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# BOREHOLE ENGINEERING LOG

HOLE NO : N071B\_BH04

CLIENT : TRANSPORT AND MAIN ROADS	POSITION : E: 358648, N: 8137295 (56 MGA94)	PAGE : 1 OF 3
PROJECT : TNRP	SURFACE ELEVATION : 337.0 (AHD)	DATE DRILLED : 7/22/13 TO 7/22/13
JOB NO : CB27000.F687	DIP / AZIMUTH : 90°	LOGGED BY : JP
LOCATION : KENNEDY HWY (CAIRNS - MAREEBA)	CHECKED BY : AJ	

DRILLING				MATERIAL			
PROGRESS	DRILLING & CASING	DRILLING PENETRATION	SAMPLES & FIELD TESTS	DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	STRUCTURE & Other Observations
	ADT	H		337.0 - 0.0		0.10m ASPHALT: (0.10 m).	FILL
		F	DS	0.50m		SANDY GRAVEL: Grey, fine to medium, angular, trace fine to medium grain sand.	
		H		0.70m			
			1.00m SPT 1, 0, 1 N=1	336.0 - 1.0		SILTY CLAY (CI): Orange brown, medium plasticity, with fine to medium grain sand, trace fine to medium grained angular gravel comprising of very low strength phyllite, rootlets and organics gravel.	
			1.45m			At 0.80 m trace of cobbles	
		F		335.0 - 2.0		2.20m SILTY CLAY (CI): Orange brown, medium plasticity.	RESIDUAL SOIL
			2.50m SPT 5, 7, 7 N=14				St 2.70: HP In-situ = 280 kPa 2.70: HP In-situ = 320 kPa 2.70: HP In-situ = 410 kPa
			2.95m	334.0 - 3.0			
			3.50m SPT 5, 7, 10 N=17			3.20m QUARTZITE: Orange brown, with fine to medium grained sand, extremely weathered, extremely low strength appears as SILTY CLAY (CL-CI), trace of rootlets.	EXTREMELY WEATHERED ROCK
			3.95m	333.0 - 4.0			
		H	5.00m SPT 9, 11, 17 N=28	332.0 - 5.0			VSt - H
			5.45m	331.0 - 6.0			

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

HOLE NO : N071B\_BH04

CLIENT : TRANSPORT AND MAIN ROADS	POSITION : E: 358648, N: 8137295 (56 MGA94)	PAGE : 2 OF 3
PROJECT : TNRP	SURFACE ELEVATION : 337.0 (AHD)	DATE DRILLED : 7/22/13 TO 7/22/13
JOB NO : CB27000.F687	DIP / AZIMUTH : 90°	LOGGED BY : JP
LOCATION : KENNEDY HWY (CAIRNS - MAREEBA)		CHECKED BY : AJ

DRILLING					MATERIAL							
DRILLING & CASING	WATER	DRILLING PENETRATION	GROUND WATER LEVELS	SAMPLES & FIELD TESTS	RL (m)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION Soil Type, Colour, Plasticity or Particle Characteristic Secondary and Minor Components	MOISTURE CONDITION	CONSISTENCY	STRUCTURE & Other Observations
WB		H		6.50m SPT 13, 18, 24 N=42	331.0	6.0			QUARTZITE: Orange brown, with fine to medium grained sand, extremely weathered, extremely low strength appears as SILTY CLAY (CL-CI), trace of rootlets. (continued)		VSt - H	EXTREMELY WEATHERED ROCK
		VH		6.95m	330.0	7.0		6.85m	QUARTZITE: Pale brown, extremely weathered to highly weathered, very low to low strength.			EXTREMELY TO HIGHLY WEATHERED ROCK
					329.0	8.0			Continued as Cored Drill Hole			
					328.0	9.0						
					327.0	10.0						
					326.0	11.0						
					325.0	12.0						

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



# CORED BOREHOLE ENGINEERING LOG HOLE NO : N071B\_BH04


CLIENT : TRANSPORT AND MAIN ROADS	POSITION : E: 358648, N: 8137295 (56 MGA94)	PAGE : 3 OF 3
PROJECT : TNRP	SURFACE ELEVATION : 337.0 (AHD)	DATE DRILLED : 22/7/13 TO 22/7/13
JOB NO : CB27000.F687	DIP / AZIMUTH : 90°	LOGGED BY : JP
LOCATION : KENNEDY HWY (CAIRNS - MAREEBA)	CONTRACTOR : SAXON DRILLING	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)	COMMENTS	GENERAL
						ROCK TYPE : Colour, Grain size, Structure (texture, fabric, mineral composition, hardness alteration, cementation, etc as applicable)		EL -0.03 VI -0.1 L -0.3 M -1 H -2 VH -3 EH -10	20 60 200 600 2000	Description of joints, seams, defects, additional observations and comments	
			334.0	6.0							
			330.0	7.0							
						START CORING AT 7.65m					
		100% TCR 29% RQD 8.00	329.0	8.0		QUARTZITE: Grey, green grey, orange brown, indistinct to distinct foliations 40° to 60°	MW			JT 80° IR RF JT 70° IR VR Fe JT 70° IR VR Fe JT 50° UN VR Fe JT 60° UN VR Fe JT 80° UN VR Fe JT 60° UN VR Fe CZ 40° UN VR Fe JT 60° PR RF Fe JT 90° PR RF JT 50° PR RF CZ 60° UN VR JT 40° PR RF JT 40° UN RF CZ 20° IR VR JT 80° UN RF JT 60° IR VR JT 40° PR RF Fe JT 50° PR RF JT 60° PR RF JT 60° PR RF JT 90° IR RF JT 70° UN RF CZ 70° ST - IR, VR, 50 mm JT 80° ST VR Fe JT 80° IR RF Fe JT 40° IR VR JT 60° UN VR JT 30° IR VR JT 90° UN VR JT 80° UN VR JT 60° IR RF JT 30° PR S JT 80° PR RF JT 60° PR RF JT 30° PR RF JT 60° CU RF JT 60° IR RF Fe JT 60° PR RF Fe JT 60° IR VR Fe JT 60° VR Fe JT 90° IR VR JT 60° CU RF JT 50° PR RF JT 60° IR RF Fe JT 10° PR RF Fe JT 30° IR RF Fe JT 70° IR RF Fe JT 80° IR RF Fe JT 80° IR RF Fe JT 70° PR S Fe JT 70° IR RF Fe JT 30° IR RF JT 80° IR RF Fe JT 90° PR S Fe JT 60° PR S Fe JT 80° IR RF Fe	
		100% TCR 51% RQD 8.95	328.0	9.0							
		100% TCR 42% RQD 9.90	327.0	10.0							
		100% TCR 0% RQD 10.10									
		100% TCR 41% RQD 11.35	326.0	11.0							
			11.35m			End of Borehole					
			325.0	12.0							

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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 Slicksided	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: Transport Network Reconstruction Program	
drawn	AJ	Core Photograph – N071B_BH04	
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scale	NTS	Photo No: N071B_BH04 1 of 1	