FINAL 27/09/2018

Queensland Government

GEOTECHNICAL BOREHOLE LOG

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

BOREHOLE No **CRR909**

Sheet 1 of 3

REFERENCE No **H13100**

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

LOCATION Clapham Yard — COORDINATES 501319.3 E; 6954386.4 N

PROJECT No FG6470 — SURFACE RL 8.76m — PLUNGE 90° — DATE STARTED 25/06/2018 — GRID DATUM MGA94

JOB No — HEIGHT DATUM AHD — BEARING ° — DATE COMPLETED 26/06/2018 — 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	7.96				COBBLES with Clay trace Sand (Fill) Brown grey, dry, dense. Cobbles 20-70mm, angular ballast. Clay fraction is medium to high plasticity. Sand fraction is fine to coarse.						
1				A	CLAY with Sand (Alluvium) Grey mottled pale red and brown, moist, firm. Medium plasticity. Interbedded Sandy Clay and Clay with sand layers. Fine to medium grained sand.						BULK
				B						3, 3, 4 N=7	SPT
2											
				C	from 2.5m: stiff.					7, 9, 7 N=16	SPT
3							(CI)				
				D	from 3.5m: very stiff to hard.					3.50m-3.95m: CU Triaxial Test; MC=24.1% DD= 1.63 t/m3 WD= 2.02 t/m3	U50
4											
				E	from 4.5m: pale grey mottled pale red and orange. Trace fine grained sand.					5, 13, 13 N=26 LL=40% PI= 22% MC=25.3% LS= 8% <75µm= 63%	SPT
5	3.26										
				F	Sandy CLAY (Alluvium) Grey to pale brown, moist, very stiff to hard. Medium plasticity. Fine grained sand.					9, 19, 19 N=38	SPT
6											
7				G			CI			8, 7, 10 N=17	SPT
8											
				H						5, 8, 10 N=18 LL=36% PI= 16% MC=26.1% LS= 11% <75µm= 46%	SPT
9	-1.24										

Continued on next sheet

REMARKS: Rip - Aspley Formation

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 **CRR909**

Sheet 2 of 3

REFERENCE No **H13100**

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

LOCATION Clapham Yard — COORDINATES 501319.3 E; 6954386.4 N

PROJECT No FG6470 — SURFACE RL 8.76m — PLUNGE 90° — DATE STARTED 25/06/2018 — GRID DATUM MGA94

JOB No — HEIGHT DATUM AHD — BEARING ° — DATE COMPLETED 26/06/2018 — 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
				I	Clayey Sandy GRAVEL (Alluvium) Grey to brown mottled orange and dark grey, moist, very dense. Fine to coarse gravel, subrounded. Medium to coarse sand. High plasticity.		(GC)			MC=10.9% <75µm= 20%	SPT
										15, 30/145mm	
11				J						19, 30/120mm	SPT
	-2.74				GRAVEL with Sand and Clay (Alluvium) Grey to brown, moist, very dense. Coarse gravel and cobbles <100mm, subrounded to subangular. Coarse sand, subrounded to subangular.						
12				K	at 12.30m: Clay band. Grey, moist, hard. Medium plasticity.		(GP-GC)			30/50mm	SPT
13											
	-5.24										
14				L	SILTSTONE (Rip) XW: Recovered as black with trace orange mottling, moist, hard, Sandy SILT. Fine grained. With interbedded coal and carbonaceous siltstone.		XW			30/100mm	SPT
	-6.24										
15			(0)		SILTSTONE (Rip) HW: Black with trace orange mottling, fine grained, thinly bedded, very low to medium strength. Interbedded carbonaceous siltstone, typically low strength. - BP: 0°-10° (8-14/m), Pl/Sm, OP, Cn, Clay / Coal Vr.		MW			15.13m-15.15m: BZ	D (15.15m)
			100				HW			15.24m-15.35m: BZ, Coal Is(50)=0.04 MPa Is(50)=0.01 MPa	A (15.16m)
			(12)				MW			15.42m-15.54m: BZ, Coal	
							HW			15.56m-15.61m: Coal 15.65m-15.96m: BZ, Coal	
16							MW			16.01m-16.05m: HW 16.09m-16.20m: HW Coal 16.25m-16.38m: HW Coal	
							HW			16.46m-16.80m: HW Coal	
	-8.04										
17			100		SANDSTONE (Rip) MW: Grey, fine to medium grained, thinly bedded, medium strength. Siltstone/Carbonaceous siltstone beds throughout. -BP: 0°-10° (1-3/m, Pl/Sm, OP, Cn.					16.83m-16.86m: BZ Is(50)=0.38 MPa Is(50)=0.04 MPa	A (16.92m) D (16.97m)
			(71)				MW				
18										UCS=15.00 MPa E=1.25 GPa v= 0.045 Is(50)=0.07 MPa Is(50)=0.40 MPa	(17.63m) D (17.81m) A (17.82m)
			100							18.33m-18.35m: XW Cly	
	-9.91		(82)								
19					SILTSTONE (Rip) MW: Grey, fine grained, thinly bedded, medium strength. -BP: 0°-10° (1-3/m), Pl/Sm, OP, Cn		MW			Is(50)=0.31 MPa Is(50)=0.52 MPa	D (18.90m) A (18.91m)
	-10.60				SANDSTONE (Rip) MW:		MW			19.34m-19.36m: XW Cly	
	-11.24										

Continued on next sheet

REMARKS: Rip - Aspley Formation

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FINAL 27/09/2018

Queensland Government

GEOTECHNICAL BOREHOLE LOG

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

BOREHOLE No **CRR909**

Sheet 3 of 3

REFERENCE No **H13100**

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

LOCATION Clapham Yard

COORDINATES 501319.3 E; 6954386.4 N

PROJECT No FG6470 | SURFACE RL 8.76m | PLUNGE 90° | DATE STARTED 25/06/2018 | GRID DATUM MGA94

JOB No | HEIGHT DATUM AHD | BEARING ° | DATE COMPLETED 26/06/2018 | 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
21					SANDSTONE (Rip) MW: Cont'd. Grey, white and pale grey, medium to coarse grained, thinly bedded, low to medium strength. Siltstone interbeds throughout <30mm thick. BP: 0°-20° (~30/m), Pl/Sm, OP, Cn.		MW	LM	M	Is(50)=0.06 MPa Is(50)=0.27 MPa UCS=6.45 MPa E=0.39 GPa v= 0.085 Is(50)=0.08 MPa Is(50)=0.33 MPa	D (20.29m) A (20.30m) (20.43m) D (20.70m) A (20.71m)
	-12.84		100		21.00m to 21.22m: Siltstone bed (MW): Grey, fine grained, medium strength.				M	Is(50)=0.52 MPa Is(50)=0.08 MPa	D (21.32m) A (21.33m)
22					Borehole completed at 21.60m						
23											
24											
25											
26											
27											
28											
29											

REMARKS: Rip - Aspley Formation

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.	**CRR909**					**Surface RL**	**8.76**		
Geologist	**N.DEWAR**					**Date**	**27/06/2018**		
						Page	**1**	**of**	**1**

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
17.06	BP	5°	UN	SM		OP	CN		
17.07	BP	5°	PI	SM		OP	CN		
17.13	BP	10°	UN	SM		OP	CN		
17.14	J	70°	PI	SM		OP	CN		
17.25	BP	20°	UN	SM		OP	CN		
17.36	BP	0°	PI	Ro		OP	CN		
17.43	J	0-40°	UN	SM		OP	CN		
17.46	-	-	-	-		-	-		
17.81	J	20°	UN	Ro(coarse sandstone)		OP	CN		
18.08	BP	10°	UN	SM		OP	Vr		SILT/CLAY
18.28	J	25°	UN	SM		OP	Vr		-
18.54	BP	5°	PI	SM		OP	Vr		COAL/CLAY
18.62	BP	0°	PI	SM		OP	Vr		CLAY
18.66	J	50°	UN	SM		OP	Ct		COAL(2mm)
18.82	J	0°	PI	Ro(coarse sandstone)		OP	CN		
19.09	BP	0°	PI	SM		OP	CN		
19.33	BP	10°	PI	SM		OP	CN		
19.34	J	40°							
19.45	BP	10°	PI	SM		OP	Vr		CLAY
19.34-19.54	J	80-90°	UN	SM		OP	CN		
19.54	J	5°	UN	Ro(coarse sandstone)		OP	CN		
19.70	J	10°	PI	-		OP	CN		
19.94	J	30°	UN	SM		OP	Vr		CLAY
20.55	J	5°	UN	Ro(coarse sandstone)		OP	CN		
20.86	J	10°	PI	-		OP	CN		
21.09	J	20°	UN			CD			
21.21	BP	0°	PI	SM		OP	CN		
21.50	J	50°	UN	Ro(coarse sandstone)		OP	CN		
21.53	J	10°	UN	-		-	-		
21.55	J	10°	UN	-		OP	Vr		CLAY
21.57	J	30°	UN	-		OP	CN		

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	25/06/2018
Borehole No.	CRR909	Reference No.	H13100
Location	Clapham Yard	Start Depth (m)	15.0
Submitted By	J. Armstrong	Finish Depth (m)	21.6