CHADWICK GEOTECHNICS

REPORT

Level One Inspection and Testing Services

Meridian Central Estate Stage 37, Clyde
Lot's 3701 to 3717

Prepared for:

Grosvenor Lodge Pty Ltd

10 August 2022

Our Ref: 3807351.037.v1

25 Metcalf Street, Dandenong South, Vic 3175, Melbourne, Australia
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Document control

Title: Level One Inspection and Testing Services					
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Distribution:

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

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1 Introduction

As part of the construction of the Meridian Central Estate development in Clyde North, Chadwick Geotechnics Pty Ltd (Chadwick Geotechnics), has been engaged by Grosvenor Lodge Pty Ltd (Grosvenor Lodge) to provide Geotechnical Inspection and Testing Authority (GITA) services for the earthworks within Stage 37 of the Estate (referred to Stage 37 herein).

This report presents the earthworks supervision methods and density testing results for the residential lot's 3701 to 3717 within the Stage 37 site. The earthworks were completed between 22 February 2022 and 28 April 2022.

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.

2 Project details

2.1 Location

The Meridian Central Estate is in Clyde North. Stage 37 is located to the to the West of Stage 36 and South of Stage 35 within the Meridian Central Estate. The stage is being developed as a residential development.

The included works are shown on the Site Plan in Appendix A. The general site overview is shown on the aerial map extracted from Nearmap shown in Figure 1 below.

Figure 1: Stage 37 – extract from Nearmap.

2.2 Roles

The organisations and their roles are presented in Table 2.1 below.

Table 1 Project roles

Role	Organisation
Developer	Grosvenor Lodge Pty Ltd
Geotechnical Inspection and Testing Authority (GITA)	Chadwick Geotechnics Pty Ltd
Civil Designer	Beveridge Williams Pty Ltd
Earthworks Contractor	Brown Property Group Pty Ltd

2.3 Fill specification

A summary of the specification is shown below:

- All filling in excess of 300mm depth shall be constructed to specifications satisfying the requirements of AS 3798-2007 "Guidelines on Earthworks for Commercial and Residential Developments".
- All filling works shall be undertaken with supervision to the standard detailed as "Level 1 Inspection and Testing" in AS 3798-2007, such that the supervisor will issue a notice detailing that the works comply with the specifications and drawings.
- The fill soils to comply with the 'Suitable Material' in accordance with Section 4.4 of the AS3798-2007, and the following:
  - Maximum particle size of 150mm.
  - Particles over 37.5mm diameter not to exceed 20% of the material.
  - Organic soils, topsoil, silts, or soils containing organic matter, wood, plastics, metal or other deleterious materials are not acceptable.
- Subgrade to be proof rolled in presence of the Level 1 Inspector prior to the placement of engineered fill.
- Fill to be compacted in near horizontal layers.
- Compaction to achieve a ratio of at least 95% Standard MDD (maximum dry density).
- Frequency of testing to be in accordance with Table 8.1 of AS3798-2007.

2.4 Dates on site

Geotechnical technical and engineering staff from Chadwick Geotechnics were onsite for the duration of the earthworks program on the days shown in Table 2.

Table 2: Dates on Site

Month	Dates on site
February 2022	22, 24, 26
March 2022	29
April 2022	1,7,9,12,13,14 and 28

2.5 Included areas

This report is applicable to material placed by the contractor on the residential lots 3701 to 3717 within Stage 37 of Meridian Estate, as shown on the Site Plan in Appendix A, and with reference to Section 2.6 (Excluded Areas) of this report.

2.6 Excluded areas

This report does not include fill outside the general boundary of the filled areas as shown in Appendix A of this report. No fill was placed on the residential lots not mentioned in Section 2.5 of this report.

Backfill of trenches for the underground services, fill on footpaths, driveways and roads, or placement of topsoil, were not part of the scope for the works supervised by Chadwick Geotechnics.

3 Inspection and Testing

The inspection and testing of earthworks have 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 Table 8.1 (explained in Section 3.5 of this report). Compaction control laboratory testing was performed in a Chadwick Geotechnics' NATA accredited laboratory in accordance with AS1289 'Methods of Testing Soils for Engineering Purposes'.

3.1 Earthworks

The earthworks for the project comprised of the following phases:

- Stripping of topsoil from the proposed fill area;
- Assessment, remediation and proof rolling of subgrade; and,
- Placement and compaction of engineered fill.

Below are two photographs of typical earthwork operations completed during earthworks.

Table 3 Photographs showing typical works at Stage 36

Photograph 1: Proof Roll	Photograph 2: Spreading material
	

3.2 Subgrade Assessment

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. The topsoil surface was stripped to natural clay and proof rolled. Proof rolls were undertaken between the 22 February to 13 April 2022 with the use of a loaded dump truck or pad foot roller. The area was found to be firm and free of vegetation and other deleterious material. All pre-existing uncontrolled fill was removed prior to the placement of engineered fill to achieve the design levels.

3.3 Earthwork Equipment

The fill was placed and compacted using vibrating Pad foot rollers. Water trucks with water cannons attached were used to moisture condition the soil materials. The layer thicknesses were controlled using earthwork machinery with built-in GPS systems. The following machinery was on site during earthworks.

Table 4: Earthworks plant on site

Equipment type	Model
Dozer	D6
Excavator	20 T and 32T
Pad foot roller	Yes
Dump Trucks	Yes
Water cannon	Yes

3.4 Fill Material

Material used for the construction of the fill comprised of local silty clays won from the road boxing and trench excavations across the site.

Sample taken from the site stockpiles comprising local material used for fill was taken for geotechnical compliance testing. The material compliance test results are summarised in Table 3. The laboratory test certificate is attached in Appendix C. The material is consistent for Stage 31 to 45.

Table 1: Compliance test result summary

Date tested	Particle Size Distribution (PSD) passing						Liquid Limit	Plastic Limit	Plasticity Index
9th April 2022	150mm	37.5mm	13.2mm	4.75mm	1.18mm	0.75µm	18%	12%	6%
	100	99	92	89	86	30			

The fill placed within the lots is considered as 'Suitable Material' in accordance with Section 4.4 of the AS3798-2007. The material was deemed as being derived from natural soils.

The fill material was not tested for classification of 'Fill Material' as defined in EPA Publication IWRG621.

Any observed organic or deleterious matter including any oversize cobbles or boulders were removed from the tested areas during the fill placement.

Below are two photographs of the fill material used during construction.

Table 5: Materials used for fill

Photograph 3. Material ready for placement	Photograph 4: Orange sandy Clay
	

3.5 Engineered Fill Construction

All fill material was placed in lift sequences comprising horizontal layers not exceeding 300mm compacted thickness. 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. Once the placed fill was approved, the layer was compacted accordingly.

Chadwick's Geotechnics personnel were on site on a fulltime basis during the placement, moisture conditioning, compaction and testing of the fill on the dates noted in Table 2 of this report.

3.6 Density testing

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 handheld GPS units.

Testing was undertaken under the frequencies listed below, subject to the area and volume worked on the day of testing:

- 1 test per material type per layer per 2500m² or 1 test per 500m³ distributed reasonably evenly or 3 tests per lot – whichever requires the most tests in accordance with Type 1 Earthworks (large scale operations) as defined in Table 8.1 of the AS 3798-2007;
- 1 test per layer per 1,000m² or 1 test per 200m³ distributed reasonably evenly or 1 test per residential lot - whichever requires the most tests in accordance with Type 2 Earthworks (small scale operations) as defined in Table 8.1 of the AS 3798-2007;
- 1 test per layer per 500m² or 1 test per 100m³ distributed reasonably evenly or 3 tests per visit - whichever requires the most tests in accordance with Type 3 Earthworks (concentrated scale operations) as defined in Table 8.1 of the AS 3798-2007; and

- 1 test per 2 layers per 50m² distributed reasonably evenly throughout the fill depth –in accordance with Type 4 Earthworks (confined operations) as defined in Table 8.1 of the AS 3798-2007.

A total of 33 tests were performed across the Stage 37 area during the filling process.

The results show that 5 tests failed to meet the specification requirements for the project. The earthworks contractor was advised of the tests that failed and the fill relevant to the area was reworked, reconditioned, re-compacted and subsequently retested. Once retested, the final results show that the tests achieved the specification requirements for the project.

A site plan showing the field density test locations is provided in Appendix A. A summary of the Hilf density test reports is provided within Appendix B, and the laboratory test reports are provided within Appendix C. The Controlled Fill Certificate is provided within Appendix E.

4 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 fill material placed was tested at a suitable frequency in accordance with AS 3798-2007- Table 8.1 and the results indicate the compacted material achieved the minimum density requirement of the specification.
- Given the consistent construction practices followed by the earthworks contractor, and as witnessed by 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.

5 Applicability

This report has been prepared for the exclusive use of our client Grosvenor Lodge Pty Ltd in good faith with respect to the particular brief given to us and it may not be relied upon in other contexts or for any other purpose, or by any person other than our client, without our prior written agreement.

Recommendations and opinions in this report are based on data from discrete investigation locations. The nature and continuity of materials away from these locations are inferred but it must be appreciated that actual conditions could vary from the assumed model.

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:

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Robert Barden
Project Manager

Authorised for Chadwick Geotechnics Pty Ltd by:

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Tim Chadwick
Project Director

Appendix A : Site plan

T:\Dandenong\Geo Projects\3807351\37 Stage 37\WorkingMaterial\CAD\FIG\3807351-F01.dwg 2022-Jun-22 2:51:04 PM Plotted By: KATHRYN JACKSON

CHADWICK GEOTECHNICS
www.chadwickgeotechnics.com.au

NOTES:
1. AERIAL IMAGE SOURCED FROM NEARMAP. COPYRIGHT NEARMAP PTY LTD IMAGERY DATE: 25.04.2022.
2. BASE PLAN PROVIDED BY GROSVENOR LODGE PTY LTD. DRAWING REFERENCE: 1801767-37-BASE 211027 DATE RECEIVED: 22/06/2022.

A3 SCALE 1:1250
0 25 50 75 (m)

ORIGINAL IN COLOUR

PROJECT No.	3807351		
DESIGNED	STPA	Jun.22	
DRAWN	DAL	Jun.22	
CHECKED			
		APPROVED	DATE

CLIENT GROSVENOR LODGE PTY LTD
PROJECT MERIDIAN ESTATE - STAGE 37
TITLE LEVEL1 HILF DENSITY TESTING
HILF DENSITY TEST LOCATION PLAN

UNDER SUPERVISION 1

SCALE (A3) 1:1250 FIG No. 3807351-F01 REV 1

Appendix B : Hilf density test summary

Meridian Estate Stage 37 - 3807351.037

HILF Density Testing Summary

Chadwick Geotechnics
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Report No	Sample No	Test Number	Date	Lot	Easting	Northing	Layer/RL	Density Ratio (≥95%)	Moisture Variation From OMC (%)	Pass / Fail	Remarks
W22DS00437	1431	1	24/02/2022	3702	356293	5781444	44.34	91	2.5 dry	Fail	See Retest 1472
W22DS00452	1469	1	26/02/2022	3708	356293	5781370	44.31	98.5	0.5 wet	Pass	
W22DS00452	1470	2	26/02/2022	3706	356273	5781391	44.45	100.5	0 dry	Pass	
W22DS00452	1471	3	26/02/2022	3704	356229	5781443	44.35	95	0 wet	Pass	
W22DS00452	1472	4	26/02/2022	3702	356340	5781272	44.405	95	2.5 dry	Pass	Retest of 1431
W22DS00738	2479	1	29/03/2022	3701	356226	5781450	44.53	103.5	2 dry	Pass	
W22DS00738	2480	2	29/03/2022	3703	356239	6372409	44.615	98.5	1.5 dry	Pass	
W22DS00738	2481	3	29/03/2022	3705	356259	5781407	44.57	100	0.5 dry	Pass	
W22DS00738	2482	4	29/03/2022	3707	356285	5781382	44.585	105	2.5 dry	Pass	
W22DS00777	2609	1	1/04/2022	3704	356242	5781415	45.205	97.5	3 dry	Pass	
W22DS00777	2610	2	1/04/2022	3702	356240	5781449	44.774	106.5	3 dry	Pass	
W22DS00777	2611	3	1/04/2022	3706	356278	5781402	44.778	93	2.5 dry	Fail	See Retest 2794
W22DS00826	2790	1	7/04/2022	3706	356278	5781402	44.778	99	3 dry	Pass	
W22DS00826	2794	2	7/04/2022	3706	356286	5781364	44.84	97.5	4.5 dry	Fail	Retest of 2611, See Retest 2939
W22DS00826	2795	3	7/04/2022	3709	356303	5781355	44.21	91.5	2.5 dry	Fail	See Retest 2814
W22DS00826	2796	4	7/04/2022	3711	356320	5781336	44.34	99	2.5 dry	Pass	
W22DS00836	2814	1	9/04/2022	3709	356293	5781353	44.21	99.5	2 dry	Pass	Retest of 2795
W22DS00869	2939	1	12/04/2022	3706	356286	5781364	48.88	98.5	4.5 dry	Fail	Retest of 2794, See Retest 3110
W22DS00869	2940	2	12/04/2022	3708	356303	5781355	44.478	99	2.5 dry	Pass	
W22DS00888	3010	1	13/04/2022	3708	356286	5781364	44.888	100.5	1.5 dry	Pass	Retest of 2939

Meridian Estate Stage 37 - 3807351.037

HILF Density Testing Summary

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Report No	Sample No	Test Number	Date	Lot	Easting	Northing	Layer/RL	Density Ratio (≥95%)	Moisture Variation From OMC (%)	Pass / Fail	Remarks
W22DS00888	3011	2	13/04/2022	3705	356254	5781401	45.332	102	2 dry	Pass	
W22DS00888	3012	3	13/04/2022	3703	356251	5781437	45.001	107.5	2.5 dry	Pass	
W22DS00888	3013	4	13/04/2022	3701	356216	5781450	45.2	101.5	2 dry	Pass	
W22DS00905	3066	1	14/04/2022	3707	356286	5781383	44.95	100.5	0 wet	Pass	
W22DS00905	3067	2	14/04/2022	3709	356293	5781351	44.69	95	0 wet	Pass	
W22DS00905	3068	3	14/04/2022	3710	356316	5781349	44.43	98	0 dry	Pass	
W22DS00905	3069	4	14/04/2022	3713	356341	5781309	44.763	101	2.5 dry	Pass	
W22DS00905	3070	5	14/04/2022	3714	356341	5781309	45.167	106.5	2 dry	Pass	
W22DS00905	3071	6	14/04/2022	3715	356340	5781272	45.373	102	0 wet	Pass	
W22DS00905	3072	7	14/04/2022	3716	356303	5781359	45.427	101	0.5 dry	Pass	
W22DS00905	3073	8	14/04/2022	3717	356306	5781343	45.388	101.5	2.5 dry	Pass	
W22DS00972	3446	1	28/04/2022	3709	356327	5781263	44.867	99	0 wet	Pass	
W22DS00972	3447	2	28/04/2022	3710	356314	5781254	44.894	100	0 wet	Pass	

Appendix C : Hilf density testing reports

CHADWICK GEOTECHNICS

Think Act Safe Be

Dandenong South
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Report No: HDR:W22DS00437
Issue No: 1

HILF Density Ratio Report

Client: Greenridge Properties Pty Ltd
Address: PO Box 3131
AUBURN VIC 3123
Project: Meridian Estate - Stage 37
Project No.: 3807351.037
Order No.: **CG Request No.:**
TRN: **Lot No.:**

Accredited for compliance with ISO/IEC 17025 – Testing

Accreditation Number: 12719
Site Number: 12712
Approved Signatory: M. Robinson (Team Leader)
Date of Issue: 28/02/2022

Sample Details

Location:	Clyde North
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	S22DS-01431					
Field Sample ID	1					
Date Tested	24/02/2022					
Lot No:	3702					
E:	2470.080					
N:	604.550					
Elv:	44.340					
	Layer 1					

Field and Laboratory Data

Depth of Test (mm)	225					
Depth of Layer (mm)	250					
AS Sieve Size (mm)	19.0					
Oversize Wet (%)	0					
Field Wet Density (t/m³)	1.94					
Peak Converted Wet Density (t/m³)	2.13					
Compactive Effort	Standard					
Moisture Variation (%)	2.5 dry					
Hilf Density Ratio (%)	**91.0**					

Comments

CHADWICK GEOTECHNICS

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Report No: HDR:W22DS00452
Issue No: 1

HILF Density Ratio Report

Client: Greenridge Properties Pty Ltd
Address: PO Box 3131
AUBURN VIC 3123
Project: Meridian Estate - Stage 37
Project No.: 3807351.037
Order No.: **CG Request No.:**
TRN: **Lot No.:**

Accredited for compliance with ISO/IEC 17025 – Testing

Accreditation Number: 12719
Site Number: 12712
Approved Signatory: M. Robinson (Team Leader)
Date of Issue: 28/02/2022

Sample Details

Location:	Clyde North
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	S22DS-01469	S22DS-01470	S22DS-01471	S22DS-01472		
Field Sample ID	1	2	3	4		
Date Tested	26/02/2022	26/02/2022	26/02/2022	26/02/2022		
Lot No:	3708	3706	3704	3702		
E:	2469.260	2450.100	2429.520	2405.390		
N:	531.350	552.316	577.300	603.670		
Elv:	44.310	44.450	44.350	44.405		
				Retest of S22DS-01431		

Field and Laboratory Data

Depth of Test (mm)	225	225	225	225		
Depth of Layer (mm)	250	250	250	250		
AS Sieve Size (mm)	19.0	19.0	19.0	19.0		
Oversize Wet (%)	0	0	0	0		
Field Wet Density (t/m³)	2.10	2.12	2.02	2.05		
Peak Converted Wet Density (t/m³)	2.13	2.11	2.13	2.15		
Compactive Effort	Standard	Standard	Standard	Standard		
Moisture Variation (%)	0.5 wet	0.0	0.0	2.5 dry		
Hilf Density Ratio (%)	**98.5**	**100.5**	**95.0**	**95.0**		

Comments

CHADWICK GEOTECHNICS

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Report No: HDR:W22DS00738
Issue No: 1

HILF Density Ratio Report

Client: Greenridge Properties Pty Ltd
Address: PO Box 3131
AUBURN VIC 3123
Project: Meridian Estate - Stage 37
Project No.: 3807351.037
Order No.: **CG Request No.:**
TRN: **Lot No.:**

Accredited for compliance with ISO/IEC 17025 – Testing

Accreditation Number: 12719
Site Number: 12712
Approved Signatory: M. Robinson (Team Leader)
Date of Issue: 19/04/2022

Sample Details

Location:	Clyde North
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:	Silty Clay

Sample Data

Sample ID	S22DS-02479	S22DS-02480	S22DS-02481	S22DS-02482		
Field Sample ID	1	2	3	4		
Date Tested	29/03/2022	29/03/2022	29/03/2022	29/03/2022		
E:	2402.775	2415.800	2435.950	2461.444		
N:	610.995	591570	568.410	543.125		
RL:	44.530	44.615	44.570	44.585		
Layer:	2	2	2	2		
Field and Laboratory Data						
Depth of Test (mm)	175	175	175	175		
Depth of Layer (mm)	200	200	200	200		
AS Sieve Size (mm)	19.0	19.0	19.0	19.0		
Oversize Wet (%)	0	0	0	0		
Field Wet Density (t/m³)	2.11	2.01	2.10	2.15		
Peak Converted Wet Density (t/m³)	2.05	2.04	2.10	2.05		
Compactive Effort	Standard	Standard	Standard	Standard		
Moisture Variation (%)	2.0 dry	1.5 dry	0.5 dry	2.5 dry		
Hilf Density Ratio (%)	**103.5**	**98.5**	**100.0**	**105.0**		

Comments

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Report No: HDR:W22DS00777
Issue No: 1

HILF Density Ratio Report

Client: Greenridge Properties Pty Ltd
Address: PO Box 3131
AUBURN VIC 3123
Project: Meridian Estate - Stage 37
Project No.: 3807351.037
Order No.: **CG Request No.:**
TRN: **Lot No.:**

Accredited for compliance with ISO/IEC 17025 – Testing

Accreditation Number: 12719
Site Number: 12712
Approved Signatory: M. Robinson (Team Leader)
Date of Issue: 19/04/2022

Sample Details

Location:	Clyde North
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:	Red Sandy Clay

Sample Data

Sample ID	S22DS-02609	S22DS-02610	S22DS-02611			
Field Sample ID	1	2	3			
Date Tested	1/04/2022	1/04/2022	1/04/2022			
Time Tested	09:45	09:55	10:05			
E:	2419.052 (356240)	2416.706 (356238)	2454.804 (356279)			
N:	576.428 (5781416)	609.866 (5781449)	562.585 (5781405)			
EL:	45.205	44.774	44.778			
Lot / Layer:	3704 / 3	3702 / 3	3706 / 3			
Other:	Sample 11	Sample 10	Sample 12			
Field and Laboratory Data						
Depth of Test (mm)	225	225	200			
Depth of Layer (mm)	250	250	225			
AS Sieve Size (mm)	19.0	19.0	19.0			
Oversize Wet (%)	0	0	0			
Field Wet Density (t/m³)	1.91	2.00	1.92			
Peak Converted Wet Density (t/m³)	1.95	1.87	2.06			
Compactive Effort	Standard	Standard	Standard			
Moisture Variation (%)	3.0 dry	3.0 dry	2.5 dry			
Hilf Density Ratio (%)	**97.5**	**106.5**	**93.0**			

Comments

CHADWICK GEOTECHNICS

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Report No: HDR:W22DS00826
Issue No: 1

HILF Density Ratio Report

Client: Greenridge Properties Pty Ltd
Address: PO Box 3131
AUBURN VIC 3123
Project: Meridian Estate - Stage 37
Project No.: 3807351.037
Order No.: **CG Request No.:**
TRN: **Lot No.:**

Accredited for compliance with ISO/IEC 17025 – Testing

Accreditation Number: 12719
Site Number: 12712
Approved Signatory: M. Robinson (Team Leader)
Date of Issue: 19/04/2022

Sample Details

Location:	Clyde North
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:	Red Sandy Clay / Silty Clay

Sample Data

Sample ID	S22DS-02790	S22DS-02794	S22DS-02795	S22DS-02796		
Field Sample ID	1	5	6	7		
Date Tested	7/04/2022	7/04/2022	7/04/2022	7/04/2022		
Time Tested	09:20	09:30	09:40	09:45		
E:	2454.804 (356279)	2462.270 (356284)	2479.450 (356300)	2496.650 (356322)		
N:	562.585 (5781405)	525.450 (5781369)	515.800 (5781358)	497.150 (5781342)		
EL:	44.778	448.880	44.210	44.340		
Layer:	3	3	1	1		
Other:	Retest of S22DS-02611 / Sample 13	Sample 14	Sample 15	Sample 16		
Field and Laboratory Data						
Depth of Test (mm)	200	200	200	200		
Depth of Layer (mm)	225	225	225	225		
AS Sieve Size (mm)	19.0	19.0	19.0	19.0		
Oversize Wet (%)	0	0	4	0		
Field Wet Density (t/m³)	2.01	1.86	1.98	2.05		
Peak Converted Wet Density (t/m³)	2.03	1.91	2.16	2.07		
Compactive Effort	Standard	Standard	Standard	Standard		
Moisture Variation (%)	3.0 dry	4.5 dry	2.5 dry	2.5 dry		
Hilf Density Ratio (%)	**99.0**	**97.5**	**91.5**	**99.0**		

Comments

CHADWICK GEOTECHNICS

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Report No: HDR:W22DS00836
Issue No: 1

HILF Density Ratio Report

Client: Greenridge Properties Pty Ltd
Address: PO Box 3131
AUBURN VIC 3123
Project: Meridian Estate - Stage 37
Project No.: 3807351.037
Order No.: **CG Request No.:**
TRN: **Lot No.:**

Accredited for compliance with ISO/IEC 17025 – Testing

Accreditation Number: 12719
Site Number: 12712
Approved Signatory: M. Robinson (Team Leader)
Date of Issue: 19/04/2022

Sample Details

Location:	Clyde North
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:	Red Sandy Clay

Sample Data

Sample ID	S22DS-02814					
Field Sample ID	1					
Date Tested	9/04/2022					
E:	356306					
N:	5781358					
Lot / Layer:	3709					
	1					
	Retest of S22Ds-02795 / Sample 17					

Field and Laboratory Data

Depth of Test (mm)	200					
Depth of Layer (mm)	225					
AS Sieve Size (mm)	19.0					
Oversize Wet (%)	0					
Field Wet Density (t/m³)	2.10					
Peak Converted Wet Density (t/m³)	2.11					
Compactive Effort	Standard					
Moisture Variation (%)	2.0 dry					
Hilf Density Ratio (%)	**99.5**					

Comments

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Report No: HDR:W22DS00869
Issue No: 1

HILF Density Ratio Report

Client: Greenridge Properties Pty Ltd
Address: PO Box 3131
AUBURN VIC 3123
Project: Meridian Estate - Stage 37
Project No.: 3807351.037
Order No.: **CG Request No.:**
TRN: **Lot No.:**

Accredited for compliance with ISO/IEC 17025 – Testing

Accreditation Number: 12719
Site Number: 12712
Approved Signatory: M. Robinson (Team Leader)
Date of Issue: 19/04/2022

Sample Details

Location:	Clyde North
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:	Red Sandy Clay

Sample Data

Sample ID	S22DS-02939	S22DS-02940				
Field Sample ID	1	2				
Date Tested	12/04/2022	12/04/2022				
Time Tested	12:47	12:58				
E:	2462.270 (356284)	2486.192 (356313)				
N:	525.450 (5781369)	503.669 (5781347)				
EL:	448.880	44.478				
Layer:	3	2				
	Retest of S22DS-02794 / Sample 18	Sample 19				

Field and Laboratory Data

Depth of Test (mm)	200	175				
Depth of Layer (mm)	225	200				
AS Sieve Size (mm)	19.0	19.0				
Oversize Wet (%)	0	0				
Field Wet Density (t/m³)	1.94	1.96				
Peak Converted Wet Density (t/m³)	1.97	1.98				
Compactive Effort	Standard	Standard				
Moisture Variation (%)	4.5 dry	2.5 dry				
Hilf Density Ratio (%)	**98.5**	**99.0**				

Comments

CHADWICK GEOTECHNICS

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Report No: HDR:W22DS00888
Issue No: 1

HILF Density Ratio Report

Client: Greenridge Properties Pty Ltd
Address: PO Box 3131
AUBURN VIC 3123
Project: Meridian Estate - Stage 37
Project No.: 3807351.037
Order No.: **CG Request No.:**
TRN: **Lot No.:**

Accredited for compliance with ISO/IEC 17025 – Testing

Accreditation Number: 12719
Site Number: 12712
Approved Signatory: M. Robinson (Team Leader)
Date of Issue: 19/04/2022

Sample Details

Location:	Clyde North
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:	Silty Clay / Sandy Clay

Sample Data

Sample ID	S22DS-03010	S22DS-03011	S22DS-03012	S22DS-03013		
Field Sample ID	1	2	3	4		
Date Tested	13/04/2022	13/04/2022	13/04/2022	13/04/2022		
Time Tested	10:20	10:45	10:55	11:05		
E:	2462.270 (356284)	2431.238 (356258)	2428.029 (356251)	2392.645 (356217)		
N:	525.450 (5781369)	561.831 (5781405)	598.229 (5781440)	611.043 (5781454)		
EL:	448.880	45.332	45.001	45.200		
Lot / Layer:	3708 / 3	3705 / 4	3703 / 4	3701 / 4		
Other:	Retest of S22DS-02794 & 02939 / Sample 20	Sample 21	Sample 22	Sample 23		
Field and Laboratory Data						
Depth of Test (mm)	200	175	175	175		
Depth of Layer (mm)	225	200	200	200		
AS Sieve Size (mm)	19.0	19.0	19.0	19.0		
Oversize Wet (%)	0	0	0	0		
Field Wet Density (t/m³)	2.00	2.04	2.20	2.03		
Peak Converted Wet Density (t/m³)	1.99	2.00	2.05	2.00		
Compactive Effort	Standard	Standard	Standard	Standard		
Moisture Variation (%)	1.5 dry	2.0 dry	2.5 dry	2.0 dry		
Hilf Density Ratio (%)	**100.5**	**102.0**	**107.5**	**101.5**		

Comments

CHADWICK GEOTECHNICS

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Report No: HDR:W22DS00905
Issue No: 1

HILF Density Ratio Report

Client: Greenridge Properties Pty Ltd
Address: PO Box 3131
AUBURN VIC 3123
Project: Meridian Estate - Stage 37
Project No.: 3807351.037
Order No.: **CG Request No.:**
TRN: **Lot No.:**

Accredited for compliance with ISO/IEC 17025 – Testing

Accreditation Number: 12719
Site Number: 12712
Approved Signatory: M. Robinson (Team Leader)
Date of Issue: 6/06/2022

Sample Details

Location:	Clyde North
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	S22DS-03066	S22DS-03067	S22DS-03068	S22DS-03069	S22DS-03070	S22DS-03071
Field Sample ID	1	2	3	4	5	6
Client Sample ID	24	25	26	27	28	29
Date Tested	14/04/2022	14/04/2022	14/04/2022	14/04/2022	14/04/2022	14/04/2022
Time Tested	10:05	10:13	10:22	10:30	10:40	10:45
E:	2462.430 (356287)	2469.630 (354294)	2492.560 (356316)	2517.922 (356342)	2519.733 (356342)	2516.537 (356340)
N:	544.310 (5781385)	512.100 (5781353)	510.530 (5791353)	470.066 (5781313)	447.956 (5781291)	433.026 (5781275)
EL:	44.950	44.690	44.430	44.763	45.167	45.373
Layer:	4	3	3	1	1	1
Lot:	3707	3709	3710	3713	3714	3715
Field and Laboratory Data						
Depth of Test (mm)	175	175	175	175	250	175
Depth of Layer (mm)	200	200	200	200	275	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)	2.01	1.89	2.00	2.00	2.09	2.06
Peak Converted Wet Density (t/m³)	2.01	1.99	2.05	1.98	1.96	2.02
Compactive Effort	Standard	Standard	Standard	Standard	Standard	Standard
Moisture Variation (%)	0.0	0.0	0.0	2.5 dry	2.0 dry	0.0
Hilf Density Ratio (%)	**100.5**	**95.0**	**98.0**	**101.0**	**106.5**	**102.0**

Comments

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Report No: HDR:W22DS00905
Issue No: 1

HILF Density Ratio Report

Client: Greenridge Properties Pty Ltd
Address: PO Box 3131
AUBURN VIC 3123
Project: Meridian Estate - Stage 37
Project No.: 3807351.037
Order No.: **CG Request No.:**
TRN: **Lot No.:**

Accredited for compliance with ISO/IEC 17025 – Testing

Accreditation Number: 12719
Site Number: 12712
Approved Signatory: M. Robinson (Team Leader)
Date of Issue: 6/06/2022

Sample Details

Location:	Clyde North
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	S22DS-03072	S22DS-03073				
Field Sample ID	7	8				
Client Sample ID	30	31				
Date Tested	14/04/2022	14/04/2022				
Time Tested	10:50	10:55				
E:	2503.978 (356329)	2490.704 (356315)				
N:	423.565 (5781267)	414.901 (5781760)				
EL:	45.427	45.388				
Layer:	1	1				
Lot:	3716	3717				
Field and Laboratory Data						
Depth of Test (mm)	175	125				
Depth of Layer (mm)	200	150				
AS Sieve Size (mm)	19.0	19.0				
Oversize Wet (%)	0	0				
Field Wet Density (t/m³)	2.07	2.03				
Peak Converted Wet Density (t/m³)	2.04	2.00				
Compactive Effort	Standard	Standard				
Moisture Variation (%)	0.5 dry	2.5 dry				
Hilf Density Ratio (%)	**101.0**	**101.5**				

Comments

CHADWICK GEOTECHNICS

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Report No: HDR:W22DS00972
Issue No: 1

HILF Density Ratio Report

Client: Greenridge Properties Pty Ltd
Address: PO Box 3131
AUBURN VIC 3123
Project: Meridian Estate - Stage 37
Project No.: 3807351.037
Order No.: **CG Request No.:**
TRN: **Lot No.:**

Accredited for compliance with ISO/IEC 17025 – Testing

Accreditation Number: 12719
Site Number: 12712
Approved Signatory: M. Robinson (Team Leader)
Date of Issue: 6/06/2022

Sample Details

Location:	Clyde North
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 1289.2.1.1, AS 1289.5.7.1
Sampling Method:	AS1289.1.2.1 Clause 6.4 (b)
Source:	Onsite
Material:	Clay

Sample Data

Sample ID	S22DS-03446	S22DS-03447				
Field Sample ID	1	2				
Client Sample ID	32	33				
Date Tested	28/04/2022	28/04/2022				
Time Tested	08:52	09:00				
E:	2479.462 (356304)	2482.471 (356307)				
N:	520.014 (5781362)	503.547 (5781345)				
EL:	44.867	44.894				
Layer:	4	4				
Lot:	3709	3710				
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 Moisture Content (%)	20.1	20.5				
Field Moisture Content Method	AS 1289.2.1.1	AS 1289.2.1.1				
Field Wet Density (t/m³)	2.01	2.03				
Field Dry Density (t/m³)	1.67	1.68				
Peak Converted Wet Density (t/m³)	2.03	2.03				
Optimum Moisture Content (%)	20.0	20.5				
Compactive Effort	Standard	Standard				
Moisture Ratio (%)	101.0	101.0				
Moisture Variation (%)	0.0	0.0				
Hilf Density Ratio (%)	**99.0**	**100.0**				

Comments

CHADWICK GEOTECHNICS

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Report No: MAT:S22DS-02815/1
Issue No: 1

Material Test Report

Client: Greenridge Properties Pty Ltd
Address: PO Box 3131
AUBURN VIC 3123
Project: Meridian Estate - Stage 37
Project No.: 3807351.037
Order No.: **CG Request No.:**
TRN: **Lot No.:**

Accredited for compliance with ISO/IEC 17025 – Testing

Accreditation Number: 12719
Site Number: 12712
Approved Signatory: J. Lamont (Dandenong Laboratory Manager)
Date of Issue: 31/05/2022

Sample Details

Sample Location	E 356306, N 5781358, Lot 3709, 1, Sample 17
Field Sample ID	1
Date Sampled	9/04/2022
Source	Onsite
Material	Red Sandy Clay
Specification	AS Grading
Sampling Method	AS1289.1.2.1 Clause 6.4 (b)
Sample ID	S22DS-02815

Other Test Results

Description	Method	Result	Limits
Moisture Content (%)	AS 1289.2.1.1	6.6	
Sample History	AS 1289.1.1	Oven-dried	
Preparation	AS 1289.1.1	Dry Sieved	
Linear Shrinkage (%)	AS 1289.3.4.1	2.0	
Mould Length (mm)		250	
Crumbling		No	
Curling		No	
Cracking		Yes	
Liquid Limit (%)	AS 1289.3.1.2	18	
Plastic Limit (%)	AS 1289.3.2.1	12	
Plasticity Index (%)	AS 1289.3.3.1	6	
Date Tested		26/04/2022	

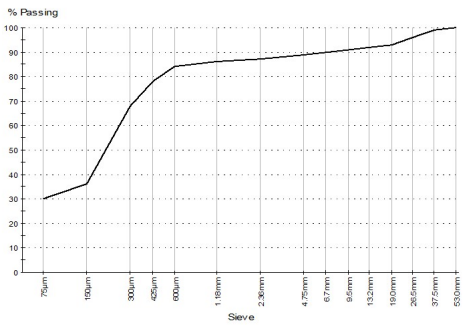
Particle Size Distribution

Method: AS 1289.3.6.1
Drying by: Oven
Date Tested: 21/04/2022

Note: Sample Washed

Sieve Size	% Passing	Limits
53.0mm	100	
37.5mm	99	
26.5mm	96	
19.0mm	93	
13.2mm	92	
9.5mm	91	
6.7mm	90	
4.75mm	89	
2.36mm	87	
1.18mm	86	
600µm	84	
425µm	78	
300µm	68	
150µm	36	
75µm	30	

Chart



Comments

N/A

Appendix D : Controlled Fill certificate

CHADWICK GEOTECHNICS

CONTROLLED FILL CERTIFICATE - LEVEL 1 INSPECTION & TESTING

PROJECT : Lot No's: 3701 to 3717
Meridian Central Estate Stage 37

Chadwick Geotechnics REF: 3807351.037.v1

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

DATE: 10 August 2022

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 topsoil).

This report is based on the conditions present and factors affecting the soil at the time of inspection (22 February 2022 and was completed on 28 April 2022). 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
Project Manager

Timothy Chadwick
Project Director

www.chadwickgeotechnics.com.au

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