Appendix B

TEST PIT LOGS AND EXPLANATORY NOTES – HOLMES HUB SITE

Open Excavation Log

Test Pit No. **TP H-1**

Connell Wagner Limited
195 Hereford St. (PO Box 1061
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Telephone: +64 3 366 0821
Facsimile: +64 3 379 6955

Client: Selwyn Plantation Board Ltd	Location (measured using hand held GPS): 1547696 , 5172033		Date: 12/09/2008
Project: SPBL Rolleston Plan Change	Logged By: CG	Weather Conditions: cloudy & dry	Job Number: 36951-001

Water	Depth (m)	Soil Symbol	FACE 1 — SOIL DESCRIPTION: Colour, structure, weathering, subordinate/ main / minor COMPONENTS.
	0		Grass over sandy TOPSOIL, brown, moist.
	0 – 1.5		Sandy GRAVEL with cobbles and minor boulders. Mid brown, medium to coarse grained, rounded, gap graded, near horizontal long-axis pebble alignment. Moist.
	1.5		End of Test Pit at 1.5m (Target Depth)

Water	Depth (m)	Soil Symbol	FACE 2 — SOIL DESCRIPTION: Colour, structure, weathering, subordinate/ main / minor COMPONENTS.
	0.5		
	1		
	1.5		
	2		
	2.5		

Undrained Shear Strength (kPa) ●
Measured Using a Hand Held Shear Vane[1]
25 50 75 100 125 150

Scala Penetrometer Test[2] ×
(Blows/ 150mm)
2 4 6 8 10 12

Test Description
1 - Hand held shear vane test in accordance with BS1377:1990
2 - Scala Penetrometer Test in accordance with NZS4402:1986 for the first three meters

Notes
Groundwater not encountered
Soak test undertaken and reported separately

Pit dimensions
1.0m
2.2m

Open Excavation Log

Test Pit No. **TP H-2**

Connell Wagner Limited
195 Hereford St. (PO Box 1061
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Telephone: +64 3 366 0821
Facsimile: +64 3 379 6955

Client: Selwyn Plantation Board Ltd	Location (measured using hand held GPS): 1547734, 5171797		Date: 12/09/2008
Project: SPBL Rolleston Plan Change	Logged By: CG	Weather Conditions: cloudy & dry	Job Number: 36951-001

Water	Depth (m)	Soil Symbol	FACE 1 — SOIL DESCRIPTION: Colour, structure, weathering, subordinate/ main / minor COMPONENTS.
	0		Grass over silty TOPSOIL, brown, moist.
	0.5		Sandy GRAVEL with cobbles and minor boulders. Mid brown, medium to coarse grained, rounded, gap graded, near horizontal long-axis pebble alignment. Moist.
	1		
	1.5		End of Test pit at 1.4m (Target depth)
	2		
	2.5		

Water	Depth (m)	Soil Symbol	FACE 2 — SOIL DESCRIPTION: Colour, structure, weathering, subordinate/ main / minor COMPONENTS.
	0		
	0.5		
	1		
	1.5		
	2		
	2.5		

Undrained Shear Strength (kPa) ●
Measured Using a Hand Held Shear Vane[1]
25 50 75 100 125 150

Scala Penetrometer Test[2] ×
(Blows/ 150mm)
2 4 6 8 10 12

Test Description
1 - Hand held shear vane test in accordance with BS1377:1990
2 - Scala Penetrometer Test in accordance with NZS4402:1986 for the first three meters

Notes
Groundwater not encountered
Soak test undertaken and reported separately

Pit dimensions
1.0m
2.0m

Connell Wagner

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Open Excavation Log

Test Pit No. **TP H-3**

Client: Selwyn Plantation Board Ltd	Location (measured using hand held GPS): 1547283, 5171554		Date: 12/09/2008
Project: SPBL Rolleston Plan Change	Logged By: CG	Weather Conditions: cloudy & dry	Job Number: 36951-001

Water	Depth (m)	Soil Symbol	FACE 1 — SOIL DESCRIPTION: Colour, structure, weathering, subordinate/ main / minor COMPONENTS.
	0		Grass over silty TOPSOIL, brown, moist.
	0.5		Sandy GRAVEL with cobbles and minor boulders. Mid brown, medium to coarse grained, rounded, gap graded, near horizontal long-axis pebble alignment. Moist.
	1		
	1.5		End of Test pit at 1.4m (Target depth)
	2		
	2.5		

Water	Depth (m)	Soil Symbol	FACE 2 — SOIL DESCRIPTION: Colour, structure, weathering, subordinate/ main / minor COMPONENTS.
	0		
	0.5		
	1		
	1.5		
	2		
	2.5		

Undrained Shear Strength (kPa) ●
Measured Using a Hand Held Shear Vane[1]
25 50 75 100 125 150

Scala Penetrometer Test[2] ×
(Blows/ 150mm)
2 4 6 8 10 12

Test Description
1 - Hand held shear vane test in accordance with BS1377:1990
2 - Scala Penetrometer Test in accordance with NZS4402:1986 for the first three meters

Notes
Groundwater not encountered
Soak test undertaken and reported separately

Pit dimensions
1.0m
2.1m

GENERAL NOTES

This site investigation was carried out in accordance with described in the New Zealand Geotechnical Society's "*Guidelines for the Field Description of Soils and Rocks in Engineering Use*" for the specific purpose and client as defined in the introductory section(s) of this document. The report should not be used by other parties or for other purposes without prior consultation with Connell Wagner, as it may not contain adequate or appropriate information.

LOGGING

The information on the Logs (Boreholes, Test Pits, Natural Exposures etc.) has been based on a visual and tactile assessment except at the discrete locations where test information has been reported (eg field and/or laboratory results).

Reference should be made to our standard sheets for the definition of our logging procedures (Soil and/or Rock Descriptions, as appropriate).

GROUNDWATER

Unless otherwise indicated, the water levels given on the logs are the levels of free water or seepage in the test hole recorded at the given time of measuring. The measured ground water level may be affected by the method of investigation (for example, if rotary drilling is utilised, drilling fluids will be pumped into the ground).

The actual groundwater level may differ from the recorded level depending on material permeabilities. Further variations of this level could occur with time due to such effects as seasonal and tidal fluctuations or construction activities.

Final confirmation of levels can only be made by appropriate instrumentation techniques and programmes.

SAMPLING

Samples extracted during the fieldwork phase of a site investigation may be 'disturbed' or 'undisturbed' (as indicated on the logs) depending on the intended mature and purpose of the sample as well as the practicable method of extraction, transportation, extrusion and testing. This aspect should be taken into account when assessing test results which must of necessity reflect the effects of such disturbance.

Generally, 'disturbed' samples would be suitable for visual identification, moisture content determination, Atterberg Limits testing, compaction and California bearing ratio (CBR) testing, amongst others.

The amount sampled is also a limiting factor in the suitability for testing purposes, for example, a minimum of 10 kg is necessary for compaction and CBR testing.

'Undisturbed' samples are normally necessary for laboratory testing such as shrink-swell tests. These samples are obtained by pushing a thin-walled, mild steel tube with a machined cutting edge into the soil, and extracting the assembly. The soil (normally of nominal 50 mm diameter) is extruded at the laboratory prior to testing.

LABORATORY TESTING

Laboratory testing is normally carried out in accordance with relevant British, Australian or New Zealand Standards (eg AS1289) or to State Roads Authoities or TransitNZ Standards where specified. All testing is carried out in ISO9001 laboratories unless prior agreements are made between Connell Wagner and the client.

Where tests are used which are not covered by Standard procedures, the method details are provided in the report.

All soil properties (as measured by laboratory testing) exhibit inherent variability and thus a certain statistical number of tests is required in order to predict an average property with any degree of confidence. The site

variability of soil strata, future changes in moisture and other conditions and the discrete sampling positions must also be considered when assessing the representative nature of the laboratory programme.

Certain laboratory tests provide interpreted soil properties as derived by conventional mathematical procedures. The applicability of such properties to engineering design must be assessed with due regard to the site, sample condition, procedure and the proposed development.

INTERPRETATION OF RESULTS

The discussion and any recommendations contained within this report are normally based on a site evaluation from discrete test hole data. Generalised or idealised subsurface conditions (including any cross-sections contained in the report) have been assumed or prepared by interpolation and /or extrapolation of these data. As such, these conditions are an interpretation and must be considered as a guide only.

CHANGE IN CONDITIONS

Local variations or anomalies in the generalised ground conditions used for this report can occur, particularly between discrete test hole locations. Furthermore, certain design or construction procedures may have been assumed in assessing the soil-structure interaction behaviour of the site.

Any change in design, in construction methods, or in ground conditions as noted during construction, from those assumed in this report should be referred to Connell Wagner for appropriate assessment and comment.

FOUNDATION DEPTH

Where referred to in the report, the recommended depth of any foundation (piles, caissons, footings, etc.) is an engineering estimate of the depth to which they should be constructed. The estimate is influenced and perhaps limited by the fieldwork method and testing carried out in connection with the site investigation, and other pertinent information as has been made available. The depth remains, however, an estimate and therefore liable to variation. Foundation drawings, designs and specifications based upon this report should provide for variations in the final depth depending upon the ground conditions at each point of support.

REPRODUCTION OF REPORTS

Where it is desired to reproduce the information contained in this report for the inclusion in the contract documents or engineering specification of the subject development, such reproduction should include all of the report, including appendices (if any).