

# PANAMA CANAL AUTHORITY

## DEPARTMENT OF ENGINEERING AND PROGRAMS MANAGEMENT

### GEOLOGICAL FIELD LOG

#### BORING CCMT-8

**PROJECT: CONTROL CENTER - MARINE TRAFFIC**

PAGE 1 OF 6

**LOCATION:** BALBOA REACH - EAST BANK - WEST COROZAL

**NORTHING:** 993102.014 m

**STATION:** 69K + 601.15 m

**CORE RECOVERY:** 74%

**START DATE:** 06/June/2011

**GEOLOGIST:** M. J. Lacerda

**CHECKED BY:** Pastora Franceschi S.

**EASTING:** 656261.242 m

**OFFSET:** 317.01 m E

**COMPLET. DATE:** 07/June/2011

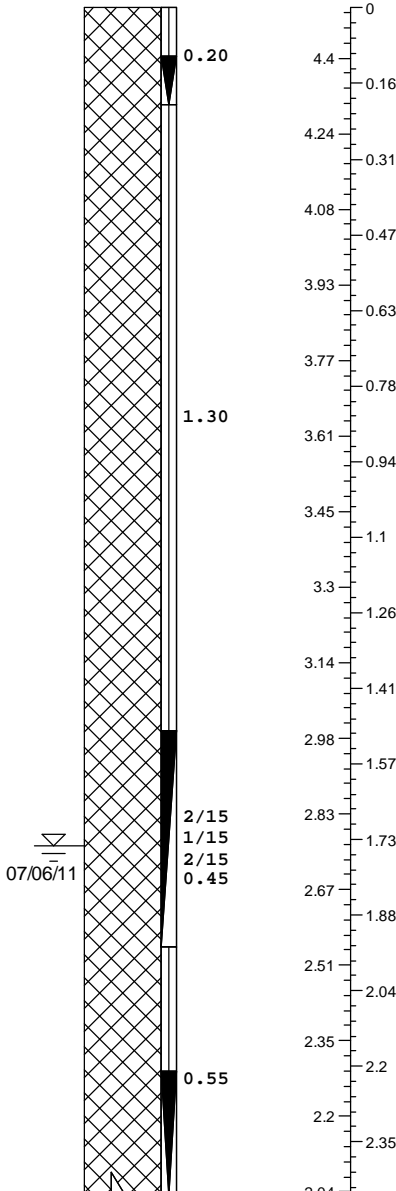
**GROUND ELEVATION:** 4.500 m

**TOTAL DEPTH:** 13.75 m

**INCLINATION:** Vertical

**LOGGER:** M. J. Lacerda

**DRILLER:** Jorge English

SOIL SYMBOLS, SAMPLERS, FIELD TEST DATA AND CORE RUN	ELEVATION	DEPTH	DESCRIPTION OF MATERIAL	DISCONTINUITY	DRILLING CHARACTERISTICS	qu MPa	CORE RECOV (%)	RQD (%)
	(meters)							
	0.20	0.00	0.00 m FILL, OC-1 to RH-4, low consistency to hard rock, low to high strength, low to high plasticity, moderate to high water content, consists of clay, silt, sand, concrete, angular rock fragments up to 100 mm long, vegetation roots, organic material. Color: brown, gray and black.		Pushed and drilled dry with HQ single tube. H. P. 600 PSI.		100%	-
	1.30	0.16	0.20 m - 1.50 m Drilled with HQ double tube, diamond bit and water.					
	2/15 1/15 2/15 0.45	0.31	C.R.=38%					
	0.55	0.47	1.50 m FILL, OC-1, low consistency, high plasticity, moderate to high water content, consists of clay, silt, sand, small pebbles, vegetation roots, some organic material. Color: medium red red brown with red iron oxides.		From 1.50 m to 1.95 m SPT #1 - N=3		23%	-
		0.63	C.R.=22%		NOTE: SPT's were taken with a standard 2 in. split spoon & a 140-lbs. safety hammer dropped 30 inches for each blow.		22%	-
		0.78			1.95 m - 2.50 m Pushed and drilled dry with HQ single tube. H. P. 300 PSI.			

*This hole was drilled by ACP with drill rig CS-1000-P4 from ATLAS COPCO.*

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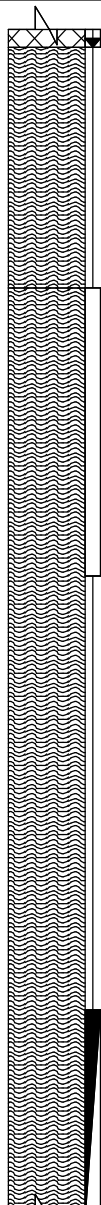
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**INCLINATION:** Vertical

**LOGGER:** M. J. Lacerda

**DRILLER:** Jorge English

SOIL SYMBOLS, SAMPLERS, FIELD TEST DATA AND CORE RUN	ELEVATION	DEPTH	DESCRIPTION OF MATERIAL	DISCONTINUITY	DRILLING CHARACTERISTICS	qu MPa	CORE RECOV (%)	RQD (%)
	(meters)							
		2.51	2.50 m		NOTE: H.P. is the hydraulic pressure on drill head necessary to cause core barrel to penetrate the soil, measured in PSI (Pounds per square inch).  2.50 m - 3.00 m Pushed dry with HQ single tube. H. P. 100 PSI. Undisturbed thin wall Shelby tube. Shelby #1 H.P. 0 PSI.  Pushed dry with HQ single tube. H. P. 0 PSI.  From 4.50 m to 4.95 m: SPT #2 - N=1.		69%	-
		1.88	PACIFIC MUCK, OC-1 to OC-3, low to medium high consistency, high plasticity, high dry strength, moderate water content, consists of clay, silt, very fine sand, abundant organic material, vegetation roots, semi decayed wood, fossiliferous shell debris. Color: black, brown and green.					
	0.50	2.67						
		1.73						
		2.83						
		1.57						
		2.98	C.R.=95%			66%	-	
		1.41	3.00 m					
		3.14	PACIFIC MUCK, as above.					
	0.60	1.26	C.R.=100%					
		3.3					100%	-
		1.1						
		3.45						
		0.94						
		3.61						
		0.78						
		3.77						
		0.63						
		3.93						
	0.90	0.47						
		4.08						
		0.31						
		4.24						
		0.16						
		4.4						
		0						
		4.55	4.50 m			100%	-	
			PACIFIC MUCK, as above.					
		0.16						
		4.71	C.R.=100%					
1/45								
0.45								

*This hole was drilled by ACP with drill rig CS-1000-P4 from ATLAS COPCO.*

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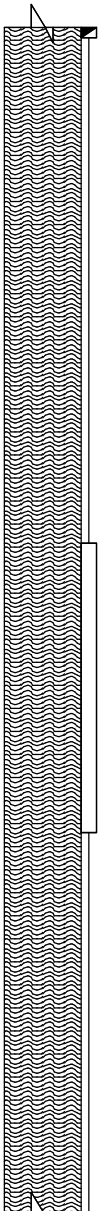
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**INCLINATION:** Vertical

**LOGGER:** M. J. Lacerda

**DRILLER:** Jorge Inglish

SOIL SYMBOLS, SAMPLERS, FIELD TEST DATA AND CORE RUN	ELEVATION	DEPTH	DESCRIPTION OF MATERIAL	DISCONTINUITY	DRILLING CHARACTERISTICS	qu MPa	CORE RECOV (%)	RQD (%)
	(meters)	(meters)						
		-0.47			Pushed dry with HQ single tube. H. P. 0 PSI.		100%	
		-5.02						
		-0.63						
		-5.18						
		-0.78						
		-5.34						
	1.05	-0.94						
		-5.49						
		-1.1						
		-5.65						
		-1.26						
		-5.81						
		-1.41						
		-5.97						
		-1.57	6.00 m PACIFIC MUCK, as above.		Undisturbed thin wall Shelby tube. Shelby #2 H. P. 0 PSI.		100%	-
		-6.12						
	0.60	-1.73	C.R.=100%					
		-6.28						
		-1.88						
		-6.44						
		-2.04						
		-6.59						
		-2.2			Pushed dry with HQ single tube. H. P. 600 - PSI.		100%	-
		-6.75						
		-2.35						
		-6.91						
		-2.51						
	0.90	-7.06						
		-2.67						
		-7.22						
		-2.83						
		-7.38						

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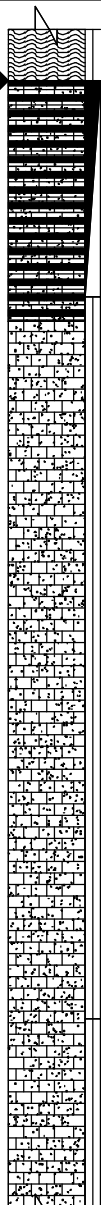
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	(meters)							
		-2.98	7.50 m - TOP OF LA BOCA FORMATION AND TOP OF HIGHLY WEATHERED ROCK		From 7.50 m to 7.95 m: SPT #3 - N=46.		100%	-
	4/15 8/15 38/15 0.45	7.54	-3.14	SANDSTONE, Calcareous, highly weathered, OC-5 to RH-1, high consistency to very soft rock, weak, no joints were observed, thin horizontal bedding, medium grained, water-laid, contains quartz and carbonaceous and fossiliferous debris. Color: greenish gray.				
		-7.69						
		-3.3					78%	-
		-7.85						
		-3.45						
		-8.01	C.R.=78%		Drilled with HQ double tube, diamond bit and water.			
		-3.61	8.00 m - TOP OF SOUND ROCK SANDSTONE, Calcareous, RH-3, medium hard rock, moderate strength, no joints were observed, massive, with abundant thin, dark grey sub horizontal bedding, probably carbonaceous, fine to medium grained, water-laid, contains quartz and calcite crystals, carbonaceous and fossiliferous debris, scattered sub angular to sub rounded rock fragments up to 2 mm in diameter. Color: light gray.		8.00 m to 8.30 m. Core is recovered in fair to poor condition.			
		-8.16						
		-3.77						
		-8.32						
		-3.93						
		-8.48						
		-4.08						
		-8.64						
1.50		-4.24	C.R.=77%	RQD=66%				
		-8.79						
		-4.4						
		-8.95						
		-4.55						
		-9.11						
		-4.71						
		-9.26						
		-4.87						
		-9.42					40%	13%
		-5.02			Drilled with HQ double tube, diamond bit and water.			
		-9.58						
		-5.18						
		-9.73						
		-5.34						

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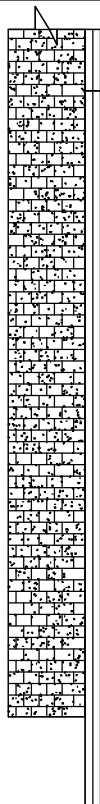
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SOIL SYMBOLS, SAMPLERS, FIELD TEST DATA AND CORE RUN	ELEVATION	DEPTH	DESCRIPTION OF MATERIAL	DISCONTINUITY	DRILLING CHARACTERISTICS	qu MPa	CORE RECOV (%)	RQD (%)															
	(meters)																						
	-7.85	12.4			Drilled with HQ double tube, diamond bit and water.		100%	100%															
	-8.01	12.56																					
	-8.16	12.72																					
	-8.32	12.87																					
	-8.48	13.03																					
	-8.63	13.19																					
	-8.79	13.35																					
	-8.95	13.5																					
	-9.11	13.66																					
	-9.26	13.82	<b>Bottom of Hole</b>  <b>CORE BOXES:</b>  <table><tr><td>BOX #</td><td>FROM</td><td>TO</td></tr><tr><td>1)</td><td>0.00 - 5.60 m</td><td></td></tr><tr><td>2)</td><td>5.60 - 10.95 m</td><td></td></tr><tr><td>3)</td><td>10.95 - 13.75 m</td><td></td></tr></table> <b>SAMPLE FOR LABORATORY TESTING PURPOSES:</b>  <table><tr><td>SAMPLE #</td><td>FROM</td><td>TO</td></tr><tr><td>1)</td><td>12.45 - 12.85 m</td><td></td></tr></table> <b>TYPE OF MATERIAL</b> Elevation:      Depth:      Description: 4.50 to 2.00      0.00 to 2.50      Fill 2.00 to -3.00      2.50 to 7.50      Pacific Muck -3.00 to -3.50      7.50 to 8.00      Top of La Boca fm & of Weathered Rock, Sandstone, Calc. -3.50 to -9.25      8.00 to 13.75      Top of sound rock - Sandstone, calcareous	BOX #	FROM	TO	1)	0.00 - 5.60 m		2)	5.60 - 10.95 m		3)	10.95 - 13.75 m		SAMPLE #	FROM	TO	1)	12.45 - 12.85 m			
BOX #	FROM	TO																					
1)	0.00 - 5.60 m																						
2)	5.60 - 10.95 m																						
3)	10.95 - 13.75 m																						
SAMPLE #	FROM	TO																					
1)	12.45 - 12.85 m																						
	-9.42	13.97					100%	100%															
	-9.58	14.13																					
	-9.73	14.29																					
	-9.89	14.44																					
	-10.05	14.6																					
	-10.2	14.76																					

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# KEY TO SYMBOLS

Symbol Description

Symbol Description

## Strata symbols

Pushed dry with casing.



Fill



Pacific Muck



Sandstone, Calcareous,  
Weathered



Sandstone, Calcareous



Undisturbed thin wall  
Shelby tube

## Misc. Symbols



Water table during  
drilling



Boring continues



Core Recovered



Length of Casing

## Soil Samplers



Pushed and drilled dry with  
casing



Rock core



Standard penetration test

## Notes:

1. The Top of Sound Rock in all the borings of the Panama Canal Authority, ACP, means the depth where fresh rock starts. Fresh rock is defined as the rock surface that has not been subjected to or altered by surface weathering. Unweathered rock is synonymous with sound or fresh rock.

2. 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.

3. qu values in this log were obtained from the standard Unconfined Compressive Strength tests performed in the Soil Laboratory of the ACP and from Point Load Tests where indicated.