
























MAJOR DIVISIONS			GROUP SYMBOLS		TYPICAL NAMES	
COARSE GRAINED SOILS (More than 50% of the material is LARGER than No. 200 sieve size.)	GRAVELS (More than 50% of coarse fraction is LARGER than the No. 4 sieve size.)	CLEAN GRAVELS (Little or no fines.)		GW	Well graded gravels, gravel-sand mixtures, little or no fines.	
				GP	Poorly graded gravels or gravel-sand mixtures, little or no fines.	
		GRAVELS WITH FINES (Appreciable amt. of fines.)		GM	Silty gravels, gravel-sand-silt mixtures.	
				GC	Clayey gravels, gravel-sand-clay mixtures.	
	SANDS (More than 50% of coarse fraction is SMALLER than the No. 4 sieve size.)	CLEAN SANDS (Little or no fines.)		SW	Well graded sands, gravelly sands, little or no fines.	
				SP	Poorly graded sands or gravelly sands, little or no fines.	
		SANDS WITH FINES (Appreciable amt. of fines.)		SM	Silty sands, sand-silt mixtures.	
				SC	Clayey sands, sand-clay mixtures.	
FINE GRAINED SOILS (More than 50% of the material is SMALLER than No. 200 sieve size.)	SILTS AND CLAYS (Liquid limit LESS than 50.)			ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity.	
				CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays.	
				OL	Organic silts and organic silty clays of low plasticity.	
	SILTS AND CLAYS (Liquid limit GREATER than 50.)			MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts.	
				CH	Inorganic clays of high plasticity, fat clays.	
				OH	Organic clays of medium to high plasticity, organic silts.	
			HIGHLY ORGANIC SOILS			PT
				FRESH TO MODERATELY WEATHERED BASALT		
				VOLCANIC TUFF / HIGHLY TO COMPLETELY WEATHERED BASALT		
				CORAL		

SAMPLE DEFINITION		
 2" O.D. Standard Split Spoon Sampler	 Shelby Tube	RQD Rock Quality Designation
 3" O.D. Split Tube Sampler	 NX / 4" Coring	 Water Level

W.O. 08-4601	Rehabilitation of Honolulu Bridge
Hirata & Associates, Inc.	BORING LOG LEGEND

BORING LOG

W.O. 08-4601

BORING NO. B1 DRIVING WT. 140 lb. START DATE 2/12/09
 SURFACE ELEV. 31±* DROP 30 in. END DATE 2/17/09

DEPTH FOOT	GRAPH	SAMPLE	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
0						
			36	85	29	Clayey SILT (MH) – Brown, moist, stiff, with sand and gravel.
			58	101	22	
5			37	91	20	Increase in sand and gravel content from 3.5 feet.
10			10/No Penetration			GRAVEL AND COBBLES (GP-GM) – Mottled brown, moist, dense, with clay, sand, and boulders. (Alluvium)
15			90/9"	113	13	
20			64	125	12	Groundwater encountered at 18.3 feet on 2/17/09 at 10:15 am.
25			10/No Penetration			Boulders from 24 to 26 feet.
30						Boulders from 28 to 30 feet. Begin NX coring at 29.5 feet. 38% Recovery from 29.5 to 34.5 feet. RQD = 0%

BORING LOG

W.O. 08-4601

BORING NO. B1 (continued) DRIVING WT. 140 lb. START DATE 2/12/09
 SURFACE ELEV. 31± DROP 30 in. END DATE 2/17/09

DEPTH	GRAPH	SAMPLE	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
30						
35						
40			57	67	56	
45			22/6" 50/4"	70	49	WEATHERED BASALT (WH-WC) – Mottled brown, dense to medium hard, highly to completely weathered.
50						
55			50/3"	79	27	
60			64	57	74	WEATHERED BASALT (WC) – Mottled brown, dense, completely weathered. (Weathered Sand and Gravel)

BORING LOG

W.O. 08-4601

BORING NO. B1 (continued) DRIVING WT. 140 lb. START DATE 2/12/09
 SURFACE ELEV. 31± DROP 30 in. END DATE 2/17/09

DEPTH	GRAPH	SAMPLE	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
60						
65			95/8"	63	58	
70						BASALT (WM) – Grayish brown, hard, moderately weathered. Begin NX coring at 66.5 feet. 83% Recovery from 66.5 to 71.5 feet. RQD = 28%
75						83% Recovery from 71.5 to 76.5 feet. RQD = 50%
80						End boring at 76.5 feet. Groundwater encountered at 18.3 feet on 2/17/09 at 10:15 am.
85						* Elevations based on preliminary site plan provided by Austin, Tsutsumi and Associates, Inc. on 1/16/09.
90						

BORING LOG

W.O. 08-4601

BORING NO. B2 DRIVING WT. 140 lb. START DATE 2/18/09
 SURFACE ELEV. 30± DROP 30 in. END DATE 2/24/09

DEPTH FOOT	GRAPH	SAMPLE	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
0						Clayey SILT (MH) – Brown, moist, stiff, with sand and gravel.
			17	71	29	
			27	83	20	
5						
			11	70	19	Reddish brown color from 8 feet, medium stiff.
10						
			10	80	41	Cobble from 12.5 to 13 feet.
15						
						Cobbles from 15.5 to 17 feet. Groundwater encountered at 16.6 feet on 2/24/09 at 7:45 am.
			50/4"	45	19	GRAVEL AND COBBLES – Brown, moist, dense, with clay, sand, and boulders. (Alluvium)
20						
			50/4"	90	20	
25						
			84/10"	126	11	Boulder at 27 feet.
30						

BORING LOG

W.O. 08-4601

BORING NO. B2 (continued) DRIVING WT. 140 lb. START DATE 2/18/09
 SURFACE ELEV. 30± DROP 30 in. END DATE 2/24/09


















DEPTH	GRAPH	SAMPLE	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
30						
						Boulder at 31 feet.
			72	111	26	
35						
40						BASALT (WM) – Mottled gray and brown, medium hard, moderately weathered.
						Begin NX coring at 38 feet.
						48% Recovery from 38 to 43 feet.
						RQD = 38%
						83% Recovery from 43 to 48 feet.
						RQD = 7%
45						
50						83% Recovery from 48 to 53 feet.
						RQD = 80%
						90% Recovery from 53 to 58 feet.
						RQD = 0%
55						WEATHERED BASALT (WC) – Brown, medium stiff to stiff, completely weathered.
			29		56	
60						

BORING LOG

W.O. 08-4601

BORING NO. B2 (continued) DRIVING WT. 140 lb. START DATE 2/18/09
 SURFACE ELEV. 30± DROP 30 in. END DATE 2/24/09

DEPTH	GRAPH	SAMPLE	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
60						
65		✕	15		66	
70		✕	32		63	
75		✕	17		75	
						End boring at 76 feet.
80						Groundwater encountered at 16.6 feet on 2/24/09 at 7:45 am.
85						
90						

MAJOR DIVISIONS			GROUP DIVISIONS	TYPICAL NAMES
COARSE GRAINED SOILS (More than 50% of the material is LARGER than No. 200 sieve size.)	GRAVELS (More than 50% of coarse fraction is LARGER than the No. 4 sieve size.)	CLEAN GRAVELS (Little or no fines.)	 GW	Well graded gravels, gravel-sand mixtures, little or no fines.
			 GP	Poorly graded gravels or gravel-sand mixtures, little or no fines.
		GRAVELS WITH FINES (Appreciable amt. of fines.)	 GM	Silty gravels, gravel-sand-silt mixtures.
			 GC	Clayey gravels, gravel-sand-clay mixtures.
	SANDS (More than 50% of coarse fraction is SMALLER than the No. 4 sieve size.)	CLEAN SANDS (Little or no fines.)	 SW	Well graded sands, gravelly sands, little or no fines.
			 SP	Poorly graded sands or gravelly sands, little or no fines.
		SANDS WITH FINES (Appreciable amt. of fines.)	 SM	Silty sands, sand-silt mixtures.
			 SC	Clayey sands, sand-clay mixtures.
FINE GRAINED SOILS (More than 50% of the material is SMALLER than No. 200 sieve size.)	SILTS AND CLAYS (Liquid limit LESS than 50.)		 ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity.
			 CL	Inorganic clays of high plasticity, lean clays.
			 OL	Organic silts and organic silty clays of low plasticity.
	SILTS AND CLAYS (Liquid limit GREATER than 50.)		 MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts.
			 CH	Inorganic clays of high plasticity, fat clays.
			 OH	Organic clays of medium to high plasticity, organic silts.
			HIGHLY ORGANIC SOILS	
FORMATIONS				FRESH TO MODERATELY WEATHERED BASALT
				VOLCANIC TUFF / HIGHLY TO COMPLETELY WEATHERED BASALT
				CORAL

SAMPLE DEFINITION

 2" O.D. Standard Split Spoon Sampler

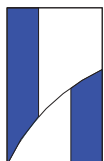
 Shelby Tube

RQD: Rock Quality Designation

 3" O.D. Split Tube Sampler

 Core Sample

 Water Table



HIRATA & ASSOCIATES, INC.

Geotechnical Engineering

W.O. 20-6475

Honolua Stream Temporary ACROW Bridge

BORING LOG LEGEND



BORING LOG

PROJECT NAME Honolua Stream Temporary ACROW Bridge

WORK ORDER NO. 20-6475 DRIVING WT. 140 lb. START DATE 1/12/21

SURFACE ELEV. 30 ±* DROP 30 in. END DATE 1/12/21

REMARKS/ SAMPLE NO.	CORE RECOVERY (%)	RQD (%)	BLOWS PER FOOT	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	DEPTH (ft)	GRAPHIC LOG	SAMPLE	MATERIAL DESCRIPTION
			22	82	30				Clayey SILT (MH) - Reddish brown, moist, medium stiff, with sand. AC fragments at 2 feet.
			17	82	29				
Begin NX coring from 11.5 feet.			11	75	32	5			Clayey SILT (ML) - Dark brown, moist, firm to medium stiff, with sand.
			28/8" 10/No Penetration		70	42			Gravel, cobbles, and occasional boulders from 9 feet.
	55	8				15			
	14	0				20			
	52	16				25			
						30			End boring at 25.0 feet. Neither groundwater nor seepage water encountered. * Elevation based on topographic survey plan provided by Austin, Tsutsumi & Associates, Inc.
						35			

**BORING LOG**PROJECT NAME Honolua Stream Temporary ACROW BridgeWORK ORDER NO. 20-6475DRIVING WT. 140 lb.START DATE 1/11/21SURFACE ELEV. 30 ±DROP 30 in.END DATE 1/11/21

REMARKS/ SAMPLE NO.	CORE RECOVERY (%)	RQD (%)	BLOWS PER FOOT	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	DEPTH (ft)	GRAPHIC LOG	SAMPLE	MATERIAL DESCRIPTION
			31	91	19				Clayey SILT (MH) - Reddish brown, moist, medium stiff.
Begin NX coring from 10 feet.	38	18	20/3"						Clayey SILT (ML) - Brown, moist, medium stiff, with sand. Cobbles at 3.5 feet. Gravel, cobbles, and occasional boulders from 6.5 feet.
			6/6" 29/6"	74	17	5			
			28/6" 25/2"	100	7	10			
						15			End boring at 15.0 feet.
									Neither groundwater nor seepage water encountered.
						20			
						25			
						30			
						35			