

FED. ROAD DIST. NO.	STATE	FEDERAL - AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-A311(4)	2006	73	180

BORING LOG				W.O. 99-3144		
BORING NO. B35 (STA 318+00)		DRIVING WT. 140 lb.		DATE OF DRILLING 2/17/99		
SURFACE ELEV. 8.8±		DROP 30 in.		WATER LEVEL 7.5 feet		
DEPTH FOOT	GRAPH	SAMPLE	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
			21	84	10	Silty SAND (SM) - Brown, moist, medium dense.
5			15	85	15	Sandy SILT (ML-CL) - Brown, moist, medium stiff.
			17	82	23	
10			2	59	68	Clayey SILT (ML) - Gray, soft.
15			3	Tip Recovery		
						End boring at 15.5 feet.
20						
25						
30						

BORING LOG				W.O. <u>99-3144</u>		
BORING NO. <u>B36 (STA 324+00)</u>		DRIVING WT. <u>140 lb.</u>		DATE OF DRILLING <u>2/17/99</u>		
SURFACE ELEV. <u>14.3±</u>		DROP <u>30 in.</u>		WATER LEVEL <u>12.7 feet</u>		
DEPTH H O	GRAPH	SAMPLE	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
			18	69	42	Sandy SILT (ML-CL) - Brown, moist, medium stiff. Firm to medium stiff from 3 feet. Boulder from 3.5 to 4.5 feet.
			3/6" 10/No	78 Penetration	17	
5			9	76	35	
10			7	79	21	
15			5	81	42	
						End boring at 15.5 feet.
20						
25						
30						

BORING LOG					W.O. 99-3144	
BORING NO. B37 (N. Kihei Rd.)			DRIVING WT. 140 lb.		DATE OF DRILLING 2/16/99	
SURFACE ELEV. 8.5±			DROP 30 in.		WATER LEVEL 5.8 feet	
DEPTH	GRAPH	SAMPLE	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
0						
			4	58	73	Silty CLAY (ML-CL) - Brown, moist, soft to firm, with sand.
			3	81	29	Increase in sand content at 3 feet.
5			2	55	72	
			29	114	17	Silty SAND (SM) - Brownish tan, dense, with coral fragments. Grinding from 7 to 8 feet.
10			3	113	19	Loose from 11 feet.
15			2	115	18	
						End boring at 15.5 feet.
20						
25						
30						


BORING LOG						W.O. <u>99-3144</u>
BORING NO. <u>B44 (N. Keshuaiwai)</u>			DRIVING WT. <u>140 lb.</u>	DATE OF DRILLING <u>6/24/99</u>		
SURFACE ELEV. <u>8.5±</u>			DROP <u>30 in.</u>	WATER LEVEL <u>None</u>		
DEPTH FOOT	GRAPH	SAMPLE	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
						Sandy SILT (ML-CL) - Brown, slightly moist, stiff.
			56	101	10	
5			15	75	26	Moist at 5 feet, medium stiff.
			19	97	14	
10						
			41	109	16	
15						Silty SAND (SM) - Mottled brown, moist, dense.
			34	78	24	
20						
			22	104	23	
25						
			21	94	28	
30						

Plate B46

[illegible]

Note:

1. *Boring Logs and Locations Reproduced From the "Soils Investigation" Report for Puunene Avenue/Mokulele Highway Widening Project, Puunene, Maui, Hawaii for Sato & Associates, Inc., By Ernest K. Hirata & Associates, Inc., W.O. 99-3144, Dated October 1, 1999.*
2. *The Boring Logs Indicate the Approximate Subsurface Soil Conditions Encountered Only At Those Times and Locations Where Borings Were Made, and May Not Represent Conditions At Other Times and Locations.*
3. *The Boring Logs are for Design Purposes Only, and are Not Intended for Use in Developing Cost Estimates By The Contractor.*

 <i>Clifford M. Araiawa</i> THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION 04/30/06 EXPIRATION DATE OF THE LICENSE	STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION <u>BORING LOGS</u> <u>MOKULELE HIGHWAY WIDENING</u> <u>Vicinity of Kealia Pond Driveway</u> <u>To</u> <u>Piilani Highway</u> <u>Federal - Aid Project No. NH-A311(4)</u> Scale: AS NOTED Date: July 2005
	SHEET No. 1 OF 4 SHEETS

FED. ROAD DIST. NO.	STATE	FEDERAL - AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-A311(4)	2006	74	180

BORING LOG						W.O. 99-3144
BORING NO. <u>B45 (N. Keahuaiwai)</u>		DRIVING WT. <u>140 lb.</u>		DATE OF DRILLING <u>6/24/99</u>		
SURFACE ELEV. <u>11±</u>		DROP <u>30 in.</u>		WATER LEVEL <u>22.8 feet</u>		
DEPTH H	GRAPH	SAMPLE	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
			26	79	25	Silty SAND (SM) - Brown, moist, medium dense to dense.
5			23	92	16	
10			12	72	20	
15			49	90	8	Slightly moist at 14 feet.
20			22	82	42	Sandy SILT (ML-CL) - Brown, moist, medium stiff, with gravel.
25			19	74	55	Silty SAND (SM) - Reddish brown, medium dense.
30						

Plate B48

BORING LOG						W.O. 99-3144
BORING NO. <u>B45 (cont.)</u>		DRIVING WT. <u>140 lb.</u>		DATE OF DRILLING <u>6/24/99</u>		
SURFACE ELEV. <u>11±</u>		DROP <u>30 in.</u>		WATER LEVEL <u>22.8 feet</u>		
DEPTH H	GRAPH	SAMPLE	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
30						
35						
40						
45						MODERATELY WEATHERED BASALT (WM) - Gray, hard.
50						End boring at 47 feet.
55						
60						

Plate B49

BORING LOG						W.O. 99-3144
BORING NO. <u>B46 (S. Keahuaiwai)</u>		DRIVING WT. <u>140 lb.</u>		DATE OF DRILLING <u>7/12/99</u>		
SURFACE ELEV. <u>16±</u>		DROP <u>30 in.</u>		WATER LEVEL <u>9.8 feet</u>		
DEPTH H	GRAPH	SAMPLE	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
			9	81	11	Silty SAND (SM) - Brown, slightly moist, medium dense.
5			18	90	28	Moist at 5 feet.
10			18	103	15	
15			12	86	32	Clayey SILT (ML-CL) - Brown, firm to medium stiff, with sand.
20			3	89	32	Firm at 17 feet.
25			12	76	52	
			10/No	Penetration		MODERATELY WEATHERED BASALT (WM) - Gray, hard.
						End boring at 25 feet.
30						

Plate B50

BORING LOG						W.O. 99-3144
BORING NO. <u>B47 (S. Keahuaiwai)</u>		DRIVING WT. <u>140 lb.</u>		DATE OF DRILLING <u>7/12/99</u>		
SURFACE ELEV. <u>15±</u>		DROP <u>30 in.</u>		WATER LEVEL <u>10.2 feet</u>		
DEPTH H	GRAPH	SAMPLE	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
			9	79	24	Silty SAND (SM) - Mottled brown, moist, medium dense.
5			12/6" 9/No	85 Penetration	17	Cobble at 4.5 feet.
10			9	93	31	Sandy SILT (ML-CL) - Brown, moist, firm to medium stiff.
15			6	83	31	
20			42/6"	101	28	WEATHERED BASALT (WH-WM) - Grayish brown, dense to medium hard.
25						End boring at 22.5 feet.
30						

Plate B51

Note:

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ORIGINAL PLAN

DATE

SURVEY PLOTTED BY

DESIGNED BY

TRACED BY

NOTED BY

CHECKED BY

No.

CLIFFORD M. ARAKAWA

LICENSED PROFESSIONAL ENGINEER

No. 1884-C

HAWAII U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

04/30/06

EXPIRATION DATE OF THE LICENSE

STATE OF HAWAII

DEPARTMENT OF TRANSPORTATION

HIGHWAYS DIVISION

BORING LOGS

MOKULELE HIGHWAY WIDENING

Vicinity of Kealia Pond Driveway

To

Piilani Highway

Federal - Aid Project No. NH-A311(4)

Scale: AS NOTED

Date: July 2005

SHEET No. 2 OF 4 SHEETS

FED. ROAD DIST. NO.	STATE	FEDERAL - AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-A311(4)	2006	75	180

BORING LOG						W.O. 99-3144
BORING NO. B48 (Waiakoa Bridge) DRIVING WT. 140 lb. DATE OF DRILLING 6/23/99						
SURFACE ELEV. 22.8± DROP 30 in. WATER LEVEL None						
DEPTH	GRAPH	SAMPLE	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
0						Silty SAND (SM) - Mottled brown, slightly moist, medium dense to dense, with gravel, cobbles, and boulders.
5			24	116	6	
10			18	119	3	
15						Cobble at 6.5 feet.
20						Boulder from 8 to 10 feet.
25			11/6" 23/2"	No Recovery		Boulder from 11.5 to 13.5 feet.
30						Cobble at 14.5 feet.
35						Boulder from 16 to 18.5 feet.
40						SLIGHTLY WEATHERED BASALT (WS) - Gray, hard.
45						
50						
55						Begin NX coring at 26 feet.
60						100% Recovery from 21 to 26 feet.
65						RQD = 81%
70						100% Recovery from 26 to 31 feet.
75						
80						

Plate B52

BORING LOG						W.O. 99-3144
BORING NO. B48 (cont.) DRIVING WT. 140 lb. DATE OF DRILLING 6/23/99						
SURFACE ELEV. 22.8± DROP 30 in. WATER LEVEL None						
DEPTH	GRAPH	SAMPLE	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
0						100% Recovery from 31 to 36 feet.
5						
10						
15						End boring at 36 feet.
20						
25						
30						
35						
40						
45						
50						
55						
60						

Plate B53

BORING LOG						W.O. 99-3144
BORING NO. B49 (Waiakoa Bridge) DRIVING WT. 140 lb. DATE OF DRILLING 6/18/99						
SURFACE ELEV. 16± DROP 30 in. WATER LEVEL None						
DEPTH	GRAPH	SAMPLE	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
0						Silty SAND (SM) - Grayish brown, slightly moist, medium dense to dense, with gravel and cobbles. Cobbles from 1 to 4 feet.
5						
10						
15						Cobbles from 5 to 9 feet.
20						
25						
30			10/6" 44/6"	Tip Recovery		WEATHERED BASALT (WH) - Mottled brown, dense.
35						SLIGHTLY WEATHERED BASALT (WS) - Gray, hard, fractured.
40						
45						
50						Begin NX coring at 13 feet.
55						91% Recovery from 13 to 18 feet.
60						RQD = 43%
65						100% Recovery from 18 to 23 feet.
70						
75						
80						RQD = 80%
85						100% Recovery from 23 to 28 feet.
90						
95						
100						RQD = 85%
105						100% Recovery from 28 to 33 feet.
110						
115						
120						RQD = 86%

Plate B54

BORING LOG						W.O. 99-3144
BORING NO. B49 (cont.) DRIVING WT. 140 lb. DATE OF DRILLING 6/18/99						
SURFACE ELEV. 16± DROP 30 in. WATER LEVEL None						
DEPTH	GRAPH	SAMPLE	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
0						End boring at 33 feet.
5						
10						
15						
20						
25						
30						
35						
40						
45						
50						
55						
60						

Plate B55

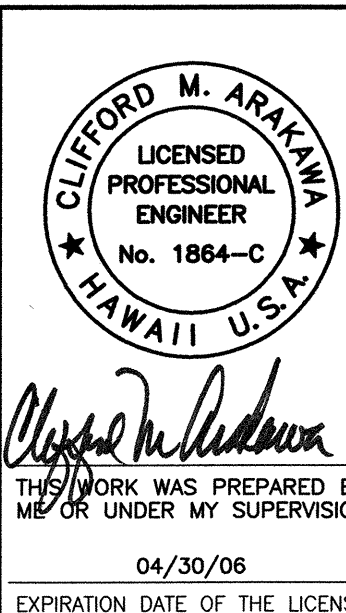
BORING LOG						W.O. 99-3144
BORING NO. B50 (Waiakoa Bridge) DRIVING WT. 140 lb. DATE OF DRILLING 6/17/99						
SURFACE ELEV. 22.7± DROP 30 in. WATER LEVEL None						
DEPTH	GRAPH	SAMPLE	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
0						Silty SAND (SM) - Grayish brown, slightly moist, medium dense to dense, with gravel, cobbles, and boulders.
5			23	76	13	
10						
15						Cobble at 1 foot.
20						Cobble at 3 feet.
25						Boulder from 4.5 to 7 feet.
30						Boulders from 8 to 13.5 feet.
35						
40						
45						Begin NX coring at 9 feet.
50						100% Recovery from 9 to 14 feet.
55						SLIGHTLY WEATHERED BASALT (WS) - Gray, hard.
60						
65						
70						100% Recovery from 14 to 19 feet.
75						RQD = 80%
80						100% Recovery from 19 to 24 feet.
85						
90						
95						RQD = 93%
100						100% Recovery from 24 to 29 feet.
105						
110						
115						RQD = 94%
120						End boring at 29 feet.
125						
130						

Plate B56

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



STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION
BORING LOGS
MOKULELE HIGHWAY WIDENING
Vicinity of Kealia Pond Driveway
To Piilani Highway
Federal - Aid Project No. NH-A311(4)
Scale: AS NOTED Date: July 2005
SHEET No. 3 OF 4 SHEETS

FED. ROAD DIST. NO.	STATE	FEDERAL - AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-A311(4)	2006	76	180

BORING LOG						W.O. 99-3144
BORING NO. B51 (Waiakoa Bridge)						
SURFACE ELEV. 20±		DRIVING WT. 140 lb.		DATE OF DRILLING 6/23/99		
		DROP 30 in.		WATER LEVEL None		
DEPTH	GRAPH	SAMPLE	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
0						
5			28	106	8	Silty SAND (SM) - Grayish brown, slightly moist, dense, with gravel, cobbles, and boulders.
10			45	97	12	Boulder from 6.5 to 7.5 feet.
15			38	124	6	Cobble at 8.5 feet.
20			22	109	8	Boulder from 11 to 13 feet.
25						SLIGHTLY WEATHERED BASALT (WS) - Gray, hard.
30						Begin NX coring at 18 feet. 100% Recovery from 18 to 23 feet. RQD = 81%
						100% Recovery from 23 to 28 feet. RQD = 83%
						100% Recovery from 28 to 33 feet. RQD = 95%

Plate B57

BORING LOG						W.O. 99-3144
BORING NO. B53 (Waiakoa Bridge)						
SURFACE ELEV. 22.4±		DRIVING WT. 140 lb.		DATE OF DRILLING 6/16/99		
		DROP 30 in.		WATER LEVEL None		
DEPTH	GRAPH	SAMPLE	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
0						
5			18/6" 43/6"	94	7	Silty SAND (SM) - Grayish brown, slightly moist, dense, with gravel and cobbles.
10			19	87	7	Cobble at 3 feet.
15			53	102	9	Cobbles from 10.5 to 12 feet.
20			71/8"	98	8	
25						SLIGHTLY WEATHERED BASALT (WS) - Gray, hard, fractured.
30						Begin NX coring at 19 feet. 100% Recovery from 19 to 20 feet. RQD = 81% 100% Recovery from 20 to 25 feet. RQD = 46%
						100% Recovery from 25 to 30 feet. RQD = 83%

Plate B60

BORING LOG						W.O. 99-3144
BORING NO. B51 (cont.)						
SURFACE ELEV. 20±		DRIVING WT. 140 lb.		DATE OF DRILLING 6/23/99		
		DROP 30 in.		WATER LEVEL None		
DEPTH	GRAPH	SAMPLE	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
0						
30						End boring at 33 feet.
35						
40						
45						
50						
55						
60						

Plate B58

BORING LOG						W.O. 99-3144
BORING NO. B53 (cont.)						
SURFACE ELEV. 22.4±		DRIVING WT. 140 lb.		DATE OF DRILLING 6/16/99		
		DROP 30 in.		WATER LEVEL None		
DEPTH	GRAPH	SAMPLE	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
0						
30						100% Recovery from 30 to 35 feet. RQD = 88%
35						100% Recovery from 35 to 38 feet. RQD = 76%
40						End boring at 38 feet.
45						
50						
55						
60						

Plate B61

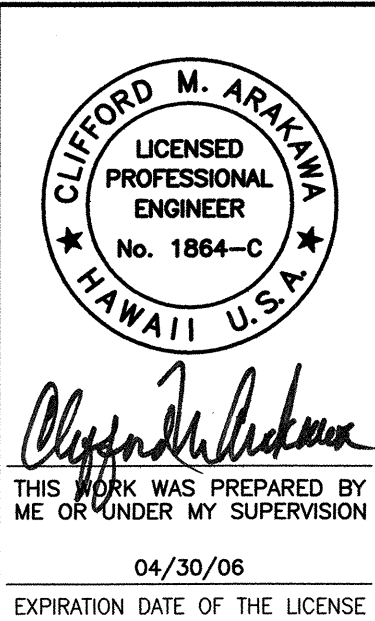
BORING LOG						W.O. 99-3144
BORING NO. B52 (Waiakoa Bridge)						
SURFACE ELEV. 13±		DRIVING WT. 140 lb.		DATE OF DRILLING 6/22/99		
		DROP 30 in.		WATER LEVEL None		
DEPTH	GRAPH	SAMPLE	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
0						
5			24/4"	108	7	Silty SAND (SM) - Grayish brown, slightly moist, dense, with gravel, cobbles, and boulders. Cobble at 0.5 feet. Cobbles from 2.5 to 4 feet.
10						Boulder from 5.5 to 8 feet.
15						Clayey SILT (ML-CL) - Brown, moist, stiff, with sand and gravel. Begin NX coring at 8 feet. 100% Recovery from 8 to 13 feet. RQD = 50%
20						SLIGHTLY WEATHERED BASALT (WS) - Gray, hard.
25						100% Recovery from 13 to 18 feet. RQD = 97%
						100% Recovery from 18 to 23 feet. RQD = 90%
						100% Recovery from 23 to 28 feet. RQD = 88%
30						End boring at 28 feet.

Plate B59

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



STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION
BORING LOGS
MOKULELE HIGHWAY WIDENING
Vicinity of Kealia Pond Driveway To Piilani Highway Federal - Aid Project No. NH-A311(4)
Scale: AS NOTED Date: July 2005
SHEET No. 4 OF 4 SHEETS