

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	560A-03-99	2002	6	86

ERNEST K. HIRATA & ASSOCIATES, INC.  
Geotechnical Engineering

BORING LOG						W.O. 00-3327
BORING NO.	B1	DRIVING WT.	140 lb.	DATE OF DRILLING	11/16/00	
SURFACE ELEV.	22±*	DROP	30 in.	WATER LEVEL	None	
DEPTH	GRAPH	SAMPLE	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
0						Clayey SILT (MH) - Mottled brown, moist, stiff, with sand and weathered basalt fragments. Boulder from 0.5 to 2 feet.
5			30	95	21	Boulder from 4.5 to 5.5 feet. Medium stiff at 5.5 feet.
10			16	83	19	
			50/6"	94	19	
10						End boring at 9.5 feet.
15						
20						
25						
30						
						* Elevations based on Topographic Map prepared by Imata & Associates, Inc.
						Plate B1

ERNEST K. HIRATA & ASSOCIATES, INC.  
Geotechnical Engineering

BORING LOG						W.O. 00-3327
BORING NO.	B2	DRIVING WT.	140 lb.	DATE OF DRILLING	11/16/00	
SURFACE ELEV.	12±	DROP	30 in.	WATER LEVEL	8.4 ft.	
DEPTH	GRAPH	SAMPLE	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
0			26	89	6	SAND (SP) - Tan, slightly moist, medium dense to dense. Covered by 6 inches of asphaltic concrete over 4 inches of base course.
			21	98	3	
5			19	92	5	
10			15	92	31	Silty SAND (SM) - Gray, medium dense.
10						End boring at 10.5 feet.
15						
20						
25						
30						
						Plate B2

ERNEST K. HIRATA & ASSOCIATES, INC.  
Geotechnical Engineering

BORING LOG						W.O. 00-3327
BORING NO.	B3	DRIVING WT.	140 lb.	DATE OF DRILLING	11/20/00	
SURFACE ELEV.	32±	DROP	30 in.	WATER LEVEL	None	
DEPTH	GRAPH	SAMPLE	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
0			26	71	27	Clayey SILT (MH) - Mottled brown, moist, stiff, with sand. Covered by 4 inches of asphaltic concrete over 6 inches of base course.
			26	85	29	
5			10/No Penetration			MODERATELY WEATHERED BASALT (WM) - Gray, hard, slightly fractured, vesicular. Begin NX core at 7 feet. 100% Recovery from 7 to 12 feet. RQD = 86%
10						
15						
20						
25						
30						End boring at 12 feet.
						Plate B3

Boring Notes:

- Boring Logs were taken from "Geotechnical Investigation, Kuhio Highway, Shoulder and Guardrail Improvements, Princeville to Haena, Kauai, Project No. 560A-03-99 for Imata and Associates, Inc." Prepared by Ernest K. Hirata & Associates, Inc., W.O. 00-3327, Dated September 14, 2001.
- The Boring Logs indicate the approximate subsurface soil conditions encountered only at the excavation holes where the borings were made, at the time designated on the log, and may not represent conditions at other locations, or on other dates. Soil conditions and water levels may change with the passage of time and construction methods on improvements at the site.
- For boring locations, see Sheets 37-60.

ERNEST K. HIRATA & ASSOCIATES, INC.  
Geotechnical Engineering

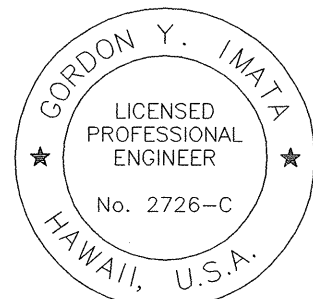
BORING LOG						W.O. 00-3327
BORING NO.	B4	DRIVING WT.	140 lb.	DATE OF DRILLING	11/20/00	
SURFACE ELEV.	34±	DROP	30 in.	WATER LEVEL	None	
DEPTH	GRAPH	SAMPLE	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
0			26	69	34	Clayey SILT (MH) - Mottled brown, moist, stiff, with sand and weathered basalt fragments. Covered by 4 inches of asphaltic concrete over 6 inches of base course.
			41	63	28	
5			10/No Penetration			MODERATELY WEATHERED BASALT (WM) - Gray, medium hard to hard, slightly fractured, vesicular. Begin NX core at 7 feet. 100% Recovery from 7 to 12 feet. RQD = 86%
10			10/No Penetration			
15						
20						
25						
30						End boring at 12 feet.
						Plate B4

ERNEST K. HIRATA & ASSOCIATES, INC.  
Geotechnical Engineering

BORING LOG						W.O. 00-3327
BORING NO.	B5	DRIVING WT.	140 lb.	DATE OF DRILLING	11/21/00	
SURFACE ELEV.	33±	DROP	30 in.	WATER LEVEL	None	
DEPTH	GRAPH	SAMPLE	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
0			50/8"	99	19	Sandy SILT (MH) - Mottled brown, moist, stiff, with weathered basalt fragments. Covered by 6 inches of asphaltic concrete over 4 inches of base course.
5						MODERATELY WEATHERED BASALT (WM) - Gray, medium hard to hard, slightly fractured, vesicular. Begin NX core at 3 feet. 100% Recovery from 3 to 8 feet. RQD = 86%
10						End boring at 8 feet.
15						
20						
25						
30						
						Plate B5

ERNEST K. HIRATA & ASSOCIATES, INC.  
Geotechnical Engineering

BORING LOG						W.O. 00-3327
BORING NO.	B6	DRIVING WT.	140 lb.	DATE OF DRILLING	11/21/00	
SURFACE ELEV.	29±	DROP	30 in.	WATER LEVEL	None	
DEPTH	GRAPH	SAMPLE	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
0			19	77	29	Sandy SILT (MH) - Mottled brown, moist, medium stiff to stiff, with weathered basalt fragments. Covered by 6 inches of asphaltic concrete over 4 inches of base course.
5			18	81	19	
10			28	69	33	Boulders from 10 to 18 feet.
15			17/2" 10/No Penetration	No Recovery		
20			10/No Penetration			MODERATELY WEATHERED BASALT (WM) - Gray, hard, slightly fractured, slightly vesicular. Begin NX core from 19 feet. 100% Recovery from 19 to 24 feet. RQD = 92%
25						End boring at 24 feet.
30						
						Plate B6



THIS WORK WAS PREPARED BY  
OR UNDER MY SUPERVISION.  
*Gordon Y. Imata*

STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION  
**BORING LOGS AND NOTES**  
KUHIO HIGHWAY  
SHOULDER IMPROVEMENTS  
Haena to Princeville  
Project No. 560A-03-99

Scale: As Shown Date: February, 2002  
SHEET No. 1 OF 3 SHEETS

ERNEST K. HIRATA & ASSOCIATES, INC.

Geotechnical Engineering

BORING LOG W.O. 00-3327  
BORING NO. B7 DRIVING WT. 140 lb. DATE OF DRILLING 11/21/00  
SURFACE ELEV. 24± DROP 30 in. WATER LEVEL None

DEPTH H O	GRAPH	SAMPLE	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
0			13	68	28	Sandy SILT (MH) - Light brown, moist, medium stiff, with weathered basalt fragments. Covered by 4 inches of asphaltic concrete over 6 inches of base course.
5			16	76	41	Clayey SILT (MH) - Mottled grayish brown, moist, medium stiff to stiff, with sand. Boulders from 6 to 9.5 feet.
10			33	89	24	
15						MODERATELY WEATHERED BASALT (WM) - Gray, hard, slightly fractured, slightly vesicular. Begin NX core at 13 feet. 98% Recovery from 13 to 18 feet. RQD = 84%
20						End boring at 18 feet.
25						
30						

Plate B7

ERNEST K. HIRATA & ASSOCIATES, INC.

Geotechnical Engineering

BORING LOG W.O. 00-3327  
BORING NO. B10 DRIVING WT. 140 lb. DATE OF DRILLING 5/1/01  
SURFACE ELEV. 7± DROP 30 in. WATER LEVEL 5.2 ft.

DEPTH H O	GRAPH	SAMPLE	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
0			10			Silty SAND (SM) - Brown, moist, medium dense. Covered by 5.5 inches of asphaltic concrete over 4 inches of base course.
5			15	68	62	Sandy SILT (ML) - Dark gray, medium stiff.
10			23	87	37	Silty SAND (SM) - Dark gray, medium dense.
15			24	123		
20			20	126	15	Dark grayish brown color at 18 feet.
25			5	72	55	Clayey SILT (ML) - Dark gray, firm, with sand.
30			24	71	53	Medium stiff at 28 feet.

Plate B10

ERNEST K. HIRATA & ASSOCIATES, INC.

Geotechnical Engineering

BORING LOG W.O. 00-3327  
BORING NO. B8 DRIVING WT. 140 lb. DATE OF DRILLING 11/16/00  
SURFACE ELEV. 11.5± DROP 30 in. WATER LEVEL 7.7 ft.

DEPTH H O	GRAPH	SAMPLE	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
0			21	84	19	Clayey SILT (MH) - Grayish brown, moist, medium stiff to stiff, with sand and gravel.
5			36	119	3	SAND (SP) - Mottled tan, slightly moist, dense.
10			53	112	4	
15			53	108	15	Silty SAND (SM) - Gray, dense.
20						End boring at 10.5 feet.
25						
30						

Plate B8

ERNEST K. HIRATA & ASSOCIATES, INC.

Geotechnical Engineering

BORING LOG W.O. 00-3327  
BORING NO. B10 (cont.) DRIVING WT. 140 lb. DATE OF DRILLING 5/1/01  
SURFACE ELEV. 7± DROP 30 in. WATER LEVEL 5.2 ft.

DEPTH H O	GRAPH	SAMPLE	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
30			8	66	63	
35			7	76	53	
40			4	67	65	Soft to firm from 43 feet.
45			2	63	69	
50			25	69	57	Clayey SILT (MH) - Mottled brown, stiff, with sand.
55			35	70	55	
60						

Plate B11

ERNEST K. HIRATA & ASSOCIATES, INC.

Geotechnical Engineering

BORING LOG W.O. 00-3327  
BORING NO. B9 DRIVING WT. 140 lb. DATE OF DRILLING 11/17/00  
SURFACE ELEV. 7± DROP 30 in. WATER LEVEL 6.5 ft.

DEPTH H O	GRAPH	SAMPLE	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
0			20	90	13	Silty SAND (SM) - Light brown, slightly moist, medium dense to dense. Covered by 6 inches of asphaltic concrete over 4 inches of base course.
5			9	86	38	Clayey SILT (MH) - Grayish brown, moist, firm to medium stiff, with sand.
10			2	65	59	Sandy SILT (ML) - Gray, soft.
15			3	62	76	
20			27	94	30	Silty SAND (SM) - Gray, medium dense to dense.
25						End boring at 15.5 feet.
30						

Plate B9

ERNEST K. HIRATA & ASSOCIATES, INC.

Geotechnical Engineering

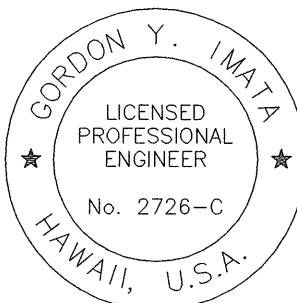
BORING LOG W.O. 00-3327  
BORING NO. B10 (cont.) DRIVING WT. 140 lb. DATE OF DRILLING 5/1/01  
SURFACE ELEV. 7± DROP 30 in. WATER LEVEL 5.2 ft.

DEPTH H O	GRAPH	SAMPLE	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
60			31	63	66	
65			28	67	62	
70			31	65	64	
75			40	66	62	
80						End boring at 79.5 feet.
85						
90						

Plate B12

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	560A-03-99	2002	7	86

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
NOTE BOOK	DESIGNED BY	
QUANTITIES BY	CHECKED BY	
NO. 10/10/02		



THIS WORK WAS PREPARED BY  
ME OR UNDER MY SUPERVISION.  
*Gordon Y. Inata*

STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

BORING LOGS

KUHIO HIGHWAY  
SHOULDER IMPROVEMENTS  
Haena to Princeville  
Project No. 560A-03-99

Scale: As Shown Date: February, 2002  
SHEET No. 2 OF 3 SHEETS



FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	560A-03-99	2002	8	86

ERNEST K. HIRATA & ASSOCIATES, INC.  
Geotechnical Engineering

BORING LOG						W.O. 00-3327
BORING NO. B11		DRIVING WT. 140 lb.		DATE OF DRILLING 4/30/01		
SURFACE ELEV. 7±		DROP 30 in.		WATER LEVEL Not recorded		
DEPTH	GRAPH	SAMPLE	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
0						Silty SAND (SM) - Brown, moist, loose. Covered by 5.5 inches of asphaltic concrete over 4 inches of base course.
			4	87	33	
			5	83	30	
5			4	85	42	Clayey SILT (ML) - Dark gray, wet, firm, with sand.
			12	54	85	
10			7	90	32	Silty SAND (SM) - Dark gray, wet, loose.
			6	79	46	
20			7	71	55	Sandy SILT (ML) - Dark gray, wet, firm.
			5	70	56	
30						

Plate B13

ERNEST K. HIRATA & ASSOCIATES, INC.  
Geotechnical Engineering

BORING LOG						W.O. 00-3327
BORING NO. B12		DRIVING WT. 140 lb.		DATE OF DRILLING 11/17/00		
SURFACE ELEV. 6±		DROP 30 in.		WATER LEVEL 6.2 ft.		
DEPTH	GRAPH	SAMPLE	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
0			13	79	43	Clayey SILT (MH) - Dark brown, moist, medium stiff, with sand. Covered by 8 inches of asphaltic concrete over 4 inches of base course.
			4	57	61	Firm from 3 feet.
5			2	65	62	Sandy SILT (ML) - Gray, soft.
			11	96	27	Silty SAND (SM) - Gray, medium dense.
10			23	107	15	
15			11	97	33	
20						End boring at 20.5 feet.
25						
30						

Plate B16

ERNEST K. HIRATA & ASSOCIATES, INC.  
Geotechnical Engineering

BORING LOG						W.O. 00-3327
BORING NO. B11 (cont.)		DRIVING WT. 140 lb.		DATE OF DRILLING 4/30/01		
SURFACE ELEV. 7±		DROP 30 in.		WATER LEVEL Not recorded		
DEPTH	GRAPH	SAMPLE	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
30						Soft to firm from 32 feet.
			4	72	52	
35			3			
40			4	70	54	
45			4	70	57	
50			2	66	65	
55			5	50	92	
60						

Plate B14

ERNEST K. HIRATA & ASSOCIATES, INC.  
Geotechnical Engineering

BORING LOG						W.O. 00-3327
BORING NO. B13		DRIVING WT. 140 lb.		DATE OF DRILLING 11/20/00		
SURFACE ELEV. 7±		DROP 30 in.		WATER LEVEL 5.2 ft.		
DEPTH	GRAPH	SAMPLE	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
0			28	103	21	Clayey SILT (MH) - Dark brown, moist, stiff, with sand and coral fragments. Covered by 10 inches of asphaltic concrete.
			6/6" 10/No Penetration			Firm to medium stiff from 3 feet. Boulder from 3.5 to 6 feet.
			3	74	51	Sandy SILT (ML) - Gray, soft.
10			3	58	73	
15			16	87	31	Silty SAND (SM) - Gray, medium dense.
20			17	93	35	
25						End boring at 20.5 feet.
30						

Plate B17

ERNEST K. HIRATA & ASSOCIATES, INC.  
Geotechnical Engineering

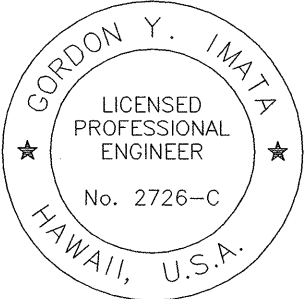
BORING LOG						W.O. 00-3327
BORING NO. B11 (cont.)		DRIVING WT. 140 lb.		DATE OF DRILLING 4/30/01		
SURFACE ELEV. 7±		DROP 30 in.		WATER LEVEL Not recorded		
DEPTH	GRAPH	SAMPLE	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
60			20	71	56	Clayey SILT (MH) - Mottled brown, wet, medium stiff to stiff. With sand from 62 to 68 feet.
65			34	66	63	Stiff from 68 feet. Mottled reddish brown color at 69 feet.
70			23	63	68	
75			36			
80			33			
85						End boring at 85.5 feet.
90						

Plate B15

ERNEST K. HIRATA & ASSOCIATES, INC.  
Geotechnical Engineering

BORING LOG						W.O. 00-3327
PROBE NO. P1		DRIVING WT. NA		DATE OF DRILLING 11/21/00		
SURFACE ELEV. 27±		DROP NA		WATER LEVEL None		
DEPTH	GRAPH	SAMPLE	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
0						Sandy SILT (MH) - Light brown, moist, medium stiff to stiff, with weathered basalt fragments. Covered by 4 inches of asphaltic concrete over 6 inches of base course.
5						Boulders from 5.5 to 15 feet.
10						
15						MODERATELY WEATHERED BASALT (WM) - Gray, hard, slightly fractured, slightly vesicular.
20						End probe at 17 feet.
25						
30						

Plate B18



THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.  
*[Signature]*

STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

BORING LOGS

KUHIO HIGHWAY  
SHOULDER IMPROVEMENTS  
Haena to Princeville  
Project No. 560A-03-99

Scale: As Shown      Date: February, 2002

SHEET No. 3 OF 3 SHEETS

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
	DRAWN BY	JAN. 2001
	NOTED BY	JAN. 2001
	DESIGNED BY	
NOTE BOOK	QUANTITIES BY	
	CHECKED BY	
	DATE	
	BY	