| FED. ROAD DIST. NO. | STATE | FED. AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|
| HAWAII | HAWAII | BR-083-1(50) | 2005 | 45 | 81 |

# 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 |
| | 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
- 3-INCH O.D. MODIFIED CALIFORNIA SAMPLE
- S SHELBY TUBE SAMPLE
- G 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 "Kamehameha Highway ( Route 83), Kokololio Stream Bridge Replacement, Koolauloa, Oahu, Hawaii dated July 25, 2003 has been prepared by Geolabs, Inc. A copy of the report will be supplied to the Contractor by the State and is also on file at the office of the Engineer for review by the Contractor.

2. For boring locations, see Sheet C-40.

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

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

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

4/30/2014
EXP. DATE

GEOLABS, INC.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

**BORING LOG - 1**

KAMEHAMEHA HIGHWAY
REPLACEMENT OF KOKOLOLIO STREAM BRIDGE
Federal Aid Project No. BR-083-1(50)

Scale: As Noted Date: August 2004

SHEET No. **C-43** OF **51** SHEETS

| FED. ROAD DIST. NO. | STATE | FED. AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|
| HAWAII | HAWAII | BR-083-1(50) | 2005 | 46 | 81 |

GEOLABS, INC.
Geotechnical Engineering

KAMEHAMEHA HIGHWAY (ROUTE 83)
KOKOLOLIO STREAM BRIDGE REPLACEMENT
KOOLAULOA, OAHU, HAWAII

Log of Boring 1

Approximate Ground Surface Elevation" "(feet MSL): 13 *

| 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 | | | | 32 | | | | GW | BASE COURSE |
| | | | | | | | | | SP | Tan GRAVELLY SAND, medium dense, damp (fill) |
| | 4 | 89 | | | 37 | | | | SP | Tannish white SAND, medium dense, damp |
| | 5 | | | | 13 | | 5 | | | (beach sand) |
| | | | | | | | | | | grades with coral gravel |
| | 19 | | | | 47/.5' +25/.1' | | 10 | | SP | Tannish white SAND with some coralline gravel, dense (beach sand) |
| | 22 | | | | 57 | | 15 | | | |
| | 22 | | | | 18 | | 20 | | GW-GM | Tannish white SANDY CORALLINE GRAVEL with silt medium dense (coralline detritus) |
| | | | | | | | | | | Boring terminated at 21.5 feet |
| | | | | | | | 25 | | | * Elevations estimated from Topographic Survey Map transmitted by Mitsunaga & Associates, Inc. on April 5, 2002. |
| | | | | | | | 30 | | | |
| | | | | | | | 35 | | | |
| | | | | | | | 40 | | | |
| | | | | | | | 45 | | | |
| | | | | | | | 50 | | | |

| | | | |
|---|---|---|---|
| Date Started: | March 27, 2000 | Water Level: ▽ | 9.2 ft. 3/27/00 1005 HRS |
| Date Completed: | March 27, 2002 | | |
| Logged By: | S. Latronic | Drill Rig: | CME-55 |
| Total Depth: | 21.5 feet | Drilling Method: | 4" Auger |
| Work Order: | 4863-00 | Driving Energy: | 140 lb. wt., 30 in. drop |

GEOLABS, INC.
Geotechnical Engineering

KAMEHAMEHA HIGHWAY (ROUTE 83)
KOKOLOLIO STREAM BRIDGE REPLACEMENT
KOOLAULOA, OAHU, HAWAII

Log of Boring 2

Approximate Ground Surface Elevation" "(feet MSL): 10 *

| Other Tests | Moisture Content (%) | Dry Unit Weight (pcf) | Core Recovery (%) | RQD (%) | Penetration Resistance (blows/foot) | Pocket Pen. (tsf) | Depth (feet) | Sample Graphic | USCS | Description |
|---|---|---|---|---|---|---|---|---|---|---|
| | 10 | 94 | | | 17 | | | | CH | Brown SILTY CLAY with traces of gravel, medium stiff, moist (fill) |
| | 25 | 81 | | | 26 | | | | | |
| | 24 | | | | 9 | | 5 | | | |
| | | | | | | | | | MH | Dark brownish gray CLAYEY SILT with sand, gravel and cobbles, soft, wet (fill) |
| | 31 | | | | 4 | | 10 | | GM | Dark gray SILTY GRAVEL with sand, loose (coralline detritus) |
| | 26 | | | | 9 | | 15 | | | |
| | 56 | | | | 2 | | | | SM | Grayish white SILTY SAND with gravel, very loose (coralline detritus) |
| | 9 | | | | 9 | | 20 | | | |
| | | | | | | | | | MH | Brown and gray CLAYEY SILT, stiff, moist (residual) |
| | | | | | 14 | | 25 | | | |
| | | | | | | | | | | Brown and gray BASALT, severely fractured, extremely weathered, soft (saprolite) |
| | 51 | | 83 | | 28 | | 30 | | | Brown and gray BASALT, severely fractured, extremely weathered, soft (saprolite) |
| | | | 43 | | | | 35 | | | |
| | 60 | | 67 | 40 | 16 | | 40 | | | |
| | 59 | | 59 | 55 | 29 | | 45 | | | Brownish gray vesicular BASALT, moderately fractured, highly weathered, soft to medium hard (basalt formation) |
| | | | 80 | 52 | | | 50 | | | |

| | | | |
|---|---|---|---|
| Date Started: | April 1, 2002 | Water Level: ▽ | 9 ft. 4/1/02 1120 HRS<br>11.3 ft. 4/1/02 1411 HRS |
| Date Completed: | April 1, 2002 | | |
| Logged By: | S. Latronic | Drill Rig: | DIEDRICH D-25 |
| Total Depth: | 80 feet | Drilling Method: | 4" Auger & 4" Casing |
| Work Order: | 4863-00 | Driving Energy: | 140 lb. wt., 30 in. drop |

ORIGINAL PLANS | SURVEY PLOTTED BY ____ DATE
DRAWN BY ____ " "
NOTE BOOK ____ TRACED BY ____ " "
DESIGNED BY ____ " "
QUANTITIES BY ____ " "
CHECKED BY ____ " "
No. ____

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

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

4/30/2014
GEOLABS, INC. EXP. DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

# BORING LOG - 2

KAMEHAMEHA HIGHWAY
REPLACEMENT OF KOKOLOLIO STREAM BRIDGE
Federal Aid Project No. BR-083-1(50)

Scale: As Noted Date: August 2004

SHEET No. C-44 OF 51 SHEETS

| FED. ROAD DIST. NO. | STATE | FED. AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|
| HAWAII | HAWAII | BR-083-1(50) | 2005 | 47 | 81 |

## GEOLABS, INC.
Geotechnical Engineering

KAMEHAMEHA HIGHWAY (ROUTE 83)
KOKOLOLIO STREAM BRIDGE REPLACEMENT
KOOLAULOA, 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) |
| | | | | | | | | | | | grades to moderately weathered, medium hard to hard |
| | | | 100 | 90 | | | 55 | | | | |
| | | | 100 | 87 | | | 60 | | | | Brownish gray vesicular BASALT, moderately fractured, slightly to moderately weathered, medium hard to hard (basalt formation) |
| | | | 100 | 95 | | | 65 | | | | Gray vugular BASALT, slightly fractured, slightly weathered, hard (basalt formation) |
| | | | 98 | 95 | | | 70 | | | | |
| | | | 100 | 80 | | | 75 | | | | Brownish gray BASALT, moderately fractured, slightly to moderately weathered, hard |
| | | | 100 | 100 | | | 80 | | | | grades to massive, unweathered, very hard |
| | | | | | | | | | | | Boring terminated at 80 feet |
| | | | | | | | 85 | | | | |
| | | | | | | | 90 | | | | |
| | | | | | | | 95 | | | | |
| | | | | | | | 100 | | | | |

BORING LOG.DGN 4863-00.GPJ GEOLABS.GDT 1/29/03

| | | | |
|---|---|---|---|
| Date Started: | April 1, 2002 | Water Level: ▽ | 9 ft. 4/1/02 1120 HRS<br>11.3 ft. 4/1/02 1411 HRS |
| Date Completed: | April 1, 2002 | | |
| Logged By: | S. Latronic | Drill Rig: | DIEDRICH D-25 |
| Total Depth: | 80 feet | Drilling Method: | 4" Auger & 4" Casing |
| Work Order: | 4863-00 | Driving Energy: | 140 lb. wt., 30 in. drop |

## GEOLABS, INC.
Geotechnical Engineering

KAMEHAMEHA HIGHWAY (ROUTE 83)
KOKOLOLIO STREAM BRIDGE REPLACEMENT
KOOLAULOA, 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 | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | Approximate Ground Surface Elevation" "(feet MSL): 11 * |
| LL=59 PI=34 | 19 | 87 | | | 13 | | | | | CH | Brown SILTY CLAY with sand and gravel, stiff, moist (fill) |
| | 17 | 82 | | | 8 | | 5 | | | | grades to medium stiff |
| | | | | | | | | | | | grades to very soft, wet |
| | 73 | 54 | | | 2 | | 10 | | | MH | Dark gray CLAYEY SILT with sand, very soft (alluvium) |
| | | | | | | | | | | SP-SM | Grayish white GRAVELLY SAND with silt, loose to medium dense (coralline detritus) |
| | 49 | | | | 6 | | 15 | | | | |
| | | | | | 4 | | 20 | | | MH-OH | Dark gray CLAYEY SILT with organics and gravel, very soft (alluvium) |
| | | | | | | | 25 | | | | Gray BOULDERS, COBBLES AND GRAVEL with sand and silt, dense (alluvium) |
| | | | 83 | | | | | | | | |
| | | | 45 | | | | | | | | |
| | 33 | | | | 63 | | 30 | | | | Brownish gray BASALT, severely fractured, extremely weathered, soft (saprolite) |
| | | | 76 | 19 | | | 35 | | | | |
| | 64 | | | | 19 | | | | | | Brownish gray vesicular BASALT, moderately fractured, highly weathered, soft to medium hard (saprolite) |
| | | | 79 | 57 | | | 40 | | | | |
| | | | 60 | 20 | | | 45 | | | | |
| | 58 | | | | 31 | | | | | | |
| | | | 67 | 50 | | | 50 | | | | |

BORING LOG.DGN 4863-00.GPJ GEOLABS.GDT 1/29/03

| | | | |
|---|---|---|---|
| Date Started: | April 3, 2002 | Water Level: ▽ | 10.2 ft. 4/3/02 0918 HRS<br>9.3 ft. 4/3/02 1100 HRS |
| Date Completed: | April 3, 2002 | | |
| Logged By: | S. Latronic | Drill Rig: | DIEDRICH D-25 |
| Total Depth: | 82 feet | Drilling Method: | 4" Auger & 4" Casing |
| Work Order: | 4863-00 | Driving Energy: | 140 lb. wt., 30 in. drop |

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

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

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

4/30/2014
GEOLABS, INC. EXP. DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

# BORING LOG - 3

KAMEHAMEHA HIGHWAY
REPLACEMENT OF KOKOLOLIO STREAM BRIDGE
Federal Aid Project No. BR-083-1(50)

Scale: As Noted Date: August 2004

SHEET No. C-45 OF 51 SHEETS

| FED. ROAD DIST. NO. | STATE | FED. AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|
| HAWAII | HAWAII | BR-083-1(50) | 2005 | 48 | 81 |

GEOLABS, INC.
Geotechnical Engineering

KAMEHAMEHA HIGHWAY (ROUTE 83)
KOKOLOLIO STREAM BRIDGE REPLACEMENT
KOOLAULOA, 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 | Description |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | (Continued from previous plate) |
| | | | | | | | | | | Brownish gray vesicular BASALT, moderately fractured, moderately weathered, soft to medium hard (basalt formation) |
| | | | 100 | 70 | | | 55 | | | |
| | | | | | | | | | | Gray vesicular BASALT, slightly fractured, slightly weathered, hard (basalt formation) |
| | | | 95 | 60 | | | | | | CLINKER |
| | | | | | | | | | | Gray vugular BASALT, moderately fractured, slightly to moderately weathered, hard (basalt formation) |
| | | | 100 | 67 | | | 60 | | | |
| | | | | | | | 65 | | | |
| | | | 100 | 88 | | | | | | grades to very hard, slightly fractured |
| | | | | | | | 70 | | | |
| | | | 100 | 88 | | | | | | |
| | | | | | | | 75 | | | |
| | | | 100 | 100 | | | | | | |
| | | | | | | | 80 | | | |
| | | | | | | | | | | Boring terminated at 82 feet |
| | | | | | | | 85 | | | |
| | | | | | | | 90 | | | |
| | | | | | | | 95 | | | |
| | | | | | | | 100 | | | |

| | | | |
|---|---|---|---|
| Date Started: | April 3, 2002 | Water Level: ▽ | 10.2 ft. 4/3/02 0918 HRS<br>9.3 ft. 4/3/02 1100 HRS |
| Date Completed: | April 3, 2002 | | |
| Logged By: | S. Latronic | Drill Rig: | DIEDRICH D-25 |
| Total Depth: | 82 feet | Drilling Method: | 4" Auger & 4" Casing |
| Work Order: | 4863-00 | Driving Energy: | 140 lb. wt., 30 in. drop |

GEOLABS, INC.
Geotechnical Engineering

KAMEHAMEHA HIGHWAY (ROUTE 83)
KOKOLOLIO STREAM BRIDGE REPLACEMENT
KOOLAULOA, OAHU, HAWAII

Log of Boring 4

Approximate Ground Surface Elevation" "(feet MSL): 13 *

| 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 |
| | | | | | | | | | GW | BASE COURSE |
| | 49 | 67 | | | 9 | | | | CH | Brown SILTY CLAY, medium stiff, moist (fill) |
| | 33 | 77 | | | 17 | | 5 | | CH | Brown SILTY CLAY with sand and gravel, medium stiff, moist (fill) |
| LL=58<br>PI=32 | 30 | 75 | | | 7 | | 10 | | | |
| | | | | | | | | | | CONCRETE |
| | 35 | | | | 14 | | 15 | | SM | Tannish white SILTY SAND with gravel, loose (coralline detritus) |
| | 43 | 69 | | | 6 | | 20 | | GM | Gray white SILTY GRAVEL AND SAND, loose (coralline detritus) |
| | 68 | | | | 7/.5'<br>+50/.3' | 2.0 | 25 | | MH | Brown CLAYEY SILT with traces of gravel, stiff (residual) |
| | | | | | | | | | | Brownish gray vesicular BASALT, severely fractured, extremely weathered, soft (saprolite) |
| | 8 | | 48 | 6 | 50/.1' | | 30 | | | Brownish gray vesicular BASALT, severely fractured, extremely weathered, soft (saprolite) |
| | 59 | | 71 | 49 | 50/.4' | | 35 | | | Gray vugular BASALT, moderately fractured, slightly to moderately weathered, hard |
| | | | 57 | | | | 40 | | | |
| | | | | | | | | | | Brown and gray BASALT, severely fractured, extremely weathered, soft (saprolite) |
| | 59 | | 50 | | 19 | 2.0<br>2.5 | 45 | | | |
| | | | | | | | 50 | | | |

| | | | |
|---|---|---|---|
| Date Started: | March 21, 2002 | Water Level: ▽ | 10.5 ft. 3/21/02 0925 HRS |
| Date Completed: | March 21, 2002 | | |
| Logged By: | S. Latronic | Drill Rig: | CME-55 |
| Total Depth: | 80.5 feet | Drilling Method: | 4" Auger & 4" Casing |
| Work Order: | 4863-00 | Driving Energy: | 140 lb. wt., 30 in. drop |

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

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

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

4/30/2014
GEOLABS, INC. EXP. DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

**BORING LOG - 4**

KAMEHAMEHA HIGHWAY
REPLACEMENT OF KOKOLOLIO STREAM BRIDGE
Federal Aid Project No. BR-083-1(50)

Scale: As Noted Date: August 2004

SHEET No. **C-46** OF **51** SHEETS

| FED. ROAD DIST. NO. | STATE | FED. AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|
| HAWAII | HAWAII | BR-083-1(50) | 2005 | 49 | 81 |

## GEOLABS, INC.
Geotechnical Engineering

KAMEHAMEHA HIGHWAY (ROUTE 83)
KOKOLOLIO STREAM BRIDGE REPLACEMENT
KOOLAULOA, 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 |
|---|---|---|---|---|---|---|---|---|---|---|
| | 58 | | | | 43 | | | | | |
| | | | 95 | 81 | | | 55 | | | Gray vesicular BASALT, slightly fractured, slightly weathered, hard (basalt formation) |
| | | | 100 | 45 | | | | | | |
| | | | 88 | 77 | | | 60 | | | Brownish gray vesicular BASALT, moderately fractured, moderately weathered, medium hard (basalt formation) |
| | | | | | | | | | | CLINKER |
| | | | | | | | 65 | | | Gray vugular BASALT, slightly fractured, slightly weathered, very hard (basalt formation) |
| | | | 100 | 90 | | | | | | |
| | | | 100 | 73 | | | 70 | | | |
| | | | 100 | 67 | | | 75 | | | Brownish gray vesicular BASALT, moderately fractured, slightly to moderately weathered, medium hard (basalt formation) |
| | | | | | | | 80 | | | Boring terminated at 80.5 feet |
| | | | | | | | 85 | | | |
| | | | | | | | 90 | | | |
| | | | | | | | 95 | | | |
| | | | | | | | 100 | | | |

| | | | |
|---|---|---|---|
| Date Started: | March 21, 2002 | Water Level: ▽ | 10.5 ft. 3/21/02 0925 HRS |
| Date Completed: | March 21, 2002 | | |
| Logged By: | S. Latronic | Drill Rig: | CME-55 |
| Total Depth: | 80.5 feet | Drilling Method: | 4" Auger ∉ 4" Casing |
| Work Order: | 4863-00 | Driving Energy: | 140 lb. wt., 30 in. drop |

## GEOLABS, INC.
Geotechnical Engineering

KAMEHAMEHA HIGHWAY (ROUTE 83)
KOKOLOLIO STREAM BRIDGE REPLACEMENT
KOOLAULOA, 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): 13 * Description |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | 10-inch ASPHALTIC CONCRETE |
| | | | | | | | | | GW | BASE COURSE |
| | 39 | 62 | | | 12 | 1.5 | | | CH | Brown SILTY CLAY, stiff, moist (fill) |
| | 52 | 59 | | | 6 | 0.5 | 5 | | | grades to medium stiff |
| | | | | | | | | | MH | Dark gray CLAYEY SILT with sand, gravel and cobbles, very soft, wet (alluvium) |
| | 37 | 79 | | | 3 | | 10 | | | |
| | | | | | | | | | | BOULDER |
| | 31 | | | | 7 | | 15 | | SP-SM | Tannish white GRAVELLY SAND with silt, loose (coralline detritus) |
| | 39 | | | | 6 | | 20 | | GM | Grayish white SILTY GRAVEL AND SAND, loose (coralline detritus) |
| | 59 | 62 | | | 6 | | 25 | | SM-ML | Dark grayish brown SILTY SAND with gravel, loose, interbedded with gray organic silt, soft (alluvium) |
| | | | | | | | | | | Gray BOULDERS, COBBLES AND GRAVEL with sand and silt, dense |
| | 8 | | 27 | | 52 | | 30 | | | Gray BOULDERS, COBBLES AND GRAVEL with sand and silt, dense |
| | 28 | | 27 | | 74 | | 35 | | | Brownish gray BASALT, severely fractured, extremely weathered, soft (saprolite) |
| | 77 | | 90 | | 11 | | 40 | | | |
| | 69 | | 45 | 10 | 16 | | 45 | | | |
| | | | | | | | 50 | | | |

| | | | |
|---|---|---|---|
| Date Started: | March 28, 2002 | Water Level: ▽ | 14.1 ft. 3/28/02 0940 HRS |
| Date Completed: | March 28, 2002 | | |
| Logged By: | S. Latronic | Drill Rig: | CME-55 |
| Total Depth: | 80.5 feet | Drilling Method: | 4" Auger ∉ 4" Casing |
| Work Order: | 4863-00 | Driving Energy: | 140 lb. wt., 30 in. drop |

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

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

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

4/30/2014
GEOLABS, INC. EXP. DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

# BORING LOG - 5

KAMEHAMEHA HIGHWAY
REPLACEMENT OF KOKOLOLIO STREAM BRIDGE
Federal Aid Project No. BR-083-1(50)

Scale: As Noted Date: August 2004

SHEET No. C-47 OF 51 SHEETS

| FED. ROAD DIST. NO. | STATE | FED. AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|
| HAWAII | HAWAII | BR-083-1(50) | 2005 | 50 | 81 |

GEOLABS, INC.
Geotechnical Engineering

KAMEHAMEHA HIGHWAY (ROUTE 83)
KOKOLOLIO STREAM BRIDGE REPLACEMENT
KOOLAULOA, 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 | (Continued from previous plate) Description |
|---|---|---|---|---|---|---|---|---|---|---|
| | 63 | | | | 64 | | | | | |
| | | | 67 | 36 | | | | | | Gray vesicular BASALT, moderately fractured, moderately weathered, medium hard (basalt formation) |
| | | | 100 | 100 | | | 55 | | | Gray vugular BASALT, moderately to slightly fractured, slightly weathered, hard (basalt formation) |
| | | | 85 | 40 | | | 60 | | | CLINKER |
| | | | 100 | 90 | | | 65 | | | Gray vugular BASALT, slightly fractured, slightly weathered, hard (basalt formation) |
| | | | 100 | 85 | | | 70 | | | Brownish gray vesicular BASALT, moderately fractured, moderately weathered, medium hard (basalt formation) |
| | | | 95 | 70 | | | 75 | | | Gray vugular BASALT, moderately to slightly fractured, slightly to moderately weathered, hard (basalt formation) |
| | | | | | | | 80 | | | Brown gray vesicular BASALT, moderately fractured, moderately to highly weathered, medium hard (basalt formation) |
| | | | | | | | | | | Boring terminated at 80.5 feet |
| | | | | | | | 85 | | | |
| | | | | | | | 90 | | | |
| | | | | | | | 95 | | | |
| | | | | | | | 100 | | | |

| | | | |
|---|---|---|---|
| Date Started: | March 28, 2002 | Water Level: ▽ | 14.1 ft. 3/28/02 0940 HRS |
| Date Completed: | March 28, 2002 | | |
| Logged By: | S. Latronic | Drill Rig: | CME-55 |
| Total Depth: | 80.5 feet | Drilling Method: | 4" Auger ∉ 4" Casing |
| Work Order: | 4863-00 | Driving Energy: | 140 lb. wt., 30 in. drop |

GEOLABS, INC.
Geotechnical Engineering

KAMEHAMEHA HIGHWAY (ROUTE 83)
KOKOLOLIO STREAM BRIDGE REPLACEMENT
KOOLAULOA, 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: Description |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | 10-inch ASPHALTIC CONCRETE |
| | 30 | | | | 27 | | | | GW | BASE COURSE |
| | | | | | | | | | SP | Tan SAND with traces of gravel, medium dense, damp (fill) |
| | 5 | 95 | | | 32 | | | | SP | Tannish white SAND, medium dense, damp (beach sand) |
| | 6 | | | | 12 | | 5 | | | |
| | 19 | | | | 48 | | 10 | | SP | Tannish white SAND with traces of silt and coralline gravel, dense (beach sand) |
| | 21 | | | | 39 | | 15 | | GM-GW | Tannish white SILTY CORALLINE SAND with gravel, medium dense (coralline detritus) |
| | 39 | | | | 4 | | 20 | | GM | Tan SILTY CORALLINE GRAVEL, loose (coralline detritus) |
| | | | | | | | | | | Boring terminated at 21.5 feet |
| | | | | | | | 25 | | | |
| | | | | | | | 30 | | | |
| | | | | | | | 35 | | | |
| | | | | | | | 40 | | | |
| | | | | | | | 45 | | | |
| | | | | | | | 50 | | | |

| | | | |
|---|---|---|---|
| Date Started: | March 27, 2002 | Water Level: ▽ | 10.7 ft. 3/27/02 1150 HRS<br>10.7 ft. 3/27/02 HRS |
| Date Completed: | March 27, 2002 | | |
| Logged By: | S. Latronic | Drill Rig: | CME-55 |
| Total Depth: | 21.5 feet | Drilling Method: | 4" Auger |
| Work Order: | 4863-00 | Driving Energy: | 140 lb. wt., 30 in. drop |

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

ROBIN M. LIM
LICENSED PROFESSIONAL ENGINEER
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HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

4/30/2014
GEOLABS, INC. EXP. DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

**BORING LOG - 6**

KAMEHAMEHA HIGHWAY
REPLACEMENT OF KOKOLOLIO STREAM BRIDGE
Federal Aid Project No. BR-083-1(50)

Scale: As Noted Date: August 2004

SHEET No. **C-48** OF **51** SHEETS

| FED. ROAD DIST. NO. | STATE | FED. AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|
| HAWAII | HAWAII | BR-083-1(50) | 2005 | 51 | 81 |

**GEOLABS, INC.**
Geotechnical Engineering

KAMEHAMEHA HIGHWAY (ROUTE 83)
KOKOLOLIO STREAM BRIDGE REPLACEMENT
KOOLAULOA, OAHU, HAWAII

Log of Boring 7

Approximate Ground Surface Elevation" "(feet MSL): 12 *

| 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 |
| | | | | | | | | | | | BASE COURSE |
| | 8 | 90 | | | 44 | | | | | SP | Tan SAND with gravel, medium dense, damp (fill) |
| | 4 | | | | 22 | | | | | SP | Tannish white SAND, medium dense, damp (beach sand) |
| | 4 | | | | 12 | | 5 | | | | |
| | 9 | | | | 30/.3' | | 10 | | | | Tannish white CORAL, moderately fractured, slightly weathered, medium hard to hard (coral formation) |
| | 20 | | | | 50/.4' | | 15 | | | | |
| | 25 | | | | 15 | | 20 | | | SW-SM | Tannish white SILTY CORALLINE SAND AND GRAVEL, medium dense (coralline) |
| | | | | | | | | | | | Boring terminated at 21.5 feet |
| | | | | | | | 25 | | | | |
| | | | | | | | 30 | | | | |
| | | | | | | | 35 | | | | |
| | | | | | | | 40 | | | | |
| | | | | | | | 45 | | | | |
| | | | | | | | 50 | | | | |

| | | | |
|---|---|---|---|
| Date Started: | March 27, 2002 | Water Level: ▽ | 10.3 ft. 3/27/02 1345 HRS |
| Date Completed: | March 27, 2002 | | |
| Logged By: | S. Latronic | Drill Rig: | CME-55 |
| Total Depth: | 21.5 feet | Drilling Method: | 4" Auger |
| Work Order: | 4863-00 | Driving Energy: | 140 lb. wt., 30 in. drop |

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

ROBIN M. LIM
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4/30/2014
GEOLABS, INC. EXP. DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

**BORING LOG - 7**

KAMEHAMEHA HIGHWAY
REPLACEMENT OF KOKOLOLIO STREAM BRIDGE
Federal Aid Project No. BR-083-1(50)

Scale: As Noted Date: August 2004

SHEET No. **C-49** OF **51** SHEETS