CHADWICK GEOTECHNICS

REPORT

Level One Inspection and Testing Services

Meridian Central Estate, Stage 23, Lots 2301 to 2329

Prepared for:

Grosvenor Lodge Pty Ltd

April / 2021

Our Ref: 3807351.023.v1

25 Metcalf Street, Dandenong South, Vic 3175, Australia
www.chadwickgeotechnics.com.au

Document Control

Title: Level One Inspection and Testing Services					
Date	Version	Description	Prepared by:	Reviewed by:	Authorised by:
30-04-2021	1	Level One report, 3807351.023.V1	RHB	RHB	TJJC

Distribution:

Grosvenor Lodge Pty Ltd	1 electronic copy
Chadwick Geotechnics Pty Ltd (FILE)	1 electronic copy

Table of contents

1 Introduction

Chadwick Geotechnics Pty Ltd (Chadwick Geotechnics) was engaged by Grosvenor Lodge Pty Ltd, to provide Level 1 Geotechnical Inspection and Testing Authority (GITA) services for the earthworks within Stage 23 of the Meridian Central Estate in Clyde North.

2 Project details

The project included the preparation and filling of lot's 2301 to 2329. The specification required the earthworks to be completed under Level 1 GITA Supervision, that is, full-time Geotechnical 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.

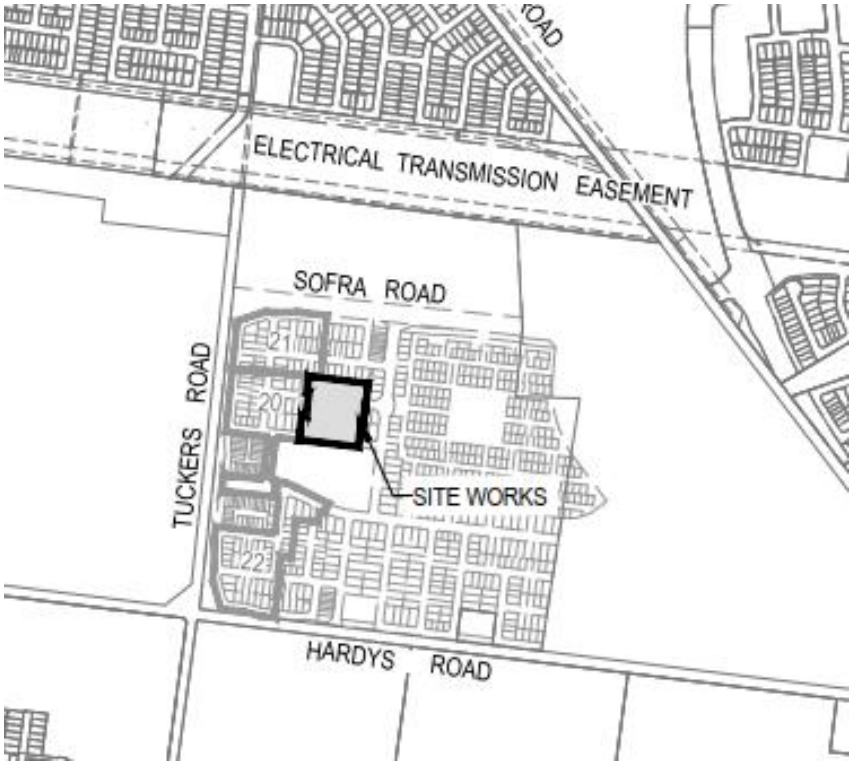

Figure 1: Approximate site location

(Image sourced from Meridian Central Stage 23 Project Ref, 1801767, Cover Sheet)

3 Geology

Published information[1] shows that the site is primarily underlain by Red Bluff Sandstone (Nbr) (Miocene to Pliocene). Sandstone, conglomerate: pale yellow and brown; fine to coarse-grained, massive to well bedded; cross-bedded; local 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 laboratories 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 7 October 2020 and was completed on 16 October 2020. During this period Chadwick Geotechnics observed the earthworks the earthworks contractor was placing fill. This included 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 that of additional lifts, was 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 portable density and moisture 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.

Thirteen (13) 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. The Fill certificate is provided in Appendix D.

[1]. VicGeo Earth Resources (https://gsv.vic.gov.au) Geological Unit (250k)

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 – Level 1 Inspection and Testing - AS3798-2007 “Guidelines on Earthworks for Commercial and Residential Developments”.

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 prevailing conditions between 7 October 2020 and 16 October 2020. 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:

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Robert Barden

Geotechnical Engineer

.....

Timothy Chadwick

Project Director

www.chadwickgeotechnics.com.au

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Appendix A: Density Test Location Plan

T:\Dandenong\Geo Projects\3807351\23 Stage 23\WorkingMaterial\CAD\FIG\3807351.023-F01dwg.dwg 2020-Nov-30 10:35:46 AM Plotted By: KATHRYN JACKSON

LEGEND

S20DS-13412 HILF DENSITY TEST LOCATION

NOTES:
1. AERIAL IMAGE SOURCED FROM NEARMAP. COPYRIGHT NEARMAP PTY LTD IMAGERY DATE: 06/09/2020.
2. BASE PLAN PROVIDED BY BEVERIDGE WILLIAMS. DRAWING REFERENCE: 1801767-23-BASE-201119. DATE RECEIVED: 27/11/2020.

A3 SCALE 1:750

0 5 10 15 20 25 30 35 40 (m)

ORIGINAL IN COLOUR

CHADWICK GEOTECHNICS
www.chadwickgeotechnics.com.au

PROJECT No.	3807351.023	
DESIGNED	RBR	Nov.20
DRAWN	KMJA	Nov.20
CHECKED		
APPROVED		DATE

CLIENT GROSVENOR LODGE PTY LTD
PROJECT MERIDIAN ESTATE - STAGE 23
TITLE LEVEL ONE HILF DENSITY TESTING
HILF DENSITY TEST PLAN

UNDER REVISION 1

SCALE (A3) 1:750 FIG No. FIGURE 01 REV 1

Appendix B: Table of field density results

CHADWICK GEOTECHNICS

380735.023 - Meridian Estate Stage 23 - HILF Summary

Chadwick Geotechnics
25 Metcalf S Tel : (03) 8796 7900
Dandenong Fax: (03) 8796 7944

Report No	Sample No	Date	Test Number	Location [E]	Location [N]	RL (m)	Layer	Density Ratio HILF test (≥95%)	Moisture Variation	Pass / Fail	Remarks
HDR:W20DS05519	S20DS-19970	7/10/2020	1	355483	5781564	34.169	2	100	OMC	Pass	
HDR:W20DS05519	S20DS-19971	7/10/2020	2	355548	5781484	35.660	1	101	0.5 dry	Pass	
HDR:W20DS05519	S20DS-19972	7/10/2020	3	355486	5781487	34.340	1	103.5	OMC	Pass	
HDR:W20DS05519	S20DS-19973	7/10/2020	4	355471	5781527	34.440	2	100	OMC	Pass	
HDR:W20DS05519	S20DS-19974	7/10/2020	5	355516	5781521	35.127	2	102	OMC	Pass	
HDR:W20DS05519	S20DS-19975	7/10/2020	6	355495	5781578	34.599	3	100	OMC	Pass	
HDR:W20DS05555	S20DS-20086	12/10/2020	1	355564	5781566	35.830	1	97.5	1.0 wet	Pass	
HDR:W20DS05555	S20DS-20087	12/10/2020	2	355536	5781560	35.081	1	96	0.5 wet	Pass	
HDR:W20DS05569	S20DS-20127	13/10/2020	1	355516	5781579	35.045	2	99.5	OMC	Pass	
HDR:W20DS05569	S20DS-20128	13/10/2020	2	355559	5781557	35.847	2	100	1.5 dry	Pass	
HDR:W20DS05574	S20DS-20139	14/10/2020	1	355524	5781578	35.289	FSL	98.5	OMC	Pass	
HDR:W20DS05574	S20DS-20140	14/10/2020	2	355546	5781572	35.723	FSL	101.5	0.5 dry	Pass	
HDR:W20DS05619	S20DS-20290	16/10/2020	1	355572	5781486	36.146	1	100	2.8 dry	Pass	
No further testing required											

Appendix C NATA endorsed laboratory reports

CHADWICK GEOTECHNICS

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:W20DS05519
Issue No: 1

HILF Density Ratio Report

Client: Greenridge Properties Pty Ltd
Address: PO Box 3131
AUBURN VIC 3123
Project: Meridian Estate, Stage 23
Project No.: 3807351.023
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.

Approved Signatory: M. Longfield
(Senior Technician)
12712 Date of Issue: 12/10/2020

Sample Details

Location:
Client Request ID:
Specification Requirements: Minimum Hilf Density Ratio of 95% (+- 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: Clay

Sample Data

Sample ID	S20DS-19970	S20DS-19971	S20DS-19972	S20DS-19973	S20DS-19974	S20DS-19975
Field Sample ID	1	2	3	4	5	6
Date Tested	7/10/2020	7/10/2020	7/10/2020	7/10/2020	7/10/2020	7/10/2020
E:	1659.353	725.137	1662.500	1647.749	1693.201	1671.734
N:	724.607	645.328	647.833	687.948	682.326	738.724
EL:	34.169	35.660	34.340	34.440	35.127	34.599
Lot:	2317	2307	2303	2314	2311	2318
Layer:	2	1	1	2	2	3
Field and Laboratory Data						
Depth of Test (mm)	175	175	175	175	175	175
Depth of Layer (mm)	200	200	200	200	200	200
AS Sieve Size (mm)	19.0	19.0	19.0	19.0	19.0	19.0
Oversize Wet (%)	0	0	0	0	0	0
Field Wet Density (t/m³)	2.08	2.10	2.05	2.01	2.04	2.00
Peak Converted Wet Density (t/m³)	2.08	2.07	1.99	2.01	2.01	2.00
Compactive Effort	Standard	Standard	Standard	Standard	Standard	Standard
Moisture Variation (%)	0.0	0.5 dry	0.0	0.0	0.0	0.0
Hilf Density Ratio (%)	**100.0**	**101.0**	**103.5**	**100.0**	**102.0**	**100.0**

Comments

CHADWICK GEOTECHNICS

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:W20DS05555
Issue No: 1

HILF Density Ratio Report

Client: Greenridge Properties Pty Ltd
Address: PO Box 3131
AUBURN VIC 3123
Project: Meridian Estate, Stage 23
Project No.: 3807351.023
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.

Approved Signatory: M. Longfield
(Senior Technician)
12712 Date of Issue: 20/10/2020

Sample Details

Location:
Client Request ID:
Specification Requirements: Minimum Hilf Density Ratio of 95% (+- 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: Rocky Clay

Sample Data

Sample ID	S20DS-20086	S20DS-20087				
Field Sample ID	1	2				
Date Tested	12/10/2020	12/10/2020				
E:	1740.289	1712.318				
N:	726.759	721.475				
EL:	35.830	35.081				
Lot:	2323	2323				
Layer:	1	1				
Field and Laboratory Data						
Depth of Test (mm)	175	175				
Depth of Layer (mm)	200	200				
AS Sieve Size (mm)	19.0	19.0				
Oversize Wet (%)	0	0				
Field Wet Density (t/m³)	1.96	1.97				
Peak Converted Wet Density (t/m³)	2.01	2.05				
Compactive Effort	Standard	Standard				
Moisture Variation (%)	1.0 wet	0.5 wet				
Hilf Density Ratio (%)	**97.5**	**96.0**				

Comments

CHADWICK GEOTECHNICS

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:W20DS05569
Issue No: 1

HILF Density Ratio Report

Client: Greenridge Properties Pty Ltd
Address: PO Box 3131
AUBURN VIC 3123
Project: Meridian Estate, Stage 23
Project No.: 3807351.023
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.

Approved Signatory: M. Longfield
(Senior Technician)
12712 Date of Issue: 20/10/2020

Sample Details

Location:
Client Request ID:
Specification Requirements: Minimum Hilf Density Ratio of 95% (+- 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: Rocky Clay

Sample Data

Sample ID	S20DS-20127	S20DS-20128				
Field Sample ID	1	2				
Date Tested	13/10/2020	13/10/2020				
E:	1692.687	1735.438				
N:	739.660	717.485				
EL:	35.045	35.847				
Lot:	2319	2322				
Layer:	2	2				
Field and Laboratory Data						
Depth of Test (mm)	175	175				
Depth of Layer (mm)	200	200				
AS Sieve Size (mm)	19.0	19.0				
Oversize Wet (%)	0	0				
Field Wet Density (t/m³)	1.98	1.96				
Peak Converted Wet Density (t/m³)	1.98	1.97				
Compactive Effort	Standard	Standard				
Moisture Variation (%)	0.0	1.5 dry				
Hilf Density Ratio (%)	**99.5**	**100.0**				

Comments

CHADWICK GEOTECHNICS

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:W20DS05574
Issue No: 1

HILF Density Ratio Report

Client: Greenridge Properties Pty Ltd
Address: PO Box 3131
AUBURN VIC 3123
Project: Meridian Estate, Stage 23
Project No.: 3807351.023
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.

Approved Signatory: M. Longfield
(Senior Technician)
12712 Date of Issue: 20/10/2020

Sample Details

Location:
Client Request ID:
Specification Requirements: Minimum Hilf Density Ratio of 95% (+- 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: Rocky Clay

Sample Data

Sample ID	S20DS-20139	S20DS-20140				
Field Sample ID	1	2				
Date Tested	14/10/2020	14/10/2020				
E:	1700.915	1722.525				
N:	738.689	733.323				
EL:	35.289	35.723				
Lot:	2320	2321				
Layer:	FSL	FSL				
Field and Laboratory Data						
Depth of Test (mm)	175	175				
Depth of Layer (mm)	200	200				
AS Sieve Size (mm)	19.0	19.0				
Oversize Wet (%)	0	0				
Field Wet Density (t/m³)	2.00	1.95				
Peak Converted Wet Density (t/m³)	2.03	1.92				
Compactive Effort	Standard	Standard				
Moisture Variation (%)	0.0	0.5 dry				
Hilf Density Ratio (%)	**98.5**	**101.5**				

Comments

CHADWICK GEOTECHNICS

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:W20DS05619
Issue No: 1

HILF Density Ratio Report

Client: Greenridge Properties Pty Ltd
Address: PO Box 3131
AUBURN VIC 3123
Project: Meridian Estate, Stage 23
Project No.: 3807351.023
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.

Approved Signatory: M. Longfield
(Senior Technician)
12712 Date of Issue: 4/11/2020

Sample Details

Location:
Client Request ID:
Specification Requirements: Minimum Hilf Density Ratio of 98% (+- 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: Rocky Clay

Sample Data

Sample ID	S20DS-20290					
Field Sample ID	1					
Date Tested	16/10/2020					
E:	1748.637					
N:	646.557					
EL:	36.146					
Layer:	1					

Field and Laboratory Data

Depth of Test (mm)	175					
Depth of Layer (mm)	200					
AS Sieve Size (mm)	19.0					
Oversize Wet (%)	0					
Field Wet Density (t/m³)	1.95					
Peak Converted Wet Density (t/m³)	1.96					
Compactive Effort	Standard					
Moisture Variation (%)	3.0 dry					
Hilf Density Ratio (%)	**100.0**					

Comments

Appendix D: Controlled fill certificate

CONTROLLED FILL CERTIFICATE - LEVEL 1 INSPECTION & TESTING

PROJECT	: Lot No's: 2301 to 2329 Meridian Central Estate Stage 23	Chadwick Geotechnics REF: 3807351.023.v1	
CLIENT	: Grosvenor Lodge Pty Ltd PO Box 4136 DANDENONG SOUTH VIC 3164	DATE	: April / 2021

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 (7 October 2020 and was completed on 16 October 2020) 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

Robert Barden
Geotechnical Engineer

Timothy Chadwick
Project Director

CHADWICK
GEOTECHNICS