Queensland Government
Department of Main Roads

ENGINEERING BOREHOLE

FOR GEOTECHNICAL TERMS AND SYMBOLS REFER FORM F:GEOT 017/2-2004

BOREHOLE No **BH11**
SHEET 1 of 6
REFERENCE No **H9560**

PROJECT GATEWAY UPGRADE PROJECT - GATEWAY BRIDGE DUPLICATION FOUNDATION INVESTIGATION
LOCATION PIER 6 - SOUTHERN FACE OF THE PILE CAP — COORDINATES 10316.4 E; 167691.5 N
PROJECT No FG5388 — SURFACE R.L. -1.84 — DATE STARTED 10/3/05 — DATUM SETP
JOB No — DATUM AHD — DATE COMPLETED 11/3/05 — DRILLER CAIRNS DRILLING

DEPTH (m)	R.L (m)	CASING / WASH BORING / CORE DRILLING	RQD ( )% CORE REC %	SAMPLE	MATERIAL DESCRIPTION	LITHOLOGY	USC	WEATHERING	INTACT STRENGTH (EH VH H M L VL EL)	DEFECT SPACING (mm) (20 60 200 600 2000)	GRAPHIC LOG	ADDITIONAL DATA AND TEST RESULTS	SAMPLES	TESTS
0	-1.84				**ESTUARINE SANDY SILTY CLAY** Dark grey to black, moist, wet, very soft to soft. Becoming more organic silty clay with depth; some partly decomposed shell fragments.			OH					RW,-,- N<1		SPT
1														
2														
3												RW,-,- N<1		SPT
4	-6.04											Used roller bit below 4.2m.		
					LOW GRADE COAL **FINE GRAINED MAINLY DULL TO VITREOUS THINLY LAMINATED FRAGILE CARBONACEOUS SEDIMENTARY ROCK** XW : Generally exhibits engineering properties of black, moist, very stiff silt.			XW						
5	-6.84											0,2,18 N=20		SPT

BOREHOLE WITH LITHOLOGY MEERA PIER 6 BOREHOLES-GATEWAY BRIDGE - GATEWAY UPGRADE PROJECT.GPJ ENGINEERING BOREHOLE 09_04.GDT 31/8/05

REMARKS This borelog should be read in conjunction with the appropriate Defect Description Sheets. Defect angles have been measured with respect to a horizontal plane.

LOGGED BY
A. DISSANAYAKE (DISS)

Queensland Government
Department of Main Roads

ENGINEERING BOREHOLE

FOR GEOTECHNICAL TERMS AND SYMBOLS REFER FORM F:GEOT 017/2-2004

BOREHOLE No BH11
SHEET 2 of 6
REFERENCE No H9560

PROJECT GATEWAY UPGRADE PROJECT - GATEWAY BRIDGE DUPLICATION FOUNDATION INVESTIGATION
LOCATION PIER 6 - SOUTHERN FACE OF THE PILE CAP
COORDINATES 10316.4 E; 167691.5 N
PROJECT No FG5388
SURFACE R.L. -1.84
DATE STARTED 10/3/05
DATUM SETP
JOB No
DATUM AHD
DATE COMPLETED 11/3/05
DRILLER CAIRNS DRILLING

DEPTH (m)	R.L. (m)	CASING / WASH BORING / CORE DRILLING	RQD ( )% CORE REC %	SAMPLE	MATERIAL DESCRIPTION	LITHOLOGY	USC	WEATHERING	INTACT STRENGTH (EH VH H M L VL EL)	DEFECT SPACING (mm) (20 60 200 600 2000)	GRAPHIC LOG	ADDITIONAL DATA AND TEST RESULTS	SAMPLES / TESTS
5	-6.84				**LOW GRADE COAL** XW : (As above)		XW						
	-7.34				**HW** Black moist to mainly dry very dense silty gravel gradually grading into very low to low strength coal with depth.								
6												17,30/120 N>50	SPT
7							HW					30/120 N>50	SPT
8			(22)									30/80 N>50	SPT
	-10.14		57		**MW:** Mainly black to grey, fine grained, mainly dull to occasionally vitreous, low to medium strength.							Coreloss	
			(0)		Frequent very low strength highly broken and weathered seams; some siltstone interbeds.							Siltstone interbed	Is(50)=0.13 MPa x Is(50)=0.30 MPa o
9			100		Defects : Mainly lamination/bedding partings <20° (5/m)		MW					Broken siltstone interbed	Is(50)=0.23 MPa o Is(50)=0.07 MPa x
			(23)										
10	-11.84		50									Coreloss	

BOREHOLE WITH LITHOLOGY MEERA PIER 6 BOREHOLES-GATEWAY BRIDGE - GATEWAY UPGRADE PROJECT.GPJ ENGINEERING BOREHOLE 09_04.GDT 31/8/05

REMARKS This borelog should be read in conjunction with the appropriate Defect Description Sheets. Defect angles have been measured with respect to a horizontal plane.

LOGGED BY
A. DISSANAYAKE (DISS)

Queensland Government
Department of Main Roads

ENGINEERING BOREHOLE

FOR GEOTECHNICAL TERMS AND SYMBOLS REFER FORM F:GEOT 017/2-2004

BOREHOLE No BH11
SHEET 3 of 6
REFERENCE No H9560

PROJECT GATEWAY UPGRADE PROJECT - GATEWAY BRIDGE DUPLICATION FOUNDATION INVESTIGATION
LOCATION PIER 6 - SOUTHERN FACE OF THE PILE CAP
COORDINATES 10316.4 E; 167691.5 N
PROJECT No FG5388
SURFACE R.L. -1.84
DATE STARTED 10/3/05
DATUM SETP
JOB No
DATUM AHD
DATE COMPLETED 11/3/05
DRILLER CAIRNS DRILLING

DEPTH (m)	R.L. (m)	CASING / WASH BORING / CORE DRILLING	RQD ( )% CORE REC %	SAMPLE	MATERIAL DESCRIPTION	LITHOLOGY	USC	WEATHERING	INTACT STRENGTH (ER VH H M L VL EL)	DEFECT SPACING (mm) (20 60 200 600 2000)	GRAPHIC LOG	ADDITIONAL DATA AND TEST RESULTS	SAMPLES	TESTS
10	-11.84		(34)		**LOW GRADE COAL** MW : (As above).			MW				Siltstone interbed		
												Is(50)=0.49 MPa		o
11												Siltstone interbed		
												Is(50)=0.01 MPa		x
												Is(50)=0.22 MPa		o
												Siltstone interbed		
												Is(50)=0.10 MPa		x
12												Is(50)=0.25 MPa		o
			86					HW				Coreloss		
			(41)											
13												Is(50)=0.17 MPa		o
												Is(50)=0.17 MPa		x
												Is(50)=0.35 MPa		o
								MW				Siltstone interbed		
14												Siltstone interbed		
	-16.01				**SILTSTONE** **FINE GRAINED THINLY LAMINATED SEDIMENTARY ROCK**							Is(50)=0.98 MPa		x
			82		MW - SW : Pale grey to grey, fine grained, thinly laminated, mainly medium strength.			MW-SW				UCS=9.7MPa;		
			(69)		Defects: Generally rare.							MC=9.6%		
					Occasional drilling induced lamination partings <10° (1-2/m)							WD=2412/m²		
	-16.69											Is(50)=0.20 MPa		o
												Is(50)=3.11 MPa		x
												UCS=9.4MPa		
												MC=9.6%		
15	-16.84				**INTERBEDDED COAL** See below			MW				Is(50)=5.35 MPa WD=2377N/m²		o

BOREHOLE WITH LITHOLOGY MEERA PIER 6 BOREHOLES-GATEWAY BRIDGE - GATEWAY UPGRADE PROJECT.GPJ ENGINEERING BOREHOLE 09_04.GDT 31/8/05

REMARKS This borelog should be read in conjunction with the appropriate Defect Description Sheets. Defect angles have been measured with respect to a horizontal plane.

LOGGED BY
A. DISSANAYAKE (DISS)

Queensland Government
Department of Main Roads

ENGINEERING BOREHOLE

FOR GEOTECHNICAL TERMS AND SYMBOLS REFER FORM F:GEOT 017/2-2004

BOREHOLE No BH11
SHEET 4 of 6
REFERENCE No H9560

PROJECT GATEWAY UPGRADE PROJECT - GATEWAY BRIDGE DUPLICATION FOUNDATION INVESTIGATION
LOCATION PIER 6 - SOUTHERN FACE OF THE PILE CAP
COORDINATES 10316.4 E; 167691.5 N
PROJECT No FG5388
SURFACE R.L. -1.84
DATE STARTED 10/3/05
DATUM SETP
JOB No
DATUM AHD
DATE COMPLETED 11/3/05
DRILLER CAIRNS DRILLING

DEPTH (m)	R.L. (m)	CASING / WASH BORING / CORE DRILLING	RQD ( )% CORE REC %	SAMPLE	MATERIAL DESCRIPTION	LITHOLOGY	USC	WEATHERING	INTACT STRENGTH (EH VH H M L VL EL)	DEFECT SPACING (mm) (20 60 200 600 2000)	GRAPHIC LOG	ADDITIONAL DATA AND TEST RESULTS	SAMPLES	TESTS
15	-16.84				**INTERBEDDED LOW GRADE COAL / SILTSTONE & SANDSTONE. LOW GRADE COAL DOMINANT** MW -SW: Pale grey to black, fine grained, laminated/interbedded, mainly medium strength with some low and high strength bnads.. Defects : Mainly lamination partings <5° (2-8/m) Becoming sandstone, dominantes between 15.5m and 16.25m; highly altered and weathered along bedding/lamination partings.							Is(50)=0.38 MPa Is(50)=1.28 MPa	x o	
												Is(50)=0.75 MPa	o	
16														
												Is(50)=0.26 MPa Is(50)=0.14 MPa	x o	
17			82 (54)				MW					Coreloss		
18							HW-MW							
							MW-SW					Is(50)=0.47 MPa Is(50)=0.46 MPa	x o	
19	-21.09		89 (87)		**SILTSTONE FINE GRAINED THINLY LAMINATED SEDIMENTARY ROCK** SW : Pale grey to grey, fine grained, thinly laminated, mainly medium strength.							Is(50)=0.48 MPa Is(50)=0.32 MPa	o x	
20	-21.84						SW					Is(50)=0.42 MPa Is(50)=0.56 MPa	x o	

BOREHOLE WITH LITHOLOGY MEERA PIER 6 BOREHOLES-GATEWAY BRIDGE - GATEWAY UPGRADE PROJECT.GPJ ENGINEERING BOREHOLE 09_04.GDT 31/8/05

REMARKS This borelog should be read in conjunction with the appropriate Defect Description Sheets. Defect angles have been measured with respect to a horizontal plane.

LOGGED BY
A. DISSANAYAKE (DISS)

Queensland Government
Department of Main Roads

ENGINEERING BOREHOLE

FOR GEOTECHNICAL TERMS AND SYMBOLS REFER FORM F:GEOT 017/2-2004

BOREHOLE No BH11
SHEET 5 of 6
REFERENCE No H9560

PROJECT GATEWAY UPGRADE PROJECT - GATEWAY BRIDGE DUPLICATION FOUNDATION INVESTIGATION
LOCATION PIER 6 - SOUTHERN FACE OF THE PILE CAP COORDINATES 10316.4 E; 167691.5 N
PROJECT No FG5388 SURFACE R.L. -1.84 DATE STARTED 10/3/05 DATUM SETP
JOB No DATUM AHD DATE COMPLETED 11/3/05 DRILLER CAIRNS DRILLING

DEPTH (m)	R.L. (m)	CASING / WASH BORING / CORE DRILLING	RQD ( )% CORE REC %	SAMPLE	MATERIAL DESCRIPTION	LITHOLOGY	USC	WEATHERING	INTACT STRENGTH (EH VH H M L VL EL)	DEFECT SPACING (mm) (20 60 200 600 2000)	GRAPHIC LOG	ADDITIONAL DATA AND TEST RESULTS	SAMPLES	TESTS
20	-21.84				**SILTSTONE** SW : (As above). Defect : Generally rare. - Some infrequent HW-MW broken zones up to 70mm. Exhibits some sandstone properties with depth.			SW				Is(50)=0.43 MPa Is(50)=0.38 MPa		x o
21	-23.24				**SANDSTONE** **FINE TO MEDIUM GRAINED, LAMINATED SEDIMENTARY ROCK** MW - SW : Pale grey to grey, slightly massive to mainly laminated, low to mainly medium strength. Highly fractured and weathered in some areas; frequent concordant carbonaceous laminations and minor siltstone/mudstone interbeds. Defects : Drilling induced lamination partings<20° (3-4/m) Broken and weathered seams Irregular subvertical fractures.			MW SW MW-SW SW				UCS=10.2MPa MC=4.0% WD=2445/m² UCS=9.7MPa MC=4.0% WD=2428/m² Carbonaceous laminations Carbonaceous laminations Few low grade coal seams Is(50)=0.57 MPa UCS=20.8MPa MC=4.0% WD=2470Nm² Is(50)=0.53 MPa		x o
22			100 (66)											
23														
24	-26.50													
25	-26.84				**MUDSTONE** **FINE GRAINED THINLY LAMINATED SEDIMENTARY ROCK** SW :See below			SW						

BOREHOLE WITH LITHOLOGY MEERA PIER 6 BOREHOLES-GATEWAY BRIDGE - GATEWAY UPGRADE PROJECT.GPJ ENGINEERING BOREHOLE 09_04.GDT 31/8/05

REMARKS This borelog should be read in conjunction with the appropriate Defect Description Sheets. Defect angles have been measured with respect to a horizontal plane.

LOGGED BY
A. DISSANAYAKE (DISS)

Queensland Government
Department of Main Roads

ENGINEERING BOREHOLE

FOR GEOTECHNICAL TERMS AND SYMBOLS REFER FORM F:GEOT 017/2-2004

BOREHOLE No BH11
SHEET 6 of 6
REFERENCE No H9560

PROJECT GATEWAY UPGRADE PROJECT - GATEWAY BRIDGE DUPLICATION FOUNDATION INVESTIGATION
LOCATION PIER 6 - SOUTHERN FACE OF THE PILE CAP
COORDINATES 10316.4 E; 167691.5 N
PROJECT No FG5388
SURFACE R.L. -1.84
DATE STARTED 10/3/05
DATUM SETP
JOB No
DATUM AHD
DATE COMPLETED 11/3/05
DRILLER CAIRNS DRILLING

DEPTH (m)	R.L. (m)	CASING / WASH BORING / CORE DRILLING	RQD ( )% CORE REC %	SAMPLE	MATERIAL DESCRIPTION	LITHOLOGY	USC	WEATHERING	INTACT STRENGTH (EH VH H M L VL EL)	DEFECT SPACING (mm) (20 60 200 600 2000)	GRAPHIC LOG	ADDITIONAL DATA AND TEST RESULTS	SAMPLES	TESTS
25	-26.84													
	-26.99		100		**MUDSTONE** SW : Dark grey to black, fine grained, thinly laminated, low to mainly medium strength. Defects : Generally rare. Occasional drilling induced lamination partings <10° (1/m) and irregular fractures. Borehole terminated at 25.15m		SW							

BOREHOLE WITH LITHOLOGY MEERA PIER 6 BOREHOLES-GATEWAY BRIDGE - GATEWAY UPGRADE PROJECT.GPJ ENGINEERING BOREHOLE 09_04.GDT 31/8/05

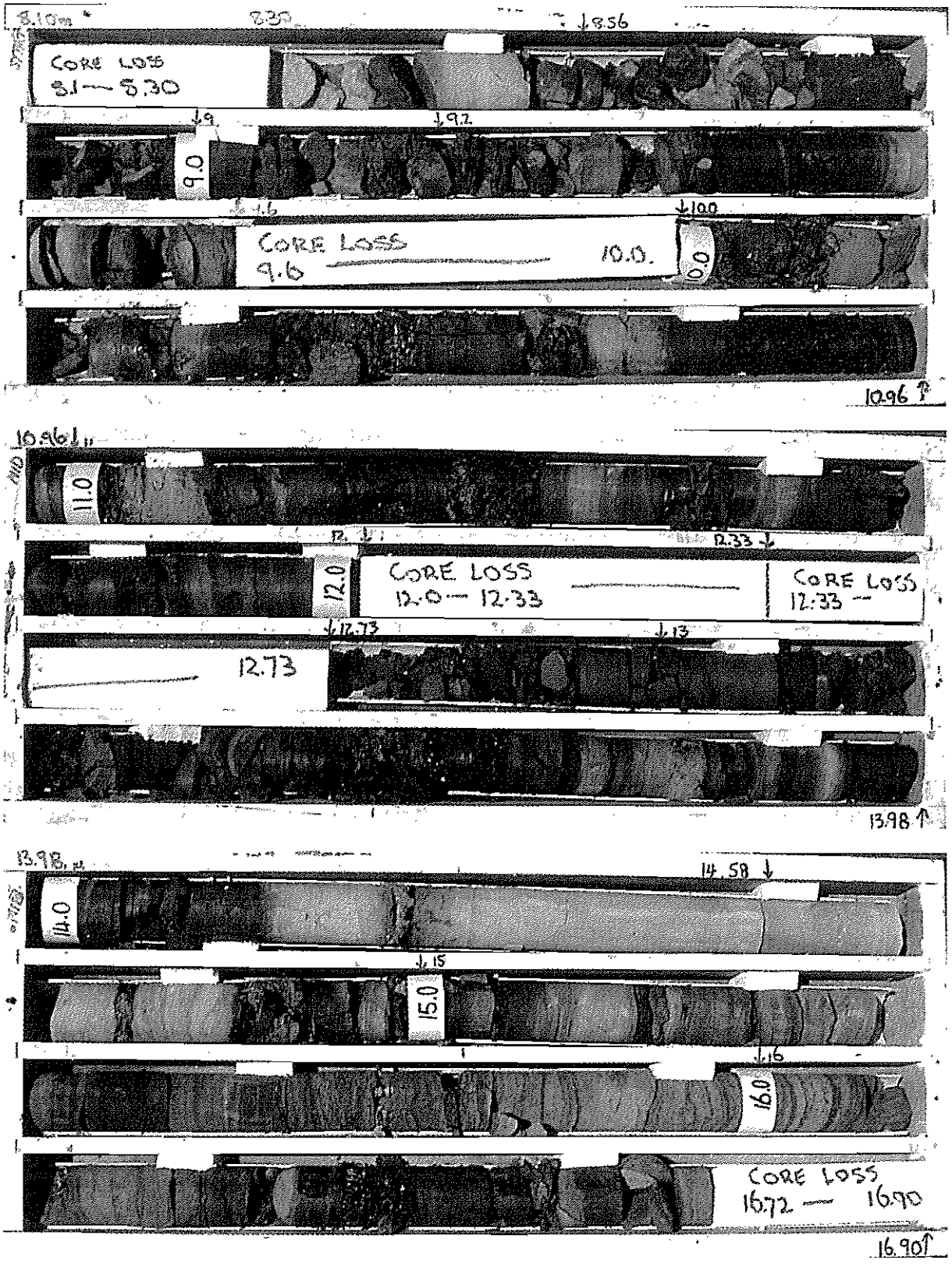
REMARKS This borelog should be read in conjunction with the appropriate Defect Description Sheets. Defect angles have been measured with respect to a horizontal plane.

LOGGED BY
A. DISSANAYAKE (DISS)

Project: **Gateway Upgrade Project - Gateway Bridge**

Borehole No: **BH 11**

Start Depth: 8.10m
Finish Depth: 25.15m
Project No: FG 5388
H No: ????



Project: **Gateway Upgrade Project - Gateway Bridge**

Borehole No: **BH 11**

Start Depth: 8.10m
Finish Depth: 25.15m
Project No: FG 5388
H No: ????

ROAD SYSTEM AND ENGINEERING
Geotechnical Branch
35 Butterfield Street HERSTON Q 4006
Phone: (07) 38343035 Fax: (07) 38343011

Queensland Government
Department of Main Roads

DEFECT DESCRIPTIONS OF ENGINEERING BORELOGS

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

BOREHOLE NO	: BH11
SHEET	: 1 of 5
REFERENCE NO	: H9560

PROJECT : GATEWAY UPGRADE PROJECT – GATEWAY BRIDGE DUPLICATION FOUNDATION INVESTIGATION

LOCATION : PIER 6 - SOUTHERN FACE OF THE PILE CAP

PROJECT NO : FG5388 SURFACE R.L : -1.84 DRILLER : CAIRNS DRILLING PTY LTD

JOB NO : DATUM : AHD DATE DRILLED : 10-11/03/05

DEPTH	DEFECT TYPE	DIP	PLANARITY	ROUGHNESS	APERTURE	WALL ALTERATION	OTHER
8.1-8.3	-	-	-	-	-	-	Core loss
8.3-8.39	BZ	-	-	-	-	Cn	BP
8.39	BP	20°	P	S	O	Cn	Polished
8.50-8.75	WS	-	-	-	-	W	Gravely clay
8.86-8.87	WS/BZ	-	-	-	-	W	-
9.05-9.33	WS/BZ	-	-	-	-	W	BP
9.38	LP	<10°	P	S	O	Cn	-
9.39-9.44	WS/BZ	<10°	P	S	C	W	-
9.40-9.47	WS/BZ	-	-	-	-	W	-
9.44	LP	<10°	P	S	O	Cn	-
9.49	LP	<10°	P	S	C	Cn	LP
9.52	LP	<10°	P	S	C	Cn	-
9.56	LP	<10°	P	S	C	Cn	-
9.6-10.0	-	-	-	-	-	-	Core loss
10.0-10.06	WS/BZ	-	-	-	-	W	-
10.0-10.12	WS/BZ	-	-	-	-	W	-
10.21-10.24	WS	-	-	-	-	W	BP
10.30-10.32	WS	-	-	-	-	W	-
10.35-10.37	WS	-	-	-	-	W	-
10.40-10.54	WS	-	-	-	-	W	BP
10.61	LP	-	P	S	O	Cn	-
10.61-10.69	WS	-	-	-	-	W	BP

Abbreviations

ROUGHNESS		WALL ALTERATIONS		TYPE		OTHER	
R	Rough	FeSt	Iron Stained	J	Joint	DI	Drilling Induced
S	Smooth	W	Weathered	B	Bedding	CL	Carbonaceous lamination
SL	Slickensided	SM	Secondary Mineralisation	BP	Bedding Parting	Co	Coal seam
				FP	Foliation Parting	In	Incipient
PLANARITY		APERTURE		LP	Lamination Parting	SI	Sand Infill
P	Planar	C	Closed	SZ	Sheared Zone	H	Horizontal
St	Stepped	O	Open	CZ	Crushed Zone	V	Vertical
Un	Undulating	F	Filled	WS	Weathered Seam	CI	Clay Infill
Cu	Curved	T	Tight	BZ	Broken Zone	Cn	Clean
Ir	Irregular			HFZ	Highly Fractured Zone	CS	Clay Seam
				Fr	Fracture		

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

ROAD SYSTEM AND ENGINEERING
Geotechnical Branch
35 Butterfield Street HERSTON Q 4006
Phone: (07) 38343035 Fax: (07) 38343011

Queensland Government
Department of Main Roads

DEFECT DESCRIPTIONS OF ENGINEERING BORELOGS

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

BOREHOLE NO	: BH11
SHEET	: 2 of 5
REFERENCE NO	: H9560

PROJECT : GATEWAY UPGRADE PROJECT – GATEWAY BRIDGE DUPLICATION FOUNDATION INVESTIGATION

LOCATION : PIER 6 – SOUTHERN FACE OF THE PILE CAP

PROJECT NO : FG5388 SURFACE R.L : -1.84 DRILLER : CAIRNS DRILLING PTY LTD

JOB NO : DATUM : AHD DATE DRILLED : 10-11/3/05

DEPTH	DEFECT TYPE	DIP	PLANARITY	ROUGHNESS	APERTURE	WALL ALTERATION	OTHER
10.75	LP	<10°	P	S	C	Cn	-
10.98	LP	15°	P	S	C	Cn	-
11.0	LP	20°	P	S	O	Cn	-
11.0	LP	15°	P	S	C	Cn	-
11.11	LP	20°	P	S	O	-	CI
11.14	LP	20°	P	S	O	Cn	-
11.21	LP	10°	P	-	O	Cn	-
11.30-11.32	WS	-	-	-	-	W	-
11.35-11.37	WS	-	-	-	-	W	-
11.51-11.54	BZ/WS	-	-	-	-	W	-
11.61	LP	15°	P	-	-	Cn	-
11.79-11.96	BZ	-	-	-	-	Cn	-
11.98	LP	15°	P	S	C	Cn	-
12.0-12.73	-	-	-	-	-	-	Coreloss
12.73-12.92	WS/BZ	-	-	-	-	W	-
12.97-13.01	BZ	-	-	-	-	Cn	-
13.10-13.15	BZ/WS	-	-	-	-	W	-
13.5-13.70	BZ/WS	-	-	-	-	W	-
13.80	BP/LP	-	-	-	-	Cn	-
13.81-13.85	WS/BZ	-	-	-	-	W	-
14.05	LP	-	P	S	O	-	-

Abbreviations

ROUGHNESS		WALL ALTERATIONS		TYPE		OTHER	
R	Rough	FeSt	Iron Stained	J	Joint	DI	Drilling Induced
S	Smooth	W	Weathered	B	Bedding	CL	Carbonaceous lamination
SL	Slickensided	SM	Secondary Mineralisation	BP	Bedding Parting	Co	Coal seam
				FP	Foliation Parting	In	Incipient
PLANARITY		**APERTURE**		LP	Lamination Parting	SI	Sand Infill
P	Planar	C	Closed	SZ	Sheared Zone	H	Horizontal
St	Stepped	O	Open	CZ	Crushed Zone	V	Vertical
Un	Undulating	F	Filled	WS	Weathered Seam	CI	Clay Infill
Cu	Curved	T	Tight	BZ	Broken Zone	Cn	Clean
Ir	Irregular			HFZ	Highly Fractured Zone	CS	Clay Seam
				Fr	Fracture		

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

ROAD SYSTEM AND ENGINEERING
Geotechnical Branch
35 Butterfield Street HERSTON Q 4006
Phone: (07) 38343035 Fax: (07) 38343011

Queensland Government
Department of Main Roads

DEFECT DESCRIPTIONS OF ENGINEERING BORELOGS

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

BOREHOLE NO	: BH11
SHEET	: 3 of 5
REFERENCE NO	: H9560

PROJECT : GATEWAY UPGRADE PROJECT – GATEWAY BRIDGE DUPLICATION FOUNDATION INVESTIGATION

LOCATION : PIER 6 – SOUTHERN FACE OF THE PILE CAP

PROJECT NO : FG5388 SURFACE R.L : -1.84 DRILLER : CAIRNS DRILLING PTY LTD

JOB NO : DATUM : AHD DATE DRILLED : 10-11/3/05

DEPTH	DEFECT TYPE	DIP	PLANARITY	ROUGHNESS	APERTURE	WALL ALTERATION	OTHER
14.08-14.10	BZ/WS	-	-	-	-	W	-
14.28-14.29	BZ	-	-	-	-	-	Parallel to LP
14.60	LP	-	P	S	T	-	DI
14.74-14.75	CS	-	-	-	-	-	CI
14.82-15.05	BZ	-	-	-	-	-	Parallel to LP
15.18	LP	P	S	-	-	Cn	-
15.28	LP	P	S	-	-	Cn	-
15.31	LP	P	S	-	-	Cn	-
15.34	LP	P	S	-	-	Cn	-
15.5	LP	P	S	-	-	Cn	-
15.6	LP	P	S	-	-	Cn	-
15.68	LP	P	S	-	-	W	-
15.76-15.78	BZ	-	-	-	-	Cn	Parallel to LP
15.91	LP	P	S	O	-	Cn	-
16.27	LP	P	S	O	-	Cn	-
16.3-16.35	WS/BZ	-	-	-	-	W	Parallel to LP
16.41-16.48	WS/BZ	-	-	-	-	W	Parallel to LP
16.54-16.60	WS/BZ	-	-	-	-	W	Parallel to LP
16.65-16.70	BZ	-	-	-	-	Cn	-
16.72-17.40	-	-	-	-	-	-	Coreloss
17.40-17.50	BZ/WS	-	-	R	O	W	-
17.68-17.78	WS	-	-	-	O	W	Parallel to LP

Abbreviations

ROUGHNESS		WALL ALTERATIONS		TYPE		OTHER	
R	Rough	FeSt	Iron Stained	J	Joint	DI	Drilling Induced
S	Smooth	W	Weathered	B	Bedding	CL	Carbonaceous lamination
SL	Slickensided	SM	Secondary Mineralisation	BP	Bedding Parting	Co	Coal seam
				FP	Foliation Parting	In	Incipient
PLANARITY		**APERTURE**		LP	Lamination Parting	SI	Sand Infill
P	Planar	C	Closed	SZ	Sheared Zone	H	Horizontal
St	Stepped	O	Open	CZ	Crushed Zone	V	Vertical
Un	Undulating	F	Filled	WS	Weathered Seam	CI	Clay Infill
Cu	Curved	T	Tight	BZ	Broken Zone	Cn	Clean
Ir	Irregular			HFZ	Highly Fractured Zone	CS	Clay Seam
				Fr	Fracture		

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

F:GEOT533/4

ROAD SYSTEM AND ENGINEERING
Geotechnical Branch
35 Butterfield Street HERSTON Q 4006
Phone: (07) 38343035 Fax: (07) 38343011

Queensland Government
Department of Main Roads

DEFECT DESCRIPTIONS OF ENGINEERING BORELOGS

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

BOREHOLE NO	: BH11
SHEET	: 4 of 5
REFERENCE NO	: H9560

PROJECT : GATEWAY UPGRADE PROJECT – GATEWAY BRIDGE DUPLICATION FOUNDATION INVESTIGATION

LOCATION : PIER 6 – SOUTHERN FACE OF THE PILE CAP

PROJECT NO : FG5388 SURFACE R.L : -1.84 DRILLER : CAIRNS DRILLING PTY LTD

JOB NO : DATUM : AHD DATE DRILLED : 10-11/3/05

DEPTH	DEFECT TYPE	DIP	PLANARITY	ROUGHNESS	APERTURE	WALL ALTERATION	OTHER
17.83	LP	<5°	-	-	O	Cn	-
17.89-17.93	WS	-	-	-	O	W	-
18.14-18.17	WS	-	-	-	-	W	-
18.38	LP	<5°	Cu	R	-	Cn	-
18.45-18.54	BZ	-	-	-	C	Cn	CS
18.61	BP	<5°	P	S	C	Cn	LP
18.69-18.85	BZ	10°	P	-	C	Cn	-
19.25	LP	10°	Ir	R	-	W	-
19.29-19.33	BZ	-	-	-	O	Cn	Partly broken
19.61-19.68	WS	-	-	-	O	W	-
19.77-19.81	BZ	-	-	R	O	Cn	LP
19.96	Fr	-	Ir	-	C	Cn	Parallel to LP
20.08	J	35°	Un	R	O	Cn	DI
20.25	J	35°	P/Ir	R	T	Cn	DI
20.35	J	35°	Ir	R	T	Cn	DI
20.38	J	35°	Ir	R	T	Cn	DI
20.50	LP	20°	P	R	T	Cn	DI
20.69	LP	<10°	Cu	R	T	Cn	DI
20.79	LP	<10°	Cu	R	T	Cn	DI
20.91	LP	<10°	Ir	R	T	Cn	DI
21.20	LP	<5°	P	R	T	Cn	DI

Abbreviations

ROUGHNESS		WALL ALTERATIONS		TYPE		OTHER	
R	Rough	FeSt	Iron Stained	J	Joint	DI	Drilling Induced
S	Smooth	W	Weathered	B	Bedding	CL	Carbonaceous lamination
SL	Slickensided	SM	Secondary Mineralisation	BP	Bedding Parting	Co	Coal seam
				FP	Foliation Parting	In	Incipient
PLANARITY		APERTURE		LP	Lamination Parting	SI	Sand Infill
P	Planar	C	Closed	SZ	Sheared Zone	H	Horizontal
St	Stepped	O	Open	CZ	Crushed Zone	V	Vertical
Un	Undulating	F	Filled	WS	Weathered Seam	Cl	Clay Infill
Cu	Curved	T	Tight	BZ	Broken Zone	Cn	Clean
Ir	Irregular			HFZ	Highly Fractured Zone	CS	Clay Seam
				Fr	Fracture		

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

ROAD SYSTEM AND ENGINEERING
Geotechnical Branch
35 Butterfield Street HERSTON Q 4006
Phone: (07) 38343035 Fax: (07) 38343011

Queensland Government
Department of Main Roads

DEFECT DESCRIPTIONS OF ENGINEERING BORELOGS

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

BOREHOLE NO	: BH11
SHEET	: 5 of 5
REFERENCE NO	: H9560

PROJECT : GATEWAY UPGRADE PROJECT – GATEWAY BRIDGE DUPLICATION FOUNDATION INVESTIGATION

LOCATION : PIER 6 – SOUTHERN FACE OF THE PILE CAP

PROJECT NO : FG5388 SURFACE R.L : -1.84 DRILLER : CAIRNS DRILLING PTY LTD

JOB NO : DATUM : AHD DATE DRILLED : 10-11/3/05

DEPTH	DEFECT TYPE	DIP	PLANARITY	ROUGHNESS	APERTURE	WALL ALTERATION	OTHER
21.30-21.60	BZ	-	-	-	-	Cn	Parallel to LP
21.50	J	45-50°	Un	R	O	Cn	-
22.23	Fr	<10°	Ir	R	O	Cn	DI
22.28-22.92	BZ	-	-	-	-	-	CI
22.90-23.18	BZ	-	-	-	C	Cn	-
23.10-23.20	Fr	70°	St	R	C	Cn	-
23.14-23.19	SZ	45°	Ir	-	C	Cn	-
23.30-23.60	Fr	60-90°	Ir	R	T	Cn	DI?
23.65	LP	<10°	P	S	C	Cn	CL
23.71	J	35°	Ir	R	-	Cn	?
23.76	LP	<10°	P	S	C	Cn	-
23.85-23.96	BZ	-	-	-	-	Cn	Parallel to LP
24.51	LP	<10°	P	R	C	Cn	-
24.64	BZ	-	-	-	C	Cn	Parallel to LP

Abbreviations

ROUGHNESS		WALL ALTERATIONS		TYPE		OTHER	
R	Rough	FeSt	Iron Stained	J	Joint	DI	Drilling Induced
S	Smooth	W	Weathered	B	Bedding	CL	Carbonaceous lamination
SL	Slickensided	SM	Secondary Mineralisation	BP	Bedding Parting	Co	Coal seam
				FP	Foliation Parting	In	Incipient
PLANARITY		**APERTURE**		LP	Lamination Parting	SI	Sand Infill
P	Planar	C	Closed	SZ	Sheared Zone	H	Horizontal
St	Stepped	O	Open	CZ	Crushed Zone	V	Vertical
Un	Undulating	F	Filled	WS	Weathered Seam	CI	Clay Infill
Cu	Curved	T	Tight	BZ	Broken Zone	Cn	Clean
Ir	Irregular			HFZ	Highly Fractured Zone	CS	Clay Seam
				Fr	Fracture		

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