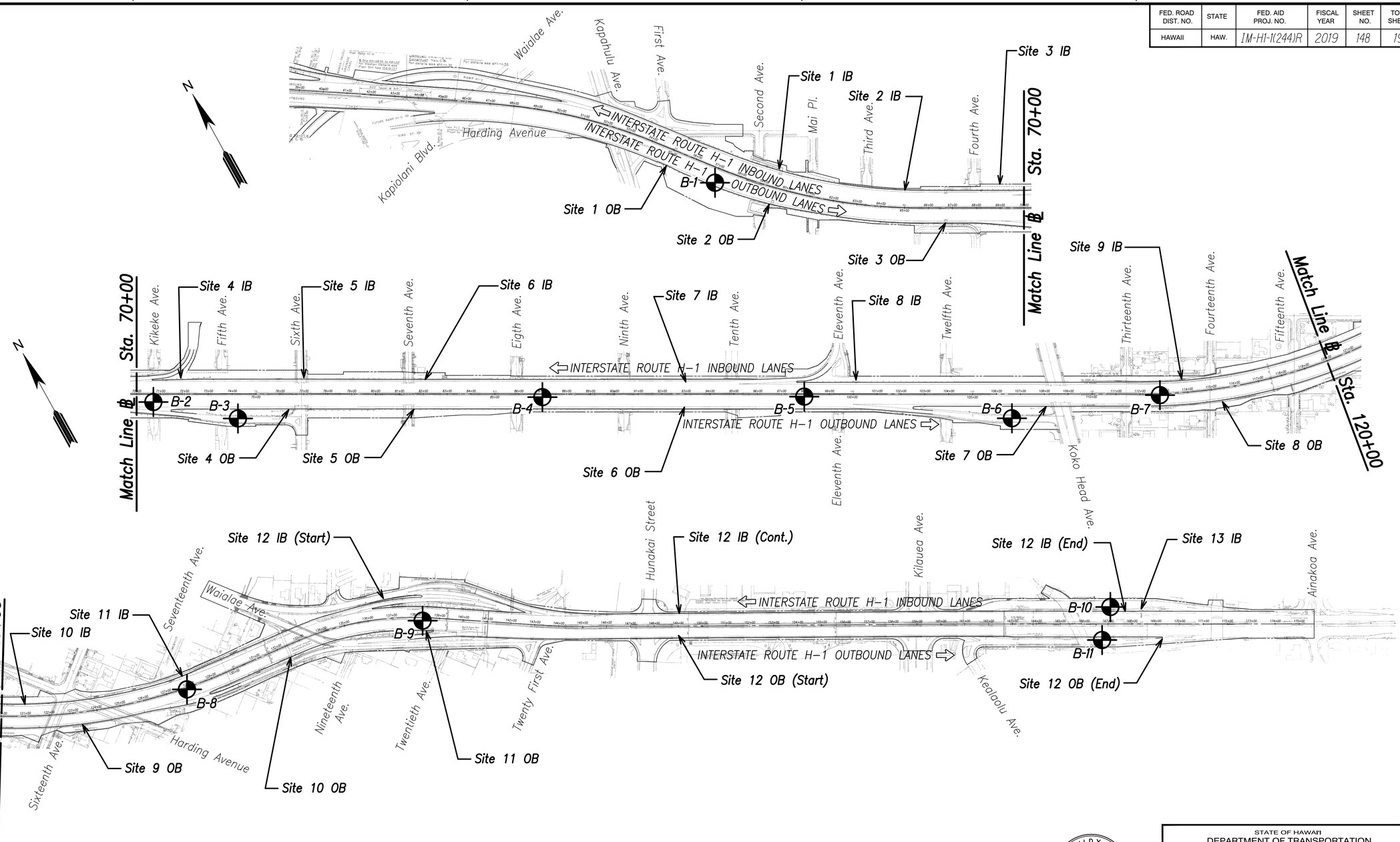
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(244)R	2019	148	190



LEGEND:

Approximate Boring Location

0 200 400 800 1200 Ft.

Graphic Scale

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

DRAWING NAME: A:\DRAFTING\DRAFTING\COMPLETED\47\6099-00_H-1GUARDRAILKAPOLIANITOANNAKOA\148-G-1.DWG PLOT TIME: 11-22-21, 10:20 PM

GERALD Y. SEKI
LICENSED PROFESSIONAL ENGINEER
No. 5635-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

GEOLABS, INC. APRIL 30, 2020. LIC. EXP. DATE

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BORING LOCATION PLAN

INTERSTATE ROUTE H-1 Guardrail and Shoulder Improvements, Kapiolani Interchange to Ainakoa Avenue Federal-Aid Project No. IM-HI-1(244)R

Scale: As Shown Date: July 2018

SHEET No. G-1 OF 6 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(244)R	2019	149	190

GEOLABS, INC.
Geotechnical Engineering

Soil 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
	SANDS	CLEAN SANDS	SW	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
MORE THAN 50% OF MATERIAL RETAINED ON NO. 200 SIEVE		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	LL	LIQUID LIMIT (NP=NON-PLASTIC)
	(3-INCH) O.D. MODIFIED CALIFORNIA SAMPLE	PI	PLASTICITY INDEX (NP=NON-PLASTIC)
	SHELBY TUBE SAMPLE	TV	TORVANE SHEAR (tsf)
	GRAB SAMPLE	PEN	POCKET PENETROMETER (tsf)
	CORE SAMPLE	UC	UNCONFINED COMPRESSION (ksf)
	WATER LEVEL OBSERVED IN BORING AT TIME OF DRILLING	TXUU	UNCONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION (ksf)
	WATER LEVEL OBSERVED IN BORING AFTER DRILLING		
	WATER LEVEL OBSERVED IN BORING OVERNIGHT		

Plate
A-0.1

LOG LEGEND FOR SOIL 6099-00.GPJ GEOLABS.GDT 7/12/16

GEOLABS, INC.
Geotechnical Engineering

Soil Classification Log Key
(with deviations from ASTM D2488)

GEOLABS, INC. CLASSIFICATION*

GRANULAR SOIL (- #200 <50%)	COHESIVE SOIL (- #200 ≥50%)
• PRIMARY constituents are composed of the largest percent of the soil mass. Primary constituents are capitalized and bold (i.e., GRAVEL, SAND)	• PRIMARY constituents are based on plasticity. Primary constituents are capitalized and bold (i.e., CLAY, SILT)
• SECONDARY constituents are composed of a percentage less than the primary constituent. If the soil mass consists of 12 percent or more fines content, a cohesive constituent is used (SILTY or CLAYEY); otherwise, a granular constituent is used (GRAVELLY or SANDY) provided that the secondary constituent consists of 20 percent or more of the soil mass. Secondary constituents are capitalized and bold (i.e., SANDY GRAVEL, CLAYEY SAND) and precede the primary constituent.	• SECONDARY constituents are composed of a percentage less than the primary constituent, but more than 20 percent of the soil mass. Secondary constituents are capitalized and bold (i.e., SANDY CLAY, SILTY CLAY, CLAYEY SILT) and precede the primary constituent.
• accessory descriptions compose of the following: with some: >12% with a little: 5 - 12% with traces of: <5% accessory descriptions are lower cased and follow the Primary and Secondary Constituents (i.e., SILTY GRAVEL with a little sand)	• accessory descriptions compose of the following: with some: >12% with a little: 5 - 12% with traces of: <5% accessory descriptions are lower cased and follow the Primary and Secondary Constituents (i.e., SILTY CLAY with some sand)
EXAMPLE: Soil Containing 60% Gravel, 25% Sand, 15% Fines. Described as: SILTY GRAVEL with some sand	

RELATIVE DENSITY / CONSISTENCY

Granular Soils			Cohesive Soils			
N-Value (Blows/Foot)		Relative Density	N-Value (Blows/Foot)		PP Readings (tsf)	Consistency
SPT	MCS		SPT	MCS		
0 - 4	0 - 7	Very Loose	0 - 2	0 - 4		Very Soft
4 - 10	7 - 18	Loose	2 - 4	4 - 7	< 0.5	Soft
10 - 30	18 - 55	Medium Dense	4 - 8	7 - 15	0.5 - 1.0	Medium Stiff
30 - 50	55 - 91	Dense	8 - 15	15 - 27	1.0 - 2.0	Stiff
> 50	> 91	Very Dense	15 - 30	27 - 55	2.0 - 4.0	Very Stiff
			> 30	> 55	> 4.0	Hard

MOISTURE CONTENT DEFINITIONS

Dry: Absence of moisture, dry to the touch

Moist: Damp but no visible water

Wet: Visible free water, usually soil is below water table

GRAIN SIZE DEFINITION

Description	Sieve Number and / or Size
Boulders	> 12 inches (305-mm)
Cobbles	3 to 12 inches (75-mm to 305-mm)
Gravel	3-inch to #4 (75-mm to 4.75-mm)
Coarse Gravel	3-inch to 3/4-inch (75-mm to 19-mm)
Fine Gravel	3/4-inch to #4 (19-mm to 4.75-mm)
Sand	#4 to #200 (4.75-mm to 0.075-mm)
Coarse Sand	#4 to #10 (4.75-mm to 2-mm)
Medium Sand	#10 to #40 (2-mm to 0.425-mm)
Fine Sand	#40 to #200 (0.425-mm to 0.075-mm)

ABBREVIATIONS

WOH: Weight of Hammer

WOR: Weight of Drill Rods

SPT: Standard Penetration Test Split-Spoon Sampler

MCS: Modified California Sampler

PP: Pocket Penetrometer

**Soil descriptions are based on ASTM D2488-09a, Visual-Manual Procedure, with the above modifications by Geolabs, Inc. to the Unified Soil Classification System (USCS).*

Plate
A-0.2

SOIL_CLASS_LOG_KEY 6099-00.GPJ GEOLABS.GDT 7/12/16

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

DRAWING NAME: A:\DRAFTING\DRAFTING\COMPLETED\47 6099-00_HI-1GUARDRAILKAPOLANITOANIAKOA\149-G-2.DWG PLOT TIME: 11-22-21, 10:25 PM

GERALD Y. SEKI
LICENSED PROFESSIONAL ENGINEER
No. 5635-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

GEOLABS, INC. — APRIL 30, 2020. LIC. EXP. DATE

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BORING LOG LEGENDS

INTERSTATE ROUTE H-1
Guardrail and Shoulder Improvements,
Kapiolani Interchange to Alnakoa Avenue
Federal-Aid Project No. IM-HI-1(244)R

Scale: None Date: July 2018

SHEET No. G-2 OF 6 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(244)R	2019	150	190

GEOLABS, INC.

Geotechnical Engineering

Rock Log Legend

ROCK DESCRIPTIONS

	BASALT		FINGER CORAL
	BOULDERS		LIMESTONE
	BRECCIA		SANDSTONE
	CLINKER		SILTSTONE
	COBBLES		TUFF
	CORAL		VOID/CAVITY

ROCK DESCRIPTION SYSTEM

ROCK FRACTURE CHARACTERISTICS

The following terms describe general fracture spacing of a rock:

Massive:	Greater than 24 inches apart
Slightly Fractured:	12 to 24 inches apart
Moderately Fractured:	6 to 12 inches apart
Closely Fractured:	3 to 6 inches apart
Severely Fractured:	Less than 3 inches apart

DEGREE OF WEATHERING

The following terms describe the chemical weathering of a rock:

Unweathered:	Rock shows no sign of discoloration or loss of strength.
Slightly Weathered:	Slight discoloration inwards from open fractures.
Moderately Weathered:	Discoloration throughout and noticeably weakened though not able to break by hand.
Highly Weathered:	Most minerals decomposed with some corestones present in residual soil mass. Can be broken by hand.
Extremely Weathered:	Saprolite. Mineral residue completely decomposed to soil but fabric and structure preserved.

HARDNESS

The following terms describe the resistance of a rock to indentation or scratching:

Very Hard:	Specimen breaks with difficulty after several "pinging" hammer blows. Example: Dense, fine grain volcanic rock
Hard:	Specimen breaks with some difficulty after several hammer blows. Example: Vesicular, vugular, coarse-grained rock
Medium Hard:	Specimen can be broked by one hammer blow. Cannot be scraped by knife. SPT may penetrate by ~25 blows per inch with bounce. Example: Porous rock such as clinker, cinder, and coral reef
Soft:	Can be indented by one hammer blow. Can be scraped or peeled by knife. SPT can penetrate by ~100 blows per foot. Example: Weathered rock, chalk-like coral reef
Very Soft:	Crumbles under hammer blow. Can be peeled and carved by knife. Can be indented by finger pressure. Example: Saprolite

Plate A-0.3

LOG LEGEND FOR ROCK 6099-00.GPJ GEOLABS.GDT 7/12/16

GEOTECHNICAL NOTES:

1. *A geotechnical engineering report entitled "Geotechnical Engineering Exploration, Interstate Route H-1 Guardrail and Shoulder Improvements, Kapiolani Interchange to Ainakoa Avenue, Honolulu, Oahu, Hawaii" dated July 22, 2016 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 G-1.*

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.*

GERALD Y. SEKI
LICENSED PROFESSIONAL ENGINEER
No. 5635-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

GEOLABS, INC. — APRIL 30, 2020. LIC. EXP. DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BORING LOG LEGEND & NOTES

INTERSTATE ROUTE H-1
Guardrail and Shoulder Improvements,
Kapiolani Interchange to Ainakoa Avenue
Federal-Aid Project No. IM-HI-1(244)R

Scale: None — Date: July 2018

SHEET No. G-3 OF 6 SHEETS

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

DRAWING NAME: A:\DRAFTING\DRAFTING\COMPLETED\47\6099-00_H-1GUARDRAILKAPOLAINTOAINAKOA\150-G-3.DWG PLOT TIME: 11-22-21, 10:52 PM)

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(244)R	2019	151	190

GEOLABS, INC.
Geotechnical Engineering

INTERSTATE ROUTE H-1 GUARDRAIL AND SHOULDER IMPROVEMENTS
KAPIOLANI INTERCHANGE TO AINAKOA AVENUE
HONOLULU, OAHU, HAWAII

Log of Boring 1

Approximate Ground Surface Elevation (feet MSL): 58 *

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				9-inch CONCRETE
	11	109			35/3"					GW GC	Light gray SANDY GRAVEL (BASALTIC) with silt, dense, damp (base course)
Sieve - #200 = 20.9%	8				28						Brownish gray GRAVEL (BASALTIC) with sand and clay and some cobbles (basaltic), medium dense, damp (fill)
Direct Shear	9	121			29/6" +30/3"		5				
											Gray with brown mottling COBBLES AND BOULDERS (BASALTIC) with clayey sand, very dense, damp (fill)
					20/3"		10				Boring terminated at 10.25 feet
											* Elevations estimated from Google Earth © 2013.
							15				
							20				Latitude: 21.28670° N Longitude: 157.81214° W

Date Started:	February 8, 2010	Water Level: ▽	Not Encountered
Date Completed:	February 8, 2010		
Logged By:	Y. Chiba	Drill Rig:	CME-55
Total Depth:	10.25 feet	Drilling Method:	4" Auger & HQ Coring
Work Order:	6099-00	Driving Energy:	140 lb. wt.,30 in. drop

GEOLABS, INC.
Geotechnical Engineering

INTERSTATE ROUTE H-1 GUARDRAIL AND SHOULDER IMPROVEMENTS
KAPIOLANI INTERCHANGE TO AINAKOA AVENUE
HONOLULU, OAHU, HAWAII

Log of Boring 3

Approximate Ground Surface Elevation (feet MSL): 108 *

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				11-inch CONCRETE
	20	95			23					GW SC	Grayish brown SANDY GRAVEL (BASALTIC) with silt, dense, damp (base course)
LL=NP PI=NP	22				9						Reddish brown with black mottling medium CLAYEY SAND with gravel (basaltic), medium dense, damp (fill)
Sieve - #200 = 41.4%	22	76			13		5				
											Dark gray with red mottling COBBLES (BASALTIC) with sand and some silt, medium dense, damp (fill)
					15/1"		10				Boring terminated at 10.1 feet
							15				
							20				Latitude: 21.28393° N Longitude: 157.80797° W

Date Started:	February 8, 2010	Water Level: ▽	Not Encountered
Date Completed:	February 8, 2010		
Logged By:	Y. Chiba	Drill Rig:	CME-55
Total Depth:	10.1 feet	Drilling Method:	4" Auger & HQ Coring
Work Order:	6099-00	Driving Energy:	140 lb. wt.,30 in. drop

GEOLABS, INC.
Geotechnical Engineering

INTERSTATE ROUTE H-1 GUARDRAIL AND SHOULDER IMPROVEMENTS
KAPIOLANI INTERCHANGE TO AINAKOA AVENUE
HONOLULU, OAHU, HAWAII

Log of Boring 2

Approximate Ground Surface Elevation (feet MSL): 87 *

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				9-inch CONCRETE
	17	111			80					GW SM	Gray SANDY GRAVEL (BASALTIC) with little silt, dense, damp (base course)
	33	90			36	3.0				CL-ML	Reddish brown with dark gray mottling medium to coarse SILTY SAND with some gravel (basaltic) and traces of clay, dense, damp (fill)
	8				18/3"		5			GP	
											Reddish brown with gray mottling CLAYEY SILT with fine sand, very stiff, damp (residual soil)
											Dark gray with orange mottling GRAVEL (BASALTIC) with silt, dense, dry to damp (weathered rock)
					15/1"		10				Gray with orange mottling vesicular BASALT, closely fractured, highly weathered, very hard
											Boring terminated at 10.1 feet
							15				
							20				Latitude: 21.28455° N Longitude: 157.80877° W

Date Started:	February 9, 2010	Water Level: ▽	Not Encountered
Date Completed:	February 9, 2010		
Logged By:	Y. Chiba	Drill Rig:	Mobile B-80
Total Depth:	10.1 feet	Drilling Method:	4" Auger & HQ Coring
Work Order:	6099-00	Driving Energy:	140 lb. wt.,30 in. drop

GEOLABS, INC.
Geotechnical Engineering

INTERSTATE ROUTE H-1 GUARDRAIL AND SHOULDER IMPROVEMENTS
KAPIOLANI INTERCHANGE TO AINAKOA AVENUE
HONOLULU, OAHU, HAWAII

Log of Boring 4

Approximate Ground Surface Elevation (feet MSL): 144 *

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				9-inch CONCRETE
	12	127			63	3.5				GW CH	Gray SANDY GRAVEL (BASALTIC) with some silt, dense, dry to damp (base course)
LL=70 PI=44	38				60/3"	3.5					Reddish brown CLAY with gravel (basaltic), very stiff, damp (fill)
UC= 11050 psi			90	90			5				Gray vesicular BASALT, moderately fractured, slightly weathered, very hard
UC= 13620 psi											
							10				Boring terminated at 10 feet
							15				
							20				Latitude: 21.28247° N Longitude: 157.80458° W

Date Started:	February 9, 2010	Water Level: ▽	Not Encountered
Date Completed:	February 9, 2010		
Logged By:	Y. Chiba	Drill Rig:	Mobile B-80
Total Depth:	10 feet	Drilling Method:	4" Auger & HQ Coring
Work Order:	6099-00	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.

DRAWING NAME: A:\DRAFTING\DRAFTING\COMPLETED\47\6099-00_H-1GUARDRAILKAPIOLANITOAINAKOA\151-G-4.DWG PLOT TIME: 11-22-21, 10:55 PM)

BORING LOG DOT JAN.F 6099-00.GPJ GEOLABS.GDT 7/12/16

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

GERALD Y. SEKI — LICENSED PROFESSIONAL ENGINEER No. 5635-C — HAWAII, U.S.A.

GEOLABS, INC. — APRIL 30, 2020. LIC. EXP. DATE

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BORING LOGS-1

INTERSTATE ROUTE H-1 Guardrail and Shoulder Improvements, Kapiolani Interchange to Ainakoa Avenue Federal-Aid Project No. IM-HI-1(244)R

Scale: None — Date: July 2018

SHEET No. G-4 OF 6 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(244)R	2019	152	190

GEOLABS, INC.
Geotechnical Engineering

INTERSTATE ROUTE H-1 GUARDRAIL AND SHOULDER IMPROVEMENTS
KAPIOLANI INTERCHANGE TO AINAKOA AVENUE
HONOLULU, OAHU, HAWAII

Log of Boring 5

Approximate Ground Surface Elevation (feet MSL): 181 *

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-inch CONCRETE
	25	99			35/6" +15/1"	3.0				GW	Brownish gray SANDY GRAVEL (BASALTIC) with some silt, dense, damp (base course)
	9				40					CL	Reddish brown SANDY CLAY with silt, very stiff, damp (fill)
	9				41		5				grades with gravel and some cobbles (basaltic)
										CH	Dark reddish brown with gray mottling SILTY CLAY with sand and some gravel (coralline), very stiff, damp (fill)
	26	94			20/6" +15/3"	2.5	10				Boring terminated at 10.75 feet
							15				
							20				Latitude: 21.28102° N Longitude: 157.80172° W

Date Started:	February 9, 2010	Water Level: ▽	Not Encountered
Date Completed:	February 9, 2010		
Logged By:	Y. Chiba	Drill Rig:	Mobile B-80
Total Depth:	10.75 feet	Drilling Method:	4" Auger & HQ Coring
Work Order:	6099-00	Driving Energy:	140 lb. wt.,30 in. drop

BORING LOG DOT JAN.F 6099-00.GPJ GEOLABS.GDT 7/12/16

GEOLABS, INC.
Geotechnical Engineering

INTERSTATE ROUTE H-1 GUARDRAIL AND SHOULDER IMPROVEMENTS
KAPIOLANI INTERCHANGE TO AINAKOA AVENUE
HONOLULU, OAHU, HAWAII

Log of Boring 7

Approximate Ground Surface Elevation (feet MSL): 181 *

Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample	Graphic	USCS	Description
											9-inch CONCRETE
										GW	Light grayish brown SANDY GRAVEL (BASALTIC) with some silt, dense, damp (base course)
UC= 3180 psi			89	83							Reddish gray vesicular BASALT, closely to severely fractured, slightly weathered, very hard
			95	50			5				grades to moderately fractured at 3 feet grades to closely fractured
							10				Boring terminated at 10 feet
							15				
							20				Latitude: 21.27911° N Longitude: 157.79793° W

Date Started:	February 10, 2010	Water Level: ▽	Not Encountered
Date Completed:	February 10, 2010		
Logged By:	Y. Chiba	Drill Rig:	Mobile B-80
Total Depth:	10 feet	Drilling Method:	4" Auger & HQ Coring
Work Order:	6099-00	Driving Energy:	140 lb. wt.,30 in. drop

BORING LOG DOT JAN.F 6099-00.GPJ GEOLABS.GDT 7/12/16

GEOLABS, INC.
Geotechnical Engineering

INTERSTATE ROUTE H-1 GUARDRAIL AND SHOULDER IMPROVEMENTS
KAPIOLANI INTERCHANGE TO AINAKOA AVENUE
HONOLULU, OAHU, HAWAII

Log of Boring 6

Approximate Ground Surface Elevation (feet MSL): 203 *

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 CONCRETE
	23	83			25/1"					GW	Grayish brown SANDY GRAVEL (BASALTIC) with some silt, dense, damp (base course)
	6				15/6" +10/0"					CL GP	Reddish brown SANDY CLAY with gravel (basaltic), medium stiff, damp (fill)
	8				Ref. 20/3"		5				Dark brownish gray GRAVEL (BASALTIC) with some sand, dense, damp to dry (weathered rock)
											Dark gray with orange mottling scoriaceous BASALT, closely fractured, highly weathered, medium hard to hard
	3				15/1"		10				Boring terminated at 10.1 feet
							15				
							20				Latitude: 21.27969° N Longitude: 157.79964° W

Date Started:	February 11, 2010	Water Level: ▽	Not Encountered
Date Completed:	February 11, 2010		
Logged By:	Y. Chiba	Drill Rig:	Mobile B-80
Total Depth:	10.1 feet	Drilling Method:	4" Auger & HQ Coring
Work Order:	6099-00	Driving Energy:	140 lb. wt.,30 in. drop

BORING LOG DOT JAN.F 6099-00.GPJ GEOLABS.GDT 7/12/16

GEOLABS, INC.
Geotechnical Engineering

INTERSTATE ROUTE H-1 GUARDRAIL AND SHOULDER IMPROVEMENTS
KAPIOLANI INTERCHANGE TO AINAKOA AVENUE
HONOLULU, OAHU, HAWAII

Log of Boring 8

Approximate Ground Surface Elevation (feet MSL): 115 *

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 CONCRETE
										GW	4-inch CONCRETE
	21	101			26					SC SP	Grayish brown SANDY GRAVEL (BASALTIC) with silt, dense, damp (base course)
	8				24						Orangish brown CLAYEY SAND with gravel (basaltic), medium dense, damp (fill)
					10/1"		5				Dark gray SAND with some gravel (basaltic), medium dense, damp (weathered rock)
											Reddish gray scoriaceous BASALT, closely to severely fractured, highly weathered, medium hard
					12/1"		10				grades to very hard
											Boring terminated at 10.1 feet
							15				
							20				Latitude: 21.27863° N Longitude: 157.79352° W

Date Started:	February 10, 2010	Water Level: ▽	Not Encountered
Date Completed:	February 10, 2010		
Logged By:	Y. Chiba	Drill Rig:	Mobile B-80
Total Depth:	10.1 feet	Drilling Method:	4" Auger & HQ Coring
Work Order:	6099-00	Driving Energy:	140 lb. wt.,30 in. drop

BORING LOG DOT JAN.F 6099-00.GPJ GEOLABS.GDT 7/12/16

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

DRAWING NAME: A:\DRAFTING\DRAFTING\COMPLETED\47\6099-00_H-1GUARDRAILKAPIOLANITOAINAKOA\152-G-5.DWG PLOT TIME: 11-22-21, 11:03 PM)

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

GERALD Y. SEKI LICENSED PROFESSIONAL ENGINEER No. 5635-C HAWAII, U.S.A.

GEOLABS, INC. — APRIL 30, 2020. LIC. EXP. DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BORING LOGS-2

INTERSTATE ROUTE H-1 Guardrail and Shoulder Improvements, Kapiolani Interchange to Ainakoa Avenue Federal-Aid Project No. IM-HI-1(244)R

Scale: None — Date: July 2018

SHEET No. G-5 OF 6 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(244)R	2019	153	190

GEOLABS, INC.
Geotechnical Engineering

INTERSTATE ROUTE H-1 GUARDRAIL AND SHOULDER IMPROVEMENTS
KAPIOLANI INTERCHANGE TO AINAKOA AVENUE
HONOLULU, OAHU, HAWAII

Log of Boring 9

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)	Sample	Graphic	USCS	Description
											9-inch CONCRETE
	21	105			40/3"	3.0				GW	3-inch CONCRETE
	17				29	3.0				CL	Grayish brown SANDY GRAVEL (BASALTIC) with silt, dense, damp (base course)
					15/1"		5				Dark reddish brown SANDY CLAY with gravel (basaltic) and little gravel (coralline), very stiff, damp (fill)
											Brownish gray SILTY COBBLES (BASALTIC) with gravel and some boulders, dense, damp (weathered rock)
					8/1"		10				Reddish gray vesicular BASALT, closely fractured, highly weathered, very hard
											Boring terminated at 10.1 feet
							15				
							20				

Latitude: 21.27908° N
Longitude: 157.79063° W

Date Started:	February 10, 2010	Water Level: ▽	Not Encountered
Date Completed:	February 10, 2010		
Logged By:	Y. Chiba	Drill Rig:	Mobile B-80
Total Depth:	10.1 feet	Drilling Method:	4" Auger & HQ Coring
Work Order:	6099-00	Driving Energy:	140 lb. wt.,30 in. drop

GEOLABS, INC.
Geotechnical Engineering

INTERSTATE ROUTE H-1 GUARDRAIL AND SHOULDER IMPROVEMENTS
KAPIOLANI INTERCHANGE TO AINAKOA AVENUE
HONOLULU, OAHU, HAWAII

Log of Boring 11

Approximate Ground Surface Elevation (feet MSL): 30 *

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-inch ASPHALTIC CONCRETE
	9	136			95					GW	Light tan SANDY GRAVEL (CORALLINE) with
	20									SC	some clay, dense, damp (fill)
											grades to light gray sandy gravel (basaltic) at 1.5 feet
	13	92			53		5				Reddish brown with multi-color mottling CLAYEY SAND with gravel and some sand (coralline), dense, damp (fill)
										CH	Brown SANDY COBBLES (BASALTIC) with clay, dense, moist (alluvium)
LL=51 PI=27	36				5	1.0	10				Blackish brown SANDY CLAY, soft, moist (alluvium)
										GC	Brown with dark gray mottling CLAYEY GRAVEL (BASALTIC) with some sand, medium dense, wet (alluvium)
Sieve #200 = 12.7%	17				44		15				
											Boring terminated at 16.5 feet
							20				

Latitude: 21.27795° N
Longitude: 157.78233° W

Date Started:	February 11, 2010	Water Level: ▽	13.0 ft. 02/11/2010 1140 HRS
Date Completed:	February 11, 2010		
Logged By:	Y. Chiba	Drill Rig:	Mobile B-80
Total Depth:	16.5 feet	Drilling Method:	4" Auger & HQ Coring
Work Order:	6099-00	Driving Energy:	140 lb. wt.,30 in. drop

GEOLABS, INC.
Geotechnical Engineering

INTERSTATE ROUTE H-1 GUARDRAIL AND SHOULDER IMPROVEMENTS
KAPIOLANI INTERCHANGE TO AINAKOA AVENUE
HONOLULU, OAHU, HAWAII

Log of Boring 10

Approximate Ground Surface Elevation (feet MSL): 35 *

Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample	Graphic	USCS	Description
											4-inch ASPHALTIC CONCRETE
	6	118			56/6"					SW	
					+40/3"					GW	Tan with white mottling GRAVELLY SAND (CORALLINE) with silt and little clay, very dense,
	19				77	3.0				CH	damp (fill)
											Light gray SANDY GRAVEL (BASALTIC) with some silt, very dense, damp (fill)
	31				20	2.5	5				
										CH	Brown SANDY CLAY with some sand (coralline) and gravel (basaltic), very stiff, damp (fill)
											Dark brown SANDY CLAY with some silt and gravel (basaltic), soft, moist (alluvium)
LL=54 PI=26	33	79			9	1.0	10				
											Brownish gray vesicular BASALT, closely fractured, highly weathered, hard
					12/1"		15				
											Boring terminated at 15.1 feet
							20				

Latitude: 21.27831° N
Longitude: 157.78218° W

Date Started:	February 11, 2010	Water Level: ▽	Not Encountered
Date Completed:	February 11, 2010		
Logged By:	Y. Chiba	Drill Rig:	Mobile B-80
Total Depth:	15.1 feet	Drilling Method:	4" Auger & HQ Coring
Work Order:	6099-00	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.

DRAWING NAME: A:\DRAFTING\DRAFTING\COMPLETED\TA 6099-00_H-1 GUARDRAIL\KAPIOLANITOAINAKOA 153-G-6.DWG PLOT TIME: 11-22-21, 11:04 PM

BORING LOG, DOT, HALE, 6099-00.GPJ, GEOLABS.GDT, 7/12/18

GERALD Y. SEKI
LICENSED PROFESSIONAL ENGINEER
No. 5635-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

GEOLABS, INC. — APRIL 30, 2020. LIC. EXP. DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BORING LOGS-3

**INTERSTATE ROUTE H-1
Guardrail and Shoulder Improvements
Kapiolani Interchange to Ainakoa Avenue
Federal-Aid Project No. IM-HI-1(244)R**

Scale: None — Date: July 2018

SHEET No. G-6 OF 6 SHEETS