Land Dynamics Australia

Geotechnical Site Classification

Proposed Residential Subdivision

Stage 2, The Sanctuary, 344 John Oxley Drive, Thrumster

Report No. RGS21087-AQ

13 June 2024

REGIONAL GEOTECHNICAL SOLUTIONS

REGIONAL GEOTECHNICAL SOLUTIONS

Manning-Great Lakes
Port Macquarie
Coffs Harbour

RGS21087-AQ

13 June 2024

Land Dynamics Australia
77 Lord Street
PORT MACQUARIE NSW 2444

Attention: Jodie Chapman

Dear Jodie,

RE: Proposed Residential Subdivision – Stage 2, The Sanctuary, 344 John Oxley Drive, Thrumster

Geotechnical Site Classification

As requested, Regional Geotechnical Solutions Pty Ltd (RGS) has undertaken a geotechnical site classification in accordance with AS2870-2011 *Residential Slabs and Footings* for the proposed residential lots located in Stage 2 of The Sanctuary Estate, 344 John Oxley Drive (Lot 1 DP 1245588) Thrumster.

Stage 2 comprises Lot No's 201 – 227 as shows on the supplied plan titled "Plan of Subdivision of Lot 1 DP 12455888".

Based on the existing profiles encountered at the time of the field investigations and on the basis that all fill present in the fill platform was placed under Level One Inspection and Testing as defined in AS3798-2007, the building areas within the lots present are classified in accordance with AS2870-2011 *Residential Slabs and Footings* as detailed in the attached report.

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

For and on behalf of **Regional Geotechnical Solutions Pty Ltd**

Prepared by

Grant Colliar

Engineering Geologist

Reviewed by

Simon Keen

Associate Geotechnical Engineer

Table of Contents

1 INTRODUCTION 1

2 METHODOLOGY 1

3 SITE CONDITIONS 1

3.1 Surface Conditions 1

3.2 Subsurface Conditions 3

4 SITE CLASSIFICATION 4

5 CONSTRUCTION AND SITE MAINTENANCE CONSIDERATIONS 5

6 LIMITATIONS 6

Figures

Figure 1 Investigation Location Plan

Appendices

Appendix A Results of Field Investigations

Appendix B Laboratory Test Result Sheets

1 INTRODUCTION

Regional Geotechnical Solutions Pty Ltd (RGS) has undertaken a geotechnical site classification in accordance with AS2870-2011 *Residential Slabs and Footings* for the proposed residential lots located in Stage 2 of The Sanctuary Estate, 344 John Oxley Drive (Lot 1 DP 1245588) Thrumster.

Stage 2 comprises Lot No's 201 - 227 as shows on the supplied plan titled "Plan of Subdivision of Lot 1 DP 12455888".

The majority of the residential lots have been modified by site regrading works comprising up to approximately 5m cut, or, placement of up to approximately 3m of clay fill. Filling works was undertaken by Kazac Civil Pty Ltd, with Level One Inspection and Testing of the works undertaken by Douglas CMG Pty Ltd. A copy of the Level One report has been provided to RGS.

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

- Subsurface profile, including the presence of fill and the depth to weathered rock and groundwater (if encountered);
- Site classification to AS2870-2011 '*Residential slabs and footings*'; and
- Foundation design parameters.

2 METHODOLOGY

Field work for the assessment was undertaken on 21 May 2024 and was based on the supplied drawing titled "Plan of Subdivision of Lot 1 DP 12455888". Field work was undertaken by an Engineering Geologist from RGS and included:

- Observation of site features and surrounding features relevant to the geotechnical conditions of the site;
- 15 boreholes undertaken by a 4WD mounted drilling rig to depths of between 1.5m and 2.9m, logged and sampled by an Engineering Geologist; and
- Collection of U50 tube samples collected from soil horizons considered representative of cohesive soil profiles. Laboratory shrink-swell testing was undertaken on seven samples by a NATA accredited laboratory. An Atterberg limits test was undertaken on one sample that was unsuitable for shrink-swell testing.

3 SITE CONDITIONS

3.1 Surface Conditions

Stage 2 is located to the north of John Oxley Drive in an area of gently to moderately undulating topography where it is situated on the north east and east facing slopes a low hill that is up to RL 22m in elevation. Surface elevations across the site range from approximately RL 22m in the south western corner to approximately RL 8.5m along the eastern boundary.

A satellite image of the site that shows the location of the site and the site setting is reproduced below.

Satellite image dated 2023 obtained from Google Earth that illustrates the site location and setting. The approximate site boundaries of Stage 2 are outlined in red.

Surface slopes have been modified by cut and fill and range from approximately 2° – 8°. Some lots have been terraced and are separated by concrete block retaining walls that are up to approximately 2m height.

Lots 201 – 207 and 213 - 227 have been modified by earthworks comprising placement of more than 0.4m of clay fill that was placed under Level One inspection and monitoring as defined in AS3798-2007 '*Guidelines on Earthworks for Commercial and Residential Developments*' by Douglas Partners refer Level 1 Geotechnical Certification and Report, by Douglas - Project 209310, dated 10 November 2022. The approximate extent of the fill areas is shown on Figure 1.

Drainage of the site would be via a combination of overland flow and surface infiltration.

Selected site images are presented below.

Looking north west at retaining walls located between Lots 15 – 17.

Looking east across undulating slope and Lots 207-210.

3.2 Subsurface Conditions

The site is situated in an area underlain by deeply weathered geological units of the Port Macquarie Block which includes weathered slate and dolerite.

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

Table 1: Summary of Geotechnical Units

Unit	Material	Material Description
UNIT 1A	TOPSOIL/ FILL	Silty Sandy CLAY, high plasticity/medium plasticity, dark brown
UNIT 1B	FILL – CLAY (CONTROLLED)	Silty Sandy CLAY, low plasticity, pale brown/red/grey, stiff to very stiff
UNIT 2	RESIDUAL	Silty Sandy CLAY low plasticity to medium plasticity, red/brown, stiff to hard
UNIT 3	EW SLATE	Extremely Weathered SLATE, recovered as Silty Sandy CLAY, medium to high plasticity, pale red/pale grey/grey/pale red, stiff to hard, traces of rock fabric.

Table 2: Summary of Subsurface Profiles - Depth to Base of Material Layer (m)

BH	Lot	Unit 1A - Topsoil	Unit 1B - Controlled Fill	Unit 2 - Residual	Unit 3 – EW Slate
BH301	201/202	0.3	--	≥1.2	≥1.5
BH302	136	0.25	1.5	≥1.9	--
BH303	134/135	0.2			≥1.5
BH304	203/204	0.2		≥1.5	
BH305	205	0.2	1.0	≥1.5	--

BH	Lot	Unit 1A - Topsoil	Unit 1B - Controlled Fill	Unit 2 - Residual	Unit 3 – EW Slate
BH306	207/208	0.2	--	--	≥1.5
BH307	209/210	0.2	--	--	≥1.5
BH308	211/212	0.25	0.5	≥2.9	--
BH309	213/214	0.35	1.1	≥1.5	--
BH310	215/216	0.15	0.5	≥1.5	--
BH311	217/218	0.25	0.4	≥1.5	--
BH312	219/220	0.2	0.4	≥1.5	--
BH313	221/222	0.15	0.6	≥1.5	--
BH314	223/224	0.25	0.4	≥1.5	--
BH315	225/226	0.15	0.4	≥1.5	--

Note: ≥ Indicates that base of material layer was not encountered
-- Indicates that the material was not encountered at the test location

Groundwater was not encountered during the investigation. It should be noted that fluctuations in groundwater levels can occur because of seasonal variations, temperature, rainfall and other similar factors, the influence of which may not have been apparent at the time of the assessment.

A summary of the laboratory test results is presented in Table 3. Test result sheets are presented in Appendix B.

Table 3: Laboratory Testing Summary

Location	Depth (m)	Lot	Material	Shrink Swell Index (%)	Linear Shrinkage (%)	Plasticity Index (%)
BH301	0.3 - 0.8	201/202	Residual CLAY	2.6	-	-
BH303*	0.2 - 0.5	134/135	EW Slate	-	5.0	14.0
BH305	0.4 - 0.9	205	Fill CLAY	2.9	-	-
BH308	0.5 - 1.0	211/212	Residual CLAY	2.9	-	-
BH309	0.4 - 0.7	213/214	Fill CLAY	3.0	-	-
BH311	0.5 -1.0	217/218	Residual CLAY	4.1	-	-
BH313	0.2 - 0.6	221/222	Fill CLAY	2.2	-	-
BH315	0.4 - 0.8	225/226	Residual CLAY	2.8	-	-

4 SITE CLASSIFICATION

For structures or components that are similar in construction, performance expectation, and loading to a typical domestic structure, the guidance provided in AS2870-2011 "*Residential Slabs and Footings*" would be appropriate.

In assessing the estimated characteristic surface movement (y_s) values the following has been adopted:

- All clay fill of > 0.4m thickness was placed under Level 1 Inspection and Testing as defined in AS3798-2007, and can therefore be considered as Controlled Fill with respect to AS2870-2011;
- Where there was cut undertaken the depth of cracked zone was reduced by the depth of cut;
- 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} for Controlled clay fill of between 2.2 and 3.0%, based on a combination of previous experience in the area and the laboratory test results;
- Characteristic I_{ss} for residual clay of between 2.6 and 4.1%, based on a combination of previous experience in the area and the laboratory test results;
- Adopted I_{ss} for extremely weathered slate of 2%, based on a combination of previous experience in the area and the laboratory test result;
- Trees are beyond the influence distance from the individual lots; and
- The existing retaining walls that are located between some of the lots have either been designed to support residential footing loads behind the walls, or the structures are setback a distance of at least the height of the wall from the retaining wall.

The proposed building areas for Lot No's 201 – 207 and 213 - 227 been modified by the placement of controlled fill to depths of greater than 0.4m and are therefore classified as Class P in accordance with AS2870-2011, Clause 2.5.3(a). In accordance with Section 2.5.3(c), the above mentioned lots have been reclassified in accordance with engineering principles.

Based on the above and the results of the site investigations, the individual lot classifications are presented in Table 4.

Table 4: Site Classification Summary

Lots	Site Re-classification	Characteristic Surface Movement, y_s (mm)
208 - 210	Class M	30 – 40mm
201 – 207, 211 - 227	Class H1	40 - 50mm

5 CONSTRUCTION AND SITE MAINTENANCE CONSIDERATIONS

All structural footings should be founded as follows:

- All footings should be founded in Controlled Fill or natural soils below all topsoil, uncontrolled fill materials and disturbed soil;
- Footings can be designed based on a maximum allowable base bearing pressure of **100kPa** for footings founded within the Controlled Fill, residual clay or extremely weathered slate 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, retaining walls, downslope batters, and other subsurface structures;

- The engineering design for the retaining walls present allows for any surcharge affecting the walls such as footing loads (where the structures are located closer than the height of the wall from the structure), structures or sloping surfaces;
- The soils in the Port Macquarie area are prone to fretting and softening on exposure to air and water. It is therefore recommended that concrete be poured as soon as possible after footing excavation. In the event that wet weather occurs prior to pouring of concrete, the base of footing excavations should be checked for the presence of loose or softened material, which should be removed prior to pouring concrete; and
- 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.

Where lot filling works are proposed, all fill for the support of structures should be placed and compacted in accordance with the recommendations outlined in AS3798-2007 *Guidelines on Earthworks for Residential and Commercial Developments*, under Level 1 supervision, for it to be considered Controlled Fill as defined in AS2870-2011. The founding of structures on fill that is not placed in accordance with Level 1 requirements is not recommended.

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 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 should be considered when selecting design values for differential movement across the building.

6 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 its writing. The estimate is influenced and limited by the fieldwork method and testing 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

Grant Colliar

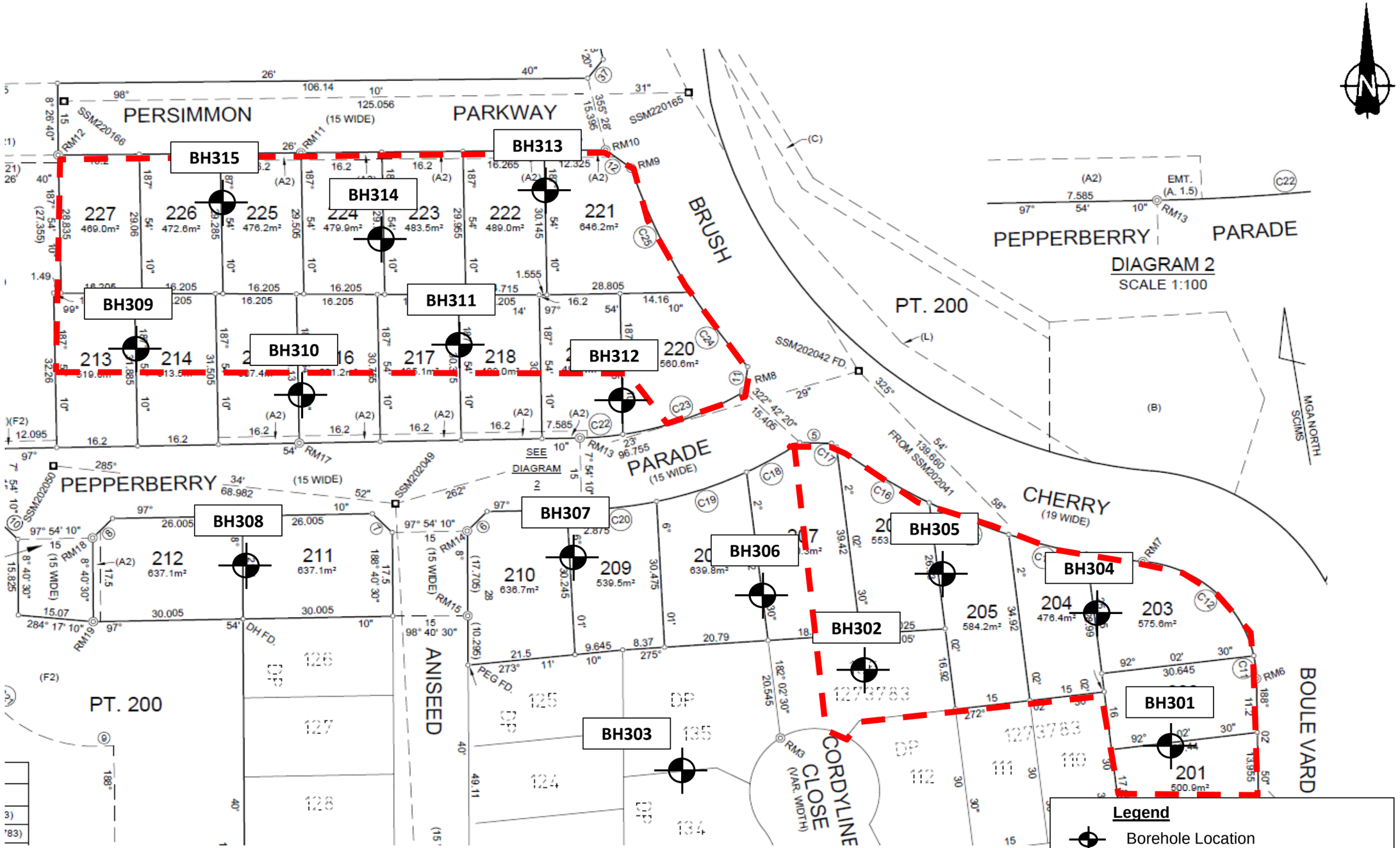
Engineering Geologist

Reviewed by

Simon Keen

Associate Geotechnical Engineer

Figures



Based on supplied drawing titled " PLAN OF SUBDIVISION OF LOT 100 DP1273783 "

REGIONAL GEOTECHNICAL SOLUTIONS	Client:	LAND DYNAMICS AUSTRALIA	Job No.	RGS21087.1
	Project:	THE SANCTUARY, STAGE 2	Drawn By:	HM
			Scale:	NTS
		344 JOHN OXLEY DRIVE, PORT MACQUARIE	Date:	11-Jun-24
	Title:	INVESTIGATION LOCATION PLAN	Figure No.	1

Appendix A

Results of Field Investigations

REGIONAL GEOTECHNICAL SOLUTIONS

ENGINEERING LOG - BOREHOLE

BOREHOLE NO: BH301

CLIENT: Land Dynamics Australia
PAGE: 1 of 1
PROJECT NAME: The Sanctuary - Stage 2
JOB NO: RGS21087.1
SITE LOCATION: 344 John Oxley Drive, Thrumster
LOGGED BY: HFM
TEST LOCATION: Lots 201/202
DATE: 21/5/24

DRILL TYPE: RGS Ute Mounted Drill Rig
EASTING: 485525 m
SURFACE RL:
BOREHOLE DIAMETER: 50 mm
INCLINATION: 90°
NORTHING: 6519755 m
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	0.30m				CL	**FILL/TOPSOIL:** Silty Sandy CLAY, low plasticity, dark brown, sand fine to medium grained	$M < w_P$	St	HP	150	FILL/TOPSOIL
							0.30m			HP	140	
										HP	150	
										HP	400	
						CI	**Silty Sandy CLAY:** Medium plasticity, orange brown, sand fine to medium grained, traces of gravel fine grained, subangular-subrounded		H			RESIDUAL
				0.5						HP	450	
		U50								HP	450	
		0.80m										
							0.90m			HP	450	
				1.0		CI	**Silty Sandy CLAY:** Medium plasticity, red mottled brown, sand fine to medium grained			HP	440	
							1.00m					
						CH	**Silty Sandy CLAY:** Medium to high plasticity, red-grey, sand fine to medium grained, traces of gravel fine grained, subangular-subrounded			HP	460	EXTREMELY WEATHERED SLATE
				1.5			1.50m					
							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 distict strata change

Notes, Samples and Tests

U_{50}	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)
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	

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%

Moisture Condition

D	Dry
M	Moist
W	Wet
W_p	Plastic Limit
W_L	Liquid Limit

REGIONAL GEOTECHNICAL SOLUTIONS

ENGINEERING LOG - BOREHOLE

BOREHOLE NO: BH302

CLIENT: Land Dynamics Australia
PAGE: 1 of 1
PROJECT NAME: The Sanctuary - Stage 2
JOB NO: RGS21087.1
SITE LOCATION: 344 John Oxley Drive, Thrumster
LOGGED BY: HFM
TEST LOCATION: Lot 136
DATE: 21/5/24

DRILL TYPE: RGS Ute Mounted Drill Rig
EASTING: 485453 m
SURFACE RL:
BOREHOLE DIAMETER: 50 mm
INCLINATION: 90°
NORTHING: 6519773 m
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	**FILL/TOPSOIL:** Silty Sandy CLAY, low plasticity, dark brown, sand fine to medium grained	M < w_P	Fr			FILL/TOPSOIL
							0.25m					
						CL	**FILL:** Silty Sandy CLAY, low plasticity, pale brown, sand fine to medium grained					FILL-CLAY
				0.5			0.50m					
						CL	**FILL:** Silty Sandy CLAY, low plasticity, red-grey, sand fine to medium grained		VSt / Fr	HP	300	
							0.75m			HP	300	
										HP	320	
						CL	**FILL:** Silty Sandy CLAY, low plasticity, orange-brown, sand fine to medium grained					
				1.0					St	HP	200	
										HP	120	
										HP	165	
				1.5			1.50m					
						CH	**Silty Sandy CLAY:** Medium to high plasticity, reddish brown, sand fine to medium grained.		H / Fr	HP	460	RESIDUAL
										HP	450	
							1.90m			HP	440	
							Hole Terminated at 1.90 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 distict strata change

Notes, Samples and Tests

U_{50}	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)
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	

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%

Moisture Condition

D	Dry
M	Moist
W	Wet
W_p	Plastic Limit
W_L	Liquid Limit

REGIONAL GEOTECHNICAL SOLUTIONS

ENGINEERING LOG - BOREHOLE

BOREHOLE NO: BH303

CLIENT: Land Dynamics Australia
PROJECT NAME: The Sanctuary - Stage 2
SITE LOCATION: 344 John Oxley Drive, Thrumster
TEST LOCATION: Lots 134/135

PAGE: 1 of 1
JOB NO: RGS21087.1
LOGGED BY: HFM
DATE: 21/5/24

DRILL TYPE: RGS Ute Mounted Drill Rig
BOREHOLE DIAMETER: 50 mm
INCLINATION: 90°
EASTING: 485423 m
NORTHING: 6519758 m
SURFACE RL:
DATUM: AHD

Drilling and Sampling					Material description and profile information					Field Test		
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	Structure and additional observations
AD/T	Not Encountered	0.20m				Cl	**FILL/TOPSOIL:** Silty Sandy CLAY, medium plasticity, dark brown, sand fine to medium grained 0.20m	M < w_P	Fr			FILL/TOPSOIL
		U50 0.50m		0.5		Cl	**Silty Sandy CLAY:** Medium plasticity, red-grey, sand fine to medium grained, traces of gravel fine to medium grained, traces of rock fabric		Fr / VSt			EXTREMELY WEATHERED SLATE
				1.0								
				1.5			1.50m 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 distict strata change

Notes, Samples and Tests

U_{50}	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)
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	

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%

Moisture Condition

D	Dry
M	Moist
W	Wet
W_p	Plastic Limit
W_L	Liquid Limit

REGIONAL GEOTECHNICAL SOLUTIONS

ENGINEERING LOG - BOREHOLE

BOREHOLE NO: BH304

CLIENT: Land Dynamics Australia
PROJECT NAME: The Sanctuary - Stage 2
SITE LOCATION: 344 John Oxley Drive, Thrumster
TEST LOCATION: Lots 203/204

PAGE: 1 of 1
JOB NO: RGS21087.1
LOGGED BY: HFM
DATE: 21/5/24

DRILL TYPE: RGS Ute Mounted Drill Rig
BOREHOLE DIAMETER: 50 mm
INCLINATION: 90°
EASTING: 485506 m
NORTHING: 6519781 m
SURFACE RL:
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		CH	**FILL/TOPSOIL:** Silty Sandy CLAY, medium to high plasticity, dark brown, sand fine to medium grained	M < w_P	Fr / St	HP	100	FILL/TOPSOIL
							0.20m			HP	100	
						CI	**Silty Sandy CLAY:** Medium plasticity, red-brown, sand fine to medium grained, traces of gravel fine grained, subangular-subrounded			HP	100	RESIDUAL
				0.5					H / Fr	HP	450	
										HP	450	
										HP	440	
										HP	450	
							0.80m			HP	520	
						CI	**Silty Sandy CLAY:** Medium plasticity, red-brown, mottled grey, sand fine to medium grained			HP	530	
				1.0						HP	500	
										HP	550	
				1.5			1.50m					
							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 distict strata change

Notes, Samples and Tests

U_{50}	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)
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	

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%

Moisture Condition

D	Dry
M	Moist
W	Wet
W_p	Plastic Limit
W_L	Liquid Limit

REGIONAL GEOTECHNICAL SOLUTIONS

ENGINEERING LOG - BOREHOLE

BOREHOLE NO: BH305

CLIENT: Land Dynamics Australia
PROJECT NAME: The Sanctuary - Stage 2
SITE LOCATION: 344 John Oxley Drive, Thrumster
TEST LOCATION: Lot 205

PAGE: 1 of 1
JOB NO: RGS21087.1
LOGGED BY: HFM
DATE: 21/5/24

DRILL TYPE: RGS Ute Mounted Drill Rig
BOREHOLE DIAMETER: 50 mm
INCLINATION: 90°
EASTING: 485477 m
NORTHING: 6519800 m
SURFACE RL:
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	**FILL/TOPSOIL:** Silty Sandy CLAY, low plasticity, dark brown, sand fine to medium grained		Fr / St			FILL/TOPSOIL
							0.20m			HP	150	
						CI	**FILL:** Silty Sandy CLAY, medium plasticity, red-brown, sand fine to medium grained			HP	120	FILL-CLAY
		0.40m					0.40m			HP	130	
				0.5		CI	**FILL:** Silty Sandy CLAY, medium plasticity, red-pale brown, sand fine to medium grained		Fr / VSt	HP	350	
		U50								HP	310	
		0.90m								HP	320	
				1.0			1.00m					
						CI	**FILL:** Silty Sandy CLAY, medium plasticity, red-brown, sand fine to medium grained, traces of gravel fine grained, subangular-subrounded			HP	350	
							1.20m			HP	310	
						CH	**Silty Sandy CLAY:** Medium to high plasticity, red-brown, sand fine to medium grained		H / Fr	HP	320	RESIDUAL
										HP	550	
				1.5			1.50m			HP	550	
							Hole Terminated at 1.50 m			HP	550	
				2.0								
				2.5								

LEGEND:

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

Strata Changes
- Gradational or transitional strata
- Definitive or distict strata change

Notes, Samples and Tests

U_{50}	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)
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	

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%

Moisture Condition

D	Dry
M	Moist
W	Wet
W_p	Plastic Limit
W_L	Liquid Limit

REGIONAL GEOTECHNICAL SOLUTIONS

ENGINEERING LOG - BOREHOLE

BOREHOLE NO: BH306

CLIENT: Land Dynamics Australia
PAGE: 1 of 1
PROJECT NAME: The Sanctuary - Stage 2
JOB NO: RGS21087.1
SITE LOCATION: 344 John Oxley Drive, Thrumster
LOGGED BY: HFM
TEST LOCATION: Lots 207/208
DATE: 21/5/24

DRILL TYPE: RGS Ute Mounted Drill Rig
EASTING: 485441 m
SURFACE RL:
BOREHOLE DIAMETER: 50 mm
INCLINATION: 90°
NORTHING: 6519802 m
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	**FILL/TOPSOIL:** Silty Sandy CLAY, low plasticity, dark brown, sand fine to medium grained		F	HP	100	FILL/TOPSOIL
							0.20m			HP	100	
						CH	**Silty Sandy CLAY:** Medium to high plasticity, red-brown, mottled grey, sand fine to medium grained, traces of gravel fine to medium grained, subangular-subrounded, traces of rock fabric		St	HP	110	EXTREMELY WEATHERED SLATE
				0.5						HP	450	
										HP	400	
				1.0						HP	420	
				1.5			1.50m			HP	445	
							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 distict strata change

Notes, Samples and Tests

U_{50}	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)
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	

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%

Moisture Condition

D	Dry
M	Moist
W	Wet
W_p	Plastic Limit
W_L	Liquid Limit

REGIONAL GEOTECHNICAL SOLUTIONS

ENGINEERING LOG - BOREHOLE

BOREHOLE NO: BH307

CLIENT: Land Dynamics Australia
PAGE: 1 of 1
PROJECT NAME: The Sanctuary - Stage 2
JOB NO: RGS21087.1
SITE LOCATION: 344 John Oxley Drive, Thrumster
LOGGED BY: HFM
TEST LOCATION: Lots 210/209
DATE: 21/5/24

DRILL TYPE: RGS Ute Mounted Drill Rig
EASTING: 485403 m
SURFACE RL:
BOREHOLE DIAMETER: 50 mm
INCLINATION: 90°
NORTHING: 6519809 m
DATUM: AHD

Drilling and Sampling					Material description and profile information					Field Test		
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	Structure and additional observations
AD/T	Not Encountered			0		CL	**FILL/TOPSOIL:** Silty Sandy CLAY, low plasticity, dark brown, sand fine to medium grained		Fr / St	HP	100	FILL/TOPSOIL
							0.20m			HP	80	EXTREMELY WEATHERED SLATE
						Cl	**Silty Sandy CLAY:** Medium plasticity, red-grey, sand fine to medium grained, traces of gravel fine grained, subangular-subrounded, traces of rock fabric			HP	75	
				0.5								
				1.0								
				1.5			1.50m					
							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 distict strata change

Notes, Samples and Tests

U_{50}	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)
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	

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%

Moisture Condition

D	Dry
M	Moist
W	Wet
W_p	Plastic Limit
W_L	Liquid Limit

REGIONAL GEOTECHNICAL SOLUTIONS

ENGINEERING LOG - BOREHOLE

BOREHOLE NO: BH308

CLIENT: Land Dynamics Australia
PAGE: 1 of 1
PROJECT NAME: The Sanctuary - Stage 2
JOB NO: RGS21087.1
SITE LOCATION: 344 John Oxley Drive, Thrumster
LOGGED BY: HFM
TEST LOCATION: Lots 211/212
DATE: 21/5/24

DRILL TYPE: RGS Ute Mounted Drill Rig
EASTING: 485339 m
SURFACE RL:
BOREHOLE DIAMETER: 50 mm
INCLINATION: 90°
NORTHING: 6519818 m
DATUM: AHD

Drilling and Sampling					Material description and profile information					Field Test		
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	Structure and additional observations
AD/T	Not Encountered					CL	**FILL/TOPSOIL:** Silty Sandy CLAY, low plasticity, dark brown, sand fine to medium grained		F / St	HP	100	FILL/TOPSOIL
							0.25m			HP	100	
						Cl	**FILL:** Silty Sandy CLAY, medium plasticity, red-pale brown, sand fine to medium grained, traces of gravel fine grained, subangular-subrounded			HP	100	RESIDUAL
		0.50m		0.5			0.50m			HP	350	
						CH	**Sandy Gravelly CLAY:** Medium to high plasticity, red, sand fine to medium grained, gravel fine to medium grained, trace of rock fabric		Fr / VSt	HP	350	EXTREMELY WEATHERED SLATE
		U50								HP	350	
		1.00m		1.0								
				1.5								
				2.0								
				2.5						HP	200	
										HP	120	
										HP	200	
							2.90m					
							Hole Terminated at 2.90 m					

LEGEND:

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

Strata Changes
- Gradational or transitional strata
- Definitive or distict strata change

Notes, Samples and Tests

U_{50}	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)
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	

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%

Moisture Condition

D	Dry
M	Moist
W	Wet
W_p	Plastic Limit
W_L	Liquid Limit

REGIONAL GEOTECHNICAL SOLUTIONS

ENGINEERING LOG - BOREHOLE

BOREHOLE NO: BH309

CLIENT: Land Dynamics Australia
PAGE: 1 of 1
PROJECT NAME: The Sanctuary - Stage 2
JOB NO: RGS21087.1
SITE LOCATION: 344 John Oxley Drive, Thrumster
LOGGED BY: HFM
TEST LOCATION: Lots 213/214
DATE: 21/5/24

DRILL TYPE: RGS Ute Mounted Drill Rig
EASTING: 485323 m
SURFACE RL:
BOREHOLE DIAMETER: 50 mm
INCLINATION: 90°
NORTHING: 6519862 m
DATUM: AHD

Drilling and Sampling					Material description and profile information					Field Test		
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	Structure and additional observations
AD/T	Not Encountered	0.40m U50 0.70m		0.5 1.0 1.5		CL	**FILL/TOPSOIL:** Silty Sandy CLAY, low plasticity, dark brown, sand fine to medium grained 0.35m		Fr	HP HP HP	150 150 130	FILL/TOPSOIL
						Cl	**FILL:** Silty Sandy CLAY, medium plasticity, red-pale brown, sand, fine to medium grained 0.70m		Fr / VSt	HP HP HP HP HP	210 180 300 220 250	FILL-CLAY
						Cl	**FILL:** Silty Sandy CLAY, medium plasticity, red-brown, sand fine to medium grained 1.10m			HP	250	
						CH	**Silty Sandy CLAY:** Medium to high plasticity, red, sand fine to medium grained 1.50m		H	HP HP HP	400 400 410	RESIDUAL
				2.0 2.5			Hole Terminated at 1.50 m					

LEGEND:

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

Strata Changes
- Gradational or transitional strata
- Definitive or distict strata change

Notes, Samples and Tests

U_{50}	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)
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	

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%

Moisture Condition

D	Dry
M	Moist
W	Wet
W_p	Plastic Limit
W_L	Liquid Limit

REGIONAL GEOTECHNICAL SOLUTIONS

ENGINEERING LOG - BOREHOLE

BOREHOLE NO: BH310

CLIENT: Land Dynamics Australia
PAGE: 1 of 1
PROJECT NAME: The Sanctuary - Stage 2
JOB NO: RGS21087.1
SITE LOCATION: 344 John Oxley Drive, Thrumster
LOGGED BY: HFM
TEST LOCATION: Lots 215/216
DATE: 21/5/24

DRILL TYPE: RGS Ute Mounted Drill Rig
EASTING: 485351 m
SURFACE RL:
BOREHOLE DIAMETER: 50 mm
INCLINATION: 90°
NORTHING: 6519847 m
DATUM: AHD

Drilling and Sampling					Material description and profile information					Field Test		
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	Structure and additional observations
AD/T	Not Encountered			0		CL	**FILL/TOPSOIL:** Silty Sandy CLAY, low plasticity, dark grey, sand fine to medium grained		F	HP	110	FILL/TOPSOIL
							0.25m			HP	80	
						Cl	**FILL:** Silty Sandy CLAY, medium plasticity, red, sand, fine to medium grained, traces of gravel, fine grained, subangular-subrounded		St	HP	80	FILL-CLAY
				0.5			0.50m			HP	400	
						CH	**Silty Sandy CLAY:** Medium to high plasticity, red, sand fine to medium grained		Fr	HP	400	RESIDUAL
				1.0						HP	400	
				1.5			1.50m					
							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 distict strata change

Notes, Samples and Tests

U_{50}	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)
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	

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%

Moisture Condition

D	Dry
M	Moist
W	Wet
W_p	Plastic Limit
W_L	Liquid Limit

REGIONAL GEOTECHNICAL SOLUTIONS

ENGINEERING LOG - BOREHOLE

BOREHOLE NO: BH311

CLIENT: Land Dynamics Australia
PROJECT NAME: The Sanctuary - Stage 2
SITE LOCATION: 344 John Oxley Drive, Thrumster
TEST LOCATION: Lots 217/218

PAGE: 1 of 1
JOB NO: RGS21087.1
LOGGED BY: HFM
DATE: 21/5/24

DRILL TYPE: RGS Ute Mounted Drill Rig
BOREHOLE DIAMETER: 50 mm
INCLINATION: 90°
EASTING: 485388 m
NORTHING: 6519863 m
SURFACE RL:
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		CL	**FILL/TOPSOIL:** Silty Sandy CLAY, low plasticity, dark grey, sand fine to medium grained		Fr / St	HP	110	FILL/TOPSOIL
							0.25m			HP	110	
						CL	**FILL:** Silty Sandy CLAY, low to medium plasticity, red, sand, fine to medium grained, traces of gravel, fine grained, subangular-subrounded			HP	100	FILL-CLAY
							0.40m					
		0.50m		0.5		Cl	**Silty Sandy CLAY:** Medium plasticity, red, sand fine to medium grained		Fr / VSt			RESIDUAL
		U50										
		1.00m		1.0								
				1.5			1.50m					
							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 distict strata change

Notes, Samples and Tests

U_{50}	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)
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	

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%

Moisture Condition

D	Dry
M	Moist
W	Wet
W_p	Plastic Limit
W_L	Liquid Limit

REGIONAL GEOTECHNICAL SOLUTIONS

ENGINEERING LOG - BOREHOLE

BOREHOLE NO: BH312

CLIENT: Land Dynamics Australia
PAGE: 1 of 1
PROJECT NAME: The Sanctuary - Stage 2
JOB NO: RGS21087.1
SITE LOCATION: 344 John Oxley Drive, Thrumster
LOGGED BY: HFM
TEST LOCATION: Lots 219/220
DATE: 21/5/24

DRILL TYPE: RGS Ute Mounted Drill Rig
EASTING: 485425 m
SURFACE RL:
BOREHOLE DIAMETER: 50 mm
INCLINATION: 90°
NORTHING: 6519838 m
DATUM: AHD

Drilling and Sampling					Material description and profile information					Field Test		
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	Structure and additional observations
AD/T	Not Encountered					CL	**FILL/TOPSOIL:** Silty Sandy CLAY, low plasticity, dark brown, sand fine to medium grained		F / St	HP	130	FILL/TOPSOIL
							0.20m			HP	110	
						Cl	**FILL:** Silty Sandy CLAY, medium plasticity, red, sand, fine to medium grained, traces of gravel, fine grained, subangular-subrounded			HP	120	FILL
							0.40m			HP	220	
				0.5		Cl	**Silty Sandy CLAY:** Medium plasticity, red, sand fine to medium grained		Fr / VSt	HP	300	RESIDUAL
				1.0						HP	240	
				1.5			1.50m					
							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 distict strata change

Notes, Samples and Tests

U_{50}	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)
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	

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%

Moisture Condition

D	Dry
M	Moist
W	Wet
W_p	Plastic Limit
W_L	Liquid Limit

REGIONAL GEOTECHNICAL SOLUTIONS

ENGINEERING LOG - BOREHOLE

BOREHOLE NO: BH313

CLIENT: Land Dynamics Australia
PROJECT NAME: The Sanctuary - Stage 2
SITE LOCATION: 344 John Oxley Drive, Thrumster
TEST LOCATION: Lots 221/222

PAGE: 1 of 1
JOB NO: RGS21087.1
LOGGED BY: HFM
DATE: 21/5/24

DRILL TYPE: RGS Ute Mounted Drill Rig
BOREHOLE DIAMETER: 50 mm
INCLINATION: 90°
EASTING: 485414 m
NORTHING: 6519888 m
SURFACE RL:
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	**FILL/TOPSOIL:** Silty Sandy CLAY, low plasticity, dark brown, sand fine to medium grained		Fr			FILL/TOPSOIL
							0.15m			HP	320	
		0.20m				CL	**FILL:** Silty Sandy CLAY, low plasticity, red-brown, sand, fine to medium grained		VSt	HP	210	FILL-CLAY
		U50		0.5						HP	120	
										HP	380	
		0.60m					0.60m			HP	400	
						CH	**Silty Sandy CLAY:** Medium to high plasticity, dark red, sand fine to medium grained		H	HP	400	RESIDUAL
				1.0						HP	600	
										HP	600	
				1.5			1.50m			HP	550	
							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 distict strata change

Notes, Samples and Tests

U_{50}	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)
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	

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%

Moisture Condition

D	Dry
M	Moist
W	Wet
W_p	Plastic Limit
W_L	Liquid Limit

REGIONAL GEOTECHNICAL SOLUTIONS

ENGINEERING LOG - BOREHOLE

BOREHOLE NO: BH314

CLIENT: Land Dynamics Australia
PAGE: 1 of 1
PROJECT NAME: The Sanctuary - Stage 2
JOB NO: RGS21087.1
SITE LOCATION: 344 John Oxley Drive, Thrumster
LOGGED BY: HFM
TEST LOCATION: Lots 223/224
DATE: 21/5/24

DRILL TYPE: RGS Ute Mounted Drill Rig
EASTING: 485369 m
SURFACE RL:
BOREHOLE DIAMETER: 50 mm
INCLINATION: 90°
NORTHING: 6519883 m
DATUM: AHD

Drilling and Sampling					Material description and profile information					Field Test		
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	Structure and additional observations
AD/T	Not Encountered					CL	**FILL/TOPSOIL:** Silty Sandy CLAY, low plasticity, dark brown, sand fine to medium grained		St	HP	110	FILL/TOPSOIL
							0.25m					
						Cl	**FILL:** Silty Sandy CLAY, medium plasticity, red-brown, sand, fine to medium grained					FILL-CLAY
							0.40m			HP	250	RESIDUAL
				0.5		Cl	**Silty Sandy CLAY:** Medium plasticity, dark red, sand fine to medium grained		Fr / VSt	HP	220	
										HP	200	
									H / Fr	HP	410	
										HP	500	
				1.0						HP	460	
							1.20m			HP	550	
						Cl	**Silty Sandy CLAY:** Medium plasticity, red-brown, sand fine to medium grained, traces of gravel, fine to medium grained, subangular-subrounded			HP	550	
				1.5			1.50m			HP	520	
							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 distict strata change

Notes, Samples and Tests

U_{50}	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)
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	

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%

Moisture Condition

D	Dry
M	Moist
W	Wet
W_p	Plastic Limit
W_L	Liquid Limit

REGIONAL GEOTECHNICAL SOLUTIONS

ENGINEERING LOG - BOREHOLE

BOREHOLE NO: BH315

CLIENT: Land Dynamics Australia
PAGE: 1 of 1
PROJECT NAME: The Sanctuary - Stage 2
JOB NO: RGS21087.1
SITE LOCATION: 344 John Oxley Drive, Thrumster
LOGGED BY: HFM
TEST LOCATION: Lots 225/226
DATE: 21/5/24

DRILL TYPE: RGS Ute Mounted Drill Rig
EASTING: 485334 m
SURFACE RL:
BOREHOLE DIAMETER: 50 mm
INCLINATION: 90°
NORTHING: 6519901 m
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					CH	**FILL/TOPSOIL:** Silty Sandy CLAY, high plasticity, dark brown, sand fine to medium grained		S	HP	100	FILL/TOPSOIL
							0.15m					
						CI	**FILL:** Silty Sandy CLAY, medium plasticity, red, sand, fine to medium grained, traces of gravel, fine to medium grained, subangular/subrounded		St	HP	100	FILL
										HP	80	
		0.40m					0.40m			HP	380	RESIDUAL
				0.5		CL	**Silty Sandy CLAY:** Low plasticity, dark red, sand fine to medium grained, gravel, fine to medium grained, subangular-subrounded		Fr / VSt	HP	360	
		U50								HP	300	
										HP	320	
		0.80m					0.80m			HP	500	
						CL	**Silty Sandy CLAY:** Low to medium plasticity, red, sand fine to medium grained		Fr / H	HP	510	
				1.0						HP	480	
										HP	460	
										HP	490	
				1.5			1.50m					
							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 distict strata change

Notes, Samples and Tests

U_{50}	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)
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	

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%

Moisture Condition

D	Dry
M	Moist
W	Wet
W_p	Plastic Limit
W_L	Liquid Limit

Appendix B

Laboratory Test Result Sheets

Material Test Report

Qualtest LABORATORY (NSW) PTY LTD
Newcastle Laboratory
2 Murray Dwyer Circuit Mayfield West NSW 2304
Phone: (02) 4968 4468
Email: brentcullen@qualtest.com.au

Accredited for compliance with ISO/IEC 17025 - Testing

NATA WORLD RECOGNISED ACCREDITATION

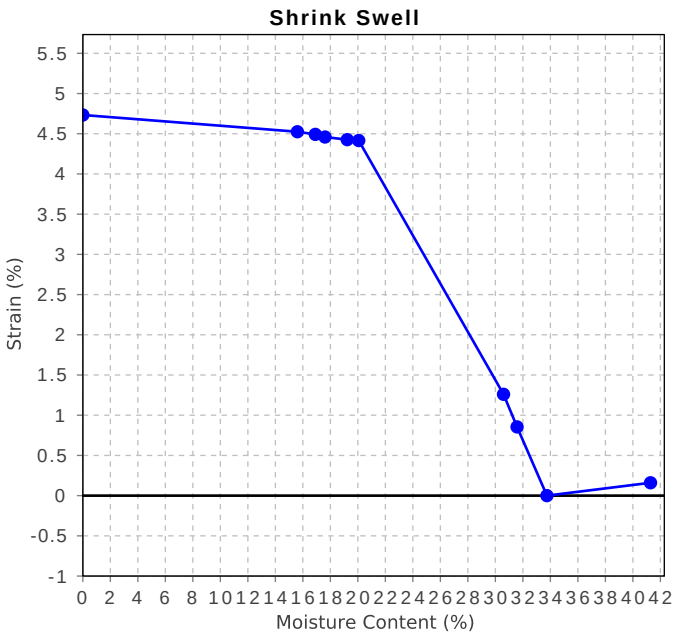
Approved Signatory: Brent Cullen
Engineering Geologist
NATA Accredited Laboratory Number: 18686

Report Number:	**MNC16P-0001-92**
Issue Number:	1
Date Issued:	31/05/2024
Client:	Regional Geotechnical Solutions Pty Ltd
	44 Bent Street, Wingham NSW 2429
Project Number:	MNC16P-0001
Project Name:	Various Testing
Project Location:	344 John Oxley Drive
Client Reference:	RGS21087.1
Work Request:	4206
Sample Number:	NEW24S-4206A
Date Sampled:	21/05/2024
Dates Tested:	22/05/2024 - 23/05/2024
Sampling Method:	Sampled by Client
	The results apply to the sample as received
Sample Location:	**BH301 - (0.3 - 0.8m)**
Material:	Insitu
Material Source:	On-Site

Shrink Swell Index (AS 1289 7.1.1 & 2.1.1)	
Iss (%)	**2.6**
Visual Description	Clay
* Shrink Swell Index (Iss) reported as the percentage vertical strain per pF change in suction.	

Core Shrinkage Test	
Shrinkage Strain - Oven Dried (%)	**4.7**
Estimated % by volume of significant inert inclusions	1
Cracking	Slightly Cracked
Crumbling	No
Moisture Content (%)	33.7

Swell Test	
Initial Pocket Penetrometer (kPa)	580
Final Pocket Penetrometer (kPa)	340
Initial Moisture Content (%)	33.7
Final Moisture Content (%)	41.3
Swell (%)	**-0.2**
* NATA Accreditation does not cover the performance of pocket penetrometer readings.	



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NATA Accredited Laboratory Number: 18686

Report Number: **MNC16P-0001-92**
Issue Number: 1
Date Issued: 31/05/2024
Client: Regional Geotechnical Solutions Pty Ltd
44 Bent Street, Wingham NSW 2429
Project Number: MNC16P-0001
Project Name: Various Testing
Project Location: 344 John Oxley Drive
Client Reference: RGS21087.1
Work Request: 4206
Sample Number: NEW24S-4206B
Date Sampled: 21/05/2024
Dates Tested: 22/05/2024 - 27/05/2024
Sampling Method: Sampled by Client
The results apply to the sample as received
Sample Location: **BH303 - (0.2 - 0.5m)**
Material: Insitu
Material Source: On-Site

Atterberg Limit (AS1289 3.1.1 & 3.2.1 & 3.3.1)		Min	Max
Sample History	Air Dried		
Preparation Method	Dry Sieve		
Liquid Limit (%)	38		
Plastic Limit (%)	24		
Plasticity Index (%)	**14**		

Linear Shrinkage (AS1289 3.4.1)		Min	Max
Moisture Condition Determined By	AS 1289.3.1.1		
Linear Shrinkage (%)	**5.0**		
Cracking Crumbling Curling	None		

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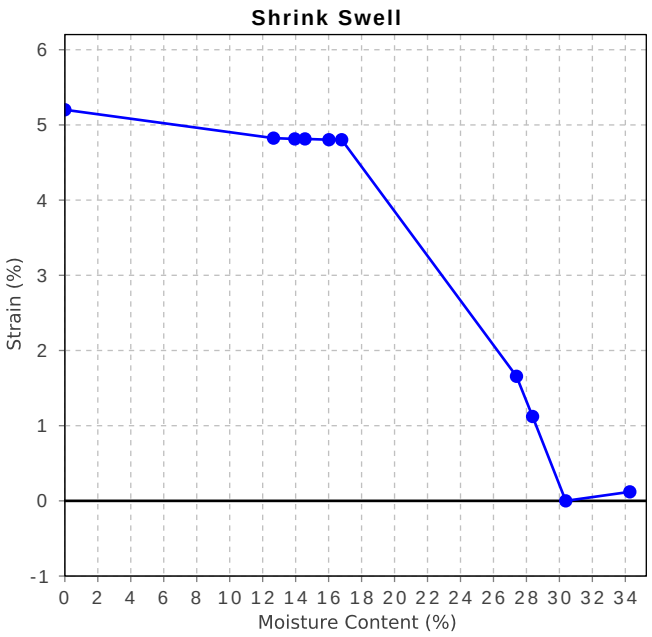
Report Number:	**MNC16P-0001-92**
Issue Number:	1
Date Issued:	31/05/2024
Client:	Regional Geotechnical Solutions Pty Ltd
	44 Bent Street, Wingham NSW 2429
Project Number:	MNC16P-0001
Project Name:	Various Testing
Project Location:	344 John Oxley Drive
Client Reference:	RGS21087.1
Work Request:	4206
Sample Number:	NEW24S-4206C
Date Sampled:	21/05/2024
Dates Tested:	22/05/2024 - 23/05/2024
Sampling Method:	Sampled by Client
	The results apply to the sample as received
Sample Location:	**BH305 - (0.4 - 0.9m)**
Material:	Insitu
Material Source:	On-Site

Shrink Swell Index (AS 1289 7.1.1 & 2.1.1)	
Iss (%)	**2.9**
Visual Description	Gravelly Clay
* Shrink Swell Index (Iss) reported as the percentage vertical strain per pF change in suction.	

Core Shrinkage Test	
Shrinkage Strain - Oven Dried (%)	**5.2**
Estimated % by volume of significant inert inclusions	3
Cracking	Fragmented
Crumbling	No
Moisture Content (%)	30.4

Swell Test	
Initial Pocket Penetrometer (kPa)	480
Final Pocket Penetrometer (kPa)	400
Initial Moisture Content (%)	29.7
Final Moisture Content (%)	34.3
Swell (%)	**-0.1**
* NATA Accreditation does not cover the performance of pocket penetrometer readings.	



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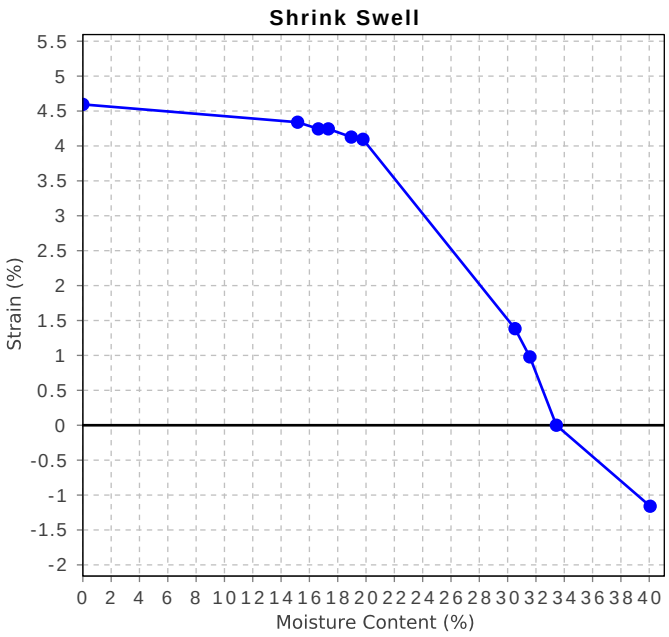
Report Number:	**MNC16P-0001-92**
Issue Number:	1
Date Issued:	31/05/2024
Client:	Regional Geotechnical Solutions Pty Ltd
	44 Bent Street, Wingham NSW 2429
Project Number:	MNC16P-0001
Project Name:	Various Testing
Project Location:	344 John Oxley Drive
Client Reference:	RGS21087.1
Work Request:	4206
Sample Number:	NEW24S-4206D
Date Sampled:	21/05/2024
Dates Tested:	22/05/2024 - 23/05/2024
Sampling Method:	Sampled by Client
	The results apply to the sample as received
Sample Location:	**BH308 - (0.5 - 1m)**
Material:	Insitu
Material Source:	On-Site

Shrink Swell Index (AS 1289 7.1.1 & 2.1.1)	
Iss (%)	**2.9**
Visual Description	Clay
* Shrink Swell Index (Iss) reported as the percentage vertical strain per pF change in suction.	

Core Shrinkage Test	
Shrinkage Strain - Oven Dried (%)	**4.6**
Estimated % by volume of significant inert inclusions	1
Cracking	Slightly Cracked
Crumbling	No
Moisture Content (%)	33.4

Swell Test	
Initial Pocket Penetrometer (kPa)	>600
Final Pocket Penetrometer (kPa)	600
Initial Moisture Content (%)	33.5
Final Moisture Content (%)	40.1
Swell (%)	**1.2**
* NATA Accreditation does not cover the performance of pocket penetrometer readings.	



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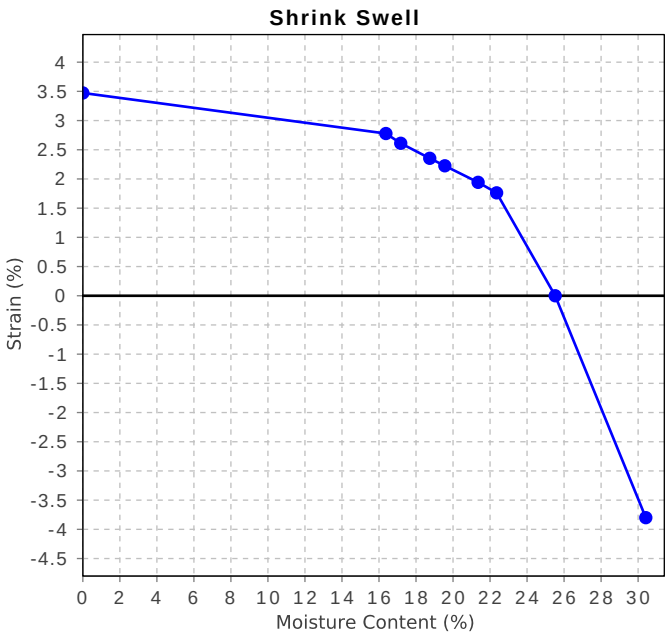
Report Number:	**MNC16P-0001-92**
Issue Number:	1
Date Issued:	31/05/2024
Client:	Regional Geotechnical Solutions Pty Ltd
	44 Bent Street, Wingham NSW 2429
Project Number:	MNC16P-0001
Project Name:	Various Testing
Project Location:	344 John Oxley Drive
Client Reference:	RGS21087.1
Work Request:	4206
Sample Number:	NEW24S-4206E
Date Sampled:	21/05/2024
Dates Tested:	22/05/2024 - 27/05/2024
Sampling Method:	Sampled by Client
	The results apply to the sample as received
Sample Location:	**BH309 - (0.4 - 0.7m)**
Material:	Insitu
Material Source:	On-Site

Shrink Swell Index (AS 1289 7.1.1 & 2.1.1)	
Iss (%)	**3.0**
Visual Description	Sandy Clay
* Shrink Swell Index (Iss) reported as the percentage vertical strain per pF change in suction.	

Core Shrinkage Test	
Shrinkage Strain - Oven Dried (%)	**3.5**
Estimated % by volume of significant inert inclusions	6
Cracking	Moderately Cracked
Crumbling	No
Moisture Content (%)	25.5

Swell Test	
Initial Pocket Penetrometer (kPa)	590
Final Pocket Penetrometer (kPa)	570
Initial Moisture Content (%)	26.2
Final Moisture Content (%)	30.4
Swell (%)	**3.8**
* NATA Accreditation does not cover the performance of pocket penetrometer readings.	



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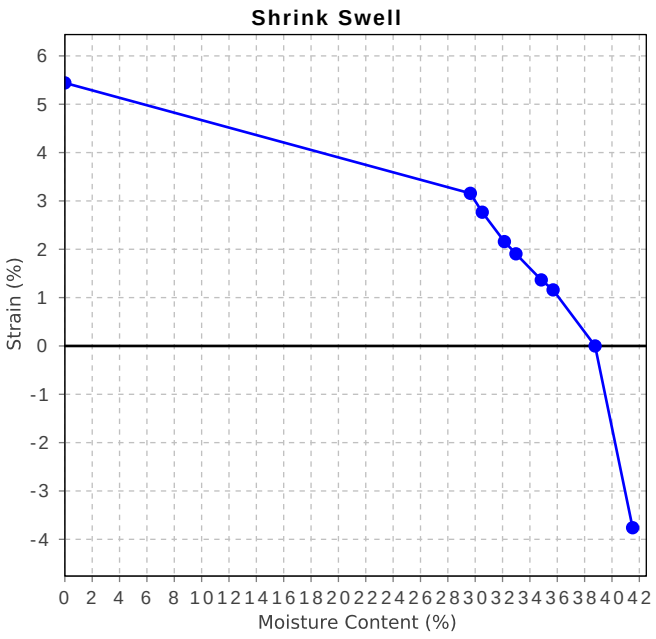
Report Number:	**MNC16P-0001-92**
Issue Number:	1
Date Issued:	31/05/2024
Client:	Regional Geotechnical Solutions Pty Ltd
	44 Bent Street, Wingham NSW 2429
Project Number:	MNC16P-0001
Project Name:	Various Testing
Project Location:	344 John Oxley Drive
Client Reference:	RGS21087.1
Work Request:	4206
Sample Number:	NEW24S-4206F
Date Sampled:	21/05/2024
Dates Tested:	22/05/2024 - 27/05/2024
Sampling Method:	Sampled by Client
	The results apply to the sample as received
Sample Location:	**BH311 - (0.5 - 1m)**
Material:	Insitu
Material Source:	On-Site

Shrink Swell Index (AS 1289 7.1.1 & 2.1.1)	
Iss (%)	**4.1**
Visual Description	Clay
* Shrink Swell Index (Iss) reported as the percentage vertical strain per pF change in suction.	

Core Shrinkage Test	
Shrinkage Strain - Oven Dried (%)	**5.4**
Estimated % by volume of significant inert inclusions	1
Cracking	Moderately Cracked
Crumbling	Yes
Moisture Content (%)	38.8

Swell Test	
Initial Pocket Penetrometer (kPa)	370
Final Pocket Penetrometer (kPa)	350
Initial Moisture Content (%)	35.8
Final Moisture Content (%)	41.5
Swell (%)	**3.8**
* NATA Accreditation does not cover the performance of pocket penetrometer readings.	



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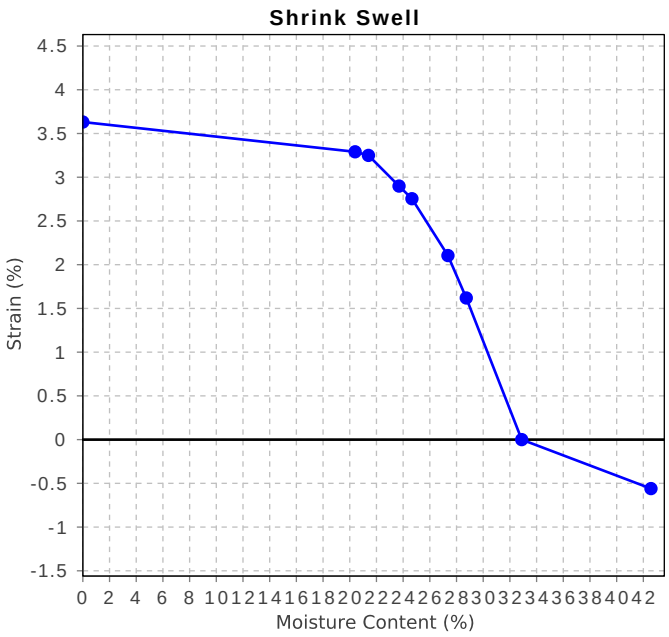
Report Number:	**MNC16P-0001-92**
Issue Number:	1
Date Issued:	31/05/2024
Client:	Regional Geotechnical Solutions Pty Ltd
	44 Bent Street, Wingham NSW 2429
Project Number:	MNC16P-0001
Project Name:	Various Testing
Project Location:	344 John Oxley Drive
Client Reference:	RGS21087.1
Work Request:	4206
Sample Number:	NEW24S-4206G
Date Sampled:	21/05/2024
Dates Tested:	22/05/2024 - 27/05/2024
Sampling Method:	Sampled by Client
	The results apply to the sample as received
Sample Location:	**BH313 - (0.2 - 0.6m)**
Material:	Insitu
Material Source:	On-Site

Shrink Swell Index (AS 1289 7.1.1 & 2.1.1)	
Iss (%)	**2.2**
Visual Description	Clay
* Shrink Swell Index (Iss) reported as the percentage vertical strain per pF change in suction.	

Core Shrinkage Test	
Shrinkage Strain - Oven Dried (%)	**3.6**
Estimated % by volume of significant inert inclusions	1
Cracking	Slightly Cracked
Crumbling	No
Moisture Content (%)	32.9

Swell Test	
Initial Pocket Penetrometer (kPa)	580
Final Pocket Penetrometer (kPa)	330
Initial Moisture Content (%)	34.1
Final Moisture Content (%)	42.6
Swell (%)	**0.6**
* NATA Accreditation does not cover the performance of pocket penetrometer readings.	



Material Test Report

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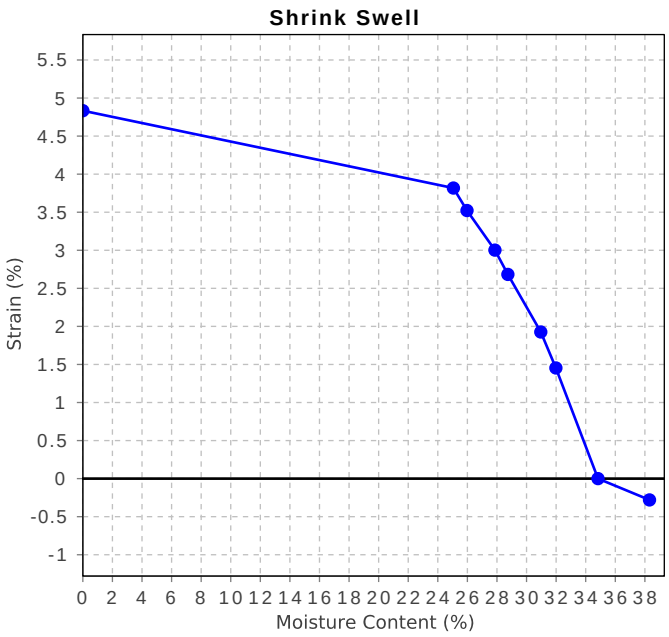
Engineering Geologist
NATA Accredited Laboratory Number: 18686

Report Number:	**MNC16P-0001-92**
Issue Number:	1
Date Issued:	31/05/2024
Client:	Regional Geotechnical Solutions Pty Ltd
	44 Bent Street, Wingham NSW 2429
Project Number:	MNC16P-0001
Project Name:	Various Testing
Project Location:	344 John Oxley Drive
Client Reference:	RGS21087.1
Work Request:	4206
Sample Number:	NEW24S-4206H
Date Sampled:	21/05/2024
Dates Tested:	22/05/2024 - 27/05/2024
Sampling Method:	Sampled by Client
	The results apply to the sample as received
Sample Location:	**BH315 - (0.4 - 0.8m)**
Material:	Insitu
Material Source:	On-Site

Shrink Swell Index (AS 1289 7.1.1 & 2.1.1)	
Iss (%)	**2.8**
Visual Description	Clay
* Shrink Swell Index (Iss) reported as the percentage vertical strain per pF change in suction.	

Core Shrinkage Test	
Shrinkage Strain - Oven Dried (%)	**4.8**
Estimated % by volume of significant inert inclusions	1
Cracking	Uncracked
Crumbling	No
Moisture Content (%)	34.8

Swell Test	
Initial Pocket Penetrometer (kPa)	600
Final Pocket Penetrometer (kPa)	450
Initial Moisture Content (%)	35.4
Final Moisture Content (%)	38.3
Swell (%)	**0.3**
* NATA Accreditation does not cover the performance of pocket penetrometer readings.	



Material Test Report

Report Number: **MNC16P-0001-92**
Issue Number: 1
Date Issued: 31/05/2024
Client: Regional Geotechnical Solutions Pty Ltd
44 Bent Street, Wingham NSW 2429
Project Number: MNC16P-0001
Project Name: Various Testing
Project Location: 344 John Oxley Drive
Client Reference: RGS21087.1
Work Request: 4206
Dates Tested: 22/05/2024 - 27/05/2024

Qualtest LABORATORY (NSW) PTY LTD
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Email: brentcullen@qualtest.com.au

NATA WORLD RECOGNISED ACCREDITATION

Accredited for compliance with ISO/IEC 17025 - Testing

Approved Signatory: Brent Cullen
Engineering Geologist
NATA Accredited Laboratory Number: 18686

Shrink Swell Index AS 1289 7.1.1 & 2.1.1					
Sample Number	NEW24S-4206A	NEW24S-4206C	NEW24S-4206D	NEW24S-4206E	NEW24S-4206F
Date Sampled	21/05/2024	21/05/2024	21/05/2024	21/05/2024	21/05/2024
Date Tested	23/05/2024	23/05/2024	23/05/2024	27/05/2024	27/05/2024
Material Source	On-Site Insitu	On-Site Insitu	On-Site Insitu	On-Site Insitu	On-Site Insitu
Sample Location	BH301 - (0.3 - 0.8m)	BH305 - (0.4 - 0.9m)	BH308 - (0.5 - 1m)	BH309 - (0.4 - 0.7m)	BH311 - (0.5 - 1m)
Inert Material Estimate (%)	1	3	1	6	1
Pocket Penetrometer before (kPa)	580	480	>600	590	370
Pocket Penetrometer after (kPa)	340	400	600	570	350
Shrinkage Moisture Content (%)	33.7	30.4	33.4	25.5	38.8
Shrinkage (%)	**4.7**	**5.2**	**4.6**	**3.5**	**5.4**
Swell Moisture Content Before (%)	33.7	29.7	33.5	26.2	35.8
Swell Moisture Content After (%)	41.3	34.3	40.1	30.4	41.5
Swell (%)	**-0.2**	**-0.1**	**1.2**	**3.8**	**3.8**
Shrink Swell Index Iss (%)	**2.6**	**2.9**	**2.9**	**3.0**	**4.1**
Visual Description	Clay	Gravelly Clay	Clay	Sandy Clay	Clay
Cracking	SC	FR	SC	MC	MC
Crumbling	No	No	No	No	Yes
Remarks	**	**	**	**	**

Shrink Swell Index (Iss) reported as the percentage vertical strain per pF change in suction.
Cracking Terminology: UC Uncracked, SC Slightly Cracked, MC Moderately Cracked, HC Highly Cracked, FR Fragmented.
NATA Accreditation does not cover the performance of pocket penetrometer readings.

Material Test Report

Report Number: **MNC16P-0001-92**
Issue Number: 1
Date Issued: 31/05/2024
Client: Regional Geotechnical Solutions Pty Ltd
44 Bent Street, Wingham NSW 2429
Project Number: MNC16P-0001
Project Name: Various Testing
Project Location: 344 John Oxley Drive
Client Reference: RGS21087.1
Work Request: 4206
Dates Tested: 22/05/2024 - 27/05/2024

Qualtest LABORATORY (NSW) PTY LTD
Newcastle Laboratory
2 Murray Dwyer Circuit Mayfield West NSW 2304
Phone: (02) 4968 4468
Email: brentcullen@qualtest.com.au

NATA WORLD RECOGNISED ACCREDITATION
Accredited for compliance with ISO/IEC 17025 - Testing

Approved Signatory: Brent Cullen
Engineering Geologist
NATA Accredited Laboratory Number: 18686

Shrink Swell Index AS 1289 7.1.1 & 2.1.1					
Sample Number	NEW24S-4206G	NEW24S-4206H			
Date Sampled	21/05/2024	21/05/2024			
Date Tested	27/05/2024	27/05/2024			
Material Source	On-Site Insitu	On-Site Insitu			
Sample Location	BH313 - (0.2 - 0.6m)	BH315 - (0.4 - 0.8m)			
Inert Material Estimate (%)	1	1			
Pocket Penetrometer before (kPa)	580	600			
Pocket Penetrometer after (kPa)	330	450			
Shrinkage Moisture Content (%)	32.9	34.8			
Shrinkage (%)	**3.6**	**4.8**			
Swell Moisture Content Before (%)	34.1	35.4			
Swell Moisture Content After (%)	42.6	38.3			
Swell (%)	**0.6**	**0.3**			
Shrink Swell Index Iss (%)	**2.2**	**2.8**			
Visual Description	Clay	Clay			
Cracking	SC	UC			
Crumbling	No	No			
Remarks	**	**			

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