

Land Dynamics Australia

Geotechnical Site Classification

Proposed Residential Subdivision

Stage 1 The Sanctuary, 344 John Oxley Drive, Thrumster

Report No. RGS21087.1-AP

31 January 2024



RGS21087.1-AP

31 January 2024

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 1245588".

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 1245588".

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 1245588". 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.





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.



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	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 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

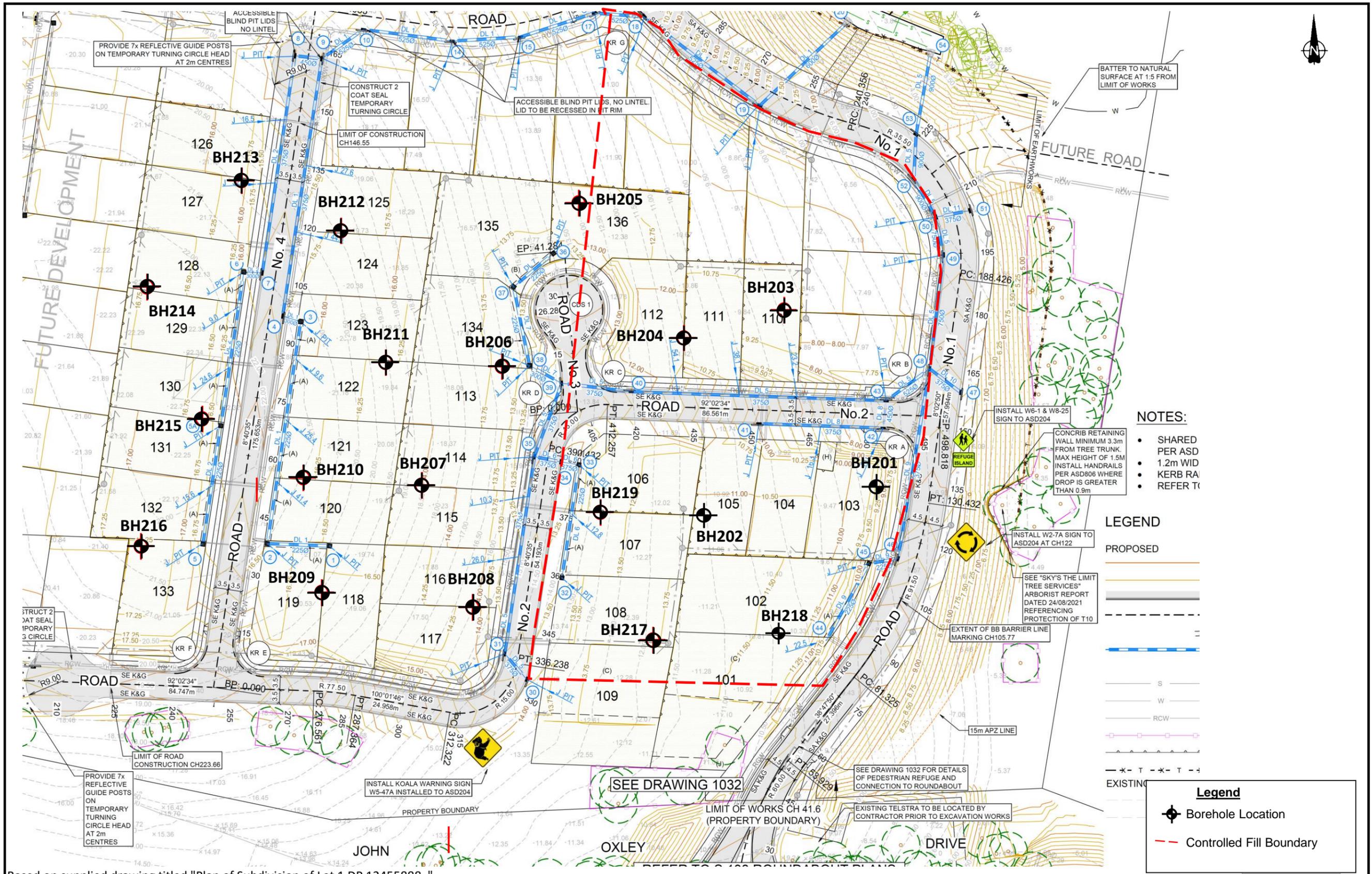
Reviewed by

Steven Morton

Principal Geotechnical Engineer



Figures



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

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



Appendix A

Results of Field Investigations



ENGINEERING LOG - BOREHOLE

BOREHOLE NO: **BH201**

CLIENT: Land Dynamics Australia
PROJECT NAME: Stage 1, The Sanctuary
SITE LOCATION: John Oxley Drive, Port Macquarie
TEST LOCATION: Lot 103

PAGE: 1 of 1
JOB NO: RGS21087.1
LOGGED BY: GC
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		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		9.5	0.5		ML	FILL: Sandy SILT, brown, sand, fine to medium grained	D		HP	250	FILL/TOPSOIL
						CI	FILL: Silty CLAY, medium plasticity, pale brown with pale grey mottling	M < Wp	Fr / VSt			FILL-CLAY
						CI	Sandy CLAY: Medium plasticity, red, traces of pale brown					RESIDUAL
			9.0							HP	300	
			1.0							HP	280	
			8.5									
			1.5				Hole Terminated at 1.50 m					
			8.0									
			2.0									
			7.5									
			2.5									
			7.0									

RG 2.00.3.LIB.GLB.Log_RG_NON-CORED BOREHOLE - TEST PIT_RGS21087.1_BH200 SERIES.LOCS.GPJ <DrawingFiles> 30/12/2024 11:04 10.03.00.09 D:\rgi Lab and in Situ Tool - DGD Lib, RG 2.00.3.2022-03-03.Pjt, RG 2.00.0.2021-06-30

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



ENGINEERING LOG - BOREHOLE

BOREHOLE NO: **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 EASTING: 485477 m SURFACE RL: 11.0 m
 BOREHOLE DIAMETER: 120 mm INCLINATION: 90° NORTHING: 6519693 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					ML	FILL: Sandy SILT, dark brown, sand, fine to medium grained	D				FILL/TOPSOIL
		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
		0.70m		10.0	1.0	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			Hole Terminated at 1.50 m					
				9.0	2.0							
				8.5	2.5							

RGS 2.00.3.LIB.GLB.Log_RGNON-CORED BOREHOLE - TEST PIT_RGS21087.1_BH202 SERIES.LOCS.GPJ <<DrawingFiles>> 30/1/2024 11:04 10.03.00.09 D:\rgi Lab and in Situ Tool - DGD.LIB.RG 2.00.3.2022-03-03.Pjt.RG 2.00.0.202-06-30

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



ENGINEERING LOG - BOREHOLE

BOREHOLE NO: **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		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	U50	9.0	0.30m		CI	FILL: Sandy CLAY, medium plasticity, dark brown, traces of gravel	M < WP	Fr	HP	280	FILL/TOPSOIL		
						CI	FILL: Silty CLAY, medium plasticity, pale brown/pale red, traces of white					Fr / VSt	FILL-CLAY	
						CH	Sandy CLAY: Medium to high plasticity, brown with pale brown mottling, traces of gravel, fine grained, subangular					HP	300	RESIDUAL
												HP	350	
8.5	0.70m	0.80m	HP	390										
			8.0											
			7.5				Hole Terminated at 1.50 m							
			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 distinct strata change

Notes, Samples and Tests

- U₅₀ 50mm Diameter tube sample
- CBR Bulk sample for CBR testing
- E Environmental sample
- ASS Acid Sulfate Soil Sample
- B Bulk Sample

Field Tests

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

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

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ENGINEERING LOG - BOREHOLE

BOREHOLE NO: **BH204**

CLIENT: Land Dynamics Australia
PROJECT NAME: Stage 1, The Sanctuary
SITE LOCATION: John Oxley Drive, Port Macquarie
TEST LOCATION: Lot 111/112

PAGE: 1 of 1
JOB NO: RGS21087.1
LOGGED BY: GC
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		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					ML	FILL: Sandy SILT, dark brown, traces of gravel, fine grained, subangular	D				FILL/TOPSOIL		
			10.5			CI	FILL: Silty CLAY, medium plasticity, pale grey/pale brown, traces of gravel, fine to medium grained, subangular	M < Wp	Fr / VSt			FILL-CLAY		
			0.5								HP	250		
			10.0			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		
			1.0			CI	FILL: Silty CLAY, medium plasticity, pale red/pale brown with white mottling							
			9.5											
			1.5			CH	Sandy CLAY: Medium plasticity, red, sand, fine to medium grained					RESIDUAL		
			9.0											
			2.0				Hole Terminated at 2.00 m							
			8.5											
			2.5											
			8.0											

RG 2.00.3.LIB.GLB.Log_RGNON-CORED BOREHOLE - TEST PIT_RGS21087.1_BH200 SERIES.LOCS.GPJ <DrawingFiles> 30/12/2024 11:04 10.03.00.09 D:\rgi Lab and In Situ Tool - DGD Lib - RGS 2.00.3 2022-03-03 Proj_RG 2.00.0 2021-06-30

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



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		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	U50	12.5	0.5		ML	FILL: Sandy SILT, dark brown, traces of gravel, fine to medium grained, subrounded	D				FILL/TOPSOIL
						CI	FILL: Silty CLAY, medium plasticity, pale brown/pale red	M < Wp	Fr / VSt	HP	250	FILL-CLAY
						CH	Sandy CLAY: Medium to high plasticity, red, sand, fine to medium grained			HP	390	RESIDUAL
									HP	400		
									HP	390		
			12.0	1.0		CI	Silty CLAY: Medium plasticity, pale grey/white with red mottling, traces of rock fabric			HP	370	EXTREMELY WEATHERED SLATE
			11.5	1.5			Hole Terminated at 1.50 m					
			11.0	2.0								
			10.5	2.5								

RG 2.00.3.LIB.GLB.Log_RG_NON-CORED BOREHOLE - TEST PIT_RGS21087.1_BH205 SERIES LOGS.GPJ <DrawingFiles> 30/1/2024 11:04 10.03.00.09 D:\rgi Lab and in Situ Tool - DGD Lib - RG 2.00.3.2022-03-03 Proj - RG 2.00.0 2021-06-30

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



ENGINEERING LOG - BOREHOLE

BOREHOLE NO: **BH206**

CLIENT: Land Dynamics Australia
PROJECT NAME: Stage 1, The Sanctuary
SITE LOCATION: John Oxley Drive, Port Macquarie
TEST LOCATION: Lot 113/134

PAGE: 1 of 1
JOB NO: RGS21087.1
LOGGED BY: GC
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		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		13.0	0.5		ML	FILL: Sandy SILT, dark brown, traces of gravel, fine grained, subangular, sand, fine to medium grained	D	Fr	HP	250	FILL/TOPSOIL
						CH	Sandy Silty CLAY: Medium to high plasticity, white/pale grey with red mottling, traces of rock fabric	M < w _p	Fr / VSt			HP
			12.0	1.5			Hole Terminated at 1.50 m					
			11.5	2.0								
			11.0	2.5								

RG 2.00.3.LIB.GLB_Log_RG_NON-CORED BOREHOLE - TEST PIT_RGS21087.1_BH206 SERIES LOGS.GPJ <<DrawingFiles>> 30/1/2024 11:04 10.03.00.09 D:\rgi Lab and in Situ Tool - DGD Lib_RG 2.00.3 2022-03-03 Pjt:RG 2.00.0 2021-06-30

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



ENGINEERING LOG - BOREHOLE

BOREHOLE NO: **BH207**

CLIENT: Land Dynamics Australia
 PROJECT NAME: Stage 1, The Sanctuary
 SITE LOCATION: John Oxley Drive, Port Macquarie
 TEST LOCATION: Lot 114/115

PAGE: 1 of 1
 JOB NO: RGS21087.1
 LOGGED BY: GC
 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		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					ML	FILL: Sandy SILT, dark brown, traces of gravel, fine to medium grained, subrounded	D	Fr			FILL/TOPSOIL
			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			Hole Terminated at 1.50 m					
			12.0	2.0								
			11.5	2.5								

RGS 2.00.3.LIB.GLB.Log_RGNON-CORED BOREHOLE - TEST PIT_RGS21087.1_BH200 SERIES.LOCS.GPJ <DrawingFiles> 30/12/2024 11:08 10.03.00.08 D:\egp\Lab and in Situ_Tool - DGD\Lib_RGS 2.00.3.2022-03-03.Pjt.RGS 2.00.0.202-06-30

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



ENGINEERING LOG - BOREHOLE

BOREHOLE NO: **BH208**

CLIENT: Land Dynamics Australia
PROJECT NAME: Stage 1, The Sanctuary
SITE LOCATION: John Oxley Drive, Port Macquarie
TEST LOCATION: Lot 116/117

PAGE: 1 of 1
JOB NO: RGS21087.1
LOGGED BY: GC
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		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	U50	13.0	0.70m	[Graphic Log: 0.40m interval with ML and CI symbols]	ML	FILL: Sandy SILT, dark brown, sand, fine to medium grained	D	Fr	HP	220	FILL/TOPSOIL
						CI	Silty CLAY: Medium plasticity, pale red/white, traces of rock fabric	M < Wp	Fr / VSt	HP	250	EXTREMELY WEATHERED SLATE
			12.5	1.50m	[Graphic Log: 1.50m interval with CI symbol]		Hole Terminated at 1.50 m					
			11.5	2.5	[Graphic Log: 2.5m interval with CI symbol]							
			12.0	2.0	[Graphic Log: 2.0m interval with CI symbol]							

RG 2.00.3.LIB.GLB.Log_RG.NON-CORED.BOREHOLE - TEST.PLT_RGS21087.1.BH208.SERIES.LOCS.GPJ <<DrawingFiles>> 30/12/2024 11:05 10.03.00.09 D:\rgi Lab and in Situ Tool - DGD.LIB.RG 2.00.3.2022-03-03.Plt.RG 2.00.0.202-06-30

LEGEND:

Water

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

Strata Changes

- Gradational or transitional strata
- Definitive or distinct strata change

Notes, Samples and Tests

- U₅₀ 50mm Diameter tube sample
- CBR Bulk sample for CBR testing
- E Environmental sample
- ASS Acid Sulfate Soil Sample
- B Bulk Sample

Field Tests

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

Consistency	UCS (kPa)	Moisture Condition
VS Very Soft	<25	D Dry
S Soft	25 - 50	M Moist
F Firm	50 - 100	W Wet
St Stiff	100 - 200	W _p Plastic Limit
VSt Very Stiff	200 - 400	W _L Liquid Limit
H Hard	>400	
Fb Friable		

Density	Density Index
V Very Loose	<15%
L Loose	15 - 35%
MD Medium Dense	35 - 65%
D Dense	65 - 85%
VD Very Dense	85 - 100%



ENGINEERING LOG - BOREHOLE

BOREHOLE NO: **BH209**

CLIENT: Land Dynamics Australia
PROJECT NAME: Stage 1, The Sanctuary
SITE LOCATION: John Oxley Drive, Port Macquarie
TEST LOCATION: Lot 118/119

PAGE: 1 of 1
JOB NO: RGS21087.1
LOGGED BY: GC
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		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		16.0	0.5		ML	FILL: Sandy SILT, dark brown	D	Fr			FILL/TOPSOIL
							0.15m					SLATE: Pale grey/white, inferred very low to low strength, foliated, recovered as Sandy GRAVEL
			15.0	1.5								
			14.5	2.0			Hole Terminated at 1.50 m					
			14.0	2.5								

RGS 2.00.3.LIB.GLB.Log_RG.NON-CORED.BOREHOLE - TEST.PIT_RGS21087.1.BH209.SERIES.LOCS.GPJ <DrawingFiles> 30/12/2024 11:05 10.03.00.09 D:\rgi Lab and in Situ Tool - DGD.LIB.RG 2.00.3.2022-03-03.Pjt.RG 2.00.0.202-06-30

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



ENGINEERING LOG - BOREHOLE

BOREHOLE NO: **BH210**

CLIENT: Land Dynamics Australia
PROJECT NAME: Stage 1, The Sanctuary
SITE LOCATION: John Oxley Drive, Port Macquarie
TEST LOCATION: Lot 120/121

PAGE: 1 of 1
JOB NO: RGS21087.1
LOGGED BY: GC
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		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	0.30m	16.0	0.5	[X-pattern]	ML	FILL: Sandy SILT, dark brown, sand, fine to medium grained	D	Fr	HP	210	FILL/TOPSOIL
		0.70m				U50	CH	Sandy Silty CLAY: Medium to high plasticity, pale red with brown/red mottling, traces of rock fabric	M < w _p		Fr / VSt	HP
			15.0	1.5	[X-pattern]		Hole Terminated at 1.50 m					
			14.5	2.0								
			14.0	2.5								

RG 2.00.3.LIB.GLB.Log_RG.NON-CORED.BOREHOLE - TEST.PIT_RGS21087.1.BH210.SERIES.LOCS.GPJ <<DrawingFiles>> 30/1/2024 11:08 10.03.00.08 D:\rgi Lab and in Situ Tool - DGD Lib, RG 2.00.3.2022-03-03.Pjt.RG 2.00.0.202-06-30

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



ENGINEERING LOG - BOREHOLE

BOREHOLE NO: **BH211**

CLIENT: Land Dynamics Australia
PROJECT NAME: Stage 1, The Sanctuary
SITE LOCATION: John Oxley Drive, Port Macquarie
TEST LOCATION: Lot 122/123

PAGE: 1 of 1
JOB NO: RGS21087.1
LOGGED BY: GC
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		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		16.0	0.15m		ML	FILL: Sandy SILT, dark brown, traces of gravel, fine to medium grained	D	Fr	HP	250	FILL/TOPSOIL
						CI	Silty CLAY: Medium plasticity, pale red/pale grey, traces of rock fabric	M < WP	Fr / VSt			EXTREMELY WEATHERED SLATE
							SLATE: Pale orange/pale brown, inferred very low to low strength, recovered as Sandy SILT					HIGHLY TO MODERATELY WEATHERED SLATE
			1.50m				Hole Terminated at 1.50 m					

RG 2.00.3.LIB.GLB.Log_RG.NON-CORED.BOREHOLE - TEST.PIT_RGS21087.1.BH200.SERIES.LOCS.GPJ <DrawingFiles> 30/1/2024 11:05 10.03.00.09 D:\rgi Lab and in Situ Tool - DGD Lib - RGS 2.00.3 2022-03-03.Pjt.RG 2.00.0 2021-06-30

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



ENGINEERING LOG - BOREHOLE

BOREHOLE NO: **BH212**

CLIENT: Land Dynamics Australia
PROJECT NAME: Stage 1, The Sanctuary
SITE LOCATION: John Oxley Drive, Port Macquarie
TEST LOCATION: Lot 124/125

PAGE: 1 of 1
JOB NO: RGS21087.1
LOGGED BY: GC
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		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		15.5	0.5		ML	FILL: Sandy SILT, pale brown	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							HP	300	
			14.5							HP	300	
			1.5				Hole Terminated at 1.50 m					
			14.0									
			2.0									
			13.5									
			2.5									
			13.0									

RG 2.00.3.LIB.GLB.Log_RG.NON-CORED.BOREHOLE - TEST PIT_RGS21087.1.BH200.SERIES.LOCS.GPJ <DrawingFiles> 30/12/2024 11:08 10.03.00.08 D:\rgi Lab and in Situ Tool - DGD.LIB.RG 2.00.3.2022-03-03.Pjt.RG 2.00.0.202-06-30

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



ENGINEERING LOG - BOREHOLE

BOREHOLE NO: BH213

CLIENT: Land Dynamics Australia
PROJECT NAME: Stage 1, The Sanctuary
SITE LOCATION: John Oxley Drive, Port Macquarie
TEST LOCATION: Lot 126/127

PAGE: 1 of 1
JOB NO: RGS21087.1
LOGGED BY: GC
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		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		15.5	0.5		CL	FILL: Sandy CLAY, low plasticity, dark brown	M < WP	Fr	HP	450	FILL/TOPSOIL
						CH	Sandy CLAY: Medium to high plasticity, red, sand, fine to medium grained				Fr / H	450
			15.0	1.0						HP	470	
			14.5	1.5			Hole Terminated at 1.50 m			HP	450	
			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 distinct strata change

Notes, Samples and Tests

U₅₀ 50mm Diameter tube sample
 CBR Bulk sample for CBR testing
 E Environmental sample
 ASS Acid Sulfate Soil Sample
 B Bulk Sample

Field Tests

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

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

RGS 2.00.3.LIB.GLB.Log_RGNON-CORED BOREHOLE - TEST PIT_RGS21087.1_BH200 SERIES LOGS.GPJ <<DrawingFiles>> 30/12/2024 11:08 10.03.00.08 D:\rgs\Lab and in Situ Tool - DGD\Lib_RG 2.00.3 2022-03-03 Pjt:RG 2.00.0 202-06-30



ENGINEERING LOG - BOREHOLE

BOREHOLE NO: BH214

CLIENT: Land Dynamics Australia
PROJECT NAME: Stage 1, The Sanctuary
SITE LOCATION: John Oxley Drive, Port Macquarie
TEST LOCATION: Lot 128/129

PAGE: 1 of 1
JOB NO: RGS21087.1
LOGGED BY: GC
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		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	U50	16.5	0.30m	[Graphic Log]	CL	FILL: Sandy CLAY, low plasticity, dark brown	M < WP	Fr	HP	300	FILL/TOPSOIL
						CH	Sandy CLAY: Medium to high plasticity, yellow/pale brown, sand, fine to medium grained, traces of rock fabric					Fr / VSt
			16.0	0.70m						HP	230	
			15.5									
			15.0				Hole Terminated at 1.50 m					
			14.5									
			14.0									

RG 2.00.3.LIB.GLB.Log_RG_NON-CORED BOREHOLE - TEST PIT_RGS21087.1_BH200 SERIES.LOGS.GPJ <DrawingFiles> 30/1/2024 11:08 10.03.00.09 D:\rgi Lab and in Situ Tool - DGD.LIB.RG 2.00.3.2022-03-03.Pjt.RG 2.00.0.202-06-30

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



ENGINEERING LOG - BOREHOLE

BOREHOLE NO: 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		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		16.5	0.5		ML	FILL: Sandy SILT, dark brown, traces of gravel, fine grained, subangular	D	Fr			FILL/TOPSOIL
						CH	Sandy CLAY: Medium plasticity, pale brown/yellow, traces of rock fabric	M < Wp	Fr / VSt	HP	210	EXTREMELY WEATHERED DOLERITE
			16.0							HP	200	
			15.5							HP	220	
			1.5				Hole Terminated at 1.50 m					
			15.0									
			2.0									
			14.5									
			2.5									
			14.0									

RG 2.00.3.LIB.GLB.Log_RGNON-CORED BOREHOLE - TEST PIT_RGS21087.1_BH200 SERIES.LOGS.GPJ <<DrawingFiles>> 30/1/2024 11:05 10.03.00.09 D:\rgi Lab and in Situ Tool - DGD Lib_RG 2.00.3 2022-03-03 Pjt:RG 2.00.0 2021-06-30

LEGEND:

Water

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

Strata Changes

- Gradational or transitional strata
- Definitive or distinct strata change

Notes, Samples and Tests

- U₅₀ 50mm Diameter tube sample
- CBR Bulk sample for CBR testing
- E Environmental sample
- ASS Acid Sulfate Soil Sample
- B Bulk Sample

Field Tests

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

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



ENGINEERING LOG - BOREHOLE

BOREHOLE NO: **BH216**

CLIENT: Land Dynamics Australia
PROJECT NAME: Stage 1, The Sanctuary
SITE LOCATION: John Oxley Drive, Port Macquarie
TEST LOCATION: Lot 132/133

PAGE: 1 of 1
JOB NO: RGS21087.1
LOGGED BY: GC
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		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		17.0	0.20m		ML	FILL: Sandy SILT, dark brown, traces of gravel, fine grained, subangular	D	Fr			FILL/TOPSOIL
			16.5	0.5			SLATE: Yellow/pale grey, very low to low strength, recovered as Sandy SILT					HIGHLY TO MODERATELY WEATHERED SLATE
			16.0	1.0								
			15.5	1.50m			Hole Terminated at 1.50 m					
			15.0	2.0								
			14.5	2.5								

RG 2.00.3.LIB.GLB.Log_RG_NON-CORED BOREHOLE - TEST PIT_RGS21087.1_BH200 SERIES LOGS.GPJ <DrawingFiles> 30/12/2024 11:08 10.03.00.09 D:\rgi Lab and in Situ Tool - DGD Lib_RG 2.00.3 2022-03-03 Pjt:RG 2.00.0 2021-06-30

LEGEND:

Water

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

Strata Changes

- Gradational or transitional strata
- Definitive or distinct strata change

Notes, Samples and Tests

- U₅₀ 50mm Diameter tube sample
- CBR Bulk sample for CBR testing
- E Environmental sample
- ASS Acid Sulfate Soil Sample
- B Bulk Sample

Field Tests

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

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



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 EASTING: 485464 m SURFACE RL: 13.8 m
BOREHOLE DIAMETER: 120 mm INCLINATION: 90° NORTHING: 6519664 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		13.5	0.5		ML	FILL: Sandy SILT, dark brown, traces of gravel, fine to medium grained, subangular	D	Fr	HP	220	FILL/TOPSOIL
						CI	FILL: Sandy Silty CLAY, medium plasticity, pale red/pale grey, some gravel, fine to medium grained, subangular	M < WP	Fr / VSt			FILL-CLAY
			13.0							HP	250	
			12.5							HP	230	
			1.5				Hole Terminated at 1.50 m					
			12.0									
			2.0									
			11.5									
			2.5									
			11.0									

RG 2.00.3.LIB.GLB.Log_RG_NON-CORED BOREHOLE - TEST PIT_RGS21087.1_BH200 SERIES LOGS.GPJ <DrawingFiles> 30/12/2024 11:08 10.03.00.08 D:\rgi Lab and in Situ Tool - DGD Lib_RG 2.00.3 2022-03-03 Pjt_RG 2.00.0 2021-06-30

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



ENGINEERING LOG - BOREHOLE

BOREHOLE NO: **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 EASTING: 485494 m SURFACE RL: 11.5 m
 BOREHOLE DIAMETER: 120 mm INCLINATION: 90° NORTHING: 6519666 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		11.0	0.5		ML	FILL: Sandy SILT, dark brown, traces of gravel, fine to medium grained, subrounded	D	Fr	HP	350	FILL/TOPSOIL	
						CI	FILL: Silty CLAY, low to medium plasticity, pale grey/white with red mottling	M < Wp	Fr / VSt			FILL-CLAY	
							SLATE: Pale grey/pale red, inferred very low to low strength, recovered as Sandy SILT					HIGHLY WEATHERED SLATE	
			10.0	1.5			Hole Terminated at 1.50 m						
			9.5	2.0									
			9.0	2.5									

RGS 2.00.3.LIB.GLB.Log_RG.NON-CORED.BOREHOLE - TEST.PIT_RGS21087.1.BH200.SERIES.LOCS.GPJ <DrawingFiles> 30/12/2024 11:08 10.03.00.08 D:\rgi Lab and in Situ Tool - DGD.LIB.RG 2.00.3.2022-03-03.Pjt.RG 2.00.0.202-06-30

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



ENGINEERING LOG - BOREHOLE

BOREHOLE NO: **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 EASTING: 485454 m SURFACE RL: 12.5 m
BOREHOLE DIAMETER: 120 mm INCLINATION: 90° NORTHING: 6519704 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		12.0	0.5		ML	FILL: Sandy SILT, dark brown, traces of gravel, fine to medium grained, subangular, sand, fine to medium grained	D	Fr			FILL/TOPSOIL
						CI	Sandy CLAY: Medium plasticity, red, sand, fine to medium grained	M < Wp	Fr / VSt			RESIDUAL
			11.5	1.0			Some pale brown mottling			HP	390	
			11.0	1.5			Hole Terminated at 1.50 m			HP	380	
			10.5	2.0						HP	250	
			10.0	2.5								

RG 2.00.3.LIB.GLB.Log_RG_NON-CORED BOREHOLE - TEST PIT_RGS21087.1_BH200 SERIES LOGS.GPJ <DrawingFiles> 30/12/2024 11:08 10.03.00.08 D:\rgi Lab and in Situ Tool - DGD Lib_RG 2.00.3 2022-03-03 Pjt:RG 2.00.0 2021-06-30

LEGEND:

Water

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

Strata Changes

- Gradational or transitional strata
- Definitive or distinct strata change

Notes, Samples and Tests

- U₅₀ 50mm Diameter tube sample
- CBR Bulk sample for CBR testing
- E Environmental sample
- ASS Acid Sulfate Soil Sample
- B Bulk Sample

Field Tests

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

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



Appendix B

Laboratory Test Result Sheets

Material Test Report

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



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

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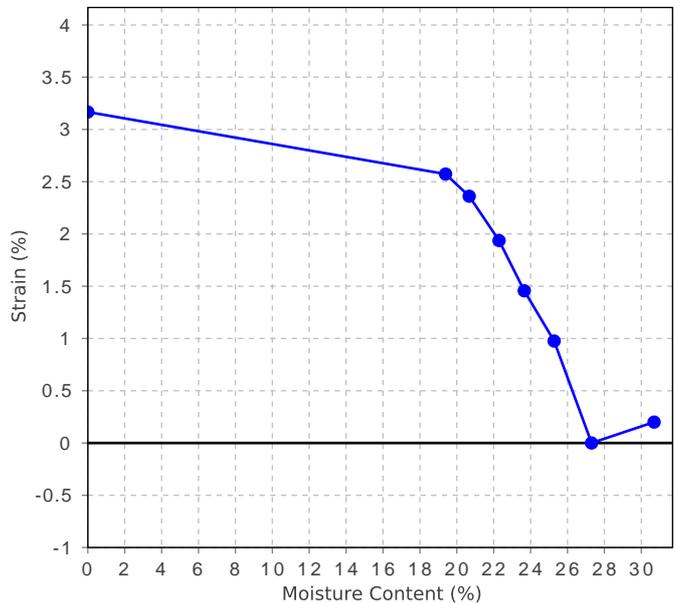


Approved Signatory: Brent Cullen
 Engineering Geologist
 NATA Accredited Laboratory Number: 18686

B. Cullen

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.	

Shrink Swell



Material Test Report

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



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Approved Signatory: Brent Cullen

Engineering Geologist

NATA Accredited Laboratory Number: 18686

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

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



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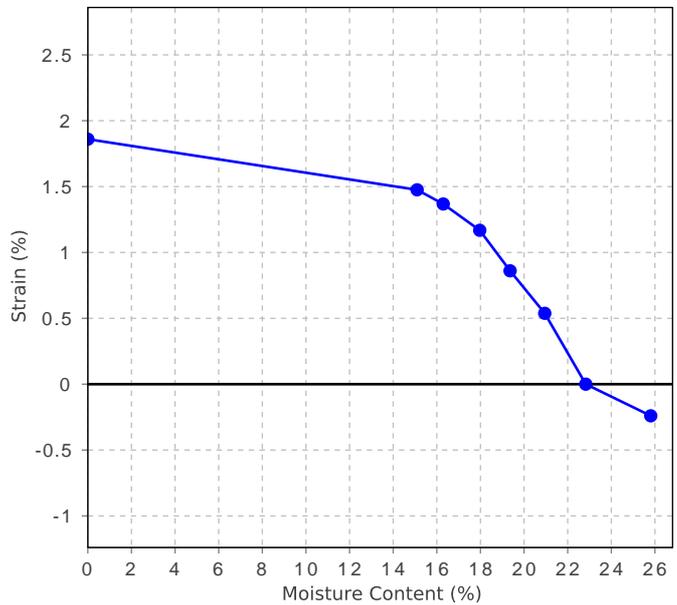
Approved Signatory: Brent Cullen

Engineering Geologist

NATA Accredited Laboratory Number: 18686

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.	

Shrink Swell



Material Test Report

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



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Approved Signatory: Brent Cullen

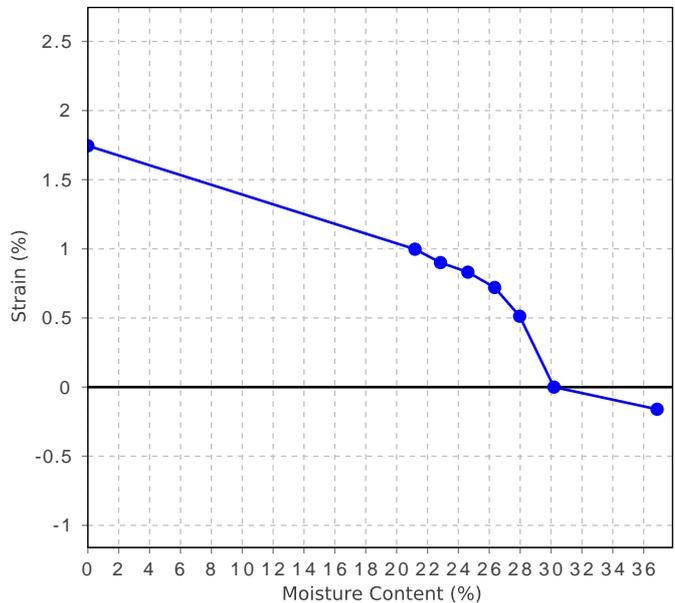
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NATA Accredited Laboratory Number: 18686

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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.	

Shrink Swell



Material Test Report

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



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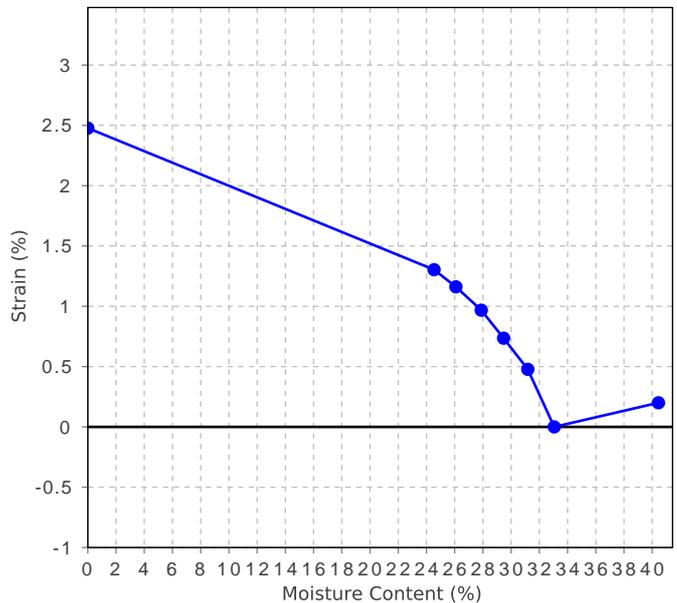


Approved Signatory: Brent Cullen
 Engineering Geologist
 NATA Accredited Laboratory Number: 18686

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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.	

Shrink Swell



Material Test Report



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

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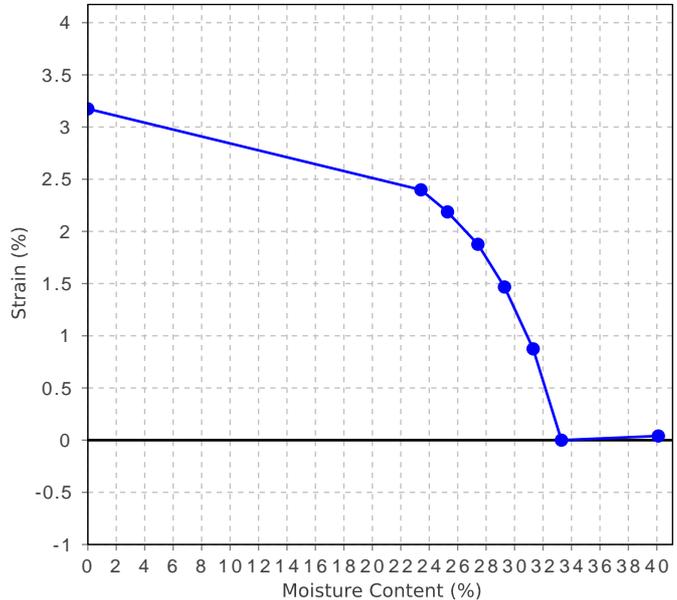
Approved Signatory: Brent Cullen

Engineering Geologist

NATA Accredited Laboratory Number: 18686

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.	

Shrink Swell



Material Test Report



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

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 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



B. Cullen

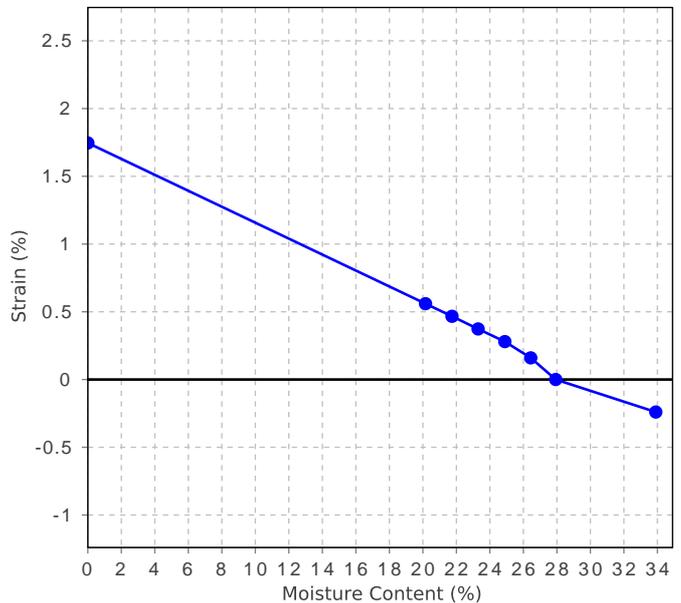
Approved Signatory: Brent Cullen

Engineering Geologist

NATA Accredited Laboratory Number: 18686

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.	

Shrink Swell



Material Test Report

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



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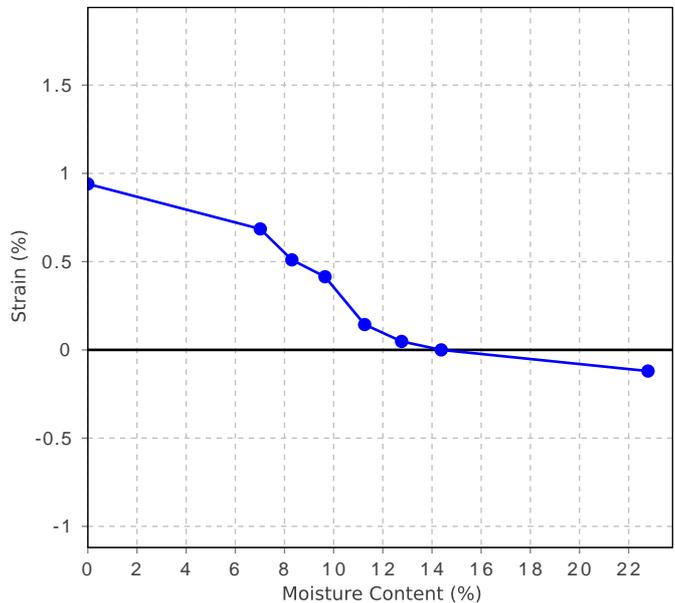
Approved Signatory: Brent Cullen

Engineering Geologist

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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.	

Shrink Swell



Material Test Report

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



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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		