FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(245)	2005	164	183

Boring Log Legend

UNIFIED SOIL CLASSIFICATION SYSTEM (USCS)

MAJOR DIVISIONS			USCS	TYPICAL DESCRIPTIONS
COARSE-GRAINED SOILS — MORE THAN 50% OF MATERIAL RETAINED ON NO. 200 SIEVE	GRAVELS — MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	CLEAN GRAVELS — LESS THAN 5% FINES	GW	WELL-GRADED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES
			GP	POORLY-GRADED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES
		GRAVELS WITH FINES — MORE THAN 12% FINES	GM	SILTY GRAVELS, GRAVEL-SAND-SILT MIXTURES
			GC	CLAYEY GRAVELS, GRAVEL-SAND-CLAY MIXTURES
	SANDS — 50% OR MORE OF COARSE FRACTION PASSING THROUGH NO. 4 SIEVE	CLEAN SANDS — LESS THAN 5% FINES	SW	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
			SP	POORLY-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
		SANDS WITH FINES — MORE THAN 12% FINES	SM	SILTY SANDS, SAND-SILT MIXTURES
			SC	CLAYEY SANDS, SAND-CLAY MIXTURES
FINE-GRAINED SOILS — 50% OR MORE OF MATERIAL PASSING THROUGH NO. 200 SIEVE	SILTS AND CLAYS — LIQUID LIMIT LESS THAN 50		ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY
			CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
			OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS — LIQUID LIMIT 50 OR MORE		MH	INORGANIC SILT, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS
			CH	INORGANIC CLAYS OF HIGH PLASTICITY
			OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
HIGHLY ORGANIC SOILS			PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS

LEGEND

	2-INCH O.D. STANDARD PENETRATION TEST	LL	LIQUID LIMIT
	3-INCH O.D. MODIFIED CALIFORNIA SAMPLE	PI	PLASTICITY INDEX
S	SHELBY TUBE SAMPLE	TV	TORVANE SHEAR (tsf)
G	GRAB SAMPLE	PEN	POCKET PENETROMETER (tsf)
	CORE SAMPLE	UC	UNCONFINED COMPRESSION (psi)
		▽	WATER LEVEL OBSERVED IN BORING

GEOTECHNICAL NOTES

1. A geotechnical engineering report entitled "Geotechnical Engineering Exploration, Interstate Route H-1 Rehabilitation, Eastbound Lanes, Waiau Interchange to Kaimakani Street, Ewa, Oahu, Hawaii" dated July 11, 2005 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 Sheets F1 to F15.
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.

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

J:/COE H1 REHAB/BORINGS/NOTES.dgn

CLAYTON S. MIMURA — LICENSED PROFESSIONAL ENGINEER — No. 4176-C — HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

SIGNATURE — 4-30-06 EXPIRATION DATE OF THE LICENSE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BORING LOGS
NOTES AND LEGEND

INTERSTATE ROUTE H-1 REHABILITATION
EASTBOUND LANES
WAIAU INTERCHANGE TO KAIMAKANI STREET

Scale: None — Date: Jan. 24, 2006

SHEET No. B1 OF 20 SHEETS

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-H1-1(245)	2005	165	183

GEOLABS, INC.
Geotechnical Engineering

INTERSTATE ROUTE H–1 REHAB., EB LANES
WAIAU INTERCHANGE TO KAIMAKANI STREET
EWA, OAHU, HAWAII

Log of Boring 1

Approximate Ground Surface Elevation (feet MSL): 72 *

Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample	Graphic	USCS	Description
										GW	1.5–inch ASPHALTIC CONCRETE
										CH	7–inch CONCRETE
											12–inch BASE COURSE
	28	92			18	2.0					Brown with multi–color mottling SILTY CLAY with sand and gravel, medium stiff, moist (fill)
LL=59 PI=36	31				6	3.0					
	35	82			10	1.0	5				grades with less gravel
	33				7	0.5	10				grades to dark brown, moist to wet
	27	83			15	< 0.5	15				grades to brown, stiff, wet
	27				19	3.5	20				grades to very stiff
	39	77			20	3.5	25				
LL=56 PI=35	29				11	3.5	30			CH	Brown SILTY CLAY with some roots/rootlets, stiff, moist (saprolite)
	29	84			68	> 4.5	35				grades with red mottling, hard
	27				39/.5' +40/.3' Ref.	> 4.5	40				grades to reddish brown
	40				7/.5' +15/.3' Ref.		45				Gray BASALT, completely fractured, extremely weathered, soft (basalt formation)
	14				30/.3' Ref.		50				grades to vesicular, moderately weathered, medium hard
							55				Boring terminated at 50.3 feet

* Elevations estimated from Site Plan transmitted by Parsons Brinckerhoff on 4/9/04.

Date Started:	October 26, 2003	Water Level: ▽	Not Encountered
Date Completed:	October 26, 2003		
Logged By:	Y. Chiba	Drill Rig:	CME–75
Total Depth:	50.3 feet	Drilling Method:	4" Auger
Work Order:	5088–00(A)	Driving Energy:	140 lb. wt., 30 in. drop

GEOLABS, INC.
Geotechnical Engineering

INTERSTATE ROUTE H–1 REHAB., EB LANES
WAIAU INTERCHANGE TO KAIMAKANI STREET
EWA, OAHU, HAWAII

Log of Boring 2

Approximate Ground Surface Elevation (feet MSL): 74 *

Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample	Graphic	USCS	Description
										GW	4–inch ASPHALTIC CONCRETE
										CH	14–inch BASE COURSE
	20	91			20/.5' 9	1.5					Brown SILTY CLAY with gravel, stiff, damp (fill)
											grades to medium stiff, moist
	37	80			11		5				grades to wet
LL=56 PI=27	48				10	1.0	10				
	35	83			34	0.5	15				
	33				21	1.0	20				
LL=65 PI=32	31	88			52	2.0	25				
	29				32	> 4.5	30			MH	Brown with black mottling CLAYEY SILT, very stiff, moist (residual soil)
	41	75			27		35				grades with remnant rock structure
	35				45/.5' +50/.4'		40				grades with gray mottling
	38				30/.1' Ref.		45				Brown and gray BASALT, completely fractured, extremely to highly weathered, soft (basalt formation)
	19				25/.1' Ref.		50				grades to medium hard
							55				Boring terminated at 50.1 feet

Date Started:	October 26, 2003	Water Level: ▽	Not Encountered
Date Completed:	October 27, 2003		
Logged By:	Y. Chiba	Drill Rig:	CME–75
Total Depth:	50.1 feet	Drilling Method:	4" Auger
Work Order:	5088–00(A)	Driving Energy:	140 lb. wt., 30 in. drop

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

J:/COE H1 REHAB/BORINGS/B_LOG_01.dgn

CLAYTON S. MIMURA LICENSED PROFESSIONAL ENGINEER No. 4176-C HAWAII, U.S.A.

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SIGNATURE | EXPIRATION DATE OF THE LICENSE 4-30-08

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BORING LOGS

INTERSTATE ROUTE H-1 REHABILITATION
EASTBOUND LANES
WAIAU INTERCHANGE TO KAIMAKANI STREET

Scale: None Date: Jan. 24, 2006

SHEET No. B2 OF 20 SHEETS

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(245)	2005	166	183

GEOLABS, INC. Geotechnical Engineering

INTERSTATE ROUTE H–1 REHAB., EB LANES
WAIAU INTERCHANGE TO KAIMAKANI STREET
EWA, OAHU, HAWAII

Log of Boring 3

Approximate Ground Surface Elevation (feet MSL): 102.5 *

Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample	Graphic	USCS	Description
							0				13–inch ASPHALTIC CONCRETE
										GW	11–inch BASE COURSE
	32	92			22	1.5				CH	Brown SILTY CLAY, stiff, moist (fill)
LL=65 PI=36	27				10		5				
	33	80			14						grades with some sand and gravel
	37				12	0.8	10				grades to wet
	37	81			16		15				
	32				13	1.0	20				grades with traces of gravel, moist
					29	1.5	25				grades to stiff to very stiff
	35				15		30				COBBLE
			50								
			40				35				grades with gravel, cobbles and metallic debris, stiff
						2.5					grades to very stiff
					39		40				
					48						
			75								
LL=52 PI=25	31				27		45			CH	Brown SILTY CLAY, very stiff, moist (alluvium)
			52								
	39	80	100	87	50/.2'		50				Brown BASALT, severely fractured, highly weathered, soft to medium hard (basalt formation) grades to reddish brown to gray dense with welded clinker, slightly fractured, slightly weathered, very hard at 51 feet
							55				

Date Started:	October 20, 2003	Water Level: ▽	Not Encountered
Date Completed:	October 21, 2003		
Logged By:	S. Latronic	Drill Rig:	CME–75
Total Depth:	64.5 feet	Drilling Method:	4" Auger & PQ Coring
Work Order:	5088–00(A)	Driving Energy:	140 lb. wt., 30 in. drop

GEOLABS, INC. Geotechnical Engineering

INTERSTATE ROUTE H–1 REHAB., EB LANES
WAIAU INTERCHANGE TO KAIMAKANI STREET
EWA, OAHU, HAWAII

Log of Boring 3

(Continued from previous plate)

Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample	Graphic	USCS	Description
			100	68			60				grades to massive
			100	100							
							65				Boring terminated at 64.5 feet
							70				
							75				
							80				
							85				
							90				
							95				
							100				
							105				
							110				

Date Started:	October 20, 2003	Water Level: ▽	Not Encountered
Date Completed:	October 21, 2003		
Logged By:	S. Latronic	Drill Rig:	CME–75
Total Depth:	64.5 feet	Drilling Method:	4" Auger & PQ Coring
Work Order:	5088–00(A)	Driving Energy:	140 lb. wt., 30 in. drop

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

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C. Mimura — 4-30-08
SIGNATURE — EXPIRATION DATE OF THE LICENSE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BORING LOGS

INTERSTATE ROUTE H-1 REHABILITATION
EASTBOUND LANES
WAIAU INTERCHANGE TO KAIMAKANI STREET

Scale: None — Date: Jan. 24, 2006

SHEET No. B3 OF 20 SHEETS

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(245)	2005	167	183

GEOLABS, INC.
Geotechnical Engineering

INTERSTATE ROUTE H–1 REHAB., EB LANES
WAIAU INTERCHANGE TO KAIMAKANI STREET
EWA, OAHU, HAWAII

Log of Boring 4

Approximate Ground Surface Elevation (feet MSL): 104 *

Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample Graphic	USCS	Description
										12–inch ASPHALTIC CONCRETE
										12–inch CONCRETE
										12–inch BASE COURSE
	18	101			48	4.0			CH	Orangish red SILTY CLAY with sand and some gravel, hard, damp (fill)
	29				6	3.0	5			grades to grayish brown with multi–color mottling, very stiff, moist
LL = 60 PI = 34	28	88			14	2.5	10			grades to orangish brown with gray mottling
							15			
	32				11	2.0	20			grades to brown with multi–color mottling, moist to wet
						1.5	25			
	36	83			20	1.5	30			grades to medium stiff to stiff, wet
									CH	Brown with multi–color mottling SILTY CLAY with sand and rounded cobbles and gravel, medium stiff, wet (alluvium)
	35				10	2.0	35			grades to grayish brown with multi–color mottling, stiff
	28	83			27	2.0	40			grades to dark brown with some orange, moist
	27				6	3.0	45			grades to orange–brown, very stiff
	28	65			11	1.0	50			grades with black mottling with some roots/rootlets, medium stiff
							55			

Date Started:	October 27, 2003	Water Level: ▽	Not Encountered
Date Completed:	October 29, 2003		
Logged By:	Y. Chiba	Drill Rig:	CME–75
Total Depth:	77 feet	Drilling Method:	4" Auger & PQ Coring
Work Order:	5088–00(A)	Driving Energy:	140 lb. wt., 30 in. drop

GEOLABS, INC.
Geotechnical Engineering

INTERSTATE ROUTE H–1 REHAB., EB LANES
WAIAU INTERCHANGE TO KAIMAKANI STREET
EWA, OAHU, HAWAII

Log of Boring 4

(Continued from previous plate)

Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample Graphic	USCS	Description
	28				15	4.0			CH	grades to hard
	27	87	54	0	30/.3' Ref.		60		SM	Reddish brown with yellow and tan mottling SILTY SAND with gravel, medium dense, wet (alluvium)
									CH	Gray with brownish orange mottling SILTY CLAY in a sand and gravel matrix, hard, wet (alluvium)
			53	0	15/.0' Ref.		65			
			60	0	10/.0' Ref.		70			grades to tannish gray with multi–color mottling with rounded cobbles and boulders
	40				32		75			
										Boring terminated at 77 feet
							80			
							85			
							90			
							95			
							100			
							105			
							110			

Date Started:	October 27, 2003	Water Level: ▽	Not Encountered
Date Completed:	October 29, 2003		
Logged By:	Y. Chiba	Drill Rig:	CME–75
Total Depth:	77 feet	Drilling Method:	4" Auger & PQ Coring
Work Order:	5088–00(A)	Driving Energy:	140 lb. wt., 30 in. drop

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

J:/COE H1 REHAB/BORINGS/B_LOG_03.dgn

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C. Mimura 4-30-06
SIGNATURE EXPIRATION DATE OF THE LICENSE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BORING LOGS

INTERSTATE ROUTE H-1 REHABILITATION
EASTBOUND LANES
WAIAU INTERCHANGE TO KAIMAKANI STREET

Scale: None Date: Jan. 24, 2006

SHEET No. B4 OF 20 SHEETS

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-H1-1(245)	2005	168	183

GEOLABS, INC.
Geotechnical Engineering

INTERSTATE ROUTE H–1 REHAB., EB LANES
WAIAU INTERCHANGE TO KAIMAKANI STREET
EWA, OAHU, HAWAII

Log of Boring 5

Approximate Ground Surface Elevation (feet MSL): 102 *

Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample	Graphic	USCS	Description
											11.5–inch ASPHALTIC CONCRETE
											21.5–inch BASE COURSE
	25	83			27	4.0				CH	Brownish red with multi–color mottling SILTY CLAY with some gravel and sand, very stiff, damp (fill)
	28				14	>4.5	5				grades to brown with multi–color mottling, stiff
	24	93			27	>4.5	10				grades to dark reddish brown with multi–color mottling, very stiff
LL=57 PI=29	24				18	>4.5	15				grades to dark reddish brown
LL=62 PI=29	32	80			21	>4.5	20			MH	Brownish red with multi–color mottling CLAYEY SILT with sand and some gravel, very stiff, moist to wet (fill)
	28				9	4.0	25			CH	Dark reddish brown SILTY CLAY with some sand, stiff, moist (fill)
	31	81			23	3.0	30			CH	Grayish brown with multi–color mottling SILTY CLAY with sand, rounded gravel, pebbles and some cobbles, very stiff, moist to wet (alluvium)
	31				19	1.5	35				
	27	95			23	>4.5	40				grades to dark reddish brown with some subrounded pebbles and roots/rootlets
	29				18	0.5	45				grades with some sand, stiff to very stiff
	30	92			24	2.0	50				grades to very stiff
							55				

Date Started:	October 21, 2003	Water Level: ▽	Not Encountered
Date Completed:	October 22, 2003		
Logged By:	Y. Chiba	Drill Rig:	CME–75
Total Depth:	70.5 feet	Drilling Method:	4" Auger & PQ Coring
Work Order:	5088–00(A)	Driving Energy:	140 lb. wt., 30 in. drop

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Geotechnical Engineering

INTERSTATE ROUTE H–1 REHAB., EB LANES
WAIAU INTERCHANGE TO KAIMAKANI STREET
EWA, OAHU, HAWAII

Log of Boring 5

(Continued from previous plate)

Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample	Graphic	USCS	Description
LL=65 PI=38	30				19	4.0				CH	grades to reddish brown with gray mottling
	10		92	0	30/.1' Ref.		60				Orangish red with gray mottling CLINKER, severely fractured, extremely weathered, hard (basalt formation)
	17		100	26	30/.3' Ref.		65				
							70				Gray with dark brown mottling dense to vesicular BASALT, closely fractured, highly to moderately weathered, hard to medium hard (basalt formation)
											grades to severely fractured with some red silty clay seams on fractured surfaces, medium hard at 69.3 feet
											Boring terminated at 70.5 feet
							75				
							80				
							85				
							90				
							95				
							100				
							105				
							110				

Date Started:	October 21, 2003	Water Level: ▽	Not Encountered
Date Completed:	October 22, 2003		
Logged By:	Y. Chiba	Drill Rig:	CME–75
Total Depth:	70.5 feet	Drilling Method:	4" Auger & PQ Coring
Work Order:	5088–00(A)	Driving Energy:	140 lb. wt., 30 in. drop

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

J:/COE H-1 REHAB/BORINGS/B_LOG.DMdgn

CLAYTON S. MIURA
LICENSED PROFESSIONAL ENGINEER
No. 4176-C
HAWAII, U.S.A.

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SIGNATURE — EXPIRATION DATE OF THE LICENSE: 4-30-06

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BORING LOGS

INTERSTATE ROUTE H-1 REHABILITATION
EASTBOUND LANES
WAIAU INTERCHANGE TO KAIMAKANI STREET

Scale: None — Date: Jan. 24, 2006

SHEET No. B5 OF 20 SHEETS

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(245)	2005	169	183

GEOLABS, INC.
Geotechnical Engineering

INTERSTATE ROUTE H–1 REHAB., EB LANES
WAIAU INTERCHANGE TO KAIMAKANI STREET
EWA, OAHU, HAWAII

Log of Boring 6

Approximate Ground Surface Elevation (feet MSL): 103.5 *

Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample	Graphic	USCS	Description
							0				12–inch ASPHALTIC CONCRETE
											12–inch CONCRETE
											12–inch BASE COURSE
	29	86			28					CH	Brown SILTY CLAY with gravel, stiff to very stiff, moist (fill)
	32				12	2.0	5				
	28	82			15	2.5					
							10				
LL = 51 PI = 25	28				9	1.5					grades to stiff
							15				
										CH	Brown SILTY CLAY with sand, very stiff, moist to wet (alluvium)
	31	90			22	2.0	20				
							25				
							30				
	33				31						Brownish gray BASALT, completely fractured, extremely weathered, soft (basalt formation)
	28	74			50/.2'		35				grades to gray, moderately weathered, medium hard
			50 100	50 87			40				grades to dense, slightly fractured to massive, slightly weathered, very hard
							45				
			95	33							Reddish gray CLINKER, severely fractured, moderately weathered, medium hard (basalt formation)
			73	0			50				
							55				

Date Started:	October 27, 2003	Water Level: ▽	Not Encountered
Date Completed:	October 27, 2003		
Logged By:	Y. Chiba	Drill Rig:	CME–75
Total Depth:	65 feet	Drilling Method:	4" Auger & PQ Coring
Work Order:	5088–00(A)	Driving Energy:	140 lb. wt., 30 in. drop

GEOLABS, INC.
Geotechnical Engineering

INTERSTATE ROUTE H–1 REHAB., EB LANES
WAIAU INTERCHANGE TO KAIMAKANI STREET
EWA, OAHU, HAWAII

Log of Boring 6

(Continued from previous plate)

Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample	Graphic	USCS	Description
			100	0			60				grades to highly weathered, soft
			90	15							
							65				Gray dense BASALT, moderately fractured, slightly weathered, hard (basalt formation)
											Boring terminated at 65 feet
							70				
							75				
							80				
							85				
							90				
							95				
							100				
							105				
							110				

Date Started:	October 27, 2003	Water Level: ▽	Not Encountered
Date Completed:	October 27, 2003		
Logged By:	Y. Chiba	Drill Rig:	CME–75
Total Depth:	65 feet	Drilling Method:	4" Auger & PQ Coring
Work Order:	5088–00(A)	Driving Energy:	140 lb. wt., 30 in. drop

ORIGINAL PLAN
SURVEY PLOTTED BY
DRAWN BY
TRACED BY
DESIGN CHECKED BY
QUANTITIES BY
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NOTE BOOK
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DATE

J:/COE H1 REHAB/BORINGS/B_LOG_05.dgn

CLAYTON S. MIMURA
LICENSED PROFESSIONAL ENGINEER
No. 4176-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

C. Mimura 4-30-06
SIGNATURE EXPIRATION DATE OF THE LICENSE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BORING LOGS

INTERSTATE ROUTE H-1 REHABILITATION
EASTBOUND LANES
WAIAU INTERCHANGE TO KAIMAKANI STREET

Scale: None Date: Jan. 24, 2006

SHEET No. B6 OF 20 SHEETS

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(245)	2005	170	183

GEOLABS, INC.
Geotechnical Engineering

INTERSTATE ROUTE H–1 REHAB., EB LANES
WAIAU INTERCHANGE TO KAIMAKANI STREET
EWA, OAHU, HAWAII

Log of Boring 7

Approximate Ground Surface Elevation (feet MSL): 92 *

Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample	Graphic	USCS	Description
											5.5–inch ASPHALTIC CONCRETE
											15.5–inch BASE COURSE
	25	95			20/.5' +30/.3' Ref.	>4.5				CL	Orangish brown with multi–color mottling SANDY CLAY with gravel and silt, hard, damp (fill)
							5			CH	grades with cobbles at 2.5 feet
	23				15/.1' Ref.	>4.5					Brown SILTY CLAY with gravel and sand, very stiff, damp (alluvium)
					20					SC	Brown CLAYEY SAND with silt and gravel, stiff to very stiff, damp (alluvium)
	16				8/.5' +15/.3' Ref.		10				grades with some cobbles
										CH	Reddish brown with multi–color mottling SILTY CLAY with some sand and gravel, hard, damp (alluvium)
LL=64 PI=38	25	92			62	>4.5	15				grades with rock fragments
			28	0							
							20				Boring terminated at 21 feet
							25				
							30				
							35				
							40				
							45				
							50				
							55				

Date Started:	October 15, 2003	Water Level: ▽	Not Encountered
Date Completed:	October 15, 2003		
Logged By:	Y. Chiba	Drill Rig:	CME–75
Total Depth:	21 feet	Drilling Method:	4" Auger & PQ Coring
Work Order:	5088–00(A)	Driving Energy:	140 lb. wt., 30 in. drop

GEOLABS, INC.
Geotechnical Engineering

INTERSTATE ROUTE H–1 REHAB., EB LANES
WAIAU INTERCHANGE TO KAIMAKANI STREET
EWA, OAHU, HAWAII

Log of Boring 8

Approximate Ground Surface Elevation (feet MSL): 93 *

Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample	Graphic	USCS	Description
											12–inch ASPHALTIC CONCRETE
											15–inch BASE COURSE
	23	84			51	>4.5				CH	Reddish brown with multi–color mottling SILTY CLAY with some sand and gravel, hard, damp (fill)
LL=66 PI=42	24				26	>4.5	5				grades to very stiff
	24	85			29	>4.5	10				grades with some cobbles
						>4.5	15				
	24				31	>4.5	20				grades to hard
	22	64			20/.3' Ref.	>4.5	30				grades to dark reddish brown with roots/rootlets and cobbles/boulders
	24				21/.5' +28/.3' Ref.	3.0	40				
							45			CH	Dark grayish brown with blue and brown mottling SILTY CLAY with fine sand and subrounded gravel and pebbles, hard, damp (recent alluvium)
LL=63 PI=34	25	92			38	3.5 4.0	50				
							55				

Date Started:	October 16, 2003	Water Level: ▽	Not Encountered
Date Completed:	October 20, 2003		
Logged By:	Y. Chiba	Drill Rig:	CME–75
Total Depth:	120 feet	Drilling Method:	4" Auger & HQ Coring
Work Order:	5088–00(A)	Driving Energy:	140 lb. wt., 30 in. drop

ORIGINAL PLAN
NOTE BOOK No.
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CLAYTON S. MIMURA
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No. 4176-C
HAWAII, U.S.A.

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SIGNATURE — EXPIRATION DATE OF THE LICENSE: 4-30-06

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BORING LOGS

INTERSTATE ROUTE H-1 REHABILITATION
EASTBOUND LANES
WAIAU INTERCHANGE TO KAIMAKANI STREET

Scale: None Date: Jan. 24, 2006

SHEET No. B7 OF 20 SHEETS

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(245)	2005	171	183

GEOLABS, INC.
Geotechnical Engineering

INTERSTATE ROUTE H–1 REHAB., EB LANES
WAIAU INTERCHANGE TO KAIMAKANI STREET
EWA, OAHU, HAWAII

Log of Boring 8

(Continued from previous plate)

Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample	Graphic	USCS	Description
			83							CL	Dark brown SANDY CLAY with silt and cobbles and boulders, very stiff, moist (river deposit)
			25				60				
			100	0	15/.0' Ref.						
						1.5	65			MH	Brown with multi–color mottling CLAYEY SILT with rounded pebbles and some gravel, stiff, moist (old alluvium)
LL = 56 PI = 21	54				10						grades to wet
			100	0		0.5	70				
	56				14	0.5					
			100	0			75				grades with some cobbles
						0.5					grades with friable sand, stiff to very stiff
LL = 57 PI = 21	53				17	0.5					
			100	0			80				grades with well–rounded coarse sand and pebbles, medium stiff
LL = 62 PI = 27	50				16	0.5					
			100	0			85				
	47				18	0.5					
			100	0			90				
											grades to dark brown with multi–color mottling, stiff to very stiff
LL = 75 PI = 38	48				15						
			52	0		3.5	95				
	53				15	2.5					grades to medium stiff
			100	0			100				
						0.5					grades to brown with extremely weathered friable subrounded to rounded gravel and cobbles, very stiff to hard
	48				30	2.0	105				
			100	0							
	53				13	2.0					grades to orangish brown with fine sand, stiff
							110				

Date Started:	October 16, 2003	Water Level: ▽	Not Encountered
Date Completed:	October 20, 2003		
Logged By:	Y. Chiba	Drill Rig:	CME–75
Total Depth:	120 feet	Drilling Method:	4" Auger & HQ Coring
Work Order:	5088–00(A)	Driving Energy:	140 lb. wt., 30 in. drop

GEOLABS, INC.
Geotechnical Engineering

INTERSTATE ROUTE H–1 REHAB., EB LANES
WAIAU INTERCHANGE TO KAIMAKANI STREET
EWA, OAHU, HAWAII

Log of Boring 8

(Continued from previous plate)

Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample	Graphic	USCS	Description
			100	0						MH	
	65				21	2.0	115				grades to dark brown with sand
			100	0							
	69				18	1.5	120				grades to brownish red with friable sand, very stiff
											Boring terminated at 120 feet
							125				
							130				
							135				
							140				
							145				
							150				
							155				
							160				
							165				

Date Started:	October 16, 2003	Water Level: ▽	Not Encountered
Date Completed:	October 20, 2003		
Logged By:	Y. Chiba	Drill Rig:	CME–75
Total Depth:	120 feet	Drilling Method:	4" Auger & HQ Coring
Work Order:	5088–00(A)	Driving Energy:	140 lb. wt., 30 in. drop

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

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CLAYTON S. MIYAMURA
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SIGNATURE | 4-30-06 EXPIRATION DATE OF THE LICENSE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BORING LOGS

INTERSTATE ROUTE H-1 REHABILITATION
EASTBOUND LANES
WAIAU INTERCHANGE TO KAIMAKANI STREET

Scale: None Date: Jan. 24, 2006

SHEET No. B8 OF 20 SHEETS

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(245)	2005	172	183

GEOLABS, INC.
Geotechnical Engineering

INTERSTATE ROUTE H–1 REHAB., EB LANES
WAIAU INTERCHANGE TO KAIMAKANI STREET
EWA, OAHU, HAWAII

Log of Boring 9

Approximate Ground Surface Elevation (feet MSL): 97.5 *

Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample	Graphic	USCS	Description
							0				18–inch ASPHALTIC CONCRETE
											12–inch BASE COURSE
	24	81			51		5			CH	Brown SILTY CLAY with gravel, very stiff, damp (fill)
	23				30/.5' +20/.1' Ref.	4.5				GP	Gray BOULDERS AND COBBLES with sand, dense (fill)
	12				28		10			CH	Brown SILTY CLAY with gravel, very stiff (fill)
	4				25/.1' Ref.		15				grades with cobbles and boulders
	28		100		50/.1' Ref.	4.0	20				
			65				25				
							30			GP	Gray BOULDERS AND COBBLES in a silty clay matrix, very dense, damp (fill)
			100				35				
			95				40				
			45				45				
LL=63 PI=41	39				16	1.0	50			CH	Brownish gray SILTY CLAY with gravel, stiff to very stiff, moist to wet (recent alluvium)
			100			2.5	55				

Date Started:	October 26, 2003	Water Level: ▽	Not Encountered
Date Completed:	November 3, 2003		
Logged By:	S. Latronic	Drill Rig:	CME–75
Total Depth:	119.5 feet	Drilling Method:	4" Auger & PQ Coring
Work Order:	5088–00(A)	Driving Energy:	140 lb. wt., 30 in. drop

GEOLABS, INC.
Geotechnical Engineering

INTERSTATE ROUTE H–1 REHAB., EB LANES
WAIAU INTERCHANGE TO KAIMAKANI STREET
EWA, OAHU, HAWAII

Log of Boring 9

(Continued from previous plate)

Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample	Graphic	USCS	Description
			40			3.0	60			CH	
	40		100		15		65			SM	Brown and black SILTY SAND with cobbles and boulders, medium dense to dense, moist to wet (river deposit)
			57				70				
			80				75				
			50				80				
			20				85			MH	Grayish brown CLAYEY SILT, very stiff, moist to wet (old alluvium)
	50		100		24		90				
			100				95				
			100	0			100				Dark gray BASALT, severely fractured, highly weathered, soft to medium hard (basalt formation)
			95	0			105				
			93	0			110				

Date Started:	October 26, 2003	Water Level: ▽	Not Encountered
Date Completed:	November 3, 2003		
Logged By:	S. Latronic	Drill Rig:	CME–75
Total Depth:	119.5 feet	Drilling Method:	4" Auger & PQ Coring
Work Order:	5088–00(A)	Driving Energy:	140 lb. wt., 30 in. drop

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DESIGN BY
QUANTITIES BY
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ORIGINAL PLAN
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CLAYTON S. MIMURA
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THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

SIGNATURE: C. Mimura 4-30-06
EXPIRATION DATE OF THE LICENSE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BORING LOGS

INTERSTATE ROUTE H-1 REHABILITATION
EASTBOUND LANES
WAIAU INTERCHANGE TO KAIMAKANI STREET

Scale: None Date: Jan. 24, 2006

SHEET No. B9 OF 20 SHEETS

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(245)	2005	173	183

GEOLABS, INC.
Geotechnical Engineering

INTERSTATE ROUTE H–1 REHAB., EB LANES
WAIAU INTERCHANGE TO KAIMAKANI STREET
EWA, OAHU, HAWAII

Log of Boring 9

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
			95	20							
			100	0			115				grades to medium hard
							120				Boring terminated at 119.5 feet
							125				
							130				
							135				
							140				
							145				
							150				
							155				
							160				
							165				

Date Started:	October 26, 2003	Water Level: ▽	Not Encountered
Date Completed:	November 3, 2003		
Logged By:	S. Latronic	Drill Rig:	CME–75
Total Depth:	119.5 feet	Drilling Method:	4" Auger & PQ Coring
Work Order:	5088–00(A)	Driving Energy:	140 lb. wt., 30 in. drop

GEOLABS, INC.
Geotechnical Engineering

INTERSTATE ROUTE H–1 REHAB., EB LANES
WAIAU INTERCHANGE TO KAIMAKANI STREET
EWA, OAHU, HAWAII

Log of Boring 10

Approximate Ground Surface Elevation (feet MSL): 95 *

Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample	Graphic	USCS	Description
											8–inch ASPHALTIC CONCRETE
											22–inch BASE COURSE
	18	92			42					CH	Reddish brown with multi–color mottling SILTY CLAY with some gravel and sand, stiff to very stiff, damp (fill)
	22				19	> 4.5					
	27	91			41	> 4.5	5				grades to very stiff to hard, moist
LL = 56 PI = 30	30				24		10				grades to very stiff
											grades with some cobbles
	24	83			54	> 4.5	15				grades to hard, damp
	23				21		20				grades to very stiff, moist
	26	95			50	> 4.5	25				grades to hard
	23				24		30			MH	Brown with red mottling CLAYEY SILT with some gravel, very stiff, damp (fill)
	27	93			300–700 psi 40/.3' Ref.		35			GM	Grayish brown with multi–color mottling SILTY GRAVEL with sand and some cobbles, very dense, damp
	14	85		85							
				83			40			CH	Reddish brown with multi–color mottling SILTY CLAY with basaltic gravel, stiff (fill)
	36			100	25		45				
	27	88		54	48/.5' Ref.		50			CH	Reddish brown with multi–color mottling SILTY CLAY with cobbles and gravel, hard (river deposit)
							55				

Date Started:	October 15, 2003	Water Level: ▽	Not Encountered
Date Completed:	October 17, 2003		
Logged By:	E. Shinsato	Drill Rig:	CME–75
Total Depth:	109.5 feet	Drilling Method:	4" Auger & PQ Coring
Work Order:	5088–00(A)	Driving Energy:	140 lb. wt., 30 in. drop

ORIGINAL PLAN
SURVEY PLOTTED BY
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SIGNATURE — EXPIRATION DATE OF THE LICENSE 4-30-06

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BORING LOGS

INTERSTATE ROUTE H-1 REHABILITATION
EASTBOUND LANES
WAIAU INTERCHANGE TO KAIMAKANI STREET

Scale: None Date: Jan. 24, 2006

SHEET No. B10 OF 20 SHEETS

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(245)	2005	174	183

GEOLABS, INC.
Geotechnical Engineering

INTERSTATE ROUTE H–1 REHAB., EB LANES
WAIAU INTERCHANGE TO KAIMAKANI STREET
EWA, OAHU, HAWAII

Log of Boring 10

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
	27		90		25		60		CH	grades with some organic odor
			20		25/.0' Ref.				GM	Grayish brown SILTY GRAVEL with some cobbles and sand, medium dense to dense (river deposit)
	26		57		21		65			grades with some basaltic boulders
			37		20/.0' Ref.		70			
	42		100	0	80		75		SM	Brownish gray SILTY SAND, very dense (river deposit)
			100	0			80			Grayish brown BASALT, severely fractured, moderately to highly weathered, soft to medium hard (basalt formation)
			97	48			85			Reddish gray CLINKER with red clay seams, severely fractured, highly weathered, medium hard (basalt formation)
			100	40			90			Reddish brown vesicular BASALT, closely fractured, moderately weathered, medium hard (basalt formation) grades to grayish brown, soft to medium hard at 87 feet grades to gray at 88.5 feet grades to dark gray
			50	0			95			grades to brown
			90	13			100			Reddish gray CLINKER, severely fractured, moderately to highly weathered, soft (basalt formation)
										Gray vugular BASALT, severely fractured, moderately weathered, medium hard (basalt formation)
			73	48			105			Reddish gray CLINKER, severely fractured, highly weathered, soft (basalt formation)
										Reddish gray–brown with tan vesicular BASALT, closely to moderately fractured, moderately weathered, medium hard (basalt formation)
							110			Boring terminated at 109.5 feet

Date Started:	October 15, 2003	Water Level: ▽	Not Encountered
Date Completed:	October 17, 2003	Drill Rig:	CME–75
Logged By:	E. Shinsato	Drilling Method:	4" Auger & PQ Coring
Total Depth:	109.5 feet	Driving Energy:	140 lb. wt., 30 in. drop
Work Order:	5088–00(A)		

GEOLABS, INC.
Geotechnical Engineering

INTERSTATE ROUTE H–1 REHAB., EB LANES
WAIAU INTERCHANGE TO KAIMAKANI STREET
EWA, OAHU, HAWAII

Log of Boring 11

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): 100 * Description
										10.75–inch ASPHALTIC CONCRETE
										13.25–inch BASE COURSE
	24	93			29	>4.5			CH	Orangish red SILTY CLAY with sand and some gravel, hard, damp (fill)
	22				30	>4.5	5			grades with multi–color mottling
	25	82			21	>4.5	10			grades to very stiff
							15			
	18				19	4.0	20			grades to reddish brown
							25			
LL=56 PI=32	26	91			27	>4.5	30			grades to orangish brown with multi–color mottling, hard
							35			grades to dark brown with multi–color mottling, very stiff
	28				12	3.0	40		CL	Dark brown SANDY SILT with gravel, very stiff, moist to wet (alluvium)
	32	83			18	2.5	45			
			55	0	15/.0' Ref.		50		CH	Dark grayish brown SILTY CLAY with sand, subrounded pebbles and gravel, very stiff, wet (alluvium)
							55			

Date Started:	October 29, 2003	Water Level: ▽	Not Encountered
Date Completed:	November 3, 2003	Drill Rig:	CME–75
Logged By:	Y. Chiba	Drilling Method:	4" Auger & PQ Coring
Total Depth:	123.3 feet	Driving Energy:	140 lb. wt., 30 in. drop
Work Order:	5088–00(A)		

ORIGINAL PLAN
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LICENSED PROFESSIONAL ENGINEER
CLAYTON S. MIMURA
No. 4176-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

SIGNATURE — EXPIRATION DATE OF THE LICENSE 4-30-06

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BORING LOGS

INTERSTATE ROUTE H-1 REHABILITATION
EASTBOUND LANES
WAIAU INTERCHANGE TO KAIMAKANI STREET

Scale: None Date: Jan. 24, 2006

SHEET No. B11 OF 20 SHEETS

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-H1-1(245)	2005	175	183

GEOLABS, INC.
Geotechnical Engineering

INTERSTATE ROUTE H–1 REHAB., EB LANES
WAIAU INTERCHANGE TO KAIMAKANI STREET
EWA, OAHU, HAWAII

Log of Boring 11

GEOLABS, INC.
Geotechnical Engineering

INTERSTATE ROUTE H–1 REHAB., EB LANES
WAIAU INTERCHANGE TO KAIMAKANI STREET
EWA, OAHU, HAWAII

Log of Boring 11

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
			58	0		3.0				CH	
							60				
	41	78			28	3.5				SC	Brownish orange with multi–color mottling CLAYEY SAND with rounded pebbles and some gravel, hard, wet (river deposit)
			0	0							
										SM	Brown with multi–color mottling SILTY SAND with rounded pebbles and gravel, stiff, wet (river deposit)
	54				14	2.0	65				
			83	0						MH	Reddish brown CLAYEY SILT with sand, subrounded cobbles and pebbles, medium stiff, wet (river deposit)
							70				
	43	78			28						grades to brownish gray with multi–color mottling, very stiff
			100	0			75				
LL = 82 PI = 40	47				15						grades to stiff
			100	0			80				
	55	65			38	2.0					grades to stiff to very stiff
			76	0			85				
	70				12					SM	Orange SILTY SAND with gravel, medium dense, wet (river deposit)
			0	0			90				
	52	64			30	2.0					grades to brown with pebbles
			100	0			95				
			100	33	10/.3' Ref.	2.0					Gray with dark brown mottling dense to vesicular BASALT, moderately fractured, highly weathered, medium hard (basalt formation)
	62	56			30		100				
			100	0							grades to severely fractured, extremely weathered, soft
							105				grades to dark brown with multi–color mottling, extremely to highly weathered
	29		100	0	45/.4' Ref.		110				

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
	13		35	0	18/.3' Ref.						grades to vesicular to scoriaceous
											grades to extremely weathered
							115				
			100	14	10/.1' Ref.						grades to dark gray scoriaceous to dense, moderately fractured, highly to moderately weathered, hard
							120				
	18				25/.3' Ref.						Boring terminated at 123.3 feet
							125				
							130				
							135				
							140				
							145				
							150				
							155				
							160				
							165				

Date Started:	October 29, 2003	Water Level: ▽ Not Encountered	
Date Completed:	November 3, 2003		
Logged By:	Y. Chiba	Drill Rig:	CME–75
Total Depth:	123.3 feet	Drilling Method:	4" Auger & PQ Coring
Work Order:	5088–00(A)	Driving Energy:	140 lb. wt., 30 in. drop

Date Started:	October 29, 2003	Water Level: ▽ Not Encountered	
Date Completed:	November 3, 2003		
Logged By:	Y. Chiba	Drill Rig:	CME–75
Total Depth:	123.3 feet	Drilling Method:	4" Auger & PQ Coring
Work Order:	5088–00(A)	Driving Energy:	140 lb. wt., 30 in. drop

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

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CLAYTON S. MINURA
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No. 4176-C
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THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

SIGNATURE — EXPIRATION DATE OF THE LICENSE 4-30-06

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BORING LOGS

INTERSTATE ROUTE H-1 REHABILITATION
EASTBOUND LANES
WAIAU INTERCHANGE TO KAIMAKANI STREET

Scale: None Date: Jan. 24, 2006

SHEET No. B12 OF 20 SHEETS

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(245)	2005	176	183

GEOLABS, INC.
Geotechnical Engineering

INTERSTATE ROUTE H–1 REHAB., EB LANES
WAIAU INTERCHANGE TO KAIMAKANI STREET
EWA, OAHU, HAWAII

Log of Boring 12

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): 80 * — Description
							0				1–inch ASPHALTIC CONCRETE
										MH	10–inch CONCRETE
											7–inch BASE COURSE
	23	89			49						Brown CLAYEY SILT with sand and gravel, hard,
	26				24	3.5	5			CH	damp (fill)
	24	86			75						Brown SILTY CLAY with sand and gravel, very stiff, damp (fill)
											grades to very hard
											COBBLE
LL=57 PI=29	24				43	3.5	10				
											COBBLE
											grades with subrounded gravel
	30	84			20	1.5	15				grades to very stiff, moist
	21				27		20				
			100	85	20/.0' Ref.		25				Gray dense BASALT, widely fractured, slightly weathered, hard to very hard (basalt formation)
			90	70			30				grades to vugular
			80	33			35				Reddish gray CLINKER, severely fractured, highly weathered, soft (basalt formation)
			68	0			40				Gray dense vugular BASALT, moderately fractured, slightly weathered, hard to very hard (basalt formation)
											Reddish gray CLINKER, severely fractured, moderately weathered, medium hard (basalt formation)
							45				Boring terminated at 45 feet
							50				
							55				

Date Started:	October 23, 2003	Water Level: ▽	Not Encountered
Date Completed:	October 23, 2003		
Logged By:	S. Latronic	Drill Rig:	CME–75
Total Depth:	45 feet	Drilling Method:	4" Auger & PQ Coring
Work Order:	5088–00(A)	Driving Energy:	140 lb. wt., 30 in. drop

GEOLABS, INC.
Geotechnical Engineering

INTERSTATE ROUTE H–1 REHAB., EB LANES
WAIAU INTERCHANGE TO KAIMAKANI STREET
EWA, OAHU, HAWAII

Log of Boring 13

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): 80 * — Description
							0				10–inch CONCRETE
	15	102			20						14–inch BASE COURSE
	35				15	4.0				CH	Brown SILTY CLAY with sand and gravel, very stiff to stiff, moist to wet (new fill)
	35	81			18	1.5	5				
										CH	Brown SILTY CLAY with sand and some gravel, stiff to very stiff, damp (old fill)
	24				19	1.5	10				
	21	83			15	1.5	15				grades to dark brown with multi–color mottling, with some cobbles and concrete fragments
LL=56 PI=32	30				7	1.5	20				grades to medium stiff, moist
			94	71			25				Gray dense BASALT, moderately fractured, moderately weathered, hard (basalt formation)
							30				grades to vesicular, slightly weathered, very hard
			87	73							grades to brown with gray mottling scoriaceous, medium dense
											grades to gray dense, moderately to slightly weathered, very hard
			42	12			35				Brownish gray with multi–color mottling CLINKER, moderately fractured, extremely weathered, medium hard (basalt formation)
			100	100			40				Gray vesicular BASALT, slightly fractured, slightly weathered, very hard (basalt formation)
			38	8			45				Brown with multi–color mottling CLINKER, severely fractured, extremely to highly weathered, medium hard (basalt formation)
	39				15		50				
			100	29			55				

Date Started:	November 3, 2003	Water Level: ▽	Not Encountered
Date Completed:	November 4, 2003		
Logged By:	Y. Chiba	Drill Rig:	CME–75
Total Depth:	61 feet	Drilling Method:	4" Auger & PQ Coring
Work Order:	5088–00(A)	Driving Energy:	140 lb. wt., 30 in. drop

SURVEY PLOTTED BY — DATE
DRAWN BY
TRACED BY
DESIGNED BY
QUANTITIES BY
CHECKED BY
ORIGINAL PLAN
NOTE BOOK
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LICENSED PROFESSIONAL ENGINEER
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THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

SIGNATURE — EXPIRATION DATE OF THE LICENSE: 4-30-06

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BORING LOGS

INTERSTATE ROUTE H-1 REHABILITATION
EASTBOUND LANES
WAIAU INTERCHANGE TO KAIMAKANI STREET

Scale: None — Date: Jan. 24, 2006

SHEET No. B13 OF 20 SHEETS

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(245)	2005	177	183

GEOLABS, INC.
Geotechnical Engineering

INTERSTATE ROUTE H–1 REHAB., EB LANES
WAIAU INTERCHANGE TO KAIMAKANI STREET
EWA, OAHU, HAWAII

Log of Boring 13

(Continued from previous plate)

Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample	Graphic	USCS	Description
			100	95	15/.0' Ref.		60				Gray vesicular BASALT, moderately fractured, moderately weathered, very hard (basalt formation)
											Boring terminated at 61 feet
							65				
							70				
							75				
							80				
							85				
							90				
							95				
							100				
							105				
							110				

Date Started:	November 3, 2003	Water Level: ▽	Not Encountered
Date Completed:	November 4, 2003		
Logged By:	Y. Chiba	Drill Rig:	CME–75
Total Depth:	61 feet	Drilling Method:	4" Auger & PQ Coring
Work Order:	5088–00(A)	Driving Energy:	140 lb. wt., 30 in. drop

GEOLABS, INC.
Geotechnical Engineering

INTERSTATE ROUTE H–1 REHAB., EB LANES
WAIAU INTERCHANGE TO KAIMAKANI STREET
EWA, OAHU, HAWAII

Log of Boring 14

Approximate Ground Surface Elevation (feet MSL): 77.5 *

Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample	Graphic	USCS	Description
											1–inch ASPHALTIC CONCRETE
											11–inch CONCRETE
										CH	6–inch BASE COURSE
	30	83			25						Brown SILTY CLAY with gravel, very stiff, moist (fill)
	24				34	2.5	5				grades to hard, damp
	31	84			23	1.0					COBBLE
											grades to very stiff, moist
	30				16		10				
	31	88			10	1.5	15				grades to grayish brown, stiff
	22				67		20				grades to brown with sand, very hard
											Brownish gray vesicular BASALT, severely fractured, moderately weathered, hard (basalt formation)
			100	30	25/.0' Ref.		25				grades to gray dense, moderately fractured, slightly weathered, hard to very hard
			95	58			30				
			60	30			35				Grayish brown CLINKER, severely fractured, completely weathered, soft (basalt formation)
											Gray vesicular BASALT, widely fractured, slightly to moderately weathered, hard (basalt formation)
											Reddish gray CLINKER, severely fractured, highly weathered, soft (basalt formation)
			55	50			40				Gray dense to vugular BASALT, moderately fractured, slightly weathered, hard to very hard (basalt formation)
							45				Reddish gray CLINKER, severely fractured, highly weathered, soft (basalt formation)
											Boring terminated at 45 feet
							50				
							55				

Date Started:	October 22, 2003	Water Level: ▽	Not Encountered
Date Completed:	October 22, 2003		
Logged By:	S. Latronic	Drill Rig:	CME–75
Total Depth:	45 feet	Drilling Method:	4" Auger & PQ Coring
Work Order:	5088–00(A)	Driving Energy:	140 lb. wt., 30 in. drop

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

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CLAYTON S. MIMURA
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No. 4176-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

SIGNATURE ____ 4-30-06 EXPIRATION DATE OF THE LICENSE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BORING LOGS

INTERSTATE ROUTE H-1 REHABILITATION
EASTBOUND LANES
WAIAU INTERCHANGE TO KAIMAKANI STREET

Scale: None Date: Jan. 24, 2006

SHEET No. B14 OF 20 SHEETS

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(245)	2005	178	183

GEOLABS, INC.
Geotechnical Engineering

INTERSTATE ROUTE H–1 REHAB., EB LANES
WAIAU INTERCHANGE TO KAIMAKANI STREET
EWA, OAHU, HAWAII

Log of Boring 15

Approximate Ground Surface Elevation (feet MSL): 62.1 *

Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample	Graphic	USCS	Description
							0				1–inch ASPHALTIC CONCRETE overlay
					7	0.5				GW	12–inch CONCRETE
										CH	Grayish brown SANDY BASALTIC GRAVEL in a silt matrix, medium dense, damp (base course)
					7	< 0.5	5			CH	Brown SILTY CLAY with sand and some organic fragments, very soft, moist (fill)
											Brown with multi–color mottling SILTY CLAY with rounded coarse sand and gravel, very soft, moist (alluvium)
					2	1.0	10				grades to medium stiff
										CL	Brown SANDY CLAY with rounded gravel and some silt, very soft
					4	< 0.5	15				
											grades with debris
					30/.3' Ref.		20				Boring terminated at 20.3 feet
											Boring was backfilled by bentonite capped with black top.
							25				*Elevations estimated from Topographic Map transmitted by Parsons Brinckerhoff on June 13, 2005.
							30				
							35				
							40				
							45				
							50				
							55				

Date Started:	May 19, 2005	Water Level: ▽	14.8 ft. 5/19/05 1405 HRS
Date Completed:	May 19, 2005		
Logged By:	Y. Chiba	Drill Rig:	CME–75
Total Depth:	20.3 feet	Drilling Method:	4" Concrete Core & 4" Auger
Work Order:	5088–10	Driving Energy:	140 lb. wt., 30 in. drop

GEOLABS, INC.
Geotechnical Engineering

INTERSTATE ROUTE H–1 REHAB., EB LANES
WAIAU INTERCHANGE TO KAIMAKANI STREET
EWA, OAHU, HAWAII

Log of Boring 16

Approximate Ground Surface Elevation (feet MSL): 62.2 *

Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample	Graphic	USCS	Description
							0				4.75–inch ASPHALTIC CONCRETE overlay
					21					GM	4.5–inch ASPHALTIC CONCRETE
					29	0.5				CL	4–inch PERMEABLE BASE
											Grayish dark brown SILTY BASALTIC GRAVEL AND SAND, medium dense (base course)
					27		5			GW	Brown with multi–color mottling SANDY CLAY with well–rounded coarse sand and gravel, medium stiff, damp (alluvium)
											Brown with multi–color mottling well–rounded
					37	> 4.5	10			CH	SANDY BASALTIC GRAVEL in a silty clay matrix with some cobbles, medium dense, moist
											grades with boulders and cobbles at 7.6 feet
											Brown with multi–color mottling SILTY CLAY with some coarse sand, very hard, damp (alluvium)
					56	> 4.5	15				grades to brown with black and gray mottling
										ML	Brown with multi–color mottling SANDY SILT with clay and highly weathered basaltic gravel and cobbles, very stiff, damp (alluvium)
					48/.3' Ref.		20				Boring terminated at 20.8 feet
											Boring was backfilled by bentonite capped with black top.
							25				
							30				
							35				
							40				
							45				
							50				
							55				

Date Started:	May 19, 2005	Water Level: ▽	Not Encountered
Date Completed:	May 19, 2005		
Logged By:	Y. Chiba	Drill Rig:	CME–75
Total Depth:	20.8 feet	Drilling Method:	4" Concrete Core & 4" Auger
Work Order:	5088–10	Driving Energy:	140 lb. wt., 30 in. drop

ORIGINAL PLAN
NOTE BOOK
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SIGNATURE — EXPIRATION DATE OF THE LICENSE: 4-30-08

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BORING LOGS

INTERSTATE ROUTE H-1 REHABILITATION
EASTBOUND LANES
WAIAU INTERCHANGE TO KAIMAKANI STREET

Scale: None — Date: Jan. 24, 2006

SHEET No. B15 OF 20 SHEETS

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(245)	2005	179	183

GEOLABS, INC.
Geotechnical Engineering

INTERSTATE ROUTE H–1 REHAB., EB LANES
WAIAU INTERCHANGE TO KAIMAKANI STREET
EWA, OAHU, HAWAII

Log of Boring 17

Approximate Ground Surface Elevation (feet MSL): 61.1 *

Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample	Graphic	USCS	Description
							0				1–inch ASPHALTIC CONCRETE overlay
					21					GW	10–inch CONCRETE
					19	1.5				CL	4.5–inch PERMEABLE BASE Grayish brown BASALTIC SANDY GRAVEL in a silt matrix, medium dense, damp (base course)
					46	4.0	5				Brown with multi–color mottling fine friable SANDY CLAY with basaltic gravel and some cobbles, very stiff, damp (fill)
										CH	grades to hard at 5.2 feet
					9	3.5	10				Brown with multi–color mottling SILTY CLAY with basaltic gravel, hard, damp (fill)
					9	< 0.5	15			CL	Dark brown with multi–color mottling fine SANDY CLAY with some basaltic gravel, soft, moist (alluvium) VOID
					60/.5' + 20/.3' Ref.		20			GW	Orangish brown with multi–color mottling SANDY ROUNDED HIGHLY WEATHERED BASALTIC GRAVEL AND COBBLES in a silt matrix, very dense, wet (alluvium)
							25				Boring terminated at 21.3 feet Boring was backfilled by bentonite capped with black top.
							30				
							35				
							40				
							45				
							50				
							55				

Date Started:	May 20, 2005	Water Level: ▽	Not Encountered
Date Completed:	May 20, 2005		
Logged By:	Y. Chiba	Drill Rig:	CME–75
Total Depth:	21.3 feet	Drilling Method:	4" Concrete Core & 4" Auger
Work Order:	5088–10	Driving Energy:	140 lb. wt., 30 in. drop

GEOLABS, INC.
Geotechnical Engineering

INTERSTATE ROUTE H–1 REHAB., EB LANES
WAIAU INTERCHANGE TO KAIMAKANI STREET
EWA, OAHU, HAWAII

Log of Boring 18

Approximate Ground Surface Elevation (feet MSL): 61.2 *

Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample	Graphic	USCS	Description
							0				3–inch ASPHALTIC CONCRETE overlay
					15	1.5				GW	3.25–inch ASPHALTIC CONCRETE overlay
					6					CH	4–inch ASPHALTIC CONCRETE Gray BASALTIC SANDY GRAVEL, medium dense, damp (base course)
					14	0.5	5				Brown SILTY CLAY with sand, medium stiff, moist (fill)
										CL	grades to soft at 3 feet grades with some subrounded basaltic gravel at 4.7 feet
					20/.3' Ref.		10				Orangish brown with multi–color mottling highly weathered BASALTIC GRAVELLY CLAY AND SAND, very stiff, damp (alluvium)
										CL	
					47	2.0	15				Brownish orange with multi–color mottling SANDY CLAY with rounded highly weathered basaltic coarse sand and gravel with some boulders, very stiff, moist (alluvium)
					30	2.0	20				Boring terminated at 21.5 feet Boring was backfilled by bentonite capped with black top.
							25				
							30				
							35				
							40				
							45				
							50				
							55				

Date Started:	May 20, 2005	Water Level: ▽	Not Encountered
Date Completed:	May 20, 2005		
Logged By:	Y. Chiba	Drill Rig:	CME–75
Total Depth:	21.5 feet	Drilling Method:	4" Concrete Core & 4" Auger
Work Order:	5088–10	Driving Energy:	140 lb. wt., 30 in. drop

ORIGINAL PLAN
SURVEY PLOTTED BY
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NOTE BOOK
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C. CLAYTON S. MIMURA
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SIGNATURE — EXPIRATION DATE OF THE LICENSE 4-30-08.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BORING LOGS

INTERSTATE ROUTE H-1 REHABILITATION
EASTBOUND LANES
WAIAU INTERCHANGE TO KAIMAKANI STREET

Scale: None Date: Jan. 24, 2006

SHEET No. B16 OF 20 SHEETS

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(245)	2005	180	183

GEOLABS, INC.
Geotechnical Engineering

INTERSTATE ROUTE H–1 REHAB., EB LANES
WAIAU INTERCHANGE TO KAIMAKANI STREET
EWA, OAHU, HAWAII

Log of Boring 101

Approximate Ground Surface Elevation (feet MSL): 103.3 *

Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample	Graphic	USCS	Description
											12.75–inch ASPHALTIC CONCRETE
											9.75–inch CONCRETE
										GW	Gray with brown mottling densely cemented SANDY GRAVEL with silt, dense
											Boring terminated at 2.2 feet
							5				
							10				

Date Started:	October 24, 2003	Water Level: ▽	Not Encountered
Date Completed:	October 24, 2003		
Logged By:	Y. Chiba	Drill Rig:	CME–75
Total Depth:	2.2 feet	Drilling Method:	5" Concrete Core
Work Order:	5088–00(A)	Driving Energy:	140 lb. wt., 30 in. drop

GEOLABS, INC.
Geotechnical Engineering

INTERSTATE ROUTE H–1 REHAB., EB LANES
WAIAU INTERCHANGE TO KAIMAKANI STREET
EWA, OAHU, HAWAII

Log of Boring 102

Approximate Ground Surface Elevation (feet MSL): 102.6 *

Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample	Graphic	USCS	Description
											10.63–inch ASPHALTIC CONCRETE
											9.38–inch CONCRETE
											Boring terminated at 1.7 feet
							5				
							10				

Date Started:	October 24, 2003	Water Level: ▽	Not Encountered
Date Completed:	October 24, 2003		
Logged By:	Y. Chiba	Drill Rig:	CME–75
Total Depth:	1.7 feet	Drilling Method:	5" Concrete Core
Work Order:	5088–00(A)	Driving Energy:	140 lb. wt., 30 in. drop

ORIGINAL PLAN
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SIGNATURE

4-30-06
EXPIRATION DATE OF THE LICENSE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BORING LOGS

INTERSTATE ROUTE H-1 REHABILITATION
EASTBOUND LANES
WAIAU INTERCHANGE TO KAIMAKANI STREET

Scale: None Date: Jan. 24, 2006

SHEET No. B17 OF 20 SHEETS

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(245)	2005	181	183

GEOLABS, INC.
Geotechnical Engineering

INTERSTATE ROUTE H–1 REHAB., EB LANES
WAIAU INTERCHANGE TO KAIMAKANI STREET
EWA, OAHU, HAWAII

Log of Boring 103

Approximate Ground Surface Elevation (feet MSL): 93.9 *

Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample	Graphic	USCS	Description
							0				4–inch ASPHALTIC CONCRETE
											9.25–inch CONCRETE
							5				Boring terminated at 1.1 feet
							10				

Date Started:	October 23, 2003	Water Level: ▽	Not Encountered
Date Completed:	October 23, 2003		
Logged By:	Y. Chiba	Drill Rig:	CME–75
Total Depth:	1.1 feet	Drilling Method:	5" Concrete Core
Work Order:	5088–00(A)	Driving Energy:	140 lb. wt., 30 in. drop

GEOLABS, INC.
Geotechnical Engineering

INTERSTATE ROUTE H–1 REHAB., EB LANES
WAIAU INTERCHANGE TO KAIMAKANI STREET
EWA, OAHU, HAWAII

Log of Boring 104

Approximate Ground Surface Elevation (feet MSL): 96 *

Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample	Graphic	USCS	Description
							0				3–inch ASPHALTIC CONCRETE
											9.13–inch CONCRETE
							5				Boring terminated at 1 feet
							10				

Date Started:	October 23, 2003	Water Level: ▽	Not Encountered
Date Completed:	October 23, 2003		
Logged By:	Y. Chiba	Drill Rig:	CME–75
Total Depth:	1 feet	Drilling Method:	5" Concrete Core
Work Order:	5088–00(A)	Driving Energy:	140 lb. wt., 30 in. drop

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

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CLAYTON S. MIMURA
LICENSED PROFESSIONAL ENGINEER
No. 4176-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

SIGNATURE | 4-30-06 EXPIRATION DATE OF THE LICENSE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BORING LOGS

INTERSTATE ROUTE H-1 REHABILITATION
EASTBOUND LANES
WAIAU INTERCHANGE TO KAIMAKANI STREET

Scale: None Date: Jan. 24, 2006

SHEET No. B18 OF 20 SHEETS

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(245)	2005	182	183

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Geotechnical Engineering

INTERSTATE ROUTE H–1 REHAB., EB LANES
WAIAU INTERCHANGE TO KAIMAKANI STREET
EWA, OAHU, HAWAII

Log of Boring 105

Approximate Ground Surface Elevation (feet MSL): 104.2 *

Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample	Graphic	USCS	Description
											17–inch ASPHALTIC CONCRETE
										GW	BASE COURSE
											Boring terminated at 1.8 feet
							5				
							10				

Date Started:	November 3, 2003	Water Level: ▽ Not Encountered	
Date Completed:	November 3, 2003		
Logged By:	S. Latronic	Drill Rig:	CME–75
Total Depth:	1.8 feet	Drilling Method:	4.5" Concrete Core
Work Order:	5088–00(A)	Driving Energy:	140 lb. wt., 30 in. drop

GEOLABS, INC.
Geotechnical Engineering

INTERSTATE ROUTE H–1 REHAB., EB LANES
WAIAU INTERCHANGE TO KAIMAKANI STREET
EWA, OAHU, HAWAII

Log of Boring 106

Approximate Ground Surface Elevation (feet MSL): 103.7 *

Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample	Graphic	USCS	Description
											14–inch ASPHALTIC CONCRETE
										GW	BASE COURSE
											Boring terminated at 1.5 feet
							5				
							10				

Date Started:	November 3, 2003	Water Level: ▽ Not Encountered	
Date Completed:	November 3, 2003		
Logged By:	S. Latronic	Drill Rig:	CME–75
Total Depth:	1.5 feet	Drilling Method:	4.5" Concrete Core
Work Order:	5088–00(A)	Driving Energy:	140 lb. wt., 30 in. drop

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

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SIGNATURE — EXPIRATION DATE OF THE LICENSE: 4-30-06

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BORING LOGS

INTERSTATE ROUTE H-1 REHABILITATION
EASTBOUND LANES
WAIAU INTERCHANGE TO KAIMAKANI STREET

Scale: None Date: Jan. 24, 2006

SHEET No. B19 OF 20 SHEETS

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(245)	2005	183	183

GEOLABS, INC.
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INTERSTATE ROUTE H–1 REHAB., EB LANES
WAIAU INTERCHANGE TO KAIMAKANI STREET
EWA, OAHU, HAWAII

Log of Boring 107

Approximate Ground Surface Elevation (feet MSL): 62.1 *

Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample	Graphic	USCS	Description
							0				1.75–inch ASPHALTIC CONCRETE overlay
											9.25–inch CONCRETE
											6–inch PERMEABLE BASE
					40					GW	Dark grayish brown with multi–color mottling SANDY BASALTIC GRAVEL in a silty clay matrix with friable gravel, dense (base course)
							3				Boring terminated at 3 feet
											Boring was backfilled by bentonite capped with black top.
							5				
							10				

Date Started:	May 19, 2005	Water Level: ▽ Not Encountered	
Date Completed:	May 19, 2005		
Logged By:	Y. Chiba	Drill Rig:	CME–75
Total Depth:	3 feet	Drilling Method:	4" Concrete Core
Work Order:	5088–10	Driving Energy:	140 lb. wt., 30 in. drop

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Geotechnical Engineering

INTERSTATE ROUTE H–1 REHAB., EB LANES
WAIAU INTERCHANGE TO KAIMAKANI STREET
EWA, OAHU, HAWAII

Log of Boring 108

Approximate Ground Surface Elevation (feet MSL): 61.2 *

Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample	Graphic	USCS	Description
							0				1–inch ASPHALTIC CONCRETE overlay
											9.25–inch CONCRETE
											5–inch PERMEABLE BASE
					20/.4' Ref.					GW	Brownish gray SANDY BASALTIC GRAVEL in a silt matrix, dense, damp (base course)
						2.0				CH	Brown with gray mottling SILTY CLAY with basaltic gravel, very stiff, damp
							2.4				Boring terminated at 2.4 feet
											Boring was backfilled by bentonite capped with black top.
							5				
							10				

Date Started:	May 20, 2005	Water Level: ▽ Not Encountered	
Date Completed:	May 20, 2005		
Logged By:	Y. Chiba	Drill Rig:	CME–75
Total Depth:	2.4 feet	Drilling Method:	4" Concrete Core
Work Order:	5088–10	Driving Energy:	140 lb. wt., 30 in. drop

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

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SIGNATURE ____ EXPIRATION DATE OF THE LICENSE 4-30-06

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BORING LOGS

INTERSTATE ROUTE H-1 REHABILITATION
EASTBOUND LANES
WAIAU INTERCHANGE TO KAIMAKANI STREET

Scale: None Date: Jan. 24, 2006

SHEET No. B20 OF 20 SHEETS