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Easting: 502970 Northing: 6958948 RL: 24.38 m

Logger: SO/DT Operator: SO Machine: Scout 2

Drilling Method				Depth	Graphic	Description	Weathering	Strength Estimated	Defect Spacing	Rec (%)	RQD	Samples and Remarks
TC	WB	RR	NW/CL									
				0.10	[Pattern]	FILL Cement						
				0.60	[Pattern]	FILL Clayey Sandy GRAVEL (GP) Dense, fine to medium size, brown and orange, fine to coarse grained sand, low to medium plasticity fines, moist.						
				1.0	[Pattern]	NATURAL Clayey SAND (SC) Dense, fine to medium grained, brown orange and red, medium to high plasticity fines, moist.						
				1.50	[Pattern]							
				2.0	[Pattern]	TUFF, fine grained, pale grey stained orange brown and red, porphyritic, fragmented to closely spaced fractures. Diagenetic quartz in weathered areas; tending to clay.	XW			100	0	
				2.60	[Pattern]					100	0	
				2.70	[Pattern]	CORE LOSS 0.10m (2.60-2.70)						
				3.0	[Pattern]	TUFF, fine grained, pale grey stained orange brown and red, porphyritic, fragmented to closely spaced fractures, with some Diagenetic quartz	XW - DW			100	46	
				3.94	[Pattern]							
				4.0	[Pattern]	TUFF, pale grey, porphyritic, closely spaced fractures.	SW					4.04 m; J, 30°, S, S, O, Z 4.17 m; J, 15°, U, S, O, Z 4.30 m; J, 35°, S, R, O, L
				4.48	[Pattern]					104	38	
				4.70	[Pattern]	TUFF, fine grained, pale grey stained orange brown and red, porphyritic, fragmented to closely spaced fractures, with some Diagenetic quartz.	XW					
				4.80	[Pattern]	CORE LOSS 0.10m (4.70-4.80)				100	0	
				5.0	[Pattern]	TUFF, fine grained, pale grey stained orange brown and red, porphyritic, fragmented to closely spaced fractures, with some Diagenetic quartz.	DW					
				5.50	[Pattern]	MUDSTONE, fine grained, dark grey, thinly laminated, extremely closely spaced to moderately widely spaced fractures.	SW					
				6.0	[Pattern]							
				7.0	[Pattern]							
				7.85	[Pattern]	CORE LOSS 0.70m (7.85-8.55)				0	0	
				8.55	[Pattern]	MUDSTONE, fine grained, dark grey, thinly laminated, extremely closely spaced fractures.	SW					
				9.0	[Pattern]					73	0	
				9.15	[Pattern]	CORE LOSS 0.15m (9.00-9.15)						
				10.0	[Pattern]	MUDSTONE, fine grained, dark grey, thinly laminated, extremely closely spaced to moderately widely spaced fractures.	SW					
				9.99	[Pattern]					101	54	

Comments:  
1) Groundwater not observed. 2) Monitoring well installed to 13.5m on completion.

**Defects - 1.54m : F,60° P,R,O,C**

Type	Dip (Deg)	Planarity	Roughness	Aperture	Width
B - Bedding	C - Curvilinear	L - Slickensides	C - Closed	C - Clay	C - Clay
F - Foliation	D - Discontinuous	P - Polished	F - Filled	F - Iron Oxide	F - Iron Oxide
H - Schistosity	P - Planar	R - Rough	N - Clean	K - Calcite	K - Calcite
J - Joint	S - Subplanar	S - Smooth	O - Open	L - Limonite	L - Limonite
L - Cleavage	T - Stepped	U - Undulating	V - Very rough	S - Silt	S - Silt
R - Fracture				U - Undersized mineral	U - Undersized mineral
S - Shear zone				W - Weathered rock	W - Weathered rock
T - Contact				X - Carbonaceous	X - Carbonaceous
V - Vein				Z - Clean	Z - Clean
Z - Decomposed Zone					
DI - Drilling induced break					

**Weathering Grades**

RS - Residual Soil
XW - Extremely weathered
DW - Distinctly weathered
SW - Slightly weathered
FR - Fresh
W - Weak
MS - Medium strong
S - Strong
VS - Very strong
ES - Extremely strong

**Samples**

U50
SPT
Disturbed Sample

Approved: \_\_\_\_\_  
Date: \_\_\_\_\_

SOIL SURVEYS 00: LIBRARY 2012:05:GLB Log SOIL SURVEY BOREHOLE LOG 111-12936 NEW.GPJ <<DrawingFiles>> 21/05/2012 14:34 8.30.002 Developed by Datigel



Drilling Method				Depth	Graphic	Description	Weathering	Strength Estimated	Defect Spacing	Rec (%)	RQD	Samples and Remarks
TC	WB	FR	NW/LC									
				11.0		Interlaminated SILTSTONE and MUDSTONE, fine grained, dark grey banded pale grey, granular, thinly laminated, closely spaced to moderately widely spaced fractures. Trace sandstone laminae. (continued)	FR			101	54	10.34 m; S, 40°, P, P, O, L
				11.63		CORE LOSS 0.80m (11.63-12.43)				0	0	
				12.43		SANDSTONE, fine grained, pale grey, granular, thickly bedded, closely spaced to moderately widely spaced fractures.	FR					12.84 m; J, 61°, S, R, O, W
				13.23		Interbedded SANDSTONE and SILTSTONE, fine grained, alternating pale grey and dark grey, granular, thinly bedded to laminated, extremely closely spaced to closely spaced fractures. Trace of fine gravel in sandstone.				100	54	13.39 m; J, 5°, P, S, O, Coal 13.66 m; J, 40°, C, S, O, C
				14.75		CORE LOSS 0.15m (14.75-14.90)				100	21	
				14.90		Interbedded SANDSTONE and SILTSTONE, fine grained, alternating pale grey and dark grey, granular, thinly bedded to laminated, extremely closely spaced to closely spaced fractures. Trace of fine gravel in sandstone, trace coal stringers.	FR					15.47 m; J, 10°, P, S, O, L 15.67 m; B, 2°, P, S, O, L
				16.24		Interbedded CONGLOMERATE and SANDSTONE, coarse grained, pale grey speckled grey, granular, thinly bedded, moderately widely spaced fractures. Conglomerate clasts are fine gravel sized quartz, mudstone and tuff. Trace coal stringers.				93	79	16.22 m; J, 15°, P, R, O, W 16.67 m; J, 75°, P, R, O, W 16.90 m; J, 42°, S, R, O, L 17.14 m; J, 65°, S, R, O, W 17.45 m; J, 20°, P, S, O, Coal
				17.88		CONGLOMERATE, coarse grained, pale green grey, granular, thickly bedded, moderately widely spaced fractures. Clasts are medium gravel sized, with trace cobbles, of quartz, mudstone, tuff, quartzite and phyllite in a sand matrix.				100	75	17.90 m; J, 85°, S, R, O, W 18.30 m; J, 80°, U, V, O, Z 19.30 m; DI, 10°, U, S, O, Z 19.62 m; J, 40°, U, R, O, W
				19.26								
				20.0								

Comments:  
1) Groundwater not observed. 2) Monitoring well installed to 13.5m on completion.

**Defects - 1.54m : F,60°,P,R,O,C**

Depth (m)	Type	Dip (deg)	Planarity	Roughness	Aperture	Width
	B - Bedding		C - Curvilinear	L - Slickensides	C - Closed	C - Clay
	C - Clay seam		D - Discontinuous	P - Polished	F - Filled	F - Iron Oxide
	F - Foliation		P - Planar	R - Rough	N - Clean	K - Calcite
	H - Schistosity		S - Subplanar	S - Smooth	O - Open	L - Limonite
	J - Joint		T - Stepped	V - Very rough	S - Stain	Q - Quartz
	L - Cleavage					S - Secondary mineral
	R - Fracture					U - Unidentified mineral
	S - Shear zone					W - Weathered rock
	T - Contact					X - Carbonaceous
	V - Vein					Z - Clean
	Z - Decomposed Zone					
	DI - Drilling induced break					

**Weathering Grades**

RS - Residual Soil  
XW - Extremely weathered  
DW - Distinctly weathered  
SW - Slightly weathered  
FR - Fresh

**Rock Strength**

VW - Very weak  
W - Weak  
MS - Medium strong  
S - Strong  
VS - Very strong  
ES - Extremely strong

**Samples**

U50  
SPT  
Disturbed Sample

Approved: \_\_\_\_\_  
Date: \_\_\_\_\_

SOIL SURVEYS 00:LIBRARY 2012:05:G.LB Log SOIL SURVEY BOREHOLE LOG 111-12936 NEW.GPJ <<DrawingFiles>> 21/05/2012 14:34 8.30.002 Developed by Dajgeel









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TITLE

AECOM  
Brisbane  
Cross River Rail  
Core Photo - BH 330

DRAWN	DT	DATE	26/04/2012
CHECKED	CB	DATE	26/04/2012
SCALE	Not To Scale		A4
PROJECT No	110-12936	FIGURE No	2/2

## IN-SITU PACKER PERMEABILITY TEST RESULT

<b>PROJECT:</b>	<b>CRR</b>	<b>BH No.:</b>	<b>330</b>	<b>Packer type:</b>	Double
<b>PROJECT No.:</b>	<b>110-12936</b>	<b>Test No.:</b>	<b>1</b>	<b>Packer pressure:</b>	3000kPa
		<b>Date:</b>	<b>24/02/2012</b>	<b>Gauge pressures measured in:</b>	kPa
				<b>Tested by:</b>	CB

Vertical depth to:	<table style="width: 100%; border-collapse: collapse;"> <tr><td style="width: 60%;">Top of test section (m):</td><td style="width: 40%;">15.00</td></tr> <tr><td>Base of test section (m):</td><td>16.50</td></tr> <tr><td>Centre of test section(m):</td><td>15.75</td></tr> <tr><td>Base of casing (m):</td><td>14.00</td></tr> <tr><td>Ground water (m)</td><td>NR</td></tr> </table>	Top of test section (m):	15.00	Base of test section (m):	16.50	Centre of test section(m):	15.75	Base of casing (m):	14.00	Ground water (m)	NR	<table style="width: 100%; border-collapse: collapse;"> <tr><td style="width: 60%;">Depth of centre of test section (m)</td><td style="width: 40%;">15.75</td></tr> <tr><td>Length of test section (m):</td><td>1.50</td></tr> </table>	Depth of centre of test section (m)	15.75	Length of test section (m):	1.50
Top of test section (m):	15.00															
Base of test section (m):	16.50															
Centre of test section(m):	15.75															
Base of casing (m):	14.00															
Ground water (m)	NR															
Depth of centre of test section (m)	15.75															
Length of test section (m):	1.50															
	<table style="width: 100%; border-collapse: collapse;"> <tr><td style="width: 60%;">Gauge Height above ground level</td><td style="width: 40%;">0.00</td></tr> <tr><td>Hole Diameter in test section (mm)</td><td>75</td></tr> </table>	Gauge Height above ground level	0.00	Hole Diameter in test section (mm)	75											
Gauge Height above ground level	0.00															
Hole Diameter in test section (mm)	75															

1st period	Time (mins)	0	5	10	15	Average	
Gauge Pressure 100	Flow reading	3809.0	3815.0	3821.6	3828.6	Flow (l/min)	
	Water Take	0.00	6.00	6.60	7.00	1.307	
2nd period	Time (mins)	0	5	10	15	Average	
	Gauge Pressure	Flow reading	3832.6	3844.0	3857.0	3872.4	Flow (l/min)
200	Water Take	0.00	11.40	13.00	15.40	2.653	
	Time (mins)	0	5	10	15	Average	
3rd period	Gauge Pressure	Flow reading	3878.0	3900.0	3919.2	3942.0	Flow (l/min)
	Water Take	0.00	22.00	19.20	22.80	4.267	
4th period	Time (mins)	0	5	10	15	Average	
	Gauge Pressure	Flow reading	3944.6	3956.0	3972.0	3985.0	Flow (l/min)
200	Water Take	0.00	11.40	16.00	13.00	2.693	
	Time (mins)	0	5	10	15	Average	
5th period	Gauge Pressure	Flow reading	3983.7	3988.2	3994.0	3999.0	Flow (l/min)
	Water Take	0.00	4.50	5.80	5.00	1.020	

Period	Flow (q) (l/min)	Gauge Press (kPa)	Gauge Press (m of water)	Friction Loss (m)*		Total Head (m)	Lugeon Value	Perm. (m/s)
				Basic	In extra rods			
1st	1.307	100.00	10.220	0.000	0.000	25.970	3.427	3.28E-07
2nd	2.653	200.00	20.440	0.000	0.000	36.190	4.993	4.78E-07
3rd	4.267	300.00	30.660	0.000	0.000	46.410	6.261	5.99E-07
4th	2.693	200.00	20.440	0.000	0.000	36.190	5.068	4.85E-07
5th	1.020	100.00	10.220	0.000	0.000	25.970	2.675	2.56E-07

\*Where friction loss is assumed to be negligible.

N.B. Pressure Conversion: 1 bar = 100 kPa = 14.503 psi