

# Lakeview Estate Stage 4, Moama

## Earthworks Supervision Report for Midland Contractors

Report 17C 0221  
March, 2017

# Lakeview Estate Stage 4 Moama

## Earthworks Supervision Report for Midland Contractors

### Revision

Revision	Date	Authorised
17C 0221	27/3/17	SEH

### Distribution (this revision only)

Recipient	Format	Date
GTSS	On file	27/3/17
Midland Contractors Contact: Shane Houlahan  Cc: Terraco Attn: Neil Bowe	Email PDF <a href="mailto:admin@midlandcontractors.com.au">admin@midlandcontractors.com.au</a>  <a href="mailto:nbowe@terraco.com.au">nbowe@terraco.com.au</a>	27/3/17

# **TABLE OF CONTENTS**

1	INTRODUCTION .....	4
2	SCOPE OF WORKS.....	4
2.1	AREA OF WORK.....	4
2.2	PLACEMENT SPECIFICATION .....	4
3	INSPECTION AND TESTING.....	5
4	SUMMARY OF TEST RESULTS.....	5
5	STATEMENT OF COMPLIANCE .....	6

## **APPENDIX**

Site Plan  
Test Reports

## **1 INTRODUCTION**

Midland Contractors commissioned Geotechnical Testing Services (GTS) to undertake Level 1 Supervision and testing (AS3798-2007) for the earthworks at Lakeview Estate Stage 4, Moama.

Level 1 Testing was generally performed in line with AS3798-2007 "Guidelines on Earthworks for Commercial and Residential Development" and provides inspection of the construction of controlled fill and compaction testing in accordance with AS1289 "Methods of Testing Soils for Engineering Purposes". The Level 1 testing was undertaken by Geotechnicians with supervision provided by a Geotechnical Engineer from GTS.

## **2 SCOPE OF WORKS**

### **2.1 AREA OF WORK**

Geotechnical Testing Services provided Level 1 inspection and testing of the engineered fill placed to raise the surface of Lots 97 to 107, 609 (future stage) and backfill the drain in Lots 94 and 95.

The depth of fill across the site varied from none to around 1.4 metres with the approximate location shown on the attached site plan. It is noted that the sites with 300mm or less of fill were not included in the inspection and testing.

### **2.2 PLACEMENT SPECIFICATION**

Whilst there was no earthworks specification compiled for this project, the placement of the fill and associated works generally followed the recommendations outlined in AS3798-2007 "Guidelines for Earthworks for Commercial and Residential Developments" and the construction specification.

In summary, the earthworks comply with the following:

- The layers for residential lots are to be compacted to at least 95% of the density ratio in accordance with AS1289 5.1.1 (or 5.7.1), based on Standard compaction.

In accordance with Table 8.1 of AS3798-2007, the site would be considered large scale (greater than 1500m<sup>2</sup>). Therefore a minimum of 1 test per 2500m<sup>2</sup> per layer or 3 tests per visit are required. The testing conducted typically meets the minimum requirement. In the initial stages/layers, the area would be considered small scale and 1 test per 1000m<sup>2</sup> per layer was conducted. Due to the size of the project, 1 test per residential lot per layer is not required.

### 3 INSPECTION AND TESTING

Inspection of the excavated base was conducted by a Geotechnician and it was observed that the unsuitable material (vegetation, top soil/silt) had been removed with the base consisting of a Silty Clay material of good strength.

Level 1 inspection and testing was undertaken by a geotechnician from GTS who nominated the timing and location of the in-situ density tests. The approximate location of each test is recorded on the test reports and attached fill plan.

Laboratory compaction testing was undertaken on a one to one basis at our Bendigo laboratory. A summary of the results of the compaction control testing is presented in a table below with the full NATA endorsed test reports included in the Appendix.

### 4 SUMMARY OF TEST RESULTS

A summary of the test results is included in the following table with full NATA accredited reports included in the Appendix.

Project No.	Report No.	Test Date.	Location.	Reduced Level (mm)	Moisture Variation %O.M.C	Hilf Density Ratio %
1	16E 3069A	19/10/16	Lot 103	1100	1.0 dry	96.5
2	16E 3094A	21/10/16	Lot 103	800	2.5 dry	100.5
3	16E 3094B	21/10/16	Lot 107	800	3.0 dry	98.0
4	16E 3100A	24/10/16	Lot 98	150	0.5 dry	99.0
5	16E 3100B	24/10/16	Lot 97	150	0.5 dry	96.0
6	16E 3117A	26/10/16	Lot 609	750	0.0	99.5
7	16E 3117B	26/10/16	Lot 100	950	0.5 dry	100.5
8	16E 3117C	26/10/16	Lot 102	750	0.0	98.0
9	16E 3117D	26/10/16	Lot 103	500	0.5 dry	100.0
10	16E 3117E	26/10/16	Lot 104	500	0.5 dry	104.5
11	16E 3117F	26/10/16	Lot 107	500	0.0	100.0
12	16E 3130A	27/10/16	Lot 609	500	2.0 dry	100.5
13	16E 3130B	27/10/16	Lot 100	500	2.5 dry	99.0
14	16E 3130C	27/10/16	Lot 99	500	3.0 dry	94.5
RT 14	16E 3139A	31/10/16	Lot 99	500	2.5 dry	103.0
15	16E 3140A	31/10/16	Lot 103	150	2.5 dry	102.0
16	16E 3140B	31/10/16	Lot 107	150	0.5 dry	101.5
17	16E 3140C	31/10/16	Lot 106	150	3.0 dry	102.0

Project No.	Report No.	Test Date.	Location.	Reduced Level (mm)	Moisture Variation %O.M.C	Hilf Density Ratio %
18	16E 3140D	31/10/16	Lot 104	150	2.0 dry	105.5
19	16E 3148A	2/11/16	Lot 95	150	0.5 dry	100.5
20	16E 3148B	2/11/16	Lot 94	150	2.0 dry	102.5
21	16E 3149A	2/11/16	Lot 101	150	2.5 dry	98.5
22	16E 3149B	2/11/16	Lot 100	150	0.5 dry	100.0
23	16E 3149C	2/11/16	Lot 99	150	1.0 dry	102.0
24	16E 3149D	2/11/16	Lot 102	150	1.5 dry	100.5

## 5 STATEMENT OF COMPLIANCE

GTS personnel have provided Level 1 inspection and testing services during the placement of material for the filling of Lots 94,95 and 97 to 107 with partial completion of Lot 609. It is noted that whilst no compaction tests were conducted on Lot 105, the fill was placed in conjunction with the surrounding lots and is therefore considered controlled fill. As outlined in Section 2.2, tests are not required on every layer of every lot to meet the testing frequency outlined in AS3798. The placement of fill and construction techniques adopted was observed throughout the project.

Based on observations made by GTS personnel and the results of field and laboratory tests, we consider that the fill has been placed and compacted and is considered to be engineered or controlled fill. It is noted that the controlled fill was placed to 150mm from the finished surface level to allow for a layer of top soil material to be spread across the sites. It is noted that this top soil material is not considered controlled fill. Therefore, subject to residential site classifications, the controlled fill material is deemed a suitable founding medium for future residential buildings



**Shane Hampton** (BE (Hons))  
**Senior Geotechnical Engineer**

Telephone: (03) 5441 4881  
Mobile: 0437 496 215  
Email: [shaneh@geotestsouthern.com.au](mailto:shaneh@geotestsouthern.com.au)

# APPENDIX

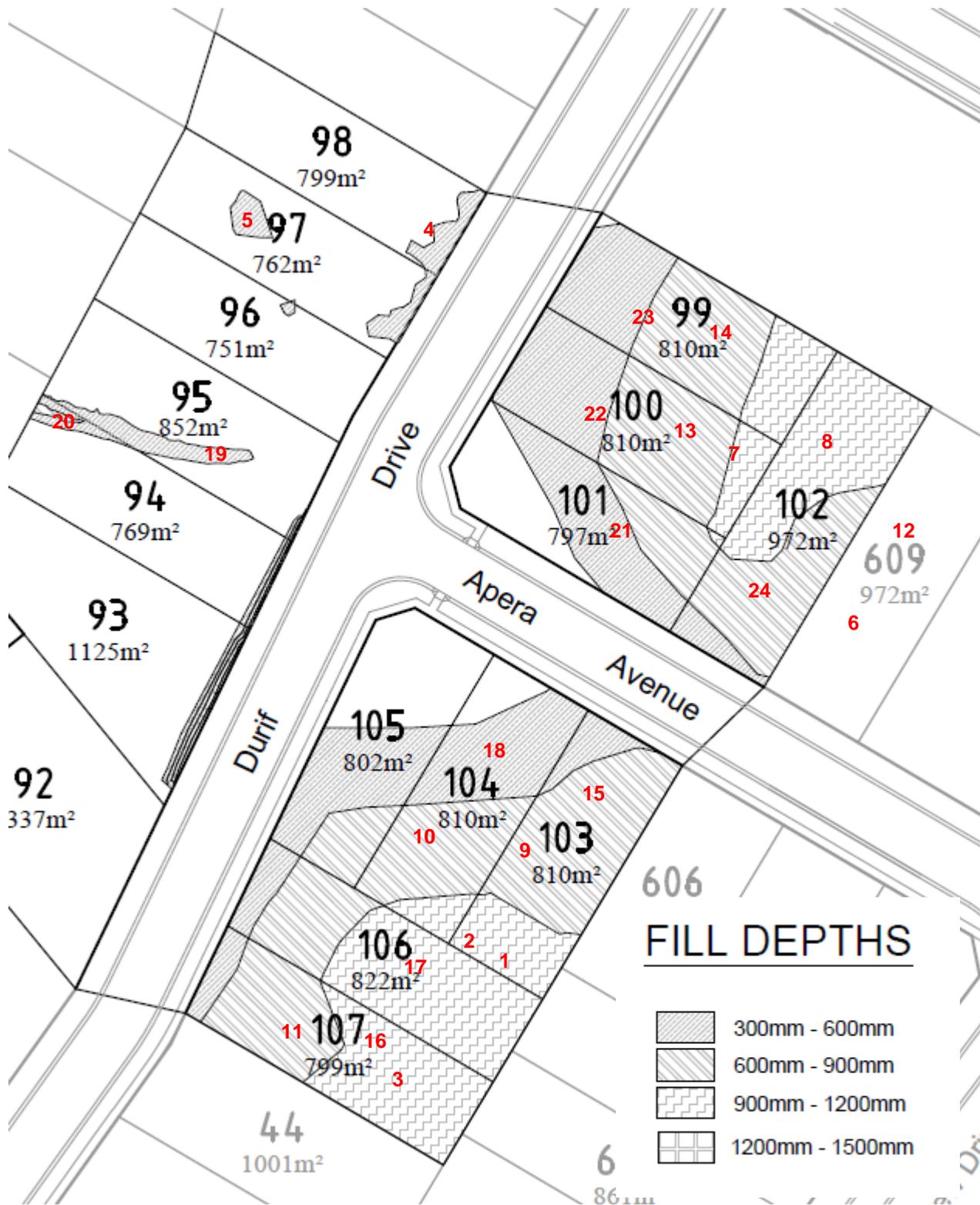


Fig 1: Site Plan

Client: Midland Contracting P.O. Box 626 BENDIGO VICTORIA 3550	Report N <sup>o</sup> :	16E3069
	Revision N <sup>o</sup> :	REV 0
	Sheet:	1 of 2
	Date of Report:	20/10/2016

Project:	Lake View Stage 4, Moama					
Location:	House Lots					
Test Request No / Lot No:	*					
Layer Thickness: (mm)	300mm					
Depth Below FSL/CSL:	1100mm					
Compaction Type:	Standard					
Date Sampled:	19/10/2016					
Sampling Method:	AS1289.1.2.1 part 6.4b					
Material Description:	16E3069	/A	Brown Silty Clay			
Material Stabilised:	No	If Stabilised Time from Stabilisation to Lab Test:				*
Test Number:	16E3069A	*	*	*	*	*
Hilf Density Ratio (%):	<b>96.5</b>	*	*	*	*	*

As Per: AS1289 5.7.1 5.8.1

Approved Signatory:   
 \_\_\_\_\_  
 B.P.Mott

The results of the tests included in this document are traceable to Australian /National Standards. Accredited for compliance with ISO/IEC 17025.  
 This document shall not be reproduced, except in full.



Echuca: Corporate Site #16874  
 Shed 3, 140 Ogilvie Ave, Echuca, 3564  
 PO Box 13, Strathdale, 3550 Ph(03) 5441 4881, Fax (03) 5441 5089

Laboratory accreditation number 19506

Offices: Bendigo, Echuca Web: www.geotestsouthern.com.au Email: info@geotestsouthern.com.au ABN: 18 169 924 109 ACN: 169 924 109

- Geotechnical Investigations • Contract Drilling • Land Capability Assessments • Contamination Assessments • Compaction Control Testing • On-site Wastewater Management • Site Classifications • Residential and Industrial • Soil, Concrete and Aggregate Testing Laboratories • Site Laboratory • Construction Material Testing Services

Client: Midland Contracting P.O. Box 626 BENDIGO VICTORIA 3550	Report N°:	16E3069
	Revision N°:	REV 0
	Sheet:	2 of 2
	Date of Report:	20/10/2016

Test Number:	16E3069A	*	*	*	*	*
Project Test Number:	*	*	*	*	*	*
Time of Test:	1:52pm	*	*	*	*	*
Probe Depth: (mm)	275	*	*	*	*	*
Chainage:	Lot 103	*	*	*	*	*
Reduced Level: (mm)	-1100.0	*	*	*	*	*
Offset / Centre Line:	5m East	*	*	*	*	*
#Eastings:	* No GPS	*	*	*	*	*
#Northings:	* *	*	*	*	*	*
Percentage Oversize Wet:	0.0	*	*	*	*	*
Oversize Sieve Size: (mm)	19	*	*	*	*	*
Field Wet Density: t/m <sup>3</sup>	2.03	*	*	*	*	*
Peak Conv. Wet Density: t/m <sup>3</sup>	2.11	*	*	*	*	*
Adj. Peak Conv. Wet Density: t/m <sup>3</sup>	*	*	*	*	*	*
Moisture Variation: % (Wet/Dry)	1.0Dry	*	*	*	*	*
Adj. Moist. Variation: % (Wet/Dry)	*	*	*	*	*	*
Moisture Content: %	*	*	*	*	*	*
<b>HILF DENSITY RATIO (%):</b>	<b>96.5</b>	*	*	*	*	*

#Map Datum AUS84

As Per: AS1289 5.7.1 5.8.1

Approved Signatory:



B.P.Mott

The results of the tests included in this document are traceable to Australian /National Standards. Accredited for compliance with ISO/IEC 17025.

This document shall not be reproduced, except in full.



Echuca: Corporate Site #16874  
 Shed 3, 140 Ogilvie Ave, Echuca, 3564  
 PO Box 13, Strathdale, 3550 Ph(03) 5441 4881, Fax (03) 5441 5089

Laboratory accreditation number 19506

Offices: Bendigo, Echuca Web: www.geotestsouthern.com.au Email: info@geotestsouthern.com.au ABN: 18 169 924 109 ACN: 169 924 109

- Geotechnical Investigations • Contract Drilling • Land Capability Assessments • Contamination Assessments • Compaction Control Testing • On-site Wastewater Management • Site Classifications • Residential and Industrial • Soil, Concrete and Aggregate Testing Laboratories • Site Laboratory • Construction Material Testing Services

Client: Midland Contracting P.O. Box 626 BENDIGO VICTORIA 3550	Report N <sup>o</sup> :	16E3094
	Revision N <sup>o</sup> :	REV 0
	Sheet:	1 of 2
	Date of Report:	21/10/2016

Project:	Lake View Stage 4 Moama					
Location:	House Lots					
Test Request No / Lot No:	*					
Layer Thickness: (mm)	300mm					
Depth Below FSL/CSL:	800mm & FSL					
Compaction Type:	Standard					
Date Sampled:	21/10/2016					
Sampling Method:	AS1289.1.2.1 part 6.4b					
Material Description:	16E3094	/A	Light Brown Silty Clay			
	16E3094	/B	Light Brown Silty Clay			
Material Stabilised:	No	If Stabilised Time from Stabilisation to Lab Test:				*
Test Number:	16E3094A	16E3094B	*	*	*	*
Hilf Density Ratio (%):	<b>100.5</b>	<b>98.0</b>	*	*	*	*

As Per: AS1289 5.7.1 5.8.1

Approved Signatory:   
 \_\_\_\_\_  
 B.P.Mott

The results of the tests included in this document are traceable to Australian /National Standards. Accredited for compliance with ISO/IEC 17025.  
 This document shall not be reproduced, except in full.



Echuca: Corporate Site #16874  
 Shed 3, 140 Ogilvie Ave, Echuca, 3564  
 PO Box 13, Strathdale, 3550 Ph(03) 5441 4881, Fax (03) 5441 5089

Laboratory accreditation number 19506

Offices: Bendigo, Echuca Web: www.geotestsouthern.com.au Email: info@geotestsouthern.com.au ABN: 18 169 924 109 ACN: 169 924 109

- Geotechnical Investigations • Contract Drilling • Land Capability Assessments • Contamination Assessments • Compaction Control Testing • On-site Wastewater Management • Site Classifications • Residential and Industrial • Soil, Concrete and Aggregate Testing Laboratories • Site Laboratory • Construction Material Testing Services

Client: Midland Contracting P.O. Box 626 BENDIGO VICTORIA 3550	Report N°: 16E3094
	Revision N°: REV 0
	Sheet: 2 of 2
	Date of Report: 21/10/2016

Test Number:	16E3094A	16E3094B	*	*	*	*
Project Test Number:	*	*	*	*	*	*
Time of Test:	9:42am	9:54am	*	*	*	*
Probe Depth: (mm)	275	275	*	*	*	*
Chainage:	Lot 103	Lot 107	*	*	*	*
Reduced Level: (mm)	-800.0	FSL	*	*	*	*
Offset / Centre Line:	*	*	*	*	*	*
#Eastings:	*	No GPS	No GPS	*	*	*
#Northings:	*	*	*	*	*	*
Percentage Oversize Wet:	0.0	0.0	*	*	*	*
Oversize Sieve Size: (mm)	19	19	*	*	*	*
Field Wet Density: t/m <sup>3</sup>	2.04	1.98	*	*	*	*
Peak Conv. Wet Density: t/m <sup>3</sup>	2.02	2.02	*	*	*	*
Adj. Peak Conv. Wet Density: t/m <sup>3</sup>	*	*	*	*	*	*
Moisture Variation: % (Wet/Dry)	2.5Dry	3.0Dry	*	*	*	*
Adj. Moist. Variation: % (Wet/Dry)	*	*	*	*	*	*
Moisture Content: %	*	*	*	*	*	*
<b>HILF DENSITY RATIO (%):</b>	<b>100.5</b>	<b>98.0</b>	*	*	*	*

#Map Datum AUS84

As Per: AS1289 5.7.1 5.8.1

Approved Signatory:



B.P.Mott

The results of the tests included in this document are traceable to Australian /National Standards. Accredited for compliance with ISO/IEC 17025.

This document shall not be reproduced, except in full.



Echuca: Corporate Site #16874  
 Shed 3, 140 Ogilvie Ave, Echuca, 3564  
 PO Box 13, Strathdale, 3550 Ph(03) 5441 4881, Fax (03) 5441 5089

Laboratory accreditation number 19506

Offices: Bendigo, Echuca Web: www.geotestsouthern.com.au Email: info@geotestsouthern.com.au ABN: 18 169 924 109 ACN: 169 924 109

- Geotechnical Investigations • Contract Drilling • Land Capability Assessments • Contamination Assessments • Compaction Control Testing • On-site Wastewater Management • Site Classifications • Residential and Industrial • Soil, Concrete and Aggregate Testing Laboratories • Site Laboratory • Construction Material Testing Services

Client: Midland Contracting P.O. Box 626 BENDIGO VICTORIA 3550	Report N <sup>o</sup> :	16E3100
	Revision N <sup>o</sup> :	REV 0
	Sheet:	1 of 2
	Date of Report:	26/10/2016

Project:	Lakeview Stage 4 Moama					
Location:	House Blocks					
Test Request No / Lot No:	*					
Layer Thickness: (mm)	250mm					
Depth Below FSL/CSL:	150mm					
Compaction Type:	Standard					
Date Sampled:	24/10/2016					
Sampling Method:	AS1289.1.2.1 part 6.4b					
Material Description:	16E3100	/A	Silty Clay Brown			
	16E3100	/B	Silty Clay Brown			
Material Stabilised:	No	If Stabilised Time from Stabilisation to Lab Test:				*
Test Number:	16E3100A	16E3100B	*	*	*	*
Hilf Density Ratio (%):	<b>99.0</b>	<b>96.0</b>	*	*	*	*

As Per: AS1289 5.7.1 5.8.1

Approved Signatory:   
 \_\_\_\_\_  
 B.P.Mott

The results of the tests included in this document are traceable to Australian /National Standards. Accredited for compliance with ISO/IEC 17025.  
 This document shall not be reproduced, except in full.



Echuca: Corporate Site #16874  
 Shed 3, 140 Ogilvie Ave, Echuca, 3564  
 PO Box 13, Strathdale, 3550 Ph(03) 5441 4881, Fax (03) 5441 5089

Laboratory accreditation number 19506

Offices: Bendigo, Echuca Web: www.geotestsouthern.com.au Email: info@geotestsouthern.com.au ABN: 18 169 924 109 ACN: 169 924 109

- Geotechnical Investigations • Contract Drilling • Land Capability Assessments • Contamination Assessments • Compaction Control Testing • On-site Wastewater Management • Site Classifications • Residential and Industrial • Soil, Concrete and Aggregate Testing Laboratories • Site Laboratory • Construction Material Testing Services

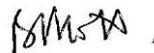
Client: Midland Contracting P.O. Box 626 BENDIGO VICTORIA 3550	Report N°: 16E3100
	Revision N°: REV 0
	Sheet: 2 of 2
	Date of Report: 26/10/2016

Test Number:	16E3100A	16E3100B	*	*	*	*
Project Test Number:	*	*	*	*	*	*
Time of Test:	12.00pm	12.09pm	*	*	*	*
Probe Depth: (mm)	225	225	*	*	*	*
Chainage:	Lot 98	Lot 97	*	*	*	*
Reduced Level: (mm)	-150.0	-150.0	*	*	*	*
Offset / Centre Line:	Refer to Map	Refer to Map	*	*	*	*
#Eastings:	*	No GPS	No GPS	*	*	*
#Northings:	*	*	*	*	*	*
Percentage Oversize Wet:	0.0	0.0	*	*	*	*
Oversize Sieve Size: (mm)	19	19	*	*	*	*
Field Wet Density: t/m <sup>3</sup>	2.04	2.00	*	*	*	*
Peak Conv. Wet Density: t/m <sup>3</sup>	2.07	2.08	*	*	*	*
Adj. Peak Conv. Wet Density: t/m <sup>3</sup>	*	*	*	*	*	*
Moisture Variation: % (Wet/Dry)	0.5Dry	0.5Dry	*	*	*	*
Adj. Moist. Variation: % (Wet/Dry)	*	*	*	*	*	*
Moisture Content: %	*	*	*	*	*	*
<b>HILF DENSITY RATIO (%):</b>	<b>99.0</b>	<b>96.0</b>	*	*	*	*

#Map Datum AUS84

As Per: AS1289 5.7.1 5.8.1

Approved Signatory:



B.P.Mott

The results of the tests included in this document are traceable to Australian /National Standards. Accredited for compliance with ISO/IEC 17025.

This document shall not be reproduced, except in full.



Echuca: Corporate Site #16874  
 Shed 3, 140 Ogilvie Ave, Echuca, 3564  
 PO Box 13, Strathdale, 3550 Ph(03) 5441 4881, Fax (03) 5441 5089

Laboratory accreditation number 19506

Offices: Bendigo, Echuca Web: www.geotestsouthern.com.au Email: info@geotestsouthern.com.au ABN: 18 169 924 109 ACN: 169 924 109

• Geotechnical Investigations • Contract Drilling • Land Capability Assessments • Contamination Assessments • Compaction Control Testing • On-site Wastewater Management • Site Classifications • Residential and Industrial • Soil, Concrete and Aggregate Testing Laboratories • Site Laboratory • Construction Material Testing Services

Client: Midland Contracting P.O. Box 626 BENDIGO VICTORIA 3550	Report N <sup>o</sup> :	16E3117
	Revision N <sup>o</sup> :	REV 0
	Sheet:	1 of 2
	Date of Report:	28/10/2016

Project:	Lakeview Stage 4 Moama					
Location:	Lot Fill					
Test Request No / Lot No:	*					
Layer Thickness: (mm)	300mm					
Depth Below FSL/CSL:	500mm, 750mm & 950mm					
Compaction Type:	Standard					
Date Sampled:	26/10/2016					
Sampling Method:	AS1289.1.2.1 part 6.4b					
Material Description:	16E3117	/A	Silty Clay Red Brown			
	16E3117	/B	Silty Clay Red Brown			
	16E3117	/C	Silty Clay Red Brown			
	16E3117	/D	Silty Clay Red Brown			
	16E3117	/E	Silty Clay Red Brown			
	16E3117	/F	Silty Clay Red Brown			
Material Stabilised:	No	If Stabilised Time from Stabilisation to Lab Test:				*
Test Number:	16E3117A	16E3117B	16E3117C	16E3117D	16E3117E	16E3117F
Hilf Density Ratio (%):	<b>99.5</b>	<b>100.5</b>	<b>98.0</b>	<b>100.0</b>	<b>104.5</b>	<b>100.0</b>

As Per: AS1289 5.7.1 5.8.1

Approved Signatory:   
 \_\_\_\_\_  
 B.P.Mott

The results of the tests included in this document are traceable to Australian /National Standards. Accredited for compliance with ISO/IEC 17025.  
 This document shall not be reproduced, except in full.



Echuca: Corporate Site #16874  
 Shed 3, 140 Ogilvie Ave, Echuca, 3564  
 PO Box 13, Strathdale, 3550 Ph(03) 5441 4881, Fax (03) 5441 5089

Laboratory accreditation number 19506

Offices: Bendigo, Echuca Web: www.geotestsouthern.com.au Email: info@geotestsouthern.com.au ABN: 18 169 924 109 ACN: 169 924 109

- Geotechnical Investigations • Contract Drilling • Land Capability Assessments • Contamination Assessments • Compaction Control Testing • On-site Wastewater Management • Site Classifications • Residential and Industrial • Soil, Concrete and Aggregate Testing Laboratories • Site Laboratory • Construction Material Testing Services

Client: Midland Contracting P.O. Box 626 BENDIGO VICTORIA 3550	Report N <sup>o</sup> :	16E3117
	Revision N <sup>o</sup> :	REV 0
	Sheet:	2 of 2
	Date of Report:	28/10/2016

Test Number:	16E3117A	16E3117B	16E3117C	16E3117D	16E3117E	16E3117F
Project Test Number:	*	*	*	*	*	*
Time of Test:	12.50pm	1.00pm	1.10pm	1.25pm	1.35pm	1.45pm
Probe Depth: (mm)	275	275	275	275	275	275
Chainage:	Lot 609	Lot 100	Lot 102	Lot 103	Lot 104	Lot 107
Reduced Level: (mm)	-750.0	-950.0	-750.0	-500.0	-500.0	-500.0
Offset / Centre Line:	Refer to Map					
#Eastings:	*	No GPS				
#Northings:	*	*	*	*	*	*
Percentage Oversize Wet:	0.0	0.0	0.0	0.0	0.0	0.0
Oversize Sieve Size: (mm)	19	19	19	19	19	19
Field Wet Density: t/m <sup>3</sup>	2.09	2.09	2.01	2.05	2.15	2.07
Peak Conv. Wet Density: t/m <sup>3</sup>	2.10	2.08	2.05	2.05	2.05	2.08
Adj. Peak Conv. Wet Density: t/m <sup>3</sup>	*	*	*	*	*	*
Moisture Variation: % (Wet/Dry)	0.0Wet	0.5Dry	0.0Wet	0.5Dry	0.5Dry	0.0Wet
Adj. Moist. Variation: % (Wet/Dry)	*	*	*	*	*	*
Moisture Content: %	*	*	*	*	*	*
<b>HILF DENSITY RATIO (%):</b>	<b>99.5</b>	<b>100.5</b>	<b>98.0</b>	<b>100.0</b>	<b>104.5</b>	<b>100.0</b>

#Map Datum AUS84

As Per: AS1289                      5.7.1                      5.8.1

Approved Signatory: \_\_\_\_\_  
  
 B.P.Mott

The results of the tests included in this document are traceable to Australian /National Standards. Accredited for compliance with ISO/IEC 17025.  
 This document shall not be reproduced, except in full.



Echuca: Corporate Site #16874  
 Shed 3, 140 Ogilvie Ave, Echuca, 3564  
 PO Box 13, Strathdale, 3550 Ph(03) 5441 4881, Fax (03) 5441 5089

Laboratory accreditation number 19506

Offices: Bendigo, Echuca    Web: www.geotestsouthern.com.au    Email: info@geotestsouthern.com.au    ABN: 18 169 924 109    ACN: 169 924 109

- Geotechnical Investigations • Contract Drilling • Land Capability Assessments • Contamination Assessments • Compaction Control Testing • On-site Wastewater Management • Site Classifications • Residential and Industrial • Soil, Concrete and Aggregate Testing Laboratories • Site Laboratory • Construction Material Testing Services

Client: Midland Contracting P.O. Box 626 BENDIGO VICTORIA 3550	Report N <sup>o</sup> :	16E3130
	Revision N <sup>o</sup> :	REV 0
	Sheet:	1 of 2
	Date of Report:	28/10/2016

Project:	Lakeview Stage 4 Moama					
Location:	Lot Fill					
Test Request No / Lot No:	*					
Layer Thickness: (mm)	300mm					
Depth Below FSL/CSL:	500mm					
Compaction Type:	Standard					
Date Sampled:	27/10/2016					
Sampling Method:	AS1289.1.2.1 part 6.4b					
Material Description:	16E3130	/A	Silty Clay Brown			
	16E3130	/B	Silty Clay Brown			
	16E3130	/C	Silty Clay Brown			
Material Stabilised:	No	If Stabilised Time from Stabilisation to Lab Test:				*
Test Number:	16E3130A	16E3130B	16E3130C	*	*	*
Hilf Density Ratio (%):	<b>100.5</b>	<b>99.0</b>	<b>94.5</b>	*	*	*

As Per: AS1289 5.7.1 5.8.1

Approved Signatory:   
 \_\_\_\_\_  
 B.P.Mott

The results of the tests included in this document are traceable to Australian /National Standards. Accredited for compliance with ISO/IEC 17025.  
 This document shall not be reproduced, except in full.



Echuca: Corporate Site #16874  
 Shed 3, 140 Ogilvie Ave, Echuca, 3564  
 PO Box 13, Strathdale, 3550 Ph(03) 5441 4881, Fax (03) 5441 5089

Laboratory accreditation number 19506

Offices: Bendigo, Echuca Web: www.geotestsouthern.com.au Email: info@geotestsouthern.com.au ABN: 18 169 924 109 ACN: 169 924 109

- Geotechnical Investigations • Contract Drilling • Land Capability Assessments • Contamination Assessments • Compaction Control Testing • On-site Wastewater Management • Site Classifications • Residential and Industrial • Soil, Concrete and Aggregate Testing Laboratories • Site Laboratory • Construction Material Testing Services

Client: Midland Contracting P.O. Box 626 BENDIGO VICTORIA 3550	Report N°:	16E3130
	Revision N°:	REV 0
	Sheet:	2 of 2
	Date of Report:	28/10/2016

Test Number:	16E3130A	16E3130B	16E3130C	*	*	*
Project Test Number:	*	*	*	*	*	*
Time of Test:	3.55pm	4.05pm	4.15pm	*	*	*
Probe Depth: (mm)	275	275	275	*	*	*
Chainage:	Lot 609	Lot 100	Lot 99	*	*	*
Reduced Level: (mm)	-500.0	-500.0	-500.0	*	*	*
Offset / Centre Line:	Refer to Map	Refer to Map	Refer to Map	*	*	*
#Eastings:	*	No GPS	No GPS	No GPS	*	*
#Northings:	*	*	*	*	*	*
Percentage Oversize Wet:	0.0	0.0	0.0	*	*	*
Oversize Sieve Size: (mm)	19	19	19	*	*	*
Field Wet Density: t/m <sup>3</sup>	2.07	1.95	1.83	*	*	*
Peak Conv. Wet Density: t/m <sup>3</sup>	2.06	1.97	1.93	*	*	*
Adj. Peak Conv. Wet Density: t/m <sup>3</sup>	*	*	*	*	*	*
Moisture Variation: % (Wet/Dry)	2.0Dry	2.5Dry	3.0Dry	*	*	*
Adj. Moist. Variation: % (Wet/Dry)	*	*	*	*	*	*
Moisture Content: %	*	*	*	*	*	*
<b>HILF DENSITY RATIO (%):</b>	<b>100.5</b>	<b>99.0</b>	<b>94.5</b>	*	*	*

#Map Datum AUS84

As Per: AS1289                      5.7.1                      5.8.1

Approved Signatory:



B.P.Mott

The results of the tests included in this document are traceable to Australian /National Standards. Accredited for compliance with ISO/IEC 17025.

This document shall not be reproduced, except in full.



Echuca: Corporate Site #16874  
 Shed 3, 140 Ogilvie Ave, Echuca, 3564  
 PO Box 13, Strathdale, 3550 Ph(03) 5441 4881, Fax (03) 5441 5089

Laboratory accreditation number 19506

Offices: Bendigo, Echuca    Web: www.geotestsouthern.com.au    Email: info@geotestsouthern.com.au    ABN: 18 169 924 109    ACN: 169 924 109

- Geotechnical Investigations • Contract Drilling • Land Capability Assessments • Contamination Assessments • Compaction Control Testing • On-site Wastewater Management • Site Classifications • Residential and Industrial • Soil, Concrete and Aggregate Testing Laboratories • Site Laboratory • Construction Material Testing Services

Client: Midland Contracting P.O. Box 626 BENDIGO VICTORIA 3550	Report N°:	16E3139
	Revision N°:	REV 0
	Sheet:	1 of 2
	Date of Report:	2/11/2016

Project:	Lakeview Moama Stage 4					
Location:	Lot Fill - Retest					
Test Request No / Lot No:	*					
Layer Thickness: (mm)	300mm					
Depth Below FSL/CSL:	500mm					
Compaction Type:	Standard					
Date Sampled:	21/10/2016					
Sampling Method:	AS1289.1.2.1 part 6.4b					
Material Description:	16E3139	/A	Brown Silty Clay			
Material Stabilised:	No	If Stabilised Time from Stabilisation to Lab Test:				*
Test Number:	16E3139A	*	*	*	*	*
Hilf Density Ratio (%):	<b>103.0</b>	*	*	*	*	*

As Per: AS1289 5.7.1 5.8.1

Approved Signatory:   
 \_\_\_\_\_  
 B.P.Mott

The results of the tests included in this document are traceable to Australian /National Standards. Accredited for compliance with ISO/IEC 17025.  
 This document shall not be reproduced, except in full.



Echuca: Corporate Site #16874  
 Shed 3, 140 Ogilvie Ave, Echuca, 3564  
 PO Box 13, Strathdale, 3550 Ph(03) 5441 4881, Fax (03) 5441 5089

Laboratory accreditation number 19506

Offices: Bendigo, Echuca Web: www.geotestsouthern.com.au Email: info@geotestsouthern.com.au ABN: 18 169 924 109 ACN: 169 924 109

- Geotechnical Investigations • Contract Drilling • Land Capability Assessments • Contamination Assessments • Compaction Control Testing • On-site Wastewater Management • Site Classifications • Residential and Industrial • Soil, Concrete and Aggregate Testing Laboratories • Site Laboratory • Construction Material Testing Services



Client: Midland Contracting P.O. Box 626 BENDIGO VICTORIA 3550	Report N°:	16E3139
	Revision N°:	REV 0
	Sheet:	2 of 2
	Date of Report:	2/11/2016

Test Number:	16E3139A	*	*	*	*	*
Project Test Number:	*	*	*	*	*	*
Time of Test:	1.34pm	*	*	*	*	*
Probe Depth: (mm)	275	*	*	*	*	*
Chainage:	Lot 99	*	*	*	*	*
Reduced Level: (mm)	-500.0	*	*	*	*	*
Offset / Centre Line:	*	*	*	*	*	*
#Eastings:	*	No GPS	*	*	*	*
#Northings:	*	*	*	*	*	*
Percentage Oversize Wet:	0.0	*	*	*	*	*
Oversize Sieve Size: (mm)	19	*	*	*	*	*
Field Wet Density: t/m <sup>3</sup>	2.08	*	*	*	*	*
Peak Conv. Wet Density: t/m <sup>3</sup>	2.02	*	*	*	*	*
Adj. Peak Conv. Wet Density: t/m <sup>3</sup>	*	*	*	*	*	*
Moisture Variation: % (Wet/Dry)	2.5Dry	*	*	*	*	*
Adj. Moist. Variation: % (Wet/Dry)	*	*	*	*	*	*
Moisture Content: %	*	*	*	*	*	*
<b>HILF DENSITY RATIO (%):</b>	<b>103.0</b>	*	*	*	*	*

#Map Datum AUS84

As Per: AS1289 5.7.1 5.8.1

Approved Signatory:

B.P.Mott

The results of the tests included in this document are traceable to Australian /National Standards. Accredited for compliance with ISO/IEC 17025.

This document shall not be reproduced, except in full.



Echuca: Corporate Site #16874  
 Shed 3, 140 Ogilvie Ave, Echuca, 3564  
 PO Box 13, Strathdale, 3550 Ph(03) 5441 4881, Fax (03) 5441 5089

Laboratory accreditation number 19506

Offices: Bendigo, Echuca Web: www.geotestsouthern.com.au Email: info@geotestsouthern.com.au ABN: 18 169 924 109 ACN: 169 924 109

- Geotechnical Investigations • Contract Drilling • Land Capability Assessments • Contamination Assessments • Compaction Control Testing • On-site Wastewater Management • Site Classifications • Residential and Industrial • Soil, Concrete and Aggregate Testing Laboratories • Site Laboratory • Construction Material Testing Services

Client: Midland Contracting P.O. Box 626 BENDIGO VICTORIA 3550	Report N <sup>o</sup> :	16E3140
	Revision N <sup>o</sup> :	REV 0
	Sheet:	1 of 2
	Date of Report:	2/11/2016

Project:	Lakeview Stage 4 Moama					
Location:	Lot Fill					
Test Request No / Lot No:	*					
Layer Thickness: (mm)	350mm					
Depth Below FSL/CSL:	150mm					
Compaction Type:	Standard					
Date Sampled:	31/10/2016					
Sampling Method:	AS1289.1.2.1 part 6.4b					
Material Description:	16E3140	/A	Silty Clay, Brown			
	16E3140	/B	Silty Clay, Brown			
	16E3140	/C	Silty Clay, Brown			
	16E3140	/D	Silty Clay, Brown			
Material Stabilised:	No	If Stabilised Time from Stabilisation to Lab Test:				*
Test Number:	16E3140A	16E3140B	16E3140C	16E3140D	*	*
Hilf Density Ratio (%):	<b>102.0</b>	<b>101.5</b>	<b>102.0</b>	<b>105.5</b>	*	*

As Per: AS1289 5.7.1 5.8.1

Approved Signatory:   
 \_\_\_\_\_  
 B.P.Mott

The results of the tests included in this document are traceable to Australian /National Standards. Accredited for compliance with ISO/IEC 17025.  
 This document shall not be reproduced, except in full.



Echuca: Corporate Site #16874  
 Shed 3, 140 Ogilvie Ave, Echuca, 3564  
 PO Box 13, Strathdale, 3550 Ph(03) 5441 4881, Fax (03) 5441 5089

Laboratory accreditation number 19506

Offices: Bendigo, Echuca Web: www.geotestsouthern.com.au Email: info@geotestsouthern.com.au ABN: 18 169 924 109 ACN: 169 924 109

- Geotechnical Investigations • Contract Drilling • Land Capability Assessments • Contamination Assessments • Compaction Control Testing • On-site Wastewater Management • Site Classifications • Residential and Industrial • Soil, Concrete and Aggregate Testing Laboratories • Site Laboratory • Construction Material Testing Services

Client: Midland Contracting P.O. Box 626 BENDIGO VICTORIA 3550	Report N <sup>o</sup> :	16E3140
	Revision N <sup>o</sup> :	REV 0
	Sheet:	2 of 2
	Date of Report:	2/11/2016

Test Number:	16E3140A	16E3140B	16E3140C	16E3140D	*	*	
Project Test Number:	*	*	*	*	*	*	
Time of Test:	12.50pm	12.59pm	1.05pm	1.16pm	*	*	
Probe Depth: (mm)	275	275	275	275	*	*	
Chainage:	Lot 103	Lot 107	Lot 106	Lot 104	*	*	
Reduced Level: (mm)	-150.0	-150.0	-150.0	-150.0	*	*	
Offset / Centre Line:	Refer to Map	Refer to Map	Refer to Map	Refer to Map	*	*	
#Eastings:	*	No GPS	No GPS	No GPS	No GPS	*	*
#Northings:	*	*	*	*	*	*	*
Percentage Oversize Wet:	0.0	0.0	0.0	0.0	*	*	
Oversize Sieve Size: (mm)	19	19	19	19	*	*	
Field Wet Density: t/m <sup>3</sup>	2.04	2.03	2.00	2.12	*	*	
Peak Conv. Wet Density: t/m <sup>3</sup>	2.00	2.00	1.97	2.01	*	*	
Adj. Peak Conv. Wet Density: t/m <sup>3</sup>	*	*	*	*	*	*	
Moisture Variation: % (Wet/Dry)	2.5Dry	0.5Dry	3.0Dry	2.0Dry	*	*	
Adj. Moist. Variation: % (Wet/Dry)	*	*	*	*	*	*	
Moisture Content: %	*	*	*	*	*	*	
<b>HILF DENSITY RATIO (%):</b>	<b>102.0</b>	<b>101.5</b>	<b>102.0</b>	<b>105.5</b>	*	*	

#Map Datum AUS84

As Per: AS1289                      5.7.1                      5.8.1

Approved Signatory:



B.P.Mott

The results of the tests included in this document are traceable to Australian /National Standards. Accredited for compliance with ISO/IEC 17025.

This document shall not be reproduced, except in full.



Echuca: Corporate Site #16874  
 Shed 3, 140 Ogilvie Ave, Echuca, 3564  
 PO Box 13, Strathdale, 3550 Ph(03) 5441 4881, Fax (03) 5441 5089

Laboratory accreditation number 19506

Offices: Bendigo, Echuca    Web: www.geotestsouthern.com.au    Email: info@geotestsouthern.com.au    ABN: 18 169 924 109    ACN: 169 924 109

- Geotechnical Investigations • Contract Drilling • Land Capability Assessments • Contamination Assessments • Compaction Control Testing • On-site Wastewater Management • Site Classifications • Residential and Industrial • Soil, Concrete and Aggregate Testing Laboratories • Site Laboratory • Construction Material Testing Services

Client: Midland Contracting P.O. Box 626 BENDIGO VICTORIA 3550	Report N <sup>o</sup> :	16E3148
	Revision N <sup>o</sup> :	REV 0
	Sheet:	1 of 2
	Date of Report:	4/11/2016

Project:	Lakeview Stage 4, Moama					
Location:	V Drain Backfill					
Test Request No / Lot No:	*					
Layer Thickness: (mm)	300mm					
Depth Below FSL/CSL:	150mm					
Compaction Type:	Standard					
Date Sampled:	2/11/2016					
Sampling Method:	AS1289.1.2.1 part 6.4b					
Material Description:	16E3148	/A	Brown Silty Clay			
	16E3148	/B	Brown Silty Clay			
Material Stabilised:	No	If Stabilised Time from Stabilisation to Lab Test:				*
Test Number:	16E3148A	16E3148B	*	*	*	*
Hilf Density Ratio (%):	<b>100.5</b>	<b>102.5</b>	*	*	*	*

As Per: AS1289 5.7.1 5.8.1

Approved Signatory:   
 \_\_\_\_\_  
 B.P.Mott

The results of the tests included in this document are traceable to Australian /National Standards. Accredited for compliance with ISO/IEC 17025.  
 This document shall not be reproduced, except in full.



Echuca: Corporate Site #16874  
 Shed 3, 140 Ogilvie Ave, Echuca, 3564  
 PO Box 13, Strathdale, 3550 Ph(03) 5441 4881, Fax (03) 5441 5089

Laboratory accreditation number 19506

Offices: Bendigo, Echuca Web: www.geotestsouthern.com.au Email: info@geotestsouthern.com.au ABN: 18 169 924 109 ACN: 169 924 109

- Geotechnical Investigations • Contract Drilling • Land Capability Assessments • Contamination Assessments • Compaction Control Testing • On-site Wastewater Management • Site Classifications • Residential and Industrial • Soil, Concrete and Aggregate Testing Laboratories • Site Laboratory • Construction Material Testing Services

Client: Midland Contracting P.O. Box 626 BENDIGO VICTORIA 3550	Report N°: 16E3148
	Revision N°: REV 0
	Sheet: 2 of 2
	Date of Report: 4/11/2016

Test Number:	16E3148A	16E3148B	*	*	*	*
Project Test Number:	*	*	*	*	*	*
Time of Test:	3:53pm	3:59pm	*	*	*	*
Probe Depth: (mm)	275	275	*	*	*	*
Chainage:	Refer to Map	Refer to Map	*	*	*	*
Reduced Level: (mm)	-150.0	-150.0	*	*	*	*
Offset / Centre Line:	C/L	C/L	*	*	*	*
#Eastings:	*	No GPS	No GPS	*	*	*
#Northings:	*	*	*	*	*	*
Percentage Oversize Wet:	0.0	0.0	*	*	*	*
Oversize Sieve Size: (mm)	19	19	*	*	*	*
Field Wet Density: t/m <sup>3</sup>	2.03	2.04	*	*	*	*
Peak Conv. Wet Density: t/m <sup>3</sup>	2.02	1.99	*	*	*	*
Adj. Peak Conv. Wet Density: t/m <sup>3</sup>	*	*	*	*	*	*
Moisture Variation: % (Wet/Dry)	0.5Dry	2.0Dry	*	*	*	*
Adj. Moist. Variation: % (Wet/Dry)	*	*	*	*	*	*
Moisture Content: %	*	*	*	*	*	*
<b>HILF DENSITY RATIO (%):</b>	<b>100.5</b>	<b>102.5</b>	*	*	*	*

#Map Datum AUS84

As Per: AS1289 5.7.1 5.8.1

Approved Signatory:



B.P.Mott

The results of the tests included in this document are traceable to Australian /National Standards. Accredited for compliance with ISO/IEC 17025.

This document shall not be reproduced, except in full.



Echuca: Corporate Site #16874  
 Shed 3, 140 Ogilvie Ave, Echuca, 3564  
 PO Box 13, Strathdale, 3550 Ph(03) 5441 4881, Fax (03) 5441 5089

Laboratory accreditation number 19506

Offices: Bendigo, Echuca Web: www.geotestsouthern.com.au Email: info@geotestsouthern.com.au ABN: 18 169 924 109 ACN: 169 924 109

- Geotechnical Investigations • Contract Drilling • Land Capability Assessments • Contamination Assessments • Compaction Control Testing • On-site Wastewater Management • Site Classifications • Residential and Industrial • Soil, Concrete and Aggregate Testing Laboratories • Site Laboratory • Construction Material Testing Services



Client: Midland Contracting P.O. Box 626 BENDIGO VICTORIA 3550	Report N <sup>o</sup> :	16E3149
	Revision N <sup>o</sup> :	REV 0
	Sheet:	1 of 2
	Date of Report:	4/11/2016

Project:	Lakeview Stage 4, Moama					
Location:	House Lots					
Test Request No / Lot No:	*					
Layer Thickness: (mm)	300mm					
Depth Below FSL/CSL:	150mm					
Compaction Type:	Standard					
Date Sampled:	2/11/2016					
Sampling Method:	AS1289.1.2.1 part 6.4b					
Material Description:	16E3149	/A	Brown Silty Clay			
	16E3149	/B	Brown Silty Clay			
	16E3149	/C	Brown Silty Clay			
	16E3149	/D	Brown Silty Clay			
Material Stabilised:	No	If Stabilised Time from Stabilisation to Lab Test:				*
Test Number:	16E3149A	16E3149B	16E3149C	16E3149D	*	*
Hilf Density Ratio (%):	<b>98.5</b>	<b>100.0</b>	<b>102.0</b>	<b>100.5</b>	*	*

As Per: AS1289 5.7.1 5.8.1

Approved Signatory:   
 B.P.Mott

The results of the tests included in this document are traceable to Australian /National Standards. Accredited for compliance with ISO/IEC 17025.  
 This document shall not be reproduced, except in full.



Echuca: Corporate Site #16874  
 Shed 3, 140 Ogilvie Ave, Echuca, 3564  
 PO Box 13, Strathdale, 3550 Ph(03) 5441 4881, Fax (03) 5441 5089

Laboratory accreditation number 19506

Offices: Bendigo, Echuca Web: www.geotestsouthern.com.au Email: info@geotestsouthern.com.au ABN: 18 169 924 109 ACN: 169 924 109

- Geotechnical Investigations • Contract Drilling • Land Capability Assessments • Contamination Assessments • Compaction Control Testing • On-site Wastewater Management • Site Classifications • Residential and Industrial • Soil, Concrete and Aggregate Testing Laboratories • Site Laboratory • Construction Material Testing Services

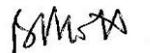
Client: Midland Contracting P.O. Box 626 BENDIGO VICTORIA 3550	Report N <sup>o</sup> :	16E3149
	Revision N <sup>o</sup> :	REV 0
	Sheet:	2 of 2
	Date of Report:	4/11/2016

Test Number:	16E3149A	16E3149B	16E3149C	16E3149D	*	*	
Project Test Number:	*	*	*	*	*	*	
Time of Test:	3:40pm	3:38pm	3:33pm	3:44pm	*	*	
Probe Depth: (mm)	275	275	275	275	*	*	
Chainage:	Lot 101	Lot 100	Lot 99	Lot 102	*	*	
Reduced Level: (mm)	-150.0	-150.0	-150.0	-150.0	*	*	
Offset / Centre Line:	Refer to Map	Refer to Map	Refer to Map	Refer to Map	*	*	
#Eastings:	*	No GPS	No GPS	No GPS	No GPS	*	*
#Northings:	*	*	*	*	*	*	*
Percentage Oversize Wet:	0.0	0.0	0.0	0.0	*	*	
Oversize Sieve Size: (mm)	19	19	19	19	*	*	
Field Wet Density: t/m <sup>3</sup>	1.94	1.99	2.03	2.02	*	*	
Peak Conv. Wet Density: t/m <sup>3</sup>	1.97	1.99	1.99	2.01	*	*	
Adj. Peak Conv. Wet Density: t/m <sup>3</sup>	*	*	*	*	*	*	
Moisture Variation: % (Wet/Dry)	2.5Dry	0.5Dry	1.0Dry	1.5Dry	*	*	
Adj. Moist. Variation: % (Wet/Dry)	*	*	*	*	*	*	
Moisture Content: %	*	*	*	*	*	*	
<b>HILF DENSITY RATIO (%):</b>	<b>98.5</b>	<b>100.0</b>	<b>102.0</b>	<b>100.5</b>	*	*	

#Map Datum AUS84

As Per: AS1289      5.7.1      5.8.1

Approved Signatory:



B.P.Mott

The results of the tests included in this document are traceable to Australian /National Standards. Accredited for compliance with ISO/IEC 17025.

This document shall not be reproduced, except in full.



Echuca: Corporate Site #16874  
 Shed 3, 140 Ogilvie Ave, Echuca, 3564  
 PO Box 13, Strathdale, 3550 Ph(03) 5441 4881, Fax (03) 5441 5089

Laboratory accreditation number 19506

Offices: Bendigo, Echuca    Web: www.geotestsouthern.com.au    Email: info@geotestsouthern.com.au    ABN: 18 169 924 109    ACN: 169 924 109

• Geotechnical Investigations • Contract Drilling • Land Capability Assessments • Contamination Assessments • Compaction Control Testing • On-site Wastewater Management • Site Classifications • Residential and Industrial • Soil, Concrete and Aggregate Testing Laboratories • Site Laboratory • Construction Material Testing Services