

Provenance Estate Stage 3 Huntly

Earthworks Supervision Report for Maine Civil

Report 21C 0302
September, 2021

Provenance Estate Stage 3 Huntly

Earthworks Supervision Report for Maine Civil

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1 INTRODUCTION

Maine Civil commissioned Geotechnical Testing Services (GTS) to undertake Level 1 Supervision and testing (AS3798-2007) for the earthworks for the residential subdivision Provenance Estate Stage 3, Huntly.

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 level Lots 226 to 227, 230 to 234, 241 and 249 to 254.

The depth of fill across the site varied from none to around 700mm with the approximate locations shown on the attached site plan. It is noted that sites with less than 300mm were not included in the controlled fill.

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 filling area varies but may be considered small to large scale filling (varying from individual residential lots, to greater than 1500m²) which requires a minimum of 1 test per layer per 2500m² or 1 test per 500m³ for large scale filling and 1 test per

layer per 1000m² or 1 test per residential lot per layer for small scale filling. The testing conducted meets the minimum requirements.

3 INSPECTION AND TESTING

Inspection of the excavated bases were conducted by a Senior Geotechnical Engineer and it was observed that the unsuitable material (vegetation, topsoil/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.	Sample No.	Test Date	Location	Reduced Level (mm)	Moisture Variation %O.M.C	Hilf Density Ratio %
1	B21-8765A	23/03/2021	Lot 232	-400	1.0	104.0
2	B21-8765B	23/03/2021	Lot 231	-400	0.0	100.5
3	B21-8765C	23/03/2021	Lot 230	-400	0.0	100.0
4	B21-8826A	1/04/2021	Lot 234	FSL	2.5	109.0
5	B21-8826B	1/04/2021	Lot 233	FSL	3.0	104.5
6	B21-8826C	1/04/2021	Lot 232	FSL	2.5	107.0
7	B21-8826D	1/04/2021	Lot 231	FSL	3.0	104.0
8	B21-8826E	1/04/2021	Lot 230	FSL	3.0	105.5
9	B21-8826F	1/04/2021	Lot 241	FSL	3.0	105.0
10	B21-8898A	13/04/2021	Lot 249	-900	2.0	98.0

Project No.	Sample No.	Test Date	Location	Reduced Level (mm)	Moisture Variation %O.M.C	Hilf Density Ratio %
11	B21-8898B	13/04/2021	Lot 250	-900	2.0	103.5
12	B21-8898C	13/04/2021	Lot 251	-400	2.5	102.0
13	B21-8898D	13/04/2021	Lot 252	-400	1.5	103.5
14	B21-8898E	13/04/2021	Lot 253	-300	2.5	105.5
15	B21-8898F	13/04/2021	Lot 254	-300	1.5	106.5
16	B21-8898G	13/04/2021	Lot 226	FSL	5.0	106.0
17	B21-8898H	13/04/2021	Lot 227	FSL	4.0	104.5
18	B21-8929A	19/04/2021	Lot 249	FSL	3.0	103.0
19	B21-8929B	19/04/2021	Lot 249	-300	3.5	103.5
20	B21-8929C	19/04/2021	Lot 249	-600	2.5	97.5
21	B21-8929D	19/04/2021	Lot 250	FSL	0.5	103.5
22	B21-8929E	19/04/2021	Lot 250	-300	2.5	103.0
23	B21-8929F	19/04/2021	Lot 250	-600	2.0	96.5
24	B21-8929G	19/04/2021	Lot 251	FSL	3.0	106.5
25	B21-8929H	19/04/2021	Lot 252	FSL	4.0	106.0
26	B21-8929I	19/04/2021	Lot 253	FSL	2.0	104.0
27	B21-8929J	19/04/2021	Lot 254	FSL	2.5	100.5

5 STATEMENT OF COMPLIANCE

GTS personnel have provided Level 1 inspection and testing services during the placement of material for filling and levelling of Lots 226 to 227, 230 to 234, 241 and 249 to 254. 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. Therefore, subject to residential site classifications, the controlled fill material is deemed a suitable founding medium for future residential buildings. It is noted that topsoil material may be spread across the sites following completion of these earthworks and that this topsoil material is not considered controlled fill.

Prepared by



Jackson Blakemore BE (Hons), GradIEAust
Geotechnical Engineer

Reviewed by



Shane Hampton BE (Hons), MIEAust
Principal Geotechnical Engineer

APPENDIX



Fig 1 Site Plan

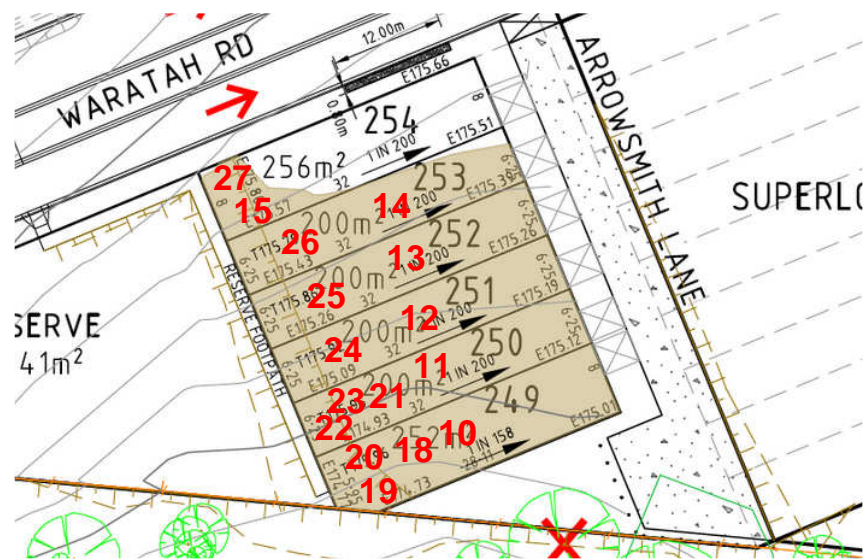


Fig 2 Site Plan

Material Test Report



Report Number: P19806-15
Issue Number: 1
Date Issued: 24/03/2021
Client: Mainecivil
 9 Merrifield St, CASTLEMAINE Vic 3450
Contact: George Hodoras
Project Number: P19806
Project Name: Provenance Estate
Project Location: Huntly
Work Request: 8765
Date Sampled: 23/03/2021
Dates Tested: 23/03/2021 - 24/03/2021
Sampling Method: AS 1289.1.2.1 6.4 (b) - Sampling from layers in earthworks or pavement - compacted
Site Selection: Selected by Client
Location: Huntly
Lot Number: Stage 2
Material Source: Test Location

Geotechnical Testing Services (Southern)
 Bendigo Soil and Concrete Testing Laboratory
 13 Alstonvale Court East Bendigo VIC 3550
 Phone: (03) 5441 4881
 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			
Sample Number	B21-8765A	B21-8765B	B21-8765C
Date Tested	23/03/2021	23/03/2021	23/03/2021
Time Tested	15:22	15:30	15:38
Test Request #/Location	House Block Block 232	House Block Block 231	House Block Block 230
Chainage (m)	North West	North West	North West
Location Offset (m)	Corner	Corner	Corner
Layer / Reduced Level	-400	-400	-400
Thickness of Layer (mm)	300	300	300
Soil Description	Gravelly Clay	Gravelly Clay	Gravelly 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	2.08	2.14	2.11
Field Dry Density (FDD) t/m ³	**	**	**
Peak Converted Wet Density t/m ³	2.01	2.14	2.11
Adjusted Peak Converted Wet Density t/m ³	**	**	**
Moisture Variation (Wv) %	1.0	0.0	0.0
Adjusted Moisture Variation %	**	**	**
Hilf Density Ratio (%)	104.0	100.5	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

Material Test Report



Report Number: P19806-16
Issue Number: 1
Date Issued: 06/04/2021
Client: Mainecivil
 9 Merrifield St, CASTLEMAINE Vic 3450
Contact: George Hodoras
Project Number: P19806
Project Name: Provenance Estate
Project Location: Huntly
Work Request: 8826
Date Sampled: 01/04/2021
Dates Tested: 01/04/2021 - 06/04/2021
Sampling Method: AS 1289.1.2.1 6.4 (b) - Sampling from layers in earthworks or pavement - compacted
Site Selection: Selected by Client
Location: Huntly
Lot Number: Stage 2
Material Source: Test Location

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Approved Signatory: Josh Lagodzki
 NATA Accredited Laboratory Number: 19506

Compaction Control AS 1289 5.7.1 & 5.8.1						
Sample Number	B21-8826A	B21-8826B	B21-8826C	B21-8826D	B21-8826E	B21-8826F
Date Tested	01/04/2021	01/04/2021	01/04/2021	01/04/2021	01/04/2021	01/04/2021
Time Tested	14:49	14:54	15:00	15:04	15:07	15:11
Test Request #/Location	Stage 2 House Blocks	Stage 2 House Blocks	Stage 2 House Blocks	Stage 2 House Blocks	Stage 2 House Blocks	Stage 2 House Blocks
Chainage (m)	Lot 234	Lot 233	Lot 232	Lot 231	Lot 230	Lot 241
Location Offset (m)	Rear Centre	Front Centre	Front Centre	Front Centre	Front Centre	Rear Centre
Layer / Reduced Level	FSL	FSL	FSL	FSL	FSL	FSL
Thickness of Layer (mm)	300	300	300	300	300	300
Soil Description	Gravelly Silty Clay	Gravelly Silty Clay	Gravelly Silty Clay	Gravelly Silty Clay	Gravelly Silty Clay	Gravelly Silty Clay
Test Depth (mm)	250	250	250	250	250	250
Sieve used to determine oversize (mm)	19.0	19.0	19.0	19.0	19.0	19.0
Percentage of Wet Oversize (%)	0	0	0	0	0	0
Field Wet Density (FWD) t/m ³	2.14	2.11	2.12	2.07	2.10	2.05
Field Dry Density (FDD) t/m ³	**	**	**	**	**	**
Peak Converted Wet Density t/m ³	1.97	2.02	1.98	1.99	1.99	1.95
Adjusted Peak Converted Wet Density t/m ³	**	**	**	**	**	**
Moisture Variation (Wv) %	2.5	3.0	2.5	3.0	3.0	3.0
Adjusted Moisture Variation %	**	**	**	**	**	**
Hilf Density Ratio (%)	109.0	104.5	107.0	104.0	105.5	105.0
Compaction Method	Standard	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: P19806-17
Issue Number: 1
Date Issued: 14/04/2021
Client: Mainecivil
 9 Merrifield St, CASTLEMAINE Vic 3450
Contact: George Hodoras
Project Number: P19806
Project Name: Provenance Estate
Project Location: Huntly
Work Request: 8898
Date Sampled: 13/04/2021
Dates Tested: 13/04/2021 - 13/04/2021
Sampling Method: AS 1289.1.2.1 6.4 (b) - Sampling from layers in earthworks or pavement - compacted
Site Selection: Selected by Client
Location: Huntly
Material Source: Test location

Geotechnical Testing Services (Southern)
 Bendigo Soil and Concrete Testing Laboratory
 13 Alstonvale Court East Bendigo VIC 3550
 Phone: (03) 5441 4881
 Email: joshl@gts.com.au

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Approved Signatory: Josh Lagodzki
 NATA Accredited Laboratory Number: 19506

Compaction Control AS 1289 5.7.1 & 5.8.1				
Sample Number	B21-8898A	B21-8898B	B21-8898C	B21-8898D
Date Tested	13/04/2021	13/04/2021	13/04/2021	13/04/2021
Time Tested	10:13	10:17	10:18	10:20
Test Request #/Location	Stage 2 House blocks	Stage 2 House blocks	Stage 2 House blocks	Stage 2 House blocks
Chainage (m)	Lot 249	Lot 250	Lot 251	Lot 252
Location Offset (m)	Back Of Block	Back Of Block	Back Of Block	Back Of Block
Elevation (m)	-900	-900	-400	-400
Thickness of Layer (mm)	300	300	300	300
Soil Description	Gravelly Silty Clay	Gravelly Silty Clay	Gravelly Silty Clay	Gravelly Silty Clay
Test Depth (mm)	250	250	250	250
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	2.01	2.11	2.07	2.09
Field Dry Density (FDD) t/m ³	**	**	**	**
Peak Converted Wet Density t/m ³	2.05	2.04	2.03	2.02
Adjusted Peak Converted Wet Density t/m ³	**	**	**	**
Moisture Variation (Wv) %	2.0	2.0	2.5	1.5
Adjusted Moisture Variation %	**	**	**	**
Hilf Density Ratio (%)	98.0	103.5	102.0	103.5
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: P19806-17
Issue Number: 1
Date Issued: 14/04/2021
Client: Mainecivil
 9 Merrifield St, CASTLEMAINE Vic 3450
Contact: George Hodoras
Project Number: P19806
Project Name: Provenance Estate
Project Location: Huntly
Work Request: 8898
Date Sampled: 13/04/2021
Dates Tested: 13/04/2021 - 13/04/2021
Sampling Method: AS 1289.1.2.1 6.4 (b) - Sampling from layers in earthworks or pavement - compacted
Site Selection: Selected by Client
Location: Huntly
Material Source: Test location

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Compaction Control AS 1289 5.7.1 & 5.8.1				
Sample Number	B21-8898E	B21-8898F	B21-8898G	B21-8898H
Date Tested	13/04/2021	13/04/2021	13/04/2021	13/04/2021
Time Tested	10:22	10:24	10:35	10:38
Test Request #/Location	Stage 2 House blocks	Stage 2 House blocks	Stage 2 House blocks	Stage 2 House blocks
Chainage (m)	Lot 253	Lot 254	Lot 226	Lot 227
Location Offset (m)	Back Of Block	Back Of Block	Centre of Block	Back Right of Block
Elevation (m)	-300	-300	FSL	FSL
Thickness of Layer (mm)	300	300	300	300
Soil Description	Gravelly Silty Clay	Gravelly Silty Clay	Gravelly Silty Clay	Gravelly Silty Clay
Test Depth (mm)	250	250	250	250
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	2.09	2.12	2.09	2.05
Field Dry Density (FDD) t/m ³	**	**	**	**
Peak Converted Wet Density t/m ³	1.98	1.98	1.96	1.96
Adjusted Peak Converted Wet Density t/m ³	**	**	**	**
Moisture Variation (Wv) %	2.5	1.5	5.0	4.0
Adjusted Moisture Variation %	**	**	**	**
Hilf Density Ratio (%)	105.5	106.5	106.0	104.5
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: P19806-18
Issue Number: 1
Date Issued: 20/04/2021
Client: Mainecivil
 9 Merrifield St, CASTLEMAINE Vic 3450
Contact: George Hodoras
Project Number: P19806
Project Name: Provenance Estate
Project Location: Huntly
Work Request: 8929
Date Sampled: 19/04/2021
Dates Tested: 19/04/2021 - 19/04/2021
Sampling Method: AS 1289.1.2.1 6.4 (b) - Sampling from layers in earthworks or pavement - compacted
Site Selection: Selected by Client
Location: Huntly
Material Source: Test Location

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 Phone: (03) 5441 4881
 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					
Sample Number	B21-8929A	B21-8929B	B21-8929C	B21-8929D	B21-8929E
Date Tested	19/04/2021	19/04/2021	19/04/2021	19/04/2021	19/04/2021
Time Tested	09:28	09:32	09:36	09:41	09:46
Test Request #/Location	Stage 2 House Blocks	Stage 2 House Blocks	Stage 2 House Blocks	Stage 2 House Blocks	Stage 2 House Blocks
Chainage (m)	Lot 249	Lot 249	Lot 249	Lot 250	Lot 250
Location Offset (m)	Back Centre of Block	Back Centre of Block	Back Centre of Block	Back Centre of Block	Back Centre of Block
Layer / Reduced Level	FSL	-300	-600	FSL	-300
Thickness of Layer (mm)	300	300	300	300	300
Soil Description	Gravelly Silty Clay	Gravelly Silty Clay	Gravelly Silty Clay	Gravelly Silty Clay	Gravelly Silty Clay
Test Depth (mm)	250	250	250	250	250
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	2.03	2.08	1.99	2.14	2.10
Field Dry Density (FDD) t/m ³	**	**	**	**	**
Peak Converted Wet Density t/m ³	1.97	2.01	2.04	2.06	2.04
Adjusted Peak Converted Wet Density t/m ³	**	**	**	**	**
Moisture Variation (Wv) %	3.0	3.5	2.5	0.5	2.5
Adjusted Moisture Variation %	**	**	**	**	**
Hilf Density Ratio (%)	103.0	103.5	97.5	103.5	103.0
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: P19806-18
Issue Number: 1
Date Issued: 20/04/2021
Client: Mainecivil
 9 Merrifield St, CASTLEMAINE Vic 3450
Contact: George Hodoras
Project Number: P19806
Project Name: Provenance Estate
Project Location: Huntly
Work Request: 8929
Date Sampled: 19/04/2021
Dates Tested: 19/04/2021 - 19/04/2021
Sampling Method: AS 1289.1.2.1 6.4 (b) - Sampling from layers in earthworks or pavement - compacted
Site Selection: Selected by Client
Location: Huntly
Material Source: Test Location



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Approved Signatory: Josh Lagodzki
 NATA Accredited Laboratory Number: 19506

Compaction Control AS 1289 5.7.1 & 5.8.1					
Sample Number	B21-8929F	B21-8929G	B21-8929H	B21-8929I	B21-8929J
Date Tested	19/04/2021	19/04/2021	19/04/2021	19/04/2021	19/04/2021
Time Tested	09:51	09:56	10:02	10:09	10:15
Test Request #/Location	Stage 2 House Blocks	Stage 2 House Blocks	Stage 2 House Blocks	Stage 2 House Blocks	Stage 2 House Blocks
Chainage (m)	Lot 250	Lot 251	Lot 252	Lot 253	Lot 254
Location Offset (m)	Back Centre of Block	Back Centre of Block	Centre of Block	Centre of Block	Centre of Block
Layer / Reduced Level	-600	FSL	FSL	FSL	FSL
Thickness of Layer (mm)	300	300	300	300	300
Soil Description	Gravelly Silty Clay	Gravelly Silty Clay	Gravelly Silty Clay	Gravelly Silty Clay	Gravelly Silty Clay
Test Depth (mm)	250	250	250	250	250
Sieve used to determine oversize (mm)	19.0	19.0	19.0	19.0	19.0
Percentage of Wet Oversize (%)	2	0	2	0	3
Field Wet Density (FWD) t/m ³	1.98	2.13	2.13	2.15	2.04
Field Dry Density (FDD) t/m ³	**	**	**	**	**
Peak Converted Wet Density t/m ³	**	2.00	**	2.06	**
Adjusted Peak Converted Wet Density t/m ³	2.06	**	2.01	**	2.03
Moisture Variation (Wv) %	**	3.0	**	2.0	**
Adjusted Moisture Variation %	2.0	**	4.0	**	2.5
Hilf Density Ratio (%)	96.5	106.5	106.0	104.0	100.5
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