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ENGINEERING BOREHOLE LOG

FOR GEOTECHNICAL TERMS AND SYMBOLS REFER FORM F:GEOT 017/5-2009

BOREHOLE No ___BH059__

SHEET __1_ of __3__

REFERENCE NO __H10623__

PROJECT BRUCE HIGHWAY (COORDY - CURRA) SECTION A GEOTECHNICAL INVESTIGATION LOCATION Cut 23 COORDINATES 4									OORDINATES 4817	 53.0 E; 7080678.3				
					SURFACE R.L. <u>122.34m</u> PLUNGE									
					HEIGHT DATUM AHD BEARING							R R & D Drilling		
DЕРТН (m)	R.L. (m)	ORING	RQD ()%		MATERIAL		HERING	INTACT STRENGTH	DEFECT SPACING (mm)	GRAPHIC LOG	ADDITIONAL DATA		S	
DEPTI			0005	SAMPLE	DESCRIPTION	LITHOLOGY	SATHE	xx	00000	APHI	TEST RES		SAMPLES	
0	122.34	2880 08080	REC %	SAI		크	S N	파고 	71111	8			SA	
-	121.84				Gravelly SILT (Topsoil) Mottled brown, dry.		(MLG				— Driller's log only			
-1	121.14			А	Clayey SILT (Residual) Brown to grey, moist, stiff, low plasticity, occasional coarse sand and fine gravels.		(CI- ML)	- - - -				5,6,8 N=14	SPT :	
E	121.17				PHYLLITE (HW)	***						20/80]	
- - -				В	Generally exhibits the engineering properties of pale brown, moist, hard, clayey SILT of intermediate plasticity.	*****						30/80 N>50	SPT _	
-2 - -						***	нw					30/80		
			3	С	Becoming wet @ 2.5m.	***						N>50	SPT	
-3	119.34	4	(49)		PHYLLITE (MW/SW)	\approx							_	
					Pale grey with dark grey interbeds, fine grained.	***				****	Crushed zone	s(50) = 2.02MPa s(50) = 1.17MPa	x -	
-					Strongly foliated, dips at 45°-50°.	***							=	
-4			100		Defects medium to wide spacing. Prominent defect sets typically dip parallel to foliation and at 10°, 40° and 60°. Defect	<pre>>>>>>></pre>					Clay seam, 50°		-	
-			(21)		surfaces generally clay infilled and iron stained.	}								
-5 -						>>>>						s(50) = 0.87MPa	0	
-					5.25m Foliations ~60°.	***					I	s(50) = 1.67MPa	x _	
-6			100			***					— J, Un, Cl, 70°		-	
-			(55)		From 6.0m Foliations 55°-60°.	**	}							
						}	MW- SW			7	Sheared Zone		-	
7						***				13/2		s(50) = 1.10MPa s(50) = 3.00MPa	o -	
-			100 (79)			***							-	
-			()			**								
-8					Detailed defect descriptions are shown on	**							-	
					Form GEOT533/8 attached.	***								
-						**							-	
-			100			**								
-9 -			(44)			***					Н	ls(50) = 1.37MPa ls(50) = 1.81MPa	0 X	
		3				**	1				J, 80°, clay filled, 3	mm, PI, C	_	
E						**								
10	(See over)										<u> </u>			
F	REMARK	S <u>Deta</u>	iled defe	ct de	scriptions are shown on Form GEOT533/8 attac	ied.					-	LOGGED BY MW		



ENGINEERING BOREHOLE LOG

FOR GEOTECHNICAL TERMS AND SYMBOLS REFER FORM F:GEOT 017/5-2009

BOREHOLE No	BH059						
SHEET	_2_ of _3_						
REFERENCE No	H10623						

BRUCE HIGHWAY (COORDY - CURRA) SECTION A GEOTECHNICAL INVESTIGATION **PROJECT** Cut 23_ COORDINATES 481753.0 E; 7080678.3 N LOCATION PROJECT No _FG5825 ____ GRID DATUM MGA94_ SURFACE R.L. _ 122.34m PLUNGE _ _ _ _ DATE STARTED 31/8/09 HEIGHT DATUM _AHD __ BEARING _ _ _ _ DATE COMPLETED 31/8/09 DRILLER R & D Drilling ____ 128/10A/901 JOB No RQD INTACT DEFECT R.L ADDITIONAL DATA STRENGTH SPACING (m) ()% 90 E MATERIAL (mm) LITHOLOGY AND SAMPLES DESCRIPTION ESTS. SAMPL TEST RESULTS CORE ¥8\8\8 REC % 112.34 10 PHYLLITE (MW/SW) (Cont'd) 100 (72)10.5m Foliations, 65°. MW SW Is(50) = 1.81MPa Is(50) = 1.30MPa0 J, PI, 75°, S, CI Datgel CPT Tool gINt Add-In 12/05/2010 10:31 110.41 100 ANDESITE (MW) MW Is(50) = 0.36MPa (39) X Brown-orange, fine to medium grained 110.03 ls(50) = 0.40MPacrystals in fine grained groundmass PHYLLITE (MW/SW) Pale grey with dark grey interbeds, fine grained. Is(50) = 2.52MPa Strongly foliated, dips at 45°-50° and Is(50) = 0.92MPadisturbed in places. 100 DWG95012.GDW Defects medium to wide spacing. (70) Prominent defect sets typically dip parallel to foliation and at 10°, 40° and 60°. Defect surfaces generally clay infilled and iron stained. FG5825 BRUCE HWY COOROY-CURRA SECTION A BHS.GPJ 12.83m Foliations, 50-60°. 100 Is(50) = 1.15MPa (72) Is(50) = 0.22MPa From 15.15m Foliations, 65-70°. J, 70°, C SIM 100 (52) Log A_ENGINEERING BOREHOLE LOG W LITHOLOGY Crushed zone Is(50) = 0.52MPa Is(50) = 2.13MPa 100 Detailed defect descriptions are shown on (70) Form GEOT533/8 attached. LIB_01.GLB 100 Is(50) = 1.24MPa DMR (58)Is(50) = 0.61MPa0 상 (See over) LOGGED BY REMARKS Detailed defect descriptions are shown on Form GEOT533/8 attached. MW



ENGINEERING BOREHOLE LOG

FOR GEOTECHNICAL TERMS AND SYMBOLS REFER FORM F:GEOT 017/5-2009

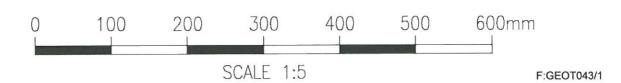
BOREHOLE No	BH059
SHEET	_3_ of _3_
REFERENCE No	H10623

	JECT ATION				AY (COOROY - CURRA) SECTION A GEOTI				<u>IGATION</u>		OORDINATES 481753.0 E; 7080678	3 N
					SURFACE R.L. <u>122.34m</u> PLUNGE				STARTED			
JOB	No	_128/	10 <u>A</u> /901		HEIGHT DATUM _AHD BEARING			DATE CO	MPLETED .	31/8/	09 DRILLER R & D Drilling	L
OEPTH (m)	R.L. (m)	AUGER CASING WASH BORING CORE DRILLING	RQD ()% CORE REC%	SAMPLE	MATERIAL DESCRIPTION	LITHOLOGY	USC	INTACT STRENGTH	DEFECT SPACING (mm)	GRAPHIC LOG	ADDITIONAL DATA AND TEST RESULTS	SAMPLES TESTS
-21					PHYLLITE (MW) (Cont')	\$\$\$\$\$\$\$					Jt, 80-85°, PI, CI, R, W Is(50) = 1.10MPa	0
-22			3000.00		Detailed defect descriptions are shown on Form GEOT533/8 attached.	3}}}}}}	MW				Is(50) = 1.08MPa Is(50) = 2.13MPa Is(50) = 1.68MPa	x -
	99.84		100	e ilu	Borehole terminated at 22.5m	~			1		H ⊢ Broken zone	
-24 -25 -26 -27 -27 -28 -28									*			
	EMADE	S Deta	iled defe	ct de	scriptions are shown on Form GEOT533/8 attac	ned.		1	<u> </u>		LOGGED BY	
KENNAKV2 Toming again and a significant and a si							MW					

Project: Bruce Highway Upgrade (Cooroy - Curra) Section A

Borehole No: BH 59
Start Depth: 3.00m
Finish Depth: 22.50m
Project No: FG5825
H No: 10623

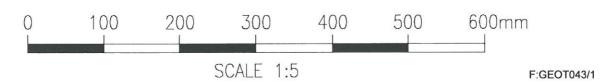




Project: Bruce Highway Upgrade (Cooroy - Curra) Section A

Borehole No: BH 59
Start Depth: 3.00m
Finish Depth: 22.50m
Project No: FG5825
H No: 10623





GEOTECHNICAL BRANCH LABORATORY

Materials Services - Brisbane 35 Butterfield Street, HERSTON Q 4006 Phone: (07) 3115 3035 Fax: (07) 3115 3011



DEFECT DESCRIPTIONS OF ENGINEERING BORELOGS

[CHARACTERISATION OF DEFECTS ARE IN ACCORDANCE WITH ISRM SUGGESTED METHODS (1981)]

 BOREHOLE NO.:
 BH59

 SHEET:
 1 of 2

REFERENCE NO.: H10623

PROJECT: Bruce Highway (Cooroy – Curra) Section A Geotechnical Investigation

LOCATION: Cut 23

PROJECT NO.: FG5825 SURFACE R.L.: 122,30 DRILLER: R & D Drilling

JOB NO.: 128/10A/901 DATUM: AHD DATE DRILLED: 31/08/09

DEPTH	DEFECT TYPE	DIP°	PLANARITY	ROUGHNESS	APERTURE	WALL ALTERATION	OTHER
3.06	J	35°	St	R	0		
3.18-3.29	CZ/DI\$	50°		S	0		Clay Veneer
3.67	FP	60°	Pl	SR	С	FeSt	
3.80	J	45°	Pl		С		
3.84	J	55°	Pl		С		
4.02	Clay Seam	30°	Un		С		
4.52	J	75°	Un-St	S	С		Cn
4.56	J	25°	Un	SR	С		Clay Veneer
4.58	J	60°	Un	S	С		Clay Veneer
4.65	J	30°	Un	R	С	W	
4.68	J	20°	PI	S	С		CI, In
4.71	J	25°	PI	S	С		
5.04	J	40°	PI	S	С		Cn
5.30	J	60	Un-St	SR	С	FeSt	
5.50	J	70°	Un	SR	С	FeSt	
5.80	J	65°	Un	R	С	FeSt, MnSt	
6.38-6.92	SZ	65°	PI		С		Clay w/ crushed rock and gravel
8.45	J	65°	PI	SR	С	FeSt	Clay veneer. Crushed rock infill

Abbreviations (as per F: GEOT 017/5 - 2009)

	ROUGHNESS		WALL ALTERATIONS		TYPE		OTHER
R	Rough	FeSt	Iron Stained	J, Js	Joint, Joints	CI	Clay Infill
Sr	Slightly Rough	W	Weathered	В	Bedding	CLy	Clayey
S	Smooth	Smn	Secondary Mineralisation	BP	Bedding Parting	Со	Coal Seam
SL	Slickensided	Cn	Clean	FP	Foliation Parting	Carb	Carbonaceous
РО	Polished	MnSt	Manganese Stained	LP	Lamination Parting	SI	Sand Infill
PLANARITY			APERTURE		Cleavage	QZ	Quartz
Pl	Planar	С	Closed	Fr	Fracture	CA	Calcite
St	Stepped	0	Open	SZ	Sheared Zone	Chl	Chlorite
Un	Undulating	F	Filled	CZ	Crushed Zone	ln	Incipient
Cu	Curved	T	Tight	BZ	Broken Zone	Int	Intersecting
lr	Irregular			HFZ	Highly Fractured Zone	Lam (s)	Lamination (s)
				WS	Weathered Seam	Di	Drilling Induced
				Vn	Vein	Н	Horizontal
						V	Vertical

NOTE: This sheet should be read in conjunction with appropriate Engineering Borelog. Defect angles were measured with respect to horizontal plane.

 BOREHOLE NO.:
 BH59

 SHEET:
 2 of 2

REFERENCE NO.: H10623

DEPTH	DEFECT TYPE	DIP°	PLANARITY	ROUGHNESS	APERTURE	WALL ALTERATION	OTHER
8.52	J	40°	PI		С	W	Rehealed
8.61	J	35°	Un	S	С	W	
9.22-9.50	J	80°	Pl	S	С		CI, 3 mm
10.06	J	55°	PI	SR	С	FeSt, W	
10.36	J	80°	lr .	R	С	FeSt, MnSt	
10.67	DI	60°	Un	S	С	FeSt, MnSt	
10.72	J	0°			С		Rehealed
11.13	J	50°	Pl	S	С	Cn	
11.66	J	75°	PI	SR		W, FeSt, MnSt	
11.93	BP	10°	PI	SR	С		
12.10	J	35°	PI	S	С	W, FeSt, MnSt	
12.20	J	10°	PI	S	С	W, FeSt, MnSt	
12.23	J	10°	Pl	S	С	W, FeSt, MnSt	
12.31	BP	15°	PI	SR	С		5mm Crushed rock infill
12.27	J	70°	Un	S	С	FeSt	
12.54	j	25°	PI	S	С	W	
12.83	J	45°	lr	R	С	W	
13.54	J	60°	Un	S	0		Clay Veneer
13.76	J	5°	PI	SR	С		
13.79	J	10°	Un	SR	0		
14.12	J	30°	Un	SR	С	FeSt	
14.32	J	65°	PI	SR	С	FeSt, MnSt	
14.36	J	70°	PI		С		1 mm crushed rock infill
14.77	J	25°	Pl	SR	0	TOTAL CONTRACTOR CONTR	Crushed rock <10mn
15.75-15.94	J	70°	Un-St	R	С	FeSt, W	
16.12	J	25°	Un	R	С	W	
17.07-17.14	CZ	70°			С		
17.62	J	80°	Pl	S	С		Crushed Rock/ clay infill
18.36	J	40°	PI	R	С	W, FeSt	
18.69	J	35°	PI	SR	С	FeSt ,W	
19.09	J	35°	St	R	С	Cn	
19.45	J	80°	PI	R	С	W	
19.91	J	0°	St	R	0		Cn
20.58	J	35°	Un	R	С	FeSt	
20.64	J	50°	Un	R	С	FeSt	
20.96	J	45°	Un	R	С	W	
22.30-22.72	J	80°	PI	S	С	FeSt, W	
22.30	J	80°	PI	S	С	FeSt, W	
22.43	J	40°	St	SR	С	FeSt	