

Mclvor Forest Estate Stage 17, Junortoun

Earthworks Supervision Report for Maine Civil

Report 16C 0713
August, 2016

Mclvor Forest Estate Stage 17 Junortoun

Earthworks Supervision Report

for
Maine Civil

Revision

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Site Plan
Test Reports

1 INTRODUCTION

Maine Civil commissioned Geotechnical Testing Services (GTS) to undertake Level 1 Supervision and testing (AS3798-2007) for the earthworks at Mclvor Forest Stage 17 residential subdivision on Aberdeen Drive, Junortoun.

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 throughout Lots 1 to 4 and 34 to 40.

The depth of fill across the site varied from none to around 1 metre with the approximate fill depth shown on the attached site plan. It is noted that the sites with less than 300mm 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 1500m²) and therefore a minimum of 3 test per visit is required.

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, 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	15B 1589A	30/9/15	Lot 38	700	0.0	99.0
2	15B 1589B	30/9/15	Lot 37	700	0.5 dry	97.5
3	15B 1589C	30/9/15	Lot 36	700	1.0 dry	98.5
4	15B 1612A	6/10/15	Lot 1	FSL	0.5 dry	104.0
5	15B 1612B	6/10/15	Lot 2/3	FSL	0.0	104.5
6	16B 0061A	20/1/16	Lot 36	300	2.5 dry	97.5
7	16B 0061B	20/1/16	Lot 37	300	2.0 dry	100.0
8	16B 0061C	20/1/16	Lot 38	300	0.0	100.0
9	16B 0061D	20/1/16	Lot 40	300	4.0 dry	102.5
10	16B 0080A	22/1/16	Lot 35	FSL	3.0 dry	100.0
11	16B 0080B	22/1/16	Lot 37	FSL	0.0	101.0
12	16B 0080C	22/1/16	Lot 38	FSL	2.0 dry	102.5
13	16B 0080D	22/1/16	Lot 40	FSL	2.5 dry	98.5

It is noted that due to the area of the fill placed, that compaction control tests are not required on every lot. As such, whilst no direct tests were conducted on Lots 4,34 and 39, the fill is still considered to be controlled on these sites.

5 STATEMENT OF COMPLIANCE

GTS personnel have provided Level 1 inspection and testing services during the placement of material for the filling of across Lots 1 to 4 and 34 to 40. 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 top soil material may be spread across the sites following completion of these earthworks and that this top soil material is not considered controlled fill.



Shane Hampton (BE (Hons))
Senior Geotechnical Engineer

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Email: shaneh@geotestsouthern.com.au

APPENDIX



GENERAL NOTES

1. THIS PLAN SHOWS DETAILS OF FILLING CARRIED OUT ON THE FOREST ESTATE
2. FILL DEPTHS ARE APPROXIMATE & INDICATIVE. PLAN SHOULD BE CONSIDERED IN CONJUNCTION WITH INVESTIGATIONS CARRIED OUT BY GEOTECHNICAL SERVICES
3. THIS PLAN DOES NOT SHOW ANY OTHER FILL PLACED PRIOR TO RESIDENTIAL SUBMISSION OF T OR SPREADING TO CORRECT MINOR SURFACE IRE
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Fig 1: Site Plan



Fig 2: Site Plan

COMPACTION ASSESSMENT

Nuclear Gauge Method Hilf (Wet) Density Ratio

TEST REPORT:
GEOTECHNICAL
 TESTING SERVICES
 SOUTHERN

Client: Mainecivil 9 Merrifield Street CASTLEMAINE VICTORIA 3450	Report N ^o :	15B1589
	Revision N ^o :	REV 0
	Sheet:	1 of 2
	Date of Report:	1/10/2015

Project:	Mclvor Forrest Estate Junortoun					
Location:	House Blocks					
Test Request No / Lot No:	*					
Layer Thickness: (mm)	300mm					
Depth Below FSL/CSL:	Layer 1					
Compaction Type:	Standard					
Date Sampled:	30/09/2015					
Sampling Method:	AS1289.1.2.1 part 6.4b					
Material Description:	15B1589	/A	Brown Silty Clay			
	15B1589	/B	Brown Silty Clay			
	15B1589	/C	Brown Silty Clay			
Material Stabilised:	No	If Stabilised Time from Stabilisation to Lab Test:				*
Test Number:	15B1589A	15B1589B	15B1589C	*	*	*
Hilf Density Ratio (%):	99.0	97.5	98.5	*	*	*

As Per: AS1289 5.7.1 5.8.1

Approved Signatory:

B.P.Mott

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Bendigo: Corporate Site #835

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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

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COMPACTION ASSESSMENT

Nuclear Gauge Method Hilf (Wet) Density Ratio

TEST REPORT:
GEOTECHNICAL
 TESTING SERVICES
 SOUTHERN

Client: Mainecivil 9 Merrifield Street CASTLEMAINE VICTORIA 3450	Report N ^o :	15B1589
	Revision N ^o :	REV 0
	Sheet:	2 of 2
	Date of Report:	1/10/2015

Test Number:	15B1589A	15B1589B	15B1589C	*	*	*
Project Test Number:	*	*	*	*	*	*
Time of Test:	2.15pm	2.25pm	2.35pm	*	*	*
Probe Depth: (mm)	275	275	275	*	*	*
Chainage:	Lot 38	Lot 37	Lot 36	*	*	*
Reduced Level: (mm)	Layer 1	Layer 1	Layer 1	*	*	*
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 ³	2.05	1.97	2.03	*	*	*
Peak Conv. Wet Density: t/m ³	2.07	2.02	2.06	*	*	*
Adj. Peak Conv. Wet Density: t/m ³	*	*	*	*	*	*
Moisture Variation: % (Wet/Dry)	0.0Wet	0.5Dry	1.0Dry	*	*	*
Adj. Moist. Variation: % (Wet/Dry)	*	*	*	*	*	*
Moisture Content: %	*	*	*	*	*	*
HILF DENSITY RATIO (%):	99.0	97.5	98.5	*	*	*

#Map Datum AUS84

As Per: AS1289 5.7.1 5.8.1

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COMPACTION ASSESSMENT

Nuclear Gauge Method Hilf (Wet) Density Ratio

TEST REPORT:
GEOTECHNICAL
 TESTING SERVICES
 SOUTHERN

Client: Mainecivil 9 Merrifield Street CASTLEMAINE VICTORIA 3450	Report N°:	15B/1612
	Revision N°:	REV 0
	Sheet:	1 of 2
	Date of Report:	8/10/2015

Project:	Mclvor Forrest Estate Junortoun					
Location:	House Blocks					
Test Request No / Lot No:	*					
Layer Thickness: (mm)	400mm					
Depth Below FSL/CSL:	FSL					
Compaction Type:	Standard					
Date Sampled:	6/10/2015					
Sampling Method:	AS1289.1.2.1 part 6.4b					
Material Description:	15B/1612	/A	Gravelly silty clay brown			
	15B/1612	/B	Gravelly silty clay brown			
Material Stabilised:	No	If Stabilised Time from Stabilisation to Lab Test:				*
Test Number:	15B/1612A	15B/1612B	*	*	*	*
Hilf Density Ratio (%):	104.0	104.5	*	*	*	*

As Per: AS1289 5.7.1 5.8.1

Approved Signatory:

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COMPACTION ASSESSMENT

Nuclear Gauge Method Hilf (Wet) Density Ratio

TEST REPORT:
GEOTECHNICAL
 TESTING SERVICES
 SOUTHERN

Client: Mainecivil 9 Merrifield Street CASTLEMAINE VICTORIA 3450	Report N ^o :	15B/1612
	Revision N ^o :	REV 0
	Sheet:	2 of 2
	Date of Report:	8/10/2015

Test Number:	15B/1612A	15B/1612B	*	*	*	*
Project Test Number:	*	*	*	*	*	*
Time of Test:	2.10pm	2.20pm	*	*	*	*
Probe Depth: (mm)	300	300	*	*	*	*
Chainage:	Lot 1	Lot 2	*	*	*	*
Reduced Level: (mm)	FSL	FSL	*	*	*	*
Offset / Centre Line:	Front	Front	*	*	*	*
#Eastings:	55026	2797	2792	*	*	*
#Northings:	592	6469	6461	*	*	*
Percentage Oversize Wet:	0.0	0.0	*	*	*	*
Oversize Sieve Size: (mm)	19	19	*	*	*	*
Field Wet Density: t/m ³	2.11	2.14	*	*	*	*
Peak Conv. Wet Density: t/m ³	2.03	2.05	*	*	*	*
Adj. Peak Conv. Wet Density: t/m ³	*	*	*	*	*	*
Moisture Variation: % (Wet/Dry)	0.5Dry	0.0Wet	*	*	*	*
Adj. Moist. Variation: % (Wet/Dry)	*	*	*	*	*	*
Moisture Content: %	*	*	*	*	*	*
HILF DENSITY RATIO (%):	104.0	104.5	*	*	*	*

#Map Datum AUS84

As Per: AS1289 5.7.1 5.8.1

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COMPACTION ASSESSMENT

Nuclear Gauge Method Hilf (Wet) Density Ratio

TEST REPORT:
GEOTECHNICAL
 TESTING SERVICES
 SOUTHERN

Client: Mainecivil 9 Merrifield Street CASTLEMAINE VICTORIA 3450	Report N°:	16B0061
	Revision N°:	REV 0
	Sheet:	1 of 2
	Date of Report:	22/01/2016

Project:	Mclvor Forrest Estate					
Location:	House Blocks					
Test Request No / Lot No:	*					
Layer Thickness: (mm)	300mm					
Depth Below FSL/CSL:	Second Layer					
Compaction Type:	Standard					
Date Sampled:	20/01/2016					
Sampling Method:	AS1289.1.2.1 part 6.4b					
Material Description:	16B0061	/A	Gravelly Clay, Brown			
	16B0061	/B	Gravelly Clay, Brown			
	16B0061	/C	Gravelly Clay, Brown			
	16B0061	/D	Gravelly Clay, Brown			
Material Stabilised:	No	If Stabilised Time from Stabilisation to Lab Test:				*
Test Number:	16B0061A	16B0061B	16B0061C	16B0061D	*	*
Hilf Density Ratio (%):	97.5	100.0	100.0	102.5	*	*

As Per: AS1289 5.7.1 5.8.1

Approved Signatory:

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COMPACTION ASSESSMENT

Nuclear Gauge Method Hilf (Wet) Density Ratio

TEST REPORT:
GEOTECHNICAL
 TESTING SERVICES
 SOUTHERN

Client: Mainecivil 9 Merrifield Street CASTLEMAINE VICTORIA 3450	Report N ^o :	16B0061
	Revision N ^o :	REV 0
	Sheet:	2 of 2
	Date of Report:	22/01/2016

Test Number:	16B0061A	16B0061B	16B0061C	16B0061D	*	*	
Project Test Number:	*	*	*	*	*	*	
Time of Test:	9.35am	9.40am	9.45am	9.55am	*	*	
Probe Depth: (mm)	275	275	275	275	*	*	
Chainage:	LOT 36	LOT 37	LOT 38	LOT 40	*	*	
Reduced Level: (mm)	Lift 2	Lift 2	Lift 2	Lift 2	*	*	
Offset / Centre Line:	Center	Center	Center	Center	*	*	
#Eastings:	55026	2789	2786	2782	2729	*	*
#Northings:	592	6329	6317	6295	6316	*	*
Percentage Oversize Wet:	0.0	0.0	0.0	0.0	*	*	
Oversize Sieve Size: (mm)	19	19	19	19	*	*	
Field Wet Density: t/m ³	1.97	2.06	2.09	2.02	*	*	
Peak Conv. Wet Density: t/m ³	2.02	2.06	2.09	1.97	*	*	
Adj. Peak Conv. Wet Density: t/m ³	*	*	*	*	*	*	
Moisture Variation: % (Wet/Dry)	2.5Dry	2.0Dry	0.0Wet	4.0Dry	*	*	
Adj. Moist. Variation: % (Wet/Dry)	*	*	*	*	*	*	
Moisture Content: %	*	*	*	*	*	*	
HILF DENSITY RATIO (%):	97.5	100.0	100.0	102.5	*	*	

#Map Datum AUS84

As Per: AS1289 5.7.1 5.8.1

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COMPACTION ASSESSMENT

Nuclear Gauge Method Hilf (Wet) Density Ratio

TEST REPORT:
GEOTECHNICAL
 TESTING SERVICES
 SOUTHERN

Client: Mainecivil 9 Merrifield Street CASTLEMAINE VICTORIA 3450	Report N°:	16B0080
	Revision N°:	REV 0
	Sheet:	1 of 2
	Date of Report:	28/01/2016

Project:	Mclvor Forrest Estate					
Location:	House Blocks					
Test Request No / Lot No:	*					
Layer Thickness: (mm)	300mm					
Depth Below FSL/CSL:	FSL					
Compaction Type:	Standard					
Date Sampled:	22/01/2016					
Sampling Method:	AS1289.1.2.1 part 6.4b					
Material Description:	16B0080	/A	Gravelly Clay, Brown			
	16B0080	/B	Gravelly Clay, Brown			
	16B0080	/C	Gravelly Clay, Brown			
	16B0080	/D	Gravelly Clay, Brown			
Material Stabilised:	No	If Stabilised Time from Stabilisation to Lab Test:				*
Test Number:	16B0080A	16B0080B	16B0080C	16B0080D	*	*
Hilf Density Ratio (%):	100.0	101.0	102.5	98.5	*	*

As Per: AS1289 5.7.1 5.8.1

Approved Signatory:

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COMPACTION ASSESSMENT

Nuclear Gauge Method Hilf (Wet) Density Ratio

TEST REPORT:
GEOTECHNICAL
 TESTING SERVICES
 SOUTHERN

Client: Mainecivil 9 Merrifield Street CASTLEMAINE VICTORIA 3450	Report N ^o :	16B0080
	Revision N ^o :	REV 0
	Sheet:	2 of 2
	Date of Report:	28/01/2016

Test Number:	16B0080A	16B0080B	16B0080C	16B0080D	*	*	
Project Test Number:	*	*	*	*	*	*	
Time of Test:	2.55pm	3.00pm	3.05pm	3.15pm	*	*	
Probe Depth: (mm)	275	275	275	275	*	*	
Chainage:	Block 36	Block 37	Block 38	Block 40	*	*	
Reduced Level: (mm)	FSL	FSL	FSL	FSL	*	*	
Offset / Centre Line:	Centre	Centre	Centre	Centre	*	*	
#Eastings:	55026	2802	2805	2799	2748	*	*
#Northings:	593	6327	6318	6290	6322	*	*
Percentage Oversize Wet:	0.0	0.0	0.0	0.0	0.0	*	*
Oversize Sieve Size: (mm)	19	19	19	19	19	*	*
Field Wet Density: t/m ³	2.09	2.12	2.09	2.00	2.00	*	*
Peak Conv. Wet Density: t/m ³	2.08	2.10	2.04	2.03	2.03	*	*
Adj. Peak Conv. Wet Density: t/m ³	*	*	*	*	*	*	*
Moisture Variation: % (Wet/Dry)	3.0Dry	0.0Wet	2.0Dry	2.5Dry	2.5Dry	*	*
Adj. Moist. Variation: % (Wet/Dry)	*	*	*	*	*	*	*
Moisture Content: %	*	*	*	*	*	*	*
HILF DENSITY RATIO (%):	100.0	101.0	102.5	98.5	98.5	*	*

#Map Datum AUS84

As Per: AS1289 5.7.1 5.8.1

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