COPYRIGHT NOTICE

This geotechnical log and its associated data (the Document) is licensed by the Queensland Department of Transport and Main Roads under the <u>Creative Commons Attribution 4.0 Licence</u> (CC BY 4.0). When reusing the Document, in whole or in part, please attribute the Department and author as follows: "(c) State of Queensland (Department of Transport and Main Roads) 2020, licensed under the CC BY 4.0 Licence, prepared by Jacobs". This licence does not apply to the Queensland Government logo or trademarks.

LIMITATION OF LIABILITY

The CC BY 4.0 Licence contains a comprehensive Disclaimer of Warranties and Limitation of Liability. In addition, please note that this Document was prepared for Departmental use only. Reuse of the Document by anyone for any other purpose could result in error and/or loss. You should obtain professional advice before making decisions based on the contents of the Document.

When reproducing any part of this Document, you must also reproduce this limitation of liability notice in addition to the italicised attribution statement above.

Retrieved from the Queensland Geotechnical Database http://qgd.org.au/

This log has been contributed to the Queensland Geotechnical Database with the permission of Jacobs.

BOREHOLE ENGINEERING LOG HOLE NO: CURVE 59 BH03 POSITION: E: 358657, N: 8137028 (55 MGA94) PAGE: 1 OF 4 CLIENT: TMR PROJECT: SAFER ROADS SOONER PROJECT SURFACE ELEVATION: 317.6 (AHD) DATE DRILLED: 4/8/13 TO 4/8/13 LOGGED BY: JP JOB NO: CB24735.01 DIP / AZIMUTH : 90° CHECKED BY: AJ LOCATION: KENNEDY HWY (CAIRNS - MAREEBA) DRILLING MATERIAL WATER LES & TESTS Œ CONSISTENCY MATERIAL DESCRIPTION MOISTURE $\widehat{\Xi}$ DRILLING PENETRAT STRUCTURE **SRAPHIC** DEPTH & CASING Soil Type, Colour, Plasticity or Particle Characteristic Secondary and Minor Components GROUND \ & Other Observations WATER SAMPL FIELD 1 Ζ 90 VΗ ASPHALT: (0.10). 0.15m GRAVELLY SILT: Brown, grey brown, fine to coarse 0.15: Moisture Content (%) = 14.1, Liquid Limit (%) = 31, Plastic Limit (%) = 21, Plasticity Index (%) = 10, % Passing 2.36mm: 79, % Passing 0.425mm: 66, % Passing 0.075mm: 55, % Passing 0.002mm: 9, Max. Dry Density (t/m³) = 1.86, OMC (%) = 14.5 В sand, with fine to medium grained angular gravel and clay, trace of cobbles. F 7 D From 0.80 m to 1.20 m with cobbles. 1.30 316.6 RETURN Water CLAYEY SILT (ML): Red brown, medium plasticity, with fine to medium grained, sub-angular gravel, and fine to coarse grained sand, trace of organics, rootlets RESIDUAL SOIL %0 and cobbles .50m PT , 2, 2 N=4 2.50: Moisture Content (%) = 24, Liquid Limit (%) = 44, Plastic Limit (%) = 24, Plasticity Index (%) = 20, Linear Shrinkage (%) = 9.5, % Passing 2.36mm: 71, % Passing 0.425mm: 71, % Passing 0.075mm: 63, % Passing 0.002mm: 20 OBSERVED ML 2.95m 314.6 -3.0 NOT WB 4.00m SPT 3, 4, 6 N=10 313.6 4.0 EXTREMELY WEATHERED ROCK GNEISS: Orange brown, extremely weathered, extremely low to very low strength, appears as SANDY SILT (ML), comprised by fine to coarse #A00: Moisture Content (%) = 21.2, Liquid Limit (%) = 33, Plastic Limit (%) = 26, Plasticity Index (%) = 7, Linear Shrinkage (%) = 3.5, % Passing 2.36mm: 87, % Passing 0.425mm: 75, % Passing 0.075mm: 56, % Passing 0.002mm: 5 EXTREMELY WEATHERED ROCK grained sand, trace of fine to medium grained angular <<Dra>c<DrawingFile>> 04/12/2013 4.45m GNEISS: Orange brown and grey, extremely to highly weathered, extremely low to very low strength. EXTREMELY TO HIGHLY WEATHERED ROCK 312.6--5.0 CB24735.01.GPJ Н 5.50m SPT 12, 16, 18 N=34 BOREHOLE Log CURRENT.GLB DRILLING SAMPLES & FIELD TESTS CONSISTENCY (Su) {N-value} DENSITY (SPT N-value) Hand Auger Disturbed Sample SPT Standard Penetration Test RR Rock Rolling VL Very Loose 0 - 4 VS Very Soft < 12 kPa {0-2} Env Soil Sample Undisturbed Tube Sample Auger Screw AT Auger Drill TC-bit HQ AS Air Track HQ Coring ı Loose 4 - 10 S Soft 12 - 25 {2-4} Water Sample EW Env Water Sample **IBRARY** MD Medium Dense 10 - 30 F 25 - 50 {4-8} Firm Auger Drill V-bit Washbore NQ NQ Coring NMLC NMLC Coring AD/V WB D Dense 30 - 50 St Stiff 50 - 100 {8-15} HP Hand Penetrometer HV Hand Vane Shear MOISTURE CONDITION
D = Dry M = Moist W = Wet DRILLING PENETRATION VD Very Dense 50 - 100 VSt Very Stiff 100 - 200 {15-30} OFFICE F Firm H Hard VE Very Easy E Easy Very Hard (P: Peak Su R: Residual Su) CO Compact >50/150mm Н Hard > 200 kPa {>30} N SPT blows per 300mm HW SPT penetration by hammer weight **GROUNDWATER SYMBOLS** RW SPT penetration by rod weight = Water level (static) = Water level (during drilling)

File: CB24735.01 CURVE 59_BH03 Page 1 OF 4

	S	Ľ		1	В	ORI	EHC)LE	ENGINEERING LO	G		I	HOLE N	NO : CURVE	59_BH03		
PRC	NT : DJECT NO :	Г : SA		ROADS S	SOONE	ER PR	OJECT		POSITION: E: 358657, N: 8137028 (SURFACE ELEVATION: 317.6 (AHL DIP / AZIMUTH: 90°			[PAGE: 2 OF 4 DATE DRILLED: 4/8/13 TO 4/8/13 LOGGED BY: JP				
-			NNE	DY HWY	(CAIR	NS - N	MAREE	3A)	CHECKED BY: AJ								
PROG	SRESS	z	1	LING				z	MATERIAL								
DRILLING & CASING		DRILLING PENETRATION	GROUND WATER LEVELS	SAMPLES & FIELD TESTS	RL (m)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION Soil Type, Colour, Plasticity or Particle Cha Secondary and Minor Component	racteristic s	MOISTURE	CONSISTENCY					
					311.6-	6.0 - -			GNEISS: Orange brown and grey, extrem- weathered, extremely low to very low strer				EXTREME	LY TO HIGHLY WEA	THERED ROCK		
						-			(continued)						-		
					_	_									_		
						-									-		
						-									-		
		Н		7.00m SPT 6. 0. 10	310.6-	7.0			GNEISS: Orange brown and grey, extreme	ely			EXTREME	LY WEATHERED RO	OCK _		
WB				6, 0, 10 N=10		-			weathered, extremely low strength, appea CLAY (CL), low plasticity, trace of medium sand and fine to medium grained angular	grained					=		
				7.45m		F						St -			=		
					-	F						VSt			-		
						-									- -		
					309.6-	8.0									-		
						-						V/O4			=		
		VH				-						VSt - H			-		
+				8.50m SPT 15/40mm	-	_			.55m Continued as Cored Drill Hole								
				N=R 8.54m		L			Continued as Cored Drill Flore						=		
						F									- -		
					308.6-	—9.0 -									-		
						-									-		
					_	_									-		
						-									-		
						-									-		
					307.6-	10.0									-		
						_									=		
					_	L									-		
						L									=		
						_									=		
					306.6-	11.0											
						-									-		
						Ē									- -		
						F									-		
						-									- -		
					305.6	L _{12.0}									-		
HA		d Auge		RR Ro	ock Rollin	ng	DS D	isturbe	SAMPLES & FIELD TESTS Sample SPT Standard Penetration Test	DENS VL Very	SITY (S Loose		value) - 4	CONSISTENCY VS Very Soft	(Su) {N-value} < 12 kPa {0-2}		
AS AD/1 AD/1	Auge F Aug Auge	er Scre Jer Drill er Drill	TC-bit	AT Ai HQ H	r Track Q Coring		ES En	/ Soil S / Wate	ample U Undisturbed Tube Sample Sample W Water Sample	L Loos	e	4	- 10	S Soft F Firm	12 - 25 {2-4} 25 - 50 {4-8}		
WB	Was	hbore		NQ NO NMLC N ETRATION	MLC Cor		HP Han	d Pene	rometer MOISTURE CONDITION	D Dens	se	30	0 - 50 0 - 100	St Stiff VSt Very Stiff	50 - 100 {8-15} 100 - 200 {15-30}		
VE E	Very Ea Easy	asy	F Fi	irm VH ard	Very I	Hard	(P: Peal N SPT	k Su R blows	Residual Su) er 300mm	CO Com			50/150mm	H Hard	> 200 kPa {>30}		
	<u> </u>	= Wate	r level	TER SYMB (static)			HW SP	T pene	ration by hammer weight ration by rod weight								
	<u> </u>	= Wate	r level	(during dril	ing)					Fil	le: CE	3247	35.01 CL	JRVE 59_BH03	Page 2 OF 4		

	S	1		Y	C	ORE	BOF	REHOL	E ENG	SINEE	ERIN	IG	LC	OG	Н	OLE	E NO :	CURVE	59_BH	103
PF	ROJE				S SOO	NER PROJE	ECT		: E: 358657, ELEVATION JTH: 90°			3A94)		DA	TE [: 3 OF DRILLED ED BY :	: 4/8/13 To	O 4/8/13	
-	CATI	ON : k	ENNE		WY (CA	IRNS - MAR	EEBA)							CH	CHECKED BY: AJ					
		DRILL	ING					MATERI	AL			ESTIMA	TED ST	RENGTH	D	EFEC		TS & COMI	MENTS	
DRILLING	WATER DETAIL	HIAND TCR/RQD	윤 교 311.6	9 DEPTH (m)	GRAPHIC LOG	(texture	TYPE : Co , fabric, mir	SCRIPTION plour, Grain so neral composontation, etc a	ition, hardnes		Weathering	0	Is(50) ■ - Axia - Diamel	tral	SF	PACIN (mm)	IG Des	cription of join defects, addi ervations and	tional	GENERAL
			310.6-	- - - - - -																
				_			NG AT 8.55m	e brown, grey br	own indicting fo	liation	MW	+	++		H		8.59	JT 90° IR RF		
		100% TCR 45% RQD	-			From 9.00 m	to 11.05 m dis	stinct foliation at	30° to 40°.		HW -						8.7	JT 0° IR RF JT 90° IR RF JT 90° IR RF JT 0 - 5° IR F JT 60° IR RF JT 60° IR RF JT 60° IR VR JT 10° IR VR JT 90° IR VR JT 90° IR VR	R RF RVR RF	JT 20° - 40° Fe CH IR-UN RF-VR
		100% TCR 37% RQD	- - - - - - - - - - - - - - - - - - -	- - - - - - - - - - -		From 11.05 n	1 to 12.30 m o	range brown, gr	ey brown, indisti	nct	HW - MW						11.3 11.3 11.4 11.4 11.9 1 11.9	9 JT 90° IR R 2 JT 60° IR VI 6 JT 90° UN F 17 JT 90° Fe IF 13 JT 5° IR RF 16 JT 80° IR RF 14 JT 90° UN F 15 JT 70 - 90° 11 JT 70° IR RI 14 JT 70° IR RI 14 JT 70° IR RI	ERF ERF ST RF E	- - - - - - -
	DRILLING NMLC NMLC Coring HQ HQ Coring D Dist NQ NQ Coring PQ PQ Coring W Wate SPT SPT							rbed Sample r Sample	& FIELD TESTS ES Env Soil EW Env Wat mple	Sample	DEFECT ABBRE CS Crushed Seam CN Cle CZ Crushed Zone CT Coa DB Drill Break SN Stai FZ Fractured Zone JT Joint IS Infilled Seam SZ Shear Zone VN Vein S S m SL Site			ean ating ain neer olishe ough mooth	Cu IR PR ST Un d	Curved Irregular Planar Stepped Undulated	0-0.03 0.03-0.7 0.1-0.3 0.3-1.0		/ Low	
														File	: CE	3247	'35.01 (URVE 59	BH03	3 OF 4

	S	1		Y		ORE	BOREHOLE ENGINEE	RIN	NG LO	OG	HOLE I	NO :	CURVE 59_BH	103
PI	LIENT ROJEC DB NO	CT : S	AFER		os soo	NER PROJE	POSITION : E: 358657, N: 8137028 ECT SURFACE ELEVATION : 317.6 (A DIP / AZIMUTH : 90°		IGA94)		PAGE : 4 DATE DR LOGGED	ILLED	: 4/8/13 TO 4/8/13	
\vdash	CATIO	ON : H	KENNE		WY (CA	IRNS - MAR	REEBA)	DII // ZINIGITI : 00						
L		DRILL	.ING				MATERIAL		ESTIMATED S	TDENCTH	DEFECTS & COMMENTS DEFECT			
DRILLING	WATER DETAIL	HIND TOR/ROD	(E) 305.6	DEPTH (m)	GRAPHIC LOG	(texture	DESCRIPTION CTYPE : Colour, Grain size, Structure , fabric, mineral composition, hardness ation, cementation, etc as applicable)	Weathering	Is(50) ial	SPACING (mm)	obsei	ription of joints, seams, defects, additional vations and comments	GENERAL
			303.0	- 12.0		GNEISS: Dar (continued)	k grey, orange brown, grey brown, indistinct foliation.	HW - MW					T 60° IR RF	-
			_	-	5/4	From 12.26 r thick.	n CLAYEY GRAVEL (GC), fine to medium grained 60 mm	SW				12.34) JT 10° IR RF 5 CZ 10° CH-CG RF 60 m 1 JT 90° IR RF	
		100%											3 JT 60° PR RF 3 JT 70° Fe IR RF	CH IR-UN RF-VR
- NMLC		TCR 37%		_	PH	From 12.78 r	n CLAYEY GRAVEL (GC), fine to medium grained 70 mm	MW				70 m		Fe CH
		RQD	304.6-	13.0			n to 13.20 m distinct foliation at 30° to 40°.					12.94	3 JT 50° IR RF 1 JT 0° IR RF 3 JT 70° ST RF 3 JT 10° IR RF	- 40°
				-	10 / d		n to 13.45 orange brown, grey brown.					13.06	3 JT 10° IR RF 3 JT 60° IR RF 7 JT 60° IR RF	JT 20°
			_	L		thick.	n CLAYEY GRAVEL (GC), fine to medium grained 50 mm					13.24	JT 60° IR VR CZ 20 - 60° CH-CG IR	-
*		13.60					n to 13.60 m distinct foliation at 30° to 40°. Drill Hole at 13.60 m					13.41	JT 0 - 90° ST RF JT 10° IR RF	
				F								13.50	JT 80° IR RF JT 50° UN RF JT 60° UN RF	
			303.6-	14.0								13.60) JT 50° Fe IR RF	-
				-										-
				-										-
			-	-										-
				-										-
			302 6-	- 15.0										_
			302.0	- 13.0										-
				F										-
			-	-										-
				-										-
				-										-
			301.6-	16.0										_
				L										-
				-										-
				F										_
				F										-
			300.6-	17.0										_
				-										-
				-										-
			-	-										_
				_										-
			299.6	18.0										
			DF	RILLING		IO Co-:	SAMPLES & FIELD TESTS	00.0-			VIATIONS	ınıod	ROCK STRENGTH (Is	
	NMLC N NQ N	MLC Q Cor	Coring ng			IQ Coring Q Coring	D Disturbed Sample ES Env Soil Sample W Water Sample EW Env Water Sample SPT SPT Sample		shed Seam shed Zone I Break		ating IR Irre	egular	0-0.03 Extremely 0.03-0.1 Very Low 0.1-0.3 Low	LOW
	T F	QD 9	6 core r	un recov un > 100	Omm long	I).	U Undisturbed Tube Sample	FZ Frag JT Join	ctured Zone t	VR Ver	neer ST Ste Un Un		0.3-1.0 Medium 1.0-3.0 High	
		•		•	measure	•			ed Seam ear Zone	POL Po RF Ro S Sn			3.0-10 Very High	
	7	= \	Vater le	vel (stat	SYMBOL ic)			AIA AGI		SL Sli	ckensided			
	-	<u>√</u> =\	vater le	veı (duri	ing drilling)								



	SINGLAIR KNIGHT MERZ	Client: Transport and Main Roa	ads						
drawn	AJ	Project: Safer Road Sooner							
date	14/08/2013	Core Photograph – Curve 59 I	BH03						
scale NTS		Project no. CB24735.01							