Queensland Government
Department of Main Roads

ENGINEERING BOREHOLE

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

BOREHOLE No BH15
SHEET 1 of 13
REFERENCE No H9564

PROJECT GATEWAY UPGRADE PROJECT - GATEWAY BRIDGE DUPLICATION FOUNDATION INVESTIGATION
LOCATION PIER 7 - SOUTHERN FACE OF PILE CAP- DOWNSTREAM RIGHT HAND SIDE
COORDINATES 10230.6 E, 167936.4 N
PROJECT No FG5388 SURFACE R.L. -2.70 DATE STARTED 11/04/05 DATUM SETP
JOB No DATUM AHD DATE COMPLETED 14/04/05 DRILLER CAIRNS DRILLING

DEPTH (m)	R.L. (m)	CASING / WASH BORING / CORE DRILLING	ROD ( )% 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	-2.70				**ESTUARINE SILTY CLAY** Dark grey to pale grey brown, mainly wet, very soft to soft. High plasticity. Minor sand towards bottom.		OH						
-4.60					**POSSIBLE SAND** No recovery with SPT.		SC-SM					Driller's record only	RW,-,- N<1 SPT HW,-,- N<1 SPT
-6.20					**ESTUARINE SILTY CLAY** Dark grey to black, mainly moist to slightly wet, very soft to soft. High plasticity, high organic content; occasional partly decomposed plant fragments.		OH						RW,-,- N<1 SPT
-7.70													

BOREHOLE WITH LITHOLOGY MEERA PIER 7 BOREHOLES-GATEWAY BRIDGE - GATEWAY UPGRADE PROJECT.GPJ ENGINEERING BOREHOLE 09_04.GDT 31/08/05

REMARKS SPT N values in gravel can overestimate density due to influence of coarser size gravel particles. This borelog should be read in conjunction with the appropriate Defect Description Sheets. Defect angles were 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 BH15
SHEET 2 of 13
REFERENCE No H9564

PROJECT GATEWAY UPGRADE PROJECT - GATEWAY BRIDGE DUPLICATION FOUNDATION INVESTIGATION
LOCATION PIER 7 - SOUTHERN FACE OF PILE CAP- DOWNSTREAM RIGHT HAND SIDE COORDINATES 10230.6 E; 167936.4 N
PROJECT No FG5388 SURFACE R.L. -2.70 DATE STARTED 11/04/05 DATUM SETP
JOB No DATUM AHD DATE COMPLETED 14/04/05 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	-7.70				**ESTUARINE SILTY CLAY** Dark grey to black, mainly moist to slightly wet, very soft to soft. High plasticity, high organic content; occasional partly decomposed plant fragments.		OH						
6												RW,-,- N<1	SPT
7	-9.70				**ESTUARINE SILTY SAND** Green grey to grey, wet, very loose. Fine grained sand.		SC-SM						
8												RW,-,- N<1	SPT
	-11.20				**ESTUARINE SILTY CLAY** Dark grey to black, mainly moist to slightly wet, very soft to soft. High plasticity, high organic content; occasional partly decomposed shell fragments.								
9							OH					RW,-,- N<1	SPT
10	-12.70												

BOREHOLE WITH LITHOLOGY MEERA PIER 7 BOREHOLES-GATEWAY BRIDGE - GATEWAY UPGRADE PROJECT.GPJ ENGINEERING BOREHOLE 09_04.GDT 31/08/05

REMARKS SPT N values in gravel can overestimate density due to influence of coarser size gravel particles. This borelog should be read in conjunction with the appropriate Defect Description Sheets. Defect angles were 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 BH15
SHEET 3 of 13
REFERENCE No H9564

PROJECT GATEWAY UPGRADE PROJECT - GATEWAY BRIDGE DUPLICATION FOUNDATION INVESTIGATION
LOCATION PIER 7 - SOUTHERN FACE OF PILE CAP- DOWNSTREAM RIGHT HAND SIDE COORDINATES 10230.6 E; 167936.4 N
PROJECT No FG5388 SURFACE R.L. -2.70 DATE STARTED 11/04/05 DATUM SETP
JOB No DATUM AHD DATE COMPLETED 14/04/05 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	-12.70				**ESTUARINE SILTY CLAY** (As above).		OH						
	-13.00				**ALLUVIAL SILTY CLAY** Pale grey to grey brown, moist, stiff becoming firm with depth. Minor orange yellow incipient lateritic features; slightly dessicated in some places; medium to high plasticity.							2,5,8 N=13	SPT
11													
12												3,4,7 N=11	SPT
13							CI- CH						
14												1,2,3 N=5	SPT
15	-17.70												

BOREHOLE WITH LITHOLOGY MEERA PIER 7 BOREHOLES-GATEWAY BRIDGE - GATEWAY UPGRADE PROJECT.GPJ ENGINEERING BOREHOLE 09_04.GDT 31/08/05

REMARKS SPT N values in gravel can overestimate density due to influence of coarser size gravel particles. This borelog should be read in conjunction with the appropriate Defect Description Sheets. Defect angles were 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 BH15
SHEET 4 of 13
REFERENCE No H9564

PROJECT GATEWAY UPGRADE PROJECT - GATEWAY BRIDGE DUPLICATION FOUNDATION INVESTIGATION
LOCATION PIER 7 - SOUTHERN FACE OF PILE CAP- DOWNSTREAM RIGHT HAND SIDE COORDINATES 10230.6 E; 167936.4 N
PROJECT No FG5388 SURFACE R.L. -2.70 DATE STARTED 11/04/05 DATUM SETP
JOB No DATUM AHD DATE COMPLETED 14/04/05 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	-17.70				**ALLUVIAL SILTY CLAY** Pale grey to grey brown, moist, stiff to vey stiff becoming firm with depth. Minor orange yellow incipient lateritic features; slightly dessicated in some places; medium to high plasticity.		CI-CH					3,5,7 N=12	SPT
16												1,2,3 N=5	SPT
17													
18												RW,3,4 N=7	SPT
19													
20	-22.70											1,2,5 N=7	SPT

BOREHOLE WITH LITHOLOGY MEERA PIER 7 BOREHOLES-GATEWAY BRIDGE - GATEWAY UPGRADE PROJECT.GPJ ENGINEERING BOREHOLE 09_04.GDT 31/08/05

REMARKS SPT N values in gravel can overestimate density due to influence of coarser size gravel particles. This borelog should be read in conjunction with the appropriate Defect Description Sheets. Defect angles were 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 BH15
SHEET 5 of 13
REFERENCE No H9564

PROJECT GATEWAY UPGRADE PROJECT - GATEWAY BRIDGE DUPLICATION FOUNDATION INVESTIGATION
LOCATION PIER 7 - SOUTHERN FACE OF PILE CAP - DOWNSTREAM RIGHT HAND SIDE COORDINATES 10230.6 E; 167936.4 N
PROJECT No FG5388 SURFACE R.L. -2.70 DATE STARTED 11/04/05 DATUM SETP
JOB No DATUM AHD DATE COMPLETED 14/04/05 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	-22.70				**ALLUVIAL SILTY CLAY** (As above).								
21							CI-CH					RW,4,5 N=9	SPT
22	-24.70				**ALLUVIAL SILTY SAND** Pale brown to brown, wet, medium dense. Fine grained sand.								
23							SM					4,8,13 N=21	SPT
	-26.20				**ALLUVIAL SAND AND GRAVEL** Pale brown to grey brown, wet, very dense. Poorly sorted coarse sand and gravel sizing up to 40mm; subrounded to subangularlithic and quartzitic fragments. (Sand fraction<Gravel fraction)								
24							GP-GM					9,26,30/130 N>50	SPT
25	-27.70												

BOREHOLE WITH LITHOLOGY MEERA PIER 7 BOREHOLES-GATEWAY BRIDGE - GATEWAY UPGRADE PROJECT.GPJ ENGINEERING BOREHOLE 09_04.GDT 31/08/05

REMARKS SPT N values in gravel can overestimate density due to influence of coarser size gravel particles. This borelog should be read in conjunction with the appropriate Defect Description Sheets. Defect angles were 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 BH15
SHEET 6 of 13
REFERENCE No H9564

PROJECT GATEWAY UPGRADE PROJECT - GATEWAY BRIDGE DUPLICATION FOUNDATION INVESTIGATION
LOCATION PIER 7 - SOUTHERN FACE OF PILE CAP- DOWNSTREAM RIGHT HAND SIDE
COORDINATES 10230.6 E; 167936.4 N
PROJECT No FG5388
SURFACE R.L. -2.70
DATE STARTED 11/04/05
DATUM SETP
JOB No
DATUM AHD
DATE COMPLETED 14/04/05
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	-27.70				**ALLUVIAL SAND AND GRAVEL** Pale brown to grey brown, wet, very dense. As Above		GP-GM						8,10,6 N=16 SPT
26													
27													
	-30.10				**POSSIBLE LOW GRADE COAL** HW : (Drillers record only)		HW						
28	-30.70		(55)		**LOW GRADE COAL** MW : Black mainly dull to occasionally vitreous, fine grained, thinly laminated, mainly low to medium strength. Highly fractured, weathered and altered seams throughout; frequent siltstone interbeds. Defects : - Numerous lamination/bedding partings<**deg - Fractured, weathered & altered seams<**							Siltstone interbed Siltstone interbed Siltstone interbed Siltstone interbed Siltstone interbed Siltstone interbed Siltstone interbed Siltstone interbed	Is(50)=0.08 MPa x Is(50)=0.23 MPa o Is(50)=0.13 MPa x Is(50)=0.41 MPa o Is(50)=0.18 MPa x Is(50)=0.24 MPa o Is(50)=0.12 MPa x Is(50)=1.08 MPa o	
			100										
29			(49)				MW						
30	-32.70												

REMARKS SPT N values in gravel can overestimate density due to influence of coarser size gravel particles. This borelog should be read in conjunction with the appropriate Defect Description Sheets. Defect angles were measured with respect to a horizontal plane.

LOGGED BY
A. DISSANAYAKE (DISS)

BOREHOLE WITH LITHOLOGY MEERA PIER 7 BOREHOLES-GATEWAY BRIDGE - GATEWAY UPGRADE PROJECT.GPJ ENGINEERING BOREHOLE 09_04.GDT 31/08/05

Queensland Government
Department of Main Roads

ENGINEERING BOREHOLE

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

BOREHOLE No BH15
SHEET 7 of 13
REFERENCE No H9564

PROJECT GATEWAY UPGRADE PROJECT - GATEWAY BRIDGE DUPLICATION FOUNDATION INVESTIGATION
LOCATION PIER 7 - SOUTHERN FACE OF PILE CAP- DOWNSTREAM RIGHT HAND SIDE
COORDINATES 10230.6 E; 167936.4 N
PROJECT No FG5388
SURFACE R.L. -2.70
DATE STARTED 11/04/05
DATUM SETP
JOB No
DATUM AHD
DATE COMPLETED 14/04/05
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	-32.70				**LOW GRADE COAL** MW : (As above).							Siltstone interbed	Is(50)=0.24 MPa	x
												Siltstone interbed	Is(50)=0.11 MPa	o
												Siltstone interbed		
												Siltstone interbed		
31												Siltstone interbed		
												Siltstone interbed		
			94 (0)									Coreloss		
32													Is(50)=0.04 MPa	x
			100 (26)					MW				High plastic clay band Siltstone interbed		
												Coreloss		
												Siltstone interbed		
33													Is(50)=0.04 MPa	x
												Siltstone interbed		
34													Is(50)=0.18 MPa	o
													Is(50)=0.29 MPa	x
			89 (41)									Coreloss		
35	-37.70												Is(50)=0.07 MPa	x
													Is(50)=0.04 MPa	o

BOREHOLE WITH LITHOLOGY MEERA PIER 7 BOREHOLES-GATEWAY BRIDGE - GATEWAY UPGRADE PROJECT.GPJ ENGINEERING BOREHOLE 09_04.GDT 31/08/05

REMARKS SPT N values in gravel can overestimate density due to influence of coarser size gravel particles. This borelog should be read in conjunction with the appropriate Defect Description Sheets. Defect angles were measured with respect to a

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 BH15
SHEET 8 of 13
REFERENCE No H9564

PROJECT GATEWAY UPGRADE PROJECT - GATEWAY BRIDGE DUPLICATION FOUNDATION INVESTIGATION
LOCATION PIER 7 - SOUTHERN FACE OF PILE CAP- DOWNSTREAM RIGHT HAND SIDE COORDINATES 10230.6 E; 167936.4 N
PROJECT No FG5388 SURFACE R.L. -2.70 DATE STARTED 11/04/05 DATUM SETP
JOB No DATUM AHD DATE COMPLETED 14/04/05 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
35	-37.70				**LOW GRADE COAL** MW : (As above).			MW				Is(50)=0.08 MPa Is(50)=0.14 MPa		o x
	-38.26				**SILTY SANDSTONE** MW-SW: Pale grey, fine grained, thinly laminated, mainly medium to high strength. Defects : Generally rare.			MW-SW				Is(50)=0.32 MPa Is(50)=1.70 MPa		o x
36	-38.86				**LOW GRADE COAL** MW : Black mainly dull to occasionally vitreous, fine grained, thinly laminated, mainly low to medium strength. Grading into more siltstone with depth.			MW						
	-39.50		94 (49)		**CLAYSTONE / SILTSTONE** MW-SW: Grey to dark grey, fine grained, thinly laminated to massive, mainly low to medium strength. Some alteration along irregular fractures and core appears to be erodable.			MW				High plastic clay band High plastic clay band LL=28%; PI=10%; LS=4.8 Is(50)=0.10 MPa Is(50)=0.05 MPa Is(50)=0.23 MPa High plastic clay band LL=35.6%; PI=15%; LS=8.4 Coal seam Coreloss High plastic clay band		o x o
37														
38			81 (46)											
39														
	-42.25				**SILTY SANDSTONE** SW: Grey to pale grey, fine grained, thinly laminated, low to mainly medium strength. Defects : Rare.							Is(50)=0.23 MPa Is(50)=0.71 MPa Is(50)=0.18 MPa Is(50)=0.30 MPa		x o x o
40	-42.70													

BOREHOLE WITH LITHOLOGY MEERA PIER 7 BOREHOLES-GATEWAY BRIDGE - GATEWAY UPGRADE PROJECT.GPJ ENGINEERING BOREHOLE 09_04.GDT 31/08/05

REMARKS SPT N values in gravel can overestimate density due to influence of coarser size gravel particles. This borelog should be read in conjunction with the appropriate Defect Description Sheets. Defect angles were 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 BH15
SHEET 9 of 13
REFERENCE No H9564

PROJECT GATEWAY UPGRADE PROJECT - GATEWAY BRIDGE DUPLICATION FOUNDATION INVESTIGATION
LOCATION PIER 7 - SOUTHERN FACE OF PILE CAP- DOWNSTREAM RIGHT HAND SIDE
COORDINATES 10230.6 E; 167936.4 N
PROJECT No FG5388
SURFACE R.L. -2.70
DATE STARTED 11/4/05
DATUM SETP
JOB No
DATUM AHD
DATE COMPLETED 14/4/05
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
40	-42.70				**LOW GRADE COAL** MW : Black mainly dull to occasionally vitreous, fine grained, thinly laminated, mainly low to medium strength. Highly fractured, weathered and altered seams throughout; some siltstone interbeds. Defects : - Numerous lamination/bedding partings < 30° - Fractured, weathered & altered seams 40 - 150mm thick		MW					Is(50)=0.35 MPa Is(50)=0.20 MPa	x o	
41			87 (89)									Coreloss Coreloss		
	-43.90				**SANDSTONE** **FINE TO MEDIUM GRAINED, LAMINATED TO MASSIVE SEDIMENTARY ROCK** SW : Grey to white grey, laminated to massive, medium to mainly high strength. A minor weatherd, broken and altered band in the upper area. Defects : Generally rare. - Occasional drilling induced lamination partings <15° (1/m).		HW-MW					MW siltstone interbed. Is(50)=0.02 MPa Is(50)=1.26 MPa UCS=42.5MPa MC=3.6% WD=2375N/m² Is(50)=0.71 MPa Is(50)=0.58 MPa UCS=30MPa MC=2.65% WD=2660N/m² Is(50)=1.04 MPa	x o x o x o	
42														
43							SW					Is(50)=0.74 MPa Is(50)=1.45 MPa UCS=38.9MPa MC=3.2% WD=2482N/m² Is(50)=0.66 MPa Is(50)=0.83 MPa UCS28.8MPa MC=3.2% WD=2436N/m² **Pressuremeter Test 4 @ 43.0m** Is(50)=1.21 MPa Is(50)=0.50 MPa Is(50)=0.34 MPa Is(50)=1.26 MPa	x o x o o x x o	
44	-46.70		97 (90)		**INTERBEDDED SANDSTONE & MUDSTONE** SANDSTONE DOMINANT SW : Pale grey to dark grey, fine grained, thinly laminated and interbedded, medium to mainly high strength. Minor faulting features in some places. Defects : Generally rare. - Occasional drilling induced lamination partings <15° (2-3/m).		SW					UCS=28.4MPa MC=3.1% WD=2470N/m² Is(50)=1.04 MPa Is(50)=1.46 MPa Is(50)=0.14 MPa Is(50)=1.25 MPa Is(50)=0.56 MPa Is(50)=0.92 MPa	x o x o x o	
45	-47.70													

BOREHOLE WITH LITHOLOGY MEERA PIER 7 BOREHOLES-GATEWAY BRIDGE - GATEWAY UPGRADE PROJECT.GPJ ENGINEERING BOREHOLE 09_04.GDT 31/8/05

REMARKS SPT N values in gravel can overestimate density due to influence of coarser size gravel particles. This borelog should be read in conjunction with the appropriate Defect Description Sheets. Defect angles were 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 BH15
SHEET 10 of 13
REFERENCE No H9564

PROJECT GATEWAY UPGRADE PROJECT - GATEWAY BRIDGE DUPLICATION FOUNDATION INVESTIGATION
LOCATION PIER 7 - SOUTHERN FACE OF PILE CAP- DOWNSTREAM RIGHT HAND SIDE COORDINATES 10230.6 E; 167936.4 N
PROJECT No FG5388 SURFACE R.L. -2.70 DATE STARTED 11/04/05 DATUM SETP
JOB No DATUM AHD DATE COMPLETED 14/04/05 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
45	-47.70				**MUDSTONE** SW: Grey to dark grey, fine grained thinly laminated, medium to high strength. Frequent thin sandstone interbeds. Defects : Generally Nil.		SW					SW siltstone interbed. Is(50)=1.55 MPa Is(50)=0.27 MPa		o x
	-48.32				**SANDSTONE** **FINE TO MEDIUM GRAINED, LAMINATED TO MASSIVE SEDIMENTARY ROCK** SW : Grey to white grey, laminated to massive, medium to mainly high strength. Defects : Generally rare. - Occasional drilling induced lamination partings <15° (1-2/m). - Occasional subvertical joints @ 70°-80° (1/m)							Is(50)=0.52 MPa Is(50)=0.09 MPa Is(50)=1.44 MPa UCS=34.8MPa MC=13.6% WD=2374N/m² Is(50)=0.34 MPa Is(50)=0.35 MPa Is(50)=1.38 MPa		x o o x x o
46														
												Is(50)=0.22 MPa Is(50)=0.58 MPa UCS=19.1MPa MC=4.4% WD=2402N/m²		x o
47			100 (83)				SW					UCS=37MPa MC=2.54% WD=2540N/m² Is(50)=0.90 MPa Is(50)=1.15 MPa Is(50)=1.54 MPa		o o x
												Pressuremeter Test 3 @ 47.4m Is(50)=0.86 MPa Is(50)=1.12 MPa		x o
												UCS=36.4MPa MC=3.4% WD=2474N/m² Is(50)=0.59 MPa Is(50)=1.20 MPa		x o
48												Is(50)=0.66 MPa Is(50)=0.27 MPa		o x
												UCS=38.2MPa MC=2.4% WD=2604N/m² Is(50)=2.47 MPa Is(50)=1.48 MPa		o x
	-51.68													
49					**MUDSTONE (SHEARED)** **FINE GRAINED THINLY LAMINATED SEDIMENTARY ROCK** HW-MW: Pale grey to grey, fine grained, thinly laminated, medium to high strength.									
			100 (0) 37 (64)				HW-MW					Coreloss		
50	-52.70													

BOREHOLE WITH LITHOLOGY MEERA PIER 7 BOREHOLES-GATEWAY BRIDGE - GATEWAY UPGRADE PROJECT.GPJ ENGINEERING BOREHOLE 09_04.GDT 01/09/05

REMARKS SPT N values in gravel can overestimate density due to influence of coarser size gravel particles. This borelog should be read in conjunction with the appropriate Defect Description Sheets. Defect angles were 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 BH15
SHEET 11 of 13
REFERENCE No H9564

PROJECT GATEWAY UPGRADE PROJECT - GATEWAY BRIDGE DUPLICATION FOUNDATION INVESTIGATION
LOCATION PIER 7 - SOUTHERN FACE OF PILE CAP- DOWNSTREAM RIGHT HAND SIDE
COORDINATES 10230.6 E; 167936.4 N
PROJECT No FG5388
SURFACE R.L. -2.70
DATE STARTED 11/4/05
DATUM SETP
JOB No
DATUM AHD
DATE COMPLETED 14/4/05
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
50	-52.70				**MUDSTONE (SHEARED)** As above HW-MW: Highly fractured and clayey infilled in the upper area; some faulting and healed shearing features throughout.		HW-MW					Healed crushed zone		
	-53.00		100 (95)		**INTERBEDDED SANDSTONE & MUDSTONE. SANDSTONE DOMINANT.** SW : Pale grey to dark grey, fine grained, thinly laminated and interbedded, medium to mainly high strength. Some healed faulting and shearing features throughout. Defects : Generally rare. - Drilling induced lamination/bedding partings <20° (2-3/m).		SW					Is(50)=0.83 MPa		x
51												Is(50)=0.54 MPa Is(50)=2.54 MPa		x o
	-53.87				**SANDSTONE FINE TO MEDIUM GRAINED MAINLY LAMINATED TO SLIGHTLY MASSIVE SEDIMENTARY ROCK** SW: Pale grey grey white, fine to medium grained, thinly laminated, mainly high strength. A low strength altered band at the depth between 51.17m and 51.41m. Defects - Generally rare. - Drilling induced lamination partings <30° (1/m)		SW					UCS=40MPa MC=2.50% WD=2640N/m^2 Is(50)=1.31 MPa Is(50)=1.68 MPa		x o
52												Is(50)=1.44 MPa Is(50)=4.12 MPa		x o
	-55.20											UCS=49.0MPa MC=2.2% WD=2902N/m^2?? Is(50)=1.12 MPa Is(50)=2.76 MPa **Pressuremeter Test 2 @ 52.6m**		x o
					INTERBEDDED SANDSTONE & MUDSTONE. SANDSTONE DOMINANT SW : Pale grey to dark grey, fine grained, thinly laminated and interbedded, medium to mainly high strength. Some healed faulting and shearing features. Defects - Generally rare. - Drilling indcued lamination partings <30° (1/m)		SW							
53							HW-MW					Healed sheared fault zone		
			100 (98)				SW					Is(50)=1.04 MPa Is(50)=1.90 MPa UCS=27.6MPa MC=3.2% WD=2434N/m^2 Is(50)=1.50 MPa **Pressuremeter Test 1 @ 53.6m** Is(50)=0.59 MPa		x o o x
54												Is(50)=1.07 MPa Is(50)=1.12 MPa Is(50)=1.72 MPa Is(50)=0.67 MPa		o x o x
	-57.20						HW-MW					Healed sheared fault zone infilled with contorted calcite veins.		
					SANDSTONE, FINE TO MEDIUM GRAINED, LAMINATED TO MASSIVE SEDIMENTARY ROCK SW : Grey to white grey, laminated to massive, medium to mainly high strength. Defects generally rare.		SW					Is(50)=1.79 MPa Is(50)=0.44 MPa		x o
55	-57.70													

BOREHOLE WITH LITHOLOGY MEERA PIER 7 BOREHOLES-GATEWAY BRIDGE - GATEWAY UPGRADE PROJECT.GPJ ENGINEERING BOREHOLE 09_04.GDT 31/8/05

REMARKS SPT N values in gravel can overestimate density due to influence of coarser size gravel particles. This borelog should be read in conjunction with the appropriate Defect Description Sheets. Defect angles were measured with respect to a

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 BH15
SHEET 12 of 13
REFERENCE No H9564

PROJECT GATEWAY UPGRADE PROJECT - GATEWAY BRIDGE DUPLICATION FOUNDATION INVESTIGATION
LOCATION PIER 7 - SOUTHERN FACE OF PILE CAP- DOWNSTREAM RIGHT HAND SIDE COORDINATES 10230.6 E; 167936.4 N
PROJECT No FG5388 SURFACE R.L. -2.70 DATE STARTED 11/04/05 DATUM SETP
JOB No DATUM AHD DATE COMPLETED 14/04/05 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
55	-57.70													
	-57.75				**SANDSTONE** SW : (As Above). Drilling induced lamination partings <30° (1/m).		SW							
					INTERBEDDED MUDSTONE & SANDSTONE MUDSTONE DOMINANT SW : Pale grey to dark grey, fine grained, thinly laminated and interbedded, medium to mainly high strength. Some rehealed faulting and shearing features throughout.		SW							
56														
	-59.20		100 (20)		**MUDSTONE** **FINE GRAINED THINLY LAMINATED SEDIMENTARY ROCK** SW: Grey to dark grey, highly fractured, brecciated in most places, mainly very low to low strength. Rehealed brecciated rock fragments, some areas, matrix is high plastic clay and some feldspathic matrix. Defects: - Lamination partings <30° (1/m). - Irregular numarous mutidirctional joints in non breciccated areas.		SW					Is(50)=0.10 MPa Is(50)=0.12 MPa	x o	
57												Brecciated zone in high plastic clayey matrix.		
							HW-MW					Is(50)=0.03 MPa Is(50)=0.07 MPa	o x	
			100 (38)											
58														
							SW					Is(50)=0.32 MPa Is(50)=0.07 MPa	x o	
59												Is(50)=0.25 MPa Is(50)=0.49 MPa	x o	
							HW-MW					Is(50)=0.08 MPa Is(50)=0.03 MPa Partly helaed brecciated zone. Some areas infilled with high plastic clay. Is(50)=0.08 MPa Is(50)=0.09 MPa	x o x o	
60	-62.70													

BOREHOLE WITH LITHOLOGY MEERA PIER 7 BOREHOLES-GATEWAY BRIDGE - GATEWAY UPGRADE PROJECT.GPJ ENGINEERING BOREHOLE 09_04.GDT 31/08/05

REMARKS SPT N values in gravel can overestimate density due to influence of coarser size gravel particles. This borelog should be read in conjunction with the appropriate Defect Description Sheets. Defect angles were 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 BH15
SHEET 13 of 13
REFERENCE No H9564

PROJECT GATEWAY UPGRADE PROJECT - GATEWAY BRIDGE DUPLICATION FOUNDATION INVESTIGATION
LOCATION PIER 7 - SOUTHERN FACE OF PILE CAP- DOWNSTREAM RIGHT HAND SIDE
COORDINATES 10230.6 E; 167936.4 N
PROJECT No FG5388 SURFACE R.L. -2.70 DATE STARTED 11/04/05 DATUM SETP
JOB No DATUM AHD DATE COMPLETED 14/04/05 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
60	-62.70	1			**MUDSTONE** SW: (As above).			HW-MW				Partly helaed brecciated zone. Some areas are infilled with high plastic clay.		Is(50)=0.14 MPa Is(50)=0.09 MPa Is(50)=0.11 MPa Is(50)=0.07 MPa
	-63.45		100		Borehole terminated at 60.75m									x o x x
61														
62														
63														
64														
65														

BOREHOLE WITH LITHOLOGY MEERA PIER 7 BOREHOLES-GATEWAY BRIDGE - GATEWAY UPGRADE PROJECT.GPJ ENGINEERING BOREHOLE 09_04.GDT 31/08/05

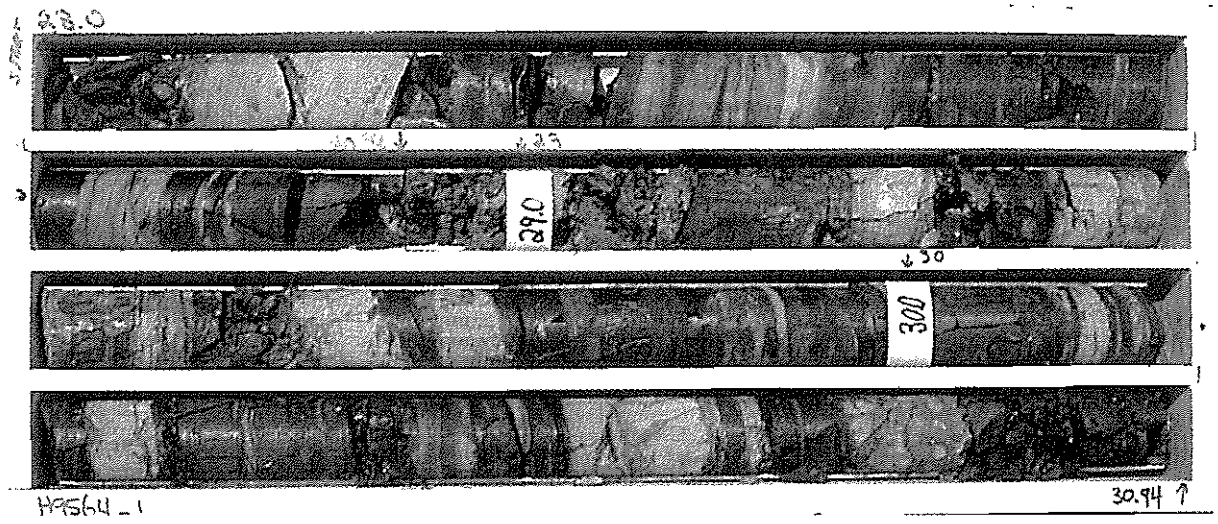
REMARKS SPT N values in gravel can overestimate density due to influence of coarser size gravel particles. This borelog should be read in conjunction with the appropriate Defect Description Sheets. Defect angles were measured with respect to a horizontal plane.

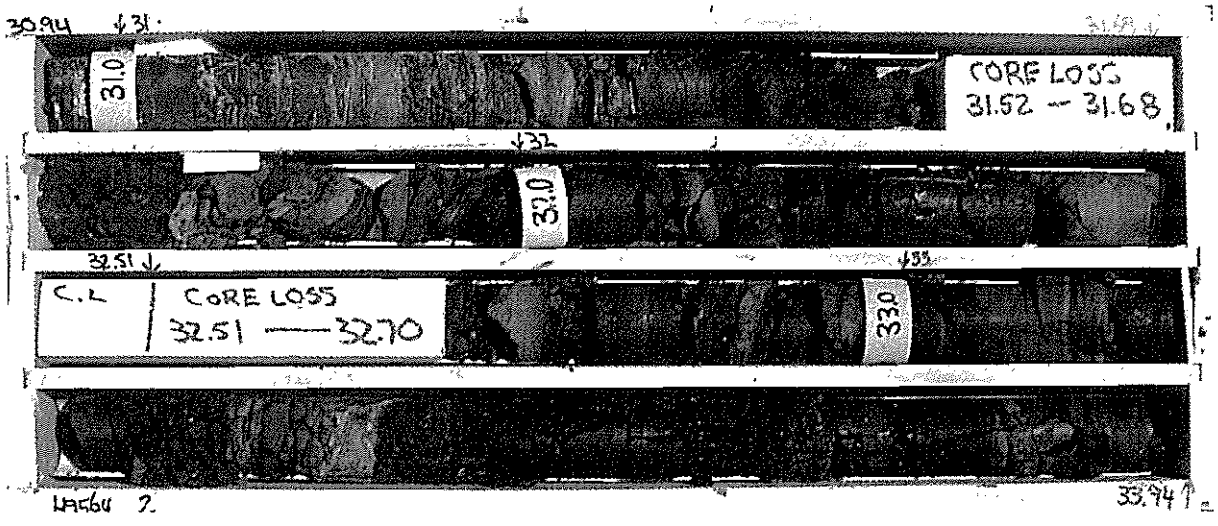
LOGGED BY
A. DISSANAYAKE (DISS)

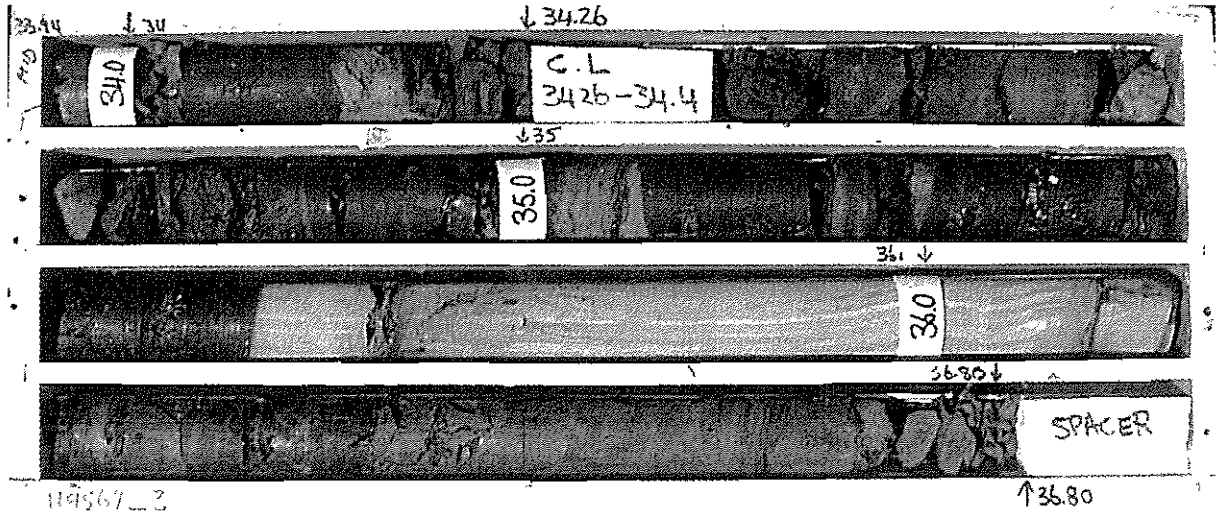
Project: **Gateway Upgrade Project - Gateway Bridge**

Borehole No: **BH 15**

Start Depth: 28.00m
Finish Depth: 60.75m
Project No: FG 5388
H No: 9564



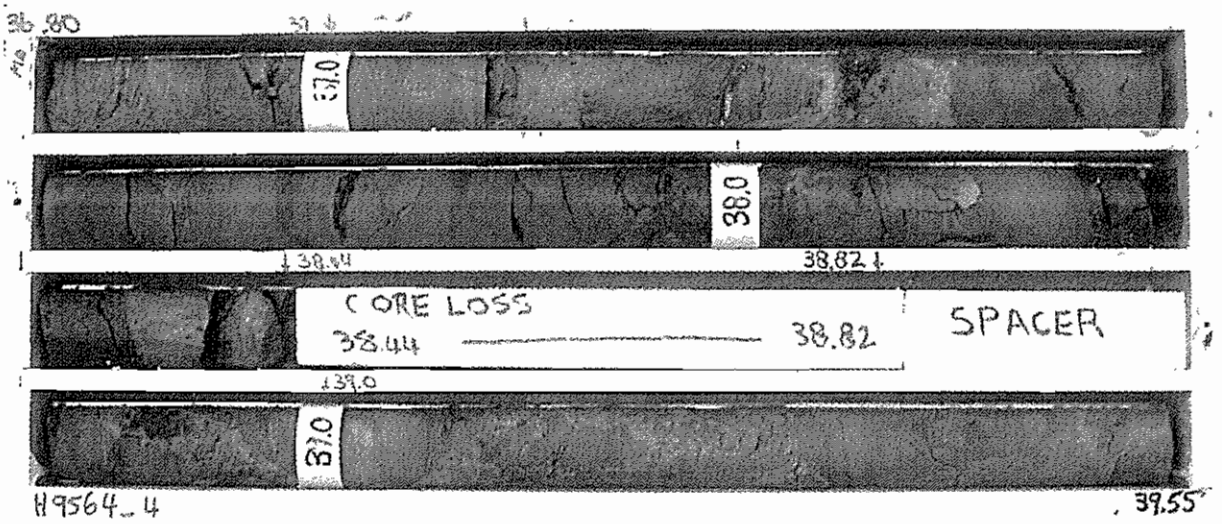


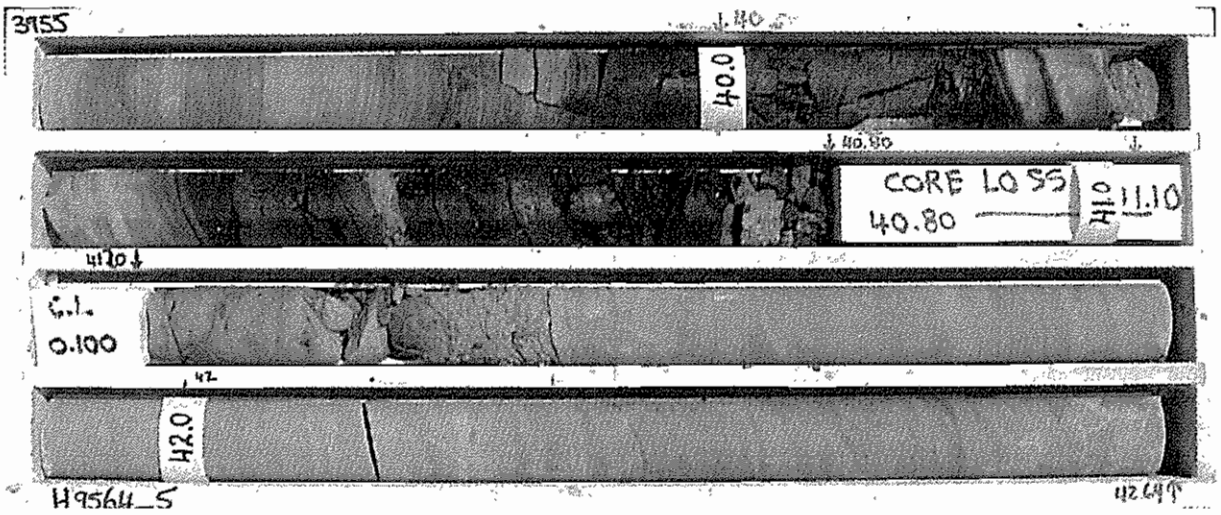


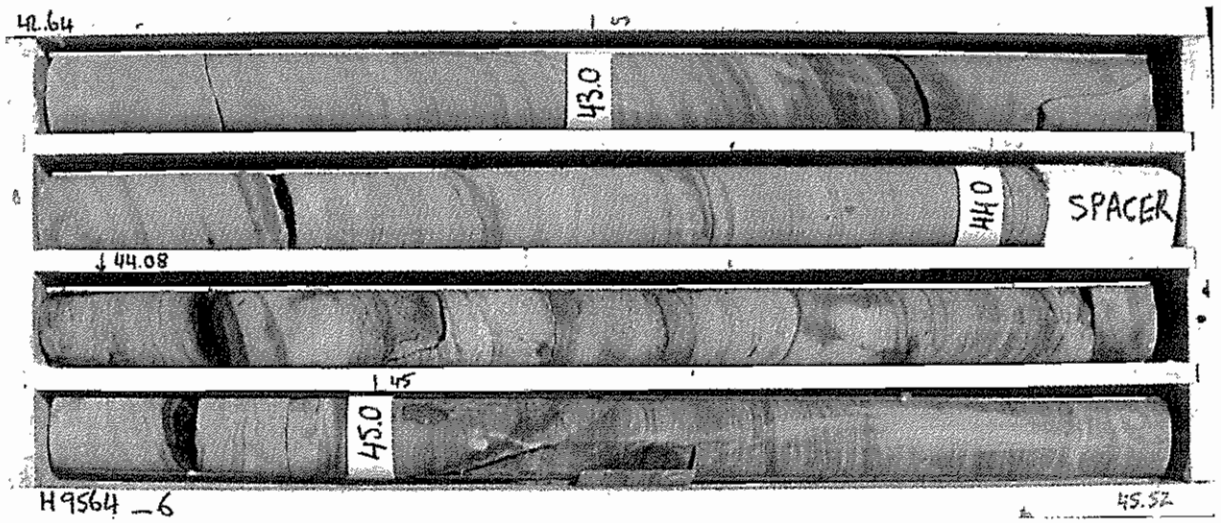
Project: **Gateway Upgrade Project - Gateway Bridge**

Borehole No: **BH 15**

Start Depth: 28.00m
Finish Depth: 60.75m
Project No: FG 5388
H No: 9564



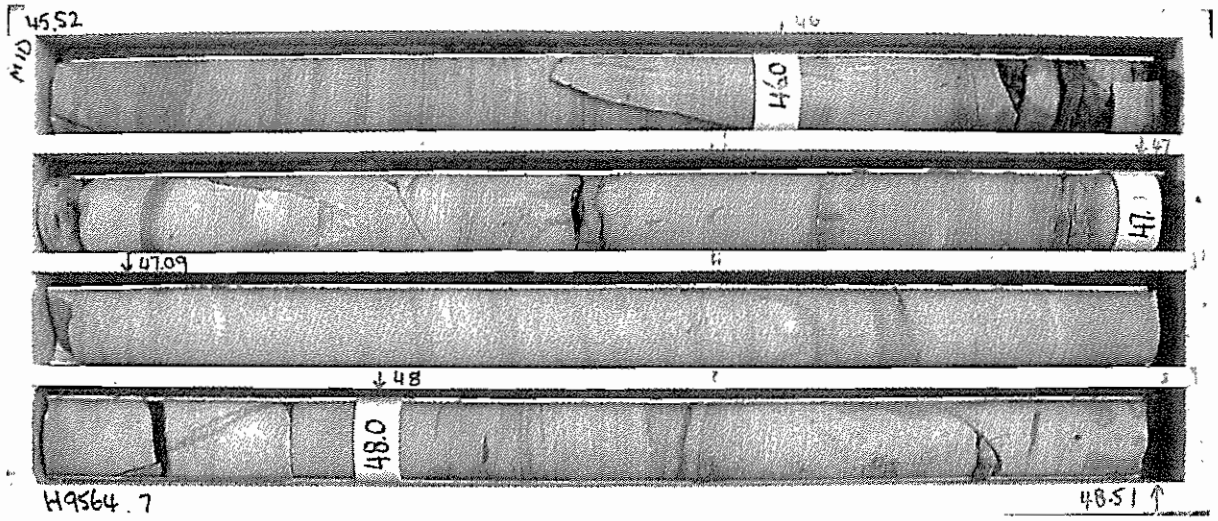


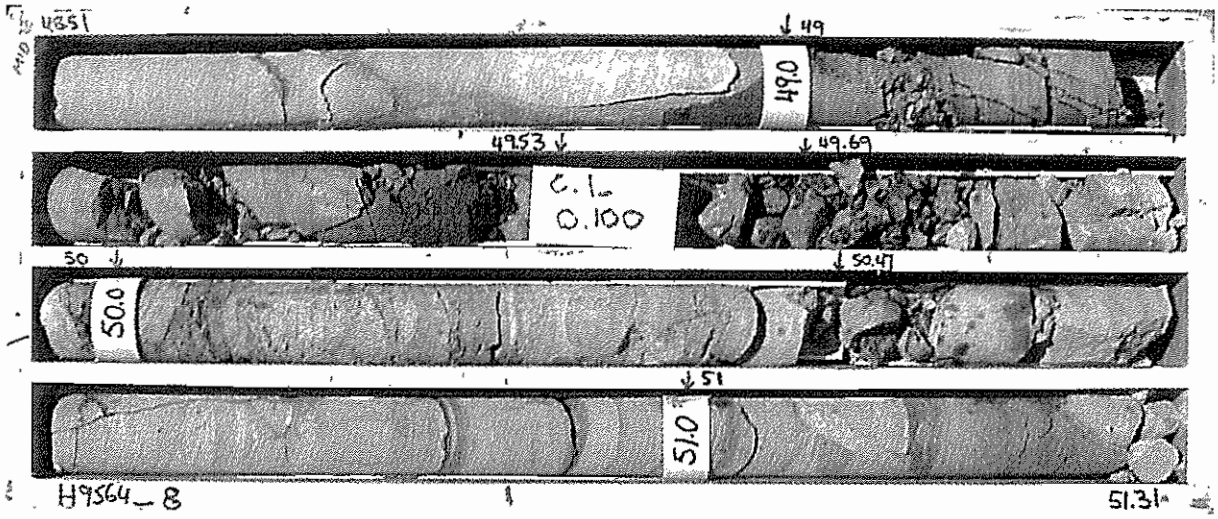


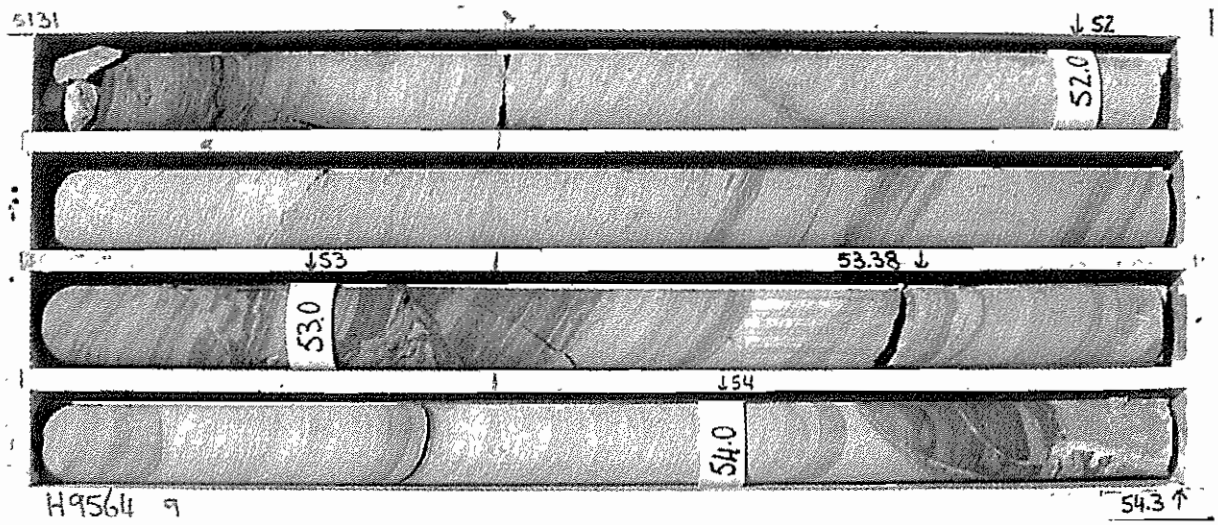
Project: **Gateway Upgrade Project - Gateway Bridge**

Borehole No: **BH 15**

Start Depth: 28.00m
Finish Depth: 60.75m
Project No: FG 5388
H No: 9564



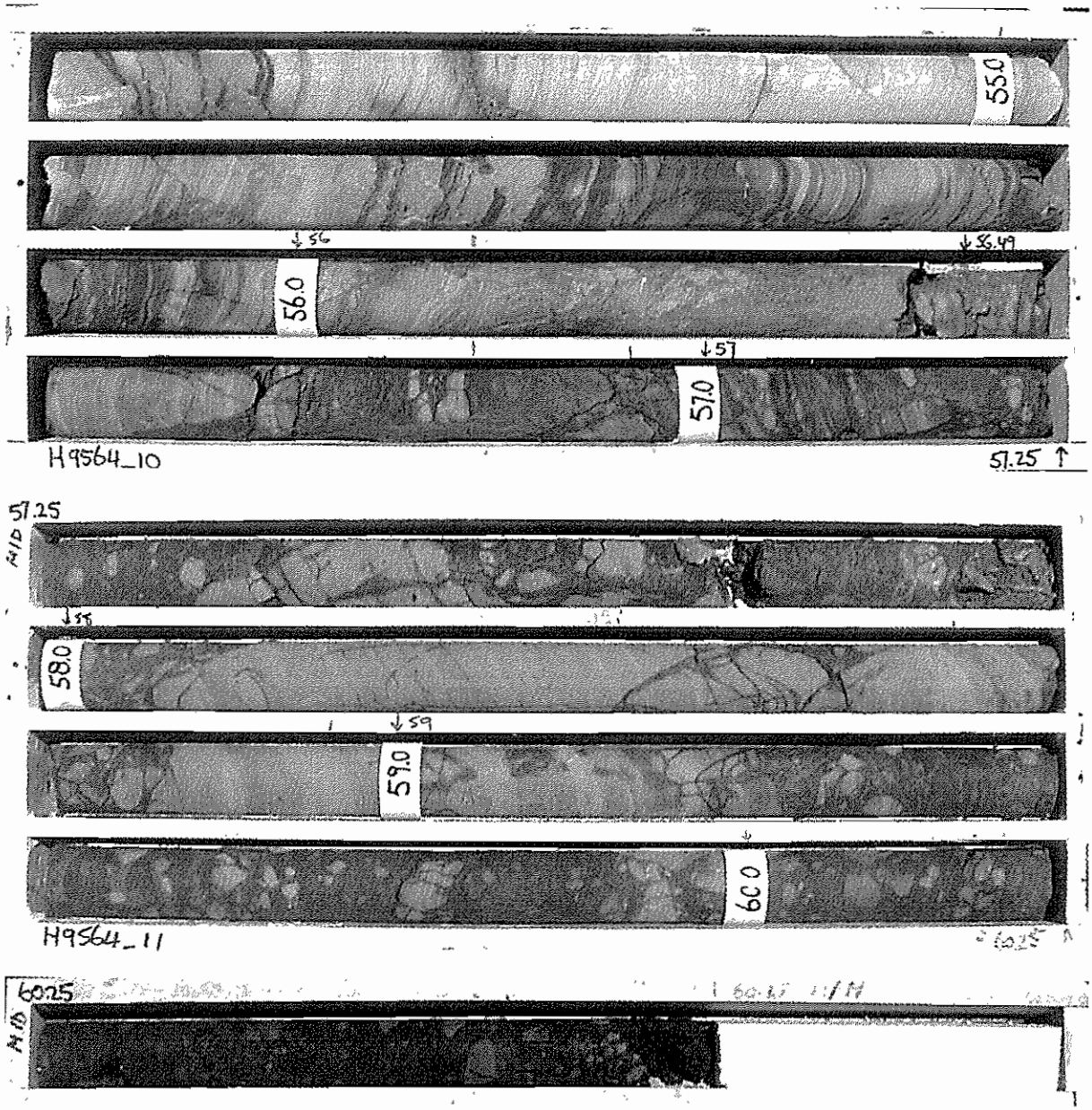




Project: **Gateway Upgrade Project - Gateway Bridge**

Borehole No: **BH 15**

Start Depth: 28.00m
Finish Depth: 60.75m
Project No: FG 5388
H No: 9564



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	: BH15
SHEET	: 1 of 7
REFERENCE NO	: H9564

PROJECT : GATEWAY UPGRADE PROJECT – GATEWAY BRIDGE DUPLICATION FOUNDATION INVESTIGATION

LOCATION : PIER 7 – SOUTHERN FACE OF PILE CAP – DOWNSTREAM/RIGHT HAND SIDE

PROJECT NO : FG5388 SURFACE R.L : -2.70 DRILLER : CAIRNS DRILLING PTY LTD

JOB NO : DATUM : AHD DATE DRILLED : 11-14/4/05

DEPTH	DEFECT TYPE	DIP	PLANARITY	ROUGHNESS	APERTURE	WALL ALTERATION	OTHER
28.00-28.10	BZ	-	-	-	O	Cn	
28.17	LP	25°	CHR	5	C	Cn	
28.25-28.30	BZ	-	-	-	O		Parallel to LP
28.33	LP	10°	St	R	O	Cn	
28.37	LP	15°	P	S	O	Cn	
28.58	LP	10°	P	S	O	Cn	
28.87	LP	<10°	P	S	O	Cn	
28.92-28.97	WS	-	-	-	O	W	
28.05-29.11	CZ				O	W	Parallel to LP
29.20	LP	<10°	P	S	C	Cn	
29.25	LP	<10°	P	S	O	Cn	
29.27-29.31	BZ	-			O	Cn	
29.30	Fr	80° -90°	Cu	-	C		
29.56-29.61	WS					W	
29.74	LP	<15°	P	S	C	Cn	DI
29.77	LP	<15°	P	S	C		DI
30.28-30.29	WS	-	-	-	O		CI
30.39.30.43	BZ	-	-	-	O	Cn	Parallel to LP
30.50	LP	10°	P	S	C	Cn	DI
30.53	LP	10°	P	S	C	Cn	DI
30.66	LP	10°	P	S	C	Cn	DI
30.69	LP	10°	P	S	C	Cn	DI

Abbreviations

ROUGHNESS		WALL ALTERATIONS		TYPE		OTHER	
R	Rough	FeSt	Iron Stained	J	Joint	P	Partly
Sm	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
Pl	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	DI	Drilling Induced

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	: BH15
SHEET	: 2 of 7
REFERENCE NO	: H9564

PROJECT : GATEWAY UPGRADE PROJECT – GATEWAY BRIDGE DUPLICATION FOUNDATION INVESTIGATION

LOCATION : PIER 7 – SOUTHERN FACE OF PILE CAP – DOWNSTREA/ RIGHT HAND SIDE

PROJECT NO : FG5388 SURFACE R.L : -2.70 DRILLER : CAIRNS DRILLING PTY LTD

JOB NO : DATUM : AHD DATE DRILLED : 11-14/4/05

DEPTH	DEFECT TYPE	DIP	PLANARITY	ROUGHNESS	APERTURE	WALL ALTERATION	OTHER
30.78	J	30°	P	S	C	Cn	
30.80	LP	<10°	P	-	-	-	
30.83-30.87	BZ	-	-	-			DI, parallel to LP
31.10	LP	<10°	P	S	C	Cn	DI
31.23	LP	<10°	P	S	C	Cn	DI
31.30-31.33	BZ	-	-	-	O		Parallel to LP
31.40-31.52	BZ	-	-	-	O		
31.52-31.68							Coreloss
31.68-31.80	WS	-	-	-	-	W	Parallel to LP
32.08-32.24	BZ	-	-	-	-		
32.51-32.70							Coreloss
32.70-32.95	BZ	-	-	-	O		
33.33-33.67	WS	-	-	-	-	W	
34.00-34.26	WS	-	-	-	-	W	
34.26-34.4	-	-	-	-	-	-	Coreloss
34.40-34.47	WS					W	
34.50	LP		St	R	-	Cn	DI
34.57	LP	20°	P	S	C	Cn	
34.72	LP	<10°	P	R	C	Cn	DI
34.76	LP	<10°	P	R	C	Cn	DI
34.80	LP	<10°	P	R	O	Cn	
34.88	LP	<10°	P	R	O	Cn	

Abbreviations

ROUGHNESS		WALL ALTERATIONS		TYPE		OTHER	
R	Rough	FeSt	Iron Stained	J	Joint	P	Partly
Sm	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
Pl	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	DI	Drilling Induced

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	: BH15
SHEET	: 3 of 7
REFERENCE NO	: H9564

PROJECT : GATEWAY UPGRADE PROJECT – GATEWAY BRIDGE DUPLICATION FOUNDATION INVESTIGATION

LOCATION : PIER 7 – SOUTHERN FACE OF PILE CAP – DOWNSTREAM/RIGHT HAND SIDE

PROJECT NO : FG5388 SURFACE R.L : -2.70 DRILLER : CAIRNS DRILLING PTY LTD

JOB NO : DATUM : AHD DATE DRILLED : 11-14/4/05

DEPTH	DEFECT TYPE	DIP	PLANARITY	ROUGHNESS	APERTURE	WALL ALTERATION	OTHER
34.95-34.98	BZ	-	-	-	O		
35.20	LP	<5°	P	S	C	Cn	DI
35.23-35.26	WS	-	-		O	W	
35.35	LP	<00°	P	R	-	Cn	
35.40-35.43	WS	-	-	-	O	W	
35.50	LP	20°	P	S	C	Cn	DI
35.57	BP	20°	P	S	T	Cn	DI
35.65	LP	<20°	P	R	O	W	
36.12	LP	<20°	Un	R	C	Cn	DI
36.95	LP	<5°	P	S	T	-	-
37.10-37.25	CB						
37.24	LP	<10°	Un	-	T		Co
37.27	LP	<10°					Co
37.30-37.40	CB		-	-	-		
37.47	LP	<20°	P	-	-		
37.75	LP	<20°	Un	S	-		DI
37.90-38.05	WS	-	-	-	T	-	-
38.05-38.10	CB	-	-	-	-	-	
38.12-38.44	CB	-	-	-	-	-	
38.44-38.82	-	-	-	-	-	-	Coreloss
38.95-38.99	CB	60°	P	-	T		
39.07-39.30	CS	-	-	-	O	-	Cl

Abbreviations

ROUGHNESS		WALL ALTERATIONS		TYPE		OTHER	
R	Rough	FeSt	Iron Stained	J	Joint	P	Partly
Sm	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
Pl	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	DI	Drilling Induced

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	: BH15
SHEET	: 4 of 7
REFERENCE NO	: H9564

PROJECT : GATEWAY UPGRADE PROJECT – GATEWAY BRIDGE DUPLICATION FOUNDATION INVESTIGATION

LOCATION : PIER 7 – SOUTHERN FACE OF PILE CAP – DOWNSTREAM/RIGHT HAND SIDE

PROJECT NO : FG5388 SURFACE R.L : -2.70 DRILLER : CAIRNS DRILLING PTY LTD

JOB NO : DATUM : AHD DATE DRILLED : 11-14/4/05

DEPTH	DEFECT TYPE	DIP	PLANARITY	ROUGHNESS	APERTURE	WALL ALTERATION	OTHER
39.49-39.52	CB	70°	Un	-	T	-	-
36.20-36.28	CB	0°	-	-	-	-	
36.32-36.35	CB	0°	-	-	-	-	
36.70-36.80	WS	-	-	-	-		
39.90	BP	15°	P	S	C		DI
39.90	J	60°		R	C		DI
40.00-40.05	WS	-	Ir	-		W	
40.14-40.18	BZ	-	-	-	O		
40.38	BP	20°	-	S	C		DI
40.35-40.50	WS/BZ		P	-	O	W	
40.80-41.10							Coreloss
41.35-44.46	WS/BZ		-	-		W	
42.0	LP	10°	-	R	C		DI
42.74	LP	20°	P	S	C		DI
43.2	LP	30°	P	S	C		DI
43.55	LP	30°	P	S	C		
44.15	LP	25°	P	S	C		
44.30	FR	45°	Ir	R			DI
44.37	LP	25°	P	R			DI
44.44	LP	25°	P	-	T		
44.72	LP	<10°	St	R	C		

Abbreviations

ROUGHNESS		WALL ALTERATIONS		TYPE		OTHER	
R	Rough	FeSt	Iron Stained	J	Joint	P	Partly
Sm	Smooth	W	Weathered	B	Bedding	CL	Carbonaceous lamination
SL	Slickensided	SM	Secondary Mineralisation	BP	Bedding Parting	Co	Coal seam
				CB	Clay Band	In	Incipient
PLANARITY		APERTURE		LP	Lamination Parting	SI	Sand Infill
Pl	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	DI	Drilling Induced

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	: BH15
SHEET	: 5 of 7
REFERENCE NO	: H9564

PROJECT : GATEWAY UPGRADE PROJECT – GATEWAY BRIDGE DUPLICATION FOUNDATION INVESTIGATION

LOCATION : PIER 7 – SOUTHERN FACE OF PILE CAP – DOWNSTREAM/RIGHT HAND SIDE

PROJECT NO : FG5388 SURFACE R.L : -2.70 DRILLER : CAIRNS DRILLING PTY LTD

JOB NO : DATUM : AHD DATE DRILLED : 11-14/4/05

DEPTH	DEFECT TYPE	DIP	PLANARITY	ROUGHNESS	APERTURE	WALL ALTERATION	OTHER
44.86	LP	15°	P	S	C		DI
44.97	LP	20°	P	S	C		DI
45.15	J	80°	P	R	C		
45.85-46.00	J	75°	Un	R	C		DI
46.12-46.30	BZ	-	-	-	C		DI
46.35	J	80°-90°	Un	R	C		DI
46.62	LP	<10°	Un	R	C		DI
46.78	LP	<10°	P	S	T		DI
46.94-46.97	WS	15°	-		C		
47.85	LP	25°	P	S	C		
48.40	J	35°	P	R	T		DI
48.64	Fr	-	Ir	-	T		DI
48.70	Fr	-	Ir	-	T		DI
48.85-48.95	Fr	75°-90°		-	T		DI
49.07-49.12	WS	-	-			W	Parallel to LP
49.12-49.30	BZ	-	-				DI
49.40-49.47	WS		-	-		W	-
49.53-49.85	WS/BZ	-	-	-	-	W	CI
49.97-49.98	CS						CI
50.03-50.30	SZ/BrZ	-	-	-	-	-	Healed
50.34-50.54	BZ	-	-	-	O	-	
50.60	LP	-	-	-			DI

Abbreviations

ROUGHNESS		WALL ALTERATIONS		TYPE		OTHER	
R	Rough	FeSt	Iron Stained	J	Joint	P	Partly
Sm	Smooth	W	Weathered	B	Bedding	CL	Carbonaceous lamination
SL	Slickensided	SM	Secondary Mineralisation	BP	Bedding Parting	Co	Coal seam
				BrZ	Brecciated Zone	In	Incipient
PLANARITY		APERTURE		LP	Lamination Parting	SI	Sand Infill
Pl	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	DI	Drilling Induced

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	: BH15
SHEET	: 6 of 7
REFERENCE NO	: H9564

PROJECT : GATEWAY UPGRADE PROJECT – GATEWAY BRIDGE DUPLICATION FOUNDATION INVESTIGATION

LOCATION : PIER 7 – SOUTHERN FACE OF PILE CAP – DOWNSTREAM/RIGHT HAND SIDE

PROJECT NO : FG5388 SURFACE R.L : -2.70 DRILLER : CAIRNS DRILLING PTY LTD

JOB NO : DATUM : AHD DATE DRILLED : 11-14/4/05

DEPTH	DEFECT TYPE	DIP	PLANARITY	ROUGHNESS	APERTURE	WALL ALTERATION	OTHER
50.65	J	70°	P	R	C		DI
50.85	BP	30°	P	S	C		DI
50.90	BP	30°	P	S	C		DI
51.04	LP	30°	P	R	C		DI
51.07-51.10	Fu	60°	P		T		
51.27	J	60°	P	R	C		DI
51.31-51.35	BZ				T		DI
51.35-51.47	SZ		-	-	T		
51.47	J	45°	P	R	T		DI
51.62	Fr	<5°	P	R	T		DI
51.80	J	60°	P	-	C		
52.21	J	35°	P	-	T		DI, Cv
52.50	BP	30°	P	-	T		DI
52.93	J/Fu	45°	P	-	T	-	
53.09	J	45°	P	-	T		
53.13	J/Fu	45°	St	-	T		DI
53.38	Fr	<20°	St	R	C		DI
53.80	LP	35°	P	S	T		DI
54.10-54.45	SZ	-		-	T		
54.60-54.62	SZ	50°	-	-	T		
54.83	LP	30°	P	-	T		DI
54.90	J	45°	Un	-	T		

Abbreviations

ROUGHNESS		WALL ALTERATIONS		TYPE		OTHER	
R	Rough	FeSt	Iron Stained	J	Joint	P	Partly
Sm	Smooth	W	Weathered	B	Bedding	CL	Carbonaceous lamination
SL	Slickensided	SM	Secondary Mineralisation	Fu	Fault	Cv	Calcite Vein
				BrZ	Brecciated Zone	In	Incipient
PLANARITY		APERTURE		LP	Lamination Parting	SI	Sand Infill
Pl	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	DI	Drilling Induced

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	: BH15
SHEET	: 7 of 7
REFERENCE NO	: H9564

PROJECT : GATEWAY UPGRADE PROJECT – GATEWAY BRIDGE DUPLICATION FOUNDATION INVESTIGATION

LOCATION : PIER 7 – SOUTHERN FACE OF PILE CAP – DOWNSTREAM/RIGHT HAND SIDE

PROJECT NO : FG5388 SURFACE R.L : -2.70 DRILLER : CAIRNS DRILLING PTY LTD

JOB NO : DATUM : AHD DATE DRILLED : 11-14/4/05

DEPTH	DEFECT TYPE	DIP	PLANARITY	ROUGHNESS	APERTURE	WALL ALTERATION	OTHER
55.05-55.65	BrZ		-	-	C		
55.49	CS		-	-	-	-	Parallel to LP
55.65-57.45	BrZ		-	-	O-C		Healed
57.69-58.10	BrZ	-	-	-	C		CI
58.35	J	60°	St	-	C		CI
58.45	J	40°	St	-	C		CI
58.46	J	40°	St	-	C		CI
58.55	J	80°-90°	P	R	C		
58.75-58.85	BrZ	-	-	-	C		CI
59.02	J	30°	St	-	T	DI	
59.25-60.75	BrZ		-	-	C	-	

Abbreviations

ROUGHNESS		WALL ALTERATIONS		TYPE		OTHER	
R	Rough	FeSt	Iron Stained	J	Joint	P	Partly
Sm	Smooth	W	Weathered	B	Bedding	CL	Carbonaceous lamination
SL	Slickensided	SM	Secondary Mineralisation	BP	Bedding Parting	Co	Coal seam
				BrZ	Brecciated Zone	In	Incipient
PLANARITY		APERTURE		LP	Lamination Parting	SI	Sand Infill
Pl	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	DI	Drilling Induced

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