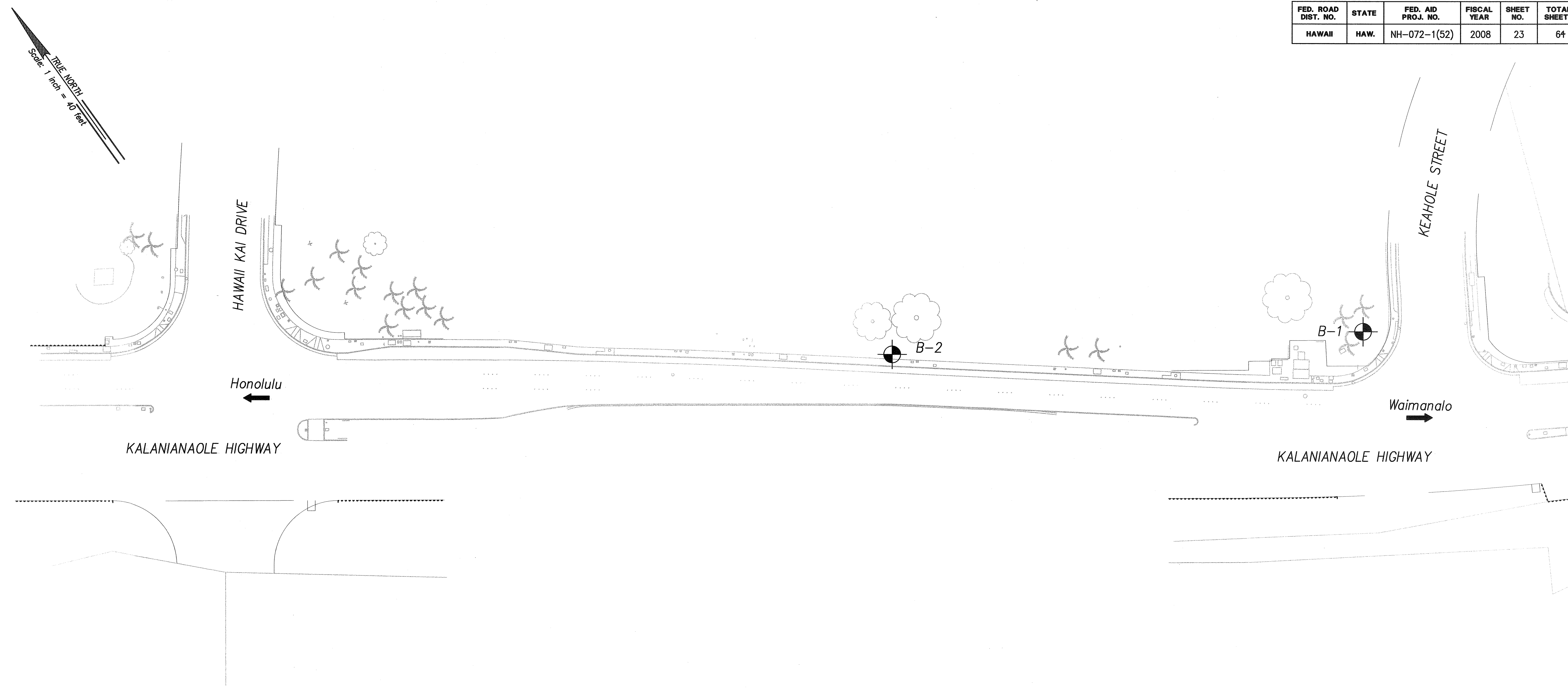


FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-072-1(52)	2008	23	64

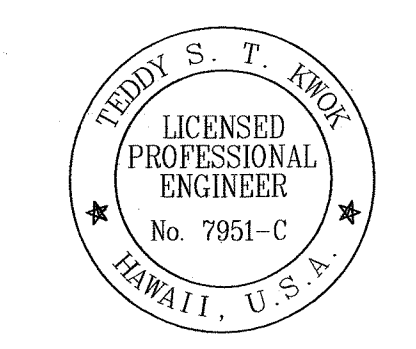


**LEGEND:**

 APPROXIMATE BORING LOCATION

REFERENCE: PRELIMINARY LAYOUT PLAN TRANSMITTED BY KN CONSULTING SERVICES, INC. ON OCTOBER 7, 2004.

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



*Teddy S. T. Kwok*  
 SIGNATURE  
 APRIL 30, 2010  
 EXPIRATION DATE OF LICENSE  
 THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION  
 GEOLABS, INC.

STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

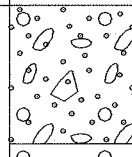

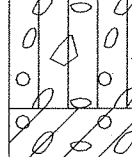
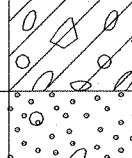
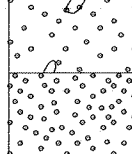
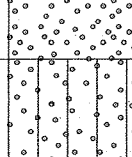
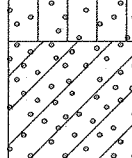
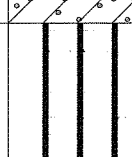
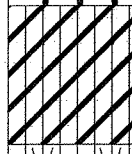

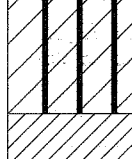
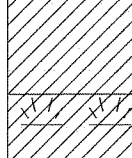
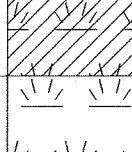
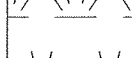
**BORING LOCATION PLAN**

KALANIANA'OLE HIGHWAY IMPROVEMENTS  
VICINITY OF HAWAII KAI DRIVE  
TO KEAHOLE STREET  
FEDERAL-AID PROJECT NO. NH-072-1(52)  
SCALE: 1" = 40' DATE: November 2008

**SHEET No. C-18 OF 22 SHEETS**

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	
				OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY	
	50% OR MORE OF MATERIAL PASSING THROUGH NO. 200 SIEVE	SILTS AND CLAYS	LIQUID LIMIT 50 OR MORE		MH	INORGANIC SILT, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS
					CH	INORGANIC CLAYS OF HIGH PLASTICITY
					OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
HIGHLY ORGANIC SOILS				PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS	

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS

LEGEND

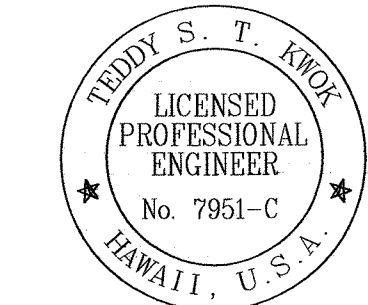
- 2-INCH O.D. STANDARD PENETRATION TEST
- 3-INCH O.D. MODIFIED CALIFORNIA SAMPLE
- SHELBY TUBE SAMPLE
- GRAB SAMPLE
- CORE SAMPLE

- 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

1. A geotechnical engineering report entitled "Geotechnical Engineering Exploration, Kalaniana'ole Highway Improvements, Keahole Street to Hawaii Kai Drive, Hawaii Kai, Oahu, Hawaii" dated March 4, 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 Sheet C-17.
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 _____	DATE _____
	DRAWN BY _____	DESIGNED BY _____
	NOTE BOOK	QUANTITIES BY _____
	NO. _____	CHECKED BY _____



Teddy S. T. Knok  
SIGNATURE  
APRIL 30, 2010  
EXPIRATION DATE OF LICENSE  
THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION  
GEOLABS, INC.

STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

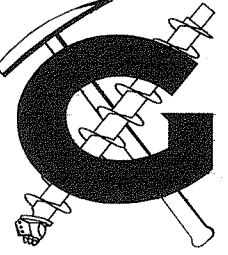
BORING LOG LEGEND  
AND NOTES


KALANIANA'OLE HIGHWAY IMPROVEMENTS  
VICINITY OF HAWAII KAI DRIVE  
TO KEAHOLE STREET  
FEDERAL-AID PROJECT NO. NH-072-1(52)  
DATE: November 2008

SHEET No. C-19 OF 22 SHEETS

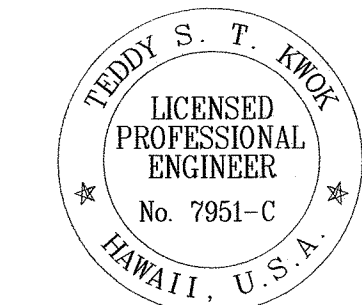


FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-072-1(52)	2008	25	64

		GEOLABS, INC. Geotechnical Engineering		KALANIANA'OLE HIGHWAY IMPROVEMENTS KEAHOLE STREET TO HAWAII KAI DRIVE HAWAII KAI, OAHU, HAWAII		Log of Boring <b>1</b>	
Laboratory		Field		Approximate Ground Surface Elevation (feet MSL): 4.8 *		Description	
Other Tests	Moisture Content (%)	Dry Density (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)		
LL=85 PI=61	40	74			18		MH Tannish gray CLAYEY SILT with some sand, medium stiff, moist (fill)
	62				4		CH Light brown SILTY CLAY with sand and some gravel, medium stiff to stiff, moist (fill)
	89	50			3		grades to tannish gray, soft
	30				8		SM Light grayish white SILTY SAND with clay and some finger coral, very loose (coralline detritus)
	33				2		grades to light tannish gray
43					2		grades to dark tannish gray
Boring terminated at 21.5 feet * Elevations estimated from Preliminary Layout Plan transmitted by KN Consulting Services, Inc. on October 7, 2004.							
Date Started: February 3, 2005		Water Level: 4.8 ft. 2/3/05 1120 HRS		Plate		A - 1	
Date Completed: February 3, 2005							
Logged By: F. Meyer		Drill Rig: CME-75					
Total Depth: 21.5 feet		Drilling Method: 4" Solid-Stem Auger & T.C. Finger Bit					
Work Order: 5389-00(A)		Driving Energy: 140 lb. wt., 30 in. drop					

		GEOLABS, INC. Geotechnical Engineering		KALANIANA'OLE HIGHWAY IMPROVEMENTS KEAHOLE STREET TO HAWAII KAI DRIVE HAWAII KAI, OAHU, HAWAII		Log of Boring <b>2</b>	
Laboratory		Field		Approximate Ground Surface Elevation (feet MSL): 4.6 *		Description	
Other Tests	Moisture Content (%)	Dry Density (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)		
	42	72			11		MH Brown CLAYEY SILT with sand, stiff, moist (fill)
	44				4		CH Light brown SILTY CLAY with organic matter, soft, moist (fill)
	96	48			4		grades to gray
	45				3		SM Gray and white SILTY SAND, loose
	41				4		CH Gray SILTY CLAY, very soft
	40	83			4		SM Gray SILTY FINE SAND, loose
							GC Light gray CLAYEY CORALLINE GRAVEL, very loose
	45				3		CH Gray SILTY CLAY, very soft
	56				1/1.5'		Boring terminated at 21.5 feet
Boring terminated at 21.5 feet							
Date Started: February 3, 2005		Water Level: 4.7 ft. 2/3/05 1350 HRS		Plate		A - 2	
Date Completed: February 3, 2005							
Logged By: F. Meyer		Drill Rig: CME-75					
Total Depth: 21.5 feet		Drilling Method: 4" Solid-Stem Auger & T.C. Finger Bit					
Work Order: 5389-00(A)		Driving Energy: 140 lb. wt., 30 in. drop					

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



Teddy S. T. Kwok  
SIGNATURE  
APRIL 30, 2010  
EXPIRATION DATE OF LICENSE  
THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION  
GEOLABS, INC.

STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION	
BORING LOGS	
KALANIANA'OLE HIGHWAY IMPROVEMENTS VICINITY OF HAWAII KAI DRIVE TO KEAHOLE STREET FEDERAL-AID PROJECT NO. NH-072-1(52) DATE: November 2008	
SHEET No. C-20 OF 22 SHEETS	