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GEOTECHNICAL LOG OF NON-CORE DRILLHOLE

Borehole No: BH102
Sheet No: 1 OF 2
Project No: 3003659

Client: QDTMR
Project: Smith Olsen Detailed Design Geotech Investigation
Feature:
Location: Refer Location Plan
Co-ordinates System: UTM Zone 56
Easting: 534910.0m E
Northing: 6906930.0m S
Surface RL (m): 19.37
Angle from Horz: 90
Direction: n/a

DRILLING							TESTING				SUBSTANCE					
Method	Support	Rate: Fast	Rate: Medium	Rate: Slow	Water	Sample	Depth (m)	Depth/RL	Type	Sample or Field Test	Graphic Log	USC Symbol	Description Soil Type: density/consistency, grain size/plasticity, colour, particle shape/secondary components, minor constituents, moisture, origin, additional observations.	Moisture	Consistency/ Density	Other Observations
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
ATC						SPT SPT SPT	1	19.37 0.15 19.22 0.50 18.87 1.50 17.87 1.80	S S S	20,31/ 140mm N*= 66 16,30/ 85mm N*= 106 30/ 80mm N*= 113		GM	ASPHALT Silty GRAVEL: Dense, medium to coarse gravel, grey, dry, road base. Gravelly SILT: Hard, pale brown, with low to medium strength siltstone gravel, dry, possible weathered rock. Hard, fine, medium to high strength siltstone gravel.	D	D VSt H	SPT sample inconclusive (bouncing due to rock fall in).
							2 3 4 5 6 7 8 9						Refer to Geotechnical Log of Cored Drillhole			

Notes (Instrumentation etc):

Contractor: GeoDrill
Equipment: Hydropower Scout
Commenced: 12/07/11
Completed: 12/07/11
Logged By: ME/BD
Checked By: AR

Basis of description and details of abbreviations are given on explanatory notes

SMEC GOLD COAST BOREHOLE NON CORE LOG I:\PROJECTS\3003659\005_OPERATIONS\DD15 GEOTECHNICAL\INVESTIGATIONS\GINT FILES\SMITH - OLSEN BOREHOLES (CURRENT).GPJ 23/11/11

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GEOTECHNICAL INVESTIGATIONS LOG

Borehole No: BH102
Sheet No: 2 OF 2
Project No: 3003659

Client: QDTMR
Project: Smith Olsen Detailed Design Geotech Investigation **Co-ordinates System:** UTM Zone 56
Feature: **E:** 534910.0
Location: Refer Location Plan **N:** 6906930.0

Surface RL (m): 19.37
Angle from Horz: 90
Direction: n/a

DRILLING						SUBSTANCE					TEST		DEFECTS	
Method	Water	TCR %	RQD %	Lift	Depth (m)	Depth/RL	Graphic Log	Description ROCK TYPE, mineralogy, grain size, colour, fabric, etc.	Weathering EW HW MW SW FS FR	Estimated Strength EL VL L M H VH EH	Type	Result	Fracture Spacing (mm) 20 40 100 300 1000	Description Depth / Type, Orientation, Spacing, Infilling, Coating, Planarity, Roughness, Thickness.
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15 / 16
					1			Refer to Geotechnical log of Non-cored Drillhole						
						1.80		Start Coring at 1.80m						
NMLC		100	67	2.1	2	17.57 17.47		SANDSTONE: Fine grained, pale grey-brown, extremely low strength, extremely weathered.						1.90 J, 46, Ct, Cy, Cu, Vr
		100	55	2.5				SANDSTONE/SILTSTONE: Interbedded, fine grained, pale grey-brown sandstone with dark grey siltstone, trace of clay in defects, slightly fractured, high strength, moderately weathered.						2.10 J, 67, Vn, Cy, Pl, Sm 2.40 Be, 55, Ct, Cy, Pl, Sm 2.43-2.50 CZ
					3	2.98 16.39 16.32		With some unknown mineralisation ??? No mineralisation.						3.06 J, 46, St, Fe, Ir, Ro 3.18 J, 55, Vn, Fe, St, Sm 3.28 J, 43, Vn, Fe, Pl, Ro
		100	66			3.50 15.87		Fractured						3.40 Be, 55, Ct, Cl, Pl, Ro 3.50-3.60 CZ, Ct, Cl
				3.9		3.70 15.67		Slightly fractured.						3.83 J, 70, St, Fe, Ir, Ro
					4			Hole discontinued at 3.85m						3.85 Be, 55, Vn, Cl, St, Ro
					5									
					6									
					7									
					8									
					9									

Notes (Instrumentation etc):

Contractor: GeoDrill **Commenced:** 12/07/11 **Logged By:** ME/BD
Equipment: Hydropower Scout **Completed:** 12/07/11 **Checked By:** AR

Basis of description and details of abbreviations are given on explanatory notes

SMEC GOLD COAST BOREHOLE CORE LOG I:\PROJECTS\3003659\005_OPERATION\SDD15 GEOTECHNICAL\INVESTIGATION\SIGINT FILES\SMITH - OLSEN BOREHOLES (CURRENT).GPJ 23/11/11

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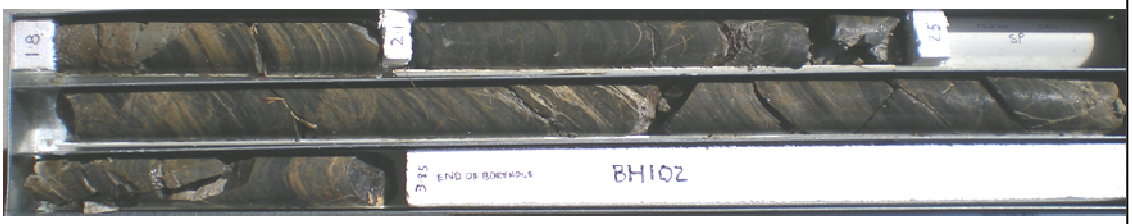
Grey Scale

Colour Scale

Borehole Number		BH102	
Box	1	of	1
Depth	1.8m	to	3.85m

Project	Smith St & Olsen Av
Number	3003659
Client	QDTMR



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Member of the Surbana Jurong Group

NOTES RELATING TO GEOTECHNICAL REPORTS AND SITE INVESTIGATION LOGS

GEOTECHNICAL REPORTS AND SITE INVESTIGATION LOGS

Geotechnical reports/logs are prepared by qualified personnel on the information supplied or obtained and are based on current engineering standards of interpretation and analysis.

Information may be gained from limited subsurface testing, surface observations, previous work, and is supplemented by knowledge of the local geology and experience of the range of properties that may exhibited by the materials present. For this reason, geotechnical reports should be regarded as interpretative rather than factual documents, limited to some extent by the scope of information on which they rely.

Where the report/log has been prepared for a specific purpose (e.g. design of a three-storey building), the information and interpretation may not be appropriate if the design is changed (e.g. a twenty-storey building). In such cases, the report/log and the sufficiency of the existing work should be reviewed by SMEC in the light of the new proposal.

Every care is taken with the report/log content; however, it is not always possible to anticipate or assume responsibility for the following conditions:

- Unexpected variations in ground conditions. The potential for this depends on the amount of investigative work undertaken.
- Changes in policy or interpretation by statutory authorities
- The actions of contractors responding to commercial pressures

If these occur, SMEC would be pleased to resolve the matter through further investigation, analysis or advice.

UNFORESEEN CONDITIONS

Should conditions encountered on site differ markedly from those anticipated from the information contained in the report/log, SMEC should be notified immediately. Early identification of site anomalies generally results in any problems being more readily resolved and allows re-interpretation and assessment of the implications for future work.

SUBSURFACE INFORMATION

Logs of a borehole, recovered core, test pit, excavated face, or cone penetration test are an engineering and/or geological interpretation of the subsurface conditions. The reliability of the logged information depends on the drilling/testing method, sampling/observation spacing's and the ground conditions. It is not always possible or economic to obtain continuous high-quality data. It should also be recognised that the volume of material observed or tested is only a fraction of the total subsurface profile.

Interpretation of subsurface information and application to design and construction must take into consideration the spacing of the test locations, the frequency of observations and testing, and the possibility that geological boundaries may vary between observation points.

Groundwater observations and measurements outside of specially designed and constructed piezometers should be treated with care for the following reasons:

- In low permeability soils groundwater may not seep into an excavation or bore in the short time it is left open.
- A localised perched water table may not represent the true water table.
- Groundwater levels vary according to rainfall events or season.
- Some drilling and testing procedures mask or prevent groundwater inflow.

The installation of piezometers and long-term monitoring of groundwater levels may be required to adequately identify groundwater conditions.