FINAL 11/12/2018

Queensland Government

GEOTECHNICAL BOREHOLE LOG

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

BOREHOLE No **CRR932**

Sheet 1 of 2

REFERENCE No **H13053**

PROJECT Cross River Rail (CRR) Project - Additional Geotechnical Investigation

LOCATION QR, Grafton St, Windsor — COORDINATES 503874.0 E; 6965668.5 N

PROJECT No FG6470 — SURFACE RL 6.03m — PLUNGE 90° — DATE STARTED 28/05/2018 — GRID DATUM MGA94

JOB No — HEIGHT DATUM AHD — BEARING ° — DATE COMPLETED 29/05/2018 — DRILLER Geodrill

DEPTH (m)	R.L. (m)	AUGER / CASING / WASH BORING / CORE DRILLING	RQD ( ) % / CORE REC %	SAMPLE	MATERIAL DESCRIPTION	LITHOLOGY	USCS WEATHERING	INTACT STRENGTH (EH VH H M L VL EL)	DEFECT SPACING (EC VC C M W VW EW)	ADDITIONAL DATA AND TEST RESULTS	SAMPLES TESTS
0	5.53				Clayey GRAVEL with Cobbles (Fill) Brown, moist, dense, medium to coarse, angular gravel. Medium to high plasticity. Some angular cobbles.		(GC)			0.00m-2.10m: NDD to 2.1m	
1					Sandy GRAVEL with Clay (Fill) Dark grey, mottled pale grey, dry, loose, fine to coarse angular to sub-angular gravel. Medium to coarse grained sand. Some high plasticity fines. Anthropogenic material throughout (ash, ceramic).						
2							(GP-GM)				
3											
4	2.03				CLAY (Alluvium) Grey, mottled pale brown, moist, firm, high plasticity.						
5				A			(CH)			LL=70% PI= 40% MC=51.9% LS= 18% DD= 1 t/m3 WD= 1.51 t/m3	U50
6				C						hw, hw, 3 N=3	SPT
7	-0.47				TUFF (Rif) XW: Recovered as Gravelly CLAY. Brown, pale red, mottled pale grey, moist, hard, high plasticity. Fine to coarse sub-angular gravel. Trace fine to coarse grained sand.		XW		VC	7.08m-7.11m: XW Band 7.21m-7.26m: XW Band 7.26m-7.35m: HW 7.35m-7.40m: XW Band	SPT hb
	-1.01		(17)	B							
8			100 (39)		TUFF (Rif) MW: Pale red, mottled pale grey and pale brown, fine grained, fine to medium, subrounded clasts within clayey matrix, high strength, some iron staining, massive. Js: 0-20°, (4-6/m), Un/Sm, OP-TI-CD, FeSt, some Vn Cly		MW		MH H	7.79m-7.82m: HW	Is(50)=2.60 MPa Is(50)=1.80 MPa D (8.04m) A (8.10m)
			100 (61)							8.54m-8.56m: XW Band	
9							SW		H		Is(50)=0.56 MPa Is(50)=1.30 MPa D (8.78m) A (8.90m)
							MW		H		UCS=15.50 MPa E=2.11 GPa (9.41m)
	-3.97										

Continued on next sheet

REMARKS: Rif - Brisbane Tuff. Standpipe piezometer installed.

LOGGED BY	REVIEWED BY
ND	S.Foley

Queensland Government

GEOTECHNICAL BOREHOLE LOG

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

BOREHOLE No **CRR932**

Sheet 2 of 2

REFERENCE No **H13053**

PROJECT Cross River Rail (CRR) Project - Additional Geotechnical Investigation

LOCATION QR, Grafton St, Windsor — COORDINATES 503874.0 E; 6965668.5 N

PROJECT No FG6470 — SURFACE RL 6.03m — PLUNGE 90° — DATE STARTED 28/05/2018 — GRID DATUM MGA94

JOB No — HEIGHT DATUM AHD — BEARING ° — DATE COMPLETED 29/05/2018 — DRILLER Geodrill

DEPTH (m)	R.L. (m)	AUGER / CASING / WASH BORING / CORE DRILLING	RQD ( ) % / CORE REC %	SAMPLE	MATERIAL DESCRIPTION	LITHOLOGY	USCS WEATHERING	INTACT STRENGTH (EH VH H M J VL EL)	DEFECT SPACING (EC VC C M W VW EW)	ADDITIONAL DATA AND TEST RESULTS	SAMPLES TESTS
11			100 (60)		TUFF (Rif) MW: Cont'd		MW	MH, H, MH		UCS=16.30 MPa E=2.25 GPa Is(50)=0.35 MPa Is(50)=0.78 MPa	(11.03m) D (11.29m) A (11.30m)
12							SW	H	C		
13							MW	MH		Is(50)=0.40 MPa Is(50)=0.94 MPa	D (13.38m) A (13.41m)
	-7.76		100		Borehole completed at 13.79m			LM			
14											
15											
16											
17											
18											
19											

REMARKS: Rif - Brisbane Tuff. Standpipe piezometer installed.

LOGGED BY	REVIEWED BY
ND	S.Foley

Detailed Discontinuity Description Log

Queensland Government

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 - Stage 2**	**Project No.**	**FG6470**		
Site ID / Borehole No.	**CRR932**	**Surface RL**	**6.03**		
Geologist	**Nick Dewar**	**Date**	**29/05/2018**		
		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 / Pl	Roughness Ro / Sm / Sl	Roughness Class I to IX	Aperture CD / OP / FL / Tl	Infilling Cn / St / Vr / Ct [1]	Zones [1] SZ / CZ / HFZ / AZ	Other
7.08	J	5	Un	Ro	IV	OP	St		Fe
7.14	J	5	Un	Sm	V	OP	St		Fe
7.18	J	10	Un	Sm	V	OP	St		Fe
7.21	J	0	Un	Sm	V	OP	St		Fe
7.28	J	50	Un	Sm	V	OP	Cn		
7.35	J	40	Un	Sm	V	OP	Cn		Cly
7.41	J	80	Un	Sm	V	OP	St		Fe
7.42	J	10	Un	Sm	V	OP	St		Fe
7.56	J	5	Un	Sm	V	OP	St		Fe
7.62	J	5	Un	Sm	V	CD	St		Fe
7.80	J	20	Un	Sm	V	OP	Cn		
8.01	J	5	Un	Sm	V	OP	Vr		Cly
8.06	J	10	Un	Sm	V	OP	St		Fe
8.14	J	15	Un	Sm	V	FL	Ct/St	Cly(15mm)/Fe	
8.19	J	70	Un	Sm	V	OP	St	Fe, J: 8.19-8.44m	
8.34	J	10	Un	Sm	V	OP	Cn		
8.40	J	10	Un	Sm	V	OP	Cn		
8.55	J	5	Un	Sm	V	FL	Ct/St		Cly/Fe
8.64	J	10	Un	Sm	V	FL	Ct/St		Cly/Fe
8.73	J	10	Un	Sm	V	OP	St		Fe
8.81	J	5	Un	Sm	V	OP	Cn		
8.97	J	20	Un	Sm	V	FL	Ct		Cly
9.05	J	30	Un	Sm	V	OP	Cn		
9.13	J	20	Un	Sm	V	OP	St		Minor Fe
9.31	J	20	Un	Sm	V	OP	St		Fe
9.34	J	10	Un	Sm	V	TI			
9.40	J	5	Un	Sm	V	OP	St		Minor Fe
9.40	J	0-15	Un			CD	St	Fe, J: 9.4-9.65m	
9.67	J	10	Stp	Sm	II	OP	St		Fe
9.85	J	5	Stp	Sm	II	OP	St		Fe
9.88	J	10	Un	Sm	V	FL			Cly

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

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Project Name	**Cross River Rail - Stage 2**	**Project No.**	**FG6470**		
Site ID / Borehole No.	**CRR932**	**Surface RL**	**6.03**		
Geologist	**Nick Dewar**	**Date**	**29/05/2018**		
		Page	**2**	**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 / Tl	Infilling Cn / St / Vr / Ct [1]	Zones [1] SZ / CZ / HFZ / AZ	Other
10.11	J	10	Un	Sm	V	OP	St		Fe
10.24	J	0	Un	Sm	V	CD			
10.30	J	10	Un	Sm	V	OP	St		Fe
10.46	J	5	Un	Sm	V	OP	Cn		
10.52	J	5	Un	Sm	V	FL	Ct		Cly(8mm)
10.52	J	90	Un	Sm	V	OP	St	Fe, J: 10.52-10.65m	
10.61	J	20	Un	Sm	V	OP	St		Fe
10.70	J	30	Un	Sm	V	OP	St		Fe
10.84	J	20	Pl	Sm	VIII	OP	Cn		
11.00	J	0	Un	Sm	V	OP	Cn		
11.24	J	10	Un	Sm	V	OP	Cn		
11.50	J	10	Un	Sm	V	OP	Cn		
11.56	J	0	Un	Sm	V	OP	Cn		
11.61	J	10	Un	Sm	V	OP	St		Minor Fe
11.63	J	10	Un			CD/FL	Ct		Cly
11.78	J	10	Un	Sm	V	OP	St		Minor Fe
11.81	J	5	Un	Sm	V	OP	Cn		
11.91	J	5	Un	Sm	V	OP	Cn		
12.02	J	10	Un	Sm	V	OP	Cn		
12.08	J	10	Un	Sm	V	TI			
12.20	J	0	Un	Sm	V	OP	St		Fe
12.33	J	10	Un	Sm	V	OP	Cn		
12.37	J	10	Un	Sm	V	OP	St		Fe
12.41	J	5	Un	Sm	V	OP	St		Fe
12.52	J	0	Un	Sm	V	OP	Cn		
12.54	J	5	Un	Sm	V	OP	St		Fe
12.61	J	0	Un	Sm	V	OP	Cn		
12.72	J	20	Un	Sm	V	TI	St		Fe
12.87	J	20	Un	Sm	V	OP	St		Fe
13.14	J	10	Un	Sm	V	OP	Cn		
13.24	J	20	Un	Sm	V	OP	St		Fe

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

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Site ID / Borehole No.	**CRR932**	**Surface RL**	**6.03**		
Geologist	**Nick Dewar**	**Date**	**29/05/2018**		
		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 / Tl	Infilling Cn / St / Vr / Ct [1]	Zones [1] SZ / CZ / HFZ / AZ	Other
13.43	J	0	Un	Sm	V	OP	St		Fe
13.63	J	10	Un	Sm	V	OP	Cn		

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

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BOREHOLE No **CRR932**

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REFERENCE No **H13053**

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1					Sandy GRAVEL with Clay (Fill) Dark grey, mottled pale grey, dry, loose, fine to coarse angular to sub-angular gravel. Medium to coarse grained sand. Some high plasticity fines. Anthropogenic material throughout (ash, ceramic).						
2							(GP-GM)				
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5				A			(CH)			LL=70% PI= 40% MC=51.9% LS= 18% DD= 1 t/m3 WD= 1.51 t/m3	U50
6				C						hw, hw, 3 N=3	SPT
7	-0.47				TUFF (Rif) XW: Recovered as Gravelly CLAY. Brown, pale red, mottled pale grey, moist, hard, high plasticity. Fine to coarse sub-angular gravel. Trace fine to coarse grained sand.		XW		VC	7.08m-7.11m: XW Band 7.21m-7.26m: XW Band 7.26m-7.35m: HW 7.35m-7.40m: XW Band	SPT hb
	-1.01		(17)	B							
8			100 (39)		TUFF (Rif) MW: Pale red, mottled pale grey and pale brown, fine grained, fine to medium, subrounded clasts within clayey matrix, high strength, some iron staining, massive. Js: 0-20°, (4-6/m), Un/Sm, OP-TI-CD, FeSt, some Vn Cly		MW		MH H	7.79m-7.82m: HW	Is(50)=2.60 MPa Is(50)=1.80 MPa D (8.04m) A (8.10m)
			100 (61)							8.54m-8.56m: XW Band	
9							SW		H		Is(50)=0.56 MPa Is(50)=1.30 MPa D (8.78m) A (8.90m)
							MW		H		UCS=15.50 MPa E=2.11 GPa (9.41m)
	-3.97										

Continued on next sheet

REMARKS: Rif - Brisbane Tuff. Standpipe piezometer installed.

LOGGED BY	REVIEWED BY
ND	S.Foley

Queensland Government

GEOTECHNICAL BOREHOLE LOG

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

BOREHOLE No **CRR932**

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12							SW	H	C		
13							MW	MH		Is(50)=0.40 MPa Is(50)=0.94 MPa	D (13.38m) A (13.41m)
	-7.76		100		Borehole completed at 13.79m			LM			
14											
15											
16											
17											
18											
19											

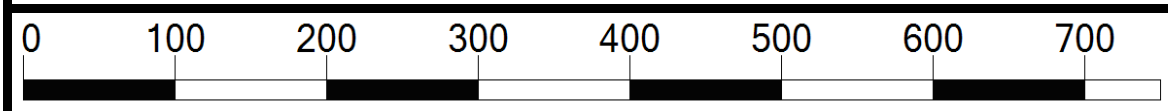
REMARKS: Rif - Brisbane Tuff. Standpipe piezometer installed.

LOGGED BY	REVIEWED BY
ND	S.Foley

CORE PHOTO LOG
DEPARTMENT OF TRANSPORT AND MAIN ROADS
GEOTECHNICAL SECTION

Queensland Government

Project Name	**Cross River Rail CRR 2018 – Geotechnical Investigation**		
Project No.	FG6470	Date	29/05/2018
Borehole No.	CRR932	Reference No.	H13053
Location	QR Rail Corridor	Start Depth (m)	7.04
Submitted By	J. Armstrong	Finish Depth (m)	13.79



SCALE (mm)