BOREHOLE LOG

CLIENT: AECOM Australia Pty Ltd
PROJECT: Cross River Rail - Phase 1
LOCATION: Fenton Street, Fairfield

SURFACE LEVEL: 17.3 m AHD
EASTING: 502777
NORTHING: 6957911
DIP/AZIMUTH: -90°/--

BORE No: CRR104
PROJECT No: 74321.00
DATE: 19 April 2010
SHEET 1 OF 4

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low, Very Low, Low, Medium, High, Very High, Ex High)	Water	Fracture Spacing (m) (0.01, 0.05, 0.10, 0.50, 1.00)	Discontinuities (B - Bedding J - Joint S - Shear D - Drill Break)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
	0.1	ASPHALTIC CONCRETE										
	0.3	FILLING - moderately compacted, dark grey, sandy gravel filling, medium to coarse grained sand and fine to medium gravel fractions with some silt, moist										
17		SILTY CLAY - stiff to very stiff, grey and red-brown mottled, high plasticity, silty clay, with trace of fine to medium grained sand, moist (residual)							pp			pp = 250kPa
	1	- becoming very stiff to hard										
16									S			8,14,14 N = 28
	1.8	TUFF - extremely low to very low strength, highly to moderately weathered, grey and red-brown mottled, tuff						(See attached sheet fpr abbreviations)				
15	2								S			11, 30/125mm
	2.7	TUFF - extremely low strength, highly to moderately weathered, fractured, grey and orange-brown mottled, tuff						Defects generally overprinted by pervasive weathering 2.78m: J: sv, un, sm, cf 8mm, to 2.94m 2.9m: Numerous tight hairline fractures to 3.20m				
	3	- becoming high strength, moderately to slightly weathered										
14		- becoming extremely low strength, highly to moderately weathered, some medium to high strength bands to 10mm						3.42m: J: 45°, un, sm, cf 3mm				
		- brown-grey and red-brown mottled							C	100	37	
	4							3.95m: J: 30°, un, sm, 4mm				
13	4.7	SANDSTONE (see over)						4.73m: J: sv, un, sm, to 4.83m				

RIG: MD300 **DRILLER:** Taberner **LOGGED:** MAH **CASING:** HW to 2.7m

TYPE OF BORING: Auger 0.00-2.70m, NMLC core 2.70-15.00m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	PID	Photo ionisation detector
B	Bulk sample	S	Standard penetration test
U_x	Tube sample (x mm dia.)	PL	Point load strength Is(50) MPa
W	Water sample	V	Shear Vane (kPa)
C	Core drilling	▷	Water seep ▼ Water level

CHECKED
Initials: CB
Date: 24/6/10

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SHEET 2 OF 4

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low, Very Low, Low, Medium, High, Very High, Ex High)	Water	Fracture Spacing (m) (0.01, 0.05, 0.10, 0.50, 1.00)	Discontinuities (B - Bedding J - Joint S - Shear D - Drill Break)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
12	5.0	SANDSTONE - medium strength, moderately weathered, fresh, grey and orange-brown mottled, fine to medium sandstone, bedding subhorizontal, clay seams to 30mm at 50-100mm spacings to 5.65m						5.05m: J: 40°, un, sm, cc 5.08m: J: 50°, un, sm, cf 4mm 5.1m: B: 10°, pl, sm	C	100	37	
		becoming generally high strength with clay seams, slightly weathered						5.44m: J: sv, un, ro, lim, to 5.55m 5.45m: B: sh, pl, ro, lim 5.6m: B: sh, pl, sm, ag 5.67, 5.85m				
		becoming highly weathered, red-brown						5.72m: B: 10°, pl, ro, lim	LAB LAB			PL(A) = 0.27MPa PL(A) = 0.27MPa PL(D) = 0.2MPa PL(D) = 0.27MPa
		becoming moderately weatherd, grey and orange-brown mottled										
		60mm clay band, wood fragment										
	6	becoming medium to high strength, moderately to slightly weathered, sporadic laminae of coarse sandstone to 20mm						6.05m: J: 45°, un, ro 6.17m: J: 45°, pl, sm, cf 5mm				
11		40mm clay band										
		70mm clay band						6.43m: J: 70°, un, sm				
		becoming fracture stained						6.51m: B: 10°, pl, sm, lim, ag 6.83, 7.00, 7.23, 7.65, 8.00m	UCS			4.114 MPa
		becoming medium to coarse sandstone										
		becoming medium to high strength						6.85m: J: 60°, un, ro, cc				
	7	150mm moderately to slightly weathered, orange-brown and grey mottled, fine to medium breccia band							C	100	90	
		becoming high strength						7.23m: J: 30°, un, ro, lim				
10		becoming medium strength, grey, fine to medium sandstone										
		70mm high strength, fine to medium breccia band						7.63m: B: 10°, pl, sm, cf 5mm				
		10mm clay seam										
		5mm clay seam										
		becoming fresh										
	8							8.04m: B: 20°, un, sm				
		50mm high strength, fractured conglomerate interbed										
9	8.25	CONGLOMERATE - low strength, moderately weathered, fractured, orange-brown and grey mottled, fine to medium conglomerate, subhorizontal clast alignment						8.2m: B: 10°, un, sm, lim 8.34m: B: 15°, pl, sm, cf 6mm				PL(A) = 0.39MPa PL(D) = 0.3MPa
	8.65	becoming low strength, medium to coarse conglomerate						8.6m: J: 30°, un, ro 8.65m: CORE LOSS: 200mm				
	8.85	becoming medium to high strength						8.9m: frg to 9.05m, di				
	9											
8	9.1	SANDSTONE - low strength, moderately weathered, fractured, orange-grey, medium to coarse sandstone, bedding subhorizontal							C	89	86	
		becoming slightly weathered, grey										
		180mm fine conglomerate interbed										
		becoming fine to medium sandstone										
		becoming fresh										
		becoming slightly weathered						9.94m: J: 45°, pl, ro, lim				

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		- becoming medium to high strength						9.95m: frg to 10.00m, di				
	10.18	- becoming low to medium strength						10.04m: J: 65°, pl, ro	C	89	86	PL(A) = 0.1MPa PL(D) = 0.12MPa
		CONGLOMERATE - very low strength, slightly weathered, fractured, grey, fine to medium conglomerate, subhorizontal clast alignment										
		- 200mm very low to low strength, medium to coarse sandstone interbed						10.61m: B: 15°, pl, ti, lim				
	11	- becoming low strength										
		- becoming medium strength, moderately to slightly weathered, grey and orange-brown banded										PL(A) = 0.26MPa PL(D) = 0.2MPa
		- becoming medium to coarse conglomerate						11.3m: J: 30°, un, h, lim				
		- becoming medium to high strength						11.49m: B: 30°, un, ro, lim				
		- 130mm fine to medium sandstone intered										
	11.72	- becoming fresh							C	100	100	
		SANDSTONE - medium strength, fresh, slightly fractured, grey, fine to medium sandstone, bedding subhorizontal, sporadic coal laminae to 5mm						11.8m: B: sh, pl, sm, ag 12.00, 12.10, 12.16, 12.34m				
	12	- becoming high strength, medium sandstone										PL(A) = 0.55MPa PL(D) = 0.36MPa
		- becoming medium strength, dark grey ,fine sandstone										
	12.4	CONGLOMERATE - medium strength, moderately to highly weathered, slightly fractured, orange-brown and grey, medium to coarse conglomerate, subhorizontal clast orientation						12.75m: J: 30°, un, ro				
	13	- becoming moderately weathered										PL(A) = 0.9MPa PL(D) = 0.63MPa
		- becoming highly weathered, orange-brown						13.1m: J: 15°, un, ro, lim				
	13.23	SANDSTONE - very low strength, slightly weathered, slightly fractured, grey, fine to medium sandstone, bedding at 20°						13.38m: B: 30°, pl, sm, cf 5mm				
		- 5mm clay seam										
		- becoming low strength										
		- becoming medium to highb strength, medium sandstone										
	13.9	- becoming coarse sandstone						13.89m: B: 10°, pl, ro	C	100	100	
	14 14.0	CONGLOMERATE - low to medium strength, fresh, slightly fractured, grey, fine to medium conglomerate, subhorizontal clast orientation										PL(A) = 0.17MPa PL(D) = 0.12MPa
								14.4m: J: sv, un, ro, to 14.90m				
	14.58	SANDSTONE - high strength, fresh, slightly fractured, grey, medium to coarse sandstone, bedding subhorizontal to 20°, coal laminae to 3mm						14.9m: B: 20°, pl, sm,				

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	15.0	- becoming medium strength, medium sandstone - 5mm coal laminae Bore discontinued at 15.0m						cslam 5mm				

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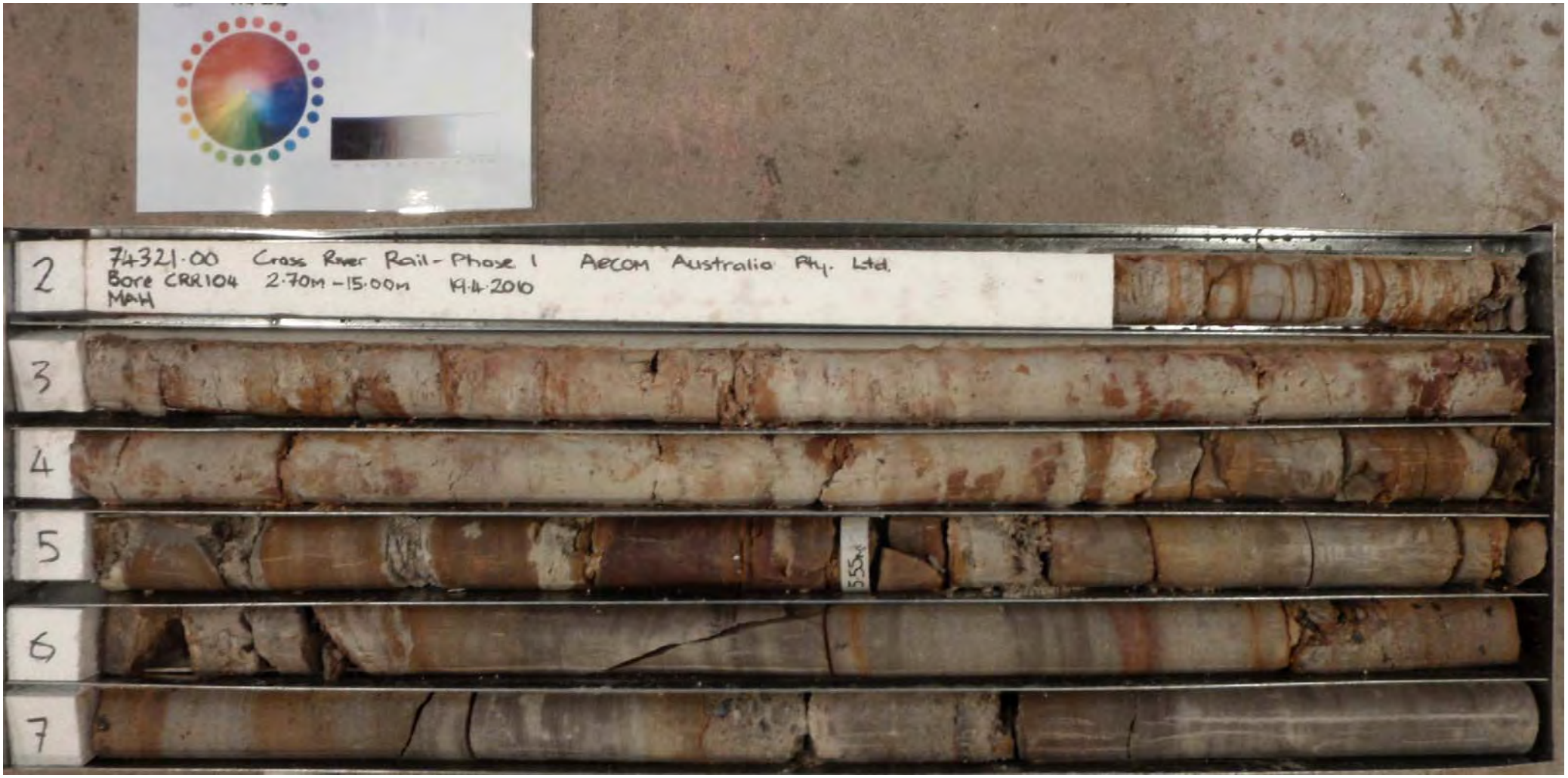

CROSS RIVER RAIL – PHASE 1 GEOTECHNICAL INVESTIGATION	**BORE CRR104**	**Project 74321.00**	Douglas Partners Geotechnics · Environment · Groundwater