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GEOTECHNICAL BOREHOLE LOG

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

BOREHOLE No **CRR908**

Sheet 1 of 3

REFERENCE No **H13108**

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

LOCATION Clapham Yard — COORDINATES 501250.7 E; 6954226.3 N

PROJECT No FG6470 — SURFACE RL 8.10m — PLUNGE 90° — DATE STARTED 25/06/2018 — GRID DATUM MGA94

JOB No — HEIGHT DATUM AHD — BEARING ° — DATE COMPLETED 27/06/2018 — 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	7.10			A	Silty SAND (Fill) Brown and grey-brown, dry, loose. Medium to coarse grained. Trace fine to coarse gravel. Trace ballast.		(SM)				DIST
				B							DIST
1				C	Silty CLAY (Alluvium) Orange-brown, red-brown, moist, stiff. High plasticity. With layers of hard clay. Trace Sand.						DIST
				D			(CH)			3, 5, 5 N=10 LL=89% PI= 63% MC=28.4% LS= 23% <75µm= 87%	SPT
2	5.40			E	Clayey SAND (Alluvium) Grey and brown, moist, dense. Fine grained.		(SC)			16, 18, 28 N=46	SPT
3	4.90				Sandy CLAY (Alluvium) Grey and brown mottled yellow, moist, very stiff to hard. High plasticity. Fine grained sand.						
				F						12, 13, 18 N=31	SPT
4				G						6, 11, 10 N=21	SPT
5				H			(CH)			5.00m-5.30m: CU Triaxial Test — MC=24.7% DD= 1.51 t/m3 WD= 1.88 t/m3	U50
6	1.30			I						8, 14, 16 N=30 LL=58% PI= 39% MC=27.7% LS= 16% <75µm= 54%	SPT
7				J	Clayey Sandy SILT (Alluvium) Grey and orange-brown, moist, hard. Fine grained. Low plasticity.		(ML)			15, 24, 30/125mm MC=25.8% <75µm= 41%	SPT
8	-0.40				Sandy CLAY (Alluvium) Grey and orange-brown, moist, very stiff. Low plasticity. Fine grained sand. Trace silt.						
9				K			(CL)			6, 8, 9 N=17	SPT
	-1.90										

Continued on next sheet

REMARKS: Rip - Aspley Formation. Standpipe piezometer installed.

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TMR GEOTECHNICAL BOREHOLE LOG - CREATED WITH HOLEBASE SI

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GEOTECHNICAL BOREHOLE LOG

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

BOREHOLE No **CRR908**

Sheet 2 of 3

REFERENCE No **H13108**

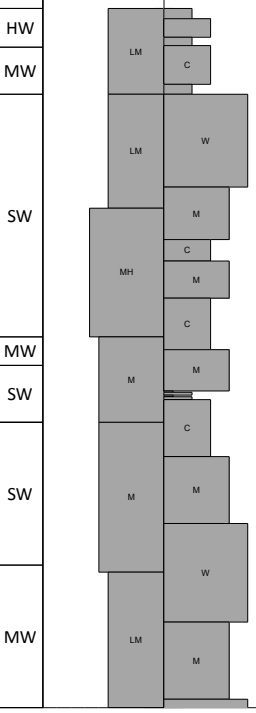
PROJECT Cross River Rail (CRR) Project - Additional Geotechnical Investigation

LOCATION Clapham Yard — COORDINATES 501250.7 E; 6954226.3 N

PROJECT No FG6470 — SURFACE RL 8.10m — PLUNGE 90° — DATE STARTED 25/06/2018 — GRID DATUM MGA94

JOB No — HEIGHT DATUM AHD — BEARING ° — DATE COMPLETED 27/06/2018 — DRILLER Geodrill

DEPTH (m)	R.L. (m)	RQD ( ) % / CORE REC %	SAMPLE	MATERIAL DESCRIPTION	USCS WEATHERING	ADDITIONAL DATA AND TEST RESULTS	SAMPLES TESTS
	-2.10			Sandy CLAY (Alluvium) Cont'd	(CL)		
11			L	Sandy SILT (Alluvium) Orange-brown mottled grey, moist, stiff. Low plasticity. Fine grained sand. Trace clay.	(ML)	3, 5, 6 N=11	SPT
12	-4.00		M	Silty CLAY (Alluvium) Orange-brown and grey, moist, stiff. Medium plasticity. Fine grained sand.	(CI)	5, 5, 8 N=13	SPT
13	-4.90			Sandy GRAVEL (Alluvium) Orange-brown, grey, and dark grey, wet, very dense. Medium to coarse, sub-rounded to rounded. Fine to coarse grained sand. Trace silt.	GW	5/0mm hb	
14	-6.60			SILTSTONE (Rip) XW: Recovered as Clayey SAND, grey, moist, very dense, fine grained, with trace carbonaceous material. Trace sub-angular gravel.	XW		
15	-7.00	(63) 100			HW MW		
16		(87)		SILTSTONE (Rip) SW: Grey, dark grey with some iron staining, fine grained, thinly bedded, low to medium strength. With interlaminated to interbedded fine grained sandstone layers.	SW	UCS=34.20 MPa E=4.41 GPa v= 0.177	(16.61m)
17		100 (98)			MW SW	Is(50)=0.33 MPa Is(50)=0.88 MPa	D (17.70m) A (17.71m)
18	-9.90			SANDSTONE (Rip) SW: Grey, pale grey, fine to coarse grained, thinly to medium bedded, medium to high strength, interbedded conglomerate layers. Occasional interlaminated siltstone layers.	SW	Is(50)=0.51 MPa Is(50)=0.47 MPa	D (18.57m) A (18.58m)
19						UCS=6.44 MPa E=0.303 GPa v= 0.047 Is(50)=0.04 MPa Is(50)=0.27 MPa	(18.87m) D (19.07m) A (19.08m)
	-11.90				MW		



AUGER / CASING / WASH BORING / CORE DRILLING

Continued on next sheet

REMARKS: Rip - Aspley Formation. Standpipe piezometer installed.

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GEOTECHNICAL BOREHOLE LOG

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

BOREHOLE No **CRR908**

Sheet 3 of 3

REFERENCE No **H13108**

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

LOCATION Clapham Yard — COORDINATES 501250.7 E; 6954226.3 N

PROJECT No FG6470 — SURFACE RL 8.10m — PLUNGE 90° — DATE STARTED 25/06/2018 — GRID DATUM MGA94

JOB No — HEIGHT DATUM AHD — BEARING ° — DATE COMPLETED 27/06/2018 — 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 J VL EL)	DEFECT SPACING (EC VC C M W VW EW)	ADDITIONAL DATA AND TEST RESULTS	SAMPLES TESTS
21			100 (95)		SANDSTONE (Rip) SW: Cont'd		SW	H, M, H, M	W, M, C	Is(50)=0.18 MPa Is(50)=0.60 MPa	D (20.54m) A (20.55m)
22								H	M, C	Is(50)=2.20 MPa Is(50)=2.60 MPa	D (21.96m) A (21.97m)
	-14.57							M	W, M, C, M	UCS=17.30 MPa E=1.79 GPa v= 0.025 Is(50)=0.27 MPa Is(50)=0.74 MPa Is(50)=0.30 MPa Is(50)=0.87 MPa	(22.30m) D (22.48m) A (22.49m) D (22.65m) A (22.66m)
23	-15.23		100		CONGLOMERATE (Rip) SW: Grey, pale grey, fine to medium gravel sized clasts within sandy clay matrix, thinly to medium bedded, medium strength, interlaminated with siltstone and sandstone. Borehole completed at 23.33m		SW				
24											
25											
26											
27											
28											
29											

REMARKS: Rip - Aspley Formation. Standpipe piezometer installed.

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Detailed Discontinuity Description Log

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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.	**CRR908**	**Surface RL**	**8.1**		
Geologist	**MARK HAYES**	**Date**	**26/06/2018**		
		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
15.12	B	5°	Pl	Sm	VIII	CD	St	FE	
15.14	J	30°	Pl	Sm	VIII	CD	CN		
15.16	B	5°	Pl	Sm	VIII	CD	CN		
15.18	B	5°	Pl	Sm	VIII	CD	CN		
15.30	B	5°	Un	Sm	V	CD	St		
15.34	B	5°	Pl	Sm	VIII	CD	CN		
15.36	B	5°	Pl	Sm	VIII	CD	St	FE	
15.50	B	0°	Pl	Sm	VIII	CD	CN		
15.62	B	0°	Un	Sm	VIII	CD	CN		
15.66	B	5°	Pl	Sm	VIII	CD	CN		
15.70	B	5°	Pl	Sm	VIII	CD	CN		
16.35	B	5°	Pl	Sm	VIII	CD	CN		
16.72	B	0°	Pl	Sm	VIII	CD	CN		
16.79	B	5°	Un	Sm	V	CD	Vr	CLAY	
16.87	B	0°	Pl	Sm	VIII	CD	CN		
17.13	B	0°	Pl	Sm	VIII	CD	CN		
17.30	B	5°	Pl	Sm	VIII	CD	CN		
17.49	B	0°	Un	Sm	V	CD	CN		
17.78	B	5°	Pl	Sm	VIII	CD	CN		
17.79	B	5°	Pl	Sm	VIII	CD	CN		
17.81	J	60°	Pl	Sm	VIII	CD	CN		
17.82	B	5°	Pl	Sm	VIII	CD	Vr	CLAY	
17.84	B	5°	Pl	Sm	VIII	CD	CN		
18.00	B	5°	Pl	Sm	VIII	CD	CN		
18.14	B	5°	Pl	Ro	VII	CD	CN		
18.24	J	75°	Pl	Sm	VII	CD	CN		
18.46	B	5°	Pl	Sm	VIII	CD	CN		
18.71	B	5°	Pl	Sm	VIII	CD	CN		
19.40	B	5°	Pl	Sm	VIII	CD	FL	BZ/CLAY 5mm	
19.69	B	5°	Pl	Sm	VIII	CD	CN		
19.94	B	5°	Pl	Sm	VIII	CD	FL	CLAY 5mm	

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

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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.	**CRR908**	**Surface RL**	**8.1**
Geologist	**MARK HAYES**	**Date**	**26/06/2018**
		Page	**2 of 2**

20.68	B	10°	Pl	Sm	VIII	CD	CN		
20.70	B	10°	Pl	Sm	VIII	CD	CN	CS Lam	
21.00	B	5°	Pl	Sm	VIII	CD	CN	CS Lam	
21.18	J	20°	Pl	Sm	VIII	CD	CN		
21.20	B	5°	Pl	Sm	VIII	CD	CN		
21.51	J	20°	Un	Sm	V	CD	CN		
21.86	B	10°	Pl	Sm	VIII	CD	CN		
22.04	B	5°	Pl	Sm	VIII	CD	CN		
22.06	J	30°	Pl	Sm	VIII	CD	CN		
22.74	B	5°	Un	Sm	V	CD	CN	CS Lam	
22.96	J	0°	Un	Sm	V	CD	CN		
23.04	B	30°	Un	Sm	V	CD	CN	CS Lam	
23.11	B	10°	Un	Sm	V	CD	CN	CS Lam	
23.12	J	60°	Un	Sm	VI	CD	CN		

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

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STANDPIPE PIEZOMETER INSTALLATION LOG

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

BOREHOLE No **CRR908**

Sheet 1 of 3

PIEZOMETER No **CRR908**

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

LOCATION Clapham Yard COORDINATES 501250.7 E; 6954226.3 N

PROJECT No FG6470 SURFACE RL 8.10m PLUNGE 90° DATE STARTED 25/06/2018 GRID DATUM MGA94

JOB No HEIGHT DATUM AHD BEARING ° DATE COMPLETED 27/06/2018 DRILLER Geodrill

DEPTH (m)	R.L. (m)	LITHOLOGY	MATERIAL DESCRIPTION	Standpipe Piezometer Construction Details: Depth (m) /RL (AHD)	50mm PVC Class No. 18 Stick Up = 0.84m	Backfill Details
0			Silty SAND (Fill) Brown and grey-brown, dry, loose. Medium to coarse grained. Trace fine to coarse gravel. Trace ballast.			
	7.10					Grout: Bentonite / Cement Mix
1			Silty CLAY (Alluvium) Orange-brown, red-brown, moist, stiff. High plasticity. With layers of hard clay. Trace Sand.			
2				2.00m / 6.10 AHD		
	5.40					
3			Clayey SAND (Alluvium) Grey and brown, moist, dense. Fine grained.			Bentonite Seal
	4.90					
4			Sandy CLAY (Alluvium) Grey and brown mottled yellow, moist, very stiff to hard. High plasticity. Fine grained sand.	4.00m / 4.10 AHD		
5						
6						
	1.30					
7			Clayey Sandy SILT (Alluvium) Grey and orange-brown, moist, hard. Fine grained. Low plasticity.			
8						
	-0.40					
9			Sandy CLAY (Alluvium) Grey and orange-brown, moist, very stiff. Low plasticity. Fine grained sand. Trace silt.			
	-1.90					

Continued on next sheet

REMARKS: Rip - Aspley Formation. Standpipe piezometer installed.

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STANDPIPE PIEZOMETER INSTALLATION LOG

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

BOREHOLE No **CRR908**

Sheet 2 of 3

PIEZOMETER No **CRR908**

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

LOCATION Clapham Yard COORDINATES 501250.7 E; 6954226.3 N

PROJECT No FG6470 SURFACE RL 8.10m PLUNGE 90° DATE STARTED 25/06/2018 GRID DATUM MGA94

JOB No HEIGHT DATUM AHD BEARING ° DATE COMPLETED 27/06/2018 DRILLER Geodrill

DEPTH (m)	R.L. (m)	LITHOLOGY	MATERIAL DESCRIPTION	Standpipe Piezometer Construction Details: Depth (m) /RL (AHD)	50mm PVC Class No. 18 Stick Up = 0.84m	Backfill Details
11	-2.10		Sandy CLAY (Alluvium) Cont'd			
			Sandy SILT (Alluvium) Orange-brown mottled grey, moist, stiff. Low plasticity. Fine grained sand. Trace clay.			
12	-4.00		Silty CLAY (Alluvium) Orange-brown and grey, moist, stiff. Medium plasticity. Fine grained sand.			
13	-4.90		Sandy GRAVEL (Alluvium) Orange-brown, grey, and dark grey, wet, very dense. Medium to coarse, sub-rounded to rounded. Fine to coarse grained sand. Trace silt.			
14	-6.60		SILTSTONE (Rip) XW: Recovered as Clayey SAND, grey, moist, very dense, fine grained, with trace carbonaceous material. Trace sub-angular gravel.			Filter: Washed / Graded Sand
15	-7.00		SILTSTONE (Rip) SW: Grey, dark grey with some iron staining, fine grained, thinly bedded, low to medium strength. With interlaminated to interbedded fine grained sandstone layers.			
16						
17						
18	-9.90		SANDSTONE (Rip) SW: Grey, pale grey, fine to coarse grained, thinly to medium bedded, medium to high strength, interbedded conglomerate layers. Occasional interlaminated siltstone layers.			
19						
	-11.90					

Continued on next sheet

REMARKS: Rip - Aspley Formation. Standpipe piezometer installed.

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STANDPIPE PIEZOMETER INSTALLATION LOG

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BOREHOLE No **CRR908**

Sheet 3 of 3

PIEZOMETER No **CRR908**

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

LOCATION Clapham Yard

COORDINATES 501250.7 E; 6954226.3 N

PROJECT No FG6470 | SURFACE RL 8.10m | PLUNGE 90° | DATE STARTED 25/06/2018 | GRID DATUM MGA94

JOB No | HEIGHT DATUM AHD | BEARING ° | DATE COMPLETED 27/06/2018 | DRILLER Geodrill

DEPTH (m)	R.L. (m)	LITHOLOGY	MATERIAL DESCRIPTION	Standpipe Piezometer Construction Details: Depth (m) /RL (AHD)	50mm PVC Class No. 18 Stick Up = 0.84m	Backfill Details
21			SANDSTONE (Rip) SW: Cont'd	20.30m / -12.20 AHD		Top of Slotted Pipe
22	-14.57					
23	-15.23		CONGLOMERATE (Rip) SW: Grey, pale grey, fine to medium gravel sized clasts within sandy clay matrix, thinly to medium bedded, medium strength, interlaminated with siltstone and sandstone. Borehole completed at 23.33m	23.30m / -15.20 AHD		
24						
25						
26						
27						
28						
29						

REMARKS: Rip - Aspley Formation. Standpipe piezometer installed.

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TMR STANDPIPE PIEZOMETER INSTALLATION LOG - CREATED WITH HOLEBASE SI

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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	26.06.18
Borehole No.	CRR908	Reference No.	H13108
Location	Clapham Yard	Start Depth (m)	15.10
Submitted By	J. Armstrong	Finish Depth (m)	23.33

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