# **Land Dynamics Australia**

## **Geotechnical Site Classification**

# **Proposed Residential Subdivision**

Stage 3, The Sanctuary, 344 John Oxley Drive, Thrumster

Report No. RGS21087-AS

26 September 2024





Manning-Great Lakes
Port Macquarie
Coffs Harbour

RGS21087-AS

26 September 2024

Land Dynamics Australia 77 Lord Street PORT MACQUARIE NSW 2444

Attention: Jodie Chapman

Dear Jodie,

RE: Proposed Residential Subdivision – Stage 3, 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 3 of The Sanctuary Estate, 344 John Oxley Drive (Lot 200 DP 1306921) Thrumster.

Stage 3 comprises Lots 301 - 332 as shown on the supplied plan titled "Plan of Subdivision of Lot 200 DP 1306921".

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

Reviewed by

**Chris Oviawe** 

**Grant Colliar** 

Geotechnical Engineer

Senior Engineering Geologist



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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 3 of The Sanctuary Estate, 344 John Oxley Drive (Lot 200 DP 1306921) Thrumster.

Stage 3 comprises Lots 301 – 332 as shown on the supplied plan titled "Plan of Subdivision of Lot 200 DP 1306921".

Some of the lots have been modified by site regrading works and placing up to approximately 2.5m of clay fill. Filling works were undertaken by Kazac Civil Pty Ltd, with Level One Inspection and Testing of the works undertaken by Douglas Partners Pty Ltd. A copy of the Level One reports have been provided to RGS.

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

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

## 2 METHODOLOGY

Field work for the assessment was undertaken on 21 August 2024 and was based on the supplied drawing titled "Plan of Subdivision of Lot 200 DP 1306921". 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:
- 16 boreholes undertaken by a 4WD mounted drilling rig to depths of between 1.5m and
   2.5m, logged and sampled by an Engineering Geologist; and
- Collection of U50 tube samples collected from soil horizons considered representative of cohesive soil profiles. Laboratory shrink-swell testing was undertaken on eight samples by a NATA-accredited laboratory.

## 3 SITE CONDITIONS

## 3.1 Surface Conditions

Stage 3 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 facing upper to lower slopes of a low hill. Surface elevations across the site range from approximately 15m AHD on the upper slopes to approximately 10m AHD along the northern boundary.

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





Satellite image dated 2024 obtained from Google Earth that illustrates the site location and setting.

The approximate site boundaries of Stage 3 are outlined in red.

Surface slopes have been modified by cut and fill and range from approximately  $2^{\circ}$  –  $8^{\circ}$ . Some lots have been terraced and are separated by concrete block retaining walls that are up to 2m high.

Lots 310 – 312, 314, and 321 -332 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 Certifications and Reports, by Douglas - Project 209310, dated 10 November 2022 and Project 209310 dated 10 November 2022. The approximate extent of the fill areas is shown in Figures 1.

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

#### 3.2 Subsurface Conditions

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

The materials encountered during the investigation are summarised in Tables 1 and 2. Further details are presented in the engineering logs in Appendix A.



**Table 1: Summary of Geotechnical Units** 

Unit	Material	Material Description
UNIT 1A	TOPSOIL/FILL	Sandy Gravelly CLAY, medium plasticity, grey, brown
UNIT 1B	FILL – CLAY (CONTROLLED)	Sandy CLAY to Sandy Gravelly CLAY to Silty Sandy CLAY, low to high plasticity, red, brown, pale brown
UNIT 2A	residual a	Sandy CLAY, medium to high plasticity, red/brown/orange, very stiff to hard
UNIT 2B	RESIDUAL B	Sandy CLAY, medium to high plasticity, pale brown/yellow, stiff to very stiff
UNIT 3A	EW SLATE	Extremely Weathered SLATE, recovered as Sandy CLAY to Sandy Gravelly CLAY, medium to high plasticity, brown/yellow/pale brown, very stiff, trace rock fabric
UNIT 3B	EW DOLERITE	Extremely Weathered DOLERITE, recovered as Sandy CLAY to Silty Gravelly CLAY, medium to high plasticity, yellow/pale brown, very stiff, trace rock fabric

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

вн	Lot	Unit 1A – Fill/Topsoil	Unit 1B - Controlled Fill	Unit 2A – Residual A	Unit 2B – Residual B	Unit 3A – EW Slate	Unit 3B – EW Dolerite
BH401	301/302	0.15			1.5		≥2
BH402	303/304	0.2					≥2
BH403	305/306	0.25					≥1.5
BH404	307/308	0.15	0.25				≥2
BH405	316/317	0.2		≥2			
BH406	314/315	0.2		1.2		≥2.2	
BH407	312/313	0.25	0.95			≥1.5	
BH408	310/311	0.2		≥2			
BH409	319	0.2		≥1.5			
BH410	320	0.2	0.4		1.0		≥1.5
BH411	321/322	0.2	1.5	≥2.0			
BH412	323/324	0.2	1.4	2.1		≥2.5	
BH413	325/326	0.2		≥1.5			
BH414	327/328	0.2		≥1.5			
BH415	329/330	0.25	0.8	1.7		≥2.5	
BH416	331/332	0.25	1.3				≥1.7

Note: ≥ Indicates that base of material layer was not encountered

-- Indicates that the material was not encountered at the test location



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

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

Table 3: Laboratory Testing Summary

Location	Depth (m)	Lot	Material	Shrink Swell Index (%)
BH401	0.5 – 1	301/302	Unit 2B - Residual CLAY	0.8
BH403	0.5 – 0.8	305/306	Unit 3B - EW Dolerite	1.3
BH405	0.5 – 1	316/317	Unit 2A - Residual CLAY	2
BH407	0.3 – 0.7	312/313	Unit 1B - Fill CLAY	2.8
BH409	0.5 – 1	319	Unit 2A - Residual CLAY	2.1
BH410	0.5 – 0.9	320	Unit 2B - Residual CLAY	4.8
BH411	0.4 - 0.8	321/322	Unit 1B - Fill CLAY	3.5
BH414	0.4 - 0.8	327/328	Unit 2A - Residual CLAY	1.2

## 4 SITE CLASSIFICATION

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

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

- All clay fill of > 0.4m thickness was placed under Level 1 Inspection and Testing as defined in AS3798-2007, and can therefore be considered as Controlled Fill with respect to AS2870-2011;
- Where there was cut undertaken the depth of cracked zone was reduced by the depth of cut;
- Suction change at ground surface of pf 1.2;
- Depth of suction change of 1.5m;
- Crack depth multiplication factor of 0.5;
- Characteristic Iss for Controlled clay fill of between 2.8 and 3.5%, based on a combination of previous experience in the area and the laboratory test results;
- Characteristic Iss for red residual clay of between 1.2 and 2.1%, based on a combination of previous experience in the area and the laboratory test results;
- Characteristic Iss for yellow residual clay of between 0.8 and 4.8%, based on a combination of previous experience in the area and the laboratory test results;
- Characteristic Iss for extremely weathered dolerite of 1.3%, based on a combination of previous experience in the area and the laboratory test result;



- Adopted characteristic Iss for extremely weathered slate of 2%, based on previous experience in the area;
- The existing retaining walls that are located between some of the lots have either been designed to support residential footing loads behind the walls, or the structures are setback a distance of at least the height of the wall from the retaining wall; and
- Trees of up to 25m height are present within approximately 20m of Lot No's 301, 302 and 310.

Potential surface movements for proposed building areas that are located within the influence distance of group of trees must take into account the potential drying effects of trees and be calculated in accordance with the methodology outlined in AS2870-2011 (Appendix H). Actual building areas within the lots and the distance between the proposed dwelling footprints and existing large trees are not yet known, so calculations were made based on the parameters outlined below:

- Distance of trees (Dt) to the potential building areas in Lot No's 301, 302 and 310 is approximately 20m;
- Typical tree height is (HT) 15m and,  $D_i = 1.0 \times HT = 25m$ ;
- Maximum design drying depth for Port Macquarie ( $H_t$ ) = 3.0m where a group of trees is present within the influence distance; and
- Maximum extra suction change of pf =0.38 where a group of trees is present within the influence distance.

The proposed building areas for Lots 310 – 312, 314, and 321 -332 have been modified by the placement of controlled fill to depths of greater than 0.4m and are therefore classified as Class P in accordance with AS2870-2011, Clause 2.5.3(a). In accordance with Section 2.5.3(c), the above mentioned lots have been reclassified in accordance with engineering principles.

The reclassified site classifications and expected shrink-swell related characteristic free surface movements  $(y_s)$  estimated, including tree effects  $(y_t)$ , for the profiles encountered during the field investigation in the building areas in each lot are summarised in Table 4.

 Lots
 Site Re-classification
 Characteristic Surface Movement, ys (mm)

 303, 304, 305, 306, 307, 308, 309, 315, 316, 317, 318, 319
 Class M
 30 – 40mm

 301, 302, 310, 311, 312, 313, 314, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332
 Class H1
 40 - 60mm

Table 4: Site Classification Summary

## 5 CONSTRUCTION AND SITE MAINTENANCE CONSIDERATIONS

All structural footings should be founded as follows:

- All footings should be founded in Controlled Fill or natural soils below all topsoil, uncontrolled fill materials and disturbed soil;
- Footings can be designed based on a maximum allowable base bearing pressure of 100kPa for footings founded within the Controlled Fill, residual clay or extremely weathered rock of at least very stiff strength.



- All footings, edge beams and internal beams should be entirely founded on similar material
  and outside or below the zones of influence resulting from existing or future service trenches,
  retaining walls, downslope batters, and other subsurface structures;
- The engineering design for the retaining walls present allows for any surcharge affecting the
  walls such as footing loads (where the structures are located closer than the height of the
  wall from the structure), structures or sloping surfaces;
- The soils in the Port Macquarie area are prone to fretting and softening on exposure to air
  and water. It is therefore recommended that concrete be poured as soon as possible after
  footing excavation. In the event that wet weather occurs prior to pouring of concrete, the
  base of footing excavations should be checked for the presence of loose or softened
  material, which should be removed prior to pouring concrete; and
- Prior to the placement of concrete we recommend that footings be observed and assessed by a suitably experienced geotechnical engineer to assess that the correct founding material has been achieved.

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

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

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

## 6 LIMITATIONS

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

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

The recommended depth and properties of any soil, rock, groundwater, or other material referred to in this report is an engineering estimate based on the information available at the time of its writing. The estimate is influenced and limited by the fieldwork method and testing carried out in the site investigation, and other relevant information as has been made available. In cases where information has been provided to Regional Geotechnical Solutions for the purposes of preparing



this report it has been assumed that the information is accurate and appropriate for such use. No responsibility is accepted by Regional Geotechnical Solutions for inaccuracies within any data supplied by others.

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

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

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

For and on behalf of Regional Geotechnical Solutions Pty Ltd

Prepared by

Reviewed by

**Chris Oviawe** 

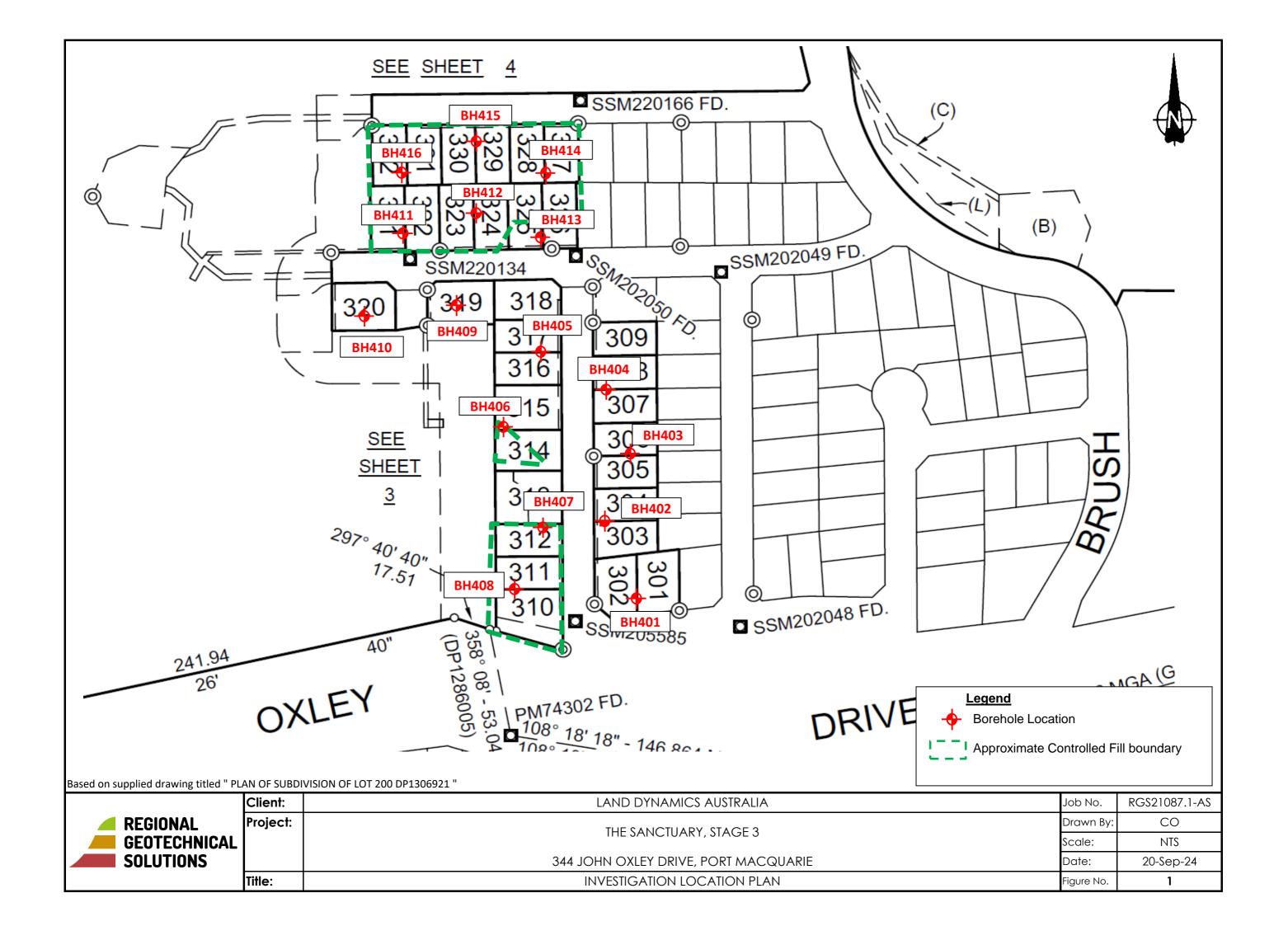
Geotechnical Engineer

**Grant Colliar** 

Senior Engineering Geologist



# **Figures**





# Appendix A Results of Field Investigations



CLIENT:

Land Dynamics Australia

PROJECT NAME: The Sanctuary Stage 3

SITE LOCATION: John Oxley Drive, Port Macquarie LOGGED BY:

**TEST LOCATION:** Lot 301/302 **DATE:** 26/8/24

BOREHOLE NO: BH401

1 of 1

НМ

RGS21087.1

PAGE:

JOB NO:

**DRILL TYPE**: 4x4 Mounted Rig **EASTING**: 485311 m **SURFACE RL**:

		YPE: OLE DIAN		ounted F 50 mi		IN	EASTING: CLINATION: 90° NORTHING	485311 : 6519681		SURF. DATU		RL:	AHD
	Dril	ing and Sar	npling				Material description and profile information				Field	d Test	
METHOD	WATER	SAMPLES	RL (Not measured)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION: Soil type, plastic characteristics,colour,minor compone		MOISTURE	CONSISTENCY DENSITY	Test Type	Result	Structure and additional observations
AD/T	Encountered			-		CI	Sandy Gravelly CLAY: Medium plasticity brown, sand, brown, fint to coarse grained brown, fine to medium grained, subangua	l, gravel,	× ×	F			TOPSOIL FILL
	Not Encou			0. <u>2</u>		СН	subrounded.  Sandy CLAY: Medium to high plasticity, y brown, sand, brown, fine to medium grain of gravel, fine to medium grained, subang	ed, traces	-	VSt	HP	350	RESIDUAL
	-			0.4			subrounded.	ulai to			HP	360	
		0.50m		-			0.50m				HP	360	
		0.00111		0.6		СН	Sandy CLAY: Medium to high plasticity, y mottled red, brown, sand, brown, fine to n				HP	350	
				-			grained.				HP	320	
		U50		0.8							ויור	330	
0 2021-06-3				-									
10.03.00.09 Datgel Lab and in Stu Tool - DGD   Lib. RG 2.00.3 2022-03-03 Prj; RG 2.00.0 20 21-05-30		1.00m		1.0									
2022-03-03				-									
: RG 2.00.3				1.2							HP	300	
- DGD   Lib:				-							HP	360	
In Situ Tool				1. <u>4</u>							HP	330	
tgel Lab and				1.6		CL	Sandy CLAY: Medium to high plasticity, y brown, sand, fine to medium grained, trac	ellow es of rock					EXTREMELY WEATHERED DOLERITE
03.00.09 Da							fabric.						
13:46				1. <u>8</u>									
>> 26/9/2024				-									
< <drawingfile>&gt;</drawingfile>				2.0			2.00m						
GS.GPJ <<				-			Hole Terminated at 2.00 m						
SERIES LO				2.2									
87.1 BH 400				-									
TEST PIT RGS21087.1 BH 400 SERIES LOGS.GPJ				2.4									
LE: LEST Ma	GEND:		<u> </u>	Notes, Sa	mples a	nd Test	<u>s</u>	Consiste VS V	ncy ery Soft			 <b>CS (kPa</b> 25	Moisture Condition D Dry
D BOREHO	. Wat	er Level te and time s	hown)	U₅o CBR	Bulk s	ample f	er tube sample or CBR testing	S S	oft irm		25 50	5 - 50 0 - 100	M Moist W Wet
NON-CORE	- Wat	er Inflow er Outflow	1	E ASS B	Acid S		l sample oil Sample	VSt V	tiff ery Stiff ard		20	)0 - 200 )0 - 400 100	P
Str Str		radational or	1 7	Field Test	ts_		n detector reading (		riable V		ery Lo	oose	Density Index <15%
2.00.3 LIB.GLB Log RG NON-CORED BOREHOLE -	D	ansitional stra efinitive or di rata change		PID DCP(x-y) HP	Dynan	nic pene	n detector reading (ppm) trometer test (test depth interval shown) meter test (UCS kPa)		L ME D	) N D	ense	n Dense	Density Index 65 - 85%
8									VD	V	ery De	ense	Density Index 85 - 100%



Land Dynamics Australia

**PROJECT NAME:** The Sanctuary Stage 3

SITE LOCATION: John Oxley Drive, Port Macquarie

**TEST LOCATION:** Lot 303/304

CLIENT:

BOREHOLE NO: BH402

1 of 1

26/8/24

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RGS21087.1

PAGE:

DATE:

JOB NO:

LOGGED BY:

			YPE: OLE DIAN		ounted F 50 mi	-	IN	EASTING: CLINATION: 90° NORTHING:	485301 6519723		SURF		RL:	AHD
		Drilli	ing and Sar	npling				Material description and profile information				Field	d Test	
i i	METHOD	WATER	SAMPLES	RL (Not measured)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION: Soil type, plasticity characteristics,colour,minor component		MOISTURE	CONSISTENCY DENSITY	Test Type	Result	Structure and additional observations
RG 2003 LB.GLB. Log RG NON-CORED BORRHOLE - TEST PIT RGSZ1087 1 BH 400 SERIES LOGS.GPJ <	AD/T	Not Encountered			0.2 0.4 0.6 0.6 0.8 1.0 1.2 1.4 1.6 1.8 2.0		CH CH	Sandy Gravelly CLAY: Medium plasticity, prown, sand, fine to coarse grained, gravel medium grained, subabgular to subrounder sandtled orange brown, sand, fine to coarse traces of gravel, fine to medium grained, sut to subrounded.  2.00m  Hole Terminated at 2.00 m	, fine to d. lle brown, grained,	M < W <sub>P</sub>	H	НР НР		EXTREMELY WEATHERED DOLERITE
RG NON-CORED BOREHOLE - 1EST	Wate	Wate (Dat Wate Wate	er Level e and time s er Inflow er Outflow enges	hown)	U <sub>50</sub> CBR E ASS B	50mm Bulk s Enviro	Diame ample f nmenta sulfate S	<u>s</u> ter tube sample or CBR testing I sample ioil Sample	S S F F St S VSt V H H	ncy /ery Soft foft firm tiff /ery Stiff lard riable		25 50 10 20	CS (kPa 25 5 - 50 0 - 100 00 - 200 00 - 400 400	) Moisture Condition  D Dry  M Moist  W Wet  W <sub>p</sub> Plastic Limit  W <sub>L</sub> Liquid Limit
RG 2:00.3 LIB.GLB Log		Gr tra – De	radational or ansitional stra efinitive or dis rata change	ata	Field Test PID DCP(x-y) HP	Photoi Dynan	nic pene	on detector reading (ppm) etrometer test (test depth interval shown) meter test (UCS kPa)	Density	V L MD D VD	Lo M D	ery Lo cose lediun ense ery De	n Dense	Density Index <15% Density Index 15 - 35% Density Index 35 - 65% Density Index 65 - 85% Density Index 85 - 100%



CLIENT:

Land Dynamics Australia

**PROJECT NAME:** The Sanctuary Stage 3 **JOB NO:** RGS21087.1

BOREHOLE NO: BH403

1 of 1

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LOGGED BY:

SITE LOCATION: John Oxley Drive, Port Macquarie

**TEST LOCATION:** Lot 305/306 **DATE:** 26/8/24

DRILL TYPE: 4x4 Mounted Rig EASTING: 485330 m SURFACE RL:

		YPE: OLE DIAN		ounted f 50 mi		IN		EASTING: NORTHING:	485330 6519759		SURF/ DATUI		RL:	AHD
	Drilli	ing and Sar	npling				Material description and profile	e information				Field	d Test	
МЕТНОD	WATER	SAMPLES	RL (Not measured)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION: So characteristics,colour,mi			MOISTURE CONDITION	CONSISTENCY DENSITY	Test Type	Result	Structure and additional observations
AD/T	Not Encountered			0.2		CI	Sandy Gravelly CLAY: Med sand, brown, fine to coarse of fine to medium grained, subs	grained, gravel, angular to subro	brown, ounded.	M < W <sub>p</sub>	Fr			TOPSOIL FILL
	z			0.4 - - - - 0.6		CH	Sandy CLAY: Medium to high brown, sand, fine to coarse (	gh plasticity, yell grained.	low		VSt	HP	250	EXTREMELY WEATHERED DOLERITE
				0.8 - - - - 1.0								HP	280	
				1.2 - - - - 1.4										
				- - 1. <u>6</u>			1.50m Hole Terminated at 1.50 m							
				- - 1. <u>8</u>										
				2. <u>0</u>										
				2.2 -										
				2. <u>4</u>										
Wate	Wate (Date Wate	er Level e and time si er Inflow er Outflow anges	hown)	U <sub>50</sub> CBR E ASS B	50mm Bulk s Enviro	Diame ample f nmenta	s er tube sample or CBR testing I sample oil Sample		S So F Fi St St VSt Ve H Ha	ery Soft oft rm		25 50 10 20	CS (kPa 25 5 - 50 0 - 100 00 - 200 00 - 400	D Dry M Moist W Wet W <sub>p</sub> Plastic Limit W <sub>L</sub> Liquid Limit
	Gr tra — De	radational or insitional stra efinitive or dis rata change	ata	PID PID DCP(x-y) HP	Photoi Dynan	nic pen	n detector reading (ppm) strometer test (test depth interval show meter test (UCS kPa)	vn)	<u>Density</u>	V L MC D VD	Lo M De	ery Lo oose edium ense ery De	n Dense	Density Index <15% Density Index 15 - 35% Density Index 35 - 65% Density Index 65 - 85% Density Index 85 - 100%



4x4 Mounted Rig

DRILL TYPE:

**ENGINEERING LOG - BOREHOLE** 

CLIENT: Land Dynamics Australia

**PROJECT NAME:** The Sanctuary Stage 3 JOB NO:

SITE LOCATION: John Oxley Drive, Port Macquarie LOGGED BY: DATE:

**EASTING**:

485315 m

BOREHOLE NO: BH404

1 of 1

26/8/24

НМ

RGS21087.1

PAGE:

SURFACE RL:

TEST LOCATION: Lot 307/308

во	REH	OLE DIAN	4x4 Mo IETER:	50 mi	m	IN	EASTING: CLINATION: 90° NORTHING:	485315 6519808		DATU	ACE M:		AHD
	Drilli	ng and San	npling				Material description and profile information				Field	d Test	
METHOD	WATER	SAMPLES	RL (Not measured)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION: Soil type, plasticit characteristics,colour,minor componen		MOISTURE CONDITION	CONSISTENCY DENSITY	Test Type	Result	Structure and additional observations
AD/T	Not Encountered			-		CI	Sandy Gravelly CLAY: Medium plasticity, sand, fine to medium grained, gravel, fine t grained, subangular to subrounded.		M < W <sub>P</sub>	Fr			TOPSOIL FILL
	Encol			0.2		CL	0.15m  Sandy CLAY: Low plasticity, redish brown, fine to coarse grained.	sand,		St		-	FILL CLAY
	ON .			0.4 0.6 0.8 1.0 1.2 1.4 1.6 - 1.8 - 2.0		СН	Sandy CLAY: Medium to high plasticity, ye brown, sand, fine to coarse grained, traces fabric.  2.00m  Hole Terminated at 2.00 m	llow of rock		St	£	190	EXTREMELY WEATHERED DOLERITE
LEG	END:			Notes, Sa	mples a	nd Teef	s	Consister	ncv		114	CS (kPa	) Moisture Condition
Wat	Wate (Date Wate Wate Mata Cha Tra	er Level e and time sl er Inflow er Outflow inges adational or insitional stra	hown)	U <sub>50</sub> CBR E ASS B Field Test PID DCP(x-y) HP	50mm Bulk s Enviro Acid S Bulk S Bulk S	Diamei ample fonmenta Sulfate S Sample ionisationic pene	ter tube sample or CBR testing al sample soil Sample on detector reading (ppm) etrometer test (test depth interval shown) meter test (UCS kPa)	VS VI S SI F Fi St Si VSt VI H H	ery Soft oft irm tiff ery Stiff ard riable V L MC	Vi Lo	25 50 10 20 >4 ery Lo	25 5 - 50 0 - 100 00 - 200 00 - 400	D Dry M Moist W Wet W <sub>p</sub> Plastic Limit W <sub>L</sub> Liquid Limit  Density Index <15% Density Index 15 - 35%



CLIENT:

Land Dynamics Australia

**PROJECT NAME:** The Sanctuary Stage 3 **JOB NO:** RGS21087.1

BOREHOLE NO: BH405

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PAGE:

SITE LOCATION:John Oxley Drive, Port MacquarieLOGGED BY:HMTEST LOCATION:Lot 316/317DATE:26/8/24

DRILL TYPE: 4x4 Mounted Rig EASTING: 485296 m SURFACE RL:

		YPE: OLE DIAN		ounted I 50 m		IN	CLINATION: 90°	EASTING: NORTHING:	485296 6519829		SURF/ DATU		RL:	AHD
	Drill	ing and Sar	npling				Material description and pro	ofile information				Field	d Test	
METHOD	WATER	SAMPLES	RL (Not measured)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION: 9 characteristics,colour,			MOISTURE CONDITION	CONSISTENCY DENSITY	Test Type	Result	Structure and additional observations
AD/T	Not Encountered	0.50m U50		0.2 0.4 0.6 0.8 1.0 1.6 1.8 2.0		CH CH	Sandy Gravelly CLAY: M sand, fine to medium grain grained, subangular to sul 0.20m  Sandy CLAY: Medium to fine to medium grained.  Hole Terminated at 2.00 n	ned, gravel, fine to brounded.	medium	M < Wp	Fr H	HP HP	450 500 450	TOPSOIL FILL  RESIDUAL
Wate	Wat (Dat Wat Wat	er Level e and time si er Inflow er Outflow anges	hown)	2.2 2.4 2.4 Notes, Sa U <sub>50</sub> CBR E ASS B	mples ar 50mm Bulk s Enviro Acid S Bulk S	Diame ample f nmenta	ter tube sample or CBR testing Il sample soil Sample		S So F Fi St St VSt Ve H Ha	ery Soft oft rm	f	25 50 10 20	5 - 50 0 - 100 00 - 200 00 - 400 400	D Dry M Moist W Wet W <sub>p</sub> Plastic Limit
	tra — De	radational or ansitional stra efinitive or dis rata change	ata	PID DCP(x-y) HP	Photoi Dynan	nic pen	on detector reading (ppm) etrometer test (test depth interval sh meter test (UCS kPa)	own)	Density	V L ME D VE	Lo D M D	oose	n Dense	Density Index 15 - 35%



CLIENT:

Land Dynamics Australia

PROJECT NAME: The Sanctuary Stage 3 JOB NO:

SITE LOCATION:John Oxley Drive, Port MacquarieLOGGED BY:HMTEST LOCATION:Lot 314/315DATE:26/8/24

BOREHOLE NO: BH406

1 of 1

RGS21087.1

PAGE:

DRILL TYPE: 4x4 Mounted Rig EASTING: 485261 m SURFACE RL:

		YPE: OLE DIAN		ounted F	Rig	IN		TING: RTHING:	485261 6519786		SURF. DATU		RL:	AHD
<u> </u>	Drilli	ng and San	npling				Material description and profile info	rmation				Field	d Test	
МЕТНОБ	WATER	SAMPLES	RL (Not measured	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION: Soil type characteristics,colour,minor co			MOISTURE CONDITION	CONSISTENCY DENSITY	Test Type	Result	Structure and additional observations
EG te with the contract of the	Not Encountered			0.2		CH	Sandy Gravelly CLAY: Medium properties and, fine to medium grained, gragrained, subangular to subrounded substance.  Sandy CLAY: Medium to high platine to medium grained.  Sandy Gravelly CLAY: Medium to yellow brown, sand, fine to medium fine to medium grained, subangular fine to medium grained at 2.20 m  Hole Terminated at 2.20 m	o high plam grained	o medium d, sand,	M < Wp	Fr H	HP HP HP HP	430 - 420 400 320 - 300 290	RESIDUAL  EXTREMELY WEATHERED SLATE
LEGIE Water	Wate (Date Wate Wate a Cha	er Level e and time si er Inflow er Outflow inges adational or	hown)	U <sub>50</sub> CBR E ASS B Field Test	50mm Bulk sa Enviro Acid S Bulk S	Diame ample f nmenta ulfate S ample onisatio	ter tube sample or CBR testing il sample Soil Sample on detector reading (ppm)		S So F Fin St St VSt Ve H Ha	ery Soft oft off iff ery Stiff ard iable V L	· V Le	25 50 10 20 >2 ery Lo		D Dry M Moist W Wet W <sub>p</sub> Plastic Limit W Liquid Limit  Density Index <15% Density Index 15 - 35%
	_ De	efinitive or dis		DCP(x-y) HP			etrometer test (test depth interval shown) meter test (UCS kPa)			ME D VD	D	lediun ense ery De	n Dense ense	Density Index 35 - 65% Density Index 65 - 85% Density Index 85 - 100%



**CLIENT:** Land Dynamics Australia

**PROJECT NAME:** The Sanctuary Stage 3 **JOB NO:** RGS21087.1

BOREHOLE NO: BH407

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НМ

PAGE:

LOGGED BY:

SITE LOCATION: John Oxley Drive, Port Macquarie

**TEST LOCATION:** Lot 312/313 **DATE:** 26/8/24

DRILL TYPE: 4x4 Mounted Rig EASTING: 485272 m SURFACE RL:

- 1		.TYPE: HOLE DIAM		ounted F 50 mi	-	IN	EASTING: CLINATION: 90° NORTHING:	485272 6519733		SURF/ DATU		RL:	AHD
	D	rilling and Sa	mpling				Material description and profile information				Field	d Test	
METHOD	WATER	SAMPLES	RL (Not measured)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION: Soil type, plasticit characteristics,colour,minor componen		MOISTURE	CONSISTENCY DENSITY	Test Type	Result	Structure and additional observations
AD/T	Encount			0.2		CI	Sandy Gravelly CLAY: Medium plasticity, sand, fine to coarse grained, gravel, fine to grained, subangular to subrounded.	brown, medium	M < Wp	Fr			TOPSOIL FILL
	Not	0.30m	-	0.4		CH	Sandy Gravelly CLAY: Medium to high pla red, sand, fine to medium grained, gravel, t medium grained, subangular to subrounde	fine to		St	HP	190	FILL CLAY
		U50 0.70m	-	0. <u>6</u>									
.00.0 2021-06-30				0.8			0.95m				HP	200	
G 2.00,3 2022-03-03 Prj: RG 2.				1. <u>0</u> - - 1. <u>2</u>		CL	Sandy CLAY: Low plasticity, yellow brown, fine to coarse grained, traces of gravel, fine medium grained, subangular to subrounde	e to					EXTREMELY WEATHERED SLATE
and In Situ Tool - DGD   Lib: R				1. <u>4</u>			1.50m						
10.03.00.09 Datgel Lab				1.6 - -			Hole Terminated at 1.50 m						
wingFile>> 26/9/2024 13:46				1.8									
SERIES LOGS.GPJ < <drav.< th=""><td></td><td></td><td></td><td>2.2</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></drav.<>				2.2									
TPIT RGS21087.1 BH 400				2. <u>4</u>									
G NON-CORED BOREHOLE -	- (□ - W	D: /ater Level Date and time s /ater Inflow /ater Outflow Changes	shown)	Notes, Sa  U <sub>50</sub> CBR E ASS B	50mm Bulk s Enviro Acid S	Diame ample f	ter tube sample for CBR testing al sample Soil Sample	S S F F St S VSt V	ncy /ery Soft Soft Firm Stiff /ery Stiff lard Friable		25 50 10 20	CS (kPa) 25 5 - 50 0 - 100 00 - 200 00 - 400	Moisture Condition  D Dry  M Moist  W Wet  W <sub>p</sub> Plastic Limit  W <sub>L</sub> Liquid Limit
RG 2.00.3 LIB.GLB Log		Gradational or transitional str Definitive or d strata change	ata	Field Test PID DCP(x-y) HP	Photo Dynar	nic pen	on detector reading (ppm) etrometer test (test depth interval shown) ometer test (UCS kPa)	Density	V L MC D VD	Lo M D	ery Lo oose lediun ense ery De	n Dense	Density Index <15% Density Index 15 - 35% Density Index 35 - 65% Density Index 65 - 85% Density Index 85 - 100%



CLIENT: Land Dynamics Australia

**PROJECT NAME:** The Sanctuary Stage 3 JOB NO: RGS21087.1

BOREHOLE NO: BH408

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26/8/24

НМ

PAGE:

SITE LOCATION: John Oxley Drive, Port Macquarie LOGGED BY: DATE:

**TEST LOCATION:** Lot 310/311

DRILL TYPE: 4x4 Mounted Rig **EASTING**: 485247 m SURFACE RL:

		YPE: OLE DIAN		ounted f 50 mi		IN		EASTING: NORTHING:	485247 6519692		SURFA DATUI		RL:	AHD
	Drilli	ng and San	npling				Material description and profile	information				Field	d Test	
METHOD	WATER	SAMPLES	RL (Not measured	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION: Soil characteristics,colour,min			MOISTURE CONDITION	CONSISTENCY DENSITY	Test Type	Result	Structure and additional observations
AD/T	Not Encountered			0.2   0.4   0.6   0.8   1.0   1.2   1.4   1.6   1.8   2.0   2.2   2.4   2.4   1.6   2.4   2.4   2.4   2.4   2.5   2.4   2.5   2.4   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5   2.5		CL	Sandy Gravelly CLAY: Low fine to coarse grained, gravel grained, subangular to subrout coarse grained, trace of grave grained, subangular to subrout grained, subangular to subrout grained.  2.00m  Hole Terminated at 2.00 m	, fine to mediun unded. city, red, sand, fel, fine to mediu	fine to	$M < w_p$	Fr VSt	HP	350	RESIDUAL RESIDUAL
Wate	Wate (Date Wate Wate ta Cha	er Level e and time si er Inflow er Outflow inges adational or nsitional stra	hown)	U <sub>50</sub> CBR E ASS B Field Test	50mm Bulk s Enviro Acid S Bulk S	Diame ample f onmenta Sulfate S Sample	ser tube sample or CBR testing Il sample soil Sample		S So F Fir St Sti VSt Ve H Ha	ery Soft oft rm	Ve	25 50 10 20	5 - 50 0 - 100 00 - 200 00 - 400	D Dry M Moist W Wet W <sub>p</sub> Plastic Limit
	_ De	nsitional stra efinitive or dis ata change		DCP(x-y) HP	Dynan	nic pen	etrometer test (test depth interval shown meter test (UCS kPa)	1)		MD D VD	) M		n Dense ense	



CLIENT:

Land Dynamics Australia

**PROJECT NAME:** The Sanctuary Stage 3 JOB NO: RGS21087.1

BOREHOLE NO: BH409

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PAGE:

SITE LOCATION: John Oxley Drive, Port Macquarie LOGGED BY: НМ DATE: 26/8/24

TEST LOCATION: Lot 319

ı		YPE: OLE DIAN		ounted f	•	IN	EASTING: CLINATION: 90° NORTHING:	485248 6519829		SURF		RL:	AHD
	Drill	ing and Sar	npling				Material description and profile information				Field	d Test	
МЕТНОБ	WATER	SAMPLES	RL (Not measured)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION: Soil type, plasticit characteristics,colour,minor componen		MOISTURE	CONSISTENCY DENSITY	Test Type	Result	Structure and additional observations
AD/T	Not Encountered			-		CL	Sandy Gravelly CLAY: Low plasticity, brow fine to coarse grained, gravel, fine to media grained, subangular to subrounded.		M < W	Fr			TOPSOIL FILL
	Not Enc	0.30m		0. <u>2</u> - - - 0. <u>4</u> - -		CI	Sandy CLAY: Medium plasticity, red, sand coarse grained, gravel, fine to medium gra subangular to subrounded.			VSt	HP	350	RESIDUAL
		U50		0.6_ - - - 0.8_									
		1.00m		1.0 - - - 1.2							HP	300	
				1.4 - -			1.50m Hole Terminated at 1.50 m						
				1.6									
				2.0 - - - - 2.2									
LEG Wat				2. <u>4</u>									
	Water Level (Date and time shown)  ► Water Inflow  Water Outflow  B  CBR E E ASS AB BB  BB  BB			50mm Bulk s Enviro	Diame ample f nmenta ulfate S	<u>s</u> er tube sample or CBR testing I sample oil Sample	S S F F St S VSt V	/ery Soft Soft Firm Stiff /ery Stiff Hard		25 50 10 20	CS (kPa 25 5 - 50 0 - 100 00 - 200 00 - 400 400	D Dry M Moist W Wet W <sub>p</sub> Plastic Limit	
	Definitive or distict DCP(x-y) Dy			Photoi Dynan	nic pene	n detector reading (ppm) strometer test (test depth interval shown) meter test (UCS kPa)	Density	V L MC D VD	Lo M D	ery Lo oose lediun ense ery De	n Dense	Density Index <15% Density Index 15 - 35% Density Index 35 - 65% Density Index 65 - 85% Density Index 85 - 100%	



CLIENT:

Land Dynamics Australia

PROJECT NAME: The Sanctuary Stage 3

SITE LOCATION: John Oxley Drive, Port Macquarie LOGGED BY: HM

**TEST LOCATION:** Lot 320 **DATE:** 26/8/24

BOREHOLE NO: BH410

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RGS21087.1

PAGE:

JOB NO:

DRILL TYPE: 4x4 Mounted Rig EASTING: 485202 m SURFACE RL:

	DRILL TYPE: 4x4 Mounted BOREHOLE DIAMETER:				Rig	IN	EASTING: CLINATION: 90° NORTHING:	485202 m <b>SURFACE RL:</b> : 6519837 m <b>DATUM:</b> AHD					AHD
	Drill	ling and Sar	npling				Material description and profile information				Fiel	d Test	
METHOD	WATER	SAMPLES	RL (Not measured)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION: Soil type, plasticit characteristics,colour,minor componen		MOISTURE	CONSISTENCY DENSITY	Test Type	Result	Structure and additional observations
	Encountered			0.2		CI	Sandy Gravelly CLAY: Medium plasticity, sand, fine to coarse grained, gravel, fine to grained, subangular to subrounded.		M × W	Fr			TOPSOIL FILL
	Not Er			0.2		CL	Sandy Gravelly CLAY: Medium plasticity, brown, sand, fine to coarse grained, gravel medium grained, subangular to subrounde	, fine to		VSt	HP HP HP	300 280 290	FILL CLAY
		0.50m		-		СН	Sandy CLAY: High plasticity, pale brown, s to medium plasticitiy.	sand, fine			HP HP HP	200 200 180	RESIDUAL
2021-06-30		U50 0.90m		0.6_ - - - 0.8_ -									
2.00.3 2022-03-03 Prj; RG 2.00.0				1. <u>0</u> - - - 1.2		СН	Sandy CLAY: Medium to high plasticity, br sand, fine to medium grained.	own,	_		HP	340 360	EXTREMELY WEATHERED DOLERITE
nd In Situ Tool - DGD   Lib: RG 3				1. <u>4</u>			1.50m				HP	330	
i 13:46 10.03.00.09 Datgel Lab e				1.6 - - - 1.8			Hole Terminated at 1.50 m						
PJ < <drawingfile>&gt; 26/9/202</drawingfile>				2.0									
77.1 BH 400 SERIES LOGS.G				2. <u>2</u> -									
- TEST PIT RGS2106	GEND:		<u> </u>	2.4  Notes, Sa		nd Tes	<u>s</u>	Consiste				CS (kPa	
S NON-CORED BOREH	Dat Wat Wat	ter Level te and time s ter Inflow ter Outflow anges	hown)	U <sub>50</sub> CBR E ASS B	Bulk s Enviro Acid S	ample f	ter tube sample or CBR testing il sample ìoil Sample	S S F F St S VSt V H H	ery Soft oft irm otiff ery Stiff lard riable		25 50 10 20	25 5 - 50 0 - 100 00 - 200 00 - 400	P P
RG 2.00.3 LIB.GLB Log	Strata Changes  Gradational or transitional strata Definitive or distict strata change  Field Tests PID F DCP(x-y) D HP H				Photo Dynar	nic pen	on detector reading (ppm) etrometer test (test depth interval shown) meter test (UCS kPa)	Density	V L ME D VD	L D M D	ery Lo oose lediun ense ery D	n Dense	Density Index <15% Density Index 15 - 35% Density Index 35 - 65% Density Index 65 - 85% Density Index 85 - 100%



CLIENT:

Land Dynamics Australia

PROJECT NAME: The Sanctuary Stage 3

SITE LOCATION: John Oxley Drive, Port Macquarie

**TEST LOCATION:** Lot 321/322 **DATE:** 26/8/24

BOREHOLE NO: BH411

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НМ

RGS21087.1

PAGE:

JOB NO:

LOGGED BY:

DRILL TYPE: 4x4 Mounted Rig EASTING: 485230 m SURFACE RL:

	BOREHOLE DIAMETER: 50 r				-	IN	EASTING: CLINATION: 90° NORTHING:	485230 m SURFACE RL: 6519860 m DATUM: AHD					AHD
	Drill	ing and Sar	npling				Material description and profile information				Field	d Test	
METHOD	WATER	SAMPLES	RL (Not measured	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION: Soil type, plasticit characteristics,colour,minor componen		MOISTURE	CONSISTENCY DENSITY	Test Type	Result	Structure and additional observations
AD/T	Encountered			-		CI	Sandy Gravelly CLAY: Medium plasticity, sand, fine to coarse grained, gravel, fine to grained, subangular to subrounded.		M × W	Fr			TOPSOIL FILL
	Not En			0.2		CI	FILL: Sandy CLAY, medium plasticity, red, fine to coarse grained, gravel, fine to mediu grained, subangular to subrounded.		_	VSt	HP	350	FILL CLAY
		0.40m		0.4							HP	350	
		U50		0.6							HP	320	
		0.80m		0.8									
LEC Wat				1. <u>0</u>		СН	1.00m Silty Sandy CLAY: High plasticity, pale bro	nwn					
				1.2	×	J.1	sand, fine to medium grained.	,			HP	200	
				-	- ×						HP	300	
				1. <u>4</u>	x x		1.50m			_	HP	200	DECIDITAL
				1. <u>6</u>		CL	Sandy Gravelly CLAY: Low plasticity, brow fine to coarse grained, gravel, fine to mediu grained, subangular to subrounded.			St	HP	180	RESIDUAL
				1.8		СН	1.80m Sandy CLAY Medium to high placticity, re-	d sand	-	Н	HP HP	500	
				2.0			Sandy CLAY: Medium to high plasticity, refine to coarse grained.	u, sanu,		•	HP	500	
				-			Hole Terminated at 2.00 m						
				2.2									
				2.4	-								
Wat		er Level		Notes, Sa  U <sub>50</sub> CBR	50mm	ı Diame	er tube sample	S S	ncy ery Soft oft irm		-2 25	<b>CS (kPa</b> 25 5 - 50 0 - 100	n) Moisture Condition D Dry M Moist W Wet
	· Wat I Wat	te and time seer Inflow eer Outflow	hown)	E ASS B	Enviro Acid S	nmenta	or CBR testing I sample ioil Sample	St Si VSt V H H	tiff ery Stiff ard		10 20	0 - 100 00 - 200 00 - 400 400	W <sub>p</sub> Plastic Limit
<u>otra</u>	Strata Changes  Gradational or transitional strata Definitive or distict strata change  Field Tests PID DCP(x-y) HP			Photo Dynar	Photoionisation detector reading (ppm) Dynamic penetrometer test (test depth interval shown) Hand Penetrometer test (UCS kPa)		Fb   Friable		n Dense	Density Index <15% Density Index 15 - 35% Density Index 35 - 65% Density Index 65 - 85% Density Index 85 - 100%			



DRILL TYPE:

**ENGINEERING LOG - BOREHOLE** 

Land Dynamics Australia

**PROJECT NAME:** The Sanctuary Stage 3

**SITE LOCATION:** John Oxley Drive, Port Macquarie LOGGED BY: DATE:

**TEST LOCATION:** Lot 323/324

CLIENT:

4x4 Mounted Rig

**EASTING**: 485263 m **SURFACE RL**:

BOREHOLE NO: BH412

1 of 1

26/8/24

НМ

RGS21087.1

PAGE:

JOB NO:

INCLINATION: 00°

L	BOREHOLE DIAMETER: 50 mm			m	IN	CLINATION: 90° NORTHING:	6519826	6519826 m <b>DATU</b>				AHD		
		Drill	ing and Sar	npling				Material description and profile information				Field	d Test	
C THE	חסרו שא	WATER	SAMPLES	RL (Not measured)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION: Soil type, plasticit characteristics,colour,minor componen		MOISTURE	CONSISTENCY DENSITY	Test Type	Result	Structure and additional observations
Ę	AU/I	Encountered			-		CI	Sandy Gravelly CLAY: Medium plasticity, sand, fine to coarse grained, gravel, fine to grained, subangular to subrounded.		M × W	Fr			TOPSOIL FILL
		Not Enc			0.2		CI	Sandy CLAY: Medium plasticity, red, sand			Н	HP	440	FILL CLAY
		2			0.4			coarse grained, traces of gravel, fine to me grained, subangular to subrounded.	dium			HP	420	
					-		СН	Sandy CLAY: High plasticity, pale brown, s to medium grained.	sand, fine		VSt	HP	400	
					0. <u>6</u>							HP	300	
					-							HP	310	
06-30					0.8		CL	Sandy CLAY: Medium plasticity, red, sand			Н	HP	410	
2.00.0 2021-4					-			coarse grained, traces of gravel, fine to me grained, subangular to subrounded.	dium			HP	400	
33-03 Prj: RG					1. <u>0</u> -							HP	410	
13:46 10.03.00.09 Datget Lab. and In Sftu Tool - DGD   Lib: RG 2.00.3 2022-03-03 Prj: RG 2.00.0 20 21-06-30					1. <u>2</u>									
OGD   Lib: RG					-									
n Situ Tool - [					1. <u>4</u>		СН	1.40m Sandy CLAY: Medium to high plasticity, re fine to coarse grained.	d, sand,			HP	500	RESIDUAL
tgel Lab and I					1.6			ille to coalse granted.				HP	500	
.03.00.09 Da					-							HP	500	
/9/2024 13:46 10					1.8									
56					-									
J < <drawing< th=""><td></td><td></td><td></td><td></td><td>2.0</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></drawing<>					2.0									
- TEST PIT RGS21087.1 BH 400 SERIES LOGS.GPJ < <drawingfile>&gt; </drawingfile>					2.2		CI	2.10m  Sandy Gravelly CLAY: Medium plasticity, brown, sand, fine to medium grained, grave	el, fine to			HP	400	EXTEMELY WEATHERED SLATE
BH 400 SERI					-			medium grained, subangular to subrounde	a.			HP	420	
RGS21087.1					2.4									
ESTPIT	FG	END:		<u> </u>	Notes Sa	mples a	nd Teef	s Hole Terminated at 2.50 m	Consister	ncv		114	CS (kPa	Moisture Condition
Z J	LEGEND:   Notes, Samples and Tests   Hole Tell					VS V	ery Soft		<2		D Dry			
RG NON-CORED BOREHOLE	Water Level CBR Bulk			Bulk s	n Diameter tube sample sample for CBR testing		F F	irm		50	- 100	W Wet		
COREC	· '*' ' ' ' ' ' ' ' ' ' ' ' ' ' ' ' ' '					l sample soil Sample	1	tiff ery Stiff			00 - 200 00 - 400	, r		
NON	→ Water Outflow B Bulk Sam					on compto	н н	lard			100 - 400 100	TYL ENGINEENING		
Log RG	Strata Changes  Credetional or Field Tests						Fb F Density	riable V	\/	ery Lo	oose	Density Index <15%		
GLB 1			radational or ansitional stra	ata   -	PID	Photoi		on detector reading (ppm)	Density	L	Lo	ose	, <del>.</del>	Density Index 15 - 35%
2.00.3 LIB.GLB Log		_ De	efinitive or di		DCP(x-y) HP			etrometer test (test depth interval shown) meter test (UCS kPa)	depth interval shown) MD Medium Dense Density Inc			Density Index 35 - 65% Density Index 65 - 85%		
RG 2:0		stı	rata change			iaiiu	CHEU	motor tost (000 ki a)		VD		ense ery De	ense	Density Index 85 - 100%
본 <u> </u>										, _\		, 30 10070		



CLIENT:

Land Dynamics Australia

**PROJECT NAME:** The Sanctuary Stage 3 **JOB NO:** RGS21087.1

BOREHOLE NO: BH413

1 of 1

PAGE:

SITE LOCATION: John Oxley Drive, Port Macquarie LOGGED BY: HM

**TEST LOCATION:** Lot 325/326 **DATE:** 26/8/24

DRILL TYPE: 4x4 Mounted Rig EASTING: 485289 m SURFACE RL:



**CLIENT:** Land Dynamics Australia

**PROJECT NAME:** The Sanctuary Stage 3 **JOB NO:** RGS21087.1

SITE LOCATION: John Oxley Drive, Port Macquarie LOGGED BY:

**TEST LOCATION:** Lot 327/328 **DATE:** 26/8/24

BOREHOLE NO: BH414

1 of 1

НМ

PAGE:

DRILL TYPE: 4x4 Mounted Rig EASTING: 485301 m SURFACE RL:

	BOREHOLE DIAMETER: 50 mm						EASTING: CLINATION: 90° NORTHING:	485301 6519892		DATU		KL.	AHD
	Drill	ing and Sar	npling				Material description and profile information				Field	d Test	
МЕТНОВ	WATER	SAMPLES	RL (Not measured)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION: Soil type, plasticit characteristics,colour,minor componen		MOISTURE CONDITION	CONSISTENCY DENSITY	Test Type	Result	Structure and additional observations
AD/T	Not Encountered			0.2		CI	Sandy Gravelly CLAY: Medium plasticity, sand, fine to coarse grained, gravel, fine to grained, subangular to subrounded.  3.20m  Sandy CLAY: Medium plasticity, orange br to coarse grained, traces of gravel, fine to r grained, subangular to subrounded.	medium own, fine	M < W <sub>P</sub>	H	HP	550	RESIDUAL
		0.40m U50		0.4_ - - - 0.6_							HP	540 530	
		0.80m		0.8 <u>-</u> - - 1.0 <u>-</u>									
				1.2_ - - - 1.4_									
				1.6			Hole Terminated at 1.50 m						
Wate		er Level		2.2	mples a	Diame	ter tube sample	S S	ery Soft oft		<2 25	5 - 50	D Dry M Moist
(Date and time shown)  ► Water Inflow  ✓ Water Outflow  Strata Changes  — Gradational or transitional strata  — Definitive or distict  CBR Bulk  E Envir  ASS Acid  B Bulk  Field Tests  PID Photo DCP(x-y) Dyna			Enviro Acid S Bulk S ts Photoi Dynan	onmenta Sulfate S Sample Sonisation	or CBR testing Il sample Soil Sample on detector reading (ppm) etrometer test (test depth interval shown) meter test (UCS kPa)	St Si VSt Vi H H	irm tiff ery Stiff ard riable V L MD D VD	Vo Lo M D	10 20 >2 ery Lo	n Dense	W Wet W <sub>p</sub> Plastic Limit W <sub>L</sub> Liquid Limit  Density Index <15% Density Index 15 - 35% Density Index 35 - 65% Density Index 65 - 85% Density Index 85 - 100%		



CLIENT: Land Dynamics Australia

**PROJECT NAME:** The Sanctuary Stage 3 JOB NO: RGS21087.1

BOREHOLE NO: BH415

1 of 1

PAGE:

SITE LOCATION: John Oxley Drive, Port Macquarie LOGGED BY: НМ

**TEST LOCATION:** Lot 329/330 DATE: 26/8/24

DRILL TYPE: 4x4 Mounted Rig **EASTING:** 485267 m **SURFACE RL**:

	BOREHOLE DIAMETER:					IN	CLINATION: 90° NORTHING:	6519908		DATU			AHD
	Dril	ling and Sar	npling				Material description and profile information				Field	d Test	
METHOD	WATER	SAMPLES	RL (Not measured	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION: Soil type, plasticit characteristics, colour, minor componen		MOISTURE	CONSISTENCY DENSITY	Test Type	Result	Structure and additional observations
	t Encountered			0.2		CI	Sandy Gravelly CLAY: Medium plasticity, sand, fine to coarse grained, gravel, fine to grained, subangular to subrounded.		M × W	F			TOPSOIL FILL
	Not			0.4		CI	Sandy CLAY: Medium plasticity, red/ dark sand, fine to medium grained.	red,		VSt	HP HP HP	300 240 200	FILL CLAY
				0.6 - - - 0.8			0.80m						
						CL	Sandy CLAY: Low plasticity, dark red, san medium grained.	d, fine to			HP	300	RESIDUAL
17. 26.20				1.0							HP	310	
לערכיר-טיב בעונג ביטטינג לא				1.2							HP	320	
720% 1377 10030009 Daggit tale of no 1001-000 [Life v. 2,003.2022/24/34 PFN C. 2,003.2020/24/34 PFN C. 2,000.2021/2024 1377 10030009 Daggit tale of no 1001-000 [Life v. 2,003.2020/24/34 PFN C. 2,000.2021/2024 1377 10030009 Daggit tale of no 1001-000 [Life v. 2,000.2022/24/34 PFN C. 2,000.2021/24/34 PFN C. 2,000.2021/24/24/24/24/24/24/24/24/24/24/24/24/24/				1. <u>4</u>									
X.03 Datger Lab and				1. <u>6</u>		СН	Sandy CLAY: Medium to high plasticity, or red, sand, fine to medium grained.	ange,		St	HP	280	RESIDUAL
9:41				1.8		СН	1.70m  Sandy Gravelly CLAY: Medium to high plate orange/ brown, sand, fine to medium grain.			St	HP	260 -	EXTREMELY WEATHERED SLATE
LUI GEORGE				-			fine to medium grained, subangular to sub	rounded.			HP	300	
- Colonium in the colonium in				2.0							HP	310	
1400 GENEC & CCC. :				2.2 -									
FII NGSZIVOT.				2. <u>4</u>			2.50m						
LEC Wa	GEND: ter			Notes, Sa			s Hole Terminated at 2.50 m	1	ery Soft		<2		D Dry
<b>X</b>	Water Level (Date and time shown)  Water Inflow  Water Outflow  U₅₀ CBR E ASS B			Bulk s Enviro Acid S	50mm Diameter tube sample Bulk sample for CBR testing Environmental sample Acid Sulfate Soil Sample Bulk Sample			oft irm itiff ery Stiff lard		50 10 20	5 - 50 0 - 100 00 - 200 00 - 400 400	M Moist W Wet W <sub>p</sub> Plastic Limit W <sub>L</sub> Liquid Limit	
TO STOUST BENGE BY THE WORK OF THE STOUST BY THE WORK OF THE STOUST BY T	Strata Changes  — Gradational or transitional strata — Definitive or distict strata change			·			Fb         Friable           Density         V         Very Loose           L         Loose           MD         Medium Dens           D         Dense			oose lediun	n Dense	Density Index <15% Density Index 15 - 35% Density Index 35 - 65% Density Index 65 - 85% Density Index 85 - 100%	



**CLIENT:** Land Dynamics Australia

**PROJECT NAME:** The Sanctuary Stage 3 **JOB NO:** RGS21087.1

BOREHOLE NO: BH416

1 of 1

PAGE:

SITE LOCATION: John Oxley Drive, Port Macquarie LOGGED BY: HM

**TEST LOCATION:** Lot 331/332 **DATE:** 26/8/24

DRILL TYPE: 4x4 Mounted Rig EASTING: 485232 m SURFACE RL:

	DRILL TYPE: 4x4 Mounted Rig BOREHOLE DIAMETER:						EASTING: CLINATION: 90° NORTHING:	485232 6519902		SURF.		RL:	AHD
	Dril	ling and Sar	npling				Material description and profile information				Field	d Test	
METHOD	WATER	SAMPLES	RL (Not measured	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION: Soil type, plasticit characteristics,colour,minor componen	y/particle ts	MOISTURE	CONSISTENCY DENSITY	Test Type	Result	Structure and additional observations
	Not Encountered			0.2		CI	Sandy Gravelly CLAY: Medium plasticity, sand, fine to coarse grained, gravel, fine to grained, subangualr to subrounded.	brown, medium	M × W <sub>p</sub>	Fr			TOPSOIL FILL
	Not			0.4		CL	Sandy CLAY: Low plasticity, red, sand, fine medium grained, traces of sand, fine to me grained, subangular to subrounded.			Н	HP HP	450 440	FILL CLAY
				0. <u>6</u>							HP	450	
RG 2.00.0 2021-06-30				0.8 - - 1.0							HP HP	550	
b: RG 2.00.3 2022-03-03 Prj.f				1. <u>2</u>							HP	540	
Datgel Lab and In Situ Tool - DGD   Li				1.4		CI	Silty Gravelly CLAY: Medium plasticity, pa sand, fine to medium grained, traces of roc	ile brown, k faric		F	HP HP	150 200 180	EXTREMELY WEATHERED DOLERITE
24 13:47 10:03:00:06				1.8	- <u>·</u>		Hole Terminated at 1.70 m						
S.GPJ < <drawingfile>&gt; 2619/20</drawingfile>				2. <u>0</u> -									
GS21087.1 BH 400 SERIES LOG				2.2 - - 2.4									
S NON-CORED BOREHOLE -	LEGEND:  Water  Water Level (Date and time shown)  Water Inflow  Water Outflow  Notes, Samples a  U <sub>50</sub> 50mm  CBR Bulk s  E Envire  ASS Acid s  B Bulk S			50mm Bulk s Enviro Acid S	Diame ample f	ser tube sample or CBR testing I sample ioil Sample	S S F F St S VSt V H F	ncy /ery Soft Soft Firm Stiff /ery Stiff lard		25 50 10 20	CS (kPa 25 5 - 50 0 - 100 00 - 200 00 - 400	Moisture Condition  D Dry  M Moist  W Wet  Wp Plastic Limit  WL Liquid Limit	
RG 2.00.3 LIB.GLB Log	Strata Changes  Gradational or transitional strata Definitive or distict strata change  Field Tests PID Photo DCP(x-y) Dynar HP Hand				Photo Dynar	nic pene	on detector reading (ppm) etrometer test (test depth interval shown) meter test (UCS kPa)	Density	V L ME D VD	Lo M D	ery Lo oose ledium ense ery De	n Dense	Density Index <15% Density Index 15 - 35% Density Index 35 - 65% Density Index 65 - 85% Density Index 85 - 100%



# Appendix B Laboratory Test Result Sheets

**Report Number:** MNC16P-0001-134

Issue Number:

Date Issued: 11/09/2024

Client: Regional Geotechnical Solutions Pty Ltd

44 Bent Street, Wingham NSW 2429

**Project Number:** MNC16P-0001 **Project Name:** Various Testing **Project Location:** 344 John Oxley Drive

**Client Reference:** RGS21087.1

Work Request: 5968

Sample Number: NEW24S-5968A **Date Sampled:** 27/08/2024

**Dates Tested:** 30/08/2024 - 04/09/2024 Sampling Method: Sampled by Client

The results apply to the sample as received

Sample Location: BH401 - (0.5 - 1.0m)

Material: Insitu **Material Source:** On-Site

Shrink Swell Index (AS 1289 7.1.1 & 2.1.1)									
Iss (%)	0.8								
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 (%)	1.4
Estimated % by volume of significant inert inclusions	2
Cracking	Slightly Cracked
Crumbling	No
Moisture Content (%)	28.4

Swell Test	
Initial Pocket Penetrometer (kPa)	>600
Final Pocket Penetrometer (kPa)	>600
Initial Moisture Content (%)	28.6
Final Moisture Content (%)	30.3
Swell (%)	0.3

NATA Accreditation does not cover the performance of pocket penetrometer readings.



Newcastle Laboratory

2 Murray Dwyer Circuit Mayfield West NSW 2304

Phone: (02) 4968 4468

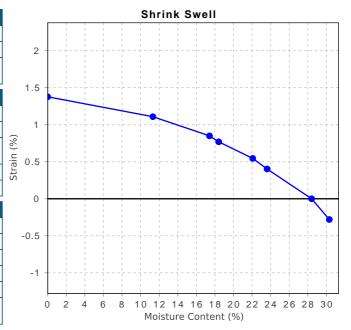
Email: brentcullen@qualtest.com.au

Accredited for compliance with ISO/IEC 17025 - Testing



Approved Signatory: Brent Cullen

**Engineering Geologist** 



**Report Number:** MNC16P-0001-134

Issue Number:

Date Issued: 11/09/2024

Client: Regional Geotechnical Solutions Pty Ltd

44 Bent Street, Wingham NSW 2429

**Project Number:** MNC16P-0001 **Project Name:** Various Testing **Project Location:** 344 John Oxley Drive

**Client Reference:** RGS21087.1

Work Request: 5968

Sample Number: NEW24S-5968B **Date Sampled:** 27/08/2024

**Dates Tested:** 30/08/2024 - 04/09/2024 Sampling Method: Sampled by Client

The results apply to the sample as received

Sample Location: BH403 - (0.5 - 0.8m)

Material: Insitu **Material Source:** On-Site



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Approved Signatory: Brent Cullen

**Engineering Geologist** 

NATA Accredited Laboratory Number: 18686

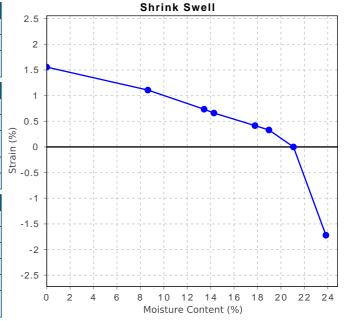
Shrink Swell Index (AS 1289 7.1.1 & 2.1.1)									
Iss (%)	1.3								
Visual Description	Clay								
* Chrink Cwall Inday /	les) reported as the persentage vertical strain per								

Shrink Swell Index (Iss) reported as the percentage vertical strain per pF change in suction.

Core Shrinkage Test		
Shrinkage Strain - Oven Dried (%)	1.6	
Estimated % by volume of significant inert inclusions	2	
Cracking	Slightly Cracked	
Crumbling	No	
Moisture Content (%)	21.1	

Swell Test	
Initial Pocket Penetrometer (kPa)	>600
Final Pocket Penetrometer (kPa)	>600
Initial Moisture Content (%)	20.7
Final Moisture Content (%)	23.8
Swell (%)	1.7

NATA Accreditation does not cover the performance of pocket penetrometer readings



**Report Number:** MNC16P-0001-134

Issue Number:

Date Issued: 11/09/2024

Client: Regional Geotechnical Solutions Pty Ltd

44 Bent Street, Wingham NSW 2429

**Project Number:** MNC16P-0001 **Project Name:** Various Testing **Project Location:** 344 John Oxley Drive

**Client Reference:** RGS21087.1

Work Request: 5968

Sample Number: NEW24S-5968C **Date Sampled:** 27/08/2024

**Dates Tested:** 30/08/2024 - 04/09/2024 Sampling Method: Sampled by Client

The results apply to the sample as received

Sample Location: BH405 - (0.5 - 1.0m)

Material: Insitu **Material Source:** On-Site

Shrink Swell Index (AS 1289 7.1.1 & 2.1.1)		
Iss (%)	2.0	
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 (%)	3.3
Estimated % by volume of significant inert inclusions	2
Cracking	Moderately Cracked
Crumbling	No
Moisture Content (%)	34.0

Swell Test	
Initial Pocket Penetrometer (kPa)	>600
Final Pocket Penetrometer (kPa)	500
Initial Moisture Content (%)	33.7
Final Moisture Content (%)	36.4
Swell (%)	0.8

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**Engineering Geologist** 



**Report Number:** MNC16P-0001-134

Issue Number:

Date Issued: 11/09/2024

Client: Regional Geotechnical Solutions Pty Ltd

44 Bent Street, Wingham NSW 2429

**Project Number:** MNC16P-0001 **Project Name:** Various Testing **Project Location:** 344 John Oxley Drive

**Client Reference:** RGS21087.1

Work Request: 5968

Sample Number: NEW24S-5968D **Date Sampled:** 27/08/2024

**Dates Tested:** 30/08/2024 - 05/09/2024 Sampling Method: Sampled by Client

The results apply to the sample as received

Sample Location: BH407 - (0.3 - 0.7m)

Material: Insitu **Material Source:** On-Site

Shrink Swell Index (AS 1289 7.1.1 & 2.1.1)		
Iss (%)	2.8	
Visual Description	Clay	

Shrink Swell Index (Iss) reported as the percentage vertical strain per pF change in suction

Core Shrinkage Test	
Shrinkage Strain - Oven Dried (%)	4.9
Estimated % by volume of significant inert inclusions	1
Cracking	Slightly Cracked
Crumbling	No
Moisture Content (%)	33.0

Swell Test	
Initial Pocket Penetrometer (kPa)	>600
Final Pocket Penetrometer (kPa)	550
Initial Moisture Content (%)	32.6
Final Moisture Content (%)	34.6
Swell (%)	0.2

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**Engineering Geologist** 



**Report Number:** MNC16P-0001-134

Issue Number:

Date Issued: 11/09/2024

Client: Regional Geotechnical Solutions Pty Ltd

44 Bent Street, Wingham NSW 2429

**Project Number:** MNC16P-0001 **Project Name:** Various Testing **Project Location:** 344 John Oxley Drive

**Client Reference:** RGS21087.1

Work Request: 5968

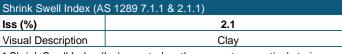
Sample Number: NEW24S-5968E **Date Sampled:** 27/08/2024

**Dates Tested:** 30/08/2024 - 05/09/2024 Sampling Method: Sampled by Client

The results apply to the sample as received

Sample Location: BH409 - (0.5 - 1.0m)

Material: Insitu **Material Source:** On-Site



\* Shrink Swell Index (Iss) reported as the percentage vertical strain per pF change in suction.

Core Shrinkage Test	
Shrinkage Strain - Oven Dried (%)	3.5
Estimated % by volume of significant inert inclusions	1
Cracking	Slightly Cracked
Crumbling	Yes / No
Moisture Content (%)	38.2

Swell Test	
Initial Pocket Penetrometer (kPa)	530
Final Pocket Penetrometer (kPa)	450
Initial Moisture Content (%)	38.2
Final Moisture Content (%)	40.6
Swell (%)	0.7

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**Engineering Geologist** 



**Report Number:** MNC16P-0001-134

Issue Number:

Date Issued: 11/09/2024

Regional Geotechnical Solutions Pty Ltd Client:

44 Bent Street, Wingham NSW 2429

**Project Number:** MNC16P-0001 **Project Name:** Various Testing **Project Location:** 344 John Oxley Drive

**Client Reference:** RGS21087.1

Work Request: 5968

Sample Number: NEW24S-5968F **Date Sampled:** 27/08/2024

**Dates Tested:** 30/08/2024 - 05/09/2024 Sampling Method: Sampled by Client

The results apply to the sample as received

Sample Location: BH410 - (0.5 - 0.9m)

Material: Insitu **Material Source:** On-Site

Shrink Swell Index (AS 1289 7.1.1 & 2.1.1)  Iss (%)  Visual Description  * Shrink Swell Index (Iss) reported as the percentage vertical strain of		
		4.8
		Clay
		les) reported as the percentage vertical strain per

pF change in suction.

Core Shrinkage Test	
Shrinkage Strain - Oven Dried (%)	8.5
Estimated % by volume of significant inert inclusions	1
Cracking	Uncracked
Crumbling	Yes / No
Moisture Content (%)	33.8

` '	
Swell Test	
Initial Pocket Penetrometer (kPa)	150
Final Pocket Penetrometer (kPa)	140
Initial Moisture Content (%)	34.5
Final Moisture Content (%)	36.7
Swell (%)	0.2

<sup>\*</sup> NATA Accreditation does not cover the performance of pocket penetrometer readings.



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Phone: (02) 4968 4468

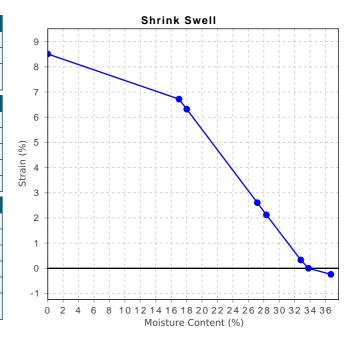
Email: brentcullen@qualtest.com.au

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**Engineering Geologist** 



**Report Number:** MNC16P-0001-134

Issue Number:

Date Issued: 11/09/2024

Regional Geotechnical Solutions Pty Ltd Client:

44 Bent Street, Wingham NSW 2429

**Project Number:** MNC16P-0001 **Project Name:** Various Testing **Project Location:** 344 John Oxley Drive

RGS21087.1 **Client Reference:** 

Work Request: 5968

Sample Number: NEW24S-5968G **Date Sampled:** 27/08/2024

**Dates Tested:** 30/08/2024 - 05/09/2024 Sampling Method: Sampled by Client

The results apply to the sample as received

Sample Location: BH411 - (0.4 - 0.8m)

Material: Insitu **Material Source:** On-Site

Shrink Swell Index (AS 1289 7.1.1 & 2.1.1)				
Iss (%)	3.5			
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 (%)	6.4
Estimated % by volume of significant inert inclusions	1
Cracking	Uncracked
Crumbling	No
Moisture Content (%)	29.9

Swell Test	
Initial Pocket Penetrometer (kPa)	270
Final Pocket Penetrometer (kPa)	250
Initial Moisture Content (%)	29.3
Final Moisture Content (%)	34.9
Swell (%)	-0.1

\* NATA Accreditation does not cover the performance of pocket penetrometer readings.



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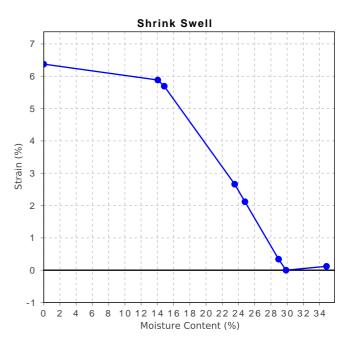
Email: brentcullen@qualtest.com.au

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Approved Signatory: Brent Cullen

**Engineering Geologist** 



**Report Number:** MNC16P-0001-134

Issue Number:

Date Issued: 11/09/2024

Client: Regional Geotechnical Solutions Pty Ltd

44 Bent Street, Wingham NSW 2429

**Project Number:** MNC16P-0001 **Project Name:** Various Testing **Project Location:** 344 John Oxley Drive

**Client Reference:** RGS21087.1

Work Request: 5968

Sample Number: NEW24S-5968H **Date Sampled:** 27/08/2024

**Dates Tested:** 30/08/2024 - 05/09/2024 Sampling Method: Sampled by Client

The results apply to the sample as received

Sample Location: BH414 - (0.4 - 0.8m)

Material: Insitu **Material Source:** On-Site

Shrink Swell Index (AS 1289 7.1.1 & 2.1.1)			
Iss (%)	1.2		
Visual Description	Clay		
* 01 : 1 0   11 1   /			

Shrink Swell Index (Iss) reported as the percentage vertical strain per pF change in suction.

Core Shrinkage Test	
Shrinkage Strain - Oven Dried (%)	1.8
Estimated % by volume of significant inert inclusions	3
Cracking	Slightly Cracked
Crumbling	No
Moisture Content (%)	24.3

Swell Test	
Initial Pocket Penetrometer (kPa)	>600
Final Pocket Penetrometer (kPa)	600
Initial Moisture Content (%)	25.2
Final Moisture Content (%)	27.3
Swell (%)	0.9

NATA Accreditation does not cover the performance of pocket penetrometer readings



Newcastle Laboratory

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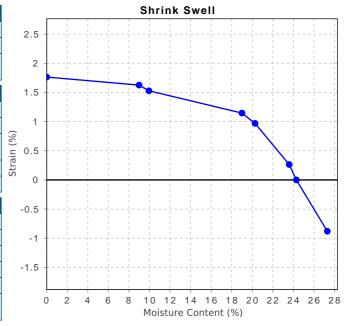
Email: brentcullen@qualtest.com.au

Accredited for compliance with ISO/IEC 17025 - Testing



Approved Signatory: Brent Cullen

**Engineering Geologist** 



**Report Number:** MNC16P-0001-134

Issue Number:

Date Issued: 11/09/2024

Client: Regional Geotechnical Solutions Pty Ltd

44 Bent Street, Wingham NSW 2429

**Project Number:** MNC16P-0001 **Project Name:** Various Testing **Project Location:** 344 John Oxley Drive RGS21087.1

**Client Reference:** Work Request: 5968

**Dates Tested:** 30/08/2024 - 05/09/2024



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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					
Sample Number	NEW24S-5968A	NEW24S-5968B	NEW24S-5968C	NEW24S-5968D	NEW24S-5968E
Date Sampled	27/08/2024	27/08/2024	27/08/2024	27/08/2024	27/08/2024
Date Tested	04/09/2024	04/09/2024	04/09/2024	05/09/2024	05/09/2024
Material Source	On-Site Insitu				
Sample Location	BH401 - (0.5 - 1.0m)	BH403 - (0.5 - 0.8m)	BH405 - (0.5 - 1.0m)	BH407 - (0.3 - 0.7m)	BH409 - (0.5 - 1.0m)
Inert Material Estimate (%)	2	2	2	1	1
Pocket Penetrometer before (kPa)	>600	>600	>600	>600	530
Pocket Penetrometer after (kPa)	>600	>600	500	550	450
Shrinkage Moisture Content (%)	28.4	21.1	34.0	33.0	38.2
Shrinkage (%)	1.4	1.6	3.3	4.9	3.5
Swell Moisture Content Before (%)	28.6	20.7	33.7	32.6	38.2
Swell Moisture Content After (%)	30.3	23.8	36.4	34.6	40.6
Swell (%)	0.3	1.7	0.8	0.2	0.7
Shrink Swell Index Iss (%)	0.8	1.3	2.0	2.8	2.1
Visual Description	Clay	Clay	Clay	Clay	Clay
Cracking	SC	SC	MC	SC	SC
Crumbling	No	No	No	No	**
Remarks	**	**	**	**	**

Shrink Swell Index (Iss) reported as the percentage vertical strain per pF change in suction.

Cracking Terminology: UC Uncracked, SC Slightly Cracked, MC Moderately Cracked, HC Highly Cracked, FR Fragmented.

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**Report Number:** MNC16P-0001-134

Issue Number:

Date Issued: 11/09/2024

Client: Regional Geotechnical Solutions Pty Ltd

44 Bent Street, Wingham NSW 2429

**Project Number:** MNC16P-0001 **Project Name:** Various Testing **Project Location:** 344 John Oxley Drive **Client Reference:** RGS21087.1

Work Request: 5968

**Dates Tested:** 30/08/2024 - 05/09/2024



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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			
Sample Number	NEW24S-5968F	NEW24S-5968G	NEW24S-5968H	
Date Sampled	27/08/2024	27/08/2024	27/08/2024	
Date Tested	05/09/2024	05/09/2024	05/09/2024	
Material Source	On-Site Insitu	On-Site Insitu	On-Site Insitu	
Sample Location	BH410 - (0.5 - 0.9m)	BH411 - (0.4 - 0.8m)	BH414 - (0.4 - 0.8m)	
Inert Material Estimate (%)	1	1	3	
Pocket Penetrometer before (kPa)	150	270	>600	
Pocket Penetrometer after (kPa)	140	250	600	
Shrinkage Moisture Content (%)	33.8	29.9	24.3	
Shrinkage (%)	8.5	6.4	1.8	
Swell Moisture Content Before (%)	34.5	29.3	25.2	
Swell Moisture Content After (%)	36.7	34.9	27.3	
Swell (%)	0.2	-0.1	0.9	
Shrink Swell Index Iss (%)	4.8	3.5	1.2	
Visual Description	Clay	Clay	Clay	
Cracking	UC	UC	SC	
Crumbling	**	No	No	
Remarks	**	**	**	

Shrink Swell Index (Iss) reported as the percentage vertical strain per pF change in suction.

Cracking Terminology: UC Uncracked, SC Slightly Cracked, MC Moderately Cracked, HC Highly Cracked, FR Fragmented.

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