Land Dynamics Australia

Geotechnical Site Classification

Proposed Residential Subdivision

Stage 1 The Sanctuary, 344 John Oxley Drive, Thrumster

Report No. RGS21087.1-AP_Rev1

21 June 2025

REGIONAL GEOTECHNICAL SOLUTIONS

REGIONAL GEOTECHNICAL SOLUTIONS

Manning-Great Lakes
Port Macquarie
Coffs Harbour

RGS21087.1-AP_Rev1

21 June 2025

Land Dynamics Australia
77 Lord Street
PORT MACQUARIE NSW 2444

Attention: Jodie Chapman

Dear Jodie,

RE: Proposed Residential Subdivision – Stage 1 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 1 of The Sanctuary Estate, 344 John Oxley Drive (Lot 1 DP 1245588) Thrumster. Stage 1 comprises Lot No's 101 to 136 as shown 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

Senior Engineering Geologist

Reviewed by

Steven Morton

Principal Geotechnical Engineer

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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 1 of The Sanctuary Estate, 344 John Oxley Drive (Lot 1 DP 1245588) Thrumster. Stage 1 comprises Lot No's 101 to 136 as shown 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.

2 METHODOLOGY

Field work for the assessment was undertaken on 20 December 2023 and was based on the supplied drawing titled "Plan of Subdivision of Lot 1 DP 12455888". Fieldwork 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;
- 19 boreholes undertaken by a 4WD mounted drilling rig to depths of between 1.5m and 2m logged and sampled by an Engineering Geologist; and
- U50 tube samples collected from soil horizons considered representative of cohesive soil profiles.

Engineering logs of the boreholes are presented in Appendix A. Investigation locations are shown on Figure 1 and were obtained by measurements to prominent site features. Coordinates of investigation locations were recorded using a hand held GPS and the coordinates are shown on the engineering logs. Reduced levels at the borehole locations were estimated from the supplied drawings and are shown on the engineering logs.

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) on nine U50 samples. Atterberg Limits testing was undertaken on one sample that crumbled during extraction from the U50 tube. Results are presented in Appendix B and summarised in Table 1.

Table 1: Laboratory Testing Summary

Location	Depth (m)	Lot	Material	Shrink Swell Index (%)	Linear Shrinkage (%)	Plasticity Index (%)
BH202	0.4 – 0.7	105	Residual Clay	1.8	-	-
BH203	0.3 – 0.7	110	Fill Clay	2.3	-	-
BH205	0.4 – 0.7	136	Residual Clay	1.1	-	-

Location	Depth (m)	Lot	Material	Shrink Swell Index (%)	Linear Shrinkage (%)	Plasticity Index (%)
BH208	0.7 – 1.1	116/117	EW Slate	1.0	-	-
BH210	0.3 – 0.7	120/121	EW Slate	1.4	-	-
BH212	0.3 – 0.7	124/125	Residual Clay	1.8	-	-
BH214	0.3 – 0.7	128/129	EW Dolerite	1.0	-	-
BH217	0.3 – 0.7	108/109	Fill Clay	0.6	-	-
BH218*	0.3 – 0.6	101/102	Fill Clay	-	5.0	13.0

Note: * *Atterberg Limits testing undertaken on U50 sample that crumbled upon extraction*

4 SITE CONDITIONS

4.1 Surface Conditions

Stage 1 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 along the western boundary 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 for Stage 1 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 retaining walls that are up to approximately 2m height.

Lots 101 – 112 and 136 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 south west across Lots 14 and 105 which has been terraced and modified by controlled fill.

Looking north across Lots 126 -129. A 2m high concrete sleeper retaining wall is located along the western boundary.

4.2 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 B.

Table 2: Summary of Geotechnical Units

Unit	Material	Material Description
UNIT 1A	TOPSOIL/ FILL	Sandy SILT to Sandy CLAY, low plasticity, dark brown/brown, traces of gravel
UNIT 1B	FILL – CLAY (CONTROLLED)	Sandy Silty CLAY to Sandy CLAY to Silty CLAY, medium to high plasticity, pale brown/pale red/pale grey, very stiff, traces to some gravel, fine to medium

Unit	Material	Material Description
UNIT 2	RESIDUAL	Sandy CLAY to Sandy Silty CLAY, medium to high plasticity, pale red/ red/brown, very stiff, traces of gravel, fine
UNIT 3	EW SLATE	Extremely Weathered SLATE, recovered as Silty CLAY or Sandy Silty CLAY, medium to high plasticity, pale red/pale grey/grey/pale red, traces of rock fabric
UNIT 4	EW DOLERITE	Extremely Weathered dolerite, recovered as Sandy CLAY, medium to high plasticity, yellow/pale brown, traces or rock fabric
UNIT 5	HW TO MW SLATE	Highly to Moderately Weathered Slate, pale grey/white/pale orange, inferred very low to low strength, foliated, recovered as Silty SAND to Sandy SILT

Table 3: Summary of Subsurface Profiles - Depth to Base of Material Layer (m)

BH	Lot	Unit 1A – Fill/ Topsoil	Unit 1B - Controlled Fill Clay	Unit 2 - Residual	Unit 3 - EW Slate	Unit 4 - EW Dolerite	Unit 5 - HW to MW Slate
BH201	103	0.15	0.7	≥ 1.5	-	-	-
BH202	105	0.2	1.0	-	≥ 1.5	-	-
BH203	110	0.15	0.5	≥ 1.5	-	-	-
BH204	111/112	0.15	1.5	≥2.0	-	-	-
BH205	136	0.2	0.4	1.3	≥ 1.5	-	-
BH206	113/134	0.1	--	-	≥ 1.5	-	-
BH207	114/115	0.2	-	-	-	-	≥ 1.5
BH208	116/117	0.15	--	-	≥ 1.5	-	-
BH209	118/119	0.15	-	-	-	-	≥ 1.5
BH210	120/121	0.1	-	-	≥ 1.5	-	-
BH211	122/123	0.15	-	-	0.5	-	≥ 1.5
BH212	124/125	0.1	-	≥ 1.5	-	-	-
BH213	126/127	0.1	-	≥ 1.5	-	-	-
BH214	128/129	0.15	-	-	-	≥ 1.5	-
BH215	130/131	0.15	-	-	-	≥ 1.5	-
BH216	132/133	0.2	-	-	-	-	≥ 1.5
BH217	108/109	0.15	≥ 1.5	-	-	-	-

BH	Lot	Unit 1A – Fill/ Topsoil	Unit 1B - Controlled Fill Clay	Unit 2 - Residual	Unit 3 - EW Slate	Unit 4 - EW Dolerite	Unit 5 - HW to MW Slate
BH218	101/102	0.15	0.7	-	-	-	≥ 1.5
BH219	106/107	0.15	-	≥ 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 within the boreholes. It should be noted that fluctuations in groundwater levels can occur 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

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;
- 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;
- Characteristic I_{ss} for controlled clay fill of between 0.6 and 2.3%;
- Characteristic I_{ss} for residual clay of between 1.1 and 1.8%;
- Characteristic I_{ss} for extremely weathered slate of between 1.0 and 1.4%; and
- Characteristic I_{ss} for extremely weathered dolerite of 1.0%.

The proposed building areas for Lot No's 101 – 112 and 136 have been modified by filling works of >0.4m thickness. These lots are classified as Class P in accordance with AS2870-2011, Clause 2.5.3 Section (a) due to the presence of clay fill of >0.4m, requiring footings to be designed in accordance with engineering principles.

The building areas for the lots modified by filling works undertaken under Level One supervision have been reclassified as summarised in Table 4 in accordance with Clause 2.5.3 Section(c) of AS2870-2011, based on the existing profiles at the time of field investigation, the properties of the Controlled Fill that was placed under Level One supervision as defined by AS3798- 2007, the properties of the underlying natural profile, and the estimated surface movement (y_s).

Table 4: Site Classification Summary

Lots	Site Re-classification	Expected Surface Movement $y_s + y_t$ (mm)
114, 115, 118, 119, 122, 123, 132, 133	Class S	20mm
101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 116, 117, 120, 121, 124, 125, 126, 127, 128, 129, 130, 131, 134, 135, 136	Class M	30 – 40mm

6 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 and uncontrolled fill materials;
- Footings can be designed on the basis of 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. Footings founded in highly to moderately weathered rock of at least low strength can be designed on the basis of a maximum allowable base bearing pressure of **300kPa**;
- 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;
- The engineering design for the retaining walls present allows for any surcharge affecting the walls such as proposed footings, 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 further 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 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 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

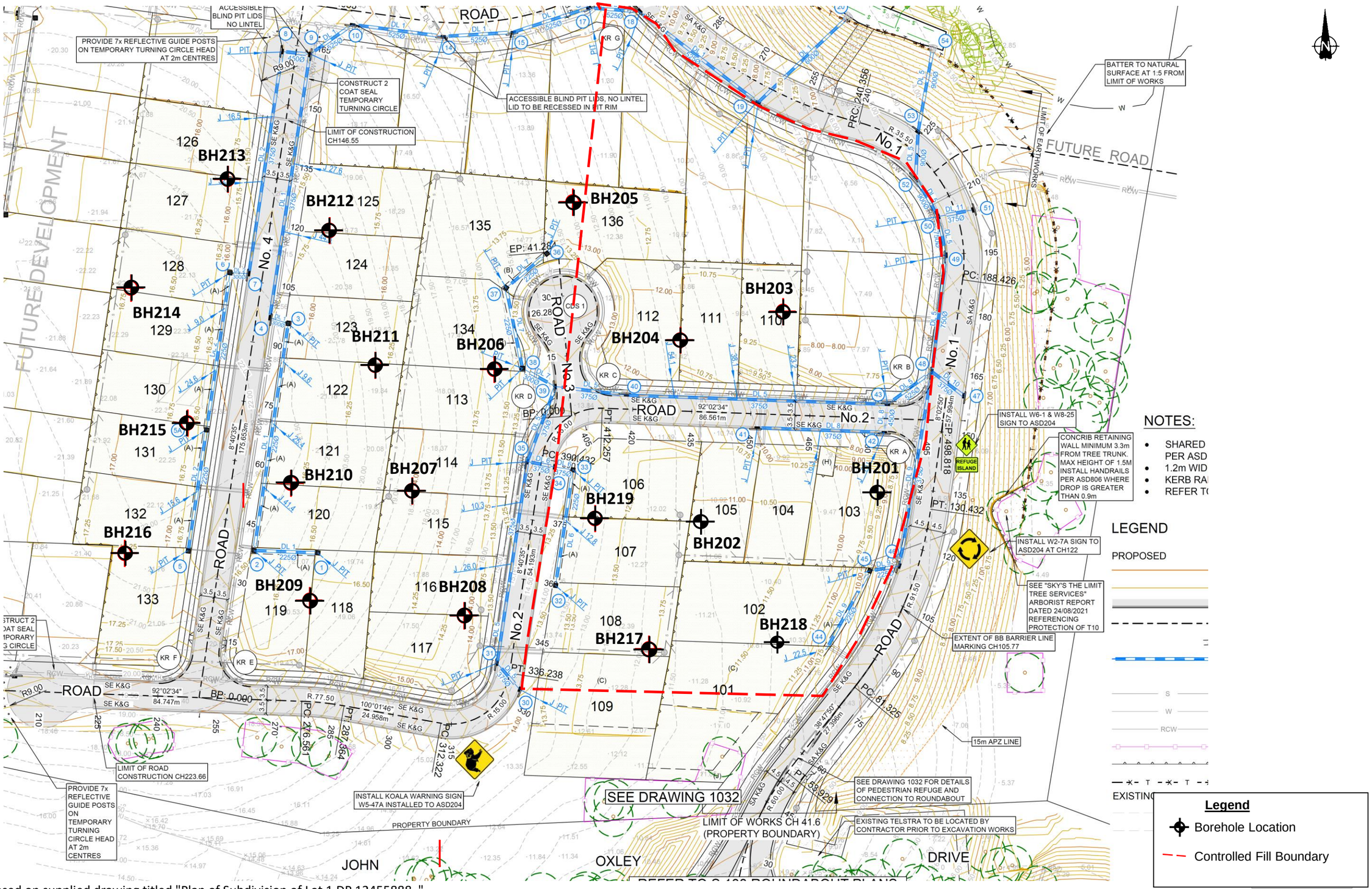
Senior Engineering Geologist

Reviewed by

Steven Morton

Principal Geotechnical Engineer

Figures



Based on supplied drawing titled "Plan of Subdivision of Lot 1 DP 12455888 "

REGIONAL GEOTECHNICAL SOLUTIONS	Client:	LAND DYNAMICS AUSTRALIA	Job No.	RGS21087.1
	Project:	PROPOSED RESIDENTIAL SUBDIVISION THE SANCTUARY STAGE 1 - 344 JOHN OXLEY DRIVE, THRUMSTER	Drawn By:	ZA
			Scale:	NTS
			Date:	23-Jan-24
	Title:	INVESTIGATION LOCATION PLAN	Figure No.	1

Appendix A

Results of Field Investigations

REGIONAL GEOTECHNICAL SOLUTIONS

ENGINEERING LOG - BOREHOLE

BOREHOLE NO: BH201

CLIENT: Land Dynamics Australia
PAGE: 1 of 1
PROJECT NAME: Stage 1, The Sanctuary
JOB NO: RGS21087.1
SITE LOCATION: John Oxley Drive, Port Macquarie
LOGGED BY: GC
TEST LOCATION: Lot 103
DATE: 20/12/23

DRILL TYPE: RGS Ute Mounted Drill Rig
EASTING: 485517 m
SURFACE RL: 9.8 m
BOREHOLE DIAMETER: 120 mm
INCLINATION: 90°
NORTHING: 6519705 m
DATUM: AHD

Drilling and Sampling					Material description and profile information					Field Test		
METHOD	WATER	SAMPLES	RL (m)	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		9.8	0.0		ML	**FILL:** Sandy SILT, brown, sand, fine to medium grained	D				FILL/TOPSOIL
							0.15m					
			9.5	0.5		CI	**FILL:** Silty CLAY, medium plasticity, pale brown with pale grey mottling	M < w_P	Fr / VSt	HP	250	FILL-CLAY
										HP	300	
			9.0	0.70m		CI	**Sandy CLAY:** Medium plasticity, red, traces of pale brown					RESIDUAL
				1.0						HP	300	
			8.5							HP	280	
				1.5			1.50m					
							Hole Terminated at 1.50 m					
			8.0	2.0								
			7.5	2.5								
			7.0									

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: BH202

CLIENT: Land Dynamics Australia
PROJECT NAME: Stage 1, The Sanctuary
SITE LOCATION: John Oxley Drive, Port Macquarie
TEST LOCATION: Lot 105

PAGE: 1 of 1
JOB NO: RGS21087.1
LOGGED BY: GC
DATE: 20/12/23

DRILL TYPE: RGS Ute Mounted Drill Rig
BOREHOLE DIAMETER: 120 mm
INCLINATION: 90°
EASTING: 485477 m
NORTHING: 6519693 m
SURFACE RL: 11.0 m
DATUM: AHD

Drilling and Sampling					Material description and profile information					Field Test		
METHOD	WATER	SAMPLES	RL (m)	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					ML	**FILL:** Sandy SILT, dark brown, sand, fine to medium grained	D				FILL/TOPSOIL
							0.20m					
		0.40m	10.5	0.5		CH	**Sandy Silty CLAY:** Medium to high plasticity, pale red with pale brown mottling, traces of gravel, fine grained, rounded	M < w_P	Fr / VSt	HP	250	RESIDUAL
		U50 0.70m										
			10.0	1.0			1.00m					
						CH	**Silty CLAY:** Medium to high plasticity, pale red with pale grey/white mottling, traces of rock fabric	M > w_P	St	HP	150	EXTREMELY WEATHERED SLATE
			9.5	1.5			1.50m					
							Hole Terminated at 1.50 m					
			9.0	2.0								
			8.5	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: BH203

CLIENT: Land Dynamics Australia
PAGE: 1 of 1
PROJECT NAME: Stage 1, The Sanctuary
JOB NO: RGS21087.1
SITE LOCATION: John Oxley Drive, Port Macquarie
LOGGED BY: GC
TEST LOCATION: Lot 110
DATE: 20/12/23

DRILL TYPE: RGS Ute Mounted Drill Rig
EASTING: 485500 m
SURFACE RL: 9.3 m
BOREHOLE DIAMETER: 120 mm
INCLINATION: 90°
NORTHING: 6519750 m
DATUM: AHD

Drilling and Sampling					Material description and profile information					Field Test		
METHOD	WATER	SAMPLES	RL (m)	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	0.30m	9.0	0.5		CI	**FILL:** Sandy CLAY, medium plasticity, dark brown, traces of gravel	M < w_P	Fr			FILL/TOPSOIL
		U50				CI	0.15m **FILL:** Silty CLAY, medium plasticity, pale brown/pale red, traces of white		Fr / VSt	HP	280	FILL-CLAY
		0.70m	8.5							HP	300	
				1.0		CH	0.80m **Sandy CLAY:** Medium to high plasticity, brown with pale brown mottling, traces of gravel, fine grained, subangular			HP	350	RESIDUAL
			8.0							HP	390	
				1.5			1.50m Hole Terminated at 1.50 m					
			7.5	2.0								
			7.0	2.5								
			6.5									

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: BH204

CLIENT: Land Dynamics Australia
PAGE: 1 of 1
PROJECT NAME: Stage 1, The Sanctuary
JOB NO: RGS21087.1
SITE LOCATION: John Oxley Drive, Port Macquarie
LOGGED BY: GC
TEST LOCATION: Lot 111/112
DATE: 20/12/23

DRILL TYPE: RGS Ute Mounted Drill Rig
EASTING: 485467 m
SURFACE RL: 10.8 m
BOREHOLE DIAMETER: 120 mm
INCLINATION: 90°
NORTHING: 6519751 m
DATUM: AHD

Drilling and Sampling					Material description and profile information					Field Test		
METHOD	WATER	SAMPLES	RL (m)	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		10.8	0.0		ML	**FILL:** Sandy SILT, dark brown, traces of gravel, fine grained, subangular	D				FILL/TOPSOIL
							0.15m					
			10.5	0.5		CI	**FILL:** Silty CLAY, medium plasticity, pale grey/pale brown, traces of gravel, fine to medium grained, subangular	M < w_P	Fr / VSt	HP	250	FILL-CLAY
							0.70m					
			10.0	1.0		CH	**FILL:** Sandy CLAY, medium to high plasticity, brown, traces of white/yellow sand, fine to medium grained, traces of gravel, fine grained, subangular			HP	300	
							1.00m					
			9.5	1.5		CI	**FILL:** Silty CLAY, medium plasticity, pale red/pale brown with white mottling					
							1.50m					
			9.0	2.0		CH	**Sandy CLAY:** Medium plasticity, red, sand, fine to medium grained					RESIDUAL
							2.00m					
							Hole Terminated at 2.00 m					
			8.5	2.5								
			8.0									

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: BH205

CLIENT: Land Dynamics Australia
PAGE: 1 of 1
PROJECT NAME: Stage 1, The Sanctuary
JOB NO: RGS21087.1
SITE LOCATION: John Oxley Drive, Port Macquarie
LOGGED BY: GC
TEST LOCATION: Lot 136
DATE: 20/12/23

DRILL TYPE: RGS Ute Mounted Drill Rig
EASTING: 485445 m
SURFACE RL: 13.0 m
BOREHOLE DIAMETER: 120 mm
INCLINATION: 90°
NORTHING: 6519775 m
DATUM: AHD

Drilling and Sampling					Material description and profile information					Field Test		
METHOD	WATER	SAMPLES	RL (m)	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					ML	**FILL:** Sandy SILT, dark brown, traces of gravel, fine to medium grained, subrounded	D				FILL/TOPSOIL
							0.20m					
						CI	**FILL:** Silty CLAY, medium plasticity, pale brown/pale red	M < w_P	Fr / VSt	HP	250	FILL-CLAY
		0.40m					0.40m					
			12.5	0.5		CH	**Sandy CLAY:** Medium to high plasticity, red, sand, fine to medium grained			HP	390	RESIDUAL
		U50								HP	400	
		0.70m								HP	390	
			12.0	1.0								
							1.30m			HP	370	
			11.5	1.5		CI	**Silty CLAY:** Medium plasticity, pale grey/white with red mottling, traces of rock fabric					EXTREMELY WEATHERED SLATE
							1.50m					
							Hole Terminated at 1.50 m					
			11.0	2.0								
			10.5	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: BH206

CLIENT: Land Dynamics Australia
PAGE: 1 of 1
PROJECT NAME: Stage 1, The Sanctuary
JOB NO: RGS21087.1
SITE LOCATION: John Oxley Drive, Port Macquarie
LOGGED BY: GC
TEST LOCATION: Lot 113/134
DATE: 20/12/23

DRILL TYPE: RGS Ute Mounted Drill Rig
EASTING: 485425 m
SURFACE RL: 13.5 m
BOREHOLE DIAMETER: 120 mm
INCLINATION: 90°
NORTHING: 6519739 m
DATUM: AHD

Drilling and Sampling					Material description and profile information					Field Test		
METHOD	WATER	SAMPLES	RL (m)	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					ML	**FILL:** Sandy SILT, dark brown, traces of gravel, fine grained, subangular, sand, fine to medium grained	D	Fr			FILL/TOPSOIL
							0.25m	M < w_P	Fr / VSt			
						CH	**Sandy Silty CLAY:** Medium to high plasticity, white/pale grey with red mottling, traces of rock fabric					EXTREMELY WEATHERED SLATE
			13.0	0.5						HP	250	
										HP	230	
			12.5	1.0								
			12.0	1.5			1.50m					
							Hole Terminated at 1.50 m					
			11.5	2.0								
			11.0	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: BH207

CLIENT: Land Dynamics Australia
PAGE: 1 of 1
PROJECT NAME: Stage 1, The Sanctuary
JOB NO: RGS21087.1
SITE LOCATION: John Oxley Drive, Port Macquarie
LOGGED BY: GC
TEST LOCATION: Lot 114/115
DATE: 20/12/23

DRILL TYPE: RGS Ute Mounted Drill Rig
EASTING: 485405 m
SURFACE RL: 14.0 m
BOREHOLE DIAMETER: 120 mm
INCLINATION: 90°
NORTHING: 6519709 m
DATUM: AHD

Drilling and Sampling					Material description and profile information					Field Test		
METHOD	WATER	SAMPLES	RL (m)	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					ML	**FILL:** Sandy SILT, dark brown, traces of gravel, fine to medium grained, subrounded	D	Fr			FILL/TOPSOIL
							0.20m					
			13.5	0.5			**SLATE:** Pale grey/white, inferred very low to low strength, foliated, recovered as Silty SAND					HIGHLY TO MODERATELY WEATHERED SLATE
			13.0	1.0			Traces of pink					
			12.5	1.5			1.50m					
							Hole Terminated at 1.50 m					
			12.0	2.0								
			11.5	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: BH208

CLIENT: Land Dynamics Australia
PAGE: 1 of 1
PROJECT NAME: Stage 1, The Sanctuary
JOB NO: RGS21087.1
SITE LOCATION: John Oxley Drive, Port Macquarie
LOGGED BY: GC
TEST LOCATION: Lot 116/117
DATE: 20/12/23

DRILL TYPE: RGS Ute Mounted Drill Rig
EASTING: 485414 m
SURFACE RL: 14.0 m
BOREHOLE DIAMETER: 120 mm
INCLINATION: 90°
NORTHING: 6519680 m
DATUM: AHD

Drilling and Sampling					Material description and profile information					Field Test		
METHOD	WATER	SAMPLES	RL (m)	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					ML	**FILL:** Sandy SILT, dark brown, sand, fine to medium grained	D	Fr			FILL/TOPSOIL
							0.40m	M < w_P	Fr / VSt	HP	220	
			13.5	0.5		CI	**Silty CLAY:** Medium plasticity, pale red/white, traces of rock fabric			HP	250	EXTREMELY WEATHERED SLATE
		0.70m										
		U50										
		1.00m	13.0	1.0						HP	200	
			12.5	1.5			1.50m					
							Hole Terminated at 1.50 m					
			12.0	2.0								
			11.5	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: BH209

CLIENT: Land Dynamics Australia
PAGE: 1 of 1
PROJECT NAME: Stage 1, The Sanctuary
JOB NO: RGS21087.1
SITE LOCATION: John Oxley Drive, Port Macquarie
LOGGED BY: GC
TEST LOCATION: Lot 118/119
DATE: 20/12/23

DRILL TYPE: RGS Ute Mounted Drill Rig
EASTING: 485374 m
SURFACE RL: 16.5 m
BOREHOLE DIAMETER: 120 mm
INCLINATION: 90°
NORTHING: 6519671 m
DATUM: AHD

Drilling and Sampling					Material description and profile information					Field Test		
METHOD	WATER	SAMPLES	RL (m)	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					ML	**FILL:** Sandy SILT, dark brown 0.15m	D	Fr			FILL/TOPSOIL
			16.0	0.5			**SLATE:** Pale grey/white, inferred very low to low strength, foliated, recovered as Sandy GRAVEL					HIGHLY TO MODERATELY WEATHERED SLATE
			15.5	1.0								
			15.0	1.5			1.50m					
							Hole Terminated at 1.50 m					
			14.5	2.0								
			14.0	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: BH210

CLIENT: Land Dynamics Australia
PAGE: 1 of 1
PROJECT NAME: Stage 1, The Sanctuary
JOB NO: RGS21087.1
SITE LOCATION: John Oxley Drive, Port Macquarie
LOGGED BY: GC
TEST LOCATION: Lot 120/121
DATE: 20/12/23

DRILL TYPE: RGS Ute Mounted Drill Rig
EASTING: 485370 m
SURFACE RL: 16.5 m
BOREHOLE DIAMETER: 120 mm
INCLINATION: 90°
NORTHING: 6519707 m
DATUM: AHD

Drilling and Sampling					Material description and profile information					Field Test		
METHOD	WATER	SAMPLES	RL (m)	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	0.30m				ML	**FILL:** Sandy SILT, dark brown, sand, fine to medium grained	D	Fr			FILL/TOPSOIL
							0.10m					
						CH	**Sandy Silty CLAY:** Medium to high plasticity, pale red with brown/red mottling, traces of rock fabric	M < w_P	Fr / VSt			EXTREMELY WEATHERED SLATE
		U50	16.0	0.5						HP	210	
		0.70m								HP	220	
			15.5	1.0								
			15.0	1.5			1.50m					
							Hole Terminated at 1.50 m					
			14.5	2.0								
			14.0	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: BH211

CLIENT: Land Dynamics Australia
PAGE: 1 of 1
PROJECT NAME: Stage 1, The Sanctuary
JOB NO: RGS21087.1
SITE LOCATION: John Oxley Drive, Port Macquarie
LOGGED BY: GC
TEST LOCATION: Lot 122/123
DATE: 20/12/23

DRILL TYPE: RGS Ute Mounted Drill Rig
EASTING: 485394 m
SURFACE RL: 16.3 m
BOREHOLE DIAMETER: 120 mm
INCLINATION: 90°
NORTHING: 6519736 m
DATUM: AHD

Drilling and Sampling					Material description and profile information					Field Test		
METHOD	WATER	SAMPLES	RL (m)	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		16.0	0.5		ML	**FILL:** Sandy SILT, dark brown, traces of gravel, fine to medium grained 0.15m	D	Fr			FILL/TOPSOIL
						Cl	**Silty CLAY:** Medium plasticity, pale red/pale grey, traces of rock fabric 0.50m	M < w_P	Fr / VSt	HP	250	EXTREMELY WEATHERED SLATE
			15.5	1.0			**SLATE:** Pale orange/pale brown, inferred very low to low strength, recovered as Sandy SILT 1.50m					HIGHLY TO MODERATELY WEATHERED SLATE
			15.0	1.5			Hole Terminated at 1.50 m					
			14.5	2.0								
			14.0	2.5								
			13.5									

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: BH212

CLIENT: Land Dynamics Australia
PAGE: 1 of 1
PROJECT NAME: Stage 1, The Sanctuary
JOB NO: RGS21087.1
SITE LOCATION: John Oxley Drive, Port Macquarie
LOGGED BY: GC
TEST LOCATION: Lot 124/125
DATE: 20/12/23

DRILL TYPE: RGS Ute Mounted Drill Rig
EASTING: 485381 m
SURFACE RL: 15.8 m
BOREHOLE DIAMETER: 120 mm
INCLINATION: 90°
NORTHING: 6519769 m
DATUM: AHD

Drilling and Sampling					Material description and profile information					Field Test		
METHOD	WATER	SAMPLES	RL (m)	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		15.5	0.5		ML	**FILL:** Sandy SILT, pale brown 0.10m	D	Fr			FILL/TOPSOIL
						CH	**Sandy CLAY:** Medium plasticity, red, sand, fine to medium grained, traces of pale brown/white	M < w_P	Fr / VSt	HP	250	RESIDUAL
			15.0	1.0						HP	300	
			14.5	1.5			1.50m			HP	300	
			14.0	2.0			Hole Terminated at 1.50 m					
			13.5	2.5								
			13.0									

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: BH213

CLIENT: Land Dynamics Australia
PAGE: 1 of 1
PROJECT NAME: Stage 1, The Sanctuary
JOB NO: RGS21087.1
SITE LOCATION: John Oxley Drive, Port Macquarie
LOGGED BY: GC
TEST LOCATION: Lot 126/127
DATE: 20/12/23

DRILL TYPE: RGS Ute Mounted Drill Rig
EASTING: 485358 m
SURFACE RL: 16.0 m
BOREHOLE DIAMETER: 120 mm
INCLINATION: 90°
NORTHING: 6519786 m
DATUM: AHD

Drilling and Sampling					Material description and profile information					Field Test		
METHOD	WATER	SAMPLES	RL (m)	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		16.0	0.0		CL	**FILL:** Sandy CLAY, low plasticity, dark brown	$M < w_P$	Fr			FILL/TOPSOIL
							0.10m					
						CH	**Sandy CLAY:** Medium to high plasticity, red, sand, fine to medium grained					RESIDUAL
									Fr / H	HP	450	
			15.5	0.5								
										HP	470	
			15.0	1.0								
										HP	450	
			14.5	1.5			1.50m					
							Hole Terminated at 1.50 m					
			14.0	2.0								
			13.5	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: BH214

CLIENT: Land Dynamics Australia
PAGE: 1 of 1
PROJECT NAME: Stage 1, The Sanctuary
JOB NO: RGS21087.1
SITE LOCATION: John Oxley Drive, Port Macquarie
LOGGED BY: GC
TEST LOCATION: Lot 128/129
DATE: 20/12/23

DRILL TYPE: RGS Ute Mounted Drill Rig
EASTING: 485340 m
SURFACE RL: 16.8 m
BOREHOLE DIAMETER: 120 mm
INCLINATION: 90°
NORTHING: 6519754 m
DATUM: AHD

Drilling and Sampling					Material description and profile information					Field Test		
METHOD	WATER	SAMPLES	RL (m)	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	0.30m U50 0.70m	16.5 16.0 15.5	0.5 1.0 1.5		CL CH	**FILL:** Sandy CLAY, low plasticity, dark brown 0.15m **Sandy CLAY:** Medium to high plasticity, yellow/pale brown, sand, fine to medium grained, traces of rock fabric 1.50m	$M < w_P$	Fr Fr / VSt	HP HP HP	300 250 230	FILL/TOPSOIL EXTREMELY WEATHERED DOLERITE
			15.0 14.5 14.0	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: BH215

CLIENT: Land Dynamics Australia
PAGE: 1 of 1
PROJECT NAME: Stage 1, The Sanctuary
JOB NO: RGS21087.1
SITE LOCATION: John Oxley Drive, Port Macquarie
LOGGED BY: GC
TEST LOCATION: Lot 130/131
DATE: 20/12/23

DRILL TYPE: RGS Ute Mounted Drill Rig
EASTING: 485345 m
SURFACE RL: 16.8 m
BOREHOLE DIAMETER: 120 mm
INCLINATION: 90°
NORTHING: 6519726 m
DATUM: AHD

Drilling and Sampling					Material description and profile information					Field Test		
METHOD	WATER	SAMPLES	RL (m)	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		16.8	0.0		ML	**FILL:** Sandy SILT, dark brown, traces of gravel, fine grained, subangular	D	Fr			FILL/TOPSOIL
							0.15m					
			16.5	0.5		CH	**Sandy CLAY:** Medium plasticity, pale brown/yellow, traces of rock fabric	M < w_P	Fr / VSt	HP	210	EXTREMELY WEATHERED DOLERITE
			16.0	1.0						HP	200	
			15.5	1.5						HP	220	
							1.50m					
							Hole Terminated at 1.50 m					
			15.0	2.0								
			14.5	2.5								
			14.0									

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: BH216

CLIENT: Land Dynamics Australia
PAGE: 1 of 1
PROJECT NAME: Stage 1, The Sanctuary
JOB NO: RGS21087.1
SITE LOCATION: John Oxley Drive, Port Macquarie
LOGGED BY: GC
TEST LOCATION: Lot 132/133
DATE: 20/12/23

DRILL TYPE: RGS Ute Mounted Drill Rig
EASTING: 485341 m
SURFACE RL: 17.3 m
BOREHOLE DIAMETER: 120 mm
INCLINATION: 90°
NORTHING: 6519697 m
DATUM: AHD

Drilling and Sampling					Material description and profile information					Field Test		
METHOD	WATER	SAMPLES	RL (m)	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		17.0	0.5		ML	**FILL:** Sandy SILT, dark brown, traces of gravel, fine grained, subangular 0.20m	D	Fr			FILL/TOPSOIL
			16.5	1.0			**SLATE:** Yellow/pale grey, very low to low strength, recovered as Sandy SILT					HIGHLY TO MODERATELY WEATHERED SLATE
			16.0	1.5			1.50m					
			15.5	2.0			Hole Terminated at 1.50 m					
			15.0	2.5								
			14.5									

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: BH217

CLIENT: Land Dynamics Australia
PROJECT NAME: Stage 1, The Sanctuary
SITE LOCATION: John Oxley Drive, Port Macquarie
TEST LOCATION: Lot 108/109

PAGE: 1 of 1
JOB NO: RGS21087.1
LOGGED BY: GC
DATE: 20/12/23

DRILL TYPE: RGS Ute Mounted Drill Rig
BOREHOLE DIAMETER: 120 mm
INCLINATION: 90°
EASTING: 485464 m
NORTHING: 6519664 m
SURFACE RL: 13.8 m
DATUM: AHD

Drilling and Sampling					Material description and profile information					Field Test		Structure and additional observations
METHOD	WATER	SAMPLES	RL (m)	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		13.8	0.0		ML	**FILL:** Sandy SILT, dark brown, traces of gravel, fine to medium grained, subangular	D	Fr			FILL/TOPSOIL
							0.15m					
			13.5	0.5		CI	**FILL:** Sandy Silty CLAY, medium plasticity, pale red/pale grey, some gravel, fine to medium grained, subangular	M < w_P	Fr / VSt	HP	220	FILL-CLAY
			13.0	1.0						HP	250	
			12.5	1.5						HP	230	
							1.50m					
							Hole Terminated at 1.50 m					
			12.0	2.0								
			11.5	2.5								
			11.0									

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	

Moisture Condition

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

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%

REGIONAL GEOTECHNICAL SOLUTIONS

ENGINEERING LOG - BOREHOLE

BOREHOLE NO: BH218

CLIENT: Land Dynamics Australia
PROJECT NAME: Stage 1, The Sanctuary
SITE LOCATION: John Oxley Drive, Port Macquarie
TEST LOCATION: Lot 101/102

PAGE: 1 of 1
JOB NO: RGS21087.1
LOGGED BY: GC
DATE: 20/12/23

DRILL TYPE: RGS Ute Mounted Drill Rig
BOREHOLE DIAMETER: 120 mm
INCLINATION: 90°
EASTING: 485494 m
NORTHING: 6519666 m
SURFACE RL: 11.5 m
DATUM: AHD

Drilling and Sampling					Material description and profile information					Field Test		
METHOD	WATER	SAMPLES	RL (m)	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		11.5	0.0		ML	**FILL:** Sandy SILT, dark brown, traces of gravel, fine to medium grained, subrounded 0.15m	D	Fr			FILL/TOPSOIL
			11.0	0.5		CI	**FILL:** Silty CLAY, low to medium plasticity, pale grey/white with red mottling 0.70m	M < w_P	Fr / VSt	HP	350	FILL-CLAY
			10.5	1.0			**SLATE:** Pale grey/pale red, inferred very low to low strength, recovered as Sandy SILT 1.50m					HIGHLY WEATHERED SLATE
			10.0	1.5			Hole Terminated at 1.50 m					
			9.5	2.0								
			9.0	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: BH219

CLIENT: Land Dynamics Australia
PROJECT NAME: Stage 1, The Sanctuary
SITE LOCATION: John Oxley Drive, Port Macquarie
TEST LOCATION: Lot 106

PAGE: 1 of 1
JOB NO: RGS21087.1
LOGGED BY: GC
DATE: 20/12/23

DRILL TYPE: RGS Ute Mounted Drill Rig
BOREHOLE DIAMETER: 120 mm
INCLINATION: 90°
EASTING: 485454 m
NORTHING: 6519704 m
SURFACE RL: 12.5 m
DATUM: AHD

Drilling and Sampling					Material description and profile information					Field Test		
METHOD	WATER	SAMPLES	RL (m)	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					ML	**FILL:** Sandy SILT, dark brown, traces of gravel, fine to medium grained, subangular, sand, fine to medium grained	D	Fr			FILL/TOPSOIL
							0.15m					
						Cl	**Sandy CLAY:** Medium plasticity, red, sand, fine to medium grained	M < w_P	Fr / VSt			RESIDUAL
			12.0	0.5						HP	390	
										HP	380	
			11.5	1.0			Some pale brown mottling			HP	250	
			11.0	1.5			1.50m					
							Hole Terminated at 1.50 m					
			10.5	2.0								
			10.0	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

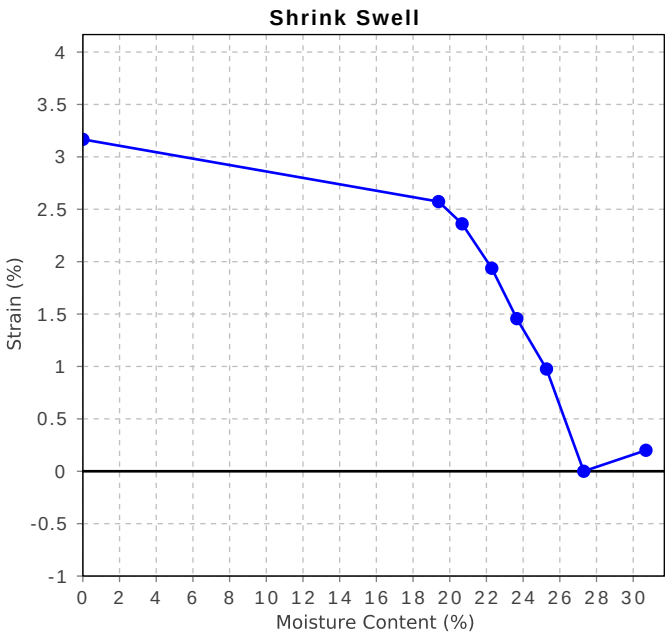
Approved Signatory: Brent Cullen
Engineering Geologist
NATA Accredited Laboratory Number: 18686

Report Number:	**MNC16P-0001-29**
Issue Number:	1
Date Issued:	16/01/2024
Client:	Regional Geotechnical Solutions Pty Ltd
	44 Bent Street, Wingham NSW 2429
Project Number:	MNC16P-0001
Project Name:	Various Testing
Project Location:	The Sanctuary John Oxley Drive, Port Macquarie, NSW
Client Reference:	RGS21087.1
Work Request:	1583
Sample Number:	NEW23S-1583A
Date Sampled:	20/12/2023
Dates Tested:	21/12/2023 - 09/01/2024
Sampling Method:	Sampled by Client
	The results apply to the sample as received
Sample Location:	**BH202 - (0.4 - 0.7m)**
Material:	Clay
Material Source:	On-Site Insitu

Shrink Swell Index (AS 1289 7.1.1 & 2.1.1)	
Iss (%)	**1.8**
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 (%)	**3.2**
Estimated % by volume of significant inert inclusions	6
Cracking	Moderately Cracked
Crumbling	No
Moisture Content (%)	27.3

Swell Test	
Initial Pocket Penetrometer (kPa)	500
Final Pocket Penetrometer (kPa)	430
Initial Moisture Content (%)	27.7
Final Moisture Content (%)	30.7
Swell (%)	**-0.2**
* NATA Accreditation does not cover the performance of pocket penetrometer readings.	



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

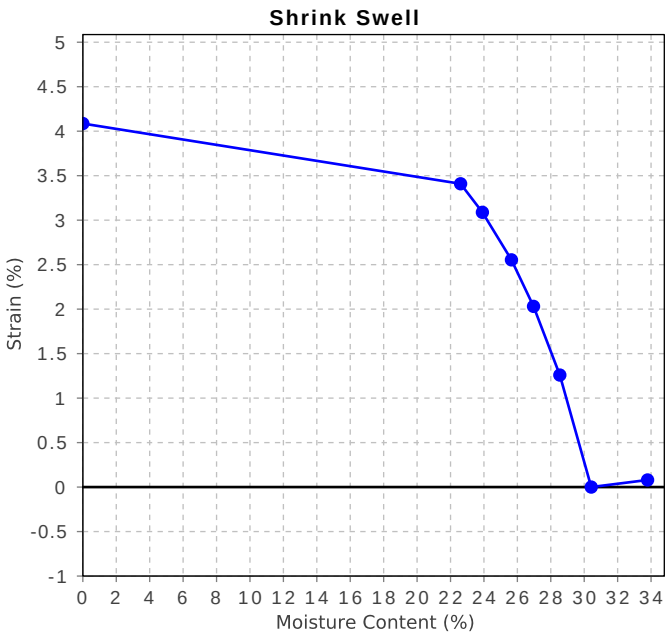
Approved Signatory: Brent Cullen
Engineering Geologist
NATA Accredited Laboratory Number: 18686

Report Number:	**MNC16P-0001-29**
Issue Number:	1
Date Issued:	16/01/2024
Client:	Regional Geotechnical Solutions Pty Ltd
	44 Bent Street, Wingham NSW 2429
Project Number:	MNC16P-0001
Project Name:	Various Testing
Project Location:	The Sanctuary John Oxley Drive, Port Macquarie, NSW
Client Reference:	RGS21087.1
Work Request:	1583
Sample Number:	NEW23S-1583B
Date Sampled:	20/12/2023
Dates Tested:	21/12/2023 - 09/01/2024
Sampling Method:	Sampled by Client
	The results apply to the sample as received
Sample Location:	**BH203 - (0.3 - 0.7m)**
Material:	Clay
Material Source:	On-Site Insitu

Shrink Swell Index (AS 1289 7.1.1 & 2.1.1)	
Iss (%)	**2.3**
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 (%)	**4.1**
Estimated % by volume of significant inert inclusions	6
Cracking	Slightly Cracked
Crumbling	No
Moisture Content (%)	30.4

Swell Test	
Initial Pocket Penetrometer (kPa)	480
Final Pocket Penetrometer (kPa)	450
Initial Moisture Content (%)	29.4
Final Moisture Content (%)	33.8
Swell (%)	**-0.1**
* NATA Accreditation does not cover the performance of pocket penetrometer readings.	



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

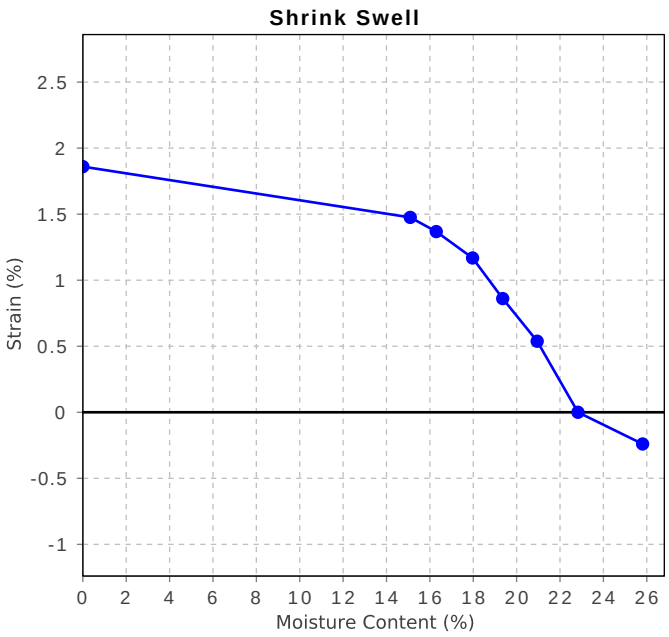
Approved Signatory: Brent Cullen
Engineering Geologist
NATA Accredited Laboratory Number: 18686

Report Number:	**MNC16P-0001-29**
Issue Number:	1
Date Issued:	16/01/2024
Client:	Regional Geotechnical Solutions Pty Ltd
	44 Bent Street, Wingham NSW 2429
Project Number:	MNC16P-0001
Project Name:	Various Testing
Project Location:	The Sanctuary John Oxley Drive, Port Macquarie, NSW
Client Reference:	RGS21087.1
Work Request:	1583
Sample Number:	NEW23S-1583C
Date Sampled:	20/12/2023
Dates Tested:	21/12/2023 - 09/01/2024
Sampling Method:	Sampled by Client
	The results apply to the sample as received
Sample Location:	**BH205 - (0.4 - 0.7m)**
Material:	Clay
Material Source:	On-Site Insitu

Shrink Swell Index (AS 1289 7.1.1 & 2.1.1)	
Iss (%)	**1.1**
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 (%)	**1.9**
Estimated % by volume of significant inert inclusions	4
Cracking	Slightly Cracked
Crumbling	No
Moisture Content (%)	22.8

Swell Test	
Initial Pocket Penetrometer (kPa)	>600
Final Pocket Penetrometer (kPa)	520
Initial Moisture Content (%)	22.8
Final Moisture Content (%)	25.8
Swell (%)	**0.2**
* NATA Accreditation does not cover the performance of pocket penetrometer readings.	



Material Test Report

Qualtest LABORATORY (NSW) PTY LTD
Newcastle Laboratory
2 Murray Dwyer Circuit Mayfield West NSW 2304
Phone: (02) 4968 4468
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Accredited for compliance with ISO/IEC 17025 - Testing

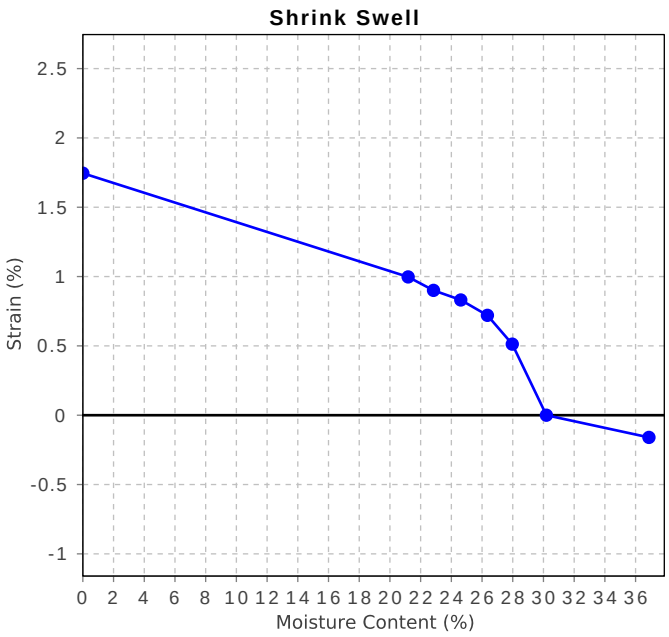
Approved Signatory: Brent Cullen
Engineering Geologist
NATA Accredited Laboratory Number: 18686

Report Number:	**MNC16P-0001-29**
Issue Number:	1
Date Issued:	16/01/2024
Client:	Regional Geotechnical Solutions Pty Ltd
	44 Bent Street, Wingham NSW 2429
Project Number:	MNC16P-0001
Project Name:	Various Testing
Project Location:	The Sanctuary John Oxley Drive, Port Macquarie, NSW
Client Reference:	RGS21087.1
Work Request:	1583
Sample Number:	NEW23S-1583D
Date Sampled:	20/12/2023
Dates Tested:	21/12/2023 - 09/01/2024
Sampling Method:	Sampled by Client
	The results apply to the sample as received
Sample Location:	**BH208 - (0.7 - 1.1m)**
Material:	Clay
Material Source:	On-Site Insitu

Shrink Swell Index (AS 1289 7.1.1 & 2.1.1)	
Iss (%)	**1.0**
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 (%)	**1.7**
Estimated % by volume of significant inert inclusions	6
Cracking	Moderately Cracked
Crumbling	No
Moisture Content (%)	30.2

Swell Test	
Initial Pocket Penetrometer (kPa)	>600
Final Pocket Penetrometer (kPa)	420
Initial Moisture Content (%)	29.2
Final Moisture Content (%)	36.9
Swell (%)	**0.2**
* NATA Accreditation does not cover the performance of pocket penetrometer readings.	



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

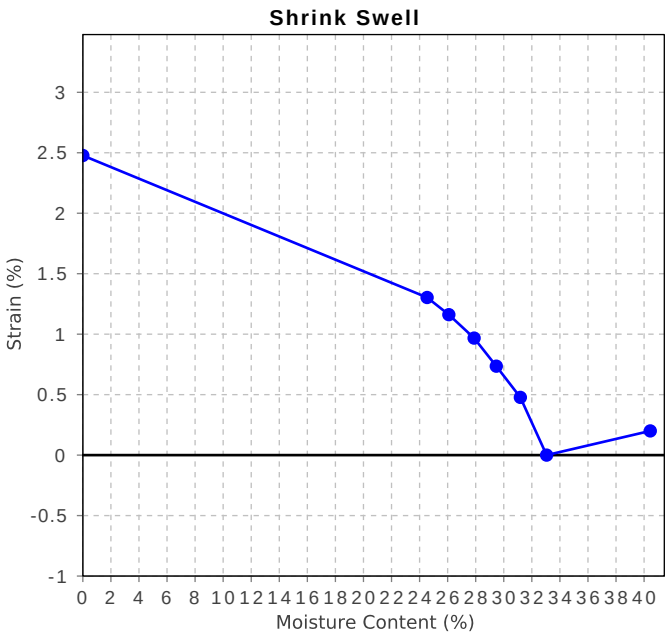
Approved Signatory: Brent Cullen
Engineering Geologist
NATA Accredited Laboratory Number: 18686

Report Number:	**MNC16P-0001-29**
Issue Number:	1
Date Issued:	16/01/2024
Client:	Regional Geotechnical Solutions Pty Ltd
	44 Bent Street, Wingham NSW 2429
Project Number:	MNC16P-0001
Project Name:	Various Testing
Project Location:	The Sanctuary John Oxley Drive, Port Macquarie, NSW
Client Reference:	RGS21087.1
Work Request:	1583
Sample Number:	NEW23S-1583E
Date Sampled:	20/12/2023
Dates Tested:	21/12/2023 - 09/01/2024
Sampling Method:	Sampled by Client
	The results apply to the sample as received
Sample Location:	**BH210 - (0.3 - 0.7m)**
Material:	Clay
Material Source:	On-Site Insitu

Shrink Swell Index (AS 1289 7.1.1 & 2.1.1)	
Iss (%)	**1.4**
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 (%)	**2.5**
Estimated % by volume of significant inert inclusions	3
Cracking	Moderately Cracked
Crumbling	No
Moisture Content (%)	33.1

Swell Test	
Initial Pocket Penetrometer (kPa)	350
Final Pocket Penetrometer (kPa)	330
Initial Moisture Content (%)	32.7
Final Moisture Content (%)	40.4
Swell (%)	**-0.2**
* NATA Accreditation does not cover the performance of pocket penetrometer readings.	



Material Test Report

Qualtest LABORATORY (NSW) PTY LTD
Newcastle Laboratory
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Phone: (02) 4968 4468
Email: brentcullen@qualtest.com.au

Accredited for compliance with ISO/IEC 17025 - Testing

NATA WORLD RECOGNISED ACCREDITATION

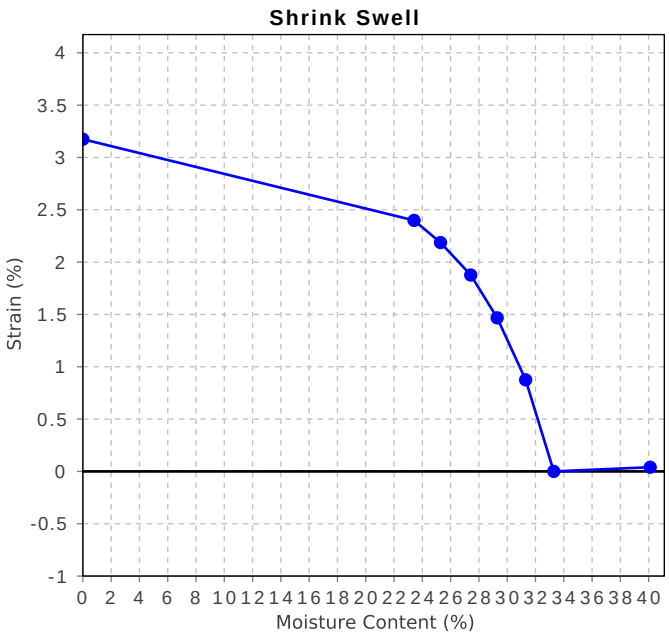
Approved Signatory: Brent Cullen
Engineering Geologist
NATA Accredited Laboratory Number: 18686

Report Number:	**MNC16P-0001-29**
Issue Number:	1
Date Issued:	16/01/2024
Client:	Regional Geotechnical Solutions Pty Ltd
	44 Bent Street, Wingham NSW 2429
Project Number:	MNC16P-0001
Project Name:	Various Testing
Project Location:	The Sanctuary John Oxley Drive, Port Macquarie, NSW
Client Reference:	RGS21087.1
Work Request:	1583
Sample Number:	NEW23S-1583F
Date Sampled:	20/12/2023
Dates Tested:	21/12/2023 - 09/01/2024
Sampling Method:	Sampled by Client
	The results apply to the sample as received
Sample Location:	**BH212 - (0.3 - 0.7m)**
Material:	Clay
Material Source:	On-Site Insitu

Shrink Swell Index (AS 1289 7.1.1 & 2.1.1)	
Iss (%)	**1.8**
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 (%)	**3.2**
Estimated % by volume of significant inert inclusions	3
Cracking	Slightly Cracked
Crumbling	No
Moisture Content (%)	33.3

Swell Test	
Initial Pocket Penetrometer (kPa)	>600
Final Pocket Penetrometer (kPa)	520
Initial Moisture Content (%)	34.1
Final Moisture Content (%)	40.1
Swell (%)	**-0.0**
* NATA Accreditation does not cover the performance of pocket penetrometer readings.	



Material Test Report

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NATA WORLD RECOGNISED ACCREDITATION

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

Report Number:	**MNC16P-0001-29**
Issue Number:	1
Date Issued:	16/01/2024
Client:	Regional Geotechnical Solutions Pty Ltd
	44 Bent Street, Wingham NSW 2429
Project Number:	MNC16P-0001
Project Name:	Various Testing
Project Location:	The Sanctuary John Oxley Drive, Port Macquarie, NSW
Client Reference:	RGS21087.1
Work Request:	1583
Sample Number:	NEW23S-1583G
Date Sampled:	20/12/2023
Dates Tested:	21/12/2023 - 09/01/2024
Sampling Method:	Sampled by Client
	The results apply to the sample as received
Sample Location:	**BH214 - (0.3 - 0.7m)**
Material:	Clay
Material Source:	On-Site Insitu

Shrink Swell Index (AS 1289 7.1.1 & 2.1.1)	
Iss (%)	**1.0**
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 (%)	**1.7**
Estimated % by volume of significant inert inclusions	2
Cracking	Moderately Cracked
Crumbling	No
Moisture Content (%)	27.9

Swell Test	
Initial Pocket Penetrometer (kPa)	>600
Final Pocket Penetrometer (kPa)	510
Initial Moisture Content (%)	26.8
Final Moisture Content (%)	33.9
Swell (%)	**0.2**
* NATA Accreditation does not cover the performance of pocket penetrometer readings.	

Material Test Report

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NATA WORLD RECOGNISED ACCREDITATION

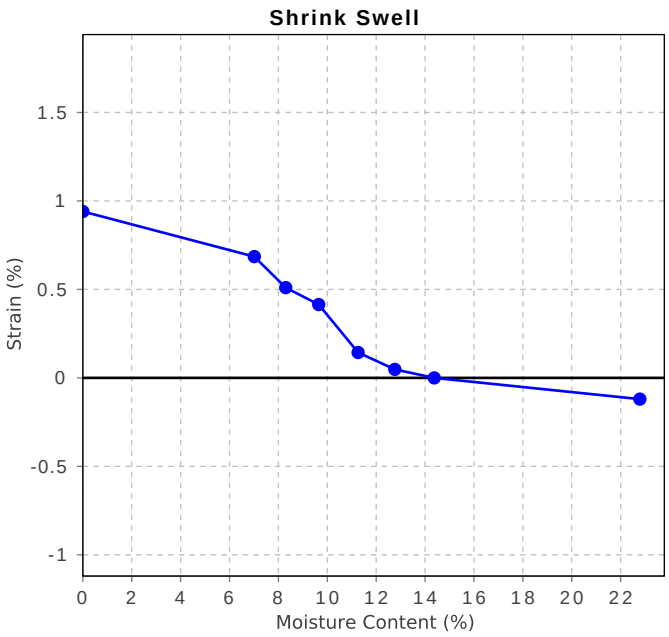
Approved Signatory: Brent Cullen
Engineering Geologist
NATA Accredited Laboratory Number: 18686

Report Number:	**MNC16P-0001-29**
Issue Number:	1
Date Issued:	16/01/2024
Client:	Regional Geotechnical Solutions Pty Ltd
	44 Bent Street, Wingham NSW 2429
Project Number:	MNC16P-0001
Project Name:	Various Testing
Project Location:	The Sanctuary John Oxley Drive, Port Macquarie, NSW
Client Reference:	RGS21087.1
Work Request:	1583
Sample Number:	NEW23S-1583H
Date Sampled:	20/12/2023
Dates Tested:	21/12/2023 - 09/01/2024
Sampling Method:	Sampled by Client
	The results apply to the sample as received
Sample Location:	**BH217 - (0.3 - 0.7m)**
Material:	Clay
Material Source:	On-Site Insitu

Shrink Swell Index (AS 1289 7.1.1 & 2.1.1)	
Iss (%)	**0.6**
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 (%)	**0.9**
Estimated % by volume of significant inert inclusions	7
Cracking	Slightly Cracked
Crumbling	No
Moisture Content (%)	14.4

Swell Test	
Initial Pocket Penetrometer (kPa)	>600
Final Pocket Penetrometer (kPa)	370
Initial Moisture Content (%)	13.7
Final Moisture Content (%)	22.8
Swell (%)	**0.1**
* NATA Accreditation does not cover the performance of pocket penetrometer readings.	



Material Test Report

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NATA WORLD RECOGNISED ACCREDITATION

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

Report Number: **MNC16P-0001-29**
Issue Number: 1
Date Issued: 16/01/2024
Client: Regional Geotechnical Solutions Pty Ltd
44 Bent Street, Wingham NSW 2429
Project Number: MNC16P-0001
Project Name: Various Testing
Project Location: The Sanctuary John Oxley Drive, Port Macquarie, NSW
Client Reference: RGS21087.1
Work Request: 1583
Sample Number: NEW23S-1583I
Date Sampled: 20/12/2023
Dates Tested: 21/12/2023 - 15/01/2024
Sampling Method: Sampled by Client
The results apply to the sample as received
Sample Location: **BH218 - (0.3 - 0.6m)**
Material: Clay
Material Source: On-Site Insitu

Atterberg Limit (AS1289 3.1.2 & 3.2.1 & 3.3.1)		Min	Max
Sample History	Oven Dried		
Preparation Method	Dry Sieve		
Liquid Limit (%)	41		
Plastic Limit (%)	28		
Plasticity Index (%)	**13**		

Linear Shrinkage (AS1289 3.4.1)		Min	Max
Moisture Condition Determined By	AS 1289.3.1.1		
Linear Shrinkage (%)	**5.0**		
Cracking Crumbling Curling	Cracking		