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# REPORT OF BOREHOLE: CRR 201

SHEET: 1 OF 5

CLIENT: Aecom Australia Pty Ltd  
 PROJECT: Cross River Rail  
 LOCATION: Roma St  
 JOB NO: 107632034

COORDS: 502129.32 m E 6961818.04 m N MGA94 56  
 SURFACE RL: 12.70 m DATUM: AHD  
 INCLINATION: -90°  
 HOLE DEPTH: 35.00 m

DRILL RIG: FD500  
 CONTRACTOR: Foundril Pty Ltd  
 LOGGED: CA DATE: 16/9/10  
 CHECKED: NK DATE: 18/10/10

Drilling			Sampling		Field Material Description								
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS		
ADT	L		0	12.70				ASPHALT					
				0.20									
				12.50					GP	Sandy GRAVEL fine to medium grained, grey, fine sand, trace fines	D - M	MD	
				0.50									
				12.20					CI-CH	Silty CLAY medium to high plasticity, brown orange, trace fine to medium gravel			
				1.00									
				11.70			SPT 1.00-1.45 m 3, 3, 6 N=9			becoming grey and red brown			
				2.00							M	F	
				10.70						encountered some cobbles			
			RD	L-M									
			3					For Continuation Refer to Sheet 2					
			4										
			5										
			6										
			7										
			8										
			9										
			10										

This report of borehole must be read in conjunction with accompanying notes and abbreviations. It has been prepared for geotechnical purposes only, without attempt to assess possible contamination. Any references to potential contamination are for information only and do not necessarily indicate the presence or absence of soil or groundwater contamination.

GAP gINT FN. F01a  
RL3

GAP 8.03 LIB:GLE Log GAP NON-CORED FULL PAGE 107632034\_ACO.GPJ <<DrawingFile>> 29/11/2010 13:38 8.2.007



# REPORT OF BOREHOLE: CRR 201

SHEET: 2 OF 5

CLIENT: Aecom Australia Pty Ltd  
 PROJECT: Cross River Rail  
 LOCATION: Roma St  
 JOB NO: 107632034

COORDS: 502129.32 m E 6961818.04 m N MGA94 56  
 SURFACE RL: 12.70 m DATUM: AHD  
 INCLINATION: -90°  
 HOLE DEPTH: 35.00 m

DRILL RIG: FD500  
 CONTRACTOR: Foundril Pty Ltd  
 LOGGED: CA DATE: 16/9/10  
 CHECKED: NK DATE: 18/10/10

Drilling					Field Material Description				Defect Information				
METHOD	WATER	TCR	RQD (SCR)	DEPTH (metres)	DEPTH RL	GRAPHIC LOG	ROCK / SOIL MATERIAL DESCRIPTION	WEATHERING	INFERRED STRENGTH $I_{s(50)}$ MPa	DEFECT DESCRIPTION & Additional Observations		FRACTURE FREQUENCY (Defects per unit metre length)	
				0									
				1									
				2									
				2.80			Continuation of Sheet 1						
				3	9.90		META SILTSTONE mixture of SOIL and COBBLES: Soil is: Silty CLAY, low plasticity, some fine to medium gravel, pale brown and orange brown	EW - RS					
				3.70			CORE LOSS						
				4	9.00		META SILTSTONE fine grained, foliated, dark grey with brown bands, orange to brown with some grey, interlaminated with dark grey ARGILITE, joints along/parallel to foliation	DW					
				4	8.78								
			75	15									
			100	35									
			100	10									
			100	45									
			100	35									
			100	75									
				10									

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GAP gINT FN. F02b  
RL3

GAP 8\_03 LIB: GLE Log GAP CORED BOREHOLE 107632034\_ACO.GPJ <<DrawingFile>> 29/11/2010 13:48 8.2.007



# REPORT OF BOREHOLE: CRR 201

SHEET: 3 OF 5

CLIENT: Aecom Australia Pty Ltd  
 PROJECT: Cross River Rail  
 LOCATION: Roma St  
 JOB NO: 107632034

COORDS: 502129.32 m E 6961818.04 m N MGA94 56  
 SURFACE RL: 12.70 m DATUM: AHD  
 INCLINATION: -90°  
 HOLE DEPTH: 35.00 m

DRILL RIG: FD500  
 CONTRACTOR: Foundril Pty Ltd  
 LOGGED: CA DATE: 16/9/10  
 CHECKED: NK DATE: 18/10/10

Drilling					Field Material Description			Defect Information									
METHOD	WATER	TCR	RQD (SCR)	DEPTH (metres)	DEPTH RL	GRAPHIC LOG	ROCK / SOIL MATERIAL DESCRIPTION	WEATHERING	INFERRED STRENGTH Is(50) Mpa	DEFECT DESCRIPTION & Additional Observations	FRACTURE FREQUENCY (Defects per unit metre length)						
								EL 0.03 VL 0.01 J 0.1 M 0.3 H 1 VH 0 EH			5 0 0 0 0 0 0 0 0 0						
NMLC			100 75	10			META SILTSTONE fine grained, foliated, dark grey with brown bands, orange to brown with some grey, interlaminated with dark grey ARGILITE, joints along/parallel to foliation	DW		7.80-8.11: J, 90°, Un, Sm, Ct, clay, pale grey, wet, very soft 7.85: J, 30°, Un, Sm, Ct, clay, pale brown 8.00: J, 40°, Un, Sm, Sn, orange brown 8.12: J, St, Sm, Ct, clay, pale grey 8.15: J, 60°, Un, Sm, Vr, clay, orange 8.20: J, 60°, Pl, Sm, Vr, clay, orange 8.31: J, 30°, Un, Sm, Cn 8.36-8.39: CZ, 20°, Un, Sm, 30 mm, clay rock fragments, fine, platy 8.43: J, 40°, Un, Sm, Vr, clay, pale grey 8.47: J, 35°, Un, Sm, Vr, clay, pale brown 8.60: J, 25°, Un-St, Sm, Vr, clay, pale grey 8.64: J, 40°, Pl, Sm, Ct, clay, pale grey 8.70: J, 0°, Un, Sm, Cn 8.73: J, 30°, Pl, Sm, Cn 8.83: V, 45°, Pl, 2 mm, quartz 8.86: J, 20°, Un, Sm, Ct, clay, pale grey 9.03: J, 30°, Un, Sm, Sn, brown 9.06: J, 30°, Pl, Sm, Ct, clay, pale grey 9.16: J, 40°, Pl, Sm, Ct, clay, pale grey 9.22: J, 40°, Pl, Sm, Vr, clay, pale grey 9.34: J, 70°, Un, Sm, Ct, clay, pale grey 9.40-9.60: J, 75°, Un, Sm, Ct, clay, pale grey 9.49-9.53: DS, 40 mm, silty clay, low plasticity, pale grey 9.58-9.62: CS, 40 mm, clayey rock fragments, 2mm to 40mm, platy 9.72-9.77: CS, 50 mm, clayey rock fragments, 2mm to 40mm, platy 9.95: J, 40°, Pl, Sm, Vr, clay, orange 10.08: J, 60°, Un, Sm, Sn, FeO 10.15: J, 30°, Un, Sm, Sn, FeO 10.26: J, 50°, Un, Sm, Vr, clay, orange 10.44: J, 60°, Un, Sm, Vr, clay, orange 10.62: J, 50°, Pl, Sm, Ct, clay, pale grey, wet, very soft 10.71: J, 50°, Un, Sm, Vr, clay, orange 10.81: J, 40°, Un, Sm, Sn, FeO 10.82: J, 40°, Un, Sm, Sn, FeO 10.83: J, 40°, Pl, Sm, Vr, clay, orange 10.90: J, 45°, Pl, Sm, Sn, FeO 11.04: J, 30°, Un, Sm, Vr, clay, orange 11.07: J, 35°, Pl, Sm, Ct, clay, orange, wet, very soft 11.17: J, 45°, Un, Sm, Ct, clay, orange, wet, very soft 11.36: J, 40°, Pl, Sm, Ct, clay, orange, wet, very soft 11.47: J, 40°, Pl, Sm, Sn, FeO 11.50: J, 40°, Pl, Sm, Sn, FeO 11.52: J, 40°, Pl, Sm, Vr, clay, orange 11.57: J, 30°, Un, Sm, Ct, clay, pale grey, wet, very soft 11.60: J, 30°, Un, Sm, Ct, clay, pale grey, wet, very soft 11.73: J, 15°, Un-St, Ro, Vr, clay, yellow brown 11.77: J, 15°, Un-St, Ro, Vr, clay, yellow brown 11.87: J, 20°, Un, Sm, Sn, FeO 11.97: J, 40°, Pl, Sm, Sn, FeO 12.06: V, 35°, Pl, 5 mm, quartz 12.07: J, 35°, Pl, Sm, Sn, FeO 12.12: V, 20°, Un, 5 mm, quartz 12.13: J, 20°, Un, Sm, Sn, FeO 12.33: J, 30°, Un, Sm, Sn, FeO 12.37: J, 30°, Un, Sm, Sn, FeO 12.40: J, 35°, Pl, Sm, Sn, FeO 12.51: J, 35°, Pl, Sm, Ct, clay, orange 12.74: J, 10°, Un, Sm, Sn, FeO 12.87: J, 40°, Pl, Sm, Ct, orange clay and platy rock fragments 12.93: J, 45°, Pl, Sm, Vr, silt, brown, 13.10: J, 40°, Pl, Sm, Vr, silt, brown 13.20: J, 55°, Pl, Sm, Sn, FeO 13.22: J, 55°, Pl, Sm, Ct, clay, orange 13.69: J, 45°, Pl-Un, Sm, Sn, clay, orange 13.75: J, 30°, Pl-St, Sm, Sn, FeO, perpendicular to foliation 13.92: J, 40°, Pl, Sm, Ct, platy fragments, brittle, orange 13.97: J, 50°, Pl, Sm, Sn, FeO 14.00-14.80: J, 90°, Un, Ro, Sn, vertical joint, healed, open in places with distinct FeO staining 14.07: J, 30°, Un, Sm, Sn, FeO 14.12: J, 20°, Un, Ro, Sn, FeO 14.35: DB, 40°, Un, Sm, Sn, drilling break along healed joint, FeO staining 14.56: J, 30°, Pl, Sm, Sn, FeO 14.84: J, 55°, Pl, Sm, Ct, silt, orange, wet, very soft 14.84-14.93: CS, 90 mm, fragments up to 50mm with FeO staining 14.93: J, 30°, Pl, Sm, Ct, silt, orange, wet, very soft with platy rock fragments 15.00: partial water loss 15.09: J, 30°, Pl, Sm, Sn, FeO 15.23: J, 35°, Pl, Sm, Sn, FeO 15.43: J, 40°, Pl, Sm, Sn, FeO 15.47: J, 60°, Pl, Sm, Sn, FeO, perpendicular to foliation 15.55: J, 10°, Un, Sm, Sn, FeO							
			100 45	11										DW - SW			
			100 40	12													
				13													
				14	14.00 -1.30							becoming grey		SW - FR			
			100 85	15													
				16													
				17													
			100 75	18													
			100 100	19													
		100 100	20														

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GAP gINT FN. F02b  
RL3

GAP 8.03 LIB: GLE Log GAP CORED BOREHOLE 107632034\_ACO.GPJ <<DrawingFile>> 20/11/2010 13:48 8.2.007



# REPORT OF BOREHOLE: CRR 201

SHEET: 4 OF 5

CLIENT: Aecom Australia Pty Ltd  
 PROJECT: Cross River Rail  
 LOCATION: Roma St  
 JOB NO: 107632034

COORDS: 502129.32 m E 6961818.04 m N MGA94 56  
 SURFACE RL: 12.70 m DATUM: AHD  
 INCLINATION: -90°  
 HOLE DEPTH: 35.00 m

DRILL RIG: FD500  
 CONTRACTOR: Foundril Pty Ltd  
 LOGGED: CA DATE: 16/9/10  
 CHECKED: NK DATE: 18/10/10

Drilling					Field Material Description				Defect Information				
METHOD	WATER	TCR	RQD (SCR)	DEPTH (metres)	DEPTH RL	GRAPHIC LOG	ROCK / SOIL MATERIAL DESCRIPTION	WEATHERING	INFERRED STRENGTH Is(50) Mpa	DEFECT DESCRIPTION & Additional Observations		FRACTURE FREQUENCY (Defects per unit metre length)	
				20			<p><b>META SILTSTONE</b>            fine grained, foliated, dark grey with brown bands, orange to brown with some grey, interlaminated with dark grey ARGILITE, joints along/parallel to foliation</p>	SW - FR		<p>15.60: J, 25°, Pl, Sm, Sn, FeO            15.72: J, 30°, Pl, Sm, Sn, FeO            15.90: J, 30°, Pl-Un, Sm, Sn, FeO            15.97-16.00: CS, platy rock fragments in orange clay matrix, average size 2mm, brittle            16.10: J, 20°, Un, Sm, Sn, FeO            16.52: J, 25°, Pl, Sm-Ro, Sn, FeO            16.81: J, 20°, Un, Ro, Sn, FeO            17.07: J, 40°, Un, Sm-Ro, Sn, FeO, perpendicular to foliation            17.22: J, 35°, Pl, Ro, Sn, FeO, perpendicular to foliation            17.33: J, Pl, Sm, Sn, FeO            17.41: J, 40°, Pl-Un, Sm, Sn, FeO, perpendicular to foliation            17.88: J, 30°, Pl, Sm-Ro, Sn, FeO            17.93: J, 45°, Pl, Ct, 10 mm, platy rock fragments in orange clay matrix, average size 5mm, FeO stains            17.98: J, 50°, Un, Sm, Vr with clay and FeO stains            18.02: J, 10°, Un, Ro, Sn, FeO            18.08: J, 55°, Pl, Sm, Sn, FeO            18.12: J, 55°, Pl, Sm, Sn, FeO            18.17: J, 0°, Pl-Un, Sm, 10 mm, platy rock fragments, average size 5mm, FeO staining            18.25: J, 65°, Pl, Sm, Sn, FeO            18.50: CS, 30°, 20 mm, platy rock fragments, average size 2mm, FeO stains            18.54: J, 30°, Un, Sm, 5 mm, platy rock fragments, average size 2mm, FeO stains            18.63: J, 50°, Un, Sm, Sn, FeO            18.71: J, 45°, Un, Sm, 3 mm, platy rock fragments, average size 2mm, FeO stains            19.33: J, 40°, Pl, Sm, Cn, possible drilling break along foliation plane            19.58: DB, 0°, Un-St, Sm, Cn, drilling break            19.93: J, 30°, Un, Sm, Sn, possible drilling break along foliation plane            20.11: J, 45°, Pl, Sm, Cn, possible drilling break along foliation plane            20.46: DB, 10°, Un-St, Sm, Cn, drilling break            21.09: DB, 0°, Un, Sm, Cn, drilling break            21.49: DB, 10°, Un, Sm, Cn, drilling break            21.88: J, 40°, Un, Sm, Cn, possible drilling break along foliation plane            22.08: J, 40°, Un, Sm, Cn, possible drilling break along foliation plane            22.18: J, 35°, Pl, Sm, Cn, possible drilling break along foliation plane            22.80: J, 30°, Pl, Sm, Cn, possible drilling break along foliation plane            23.05: DB, 40°, St, Sm, Cn, drilling break            23.31-23.45: J, 80°, Un, Ro, Cn-Sn, some FeO patches, possible drilling break            23.56: DB, 30°, Un, Sm, Cn, drilling break            23.75: DB, 0°, Un, Sm, Cn, drilling break            24.17: DB, 10°, Un-St, Sm, Cn, drilling break            24.27: J, 0°, Un, Sm-Ro, open 5mm, platy rock fragments up to 5mm            24.37: J, 45°, Un, Sm, Cn, possible drilling break along foliation plane            24.58-24.84: J, 90°, Un, Ro, Sn, appears to be drilling break along healed white plane            24.87: complete water loss            25.00-25.60: J, 90°, Un, Sm, Cn, appears to be drilling break along healed plane            25.72: J, 35°, Pl, Sm, Cn, possible drilling break along foliation plane</p>			
		100	100	21									
				22									
		100	100	23									
				24									
		100	45	25									
				26									
		100	100	27									
				28						<p>27.63: J, 50°, Pl-Un, Sm, Cn, along foliation, carbonaceous            27.88: J, 15°, Un, Sm, Ct, sand, dark grey            28.00: partial water loss, approximately 10% return</p>			
				29						<p>28.88: J, 35°, Pl-Un, Sm, Cn, along foliation</p>			
		100	95	30						<p>29.55: J, 30°, Pl-Un, Sm, Cn, along foliation</p>			

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GAP gINT FN. F02b  
RL3

GAP 8.03 LIB: GLE Log GAP CORED BOREHOLE 107632034\_ACO.GPJ <<DrawingFile>> 29/11/2010 13:48 8.2.007



# REPORT OF BOREHOLE: CRR 201

SHEET: 5 OF 5

CLIENT: Aecom Australia Pty Ltd  
 PROJECT: Cross River Rail  
 LOCATION: Roma St  
 JOB NO: 107632034

COORDS: 502129.32 m E 6961818.04 m N MGA94 56  
 SURFACE RL: 12.70 m DATUM: AHD  
 INCLINATION: -90°  
 HOLE DEPTH: 35.00 m

DRILL RIG: FD500  
 CONTRACTOR: Foundril Pty Ltd  
 LOGGED: CA DATE: 16/9/10  
 CHECKED: NK DATE: 18/10/10

Drilling					Field Material Description				Defect Information								
METHOD	WATER	TCR	RQD (SCR)	DEPTH (metres)	DEPTH RL	GRAPHIC LOG	ROCK / SOIL MATERIAL DESCRIPTION	WEATHERING	INFERRED STRENGTH Is(50) MPa	DEFECT DESCRIPTION & Additional Observations		FRACTURE FREQUENCY (Defects per unit metre length)					
NMLC			100	95	30		META SILTSTONE fine grained, foliated, dark grey with brown bands, orange to brown with some grey, interlaminated with dark grey ARGILITE, joints along/parallel to foliation	SW - FR			30.22: J, 40°, Pl-Un, Sm, Cn, crushed subangular fragments, average size 20mm	30.44: J, 30°, Pl-Un, Sm, Cn, along foliation	30.55: DB, 20°, Un, Ro, Cn, drilling break				
			100	100	31						30.82: DB, 60°, Pl, Ro, Cn, perpendicular to foliation	30.95: J, Pl-Un, Sm, Cn, along foliation	31.15: J, 40°, Pl-Un, Sm, Ct, along foliation, carbonaceous soil infill	31.20: J, 35°, Un, Sm, Cn, along foliation, platy fragments, brittle, average size 5mm	31.42: DB, 30°, Un, Ro, Cn, drilling break, perpendicular to foliation	31.70: J, 50°, Un, Sm, Cn, along foliation	31.84: J, 40°, Un, Sm, Cn, along foliation
			75	75	33						32.90: DB, 0°, Un-St, Ro, Cn, drilling break	33.18: DB, 0°, Un, Sm, Cn, drilling break					
					34						33.70: DB, 10°, Un, Sm, Cn, drilling break	33.74: J, 35°, Pl, Sm, Cn, along foliation, carbonaceous	33.84: J, 30°, Un-St, Sm, Cn, drilling break	34.05: J, 65°, Pl, Sm, Cn, along foliation, carbonaceous	34.18: DB, 30°, Un, Ro, Cn, drilling break	34.18-34.30: DB, 80°, Pl, Sm, Cn, drilling break	34.30: DB, 30°, Un, Ro, Cn, drilling break
					34.83 35.00 -22.30		CORE LOSS				34.83: last 170 mm core slipped out of barrel, remains down hole						
							END OF BOREHOLE @ 35.00 m TARGET DEPTH LEFT OPEN GW @ 3.7m 14/09/10 GW @ 6.7m 15/09/10										
					36												
					37												
					38												
					39												
					40												

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GAP gINT FN. F02b  
RL3

GAP 8.03 LIB: GLE Log GAP CORED BOREHOLE 107632034\_ACO.GPJ <<DrawingFile>> 29/11/2010 13:48 8.2.007





# REPORT OF CORE PHOTOGRAPHS: CRR 201

CLIENT: Aecom Australia Pty Ltd  
PROJECT: Cross River Rail  
LOCATION: Roma St  
JOB NO: 107632034

COORDS: 502129.32 m E 6961818.04 m N  
SURFACE RL: 12.70m DATUM: AHD  
INCLINATION: -90°  
HOLE DEPTH: 35.0 m

DEPTH RANGE: 3.7-21.0 m  
DRILL RIG: FD500  
DRILLER: Foundril Pty Ltd  
LOGGED: CJA DATE: 16/09/10  
CHECKED: NK DATE: 4/10/10





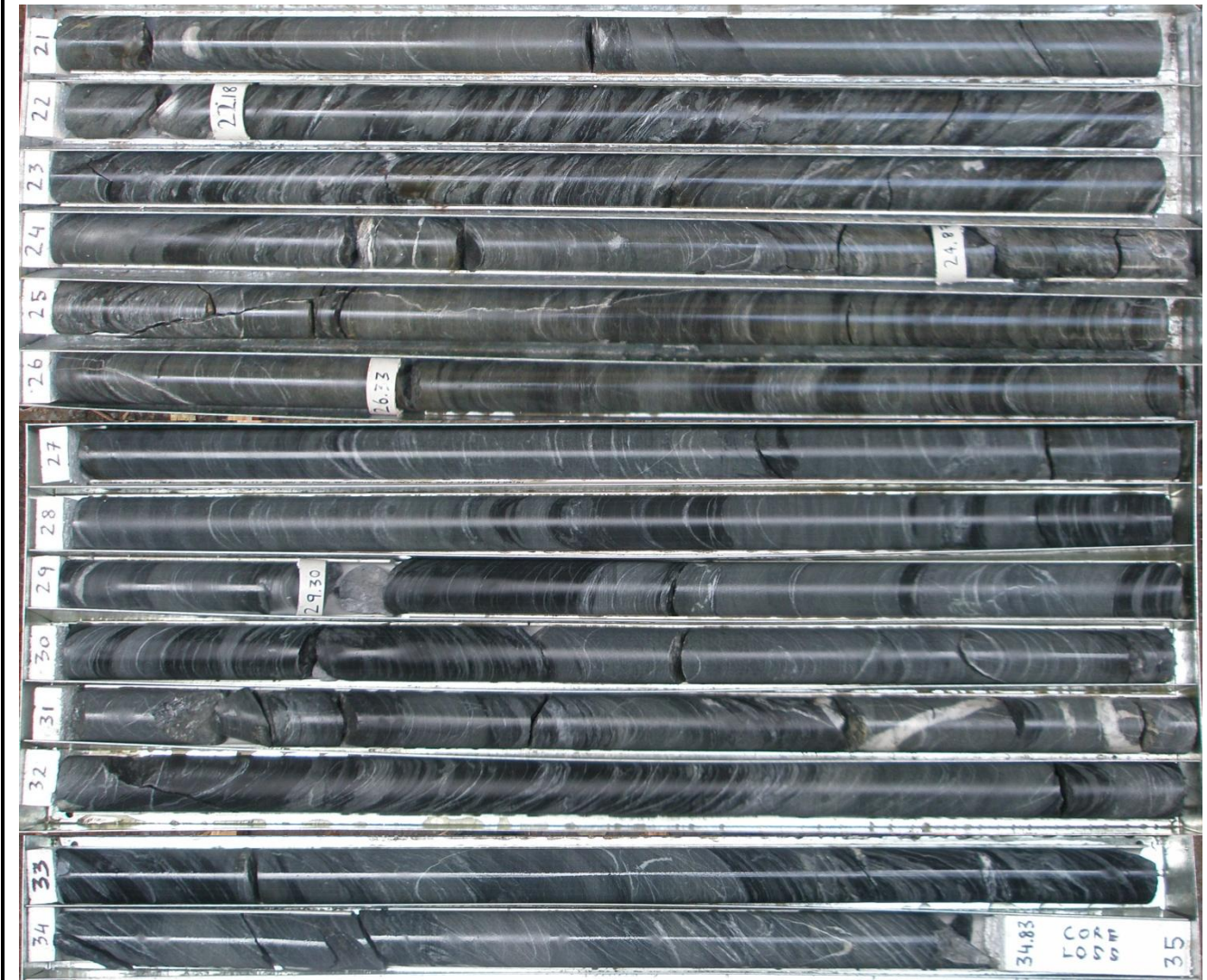


# PRELIMINARY REPORT OF CORE PHOTOGRAPHS: CRR 201

CLIENT: Aecom Australia Pty Ltd  
PROJECT: Cross River Rail  
LOCATION: Roma St  
JOB NO: 107632034

COORDS: 502129.32 m E 6961818.04 m N  
SURFACE RL: 12.70      DATUM: AHD  
INCLINATION: -90°  
HOLE DEPTH: 35.0 m

DEPTH RANGE: 21.0-35.0 m  
DRILL RIG: FD500  
DRILLER: Foundril Pty Ltd  
LOGGED: CJA      DATE: 16/09/10  
CHECKED: NK      DATE: 4/10/10







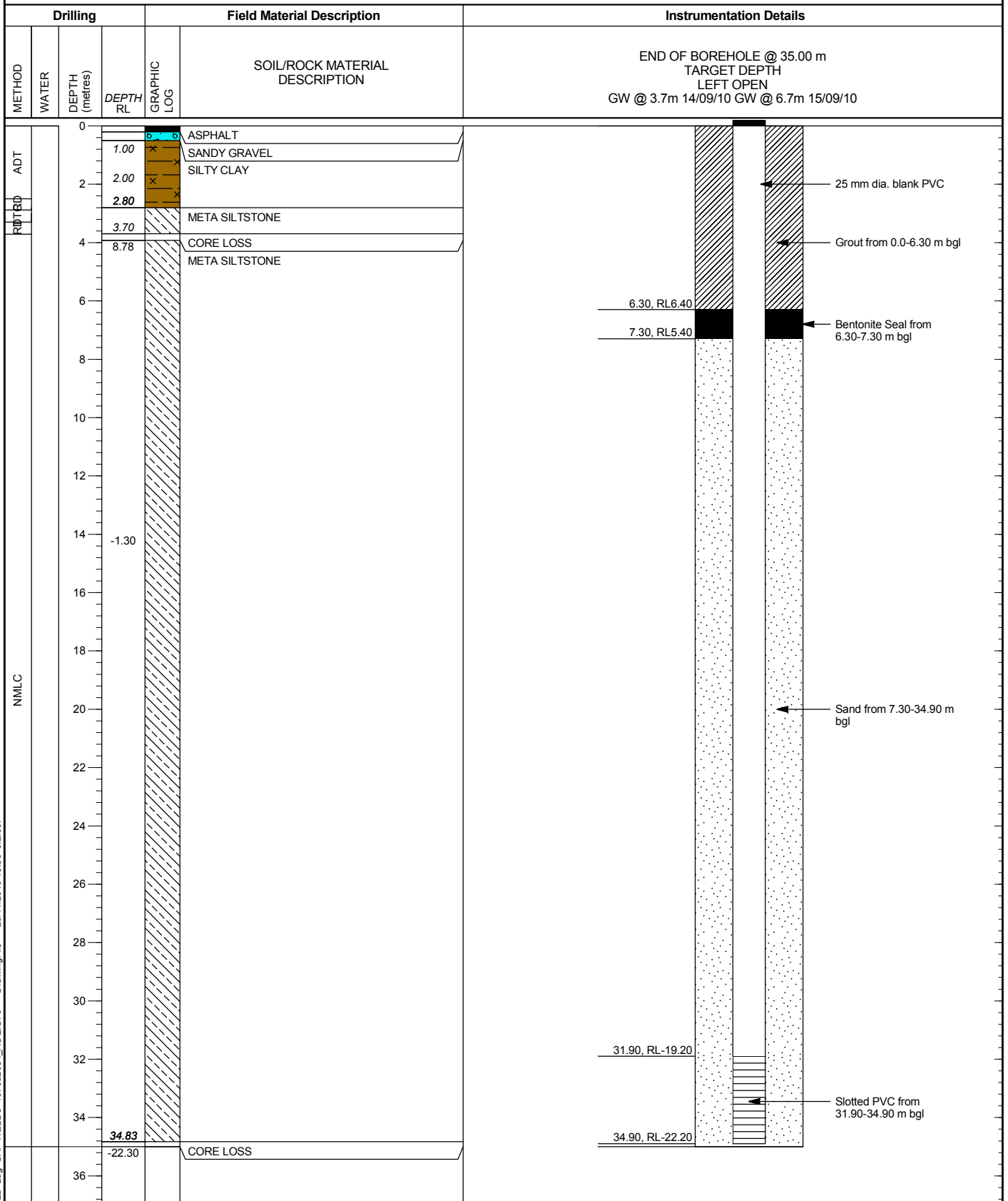
# REPORT OF STANDPIPE INSTALLATION: CRR 201

SHEET: 1 OF 1

CLIENT: Aecom Australia Pty Ltd  
 PROJECT: Cross River Rail  
 LOCATION: Roma St  
 JOB NO: 107632034

COORDS: 502129.32 m E 6961818.04 m N MGA94 56  
 SURFACE RL: 12.70 m DATUM: AHD  
 INCLINATION: -90°  
 HOLE DEPTH: 35.00 m


DRILL RIG: FD500  
 CONTRACTOR: Foundril Pty Ltd  
 LOGGED: CA DATE: 16/9/10  
 CHECKED: NK DATE: 18/10/10

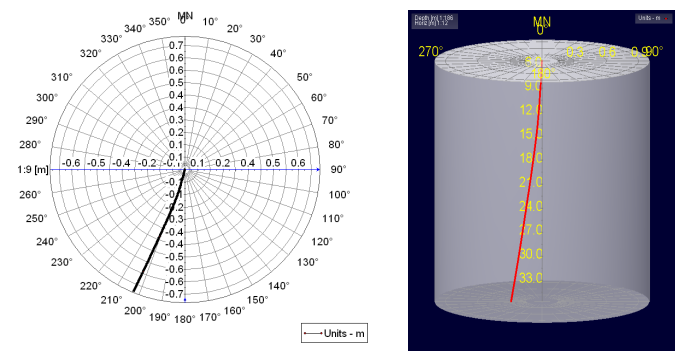


This report of standpipe installation must be read in conjunction with accompanying notes and abbreviations. It has been prepared for geotechnical purposes only, without attempt to assess possible contamination. Any references to potential contamination are for information only and do not necessarily indicate the presence or absence of soil or groundwater contamination.

GAP gINT FN. F17  
RL1

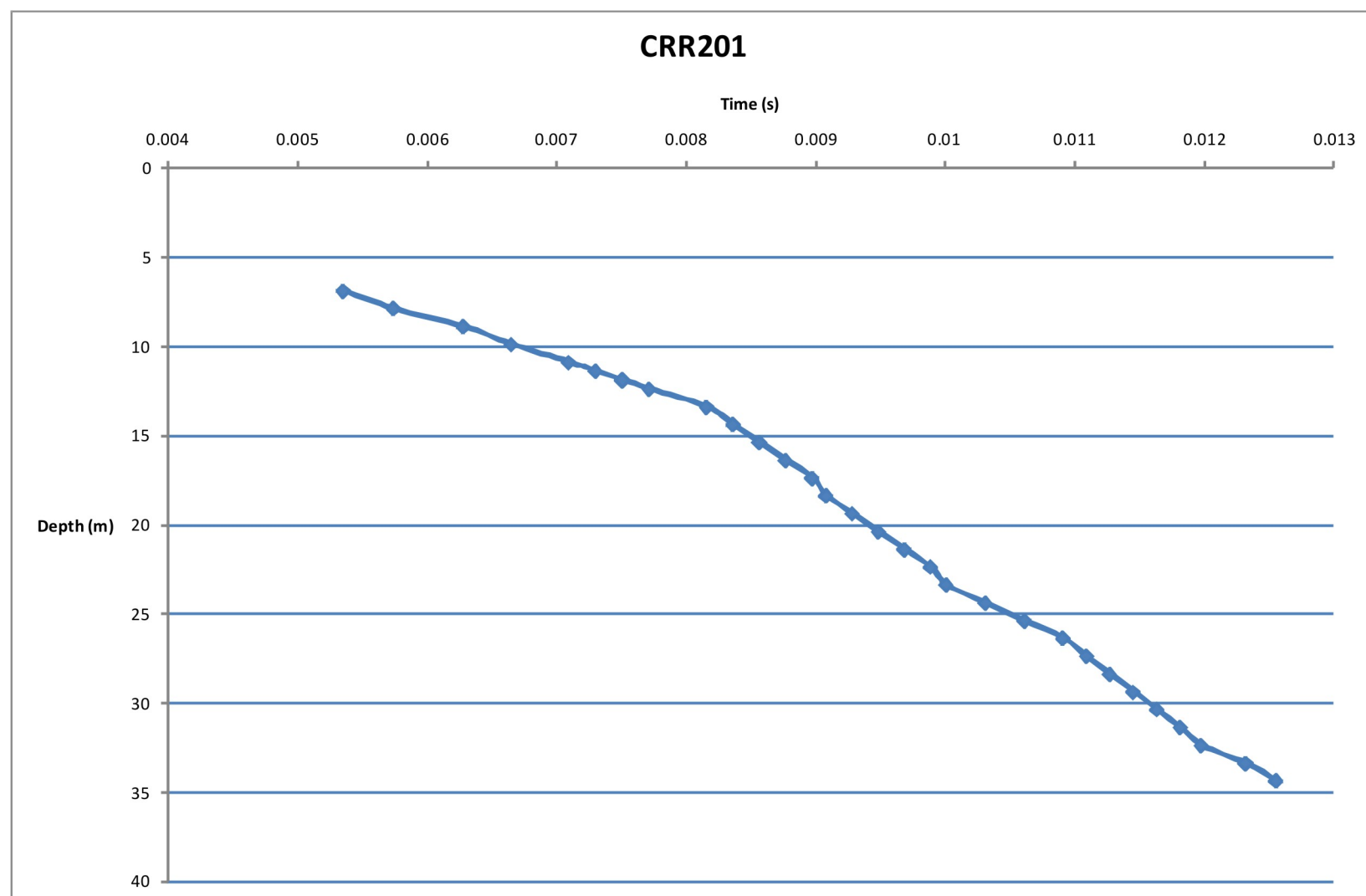
GAP-8.03.LIB.GLB Log GAP-WELL-3 107632034\_ACO.GPJ <<DrawingFile>> 29/11/2010 15:36 8.2.007

	<b>GEOPHYSICAL RECORD OF BOREHOLE: CRR 201</b>		<b>DEVIATION DATA</b>	
	PROJECT	Cross River Rail	PROJECT #	107632034
	CLIENT	Department of Transport and Main Roads	DATE	11/10/2010
LOCATION- Roma St	LOGGED BY- CA	<b>Lithology</b>		
EASTING- 502120.00 m E	LOGGED DATE- 16/9/10			
NORTHING- 6961808.00 m N	LOGGING DATUM-			
ELEVATION-	LOGGED DEPTH- 78.38 m			
DRILLED DEPTH- 35.00 m	DIAMETER-			
PLUNGE- -90°	AZIMUTH- 000°			
CASING- DEPTH-	FILE NAME- CRR201-U.HED.WCL			



Interpreted Structures					
	Joint - High Confidence		Crushed Seam - High Confidence		Joint - Low Confidence
	Joint - Medium Confidence		Foliation - Medium Confidence		Foliation - Low Confidence
	Foliation - High Confidence				

Depth 1:15	RL	TELEVIEWER DATA				CORE DATA						
		NATURAL GAMMA 0 cps 300	ATV - Caliper 0 mm 300	Amplitude 0° 90° 180° 270° 0°	Structure Orientations 0 90	3D log 293°	Core Photo	Lithology	Logged FF 0 30	RQD 0 100	TCR 0 100	Defect Description
				Interpreted Structures 0° 90° 180° 270° 0°	ATV FF 0 counts/m 16	(Refer to detailed core log, provided separately)						
-5.5												
6.0												
-6.5												
7.0												
-7.5												
8.0												
-8.0												



Geophone Depth (m)		Interval velocity (P wave m/s)
from	to	
6.9	7.9	2578
7.9	8.9	1855
8.9	9.9	2704
9.9	10.9	2253
10.9	11.4	2409
11.4	11.9	2411
11.9	12.4	2413
12.4	13.4	2268
13.4	14.4	4883
14.4	15.4	4893
15.4	16.4	4902
16.4	17.4	4908
17.4	18.4	9332
18.4	19.4	4958
19.4	20.4	4961
20.4	21.4	4964
21.4	22.4	4967
22.4	23.4	8245
23.4	24.4	3306
24.4	25.4	3307
25.4	26.4	3366
26.4	27.4	5483
27.4	28.4	5613
28.4	29.4	5495
29.4	30.4	5495
30.4	31.4	5496
31.4	32.4	6203
32.4	33.4	2914
33.4	34.4	4236

Note:

\* - 1st arrival not clear due to noise

Calculations done without accounting for borehole deviation

	CLIENT <b>Department of Transport and Main Roads</b>		PROJECT <b>Cross River Rail</b>	
	DRAWN <b>GDK</b>	DATE <b>OCT 4</b>	TITLE <b>CRR201 VSP</b>	
	CHECKED <b>TR</b>	DATE		
	SCALE <b>NTS</b>	PROJECT No <b>000-107632034</b>	FIGURE No	REV No <b>A3</b>





# WATER PRESSURE TEST

Revision No : 12.00

Job No. : 107632034	Hole No. : CRR201	Drilling Method : NMLC	Vertical depth to Groundwater	Immediately prior to test (m bgl) : 3.70
Client : AECOM	Dip (Deg) : -90	Hole Diameter (m) : 0.0757		Used in analysis (m bgl) : 3.70
Project : Cross River Rail	Interval Top (m) : 13.00	Tested Length (m) : 6.00		Pressure Gauge Height (m agl) : 1.70
Location : Roma St	Interval Base (m) : 19.00	Packer Type : Mechanical - Non-Wireline - Single		Presumed Water Temperature : 25
Tested By : CJA	Computed By : CJA	Rock tested :		Casing Inner Diameter (mm) : 60.300
Date : 14/09/2010	Date : 14/09/2010	Water Meter Reading in Litres	Checked By : NK	Date : 28/10/2010

Pressure Stage	Gauge Pressure kPa	No	Actual	Time	Water Meter Readings	Volume (L)	Discharge (L/min)	Discharge/m (L/min/m)	Remarks
			Time (h:m:s)	Intervals (min)					
P1	35	0	0:00:00	0	18000.00	0.00	0.00	0.00	c : 1
		1	0:01:00	01:00	18031.00	31.00	31.00	5.17	
		2	0:02:00	01:00	18062.00	31.00	31.00	5.17	
		3	0:03:00	01:00	18091.00	29.00	29.00	4.83	
		4	0:04:00	01:00	18119.00	28.00	28.00	4.67	
		5	0:05:00	01:00	18146.00	27.00	27.00	4.50	
		6	0:06:00	01:00	18171.00	25.00	25.00	4.17	
		7	0:07:00	01:00	18196.00	25.00	25.00	4.17	
		8	0:08:00	01:00	18222.00	26.00	26.00	4.33	
		9	0:09:00	01:00	18247.00	25.00	25.00	4.17	
		10	0:10:00	01:00	18271.00	24.00	24.00	4.00	
						Total :	271.00	45.17	
						Average:	27.100	4.517	
P2	75	0	0:11:00	0	18295.00	0.00	0.00	0.00	c : 1
		1	0:12:00	01:00	18331.00	36.00	36.00	6.00	
		2	0:13:00	01:00	18367.00	36.00	36.00	6.00	
		3	0:14:00	01:00	18402.00	35.00	35.00	5.83	
		4	0:15:00	01:00	18437.00	35.00	35.00	5.83	
		5	0:16:00	01:00	18473.00	36.00	36.00	6.00	
		6	0:17:00	01:00	18509.00	36.00	36.00	6.00	
		7	0:18:00	01:00	18544.00	35.00	35.00	5.83	
		8	0:19:00	01:00	18580.00	36.00	36.00	6.00	
		9	0:20:00	01:00	18615.00	35.00	35.00	5.83	
		10	0:21:00	01:00	18650.00	35.00	35.00	5.83	
						Total :	355.00	59.17	
						Average:	35.500	5.917	
P3	110	0	0:22:00	0	18685.00	0.00	0.00	0.00	c : 1
		1	0:23:00	01:00	18732.00	47.00	47.00	7.83	
		2	0:24:00	01:00	18778.00	46.00	46.00	7.67	
		3	0:25:00	01:00	18822.00	44.00	44.00	7.33	
		4	0:26:00	01:00	18866.00	44.00	44.00	7.33	
		5	0:27:00	01:00	18909.00	43.00	43.00	7.17	
		6	0:28:00	01:00	18952.00	43.00	43.00	7.17	
		7	0:29:00	01:00	18996.00	44.00	44.00	7.33	
		8	0:30:00	01:00	19038.00	42.00	42.00	7.00	
		9	0:31:00	01:00	19080.00	42.00	42.00	7.00	
		10	0:32:00	01:00	19122.00	42.00	42.00	7.00	
						Total :	437.00	72.83	
						Average:	43.700	7.283	
P4	75	0	0:33:00	0	19164.00	0.00	0.00	0.00	c : 1
		1	0:34:00	01:00	19202.00	38.00	38.00	6.33	
		2	0:35:00	01:00	19239.00	37.00	37.00	6.17	
		3	0:36:00	01:00	19276.00	37.00	37.00	6.17	
		4	0:37:00	01:00	19309.00	33.00	33.00	5.50	
		5	0:38:00	01:00	19342.00	33.00	33.00	5.50	
		6	0:39:00	01:00	19374.00	32.00	32.00	5.33	
		7	0:40:00	01:00	19406.00	32.00	32.00	5.33	
		8	0:41:00	01:00	19438.00	32.00	32.00	5.33	
		9	0:42:00	01:00	19470.00	32.00	32.00	5.33	
		10	0:43:00	01:00	19502.00	32.00	32.00	5.33	
						Total :	338.00	56.33	
						Average:	33.800	5.633	
P5	35	1	0:44:00	0	19532.00	0.00	0.00	0.00	c : 1
		2	0:45:00	01:00	19551.50	19.50	19.50	3.25	
		3	0:46:00	01:00	19569.50	18.00	18.00	3.00	
		4	0:47:00	01:00	19587.50	18.00	18.00	3.00	
		5	0:48:00	01:00	19605.25	17.75	17.75	2.96	
		6	0:49:00	01:00	19623.00	17.75	17.75	2.96	
		7	0:50:00	01:00	19640.75	17.75	17.75	2.96	
		8	0:51:00	01:00	19658.25	17.50	17.50	2.92	
		9	0:52:00	01:00	19675.75	17.50	17.50	2.92	
		10	0:53:00	01:00	19693.25	17.50	17.50	2.92	
		11	0:54:00	01:00	19710.50	17.25	17.25	2.88	
								Total :	
						Average:	17.850	2.975	

**TEST RESULTS**

Stage No.	Houlsby (1976) Value	Lugeon Value Curve	Nett Pressures	Pressure Vs Flow	Interpreted Result & Hydraulic Conductivity
P1	129.0		75.2		<p>H<sub>LOSS</sub> 33.06 kPa</p> <p>Stage No. <b>P3</b></p> <p>Gauge Pressure 110 kPa</p> <p>Q 43.70 L/min</p> <p>H 13.2 m</p> <p>Interpreted Result 66 uL</p> <p>Reported k at Stage <b>P3</b></p> <p>Analytical Method 1: (ref = Golder geotechnical field notes draft 1997) <math>k = Q/H \times 6.10889 \times 10^{-6} \times (\log(2L/D)/L)</math></p> <p><b>k = 7.4E-06 m/s</b></p> <p>Analytical Method 2: (ref = Sharp, J.C 1975 Pit Slope Manual, CANMET report) <math>k = 1/(2L \times 3.14) \times (Q/H) \ln(R/r)</math> m/s (convert L/min to m/s). Assume R = radius of influence of 100m &amp; r = radius of borehole.</p> <p><b>k = 1.1E-05 m/s</b></p>
P2	78.9		106.1		
P3	66.2		129.9		
P4	75.1		108.2		
P5	85.0		82.4		
<p>Houlsby (1976) method - no pressure corrections for Hf (head losses), nor is the pressure corrected for Hg (location of watertable).</p>		<p>Flow Type <b>TURBULENT FLOW</b></p> <p>COMMENTS No Flow</p>			



# WATER PRESSURE TEST

Revision No : 12.00

Job No. : 107632034	Hole No. : CRR201	Drilling Method : NMLC	Vertical depth to Groundwater	Immediately prior to test (m bgl) : 6.70
Client : AECOM	Dip (Deg) : -90	Hole Diameter (m) : 0.0757		Used in analysis (m bgl) : 6.70
Project : Cross River Rail	Interval Top (m) : 19.00	Tested Length (m) : 7.33		Pressure Gauge Height (m agl) : 1.70
Location : Roma St	Interval Base (m) : 26.33	Packer Type : Mechanical - Non-Wireline - Single		Presumed Water Temperature : 25
Tested By : CJA	Computed By : CJA	Rock tested :		Casing Inner Diameter (mm) : 60.300
Date : 15/09/2010	Date : 15/09/2010	Water Meter Reading in Litres	Checked By : NK	Date : 28/10/2010

Pressure Stage	Gauge Pressure kPa	No	Actual	Time	Water Meter Readings		Volume	Discharge	Discharge/m	Remarks
			Time (h:m:s)	Intervals (min)	Reading (Litres)		(L)	(L/min)	(L/min/m)	
P1	60	0	0:00:00	0		19760.00	0.00	0.00	0.00	Water leaking through collar, packer set twice but leaking continued, stage ended early due to rapid water use
		1	0:01:00	01:00	19839.00	79.00	79.00	10.78		
		2	0:02:00	01:00	19913.00	74.00	74.00	10.10		
		3	0:03:00	01:00	19987.00	74.00	74.00	10.10		
		4	0:04:00	01:00	20062.00	75.00	75.00	10.23		
		5	0:05:00	01:00	20136.00	74.00	74.00	10.10		
		6	0:06:00	01:00	20210.00	74.00	74.00	10.10		
		7	0:07:00	01:00	20284.00	74.00	74.00	10.10		
		8								
		9								
10										
Total :							524.00	71.49		
Average:							74.857	10.212		
P2	115	0	0:11:00	0		20364.00	0.00	0.00	0.00	stage ended early due to rapid water use
		1	0:12:00	01:00	20464.00	100.00	100.00	13.64		
		2	0:13:00	01:00	20564.00	100.00	100.00	13.64		
		3	0:14:00	01:00	20663.00	99.00	99.00	13.51		
		4	0:15:00	01:00	20762.00	99.00	99.00	13.51		
		5	0:16:00	01:00	20861.00	99.00	99.00	13.51		
		6								
		7								
		8								
		9								
10										
Total :							497.00	67.80		
Average:							99.400	13.561		
P3	175	0	0:22:00	0		20981.00	0.00	0.00	0.00	Test ended prematurely, water being used too rapidly, water not readily available on site
		1	0:23:00	01:00	21119.00	138.00	138.00	18.83		
		2	0:24:00	01:00	21257.00	138.00	138.00	18.83		
		3	0:25:00	01:00	21395.00	138.00	138.00	18.83		
		4								
		5								
		6								
		7								
		8								
		9								
10										
Total :							414.00	56.48		
Average:							138.000	18.827		
P4	115	0								Test not carried out
		1								
		2								
		3								
		4								
		5								
		6								
		7								
		8								
		9								
10										
Total :										
Average:										
P5	60	1								Test not carried out
		2								
		3								
		4								
		5								
		6								
		7								
		8								
		9								
		10								
		11								
Total :										
Average:										

**TEST RESULTS**

Stage No.	Houlsby (1976) Value	Lugeon Value Curve	Nett Pressures	Pressure Vs Flow	Interpreted Result & Hydraulic Conductivity
P1	170.2		45.2		$H_{LOSS}$ 330.03 kPa Stage No. <b>P3</b> Gauge Pressure 175 kPa Q 138.00 L/min H -7.4 m Interpreted Result 108 uL Reported k at Stage <b>P3</b>
P2	117.9		26.1		Analytical Method 1: (ref = Golder geotechnical field notes draft 1997) $k = Q/H \times 6.10889 \times 10^{-6} \times (\log(2L/D))/L$ $k = -3.6E-05$ m/s
P3	107.6		-72.7		Analytical Method 2: (ref = Sharp, J.C 1975 Pit Slope Manual, CANMET report) $k = 1/(2L \times 3.14) \times (Q/H) \ln(R/r)$ m/s (convert L/min to m/s). Assume R = radius of influence of 100m & r = radius of borehole. $k = -5.3E-05$ m/s
P4			#VALUE!		
P5			#VALUE!		
<b>Flow Type</b>		<b>TURBULENT FLOW</b>	COMMENTS	No Flow	