



WOODS ROAD STAGE 5

Level One Report

Universal Corporation

5th July 2018 REV:1

Pearce Geotech Pty Ltd ABN 96 155 312 879
23 Nobility Street, Moolap, VIC 3221 Australia
Ph: 03 5248 7887



5th July 2018

Universal Corporation
Level 14, 50 Market Street
Melbourne, VIC, 3000

Attention:

Dear

RE: Woods Road Stage 5

Level 1 Compaction Control

This letter presents a report by Pearce Geotech Pty Ltd (PG) on Level 1 Testing Services undertaken during the construction of allotment filling at Woods Rd stage 5. One electronic copy provided.

Please do not hesitate to contact the undersigned should there be any queries regarding this report.

For and on behalf of Pearce Geotech Pty Ltd

A handwritten signature in black ink, appearing to read 'Daniel Pearce', is enclosed within a hand-drawn oval scribble.

Regards

Daniel Pearce

PEARCE GEOTECH PTY LTD

23 Nobility Street, Moolap 3221

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danielp@pgeo.com.au

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Woods Rd stage 5

1 INTRODUCTION

This report presents the results of compaction control and laboratory testing services provided by Pearce Geotech Pty Ltd (PG) during the construction of the allotment filling at Woods Rd stage 5.

PG was engaged by Universal Corporation Pty Ltd (Universal) to provide Level 1 testing services for the duration of these works in accordance with the specification supplied. The work was commissioned by universal.

Level 1 testing, as defined in AS3798-2007 "Guidelines on Earthworks for Commercial and Residential Development", provides for full-time inspection of the construction of controlled fill and compaction testing in accordance with AS1289 "Methods of Testing Soils for Engineering Purposes". The Level 1 testing was undertaken by technicians from PG from the 11th July 2017 to the 14th July 2017.

2 SCOPE OF WORK

2.1 Area of Work

PG provided Level 1 testing and supervision of the Allotment filling placed. Material selection and condition, as well as compaction testing, were conducted during the construction of this fill.

This report does not include fill other than where mentioned in this report or any other fill that may be placed during this period or subsequent periods at or surrounding the subject site.

2.2 Placement Specification

As no specification was supplied AS 3798 "Guidelines on earthworks for commercial and residential developments" was adopted.

- Minimum density ratio as per item 1 below.

TABLE 5.1
MINIMUM RELATIVE COMPACTION

Item	Application	Minimum relative compaction, %	
		Minimum density ratio (at standard compactive effort) (Cohesive soils) (see Note 1)	Minimum density index (Cohesionless soils) (see Note 2)
1	Residential—lot, fill, house, sites	95 (see Note 3)	70
2	Commercial—fills to support minor loadings, including floor loadings of up to 20 kPa and isolated pad or strip footings to 100 kPa	98 (see Note 4)	75
3	Fill to support pavements (see Note 5)		
	(a) General fill	95	70
	(b) Subgrade (to a depth of 0.3 m)	98	75

Woods Rd stage 5

3 CONSTRUCTION PLANT

The following construction plant was used on site as required:

- 1 x Grader
- 1 x Excavator
- 1 x pad-foot rollers
- 1 x Smooth drum roller
- 1 x water truck
- dump trucks as required

4 INSPECTION AND TESTING

4.1 Construction Materials

Insitu Clay was used as the fill for this project.

Fill material was sourced from:

- Site excavation

All material was tested for compliance, spread and watered to achieve the specified density and moisture specification.

4.2 Fill Placement

Initial site inspection showed two prepared fill areas as per the attached site plan. The test areas had already been stripped and all deleterious material removed from the placement sites.

Compaction tests were conducted on the individual layers to ensure compliance with the specification and samples of the fill material were tested in PG's NATA accredited laboratory (Accreditation Number 18877) to determine the Hilf density ratio and moisture ratio of the material. In total 14 field density tests, 14 Hilf rapid compaction tests and 14 moisture contents were conducted.

4.2.1 Test Summary

Field No.	Date	Location	Layer	Min Ratio	Density Ratio %
S-30566	11/07/2017	See Site Plan	L1	95% Std	98
S-30567	11/07/2017	See Site Plan	L1	95% Std	98

Woods Rd stage 5

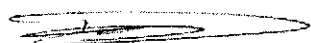
S-30568	11/07/2017	See Site Plan	L2	95% Std	102.5
S-30636	12/07/2017	See Site Plan	L1	95% Std	99
S-30637	12/07/2017	See Site Plan	L1	95% Std	104.5
S-30638	12/07/2017	See Site Plan	L1	95% Std	98
S-30639	12/07/2017	See Site Plan	SG	95% Std	104
S-30640	12/07/2017	See Site Plan	SG	95% Std	101.5
S-30641	12/07/2017	See Site Plan	SG	95% Std	101
S-30642	12/07/2017	See Site Plan	SG	95% Std	101
S-30705	14/07/2017	See Site Plan	L1	95% Std	98
S-30706	14/07/2017	See Site Plan	L1	95% Std	98
S-30707	14/07/2017	See Site Plan	L2	95% Std	98.5
S-30708	14/07/2017	See Site Plan	L2	95% Std	98

5 STATEMENT OF COMPLIANCE

PG personnel provided Level 1 inspection and testing services during construction of the fill at Woods Rd stage 5. A technician from PG was on site on a fulltime basis during fill placement and observed the construction techniques adopted.

Based on observations made by PG personnel and the results of field and laboratory tests, we consider that the fill has been placed in accordance with the intent of the specification.

For and on behalf of Pearce Geotech Pty Ltd



Regards

Daniel Pearce

Pearce Geotech Pty. Ltd.
Report No.CS-783-1 REV: 1
5th July 2018

3

Woods Rd stage 5

PEARCE GEOTECH PTY LTD

23 Nobility Street, Moolap 3221

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Appendix A

Test Results



Moolap Laboratory
Pearce Geotech Pty Ltd
23 Nobility Street
Moolap VIC 3221

Hilf Density Ratio Report

Client :	Universal	Report Number:	CS-783 - 1/1
Address :	Level 14, 50 Market St, Melbourne, VIC, 3000	Report Date :	18/07/2017
Project Name :	Woods Road Stage 5	Order Number :	
Project Number :	CS-783	Test Method :	AS1289.5.7.1
Location:		Page 1 of 1	

Sample Number :	S-30566	S-30567	S-30568
Test Number :			
Sampling Method :	AS1289.1.2.1 6.4(b)	AS1289.1.2.1 6.4(b)	AS1289.1.2.1 6.4(b)
Date Sampled :	11/07/2017	11/07/2017	11/07/2017
Date Tested :	11/07/2017	11/07/2017	11/07/2017
Material Type :	Clay	Clay	Clay
Material Source :	In situ	In situ	In situ
Lot Number :			
Sample Location :	Lot-519 Subgrade Lift 1 Refer to Plan	Lot-523 Subgrade Lift 1 Refer to Plan	Lot-534 Subgrade Lift 2 Refer to Plan
Test Depth (mm) :	125	125	125
Layer Depth (mm) :	150	150	150
Maximum Size (mm) :	19	19	19
Oversize Wet (%) :	0	8	4
Oversize Dry (%) :			
Oversize Density (t/m ³) :		1.865	2.267
Field Moisture Content (%) :	23.4	23.3	22.8
Hilf MDR Number :	S-30566	S-30567	S-30568
Hilf MDR Method :	AS1289.5.7.1	AS1289.5.7.1	AS1289.5.7.1
Compactive Effort :	Standard	Standard	Standard
Field Density Method :	AS1289.5.8.1	AS1289.5.8.1	AS1289.5.8.1
Moisture Method :	AS1289.2.1.1	AS1289.2.1.1	AS1289.2.1.1
Moisture Ratio (%) :	83	86.5	87
Field Wet Density (t/m ³) :	1.78	1.82	1.84
Optimum Moisture Content (%) :	28.1	27.0	26.1
Moisture Variation :	4.5	3.5	3.5
Peak Converted Wet Density (t/m ³) :	1.82	1.86	1.80
Hilf Density Ratio (%) :	98.0	98.0	102.5
Minimum Specification :	98% Standard	98% Standard	98% Standard
Moisture Specification :			
Site Selection :	Random	Random	Random
Soil Description :			
Remarks :			

<p>NATA WORLDWIDE ACCREDITED ACCREDITATION</p>	<p>The results of the tests in this report are traceable to Australian/National standards. Accredited for compliance with ISO/IEC 17025</p>	APPROVED SIGNATORY
		<p><i>Anthony Green</i> Anthony Green - Technician NATA Accreditation Number 18877</p>

Document Code RF89-12



Moolap Laboratory
Pearce Geotech Pty Ltd
23 Nobility Street
Moolap VIC 3221

Hilf Density Ratio Report

Client :	Universal	Report Number:	CS-783 - 2/1
Address :	Level 14, 50 Market St., Melbourne, VIC, 3000	Report Date :	25/07/2017
Project Name :	Woods Road Stage 5	Order Number :	
Project Number :	CS-783	Test Method :	AS1289.5.7.1
Location:		Page 1 of 1	

Sample Number :	S-30705	S-30706	S-30707	S-30708
Test Number :				
Sampling Method :	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)
Date Sampled :	14/07/2017	14/07/2017	14/07/2017	14/07/2017
Date Tested :	24/07/2017	24/07/2017	24/07/2017	24/07/2017
Material Type :	Clay	Clay	Clay	Clay
Material Source :	Insitu	Insitu	Insitu	Insitu
Lot Number :				
Sample Location :	Allotment Fill Subgrade Lift 1 Refer to Plan	Allotment Fill Subgrade Lift 1 Refer to Plan	Allotment Fill Subgrade Lift 2 Refer to Plan	Allotment Fill Subgrade Lift 2 Refer to Plan
Test Depth (mm) :	175	175	175	175
Layer Depth (mm) :	200	200	200	200
Maximum Size (mm) :	19	19	19	19
Oversize Wet (%) :	0	0	0	0
Oversize Dry (%) :				
Oversize Density (t/m ³) :				
Field Moisture Content (%) :	17.7	19.7	18.3	24.5
Hilf MDR Number :	S-30705	S-30706	S-30707	S-30708
Hilf MDR Method :	AS1289.5.7.1	AS1289.5.7.1	AS1289.5.7.1	AS1289.5.7.1
Compactive Effort :	Standard	Standard	Standard	Standard
Field Density Method :	AS1289.5.8.1	AS1289.5.8.1	AS1289.5.8.1	AS1289.5.8.1
Moisture Method :	AS1289.2.1.1	AS1289.2.1.1	AS1289.2.1.1	AS1289.2.1.1
Moisture Ratio (%) :	87.5	99	89	98.5
Field Wet Density (t/m ³) :	1.85	1.91	1.87	1.93
Optimum Moisture Content (%) :	20.2	20.0	20.6	24.9
Moisture Variation :	2.5	0.0	2.0	0.5
Peak Converted Wet Density (t/m ³) :	1.89	1.95	1.90	1.97
Hilf Density Ratio (%) :	98.0	98.0	98.5	98.0
Minimum Specification :	98% Standard	98% Standard	98% Standard	98% Standard
Moisture Specification :				
Site Selection :	Random	Random	Random	Random
Soil Description :				
Remarks :				



The results of the tests in this report are traceable to Australian/National standards. Accredited for compliance with ISO/IEC 17025

APPROVED SIGNATORY

Anthony Green - Technician
NATA Accreditation Number
18877

Document Code RF89-12



Moolap Laboratory
Pearce Geotech Pty Ltd
23 Nobility Street
Moolap VIC 3221

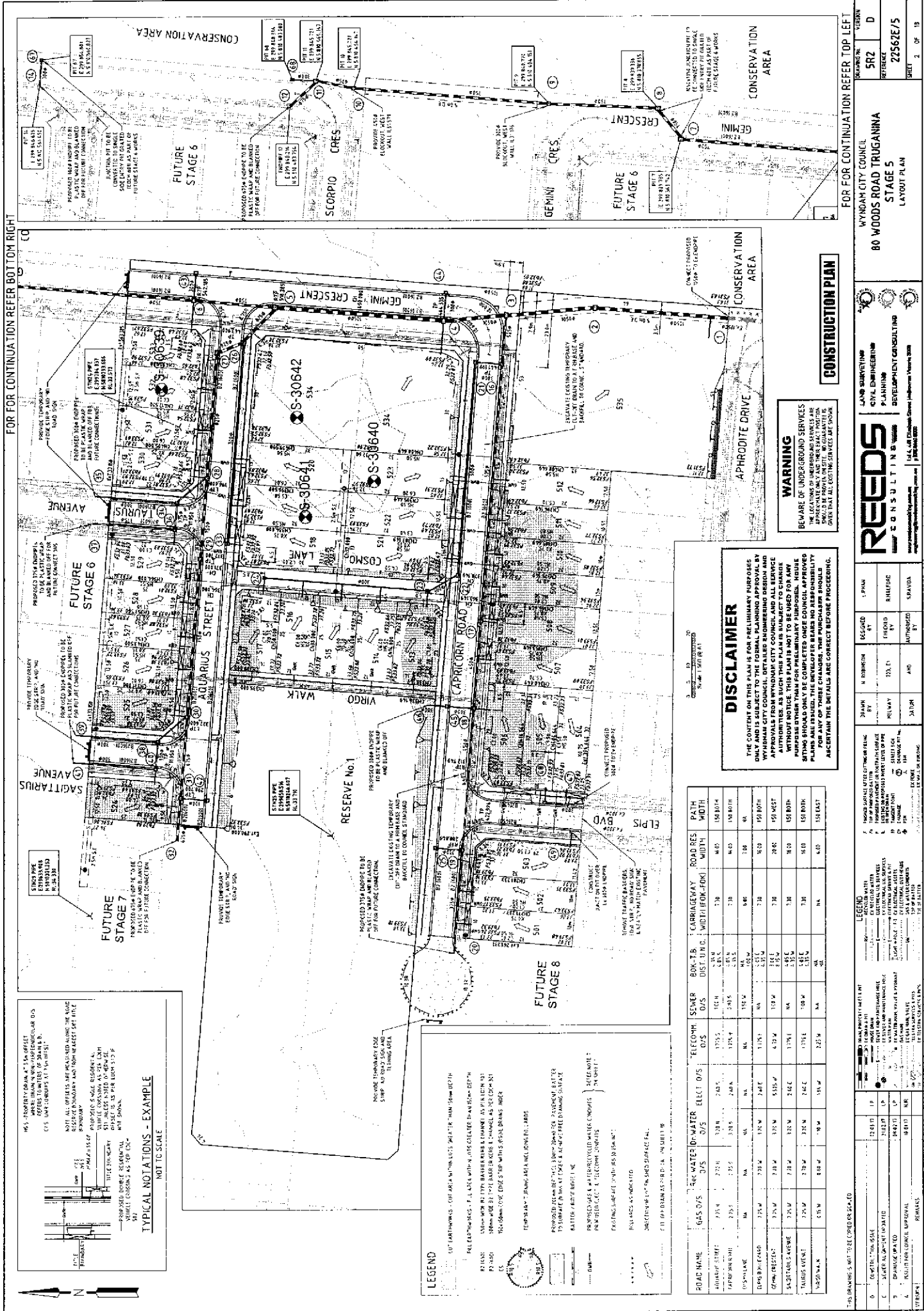
Hilf Density Ratio Report

Client :	Universal	Report Number:	CS-783 - 3/1
Address :	Level 14, 50 Market St., Melbourne, VIC, 3000	Report Date :	2/08/2017
Project Name :	Woods Road Stage 5	Order Number :	
Project Number :	CS-783	Test Method :	AS1289.5.7.1
Location:		Page 1 of 1	

Sample Number :	S-30639	S-30640	S-30641	S-30642
Test Number :				
Sampling Method :	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)
Date Sampled :	12/07/2017	12/07/2017	12/07/2017	12/07/2017
Date Tested :	12/07/2017	12/07/2017	12/07/2017	12/07/2017
Material Type :	Clay	Clay	Clay	Clay
Material Source :	Insitu	Insitu	Insitu	Insitu
Lot Number :				
Sample Location :	Allotment Fill Subgrade Refer to Plan	Allotment Fill Subgrade Refer to Plan	Allotment Fill Subgrade Refer to Plan	Allotment Fill Subgrade Refer to Plan
Test Depth (mm) :	175	175	175	175
Layer Depth (mm) :	200	200	200	200
Maximum Size (mm) :	19	19	19	19
Oversize Wet (%) :	0	0	0	0
Oversize Dry (%) :				
Oversize Density (t/m ³) :				
Field Moisture Content (%) :	18.0	22.6	23.6	21.9
Hilf MDR Number :	S-30639	S-30640	S-30641	S-30642
Hilf MDR Method :	AS1289.5.7.1	AS1289.5.7.1	AS1289.5.7.1	AS1289.5.7.1
Compactive Effort :	Standard	Standard	Standard	Standard
Field Density Method :	AS1289.5.8.1	AS1289.5.8.1	AS1289.5.8.1	AS1289.5.8.1
Moisture Method :	AS1289.2.1.1	AS1289.2.1.1	AS1289.2.1.1	AS1289.2.1.1
Moisture Ratio (%) :	86	82	85	84
Field Wet Density (t/m ³) :	1.79	1.78	1.76	1.78
Optimum Moisture Content (%) :	21.0	27.5	27.7	26.1
Moisture Variation :	3.5	5.0	4.0	4.0
Peak Converted Wet Density (t/m ³) :	1.72	1.76	1.74	1.77
Hilf Density Ratio (%) :	104.0	101.5	101.0	101.0
Minimum Specification :	98% Standard	98% Standard	98% Standard	98% Standard
Moisture Specification :				
Site Selection :	Random	Random	Random	Random
Soil Description :				
Remarks :				

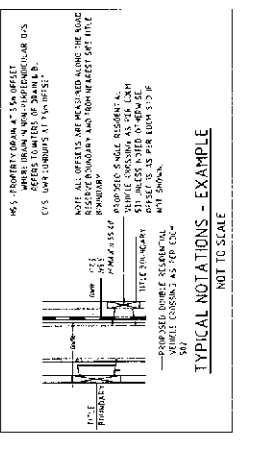
	<p>The results of the tests in this report are traceable to Australian/National standards. Accredited for compliance with ISO/IEC 17025</p>	APPROVED SIGNATORY
		<p><i>Anthony Green</i></p> <p>Anthony Green - Technician NATA Accreditation Number 18877</p>

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FOR FOR CONTINUATION REFER BOTTOM RIGHT

FOR FOR CONTINUATION REFER TOP LEFT



LEGEND

CUT EARTHWORKS, CUT AREA WITHIN LINES SHALL BE 1:1 FROM 1:100 TO 1:1000

RELEASED TO THE PUBLIC BY THE ENGINEER FOR THE PROJECT AND SHALL BE USED FOR THE PROJECT ONLY. THIS PLAN IS NOT TO BE USED FOR ANY OTHER PROJECT.

DATE: 11/15/17

PROJECT: 80 WOODS ROAD TRUGANINA STAGE 5

DESIGNER: MARSHALL FREEMAN

CLIENT: WYNDHAM CITY COUNCIL

SCALE: AS SHOWN

DISCLAIMER

THE CONTENT OF THIS PLAN IS FOR PRELIMINARY PURPOSES ONLY. IT IS NOT TO BE USED FOR CONSTRUCTION OR ANY OTHER PURPOSES WITHOUT THE WRITTEN APPROVAL OF MARSHALL FREEMAN. THE ENGINEER ACCEPTS NO LIABILITY FOR ANY DAMAGE OR INJURY TO PERSONS OR PROPERTY ARISING FROM THE USE OF THIS PLAN.

WARNING

BEWARE OF UNDERGROUND SERVICES. THE LOCATION OF UNDERGROUND SERVICES ARE SHOWN ON THIS PLAN. THE PURCHASER SHOULD OBTAIN ALL NECESSARY SERVICES AND SHOWN ON THIS PLAN.

CONSTRUCTION PLAN

ROAD NAME	6.5m O/S	7.5m O/S	8.5m O/S	TELECOM O/S	ELECT O/S	WATER O/S	SEWER O/S	ROW	SEWER B.K. T.B. DIST. (M)	ROAD RES. WIDTH (M)	CARRIAGEWAY WIDTH (M)	ROAD RES. WIDTH (M)	PATH WIDTH (M)
ROADWAY STREET	7.5m	7.5m	7.5m	7.5m	7.5m	7.5m	7.5m	7.5m	7.5m	7.5m	7.5m	7.5m	7.5m
FAIRFAX DRIVE	7.5m	7.5m	7.5m	7.5m	7.5m	7.5m	7.5m	7.5m	7.5m	7.5m	7.5m	7.5m	7.5m
WINDMILL LANE	7.5m	7.5m	7.5m	7.5m	7.5m	7.5m	7.5m	7.5m	7.5m	7.5m	7.5m	7.5m	7.5m
DRIVE BENTLEY	7.5m	7.5m	7.5m	7.5m	7.5m	7.5m	7.5m	7.5m	7.5m	7.5m	7.5m	7.5m	7.5m
DRIVE BENTLEY	7.5m	7.5m	7.5m	7.5m	7.5m	7.5m	7.5m	7.5m	7.5m	7.5m	7.5m	7.5m	7.5m
SAGITTARIUS AVENUE	7.5m	7.5m	7.5m	7.5m	7.5m	7.5m	7.5m	7.5m	7.5m	7.5m	7.5m	7.5m	7.5m
AQUARIUS STREET	7.5m	7.5m	7.5m	7.5m	7.5m	7.5m	7.5m	7.5m	7.5m	7.5m	7.5m	7.5m	7.5m
WIRGO WALK	7.5m	7.5m	7.5m	7.5m	7.5m	7.5m	7.5m	7.5m	7.5m	7.5m	7.5m	7.5m	7.5m
ELPHIN BLVD	7.5m	7.5m	7.5m	7.5m	7.5m	7.5m	7.5m	7.5m	7.5m	7.5m	7.5m	7.5m	7.5m

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www.reedsconsulting.com.au

WYNDHAM CITY COUNCIL
80 WOODS ROAD TRUGANINA
STAGE 5
LAYOUT PLAN

DATE: 11/15/17
DRAWN BY: [Name]
CHECKED BY: [Name]
APPROVED BY: [Name]

SHEET 2 OF 18



Moolap Laboratory
Pearce Geotech Pty Ltd
23 Nobility Street
Moolap VIC 3221

Hilf Density Ratio Report

Client : Universal	Report Number: CS-783 - 4/1
Address : Level 14, 50 Market St., Melbourne, VIC, 3000	Report Date : 3/08/2017
Project Name : Woods Road Stage 5	Order Number :
Project Number : CS-783	Test Method : AS1289.5.7.1
Location:	Page 1 of 1

Sample Number :	S-30636	S-30637	S-30638
Test Number :			
Sampling Method :	AS1289.1.2.1 6.4(b)	AS1289.1.2.1 6.4(b)	AS1289.1.2.1 6.4(b)
Date Sampled :	12/07/2017	12/07/2017	12/07/2017
Date Tested :	12/07/2017	12/07/2017	12/07/2017
Material Type :	Clay	Clay	Clay
Material Source :	Insitu	Insitu	Insitu
Lot Number :			
Sample Location :	Allotment Fill Subgrade Lift 1 Refer to Plan	Allotment Fill Subgrade Lift 1 Refer to Plan	Allotment Fill Subgrade Lift 1 Refer to Plan
Test Depth (mm) :	175	175	175
Layer Depth (mm) :	200	200	200
Maximum Size (mm) :	19	19	19
Oversize Wet (%) :	0	0	0
Oversize Dry (%) :			
Oversize Density (t/m ³) :			
Field Moisture Content (%) :	20.9	24.4	25.7
Hilf MDR Number :	S-30636	S-30637	S-30638
Hilf MDR Method :	AS1289.5.7.1	AS1289.5.7.1	AS1289.5.7.1
Compactive Effort :	Standard	Standard	Standard
Field Density Method :	AS1289.5.8.1	AS1289.5.8.1	AS1289.5.8.1
Moisture Method :	AS1289.2.1.1	AS1289.2.1.1	AS1289.2.1.1
Moisture Ratio (%) :	88	90.5	99
Field Wet Density (t/m ³) :	1.85	1.93	1.87
Optimum Moisture Content (%) :	23.7	27.0	26.0
Moisture Variation :	2.5	2.5	0.0
Peak Converted Wet Density (t/m ³) :	1.87	1.84	1.92
Hilf Density Ratio (%) :	99.0	104.5	98.0
Minimum Specification :	98% Standard	98% Standard	98% Standard
Moisture Specification :			
Site Selection :	Random	Random	Random
Soil Description :			
Remarks :	-		



The results of the tests in this report are traceable to Australian/National standards. Accredited for compliance with ISO/IEC 17025

APPROVED SIGNATORY

Anthony Green - Technician
NATA Accreditation Number
18877

Document Code RF89-12

