FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	CMAQ-076-1(8)	2004	99	127

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
	MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	LESS THAN 5% FINES	GP	POORLY-GRADED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES
		GRAVELS WITH FINES	GM	SILTY GRAVELS, GRAVEL-SAND-SILT MIXTURES
		MORE THAN 12% FINES	GC	CLAYEY GRAVELS, GRAVEL-SAND-CLAY MIXTURES
MORE THAN 50% OF MATERIAL RETAINED ON NO. 200 SIEVE	SANDS	CLEAN SANDS	SW	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
	50% OR MORE OF COARSE FRACTION PASSING THROUGH NO. 4 SIEVE	LESS THAN 5% FINES	SP	POORLY-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
		SANDS WITH FINES	SM	SILTY SANDS, SAND-SILT MIXTURES
		MORE THAN 12% FINES	SC	CLAYEY SANDS, SAND-CLAY MIXTURES
FINE-GRAINED SOILS	SILTS AND CLAYS	LIQUID LIMIT LESS THAN 50	ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY
			CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
			OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
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	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	▽	WATER LEVEL OBSERVED IN BORING

GEOTECHNICAL NOTES

1. A geotechnical engineering report entitled "Geotechnical Engineering Exploration, Fort Weaver Road (Route76) Widening, Near Lalaunui Street, Ewa, Oahu, Hawaii" dated June 24, 2002 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 18 to 23.

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
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 LOG
LEGEND AND NOTES

FORT WEAVER ROAD WIDENING
NEAR LAULAUNUI STREET

FEDERAL AID PROJECT NO. CMAQ-076-1(8)

SCALE: AS NOTED DATE: October 2003

SHEET No. 1 OF 5 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	CMAQ-076-1(8)	2004	100	127

GEOLABS, INC.
Geotechnical Engineering

FORT WEAVER ROAD (ROUTE 76) WIDENING
NEAR LAULAUNUI STREET
EWA, OAHU, HAWAII

Log of Boring 1

Approximate Ground Surface Elevation (feet MSL): 63 *

Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample	Graphic	USCS	Description
										CL	Brown SILTY CLAY, very stiff, dry to damp (fill)
LL=38 PI=22	11	83			49						
	14				32						
	13				50/.3'		5			MH-CH	Brown SILTY CLAY, hard, dry (alluvium)
	19				50/.3'		10				
	18				21		15			SM-SP	Brown SILTY SAND, medium dense, dry (cinder)
											Boring terminated at 16.5 feet
							20				* Elevations estimated from Topographic Survey Map transmitted by KN Consulting Services, Inc. on February 27, 2002.
							25				

Date Started:	March 26, 2002	Water Level: ▽	Not Encountered
Date Completed:	March 26, 2002		
Logged By:	S. Latronic	Drill Rig:	CME-55
Total Depth:	16.5 feet	Drilling Method:	4" Auger
Work Order:	4870-00	Driving Energy:	140 lb. wt., 30 in. drop

BORING LOG.DGT 4870-00.GPJ GEOLABS.GDT 4/11/03

GEOLABS, INC.
Geotechnical Engineering

FORT WEAVER ROAD (ROUTE 76) WIDENING
NEAR LAULAUNUI STREET
EWA, OAHU, HAWAII

Log of Boring 2

Approximate Ground Surface Elevation (feet MSL): 60 *

Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample	Graphic	USCS	Description
	16				19					MH	Brown CLAYEY SILT, very stiff, damp (fill)
	15	102			90					CL	Brown SILTY CLAY, hard, damp (alluvium)
LL=46 PI=27	16	101			40		5				
	15				24		10				
	26				21		15			ML	Brown SILT, very stiff, dry (alluvium)
											Boring terminated at 16.5 feet
							20				
							25				

Date Started:	March 26, 2002	Water Level: ▽	Not Encountered
Date Completed:	March 26, 2002		
Logged By:	S. Latronic	Drill Rig:	CME-55
Total Depth:	16.5 feet	Drilling Method:	4" Auger
Work Order:	4870-00	Driving Energy:	140 lb. wt., 30 in. drop

BORING LOG.DGT 4870-00.GPJ GEOLABS.GDT 4/11/03

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 1 AND 2

FORT WEAVER ROAD WIDENING
NEAR LAULAUNUI STREET

FEDERAL AID PROJECT NO. CMAQ-076-1(8)

SCALE: AS NOTED DATE: October 2003

SHEET No. 2 OF 5 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	CMAQ-076-1(8)	2004	101	127

GEOLABS, INC.
Geotechnical Engineering

FORT WEAVER ROAD (ROUTE 76) WIDENING
NEAR LAULAUNUI STREET
EWA, OAHU, HAWAII

Log of Boring 3

Approximate Ground Surface Elevation (feet MSL): 56 *

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	2-inch ASPHALTIC CONCRETE
	8	98			42					GW	Reddish brown SANDY GRAVEL, dense, damp (fill)
	17				8					MH	Brown CLAYEY SILT, medium to stiff, damp (alluvium)
	24	98			15		5				
	15				50/.3'		10			SM	Light brown SILTY SAND AND GRAVEL, dense, damp (weathered tuff)
	7				37/.5' +50/.3'		15				Boring terminated at 15.9 feet
							20				
							25				

Date Started:	March 25, 2002	Water Level: ⊽	Not Encountered
Date Completed:	March 25, 2002		
Logged By:	F. Meyer	Drill Rig:	CME-55
Total Depth:	15.9 feet	Drilling Method:	4" Auger w/ TC Bit
Work Order:	4870-00	Driving Energy:	140 lb. wt., 30 in. drop

BORING_LOG_DOT 4870-00.GPJ GEOLABS.GDT 4/11/02

GEOLABS, INC.
Geotechnical Engineering

FORT WEAVER ROAD (ROUTE 76) WIDENING
NEAR LAULAUNUI STREET
EWA, OAHU, HAWAII

Log of Boring 4

Approximate Ground Surface Elevation (feet MSL): 52 *

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
	9				15					GW	Reddish brown SANDY GRAVEL, loose to medium, damp (fill)
	23	99			25					CH	Brown SILTY CLAY, stiff, damp (alluvium)
	22				18		5				
	18				50/.3'		10			SM	Light brown SILTY SAND, dense, damp
	16				50/.3'		15				Boring terminated at 15.3 feet
							20				
							25				

Date Started:	March 25, 2002	Water Level: ⊽	Not Encountered
Date Completed:	March 25, 2002		
Logged By:	F. Meyer	Drill Rig:	CME-55
Total Depth:	15.3 feet	Drilling Method:	4" Auger w/ TC Bit
Work Order:	4870-00	Driving Energy:	140 lb. wt., 30 in. drop

BORING_LOG_DOT 4870-00.GPJ GEOLABS.GDT 4/11/02

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

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BORING LOGS 3 AND 4

FORT WEAVER ROAD WIDENING
NEAR LAULAUNUI STREET

FEDERAL AID PROJECT NO. CMAQ-076-1(8)

SCALE: AS NOTED DATE: October 2003

SHEET No. 3 OF 5 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	CMAQ-076-1(8)	2004	102	127

GEOLABS, INC.
Geotechnical Engineering

FORT WEAVER ROAD (ROUTE 76) WIDENING
NEAR LAULAUNUI STREET
EWA, OAHU, HAWAII

Log of Boring 5

Approximate Ground Surface Elevation (feet MSL): 38 *

Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample	Graphic	USCS	Description
											3-inch ASPHALTIC CONCRETE
	5				27					GW	Reddish tan SANDY GRAVEL, medium dense, damp (fill)
	21	77			39					SM	Light brown SILTY SAND, dense, damp
	15				17		5				
	30	75			73		10				
	30				43		15				
											Boring terminated at 16.5 feet
							20				
							25				

Date Started:	March 25, 2002	Water Level: ▽	Not Encountered
Date Completed:	March 25, 2002		
Logged By:	F. Meyer	Drill Rig:	CME-55
Total Depth:	16.5 feet	Drilling Method:	4" Auger w/ TC Bit
Work Order:	4870-00	Driving Energy:	140 lb. wt., 30 in. drop

BORING LOG (DOT 4870-00).GPJ GEOLABS.GDT 4/1/03

GEOLABS, INC.
Geotechnical Engineering

FORT WEAVER ROAD (ROUTE 76) WIDENING
NEAR LAULAUNUI STREET
EWA, OAHU, HAWAII

Log of Boring 6

Approximate Ground Surface Elevation (feet MSL): 19 *

Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample	Graphic	USCS	Description
	27				24					MH	Brown CLAYEY SILT, very stiff, damp (fill)
	30	88			46						
	21	97			61		5			SM	Orange-brown SILTY SAND, dense, damp (cinder)
	41				6	.25	10			MH	Brown CLAYEY SILT, medium stiff, moist (alluvium)
	28				53		15				grades to wet
										GM	Brownish gray SILTY GRAVEL, dense, moist (alluvium)
											Boring terminated at 16.5 feet
							20				
							25				

Date Started:	March 26, 2002	Water Level: ▽	11.1 ft. 4/26/02 1056 HRS 10.6 ft. 3/26/02 1115 HRS
Date Completed:	March 26, 2002		
Logged By:	S. Latronic	Drill Rig:	CME-55
Total Depth:	16.5 feet	Drilling Method:	4" Auger
Work Order:	4870-00	Driving Energy:	140 lb. wt., 30 in. drop

BORING LOG (DOT 4870-00).GPJ GEOLABS.GDT 4/1/03

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

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BORING LOGS 5 AND 6

FORT WEAVER ROAD WIDENING
NEAR LAULAUNUI STREET

FEDERAL AID PROJECT NO. CMAQ-076-1(8)

SCALE: AS NOTED DATE: October 2003

SHEET No. 4 OF 5 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	CMAQ-076-1(8)	2004	103	127

GEOLABS, INC.
Geotechnical Engineering

FORT WEAVER ROAD (ROUTE 76) WIDENING
NEAR LAULAUNUI STREET
EWA, OAHU, HAWAII

Log of Boring 7

Approximate Ground Surface Elevation" "(feet MSL): 68 *

Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample	Graphic	USCS	Description
										CL	Tannish brown SILTY CLAY with sand, very soft, dry
LL=42 PI=20	15	64			8	<0.5					VOID at 0.5 feet
											grades to dark brown with black mottling, very hard, damp
	20				29	>4.5					
	17	91			15/.1' Ref.	>4.5	5				
										SM	Dark brown SILTY SAND, very dense, damp
	9				30/.5' +15/.3' Ref.		10				
											grades with traces of clay
	19				39		15				
										MH	Dark brown CLAYEY SILT with sand, very hard, damp
	22				55	>4.5	20				
											Boring terminated at 21.5 feet
											* Elevations estimated from Topographic Survey Map transmitted by KN Consulting Services, Inc. on May 27, 2003.
							25				

Date Started:	May 29, 2003	Water Level: ▽	Not encountered
Date Completed:	May 29, 2003		
Logged By:	Y. Chiba	Drill Rig:	MOBILE B-80
Total Depth:	21.5 feet	Drilling Method:	4" Auger
Work Order:	4870-00(B)	Driving Energy:	140 lb. wt., 30 in. drop

BORING_LOG_DOT 4870-26.GPJ GEOLAB.GDT 7/7/03

GEOLABS, INC.
Geotechnical Engineering

FORT WEAVER ROAD (ROUTE 76) WIDENING
NEAR LAULAUNUI STREET
EWA, OAHU, HAWAII

Log of Boring 8

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
										CL	Brown SANDY CLAY with some gravel, hard, dry (fill)
	7	94			15/.3' Ref.	>4.5					
LL=42 PI=21	18				38	>4.5					grades to SILTY CLAY, very hard
	17	87			15/.3' Ref.	>4.5	5				
											grades with black mottling
	15				33/.5' +15/.3' Ref.	>4.5	10				
										SM	Brown strongly cemented SILTY SAND, very dense, damp
	11				30/.3' Ref.		15				
	16				30/.3' Ref.		20				
											Boring terminated at 20.3 feet
							25				

Date Started:	May 29, 2003	Water Level: ▽	Not encountered
Date Completed:	May 29, 2003		
Logged By:	Y. Chiba	Drill Rig:	MOBILE B-80
Total Depth:	20.3 feet	Drilling Method:	4" Auger
Work Order:	4870-00(B)	Driving Energy:	140 lb. wt., 30 in. drop

BORING_LOG_DOT 4870-26.GPJ GEOLAB.GDT 7/7/03

SURVEY PLOTTED BY
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DESIGNED BY
QUANTITIES BY
CHECKED BY
DATE

ORIGINAL PLAN
NOTE BOOK
No.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BORING LOGS 7 AND 8

FORT WEAVER ROAD WIDENING
NEAR LAULAUNUI STREET

FEDERAL AID PROJECT NO. CMAQ-076-1(8)

SCALE: AS NOTED DATE: October 2003

SHEET No. 5 OF 5 SHEETS