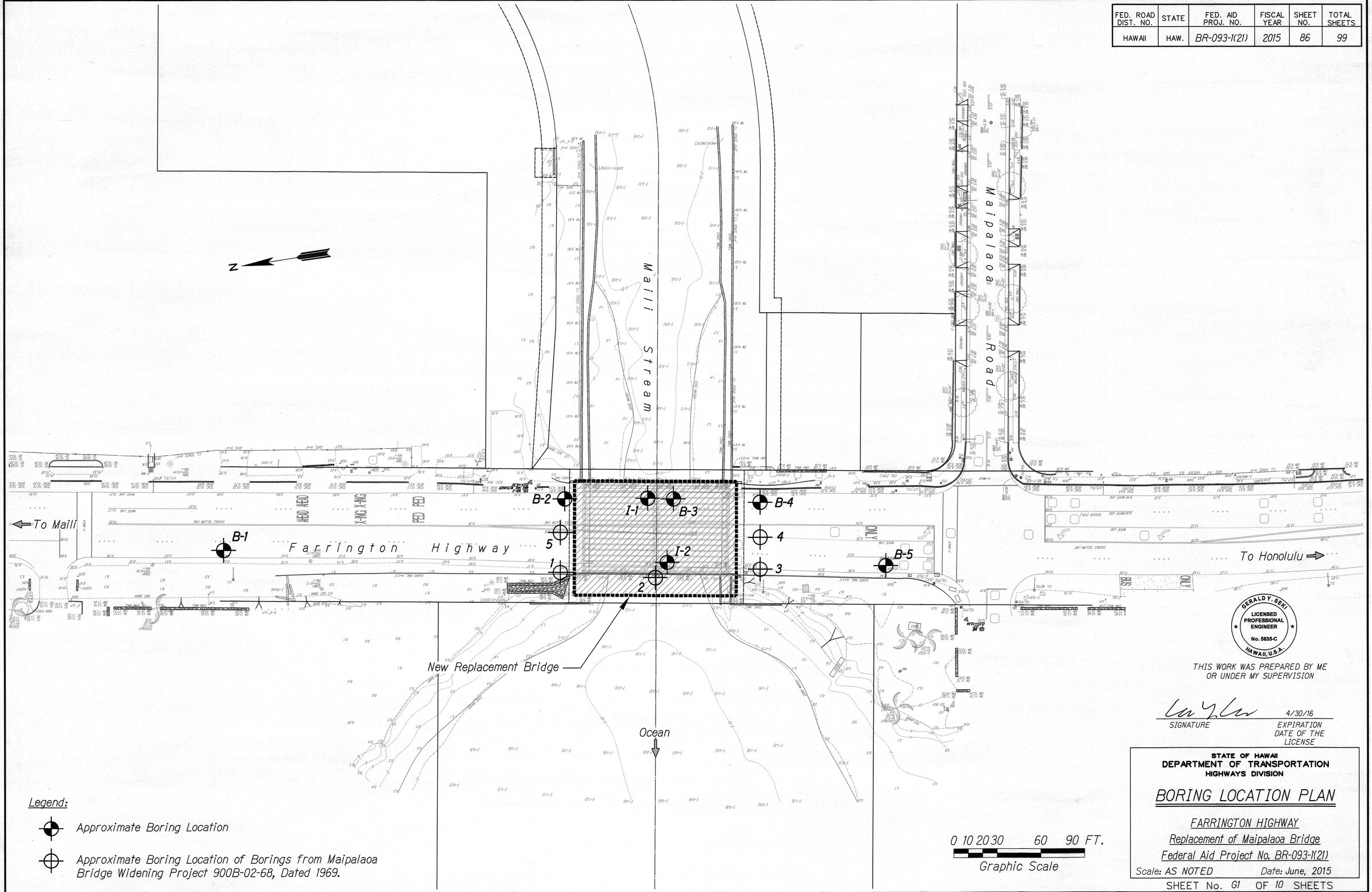
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-093-1(21)	2015	86	99



Legend:

- Approximate Boring Location
- Approximate Boring Location of Borings from Maipalaoa Bridge Widening Project 900B-02-68, Dated 1969.

0 10 20 30 60 90 FT.

Graphic Scale

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

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BORING LOCATION PLAN

FARRINGTON HIGHWAY
Replacement of Maipalaoa Bridge
Federal Aid Project No. BR-093-1(21)

Scale: AS NOTED Date: June, 2015

SHEET No. G1 OF 10 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.	BR-093-1(21)	2015	87	99

GEOLABS, INC.
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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
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 (NP=NON-PLASTIC)
	(3-INCH) O.D. MODIFIED CALIFORNIA SAMPLE	PI	PLASTICITY INDEX (NP=NON-PLASTIC)
S	SHELBY TUBE SAMPLE	TV	TORVANE SHEAR (tsf)
G	GRAB SAMPLE	PEN	POCKET PENETROMETER (tsf)
	CORE SAMPLE	UC	UNCONFINED COMPRESSION (psi)
▽	WATER LEVEL OBSERVED IN BORING	UU	UNCONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION (ksf)

LOG LEGEND FOR SOIL 6093-00.GPJ GEOLABS.GDT 12/2/08

Plate A-0.1

GEOLABS, INC.
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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 rock 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

LOG LEGEND FOR ROCK 6093-00.GPJ 12/2/08

Plate A-0.2

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

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BORING LOG LEGEND

FARRINGTON HIGHWAY
Replacement of Maipalaoa Bridge
Federal Aid Project No. BR-093-1(21)

Scale: AS NOTED Date: June, 2015

SHEET No. G2 OF 10 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.	BR-093-1(21)	2015	88	99

GEOTECHNICAL NOTES

1. A geotechnical engineering report entitled "Geotechnical Engineering Exploration, Replacement of Maipalaoa Bridge, Farrington Highway, Federal Aid Project No. BR-093-1(21), Waianae, Oahu, Hawaii" dated September 12, 2014 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.

GEOLABS, INC.
Geotechnical Engineering

REPLACEMENT OF MAIPALAOA BRIDGE
WAIANAE, OAHU, HAWAII

Log of Boring **1**

Approximate Ground Surface Elevation (feet): 9.5 *

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-inch ASPHALTIC CONCRETE
	4	92			43					GW	Gray with dark red mottling SANDY GRAVEL (BASALTIC) with clayey silt, dense, damp (fill)
	5				24					SP	Light whitish tan SAND (CORALLINE), medium dense, dry (beach sand)
Sieve - #200 = 2.1%	6	91			52		5				
	15				15		10				grades coarse sand (coralline), saturated
										SM	White SILTY SAND (CORALLINE) with traces of gravel, dense (coralline detritus)
	14				32		15				
										GM	White with light brown mottling SILTY GRAVEL (CORALLINE) with sand, medium dense (coralline detritus)
	27				12		20				
											Boring terminated at 21.5 feet
							25				* Elevations estimated from Preliminary Topo transmitted by SSFM International, Inc. on March 7, 2009.
							30				
							35				

Date Started:	March 4, 2009	Water Level: ▽	9.5 ft. 03/04/2009 1131 HRS
Date Completed:	March 4, 2009		
Logged By:	Y. Chiba	Drill Rig:	CME-45
Total Depth:	21.5 feet	Drilling Method:	4" Auger & PQ Coring
Work Order:	6138-00	Driving Energy:	140 lb. wt.,30 in. drop

BORING_LOG_DOT 6138-00.GPJ GEOLABS.GDT 9/29/09

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

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Gerald Y. Seki 4/30/16
SIGNATURE EXPIRATION DATE OF THE LICENSE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

NOTES & BORING LOGS - 1

FARRINGTON HIGHWAY
Replacement of Maipalaoa Bridge
Federal Aid Project No. BR-093-1(21)

Scale: AS NOTED Date: June, 2015

SHEET No. G3 OF 10 SHEETS

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

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-093-1(21)	2015	89	99

GEOLABS, INC.
Geotechnical Engineering

REPLACEMENT OF MAIPALAOA BRIDGE
WAIANAE, OAHU, HAWAII

Log of Boring 2

Approximate Ground Surface Elevation (feet): 9.3 *

Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample	Graphic	USCS	Description
											5-inch ASPHALTIC CONCRETE
	11	100			18					SC	Light tannish gray CLAYEY SAND (CORALLINE) with some sand (basaltic) and gravel (coralline), medium dense, damp (fill)
	14				8						grades to loose at 3 feet
Direct Shear	17	85			16		5				grades to dark brown, medium dense, moist
										SM	Light whitish tan SILTY SAND (CORALLINE) with gravel (coralline), dense, saturated (coralline detritus)
	13				15/3"		10				
UC=310			73	67							White CALCAREOUS SANDSTONE, moderately fractured, moderately weathered, medium hard (coralline sandstone)
UC=170			53	47			15				
			53	33			20				
UC=1910			100	100			25				grades to densely cemented, massive, slightly weathered, very hard
UC=610			93	93			30				
							35				

Date Started:	March 5, 2009	Water Level: ▽	8.1 ft. 03/05/2009 1045 HRS
Date Completed:	March 6, 2009		
Logged By:	Y. Chiba	Drill Rig:	CME-45
Total Depth:	82 feet	Drilling Method:	4" Auger & PQ Coring
Work Order:	6138-00	Driving Energy:	140 lb. wt.,30 in. drop

BORING LOG.DOT 6138-00.GPJ GEOLABS.GDT 9/29/09

GEOLABS, INC.
Geotechnical Engineering

REPLACEMENT OF MAIPALAOA BRIDGE
WAIANAE, 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)	Sample	Graphic	USCS	Description
					12/3"						
			16	0						SW	White GRAVELLY SAND (CORALLINE), loose (coralline detritus)
							40				White with brown mottling CORAL, closely fractured, moderately weathered, hard
			47	20							
							45				
			30	25						SW	Light tannish white with tan mottling GRAVELLY SAND (CORALLINE), loose (coralline detritus)
							50				Light whitish tan with light tan mottling CALCAREOUS SANDSTONE, closely fractured, moderately weathered, very hard (coralline sandstone)
			15	7							grades to light tan, highly weathered, medium hard
							55			SM	Light tan SILTY SAND (CORALLINE) with some gravel, medium dense (coralline detritus)
			24		20						
			14				60				
			18		14						
			29	0			65				
											Light tannish white with light brown mottling CORAL, closely to severely fractured, highly weathered, medium hard
			37	0	8/1"						
							70				

Date Started:	March 5, 2009	Water Level: ▽	8.1 ft. 03/05/2009 1045 HRS
Date Completed:	March 6, 2009		
Logged By:	Y. Chiba	Drill Rig:	CME-45
Total Depth:	82 feet	Drilling Method:	4" Auger & PQ Coring
Work Order:	6138-00	Driving Energy:	140 lb. wt.,30 in. drop

BORING LOG.DOT 6138-00.GPJ GEOLABS.GDT 9/29/09

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

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

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DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BORING LOGS - 2

FARRINGTON HIGHWAY
Replacement of Maipalaoa Bridge
Federal Aid Project No. BR-093-1(21)

Scale: AS NOTED Date: June, 2015

SHEET No. G4 OF 10 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-093-1(21)	2015	90	99

GEOLABS, INC.
Geotechnical Engineering

REPLACEMENT OF MAIPALAOA BRIDGE
WAIANAE, OAHU, HAWAII

Log of Boring 2

Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample	Graphic	USCS	Description
											(Continued from previous plate)
			35	18	10/3"		75				Light whitish tan CEMENTED GRAVEL AND SAND (CORALLINE), closely fractured, moderately to highly weathered, hard (conglomerate)
											grades to very hard at 75 feet
			67	53							grades to moderately fractured
							80				Boring terminated at 82 feet
							85				
							90				
							95				
							100				
							105				

Date Started:	March 5, 2009	Water Level: ▽	8.1 ft. 03/05/2009 1045 HRS
Date Completed:	March 6, 2009		
Logged By:	Y. Chiba	Drill Rig:	CME-45
Total Depth:	82 feet	Drilling Method:	4" Auger & PQ Coring
Work Order:	6138-00	Driving Energy:	140 lb. wt.,30 in. drop

BORING LOG DOT 6138-00.GPJ GEOLABS.GDT 9/29/09

GEOLABS, INC.
Geotechnical Engineering

REPLACEMENT OF MAIPALAOA BRIDGE
WAIANAE, OAHU, HAWAII

Log of Boring 3

Approximate Ground Surface Elevation (feet): 9.2 *

Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot	Pocket Pen. (tsf)	Depth (feet)	Sample	Graphic	USCS	Description
											2-inch ASPHALTIC CONCRETE
											7-inch CONCRETE
											VOID BENEATH BRIDGE
							5				
											10-inch WATER
			7				10			SP	Light whitish tan SAND (CORALLINE), very loose (estuarine deposit)
										GP	6-inch CONCRETE
										SP	Reddish gray GRAVEL (BASALTIC) with some sand, medium dense (fill)
											Light whitish tan SAND (CORALLINE) with some gravel (basaltic), loose (coralline detritus)
Sieve - #200 = 4.2%	15				19		15				grades to medium dense
			0								
	24				2		20				grades to very loose
			0								
UC=900	19		100	100	3/0"		25			SM	White SILTY SAND (CORALLINE), very loose (coralline detritus)
											White with light tan mottling CORAL, moderately fractured, slightly weathered, very hard
							30				White CALCAREOUS SANDSTONE, moderately fractured, slightly weathered, very hard (coralline sandstone)
UC=400			75	55			35				

Date Started:	March 6, 2009	Water Level: ▽	9.5 ft. 03/06/2009 1200 HRS
Date Completed:	March 10, 2009		
Logged By:	Y. Chiba	Drill Rig:	CME-45
Total Depth:	93 feet	Drilling Method:	4" Auger & PQ Coring
Work Order:	6138-00	Driving Energy:	140 lb. wt.,30 in. drop

BORING LOG DOT 6138-00.GPJ GEOLABS.GDT 9/29/09

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

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

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HIGHWAYS DIVISION

BORING LOGS - 3

FARRINGTON HIGHWAY
Replacement of Maipalaoa Bridge
Federal Aid Project No. BR-093-1(21)

Scale: AS NOTED Date: June, 2015

SHEET No. G5 OF 10 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-093-1(21)	2015	91	99

GEOLABS, INC.
Geotechnical Engineering

REPLACEMENT OF MAIPALAOA BRIDGE
WAIANAE, OAHU, HAWAII

Log of Boring 3

Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample Graphic	USCS	(Continued from previous plate) Description
			50	50			40			
			52	22						
							45			
			5						SC	Light whitish tan with white mottling CLAYEY SAND (CORALLINE) with some gravel, loose (estuarine deposit)
							50			
	41				4					
			0							
							55			
	42				5					
			48							
							60		CH	Light brownish tan SANDY CLAY (CORALLINE) with some gravel (coralline), very soft (estuarine deposit)
LL=65 PI=34	38				3	<0.5				
			57	43						
							65			White LIMESTONE, closely fractured, moderately weathered, hard (coralline limestone)
			37	28	10/0"					
							70			

Date Started:	March 6, 2009	Water Level: ▽	9.5 ft. 03/06/2009 1200 HRS
Date Completed:	March 10, 2009		
Logged By:	Y. Chiba	Drill Rig:	CME-45
Total Depth:	93 feet	Drilling Method:	4" Auger & PQ Coring
Work Order:	6138-00	Driving Energy:	140 lb. wt.,30 in. drop

BORING LOG_DOT 6138-00.GPJ GEOLABS.GDT 9/29/09

GEOLABS, INC.
Geotechnical Engineering

REPLACEMENT OF MAIPALAOA BRIDGE
WAIANAE, OAHU, HAWAII

Log of Boring 3

Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample Graphic	USCS	(Continued from previous plate) Description
UC=370	12		37	28	10/0"					
							75			White with tan-brown CEMENTED GRAVEL AND SAND (CORALLINE), closely fractured, moderately to highly weathered, hard (conglomerate)
			15							grades to highly weathered at 77 feet
							80			
			0		12/3"				SC	Light tan CLAYEY SAND (CORALLINE) with some silt, medium dense (estuarine deposit)
	27				14		85			
			0							
							90			
	19				7					grades to loose
										Boring terminated at 93 feet
							95			
							100			
							105			

Date Started:	March 6, 2009	Water Level: ▽	9.5 ft. 03/06/2009 1200 HRS
Date Completed:	March 10, 2009		
Logged By:	Y. Chiba	Drill Rig:	CME-45
Total Depth:	93 feet	Drilling Method:	4" Auger & PQ Coring
Work Order:	6138-00	Driving Energy:	140 lb. wt.,30 in. drop

BORING LOG_DOT 6138-00.GPJ GEOLABS.GDT 9/29/09

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

GERALD Y. SEKI
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HAWAII, U.S.A.

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BORING LOGS - 4

FARRINGTON HIGHWAY
Replacement of Maipalaoa Bridge
Federal Aid Project No. BR-093-1(21)

Scale: AS NOTED Date: June, 2015

SHEET No. G6 OF 10 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-093-1(21)	2015	92	99

GEOLABS, INC.
Geotechnical Engineering

REPLACEMENT OF MAIPALAOA BRIDGE
WAIANAE, OAHU, HAWAII

Log of Boring 4

Approximate Ground Surface Elevation (feet): 9.4 *

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-inch ASPHALTIC CONCRETE
	23	90			12					SC	Light tan with white mottling CLAYEY SAND (CORALLINE) with some gravel (basaltic), medium dense, damp (fill)
LL=64 PI=33	28				9					CH	Light tan with white mottling SANDY CLAY (CORALLINE) with some gravel, medium stiff, moist (fill)
	25	90			17		5			SC	Light brownish tan with white mottling CLAYEY SAND (CORALLINE) with some gravel, medium dense, moist (estuarine deposit)
	23				18		10			SM	White with light gray mottling SILTY SAND (CORALLINE) with some gravel, medium dense, saturated (lagoonal deposit)
	28		6		5/0"		15				
Sieve #200 = 29.3%	38		0		8		20				grades to loose
	38		12		10		25				
UC=1000	39		36	29	20	3.5	30			CH	Tannish brown and gray CLAY with some sand (coralline), very stiff (alluvium)
							35				

Date Started:	March 11, 2009	Water Level: ▽	9.2 ft. 03/11/2009 1000 HRS
Date Completed:	March 12, 2009		
Logged By:	Y. Chiba	Drill Rig:	CME-45
Total Depth:	81.8 feet	Drilling Method:	4" Auger & PQ Coring
Work Order:	6138-00	Driving Energy:	140 lb. wt.,30 in. drop

GEOLABS, INC.
Geotechnical Engineering

REPLACEMENT OF MAIPALAOA BRIDGE
WAIANAE, 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)	Sample	Graphic	USCS	Description
			33	20							White with light tan mottling CALCAREOUS SANDSTONE, closely fractured, moderately weathered, hard (coralline sandstone)
							40				
UC=320			60	33							grades to white with orange mottling, highly weathered
							45				
UC=1420			43	37							
			15				50			SP	White with light gray mottling SAND (CORALLINE), loose
	32				42	3.5	55				
			12							CL	Brown with white SANDY CLAY (CORALLINE) with some gravel (coralline), hard (alluvium)
	19				30	3.0	60				
			26	14						SM	White with orange mottling SILTY SAND (CORALLINE) with some gravel, medium dense (coralline detritus)
			35	20			65				White with orange mottling CORAL, closely fractured, moderately weathered, hard
							70				

Date Started:	March 11, 2009	Water Level: ▽	9.2 ft. 03/11/2009 1000 HRS
Date Completed:	March 12, 2009		
Logged By:	Y. Chiba	Drill Rig:	CME-45
Total Depth:	81.8 feet	Drilling Method:	4" Auger & PQ Coring
Work Order:	6138-00	Driving Energy:	140 lb. wt.,30 in. drop

SURVEY PLOTTED BY
DRAWN BY
TRACED BY
DESIGNED BY
QUANTITIES BY
CHECKED BY
DATE

ORIGINAL PLAN
NOTE BOOK
No.

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

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

SIGNATURE

4/30/16
EXPIRATION DATE OF THE LICENSE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BORING LOGS - 5

FARRINGTON HIGHWAY
Replacement of Maipalaoa Bridge
Federal Aid Project No. BR-093-1(21)

Scale: AS NOTED Date: June, 2015

SHEET No. G7 OF 10 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-093-1(21)	2015	93	99

GEOLABS, INC.
Geotechnical Engineering

REPLACEMENT OF MAIPALAOA BRIDGE
WAIANAE, OAHU, HAWAII

Log of Boring 4

Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample	Graphic	USCS	(Continued from previous plate) Description
	27		52		16		75			SC	Light tan with multi-color mottling CLAYEY SAND (CORALLINE) with some gravel, medium dense (estuarine deposit)
	24		36		20		80				
					8/3"						Boring terminated at 81.8 feet
							85				
							90				
							95				
							100				
							105				

Date Started:	March 11, 2009	Water Level: ⊻	9.2 ft. 03/11/2009 1000 HRS
Date Completed:	March 12, 2009		
Logged By:	Y. Chiba	Drill Rig:	CME-45
Total Depth:	81.8 feet	Drilling Method:	4" Auger & PQ Coring
Work Order:	6138-00	Driving Energy:	140 lb. wt.,30 in. drop

GEOLABS, INC.
Geotechnical Engineering

REPLACEMENT OF MAIPALAOA BRIDGE
WAIANAE, OAHU, HAWAII

Log of Boring 5

Approximate Ground Surface Elevation (feet): 9 *

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 ASPHALTIC CONCRETE
	5	99			31					GW	Gray with red mottling SANDY GRAVEL (BASALTIC) with clayey silt, medium dense, damp (fill)
	8				9					SP	Dark tannish brown SAND (CORALLINE) with silt, medium dense, damp (fill)
	40				7		5				grades to loose
										CH	Tannish brown CLAY with some sand, medium stiff, damp (alluvium)
										SP	Light tannish gray SAND (CORALLINE) with shells and some gravel (coralline), medium dense to dense, wet (coralline detritus)
	18				33		10				
										SM	Whitish gray SILTY GRAVEL (BASALTIC) with some gravel (coralline), loose (lagoonal deposit)
	25				11		15				
	28				16		20				grades to medium dense
											Boring terminated at 21.5 feet
							25				
							30				
							35				

Date Started:	March 4, 2009	Water Level: ⊻	9.4 ft. 03/04/2009 1322 HRS
Date Completed:	March 4, 2009		
Logged By:	Y. Chiba	Drill Rig:	CME-45
Total Depth:	21.5 feet	Drilling Method:	4" Auger & PQ Coring
Work Order:	6138-00	Driving Energy:	140 lb. wt.,30 in. drop

BORING_LOG_DOT 6138-00.GPJ GEOLABS.GDT 9/29/09

SURVEY PLOTTED BY ____ DATE ____
DRAWN BY ____
TRACED BY ____
DESIGNED BY ____
QUANTITIES BY ____
CHECKED BY ____

ORIGINAL PLAN
NOTE BOOK
No. ____

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

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EXPIRATION DATE OF THE LICENSE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BORING LOGS - 6

FARRINGTON HIGHWAY
Replacement of Maipalaoa Bridge
Federal Aid Project No. BR-093-1(21)

Scale: AS NOTED Date: June, 2015

SHEET No. G8 OF 10 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-093-1(21)	2015	94	99

GEOLABS, INC.
Geotechnical Engineering

REPLACEMENT OF MAIPALAOA BRIDGE
WAIANAE, OAHU, HAWAII

Log of Boring I-1

Approximate Ground Surface Elevation (feet): 9.2 *

Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample	Graphic	USCS	Description
											2-inch ASPHALTIC CONCRETE
											6-inch CONCRETE
											VOID BENEATH BRIDGE
							5				
											13-inch WATER
			15				10			SP	Light tannish white SAND (CORALLINE), very loose (estuarine deposit)
										GP	
										GP	5-inch CONCRETE
										SC	Reddish brown with gray mottling GRAVEL (BASALTIC) with some sand, loose (fill)
							15				Gray and white GRAVELS AND COBBLE (BASALTIC AND CORALLINE), loose (fill)
Sieve - #200 = 28.1%	23				24						White CLAYEY SAND (BASALTIC) with some gravel, medium dense (coralline detritus)
			0				20				
	31				7						grades to loose
			10				25				
			3								
							30			GP	White with light brown mottling GRAVEL (CORALLINE) with some cobbles with sand, loose (coralline detritus)
	11				8						
			0				35				

Date Started:	March 3, 2009	Water Level: ▽	9.3 ft. 03/03/2009 0949 HRS
Date Completed:	March 3, 2009		
Logged By:	Y. Chiba	Drill Rig:	CME-45
Total Depth:	52 feet	Drilling Method:	4" Auger & PQ Coring
Work Order:	6138-00(B)	Driving Energy:	140 lb. wt.,30 in. drop

BORING_LOG_DOT 6138-00.GPJ GEOLABS.GDT 9/29/09

GEOLABS, INC.
Geotechnical Engineering

REPLACEMENT OF MAIPALAOA BRIDGE
WAIANAE, OAHU, HAWAII

Log of Boring I-1

(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
										GP	
	16		59	56	5/0"		40				White CALCAREOUS SANDSTONE, moderately fractured, slightly weathered, very hard (coralline sandstone)
UC=370			67	53							grades with brown mottling
							45				
UC=950			73	55							Light tannish white with light tan mottling CORAL, closely fractured, moderately weathered, very hard
							50				Boring terminated at 52 feet
							55				
							60				
							65				
							70				

Date Started:	March 3, 2009	Water Level: ▽	9.3 ft. 03/03/2009 0949 HRS
Date Completed:	March 3, 2009		
Logged By:	Y. Chiba	Drill Rig:	CME-45
Total Depth:	52 feet	Drilling Method:	4" Auger & PQ Coring
Work Order:	6138-00	Driving Energy:	140 lb. wt.,30 in. drop

BORING_LOG_DOT 6138-00.GPJ GEOLABS.GDT 9/29/09

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

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

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BORING LOGS - 7

FARRINGTON HIGHWAY
Replacement of Maipalaoa Bridge
Federal Aid Project No. BR-093-1(21)

Scale: AS NOTED Date: June, 2015

SHEET No. G9 OF 10 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-093-1(21)	2015	95	99

GEOLABS, INC.
Geotechnical Engineering

REPLACEMENT OF MAIPALAOA BRIDGE
WAIANAE, OAHU, HAWAII

Log of Boring **I-2**

Approximate Ground Surface Elevation (feet): 8.8 *

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				2-inch ASPHALTIC CONCRETE 8-inch CONCRETE VOID BENEATH BRIDGE
							5				
							10			SP SM	1-inch WATER Light tannish white SAND (CORALLINE), very loose (estuarine deposit) 6-inch CONCRETE White SILTY SAND (CORALLINE) with traces of gravel, very loose (coralline detritus)
	20		8		4		15				
			0				20				grades to loose
	28				8		25				
UC=1190			0 100	100	21/3"		30				Light tannish white CALCAREOUS SANDSTONE, slightly fractured, slightly weathered, very hard (coralline sandstone)
			83	53			35				

Date Started:	March 2, 2009	Water Level: ▽	9.2 ft. 03/02/2009 1034 HRS
Date Completed:	March 2, 2009		
Logged By:	Y. Chiba	Drill Rig:	CME-75
Total Depth:	51 feet	Drilling Method:	4" Auger & PQ Coring
Work Order:	6138-00	Driving Energy:	140 lb. wt.,30 in. drop

SORING LOG DOT 6138-00.GPJ GEOLABS.GDT 9/29/09

GEOLABS, INC.
Geotechnical Engineering

REPLACEMENT OF MAIPALAOA BRIDGE
WAIANAE, OAHU, HAWAII

Log of Boring **I-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)	Sample	Graphic	USCS	Description
			67	50			40			GP	White with brown mottling GRAVEL (CORALLINE) with some cobbles and sand, loose (coralline detritus)
			20	13			45				White with brown mottling CALCAREOUS SANDSTONE, moderately fractured, slightly weathered, very hard (coralline sandstone)
										GP	White with brown mottling GRAVEL (CORALLINE) with cobbles and sand, loose (coralline detritus)
			70	51	8/0"		50				White with brown mottling CORAL, closely fractured, moderately weathered, very hard
							55				Boring terminated at 51 feet
							60				
							65				
							70				

Date Started:	March 2, 2009	Water Level: ▽	9.2 ft. 03/02/2009 1034 HRS
Date Completed:	March 2, 2009		
Logged By:	Y. Chiba	Drill Rig:	CME-75
Total Depth:	51 feet	Drilling Method:	4" Auger & PQ Coring
Work Order:	6138-00(B)	Driving Energy:	140 lb. wt.,30 in. drop

SORING LOG DOT 6138-00.GPJ GEOLABS.GDT 9/29/09

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

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

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SIGNATURE 4/30/16 EXPIRATION DATE OF THE LICENSE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BORING LOGS - 8

FARRINGTON HIGHWAY
Replacement of Maipalaoa Bridge
Federal Aid Project No. BR-093-1(21)

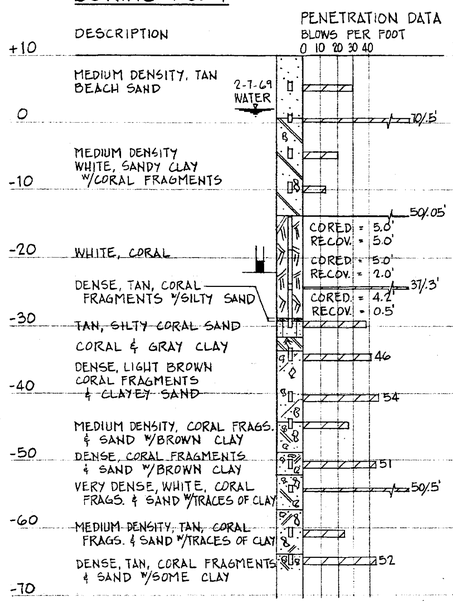
Scale: AS NOTED Date: June, 2015

SHEET No. G10 OF 10 SHEETS

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.		1969	63	104

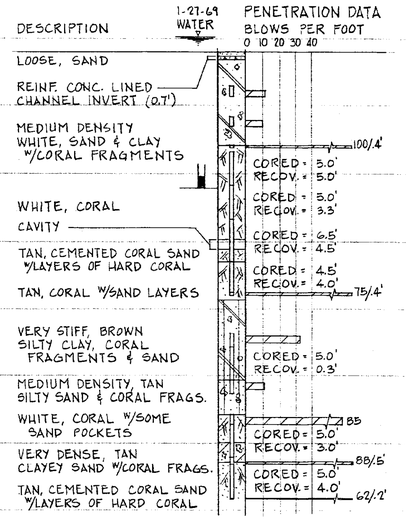
PROJECT 900B-02-68 UNIT 2

BORING No. 1



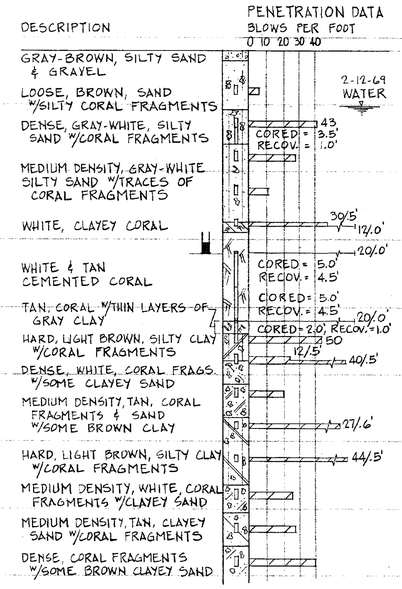
END OF BORING @ 66.5'

BORING No. 2



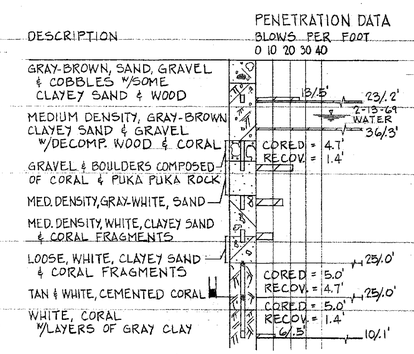
END OF BORING @ 67.7'

BORING No. 3



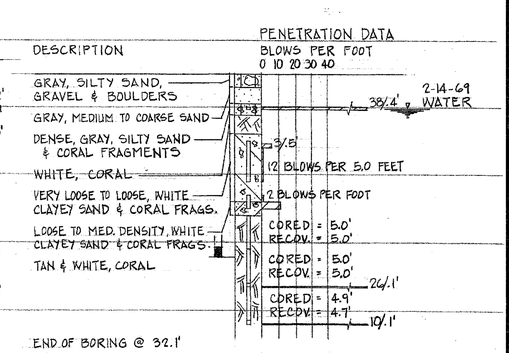
END OF BORING @ 68.5'

BORING No. 4



END OF BORING @ 34.1'

BORING No. 5



END OF BORING @ 32.1'

(A/6) BORING LOGS

NOTE:

BORING LOGS TAKEN FROM REPORT PREPARED BY WALTER LUM ASSOCIATES, INC. "FARRINGTON HIGHWAY WIDENING, MAIPALOA BRIDGE" DATED FEBRUARY 26, 1969.

LEGEND

▮ ESTIMATED PILE TIP ELEV.

ORIGINAL PLAT | SURVEY PLOTTED BY | DRAWN BY | TRACED BY | DESIGNED BY | QUANTITIES BY | CHECKED BY | DATE

NOTE BOOK | No.

PRINTED ON NO. 1000H CLEARPRINT

2

10/30/15	Sheet Added for Reference and Information
DATE	REVISION

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
MAIPALAOA HIGHWAYS DIVISION

~~MAIPALAOA BRIDGE WIDENING~~
BORING LOGS
~~FARRINGTON HIGHWAY WIDENING~~
~~PROJECT 900B-02-68~~
~~UNIT 2~~

~~SCALE: AS NOTED~~

EDWARD K. WATANABE REGISTERED PROFESSIONAL ENGINEER No. 947 HAWAII, U.S.A.

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WALTER LUM ASSOCIATES, INC.
By E.K. Watanabe

SHEET No. 6 OF 7 SHEETS

63