Queensland Government
Department of Main Roads

ENGINEERING BOREHOLE

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

BOREHOLE No BH23
SHEET 1 of 5
REFERENCE No H9572

PROJECT GATEWAY BRIDGE DUPLICATION FOUNDATION INVESTIGATION - GATEWAY UPGRADE PROJECT
LOCATION PIER 11 - DOWN STREAM END
COORDINATES 10048.2 E; 168279.2 N
PROJECT No FG5388
SURFACE R.L. 4.13
DATE STARTED 16/2/05
DATUM SETP
JOB No
DATUM AHD
DATE COMPLETED 18/2/05
DRILLER R&D DRILLING PTY LTD

DEPTH (m)	R.L (m)	MATERIAL DESCRIPTION	USC	WEATHERING	INTACT STRENGTH (EH VH H M L VL EL)	DEFECT SPACING (mm) (20 60 200 600 2000)	ADDITIONAL DATA AND TEST RESULTS	SAMPLES TESTS
0	4.13	**ESTUARINE WEATHERED OC CRUST** Dark grey to mottled grey, slightly moist to mainly dry, stiff silty clay. Some organics in the upper area.	OL				▽ 18/02/05 1,3,7 N=10	SPT
2.53		**ESTUARINE SILTY CLAY** Dark grey to black, moist, very soft to soft. High plasticity.	OH				RW,-,1 N<1	SPT
							RW,-,- N<1	SPT
-0.87		**ALLUVIAL SAND** Grey brown to brown, wet, medium dense becoming loose with depth. Medium grained sand, some shell fragments.	SP				4,5,6 N=11	SPT
							1,6,4 N=10	SPT
-5.87							3,2,3 N=5	SPT

AUGER / CASING / WASH BORING / CORE DRILLING
RQD ( )% CORE REC %
SAMPLE
LITHOLOGY
GRAPHIC LOG

BOREHOLE WITH LITHOLOGY 24_5_2005 - NORTHERN APPROACH PIERS AND ABUTMENT BOREHOLES.GPJ ENGINEERING BOREHOLE 09_04.GDT 31/8/05

REMARKS SPT N values in clayey gravel can overestimate density due to influence of coarser size gravel particles. 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 BH23
SHEET 2 of 5
REFERENCE No H9572

PROJECT GATEWAY BRIDGE DUPLICATION FOUNDATION INVESTIGATION - GATEWAY UPGRADE PROJECT
LOCATION PIER 11 - DOWN STREAM END
COORDINATES 10048.2 E; 168279.2 N
PROJECT No FG5388
SURFACE R.L. 4.13
DATE STARTED 16/2/05
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JOB No
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DATE COMPLETED 18/2/05
DRILLER R&D DRILLING PTY LTD

DEPTH (m)	R.L. (m)	AUGER / 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
10	-5.87				**ALLUVIAL SAND** Becoming very loose along the profile.		SP					1,1,2 N=3	SPT
11													
	-7.37				**SILTY SAND / SANDY SILT** Grey brown to brown, wet, becoming very loose. Fine to medium grained sand.		SM					RW,-,- N<1	SPT
12													
13												RW,-,- N<1	SPT
	-9.87				**ESTUARINE SILTY CLAY** Dark grey to black, moist, very soft.		OH						
14												RW,-,- N<1	SPT
15													
	-11.37				**SILTY SAND** Grey brown to brown, wet, mainly very loose. Fine grained sand, minor shell content.		SM					1,RW,- N<1	SPT
16													
17												1,RW,- N<1	SPT
18													
	-14.37				**SILTY SAND / SAND** Dark grey to dark brown, wet, medium dense, becoming loose with depth.		SM-SP						
19												6,7,7 N=14	SPT
20	-15.87												

BOREHOLE WITH LITHOLOGY 24_5_2005 - NORTHERN APPROACH PIERS AND ABUTMENT BOREHOLES.GPJ ENGINEERING BOREHOLE 09_04.GDT 31/8/05

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BOREHOLE No BH23
SHEET 3 of 5
REFERENCE No H9572

PROJECT GATEWAY BRIDGE DUPLICATION FOUNDATION INVESTIGATION - GATEWAY UPGRADE PROJECT
LOCATION PIER 11 - DOWN STREAM END
COORDINATES 10048.2 E; 168279.2 N
PROJECT No FG5388
SURFACE R.L. 4.13
DATE STARTED 16/2/05
DATUM SETP
JOB No
DATUM AHD
DATE COMPLETED 18/2/05
DRILLER R&D DRILLING PTY LTD

DEPTH (m)	R.L. (m)	AUGER / 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	-15.87				**SILTY SAND / SAND** As above. Frequent very loose interbeds, fine sand becoming medium with depth.							4,5,6 N=11	SPT
21													
22												RW,-,1 N<1	SPT
23													
24												1,2,6 N=8	SPT
25							SM-SP					RW,-,- N<1	SPT
26													
27												5,4,1 N=5	SPT
28													
29												5,8,2 N=10	SPT
30	-25.87											1,5,2 N=7	SPT

BOREHOLE WITH LITHOLOGY 24_5_2005 - NORTHERN APPROACH PIERS AND ABUTMENT BOREHOLES.GPJ ENGINEERING BOREHOLE 09_04.GDT 31/8/05

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BOREHOLE No BH23
SHEET 4 of 5
REFERENCE No H9572

PROJECT GATEWAY BRIDGE DUPLICATION FOUNDATION INVESTIGATION - GATEWAY UPGRADE PROJECT
LOCATION PIER 11 - DOWN STREAM END
COORDINATES 10048.2 E; 168279.2 N
PROJECT No FG5388
SURFACE R.L. 4.13
DATE STARTED 16/2/05
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JOB No
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DRILLER R&D DRILLING PTY LTD

DEPTH (m)	R.L. (m)	AUGER / 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	-25.87				**SAND AND GRAVEL** Grey to grey brown, wet, medium dense. Sub-angular to sub-rounded quartzitic and lithic fragments sizing up to 50mm.		GP-GM					Gravel band	
31												8,8,5 N=13	SPT
32												Gravel band	
33												5,6,6 N=12	SPT
34												26,22,19 N=41	SPT
35	-30.87				**GRAVELLY SANDY CLAY** Brown, moist, hard. Sub-angular to sub-rounded quartzitic and lithic fragments up to 50mm.		CL						9,8,12 N=20	SPT
36													
37	-32.87				**SANDSTONE** HW : Generally exhibits engineering properties of orange to green, moist, very dense silty sand.		HW					20,30/95,- N>50	SPT
38	-33.87				**MUDSTONE** HW: Dark grey to black, slightly moist, hard silty clay. Highly fissured with some cubic structures.		HW					30/125,-,- N>50	SPT
39													
40	-35.37 -35.87		(25)		**INTERBEDDED SANDSTONE & MUDSTONE** SW : (See below).		SW						

BOREHOLE WITH LITHOLOGY 24_5_2005 - NORTHERN APPROACH PIERS AND ABUTMENT BOREHOLES.GPJ ENGINEERING BOREHOLE 09_04.GDT 31/8/05

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BOREHOLE No BH23
SHEET 5 of 5
REFERENCE No H9572

PROJECT GATEWAY BRIDGE DUPLICATION FOUNDATION INVESTIGATION - GATEWAY UPGRADE PROJECT
LOCATION PIER 11 - DOWN STREAM END COORDINATES 10048.2 E; 168279.2 N
PROJECT No FG5388 SURFACE R.L. 4.13 DATE STARTED 16/2/05 DATUM SETP
JOB No DATUM AHD DATE COMPLETED 18/2/05 DRILLER R&D DRILLING PTY LTD

DEPTH (m)	R.L. (m)	AUGER / 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	-35.87				**INTERBEDDED SANDSTONE & MUDSTONE** SW : Pale grey to black, laminated and bedded, low to medium strength with occasional high strength bands. Defects - Frequent lamination partings 30°-60° (5-10/m). - Joints @ 80° (1/m). - Broken zones <100mm.		SW					Is(50)=0.45 MPa Is(50)=0.74 MPa		x o
			100 (38)									Is(50)=0.83 MPa Is(50)=1.09 MPa		o x
41												Is(50)=0.24 MPa		x
	-37.37		100 (60)		Core has been generally broken between 40.80m and 41.5m									
					SANDSTONE FINE TO MEDIUM GRAINED, LAMINATED SEDIMENTARY ROCK. SW : Pale grey to white, low to medium strength. Defects - Joints at 50-60° (2-3/m). - Joints at 80° (1/m). - Some mudstone (<50mm) interbeds.		SW					Is(50)=0.58 MPa Is(50)=0.16 MPa		x o
42	-38.47		100 (32)									Is(50)=0.87 MPa		o
43					**MUDSTONE** FINE GRAINED THINLY LAMINATED SEDIMENTARY ROCK. MW : Dark grey to black, thinly laminated, nearly brown, very low to low strength. Occasional high strength sandstone interbeds up to 200mm. Defects - Frequent lamination partings 35° (>10/m). - Broken and weak zones >0.5m.							High strength sandstone interbed	Is(50)=2.75 MPa Is(50)=1.93 MPa		x o
			100 (16)											
44			100 (50)				MW					High strength sandstone interbed		
45			100 (0)		Core has been generally broken and altered throughout.							High strength sandstone interbed		
	-41.67		72		Becoming very weak below 45.10m.							Very low to low strength rock kernels in high plastic clay		
46			(88)		**SANDSTONE** MEDIUM TO COARSE GRAINED, MASSIVE CALCAROUSLY CEMENTED SEDIMENTARY ROCK. SW : Pale grey to white, mainly medium to high strength.		SW					Broken zone Is(50)=1.52 MPa Is(50)=0.46 MPa Is(50)=0.74 MPa		x o x
	-42.67		100									Broken zone Is(50)=0.58 MPa Is(50)=0.85 MPa		o x
47					Defects - Joints at 50° (2-3/m). - Broken zones <100mm.							Is(50)=0.61 MPa		o
					Borehole terminated at 46.8m									
48														
49														
50														

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A. DISSANAYAKE (DISS)

Project: **Gateway Bridge Duplication Investigation**

Borehole No: **BH 23**

Start Depth: **39.50m**
Finish Depth: 46.80m
Project No: FG5388
H No: 9464