

Date 25/02/2013

# UND-MEMO-02-010

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<b>To</b>	[REDACTED] s 9(2)(a)
<b>From</b>	[REDACTED] s 9(2)(a)
<b>CC</b>	[REDACTED] s 9(2)(a)
<b>Date</b>	25/02/2013
<b>Subject</b>	Detailed Design Geotechnical Parameter Selection – Revision

## RECOMMENDED DETAILED DESIGN PARAMETERS

We have completed a review of geotechnical material strength parameters, and recommend minor changes to previous recommendations. The recommended material parameters are presented in table 1 below.

The revised parameters will be carried through to the next revision of the geotechnical interpretive report following a review of the stiffness parameters that is currently underway.

**Table 1: Recommended Design Parameters**

Design Parameters		Geological Units						
		Fill	Holocene Alluvium		Organic Layers	Pleistocene Alluvium	Residual Soil	Completely Weathered Greywacke
			East	West				
<b>Unit Weight</b>	kN/m <sup>3</sup>	19	18	18	16.5	18	18	19.5
<b>Friction Angle</b>	Mid <sup>1)</sup>		32	32	28	35	34	36
	Lower <sup>2)</sup>	28	30	28	26	32	32	35
<b>Cohesion (KPa)</b>	Mid <sup>1)</sup>		6	6	2	10	10	15
	Lower <sup>2)</sup>	4	4	4	0	4	4	10
<b>Poisson's Ratio</b>	-	0.3	0.3	0.3	0.35	0.3	-	0.3

Notes:

1) Based on laboratory testing, analysis of CPT data and SPT-N value plots

2) Based on analysis of CPT data and SPT-N value plots

## BACKGROUND

Initial design parameters were used in the concept TCE design package. These parameters were based on the site investigation data available at the time including limited laboratory testing.

Since the TCE design submission further site investigation, laboratory testing and construction works have been completed. This has provided a more extensive understanding of the geotechnical materials and their parameters. As such, it is appropriate to revise the initial parameters and conduct a more intensive analysis of the site investigation data received up to February 2013.

## DESIGN PARAMETER DISCUSSION

A design parameter workshop was held to establish revised detailed design parameters. Within this workshop, the analysis of the site investigation data was presented then compared to site observations and local project knowledge.

Design parameters are determined from a combination of:

- Analysis of CPT data
- Plotting of SPT-N values
- Laboratory testing
- Local geotechnical knowledge and project experience
- Site observations of materials during initial construction and site investigation

Where available, laboratory testing has been given heavier weighting in the assessment than less direct interpolation from the CPT and N value analysis.

Annotated graphical outputs of the CPT and SPT-N value analysis and relevant laboratory testing results are enclosed in the Appendix.

Analysis of the stiffness parameters is underway.

## APPENDICIES

UND West Alluvium CPT Geological Layers  
UND West Alluvium CPT Material Behaviour  
UND East Alluvium CPT Geological Layers  
UND East Alluvium CPT Material Behaviour  
UND Rock CPT Geological Layers  
UND Rock CPT Material Behaviour  
Borehole SPT N Values  
Borehole Materials SPT N Values  
Laboratory Testing to 14.02.2013