

**Lidbury Summers & Whiteman**

**Geotechnical Site Classification Report**

**Summer Green, Stage 1B**

**The Southern Parkway, Forster**

Report No. RGS01898.1-AE

6 July 2022



RGS01898.1-AE

6 July 2022

Lidbury Summers & Whiteman  
PO Box 510  
FORSTER NSW 2428

**Attention: Phillip Lidbury**

Dear Phillip

**RE: Summer Green, Stage 1B – The Southern Parkway, Forster  
Geotechnical Site Classification Report**

As requested, Regional Geotechnical Solutions Pty Ltd (RGS) has undertaken a site classification in accordance with AS2870-2011 *Residential Slabs and Footings* for the residential lots of Stage 1B of Summer Green residential subdivision at The Southern Parkway, Forster.

The report provided herein provides surface and subsurface conditions encountered at the site along with comments and recommendations on foundation conditions and site classification in accordance with Australian Standard AS2870-2011.

If you have any questions regarding this project, please contact the undersigned.

For and on behalf of

**Regional Geotechnical Solutions Pty Ltd**

Prepared by



**Champak Nag**

Senior Geotechnical Engineer

Reviewed by



**Steve Morton**

Principal Geotechnical Engineer



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## 1 INTRODUCTION

Regional Geotechnical Solutions Pty Ltd (RGS) has undertaken a site classification in accordance with AS2870-2011 *Residential Slabs and Footings* for the residential lots of Stage 1B of the Summer Green subdivision at The Southern Parkway, Forster.

Lots within Stage 1B have been modified by regrading works comprising up to 1.8m of fill using site won materials. The filling was undertaken under Level 1 inspection and testing as defined in AS3798-2007 (Refer report RGS01898.1-AC dated 16 September 2019). The fill meets the requirements of Controlled Fill as defined in AS2870 -2011.

The purpose of the assessment was to provide comments and recommendations on the following:

- Site classification to *AS2870-2011 Residential Slabs and Footings*; and
- Comments on foundation conditions at the site, founding strata and allowable bearing pressures.

In providing this report and site classification it has been assumed that the performance expectations of AS2870-2011 are acceptable for the proposed structures within Stage 1B.

## 2 METHODOLOGY

Field work for the assessment was undertaken on 3 May 2022 based on the supplied drawings and included:

- Observation of site features and surrounding features relevant to the geotechnical conditions of the site;
- Drilling of twelve (12) boreholes (BH101 to BH112) within the proposed stage 1B development; and
- Collection of U50 tube samples from soil horizons considered representative of cohesive soil profiles for shrink-swell testing and disturbed samples for Atterberg Limit testing.

Boreholes were undertaken using a 4WD mounted drill rig and logged and sampled by a Geotechnical Engineer from RGS.

Engineering logs of the boreholes are presented in Appendix A. The locations of the boreholes are shown on Figure 1. They were obtained on site by measurement relative to lot boundaries which were pegged at the time of investigation.

## 3 LABORATORY TESTING

Samples considered representative of foundation soils were submitted to a NATA accredited laboratory for the measurement of soil volume change over an extreme range of moisture content (shrink / swell index) and Atterberg Limit tests. Results are presented in Appendix B and summarised in

Table 1.



**Table 1: Laboratory Testing Summary**

Location	Depth (m)	Lot	Material	Liquid Limit (%)	Plasticity Index (%)	Shrinkage (%)	Swell (%)	I <sub>ss</sub> (%)
BH102	0.5 – 1.0	89/90	Residual – Clay	--	--	5.7	-0.5	3.2
BH104*	0.5 – 0.8	85/86	Fill - Clay	53	29	--	--	--
BH105	0.7 – 1.2	83/84	Fill – Clay	--	--	2.2	-0.7	1.2
BH106	0.5 – 1.0	82	Fill – Clay	--	--	2.8	-0.8	1.6
BH109*	0.5-1.0	76/77	Residual – Clay	77	46	--	--	--

Note: \* Published correlations (Jayasekera & Mohajerani, 2003) with liquid limit and the plasticity index indicate that a shrink-swell index of around 3.5% and 4.5% is appropriate for BH104(0.5-0.8) and BH109(0.5-1.0) respectively.

## 4 SITE CONDITIONS

### 4.1 Surface Conditions

The Stage 1B development is situated on the south and southeast facing slopes of a generally northeast to southwest oriented section of gently sloping ridgeline within a region of gently to moderately undulating terrain.

There is a low lying area in the south and southeastern corner of the site, near the intersection of Road No. 6 and Myall Drive. Several lots within this area have been filled by approximately 1.8m of site won clay fill, placed and compacted as Controlled Fill (AS2870-2011) under Level One supervision and testing (AS3798-2007).

Further north west, in the central sloping area, lots have been filled with up to 0.4m of site won clay.

The site is well drained by runoff towards the drainage reserves to the east and southeast. Drainage of the site will be via a combination of overland flow to the lot and street drainage systems, and minor infiltration into residual clay soils and lot fill.

Typical site conditions for the Stage 1B area are shown in the photographs below.



*Looking south east from Lot 91, showing gentle slopes of 2° towards south and southeast*



*Looking north west from Lot 86, showing gentle slopes of 2° towards south and southeast*



*Looking north west from Lot 82, showing gentle slopes and patchy grass cover*



*Looking north east from Lot 73 showing grass cover and gentle slopes within stage 1B*

## **4.2 Subsurface Conditions**

Reference to the Minview website indicates the subject stage 1B development is underlain by the Devonian aged Bundook Beds comprising sandstone, siltstone, conglomerate, and limestone.

The materials encountered during the investigation are summarised in Table 2 and Table 3. Further details are presented on the attached engineering logs.



**Table 2: Summary of Geotechnical Units**

Unit	Material	Material Description
UNIT 1A	Landscaping FILL	Silty CLAY, low to medium plasticity, sand fine to medium grained, gravel fine grained
UNIT 1B	FILL – CLAY	CLAY/Silty CLAY, medium to high plasticity, trace to some sand fine to medium grained, trace to some gravel fine to medium grained, stiff to very stiff.
UNIT 2	TOPSOIL	Silty CLAY, low to medium plasticity, trace sand fine to medium grained, trace grass roots
UNIT 3	SLOPEWASH	Silty CLAY, low to medium plasticity, with gravel fine grained, trace sand fine to medium grained
UNIT 4	ALLUVIAL	CLAY, high plasticity, with sand fine to medium grained, stiff
UNIT 5	RESIDUAL	CLAY, medium to high plasticity, trace to some sand fine to medium grained, trace to some gravel fine to medium grained, stiff to very stiff
UNIT 6	EW SILTSTONE	CLAY, medium to high plasticity, with sand fine to medium grained, with some gravel fine to medium grained, very stiff to hard
UNIT 7	HW SANDSTONE	SANDSTONE, fine to coarse grained, fractured, low to medium strength, highly weathered



**Table 3: Summary of Subsurface Materials**

BH	Lot(s)	Depth of Material Layer (m)							
		Unit 1A Topsoil/Fill	Unit 1B Fill – Clay	Unit 2 Topsoil	Unit 3 Slope wash	Unit 4 Alluvial	Unit 5 Residual	Unit 6 EW Siltstone	Unit 7 HW Sandstone
BH101	91/92	0.0 – 0.15	0.15 – 0.3	--	--	--	0.3 – 1.2	1.2 – ≥1.5	--
BH102	89/90	0.0 – 0.15	0.15 – 0.3	--	0.3 – 0.5	--	0.5 – 1.1	1.1 – ≥1.3*	--
BH103	87/88	0.0 – 0.3	0.3 – 0.65	--	0.65 – 0.8	--	0.8 – ≥1.5	--	--
BH104	85/86	0.0 – 0.25	0.25 – 1.35	1.35 – 1.5	--	--	1.5 – ≥2.0	--	--
BH105	83/84	0.0 – 0.25	0.25 – 1.8	1.8 – 1.9	--	--	1.9 – ≥2.2	--	--
BH106	82	0.0 – 0.3	0.3 – 1.5	--	--	1.5 – ≥2.0	--	--	--
BH107	80/81	0.0 – 0.3	0.3 – 1.4	1.4 – 1.55	--	--	1.55 – ≥1.8	--	--
BH108	78/79	0.0 – 0.25	0.25 – 0.4	--	0.4 – 0.75	--	0.75 – ≥1.5	--	--
BH109	76/77	0.0 – 0.35	--	--	--	--	0.35 – 1.1	1.1 – ≥1.5	--
BH110	75	--	--	0.0 – 0.25	--	--	0.25 – 0.5	0.5 – ≥1.5	--
BH111	73/74	--	--	0.0 – 0.25	--	--	0.25 – 0.55	0.55 – 1.2	1.2 – ≥1.35*
BH112	71/72	--	--	0.0 – 0.25	--	--	0.25 – 0.6	0.6 – ≥1.5	--

Note: ≥ Indicates that base of material layer was not encountered  
 -- Indicates that the material was not encountered at the test location  
 \* Indicates auger bit refusal on rock

Groundwater was not encountered in the boreholes drilled. Groundwater levels fluctuate as a result of seasonal variations, temperature, rainfall and other similar factors, the influence of which may not have been apparent at the time of the assessment.



## 5 SITE CLASSIFICATION

The site classification presented herein is provided on the basis that the performance expectations of AS2870-2011 are acceptable. In assessing the estimated characteristic surface movement ( $y_s$ ) values the following has been adopted:

- Suction change at ground surface of pf 1.2;
- Depth of suction change of 1.5m;
- Crack depth multiplication factor of 0.5;
- Characteristic  $I_{ss}$  of clay fill between 1.3 and 3.9;
- Characteristic  $I_{ss}$  for residual clays between 1.6 and 5.0;
- Depth to extremely weathered rock varies from 0.5m to 1.2m on the northwestern, higher side of stage 1B

The site classifications and expected shrink-swell related characteristic free surface movements estimated for each lot are summarised in Table 4. The calculated free surface movements include the additional tree-induced movement for those lots close to existing large trees.

**Table 4: Estimated Surface Movement Summary**

Lots	Site Classification	Estimated Characteristics Surface Movement
71-75	M	20 – 30 mm
76-79, 87-92	H1	50 – 60 mm
80-86	M*	30 – 40 mm

Note : \* Based on the existing profiles encountered at the time of the field investigations the lots indicated in the bottom row of Table 4 are classified as **Class P** in accordance with AS2870-2011 due to the presence of Controlled Fill of >0.4m thickness. In accordance with Clause 2.5.3 Section C of AS2870-2011, as the filling comprises Controlled Fill that was placed under Level One supervision as defined by AS3798-2007, the lots are re-classified as outlined in Table 4.

Footings founded within controlled fill or stiff to very stiff alluvial and residual clay can be designed for an allowable bearing pressure of 100 kPa. Footings founded within weathered rock can be designed for an allowable bearing pressure of 400 kPa, provided the whole structure is founded within weathered rock.

If further site regrading works are undertaken at the site, reclassification may be required once final cut and fill depths and fill material types are known.



## 6 CONSTRUCTION AND SITE MAINTENANCE CONSIDERATIONS

All structural footings should be founded as follows:

- All footings should be founded in controlled fill, or in stiff or very stiff alluvial or residual clay soils below all topsoil and uncontrolled fill materials;
- Footings can be designed on the basis of a maximum allowable base bearing pressure of **100kPa** for footings founded within alluvial and residual soils of at least very stiff strength;
- All footings, edge beams and internal beams should be entirely founded on similar material and outside or below the zones of influence resulting from existing or future service trenches and other subsurface structures;
- Site drainage associated with the proposed development should be designed to avoid concentrated flows in the vicinity of any proposed cuttings and foundations and to discharge water downslope of the development in a controlled manner that limits erosion;
- Any foundations located within areas where tree removals or earthworks have previously been carried out or will occur in the future will need to be taken through the disturbed ground to be founded on the undisturbed natural ground beneath. All organic root material should be removed from within the building footprint;
- Prior to the placement of concrete we recommend that footings be observed and assessed by a suitably experienced geotechnical engineer to assess that the correct founding material has been achieved.

Site maintenance must comply with the recommendations and advice provided in CSIRO Sheet BTF18 "*Foundation Maintenance and Footing Performance: A Homeowners Guide*" a copy of which is available from the CSIRO website <http://www.publish.csiro.au/pid/7076.htm>

Shrink-swell related movements can be affected by alterations to the soil profile by cutting and filling, and by the suction related effects of trees close to the building area. The effects of any such cutting, filling, tree planting, or tree removal should be taken into account when selecting design values for differential movement across the building.

## 7 LIMITATIONS

This report comprises the results of an investigation carried out for a specific purpose and client as defined in the document. The report should not be used by other parties or for purposes or projects other than those assumed and stated within the report, as it may not contain adequate or appropriate information for applications other than those assumed or advised at the time of its preparation. The contents of the report are for the sole use of the client and no responsibility or liability will be accepted to any third party. The report should not be reproduced either in part or in full, without the express permission of Regional Geotechnical Solutions Pty Ltd.

Geotechnical site investigation is based on data collection, judgment, experience, and opinion. By its nature, it is less exact than other engineering disciplines. The findings presented in this report and used as the basis for the recommendations presented herein were obtained using normal, industry accepted geotechnical design practises and standards. To our knowledge, they represent a reasonable interpretation of the general condition of the site. Under no circumstances, however, can it be considered that these findings represent the actual state of the site at all points.



The recommended depth and properties of any soil, rock, groundwater, or other material referred to in this report is an engineering estimate based on the information available at the time of writing. The estimate is influenced and limited by the fieldwork and testing method carried out in the site investigation, and other relevant information as has been made available. In cases where information has been provided to Regional Geotechnical Solutions for the purposes of preparing this report it has been assumed that the information is accurate and appropriate for such use. No responsibility is accepted by Regional Geotechnical Solutions for inaccuracies within any data supplied by others.

If site conditions encountered during construction vary significantly from those discussed in this report, Regional Geotechnical Solutions Pty Ltd should be contacted for further advice.

This report alone should not be used by contractors as the basis for preparation of tender documents or project estimates. Contractors using this report as a basis for preparation of tender documents should avail themselves of all relevant background information regarding the site before deciding on selection of construction materials and equipment.

If you have any questions regarding this project, or require any additional consultations, please contact the undersigned.

For and on behalf of

**Regional Geotechnical Solutions Pty Ltd**

Prepared by

**Champak Nag**

Senior Geotechnical Engineer

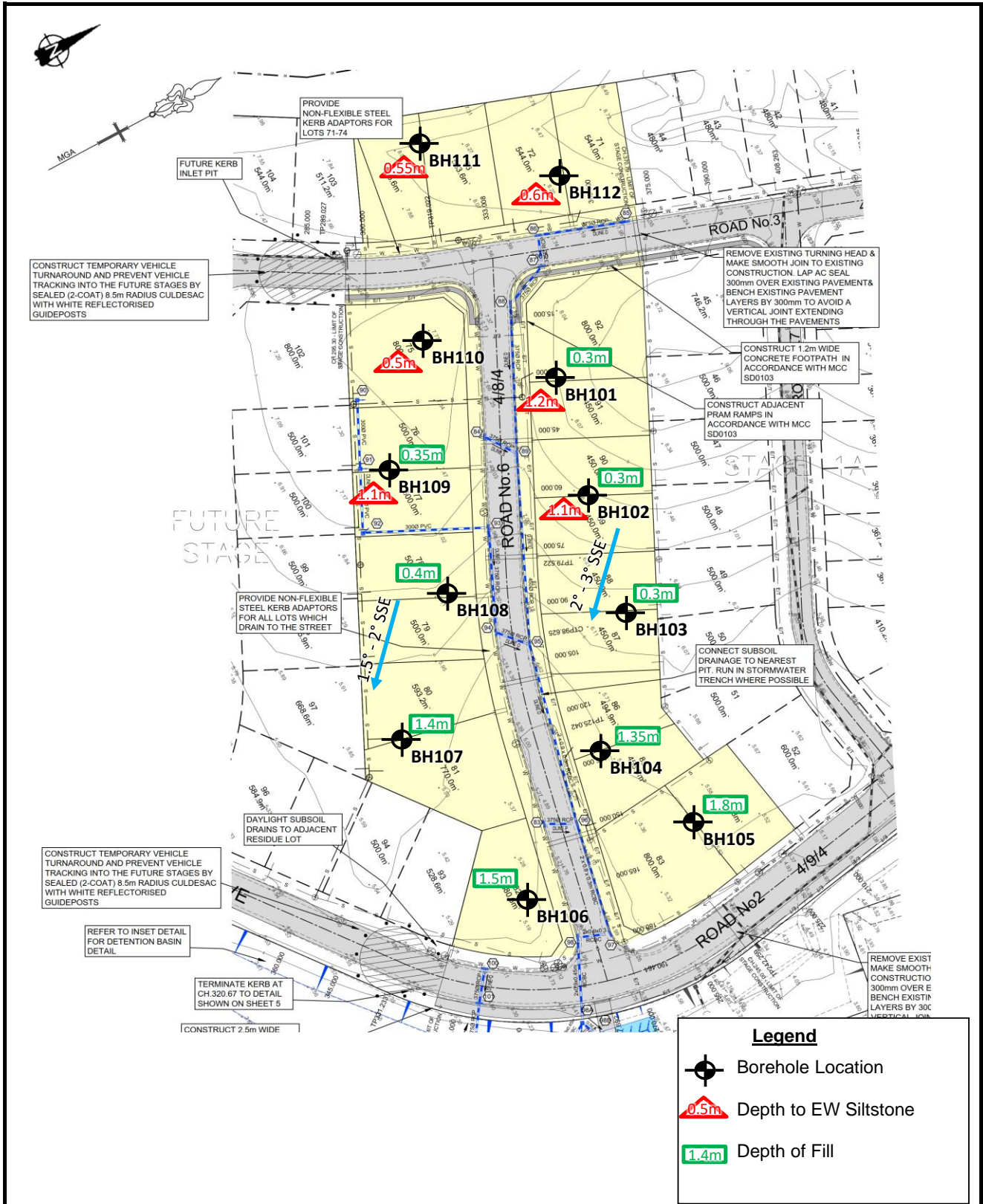
Reviewed by

**Steve Morton**

Principal Geotechnical Engineer



## Figures



\*Note: As per provided drawing titled " Sales plan - 'Summer Green' Stage 1B Issue A dt 26/2/21"

	<b>Client:</b>	Lidbury, Summers & Whiteman	<b>Job No.</b>	RG01898.1
	<b>Project:</b>	Summer Green Stage 1B	<b>Drawn By:</b>	CN
		Southern Parkway Forster	<b>Scale:</b>	NTS
	<b>Title:</b>	Borehole Location Plan	<b>Date:</b>	5-Jul-22
			<b>Drawing No.</b>	<b>Figure 1</b>



# **Appendix A**

## **Results of Field Investigations**



# ENGINEERING LOG - BOREHOLE

BOREHOLE NO: **BH101**

CLIENT: Lidbury Summers Whiteman

PAGE: 1 of 1

PROJECT NAME: Summer Green - Stage 1A & 1B

JOB NO: RGS01898.1

SITE LOCATION: Southern Parkway, Forster

LOGGED BY: RW

TEST LOCATION: Lot 91/92

DATE: 3/5/22

DRILL TYPE: RGS Ute Mounted Drill Rig

EASTING:

SURFACE RL:

BOREHOLE DIAMETER: 100 mm

INCLINATION: 90°

NORTHING:

DATUM:

AHD

Drilling and Sampling				Material description and profile information					Field Test		Structure and additional observations		
METHOD	WATER	SAMPLES	RL (Not measured)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION: Soil type, plasticity/particle characteristics, colour, minor components	MOISTURE CONDITION	CONSISTENCY DENSITY	Test Type		Result	
AD/T	Not Encountered			0.5		CL	<b>FILL:</b> Silty CLAY, low to medium plasticity, dark brown, trace sand and gravel, fine to medium grained	M < Wp	VSt / H	HP	220	FILL	
						CH	<b>FILL:</b> CLAY, medium to high plasticity, dark brown, brown, grey	M > Wp			300		RESIDUAL
						CH	<b>CLAY:</b> Medium to high plasticity, red, pale grey, grey, with some gravel, fine to coarse grained, trace sand, fine to medium grained	M < Wp			450		
						CI	<b>CLAY:</b> Medium plasticity, pale grey with red mottling, trace sand and gravel, fine to coarse grained				500	EXTREMELY WEATHERED SILTSTONE	
				1.0									
				1.20m									
				1.50m									
				1.50m			Hole Terminated at 1.50 m						
				2.0									
				2.5									

RG 2.00.3.LIB.GLB\_Log RG NON-CORED BOREHOLE - TEST P/T RGS01898.1 BH LOGS 100 SERIES.GPJ --DrawingFile-- 5/7/2022 16:19 10.03.00.09 Daigal Lab and In Situ Test - DGD Lib: RG 2.00.3.2022-03-03 P1: RG 2.00.0.2021-06-30

**LEGEND:**

**Water**

- Water Level (Date and time shown)
- Water Inflow
- Water Outflow

**Strata Changes**

- Gradational or transitional strata
- Definitive or distinct strata change

**Notes, Samples and Tests**

- U<sub>50</sub> 50mm Diameter tube sample
- CBR Bulk sample for CBR testing
- E Environmental sample
- ASS Acid Sulfate Soil Sample
- B Bulk Sample

**Field Tests**

- PID Photoionisation detector reading (ppm)
- DCP(x-y) Dynamic penetrometer test (test depth interval shown)
- HP Hand Penetrometer test (UCS kPa)

Consistency	UCS (kPa)	Moisture Condition
VS Very Soft	<25	D Dry
S Soft	25 - 50	M Moist
F Firm	50 - 100	W Wet
St Stiff	100 - 200	W <sub>p</sub> Plastic Limit
VSt Very Stiff	200 - 400	W <sub>L</sub> Liquid Limit
H Hard	>400	
Fb Friable		
Density	V Very Loose	Density Index <15%
L Loose	MD Medium Dense	Density Index 15 - 35%
D Dense	D Dense	Density Index 35 - 65%
VD Very Dense	D Dense	Density Index 65 - 85%
		Density Index 85 - 100%





# ENGINEERING LOG - BOREHOLE

BOREHOLE NO: **BH103**

CLIENT: Lidbury Summers Whiteman

PAGE: 1 of 1

PROJECT NAME: Summer Green - Stage 1A & 1B

JOB NO: RGS01898.1

SITE LOCATION: Southern Parkway, Forster

LOGGED BY: RW

TEST LOCATION: Lot 87/88

DATE: 3/5/22

DRILL TYPE: RGS Ute Mounted Drill Rig

EASTING:

SURFACE RL:

BOREHOLE DIAMETER: 100 mm

INCLINATION: 90°

NORTHING:

DATUM:

AHD

Drilling and Sampling				Material description and profile information					Field Test		Structure and additional observations	
METHOD	WATER	SAMPLES	RL (Not measured)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION: Soil type, plasticity/particle characteristics, colour, minor components	MOISTURE CONDITION	CONSISTENCY DENSITY	Test Type		Result
AD/T	Not Encountered			0.5		CL	<b>FILL:</b> Silty CLAY, low to medium plasticity, dark brown, brown, trace sand and gravel, fine to coarse grained	M < w <sub>p</sub>				FILL
						CH	<b>FILL:</b> CLAY, medium to high plasticity, red, pale grey, pale brown, dark brown, trace of sand and gravel, fine to medium grained	M > w <sub>p</sub>	VSt	HP 300	HP 250	
						CL	<b>Gravelly Silty CLAY:</b> Low to medium plasticity, dark brown, dark grey, gravel, fine to medium grained, trace of sand, fine to medium grained	M < w <sub>p</sub>	St	HP 200	HP 320	SLOPEWASH
						CH	<b>CLAY:</b> High plasticity, brown, pale brown, grey with red mottling, trace sand and gravel, fine to medium grained	M > w <sub>p</sub>	VSt / H	HP 350	HP 500	RESIDUAL
				1.5			Hole Terminated at 1.50 m			HP 450		

RG 2.00.3.LIB.GLB\_Log RG NON-CORED BOREHOLE - TEST P/T RGS01898.1 BH LOGS 100 SERIES.GPJ --DrawingFile-- 5/7/2022 16:19 10.03.00.09 Daigal Lab and In Situ Test - DGD Lib: RG 2.00.3.2022-03-03 P1: RG 2.00.0.2021-06-30

<b>LEGEND:</b> <b>Water</b> Water Level (Date and time shown) Water Inflow Water Outflow <b>Strata Changes</b> Gradational or transitional strata Definitive or distinct strata change	<b>Notes, Samples and Tests</b> U <sub>50</sub> 50mm Diameter tube sample CBR Bulk sample for CBR testing E Environmental sample ASS Acid Sulfate Soil Sample B Bulk Sample	<b>Consistency</b> VS Very Soft S Soft F Firm St Stiff VSt Very Stiff H Hard Fb Friable	<b>UCS (kPa)</b> <25 25 - 50 50 - 100 100 - 200 200 - 400 >400	<b>Moisture Condition</b> D Dry M Moist W Wet W <sub>p</sub> Plastic Limit W <sub>L</sub> Liquid Limit
	<b>Field Tests</b> PID Photoionisation detector reading (ppm) DCP(x-y) Dynamic penetrometer test (test depth interval shown) HP Hand Penetrometer test (UCS kPa)	<b>Density</b> V Very Loose L Loose MD Medium Dense D Dense VD Very Dense	Density Index <15% Density Index 15 - 35% Density Index 35 - 65% Density Index 65 - 85% Density Index 85 - 100%	



# ENGINEERING LOG - BOREHOLE

BOREHOLE NO: **BH104**

CLIENT: Lidbury Summers Whiteman

PAGE: 1 of 1

PROJECT NAME: Summer Green - Stage 1A & 1B

JOB NO: RGS01898.1

SITE LOCATION: Southern Parkway, Forster

LOGGED BY: RW

TEST LOCATION: Lot 85/86

DATE: 3/5/22

DRILL TYPE: RGS Ute Mounted Drill Rig

EASTING:

SURFACE RL:

BOREHOLE DIAMETER: 100 mm

INCLINATION: 90°

NORTHING:

DATUM:

AHD

Drilling and Sampling				Material description and profile information					Field Test		Structure and additional observations		
METHOD	WATER	SAMPLES	RL (Not measured)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION: Soil type, plasticity/particle characteristics, colour, minor components	MOISTURE CONDITION	CONSISTENCY DENSITY	Test Type		Result	
AD/T	Not Encountered	D		0.50m	[Cross-hatched pattern]	CL	<b>FILL:</b> Silty CLAY, low to medium plasticity, dark brown, dark grey, trace sand and gravel, fine to medium grained	M > Wp	St	HP	220	FILL	
				0.80m		CH	<b>FILL:</b> CLAY, medium to high plasticity, brown, dark brown, grey, pale grey, trace of sand and gravel, fine to medium grained				230		
				1.35m	[Diagonal hatched pattern]	CL	<b>TOPSOIL:</b> Silty CLAY, low to medium plasticity, dark brown, trace sand, fine to medium grained				130		ORIGINAL TOPSOIL
				1.50m		CH	<b>CLAY:</b> Medium to high plasticity, brown, grey with red mottling, trace sand and gravel, fine to medium grained				100		RESIDUAL
				2.00m	[Horizontal hatched pattern]	CH					220		
				2.00m					HP	150		Hole Terminated at 2.00 m	

RG 2.00.3.LIB.GLB\_Log RG NON-CORED BOREHOLE - TEST P/T RGS01898.1 BH LOGS 100 SERIES.GPJ --DrawingFile-- 5/7/2022 16:19 10.03.00.09 Daigel Lab and In Situ Test - DGD Lib. RG 2.00.3.2022-03-03 Pj; RG 2.00.0.2021-06-30

**LEGEND:**

**Water**

- Water Level (Date and time shown)
- Water Inflow
- Water Outflow

**Strata Changes**

- Gradational or transitional strata
- Definitive or distinct strata change

**Notes, Samples and Tests**

- U<sub>50</sub> 50mm Diameter tube sample
- CBR Bulk sample for CBR testing
- E Environmental sample
- ASS Acid Sulfate Soil Sample
- B Bulk Sample

**Field Tests**

- PID Photoionisation detector reading (ppm)
- DCP(x-y) Dynamic penetrometer test (test depth interval shown)
- HP Hand Penetrometer test (UCS kPa)

Consistency		UCS (kPa)	Moisture Condition	
VS	Very Soft	<25	D	Dry
S	Soft	25 - 50	M	Moist
F	Firm	50 - 100	W	Wet
St	Stiff	100 - 200	W <sub>p</sub>	Plastic Limit
VSt	Very Stiff	200 - 400	W <sub>L</sub>	Liquid Limit
H	Hard	>400		
Fb	Friable			
Density		V	Very Loose	Density Index <15%
L	Loose			Density Index 15 - 35%
MD	Medium Dense			Density Index 35 - 65%
D	Dense			Density Index 65 - 85%
VD	Very Dense			Density Index 85 - 100%





# ENGINEERING LOG - BOREHOLE

BOREHOLE NO: **BH106**

CLIENT: Lidbury Summers Whiteman

PAGE: 1 of 1

PROJECT NAME: Summer Green - Stage 1A & 1B

JOB NO: RGS01898.1

SITE LOCATION: Southern Parkway, Forster

LOGGED BY: RW

TEST LOCATION: Lot 82

DATE: 3/5/22

DRILL TYPE: RGS Ute Mounted Drill Rig

EASTING:

SURFACE RL:

BOREHOLE DIAMETER: 100 mm

INCLINATION: 90°

NORTHING:

DATUM:

AHD

Drilling and Sampling				Material description and profile information					Field Test		Structure and additional observations					
METHOD	WATER	SAMPLES	RL (Not measured)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION: Soil type, plasticity/particle characteristics, colour, minor components	MOISTURE CONDITION	CONSISTENCY DENSITY	Test Type		Result				
AD/T	Not Encountered			0.5		CL	<b>FILL:</b> Silty CLAY, low to medium plasticity, dark brown, trace sand and gravel, fine to medium grained	M < WP				FILL				
						CH	<b>FILL:</b> CLAY, medium to high plasticity, grey, pale grey, dark brown, red, trace of sand and gravel, fine to medium grained	M > WP	St	HP	160					
				1.0												
				1.5												
				2.0												
				2.5												
							Hole Terminated at 2.00 m									

**LEGEND:**

**Water**

- Water Level (Date and time shown)
- Water Inflow
- Water Outflow

**Strata Changes**

- Gradational or transitional strata
- Definitive or distinct strata change

**Notes, Samples and Tests**

- U<sub>50</sub> 50mm Diameter tube sample
- CBR Bulk sample for CBR testing
- E Environmental sample
- ASS Acid Sulfate Soil Sample
- B Bulk Sample

**Field Tests**

- PID Photoionisation detector reading (ppm)
- DCP(x-y) Dynamic penetrometer test (test depth interval shown)
- HP Hand Penetrometer test (UCS kPa)

<b>Consistency</b>		<b>UCS (kPa)</b>	<b>Moisture Condition</b>	
VS	Very Soft	<25	D	Dry
S	Soft	25 - 50	M	Moist
F	Firm	50 - 100	W	Wet
St	Stiff	100 - 200	W <sub>p</sub>	Plastic Limit
VSt	Very Stiff	200 - 400	W <sub>L</sub>	Liquid Limit
H	Hard	>400		
Fb	Friable			
<b>Density</b>				
V	Very Loose		Density Index <15%	
L	Loose		Density Index 15 - 35%	
MD	Medium Dense		Density Index 35 - 65%	
D	Dense		Density Index 65 - 85%	
VD	Very Dense		Density Index 85 - 100%	

RG 2.00.3.LIB.GLB Log RG NON-CORED BOREHOLE - TEST P/T RGS01898.1 BH LOGS 100 SERIES.GPJ --DrawingFile-- 5/7/2022 16:19 10.03.00.09 Daigel Lab and In Situ Test - DGD Lib. RG 2.00.3.2022-03-03 Pj; RG 2.00.0.2021-06-30



# ENGINEERING LOG - BOREHOLE

BOREHOLE NO: **BH107**

CLIENT: Lidbury Summers Whiteman

PAGE: 1 of 1

PROJECT NAME: Summer Green - Stage 1A & 1B

JOB NO: RGS01898.1

SITE LOCATION: Southern Parkway, Forster

LOGGED BY: RW

TEST LOCATION: Lot 80/81

DATE: 3/5/22

DRILL TYPE: RGS Ute Mounted Drill Rig

EASTING:

SURFACE RL:

BOREHOLE DIAMETER: 100 mm

INCLINATION: 90°

NORTHING:

DATUM:

AHD

Drilling and Sampling				Material description and profile information					Field Test		Structure and additional observations			
METHOD	WATER	SAMPLES	RL (Not measured)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION: Soil type, plasticity/particle characteristics, colour, minor components	MOISTURE CONDITION	CONSISTENCY DENSITY	Test Type		Result		
AD/T	Not Encountered					CL	<b>FILL:</b> Silty CLAY, low plasticity, dark brown, trace sand and gravel, fine to medium grained	M < WP				FILL		
				0.30m		CH	<b>FILL:</b> CLAY, medium to high plasticity, brown, pale brown, grey, dark brown, with some sand and gravel, fine to medium grained	M > WP	St - VSt	HP	220			
				0.5							HP		150	
				1.0							HP		140	
				1.40m		CL	<b>TOPSOIL:</b> Silty CLAY, low to medium plasticity, dark brown, trace sand, fine to medium grained							ORIGINAL TOPSOIL
				1.55m		CH	<b>CLAY:</b> High plasticity, brown, pale brown, grey, red mottling, with some sand, fine to medium grained, trace gravel, fine to medium grained		St					RESIDUAL
				1.80m			Hole Terminated at 1.80 m			HP	150			
				2.0										
				2.5										

**LEGEND:**

**Water**

- Water Level (Date and time shown)
- Water Inflow
- Water Outflow

**Strata Changes**

- Gradational or transitional strata
- Definitive or distinct strata change

**Notes, Samples and Tests**

- U<sub>50</sub> 50mm Diameter tube sample
- CBR Bulk sample for CBR testing
- E Environmental sample
- ASS Acid Sulfate Soil Sample
- B Bulk Sample

**Field Tests**

- PID Photoionisation detector reading (ppm)
- DCP(x-y) Dynamic penetrometer test (test depth interval shown)
- HP Hand Penetrometer test (UCS kPa)

Consistency	UCS (kPa)	Moisture Condition
VS Very Soft	<25	D Dry
S Soft	25 - 50	M Moist
F Firm	50 - 100	W Wet
St Stiff	100 - 200	W <sub>p</sub> Plastic Limit
VSt Very Stiff	200 - 400	W <sub>L</sub> Liquid Limit
H Hard	>400	
Fb Friable		
<b>Density</b>	V Very Loose	Density Index <15%
L Loose	MD Medium Dense	Density Index 15 - 35%
D Dense	D Dense	Density Index 35 - 65%
VD Very Dense	D Dense	Density Index 65 - 85%
		Density Index 85 - 100%

RG 2.00.3.LIB.GLB Log RG NON-CORED BOREHOLE - TEST P/T RGS01898.1 BH LOGS 100 SERIES.GPJ --DrawingFile-- 5/7/2022 16:19 10.03.00.09 Daigal Lab and In Situ Test - DGD Lib. RG 2.00.3.2022-03-03 P1; RG 2.00.0.2021-06-30



# ENGINEERING LOG - BOREHOLE

BOREHOLE NO: **BH108**

CLIENT: Lidbury Summers Whiteman

PAGE: 1 of 1

PROJECT NAME: Summer Green - Stage 1A & 1B

JOB NO: RGS01898.1

SITE LOCATION: Southern Parkway, Forster

LOGGED BY: RW

TEST LOCATION: Lot 78/79

DATE: 3/5/22

DRILL TYPE: RGS Ute Mounted Drill Rig

EASTING:

SURFACE RL:

BOREHOLE DIAMETER: 100 mm

INCLINATION: 90°

NORTHING:

DATUM:

AHD

Drilling and Sampling				Material description and profile information					Field Test		Structure and additional observations		
METHOD	WATER	SAMPLES	RL (Not measured)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION: Soil type, plasticity/particle characteristics, colour, minor components	MOISTURE CONDITION	CONSISTENCY DENSITY	Test Type		Result	
AD/T	Not Encountered			0.5		CL	<b>FILL:</b> Silty CLAY, low plasticity, dark brown, trace sand and gravel, fine to medium grained	M < W <sub>p</sub>					FILL
						CL	<b>FILL:</b> Silty CLAY, low to medium plasticity, dark brown, brown, orange-brown, with some gravel, fine to medium grained, trace sand, fine to medium grained		VSt	HP	250	SLOPEWASH	
						CL	<b>Silty CLAY:</b> Low to medium plasticity, dark brown, with some gravel, fine grained, trace sand, fine to medium grained	M > W <sub>p</sub>		HP	220		
						CH	<b>CLAY:</b> Medium to high plasticity, grey, pale grey, pale brown with red mottling, trace of sand and gravel, fine to medium grained			HP	250	RESIDUAL	
				1.5			Hole Terminated at 1.50 m			HP	320		

RG 2.00.3.LIB.GLB\_Log; RG NON-CORED BOREHOLE - TEST P/T; RGS01898.1; BH LOGS; 100 SERIES; G.P.J. - Drawing File > 5/7/2022 16:19; 10.03.00.09; Daigal Lab and In Situ Test - DGD Lib; RG 2.00.3.2022-03-03 P1; RG 2.00.0.2021-06-30

<b>LEGEND:</b> <b>Water</b> Water Level (Date and time shown) Water Inflow Water Outflow <b>Strata Changes</b> Gradational or transitional strata Definitive or distinct strata change	<b>Notes, Samples and Tests</b> U <sub>50</sub> 50mm Diameter tube sample CBR Bulk sample for CBR testing E Environmental sample ASS Acid Sulfate Soil Sample B Bulk Sample	<b>Consistency</b> VS Very Soft <25 S Soft 25 - 50 F Firm 50 - 100 St Stiff 100 - 200 VSt Very Stiff 200 - 400 H Hard >400 Fb Friable	<b>UCS (kPa)</b> <25 25 - 50 50 - 100 100 - 200 200 - 400 >400	<b>Moisture Condition</b> D Dry M Moist W Wet W <sub>p</sub> Plastic Limit W <sub>L</sub> Liquid Limit
	<b>Field Tests</b> PID Photoionisation detector reading (ppm) DCP(x-y) Dynamic penetrometer test (test depth interval shown) HP Hand Penetrometer test (UCS kPa)	<b>Density</b> V Very Loose L Loose MD Medium Dense D Dense VD Very Dense	Density Index <15% Density Index 15 - 35% Density Index 35 - 65% Density Index 65 - 85% Density Index 85 - 100%	



# ENGINEERING LOG - BOREHOLE

BOREHOLE NO: **BH109**

CLIENT: Lidbury Summers Whiteman

PAGE: 1 of 1

PROJECT NAME: Summer Green - Stage 1A & 1B

JOB NO: RGS01898.1

SITE LOCATION: Southern Parkway, Forster

LOGGED BY: RW

TEST LOCATION: Lot 76/77

DATE: 3/5/22

DRILL TYPE: RGS Ute Mounted Drill Rig

EASTING:

SURFACE RL:

BOREHOLE DIAMETER: 100 mm

INCLINATION: 90°

NORTHING:

DATUM:

AHD

Drilling and Sampling				Material description and profile information					Field Test		Structure and additional observations	
METHOD	WATER	SAMPLES	RL (Not measured)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION: Soil type, plasticity/particle characteristics, colour, minor components	MOISTURE CONDITION	CONSISTENCY DENSITY	Test Type		Result
AD/T	Not Encountered	D		0.50m		CL	<b>FILL:</b> Silty CLAY, low to medium plasticity, dark brown, dark grey, grey, trace sand and gravel, fine to medium grained					FILL
						CH	0.35m <b>CLAY:</b> Medium to high plasticity, pale grey, grey, red mottling, trace of sand and gravel, fine to medium grained	M > W <sub>p</sub>	H	HP	500	RESIDUAL
						CH	1.10m <b>CLAY:</b> Medium to high plasticity, pale grey, grey, red mottling, with some gravel, fine to coarse grained, trace of sand, fine to medium grained	M < W <sub>p</sub>	H / Fr	HP	400	EXTREMELY WEATHERED SILTSTONE
				1.50m			Hole Terminated at 1.50 m					

RG 2.00.3.LIB.GLB\_Log RG NON-CORED BOREHOLE - TEST P/T RGS01898.1 BH LOGS 100 SERIES.GPJ --DrawingFile-- 5/7/2022 16:19 10.03.00.09 Daigel Lab and In Situ Test - DGD Lib RG 2.00.3.2022-03-03 P1; RG 2.00.0.2021-06-30

**LEGEND:**

**Water**

- Water Level (Date and time shown)
- Water Inflow
- Water Outflow

**Strata Changes**

- Gradational or transitional strata
- Definitive or distinct strata change

**Notes, Samples and Tests**

- U<sub>50</sub> 50mm Diameter tube sample
- CBR Bulk sample for CBR testing
- E Environmental sample
- ASS Acid Sulfate Soil Sample
- B Bulk Sample

**Field Tests**

- PID Photoionisation detector reading (ppm)
- DCP(x-y) Dynamic penetrometer test (test depth interval shown)
- HP Hand Penetrometer test (UCS kPa)

Consistency		UCS (kPa)	Moisture Condition	
VS	Very Soft	<25	D	Dry
S	Soft	25 - 50	M	Moist
F	Firm	50 - 100	W	Wet
St	Stiff	100 - 200	W <sub>p</sub>	Plastic Limit
VSt	Very Stiff	200 - 400	W <sub>L</sub>	Liquid Limit
H	Hard	>400		
Fb	Friable			
Density				
V	Very Loose		Density Index <15%	
L	Loose		Density Index 15 - 35%	
MD	Medium Dense		Density Index 35 - 65%	
D	Dense		Density Index 65 - 85%	
VD	Very Dense		Density Index 85 - 100%	



# ENGINEERING LOG - BOREHOLE

BOREHOLE NO: **BH110**

CLIENT: Lidbury Summers Whiteman

PAGE: 1 of 1

PROJECT NAME: Summer Green - Stage 1A & 1B

JOB NO: RGS01898.1

SITE LOCATION: Southern Parkway, Forster

LOGGED BY: RW

TEST LOCATION: Lot 75

DATE: 3/5/22

DRILL TYPE: RGS Ute Mounted Drill Rig

EASTING:

SURFACE RL:

BOREHOLE DIAMETER: 100 mm

INCLINATION: 90°

NORTHING:

DATUM:

AHD

Drilling and Sampling				Material description and profile information					Field Test		Structure and additional observations	
METHOD	WATER	SAMPLES	RL (Not measured)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION: Soil type, plasticity/particle characteristics, colour, minor components	MOISTURE CONDITION	CONSISTENCY DENSITY	Test Type		Result
AD/T	Not Encountered					CL	<b>TOPSOIL:</b> Silty CLAY, low plasticity, dark brown, trace sand and gravel, fine to medium grained	M > W <sub>p</sub>				TOPSOIL
				0.25		CI	<b>CLAY:</b> Medium plasticity, pale grey, grey, red mottling, trace of sand and gravel, fine to medium grained		VSt	HP	350	RESIDUAL
				0.50		CH	<b>CLAY:</b> Medium to high plasticity, pale grey, grey, pale brown with red mottling, trace of gravel, fine to coarse grained	M < W <sub>p</sub>	H / Fr			EXTREMELY WEATHERED SILTSTONE
				1.0								
				1.50			Hole Terminated at 1.50 m					
				2.0								
				2.5								

**LEGEND:**

**Water**

- Water Level (Date and time shown)
- Water Inflow
- Water Outflow

**Strata Changes**

- Gradational or transitional strata
- Definitive or distinct strata change

**Notes, Samples and Tests**

U<sub>50</sub> 50mm Diameter tube sample  
 CBR Bulk sample for CBR testing  
 E Environmental sample  
 ASS Acid Sulfate Soil Sample  
 B Bulk Sample

**Field Tests**

PID Photoionisation detector reading (ppm)  
 DCP(x-y) Dynamic penetrometer test (test depth interval shown)  
 HP Hand Penetrometer test (UCS kPa)

Consistency	UCS (kPa)	Moisture Condition
VS Very Soft	<25	D Dry
S Soft	25 - 50	M Moist
F Firm	50 - 100	W Wet
St Stiff	100 - 200	W <sub>p</sub> Plastic Limit
VSt Very Stiff	200 - 400	W <sub>L</sub> Liquid Limit
H Hard	>400	
Fb Friable		
<b>Density</b>	V Very Loose	Density Index <15%
	L Loose	Density Index 15 - 35%
	MD Medium Dense	Density Index 35 - 65%
	D Dense	Density Index 65 - 85%
	VD Very Dense	Density Index 85 - 100%

RG 2.00.3.LIB.GLB Log RG NON-CORED BOREHOLE - TEST P/T RGS01898.1 BH LOGS 100 SERIES.GPJ --DrawingFile-- 5/7/2022 16:19 10.03.00.09 Daigel Lab and In Situ Test - DGD Lib RG 2.00.3.2022-03-03 Pj; RG 2.00.0.2021-06-30



# ENGINEERING LOG - BOREHOLE

BOREHOLE NO: **BH111**

CLIENT: Lidbury Summers Whiteman

PAGE: 1 of 1

PROJECT NAME: Summer Green - Stage 1A & 1B

JOB NO: RGS01898.1

SITE LOCATION: Southern Parkway, Forster

LOGGED BY: RW

TEST LOCATION: Lot 73/74

DATE: 3/5/22

DRILL TYPE: RGS Ute Mounted Drill Rig

EASTING:

SURFACE RL:

BOREHOLE DIAMETER: 100 mm

INCLINATION: 90°

NORTHING:

DATUM:

AHD

Drilling and Sampling				Material description and profile information					Field Test		Structure and additional observations	
METHOD	WATER	SAMPLES	RL (Not measured)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION: Soil type, plasticity/particle characteristics, colour, minor components	MOISTURE CONDITION	CONSISTENCY DENSITY	Test Type		Result
AD/T	Not Encountered					CL	<b>TOPSOIL:</b> Silty CLAY, low plasticity, dark brown, trace sand and gravel, fine to medium grained	M < w <sub>p</sub>				TOPSOIL
				0.25m		CH	<b>CLAY:</b> Medium to high plasticity, pale brown, orange, grey, with some sand and gravel, fine to medium grained	M > w <sub>p</sub>	VSt	HP	380	RESIDUAL
				0.56m		CI	<b>Sandy CLAY:</b> Medium plasticity, pale orange-brown, brown, grey, sand, fine to coarse grained, trace of gravel, fine to medium grained	M < w <sub>p</sub>	H / Fr			EXTREMELY WEATHERED SANDSTONE
				1.20m			<b>SANDSTONE:</b> Fine to coarse grained sand, brown, orange-brown, dry, low to medium strength, fractured, highly weathered	D				HIGHLY WEATHERED SANDSTONE
				1.35m			Hole Terminated at 1.35 m Refusal on Sandstone					
				1.5								
				2.0								
				2.5								

**LEGEND:**

**Water**

- Water Level (Date and time shown)
- Water Inflow
- Water Outflow

**Strata Changes**

- Gradational or transitional strata
- Definitive or distinct strata change

**Notes, Samples and Tests**

- U<sub>50</sub> 50mm Diameter tube sample
- CBR Bulk sample for CBR testing
- E Environmental sample
- ASS Acid Sulfate Soil Sample
- B Bulk Sample

**Field Tests**

- PID Photoionisation detector reading (ppm)
- DCP(x-y) Dynamic penetrometer test (test depth interval shown)
- HP Hand Penetrometer test (UCS kPa)

Consistency	UCS (kPa)	Moisture Condition
VS Very Soft	<25	D Dry
S Soft	25 - 50	M Moist
F Firm	50 - 100	W Wet
St Stiff	100 - 200	W <sub>p</sub> Plastic Limit
VSt Very Stiff	200 - 400	W <sub>L</sub> Liquid Limit
H Hard	>400	
Fb Friable		
Density	V Very Loose	Density Index <15%
L Loose	MD Medium Dense	Density Index 15 - 35%
D Dense	VD Very Dense	Density Index 35 - 65%
		Density Index 65 - 85%
		Density Index 85 - 100%

RG 2.00.3.LIB.GLB Log RG NON-CORED BOREHOLE - TEST P/T RGS01898.1 BH LOGS 100 SERIES.GPJ --DrawingFile-- 5/7/2022 16:20 10.03.00.09 Daigel Lab and In Situ Test - DGD Lib RG 2.00.3.2022-03-03 P1; RG 2.00.0.2021-06-30



# ENGINEERING LOG - BOREHOLE

BOREHOLE NO: **BH112**

CLIENT: Lidbury Summers Whiteman

PAGE: 1 of 1

PROJECT NAME: Summer Green - Stage 1A & 1B

JOB NO: RGS01898.1

SITE LOCATION: Southern Parkway, Forster

LOGGED BY: RW

TEST LOCATION: Lot 71/72

DATE: 3/5/22

DRILL TYPE: RGS Ute Mounted Drill Rig

EASTING:

SURFACE RL:

BOREHOLE DIAMETER: 100 mm

INCLINATION: 90°

NORTHING:

DATUM:

AHD

Drilling and Sampling				Material description and profile information					Field Test		Structure and additional observations	
METHOD	WATER	SAMPLES	RL (Not measured)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION: Soil type, plasticity/particle characteristics, colour, minor components	MOISTURE CONDITION	CONSISTENCY DENSITY	Test Type		Result
AD/T	Not Encountered			0.25m		CL	<b>TOPSOIL:</b> Silty CLAY, low plasticity, dark brown, trace sand and gravel, fine to medium grained	M > Wp				TOPSOIL
						CH	<b>CLAY:</b> Medium to high plasticity, brown, grey, pale grey with red mottling, trace of sand and gravel, fine to medium grained	VSt	HP	260	RESIDUAL	
						CI	<b>CLAY:</b> Medium plasticity, pale grey, orange, red mottling, trace of sand, and gravel, fine to medium grained	M < Wp	VSt / H	HP	350	EXTREMELY WEATHERED SILTSTONE
				1.50m			Hole Terminated at 1.50 m					

RG 2.00.3.LIB.GLB.Log REGIONAL GEOTECHNICAL SOLUTIONS - TEST PLOT - RGS01898.1 - BH LOGS - 100 SERIES.GPJ - Drawing File - 5/7/2022 16:20 10.03.00.09 Daigal Lab and In Situ Test - DGD Lib - RG 2.00.3.2022-03-03 P1 - RG 2.00.0.202-496-30

**LEGEND:**

**Water**

- Water Level (Date and time shown)
- Water Inflow
- Water Outflow

**Strata Changes**

- Gradational or transitional strata
- Definitive or distinct strata change

**Notes, Samples and Tests**

- U<sub>50</sub> 50mm Diameter tube sample
- CBR Bulk sample for CBR testing
- E Environmental sample
- ASS Acid Sulfate Soil Sample
- B Bulk Sample

**Field Tests**

- PID Photoionisation detector reading (ppm)
- DCP(x-y) Dynamic penetrometer test (test depth interval shown)
- HP Hand Penetrometer test (UCS kPa)

Consistency	UCS (kPa)	Moisture Condition
VS Very Soft	<25	D Dry
S Soft	25 - 50	M Moist
F Firm	50 - 100	W Wet
St Stiff	100 - 200	W <sub>p</sub> Plastic Limit
VSt Very Stiff	200 - 400	W <sub>L</sub> Liquid Limit
H Hard	>400	
Fb Friable		
<b>Density</b>	V Very Loose	Density Index <15%
	L Loose	Density Index 15 - 35%
	MD Medium Dense	Density Index 35 - 65%
	D Dense	Density Index 65 - 85%
	VD Very Dense	Density Index 85 - 100%



# **Appendix B**

## **Laboratory Test Result Sheets**


**Report No: SSI:NEW22W-1364-S01**

**Issue No: 1**

# Shrink Swell Index Report

**Client:** Regional Geotechnical Solutions Pty Ltd  
 44 Bent Street  
 Wingham NSW 2429

**Project No.:** MNC16P-0001  
**Project Name:** Various Testing  
**Project Location:** The Southern Parkway, Forster, NSW



Accredited for compliance with ISO/IEC 17025-Testing. The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.  
 Results provided relate only to the items tested or sampled.

*B. Cullen*  
 Approved Signatory: Brent Cullen  
 (Engineering Geologist)  
 NATA Accredited Laboratory Number: 18686  
 Date of Issue: 7/06/2022

## Sample Details

**Sample ID:** NEW22W-1364-S01      **Test Request No.:** RGS01898.1

**Sampling Method:** The results outlined below apply to the sample as received

**Material:** Clay      **Date Sampled:** 5/05/2022

**Source:** On-Site Insitu      **Date Submitted:** 10/05/2022

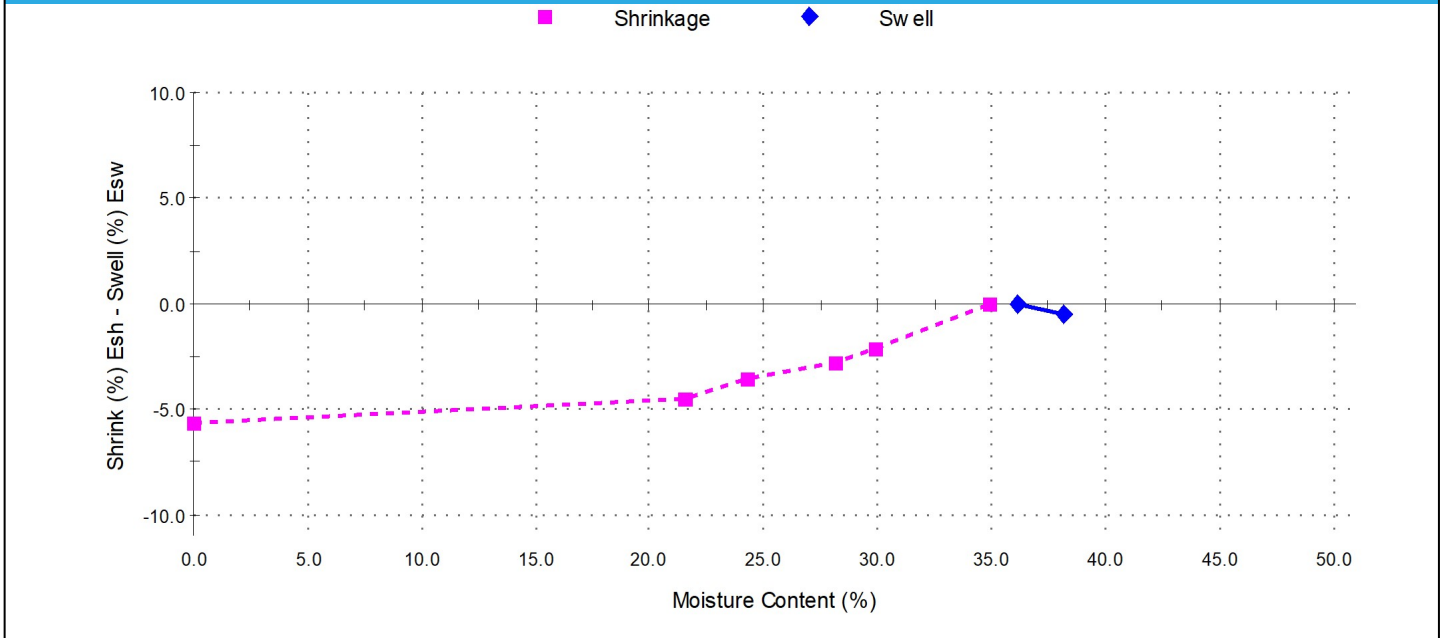
**Specification:** No Specification

**Sample Location:** BH102 - (0.5 - 1.0m)

**Date Tested:** 30/05/2022

Swell Test AS 1289.7.1.1		Shrink Test AS 1289.7.1.1	
<b>Swell on Saturation (%):</b>	-0.5	<b>Shrink on drying (%):</b>	5.7
<b>Moisture Content before (%):</b>	36.1	<b>Shrinkage Moisture Content (%):</b>	34.9
<b>Moisture Content after (%):</b>	38.2	<b>Est. inert material (%):</b>	1%
<b>Est. Unc. Comp. Strength before (kPa):</b>	580	<b>Crumbling during shrinkage:</b>	Nil
<b>Est. Unc. Comp. Strength after (kPa):</b>	390	<b>Cracking during shrinkage:</b>	Moderate

## Shrink Swell



**Shrink Swell Index - Iss (%): 3.2**

## Comments

**Report No: MAT:NEW22W-1364-S02**

**Issue No: 1**

## Material Test Report

**Client:** Regional Geotechnical Solutions Pty Ltd  
44 Bent Street  
Wingham NSW 2429

**Project No.:** MNC16P-0001

**Project Name:** Various Testing

**Project Location:** The Southern Parkway, Forster, NSW



Accredited for compliance with ISO/IEC 17025-Testing.  
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Results provided relate only to the items tested or sampled.

*B. Cullen*

Approved Signatory: Brent Cullen  
(Engineering Geologist)

NATA Accredited Laboratory Number: 18686

Date of Issue: 17/05/2022

### Sample Details

**Sample ID:** NEW22W-1364-S02  
**Date Sampled:** 05/05/2022  
**Date Received:** 10/05/2022  
**Source:** On-Site Insitu  
**Material:** Clay  
**Specification:** No Specification  
The results outlined below apply to the sample as received  
**TRN:** RGS01898.1  
**Sample Location:** BH104 - (0.5 - 0.8m)

### Test Results

Description	Method	Result	Limits
Sample History	AS 1289.1.1	Oven-dried	
Preparation	AS 1289.1.1	Dry Sieved	
Linear Shrinkage (%)	AS 1289.3.4.1	13.0	
Mould Length (mm)		250	
Crumbling		No	
Curling		No	
Cracking		No	
Liquid Limit (%)	AS 1289.3.1.1	53	
Method		Four Point	
Plastic Limit (%)	AS 1289.3.2.1	24	
Plasticity Index (%)	AS 1289.3.3.1	29	
Date Tested		16/05/2022	

### Comments

N/A


**Report No: SSI:NEW22W-1364-S03**

**Issue No: 1**

# Shrink Swell Index Report

**Client:** Regional Geotechnical Solutions Pty Ltd  
 44 Bent Street  
 Wingham NSW 2429

**Project No.:** MNC16P-0001  
**Project Name:** Various Testing  
**Project Location:** The Southern Parkway, Forster, NSW



Accredited for compliance with ISO/IEC 17025-Testing. The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.  
 Results provided relate only to the items tested or sampled.

*B. Cullen*  
 Approved Signatory: Brent Cullen  
 (Engineering Geologist)  
 NATA Accredited Laboratory Number: 18686  
 Date of Issue: 7/06/2022

## Sample Details

**Sample ID:** NEW22W-1364-S03      **Test Request No.:** RGS01898.1

**Sampling Method:** The results outlined below apply to the sample as received

**Material:** Clay      **Date Sampled:** 5/05/2022

**Source:** On-Site Insitu      **Date Submitted:** 10/05/2022

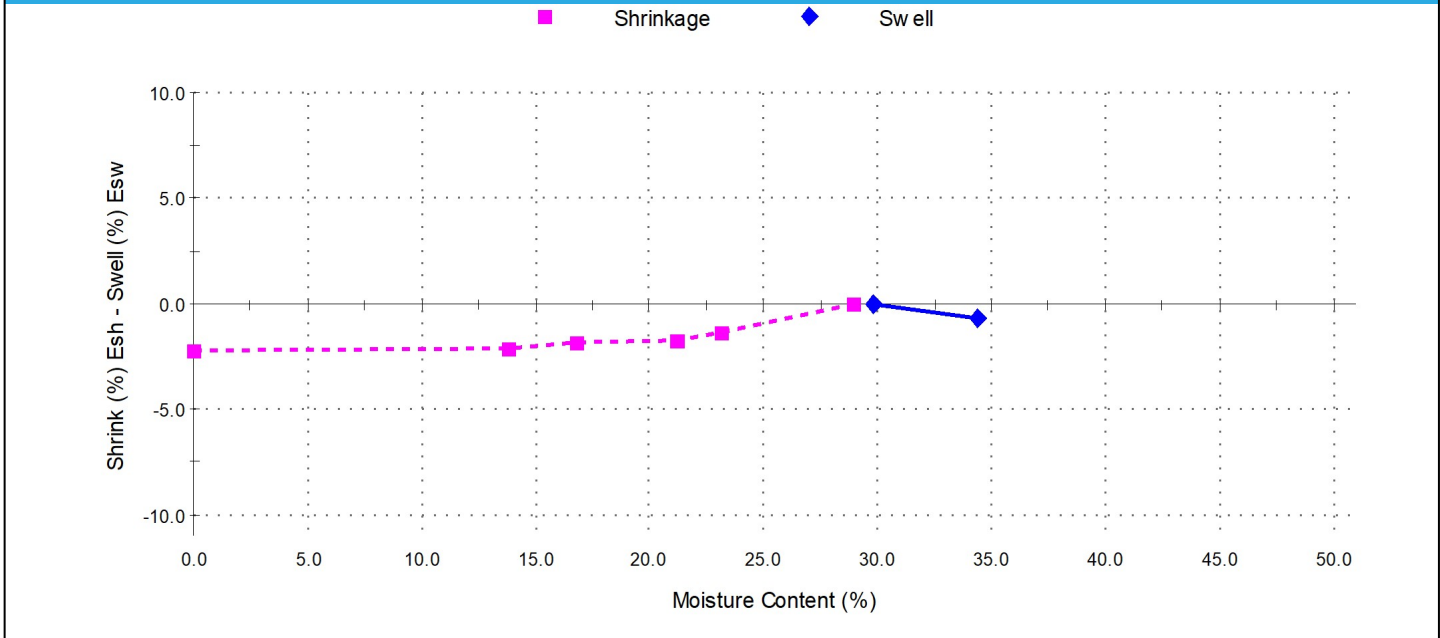
**Specification:** No Specification

**Sample Location:** BH105 - (0.7 - 1.2m)

**Date Tested:** 30/05/2022

Swell Test AS 1289.7.1.1		Shrink Test AS 1289.7.1.1	
<b>Swell on Saturation (%):</b>	-0.7	<b>Shrink on drying (%):</b>	2.2
<b>Moisture Content before (%):</b>	29.8	<b>Shrinkage Moisture Content (%):</b>	28.9
<b>Moisture Content after (%):</b>	34.3	<b>Est. inert material (%):</b>	2%
<b>Est. Unc. Comp. Strength before (kPa):</b>	270	<b>Crumbling during shrinkage:</b>	Nil
<b>Est. Unc. Comp. Strength after (kPa):</b>	180	<b>Cracking during shrinkage:</b>	Moderate

## Shrink Swell



**Shrink Swell Index - Iss (%): 1.2**

## Comments


**Report No: SSI:NEW22W-1364-S04**

**Issue No: 1**

# Shrink Swell Index Report

**Client:** Regional Geotechnical Solutions Pty Ltd  
 44 Bent Street  
 Wingham NSW 2429

**Project No.:** MNC16P-0001  
**Project Name:** Various Testing  
**Project Location:** The Southern Parkway, Forster, NSW



Accredited for compliance with ISO/IEC 17025-Testing. The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.  
 Results provided relate only to the items tested or sampled.

*B. Cullen*  
 Approved Signatory: Brent Cullen  
 (Engineering Geologist)  
 NATA Accredited Laboratory Number: 18686  
 Date of Issue: 7/06/2022

## Sample Details

**Sample ID:** NEW22W-1364-S04      **Test Request No.:** RGS01898.1

**Sampling Method:** The results outlined below apply to the sample as received

**Material:** Clay      **Date Sampled:** 5/05/2022

**Source:** On-Site Insitu      **Date Submitted:** 10/05/2022

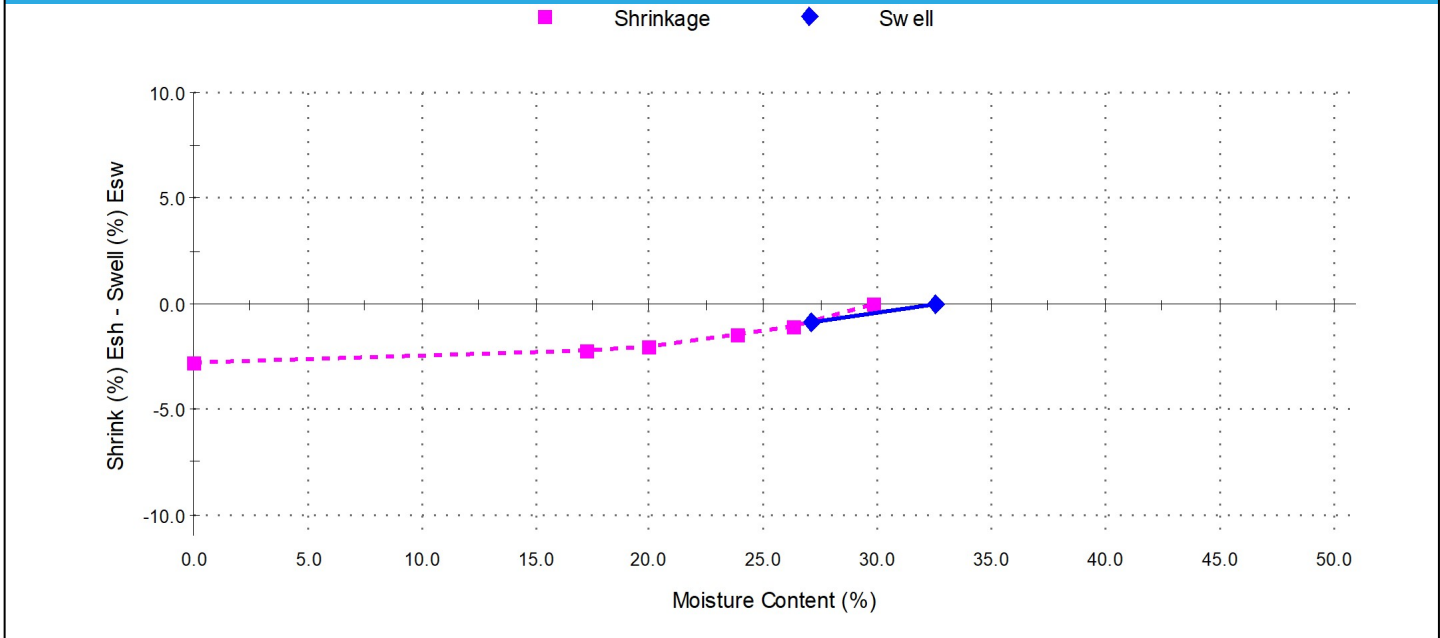
**Specification:** No Specification

**Sample Location:** BH106 - (0.5 - 1.0m)

**Date Tested:** 30/05/2022

Swell Test AS 1289.7.1.1		Shrink Test AS 1289.7.1.1	
<b>Swell on Saturation (%):</b>	-0.8	<b>Shrink on drying (%):</b>	2.8
<b>Moisture Content before (%):</b>	32.5	<b>Shrinkage Moisture Content (%):</b>	29.8
<b>Moisture Content after (%):</b>	27.1	<b>Est. inert material (%):</b>	5%
<b>Est. Unc. Comp. Strength before (kPa):</b>	410	<b>Crumbling during shrinkage:</b>	Nil
<b>Est. Unc. Comp. Strength after (kPa):</b>	350	<b>Cracking during shrinkage:</b>	Major

## Shrink Swell



**Shrink Swell Index - Iss (%): 1.6**


## Comments

**Report No: MAT:NEW22W-1364-S05**
**Issue No: 1**

# Material Test Report

**Client:** Regional Geotechnical Solutions Pty Ltd  
 44 Bent Street  
 Wingham NSW 2429

**Project No.:** MNC16P-0001  
**Project Name:** Various Testing  
**Project Location:** The Southern Parkway, Forster, NSW



Accredited for compliance with ISO/IEC 17025-Testing.  
 The results of the tests, calibrations and/or measurements  
 included in this document are traceable to Australian/national  
 standards.  
 Results provided relate only to the items tested or sampled.

*B. Cullen*  
 Approved Signatory: Brent Cullen  
 (Engineering Geologist)  
 NATA Accredited Laboratory Number: 18686  
 Date of Issue: 23/05/2022

## Sample Details

**Sample ID:** NEW22W-1364-S05  
**Date Sampled:** 05/05/2022  
**Date Received:** 10/05/2022  
**Source:** On-Site Insitu  
**Material:** Clay  
**Specification:** No Specification  
 The results outlined below apply to the sample as received

**TRN:** RGS01898.1  
**Sample Location:** BH109 - (0.5 - 1.0m)

## Test Results

Description	Method	Result	Limits
Sample History	AS 1289.1.1	Oven-dried	
Preparation	AS 1289.1.1	Dry Sieved	
Linear Shrinkage (%)	AS 1289.3.4.1	15.0	
Mould Length (mm)		250	
Crumbling		No	
Curling		No	
Cracking		No	
Liquid Limit (%)	AS 1289.3.1.1	77	
Method		Four Point	
Plastic Limit (%)	AS 1289.3.2.1	31	
Plasticity Index (%)	AS 1289.3.3.1	46	
Date Tested		20/05/2022	

## Comments

N/A