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Location Number: BH 308

Project Number: 110-12936

Project Name: Cross River Rail

Location: Brisbane

Client: AECOM

Date: 05/12/2011

Easting: 503265 Northing: 6960857 RL: -10.17 m

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

Page: 1 OF 6

Drilling Method				Depth	Graphic	Description	Weathering	Strength Estimated	Defect Spacing	Rec (%)	RQD	Samples and Remarks
TC	WB	FR	NMLC									
				0.00		Silty CLAY (CH) Very soft, high plasticity, dark grey.						
				3.50		SAND (SP) Loose to medium dense, fine to medium grained, grey and brown.						
				9.50		Gravelly SAND (SP) Medium dense, fine to coarse grained, grey and brown, fine to medium size gravel, with some wood and peat.						

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.

Defects - 1.54m : F,60° P,R,O,C

Depth (m)	Type	Dip (Deg)	Planarity	Roughness	Aperture	Wt%
	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 - Kaolinite
	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: _____

SOIL SURVEYS 00: LIBRARY 2012:05:G.LB Log SOIL SURVEY BOREHOLE LOG 111-12936 NEW.GPJ <<DrawingFiles>> 21/05/2012 14:32 8.30.002 Developed by Datigel

Water First Noted Water Steady Level



Drilling Method				Depth	Graphic	Description	Weathering	Strength Estimated	Defect Spacing	Rec (%)	RQD	Samples and Remarks
TC	WB	FR	NM/LC									
				10.40	[Graphic: Sandy Gravel]	Sandy GRAVEL (GP) Dense, fine to coarse size, grey and brown, fine to coarse grained sand.						
				11.0								
				12.0								
				13.0	[Graphic: Tuff]	TUFF (DW) Moderately strong, yellow brown and light grey.						
				15.30								
				15.70								
				15.90	[Graphic: Conglomerate]	CONGLOMERATE (SW) Moderately strong, light grey.	FR					16.13m; Is50 = 0.7 MPa 16.05m; DI, 10°, P, R, O, Z 16.32m; T, 80°, U, R, O, Z 16.43m; DI, 13°, S, R, O, Z 16.46m; DI, 80°, S, R, O, Z 16.60m; J, 25°, U, R, O, Z 16.83m; B, 40°, P, R, O, Z 17.49m; DI, 20°, U, R, O, Z 17.73m; Is50 = 1.81 MPa 17.86m; J, 30°, U, S, O, Z 18.13m; J, 50°, P, R, O, Z 18.70m; DI, 20°, S, V, O, Z 19.06m; Is50 = 1.26 MPa 19.18m; J, 18°, P, R, O, Z 19.41m; DI, 60°, P, R, O, Z 19.58m; B, 20°, U, R, O, Z
				16.0								
				17.0								
				18.0	[Graphic: Conglomerate]	CONGLOMERATE, coarse grained, pale white grey, granular, very thickly bedded, closely to widely spaced fractures. Clasts are medium gravel sized, sub-rounded siltstone, sandstone and quartz. Clast supported, fine gravel from 15.95m to 16.06m, 16.49m to 16.6m, 18.28m to 18.44m. With a medium grained sandstone lense from 16.79m to 16.90m. With some coarse gravel sized clasts.						
				19.0								
				20.0								

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.

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	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 - Silt	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 [Symbol]
SPT [Symbol]
Disturbed Sample [Symbol]

Approved: [Signature]
Date: [Date]

SOIL SURVEYS 00: LIBRARY 2012:05:G.LB Log SOIL SURVEY BOREHOLE LOG 111-12936 NEW.GPJ <<DrawingFiles>> 21/05/2012 14:32 8.30.002 Developed by Dajgeel



Drilling Method				Depth	Graphic	Description	Weathering	Strength Estimated	Defect Spacing	Rec (%)	RQD	Samples and Remarks
TC	WB	FR	NMLC									
				21.0			FR					19.93 m; DI, 80°, S, V, O, Z 20.25 m; DI, 8°, S, R, O, Z 20.48 m; Is50 = 1.44 MPa 20.61 m; J, 15°, P, R, O, Z 20.79 m; J, 15°, P, R, O, Z
				21.10		SANDSTONE, medium grained, pale grey, granular, medium bedded, moderately widely spaced fractures.				100	84	21.14 m; J, 60°, P, R, O, Z 21.19 m; DI, 0°, P, S, O, Z 21.435m; Is50 = 1.33 MPa
				21.61		Interbedded SANDSTONE and CONGLOMERATE, medium to coarse grained, pale grey, thinly bedded, closely spaced fractures. Conglomerate is medium gravel sized and matrix supported.						21.62 m; J, 60°, S, R, O, Z 21.83 m; J, 10°, C, R, O, Z 22.075m; Is50 = 1.21 MPa
				22.0		CONGLOMERATE, coarse grained, pale white grey, granular, very thickly bedded, closely to widely spaced fractures. Clasts are medium gravel sized, sub-rounded siltstone, sandstone and quartz. Clast supported, fine gravel from 15.95m to 16.06m, 16.49m to 16.6m, 18.28m to 16.9m. Some coarse gravel sized clasts present.						22.55 m; J, 20°, S, V, O, Z 22.72 m; DI, 40°, P, R, O, Z
				23.0		CONGLOMERATE, coarse grained, pale white grey, speckled dark grey, granular, very thickly bedded, closely to widely spaced fractures. Clasts are medium gravel sized, subangular siltstone, sandstone and quartz. Clast supported. Some coarse gravel sized clasts present.				101	83	23.10 m; DI, 25°, U, R, O, Z 23.32 m; DI, 10°, S, R, O, Z
				23.30		CONGLOMERATE, coarse grained, pale white grey, speckled dark grey, granular, very thickly bedded, closely to widely spaced fractures. Clasts are medium gravel sized, subangular siltstone, sandstone and quartz. Clast supported. Some coarse gravel sized clasts present.						23.63m; Is50 = 2.25 MPa 23.56 m; DI, 20°, P, R, O, Z 23.68 m; B, 10°, P, S, O, Z 23.83 m; DI, 40°, U, R, O, Z 24.065m; Is50 = 0.54 MPa 24.12 m; DI, 21°, C, R, O, Z
				24.0		CONGLOMERATE, coarse grained, pale white grey, granular, very thickly bedded, closely to widely spaced fractures. Clasts are medium gravel sized, subangular siltstone, sandstone and quartz. Clast supported. Some coarse gravel sized clasts present.						24.34 m; DI, 10°, C, S, O, Z 24.44 m; J, 13°, P, R, O, Z 24.60 m; DI, 10°, P, V, O, Z 24.75 m; DI, 50°, U, V, O, Z 24.83 m; DI, 30°, P, R, O, Z 24.90 m; J, 17°, P, R, O, Z
				25.0		CONGLOMERATE, coarse grained, pale white grey, granular, very thickly bedded, closely to widely spaced fractures. Clasts are medium gravel sized, sub-rounded siltstone, sandstone and quartz. Clast supported. Some fine gravel sized clasts.				103	49	25.10 m; DI, 90°, U, V, O, Z 25.27 m; J, 15°, S, R, O, Z 25.33 m; DI, 30°, U, R, O, Z 25.43 m; DI, 20°, S, R, O, Z 25.605m; Is50 = 1.1 MPa 25.56 m; J, 50°, P, S, O, Z 24.12 m; DI, 21°, C, R, O, Z 25.72 m; DI, 110°, S, R, O, Z 25.80 m; J, 30°, P, R, O, Z 25.92 m; DI, 140°, S, V, O, Z 26.14 m; J, 250°, S, R, O, Z 26.28 m; DI, 20°, P, R, O, Z
				26.0		CONGLOMERATE, coarse grained, pale white grey, granular, very thickly bedded, closely to widely spaced fractures. Clasts are medium gravel sized, sub-rounded siltstone, sandstone and quartz. Clast supported. Some coarse gravel sized clasts present.				95	55	26.70 m; J, 18°, S, R, O, Z
				26.18		CONGLOMERATE, coarse grained, pale white grey, granular, very thickly bedded, closely to widely spaced fractures. Clasts are medium gravel sized, sub-rounded siltstone, sandstone and quartz. Clast supported. Some fine gravel sized clasts.						26.92 m; T, 14°, S, S, O, Z 26.98 m; T, 43°, P, S, O, Z 27.24m; Is50 = 0.96 MPa 27.19 m; J, 25°, P, R, O, Z 27.36 m; DI, 30°, S, V, O, Z
				26.45		CONGLOMERATE, coarse grained, pale white grey, granular, very thickly bedded, closely to widely spaced fractures. Clasts are medium gravel sized, sub-rounded siltstone, sandstone and quartz. Clast supported. Some coarse gravel sized clasts present.						27.61 m; DI, 10°, P, S, O, Z 27.80 m; B, 40°, P, S, O, Z 27.99 m; DI, 30°, S, R, O, Z
				27.0		SANDSTONE, fine grained, pale grey banded dark grey, laminated, closely spaced fractures, siltstone laminae from 27.61m to 27.64m and 27.75m to 27.82m.						28.52m; Is50 = 2.27 MPa 28.48 m; B, 50°, P, R, O, Z
				27.61		SANDSTONE, coarse grained, pale white grey, granular, very thickly bedded, closely to widely spaced fractures. With some fine gravel sized, sub-rounded clasts of siltstone, sandstone and quartz.						28.67 m; B, 60°, P, R, O, Z
				27.85		SANDSTONE, coarse grained, pale white grey, granular, very thickly bedded, closely to widely spaced fractures. With some fine gravel sized, sub-rounded clasts of siltstone, sandstone and quartz.						29.78 m; DI, 140°, S, R, O, Z
				28.0								
				29.0								
				30.0								

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.

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 - Fallation		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		R - Fracture			S - Secondary mineral
	R - Fracture		S - Shear zone			U - Unidentified mineral
	T - Contact		V - Vein			W - Weathered rock
	Z - Decomposed Zone		DI - Drilling induced fracture			X - Carbonaceous
						Z - Clean

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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Specialist in Applied Geotechnics

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BOREHOLE RECORD SHEET

Location Number: BH 308

Project Number: 110-12936

Project Name: Cross River Rail

Location: Brisbane

Client: AECOM

Date: 05/12/2011

Easting: 503265 Northing: 6960857 RL: -10.17 m

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

Page: 4 OF 6

Drilling Method				Depth	Graphic	Description	Weathering	Strength Estimated	Defect Spacing	Rec (%)	RQD	Samples and Remarks
TC	WB	RR	NMLC									
				31.0		SANDSTONE, coarse grained, pale white grey, granular, very thickly bedded, closely to widely spaced fractures. With some fine gravel sized, sub-rounded clasts of siltstone, sandstone and quartz. (continued)	FR			99	98	30.20 m; DI, 40°, P, R, O, Z
				31.19								30.87 m; DI, 60°, S, R, O, Z
				31.70		SANDSTONE, fine grained, pale grey banded dark grey, laminated, closely spaced fractures, some siltstone laminae.						31.19 m; T, 70°, S, R, O, Z 31.35 m; B, 70°, P, S, O, Z
				32.0		Interlaminated SILTSTONE and SANDSTONE, fine grained, alternating pale grey and dark grey, granular, thinly laminated, moderately widely spaced fractures.						31.52 m; B, 70°, P, S, O, Z 31.59 m; B, 70°, P, S, O, Z 31.66 m; DI, 0°, P, S, O, Z
				32.76		Interlaminated SILTSTONE and MUDSTONE, fine grained, alternating pale grey and dark grey, granular to cryptocrystalline, thinly laminated, very closely spaced to moderately widely spaced fractures. With some interbedded, medium gravel size, matrix supported conglomerate from 40.04m to 40.50m. With some fine grained sandstone laminae.				98	55	31.90 m; B, 30°, P, S, O, Z 32.18 m; B, 30°, P, S, O, Z 32.27 m; B, 30°, S, R, O, Z 32.56 m; Is50 = 0.41 MPa 32.51 m; B, 30°, P, S, O, Z 32.73 m; B, 30°, P, S, O, Z
				33.0								33.08 m; Is50 = 1.74 MPa
				34.0								33.24 m; B, 30°, P, S, O, Z 33.35 m; B, 30°, P, S, O, Z 33.51 m; B, 30°, P, S, O, Z 33.645 m; Is50 = 1.05 MPa 33.55 m; B, 40°, S, R, O, Z
				35.0								34.05 m; DI, 20°, P, R, O, Z 34.325 m; Is50 = 1.31 MPa 34.24 m; DI, 30°, P, S, O, Z 34.51 m; B, 30°, P, S, O, Z 34.70 m; B, 30°, P, S, O, Z 34.85 m; B, 30°, P, S, O, Z 34.88 m; B, 30°, P, S, O, Z 35.05 m; B, 30°, P, S, O, Z
				36.0						100	87	35.57 m; B, 40°, P, S, O, Z 35.83 m; B, 50°, P, S, O, Z 36.04 m; B, 50°, P, S, O, Z 36.30 m; B, 50°, P, S, O, Z 36.49 m; B, 50°, P, S, O, Z
				37.0								36.92 m; B, 50°, P, S, O, Z 37.06 m; B, 50°, P, S, O, Z
				38.0								37.54 m; B, 50°, P, S, O, Z 37.78 m; B, 50°, P, S, O, Z
				39.0								38.25 m; B, 40°, P, S, O, Z 38.37 m; B, 40°, P, S, O, Z
				40.0						100	41	38.72 m; B, 40°, P, S, O, Z 38.75 m; J, 45°, S, R, O, Z 38.86 m; B, 40°, P, S, O, Z 39.15 m; DI, 60°, S, R, O, Z 39.31 m; DI, 40°, S, R, O, Z 39.35 m; J, 45°, P, R, O, Z 39.52 m; B, 40°, P, S, O, Z 39.72 m; J, 80°, U, S, 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.

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	F - Iron Oxide
	C - Clay seam		D - Discontinuous	P - Polished	F - Filled	K - Calcite
	F - Foliation		P - Planar	R - Rough	N - Clean	L - Limonite
	H - Schistosity		S - Subplanar	S - Smooth	O - Open	Q - Quartz
	J - Joint		T - Stepped	V - Very rough	S - Stain	S - Secondary mineral
	L - Cleavage		U - Undulating			U - Unidentified mineral
	R - Fracture					W - Weathered rock
	S - Shear zone					X - Carbonaceous
	T - Contact					Z - Clean
	V - Vein					
	Z - Decomposed Zone					
	DI - Drilling induced fracture					

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 14:32 8.30.002 Developed by Dafgei



Drilling Method				Depth	Graphic	Description	Weathering	Strength Estimated	Defect Spacing	Rec (%)	RQD	Samples and Remarks
TC	WB	RR	NM/LC									
				40.78		MUDSTONE, fine grained, white grey, cryptocrystalline, thinly laminated, very closely spaced fractures, trace of siltstone laminae.	FR			100	41	39.93 m; J, 85°, D, S, O, Z 39.95 m; B, 40°, P, S, O, Z 40.33 m; J, 70°, S, V, O, Z 40.54 m; B, 75°, D, R, O, Z 40.72 m; B, 80°, P, S, O, Z 40.90 m; B, 80°, P, S, O, Z 41.10 m; B, 80°, P, S, O, Z 41.20 m; B, 80°, P, S, O, Z 41.45 m; J, 55°, P, S, O, Z
				41.69		Interlaminated SILTSTONE and MUDSTONE, fine grained, alternating pale grey and dark grey, granular to cryptocrystalline, thinly laminated, very closely spaced to moderately widely spaced fractures. With some fine grained sandstone laminae.				100	90	41.69 m; T, 50°, P, S, O, Z 41.92 m; B, 80°, P, S, O, Z 42.03 m; J, 90°, D, S, O, Z 42.13 m; T, 60°, P, R, O, Z 42.54 m; J, 80°, S, R, O, Z
				42.17		CONGLOMERATE, coarse grained, pale white grey, speckled dark grey, granular, very thickly bedded, widely spaced fractures. Clasts are medium gravel sized, subangular siltstone, sandstone and quartz. Clast supported. Some coarse gravel sized clasts present. With a pale grey, cryptocrystalline, foliated, Phyllite band from 43.85m to 44.11m.						43.53 m; DI, 20°, P, R, O, Z 43.97 m; DI, 30°, P, R, O, Z 44.04 m; DI, 30°, P, R, O, Z 44.12 m; T, 24°, P, S, O, Z
				43.0		QUARTZITE, fine grained, pale grey banded white, cryptocrystalline, laminated, very closely spaced fractures, phyllite laminae present.				100	76	44.37 m; DI, 90°, S, V, O, Z 44.59 m; DI, 30°, P, S, O, Z 44.67 m; B, 50°, U, S, O, Z 44.90 m; B, 50°, P, S, O, Z 45.06 m; B, 50°, P, S, O, X 45.12 m; V, 15°, P, R, O, K 45.34 m; J, 18°, P, S, O, Z
				44.0		Interbedded SILTSTONE and SANDSTONE, fine grained, pale brown and grey, granular, thinly bedded.						45.95 m; DI, 30°, P, R, O, Z 46.37 m; DI, 0°, P, S, O, Z 46.71 m; DI, 30°, U, R, O, Z 47.36 m; DI, 10°, C, S, O, Z 47.77 m; J, 40°, C, S, O, Z 48.07 m; DI, 60°, S, R, O, Z 48.37 m; DI, 30°, U, R, O, Z 48.45 m; J, 10°, P, S, O, Z
				44.26		MUDSTONE, fine grained, white grey, cryptocrystalline, thinly laminated, very closely spaced fractures, trace of siltstone laminae.						49.39 m; DI, 60°, S, R, O, Z 49.76 m; J, 16°, P, S, O, Z
				44.40		Interlaminated SILTSTONE and SANDSTONE, fine grained, alternating pale grey and dark grey, granular, thinly laminated, moderately widely spaced fractures, fine gravel sized conglomerate lenses from 44.67m to 44.83m.						
				44.44		SANDSTONE, fine grained, pale grey, granular, thinly bedded, moderately widely spaced fractures, with some siltstone.						
				44.54		CONGLOMERATE, coarse grained, pale white grey, granular, very thickly bedded, closely to widely spaced fractures. Clasts are medium gravel sized, sub-rounded siltstone, sandstone and quartz. Clast supported. Some coarse gravel sized clasts present, fine sandstone lenses from 46.36m to 46.48m.						
				44.60		QUARTZITE, fine grained, pale grey banded white, cryptocrystalline, laminated, very closely spaced fractures.						
				45.0								
				45.40								
				45.60								
				46.0								
				46.70								
				47.0								
				47.70								
				48.0								
				48.72								
				48.97								
				49.0								
				50.0								

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.

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	
	Cl - 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	R - Fracture			S - Secondary mineral	
	S - Shear zone	T - Contact			U - Unidentified mineral	
	V - Vein	Z - Decomposed Zone			W - Weathered rock	
	DI - Drilling induced break				X - Carbonaceous	
					Z - Clean	

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:GLB Log SOIL SURVEY BOREHOLE LOG 111-12936 NEW.GPJ <-DrawingFiles> 21/05/2012 14:32 8.30.002 Developed by Dajgeel

Water First Noted Water Steady Level



Easting: 503265 Northing: 6960857 RL: -10.17 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	FR	NMLC	Casing									
					50.42	○○○○○ ○○○○○ ○○○○○	CONGLOMERATE, coarse grained, pale white grey, granular, very thickly bedded, closely to widely spaced fractures. Clasts are medium gravel sized, sub-rounded siltstone, sandstone, Tuff and quartz. Clast supported. Some coarse gravel sized clasts present. Phyllite band from 49.78m to 49.84m. (continued)	FR			100	100	
					51.0								
					52.0								
					53.0								
					54.0								
					55.0								
					56.0								
					57.0								
					58.0								
					59.0								
					60.0								

BOREHOLE BH 308 TERMINATED AT 50.42 m

SOIL SURVEYS 00: LIBRARY 2012:05:G.LB Log SOIL SURVEY BOREHOLE LOG 111-12936 NEW.GPJ <<DrawingFiles>> 21/05/2012 14:32 8.30.002 Developed by Dargei

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.

Defects - 1.54m : F,60° P,R,O,C

Type	Dip (Deg)	Planarity	Roughness	Aperture	Wt%
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

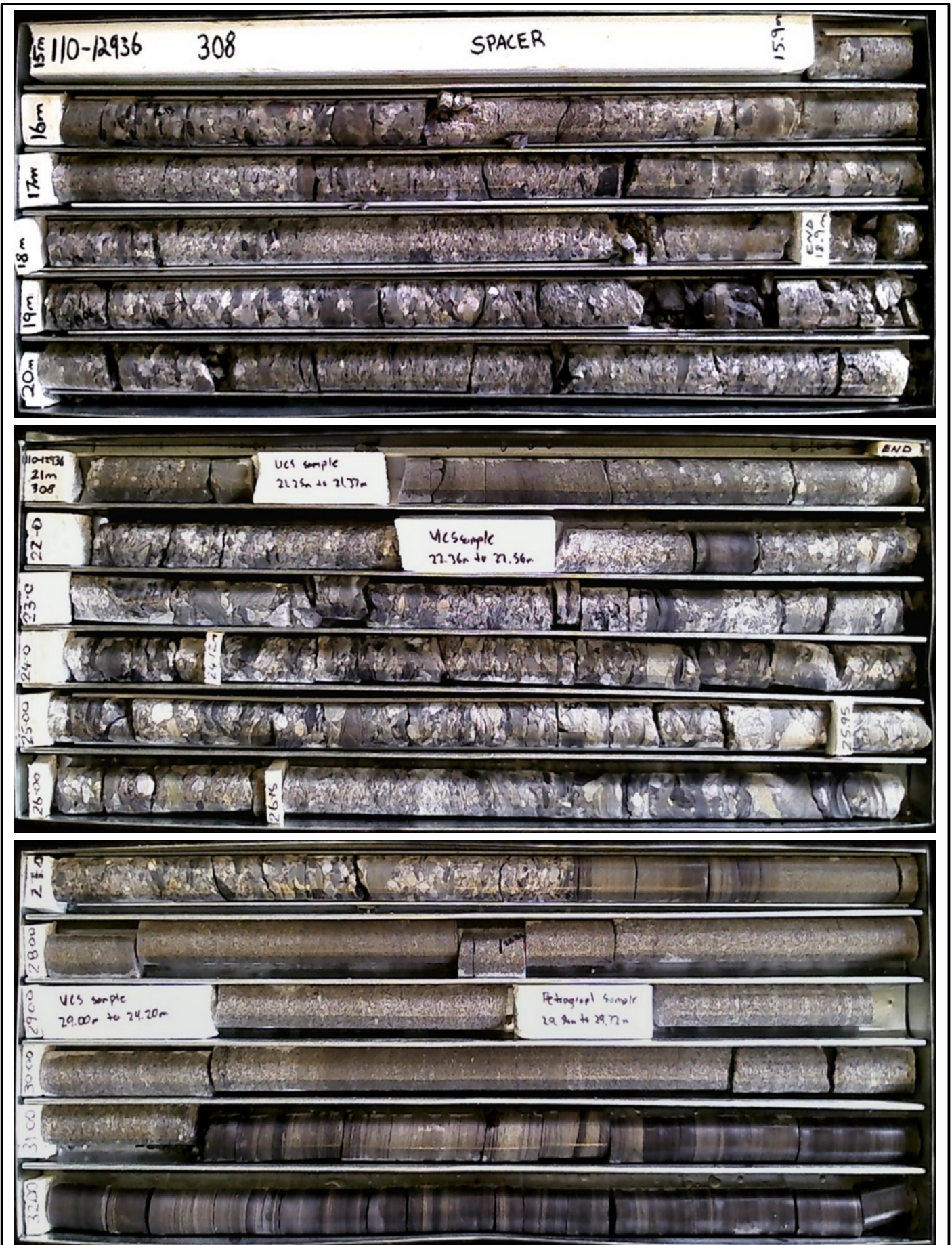
Rock Strength
VW - Very weak
W - Weak
MS - Medium strong
S - Strong
VS - Very strong
ES - Extremely strong

Samples
U50
SPT
Disturbed Sample

Approved: _____
Date: _____

Water First Noted Water Steady Level

SOIL_SURVEYS_00.LIBRARY.GLB.GriCtbl.DG PHOTO CORE PHOTO 4 PER PAGE 111-12936 NEW.GPJ <<DrawingFile>> 26/04/2012 14:47 8.2.856 Developed by Datgsl



TITLE

AECOM
Brisbane
Cross River Rail
Core Photo - BH 308

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 308

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.: 308
Test No.: 1
Date: 6/12/2011

Packer type: Double
Packer pressure: 2250kPa
Gauge pressures measured in: kPa
Tested by: CS

Vertical depth to:
(below river bed)

Top of test section (m):	39.00
Base of test section (m):	41.00
Centre of test section(m):	40.00
Base of casing (m):	38.00
Ground water (m)	TIDAL

Depth of centre of test section (m):	40.00
Length of test section (m):	2.00

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	468.5	469.7	471.5	472.9	Flow (l/min)
	Water Take	0.00	1.20	1.80	1.40	0.293
2nd period	Time (mins)	0	5	10	15	Average
	Gauge Pressure 200	Flow reading	475.6	477.5	478.8	479.9
	Water Take	0.00	1.90	1.30	1.10	0.287
3rd period	Time (mins)	0	5	10	15	Average
	Gauge Pressure 300	Flow reading	480.2	481.1	482.1	483.2
	Water Take	0.00	0.90	1.00	1.10	0.200
4th period	Time (mins)	0	5	10	15	Average
	Gauge Pressure 200	Flow reading	483.2	483.6	484.3	485.0
	Water Take	0.00	0.40	0.70	0.70	0.120
5th period	Time (mins)	0	5	10	15	Average
	Gauge Pressure 100	Flow reading	485.1	485.3	485.6	485.9
	Water Take	0.00	0.00	0.30	0.30	0.040

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	0.293	100.00	10.220	0.000	0.000	50.220	0.298	3.08E-08
2nd	0.287	200.00	20.440	0.000	0.000	60.440	0.242	2.50E-08
3rd	0.200	300.00	30.660	0.000	0.000	70.660	0.145	1.49E-08
4th	0.120	200.00	20.440	0.000	0.000	60.440	0.101	1.05E-08
5th	0.040	100.00	10.220	0.000	0.000	50.220	0.041	4.19E-09

*Where friction loss is assumed to be negligible.

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

IN-SITU PACKER PERMEABILITY TEST RESULT

PROJECT: CRR
PROJECT No.: 110-12936

BH No.: 308
Test No.: 2
Date: 6/12/2011

Packer type: Double
Packer pressure: 2250kPa
Gauge pressures measured in: kPa
Tested by: CS

Vertical depth to:
(below river bed)

Top of test section (m):	29.00
Base of test section (m):	31.50
Centre of test section(m):	30.25
Base of casing (m):	28.00
Ground water (m)	TIDAL

Depth of centre of test section (m):	30.25
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	491.0	493.5	495.0	497.4	Flow (l/min)
	Water Take	0.00	2.50	1.50	2.40	0.427
2nd period	Time (mins)	0	5	10	15	Average
	Gauge Pressure 200	Flow reading	498.0	498.5	498.5	498.5
	Water Take	0.00	0.50	0.00	0.00	0.033
3rd period	Time (mins)	0	5	10	15	Average
	Gauge Pressure 300	Flow reading	498.5	498.6	498.7	498.7
	Water Take	0.00	0.10	0.10	0.00	0.013
4th period	Time (mins)	0	5	10	15	Average
	Gauge Pressure 200	Flow reading	498.8	498.8	498.8	498.8
	Water Take	0.00	0.00	0.00	0.00	0.000
5th period	Time (mins)	0	5	10	15	Average
	Gauge Pressure 100	Flow reading				
	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	0.427	100.00	10.220	0.000	0.000	40.470	0.431	4.69E-08
2nd	0.033	200.00	20.440	0.000	0.000	50.690	0.027	2.93E-09
3rd	0.013	300.00	30.660	0.000	0.000	60.910	0.009	9.74E-10
4th	0.000	200.00	20.440	0.000	0.000	50.690	0.000	0.00E+00
5th	0.000	100.00	10.220	0.000	0.000	40.470	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 in peiod 4 - test ended

IN-SITU PACKER PERMEABILITY TEST RESULT

PROJECT: CRR
PROJECT No.: 110-12936

BH No.: 308
Test No.: 3
Date: 7/12/2011

Packer type: Double
Packer pressure: 2000kPa
Gauge pressures measured in: kPa
Tested by: CS

Vertical depth to:
(below river bed)

Top of test section (m):	19.00
Base of test section (m):	21.50
Centre of test section(m):	20.25
Base of casing (m):	18.00
Ground water (m)	TIDAL

Depth of centre of test section (m):	20.25
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	504.3	504.7	505.6	506.3	Flow (l/min)
	Water Take	0.00	0.40	0.90	0.70	0.133
2nd period	Time (mins)	0	5	10	15	Average
	Gauge Pressure 200	Flow reading	509.4	509.8	511.0	511.9
	Water Take	0.00	0.40	1.20	0.90	0.167
3rd period	Time (mins)	0	5	10	15	Average
	Gauge Pressure 300	Flow reading	513.5	514.4	515.5	516.4
	Water Take	0.00	0.90	1.10	0.90	0.193
4th period	Time (mins)	0	5	10	15	Average
	Gauge Pressure 200	Flow reading	515.5	515.5	516.0	516.3
	Water Take	0.00	0.00	0.50	0.30	0.053
5th period	Time (mins)	0	5	10	15	Average
	Gauge Pressure 100	Flow reading	514.0	514.0	514.0	514.0
	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	0.133	100.00	10.220	0.000	0.000	30.470	0.179	1.95E-08
2nd	0.167	200.00	20.440	0.000	0.000	40.690	0.167	1.82E-08
3rd	0.193	300.00	30.660	0.000	0.000	50.910	0.155	1.69E-08
4th	0.053	200.00	20.440	0.000	0.000	40.690	0.054	5.83E-09
5th	0.000	100.00	10.220	0.000	0.000	30.470	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 in period 4 - test ended