PRELIMINARY GEOTECHNICAL INVESTIGATION

For Local Structure Plan

LOTS 50 and M1456 GREAT NORTHERN HIGHWAY MUCHEA WESTERN AUSTRALIA

> DECEMBER 2020 Ref: 20049

FOR Tallangatta Beef Pty Ltd c/- iParks Property Group Pty



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- 6. The recommendations of this report should be considered a starting point. Recommendations should be continuously reviewed during the earthworks stage as subsurface information and results from monitoring become available. It is strongly recommended that the Company be retained to provide consultancy and/or inspections during the earthwork stages.

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1 Introduction

In November 2020 Brown Geotechnical was commissioned by iParks Property Group on behalf of the client – Tallangatta Beef Pty Ltd to undertake a preliminary geotechnical investigation for the development of a Local Structure Plan at Lots 50 and M1456 Great Northern Highway, Muchea (the site), refer Figure 1. This report presents the results of the investigation conducted at the site. The fieldwork was carried out over the 19th and 20th November 2020. Details of the site were supplied by planners iParks Property Group Pty.

<u>Note</u>: It should be noted that this is a preliminary geotechnical investigation for the development of a Local Structure Plan. In portions of the site where soils are non-homogenous, or where boundaries lines are drawn on Figures, for example between zones of different soil types or site classification, additional investigation should be undertaken. The conclusions in this report are based on limited sampling and testing, and should be used as starting point for further detailed investigations as the project proceeds.

2 Brief

The brief discussed with the planners required the report to address:

- Subsurface conditions.
- An estimate of existing soil classification in accordance with AS2870 (2011).
- Any earthworks required to obtain a classification suitable for development including estimated additional fill thickness requirements.
- The presents of uncontrolled fill.
- Estimated CBR for road pavement design.
- Suitability of existing soils for use in the development.
- An assessment of acid sulphate soil issues
- Estimated site permeability and likely drainage issues.

3 Desk Studies

The site covers approximately 213ha and consists of large fenced paddocks. The paddocks are mostly grass covered with some areas of trees. A small creek runs east west across the north of the site. The depth varies from 0.5m to 1m.

The geological map for the area indicates the majority of the site to be underlain by the Guildford Formation consisting of clay, sand, silt and gravels. Quartz sand is noted in the centre and along the eastern boundary, with lateritic gravels towards the north eastern corner.

The Perth Groundwater Map indicates the historical maximum groundwater level to be about 50m AHD, approximately 8m below ground level. It is understood that pre-development groundwater monitoring is to be carried out on the site by others.

The acid sulphate soil risk map for the area, indicates soils to be in the No Known Risk category.

The site rises eastwards from approx. 50m along the Great Northern Highway to 93m AHD in the north east. Some steeper slopes rise in the north east, likely associated with the outcropping laterite deposits noted on the geological map.

4 Fieldwork and Laboratory Testing

4.1 Scope of Work

As detailed in the Brown Geotechnical proposal, the following scope of work was undertaken:

- A desk study to determine likely soil types below the site.
- Follow-up fieldwork including a walk-over survey to determine any obvious geological features, hazards and ASS indicators.
- Test holes excavated at approximate 200m centres to confirm soil type identified in the desk study. Some areas allowed limited access, however enough information was collected for the preliminary report.
- Limited soil sampling was carried out for laboratory analysis to determine soil classification and geotechnical properties.
- Laboratory testing included: particle size distribution, Atterberg Limits, percent fines content and organic content.
- In the absence of any high-risk ASS indicators, no preliminary acid sulphate soil testing was required as initially indicated in the proposal.
- Organic content determination was carried out for potential blending ratios of topsoil with clean sand fill for use in the future development.
- Permeability testing was carried out typical soil types encountered for site drainage information.

Test locations are shown on Figure 1, with test hole logs enclosed in Appendix A and penetrometer plots in Appendix B.

4.2 Laboratory Testing

Soil samples were delivered to the NATA accredited Western Geotechnical Laboratory Services for geotechnical testing. The laboratory test certificates are presented in Appendix C.

5 Geotechnical Results

5.1 Subsurface Condition

Subsurface conditions encountered in the test holes and inferred from laboratory test results and PSP plots are described as follows:

5.1.1 Topsoil and Fill

Test holes encountered topsoil consisting of grey silty sand with organics, locally with rootlets. The topsoil varied in thickness from 0.1m to 0.15m, the average across the site being 0.1m.

No uncontrolled fill was encountered in test holes and there were no obvious signs of old structures, foundations or infill areas within the paddocks.

5.1.2 Sand with Silt

Fine to medium grained, sand with low to moderate silt content was encountered in all test holes below the topsoil in the central and north western portion of the site (refer Figure 2). Penetrometer tests show the material to be medium dense. The thickness varied from approximately 0.3m to 0.5m.

The sand extends to greater depths in the north eastern portion of the site, locally >2m and at one locality on the western boundary (refer Figure 2).

5.1.3 Sandy Gravel

Fine to medium grained, gravel with sand was encountered in all test holes below the topsoil in the southern portion of the site (refer Figure 2). Penetrometer tests show the material to be medium dense to dense. The thickness varied from approximately 0.1m to 0.55m.

5.1.4 Laterite (Cemented Sandy Gravel)

A very dense, often cemented, sandy gravel or Laterite was encountered at the surface in TH15 and TH16 on the eastern boundary. The excavator refused in the material at about 0.6m.

5.1.5 Gravelly Sand with Clay

Very dense, fine to medium grained sandy gravel with clay was encountered below the silty sand and sandy gravel areas of the site. The material was occasionally present at the surface in the center of the site in the vicinity of TH7, 11 and 12. Test results show the material to have a moderate fines content, intermediate to low plasticity with a low expansive nature. The material often became hard after about 1m due to pockets of iron rich cementation resulting in slow excavation and often caused refusal of the 5 tonne excavator.

5.1.6 Groundwater

No groundwater was not encountered in test holes. The Perth Groundwater Map indicates the historical maximum groundwater levels to be about 50m AHD, approximately 8m below ground level.

5.2 Laboratory Test Results

Laboratory test results are summarized in Table 1

Test	Depth	LL	PL	PI	Particle Size Distribution			Organic
Hole No.	(m)	(%)	(%)	(%)	Fines (%)	Sand (%)	Gravel(%)	(%)
TH01	0.2-0.5	NP	NP	NP	13	79	8	
TH06	1.5-2.0	31	13	21	27			
TH14	0.1							5.8
TH14	1.0-1.5	NP	NP	NP	22	71	7	
TH19	0.3-0.8				4	26	70	
TH19	1.0-1.5	28	14	14	19			
TH21	1.5-1.9	35	16	19	24			
TH29	0.1-0.5	NP	NP	NP	5	27	68	
TH29	0.5-1.1	23	17	6				
TH37	1.2-1.6	31	14	17	21			

	Table 1 –	Classification	Test Results
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*Non-plastic

5.3 Soil Permeability

Permeability test results are summarized in Table 2.

Test Location	Testing Material	In-situ Permeability Test Result (m/s)	Drainage Characteristics
P1 (TH12)	Very dense gravelly sand with clay	*1x10 ⁻⁹ m/s	Poor
P2 (TH01)	Medium dense sand with silt	5x10⁻⁴m/s	Moderate to Good
P3 (TH19)	Medium dense sandy gravel with silt	6x10 ⁻⁴ m/s	Moderate to Good

*Estimated: Minimal Soakage

6 Analysis and Conclusions

6.1 Subsurface Conditions (refer Figure 2)

The topsoil has an average thickness of 0.1m. Once the grass and roots are removed the topsoil will be relatively low in organic content. Testing a typical sample gave an organic content of 5.8%. It should be suitable for use as engineering fill when screened and blended with clean sand fill at a ratio of approximately 1:3 (screened topsoil : clean sand). Further testing following screening could bring the ratio down to 1:2 or 1:1 for some portions of the site.

Below the topsoil, much of the site is covered by 0.3-0.5m of granular soils with a moderate silt content (sand and gravels). These soils are non-cohesive, relatively free draining with moderate to good drainage characteristics.

These sand and gravels are underlain by a clayey subgrade across the majority of the site, except for the north east area. The soil is a very dense gravel with clay. The clayey subgrade extends to at least 2.0m. The soils have a moderate to low plastic fines content, an intermediate to low plasticity and a low expansive nature. The drainage in the clayey soil is poor. The material often becomes hard with iron cementation below about 1m which caused refusal of the 5 tonne excavator in most holes.

The north eastern area consists of deeper sands, with hard lateritic soils on the eastern boundary which caused refusal of the 5 tonne excavator close to the surface.

No uncontrolled fill was encountered in test holes.

With respect to the desk study and geological information obtained prior to the fieldwork, it appears that the sands discussed are not as extensive as anticipated, confined only to the north east area. The remainder of the site is underlain by the Guildford Formation as suggested, with the laterite deposits to the east.

6.2 Groundwater

No groundwater was not encountered in test holes. The Perth Groundwater Map indicates the historical maximum groundwater levels to be about 50m AHD, approximately 8m below ground level. It is likely that in times of heavy rainfall, the granular soils above of the clayey subgrade will saturate resulting in a perched water table. The soils would then likely drain towards the creek; or the deeper sand deposits from the raised lateritic area.

6.3 Site Classification and Fill Requirements

Based on this preliminary geotechnical investigation, test hole spacing and limited testing, the classification for the site in accordance with AS 2870 – 2011 can be divided in to two classes. The portion underlain by a clayey subgrade with moderate to low plastic fines content, low plasticity and low expansive nature has an existing classification of Class 'S'. The portion underlain by deeper sand and laterite has an existing classification of Class 'A' (refer Figure 2 and Table 3).

To obtain a site classification of Class 'A' in all areas, additional sand fill will be required. A total of 1.8m of granular material will be required above the clayey subgrade. The approximate thickness of additional fill varies from 0.2m to 1.8m and is shown on Figure 2.

Further investigation will be required to determine the exact boundaries between the site classification zones for specific Lots, and the amount of sand fill required could vary.

Table 3 – Definition of Site Classification	s (Australian Standard AS2870-2011)
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Class	Foundation					
A	Most sand and rock sites with little or no ground movement from moisture changes					
S	Slightly reactive clay sites with only slight ground movement for moisture changes $(y_s < 20 \text{mm})$.					
М	Moderately reactive clay or silt sites, which can experience moderate ground movement from moisture changes (y_s 20-40mm).					
H1	Highly reactive clay site, which can experience moderate to high ground movement from moisture changes (y_s 40-60mm)					
H2	Highly reactive clay site, which can experience high ground movement from moisture changes (y_s 60-75mm)					
E	Extremely reactive sites, which can experience extreme ground movement from moisture changes (y_s >75mm)					
Ρ	Sites which include: soft soils, such as soft clays or silts or loose sands; landslip; mine subsidence; collapsing soils; soils subject to erosion; reactive sites subject to abnormal moisture conditions or sites which cannot be classified otherwise					

ys: Characteristic Surface Movement

6.4 Earthworks

6.4.1 Introduction

All earthworks should be undertaken in accordance with AS3798-1996 "Guidelines on earthworks for commercial and residential developments". This section should act as a guide to likely earthwork requirements for the site, pending a detailed investigation.

6.4.2 Topsoil and Fill Management

A thin layer of topsoil is present across the site. It is not suitable for foundation support and should be removed along with trees and roots then replaced with clean sand fill. The topsoil may be used in landscaping following the removal of any tree roots, unless screened and blended as described below. A geotechnical inspection will be required to confirm topsoil stripping.

6.4.1 Blending of Topsoil for use as Engineering Fill

Topsoil in most areas of the site appears to be of lower quality i.e. lower in organic and fines content. An option would be to blend the screened topsoil with clean sand fill to reduce the organic and fines content to acceptable levels for use in residential or commercial development. Limited testing on non-screened topsoil, but with grass and roots removed, suggest a ratio of approximately 1:3 (screened topsoil : clean sand) to be appropriate. Further testing following screening could bring the ration down to 1:2 or 1:1 for portions of the site.

Ongoing tests for organic and fines content would be required post screening and on the blended soil to confirm suitability for use in the development.

6.4.2 Proof Rolling

Following the removal of topsoil, prior to footing placement or placing any additional fill on site, the surface should be proof rolled to achieve at least 95% SMDD for residential and 98% SMDD for commercial developments.

6.4.3 Imported Fill Material

Any sand fill imported to obtain site formation levels should be compacted in layers not more than 300mm thick to at least 95% SMDD for residential and 98% SMDD for commercial developments. In-situ density tests should be carried out to calibrate a PSP to specific densities of the compacted material to check fill compaction. Moisture conditioning (wetting) of the sand may to be required to optimise compaction. Imported sand should ideally contain less than 5% non-plastic fines to maintain good drainage conditions.

Following excavation for foundations, the bases of pad and strip footings should also be compacted to achieve at least 95% SMDD for residential and 98% SMDD for commercial developments.

6.4.4 Earthwork Inspections

A geotechnical engineer should inspect the site following the removal of vegetation, trees, roots and unsuitable materials, and to confirm the compaction of the subsurface following proof rolling. Inspections and auditing of the earthworks should be carried out by the geotechnical engineer to enable confirmation of the final site classification.

6.5 Suitability of In-situ Soils as Engineering Fill

The majority of the in-situ sands, particularly in the central and north area, contain a moderate fines content but zero plasticity. The soils will be suitable for use as engineering fill in the future development but have a reduced permeability due to the raised silt content. Blending with clean sand fill would reduce the fines content and increase drainage potential.

The sandy gravel with clay could also be blended with clean sand to reduce the fines. The material may be appropriate as a base layer above the existing clayey subgrade if major earthworks are required and removal of the existing granular soils is necessary.

6.6 Design CBR

Assuming the subgrade material below the road pavement or car park areas will be the natural in-situ near surface sand, a design CBR of 20 is suitable pavement design. Pavements founded on the sandy gravels could have a higher CBR of at least 30. Pavements founded within imported sand fill will require CBR testing during earthworks.

6.7 Retaining Wall Parameters

The site is gently sloping to the west and some retaining maybe required in the development. The following retaining wall parameters have been based on a compacted dense sand soil with ϕ =40°.

γ=19 kN/m³ Ko=0.36 Ka=0.22 Kp=4.6

The parameters detailed above assume design of the retaining structure and compaction of the foundations are in accordance with AS 4678-2002, and that backfill material is composed of clean cohesionless sand.

6.8 Acid Sulphate Soils

The acid sulphate soil risk map for the area indicate soils below the site to be in the No Known Risk category. The walkover survey and descriptions from test holes indicated no soils associated with high-risk ASS.

6.9 Site Permeability and Drainage Recommendations

The near surface sand and gravels contain moderate fines, zero plasticity and are free draining. The drainage condition within the sands prior to proof rolling is moderate to good. Permeability of approx. $5x10^{-4}$ m/s was recorded. Permeability of the underlying clayey subgrade was poor.

For soakwell installation, additional sand fill may be required in some areas, especially where the clayey subgrade approaches the existing surface. A suitably designed drainage system would allow for the use of soakwells if sufficient height, say at least 1.2m, is obtained above the clayey subgrade and the groundwater. Further permeability testing and groundwater monitoring is recommended as part of the detailed geotechnical investigation to refine these observations.

If clean fill sand is to be imported on to the site to raise site formation levels, permeability can vary depending on the source, and could vary between 1×10^{-3} and a 1×10^{-5} m/s based on observed results on typical Perth fill sands.

Permeability and drainage conditions may be reduced during earthworks due to compaction of in-situ and imported sands. Over compaction during earthworks can seriously reduce soil permeability. It is recommended that further permeability testing be carried out following earthworks to confirm parameters used during drainage design.

BROWN GEOTECHNICAL

Ferry Haryono Senior Geotechnical Engineer Reviewed by Ken Brown Senior Geotechnical Engineer

REFERENCES

- 1. Standards Australia AS 2870 (2011). Residential Slabs and Footings Construction.
- 2. Geological Survey of Western Australia. 1:50,000 Environmental Geology Series, Perth.
- 3. Department of Water. *Perth Groundwater Map*
- 4. Standards Australia AS3798-2011. "Guidelines on earthworks for commercial and residential developments".
- 5. Standards Australia AS 4678-2002. Earth-Retaining Structures.

FIGURES





APPENDIX A

SOIL CLASSIFICATION CHART

NA 1			SYM	BOLS	TYPICAL	
1717	AJUR DIVISI	10113	GRAPH	LETTER	DESCRIPTIONS	
	GRAVEL AND	CLEAN CLEAN GRAVELS		GW	WELL-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES	
	GRAVELLY SOILS	(LITTLE OR NO FINES)		GP	POORLY-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES	
COARSE GRAINED SOILS	MORE THAN 50% OF COARSE	GRAVELS WITH FINES		GM	SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES	
	FRACTION RETAINED ON NO. 4 SIEVE	(APPRECIABLE AMOUNT OF FINES)		GC	CLAYEY GRAVELS, GRAVEL - SAND - CLAY MIXTURES	
MORE THAN 50% OF	SAND AND	CLEAN SANDS		sw	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES	
MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	SANDY SOILS	(LITTLE OR NO FINES)		SP	POORLY-GRADED SANDS, GRAVELLY SAND, LITTLE OR NO FINES	
	MORE THAN 50% OF COARSE	SANDS WITH FINES		SM	SILTY SANDS, SAND - SILT MIXTURES	
	FRACTION PASSING ON NO. 4 SIEVE	(APPRECIABLE AMOUNT OF FINES)		SC	CLAYEY SANDS, SAND - CLAY MIXTURES	
				ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY	
FINE	SILTS AND CLAYS	LIQUID LIMIT LESS THAN 50		CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS	
GRAINED SOILS				OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY	
MORE THAN 50% OF MATERIAL IS SMALLER				МН	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS	
THAN NO. 200 SIEVE SIZE	SILTS AND CLAYS	LIQUID LIMIT GREATER THAN 50		СН	INORGANIC CLAYS OF HIGH PLASTICITY	
				ОН	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS	
HI	SOILS		PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS		

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS

E	3	G	Brown G	eotech	nical			BOREHO	DLE NUMBER TH01 PAGE 1 OF 1
CL		Γ <u>Τ</u> α CT Ν	, <u>llangatta B</u> UMBER 2	<u>eef Pty</u> 20049	r Ltd		PROJECT NAME LOTS	50 and M1456	3
DA DR EC HC	ATE \$ RILLI QUIPI DLE \$	STAR NG C MENT SIZE	TED _ 20/1 ONTRACT(_ 5 tonne 0.5mx1.5r	0/20 DR excava m	tor	_20/10/20	 R.L. SURFACE SLOPE _90° HOLE LOCATION _40549′ LOGGED BY _FH	1 6504955	DATUM BEARING CHECKED BY _KB
Method	Water	RL (m)	(m) Graphic Log	Classification Symbol		Material Descript	ion	Samples Tests Remarks	Additional Observations
	Not Encountered			SP-SM	TOPSOIL: Loose, dark greet SAND: Loose to medium of gravel, dry GRAVELLY SAND with Classical structure Borehole TH01 terminated	ey, silty sand with roo dense, fine to mediun LAY: Very dense, fine	tiets a grained, grey, with silt, trace to coarse, yellowish brown, dry	Fines=8% Sand=79% Gravel=13%	

E	3(G	Brown G	eotechi	nical		В	OREHO	DLE NUMBER TH02 PAGE 1 OF 1		
CLI	ENT	Ta	llangatta B	eef Pty	Ltd		PROJECT NAME LOTS 50 and M1456				
PR	OJE	CT NI	JMBER _2	20049			PROJECT LOCATION	JCHEA			
DA	TE S	TAR	ED <u>20/1</u>	0/20	COMPLETED	20/10/20					
							SLOPE <u>90°</u> HOLE OCATION 405738	6505809	BEARING		
HOLE SIZE 0.5mx1.5m							LOGGED BY _FH		CHECKED BY KB		
NO	TES										
Method	Water	RL (m)	(m) Graphic Log	Classification Symbol		Material Descripti	on	Samples Tests Remarks	Additional Observations		
			$\frac{\frac{\sqrt{1}}{\sqrt{1}}}{\frac{1}{\sqrt{1}}}$	<u>.</u>	TOPSOIL: Loose, dark gre	y, silty sand with root	lets				
				SP-SM	SAND: Loose to medium d	ense, fine to medium	grained, grey, with silt, trace				
			0.5	GP-GC	GRAVELLY SAND with CL	AY: Very dense, fine	to coarse, yellowish brown, dry				
	Not Encountered										
			- 2 <u>.0</u> - - -		REFUSAL Borehole TH02 terminated	at 1.8m					

	3	G	Brov	wn Ge	otechr	lical	E	BOREHO	DLE NUMBER TH03 PAGE 1 OF 1
CL PR		Γ <u>Τ</u> α CT N I	llanga JMBE	tta Be R _2(ef Pty 0049	Ltd	PROJECT NAME LOTS	50 and M1456 UCHEA	6
DA DR EQ HC	TE S ILLI UIPI DLE S	START NG CO MENT SIZE	ED	20/10 ACTO onne e x1.5m	/20 R xcavat	completed 20/10/20	R.L. SURFACE SLOPE 90° HOLE LOCATION 405992 LOGGED BY FH	6505834	DATUM BEARING CHECKED BY _KB
Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Descript	ion	Samples Tests Remarks	Additional Observations
	Not Encountered V				GP-GC	TOPSOIL: Loose, dark grey, silty sand with roo SAND: Loose to medium dense, fine to medium gravel, dry GRAVELLY SAND with CLAY: Very dense, fine Borehole TH03 terminated at 1m	tlets a grained, grey, with silt, trace to coarse, yellowish brown, dry		

E	3	G	Brown	n Geotech	hnical			В	OREHO	DLE NUMBER TH04 PAGE 1 OF 1
CL		TA	ı Ilangatta UMBER	<u>a Beef Pt</u> _ <u>2</u> 0049	ty Ltd	F	ROJECT NAME	E <u>LOTS 5</u>	0 and M1456 ICHEA	3
DA DR	TE S	STAR NG C	TED _20	D/10/20	COMPLETED _20/10)/20 R.I SL	L. SURFACE			DATUM BEARING
EG HC NC	UIPI DLE \$ DTES	MENT SIZE	<u>5 tonr</u> 0.5mx1	ne excav I.5m	ator	HC	DLE LOCATION	406198	6505805	CHECKED BY KB
Method	Water	RL (m)	Depth (m)	Graphic Log Classification Symbol	Mat	terial Description			Samples Tests Remarks	Additional Observations
				<u>1</u>	TOPSOIL: Loose, dark grey, silty	sand with rootlets				
				SP-SI	M SAND: Loose to medium dense, f gravel, dry	îne to medium graiı	ned, grey, with silt,	trace		
			0.5	GP-G	C GRAVELLY SAND with CLAY: Ve	ery dense, fine to co	parse, yellowish bro	own, dry		
	Not Encountered									
5/12/20			1.5 0		REFUSAL Borehole TH04 terminated at 1 6n	n				
AUSTRALIA.GDT										
HAE.GPJ GINI SIU			2 <u>.0</u>							
DLE / TEST PIT MUCI										
BOREHC			2.5							

E	3	G	Brown Ge	eotechi	nical		BOREHOLE NUMBER TH05 PAGE 1 OF 1 PROJECT NAME LOTS 50 and M1456			
CL		Γ <u>Τα</u> CT NI	Ilangatta Bo JMBER 2	<u>əef Pty</u> 0049	Ltd		PROJECT NAME PROJECT LOCAT	<u>LOTS 50</u>	and M1456) CHEA	3
DA DR EC HC	ATE S RILLI QUIPI DLE S DTES	START NG CO MENT SIZE	TED <u>20/10</u> ONTRACTO <u>5 tonne e</u> 0.5mx1.5r)/20 DR excava	tor)/10/20	R.L. SURFACE SLOPE _90° HOLE LOCATION _ LOGGED BY _FH	406306	6505635	DATUM BEARING CHECKED BY _KB
Method	Water	RL (m)	(m) Graphic Log	Classification Symbol		Material Descriptio	n		Samples Tests Remarks	Additional Observations
				SP-SM	TOPSOIL: Loose, dark grey, si SAND: Medium dense, fine to	ilty sand with rootle medium grained, g	ets grey, with silt, trace grave	el, dry		
BOREHOLE/ TEST PIT MUCHAE.GPJ GNT STD AUSTRALIA.GDT 15/12/20	Not Encountered				Borehole TH05 terminated at 2	2m				

B	G	Brov	wn Ge	otechr	ical			BOREHO	DLE NUMBER THOE PAGE 1 OF
CLIEN	IT _⊺a ECT N	_ allanga UMBE	<u>itta Be</u> R _2(eef Pty 0049	Ltd		PROJECT NAME <u>LOTS</u> PROJECT LOCATION <u>M</u>	50 and M1456	3
DATE DRILL EQUII HOLE	STAR ING C PMEN SIZE	TED _ ONTR 5 to 	20/10 ACTO onne e x1.5m	<u>20</u> ראש ביים אין	completed 20/	10/20	R.L. SURFACE SLOPE _90° HOLE LOCATION _406306 LOGGED BY _FH	6505635	DATUM BEARING CHECKED BY _KB
Method Water	S	Depth (m)	Graphic Log	Classification Symbol	M	laterial Descriptio	n	Samples Tests Remarks	Additional Observations
Not Encountered		(m) (m) (m) (m) (m) (m) (m) (m) (m) (m)		GP-GC	TOPSOIL: Loose, dark grey, sill SAND: Loose to medium dense gravel, dry GRAVELLY SAND with CLAY: 1 Borehole TH06 terminated at 2r	ty sand with rootle	o coarse, yellowish brown, dry	LL=34 PL=13 Fines=27% LS=6%	

E	3	G	Brown G	eotechi	nical	BOREHOLE NUMBER TH07 PAGE 1 OF 1				
CL	IEN	T Ta] Ilangatta B	eef Pty	Ltd	PROJECT NAME LOTS 5	50 and M1450	6		
PR	OJE		JMBER _2	0049		PROJECT LOCATION ML	JCHEA			
DA	TE S	STAR	FED 20/1	0/20	COMPLETED 20/10/20	R.L. SURFACE		DATUM		
DR	RILLI	ING C	ONTRACTO	DR		SLOPE 90°		BEARING		
EQ	UIP	MENT	5 tonne	excava	tor	HOLE LOCATION 405567	6505550			
нс	DLE	SIZE	0.5mx1.5r	n		LOGGED BYFH		CHECKED BY KB		
NC	DTES	S			1					
Method	Water	RL (m)	(m) Graphic Log	Classification Symbol	Material Descri	ption	Samples Tests Remarks	Additional Observations		
			<u>, st 1,</u>		TOPSOIL: Loose, dark grey, silty sand with ro	potlets				
	þ			GP-GC	GRAVELLY SAND with CLAY: Very dense fi	ne to coarse, vellowish brown, dry				
	Not Encounte				REFUSAL					
			_		Borehole TH07 terminated at 0.5m					
			_							
			1 <u>.0</u>							
			-							
			- 1 <u>.5</u>							
0T 15/12/20										
USTRALIA.GI										
J GINT STD /			2 <u>.0</u>							
MUCHAE.GP.										
JLE / TEST PII										
BOREHC			2.5							

E	3(G	Brov	wn Ge	eotechr	nical	B	OREHO	DLE NUMBER TH08 PAGE 1 OF 1
CL PR	IENT OJE	Γ <u>Τ</u> α CT N I	llanga JMBE	itta Be R _2(eef Pty 0049	Ltd	PROJECT NAME LOTS 5	50 and M1456 JCHEA	3
DA DR	TE S		TED _ ONTR	20/10 ACTO)/20 R	COMPLETED _20/10/20	R.L. SURFACE SLOPE 90° HOLE L OCATION 405251		DATUM BEARING
HO	UIPI DLE S		<u> </u>	x1.5n	n n	tor	LOGGED BY FH	6505641	CHECKED BY KB
Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Descripti	n	Samples Tests Remarks	Additional Observations
			_	<u>x1 1/</u> X 1/ X1/		TOPSOIL: Loose, dark grey, silty sand with root	lets		
	incountered				GM	GRAVELLY SAND:Medium dense, fine to mediu	ım grained, grey, with silt, dry		
	Not E				GP-GC	GRAVELLY SAND with CLAY: Very dense, fine	to coarse, yellowish brown, dry		
			<u>1.0</u> - - 1 <u>.5</u> - 2 <u>.0</u> - - - - 2.5			REFUSAL Borehole TH08 terminated at 1m			

	3	G	Brown (Geotech	nical		B	OREHO	LE NUMBER TH09 PAGE 1 OF 1
CL PR		Γ <u>Τ</u> α CT Ν Ι	llangatta JMBER _	Beef Pty 20049	Ltd		PROJECT NAME LOTS 5	50 and M1456 JCHEA	
DA DR EC	TE S ILLI UIPI	STAR NG CO	TED _20/ ONTRACT	10/20 OR e excava	tor	20	R.L. SURFACE SLOPE 90° HOLE LOCATION 404995	[E 6505634	Datum Bearing
HC		SIZE	0.5mx1.	ōm			LOGGED BY FH	(CHECKED BY KB
Method	Water	RL (m)	Depth (m)	Classification Symbol	Mater	rial Descriptio	n	Samples Tests Remarks	Additional Observations
	Not Encountered			SP-SM	TOPSOIL: Loose, dark grey, silty sa SAND: Loose to medium dense, find gravel, dry GRAVELLY SAND with CLAY: Very Borehole TH09 terminated at 2m	e to medium	ets grained, grey, with silt, trace		

E	3(G	Brov	wn Ge	eotechr	nical	B	BOREHC	DLE NUMBER TH10 PAGE 1 OF 1
CL	IENT	Ta	llanga	itta Be	eef Pty	Ltd	PROJECT NAME _LOTS 5	50 and M1456	;
PR	OJE	CT NI	JMBE	R _2	0049		PROJECT LOCATION MU	JCHEA	
DA	TE S			20/10)/20 P	COMPLETED			DATUM
EQ	UIP		5 to	onne e	excava	tor	HOLE LOCATION 405083	6505388	DEARING
но	LES	SIZE	0.5m	x1.5n	n		LOGGED BY FH		CHECKED BY KB
NO	TES				1				
Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	n	Samples Tests Remarks	Additional Observations
				<u>x17</u> x 17 x 17		TOPSOIL: Loose, dark grey, silty sand with root	ets		
			-		SP-SM	SAND: Loose to medium dense, fine to medium gravel, dry	grained, grey, with silt, trace		
			_						
	pa		_						
	ounter		_						
	ot Enco		0.5						
	ž			0	GP-GC	GRAVELLY SAND with CLAY: Very dense, fine	to coarse, yellowish brown, dry		
			-						
			_						
			_						
			10			REFUSAL Borehole TH10 terminated at 0.9m			
			_						
			_						
			_						
			1.5						
			-						
			_						
			-						
			2.0						
			-						
			-						
			-						
			25						
			_ 2.J	L	I				

E	3	G	Brown G	Geotech	nical		BOREH	DLE NUMBER TH11 PAGE 1 OF 1
CL	.IEN ROJE	T <u>Ta</u>	Ilangatta E UMBER	3eef Pty 20049	' Ltd	PROJECT NAME _LOTS	50 and M1450	6
D/ DF	ATE S RILLI	STAR NG C	TED _20/1	0/20 OR	COMPLETED _20/10/20	R.L. SURFACE		DATUM BEARING
EC HC NC	QUIPI DLE (DTES	MENT SIZE	<u>5 tonne</u> 0.5mx1.5	excava m	tor	HOLE LOCATION _40544 LOGGED BY _FH	.7 6505378	CHECKED BY KB
Method	Water	RL (m)	(m) Graphic Log	Classification Symbol	Material Descr	ription	Samples Tests Remarks	Additional Observations
			<u></u>		TOPSOIL: Loose, dark grey, silty sand with r	rootlets		
	Not Encountered			GP-GC	GRAVELLY SAND with CLAY: Very dense, f	fine to coarse, yellowish brown, dry		
			-		REFUSAL Borehole TH11 terminated at 0.6m			
			_ 1 <u>.0</u>					
			-					
			_ 1 <u>.5</u>					
RALIA.GDT 15/12/20			-					
U GINT STD AUSTF			_ 2 <u>.0</u>					
ST PIT MUCHAE.GF								
BOREHOLE / TES			2.5					

E	3	G	Brown Ge	eotechi	nical	В	OREHO	DLE NUMBER TH12 PAGE 1 OF 1
CL	.IEN	T _Ta] <u>Ilangatta B</u>	<u>eef Pt</u> y	Ltd	PROJECT NAME 5	0 and M1456	3
PF	ROJE		UMBER _2	0049		PROJECT LOCATION MU	JCHEA	
DA	ΑTE	STAR	TED _ 20/10	0/20	COMPLETED _20/10/20	R.L. SURFACE		DATUM
DF	RILL	ING CO	ONTRACTO	DR		SLOPE 90°		BEARING
EC	QUIP	MENT	5 tonne	excava	tor	HOLE LOCATION 405709	6505396	
н	DLE	SIZE	0.5mx1.5r	n		LOGGED BY FH		CHECKED BY KB
NC		s						
Method	Water	RL (m)	Graphic Log	Classification Symbol	Material Descri	otion	Samples Tests Remarks	Additional Observations
				<u>.</u>	TOPSOIL: Loose, dark grey, silty sand with ro	otlets		
	be			GP-GC	GRAVELLY SAND with CLAY: Very dense, fir	ne to coarse, yellowish brown, dry		
	Not Encounter				REFUSAL			
			_		Borehole TH12 terminated at 0.5m			
			_ 1 <u>.0</u>					
			_					
			1.5					
5/12/20								
RALIA.GDT 1								
IT STD AUSTI								
IAE.GPJ GIN			2 <u>.0</u> _					
ST PIT MUCH								
OREHOLE / TE			25					

E	3	G	Brov	wn Ge	otechi	nical	E	BOREHO	DLE NUMBER TH13 PAGE 1 OF 1
CL		Τ <u>α</u> CT NI	l Ilanga JMBE	itta Be R 20	eef Pty 0049	Ltd	PROJECT NAME LOTS	<u>50 and M1456</u> UCHEA	5
DA DR EQ HC	TE S ILLII UIPI OLE S	STAR NG CO MENT SIZE	FED _ ONTR <u>5 to</u> 0.5m	20/10 ACTO	0/20 R excava	COMPLETED 20/10/20	R.L. SURFACE	6505635	DATUM BEARING CHECKED BY KB
NC	TES								
Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Descripti	on	Samples Tests Remarks	Additional Observations
				<u>17 - 17 - 1</u> 7		TOPSOIL: Loose, dark grey, silty sand with root	lets		
	Not Encountered				GP-GC	SAND: Loose to medium dense, fine to medium grey, with silt, trace gravel, dry GRAVELLY SAND with CLAY: Very dense, fine REFUSAL Borehole TH13 terminated at 1.1m	grained, yellowish brown &		
			2.5						

E	3	G	Brown Ge	otechr	nical	E	BOREHO	DLE NUMBER TH14 PAGE 1 OF 1
С	IENT	г а	llangatta Be	ef Pty	Ltd	PROJECT NAME LOTS	50 and M1456	3
PF			UMBER _ 20)049 //20			UCHEA	
DF	RILLI	NG C		<u>720</u> R		SLOPE 90°		BEARING
EC	QUIPI	MENT	5 tonne e	xcava	tor	HOLE LOCATION 406082	6505424	
н	OLE S	SIZE	0.5mx1.5m	1		LOGGED BY FH		CHECKED BY KB
NC		;						
Method	Water	RL (m)	Graphic Log	Classification Symbol	Material Descript	ion	Samples Tests Remarks	Additional Observations
					TOPSOIL: Loose, dark grey, silty sand with roo	tlets		
	Not Encountered			SP-SM	SAND: Medium dense, fine to medium grained, and gravel, dry	yellowish brown & grey, with silt	Fines=22% Sand= 71% Gravel=7%	

E	3	G	Brov	wn Ge	eotechi	nical	E	BOREHC	DLE NUMBER TH15 PAGE 1 OF 1	
CL PR		- <u>Τa</u> CT NI	llanga JMBE	itta Be R _2(eef Pty	Ltd	PROJECT NAME _LOTS	50 and M1456 UCHEA	;	
DA DR	TE S	STAR	ied _ Ontr	20/10 ACTO)/20 R	COMPLETED <u>20/10/20</u>	_ R.L. SURFACE		DATUM BEARING	
EC HC		MENT SIZE	<u>5 to</u> 0.5m	nne e x1.5m	excava า	tor	_ HOLE LOCATION _406323 _ LOGGED BY _FH	6505444	4 _ CHECKED BY <u>KB</u>	
Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Descri	ption	Samples Tests Remarks	Additional Observations	
			_	<u>, 17 - 17</u> 17 - <u>1</u> 1 - <u>1</u> 7		TOPSOIL: Loose, dark grey, silty sand with ro	otlets			
	Not Encountered				GPS	GRAVELLY SAND / LATERITE: Very dense (dry	cemented), fine to coarse, brown,			
			-			REFUSAL Borehole TH15 terminated at 0.6m				
			- 1 <u>.0</u> -							
			-							
			1 <u>.5</u> _							
			-							
			2 <u>.0</u> –							
			-							
			2.5							

E	DLE NUMBER TH16 PAGE 1 OF 1									
CL		Ta	llanga	itta Be	eef Pty	r Ltd	PROJECT NAME LOTS 50 and M1456			
PR			JWIBE	к <u>2</u>	0049			UCHEA		
DR		NG CO			<i>⊪∠</i> ∪ R	COMPLETED _20/10/20	SLOPE <u>90°</u>		BEARING	
EQ	UIPI	MENT	_5 tc	onne e	excava	tor	HOLE LOCATION _406312	6505233		
но	LE S	SIZE	0.5m	x1.5n	n		LOGGED BY FH		CHECKED BY KB	
NO	TES									
Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Descriptic	'n	Samples Tests Remarks	Additional Observations	
				<u>x 1, x</u> 1, x 1,		TOPSOIL: Loose, dark grey, silty sand with rooth	ets			
			-	<u></u>	0.50					
			-	F::: ::F::	GPS	dry	nented), line to coarse, brown,			
	ntered		-	:::: ::::F						
	Encou		_	È						
	Not		0 <u>.5</u>	F 						
				:::. :::: €::::						
			-	F.						
			-	:::F						
				<u>F:::</u>		REFUSAL Borebole TH16 terminated at 0.8m				
			-							
			1 <u>.0</u>							
			_							
			_							
			-							
			1 <u>.5</u>							
			-							
			-							
			_							
			_							
			2.0							
			-							
			-							
			-							
			-							
			2.5							

E	3	G	Brown G	eotech	nical	E	BOREHO	DLE NUMBER TH17 PAGE 1 OF 1			
CL	IEN	T <u>Ta</u>	ı Ilangatta E	Beef Pty	' Ltd		PROJECT NAME LOTS 50 and M1456				
PR	OJE		JMBER	20049			PROJECT LOCATION MUCHEA				
DA	TES	STAR	red _20/1	0/20	COMPLETED	20/10/20	R.L. SURFACE	DATUM			
DR	ILLI	NG CO	ONTRACT	OR			SLOPE <u>90°</u>		BEARING		
EQ			<u>5 tonne</u>	excava	tor			6505177			
	HOLE SIZE										
Method	Water	RL (m)	Depth (m)				on	Samples Tests Remarks	Additional Observations		
				. <u>.</u>	TOPSOIL: Loose, dark gre	ey, silty sand with root	lets				
A.GDT 15/12/20	Not Encountered			GP-GC	SAND: Loose to medium o gravel, dry	dense, fine to coarse LAY: Very dense, fine	grained, grey, with silt, trace				
BOREHOLE / TEST PIT MUCHAE.GPJ GINT STD AUSTRAL			2.0								

	3	G	Brown G	eotech	nical			BOREH	DLE NUMBER TH18 PAGE 1 OF 1	
CL	IEN	T Ta	ı Ilangatta B	eef Pty	/ Ltd		PROJECT NAME LOT:	S 50 and M145	6	
PR	OJE	CT N	UMBER _2	20049			PROJECT LOCATION	MUCHEA		
DA	TES	STAR	TED _ 20/1	0/20	COMPLETED	20/10/20	R.L. SURFACE		DATUM	
DR	RILLI	NG C	ONTRACTO	DR			SLOPE 90°		BEARING	
EQ	UIP	MENT	5 tonne	excava	itor		HOLE LOCATION40576	6505169		
но	DLE	SIZE	0.5mx1.5	m			LOGGED BYFH		CHECKED BY KB	
NC	DTES	\$			1					
Method	Water	RL (m)	Graphic Log	Classification Symbol		Material Descri	ption	Samples Tests Remarks	Additional Observations	
			<u>x¹ 1₂</u>	<u>:</u> :	TOPSOIL: Loose, dark gre	ey, silty sand with ro	potlets			
				SP-SM	SAND: Loose to medium o gravel, dry	dense, fine to coars	e grained, grey, with silt, trace	-		
	Not Encountered									
2120			1.5 0		REFUSAL			_		
					Borehole TH18 terminated	d at 1.6m				
			2 <u>.0</u>							
			2.5							

STD AUSTRALIA.GDT 15/12/20 LNIC Цd
	3	G	Brow	vn Ge	eotechr	nical		BOREHO	DLE NUMBER TH19 PAGE 1 OF 1
CL	IENT	r _ Ta	llangat	tta Be	eef Pty	Ltd	_ PROJECT NAME _LOTS	6 50 and M1456	3
PR	OJE	CT N	UMBER	R _20	0049		PROJECT LOCATION	MUCHEA	
DA	TE S	STAR	TED	20/10)/20	COMPLETED <u>20/10/20</u>	R.L. SURFACE		DATUM
DR	ILLI	NG C	ONTRA	асто	R		_ SLOPE _90°		BEARING
EQ	UIPI	MENT	5 to	nne e	excava	tor	HOLE LOCATION 40546	6505127	
но	DLE S	SIZE	0.5m	x1.5m	1		_ LOGGED BY _FH		CHECKED BY KB
NO	DTES	\$	<u> </u>					1	
Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Descrip	vtion	Samples Tests Remarks	Additional Observations
				<u>x1 / .</u>		TOPSOIL: Loose, dark grey, silty sand with ro	otlets		
			-		GPS	SANDY GRAVEL: Medium dense to dense, fir	ne to coarse grained, grey, trace	-	
						Siit, dry			
				ن م:(`×٩					
			0.5	6 0 0 (
				\circ				Fines=4% Sand=26%	
								Gravel=/0%	
				، <u>(ز)</u> ہ ۲۰۰۰ ک					
	red			0.0					
	ountei				GP-GC	GRAVELLY SAND with CLAY: Very dense, fin	e to coarse, yellowish brown, dry		
	t Enco		-						
	Not		1.0						
			-	$\mathbb{S}_{\mathcal{I}}$					
			_					LL=28	
								PL=14 Fines=19%	
								LS=4%	
			-						
			1.5						
12/21				ŝ					
£									
LIA.GI									
				OW		REFUSAL Borehole TH19 terminated at 1 8m		1	
D A U									
			2.0						
2									
1AE.G			-						
MUCF									
1									
/ IEV			-						
HULE									
SORE			25						
ш — ——	1	1	2.0		1	1		1	I

E	3	G	Brown G	eotech	nical		B	OREHO	DLE NUMBER TH20 PAGE 1 OF 1
CL		Γ <u></u> Τα CT Ν] Ilangatta E UMBER 2	eef Pty 20049	/ Ltd		PROJECT NAME LOTS S	50 and M1456 JCHEA	6
DA DR EQ HC NO	TE S ILLI UIPI DLE S	STAR NG C MENT SIZE	TED _20/1 ONTRACTO _5 tonne 0.5mx1.5	0/20 DR excava m	completed	_20/10/20	R.L. SURFACE SLOPE 90° HOLE LOCATION 405178 LOGGED BY FH	6505190	DATUM BEARING CHECKED BY _KB
Method	Water	RL (m)	(m) Graphic Log	Classification Symbol		Material Descrip	otion	Samples Tests Remarks	Additional Observations
	Not Encountered			GP-GC	TOPSOIL: Loose, dark gr SANDY GRAVEL: Mediur silt, dry GRAVELLY SAND with C GRAVELLY SAND with C Borehole TH20 terminated	ey, silty sand with ro n dense to dense, fir LAY: Very dense, fir	otlets ne to coarse grained, grey, trace ne to coarse, yellowish brown, dry		

STD AUSTRALIA.GDT 15/12/20 LNIC Цd

	B	8(G	Brown Ge	eotechr	nical		BOREHO	DLE NUMBER TH21 PAGE 1 OF 1	
 C P	:LIE 'RO	ENT	Tal	llangatta Be JMBER _2	eef Pty 0049	Ltd	PROJECT NAME LOTS 50 and M1456 PROJECT LOCATION MUCHEA			
	DAT RIL QU	e st _lin IIPM E si Es	G CC ENT ZE	ED <u>21/10</u> DNTRACTO <u>5 tonne e</u> 0.5mx1.5n)/20 PR excava	COMPLETED _21/10/20	R.L. SURFACE SLOPE _90° HOLE LOCATION _40524 LOGGED BY _FH	6 6504978	DATUM BEARING CHECKED BY _KB	
Mothod	Method	Water	RL (m)	(m) Graphic Log	Classification Symbol	Material Descripti	on	Samples Tests Remarks	Additional Observations	
BOREHOLE / TEST PIT MUCHAE.GPJ GINT STD AUSTRALIA.GDT 15/12/20		Not Encountered			SP-SM	TOPSOIL: Loose, dark grey, silty sand with root SAND: Medium dense, fine to coarse grained, y trace gravel, dry with some clay below 1.5m	lets ellowish brown & grey, with silt,	LL=35 PL=16 Fines=24% LS=6%		

E	3(G	Brov	vn Ge	eotechr	nical		E	BOREHC	DLE NUMBER TH22 PAGE 1 OF 1
CL		• <u>Ta</u>	llanga	tta Be	eef Pty	Ltd			50 and M1456	3
PR	OJE		JMBE	R _2	0049			PROJECT LOCATION	JCHEA	
	TES		ED _	21/10)/20 P	COMPLETED	21/10/20			
EQ	UIPN		5 to	nne e	excava	tor		HOLE LOCATION 405246	6504978	
но	LES	SIZE .	0.5m	x1.5n	n			LOGGED BY _FH		CHECKED BY KB
NO	TES				1					
Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol		Material Description	on	Samples Tests Remarks	Additional Observations
				<u>×1/</u> ×		TOPSOIL: Loose, dark gre	ey, silty sand with rootl	ets		
	Not Encountered		- - - - - - - - - - - - - - - - - - -		SP-SM	SAND: Loose to medium o gravel, dry	Jense, fine to medium	grained, grey, with silt, trace		
						REFUSAL Borehole TH22 terminated	at 1.9m			
			2 <u>.0</u>							
			-							
			-							
			2.5							

E	3	G	Brov	wn Ge	eotechi	OREH	DLE NUMBER TH23 PAGE 1 OF 1			
CL PR	IENT OJE	Γ <u>Τa</u> CT N I	llanga JMBE	tta Be R _2(eef Pty 0049	/ Ltd	PROJECT NAME LOTS 50 and M1456 PROJECT LOCATION MUCHEA			
DA DR	TE S	STAR	TED _	21/10 АСТО)/20 R	COMPLETED 21/10/20	R.L. SURFACE		DATUM BEARING	
EQ HO	UIPI LE S	MENT SIZE	<u>5 to</u> 0.5m	nne e x1.5m	excava า	tor	LOGGED BY FH	405762	CHECKED BY KB	
NO	TES	. <u> </u>								
Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Descript	ion	Samples Tests Remarks	Additional Observations	
				<u>, 17</u> 17 - <u>1</u> 1 - <u>1</u>		TOPSOIL: Loose, dark grey, silty sand with roo	tlets			
	ntered		-	0	SP-SM GP-GC	SAND: Loose to medium dense, fine to medium gravel, dry	grained, grey, with silt, trace			
	Not Encou		_ 0 <u>.5</u>			grey, dry				
			_							
						REFUSAL Borehole TH23 terminated at 0.8m				
			1 <u>.0</u>							
			_							
			_							
			_							
			_							
			1 <u>.5</u>							
			_							
			_							
			_							
			2 <u>.0</u>							
			-							
			-							
			-							
			2.5							

	3(G	Brov	wn Ge	eotechr	nical	E	BOREHO	DLE NUMBER TH24 PAGE 1 OF 1
CL	IENT	Ta	llanga	tta Be	eef Pty	Ltd	PROJECT NAME LOTS	50 and M1456)
PR	OJE		JMBE	R _2	0049		PROJECT LOCATION _M	UCHEA	
DA	TE S	STAR	red _	21/10)/20	COMPLETED <u>21/10/20</u>	R.L. SURFACE		DATUM
				ACTO)R			6504072	BEARING
HO			0.5m	x1.5n	n		LOGGED BY FH	0304973	СНЕСКЕД ВУ КВ
NO	TES								
Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Descriptio	n	Samples Tests Remarks	Additional Observations
				<u>__</u> \ \		TOPSOIL: Loose, dark grey, silty sand with rooth	ets		
	Not Encountered		- - 0 <u>.5</u>		SP-SM GP-GC	SAND: Loose to medium dense, fine to medium gravel, dry GRAVELLY SAND with CLAY: Very dense, fine grey, dry	grained, grey, with silt, trace		
					1	REFUSAL Borehole TH24 terminated at 0.7m			
			_						
			_						
			10						
			-						
			_						
			1.5						
			-						
			_						
			2.0						
			-						
			-						
		1	2.5						

	3	G	Brov	vn Ge	eotechr	nical	E	BOREHO	DLE NUMBER TH25 PAGE 1 OF 1	
CL PR	IENT OJE	- <u>Τa</u> CT NI	llanga JMBE	<u>tta Be</u> R _2	eef Pty 0049	Ltd	PROJECT NAME LOTS 50 and M1456 PROJECT LOCATION MUCHEA			
DA	TE S	TAR	ſED	21/10)/20	COMPLETED 21/10/20	R.L. SURFACE		DATUM	
DR	ILLI	NG CO		ACTO	R		SLOPE 90°		BEARING	
EQ	UIPI	MENT	_5 to	nne e	excava	tor	HOLE LOCATION 406284	6504795		
но	LE S	SIZE	0.5m	x1.5n	n		LOGGED BY _FH		CHECKED BY KB	
NO	TES									
Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Descriptic	n	Samples Tests Remarks	Additional Observations	
				<u></u>		TOPSOIL: Loose, dark grey, silty sand with rootle	ets			
			-		SP-SM	SAND: Loose to medium dense, fine to medium	grained, grey, with silt, trace			
	countered		_			gravel, dry				
	ot En		_							
	z		0.5	$\hat{\circ}$	GP-GC	GRAVELLY SAND with CLAY: Very dense, fine t grey, dry	o coarse, yellowish brown &			
			0.5							
			_							
						REFUSAL Borehole TH25 terminated at 0.7m				
			_							
			_							
			1 <u>.0</u>							
			_							
			_							
			_							
			1.5							
			-							
			_							
			_							
			2.0							
			_							
			_							
			2.5							

E	3	G	Brov	wn Ge	eotechr	nical	E	BOREHO	DLE NUMBER TH26 PAGE 1 OF 1
CLI	EN1 OJE	Γ <u>Τ</u> α CT NI	llanga JMBE	itta Be R _2	eef Pty 0049	Ltd	PROJECT NAME _ LOTS : PROJECT LOCATION _ MI	50 and M1456 UCHEA	3
DA [:] DR	TE S	STAR	red _ Ontra	21/10 ACTO)/20 R	COMPLETED <u>21/10/20</u>	R.L. SURFACE SLOPE _90°		DATUM BEARING
EQ HO NO	UIPI LE \$ TES	MENT SIZE	<u>5 to</u> 0.5m	nne e x1.5n	excavat n	tor	HOLE LOCATION 405946	6504827	CHECKED BY KB
Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	n	Samples Tests Remarks	Additional Observations
M	Not Encountered M				GP-GC	TOPSOIL: Loose, dark grey, silty sand with root SAND: Loose to medium dense, fine to medium gravel, dry GRAVELLY SAND with CLAY: Very dense, fine grey, dry REFUSAL Borehole TH26 terminated at 1m	ets grained, grey, with silt, trace to coarse, yellowish brown &		
			2.5						

E	3(G	Brov	vn Ge	eotechr	nical	E	BOREHO	DLE NUMBER TH27 PAGE 1 OF 1
CL	IENT	T <u>a</u>	llanga	tta Be	eef Pty	Ltd	PROJECT NAME LOTS	50 and M1456)
PR	OJE		JMBE	R _2	0049		PROJECT LOCATION _M	JCHEA	
DA	TE S	STAR	red _	21/10)/20	COMPLETED <u>21/10/20</u>	R.L. SURFACE		DATUM
				АСТО	0R			6504055	BEARING
HO			0.5m	x1.5n	n		LOGGED BY FH	0304933	СНЕСКЕД ВУ КВ
NO	TES	·							
Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	n	Samples Tests Remarks	Additional Observations
Meth	Not Encountered Wate	RL (m)	Depth (m) - - - - - - - - - - - - - - - - - - -		GP-GC	TOPSOIL: Loose, dark grey, silty sand with root SAND: Loose to medium dense, fine to medium gravel, dry GRAVELLY SAND with CLAY: Very dense, fine grey, dry REFUSAL Borehole TH27 terminated at 0.7m	ets grained, grey, with silt, trace		
			2.5						

	3(G	Brov	wn Ge	eotechr	nical	E	BOREH	DLE NUMBER TH28 PAGE 1 OF 1
CL			llanga	tta Be	ef Pty	Ltd		50 and M145	6
	0JE			rt <u>2</u>	0049				
	IE S ILLII	NG CO		<u>21/10</u> ACTO	<i>⊪∠</i> ∪ R	COMPLETED <u>21/10/20</u>	R.L. SURFACE		BEARING
EQ	UIPN	MENT	5 to	onne e	excavat	tor	HOLE LOCATION _405541	6504777	
но	LE S	SIZE _	0.5m	x1.5n	n		LOGGED BY _FH		CHECKED BY KB
NO	TES								
Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Descriptio	n	Samples Tests Remarks	Additional Observations
				<u>\\</u> <u>\</u> <u>\</u>		TOPSOIL: Loose, dark grey, silty sand with rooth	ets		
			-		SP-SM	SAND: Loose to medium dense, fine to medium gravel, dry	grained, grey, with silt and		
			-						
			_						
	ered								
	ncount		0.5						
	Not E								
			_		GP-GC	GRAVELLY SAND with CLAY: Very dense, fine a grey, dry	to coarse, yellowish brown &		
			_						
			_						
			_						
			1.0						
				a 5077		REFUSAL Borehole TH28 terminated at 1m			
			_						
			-						
			-						
			-						
			1.5						
			-						
			-						
			_						
			2.0						
			-						
			-						
			_						
			2.5						
			2.5						

	3	G	Brown	i Geo	techn	nical	E	BOREHO	DLE NUMBER TH29 PAGE 1 OF 1
CL	IEN	r _ Ta	llangatta	a Bee	f Pty	Ltd	PROJECT NAME LOTS	50 and M1456	6
PR	OJE	CTN	UMBER	200	49		PROJECT LOCATION _M	IUCHEA	
DA	TE S	STAR		1/10/2	20	COMPLETED _21/10/20			
			5 ton			or	HOLE LOCATION 405342	6504804	DEAKING
но	DLE \$	SIZE	0.5mx1	l.5m			LOGGED BY FH		CHECKED BY KB
NO	TES	s							
Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Descripti	on	Samples Tests Remarks	Additional Observations
			<u>i.</u>	<u>1/2: .x</u>		TOPSOIL: Loose, dark grey, silty sand with root	lets		
					GPS	SANDY GRAVEL: Medium dense, fine to mediu	m grained, grey, with silt, dry		
	pg				P-GC	GRAVELLY SAND with CLAY. Very dense, fine	to coarse vellowish brown dry	Fines=5% Sand=27% Gravel=68%	
	Not Encountere							LL=23 PL=17 LS=2%	
						REFUSAL Borehole TH29 terminated at 1.3m			
			1 <u>.5</u> _						
			2.0						
			2.5						

E	3	G	Brown G	eotech	nical	E	BOREHO	DLE NUMBER TH30 PAGE 1 OF 1
	IEN1	T <u>Ta</u>] illangatta B U MBER 2	eef Pty 20049	/ Ltd	PROJECT NAME LOTS	50 and M1456 UCHEA	ô
DA DF EC	ATE S RILLI QUIPI DLE S	STAR NG C MENT SIZE	TED _21/1 ONTRACT(0/20 DR excava	completed _21/10/20		6504605	DATUM BEARING CHECKED BY _KB
Method	Water	8 RL (m)	(m) Graphic Log	Classification Symbol	Material Descri	ption	Samples Tests Remarks	Additional Observations
MUCHAE.GPJ GINT STD AUSTRALIA.GDT 15/12/20	Not Encountered			GPS	TOPSOIL: Loose, dark grey, silty sand with response of the second sec	ootlets dium grained, grey, with silt, dry ne to coarse, yellowish brown, dry		
BOREHOLE / TEST PIT			2.5					

E	3(G	Brov	wn Ge	otechr	nical	В	OREHO	DLE NUMBER TH31 PAGE 1 OF 1
CL PR	IENT OJE	Γ <u>Τ</u> α CT N I	llanga JMBE	tta Be R _2(ef Pty 0049	Ltd	PROJECT NAME LOTS 5	50 and M1456 JCHEA	<u>.</u>
DA DR EQ	TE S ILLII	STAR	TED _ ONTRA	21/10 ACTO)/20 R	COMPLETED _21/10/20	R.L. SURFACE SLOPE 90° HOLE LOCATION 405570	6504604	DATUM BEARING
но	LES	SIZE .	0.5m	x1.5n	ı		LOGGED BY _FH		CHECKED BY KB
Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Descriptio	on	Samples Tests Remarks	Additional Observations
	-	()	()	<u>, 17</u> , <u>, 1</u>		TOPSOIL: Loose, dark grey, silty sand with root	ets		
	Not Encountered		- - - 0. <u>5</u> - 1. <u>0</u> - - - - - - - - - - - - - - - - - - -		GP-GC	SANDY GRAVEL: Medium dense, fine to mediu GRAVELLY SAND with CLAY: Very dense, fine grey, dry REFUSAL Borehole TH31 terminated at 0.7m	m grained, grey, with silt, dry		
			2.5						

	3	G	Brov	wn Ge	eotechi	nical	E	BOREHO	DLE NUMBER TH32 PAGE 1 OF 1
CL		Ta	llanga	tta Be	ef Pty	Ltd	PROJECT NAME LOTS	50 and M1456	3
PR	OJE		JMBE	R _20	0049		PROJECT LOCATION	UCHEA	
	TE S			21/10)/20 P	COMPLETED			DATUM
EQ	UIPI		5 to	nne e	excava	tor	HOLE LOCATION 405859	6504616	BEARING
но	LE S	SIZE	0.5m	x1.5n	ı		LOGGED BY _FH		CHECKED BY KB
NO	TES					1			
Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	n	Samples Tests Remarks	Additional Observations
				<u>x 1,</u> x		TOPSOIL: Loose, dark grey, silty sand with root	ets		
			-		GPS	SANDY GRAVEL: Medium dense, fine to mediu	m grained, grey, with silt, dry		
			_						
	ntered		_						
	Encoul		_				to cooke wellowish hypure 9		
	Not		0.5		GF-GC	grey, dry	to coarse, yenowish brown a		
			-						
			_						
						REFUSAL			
			_			Borehole TH32 terminated at 0.8m			
			1.0						
			_						
			_						
			_						
			-						
			1 <u>.5</u>						
			_						
			-						
			_						
			2 <u>.0</u>						
			-						
			-						
			_						
			2.5						

E	3(G	Brov	wn Ge	eotechi	nical	B	OREHO	DLE NUMBER TH33 PAGE 1 OF 1
CL PR	IENT OJE	Γ <u>Τ</u> α CT NI	llanga JMBE	itta Be R _2(eef Pty 0049	/ Ltd	PROJECT NAME LOTS 5	50 and M1456 JCHEA	3
DA DR	TE S ILLII	STAR	red _ Ontra	21/10 АСТО)/20 R	COMPLETED 21/10/20	R.L. SURFACE SLOPE 90°		DATUM BEARING
EQ HO	UIP	MENT SIZE	<u>5 to</u> 0.5m	onne e x1.5m	excava	tor	HOLE LOCATION 405984	6504614	CHECKED BY KB
NO	TES					1			
Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Descripti	on	Samples Tests Remarks	Additional Observations
				<u>\ 1/.\</u> \ 1/.		TOPSOIL: Loose, dark grey, silty sand with root	lets		
	tered		_		GPS	SANDY GRAVEL: Medium dense, fine to mediu	m grained, grey, with silt, dry		
	Not Encoun		_		GP-GC	GRAVELLY SAND with CLAY: Very dense, fine	to coarse, yellowish brown &		
			0 <u>.5</u> –			grey, dry			
				° 💋		REFUSAL			
			_			Borenole 1H33 terminated at 0.7m			
			_						
			1 <u>.0</u>						
			_						
			_						
			_						
			1 <u>.5</u>						
			_						
			_						
			_						
			2 <u>.0</u>						
			_						
			_						
			-						

E	3	G	Brov	wn Ge	eotechr	nical	В	OREHO	LE NUMBER TH34 PAGE 1 OF 1
CL PR		. <u>Та</u> СТ NI	l Ilanga JMBE	itta Be	eef Pty 0049	Ltd	PROJECT NAME LOTS 5	0 and M1456 JCHEA	
DA	TE S	TAR	TED	21/10)/20	COMPLETED 21/10/20	R.L. SURFACE	C	ATUM
DR	ILLI	NG CO	ONTR	АСТО	R		SLOPE 90°	E	BEARING
EQ	UIPI	IENT	<u>5 to</u>	onne e	excava	tor	HOLE LOCATION 406020	6504417	
		SIZE _	0.5m	1.5m	1		LOGGED BY FH	C	CHECKED BY KB
Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Descriptic	n	Samples Tests Remarks	Additional Observations
				<u>x' 1/ x</u>		TOPSOIL: Loose, dark grey, silty sand with rootle	ets		
	Not Encountered		- - 0. <u>5</u> - - 1.0 - - - - - - - - - - - - - - - - - - -		GPS GP-GC	SANDY GRAVEL: Medium dense, fine to medium GRAVELLY SAND with CLAY: Very dense, fine to grey, dry REFUSAL Borehole TH34 terminated at 1m	n grained, grey, with silt, dry		
			2 <u>.0</u>						
			-						
			-						
			_						
			2.5						

	3	G	Brov	wn Ge	eotechi	nical	В	OREHO	PAGE 1 OF 1
CL	IENT	T <u>Ta</u>	llanga	itta Be	ef Pty	Ltd	PROJECT NAME LOTS 5	0 and M1456	
PR	OJE		JMBE	R _2	0049		PROJECT LOCATION _MU	JCHEA	
DA	TES			21/10)/20 P	COMPLETED _21/10/20			
EQ	UIPI		5 to	onne e	xcava	tor	HOLE LOCATION 405736	6504450	DEARING
но	LES	SIZE	0.5m	x1.5n	า		LOGGED BY FH		CHECKED BY KB
NO	TES					I			
Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Descripti	on	Samples Tests Remarks	Additional Observations
				<u>x' 1/</u> x		TOPSOIL: Loose, dark grey, silty sand with root	lets		
	untered		-		GPS	SANDY GRAVEL: Medium dense, fine to mediu	m grained, grey, with silt, dry		
	Not Encor		0 <u>.5</u> _		GP-GC	GRAVELLY SAND with CLAY: Very dense, fine grey, dry	to coarse, yellowish brown &		
			1. <u>0</u> 1. <u>5</u> - 2. <u>0</u> 			REFUSAL Borehole TH35 terminated at 0.9m			

E	3(G	Brov	vn Ge	eotechr	nical	B	BOREHO	DLE NUMBER TH36 PAGE 1 OF 1
CLI PR	ENT OJE	. <u>Ta</u> CT NI	llanga JMBE	tta Be R _2	eef Pty 0049	Ltd	PROJECT NAME LOTS &	50 and M1456 JCHEA)
DA [.] DR	TE S ILLII	TAR	red _ Ontr/	21/10 ACTO)/20 R	COMPLETED <u>21/10/20</u>	R.L. SURFACE		DATUM BEARING
EQ	UIPN	IENT	_5 to	nne e	excava	tor	HOLE LOCATION 405519	6504466	
HO	LE S	SIZE _	0.5m	x1.5n	n		LOGGED BY FH		CHECKED BY KB
Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Descriptio	on	Samples Tests Remarks	Additional Observations
			1	<u>17 - 77 17</u> 7 <u>7 17</u>		TOPSOIL: Loose, dark grey, silty sand with root	ets		
	red		_		GPS	SANDY GRAVEL: Medium dense, fine to mediu	n grained, grey, with silt, dry		
	Icounte		_		GP-GC	GRAVELLY SAND with CLAY: Very dense, fine	to coarse, yellowish brown &		
	Not Er		_			grey, dry			
			0 <u>.5</u>						
			_						
						REFUSAL Borehole TH36 terminated at 0.7m			
			_						
			1 <u>.0</u>						
			_						
			-						
			_						
			1 <u>.5</u>						
			_						
			_						
			_						
			2.0						
			-						
			_						
			2.5						

E	3	G	Brow	n Ge	otechr	nical		BOREHO	DLE NUMBER TH37 PAGE 1 OF 1
CL	IEN	T _ Ta	llangatt	ta Be	ef Pty	Ltd	PROJECT NAME LOTS	50 and M1456	3
PR				<u>20</u>	049			IUCHEA	
DA	ATE S NILLI	STAR NG C	TED _2	21/10/ CTO	/20 R	COMPLETED <u>21/10/20</u>	R.L. SURFACE SLOPE 90°		DATUM BEARING
EQ		MENT	5 ton	ne e	xcava	tor	HOLE LOCATION 405588	6504333	
но	DLE	SIZE	0.5mx	1.5m			LOGGED BY FH		CHECKED BY KB
NO	DTES	≶							
Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Descript	ion	Samples Tests Remarks	Additional Observations
				<u> </u>		TOPSOIL: Loose, dark grey, silty sand with roo	tlets		
					GPS	SANDY GRAVEL: Medium dense, fine to mediu	um grained, grey, with silt, dry		
	Not Encountered				GP-GC	GRAVELLY SAND with CLAY: Very dense, fine grey, dry	to coarse, yellowish brown &		
7/50				A B B B B B B B B B B B B B B B B B B B		REFUSAI		LL=31 PL=14 Fines=21% LS=6%	·
			2 <u>.0</u> - - - - 2.5			Borehole TH37 terminated at 1.6m			

	3	G	Brov	wn Ge	eotechi	nical	E	BOREHC	DLE NUMBER TH38 PAGE 1 OF 1
CL PR		Γ <u>Τ</u> α CT ΝΙ	llanga JMBE	itta Be R _2(eef Pty 0049	/ Ltd	PROJECT NAME LOTS : PROJECT LOCATION	50 and M1456 UCHEA	j
DA DR	TE S	STAR	red _ Ontr	21/10 АСТО)/20 R	COMPLETED <u>21/10/20</u>	R.L. SURFACE SLOPE _90°		DATUM BEARING
EQ HO	UIPI	MENT	<u>5 tc</u> 0.5m	nne e x1.5m	excava	tor	HOLE LOCATION 405777 LOGGED BY FH	6504329	CHECKED BY KB
NC	TES								
Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Descripti	n	Samples Tests Remarks	Additional Observations
				<u>x 1</u> , <u>x</u> 1, x 1,		TOPSOIL: Loose, dark grey, silty sand with root	ets		
			-		GPS	SANDY GRAVEL: Medium dense, fine to mediu	m grained, grey, with silt, dry		
	tered		-						
	Encour		-						
	Not		-		GP-GC	GRAVELLY SAND with CLAY: Very dense, fine grey, dry	to coarse, yellowish brown &		
			0 <u>.5</u>						
			-						
						REFUSAL Borehole TH38 terminated at 0.7m			
			-						
			-						
			1 <u>.0</u>						
			-						
			-						
			-						
			-						
			1 <u>.5</u>						
			-						
			-						
			-						
			_						
			2 <u>.0</u>						
			-						
			-						
			-						
			2.5						

E	B (G	Brov	wn Ge	otechr	nical	B	BOREHO	DLE NUMBER TH39 PAGE 1 OF 1
CLIE PRC	ENT DJE	. <u>Ta</u> CT NI	Ilanga JMBE	tta Be R _20	ef Pty 0049	Ltd	PROJECT NAME LOTS &	50 and M1456 JCHEA	<u>.</u>
DAT DRII	'E S	STAR	red _ Ontr	21/10 АСТО)/20 R	COMPLETED <u>21/10/20</u>	R.L. SURFACE SLOPE _90°		DATUM BEARING
EQU HOL	JIPN .E S	MENT	<u>5 tc</u> 0.5m	nne e x1.5m	excava า	tor	HOLE LOCATION 406096	6504327	CHECKED BY KB
Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Descripti	n	Samples Tests Remarks	Additional Observations
	Not Encountered		-		GPS GP-GC	TOPSOIL: Loose, dark grey, silty sand with root SANDY GRAVEL: Dense, fine to medium graine GRAVELLY SAND with CLAY: Very dense, fine grey, dry	ets ed, grey, with silt, dry to coarse, yellowish brown &		
				o ₩		REFUSAL Borehole TH39 terminated at 0.5m			

E	3	G	Brov	wn Ge	otechr	nical	B	BOREHO	DLE NUMBER TH40 PAGE 1 OF 1
CL		Г <u>Та</u>	llanga	itta Be	ef Pty	Ltd	PROJECT NAME LOTS	50 and M1456	;
PR	OJE		JMBE	R _20	049		PROJECT LOCATIONML	JCHEA	
	TE S			21/10)/20 P	COMPLETED			
EQ	UIPI		5 to	onne e	excavat	tor	HOLE LOCATION 406357	6504220	BEARING
но	LE S	SIZE	0.5m	x1.5m	1		LOGGED BY _FH		CHECKED BY KB
NC	TES		1			1	I		1
Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Descriptio	n	Samples Tests Remarks	Additional Observations
				<u>x 1/</u> 1/ 1/		TOPSOIL: Loose, dark grey, silty sand with root	ets		
	ot Encountered		_ _ 0 <u>.5</u>		GPS GP-GC	SANDY GRAVEL: Dense, fine to medium graine GRAVELLY SAND with CLAY: Very dense, fine	d, grey, with silt, dry to coarse, yellowish brown &		
	No		_ _ 			grey, dry			
			-			REFUSAL Borehole TH40 terminated at 1m			
			_						
			- 1 <u>.5</u>						
			_						
			-						
			_						
			2 <u>.0</u>						
			-						
			_						
			2.5						

E	3	G	Brow	n Ge	otechr	nical		BOREH	DLE NUMBER TH41 PAGE 1 OF 1
CL		T <u>Ta</u> CT N	ullangati UMBER	ta Be 20	<u>ef Pty</u> 0049	Ltd	_ PROJECT NAME _LO	TS 50 and M145 _MUCHEA	6
DA DR EC	TE S RILLI QUIP	STAR NG C MENT	TED _2 ONTRA	21/10 CTO	/20 R xcava	completed _21/10/20		108 6504220	DATUM BEARING
HC NC	DLE S	SIZE	0.5mx	(1.5m	I		_ LOGGED BY _FH		CHECKED BY KB
Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Descriț	tion	Samples Tests Remarks	Additional Observations
				<u>x · x · v</u>		TOPSOIL: Loose, dark grey, silty sand with ro	otlets		
			-0.0		GPS	SANDY GRAVEL: Dense, fine to medium gra	ned, grey, with silt, dry	_	
					GP-GC	GRAVELLY SAND with CLAY: Very dense, fir grey, dry	e to coarse, yellowish brown &		
	Itered								
	ot Encour								
	ž								
			1 <u>.0</u> 2						
0			1 <u>.5</u> 2						
0T 15/12/2						REFUSAL Borehole TH41 terminated at 1.6m			
TRALIA.GI									
STD AUS									
GPJ GINT			2 <u>.0</u>						
MUCHAE.									
LEST PIT									
KEHOLE / 1									
BOR			2.5						

E	3	G	Brown G	eotech	nical	E	BOREHO	DLE NUMBER TH42 PAGE 1 OF 1
CL PR	.IEN ROJE	T <u>Ta</u>	」 illangatta B UMBER _2	eef Pty 20049	/ Ltd	PROJECT NAME LOTS	50 and M1456 UCHEA	3
DA DF	ATE \$ RILLI	STAR NG C	TED _21/1 ONTRACTO	0/20 DR	COMPLETED _21/10/20	R.L. SURFACE	6504214	DATUM BEARING
HC	DLE 9	SIZE	0.5mx1.5	m		LOGGED BY FH		CHECKED BY KB
Method	Water	RL (m)	Graphic Log	Classification Symbol	Material Descr	iption	Samples Tests Remarks	Additional Observations
			$\frac{1}{\sqrt{1}} \cdot \frac{1}{\sqrt{1}}$		TOPSOIL: Loose, dark grey, silty sand with r	ootlets		
				GPS	SANDY GRAVEL: Dense, fine to medium gra	ained, grey, with silt, dry		
	Not Encountered			GP-GC	GRAVELLY SAND with CLAY: Very dense, fi grey, dry	ine to coarse, yellowish brown &		
NT STD AUSTRALIA.GDT 15/12/20			- 1. <u>5</u> - - - - 2.0		REFUSAL Borehole TH42 terminated at 1.3m			
BOREHOLE / TEST PIL MUCHAE.GPU GIL			2.5					

E	3(G	Brov	wn Ge	eotechr	nical	В	OREHC	DLE NUMBER TH43 PAGE 1 OF 1
CLI	EN1 DJE	Γ <u>Τ</u> α CT Ν	llanga JMBE	tta Be	<u>eef Pty</u> 0049	Ltd	PROJECT NAME _LOTS 5	0 and M1456 ICHEA	·
DA	TE S	STAR	ED	21/10)/20	COMPLETED 21/10/20			DATUM
DRI		NG C		ACTO)r				BEARING
EQ	JIPI	MENT	_5 to	nne e	excava	tor	HOLE LOCATION 405652	6504213	
HO	LES	SIZE	0.5m	x1.5n	n		_ LOGGED BY _FH		CHECKED BY KB
NO	TES	;							
Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Descrip	tion	Samples Tests Remarks	Additional Observations
				<u>, 17</u> 		TOPSOIL: Loose, dark grey, silty sand with roo	otlets		
			-		GPS	SANDY GRAVEL: Dense, fine to medium grai	ned, grey, with silt, dry		
	Not Encountered		- 0. <u>5</u> - 1. <u>0</u> - 1. <u>5</u> - -		GP-GC	GRAVELLY SAND with CLAY: Very dense, fin grey, dry REFUSAL Borehole TH43 terminated at 1.8m	e to coarse, yellowish brown &		
			2 <u>.0</u> _ _ _						
			2.5						

APPENDIX B



Perth Sand Penetrometer Test Plots

Depth (mm)	Blow Counts	Perth Sand Pen	netrometer Results - Test 05	Job Name:	Lot 50 &
300	16		Blow Counts		M1456
600	16	0 1 2 3 4	4 5 6 7 8 9 10 11 12 13 14 15 16		Muchae
900		300		Job No:	20049
1200		900		Date:	20/11/2020
1500		Ê 1200		Location:	TH11
1800		<u>E</u> 1500			
2100					
2400		2400			
2700		2700			
3000		3000			

Depth (mm)	Blow Counts		Perth	n San	d Pe	netr	rome	eter	Resi	ults -	Tes	t 06					Job Name:	Lot 50 &
300	7							Blo	w Co	unts								M1456
600	7) 1	2	3	4	5	6 7		9	10	11	12	13 1	4 15	5 16		Muchae
900	8	300 600															Job No:	20049
1200	8	900															Date:	20/11/2020
1500		Ē ¹²⁰⁰															Location:	TH14
1800		ら ₁₅₀₀																
2100		a 1800 a 2100																
2400		2400																
2700		2700																
3000		3000																

Depth (mm)	Blow Counts		Per	th Sa	nd F	Pen	etror	nete	er R	esu	lts -	Tes	st 07	,				Job Name:	Lot 50 &
300	6						_	E	Blow	Cou	ints								M1456
600	7	(0 ·	1 2	3	4	5	6	7	8	9	10	11	12	13	14	15 16		Muchae
900	8	300 600																Job No:	20049
1200	15	900																Date:	20/11/2020
1500		<u>ਵ</u> ਿ 1200					_	_								<u> </u>	∍	Location:	TH17
1800		ម្ ₁₅₀₀																	
2100		0 1800																	
2400		2400																	
2700		2700																	
3000		3000																	

Depth (mm)	Blow Counts		Р	ert	h Sa	nd	Pen	etro	ome	eter	Res	sult	s -	Tes	t 08						Job Name:	Lot 50 &
300	7									Blo	ow C	oun	ts									M1456
600	7		0 ↓	1	2	3	4	- 5	5	6	7	8	9	10	11	12	13	14	15 1	16 1		Muchae
900	8	600	, 																		Job No:	20049
1200	8	900								_	1										Date:	20/11/2020
1500		Ē ¹²⁰⁰																			Location:	TH21
1800		ਦ ₁₅₀₀																				
2100		a 1800 a 2100	} -																			
2400		2400																				
2700		2700																				
3000		3000																				



Depth (mm)	Blow Counts	Per	th Sand Pe	enetrometer	Results -	Test 10		Job Name:	Lot 50 &
300	6			BI	ow Counts				M1456
600	7		1 2 3	4 5 6	7 8 9	10 11 12 13	3 14 15 16		Muchae
900	13	300 600						Job No:	20049
1200	16	900						Date:	20/11/2020
1500		Ē 1200						Location:	TH28
1800		୍ର ₁₅₀₀							
2100		G 1800 D 2100							
2400		2400							
2700		2700							
3000		3000							

Depth (mm)	Blow Counts		Pert	h Sa	nd Po	eneti	ome	eter F	Resu	ılts -	Tes	t 11				Job Name:	Lot 50 &
300	5		_		_		_	Blov	w Co	unts							M1456
600	8			2	3	4	5	67	8	9	10	11	12 1:	3 14	15 16		Muchae
900	16	300 600														Job No:	20049
1200	16	900														Date:	20/11/2020
1500		፪ ¹²⁰⁰				<u> </u>	<u> </u>				_				<u></u>	Location:	TH32
1800		្រំ ₁₅₀₀															
2100			-														
2400		2100															
2700		2700															
3000		3000	1														

Depth (mm)	Blow Counts		Per	th Sa	nd P	ene	trom	neter	Res	sults	s - Te	est 12	2				Job Name:	Lot 50 &
300	5							BI	ow C	ount	S							M1456
600	8		0	12	3	4	5	6	7 8	8 9	9 1	0 11	12	13	14	15 16		Muchae
900	16	300 600															Job No:	20049
1200		900															Date:	20/11/2020
1500		Ē 1200	1														Location:	TH38
1800		ຍ ₁₅₀₀	-															
2100		a 1800 a 2100	-															
2400		2400	1															
2700		2700	1															
3000		3000																



Depth (mm)	Blow Counts		Pert	h Sa	nd P	enet	rom	eter l	Resu	lts -	Tes	t 14				Job Name:	Lot 50 &
300	10			_	_		_	Blo	w Co	unts							M1456
600	15		0 1	2	3	4	5	6 7	8	9	10	11	12 1	3 14	15 16		Muchae
900	16	300 600														Job No:	20049
1200		900									_					Date:	20/11/2020
1500		Ê 1200														Location:	TH43
1800		ម្ ₁₅₀₀															
2100		G 1800	-														
2400		2400															
2700		2700															
3000		3000															

Depth (mm) Blow Counts Perth Sand Penetrometer Results - Test 15													Job Name:							
300									E	Blow	Cou	nts								
600			0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
900		300 600	-																	Job No:
1200		900	1																	Date:
1500		Ê 1200	1																	Location:
1800		ຍ ₁₅₀₀ ສ																		
2100																				
2400		2400																		
2700		2700	1																	
3000		3000																		

Depth (mm)	Blow Counts		Perth Sand Penetrometer Results - Test 16														Job Name:			
300									E	Blow	Cou	ints			-					
600			0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
900		300 600	1																	Job No:
1200		900																		Date:
1500		Ê 1200	1																	Location:
1800		ម្ ₁₅₀₀																		
2100		a 1800 a 2100																		
2400		2400	1																	
2700		2700	1																	
3000		3000																		

APPENDIX C



	SOIL AGGREGATE	CONCRETE	CRUSH	ING
	TEST REP	ORT - AS 1289.3.6.1		
Client:	Brown Geotechnical		Ticket No.	S1928
Client Address:	PO Box 278 Como, WA, 6952		Report No.	WG20/9800_1_PSD
Project:	Tallangatta		Sample No.	WG20/9800
Location:	Muchae		Date Sampled:	20-10-2020
Sample Identification	<i>n:</i> TH1 0.2-0.5m		Date Tested:	28-29/10/2020

TEST RESULTS - Particle Size Distribution of Soil







AGGREGATE CONCRETE CRUSHING SOIL **TEST REPORT - AS 1289.3.6.1 (% Fines)** Client: **Brown Geotechnical** Ticket No. **S1928 Client Address:** PO Box 278 Como, WA, 6952 Report No. WG20/9801_1_%FINES **Project:** WG20/9801 **Tallangatta** Sample No. Muchae Date Sampled: 20-10-2020 Location: TH6 1.5-2.0m Sample Identification: Date Tested: 28-29/10/2020 **TEST RESULTS - Particle Size Distribution of Soil** Sampled by Client, Tested as Received Sampling Method: Sieve Size **Percent Passing** 100 (mm) Sieve (%) 90 80 75.0 37.5 70 -19.0 60 9.5 850 4.75 Passing (2.36 1.18 30 0.600 20 0.425 0.300 10 -0.150 0 0.0 0.1 10.0 100.0 1000.0 1.0 0.075 27 Particle Size (mm)

Comments: Clients request for the % Fines of Material passing 0.075mm only.





SOIL AGGREGATE CONCRETE CRUSHING TEST REPORT - AS 1289.3.1.1, 3.2.1, 3.3.1 & 3.4.1 Client: **Brown Geotechnical** Ticket No. **S1928 Client Address:** PO Box 278 Como, WA, 6952 Report No. WG20/9801_1_PI **Project:** Tallangatta Sample No. WG20/9801 Location: Muchae Date Sampled: 20-10-2020 Sample Identification: TH6 1.5-2.0m Date Tested: 29-10-2020

TEST RESULTS - Consistency Limits (Casagrande)

Sampling Method:	Sampled by Client, Tested as Received		
History of Sample:	Oven Dried <50°C		
Method of Preparation:	Dry Sieved		

AS 1289.3.1.1	Liquid Limit (%)	34
AS 1289.3.2.1	Plastic Limit (%)	13
AS 1289.3.3.1	Plasticity Index (%)	21
AS 1289.3.4.1	Linear Shrinkage (%)	6.5
AS 1289.3.4.1	Length of Mould (mm)	250
AS 1289.3.4.1	Condition of Dry Specimen:	Cracked, Curled

Comments:	
Approved Signatory: Name: Brooke Elliott Date: 02-November-2020	Accreditation No. 20599 Accredited for compliance with ISO/IEC 17025 - Testing This document shall not be reproduced except in full
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SC	DIL AGGREGATE	CONCRETE CRUS	SHING			
TEST REPORT - ASTM D2974-14 (Test Method C)						
Client:	Brown Geotechnical	Ticket No.	S1			
Client Address:	PO Box 278 Como, WA, 6952	Report No.	WG20/ _1_ORG			
Project:	Tallangatta	Sample No. WG20/9802-1				
Location:	Muchae	Date Sampled: 22020				
Sample Identification:	TH14 0.1m	Date Tested:	2020			
	TEST RESULTS	S - Organic Content				
Sampling M	ethod:	Sampled by Client, Tested a	as Received			
Testing Comp	ing Completed By: KT					
Furnace Temperature (°C):		440				
Sample Number	Sample Identification	Ash Content (%)	Organic Content (%)			
WG20/9802-1	S1	94.2	5.8			
0	0	#DIV/0!	#DIV/0!			
0	0	#DIV/0!	#DIV/0!			
0	0	#DIV/0!	#DIV/0!			
0	0	#DIV/0!	#DIV/0!			
0	0	#DIV/0!	#DIV/0!			
0	0	#DIV/0!	#DIV/0!			
0	0	#DIV/0!	#DIV/0!			
0	0	#DIV/0!	#DIV/0!			

Comments:



Name: Brooke Elliott
Date:30-October-2020

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	SOIL AGGREGATE	CONCRETE	CRUSH	ING		
TEST REPORT - AS 1289.3.6.1						
Client:	Brown Geotechnical		Ticket No.	S1928		
Client Address:	PO Box 278 Como, WA, 6952		Report No.	WG20/9802_1_PSD		
Project:	Tallangatta		Sample No.	WG20/9802		
Location:	Muchae		Date Sampled:	20-10-2020		
Sample Identificatio	<i>n:</i> TH14 1.0-1.5m		Date Tested:	28-29/10/2020		

TEST RESULTS - Particle Size Distribution of Soil



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	SOIL AGGREGATE	CONCRETE	CRUSH	ING
	TEST REPC	ORT - AS 1289.3.6.1		
Client:	Brown Geotechnical		Ticket No.	S1928
Client Address:	PO Box 278 Como, WA, 6952		Report No.	WG20/9803_1_PSD
Project:	Tallangatta		Sample No.	WG20/9803
Location:	Muchae		Date Sampled:	20-10-2020
Sample Identification	: Th19 0.3-0.8m		Date Tested:	28-29/10/2020

TEST RESULTS - Particle Size Distribution of Soil



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Name: Brooke Elliott

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AGGREGATE CONCRETE CRUSHING SOIL **TEST REPORT - AS 1289.3.6.1 (% Fines)** Client: **Brown Geotechnical** Ticket No. **S1928 Client Address:** PO Box 278 Como, WA, 6952 Report No. WG20/9804_1_%FINES **Project:** WG20/9804 **Tallangatta** Sample No. Muchae Date Sampled: 20-10-2020 Location: TH19 1.0-1.5m Sample Identification: Date Tested: 28-29/10/2020 **TEST RESULTS - Particle Size Distribution of Soil** Sampled by Client, Tested as Received Sampling Method: Sieve Size **Percent Passing** 100 (mm) Sieve (%) 90 80 75.0 37.5 70 -19.0 60 9.5 850 4.75 Passing (2.36 1.18 30 0.600 20 0.425 0.300 10 0.150 0 0.0 0.1 10.0 100.0 1000.0 1.0 0.075 19 Particle Size (mm)

Comments: Clients request for the % Fines of Material passing 0.075mm only.



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Date: 02-November-2020

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SOIL AGGREGATE CONCRETE CRUSHING TEST REPORT - AS 1289.3.1.1, 3.2.1, 3.3.1 & 3.4.1 Client: **Brown Geotechnical** Ticket No. **S1928 Client Address:** PO Box 278 Como, WA, 6952 Report No. WG20/9804_1_PI **Project:** Tallangatta Sample No. WG20/9804 Location: Muchae Date Sampled: 20-10-2020 Sample Identification: TH19 1.0-1.5m Date Tested: 29-10-2020

Sampling Method:	Sampled by Client, Tested as Received
History of Sample:	Oven Dried <50°C
Method of Preparation:	Dry Sieved

AS 1289.3.1.1	Liquid Limit (%)	28
AS 1289.3.2.1	Plastic Limit (%)	14
AS 1289.3.3.1	Plasticity Index (%)	14
AS 1289.3.4.1	Linear Shrinkage (%)	4.0
AS 1289.3.4.1	Length of Mould (mm)	250
AS 1289.3.4.1	Condition of Dry Specimen:	-

Comments:	
Approved Signatory:	Accreditation No. 20599 Accredited for compliance
Name: Brooke Elliott	ACCREDITATION
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AGGREGATE CONCRETE CRUSHING SOIL **TEST REPORT - AS 1289.3.6.1 (% Fines)** Client: **Brown Geotechnical** Ticket No. **S1928 Client Address:** PO Box 278 Como, WA, 6952 Report No. WG20/9805_1_%FINES **Project:** WG20/9805 **Tallangatta** Sample No. Muchae Date Sampled: 20-10-2020 Location: TH21 1.5-1.9m Sample Identification: Date Tested: 28-29/10/2020 **TEST RESULTS - Particle Size Distribution of Soil** Sampled by Client, Tested as Received Sampling Method: Sieve Size **Percent Passing** 100 (mm) Sieve (%) 90 80 75.0 37.5 70 -19.0 60 9.5 850 4.75 Passing (2.36 1.18 30 0.600 20 0.425 0.300 10 -0.150 0 0.0 0.1 10.0 100.0 1000.0 1.0 0.075 24 Particle Size (mm)

Comments: Clients request for the % Fines of Material passing 0.075mm only.



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SOIL AGGREGATE CONCRETE CRUSHING TEST REPORT - AS 1289.3.1.1, 3.2.1, 3.3.1 & 3.4.1 Client: **Brown Geotechnical** Ticket No. **S1928 Client Address:** PO Box 278 Como, WA, 6952 Report No. WG20/9805_1_PI **Project:** Tallangatta Sample No. WG20/9805 Location: Muchae Date Sampled: 20-10-2020 Sample Identification: TH21 1.5-1.9m Date Tested: 29-10-2020

Sampling Method:	Sampled by Client, Tested as Received
History of Sample:	Oven Dried <50°C
Method of Preparation:	Dry Sieved

AS 1289.3.1.1	Liquid Limit (%)	35
AS 1289.3.2.1	Plastic Limit (%)	16
AS 1289.3.3.1	Plasticity Index (%)	19
AS 1289.3.4.1	Linear Shrinkage (%)	6.0
AS 1289.3.4.1	Length of Mould (mm)	250
AS 1289.3.4.1	Condition of Dry Specimen:	Cracked

Comments:	
Approved Signatory: Rame: Brooke Elliott	Accreditation No. 20599 Accredited for compliance with ISO/IEC 17025 - Testing
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)

CONCDETE

TEST RESULTS - Particle Size Distribution of Soil



Comments: *AS 1289.1.1- Deviation from standard: Insufficient sample according to test method requirements. NATA accreditation does not cover the performance of this service.

Approved Signatory:

: Ratit

Name: Brooke Elliott

Date: 30-October-2020

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SOIL AGGREGATE CONCRETE CRUSHING TEST REPORT - AS 1289.3.1.1, 3.2.1, 3.3.1 & 3.4.1 Client: **Brown Geotechnical** Ticket No. **S1928 Client Address:** PO Box 278 Como, WA, 6952 Report No. WG20/9807_1_PI **Project:** Tallangatta Sample No. WG20/9807 Location: Muchae Date Sampled: 20-10-2020 Sample Identification: TH29 0.5-1.1m Date Tested: 29-10-2020

Sampling Method:	Sampled by Client, Tested as Received
History of Sample:	Oven Dried <50°C
Method of Preparation:	Dry Sieved

AS 1289.3.1.1	Liquid Limit (%)	23
AS 1289.3.2.1	Plastic Limit (%)	17
AS 1289.3.3.1	Plasticity Index (%)	6
AS 1289.3.4.1	Linear Shrinkage (%)	2.0
AS 1289.3.4.1	Length of Mould (mm)	250
AS 1289.3.4.1	Condition of Dry Specimen:	Cracked

Comments:	
Approved Signatory:	Accreditation No. 20599 Accredited for compliance
Name: Brooke Elliott	WORLD RECORDERED WITH ISO/IEC 17025 - Testing
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AGGREGATE CONCRETE CRUSHING SOIL **TEST REPORT - AS 1289.3.6.1 (% Fines)** Client: **Brown Geotechnical** Ticket No. **S1928 Client Address:** PO Box 278 Como, WA, 6952 Report No. WG20/9808_1_%FINES **Project:** WG20/9808 **Tallangatta** Sample No. Muchae Date Sampled: 20-10-2020 Location: TH37 1.2-1.6m Sample Identification: Date Tested: 28-29/10/2020 **TEST RESULTS - Particle Size Distribution of Soil** Sampled by Client, Tested as Received Sampling Method: Sieve Size **Percent Passing** 100 (mm) Sieve (%) 90 80 75.0 37.5 70 -19.0 60 9.5 850 4.75 Passing (2.36 1.18 30 0.600 20 0.425 0.300 10 -0.150 0 0.0 0.1 10.0 100.0 1000.0 1.0 0.075 21 Particle Size (mm)

Comments: Clients request for the % Fines of Material passing 0.075mm only.



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SOIL AGGREGATE CONCRETE CRUSHING TEST REPORT - AS 1289.3.1.1, 3.2.1, 3.3.1 & 3.4.1 Client: **Brown Geotechnical** Ticket No. **S1928 Client Address:** PO Box 278 Como, WA, 6952 Report No. WG20/9808_1_PI **Project:** Tallangatta Sample No. WG20/9808 Location: Muchae Date Sampled: 20-10-2020 Sample Identification: TH37 1.2-1.6m Date Tested: 29-10-2020

Sampling Method:	Sampled by Client, Tested as Received
History of Sample:	Oven Dried <50°C
Method of Preparation:	Dry Sieved

AS 1289.3.1.1	Liquid Limit (%)	31
AS 1289.3.2.1	Plastic Limit (%)	14
AS 1289.3.3.1	Plasticity Index (%)	17
AS 1289.3.4.1	Linear Shrinkage (%)	6.5
AS 1289.3.4.1	Length of Mould (mm)	250
AS 1289.3.4.1	Condition of Dry Specimen:	-

Comments:	
Approved Signatory:	Accreditation No. 20599 Accredited for compliance
Name: Brooke Elliott	ACCREDITATION
Date: 02-November-2020	This document shall not be reproduced except in full
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