

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-037-1(24)	2005	8	288

ERNEST K. HIRATA & ASSOCIATES, INC.
Geotechnical Engineering

BORING LOG

W.O. 95-2687

BORING NO. B1 (STA 7+50) DRIVING WT. 140 lb. DATE OF DRILLING 6/4/96
SURFACE ELEV. 96±* DROP 30 in. WATER LEVEL None

DEPTH	G R A P H	S A M P L E	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
0						Silty CLAY (CL-ML) - Reddish brown, moist, stiff, with cobbles and gravel.
			10/No	Penetration		Cobble at 2 feet. Cobble at 3 feet.
5			36	93	25	
10			50/6"	100	24	HIGHLY WEATHERED BASALT (WH) - Mottled grayish brown, moist, dense.
						SLIGHTLY WEATHERED BASALT (WS) - Gray, hard.
15						End boring at 14 feet.

* Elevations based on Topographic Survey prepared by Engineers Surveyors Hawaii, Inc.

Plate B1

ERNEST K. HIRATA & ASSOCIATES, INC.
Geotechnical Engineering

BORING LOG

W.O. 95-2687

BORING NO. B2 (STA 18+00) DRIVING WT. 140 lb. DATE OF DRILLING 6/4/96
SURFACE ELEV. 102± DROP 30 in. WATER LEVEL None

DEPTH	G R A P H	S A M P L E	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
0						Silty CLAY (CL-ML) - Reddish brown, moist, stiff, with weathered gravel.
5			20	101	27	
			46/11"	99	19	HIGHLY WEATHERED BASALT (WH) - Mottled grayish brown, moist, dense.
						SLIGHTLY WEATHERED BASALT (WS) - Gray, hard.
10						End boring at 11 feet.

Plate B2

ERNEST K. HIRATA & ASSOCIATES, INC.
Geotechnical Engineering

BORING LOG

W.O. 95-2687

BORING NO. B3 (STA 31+50) DRIVING WT. 140 lb. DATE OF DRILLING 6/4/96
SURFACE ELEV. 104± DROP 30 in. WATER LEVEL None

DEPTH	G R A P H	S A M P L E	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
0						Silty CLAY (CL-ML) - Reddish brown, moist, medium stiff, with cobbles and gravel.
			41/9"	96	27	HIGHLY WEATHERED BASALT (WH) - Mottled yellowish brown, moist, dense.
						SLIGHTLY WEATHERED BASALT (WS) - Gray, hard, fractured.
						Begin NX coring at 4 feet.
						100% recovery from 4 to 9 feet.
						RQD=28%
						Highly weathered basalt from 5.5 to 8.5 feet, dense.
10						End boring at 9 feet.

Plate B3

ERNEST K. HIRATA & ASSOCIATES, INC.
Geotechnical Engineering

BORING LOG

W.O. 95-2687

BORING NO. B4 (STA 41+50) DRIVING WT. 140 lb. DATE OF DRILLING 6/4/96
SURFACE ELEV. 110± DROP 30 in. WATER LEVEL None

DEPTH	G R A P H	S A M P L E	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
0						Silty CLAY (CL-ML) - Reddish brown, moist, medium stiff, with weathered gravel.
5			19	73	17	
			12	98	25	
10			12/10"	85	36	HIGHLY WEATHERED BASALT (WH) - Mottled grayish brown, moist, medium dense.
						SLIGHTLY WEATHERED BASALT (WS) - Gray, hard.
15						End boring at 10 feet.

Plate B4

ERNEST K. HIRATA & ASSOCIATES, INC.
Geotechnical Engineering

BORING LOG

W.O. 95-2687

BORING NO. B5 (STA 53+50) DRIVING WT. 140 lb. DATE OF DRILLING 6/4/96
SURFACE ELEV. 120.5± DROP 30 in. WATER LEVEL None

DEPTH	G R A P H	S A M P L E	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
0						Silty CLAY (CL-ML) - Reddish brown, moist, stiff.
5			24	90	24	
			74	98	23	Cobbles from 5.5 to 7 feet.
10			18	92	34	COMPLETELY TO HIGHLY WEATHERED BASALT (WC-WH) - Mottled reddish brown, moist, medium stiff.
			4/6"	69	44	Hard at 14.5 feet.
			20/2"			End boring at 14.5 feet.

Plate B5

ERNEST K. HIRATA & ASSOCIATES, INC.
Geotechnical Engineering

BORING LOG

W.O. 95-2687

BORING NO. B6 (STA 87+70) DRIVING WT. 140 lb. DATE OF DRILLING 5/28/96
SURFACE ELEV. 192± DROP 30 in. WATER LEVEL None

DEPTH	G R A P H	S A M P L E	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
0						Silty CLAY (CL-ML) - Reddish brown, moist, medium stiff, with gravel.
5			13	96	19	
			27	86	29	HIGHLY WEATHERED BASALT (WH) - Mottled grayish brown, moist, dense.
10			100/8"	91	28	Dense to medium hard from 10 feet.
15			73/10"	78	26	
20			50/3"			Moderately weathered basalt (WM) - Mottled gray, medium hard.
						Tip Recovery
25						End boring at 25 feet.

Plate B6

ERNEST K. HIRATA & ASSOCIATES, INC.
Geotechnical Engineering

BORING LOG

W.O. 95-2687

BORING NO. B7 (STA 88+30) DRIVING WT. 140 lb. DATE OF DRILLING 5/24/96
SURFACE ELEV. 195± DROP 30 in. WATER LEVEL None

DEPTH	G R A P H	S A M P L E	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
0						Silty CLAY (CL-ML) - Reddish brown, moist, medium stiff, with cobbles and gravel.
5			16	85	39	COMPLETELY WEATHERED BASALT (WC) - Mottled reddish and grayish brown, moist, medium dense.
			15	85	38	
10			80/8"	107	15	HIGHLY WEATHERED BASALT (WH) - Mottled gray, slightly moist, dense to medium hard, highly fractured.
15						MODERATELY TO SLIGHTLY WEATHERED BASALT (WM-WS) - Gray, hard, fractured.
						Begin NX coring at 11.5 feet.
						100% Recovery from 11.5 to 16.5 feet.
						RQD = 40%
						90% Recovery from 16.5 to 21.5 feet.
						RQD = 24%
20						End boring at 21.5 feet.

Plate B7

ERNEST K. HIRATA & ASSOCIATES, INC.
Geotechnical Engineering

BORING LOG

W.O. 95-2687

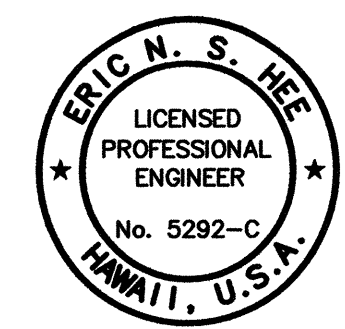
BORING NO. B8 (STA 98+80) DRIVING WT. 140 lb. DATE OF DRILLING 5/30/96
SURFACE ELEV. 231± DROP 30 in. WATER LEVEL None

DEPTH	G R A P H	S A M P L E	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
0						Silty CLAY (CL-ML) - Reddish brown, moist, stiff, with cobbles and gravel.
5			36/8"	94	26	Cobble at 3.5 feet.
			32	80	30	Cobble at 5 feet.
						Mottled reddish brown color from 5.5 feet.
10						Cobble at 7.5 feet.
						Boulder at 9 to 10 feet.
						Cobble at 10 feet.
						Cobble at 11.5 feet.
15			14	92	31	COMPLETELY WEATHERED BASALT (WC) - Mottled reddish brown, moist, medium dense.
						End boring at 14.5 feet.

Plate B8

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

LEP-1 (encl) Engineering Projects \1994\94-038 Haleakala Hwy PHASE 2\BORING\B8\B8-1.dwg Fri, Sep 30 2005 - 8:28am



THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.
Eric N. S. Hira
ENGINEERS SURVEYORS HAWAII, INC.
LICENSE EXPIRATION DATE: 4/30/06

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BORING LOGS

**HALEAKALA HIGHWAY WIDENING, PHASE 2
HANA HIGHWAY TO PUKALANI BYPASS
FED. AID PROJ. NO. NH-037-1(24)**

SCALE: AS NOTED DATE: MAY, 2005

SHEET No. 1 OF 4 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-037-1(24)	2005	9	288

ERNEST K. HIRATA & ASSOCIATES, INC.
Geotechnical Engineering

BORING LOG

W.O. 95-2687

BORING NO. B9 (STA 108+50) DRIVING WT. 140 lb. DATE OF DRILLING 5/30/96
SURFACE ELEV. 266± DROP 30 in. WATER LEVEL None

DEPTH	G R A P H	S A M P L E	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
0						Silty CLAY (CL-ML) - Reddish brown, slightly moist, stiff.
3			33	86	14	COMPLETELY TO HIGHLY WEATHERED BASALT (WC-WH) - Mottled brown, slightly moist to moist, dense.
6			67	84	22	SLIGHTLY WEATHERED BASALT (WM) - Gray, hard, highly vesicular. Begin NX coring at 6 feet. 90% Recovery from 6 to 11 feet. RQD = 68%
11						End boring at 11 feet.

Plate B9

ERNEST K. HIRATA & ASSOCIATES, INC.
Geotechnical Engineering

BORING LOG

W.O. 95-2687

BORING NO. B10 (STA 129+00) DRIVING WT. 140 lb. DATE OF DRILLING 5/24/96
SURFACE ELEV. 339± DROP 30 in. WATER LEVEL None

DEPTH	G R A P H	S A M P L E	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
0						Silty CLAY (CL-ML) - Reddish brown, moist, medium stiff.
4			14	94	30	COMPLETELY TO HIGHLY WEATHERED BASALT (WC-WH) - Mottled grayish brown, moist, medium dense.
5			13	69	34	Dense from 7 feet.
9			39	91	16	SLIGHTLY WEATHERED BASALT (WS) - Gray, hard, highly vesicular. Begin NX coring at 12 feet. 100% Recovery from 12 to 17 feet. RQD = 86%
17						End boring at 17 feet.

Plate B10

ERNEST K. HIRATA & ASSOCIATES, INC.
Geotechnical Engineering

BORING LOG

W.O. 95-2687

BORING NO. B11 (STA 129+70) DRIVING WT. 140 lb. DATE OF DRILLING 5/23/96
SURFACE ELEV. 340± DROP 30 in. WATER LEVEL None

DEPTH	G R A P H	S A M P L E	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
0						Silty CLAY (CL-ML) - Reddish brown, moist, stiff, with cobbles and gravel. Cobbles at 1.5 feet.
2			26/6" 10/No	79	14	Penetration
3			40	99	25	COMPLETELY WEATHERED BASALT (WC) - Mottled reddish brown, moist, medium dense.
6			13	87	37	Mottled grayish brown color from 9.5 feet.
9			17	78	41	Moderately weathered basalt (WM) - Gray, medium hard.
15			15	73	40	Dense to medium hard from 19 feet.
19			90/9"			Tip Recovery
24			50/3"			No Recovery
24.5						End boring at 24.5 feet.

Plate B11

ERNEST K. HIRATA & ASSOCIATES, INC.
Geotechnical Engineering

BORING LOG

W.O. 95-2687

BORING NO. B12 (STA 140+50) DRIVING WT. 140 lb. DATE OF DRILLING 5/30/96
SURFACE ELEV. 376± DROP 30 in. WATER LEVEL None

DEPTH	G R A P H	S A M P L E	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
0						Silty CLAY (CL-ML) - Brown, moist, stiff, with cobbles and gravel.
4			40	98	21	Cobble at 5 feet. Grayish brown color from 5.5 feet.
6			40	114	17	Mottled reddish brown color from 9 feet.
9			56/10"	97	21	Boulder at 10.5 to 11.5 feet.
11			51/11"	97	23	Cobble at 12 feet.
15.5						End boring at 15.5 feet.

Plate B12

ERNEST K. HIRATA & ASSOCIATES, INC.
Geotechnical Engineering

BORING LOG

W.O. 95-2687

BORING NO. B13 (STA 150+50) DRIVING WT. 140 lb. DATE OF DRILLING 5/29/96
SURFACE ELEV. 411± DROP 30 in. WATER LEVEL None

DEPTH	G R A P H	S A M P L E	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
0						Silty GRAVEL (GM) - Grayish brown, slightly moist, dense, with cobbles.
3			90/9"	109	12	Cobble at 3 feet.
4.5			50/5"			No Recovery
6.5						Cobbles from 6.5 to 8 feet.
9			10/No			Penetration
9						Cobble at 9 feet.
14						MODERATELY TO SLIGHTLY WEATHERED BASALT (WM-WS) - Gray, medium hard to hard.
14						End boring at 14 feet.

Plate B13

ERNEST K. HIRATA & ASSOCIATES, INC.
Geotechnical Engineering

BORING LOG

W.O. 95-2687

BORING NO. B14 (STA 171+10) DRIVING WT. 140 lb. DATE OF DRILLING 5/23/96
SURFACE ELEV. 477± DROP 30 in. WATER LEVEL None

DEPTH	G R A P H	S A M P L E	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
0						Silty CLAY (CL-ML) - Reddish brown, moist, stiff.
1.5			64	104	21	Cobble at 1.5 feet.
3			14	96	30	Medium stiff at 3 feet.
6			44	87	30	Brown color from 6 feet.
8			6	84	35	Firm from 8 to 11.5 feet.
17			65/5"	118	18	HIGHLY WEATHERED BASALT (WH) - Dark brown, moist, dense.
17						SLIGHTLY WEATHERED BASALT (WS) - Gray, hard. Begin NX coring at 17 feet. 100% Recovery from 17 to 22 feet. RQD = 100%
22						End boring at 22 feet.

Plate B14

ERNEST K. HIRATA & ASSOCIATES, INC.
Geotechnical Engineering

BORING LOG

W.O. 95-2687

BORING NO. B15 (STA 171+70) DRIVING WT. 140 lb. DATE OF DRILLING 5/23/96
SURFACE ELEV. 480± DROP 30 in. WATER LEVEL None

DEPTH	G R A P H	S A M P L E	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
0						Silty CLAY (CL-ML) - Reddish brown, moist, stiff, with sand.
4			24	93	20	Medium stiff from 4 to 7 feet.
7			11	95	27	Brown color from 7 feet.
10			49	100	27	COMPLETELY WEATHERED BASALT (WC) - Mottled dark brown, moist, dense.
17			65/6"	70	22	SLIGHTLY WEATHERED BASALT (WM) - Gray, hard.
24			86/10"	104	16	End boring at 24 feet.
24			10/No			Penetration

Plate B15

ERNEST K. HIRATA & ASSOCIATES, INC.
Geotechnical Engineering

BORING LOG

W.O. 95-2687

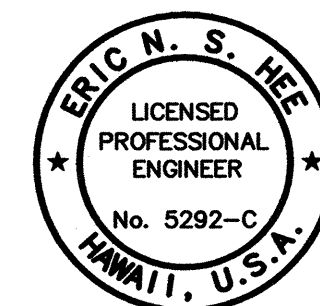
BORING NO. B16 (STA 183+60) DRIVING WT. 140 lb. DATE OF DRILLING 5/29/96
SURFACE ELEV. 529± DROP 30 in. WATER LEVEL None

DEPTH	G R A P H	S A M P L E	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
0						Silty CLAY (CL-ML) - Reddish brown, moist, stiff, with gravel.
4			27	96	24	COMPLETELY WEATHERED BASALT (WC) - Mottled reddish brown, moist, firm.
7			22	98	29	Hard at 12 feet.
12.5			7	75	47	End boring at 12.5 feet.

Plate B16

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

1. Each Engineering Project 1994-1998 Retainable Fee Phase 2 (Work Order 02/05/96) 18-2 Aug 96, Sep 30, 2005 - 83.70m



THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.
Eric N. S. Hee
ENGINEERS SURVEYORS HAWAII, INC.
LICENSE EXPIRATION DATE: 4/30/06

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BORING LOGS

HALEAKALA HIGHWAY WIDENING, PHASE 2
HANA HIGHWAY TO PUKALANI BYPASS
FED. AID PROJ. NO. NH-037-1(24)

SCALE: AS NOTED DATE: MAY, 2005

SHEET No. 2 OF 4 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-037-1(24)	2005	10	288

ERNEST K. HIRATA & ASSOCIATES, INC.
Geotechnical Engineering

BORING LOG W.O. 95-2687

BORING NO. B17 (STA 196+00) DRIVING WT. 140 lb. DATE OF DRILLING 5/29/96
SURFACE ELEV. 592.5± DROP 30 in. WATER LEVEL None

DEPTH	GRAVEL	SAMPLE	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
0						Silty GRAVEL (GM) - Grayish brown, moist, medium dense.
5			6/6" 10/6"	93	27	Silty CLAY (CL-ML) - Reddish brown, moist, medium stiff, with cobbles, gravel, and sand. Boulder at 4 to 5 feet. Begin NX coring at 5 feet. 58% recovery from 5 to 9 feet. Cobbles from 5 to 6 feet. Cobbles from 7.5 to 8.5 feet. End NX coring at 9 feet. Cobbles from 9 to 11 feet.
10						Silty CLAY (CL-ML) - Brown, moist, medium stiff.
15			19	80	31	End boring at 14.5 feet.

Plate B17

ERNEST K. HIRATA & ASSOCIATES, INC.
Geotechnical Engineering

BORING LOG W.O. 95-2687

BORING NO. B18 (STA 205+50) DRIVING WT. 140 lb. DATE OF DRILLING 5/29/96
SURFACE ELEV. 641± DROP 30 in. WATER LEVEL None

DEPTH	GRAVEL	SAMPLE	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
0						Silty CLAY (CL-ML) - Reddish brown, slightly moist, stiff, with cobbles, gravel, and sand. Boulder at 0.5 to 2 feet. Cobbles from 3 to 4.5 feet.
5			70/10"	105	11	SLIGHTLY WEATHERED BASALT (WS) - Gray, hard. Begin NX coring at 5 feet. 94% Recovery from 5 to 10 feet. RQD = 80%
10						End boring at 10 feet.

Plate B18

ERNEST K. HIRATA & ASSOCIATES, INC.
Geotechnical Engineering

BORING LOG W.O. 95-2687

BORING NO. B19 (STA 239+75) DRIVING WT. 140 lb. DATE OF DRILLING 5/23/96
SURFACE ELEV. 815± DROP 30 in. WATER LEVEL None

DEPTH	GRAVEL	SAMPLE	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
0						Silty CLAY (CL-ML) - Brown, moist, medium stiff, with cobbles. Cobbles from 2 to 3 feet.
5			4/6" 15/No	95	30	Tip Recovery Penetration
10			16	95	30	
15			15	86	37	
20			17	82	22	COMPLETELY WEATHERED BASALT (WC) - Mottled brown, moist, medium dense.
25			15/No			Penetration
30						SLIGHTLY WEATHERED BASALT (WS) - Gray, hard, vesicular. Begin NX coring at 13 feet. 100% Recovery from 13 to 18 feet. RQD = 80%
35						End boring at 18 feet.

Plate B19

ERNEST K. HIRATA & ASSOCIATES, INC.
Geotechnical Engineering

BORING LOG W.O. 95-2687

BORING NO. B20 (STA 240+25) DRIVING WT. 140 lb. DATE OF DRILLING 5/22/99
SURFACE ELEV. 811± DROP 30 in. WATER LEVEL None

DEPTH	GRAVEL	SAMPLE	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
0						Silty CLAY (CL-ML) - Dark brown, moist, medium stiff. Cobble at 2 feet. Firm at 3 feet.
5			19	99	27	
10			7	90	30	
15			13	95	31	
20			10/No			Penetration
25						SLIGHTLY WEATHERED BASALT (WS) - Gray, hard, fractured. Begin NX coring at 10 feet. 100% Recovery from 10 to 15 feet. RQD = 50% Vesicular from 11.5 feet.
30						100% Recovery from 15 to 20 feet. RQD = 84%
35						End boring at 20 feet.

Plate B20

ERNEST K. HIRATA & ASSOCIATES, INC.
Geotechnical Engineering

BORING LOG W.O. 95-2687

BORING NO. B21 (STA 255+20) DRIVING WT. 140 lb. DATE OF DRILLING 5/29/99
SURFACE ELEV. 870± DROP 30 in. WATER LEVEL None

DEPTH	GRAVEL	SAMPLE	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
0						Silty CLAY (CL-ML) - Brown, moist, medium stiff, with gravel. Covered by 3 inches of asphaltic concrete.
5			13	84	28	
10			21	97	24	COMPLETELY TO HIGHLY WEATHERED BASALT (WC-WH) - Mottled grayish brown, moist, dense.
15			28	88	38	
20			63	93	25	
25						End boring at 14 feet.

Plate B21

ERNEST K. HIRATA & ASSOCIATES, INC.
Geotechnical Engineering

BORING LOG W.O. 95-2687

BORING NO. B22 (STA 270+00) DRIVING WT. 140 lb. DATE OF DRILLING 5/28/96
SURFACE ELEV. 951± DROP 30 in. WATER LEVEL None

DEPTH	GRAVEL	SAMPLE	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
0						COMPLETELY WEATHERED BASALT (WC) - Mottled brown, moist, medium dense. Covered by 2.5 inches of asphaltic concrete.
5			13	75	39	
10			20	76	42	
15			50/6"	86	20	HIGHLY WEATHERED BASALT (WH) - Grayish brown, moist, dense.
20			82/7"			Tip Recovery
25						MODERATELY WEATHERED BASALT (WM) - Mottled gray, dense to medium hard.
30						End boring at 15 feet.

Plate B22

ERNEST K. HIRATA & ASSOCIATES, INC.
Geotechnical Engineering

BORING LOG W.O. 95-2687

BORING NO. B23 (STA 284+10) DRIVING WT. 140 lb. DATE OF DRILLING 5/28/96
SURFACE ELEV. 1022± DROP 30 in. WATER LEVEL None

DEPTH	GRAVEL	SAMPLE	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
0						Silty CLAY (CL-ML) - Grayish brown, moist, medium stiff, with gravel. Brown color from 1 foot.
5			12	89	31	
10			20	80	30	
15			21	73	46	COMPLETELY TO HIGHLY WEATHERED BASALT (WC-WH) - Mottled yellowish brown, moist, medium dense.
20			50/2"			No Recovery
25						MODERATELY WEATHERED BASALT (WM) - Gray, medium hard.
30						End boring at 14 feet.

Plate B23

ERNEST K. HIRATA & ASSOCIATES, INC.
Geotechnical Engineering

BORING LOG W.O. 95-2687

BORING NO. B24 (STA 65+40) DRIVING WT. 140 lb. DATE OF DRILLING 5/30/96
SURFACE ELEV. 146± DROP 30 in. WATER LEVEL None

DEPTH	GRAVEL	SAMPLE	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
0						Silty CLAY (CL-ML) - Reddish brown, slightly moist, medium stiff.
5			24	70	21	COMPLETELY WEATHERED BASALT (WC) - Grayish brown, moist, dense.
10						MODERATELY TO SLIGHTLY WEATHERED BASALT (WM-WS) - Gray, hard, vesicular. Begin NX coring at 5 feet. 98% Recovery from 5 to 10 feet. RQD = 82%
15						End boring at 10 feet.

Plate B24

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

1:1 (Scale) Engineering Projects 1994/1995-1998 Honolulu Hwy Phase 2 (WIDENING) (BYPASS) (P-3) Org. Tr. Sep. 30, 2005 - 6:12pm



THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.
Eric N. S. Hira
ENGINEERS SURVEYORS HAWAII, INC.
LICENSE EXPIRATION DATE: 4/30/06

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BORING LOGS

HALEAKALA HIGHWAY WIDENING, PHASE 2
HANA HIGHWAY TO PUKALANI BYPASS
FED. AID PROJ. NO. NH-037-1(24)

SCALE: AS NOTED DATE: MAY, 2005

SHEET No. 3 OF 4 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-037-1(24)	2005	11	288

ERNEST K. HIRATA & ASSOCIATES, INC.
Geotechnical Engineering

BORING LOG W.O. 95-2687

BORING NO. B25 (STA 78+00) DRIVING WT. 140 lb. DATE OF DRILLING 5/30/96
SURFACE ELEV. 170± DROP 30 in. WATER LEVEL None

DEPTH (ft)	GRAPEL SAMPLE	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
0		51	87	18	Silty CLAY (CL-ML) - Reddish brown, moist, stiff.
5		10/No Penetration			HIGHLY WEATHERED BASALT (WH) - Mottled grayish brown, moist, dense to medium hard.
10		15/4" 10/No Penetration	80	15	MODERATELY WEATHERED BASALT (WM) - Gray, medium hard. Dense to medium hard from 12 feet.
15					End boring at 15 feet.

Plate B25

ERNEST K. HIRATA & ASSOCIATES, INC.
Geotechnical Engineering

BORING LOG W.O. 95-2687

BORING NO. B26 (STA 118+60) DRIVING WT. 140 lb. DATE OF DRILLING 5/30/99
SURFACE ELEV. 302± DROP 30 in. WATER LEVEL None

DEPTH (ft)	GRAPEL SAMPLE	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
0		40/4"			Silty GRAVEL (GM) - Grayish brown, slightly moist, dense. Silty CLAY (CL-ML) - Grayish brown, slightly moist, stiff, with cobbles and gravel. Cobble at 1 foot. Cobble at 3 feet.
5		50/5"			MODERATELY WEATHERED BASALT (WM) - Gray, medium hard, highly vesicular.
10		50/2"			Tip Recovery
15		10/No Penetration			End boring at 15 feet.

Plate B26

ERNEST K. HIRATA & ASSOCIATES, INC.
Geotechnical Engineering

BORING LOG W.O. 95-2687

BORING NO. B27 (STA 160+70) DRIVING WT. 140 lb. DATE OF DRILLING 5/29/96
SURFACE ELEV. 444± DROP 30 in. WATER LEVEL None

DEPTH (ft)	GRAPEL SAMPLE	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
0		47	119	6	Silty GRAVEL (GM) - Grayish brown, slightly moist, dense. Brown color from 2 feet.
5		24	97	26	Silty CLAY (CL-ML) - Reddish brown, moist, stiff.
10		4/6" 12/6"	93	30	COMPLETELY TO HIGHLY WEATHERED BASALT (WC-WH) - Mottled grayish brown, moist, medium dense to dense. End boring at 9.5 feet.

Plate B27

ERNEST K. HIRATA & ASSOCIATES, INC.
Geotechnical Engineering

BORING LOG W.O. 95-2687

BORING NO. B28 (STA 216+60) DRIVING WT. 140 lb. DATE OF DRILLING 5/29/96
SURFACE ELEV. 697± DROP 30 in. WATER LEVEL None

DEPTH (ft)	GRAPEL SAMPLE	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
0		35	88	29	Silty CLAY (CL-ML) - Brown, moist, stiff, with gravel. HIGHLY WEATHERED BASALT (WH) - Mottled grayish brown, moist, dense.
5		65	105	18	Mottled yellowish brown color at 4 feet.
10		50/5"			Tip Recovery SLIGHTLY WEATHERED BASALT (WS) - Gray, hard.
15					End boring at 12.5 feet.

Plate B28

ERNEST K. HIRATA & ASSOCIATES, INC.
Geotechnical Engineering

BORING LOG W.O. 95-2687

BORING NO. B29 (STA 227+90) DRIVING WT. 140 lb. DATE OF DRILLING 5/29/96
SURFACE ELEV. 754± DROP 30 in. WATER LEVEL None

DEPTH (ft)	GRAPEL SAMPLE	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
0		29/6" 35/1"	97	23	Silty GRAVEL (GM) - Reddish brown, slightly moist, dense. HIGHLY WEATHERED BASALT (WH) - Mottled grayish brown, moist, dense.
5		50/5"			Tip Recovery MODERATELY WEATHERED BASALT (WM) - Mottled gray, dense to medium hard.
10		50/3"			No Recovery End boring at 9 feet.

Plate B29

ERNEST K. HIRATA & ASSOCIATES, INC.
Geotechnical Engineering

BORING LOG W.O. 95-2687

BORING NO. B30 (STA 126+25) DRIVING WT. 140 lb. DATE OF DRILLING 8/25/99
SURFACE ELEV. 333± DROP 30 in. WATER LEVEL None

DEPTH (ft)	GRAPEL SAMPLE	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
0		42	91	26	Silty CLAY (CL-ML) - Reddish brown, moist, stiff, with sand and gravel.
5		45	90	28	
10		43	86	34	
15		19/2"			No Recovery HIGHLY WEATHERED BASALT (WH) - Mottled grayish brown, moist, dense.
10		10/No Penetration			MODERATELY WEATHERED BASALT (WM) - Gray, medium hard.
15		10/No Penetration			End boring at 13 feet.

Plate B30

ERNEST K. HIRATA & ASSOCIATES, INC.
Geotechnical Engineering

BORING LOG W.O. 95-2687

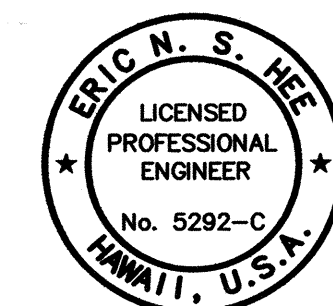
BORING NO. B31 (STA 128+00) DRIVING WT. 140 lb. DATE OF DRILLING 8/25/99
SURFACE ELEV. 337± DROP 30 in. WATER LEVEL None

DEPTH (ft)	GRAPEL SAMPLE	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
0		50	99	26	Silty CLAY (CL-ML) - Brown, moist, stiff, with sand and gravel.
5		38	90	29	
10		16	81	34	
15		53/6" 10/No Penetration	68	18	HIGHLY WEATHERED BASALT (WH) - Grayish brown, moist, dense.
10		10/No Penetration			MODERATELY WEATHERED BASALT (WM) - Gray, medium hard.
15					End boring at 15 feet.

Plate B31

ORIGINAL PLAN _____ DATE _____
DRAWN BY _____
DESIGNED BY _____
QUANTITIES BY _____
CHECKED BY _____
No. _____

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THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.
Eric N. S. Hee
ENGINEERS SURVEYORS HAWAII, INC.
LICENSE EXPIRATION DATE: 4/30/06

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
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