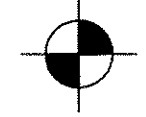


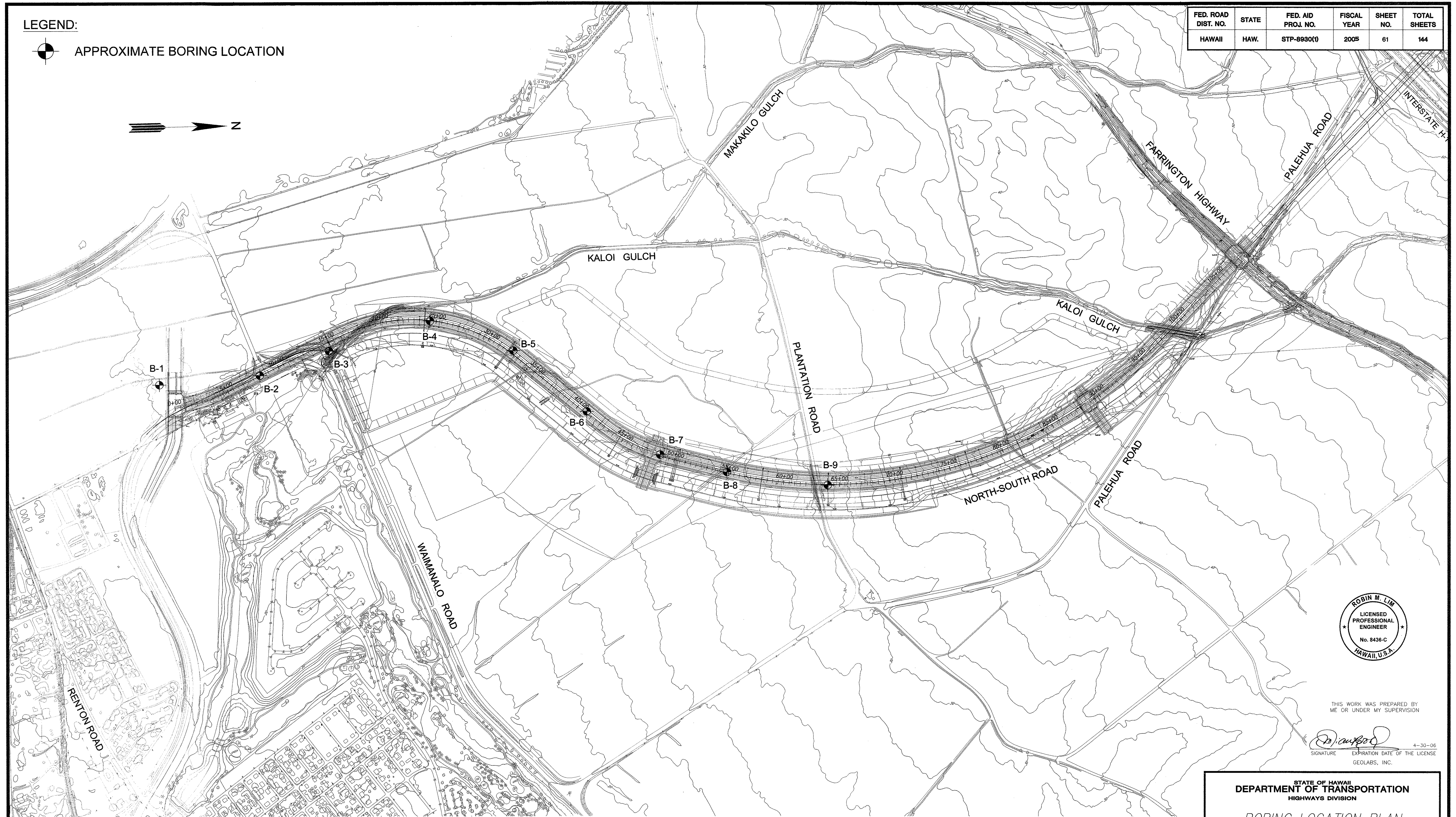
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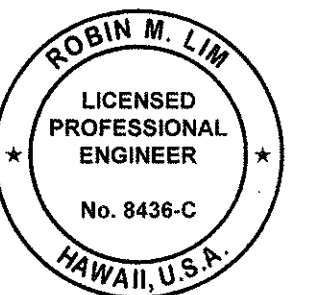
APPROXIMATE BORING LOCATION



FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-8930(1)	2005	61	144

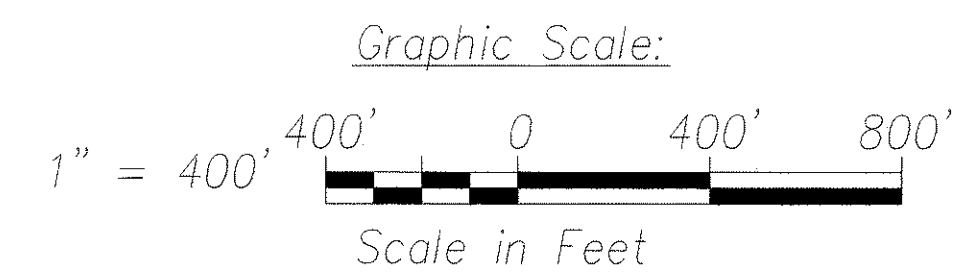


SURVEY PLOTTED BY	DATE
DRAWN BY	
DESIGNED BY	
QUANTITIES BY	
CHECKED BY	
ORIGINAL PLAN	
NOTE BOOK	
No.	



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STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

BORING LOCATION PLAN

North-South Road  
Phase 1A  
F.A.I. Proj. No. STP-8930(1)

Scale: 1" = 400' Date: Dec. 22, 2004

SHEET No. 60.1 OF 7 SHEETS

REFERENCE: SITE PLAN DOWNLOADED FROM R.M. TOWILL  
CORPORATION FTP WEBSITE ON AUGUST 3, 2004.



FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-8930(1)	2005	62	144

# Boring Log Legend

UNIFIED SOIL CLASSIFICATION SYSTEM (USCS)

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

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS

## LEGEND

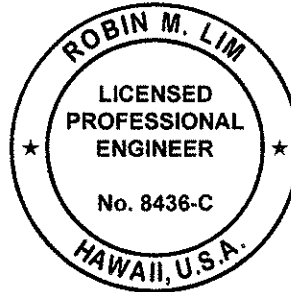


2-INCH O.D. STANDARD PENETRATION TEST  
3-INCH O.D. MODIFIED CALIFORNIA SAMPLE  
SHELBY TUBE SAMPLE  
GRAB SAMPLE  
CORE SAMPLE

LL LIQUID LIMIT  
PI PLASTICITY INDEX  
TV TORVANE SHEAR (tsf)  
PEN POCKET PENETROMETER (tsf)  
UC UNCONFINED COMPRESSION (psi)  
▽ WATER LEVEL OBSERVED IN BORING

## GEOTECHNICAL NOTES

- A geotechnical engineering report entitled "Geotechnical Engineering Exploration, North-South Road, Phase 1A, F.A.I. Proj. No. STP-8930(1), Ewa, Oahu, Hawaii" dated September 10, 2004 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.
- For boring locations, see Sheet G0.1.
- 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.
- 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.
- The data given is for general information only. Bidders shall examine the site and the boring data and draw their own conclusions therefrom as to the character of materials to be encountered. The Engineer will not assume responsibility for variations of subsoil quality or conditions other than at the boring locations shown and at the time the borings were taken.



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DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION


## BORING LOG LEGEND AND NOTES

North-South Road  
Phase 1A  
F.A.I. Proj. No. STP-8930(1)

Scale: NTS Date: Dec. 22, 2004

SHEET No. G11 OF 7 SHEETS

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











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

SIGNATURE W. J. Campbell EXPIRATION DATE OF THE LICENSE 4-30-06  
GEOLABS, INC.


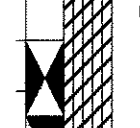
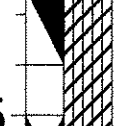
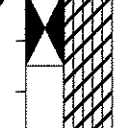
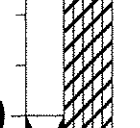
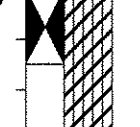
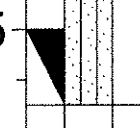
North-South Road  
Phase 1A  
F.A.I. Proj. No. STP-8930(1)


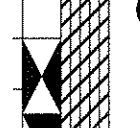
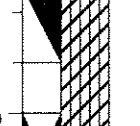
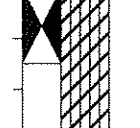
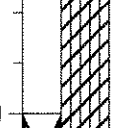
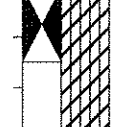
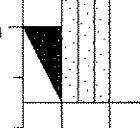
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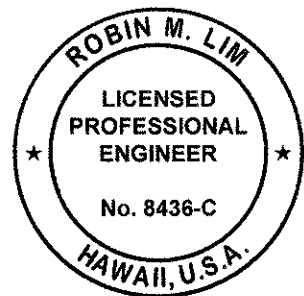
		<b>GEOLABS, INC.</b> Geotechnical Engineering						NORTH-SOUTH ROAD, PHASE 1A F.A.I. PROJ. NO. STP-8930(1) EWA, OAHU, HAWAII				Log of Boring <b>2</b>		
Other Tests		Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen (tsf)	Depth (feet)	Sample Graphic	USCS	Approximate Ground Surface Elevation (feet MSL): 60.7 *			
											Description			
		14	92			32				SW	1-inch ASPHALTIC CONCRETE			
		23				21	4.0			CL	Tan GRAVELLY SAND with silt, medium dense to dense, damp (fill)			
		21	101			41	>4.5	5			Brown with black mottling SILTY CLAY, very stiff, moist (alluvium) grades to hard			
		21	96			60	>4.5	10						
		19				60		15						
		16				30/.3' Ref.		20			grades with coralline sand Boring terminated at 20.3 feet			
								25						
								30						
								35						
								40						
								45						
								50						
								55						
Date Started: October 1, 1997										Water Level: 		Not Encountered		
Date Completed: October 1, 1997														
Logged By: S. Tanaka										Drill Rig: CME-75				
Total Depth: 20.3 feet										Drilling Method: 4" Auger				
Work Order: 3860-20										Driving Energy: 140 lb. wt., 30 in. drop				

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


FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-8930(1)	2005	64	144

	GEOLABS, INC.		NORTH-SOUTH ROAD, PHASE 1A		Log of Boring 3					
	Geotechnical Engineering		F.A.I. PROJ. NO. STP-8930(1) EWA, OAHU, HAWAII							
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): 64 *
										Description
	14	97			43	>4.5			CL	Brown SILTY CLAY with coralline sand, hard, damp (alluvium)
	18				38					
	19	112			59	>4.5	5			grades to moist
	19	106			84	>4.5	10			grades with black mottling
	10				87		15		SM	White SILTY CORALLINE SAND with coralline gravel, very dense, damp (coral formation)
					20/.0' Ref.		20			
	9				38		25			Boring terminated at 26.5 feet
							30			
							35			
							40			
							45			
							50			
							55			
Date Started: October 1, 1997					Water Level: ∅		Not Encountered			
Date Completed: October 1, 1997					Drill Rig: CME-75					
Logged By: S. Tanaka					Drilling Method: 4" Auger					
Total Depth: 26.5 feet					Driving Energy: 140 lb. wt., 30 in. drop					
Work Order: 3860-20										

	GEOLABS, INC.		NORTH-SOUTH ROAD, PHASE 1A		Log of Boring 4					
	Geotechnical Engineering		F.A.I. PROJ. NO. STP-8930(1) EWA, OAHU, HAWAII							
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): 68.9 *
										Description
	16	96			37	>4.5			CL	Brown SILTY CLAY, hard, damp (alluvium)
	15				31					
	16	105			76	>4.5	5			grades with black mottling
	21	106			83	>4.5	10			grades to moist
	15				50/.5' Ref.		15			grades with coralline sand
					20/.0' Ref.		20		SM	Tan SILTY CORALLINE SAND with coralline gravel, medium dense, damp (coral formation)
	8				24		25			Boring terminated at 26.5 feet
							30			
							35			
							40			
							45			
							50			
							55			
Date Started: October 1, 1997					Water Level: ∅		Not Encountered			
Date Completed: October 1, 1997					Drill Rig: CME-75					
Logged By: S. Tanaka					Drilling Method: 4" Auger					
Total Depth: 26.5 feet					Driving Energy: 140 lb. wt., 30 in. drop					
Work Order: 3860-20										



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STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

*BORING LOGS*


*North-South Road  
Phase 1A  
F.A.I. Proj. No. STP-8930(1)*


Scale: NTS      Date: Dec. 22, 2004

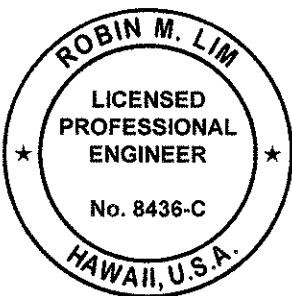
SHEET No. G13 OF 7 SHEETS



FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-8930(1)	2005	65	144

	GEOLABS, INC. Geotechnical Engineering		NORTH-SOUTH ROAD, PHASE 1A F.A.I. PROJ. NO. STP-8930(1) EWA, OAHU, HAWAII				Log of Boring 5					
	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): 75.5 *	Description
		15	87			66	>4.5			CL		Brown SILTY CLAY, hard, damp (alluvium)
		15				52						
		15	90			50/.3' Ref.	>4.5	5				grades with black mottling
		20	104			79	>4.5	10				grades to moist
		14				50/.3' Ref.		15				grades with coralline sand and gravel
		16				50/.3' Ref.		20				
		18				50/.5' Ref.		25				Boring terminated at 25.5 feet
								30				
								35				
								40				
								45				
								50				
								55				
Date Started: October 1, 1997												Water Level: ∇ Not Encountered
Date Completed: October 1, 1997												
Logged By: S. Tanaka												Drill Rig: CME-75
Total Depth: 25.5 feet												Drilling Method: 4" Auger
Work Order: 3860-20												Driving Energy: 140 lb. wt., 30 in. drop

	GEOLABS, INC. Geotechnical Engineering		NORTH-SOUTH ROAD, PHASE 1A F.A.I. PROJ. NO. STP-8930(1) EWA, OAHU, HAWAII				Log of Boring 6					
	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): 80.4 *	Description
		16	98			46	>4.5			CL		Brown SILTY CLAY, hard, damp (alluvium)
		7				39						grades with coralline sand
		16	117			50/.5' +30/.3' Ref.	>4.5	5				
		22	109			59	>4.5	10				grades to moist
		20				42		15				
		18				31/.5' +50/.3' Ref.		20				Boring terminated at 21.3 feet
								25				
								30				
								35				
								40				
								45				
								50				
								55				
Date Started: September 30, 1997												Water Level: ∇ Not Encountered
Date Completed: September 30, 1997												
Logged By: S. Tanaka												Drill Rig: CME-75
Total Depth: 21.3 feet												Drilling Method: 4" Auger
Work Order: 3860-20												Driving Energy: 140 lb. wt., 30 in. drop




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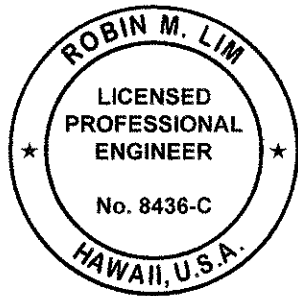
STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION	
BORING LOGS	
North-South Road Phase 1A F.A.I. Proj. No. STP-8930(1)	
Scale: NTS	Date: Dec. 22, 2004
SHEET No. G14 OF 7 SHEETS	

ORIGINAL PLAN	No.	CHECKED BY	DESIGNED BY	TRACED BY	DATE


FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-8930(1)	2005	66	144

	GEOLABS, INC.		NORTH-SOUTH ROAD, PHASE 1A		Log of Boring														
	Geotechnical Engineering		F.A.I. PROJ. NO. STP-8930(1) EWA, OAHU, HAWAII		7														
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): 82 *									
										Description									
LL=46 PI=30	16	90			55	>4.5			CL	Brown SILTY CLAY, hard, damp (alluvium)									
	17				44					grades with black mottling									
	19	108			84	>4.5	5			grades with coralline sand									
	20	104			78	>4.5	10			grades to moist									
	20				58		15												
	18				50/.5' Ref.		20												
	17				50/.5' Ref.		25			Boring terminated at 25.5 feet									
										30									
										35									
										40									
										45									
										50									
										55									
Date Started: September 30, 1997					Water Level: $\nabla$ Not Encountered														
Date Completed: September 30, 1997																			
Logged By: S. Tanaka					Drill Rig: CME-75														
Total Depth: 25.5 feet					Drilling Method: 4" Auger														
Work Order: 3860-20					Driving Energy: 140 lb. wt., 30 in. drop														

	GEOLABS, INC.		NORTH-SOUTH ROAD, PHASE 1A		Log of Boring														
	Geotechnical Engineering		F.A.I. PROJ. NO. STP-8930(1) EWA, OAHU, HAWAII		8														
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): 88.6 *									
										Description									
	16	103			92	>4.5			CL	Brown with black mottling SILTY CLAY, hard, damp (alluvium)									
	16				48/.5' +50/.3' Ref.					grades with a little coralline sand									
	17	107			50/.3' Ref.	>4.5	5												
	17	114			48/.5' +50/.3' Ref.	>4.5	10			grades to moist									
	19				66		15												
	20				74		20												
											Boring terminated at 21.5 feet								
										25									
										30									
										35									
										40									
										45									
										50									
										55									
Date Started: September 30, 1997					Water Level: $\nabla$ Not Encountered														
Date Completed: September 30, 1997																			
Logged By: S. Tanaka					Drill Rig: CME-75														
Total Depth: 21.5 feet					Drilling Method: 4" Auger														
Work Order: 3860-20					Driving Energy: 140 lb. wt., 30 in. drop														



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4-30-06  
GEOLABS, INC.

STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION


BORING LOGS

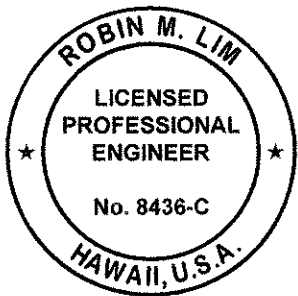
North-South Road  
Phase 1A  
F.A.I. Proj. No. STP-8930(1)

Scale: NTS Date: Dec. 22, 2004


SHEET No. G15 OF 7 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-8930(1)	2005	67	144

		GEOLABS, INC. Geotechnical Engineering		NORTH-SOUTH ROAD, PHASE 1A F.A.I. PROJ. NO. STP-8930(1) 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	Approximate Ground Surface Elevation (feet MSL): 101.7 *
										Description
	17	90			38	>4.5			CL	Brown SILTY CLAY, hard, damp (alluvium)
	16				24					
	20	107			83	>4.5	5			grades with black mottling
	19	114			99	>4.5	10			grades with some coralline sand, moist
	20				52		15			
	18				48/5' +30/2' Ref.		20			Boring terminated at 21.2 feet
							25			
							30			
							35			
							40			
							45			
							50			
							55			
Date Started:		September 30, 1997		Water Level: ▽		Not Encountered				
Date Completed:		September 30, 1997		Drill Rig:		CME-75				
Logged By:		S. Tanaka		Drilling Method:		4" Auger				
Total Depth:		21.2 feet		Driving Energy:		140 lb. wt., 30 in. drop				
Work Order:		3860-20								



THIS WORK WAS PREPARED BY  
ME OR UNDER MY SUPERVISION

 4-30-06  
SIGNATURE EXPIRATION DATE OF THE LICENSE  
GEOLABS, INC.

STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION	
BORING LOGS	
North-South Road Phase 1A F.A.I. Proj. No. STP-8930(1)	
Scale: NTS	Date: Dec. 22, 2004
SHEET No. G16 OF 7 SHEETS	

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