

PANAMA CANAL COMMISSION

ENGINEERING AND CONSTRUCTION BUREAU

GEOLOGICAL FIELD LOG

BORING CMRB-1A

PROJECT: COROZAL MIRAFLORES ROAD AND BRIDGE

PAGE 1 OF 4

LOCATION: MIRAFLORES - RIO GRANDE

NORTHING: 993387.76

STATION: 69K+398.23

CORE RECOVERY: 84%

START DATE: 04 Oct. 1999

GEOLOGIST: P. Franceschi & J. Ramesch

EASTING: 656165.01

OFFSET: -145.86

COMPLET. DATE: 07 Oct. 1999

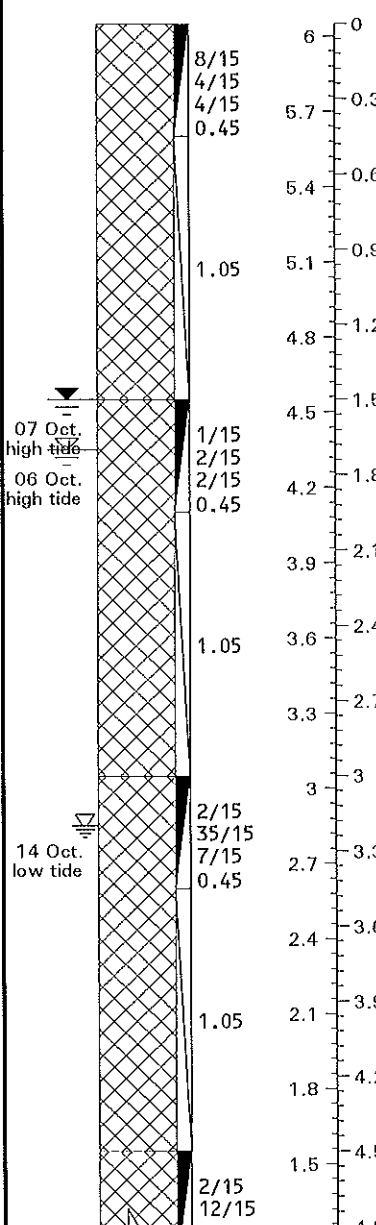
GROUND ELEVATION: 6.05m

TOTAL DEPTH: 16.85 m

INCLINATION: Vertical

LOGGER J. Ramesch & P. Franceschi

DRILLER: A. Mendoza

SOIL SYMBOLS, SAMPLERS, FIELD TEST DATA AND CORE RUN	ELEVATION	DEPTH	DESCRIPTION OF MATERIAL	DISCONTINUITY	DRILLING CHARACTERISTICS	CORE RECOV (%)	RQD (%)
	(meters)						
 <p>07 Oct. high tide</p> <p>06 Oct. high tide</p> <p>14 Oct. low tide</p>	8/15	0	FILL, OC-2, medium-low consistency, weak, low water content, low plasticity, low dry strength, consists of clay, sand, and silt mixed with angular to sub-angular basaltic and andesitic fragments up to 3.5cm in diameter, contains some roots in upper 18cm and is more clayey, lower 27cm contains abundant iron oxides. Color: upper 18cm are brown, red-brown, and black, lower 27cm are ochre, orange, and red-brown.		SPT #1	100%	-
	4/15	0.3					
	4/15	0.6					
	0.45	0.9					
	1.05	1.2	FILL, OC-2, medium-low consistency, weak, moderate water content, moderate plasticity, high dry strength, consists of clay, coarse-grained sand, abundant small pebbles, and silt, mixed with sub-angular to angular basaltic and andesitic fragments up to 3.5cm in diameter. Color: mottled medium yellow and red-brown, brownish gray, and green.		SPT #2	40%	-
		1.5					
	1/15	1.8					
	2/15	2.1					
	0.45	2.4	FILL, OC-1 to OC-2, low to medium-low consistency, weak, moderate to high water content, high plasticity, sticky, moderate to high dry strength, consists of clay, silt and sand, and abundant small pebbles, with one hard, basaltic or andesitic fragment 3cm in diameter. Color: medium gray-brown mottled with red and blue-gray, and scattered ochre and green.		SPT #3	42%	-
		2.7					
	2/15	3.0					
	35/15	3.3					
	7/15	3.6	FILL, OC-1, low consistency, weak, high water content, high plasticity, sticky, high dry strength, consists of clay,		SPT #4		
	0.45	3.9					
		4.2					
	1.05	4.5					
	4.8						

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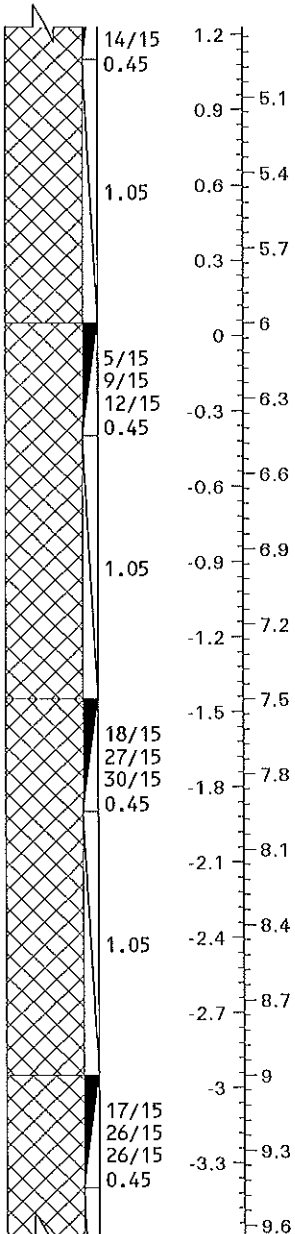
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LOGGER J. Ramesch & P. Franceschi

DRILLER: A. Mendoza

SOIL SYMBOLS, SAMPLERS, FIELD TEST DATA AND CORE RUN	ELEVATION	DEPTH	DESCRIPTION OF MATERIAL	DISCONTINUITY	DRILLING CHARACTERISTICS	CORE RECOV (%)	RQD (%)
	(meters)						
	14/15	1.2	silt, and sand mixed with abundant, small, hard andesitic and basaltic pebbles and scattered few sub-angular and angular fragments of varying composition up to 3cm in diameter. Color: medium gray-brown mottled with red and green-gray.		Cleaned with 3 1/2 in. tricone rotary bit and water. 4.5m of 4" casing installed.	22%	-
	0.45	5.1					
	1.05	5.4					
		5.7					
		6					
	5/15	0	FILL, OC-2 to OC-3, medium-low to medium-high consistency, weak, low water content, variable plasticity, low dry strength, consists of clay, sand and silt, contains clasts of less altered tuff and scattered iron oxides. Color: pockets of mottled green-gray, red-brown, yellow, and ochre.	SPT #5	Cleaned with 3 1/2 in. tricone rotary bit and water. 6.0m of 4" casing installed.	100%	-
	9/15	6.3					
	12/15	-0.3					
	0.45	6.6					
		6.9					
	18/15	-1.5	FILL, OC-2 to RH-5, medium-low consistency to very hard rock, weak, low to moderate water content, low plasticity, low dry strength, consists of abundant hard, angular gravel up to 1.5cm in diameter, weakly cemented by pockets of clay and sand, material is friable, and contains scattered iron oxides. Color: black with pockets of ochre, cream, and red-brown.	SPT #6	Cleaned with 3 1/2 in. tricone rotary bit and water. At depth 7.20m water color became light creamy gray.	100%	-
	27/15	7.8					
	30/15	-1.8					
	0.45	8.1					
		8.4					
	17/15	-3	FILL, same as in SPT #6, OC-2 to RH-5, medium-low consistency to very hard rock, weak, low to moderate water content, low plasticity, low dry strength, consists of abundant hard, angular gravel up to 1.5cm in diameter weakly cemented by pockets of clay and	SPT #7	Cleaned with 3 1/2 in. tricone rotary	91%	-
	26/15	9.3					
	0.45	9.6					

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DRILLER: A. Mendoza

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	(meters)						
	-3.6		sand, contains scattered iron oxides, material is friable, breaks apart with little pressure. Color: black with pockets of light yellow-green, cream, ochre, and red-brown.		bit and water. At depth 8.40m water color changed to dark grey and contained fine-grained black sand.		
	-3.9	9.9					
	-4.2	10.2					
	-4.5	10.5	GRAVEL, RH-4, hard rock, strong, consists of angular to sub-angular fragments up to 3.5cm in diameter, no matrix is evident, gravel is loose. This layer is also present in CMRB-1. Color: black.		SPT #8 Cleaned with 3 1/2 in. tricone rotary bit and water.	62%	
	-4.8	10.8					
	-5.1	11.1					
	-5.4	11.4	TOP OF LAS CASCADAS FORMATION OVERBURDEN, OC-3, medium-high consistency, weak, low water content, low plasticity, low dry strength, consists of sand, silt, and clay, contains clasts and pockets of less altered tuff, sub-rounded to sub-angular sub-angular hard fragments and pebbles up to 2.5cm in diameter, and scattered iron oxides, material is residual, saprolitic, and derived from tuff agglomeratic by natural weathering processes. Color: light green-yellow, with pockets of dusky red, green-gray, dark olive green, and ochre.		Water color is clear and contains black fragments. At depth 10.50m water traveling and escaping from CMRB-1 approximately five feet away. At depth 11.50m water color changed to light brown. SPT #9 Cleaned with 3 1/2 in. tricone rotary bit and water.	100%	
	-6.3	12.3					
	-6.6	12.6					
	-6.9	12.9	OVERBURDEN, OC-4 to RH-1, medium-high consistency to very soft rock, weak, low water content, low plasticity, low dry strength, consists of sand, silt, and clay, contains abundant fine-grained sand with a metallic grey to black luster, most likely magnetite, also contains pockets and seams of white sandy clay, and scattered few iron oxides. Color: weak red to dusky red,		At depth 12.0m water color was white. At depth 13.1m water color changed to light pinkish brown. SPT #10 Drilled with 3 7/8 in. double tube, carboloy bit and water.	100%	
	-7.2	13.2					
	-7.5	13.5					
	-7.8	13.8			Water color was dark red-brown.		
	-8.1	14.1					
	-8.4	14.4					

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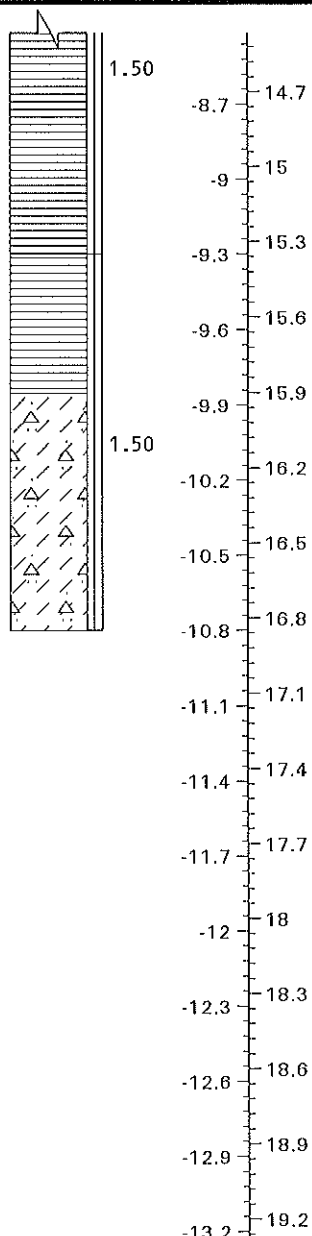
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INCLINATION: Vertical

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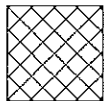
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	(meters)						
	1.50	14.7	mottled with scattered white.				
	-8.7	15	TOP OF FAIRLY SOUND ROCK, CLAYSHALE, RH-2, medium-soft rock, weak, very close jointing, joints are open, sub-horizontal, sub-vertical, some joints coated with iron oxides and manganese stains, one joint is slickensided, massive bedding, very fine-grained, water-laid, contains abundant fine-grained sand with a grey to black metallic lustre, possibly magnetite, altered to clay minerals. Color: weak to dusky red.		Drilled slowly, as above.	100%	0.0%
	-9.3	15.3	CLAYSHALE, as above, but RH-1 to RH-2, material was removed from barrel in disturbed condition, as clay with clayshale intact in center.				
	-9.6	15.6	TUFF, AGGLOMERATIC, RH-2 to RH-3, as in CMRB-1, medium-soft to medium-hard rock, weak to moderate strength, close jointing, joints are open, horizontal to sub-horizontal, massive bedding, consists of sub-angular to angular fragments of varying composition in a fine-grained, sandy, tuffaceous matrix altered to clay minerals, contains elongated and sub-rounded clasts of tuff up to 2cm in length, some clasts are altered to clay minerals, some are less altered and harder, contains fine-grained sand with a black metallic lustre, possibly magnetite. Color: light purplish grey mottled with dusky red.			93%	51%
	-9.9	15.9					
	-10.2	16.2					
	-10.5	16.5					
	-10.8	16.8					
	-11.1	17.1					
	-11.4	17.4					
	-11.7	17.7					
	-12	18					
	-12.3	18.3					
	-12.6	18.6					
	-12.9	18.9					
	-13.2	19.2					

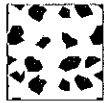
KEY TO SYMBOLS

Symbol Description

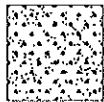
Strata symbols



Fill



Gravel



Overburden



Clayshale



Tuff
Agglomeratic

Misc. Symbols



Water table at date
indicated



Water table at date indicated



Water table at date indicated



Boring continues



Core Recovery

Symbol Description



Casing at depth indicated

Soil Samplers



Standard penetration test



No recovery



Rock core

Notes:

1. The C.R.% and the RQD% at the end of each material unit means the total core recovery and the quality of the rock recovered per material unit, given as a percentage.