

64 Webb Road Bonshaw

Earthworks Supervision Report for Ballarat Civil Construction

Report 22C 0877
March 2023

64 Webb Road Bonshaw

Earthworks Supervision Report for Ballarat Civil Construction

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1 INTRODUCTION

Ballarat Civil Construction commissioned Geotechnical Testing Services (GTS) to undertake Level 1 Supervision and testing (*AS3798-2007*) for the earthworks at 64 Webb Road, Bonshaw.

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 1 to 20 and 32 to 33, including the filling of a former swimming pool and farm dam located in these lots.

The total depth of engineered fill across the site varied from none to 2.2 metres, with approximate locations shown on the attached site plan. It is noted that the client has indicated that approximately 0.2 metres of uncontrolled fill (topsoil) may subsequently be placed over the engineered fill to bring the Lots.

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 filling was considered large scale operations (greater than 1,500m²). The conducted testing met or exceeded the minimum requirement for these operations.

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 stiff to very stiff silty clay material of good strength or highly to weathered basalt rock.

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 %	Field Wet Density (t/m ³)
1	D23-2745A	25/01/2023	Lot 16	-1900	4.5 dry	100.00	1.98
2	D23-2745B	25/01/2023	Lot 6	-1900	0.0	n/a	1.94
3	D23-2745C	25/01/2023	Lot 6	-1600	2.0 dry	97.5	2.06
4	D23-2745D	25/01/2023	Lot 16	-1600	0.5 dry	93.5	1.90
5	D23-2745E	25/01/2023	Lot 32	-600	2.5 dry	102.5	2.03
6	D23-2745F	25/01/2023	Lot 12	-600	2.5 dry	107.0	2.19
7	D23-2745G	25/01/2023	Lot 19	-600	2.0 dry	101.0	2.19
8	D23-2751A	31/01/2023	Lot 6	-1300	0.5 wet	101.0	2.10
9 (RT 2)	D23-2751B	31/01/2023	Lot 6	-1900	4.0 dry	99.5	1.96
10	D23-2751C	31/01/2023	Lot 6	-1000	4.0 dry	100.5	2.04
11	D23-2751D	31/01/2023	Lot 16	-1000	1.0 dry	100.5	2.11
12 (RT 4)	D23-2751E	31/01/2023	Lot 16	-1600	2.0 dry	98.5	1.97
13	D23-2751F	31/01/2023	Lot 16	-1300	2.5 dry	100.5	2.05
14	D23-2751G	31/01/2023	Lot 17	-600	0.0	104.0	2.07
15	D23-2751H	31/01/2023	Lot 8	-600	0.0	92.0	1.92
16	D23-2751I	31/01/2023	Lot 10	-600	1.5 dry	102.0	2.12
17	D23-2751J	31/01/2023	Lot 15	-600	2.5 dry	102.5	2.09
18	D23-2759A	03/02/2023	Lot 6	-700	0.0	98.5	2.04
19	D23-2759B	03/02/2023	Lot 6	-400	1.5 wet	102.5	2.11
20	D23-2759C	03/02/2023	Lot 16	-400	2.5 wet	97.0	2.05
21	D23-2759D	03/02/2023	Lot 16	-700	2.0 wet	97.5	2.01
22	D23-2759E	03/02/2023	Lot 32	-300	1.0 wet	98.5	1.98
23	D23-2759F	03/02/2023	Lot 18	-300	0.5 wet	101.5	2.07

Project No.	Sample No.	Test Date	Location	Reduced Level* (mm)	Moisture Variation % O.M.C.	Hilf Density Ratio %	Field Wet Density (t/m ³)
24	D23-2759G	03/02/2023	Lot 13	-300	0.0	106.0	2.22
25	D23-2759H	03/02/2023	Lot 11	-300	2.5 wet	99.0	2.07
26	D23-2759I	03/02/2023	Lot 16	-300	0.5 dry	97.0	2.04
27	D23-2759J	03/02/2023	Lot 9	-300	0.5 wet	101.0	2.05
28	D23-2768A	08/02/2023	Lot 19	-200	2.0 dry	101.0	2.10
29	D23-2768B	08/02/2023	Lot 33	-200	2.5 dry	104.5	2.12
30	D23-2768C	08/02/2023	Lot 17	-200	0.0	101.5	2.13
31	D23-2768D	08/02/2023	Lot 10	-200	0.5 dry	103.5	2.14
32	D23-2768E	08/02/2023	Lot 12	-200	1.5 dry	102.5	2.05
33	D23-2768F	08/02/2023	Lot 15	-200	1.5 wet	101.5	2.14
34 (RT 15)	D23-2768G	08/02/2023	Lot 8	-600	4.0 dry	106.5	2.20
35	D23-2768H	08/02/2023	Lot 8	-200	3.0 wet	103.0	2.10
36	D23-2768I	08/02/2023	Lot 14	-300	2.5 wet	99.5	2.13
37	D23-2768J	08/02/2023	Lot 13	-300	0.0	108.0	2.26
38	D23-2768K	08/02/2023	Lot 2	-200	1.0 dry	103.5	2.13
39	D23-2768L	08/02/2023	Lot 1	-200	1.0 wet	100.5	2.04
40	D23-2768M	08/02/2023	Lot 4	-200	0.0	104.0	2.17
41	D23-2768N	08/02/2023	Lot 5	-400	0.0	105.0	2.21
42	D23-2775A	14/02/2023	Lot 6	-150	1.0 dry	106.5	2.01
43	D23-2775B	14/02/2023	Lot 7	-150	0.5 wet	101.0	1.95
44	D23-2775C	14/02/2023	Lot 20	-150	2.5 dry	104.0	2.00

5 STATEMENT OF COMPLIANCE

GTS personnel have provided Level 1 inspection and testing services during the placement of material for the filling of Lots 1 to 20 and 32 to 33, including the filling of a former swimming pool and farm dam located in these lots. 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, including measured in situ densities of the placed fill, we consider that the fill has been placed and compacted and is considered to be engineered or controlled fill. It is noted that any additional topsoil has subsequently placed over the engineered fill is not considered to be controlled fill.

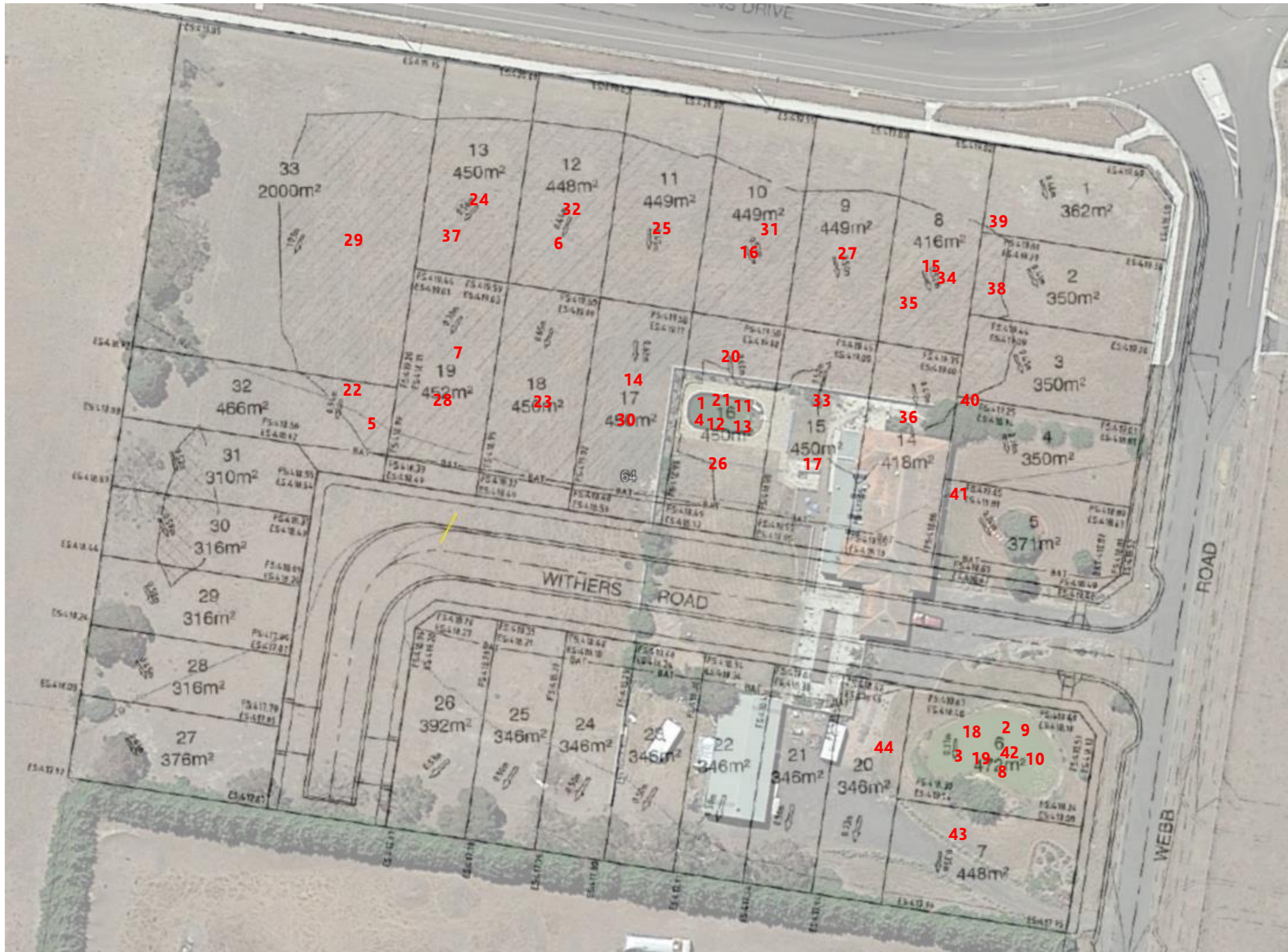
Subject to residential site classifications, the controlled fill material is deemed a suitable founding medium for future residential buildings.



Benj Beatty BA/BSc (Hons), MPA, MAusIMM, MAIG
Engineering Geologist – WVST
For Geotechnical Testing Services

APPENDIX

**64 WEBB ROAD
 BONSHAW**



Material Test Report



Report Number: P23488-1
Issue Number: 1
Date Issued: 31/01/2023
Client: Ballarat Civil Construction
 47 Wallis St , Delacombe VIC 3356
Project Number: P23488
Project Name: 64 Webb Road
Project Location: Bonshaw
Client Reference: J365
Work Request: 2745
Date Sampled: 25/01/2023
Dates Tested: 25/01/2023 - 30/01/2023
Sampling Method: AS 1289.1.2.1 6.4 (b) - Sampling from layers in earthworks or pavement - compacted
Site Selection: Selected by Client
Location: Delacombe
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
 CMT Manager

NATA Accredited Laboratory Number: 19506

Compaction Control AS 1289 5.7.1 & 5.8.1 & 2.1.1				
Sample Number	D23-2745A	D23-2745B	D23-2745C	D23-2745D
Date Tested	25/01/2023	25/01/2023	25/01/2023	25/01/2023
Time Tested	13:41	14:00	14:24	14:47
Test Request #/Location	Lot 16 64 webb road	Lot 6 64 webb road	Lot 6 64 webb road	Lot 16 64 webb road
Easting	748250	748255	748246	748217
Northing	54H 5835420	54H 5835367	54H 5835368	54H 5835426
Layer / Reduced Level	-1900	-1900	-1600	-1600
Thickness of Layer (mm)	300	300	300	300
Soil Description	Gravelly Clay	Gravelly Clay	Gravelly Clay	Gravelly Clay
Test Depth (mm)	275	275	275	275
Sieve used to determine oversize (mm)	19.0	37.5	37.5	19.0
Percentage of Wet Oversize (%)	6	26	20	4
Field Wet Density (FWD) t/m ³	1.98	1.94	2.06	1.90
Field Moisture Content %	12.7	13.6	17.7	20.6
Field Dry Density (FDD) t/m ³	1.75	1.71	1.75	1.58
Peak Converted Wet Density t/m ³	**	**	**	**
Adjusted Peak Converted Wet Density t/m ³	1.98	**	2.10	2.04
Moisture Variation (Wv) %	**	**	**	**
Adjusted Moisture Variation %	4.5	**	2.0	0.5
Hilf Density Ratio (%)	100.0	**	97.5	93.5
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: P23488-1
Issue Number: 1
Date Issued: 31/01/2023
Client: Ballarat Civil Construction
 47 Wallis St , Delacombe VIC 3356
Project Number: P23488
Project Name: 64 Webb Road
Project Location: Bonshaw
Client Reference: J365
Work Request: 2745
Date Sampled: 25/01/2023
Dates Tested: 25/01/2023 - 30/01/2023
Sampling Method: AS 1289.1.2.1 6.4 (b) - Sampling from layers in earthworks or pavement - compacted
Site Selection: Selected by Client
Location: Delacombe
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
 CMT Manager

NATA Accredited Laboratory Number: 19506

Compaction Control AS 1289 5.7.1 & 5.8.1 & 2.1.1			
Sample Number	D23-2745E	D23-2745F	D23-2745G
Date Tested	25/01/2023	25/01/2023	25/01/2023
Time Tested	16:17	16:19	16:22
Test Request #/Location	Lot 32 64 Webb Rd	Lot 12 64 Webb Rd	Lot 19 64 Webb Rd
Easting	748142	748173	748162
Northing	54H 5835454	54H 5835461	54H 5835432
Layer / Reduced Level	-600	-600	-600
Thickness of Layer (mm)	300	300	300
Soil Description	Gravelly brown clay	Gravelly brown clay	Gravelly brown clay
Test Depth (mm)	275	275	275
Sieve used to determine oversize (mm)	19.0	19.0	19.0
Percentage of Wet Oversize (%)	0	2	3
Field Wet Density (FWD) t/m ³	2.03	2.19	2.19
Field Moisture Content %	20.6	17.8	14.0
Field Dry Density (FDD) t/m ³	1.68	1.86	1.92
Peak Converted Wet Density t/m ³	1.98	**	**
Adjusted Peak Converted Wet Density t/m ³	**	2.05	2.17
Moisture Variation (Wv) %	2.5	**	**
Adjusted Moisture Variation %	**	2.5	2.0
Hilf Density Ratio (%)	102.5	107.0	101.0
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: P23488-2
Issue Number: 1
Date Issued: 06/02/2023
Client: Ballarat Civil Construction
 47 Wallis St , Delacombe VIC 3356
Project Number: P23488
Project Name: 64 Webb Road
Project Location: Bonshaw
Client Reference: J365
Work Request: 2751
Date Sampled: 31/01/2023
Dates Tested: 31/01/2023 - 06/02/2023
Sampling Method: AS 1289.1.2.1 6.4 (b) - Sampling from layers in earthworks or pavement - compacted
Site Selection: Selected by Client
Location: Bonshaw - Level 1
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
 CMT Manager

NATA Accredited Laboratory Number: 19506

Compaction Control AS 1289 5.7.1 & 5.8.1 & 2.1.1					
Sample Number	D23-2751A	D23-2751B	D23-2751C	D23-2751D	D23-2751E
Date Tested	31/01/2023	31/01/2023	31/01/2023	31/01/2023	31/01/2023
Time Tested	13:13	13:29	13:40	13:54	14:02
Test Request #/Location	Lot 6 64 Webb Road	Lot 6 - Retest 64 Webb Road	Lot 6 64 Webb Road	Lot 16 64 Webb Road	Lot 16 - Retest 64 Webb Road
Easting	748252	748252	748240	748209	748207
Northing	5835371	5835367	5835369	5835418	5835420
Layer / Reduced Level	-1300	-1900	-1000	-1000	-1600
Thickness of Layer (mm)	300	300	300	300	300
Soil Description	Brown rocky clay	Brown rocky clay	Brown rocky clay	Brown rocky clay	Brown rocky 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 (%)	11	1	19	3	1
Field Wet Density (FWD) t/m ³	2.10	1.96	2.04	2.11	1.97
Field Moisture Content %	22.5	14.2	14.7	18.1	18.4
Field Dry Density (FDD) t/m ³	1.72	1.72	1.78	1.78	1.66
Peak Converted Wet Density t/m ³	**	**	**	**	**
Adjusted Peak Converted Wet Density t/m ³	2.08	1.97	2.03	2.10	2.00
Moisture Variation (Wv) %	**	**	**	**	**
Adjusted Moisture Variation %	-0.5	4.0	4.0	1.0	2.0
Hilf Density Ratio (%)	101.0	99.5	100.5	100.5	98.5
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

Material Test Report



Report Number: P23488-2
Issue Number: 1
Date Issued: 06/02/2023
Client: Ballarat Civil Construction
 47 Wallis St , Delacombe VIC 3356
Project Number: P23488
Project Name: 64 Webb Road
Project Location: Bonshaw
Client Reference: J365
Work Request: 2751
Date Sampled: 31/01/2023
Dates Tested: 31/01/2023 - 06/02/2023
Sampling Method: AS 1289.1.2.1 6.4 (b) - Sampling from layers in earthworks or pavement - compacted
Site Selection: Selected by Client
Location: Bonshaw - Level 1
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
 CMT Manager

NATA Accredited Laboratory Number: 19506

Compaction Control AS 1289 5.7.1 & 5.8.1 & 2.1.1					
Sample Number	D23-2751F	D23-2751G	D23-2751H	D23-2751I	D23-2751J
Date Tested	31/01/2023	31/01/2023	31/01/2023	31/01/2023	31/01/2023
Time Tested	14:10	14:22	14:34	14:41	14:49
Test Request #/Location	Lot 16 64 Webb Road	Lot 17 64 Webb Road	Lot 8 64 Webb Road	Lot 10 64 Webb Road	Lot 15 64 Webb Road
Easting	748209	748197	748240	748217	748223
Northing	5835422	5835424	5835438	5835454	5835409
Layer / Reduced Level	-1300	-600	-600	-600	-600
Thickness of Layer (mm)	300	300	300	300	300
Soil Description	Brown rocky clay	Brown rocky clay	Brown rocky clay	Brown rocky clay	Brown Rocky 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 (%)	7	1	1	4	5
Field Wet Density (FWD) t/m ³	2.05	2.07	1.92	2.12	2.09
Field Moisture Content %	15.7	21.5	16.4	15.7	15.6
Field Dry Density (FDD) t/m ³	1.77	1.71	1.65	1.83	1.81
Peak Converted Wet Density t/m ³	**	**	**	**	**
Adjusted Peak Converted Wet Density t/m ³	2.04	1.99	2.08	2.08	2.04
Moisture Variation (Wv) %	**	**	**	**	**
Adjusted Moisture Variation %	2.5	0.0	0.0	1.5	2.5
Hilf Density Ratio (%)	100.5	104.0	92.0	102.0	102.5
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

Material Test Report



Report Number: P23488-3
Issue Number: 1
Date Issued: 06/02/2023
Client: Ballarat Civil Construction
 47 Wallis St , Delacombe VIC 3356
Project Number: P23488
Project Name: 64 Webb Road
Project Location: Bonshaw
Client Reference: J365
Work Request: 2759
Date Sampled: 03/02/2023
Dates Tested: 03/02/2023 - 06/02/2023
Sampling Method: AS 1289.1.2.1 6.4 (b) - Sampling from layers in earthworks or pavement - compacted
Site Selection: Selected by Client
Location: Bonshaw
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
 CMT Manager

NATA Accredited Laboratory Number: 19506

Compaction Control AS 1289 5.7.1 & 5.8.1 & 2.1.1					
Sample Number	D23-2759A	D23-2759B	D23-2759C	D23-2759D	D23-2759E
Date Tested	03/02/2023	03/02/2023	03/02/2023	03/02/2023	03/02/2023
Time Tested	08:31	08:41	08:50	08:55	09:10
Test Request #/Location	Lot 6 64 Webb Road	Lot 6 64 Webb Road	Lot 16 64 Webb Road	Lot 16 64 Webb Road	Lot 32 64 Webb Road
Easting	748251	748246	748211	748299	748131
Northing	5835371	5835370	5835425	5835443	5835428
Layer / Reduced Level	-700	-400	-400	-700	-300
Thickness of Layer (mm)	300	300	300	300	300
Soil Description	Brown rocky clay	Brown rocky clay	Brown rocky clay	Brown rocky clay	Brown rocky 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 (%)	2	3	5	3	0
Field Wet Density (FWD) t/m ³	2.04	2.11	2.05	2.01	1.98
Field Moisture Content %	22.5	22.8	24.9	23.6	25.8
Field Dry Density (FDD) t/m ³	1.67	1.72	1.64	1.63	1.57
Peak Converted Wet Density t/m ³	**	**	**	**	2.00
Adjusted Peak Converted Wet Density t/m ³	2.07	2.06	2.11	2.07	**
Moisture Variation (Wv) %	**	**	**	**	-1.0
Adjusted Moisture Variation %	0.0	-1.5	-2.5	-2.0	**
Hilf Density Ratio (%)	98.5	102.5	97.0	97.5	98.5
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

Material Test Report



Report Number: P23488-3
Issue Number: 1
Date Issued: 06/02/2023
Client: Ballarat Civil Construction
 47 Wallis St , Delacombe VIC 3356
Project Number: P23488
Project Name: 64 Webb Road
Project Location: Bonshaw
Client Reference: J365
Work Request: 2759
Date Sampled: 03/02/2023
Dates Tested: 03/02/2023 - 06/02/2023
Sampling Method: AS 1289.1.2.1 6.4 (b) - Sampling from layers in earthworks or pavement - compacted
Site Selection: Selected by Client
Location: Bonshaw
Material Source: Test Location

Geotechnical Testing Services (Southern)
 Ballarat Soil and Concrete Testing Laboratory
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 Phone: (03) 5335 6494
 Email: joshl@gts.com.au

Accredited for compliance with ISO/IEC 17025 - Testing



Approved Signatory: Josh Lagodzki
 CMT Manager

NATA Accredited Laboratory Number: 19506

Compaction Control AS 1289 5.7.1 & 5.8.1 & 2.1.1					
Sample Number	D23-2759F	D23-2759G	D23-2759H	D23-2759I	D23-2759J
Date Tested	03/02/2023	03/02/2023	03/02/2023	03/02/2023	03/02/2023
Time Tested	09:22	09:34	09:45	09:56	10:02
Test Request #/Location	Lot 18 64 Webb Road	Lot 13 64 Webb Road	Lot 11 64 Webb Road	Lot 16 64 Webb Road	Lot 9 64 Webb Road
Easting	748179	748172	748201	748204	748224
Northing	5835425	5835456	5835460	5835429	5835447
Layer / Reduced Level	-300	-300	-300	-300	-300
Thickness of Layer (mm)	300	300	300	300	300
Soil Description	Brown rocky clay	Brown rocky clay	Brown rocky clay	Brown rocky clay	Brown rocky 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	3	3	1	0
Field Wet Density (FWD) t/m ³	2.07	2.22	2.07	2.04	2.05
Field Moisture Content %	21.9	22.9	24.9	19.4	22.5
Field Dry Density (FDD) t/m ³	1.70	1.80	1.66	1.71	1.67
Peak Converted Wet Density t/m ³	2.04	**	**	**	2.03
Adjusted Peak Converted Wet Density t/m ³	**	2.09	2.09	2.10	**
Moisture Variation (Wv) %	-0.5	**	**	**	-0.5
Adjusted Moisture Variation %	**	0.0	-2.5	0.5	**
Hilf Density Ratio (%)	101.5	106.0	99.0	97.0	101.0
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: P23488-4
Issue Number: 1
Date Issued: 13/02/2023
Client: Ballarat Civil Construction
 47 Wallis St , Delacombe VIC 3356
Project Number: P23488
Project Name: 64 Webb Road
Project Location: Bonshaw
Client Reference: J365
Work Request: 2768
Date Sampled: 08/02/2023
Dates Tested: 08/02/2023 - 11/02/2023
Sampling Method: AS 1289.1.2.1 6.4 (b) - Sampling from layers in earthworks or pavement - compacted
Site Selection: Selected by Client
Location: 64 Webb Road, Bonshaw
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: bryanm@gts.com.au

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Bryan Mott

Approved Signatory: Bryan Mott
 CMT Supervisor
 NATA Accredited Laboratory Number: 19506

Compaction Control AS 1289 5.7.1 & 5.8.1 & 2.1.1						
Sample Number	D23-2768A	D23-2768B	D23-2768C	D23-2768D	D23-2768E	D23-2768F
Date Tested	08/02/2023	08/02/2023	08/02/2023	08/02/2023	08/02/2023	08/02/2023
Time Tested	12:26	12:32	12:40	12:47	12:55	13:01
Test Request #/Location	House Block Lot 19	House Block Lot 33	House Block Lot 17	House Block Lot 10	House Block Lot 12	House Block Lot 15
Easting	748168	748138	748195	748211	748186	748223
Northing	5835431	5835459	5835431	5835440	5835456	5835421
Layer / Reduced Level	-200mm	-200mm	-200mm	-200mm	-200mm	-200mm
Thickness of Layer (mm)	300	300	300	300	300	300
Soil Description	Fine gravelly clay	Fine gravelly clay	Fine gravelly clay	Fine gravelly clay	Fine gravelly clay	Fine gravelly clay
Test Depth (mm)	275	275	275	275	275	275
Sieve used to determine oversize (mm)	19.0	19.0	19.0	19.0	19.0	19.0
Percentage of Wet Oversize (%)	0	0	2	0	0	0
Field Wet Density (FWD) t/m ³	2.10	2.12	2.13	2.14	2.05	2.14
Field Moisture Content %	18.8	17.9	21.7	19.7	18.3	21.9
Field Dry Density (FDD) t/m ³	1.77	1.80	1.75	1.79	1.73	1.76
Peak Converted Wet Density t/m ³	2.08	**	**	2.06	2.00	2.11
Adjusted Peak Converted Wet Density t/m ³	**	2.02	2.09	**	**	**
Moisture Variation (Wv) %	2.0	**	**	0.5	1.5	-1.5
Adjusted Moisture Variation %	**	2.5	0.0	**	**	**
Hilf Density Ratio (%)	101.0	104.5	101.5	103.5	102.5	101.5
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: P23488-4
Issue Number: 1
Date Issued: 13/02/2023
Client: Ballarat Civil Construction
 47 Wallis St , Delacombe VIC 3356
Project Number: P23488
Project Name: 64 Webb Road
Project Location: Bonshaw
Client Reference: J365
Work Request: 2768
Date Sampled: 08/02/2023
Dates Tested: 08/02/2023 - 11/02/2023
Sampling Method: AS 1289.1.2.1 6.4 (b) - Sampling from layers in earthworks or pavement - compacted
Site Selection: Selected by Client
Location: 64 Webb Road, Bonshaw
Material Source: Test Location

Geotechnical Testing Services (Southern)
 Ballarat Soil and Concrete Testing Laboratory
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Bryan Mott

Approved Signatory: Bryan Mott
 CMT Supervisor
 NATA Accredited Laboratory Number: 19506

Compaction Control AS 1289 5.7.1 & 5.8.1 & 2.1.1						
Sample Number	D23-2768G	D23-2768H	D23-2768I	D23-2768J	D23-2768K	D23-2768L
Date Tested	08/02/2023	08/02/2023	08/02/2023	08/02/2023	08/02/2023	08/02/2023
Time Tested	13:15	13:24	13:31	13:43	13:50	13:59
Test Request #/Location	House Block Lot 8 - Retest	House Block Lot 8	House Block Lot 14	House Block Lot 13	House Block Lot 2	House Block Lot 1
Easting	748238	748241	748236	748259	748261	748262
Northing	5835453	5835435	5835409	5835428	5835438	5835451
Layer / Reduced Level	-600mm	-200mm	-300mm	-300mm	-200mm	-200mm
Thickness of Layer (mm)	300	300	300	300	300	300
Soil Description	Fine gravelly clay	Fine gravelly clay	Fine gravelly clay	Fine gravelly clay	Fine gravelly clay	Fine gravelly clay
Test Depth (mm)	275	275	275	275	275	275
Sieve used to determine oversize (mm)	19.0	19.0	19.0	19.0	19.0	19.0
Percentage of Wet Oversize (%)	1	0	3	1	0	0
Field Wet Density (FWD) t/m ³	2.20	2.10	2.13	2.26	2.13	2.04
Field Moisture Content %	14.2	25.3	22.6	20.6	21.5	24.0
Field Dry Density (FDD) t/m ³	1.93	1.68	1.74	1.87	1.76	1.65
Peak Converted Wet Density t/m ³	**	2.04	**	**	**	2.03
Adjusted Peak Converted Wet Density t/m ³	2.06	**	2.14	2.09	2.06	**
Moisture Variation (Wv) %	**	-3.0	**	**	**	-1.0
Adjusted Moisture Variation %	4.0	**	-2.5	0.0	1.0	**
Hilf Density Ratio (%)	106.5	103.0	99.5	108.0	103.5	100.5
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: P23488-4
Issue Number: 1
Date Issued: 13/02/2023
Client: Ballarat Civil Construction
 47 Wallis St , Delacombe VIC 3356
Project Number: P23488
Project Name: 64 Webb Road
Project Location: Bonshaw
Client Reference: J365
Work Request: 2768
Date Sampled: 08/02/2023
Dates Tested: 08/02/2023 - 11/02/2023
Sampling Method: AS 1289.1.2.1 6.4 (b) - Sampling from layers in earthworks or pavement - compacted
Site Selection: Selected by Client
Location: 64 Webb Road, Bonshaw
Material Source: Test Location

Geotechnical Testing Services (Southern)
 Ballarat Soil and Concrete Testing Laboratory
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Bryan Mott

Approved Signatory: Bryan Mott
 CMT Supervisor
 NATA Accredited Laboratory Number: 19506

Compaction Control AS 1289 5.7.1 & 5.8.1 & 2.1.1						
Sample Number	D23-2768M	D23-2768N				
Date Tested	08/02/2023	08/02/2023				
Time Tested	14:06	14:17				
Test Request #/Location	House Block Lot 4	House Block Lot 5				
Easting	748258	748256				
Northing	5835406	5835398				
Layer / Reduced Level	-200mm	-400mm				
Thickness of Layer (mm)	300	300				
Soil Description	Fine gravelly clay	Fine gravelly clay				
Test Depth (mm)	275	275				
Sieve used to determine oversize (mm)	19.0	19.0				
Percentage of Wet Oversize (%)	4	2				
Field Wet Density (FWD) t/m ³	2.17	2.21				
Field Moisture Content %	23.6	21.0				
Field Dry Density (FDD) t/m ³	1.76	1.82				
Peak Converted Wet Density t/m ³	**	**				
Adjusted Peak Converted Wet Density t/m ³	2.09	2.11				
Moisture Variation (Wv) %	**	**				
Adjusted Moisture Variation %	0.0	0.0				
Hilf Density Ratio (%)	104.0	105.0				
Compaction Method	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: P23488-5
Issue Number: 1
Date Issued: 15/02/2023
Client: Ballarat Civil Construction
 47 Wallis St , Delacombe VIC 3356
Project Number: P23488
Project Name: 64 Webb Road
Project Location: Bonshaw
Client Reference: J365
Work Request: 2775
Date Sampled: 14/02/2023
Dates Tested: 14/02/2023 - 14/02/2023
Sampling Method: AS 1289.1.2.1 6.4 (b) - Sampling from layers in earthworks or pavement - compacted
Site Selection: Selected by Client
Location: Bonshaw
Material Source: Test Location

Geotechnical Testing Services (Southern)
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Bryan Mott

Approved Signatory: Bryan Mott
 CMT Supervisor
 NATA Accredited Laboratory Number: 19506

Compaction Control AS 1289 5.7.1 & 5.8.1 & 2.1.1			
Sample Number	D23-2775A	D23-2775B	D23-2775C
Date Tested	14/02/2023	14/02/2023	14/02/2023
Time Tested	11:04	11:11	11:16
Test Request #/Location	Lot 6 House Block	Lot 7 House Block	Lot 20 House Block
Easting	748251	748249	748228
Northing	5835371	5835360	5835374
Layer / Reduced Level	-150mm	-150mm	-150mm
Thickness of Layer (mm)	200	200	200
Soil Description	Brown gravelly clay	Brown gravelly clay	Brown gravelly clay
Test Depth (mm)	175	175	175
Sieve used to determine oversize (mm)	19.0	19.0	19.0
Percentage of Wet Oversize (%)	0	0	2
Field Wet Density (FWD) t/m ³	2.01	1.95	2.00
Field Moisture Content %	27.0	23.4	20.2
Field Dry Density (FDD) t/m ³	1.58	1.58	1.66
Peak Converted Wet Density t/m ³	1.89	1.93	**
Adjusted Peak Converted Wet Density t/m ³	**	**	1.92
Moisture Variation (Wv) %	1.0	-0.5	**
Adjusted Moisture Variation %	**	**	2.5
Hilf Density Ratio (%)	106.5	101.0	104.0
Compaction Method	Standard	Standard	Standard
Report Remarks	**	**	**

Moisture Variation Note:

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