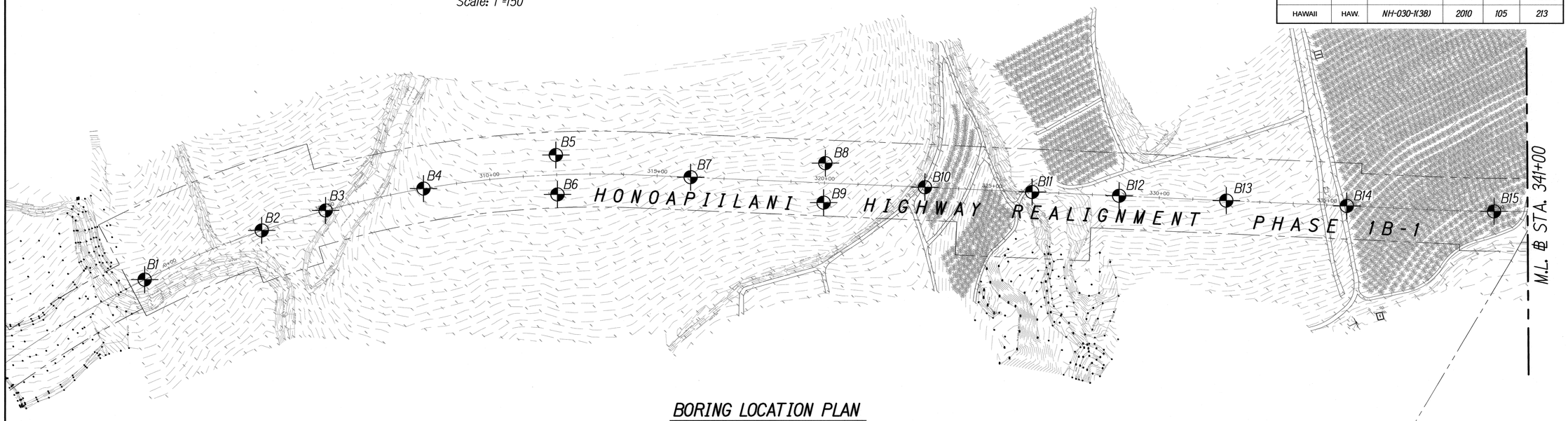
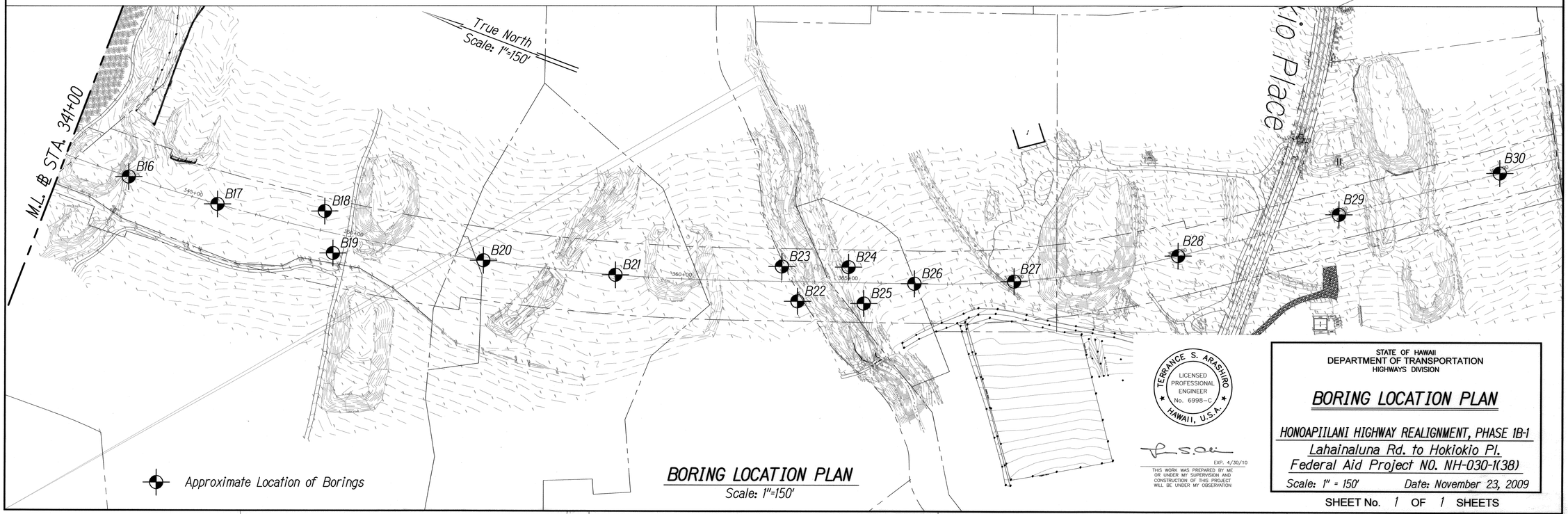
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-030-1(38)	2010	105	213

True North
Scale: 1"=150'



BORING LOCATION PLAN
Scale: 1"=150'

True North
Scale: 1"=150'



Approximate Location of Borings

BORING LOCATION PLAN
Scale: 1"=150'

TERRANCE S. ARASHIRO
LICENSED PROFESSIONAL ENGINEER
No. 6998-C
HAWAII, U.S.A.

EXP. 4/30/10

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BORING LOCATION PLAN

HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1B-1
Lahainaluna Rd. to Hokiokio Pl.
Federal Aid Project NO. NH-030-1(38)

Scale: 1" = 150' Date: November 23, 2009

SHEET No. 1 OF 1 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-030-1(38)	2010	106	213

HIRATA & ASSOCIATES, INC.

BORING LOG — W.O. 08-4582

BORING NO. B1 — DRIVING WT. 140 lb. — START DATE 8/21/08
SURFACE ELEV. 224±* — DROP 30 in. — END DATE 8/21/08

DEPTH	GRAPH	SAMPLE	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
0			54	76	27	Clayey SILT (ML) – Reddish brown, moist, stiff to very stiff, with gravel.
			37	61	27	
5			31	70	35	BASALT (WH–WC) – Dark gray, moist, dense, highly to completely weathered, with volcanic clinker. Grayish brown in color from 7 feet.
10			50/No Penetration			BASALT (WS) – Gray, hard, slightly fractured, slightly weathered. Begin NX coring at 10 feet. 100% Recovery from 10 to 15 feet. RQD = 100%
15						87% Recovery from 15 to 20 feet. RQD = 78%
20						95% Recovery from 20 to 25 feet. RQD = 78% Moderately fractured from 23 feet.
25						92% Recovery from 25 to 30 feet. RQD = 53%
30						GRAVEL AND COBBLES – Brownish gray, medium hard, partially cemented. (Welded Volcanic Clinker)

Plate A4.1

HIRATA & ASSOCIATES, INC.

BORING LOG — W.O. 08-4582

BORING NO. B1 (Continued) — DRIVING WT. 140 lb. — START DATE 8/21/08
SURFACE ELEV. 224± — DROP 30 in. — END DATE 8/21/08

DEPTH	GRAPH	SAMPLE	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
30						BASALT (WS) – Gray, hard, slightly fractured, slightly weathered. 90% Recovery from 30 to 35 feet. RQD = 53% Volcanic clinker at 31 feet.
35						End boring at 35 feet. Neither groundwater nor seepage water encountered.
40						* Elevations based on a topographic survey map provided by Austin, Tsutsumi & Associates, Inc.
45						
50						
55						
60						

Plate A4.2

HIRATA & ASSOCIATES, INC.

BORING LOG — W.O. 08-4582

BORING NO. B2 — DRIVING WT. 140 lb. — START DATE 8/22/08
SURFACE ELEV. 214± — DROP 30 in. — END DATE 8/22/08

DEPTH	GRAPH	SAMPLE	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
0			50/5"		8	Silty CLAY (CL) – Reddish brown, moist, stiff, with highly weathered rock.
5						BASALT (WS) – Gray, hard, slightly fractured, slightly weathered. Begin NX coring at 4 feet. 80% Recovery from 4 to 9 feet. RQD = 70%
10						100% Recovery from 9 to 14 feet. RQD = 83% Highly to moderately weathered from 9 to 11 feet.
15						100% Recovery from 14 to 19 feet. RQD = 92%
20						CEMENTED SAND AND GRAVEL – Mottled reddish brown, medium hard. (Welded Volcanic Clinker) End boring at 19 feet. Neither groundwater nor seepage water encountered.
25						
30						

Plate A4.3

HIRATA & ASSOCIATES, INC.

BORING LOG — W.O. 08-4582

BORING NO. B3 — DRIVING WT. 140 lb. — START DATE 8/22/08
SURFACE ELEV. 215± — DROP 30 in. — END DATE 8/25/08

DEPTH	GRAPH	SAMPLE	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
0			36	77	17	Silty CLAY (CL) – Reddish brown, moist, stiff, with gravel.
			45	81	27	
5			24/6" 50/2"	89	21	BASALT (WH) – Dark gray, moist, dense, highly weathered.
10						BASALT (WS) – Gray, hard, slightly fractured, slightly weathered. Begin NX coring at 9 feet. 88% Recovery from 9 to 14 feet. RQD = 47%
15						GRAVEL (GP) – Gray, dense to medium hard, inter–layered with basalt. 81% Recovery from 14 to 17 feet. RQD = 22% 94% Recovery from 17 to 20 feet. RQD = 44%
20						BASALT (WS) – Gray, hard, slightly fractured, slightly weathered. End boring at 20 feet. Neither groundwater nor seepage water encountered.
25						
30						

Plate A4.4

HIRATA & ASSOCIATES, INC.

BORING LOG — W.O. 08-4582

BORING NO. B4 — DRIVING WT. 140 lb. — START DATE 8/25/08
SURFACE ELEV. 235± — DROP 30 in. — END DATE 8/26/08

DEPTH	GRAPH	SAMPLE	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
0			10/No Penetration			Silty CLAY (CL) – Reddish brown, moist, stiff. Boulder from 0.5 to 3.5 feet.
			10/No Penetration			
5			17	63	20	BASALT (WH–WC) – Dark grayish brown, moist, medium dense, highly to completely weathered. Dense from 6.5 feet.
10			10/No Penetration			BASALT (WS) – Gray, hard, slightly weathered.
15			22	86	6	GRAVEL (GP) – Mottled reddish brown, slightly moist, medium dense. (Volcanic Clinker)
20						BASALT (WS) – Gray, hard, slight to moderately fractured, slightly weathered. Begin NX coring at 19 feet. 90% Recovery from 19 to 24 feet. RQD = 55% Weathered seam at 20 feet.
25						90% Recovery from 24 to 29 feet. RQD = 48%
30						Volcanic clinker from 28 to 31 feet. 93% Recovery from 29 to 34 feet. RQD = 63%

Plate A4.5

HIRATA & ASSOCIATES, INC.

BORING LOG — W.O. 08-4582

BORING NO. B4 (Continued) — DRIVING WT. 140 lb. — START DATE 8/25/08
SURFACE ELEV. 235± — DROP 30 in. — END DATE 8/26/08

DEPTH	GRAPH	SAMPLE	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
30						92% Recovery from 34 to 39 feet. RQD = 65%
35						98% Recovery from 39 to 44 feet. RQD = 80% Volcanic Clinker at 39 feet.
40						End boring at 44 feet. Neither groundwater nor seepage water encountered.
45						
50						
55						
60						

Plate A4.6

HIRATA & ASSOCIATES, INC.

BORING LOG — W.O. 08-4582

BORING NO. B5 — DRIVING WT. 140 lb. — START DATE 5/21/09
SURFACE ELEV. 243± — DROP 30 in. — END DATE 5/21/09

DEPTH	GRAPH	SAMPLE	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
0			23	76	16	Silty CLAY (CL) – Reddish brown, moist, medium stiff.
			45	67	4	BASALT (WH–WC) – Dark grayish brown, moist, dense to medium hard, highly to completely weathered.
5			50/5"	68	3	Mottled reddish brown in color at 5 feet.
10						BASALT (WS) – Gray, hard, slightly fractured, slightly weathered. Begin NX coring at 8 feet. 83% Recovery from 8 to 13 feet. RQD = 73% Volcanic clinker from 11.5 to 14 feet. 93% Recovery from 13 to 18 feet. RQD = 0% Highly fractured from 16 feet.
15						
20						GRAVEL (GP) – Reddish brown, dense to medium hard. (Volcanic Clinker) 37% Recovery from 18 to 23 feet. RQD = 0%
25						BASALT (WS) – Dark gray, medium hard to hard, highly vesicular, highly fractured, slightly weathered. 100% Recovery from 23 to 28 feet. RQD = 38% 100% Recovery from 28 to 33 feet. RQD = 48%
30						

Plate A4.7

NOTES:

1. Boring logs for Honoapiilani Highway Realignment, Phase 1B-1, Lahaina, Maui, Hawaii for Austin, Tsutsumi & Associates, Inc., by Hirata & Associates, Inc. W.O. 08-4582, dated October 21, 2009.

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.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BORING LOGS

HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1B-1
Lahainaluna Rd. to Hokiokio Pl.
Federal Aid Project NO. NH-030-1(38)

Scale: As Noted *Date: November 23, 2009*

SHEET No. 1 OF 7 SHEETS

106

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-030-1(38)	2010	107	213

HIRATA & ASSOCIATES, INC.

BORING LOG — W.O. 08-4582

BORING NO. B5 (Continued) — DRIVING WT. 140 lb. — START DATE 5/21/09
SURFACE ELEV. 243± — DROP 30 in. — END DATE 5/21/09

DEPTH	GRAPH	SAMPLE	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
30						
						100% Recovery from 33 to 38 feet. RQD = 48%
35						
						100% Recovery from 38 to 43 feet. RQD = 63%
40						
						End boring at 43 feet.
45						Neither groundwater nor seepage water encountered.
50						
55						
60						

Plate A4.8

HIRATA & ASSOCIATES, INC.

BORING LOG — W.O. 08-4582

BORING NO. B6 — DRIVING WT. 140 lb. — START DATE 8/27/08
SURFACE ELEV. 235± — DROP 30 in. — END DATE 8/28/08

DEPTH	GRAPH	SAMPLE	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
0						Silty CLAY (CL) – Reddish brown, moist, medium stiff, with gravel.
			6	58	13	
5			31	84	5	BASALT (WH-WC) – Dark grayish brown, slightly moist, medium dense, highly to completely weathered.
						BASALT (WS) – Gray, hard, slightly fractured, slightly weathered. Begin NX coring at 9 feet. 85% Recovery from 9 to 14 feet. RQD = 55% Weathered seam at 11 feet.
10						
						GRAVEL (GP) – Gray, dense to medium hard. (Volcanic Clinker) 78% Recovery from 14 to 19 feet. RQD = 47%
15						BASALT (WS) – Gray, hard, slightly fractured, slightly weathered. Volcanic Clinker at 18 feet. 93% Recovery from 19 to 24 feet. RQD = 63%
20						
						Volcanic clinker at 23 feet.
25						BASALT (WS-WM) – Brownish gray, hard, highly fractured, slight to moderately weathered, with clinker seams. 87% Recovery from 24 to 29 feet. RQD = 42%
30						100% Recovery from 29 to 34 feet. RQD = 28%

Plate A4.9

HIRATA & ASSOCIATES, INC.

BORING LOG — W.O. 08-4582

BORING NO. B6 (Continued) — DRIVING WT. 140 lb. — START DATE 8/27/08
SURFACE ELEV. 235± — DROP 30 in. — END DATE 8/28/08

DEPTH	GRAPH	SAMPLE	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
30						Volcanic clinker at 31 feet.
						BASALT (WS) – Gray, hard, slightly fractured, slightly weathered. 100% Recovery from 34 to 39 feet. RQD = 97%
35						
						75% Recovery from 39 to 44 feet. RQD = 47%
40						CEMENTED SAND AND GRAVEL – Reddish brown, medium hard, moderated weathered. (Welded Volcanic Clinker)
45						BASALT (WS) – Gray, hard, highly fractured, slightly weathered. 97% Recovery from 44 to 49 feet. RQD = 30%
50						95% Recovery from 49 to 54 feet. RQD = 60% Welded Volcanic Clinker at 50 feet.
						BASALT (WS) – Gray, hard, slightly fractured, slightly weathered.
55						97% Recovery from 54 to 59 feet. RQD = 78%
						End boring at 59 feet.
60						Neither groundwater nor seepage water encountered.

Plate A4.10

HIRATA & ASSOCIATES, INC.

BORING LOG — W.O. 08-4582

BORING NO. B7 — DRIVING WT. 140 lb. — START DATE 5/27/09
SURFACE ELEV. 229± — DROP 30 in. — END DATE 5/27/09

DEPTH	GRAPH	SAMPLE	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
0						Silty CLAY (CL) – Reddish brown, moist, stiff, with gravel.
			21/6" 50/3"	68	25	
			50/5"	76	7	BASALT (WH-WC) – Mottled grayish brown, moist, dense to medium hard, highly to completely weathered.
5			13	70	33	Weathered volcanic clinker from 4.5 to 7.5 feet, medium dense.
			10/6" 10/No Penetration	84	11	
10						BASALT (WS) – Gray, hard, slightly fractured, slightly weathered. Begin HQ coring at 10.5 feet. 91% Recovery from 10.5 to 15 feet. RQD = 80%
15						100% Recovery from 15 to 20 feet. RQD = 95%
20						BASALT (WS) – Gray, medium hard to hard, vesicular, moderately fractured, slightly weathered. 87% Recovery from 20 to 25 feet. RQD = 38% Welded volcanic clinker at 20 feet.
25						Welded volcanic clinker at 24 feet. 83% Recovery from 25 to 30 feet. RQD = 57%
30						

Plate A4.11

HIRATA & ASSOCIATES, INC.

BORING LOG — W.O. 08-4582

BORING NO. B7 (Continued) — DRIVING WT. 140 lb. — START DATE 5/27/09
SURFACE ELEV. 229± — DROP 30 in. — END DATE 5/27/09

DEPTH	GRAPH	SAMPLE	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
30						92% Recovery from 30 to 35 feet. RQD = 25% Welded volcanic clinker at 30 feet.
35						80% Recovery from 35 to 40 feet. RQD = 43%
40						95% Recovery from 40 to 45 feet. RQD = 38% Welded volcanic clinker at 40 feet.
						Welded volcanic clinker at 44 feet.
45						End boring at 45 feet.
50						Neither groundwater nor seepage water encountered.
55						
60						

Plate A4.12

HIRATA & ASSOCIATES, INC.

BORING LOG — W.O. 08-4582

BORING NO. B8 — DRIVING WT. 140 lb. — START DATE 8/26/08
SURFACE ELEV. 226± — DROP 30 in. — END DATE 8/27/08

DEPTH	GRAPH	SAMPLE	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
0						Silty CLAY (ML) – Brown, moist, stiff, with gravel.
			40	74	22	BASALT (WH-WC) – Gray, dense to medium hard, highly to completely weathered.
			35/6" 50/3"	83	24	
5			63	79	36	Reddish brown in color from 5 feet.
			76/11"	70	26	
10						
			10/No Penetration			BASALT (WS) – Gray, hard, slightly fractured, slightly weathered. Begin NX coring at 14 feet. 96% Recovery from 14 to 18.5 feet. RQD = 96%
15						98% Recovery from 18.5 to 23.5 feet. RQD = 83% Volcanic clinker at 19.5 feet.
20						
						95% Recovery from 23.5 to 28.5 feet. RQD = 92%
25						
						98% Recovery from 28.5 to 32.5 feet. RQD = 52%
30						

Plate A4.13

HIRATA & ASSOCIATES, INC.

BORING LOG — W.O. 08-4582

BORING NO. B8 (Continued) — DRIVING WT. 140 lb. — START DATE 8/26/08
SURFACE ELEV. 226± — DROP 30 in. — END DATE 8/27/08

DEPTH	GRAPH	SAMPLE	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
30						Volcanic clinker at 30 feet
						Volcanic clinker at 32 feet. 100% Recovery from 32.5 to 37.5 feet. RQD = 95%
35						
						95% Recovery from 37.5 to 42.5 feet. RQD = 72%
40						
						100% Recovery from 42.5 to 47.5 feet. RQD = 83%
45						CEMENTED SAND AND GRAVEL – Mottled reddish brown, medium hard. (Welded Volcanic Clinker)
						BASALT (WS) – Gray, hard, slight to moderately fractured, slightly weathered.
50						100% Recovery from 47.5 to 52.5 feet. RQD = 75%
						97% Recovery from 52.5 to 57.5 feet. RQD = 58%
55						
						Volcanic clinker at 55 feet. 100% Recovery from 57.5 to 60 feet. RQD = 70%
						End boring at 60 feet.
60						Neither groundwater nor seepage water encountered.

Plate A4.14

NOTES:

1. Boring logs for Honoapiilani Highway Realignment, Phase 1B-1, Lahaina, Maui, Hawaii for Austin, Tsutsumi & Associates, Inc., by Hirata & Associates, Inc. W.O. 08-4582, dated October 21, 2009.

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.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BORING LOGS

HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1B-1
Lahainaluna Rd. to Hokiokio Pl.
Federal Aid Project NO. NH-030-1(38)

Scale: As Noted *Date: November 23, 2009*

SHEET No. 2 OF 7 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-030-1(38)	2010	108	213

HIRATA & ASSOCIATES, INC.

BORING LOG — W.O. 08-4582

BORING NO. B9 — DRIVING WT. 140 lb. — START DATE 5/27/09
SURFACE ELEV. 216± — DROP 30 in. — END DATE 5/28/09

DEPTH	GRAPH	SAMPLE	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
0			63	70	18	Silty CLAY (CL) – Brown, moist, stiff, with gravel. Cobble from 0.5 foot.
			10/No Penetration			BASALT (WS) – Gray, hard, slight to moderately fractured, slightly weathered. Begin HQ coring at 4 feet. 100% Recovery from 4 to 9 feet. RQD = 42%
5						73% Recovery from 9 to 14 feet. RQD = 13%
10						Volcanic clinker from 11.5 to 14 feet.
15						97% Recovery from 14 to 19 feet. RQD = 48% Volcanic clinker from 15.5 to 17.5 feet.
20						BASALT (WS-WM) – Gray, medium hard to hard, highly fractured, slight to moderately weathered. 75% Recovery from 19 to 24 feet. RQD = 40% Volcanic clinker from 22 to 24 feet.
25						80% Recovery from 24 to 29 feet. RQD = 13%
30						

Plate A4.15

HIRATA & ASSOCIATES, INC.

BORING LOG — W.O. 08-4582

BORING NO. B9 (Continued) — DRIVING WT. 140 lb. — START DATE 5/27/09
SURFACE ELEV. 216± — DROP 30 in. — END DATE 5/28/09

DEPTH	GRAPH	SAMPLE	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
30						BASALT (WS) – Gray, hard, slightly fractured, slightly weathered. 93% Recovery from 29 to 34 feet. RQD = 73%
35						92% Recovery from 34 to 39 feet. RQD = 40% Volcanic clinker at 35 feet. Moderately fractured from 36 feet.
40						End boring at 39 feet. Neither groundwater nor seepage water encountered.
45						
50						
55						
60						

Plate A4.16

HIRATA & ASSOCIATES, INC.

BORING LOG — W.O. 08-4582

BORING NO. B10 — DRIVING WT. 140 lb. — START DATE 6/2/09
SURFACE ELEV. 196± — DROP 30 in. — END DATE 6/2/09

DEPTH	GRAPH	SAMPLE	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
0			30/4"	87	9	Silty CLAY (CL) – Brown, moist, stiff, with cobbles and boulders.
			10/No Penetration			
5			50/4"	86	12	
			10/No Penetration			
10			34	88	24	BASALT (WH-WC) – Mottled grayish brown, moist, medium dense to dense, highly to completely weathered.
15			10/No Penetration			BASALT (WS) – Gray, hard, slightly fractured, slightly weathered. Begin NX coring at 14 feet. 92% Recovery from 14 to 19 feet. RQD = 92%
20						End boring at 19 feet. Neither groundwater nor seepage water encountered.
25						
30						

Plate A4.17

HIRATA & ASSOCIATES, INC.

BORING LOG — W.O. 08-4582

BORING NO. B11 — DRIVING WT. 140 lb. — START DATE 5/21/09
SURFACE ELEV. 158± — DROP 30 in. — END DATE 5/21/09

DEPTH	GRAPH	SAMPLE	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
0			18/6"			Silty CILAY (CL) – Brown, moist, stiff, with cobbles and boulders.
			10/No Penetration			
5			86/10"	84	20	
			50/2"			
10			35	71	11	BASALT (WH-WC) – Mottled reddish brown, moist, dense, highly to completely weathered.
15						BASALT (WS) – Gray, hard, slight to moderately fractured, slightly weathered. Begin NX coring at 13 feet. 100% Recovery from 13 to 18 feet. RQD = 65% Volcanic clinker at 17 feet.
20						End boring at 18 feet. Neither groundwater nor seepage water encountered.
25						
30						

Plate A4.18

HIRATA & ASSOCIATES, INC.

BORING LOG — W.O. 08-4582

BORING NO. B12 — DRIVING WT. 140 lb. — START DATE 5/26/09
SURFACE ELEV. 165± — DROP 30 in. — END DATE 5/26/09

DEPTH	GRAPH	SAMPLE	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
0						BASALT (WS-WM) – Gray, hard, slight to moderately fractured, slight to moderately weathered. Covered by a thin layer of brown silty clay. Begin NX coring at 2 feet. 100% Recovery from 2 to 5 feet. RQD = 61%
5						95% Recovery from 5 to 10 feet. RQD = 20% Volcanic clinker at 5.5 feet.
10						100% Recovery from 10 to 15 feet. RQD = 52% Volcanic clinker at 12 feet.
15						End boring at 15 feet. Neither groundwater nor seepage water encountered.
20						
25						
30						

Plate A4.19

HIRATA & ASSOCIATES, INC.

BORING LOG — W.O. 08-4582

BORING NO. B13 — DRIVING WT. 140 lb. — START DATE 6/2/09
SURFACE ELEV. 162± — DROP 30 in. — END DATE 6/2/09

DEPTH	GRAPH	SAMPLE	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
0			37	76	23	Silty CLAY (CL) – Reddish brown, moist, stiff, with gravel.
			56		17	BASALT (WH) – Mottled grayish brown, moist, dense to medium hard, highly weathered.
5			10/No Penetration			
10			34/6" 50/4"	77	10	
15			10/No Penetration			BASALT (WS) – Gray, hard, slight to moderately fractured, slightly weathered. Begin NX coring at 14 feet. 100% Recovery from 14 to 19 feet. RQD = 23% Weathered seam at 18 feet.
20						End boring at 19 feet. Neither groundwater nor seepage water encountered.
25						
30						

Plate A4.20

HIRATA & ASSOCIATES, INC.

BORING LOG — W.O. 08-4582

BORING NO. B14 — DRIVING WT. 140 lb. — START DATE 5/28/09
SURFACE ELEV. 145± — DROP 30 in. — END DATE 5/28/09

DEPTH	GRAPH	SAMPLE	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
0			30	73	30	Silty CLAY (CL) – Reddish brown, moist, stiff, with gravel.
			48	75	21	WEATHERED BASALT (WH) – Mottled gray, moist, dense, highly weathered.
5			31	84	15	
10						BASALT (WS) – Gray, hard, moderately to highly fractured, slightly weathered. Begin NX coring at 9 feet. 100% Recovery from 9 to 10 feet. RQD = 0% 100% Recovery from 10 to 15 feet. RQD = 87%
15						93% Recovery from 15 to 20 feet. RQD = 20% Volcanic clinker from 15.5 to 18 feet.
20						End boring at 20 feet. Neither groundwater nor seepage water encountered.
25						
30						

Plate A4.21

NOTES:

1. Boring logs for Honoapiilani Highway Realignment, Phase 1B-1, Lahaina, Maui, Hawaii for Austin, Tsutsumi & Associates, Inc., by Hirata & Associates, Inc. W.O. 08-4582, dated October 21, 2009.

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.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BORING LOGS

HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1B-1
Lahainaluna Rd. to Hokiokio Pl.
Federal Aid Project NO. NH-030-1(38)

Scale: As Noted *Date: November 23, 2009*

SHEET No. 3 OF 7 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-030-1(38)	2010	109	213

HIRATA & ASSOCIATES, INC.

BORING LOG — W.O. 08-4582

BORING NO. B15 — DRIVING WT. 140 lb. — START DATE 6/1/09
SURFACE ELEV. 114± — DROP 30 in. — END DATE 6/1/09

DEPTH	GRAPH	SAMPLE	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
0						Silty CLAY (CL) – Brown, moist, stiff, with gravel.
			99/11"	94	25	
			54	75	26	WEATHERED BASALT (WH–WC) – Mottled brown, moist, dense, highly to completely weathered.
5			17/6" 50/3"	71	24	
						Mottled dark gray, medium dense from 8.5 feet
10			18	70	20	
15			19	69	12	
			10/No Penetration			BASALT (WM–WH) – Gray, hard, moderately to highly weathered.
						End boring at 18 feet.
20						Neither groundwater nor seepage water encountered.
25						
30						

Plate A4.22

HIRATA & ASSOCIATES, INC.

BORING LOG — W.O. 08-4582

BORING NO. B16 — DRIVING WT. 140 lb. — START DATE 5/20/09
SURFACE ELEV. 109± — DROP 30 in. — END DATE 5/20/09

DEPTH	GRAPH	SAMPLE	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
0			40/6"	81	12	COBBLES AND BOULDERS – Brown, slightly moist, dense, in a matrix of silt, sand, and gravel. (Older Alluvium) Covered by a thin layer of brown silty clay.
			10/No Penetration			
5						Begin NX coring at 5.5 feet. 67% Recovery from 5.5 to 7.5 feet.
						End NX coring at 7.5 feet.
						Begin HQ coring at 7.5 feet. 100% Recovery from 7.5 to 10 feet.
10						75% Recovery from 10 to 15 feet.
15						BASALT (WS) – Gray, hard, moderately fractured, slightly weathered.
						End boring at 15 feet.
20						Neither groundwater nor seepage water encountered.
25						
30						

Plate A4.23

HIRATA & ASSOCIATES, INC.

BORING LOG — W.O. 08-4582

BORING NO. B17 — DRIVING WT. 140 lb. — START DATE 5/20/09
SURFACE ELEV. 113± — DROP 30 in. — END DATE 5/20/09

DEPTH	GRAPH	SAMPLE	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
0			10/No Penetration			COBBLES AND BOULDERS – Brown, slightly moist, dense, in a matrix of silt, sand, and gravel. (Older Alluvium) Covered by a thin layer of brown silty clay.
			10/No Penetration			
5			10/No Penetration			
10			50/3"		9	Begin NX coring at 10 feet. 92% Recovery from 10 to 15 feet.
						BASALT (WS) – Gray, hard, slightly fractured, slightly weathered.
15						83% Recovery from 15 to 20 feet. RQD = 70%
						Slight to moderately weathered from 18 feet.
20						End boring at 20 feet.
						Neither groundwater nor seepage water encountered.
25						
30						

Plate A4.24

HIRATA & ASSOCIATES, INC.

BORING LOG — W.O. 08-4582

BORING NO. B18 — DRIVING WT. 140 lb. — START DATE 5/14/09
SURFACE ELEV. 116± — DROP 30 in. — END DATE 5/18/09

DEPTH	GRAPH	SAMPLE	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
0			83/10"	91	12	Silty CLAY (CL) – Brown, slightly moist, stiff, with sand, gravel, and cobbles.
			100/9"	99	9	
5			50/2"			COBBLES AND BOULDERS – Brown, slightly moist, dense, in a matrix of silt, sand, and gravel. (Older Alluvium)
10			79	101	17	
						Begin NX coring at 12 feet. 75% Recovery from 12 to 17 feet.
15						
						69% Recovery from 17 to 20 feet.
20						71% Recovery from 20 to 22 feet.
						End NX coring at 22 feet.
						Begin HQ coring at 22 feet. 65% Recovery from 22 to 27 feet.
25						
						BASALT (WS–WM) – Gray, hard, slight to moderately fractured, slightly weathered. 97% Recovery from 27 to 32 feet. RQD = 67%
30						

Plate A4.25

HIRATA & ASSOCIATES, INC.

BORING LOG — W.O. 08-4582

BORING NO. B18 (Continued) — DRIVING WT. 140 lb. — START DATE 5/14/09
SURFACE ELEV. 116± — DROP 30 in. — END DATE 5/18/09

DEPTH	GRAPH	SAMPLE	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
30						Volcanic clinker at 31 feet.
						End boring at 32 feet.
35						Neither groundwater nor seepage water encountered.
40						
45						
50						
55						
60						

Plate A4.26

HIRATA & ASSOCIATES, INC.

BORING LOG — W.O. 08-4582

BORING NO. B19 — DRIVING WT. 140 lb. — START DATE 5/19/09
SURFACE ELEV. 108± — DROP 30 in. — END DATE 5/19/09

DEPTH	GRAPH	SAMPLE	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
0			22/6"	70	20	COBBLES AND BOULDERS – Brown, slightly moist, dense, in a matrix of silt, sand, and gravel. (Older Alluvium) Covered by a thin layer of brown silty clay.
			10/No Penetration			
			40/6" 50/4"	106	16	
5						
			10/No Penetration			
			50/3"			
10						Begin HQ coring at 11 feet. 73% Recovery from 11 to 16 feet.
15						92% Recovery from 16 to 21 feet.
20						98% Recovery from 21 to 26 feet.
25						BASALT (WS) – Gray, hard, slightly to moderately fractured, slightly weathered.
						92% Recovery from 26 to 31 feet. RQD = 70%
30						Volcanic clinker at 28 feet.

Plate A4.27

HIRATA & ASSOCIATES, INC.

BORING LOG — W.O. 08-4582

BORING NO. B19 (Continued) — DRIVING WT. 140 lb. — START DATE 5/19/09
SURFACE ELEV. 109± — DROP 30 in. — END DATE 5/19/09

DEPTH	GRAPH	SAMPLE	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
30						98% Recovery from 31 to 35 feet. RQD = 77%
35						End boring at 35 feet.
						Neither groundwater nor seepage water encountered.
40						
45						
50						
55						
60						

Plate A4.28

NOTES:

1. Boring logs for Honoapiilani Highway Realignment, Phase 1B-1, Lahaina, Maui, Hawaii for Austin, Tsutsumi & Associates, Inc., by Hirata & Associates, Inc. W.O. 08-4582, dated October 21, 2009.

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BORING LOGS

HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1B-1
Lahainaluna Rd. to Hokiokio Pl.
Federal Aid Project NO. NH-030-1(38)

Scale: As Noted *Date: November 23, 2009*

SHEET No. 4 OF 7 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-030-1(38)	2010	110	213

HIRATA & ASSOCIATES, INC.

BORING LOG — W.O. 08-4582

BORING NO. B20 — DRIVING WT. 140 lb. — START DATE 4/30/09
SURFACE ELEV. 119± — DROP 30 in. — END DATE 4/30/09

DEPTH	SAMPLE	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
0		17/6"	83	21	COBBLES AND BOULDERS – Brown, slightly moist, dense, in a matrix of silt, sand, and gravel. (Older Alluvium) Covered by a thin layer of brown sitly clay.
		10/No Penetration			
		46/6"	103	11	
		50/2"			
5		25/6"	98	14	
		50/2"			
		50/5"			
10					
15					Begin NX coring at 15 feet. 92% Recovery from 15 to 20 feet.
20					End boring at 20 feet.
					Neither groundwater nor seepage water encountered.
25					
30					

Plate A4.29

HIRATA & ASSOCIATES, INC.

BORING LOG — W.O. 08-4582

BORING NO. B21 — DRIVING WT. 140 lb. — START DATE 4/29/09
SURFACE ELEV. 121± — DROP 30 in. — END DATE 4/29/09

DEPTH	SAMPLE	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
0		19/5"	93	14	COBBLES AND BOULDERS – Brown, slightly moist, dense, in a matrix of silt, sand, and gravel. (Older Alluvium) Covered by a thin layer of brown silty clay.
		10/No Penetration			
5					Begin HQ coring at 7 feet. 54% Recovery from 7 to 9 feet.
		10/No Penetration			100% Recovery from 9 to 11 feet.
10					80% Recovery from 11 to 16 feet.
15					75% Recovery from 16 to 20 feet.
20					End boring at 20 feet.
					Neither groundwater nor seepage water encountered.
25					
30					

Plate A4.30

HIRATA & ASSOCIATES, INC.

BORING LOG — W.O. 08-4582

BORING NO. B22 — DRIVING WT. 140 lb. — START DATE 4/23/09
SURFACE ELEV. 116± — DROP 30 in. — END DATE 4/28/09

DEPTH	SAMPLE	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
0					Clayey SILT (ML) – Reddish brown, slightly moist, stiff, with sand and gravel. Boulder at one foot.
		19/6"	95	6	
		50/5"			
5		10/No Penetration			COBBLES AND BOULDERS – Mottled brown, dense to very dense, in a matrix of silt, sand, and gravel. (Older Alluvium) Begin HQ coring at 6 feet. 70% Recovery from 6 to 11 feet.
10					70% Recovery from 11 to 16 feet.
15		50/4"			
		10/No Penetration			88% Recovery from 16 to 21 feet.
20					72% Recovery from 21 to 26 feet.
25		10/No Penetration			88% Recovery from 26 to 31 feet.
30					COBBLES AND BOULDERS – Mottled brown, medium hard to hard, in a matrix of cemented silt, sand, and gravel. (Older Alluvium)

Plate A4.31

HIRATA & ASSOCIATES, INC.

BORING LOG — W.O. 08-4582

BORING NO. B22 (Continued) — DRIVING WT. 140 lb. — START DATE 4/23/09
SURFACE ELEV. 116± — DROP 30 in. — END DATE 4/28/09

DEPTH	SAMPLE	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
30					35% Recovery from 31 to 36 feet.
35					100% Recovery from 36 to 41 feet.
40					COBBLES AND BOULDERS – Mottled brown, dense to very dense, in a matrix of silt, sand, and gravel. (Older Alluvium) 70% Recovery from 41 to 46 feet.
45		10/No Penetration			COBBLES AND BOULDERS – Mottled brown, medium hard to hard, in a matrix of cemented silt, sand, and gravel. (Older Alluvium) 100% Recovery from 46 to 51 feet.
50					83% Recovery from 51 to 56 feet.
55		90/10"		26	COBBLES AND BOULDERS – Mottled gray, dense to very dense, in a matrix of silt, sand, and gravel. (Older Alluvium) 70% Recovery from 56 to 61 feet.
60					

Plate A4.32

HIRATA & ASSOCIATES, INC.

BORING LOG — W.O. 08-4582

BORING NO. B22 (Continued) — DRIVING WT. 140 lb. — START DATE 4/23/09
SURFACE ELEV. 116± — DROP 30 in. — END DATE 4/28/09

DEPTH	SAMPLE	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
60		10/No Penetration			End boring at 61 feet.
65					Neither groundwater nor seepage water encountered.
70					
75					
80					
85					
90					

Plate A4.33

HIRATA & ASSOCIATES, INC.

BORING LOG — W.O. 08-4582

BORING NO. B23 — DRIVING WT. 140 lb. — START DATE 4/14/09
SURFACE ELEV. 120± — DROP 30 in. — END DATE 4/16/09

DEPTH	SAMPLE	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
0		18	84	8	Clayey SILT (ML) – Reddish brown, slightly moist, medium stiff to stiff, with sand and gravel.
		15	105	9	
5		10/No Penetration			COBBLES AND BOULDERS – Mottled brown, dense to very dense, in a matrix of silt, sand, and gravel. (Older Alluvium) Begin HQ coring at 5.5 feet. 47% Recovery from 5.5 to 8 feet.
10					80% Recovery from 8 to 13 feet.
15					58% Recovery from 13 to 18 feet.
20					92% Recovery from 18 to 21 feet.
25					87% Recovery from 21 to 26 feet.
30					COBBLES AND BOULDERS – Mottled gray, medium hard to hard, in a matrix of cemented silt, sand, and gravel. (Older Alluvium) 90% Recovery from 26 to 31 feet.

Plate A4.34

HIRATA & ASSOCIATES, INC.

BORING LOG — W.O. 08-4582

BORING NO. B23 (Continued) — DRIVING WT. 140 lb. — START DATE 4/14/09
SURFACE ELEV. 120± — DROP 30 in. — END DATE 4/16/09

DEPTH	SAMPLE	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
30					90% Recovery from 31 to 36 feet.
35					100% Recovery from 36 to 41 feet.
40					100% Recovery from 41 to 46 feet.
45					100% Recovery from 46 to 51 feet.
50					100% Recovery from 51 to 56 feet.
55					100% Recovery from 56 to 61 feet.
60					

Plate A4.35

NOTES:

1. Boring logs for Honoapiilani Highway Realignment, Phase 1B-1, Lahaina, Maui, Hawaii for Austin, Tsutsumi & Associates, Inc., by Hirata & Associates, Inc. W.O. 08-4582, dated October 21, 2009.

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BORING LOGS

HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1B-1
Lahainaluna Rd. to Hokiokio Pl.
Federal Aid Project NO. NH-030-1(38)

Scale: As Noted *Date: November 23, 2009*

SHEET No. 5 OF 7 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-030-1(38)	2010	111	213

HIRATA & ASSOCIATES, INC.

BORING LOG

W.O. 08-4582

BORING NO. B23 (Continued) DRIVING WT. 140 lb. START DATE 4/14/09
SURFACE ELEV. 120± DROP 30 in. END DATE 4/16/09

DEPTH	GRAPH	SAMPLE	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
60						100% Recovery from 61 to 66 feet.
65						100% Recovery from 66 to 71 feet.
70						100% Recovery from 71 to 76 feet.
75						100% Recovery from 76 to 81 feet.
80						78% Recovery from 81 to 84 feet.
85						End boring at 84 feet. Neither groundwater nor seepage water encountered.
90						

Plate A4.36

HIRATA & ASSOCIATES, INC.

BORING LOG

W.O. 08-4582

BORING NO. B24 DRIVING WT. 140 lb. START DATE 9/8/08
SURFACE ELEV. 116± DROP 30 in. END DATE 9/12/08

DEPTH	GRAPH	SAMPLE	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
0						Clayey SILT (ML) – Brown, moist, medium stiff, with sand and gravel.
			10/No Penetration			COBBLES AND BOULDERS – Brown, dense to very dense, in a matrix of partially cemented silt, sand, and gravel. (Older Alluvium)
5			10/No Penetration			
			10/No Penetration			Begin NX coring at 9 feet. 77% Recovery from 9 to 14 feet.
10						60% Recovery from 14 to 19 feet.
15						95% Recovery from 19 to 24 feet.
20						77% Recovery from 24 to 29 feet.
25						83% Recovery from 29 to 32 feet.
30						

Plate A4.37

HIRATA & ASSOCIATES, INC.

BORING LOG

W.O. 08-4582

BORING NO. B24 (Continued) DRIVING WT. 140 lb. START DATE 9/8/08
SURFACE ELEV. 116± DROP 30 in. END DATE 9/12/08

DEPTH	GRAPH	SAMPLE	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
30						72% Recovery from 32 to 35 feet.
35						COBBLES AND BOULDERS – Mottled gray, medium hard to hard, in a matrix of cemented silt, sand, and gravel. (Older Alluvium) 78% Recovery from 35 to 40 feet.
40						COBBLES AND BOULDERS – Mottled brown, dense to very dense, in a matrix of silt, sand, and gravel. (Older Alluvium) 92% Recovery from 40 to 45 feet.
45						77% Recovery from 45 to 50 feet.
50						75% Recovery from 50 to 52 feet.
55						COBBLES AND BOULDERS – Mottled brown, medium hard to hard, in a matrix of cemented silt, sand, and gravel. (Older Alluvium) 97% Recovery from 52 to 55 feet.
60						95% Recovery from 55 to 60 feet.

Plate A4.38

HIRATA & ASSOCIATES, INC.

BORING LOG

W.O. 08-4582

BORING NO. B24 (Continued) DRIVING WT. 140 lb. START DATE 9/8/08
SURFACE ELEV. 116± DROP 30 in. END DATE 9/12/08

DEPTH	GRAPH	SAMPLE	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
60						100% Recovery from 60 to 65 feet.
65						100% Recovery from 65 to 70 feet.
70						100% Recovery from 70 to 75 feet.
75						100% Recovery from 75 to 80 feet.
80						COBBLES AND BOULDERS – Mottled brown, dense to very dense, in a matrix of silt, sand, and gravel. (Older Alluvium) 87% Recovery from 80 to 85 feet.
85						End boring at 85 feet. Neither groundwater nor seepage water encountered.
90						

Plate A4.39

HIRATA & ASSOCIATES, INC.

BORING LOG

W.O. 08-4582

BORING NO. B25 DRIVING WT. 140 lb. START DATE 5/11/09
SURFACE ELEV. 111± DROP 30 in. END DATE 5/13/09

DEPTH	GRAPH	SAMPLE	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
0						Clayey SILT (ML) – Reddish brown, slightly moist, stiff, with sand and gravel.
			10/No Penetration			COBBLES AND BOULDERS – Mottled brown, dense to very dense, in a matrix of silt, sand, and gravel. Partially cemented from 2 to 10 feet, medium hard to hard. (Older Alluvium)
5						
10						Begin HQ coring at 9 feet. 70% Recovery from 9 to 14 feet.
15			12		31	100% Recovery from 16 to 19 feet.
20						100% Recovery from 19 to 24 feet.
25			50/2"		10	92% Recovery from 24 to 29 feet.
30			50/3"		12	67% Recovery from 29 to 34 feet.

Plate A4.40

HIRATA & ASSOCIATES, INC.

BORING LOG

W.O. 08-4582

BORING NO. B25 (Continued) DRIVING WT. 140 lb. START DATE 5/11/09
SURFACE ELEV. 111± DROP 30 in. END DATE 5/13/09

DEPTH	GRAPH	SAMPLE	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
30						58% Recovery from 34 to 39 feet.
35						
40			10/No Penetration			92% Recovery from 39 to 44 feet.
45						70% Recovery from 44 to 49 feet.
50			25/6" 10/No Penetration		21	83% Recovery from 50 to 54 feet.
55						83% Recovery from 54 to 59 feet.
60			10/No Penetration			COBBLES AND BOULDERS – Brown, medium hard to hard, in a matrix of cemented silt, sand, and gravel. (Older Alluvium)

Plate A4.41

HIRATA & ASSOCIATES, INC.

BORING LOG

W.O. 08-4582

BORING NO. B25 (Continued) DRIVING WT. 140 lb. START DATE 5/11/09
SURFACE ELEV. 111± DROP 30 in. END DATE 5/13/09

DEPTH	GRAPH	SAMPLE	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
60						100% Recovery from 59 to 64 feet.
65						End boring at 64 feet. Neither groundwater nor seepage water encountered.
70						
75						
80						
85						
90						

Plate A4.42

NOTES:

1. Boring logs for Honoapiilani Highway Realignment, Phase 1B-1, Lahaina, Maui, Hawaii for Austin, Tsutsumi & Associates, Inc., by Hirata & Associates, Inc. W.O. 08-4582, dated October 21, 2009.

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BORING LOGS

HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1B-1
Lahainaluna Rd. to Hokiokio Pl.
Federal Aid Project NO. NH-030-1(38)

Scale: As Noted Date: November 23, 2009

SHEET No. 6 OF 7 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-030-1(38)	2010	112	213

HIRATA & ASSOCIATES, INC.

BORING LOG — W.O. 08-4582

BORING NO. B26 — DRIVING WT. 140 lb. — START DATE 9/13/08
SURFACE ELEV. 107± — DROP 30 in. — END DATE 9/13/08

DEPTH	GRAPH	SAMPLE	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
0			8/6" 50/2"	89	6	COBBLES AND BOULDERS – Brown, slightly moist, dense, in a matrix of silt, sand, and gravel. (Older Alluvium) Covered by a thin layer of brown clayey silt.
5						
10						Begin NX coring at 9 feet. 93% Recovery from 9 to 11.5 feet. 67% Recovery from 11.5 to 15 feet.
15						65% Recovery from 15 to 19.5 feet.
20						End boring at 19.5 feet. Neither groundwater nor seepage water encountered.
25						
30						

Plate A4.43

HIRATA & ASSOCIATES, INC.

BORING LOG — W.O. 08-4582

BORING NO. B27 — DRIVING WT. 140 lb. — START DATE 9/13/08
SURFACE ELEV. 103± — DROP 30 in. — END DATE 9/13/08

DEPTH	GRAPH	SAMPLE	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
0			28/6" 50/3"	93	15	COBBLES AND BOULDERS – Brown, slightly moist, dense, in a matrix of silt, sand, and gravel. (Older Alluvium) Covered by a thin layer of brown clayey silt.
5						
10			50/5" 50/4"			
15			50/5"	86	21	
20			50/4"	102	8	End boring at 20.5 feet. Neither groundwater nor seepage water encountered.
25						
30						

Plate A4.44

HIRATA & ASSOCIATES, INC.

BORING LOG — W.O. 08-4582

BORING NO. B28 — DRIVING WT. 140 lb. — START DATE 9/2/08
SURFACE ELEV. 118± — DROP 30 in. — END DATE 9/2/08

DEPTH	GRAPH	SAMPLE	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
0			28/6" 50/3"	97	6	COBBLES AND BOULDERS – Brown, slightly moist, dense, in a matrix of silt, sand, and gravel. (Older Alluvium) Covered by a thin layer of brown clayey silt.
5			43/6" 50/2"	97	11	Begin NX coring at 5 feet. 80% Recovery from 5 to 10 feet.
10						100% Recovery from 10 to 11 feet. 88% Recovery from 11 to 15 feet.
15						79% Recovery from 15 to 19 feet.
20						End boring at 19 feet. Neither groundwater nor seepage water encountered.
25						
30						

Plate A4.45

HIRATA & ASSOCIATES, INC.

BORING LOG — W.O. 08-4582

BORING NO. B29 — DRIVING WT. 140 lb. — START DATE 9/3/08
SURFACE ELEV. 135± — DROP 30 in. — END DATE 9/4/08

DEPTH	GRAPH	SAMPLE	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
0			50/5"	72	18	Clayey SILT (ML) – Brown, slightly moist, stiff, with sand, gravel, and cobbles.
5			10/No Penetration			COBBLES AND BOULDERS – Brown, slightly moist, dense, in a matrix of silt, sand, and gravel. (Older Alluvium) Begin NX coring at 5 feet. 97% Recovery from 5 to 10 feet.
10						COBBLES AND BOULDERS – Mottled gray, medium hard, to hard, in a matrix of cemented silt, sand, and gravel. (Older Alluvium) 90% Recovery from 10 to 15 feet.
15						93% Recovery from 15 to 20 feet.
20						COBBLES AND BOULDERS – Mottled gray, dense, in a matrix of silt, sand, and gravel. (Older Alluvium) 67% Recovery from 20 to 25 feet.
25						85% Recovery from 25 to 29 feet.
30						72% Recovery from 29 to 34 feet.

Plate A4.46

HIRATA & ASSOCIATES, INC.

BORING LOG — W.O. 08-4582

BORING NO. B29 (Continued) — DRIVING WT. 140 lb. — START DATE 9/3/08
SURFACE ELEV. 135± — DROP 30 in. — END DATE 9/4/08

DEPTH	GRAPH	SAMPLE	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
30						
35						End boring at 34 feet. Neither groundwater nor seepage water encountered.
40						
45						
50						
55						
60						

Plate A4.47

HIRATA & ASSOCIATES, INC.

BORING LOG — W.O. 08-4582

BORING NO. B30 — DRIVING WT. 140 lb. — START DATE 9/4/08
SURFACE ELEV. 136± — DROP 30 in. — END DATE 9/5/08

DEPTH	GRAPH	SAMPLE	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
0			63	71	23	Clayey SILT (ML) – Brown, moist, stiff, with sand and gravel.
5			50/3" 50/2"			COBBLES AND BOULDERS – Mottled brown, slightly moist, dense to very dense, in a matrix of silt, sand, and gravel. (Older Alluvium)
10			10/No Penetration			
15			50/4"	79	14	
20						Begin NX coring at 19 feet. 90% Recovery from 19 to 24 feet.
25						81% Recovery from 24 to 27 feet.
30						COBBLES AND BOULDERS – Brown, medium hard to hard, in a matrix of cemented silt, sand, and gravel. (Older Alluvium) 100% Recovery from 27 to 30 feet.

Plate A4.48

HIRATA & ASSOCIATES, INC.

BORING LOG — W.O. 08-4582

BORING NO. B30 (Continued) — DRIVING WT. 140 lb. — START DATE 9/4/08
SURFACE ELEV. 136± — DROP 30 in. — END DATE 9/5/08

DEPTH	GRAPH	SAMPLE	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
30						98% Recovery from 30 to 35 feet.
35						End boring at 35 feet. Neither groundwater nor seepage water encountered.
40						
45						
50						
55						
60						

Plate A4.49

NOTES:

1. Boring logs for Honoapiilani Highway Realignment, Phase 1B-1, Lahaina, Maui, Hawaii for Austin, Tsutsumi & Associates, Inc., by Hirata & Associates, Inc. W.O. 08-4582, dated October 21, 2009.

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.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BORING LOGS

HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1B-1
Lahainaluna Rd. to Hokiokio Pl.
Federal Aid Project NO. NH-030-1(38)

Scale: As Noted *Date: November 23, 2009*

SHEET No. 7 OF 7 SHEETS