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GEOTECHNICAL
BOREHOLE LOG

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

BOREHOLE No **CRR725**

Sheet 1 of 2

REFERENCE No **H12951**

PROJECT	Cross River Rail CRR2017 - Additional Geotechnical Investigation				
LOCATION	QR Land			COORDINATES 501867.0 E; 6962874.5 N	
PROJECT No	FG6470	SURFACE RL	26.08m	PLUNGE	90°
				DATE STARTED	07/09/2017
				GRID DATUM	MGA94
JOB No		HEIGHT DATUM	AHD	BEARING	°
				DATE COMPLETED	11/09/2017
				DRILLER	Geodrill

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
					COBBLES with Gravel and Sandy Clay (Fill)					0.00m-0.85m: Non destructive drilling.	
1	24.78			A							1, 2, 3 N=5 SPT
2					ARGILLITE (DCf) XW: Recovered as Gravelly CLAY (CL). Orange brown and brown, moist, firm. Low to medium plasticity.						
3				B	From 2.5m: Becoming stiff.		XW				3, 4, 7 N=11 SPT
4	22.08			C	ARGILLITE (DCf) MW: Grey with orange brown, fine grained, foliated, medium to high strength.		HW				2/0mm hb SPT
5			(64)		With frequent quartz veins up to 10mm thick, some crenulated.		MW	H	VC	4.73m-4.75m: XW Clay	
			100 (27)		-FP: 20°-40° (5-6/m), Pl-Un/Ro, TI, Cn with some Cly Vr and FeSt		SW	H	C	Is(50)=1.10 MPa Is(50)=1.70 MPa	D (5.00m) A (5.01m)
6			100 (46)		-Js: 70°-80° (<1/m), Pl/Ro, TI-OP, FeSt with some Cly Vr		MW		C	Is(50)=0.17 MPa Is(50)=0.76 MPa	D (5.44m) A (5.46m)
					-Js: 5°-10° (1-2/m), Pl/Ro, TI, FeSt		SW		VC	5.75m-5.90m: Very closely spaced Js, cly Cts and Qz VNs <10mm.	
7							SW	M	C	6.39m: CAI=1.5	Is(50)=0.22 MPa Is(50)=0.30 MPa D (6.50m) A (6.52m)
8							HW		VC	7.80m-7.83m: XW, gravelly clay. 7.91m-7.93m: XW, gravelly clay.	Is(50)=0.05 MPa Is(50)=0.36 MPa D (7.76m) A (7.77m)
9	16.71		100 (56)				MW	M	VC	8.35m-8.42m: XW, sandy clay. 8.50m-8.70m: BZ	Is(50)=0.36 MPa Is(50)=2.50 MPa D (8.80m) A (8.81m)
	16.08				ARGILLITE (DCf) FR: Grey, fine grained, foliated, medium to high strength. (see over)		SW		C	9.25m-9.37m: Very closely spaced Qz VNs.	Is(50)=0.41 MPa Is(50)=1.40 MPa D (9.40m) A (9.41m)
										9.82m: CAI=269	

Continued on next sheet

REMARKS: CAI = Average Cerchar abrasivity index (HRC=55). DCf - Neranleigh Fernvale Beds. Standpipe piezometer installed.	LOGGED BY	REVIEWED BY
	GP	S. Foley



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GEOTECHNICAL BOREHOLE LOG

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

BOREHOLE No **CRR725**

Sheet 2 of 2

REFERENCE No **H12951**

PROJECT **Cross River Rail CRR2017 - Additional Geotechnical Investigation**

LOCATION **QR Land**

COORDINATES **501867.0 E; 6962874.5 N**

PROJECT No **FG6470**

SURFACE RL **26.08m**

PLUNGE **90°**

DATE STARTED **07/09/2017**

GRID DATUM **MGA94**

JOB No

HEIGHT DATUM **AHD**

BEARING °

DATE COMPLETED **11/09/2017**

DRILLER **Geodrill**

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																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
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11			100 (70)		ARGILLITE (DCf) FR: Cont'd. With very closely spaced quartz veins, crenulated in parts. -FP: 40°-60° (6/m), Pl/Ro, TI-OP, Cn -Js: 5°-10° (4/m), Pl/Ro, TI, Cn																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												

REMARKS: CAI = Average Cerchar abrasivity index (HRC=55). DCf - Neranleigh Fernvale Beds.
Standpipe piezometer installed.

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STANDPIPE INSTALLATION LOG

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

BOREHOLE No **CRR725**

Sheet 1 of 2

PIEZOMETER No **CRR725**

PROJECT	Cross River Rail CRR2017 - Additional Geotechnical Investigation					
LOCATION	QR Land			COORDINATES 501867.0 E; 6962874.5 N		
PROJECT No	FG6470	SURFACE RL	26.08m	PLUNGE	90°	DATE STARTED 07/09/2017
JOB No		HEIGHT DATUM	AHD	BEARING	°	DATE COMPLETED 11/09/2017
						GRID DATUM MGA94
						DRILLER Geodrill

DEPTH (m)	R.L. (m)	LITHOLOGY	MATERIAL DESCRIPTION	Standpipe Construction Details		
				Depth (m) / RL (AHD)	50mm PVC Class No. 18 Stick Up = 0.00m	Backfill Details
1	24.78		COBBLES with Gravel and Sandy Clay(Fill)			
2			ARGILLITE Recovered as Gravelly CLAY (CL). Orange brown and brown, moist, firm. Low to medium plasticity.			
3			From 2.5m: Becoming stiff.			
4	22.08		ARGILLITE Grey with orange brown, fine grained, foliated, medium to high strength. With frequent quartz veins up to 10mm thick, some crenulated. -FP: 20°-40° (5-6/m), Pl-Un/Ro, TI, Cn with some Cly Vr and FeSt -Js: 70°-80° (<1/m), Pl/Ro, TI-OP, FeSt with some Cly Vr -Js: 5°-10° (1-2/m), Pl/Ro, TI, FeSt			
5						Grout: Cement / Bentonite mix
6						
7						
8						
9	16.71		ARGILLITE Grey, fine grained, foliated, medium to high strength. (see over)			
	16.08					

Continued on next sheet

REMARKS: CAI = Average Cerchar abrasivity index (HRC=55). DCF - Neranleigh Fernvale Beds. Standpipe piezometer installed.

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STANDPIPE INSTALLATION LOG

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

BOREHOLE No **CRR725**

Sheet 2 of 2

PIEZOMETER No **CRR725**

PROJECT	Cross River Rail CRR2017 - Additional Geotechnical Investigation					
LOCATION	QR Land			COORDINATES 501867.0 E; 6962874.5 N		
PROJECT No	FG6470	SURFACE RL	26.08m	PLUNGE	90°	DATE STARTED 07/09/2017
JOB No		HEIGHT DATUM	AHD	BEARING	°	DATE COMPLETED 11/09/2017
						GRID DATUM MGA94
						DRILLER Geodrill

DEPTH (m)	R.L. (m)	LITHOLOGY	MATERIAL DESCRIPTION	Standpipe Construction Details		
				Depth (m) / RL (AHD)	50mm PVC Class No. 18 Stick Up = 0.00m	Backfill Details
11			ARGILLITE Cont'd. With very closely spaced quartz veins, crenulated in parts. -FP: 40°-60° (6/m), Pl/Ro, TI-OP, Cn -Js: 5°-10° (4/m), Pl/Ro, TI, Cn			
12				12.20m / 13.88 AHD		
13				13.20m / 12.88 AHD		Bentonite Seal Top of Slotted Pipe
14						
15						
16						
17						
18						
19	6.88			19.20m / 6.88 AHD		Filter: Washed / Graded Sand
			Borehole completed at 19.20m			

REMARKS: CAI = Average Cerchar abrasivity index (HRC=55). DCF - Neranleigh Fernvale Beds. Standpipe piezometer installed.

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REVIEWED BY

GP

S. Foley

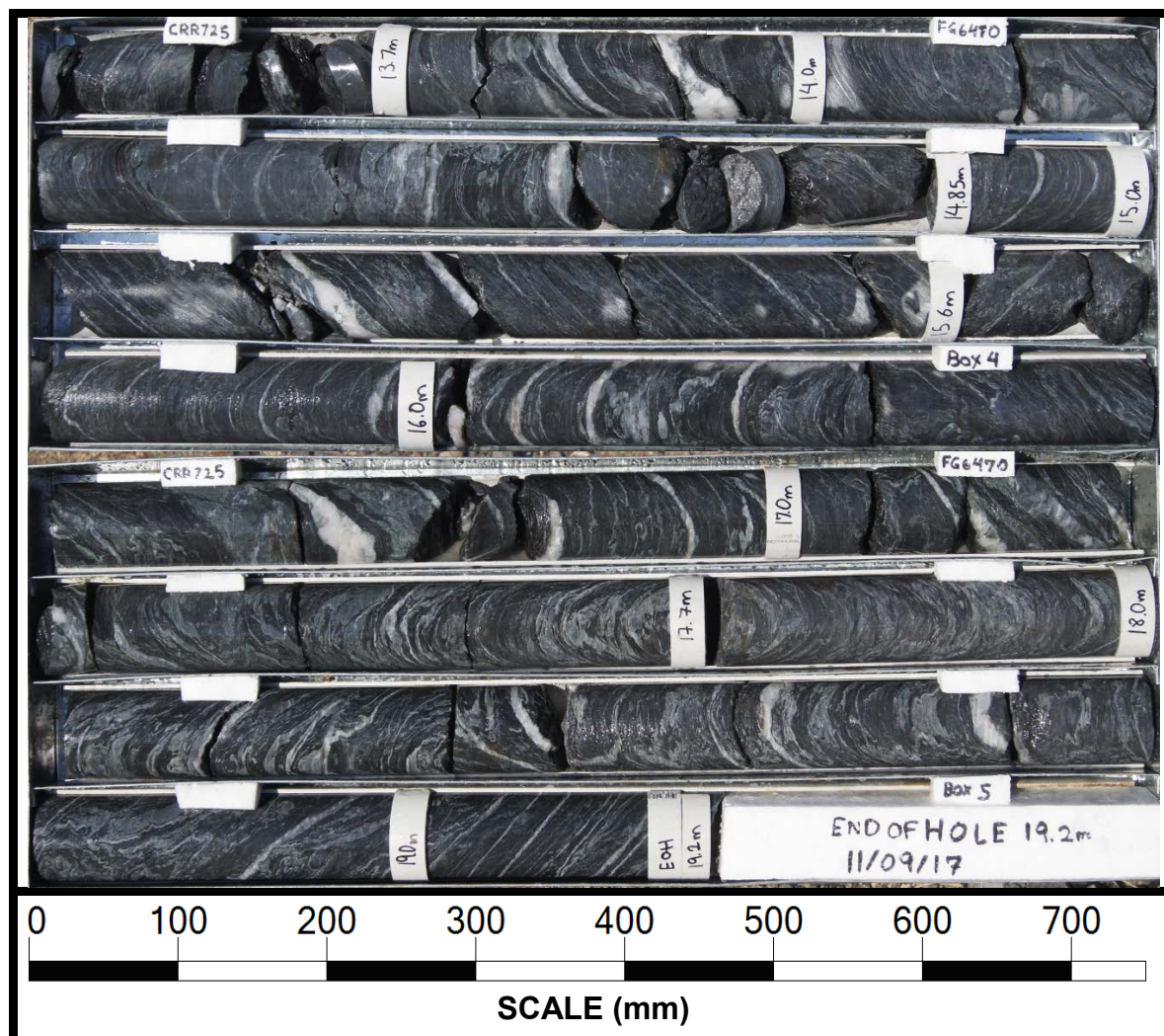
CORE PHOTO LOG
DEPARTMENT OF TRANSPORT AND MAIN ROADS
GEOTECHNICAL SECTION

Project Name	Cross River Rail CRR2017 – Geotechnical Investigation		
Project No.	FG6470	Date	11/09/2017
Borehole No.	CRR725	Reference No.	H12951
Location	QR land	Start Depth (m)	4.50
Submitted By	M. de Gee	Finish Depth (m)	19.20



CORE PHOTO LOG
DEPARTMENT OF TRANSPORT AND MAIN ROADS
GEOTECHNICAL SECTION

Project Name	Cross River Rail CRR2017 – Geotechnical Investigation		
Project No.	FG6470	Date	11/09/2017
Borehole No.	CRR725	Reference No.	H12951
Location	QR land	Start Depth (m)	4.50
Submitted By	M. de Gee	Finish Depth (m)	19.20



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.		CRR725				Surface RL		26.08	
Geologist		G.P.				Date		11/09/2017	
						Page		1	of
									4
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 / SI	Roughness Class I to IX	Aperture CD / OP / FL / TI	Infilling Cn / St / Vr / Ct ¹	Zones ¹ SZ / CZ / HFZ / AZ	Other
4.54	FP	50	Un	Ro	IV	OP	Cn		
4.59	J	0	Un	Ro	IV	OP	Cn		
4.62	J	10	Un	Ro	IV	FL	Cly		
4.66	J	10	Un	Ro	IV	OP	Cn		
4.70	J	0	Un	Ro	IV	OP	Cn		
4.70-4.86	FP	60	Stp	Ro	I	OP / FL	Cly	HFZ	
5.00	J	0	Un	Ro	IV	FL	Ct		Cly, Qz
5.20	FP	20	Un	Ro	IV	OP	Cn		
5.20-5.27	J	70	St	Ro	I	FL	Ct		Qz VN, Cly
5.35	J	80	Un	Ro	IV	OP	Cn		
5.44	J	5	Un	Ro	IV	OP	Cn		
5.49	J	85	Un	Ro	IV	OP	Cn		
5.54	J	5	Un	Ro	IV	OP	Cn		
5.58	J	0	Stp	Ro	I	CD	Cn		
5.66	FP	5	Stp	Ro	I	FL	Ct	SZ	Cly
5.70	Handling Break								
5.72-5.79	J	25	Un	Ro	IV	OP	Cn		
5.78	J	0	Un	Ro	IV	OP	Cn		
5.85	J	0	Un	Ro	IV	OP	Cn		
6.08	FP	10	Un	Ro	IV	CD	Cn		
6.14	FP	10	Un	Ro	IV	CD	Cn		
6.17	FP	20-70	Un	Ro	IV	OP	Cn		30mm
6.26	J	0	Pl	Ro	VII	OP	Cn		
6.30	FP	80	Stp	Ro	I	OP	Cn		
6.40	FP	80	Un	Ro	IV	CD	Cn		
6.49	FP	80	Un	Ro	IV	CD	Cn		
6.58	J	15	Un	Ro	IV	CD	Cn		
6.64	J	0	Un	Ro	IV	OP	St		
6.68	J	70	Stp	Ro	I	OP	St		
6.75	J	0	Stp	Ro	I	OP	Cn		
6.84	FP	75	Un	Ro	IV	CD	Cn		

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

F:GEOT 533/9 – 2014

Detailed Discontinuity Description Log

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Project Name		Cross River Rail				Project No.		FG6470	
Site ID / Borehole No.		CRR725				Surface RL		26.08	
Geologist		G.P.				Date		11/09/2017	
						Page		2 of 4	
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 / SI	Roughness Class I to IX	Aperture CD / OP / FL / TI	Infilling Cn / St / Vr / Ct ¹	Zones ¹ SZ / CZ / HFZ / AZ	Other
6.90	FP	80	Un	Ro	IV	OP	Cn		
7.20	FP	0	Stp	Ro	I	CD	Cn		
7.39	FP	0	Un	Ro	IV	CD	Cn		
7.44	Handling Break								
7.57	FP	0	Pl	Ro	VII	CD	Cn		
7.74	FP	5	Un	Ro	IV	CD	Cn		
7.77	FP	0	Un	Ro	IV	CD	Cn		
7.94	FP	20	Un	Ro	IV	FL	Ct		
8.08	J	85	Un	Ro	IV	CD	Cn		
8.16	J	5	Stp	Ro	I	CD	Cn		
8.33	FP	10	Stp	Ro	I	OP	Cn		
8.39	J	20	Un	Ro	IV	FL	Ct		
8.43-8.50	J	75	Pl	Ro	VII	OP	Cn		
8.50	FP	5	Un	Ro	IV	OP	Cn		
8.50-8.70	FP	-	IR	Ro	I	OP	St	BZ	
8.76	FP	20	Un	Ro	IV	OP	Cn		
8.82	J	0	Un	Ro	IV	OP	Vr		Qz VN
8.93	FP	10	Un	Ro	IV	OP	St		
9.02	FP	0	Un	Ro	IV	OP	St		
9.05	FP	0	Un	Ro	IV	OP	St		
9.05-9.10	J	45	Pl	Ro	VII	OP	St		
9.15	FP	10	Stp	Ro	I	OP	St		
9.19	FP	10	Un	Ro	IV	CD	St		
9.25	J	0	Un	Ro	IV	CD	Cn		
9.27	FP	5	Stp	Ro	I	OP	Cn		
9.36	J	10	Un	Ro	IV	OP	Cn		
9.48	FP	0	Un	Ro	IV	OP	Cn		
9.61	FP	20	Un	Ro	IV	OP	St		
9.69	FP	25	Un	Ro	IV	OP	Cn		
9.94	J	85	Un	Ro	IV	OP	Cn		
10.00	FP	10	Un	Ro	IV	OP	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.		CRR725				Surface RL		26.08	
Geologist		G.P.				Date		11/09/2017	
						Page		3 of 4	
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 / SI	Roughness Class I to IX	Aperture CD / OP / FL / TI	Infilling Cn / St / Vr / Ct ¹	Zones ¹ SZ / CZ / HFZ / AZ	Other
12.76	FP	70	Un	Ro	IV	OP	Cn		
12.87	FP	70	Un	Ro	IV	OP	Cn		
13.02	FP	70	Un	Ro	IV	OP	Cn		
13.06	J	0	Stp	Ro	I	OP	Cn		
13.10	FP	45	Un	Ro	IV	OP	Cn		
13.17	DI								
13.30	J	0	Stp	Ro	I	OP	Cn		
13.37-13.73	DI								
13.79	J	5	Stp	Ro	I	OP	Cn		
13.92	FP	70	Un	Ro	IV	FL	Vr		VN 20mm
14.15	J	0	Stp	Ro	I	OP	Cn		
14.30	FP	55	Un	Sm	V	OP	Cn		
14.45	J	0	Stp	Ro	I	OP	Cn		
14.60-14.85	DI								
15.15	FP	60	Stp	Ro	I	OP	Cn	BZ	VN 30mm
15.29	FP	60	Stp	Ro	I	OP	Cn		
15.40	J	75	Un	Ro	IV	OP	Cn		
15.57	J	75	Un	Ro	IV	OP	Cn		
15.60	DI								
15.70	DI								
16.02	FP	80	Un	Ro	IV	OP	Cn		
16.30	J	0	Un	Ro	IV	OP	Cn		
16.66	FP	85	Un	Ro	IV	OP	Cn		
16.76	FP	80	Stp	Ro	I	OP	Cn		70mm
17.04	J	0	Un	Ro	IV	OP	Cn		
17.11	J	0	Un	Ro	IV	OP	Cn		
17.29	DI								
17.31	FP	60	Un	Ro	IV	OP	Cn		
17.43	J	85	Un	Ro	IV	OP	Cn		
17.55	FP	0	Un	Ro	IV	OP	Cn		
17.70	DI								

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.		CRR725				Surface RL		26.08		
Geologist		G.P.				Date		11/09/2017		
						Page		4	of	4
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	
18.10	FP	20	Un	Ro	IV	OP	Cn			
18.26	J	0	Un	Ro	IV	OP	Cn			
18.34	J	85	Un	Ro	IV	OP	Cn			
18.46	FP	65	Un	Ro	IV	OP	Cn			
18.64	J	85	Stp	Ro	I	OP	Cn			

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

F:GEOT 533/9 – 2014