FINAL 11/12/2018

Queensland Government

GEOTECHNICAL BOREHOLE LOG

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

BOREHOLE No **CRR931**

Sheet 1 of 2

REFERENCE No **H13044**

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

LOCATION QR Mayne Yard

COORDINATES 503901.8 E; 6965562.4 N

PROJECT No FG6470 | SURFACE RL 4.87m | PLUNGE 90° | DATE STARTED 25/08/2018 | GRID DATUM MGA94

JOB No | HEIGHT DATUM AHD | BEARING ° | DATE COMPLETED 28/08/2018 | 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	4.72				CLAY with Gravel (Topsoil)		(Cl)			0.00m-2.10m: NDD to 2.1m 0.00m-0.30m: Rootlets	
	4.57				Brown, moist, very stiff.		(SM)				
1					Silty SAND with Gravel (Fill) Pale brown, moist, medium dense. Fine grained sand; fine to medium gravel, subangular.						
					CLAY with Sand and Gravel (Fill) Brown, moist, very stiff. Medium to high plasticity; fine to medium sand; fine to coarse gravel, subangular; miscellaneous anthropogenic material.		(Cl)				
2					1.2m: Becoming pale brown.						
				A	2.5m: Soft						2, 2, 2 N=4 SPT
	1.97									2.80m-2.90m: Pale grey mottled pale brown and orange.	
3					CLAY (Alluvium) Grey mottled pale brown, moist, soft to firm. High plasticity.						
				B							MC=44.2% Oedometer DD= 1.24 t/m3 WD= 1.79 t/m3 U50
4				C							hw, 1, 4 N=5 SPT
5											
				D						5.50m-5.88m: UU Triaxial Test	MC=32.3% DD= 1.38 t/m3 WD= 1.82 t/m3 U50
6					6.0m: Becoming stiff.		(CH)				
7				E							2, 4, 6 N=10 SPT
8											
				F	8.5m: Becoming grey mottled pale brown, white speckles, trace medium to coarse sand, very stiff.						4, 6, 11 N=17 LL=64% PI= 45% MC=22% LS= 21% SPT
9					9.5m: Interbedded bands of Sandy CLAY and CLAY with Sand, fine to medium grained sand.						
	-5.13										

Continued on next sheet

REMARKS: Rif - Brisbane Tuff

LOGGED BY	REVIEWED BY
ND	S. Foley

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JOB No — HEIGHT DATUM AHD — BEARING ° — DATE COMPLETED 28/08/2018 — DRILLER GeoDrill

DEPTH (m)	R.L. (m)	RQD ( ) % / CORE REC %	SAMPLE	MATERIAL DESCRIPTION	USCS WEATHERING	ADDITIONAL DATA AND TEST RESULTS	SAMPLES TESTS
			G	CLAY (Alluvium) Cont'd.	(CH)	7, 10, 13 N=23	SPT
11	-6.13			CLAY (Residual) Grey mottled pale brown, moist, very stiff. Trace gravel, fine to medium, subangular.	(CI)		
	-6.78		H	TUFF (Rif) XW: Recovered as CLAY trace Gravel. White / pale grey mottled pale brown, moist, hard, medium plasticity. Fine to medium gravel sized clasts, subangular.	XW	7, 13, 24 N=37	SPT
12							
13	-8.23		I			30/50mm hb	SPT
		(27)		TUFF (Rif) MW: Pale grey mottled orange brown and red, fine to medium sized clasts in a fine grained matrix, massive, medium to high strength. - Js: 0-20° (5-8/m) Pl-Un/Ro, OP, Fe St, Cly Vr	HW / MW / HW / MW		D (13.35m) A (13.36m) (13.65m)
14		100 (70)		- Js: 70°-90° (1-2/m) Un/Ro, Tl-OP, Fe St, Cly Vr	HW / MW	Is(50)=0.35 MPa Is(50)=0.49 MPa UCS=7.87 MPa E=2.08 GPa Is(50)=0.31 MPa Is(50)=0.26 MPa	D (14.08m) A (14.09m)
15					HW / MW	Is(50)=0.79 MPa Is(50)=0.65 MPa	D (15.05m) A (15.06m)
					HW / MW / HW / MW		
16	-11.55					Is(50)=0.77 MPa Is(50)=1.10 MPa	D (16.25m) A (16.26m)
				TUFF (Rif) SW: Pale grey, fine grained with fine to medium gravel sized clasts, massive, high to very high strength. - Js: <10° (<1/m) Pl/Ro, OP, Cn		UCS=63.60 MPa E=10.8 GPa	(16.85m)
17		100 (95)		- Js: 60°-80° (1/m) Pl/Ro, Tl-CD, Cn or Fe St	SW	Is(50)=4.60 MPa Is(50)=5.00 MPa	D (17.15m) A (17.16m)
18						Is(50)=1.50 MPa Is(50)=3.30 MPa	D (18.46m) A (18.47m)
19	-14.63	100		Borehole completed at 19.50m			

REMARKS: Rif - Brisbane Tuff

LOGGED BY	REVIEWED BY
ND	S. Foley

TMR GEOTECHNICAL BOREHOLE LOG - CREATED WITH HOLEBASE SI

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.	**CRR931**	**Surface RL**	**4.869**		
Geologist	**Nick Dewar**	**Date**	**25-28/5/18**		
		Page	**1**	**of**	**2**

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
13.24	J	10	Un	Sm	V	OP	Vr		Cly
13.30	J	0	Un	Sm	V	OP	Vr		Fe/Cly
13.34	J	0	Pl	Sm	VIII	OP	St		Minor Fe
13.42	J	10	Un	Sm	V	OP	St		Minor Fe
13.49	Sm								Cly
13.52	J	70	Pl	Sm	VIII	OP	St	Minor Fe, J: 13.52-13.59m	
13.65	J	10	Un	Sm	V	OP	St		Minor Fe
13.91	Sm								Cly
13.93	J	90	Un	Sm	V	OP	St		Fe
13.96	Sm								Cly(5mm)
13.97	J	85	Un	Sm	V	OP	St		Fe
13.98	J	10	Un	Sm	V	OP	St		Fe
14.05	J	5	Un	Sm	V	OP	Cn		
14.18	J	10	Un	Sm	V	OP	Vr		Fe/Cly
14.24	J	20	Un	Sm	V	OP	Ct		Cly(10mm)
14.31	J	10	Un	Sm	V	OP	St		Minor Fe
14.35	Sm								Cly(30mm)
14.52	J	20	Un	Sm	V	OP	St		Fe
14.58	J	10	Un	Sm	V	OP	St		Minor Fe
14.60	J	10	Un	Sm	V	OP	St		Minor Fe
14.67	J	0	Pl	Sm	VIII	OP	St		Fe
14.78	J	0	Pl	Sm	VIII	OP	St		Fe
14.87	J	70	Un	Sm	V	OP	St		Fe
14.89	J	5	Un	Sm	V	OP	St		Fe
15.15	J	5	Un	Sm	V	OP	Cn		
15.59	Sm								20mm
15.60	J	80	Un			CD	St	Fe, J: 15.6-15.7m	
15.71	J	10	Un	Sm	V	OP	Cn		
15.82	J	0	Pl	Sm	VIII	OP	Cn		
15.94	J	10	Un	Sm	V	OP	St		Minor Fe
15.98	J	20	Un			CD			

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

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Site ID / Borehole No.	**CRR931**	**Surface RL**	**4.869**		
Geologist	**Nick Dewar**	**Date**	**25-28/5/18**		
		Page	**2**	**of**	**2**

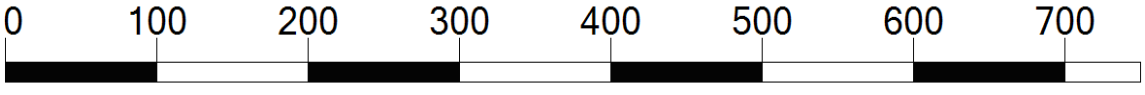
Traverse Chainage; or Down hole depth (rock core)	Type LP / BP / FP / J etc.	Dip ° / Dip Direction °; or Angle ° from horizontal (rock core)	Planarity Stp / Un / Pl	Roughness Ro / Sm / Sl	Roughness Class I to IX	Aperture CD / OP / FL / Tl	Infilling Cn / St / Vr / Ct [1]	Zones [1] SZ / CZ / HFZ / AZ	Other
16.10	Sm								Cly
16.12	J	10	Un	Sm	V	OP	St		Fe
16.13	J	5	Pl	Sm	VIII	OP	St		Fe
16.41	J	10	Un	Sm	V	OP	St		Fe
16.81	J	10	Un	Sm	V	OP	Cn		
17.72	J	5	Un	Sm	V	OP	Cn		
17.73	J	60	Un	Sm	V	OP	Cn		
17.85	J	10	Un	Sm	V	CD			
17.95	J	50	Un			CD			Qz
18.31	J	60	Un			CD			Qz
18.34	J	0	Un	Sm	V	OP	Cn		
18.55	J	90	Un			CD		Qz, J: 18.55-18.75m	
18.86	J	10	Un	Sm	V	OP	Cn		
18.86	J	80	Un			CD		Qz, J: 18.86-19m	

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

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	28/5/18
Borehole No.	CRR931	Reference No.	H13044
Location	QR Mayne Yard	Start Depth (m)	13.10
Submitted By	J. Armstrong	Finish Depth (m)	19.50



SCALE (mm)