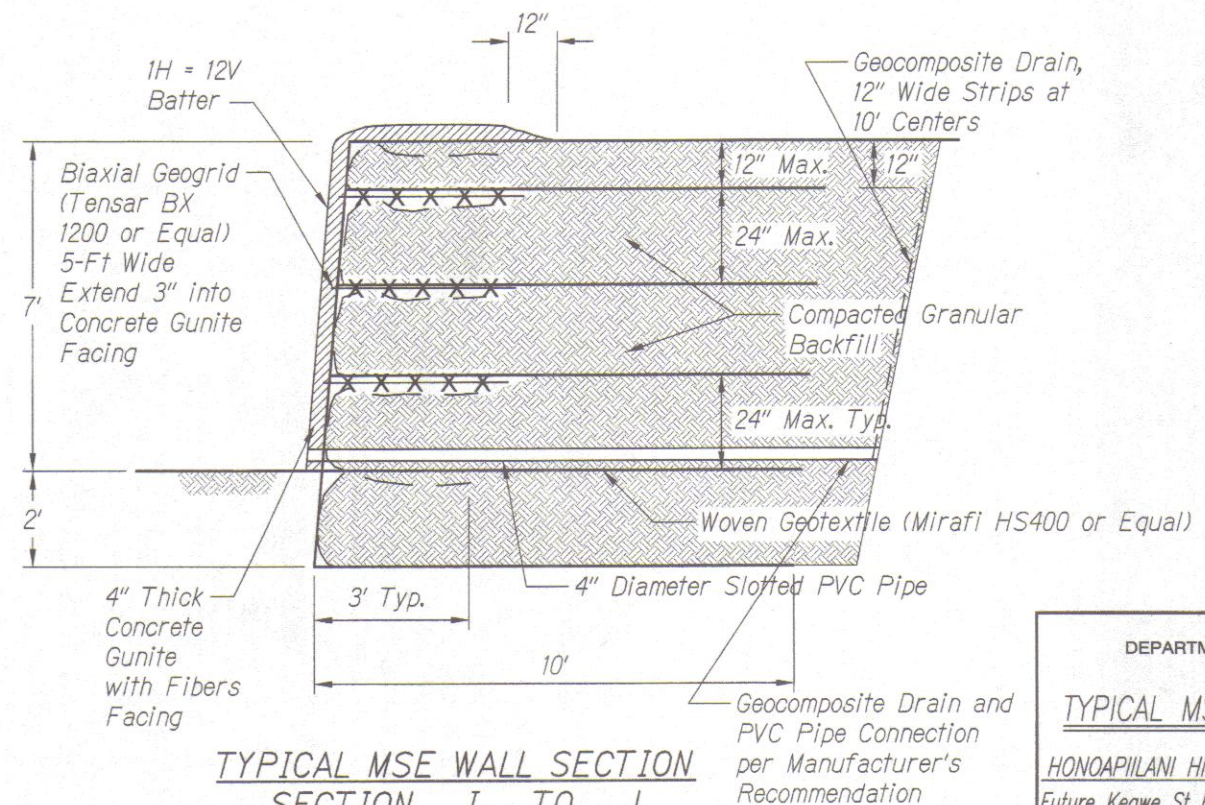
**TYPICAL MSE WALL SECTION
SECTION E TO F**
Scale: 1"=2'



**TYPICAL MSE WALL SECTION
SECTION G TO H**
Scale: 1"=2'



**TYPICAL MSE WALL SECTION
SECTION F TO G**
Scale: 1"=2'



**TYPICAL MSE WALL SECTION
SECTION I TO J**
Scale: 1"=2'



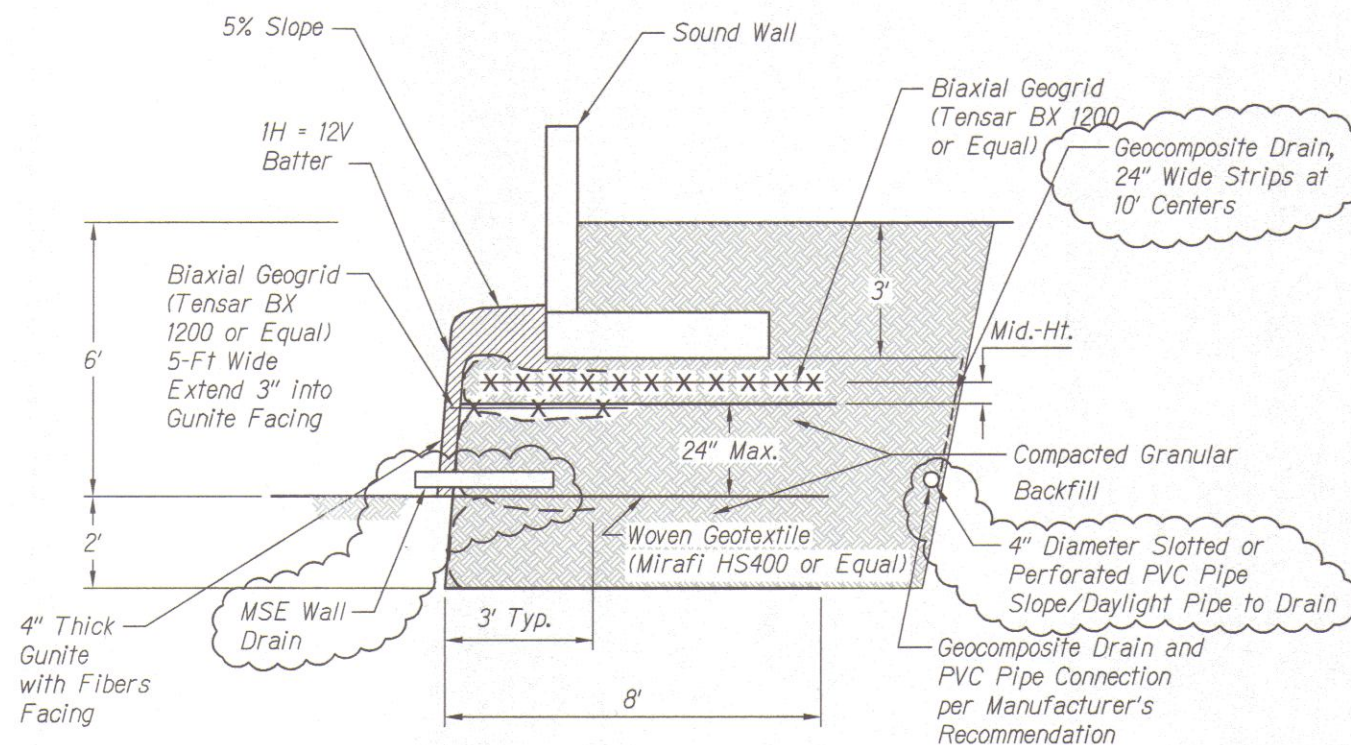
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GEOLABS, INC. APRIL 30, 2012
LIC. EXP. DATE

STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION
TYPICAL MSE WALL SECTION - 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. G4.3 OF 8 SHEETS

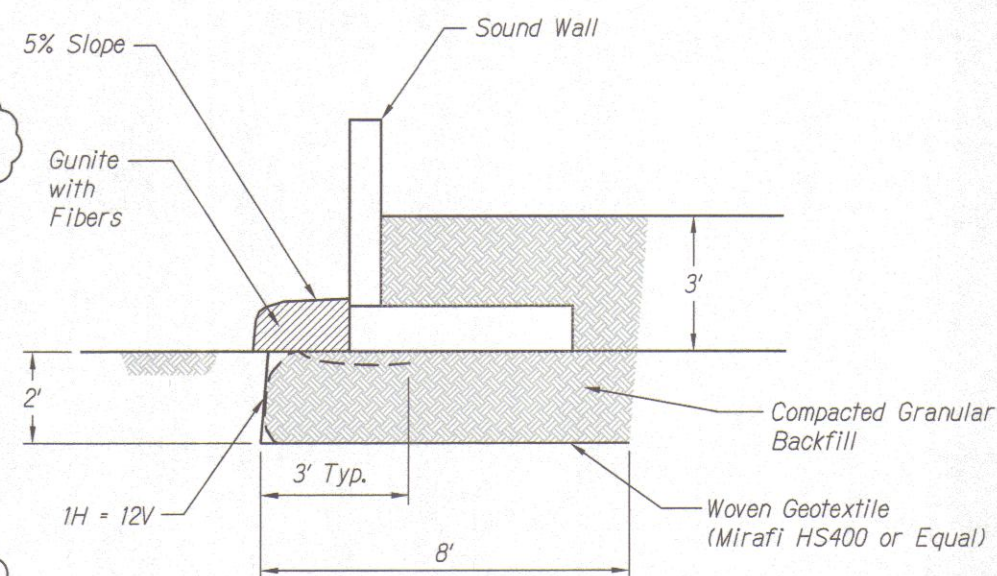
FINAL DESIGN -265 *rw*

ORIGINAL PLAN	DATE
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CHECKED BY
NOTED BY
QUANTITIES BY
NO.

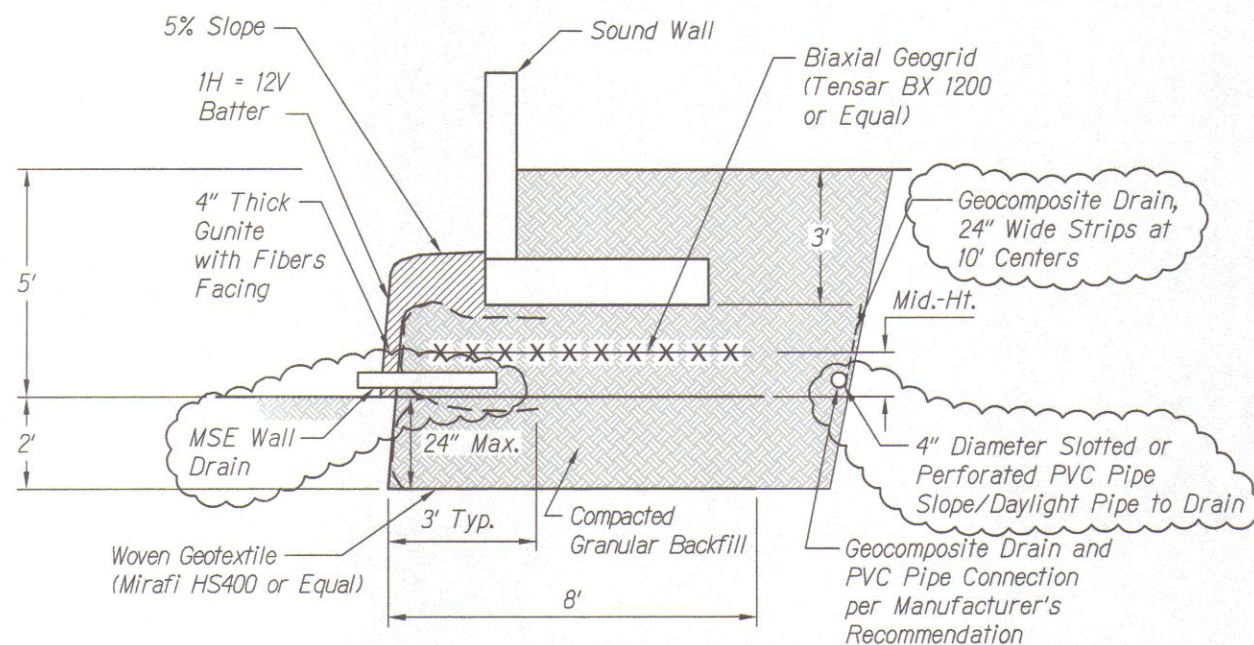
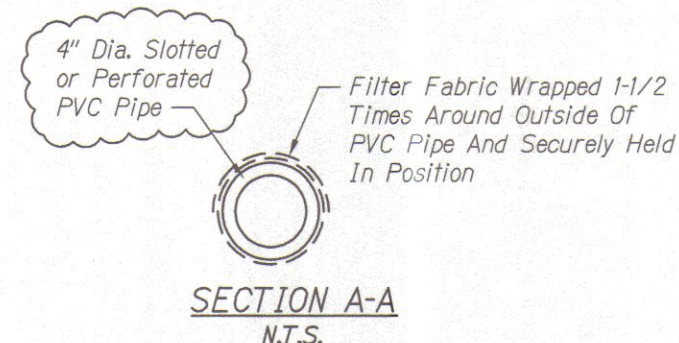
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-030-1(35)R	2009	266	382



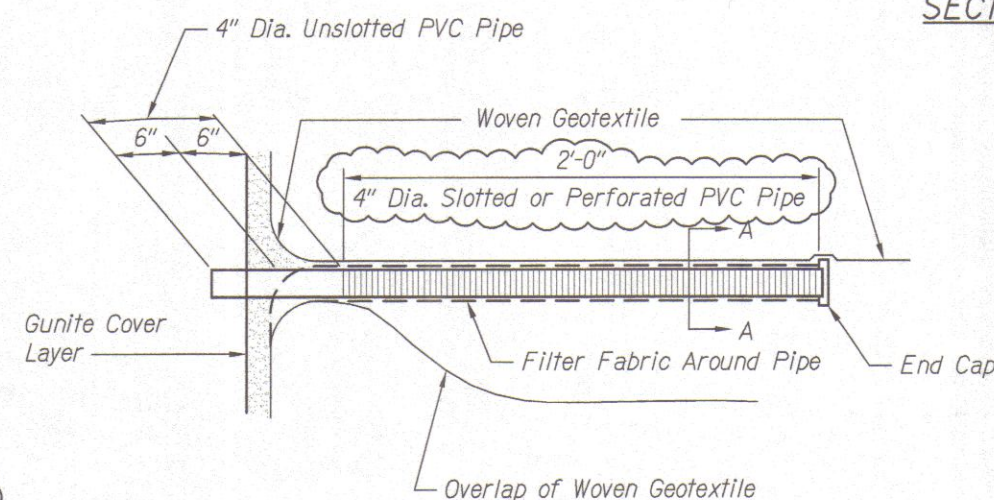
TYPICAL MSE WALL SECTION
SECTION J TO K
Scale: 1"=2'



TYPICAL MSE WALL SECTION
SECTION L TO M
Scale: 1"=2'

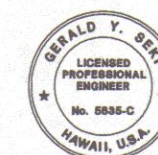


TYPICAL MSE WALL SECTION
SECTION K TO L
Scale: 1"=2'



TYPICAL MSE WALL DRAIN
N.T.S.

Note:
Wall drain shall be spaced at 10' on center and installed at 12" to 24" above the finish grade at the face of wall.



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STATE OF HAWAII
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HIGHWAYS DIVISION

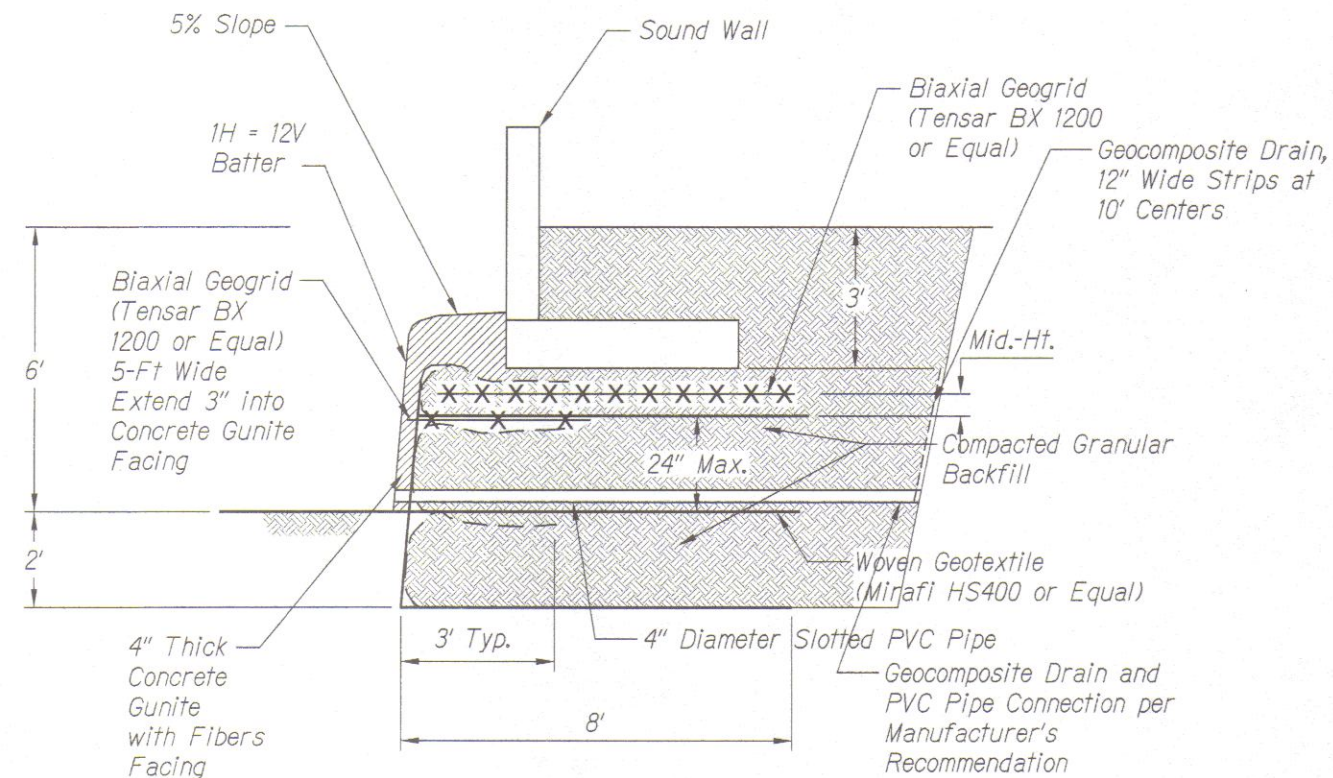
TYPICAL MSE WALL SECTION - 4

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

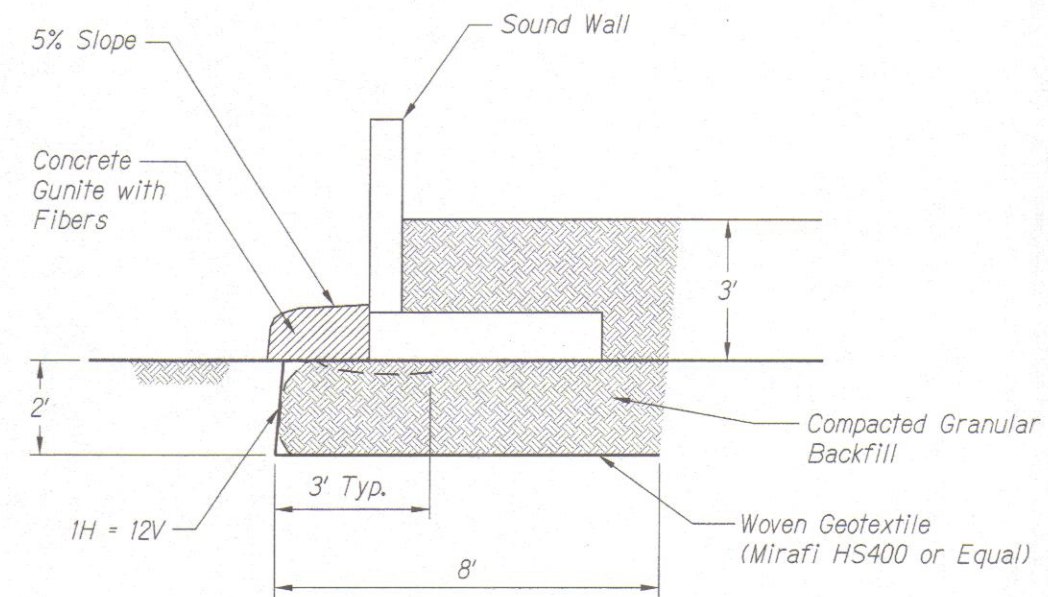
Scale: As Noted Date: June, 2010

SHEET No. G4.4 OF 8 SHEETS

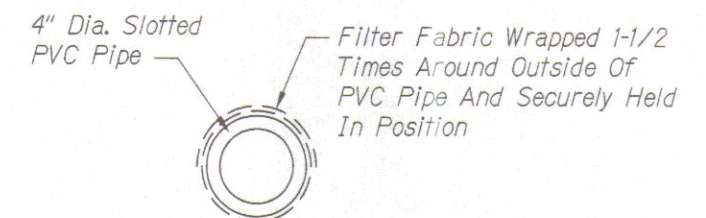
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-030-1(35)R	2009	266	382



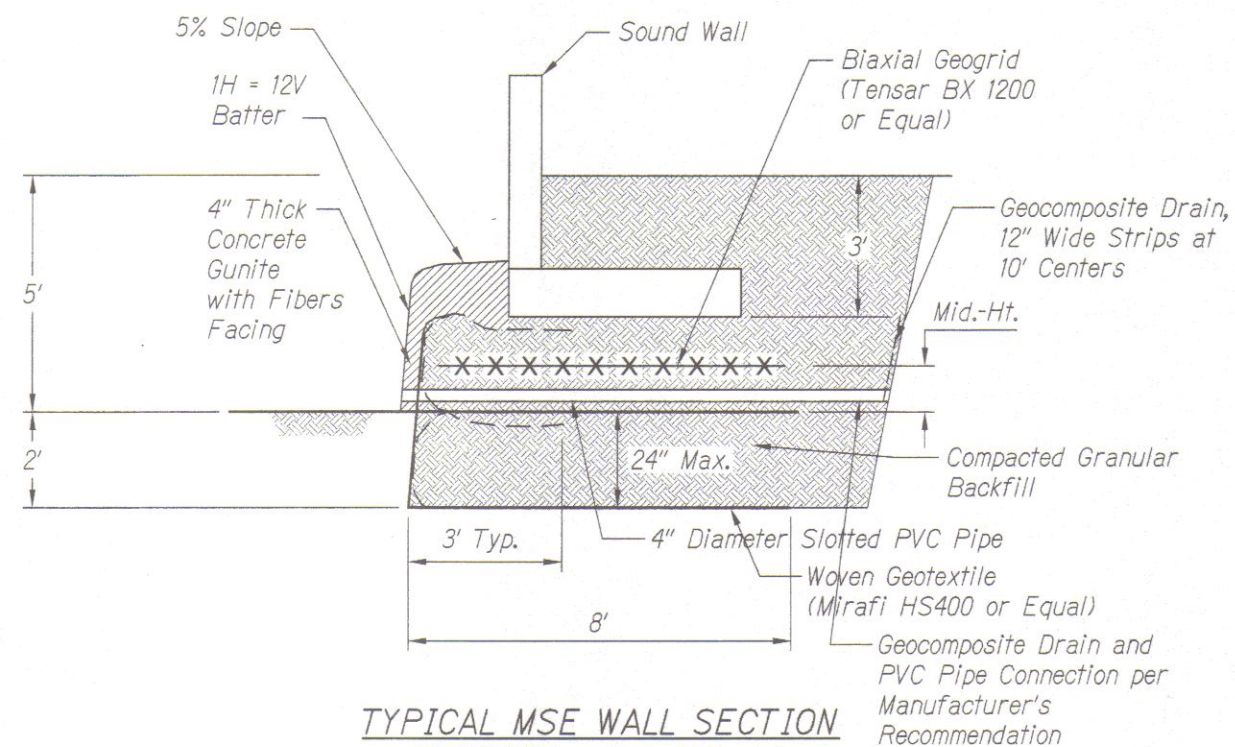
**TYPICAL MSE WALL SECTION
SECTION J TO K**
Scale: 1"=2'



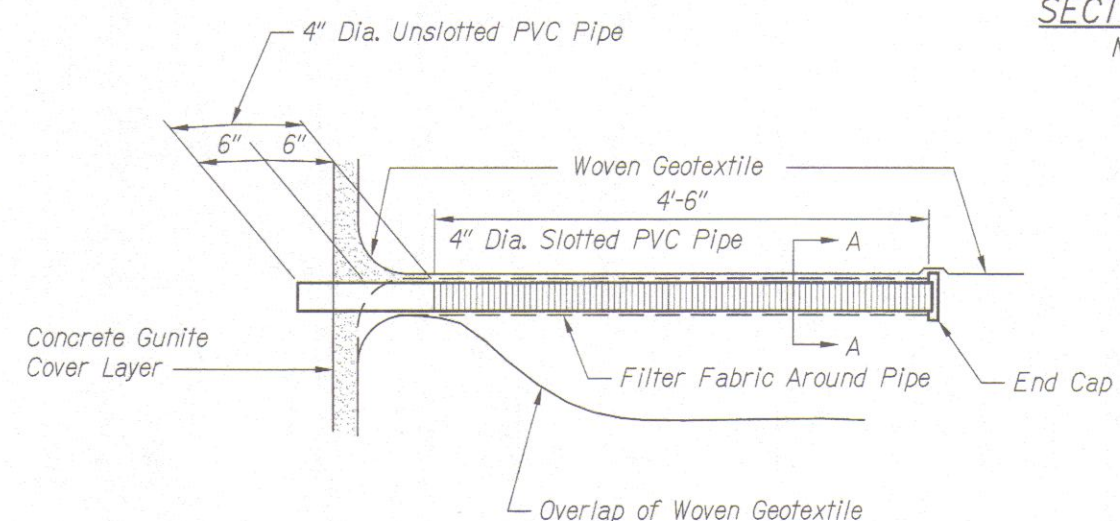
**TYPICAL MSE WALL SECTION
SECTION L TO M**
Scale: 1"=2'



SECTION A-A
N.T.S.



**TYPICAL MSE WALL SECTION
SECTION K TO L**
Scale: 1"=2'



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.

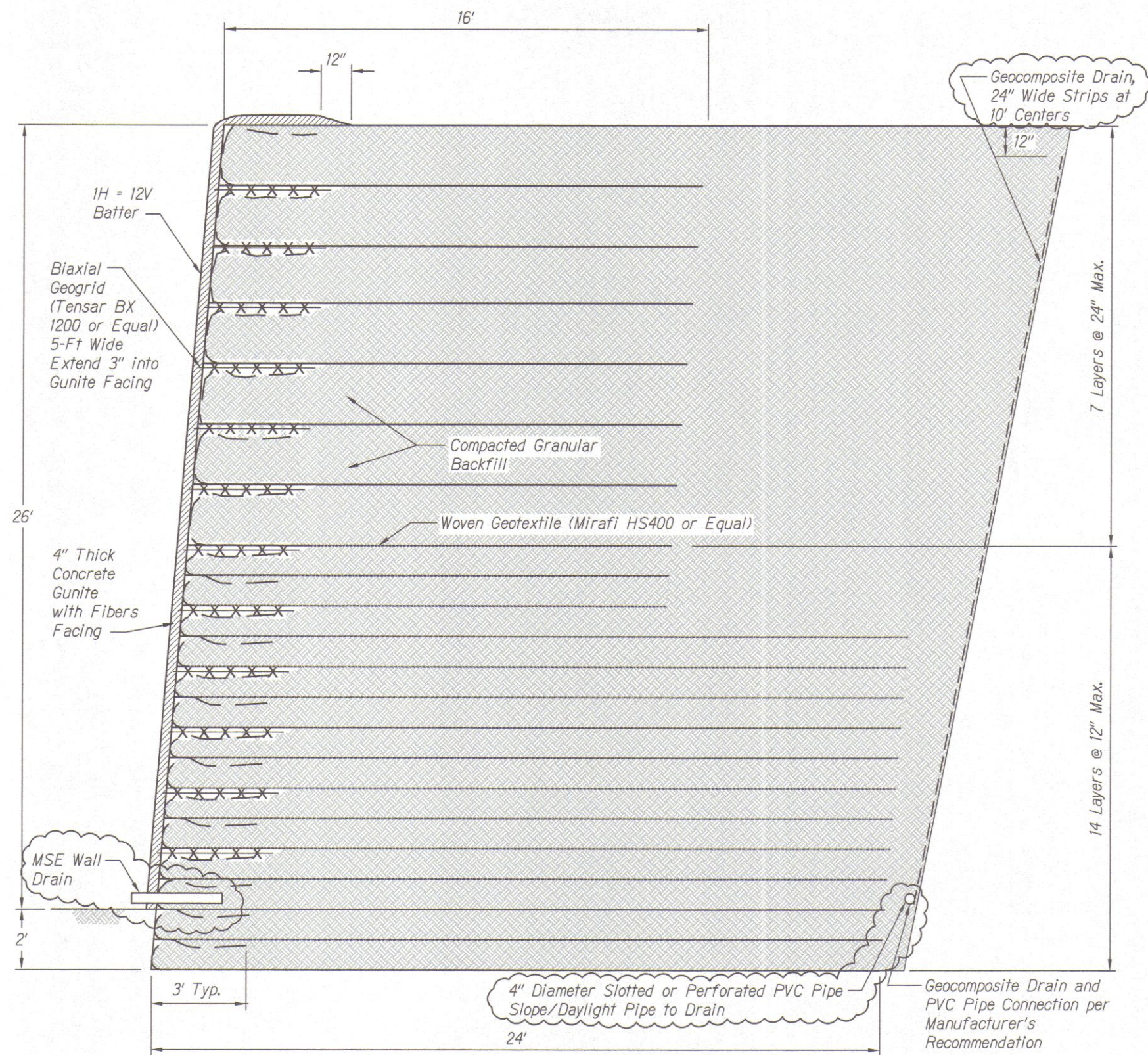


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GEO LABS, INC. APRIL 30, 2012 U.C. EXP. DATE

STATE OF HAWAII
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

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-030-1(35)R	2009	267	382



TYPICAL MSE WALL SECTION
SECTION N TO O
Scale: 1"=2'



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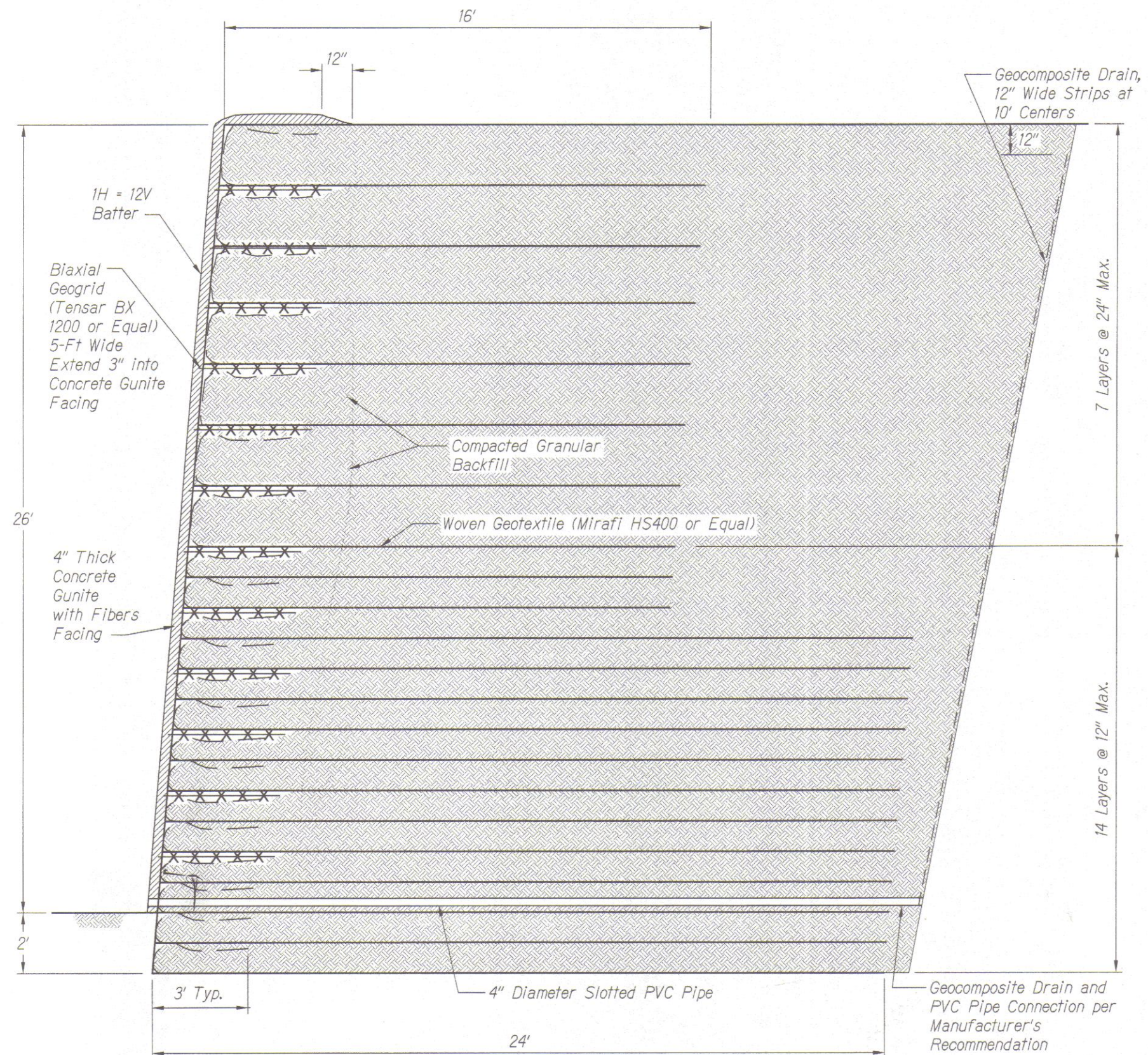
GEOLABS, INC. APRIL 30, 2012
LIC. EXP. DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TYPICAL MSE WALL SECTION - 5
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. 64.5 OF 8 SHEETS

DESIGNED BY	DATE
TRACED BY	
NOTE BOOK	
QUANTITIES BY	
CHECKED BY	
No.	

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-030-1(35)R	2009	267	382



TYPICAL MSE WALL SECTION
SECTION N TO O
 Scale: 1"=2'



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 L.C. EXP. DATE

STATE OF HAWAII
 DEPARTMENT OF TRANSPORTATION
 HIGHWAYS DIVISION

TYPICAL MSE WALL SECTION - 5

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

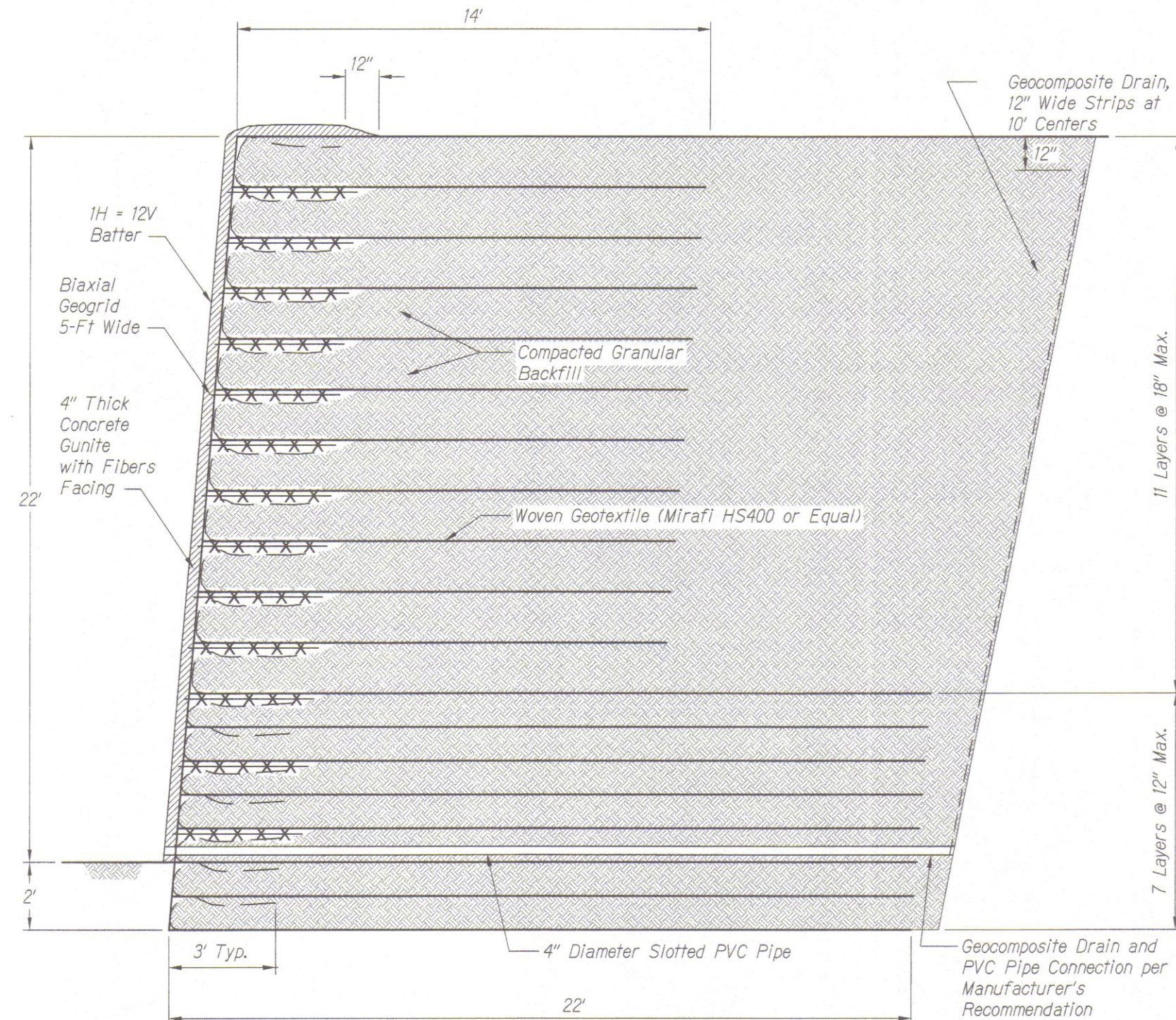
Scale: As Noted Date: June, 2010

SHEET No. G4.5 OF 8 SHEETS

FINAL DESIGN 267 Rev.

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

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'



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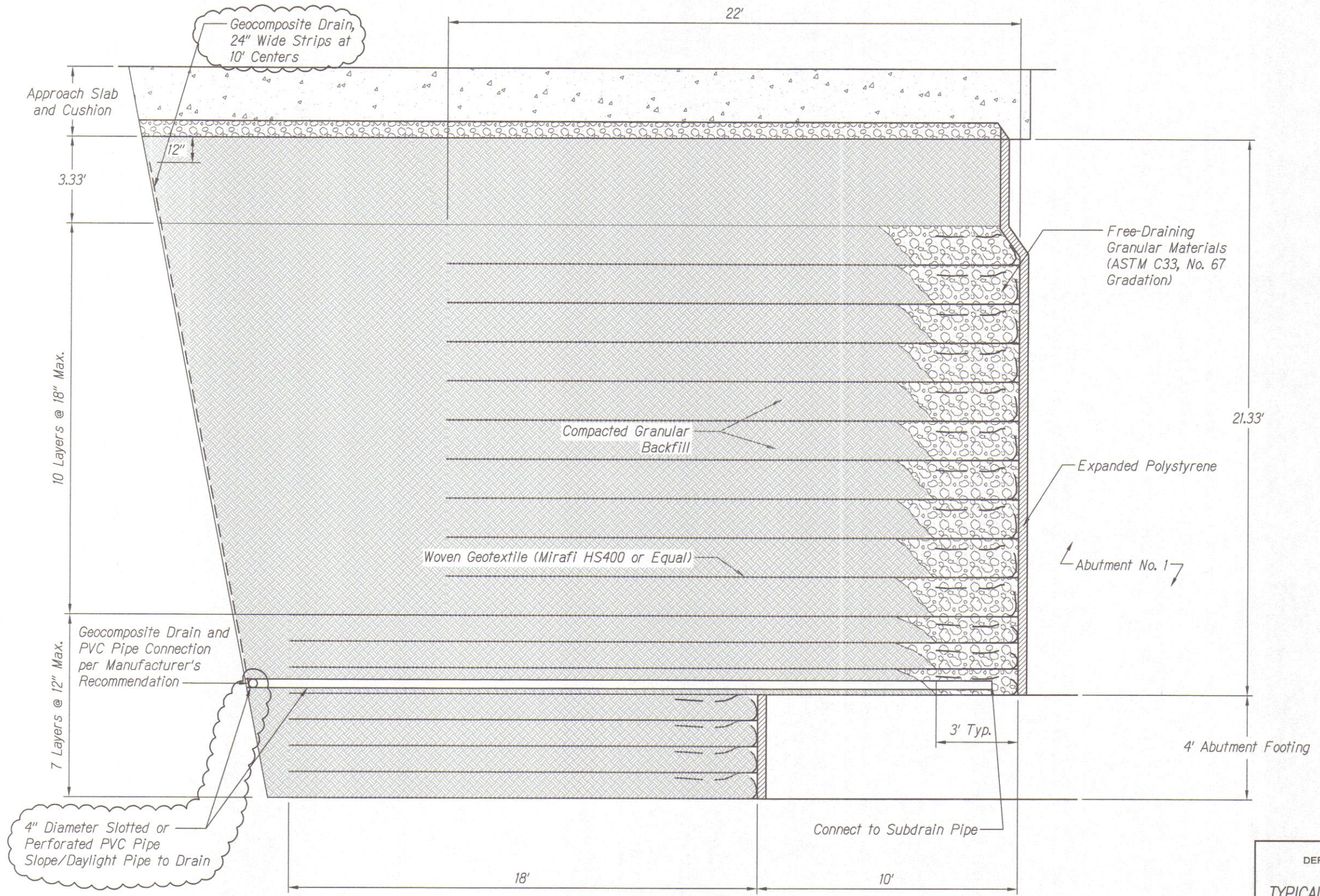
Gerald Y. Seki
 APRIL 30, 2012
 LIC. EXP. DATE

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

FINAL DESIGN 268

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

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-030-1(35)R	2009	269	382



Typical MSE Wall Section
Kahoma Stream Bridge
Abutment No. 1
Scale: 1"=2'



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GEO LABS, INC.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TYPICAL MSE WALL SECTION - 7

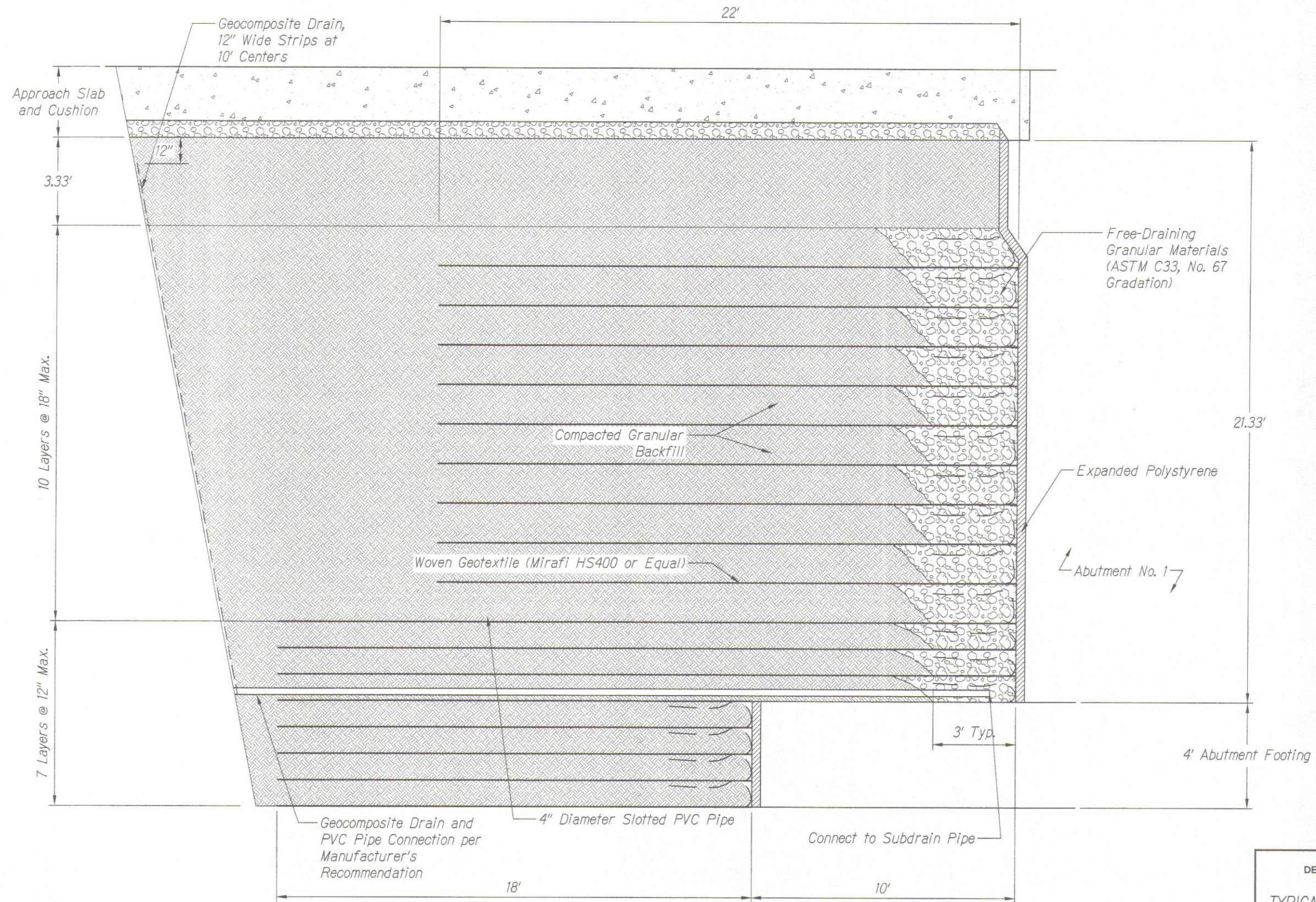
HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A
Future Keawe St Extension to Lahainaluna Rd, Part B
Fed. Aid Proj. No. NH-030-1(35)R

Scale: As Noted Date: June, 2010

SHEET No. G4.7 OF 8 SHEETS

ORIGINAL PLAN	DATE
DESIGNED BY	
CHECKED BY	
NOTED BY	
QUANTITIES BY	
CHECKED BY	
No.	

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-030-1(35)R	2009	269	382



Typical MSE Wall Section
Kahoma Stream Bridge
Abutment No. 1
Scale: 1"=2'



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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TYPICAL MSE WALL SECTION - 7

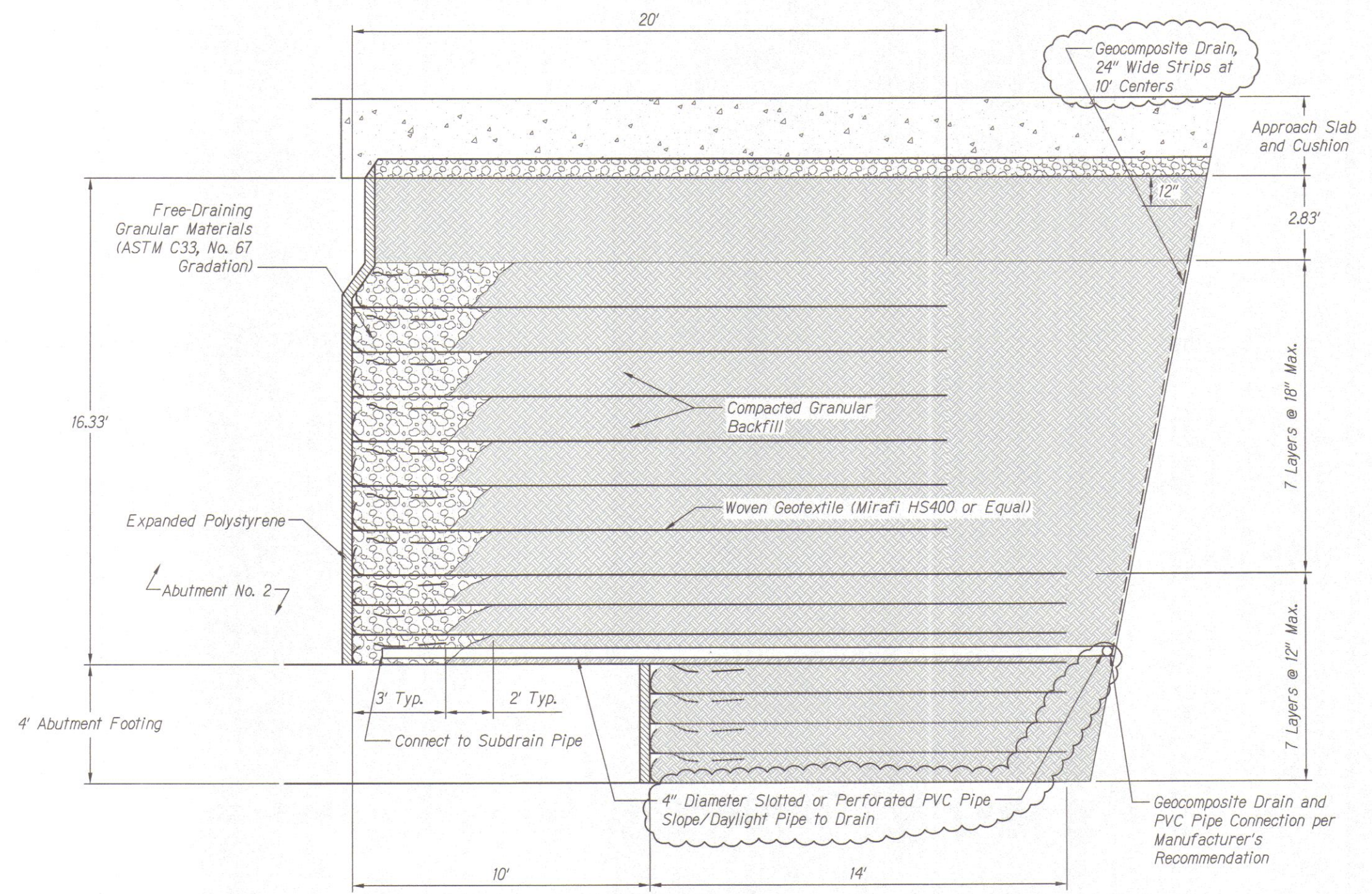
HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A
Future Keawe St Extension to Lahainaluna Rd, Part B
Fed. Aid Proj. No. NH-030-1(35)R

Scale: As Noted Date: June, 2010

SHEET No. G4.7 OF 8 SHEETS

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

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



Typical MSE Wall Section
Kahoma Stream Bridge
Abutment No. 2
 Scale: 1"=2'



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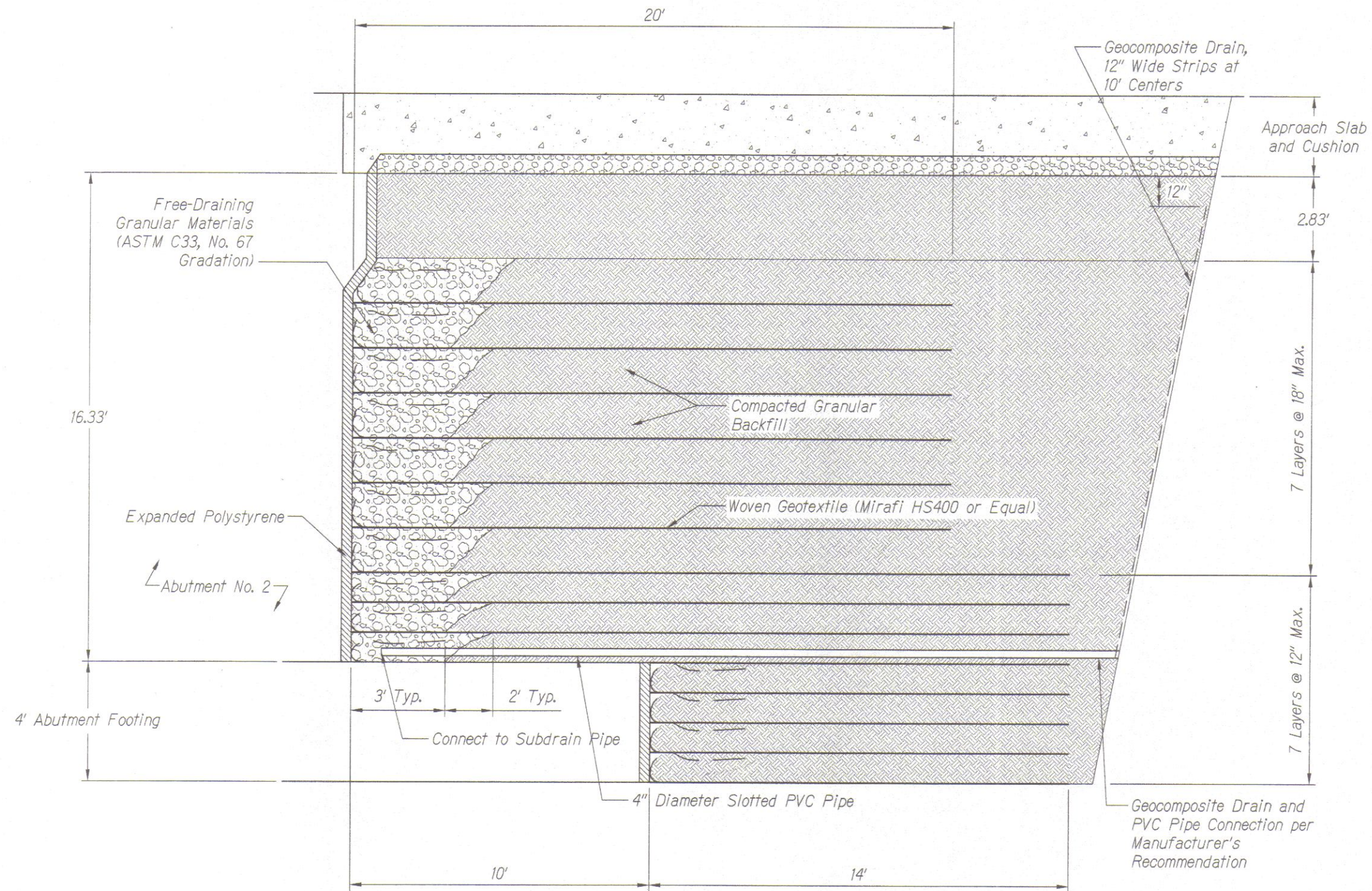
APRIL 30, 2012
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STATE OF HAWAII
 DEPARTMENT OF TRANSPORTATION
 HIGHWAYS DIVISION
TYPICAL MSE WALL SECTION - 8
 HONOLULU HIGHWAY REALIGNMENT, PHASE 1A
 Future Keawe St Extension to Lahaina Rd, Part B
 Fed. Aid Proj. No. NH-030-1(35)R
 Scale: As Noted Date: June, 2010

SHEET No. 64.8 OF 8 SHEETS

ORIGINAL PLAN	DATE
SURVEY PLOTTED BY	
DRAWN BY	
DESIGNED BY	
NOTED BY	
CHECKED BY	
No.	

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



Typical MSE Wall Section
Kahoma Stream Bridge
Abutment No. 2
Scale: 1"=2'



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APRIL 30, 2012
L.C. EXP. DATE

STATE OF HAWAII 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	

FINAL DESIGN 270 *rw*

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