Viewpoint Estate Stage E4
Huntly

Earthworks Supervision Report for
Dunlop & Pitson

Report 20C 0419
July, 2020

GTS
GEOTECHNICAL TESTING SERVICES

Viewpoint Estate Stage E4
Huntly

Earthworks Supervision Report

for

Dunlop & Pitson

Revision

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Dunlop & Pitson Contact: Darren Pitson	Email PDF	02/07/2020

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APPENDIX

1 INTRODUCTION

Dunlop & Pitson commissioned Geotechnical Testing Services (GTS) to undertake Level 1 Supervision and testing (AS3798-2007) for the earthworks for the residential subdivision Viewpoint Estate Stage E4, 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 in Lots 500 to 506 and 509 to 512.

The depth of fill across the site varied from none to around 1000mm 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 filling supervision.

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 may be considered a large scale (greater than 1500m^2) and therefore a minimum of 1 test per 2500m^2 or 3 tests per visit are required. It is noted that under this scale, not every lot required testing, however, the testing was generally conducted at 1 test per residential lot per layer which exceeds 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	B20-6496A	07/05/2020	Lot 504	-200	1.0 wet	99.5
2	B20-6496B	07/05/2020	Lot 505	-200	0.0	98.0
3	B20-6583A	19/05/2020	Lot 510	-700	0.5 dry	98.5
4	B20-6583B	19/05/2020	Lot 511	-700	1.0 dry	95.0
5	B20-6583C	19/05/2020	Lot 512	-700	1.5 dry	94.5
6	B20-6620A	25/05/2020	Lot 511	-300	2.5 dry	95.0
7	B20-6620B	25/05/2020	Lot 510	-300	1.0 dry	94.0
8	B20-6620C	25/05/2020	Lot 509	-300	0.5 dry	98.5
9	B20-6655A	28/05/2020	Lot 509	FSL	2.5 dry	100.5
10	B20-6655B	28/05/2020	Lot 510	FSL	2.5 dry	103.5
11	B20-6655C	28/05/2020	Lot 511	FSL	2.5 dry	106.0
12	B20-6655D	28/05/2020	Lot 512	FSL	2.5 dry	100.0
13	B20-6737A	10/06/2020	Lot 500	FSL	2.5 dry	101.5
14	B20-6737B	10/06/2020	Lot 501	FSL	0.0	101.0
15	B20-6737C	10/06/2020	Lot 502	FSL	0.0	104.0
16	B20-6737D	10/06/2020	Lot 503	FSL	0.0	101.0
17	B20-6744A	11/06/2020	Lot 504	FSL	2.5	103.5
18	B20-6744B	11/06/2020	Lot 505	FSL	2.5	103.0

Project No.	Sample No.	Test Date	Location	Reduced Level (mm)	Moisture Variation %O.M.C	Hilf Density Ratio %
19	B20-6744C	11/06/2020	Lot 506	FSL	3.0	102.0

It is noted that Project Nos. 5 achieve a density ratio of 94.5%. As such it was recompacted and considered satisfactory. Project No 7 achieved a density ratio of 94.0% and was also recompacted and is considered satisfactory with the subsequent layer achieving a density ratio of 103.5%.

5 STATEMENT OF COMPLIANCE

GTS personnel have provided Level 1 inspection and testing services during the placement of material for the filling in Lots 500 to 506 and 509 to 512. 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

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Geotechnical Engineer

Reviewed by

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Principal Geotechnical Engineer

APPENDIX

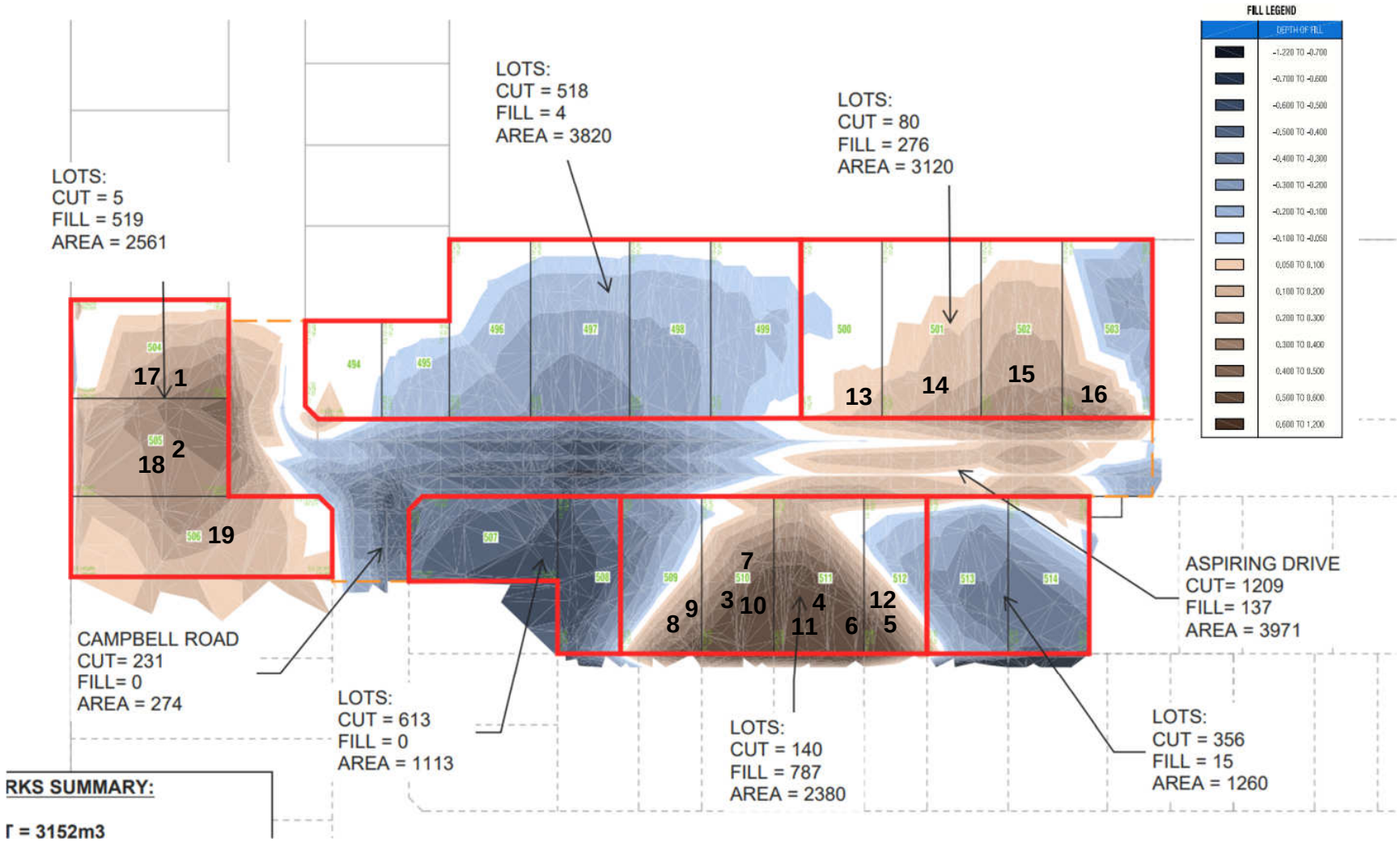

Fig 1 Site Plan

Material Test Report

Report Number: **P18615-19**
Issue Number: 1
Date Issued: 08/05/2020
Client: Dunlop & Pitson
24 Jewell Court , Bendigo VIC 3550
Project Number: P18615
Project Name: View Point Estate
Project Location: Huntly
Work Request: 6496
Date Sampled: 07/05/2020
Dates Tested: 07/05/2020 - 08/05/2020
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)
Bendigo Soil and Concrete Testing Laboratory
Gate 7, Sharon Street Bendigo VIC 3550
Phone: (03) 5441 4881
Email: bryanm@gts.com.au

Accredited for compliance with ISO/IEC 17025 - Testing

Approved Signatory: Bryan Mott
NATA Accredited Laboratory Number: 19506

Compaction Control AS 1289 5.7.1 & 5.8.1			
Sample Number	B20-6496A	B20-6496B	
Date Tested	07/05/2020	07/05/2020	
Time Tested	07:52	07:57	
Test Request #/Location	House Lot Lot 504	House Lot Lot 505	
Chainage (m)	Left Edge Center	Center	
Location Offset (m)	**	**	
Layer / Reduced Level	-200	-200	
Thickness of Layer (mm)	300	300	
Soil Description	Silty Clay	Silty Clay	
Test Depth (mm)	250	250	
Sieve used to determine oversize (mm)	19.0	19.0	
Percentage of Wet Oversize (%)	0.0	0.0	
Field Wet Density (FWD) t/m^3	2.09	2.02	
Field Dry Density (FDD) t/m^3	**	**	
Peak Converted Wet Density t/m^3	2.10	2.06	
Adjusted Peak Converted Wet Density t/m^3	**	**	
Moisture Variation (Wv) %	-1.0	0.0	
Adjusted Moisture Variation %	**	**	
Hilf Density Ratio (%)	**99.5**	**98.0**	
Compaction Method	**Standard**	**Standard**	

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

Material Test Report

Report Number: **P18615-20**
Issue Number: 1
Date Issued: 21/05/2020
Client: Dunlop & Pitson
24 Jewell Court , Bendigo VIC 3550
Project Number: P18615
Project Name: View Point Estate
Project Location: Huntly
Work Request: 6583
Date Sampled: 19/05/2020
Dates Tested: 19/05/2020 - 21/05/2020
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)
Bendigo Soil and Concrete Testing Laboratory
Gate 7, Sharon Street Bendigo VIC 3550
Phone: (03) 5441 4881
Email: bryanm@gts.com.au

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NATA Accredited Laboratory Number: 19506

Compaction Control AS 1289 5.7.1 & 5.8.1			
Sample Number	B20-6583A	B20-6583B	B20-6583C
Date Tested	19/05/2020	19/05/2020	19/05/2020
Time Tested	09:05	09:16	09:19
Test Request #/Location	House Lot Lot 510	House Lot Lot 511	House Lot Lot 512
Chainage (m)	Centre	Centre	Centre
Location Offset (m)	**	**	**
Layer / Reduced Level	-700	-700	-700
Thickness of Layer (mm)	300	300	300
Soil Description	Gravelly Silty Clay	Gravelly Silty Clay	Gravelly 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	0.0	0.0
Field Wet Density (FWD) t/m^3	1.95	1.93	1.94
Field Dry Density (FDD) t/m^3	**	**	**
Peak Converted Wet Density t/m^3	1.97	2.03	2.06
Adjusted Peak Converted Wet Density t/m^3	**	**	**
Moisture Variation (Wv) %	0.5	1.0	1.5
Adjusted Moisture Variation %	**	**	**
Hilf Density Ratio (%)	**98.5**	**95.0**	**94.5**
Compaction Method	**Standard**	**Standard**	**Standard**

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

Material Test Report

Report Number: **P18615-21**
Issue Number: 1
Date Issued: 26/05/2020
Client: Dunlop & Pitson
24 Jewell Court , Bendigo VIC 3550
Project Number: P18615
Project Name: View Point Estate
Project Location: Huntly
Work Request: 6620
Date Sampled: 25/05/2020
Dates Tested: 25/05/2020 - 25/05/2020
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)
Bendigo Soil and Concrete Testing Laboratory
Gate 7, Sharon Street Bendigo VIC 3550
Phone: (03) 5441 4881
Email: bryanm@gts.com.au

Accredited for compliance with ISO/IEC 17025 - Testing

Approved Signatory: Bryan Mott
NATA Accredited Laboratory Number: 19506

Compaction Control AS 1289 5.7.1 & 5.8.1			
Sample Number	B20-6620A	B20-6620B	B20-6620C
Date Tested	25/05/2020	25/05/2020	25/05/2020
Time Tested	08:08	08:12	08:15
Test Request #/Location	House Lot Lot 511	House Lot Lot 510	House Lot Lot 509
Chainage (m)	Centre	Centre	Centre
Location Offset (m)	**	**	**
Layer / Reduced Level	-300	-300	-300
Thickness of Layer (mm)	300	300	300
Soil Description	Gravelly Silty Clay	Gravelly Silty Clay	Gravelly Silty Clay
Test Depth (mm)	250	250	250
Sieve used to determine oversize (mm)	19.0	19.0	19.0
Percentage of Wet Oversize (%)	0.0	0.0	0.0
Field Wet Density (FWD) t/m^3	1.93	1.97	2.08
Field Dry Density (FDD) t/m^3	**	**	**
Peak Converted Wet Density t/m^3	2.03	2.10	2.11
Adjusted Peak Converted Wet Density t/m^3	**	**	**
Moisture Variation (Wv) %	2.5	1.0	0.5
Adjusted Moisture Variation %	**	**	**
Hilf Density Ratio (%)	**95.0**	**94.0**	**98.5**
Compaction Method	**Standard**	**Standard**	**Standard**

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

Material Test Report

Report Number: **P18615-22**
Issue Number: 1
Date Issued: 29/05/2020
Client: Dunlop & Pitson
24 Jewell Court , Bendigo VIC 3550
Project Number: P18615
Project Name: View Point Estate
Project Location: Huntly
Work Request: 6655
Date Sampled: 28/05/2020
Dates Tested: 28/05/2020 - 29/05/2020
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

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Accredited for compliance with ISO/IEC 17025 - Testing

Approved Signatory: Bryan Mott
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Compaction Control AS 1289 5.7.1 & 5.8.1				
Sample Number	B20-6655A	B20-6655B	B20-6655C	B20-6655D
Date Tested	28/05/2020	28/05/2020	28/05/2020	28/05/2020
Time Tested	07:57	08:02	08:07	08:12
Test Request #/Location	House Lot Lot 509	House Lot Lot 510	House Lot Lot 511	House Lot Lot 512
Chainage (m)	Centre	Centre	Centre	Centre
Location Offset (m)	**	**	**	**
Layer / Reduced Level	FSL	FSL	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	0.0	0.0
Field Wet Density (FWD) t/m^3	2.03	2.05	2.09	1.96
Field Dry Density (FDD) t/m^3	**	**	**	**
Peak Converted Wet Density t/m^3	2.02	1.98	1.98	1.96
Adjusted Peak Converted Wet Density t/m^3	**	**	**	**
Moisture Variation (Wv) %	2.5	2.5	2.5	2.5
Adjusted Moisture Variation %	**	**	**	**
Hilf Density Ratio (%)	**100.5**	**103.5**	**106.0**	**100.0**
Compaction Method	**Standard**	**Standard**	**Standard**	**Standard**

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

Material Test Report

Report Number: **P18615-23**
Issue Number: 2 - *This version supersedes all previous issues*
Reissue Reason: *Amended Locations on report*
Date Issued: 12/06/2020
Client: Dunlop & Pitson
24 Jewell Court , Bendigo VIC 3550
Project Number: P18615
Project Name: View Point Estate
Project Location: Huntly
Work Request: 6737
Date Sampled: 10/06/2020
Dates Tested: 10/06/2020 - 10/06/2020
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)
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Phone: (03) 5441 4881
Email: bryanm@gts.com.au

Accredited for compliance with ISO/IEC 17025 - Testing

Approved Signatory: Bryan Mott
NATA Accredited Laboratory Number: 19506

Compaction Control AS 1289 5.7.1 & 5.8.1				
Sample Number	B20-6737A	B20-6737B	B20-6737C	B20-6737D
Date Tested	10/06/2020	10/06/2020	10/06/2020	10/06/2020
Time Tested	08:03	08:09	08:12	08:17
Test Request #/Location	Stage 4 House Lot	Stage 4 House Lot	Stage 4 House Lot	Stage 4 House Lot
Chainage (m)	Lot 500	Lot 501	Lot 502	Lot 503
Location Offset (m)	Centre	Centre	Centre	Centre
Layer / Reduced Level	FSL	FSL	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	0.0
Field Wet Density (FWD) t/m^3	2.09	2.13	2.18	2.13
Field Dry Density (FDD) t/m^3	**	**	**	**
Peak Converted Wet Density t/m^3	2.06	2.11	2.09	2.10
Adjusted Peak Converted Wet Density t/m^3	**	**	**	**
Moisture Variation (Wv) %	2.5	0.0	0.0	0.0
Adjusted Moisture Variation %	**	**	**	**
Hilf Density Ratio (%)	**101.5**	**101.0**	**104.0**	**101.0**
Compaction Method	**Standard**	**Standard**	**Standard**	**Standard**

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

Material Test Report

Report Number: **P18615-23**
Issue Number: 2 - *This version supersedes all previous issues*
Reissue Reason: *Amended Locations on report*
Date Issued: 12/06/2020
Client: Dunlop & Pitson
24 Jewell Court , Bendigo VIC 3550
Project Number: P18615
Project Name: View Point Estate
Project Location: Huntly
Work Request: 6737
Date Sampled: 10/06/2020
Dates Tested: 10/06/2020 - 10/06/2020
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

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Compaction Control AS 1289 5.7.1 & 5.8.1				
Sample Number	B20-6737E	B20-6737F	B20-6737G	
Date Tested	10/06/2020	10/06/2020	10/06/2020	
Time Tested	08:26	08:31	08:43	
Test Request #/Location	Stage 5 House Lot	Stage 5 House Lot	Stage 5 House Lot	
Chainage (m)	Lot 519	Lot 520	Lot 521	
Location Offset (m)	Back Centre	Back Centre	Back Centre	
Layer / Reduced Level	-600	-600	-600	
Thickness of Layer (mm)	300	300	300	
Soil Description	Gravelly Silty Clay	Gravelly Silty Clay	Gravelly Silty Clay	
Test Depth (mm)	250	250	250	
Sieve used to determine oversize (mm)	19.0	19.0	19.0	
Percentage of Wet Oversize (%)	0.0	0.0	0.0	
Field Wet Density (FWD) t/m^3	2.04	2.07	1.98	
Field Dry Density (FDD) t/m^3	**	**	**	
Peak Converted Wet Density t/m^3	1.99	2.07	2.05	
Adjusted Peak Converted Wet Density t/m^3	**	**	**	
Moisture Variation (Wv) %	2.5	2.5	2.5	
Adjusted Moisture Variation %	**	**	**	
Hilf Density Ratio (%)	**103.0**	**100.0**	**96.5**	
Compaction Method	**Standard**	**Standard**	**Standard**	

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

Material Test Report

Report Number: **P18615-24**
Issue Number: 1
Date Issued: 12/06/2020
Client: Dunlop & Pitson
24 Jewell Court , Bendigo VIC 3550
Project Number: P18615
Project Name: View Point Estate
Project Location: Huntly
Work Request: 6744
Date Sampled: 11/06/2020
Dates Tested: 11/06/2020 - 11/06/2020
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)
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Email: bryanm@gts.com.au

Accredited for compliance with ISO/IEC 17025 - Testing

Approved Signatory: Bryan Mott
NATA Accredited Laboratory Number: 19506

Compaction Control AS 1289 5.7.1 & 5.8.1				
Sample Number	B20-6744A	B20-6744B	B20-6744C	B20-6744D
Date Tested	11/06/2020	11/06/2020	11/06/2020	11/06/2020
Time Tested	07:56	08:04	08:09	08:13
Test Request #/Location	Stage 4 House Lot	Stage 4 House Lot	Stage 4 House Lot	Stage 5 House Lot
Chainage (m)	Lot 504	Lot 505	Lot 506	Lot 540
Location Offset (m)	Centre	Centre	Centre	Centre
Layer / Reduced Level	FSL	FSL	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	0.0	0.0
Field Wet Density (FWD) t/m^3	2.16	2.17	2.12	2.19
Field Dry Density (FDD) t/m^3	**	**	**	**
Peak Converted Wet Density t/m^3	2.09	2.11	2.08	2.08
Adjusted Peak Converted Wet Density t/m^3	**	**	**	**
Moisture Variation (Wv) %	2.5	2.5	3.0	2.5
Adjusted Moisture Variation %	**	**	**	**
Hilf Density Ratio (%)	**103.5**	**103.0**	**102.0**	**105.5**
Compaction Method	**Standard**	**Standard**	**Standard**	**Standard**

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

Material Test Report

Report Number: **P18615-24**
Issue Number: 1
Date Issued: 12/06/2020
Client: Dunlop & Pitson
24 Jewell Court , Bendigo VIC 3550
Project Number: P18615
Project Name: View Point Estate
Project Location: Huntly
Work Request: 6744
Date Sampled: 11/06/2020
Dates Tested: 11/06/2020 - 11/06/2020
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)
Bendigo Soil and Concrete Testing Laboratory
Gate 7, Sharon Street Bendigo VIC 3550
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Accredited for compliance with ISO/IEC 17025 - Testing

Approved Signatory: Bryan Mott
NATA Accredited Laboratory Number: 19506

Compaction Control AS 1289 5.7.1 & 5.8.1				
Sample Number	B20-6744E	B20-6744F	B20-6744G	
Date Tested	11/06/2020	11/06/2020	11/06/2020	
Time Tested	14:09	14:12	14:15	
Test Request #/Location	Stage 5 House Lot	Stage 5 House Lot	Stage 5 House Lot	
Chainage (m)	Lot 519	Lot 520	Lot 521	
Location Offset (m)	Back Centre	Back Centre	Back Centre	
Layer / Reduced Level	-300	-300	-300	
Thickness of Layer (mm)	300	300	300	
Soil Description	Gravelly Silty Clay	Gravelly Silty Clay	Gravelly Silty Clay	
Test Depth (mm)	250	250	250	
Sieve used to determine oversize (mm)	19.0	19.0	19.0	
Percentage of Wet Oversize (%)	**	17.7	**	
Field Wet Density (FWD) t/m^3	2.03	1.98	2.02	
Field Dry Density (FDD) t/m^3	**	**	**	
Peak Converted Wet Density t/m^3	1.98	**	2.01	
Adjusted Peak Converted Wet Density t/m^3	**	2.04	**	
Moisture Variation (Wv) %	1.5	**	1.5	
Adjusted Moisture Variation %	**	1.5	**	
Hilf Density Ratio (%)	**102.5**	**97.0**	**101.0**	
Compaction Method	**Standard**	**Standard**	**Standard**	

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