CHADWICK GEOTECHNICS

REPORT

Level 1 Geotechnical Testing and Inspection Authority Services

Meridian Green Estate Clyde North
Stage 46
Lots 4601 to 4611 and 4650 to Lot 4664

Prepared for:

Greenridge Properties Pty Ltd

22 January 2024

Our Ref: 1091936.046.v1

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

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Document Control

Title:	Level One Inspection and testing Services.				
Date	**Version**	**Description**	**Prepared by:**	**Reviewed by:**	**Authorised by**
22 January 2024	V1	1091936.046 Meridian Green Estate Stage 46 Level One Report	STPA and RHB and SOST	RWMC	TJJC

1 Introduction

Chadwick Geotechnics Pty Ltd (Chadwick Geotechnics), was engaged by Greenridge Properties Pty Ltd, to provide Level 1 Geotechnical Inspection and Testing Authority (GITA) services for the earthworks conducted within Stage 46 of the Meridian Green Estate in Clyde North between the 1 August 2023 and 15 August 2023.

Level 1 GITA services as defined in AS3798-2007 “Guidelines on Earthworks for Commercial and Residential Development,” requires full time inspection and field and laboratory testing of earthworks in accordance with AS1289 “Methods of Testing Soils for Engineering Purposes.”

2 Project details

2.1 Location

The Stage 46 is located to the South of Clara Drive and North-East of Pound Road.

The included works are shown on the Site Plan in **Appendices A**. Figure 2.1 below is an extract from Nearmap taken at the time of writing this report.

Figure 2.1: Extract from Nearmap

2.2 Roles

The organisations and their roles are presented in Table 2.1

Table 2.1: Roles on the Project

Role	Organisation
Developer	Greenridge Properties Pty Ltd
Geotechnical Inspection and Testing Authority (GITA)	Chadwick Geotechnics Pty Ltd
Designer / Superintendent	Charlton Degg Pty Ltd
Earthworks Contractor	Brown Property Group Pty Ltd

Chadwick Geotechnics undertook the field density testing, and the compaction control laboratory testing was conducted in our NATA accredited laboratories.

2.3 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 2.2 below.

Table 2.2: Level 1 GITA – Onsite Presence

Month	Dates on site
August 2023	1, 2, 3, 4, 8, 14, 15

2.4 Included Areas

This report is applicable to material placed by the contractor on the residential lots within Meridian Green Estate Stage 46, as shown on the Site Plan in **Appendix D,** and with reference to Section 2.5 (Excluded Areas) of this report.

The following Lots were filled (or partially filled) during the Level 1 GITA supervision:

- Lots and 4601 to 4611 and 4650 to Lot 4664 were filled.

2.5 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 lots not mentioned in Section 2.4 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 Specifications

Project specifications were prepared by Charlton Degg Pty Ltd for the project. The works were to be conducted in general accordance with the 'Guidelines on earthworks for commercial and residential developments' of AS 3798-2007.

The following items were adopted as part of the project earthworks specifications:

- All Filling, in excess, of 200mm depth within the residential lots shall be undertaken to specifications satisfying the requirements of AS 3798-2007 "Guidelines on Earthworks for Commercial and Residential Development".
- 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 prior to placement of an engineered fill.
- Fill to be compacted in near horizontal layers not exceeding 250mm loose thickness.
- Compaction to achieve a ratio of at least 95% Standard Maximum Dry Density (SMDD).
- Moisture content of the fill material is to be within ±3% of the soils Standard Optimum Moisture Content (SOMC).
- Frequency of testing to be in accordance with Table 8.1 of AS3798-2007.
- Finished fill surface to be surveyed prior to placement of topsoil.

4 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 4.5 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'.

4.1 Earthworks

The earthworks for the project comprised of the following phases:

- Stripping of topsoil from the proposed fill areas.
- Scarifying, moisture conditioning and compacting the Subgrade.
- Assessment, remediation, and proof rolling of subgrade.
- Geotechnical compliance testing of the soils used for fill, and,
- Placement and compaction of engineered fill.

4.2 Fill material

Material used for the construction of the fill comprised of local gravelly and silty clays won from the road boxing and trench excavations on this and the surrounding sites.

Sample taken from the site stockpiles comprising local material used for fill was taken for geotechnical compliance testing during the works. The material compliance test results are summarised in **Table 4.1** The laboratory test certificates are attached in **Appendix C.**

Table 4.1: Compliance test Result Summary

Sample #	Particle Size Distribution (PSD)						Liquid Limit %	Plastic Limit %	Plasticity Index %	Source
	37.5 mm	13.2 mm	4.75 mm	1.18 mm	425 µm	0.75 µm				
S23DS-06268	100	99	96	88	78	55	39	17	22	On-site

The laboratory test results indicated material is clay of medium plasticity and satisfied the requirements of the Specification.

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

The fill material was not tested for classification of 'Fill Material' as defined in EPA Publication IWRG621. Environmental testing is not within the Chadwick Geotechnics scope.

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

Photographs of typical materials used during construction are shown below.

Photograph 4.1: Photographs of the material used on site

Photograph 1: Typical on-site clay material

Photograph 2: Silty Brown Clay

4.3 Subgrade Assessment / Proof Roll

The Subgrade of the site was progressively assessed during the period Chadwick Geotechnics personnel were on site.

Subgrade assessments were conducted following the removal of the topsoil and the wet soils that were present on site.

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

Two photographs of the subgrade assessment phase at the project are shown below.

Photograph 4.2: Subgrade assessment photographs

Photograph 3: Typical subgrade surface

Photograph 4: Subgrade

4.4 Engineered Fill Construction

All fill material was brought by scraper and tandem truck from local or imported sources. The fill was spread with a bulldozer and compacted with a vibrating pad foot roller. A water cart was present onsite during the works for moisture conditioning of the materials.

All fill material was placed in lift sequences comprising horizontal layers. 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 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 2.2 of this report.

The following machinery was on site during earthworks.

Table 4.2: Earthworks plant on site

Equipment type	Model
Dozer	**CAT D6 Dozer**
Pad foot roller	**CAT 15 Tonne CP56B**
Water cart	**1**
Quadtrac case	**IH 600 x 2**
Dump trucks	**Tandem**

Photographs of typical machinery on site used during construction are shown below.

Photograph 4.3: General Earthwork machinery and fill construction photographs

Photograph 5: D6 Dozer used during filling.

Photograph 6: Pad foot compacting clay

Photograph 7: Water cart for moisture conditioning

Photograph 8: Scraper placing material

4.5 Density and Moisture testing

Field density and moisture content testing was undertaken progressively during construction on the compacted fill 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**.

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;

Thirty-one (31) tests were performed during the filling process. Two (2) of the tests did not achieve the required density and or moisture ratio initially. The failed areas were reworked and retested accordingly. The retests returned passing density and moisture test results.

A summary table of HILF density tests is provided in **Appendix B** and the laboratory test reports are provided in **Appendix C**. Two photographs of field density testing conducted on site are shown below.

Photograph 4.4: Field Density/Moisture Testing photographs

Photo 9: Field density/moisture test

Photo 10: Field density/moisture test

5 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 to be determined, that:

- The materials, used by the earth-works contractor met the geotechnical property requirements of the specification.
- The sourced fill was, considered to be natural, 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.
- Based on observations made by Chadwick Geotechnics Level 1 personal and the results of field and laboratory tests, we consider that the engineered fill within the site (noted in Section 2.5), as far as we have been able to reasonably determine, have been placed in general accordance with the intent of the specification.
- 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.

Chadwick Geotechnics completed its Inspection and testing services on 15th August 2023. After this date, the maintenance of the fill is the sole responsibility of the Contractor. If the fill is not well maintained or protected with a sacrificial layer of topsoil or other fill, the uppermost layers and the exposed faces of the engineered fill may deteriorate as a result from exposure to varying weather conditions which can cause cracking or heaving of the fill. Any deterioration will need to be remediated prior to further construction on the site. Chadwick Geotechnics has not provided supervision since the above date and is not responsible for any subsequent deterioration that may have occurred or may occur since that date.

6 Applicability

This report has been prepared for the exclusive use of our client Greenridge Properties 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 1st August 2023 and 15th August 2023. 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:

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Robert Barden

Project Manager

Authorised for Chadwick Geotechnics Pty Ltd by:

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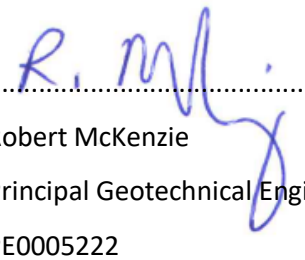
Timothy Chadwick

Project Director

Report reviewed by:



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Robert McKenzie

Principal Geotechnical Engineer

PE0005222

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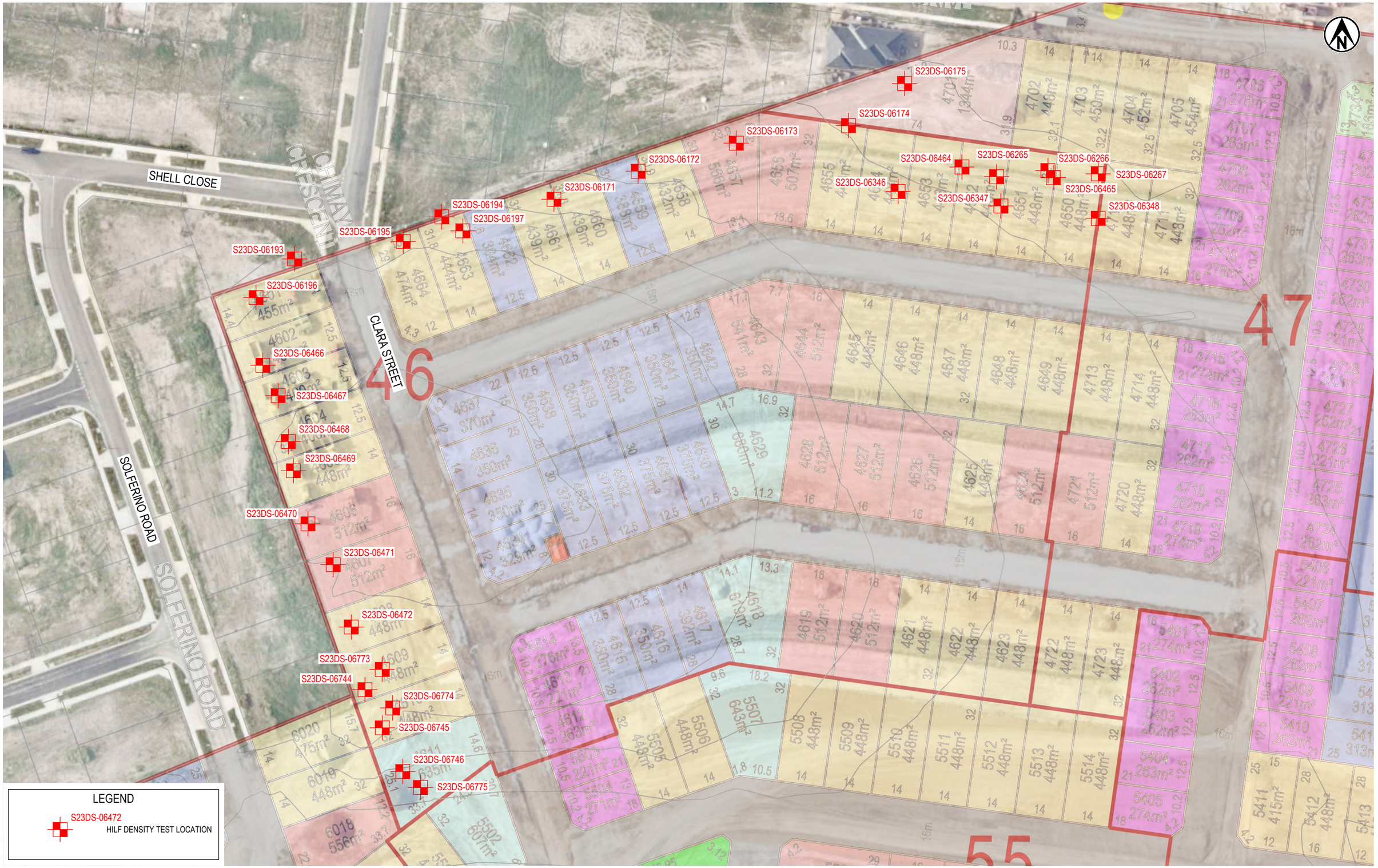
Appendix A Test Location Plan

T:\Dandenong\Geo Projects\1091936\1091936.046 Stage 46 Meridian Greens Estate\CAD\FIG\1091936.046-F01.dwg 2023-Dec-15 1:35:42 PM Plotted By: KATHRYN JACKSON



CHADWICK GEOTECHNICS
www.chadwickgeotechnics.com.au

NOTES:
1. AERIAL IMAGE SOURCED FROM NEARMAP. COPYRIGHT NEARMAP PTY LTD IMAGERY DATE: 29/10/2023.
2. BASE PLAN PROVIDED BY GREENRIDGE PROPERTIES PTY LTD REF: 1669_CPA_R CONCEPT PLAN. DATE RECEIVED: 14/12/2023.

A3 SCALE 1:1000
0 5 10 15 20 30 40 50 (m)

ORIGINAL IN COLOUR

PROJECT No.	1091936.046	
DESIGNED	STPA	Dec.23
DRAWN	KMJA	Dec.23
CHECKED		
APPROVED		DATE

CLIENT GREENRIDGE PROPERTIES PTY LTD
PROJECT MERIDIAN GREEN ESTATE - STAGE 46
TITLE LEVEL ONE HILF DENSITY TESTING HILF DENSITY TEST LOCATION PLAN

UNDER REVISION 1

SCALE (A3) 1:1000 FIG No. 1091936.046-F01 REV 1

Appendix B Hilf Density Test Summary

Meridian Green, Stage 46 1091936.046

HILF Density Testing - Field Summary

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www.chadwickgeotechnics.com.au

Report No	Sample No	Date	Test Number	Lot No	Easting	Northing	Layer/RL	Density Ratio (≥95 %)	Moisture Variation	Pass / Fail	Comments (Retest No) Compliance test taken ect
HDR:W23DS01813	S23DS-06171	1/08/2023	1	4661 / 1	356732	5781681	44.078	96	0.5 wet	Pass	
HDR:W23DS01813	S23DS-06172	1/08/2023	2	4659 / 1	356756	5781689	43.998	98	0.5 wet	Pass	
HDR:W23DS01813	S23DS-06173	1/08/2023	3	4657 / 1	356784	5781697	43.649	102.5	0.5 dry	Pass	
HDR:W23DS01813	S23DS-06174	1/08/2023	4	4655 / 1	356816	5781702	43.565	99	0 dry	Pass	
HDR:W23DS01813	S23DS-06175	1/08/2023	5	4653 / 1	356832	5781714	43.603	99	0 wet	Pass	
HDR:W23DS01821	S23DS-06193	2/08/2023	1	4601 / 1	356658	5781664	44.242	99	0.5 dry	Pass	
HDR:W23DS01821	S23DS-06194	2/08/2023	2	4633 / 1	356700	5781676	44.048	98	0 wet	Pass	
HDR:W23DS01821	S23DS-06195	2/08/2023	3	4664 / 2	356689	5781669	44.331	96.5	0 wet	Pass	
HDR:W23DS01821	S23DS-06196	2/08/2023	4	4601 / 2	356647	5781653	44.494	100	0 dry	Pass	
HDR:W23DS01821	S23DS-06197	2/08/2023	5	4663 / 3	356706	5781672	44.435	101	0 wet	Pass	
HDR:W23DS01838	S23DS-06265	3/08/2023	1	4652 / 1	356858	5781687	43.583	99.5	0.5 wet	Pass	
HDR:W23DS01838	S23DS-06266	3/08/2023	2	4651 / 1	356873	5781689	43.543	102	0 dry	Pass	
HDR:W23DS01838	S23DS-06267	3/08/2023	3	4650 / 1	356887	5781688	43.37	97.5	0 wet	Pass	
HDR:W23DS01860	S23DS-06346	4/08/2023	1	4654 / 2	356830	5781683	43.851	98	0 dry	Pass	
HDR:W23DS01860	S23DS-06347	4/08/2023	2	4652 / 2	356859	5781679	43.672	100	0.5 wet	Pass	
HDR:W23DS01860	S23DS-06348	4/08/2023	3	4650 / 2	356887	5781676	43.515	98	0 dry	Pass	
HDR:W23DS01893	S23DS-06464	8/08/2023	1	4653 / 3	356848	5781690	43.821	101	0.5 dry	Pass	
HDR:W23DS01893	S23DS-06465	8/08/2023	2	4651 / 3	356874	5781687	43.729	101.5	0.5 wet	Pass	
HDR:W23DS01893	S23DS-06466	8/08/2023	3	4602 / 1	356649	5781634	44.859	98	2.5 dry	Pass	
HDR:W23DS01893	S23DS-06467	8/08/2023	4	4603 / 1	356653	5781625	45.018	99.5	0.5 dry	Pass	
HDR:W23DS01893	S23DS-06468	8/08/2023	5	4604 / 1	356656	5781612	45.102	100.5	2.5 dry	Pass	
HDR:W23DS01893	S23DS-06469	8/08/2023	6	4605 / 1	356658	5781603	44.996	99.5	0 dry	Pass	

Meridian Green, Stage 46 1091936.046

HILF Density Testing - Field Summary

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25 Metcalf Street
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Report No	Sample No	Date	Test Number	Lot No	Easting	Northing	Layer/RL	Density Ratio (≥95 %)	Moisture Variation	Pass / Fail	Comments (Retest No) Compliance test taken ect
HDR:W23DS01893	S23DS-06470	8/08/2023	7	4606 / 1	356662	5781588	45.142	99	0 dry	Pass	
HDR:W23DS01893	S23DS-06471	8/08/2023	8	4607 / 1	356669	5781577	45.156	99	0.5 dry	Pass	
HDR:W23DS01893	S23DS-06472	8/08/2023	9	4608 / 1	356674	5781559	45.127	99.5	1.5 dry	Pass	
HDR:W23DS01949	S23DS-06744	14/08/2023	1	4609 / 1	356678	5781541	44.79	94.5	0 wet	Fail	See Retest S23DS-06773
HDR:W23DS01949	S23DS-06745	14/08/2023	2	4610 / 1	356683	5781530	44.671	93.5	0 dry	Fail	See Retest S23DS-06774
HDR:W23DS01949	S23DS-06746	14/08/2023	3	4611 / 1	356689	5781518	44.337	97.5	2 dry	Pass	
HDR:W23DS01963	S23DS-06773	15/08/2023	1	4609 / 1	356683	5781547	44.79	99.5	0 dry	Pass	Retest of S23DS-06744
HDR:W23DS01963	S23DS-06774	15/08/2023	2	4610 / 1	356686	5781536	44.671	98.5	0 wet	Pass	Retest of S23DS-06745
HDR:W23DS01963	S23DS-06775	15/08/2023	3	4611 / 2	356694	5781513	44.418	100.5	0 dry	Pass	
											no further tests

Appendix C NATA endorsed laboratory reports

CHADWICK GEOTECHNICS

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25 Metcalf Street
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Ph: + 61 3 8796 7900
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Report No: HDR:W23DS01813
Issue No: 1

HILF Density Ratio Report

Client: Greenridge Properties Pty Ltd
Address: PO Box 3131
AUBURN VIC 3123
Project: Meridian Green Estate, Stage 46
Project No.: 1091936.046
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. Longfield (Senior Technician)
Date of Issue: 7/08/2023

Sample Details

Location:
Client Request ID:
Specification Requirements: Minimum Hilf Density Ratio of 95%
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: Silty Clay

Sample Data

Sample ID	S23DS-06171	S23DS-06172	S23DS-06173	S23DS-06174	S23DS-06175	
Field Sample ID	1	2	3	4	5	
Client Sample ID	1	2	3	4	5	
Date Tested	1/08/2023	1/08/2023	1/08/2023	1/08/2023	1/08/2023	
Time Tested	13:50	13:58	14:04	14:12	14:19	
E:	356731.514 (356732)	356753.349 (356756)	356783.218 (356784)	356816.403 (356816)	356832.920 (356832)	
N:	5781680.931 (5781681)	5781688.212 (5781689)	5781698.976 (5781697)	5781700.295 (5781702)	5781713.839 (5781714)	
EL:	44.078	43.998	43.649	43.565	43.603	
Lot / Layer:	4661 / 1	4659 / 1	4657 / 1	4655 / 1	4653 / 1	
Field and Laboratory Data						
Depth of Test (mm)	175	175	175	175	175	
Depth of Layer (mm)	200	200	200	200	200	
AS Sieve Size (mm)	19.0	19.0	19.0	19.0	19.0	
Oversize Wet (%)	0	0	0	0	0	
Field Moisture Content (%)	15.2	20.1	25.4	24.1	25.8	
Field Moisture Content Method	AS 1289.2.1.1	AS 1289.2.1.1	AS 1289.2.1.1	AS 1289.2.1.1	AS 1289.2.1.1	
Field Wet Density (t/m³)	2.02	2.03	1.98	1.97	1.94	
Field Dry Density (t/m³)	1.75	1.69	1.58	1.59	1.54	
Peak Converted Wet Density (t/m³)	2.11	2.07	1.93	1.99	1.96	
Optimum Moisture Content (%)	15.0	20.0	26.0	24.0	25.5	
Compactive Effort	Standard	Standard	Standard	Standard	Standard	
Moisture Ratio (%)	102.5	101.5	97.5	100.0	100.5	
Moisture Variation (%)	0.5 wet	0.5 wet	0.5 dry	0.0	0.0	
Hilf Density Ratio (%)	**96.0**	**98.0**	**102.5**	**99.0**	**99.0**	

Comments

CHADWICK GEOTECHNICS

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Report No: HDR:W23DS01821
Issue No: 1

HILF Density Ratio Report

Client: Greenridge Properties Pty Ltd
Address: PO Box 3131
AUBURN VIC 3123
Project: Meridian Green Estate, Stage 46
Project No.: 1091936.046
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. Longfield (Senior Technician)
Date of Issue: 7/08/2023

Sample Details

Location:
Client Request ID:
Specification Requirements: Minimum Hilf Density Ratio of 95%
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: Silty Clay

Sample Data

Sample ID	S23DS-06193	S23DS-06194	S23DS-06195	S23DS-06196	S23DS-06197	
Field Sample ID	1	2	3	4	5	
Client Sample ID	6	7	8	9	10	
Date Tested	2/08/2023	2/08/2023	2/08/2023	2/08/2023	2/08/2023	
Time Tested	08:45	09:01	10:41	14:02	14:11	
E:	356658.351 (356654)	356699.207 (356700)	356688.996 (356689)	356646.333 (356647)	356703.195 (356706)	
N:	5781657.008 (5781664)	581670.795 (5781676)	5781666.676 (5781669)	5781651.856 (5781653)	5781671.084 (5781672)	
EL:	44.242	44.048	44.331	44.494	44.435	
Lot / Layer:	4601 / 1	4633 / 1	4664 / 2	4601 / 2	4663 / 3	
Field and Laboratory Data						
Depth of Test (mm)	175	175	175	175	175	
Depth of Layer (mm)	200	200	200	200	200	
AS Sieve Size (mm)	19.0	19.0	19.0	19.0	19.0	
Oversize Wet (%)	0	0	0	0	0	
Field Moisture Content (%)	19.7	16.2	16.5	21.0	28.2	
Field Moisture Content Method	AS 1289.2.1.1	AS 1289.2.1.1	AS 1289.2.1.1	AS 1289.2.1.1	AS 1289.2.1.1	
Field Wet Density (t/m³)	1.96	1.99	2.03	2.00	1.92	
Field Dry Density (t/m³)	1.64	1.71	1.74	1.65	1.50	
Peak Converted Wet Density (t/m³)	1.98	2.03	2.10	2.00	1.90	
Optimum Moisture Content (%)	20.5	16.0	16.5	21.0	28.0	
Compactive Effort	Standard	Standard	Standard	Standard	Standard	
Moisture Ratio (%)	97.0	100.0	101.0	100.0	100.5	
Moisture Variation (%)	0.5 dry	0.0	0.0	0.0	0.0	
Hilf Density Ratio (%)	**99.0**	**98.0**	**96.5**	**100.0**	**101.0**	

Comments

CHADWICK GEOTECHNICS

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DANDENONG SOUTH, VIC 3175

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Report No: HDR:W23DS01838
Issue No: 1

HILF Density Ratio Report

Client: Greenridge Properties Pty Ltd
Address: PO Box 3131
AUBURN VIC 3123
Project: Meridian Green Estate, Stage 46
Project No.: 1091936.046
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. Longfield (Senior Technician)
Date of Issue: 7/08/2023

Sample Details

Location:
Client Request ID:
Specification Requirements: Minimum Hilf Density Ratio of 95%
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: Silty Clay

Sample Data

Sample ID	S23DS-06265	S23DS-06266	S23DS-06267			
Field Sample ID	1	2	3			
Client Sample ID	11	12	13			
Date Tested	3/08/2023	3/08/2023	3/08/2023			
Time Tested	11:14	11:20	11:25			
E:	356858.245	356872.910	356887.234			
N:	5781687.438	5781689.184	5781688.274			
EL:	43.583	43.543	43.370			
Lot / Layer:	4652 / 1	4651 / 1	4650 / 1			
Field and Laboratory Data						
Depth of Test (mm)	175	175	175			
Depth of Layer (mm)	200	200	200			
AS Sieve Size (mm)	19.0	19.0	19.0			
Oversize Wet (%)	0	0	0			
Field Moisture Content (%)	17.5	15.8	18.1			
Field Moisture Content Method	AS 1289.2.1.1	AS 1289.2.1.1	AS 1289.2.1.1			
Field Wet Density (t/m³)	2.06	2.01	2.03			
Field Dry Density (t/m³)	1.75	1.73	1.72			
Peak Converted Wet Density (t/m³)	2.07	1.97	2.08			
Optimum Moisture Content (%)	17.0	16.0	18.0			
Compactive Effort	Standard	Standard	Standard			
Moisture Ratio (%)	102.0	99.5	101.0			
Moisture Variation (%)	0.5 wet	0.0	0.0			
Hilf Density Ratio (%)	**99.5**	**102.0**	**97.5**			

Comments

CHADWICK GEOTECHNICS

Think Act Safe Be

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Report No: HDR:W23DS01860
Issue No: 1

HILF Density Ratio Report

Client: Greenridge Properties Pty Ltd
Address: PO Box 3131
AUBURN VIC 3123
Project: Meridian Green Estate, Stage 46
Project No.: 1091936.046
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. Longfield (Senior Technician)
Date of Issue: 23/08/2023

Sample Details

Location:
Client Request ID:
Specification Requirements: Minimum Hilf Density Ratio of 95%
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: Silty Clay

Sample Data

Sample ID	S23DS-06346	S23DS-06347	S23DS-06348			
Field Sample ID	1	2	3			
Client Sample ID	14	15	16			
Date Tested	4/08/2023	4/08/2023	4/08/2023			
Time Tested	12:31	12:39	12:44			
E:	356830.158	356859.478	356887.219			
N:	5781683.244	5781679.097	5781675.579			
EL:	43.851	43.672	43.515			
Lot / Layer:	4654 / 2	4652 / 2	4650 / 2			
Field and Laboratory Data						
Depth of Test (mm)	175	175	175			
Depth of Layer (mm)	200	200	200			
AS Sieve Size (mm)	19.0	19.0	19.0			
Oversize Wet (%)	0	0	0			
Field Moisture Content (%)	16.7	20.5	17.5			
Field Moisture Content Method	AS 1289.2.1.1	AS 1289.2.1.1	AS 1289.2.1.1			
Field Wet Density (t/m³)	2.05	2.05	2.06			
Field Dry Density (t/m³)	1.76	1.70	1.75			
Peak Converted Wet Density (t/m³)	2.09	2.05	2.10			
Optimum Moisture Content (%)	16.5	20.0	17.5			
Compactive Effort	Standard	Standard	Standard			
Moisture Ratio (%)	100.0	101.5	99.0			
Moisture Variation (%)	0.0	0.5 wet	0.0			
Hilf Density Ratio (%)	**98.0**	**100.0**	**98.0**			

Comments

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Report No: HDR:W23DS01893
Issue No: 1

HILF Density Ratio Report

Client: Greenridge Properties Pty Ltd
Address: PO Box 3131
AUBURN VIC 3123
Project: Meridian Green Estate, Stage 46
Project No.: 1091936.046
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. Longfield (Senior Technician)
Date of Issue: 20/12/2023

Sample Details

Location:
Client Request ID:
Specification Requirements: Minimum Hilf Density Ratio of 95%
Field Test procedures: AS 1289.5.8.1
Laboratory Test procedures: AS 1289.2.1.1, AS 1289.5.7.1
Sampling Method:
Source: Onsite
Material: Silty Clay

Sample Data

Sample ID	S23DS-06464	S23DS-06465	S23DS-06466	S23DS-06467	S23DS-06468	S23DS-06469
Field Sample ID	1	2	3	4	5	6
Client Sample ID	14	15	16	18	17	19
Date Tested	8/08/2023	8/08/2023	8/08/2023	8/08/2023	8/08/2023	8/08/2023
Time Tested	08:00	08:12	12:35	12:46	12:43	12:57
E:	356848.378	356874.409	356648.957	356653.314	356656.216	356658.813
N:	5781690.218	5781687.178	5781633.684	5781625.012	5781611.960	5781603.269
EL:	43.821	43.729	44.859	45.018	45.102	44.996
Lot / Layer:	4653 / 3	4651 / 3	4602 / 1	4603 / 1	4604 / 1	4605 / 1
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 Moisture Content (%)	24.0	27.6	11.6	14.0	12.2	12.6
Field Moisture Content Method	AS 1289.2.1.1	AS 1289.2.1.1	AS 1289.2.1.1	AS 1289.2.1.1	AS 1289.2.1.1	AS 1289.2.1.1
Field Wet Density (t/m³)	1.96	1.93	2.05	2.12	2.10	2.13
Field Dry Density (t/m³)	1.58	1.52	1.83	1.86	1.87	1.89
Peak Converted Wet Density (t/m³)	1.94	1.90	2.09	2.12	2.08	2.14
Optimum Moisture Content (%)	24.5	27.0	14.0	14.5	14.5	13.0
Compactive Effort	Standard	Standard	Standard	Standard	Standard	Standard
Moisture Ratio (%)	98.0	102.0	83.5	97.5	83.5	99.0
Moisture Variation (%)	0.5 dry	0.5 wet	2.5 dry	0.5 dry	2.5 dry	0.0
Hilf Density Ratio (%)	**101.0**	**101.5**	**98.0**	**99.5**	**100.5**	**99.5**

Comments

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Report No: HDR:W23DS01893
Issue No: 1

HILF Density Ratio Report

Client: Greenridge Properties Pty Ltd
Address: PO Box 3131
AUBURN VIC 3123
Project: Meridian Green Estate, Stage 46
Project No.: 1091936.046
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. Longfield (Senior Technician)
Date of Issue: 20/12/2023

Sample Details

Location:
Client Request ID:
Specification Requirements: Minimum Hilf Density Ratio of 95%
Field Test procedures: AS 1289.5.8.1
Laboratory Test procedures: AS 1289.2.1.1, AS 1289.5.7.1
Sampling Method:
Source: Onsite
Material: Silty Clay

Sample Data

Sample ID	S23DS-06470	S23DS-06471	S23DS-06472			
Field Sample ID	7	8	9			
Client Sample ID	20	21	22			
Date Tested	8/08/2023	8/08/2023	8/08/2023			
Time Tested	13:04	13:10	13:16			
E:	35662.822	356669.265	356674.417			
N:	5781588.484	5781577.535	5781559.122			
EL:	45.142	45.156	45.127			
Lot / Layer:	4606 / 1	4607 / 1	4608 / 1			
Field and Laboratory Data						
Depth of Test (mm)	175	175	175			
Depth of Layer (mm)	200	200	200			
AS Sieve Size (mm)	19.0	19.0	19.0			
Oversize Wet (%)	0	0	0			
Field Moisture Content (%)	12.0	12.1	12.1			
Field Moisture Content Method	AS 1289.2.1.1	AS 1289.2.1.1	AS 1289.2.1.1			
Field Wet Density (t/m³)	2.11	2.12	2.06			
Field Dry Density (t/m³)	1.89	1.89	1.84			
Peak Converted Wet Density (t/m³)	2.13	2.13	2.08			
Optimum Moisture Content (%)	12.0	12.5	14.0			
Compactive Effort	Standard	Standard	Standard			
Moisture Ratio (%)	99.0	98.0	88.0			
Moisture Variation (%)	0.0	0.5 dry	1.5 dry			
Hilf Density Ratio (%)	**99.0**	**99.0**	**99.5**			

Comments

CHADWICK GEOTECHNICS

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Report No: HDR:W23DS01949
Issue No: 1

HILF Density Ratio Report

Client: Greenridge Properties Pty Ltd
Address: PO Box 3131
AUBURN VIC 3123
Project: Meridian Green Estate, Stage 46
Project No.: 1091936.046
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. Longfield (Senior Technician)
Date of Issue: 23/08/2023

Sample Details

Location:
Client Request ID:
Specification Requirements: Minimum Hilf Density Ratio of 95%
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: Silty Clay

Sample Data

Sample ID	S23DS-06744	S23DS-06745	S23DS-06746			
Field Sample ID	1	2	3			
Client Sample ID	23	4	25			
Date Tested	14/08/2023	14/08/2023	14/08/2023			
Time Tested	14:46	14:52	14:58			
E:	356678.088	356683.035	356688.871			
N:	5781541.209	5781530.342	5781517.880			
EL:	44.790	44.671	44.337			
Lot / Layer:	4609 / 1	4610 / 1	4611 / 1			
Field and Laboratory Data						
Depth of Test (mm)	175	175	175			
Depth of Layer (mm)	200	200	200			
AS Sieve Size (mm)	19.0	19.0	19.0			
Oversize Wet (%)	0	0	0			
Field Moisture Content (%)	18.8	17.8	18.8			
Field Moisture Content Method	AS 1289.2.1.1	AS 1289.2.1.1	AS 1289.2.1.1			
Field Wet Density (t/m³)	1.94	1.96	1.93			
Field Dry Density (t/m³)	1.63	1.67	1.62			
Peak Converted Wet Density (t/m³)	2.05	2.10	1.97			
Optimum Moisture Content (%)	18.5	18.0	21.0			
Compactive Effort	Standard	Standard	Standard			
Moisture Ratio (%)	101.0	99.0	89.5			
Moisture Variation (%)	0.0	0.0	2.0 dry			
Hilf Density Ratio (%)	**94.5**	**93.5**	**97.5**			

Comments

CHADWICK GEOTECHNICS

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Report No: HDR:W23DS01963
Issue No: 1

HILF Density Ratio Report

Client: Greenridge Properties Pty Ltd
Address: PO Box 3131
AUBURN VIC 3123
Project: Meridian Green Estate, Stage 46
Project No.: 1091936.046
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. Longfield (Senior Technician)
Date of Issue: 23/08/2023

Sample Details

Location:
Client Request ID:
Specification Requirements: Minimum Hilf Density Ratio of 95%
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: Silty Clay

Sample Data

Sample ID	S23DS-06773	S23DS-06774	S23DS-06775			
Field Sample ID	1	2	3			
Client Sample ID	26	7	28			
Date Tested	15/08/2023	15/08/2023	15/08/2023			
Time Tested	13:02	13:10	13:21			
E:	356683	356686	356693.935			
N:	5781547	5781536	5781513.316			
EL:	-	-	44.418			
Lot / Layer:	4609 / 1	4610 / 1	4611 / 2			
	Retest of S23DS-06744	Retest of S23DS-06745				
Field and Laboratory Data						
Depth of Test (mm)	175	175	175			
Depth of Layer (mm)	200	200	200			
AS Sieve Size (mm)	19.0	19.0	19.0			
Oversize Wet (%)	0	0	0			
Field Moisture Content (%)	13.6	18.0	20.0			
Field Moisture Content Method	AS 1289.2.1.1	AS 1289.2.1.1	AS 1289.2.1.1			
Field Wet Density (t/m³)	2.07	2.02	2.03			
Field Dry Density (t/m³)	1.83	1.71	1.69			
Peak Converted Wet Density (t/m³)	2.09	2.05	2.02			
Optimum Moisture Content (%)	13.5	18.0	20.0			
Compactive Effort	Standard	Standard	Standard			
Moisture Ratio (%)	99.0	101.0	100.0			
Moisture Variation (%)	0.0	0.0	0.0			
Hilf Density Ratio (%)	**99.5**	**98.5**	**100.5**			

Comments

CHADWICK GEOTECHNICS

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Report No: MAT:S23DS-06268/1
Issue No: 1

Material Test Report

Client: Greenridge Properties Pty Ltd
Address: PO Box 3131
AUBURN VIC 3123
Project: Meridian Green Estate, Stage 46
Project No.: 1091936.046
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. Longfield (Senior Technician)
Date of Issue: 13/09/2023

Sample Details

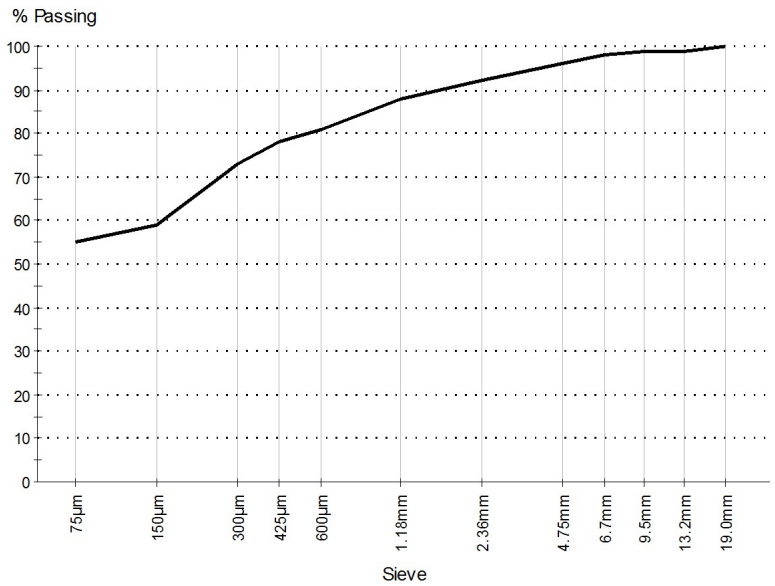
Sample Location	E: 356887.234, N: 5781688.274, EL: 43.370, Lot: 4650, Layer: 1
Field Sample ID	1
Date Sampled	3/08/2023
Time Sampled	11:25
Source	Onsite
Material	Silty Clay
Specification	AS Grading
Sampling Method	AS1289.1.2.1 Clause 6.4 (b)
Sample ID	S23DS-06268

Other Test Results

Description	Method	Result	Limits
Moisture Content (%)	AS 1289.2.1.1	17.5	
Sample History	AS 1289.1.1	Oven-dried	
Preparation	AS 1289.1.1	Dry Sieved	
Linear Shrinkage (%)	AS 1289.3.4.1	10.0	
Mould Length (mm)		250	
Crumbling		No	

Particle Size Distribution

AS 1289.3.6.1



Drying By: Oven
Date Tested: 14/08/2023

Note: Sample Washed

Sieve Size	% Passing	Limits
19.0mm	100	
13.2mm	99	
9.5mm	99	
6.7mm	98	
4.75mm	96	
2.36mm	92	
1.18mm	88	
600µm	81	
425µm	78	
300µm	73	
150µm	59	
75µm	55	

Comments

N/A

CHADWICK GEOTECHNICS

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Report No: MAT:S23DS-06268/1
Issue No: 1

Material Test Report

Client: Greenridge Properties Pty Ltd
Address: PO Box 3131
AUBURN VIC 3123
Project: Meridian Green Estate, Stage 46
Project No.: 1091936.046
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. Longfield (Senior Technician)
Date of Issue: 13/09/2023

Other Test Results

Description	Method	Result	Limits
Curling		Yes	
Cracking		Yes	
Liquid Limit (%)	AS 1289.3.1.2	39	
Plastic Limit (%)	AS 1289.3.2.1	17	
Plasticity Index (%)	AS 1289.3.3.1	22	
Date Tested		21/08/2023	

Comments

N/A

Appendix D Controlled Fill

CONTROLLED FILL CERTIFICATE - LEVEL 1 INSPECTION & TESTING

PROJECT : Meridian Green Estate Stage 46
Lots 4601 to 4611 and 4650 to 4664

Chadwick Geotechnics REF: 1091936.046.v1

CLIENT : Greenridge Properties Pty Ltd
P.O Box 4136
Dandenong South Victoria, 3164

DATE: 22 January 2024

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 can 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 (1 August 2023 and was completed on 15 August 2023). 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

CHADWICK
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