FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-072-1(51)	2007	95	106

GEOLABS, INC. — Geotechnical Engineering

KALANIANAOLE HWY. IMPROVEMENTS, MAKAPUU, OAHU, HAWAII — Log of Boring 1

Approximate Ground Surface Elevation (feet MSL): 145 *

Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	USCS	Description
	7								4-inch ASPHALTIC CONCRETE
					50/.4'			GM	Brown with white mottling SILTY GRAVEL with sand, medium dense (base material)
	14		100	25				CH	Grayish brown SILTY CLAY with basaltic gravel, very dense, very damp to moist (fill)
UC=15354 psi		157	100	83			5		Gray slightly vesicular BASALT, moderately to closely fractured, slightly weathered, hard to very hard (basalt formation)
			100	0			10		
UC=7016 psi		155	96	96			15		Gray vugular BASALT, slightly fractured, slightly weathered, hard (basalt formation)
			50	6					grades to closely fractured
			67	23			20		Grayish red with orange mottling strongly vesicular BASALT, severely fractured, moderately weathered, medium hard (clinker)
			100	19			25		Dark gray slightly vesicular BASALT, closely fractured, slightly weathered, hard (basalt formation)
			55	0			30		
			60	0			35		Grayish red with orange mottling vesicular BASALT, severely fractured, moderately weathered, medium hard (clinker)
									Dark gray vugular BASALT, closely fractured, moderately weathered, hard (basalt formation)
			60	8			40		Dark gray with yellow mottling strongly vesicular BASALT, severely fractured, moderately weathered, medium hard (clinker)
UC=4536 psi		122	100	35			45		Gray vesicular BASALT, moderately to closely fractured, moderately weathered, hard (basalt formation)
									Grayish red strongly vesicular BASALT, severely fractured, moderately weathered, medium hard (clinker)
							50		Boring terminated at 48.5 feet
							55		* Elevations estimated from Topographic Drawings provided by Park Engineering on October 11, 2001.

Date Started:	December 3, 2001	Water Level: ▽	Not Encountered
Date Completed:	December 4, 2001		
Logged By:	K. Gronseth	Drill Rig:	DIEDRICH D-25
Total Depth:	48.5 feet	Drilling Method:	4" Solid-Stem Auger & HQ Coring
Work Order:	4605-10	Driving Energy:	140 lb. wt., 30 in. drop

GEOLABS, INC. — Geotechnical Engineering

KALANIANAOLE HWY. IMPROVEMENTS, MAKAPUU, OAHU, HAWAII — Log of Boring 2

Approximate Ground Surface Elevation (feet MSL): 133 *

Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	USCS	Description
									12-inch ASPHALTIC CONCRETE
					67			GM	Grayish brown SILTY BASALTIC GRAVEL with sand, very dense, damp (base material)
					62				Grayish brown with yellow and purple mottling BASALT, highly weathered, soft (clinker)
			100	78	20/.0' Ref.		5		Gray vugular BASALT, moderately fractured, slightly weathered, very hard (basalt formation)
UC=20854 psi		171					10		
			100	62			15		Grayish brown strongly vesicular BASALT, closely to moderately fractured, moderately weathered, medium hard (basalt formation)
			100	100					
			100	83			20		Gray vugular BASALT, slightly fractured, slightly weathered, hard to very hard (basalt formation)
			100	80			25		Gray vesicular BASALT, moderately to slightly fractured, slightly weathered, medium hard to hard (basalt formation)
			100	85			30		
			77	50			35		Grayish brown strongly vesicular BASALT, closely fractured, moderately weathered, medium hard (basalt formation)
			100	88			40		Grayish brown vesicular BASALT, moderately fractured, slightly to moderately weathered, medium hard (basalt formation)
			100	33			45		grades to severely fractured
			100	72			50		Grayish brown strongly vesicular BASALT, moderately fractured, moderately weathered, medium hard (basalt formation)
UC=3006		119					55		

Date Started:	December 5, 2001	Water Level: ▽	Not Encountered
Date Completed:	December 6, 2001		
Logged By:	E. Shinsato	Drill Rig:	CME-75
Total Depth:	81.5 feet	Drilling Method:	4" Auger & HQ Coring
Work Order:	4605-10	Driving Energy:	140 lb. wt., 30 in. drop

ROBIN M. LIM
LICENSED PROFESSIONAL ENGINEER
No. 8436-C
HAWAII, U.S.A.

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

GEOLABS, INC.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BORING LOGS

Kalanianaole Highway Improvements
Retaining Wall at Makapuu, Oahu
Federal-Aid Project No. NH-072-1(51)

Scale: As Noted — Date: April 2007

SHEET No. B-3 OF 14 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-072-1(51)	2007	**96**	106

GEOLABS, INC. — Geotechnical Engineering

KALANIANAOLE HWY. IMPROVEMENTS
MAKAPUU, OAHU, HAWAII

Log of Boring 2

(Continued from previous plate)

Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	USCS	Description
psi									
			97	97					grades to gray, slightly weathered, medium hard to hard
							60		
			100	40					Dark gray vugular BASALT, closely fractured, moderately weathered, medium hard (basalt formation)
							65		
			100	83					Dark gray vugular BASALT, slightly fractured, slightly weathered, hard to very hard (basalt formation)
							70		Grayish red strongly vesicular BASALT, moderately fractured, moderately weathered, medium hard (clinker)
			97	62					
UC=1923 psi		106							
							75		Dark gray strongly vesicular BASALT, moderately fractured, slightly weathered, hard (basalt formation)
			100	80					
							80		grades to closely fractured, moderately weathered
									Boring terminated at 81.5 feet
							85		
							90		
							95		
							100		
							105		
							110		

Date Started:	December 5, 2001	Water Level: ▽	Not Encountered
Date Completed:	December 6, 2001		
Logged By:	E. Shinsato	Drill Rig:	CME-75
Total Depth:	81.5 feet	Drilling Method:	4" Auger & HQ Coring
Work Order:	4605-10	Driving Energy:	140 lb. wt., 30 in. drop

GEOLABS, INC. — Geotechnical Engineering

KALANIANAOLE HWY. IMPROVEMENTS
MAKAPUU, OAHU, HAWAII

Log of Boring 3

Approximate Ground Surface Elevation (feet MSL): 122 *

Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	USCS	Description
									10-inch ASPHALTIC CONCRETE
			70	33	10/.0' Ref.			GM	Dark brown SILTY GRAVEL with sand, dense, damp (base material)
									Gray and brown scoriaceous BASALT AND SANDY SILT, soft to medium hard (clinker)
							5		Brownish gray strongly vesicular BASALT, closely fractured, moderately to highly weathered, hard (basalt formation)
			98	28					
UC=4417 psi		126							
							10		
			100	60					Gray strongly vesicular BASALT, slightly fractured, slightly weathered, hard (basalt formation)
							15		Brownish orange with gray mottling scoriaceous BASALT, slightly fractured, moderately to highly weathered, medium hard (basalt formation)
			75	60					Gray vugular BASALT, slightly fractured, slightly weathered, hard to very hard (basalt formation)
UC=7622 psi		149					20		
			98	57					
									Reddish brown with gray mottling strongly vesicular BASALT, closely fractured, moderately weathered, medium hard (basalt formation)
							25		grades to scoriaceous
			98	20					
							30		
			88	47					Gray with dark reddish brown mottling strongly vesicular BASALT, moderately fractured, slightly to moderately weathered, hard (basalt formation)
							35		
			97	57					
									grades to closely fractured, moderately weathered
							40		Gray vugular BASALT, slightly fractured, slightly weathered, hard to very hard (basalt formation)
			100	100					
							45		Gray strongly vesicular BASALT, slightly fractured, slightly weathered, hard (basalt formation)
			100	70					
							50		Gray vugular BASALT, slightly fractured, slightly weathered, hard (basalt formation)
			100	95					
							55		

Date Started:	November 28, 2001	Water Level: ▽	Not Encountered
Date Completed:	November 29, 2001		
Logged By:	Y. Chiba	Drill Rig:	CME-55G
Total Depth:	81 feet	Drilling Method:	4" Auger & HQ Coring
Work Order:	4605-10	Driving Energy:	140 lb. wt., 30 in. drop

ROBIN M. LIM
LICENSED PROFESSIONAL ENGINEER
No. 8436-C
HAWAII, U.S.A.

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BORING LOGS

Kalanianaole Highway Improvements
Retaining Wall at Makapuu, Oahu
Federal-Aid Project No. NH-072-1(51)

Scale: As Noted — *Date: April 2007*

SHEET No. **B-4** OF **14** SHEETS

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

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-072-1(51)	2007	97	106

GEOLABS, INC.
Geotechnical Engineering

KALANIANAOLE HWY. IMPROVEMENTS
MAKAPUU, 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)	USCS	Description
			97	97					
			97	20			60		Gray vesicular BASALT, moderately fractured, slightly weathered, hard (basalt formation)
			67	53			65		Reddish brown scoriaceous BASALT, severely fractured, moderately weathered, medium hard (clinker)
									Gray vugular BASALT, moderately fractured, slightly weathered, hard (basalt formation)
			95	95			70		Reddish brown scoriaceous BASALT, closely fractured, moderately weathered, medium hard (clinker)
									Gray vugular BASALT, moderately fractured, moderately weathered, medium hard to hard (basalt formation)
			63	37			75		Grayish brown BASALT, severely fractured, moderately weathered, medium hard (clinker)
UC=2034 psi		127			10/.0' Ref.		80		Grayish brown vugular BASALT, moderately fractured, moderately weathered, medium hard (basalt formation)
									Boring terminated at 81 feet
							85, 90, 95, 100, 105, 110		

Date Started:	November 28, 2001	Water Level:	Not Encountered
Date Completed:	November 29, 2001		
Logged By:	Y. Chiba	Drill Rig:	CME-55G
Total Depth:	81 feet	Drilling Method:	4" Auger & HQ Coring
Work Order:	4605-10	Driving Energy:	140 lb. wt., 30 in. drop

BORING_LOG_DOT 4605-00.GPJ GEOLABS.GDT 4/13/05

GEOLABS, INC.
Geotechnical Engineering

KALANIANAOLE HWY. IMPROVEMENTS
MAKAPUU, OAHU, HAWAII

Log of Boring 4

Approximate Ground Surface Elevation (feet MSL): 112 *

Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	USCS	Description
									11.5-inch ASPHALTIC CONCRETE
	13				40/.3' Ref.			GM	Grayish brown SILTY BASALTIC GRAVEL with sand, very dense, damp (base material)
			70	43	20/.0' Ref.				Grayish brown strongly vesicular BASALT, closely to severely fractured, moderately weathered, medium hard (basalt formation)
			90	47			5		
			100	68			10		Gray vesicular BASALT, slightly fractured, moderately weathered, hard (basalt formation)
									Grayish brown vesicular BASALT, closely to severely fractured, moderately weathered, medium hard (basalt formation)
			85	68			15		
UC=1556 psi		104							Gray strongly vesicular BASALT, moderately fractured, moderately weathered, medium hard to hard (basalt formation)
			73	45			20		
UC=2003 psi		113					25		
			55	0					Brown vesicular BASALT, severely fractured, highly weathered, soft (clinker)
	19				40/.3' Ref.		30		
			100	88					Gray vesicular BASALT, moderately fractured, slightly weathered, medium hard to hard (basalt formation)
			100	97			35		Gray vugular BASALT, slightly fractured, slightly weathered, hard to very hard (basalt formation)
			100	100			40		Grayish brown vesicular BASALT, moderately fractured, moderately weathered, medium hard (basalt formation)
			85	42			45		Reddish gray strongly vesicular BASALT, closely fractured, moderately weathered, medium hard (basalt formation)
									Gray vugular BASALT, closely fractured, moderately weathered, hard (basalt formation)
			30	8			50		grades to severely fractured
							55		Grayish brown vesicular BASALT, severely fractured, moderately to highly weathered, soft (clinker)

Date Started:	November 28, 2001	Water Level:	Not Encountered
Date Completed:	November 29, 2001		
Logged By:	E. Shinsato	Drill Rig:	MOBILE B-80
Total Depth:	80.5 feet	Drilling Method:	4" Auger & HQ Coring
Work Order:	4605-10	Driving Energy:	140 lb. wt., 30 in. drop

BORING_LOG_DOT 4605-00.GPJ GEOLABS.GDT 4/13/05

ROBIN M. LIM
LICENSED PROFESSIONAL ENGINEER
No. 8436-C
HAWAII, U.S.A.

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BORING LOGS

Kalanianaole Highway Improvements
Retaining Wall at Makapuu, Oahu
Federal-Aid Project No. NH-072-1(51)

Scale: As Noted — Date: April 2007

SHEET No. B-5 OF 14 SHEETS

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

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-072-1(51)	2007	98	106

GEOLABS, INC. Geotechnical Engineering

KALANIANAOLE HWY. IMPROVEMENTS MAKAPUU, 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)	USCS	Description
			33	7	50/.4' Ref.				
									Gray vugular BASALT, closely fractured, moderately weathered, medium hard to hard (basalt formation)
			93	62	20/.0' Ref.		60		
							65		Grayish brown vesicular BASALT, moderately fractured, moderately weathered, medium hard (basalt formation)
			63	43					
									Grayish brown BASALT, severely fractured, moderately to highly weathered, soft to medium hard (clinker)
							70		
UC=2383 psi		102	47	7					
							75		Gray vugular BASALT, closely to moderately fractured, slightly weathered, hard to very hard (basalt formation)
			82	57	50/.3' Ref.				
							80		Boring terminated at 80.5 feet
							85		
							90		
							95		
							100		
							105		
							110		

Date Started:	November 28, 2001	Water Level: ▽	Not Encountered
Date Completed:	November 29, 2001		
Logged By:	E. Shinsato	Drill Rig:	MOBILE B-80
Total Depth:	80.5 feet	Drilling Method:	4" Auger & HQ Coring
Work Order:	4605-10	Driving Energy:	140 lb. wt., 30 in. drop

GEOLABS, INC. Geotechnical Engineering

KALANIANAOLE HWY. IMPROVEMENTS MAKAPUU, OAHU, HAWAII — Log of Boring 101

Approximate Ground Surface Elevation (feet MSL): 158 *

Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	USCS	Description
									4-inch ASPHALTIC CONCRETE
								CL	Brown with gray mottling SILTY CLAY with some weathered basaltic gravel, very stiff, moist (alluvium/fill)
	43	72			20				
								SM	Gray and brown with orange mottling SILTY SAND with some weathered basaltic gravel, dense, very damp (decomposed basalt rock)
	33				50/.5' Ref.		5		
								GM	Dark brown with orange mottling vesicular BASALT, highly weathered, soft to medium hard (basalt formation)
	36	70			77/.9' Ref.		10		
			0	0					Dark brown moderately vesicular BASALT, severely fractured, highly weathered, soft (basalt formation)
							15		
	36				7				
UC=115 psi		85	100	45					
							20		Dark brown vesicular BASALT, closely to severely fractured, moderately to highly weathered, soft to medium hard (basalt formation)
			60	6					
							25		
			100	9					
							30		Boring terminated at 30 feet
							35		
							40		
							45		
							50		
							55		

Date Started:	December 6, 2001	Water Level: ▽	Not Encountered
Date Completed:	December 6, 2001		
Logged By:	K. Gronseth	Drill Rig:	CME-75
Total Depth:	30 feet	Drilling Method:	4" Solid-Stem Auger & HQ Coring
Work Order:	4605-10	Driving Energy:	140 lb. wt., 30 in. drop

ROBIN M. LIM
LICENSED PROFESSIONAL ENGINEER
No. 8436-C
HAWAII, U.S.A.

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SIGNATURE — EXPIRATION DATE OF THE LICENSE: 4-30-08

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

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BORING LOGS

Kalanianaole Highway Improvements
Retaining Wall at Makapuu, Oahu
Federal-Aid Project No. NH-072-1(51)

Scale: As Noted — Date: April 2007

SHEET No. B-6 OF 14 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-072-1(51)	2007	**99**	106

GEOLABS, INC. — Geotechnical Engineering

KALANIANAOLE HWY. IMPROVEMENTS, MAKAPUU, OAHU, HAWAII

Log of Boring 102

Approximate Ground Surface Elevation (feet MSL): 158 *

Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)
	44	70			24	
LL=84 PI=54	37				25	
	19				82/.8' Ref.	
			73	42		
			100	60		
UC=1477 psi		106				
			100	31		
			100	64		
			100	80		
			100	38		

Depth (feet): 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55

USCS	Description
CL	3-inch ASPHALTIC CONCRETE
SM/GM	Brown with white mottling SILTY CLAY with sand (base material)
CH	Gray with orange and brown mottling SILTY SAND with highly weathered basaltic gravel, medium dense, damp, very moist (fill)
GW	Brown SILTY CLAY, very stiff, moist (saprolite)
	Grayish brown with white mottling strongly vesicular BASALT, moderately fractured, moderately to highly weathered, medium hard (basalt formation)
	Gray slightly vesicular BASALT, closely fractured, slightly weathered, hard (basalt formation)
	Gray vesicular BASALT, closely to moderately fractured, slightly weathered, hard to very hard (basalt formation)
	Gray vesicular BASALT, moderately fractured, slightly weathered, hard (basalt formation)
	Gray non-vesicular BASALT, closely fractured, slightly weathered, very hard (basalt formation)
	Boring terminated at 31.5 feet

Date Started:	November 30, 2001	Water Level: ▽	Not Encountered
Date Completed:	November 30, 2001		
Logged By:	K. Gronseth	Drill Rig:	CME-75
Total Depth:	31.5 feet	Drilling Method:	4" Solid-Stem Auger & HQ Coring
Work Order:	4605-10	Driving Energy:	140 lb. wt., 30 in. drop

GEOLABS, INC. — Geotechnical Engineering

KALANIANAOLE HWY. IMPROVEMENTS, MAKAPUU, OAHU, HAWAII

Log of Boring 103

Approximate Ground Surface Elevation (feet MSL): 156 *

Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)
	39	74			35	3.5
LL=75 PI=48	36				17	4.0
	39	56			22/.8' Ref.	
			100	0		
			100	25		
UC=203 psi		100				
			95	33		
			95	0		
			98	62		
			100	70		
			100	37		
			72	48		
			62	40		
			100	95		

Depth (feet): 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55

USCS	Description
	6-inch ASPHALTIC CONCRETE
GM	Dark brown SILTY GRAVEL, dense, dry to damp (base material)
CH	Dark brown wit orange mottling SILTY CLAY with some highly weathered basaltic gravel, hard, damp (fill)
CH	Brown with multi-colored mottling SILTY CLAY with basaltic sand and some gravel, very stiff, damp to dry (saprolite)
	Gray-brown CLAYEY DECOMPOSED BASALT, loose to medium dense, damp (decomposed basalt rock)
	Gray vugular BASALT, closely fractured, highly weathered, medium hard (basalt formation)
	Grayish brown strongly vesicular BASALT, moderately fractured, moderately weathered, medium hard (basalt formation)
	grades to vugular
	Grayish brown with yellow mottling vugular BASALT, closely fractured, highly weathered, medium hard (basalt formation)
	Gray with yellow and brown mottling vugular BASALT, moderately to slightly fractured, moderately weathered, medium hard (basalt formation)
	Gray with reddish brown mottling scoriaceous BASALT, moderately fractured, moderately weathered, medium hard (basalt formation)
	grades to vesicular
	grades to closely fractured, highly weathered
	Gray vugular BASALT, moderately fractured, slightly weathered, hard (basalt formation)
	Brownish gray with tan mottling scoriaceous BASALT, closely fractured, moderately weathered, medium hard (clinker)
	Gray vugular BASALT, slightly fractured, slightly weathered, very hard (basalt formation)

Date Started:	November 26, 2001	Water Level: ▽	Not Encountered
Date Completed:	November 26, 2001		
Logged By:	Y. Chiba	Drill Rig:	CME-55G
Total Depth:	60 feet	Drilling Method:	4" Auger, 4" Casing & HQ Coring
Work Order:	4605-10	Driving Energy:	140 lb. wt., 30 in. drop

ROBIN M. LIM
LICENSED PROFESSIONAL ENGINEER
No. 8436-C
HAWAII, U.S.A.

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

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

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BORING LOGS

Kalanianaole Highway Improvements
Retaining Wall at Makapuu, Oahu
Federal-Aid Project No. NH-072-1(51)

Scale: As Noted — *Date: April 2007*

SHEET No. **B-7** OF **14** SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-072-1(51)	2007	100	106

GEOLABS, INC. Geotechnical Engineering

KALANIANAOLE HWY. IMPROVEMENTS
MAKAPUU, OAHU, HAWAII

Log of Boring 103

(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
			73	17							Gray with yellow and black mottling BASALT, closely fractured, moderately weathered, medium hard to hard (basalt formation)
							60				Boring terminated at 60 feet
							65				
							70				
							75				
							80				
							85				
							90				
							95				
							100				
							105				
							110				

Date Started:	November 26, 2001	Water Level: ▽	Not Encountered
Date Completed:	November 26, 2001		
Logged By:	Y. Chiba	Drill Rig:	CME-55G
Total Depth:	60 feet	Drilling Method:	4" Auger, 4" Casing & HQ Coring
Work Order:	4605-10	Driving Energy:	140 lb. wt., 30 in. drop

GEOLABS, INC. Geotechnical Engineering

KALANIANAOLE HWY. IMPROVEMENTS
MAKAPUU, OAHU, HAWAII

Log of Boring 104

Approximate Ground Surface Elevation (feet MSL): 154 *

Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample	Graphic	USCS	Description
											6.5-inch ASPHALTIC CONCRETE
	6				19					GM	Grayish brown SILTY BASALTIC GRAVEL with sand, medium dense, dry (base material)
	35	79			67/.8' Ref.	>4.5				CH	Brown with orange and black mottling SILTY CLAY with traces of moderately weathered basaltic gravel and sand, very stiff, moist (fill)
			47	0			5				
			22	18							Gray vesicular BASALT, closely to severely fractured, moderately to highly weathered, soft to medium hard (basalt formation)
							10				Gray vesicular BASALT, moderately fractured, slightly weathered, hard (basalt formation)
			67	30	10/.0' Ref.						Grayish brown strongly vesicular BASALT, severely to closely fractured, moderately to highly weathered, soft to medium hard (basalt formation)
UC=584 psi		96					15				
			100	78							grades to moderately fractured, moderately weathered, medium hard
							20				Grayish brown vugular BASALT, closely to severely fractured, moderately weathered, medium hard (basalt formation)
			75	43							
							25				
			65	40							
							30				Brown and gray BASALT, severely fractured, moderately weathered, soft (clinker)
			35	0							
							35				Grayish brown vesicular BASALT, severely to closely fractured, moderately weathered, soft to medium hard (basalt formation)
			66	17	25/.1' Ref.						
							40				
			67	25							
											Gray vugular BASALT, closely fractured, slightly weathered, hard to very hard (basalt formation)
							45				
			95	87							grades to moderately fractured
							50				
			67	50							
							55				

Date Started:	November 26, 2001	Water Level: ▽	Not Encountered
Date Completed:	November 26, 2001		
Logged By:	E. Shinsato	Drill Rig:	MOBILE B-80
Total Depth:	60.7 feet	Drilling Method:	4" Auger & HQ Coring
Work Order:	4605-10	Driving Energy:	140 lb. wt., 30 in. drop

ROBIN M. LIM
LICENSED PROFESSIONAL ENGINEER
No. 8436-C
HAWAII, U.S.A.

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BORING LOGS

Kalanianaole Highway Improvements
Retaining Wall at Makapuu, Oahu
Federal-Aid Project No. NH-072-1(51)

Scale: *As Noted* Date: *April 2007*

SHEET No. B-8 OF 14 SHEETS

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

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-072-1(51)	2007	101	106

GEOLABS, INC. Geotechnical Engineering — KALANIANAOLE HWY. IMPROVEMENTS, MAKAPUU, OAHU, HAWAII — Log of Boring 104

(Continued from previous plate)

Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	USCS	Description
			10	0			55–60.7		Brown and gray BASALT, severely fractured, moderately weathered, soft (clinker)
	26				40/.2' Ref.		60.7		Boring terminated at 60.7 feet

Depth scale: 60, 65, 70, 75, 80, 85, 90, 95, 100, 105, 110

Date Started:	November 26, 2001	Water Level: ▽	Not Encountered
Date Completed:	November 26, 2001		
Logged By:	E. Shinsato	Drill Rig:	MOBILE B-80
Total Depth:	60.7 feet	Drilling Method:	4" Auger & HQ Coring
Work Order:	4605-10	Driving Energy:	140 lb. wt., 30 in. drop

GEOLABS, INC. Geotechnical Engineering — KALANIANAOLE HWY. IMPROVEMENTS, MAKAPUU, OAHU, HAWAII — Log of Boring 105

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)	USCS	Description
							0		6-inch ASPHALTIC CONCRETE
								SM	Brown SILTY SAND with gravel (base material)
	13	91			54			ML	Gray and brown SANDY SILT with basaltic gravel, dense, damp (fill)
	4				50/.4'			SP-SM	Gray and brown SAND with silt, basaltic gravel, and cobbles, loose to medium dense (colluvium)
	9				9		5		
	9				8/.5' +50/.4'		10	GW/GM	Gray and brown BASALTIC COBBLES, BOULDERS, AND GRAVEL with silt and sand, medium dense to dense (colluvium)
	9				62		15		
			57						
			40				20		
	12		59		50/.5'		25		
			33				30		
			7		20/.0' Ref.		35		
			37		20/.0' Ref.		40		
	11		20		50/.4' Ref.		45		
	10		42		50/.3' Ref.		50		

Depth scale: 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55

Date Started:	December 7, 2001	Water Level: ▽	77.5 ft. 12/11/01 1200 HRS
Date Completed:	December 11, 2001		
Logged By:	Gronseth & Shinsato	Drill Rig:	CME-75
Total Depth:	81.5 feet	Drilling Method:	4" Solid-Stem Auger & HQ Coring
Work Order:	4605-10	Driving Energy:	140 lb. wt., 30 in. drop

ROBIN M. LIM
LICENSED PROFESSIONAL ENGINEER
No. 8436-C
HAWAII, U.S.A.

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BORING LOGS

Kalanianaole Highway Improvements
Retaining Wall at Makapuu, Oahu
Federal-Aid Project No. NH-072-1(51)

Scale: As Noted — Date: April 2007

SHEET No. B-9 OF 14 SHEETS

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

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-072-1(51)	2007	102	106

GEOLABS, INC.
Geotechnical Engineering

KALANIANAOLE HWY. IMPROVEMENTS
MAKAPUU, OAHU, HAWAII

Log of Boring 105

(Continued from previous plate)

Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	USCS	Description
								GW/ GM	
	12				40				
			42						
							60		
	14				41				
			17						
							65		
			40		20/.0' Ref.				
							70		
			73	30	20/.0' Ref.				
							75		Grayish brown vugular BASALT with cemented coralline sediment and basaltic gravel, moderately fractured, moderately to slightly weathered, hard (cemented beach rock)
			97	92					
							80		Grayish brown vugular BASALT, moderately fractured, moderately weathered, hard (basalt formation)
									Boring terminated at 81.5 feet
							85		
							90		
							95		
							100		
							105		
							110		

Date Started:	December 7, 2001	Water Level: ▽	77.5 ft. 12/11/01 1200 HRS
Date Completed:	December 11, 2001		
Logged By:	Gronseth & Shinsato	Drill Rig:	CME-75
Total Depth:	81.5 feet	Drilling Method:	4" Solid-Stem Auger & HQ Coring
Work Order:	4605-10	Driving Energy:	140 lb. wt., 30 in. drop

GEOLABS, INC.
Geotechnical Engineering

KALANIANAOLE HWY. IMPROVEMENTS
MAKAPUU, OAHU, HAWAII

Log of Boring 106

Approximate Ground Surface Elevation (feet MSL): 90 *

Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	USCS	Description
									6-inch ASPHALTIC CONCRETE
	24	81			41			GM	Grayish brown SILTY BASALTIC GRAVEL with sand, medium dense, damp (base material)
	11				58/.7' Ref.			CL	Brown SILTY CLAY with coralline gravel, stiff to very stiff, moist (fill)
	10	87			96		5	GW-GM	Brown BASALTIC GRAVEL with silt and sand, dense, dry to damp (colluvium)
	8				50		10		
			60						Gray and brown BASALTIC COBBLES AND BOULDERS with sand and gravel and some clay, medium dense to dense (colluvium)
							15		
			37						
							20		
			52		50/.2' Ref.				
							25		
			55						
							30		
	26				88				
			57						
							35		
			25						
							40		
					100/.9' Ref.				
			33						
							45		
			48		50/.5' Ref.				
							50		Gray and brown BASALTIC BOULDERS with cobbles, sand and gravel, dense (colluvium)
			48						
							55		

Date Started:	December 11, 2001	Water Level: ▽	Not Encountered
Date Completed:	December 14, 2001		
Logged By:	E. Shinsato	Drill Rig:	MOBILE B-80
Total Depth:	76.5 feet	Drilling Method:	4" Auger & HQ Coring
Work Order:	4605-10	Driving Energy:	140 lb. wt., 30 in. drop

ROBIN M. LIM
LICENSED PROFESSIONAL ENGINEER
No. 8436-C
HAWAII, U.S.A.

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BORING LOGS

Kalanianaole Highway Improvements
Retaining Wall at Makapuu, Oahu
Federal-Aid Project No. NH-072-1(51)

Scale: As Noted Date: April 2007

SHEET No. B-10 OF 14 SHEETS

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

LIB2: STATE\DOT\KALANIANAOLE\RETAINING WALL\CADD\

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-072-1(51)	2007	103	106

GEOLABS, INC.
Geotechnical Engineering

KALANIANAOLE HWY. IMPROVEMENTS
MAKAPUU, OAHU, HAWAII

Log of Boring 106

(Continued from previous plate)

Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	USCS	Description
			41		40/.3' Ref.				
							60		
			38		25/.0' Ref.				
							65		
			35		20/.0' Ref.				
							70		Gray vesicular BASALT with cemented basaltic gravel and coralline sediment, slightly fractured, moderately weathered, medium hard (beach rock)
			100	100	50/.3' Ref.				Gray vugular BASALT, moderately fractured, slightly to moderately weathered, hard (basalt formation)
							75		
			100	100					
									Boring terminated at 76.5 feet
							80		
							85		
							90		
							95		
							100		
							105		
							110		

Date Started:	December 11, 2001	Water Level: ▽	Not Encountered
Date Completed:	December 14, 2001		
Logged By:	E. Shinsato	Drill Rig:	MOBILE B-80
Total Depth:	76.5 feet	Drilling Method:	4" Auger & HQ Coring
Work Order:	4605-10	Driving Energy:	140 lb. wt., 30 in. drop

GEOLABS, INC.
Geotechnical Engineering

KALANIANAOLE HWY. IMPROVEMENTS
MAKAPUU, OAHU, HAWAII

Log of Boring 107

Approximate Ground Surface Elevation (feet MSL): 94 *

Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	USCS	Description
									4.5-inch ASPHALTIC CONCRETE
	10				39	>4.5		GM	Dark brown SILTY GRAVEL with sand, dense, damp (base material)
			33					CH	Grayish brown SILTY CLAY with sand and some gravel, hard, dry to damp (fill)
							5	GM	Gray BASALTIC COBBLES AND GRAVEL with clayey silt and sand, dense (colluvium)
			40			>4.5			Dark brown and gray CLAYEY COBBLES AND BOULDERS with some sand and gravel, medium dense, damp (colluvium)
							10		
LL=74 PI=49	18		49		43/.8' Ref.	>4.5 >4.5			
			62			3.5	15		
							20		
	29		73		35/.4' Ref.				
							25		
			68			2.0			
							30		Gray with tan and brown mottling moderately to highly weathered BASALTIC COBBLES AND BOULDERS in a silty sand matrix, dense (colluvium)
			68		10/.0' Ref.				
							35		
			45						
							40		
	4		74		10/.0' Ref.				
							45		
			33						Gray and brown SANDY SILT AND BASALTIC COBBLES AND BOULDERS, dense (colluvium)
							50		
	6		47		47/.5' +10/.1' Ref.				
							55		

Date Started:	November 30, 2001	Water Level: ▽	90 ft. 12/03/01 1200 HRS
Date Completed:	December 3, 2001		
Logged By:	Chiba & Shinsato	Drill Rig:	MOBILE B-80
Total Depth:	100.5 feet	Drilling Method:	4" Auger & HQ Coring
Work Order:	4605-10	Driving Energy:	140 lb. wt., 30 in. drop

ROBIN M. LIM
LICENSED PROFESSIONAL ENGINEER
No. 8436-C
HAWAII, U.S.A.

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BORING LOGS

Kalanianaole Highway Improvements
Retaining Wall at Makapuu, Oahu
Federal-Aid Project No. NH-072-1(51)

Scale: As Noted — Date: April 2007

SHEET No. B-11 OF 14 SHEETS

LIB2: STATE\DOT\KALANIANAOLE\RETAINING WALL\CADD\

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-072-1(51)	2007	104	106

GEOLABS, INC.
Geotechnical Engineering

KALANIANAOLE HWY. IMPROVEMENTS
MAKAPUU, OAHU, HAWAII

Log of Boring 107

(Continued from previous plate)

Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	USCS	Description
			40		10/.0' Ref.				
							60		
	6		35		20/.3' Ref.				
							65		
			54		50/.3' Ref.				
							70		
			75	49	50/.3' Ref.				Gray vugular BASALT, moderately fractured with some severely fractured seams, moderately weathered, medium hard (basalt formation)
							75		
			77	43					grades to closely fractured
							80		Tannish white cemented CORAL with traces of basaltic gravel and shells, moderately weathered, medium hard (coral formation)
			82	55					Grayish brown vesicular BASALT with traces of coralline sand cemented in basalt, closely fractured, moderately weathered, medium hard (basalt formation)
							85		Gray and brown BASALTIC ROCK, severely fractured, highly weathered, soft (clinker)
			5	0					
							▽ 90		
	11		0	0	30/.2' Ref.				
							95		
	16		100	100	40/.1' Ref.				Grayish brown vesicular BASALT, moderately to closely fractured, moderately weathered, medium hard (basalt formation)
							100		Boring terminated at 100.5 feet
							105		
							110		

Date Started:	November 30, 2001	Water Level: ▽	90 ft. 12/03/01 1200 HRS
Date Completed:	December 3, 2001		
Logged By:	Chiba & Shinsato	Drill Rig:	MOBILE B-80
Total Depth:	100.5 feet	Drilling Method:	4" Auger & HQ Coring
Work Order:	4605-10	Driving Energy:	140 lb. wt., 30 in. drop

GEOLABS, INC.
Geotechnical Engineering

KALANIANAOLE HWY. IMPROVEMENTS
MAKAPUU, OAHU, HAWAII

Log of Boring 108

Approximate Ground Surface Elevation (feet MSL): 90 *

Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	USCS	Description
								GM	4-inch ASPHALTIC CONCRETE
	15	102			50/.2' Ref.				Brown SILTY BASALTIC GRAVEL with some cobbles and sand, very dense, dry (base material)
LL=58 PI=34	14				67			CH	Brown SILTY CLAY with some moderately weathered basaltic gravel and sand, hard, damp (fill)
	15	97			40/.3' Ref.	>4.5	5		
			71						Brown and gray CLAYEY BASALTIC COBBLES with some boulders, gravel and sand, dense (colluvium)
							10		
			78						
							15		
			50						
							20		
	30		75		40/.3' Ref.				
							25		
			57						
							30		
			53						
							35	SC	Dark brown and gray CLAYEY SAND with basaltic cobbles and gravel, medium dense to dense (colluvium)
			17						
							40		
			37		30/.0' Ref.				
									Gray and brown CLAYEY BASALTIC COBBLES AND BOULDERS with sand and gravel, dense (colluvium)
							45		
	11		49		75/.8' Ref.				
							50		
			62		20/.0' Ref.				
							55		

Date Started:	December 4, 2001	Water Level: ▽	72.5 ft. 12/5/01 1500 HRS
Date Completed:	December 5, 2001		
Logged By:	E. Shinsato	Drill Rig:	MOBILE B-80
Total Depth:	100.5 feet	Drilling Method:	4" Auger & HQ Coring
Work Order:	4605-10	Driving Energy:	140 lb. wt., 30 in. drop

ROBIN M. LIM
LICENSED PROFESSIONAL ENGINEER
No. 8436-C
HAWAII, U.S.A.

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BORING LOGS

Kalanianaole Highway Improvements
Retaining Wall at Makapuu, Oahu
Federal-Aid Project No. NH-072-1(51)

Scale: As Noted *Date: April 2007*

SHEET No. B-12 OF 14 SHEETS

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

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-072-1(51)	2007	**105**	106

GEOLABS, INC. — Geotechnical Engineering

KALANIANAOLE HWY. IMPROVEMENTS, MAKAPUU, OAHU, HAWAII — Log of Boring 108

(Continued from previous plate)

Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	USCS	Description
			58						
			60				60		
			67				65		
			50	30			70		Grayish brown vesicular BASALT, moderately fractured, moderately weathered, medium hard (basalt formation)
									Tannish white cemented CORAL with some basaltic gravel and shells, severely to closely fractured, moderately weathered, medium hard to hard (coral formation)
			100	55			75		
			87	47			80		Grayish brown vesicular BASALT, slightly to moderately fractured, moderately weathered, medium hard (basalt formation)
			100	57			85		
			92	38			90		grades to severely fractured
									grades to highly weathered, soft
			93	63			95		grades to medium hard
									Gray vesicular BASALT, moderately fractured, slightly to moderately weathered, hard (basalt formation)
							100		Boring terminated at 100.5 feet
							105		
							110		

Date Started:	December 4, 2001	Water Level: ▽	72.5 ft. 12/5/01 1500 HRS
Date Completed:	December 5, 2001		
Logged By:	E. Shinsato	Drill Rig:	MOBILE B-80
Total Depth:	100.5 feet	Drilling Method:	4" Auger & HQ Coring
Work Order:	4605-10	Driving Energy:	140 lb. wt., 30 in. drop

GEOLABS, INC. — Geotechnical Engineering

KALANIANAOLE HWY. IMPROVEMENTS, MAKAPUU, OAHU, HAWAII — Log of Boring 109

Approximate Ground Surface Elevation (feet MSL): 84 *

Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	USCS	Description
									7-inch ASPHALTIC CONCRETE
	13	106			67			GM	Grayish brown SILTY BASALTIC GRAVEL with sand, very dense, dry (base material)
	4				16			GC	Brown CLAYEY BASALTIC GRAVEL with some sand, medium dense, moist (fill)
								SP	
	3	86			8		5		Tan fine to medium grained CORALLINE SAND, loose to medium dense, dry (dune sand deposit)
	4				25		10		
	26	85			78/.8' Ref.	>4.5	15	CH	Brown with multi-colored mottling SILTY CLAY with some weathered basaltic gravel and traces of coralline sand, very stiff, moist (colluvium)
									grades with some basaltic cobbles
LL=67 PI=40	75				23	>4.5	20		
									grades to hard
	32	88			81/.8' Ref.	>4.5	25		
									Gray and brown CLAYEY BASALTIC COBBLES with some boulders, sand and gravel, dense (colluvium)
	10		71		50/.3' Ref.		30		
			75				35		Gray and brown CLAYEY BASALTIC COBBLES with some boulders, sand and gravel, dense (colluvium)
			38				40		
			29		50/.4' Ref.		45		
	19		67		90/.8' Ref.		50		
							55		

Date Started:	December 6, 2001	Water Level: ▽	Not Encountered
Date Completed:	December 7, 2001		
Logged By:	E. Shinsato	Drill Rig:	MOBILE B-80
Total Depth:	95.5 feet	Drilling Method:	4" Auger & HQ Coring
Work Order:	4605-10	Driving Energy:	140 lb. wt., 30 in. drop

ROBIN M. LIM
LICENSED PROFESSIONAL ENGINEER
No. 8436-C
HAWAII, U.S.A.

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STATE OF HAWAII
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HIGHWAYS DIVISION

BORING LOGS

Kalanianaole Highway Improvements
Retaining Wall at Makapuu, Oahu
Federal-Aid Project No. NH-072-1(51)

Scale: As Noted — *Date: April 2007*

SHEET No. **B-13** OF **14** SHEETS

LIB2: STATE\DOT\KALANIANAOLE\RETAINING WALL\CADD\

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-072-1(51)	2007	106	106

GEOLABS, INC.
Geotechnical Engineering

KALANIANAOLE HWY. IMPROVEMENTS
MAKAPUU, OAHU, HAWAII

Log of Boring 109

(Continued from previous plate)

Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Description
			33					
			72		20/.0' Ref.		60	
			45	25			65	
	19		30	14	50/.3' Ref.		70	Gray and white BASALTIC BOULDERS with some coral, hard (colluvium) grades to severely fractured
			72	58	40/.0' Ref.		75	
			40	0			80	Tannish white cemented CORAL, severely fractured, moderately weathered, medium hard (coral formation)
			0	0	20/.0' Ref.		85	Gray vesicular BASALT, severely fractured, moderately weathered, medium hard (basalt formation) Gray and brown BASALT, severely fractured, highly weathered, soft (clinker)
			0	0	20/.0' Ref.		90	
							95	Boring terminated at 95.5 feet
							100	
							105	
							110	

Date Started:	December 6, 2001	Water Level: ▽	Not Encountered
Date Completed:	December 7, 2001		
Logged By:	E. Shinsato	Drill Rig:	MOBILE B-80
Total Depth:	95.5 feet	Drilling Method:	4" Auger & HQ Coring
Work Order:	4605-10	Driving Energy:	140 lb. wt., 30 in. drop

BORING_LOG_DOT 4605-10.GPJ GEOLABS.GDT 3/29/05

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

ROBIN M. LIM
LICENSED PROFESSIONAL ENGINEER
No. 8436-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION

SIGNATURE 4-30-08 EXPIRATION DATE OF THE LICENSE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BORING LOGS

Kalanianaole Highway Improvements
Retaining Wall at Makapuu, Oahu
Federal-Aid Project No. NH-072-1(51)

Scale: As Noted Date: April 2007

SHEET No. B-14 OF 14 SHEETS