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## ENGINEERING BOREHOLE

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

BOREHOLE No BH113  
SHEET 1 of 4  
REFERENCE No H9422

PROJECT GATEWAY UPGRADE PROJECT GEOTECHNICAL INVESTIGATION - NORTHERN SECTION  
LOCATION CONTROL LINE: MCAO - Ch. 20766 - OFFSET 5.2 L COORDINATES 8794.9 E; 171214.3 N  
PROJECT No FM2055 SURFACE R.L. 2.89 DATE STARTED 22/7/04 DATUM SETP  
JOB No                      DATUM AHD DATE COMPLETED 22/7/04 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					DEFECT SPACING (mm)	GRAPHIC LOG	ADDITIONAL DATA AND TEST RESULTS	SAMPLES TESTS
									q <sub>t</sub>	f <sub>cd</sub>	f <sub>ci</sub>	f <sub>cu</sub>	f <sub>cl</sub>				
0	2.89					<b>GRAVELLY CLAY - FILL</b> Grey brown to brown, moist, stiff to very stiff clay comprising rock fragments sizing up to 30mm.		CL									
1																	
2	1.19					<b>ESTUARINE (??) SILTY CLAY / FILL (??)</b> Grey brown to orange, moist, soft to mainly firm.  Becoming slightly sandy with depth.  Highly organic.		OH								7/9/04 6/10/04 Possible hydraulically placed deposit.	4,10,13 N=23 SPT
3																	
4	-1.11					<b>ESTUARINE (??) SILTY / CLAYEY SAND / FILL (??)</b> Dark grey to brown, moist, very loose.  Fine to medium grained sand.  Becoming wet and coarse grained sand with depth.		SM-SC									1,-1 N<1 SPT
5																	
6	-3.51																1,1,1 N=2 SPT
7						<b>ESTUARINE SILTY CLAY</b> Dark grey, moist, firm, sensitive.  Highly organic.		OH									
8																	U50
9																	FSV
10	-7.11																

REMARKS Defect angles have been measured with respect to a horizontal plane.

LOGGED BY  
B.Woodgate & A.Dissanayake



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## ENGINEERING BOREHOLE

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BOREHOLE No BH113

SHEET 2 of 4

REFERENCE No H9422

PROJECT GATEWAY UPGRADE PROJECT GEOTECHNICAL INVESTIGATION - NORTHERN SECTION

LOCATION CONTROL LINE: MCAO - Ch. 20766 - OFFSET 5.2 L

COORDINATES 8794.9 E; 171214.3 N

PROJECT No FM2055 SURFACE R.L. 2.89

DATE STARTED 22/7/04

DATUM SETP

JOB No \_\_\_\_\_ DATUM AHD

DATE COMPLETED 22/7/04

DRILLER R & D Drilling Pty Ltd

DEPTH (m)	R.L. (m)	ALGER CASING WASH BORING CORE DRILLING	RQD (%)	CORE REC %	SAMPLE	MATERIAL DESCRIPTION	LITHOLOGY	USC WEATHERING EH VH H M L VL EL	INTACT STRENGTH	DEFECT SPACING (mm)	GRAPHIC LOG	ADDITIONAL DATA AND TEST RESULTS	SAMPLES TESTS
10	-7.11					ESTUARINE SILTY CLAY (As above)						PP=35kPa	U50
11													
12							OH					Peak Su=44.8kPa, Res Su=8kPa	FSV
13	-9.61					SAND / SILTY SAND - ALLUVIUM Grey brown to pale brown, wet, loose.  Coarse grained sand.							
14							SP- SM						U50
15	-11.41					SILTY CLAY - ALLUVIUM Grey brown to mottled orange, moist, firm to mainly stiff.						Gravel layer	
16							CI					2,4,6 N=10	SPT
17	-12.61					SILTY SAND - ALLUVIUM Pale grey brown to mottled orange, moist, loose to medium dense.  Fine grained sand.							
18							SM					2,3,4 N=7	SPT
19												5,6,10 N=16	SPT
20	-17.11											5,11,11 N=22	SPT

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## ENGINEERING BOREHOLE

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BOREHOLE No BH113

SHEET 3 of 4

REFERENCE No H9422

PROJECT GATEWAY UPGRADE PROJECT GEOTECHNICAL INVESTIGATION - NORTHERN SECTION

LOCATION CONTROL LINE: MCAO - Ch. 20766 - OFFSET 5.2 L COORDINATES 8794.9 E; 171214.3 N

PROJECT No FM2055 SURFACE R.L. 2.89 DATE STARTED 22/7/04 DATUM SETP

JOB No  DATUM AHD DATE COMPLETED 22/7/04 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	DEFECT SPACING (mm)	GRAPHIC LOG	ADDITIONAL DATA AND TEST RESULTS	SAMPLES TESTS
20	-17.11												
21						<b>BASALT</b> FINE TO MEDIUM GRAINED, LAYERED INTERMEDIATE TO BASIC EXTRUSIVE IGNEOUS ROCK.						30,30/110,- N>50	SPT
22						HW : Generally exhibits engineering properties of brown to dark brown, moist, very dense silty sand comprising very low to low strength corestones and rock kernels.	HW					30/110,-,- N>50	SPT
23												30/120,-,- N>50	SPT
24													
25	-21.61		(67)			<b>MW :</b> Dark red brown to blue grey, mainly massive to slightly layered, very low to low strength.  Frequent broken and highly altered and weathered zones.  Becoming massive and less weathered (blue grey) with depth.					XW seam	Is(50)=0.06 MPa	x
26			100 (0)			Defects are generally irregular to curved, open to occasionally closed, heavily altered and occasionally infilled with concordant calcite and zeolite veinlets <10mm.						Is(50)=0.17 MPa Is(50)=0.07 MPa Is(50)=0.12 MPa Is(50)=0.02 MPa	o x o x
27			100 (35)				MW				Fractured zone		
28											XW seam	Is(50)=0.01 MPa Is(50)=0.01 MPa	o x
29			100 (0)			Becoming medium to high strength below 28.0m.					Broken and altered zone		
30	-27.11		100 (100)								Broken and altered zone		

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BOREHOLE No BH113

SHEET 4 of 4

REFERENCE No H9422

PROJECT GATEWAY UPGRADE PROJECT GEOTECHNICAL INVESTIGATION - NORTHERN SECTION

LOCATION CONTROL LINE: MCAO - Ch. 20766 - OFFSET 5.2 L COORDINATES 8794.9 E; 171214.3 N

PROJECT No FM2055 SURFACE R.L. 2.89 DATE STARTED 22/7/04 DATUM SETP

JOB No                      DATUM AHD DATE COMPLETED 22/7/04 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	DEFECT SPACING (mm)	GRAPHIC LOG	ADDITIONAL DATA AND TEST RESULTS	SAMPLES	TESTS
30	-27.11					MW : (As above)							Is(50)=0.93 MPa Is(50)=0.92 MPa		
31								MW					Is(50)=0.93 MPa Is(50)=0.23 MPa		
	-28.61		100			Borehole terminated at 31.5m							Is(50)=0.52 MPa Is(50)=1.09 MPa		
32															
33															
34															
35															
36															
37															
38															
39															
40															

REMARKS Defect angles have been measured with respect to a horizontal plane.

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Project: **Gateway Upgrade Project Geotechnical Investigation**  
Borehole No: **BH 113**  
Start Depth: 24.50m  
Finish Depth: 31.50m  
Project No: FM2055  
H No: 9422

