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

BOREHOLE No BH046  
SHEET 1 of 3  
REFERENCE No H10616

PROJECT	BRUCE HIGHWAY (COOROY - CURRA) SECTION A GEOTECHNICAL INVESTIGATION							
LOCATION	Cut 14				COORDINATES	484162.6 E; 7081327.0 N		
PROJECT No	FG5825	SURFACE R.L.	149.76m	PLUNGE	DATE STARTED	17/8/09	GRID DATUM	MGA94
JOB No	128/10A/901	HEIGHT DATUM	AHD	BEARING	DATE COMPLETED	17/8/09	DRILLER	R & D Drilling

OLD DMR LIB 01 GLB Log A ENGINEERING BOREHOLE LOG W LITHOLOGY FG5825 BRUCE HWY COOROY-CURRA SECTION A BHS.GPJ DWG95012.GDW Datagel CPT Tool at Add-In 12/05/2010 10:31

REMARKS Detailed defect descriptions are shown on Form GEOT533/8 attached. Piezometer installed at base.

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# ENGINEERING BOREHOLE LOG

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

BOREHOLE No BH046  
SHEET 2 of 3  
REFERENCE No H10616

PROJECT BRUCE HIGHWAY (COOROY - CURRA) SECTION A GEOTECHNICAL INVESTIGATION  
LOCATION Cut 14 COORDINATES 484162.6 E; 7081327.0 N  
PROJECT No FG5825 SURFACE R.L. 149.76m PLUNGE \_\_\_\_\_ DATE STARTED 17/8/09 GRID DATUM MGA94  
JOB No 128/10A/901 HEIGHT DATUM AHD BEARING \_\_\_\_\_ DATE COMPLETED 17/8/09 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	139.76													
11			100 (32)			PHYLLITE (MW/SW) (Cont'd) Defects are generally medium to widely spaced. Defect sets dip at 10 and 45° with occasional sub-vertical sets. Defect surfaces are typically thinly clay infilled and iron stained.							Is(50) = 0.78MPa MC = 3.4%; UCS=3.54MPa	x UCS
12			100 (35)			12.0-12.8m: Zone with prominent clay seams (sheared zone?)							Is(50) = 0.33MPa	x
13			100 (78)										Is(50) = 2.78MPa Is(50) = 0.97MPa	x x
14			100 (78)			Detailed defect descriptions are shown on Form GEOT533/8 attached.							Is(50) = 2.10MPa Is(50) = 3.12MPa Is(50) = 1.44MPa Is(50) = 1.79MPa	x x x x
15			100 (78)										Is(50) = 1.00MPa MC = 1.6%; UCS=11.7MPa	x UCS
16														
17														
18			100 (89)										Is(50) = 1.44MPa Is(50) = 0.86MPa	x x
19													Is(50) = 0.62MPa MC = 2.6%; UCS=4.98MPa	x UCS
20														

REMARKS Detailed defect descriptions are shown on Form GEOT533/8 attached. Piezometer installed at base.

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Main Roads

# ENGINEERING BOREHOLE LOG

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

BOREHOLE No BH046  
SHEET 3 of 3  
REFERENCE No H10616

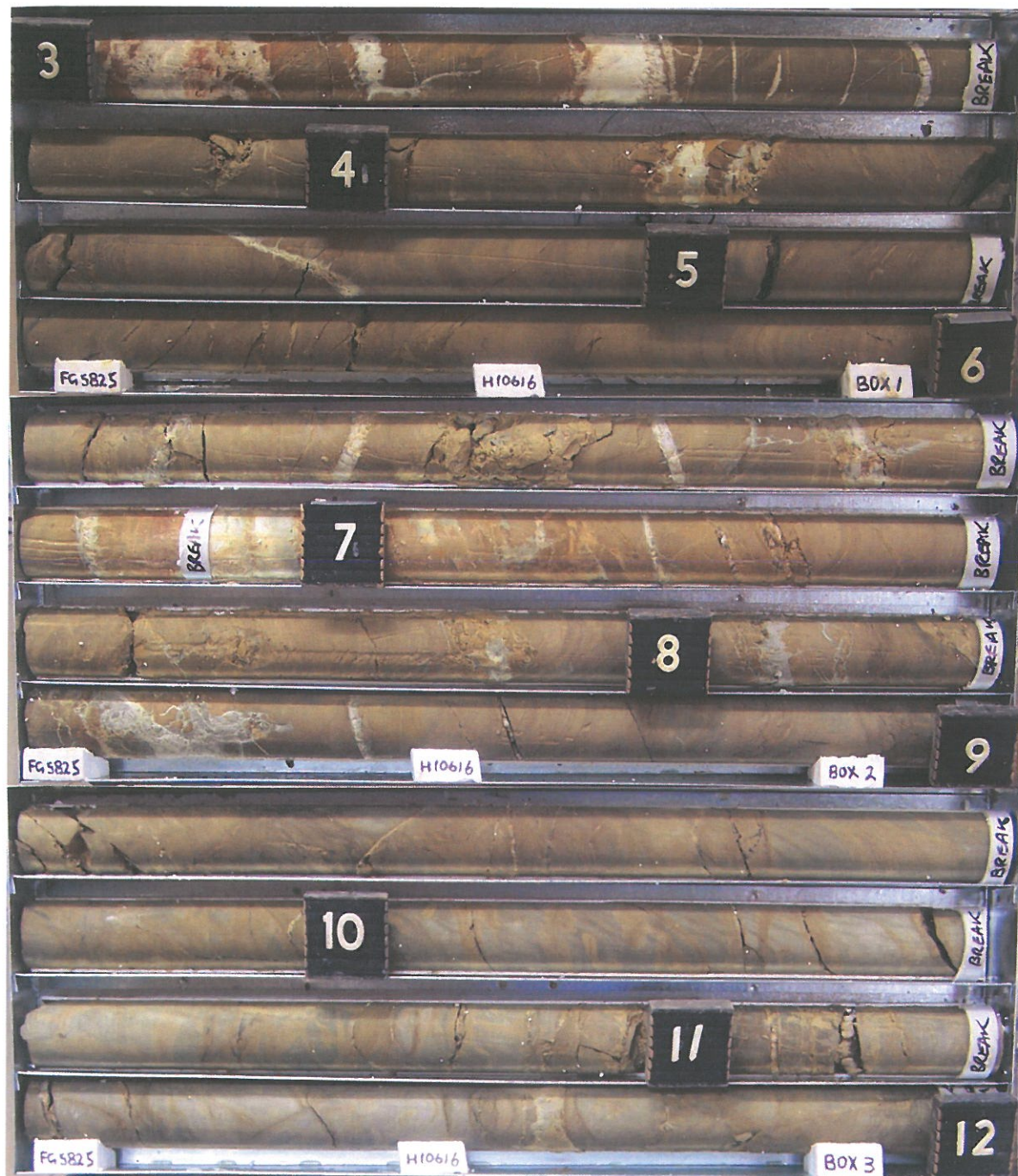
PROJECT BRUCE HIGHWAY (COOROY - CURRA) SECTION A GEOTECHNICAL INVESTIGATION  
LOCATION Cut 14 COORDINATES 484162.6 E; 7081327.0 N  
PROJECT No FG5825 SURFACE R.L. 149.76m PLUNGE \_\_\_\_\_ DATE STARTED 17/8/09 GRID DATUM MGA94  
JOB No 128/10A/901 HEIGHT DATUM AHD BEARING \_\_\_\_\_ DATE COMPLETED 17/8/09 DRILLER R & D Drilling

DEPTH (m)	R.L. (m)	AUGER CASING WASH BORING CORE DRILLING	RQD (%)	SAMPLE	MATERIAL DESCRIPTION	LITHOLOGY	USC	WEATHERING	INTACT STRENGTH	DEFECT SPACING (mm)	GRAPHIC LOG	ADDITIONAL DATA AND TEST RESULTS	SAMPLES TESTS
20	129.76				PHYLLITE (MW/SW) (Cont'd)							Is(50) = 3.51MPa	x
21			100 (87)									Is(50) = 1.97MPa	x
22					Detailed defect descriptions are shown on Form GEOT533/8 attached.							Is(50) = 0.50MPa	x
23						MW-SW						Is(50) = 0.78MPa	x
24			100 (95)		23.2-25.1m: Possible sheared zone with heavily disturbed foliations, microfractures and occasional brecciation.							Is(50) = 1.56MPa	x
25												Is(50) = 0.56MPa	x
26	124.16		100		Borehole terminated at 25.6m							Is(50) = 1.35MPa	x
27												Is(50) = 3.21MPa	x
28													
29													
30													

REMARKS Detailed defect descriptions are shown on Form GEOT533/8 attached. Piezometer installed at base.

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Project: **Bruce Highway Upgrade (Cooroy – Curra) Section A**  
Borehole No: **BH46**  
Start Depth: 3.00m  
Finish Depth: 25.60m  
Project No: FG5825  
H No: 10616



SCALE 1:5

F:GEOT043/1



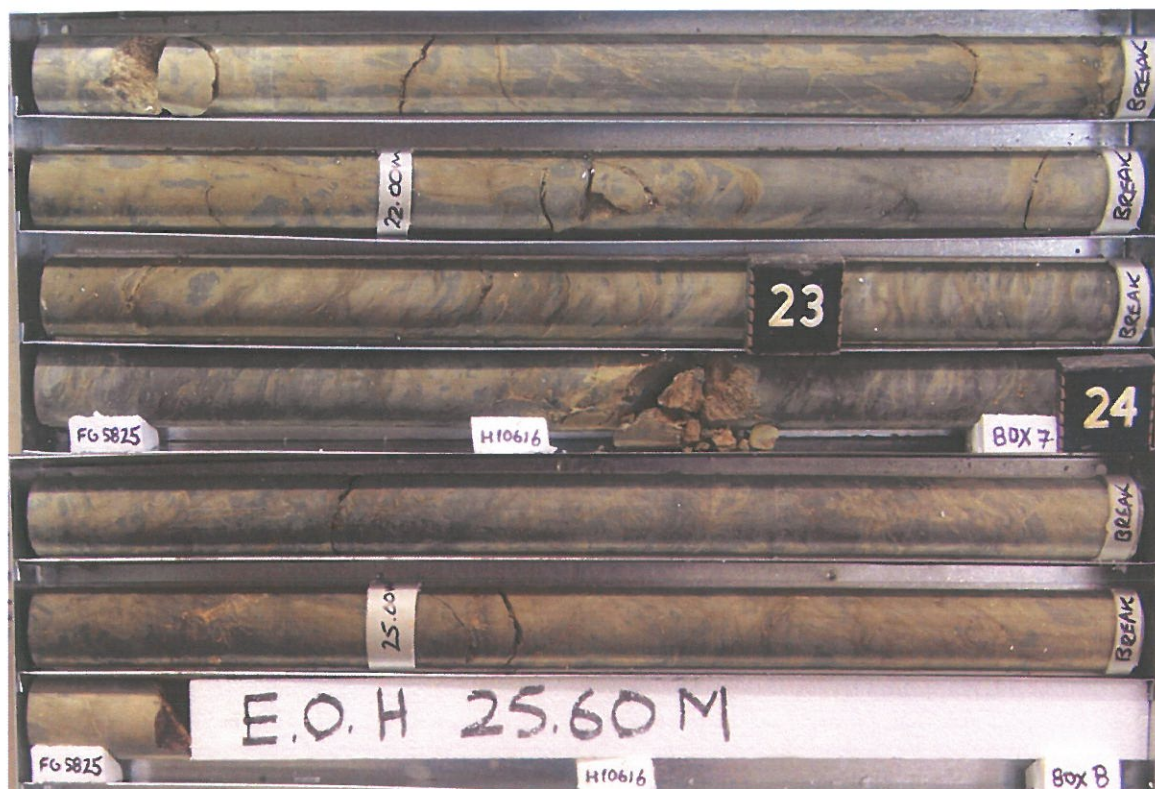
Project: **Bruce Highway Upgrade (Cooroy – Curra) Section A**  
Borehole No: **BH46**  
Start Depth: 3.00m  
Finish Depth: 25.60m  
Project No: FG5825  
H No: 10616



SCALE 1:5

F:GEOT043/1

Project: **Bruce Highway Upgrade (Cooroy – Curra) Section A**  
Borehole No: **BH46**  
Start Depth: 3.00m  
Finish Depth: 25.60m  
Project No: FG5825  
H No: 10616



SCALE 1:5

F.GEOT043/1



## DEFECT DESCRIPTIONS OF ENGINEERING BORELOGS

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

**BOREHOLE NO.:** BH46

**SHEET:** 1 of 3

**REFERENCE NO.:** H10616

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

**LOCATION:** Cut 14

**PROJECT NO.:** FG5825

**SURFACE R.L.:** 149.75

**DRILLER:** R & D Drilling

**JOB NO.:** 128/10A/901

**DATUM:** MGA94

**DATE DRILLED:** 17/08/09

DEPTH	DEFECT TYPE	DIP°	PLANARITY	ROUGHNESS	APERTURE	WALL ALTERATION	OTHER
3.04-3.20	WS						
3.24	Clay Seam	15°	PL	S	C		
3.26-3.29	WS						
3.30	Qtz Vn	25°	PL		C		
3.42-3.49	Qtz Vn						
3.50	Clay Seam	10°	PL		C		
3.54	Qtz Vn	0°	PL		C		
3.64	Crushed Seam	10°	PL		C		
3.67	Qtz Vn	15°	PL		C		
3.89-3.91	Crushed Seam	30-40°	UN		C		
3.97	Qtz Vn	25°	PL		C	W	3mm wide
4.01	Qtz Vn	20°	PL		O		
4.22	J	40°	UN	R	O	FeSt, W	
4.22-4.33	WS						
4.33	J	30°	UN	R	O	FeSt, W	
4.72	WS	75°	UN	SR	C		
4.75	J	45°	IR	R	C		
5.31	J rehealed	55°	UN		C	FeSt	

### 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	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
PL	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.



<b>BOREHOLE NO.:</b>	BH46
<b>SHEET:</b>	2 of 3
<b>REFERENCE NO.:</b>	H10616

DEPTH	DEFECT TYPE	DIP°	PLANARITY	ROUGHNESS	APERTURE	WALL ALTERATION	OTHER
5.36	J	55°	PL	SR	C	FeSt	7mm wide
5.44	J	15°	PL	S	C	FeSt	CI 1mm
5.46	J	20°	PL	S	C	FeSt	CI 3mm
5.50	J	15°	PL	SR	C	FeSt	
5.57	J	25°	St	R	C	FeSt	
5.90	J	90°	UN	SR	C	FeSt, MnSt	
6.05	J	20°	PL	SR	C		
6.11	Qtz Vn	30°	PL		C	FeSt	CI 3mm
6.21	J	35°	PL	S	C		
6.25	Qtz Vn	30°	PL		C	Cn	150 mm wide
6.40	J	70°	PL	SR	C		CI 3mm
6.49	Qtz Vn	25°	PL		C		10 mm wide
6.61-6.65	Qtz Vn, WS	25°	UN		C		
6.79	J	15°	PL		C		
6.79-6.97	WS						
7.03	J	10°	UN	R	C	FeSt	
7.17	J	15°	UN	SR	C	Cn	
7.23	Qtz Vn	20°	PL		C		4mm wide
7.28	Qtz Vn	20°	PL		C		7mm wide
7.33	Qtz Vn	25°	PL		C		
7.37	J	70°	UN	S	C	FeSt, MnSt	
7.40	J	35°	PL	S	C	FeSt	
7.56	J	30°	PL	S	C		CI 2mm
7.74	J	30°	UN		C	FeSt	
7.81-7.85	CZ		PL		C		Clayey matrix
7.97	J	45°	PL		C	Cn	
8.05-8.07	CZ		PL		C		Clayey matrix
8.19-8.43	WS	50°	PL		C		
8.50	Qtz Vn	15°	PL		C		
8.61	J	10°	PL	SR	C	FeSt, W	
8.93	J	60°	St	R	C	FeSt, W	
9.02	J	45°	PL	R	C	FeSt	Clay Veneer
9.07	J	45°	PL	R	C	FeSt	Clay Veneer
9.28	J	50°	PL		C		
9.38	Qtz Vn	5-10°	IR		C		3mm wide
9.41	Qtz Vn	10°	PL		C		2mm wide
9.52	J	25°	UN	R	C	FeSt, W	
9.55	J	20°	UN	SR	C		CI 1mm
9.83	J	10°	IR		C		
9.93	J	5-10°	St		C		
10.11	J	20°	PL		C		
10.24	J	55°	PL	S	C	FeSt, W	
10.31	J	10°	PL	R	C	FeSt, W, MnSt	
10.37	J	20°	UN	R	C	FeSt, W, MnSt	
10.47	J	30°	UN	R	C	FeSt, W, MnSt	
10.84	J	15°	PL	R	C	FeSt, W, MnSt	
10.97	Qtz Vn	15°	PL		C		
11.08	Qtz Vn	5°	PL		C		6mm wide
11.14	Qtz Vn	25°	PL		C		8-12,, wide
11.16	J	20°	UN		C		
11.61	J	35°	IR	R	C	FeSt, MnSt	
11.65-11.67	WS	20°	PL				
11.74	J	30°	PL	R	C	FeSt, MnSt	
11.88	J	80°	PL	S	C	FeSt, MnSt	
12.07	Clay Seam	70°	PL		C		
12.13-12.22	BZ				C		
12.38-12.46	WS	75°	PL		C		

<b>BOREHOLE NO.:</b>	BH46
<b>SHEET:</b>	3 of 3
<b>REFERENCE NO.:</b>	H10616

DEPTH	DEFECT TYPE	DIP°	PLANARITY	ROUGHNESS	APERTURE	WALL ALTERATION	OTHER
12.60-12.76	WS				C		
12.81	J	15°	PL	SR	C	FeSt, MnSt	
13.07	J	15°	PL	S	C	FeSt	
13.20	J	20°	PL	S	C	FeSt	
13.37	J	45°	PL	SR	C	FeSt, MnSt	
13.46	J	15°	PL	S	C	MnSt	
13.58	J	30°	PL	SR	C	FeSt	
13.69	J	10°	PL		C		
13.73	Rehealed J	10°	PL	S	C	FeSt, MnSt	
13.84	J	30°	UN	POI	C	FeSt, MnSt	
14.09	J	15°	PL	R	C	FeSt, MnSt	
14.27	J	15°	PL	S	C	FeSt	
14.43	J	10°	UN	R	C	FeSt, MnSt	
14.55	J	25°	UN	SR	C	FeSt	
14.78	J	10°	PL	SR	C	FeSt, MnSt	
14.95	J	30°	PL	SR	C	FeSt, MnSt	
15.29	Rehealed J	20°	IR		C		
15.43	J	10°	UN	R	C	FeSt, MnSt	
15.56	J	20°	PL	SR	C	FeSt	Clay Veneer
15.88	J	15°	PL	R	C	FeSt, MnSt	
16.12	J	25°	St	S	C	FeSt, MnSt	
16.29	J	15°	PL	S	C	FeSt, MnSt	
16.35	J	35°	UN	R	C	FeSt, MnSt	
17.07	J	55°	PL	SR	C		Clay Veneer
17.14	J	30°	PL	S	C	FeSt, MnSt	
17.20	J	45°	PL	POL	C		Sheared surface
17.32	J	35°	PL	SR	C	FeSt, MnSt	
17.43	J	15°	IR	S	C	FeSt, MnSt	
17.58	J	20°	PL	S	C	FeSt, MnSt	Cl 2mm
17.62	J	20°	PL	SR	C	FeSt, MnSt	Cl 2mm
17.72	J	25°	IR	SR	C		Cn
18.06	J	65°	UN	S	C		Cn
18.79	J	20°	UN	SR		MnSt	Cl 2mm
18.97	J	30°	PL	SR	C	MnSt	
19.13	J	60°	PL	SR	C	MnSt, FeSt	
19.26	J	10°	PL	R	C	FeSt	Clay Veneer
20.56	J	55°	PL	S	C		Cn
20.88	J	25°	UN	R	C	FeSt	
21.08	J	55°	UN	SR	C	FeSt	
21.26	J	30°	IR	R	C	MnSt, FeSt	
21.60	J	40°	PL	S	C	FeSt	Cl 2mm
21.72	J	0°	St		C	MnSt, FeSt	Clayey Matrix
21.88	J	25°	St	R	C	MnSt, FeSt	
21.95	J	80°	PL	S	O	FeSt	
22.13	J	65°	UN	SR	C	FeSt	
22.43	J	20°	PL	R	C	MnSt, FeSt	
22.58	J	45°	PL	R	C	FeSt	
22.77	J	45°	UN	SR	C	MnSt, FeSt	Clay Veneer
22.84	J	35°	UN	S	C	MnSt, FeSt	
23.0	J	50°	UN	SR	C	MnSt, FeSt	
23.13	DI						Clay Veneer
23.49	J	0-10°	IR	S	C	FeSt	
23.68	J	50°	IR	S	C	FeSt	
24.10	J	60°	PL	S	C	FeSt, MnSt	
25.08	J	25°	UN	S	C	FeSt	Cl <1MM
25.15	J	60°	IR	S	C	FeSt, MnSt	Clay Veneer
25.60	J	35°	UN	R	C	FeSt	