

REPORT

Level One Inspection and Testing Services

**Meridian Estate Stage 5, Clyde North
Lot's 537 to 546**

Prepared for:

Grosvenor Lodge Pty Ltd

November 2017

Our Ref: 3807351.005.v1



**CHADWICK
GEOTECHNICS**

Document Control

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Chadwick Geotechnics Pty Ltd (FILE)

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1 Introduction

Chadwick Geotechnics Pty Ltd (Chadwick Geotechnics) has been engaged by Grosvenor Lodge Pty Ltd. to provide Level 1 Supervision, Inspection and Testing services for the earthworks (including stripping, proof rolling and associated works) for the Meridian Estate Stage 5 in Clyde North.

The inspection and testing of earthworks has been carried out in accordance with AS3798-2007 Table 8.1¹, 'Guidelines on earthworks for commercial and residential developments', with a frequency of field density tests as per Type 1 project (large scale operations).

2 Project details

The project earthworks included the filling of Lot's 537 to Lot 546 at the Meridian Estate Stage 5. The specification required the earthworks to be completed under Level 1 Supervision and Testing.

Chadwick Geotechnics field technicians were onsite during the earthworks.

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 Type 1 project (large scale operations).

Compaction control laboratory testing was undertaken in our NATA accredited Dandenong South laboratory in accordance with AS1289 'Methods of Testing Soils for Engineering Purposes'.

The location of the site is shown in **Figure 1** below.



Figure 1: Approximate Site Location (Image sourced from nearmap.com.au)

¹ AS 3798 – 2007 (Incorporating Amendment No. 1), Guidelines on earthworks for commercial and residential developments

3 Geology

Published information² shows that the site is underlain by various geologies listed as follows;

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

4 Specification

A summary of the specification is shown below:

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

5 Inspection and testing

Prior to any fill being placed at the site the stripped surface of the fill areas were inspected. The Initial stripped surface inspections were performed by experienced Chadwick Geotechnics staff. 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 and the areas were firm and free of vegetation and other deleterious material.

Full time Level 1 inspection and testing of the filling operations commenced on the 3rd May 2016 and was completed on the 4th April 2017. During this period, the Chadwick Geotechnics field technician observed all works related to the construction including the supply of material, conditioning of material (moisture conditioning and oversize removal), placement and compaction of the fill.

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

Visual inspections of the fill materials were carried out at regular intervals throughout works, and where required, the contractor removed unsuitable material.

Field density and moisture content testing was carried out using a calibrated nuclear density gauge in accordance with AS 1289.5.8.1³. The HILF rapid compaction test was used for peak converted wet density determinations in accordance with AS 1289.5.7.1. The test locations were recorded using a handheld GPS unit. A site plan showing the field density and moisture content test locations is provided in **Appendix A**.

The filling works for Stages 5 was not continuous resulting in breaks in time on site. The filling process also caused a break in the sequential numbering of the density and moisture content test reports. The summary page attached within the appendix includes test results that relate to other stages of earthworks within the Meridian Estate.

² BIBBY, L.M., 2004. Simplified 1: 4 000 000 Geology of Victoria. Geological Survey of Victoria Special Publication. GeoScience Victoria.

³ AS 1289.5.8.1-2007: Methods of testing soils for engineering purposes – Soil compaction and density tests – Determination of field density and field moisture content of a soil using a nuclear surface moisture Density gauge – direct transmission mode

The test results show that all tests achieved the specified minimum density at a moisture content of between $\pm 3.0\%$ of the soils optimum moisture content. A summary table of HILF density tests is provided in **Appendix B** and the laboratory test reports are provided in **Appendix C**.

6 Conclusion

On the basis of our direct supervision 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 and moisture requirements of the specification.
- Given the consistent construction practices followed by the earthworks contractor and as witnessed by the Chadwick Geotechnics field technician, 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 in the Meridian Estate Stage 5 in Clyde North have been performed in accordance with the requirements of Section 8.2 Level 1 Inspection and testing AS 3798-2007.

The Controlled Fill Certificates for the filling works are provided in **Appendix D**.

7 Applicability

This report has been prepared in good faith and in accordance with the Chadwick Geotechnics quality system for the earthworks filling within Stage 5 of the Meridian Estate in Clyde North.

This report is based on the nature of the project and the conditions present in, or factors affecting the soil as at the time of inspection, namely the 3rd May 2016 and was completed on the 4th April 2017. No responsibility or liability will be accepted, and Chadwick Geotechnics is indemnified to the full extent permitted by law in respect of the use of this report where there has been a change in the nature of the project or the conditions on site that may alter or affect the conclusions of this report.

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

Chadwick Geotechnics Pty Ltd

Report prepared by:

Authorised for Chadwick Geotechnics Pty Ltd by:



Robert Barden

Geotechnical Engineer



Timothy Chadwick

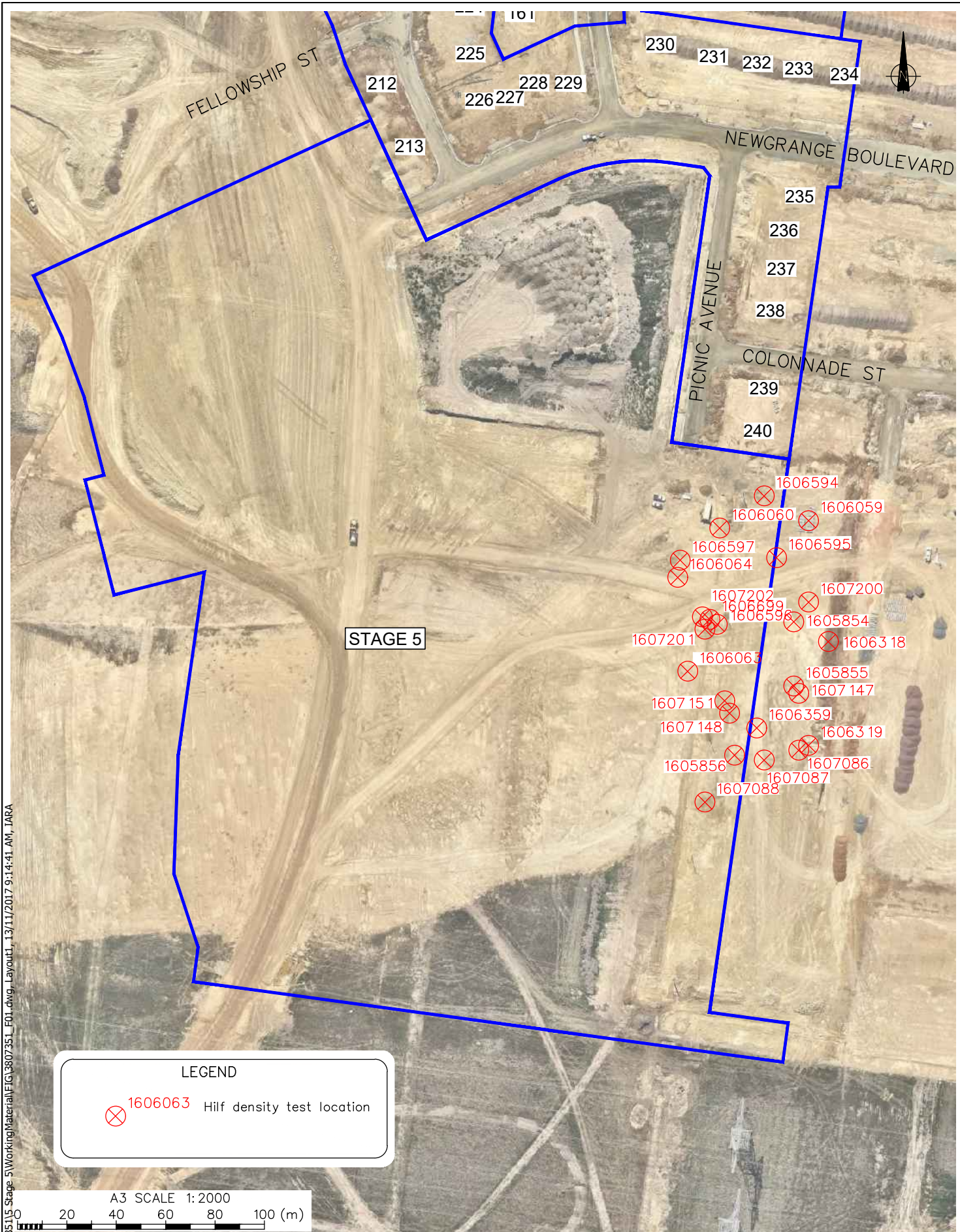
Project Director

RHB

\\keyscd\data\rep\live\geo\projects\3807351\5 stage 5\workingmaterial\level one report\380735.005 stage 5 meridian estate level one report.docx

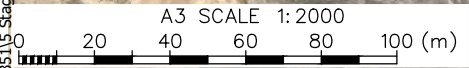
Appendix A: Density test location plan

T:\Dandenong\Geo Projects\3807351\5 Stage 5\WorkingMaterial\Fig\3807351_F01.dwg Layout1 13/11/2017 9:14:41 AM
 T:\Dandenong\Geo Projects\3807351\5 Stage 5\WorkingMaterial\Fig\3807351_F01.dwg Layout1 13/11/2017 9:14:41 AM, IARA



LEGEND

⊗ 1606063 Hilf density test location



CHADWICK GEOTECHNICS
 25 Metcalf Street
 Dandenong South, Victoria, 3175
 Ph: (03) 8796 7900
 www.chadwickt.com.au

DRAWN	IARA	Nov.17
DRAFTING CHECKED		
APPROVED		
CADFILE :	\\3807351_F01.dwg	
SCALES (AT A4 SIZE)	1:1000	
PROJECT No.	3807351	

GREENBRIDGE PROPERTIES PTY LTD
 LEVEL 1 INSPECTION AND TESTING
 MERIDIAN ESTATE – STAGE 5
 Level 1 Hilf Test Location Plan

FIG. No.	Figure 1.	REV.	0
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Appendix B: Table of field density test results



Hilf Summary Table

3807351 Meridian Estate Stage 5

Chadwick Geotechnics
25 Metcalf Street
Dandenong South VIC 3175

Tel : (03) 8796 7900
Fax: (03) 8796 7944



Report No	Sample No	Date	Test Number	Location [E]	Location [N]	Layer	Density Ratio HILF test (%)	Moisture Variation From OMC	Pass / Fail	Remarks
15	1605854	3/05/2016	52	355089	5782321	1	106	omc	Pass	
15	1605855	3/05/2016	53	355089	5782295	1	102	omc	Pass	
15	1605856	3/05/2016	54	355065	5782267	1	104	0.5 dry	Pass	
17	1606059	6/05/2016	58	355095	5782362	-	104	1.5 dry	Pass	
17	1606060	6/05/2016	59	355059	5782359	-	102	2 dry	Pass	
17	1606063	6/05/2016	62	355046	5782301	-	100	2 dry	Pass	
17	1606064	6/05/2016	63	355042	5782339	-	102.5	0.5 dry	Pass	
18	1606318	12/05/2016	64	355103	5782313	2	102.5	2 dry	Pass	
18	1606319	12/05/2016	65	355095	5782271	2	100	omc	Pass	
19	1606359	13/05/2016	66	355074	5782278	2	102	1 dry	Pass	
28	1606594	19/05/2016	92	355077	5782372	2	102.5	0.5 wet	Pass	
28	1606595	19/05/2016	93	355082	5782347	2	97	1 wet	Pass	
28	1606596	19/05/2016	94	355058	5782320	2	100.5	2 dry	Pass	
28	1606597	19/05/2016	95	355043	5782346	2	99.5	2 wet	Pass	
28	1606699	19/05/2016	102	355055	5782322	2	101	2 dry	Pass	
31	1607086	31/05/2016	105	355091	5782269	3	100	2.5 wet	Pass	
31	1607087	31/05/2016	106	355077	5782265	3	103	0.5 wet	Pass	
31	1607088	31/05/2016	107	355053	5782248	3	101	0.5 wet	Pass	
32	1607147	1/06/2016	110	355091	5782292	3	104	1.5 dry	Pass	
32	1607148	1/06/2016	111	355063	5782284	3	101	0.5 wet	Pass	
32	1607151	1/06/2016	114	355061	5782289	3	96.5	omc	Pass	
33	1607200	2/06/2016	116	355095	5782329	3	99	2 wet	Pass	
33	1607201	2/06/2016	117	355053	5782318	3	102.5	omc	Pass	
33	1607202	2/06/2016	118	355052	5782323	3	100.5	1 dry	Pass	
HDR: W17DS00032	S17DS-00123	4/04/2017	1	355071	5782401	-	98.5	1.0 Dry	Pass	

Appendix C: NATA endorsed laboratory test reports

Head Office
25 Metcalf Street
DANDENONG SOUTH VIC 3175

Ph: +61 3 8796 7900
Fax: +61 3 8796 7944



Customer: Grosevnor Lodge Pty Ltd

Customer Address: 48 Healy Road, Dandenong Sth, Vic 3175

Project: Meridian Estate

Location: Clyde North

Customer Order No.: -

Report Number: **380735** - 15

Report Date: 10/05/16

C.G Order No: **151736**

Test Method: AS1289.5.7.1

Page: 1 of 1

HILF DENSITY RATIO REPORT

Testing performed and reported at our Dandenong South Laboratory 21712

Sample No.:	1605854	1605855	1605856						
ID No.:	1	2	3						
Lot No.:	-	-	-						
Date Sampled:	3/05/2016	3/05/2016	3/05/2016						
Time Sampled:	pm	pm	pm						
Date Tested:	4/05/2016	4/05/2016	4/05/2016						
Material Source:	Site Derived	Site Derived	Site Derived						
Material Description:	Clay	Clay	Clay						
To Be Used As	Fill	Fill	Fill						
Sample Location :	E 355078 N 5782321 Layer 1	E 355089 N 5782295 Layer 1	E 355065 N 5782267 Layer 1						
Layer Depth (mm):	175	175	175						
Test Depth (mm):	150	150	150						
Sampling Procedure:	AS1289.1.2.1.6.4(b)	AS1289.1.2.1.6.4(b)	AS1289.1.2.1.6.4(b)						
Max Size (mm):	19.0	19.0	19.0						
Oversize Wet (%):	0	0	0						
Fld. Wet Density (t/m ³) AS 1289.5.8.1:	2.09	2.06	2.10						
Fld. Moisture Content (%) AS1289.2.1.1:	-	-	-						
PCWD (t/m ³):	1.97	2.02	2.02						
APCWD (t/m ³):	-	-	-						
O.M.C (%) AS1289.5.7.1:	-	-	-						
Moisture Ratio (%) AS1289.5.4.1:	-	-	-						
Moisture Variation (of omc):	omc	omc	0.5% (dry)						
Adjusted Moisture Variation (of omc):	-	-	-						
Compactive Effort:	Standard	Standard	Standard						
Hilf Density Ratio (%):	106.0	102.0	104.0						
Min Hilf Density Ratio (%):	95	95	95						

Remarks:



Accredited for compliance with ISO/IEC 17025. The results of tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

APPROVED SIGNATORY

M. Robinson

Form No.: **CG.315.002**

Issue Date: 19/02/2013

Head Office
25 Metcalf Street
DANDENONG SOUTH VIC 3175

Ph: +61 3 8796 7900
Fax: +61 3 8796 7944



Customer: Grosevnor Lodge Pty Ltd

Customer Address: 48 Healy Road, Dandenong Sth, Vic 3175

Project: Meridian Estate

Location: Clyde North

Customer Order No.: -

Report Number: **380735** - 17

Report Date: 10/05/16

C.G Order No: **151738**

Test Method: AS1289.5.7.1

Page: 1 of 1

HILF DENSITY RATIO REPORT

Testing performed and reported at our Dandenong South Laboratory 21712

Sample No.:	1606059	1606060	1606061	1606062	1606063	1606064				
ID No.:	1	2	3	4	5	6				
Lot No.:	-	-	-	-	-	-				
Date Sampled:	6/05/2016	6/05/2016	6/05/2016	6/05/2016	6/05/2016	6/05/2016				
Time Sampled:	am/pm	am/pm	am/pm	am/pm	am/pm	am/pm				
Date Tested:	9/05/2016	9/05/2016	7/05/2016	7/05/2016	9/05/2016	9/05/2016				
Material Source:	On site derived	On site derived	On site derived	On site derived	On site derived	On site derived				
Material Description:	Silty Clay	Silty Clay	Silty Clay	Silty Clay	Silty Clay	Silty Clay				
To Be Used As	Lot fill	Lot fill	Lot fill	Lot fill	Lot fill	Lot fill				
Sample Location :	355095E 5782362N	355059E 5782359N	355025E 5782270N	355018E 5782240N	355046E 5782301N	355042E 5782339N				
Layer Depth (mm):	175	175	175	175	175	175				
Test Depth (mm):	150	150	150	150	150	150				
Sampling Procedure:	AS1289.1.2.1.6.4(b)	AS1289.1.2.1.6.4(b)	AS1289.1.2.1.6.4(b)	AS1289.1.2.1.6.4(b)	AS1289.1.2.1.6.4(b)	AS1289.1.2.1.6.4(b)				
Max Size (mm):	19.0	19.0	19.0	19.0	19.0	19.0				
Oversize Wet (%):	0	0	0	0	0	0				
Fld. Wet Density (t/m ³) AS 1289.5.8.1:	2.03	2.01	1.97	2.01	1.99	2.04				
Fld. Moisture Content (%) AS1289.2.1.1:	-	-	-	-	-	-				
PCWD (t/m ³):	1.95	1.97	1.98	2.02	1.99	1.99				
APCWD (t/m ³):	-	-	-	-	-	-				
O.M.C (%) AS1289.5.7.1:	-	-	-	-	-	-				
Moisture Ratio (%) AS1289.5.4.1:	-	-	-	-	-	-				
Moisture Variation (of omc):	1.5% (dry)	2% (dry)	1.5% (dry)	2% (dry)	2% (dry)	0.5% (dry)				
Adjusted Moisture Variation (of omc):	-	-	-	-	-	-				
Compactive Effort:	Standard	Standard	Standard	Standard	Standard	Standard				
Hilf Density Ratio (%):	104.0	102.0	99.5	99.0	100.0	102.5				
Min Hilf Density Ratio (%):	95	95	95	95	95	95				

Remarks:



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Customer: Grosevnor Lodge Pty Ltd

Customer Address: 48 Healy Road, Dandenong Sth, Vic 3175

Project: Meridian Estate

Location: Clyde North

Customer Order No.: -

Report Number: **380735 - 18**

Report Date: 17/05/16

C.G Order No: -

Test Method: AS1289.5.7.1

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HILF DENSITY RATIO REPORT

Testing performed and reported at our Dandenong South Laboratory 21712

Sample No.:	1606318	1606319								
ID No.:	1	2								
Lot No.:	-	-								
Date Sampled:	12/05/2016	12/05/2016								
Time Sampled:	am/pm	-								
Date Tested:	13/05/2016	13/05/2016								
Material Source:	Site Derived	Site Derived								
Material Description:	Clay	Clay								
To Be Used As	-	-								
Sample Location :	E 355103 N 5782313 Layer 2	E 355095 N 5782271 Layer 2								
Layer Depth (mm):	175	175								
Test Depth (mm):	150	150								
Sampling Procedure:	AS1289.1.2.1.6.4(b)	AS1289.1.2.1.6.4(b)								
Max Size (mm):	19.0	19.0								
Oversize Wet (%):	0	0								
Fld. Wet Density (t/m ³) AS 1289.5.8.1:	2.07	2.07								
Fld. Moisture Content (%) AS1289.2.1.1:	-	-								
PCWD (t/m ³):	2.02	2.07								
APCWD (t/m ³)	-	-								
O.M.C (%) AS1289.5.7.1:	-	-								
Moisture Ratio (%) AS1289.5.4.1:	-	-								
Moisture Variation (of omc):	2% (dry)	omc								
Adjusted Moisture Variation (of omc):	-	-								
Compactive Effort:	Standard	Standard								
Hilf Density Ratio (%):	102.5	100.0								
Min Hilf Density Ratio (%):	95	95								

Remarks:



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Customer: Grosevnor Lodge Pty Ltd

Customer Address: 48 Healy Road, Dandenong Sth, Vic 3175

Project: Meridian Estate

Location: Clyde North

Customer Order No.: -

Report Number: **380735** - 19

Report Date: 17/05/16

C.G Order No: **151741**

Test Method: AS1289.5.7.1

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HILF DENSITY RATIO REPORT

Testing performed and reported at our Dandenong South Laboratory 21712

Sample No.:	1606359	1606360	1606361	1606362					
ID No.:	1	2	3	4					
Lot No.:	-	-	-	-					
Date Sampled:	13/05/2016	13/05/2016	13/05/2016	13/05/2016					
Time Sampled:	am/pm	am/pm	am/pm	am/pm					
Date Tested:	16/05/2016	16/05/2016	16/05/2016	16/05/2016					
Material Source:	Site Derived	Site Derived	Site Derived	Site Derived					
Material Description:	Clay	Clay	Clay	Clay					
To Be Used As	-	-	-	-					
Sample Location :	E 355074 N 5782278 Layer 2	E 354940 N 5782223 Layer 1	E 354922 N 5782296 Layer 1	E 354925 N 5782264 Layer 1					
Layer Depth (mm):	175	175	175	175					
Test Depth (mm):	150	150	150	150					
Sampling Procedure:	AS1289.1.2.1.6.4(b)	AS1289.1.2.1.6.4(b)	AS1289.1.2.1.6.4(b)	AS1289.1.2.1.6.4(b)					
Max Size (mm):	19.0	19.0	19.0	19.0					
Oversize Wet (%):	0	0	0	0					
Fld. Wet Density (t/m ³) AS 1289.5.8.1:	2.07	1.99	2.04	1.96					
Fld. Moisture Content (%) AS1289.2.1.1:	-	-	-	-					
PCWD (t/m ³):	2.02	1.92	2.06	2.00					
APCWD (t/m ³)	-	-	-	-					
O.M.C (%) AS1289.5.7.1:	-	-	-	-					
Moisture Ratio (%) AS1289.5.4.1:	-	-	-	-					
Moisture Variation (of omc):	1% (dry)	2% (dry)	0.5% (wet)	omc					
Adjusted Moisture Variation (of omc):	-	-	-	-					
Compactive Effort:	Standard	Standard	Standard	Standard					
Hilf Density Ratio (%):	102.0	103.5	99.0	97.5					
Min Hilf Density Ratio (%):	95	95	95	95					

Remarks:



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APPROVED SIGNATORY

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Form No.: **CG.315.002**

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HILF DENSITY RATIO REPORT

Report Number: **380735 - 28**

Report Date: 23/05/16

C.G Order No: **151746**

Test Method: AS1289.5.7.1

Page: 1 of 1

Customer: Grosevnor Lodge Pty Ltd
Customer Address: 48 Healy Road, Dandenong Sth, Vic 3175
Project: Meridian Estate
Location: Clyde North
Customer Order No.: -

Testing performed and reported at our Dandenong South Laboratory 21712

Sample No.:	1606594	1606595	1606596	1606597	1606598	1606599			
ID No.:	1	2	3	4	5	6			
Lot No.:	-	-	-	-	-	-			
Date Sampled:	19/05/2016	19/05/2016	19/05/2016	19/05/2016	19/05/2016	19/05/2016			
Time Sampled:	am	am	am	am	am	am			
Date Tested:	20/05/2016	20/05/2016	20/05/2016	20/05/2016	20/05/2016	19/05/2016			
Material Source:	Site Derived	Site Derived	Site Derived	Site Derived	Site Derived	Site Derived			
Material Description:	Clay	Clay	Clay	Clay	Clay	Clay			
To Be Used As	Fill	Fill	Fill	Fill	Fill	Fill			
Sample Location :	Meridian E355077 N5782372 Layer 2	Meridian E355082 N5782347 Layer 2	Meridian E355058 N5782320 Layer 2	Meridian E355043 N5782346 Layer 2	Meridian E355029 N5782311 Layer 2	Meridian E355022 N5782260 Layer 2			
Layer Depth (mm):	175	175	175	175	175	175			
Test Depth (mm):	150	150	150	150	150	150			
Sampling Procedure:	AS1289.1.2.1.6.4(b)	AS1289.1.2.1.6.4(b)	AS1289.1.2.1.6.4(b)	AS1289.1.2.1.6.4(b)	AS1289.1.2.1.6.4(b)	AS1289.1.2.1.6.4(b)			
Max Size (mm):	19.0	19.0	19.0	19.0	19.0	19.0			
Oversize Wet (%):	0	8	0	0	0	0			
Fld. Wet Density (t/m ³) AS 1289.5.8.1:	2.13	2.04	2.04	2.10	2.19	2.01			
Fld. Moisture Content (%) AS1289.2.1.1:	-	-	-	-	-	-			
PCWD (t/m ³):	2.08	-	2.02	2.11	2.12	2.02			
APCWD (t/m ³):	-	2.11	-	-	-	-			
O.M.C (%) AS1289.5.7.1:	-	-	-	-	-	-			
Moisture Ratio (%) AS1289.5.4.1:	-	-	-	-	-	-			
Moisture Variation (of omc):	0.5% (wet)	1% (wet)	2% (dry)	2% (wet)	0.5% (wet)	1% (wet)			
Adjusted Moisture Variation (of omc):	-	-	-	-	-	-			
Compactive Effort:	Standard	Standard	Standard	Standard	Standard	Standard			
Hilf Density Ratio (%):	102.5	97.0	100.5	99.5	103.5	99.5			
Min Hilf Density Ratio (%):	95	95	95	95	95	95			

Remarks:



Accredited for compliance with ISO/IEC 17025. The results of tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

APPROVED SIGNATORY

M.Robinson

Form No.: **CG.315.002**

Issue Date: 19/02/2013

Head Office
25 Metcalf Street
DANDENONG SOUTH VIC 3175

Ph: +61 3 8796 7900
Fax: +61 3 8796 7944



Customer: Grosevnor Lodge Pty Ltd

Customer Address: 48 Healy Road, Dandenong Sth, Vic 3175

Project: Meridian Estate

Location: Clyde North

Customer Order No.: -

Report Number: **380735** - 31

Report Date: 02/06/16

C.G Order No: **152051**

Test Method: AS1289.5.7.1

Page: 1 of 1

HILF DENSITY RATIO REPORT

Testing performed and reported at our Dandenong South Laboratory 21712

Sample No.:	1607086	1607087	1607088	1607089	1607090				
ID No.:	1	2	3	4	5				
Lot No.:	-	-	-	-	-				
Date Sampled:	31/05/2016	31/05/2016	31/05/2016	31/05/2016	31/05/2016				
Time Sampled:	pm	pm	pm	pm	pm				
Date Tested:	1/06/2016	1/06/2016	1/06/2016	1/06/2016	1/06/2016				
Material Source:	Site Derived	Site Derived	Site Derived	Site Derived	Site Derived				
Material Description:	Silty Clay	Silty Clay	Silty Clay	Silty Clay	Silty Clay				
To Be Used As	Fill	Fill	Fill	Fill	Fill				
Sample Location :	E 355091 N 5782269 Layer 3	E 355077 N 5782265 Layer 3	E 355053 N 5782248 Layer 3	E 355035 N 5782239 Layer 3	E 355011 N 5782230 Layer 3				
Layer Depth (mm):	150	150	150	150	150				
Test Depth (mm):	125	125	125	125	125				
Sampling Procedure:	AS1289.1.2.1.6.4(b)	AS1289.1.2.1.6.4(b)	AS1289.1.2.1.6.4(b)	AS1289.1.2.1.6.4(b)	AS1289.1.2.1.6.4(b)				
Max Size (mm):	19.0	19.0	19.0	19.0	19.0				
Oversize Wet (%):	0	0	5	3	5				
Fld. Wet Density (t/m ³) AS 1289.5.8.1:	2.06	2.11	2.14	2.12	2.13				
Fld. Moisture Content (%) AS1289.2.1.1:	-	-	-	-	-				
PCWD (t/m ³):	2.07	2.04	-	-	-				
APCWD (t/m ³):	-	-	2.11	2.11	2.06				
O.M.C (%) AS1289.5.7.1:	-	-	-	-	-				
Moisture Ratio (%) AS1289.5.4.1:	-	-	-	-	-				
Moisture Variation (of omc):	2.5% (wet)	0.5% (wet)	0.5% (wet)	omc	omc				
Adjusted Moisture Variation (of omc):	-	-	-	-	-				
Compactive Effort:	Standard	Standard	Standard	Standard	Standard				
Hilf Density Ratio (%):	100.0	103.0	101.0	100.5	103.5				
Min Hilf Density Ratio (%):	95	95	95	95	95				

Remarks:



Accredited for compliance with ISO/IEC 17025. The results of tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

APPROVED SIGNATORY

M. Robinson

Form No.: **CG.315.002**

Issue Date: 19/02/2013

Head Office
25 Metcalf Street
DANDENONG SOUTH VIC 3175

Ph: +61 3 8796 7900
Fax: +61 3 8796 7944



HILF DENSITY RATIO REPORT

Report Number: **380735 - 32**

Report Date: 03/06/16

C.G Order No: **152052**

Test Method: AS1289.5.7.1

Page: 1 of 1

Customer: Grosevnor Lodge Pty Ltd
Customer Address: 48 Healy Road, Dandenong Sth, Vic 3175
Project: Meridian Estate
Location: Clyde North
Customer Order No.: -

Testing performed and reported at our Dandenong South Laboratory 21712

Sample No.:	1607147	1607148	1607149	1607150	1607151	1607152			
ID No.:	1	2	3	4	5	6			
Lot No.:	-	-	-	-	-	-			
Date Sampled:	1/06/2016	1/06/2016	1/06/2016	1/06/2016	1/06/2016	1/06/2016			
Time Sampled:	am	am	am	am	am	am			
Date Tested:	2/06/2016	2/06/2016	2/06/2016	2/06/2016	2/06/2016	2/06/2016			
Material Source:	Site Derived	Site Derived	Site Derived	Site Derived	Site Derived	Site Derived			
Material Description:	Silty Clay	Silty Clay	Silty Clay	Silty Clay	Silty Clay	Silty Clay			
To Be Used As	Fill	Fill	Fill	Fill	Fill	Fill			
Sample Location :	E 355091 N 5782292 Layer 3	E 355063 N 5782284 Layer 3	E 355036 N 5782277 Layer 3	E 355013 N 5782266 Layer 3	E 355061 N 5782289 Layer 3	E 355034 N 5782280 Layer 3			
Layer Depth (mm):	150	150	150	150	150	150			
Test Depth (mm):	125	125	125	125	125	125			
Sampling Procedure:	AS1289.1.2.1.6.4(b)	AS1289.1.2.1.6.4(b)	AS1289.1.2.1.6.4(b)	AS1289.1.2.1.6.4(b)	AS1289.1.2.1.6.4(b)	AS1289.1.2.1.6.4(b)			
Max Size (mm):	19.0	19.0	19.0	19.0	19.0	19.0			
Oversize Wet (%):	0	3	0	0	7	2			
Fld. Wet Density (t/m ³) AS 1289.5.8.1:	2.10	2.13	2.08	2.07	2.06	2.01			
Fld. Moisture Content (%) AS1289.2.1.1:	-	-	-	-	-	-			
PCWD (t/m ³):	2.02	-	2.02	2.05	-	-			
APCWD (t/m ³):	-	2.11	-	-	2.13	2.01			
O.M.C (%) AS1289.5.7.1:	-	-	-	-	-	-			
Moisture Ratio (%) AS1289.5.4.1:	-	-	-	-	-	-			
Moisture Variation (of omc):	1.5% (dry)	0.5% (wet)	1.5% (dry)	0.5% (wet)	omc	2% (dry)			
Adjusted Moisture Variation (of omc):	-	-	-	-	-	-			
Compactive Effort:	Standard	Standard	Standard	Standard	Standard	Standard			
Hilf Density Ratio (%):	104.0	101.0	103.0	101.0	96.5	100.0			
Min Hilf Density Ratio (%):	95	95	95	95	95	95			

Remarks:



Accredited for compliance with ISO/IEC 17025. The results of tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

APPROVED SIGNATORY

M. Robinson

Form No.: **CG.315.002**

Issue Date: 19/02/2013

Head Office
25 Metcalf Street
DANDENONG SOUTH VIC 3175

Ph: +61 3 8796 7900
Fax: +61 3 8796 7944



Customer: Grosevnor Lodge Pty Ltd

Customer Address: 48 Healy Road, Dandenong Sth, Vic 3175

Project: Meridian Estate

Location: Clyde North

Customer Order No.: -

Report Number: **380735** - 33

Report Date: 06/06/16

C.G Order No: -

Test Method: AS1289.5.7.1

Page: 1 of 1

HILF DENSITY RATIO REPORT

Testing performed and reported at our Dandenong South Laboratory 21712

Sample No.:	1607200	1607201	1607202	1607203	1607204	1607205			
ID No.:	1	2	3	4	5	6			
Lot No.:	-	-	-	-	-	-			
Date Sampled:	2/06/2016	2/06/2016	2/06/2016	2/06/2016	2/06/2016	2/06/2016			
Time Sampled:	pm	pm	pm	pm	pm	pm			
Date Tested:	3/06/2016	3/06/2016	3/06/2016	3/06/2016	3/06/2016	3/06/2016			
Material Source:	Site Derived	Site Derived	Site Derived	Site Derived	Site Derived	Site Derived			
Material Description:	Silty Clay	Silty Clay	Silty Clay	Silty Clay	Silty Clay	Silty Clay			
To Be Used As	Fill	Fill	Fill	Fill	Fill	Fill			
Sample Location :	E 355095 N 5782329 Layer 3	E 355053 N 5782318 Layer 3	E 355052 N 5782323 Layer 3	E 355009 N 5782311 Layer 3	E 355029 N 5782330 Layer 3	E 355031 N 5782334 Layer 3			
Layer Depth (mm):	175	175	175	175	175	175			
Test Depth (mm):	150	150	150	150	150	150			
Sampling Procedure:	AS1289.1.2.1.6.4(b)	AS1289.1.2.1.6.4(b)	AS1289.1.2.1.6.4(b)	AS1289.1.2.1.6.4(b)	AS1289.1.2.1.6.4(b)	AS1289.1.2.1.6.4(b)			
Max Size (mm):	19.0	19.0	19.0	19.0	19.0	19.0			
Oversize Wet (%):	0	0	0	0	0	0			
Fld. Wet Density (t/m ³) AS 1289.5.8.1:	2.05	2.11	2.04	2.13	2.12	2.03			
Fld. Moisture Content (%) AS1289.2.1.1:	-	-	-	-	-	-			
PCWD (t/m ³):	2.08	2.05	2.03	2.04	2.03	2.03			
APCWD (t/m ³)	-	-	-	-	-	-			
O.M.C (%) AS1289.5.7.1:	-	-	-	-	-	-			
Moisture Ratio (%) AS1289.5.4.1:	-	-	-	-	-	-			
Moisture Variation (of omc):	2% (wet)	omc	1% (dry)	2% (dry)	2% (dry)	1.5% (dry)			
Adjusted Moisture Variation (of omc):	-	-	-	-	-	-			
Compactive Effort:	Standard	Standard	Standard	Standard	Standard	Standard			
Hilf Density Ratio (%):	99.0	102.5	100.5	104.5	104.5	99.5			
Min Hilf Density Ratio (%):	95	95	95	95	95	95			

Remarks:



Accredited for compliance with ISO/IEC 17025. The results of tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

APPROVED SIGNATORY

M. Robinson

Form No.: **CG.315.002**

Issue Date: 19/02/2013

HILF Density Ratio Report

<p>Client: Greenridge Properties Pty Ltd Address: PO Box 3131 AUBURN VIC 3123 Project: Meridian Estate Project No.: 3807351 Order No.: TRN:</p>	<p>CG Request No.: Lot No.:</p>	<p>Accredited for compliance with ISO/IEC 17025 - Testing</p>  <p>Accreditation No. 12719</p> <p>The results of the tests, calibrations and/or measurements included in this document are traceable to Australian national</p> <p>Approved Signatory: M. Robinson (Senior Technician)</p> <p>12712 Date of Issue: 10/05/2017</p> <p>THIS DOCUMENT SHALL NOT BE REPRODUCED EXCEPT IN FULL</p>
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Sample Details

Location: Lots for homes Stage 2-5

Client Request ID:

Specification Requirements: Minimum Hilf Density Ratio of 95% Std Compaction

Field Test procedures: AS 1289.5.8.1

Laboratory Test procedures: AS 1289.5.7.1

Sampling Method: AS1289.1.2.1 Clause 6.4 (b)

Source: Onsite

Material: General Fill

Sample Data

Sample ID	S17DS-00123	S17DS-00124	S17DS-00125	S17DS-00126
Field Sample ID	1	2	3	4
Date Tested	4/04/2017	4/04/2017	4/04/2017	4/04/2017
Location	E: 355071	E 355103	Retest	Retest
	N: 5782401	N: 5782410	Stage 2	Stage 3
	Stage 5			

Field and Laboratory Data

Depth of Test (mm)	150	150	150	150
Depth of Layer (mm)	175	175	175	175
AS Sieve Size (mm)	19.0	19.0	19.0	19.0
Oversize Wet (%)	0	0	0	0
Field Wet Density (t/m ³)	1.95	2.00	2.00	2.07
Peak Converted Wet Density (t/m ³)	1.98	1.97	1.94	2.08
Compactive Effort	Standard	Standard	Standard	Standard
Moisture Variation (%)	1.0 dry	4.0 dry	3.5 dry	0.5 dry
Hilf Density Ratio (%)	98.5	101.5	103.0	100.0

Comments

Appendix D: Controlled fill certificates

CONTROLLED FILL CERTIFICATE - LEVEL 1 INSPECTION & TESTING

PROJECT : Lot 537
Meridian Estate Stage 5
Clyde North VIC

Chadwick Geotechnics REF : 3807351 STG5

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

DATE : November 2017

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 Meridian Estate Stage 5 in Clyde North.

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). The moisture content of the soils tested was between 3.0% wet to 3.0% dry of the soils optimum moisture content (OMC).

LIMITATIONS

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

This report is based on the conditions present and factors affecting the soil at the time of inspection, namely the 3rd May 2016 and was completed on the 4th April 2017. 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



Tim Chadwick
Project Director

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CONTROLLED FILL CERTIFICATE - LEVEL 1 INSPECTION & TESTING

PROJECT : Lot 538
Meridian Estate Stage 5
Clyde North VIC

Chadwick Geotechnics REF : 3807351 STG5

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

DATE : November 2017

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 Meridian Estate Stage 5 in Clyde North.

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). The moisture content of the soils tested was between 3.0% wet to 3.0% dry of the soils optimum moisture content (OMC).

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).

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Chadwick Geotechnics PTY LTD



Robert Barden
Geotechnical Engineer



Tim Chadwick
Project Director

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CONTROLLED FILL CERTIFICATE - LEVEL 1 INSPECTION & TESTING

PROJECT : Lot 539
Meridian Estate Stage 5
Clyde North VIC

Chadwick Geotechnics REF : 3807351 STG5

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

DATE : November 2017

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 Meridian Estate Stage 5 in Clyde North.

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). The moisture content of the soils tested was between 3.0% wet to 3.0% dry of the soils optimum moisture content (OMC).

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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).

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Chadwick Geotechnics PTY LTD



Robert Barden
Geotechnical Engineer



Tim Chadwick
Project Director

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CONTROLLED FILL CERTIFICATE - LEVEL 1 INSPECTION & TESTING

PROJECT : Lot 540
Meridian Estate Stage 5
Clyde North VIC

Chadwick Geotechnics REF : 3807351 STG5

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

DATE : November 2017

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 Meridian Estate Stage 5 in Clyde North.

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). The moisture content of the soils tested was between 3.0% wet to 3.0% dry of the soils optimum moisture content (OMC).

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).

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Chadwick Geotechnics PTY LTD



Robert Barden
Geotechnical Engineer



Tim Chadwick
Project Director

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CONTROLLED FILL CERTIFICATE - LEVEL 1 INSPECTION & TESTING

PROJECT : Lot 541
Meridian Estate Stage 5
Clyde North VIC

Chadwick Geotechnics REF : 3807351 STG5

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

DATE : November 2017

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 Meridian Estate Stage 5 in Clyde North.

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). The moisture content of the soils tested was between 3.0% wet to 3.0% dry of the soils optimum moisture content (OMC).

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Chadwick Geotechnics PTY LTD



Robert Barden
Geotechnical Engineer



Tim Chadwick
Project Director

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CONTROLLED FILL CERTIFICATE - LEVEL 1 INSPECTION & TESTING

PROJECT : Lot 542
Meridian Estate Stage 5
Clyde North VIC

Chadwick Geotechnics REF : 3807351 STG5

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

DATE : November 2017

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 Meridian Estate Stage 5 in Clyde North.

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Chadwick Geotechnics PTY LTD



Robert Barden
Geotechnical Engineer



Tim Chadwick
Project Director

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CONTROLLED FILL CERTIFICATE - LEVEL 1 INSPECTION & TESTING

PROJECT : Lot 543
Meridian Estate Stage 5
Clyde North VIC

Chadwick Geotechnics REF : 3807351 STG5

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

DATE : November 2017

SUMMARY

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Chadwick Geotechnics PTY LTD



Robert Barden
Geotechnical Engineer



Tim Chadwick
Project Director

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CONTROLLED FILL CERTIFICATE - LEVEL 1 INSPECTION & TESTING

PROJECT : Lot 544
Meridian Estate Stage 5
Clyde North VIC

Chadwick Geotechnics REF : 3807351 STG5

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

DATE : November 2017

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 Meridian Estate Stage 5 in Clyde North.

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LIMITATIONS

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

This report is based on the conditions present and factors affecting the soil at the time of inspection, namely the 3rd May 2016 and was completed on the 4th April 2017. 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



Tim Chadwick
Project Director

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www.chadwickgeotechnics.com.au

CONTROLLED FILL CERTIFICATE - LEVEL 1 INSPECTION & TESTING

PROJECT : Lot 545
Meridian Estate Stage 5
Clyde North VIC

Chadwick Geotechnics REF : 3807351 STG5

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

DATE : November 2017

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 Meridian Estate Stage 5 in Clyde North.

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). The moisture content of the soils tested was between 3.0% wet to 3.0% dry of the soils optimum moisture content (OMC).

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