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BOREHOLE RECORD SHEET

Location Number: BH 305

Project Number: 110-12936

Project Name: Cross River Rail

Location: Brisbane

Client: AECOM

Date: 29/11/2011

Page: 1 OF 6

Easting: 503324 Northing: 6960853 RL: -13.37 m

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

Drilling Method				Depth	Graphic	Description	Weathering	Strength Estimated	Defect Spacing	Rec (%)	RQD	Samples and Remarks
TC	WB	RR	NMLC									
				1.0		Silty CLAY (CH) Very soft, high plasticity, dark grey, with organics.						
				2.0								
				3.0								
				3.00		SAND (SP) Loose, fine to medium grained, grey and brown.						
				4.0								
				5.0								
				6.0								
				7.0		Gravelly SAND (SP) Loose, fine to coarse grained, grey and brown, fine size gravel.						
				7.70								
				8.0		SAND (SP) Loose, fine to medium grained, grey and brown.						
				8.40								
				9.0								
				10.0								

Comments:

1) Drilled from floating barge - all depths measured from river bed level. 2) Note: the coring method used was NQ3 not NMLC. 3) Borehole grouted on completion.

Water First Noted Water Steady Level

Defects - 1.54m : F,60° P,R,O,C									
Depth (m)	Type	Dip (deg)	Planarity	Roughness	Aperture	Width	Frequency	Remarks	Notes
	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		U - Undulating			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:



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BOREHOLE RECORD SHEET

Location Number: BH 305

Project Number: 110-12936

Project Name: Cross River Rail

Location: Brisbane

Client: AECOM

Date: 29/11/2011

Easting: 503324 Northing: 6960853 RL: -13.37 m

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

Page: 2 OF 6

Drilling Method				Depth	Graphic	Description	Weathering	Strength Estimated	Defect Spacing	Rec (%)	RQD	Samples and Remarks
TC	WB	RR	NMLC									
				10.50		SAND (SP) Loose, fine to medium grained, grey and brown. (continued)						
				10.75		Sandy GRAVEL (GP) Medium dense, fine to medium size, grey and brown, fine to coarse grained sand.						
				11.0		CONGLOMERATE, coarse grained, pale grey speckled dark grey, sub-rounded medium gravel clasts, clast supported, granular, thinly bedded, closely spaced fractures.	SW XW SW - FR					10.85 m; J, 21°, U, R, O, Z 10.90 m; DI, 5°, P, V, O, Z 11.05 m; J, 15°, P, R, O, W 11.30 m; J, 45°, S, R, O, Z
				12.0		MUDSTONE, dark grey, cryptocrystalline, thinly laminated, fragmented, with trace of clay.						11.70 m; J, 20°, P, R, O, Z
				12.70		SANDSTONE, coarse grained, pale green, granular, medium bedded, closely spaced fractures, with some medium size sub-rounded gravel.	FR					12.03 m; J, 20°, P, R, O, W 12.10 m; DI, 5°, P, R, O, W 12.29 m; DI, 5°, P, R, O, W
				13.0		SANDSTONE, medium grained, pale grey, granular, thinly bedded, closely spaced fractures.						12.56 m; DI, 5°, P, V, O, Z 12.60 m; DI, 5°, P, V, O, Z 12.82 m; DI, 5°, P, R, O, Z 12.85 m; DI, 5°, P, R, O, Z
				14.0		CONGLOMERATE, coarse grained, pale grey speckled dark grey, granular, thickly bedded, widely spaced fractures, medium size gravel band from 13.30m to 13.80m and 13.90m to 13.98m.						13.42 m; DI, 10°, U, V, O, Z
				15.0								14.11 m; DI, 5°, P, R, O, Z
				16.0		Interlaminated SILTSTONE & SANDSTONE, fine grained, alternating pale grey and dark grey, granular, thinly laminated, fragmented to very closely spaced fractures.						15.45 m; Is50 = 2.51 MPa
				17.0		CONGLOMERATE, coarse grained, pale grey speckled dark grey, sub-rounded medium size clasts, clast supported, granular, thinly bedded, closely spaced fractures, with coarse Sandstone from 16.27m to 16.32m and 16.42m to 16.46m.						15.90 m; DI, 5°, P, S, O, Z 16.06 m; DI, 15°, U, V, O, Z 16.09 m; DI, 3°, P, R, O, Z 16.26 m; J, 5°, P, S, O, X 16.37 m; J, 10°, P, R, O, X 16.51 m; J, 10°, P, R, O, Z 16.53 m; J, 10°, P, R, O, Z
				18.0		CONGLOMERATE, coarse grained, pale grey speckled dark grey and pale brown, granular, clast supported, thickly bedded, moderately widely spaced fractures.						17m; Is50 = 2.36 MPa 16.94 m; DI, 10°, U, R, O, Z 17.16 m; J, 40°, P, R, O, Z 17.42 m; DI, 40°, U, R, O, Z 17.52 m; DI, 30°, U, R, O, Z
				19.0		CONGLOMERATE, coarse grained, pale grey speckled dark grey, medium size sub-rounded clasts, clast supported, granular, thinly bedded, widely spaced fractures.						17.81 m; DI, 5°, U, R, O, Z 18.09 m; DI, 5°, U, R, O, Z 18.27 m; DI, 10°, S, R, O, Z
				20.0								18.92 m; DI, 10°, U, V, O, Z 19.18 m; DI, 5°, U, V, O, Z

Comments:

1) Drilled from floating barge - all depths measured from river bed level. 2) Note: the coring method used was NQ3 not NMLC. 3) Borehole grouted on completion.

Water First Noted Water Steady Level

Defects - 1.54m : F, 60° P, R, O, C											
Depth (m)	Type	Drop (deg)	Planarity	Roughness	Aperture	Width	Frequency	Frequency	Frequency	Frequency	Frequency
	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 - Silty	Q - Quartz					
	L - Cleavage		U - Undulating			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:



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BOREHOLE RECORD SHEET

Location Number: BH 305

Project Number: 110-12936

Project Name: Cross River Rail

Location: Brisbane

Client: AECOM

Date: 29/11/2011

Page: 3 OF 6

Easting: 503324 Northing: 6960853 RL: -13.37 m

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

Drilling Method				Depth	Graphic	Description	Weathering	Strength Estimated	Defect Spacing	Rec (%)	RQD	Samples and Remarks
TC	WB	RR	NM/C									
				20.73		CONGLOMERATE, coarse grained, pale grey speckled dark grey, medium size sub-rounded clasts, clast supported, granular, thinly bedded, widely spaced fractures. (continued)	FR					
				21.0		CONGLOMERATE, coarse grained, pale grey speckled dark grey and pale brown, granular, clasts are coarse gravel sized, clast supported, thickly bedded, widely spaced fractures.				100	100	20.80 m; DI, 5°, U, R, O, Z
				22.0								21.565m, Is50 = 1.5 MPa
				22.18		CONGLOMERATE, coarse grained, pale grey speckled dark grey, medium size sub-rounded clasts, clast supported, granular, thinly bedded, widely spaced fractures.						21.90 m; J, 15°, P, R, O, Z
				23.0								22.39m, Is50 = 0.51 MPa 22.38 m; J, 30°, U, S, O, Z 22.53 m; DI, 20°, S, R, O, Z 22.60 m; J, 15°, P, S, O, Z
				24.0						100	84	23.07m, Is50 = 1.61 MPa 23.40 m; DI, 35°, S, R, O, Z 23.57m, Is50 = 0.73 MPa 23.80 m; DI, 20°, U, V, O, Z 23.84 m; J, 30°, S, R, O, Z 23.98 m; DI, 15°, P, R, O, Z
				25.0								24.38 m; J, 35°, S, R, O, C 24.6m, Is50 = 2.47 MPa 24.73 m; J, 25°, S, R, O, Z 25m, Is50 = 1.41 MPa
				25.28		Interbedded SANDSTONE and CONGLOMERATE, fine grained sandstone and medium size gravel conglomerate, alternating dark grey, mottled pale grey/dark grey, granular, thinly bedded, widely spaced fracturing. Sandstone has Siltstone laminae and trace of coal stringers.						25.15 m; DI, 2°, U, R, O, Z 25.29 m; DI, 10°, S, R, O, Z 25.41 m; J, 20°, P, S, O, Z
				26.0								25.79 m; B, 15°, U, S, O, Z
				26.21		Interbedded SANDSTONE and CONGLOMERATE, medium grained sandstone and fine size gravel conglomerate, pale grey, granular, medium bedded, moderately widely spaced fractures.				97	97	26.23 m; B, 15°, P, S, O, Z 26.49 m; B, 15°, P, S, O, Z
				27.0								26.98 m; B, 5°, P, R, O, Z 27.07 m; B, 5°, P, S, O, Z
				27.85								27.40 m; B, 10°, S, R, O, Z 27.58 m; DI, 15°, P, R, O, Z
				28.0		Interlaminated SANDSTONE and SILTSTONE, fine to medium grained, alternating dark grey and pale grey, granular, thinly laminated, moderately widely spaced fractures.						27.92 m; B, 5°, P, S, O, Z 28.12 m; DI, 40°, P, S, O, Z 28.35 m; B, 40°, P, S, O, Z
				29.0						100	96	28.78 m; B, 60°, P, S, O, Z 28.90 m; B, 50°, P, S, O, Z 28.92 m; B, 60°, P, S, O, Z 29.03 m; DI, 60°, S, R, O, Z 29.15 m; J, 60°, P, S, O, Z 29.40 m; DI, 10°, P, S, O, Z 29.58 m; B, 50°, P, S, O, Z 29.78 m; B, 40°, P, S, O, Z
				30.0								

Comments:

1) Drilled from floating barge - all depths measured from river bed level. 2) Note: the coring method used was NQ3 not NM/C. 3) Borehole grouted on completion.

Water First Noted Water Steady Level

Defects - 1.54m : F, 60° P, R, O, C											
Depth (m)	Type	Plane (deg)	Planarity	Roughness	Aperture	Fill	Notes	Depth (m)	Type	Plane (deg)	Planarity
	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		U - Undulating			S - Secondary mineral					
	R - Fracture					U - Undifferentiated mineral					
	S - Shear zone					W - Weathered rock					
	T - Contact					Z - 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:



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BOREHOLE RECORD SHEET

Location Number: BH 305

Project Number: 110-12936

Project Name: Cross River Rail

Location: Brisbane

Client: AECOM

Date: 29/11/2011

Page: 4 OF 6

Easting: 503324 Northing: 6960853 RL: -13.37 m
Logger: DA/DT Operator: DA Machine: Scout 2

Drilling Method				Depth	Graphic	Description	Weathering	Strength Estimated	Defect Spacing	Rec (%)	RQD	Samples and Remarks
TC	WB	RR	NMLC									
				30.11		Interlaminated SANDSTONE and SILTSTONE, fine to medium grained, alternating dark grey and pale grey, granular, thinly laminated, with widely spaced fractures.	FR			100	96	30.11 m; B, 40°, P, S, O, Z
				31.0								30.59 m; DI, 40°, P, S, O, Z 30.75 m; Is50 = 2.33 MPa
												30.95 m; DI, 40°, P, S, O, Z
				32.0						96	94	31.77 m; DI, 30°, P, S, O, Z 32m, Is50 = 0.83 MPa
												32.58 m; B, 40°, P, S, O, Z
				33.0								32.89 m; DI, 60°, U, S, O, Z
												33.81m, Is50 = 3.48 MPa 33.75 m; B, 40°, P, S, O, Z
				34.0								34.35 m; B, 5°, P, S, O, Z
										97	92	34.86 m; B, 5°, P, S, O, Z 35m, Is50 = 0.57 MPa
				35.0								35.14 m; B, 5°, P, S, O, Z
				35.25		Interlaminated SANDSTONE and SILTSTONE, fine to medium grained, alternating dark grey and pale grey, granular, thinly laminated, with extremely closely spaced fractures.						35.86 m; B, 5°, P, S, O, W
				35.43		Interlaminated SANDSTONE and SILTSTONE, fine to medium grained, alternating dark grey and pale grey, granular, thinly laminated, with widely spaced fractures.						36.15 m; B, 9°, P, S, O, Z
				36.0								36.76m, Is50 = 1.01 MPa 36.67 m; B, 8°, P, R, O, Z 36.84 m; B, 8°, P, R, O, W 36.93 m; J, 4°, P, S, O, W
				36.72		Interlaminated SANDSTONE and SILTSTONE, fine to medium grained, alternating dark grey and pale grey, granular, thinly laminated, moderately widely spaced fractures, medium gravel conglomerate band from 37.96m to 38.03m						37.08 m; J, 55°, O 37.10 m; J, 45°, P, S, O, Z
				37.0								37.45 m; DI, 5°, P, S, O, Z 37.57 m; B, 10°, P, S, O, Z
										97	68	37.82 m; DI, 10°, P, R, O, W 37.86 m; J, 10°, P, R, O, X 38m, Is50 = 1.46 MPa
				38.0								38.17 m; B, 10°, P, S, O, Z
				38.44		MUDSTONE, pale white grey, cryptocrystalline, thinly laminated, moderately widely spaced fractures, some darker siltstone and fine sandstone laminae present throughout.						38.64 m; DI, 2°, P, S, O, Z
				39.0								38.87 m; DI, 2°, P, S, O, Z 39.00 m; J, 25°, S, V, O, Z 39.12 m; DI, 10°, P, R, O, Z
				39.59								39.56 m; DI, 10°, P, R, O, Z
				40.0						91	84	39.86m, Is50 = 2.04 MPa 39.89 m; B, 10°, P, R, O, Z

Comments:
1) Drilled from floating barge - all depths measured from river bed level. 2) Note: the coring method used was NQ3 not NMLC. 3) Borehole grouted on completion.

Water First Noted Water Steady Level

Defects - 1.54m : F, 60° P, R, O, C											
Depth (m)	Type	Dip (deg)	Planarity	Roughness	Aperture	Fill	Notes	Depth (m)	Type	Dip (deg)	Planarity
B - Bedding	C - Curvilinear	D - Discontinuous	P - Polished	F - Filled	P - Iron Oxide	C - Clay		B - Bedding	C - Curvilinear	D - Discontinuous	P - Polished
C - Clay seam	F - Foliation	H - Schistosity	J - Joint	L - Cleavage	R - Fracture	S - Shear zone	T - Contact	V - Vein	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:



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BOREHOLE RECORD SHEET

Location Number: BH 305

Project Number: 110-12936

Project Name: Cross River Rail

Location: Brisbane

Client: AECOM

Date: 29/11/2011

Easting: 503324

Northing: 6960853

RL: -13.37 m

Logger: DA/DT

Operator: DA

Machine: Scout 2

Page: 5 OF 6

Drilling Method				Depth	Graphic	Description	Weathering	Strength Estimated	Defect Spacing	Rec (%)	RQD	Samples and Remarks
TC	WB	RR	NMLC									
				40.65		Interlaminated SANDSTONE and SILTSTONE, fine grained, alternating dark grey and pale grey, granular, thinly laminated, moderately widely spaced fracturing, clay seams from 40.17m to 40.29m, near vertical fractures present across clay seams. (continued)	FR					40.13 m; DI, 5°, P, S, O, Z 40.32 m; J, 80°, O,
				41.0		Interbedded SANDSTONE and CONGLOMERATE, fine grained sandstone and medium size gravel conglomerate, alternating dark grey and mottled pale grey/dark grey, granular, thinly bedded, widely spaced fractures. Sandstone has siltstone laminae and trace of coal stringers.				91	84	40.75 m; DI, 15°, U, R, O, Z
				41.90								
				42.0								
				42.07		MUDSTONE, pale white grey, cryptocrystalline, thinly laminated, moderately widely spaced fractures, some darker siltstone and fine sandstone laminae present throughout.						
				43.0		Interbedded SANDSTONE and CONGLOMERATE, medium grained sandstone and fine size gravel conglomerate, pale grey, granular, medium bedded, with widely spaced fractures.				100	94	42.79 m; J, 20°, P, R, O, Z 43.16 m; DI, 10°, S, S, O, Z
				43.38								
				43.44		Interlaminated SANDSTONE and SILTSTONE, fine grained, dark grey, alternating light green grey and pale grey, granular, thinly laminated, closely spaced fractures						43.73 m; DI, 10°, U, R, O, Z 43.91 m; DI, 25°, U, S, O, Z
				44.0								
				44.71		CONGLOMERATE, coarse grained, pale grey speckled dark grey, granular, medium sized rounded to sub-rounded clasts, clast supported, medium bedded, widely spaced fractures.						44.80 m; DI, 80°, U, R, O, Z
				44.84		CONGLOMERATE, coarse grained, pale grey speckled dark grey, granular, medium sized rounded to sub-rounded clasts, clast supported, medium bedded, extremely closely spaced fractures.						45.14 m; DI, 5°, P, R, O, Z
				45.0		CONGLOMERATE, coarse grained, pale grey speckled dark grey, granular, medium sized rounded to sub-rounded clasts, clast supported, medium bedded, with moderately widely spaced fractures. Phyllite from 44.96m to 45.16m.				100	91	45.81 m; DI, 5°, C, R, O, Z 46.18 m; DI, 15°, P, V, O, Z 46.31 m; DI, 15°, P, S, O, Z
				46.0								46.72 m; J, 20°, U, S, O, C
				47.0								47.32 m; DI, 40°, S, R, O, Z
				48.0								47.92 m; DI, 50°, C, R, O, Z 48.22 m; DI, 25°, P, R, O, Z
				49.0						100	100	48.70 m; DI, 25°, U, R, O, Z 48.86 m; DI, 30°, S, V, O, Z
				50.0								49.30 m; DI, 10°, U, V, O, Z

Comments:

1) Drilled from floating barge - all depths measured from river bed level. 2) Note: the coring method used was NQ3 not NMLC. 3) Borehole grouted on completion.

Water First Noted Water Steady Level

Defects - 1.54m : F, 60°, P, R, O, C

Depth (m)	Type	Dip (deg)	Planarity	Roughness	Aperture	With
	B - Bedding		C - Curvilinear	L - Slickensides	C - Closed	W - Clay
	F - Fault		D - Discontinuous	P - Polished	F - Filled	P - Iron Oxide
	H - Foliation		P - Planar	R - Rough	N - Clean	K - Calcite
	S - Schistosity		S - Subplanar	S - Smooth	O - Open	L - Limonite
	J - Joint		T - Stepped	V - Very rough	S - Stain	Q - Quartz
	L - Cleavage		U - Undulating			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
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Samples

U50
SPT
Disturbed Sample

Approved:
Date:



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BOREHOLE RECORD SHEET

Location Number: BH 305

Project Number: 110-12936

Project Name: Cross River Rail

Location: Brisbane

Client: AECOM

Date: 29/11/2011

Easting: 503324 Northing: 6960853 RL: -13.37 m

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

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Drilling Method					Depth	Graphic	Description	Weathering	Strength Estimated	Defect Spacing	Rec (%)	RQD	Samples and Remarks
TC	WB	RR	NM/LC	Casing									
					50.90		CONGLOMERATE, coarse grained, pale grey speckled dark grey, granular, medium sized rounded to sub-rounded clasts, clast supported, medium bedded, with moderately widely spaced fractures. Phyllite from 44.96m to 45.16m. (continued)	FR			100	100	50.14 m; DI, 10°, U, V, O, Z 50.35 m; J, 35°, P, V, O, Z 50.64 m; J, 30°, P, S, O, Z
					51.0		BOREHOLE BH 305 TERMINATED AT 50.90 m						
					52.0								
					53.0								
					54.0								
					55.0								
					56.0								
					57.0								
					58.0								
					59.0								
					60.0								

Comments:

1) Drilled from floating barge - all depths measured from river bed level. 2) Note: the coring method used was NQ3 not NM/LC. 3) Borehole grouted on completion.

Water First Noted Water Steady Level

Defects - 1.54m : F, 60° P, R, O, C

Depth (m)	Type	Dip (deg)	Planarity	Roughness	Aperture	Fill
	B - Bedding		C - Curvilinear	L - Slickensides	C - Closed	C - Clay
	C - Clay seam		D - Discontinuous	P - Polished	F - Filled	P - 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		U - Undulating			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:



TITLE

AECOM
Brisbane
Cross River Rail
Core Photo - BH 305

DRAWN

DT

DATE

26/04/2012

CHECKED

CB

DATE

26/04/2012

SCALE

Not To Scale

A4

PROJECT No

110-12936

FIGURE No

1/2



TITLE
AECOM
Brisbane
Cross River Rail
Core Photo - BH 305

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

PROJECT: CRR
PROJECT No.: 110-12936
BH No.: 305
Test No.: 1
Date: 30/11/2011

Packer type: Single
 Packer pressure: 2000kPa
 Gauge pressures measured in: kPa
 Tested by: JI

Vertical depth to:
(below river bed)

Top of test section (m):	37.00
Base of test section (m):	39.50
Centre of test section(m):	38.25
Base of casing (m):	26.00
Ground water (m)	TIDAL

Depth of centre of test section (m):	38.25
Length of test section (m):	2.50

Gauge Height above ground level (m):	
Hole Diameter in test section (mm)	75

1st period	Time (mins)	0	5	10	15	Average
Gauge Pressure 100	Flow reading	202.0	208.0	214.0	217.0	Flow (l/min)
	Water Take	0.00	6.00	6.00	3.00	1.000
2nd period	Time (mins)	0	5	10	15	Average
Gauge Pressure 200	Flow reading	216.0	217.5	219.0	219.0	Flow (l/min)
	Water Take	0.00	1.50	1.50	0.00	0.200
3rd period	Time (mins)	0	5	10	15	Average
Gauge Pressure 400	Flow reading	220.0	224.0	228.0	232.5	Flow (l/min)
	Water Take	0.00	4.00	4.00	4.50	0.833
4th period	Time (mins)	0	5	10	15	Average
Gauge Pressure 300	Flow reading	233.5	237.0	242.0	248.0	Flow (l/min)
	Water Take	0.00	3.50	5.00	6.00	0.967
5th period	Time (mins)	0	5	10	15	Average
Gauge Pressure 150	Flow reading	248.5	252.0	257.0	261.0	Flow (l/min)
	Water Take	0.00	0.00	5.00	4.00	0.600

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	1.000	100.00	10.220	0.000	0.000	48.470	0.843	9.18E-08
2nd	0.200	200.00	20.440	0.000	0.000	58.690	0.139	1.52E-08
3rd	0.833	400.00	40.880	0.000	0.000	79.130	0.430	4.69E-08
4th	0.967	300.00	30.660	0.000	0.000	68.910	0.573	6.24E-08
5th	0.600	150.00	15.330	0.000	0.000	53.580	0.458	4.98E-08

*Where friction loss is assumed to be negligible.

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

Note - leakage during period 1 - no adjustment made

IN-SITU PACKER PERMEABILITY TEST RESULT

PROJECT: **CRR** **BH No.:** **305**
PROJECT No.: **110-12936** **Test No.:** **2**
Date: **30/11/2011**

Packer type: Single
Packer pressure: 2000kPa
Gauge pressures measured in: kPa
Tested by: JI

Vertical depth to:
(below river bed)

Top of test section (m):	25.00
Base of test section (m):	27.50
Centre of test section(m):	26.25
Base of casing (m):	24.00
Ground water (m)	TIDAL

Depth of centre of test section (m):	26.25
Length of test section (m):	2.50

Gauge Height above ground level (m):	
Hole Diameter in test section (mm)	75

1st period	Time (mins)	0	5	10	15	Average
Gauge Pressure 100	Flow reading	417.0	417.5	417.5	418.0	Flow (l/min)
	Water Take	0.00	0.50	0.00	0.50	0.067
2nd period	Time (mins)	0	5	10	15	Average
Gauge Pressure 200	Flow reading	419.5	420.0	420.0	420.0	Flow (l/min)
	Water Take	0.00	0.50	0.00	0.00	0.033
3rd period	Time (mins)	0	5	10	15	Average
Gauge Pressure 400	Flow reading	422.0	425.0	427.5	429.5	Flow (l/min)
	Water Take	0.00	3.00	2.50	2.00	0.500
4th period	Time (mins)	0	5	10	15	Average
Gauge Pressure 600	Flow reading	429.0	429.0	429.0	429.0	Flow (l/min)
	Water Take	0.00	0.00	0.00	0.00	0.000
5th period	Time (mins)	0	5	10	15	Average
Gauge Pressure	Flow reading					Flow (l/min)
	Water Take	0.00	0.00	0.00	0.00	0.000

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	0.067	100.00	10.220	0.000	0.000	36.470	0.075	8.13E-09
2nd	0.033	200.00	20.440	0.000	0.000	46.690	0.029	3.18E-09
3rd	0.500	400.00	40.880	0.000	0.000	67.130	0.304	3.31E-08
4th	0.000	600.00	61.320	0.000	0.000	87.570	0.000	0.00E+00
5th	0.000	0.00	0.000	0.000	0.000	26.250	0.000	0.00E+00

*Where friction loss is assumed to be negligible.

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

Note - zero flow at period 4 - test ended

IN-SITU PACKER PERMEABILITY TEST RESULT

PROJECT: CRR
PROJECT No.: 110-12936
BH No.: 305
Test No.: 3
Date: 30/11/2011

Packer type: Single
 Packer pressure: 2000kPa
 Gauge pressures measured in: kPa
 Tested by: JI

Vertical depth to:
(below river bed)

Top of test section (m):	16.00
Base of test section (m):	18.50
Centre of test section(m):	17.25
Base of casing (m):	15.00
Ground water (m)	TIDAL

Depth of centre of test section (m):	17.25
Length of test section (m):	2.50

Gauge Height above ground level (m):	
Hole Diameter in test section (mm)	75

1st period	Time (mins)	0	5	10	15	Average
Gauge Pressure 100	Flow reading	431.0	432.5	432.8	432.8	Flow (l/min)
	Water Take	0.00	1.50	0.30	0.00	0.120
2nd period	Time (mins)	0	5	10	15	Average
Gauge Pressure 200	Flow reading	433.0	433.5	434.0	434.4	Flow (l/min)
	Water Take	0.00	0.50	0.50	0.40	0.093
3rd period	Time (mins)	0	5	10	15	Average
Gauge Pressure 400	Flow reading	435.0	437.5	440.0	442.0	Flow (l/min)
	Water Take	0.00	2.50	2.50	2.00	0.467
4th period	Time (mins)	0	5	10	15	Average
Gauge Pressure 200	Flow reading	442.0	442.0	442.0	442.0	Flow (l/min)
	Water Take	0.00	0.00	0.00	0.00	0.000
5th period	Time (mins)	0	5	10	15	Average
Gauge Pressure	Flow reading					Flow (l/min)
	Water Take	0.00	0.00	0.00	0.00	0.000

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	0.120	100.00	10.220	0.000	0.000	27.470	0.179	1.94E-08
2nd	0.093	200.00	20.440	0.000	0.000	37.690	0.101	1.10E-08
3rd	0.467	400.00	40.880	0.000	0.000	58.130	0.328	3.57E-08
4th	0.000	200.00	20.440	0.000	0.000	37.690	0.000	0.00E+00
5th	0.000	0.00	0.000	0.000	0.000	17.250	0.000	0.00E+00

*Where friction loss is assumed to be negligible.

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

Note - zero flow at period 4 - test ended