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BOREHOLE ENGINEERING LOG

HOLE NO : CURVE 22_BH06

CLIENT : TRANSPORT AND MAIN ROADS	POSITION : E: 359408, N: 8137546 (56 MGA94)	PAGE : 1 OF 3
PROJECT : BLACK SPOT PROJECT	SURFACE ELEVATION : 111.0 (AHD)	DATE DRILLED : 27/7/13 TO 27/7/13
JOB NO : CB24735.04	DIP / AZIMUTH : 90°	LOGGED BY : JP
LOCATION : KENNEDY HWY (CAIRNS - MAREEBA)		CHECKED BY : AJ

DRILLING				MATERIAL			
DRILLING & CASING	WATER	DRILLING PENETRATION	SAMPLES & FIELD TESTS	DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	STRUCTURE & Other Observations
		H		111.0		0.10m ASPHALT: 0.10 m.	FILL
		F				SILTY GRAVEL (GM): Brown, grey brown, fine to coarse grained angular gravel, with fine to coarse grained sand, trace of clay.	
			1.00m SPT 27, 17, 12 N=29	110.0		1.00m QUARTZITE: Grey, grey brown, highly weathered, low to medium strength, appears as SILTY GRAVEL (GM), fine to medium grained angular gravel, with fine to coarse grained sand, trace of clay.	HIGHLY WEATHERED ROCK
		H	1.45m				
			2.50m SPT B 5, 4, 4 N=8	109.0		From 2.10 m to 2.50 m with cobbles.	
		VH					
			2.95m	108.0			2.50: Moisture Content (%) = 8.1, Liquid Limit (%) = 19, Plastic Limit (%) = 26, Plasticity Index (%) = 0, % Passing 2.36mm: 54, % Passing 0.425mm: 44, % Passing 0.075mm: 30, % Passing 0.002mm: 6
		E					
			4.00m SPT 4, 6, 5 N=11	107.0		4.00m QUARTZITE: Brown, orange brown, extremely weathered, extremely low strength, appears as CLAYEY GRAVEL (GC), orange red brown, fine to coarse grained angular gravel, with fine to medium grained sand.	EXTREMELY WEATHERED ROCK
			4.45m				
		H		106.0		4.50m QUARTZITE: Grey, grey brown, highly weathered, low to medium strength, appear as SILTY GRAVEL (GM), fine to medium grained angular gravel, with fine to coarse grained sand, trace of clay.	HIGHLY WEATHERED ROCK
			5.50m SPT 30/70mm HB N=R 5.57m	105.0		5.60m Continued as Cored Drill Hole	

DRILLING		SAMPLES & FIELD TESTS		DENSITY (SPT N-value)		CONSISTENCY (Su) {N-value}	
HA Hand Auger	RR Rock Rolling	DS Disturbed Sample	SPT Standard Penetration Test	VL Very Loose	0 - 4	VS Very Soft	< 12 kPa {0-2}
AS Auger Screw	AT Air Track	ES Env Soil Sample	U Undisturbed Tube Sample	L Loose	4 - 10	S Soft	12 - 25 {2-4}
AD/T Auger Drill TC-bit	HQ HQ Coring	EW Env Water Sample	W Water Sample	MD Medium Dense	10 - 30	F Firm	25 - 50 {4-8}
AD/V Auger Drill V-bit	NQ NQ Coring			D Dense	30 - 50	St Stiff	50 - 100 {8-15}
WB Washbore	NMLC NMLC Coring			VD Very Dense	50 - 100	VSt Very Stiff	100 - 200 {15-30}
				CO Compact	>50/150mm	H Hard	> 200 kPa {>30}
DRILLING PENETRATION		MOISTURE CONDITION					
VE Very Easy	F Firm	VH Very Hard	D = Dry M = Moist W = Wet				
E Easy	H Hard						
GROUNDWATER SYMBOLS		HP Hand Penetrometer					
▼ = Water level (static)		HV Hand Vane Shear					
▽ = Water level (during drilling)		(P: Peak Su R: Residual Su)					
		N SPT blows per 300mm					
		HW SPT penetration by hammer weight					
		RW SPT penetration by rod weight					



CORED BOREHOLE ENGINEERING LOG HOLE NO : CURVE 22_BH06

CLIENT : TRANSPORT AND MAIN ROADS	POSITION : E: 359408, N: 8137546 (56 MGA94)	PAGE : 2 OF 3
PROJECT : BLACK SPOT PROJECT	SURFACE ELEVATION : 111.0 (AHD)	DATE DRILLED : 27/7/13 TO 27/7/13
JOB NO : CB24735.04	DIP / AZIMUTH : 90°	LOGGED BY : JP
LOCATION : KENNEDY HWY (CAIRNS - MAREEBA)		CHECKED BY : AJ

DRILLING		MATERIAL				DEFECTS & COMMENTS					
DRILLING	WATER DETAIL	TCR/RQD	RL (m)	DEPTH (m)	GRAPHIC LOG	DESCRIPTION	Weathering	ESTIMATED STRENGTH Is(50)	DEFECT SPACING (mm)	GENERAL	
						ROCK TYPE : Colour, Grain size, Structure (texture, fabric, mineral composition, hardness alteration, cementation, etc as applicable)		EL -0.03 VI -0.1 J -0.3 M -1 H -2 V1 -3 V2 -4 V3 -5 V4 -6 V5 -7 V6 -8 V7 -9 V8 -10 EH	20 60 100 140 180 220 260 300 340 380 420 460 500 540 580 620 660 700 740 780 820 860 900 940 980 1020 1060 1100 1140	Description of joints, seams, defects, additional observations and comments	
			111.0	0.0							
			110.0	1.0							
			109.0	2.0							
			108.0	3.0							
			107.0	4.0							
			106.0	5.0							
			105.0	6.0		START CORING AT 5.60m					
		100% TCR 11% RQD				QUARTZITE: Orange grey, grey brown, massive	MW		5.73 JT 0° IR RF 5.83 JT 40° IR RF 5.90 JT 50° IR RF 5.95 JT 50° IR RF	JT-700 IR RF spacing	

DRILLING NMLC NMLC Coring NQ NQ Coring TCR % core run recovered RQD % core run > 100mm long (rock fraction only measured) GROUNDWATER SYMBOLS 	SAMPLES & FIELD TESTS D Disturbed Sample W Water Sample SPT SPT Sample U Undisturbed Tube Sample ES Env Soil Sample EW Env Water Sample	DEFECT ABBREVIATIONS CS Crushed Seam CZ Crushed Zone DB Drill Break FZ Fractured Zone JT Joint IS Infilled Seam SZ Shear Zone VN Vein CN Clean CT Coating SN Stain VR Veneer POL Polished RF Rough S Smooth SL Slicksided Cu Curved IR Irregular PR Planar ST Stepped Un Undulated	ROCK STRENGTH (Is50 MPa) 0-0.03 Extremely Low 0.03-0.1 Very Low 0.1-0.3 Low 0.3-1.0 Medium 1.0-3.0 High 3.0-10 Very High
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CORED BOREHOLE ENGINEERING LOG HOLE NO : CURVE 22_BH06

CLIENT : TRANSPORT AND MAIN ROADS	POSITION : E: 359408, N: 8137546 (56 MGA94)	PAGE : 3 OF 3
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JOB NO : CB24735.04	DIP / AZIMUTH : 90°	LOGGED BY : JP
LOCATION : KENNEDY HWY (CAIRNS - MAREEBA)		CHECKED BY : AJ

DRILLING		MATERIAL		DEFECTS & COMMENTS	
DRILLING	WATER DETAIL	DEPTH (m)	DESCRIPTION	Weathering	DEFECT SPACING (mm)
100% TCR 11% ROD 6.50		105.0 - 6.0	QUARTZITE: Orange grey, grey brown, massive (continued)	EW	5.96 JT 50° IR RF 6.00 SZ 70° CG IR RF 160 mm
100% TCR 26% ROD 7.75		104.0 - 7.0	From 6.61 m becoming grey brown, orange brown.	MW	6.27 JT 90° CH IR VR 2 mm 6.31 JT 0 - 5° IR VR 40 mm 6.33 JT 50° IR RF 6.35 CZ 0° CH IR VR 15 mm 6.40 JT 60° IR VR 6.52 JT 50° IR VR 6.56 JT 60° ST VR 6.59 JT 0° IR VR 6.61 JT 5° CH IR RF 10 mm 6.66 JT 40° IR RF 6.75 JT 90° IR RF 6.80 JT 60° Fe IR VR 6.97 JT 60° Fe IR VR 7.07 JT 60° IR VR 7.10 JT 5° UN RF 7.16 JT 5° IR RF 7.27 JT 0 - 5° CH IR VR 5 - 15 mm 7.29 JT 50° IR RF 7.31 JT 7.33 JT 20° IR RF 7.35 SZ 60° GP UN VR 10 - 20 mm 7.40 JT 10° CH PR RF 1 mm 7.43 JT 60° IR RF 7.46 CZ 60 - 70° CH IR VR 5 - 20 mm 7.51 JT 40° IR RF 7.56 JT 85° CH IR VR 1 - 4 mm 7.57 JT 40° IR RF 8.05 JT 20° PR RF 8.07 JT 20° IR RF 8.08 JT 20° IR RF 8.10 JT 5° PR RF 8.34 JT 20° PR RF
100% TCR 0% ROD 9.30		103.0 - 8.0	From 7.75 m becoming dark grey, grey.	SW	8.76 JT 40° IR RF 8.82 JT 40° IR RF 8.89 JT 50° ST VR
100% TCR 0% ROD 10.40		102.0 - 9.0	From 9.27 m SILTY CLAY (Cl), trace of fine gravel, 130 mm thick band. From 9.40 m becoming grey, grey brown, orange, distinct foliation at 50° to 60°.	EW MW	9.07 JT 20° PR RF 9.12 JT 20° PR RF 9.18 JT 60° PR RF 9.22 JT 5° IR VR 9.26 JT 40° IR RF 9.27 JT 80° CH IR VR 130 mm 9.29 JT 60° PR VR 9.42 JT 40° ST VR
		101.0 - 10.0	From 10.04 m SILTY CLAY (Cl), trace of fine gravel, 250 mm thick band.	EW MW	9.77 JT 60° PR RF 9.83 JT 40° CH IR RF 1 mm 9.95 JT 10° Fe IR RF 10.03 JT 60° PR VR 10.04 SS 80° GC PR VR 250 mm 10.19 JT 50° ST VR
		100.0 - 11.0	Terminated Cored Drill Hole at 10.40 m		10.37 JT 60° PR RF 10.39 JT 70° CH PR RF 1 - 5 mm

DRILLING	SAMPLES & FIELD TESTS	DEFECT ABBREVIATIONS	ROCK STRENGTH (Is50 MPa)
NMLC NMLC Coring HQ HQ Coring NQ NQ Coring PQ PQ Coring TCR % core run recovered RQD % core run > 100mm long (rock fraction only measured) GROUNDWATER SYMBOLS = Water level (static) = Water level (during drilling)	D Disturbed Sample ES Env Soil Sample W Water Sample EW Env Water Sample SPT SPT Sample U Undisturbed Tube Sample	CS Crushed Seam CN Clean Cu Curved CZ Crushed Zone CT Coating IR Irregular DB Drill Break SN Stain PR Planar FZ Fractured Zone VR Veneer ST Stepped JT Joint Un Undulated IS Infilled Seam POL Polished SZ Shear Zone RF Rough VN Vein S Smooth SL Slickensided	0-0.03 Extremely Low 0.03-0.1 Very Low 0.1-0.3 Low 0.3-1.0 Medium 1.0-3.0 High 3.0-10 Very High



		Client: Transport and Main Roads	
		Project: Black Spot	
drawn	AJ	Core Photograph – Curve 22_BH06	
date	141/08/2013	Project no. CB24735.04	
scale	NTS	Photo No: Curve 22_BH06 1 of 1	