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ENGINEERING BOREHOLE LOG

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

BOREHOLE No BH047
SHEET 1 of 3
REFERENCE No H10602

PROJECT BRUCE HIGHWAY (COOROY - CURRA) SECTION A GEOTECHNICAL INVESTIGATION
LOCATION Cut 14 COORDINATES 484172.7 E; 7081383.3 N
PROJECT No FG5825 SURFACE R.L. 144.56m PLUNGE _____ DATE STARTED 13/8/09 GRID DATUM MGA94
JOB No 128/10A/901 HEIGHT DATUM AHD BEARING _____ DATE COMPLETED 13/8/09 DRILLER R & D Drilling

DEPTH (m)	R.L. (m)	AUGER CASING WASH BORING CORE DRILLING	RQD (%)	CORE REC %	SAMPLE	MATERIAL DESCRIPTION	LITHOLOGY	USC WEATHERING	INTACT STRENGTH	DEFECT SPACING (mm)	GRAPHIC LOG	ADDITIONAL DATA AND TEST RESULTS	SAMPLES TESTS
0	144.56					Gravelly SILT (Colluvium) Mottled red, moist, stiff.							
1					A	Intermediate plasticity.	(MI)					5,5,6 N=11	SPT
2	142.91				B	PHYLLITE (XW) Generally exhibits the engineering properties of light brown to grey, moist, very stiff to hard gravelly silt.						5,10,12 N=22	SPT
3					C	Intermediate plasticity; rock fabric visible in parts; occasional angular quartz gravels up to 15mm.						11,12,27 N=39	SPT
4					D		XW					8,18,18 N=36	SPT
5					E	4.5m: Wet clay seam.						21,30/60 N>50	SPT
6	139.56				(0)	Multiple QUARTZ Veins & PHYLLITE (HW) Mainly white with minor pale brown phyllite, fine grained.							
7					100	Quartz veins are highly fractured / brecciated with clay infilling throughout.							
8					(0)		HW						
9					100	6.7-7.0m: MW phyllite band.						Is(50) = 0.43MPa Is(50) = 0.16MPa	x o
10					(15)	Detailed defect descriptions are shown on Form GEOT533/8 attached.							
11	136.86				100	PHYLLITE (MW) Light brown to slightly green, fine grained, foliated.						Is(50) = 0.69MPa Is(50) = 0.41MPa	x o
12					(64)	Foliations vary in dip from 30-70°.							
13					100	Defects are generally close to medium spaced.	MW						
14					(36)	Prominent defect set parallel to foliation with other sets dipping at 10 and 45°.							
15					100	Defect surfaces are prominently clay infilled.							
16					(47)	Occasional clay seams up to 70mm thick.							

REMARKS Detailed defect descriptions are shown on Form GEOT533/8 attached.

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ENGINEERING BOREHOLE LOG

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

BOREHOLE No BH047

SHEET 2 of 3

REFERENCE No H10602

PROJECT BRUCE HIGHWAY (COOROY - CURRA) SECTION A GEOTECHNICAL INVESTIGATION

LOCATION Cut 14 COORDINATES 484172.7 E; 7081383.3 N

PROJECT No FG5825 SURFACE R.L. 144.56m PLUNGE _____ DATE STARTED 13/8/09 GRID DATUM MGA94

JOB No 128/10A/901 HEIGHT DATUM AHD BEARING _____ DATE COMPLETED 13/8/09 DRILLER R & D Drilling

DEPTH (m)	R.L. (m)	AUGER CASING WASH BORING CORE DRILLING	RQD (%)	CORE REC %	SAMPLE	MATERIAL DESCRIPTION	LITHOLOGY	USC WEATHERING	INTACT STRENGTH	DEFECT SPACING (mm)	GRAPHIC LOG	ADDITIONAL DATA AND TEST RESULTS	SAMPLES TESTS
10	134.56												
11			93 (0)			PHYLITE (MW) (Cont'd)						Is(50) = 0.48MPa Is(50) = 0.11MPa	o x
12			100 (41)			Detailed defect descriptions are shown on Form GEOT533/8 attached.						Is(50) = 0.47MPa Is(50) = 0.63MPa	x o
13	131.27												
14			100 (63)			PHYLITE (MW/SW) Pale grey with distinct dark grey mottling, fine grained, foliated. Foliations vary in dip from 30 to 70°. Defects are generally close to medium spaced. Prominent defect set parallel to foliation with other sets dipping at 10 and 45°. Defect surfaces are typically iron stained and thinly clay infilled. Occasional sub-vertical joints.						Is(50) = 0.87MPa Is(50) = 0.71MPa	x o
15			100 (74)									Is(50) = 1.17MPa Is(50) = 0.94MPa	x o
16													
17			100 (51)									Is(50) = 0.96MPa Is(50) = 1.99MPa	o x
18			100 (77)									Is(50) = 1.98MPa Is(50) = 1.52MPa	x o
19			100 (55)										
20													

REMARKS Detailed defect descriptions are shown on Form GEOT533/8 attached.

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ENGINEERING BOREHOLE LOG

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

BOREHOLE No BH047
SHEET 3 of 3
REFERENCE No H10602

PROJECT BRUCE HIGHWAY (COOROY - CURRA) SECTION A GEOTECHNICAL INVESTIGATION
LOCATION Cut 14 COORDINATES 484172.7 E; 7081383.3 N
PROJECT No FG5825 SURFACE R.L. 144.56m PLUNGE _____ DATE STARTED 13/8/09 GRID DATUM MGA94
JOB No 128/10A/901 HEIGHT DATUM AHD BEARING _____ DATE COMPLETED 13/8/09 DRILLER R & D Drilling

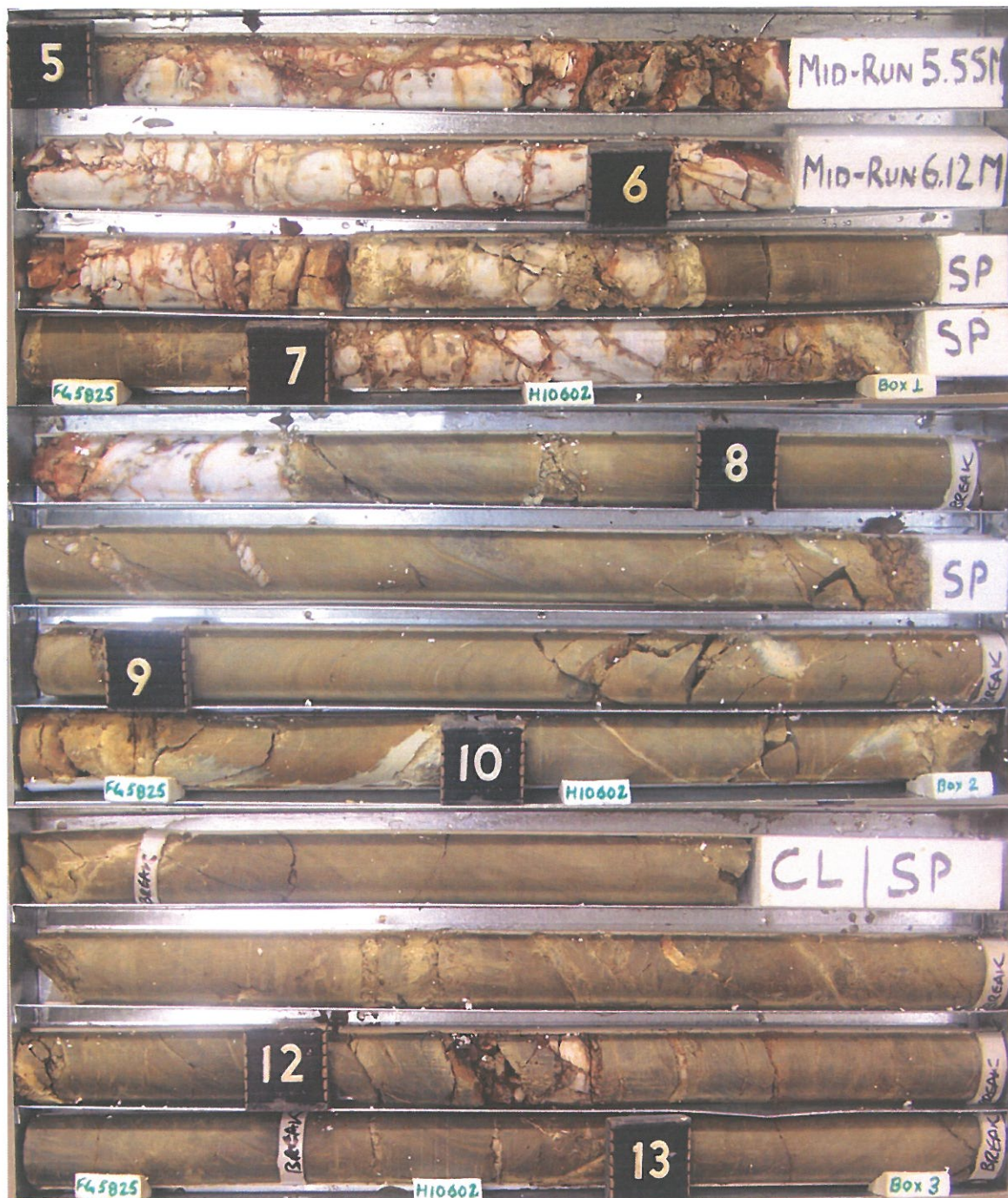
DEPTH (m)	R.L. (m)	AUGER CASING WASH BORE CORE DRILLING	RQD (%)	CORE REC %	SAMPLE	MATERIAL DESCRIPTION	LITHOLOGY	USC WEATHERING EH VH H M L VL EL	INTACT STRENGTH	DEFECT SPACING (mm)	GRAPHIC LOG	ADDITIONAL DATA AND TEST RESULTS	SAMPLES TESTS
20	124.56					PHYLLITE (MW/SW) (Cont'd)						Is(50) = 1.33MPa Is(50) = 1.07MPa	o x
	123.66		100									Is(50) = 0.80MPa Is(50) = 0.66MPa	x o
21						Borehole terminated at 20.9m							
22													
23													
24													
25													
26													
27													
28													
29													
30													

REMARKS Detailed defect descriptions are shown on Form GEOT533/8 attached.

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QLD_DMR_LIB_01_GLB_Log_A_ENGINEERING_BOREHOLE_LOG_W/LITHOLOGY_FG5825_BRUCE_HWY_COOROY_CURRA_SECTION_A_BHS_GPL_DIMG55012_GDWI_Dataisel_CPT_Tool_g/IN_Add_in_12/05/2010_10:31

Project: **Bruce Highway Upgrade (Cooroy – Curra) Section A**
 Borehole No: **BH47**
 Start Depth: 5.00m
 Finish Depth: 20.90m
 Project No: FG5825
 H No: 10602



0 100 200 300 400 500 600mm

SCALE 1:5

F:GEOT043/1

Project: **Bruce Highway Upgrade (Cooroy – Curra) Section A**
Borehole No: **BH47**
Start Depth: 5.00m
Finish Depth: 20.90m
Project No: FG5825
H No: 10602



SCALE 1:5

F:GEOT043/1

DEFECT DESCRIPTIONS OF ENGINEERING BORELOGS

[CHARACTERISATION OF DEFECTS ARE IN ACCORDANCE WITH
GEOTECHNICAL TERMS AND SYMBOLS – FORM : GEOT 017/5 – 2009]

BOREHOLE NO.:	BH47
SHEET:	1 of 4
REFERENCE NO.:	H10602

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

LOCATION: Cut 14

PROJECT NO.: FG5825

SURFACE R.L.: 144.56

DRILLER: R & D Drilling

JOB NO.: 128/10A/901

DATUM: MGA94

DATE DRILLED: 13/08/09

DEPTH	DEFECT TYPE	DIP°	PLANARITY	ROUGHNESS	APERTURE	WALL ALTERATION	OTHER
5.07	J	60	PI		C		Cl, 2mm
6.00	J	75	PI		O		Crushed clay rock in defect
6.36-6.38	J	0	PI		C		Cl, 10mm W/Qtz pebbles
6.5	J	70	PI	S	O	FeSt	
6.61-6.62	J	0	PI		C		Cl, 10mm W/Qtz pebbles
6.67	DI						
6.75	J	70	PI	S	C	FeSt	Cl, 2mm
6.80	J	0	PI		C		Cl, 5mm
6.89	J	35-40	St	R	C	FeSt	
6.96	J	45	St	SR	C	FeSt	
7.14	J	60	PI		C		Crushed clay rock in defects 7-6mm
7.25	J	60	PI		C		
7.29-7.49	Brecciated / Altered Zone						
7.53	J	40	Un		O		Cl, 3mm
7.62-7.63	CZ	40	PI		C		Cl, 6mm crushed rock
7.68-7.69	CZ	0	PI		C		
7.72	J	50	Un	S	C		
7.86-7.90	CZ	35	Un		C		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	Cl	Clay Infill
Sr	Slightly Rough	W	Weathered	B	Bedding	CLy	Clayey
S	Smooth	Smn	Secondary Mineralisation	BP	Bedding Parting	Co	Coal Seam
SL	Slickensided	Cn	Clean	FP	Foliation Parting	Carb	Carbonaceous
PO	Polished	MnSt	Manganese Stained	LP	Lamination Parting	SI	Sand Infill
PLANARITY		APERTURE		CLV	Cleavage	QZ	Quartz
PI	Planar	C	Closed	Fr	Fracture	CA	Calcite
St	Stepped	O	Open	SZ	Sheared Zone	Chl	Chlorite
Un	Undulating	F	Filled	CZ	Crushed Zone	In	Incipient
Cu	Curved	T	Tight	BZ	Broken Zone	Int	Intersecting
Ir	Irregular			HFZ	Highly Fractured Zone	Lam (s)	Lamination (s)
				WS	Weathered Seam	Di	Drilling Induced
				Vn	Vein	H	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.:	BH47
SHEET:	2 of 4
REFERENCE NO.:	H10602

DEPTH	DEFECT TYPE	DIP°	PLANARITY	ROUGHNESS	APERTURE	WALL ALTERATION	OTHER
8.33	J	55	Pl	S	C	FeSt	Cl, 2mm
8.37-8.38	QZ	35	Pl		C		10mm wide
8.65	J	35	Pl	S	C		
8.72	J	55	Pl	S	C		Cl, 2mm
8.79	QZ	30	Pl		C		QZ, 5mm wide
8.79-8.90	BZ						Clayey broken rock
8.95-8.98	CZ	40	Pl	S	C		Cl, 3mm
9.16	FP	45	Pl	S	C	FeSt	Cl, 1mm
9.23	FP	45	Pl	S	C	FeSt	Cl, 1mm
9.29	FP	45	Pl	SR	C	MnSt	
9.31	J	30	Un	SR	C	MnSt, FeSt	
9.34-9.51	BZ						
9.55-9.67	BZ						
9.67-9.75	J	0	Pl		C		Cl, 30mm
9.81	J	70	Un	S	C	FeSt, W	Crushed rock in defect, clay veneer
9.93	FP	60	Pl		C		
9.94	J	55	Un		C		
9.95-9.97	J	55	Pl		C		Cl, 20mm
9.97-10.00	Brecciated Zone						
10.02	J	28	Un	SR	C	W, FeSt	
10.09	J	55	Un		C		Cl, 4mm
10.20	J	40	Pl	S	C	FeSt	Cl, 2mm
10.32	J	55	Pl		C		Cl, 2-3mm
10.37	J	30	Pl	S	C		Cl, 2mm
10.42	J	60	Un	S	C		
10.49	J	70-80	Un		C		Cl, 2-3mm Crushed rock in defect
10.56	J	65	Un	R	C	MnSt, FeSt	
10.61	J	20	St	R	C	FeSt	
10.71	J	35	Pl	R	C	MnSt, FeSt	
10.95	J	45	Un	R	C	W	
11.16	J	65	Pl	SR	C	MnSt, W	
11.17	J	65	Pl	SR	C	MnSt, FeSt	
11.23	J	65	Pl	SR	C	FeSt, W	Cl, 2mm
11.25	J	15	St	R	C	FeSt	
11.32-11.38	BZ	0	Pl	S	C	FeSt	Cl, 10-15mm
11.40	J	35	Un	S	C	MnSt, FeSt	Cl, 1mm
11.46	J	35	Un	SR	C	FeSt	Crushed rock in defect 3mm
11.50	J	35	Pl	SR	C	FeSt	
11.58	J	55	Un	S	C	FeSt	Cl, 2mm
11.66	J	40	Pl		C		
11.66-11.82	Altered Zone						
11.82	J	25	Un	R	C		
11.92	J	60-80	Un	R	C	FeSt, MnSt	
12.04	J	55	Un	SR	O	FeSt	
12.06	J	50	St	S	C	FeSt	
12.09	J	45	St	R	C	FeSt, MnSt, W	
12.13-12.24	BZ						Large QZ clasts
12.29	QZ	30	Pl	SR	C	FeSt, W	QZ, 10mm wide
12.34	QZ	30	Pl	R	C	FeSt	QZ, 4mm wide
12.37	J	20	Un	SR	C	FeSt	Cl, 1mm
12.46	QZ	35	Pl	R	C	FeSt, W	QZ, 10mm wide
12.52	QZ	35	Pl	R	C	FeSt, W	QZ, 8mm wide
12.60	J	30	Un	SR	C	FeSt, W	
12.70	J	30	Un	SR	C	FeSt, MnSt	
12.81	QZ	5	Pl		C	W	QZ, 4mm wide

BOREHOLE NO.:	BH47
SHEET:	3 of 4
REFERENCE NO.:	H10602

DEPTH	DEFECT TYPE	DIP°	PLANARITY	ROUGHNESS	APERTURE	WALL ALTERATION	OTHER
12.91	QZ	0	Pl	SR	C	FeSt,MnSt	QZ, 7mm wide
12.93-13.06	Closely Spaced Micro Fracturing/Brecciated						
12.97	J	60	Pl		C		Cl, 2-20mm
13.09	J	20	Pl	SR	C	FeSt	
13.13	J	15	Un	SR	C	FeSt,W	Cl
13.28	J	60	Pl	SR	C	FeSt	Clay Veneer
13.34	J	75	Un-St	R	C	W	Cl,<1mm
13.42	J	20	St	R	C	FeSt	
13.51	DI						
13.58	J	15	Pl	SR	C		Cn
13.70	C	0	St		C		
13.79-13.81	CZ	40	Pl	SR	C	W,FeSt	
13.85	J	0	Un	R	0	W,FeSt	
13.97	J	80	Un	R		W	
11.80-14.05	Disturbed Foliations						
14.08	J	15	Un	SR	O		Cl, 1mm
14.19	J	15	St		C		
14.39	J	55	Un	R		W	
14.61	J	15	Un				Rehealed
14.93	J	50	Un		C		Rehealed
15.00	J	10	Un		C		Cl, Veneer
15.06	J	10	Pl		C		Rehealed
15.16	J	15	Pl		C		Rehealed
15.41	QZ	15	Pl		C		Rehealed
15.61	J	20	Pl	S	C	FeSt	
15.68	J	20	Pl		C		Rehealed
15.86	J	80	Un	SR	C	FeSt,MnSt	
16.18	J	15	St	SR	C	FeSt,MnSt	
16.23	J	30	Pl	SR	C		
16.32	J	40	Pl	S	C	FeSt,MnSt	Clay Veneer
16.39	J	40	Pl	SR	C	MnSt,FeSt	
16.45	J	15	St	SR	C	FeSt,W	
16.48	J	50	Pl	SR	C	FeSt,W	Cl, 1mm
16.49	J	60	Pl	SR	C	FeSt	Crushed rock in defect 1mm
16.50	J	20	Pl	R	O	W	
16.68	J	85	Un	SR	C	FeSt	Cl, 2mm
16.81	J	20	Pl	SR	C	MnSt,FeSt	Cl,1mm
16.87	J	35	Pl	SR	C	FeSt	Clay Veneer
16.89	J	20	Un	R	C	FeSt,W	
17.00	J	50	Un	SR	C	MnSt,FeSt	Clay Veneer
17.21	J	35	Un	S	C	FeSt	
17.26	J	5	Pl	SR	C	FeSt	
17.37	J	35	Un	SR	C	FeSt	Clay Veneer
17.42-17.80	Disturbed Foliations, Very closely Spaced Micro Fracturing and Qtz Veining (1mm-25mm wide)						
17.66	J	45	Pl	R	C	FeSt	
17.75	J	90	Pl	R	C	FeSt	Cl, <1mm
17.86	J	15	Pl		C		Rehealed
17.97	J	30	St	SR	C	FeSt,MnSt	
18.08	J	15	Un	SR	C	FeSt,MnSt	
18.37	FP	40	Un	S	C		Clay Veneer
18.97	J	35	Un	R	C	FeSt	
19.56	J	40	Un	R	C	W	
19.70	FP	40	Pl	S	C	FeSt	
19.83	J	0-55	St	SR	C	FeSt	

BOREHOLE NO.:	BH47
SHEET:	4 of 4
REFERENCE NO.:	H10602

DEPTH	DEFECT TYPE	DIP°	PLANARITY	ROUGHNESS	APERTURE	WALL ALTERATION	OTHER
19.88	J	35	St	R	C	FeSt,W	
19.94	J	70	Un	R	C	FeSt,W	Clay Veneer
19.98	J	15	Pl	SR	C	FeSt,W	
20.16-20.18	J	25	Un	R	C	FeSt,W	
20.46	J	35	Pl	S	C	FeSt	
20.52	FP	35	Pl	PO	C		
20.55	J	35	Pl	SR	C	Fe infill,3mm	
20.66-20.67	QZ	25	Pl	C			QZ, 7mm wide
20.87	J	20	Un-St	SR	C	FeSt	Cl, 3mm