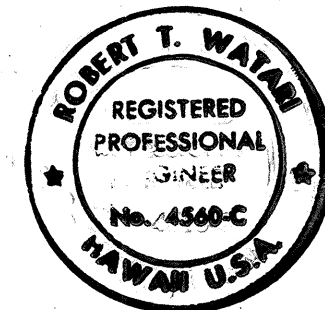


DEPTH (FEET)	GRAPH SYMBOL	UNIFIED SOIL CLASSIFICATION	BLDG. SF.	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	RELATIVE COMPACTION (%)	DESCRIPTION
0		MH-C11	75	90	26		Silty CLAY - Brown, moist, stiff, with sand and gravel.
5			27/9"	86	14		Grading with cobbles from 4 feet.
10							BASALT - Gray, hard, slightly vesicular. Begin NX coring from 11 feet. 100% Recovery from 11 to 16 feet. (RQD 100%)
15							100% Recovery from 16 to 21 feet. (RQD 100%)
20							100% Recovery from 21 to 26 feet. (RQD 100%)
25							*56% Recovery from 26 to 31 feet. (RQD 8%) Fractured with clay seams from 26 feet.
30							80% Recovery from 31 to 36 feet. (RQD 0%)
35							End boring at 36 feet.
40							* Elevations based on Preliminary Plan & Profile provided by Engineers Surveyors Hawaii, Inc.
45							
50							
55							
60							

DEPTH (FEET)	GRAPH SYMBOL	UNIFIED SOIL CLASSIFICATION	BLOWS/FT	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	RELATIVE COMPACTION (%)	DESCRIPTION
0		ML-II	8	69	49		Silty CLAY - Brown, moist, firm to medium stiff.
5		ML	2	47	94		Clayey SILT - Gray, soft, with sand.
10			3	60	70		
15			6	75	47		Grading with gravels from 15 feet.
20			15	77	40		Grading medium stiff from 19 feet.
25			86	Tip Recovery			HIGHLY WEATHERED ROCK - Orange brown, dense to medium hard.
30			82/11"	74	45		
35			10/No	Penetration			BASALT - Gray, hard. Begin NX coring from 34 feet. 100% Recovery from 34 to 39 feet. (RQD 66%)
40							100% Recovery from 39 to 44 feet. (RQD 74%)
45							88% Recovery from 44 to 49 feet. (RQD 66%) Grading to weathered condition from 44 feet.
50							End boring at 49 feet.
55							
60							

DEPTH (FEET)	GRAPH SYMBOL	UNIFIED SOIL CLASSIFICATION	BLOWS/FT	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	SHRINKAGE COMPACTION (%)	DESCRIPTION
0		MH-CL	6	69	53		Silty CLAY - Brown, moist, firm.
5		ML-CL	2	37	130		Clayey SILT - Dark gray, soft to firm, organic.
10			5	81	39		Grading with sand and gravels from 10 feet.
15			24	Tip Recovery			
20			5	No Recovery			
25			5	52	109		Shell fragments at 24 feet.
30			5	49	85		
35		CL	31	No Recovery			Silty CLAY - Mottled grayish brown, medium stiff.
40			64	84	39		
45			18	83	53		
50			19	72	56		HIGHLY WEATHERED ROCK - Mottled orange brown, dense.
55			20	63	68		
60			18	71	54		

DEPTH (FEET)	GRAPH SYMBOL	UNIFIED SOIL CLASSIFICATION	BLOWS/FT.	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	RELATIVE COMPACTION (%)	DESCRIPTION
60							Grading medium dense from 65 feet.
65			30	76	48		
70			35	68	50		
75			27	62	67		
80			46	60	68		
85			25	58	73		
90			36	63	64		
95			31	No Recovery			
100	38	68	58		End boring at 100.5 feet.		
105							
110							
115							
120							



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SHEET No. OF SHEETS

ORIGINAL PLAN	DATE
DESIGNED BY	
TRACED BY	
NOTED BY	
CHECKED BY	
NO.	

BORING LOG						W.O. 88-1693	
BORING NO. B4	DRIVING WT. 140 lb.	DATE OF DRILLING 11-23-88					
SURFACE ELEV. 7±	DROP 30 in.	WATER LEVEL @ 4.4 ft.					
DEPTH (FEET)	UNIFIED SOIL CLASSIFICATION	BLOWS/FT.	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	RELATIVE COMPACTION (%)	DESCRIPTION	
0	MH-CH	19	86	34		Silty CLAY - Brown, moist, medium stiff, with sand.	
5	SM	2	85	35		Silty SAND - Grayish brown, loose, with gravels.	
10		6	No Recovery				
15		3	94	32		Grading to dark gray color from 15 feet.	
20		10	76	44			
25	ML	4	Tip Recovery			Clayey SILT - Dark gray, soft, with shell fragments.	
30		4	No Recovery				
35		25	75	43		Grading medium stiff from 34 feet.	
40		13	76	48			
45		62/8"	106	21		Grading dense with gravels from 44 feet.	
50		40	No Recovery				
55		50/11"	78	45		HIGHLY WEATHERED ROCK - Mottled brown, medium dense to dense.	
60		59	No Recovery				

BORING LOG						W.O. 88-1693	
BORING NO. B4 (Cont.)	DRIVING WT. 140 lb.	DATE OF DRILLING 11-23-88					
SURFACE ELEV. 7±	DROP 30 in.	WATER LEVEL @ 4.4 ft.					
DEPTH (FEET)	UNIFIED SOIL CLASSIFICATION	BLOWS/FT.	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	RELATIVE COMPACTION (%)	DESCRIPTION	
60							
65		27/11"	70	54			
70		27	68	54			
75		24	54	80			
80		37	61	73		Grading to dark gray color from 79 feet.	
85		50	64	64			
90		36	59	72			
95		54	70	56			
100		56	70	54		End boring at 100.5 feet.	
105							
110							
115							
120							

BORING LOG						W.O. 88-1693	
BORING NO. B5	DRIVING WT. 140 lb.	DATE OF DRILLING 11-17-88					
SURFACE ELEV. 6±	DROP 30 in.	WATER LEVEL @ 4.3 ft.					
DEPTH (FEET)	UNIFIED SOIL CLASSIFICATION	BLOWS/FT.	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	RELATIVE COMPACTION (%)	DESCRIPTION	
0	MH-CH	17	79	36		Silty CLAY - Brown, moist, medium stiff.	
5		2	60	72		Grading soft from 5 feet.	
10		3	No Recovery				
15	SM	4	No Recovery			Silty SAND - Black, loose, with gravels.	
20		4	81	42			
25	ML-OL	4	58	70		Clayey SILT - Dark gray, soft, with shell fragments, organic.	
30		4	55	79			
35		34	83	39		Grading medium stiff to stiff from 34 feet.	
40		80/9"	Tip Recovery			HIGHLY WEATHERED ROCK - Mottled gray, medium hard to hard.	
45						Begin NX coring from 44 feet. 94% Recovery from 44 to 49 feet. (RQD 32%)	
50						56% Recovery from 49 to 54 feet. (RQD 0%)	
55		75	Tip Recovery			End NX coring at 54 feet.	
60		73/11"	87	37			

BORING LOG						W.O. 88-1693	
BORING NO. B5 (Cont.)	DRIVING WT. 140 lb.	DATE OF DRILLING 11-21-88					
SURFACE ELEV. 6±	DROP 30 in.	WATER LEVEL @ 4.3 ft.					
DEPTH (FEET)	UNIFIED SOIL CLASSIFICATION	BLOWS/FT.	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	RELATIVE COMPACTION (%)	DESCRIPTION	
60						Grading hard from 62.5 feet.	
65						Begin NX coring from 64 feet. 100% Recovery from 64 to 66.5 feet. (RQD 0%)	
70		53	78	44		End NX coring at 66.5 feet.	
75		56	No recovery				
80		65/5"	No Recovery				
85		81	Tip Recovery				
90		95	Tip Recovery				
95		52/11"	55	76			
100		45	64	61			
105		57/8"	71	47			
110							
115							
120						End boring at 100 feet.	



Robert T. Watan
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STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION
BORING LOGS
KAMEHAMEHA HIGHWAY - HELEMANO/WAIALUA JUNCTION TO HALEIWA BEACH PARK (STRUCTURES) FAP NO. F-083-1(24)
SHEET NO. OF SHEETS

ORIGINAL PLAN	SURVEY PLOTTED BY _____	DATE _____
	DRAWN BY _____	_____
	TRACED BY _____	_____
	NOTED BY _____	_____
NOTE BOOK	QUANTITIES BY _____	_____
	CHECKED BY _____	_____
NO.	_____	_____

BORING LOG							W.O. 88-1693	
BORING NO. B6	DRIVING WT. 140 lb.	DATE OF DRILLING 11-15-88						
SURFACE ELEV. 5±	DROP 30 in.	WATER LEVEL @ 4 ft.						
DEPTH (FEET)	GRAPH SYMBOL	UNIFIED SOIL CLASSIFICATION	BLOWS/FT.	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	RELATIVE COMPACTION (%)	DESCRIPTION	
0		MH-CH					Silty CLAY - Mottled brown, moist, firm to medium stiff.	
15			15	72	46			
4			4	64	62		Grading soft from 4 feet. Grading to grayish brown color from 5 feet.	
5			5	74	113		Organic material at 9 feet.	
10								
15		SM 4	78	30			Silty SAND - Mottled black, loose, with gravels.	
20		ML-OL	3	61	68		Clayey SILT - Dark gray, soft, with sand and shell fragments, organic.	
25			5	58	69		Weathered gravel at 24 feet.	
30			3	No Recovery				
35			4	59	72		Decayed wood at 34 feet.	
40			6	47	98			
45			6	58	67			
50			23	73	48			
55							BASALT - Gray, hard, slightly vesicular, slightly fractured. Begin NX coring from 54 feet. 100% Recovery from 54 to 59 feet. (RQD 100%) Weathered seam from 56.5 to 57 feet. 100% Recovery from 59 to 64 feet. (RQD 56%) 100% Recovery from 64 to 69 feet. (RQD 52%) Grading to reddish brown color from 67 feet.	
60								
65								
70							End boring at 69 feet.	
75								

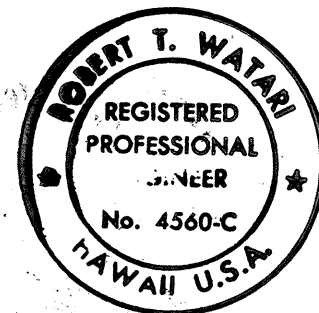
BORING LOG							W.O. 88-1693	
BORING NO. B7	DRIVING WT. 140 lb.	DATE OF DRILLING 1-6-89						
SURFACE ELEV. 9±	DROP 30 in.	WATER LEVEL @ 3.6 ft.						
DEPTH (FEET)	GRAPH SYMBOL	UNIFIED SOIL CLASSIFICATION	BLOWS/FT.	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	RELATIVE COMPACTION (%)	DESCRIPTION	
0		MH-CH					Silty CLAY - Brown, moist, firm to medium stiff.	
11			11	69	51			
5		ML-OL	2	58	70		Clayey SILT - Dark gray, soft, with sand, organic.	
10			3	53	87			
15			3	54	81			
20			4	55	74		Grading with shell fragments from 20 feet.	
25			8	Tip Recovery			Cobbles at 23 feet.	
30			9	No Recovery				
35			13	No Recovery				
40			6	62	71			
45			12	No Recovery				
50			14	No Recovery				
55							Basalt - Gray, hard, slightly vesicular. Begin NX coring from 52 feet. 100% Recovery from 52 to 57 feet. (RQD 100%)	
60							100% Recovery from 57 to 62 feet. (RQD 96%) 100% Recovery from 62 to 64 feet. (RQD 100%)	
65							End boring at 64 feet.	
70								
75								

BORING LOG							W.O. 88-1693	
BORING NO. B7A	DRIVING WT. 140 lb.	DATE OF DRILLING 5-16-89						
SURFACE ELEV. 8±	DROP 30 in.	WATER LEVEL @ 4 feet						
DEPTH (FEET)	GRAPH SYMBOL	UNIFIED SOIL CLASSIFICATION	BLOWS/FT.	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	RELATIVE COMPACTION (%)	DESCRIPTION	
0		MH-CH					Silty CLAY - Brown to reddish brown, moist, firm.	
6			6	75	43			
5		ML-OL	3	65	62		Clayey SILT - Gray, soft, with sand.	
10			1	58	63			
10.5							End boring at 10.5 feet.	
15								
20								

BORING LOG							W.O. 88-1693	
BORING NO. B7B	DRIVING WT. 140 lb.	DATE OF DRILLING 5-16-89						
SURFACE ELEV. 10±	DROP 30 in.	WATER LEVEL @ 3 feet						
DEPTH (FEET)	GRAPH SYMBOL	UNIFIED SOIL CLASSIFICATION	BLOWS/FT.	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	RELATIVE COMPACTION (%)	DESCRIPTION	
0		MH-CH					Silty CLAY - Brown, moist, medium stiff.	
21			21	73	46			
5		ML-OL	4	54	76		Clayey SILT - Gray, soft, with sand.	
10			4	45	98			
10.5							End boring at 10.5 feet.	
15								
20								

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-083-1(24)	1990	40	125

BORING LOG							W.O. 88-1693	
BORING NO. B7C	DRIVING WT. 140 lb.	DATE OF DRILLING 5-16-89						
SURFACE ELEV. 13±	DROP 30 in.	WATER LEVEL @ 5.5 feet						
DEPTH (FEET)	GRAPH SYMBOL	UNIFIED SOIL CLASSIFICATION	BLOWS/FT.	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	RELATIVE COMPACTION (%)	DESCRIPTION	
0		MH-CH					Silty CLAY - Brown, moist, medium stiff.	
17			17	80	38			
5		ML-SM	3	66	61		Sandy SILT - Brown, moist, firm to soft.	
10			9	70	55		Grading to mottled brown color and firm to medium stiff from 10 feet.	
15		MH	24	92	33		Silty CLAY - Mottled brown, stiff to medium stiff.	
20			45	94	31			
25			14	83	41		Grading with sand and highly weathered rock fragments from 25 feet.	
30			29	77	49			
35							BASALT - Gray, hard, slightly vesicular. Begin NX coring from 31 feet. 98% Recovery from 31 feet. (RQD = 96%) 88% Recovery from 36 to 41 feet. (RQD = 12%)	
40							End boring at 41 feet.	
45								



Robert T. Watani
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STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION
BORING LOGS
KAMEHAMEHA HIGHWAY - HELEMANO/WAIALUA JUNCTION TO HALEIWA BEACH PARK (STRUCTURES) FAP NO. F-083-1(24)

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
NOTE BOOK	DRAWN BY	
	DESIGNED BY	
	QUANTITIES BY	
	CHECKED BY	

BORING LOG						W.O. 88-1693	
BORING NO. B8	DRIVING WT. 140 lb.	DATE OF DRILLING 12-15-88					
SURFACE ELEV. 18±	DROP 30 in.	WATER LEVEL @ 12 ft.					
DEPTH (FEET)	GRAPH SYMBOL	UNIFIED SOIL CLASSIFICATION	BLOWS/FT.	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	RELATIVE COMPACTION (%)	DESCRIPTION
0		MH-CH	108/11"	94	29		Silty CLAY - Brown, moist, stiff, with weathered rock fragments.
5			100/10"	93	30		Grading to mottled orange and gray color from 7.5 feet.
10		SM	17	80	31		Silty SAND - Mottled brown, moist, medium dense, with gravels.
15			10	No Recovery			Grading loose from 15 feet.
20			58	92	26		Slightly cemented from 19 to 22 feet.
25			13	No Recovery			
30			8	No Recovery			
35		CL	16	70	51		Silty CLAY - Mottled grayish brown, firm to medium stiff, with highly weathered rock fragments.
40			13	76	48		
45			85/7"	No Recovery			Grading stiff from 43 feet.
50							HIGHLY WEATHERED ROCK - Light gray, medium hard to hard.
55							Grading hard from 49 feet. Begin NX coring from 49 feet. 90% Recovery from 49 to 54 feet. (RQD 66%)
60							15% Recovery from 54 to 59 feet. (RQD 6%)
							End NX coring at 59 feet.

BORING LOG						W.O. 88-1693	
BORING NO. B8 (Cont.)	DRIVING WT. 140 lb.	DATE OF DRILLING 12-15-88					
SURFACE ELEV. 18±	DROP 30 in.	WATER LEVEL @ 12 ft.					
DEPTH (FEET)	GRAPH SYMBOL	UNIFIED SOIL CLASSIFICATION	BLOWS/FT.	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	RELATIVE COMPACTION (%)	DESCRIPTION
60			62	No Recovery			
65			50/3"	No Recovery			
70							BASALT - Gray, hard, slightly vesicular, fractured.
75							Begin NX coring from 69.5 feet. 95% Recovery from 69.5 to 74.5 feet. (RQD 77%)
80							87% Recovery from 74.5 to 79.5 feet. (RQD 67%)
85							
90							End boring at 79.5 feet.

BORING LOG						W.O. 88-1693	
BORING NO. B9	DRIVING WT. 140 lb.	DATE OF DRILLING 1-31-89					
SURFACE ELEV. 10±	DROP 30 in.	WATER LEVEL @ 6.7 ft.					
DEPTH (FEET)	GRAPH SYMBOL	UNIFIED SOIL CLASSIFICATION	BLOWS/FT.	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	RELATIVE COMPACTION (%)	DESCRIPTION
0		MH-CH	17	77	44		Silty CLAY - Brown, moist, medium stiff.
5			11	72	53		
10		SM	5	74	55		Silty SAND - Brown, loose.
15			17/7"	95	21		Grading medium dense with coral fragments from 14 feet.
20		ML-OL	11	61	73		Clayey SILT - Dark gray, medium stiff, with sand, organic.
25			16	Disturbed Sample			
30			29	No Recovery			
35			32	Disturbed Sample			
40			20	66	70		
45			22	60	71		
50			23	63	66		
55			31	65	68		
60			49	No Recovery			

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-083-1(24)	1990	41	125

BORING LOG						W.O. 88-1693	
BORING NO. B9 (Cont.)	DRIVING WT. 140 lb.	DATE OF DRILLING 2-1-89					
SURFACE ELEV. 10±	DROP 30 in.	WATER LEVEL @ 6.7 ft.					
DEPTH (FEET)	GRAPH SYMBOL	UNIFIED SOIL CLASSIFICATION	BLOWS/FT.	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	RELATIVE COMPACTION (%)	DESCRIPTION
60							
65							BASALT - Gray, hard, slightly vesicular, fractured. Begin NX coring from 62 feet. 100% Recovery from 62 to 67 feet. (RQD 70%)
70							100% Recovery from 67 to 72 feet. (RQD 94%)
75							End boring at 72 feet.
80							
85							
90							



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STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION
BORING LOGS
KAMEHAMEHA HIGHWAY - HELEMANO/WAIALUA JUNCTION TO HALEIWA BEACH PARK (STRUCTURES) FAP NO. F-083-1(24)
SHEET NO. OF SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-083-1(24)	1990	42	125

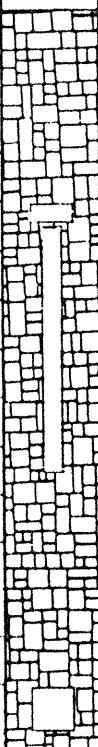
BORING LOG

BORING NO. B10		DRIVING WT. 140 lb.		W.O. 88-1693			
SURFACE ELEV. 23±		DATE OF DRILLING 12-30-88		12-30-88			
DROP 30 in.		WATER LEVEL @ 9 ft.					
DEPTH (FEET)	GRAPH SYMBOL	UNIFIED SOIL CLASSIFICATION	BLOWS/FT.	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	RELATIVE COMPACTION (%)	DESCRIPTION
0		MH-CH	31	81	40		Silty CLAY - Mottled brown, moist, stiff.
5			43	88	41		
10		SM	11	77	41		Sandy SILT - Mottled brown, medium stiff.
15							
20		MH	73	No Recovery			Silty CLAY - Mottled orange brown, stiff.
25							
30		MH	43	72	52		
35							
40		MH	25	73	53		
45							
50		MH	42	82	41		
55							
60		MH	43	69	58		
65							
70		MH	51	75	48		
75							
80		MH	58	74	48		
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1180		MH					
1185							
1190		MH					
1195							
1200		MH					
1205							
1210		MH					
1215							
1220		MH					

BORING NO. B10 (Cont.)		DRIVING WT. 140 lb.		DATE OF DRILLING 12-30-88			
SURFACE ELEV. 23±		DROP 30 in.		WATER LEVEL @ 9 ft.			
DEPTH (FEET)	GRAPH SYMBOL	UNIFIED SOIL CLASSIFICATION	BLOWS/FT.	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	RELATIVE COMPACTION (%)	DESCRIPTION
60							
65			57	88	30		
70			31	71	56		
75			70	82	50		
80			80	73	52		HIGHLY WEATHERED ROCK.- Mottled orange brown, dense.
85			85/9"	74	50		
90			33	63	63		
95			45	60	64		
100							End boring at 95.5 feet.
105							
110							
115							
120							

BORING LOG

BORING NO. B11		DRIVING WT. 140 lb.		DATE OF DRILLING 12-15-88			
SURFACE ELEV. 21 ±		DROP 30 in.		WATER LEVEL @ 9.6 ft.			
DEPTH (FEET)	GRAPH SYMBOL	UNIFIED SOIL CLASSIFICATION	BLOWS/FT.	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	RELATIVE COMPACTION (%)	DESCRIPTION
0		MH-CH	39	94	33		Silty CLAY - Brown, moist, stiff. Firm to medium stiff in upper 24 inches.
5		13	84	34			
10		SM	17	92	30		Sandy SILT - Mottled brown, moist, medium stiff.
15	MH		23	85	34		Silty CLAY - Mottled dark brown, stiff.
20		40	75	49			
25		31	70	70			
30		42	79	44			
35		28	70	54		Grading siltier from 34 feet.	
40		40	75	51		Grading with highly weathered rock fragments from 40 feet.	
45		43	72	51			
50		59	77	46			
55		35	67	54			
60		100	Tip Recovery			HIGHLY WEATHERED ROCK - Mottled dark brown, dense to medium hard.	

BORING NO. B11 (Cont.)		DRIVING WT. 140 lb.		DATE OF DRILLING 12-15-88			
SURFACE ELEV. 21 +		DROP 30 in.		WATER LEVEL @ 9.6 ft.			
DEPTH (FEET)	GRAPH SYMBOL	UNIFIED SOIL CLASSIFICATION	BLOWS/FT.	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	RELATIVE COMPACTION (%)	DESCRIPTION
60			55/3"	No	Recovery		Begin NX coring from 64.5 feet. 92% Recovery from 64.5 to 69.5 feet. (RQD 16%) End NX coring at 69.5 feet.
65							
70							
75							
80							End boring at 75.5 feet.
85							
90							

ORIGINAL PLAN	DATE
NOTED BY	
DESIGNED BY	
QUANTITIES BY	
CHECKED BY	



Robert T. Watan
THIS WORK WAS PREPARED BY
ME OR UNDER MY SUPERVISION.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BORING LOGS

KAMEHAMEHA HIGHWAY - HELEMANO/WAIALUA
JUNCTION TO HALEIWA BEACH PARK
(STRUCTURES)
FAP NO. F-083-1(24)

SHEET No. OF SHEETS

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

BORING LOG						
BORING NO. B12		W.O. 88-1693				
SURFACE ELEV. 6+		DRIVING WT. 140 lb.		DATE OF DRILLING 3-9-89		
DROP 30 in.		WATER LEVEL @ 4.2 feet				
DEPTH (FEET)	GRAPH SYMBOL	UNIFIED SOIL CLASSIFICATION	BLOWS/FT.	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	RELATIVE COMPACTION (%)
0		MH-CH				
43			86	32		
5						
19/6"			89	26		
55/9"			103	23		
10/No Penetration						
15						
20						
25						
30						
35						
40						
45						
50						
55						
60						

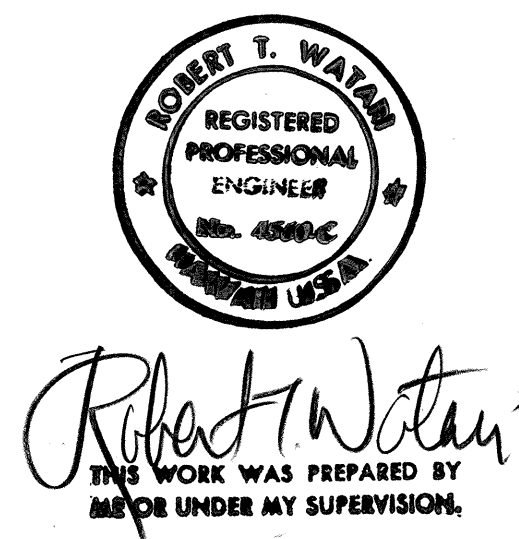
BORING LOG						
BORING NO. B13		W.O. 88-1693				
SURFACE ELEV. 4+		DRIVING WT. 140 lb.		DATE OF DRILLING 1-4-89		
DROP 30 in.		WATER LEVEL @ 4 ft.				
DEPTH (FEET)	GRAPH SYMBOL	UNIFIED SOIL CLASSIFICATION	BLOWS/FT.	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	RELATIVE COMPACTION (%)
0		MH-CH				
2			70	53		
5						
13		ML-OL	53	89		
4			76	44		
3			71	56		
4			No Recovery			
3			No Recovery			
4			No Recovery			
3			57	71		
4			Tip Recovery			
4			58	70		
6			54	83		
10			54	78		
10			51	86		
10/No Penetration						
60						

BORING LOG						
BORING NO. B13 (Cont.)		W.O. 88-1693				
SURFACE ELEV. 4+		DRIVING WT. 140 lb.		DATE OF DRILLING 1-10-89		
DROP 30 in.		WATER LEVEL @ 4 ft.				
DEPTH (FEET)	GRAPH SYMBOL	UNIFIED SOIL CLASSIFICATION	BLOWS/FT.	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	RELATIVE COMPACTION (%)
60		CL				
65						
70			83	81	42	
75			80/3"	Tip Recovery		
80						
85						
90						

BORING LOG						
BORING NO. B13A		W.O. 88-1693				
SURFACE ELEV. 6+		DRIVING WT. 140 lb.		DATE OF DRILLING 5-17-89		
DROP 30 in.		WATER LEVEL @ 5.5 feet				
DEPTH (FEET)	GRAPH SYMBOL	UNIFIED SOIL CLASSIFICATION	BLOWS/FT.	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	RELATIVE COMPACTION (%)
0		MH-CH				
8			35			
4			64	61		
1		ML-OL	68	46		
9			83	38		
15						
20						
25						
30						

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-083-1(24)	1990	43	125

BORING LOG						
BORING NO. B13B		W.O. 88-1693				
SURFACE ELEV. 6+		DRIVING WT. 140 lb.		DATE OF DRILLING 5-17-89		
DROP 30 in.		WATER LEVEL @ 5.5 feet				
DEPTH (FEET)	GRAPH SYMBOL	UNIFIED SOIL CLASSIFICATION	BLOWS/FT.	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	RELATIVE COMPACTION (%)
0		MH-CH				
11			71	47		
3			64	59		
3		ML-OL	59	70		
1			55	74		
15			76	44		
6			62	50		
6			58	65		
5			58	74		
7			58	74		
8			56	75		
7			68	53		
9			54	74		
10			50	88		



STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
BORING LOGS
KAMEHAMEHA HIGHWAY - HELEMANO/WAIALUA JUNCTION TO HALEIWA BEACH PARK (STRUCTURES)
FAP NO. F-083-1(24)
SHEET NO. OF SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-083-1(24)	1990	44	125

BORING LOG

W.O. 88-1693

BORING NO. B13B (cont.) DRIVING WT. 140 lb. DATE OF DRILLING 5-17-89
SURFACE ELEV. 6+ DROP 30 in. WATER LEVEL @ 5.5 feet

DEPTH (FEET)	GRAPH SYMBOL	UNITED SOIL CLASSIFICATION	BLOWS/FT	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	RELATIVE COMPACTION (%)	DESCRIPTION
60							
65	■		11	62	65		
70	□		108	Tip Recovery			BASALT - Gray, medium hard, slightly vesicular. Begin NX coring from 69.5 feet. 90% Recovery from 69.5 to 74.5 feet. (RQD=44%)
75							61% Recovery from 74.5 to 79.5 feet. (RQD=21%) Weathered seam at 75 feet.
80							End boring at 79.5 feet.
85							
90							

BORING LOG

WLO 88-1693

BORING NO. B14 (Cont.) DRIVING WT. 140 lb. DATE OF DRILLING 2-28-89
SURFACE ELEV. 5+ DIAM. 30 in. WATER LEVEL @ 3.5 ft

DEPTH (FEET)	GRAPH SYMBOL	UNIFIED SOIL CLASSIFICATION	BLOWS/FT.	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	RELATIVE COMPACTION (%)	DESCRIPTION
30							
35			75/8"	108	19		Grading to hard gray basalt from 35 feet. Begin NX coring from 35 feet. 100% Recovery from 35 to 39 feet. (RQD 95%)
40							100% Recovery from 39 to 44 feet. (RQD 96%)
45							100% Recovery from 44 to 49 feet. (RQD 94%)
50							100% Recovery from 49 to 54 feet. (RQD 92%)
55							80% Recovery from 54 to 59 feet. (RQD 14%)
60							End NX coring at 59 feet.
65			71/9"	No Recovery			
70			35/3"	Tip Recovery			
75			40/4"	Tip Recovery			
80			94	No Recovery			
85							End boring at 80.5 feet.
90							

BORING LOG

W.O. 88-1693

BORING NO. B14A DRIVING WT. 140 lb. DATE OF DRILLING 6-22-89
SURFACE ELEV. 5+ DROP 30 in. WATER LEVEL @ 5.0 ft

DEPTH (FEET)	GRAPHIC SYMBOL	UNIFIED SOIL CLASSI- FICATION	BLOWS/FT.	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	RELATIVE COMPACTION (%)	DESCRIPTION
0							CORAL - Tan, medium hard to hard. Boulder at 3.5 feet.
-5							BASALT - Gray, hard. Begin NX coring from 5 feet. 100% Recovery from 5 to 10 feet. RQD = 92% 100% Recovery from 10 to 15 feet. RQD = 95% 54% Recovery from 15 to 17 feet. RQD = 0% Grading weathered from 15.5 feet. 100% Recovery from 17 to 20 feet. RQD = 33% Grading to mottled brown and vesicular from 17 feet. 95% Recovery from 20 to 25 feet. RQD = 45% 83% Recovery from 25 to 27 feet. RQD = 0% Grading mottled brown to mottled gray from 25 feet. 40% Recovery from 27 to 28.3 feet. RQD = 0% 91% Recovery from 28.3 to 31 feet. RQD = 32% 16% Recovery from 31 to 34 feet. RQD = 0% Cobbles from 31 feet.
-35							End boring at 34 feet.
-40							
-45							
-50							
-55							
-60							

BORING LOG

WFO 88-1693

BORING NO. B14 DRIVING WT. 140 lb. DATE OF DRILLING 2-24-81
SURFACE/ELEV. 5.1 DEPTH 30 in. WATER LEVEL @ 3.5 ft

DEPTH (FEET)	GRAPH SYMBOL	UNITED SOIL CLASSIFICATION	BLOWS/FT	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	RELATIVE COMPACTION (%)	DESCRIPTION
0							CORAL - Tan, medium hard to hard,
5							BASALT - Gray, hard. Begin NX coring from 3.5 feet. 100% Recovery from 3.5 to 6.5 feet. (RQD 90%) 90% Recovery from 6.5 to 11.5 feet. (RQD 74%) End NX coring at 11.5 feet. Grading to weathered condition, dense to medium hard from 11 feet.
10							
15			60/5"	Tip Recovery			
20			10/No Penetration				Begin NX coring from 19 feet. 96% Recovery from 19 to 24 feet. (RQD 16%) 100% Recovery from 24 to 27 feet. (RQD 0%) End NX coring at 27 feet.
25							
30			50/6"	99	26		

BORING LOG

WO 88-1693

BORING NO. B14B DRIVING WT. 140 lb. DATE OF DRILLING 6-22-89
SURFACE ELEV. 5+ DROP 30 in. WATER LEVEL @ 1.4

DEPTH (FEET)	GRAPH SYMBOL	UNIFIED SOIL CLASSI- FICATION	BLOWS/FT	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	RELATIVE COMPACTION (%)	DESCRIPTION
0							CORAL - Tan, medium hard to hard. Begin NX coring from surface. 80% Recovery from 0 to 2.5 feet. RQD = 13%
5							BASALT - Gray, hard. 100% Recovery from 2.5 to 5 feet. RQD = 43%
							100% Recovery from 5 to 9.8 feet. RQD = 43%
-10							100% Recovery from 9.8 to 14.8 feet. RQD = 51%
							100% Recovery from 14.8 to 19.5 feet. RQD = 43%
-15							
-20							End boring at 19.5 feet.
-25							
-30							



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HIGHWAYS DIVISION

BORING LOGS

KAMEHAMEHA HIGHWAY - HELEMANO/WAIALUA
JUNCTION TO HALEIWA BEACH PARK
(STRUCTURES)
FAP NO. F-083-1(24)

SHEET No. OF SHEETS

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

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-083-1(24)	1990	45	125

BORING LOG						
W.O. 88-1693						
BORING NO. B14C DRIVING WT. 140 lb. DATE OF DRILLING 8-31-89						
SURFACE ELEV. 2+ DROP 30 in. WATER LEVEL @ 2.1 ft.						
DEPTH (FEET)	GRAPH SYMBOL	UNIFIED SOIL CLASSIFICATION	BLOWS/FT	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	RELATIVE COMPACTION (%)
0	OH					
5			1	97	221	
10			1	100	187	
15						
20						
25						
30						
Clayey SILT - Dark brown, moist, soft, organic.						
Grading to dark gray color at 5 feet.						
BASALT - Gray, dense to medium hard. Begin NX coring from 13 feet. 75% Recovery from 13 to 15 feet. RQD = 66% 87% Recovery from 15 to 19 feet. RQD = 31% 100% Recovery from 19 to 24 feet. RQD = 40% 100% Recovery from 24 to 29 feet. RQD = 75% End boring at 29 feet.						

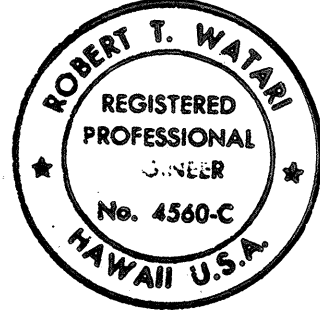
BORING LOG						
W.O. 88-1693						
BORING NO. B14D DRIVING WT. 140 lb. DATE OF DRILLING 9-6-89						
SURFACE ELEV. 2+ DROP 30 in. WATER LEVEL @ 1.0 ft.						
DEPTH (FEET)	GRAPH SYMBOL	UNIFIED SOIL CLASSIFICATION	BLOWS/FT	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	RELATIVE COMPACTION (%)
0	OH					
5				84	100	
10			1	70	176	
15			50/5"	67	63	
20						
25						
30						
Clayey SILT - Dark gray, moist, soft, organic.						
BASALT - Gray, hard to medium dense, vesicular. Begin NX coring from 14.5 feet. 90% Recovery from 14.5 to 19.5 feet. RQD = 15% 100% Recovery from 19.5 to 24.5 feet. RQD = 25% End boring at 24.5 feet.						

BORING LOG						
W.O. 88-1693						
BORING NO. B14E DRIVING WT. 140 lb. DATE OF DRILLING 9-11-89						
SURFACE ELEV. 2+ DROP 30 in. WATER LEVEL @ 0.0 ft.						
DEPTH (FEET)	GRAPH SYMBOL	UNIFIED SOIL CLASSIFICATION	BLOWS/FT	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	RELATIVE COMPACTION (%)
0	OH					
5						
10						
15						
20						
25						
30						
35						
40						
45						
50						
55						
60						
Clayey SILT - Dark gray, moist, soft, organic.						
Wt. of Hammer No Recovery						
Wt. of Rods No Recovery						
BASALT - Gray, medium hard, vesicular. Grading highly weathered from 15 feet. Begin NX coring from 14.5 feet. 37% Recovery from 14.5 to 19.5 feet. RQD = 10% 55% Recovery from 19.5 to 24.5 feet. RQD = 0% 50% Recovery from 24.5 to 29.5 feet. RQD = 0% 95% Recovery from 29.5 to 34.5 feet. RQD = 21% 100% Recovery from 34.5 to 39.5 feet. RQD = 61% End boring at 39.5 feet.						

BORING LOG						
W.O. 88-1693						
BORING NO. B15 DRIVING WT. 140 lb. DATE OF DRILLING 2-17-89						
SURFACE ELEV. 8+ DROP 30 in. WATER LEVEL @ 6.5 ft.						
DEPTH (FEET)	GRAPH SYMBOL	UNIFIED SOIL CLASSIFICATION	BLOWS/FT	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	RELATIVE COMPACTION (%)
0	SM		35/10"	79	21	
5			85	91	21	
10	ML-OL		3	30	162	
15	SM		31	95	26	
20			58	106	20	
25			64/10"	103	18	
30			40/5"	No Recovery		
35						
40	ML		15	59	75	
45			14	61	66	
50			50/4"	Tip Recovery		
55						
60			85/9"	No Recovery		
Silty SAND - Tan, dense to medium hard, with coral fragments.						
Clayey SILT - Mottled gray, moist, soft, organic.						
Silty SAND - Tan, Medium dense to dense, with coral fragments.						
Grading hard from 24 feet. Begin NX coring from 24.5 feet. 50% Recovery from 24.5 to 29.5 feet. End NX coring at 29.5 feet.						
Sandy SILT - Mottled brown, firm, with gravels.						
BASALT - Gray, medium hard to hard, vesicular. Begin NX coring from 39.5 feet. 100% Recovery from 39.5 to 44 feet. (RQD 64%) 100% Recovery from 44 to 49 feet. (RQD 86%) 100% Recovery from 49 to 54 feet. (RQD 84%) 96% Recovery from 54 to 59 feet. (RQD 26%) Grading to weathered basalt from 56 feet. End NX coring at 59 feet.						

BORING LOG						
W.O. 88-1693						
BORING NO. B15 (Cont.) DRIVING WT. 140 lb. DATE OF DRILLING 2-22-89						
SURFACE ELEV. 8+ DROP 30 in. WATER LEVEL @ 6.5 ft.						
DEPTH (FEET)	GRAPH SYMBOL	UNIFIED SOIL CLASSIFICATION	BLOWS/FT	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	RELATIVE COMPACTION (%)
60						
65			82	64	54	
70						
75						
80						
85						
90						
Grading dense to medium hard from 69 feet. Begin NX coring from 69 feet. 80% Recovery from 69 to 74 feet. (RQD 20%) 14% Recovery from 74 to 77.5 feet. (RQD 8%) End boring at 77.5 feet.						

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



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BORING LOGS

KAMEHAMEHA HIGHWAY - HELEMANO/WAIALUA
JUNCTION TO HALEIWA BEACH PARK
(STRUCTURES)
FAP NO. F-083-1(24)

SHEET No. OF SHEETS