FINAL 27/09/2018

Queensland Government

GEOTECHNICAL BOREHOLE LOG

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

BOREHOLE No **CRR902**

Sheet 1 of 3

REFERENCE No **H13106**

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

LOCATION Salisbury Station

COORDINATES 502261.4 E; 6952246.9 N

PROJECT No FG6470 | SURFACE RL 12.73m | PLUNGE 90° | DATE STARTED 05/07/2018 | GRID DATUM MGA94

JOB No | HEIGHT DATUM AHD | BEARING ° | DATE COMPLETED 10/07/2018 | 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	12.38			A	Silty Gravelly SAND (Fill) Brown-grey, moist, loose. Fine to coarse grained. Fine to coarse angular to sub-angular gravel. Trace cobbles.		(SM)				DIST
				B							DIST
1					Silty CLAY (Alluvium) Grey and red-brown, moist, firm to stiff. High plasticity. Trace fine grained sand.						
				C	from 1.60m: grey mottled orange-brown					2, 3, 5 N=8	SPT
2					from 2.0m: stiff						
				D						2.50m-2.95m: CU Triaxial Test; MC=34.6% DD= 1.39 t/m3 WD= 1.87 t/m3	U50
3											
				E						3, 5, 7 N=12 LL=77% PI= 55% MC=24.3% LS= 14% <75µm= 95%	SPT
4							(CH)				
				F						3, 6, 9 N=15	SPT
5											
				G						5, 5, 9 N=14	SPT
6											
					from 6.7m to 8.65m: SILTSTONE boulder, highly weathered, grey and brown, very low strength, some extremely weathered sections throughout.						
7				H						18, 30/140mm	SPT
8											
	4.08			I	Sandy CLAY (Alluvium) Grey, pale brown, moist, hard. Low plasticity. Fine grained sand.		(CL)			16, 30/120mm LL=34% PI= 16% MC=19.9% LS= 8% <75µm= 71%	SPT
9	3.13				Clayey Silty SAND (Alluvium)		(SC)				
	2.73										

Continued on next sheet

REMARKS: Rjbw - Woogaroo Subgroup. Standpipe piezometer installed.

LOGGED BY	REVIEWED BY
MH	S.Foley

Queensland Government

GEOTECHNICAL BOREHOLE LOG

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

BOREHOLE No **CRR902**

Sheet 2 of 3

REFERENCE No **H13106**

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

LOCATION Salisbury Station — COORDINATES 502261.4 E; 6952246.9 N

PROJECT No FG6470 — SURFACE RL 12.73m — PLUNGE 90° — DATE STARTED 05/07/2018 — GRID DATUM MGA94

JOB No — HEIGHT DATUM AHD — BEARING ° — DATE COMPLETED 10/07/2018 — DRILLER Geodrill

DEPTH (m)	R.L. (m)	RQD ( ) % / CORE REC %	SAMPLE	MATERIAL DESCRIPTION	USCS WEATHERING	ADDITIONAL DATA AND TEST RESULTS	SAMPLES TESTS
			J	Clayey Silty SAND (Alluvium)		80/80mm	SPT
		(0)		Cont'd. Orange-brown and grey, moist, very dense. Fine grained. Some fine to coarse sandstone gravels and cobbles.			
11		0					
			K		(SC)	28, 30/95mm MC=17.1% <75µm= 16%	SPT
12							
13	-0.27		L	Clayey SAND (Residual) Grey, moist, very dense. Fine to medium grained.		30/50mm	SPT
					(SC)		
14							
	-1.87		M	SILTSTONE (Rjbw) XW: Recovered as grey, moist, dense, fine grained clayey Sand. SOme fine to coarse angular to sub-angular gravel.	XW	20, 30/130mm	SPT
15							
16	-3.47		N			30/105mm	SPT
		(94)		SILTSTONE (Rjbw) HW: Grey, fine grained, very thinly to thinly bedded, very low strength, some layers of fine to medium grained sandstone.	HW		
17	-4.32			SANDSTONE (Rjbw)		Is(50)=0.08 MPa Is(50)=0.11 MPa	D (16.91m) A (16.92m)
		100 (44)		HW: Grey, fine to medium grained, very thinly to thinly bedded, very low to low strength.	HW		
	-5.07			SANDSTONE (Rjbw)			
18				HW: Pale grey, medium to coarse grained, medium bedded, generally very low to low strength.	HW	18.10m-18.15m: XW, Clayey Sand 18.15m-18.17m: XW, Clayey Gravel	
					XW		
		92 (71)			HW		
19						Is(50)=0.28 MPa Is(50)=0.41 MPa	D (18.90m) A (18.91m)
	-6.57				HW		
		100 (86)		SILTSTONE (Rjbw) HW: Grey, brown and orange, very thinly bedded, low strength.	HW		
	-7.27					Is(50)=0.12 MPa Is(50)=0.22 MPa	D (19.90m) A (19.91m)

Continued on next sheet

REMARKS: Rjbw - Woogaroo Subgroup. Standpipe piezometer installed.

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MH	S.Foley

FINAL 27/09/2018

Queensland Government

GEOTECHNICAL BOREHOLE LOG

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

BOREHOLE No **CRR902**

Sheet 3 of 3

REFERENCE No **H13106**

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

LOCATION Salisbury Station — COORDINATES 502261.4 E; 6952246.9 N

PROJECT No FG6470 — SURFACE RL 12.73m — PLUNGE 90° — DATE STARTED 05/07/2018 — GRID DATUM MGA94

JOB No — HEIGHT DATUM AHD — BEARING ° — DATE COMPLETED 10/07/2018 — DRILLER Geodrill

DEPTH (m)	R.L. (m)	RQD ( ) % / CORE REC %	MATERIAL DESCRIPTION	USCS WEATHERING	ADDITIONAL DATA AND TEST RESULTS	SAMPLES TESTS
			SILTSTONE (Rjbw) HW: Cont'd.	HW		
	-7.87	94		HW		
21		(97)	SANDSTONE (Rjbw) HW: Grey, fine grained, very thinly to thinly bedded, low strength, some interbedded siltstone layers up to 700mm	HW	UCS=2.36 MPa E=0.195 GPa v= 0.224 Is(50)=0.04 MPa Is(50)=0.11 MPa	(20.80m) D (20.95m) A (20.96m)
22				HW	21.83m-21.85m: XW Band, Cly, Coal Is(50)=0.14 MPa Is(50)=0.12 MPa	D (22.24m) A (22.25m)
23		100		HW		
	-10.82	(85)	SANDSTONE (Rjbw) MW: pale grey, medium grained, thinly bedded, low to medium strength. Some thin extremely weathered layers.	MW	UCS=9.93 MPa E=2.12 GPa v= 0.022 Is(50)=0.70 MPa Is(50)=0.31 MPa 23.89m-23.91m: XW Band, Clay 24.42m-24.45m: XW, Clay 24.42m-24.59m: MW 24.59m-24.62m: XW Band, Clay	(23.67m) D (23.85m) A (23.86m)
24				MW		
25		100		HW	25.10m-25.16m: XW Band, Clay	
		(95)		MW	Is(50)=0.10 MPa Is(50)=0.25 MPa	D (25.55m) A (25.56m)
26				MW		
	-13.70	100	Borehole completed at 26.43m		Is(50)=0.10 MPa Is(50)=0.14 MPa	D (26.25m) A (26.26m)
27						
28						
29						

REMARKS: Rjbw - Woogaroo Subgroup. Standpipe piezometer installed.

LOGGED BY	REVIEWED BY
MH	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.	**CRR902**					**Surface RL**	**12.73**		
Geologist	**MARK HAYES**					**Date**	**9/07/2018**		
						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
16.23	B	10°	Pl	SM	VIII	CD	CN		
16.44	B	5°	Pl	SM	VIII	CD	CN		
16.65	B	5°	Pl	SM	VIII	CD	VR	CLAY	
16.75	B	5°	Pl	SM	VIII	CD	CN		
17.05	B	5°	Pl	SM	VIII	CD	VR	CLAY	
17.12	B	5°	Pl	SM	VIIII	CD	CN		
17.88	B	50°	Pl	SM	VIII	CD	VR	CLAY	
18.00	J	45°	Pl	-	-	OP	BROKEN	SANDY	SURFACE
18.10	J	35°	Pl	SM	VIII	FL	Ct	CLAY	5mm
18.32	B	5°	Pl	SM	VII	FL	Ct	CLAY	
18.40	J	60°	Un	Ro	IV	CD	CN		
18.56	B	5°	Pl	SM	VIII	CD	CN		
18.80	B	5°	Un	SM	V	OP	CN		
19.14	B	5°	Pl	Ro	VII	OP	GRAVALLY CLAY		
19.27	B	5°	Un	SM	V	FL	Ct	CLAY	20mm
19.29	J	30°	Pl	Ro	VII	CD	Ct	CLAY	5mm
19.36	B	5°	Pl	SM	VIII	OP	Vr	CLAY	
19.45	J	40°	Un	Sl	VI	OP	Cr		
19.72	B	5°	Pl	Sm	VIII	CD	Cr		
19.80	TIGHT	5-15°	BEDDING	DEFECTS					
20.25	B	15°	Pl	Sm	VIII	FL	Ct	CLAY 5mm	
20.45	J	45°	Un	Sm	VIII	FL	80mm	CLAYED BROKEN ZONE	
20.53	70MM CORE(0°)								
21.03	B	5°	Pl	Sm	VIII	CD	CN		
21.33	B	5°	Un	Sm	V	CD	CN		
21.83	B	5°	Pl	Sm	VIII	FL	Ct	CLAY 20mm	
21.93	J	20°	Pl	Sm	VIII	CD	Vr	CLAY	
22.17	B	5°	Pl	Sm	VIII	CD	CN		
22.34	B	5°	Un	Sm	V	CD	CN		
22.57	B	5°	Pl	Sm	VIII	CD	CN		
23.04	B	5°	Pl	Sm	VIII	CD	CN		

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

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.	**CRR902**	**Surface RL**	**12.73**
Geologist	**MARK HAYS**	**Date**	**9/07/2018**
		Page	**2** **of** **2**

23.15	B	5°	Pl	Sm	VIII	CD	Vr	CLAY	
23.45	B	5°	Pl	Sm	IX	CD	Vr	CLAY	
23.55	B	5°	Pl	Sm	VIII	CD	Vr	CLAY	
23.79	B	0°	Un	Sm	V	CD	CN		
23.89	B	5°	Pl	Sm	VIII	FL	Ct	CLAY 20mm	
24.22	B	15°	Pl	Sm	VIII	OP	CN		
24.30	B	10°	Un	Ro	IV	OP	Vr	CLAY	
24.42	B	5°	Pl	Sm	VIII	FL	Ct	CLAY 30 mm	
24.56	B	5°	Pl	Ro	VIII	OP	CN		
24.59	B	5°	Pl	Sm	VIII	FL	Ct	CLAY 30mm	
24.66	J	30°	Pl	Ro	VIII	CD	CN		
24.95	B	5°	Pl	Sm	VIII	OP	CN		
25.08	B	5°	Pl	Sm	VIII	CD	CN		
25.10	B	5°	Pl	Sl	IX	FL	Ct	CLAY 60mm	
25.22	B	5°	Pl	Sm	VIII	CD	CN		
25.24	B	5°	Pl	Sm	VIII	CD	CN		
25.27	B	5°	Pl	Sm	VIII	CD	CN		
25.67	B	5°	Pl	Sm	VIII	CD	CN		
26.03	B	0°	Un	Sm	V	CD	CN		

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

FINAL 27/09/2018

Queensland Government

STANDPIPE PIEZOMETER INSTALLATION LOG

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

BOREHOLE No **CRR902**

Sheet 1 of 3

PIEZOMETER No **CRR902**

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

LOCATION Salisbury Station

COORDINATES 502261.4 E; 6952246.9 N

PROJECT No FG6470 | SURFACE RL 12.73m | PLUNGE 90° | DATE STARTED 05/07/2018 | GRID DATUM MGA94

JOB No | HEIGHT DATUM AHD | BEARING ° | DATE COMPLETED 10/07/2018 | 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 = 0.00m	Backfill Details
0	12.38		Silty Gravelly SAND (Fill) Brown-grey, moist, loose. Fine to coarse grained. Fine to coarse angular to sub-angular gravel. Trace cobbles.			
1			Silty CLAY (Alluvium) Grey and red-brown, moist, firm to stiff. High plasticity. Trace fine grained sand.			Grout: Bentonite / Cement Mix
			from 1.60m: grey mottled orange-brown			
2			from 2.0m: stiff	2.50m / 10.23 AHD		
3				3.50m / 9.23 AHD		Bentonite Seal
4						
5						
6						
7			from 6.7m to 8.65m: SILTSTONE boulder, highly weathered, grey and brown, very low strength, some extremely weathered sections throughout.			
8	4.08					
9			Sandy CLAY (Alluvium) Grey, pale brown, moist, hard. Low plasticity. Fine grained sand.			
	3.13					
			Clayey Silty SAND (Alluvium)			
	2.73					

Continued on next sheet

REMARKS: Rjbw - Woogaroo Subgroup. Standpipe piezometer installed.

LOGGED BY	REVIEWED BY
MH	S.Foley

Queensland Government

STANDPIPE PIEZOMETER INSTALLATION LOG

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

BOREHOLE No **CRR902**

Sheet 2 of 3

PIEZOMETER No **CRR902**

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

LOCATION Salisbury Station

COORDINATES 502261.4 E; 6952246.9 N

PROJECT No FG6470 | SURFACE RL 12.73m | PLUNGE 90° | DATE STARTED 05/07/2018 | GRID DATUM MGA94

JOB No | HEIGHT DATUM AHD | BEARING ° | DATE COMPLETED 10/07/2018 | 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 = 0.00m	Backfill Details
11			Clayey Silty SAND (Alluvium) Cont'd. Orange-brown and grey, moist, very dense. Fine grained. Some fine to coarse sandstone gravels and cobbles.			
12						
13	-0.27		Clayey SAND (Residual) Grey, moist, very dense. Fine to medium grained.			
14	-1.87		SILTSTONE (Rjbw) XW: Recovered as grey, moist, dense, fine grained clayey Sand. SOme fine to coarse angular to sub-angular gravel.			Collapsed annulus
15						
16	-3.47		SILTSTONE (Rjbw) HW: Grey, fine grained, very thinly to thinly bedded, very low strength, some layers of fine to medium grained sandstone.			
17	-4.32		SANDSTONE (Rjbw) HW: Grey, fine to medium grained, very thinly to thinly bedded, very low to low strength.			
18	-5.07		SANDSTONE (Rjbw) HW: Pale grey, medium to coarse grained, medium bedded, generally very low to low strength.	19.00m / -6.27 AHD		
19	-6.57		SILTSTONE (Rjbw) HW: Grey, brown and orange, very thinly bedded, low strength.			
	-7.27					

Continued on next sheet

REMARKS: Rjbw - Woogaroo Subgroup. Standpipe piezometer installed.

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MH	S.Foley

FINAL 27/09/2018

Queensland Government

STANDPIPE PIEZOMETER INSTALLATION LOG

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

BOREHOLE No **CRR902**

Sheet 3 of 3

PIEZOMETER No **CRR902**

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

LOCATION Salisbury Station

COORDINATES 502261.4 E; 6952246.9 N

PROJECT No FG6470 | SURFACE RL 12.73m | PLUNGE 90° | DATE STARTED 05/07/2018 | GRID DATUM MGA94

JOB No | HEIGHT DATUM AHD | BEARING ° | DATE COMPLETED 10/07/2018 | DRILLER Geodrill

DEPTH (m)	R.L. (m)	LITHOLOGY	MATERIAL DESCRIPTION
			SILTSTONE (Rjbw) HW: Cont'd.
	-7.87		
21			SANDSTONE (Rjbw) HW: Grey, fine grained, very thinly to thinly bedded, low strength, some interbedded siltstone layers up to 700mm
22			
23			
	-10.82		
24			SANDSTONE (Rjbw) MW: pale grey, medium grained, thinly bedded, low to medium strength. Some thin extremely weathered layers.
25			
26			
	-13.70		Borehole completed at 26.43m
27			
28			
29			

Standpipe Piezometer Construction Details

Depth (m) /RL (AHD)	50mm PVC Class No. 18 Stick Up = 0.00m	Backfill Details
23.20m / -10.47 AHD		Top of Slotted Pipe Filter: Washed / Graded Sand
26.20m / -13.47 AHD		
26.43m / -13.70 AHD		

REMARKS: Rjbw - Woogaroo Subgroup. Standpipe piezometer installed.

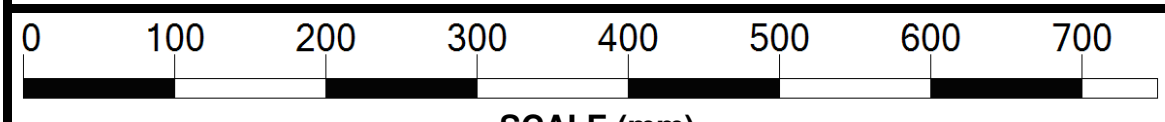
LOGGED BY	REVIEWED BY
MH	S.Foley

TMR STANDPIPE PIEZOMETER INSTALLATION LOG - CREATED WITH HOLEBASE SI

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	09.07.2018
Borehole No.	CRR902	Reference No.	H13106
Location	Salisbury Street	Start Depth (m)	16.20
Submitted By	J. Armstrong	Finish Depth (m)	26.40

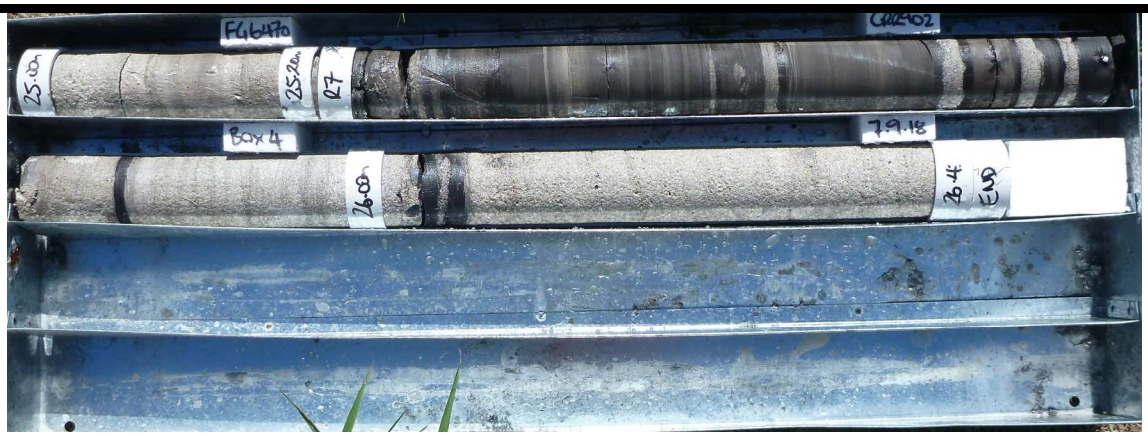


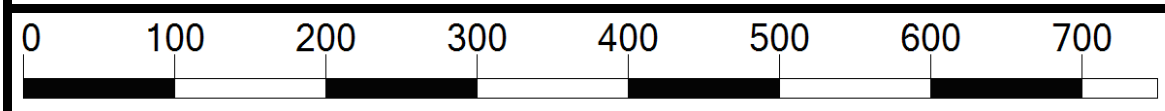
SCALE (mm)

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	09.07.2018
Borehole No.	CRR902	Reference No.	H13106
Location	Salisbury Street	Start Depth (m)	16.20
Submitted By	J. Armstrong	Finish Depth (m)	26.40





SCALE (mm)