

Lucas Grange Stage 2B Alfredton

Earthworks Supervision Report for Madica

Report 21C 1067-1
December 2021

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Revision

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1 INTRODUCTION

Madica commissioned Geotechnical Testing Services (GTS) to undertake Level 1 Supervision and testing (*AS3798-2007*) for the earthworks at Lucas Grange Stage 2B, Alfredton.

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

GTS provided Level 1 inspection and testing of the engineered fill placed to raise the surface of Lots 191 to 193 and Lots 210 to 212 in Stage 2B.

The total depth of engineered fill across the sites varied from none to 1.2 metres, with approximate locations shown on the attached site plan. It is noted that the client has indicated that between 0.2 to 0.3 metres of uncontrolled fill (topsoil) will subsequently be placed over the engineered fill to bring the Lots to their finished surface level (FSL).

It is noted that areas with less than 0.4 metres total fill depth were not included in the controlled fill.

2.2 Placement Specification

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 sites were considered small scale operation (between 500m² and 2500m²). Therefore, a minimum of 1 test per layer per 1000m², 1 test per 200m³ or 1 test per Lot per layer is required. The testing conducted meets the minimum requirement.

3 INSPECTION AND TESTING

Inspection of the excavated base was conducted by a geotechnical engineer and it was observed that the unsuitable material (vegetation, topsoil/silt) had been removed with the base consisting of a stiff to very stiff silty clay material of good strength.

Level 1 supervision, 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 Ballarat 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 the full NATA accredited reports included in the Appendix.

Project No.	Sample No.	Test Date	Location	Reduced Level* (mm)	Moisture Variation % O.M.C.	Hilf Density Ratio %
1	D21-2468A	26/11/2021	Lot 191	-500	2.0 dry	97.0
2	D21-2468B	26/11/2021	Lot 191	-200	2.0 dry	101.5
3	D21-2468C	26/11/2021	Lot 192	-500	1.5 dry	97.5
4	D21-2468D	26/11/2021	Lot 192	-200	1.5 dry	101.5
5	D21-2468E	26/11/2021	Lot 193	-500	1.5 dry	96.0
6	D21-2468F	26/11/2021	Lot 193	-200	0.5 dry	102.0
7	D21-2468G	26/11/2021	Lot 210	-900	2.0 dry	106.5
8	D21-2468H	26/11/2021	Lot 211	-900	3.0 dry	100.0
9	D21-2468I	26/11/2021	Lot 212	-900	2.0 dry	101.0
10	D21-2471A	29/11/2021	Lot 212	-600	4.0 dry	104.5
11	D21-2471B	29/11/2021	Lot 211	-600	3.5 dry	105.5
12	D21-2471C	29/11/2021	Lot 210	-600	2.0 dry	103.0
13	D21-2474A	30/11/2021	Lot 210	-300	0.0	101.5
14	D21-2474B	30/11/2021	Lot 211	-300	0.0	100.0
15	D21-2474C	30/11/2021	Lot 212	-300	0.5 dry	100.0

5 STATEMENT OF COMPLIANCE

GTS personnel have provided Level 1 inspection and testing services during the placement of material for the filling of Lots 191 to 193 and Lots 210 to 212. 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 up to an additional 200 to 300mm of topsoil will subsequently be placed over the engineered fill. This topsoil layer is not considered to be controlled fill.

Subject to residential site classifications, the controlled fill material is deemed a suitable founding medium for future residential buildings.

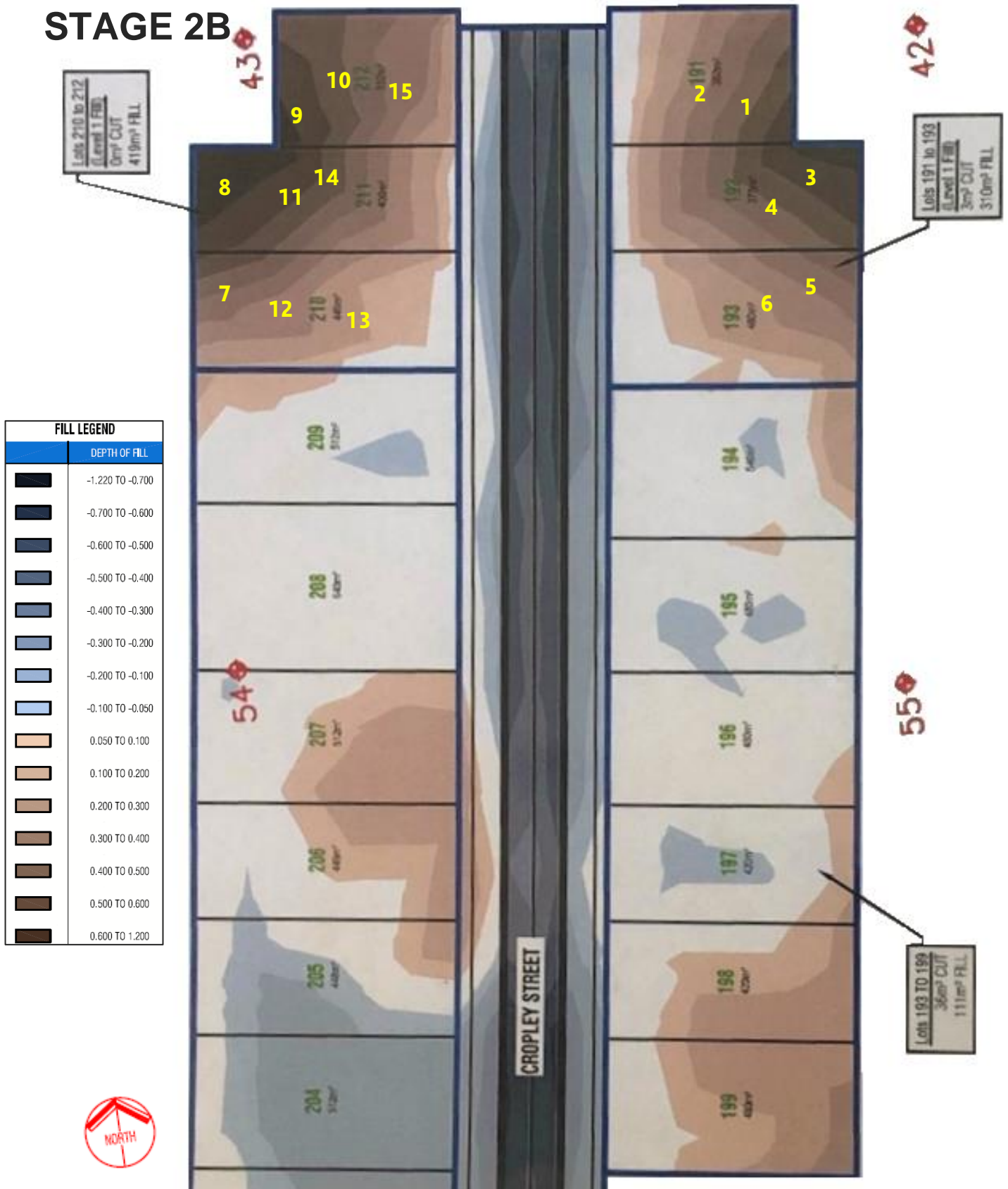


Benj Beatty BA/BSc (Hons), MPA, MAusIMM
Senior Engineering Geologist

APPENDIX

LUCAS GRANGE

STAGE 2B



Material Test Report

Report Number: P21398-25
Issue Number: 1
Date Issued: 01/12/2021
Client: Madica Pty Ltd
 PO Box 173, Buninyong Victoria 3357
Contact: Wayne Sheridan
Project Number: P21398
Project Name: Lucas Grange
Project Location: Lucas Grange - Stage 2B - Level 1
Work Request: 2468
Date Sampled: 26/11/2021
Dates Tested: 26/11/2021 - 30/11/2021
Sampling Method: AS 1289.1.2.1 6.4 (b) - Sampling from layers in earthworks or pavement - compacted
Site Selection: Selected By Tester
Material Source: Test location



Geotechnical Testing Services (Southern)
 Ballarat Soil and Concrete Testing Laboratory
 Unit 6, 33 Laidlaw Drive Delacombe VIC 3356
 Phone: (03) 5335 6494
 Email: joshl@gts.com.au

Accredited for compliance with ISO/IEC 17025 - Testing



Approved Signatory: Josh Lagodzki
 NATA Accredited Laboratory Number: 19506

Compaction Control AS 1289 5.7.1 & 5.8.1 & 2.1.1					
Sample Number	D21-2468A	D21-2468B	D21-2468C	D21-2468D	D21-2468E
Date Tested	26/11/2021	26/11/2021	26/11/2021	26/11/2021	26/11/2021
Time Tested	13:55	13:56	14:01	14:05	14:11
Test Request #/Location	House lot 191	House lot 191	House lot 192	House lot 192	House lot 193
Easting	54h 745866	54h 745866	54h 745882	54h 745877	54h 745875
Northing	5839740	5839742	5839713	5839721	5839709
Layer / Reduced Level	-500	-200	-500	-200	-500
Thickness of Layer (mm)	300	300	300	300	300
Soil Description	Brown Silty/Gravelly Clay	Brown Silty/Gravelly Clay	Brown Silty/Gravelly Clay	Brown Silty/Gravelly Clay	Brown Silty/Gravelly Clay
Test Depth (mm)	275	275	275	275	275
Sieve used to determine oversize (mm)	19.0	19.0	19.0	19.0	19.0
Percentage of Wet Oversize (%)	0	0	0	0	0
Field Wet Density (FWD) t/m ³	2.12	2.12	1.92	1.92	2.03
Field Moisture Content %	32.2	25.2	27.0	27.9	31.4
Field Dry Density (FDD) t/m ³	1.60	1.69	1.51	1.50	1.55
Peak Converted Wet Density t/m ³	2.19	2.09	1.97	1.89	2.12
Adjusted Peak Converted Wet Density t/m ³	**	**	**	**	**
Moisture Variation (Wv) %	2.0	2.0	1.5	1.5	1.5
Adjusted Moisture Variation %	**	**	**	**	**
Hilf Density Ratio (%)	97.0	101.5	97.5	101.5	96.0
Compaction Method	Standard	Standard	Standard	Standard	Standard
Report Remarks	**	**	**	**	**

Moisture Variation Note:

Positive values = test is dry of OMC
 Negative values = test is wet of OMC

Material Test Report



Report Number: P21398-25
Issue Number: 1
Date Issued: 01/12/2021
Client: Madica Pty Ltd
 PO Box 173, Buninyong Victoria 3357
Contact: Wayne Sheridan
Project Number: P21398
Project Name: Lucas Grange
Project Location: Lucas Grange - Stage 2B - Level 1
Work Request: 2468
Date Sampled: 26/11/2021
Dates Tested: 26/11/2021 - 30/11/2021
Sampling Method: AS 1289.1.2.1 6.4 (b) - Sampling from layers in earthworks or pavement - compacted
Site Selection: Selected By Tester
Material Source: Test location

Geotechnical Testing Services (Southern)
 Ballarat Soil and Concrete Testing Laboratory
 Unit 6, 33 Laidlaw Drive Delacombe VIC 3356
 Phone: (03) 5335 6494
 Email: joshl@gts.com.au

Accredited for compliance with ISO/IEC 17025 - Testing



Approved Signatory: Josh Lagodzki
 NATA Accredited Laboratory Number: 19506

Compaction Control AS 1289 5.7.1 & 5.8.1 & 2.1.1					
Sample Number	D21-2468F	D21-2468G	D21-2468H	D21-2468I	
Date Tested	26/11/2021	26/11/2021	26/11/2021	26/11/2021	
Time Tested	14:13	14:45	14:44	14:41	
Test Request #/Location	House lot 193	House lot 210	House lot 211	House lot 212	
Easting	54h 745873	54h 745801	54h 745806	54h 745820	
Northing	5839712	5839729	5839739	5839743	
Layer / Reduced Level	-200	-900	-900	-900	
Thickness of Layer (mm)	300	300	300	300	
Soil Description	Brown Silty/Gravelly Clay	Brown Silty/Gravelly Clay	Brown Silty/Gravelly Clay	Brown Silty/Gravelly Clay	
Test Depth (mm)	275	275	275	275	
Sieve used to determine oversize (mm)	19.0	19.0	19.0	19.0	
Percentage of Wet Oversize (%)	0	0	0	0	
Field Wet Density (FWD) t/m ³	2.12	1.90	1.94	1.90	
Field Moisture Content %	29.2	32.9	20.0	30.0	
Field Dry Density (FDD) t/m ³	1.64	1.43	1.61	1.46	
Peak Converted Wet Density t/m ³	2.08	1.79	1.94	1.88	
Adjusted Peak Converted Wet Density t/m ³	**	**	**	**	
Moisture Variation (Wv) %	0.5	2.0	3.0	2.0	
Adjusted Moisture Variation %	**	**	**	**	
Hilf Density Ratio (%)	102.0	106.5	100.0	101.0	
Compaction Method	Standard	Standard	Standard	Standard	
Report Remarks	**	**	**	**	

Moisture Variation Note:
 Positive values = test is dry of OMC
 Negative values = test is wet of OMC

Material Test Report



Report Number: P21398-26
Issue Number: 1
Date Issued: 01/12/2021
Client: Madica Pty Ltd
 PO Box 173, Buninyong Victoria 3357
Contact: Wayne Sheridan
Project Number: P21398
Project Name: Lucas Grange
Project Location: Lucas Grange - Stage 2B - Level 1
Work Request: 2471
Date Sampled: 29/11/2021
Dates Tested: 29/11/2021 - 30/11/2021
Sampling Method: AS 1289.1.2.1 6.4 (b) - Sampling from layers in earthworks or pavement - compacted
Site Selection: Selected by Client
Material Source: Test location

Geotechnical Testing Services (Southern)
 Ballarat Soil and Concrete Testing Laboratory
 Unit 6, 33 Laidlaw Drive Delacombe VIC 3356
 Phone: (03) 5335 6494
 Email: joshl@gts.com.au

Accredited for compliance with ISO/IEC 17025 - Testing



Approved Signatory: Josh Lagodzki
 NATA Accredited Laboratory Number: 19506

Compaction Control AS 1289 5.7.1 & 5.8.1 & 2.1.1			
Sample Number	D21-2471A	D21-2471B	D21-2471C
Date Tested	29/11/2021	29/11/2021	29/11/2021
Time Tested	10:24	10:27	10:29
Test Request #/Location	House lot 212	House lot 211	House lot 210
Easting	54h 745816	54h 745814	54h 745803
Northing	5839749	5839737	5839729
Layer / Reduced Level	-600	-600	-600
Thickness of Layer (mm)	300	300	300
Soil Description	Brown Silty Clay	Brown Silty Clay	Brown Silty Clay
Test Depth (mm)	275	275	275
Sieve used to determine oversize (mm)	19.0	19.0	19.0
Percentage of Wet Oversize (%)	0	0	0
Field Wet Density (FWD) t/m ³	1.99	2.00	2.00
Field Moisture Content %	26.6	25.1	22.8
Field Dry Density (FDD) t/m ³	1.57	1.60	1.63
Peak Converted Wet Density t/m ³	1.90	1.89	1.94
Adjusted Peak Converted Wet Density t/m ³	**	**	**
Moisture Variation (Wv) %	4.0	3.5	2.0
Adjusted Moisture Variation %	**	**	**
Hilf Density Ratio (%)	104.5	105.5	103.0
Compaction Method	Standard	Standard	Standard
Report Remarks	**	**	**

Moisture Variation Note:

Positive values = test is dry of OMC
 Negative values = test is wet of OMC

Material Test Report



Report Number: P21398-27
Issue Number: 1
Date Issued: 01/12/2021
Client: Madica Pty Ltd
 PO Box 173, Buninyong Victoria 3357
Contact: Wayne Sheridan
Project Number: P21398
Project Name: Lucas Grange
Project Location: Lucas Grange - Stage 2B - Level 1
Work Request: 2474
Date Sampled: 30/11/2021
Dates Tested: 30/11/2021 - 01/12/2021
Sampling Method: AS 1289.1.2.1 6.4 (b) - Sampling from layers in earthworks or pavement - compacted
Remarks: Laboratory Testing Performed by Bendigo Laboratory - Corporate Site Number 835
Site Selection: Selected by Client
Material Source: Test location

Geotechnical Testing Services (Southern)
 Ballarat Soil and Concrete Testing Laboratory
 Unit 6, 33 Laidlaw Drive Delacombe VIC 3356
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Approved Signatory: Josh Lagodzki
 NATA Accredited Laboratory Number: 19506

Compaction Control AS 1289 5.7.1 & 5.8.1 & 2.1.1			
Sample Number	D21-2474A	D21-2474B	D21-2474C
Date Tested	30/11/2021	30/11/2021	30/11/2021
Time Tested	11:34	11:37	11:38
Test Request #/Location	House lot 210	House lot 211	House lot 212
Easting	54h 745802	54h 745813	54h 745824
Northing	5839726	5839730	5839749
Layer / Reduced Level	-300	-300	-300
Thickness of Layer (mm)	300	300	300
Soil Description	Brown silty clay	Brown silty clay	Brown silty clay
Test Depth (mm)	275	275	275
Sieve used to determine oversize (mm)	19.0	19.0	19.0
Percentage of Wet Oversize (%)	0	0	0
Field Wet Density (FWD) t/m ³	1.95	1.90	1.91
Field Moisture Content %	27.9	27.0	27.5
Field Dry Density (FDD) t/m ³	1.52	1.50	1.50
Peak Converted Wet Density t/m ³	1.92	1.91	1.91
Adjusted Peak Converted Wet Density t/m ³	**	**	**
Moisture Variation (Wv) %	0.0	0.0	0.5
Adjusted Moisture Variation %	**	**	**
Hilf Density Ratio (%)	101.5	100.0	100.0
Compaction Method	Standard	Standard	Standard
Report Remarks	**	**	**

Moisture Variation Note:

Positive values = test is dry of OMC
 Negative values = test is wet of OMC