Queensland Government
Department of Main Roads

ENGINEERING BOREHOLE

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

BOREHOLE No BH10
SHEET 1 of 7
REFERENCE No H9559

PROJECT GATEWAY UPGRADE PROJECT - GATEWAY BRIDGE DUPLICATION FOUNDATION INVESTIGATION
LOCATION PIER 6 - SOUTHERN FACE OF THE PILE CAP COORDINATES 10342.3 E; 167709.0 N
PROJECT No FG5388 SURFACE R.L. -3.11 DATE STARTED 12/3/05 DATUM SETP
JOB No DATUM AHD DATE COMPLETED 15/3/05 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
0	-3.11				**SAND AND GRAVEL-ALLUVIUM** Dark grey to grey, wet, very loose to loose. Fine gravel and coarse sand becoming high plastic estuarine clay with depth.		GP-GM					Is(50)=0.00 MPa	x
												RW,-,- N<1	SPT
2	-5.11											No recovery	
	-5.71				**SANDSTONE** **MEDIUM TO COARSE GRAINED MAINLY MASSIVE TO SLIGHTLY LAMINATED SEDIMENTARY ROCK** HW : Pale grey to white, moist, very dense silty sand rapidly grading into low strength rock.		HW					Hammer bouncing	10/10,HB,- N>50 SPT
3			(100)		**MW :** Pale orange brown to pale grey, massive, mainly medium with occasionally high strength bands. Defects : Generally rare. - Occasional drilling induced lamination partings (< 30°) (1-2/m). Becoming more red brown and cemented with depth.		MW					Is(50)=0.37 MPa Is(50)=0.62 MPa UCS=17.1MPa MC=4.4% WD=2276N/m² Is(50)=0.58 MPa Is(50)=0.49 MPa	o x o x
4			100 (33)									Is(50)=0.61 MPa Is(50)=0.61 MPa	x o
	-7.91												
5	-8.11				**INTERBEDDED SANDSTONE AND SILTSTONE.** See next page		HW					MC=6.4% Is(50)=0.05 MPa Is(50)=0.07 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 BH10
SHEET 2 of 7
REFERENCE No H9559

PROJECT GATEWAY UPGRADE PROJECT - GATEWAY BRIDGE DUPLICATION FOUNDATION INVESTIGATION
LOCATION PIER 6 - SOUTHERN FACE OF THE PILE CAP
COORDINATES 10342.3 E; 167709.0 N
PROJECT No FG5388
SURFACE R.L. -3.11
DATE STARTED 12/3/05
DATUM SETP
JOB No
DATUM AHD
DATE COMPLETED 15/3/05
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	-8.11				**INTERBEDDED SANDSTONE AND SILTSTONE. SANDSTONE DOMINANT FINE TO MEDIUM GRAINED LAMINATED SEDIMENTARY ROCK** HW : Pale orange grey to banded black discontinously interbedded , very low to low strength.							MC=15.4% Is(50)=0.05 MPa		o
					Some irregular, contorted & sheared discontinuous bedding structures.									
6							HW							
			55 (0)									Coreloss		
7	-10.51				**LOW GRADE COAL FINE GRAINED MAINLY DULL TO VITREOUS THINLY LAMINATED FRAGILE CARBONACEOUS SEDIMENTARY ROCK** HW : Dark grey to black, fine grained, very low to low strength. Highly broken and fragmented in most areas and is filled with high plastic silty clay; frequent weathered seams and broken zones.			HW				Siltstone interbed		
8	-11.63		55 (25)									MC=4.2% Is(50)=0.21 MPa		o
					MW : Black mainly dull to occasionally vitreous, thinly laminated, mainly low to medium strength. Frequent weathered siltstone interbeds /seams and broken zones. Defects: - Numerous lamination/bedding partings <15° - Weathered and broken seams <200mm							Siltstone interbed Siltstone interbed MC=8.6% Is(50)=0.22 MPa Siltstone interbed Is(50)=0.17 MPa Siltstone interbed		x o
9							MW					Siltstone interbed Siltstone interbed MC=10% Is(50)=0.05 MPa Is(50)=0.03 MPa Siltstone interbed Siltstone interbed		x o
10	-13.11											MC=7.8% Is(50)=0.30 MPa Is(50)=0.12 MPa		o x

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.

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ENGINEERING BOREHOLE

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

BOREHOLE No BH10
SHEET 3 of 7
REFERENCE No H9559

PROJECT GATEWAY UPGRADE PROJECT - GATEWAY BRIDGE DUPLICATION FOUNDATION INVESTIGATION
LOCATION PIER 6 - SOUTHERN FACE OF THE PILE CAP
COORDINATES 10342.3 E; 167709.0 N
PROJECT No FG5388
SURFACE R.L. -3.11
DATE STARTED 12/3/05
DATUM SETP
JOB No
DATUM AHD
DATE COMPLETED 15/3/05
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
10	-13.11				**LOW GRADE COAL** MW : (As above).									
			100 (14)					MW				Coreloss		
11												Siltstone interbed MC=3.6%	Is(50)=0.03 MPa Is(50)=0.20 MPa	x o
												Siltstone interbed		
													Is(50)=0.14 MPa	o
12												MC=3.6%	Is(50)=0.81 MPa Is(50)=0.24 MPa	o x
			79 (0)					HW				Coreloss		
13												MC=4.4%	Is(50)=0.35 MPa	x
			59 (0)											
			100 (31)									MC=5.0%	Is(50)=0.34 MPa Is(50)=0.47 MPa	x o
14													Is(50)=0.16 MPa	x
								MW					Is(50)=0.31 MPa Is(50)=0.18 MPa	x o
													Is(50)=0.38 MPa Is(50)=0.16 MPa	x o
15	-18.11											Coreloss		

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.

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

Queensland Government
Department of Main Roads

ENGINEERING BOREHOLE

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

BOREHOLE No BH10
SHEET 4 of 7
REFERENCE No H9559

PROJECT GATEWAY UPGRADE PROJECT - GATEWAY BRIDGE DUPLICATION FOUNDATION INVESTIGATION
LOCATION PIER 6 - SOUTHERN FACE OF THE PILE CAP COORDINATES 10342.3 E; 167709.0 N
PROJECT No FG5388 SURFACE R.L. -3.11 DATE STARTED 12/3/05 DATUM SETP
JOB No DATUM AHD DATE COMPLETED 15/3/05 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	-18.11				**LOW GRADE COAL** MW : (As above).		SW					Coreloss			
	-18.51				**SILTSTONE** **FINE GRAINED THINLY LAMINATED SEDIMENTARY ROCK** SW : Pale grey to grey, laminated, mainly medium strength.		SW								
			68 (22)		Defects : Drilling induced l amination partings <15 deg (1-3/m)							MC=7.8%	ls(50)=0.19 MPa ls(50)=0.07 MPa	o x	
16	-19.21				**LOW GRADE COAL** SW : Black, mainly dull to vitreous, fractured, mainly low to medium strength. Defects : - Numerous lamination partings <15° (5-10/m). - Broken and weathered seams.										
17															
			100 (57)				SW					Pressuremeter Test 2 @ 17.65m			
18													ls(50)=0.07 MPa	x	
													ls(50)=0.29 MPa	o	
19												MC=2.2%	ls(50)=0.04 MPa	o	
	-22.51												ls(50)=0.49 MPa ls(50)=0.04 MPa	o x	
					SILTSTONE SW : Grey to dark grey, fine grained, thinly laminated, mainly medium strength. Heavily carbonaceous in some areas.		SW					UCS=22.3MPa MC=4.2% WD=2580N/m^2 MC=7.8%	ls(50)=0.37 MPa ls(50)=0.35 MPa	x o	
20	-23.11												ls(50)=0.55 MPa ls(50)=0.40 MPa	o x	

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

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ENGINEERING BOREHOLE

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

BOREHOLE No BH10
SHEET 5 of 7
REFERENCE No H9559

PROJECT GATEWAY UPGRADE PROJECT - GATEWAY BRIDGE DUPLICATION FOUNDATION INVESTIGATION
LOCATION PIER 6 - SOUTHERN FACE OF THE PILE CAP COORDINATES 10342.3 E; 167709.0 N
PROJECT No FG5388 SURFACE R.L. -3.11 DATE STARTED 12/3/05 DATUM SETP
JOB No DATUM AHD DATE COMPLETED 15/3/05 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	-23.11				**SILTSTONE** SW : (As above). Some thin coat and carbonaceous seams between 20.45m to 20.85m. Defects : - Lamination partings <15° (1-2/m) Gradually grading into sandstone with depth.							Coal seam coal seam UCS=19MPa MC=3.09% WD=2480N/m^2 Carbonaceous laminations		
			100 (100)										Is(50)=0.37 MPa	x
21								SW					Is(50)=0.42 MPa	o
												UCS=16.8MPa MC=4.6% WD=2477N/m^2		
												Pressuremeter Test 1 @ 21.45m	Is(50)=0.35 MPa	x
													Is(50)=0.65 MPa	o
												UCS=17.3MPa MC=5.4% WD=2505N/m^2	Is(50)=0.81 MPa	o
22													Is(50)=0.52 MPa	x
	-25.36				**INTERBEDDED SANDSTONE AND SILTSTONE. SILTSTONE DOMINANT** SW: Pale grey to dark grey, fine grained, laminated, mainly medium to high strength. Defects : Generally rare. Drilling induced lamination/bedding partings < 15° (1/m).									
			100 (99)										Is(50)=0.53 MPa	x
23													Is(50)=1.19 MPa	o
												MC=4.0%	Is(50)=0.38 MPa	x
													Is(50)=0.74 MPa	o
													Is(50)=0.93 MPa	o
								SW					Is(50)=0.47 MPa	x
24														
	-27.99													
25	-28.11				**SANDSTONE** See next page			SW					Is(50)=0.60 MPa Is(50)=0.83 MPa	o x

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.

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ENGINEERING BOREHOLE

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

BOREHOLE No BH10
SHEET 6 of 7
REFERENCE No H9559

PROJECT GATEWAY UPGRADE PROJECT - GATEWAY BRIDGE DUPLICATION FOUNDATION INVESTIGATION
LOCATION PIER 6 - SOUTHERN FACE OF THE PILE CAP COORDINATES 10342.3 E; 167709.0 N
PROJECT No FG5388 SURFACE R.L. -3.11 DATE STARTED 12/3/05 DATUM SETP
JOB No DATUM AHD DATE COMPLETED 15/3/05 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	-28.11				**SANDSTONE** **MEDIUM GRAINED SLIGHTLY MASSIVE TO MAINLY LAMINATED SEDIMENTARY ROCK** SW : Pale grey to white, laminated, mainly medium to high strength. Occasional mudstone interbeds. Defects : Drilling induced lamination/bedding partings <15° deg (1/m)						Is(50)=1.56 MPa Is(50)=1.82 MPa UCS=19.5MPa MC=3.4% WD=2600N/m² Is(50)=0.62 MPa Is(50)=0.53 MPa	x o o x
			100 (67)								Mudstone laminations.	
26							SW					
27											Is(50)=0.22 MPa Is(50)=0.70 MPa	o x
	-30.61				**MUDSTONE** **FINE GRAINED THINLY LAMINATED SEDIMENTARY ROCK** MW-SW : Grey to dark grey, laminated, mainly medium to high strength. Highly broken and altered bands throughout.						Is(50)=0.07 MPa	o
28			100 (56)				MW-SW				HW Seam.	
					Defects :- Lamination partings <25° (4/m) - Occasional joints @ 80-90° (4/3) - Broken and weathered seams.							
	-31.71				**MUDSTONE (FRACTURED & SHEARED)** MW : Dark grey to white grey, fine grained, very low to low strength. Healed faulted, contorted, sheared and altered in most places. When wet, rockmass exhibits engineering properties of firm to stiff high plastic gravelly silty clay in most places. Defects : - Lamination partings <20° (5/m) - Occasional joints < 90°(1/m)						MC=10.6% LL=36%; PI=16.6%; LS=12% MC=14.6%	Is(50)=0.06 MPa Is(50)=0.02 MPa	x o
29							MW					
	-32.33				**INTERBEDDED SANDSTONE AND MUDSTONE** SW: (As below)						Is(50)=4.30 MPa Is(50)=2.25 MPa	o x
							SW					
30	-33.11											

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

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Department of Main Roads

ENGINEERING BOREHOLE

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

BOREHOLE No BH10
SHEET 7 of 7
REFERENCE No H9559

PROJECT GATEWAY UPGRADE PROJECT - GATEWAY BRIDGE DUPLICATION FOUNDATION INVESTIGATION
LOCATION PIER 6 - SOUTHERN FACE OF THE PILE CAP COORDINATES 10342.3 E; 167709.0 N
PROJECT No FG5388 SURFACE R.L. -3.11 DATE STARTED 12/3/05 DATUM SETP
JOB No DATUM AHD DATE COMPLETED 15/3/05 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
30	-33.11				**INTERBEDDED SANDSTONE AND MUDSTONE. SANDSTONE DOMINANT** SW: Pale grey to dark grey, fine to medium grained, laminated, medium to mainly high strength. Defects: Drilling induced lamination/bedding partings <15° (2-3/m).		SW					Is(50)=1.33 MPa Is(50)=0.89 MPa UCS=32.1MPa MC=3.6% WD=2606N/m² Is(50)=0.86 MPa Is(50)=1.44 MPa		o x x o
	-33.98		100											
31					Borehole terminated at 30.87m									
32														
33														
34														
35														

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

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LOGGED BY
A. DISSANAYAKE (DISS)

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

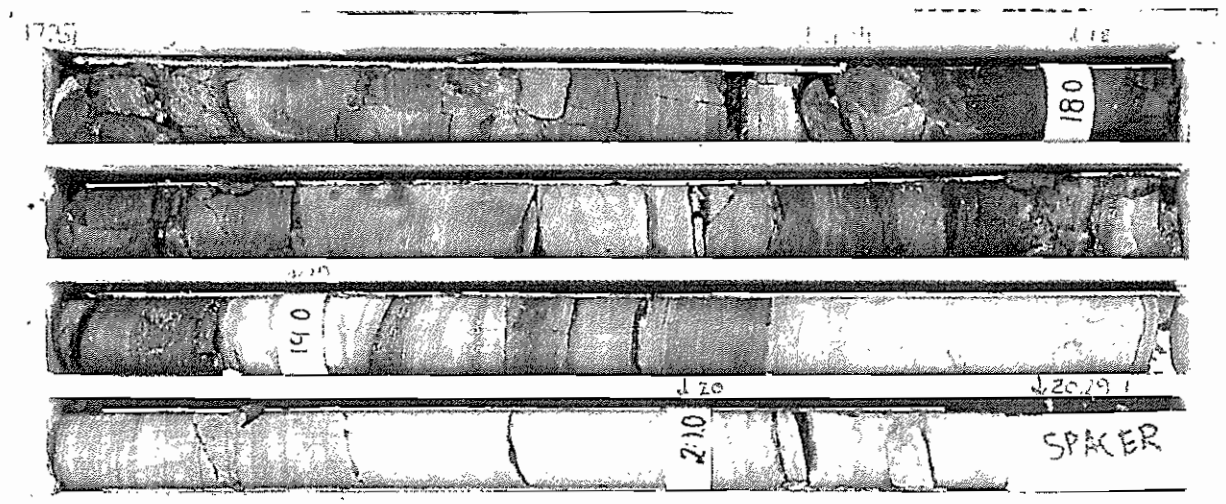
Borehole No: **BH 10**

Start Depth: 2.60m
Finish Depth: 30.87m
Project No: FG 5388
H No: 9559

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

Borehole No: **BH 10**

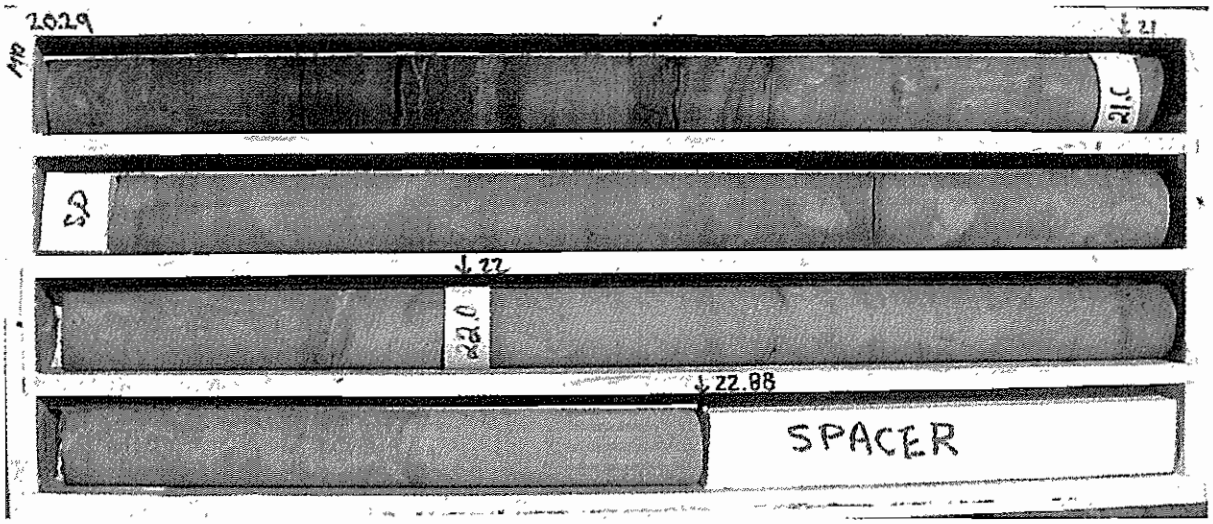
Start Depth: 2.60m
Finish Depth: 30.87m
Project No: FG 5388
H No: 9559

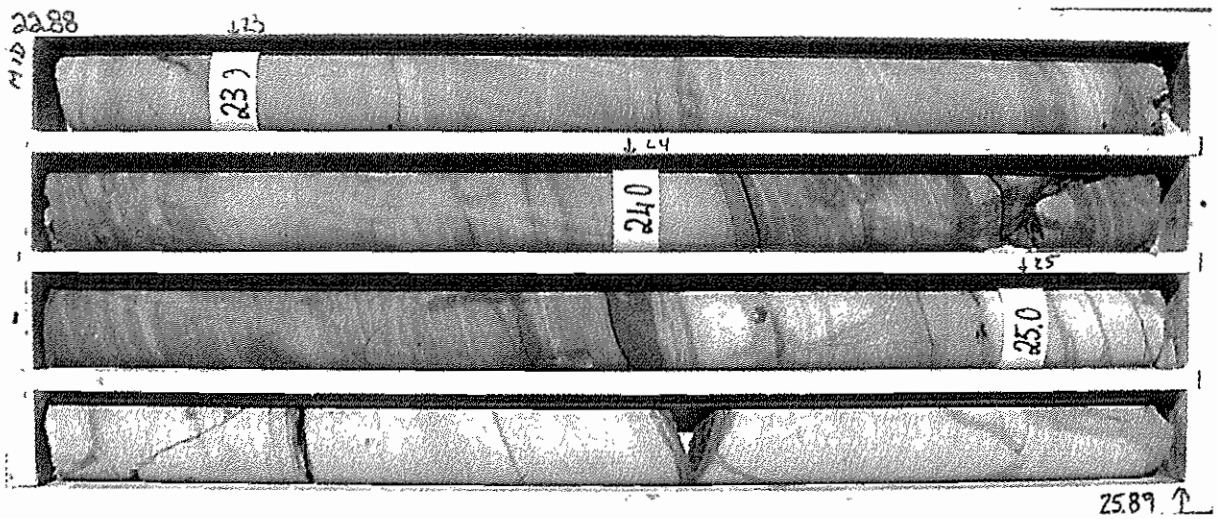


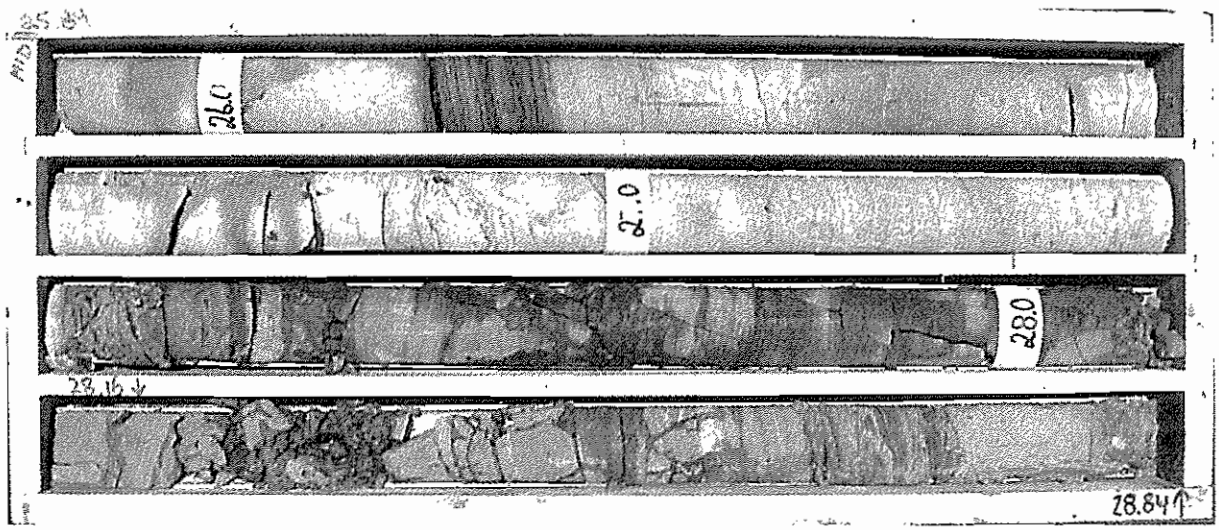
Project: **Gateway Upgrade Project - Gateway Bridge**

Borehole No: **BH 10**

Start Depth: 2.60m
Finish Depth: 30.87m
Project No: FG 5388
H No: 9559



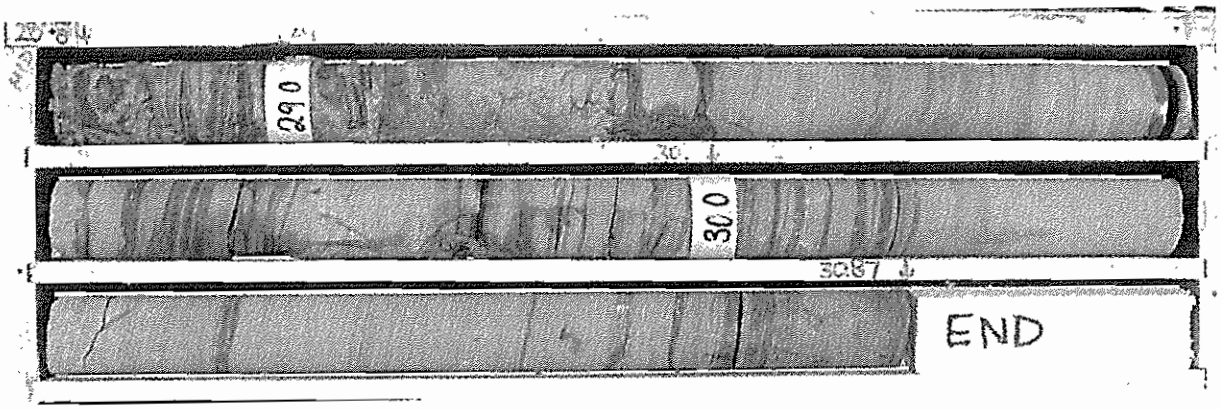




Project: **Gateway Upgrade Project - Gateway Bridge**

Borehole No: **BH 10**

Start Depth: 2.60m
Finish Depth: 30.87m
Project No: FG 5388
H No: 9559



ROAD SYSTEM AND ENGINEERING
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Queensland Government
Department of Main Roads

DEFECT DESCRIPTIONS OF ENGINEERING BORELOGS

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

BOREHOLE NO	: BH10
SHEET	: 1 of 5
REFERENCE NO	: H9559

PROJECT : GATEWAY UPGRADE PROJECT – GATEWAY BRIDGE DUPLICATION FOUNDATION INVESTIGATION

LOCATION : PIER 6 – SOUTHERN FACE OF THE PILE CAP

PROJECT NO : FG5388 SURFACE R.L : -3.11 DRILLER : CAIRNS DRILLING PTY LTD

JOB NO : DATUM : AHD DATE DRILLED : 12-15/3/05

DEPTH	DEFECT TYPE	DIP	PLANARITY	ROUGHNESS	APERTURE	WALL ALTERATION	OTHER
2.65	LP	<10°	Ir	R	O	Cn	-
3.52	LP	15°	Un	-	C	Cn	CL
3.60	LP	40°	Un/P	R	T	FeSt	CL
4.39	LP	40°	Un	R	O	FeSt	-
4.78	LP	15°	P	S	T	Cn	CL
5.08	LP	20°	P	-	T	Cn	-
5.25	LP	60°	P	-	T	Cn	-
5.38	LP	50°	P	-	T	Cn	-
5.53-5.60	BZ/WS	-	-	-	-	W	-
5.6-7.4	-	-	-	-	-	-	Coreloss
7.74-8.15	BZ/WS	-	-	-	-	-	CI
8.37-8.45	LP	-	-	-	-	Cn	CS
8.37	J	50°	P	S	C	Cn	-
8.65	J	85°	P	S	C	Cn	-
8.70-8.73	FZ	-	-	-	C	Cn	-
9.12-9.13	WS	10°	-	-	O	W	-
9.22-9.26	WS	-	-	-	C	W	-
9.45	J	60°	P	S	C	-	High plastic CI
9.51	LP	15°	P	R	C	Cn	-
9.52	J / LP	30°	P	S	T	-	CI
9.79	10.0	BZ	-	-	T	Cn	DI
10.10	J	80°	P	-	-	Cn	-

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.

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DEFECT DESCRIPTIONS OF ENGINEERING BORELOGS

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

BOREHOLE NO	: BH10
SHEET	: 2 of 5
REFERENCE NO	: H9559

PROJECT : GATEWAY UPGRADE PROJECT – GATEWAY BRIDGE DUPLICATION FOUNDATION INVESTIGATION

LOCATION : PIER 6 – SOUTHERN FACE OF THE PILE CAP

PROJECT NO : FG5388 SURFACE R.L : -3.11 DRILLER : CAIRNS DRILLING PTY LTD

JOB NO : DATUM : AHD DATE DRILLED : 12-15/3/05

DEPTH	DEFECT TYPE	DIP	PLANARITY	ROUGHNESS	APERTURE	WALL ALTERATION	OTHER
10.22-10.3	WS	-	-	-	O	W	-
10.3-10.73	-	-	-	-	-	-	Coreloss
10.73-10.89	WS	-	-	-	-	W	-
10.93-11.05	WS	-	-	-	-	W	Sandy clay
11.09	LP	<10°	P	-	T	Cn	-
11.12	LP	<10°	P	S	O	Cn	-
11.13	LP	<10°	P	S	O	Cn	-
11.17	LP	15°	P	S	C	Cn	-
11.20	LP	15°	P	S	T	Cn	-
11.22-11.26	WS	-	-	-	O	W	-
11.29-11.33	WS	-	-	-	C	W	-
11.40	LP	<10°	Ir	R	O	Cn	-
11.44	BZ/WS	-	-	-	O	W	Sandy clay
11.49-11.66	BZ/WS	-	-	-	-	W	Parallel to BP
11.74-11.82	BZ/WS	-	-	-	-	W	-
11.90-11.95	BZ/WS	-	-	-	-	W	-
12.01-12.06	BZ/WS	-	-	-	-	W	-
12.05-12.3	BZ/WS	-	-	-	-	W	-
12.3-12.7	-	-	-	-	-	-	Coreloss
12.70-12.88	BZ/WS	-	-	-	O	W	-
13.0-13.16	BZ/WS	-	-	-	O	W	-

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
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Queensland Government
Department of Main Roads

DEFECT DESCRIPTIONS OF ENGINEERING BORELOGS

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

BOREHOLE NO	BH10
SHEET	3 of 5
REFERENCE NO	H9559

PROJECT : GATEWAY UPGRADE PROJECT – GATEWAY BRIDGE DUPLICATION FOUNDATION INVESTIGATION

LOCATION : PIER 6 – SOUTHERN FACE OF THE PILE CAP

PROJECT NO : FG5388 SURFACE R.L : -3.11 DRILLER : CAIRNS DRILLING PTY LTD

JOB NO : DATUM : AHD DATE DRILLED : 12-15/3/05

DEPTH	DEFECT TYPE	DIP	PLANARITY	ROUGHNESS	APERTURE	WALL ALTERATION	OTHER
13.22-13.25	WS	-	-	-	O	W	-
13.33-13.75	BZ/WS	-	-	-	-	W	Parallel to LP
13.85-13.88	WS	-	-	-	O	W	-
13.95-14.05	BZ/WS	-	-	-	-	W	-
14.28-14.33	WS	-	-	-	O	W	Sandy clay
14.42	LP	<15°	P	S	C	Cn	-
14.49	LP	<10°	P	S	C	Cn	-
14.59-14.61	WS	-	-	-	O	W	Sandy clay
14.61	WS	<10°	Ir	R	O	W	-
14.73-15.40	-	-	-	-	-	-	Coreloss
14.87	LP	<15°	P	-	T	Cn	-
14.95	LP	<15°	P	S	C	Cn	-
15.28	LP	<10°	Ir/St	-	C	Cn	CS
20.46	LP	5°	P	S	C	Cn	-
20.52	LP	5°	P/St	S	C	Cn	-
20.70	LP	10°	Un	S	C	Cn	-
20.76	LP	5°	P	S	T	-	-
21.25	LP	0°	Un	S	T	-	DI
21.53	LP	10°	P	S	C	Cn	DI
21.90	LP	15°	Ir	R	O	-	CI
22.21	LP	30°	St	R	T	Cn	DI
22.68	J	50°	P	S	O	Cn	-

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.

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DEFECT DESCRIPTIONS OF ENGINEERING BOREHOLES

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

BOREHOLE NO	: BH10
SHEET	: 4 of 5
REFERENCE NO	: H9559

PROJECT : GATEWAY UPGRADE PROJECT – GATEWAY BRIDGE DUPLICATION FOUNDATION INVESTIGATION

LOCATION : PIER 6 – SOUTHERN FACE OF THE PILE CAP

PROJECT NO : FG5388 SURFACE R.L : -3.11 DRILLER : CAIRNS DRILLING PTY LTD

JOB NO : DATUM : AHD DATE DRILLED : 12-15/3/05

DEPTH	DEFECT TYPE	DIP	PLANARITY	ROUGHNESS	APERTURE	WALL ALTERATION	OTHER
23.10	LP	10°	Un	S	C	Cn	-
23.28	LP	10°	St	S	C	Cn	-
23.65	J	50°	P	-	T	Cn	-
23.90	LP	25°	St	S	C	Cn	DI
24.25	LP	30°	P	S	C	Cn	DI
24.30	J	60-70°	P/St	S	C	-	Gravelly clay
24.66	LP	5°	P	S	C	Cn	-
24.73	LP	10°	P	S	C	Cn	-
24.97	LP	15°	P	R	O	Cn	-
25.25	J	60°	Ir	R	C	Cn	-
25.33	LP	15°	P	R	C	Cn	CL
25.45	LP	23°	P	R	C	Cn	DI
25.58	LP	30°	P	R	O	Cn	CL
26.08	J	40°	St	R	C	Cn	DI
26.10	J	70°	St	R	C	Cn	-
26.15	LP	10°	P	R	O	Cn	CL
26.36	LP	10°	P	R	C	Cn	DI
26.50	J	80°	P	-	T	Cn	-
26.60	J	70°	P	-	T	Cn	-
26.70	LP	30°	P	R	C	Cn	-
26.75	LP	30°	P	R	C	Cn	-
26.80	LP	15°	P	R	C	Cn	Co

Abbreviations

ROUGHNESS		WALL ALTERATIONS		TYPE		OTHER	
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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		

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DEFECT DESCRIPTIONS OF ENGINEERING BORELOGS

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

BOREHOLE NO	BH10
SHEET	5 of 5
REFERENCE NO	H9559

PROJECT : GATEWAY UPGRADE PROJECT – GATEWAY BRIDGE DUPLICATION FOUNDATION INVESTIGATION

LOCATION : PIER 6 – SOUTHERN FACE OF THE PILE CAP

PROJECT NO : FG5388 SURFACE R.L : -3.11 DRILLER : CAIRNS DRILLING PTY LTD

JOB NO : DATUM : AHD DATE DRILLED : 12-15/3/05

DEPTH	DEFECT TYPE	DIP	PLANARITY	ROUGHNESS	APERTURE	WALL ALTERATION	OTHER
27.0	J	45°	P	R	C	Cn	-
27.40	J	45°	St	R	C	Cn	-
27.44	LP	15°	P	S	C	Cn	CL
27.50	LP	15°	P	S	C	Cn	CL
27.55-27.58	WS	-	-	-	-	W	-
27.65	J	80°	P	S	C	Cn	-
27.67	J	80°	P	S	C	Cn	-
27.72	J	80°	P	S	C	Cn	-
27.95	J	70°	St	R	C	Cn	-
28.18-28.32	WS	-	-	-	-	W	Gravelly clay
28.35	LP	25°	P	S	C	Cn	-
28.40	LP	25°	P	S	C	Cn	-
28.45	LP	25°	P	S	C	Cn	-
28.48	LP	25°	P	S	C	-	CI
28.59-28.60	WS	-	-	-	-	W	Parallel to LP
28.60-29.22	SZ/HFZ	-	-	-	-	W	
29.28	J	90°	-	-	-	-	CI
29.70	LP	20°	P	R	C	Cn	DI
29.85	LP	15°	P	S	C	Cn	DI
29.90	J	85°	P	R	C	Cn	-
30.13	LP	15°	P	S	C	Cn	DI
30.70	J	35°	St	R	C	Cn	-
30.77	LP	10°	P	S	C	Cn	DI

Abbreviations

ROUGHNESS		WALL ALTERATIONS		TYPE		OTHER	
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P	Planar	C	Closed	SZ	Sheared Zone	H	Horizontal
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