REGIONAL GEOTECHNICAL SOLUTIONS

The Sanctuary, Stage 5 and 6

344 John Oxley Drive, Thrumster

Geotechnical Assessment

Bird in Hand 2 Pty Ltd

RGS21087.1-AU
Revision 0
25 June 2025

Client	**Bird in Hand 2 Pty Ltd**
Client Postal Address	PO Box 243, Port Macquarie NSW 2444
Care Of	King & Campbell Pty Ltd
Client Contact	Julian Jones

Project Title	**The Sanctuary, Stage 5 and 6**
Site Location	344 John Oxley Drive, Thrumster
Project Subject	Geotechnical Assessment
Document Number	RGS21087.1-AU

Revision	Issue Date	Author	Reason for Revision
0	26/06/25	Grant Colliar	First Issue
1			
2			
3			
4			
5			

Table of Contents

Figures

Appendices

1 INTRODUCTION

Regional Geotechnical Solutions Pty Ltd (RGS) has undertaken a geotechnical assessment for the proposed Stage 5 & 6 of The Sanctuary residential development, No. 344 John Oxley Drive, Thrumster.

The drawings provided by the client indicate Stages 5 and 6 will comprise the following roads:

- Road 5, Ch385 to Ch435m & Ch30 to Ch123m
- Road 7, Ch0 to Ch276m
- Road 8, Ch0 to Ch295m
- Road 9, Ch0 to Ch69m
- Road 10, Ch0 to Ch149m

The roads are understood to be classified as an Access Streets as per Port Macquarie Hastings Council (PMHC) Aus-Spec.

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

- A geotechnical model of the site that includes general foundation conditions and the depth of the soil profiles.
- Subgrade conditions.
- Pavement thickness design for the six sections of road, including material requirements and construction recommendations.

The geotechnical assessment was undertaken in accordance with RGS proposal RGS21087.1-AT.

2 METHODOLOGY

Fieldwork for the assessment was undertaken on 8 April 2025 and included the following:

- Mapping – Observation of site features and surrounding features relevant to the geotechnical conditions of the site.
- Logging and sampling of 14 test pits excavated with a 3.5 tonne excavator to depths of between 0.75m and 1.8m.
- Collection of samples for subsequent laboratory testing by a NATA-accredited laboratory. The testing included California Bearing Ratio (CBR) testing on the collected bulk samples.

Engineering logs of the boreholes are presented in Appendix A. Test locations are shown on the appended Figures and were obtained with a handheld GPS. GPS coordinates are shown on the borehole logs.

3 SITE CONDITIONS

3.1 Surface Conditions

Stages 5 & 6 of the Sanctuary residential development are situated in an area of gently to moderately undulating topography on two low hills to the north of John Oxley Drive within Lot 1 DP1245588.

Surface elevations across the site range from approximately RL 18.9m along Road 10 on the upper hill slopes in the west, to approximately RL 8.9m along road 10 in the north. The surface slopes have been regraded by up to 2m cut and placement of up to approximately 2m of site won clay fill in 2021 and 2022. Surface slopes are now typically less than 10°.

An aerial photograph that illustrates the site location and site setting is reproduced below.

Aerial photograph dated 2024 obtained from Google Maps that illustrates the site location and site setting.

Bulk earthworks are understood to have comprised the stripping of topsoil and the placement of site won clay fill using large earthmoving equipment including scrapers and large compaction plant. Placement and compaction of fill within the lots and within the road corridors is understood to have been undertaken under Level One inspection and monitoring as defined in AS3798-2007 by Douglas CMG Pty Ltd.

The existing levels at the completion of regrading earthworks are understood to range from 0.35m-0.85m below design surface level.

Drainage of the site would be via a combination of surface infiltration and overland flow. An intermittent drainage line is located along Road 7 from Ch65m to Ch130m. This section comprises a fill embankment with a culvert.

Photographs from the site investigation are presented below.

TP8- Looking at the intersection of Road 7 and Road 5 that is underlain by clay fill.

TP2- Looking west along Road 10 Ch75m that is underlain by clay fill.

TP12- Looking at the intersection of Road 8 and Road 9 that is underlain by red residual clay.

TP5- Looking north along Road 5 Ch40m that is underlain by gravel fill and red residual clay.

3.2 Subsurface Conditions

The site is situated in an area of gently to moderately undulating topography that is underlain by deeply weathered geological units of the Port Macquarie Block which includes slate, chert, basalt, serpentinite and dolerite.

The materials encountered within the test pits undertaken during the investigation are summarised in Table 1 and Table 2. Further details are presented on the engineering logs.

Table 1: Summary of Geotechnical Units

Unit	Material	Material Description
UNIT 1A	FILL GRAVEL	Sandy GRAVEL, fine to coarse, pale grey
UNIT 1B	FILL – CLAY	Sandy CLAY, medium plasticity, pale grey/red/brown, very stiff to hard, trace to some gravel, fine to coarse

Unit	Material	Material Description
UNIT 2	ALLUVIAL	Silty Sandy CLAY, medium to high plasticity, pale brown with grey mottling, traces cobbles, stiff
UNIT 3	RESIDUAL	Sandy CLAY, low to medium plasticity, red, very stiff to hard, traces of fine to coarse gravel
UNIT 4A	EW SLATE	Extremely Weathered Slate, recovered as Sandy CLAY, low to medium plasticity, red/pale grey, hard, some fine to coarse grained gravel, trace rock fabric
UNIT 4B	EW DOLERITE	Extremely Weathered Dolerite, recovered as Sandy CLAY, medium plasticity, pale brown/grey, hard, trace rock fabric
UNIT 5	HW TO MW DOLERITE	Highly to Moderately Weathered DOLERITE, medium grained, fractured, inferred low to medium strength. Excavated as Sandy Gravel

Table 2: Summary of Subsurface Materials

Investigation	Depth to Base of Material Layer (m)							
	Location	Unit 1A- Fill Gravel	Unit 1B - Fill Clay	Unit 2 - Alluvial	Unit 3- Residual	Unit 4A – EW Slate	Unit 4B – EW Dolerite	Unit 5 – HW to MW Dolerite
TP1	Road 10 Ch110m	--	≥1.0	--	--	--	--	--
TP2	Road 10 Ch75m	--	0.8	≥1.5	--	--	--	--
TP3	Road 7 Ch205m	--	1.3	≥1.5	≥1.5	--	--	--
TP4	Road 7 Ch275m	--	0.4	--	0.75	--	≥0.95*	--
TP5	Road 5 Ch40m	0.25	--	--	1.0	≥1.5	--	--
TP6	Road 5 Ch120m	--	0.55	--	--	--	--	≥0.75*
TP7	Road 5 Ch390m	--	≥1.5	--	--	--	--	--
TP8	Road 7 Ch65m	--	≥1.5	--	--	--	--	--
TP9	Road 7 Ch175m	--	≥1.5	--	--	--	--	--
TP10	Road 8 Ch130m	--	1.15	--	≥1.6	--	--	--
TP11	Road 8 Ch10m	--	0.2	--	≥1.8	--	--	--
TP12	Road 8 Ch175m	--	0.1	--	≥1.6	--	--	--
TP13	Road 9 Ch60m	--	0.1	--	≥1.5	--	--	--
TP14	Road 8 Ch280m	--	--	--	--	≥1.5	--	--

Note: ≥ Indicates that base of material layer was not encountered
* Indicates that the test was terminated due to refusal on rock
-- Indicates that the material was not encountered at the test location

Groundwater was not encountered within the test pits. Groundwater levels do fluctuate due to inclement weather, seasonal variations, or due to reasons that may not have been apparent at the time of the site investigation.

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

Table 3: Summary of Laboratory Test Results

Sample Location	Sample Depth (m)	Location	Material	MDD (t/m³)	CBR Swell (%)	CBR (%)
TP1	0.1-0.3	Road 10 Ch110m	Unit 1B - Fill-Clay	1.51	2.5	6
TP2	0.0-0.5	Road 10 Ch75m	Unit 1B - Fill-Clay	1.57	1.5	8
TP3	0.0-0.55	Road 7 Ch205m	Unit 1B - Fill-Clay	1.54	1.5	9
TP4	0.0-0.4	Road 7 Ch275m	Unit 1B - Fill-Clay	1.47	1.5	6
TP4	0.75 -0.95	Road 7 Ch275m	Unit 4B -EW Dolerite	1.86	1.0	8
TP5	0.25-1.0	Road 5 Ch40m	Unit 3 - Residual	1.50	0.5	7
TP6	0.0-0.55	Road 5 Ch120m	Unit 1B - Fill-Clay	1.50	1.5	3.5
TP7	0.0-0.6	Road 5 Ch390m	Unit 1B - Fill-Clay	1.53	3.0	4.5
TP8	0.0-0.45	Road 7 Ch65m	Unit 1B - Fill-Clay	1.55	2.5	6
TP9	0.0-0.8	Road 7 Ch175m	Unit 1B - Fill-Clay	1.54	3.5	4
TP10	0.0-0.45	Road 8 Ch130m	Unit 1B - Fill-Clay	1.46	1.0	5
TP11	0.3-1.8	Road 8 Ch10m	Unit 3 - Residual	1.29	0.5	7
TP12	0.1-1.6	Road 8 Ch175m	Unit 3 - Residual	1.35	0.5	3.5
TP13	0.1-1.5	Road 9 Ch60m	Unit 3 - Residual	1.46	1.0	6
TP14	0.0-1.5	Road 8 Ch280m	Unit 4A - EW Slate	1.41	3.0	6

4 PAVEMENT DESIGN

4.1 Proposed Works

The proposed development of Stages 5 & 6 at The Sanctuary includes construction of five sections of road pavements as shown in Figures 1 and 2.

4.2 Subgrade

Based on the subsurface profile observed and the results of in-situ testing the following design subgrade CBR's have been adopted:

- Road 5, Ch30 to Ch123m: Design subgrade CBR of 3.5%;
- Road 5, Ch385 to Ch435m: Design subgrade CBR of 4.5%; and
- Road 7, Ch0 to Ch278m: Design subgrade CBR of 5%.
- Road 8, Ch0 to Ch120m: Design subgrade CBR of 6%.
- Road 8, Ch120 to Ch200m: Design subgrade CBR of 3.5%.
- Road 8, Ch200 to Ch350m: Design subgrade CBR of 6%.

- Road 9, Ch0 to Ch69m: Design subgrade CBR of 6%.
- Road 10, Ch0 to Ch149m: Design subgrade CBR of 6%.

4.3 Design Parameters

With reference to Port Macquarie Hastings Aus-Spec, all roads are classified as Access Streets with a design traffic of 1 x 10^6 ESA.

Options for pavement design considered the following:

- Existing levels range from approximately 0.35m-0.85m below design surface level.
- Port Macquarie Hastings Council Aus-Spec indicates a minimum 30mm AC seal for Access Streets. The AC10 seal is not included in the structural design thickness; and
- A minimum base thickness of 140mm has been adopted to assist construction, following discussions between the client and the site civil contractor.

4.4 Pavement Design

Pavement thickness design sheets based on PMHC AUS-SPEC and AUSTROADS 2017 are presented in Appendix C and summarised in Table 4.

Table 4 - Proposed Pavement Types (Thickness in mm)

Pavement	Type 1 (Access Street)	Type 2 (Access Street)	Type 3 (Access Street)	Type 4 (Access Street)
Subgrade Material	Clay Fill, Residual	Clay Fill	Clay Fill, EW Dolerite	Clay Fill, Residual, EW Slate
Subgrade Design CBR	3.5	4.5	5	6
AC10 Seal	30	30	30	30
Base Course	140	140	140	140
Sub Base	150	280	260	220
Select Fill (CBR>15 and PI<15)	190	--	--	--
Total design thickness	*480*	*420*	*400*	*360*
Total actual thickness	510	450	430	400

Nominal pavement design types for each subject pavement interval are summarised in Table 5.

Table 5 – Pavement Design Summary

Road	Chainage (m)	Classification	Subgrade	Design CBR	Nominal Pavement	Total Pavement Thickness (mm)
Road 5	30 - 123	Access Street	Clay Fill	3.5	Type 1	510
Road 5	385 – 435	Access Street	Clay Fill	4.5	Type 2	450
Road 7	0 – 278	Access Street	Clay Fill, EW Dolerite	5	Type 3	430
Road 8	0 – 120	Access Street	Residual Clay	6	Type 4	400
Road 8	120 – 200	Access Street	Clay Fill, Residual Clay	3.5	Type 1	510
Road 8	200 – 350	Access Street	Residual Clay, EW Slate	6	Type 4	400
Road 9	0 – 69	Access Street	Residual Clay	6	Type 4	400
Road 10	0 – 149	Access Streat	Clay Fill	6	Type 4	400

4.5 Moisture Environment

Highly expansive soils (CBR swells > 2.5%) as defined in Austroads Part 2 were encountered at TP7, TP9 and TP14. Extreme moisture variations in these soils can potentially produce soil volume changes. Austroads Part 2 (2017) presents a series of options that can be adopted for highly expansive subgrades to assist in limiting the effects of potential soil volume changes:

- Provide a low permeability capping layer above the expansive subgrade such as a dense graded gravel with a PI of between 4% and 15%. The capping layer should have a thickness of at least 200mm and should extend at least 500mm past the edge of pavement (i.e. lip of kerb).;
- Construct the pavement when the subgrade is near its long term equilibrium soil moisture content (EMC). It is recommended that where possible the subgrade moisture content be less than OMC prior to placement of pavement layers;
- Install subsoil drains on both sides of the pavement ensuring that they extend to the base of the Select Fill layer;
- Restrict planting of trees and shrubs close to the pavement;
- Where subgrade passes proof roll and compaction can be achieved without reworking, do not rip and recompact subgrade; and
- Following construction of pavement and placement of primer seal, an assessment can then be made on whether to place the AC or delay the placement of the AC based on weather conditions at the time.

5 CONSTRUCTION

Construction recommendations for the pavement designs are included in the appended Pavement Thickness Design Sheets. In addition, the following general construction advice is given:

- A geotechnical assessment of the roads should be undertaken following boxing out of pavement areas to assess the need for localised areas requiring subgrade replacement or other treatment;
- Particular attention should be given to cut/fill boundaries that will be encountered along Road 5, Road 7 and Road 8. A geotechnical assessment of the cut/fill line is recommended prior to placement of pavement layers;
- It is noted that previous experience with the yellow residual clay soils that can be found in the area can be difficult to bridge when over-wet. Subgrade improvement works are likely to be required in these areas prior to filling. Treatment of the exposed subgrade with quick lime, incorporation of a granular bridging layer, or, potentially a rock drainage blanket may be required before placement of fill pending geotechnical assessment and it is recommended that an allowance be made for such conditions;
- Grade subgrade down towards shoulders;
- Proof roll the exposed subgrade to highlight any loose, soft, wet, or heaving areas. Where such areas are identified they should be removed and replaced with approved granular or Select Fill (CBR >15, PI<12) to design subgrade level;
- Drying back and moisture conditioning of the clay subgrade may be required prior to compaction;
- The top 300mm of natural subgrade below pavements or the final 300mm of placed road subgrade fill should be compacted to a minimum density ratio of 100% Standard Compaction;
- Pavement gravels should be placed and maintained at 60% to 90% of Optimum Moisture Content Should wet weather occur prior to final sealing, the base course should be allowed to dry back to not more than 90% of Optimum Moisture Content prior to sealing. Trapping of excess moisture below the final seal will significantly reduce pavement life;
- A primer seal should be used to protect the pavement and maintain equilibrium moisture content. Traffic should not be allowed on a primer seal for more than a few days prior to final sealing; and
- Care will be required to promote subsurface drainage to avoid accumulation of water in the pavement profile. Subsoil drains should therefore be installed and extend to 300mm below base of pavement on both sides of the road.

6 IMPORTANT INFORMATION

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

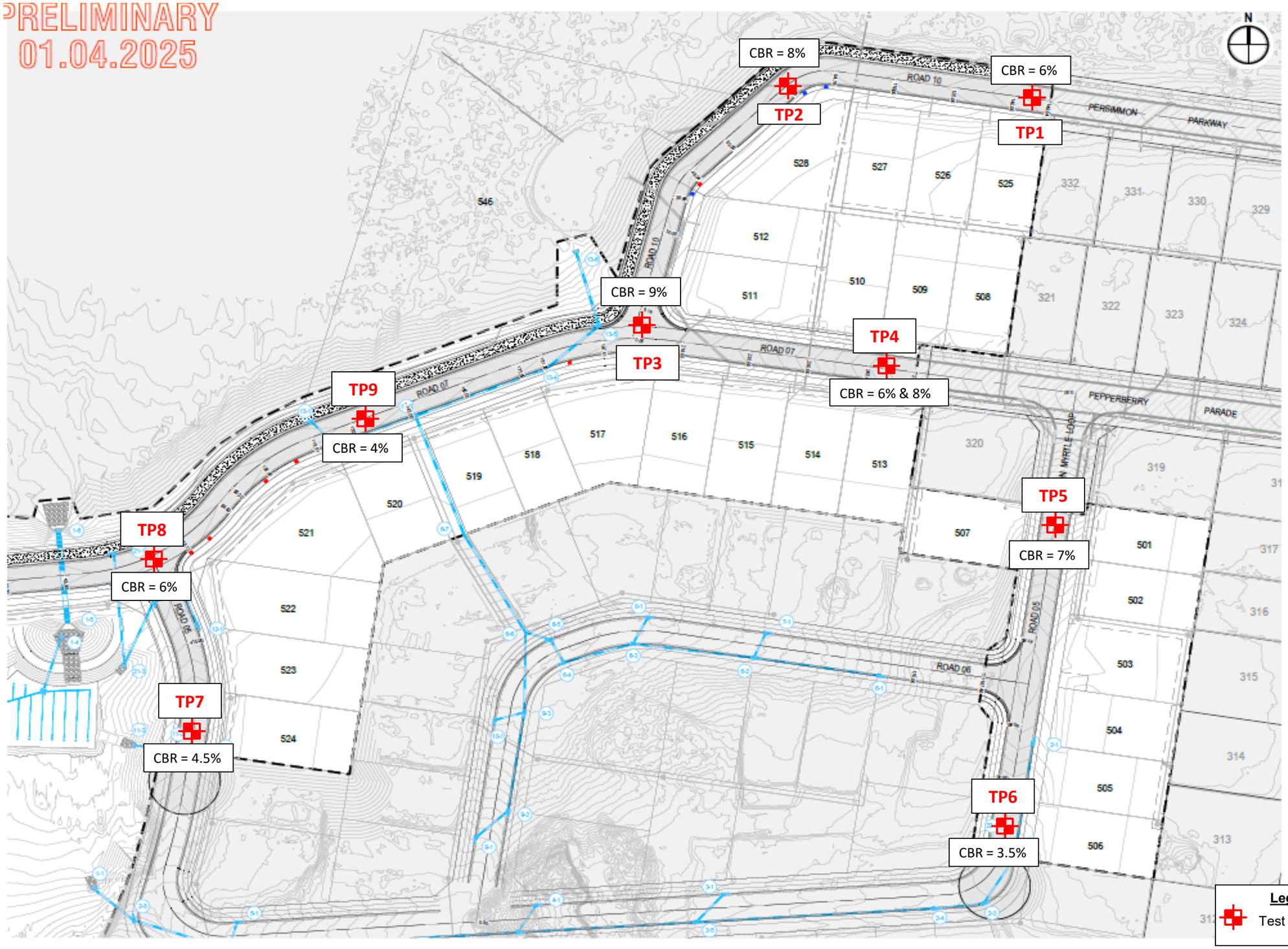
Reviewed by

Steve Morton

Principal Geotechnical Engineer

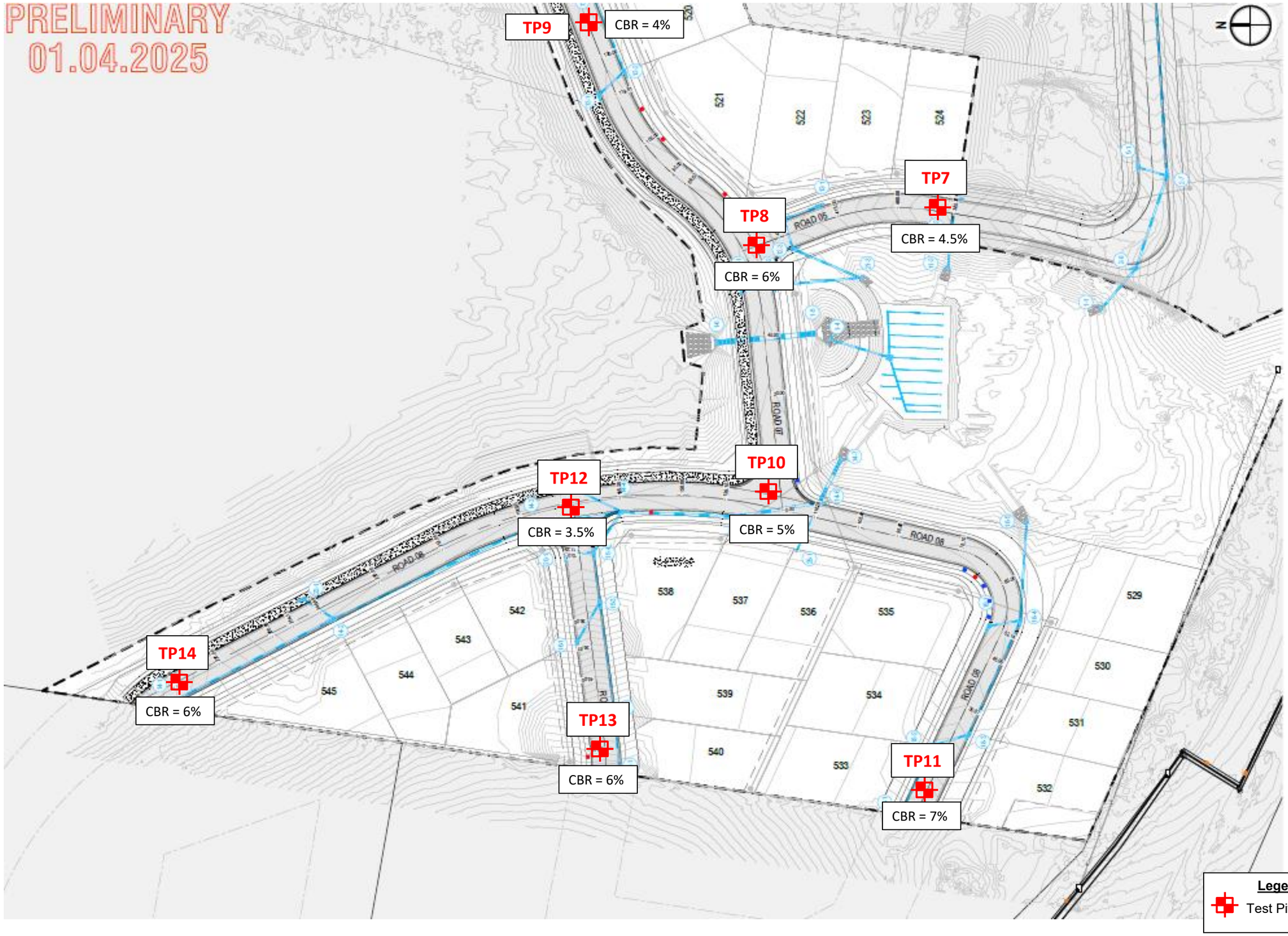
Figures

PRELIMINARY
01.04.2025



REGIONAL GEOTECHNICAL SOLUTIONS	Client:	King & Campbell Pty Ltd	Job No.	RGS21087.1-AU
	Project:	The Sanctuary, Stage 5 and 6 344 John Oxley Drive, Thrumster	Drawn By:	CO
			Scale:	NTS
			Date:	30-Jul-24
	Title:	INVESTIGATION LOCATION PLAN	Figure No.	1

PRELIMINARY
01.04.2025



REGIONAL GEOTECHNICAL SOLUTIONS	**Client:**	King & Campbell Pty Ltd	Job No.	RGS21087.1-AU
	Project:	The Sanctuary, Stage 5 and 6 344 John Oxley Drive, Thrumster	Drawn By:	CO
			Scale:	NTS
			Date:	6-Jun-25
	Title:	INVESTIGATION LOCATION PLAN	Figure No.	**1**

Appendix A

Soil & Rock Explanation Sheets

Results of Field Investigations

Soil Description Explanation Sheet

REGIONAL GEOTECHNICAL SOLUTIONS

The following summary of the description and classification of soils used by Regional Geotechnical Solutions Pty Ltd (RGS) in this report are based on Australia Standard AS1726-2017 'Geotechnical Site Investigations'. When describing soils, the dominant component is shown in upper case and secondary components are shown in lower case. Soil descriptions, in general, will contain soil type, plasticity or particle size/shape, colour, secondary components, consistency or density, moisture and inclusions, along with other relevant additional observations.

Particle Size Distribution		
Components	**Subdivision**	**Size (mm)**
Boulders		>200
Cobbles		63 - 200
Gravel	Coarse	19 - 63
	Medium	6.7 - 19
	Fine	2.36 - 6.7
Sand	Coarse	0.6 - 2.36
	Medium	0.21 - 0.6
	Fine	0.075 - 0.21
Silt		0.002 - 0.075
Clay		<0.002

Secondary & Minor Components			
Terminology	**Coarse Grained Soil**		**Fine Grained Soil**
	% Fines	**% Coarse**	**% Coarse**
Trace	≤5	≤15	≤15
With	>5, ≤12	>15, ≤30	>15, ≤30
Secondary	>12	>30	>30

Consistency			
Term	**Abbr.**	**Undrained Shear Strength (kPa)**	**Unconfined Compressive Strength (kPa)**
Very Soft	VS	<12	<24
Soft	S	12 - 25	25 – 50
Firm	F	25 - 50	50 – 100
Stiff	St	50 - 100	100 – 200
Very Stiff	VSt	100 - 200	200 – 400
Hard	H	>200	>400
Friable	Fb	Crumbles or powders under pressure	

Relative Density (Non-Cohesive Soils)		
Term	**Abbr.**	**Relative Density (%)**
Very Loose	VL	≤15
Loose	L	>15 and ≤35
Medium Dense	MD	>35 and ≤65
Dense	D	>65 and ≤85
Very Dense	VD	>85

Plasticity		
Term	**Range of Liquid Limit (Silt)**	**Range of Liquid Limit (Clay)**
Non-Plastic	Not applicable	Not applicable
Low Plasticity	≤50	≤35
Medium Plasticity	Not applicable	>35 and ≤50
High Plasticity	>50	>50

Moisture (Coarse Grained)	
Term	**Description**
Wet (W)	Feels cool, darkened and free water forms when handling
Moist (M)	Feels cool, slightly darkened, tends to stick together
Dry (D)	Non-cohesive and free-running

Moisture (Fine Grained)	
Term	**Description**
W < PL	Dry of Plastic Limit
w ≈ PL	Near Plastic Limit
W > PL	Wet of Plastic Limit

Soil Origin	
Term	**Description**
Fill	Any material placed by anthropogenic processes.
Topsoil	Near-surface soil often with high levels of organic material
Slopewash	Soils moved down a slope by gravity aided by non-channelled running water
Alluvial	Deposited by streams and rivers
Colluvial	Deposited by gravity, generally in gullies or at the base of slopes
Aeolian	Deposited by wind
Marine	Deposited in a marine environment
Lacustrine	Deposited in freshwater lakes
Estuarine	Deposited in coastal estuaries, including sediments carried by inflowing rivers and tidal currents
Residual	Formed in-situ through weathering of geological formations. No longer retains any visible structure of parent material
Extremely Weathered Material	Formed in-situ through weathering of geological formations. Retains structure of parent rock material but with soil strength.

Rock Description Explanation Sheet

REGIONAL GEOTECHNICAL SOLUTIONS

The following summary of the description and classification of rocks used in this report by Regional Geotechnical Solutions Pty Ltd (RGS) are based on Australia Standard AS1726-2017 'Geotechnical Site Investigations'. Material is described as a rock if it cannot be remoulded by hand in field conditions or when water is added. Rock descriptions, in general, will contain rock type, grain size, structure, colour, degree of weathering, strength, minor components and where applicable, the defect types, inclination, roughness and coating/infill.

Rock Description	
Sedimentary	Sedimentary rocks are deposited in beds, have grains that are cemented together and may be interbedded with varying sediment types.
Igneous	Igneous rocks are formed from molten rock and have a crystalline structure. Typically massive, with some exhibiting flow banding.
Metamorphic	Metamorphic rocks are formed when rocks are subject to significant heat and/or pressure. Commonly have direction fabric (e.g. foliation) although some are massive.
Simple rock names are often used in the absence of petrographic assessment. When rock cannot be precisely classified, the simple rock name should be chosen by considering the nature and shape of grains or crystals, the texture and fabric of the rock, the geological structure and setting along with geological map and/or knowledge of the area.	

Grain Size			
Rock Type	**Fine (F)**	**Medium (M)**	**Coarse (C)**
Sedimentary	0.06 – 0.2	0.2 – 0.6	0.6 – 2.0
Igneous / Metamorphic	<0.06	0.06 – 2.0	>2.0

Fabric & Texture		
Rock Type	**Term**	**Description**
Sedimentary	Bedding	Layering produced by changes in sedimentation. May be defined by grain size, colour etc.
	Lamination	Like bedding but developed in thin layers, typically less than 20mm.
Metamorphic	Foliation	Parallel arrangement of minerals due to metamorphic processes.
	Cleavage	A type of foliation developed in fine grained metamorphic rocks
Igneous	Flow Banding	Layering produced during flow of partially solidified igneous rock, causing crystals to become oriented.
The above terms are common terms for describing the type of texture and/or fabric in rock material. Other terms may be used.		

Degree of Fracturing	
Term	**Fracture Spacing (mm)**
Fragmented	<20
Highly Fractured	20 – 40
Fractured	40 – 200
Slightly Fractured	200 – 1,000
Unbroken	Core does not contain fractures

Rock Strength			
Term	**Abbr.**	**UCS (MPa)**	**Point Load, $I_{s(50)}$ (MPa)**
Very Low Strength	VL	0.6 – 2	0.03 – 0.1
Low Strength	L	2 - 6	0.1 – 0.3
Medium Strength	M	6 - 20	0.3 – 1.0
High Strength	H	20 - 60	1 – 3
Very High Strength	VH	60 - 200	3 – 10
Extremely High Strength	EH	>200	> 10
In absence of UCS testing or Point Load Testing a field assessment is made to adopt a strength classification.			

Weathering		
Term	**Abbr.**	**Definition**
Extremely Weathered	XW	Material is weathered to such an extent that it has soil properties. Mass structure and fabric of original rock are still visible
Highly Weathered	HW	Whole of rock material is discoloured, and rock strength is significantly changed. Some minerals have weathered to clay. Original colour is not recognisable due to iron staining, bleaching etc.
Moderately Weathered	MW	Whole of rock material is discoloured, with minor change to strength of fresh rock. Original colour is not recognisable due to iron staining, bleaching etc.
Slightly Weathered	SW	Rock is partially discoloured with staining or bleach along joints. Minimal or no change of strength from fresh rock.
Fresh	Fr	Rock shows no sign of decomposition of minerals or colour changes

Features, Inclusions & Minor Components	
Term	**Description**
Gas Bubbles	Vesicles if empty; amygdules if mineralized. Found in igneous rocks.
Veins	A sheet-like inclusion, can consist of quartz, calcite or other minerals
Cross-Bedding	Layering at an angle to the main bedding plane
Clast or Matrix Supported	Relevant to conglomerates and breccia. Clast supported is when clasts (i.e. gravel/cobbles) are in contact with each other and the matrix is filling the voids. Matrix supported is when clasts are not in contact and the matrix surrounds each clast.
The above terms are some common features, inclusions and minor components in rock material, however, other terms may be used.	

REGIONAL GEOTECHNICAL SOLUTIONS

ENGINEERING LOG - TEST PIT

CLIENT:	King & Campbell	**TEST PIT NO:**	**TP1**
PROJECT NAME:	Proposed Stage 5 & 6, The Sanctuary	**PAGE:**	1 of 1
SITE LOCATION:	344 John Oxley Drive, Thrumster NSW	**JOB NO:**	RGS21087.1
TEST LOCATION:	ROAD 10 Ch110m	**LOGGED BY:**	CO
		DATE:	8/4/25

EQUIPMENT TYPE:	3.5t Excavator		**EASTING:** 485186 m	**SURFACE RL:**	9.5 m
TEST PIT LENGTH:	1.5 m	**WIDTH:** 0.6 m	**NORTHING:** 6519936 m	**DATUM:**	AHD

Excavation and Sampling					Material description and profile information					Field Test		
METHOD	WATER	SAMPLES	RL (m)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION: Soil type, plasticity/particle characteristics,colour,minor components	MOISTURE CONDITION	CONSISTENCY DENSITY	Test Type	Result	Structure and additional observations
600mm Toothed Bucket	Not Encountered	0.10m	9.4	0.2		CI	**FILL:** Sandy CLAY, medium plasticity, traces of gravel fine to coarse grained, subangular.	M < w_P	H	HP	<600	FILL CLAY
		CBR								HP	<600	
		0.30m	9.2	0.4		CI	**FILL:** Sandy CLAY, medium plasticity, pale grey, red, traces of gravel fine to coarse grained, subangular.		H	HP	<600	
			9.0	0.6			Colour change to pale grey, red, pale brown from 0.6m			HP	<600	
			8.8	0.8								
			8.6	1.0						HP	<600	
			8.4	1.2			Hole Terminated at 1.00 m					
			8.2	1.4								
			8.0	1.6								
			7.8	1.8								
			7.6									

LEGEND:

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

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

Notes, Samples and Tests

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

Field Tests

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

Consistency

		UCS (kPa)
VS	Very Soft	<25
S	Soft	25 - 50
F	Firm	50 - 100
St	Stiff	100 - 200
VSt	Very Stiff	200 - 400
H	Hard	>400
Fb	Friable	

Density

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

Moisture Condition

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

REGIONAL GEOTECHNICAL SOLUTIONS

ENGINEERING LOG - TEST PIT

TEST PIT NO: TP2

CLIENT: King & Campbell | **PAGE:** 1 of 1

PROJECT NAME: Proposed Stage 5 & 6, The Sanctuary | **JOB NO:** RGS21087.1

SITE LOCATION: 344 John Oxley Drive, Thrumster NSW | **LOGGED BY:** CO

TEST LOCATION: ROAD 10 Ch75m | **DATE:** 8/4/25

EQUIPMENT TYPE: 3.5t Excavator | **EASTING:** 485157 m | **SURFACE RL:** 9.0 m

TEST PIT LENGTH: 1.5 m | **WIDTH:** 0.6 m | **NORTHING:** 6519925 m | **DATUM:** AHD

Excavation and Sampling					Material description and profile information					Field Test		
METHOD	WATER	SAMPLES	RL (m)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION: Soil type, plasticity/particle characteristics,colour,minor components	MOISTURE CONDITION	CONSISTENCY DENSITY	Test Type	Result	Structure and additional observations
600mm Toothed Bucket	Not Encountered	CBR 0.50m	8.8	0.2		Cl	**FILL:** Sandy CLAY, medium plasticity, pale grey, red, pale brown, traces of gravel fine to coarse grained, subangular.	M < w_P	H	HP	<600	FILL CLAY
			8.6	0.4						HP	<600	
			8.4	0.6						HP	<600	
							0.60m Colour change to pale brown, some red from 0.5m			HP	<600	
			8.2	0.8		CL	**FILL:** Sandy Gravelly CLAY, low to medium plasticity, black, some dark grey, fine to medium grained gravel.		VSt	HP	210	
							0.80m			HP	220	
			8.0	1.0		CH	**Silty Sandy CLAY:** Medium to high plasticity, grey with pale brown mottling, trace of rounded cobbles.		St	HP	150	ALLUVIAL
			7.8	1.2						HP	160	
			7.6	1.4						HP	150	
							1.50m			HP	150	
			7.4	1.6			Hole Terminated at 1.50 m					
			7.2	1.8								
			7.0									

LEGEND:

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

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

Notes, Samples and Tests

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

Field Tests

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

Consistency

		UCS (kPa)
VS	Very Soft	<25
S	Soft	25 - 50
F	Firm	50 - 100
St	Stiff	100 - 200
VSt	Very Stiff	200 - 400
H	Hard	>400
Fb	Friable	

Density

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

Moisture Condition

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

REGIONAL GEOTECHNICAL SOLUTIONS

ENGINEERING LOG - TEST PIT

TEST PIT NO: TP3

CLIENT: King & Campbell
PAGE: 1 of 1
PROJECT NAME: Proposed Stage 5 & 6, The Sanctuary
JOB NO: RGS21087.1
SITE LOCATION: 344 John Oxley Drive, Thrumster NSW
LOGGED BY: CO
TEST LOCATION: ROAD 07 Ch205m
DATE: 8/4/25

EQUIPMENT TYPE: 3.5t Excavator
EASTING: 485119 m
SURFACE RL: 9.8 m
TEST PIT LENGTH: 1.5 m
WIDTH: 0.6 m
NORTHING: 6519866 m
DATUM: AHD

Excavation and Sampling					Material description and profile information					Field Test		
METHOD	WATER	SAMPLES	RL (m)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION: Soil type, plasticity/particle characteristics,colour,minor components	MOISTURE CONDITION	CONSISTENCY DENSITY	Test Type	Result	Structure and additional observations
600mm Toothed Bucket	Not Encountered	CBR	9.6	0.2		CI	**FILL:** Sandy CLAY, medium plasticity, red, some pale grey, trace of fine to coarse grained gravel.	M < w_P	H	HP	<600	FILL CLAY
			9.4	0.4								
		0.55m	9.2	0.6			Colour change to pale brown, some red from 0.55m			HP	<600	
			9.0	0.8			Colour change to pale grey, some red from 0.75m			HP	<600	
			8.8	1.0			Colour change to red from 0.95m			HP	<600	
			8.6	1.2								
							1.30m					
			8.4	1.4		CL	**Silty Sandy CLAY:** Low to medium plasticity, grey with pale brown mottling, sand medium to coarse grained.					ALLUVIAL
							1.50m					
			8.2	1.6			Hole Terminated at 1.50 m					
			8.0	1.8								
			7.8									

LEGEND:

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

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

Notes, Samples and Tests

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

Field Tests

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

Consistency

		UCS (kPa)
VS	Very Soft	<25
S	Soft	25 - 50
F	Firm	50 - 100
St	Stiff	100 - 200
VSt	Very Stiff	200 - 400
H	Hard	>400
Fb	Friable	

Density

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

Moisture Condition

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

REGIONAL GEOTECHNICAL SOLUTIONS

ENGINEERING LOG - TEST PIT

TEST PIT NO: TP4

CLIENT: King & Campbell | **PAGE:** 1 of 1

PROJECT NAME: Proposed Stage 5 & 6, The Sanctuary | **JOB NO:** RGS21087.1

SITE LOCATION: 344 John Oxley Drive, Thrumster NSW | **LOGGED BY:** CO

TEST LOCATION: ROAD 07 Ch275m | **DATE:** 8/4/25

EQUIPMENT TYPE: 3.5t Excavator | **EASTING:** 485155 m | **SURFACE RL:** 12.2 m

TEST PIT LENGTH: 1.5 m | **WIDTH:** 0.6 m | **NORTHING:** 6519860 m | **DATUM:** AHD

Excavation 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	
600mm Toothed Bucket	Not Encountered	CBR 0.40m	12.0	0.2		CI	**FILL:** Sandy CLAY, medium plasticity, some red, pale grey, some fine to coarse grained gravel.	$M < w_P$	H	HP	500	FILL CLAY
										HP	<600	
			11.8	0.4			0.40m					
		0.75m				CL	**Sandy CLAY:** Low to medium plasticity, pale brown/grey, some fine to coarse grained gravel, traces of rock fabric.			HP	150	ALLUVIAL
			11.6	0.6								
			11.4	0.8					H / Fr	HP	<600	EXTREMELY WEATEHRED DOLERITE
		CBR 0.95m								HP	<600	
							0.95m			HP	<600	
			11.2	1.0			Hole Terminated at 0.95 m Practical Refusal of Toothed Bucket					
			11.0	1.2								
			10.8	1.4								
			10.6	1.6								
			10.4	1.8								

LEGEND:

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

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

Notes, Samples and Tests

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

Field Tests

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

Consistency

		UCS (kPa)
VS	Very Soft	<25
S	Soft	25 - 50
F	Firm	50 - 100
St	Stiff	100 - 200
VSt	Very Stiff	200 - 400
H	Hard	>400
Fb	Friable	

Density

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

Moisture Condition

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

REGIONAL GEOTECHNICAL SOLUTIONS

ENGINEERING LOG - TEST PIT

TEST PIT NO: TP5

CLIENT: King & Campbell | **PAGE:** 1 of 1

PROJECT NAME: Proposed Stage 5 & 6, The Sanctuary | **JOB NO:** RGS21087.1

SITE LOCATION: 344 John Oxley Drive, Thrumster NSW | **LOGGED BY:** CO

TEST LOCATION: ROAD 05 Ch40m | **DATE:** 8/4/25

EQUIPMENT TYPE: 3.5t Excavator | **EASTING:** 485222 m | **SURFACE RL:** 16.7 m

TEST PIT LENGTH: 1.5 m | **WIDTH:** 0.6 m | **NORTHING:** 6519807 m | **DATUM:** AHD

Excavation 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	
600mm Toothed Bucket	Not Encountered		16.6	0.2		GP	**FILL:** Sandy GRAVEL, fine to coarse grained.	D				FILL GRAVEL
		0.25m				GP	**Sandy GRAVEL:** Fine to medium grained, subangular, pale grey.					
			16.4	0.4		Cl	**Sandy CLAY:** Medium plasticity, red, trace of fine to coarse grained gravel.	M < w_P	H	HP	<600	RESIDUAL
			16.2	0.6						HP	<600	
		CBR	16.0	0.8						HP	<600	
		1.00m	15.8	1.0		Cl	**Sandy CLAY:** Medium plasticity, red, pale grey, trace of ironstone and lateritic gravel fine to coarse grained.		H			EXTREMELY WEATHERED SLATE
			15.6	1.2						HP	500	
			15.4	1.4						HP	500	
			15.2	1.5						HP	570	
				1.6			Hole Terminated at 1.50 m					
			15.0	1.8								
			14.8									

LEGEND:

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

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

Notes, Samples and Tests

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

Field Tests

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

Consistency

		UCS (kPa)
VS	Very Soft	<25
S	Soft	25 - 50
F	Firm	50 - 100
St	Stiff	100 - 200
VSt	Very Stiff	200 - 400
H	Hard	>400
Fb	Friable	

Density

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

Moisture Condition

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

REGIONAL GEOTECHNICAL SOLUTIONS

ENGINEERING LOG - TEST PIT

TEST PIT NO: TP6

CLIENT: King & Campbell | **PAGE:** 1 of 1

PROJECT NAME: Proposed Stage 5 & 6, The Sanctuary | **JOB NO:** RGS21087.1

SITE LOCATION: 344 John Oxley Drive, Thrumster NSW | **LOGGED BY:** CO

TEST LOCATION: ROAD 05 Ch120m | **DATE:** 8/4/25

EQUIPMENT TYPE: 3.5t Excavator | **EASTING:** 485208 m | **SURFACE RL:** 17.3 m

TEST PIT LENGTH: 1.5 m | **WIDTH:** 0.6 m | **NORTHING:** 6519723 m | **DATUM:** AHD

Excavation 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	
600mm Toothed Bucket	Not Encountered	CBR	17.2	0.2		Cl	**FILL:** Sandy CLAY, medium plasticity, red, some pale grey, some pale brown, some fine to coarse grained gravel.	M < w_P	VSt			FILL CLAY
			17.0	0.4						HP	250	
										HP	270	
		0.55m	16.8	0.6			0.55m					
			16.6				**DOLERITE:** Highly to moderately weathered, inferred low to medium strength. Excavates in block sizes of 20-80mm, dark grey/pale brown.					HIGHLY TO MODERATELY WEATHERED DOLERITE
				0.8			0.75m					
			16.4				Hole Terminated at 0.75 m Practical Refusal on Highly to Moderately Weathered Dolerite					
				1.0								
			16.2									
				1.2								
			16.0									
				1.4								
			15.8									
				1.6								
			15.6									
				1.8								
			15.4									

LEGEND:

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

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

Notes, Samples and Tests

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

Field Tests

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

Consistency

		UCS (kPa)
VS	Very Soft	<25
S	Soft	25 - 50
F	Firm	50 - 100
St	Stiff	100 - 200
VSt	Very Stiff	200 - 400
H	Hard	>400
Fb	Friable	

Density

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

Moisture Condition

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

REGIONAL GEOTECHNICAL SOLUTIONS

ENGINEERING LOG - TEST PIT

CLIENT:	King & Campbell	**TEST PIT NO:**	**TP7**
PROJECT NAME:	Proposed Stage 5 & 6, The Sanctuary	**PAGE:**	1 of 1
SITE LOCATION:	344 John Oxley Drive, Thrumster NSW	**JOB NO:**	RGS21087.1
TEST LOCATION:	ROAD 05 Ch390m	**LOGGED BY:**	CO
		DATE:	8/4/25

EQUIPMENT TYPE:	3.5t Excavator		**EASTING:** 485006 m	**SURFACE RL:**	12.6 m
TEST PIT LENGTH:	1.5 m	**WIDTH:** 0.6 m	**NORTHING:** 6519757 m	**DATUM:**	AHD

Excavation and Sampling					Material description and profile information					Field Test		
METHOD	WATER	SAMPLES	RL (m)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION: Soil type, plasticity/particle characteristics,colour,minor components	MOISTURE CONDITION	CONSISTENCY DENSITY	Test Type	Result	Structure and additional observations
600mm Toothed Bucket	Not Encountered	CBR 0.60m	12.4	0.2		CI	**FILL:** Sandy CLAY, medium plasticity, red, some pale grey, trace of fine to coarse grained GRAVEL.	M < w_P	H	HP	<600	FILL CLAY
			12.2	0.4								
			12.0	0.6			Colour change to pale grey from 0.6m		VSt	HP	300	
			11.8	0.8			Colour change to red, some pale grey from 0.8m		H	HP	<600	
			11.6	1.0								
			11.4	1.2			Colour change to pale grey, pale brown from 1.1m		VSt	HP	290	
							Colour change to red, pale grey, pale orange from 1.2m		H	HP	<600	
			11.2	1.4						HP	490	
							1.50m					
			11.0	1.6			Hole Terminated at 1.50 m					
			10.8	1.8								
			10.6									

LEGEND:

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

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

Notes, Samples and Tests

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

Field Tests

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

Consistency

		UCS (kPa)
VS	Very Soft	<25
S	Soft	25 - 50
F	Firm	50 - 100
St	Stiff	100 - 200
VSt	Very Stiff	200 - 400
H	Hard	>400
Fb	Friable	

Density

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

Moisture Condition

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

REGIONAL GEOTECHNICAL SOLUTIONS

ENGINEERING LOG - TEST PIT

TEST PIT NO: TP8

CLIENT: King & Campbell
PAGE: 1 of 1
PROJECT NAME: Proposed Stage 5 & 6, The Sanctuary
JOB NO: RGS21087.1
SITE LOCATION: 344 John Oxley Drive, Thrumster NSW
LOGGED BY: CO
TEST LOCATION: ROAD 07 Ch65m
DATE: 8/4/25

EQUIPMENT TYPE: 3.5t Excavator
EASTING: 484992 m
SURFACE RL: 11.3 m
TEST PIT LENGTH: 1.5 m
WIDTH: 0.6 m
NORTHING: 6519804 m
DATUM: AHD

Excavation and Sampling					Material description and profile information					Field Test		
METHOD	WATER	SAMPLES	RL (m)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION: Soil type, plasticity/particle characteristics,colour,minor components	MOISTURE CONDITION	CONSISTENCY DENSITY	Test Type	Result	Structure and additional observations
600mm Toothed Bucket	Not Encountered	CBR 0.45m	11.2	0.2		CI	**FILL:** Sandy Gravelly CLAY, medium plasticity, red, fine to coarse grained GRAVEL.	M < w_P	H	HP	<600	FILL
			11.0	0.4			Colour change to pale brown, some grey from 0.25m			HP	550	
			10.8	0.6			Colour change to red from 0.45m			HP	<600	
			10.6	0.8			Colour change to pale grey from 0.65m			HP	510	
			10.4	1.0			Colour change to red from 0.85			HP	520	
			10.2	1.2						HP	490	
			10.0	1.4			Colour change to pale grey, white from 1.25m			HP	<600	
			9.8	1.50m								
				1.6			Hole Terminated at 1.50 m					
			9.6	1.8								
			9.4									

LEGEND:

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

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

Notes, Samples and Tests

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

Field Tests

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

Consistency

		UCS (kPa)
VS	Very Soft	<25
S	Soft	25 - 50
F	Firm	50 - 100
St	Stiff	100 - 200
VSt	Very Stiff	200 - 400
H	Hard	>400
Fb	Friable	

Density

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

Moisture Condition

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

REGIONAL GEOTECHNICAL SOLUTIONS

ENGINEERING LOG - TEST PIT

TEST PIT NO: TP9

CLIENT: King & Campbell | **PAGE:** 1 of 1

PROJECT NAME: Proposed Stage 5 & 6, The Sanctuary | **JOB NO:** RGS21087.1

SITE LOCATION: 344 John Oxley Drive, Thrumster NSW | **LOGGED BY:** CO

TEST LOCATION: ROAD 07 Ch175m | **DATE:** 8/4/25

EQUIPMENT TYPE: 3.5t Excavator | **EASTING:** 485039 m | **SURFACE RL:** 10.2 m

TEST PIT LENGTH: 1.5 m | **WIDTH:** 0.6 m | **NORTHING:** 6519839 m | **DATUM:** AHD

Excavation and Sampling					Material description and profile information					Field Test		
METHOD	WATER	SAMPLES	RL (m)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION: Soil type, plasticity/particle characteristics,colour,minor components	MOISTURE CONDITION	CONSISTENCY DENSITY	Test Type	Result	Structure and additional observations
600mm Toothed Bucket	Not Encountered	CBR	10.0	0.2		CI	**FILL:** Sandy CLAY, medium plasticity, red, some fine to coarse grained GRAVEL.	M < w_P	H	HP	<600	FILL CLAY
			9.8	0.4								
			9.6	0.6			Colour change to pale brown, some red from 0.5m			HP	<600	
		0.80m	9.4	0.8			Colour change to red, pale grey/ white from 0.8m			HP	<600	
			9.2	1.0			Colour change to pale grey, some red from 1m			HP	<600	
			9.0	1.2								
			8.8	1.4			1.50m					
			8.6	1.6			Hole Terminated at 1.50 m					
			8.4	1.8								
			8.2									

LEGEND:

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

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

Notes, Samples and Tests

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

Field Tests

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

Consistency

		UCS (kPa)
VS	Very Soft	<25
S	Soft	25 - 50
F	Firm	50 - 100
St	Stiff	100 - 200
VSt	Very Stiff	200 - 400
H	Hard	>400
Fb	Friable	

Density

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

Moisture Condition

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

REGIONAL GEOTECHNICAL SOLUTIONS

ENGINEERING LOG - TEST PIT

TEST PIT NO: TP10

CLIENT: King & Campbell
PAGE: 1 of 1
PROJECT NAME: Proposed Stage 5 & 6, The Sanctuary
JOB NO: RGS21087.1
SITE LOCATION: 344 John Oxley Drive, Thrumster NSW
LOGGED BY: CO
TEST LOCATION: ROAD 08 Ch130m
DATE: 8/4/25

EQUIPMENT TYPE: 3.5t Excavator
EASTING: 484922 m
SURFACE RL: 12.5 m
TEST PIT LENGTH: 1.5 m
WIDTH: 0.6 m
NORTHING: 6519800 m
DATUM: AHD

Excavation and Sampling					Material description and profile information					Field Test		
METHOD	WATER	SAMPLES	RL (m)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION: Soil type, plasticity/particle characteristics,colour,minor components	MOISTURE CONDITION	CONSISTENCY DENSITY	Test Type	Result	Structure and additional observations
600mm Toothed Bucket	Not Encountered	CBR 0.45m	12.4 12.2 12.0 11.8 11.6 11.4 11.2 11.0 10.8 10.6	0.2 0.4 0.6 0.8 1.0 1.2 1.4 1.6 1.8		Cl	**FILL:** Sandy CLAY, medium plasticity, red, trace of ironstone gravel fine to coarse grained.	M < w_P	H	HP	<600	FILL CLAY
							Colour change to pale brown, pale grey, some red from 0.45m		VSt	HP	290	
							1.15m			HP	390	
						Cl	**Sandy CLAY:** Medium plasticity, red, sand fine to medium grained.		VSt	HP HP	310 420	RESIDUAL
							1.60m			HP	340	
							Hole Terminated at 1.60 m					

LEGEND:

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

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

Notes, Samples and Tests

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

Field Tests

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

Consistency

		UCS (kPa)
VS	Very Soft	<25
S	Soft	25 - 50
F	Firm	50 - 100
St	Stiff	100 - 200
VSt	Very Stiff	200 - 400
H	Hard	>400
Fb	Friable	

Density

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

Moisture Condition

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

REGIONAL GEOTECHNICAL SOLUTIONS

ENGINEERING LOG - TEST PIT

TEST PIT NO: TP11

CLIENT: King & Campbell | **PAGE:** 1 of 1

PROJECT NAME: Proposed Stage 5 & 6, The Sanctuary | **JOB NO:** RGS21087.1

SITE LOCATION: 344 John Oxley Drive, Thrumster NSW | **LOGGED BY:** CO

TEST LOCATION: ROAD 08 Ch10m | **DATE:** 8/4/25

EQUIPMENT TYPE: 3.5t Excavator | **EASTING:** 484866 m | **SURFACE RL:** 14.3 m

TEST PIT LENGTH: 1.5 m | **WIDTH:** 0.6 m | **NORTHING:** 6519754 m | **DATUM:** AHD

Excavation and Sampling					Material description and profile information					Field Test		
METHOD	WATER	SAMPLES	RL (m)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION: Soil type, plasticity/particle characteristics,colour,minor components	MOISTURE CONDITION	CONSISTENCY DENSITY	Test Type	Result	Structure and additional observations
600mm Toothed Bucket	Not Encountered		14.2	0.2		Cl	**FILL:** Sandy CLAY, medium plasticity, red, pale grey, trace of fine to medium grained gravel.	$M < w_P$	H	HP	500	FILL CLAY
							0.20m					
						Cl	**Sandy CLAY:** Medium plasticity, red, dark grey/ black, trace of gravel fine grained.			HP	520	RESIDUAL
		0.30m	14.0				0.30m					
				0.4		Cl	**Sandy CLAY:** Medium plasticity, red, sand fine to medium grained.		VSt	HP	300	
			13.8							HP	290	
				0.6								
			13.6									
				0.8								
			13.4									
				1.0								
		CBR	13.2									
				1.2								
			13.0									
				1.4								
			12.8							HP	260	
				1.6								
			12.6									
		1.80m		1.8			1.80m					
							Hole Terminated at 1.80 m					
			12.4									

LEGEND:

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

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

Notes, Samples and Tests

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

Field Tests

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

Consistency

		UCS (kPa)
VS	Very Soft	<25
S	Soft	25 - 50
F	Firm	50 - 100
St	Stiff	100 - 200
VSt	Very Stiff	200 - 400
H	Hard	>400
Fb	Friable	

Density

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

Moisture Condition

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

REGIONAL GEOTECHNICAL SOLUTIONS

ENGINEERING LOG - TEST PIT

TEST PIT NO: TP12

CLIENT: King & Campbell
PAGE: 1 of 1
PROJECT NAME: Proposed Stage 5 & 6, The Sanctuary
JOB NO: RGS21087.1
SITE LOCATION: 344 John Oxley Drive, Thrumster NSW
LOGGED BY: CO
TEST LOCATION: ROAD 08 Ch175m
DATE: 8/4/25

EQUIPMENT TYPE: 3.5t Excavator
EASTING: 484921 m
SURFACE RL: 11.7 m
TEST PIT LENGTH: 1.5 m
WIDTH: 0.6 m
NORTHING: 6519847 m
DATUM: AHD

Excavation 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	
600mm Toothed Bucket	Not Encountered	0.10m	11.6	0.2		CI	**FILL:** Sandy CLAY, medium plasticity, red, trace of gravel fine to medium grained. 0.10m	M < w_P	H	HP	480	FILL CLAY
			11.4	0.4		CI	**Sandy CLAY:** Medium plasticity, red, sand fine to medium grained.		VSt	HP	300	RESIDUAL
			11.2	0.6						HP	250	
			11.0	0.8						HP	310	
		CBR	10.8	1.0								
			10.6	1.2						HP	270	
			10.4	1.4								
		1.60m	10.2	1.6			1.60m			HP	310	
			10.0	1.8			Hole Terminated at 1.60 m					
			9.8									

LEGEND:

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

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

Notes, Samples and Tests

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

Field Tests

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

Consistency

		UCS (kPa)
VS	Very Soft	<25
S	Soft	25 - 50
F	Firm	50 - 100
St	Stiff	100 - 200
VSt	Very Stiff	200 - 400
H	Hard	>400
Fb	Friable	

Density

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

Moisture Condition

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

REGIONAL GEOTECHNICAL SOLUTIONS

ENGINEERING LOG - TEST PIT

TEST PIT NO: TP13

CLIENT: King & Campbell | **PAGE:** 1 of 1

PROJECT NAME: Proposed Stage 5 & 6, The Sanctuary | **JOB NO:** RGS21087.1

SITE LOCATION: 344 John Oxley Drive, Thrumster NSW | **LOGGED BY:** CO

TEST LOCATION: ROAD 09 Ch60m | **DATE:** 8/4/25

EQUIPMENT TYPE: 3.5t Excavator | **EASTING:** 484876 m | **SURFACE RL:** 17.0 m

TEST PIT LENGTH: 1.5 m | **WIDTH:** 0.6 m | **NORTHING:** 6519846 m | **DATUM:** AHD

Excavation and Sampling					Material description and profile information					Field Test		
METHOD	WATER	SAMPLES	RL (m)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION: Soil type, plasticity/particle characteristics,colour,minor components	MOISTURE CONDITION	CONSISTENCY DENSITY	Test Type	Result	Structure and additional observations
600mm Toothed Bucket	Not Encountered	0.10m				CI	**FILL:** Sandy CLAY, medium plasticity, red, trace of gravel fine to medium grained. 0.10m	M < w_P	H	HP	<600	FILL
			16.8	0.2		CI	**Sandy CLAY:** Medium plasticity, red, sand fine to medium grained.		VSt	HP	390	RESIDUAL
			16.6	0.4					H			
			16.4	0.6						HP	540	
		CBR	16.2	0.8					VSt	HP	340	
			16.0	1.0						HP	390	
		1.50m	15.8	1.2			1.50m					
			15.6	1.4			Hole Terminated at 1.50 m					
			15.4	1.6								
			15.2	1.8								

LEGEND:

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

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

Notes, Samples and Tests

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

Field Tests

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

Consistency

		UCS (kPa)
VS	Very Soft	<25
S	Soft	25 - 50
F	Firm	50 - 100
St	Stiff	100 - 200
VSt	Very Stiff	200 - 400
H	Hard	>400
Fb	Friable	

Density

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

Moisture Condition

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

REGIONAL GEOTECHNICAL SOLUTIONS

ENGINEERING LOG - TEST PIT

TEST PIT NO: TP14

CLIENT: King & Campbell
PAGE: 1 of 1
PROJECT NAME: Proposed Stage 5 & 6, The Sanctuary
JOB NO: RGS21087.1
SITE LOCATION: 344 John Oxley Drive, Thrumster NSW
LOGGED BY: CO
TEST LOCATION: ROAD 08 Ch280m
DATE: 8/4/25

EQUIPMENT TYPE: 3.5t Excavator
EASTING: 484895 m
SURFACE RL: 11.8 m
TEST PIT LENGTH:
WIDTH:
NORTHING: 6519909 m
DATUM: AHD

Excavation and Sampling					Material description and profile information					Field Test		
METHOD	WATER	SAMPLES	RL (m)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION: Soil type, plasticity/particle characteristics,colour,minor components	MOISTURE CONDITION	CONSISTENCY DENSITY	Test Type	Result	Structure and additional observations
600mm Toothed Bucket	Not Encountered	CBR	11.6	0.2		CI	**Sandy CLAY:** Medium plasticity, red, some pale brown, trace of GRAVEL, fine grained.	M < w_P	H	HP	410	EXTREMELY WEATHERED SLATE
			11.4	0.4								
			11.2	0.6						HP	500	
			11.0	0.8								
			10.8	1.0						HP	440	
			10.6	1.2						HP	420	
		1.50m	10.4	1.4			1.50m					
							Hole Terminated at 1.50 m					
			10.2	1.6								
			10.0	1.8								

LEGEND:

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

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

Notes, Samples and Tests

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

Field Tests

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

Consistency

		UCS (kPa)
VS	Very Soft	<25
S	Soft	25 - 50
F	Firm	50 - 100
St	Stiff	100 - 200
VSt	Very Stiff	200 - 400
H	Hard	>400
Fb	Friable	

Density

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

Moisture Condition

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

Appendix B

Laboratory Test Results

Material Test Report

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

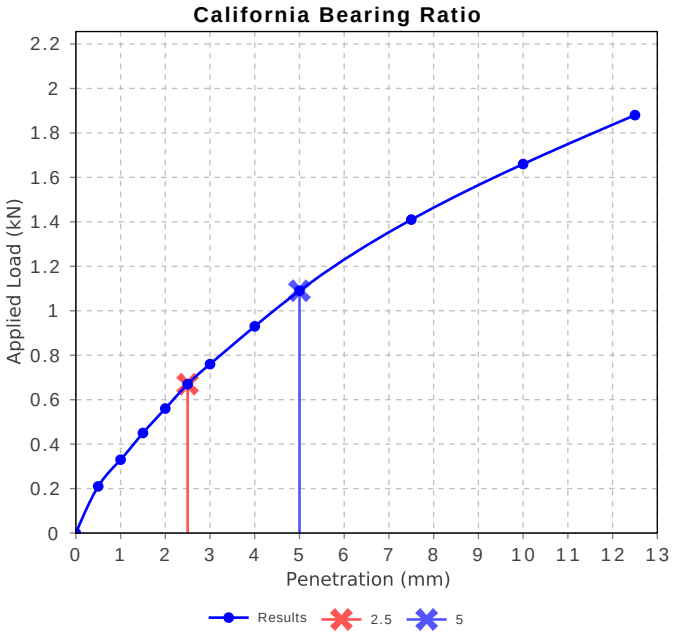
Accredited for compliance with ISO/IEC 17025 - Testing

NATA WORLD RECOGNISED ACCREDITATION

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

Report Number: **MNC16P-0001-239**
Issue Number: 1
Date Issued: 29/04/2025
Client: Regional Geotechnical Solutions Pty Ltd
82 Combined Street, Wingham NSW 2429
Project Number: MNC16P-0001
Project Name: Various Testing
Project Location: 344 John Oxley Drive, Thrumster
Client Reference: RGS21087.1
Work Request: 9459
Sample Number: NEW25S-9459A
Date Sampled: 09/04/2025
Dates Tested: 10/04/2025 - 28/04/2025
Sampling Method: Sampled by Client
The results apply to the sample as received
Sample Location: **TP1 - (0.1 - 0.3m)**
Material: Clay
Material Source: On-Site Insitu

California Bearing Ratio (AS 1289 6.1.1 & 2.1.1)		Min	Max
CBR taken at	5 mm		
CBR %	**6**		
Method of Compactive Effort	Standard		
Method used to Determine MDD	AS 1289 5.1.1 & 2.1.1		
Method used to Determine Plasticity	Visual / Tactile		
Maximum Dry Density (t/m^3)	1.51		
Optimum Moisture Content (%)	28.0		
Laboratory Density Ratio (%)	100.0		
Laboratory Moisture Ratio (%)	99.5		
Dry Density after Soaking (t/m^3)	1.47		
Field Moisture Content (%)	27.6		
Moisture Content at Placement (%)	27.9		
Moisture Content Top 30mm (%)	27.8		
Moisture Content Rest of Sample (%)	26.2		
Mass Surcharge (kg)	4.5		
Soaking Period (days)	4		
Curing Hours (h)	185.5		
Swell (%)	2.5		
Oversize Material (mm)	19		
Oversize Material Included	Excluded		
Oversize Material (%)	0.0		



Material Test Report

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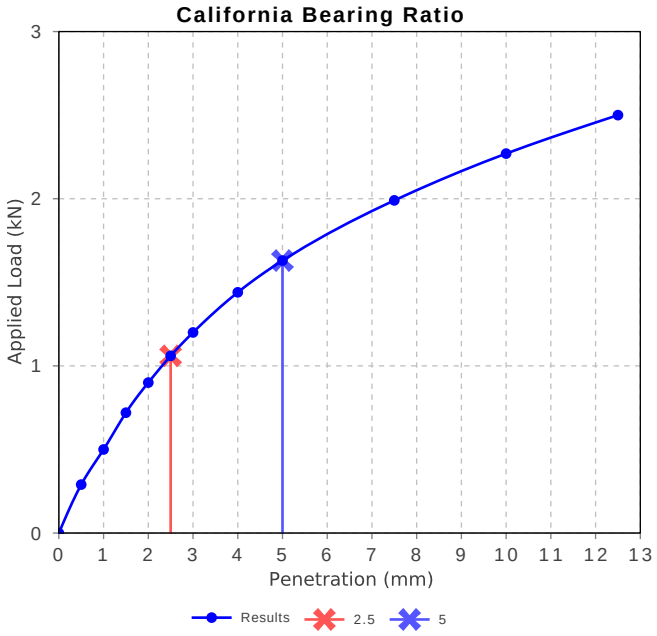
Accredited for compliance with ISO/IEC 17025 - Testing

NATA WORLD RECOGNISED ACCREDITATION

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

Report Number: **MNC16P-0001-239**
Issue Number: 1
Date Issued: 29/04/2025
Client: Regional Geotechnical Solutions Pty Ltd
82 Combined Street, Wingham NSW 2429
Project Number: MNC16P-0001
Project Name: Various Testing
Project Location: 344 John Oxley Drive, Thrumster
Client Reference: RGS21087.1
Work Request: 9459
Sample Number: NEW25S-9459B
Date Sampled: 09/04/2025
Dates Tested: 10/04/2025 - 28/04/2025
Sampling Method: Sampled by Client
The results apply to the sample as received
Sample Location: **TP2 - (0.0 - 0.5m)**
Material: Clay
Material Source: On-Site Insitu

California Bearing Ratio (AS 1289 6.1.1 & 2.1.1)		Min	Max
CBR taken at	5 mm		
CBR %	**8**		
Method of Compactive Effort	Standard		
Method used to Determine MDD	AS 1289 5.1.1 & 2.1.1		
Method used to Determine Plasticity	Visual / Tactile		
Maximum Dry Density (t/m^3)	1.57		
Optimum Moisture Content (%)	24.0		
Laboratory Density Ratio (%)	99.5		
Laboratory Moisture Ratio (%)	101.5		
Dry Density after Soaking (t/m^3)	1.54		
Field Moisture Content (%)	25.0		
Moisture Content at Placement (%)	24.4		
Moisture Content Top 30mm (%)	28.6		
Moisture Content Rest of Sample (%)	24.4		
Mass Surcharge (kg)	4.5		
Soaking Period (days)	4		
Curing Hours (h)	185.7		
Swell (%)	1.5		
Oversize Material (mm)	19		
Oversize Material Included	Excluded		
Oversize Material (%)	0.0		



Material Test Report

Qualtest LABORATORY (NSW) PTY LTD
Newcastle Laboratory
2 Murray Dwyer Circuit Mayfield West NSW 2304
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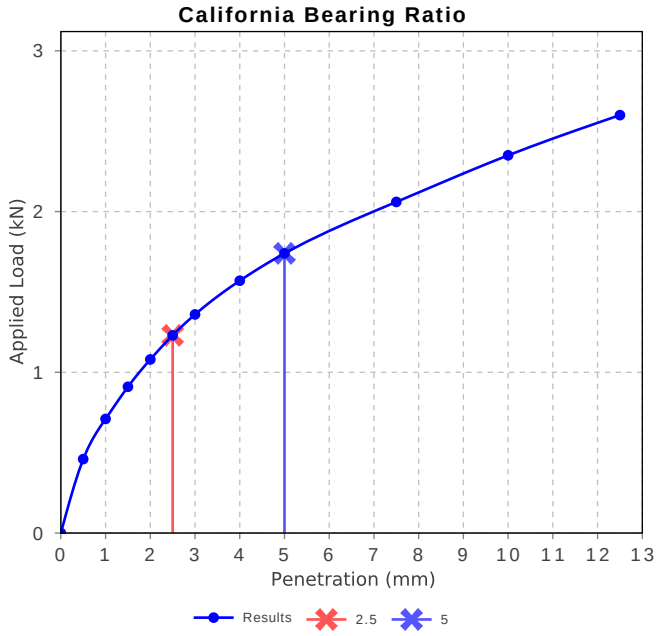
NATA WORLD RECOGNISED ACCREDITATION

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

Report Number: **MNC16P-0001-239**
Issue Number: 1
Date Issued: 29/04/2025
Client: Regional Geotechnical Solutions Pty Ltd
82 Combined Street, Wingham NSW 2429
Project Number: MNC16P-0001
Project Name: Various Testing
Project Location: 344 John Oxley Drive, Thrumster
Client Reference: RGS21087.1
Work Request: 9459
Sample Number: NEW25S-9459C
Date Sampled: 09/04/2025
Dates Tested: 10/04/2025 - 28/04/2025
Sampling Method: Sampled by Client
The results apply to the sample as received
Sample Location: **TP3 - (0.00 - 0.55m)**
Material: Clay
Material Source: On-Site Insitu

California Bearing Ratio (AS 1289 6.1.1 & 2.1.1)		Min	Max
CBR taken at	2.5 mm		
CBR %	**9**		
Method of Compactive Effort	Standard		
Method used to Determine MDD	AS 1289 5.1.1 & 2.1.1		
Method used to Determine Plasticity	Visual / Tactile		
Maximum Dry Density (t/m^3)	1.54		
Optimum Moisture Content (%)	25.0		
Laboratory Density Ratio (%)	100.0		
Laboratory Moisture Ratio (%)	100.5		
Dry Density after Soaking (t/m^3)	1.51		
Field Moisture Content (%)	28.2		
Moisture Content at Placement (%)	25.1		
Moisture Content Top 30mm (%)	30.0		
Moisture Content Rest of Sample (%)	26.0		
Mass Surcharge (kg)	4.5		
Soaking Period (days)	4		
Curing Hours (h)	186.4		
Swell (%)	1.5		
Oversize Material (mm)	19		
Oversize Material Included	Excluded		
Oversize Material (%)	0.0		



Material Test Report

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Newcastle Laboratory
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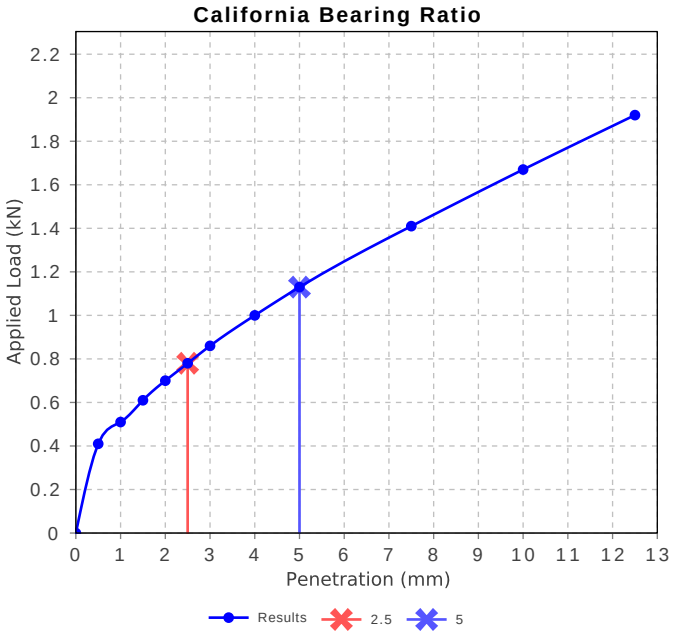
NATA WORLD RECOGNISED ACCREDITATION

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

Report Number: **MNC16P-0001-239**
Issue Number: 1
Date Issued: 29/04/2025
Client: Regional Geotechnical Solutions Pty Ltd
82 Combined Street, Wingham NSW 2429
Project Number: MNC16P-0001
Project Name: Various Testing
Project Location: 344 John Oxley Drive, Thrumster
Client Reference: RGS21087.1
Work Request: 9459
Sample Number: NEW25S-9459D
Date Sampled: 09/04/2025
Dates Tested: 10/04/2025 - 28/04/2025
Sampling Method: Sampled by Client
The results apply to the sample as received
Sample Location: **TP4 - (0.0 - 0.4m)**
Material: Clay
Material Source: On-Site Insitu

California Bearing Ratio (AS 1289 6.1.1 & 2.1.1)		Min	Max
CBR taken at	2.5 mm		
CBR %	**6**		
Method of Compactive Effort	Standard		
Method used to Determine MDD	AS 1289 5.1.1 & 2.1.1		
Method used to Determine Plasticity	Visual / Tactile		
Maximum Dry Density (t/m^3)	1.47		
Optimum Moisture Content (%)	30.5		
Laboratory Density Ratio (%)	100.0		
Laboratory Moisture Ratio (%)	98.5		
Dry Density after Soaking (t/m^3)	1.45		
Field Moisture Content (%)	24.5		
Moisture Content at Placement (%)	30.2		
Moisture Content Top 30mm (%)	30.1		
Moisture Content Rest of Sample (%)	28.6		
Mass Surcharge (kg)	4.5		
Soaking Period (days)	4		
Curing Hours (h)	187.2		
Swell (%)	1.5		
Oversize Material (mm)	19		
Oversize Material Included	Excluded		
Oversize Material (%)	0.0		



Material Test Report

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

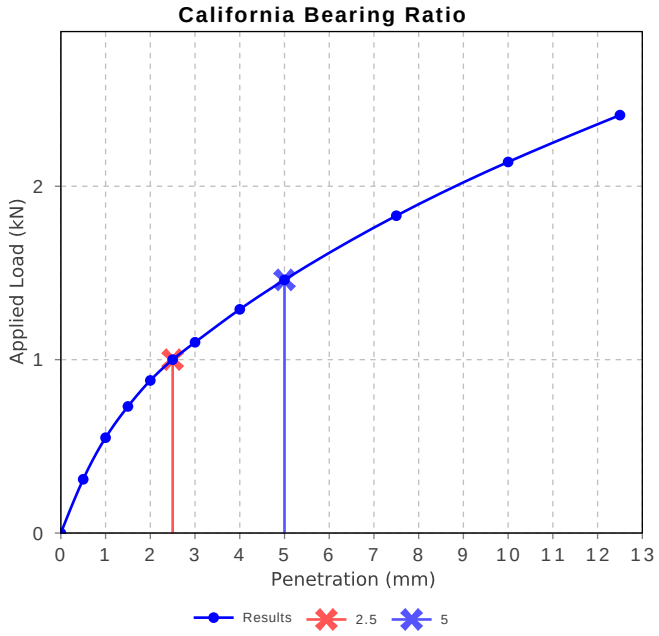
Accredited for compliance with ISO/IEC 17025 - Testing

NATA WORLD RECOGNISED ACCREDITATION

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

Report Number: **MNC16P-0001-239**
Issue Number: 1
Date Issued: 29/04/2025
Client: Regional Geotechnical Solutions Pty Ltd
82 Combined Street, Wingham NSW 2429
Project Number: MNC16P-0001
Project Name: Various Testing
Project Location: 344 John Oxley Drive, Thrumster
Client Reference: RGS21087.1
Work Request: 9459
Sample Number: NEW25S-9459E
Date Sampled: 09/04/2025
Dates Tested: 10/04/2025 - 28/04/2025
Sampling Method: Sampled by Client
The results apply to the sample as received
Sample Location: **TP4 - (0.75 - 0.95m)**
Material: Clay
Material Source: On-Site Insitu

California Bearing Ratio (AS 1289 6.1.1 & 2.1.1)		Min	Max
CBR taken at	2.5 mm		
CBR %	**8**		
Method of Compactive Effort	Standard		
Method used to Determine MDD	AS 1289 5.1.1 & 2.1.1		
Method used to Determine Plasticity	Visual / Tactile		
Maximum Dry Density (t/m^3)	1.86		
Optimum Moisture Content (%)	16.5		
Laboratory Density Ratio (%)	99.5		
Laboratory Moisture Ratio (%)	101.0		
Dry Density after Soaking (t/m^3)	1.83		
Field Moisture Content (%)	15.8		
Moisture Content at Placement (%)	16.8		
Moisture Content Top 30mm (%)	18.6		
Moisture Content Rest of Sample (%)	17.6		
Mass Surcharge (kg)	4.5		
Soaking Period (days)	4		
Curing Hours (h)	187.9		
Swell (%)	1.0		
Oversize Material (mm)	19		
Oversize Material Included	Excluded		
Oversize Material (%)	0.0		



Material Test Report

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

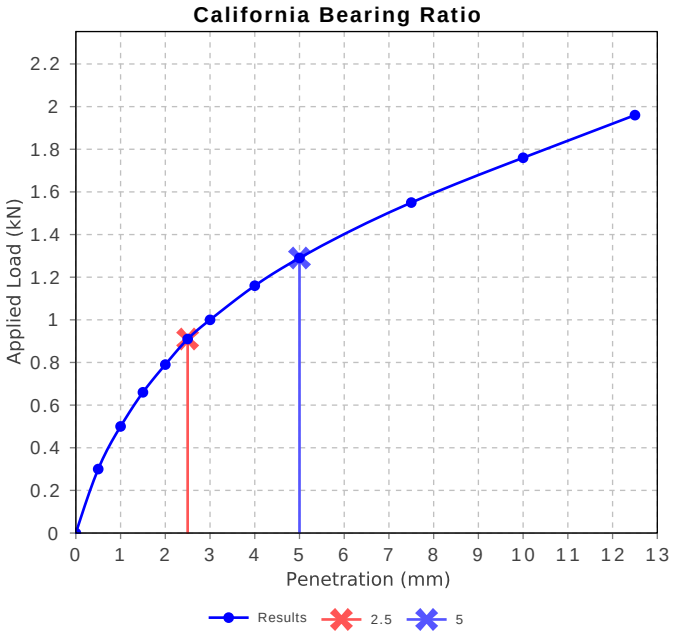
Accredited for compliance with ISO/IEC 17025 - Testing

NATA WORLD RECOGNISED ACCREDITATION

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

Report Number: **MNC16P-0001-239**
Issue Number: 1
Date Issued: 29/04/2025
Client: Regional Geotechnical Solutions Pty Ltd
82 Combined Street, Wingham NSW 2429
Project Number: MNC16P-0001
Project Name: Various Testing
Project Location: 344 John Oxley Drive, Thrumster
Client Reference: RGS21087.1
Work Request: 9459
Sample Number: NEW25S-9459F
Date Sampled: 09/04/2025
Dates Tested: 10/04/2025 - 28/04/2025
Sampling Method: Sampled by Client
The results apply to the sample as received
Sample Location: **TP5 - (0.25 - 1.0m)**
Material: Clay
Material Source: On-Site Insitu

California Bearing Ratio (AS 1289 6.1.1 & 2.1.1)		Min	Max
CBR taken at	2.5 mm		
CBR %	**7**		
Method of Compactive Effort	Standard		
Method used to Determine MDD	AS 1289 5.1.1 & 2.1.1		
Method used to Determine Plasticity	Visual / Tactile		
Maximum Dry Density (t/m^3)	1.50		
Optimum Moisture Content (%)	28.0		
Laboratory Density Ratio (%)	99.5		
Laboratory Moisture Ratio (%)	102.0		
Dry Density after Soaking (t/m^3)	1.49		
Field Moisture Content (%)	27.9		
Moisture Content at Placement (%)	28.3		
Moisture Content Top 30mm (%)	31.6		
Moisture Content Rest of Sample (%)	31.3		
Mass Surcharge (kg)	4.5		
Soaking Period (days)	4		
Curing Hours (h)	187.2		
Swell (%)	0.5		
Oversize Material (mm)	19		
Oversize Material Included	Excluded		
Oversize Material (%)	0.0		



Material Test Report

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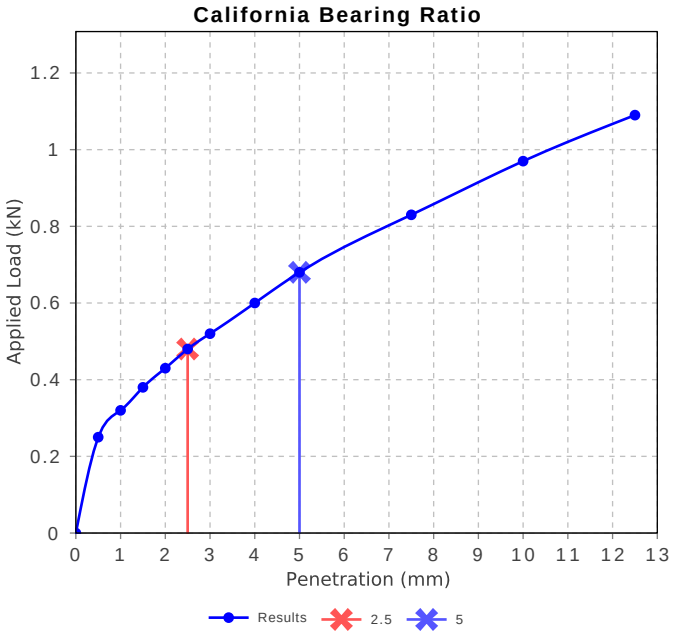
Approved Signatory: Brent Cullen
Engineering Geologist
NATA Accredited Laboratory Number: 18686

Report Number: **MNC16P-0001-239**
Issue Number: 1
Date Issued: 29/04/2025
Client: Regional Geotechnical Solutions Pty Ltd
82 Combined Street, Wingham NSW 2429
Project Number: MNC16P-0001
Project Name: Various Testing
Project Location: 344 John Oxley Drive, Thrumster
Client Reference: RGS21087.1
Work Request: 9459
Sample Number: NEW25S-9459G
Date Sampled: 09/04/2025
Dates Tested: 10/04/2025 - 24/04/2025
Sampling Method: Sampled by Client
The results apply to the sample as received
Sample Location: **TP6 - (0.00 - 0.55m)**
Material: Clay
Material Source: On-Site Insitu

California Bearing Ratio (AS 1289 6.1.1 & 2.1.1)		Min	Max
CBR taken at	2.5 mm		
CBR %	**3.5**		
Method of Compactive Effort	Standard		
Method used to Determine MDD	AS 1289 5.1.1 & 2.1.1		
Method used to Determine Plasticity	Visual / Tactile		
Maximum Dry Density (t/m^3)	1.50		
Optimum Moisture Content (%)	30.0		
Laboratory Density Ratio (%)	99.5		
Laboratory Moisture Ratio (%)	99.5		
Dry Density after Soaking (t/m^3)	1.47		
Field Moisture Content (%)	29.9		
Moisture Content at Placement (%)	29.8		
Moisture Content Top 30mm (%)	31.1		
Moisture Content Rest of Sample (%)	29.9		
Mass Surcharge (kg)	4.5		
Soaking Period (days)	4		
Curing Hours (h)	185.3		
Swell (%)	1.5		
Oversize Material (mm)	19		
Oversize Material Included	Excluded		
Oversize Material (%)	0.0		



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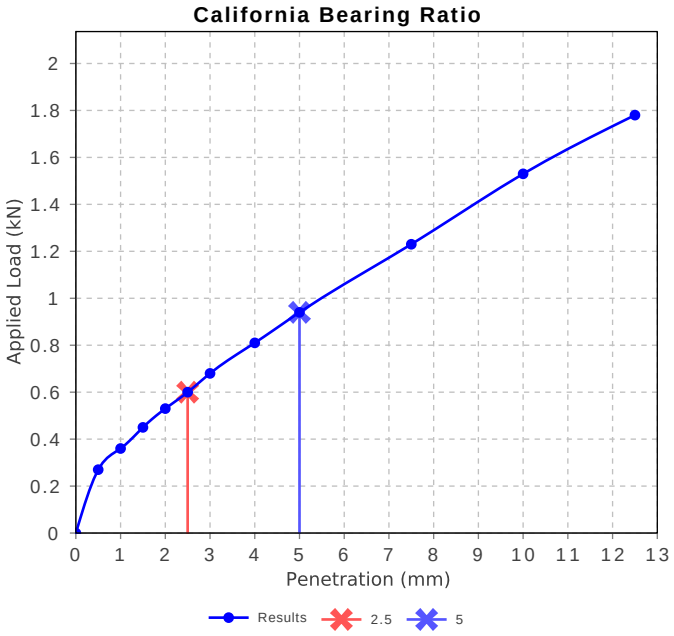
NATA Accredited Laboratory Number: 18686

Report Number: **MNC16P-0001-239**
Issue Number: 1
Date Issued: 29/04/2025
Client: Regional Geotechnical Solutions Pty Ltd
82 Combined Street, Wingham NSW 2429
Project Number: MNC16P-0001
Project Name: Various Testing
Project Location: 344 John Oxley Drive, Thrumster
Client Reference: RGS21087.1
Work Request: 9459
Sample Number: NEW25S-9459H
Date Sampled: 09/04/2025
Dates Tested: 10/04/2025 - 24/04/2025
Sampling Method: Sampled by Client
The results apply to the sample as received
Sample Location: **TP7 - (0.0 - 0.6m)**
Material: Clay
Material Source: On-Site Insitu

California Bearing Ratio (AS 1289 6.1.1 & 2.1.1)		Min	Max
CBR taken at	5 mm		
CBR %	**4.5**		
Method of Compactive Effort	Standard		
Method used to Determine MDD	AS 1289 5.1.1 & 2.1.1		
Method used to Determine Plasticity	Visual / Tactile		
Maximum Dry Density (t/m^3)	1.53		
Optimum Moisture Content (%)	28.0		
Laboratory Density Ratio (%)	100.5		
Laboratory Moisture Ratio (%)	98.0		
Dry Density after Soaking (t/m^3)	1.49		
Field Moisture Content (%)	27.2		
Moisture Content at Placement (%)	27.6		
Moisture Content Top 30mm (%)	29.9		
Moisture Content Rest of Sample (%)	26.9		
Mass Surcharge (kg)	4.5		
Soaking Period (days)	4		
Curing Hours (h)	185.8		
Swell (%)	3.0		
Oversize Material (mm)	19		
Oversize Material Included	Excluded		
Oversize Material (%)	0.0		



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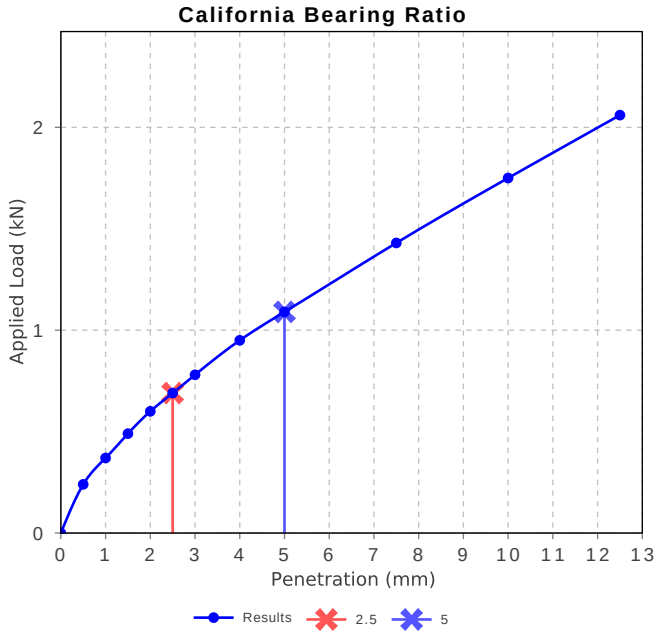
Report Number: **MNC16P-0001-239**
Issue Number: 1
Date Issued: 29/04/2025
Client: Regional Geotechnical Solutions Pty Ltd
82 Combined Street, Wingham NSW 2429
Project Number: MNC16P-0001
Project Name: Various Testing
Project Location: 344 John Oxley Drive, Thrumster
Client Reference: RGS21087.1
Work Request: 9459
Sample Number: NEW25S-9459I
Date Sampled: 09/04/2025
Dates Tested: 10/04/2025 - 24/04/2025
Sampling Method: Sampled by Client
The results apply to the sample as received
Sample Location: **TP8 - (0.00 - 0.45m)**
Material: Clay
Material Source: On-Site Insitu

California Bearing Ratio (AS 1289 6.1.1 & 2.1.1)		Min	Max
CBR taken at	5 mm		
CBR %	**6**		
Method of Compactive Effort	Standard		
Method used to Determine MDD	AS 1289 5.1.1 & 2.1.1		
Method used to Determine Plasticity	Visual / Tactile		
Maximum Dry Density (t/m^3)	1.55		
Optimum Moisture Content (%)	25.0		
Laboratory Density Ratio (%)	99.5		
Laboratory Moisture Ratio (%)	101.5		
Dry Density after Soaking (t/m^3)	1.50		
Field Moisture Content (%)	26.0		
Moisture Content at Placement (%)	25.6		
Moisture Content Top 30mm (%)	28.3		
Moisture Content Rest of Sample (%)	25.6		
Mass Surcharge (kg)	4.5		
Soaking Period (days)	4		
Curing Hours (h)	186.5		
Swell (%)	2.5		
Oversize Material (mm)	19		
Oversize Material Included	Excluded		
Oversize Material (%)	0.0		



Material Test Report

Newcastle Laboratory
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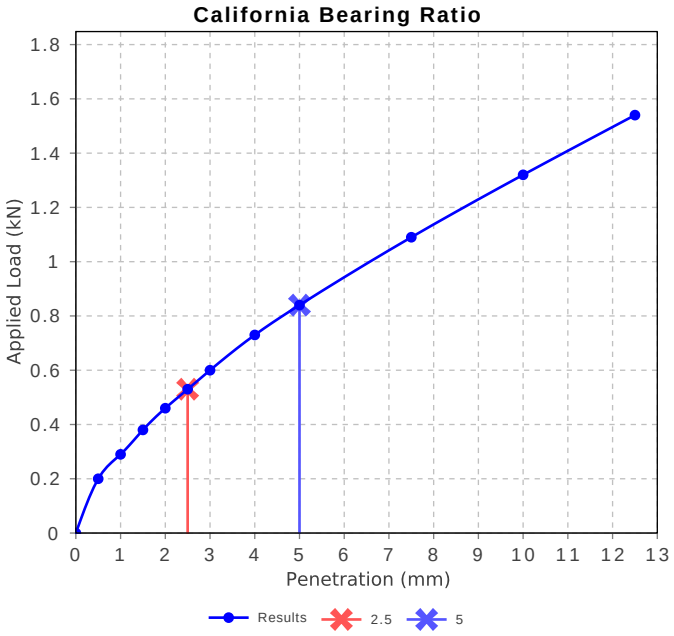
Accredited for compliance with ISO/IEC 17025 - Testing

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

Report Number: **MNC16P-0001-239**
Issue Number: 1
Date Issued: 29/04/2025
Client: Regional Geotechnical Solutions Pty Ltd
82 Combined Street, Wingham NSW 2429
Project Number: MNC16P-0001
Project Name: Various Testing
Project Location: 344 John Oxley Drive, Thrumster
Client Reference: RGS21087.1
Work Request: 9459
Sample Number: NEW25S-9459J
Date Sampled: 09/04/2025
Dates Tested: 10/04/2025 - 24/04/2025
Sampling Method: Sampled by Client
The results apply to the sample as received
Sample Location: **TP9 - (0.0 - 0.8m)**
Material: Clay
Material Source: On-Site Insitu

California Bearing Ratio (AS 1289 6.1.1 & 2.1.1)		Min	Max
CBR taken at	5 mm		
CBR %	**4.0**		
Method of Compactive Effort	Standard		
Method used to Determine MDD	AS 1289 5.1.1 & 2.1.1		
Method used to Determine Plasticity	Visual / Tactile		
Maximum Dry Density (t/m^3)	1.54		
Optimum Moisture Content (%)	25.5		
Laboratory Density Ratio (%)	100.0		
Laboratory Moisture Ratio (%)	100.5		
Dry Density after Soaking (t/m^3)	1.49		
Field Moisture Content (%)	25.1		
Moisture Content at Placement (%)	25.9		
Moisture Content Top 30mm (%)	26.5		
Moisture Content Rest of Sample (%)	26.5		
Mass Surcharge (kg)	4.5		
Soaking Period (days)	4		
Curing Hours (h)	185.7		
Swell (%)	3.5		
Oversize Material (mm)	19		
Oversize Material Included	Excluded		
Oversize Material (%)	0.0		



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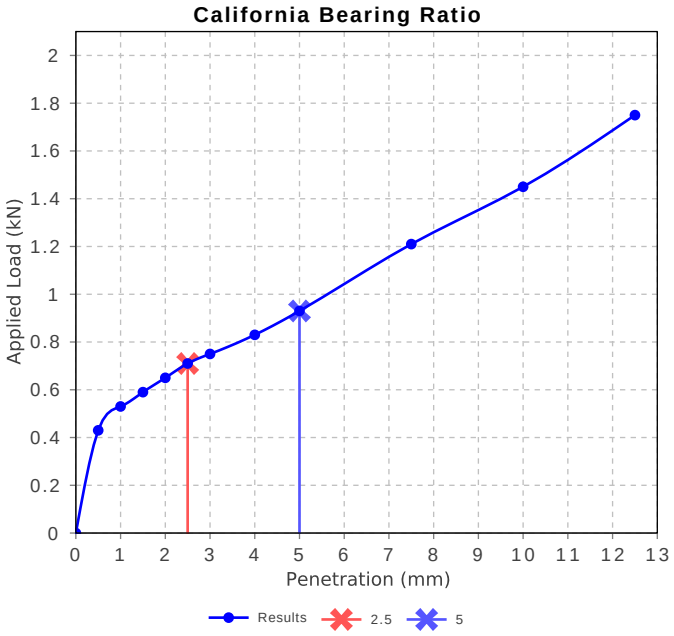
Report Number: **MNC16P-0001-239**
Issue Number: 1
Date Issued: 29/04/2025
Client: Regional Geotechnical Solutions Pty Ltd
82 Combined Street, Wingham NSW 2429
Project Number: MNC16P-0001
Project Name: Various Testing
Project Location: 344 John Oxley Drive, Thrumster
Client Reference: RGS21087.1
Work Request: 9459
Sample Number: NEW25S-9459K
Date Sampled: 09/04/2025
Dates Tested: 10/04/2025 - 28/04/2025
Sampling Method: Sampled by Client
The results apply to the sample as received
Sample Location: **TP10 - (0.00 - 0.45m)**
Material: Clay
Material Source: On-Site Insitu

California Bearing Ratio (AS 1289 6.1.1 & 2.1.1)		Min	Max
CBR taken at	2.5 mm		
CBR %	**5**		
Method of Compactive Effort	Standard		
Method used to Determine MDD	AS 1289 5.1.1 & 2.1.1		
Method used to Determine Plasticity	Visual / Tactile		
Maximum Dry Density (t/m^3)	1.46		
Optimum Moisture Content (%)	34.5		
Laboratory Density Ratio (%)	99.5		
Laboratory Moisture Ratio (%)	99.0		
Dry Density after Soaking (t/m^3)	1.44		
Field Moisture Content (%)	32.5		
Moisture Content at Placement (%)	34.3		
Moisture Content Top 30mm (%)	32.7		
Moisture Content Rest of Sample (%)	34.5		
Mass Surcharge (kg)	4.5		
Soaking Period (days)	4		
Curing Hours (h)	186.5		
Swell (%)	1.0		
Oversize Material (mm)	19		
Oversize Material Included	Excluded		
Oversize Material (%)	0.0		



Material Test Report

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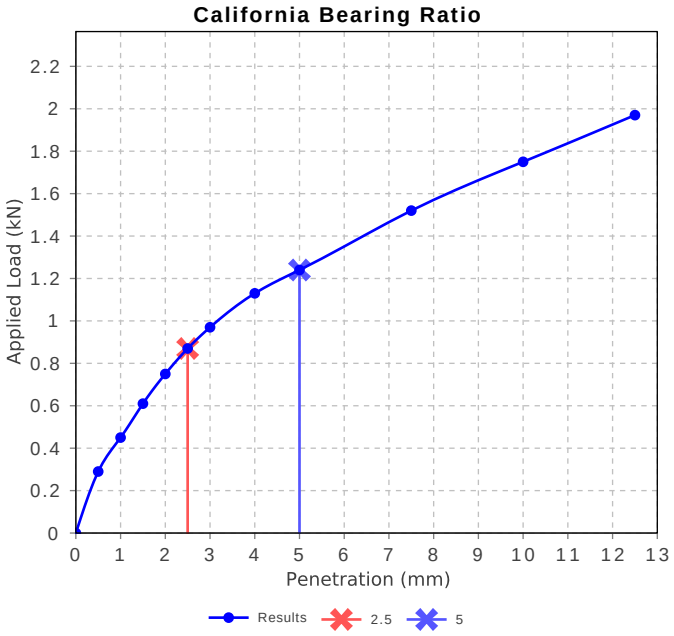
Approved Signatory: Brent Cullen
Engineering Geologist
NATA Accredited Laboratory Number: 18686

Report Number: **MNC16P-0001-239**
Issue Number: 1
Date Issued: 29/04/2025
Client: Regional Geotechnical Solutions Pty Ltd
82 Combined Street, Wingham NSW 2429
Project Number: MNC16P-0001
Project Name: Various Testing
Project Location: 344 John Oxley Drive, Thrumster
Client Reference: RGS21087.1
Work Request: 9459
Sample Number: NEW25S-9459L
Date Sampled: 09/04/2025
Dates Tested: 10/04/2025 - 28/04/2025
Sampling Method: Sampled by Client
The results apply to the sample as received
Sample Location: **TP11 - (0.3 - 1.8m)**
Material: Clay
Material Source: On-Site Insitu

California Bearing Ratio (AS 1289 6.1.1 & 2.1.1)		Min	Max
CBR taken at	2.5 mm		
CBR %	**7**		
Method of Compactive Effort	Standard		
Method used to Determine MDD	AS 1289 5.1.1 & 2.1.1		
Method used to Determine Plasticity	Visual / Tactile		
Maximum Dry Density (t/m^3)	1.29		
Optimum Moisture Content (%)	39.5		
Laboratory Density Ratio (%)	99.5		
Laboratory Moisture Ratio (%)	100.0		
Dry Density after Soaking (t/m^3)	1.28		
Field Moisture Content (%)	43.2		
Moisture Content at Placement (%)	39.6		
Moisture Content Top 30mm (%)	42.2		
Moisture Content Rest of Sample (%)	37.2		
Mass Surcharge (kg)	4.5		
Soaking Period (days)	4		
Curing Hours (h)	185.2		
Swell (%)	0.5		
Oversize Material (mm)	19		
Oversize Material Included	Excluded		
Oversize Material (%)	0.0		



Material Test Report

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Approved Signatory: Brent Cullen
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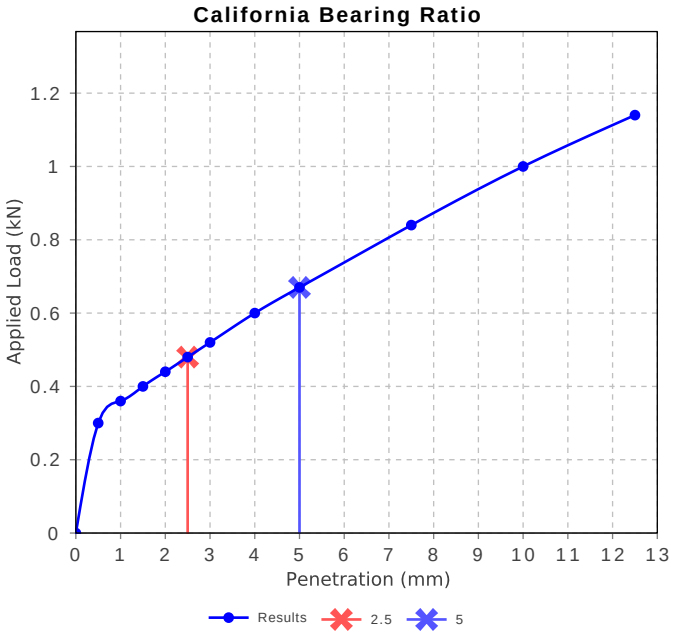
Report Number: **MNC16P-0001-239**
Issue Number: 1
Date Issued: 29/04/2025
Client: Regional Geotechnical Solutions Pty Ltd
82 Combined Street, Wingham NSW 2429
Project Number: MNC16P-0001
Project Name: Various Testing
Project Location: 344 John Oxley Drive, Thrumster
Client Reference: RGS21087.1
Work Request: 9459
Sample Number: NEW25S-9459M
Date Sampled: 09/04/2025
Dates Tested: 10/04/2025 - 24/04/2025
Sampling Method: Sampled by Client
The results apply to the sample as received
Sample Location: **TP12 - (0.1 - 1.6m)**
Material: Clay
Material Source: On-Site Insitu

California Bearing Ratio (AS 1289 6.1.1 & 2.1.1)		Min	Max
CBR taken at	2.5 mm		
CBR %	**3.5**		
Method of Compactive Effort	Standard		
Method used to Determine MDD	AS 1289 5.1.1 & 2.1.1		
Method used to Determine Plasticity	Visual / Tactile		
Maximum Dry Density (t/m^3)	1.35		
Optimum Moisture Content (%)	39.0		
Laboratory Density Ratio (%)	99.5		
Laboratory Moisture Ratio (%)	101.0		
Dry Density after Soaking (t/m^3)	1.34		
Field Moisture Content (%)	41.6		
Moisture Content at Placement (%)	39.3		
Moisture Content Top 30mm (%)	39.1		
Moisture Content Rest of Sample (%)	40.1		
Mass Surcharge (kg)	4.5		
Soaking Period (days)	4		
Curing Hours (h)	186.5		
Swell (%)	0.5		
Oversize Material (mm)	19		
Oversize Material Included	Excluded		
Oversize Material (%)	0.0		



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NATA WORLD RECOGNISED ACCREDITATION

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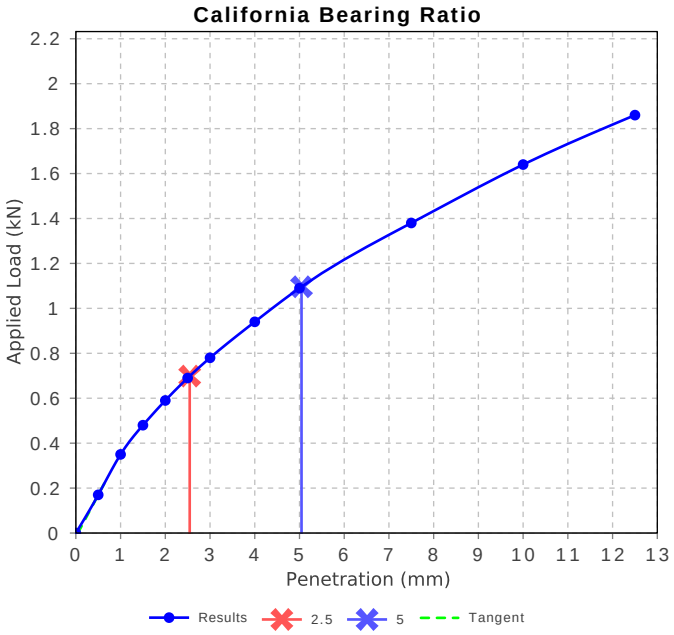
Report Number: **MNC16P-0001-239**
Issue Number: 1
Date Issued: 29/04/2025
Client: Regional Geotechnical Solutions Pty Ltd
82 Combined Street, Wingham NSW 2429
Project Number: MNC16P-0001
Project Name: Various Testing
Project Location: 344 John Oxley Drive, Thrumster
Client Reference: RGS21087.1
Work Request: 9459
Sample Number: NEW25S-9459N
Date Sampled: 09/04/2025
Dates Tested: 10/04/2025 - 24/04/2025
Sampling Method: Sampled by Client
The results apply to the sample as received
Sample Location: **TP13 - (0.1 - 1.5m)**
Material: Clay
Material Source: On-Site Insitu

California Bearing Ratio (AS 1289 6.1.1 & 2.1.1)		Min	Max
CBR taken at	5 mm		
CBR %	**6**		
Method of Compactive Effort	Standard		
Method used to Determine MDD	AS 1289 5.1.1 & 2.1.1		
Method used to Determine Plasticity	Visual / Tactile		
Maximum Dry Density (t/m^3)	1.46		
Optimum Moisture Content (%)	33.0		
Laboratory Density Ratio (%)	99.5		
Laboratory Moisture Ratio (%)	99.5		
Dry Density after Soaking (t/m^3)	1.44		
Field Moisture Content (%)	32.0		
Moisture Content at Placement (%)	32.8		
Moisture Content Top 30mm (%)	32.4		
Moisture Content Rest of Sample (%)	33.9		
Mass Surcharge (kg)	4.5		
Soaking Period (days)	4		
Curing Hours (h)	186.1		
Swell (%)	1.0		
Oversize Material (mm)	19		
Oversize Material Included	Excluded		
Oversize Material (%)	0.0		



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Report Number: **MNC16P-0001-239**
Issue Number: 1
Date Issued: 29/04/2025
Client: Regional Geotechnical Solutions Pty Ltd
82 Combined Street, Wingham NSW 2429
Project Number: MNC16P-0001
Project Name: Various Testing
Project Location: 344 John Oxley Drive, Thrumster
Client Reference: RGS21087.1
Work Request: 9459
Sample Number: NEW25S-9459O
Date Sampled: 09/04/2025
Dates Tested: 10/04/2025 - 24/04/2025
Sampling Method: Sampled by Client
The results apply to the sample as received
Sample Location: **TP14 - (0.0 - 1.5m)**
Material: Clay
Material Source: On-Site Insitu

California Bearing Ratio (AS 1289 6.1.1 & 2.1.1)		Min	Max
CBR taken at	5 mm		
CBR %	**6**		
Method of Compactive Effort	Standard		
Method used to Determine MDD	AS 1289 5.1.1 & 2.1.1		
Method used to Determine Plasticity	Visual / Tactile		
Maximum Dry Density (t/m^3)	1.41		
Optimum Moisture Content (%)	33.0		
Laboratory Density Ratio (%)	100.5		
Laboratory Moisture Ratio (%)	98.5		
Dry Density after Soaking (t/m^3)	1.37		
Field Moisture Content (%)	32.1		
Moisture Content at Placement (%)	32.5		
Moisture Content Top 30mm (%)	33.9		
Moisture Content Rest of Sample (%)	33.1		
Mass Surcharge (kg)	4.5		
Soaking Period (days)	4		
Curing Hours (h)	186.8		
Swell (%)	3.0		
Oversize Material (mm)	19		
Oversize Material Included	Excluded		
Oversize Material (%)	0.0