



# REPORT

## Level One Inspection and Testing Services

Meridian Estate Stage 13, Lot's 1301, 1302,  
1339 and 1340

Prepared for:

Grosvenor Lodge Pty Ltd

October 2018

Our Ref: 3807351.013.v1

## Document Control

Title: Level One Inspection and Testing Services					
Date	Version	Description	Prepared by:	Reviewed by:	Authorised by:
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Distribution:

Grosvenor Lodge Pty Ltd

Chadwick Geotechnics Pty Ltd (FILE)

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## 1 Introduction

Chadwick Geotechnics Pty Ltd (Chadwick Geotechnics) was engaged by Grosvenor Lodge Pty Ltd, to provide Level 1 Inspection and Testing services for the earthworks within Stage 13 of the Meridian Estate in Clyde North.

## 2 Project details

The project included the preparation and filling of lot's 1301, 1302, 1339 and 1340. The specification required the earthworks to be completed under Level 1 Supervision that is, full-time Inspection and Testing of the earthworks. Chadwick Geotechnics were onsite for the duration of the earthworks program.

The location of the site is shown in figure 1 below.



Figure 1: Approximate site location (*Image sourced from Nearmaps*)

### 3 Geology

Published information<sup>1</sup> shows that the site is underlain by various geologies listed as follows;

- Quaternary Age Unnamed dune deposits Formation (Qd1) comprising of sand, clay and calcareous sand.
- Quaternary Age Unnamed swamp and lake deposits Formation (Qm1) comprising of silt and clay.
- Palaeozoic Age Murrindindi Supergroup (Sm) comprising of mudstone and sandstone  
Neogene Age Baxter Sandstone Formation (Nxx) comprising of sandstone, conglomerate, siltstone and ironstone.

### 4 Specification

A summary of the specification is shown below:

Compaction Requirement	95 % Standard Compaction
------------------------	--------------------------

### 5 Inspection and testing

The inspection and testing of earthworks has been carried out in accordance with AS3798-2007, 'Guidelines on earthworks for commercial and residential developments', with a frequency of field density tests as per a type one project (large scale operation). Compaction control laboratory testing was undertaken in our NATA accredited Dandenong South laboratory in accordance with AS1289 'Methods of Testing Soils for Engineering Purposes'.

Prior to fill being placed the subgrade was inspected. The inspections were performed in accordance with the Level 1 guidelines presented in AS 3798–2007 Section 5.5. No soft spots were encountered during the inspections, the area was found to be firm and free of vegetation and other deleterious material.

Full time Level 1 Inspection and testing of the filling operations commenced on the 18<sup>th</sup> April 2018 and was completed on the 6<sup>th</sup> July 2018. During this period Chadwick Geotechnics observed the works, including the supply of material, conditioning of material (moisture conditioning and oversize removal), placement and compaction of the fill material.

All fill material was placed in lift sequences and Chadwick Geotechnics verified that the surface of the stripped area and additional lifts were thoroughly scarified and moisture conditioned prior to placement of additional layers to prevent delamination at the layer interface.

Field density and moisture content testing was carried out using a calibrated nuclear density gauge in accordance with AS 1289.5.8.1. The HILF rapid compaction test was used for peak converted wet density determinations in accordance with AS 1289.5.7.1. Test locations were recorded using a handheld GPS unit. A site plan showing the field density test locations is provided in Appendix A.

A total of six (6) tests were performed during the filling process.

The results show that all tests achieved the specification requirements for the project.

A summary table of Hilf density tests is provided in Appendix B and the laboratory test reports are provided in Appendix C.

<sup>1</sup> BIBBY, L.M., 2004. Simplified 1: 4 000 000 Geology of Victoria. Geological Survey of Victoria Special Publication. GeoScience Victoria.

## 6 Conclusion

On the basis of our inspections and after considering all test results relating to the project, it is our opinion, so far as it is able to be determined, that:

- The materials used by the earthworks contractor met the geotechnical property requirements of the specification.
- The sourced fill was considered to be natural and clean and suitable for use at the site.
- The fill material placed was tested at a suitable frequency in accordance with AS 3798-2007- Table 8.1 and the results indicate the compacted clay achieved the density requirement of the specification.
- Given the consistent construction practices followed by the earthworks contractor and as witnessed by the Chadwick Geotechnics, combined with the satisfactory verification of test results achieved, it is inferred that areas of the site between test locations were performed to the same standard as those areas that have been tested.

It is our opinion that the earthworks undertaken have been performed in accordance with the requirements of Section 8.2 of AS3798-2007 - Level 1 Inspection and Testing.

## 7 Applicability

This report has been prepared for the exclusive use of our client Grosvenor Lodge Pty Ltd in good faith and in accordance with the Chadwick Geotechnics quality system for the earthworks filling at the site.

This report is based on the nature of the project and the conditions present in, factors affecting the soil at the time of the inspections, namely the 18<sup>th</sup> April 2018 to the 6<sup>th</sup> July 2018. No responsibility or liability will be accepted, and Chadwick Geotechnics is indemnified to the full extent permitted by law in respect of the use of this report where there has been a change in the nature of the project or the conditions on site that may alter or affect the conclusions of this report.

Should you require any further information regarding this report, please do not hesitate to contact the undersigned on (03) 8796 7900.

Chadwick Geotechnics Pty Ltd

Report prepared by:

Authorised for Chadwick Geotechnics Pty Ltd by:



.....  
Robert Barden

.....  
Timothy Chadwick

Geotechnical Engineer

Project Director

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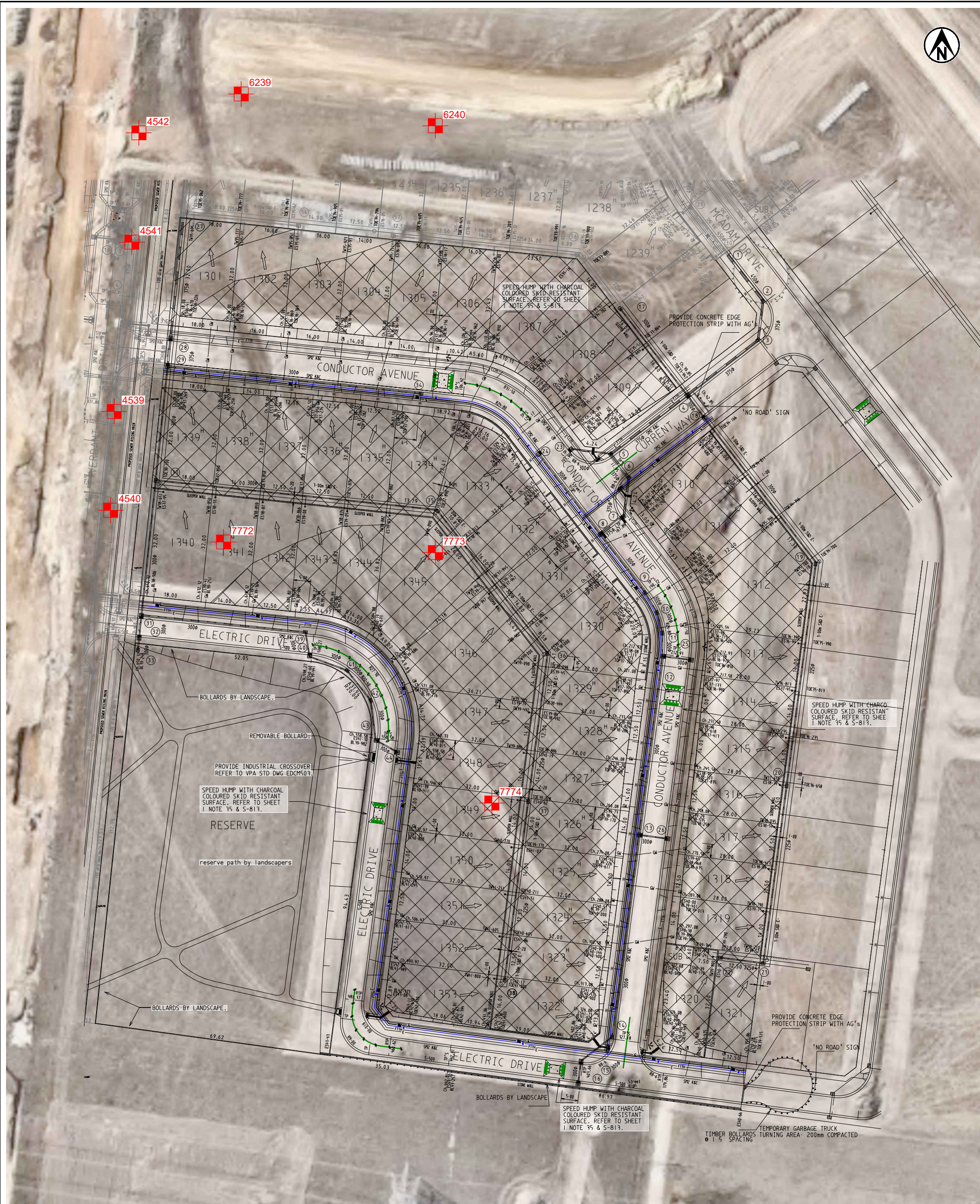
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## Appendix A: Density Test Location Plan

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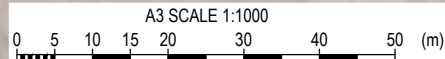


LEGEND



HILF DENSITY TEST LOCATION

AERIAL PHOTO SOURCED FROM NEARMAP. COPYRIGHT NEARMAP PTY LTD IMAGERY DATE: 22/03/2018.



PROJECT No. 3807351		
DESIGNED	KMJA	Oct.18
DRAWN		
CHECKED		
PRELIMINARY DRAFT		
APPROVED	DATE	

CLIENT	GROSVENOR LODGE PTY LTD		
PROJECT	MERIDIAN ESTATE - STAGE 13		
TITLE	HILF DENSITY TEST LOCATION PLAN		
<b>UNDER REVISION 1</b>			
SCALE (A3)	1:1000	FIG No.	FIGURE 1
REV	1		



## Appendix B: Table of field density results

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## Appendix C    NATA endorsed laboratory reports

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# HILF Density Ratio Report

**Client:** Greenridge Properties Pty Ltd  
**Address:** PO Box 3131  
 AUBURN VIC 3123  
**Project:** Merdian Estate - Stage 10  
**Project No.:** 3807351.010  
**Order No.:** **CG Request No.:**  
**TRN:** **Lot No.:**

Accredited for compliance with ISO/IEC 17025  
 - Testing



The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.  
 12712

Approved Signatory: M. Robinson  
 (Senior Technician)  
 Date of Issue: 23/04/2018

THIS DOCUMENT SHALL NOT BE REPRODUCED EXCEPT IN FULL

## Sample Details

**Location:** Clyde North  
**Client Request ID:**  
**Specification Requirements:** Minimum Hilf Density Ratio of 95% Standard Compaction +- 3% of OMC  
**Field Test procedures:** AS 1289.5.8.1  
**Laboratory Test procedures:** AS 1289.5.7.1  
**Sampling Method:** AS1289.1.2.1 Clause 6.4 (b)  
**Source:** Onsite  
**Material:** General Fill

Sample ID	S18DS-04539	S18DS-04540	S18DS-04541	S18DS-04542		
Field Sample ID	1	2	3	4		
Date Tested	18/04/2018	18/04/2018	18/04/2018	18/04/2018		
E	355376	355375	355381	355383		
N	5782279	5782251	5782327	5782358		
	Layer 1	Layer 2	Layer 1	Layer 2		
Soil Description	Clay	Clay	Sandy Clay	Clay		
Depth of Test (mm)	150	150	150	150		
Depth of Layer (mm)	200	200	200	200		
Field Wet Density (t/m <sup>3</sup> )	2.01	2.00	1.94	1.91		
Peak Converted Wet Density (t/m <sup>3</sup> )	1.95	2.01	1.99	1.92		
Compactive Effort	Standard	Standard	Standard	Standard		
Moisture Variation (%)	0.5 dry	0.0	2.0 dry	2.0 dry		
Hilf Density Ratio (%)	<b>103.0</b>	<b>100.0</b>	<b>97.5</b>	<b>100.0</b>		

## Comments



**Dandenong South**  
**ACN 143 009 330**  
 25 Metcalf Street  
 DANDENONG SOUTH, VIC 3175

Ph: + 61 3 8796 7900  
 Fax: +61 3 9706 9431


**Report No: HDR:W18DS01655**

**Issue No: 1**

# HILF Density Ratio Report

**Client:** Greenridge Properties Pty Ltd  
**Address:** PO Box 3131  
 AUBURN VIC 3123  
**Project:** Meridian Estate - Stage 12  
**Project No.:** 3807351.012  
**Order No.:** **CG Request No.:**  
**TRN:** **Lot No.:**

Accredited for compliance with ISO/IEC 17025  
 - Testing



*K. B. Patel*

The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.  
 12712

Approved Signatory: Krushik Patel  
 (Senior Geotechnician)  
 Date of Issue: 5/06/2018

THIS DOCUMENT SHALL NOT BE REPRODUCED EXCEPT IN FULL

## Sample Details

**Location:**  
**Client Request ID:**  
**Specification Requirements:** Minimum Hilf Density Ratio of 95% Standard Compaction +- 3% of OMC  
**Field Test procedures:** AS 1289.5.8.1  
**Laboratory Test procedures:** AS 1289.5.7.1  
**Sampling Method:** AS1289.1.2.1 Clause 6.4 (b)  
**Source:** Onsite  
**Material:** General Fill

Sample ID	S18DS-06237	S18DS-06238	S18DS-06239	S18DS-06240
Field Sample ID	1	2	3	4
Date Tested	1/06/2018	1/06/2018	1/06/2018	1/06/2018
Location	355421	355425	355412	355467
E	5782419	5782419	5782369	5782360
N	Layer 1	Layer 2	Layer 1	Layer 2
Soil Description	Silty Clay	Silty Clay	Silty Clay	Silty Clay
Depth of Test (mm)	150	150	150	150
Depth of Layer (mm)	200	200	200	200
AS Sieve Size (mm)	19.0	19.0	19.0	19.0
Field Wet Density (t/m <sup>3</sup> )	1.97	1.95	1.99	2.03
Peak Converted Wet Density (t/m <sup>3</sup> )	1.97	1.95	1.95	1.95
Compactive Effort	Standard	Standard	Standard	Standard
Moisture Variation (%)	2.0 wet	0.0	0.5 dry	1.5 dry
Hilf Density Ratio (%)	<b>100.0</b>	<b>100.0</b>	<b>102.0</b>	<b>104.5</b>

## Comments



**Dandenong South**  
**ACN 143 009 330**  
 25 Metcalf Street  
 DANDENONG SOUTH, VIC 3175

Ph: + 61 3 8796 7900  
 Fax: +61 3 9706 9431

**Report No: HDR:W18DS02027**

**Issue No: 1**

# HILF Density Ratio Report

**Client:** Greenridge Properties Pty Ltd  
**Address:** PO Box 3131  
 AUBURN VIC 3123  
**Project:** Meridian Estate - Stage 13  
**Project No.:** 3807351.013  
**Order No.:** **CG Request No.:**  
**TRN:** **Lot No.:**

Accredited for compliance with ISO/IEC 17025  
 - Testing

The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.  
 12712

Approved Signatory: B. Taseski  
 (Senior Technician)  
 Date of Issue: 23/07/2018

THIS DOCUMENT SHALL NOT BE REPRODUCED EXCEPT IN FULL

## Sample Details

**Location:** Clyde North  
**Client Request ID:**  
**Specification Requirements:** Minimum Hilf Density Ratio of 95% Standard Compaction +- 3% of OMC  
**Field Test procedures:** AS 1289.5.8.1  
**Laboratory Test procedures:** AS 1289.5.7.1  
**Sampling Method:** AS1289.1.2.1 Clause 6.4 (b)  
**Source:** Onsite  
**Material:** General Fill

Sample ID	S18DS-07772	S18DS-07773	S18DS-07774		
Field Sample ID	1	2	3		
Date Tested	6/07/2018	6/07/2018	6/07/2018		
E	355407	355467	355483		
N	5782242	5782239	5782168		
	Layer 1	Layer 1	Layer 1		
Soil Description	Clay	Clay	Clay		
Depth of Test (mm)	150	150	150		
Depth of Layer (mm)	200	200	200		
AS Sieve Size (mm)	19.0	19.0	19.0		
Field Wet Density (t/m³)	1.97	1.95	1.94		
Peak Converted Wet Density (t/m³)	1.93	1.98	1.92		
Compactive Effort	Standard	Standard	Standard		
Moisture Variation (%)	2.0 dry	0.0	2.0 dry		
Hilf Density Ratio (%)	<b>102.0</b>	<b>98.5</b>	<b>101.0</b>		

## Comments

## Appendix D: Controlled fill certificates

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## CONTROLLED FILL CERTIFICATE - LEVEL 1 INSPECTION & TESTING

PROJECT : Lot No: 1301  
Meridian Estate Stage 13  
Chadwick Geotechnics REF: 3807351.013.v1

CLIENT : Grosvenor Lodge Pty Ltd  
PO Box 4136  
DANDENONG SOUTH VIC 3164  
DATE : October 2018

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### SUMMARY

Chadwick Geotechnics Pty Ltd conducted Level 1 inspection and testing, in accordance with Section 8.2 Level 1 inspection and Testing *AS3798-2007, Guidelines on earthworks for commercial and residential developments*, during the filling of the site.

So far as it is able to be determined, the fill was placed in accordance with the Specification that required a minimum density ratio of 95% of HILF Density (AS1289.5.7.1) to be achieved.

### LIMITATIONS

This Certificate has been commissioned for the filling of the area mentioned above. No responsibility or liability will be accepted for the use of this report for any purpose other than that for which Chadwick Geotechnics Pty Ltd was engaged, specifically for Level 1 Inspection and Testing of the structural fill (excluding top soil).

This report is based on the conditions present and factors affecting the soil at the time of inspection, namely the 18<sup>th</sup> April 2018 to the 6<sup>th</sup> July 2018. No responsibility or liability will be accepted and Chadwick Geotechnics Pty Ltd is indemnified to the full extent permitted by law in respect of the use of this Certificate where there has been a change in the nature of the project, or in the site conditions since the site testing.

CHADWICK GEOTECHNICS PTY LTD

A handwritten signature in black ink that reads 'Robert Barden'.

Robert Barden  
Geotechnical Engineer

A handwritten signature in blue ink that reads 'Timothy Chadwick'.

Timothy Chadwick  
Project Director

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## CONTROLLED FILL CERTIFICATE - LEVEL 1 INSPECTION & TESTING

PROJECT : Lot No: 1302  
Meridian Estate Stage 13  
Chadwick Geotechnics REF: 3807351.013.v1

CLIENT : Grosvenor Lodge Pty Ltd  
PO Box 4136  
DANDENONG SOUTH VIC 3164  
DATE : October 2018

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### SUMMARY

Chadwick Geotechnics Pty Ltd conducted Level 1 inspection and testing, in accordance with Section 8.2 Level 1 inspection and Testing *AS3798-2007, Guidelines on earthworks for commercial and residential developments*, during the filling of the site.

So far as it is able to be determined, the fill was placed in accordance with the Specification that required a minimum density ratio of 95% of HILF Density (AS1289.5.7.1) to be achieved.

### LIMITATIONS

This Certificate has been commissioned for the filling of the area mentioned above. No responsibility or liability will be accepted for the use of this report for any purpose other than that for which Chadwick Geotechnics Pty Ltd was engaged, specifically for Level 1 Inspection and Testing of the structural fill (excluding top soil).

This report is based on the conditions present and factors affecting the soil at the time of inspection, namely the 18<sup>th</sup> April 2018 to the 6<sup>th</sup> July 2018. No responsibility or liability will be accepted and Chadwick Geotechnics Pty Ltd is indemnified to the full extent permitted by law in respect of the use of this Certificate where there has been a change in the nature of the project, or in the site conditions since the site testing.

CHADWICK GEOTECHNICS PTY LTD

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Robert Barden  
Geotechnical Engineer

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Timothy Chadwick  
Project Director

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## CONTROLLED FILL CERTIFICATE - LEVEL 1 INSPECTION & TESTING

PROJECT : Lot No: 1339  
Meridian Estate Stage 13

Chadwick Geotechnics REF: 3807351.013.v1

CLIENT : Grosvenor Lodge Pty Ltd  
PO Box 4136  
DANDENONG SOUTH VIC 3164

DATE : October 2018

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### SUMMARY

Chadwick Geotechnics Pty Ltd conducted Level 1 inspection and testing, in accordance with Section 8.2 Level 1 inspection and Testing *AS3798-2007, Guidelines on earthworks for commercial and residential developments*, during the filling of the site.

So far as it is able to be determined, the fill was placed in accordance with the Specification that required a minimum density ratio of 95% of HILF Density (AS1289.5.7.1) to be achieved.

### LIMITATIONS

This Certificate has been commissioned for the filling of the area mentioned above. No responsibility or liability will be accepted for the use of this report for any purpose other than that for which Chadwick Geotechnics Pty Ltd was engaged, specifically for Level 1 Inspection and Testing of the structural fill (excluding top soil).

This report is based on the conditions present and factors affecting the soil at the time of inspection, namely the 18<sup>th</sup> April 2018 to the 6<sup>th</sup> July 2018. No responsibility or liability will be accepted and Chadwick Geotechnics Pty Ltd is indemnified to the full extent permitted by law in respect of the use of this Certificate where there has been a change in the nature of the project, or in the site conditions since the site testing.

CHADWICK GEOTECHNICS PTY LTD

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Robert Barden  
Geotechnical Engineer

A handwritten signature in blue ink that reads 'Timothy Chadwick'.

Timothy Chadwick  
Project Director

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## CONTROLLED FILL CERTIFICATE - LEVEL 1 INSPECTION & TESTING

PROJECT : Lot No: 1340  
Meridian Estate Stage 13  
Chadwick Geotechnics REF: 3807351.013.v1

CLIENT : Grosvenor Lodge Pty Ltd  
PO Box 4136  
DANDENONG SOUTH VIC 3164  
DATE : October 2018

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### SUMMARY

Chadwick Geotechnics Pty Ltd conducted Level 1 inspection and testing, in accordance with Section 8.2 Level 1 inspection and Testing *AS3798-2007, Guidelines on earthworks for commercial and residential developments*, during the filling of the site.

So far as it is able to be determined, the fill was placed in accordance with the Specification that required a minimum density ratio of 95% of HILF Density (AS1289.5.7.1) to be achieved.

### LIMITATIONS

This Certificate has been commissioned for the filling of the area mentioned above. No responsibility or liability will be accepted for the use of this report for any purpose other than that for which Chadwick Geotechnics Pty Ltd was engaged, specifically for Level 1 Inspection and Testing of the structural fill (excluding top soil).

This report is based on the conditions present and factors affecting the soil at the time of inspection, namely the 18<sup>th</sup> April 2018 to the 6<sup>th</sup> July 2018. No responsibility or liability will be accepted and Chadwick Geotechnics Pty Ltd is indemnified to the full extent permitted by law in respect of the use of this Certificate where there has been a change in the nature of the project, or in the site conditions since the site testing.

CHADWICK GEOTECHNICS PTY LTD

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Robert Barden  
Geotechnical Engineer

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Timothy Chadwick  
Project Director

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