Proposed Residential Subdivision – DA1 Area Geotechnical Assessment

51 & 134 Station Lane, Lochinvar

Habball

NEW21P-0129-AC 30 March 2022



30 March 2022

McCloy Project Management Pty Ltd PO Box 2214 DANGAR NSW 2309

Attention: Mr James Goode

Dear Sir

RE: PROPOSED RESIDENTIAL SUBDIVISION – DA1 Area 51 & 134, STATION LANE, LOCHINVAR GEOTECHNICAL ASSESSMENT

Please find enclosed our Geotechnical Assessment report for the DA1 area of the proposed residential subdivision to be located at 51 & 134 Station Lane, Lochinvar.

The report includes recommendations for pavement design and construction for internal subdivision roads and Station Lane, detention basin construction, and site earthworks.

If you have any questions regarding this report, please do not hesitate to contact Ben Edwards, Shannon Kelly, or the undersigned.

For and on behalf of Qualtest Laboratory (NSW) Pty Ltd

the les

Jason Lee Principal Geotechnical Engineer

Table of Contents:

1.0		Introduction1
2.0		Desktop Study1
3.0		Field Work1
4.0		Site Description2
	4.1	Surface Conditions2
	4.2	Subsurface Conditions4
5.0		Laboratory Testing9
6.0		Discussion and Recommendations12
	6.1	Pavement Design12
	6.1.1	Design Subgrade CBR Values12
	6.1.2	Design Traffic Loadings13
	6.1.3	Flexible Pavement Thickness Design13
	6.1.4	Construction Considerations24
	6.2	Excavation Conditions25
	6.3	Site Preparation
	6.4	Fill Construction Procedures27
	6.5	Suitability of Site Materials for Re-Use as Fill27
	6.6	Proposed Detention Basin
	6.6.1	Site Materials and Suitability28
	6.6.2	Construction Recommendations29
	6.6.3	Batter Slopes & Erosion Control
	6.7	Special Requirements for Construction Procedures and Drainage31
7.0		Limitations

Attachments:

Figures:	Figure AC1:	Site Plan and Approximate Test Locations
Appendix A:	Results of Field	d Investigations
Appendix B:	Results of Lab	oratory Testing

1.0 Introduction

Qualtest Laboratory NSW Pty Ltd (Qualtest) is pleased to present this Geotechnical Assessment report to McCloy Project Management Pty Ltd (McCloy), for the DA1 area of the proposed residential subdivision, to be located at 51 and 134 Station Lane, Lochinvar.

Based on the Brief provided in an email from McCloy dated 2 February 2022, and Overall DA Master Plan (Ref: ACOR Consultants Pty Ltd, Project No. NSW212012, Drawing No. DA101-006, Issue: E, dated 24 March 2022), provided in an email from McCloy dated 9 March 2022, the proposed development within the DA1 area is understood to comprise subdivision into approximately 375 residential lots, and construction of associated infrastructure including subdivision road pavements and detention basins, as shown on Figure AC1.

The scope of work for the geotechnical investigation included providing discussion and recommendations on the following:

- Pavement design and construction to Maitland City Council (MCC) specifications;
- Detention basin design and construction recommendations, including excavation and foundation conditions, key in details, embankment construction and batter slopes;
- Excavation conditions and depth to rock;
- Site preparation;
- The suitability of the site soils for use as fill and fill construction procedures; and,
- Special requirements for construction procedures and site drainage.

This report presents the results of the field work investigations and laboratory testing, and provides recommendations for the scope outlined above.

2.0 Desktop Study

The scope of work has included a review of the following reports, with selected relevant information included to supplement current investigations where applicable.

- Preliminary Geotechnical Assessment, 'Proposed Subdivision 51, 134 & 146 Station Lane, Lochinvar', (Report Reference: NEW21P-0129-AA, dated 20 September 2021). This report should be referred to for preliminary site classification in accordance with AS2870-2011, "Residential Slabs and Footings";
- Addendum Preliminary Contamination Assessment, 'Proposed Subdivision 51, 134 & 146 Station Lane, Lochinvar', (Report Reference: NEW21P-0129-AB, dated 8 September 2021);
- Geotechnical and Salinity Investigation Report, '51, 134, 146 Station Lane, Lochinvar' (Geotesta, Report No. NE526, dated 19 September 2019).

3.0 Field Work

Field work investigations were carried out on 10 and 11 February 2022 and comprised of:

- DBYD search and visual check of proposed test locations for the presence of underground services;
- Site walkover to make observations of surface features at the property and in the immediate surrounding area;

- Excavation of 22 test pits (TP101 to TP122) using a 2.7 tonne excavator equipped with a 450mm wide bucket. Test pits were terminated at depths of between 0.80m and 2.00m;
- Bulk disturbed samples were taken for subsequent laboratory testing; and,
- Test pits were backfilled with the excavation spoil and compacted using the excavator bucket and tracks.

Investigations were carried out by an experienced Geotechnical Engineer from Qualtest who located the test pits, carried out the testing and sampling, produced field logs of the test pits, and made observations of the site surface conditions.

Engineering logs of the test pits are presented in Appendix A. Approximate test pit locations are shown on the attached Figure AC1. Test pits were located in the field by handheld GPS and relative to existing site features including topographic features, lot boundaries, existing developments and trees.

4.0 Site Description

4.1 Surface Conditions

The subject site (DA1 area) is an irregular shaped area of land with an approximate plan area of 42 hectares, and comprises nos. 51 and part of 134 Station Lane, Lochinvar, respectively known as Lot 3 DP564631, and part Lot 4 634523.

The approximate site area for DA1 area is shown on attached Figure AC1.

The site is located within a region of moderately undulating topography, on a north-south trending ridge formation that approximately bisects the site, with tributaries of Lochinvar Creek positioned near the western and eastern boundaries, draining towards the north.

Ground levels are generally in the range from roughly RL 50m (AHD) at the approximate centre of the southern boundary of the site, falling to roughly RL 35m (AHD) in the northern corners of the site. Site slopes generally vary from about 3° to 10° towards the north, east, and west (i.e. away from the crest of the ridge formation), with some locally steeper areas associated with fill stockpiles, naturally formed easements, or dam embankments.

The site is typically characterised as undeveloped rural farmland, vegetated by sparse coverage of mature trees and established grass cover. Observed developments include a dwelling and associated developments on no. 51, and farm dams on no. 134.

On the day of the investigation, the site was judged to be reasonably well drained by way of surface runoff following the natural topography towards the watercourses, which generally drain towards the north of the site. Some ponded water was present in the watercourses.

Trafficability was judged to be good by way of 4WD vehicle along the existing access tracks. Photographs of the site taken on the day of the site investigations are shown below.



Photograph 1: From near TP119, facing northeast. Showing Station Lane on right of photograph.



Photograph 3: From near TP119, facing west.



Photograph 5: From near TP114, facing north.



Photograph 7: From near TP122, facing southwest.



Photograph 9: From near TP105, facing west.



Photograph 2: From near TP119, facing southeast. Showing Station Lane on left of photograph.



Photograph 4: From near TP119, facing northwest.



Photograph 6: From near TP114, facing northeast.



Photograph 8: From near TP122, facing northeast.



Photograph 10: From near TP105, facing north. Showing Station Lane on right of photograph.



Photograph 11: From near TP107, facing north. Showing existing dwelling near the southern portion of Lot 3 DP564631.



Photograph 13: From near TP106, facing south.



Photograph 15: From near TP116, facing southeast.



Photograph 12: From near TP107, facing northeast.



Photograph 14: From near TP106, facing southwest.



Photograph 16: From near TP116, facing south.

4.2 Subsurface Conditions

Reference to the 1:100,000 Cessnock Regional Geology Series Sheet 9132 indicates the site to be underlain by the Lochinvar Formation of the Dalwood Group, which is characterised by lithic feldspathic sandstone, siltstone, shale, tuff, basalt flows and erratics.

Table 1 presents a summary of the typical soil types encountered at test pit locations during the field investigation, divided into representative geotechnical units.

Table 2 contains a summary of the distribution of the above geotechnical units at the test pit locations.

No groundwater levels or water inflows were encountered in the test pits during the limited time that they remained open on the day of the current field investigations.

It should be noted that groundwater conditions can vary due to rainfall and other influences including regional groundwater flow, temperature, permeability, recharge areas, surface condition, and subsoil drainage.

TABLE 1 – SUMMARY OF GEOTECHNICAL UNITS AND SOIL TYPE	S
---	---

Unit	Soil Type	Description
1A	FILL – TOPSOIL	Sandy CLAY - low plasticity, dark brown, fine to coarse grained sand, with fine to medium grained angular to sub-angular gravel, root affected.
1B	UNCONTROLLED FILL	Clayey Sandy GRAVEL - fine to coarse grained rounded to sub- angular, dark brown with dark grey, fine to coarse grained sand, fines of low plasticity.
2	TOPSOIL	Sandy CLAY – medium to high plasticity, colour combinations of brown, dark brown and dark grey, fine to medium grained (mostly fine grained) sand, root affected. Clayey Gravelly SAND – fine to coarse grained, grey-brown, fine to grained angular gravel, fines of low plasticity, root affected.
3	COLLUVIUM / ALLUVIUM	Sandy CLAY – medium to high plasticity, brown, trace orange and pale grey, fine grained sand. CLAY - medium to high plasticity, dark grey, with fine to coarse grained sand.
		CLAY, Sandy CLAY, Silty Sandy CLAY – medium to high plasticity, colour combinations of pale brown, brown, dark brown, grey-brown, pale brown, grey, dark grey, orange and red-brown, fine grained sand in places, with some fine grained angular gravel in places, with extremely to highly weathered pockets in places.
4	RESIDUAL SOIL	Gravelly Sandy CLAY – low to medium plasticity, colour combinations of pale brown, orange, pale grey and red-brown, fine to coarse grained sand, fine to medium grained (mostly fine grained) angular gravel, with extremely to highly weathered rock pockets in places.
		Clayey Gravelly SAND – fine to coarse grained, pale brown, fine to medium grained angular gravel, fines of low to medium plasticity, with clay pockets.
		Borderline Extremely Weathered Rock in places.
5	EXTREMELY WEATHERED (XW) ROCK with soil properties	Andesite; breaks down into Clayey Sandy GRAVEL, Clayey Gravelly SAND, Clayey SAND - fine to coarse grained, brown to pale brown, fine grained angular gravel, fines of low to medium plasticity, with Clay pockets in places, with highly weathered pockets in places.
	HIGHLY	ANDESITE – grey to dark grey and brown to dark brown, estimated extremely low to medium (mostly very low to low) strength, with extremely weathered pockets.
6	WEATHERED (HW) ROCK	BASALT – dark grey to black, estimated medium to high strength, highly fractured.
		SILTSTONE - pale brown, estimated extremely low to very low strength, fractured.

TABLE 2 – SUMMARY OF GEOTECHNICAL UNITS ENCOUNTERED AT TEST LOCATIONS	
---	--

Location	Unit 1A	Unit 1B	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6
	Fill – Topsoil	Uncontrolled Fill	Topsoil	Alluvium / Colluvium	Residual Soil	XW Rock	HW to MW Rock
				Depth in metres (m	n)		·
			Current li	nvestigation			
TP101	-	-	0.00 - 0.10	-	0.10 - 0.60	0.60 - 1.20^	-
TP102	-	-	0.00 - 0.10	-	0.10 - 1.30^	-	-
TP103	-	-	0.00 - 0.15	-	0.15 - 0.60	0.60 - 0.80^	-
TP104	-	-	0.00 - 0.10	-	0.10 - 1.20	1.20 - 1.90^	-
TP105	-	-	0.00 - 0.15	-	0.15 - 0.80	-	-
TP106	-	-	0.00 - 0.10	-	0.10 - 1.80^	-	-
TP107	-	-	0.00 - 0.20	-	0.20 - 1.10^	-	-
TP108	-	-	0.00 - 0.10	-	0.10 - 0.80	-	0.80 - 0.90^
TP109	0.00 - 0.10	0.10 - 0.40	-	-	0.40 - 1.80	1.80 - 1.90^	-
TP110	-	-	0.00 - 0.10	-	0.10 - 2.00^	-	-
TP111	-	-	0.00 - 0.10	-	0.10 - 1.10^	-	-
TP112	-	-	0.00 - 0.20	-	0.20 - 1.10^	-	-
TP113	-	-	0.00 - 0.20	-	0.20 - 1.40	1.40 - 1.90^	-
TP114	-	-	0.00 - 0.30	-	0.30 - 1.00	1.00 - 1.20^	-
TP115	-	-	0.00 - 0.20	-	0.20 - 1.20^	-	-

Location	Unit 1A	Unit 1B	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6
	Fill – Topsoil	Uncontrolled Fill	Topsoil	Alluvium / Colluvium	Residual Soil	XW Rock	HW to MW Rock
				Depth in metres (m	n)		
TP116	-	-	0.00 - 0.20	-	0.20 - 1.70*	-	-
TP117	-	-	0.00 - 0.10	-	0.10 -1.70^	-	-
TP118	-	-	0.00 - 0.20	-	0.20 - 0.80	0.80 - 1.10^	-
TP119	-	-	0.00 - 0.20	0.20 - 1.20	1.20 - 1.90	-	1.90 - 2.00^
TP120	-	-	0.00 - 0.25	-	0.25 - 1.60 1.70 - 2.00	-	1.60 - 1.70
TP121	-	-	0.00 - 0.20	-	0.20 - 1.70*	-	-
TP122	-	-	0.00 - 0.20	-	0.20 - 1.30	1.30 - 1.40^	-
		Previous Investige	ation (Ref: NEW21F	2-0129-AA, dated 2	0 September 2021)		
TP01	-	-	0.00 - 0.10	0.10 - 1.45	-	1.45 - 1.90^	-
TP02	-	-	0.00 - 0.05	-	0.05 - 2.00	-	-
TP03	-	-	0.00 - 0.20	0.20 - 1.60	1.60 - 2.00	-	-
TP04	-	-	0.00 - 0.20	0.20 - 1.00	1.00 - 1.75	1.75 - 2.00	-
TP09	-	-	0.00 - 0.20	-	0.20 - 0.80	0.80 - 1.40	1.40 - 1.50*
TP10	-	-	0.00 - 0.30	-	0.30 - 0.80	0.80 - 0.89	0.89 - 0.90^
TP11	-	-	0.00 - 0.30	0.30 - 0.90	0.90 - 1.30	-	1.30 - 1.40*
TP12	-	-	0.00 - 0.15	-	0.15 - 2.00	-	-
TP13	-	-	0.00 - 0.15	-	0.15 - 1.30	1.30 - 1.50^	-

Location	Unit 1A	Unit 1B	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6
	Fill – Topsoil	Uncontrolled Fill	Topsoil	Alluvium / Colluvium	Residual Soil	XW Rock	HW to MW Rock
		· · ·		Depth in metres (m)		
TP14	-	-	0.00 - 0.30	-	0.30 - 0.50	0.50 - 1.00	1.00 - 1.05*
TP19	-	-	0.00 - 0.25	-	0.25 - 1.15	1.15 - 1.40	1.40 - 1.50*
TP20	-	-	0.00 - 0.25	-	0.25 - 1.50	1.50 - 1.65	1.65 - 1.70*
TP21	-	-	0.00 - 0.25	-	0.25 - 0.60	0.60 - 1.10	1.10*
TP22	-	-	0.00 - 0.40	-	0.40 - 1.15	1.15 - 1.75^	-
TP23	-	-	0.00 - 0.15	-	0.15 - 2.00	-	-
TP24	-	-	0.00 - 0.30	-	0.30 - 2.00	-	-
TP25	-	0.00 - 0.30	-	-	-	-	0.30 - 0.32*
TP26	0.00 - 0.50	0.50 - 1.50	-	-	-	-	1.50 - 1.52*
TP27	0.00 - 0.30	0.30 - 1.05	-	-	-	-	1.05 - 1.10*
TP28	0.00 - 1.10	1.10 - 1.50	-	-	-	-	1.50 - 1.51*
TP29	0.00 - 0.10	0.10 - 1.30	-	-	-	1.30 - 1.50	1.50*

5.0 Laboratory Testing

Samples collected during the current field investigations were returned to our NATA accredited Warabrook Laboratory for testing which comprised of:

- (19 no.) California Bearing Ratio (CBR, 4 day soaked) & Standard Compaction;
- (11 no.) Particle Size Distribution;
- (11 no.) Atterberg Limits; and
- (11 no.) Emerson Crumb.

Results of the laboratory testing are presented in Appendix B, with a summary of the CBR, Particle Size Distribution, Atterberg Limits, and Emerson Crumb test results presented in Table 3 and Table 4.

Location	Sample Depth (m)	Field Moisture Content (%)	Optimum Moisture Content (%)	Relationship of Field MC to OMC (%)	CBR (%)
TP101	0.40 - 0.60	30.6	33.1	2.5 DRY	3.5
TP102	0.40 - 0.60	24.2	29.2	5.0 DRY	3.5
TP103	0.40 - 0.60	24.2	26.7	2.5 DRY	2.5
TP104	0.40 - 0.60	25.8	28.0	2.2 DRY	4.5
TP105	0.40 - 0.60	14.2	18.5	4.3 DRY	5
TP106	0.40 - 0.60	26.9	28.0	1.1 DRY	4.5
TP107	0.40 - 0.60	23.8	26.7	2.9 DRY	4.0
TP108	0.40 - 0.60	23.4	27.6	4.2 DRY	3.0
TP109	0.40 - 0.60	22.8	26.8	4.0 DRY	5
TP110	0.40 - 0.60	20.5	22.0	1.5 DRY	5
TP111	0.40 - 0.60	27.0	30.5	3.5 DRY	6
TP112	0.40 - 0.60	28.3	30.2	1.9 DRY	5
TP113	0.40 - 0.60	32.2	31.0	1.2 WET	3.5
TP114	0.40 - 0.60	29.2	33.7	4.5 DRY	3.5
TP115	0.40 - 0.60	28.7	34.0	5.3 DRY	5
TP116	0.40 - 0.60	20.3	23.9	3.6 DRY	7
TP117	0.40 - 0.60	19.2	19.8	0.6 DRY	2.5
TP118	0.40 - 0.60	34.5	26.1	8.4 WET	3.5
TP119	0.40 - 0.60	29.7	27.2	2.5 WET	3.0

TABLE 3 – SUMMARY OF CBR TESTING RESULTS

TABLE 4 – SUMMARY OF PARTICLE SIZE DISTRIBUTION, ATTERBERG LIMITS AND EMERSON CRUMB TESTING RESULTS

Location	Material	Grading		Atterberg Limits			Emerson
and Depth (m)	Description	Sieve (mm)	% Pass	Liquid Limit (%)	Plasticity Index (%)	Linear Shrinkage (%)	Class
		37.5	100				
TP101		19.0	100	00	50	10 5	
0.40 - 0.60	(CH) CLAY	2.36	100	82	52	19.5	4
		0.075	79				
		37.5	100	_			
TP101	(SC) Clayey Gravelly	19.0	93	42	21	9.0	4
1.00 - 1.20	SAND	2.36	53	42	21	9.0	4
		0.075	20				
		37.5	100				
TP120		19.0	100	71	51	17.5	2
0.50 - 0.60	(CH) CLAY 2.36 98 71 51 0.075 83	2.36	98	/ / /	51		
	(CH) CLAY	37.5	100	83	61	17.0	
TP120		19.0	99				4
1.00 - 1.30		2.36	95				4
		0.075	85				
		37.5	100			18.5	
TP120	(CH) Silty	19.0	99	17	4.4		
1.70 – 2.00	Sandy CLAY	2.36	93	67	44		4
		0.075	69				
		37.5	100				
TP121		19.0	100	(0	10	10.5	
0.50 – 0.70	(CH) CLAY	2.36	100	60	42	18.5	4
		0.075	81				
		37.5	100				
TP121		19.0	100		24	17 E	0
1.00 - 1.20	(CH) CLAY	2.36	96	55	34	17.5	2
		0.075	79				
		37.5	100				
TP121	(CL) Gravelly	19.0	100	47	00		
1.50 – 1.70	Sandy CLAY	2.36	83	47	23	10.0	2
		0.075	50				

Location	Material	Grac	ding	Atterberg Limits			Emerson
and Depth (m)	Description	Sieve (mm)	% Pass	Liquid Limit (%)	Plasticity Index (%)	Linear Shrinkage (%)	Class
		37.5	100				
TP122		19.0	100	7/	E A	21.0	
0.50 – 0.70	(CH) CLAY	2.36	76 54	54	21.0	4	
		0.075	85				
		37.5	100		(1	22.0	4
TP122		19.0	100	00			
1.00 - 1.20	(CH) CLAY	2.36	99	83	61		
		0.075	89				
		37.5	.5 100				
TP122	(SC) Clayey	19.0	100	27	10	FO	2
1.20 - 1.30	SAND	2.36	100	36		5.0	Z
		0.075	33				

Results of the laboratory testing indicate that the site soils typically have Emerson Classes of 2 (Sandy CLAY) or Emerson Classes of 4 (CLAY).

A soil of Emerson Class 2 can generally be described as having the following properties:

- Is susceptible to slaking (breaking up upon absorbing water from oven-dried condition);
- Is weakly susceptible to dispersion (allow the clay fraction of the soil to dissolve) when submerged in water.

A soil of Emerson Class 4 can generally be described as having the following properties:

- Is susceptible to slaking (breaking up upon absorbing water from oven-dried condition);
- Will not disperse (allow the clay fraction of the soil to dissolve) when submerged in water;
- Contain calcite or gypsums.

6.0 Discussion and Recommendations

6.1 Pavement Design

6.1.1 Design Subgrade CBR Values

Subgrade CBR test results from the nineteen tests carried out as part of investigations at the site ranged from 2.5% to 7%.

Based on the results of the field work, laboratory testing, and previous experience in the surrounding area, the following design California Bearing Ratio (CBR) values have been adopted for pavement thickness design for the proposed subdivision roads.

Road Section	Design Subgrade	Design CBR (%)
To Be Confirmed	Residual Clay, Controlled Fill - low CBR as encountered in test pits TP103 and TP117	2.5
To Be Confirmed	Residual Clay, Controlled Fill	3.0
To Be Confirmed	Residual Clay, Controlled Fill	3.5
To Be Confirmed	Residual Clay, Controlled Fill	4.0
To Be Confirmed	Weathered Rock	8
Notes:		

TABLE 5 – DESIGN SUBGRADE CBR VALUES

<u>Notes:</u>

- 1) Design subgrade CBR values should be confirmed at the time of construction by the geotechnical authority for each relevant road section.
- 2) Fill placed at road subgrade level should be assessed by the geotechnical authority. If the fill is assessed to have CBR different to that of the design CBR, then a revised pavement design will be required for that section.

Based upon the test results from the site, it is anticipated that:

- Design subgrade CBR of 3.0% to 4.0% will apply to the majority of road sections. The design CBR would generally depend upon nearby CBR results, depths of cutting carried out, and CBR of material used as fill where filling is carried out;
- Design subgrade CBR of 2.5%, may apply to localised road sections in the vicinity of TP103 and TP117, and possibly limited sections of other roads dependent on subgrade conditions encountered at the time of construction;
- Design subgrade CBR of 8% may apply to some road sections in deeper cuts which expose weathered rock provided that the ripped and re-compacted weathered rock is confirmed to have a design CBR \geq 8%.

If rock subgrade materials are encountered, the rock should be ripped and re-compacted for a minimum depth of 300mm to break-up any preferential drainage paths and provide a dense homogenous surface on which to construct the pavement. As noted above, design subgrade CBR values should be confirmed at the time of construction by the geotechnical authority for each relevant road section.

Subgrade should be prepared in accordance with the site preparation requirements presented in Section 6.3.

6.1.2 Design Traffic Loadings

For the purposes of flexible pavement design, design traffic loadings have been adopted in accordance with Maitland City Council (MCC) specifications for subdivision roads in terms of equivalent standard axles (ESA's) as outlined in Table 6.

Road classifications and design traffic loadings are based upon previous advice issued by Maitland City Council (MCC) for previous stages of nearby developments. Design traffic for is based upon similar roads within the nearby development. Designs are also provided for alternative Road Classifications if required.

Road Classification	Maximum No. Lots Serviced	Road Name	Design Traffic (ESA's)
Local – Access or Place	20	Road 11, TBC	1 x 10 ⁵
Local - Secondary	50	ТВС	2 x 10 ⁵
Local - Primary	100	ТВС	5 x 10 ⁵
Collector - Secondary	200	ТВС	1 x 10 ⁶
School Bus Route	-	ТВС	2 x 10 ⁶
Public Bus Route	-	Station Lane, TBC	5 x 10 ⁶
Sub-Arterial	3500	Terriere Drive, TBC	1 x 10 ⁷

TABLE 6 - DESIGN TRAFFIC LOADING

Confirmation should be obtained from MCC with respect to the road classifications to be adopted. In the event that different design traffic design loadings are applicable, then the pavement thickness designs presented in this report should be reviewed.

6.1.3 Flexible Pavement Thickness Design

Flexible pavement thickness design has been based on the procedures outlined in:

- MCC Manual of Engineering Standards 2014 Pavement Design;
- Austroads, "Guide to Pavement Technology, Part 2: Pavement Structural Design";
- ARRB Special Report No 41;
- APRG Report No 21.

Flexible Pavement Thickness Designs are presented in Table 7 to Table 14.

Pavement Material Specification and Compaction Requirements are presented in Table 15.

A bridging layer should be allowed for beneath the pavement where road pavement crosses any areas where poor, wet or saturated subgrade conditions are encountered. The requirement (if any) for bridging layers is likely to be dependent on the prevailing weather conditions at the time of construction.

For areas where poor or wet subgrade conditions are encountered, pavement design may require a select layer prior to design pavement thickness construction.

If stabilised subgrade is adopted, then the suitability of proposed liming rates should be confirmed by laboratory testing prior to construction.

If a select layer is required for the purpose of providing additional cover over expansive soils, the select layer should comprise Select Fill rather than lime stabilised subgrade.

If rock subgrade materials are encountered, the rock should be ripped and re-compacted for a minimum depth of 300mm to break-up preferential drainage paths and provide a dense homogenous surface on which to construct the pavement.

Any areas of uncontrolled fill should be replaced as controlled fill in accordance with AS3798-2007 prior to pavement construction.

It is recommended that each construction length be boxed out to the minimum subgrade level required by the relevant pavement thickness design. Prior to pavement construction, the exposed subgrade should be assessed by the geotechnical authority to confirm the pavement thickness requirement for that section.

Design / Construction Consideration:

With reference to the laboratory CBR test results, swells for the 19 samples tested varied from 1% to 3.5%. 15 of the 19 samples had swells of between 1.0% and 2.5%, and the two swell results of 3.5% correspond to the low CBR = 2.5% encountered at TP103 and TP117.

This indicates that the majority of subgrade soils are within the Moderate 'Expansive Nature' range, with reference to Table 5.2 in Austroads 2017 – Guide to Pavement Technology Part 2: Pavement Design (Austroads 2017), and that four samples obtained from test pits TP103, TP107, TP108 and TP117 are within the High 'Expansive Nature' range.

Austroads states that volume changes in highly expansive soils can be minimised by several options, one of which includes:

• 'Provide a low-permeability lower subbase or a select fill capping layer above the expansive soil. The minimum thickness of this layer should be the greater of 150mm or two-and-a-half times the maximum particle size. This capping layer should extend at least 500mm past the edge of pavement, and if provided, past the kerb and channel, to reduce edge movement'.

Based on recent experience for similar projects, MCC representatives have typically been directing the placement of a 300mm select layer in addition to the minimum pavement thickness design provided where clay subgrade soils are considered to be expansive soils, irrespective of subgrade CBR, swell, moisture condition, density or consistency.

MCC 'Notice of Determination – Development Application (Amended)', Ref. DA/2017/1781:1, dated 27 July 2020 has been previously provided by the client for a nearby development, which included the following Condition:

• '37. **Prior to the issue of Subdivision Works Certificate** a minimum 300mm select layer of subbase quarry product material shall be added to the pavement design due to the presence of high swell clays.'

Therefore, it is recommended that for tendering / pricing of works, any Contractors allow for an additional 300mm Select Layer of 'subbase quarry product material' as per anticipated MCC Conditions, in addition to the pavement thickness designs provided below in accordance with Austroads and MCC design standards.

Additional pavement design options have been included with the incorporation of a Select Layer as an alternative in Table 14. However, it is noted that if the Select Option is to be adopted, confirmation should be obtained in advance from MCC with respect to whether they would still require an extra 300mm Select Layer due to the presence of 'high swell clays', in addition to the 300mm Select Layer included in the pavement design.

Based upon experience with nearby subdivision developments, it is expected that MCC will require wearing course to be asphaltic concrete.

Qualtest could provide designs based upon a two-coat seal if required in accordance with MCC specification; however, the pavement subbase and total thickness specified above would generally be increased by the asphalt depths specified in Table 7 to Table 10. MCC states, 'Asphaltic concrete thickness shall be a minimum of 30mm and may be included as pavement "depth" in determining the pavement thickness. Two coat flush bitumen seals shall not be considered part of the pavement thickness'.

<u>Roundabout</u>

Based on recent experience for nearby projects, it is envisaged that Council may require a deep lift asphalt (typically 175mm to 190mm thickness overlying unbound subbase) pavement for the Terriere Drive roundabout. Qualtest can arrange for mechanistic analysis and design of this pavement if required.

TABLE 7 – FLEXIBLE PAVEMENT THICKNESS DESIGN SUMMARY – LOC	CAL – ACCESS OR PLACE

Road Classification	Local – Access or Place					
Design Traffic Loading (ESA's)	1 x 10 ⁵					
Design Subgrade CBR (%)	2.5 3.0 3.5 4.0 8.0					
Wearing Course (mm)	30 AC10	30 AC10	30 AC10	30 AC10	30 AC10	
Base Course (mm)	120	120	120	120	120	
Subbase (mm)	280	230	210	190	150	
Select Fill (mm)	-	-	-	-	-	
Total Thickness (mm)	430	380	360	340	300	

- 1) A 10mm primer seal should be placed over the base course prior to placement of the asphaltic concrete wearing course.
- 2) * Select Fill comprising approved material meeting requirements of Table 15, or Stabilised Subgrade – Lime stabilised with either 3% quicklime or 4% hydrated lime.
- 3) An allowance for additional subgrade replacement should be anticipated in any areas where poor, wet or saturated subgrade conditions are encountered. The requirement for, and depth and extent of any subgrade replacement / select filling, should be confirmed by the geotechnical authority at the time of construction.
- 4) Prior to pavement construction, the exposed subgrade should be assessed by the geotechnical authority to confirm the pavement thickness requirement for that section.
- 5) MCC may direct the placement of a 300mm select layer in addition to minimum pavement thickness designs provided above, where clay subgrade soils are considered to be expansive soils, irrespective of subgrade CBR, swell, moisture condition, density or consistency.
- 6) Note MCC Notice of Determination on nearby projects. 'Prior to the issue of Subdivision Works Certificate a minimum 300mm select layer of subbase quarry product material shall be added to the pavement design due to the presence of high swell clays'.
- 7) Due to construction practicalities when tying in with depth of kerb and gutter construction, the basecourse layer depth may be increased from 120mm to 150mm. The subbase thickness may be reduced accordingly, by up to 30mm, provided that this does not result in a minimum subbase thickness of less than 125mm.

TABLE 8 – FLEXIBLE PAVEMENT THICKNESS DESIGN SUMMARY – LOCAL – SECONDARY

Road Classification	Local – Secondary					
Design Traffic Loading (ESA's)	2 x 10 ⁵					
Design Subgrade CBR (%)	2.5 3.0 3.5 4.0 8.0					
Wearing Course (mm)	30 AC10	30 AC10	30 AC10	30 AC10	30 AC10	
Base Course (mm)	120	120	120	120	120	
Subbase (mm)	320	280	250	220	150	
Select Fill (mm)	-	-	-	-	-	
Total Thickness (mm)	470	430	400	370	300	

- 1) A 10mm primer seal should be placed over the base course prior to placement of the asphaltic concrete wearing course.
- 2) * Select Fill comprising approved material meeting requirements of Table 15, or Stabilised Subgrade – Lime stabilised with either 3% quicklime or 4% hydrated lime.
- 3) An allowance for additional subgrade replacement should be anticipated in any areas where poor, wet or saturated subgrade conditions are encountered. The requirement for, and depth and extent of any subgrade replacement / select filling, should be confirmed by the geotechnical authority at the time of construction.
- 4) Prior to pavement construction, the exposed subgrade should be assessed by the geotechnical authority to confirm the pavement thickness requirement for that section.
- 5) MCC may direct the placement of a 300mm select layer in addition to minimum pavement thickness designs provided above, where clay subgrade soils are considered to be expansive soils, irrespective of subgrade CBR, swell, moisture condition, density or consistency.
- 6) Note MCC Notice of Determination on nearby projects. 'Prior to the issue of Subdivision Works Certificate a minimum 300mm select layer of subbase quarry product material shall be added to the pavement design due to the presence of high swell clays'.
- 7) Due to construction practicalities when tying in with depth of kerb and gutter construction, the basecourse layer depth may be increased from 120mm to 150mm. The subbase thickness may be reduced accordingly, by up to 30mm, provided that this does not result in a minimum subbase thickness of less than 125mm.

TABLE 9 – FLEXIBLE PAVEMENT THICKNESS DESIGN SUMMARY – LOCAL – PRIMARY

Road Classification	Local – Primary					
Design Traffic Loading (ESA's)	5 x 10 ⁵					
Design Subgrade CBR (%)	2.5 3.0 3.5 4.0 8.0					
Wearing Course (mm)	30 AC10	30 AC10	30 AC10	30 AC10	30 AC10	
Base Course (mm)	120	120	120	120	120	
Subbase (mm)	380	320	290	270	150	
Select Fill (mm)	-	-	-	-	-	
Total Thickness (mm)	530	470	440	420	300	

- 1) A 10mm primer seal should be placed over the base course prior to placement of the asphaltic concrete wearing course.
- 2) * Select Fill comprising approved material meeting requirements of Table 15, or Stabilised Subgrade – Lime stabilised with either 3% quicklime or 4% hydrated lime.
- 3) An allowance for additional subgrade replacement should be anticipated in any areas where poor, wet or saturated subgrade conditions are encountered. The requirement for, and depth and extent of any subgrade replacement / select filling, should be confirmed by the geotechnical authority at the time of construction.
- 4) Prior to pavement construction, the exposed subgrade should be assessed by the geotechnical authority to confirm the pavement thickness requirement for that section.
- 5) MCC may direct the placement of a 300mm select layer in addition to minimum pavement thickness designs provided above, where clay subgrade soils are considered to be expansive soils, irrespective of subgrade CBR, swell, moisture condition, density or consistency.
- 6) Note MCC Notice of Determination on nearby projects. 'Prior to the issue of Subdivision Works Certificate a minimum 300mm select layer of subbase quarry product material shall be added to the pavement design due to the presence of high swell clays'.
- 7) Due to construction practicalities when tying in with depth of kerb and gutter construction, the basecourse layer depth may be increased from 120mm to 150mm. The subbase thickness may be reduced accordingly, by up to 30mm, provided that this does not result in a minimum subbase thickness of less than 125mm.

Road Classification	Collector – Secondary					
Design Traffic Loading (ESA's)	1 x 10 ⁶					
Design Subgrade CBR (%)	2.5 3.0 3.5 4.0 8.0					
Wearing Course (mm)	40 AC10	40 AC10	40 AC10	40 AC10	40 AC10	
Base Course (mm)	150	150	150	150	150	
Subbase (mm)	380	330	290	250	150	
Select Fill (mm)	-	-	-	-	-	

TABLE 10 – FLEXIBLE PAVEMENT THICKNESS DESIGN SUMMARY – COLLECTOR - SECONDARY

<u>Notes:</u>

Total Thickness (mm)

1) A 10mm primer seal should be placed over the base course prior to placement of the asphaltic concrete wearing course.

520

480

440

340

570

- 2) * Select Fill comprising approved material meeting requirements of Table 15, or Stabilised Subgrade – Lime stabilised with either 3% quicklime or 4% hydrated lime.
- 3) An allowance for additional subgrade replacement should be anticipated in any areas where poor, wet or saturated subgrade conditions are encountered. The requirement for, and depth and extent of any subgrade replacement / select filling, should be confirmed by the geotechnical authority at the time of construction.
- 4) Prior to pavement construction, the exposed subgrade should be assessed by the geotechnical authority to confirm the pavement thickness requirement for that section.
- 5) MCC may direct the placement of a 300mm select layer in addition to minimum pavement thickness designs provided above, where clay subgrade soils are considered to be expansive soils, irrespective of subgrade CBR, swell, moisture condition, density or consistency.
- 6) Note MCC Notice of Determination on nearby projects. 'Prior to the issue of Subdivision Works Certificate a minimum 300mm select layer of subbase quarry product material shall be added to the pavement design due to the presence of high swell clays'.

Road Classification	School Bus Route					
Design Traffic Loading (ESA's)	2 x 10 ⁶					
Design Subgrade CBR (%)	2.5 3.0 3.5 4.0 8.0					
Wearing Course (mm)	40 AC10	40 AC10	40 AC10	40 AC10	40 AC10	
Base Course (mm)	150	150	150	150	150	
Subbase (mm)	430	370	330	290	150	
Select Fill (mm)	-	-	-	-	-	
Total Thickness (mm)	620	560	520	480	340	

- 1) A 10mm primer seal should be placed over the base course prior to placement of the asphaltic concrete wearing course.
- 2) * Select Fill comprising approved material meeting requirements of Table 15, or Stabilised Subgrade – Lime stabilised with either 3% quicklime or 4% hydrated lime.
- 3) An allowance for additional subgrade replacement should be anticipated in any areas where poor, wet or saturated subgrade conditions are encountered. The requirement for, and depth and extent of any subgrade replacement / select filling, should be confirmed by the geotechnical authority at the time of construction.
- 4) Prior to pavement construction, the exposed subgrade should be assessed by the geotechnical authority to confirm the pavement thickness requirement for that section.
- 5) MCC may direct the placement of a 300mm select layer in addition to minimum pavement thickness designs provided above, where clay subgrade soils are considered to be expansive soils, irrespective of subgrade CBR, swell, moisture condition, density or consistency.
- 6) Note MCC Notice of Determination on nearby projects. 'Prior to the issue of Subdivision Works Certificate a minimum 300mm select layer of subbase quarry product material shall be added to the pavement design due to the presence of high swell clays'.

TABLE 12 – FLEXIBLE PAVEMENT THICKNESS DESIGN SUMMARY – PUBLIC BUS ROUTE
--

Road Classification	Public Bus Route					
Design Traffic Loading (ESA's)	5 x 10 ⁶					
Design Subgrade CBR (%)	2.5 3.0 3.5 4.0 8.0					
Wearing Course (mm)	40 AC10	40 AC10	40 AC10	40 AC10	40 AC10	
Base Course (mm)	150	150	150	150	150	
Subbase (mm)	480	420	380	340	160	
Select Fill (mm)	-	-	-	-	-	
Total Thickness (mm)	670	610	570	530	350	

- 1) A 10mm primer seal should be placed over the base course prior to placement of the asphaltic concrete wearing course.
- 2) * Select Fill comprising approved material meeting requirements of Table 15, or Stabilised Subgrade – Lime stabilised with either 3% quicklime or 4% hydrated lime.
- 3) An allowance for additional subgrade replacement should be anticipated in any areas where poor, wet or saturated subgrade conditions are encountered. The requirement for, and depth and extent of any subgrade replacement / select filling, should be confirmed by the geotechnical authority at the time of construction.
- 4) Prior to pavement construction, the exposed subgrade should be assessed by the geotechnical authority to confirm the pavement thickness requirement for that section.
- 5) MCC may direct the placement of a 300mm select layer in addition to minimum pavement thickness designs provided above, where clay subgrade soils are considered to be expansive soils, irrespective of subgrade CBR, swell, moisture condition, density or consistency.
- 6) Note MCC Notice of Determination on nearby projects. 'Prior to the issue of Subdivision Works Certificate a minimum 300mm select layer of subbase quarry product material shall be added to the pavement design due to the presence of high swell clays'.

Road Classification	Sub Arterial					
Design Traffic Loading (ESA's)	1 x 10 ⁷					
Design Subgrade CBR (%)	2.5 3.0 3.5 4.0 8.0					
Wearing Course (mm)	50 AC14	50 AC14	50 AC14	50 AC14	50 AC14	
Base Course (mm)	160	160	160	160	160	
Subbase (mm)	500	430	390	350	170	
Select Fill (mm)	-	-	-	-	-	
Total Thickness (mm)	710	640	600	560	380	

TABLE 13 – FLEXIBLE PAVEMENT THICKNESS DESIGN SUMMARY – SUB ARTERIAL

- 1) A 10mm primer seal should be placed over the base course prior to placement of the asphaltic concrete wearing course.
- 2) * Select Fill comprising approved material meeting requirements of Table 15, or Stabilised Subgrade – Lime stabilised with either 3% quicklime or 4% hydrated lime.
- 3) An allowance for additional subgrade replacement should be anticipated in any areas where poor, wet or saturated subgrade conditions are encountered. The requirement for, and depth and extent of any subgrade replacement / select filling, should be confirmed by the geotechnical authority at the time of construction.
- 4) Prior to pavement construction, the exposed subgrade should be assessed by the geotechnical authority to confirm the pavement thickness requirement for that section.
- 5) MCC may direct the placement of a 300mm select layer in addition to minimum pavement thickness designs provided above, where clay subgrade soils are considered to be expansive soils, irrespective of subgrade CBR, swell, moisture condition, density or consistency.
- 6) Note MCC Notice of Determination on nearby projects. 'Prior to the issue of Subdivision Works Certificate a minimum 300mm select layer of subbase quarry product material shall be added to the pavement design due to the presence of high swell clays'.

Road Classification	Local – Secondary	Local – Primary	Collector – Secondary	School Bus Route	Public Bus Route	Sub Arterial
Design Traffic Loading (ESA's)	2 x 10 ⁵	5 x 10 ⁵	1 x 10 ⁶	2 x 10 ⁶	5 x 10 ⁶	1 x 10 ⁷
Design Subgrade CBR (%)	2.5	2.5	2.5	2.5	2.5	2.5
Wearing Course (mm)	30 AC10	30 AC10	40 AC10	40 AC10	40 AC10	50 AC14
Base Course (mm)	120	120	150	150	150	160
Subbase (mm)	200	250	240	270	320	330
Select Fill (mm) *	300	300	300	300	300	300
Total Thickness (mm)	650	700	730	760	810	840

TABLE 14 – FLEXIBLE PAVEMENT THICKNESS DESIGN SUMMARY – 300MM SELECT LAYER

<u>Notes:</u>

- 1) A 10mm primer seal should be placed over the base course prior to placement of the asphaltic concrete wearing course.
- 2) * Select Fill to comprise approved material meeting requirements of Table 15. Not to comprise cemented subbase or lime stabilised subgrade unless approved by MCC and the geotechnical authority.
- 3) An allowance for additional subgrade replacement should be anticipated in any areas where poor, wet or saturated subgrade conditions are encountered. The requirement for, and depth and extent of any subgrade replacement / select filling, should be confirmed by the geotechnical authority at the time of construction.
- 4) Prior to pavement construction, the exposed subgrade should be assessed by the geotechnical authority to confirm the pavement thickness requirement for that section.
- 5) MCC may direct the placement of a 300mm select layer in addition to minimum pavement thickness designs provided above, where clay subgrade soils are considered to be expansive soils, irrespective of subgrade CBR, swell moisture condition, density or consistency.

Confirmation should be obtained from MCC whether an additional 300mm select layer is required in addition to the select layer included in the Select Option pavement designs provided above.

6) Due to construction practicalities when tying in with depth of kerb and gutter construction, the basecourse layer depth may be increased from 120mm to 150mm. The subbase thickness may be reduced accordingly, by up to 30mm, provided that this does not result in a minimum subbase thickness of less than 125mm.

Pavement Course	Material Specification	Compaction Requirements
Wearing Course (AC)	Maitland City Council Spec.	Maitland City Council Spec.
Base Course	CBR ≥ 80%, PI ≤ 6%	98% Modified (AS1289 5.2.1)
Subbase	CBR ≥ 30%, PI ≤ 12%	95% Modified (AS1289 5.2.1)
Select Fill / Stabilised Subgrade	Select Fill, CBR ≥ 15%, PI ≤ 15%, max particle size 75mm	95% Modified (AS1289 5.2.1)
	Or	
	2% cement stabilised subbase material	
	Or	
	Stabilised Subgrade - lime stabilised with either 3% quicklime or 4% hydrated lime to achieve CBR <u>></u> 10%	
Subgrade (top 300mm)	Minimum CBR = Design CBR	100% Standard (AS1289 5.1.1)
Subgrade / Fill Below	Minimum CBR = Design CBR	95% Standard (AS1289 5.1.1)

TABLE 15 – PAVEMENT MATERIAL SPECIFICATION AND COMPACTION REQUIREMENTS

Notes:

- Pavement materials for base course and subbase shall also comply with Maitland City Council (MCC) Manual of Engineering Standards Appendix D – Pavement Material Properties
- 2) CBR = California Bearing Ratio, PI = Plasticity Index.
- 3) Select Fill / Stabilised Subgrade option adopted will be dependent on subgrade moisture conditions. If the select layer is required for the purpose of providing additional cover over expansive soils, the select layer should comprise Select Fill rather than lime stabilised subgrade.

6.1.4 Construction Considerations

Care should also be taken to follow recommended construction practices when constructing new pavement adjacent to existing, including:

- A clean, vertical perpendicular surface at full depth should be cut for both transverse and longitudinal jointing. This will reduce the risk of plating and heaving effects on the pavement;
- Ensuring joints are not in wheel paths;
- Ensuring joints in sub-base / select layers are offset to joints in the base layer;
- Ramping between layers, and at the entry and exit points to the pavement, must be removed at all times. During construction, any temporary access ramps to properties or driveways must also be removed.

A bridging layer should be allowed for beneath the pavement where road pavements cross gullies and in any areas where poor, wet or saturated subgrade conditions are encountered. The requirement (if any) for bridging layers is likely to be dependent on the prevailing weather conditions at the time of construction.

6.2 Excavation Conditions

The depths of fill, topsoil, alluvium, colluvium, residual soils and weathered rock, together with depths of slow progress or refusal of the excavator where encountered, are summarised in Section 4.2.

In terms of excavation conditions, site materials can generally be divided into:

- Clayey and Granular Soils (Units 1, 2, 3, & 4). It is anticipated that these materials could be excavated by a conventional excavator or backhoe bucket;
- Extremely to Highly Weathered Rock or better (Units 5 & 6). Rippability is dependent on rock strength, degree of weathering and number of defects within the rock mass which can vary significantly.

It is anticipated that the Weathered Rock (Unit 5 & 6) material encountered could be excavated by conventional excavator at least to the depths indicated on the appended test pit logs.

It is expected that material below the depth of excavator bucket refusal will be excavatable by ripping to some greater depth, although this has not been assessed as part of the current investigation.

It is recommended that targeted investigations (e.g. cored boreholes) are carried out if significant excavations are proposed where bedrock depth or excavatability is important to design or construction.

The use of toothed buckets, ripping tines, and/or hydraulic rock hammers may be required if hard bands of weathered rock are encountered or for deep confined excavations such as for service trenches. Higher strength rock or randomly occurring hard bands within the rock mass if encountered, are likely to occur towards the base of deeper cuts. Methods including rotary heads, sawing, hydraulic breaking and/or pre-splitting may be considered to improve excavatability and geometry if higher strength rock is encountered.

Groundwater may exist at localised areas of the site such as within the topsoil and/or Alluvium profile, from water perched above the residual clay / bedrock profile, particularly in the vicinity of watercourses, dams or former drainage channels. It is possible that slow water inflow may be encountered from such layers, particularly if earthworks are carried out during or following periods of wet weather.

Excavations should be supported by properly designed and constructed retaining walls or else battered at 1V:2H or flatter and protected from erosion.

Temporary excavations should be battered at 1V:1H or flatter in cohesive soils, or 1V:1.5H or flatter in granular soils, and protected from erosion. Steeper excavations may be supported by means of temporary shoring.

Temporary excavations to depths of up to 1.2m in competent compact material with sufficient cohesion, such as clay of stiff consistency or better may be battered vertically, subject to inspection during excavation by the geotechnical authority.

The safe working procedures of Work Cover NSW Excavation work code of practice, dated January 2020 should be followed.

Care should be taken not to disturb or destabilise existing underground services or structures.

6.3 Site Preparation

Site preparation and earthworks suitable for pavement support and site re-grading should consist of:

- Following any bulk excavation to proposed subgrade level, all areas of proposed pavement construction or site re-grading should be stripped to remove all existing uncontrolled fill, vegetation, topsoil, root affected or other potentially deleterious materials;
- Stripping is generally expected to be required to depths of about 0.2m to 0.4m to remove topsoil and root affected material. Stripping of greater depths of fill material in addition to topsoil and root affected material is anticipated in areas affected by fill mounds or surface filling;
- Additional stripping may be required in any areas where poor, wet or saturated subgrade conditions are encountered;
- Following stripping, the exposed subgrade should be proof rolled (minimum 10 tonne static roller), to identify any wet or excessively deflecting material. Any such areas should be over excavated and backfilled with an approved select material;
- The moisture content of the subgrade materials and therefore the need for moisture conditioning or over-excavation and replacement, will be largely dependent on pre-existing and prevailing weather conditions at the time of construction;
- Subgrade preparation should be carried out using a tracked excavator equipped with a smooth sided ('gummy') bucket to minimise the risk of over-disturbance of soils;
- Protect the area after subgrade preparation to maintain moisture content as far as practicable. The placement of subbase gravel would normally provide adequate protection;
- Site preparation should include provision of drainage and erosion control as required, as well as sedimentation control measures.

At the time of the field investigations, moisture content for the clay subgrade material tested varied from 5.3% dry to 8.4% wet of standard Optimum Moisture Content (OMC). It should therefore be anticipated that moisture conditioning of the subgrade is likely to be necessary prior to compaction and placement of pavement materials.

The required time period to prepare the subgrade is likely to be dependent on the prevailing weather conditions at the time of construction.

If over-wet subgrades exist at the time of construction or deleterious materials are encountered at subgrade level, these materials should be over-excavated and be replaced with well graded granular select material with CBR of 15% or greater, or other material approved by the geotechnical authority as appropriate to the site conditions. The requirement for, and extent of subgrade replacement, should be confirmed by the geotechnical authority at the time of construction.

If the Lime Stabilisation option was to be considered, further testing would be required to confirm percentage of lime required and that adequate increase in CBR could be achieved following mixing. If the select layer is required for the purpose of providing additional cover over expansive soils, the select layer should comprise Select Fill rather than lime stabilised subgrade.

6.4 Fill Construction Procedures

Earthworks for pavement construction or support of foundations should consist of the following measures:

- Approved fill beneath pavements should be compacted in layers not exceeding 300mm loose thickness to the compaction requirements provided in Table 15;
- The top 300mm of natural subgrade below pavements or the final 300mm of road subgrade fill should be compacted to provide a subgrade that is within the moisture range of 60% to 90% of Optimum Moisture Content (OMC);
- Site fill beneath structures should be compacted to a minimum density ratio of 98% Standard Compaction within ±2% of OMC in cohesive soils;
- All fill should be supported by properly designed and constructed retaining walls or else battered at 1V:2H or flatter and protected against erosion;
- If fill is to be placed on slopes in excess of 1V:8H (7°), a prepared surface should be benched or stepped into the slope; and,
- Earthworks should be carried out in accordance with the recommendations outlined in AS3798-2007 'Guidelines for Earthworks for Commercial and Residential Developments'.

6.5 Suitability of Site Materials for Re-Use as Fill

The following comments are made with respect to suitability of site materials for re-use as fill:

- Unit 1A Topsoil Fill and Unit 2 Topsoil materials are expected to be suitable for landscaping purposes only;
- Unit 1B Fill materials may be variable. Some fill material may be suitable for landscaping purposes only due to the presence of roots and organics. If fill material is not affected by roots or other deleterious material, it is generally expected to be suitable for re-use as general fill for engineering purposes. Suitability for re-use should be confirmed prior to, or at the time of construction;
- Unit 3 Colluvium/Alluvium may be variable and suitability for re-use should be confirmed at the time of construction;
- Unit 4 Residual Soils are generally expected to be suitable for re-use as general fill for engineering purposes;
- Unit 5 Extremely Weathered Rock is generally expected to be suitable for re-use as general fill for engineering purposes; and,
- Unit 6 Highly Weathered Rock (or better) are generally expected to be suitable for reuse as general fill for engineering purposes. These materials may require sorting or processing by crushing / screening depending upon excavation methods, source material characteristics and proposed uses.

Final selection of fill materials should consider properties such as reactivity which is typically high for site won Unit 3 Colluvium / Alluvium and Unit 4 Residual Soils. The deeper sandy and gravelly Residual soils and the Weathered Rock are expected to be less reactive and likely to be preferred for use as the upper layers of lot filling to reduce calculated surface movements and subsequent site classifications to AS2870-2001.

The suitability of material for re-use should be assessed and confirmed by the geotechnical authority at the time of construction. The materials may require some moisture conditioning.

6.6 Proposed Detention Basin

6.6.1 Site Materials and Suitability

TP101, TP120, TP121 and TP122 were excavated within the footprint of proposed detention basin locations, to depths between 1.2m and 1.7m.

The profile encountered in test pits generally comprise Topsoil to depths of 0.10m and 0.25m, overlying Residual CLAY / Gravelly Sandy CLAY / Sandy CLAY soils to depths between 0.60m and 2.00m.

Extremely Weathered Rock breaking down into Clayey Gravelly SAND was only encountered in TP101 and TP122 from a depth of 0.60m and 1.20m, respectively. Test pits TP101, TP121 and TP122 were terminated due to slow progress at depths between 1.20m of 1.70m.

Detention basin embankments should be constructed using approved impervious materials. As a guide, material should have:

- Greater than 30% clay content;
- Plasticity index of between 10% and 50%;
- Permeability of less than 1 x 10⁻⁸ metres per second;
- Emerson Class Number of 4 or greater;
- Maximum particle size of 100mm.

The soil / rock profile encountered in test pits / boreholes during the current investigation by Qualtest are summarised in Section 4.

Emerson testing on the site soils indicated Emerson Classes of 2 and 4. An Emerson Class of 2 is considered weakly susceptible to dispersion (clay fraction of the soil dissolves) when submerged in water.

It is recommended that any soil with Emerson Class \leq 3 should be blended with other materials, or alternatively be stabilised with addition of 1% to 2% gypsum added to the soil and blended prior to usage in basin embankments. It is recommended that any blended or gypsum treated material be tested to confirm suitable Emerson Class prior to placement.

Results of laboratory testing of the Residual Clay Soil from the proposed basin footprint indicated that the material is likely to have relatively high plasticity index, with the soil logged as medium to high plasticity. These soils may be susceptible to swelling and softening when wet, and shrinking and block cracking when dry.

Where lower plasticity material is recommended, suitable site material should be selectively won and stockpiled, imported materials may be used, or treatment of the high plasticity Residual Soil may be carried out with gypsum and/or lime, and/or blending with lower plasticity material such as Extremely to Highly Weathered Rock or Clayey SAND may be suitable.

The Residual Sandy CLAY (Unit 4) materials are likely to be of relatively low permeability and suited for dam wall construction on the basis of permeability. Previous experience and literature indicates similar materials may have permeability of order of magnitude ranging from about 10⁻⁷ to about 10⁻¹⁰ metres per second (about 0.01 millimetres to about 100mm per day). More sandy material such as Clayey Gravelly SAND is likely to be of higher permeability, and may be more suitable if blended with Sandy CLAY material.

These materials are likely to require some moisture conditioning prior to dam embankment construction.

If fill is used to construct the basin, it should be approved by the geotechnical authority and placed under Level 1 supervision in accordance with AS3798-2007, and the general procedures outlined in Sections 6.3, 6.4 and 6.6.

6.6.2 Construction Recommendations

Earthworks for embankment construction should be in general accordance with Section 6.3 and 6.4 above, with the additional measures recommended below:

- Earthworks should be carried out in general accordance with the recommendations outlined in AS3798-2007 'Guidelines for Earthworks for Commercial and Residential Developments', and the general procedures outlined in Sections 6.3 and 6.4;
- Where fill is placed on slopes in excess of 1V:8H (7°), a prepared surface should be benched or stepped into the natural slope;
- Detention Basin embankments should be constructed using approved low permeability / impervious materials, with material specification as outlined in Section 6.6.1;
- Fill should be compacted in layers not exceeding 300mm loose thickness to a minimum density ratio of 98% Standard Compaction within ±2% of OMC. As a guide, this is likely to require at least 10 passes of a 10 tonne pad foot roller for each layer of fill placed;
- Embankment materials shall be uniformly watered, tined and rolled to produce homogenous layers over the full width of the embankment. Embankments shall be overfilled and trimmed back to design grades to expose materials compacted to the minimum standards specified above;
- Detention basin embankments should include a clay cut-off trench, 'keyed' a minimum depth of 0.5m into the underlying relatively impervious Colluvium / Residual Soils (Unit 3 & 4), with a minimum undrained shear strength S_u of 50kPa. The base of the cut off trench should be at least 3m in width to allow compaction by a pad foot roller;
- Material and key in requirements for the cut-off trench should be confirmed by the geotechnical authority at the time of construction.
- Fill may require treatment by gypsum, which can be done by mixing either in the stockpile area, or by adding and mixing through each layer following placing and prior to compaction. A pulvi mixer or rotary hoe should be used to achieve thorough mixing. Mixing by use of ripper tines is not recommended.
- All fill should be supported by properly designed and constructed retaining walls or else battered as recommended in Section 6.6.3 and protected against erosion;
- Fill material placed alongside pipes or other structures should be compacted using hand operated equipment or small compaction equipment to avoid damage to the structure, with care taken to ensure compaction is achieved;
- The embankment surface must be overlain by geofabric prior to placement of any rockfill such as rip rap.

Care should be taken to use materials and methods, which do not create a significant risk of leaving preferential underground drainage paths, which could result in softening of the surrounding areas, piping erosion and/or localised seepage.

The floor should be inspected for the presence of sand lenses, joints/fissures, or other potential conduits for water passage through the foundation. The geotechnical authority should provide advice on specific additional treatment requirements if such features are exposed.

6.6.3 Batter Slopes & Erosion Control

Excavations for the basins in site materials should be battered at 1V:3H or flatter, and protected from erosion.

Where the dam embankments are constructed of approved homogeneous earth fill, the embankments should be battered at maximum slopes of 1V:3.5H or flatter on the upstream side, and 1V:3H or flatter on the downstream side, and protected from erosion.

Selection of batter slopes should consider future maintenance activities such as operation of mowing equipment where necessary, typically requiring batters of 1V:4H or flatter.

Slopes should be designed for surcharge loading from slopes, retaining walls, structures, plant, and other anticipated loading in the vicinity of the slope.

Drainage measures should be implemented above and behind all temporary and permanent batter slopes to avoid concentrated water flows on the face or infiltration into the soil/rock profile behind the face. Surface water flows from upslope areas should be diverted away from the face.

Results of Emerson testing provide an indication into potential susceptibility to erosion. Where the results indicate that site materials are likely to be susceptible to dispersion, special care should be taken to prevent erosion by rainfall etc. The addition of gypsum may provide improved performance in some cases.

Erosion protection may include such measures as the addition of a topsoil horizon (minimum thickness of 200mm) and vegetation, or alternatively support by geosynthetic and nails, rock spall, gabion / terramesh walls or concrete lining.

The need for and selection of erosion protection will depend upon performance expectations (e.g. whether slumping is acceptable), and on operational factors (e.g. areas which may experience higher water velocities will require more robust protection).

A suitably designed spillway should be constructed to handle flood flows and prevent water overtopping the embankment, with scour protection of the downstream outlet channel comprising of a suitable riprap, rock fill, gabions or equivalent.

Ongoing monitoring of the performance and condition of the completed detention basin and earthworks should be carried out, particularly during and after large rainfall events. Maintenance or repair of aspects such as erosion protection measures may be required based on these observations.

Levels of soil erosion during construction should be able to be maintained within normally acceptable levels by adopting good soil erosion and sedimentation control practices, including:

- Minimise the area and duration of soil exposure by staged development and controlled clearing;
- Stockpile stripped soil for reuse and protect from erosion;
- Control storm water run-off by diverting clean run-off from denuded areas, minimising slope gradient, length and run-off velocities;
- Trap soil and water pollutants using silt traps, sediment basins, perimeter banks, silt fences and nutrient traps as appropriate;
- Re-vegetate as soon as is practicable, including the application of topsoil / hydromulch where necessary.

6.7 Special Requirements for Construction Procedures and Drainage

Care should be taken during backfilling of any dams or drainage depressions to reduce the risk of leaving a preferential underground drainage path which could result in softening of the surrounding area, piping erosion and/or localised seepage.

Potential effects of slope modifications on groundwater flowing from upslope should also be considered, with provision of subsurface drainage to intercept and redirect groundwater where assessed to be necessary.

The enclosed pavement thickness designs assume the provision of adequate surface and subsurface drainage of the pavement and adjacent areas to prevent moisture ingress into the pavement materials and subgrade. As a minimum, it is recommended that subsoil drains be installed:

- Along the high side of roads aligned across site slopes;
- Along both sides of roads aligned down slope.

It is recommended that surface and subsoil drainage be installed in line with the above advice, and in accordance with Maitland City Council specifications.

Adequate surface and subsurface drainage should be installed and connected to the stormwater disposal system.

Inspection should be carried out by a geotechnical authority during construction to confirm the conditions assumed in this report and in the design.

7.0 Limitations

The findings presented in the report and used as the basis for recommendations presented herein were obtained using normal, industry accepted geotechnical design practices and standards. To our knowledge, they represent a reasonable interpretation of the general conditions of the site.

The extent of testing associated with this assessment is limited to discrete test locations. It should be noted that subsurface conditions between and away from the test locations may be different to those observed during the field work and used as the basis of the recommendations contained in this report.

If subsurface conditions encountered during construction differ from those given in this report, further advice should be sought without delay.

Data and opinions contained within the report may not be used in other contexts or for any other purposes without prior review and agreement by Qualtest. If this report is reproduced, it must be in full.

If you have any further questions regarding this report, please do not hesitate to contact Ben Edwards, Shannon Kelly, or the undersigned.

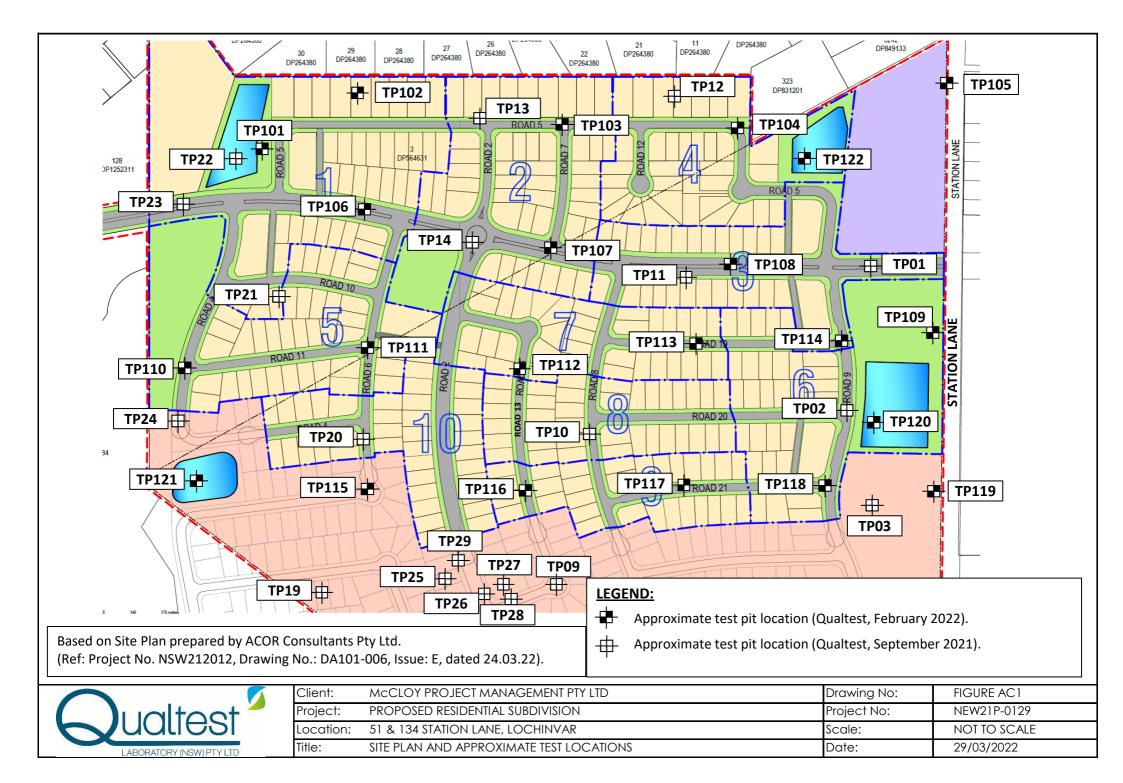
For and on behalf of Qualtest Laboratory (NSW) Pty Ltd.

the les

Jason Lee Principal Geotechnical Engineer

FIGURES:

Figure AC1 - Site Plan and Approximate Test Locations



APPENDIX A:

Results of Field Investigations



CLIENT:MCCLOY PROJECT MANAGEMENT PTY LTDPROJECT:PROPOSED RESIDENTIAL SUBDIVISIONLOCATION:51 & 134 STATION LANE, LOCHINVAR

TEST PIT NO:

PAGE:

DATE:

JOB NO:

LOGGED BY:

TP101 1 OF 1

NEW21P-0129

BE 11/2/22

		IENT TYPE		2.7 TC 2.0 m		EXCA		SURFACE RL: DATUM:					
	Dril	ing and Sam	pling				Material description and profile informa	tion			Fiel	d Test	
METHOD	WATER	SAMPLES	RL (m)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION: Soil type, pl characteristics,colour,minor comp	asticity/particle ponents	MOISTURE CONDITION	CONSISTENCY DENSITY	Test Type	Result	Structure and additional observations
< <drawingfile>> 22/03/2022 10:56 10.02.00.04 DatgeLab and in Situ Tool E</drawingfile>	Not Encountered	0.40m B 0.60m 1.00m B 1.20m				CH CH SC	TOPSOIL: Sandy CLAY - medium to dark grey to dark brown, fine grained affected. CLAY - medium to high plasticity, dar brown, with fine to coarse grained sa 0.60m Extremely Weathered Andesite with s breaks down into Clayey Gravelly SA coarse grained, pale brown, fine to angular gravel, fines of low plasticity, pockets.	sand, root , / k grey to dark nd.	≥ 0 % W	В		- >600 500	TOPSOIL RESIDUAL SOIL EXTREMELY WEATHERED ROCK
	Wat (Da - Wat I Wat at<u>a Ch</u> a<u>ta Ch</u> tra D	er Level te and time sh er Inflow er Outflow anges radational or ansitional stra efinitive or dis rata change	iown)	Notes, Sa U ₅₀ CBR E ASS B Field Test PID DCP(x-y) HP	50mm Bulk s Enviro (Glass Acid S (Plasti Bulk S S Photoi Dynan	Diame ample f onmenta s jar, se culfate S c bag, a cample conisationic pendo	ter tube sample for CBR testing al sample aled and chilled on site) Soil Sample air expelled, chilled) on detector reading (ppm) etrometer test (test depth interval shown) meter test (UCS kPa)	S S F F St S VSt V H F	Incy /ery Soft Soft Firm Hard Friable V L ME D V V V V V V	Vi La D	22 25 50 20 20 20 20 20 20 20 20 20 20 20 20 20	n Dense	D Dry M Moist W Wet Wp Plastic Limit WL Liquid Limit Density Index <15% Density Index 15 - 35%



CLIENT:MCCLOY PROJECT MANAGEMENT PTY LTDPROJECT:PROPOSED RESIDENTIAL SUBDIVISIONLOCATION:51 & 134 STATION LANE, LOCHINVAR

TEST PIT NO:

PAGE:

DATE:

JOB NO:

LOGGED BY:

TP102

1 OF 1 NEW21P-0129

BE

11/2/22

		MENT TYP		2.7 TC 2.0 m		EXCA I DTH :		ACE RL: IM:					
	Dril	ling and San	npling				Material description and profile information				Field	d Test	
METHOD	WATER	SAMPLES	RL (m)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION: Soil type, plasticit characteristics,colour,minor component	//particle is	MOISTURE CONDITION	CONSISTENCY DENSITY	Test Type	Result	Structure and additional observations
						СН	TOPSOIL: Sandy CLAY - medium to high p dark grey to dark brown, fine grained sand,	lasticity,					TOPSOIL
				-				/	,				RESIDUAL SOIL
	ountered	0.40m CBR 0.60m		0.5		СН	CLAY - medium to high plasticity, dark grey brown, with fine to coarse grained sand.			Н	HP	550	
2.00.04 Datgel Lab and In Situ Tool	Not Encountered					CL	Gravelly Sandy CLAY - low to medium plas brown to orange, with pale grey and red-bro to coarse grained sand, fine grained angula	own, fine	M < W	Fb / H			RESIDUAL SOIL / EXTREMELY WEATHERED ROCK
57 10.02							1.30m Hole Terminated at 1.30 m						
0T LIB 1.1.GLB Log NON-CORED BOREHOLE - TEST PIT NEWZIP-0129-AC LOGS - PAVEMENT & BASINS GPU <-DrawingFile>> 22/03/2022 10:57 10.02:00.04 Datgel Lab and In Situ Tool III IIII - III Situ Tool IIIIIII - IIIIIIIIIIIIIIIIIIIIIIIIII				- 1. <u>5</u> - - 2. <u>0</u> - - -			Slow progress						
	- (Da – Wa ⊲ Wa • <u>ata Ch</u> –- G	radational or ansitional stra	hown) ata	Notes, Sa U ₅₀ CBR E ASS B Field Test PID	50mm Bulk s Enviro (Glass Acid S (Plast Bulk S S Photo	i Diame ample f onmenta s jar, se Sulfate S ic bag, a Sample ionisatio	ter tube sample or CBR testing al sample aled and chilled on site) Soil Sample air expelled, chilled) on detector reading (ppm)	S S F F St S VSt N H F	/ery Soft Soft Firm Stiff /ery Stiff Hard Friable V L	Ve	25 25 50 20 20 20 24 ery Lo pose		D Dry M Moist W Wet Wp Plastic Limit WL Liquid Limit Density Index <15%
QT LIB 1.		efinitive or dis trata change	stict	DCP(x-y) HP			etrometer test (test depth interval shown) meter test (UCS kPa)		ME D VD	D	edium ense ery De	n Dense ense	Density Index 35 - 65% Density Index 65 - 85% Density Index 85 - 100%



CLIENT:MCCLOY PROJECT MANAGEMENT PTY LTDPROJECT:PROPOSED RESIDENTIAL SUBDIVISIONLOCATION:51 & 134 STATION LANE, LOCHINVAR

TEST PIT NO: PAGE:

JOB NO:

DATE:

LOGGED BY:

TP103 1 OF 1

NEW21P-0129

BE

11/2/22

		MENT TYPE		2.7 TC 2.0 m		EXCA I DTH :		FACE RL: JM:					
	Dril	ling and Sam	pling				Material description and profile information				Fiel	d Test	
METHOD	WATER	SAMPLES	RL (m)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION: Soil type, plasticit characteristics,colour,minor componen	y/particle ts	MOISTURE CONDITION	CONSISTENCY DENSITY	Test Type	Result	Structure and additional observations
				_		СН	TOPSOIL: Sandy CLAY - medium to high p dark grey to dark brown, fine to coarse gra root affected.	plasticity, ined sand,					TOPSOIL
	Encountered	0.40		-			0.15mCLAY - medium to high plasticity, dark grey brown, with fine to coarse grained sand.	 / to dark	M < Wp	H	HP	>600	RESIDUAL SOIL
ш	Not End	0.40m CBR 0.60m		0.5		— — -	0.60m				HP	550	
				-		SC	Extremely Weathered Andesite with soil pr breaks down into Clayey Gravelly SAND - coarse grained, pale brown, fine to mediun angular gravel, fines of low plasticity, with 0 0.80m pockets.	fine to n grained	D - M	D			EXTREMELY WEATHERED ROCK
LEC Wat				- 1.0 - - - - - - - - - - - - - - - - - - -			Hole Terminated at 0.80 m Slow progress						
LEC Wat Stra	Wat (Da - Wat I Wat at<u>a Ch</u> a<u>ta Ch</u> tra D	ter Level te and time sh ter Inflow ter Outflow anges radational or ansitional strat efinitive or dist rata change	a	Notes, Sa U ₅₀ CBR E ASS B Field Test PID DCP(x-y) HP	50mm Bulk s Enviro (Glass Acid S (Plasti Bulk S S Photo Dynar	Diame ample f onmenta s jar, se culfate S c bag, a cample conisationic pendo	ts ter tube sample or CBR testing al sample aled and chilled on site) Soil Sample air expelled, chilled) on detector reading (ppm) etrometer test (test depth interval shown) meter test (UCS kPa)	S S F F St S VSt V H F	ncy /ery Soft Soft Firm Stiff /ery Stiff Hard Eriable V L ME D V V	Vi La D M	22 25 50 20 20 20 20 20 20 20 20 20 20 20 20 20	n Dense	D Dry M Moist W Wet W _p Plastic Limit W _L Liquid Limit Density Index <15% Density Index 15 - 35%



CLIENT:MCCLOY PROJECT MANAGEMENT PTY LTDPROJECT:PROPOSED RESIDENTIAL SUBDIVISIONLOCATION:51 & 134 STATION LANE, LOCHINVAR

TEST PIT NO: PAGE:

JOB NO:

DATE:

LOGGED BY:

TP104 1 OF 1

NEW21P-0129

BE 11/2/22

		MENT TYP					VATOR SURFA						
TE				2.0 m	w	IDTH:	0.5 m DATUM	A:			 ;_'	1 To - 4	
	Dril	ling and San	npling			z	Material description and profile information				Field	l Test	
METHOD	WATER	SAMPLES	RL (m)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION: Soil type, plasticity/p characteristics,colour,minor components	oarticle	MOISTURE CONDITION	CONSISTENCY DENSITY	Test Type	Result	Structure and additional observations
						СН	TOPSOIL: Sandy CLAY - medium to high plas dark grey to dark brown, fine to coarse graine	sticity, ed sand,					TOPSOIL
/EMENT & BASINS.GPJ < <drawingfile>> 22/03/2022 10:57 10.02.00.04 DatgeLtab and In Situ Tool</drawingfile>	Not Encountered	0.40m CBR 0.60m				CH	1.20m Collaboration of the end	/ some	M × M	D	HP	500	RESIDUAL SOIL
	 (Da ■ 	ter Level te and time si ter Inflow ter Outflow anges iradational or ansitional stra efinitive or dis trata change	hown) ata	Notes, Sau U ₅₀ CBR E ASS B Field Test PID DCP(x-y) HP	50mm Bulk s Envirc (Glass Acid S (Plasti Bulk S S Photo Dynar	Diame ample f onmenta s jar, se Gulfate S ic bag, a Sample ionisationis ationis ationi	S ter tube sample or CBR testing I sample aled and chilled on site) ioil Sample air expelled, chilled)	S S F F St S VSt V H F	ncy /ery Soft irm tiff /ery Stiff lard triable V L MC D V V	Vi La D	<2 25 50 10 20 >4 ery Lo pose	- 50 - 100 0 - 200 0 - 400 00 ose	D Dry M Moist W Wet Wp, Plastic Limit WL Liquid Limit Density Index <15% Density Index 15 - 35%



CLIENT:MCCLOY PROJECT MANAGEMENT PTY LTDPROJECT:PROPOSED RESIDENTIAL SUBDIVISION

LOCATION: 51 & 134 STATION LANE, LOCHINVAR

TEST PIT NO:

PAGE:

DATE:

JOB NO:

LOGGED BY:

TP105

1 OF 1 NEW21P-0129

BE

11/2/22

		MENT TYPE		HAND 0.5 m		_S IDTH:	0.5 m DATUM						
	Dril	ling and Sam	npling				Material description and profile information				Fiel	d Test	
METHOD	WATER	SAMPLES	RL (m)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION: Soil type, plasticity/p characteristics,colour,minor components	particle	MOISTURE CONDITION	CONSISTENCY DENSITY	Test Type	Result	Structure and additional observations
				-		sc	TOPSOIL: Clayey Gravelly SAND - fine to coa grained, grey-brown, fine grained angular grav fines of low plasticity, root affected.		D - M				TOPSOIL
НТ	Not Encountered	0.40m CBR 0.60m		- - 0.5_ -		СН	0.15mCLAY - medium to high plasticity, brown with o grey, with fine to coarse grained sand.		M < w _p	н	HP	>600 >600	RESIDUAL SOIL
							Hole Terminated at 0.80 m						
				1. <u>0</u> - - 1. <u>5</u> - - - - - 2. <u>0</u>									
<u>Wat</u> ▼	Wai (Da Wai I Wai I Wai	ter Level te and time sh ter Inflow ter Outflow anges iradational or	iown)	Notes, Sa U ₅₀ CBR E ASS B Field Test	50mm Bulk s Enviro (Glass Acid S (Plast Bulk S	n Diamet ample fr onmenta s jar, sea Sulfate S ic bag, a Sample	er tube sample or CBR testing I sample aled and chilled on site) oil Sample ir expelled, chilled)	S S F F St S VSt V H F	Very Soft Soft Stiff Very Stiff lard Triable V	V	25 50 10 20 >2 ery Lo	5 - 50 0 - 100 00 - 200 00 - 400 400	D Dry M Moist W Wet W _p Plastic Limit Liquid Limit Density Index <15%
	D	ansitional stra efinitive or dis trata change		PID DCP(x-y) HP	Dynar	nic pene	n detector reading (ppm) trometer test (test depth interval shown) meter test (UCS kPa)		L MC D VD) M D	oose lediun ense ery De	n Dense ense	Density Index 15 - 35% Density Index 35 - 65% Density Index 65 - 85% Density Index 85 - 100%



CLIENT:MCCLOY PROJECT MANAGEMENT PTY LTDPROJECT:PROPOSED RESIDENTIAL SUBDIVISIONLOCATION:51 & 134 STATION LANE, LOCHINVAR

TEST PIT NO:

PAGE:

DATE:

JOB NO:

LOGGED BY:

TP106

1 OF 1 NEW21P-0129

BE 11/2/22

		IENT TYPE		2.7 TC 2.0 m		EXCA I DTH :	VATOR SURF 0.5 m DATU	FACE RL: JM:					
	Dril	ing and Sam	pling				Material description and profile information				Field	d Test	
METHOD	WATER	SAMPLES	RL (m)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION: Soil type, plasticit characteristics,colour,minor componen	y/particle ts	MOISTURE CONDITION	CONSISTENCY DENSITY	Test Type	Result	Structure and additional observations
						СН	TOPSOIL: Sandy CLAY - medium to high p dark grey to dark brown, fine grained sand, affected.	plasticity, root	,				
		0.40m CBR 0.60m		- - 0.5		СН	CLAY - medium to high plasticity, dark grey brown, with fine to coarse grained sand.		M > Wp	VSt	HP	350	
OT LIB 1.1 GLB Log NON-CORED BOREHOLE. TEST PTI NEWZIP-0129.AC LOGS - PAVEMENT & BASINS.GPJ < <drawingfile>> 22/03/2022 10:57 10.02:00.04 Datge Lab and In Stu Tool</drawingfile>	Not Encountered			- - 1. <u>0</u> - - 1. <u>5</u> -		CL	Gravelly Sandy CLAY - low to medium plas brown to orange, with pale grey and red-br to coarse grained sand, fine grained angula	own, fine	M < w _p	Н / ҒЬ			RESIDUAL SOIL 7 EXTREMELY WEATHERED ROCK
TEST PIT NEW21P-0129-AC LOGS - PAVEMENT & BASINS.GI					<i>9//////</i>		1.80m Hole Terminated at 1.80 m Slow progress						
QT LIB 1.1.GLB Log NON-CORED BOREHOLE - T	LEGEND: <u>Water</u> Water Level (Date and time shown) Water Inflow Water Outflow <u>Strata Changes</u> Gradational or transitional strata Definitive or distict strata change		iown)	Notes, Sar U ₅₀ CBR E ASS B Field Test PID DCP(x-y) HP	50mm Bulk s Enviro (Glass Acid S (Plast Bulk S S Photo Dynar	Diame ample f onmenta s jar, se culfate S c bag, a cample conisationic pendo	ter tube sample for CBR testing al sample aled and chilled on site) Soil Sample air expelled, chilled) on detector reading (ppm) etrometer test (test depth interval shown) meter test (UCS kPa)	S S F F St S VSt V H F	/ery Soft Soft Firm Stiff /ery Stiff -lard Friable V L MD D VD	Vi La M	25 25 50 20 20 20 24 ery Lo pose	5 - 50) - 100)0 - 200)0 - 400 100 pose n Dense	D Dry M Moist W Wet Wp Plastic Limit WL Liquid Limit Density Index <15% Density Index 15 - 35%



CLIENT:MCCLOY PROJECT MANAGEMENT PTY LTDPROJECT:PROPOSED RESIDENTIAL SUBDIVISIONLOCATION:51 & 134 STATION LANE, LOCHINVAR

TEST PIT NO:

PAGE:

DATE:

JOB NO:

LOGGED BY:

TP107 1 OF 1

NEW21P-0129

ŀ	EQ	UIPN		:	2.7 TC	NNE	EXCA	VATOR SURF	ACE RL:					
			T LENGTH		2.0 m		IDTH:	0.5 m DATU					,	
ļ		Drill	ing and Sam	pling			I	Material description and profile information		1		Fiel	d Test	
	METHOD	WATER	SAMPLES	RL (m)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION: Soil type, plasticity characteristics,colour,minor component	//particle s	MOISTURE	CONSISTENCY DENSITY	Test Type	Result	Structure and additional observations
							сн	TOPSOIL: Sandy CLAY - medium to high p dark grey to dark brown, fine to coarse grain root affected.						TOPSOIL
		Not Encountered	0.40m CBR					0.20m CLAY - medium to high plasticity, brown, tra coarse grained sand.	ace fine to	< Wp		HP	>600	RESIDUAL SOIL
n Situ Tool	ш	Not Enc	0.60m				СН			×	Н	HP	>600	
Lab and I					1.0_		 sc	Clayey Gravelly SAND - fine to coarse grain brown, fine to medium grained angular grav	ned, pale vel, fines	D - M	D	-	-	RESIDUAL SOIL /
QT LIB 1.1.GLB Log NON-CORED BOREHOLE - TEST PIT NEW21P-0129-AC LOGS - PAVEMENT & BASINS.GPJ < <drawingfile>> 22/03/2022 10:57 10.02.00.04 Datgel Lab and In Situ Tool</drawingfile>					- - 1. <u>5</u> - - - - - - - - - - - - - - - - - - -			of low plasticity, with Clay pockets. Hole Terminated at 1.10 m Very slow progress						ROCK
LIB 1.1.GLB Log NON-CORED BOREHOLE	<u>Wate</u> ▲		er Level e and time sh er Inflow er Outflow anges radational or ansitional strat efinitive or disi rata change	iown) ta	Notes, Sa U ₅₀ CBR E ASS B Field Test PID DCP(x-y) HP	50mm Bulk s Enviro (Glass Acid S (Plast Bulk S S Photo Dynar	n Diame sample f ponmenta s jar, se Sulfate S ic bag, a Sample ionisationis ationis at	S ter tube sample or CBR testing I sample aled and chilled on site) ioil Sample ir expelled, chilled) n detector reading (ppm) etrometer test (test depth interval shown) meter test (UCS kPa)	S S F F St S VSt V H F	ncy /ery Soft Soft Stiff /ery Stiff lard iriable V L D VD	Vi La D M	22 25 50 20 20 20 20 20 20 20 20 20 20 20 20 20	n Dense	D Dry M Moist W Wet W _p Plastic Limit WL Liquid Limit Density Index <15% Density Index 15 - 35%



 CLIENT:
 MCCLOY PROJECT MANAGEMENT PTY LTD

 PROJECT:
 PROPOSED RESIDENTIAL SUBDIVISION

LOCATION: 51 & 134 STATION LANE, LOCHINVAR

TEST PIT NO: PAGE:

JOB NO:

DATE:

LOGGED BY:

TP108 1 OF 1

NEW21P-0129

		MENT TYPE		2.7 TC 2.0 m		EXCA I DTH :	VATOR SURI 0.5 m DATU	FACE RL: JM:					
	Dri	lling and Sam	npling				Material description and profile information				Fiel	d Test	
METHOD	WATER	SAMPLES	RL (m)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION: Soil type, plasticit characteristics,colour,minor componen		MOISTURE CONDITION	CONSISTENCY DENSITY	Test Type	Result	Structure and additional observations
ш	Not Encountered	0.40m CBR 0.60m		- - - 0. <u>5</u> -		СН	TOPSOIL: Sandy CLAY - medium to high ; dark grey to dark brown, fine to coarse gra root affected. CLAY - medium to high plasticity, brown, w coarse grained sand.	ined sand, 	M < Wp	Н	HP	>600	TOPSOIL RESIDUAL SOIL
100				-	× × ×	SC	of low plasticity, with Clay pockets.	 ark brown, ostly very	D - M	MD - D	-		EXTREMELY TO HIGHLY WEATHERED ROCK
QT LIB 1.1.G.LB LOG NON-CORED BORFHOLE - TEST PIT NEWZ1P-0129-AC LOGS - PAVEMENT & BASINS GPJ <-DrawingFile>> 22/03/2022 10:57 10:02/00.04 Daggel Lab and In Siu Too				1. <u>0</u> - - 1. <u>5</u> - - - - - - - - - - - - - - - - - - -			low to low strength), with extremely weather pockets. Hole Terminated at 0.90 m Very slow progress	/					
	(Da – Wa 4 Wa <u>ata Ch</u> —- G tr	ter Level te and time sh ter Inflow ter Outflow anges Gradational or ansitional stra ansitional stra tefinitive or dis trata change	nown) ta	Notes, Sar U₅₀ CBR E ASS B Field Test PID DCP(x-y) HP	50mm Bulk s Enviro (Glass Acid S (Plast Bulk S S Photo Dynar	Diame ample f onmenta s jar, se Gulfate S ic bag, a Sample ionisationis ationis ationi	S ter tube sample or CBR testing Il sample aled and chilled on site) isoil Sample air expelled, chilled) on detector reading (ppm) etrometer test (test depth interval shown) imeter test (UCS kPa)	S S F F St S VSt V	very Soft Soft Firm Stiff Hard Friable V L D VD	V L D D	<2	5 - 50 0 - 100 00 - 200 00 - 400 400 pose n Dense	D Dry M Moist W Wet Wp Plastic Limit WL Liquid Limit Density Index <15%



CLIENT:MCCLOY PROJECT MANAGEMENT PTY LTDPROJECT:PROPOSED RESIDENTIAL SUBDIVISIONLOCATION:51 & 134 STATION LANE, LOCHINVAR

TEST PIT NO:

PAGE:

DATE:

JOB NO:

LOGGED BY:

TP109

1 OF 1 NEW21P-0129

		MENT TYPE		2.7 TC 2.0 m		EXCA		FACE RL: JM:					
\vdash		ling and Sam					Material description and profile information				Fiel	d Test	
METHOD	WATER	SAMPLES	RL (m)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION: Soil type, plasticit characteristics,colour,minor componen		MOISTURE CONDITION	CONSISTENCY DENSITY	Test Type	Result	Structure and additional observations
		0.40m CBR 0.60m		- - - 0.5_		GC	FILL-TOPSOIL: Sandy CLAY - low plasticit brown, fine to coarse grained sand, with fin medium grained angular to sub-angular gra {affected	e to avel, root / se vn, with s of low	M < Wp - M	н	HP		FILL: TOPSOIL
ш	Not Encountered			- - 1. <u>0</u>							HP HP	410 380	
				- - - 1. <u>5</u>		СН			M > w _P	VSt	HP HP HP	250 300 350	
				- - 2.0_ -		GC	1.80m Extremely Weathered Andesite with soil pro breaks down into Clayey Sandy GRAVEL - medium grained angular to sub-angular, da and dark brown, fine to coarse grained san medium plasticity. Hole Terminated at 1.90 m Slow progress	fine to ark grey	D - M	D	HP	380	EXTREMELY WEATHERED ROCK
<u>Wa</u> t ▼	- Wat (Da - Wat ∎ Wat ata Ch ata Ch ata Ch ata Ch ata Ch	ter Level te and time sh ter Inflow ter Outflow anges radational or ansitional strat efinitive or disi rata change	own)	Notes, Sa U ₅₀ CBR E ASS B Field Test PID DCP(x-y) HP	50mm Bulk s Enviro (Glass Acid S (Plasti Bulk S S Photoi Dynan	Diame ample f nmenta jar, se culfate S c bag, a ample onisationic pendo	ts ter tube sample or CBR testing al sample aled and chilled on site) soil Sample air expelled, chilled) on detector reading (ppm) etrometer test (test depth interval shown) meter test (UCS kPa)	S S F F St S VSt V H F	ncy fery Soft oft irm ittiff fery Stiff lard L MC D V V L MC D V	Vi La D	25 25 50 20 20 20 20 20 20 20 20 20 20 20 20 20	5 - 50) - 100)0 - 200)0 - 400 400 pose n Dense	D Dry M Moist W Wet W _p Plastic Limit W _L Liquid Limit Density Index <15% Density Index 15 - 35%



CLIENT:MCCLOY PROJECT MANAGEMENT PTY LTDPROJECT:PROPOSED RESIDENTIAL SUBDIVISIONLOCATION:51 & 134 STATION LANE, LOCHINVAR

TEST PIT NO:

PAGE:

DATE:

JOB NO:

LOGGED BY:

TP110

1 OF 1 NEW21P-0129

BE

11/2/22

EC	QUIPN		:	2.7 TC	NNE	EXCA	VATOR SURF	ACE RL:					
TE		IT LENGTH		2.0 m		IDTH:	0.5 m DATU						
	Dril	ling and Sam	pling			7	Material description and profile information				Fiel	d Test	
METHOD	WATER	SAMPLES	RL (m)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION: Soil type, plasticity characteristics,colour,minor component	//particle s	MOISTURE	CONSISTENCY DENSITY	Test Type	Result	Structure and additional observations
						СН	TOPSOIL: Sandy CLAY - medium to high p 0.10m dark grey to dark brown, fine to coarse grain						TOPSOIL
	Not Encountered	0.40m CBR 0.60m		- - - - - - - - - - - - - - - - - - -		СН	 0.10m dark grey to dark pown, me to coarse grain root affected. CLAY - medium to high plasticity, grey and brown, with some fine to coarse grained satisfies the source of t	/	M < W _P M > W _P	VSt		320 310 250 460 500	RESIDUAL SOIL
				2.0			2.00m Hole Terminated at 2.00 m Slow progress						
	 Wa (Da Wa Wa Wa Ma Ma The second seco	ter Level te and time sh ter Inflow ter Outflow anges iradational or ansitional strat efinitive or disi trata change	own)		50mm Bulk s Enviro (Glass Acid S (Plast Bulk S S Photo Dynar	n Diame ample f onmenta s jar, se Gulfate S ic bag, a Sample ionisationis ationis atio	IS ter tube sample or CBR testing al sample aled and chilled on site) Soil Sample air expelled, chilled) on detector reading (ppm) etrometer test (test depth interval shown) meter test (UCS kPa)	S S F F St S VSt V H F	ncy (ery Soft Soft 'ery Stiff lard 'riable V L ME D	V Le D M	22 25 50 20 20 20 20 20 20 20 20 20 20 20 20 20	CS (kPa) 25 5 - 50 0 - 100 00 - 200 00 - 400 400 mose	Moisture Condition D Dry M Moist W Wet Wp Plastic Limit WL Liquid Limit Density Index <15% Density Index 35 - 65% Density Index 65 - 85%



CLIENT:MCCLOY PROJECT MANAGEMENT PTY LTDPROJECT:PROPOSED RESIDENTIAL SUBDIVISIONLOCATION:51 & 134 STATION LANE, LOCHINVAR

TEST PIT NO:

PAGE:

DATE:

JOB NO:

LOGGED BY:

TP111 1 OF 1

NEW21P-0129

BE 11/2/22

res	T PI	T LENGTH	1:	2.0 m	144			FACE RL:					
	D	na and 0-		2.0 111	vv	IDTH:		UM:			 :_'	d T c - 1	
	Unili	ing and Sam	ipiing			z	Material description and profile information				Field	d Test	
MEIHOU	WATER	SAMPLES	RL (m)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION: Soil type, plastic characteristics,colour,minor componer	ty/particle nts	MOISTURE CONDITION	CONSISTENCY DENSITY	Test Type	Result	Structure and additional observations
						СН	0.10m dark grey to dark brown, fine grained sand	plasticity, l, root					
ш	ot Encountered	0.40m CBR 0.60m		- - 0. <u>5</u>		СН	CLAY - medium to high plasticity, dark gre	/ / / / / / / / / / / / / / / /	M < Wp	н	HP	450 420	RESIDUAL SOIL
	Nc			- - 1. <u>0</u>		SC	pale brown, fines of low plasticity, trace fin angular gravel, with Clay pockets.	e grained	D - M	D			RESIDUAL SOIL7
				_			Hole Terminated at 1.10 m Slow progress						
				- 1. <u>5</u> - -	-								
													-
LEGEND: Water ✓ (Date and time shown) ✓ Water Inflow ✓ Water Outflow Strata Changes Gradational or transitional strata Definitive or distict		ta	CBR E ASS B Field Test PID DCP(x-y)	Bulk s Enviro (Glass Acid S (Plast Bulk S Bulk S S Photo Dynar	ample f onmenta s jar, se Sulfate S ic bag, a Sample ionisatio mic pen	or CBR testing al sample aled and chilled on site) Soil Sample air expelled, chilled) on detector reading (ppm) etrometer test (test depth interval shown)	S S F F St S VSt V H F	Soft Firm Stiff /ery Stiff lard Friable V L MD	Vi La	25 50 10 20 >4 ery Lo pose	5 - 50 0 - 100 00 - 200 00 - 400 400	M Moist W Wet W _p Plastic Limit W _L Liquid Limit Density Index <15% Density Index 15 - 35%	
	EGE GGE	Use Figure 1 and a second sec	Begenden 0.40m Begenden CBR 0.60m 0.60m Begenden 0.60m	Image: second	Image: second secon	Baseline 0.40m CBR 0.5 0.60m 0.5 0.60m 0.5 0.60m 0.5 1.0 1.0 1.0 1.0 2.0 1.5 1.5 1.5 1.5 0.5 2.0 0.5 2.0 0.5 2.0 0.5 1.5 0.5 2.0 <td>Page 0.40m CH CBR 0.5 CH 0.60m 0.5 SC 1.0 SC 1.0 SC 1.0 SC 1.10 SC SC 1.15 1.5 SC 1.0 SC SC 1.0 SC SC 1.0 SC SC 1.15 SC SC 1.5 SC SC SC<!--</td--><td>B 0.40m 0.5 CH TOPSOL: Sandy CLAY - medium to high plasticity, dark grey to dark brown, fine grained sand, dark grey to dark brown, fines of tow plasticity, trace fine dark grey to dark brown, fines of tow plasticity, trace fine dark grey to dark brown, fines of tow plasticity, trace fine dark grey to dark brown, fines of tow plasticity, trace fine dark grey to highly weathered rock p stown, fines of tow plasticity, trace fine dark grey to highly weathered rock p stown, fines of tow plasticity, trace fine dark grey to highly weathered rock p stown, fines of tow plasticity, trace fine dark grey to highly weathered rock p stown, fines of tow plasticity, trace fine dark grey to highly weathered rock p stown, fines of tow plasticity, trace fine dark grey to highly weathered rock p stown, fines of tow plasticity, trace fine dark grey to highly weathered rock p stown, fines grey to highly to highly weathered rock p sto</td><td>0.40m 0.5 CH </td><td>0.40m 0.5 0.40m 0.5 0.50m 0.5 0.60m 0.5 0.50m 0.5 0.60m 0.5 <t< td=""><td>B.0.0m B.0.0m CH TOP SOL: Sandy CLAY - medium to high plasticity, root and fact of the data bown, fine grained sand, root and fact of the course grained sand, trace fine grained angular gravel. B.0.0m C.A.Y - medium to high plasticity, dark gray to dark bown, fines of how plasticity, trace fine grained angular gravel. B.0.0m 0.5 CH CH 0.60m 0.5 CH CH 1.0 CH SC CH 1.0 CH CH<</td><td>EGEND: Mds. Samples and Tests CH Toks OL Sandy CLAY - medum to high plastidity, dark grey to dark or the dark or</td><td>E6EMD: Mets. Samples and Tests CH TOPSOLE Sandy CLAY - meature to high plasticity, dark gray to dark for yot of ark for yot ark for yot of ark for yot yot of ark for yot yot of ark for yot yot yot yot yot yot yot yot yot yot</td></t<></td></td>	Page 0.40m CH CBR 0.5 CH 0.60m 0.5 SC 1.0 SC 1.0 SC 1.0 SC 1.10 SC SC 1.15 1.5 SC 1.0 SC SC 1.0 SC SC 1.0 SC SC 1.15 SC SC 1.5 SC SC SC </td <td>B 0.40m 0.5 CH TOPSOL: Sandy CLAY - medium to high plasticity, dark grey to dark brown, fine grained sand, dark grey to dark brown, fines of tow plasticity, trace fine dark grey to dark brown, fines of tow plasticity, trace fine dark grey to dark brown, fines of tow plasticity, trace fine dark grey to dark brown, fines of tow plasticity, trace fine dark grey to highly weathered rock p stown, fines of tow plasticity, trace fine dark grey to highly weathered rock p stown, fines of tow plasticity, trace fine dark grey to highly weathered rock p stown, fines of tow plasticity, trace fine dark grey to highly weathered rock p stown, fines of tow plasticity, trace fine dark grey to highly weathered rock p stown, fines of tow plasticity, trace fine dark grey to highly weathered rock p stown, fines of tow plasticity, trace fine dark grey to highly weathered rock p stown, fines grey to highly to highly weathered rock p sto</td> <td>0.40m 0.5 CH </td> <td>0.40m 0.5 0.40m 0.5 0.50m 0.5 0.60m 0.5 0.50m 0.5 0.60m 0.5 <t< td=""><td>B.0.0m B.0.0m CH TOP SOL: Sandy CLAY - medium to high plasticity, root and fact of the data bown, fine grained sand, root and fact of the course grained sand, trace fine grained angular gravel. B.0.0m C.A.Y - medium to high plasticity, dark gray to dark bown, fines of how plasticity, trace fine grained angular gravel. B.0.0m 0.5 CH CH 0.60m 0.5 CH CH 1.0 CH SC CH 1.0 CH CH<</td><td>EGEND: Mds. Samples and Tests CH Toks OL Sandy CLAY - medum to high plastidity, dark grey to dark or the dark or</td><td>E6EMD: Mets. Samples and Tests CH TOPSOLE Sandy CLAY - meature to high plasticity, dark gray to dark for yot of ark for yot ark for yot of ark for yot yot of ark for yot yot of ark for yot yot yot yot yot yot yot yot yot yot</td></t<></td>	B 0.40m 0.5 CH TOPSOL: Sandy CLAY - medium to high plasticity, dark grey to dark brown, fine grained sand, dark grey to dark brown, fines of tow plasticity, trace fine dark grey to dark brown, fines of tow plasticity, trace fine dark grey to dark brown, fines of tow plasticity, trace fine dark grey to dark brown, fines of tow plasticity, trace fine dark grey to highly weathered rock p stown, fines of tow plasticity, trace fine dark grey to highly weathered rock p stown, fines of tow plasticity, trace fine dark grey to highly weathered rock p stown, fines of tow plasticity, trace fine dark grey to highly weathered rock p stown, fines of tow plasticity, trace fine dark grey to highly weathered rock p stown, fines of tow plasticity, trace fine dark grey to highly weathered rock p stown, fines of tow plasticity, trace fine dark grey to highly weathered rock p stown, fines grey to highly to highly weathered rock p sto	0.40m 0.5 CH	0.40m 0.5 0.40m 0.5 0.50m 0.5 0.60m 0.5 0.50m 0.5 0.60m 0.5 <t< td=""><td>B.0.0m B.0.0m CH TOP SOL: Sandy CLAY - medium to high plasticity, root and fact of the data bown, fine grained sand, root and fact of the course grained sand, trace fine grained angular gravel. B.0.0m C.A.Y - medium to high plasticity, dark gray to dark bown, fines of how plasticity, trace fine grained angular gravel. B.0.0m 0.5 CH CH 0.60m 0.5 CH CH 1.0 CH SC CH 1.0 CH CH<</td><td>EGEND: Mds. Samples and Tests CH Toks OL Sandy CLAY - medum to high plastidity, dark grey to dark or the dark or</td><td>E6EMD: Mets. Samples and Tests CH TOPSOLE Sandy CLAY - meature to high plasticity, dark gray to dark for yot of ark for yot ark for yot of ark for yot yot of ark for yot yot of ark for yot yot yot yot yot yot yot yot yot yot</td></t<>	B.0.0m B.0.0m CH TOP SOL: Sandy CLAY - medium to high plasticity, root and fact of the data bown, fine grained sand, root and fact of the course grained sand, trace fine grained angular gravel. B.0.0m C.A.Y - medium to high plasticity, dark gray to dark bown, fines of how plasticity, trace fine grained angular gravel. B.0.0m 0.5 CH CH 0.60m 0.5 CH CH 1.0 CH SC CH 1.0 CH CH<	EGEND: Mds. Samples and Tests CH Toks OL Sandy CLAY - medum to high plastidity, dark grey to dark or the dark or	E6EMD: Mets. Samples and Tests CH TOPSOLE Sandy CLAY - meature to high plasticity, dark gray to dark for yot of ark for yot ark for yot of ark for yot yot of ark for yot yot of ark for yot



CLIENT:MCCLOY PROJECT MANAGEMENT PTY LTDPROJECT:PROPOSED RESIDENTIAL SUBDIVISIONLOCATION:51 & 134 STATION LANE, LOCHINVAR

TEST PIT NO:

PAGE:

DATE:

JOB NO:

LOGGED BY:

TP112 1 OF 1

NEW21P-0129

BE

10/2/22

								CE RL:					
⊢"		IT LENGTH		2.0 m	vv	IDTH:	0.5 m DATUN Material description and profile information	n:			Fiel	d Test	
METHOD	WATER	SAMPLES	RL (m)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION: Soil type, plasticity/ characteristics,colour,minor components	particle	MOISTURE CONDITION	CONSISTENCY DENSITY	Test Type	Result	Structure and additional observations
ш	Not Encountered	0.40m CBR 0.60m				СН	TOPSOIL: Sandy CLAY - medium to high pla dark grey to dark brown, fine grained sand, ro affected. 0.20m CLAY - medium to high plasticity, dark brown some fine to coarse grained sand. With Clayey SAND pockets. Grading into extremely weathered rock. 1.10m Hole Terminated at 1.10 m Very slow progress	oot	M < Wp	Н	HP	>600	TOPSOIL RESIDUAL SOIL
	. Wa (Da - Wa ∎ Wa ∎ Wa ∎ G _ G tr _ D	ter Level te and time sh ter Inflow ter Outflow anges radational or ansitional stra efinitive or dis rrada change	nown) ta	1.5 - - 2.0 - - - - - - - - - - - - - - - - - - -	50mm Bulk s Envirc (Glass Acid S (Plasti Bulk S S Photo Dynar	Diame ample f nmenta s jar, se culfate S c bag, a cample conisationic pendo	ter tube sample or CBR testing I sample aled and chilled on site) ioil Sample air expelled, chilled)	S S F F St S VSt V H H	riable V U V V V V V V V V V V	D D	<2 25 50 20 20 20 20 20 20 20 20 20 20 20 20 20	n Dense	D Dry M Moist W Wet W _p Plastic Limit W_L Liquid Limit Density Index <15%



CLIENT: MCCLOY PROJECT MANAGEMENT PTY LTD **PROJECT:** PROPOSED RESIDENTIAL SUBDIVISION LOCATION: 51 & 134 STATION LANE, LOCHINVAR

TEST PIT NO:

PAGE:

DATE:

JOB NO:

LOGGED BY:

TP113 1 OF 1

NEW21P-0129

			_							-			
		/IENT TYPI IT LENGTH		2.7 TC 2.0 m		EXCA I DTH :	VATOR SURFACE 0.5 m DATUM:	E RL:					
		ling and San			-		Material description and profile information				Fiel	d Test	
METHOD	WATER	SAMPLES	RL (m)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION: Soil type, plasticity/par characteristics,colour,minor components	ticle	MOISTURE CONDITION	CONSISTENCY DENSITY	Test Type	Result	Structure and additional observations
						СН	TOPSOIL: CLAY - medium to high plasticity, grey-brown, root affected.						TOPSOIL
GPJ < <drawingfile>> 22/03/2022 10:57 10.02.00.04 DatgeLtab and In Situ Tool EPU <</drawingfile>	Not Encountered	0.40m CBR 0.60m		- - - - - - - - - - - - - - - - - - -		CH CH CI SC	0.20m CLAY - medium to high plasticity, pale brown to with fine to coarse grained sand. 0.90m Sandy CLAY - medium plasticity, orange-brown, grained sand. Increasing in sand content. 140m Extremely Weathered Andesite with soil propertibreaks down into Clayey Gravelly SAND - fine to coarse grained, pale brown, fine to medium grai angular gravel, fines of low plasticity, with Clay pockets.	 , fine ies; o ned	M < Wp M < Wp M > Wp	VSt H/Fb	HP HP	280	RESIDUAL SOIL
0T LIB 1.1.GLB LOG NON-CORED BOREHOLE - TEST PIT NEWZIP-0129-AC LOGS - PAVEMENT & BASINS.GFJ	GEND			2.0_ - - -			1.90m Hole Terminated at 1.90 m Slow progress					CS ///D2	Meietura Condition
	– (Da – Wa 4 Wa <u>ata Ch</u> – G tr	ter Level te and time sł ter Inflow ter Outflow	ıta	Notes, Sa U ₅₀ CBR E ASS B Field Test PID DCP(x-y) HP	50mm Bulk s Enviro (Glass Acid S (Plast Bulk S S Photo Dynar	I Diame ample f onmenta s jar, se Gulfate S ic bag, a Sample ionisationis ationis atio	er tube sample V or CBR testing S I sample F aled and chilled on site) S oil Sample VS ir expelled, chilled) F	6 So F Fil St St St Ve H Ha	ery Soft oft m	V Lu D M	25 25 50 20 20 20 20 20 20 20 20 20 20 20 20 20	5 - 50 0 - 100 00 - 200 00 - 400 400	D Dry M Moist W Wet W _p Plastic Limit U _L Liquid Limit Density Index <15% Density Index 15 - 35%



CLIENT:MCCLOY PROJECT MANAGEMENT PTY LTDPROJECT:PROPOSED RESIDENTIAL SUBDIVISIONLOCATION:51 & 134 STATION LANE, LOCHINVAR

TEST PIT NO:

PAGE:

DATE:

JOB NO:

LOGGED BY:

TP114

1 OF 1 NEW21P-0129

BE

													10/2/22
		IENT TYPE		2.7 TC 2.0 m		EXCA I DTH :	VATOR SURF 0.5 m DATU	ACE RL: IM:					
	Dril	ing and Sam	pling				Material description and profile information				Field	d Test	
METHOD	WATER	SAMPLES	RL (m)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION: Soil type, plasticity characteristics,colour,minor component	y/particle ts	MOISTURE CONDITION	CONSISTENCY DENSITY	Test Type	Result	Structure and additional observations
				-		СН	TOPSOIL: Sandy CLAY - medium to high p dark grey-brown, fine to medium grained sa fine grained angular gravel, root affected.	lasticity, and, trace					TOPSOIL
	Encountered	<u>0.40m</u> CBR		 0.5		СН	0.30m CLAY - medium to high plasticity, dark brow grey, with some fine to coarse grained sand		M ~ W	н	HP	420	RESIDUAL SOIL
Ш	Not Enco	<u>0.60m</u>		-		sc	O.60m Clayey Gravelly SAND - fine to coarse grain brown, fine to medium grained angular grav of low plasticity, with Clay pockets.		D - M	D			
				1. <u>0</u>		SC	1.00m Extremely Weathered Andesite with soil pro breaks down into Clayey Gravelly SAND - f coarse grained, pale brown, fine to medium angular gravel, fines of low plasticity, with h 1.20m weathered pockets.	ine to grained	-				EXTREMELY WEATHERED ROCK
				- 1.5_ -			Hole Terminated at 1.20 m Very slow progress						
				- 2.0									
	₩ati (Da - Wati tata Ch ata Ch tra G	er Level te and time sh er Inflow er Outflow anges radational or ansitional strat efinitive or dis rata change	iown) ta	Notes, Sar U ₅₀ CBR E ASS B Field Test PID DCP(x-y) HP	50mm Bulk s Enviro (Glass Acid S (Plasti Bulk S S Photoi Dynan	Diame ample f onmenta s jar, sea sulfate S c bag, a c bag, a c bag, a conisationic pene	§ er tube sample or CBR testing I sample aled and chilled on site) oil Sample iir expelled, chilled) n detector reading (ppm) trometer test (test depth interval shown) meter test (UCS kPa)	S S F F St S VSt V H F	ncy fery Soft Soft Firm Stiff fard Friable V L MD D V V V V	D D	25 25 50 20 20 20 24 ery Lo pose	5 - 50 0 - 100 10 - 200 10 - 400 100 100 100 100 100 100 100	D Dry M Moist W Wet W _p Plastic Limit W _L Liquid Limit Density Index <15%



CLIENT:MCCLOY PROJECT MANAGEMENT PTY LTDPROJECT:PROPOSED RESIDENTIAL SUBDIVISIONLOCATION:51 & 134 STATION LANE, LOCHINVAR

TEST PIT NO:

PAGE:

DATE:

JOB NO:

LOGGED BY:

TP115 1 OF 1

NEW21P-0129

BE

10/2/22

							VATOR SURFAC	E RL:					
TE		PIT LENGT		2.0 m	w	IDTH:	0.5 m DATUM: Material description and profile information				Field	d Test	
METHOD	WATER	SAMPLES	RL (m)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION: Soil type, plasticity/par characteristics,colour,minor components	rticle	MOISTURE CONDITION	CONSISTENCY DENSITY	Test Type	Result	Structure and additional observations
						СН	TOPSOIL: Sandy CLAY - medium to high plasti dark grey-brown, fine to medium grained sand, fine grained angular gravel, root affected.	icity, trace					TOPSOIL
Ш	ot Encountered	0.40m CBR 0.60m		- - 0.5_ -		СН	CLAY - medium to high plasticity, dark grey-brow with some fine to coarse grained sand. Brown, with some fine grained angular gravel.	- <u> </u>	M < w _P	н	HP	550	RESIDUAL SOIL
4 Datgel Lab and In Situ Tool	Not			- - 1. <u>0</u> -		CL	0.70mSandy CLAY / Clayey Gravelly SAND - low to medium plasticity, pale brown, fine to coarse gra sand, with fine grained angular gravel.	ained		H / Fb			
GPJ < <drawingfile>> 22/03/2022 10:57 10.02.00.0</drawingfile>				- 1.5_ -	<u> </u>		Hole Terminated at 1.20 m Slow progress						
PIT NEW21P-0129-AC LOGS - PAVEMENT & BASINS				- 2.0									
	(D W ◀W <u>rata C</u>	eter Level ate and time sl ater Inflow ater Outflow hanges Gradational or ransitional stra Definitive or dis strata change	hown) ata	Notes, Sar U ₅₀ CBR E ASS B Field Test PID DCP(x-y) HP	50mm Bulk s Enviro (Glass Acid S (Plast Bulk S S Photo Dynar	n Diamet ample fi onmenta s jar, sea Sulfate S Gulfate S aic bag, a Sample ionisatic nic pene	er tube sample V or CBR testing S I sample I aled and chilled on site) S ioil Sample V ir expelled, chilled) F	S S F Fi St S St V H H	hcy ery Soft oft rm iiff ery Stiff ard iable V L MD D VD	Vi La D	22 25 50 10 20 20 >4 ery Lo pose	5 - 50 0 - 100 10 - 200 10 - 400 100 100 100 100 100 100 100	D Dry M Moist W Wet Wp Plastic Limit WL Liquid Limit Density Index <15% Density Index 15 - 35%



CLIENT:MCCLOY PROJECT MANAGEMENT PTY LTDPROJECT:PROPOSED RESIDENTIAL SUBDIVISIONLOCATION:51 & 134 STATION LANE, LOCHINVAR

TEST PIT NO:

PAGE:

DATE:

JOB NO:

LOGGED BY:

TP116 1 OF 1

NEW21P-0129

		IENT TYPE		2.7 TC 2.0 m		EXCA'	VATOR SURF 0.5 m DATU	ACE RL:					
<u> </u>		ling and Sam		2.0 111			Material description and profile information				Fiel	d Test	
METHOD	WATER	SAMPLES	RL (m)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION: Soil type, plasticity characteristics,colour,minor component		MOISTURE CONDITION	CONSISTENCY DENSITY	Test Type	Result	Structure and additional observations
						СН	TOPSOIL: Sandy CLAY - medium to high p dark grey-brown, fine to medium grained sa fine grained angular gravel, root affected.	lasticity, ind, trace	.0				TOPSOIL
				-			0.20m CLAY - medium to high plasticity, dark grey- with some fine to coarse grained sand.	 -brown,	M < W	н	HP	>600	RESIDUAL SOIL
		0.40m CBR		- 0. <u>5</u>			Pale brown, trace fine grained angular grave	el.			HP	380	
	Encountered	0.60m		-			With some red-brown.				HP	250	
0.02.00.04 Datgel Lab and In Situ Tool	Not Er			- 1. <u>0</u> -		СН			M > w _P	VSt	HP	320	
DrawingFile>> 22/03/2022 10:57 10				- 1. <u>5</u>			Pale brown to pale grey, with orange to red-	brown.			HP	350	
GPJ <<							Hole Terminated at 1.70 m Slow progress						
21P-0129-AC LOGS - PAVEMENT & BASINS.				- 2.0									
	- (Da – Wa ⊲ Wa <u>rata Ch</u> – G tr	ter Level te and time sh ter Inflow ter Outflow	nown)		50mm Bulk s Enviro (Glass Acid S (Plasti Bulk S S Photoi Dynan	Diamet ample funmenta s jar, sea sulfate S c bag, a c bag, a c bag, a conisationic pene	s er tube sample or CBR testing I sample aled and chilled on site) ioil Sample ir expelled, chilled) n detector reading (ppm) etrometer test (test depth interval shown) meter test (UCS kPa)	S S F F St S VSt V H F	ncy /ery Soft Soft /ery Stiff /ard /riable V L ME D	Vi La D M	<2 25 50 20 20 20 20 20 20 20 20 20 20 20 20 20	n Dense	D Dry M Moist W Wet W _p Plastic Limit U Liquid Limit Density Index <15%



CLIENT:MCCLOY PROJECT MANAGEMENT PTY LTDPROJECT:PROPOSED RESIDENTIAL SUBDIVISIONLOCATION:51 & 134 STATION LANE, LOCHINVAR

TEST PIT NO:

PAGE:

DATE:

JOB NO:

LOGGED BY:

TP117 1 OF 1

NEW21P-0129

													10/2/22
		IENT TYPE		2.7 TC 2.0 m		EXCA I DTH :	VATOR SURFAC						
	Dri	ling and Sam	pling				Material description and profile information				Fiel	d Test	
METHOD	WATER	SAMPLES	RL (m)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION: Soil type, plasticity/pa characteristics,colour,minor components	article	MOISTURE CONDITION	CONSISTENCY DENSITY	Test Type	Result	Structure and additional observations
OT LIB 1.1.GLB LOG NON-CORED BOREHOLE - TEST PTT NEWZIP-0129-AC LOGS - PAVEMENT & BASINS GPJ - <drawingfile>> 22/03/2022 10:57 10.02:00.04 Datgel Lab and In Stu Tool</drawingfile>	Not Encountered	0.40m CBR 0.60m				СН	TOPSOIL: Sandy CLAY - medium to high plas dark grey-brown, fine to medium grained sand fine grained angular gravel, root affected. CLAY - medium to high plasticity, grey and browith some fine to coarse grained sand. Brown. 1.20m CLAY - medium plasticity, pale grey and dark l with orange to red-brown. With highly weathered pockets. 1.70m Hole Terminated at 1.70 m Slow progress	I, trace	$M < w_p$ $M > w_p$	H H H	HP HP HP HP		TOPSOIL
	- (Da – Wa ⊲ Wa <u>rata Ch</u> G tr	ter Level te and time sh ter Inflow ter Outflow	own)	Notes, Sa U ₅₀ CBR E ASS B Field Test PID DCP(x-y) HP	50mm Bulk s Enviro (Glass Acid S (Plast Bulk S S Photo Dynar	Diame ample f onmenta s jar, se Gulfate S ic bag, a Sample ionisationisationis and pen-	ter tube sample for CBR testing al sample aled and chilled on site) Soil Sample air expelled, chilled)	S S F F St S VSt V H H	ncy /ery Soft Stiff eard Triable V L MC D VD	Vi La D D	<2	n Dense	D Dry M Moist W Wet W _p Plastic Limit W _L Liquid Limit Density Index <15%



CLIENT:MCCLOY PROJECT MANAGEMENT PTY LTDPROJECT:PROPOSED RESIDENTIAL SUBDIVISIONLOCATION:51 & 134 STATION LANE, LOCHINVAR

TEST PIT NO:

PAGE:

DATE:

JOB NO:

LOGGED BY:

TP118 1 OF 1

NEW21P-0129

									DA				10/2/22
		IENT TYPE: T LENGTH:		2.7 TC 2.0 m		EXCA I DTH :	VATOR SURFA 0.5 m DATU	ACE RL: M:					
	Drill	ing and Sampli	ing				Material description and profile information				Field	d Test	
METHOD	WATER		RL (m)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION: Soil type, plasticity/ characteristics,colour,minor components	/particle	MOISTURE CONDITION	CONSISTENCY DENSITY	Test Type	Result	Structure and additional observations
				-		СН	TOPSOIL: Sandy CLAY - medium to high pla dark grey-brown, fine to medium grained sar fine grained angular gravel, root affected.	nd, trace	_				TOPSOIL RESIDUAL SOIL
ш	Not Encountered	0.40m CBR 0.60m		0.5		СН	grey, with fine to coarse grained sand.		M > w _P	VSt	HP HP	390 300	
LEC Wat	Z			- - 1.0_		GC	0.80m Extremely Weathered Andesite with soil prop breaks down into Clayey Sandy GRAVEL - f medium grained angular to sub-angular, dar and dark brown, fine to coarse grained sand medium plasticity, with Clay pockets / bands	ine to k grey , fines of	D - M	D	-		EXTREMELY WEATHERED ROCK
					<u>, , , , , , , , , , , , , , , , , , , </u>		1.10m Hole Terminated at 1.10 m Slow progress						
<u>Wat</u> ▼	Wat (Dat Wat	er Level e and time show er Inflow	vn)	- 2.0_ - - - - - - - - - - - - - - - - - - -	50mm Bulk s Enviro (Glass Acid S	Diame ample f nmenta jar, sea sialfate S	er tube sample or CBR testing I sample aled and chilled on site) ioil Sample	S S F F St S VSt V	'ery Soft oft irm itiff 'ery Stiff		<2 25 50 10 20	5 - 50) - 100)0 - 200)0 - 400	D Dry M Moist W Wet W _p Plastic Limit
	i <u>ta Cha</u> Gi tra De	er Outflow anges radational or ansitional strata efinitive or distic rata change		B Field Test PID DCP(x-y) HP	Bulk S <u>s</u> Photo Dynar	ample ionisatic nic pene	ir expelled, chilled) on detector reading (ppm) etrometer test (test depth interval shown) meter test (UCS kPa)		lard riable V L MD D VD	D D	ery Lo oose	n Dense	Density Index <15% Density Index 15 - 35% Density Index 35 - 65% Density Index 65 - 85% Density Index 85 - 100%



CLIENT:MCCLOY PROJECT MANAGEMENT PTY LTDPROJECT:PROPOSED RESIDENTIAL SUBDIVISIONLOCATION:51 & 134 STATION LANE, LOCHINVAR

TEST PIT NO:

PAGE:

DATE:

JOB NO:

LOGGED BY:

TP119 1 OF 1

NEW21P-0129

		MENT TYPI IT LENGTH		2.7 TC 2.0 m		EXCA I DTH :	VATOR SURF 0.5 m DATU	FACE RL: JM:					
	Dril	ling and Sam	pling				Material description and profile information				Field	d Test	
METHOD	WATER	SAMPLES	RL (m)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION: Soil type, plasticit characteristics,colour,minor componen		MOISTURE CONDITION	CONSISTENCY DENSITY	Test Type	Result	Structure and additional observations
						CI	TOPSOIL: Sandy CLAY - medium plasticity fine grained sand, trace fine grained angula root affected.		~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~				TOPSOIL
				-		 СН	Sandy CLAY - medium to high plasticity, br orange and pale grey, fine grained sand.	rown, trace	_ ~ ≥	Н	HP HP	>600 450	
		0.40m CBR		0.5			0.40m CLAY - medium to high plasticity, dark grey to coarse grained sand.	/, with fine			HP	350	
el Lab and In Situ Tool E	Not Encountered	0.60m		- - - 1. <u>0</u>		СН				VSt	HP	250 200	
<				- - 1. <u>5</u>		сн	CLAY - medium to high plasticity, pale brow trace orange, with fine to coarse grained sa Trace red-brown, trace fine grained angula	and.	M > W _P	St	HP	180	RESIDUAL SOIL
ĩ				-			Pale grey, trace orange to red-brown.			0.	HP HP	190 180	
				2.0	· · _		SILTSTONE - pale brown and pale grey, ex 2.00m very low to low strength, fractured. Hole Terminated at 2.00 m	stimated	D				HIGHLY WEATHERED
OT LIB 1.1.G.LB LOG NON-CORED BOREHOLE. TEST PTI NEWZTP-07/29-AC LOGS - PAVEMENT & BASINS:G	GEND:			- - - Notes, Sa	mples a	nd Test	Very slow progress	Consiste	ncv		U	CS (kPa	a) Moisture Condition
	ater (Da — Wat ■ Wat Tata Ch	ter Level te and time sh ter Inflow ter Outflow <u>anges</u> radational or		U ₅₀ CBR E ASS B <u>Field Test</u>	50mm Bulk s Enviro (Glass Acid s (Plast Bulk s	n Diame ample f onmenta s jar, se Sulfate S ic bag, a Sample	er tube sample or CBR testing Il sample aled and chilled on site) Soil Sample air expelled, chilled)	VS V S S F F St S VSt V H H	Very Soft Soft Stiff Very Stiff lard Triable V	V	25 25 50 10 20 >4 ery Lo	25 5 - 50 0 - 100 00 - 200 00 - 400 400	D Dry M Moist W Wet Wp Plastic Limit WL Liquid Limit Density Index <15%
QT LIB 1.1.GL	tr	ansitional stra efinitive or dis trata change		PID DCP(x-y) HP	Dynar	nic pene	n detector reading (ppm) trometer test (test depth interval shown) meter test (UCS kPa)		L ME D VD) M D	oose ediun ense ery De	n Dense ense	Density Index 15 - 35% Density Index 35 - 65% Density Index 65 - 85% Density Index 85 - 100%



CLIENT:MCCLOY PROJECT MANAGEMENT PTY LTDPROJECT:PROPOSED RESIDENTIAL SUBDIVISIONLOCATION:51 & 134 STATION LANE, LOCHINVAR

TEST PIT NO:

PAGE:

DATE:

JOB NO:

LOGGED BY:

TP120 1 OF 1

NEW21P-0129

		MENT TYPE		2.7 TC 2.0 m		EXCA	VATOR SURF 0.5 m DATU	ACE RL:					
	Dril	ling and Samp	pling				Material description and profile information				Field	d Test	
METHOD	WATER	SAMPLES	RL (m)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION: Soil type, plasticity characteristics,colour,minor component		MOISTURE CONDITION	CONSISTENCY DENSITY	Test Type	Result	Structure and additional observations
				-		СН	TOPSOIL: Sandy CLAY - medium to high p dark grey-brown, fine to medium grained sa fine grained angular gravel, root affected.	lasticity, and, trace					TOPSOIL
		0.50m		-			CLAY - medium to high plasticity, dark brow grey, with fine to coarse grained sand.				HP	180	RESIDUAL SOIL
		0.50m B 0.60m		-			Grey, with some orange, trace fine to coars angular gravel.	e grained	> W _P		HP	180	
⊔ LEC Wat	Not Encountered	1.00m		- 1. <u>0</u> -		СН			Σ	St	HP	180	
		B 1.30m		-									
		1.70m		1. <u>5</u> -			1.60m BASALT - dark grey to black, estimated me 1.70m high strength, highly fractured.		D	MD - D	HP	180	HIGHLY WEATHERED
		В		-		СН	Silty Sandy CLAY - medium to high plasticit grey to pale brown, with orange to red-brow coarse grianed sand, trace fine to medium angular gravel.	n, fine to	M > w _P	VSt - H	HP	380 - 400	RESIDUAL SOIL
		2.00m		2.0	<u>.</u>		2.00m Hole Terminated at 2.00 m						
LEC Wat	Wat (Da - Wat	ter Level te and time sho ter Inflow ter Outflow anges	own)	Notes, Sa U ₅₀ CBR E ASS B	50mm Bulk s Enviro (Glass Acid S (Plasti	Diame ample f nmenta jar, se sulfate S	<u>s</u> ter tube sample or CBR testing I sample aled and chilled on site) toil Sample iir expelled, chilled)	S S F F St S VSt V H F	ncy /ery Soft Soft /ery Stiff /ery Stiff lard friable		<2 25 50 10 20	CS (kPa 25 5 - 50 0 - 100 00 - 200 00 - 400 400	D Dry M Moist W Wet W _p Plastic Limit
	G tr D	iradational or ansitional strata efinitive or disti trata change	a	Field Test PID DCP(x-y) HP	s Photo Dynar	ionisatio nic pene	n detector reading (ppm) etrometer test (test depth interval shown) meter test (UCS kPa)	<u>Density</u>	V L D VD) M D	ery Lo bose ledium ense ery De	n Dense	Density Index <15% Density Index 15 - 35% Density Index 35 - 65% Density Index 65 - 85% Density Index 85 - 100%



CLIENT:MCCLOY PROJECT MANAGEMENT PTY LTDPROJECT:PROPOSED RESIDENTIAL SUBDIVISIONLOCATION:51 & 134 STATION LANE, LOCHINVAR

TEST PIT NO:

PAGE:

DATE:

JOB NO:

LOGGED BY:

TP121 1 OF 1

NEW21P-0129

												10/2/22
		IENT TYPE: T LENGTH:		2.7 TC 2.0 m		EXCA I DTH :	VATOR SURFACE RL 0.5 m DATUM:	:				
	Drill	ing and Samp	oling				Material description and profile information			Fiel	d Test	
МЕТНОD	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
ш	Not Encountered	0.50m B 0.70m 1.00m B 1.20m 1.50m B 1.70m		- - - 0.5 - - - - - - - - - - - - - - - - - - -		СН	1.40m Gravelly Sandy CLAY - low to medium plasticity, pale brown, fine to medium grained sand, trace fine grained angular gravel, root affected. 0.20m CLAY - medium to high plasticity, brown, with fine to coarse grained sand. fine grained sand.	M > Wp	H	HP HP HP	550 450 380 350	TOPSOIL
►	r (Dat (Dat Wat Wat <u>a Cha</u> - Gi tra	er Level e and time shor er Inflow er Outflow inges adational or unsitional strata afinitive or distid ata change	wn)		50mm Bulk s Enviro (Glass Acid S (Plasti Bulk S S Photoi Dynan	Diame ample f onmenta s jar, se Gulfate S c bag, s	ter tube sample VS or CBR testing S al sample F aled and chilled on site) St Soil Sample VSt air expelled, chilled) H	Very Soft Soft Firm Stiff Very Stiff Hard Friable	V L D M	<2	CS (kPa 25 5 - 50 0 - 100 00 - 200 00 - 400 400 mose n Dense	D Dry M Moist W Wet W _p Plastic Limit W _L Liquid Limit Density Index <15%



CLIENT:MCCLOY PROJECT MANAGEMENT PTY LTDPROJECT:PROPOSED RESIDENTIAL SUBDIVISIONLOCATION:51 & 134 STATION LANE, LOCHINVAR

TEST PIT NO:

PAGE:

DATE:

JOB NO:

LOGGED BY:

TP122 1 OF 1

NEW21P-0129

BE

10/2/22

		MENT TYPI		2.7 TC 2.0 m		EXCA I DTH :	VATOR SURFAC 0.5 m DATUM:	E RL:					
	Drill	ling and Sam	npling				Material description and profile information				Field	d Test	
METHOD	WATER	SAMPLES	RL (m)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION: Soil type, plasticity/pa characteristics,colour,minor components	rticle	MOISTURE CONDITION	CONSISTENCY DENSITY	Test Type	Result	Structure and additional observations
				-		СН	TOPSOIL: Sandy CLAY - medium to high plasti dark grey-brown, fine to medium grained sand, fine grained angular gravel, root affected.						TOPSOIL
:57 10.02.00.04 Dage Lab and In Situ Tool E	Not Encountered	0.50m B 0.70m 1.00m B 1.20m B 1.30m				CH SC SC	 0.20m CLAY - medium to high plasticity, brown, with fit coarse grained sand. 1.20m Clayey SAND - fine to coarse grained, pale broging fines of low plasticity, trace fine grained gravel. Extremely Weathered Andesite with soil proper 	 wn, ties;	- M - M	VSt St D	HP HP HP	250 250 180 180	RESIDUAL SOIL
				1. <u>5</u> - - - 2. <u>0</u> - - - -	<u>~:~</u> ;		 breaks down into Clayey Gravelly SAND - fine to coarse grained, pale brown, fine to medium gravel, fines of low plasticity. Hole Terminated at 1.40 m Very slow progress 						
	Wat (Dat Wat Wat I Wat	ter Level te and time sh ter Inflow ter Outflow anges radational or	nown)	 <u>Notes, Sa</u> U₅₀ CBR E ASS ASS B <u>Field Test</u> PID	50mm Bulk s Enviro (Glass Acid S (Plasti Bulk S	Diame ample f nmenta jar, se culfate \$ c bag, s ample	ter tube sample V or CBR testing all sample aled and chilled on site) Soil Sample V in expelled, chilled) f	S S F F St S St V H H	ncy ery Soft oft irm tiff ery Stiff ard riable V L	V	<2 25 50 10 20	5 - 50) - 100)0 - 200)0 - 400 }00	Moisture Condition D Dry M Moist W Wet W _p Plastic Limit W _L Liquid Limit Density Index <15% Density Index 15 - 35%
QT LIB 1.1.0	transitional strata Definitive or distict strata change			DCP(x-y) HP	Dynar	nic pen	etrometer test (test depth interval shown) meter test (UCS kPa)		MD D VD) M D		n Dense ense	

APPENDIX B:

Results of Laboratory Testing



Califorr	McCloy Project Management Pty Ltd PO Box 2214 Dangar NSW 2309	Report	Accredited for compliance with ISO/IEC The results of the tests, calibrations and included in this document are traceable standards.	/or measurements to Australian/national		
Project No.: Project Name: Project Locatio	NEW21P-0129 Proposed Subdivision - Station St, Lochinva n:No. 51, 134 & 146 Station Street, Lochinva		Results provided relate only to the items tested or samp B. UULA Approved Signatory: Brent Cullen (Senior Geotechnician) NATA Accredited Laboratory Number: 18686 Date of Issue: 22/02/2022			
Sample Det	ails					
Sample ID:	NEW22W-0432-S01	Date Samp	led: 10/02/2022			
Sampling Meth	od: The results outlined below apply to the sa	ample as received				
Specification:	No Specification	Source:	On-Site Insitu			
Location:	TP101 - (0.40 - 0.60m)	Material:	Clay			
Date Tested:	21/02/2022					
Load vs Pe	netration		Test Results			
			AS 1289.6.1.1			
0.8			CBR at 2.5mm (%):	3.5		
			Maximum Dry Density(t/m³):	1.33		
0.7 + · · · ·			Optimum Moisture Content(%):	33.1		
0.7			Dry Density before Soaking (t/m ³):	1.33		
- :			Density Ratio before Soaking (%):	99.5		
0.6+			Moisture Content before Soaking (%):	33.1		
0.0			Moisture Ratio before Soaking (%):	100.0		
			Dry Density after Soaking (t/m³):	1.29		
7 0.5			Density Ratio after Soaking (%):	97.0		
(k K			Swell (%):	2.5		
<u>Б</u>			Moisture Content of Top 30mm (%):	46.1		
	, 🔎		Moisture Content of Remaining Depth (%):	36.6		
Load on Piston (KN)	<i>/</i>		Compaction Hammer Used:	Standard AS 1289.5.1		
<u> 0.3</u>			Surcharge Mass (kg):	9.00		
			Period of Soaking (Days):	4		
🗍 🚪			Retained on 19 mm Sieve (%):	0		
0.2+••••;		•••••	CBR Moisture Content Method:	AS 1289.2.1		
I I I I I I I I I I I I I I I I I I I			Sample Curing Time (h):	48		
		: : :	Plasticity Determination Method:	Visual/Tactil		
0.1 - 1						
0.1 - 10			AS1289.2.1.1			
0.1			In Situ (Field) Moisture Content (%):	30.6		
0.1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -		0 11.0 12.0 13.0		30.6		

Comments



Cal		ia Bearing Ratio Te McCloy Project Management Pty Ltd	est Report	Accredited for compliance with ISO/IEC 1	
Project No.: Project Name: Project Locatio		PO Box 2214 Dangar NSW 2309 NEW21P-0129 Proposed Subdivision - Station St, Loc No. 51, 134 & 146 Station Street, Loch		WORLD RECOGNISED ACCREDITATION WORLD RECOGNISED ACCREDITATION	
Sam	ple Deta	ails			
Samp		NEW22W-0432-S02	Date Sample	ed: 10/02/2022	
Sampl	ling Metho	od: The results outlined below apply to the	he sample as received		
Specif	fication:	No Specification	Source:	On-Site Insitu	
Locati	on:	TP102 - (0.40 - 0.60m)	Material:	Clay	
Date T	ested:	21/02/2022			
Load	l vs Per	netration		Test Results	
	0.9		· · · · · · · · · · · · · · · · · · ·	AS 1289.6.1.1	
			- E - E 🖌 🖌 E - I	CBR at 2.5mm (%):	3.5
				Maximum Dry Density(t/m³):	1.43
	0.8			Optimum Moisture Content(%):	29.2
	+ :			Dry Density before Soaking (t/m³):	1.42
	0.7			Density Ratio before Soaking (%):	99.5
				Moisture Content before Soaking (%):	29.6
				Moisture Ratio before Soaking (%):	101.5
-	0.6			Dry Density after Soaking (t/m³):	1.40
Ę Ŋ	- :		: : : :	Density Ratio after Soaking (%):	97.5
) uc	0.5			Swell (%):	1.5 37.9
isto				Moisture Content of Top 30mm (%): Moisture Content of Remaining Depth (%):	
Load on Piston (kN)				Compaction Hammer Used:	Standard
op	0.4	🔁 ? - [-] ? - · · ·] · · · ? ? ? ? ? ? ? ? ? ? ? ? ? ? ? ? ? ? ? ?		Compaction Hammer Osed.	AS 1289.5.1
Loa	+ :			Surcharge Mass (kg):	9.00
	0.3	The second s		Period of Soaking (Days):	4
	· /			Retained on 19 mm Sieve (%):	0
	1:			CBR Moisture Content Method:	AS 1289.2.1
	0.2 -			Sample Curing Time (h):	48
	- 			Plasticity Determination Method:	Visual/Tactil
	0.1				
	~·'			———— AS1289.2.1.1 ———	
	1			In Situ (Field) Moisture Content (%):	24.2
	0.0	20 20 40 50 20 70 00 20			
	0.0	2.0 3.0 4.0 5.0 6.0 7.0 8.0 9.0 Penetration (mm)	10.0 11.0 12.0 13.0		

Comments



Report No: CBR:NEW22W-0432-S03

PO Box		McCloy Projec PO Box 2214 Dangar NSW	C C	ent Pty Ltd			Accredited for compliance with ISO/ The results of the tests, calibrations included in this document are tracea standards. Results provided relate only to the it	and/or measurements ble to Australian/national
Project N Project N Project L	lame:	NEW21P-012 Proposed Sub No. 51, 134 &	odivision - St		ACCREDITATION ACCREDITATION B. CULL Approved Signatory: Brent Cullen (Senior Geotechnician) NATA Accredited Laboratory Number: 18686 Date of Issue: 22/02/2022			
Sample							40/00/0000	
Sample I		NEW22W-0 d: The results		w apply to t	ho samnlı	Date Samp		
Specifica	-	No Specifica		w apply to ti	ne sampi	Source:	On-Site Insitu	
Location		TP103 - (0.4				Material:	Clay	
Date Tes	ted:	21/02/2022	,				-	
Load v	s Per	etration					Test Results	
0.8	³⊤···:	••••••••••••••••••••••	••••		••••••••		AS 1289.6.1.1	
	- :		i i	: : :		2 - E -	CBR at 2.5mm (%):	2.5
0.7		: : :	: :	: : :	- i 🏒		Maximum Dry Density(t/m³): Optimum Moisture Content(%):	1.48 26.7
0.7							Dry Density before Soaking (t/m ³):	1.47
	- :			E E 🎍	*		Density Ratio before Soaking (%):	99.0
0.6							Moisture Content before Soaking (%):	26.6
0.0	:	: : :	: :		: :	: :	Moisture Ratio before Soaking (%):	99.5
	-		- E - E 🖌	🗗 E E			Dry Density after Soaking (t/m³):	1.42
7 0.5	; - · · ·						Density Ratio after Soaking (%):	95.5
(kl	·			: : :		: :	Swell (%):	3.5
ton	-		-	: : :			Moisture Content of Top 30mm (%):	43.7
<u>.9</u> 0.4		an ing an an ing Cara		·			Moisture Content of Remaining Depth (%): 27.9
Load on Piston (kN)							Compaction Hammer Used:	Standard AS 1289.5.1
<u> </u>	3	rr∕£rthinnin	· · · } · · ·				Surcharge Mass (kg):	9.00
	- :	i e t e - e -					Period of Soaking (Days):	4
				: : :		: :	Retained on 19 mm Sieve (%):	0
0.2	2 T						CBR Moisture Content Method: Sample Curing Time (h):	AS 1289.2.1 48
	+ /:						Plasticity Determination Method:	40 Visual/Tactile
0.1	1.							
0.1	11						AS1289.2.1.1 —	
	1			: : :			In Situ (Field) Moisture Content (%):	24.2
1	📕 📜 📜			· · ·				
0.0								

Comments



Califorr	McCloy Project Management Pty Ltd PO Box 2214 Dangar NSW 2309	t Report	Accredited for compliance with ISO/IE The results of the tests, calibrations an included in this document are traceab standards. Besults cruyided relate only to the iter	nd/or measurements le to Australian/national
Project No.: Project Name: Project Locatio	NEW21P-0129 Proposed Subdivision - Station St, Lochiny on:No. 51, 134 & 146 Station Street, Lochinya		Results provided relate only to the items tested or sampled B. C. Approved Signatory: Brent Cullen (Senior Geotechnician) NATA Accredited Laboratory Number: 18686 Date of Issue: 22/02/2022	
Sample De				
Sample ID:	NEW22W-0432-S04	Date Samp		
	nod: The results outlined below apply to the s	sample as received Source:	On-Site Insitu	
Specification:	No Specification TP104 - (0.40 - 0.60m)	Source: Material:		
Location: Date Tested:	21/02/2022	Material:	Clay	
Load vs Pe	netration		Test Results	
1.1 + · · · ·			AS 1289.6.1.1	4 5
-		8 8 🚂 E 🛛	CBR at 2.5mm (%):	4.5
1.0 - · · · ·		eringen der sollte	Maximum Dry Density(t/m³):	1.47
-			Optimum Moisture Content(%):	28.0
0.9 - · · · ·			Dry Density before Soaking (t/m ³):	1.47
-			Density Ratio before Soaking (%):	100.0
0.8 - · · · ·			Moisture Content before Soaking (%):	27.7
			Moisture Ratio before Soaking (%):	99.0
07-7-	······································		Dry Density after Soaking (t/m ³):	1.44
$\widehat{z}^{0.7}$			Density Ratio after Soaking (%):	98.0
			Swell (%):	2.0
9 0.6			Moisture Content of Top 30mm (%):	37.7
			Moisture Content of Remaining Depth (%	
Load on Piston (kN)			Compaction Hammer Used:	Standard AS 1289.5.1
0.4 - · · ·			Surcharge Mass (kg):	9.00
			Period of Soaking (Days):	4
0.3			Retained on 19 mm Sieve (%):	0
			CBR Moisture Content Method:	AS 1289.2.1
0.2 - 1			Sample Curing Time (h):	48
0.2		· · · · ·	Plasticity Determination Method:	Visual/Tactil
0.1++ · · ·			AS1289.2.1.1 —	05.0
l II v			In Situ (Field) Moisture Content (%):	25.8
0.0	0 2.0 3.0 4.0 5.0 6.0 7.0 8.0 9.0 10	 		

Comments



Client: Project No.: Project Name: Project Locatio	ia Bearing Ratio Test R McCloy Project Management Pty Ltd PO Box 2214 Dangar NSW 2309 NEW21P-0129 Proposed Subdivision - Station St, Lochinvar n:No. 51, 134 & 146 Station Street, Lochinvar			for measurements to Australian/national tested or sampled.
Sample Det Sample ID: Sampling Meth Specification: Location: Date Tested:	ails NEW22W-0432-S05 od: The results outlined below apply to the sample No Specification TP105 - (0.40 - 0.60m) 21/02/2022	e as received	2/2022 ite Insitu	
Load vs Pe	netration	Test Res		
1.3 1.2 1.2 1.1 1.1 1.0 0.9 0.9 0.7 0.8 0.7 0.7 0.7 0.7 0.7 0.7 0.7 0.7		Optimum Mo Dry Density Ratio Moisture Cor Moisture Ratio Dry Density Ratio Swell (%): Moisture Cor Moisture Cor Moisture Cor	AS 1289.6.1.1 mm (%): y Density(t/m ³): before Content(%): before Soaking (t/m ³): before Soaking (%): ito before Soaking (%): ito before Soaking (%): after Soaking (t/m ³): b after Soaking (%): metent of Top 30mm (%): ntent of Remaining Depth (%): Hammer Used:	5.0 1.64 18.5 1.65 100.5 17.6 95.0 1.62 98.5 2.0 27.0 23.3 Standard AS 1289.5.1

Comments



Client: Project No.: Project Name: Project Locatio	Ia Bearing Ratio Test Rep McCloy Project Management Pty Ltd PO Box 2214 Dangar NSW 2309 NEW21P-0129 Proposed Subdivision - Station St, Lochinvar n:No. 51, 134 & 146 Station Street, Lochinvar	Accredited for compliance with ISO/IEC 17025-Testing. The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards. Results provided relate only to the items tested or sampled. B. Cullur Approved Signatory: Brent Cullen (Senior Geotechnician) NATA Accredited Laboratory Number: 18686 Date of Issue: 22/02/2022
Sample Det Sample ID: Sampling Meth Specification: Location: Date Tested:	NEW22W-0432-S06 Dat od: The results outlined below apply to the sample as r No Specification	te Sampled: 10/02/2022 received urce: On-Site Insitu terial: Clay
Load vs Pe	netration	Test Results
1.3 1.2 1.2 1.1 1.1 1.0 0.9 0.9 0.7 0.7 0.7 0.7 0.7 0.7 0.7 0.7		AS 1289.6.1.1 CBR at 2.5mm (%): 4.5 Maximum Dry Density(t/m ³): 1.42 Optimum Moisture Content(%): 28.0 Dry Density before Soaking (t/m ³): 1.41 Density Ratio before Soaking (%): 99.0 Moisture Content before Soaking (%): 28.4 Moisture Ratio before Soaking (%): 101.5 Dry Density after Soaking (%): 1.37 Density Ratio after Soaking (%): 97.0 Swell (%): 2.5 Moisture Content of Top 30mm (%): 34.7 Moisture Content of Remaining Depth (%): 30.0 Compaction Hammer Used: Standard AS 1289.5.1

Comments



Report No: CBR:NEW22W-0432-S07

Client:	McCloy Project Management Pty Ltd PO Box 2214 Dangar NSW 2309		Accredited for compliance with ISO/IEC 1 The results of the tests, calibrations and// included in this document are traceable to standards. Results provided relate only to the items	or measurements o Australian/national	
Project No.: Project Name Project Locat	NEW21P-0129 Proposed Subdivision - Station St, Loch ion: No. 51, 134 & 146 Station Street, Loching		WORLD RECOGNISED ACCREDITATION BACCREDITATION ACCREDITATION ACCREDITATION NATA Accredited Laboratory Number: 18686 Date of Issue: 22/02/2022		
Sample D Sample ID: Sampling Me	etails NEW22W-0432-S07 thod: The results outlined below apply to th	Date Sample e sample as received	d: 10/02/2022		
Specification	: No Specification	Source:	On-Site Insitu		
Location: Date Tested:	TP107 - (0.40 - 0.60m) 21/02/2022	Material:	Clay		
	enetration		Test Results		
		: : : :	AS 1289.6.1.1		
1.6 - · ·			CBR at 2.5mm (%):	4.0	
			Maximum Dry Density(t/m ³): Optimum Moisture Content(%):	1.43 26.7	
	: : : : /: : : : :			1.45	
1.4 - · ·			Density Ratio before Soaking (%):	101.0	
+			Moisture Content before Soaking (%):	26.5	
1.2 - · ·			Moisture Ratio before Soaking (%):	99.0	
		- E - E - 🗩 E - I	Dry Density after Soaking (t/m³):	1.41	
(N			Density Ratio after Soaking (%):	98.0	
<u> </u>	**************************************		Swell (%):	3.0	
isto –			Moisture Content of Top 30mm (%):	39.4	
			Moisture Content of Remaining Depth (%): Compaction Hammer Used:	20.5 Standard AS 1289.5.1	
			Surcharge Mass (kg):	9.00	
0.6 - · ·			Period of Soaking (Days):	4	
† 			Retained on 19 mm Sieve (%):	0	
0.4 - · ·	itr j∕t tersplanneterskenderselenselen		CBR Moisture Content Method: Sample Curing Time (h):	AS 1289.2.1 48	
0.2 - · · ·			Plasticity Determination Method:	Visual/Tactil	
0.2			AS1289.2.1.1 ——— In Situ (Field) Moisture Content (%):	23.8	
0.0					
0.0	1.0 2.0 3.0 4.0 5.0 6.0 7.0 8.0 9.0	10.0 11.0 12.0 13.0			
0.0	Penetration (mm)				

Form No: 18986, Report No: CBR:NEW22W-0432-S07

Comments



Report No: CBR:NEW22W-0432-S08

Client:	McCloy Project Management Pty Ltd PO Box 2214 Dangar NSW 2309		Accredited for compliance with ISO/IEC 1 The results of the tests, calibrations and/ included in this document are traceable to standards. Results provided relate only to the items	or measurements o Australian/national
Project No.: Project Nan Project Loc			Approved Signatory: Brent Cullen (Senior Geotechnician) NATA Accredited Laboratory Num Date of Issue: 22/02/2022	
Sample I Sample ID:		Date Sampl	ed: 10/02/2022	
Sampling N Specification	Method: The results outlined below apply to the saon: No Specification	ample as received Source:	On-Site Insitu	
Location: Date Tested	TP108 - (0.40 - 0.60m)	Material:	Clay	
	Penetration		Test Results	
0.8 + 1			AS 1289.6.1.1 CBR at 2.5mm (%):	3.0
+		- E 🛃 🦊 E 👘	Maximum Dry Density(t/m³):	1.43
0.7 + -			Optimum Moisture Content(%):	27.6
			Dry Density before Soaking (t/m³):	1.43
			Density Ratio before Soaking (%):	100.0
0.6 - ·			Moisture Content before Soaking (%):	27.4
			Moisture Ratio before Soaking (%):	99.5
			Dry Density after Soaking (t/m³):	1.39
Q 0.5+			Density Ratio after Soaking (%):	97.5 3.0
) uo			Swell (%): Moisture Content of Top 30mm (%):	3.0 39.5
1 1 1 1 1 1 1 1 1 1			Moisture Content of Remaining Depth (%):	
Load on Piston (kN)	~~		Compaction Hammer Used:	Standard AS 1289.5.1
J _{0.3}	n de f ebre de la deservición de la des		Surcharge Mass (kg):	9.00
			Period of Soaking (Days):	4
			Retained on 19 mm Sieve (%):	0
0.2 -			CBR Moisture Content Method: Sample Curing Time (h):	AS 1289.2.1 48
0.1 + ·			Plasticity Determination Method:	46 Visual/Tactil
0.1			AS1289.2.1.1 ———	
			In Situ (Field) Moisture Content (%):	23.4
0.0	· · · · · · · · · · · · · · · · · · ·			
0.0	I I	.0 11.0 12.0 13.0		

Comments



Californ	McCloy Project Management Pty Ltd PO Box 2214	Report	Accredited for compliance with ISO/IEC The results of the tests, calibrations and,	
Project No.: Project Name: Project Locatio	Dangar NSW 2309 NEW21P-0129 Proposed Subdivision - Station St, Lochinvan n:No. 51, 134 & 146 Station Street, Lochinvar	r	WORLD RECOGNISED ACCREDITATION WORLD RECOGNISED ACCREDITATION WORLD RECOGNISED ACCREDITATION WORLD RECOGNISED ACCREDITATION NATA Accredited Laboratory Number: 18686 Date of Issue: 22/02/2022	
Sample Det	ails			
Sample ID:	NEW22W-0432-S09	Date Samp	led: 10/02/2022	
	od: The results outlined below apply to the sar	-		
Specification:	No Specification	Source:	On-Site Insitu	
Location:	TP109 - (0.40 - 0.60m)	Material:	Clay	
Date Tested:	21/02/2022		-	
Load vs Pe	netration		Test Results	
1.3 + · · · ·			AS 1289.6.1.1	
		: : :	CBR at 2.5mm (%):	5.0
1.2 - · · · ·			Maximum Dry Density(t/m³):	1.50
		See Sec.	Optimum Moisture Content(%):	26.8
1.1 - · · · · :	· · · · · · · · · · · · · · · · · · ·		Dry Density before Soaking (t/m³):	1.50
			Density Ratio before Soaking (%):	99.5
1.0 - · · · ·			Moisture Content before Soaking (%):	27.2
-			Moisture Ratio before Soaking (%):	101.0
0.9			Dry Density after Soaking (t/m³):	1.47
		: : :	Density Ratio after Soaking (%):	98.0
<u>ک</u> 0.8 کی کی ک			Swell (%):	1.5
<u>5</u> 0.7			Moisture Content of Top 30mm (%):	36.1
Pisit		: : :	Moisture Content of Remaining Depth (%):	28.8
8.0 (kN)			Compaction Hammer Used:	Standard AS 1289.5.1
9 0.5			Surcharge Mass (kg):	9.00
			Period of Soaking (Days):	4
0.4			Retained on 19 mm Sieve (%):	0
0.3	/		CBR Moisture Content Method:	AS 1289.2.1
0.0			Sample Curing Time (h):	48
			Plasticity Determination Method:	Visual/Tactile
0.2 - · · ·			AS1289.2.1.1	
+ /:			11	
0.2			In Situ (Field) Moisture Content (%):	22.8
+ /:) 2.0 3.0 4.0 5.0 6.0 7.0 8.0 9.0 10.0	11.0 12.0 13.0	In Situ (Field) Moisture Content (%):	22.8

Comments



Client: Project No.: Project Name: Project Locatio	AcCloy Project Management Pty Ltd PO Box 2214 Dangar NSW 2309 NEW21P-0129 Proposed Subdivision - Station St, Lochinvar n:No. 51, 134 & 146 Station Street, Lochinvar	•	Accredited for compliance with ISO/IEC The results of the tests, calibrations and included in this document are traceable to standards. Results provided relate only to the items B. C. W.M. Approved Signatory: Brent Culler (Senior Geotechnician) NATA Accredited Laboratory Nur Date of Issue: 22/02/2022	for measurements to Australian/national tested or sampled.
Sample Det Sample ID: Sampling Meth Specification: Location: Date Tested:	ails NEW22W-0432-S10 od: The results outlined below apply to the samp No Specification TP110 - (0.40 - 0.60m) 21/02/2022	Date Sampled ple as received Source: Material:	d: 10/02/2022 On-Site Insitu Clay	
Load vs Pe	netration		Test Results	
1.3 1.2 1.2 1.1 1.1 1.0 0.9 0.9 0.9 0.8 0.8 0.8 0.7 0.8 0.7 0.7 0.7 0.7 0.7 0.7 0.7 0.7			AS 1289.6.1.1 CBR at 2.5mm (%): Maximum Dry Density(t/m ³): Optimum Moisture Content(%): Dry Density before Soaking (t/m ³): Density Ratio before Soaking (%): Moisture Content before Soaking (%): Moisture Ratio before Soaking (%): Dry Density after Soaking (t/m ³): Density Ratio after Soaking (%): Swell (%): Moisture Content of Top 30mm (%): Moisture Content of Remaining Depth (%): Compaction Hammer Used:	5 1.51 22.0 1.50 99.5 22.4 102.0 1.48 98.5 1.5 28.0 25.1 Standard AS 1289.5.1

Comments



Report No: CBR:NEW22W-0432-S11

Client:	Client: McCloy Project Management Pty Ltd PO Box 2214 Dangar NSW 2309						Accredited for compliance with ISO/IEC 17025-Testing. The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards. Results provided relate only to the items tested or sampled.			
Project N	Project No.:NEW21P-0129Project Name:Proposed Subdivision - Station St, LochinvarProject Location:No. 51, 134 & 146 Station Street, Lochinvar							Accreditation ACCREDITATION B. CULL Approved Signatory: Brent Cullen (Senior Geotechnician) NATA Accredited Laboratory Number: 18686 Date of Issue: 22/02/2022		
Sampl Sample		ils NEW22W-	-0432-S11			Date Samp	led: 10/02/20	22		
	g Metho		s outlined be	elow apply to	the samp	le as received Source:				
Location			0.40 - 0.60m)		Material:	On-Site Insitu Clay			
Date Tes	sted:	21/02/202					-			
Load v	vs Pen	etration					Test Resu			
	I		· · ·				CBR at 2.5mm	AS 1289.6.1.1	6	
1.4	4 - • • • • • •						Maximum Dry De		1.39	
4						<u>.</u> .	Optimum Moistu	• • •	30.5	
1.:	s [11 '	re Soaking (t/m³):	1.39	
1.3	2							fore Soaking (%):	100.0	
	- :							t before Soaking (%):	30.7	
1.1	1 + · · · · · · ·		: · · · · · · · · · · · · · · · · · · ·				11	efore Soaking (%):	101.0	
1.0	0		<u>i</u>				Dry Density after		1.37	
	- :						Density Ratio aft		98.0	
<u>الا</u>	9 - · · ·		Ē				Swell (%):		2.0	
o ston	8						Moisture Conten	t of Top 30mm (%):	38.3	
Pis	- :						Moisture Conten	t of Remaining Depth (%):	33.4	
Load on Piston (kN)		[· · · · · · · · · · · · · · · · · · ·				Compaction Han		Standard AS 1289.5.1.	
Ц 0.0	°- 1						Surcharge Mass		9.00	
0.5	5 + · · · <mark>/</mark> . ·			• • • • • • • • • • • • •			Period of Soakin		4	
0.4	1.1.		i i i 				Retained on 19 r		0	
0.4	" <mark> </mark>						CBR Moisture C		AS 1289.2.1.	
0.3	3 + • 🔽 • • • •		e e e free de la			· · · · · · · · · · · · · · · · · · ·	Sample Curing T		48	
0.1	.t/		t i t San tanata				Plasticity Determ	ination Method:	Visual/Tactile	
0.2	² [0.0.1.1		
0.1	1 		; ;	• • • • • • • • • • • • • • • •			11	9.2.1.1 ———	07.0	
	1							bisture Content (%):	27.0	
				+ + + + + + + + + + + + + + + + + + + +		+ + + + + + + + + + + + + + + + + + + +				
0.0	0.0 1.0	2.0 3.0 4.	.0 5.0 6.0	7.0 8.0 9	.0 10.0 1	1.0 12.0 13.0	11			

Comments



Report No: CBR:NEW22W-0432-S12

Client:	McCloy Project Management Pty Ltd PO Box 2214 Dangar NSW 2309		Accredited for compliance with ISO/IEC The results of the tests, calibrations an included in this document are traceable standards. Results provided relate only to the item	d/or measurements e to Australian/national
Project No.: Project Name: Project Locatior	NEW21P-0129 Proposed Subdivision - Station St, Lochin No. 51, 134 & 146 Station Street, Lochiny		WORLD RECOGNISED ACCREDITATION BACCREDITATION BACCREDITATION ACCREDITATION BACCREDITATION ACCREDITATION ACCREDITATION BACCREDITATION BACCREDITATION BACCREDITATION	
Sample Deta Sample ID:	NEW22W-0432-S12	Date Sample	ed: 10/02/2022	
Sampling Metho Specification: Location: Date Tested:	 Dd: The results outlined below apply to the s No Specification TP112 - (0.40 - 0.60m) 21/02/2022 	Sample as received Source: Material:	On-Site Insitu Clay	
Load vs Per	netration		Test Results	
1.6 ····· 1.4 ····· 1.2 ····· 1.2 ····· 1.0 ····· 0.6 ···· 0.4 ···· 0.2 ·····			AS 1289.6.1.1 CBR at 2.5mm (%): Maximum Dry Density(t/m ³): Optimum Moisture Content(%): Dry Density before Soaking (%): Moisture Content before Soaking (%): Moisture Content before Soaking (%): Dry Density after Soaking (t/m ³): Density Ratio after Soaking (%): Swell (%): Moisture Content of Top 30mm (%): Moisture Content of Remaining Depth (% Compaction Hammer Used: Surcharge Mass (kg): Period of Soaking (Days): Retained on 19 mm Sieve (%): CBR Moisture Content Method: Sample Curing Time (h): Plasticity Determination Method: ————————————————————————————————————	5 1.43 30.2 1.42 99.5 30.1 100.0 1.39 97.5 2.0 38.6 Standard AS 1289.5.1 9.00 4 0 AS 1289.2.1 48 Visual/Tactile
0.0	2.0 3.0 4.0 5.0 6.0 7.0 8.0 9.0 10	0.0 11.0 12.0 13.0		

Form No: 18986, Report No: CBR:NEW22W-0432-S12

Comments



Cali	iforn	ia Bearing Ratio Te	st Report	Report No: CBR:NEW22	Issue No:
Client:		McCloy Project Management Pty Ltd PO Box 2214 Dangar NSW 2309		Accredited for compliance with ISO/IEC The results of the tests, calibrations and included in this document are traceable to standards. Results provided relate only to the items	/or measurements to Australian/national
	Name:	NEW21P-0129 Proposed Subdivision - Station St, Loch No. 51, 134 & 146 Station Street, Lochi		WORLD RECOGNISED ACCREDITATION BACCREDITATION ACCREDITATION ACCREDITATION BATA Accredited Laboratory Nur Date of Issue: 22/02/2022	
Sam	ole Deta	ails			
Sample		NEW22W-0432-S13	Date Samp	led: 10/02/2022	
Sampli	ing Metho	d: The results outlined below apply to th	e sample as received		
Specifi	ication:	No Specification	Source:	On-Site Insitu	
Locatio		TP113 - (0.40 - 0.60m)	Material:	Clay	
Date Te	ested:	21/02/2022		-	
l oad	ve Don	netration		Test Results	
	0.8 T · · · · ·			AS 1289.6.1.1	
	0.0		1 1 2 2	CBR at 2.5mm (%):	3.5
			e e e e e e e e e e e e e e e e e e e	Maximum Dry Density(t/m³):	1.37
	0.7 - · · · ·		and the second	Optimum Moisture Content(%):	31.0
				Dry Density before Soaking (t/m ³):	1.37
	-			Density Ratio before Soaking (%):	99.5
	0.6 - · · · ·			Moisture Content before Soaking (%):	31.5
				Moisture Ratio before Soaking (%):	101.5
	÷	<u></u>		Dry Density after Soaking (t/m³):	1.34
Î	0.5+···			Density Ratio after Soaking (%):	97.5
(kh	:			Swell (%):	2.0
ton				Moisture Content of Top 30mm (%):	37.0
Pis Sid	0.4			Moisture Content of Remaining Depth (%):	32.0
Load on Piston (kN)	+ /			Compaction Hammer Used:	Standard AS 1289.5.1
1	0.3 - · · · 🗯	$\cdots : \left\{ \begin{array}{c} \cdot \\ \cdot $		Surcharge Mass (kg):	9.00
	1			Period of Soaking (Days):	4
	1			Retained on 19 mm Sieve (%):	0
8	0.2			CBR Moisture Content Method:	AS 1289.2.1
	↓ :			Sample Curing Time (h):	48
				Plasticity Determination Method:	Visual/Tactil
	0.1			AS1280 2.4.4	
	4			AS1289.2.1.1 ——— I In Situ (Field) Moisture Content (%):	32.2
	0.0				52.2
		 			
	0.0 1.0	2.0 3.0 4.0 5.0 6.0 7.0 8.0 9.0	10.0 11.0 12.0 13.0	11	
		2.0 3.0 4.0 5.0 6.0 7.0 8.0 9.0 Penetration (mm)	10.0 11.0 12.0 13.0		

Comments



Report No: CBR:NEW22W-0432-S14

Sample ID: NEW22W-0432-S14 Date Sampled: 10/02/2022 Sampling Method: The results outlined below apply to the sample as received On-Site Insitu Specification: No Specification Source: On-Site Insitu Location: TP114 - (0.40 - 0.60m) Material: Clay Date Tested: 21/02/2022 AS 1289.6.1.1 CBR at 2.5mm (%): 3.5 Maximum Dry Density(t/m?): 1.33 Optimum Moisture Content(%): 33.7 Dry Density before Soaking (%): 99.5 Moisture Content tofore Soaking (%): 99.5 Moisture Content before Soaking (%): 101.5 Dry Density Ratio before Soaking (%): 101.5 Moisture Content of Top 30mm (%): 39.6 Swell (%): 10.9 Moisture Content of Top 30mm (%): 34.9 Output Output Output Surcharge Mass (kg): 9.00 Period of Soaking (Days): 4 Retained on 19 mm Sieve (%): CBR Moisture Content (%): 29.2 Sample Curing Time (h): 48 Plasticity Determination Method: Visual/Ta AS 1289.2.1.1 In Situ (Field) Moisture Content (%): 29.2	Client:		PO Box	Project M 2214 NSW 23	•	nent Pt	y Ltd					Accredited for compliance with ISO/IEC The results of the tests, calibrations and, included in this document are traceable to standards. Results provided relate only to the items	or measurements o Australian/national
Sampling Method: The results outlined below apply to the sample as received Specification: No Specification Source: On-Site Insitu Location: TP114 - (0.40 - 0.60m) Material: Clay Date Tested: 21/02/2022 Clay Location: TP114 - (0.40 - 0.60m) Material: Clay Date Tested: 21/02/2022 States (Clay) States (Clay) Location: Test Results AS 1289.6.1.1 CBR at 2.5mm (%): 3.5 Maximum Dry Density(tim?): 1.33 Optimum Moisture Content(%): 33.7 Dry Density before Soaking (%): 90.5 Moisture Content before Soaking (%): 90.5 Moisture Content before Soaking (%): 90.5 Moisture Content of Top 30mm (%): 39.9 Moisture Content of Top 30mm (%): 39.9 Moisture Content of Top 30mm (%): 39.9 Moisture Content Method: AS 1289.5 Moisture Content Method: AS 1289.5 4 Retained on 19 mm Sieve (%): CBR Moisture Content Method: AS 1289.5 Moisture Content Method: AS 1289.5 4 Retained on 19 mm Sieve (%): CBR Moisture Content (Method: AS 1289.5	Projec	t Name:	Propose	d Subdiv								(Senior Geotechnician) NATA Accredited Laboratory Nur	
Sampling Method: The results outlined below apply to the sample as received Specification: No Specification Source: On-Site Insitu Location: TP114 - (0.40 - 0.60m) Material: Clay Date Tested: 21/02/2022 Clay Locad vs Penetration AS 1289.6.1.1 CBR at 2.5mm (%): 3.5 Maximum Dry Density(tim?): 1.33 Optimum Moisture Content(%): 33.7 Dry Density before Soaking (%): 99.5 Moisture Content before Soaking (%): 99.5 Moisture Content before Soaking (%): 101.5 Dry Density after Soaking (%): 39.9 Moisture Content of Top 30mm (%): 34.9 Compaction Hammer Used: Standard 0.1 Optionum Site (%): Content Method: AS 1289.2.1.1 Moisture Content of Top 30mm (%): 34.9 Compaction Hammer Used: Standard 0.1 Optionum Site (%): Compaction Hammer Used: Standard 0.1 AS 1289.2.1.1 Im Situ (Field) Moisture Content (%): 29.2				21/1-0432	2-S14				Date	Sample	ed: 10/02/20	22	
Location: TP114 - (0.40 - 0.60m) 21/02/2022 Material: Clay Load vs Penetration AS 1289.6.1.1 CBR at 2.5mm (%): 3.5 0.8 0.7 0.8 0.7 0.8 0.7 0.6 0.7 0.6 0.7 0.6 0.7 0.6 0.7 0.6 0.7 0.6 0.7 0.6 0.5 0.5 0.5 0.5	Sampl	ing Metho	od: The re	sults out	lined be	low app	oly to tł	ne sam	ple as re	ceived			
Date Tested: 21/02/2022 Load vs Penetration Test Results 0.8 AS 1289.6.1.1 0.7 Generation 0.6 Second (%): 0.7 Second (%): 0.8 Second (%): 0.9 Second (%): 0.4 Second (%): 0.5 Second (%): 0.4 Second (%): 0.5 Second (%): 0.4 Second (%): 0.5 Second (%): 0.6 Second (%): 0.7 Second (%): 0.8 Second (%): 0.9 Second (%): 0.1 Second (%):	-										-	Insitu	
AS 1289.6.1.1 CBR at 2.5mm (%): 3.5 Maximum Dry Density(Um ³): 1.33 Optimum Moisture Content(%): 33.7 Dry Density before Soaking (%): 99.5 Moisture Content before Soaking (%): 99.5 Moisture Content before Soaking (%): 101.5 Dry Density after Soaking (%): 101.5 Dry Density after Soaking (%): 98.5 Swell (%): 1.0 Moisture Content of Top 30mm (%): 39.9 Moisture Content of Top 30mm (%): 39.9 Moisture Content of Remaining Depth (%): 34.9 Compaction Hammer Used: Standard AS 1289. Surcharge Mass (kg): 9.00 Period of Soaking (Days): 4 Retained on 19 mm Sieve (%): CBR Moisture Content Method: AS 1289. Sample Curing Time (h): 48 Plasticity Determination Method: Visual/Ta AS1289.2.1.1 In Situ (Field) Moisture Content (%): 29.2				•	0.0011)				wate	i iai.	Ciay		
0.0 CBR at 2.5mm (%): 3.5 0.7 0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.5 0.5 0.5 0.6 0.1 <th>Load</th> <th>l vs Per</th> <th>netratio</th> <th>n</th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th>Test Resu</th> <th></th> <th></th>	Load	l vs Per	netratio	n							Test Resu		
0.7		0.8				· ·		••••	:		CBR at 2 5mm		35
0.7 Optimum Moisture Content(%): 33.7 0.6 Dry Density before Soaking (%): 99.5 0.6 Moisture Content before Soaking (%): 99.5 Moisture Ratio before Soaking (%): 101.5 Dry Density after Soaking (%): 98.5 Swell (%): 1.0 Moisture Content of Top 30mm (%): 39.9 Moisture Content of Top 30mm (%): 39.9 Moisture Content of Top 30mm (%): 39.9 Moisture Content of Top 30mm (%): 34.9 Compaction Hammer Used: Standard AS 1289. Surcharge Mass (kg): 9.00 Period of Soaking (Days): 4 Retained on 19 mm Sieve (%): CBR Moisture Content Method: AS 1289. Sample Curing Time (h): 48 Plasticity Determination Method: Visual/Ta — AS1289.2.1.1 — In Situ (Field) Moisture Content (%): 29.2		-	÷ :				: :	:		a (11		
0.6 Dry Density before Soaking (½m³): 1.32 0.6 Density Ratio before Soaking (%): 99.5 Moisture Content before Soaking (%): 34.2 Moisture Ratio before Soaking (½m³): 1.31 Density Ratio after Soaking (½m³): 1.0 Moisture Content of Top 30mm (%): 39.9 Moisture Content of Remaining Depth (%): 34.9 Compaction Hammer Used: Standard AS 1289 Surcharge Mass (kg): 9.00 Period of Soaking (Days): 4 Retained on 19 mm Sieve (%): CBR Moisture Content Method: AS 1289 0.1 AS1289.2.1.1		0.7 - · · · ·											
0.6 Moisture Content before Soaking (%): 34.2 Moisture Ratio before Soaking (%): 101.5 Dry Density after Soaking (%): 98.5 Swell (%): 1.0 Moisture Content of Top 30mm (%): 39.9 Moisture Content of Top 30mm (%): 39.9 Moisture Content of Top 30mm (%): 39.9 Moisture Content of Remaining Depth (%): 34.9 Compaction Hammer Used: Standard AS 1289. Surcharge Mass (kg): 9.00 Period of Soaking (Days): 4 Retained on 19 mm Sieve (%): CBR Moisture Content Method: AS 1289. Sample Curing Time (h): 48 Plasticity Determination Method: Visual/Ta							1				11 ·	. ,	1.32
Moisture Ratio before Soaking (%): 101.5 Dry Density after Soaking (t/m ³): 1.31 Density Ratio after Soaking (%): 98.5 Swell (%): 1.0 Moisture Content of Top 30mm (%): 39.9 Moisture Content of Remaining Depth (%): 34.9 Compaction Hammer Used: Standard AS 1289. Surcharge Mass (kg): 9.00 Period of Soaking (Days): 4 Retained on 19 mm Sieve (%): CBR Moisture Content Method: AS 1289. 0.1 AS 1289. 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 <		- :				1		÷			Density Ratio be	fore Soaking (%):	99.5
0.5 Dry Density after Soaking (t/m³): 1.31 0.5 Density Ratio after Soaking (%): 98.5 Swell (%): 1.0 Moisture Content of Top 30mm (%): 39.9 Moisture Content of Remaining Depth (%): 34.9 Compaction Hammer Used: Standard AS 1289. Surcharge Mass (kg): 9.00 Period of Soaking (Days): 4 Retained on 19 mm Sieve (%): CBR Moisture Content Method: AS 1289. 0.1 AS 1289.2.1.1 — AS1289.2.1.1 — AS1289.2.1.1 In Situ (Field) Moisture Content (%): 29.2		0.6 - · · · ·									Moisture Conten	t before Soaking (%):	34.2
0.5 Density Ratio after Soaking (%): 98.5 0.4 Swell (%): 1.0 Moisture Content of Top 30mm (%): 39.9 Moisture Content of Remaining Depth (%): 34.9 Compaction Hammer Used: Standard AS 1289. Surcharge Mass (kg): 9.00 Period of Soaking (Days): 4 0.2 CBR Moisture Content Method: AS 1289. 0.1 CBR Moisture Content Method: AS 1289. 0.1 AS 1289.2.1.1 — AS1289.2.1.1 — AS1289.2.1.1 In Situ (Field) Moisture Content (%): 29.2		:	::			:	: :	:	: :	:	11		101.5
Swell (%): 1.0 Moisture Content of Top 30mm (%): 39.9 Moisture Content of Remaining Depth (%): 34.9 Compaction Hammer Used: Standard AS 1289. Surcharge Mass (kg): 9.00 Period of Soaking (Days): 4 Retained on 19 mm Sieve (%): CBR Moisture Content Method: AS 1289. 0.1 AS 1289. Surcharge Mass (kg): 9.00 Period of Soaking (Days): 4 Retained on 19 mm Sieve (%): CBR Moisture Content Method: AS 1289. Sample Curing Time (h): 48 Plasticity Determination Method: Visual/Ta		:	: :				: :	÷					
0.3 Definiting mass (ng). Definiting mass (ng). Definiting mass (ng). Period of Soaking (Days): 4 Retained on 19 mm Sieve (%): CBR Moisture Content Method: AS 1289. 0.1 Sample Curing Time (h): 48 Plasticity Determination Method: Visual/Ta In Situ (Field) Moisture Content (%): 29.2	(N)	0.5	· · · · · · · · · · · · · · · · · · ·			•••••••••••••••••••••••••••••••••••••••	÷÷			· · · ;		er Soaking (%):	
0.3 0.2 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1	u (F		;-, 🖌 🕄				i i	÷		1			
0.3 0.2 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1	isto		1				: :	:	÷ ÷		11		
0.3 Definiting mass (ng). Definiting mass (ng). Definiting mass (ng). Period of Soaking (Days): 4 Retained on 19 mm Sieve (%): CBR Moisture Content Method: AS 1289. 0.1 Sample Curing Time (h): 48 Plasticity Determination Method: Visual/Ta In Situ (Field) Moisture Content (%): 29.2	ad on P	0.4 + · · · · ·					· · · · · · · · · · · · · · · · · · ·				11		Standard AS 1289.5.1
0.2 Retained on 19 mm Sieve (%): 0.1 CBR Moisture Content Method: AS 1289. 0.1 Sample Curing Time (h): 48 Plasticity Determination Method: Visual/Ta AS1289.2.1.1 In Situ (Field) Moisture Content (%): 29.2	۲	0.3 - · · ·					i				Surcharge Mass	(kg):	9.00
0.2 0.2 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1		1			-		: :	:	: :	-	Period of Soakin	g (Days):	4
0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1		1					: :	÷			11		
0.1 Plasticity Determination Method: Visual/Ta ————————————————————————————————————		0.2				- je	\cdots	••••			11		AS 1289.2.1.
0.1 - AS1289.2.1.1		- I -				:		:		:			
AS1289.2.1.1 — In Situ (Field) Moisture Content (%): 29.2						÷	: :	÷			Plasticity Determ	ination Method:	Visual/Tactile
In Situ (Field) Moisture Content (%): 29.2		0.1+		:			: :	· · · · · · · · · · · · · · · · · · ·			Δ <u>S128</u>	9211	
						2	: :	:	: :	:	11		29.2
		0.0								+1			
0.0 1.0 2.0 3.0 4.0 5.0 6.0 7.0 8.0 9.0 10.0 11.0 12.0 13.0					0 6 0	70 0	0 90	10.0	11 0 12 0	13.0			

Comments



Report No: CBR:NEW22W-0432-S15

Client:	McCloy Project Management Pty Ltd PO Box 2214 Dangar NSW 2309		Accredited for compliance with ISO/IEC. The results of the tests, calibrations and/ included in this document are traceable t standards. Results provided relate only to the items	or measurements to Australian/national
Project No.: Project Name: Project Locatio	NEW21P-0129 Proposed Subdivision - Station St, Lochinvar n:No. 51, 134 & 146 Station Street, Lochinvar		WORLD RECOGNISED ACCREDITATION	
Sample Det Sample ID:	ails NEW22W-0432-S15	Date Sampled:	10/02/2022	
Sampling Meth Specification: Location: Date Tested:	od: The results outlined below apply to the sample No Specification TP115 - (0.40 - 0.60m) 21/02/2022	le as received Source: Material:	On-Site Insitu Clay	
Load vs Pe	netration	Т	est Results AS 1289.6.1.1	
1.0 0.9 0.9 0.9		M. Ol Di Di Di Di M. Mi Di Si Si Si Si	BR at 2.5mm (%): laximum Dry Density(t/m ³): uptimum Moisture Content(%): ry Density before Soaking (t/m ³): lensity Ratio before Soaking (%): loisture Content before Soaking (%): loisture Ratio before Soaking (%): ry Density after Soaking (t/m ³): lensity Ratio after Soaking (%): well (%): loisture Content of Top 30mm (%): loisture Content of Remaining Depth (%): compaction Hammer Used: urcharge Mass (kg): eriod of Soaking (Days):	5.0 1.32 34.0 1.33 100.5 33.6 99.0 1.30 98.0 2.0 41.8 35.3 Standard AS 1289.5.1 9.00 4

Comments



Report No: CBR:NEW22W-0432-S16

Client:	McCloy Project Management Pty Ltd PO Box 2214 Dangar NSW 2309		Accredited for compliance with ISO/IEC The results of the tests, calibrations and included in this document are traceable standards. Results provided relate only to the items	l/or measurements to Australian/national
Project No.: Project Name Project Loca	NEW21P-0129 e: Proposed Subdivision - Station St, Lochiny tion:No. 51, 134 & 146 Station Street, Lochinya		ACCREDITATION WORLD RECOGNISED ACCREDITATION ACC	
Sample D Sample ID: Sampling Me	etails NEW22W-0432-S16 ethod: The results outlined below apply to the s	Date Sample sample as received	ed: 10/02/2022	
Specification Location: Date Tested	TP116 - (0.40 - 0.60m)	Source: Material:	On-Site Insitu Clay	
Load vs F	Penetration		Test Results AS 1289.6.1.1	
2.0 - · · · 1.8 - · · · 1.6 - · · · 1.4 - · · Ny utition (KN) 1.2 - · · I.0 - · · O.8 - · · 0.6 - · · 0.4 - · ·			CBR at 2.5mm (%): Maximum Dry Density(t/m³): Optimum Moisture Content(%): Dry Density before Soaking (t/m³): Density Ratio before Soaking (%): Moisture Content before Soaking (%): Moisture Ratio before Soaking (%): Dry Density after Soaking (t/m³): Density Ratio after Soaking (%): Swell (%): Moisture Content of Top 30mm (%): Moisture Content of Remaining Depth (%) Compaction Hammer Used: Surcharge Mass (kg): Period of Soaking (Days): Retained on 19 mm Sieve (%): CBR Moisture Content Method: Sample Curing Time (h): Plasticity Determination Method: 	Standard AS 1289.5.1. 9.00 4 0 AS 1289.2.1. 48 Visual/Tactile
0.2	/		In Situ (Field) Moisture Content (%):	20.3

Comments



Report No: CBR:NEW22W-0432-S17

-	Name:			Standards. Results provided relate only to the items	tested or sampled.
Comp	Locatio	NEW21P-0129 Proposed Subdivision - Station St, Lochinv n:No. 51, 134 & 146 Station Street, Lochinva		WORLD RECOGNISED ACCREDITATION BACCR	
Sample		NEW22W-0432-S17 od: The results outlined below apply to the s	Date Sampl	ed: 10/02/2022	
Specifi		No Specification	Source:	On-Site Insitu	
Locatio		TP117 - (0.40 - 0.60m) 21/02/2022	Material:	Clay	
		netration		Test Results	
	1.0 ₁ ····			AS 1289.6.1.1	
				CBR at 5.0mm (%):	2.5
(0.9 - · · · .			Maximum Dry Density(t/m³):	1.67
	- :			Optimum Moisture Content(%):	19.8
				Dry Density before Soaking (t/m ³):	1.65 99.0
l l	J.8 - · · · ·			Density Ratio before Soaking (%): Moisture Content before Soaking (%):	99.0 19.6
				Moisture Ratio before Soaking (%):	19.6 99.0
(0.7 - · · · ·			Dry Density after Soaking (t/m ³):	1.60
(+ :	in de la classia 🖌 de la cl		Density Ratio after Soaking (%):	95.5
(k)	0.6 - · · · -			Swell (%):	3.5
uo				Moisture Content of Top 30mm (%):	31.0
Pist	0.5	eeseeseesees <mark>s</mark> aadaa daadaa daadaa a		Moisture Content of Remaining Depth (%):	21.4
ad on	0.4			Compaction Hammer Used:	Standard AS 1289.5.1
Ľ				Surcharge Mass (kg):	9.00
				Period of Soaking (Days):	4
(0.3 - · · · ·			Retained on 19 mm Sieve (%):	0
	+ :			CBR Moisture Content Method:	AS 1289.2.1.
(0.2 - · · · ·			Sample Curing Time (h):	48 Visual/Tactile
	+ 📕			Plasticity Determination Method:	Visual/Tactile
(0.1			AS1289.2.1.1 —	
	-17:			In Situ (Field) Moisture Content (%):	19.2
	2.0				
	0.0 1.	0 2.0 3.0 4.0 5.0 6.0 7.0 8.0 9.0 10	0.0 11.0 12.0 13.0		

Comments



Client: Project No.: Project Name: Project Locatio	McCloy Project Management Pty Ltd PO Box 2214 Dangar NSW 2309 NEW21P-0129 Proposed Subdivision - Station St, Lochinvar n:No. 51, 134 & 146 Station Street, Lochinvar	Accredited for compliance with ISO/IEC 17025-Testing. The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards. Results provided relate only to the items tested or sampled. B. ULL Approved Signatory: Brent Cullen (Senior Geotechnician) NATA Accredited Laboratory Number: 18686 Date of Issue: 22/02/2022
Sample Det Sample ID: Sampling Meth Specification: Location: Date Tested:	ails Date Samp NEW22W-0432-S18 Date Samp od: The results outlined below apply to the sample as received No Specification No Specification Source: TP118 - (0.40 - 0.60m) Material: 21/02/2022 Material	
Load vs Pe	netration	Test Results
1.1 - · · · · · · · · · · · · · · · · · ·		AS 1289.6.1.1 CBR at 2.5mm (%): 3.5 Maximum Dry Density(t/m³): 1.53 Optimum Moisture Content(%): 26.1 Dry Density before Soaking (t/m³): 1.52 Density Ratio before Soaking (%): 100.0 Moisture Content before Soaking (%): 26.2 Moisture Ratio before Soaking (%): 100.5 Dry Density after Soaking (%): 98.5 Swell (%): 1.5 Moisture Content of Top 30mm (%): 39.0 Moisture Content of Remaining Depth (%): 27.3 Compaction Hammer Used: AS 1289.5.1 Surcharge Mass (kg): 9.00 Period of Soaking (Days): 4 Retained on 19 mm Sieve (%): 0 CBR Moisture Content Method: AS 1289.2.1 Sample Curing Time (h): 48

Comments



Report No: CBR:NEW22W-0432-S19

Client:	McCloy Project Management Pty Ltd PO Box 2214 Dangar NSW 2309	Accredited for compliance with ISC The results of the tests, calibration included in this document are trace standards. Results provided relate only to the	s and/or measurements able to Australian/national
Project No.: Project Name: Project Locatio	NEW21P-0129 Proposed Subdivision - Station St, Lochinvar n:No. 51, 134 & 146 Station Street, Lochinvar	WORLD RECOGNISED ACCREDITATION BACCREDITATION BACCREDITATION ACCREDITATION BACCREDITATION ACCREDITATION ACCREDITATION ACCREDITATION ACCREDITATION ACCREDITATION ACCREDITATION ACCREDITATION ACCREDITATION ACCREDITATION	
Sample Det Sample ID: Sampling Meth	ails NEW22W-0432-S19 od: The results outlined below apply to the sam	Date Sampled: 10/02/2022 ple as received	
Specification: Location: Date Tested:	No Specification TP119 - (0.40 - 0.60m) 21/02/2022	Source:On-Site InsituMaterial:Clay	
Load vs Pe	netration	Test Results	
0.8 0.7 0.7 0.6 0.6 0.5 0.5 0.4 0.4 0.4 0.3 0.3 0.2 0.2		CBR at 2.5mm (%):Maximum Dry Density(t/m³):Optimum Moisture Content(%):Dry Density before Soaking (t/m³):Density Ratio before Soaking (%):Moisture Content before Soaking (%):Moisture Ratio before Soaking (%):Dry Density after Soaking (t/m³):Density Ratio after Soaking (%):Swell (%):Moisture Content of Top 30mm (%):Moisture Content of Remaining Depth (Compaction Hammer Used:Surcharge Mass (kg):Period of Soaking (Days):Retained on 19 mm Sieve (%):CBR Moisture Content Method:Sample Curing Time (h):Plasticity Determination Method:	3.0 1.45 27.2 1.44 99.5 27.4 100.5 1.41 97.5 2.0 39.9 %): 30.2 Standard AS 1289.5.1 9.00 4 0 AS 1289.2.1 48 Visual/Tactile

Form No: 18986, Report No: CBR:NEW22W-0432-S19

Comments



		Repo	ort No: MAT:NEW22W-0433-S0 Issue No:
PO Dan Project No.: NEV Project Name: Proj	A Specification NEW22W-0433-S01 10/02/2022 15/02/2022 On-Site Insitu Clay No Specification The results outlined below apply to the sample as received TP101 - (0.40 - 0.60m)	WORLD RECOGNISED	Accredited for compliance with ISO/IEC 17025-Testing. The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards. Results provided relate only to the items tested or sampled.
Dther Test Resu Description Sample History Preparation Linear Shrinkage (%) Mould Length (mm) Crumbling Curling Cracking Liquid Limit (%) Method Plastic Limit (%) Plastic Limit (%) Date Tested Emerson Class Numb	Method Result Limits AS 1289.1.1 Oven-dried AS 1289.1.1 Dry Sieved AS 1289.1.1 Dry Sieved AS 1289.3.4.1 19.5 AS 1289.3.4.1 19.5 250 No Yes No AS 1289.3.1.1 82 Four Point AS 1289.3.2.1 30 AS 1289.3.2.1 30 AS 1289.3.3.1 52 25/02/2022 25/02/2022	4.75mm 2.36mm 1.18mm 600μm 425μm 300μm 150μm 75μm	100 100 99 98 97 93 85 79
Soil Description Type of Water Date Tested	Clay Distilled 25/02/2022	Chart	
Comments		% Passing	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1



Material Te	st Report	Rep	ort No: MAT:NEW22W-0433-S02 Issue No: 1
Client: McClo PO Bo Danga Project No.: NEW2 Project Name: Propo	oy Project Management Pty Ltd ox 2214 ar NSW 2309 21P-0129 osed Subdivision - Station St, Lochinvar 1, 134 & 146 Station Street, Lochinvar	WORLD RECOONISED	Accredited for compliance with ISO/IEC 17025-Testing. The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards. Results provided relate only to the items tested or sampled.
Sample Details Sample ID: Date Sampled: Date Received: Source: Material: Specification: Sample Location:	NEW22W-0433-S02 10/02/2022 15/02/2022 On-Site Insitu Clayey Gravelly Sand No Specification The results outlined below apply to the sample as received TP101 - (1.00 - 1.20m)	Method: Drying by: Date Tested: Note: Sieve Size 37.5mm 26.5mm 19.0mm 13.2mm 9.5mm	Sample Washed % Passing Limits 100 96 93 87 82
Other Test Resul Description Sample History Preparation Linear Shrinkage (%) Mould Length (mm) Crumbling Curling Cracking Liquid Limit (%) Method Plastic Limit (%) Plasticity Index (%) Date Tested Emerson Class Number Soil Description Type of Water Date Tested	Method Result Limits AS 1289.1.1 Oven-dried AS 1289.1.1 Dry Sieved AS 1289.1.1 Dry Sieved AS 1289.3.4.1 9.0 AS 1289.3.4.1 9.0 250 No No Yes No Yes AS 1289.3.1.1 42 Four Point AS 1289.3.2.1 21 AS 1289.3.3.1 21 22/02/2022 22/02/2022 20/2	6.7mm 4.75mm 2.36mm 1.18mm 600µm 425µm 300µm 150µm 75µm	75 68 53 45 40 37 33 26 20
		% Passing	Binne Sinter Sin



Material T	est Report	Report No: MAT:NEW22W-0433- Issue	
Client: Mo PC Da Project No.: NE Project Name: Pro Project Location: No	Cloy Project Management Pty Ltd D Box 2214 Ingar NSW 2309 W21P-0129 Oposed Subdivision - Station St, Lochinvar D. 51, 134 & 146 Station Street, Lochinvar	Accredited for compliance with ISO/IEC 17025-Testing. The results of the tests, calibrations and/or measuremen included in this document are traceable to Australian/nat standards. Results provided relate only to the items tested or sampl WORLD RECOONISED ACCREDITATION Approved Signatory: Brent Cullen (Senior Geotechnician) NATA Accredited Laboratory Number: 18686 Date of Issue: 25/02/2022	tional
Sample Details Sample ID: Date Sampled: Date Received: Source: Material: Specification: Sample Location:	NEW22W-0433-S03 10/02/2022 15/02/2022 On-Site Insitu Clay No Specification The results outlined below apply to the sample as received TP120 - (0.50 - 0.60m)	Particle Size DistributionMethod:AS 1289.3.6.1Drying by:OvenDate Tested:22/02/2022Note:Sample WashedSieve Size% PassingLimits13.2mm1009.5mm1006.7mm994.75mm992.36mm98	
Other Test Res Description Sample History Preparation Linear Shrinkage (% Mould Length (mm) Crumbling Curling Cracking Liquid Limit (%) Method Plastic Limit (%) Plasticity Index (%) Date Tested Emerson Class Num Soil Description Type of Water	Method Result Limits AS 1289.1.1 Oven-dried AS 1289.1.1 Dry Sieved AS 1289.3.4.1 17.5 250 No Yes No Yes No AS 1289.3.1.1 71 Four Point AS 1289.3.2.1 20 AS 1289.3.3.1 51 24/02/2022 20	1.18mm 97 600μm 94 425μm 92 300μm 90 150μm 87 75μm 83	
Date Tested	25/02/2022	Chart	132mm



		Repo	ort No: MAT:NEW22W-0433-S04 Issue No: 1
Material 1	lest Report		
P D Project No.: N Project Name: P	IcCloy Project Management Pty Ltd O Box 2214 angar NSW 2309 EW21P-0129 roposed Subdivision - Station St, Lochinvar	WORLD RECOGNISED	Accredited for compliance with ISO/IEC 17025-Testing. The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards. Results provided relate only to the items tested or sampled. United Section 2015 Constraints of the terms tested or sampled. Approved Signatory: Brent Cullen (Senior Geotechnician) NATA Accredited Laboratory Number: 18686
Project Location: N	o. 51, 134 & 146 Station Street, Lochinvar		Date of Issue: 25/02/2022
Sample Detail	S		ize Distribution
Sample ID: Date Sampled: Date Received: Source: Material: Specification: Sample Location:	NEW22W-0433-S04 10/02/2022 15/02/2022 On-Site Insitu Clay No Specification The results outlined below apply to the sample as received TP120 - (1.00 - 1.30m)	Method: Drying by: Date Tested: Note: Sieve Size 26.5mm 19.0mm 13.2mm	AS 1289.3.6.1 Oven 22/02/2022 Sample Washed % Passing Limits 100 99 97
		9.5mm 6.7mm 4.75mm	97 96 96
Other Test Re	sults	2.36mm	90
Description Sample History Preparation Linear Shrinkage (% Mould Length (mm) Crumbling Curling Cracking Liquid Limit (%) Method Plastic Limit (%) Plasticity Index (%) Date Tested Emerson Class Nut Soil Description Type of Water Date Tested) 250 No Yes No AS 1289.3.1.1 83 Four Point AS 1289.3.2.1 22 AS 1289.3.3.1 61 24/02/2022	_ 1.18mm 600μm 425μm 300μm 150μm 75μm	94 93 92 91 88 85
		% Passing	300mm 30
Comments N/A			



Matorial T	est Report	Rep	ort No: MAT:NEW22W-0433-S0 Issue No:
Client: Mc PO Da Project No.: NE Project Name: Pro	Cloy Project Management Pty Ltd Box 2214 ngar NSW 2309 W21P-0129 posed Subdivision - Station St, Lochinvar . 51, 134 & 146 Station Street, Lochinvar	WORLD RECOGNISED	
Sample Details Sample ID: Date Sampled: Date Received: Source: Material: Specification: Sample Location:	NEW22W-0433-S05 10/02/2022 15/02/2022 On-Site Insitu Silty Clay No Specification The results outlined below apply to the sample as received TP120 - (1.70 - 2.00m)	Particle S Method: Drying by: Date Tested: Note: Sieve Size 26.5mm 19.0mm 13.2mm 9.5mm 6.7mm	Size Distribution AS 1289.3.6.1 Oven 22/02/2022 Sample Washed % Passing Limits 100 99 98 96
Dther Test Res Description Sample History Preparation Linear Shrinkage (%) Mould Length (mm) Crumbling Curling Cracking Liquid Limit (%) Method Plastic Limit (%) Plasticity Index (%) Date Tested Emerson Class Num Soil Description Type of Water	Method Result Limits AS 1289.1.1 Oven-dried AS 1289.1.1 Dry Sieved AS 1289.1.1 Dry Sieved AS 1289.3.4.1 18.5 250 No No No No No AS 1289.3.1.1 67 Four Point AS 1289.3.2.1 23 AS 1289.3.2.1 23 AS 1289.3.3.1 44 25/02/2022 Deer AS 1289.3.8.1 4 Silty Clay Distilled	600μm 425μm 300μm 150μm 75μm	96 93 91 83 78 76 73 69
Date Tested	25/02/2022	Chart	the second secon



Material T	est Renort	Repo	ort No: MAT:NEW22W-0433-S06 Issue No: *	
Instant Properties McCloy Project Management Pty Ltd PO Box 2214 Dangar NSW 2309 Oject No.: NEW21P-0129 Oject Name: Proposed Subdivision - Station St, Lochinvar Oject Location: No. 51, 134 & 146 Station Street, Lochinvar Ample Details		Accredited for compliance with ISO/IEC 17025-Testing. The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards. Results provided relate only to the items tested or sampled. Approved Signatory: Brent Cullen (Senior Geotechnician) NATA Accredited Laboratory Number: 18686 Date of Issue: 25/02/2022		
Sample ID: Date Sampled: Date Received: Source: Material: Specification: Sample Location:	NEW22W-0433-S06 10/02/2022 15/02/2022 On-Site Insitu Clay No Specification The results outlined below apply to the sample as received TP121 - (0.50 - 0.70m)	Method: Drying by: Date Tested: Note: Sieve Size 9.5mm 6.7mm 4.75mm 2.36mm 1.18mm	AS 1289.3.6.1 Oven 22/02/2022 Sample Washed % Passing Limits 100 100 100 100 99	
Other Test Res Description Sample History Preparation Linear Shrinkage (%) Mould Length (mm) Crumbling Curling Cracking Liquid Limit (%) Method Plastic Limit (%) Plastic Limit (%) Plasticity Index (%) Date Tested Emerson Class Numl Soil Description Type of Water Date Tested	Method Result Limits AS 1289.1.1 Oven-dried AS 1289.1.1 Dry Sieved AS 1289.3.4.1 18.5 250 No Yes No Yes No AS 1289.3.1.1 60 Four Point AS 1289.3.2.1 18 AS 1289.3.2.1 18 AS 1289.3.3.1 42 23/02/2022	600μm 425μm 300μm 150μm 75μm	96 94 91 87 81	
		% Passing 100 00 00 00 00 00 00 00 00 00 00 00 00		



QUALTEST Laboratory (NSW) Pty Ltd (20708) 2 Murray Dwyer Circuit, Mayfield West, NSW 2304

- 02 4968 4468 т٠
- 02 4960 9775 F:
- E: admin@qualtest.com.au W: www.qualtest.com.au ABN: 98 153 268 896

Report No: MAT:NEW22W-0433-S07 Issue No: 1 **Material Test Report** Client: Accredited for compliance with ISO/IEC 17025-Testing. McCloy Project Management Pty Ltd The results of the tests calibrations and/or measurements PO Box 2214 included in this document are traceable to Australian/national Dangar NSW 2309 standards. ΝΑΤΑ Results provided relate only to the items tested or sampled. Call. Project No.: NEW21P-0129 Approved Signatory: Brent Cullen Proiect Name: Proposed Subdivision - Station St, Lochinvar ALD RECO (Senior Geotechnician) ACCREDITATION NATA Accredited Laboratory Number: 18686 Project Location: No. 51, 134 & 146 Station Street, Lochinvar Date of Issue: 1/03/2022 Sample Details **Particle Size Distribution** Method: AS 1289.3.6.1 Sample ID: NEW22W-0433-S07 Drying by: Oven **Date Sampled:** 10/02/2022 Date Tested: 22/02/2022 **Date Received:** 15/02/2022 Source: **On-Site Insitu** Sample Washed Note: Material: Clay Specification: No Specification The results outlined below apply to the sample as received Sieve Size % Passing Limits Sample Location: TP121 - (1.00 - 1.20m) 19.0mm 100 13.2mm 100 9.5mm 100 6.7mm 99 4.75mm 98 2.36mm 96 Other Test Results 1.18mm 95 Description Result Limits Method 600um 92 Sample History AS 1289.1.1 Oven-dried 425µm 91 Preparation AS 1289.1.1 Dry Sieved 300µm 89 Linear Shrinkage (%) AS 1289.3.4.1 150µm 85 17.5 Mould Length (mm) 250 75µm 79 Crumbling No Curling Yes Cracking No Liquid Limit (%) AS 1289.3.1.1 55 Method Four Point Plastic Limit (%) AS 1289.3.2.1 21 Plasticity Index (%) AS 1289.3.3.1 34 Date Tested 28/02/2022 Emerson Class Number AS 1289.3.8.1 2 Soil Description Clay Type of Water Distilled Date Tested 25/02/2022 Chart 40 Comments N/A



			Repo	ort No: MAT:NEW	22W-0433-S08 Issue No: 1
PO Box Dangar Project No.: NEW21 Project Name: Propose	Project Management Pty Ltd 2214 NSW 2309		WORLD RECOGNIBED ACCREDITATION	Accredited for compliance with ISO. The results of the tests, calibrations included in this document are trace- standards. Results provided relate only to the i B	and/or measurements able to Australian/national tems tested or sampled. ullen
Sample Details Sample ID: Date Sampled: Date Received: Source: Material: Specification: Sample Location:	NEW22W-0433-S08 10/02/2022 15/02/2022 On-Site Insitu Gravelly Sandy Clay No Specification The results outlined below apply to the sample as TP121 - (1.50 - 1.70m)	received	Method: Drying by: Date Tested: Note: Sieve Size 19.0mm 13.2mm 9.5mm 6.7mm 4.75mm	Sample Washed % Passing 100 99 98 96 93	Limits
Other Test Results Description Sample History Preparation Linear Shrinkage (%) Mould Length (mm) Crumbling Curling Cracking Liquid Limit (%) Method Plastic Limit (%) Plasticity Index (%) Date Tested Emerson Class Number Soil Description Type of Water Date Tested	Method Result AS 1289.1.1 Oven-dried AS 1289.1.1 Dry Sieved AS 1289.3.4.1 10.0 250 No No Yes AS 1289.3.1.1 47 Four Point AS 1289.3.2.1 AS 1289.3.3.1 23 23/02/2022 AS 1289.3.8.1 AS 1289.3.8.1 2 Gravelly Sandy Clay Distilled 25/02/2022 2	Limits	2.36mm 1.18mm 600µm 425µm 300µm 150µm 75µm	83 76 72 69 66 59 50	
Date Tested	23/02/2022		Chart % Passing 00 00 00 00 00 00 00 00 00 00 00 00 00	under state of the	4.75mm 6.7mm 8.6mm 13.3mm 18.0mm
Comments _{N/A}					



WORLD RECOGNISED ACCREDITATION Particle S Particle S Pa	NATA Accredited Laboratory Number: 18686 Date of Issue: 1/03/2022 ize Distribution AS 1289.3.6.1 Oven 23/02/2022 Sample Washed % Passing Limits 100
Nethod: Drying by: Date Tested: Note	AS 1289.3.6.1 Oven 23/02/2022 Sample Washed % Passing Limits 100
.36mm .18mm 00µm 25µm	100 100 99 97 95
00μm 50μm 5μm	93 89 85
% Passing	l l l l l l l l l l l l l l l l l l l



QUALTEST Laboratory (NSW) Pty Ltd (20708) 2 Murray Dwyer Circuit, Mayfield West, NSW 2304

- 02 4968 4468 т٠
- 02 4960 9775 F:
- E: admin@qualtest.com.au W: www.qualtest.com.au ABN: 98 153 268 896

Report No: MAT:NEW22W-0433-S10 Issue No: 1 **Material Test Report** Client: Accredited for compliance with ISO/IEC 17025-Testing. McCloy Project Management Pty Ltd The results of the tests calibrations and/or measurements PO Box 2214 included in this document are traceable to Australian/national Dangar NSW 2309 standards. ΝΑΤΑ Results provided relate only to the items tested or sampled. Cull Project No.: NEW21P-0129 Approved Signatory: Brent Cullen Proiect Name: Proposed Subdivision - Station St, Lochinvar ALD RECO (Senior Geotechnician) ACCREDITATION NATA Accredited Laboratory Number: 18686 Project Location: No. 51, 134 & 146 Station Street, Lochinvar Date of Issue: 1/03/2022 Sample Details **Particle Size Distribution** Method: AS 1289.3.6.1 Sample ID: NEW22W-0433-S10 Drying by: Oven **Date Sampled:** 10/02/2022 Date Tested: 23/02/2022 **Date Received:** 15/02/2022 Source: **On-Site Insitu** Sample Washed Note: Material: Clay Specification: No Specification The results outlined below apply to the sample as received Sieve Size % Passing Limits Sample Location: TP122 - (1.00 - 1.20m) 9.5mm 100 6.7mm 100 4.75mm 100 2.36mm 99 1.18mm 98 600µm 97 Other Test Results 425µm 96 Description Result Limits 300µm Method 95 Sample History AS 1289.1.1 Oven-dried 150µm 94 Preparation AS 1289.1.1 Dry Sieved 75µm 89 Linear Shrinkage (%) AS 1289.3.4.1 22.0 Mould Length (mm) 250 Crumbling No Curling Yes Cracking No Liquid Limit (%) AS 1289.3.1.1 83 Method Four Point Plastic Limit (%) AS 1289.3.2.1 22 Plasticity Index (%) AS 1289.3.3.1 61 Date Tested 25/02/2022 Emerson Class Number AS 1289.3.8.1 4 Soil Description Clay Type of Water Distilled Date Tested 25/02/2022 Chart Comments N/A



PO Bo Danga Project No.: NEW2 Project Name: Propos	by Project Management Pty Ltd bx 2214 ar NSW 2309 21P-0129 used Subdivision - Station St, Lochinvar 1, 134 & 146 Station Street, Lochinvar	NATA	Accredited for compliance with ISO/IEC 17025-Testing. The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards. Results provided relate only to the items tested or sampled.	
•	1, 134 & 146 Station Street, Lochinvar	WORLD RECOGNISED ACCREDITATION	Approved Signatory: Brent Cullen (Senior Geotechnician)	
Sample Details	<u>.</u>	ACCREDITATION	NATA Accredited Laboratory Number: 18686 Date of Issue: 25/02/2022	
Sample ID: Date Sampled: Date Received: Source: Material:	NEW22W-0433-S11 10/02/2022 15/02/2022 On-Site Insitu Gravelly Sandy Clay	Particle Si Method: Drying by: Date Tested: Note:	ize Distribution AS 1289.3.6.1 Oven 23/02/2022 Sample Washed	
Specification: Sample Location: Other Test Result	No Specification The results outlined below apply to the sample as received TP122 - (1.20 - 1.30m)	Sieve Size 9.5mm 6.7mm 4.75mm 2.36mm 1.18mm 600µm	% Passing Limits 100 100 100 100 94 79	
Description Sample History Preparation Linear Shrinkage (%) Mould Length (mm) Crumbling Curling Cracking Liquid Limit (%) Method Plastic Limit (%) Plasticity Index (%) Date Tested Emerson Class Number Soil Description Type of Water Date Tested	Method Result Limits AS 1289.1.1 Oven-dried AS 1289.1.1 Dry Sieved AS 1289.1.1 Dry Sieved AS 1289.3.4.1 5.0 AS 1289.3.4.1 5.0 250 No No No AS 1289.3.1.1 36 500 Four Point AS 1289.3.2.1 26 AS 1289.3.2.1 26 26 AS 1289.3.3.1 10 24/02/2022	425μm 300μm 150μm 75μm	70 59 44 33	
		% Passing		