

**PANAMA CANAL AUTHORITY**  
**DEPARTMENT OF ENGINEERING AND PROGRAMS MANAGEMENT**  
**GEOLOGICAL FIELD LOG**

**BORING CCMT-7**

**PROJECT: CONTROL CENTER - MARINE TRAFFIC**

PAGE 1 OF 7

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

**NORTHING:** 993098.779 m

**STATION:** 69K + 584.28 m

**CORE RECOVERY:** 76%

**START DATE:** 08/June/2011

**GEOLOGIST:** M. J. Lacerda

**CHECKED BY:** Pastora Franceschi S.

**EASTING:** 656201.953 m

**OFFSET:** 260.08 m E

**COMPLET. DATE:** 09/June/2011

**GROUND ELEVATION:** 5.281 m

**TOTAL DEPTH:** 15.80 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)							
<div><div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></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*This hole was drilled by ACP with CS-1000-P4 drill rig from ATLAS COPCO.*

# PANAMA CANAL AUTHORITY

## DEPARTMENT OF ENGINEERING AND PROGRAMS MANAGEMENT

### GEOLOGICAL FIELD LOG

#### BORING CCMT-7

**PROJECT: CONTROL CENTER - MARINE TRAFFIC**

PAGE 2 OF 7

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

**NORTHING:** 993098.779 m

**STATION:** 69K + 584.28 m

**CORE RECOVERY:** 76%

**START DATE:** 08/June/2011

**GEOLOGIST:** M. J. Lacerda

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**EASTING:** 656201.953 m

**OFFSET:** 260.08 m E

**COMPLET. DATE:** 09/June/2011

**GROUND ELEVATION:** 5.281 m

**TOTAL DEPTH:** 15.80 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)							
<div>1.05</div> <div>1/15</div> <div>1/15</div> <div>1/15</div> <div>0.45</div> <div>1.05</div> <div>0.60</div>	1.05	2.46	<p>3.00 m</p> <p>FILL AND PACIFIC MUCK, OC-1, high consistency overburden, weak to moderate strength, high plasticity, high dry strength, moderate water content, consists of clay, silt, sand, organic material, semi-decayed wood, and medium hard, RH-3, low plasticity, high dry strength angular rock fragments up to 70 mm in diameter. Color: gray, green, brown and black.</p> <p>C.R.=66%</p> <p>Note: There is fill in upper part of the Pacific Muck.</p> <p>4.50 m</p> <p>PACIFIC MUCK, OC-1 high plasticity, high dry strength, moderate water content, consists of clay, silt, sand, decomposed wood. Color: black and brown.</p>		<p>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).</p> <p>From 3.00 m to 3.45 m: SPT #2 - N=2</p> <p>3.45 m - 4.50 m Pushed dry with HQ single tube. H.P. 400 PSI.</p> <p>Undisturbed thin wall Shelby tube. H.P.0 PSI</p>		54%	-
	2.77	2.62						
	2.62	2.77						
	2.46	2.93						
	2.31	3.08						
	2.16	3.23						
	2	3.39						
	1.85	3.54						
	1.69	3.7						
	1.54	3.85						
1.39	4							
1.23	4.16							
1.08	4.31							
0.92	4.47						6381%	-
0.77	4.62							
0.62	4.77							
0.46								

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

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#### BORING CCMT-7

**PROJECT: CONTROL CENTER - MARINE TRAFFIC**

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**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)							
		4.93	C.R.=86%					
		0.31						
		5.08					100%	-
		0.15			Pushed dry with HQ single tube.			
		5.24						
		0						
		5.39						
		-0.15						
	0.90	5.54						
		5.7						
		-0.46						
		5.85						
		-0.62						
		6.01	6.00 m PACIFIC MUCK, as above.		From 6.00 m to 6.45 m: SPT #3 - N=1		80%	-
		-0.77						
		6.16	C.R.=100%					
	1/45 0.45	-0.92						
		6.31						
		-1.08						
		6.47						
		-1.23			Pushed dry with HQ single tube. H.P. 400 PSI.		78%	-
		6.62						
		-1.39						
		6.78						
		-1.54						
		6.93						
	1.05	-1.69						
		7.08						
		-1.85						
		7.24						

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	(meters)							
<div>0.60</div> <div>0.90</div> <div>50/15 0.15</div> <div>0.70</div>	-2		7.35 m					
	-2.16	7.39	ALLUVIAL SEDIMENTS, OC-1 to RH-5, low plasticity, low dry strength, low water content, consists of sand, clay, silt, rounded rock fragments up to 30 mm in diameter, pebbles and cobbles. Color: dark gray.		Undisturbed thin wall Shelby tube. H.P. 400 PSI.		100%	-
	-2.31	7.55						
	-2.46	7.7	C.R.=85% 7.50 m					
	-2.62	7.85	ALLUVIAL SEDIMENTS, as above.					
	-2.77	8.01	C.R.=75%				75%	-
	-2.93	8.16			Pushed and drilled dry with HQ single tube. H.P. 600 PSI.			
	-3.08	8.32						
	-3.23	8.47						
	-3.39	8.62						
	-3.54	8.78						
	-3.7	8.93						
	-3.85	9.09	9.00 m - TOP OF LA BOCA FORMATION AND TOP OF SOUND ROCK.		From 9.00 m to 9.15 m: SPT #4 - N=50		61%	
	-4	9.24	SANDSTONE, Calcareous, RH-3, medium hard rock, moderate strength, close jointing, joints are planar, rough, filled with oxides and gouge, massive white, calcareous layers with thin sub-horizontal dark bedding, 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 30 mm in diameter. Color: Light gray.		Drilled with HQ double tube, diamond bit and water.		87%	-
	-4.16	9.39						
	-4.31	9.55						

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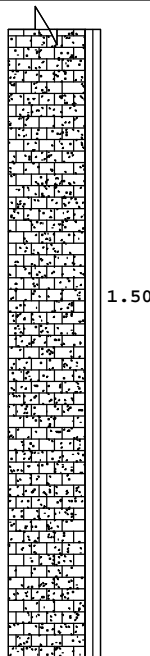
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	(meters)							
	-9.24							
		14.63						
-9.39								
	14.78							
-9.55								
	14.94							
-9.7								
	15.09							
-9.86								
	15.25							
-10.01								
	15.4							
-10.16								
	15.55							
-10.32								
	15.71							
-10.47								
	15.86							
-10.63								
	16.02							
-10.78								
	16.17							
-10.93								
	16.32							
-11.09								
	16.48							
-11.24								
	16.63							
-11.4								
	16.79							
-11.55								
<b>Bottom of Hole</b>								
<b>CORE BOXES:</b>								
<b>BOX # FROM TO</b>								
1) 0.00 - 7.30 m								
2) 7.30 - 11.35 m								
3) 11.35 - 14.30 m								
4) 14.30 - 15.80 m								
<b>SAMPLE FOR LABORATORY TESTING</b>								
<b>PURPOSES:</b>								
<b>SAMPLE # FROM TO</b>								
1) 11.75 - 12.10 m								
<b>TYPE OF MATERIAL</b>								
Elevation: Depth: Description:								
5.28 to 2.28 0.00 to 3.00 Fill								
2.28 to 0.78 3.00 to 4.50 Fill and Pacific Muck								
0.78 to -2.07 4.50 to 7.35 Pacific Muck								
-2.07 to -3.72 7.35 to 9.00 Alluvial sediments								
-3.72 to -10.52 9.00 to 15.80 Top of La Boca Fm & Top of Sound Rock, Sandstone, Calc.								
							100%	100%

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

# KEY TO SYMBOLS

Symbol Description

Symbol Description

## Strata symbols



Pushed and drilled dry with casing



Pushed dry with casing.



Undisturbed thin wall Shelby tube



Fill



Fill and Pacific Muck



Pacific Muck



Alluvial Sediments



Sandstone, Calcareous

## Misc. Symbols



Water table during drilling



Boring continues



Core Recovered



Length of Casing

## Soil Samplers



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.