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**GEOTECHNICAL
BOREHOLE LOG**

FOR GEOTECHNICAL TERMS AND
SYMBOLS REFER FORM F:GEOT 017/8-2014

BOREHOLE No **CRR703**

Sheet 1 of 4

REFERENCE No **H12929**

PROJECT	Cross River Rail CRR2017 - Additional Geotechnical Investigation		
LOCATION	Ross Street	COORDINATES	503042.2 E; 6959226.7 N
PROJECT No	FG6470	SURFACE RL	24.74m
		PLUNGE	90°
		DATE STARTED	30/10/2017
		GRID DATUM	MGA94
JOB No		HEIGHT DATUM	AHD
		BEARING	°
		DATE COMPLETED	02/11/2017
		DRILLER	Schneider

DEPTH (m)	R.L. (m)	AUGER CASING WASHBORING CORE DRILLING	RQD (%) CORE REC %	SAMPLE	MATERIAL DESCRIPTION	LITHOLOGY	USCS WEATHERING	INTACT STRENGTH	DEFECT SPACING	ADDITIONAL DATA AND TEST RESULTS	SAMPLES TESTS		
												EH	VH
24.54					ASPHALT (Fill)					0.00m-1.70m: Non destructive drilling.			
23.04					CONGLOMERATE (Rip) XW: Recovered as Sandy Clayey Gravel, orange grey brown, moist, hard.	XW							
21.99			(0)		CORE LOSS								
21.30			28.6 (69)		CONGLOMERATE (Rip) XW: Recovered as Sandy Clayey Gravel, orange grey brown, moist, hard.	XW				3.34m-3.44m: CORE LOSS			
			88 (85)		CONGLOMERATE (Rip) MW: Orange grey, medium to coarse gravel size clasts within fine grained matrix, medium bedded, low to medium strength. -BP: 0°-20° (5/m), Un/Ro, TI-OP, FeSt.	MW				4.14m-4.85m: MW Sandstone band; fine grained, distinctly bedded at 20°.	Is(50)=0.27 MPa Is(50)=0.18 MPa D (3.75m) A (3.76m)		
			100 (82)		TUFF (Rif) HW: Orange grey, fine to medium grained, massive, low to medium strength. Iron stained in parts. Sub angular clasts within fine grained matrix. -Js: 15°-45° (4/m), Pl/Ro, OP, FeSt.	HW					Is(50)=0.24 MPa Is(50)=0.14 MPa D (4.27m) A (4.28m)		
19.13			100 (86)		TUFF (Rif) MW: Orange grey, fine to medium grained, massive, low to medium strength. Iron stained in parts. Sub angular clasts within fine grained matrix. -Js: 30°-45° (1-2/m), Pl/Ro, OP, FeSt. -Js: 5° (1-2/m), Pl/Ro, OP, FeSt.	MW				5.58m-5.60m: XW	Is(50)=0.13 MPa Is(50)=0.17 MPa D (5.00m) A (5.02m)		
18.02			100 (86)		TUFF (Rif) SW: Grey orange, fine to medium grained, massive, generally medium strength. Iron stained in parts. Sub angular clasts within fine grained matrix. -Js: 5°-15° (4-6/m), Pl/Ro, TI-OP, FeSt.	SW				9.57m-9.85m: Healed sub vertical joints with iron staining, along with tight joints at 10°-45°.	Is(50)=0.31 MPa Is(50)=0.28 MPa D (6.85m) A (6.86m)		
16.21			100 (86)		TUFF (Rif) SW: Grey orange, fine to medium grained, massive, generally medium strength. Iron stained in parts. Sub angular clasts within fine grained matrix. -Js: 5°-15° (4-6/m), Pl/Ro, TI-OP, FeSt.	SW					Is(50)=0.09 MPa Is(50)=0.46 MPa UCS=5.25 MPa E=0.699 GPa v= 0.029 Is(50)=0.09 MPa Is(50)=0.29 MPa D (8.25m) A (8.27m) (8.51m) D (8.64m) A (8.65m)		
14.74											Is(50)=0.27 MPa Is(50)=0.80 MPa D (9.78m) A (9.79m)		

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REMARKS: Rip - Aspley Formation. Rif - Brisbane Tuff.

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**GEOTECHNICAL
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BOREHOLE No **CRR703**

Sheet 2 of 4

REFERENCE No **H12929**

PROJECT	Cross River Rail CRR2017 - Additional Geotechnical Investigation		
LOCATION	Ross Street	COORDINATES	503042.2 E; 6959226.7 N
PROJECT No	FG6470	SURFACE RL	24.74m
		PLUNGE	90°
		DATE STARTED	30/10/2017
		GRID DATUM	MGA94
JOB No		HEIGHT DATUM	AHD
		BEARING	°
		DATE COMPLETED	02/11/2017
		DRILLER	Schneider

DEPTH (m)	R.L. (m)	AUGER CASING WASHBORING CORE DRILLING	RQD (%) CORE REC %	SAMPLE	MATERIAL DESCRIPTION	LITHOLOGY	USCS WEATHERING	INTACT STRENGTH	DEFECT SPACING	ADDITIONAL DATA AND TEST RESULTS	SAMPLES TESTS		
												EH	VH
10.10			100 (73)		TUFF (Rif) SW: Cont'd.	SW				Is(50)=0.24 MPa Is(50)=0.41 MPa UCS=14.50 MPa E=1.49 GPa v= 0.16	D (10.10m) A (10.11m) (10.45m)		
11.76						SW		M		Is(50)=0.42 MPa Is(50)=0.16 MPa	D (11.76m) A (11.77m)		
12.92										Is(50)=0.76 MPa Is(50)=0.15 MPa	D (12.92m) A (12.93m)		
13.60	11.14		100 (89)		TUFF (Rif) FR: Pale Grey, fine to medium grained, massive, medium to high strength. Iron stained in parts. Sub angular clasts within fine grained matrix. -Js: 5°-30° (1-2/m), PI/Ro, OP, FeSt. -Js: 35°-55° (1-2/m), PI/Ro, OP, FeSt.				13.60m: Water loss	Is(50)=0.74 MPa Is(50)=1.30 MPa	D (14.53m) A (14.54m)		
16.18			100 (84)			FR				16.18m-16.30m: Brazilian Tensile Strength = 3.24 MPa 16.50m-16.70m: HFZ	D (16.45m) A (16.47m) D (16.78m) A (16.79m)		
17.15										17.15m-17.25m: CAI=0.76			
17.80										Is(50)=0.18 MPa Is(50)=1.10 MPa	D (17.80m) A (17.82m)		
18.70										18.70m-18.82m: Slake Durability Index Test			
19.02			100 (72)							Is(50)=1.20 MPa Is(50)=1.70 MPa UCS=22.60 MPa E=4.42 GPa v= 0.065 Is(50)=1.10 MPa Is(50)=1.20 MPa	D (19.02m) A (19.04m) (19.28m) D (19.55m) A (19.56m)		
19.76	4.74									19.76m-19.86m: CAI=0.48			

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REMARKS: Rip - Aspley Formation. Rif - Brisbane Tuff.

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**GEOTECHNICAL
BOREHOLE LOG**

FOR GEOTECHNICAL TERMS AND
SYMBOLS REFER FORM F:GEOT 017/8-2014

BOREHOLE No **CRR703**

Sheet 3 of 4

REFERENCE No **H12929**

PROJECT	Cross River Rail CRR2017 - Additional Geotechnical Investigation		
LOCATION	Ross Street	COORDINATES 503042.2 E; 6959226.7 N	
PROJECT No	FG6470	SURFACE RL 24.74m	PLUNGE 90°
			DATE STARTED 30/10/2017
			GRID DATUM MGA94
JOB No		HEIGHT DATUM AHD	BEARING °
			DATE COMPLETED 02/11/2017
			DRILLER Schneider

DEPTH (m)	R.L. (m)	AUGER CASING WASHBORING CORE DRILLING	RQD (%) CORE REC %	SAMPLE	MATERIAL DESCRIPTION	LITHOLOGY	USCS WEATHERING	INTACT STRENGTH	DEFECT SPACING	ADDITIONAL DATA AND TEST RESULTS	SAMPLES TESTS	
												EH VH H M L VL EL
21					TUFF (Rif) FR: Cont'd.					20.72m-20.94m: HFZ Is(50)=1.20 MPa Is(50)=1.40 MPa	D (20.64m) A (20.65m)	
22										21.42m-21.68m: HFZ Is(50)=0.19 MPa Is(50)=0.24 MPa	D (21.50m) A (21.51m)	
23			100 (56)							21.88m-21.98m: CAI=1.06		
24										22.30m-22.42m: Brazilian Tensile Strength = 3.13 MPa	Is(50)=1.00 MPa Is(50)=1.70 MPa	D (22.33m) A (22.34m)
25						FR		MH			Is(50)=0.23 MPa Is(50)=2.50 MPa	D (23.57m) A (23.58m)
26			100 (95)							25.80m-26.82m: J, 70°-90°, PI/Ro, TI, Cn.		
27											Is(50)=0.51 MPa Is(50)=0.41 MPa	D (26.64m) A (26.80m)
28			100 (99)								Is(50)=0.85 MPa Is(50)=0.87 MPa	D (28.35m) A (28.36m)
29											Is(50)=0.32 MPa Is(50)=1.10 MPa	D (29.53m) A (29.54m)

Continued on next sheet

REMARKS: Rip - Aspley Formation. Rif - Brisbane Tuff.

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**GEOTECHNICAL
BOREHOLE LOG**

FOR GEOTECHNICAL TERMS AND
SYMBOLS REFER FORM F:GEOT 017/8-2014

BOREHOLE No **CRR703**

Sheet 4 of 4

REFERENCE No **H12929**

PROJECT Cross River Rail CRR2017 - Additional Geotechnical Investigation

LOCATION Ross Street COORDINATES 503042.2 E; 6959226.7 N

PROJECT No FG6470 SURFACE RL 24.74m PLUNGE 90° DATE STARTED 30/10/2017 GRID DATUM MGA94

JOB No _____ HEIGHT DATUM AHD BEARING ° DATE COMPLETED 02/11/2017 DRILLER Schneider

DEPTH (m)	R.L. (m)	FAUGER CASING WASHBORING CORE DRILLING	RQD (%) CORE REC %	SAMPLE	MATERIAL DESCRIPTION	LITHOLOGY	USCS WEATHERING	INTACT STRENGTH	DEFECT SPACING	ADDITIONAL DATA AND TEST RESULTS	SAMPLES TESTS		
												EH	VH
-5.36			100		Borehole completed at 30.10m	FR							
31													
32													
33													
34													
35													
36													
37													
38													
39													

REMARKS: Rip - Aspley Formation. Rif - Brisbane Tuff.

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Project Name	Cross River Rail CRR2017 – Geotechnical Investigation		
Project No.	FG6470	Date	02/11/2017
Borehole No.	CRR703	Reference No.	H12929
Location	Ross Street	Start Depth (m)	1.70
Submitted By	M. de Gee	Finish Depth (m)	30.10



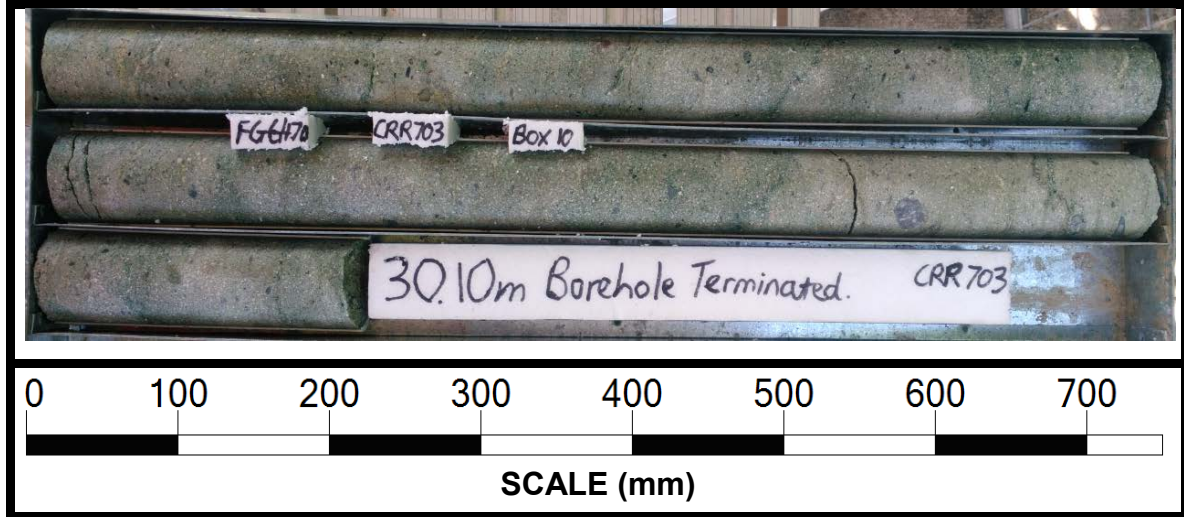
Project Name	Cross River Rail CRR2017 – Geotechnical Investigation		
Project No.	FG6470	Date	02/11/2017
Borehole No.	CRR703	Reference No.	H12929
Location	Ross Street	Start Depth (m)	1.70
Submitted By	M. de Gee	Finish Depth (m)	30.10



Project Name	Cross River Rail CRR2017 – Geotechnical Investigation		
Project No.	FG6470	Date	02/11/2017
Borehole No.	CRR703	Reference No.	H12929
Location	Ross Street	Start Depth (m)	1.70
Submitted By	M. de Gee	Finish Depth (m)	30.10



Project Name	Cross River Rail CRR2017 – Geotechnical Investigation		
Project No.	FG6470	Date	02/11/2017
Borehole No.	CRR703	Reference No.	H12929
Location	Ross Street	Start Depth (m)	1.70
Submitted By	M. de Gee	Finish Depth (m)	30.10



Detailed Discontinuity Description Log



This form is intended for the detailed description of discontinuities and defects as measured in outcrop by line mapping, or as they occur downhole in drilled rock core. The descriptions and abbreviations used shall be in accordance with Australian Standard AS1726-1993 Geotechnical site investigations and TMR Geotechnical Terms and Symbols Form F:GEOT017/8.

Project Name		Cross River Rail				Project No.		FG6470	
Site ID / Borehole No.		CRR703				Surface RL		24.71	
Geologist		H.A.				Date		30.10.17	
						Page		1	of 3
Traverse Chainage; or Down hole depth (rock core)	Type LP / BP / FP / J etc.	Dip ° / Dip Direction °; or Angle ° from horizontal (rock core)	Planarity Stp / Un / PI	Roughness Ro / Sm / SI	Roughness Class I to IX	Aperture CD / OP / FL / TI	Infilling Cn / St / Vr / Ct ¹	Zones ¹ SZ / CZ / HFZ / AZ	Other
1.70 - 12.75		CORE LOSS							
2.75	J	45	Un	Ro	IV	OP	St	HFZ	Fe
2.87	J	10	Un	Ro	IV	OP	St	HFZ	Fe
2.95	J	5	PI	Ro	VII	OP	St	HFZ	Fe
3.00	J	5	PI	Ro	VII	OP	St	HFZ	Fe
3.10	J	15	PI	Ro	VII	OP	St	HFZ	Fe
3.12	J	5	PI	Ro	VII	OP	St	HFZ	Fe
3.20	J	30	PI	Ro	VII	OP	St	HFZ	Fe
3.34 - 3.44		CORE LOSS							
3.53	J	10	PI	Ro	VII	TI	St		Fe
3.75	J	15	PI	Ro	VII	TI	St		Fe
3.90	J	15	Un	Ro	IV	OP	St		Fe
4.15	J	30	PI	Ro	VII	OP	St		Fe
4.32	J	20	PI	Ro	VII	OP	St		Fe
4.59	J	10	PI	Ro	VII	OP	St		Fe
4.81	J	10	PI	Ro	VII	OP	St		Fe
4.88	J	5	PI	Ro	VII	TI	St		Fe
5.41	J	30	PI	Ro	VII	OP	St		Fe
5.56	J	20	PI	Ro	VII	OP	St		Fe
5.62	J	45	PI	Ro	VII	OP	St		Fe
5.84	J	15	PI	Ro	VII	OP	St		Fe
5.93	J	20	PI	Ro	VII	OP	St		Fe
6.72	J	45	PI	Ro	VII	OP	St		Fe
7.14	J	30	PI	Ro	VII	OP	St		Fe
7.68	J	40	PI	Ro	VII	OP	St		Fe
7.99	J	5	PI	Ro	VII	OP	St		Fe
8.44	J	5	PI	Ro	VII	OP	St		Fe
8.60	J	5	PI	Ro	VII	OP	St		Fe
8.79	J	5	PI	Ro	VII	OP	St		Fe
8.97	J	15	PI	Ro	VII	OP	St		Fe
9.14	J	40	PI	Ro	VII	OP	St		Fe

Note: 1. Describe zones and coatings in terms of composition and thickness (mm)

F:GEOT 533/9 – 2014

Detailed Discontinuity Description Log



This form is intended for the detailed description of discontinuities and defects as measured in outcrop by line mapping, or as they occur downhole in drilled rock core. The descriptions and abbreviations used shall be in accordance with Australian Standard AS1726-1993 Geotechnical site investigations and TMR Geotechnical Terms and Symbols Form F:GEOT017/8.

Project Name		Cross River Rail				Project No. FG6470			
Site ID / Borehole No.		CRR703				Surface RL 24.71			
Geologist		H.A.				Date 30.10.17			
						Page 2		of 3	3
Traverse Chainage; or Down hole depth (rock core)	Type LP / BP / FP / J etc.	Dip ° / Dip Direction °; or Angle ° from horizontal (rock core)	Planarity Stp / Un / Pl	Roughness Ro / Sm / Sl	Roughness Class I to IX	Aperture CD / OP / FL / TI	Infilling Cn / St / Vr / Ct ¹	Zones ¹ SZ / CZ / HFZ / AZ	Other
9.30	J	10	Pl	Ro	VII	OP	St		Fe
9.35	J	9	Pl	Ro	VII	OP	St		Fe
9.44	J	5	Pl	Ro	VII	OP	St		Fe
9.83	J	10	Pl	Ro	VII	TI	St		Fe
10.63	J	15	Pl	Ro	VII	OP	Cn		
11.26	J	5	Pl	Ro	VII	TI	St		Fe
11.32	J	15	Pl	Ro	VII	OP	St		Fe
11.43	J	30	Pl	Ro	VII	OP	St		Fe
11.52	J	5	Pl	Ro	VII	TI	St		Fe
11.95	J	95	Pl	Ro	VII	TI	Cn		
12.19	J	25	Pl	Ro	VII	OP	Cn		
12.30	J	20	St	Ro	I	OP	Cn		
13.05	J	50	Pl	Ro	VII	OP	Cn		
13.27	J	45	Pl	Ro	VII	OP	Cn		
13.43	J	25	Pl	Ro	VII	OP	Cn		
13.46	J	90	Pl	Ro	VII	OP	Cn		
13.99	J	85	Pl	Ro	VII	OP	Cn		
14.04	J	110	Pl	Ro	VII	OP	Cn		
14.35	J	10	Pl	Ro	VII	OP	Cn		
15.45	J	30	Pl	Ro	VII	OP	Cn		
15.94	J	25	Pl	Ro	VII	OP	Cn		
16.11	J	15	Pl	Ro	VII	OP	Cn		
16.84	BP	10	Pl	Ro	VII	OP	Cn		
17.08	J	15	Pl	Ro	VII	OP	Cn		
17.58	J	50	Pl	Ro	VII	OP	Cn		
19.10	J	5	Pl	Ro	VII	OP	Cn		
19.81	J	5	Pl	Ro	VII	OP	Cn		
19.92	J	9	Pl	Ro	VII	OP	Cn		
20.73	J	15	Pl	Ro	VII	OP	Cn		
20.83	J	55	Pl	Ro	VII	OP	Cn		
21.02	J	30	Pl	Ro	VII	TI	Cn		

Note: 1. Describe zones and coatings in terms of composition and thickness (mm)

F:GEOT 533/9 – 2014

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Project Name		Cross River Rail				Project No. FG6470			
Site ID / Borehole No.		CRR703				Surface RL 24.71			
Geologist		H.A.				Date 30.10.17			
						Page 3		of 3	
Traverse Chainage; or Down hole depth (rock core)	Type LP / BP / FP / J etc.	Dip ° / Dip Direction °; or Angle ° from horizontal (rock core)	Planarity Stp / Un / Pl	Roughness Ro / Sm / Sl	Roughness Class I to IX	Aperture CD / OP / FL / TI	Infilling Cn / St / Vr / Ct ¹	Zones ¹	
								SZ / CZ / HFZ / AZ	Other
21.10	J	10	Pl	Ro	VII	OP	Cn		
21.34	J	45	Pl	Ro	VII	OP	Cn		
21.45	J	10	Pl	Ro	VII	OP	Cn		
21.48	J	40	Pl	Ro	VII	OP	Cn		
21.56	J	55	Pl	Ro	VII	OP	Cn		
21.60	J	60	Pl	Ro	VII	OP	Cn		
22.51	J	35	Pl	Ro	VII	OP	Cn		
22.66	J	10	Pl	Ro	VII	OP	Cn		
22.87	J	90	Pl	Ro	VII	OP	Cn		
23.12	J	80	Pl	Ro	VII	OP	Cn		
23.26	J	50	Pl	Ro	VII	OP	Cn		
23.66	J	10	Pl	Ro	VII	OP	Cn		
23.83	J	40	Pl	Ro	VII	OP	Cn		
23.86	J	45	Pl	Ro	VII	OP	Cn		
24.37	J	4	Pl	Ro	VII	OP	Cn		
24.48	J	45	Pl	Ro	VII	OP	Cn		
24.55	J	45	Pl	Ro	VII	OP	Cn		
24.71	J	50	Pl	Ro	VII	OP	Cn		
25.29	J	50	Pl	Ro	VII	TI	Cn		
25.47	J	45	Pl	Ro	VII	OP	Cn		
26.00	J	90	Pl	Ro	VII	TI	Cn		
26.48	J	50	St	Ro	I	TI	Cn		
27.06	J	100	Pl	Ro	VII	TI	Cn		
27.28	J	45	Pl	Ro	VII	TI	Cn		
29.19	J	10	Pl	Ro	VII	OP	Cn		
29.69	J	5	Pl	Ro	VII	OP	Cn		

Note: 1. Describe zones and coatings in terms of composition and thickness (mm)

F:GEOT 533/9 – 2014