Your Worksite is Our Laboratory.

Geotechnical Report
Level One Inspection and Testing

Acacia Estate Stage 13
Cranbourne

Prepared for:

Streetworks Pty Ltd
4 Len Thomas Place
Narre Warren 3804

Project 10111

25 May 2018

Prepared by:

TERRA FIRMA LABORATORIES
Geotechnical Inspection and Testing Authority

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Geotechnical Report Level One Inspection and Testing
Acacia Estate Stage 13

1 Introduction

Terra Firma Laboratories was engaged by Streetworks Pty Ltd as the geotechnical inspection and testing authority to provide Level 1 supervision and testing works on the earthworks component for Acacia Estate Stage 13. This work was conducted over the period of 1/2/2018 to 14/3/2018.

This report presents that the allotment earthworks was carried out in accordance with AS3798-2007 Guidelines for Earthworks for Commercial and Residential Development and in compliance with the compaction control specifications established by the contractor.

2 Scope of Works

2.1 Areas of work

The areas of work included lots 1301, 1315, 1316, 1318 to 1320, 1328 to 1330, 1339 to 1341, 1344, 1345, 1347 to 1349. The site will be a residential estate.

The area on which fill was placed is shown on site plan (Appendix 1) based on drawings prepared by GPR Consulting and provided by Streetworks Pty Ltd.

The supervision work by Terra Firma Laboratories involved both inspection of sub grade preparation work and full time inspection and testing of fill placement.

2.2 Specification

The placement of fill on the areas of work was to be carried out in accordance with AS3798-2007 Guidelines for Earthworks for Commercial and Residential Development, as directed by Streetworks Pty Ltd. At all times during placement of fill materials Terra Firma Laboratories maintained a Geotechnical Technician on site to perform the supervision and testing as required by AS3798-2007.

A technical specification for compaction control requirements was provided by Streetworks Pty Ltd and established that:

As referenced from AS3798-2007 (Section 5.2) establishes a specification requirement for a minimum density ratio of not less than 95% noting that soils containing more than 20% of particles coarser than 37.5mm cannot be tested for relative compaction using the procedures of AS1289.

Field density testing shall be undertaken at a frequency of not less than 3 tests per visit.

Test Rolling is required for all layers of structural fill and materials within 150mm of permanent subgrade level so as to withstand test rolling without visible deformation or springing. Corrective action is required where unstable areas exceed 20% of the area being considered by test rolling.

3 Inspection and Testing

3.1 Sub-Grade Preparation

Subgrade preparation involved stripping the site down of topsoil and organic matter to a depth of approximately 200mm below existing levels detailed on the site plans. The sub-grade area was then proof-rolled to determine soft or otherwise unsuitable zones and such zones rectified as necessary. The sub-grade was watered and scarified prior to fill placement to aid layer bonding.

3.2 Fill materials

The materials used as fill were locally sourced and observed to generally consist of Silty Clay, sourced from stockpiled materials on site. No particles greater than 150mm were observed. The fill was nominated as clean fill by the contractor.

3.3 Fill Construction

The contractor had the following plant available on-site during the construction period for use in the fill placement:

- Dozer
- Pad Fott Roller
- Traxcavator
- Water Cart
- Trucks
- Roller
- Dump Trucks
- Grader
- Scraper
- Excavator
- Loader

All fill was placed in layers of thicknesses not exceeding 300mm. The work area was typically a 2 or 3 lot area on any one particular day. At the completion of a placed layer, compaction testing was performed to confirm appropriate compaction had been achieved and supported the observations made.

It was observed that finished levels were in accordance with levels marked on site by survey. These levels are shown on site plans attached in Appendix 1.

The final 300mm of fill placed across the site was placed as a topsoil layer/ growing medium and should be considered as non-structural, as it was placed in an uncontrolled manner, as allowed by specifications.

4 Compaction Control Testing

Testing comprised of a total of 43 in-situ density tests, with a summary of results included in Appendix 2. Test Reports are referenced in Appendix 3.

Test numbers 4, 11, 13, 25, 26, 27, 29, 34, 35 and 36 originally failed to meet specification. Streetworks Pty Ltd were Notified and asked to rework the area appropriately. Upon adequate reworking Terra Firma Laboratories would perform a re-test.; this process would continue until a minimum compaction effort of 95% was achieved.

It should be noted that the tests are a representation of the fill placed and support the visual assessment of the works completed. Each lot does not necessarily require a compaction test to comply. The compaction control testing indicated that the engineered fill on all lots complied with the technical specification.

5 Uncontrolled Works

Terra Firma Laboratories cannot verify any works completed by others after the final date specified in the introduction. Uncontrolled works may include, but not limited to trenching for services, cut and fill works for slab preparation or subsequent removal of vegetation and back fill of holes.

6 Clean Fill

Terra Firma Laboratories cannot guarantee that the material used as a filling medium is free from chemical or other contamination.

7 Statement of Compliance

Inspections and testing of the fill areas at this site indicate that both sub grade preparation and fill placement have been conducted in accordance with the specification and that the completed fill areas of greater than 300mm, as shown on the site plan attached, and not any preceding the 1/2/2018 or work completed after the 14/3/2018, may be certified as being compliant with the specification.

For and on behalf of
Terra Firma Laboratories,

Tom Seymour
Managing Director

Appendices

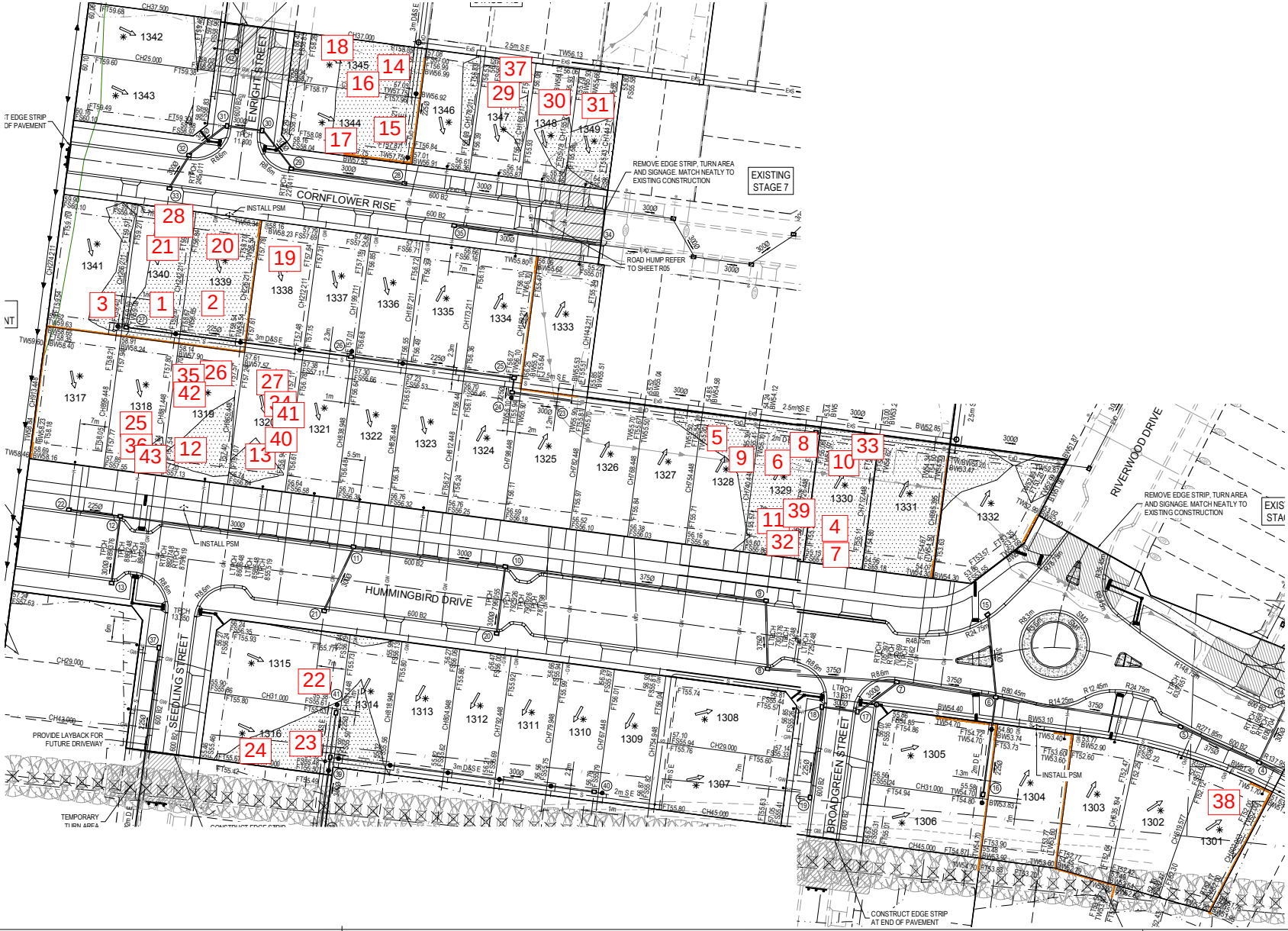
Appendix 1 Site Plan

Appendix 2 Test Summary

Appendix 3 Test Reports

Our Head Office
47 National Ave
Pakenham, VIC 3810

Our Laboratories
Pakenham 03 9769 5799
Deer Park 03 8348 5596
Bibra Lake 0481 227 980



terra firma laboratories

47 National Avenue
Pakenham VIC 3810

Test Location Plan

Client : Streetworks Pty Ltd

Project : Acacia Stage 13

Scale
NTS

Level One Test Summary

Client: Streetworks Pty Ltd **Project No:** 10111
Project: Acacia Estate Stage 13 **Specification:** 95%

Date:	Test Number:	Layer:	Retest of:	Density:	Pass/Fail:	Lot No:	Report No:
1/02/2018	1	L1		96.5	Pass	1340	10111-1
1/02/2018	2	L1		97.5	Pass	1339	10111-1
1/02/2018	3	L2		102.5	Pass	1341	10111-1
2/02/2018	4	L2		92	Fail	1330	10111-2
2/02/2018	5	L2		98.5	Pass	1328	10111-2
2/02/2018	6	L2		98	Pass	1329	10111-2
5/02/2018	7	L2	4	97	Pass	1330	10111-5
5/02/2018	8	L3		98.5	Pass	1329	10111-5
5/02/2018	9	L3		101	Pass	1328	10111-5
5/02/2018	10	L3		98	Pass	1330	10111-5
6/02/2018	11	L4		89	Fail	1329	10111-3
6/02/2018	12	L1		95.5	Pass	1319	10111-4
6/02/2018	13	L2		90	Fail	1320	10111-5
7/02/2018	14	L2		95	Pass	1345	10111-4
7/02/2018	15	L2		97	Pass	1344	10111-4
7/02/2018	16	L3		103.5	Pass	1345	10111-4
8/02/2018	17	L4		97.5	Pass	1344	10111-6
8/02/2018	18	L5		101	Pass	1345	10111-6
8/02/2018	19	L1		99	Pass	1338	10111-6
8/02/2018	20	L2		98	Pass	1339	10111-6
8/02/2018	21	L1		95	Pass	1340	10111-6
9/02/2018	22	L1		99.5	Pass	1315	10111-7
9/02/2018	23	L1		96.5	Pass	1316	10111-7
9/02/2018	24	L2		99	Pass	1316	10111-7
27/02/2018	25	L3		90	Fail	1318	10111-8
27/02/2018	26	L3		93.5	Fail	1319	10111-8
27/02/2018	27	L3		91.5	Fail	1320	10111-8
27/02/2018	28	L2		97	Pass	1340	10111-8
27/02/2018	29	L2		93.5	Fail	1347	10111-8
27/02/2018	30	L2		98	Pass	1348	10111-8
27/02/2018	31	L2		95.5	Pass	1349	10111-9
27/02/2018	32	L3		101	Pass	1329	10111-9
27/02/2018	33	L3		103	Pass	1330	10111-9
1/03/2018	34	L3	27	91	Fail	1320	10111-10
1/03/2018	35	L3	26	91.5	Fail	1319	10111-10
1/03/2018	36	L3	25	91	Fail	1318	10111-10
1/03/2018	37	L2	29	97.5	Pass	1347	10111-10
1/03/2018	38	L1		95	Pass	1301	10111-10
14/03/2018	39	L4	11	102.5	Pass	1329	10111-11
14/03/2018	40	L2	13	103.5	Pass	1320	10111-11
12/08/1903	41	L3	34	102.5	Pass	1320	10111-11

Level One Test Summary

Client: Streetworks Pty Ltd
Project No: 10111
Project: Acacia Estate Stage 13
Specification: 95%

Date:	Test Number:	Layer:	Retest of:	Density:	Pass/Fail:	Lot No:	Report No:
14/03/2018	42	L3	35	100.5	Pass	1319	10111-11
14/03/2018	43	L3	36	95	Pass	1318	10111-11

COMPACTION ASSESSMENT

BY NUCLEAR GAUGE METHOD

terra firma laboratories

47 National Avenue, Pakenham VIC 3810

ph 03 5943 0980 www.terrafirmalabs.com.au

report No 10111-1

date of issue 05-Feb-2018

Client	Streetworks
Client address	4 Len Thomas Place, Narre Warren, 3805
Project	Acacia Stage 13
Location	Cranbourne South

Feature	Block Fill
Layer thickness (mm)	300

tested by	NH
time	All Day
date	01-Feb-2018
checked by	CC

Field density test procedure AS1289.2.1.1 and 5.8.1

Test No		**1**	**2**	**3**			
location Lot No		1340	1339	1341			
Sampling procedures AS1289.1.1,1.2.1-Clause 6.4(b)							
depth from F.S.L.	m	Layer 1	Layer 1	Layer 2			
measurement depth	mm	275	275	275			
field wet density	t/m^3	1.97	1.95	1.89			
field dry density	t/m^3	1.70	1.64	1.49			
field moisture content	%	15.4	18.9	27.2			
laboratory compaction procedure AS1289 5.7.1							
compactive effort		standard	standard	standard			
oversize material retained on AS sieve	mm	19.0	19.0	19.0			
percent of oversize material	wet	0	0	0			
peak converted wet density	t/m^3	2.04	2.00	1.85			
adjusted peak converted wet density	t/m^3	-	-	-			
moisture variation from OMC (-dry,+wet)%		-2.0	-0.5	-2.0			
Moisture ratio	**%**	**89.5**	**97.5**	**92.5**			
Hilf density ratio (R_{HD})	**%**	**96.5**	**97.5**	**102.5**			

material description

Silty CLAY

NATA ACCREDITED FOR TECHNICAL COMPETENCE

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

LABORATORY ACCREDITATION No **15357**

Approved Signature

C Caulfield

COMPACTION ASSESSMENT

BY NUCLEAR GAUGE METHOD

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47 National Avenue, Pakenham VIC 3810

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report No 10111-2

date of issue 06-Feb-2018

Client	Streetworks
Client address	4 Len Thomas Place, Narre Warren, 3805
Project	Acacia Stage 13
Location	Cranbourne South

Feature	Block Fill
Layer thickness (mm)	300

tested by	MH
time	All Day
date	02-Feb-2018
checked by	CC

Field density test procedure AS1289.2.1.1 and 5.8.1

Test No		**4**	**5**	**6**			
location	Lot No	1330	1328	1329			
Sampling procedures AS1289.1.1,1.2.1-Clause 6.4(b)							
depth from F.S.L.	m	Layer 1	Layer 2	Layer 2			
measurement depth	mm	275	275	275			
field wet density	t/m^3	1.84	2.00	2.01			
field dry density	t/m^3	1.59	1.64	1.66			
field moisture content	%	15.6	21.5	21.2			
laboratory compaction procedure AS1289 5.7.1							
compactive effort		standard	standard	standard			
oversize material retained on AS sieve	mm	19.0	19.0	19.0			
percent of oversize material	wet	0	0	0			
peak converted wet density	t/m^3	2.00	2.03	2.05			
adjusted peak converted wet density	t/m^3	-	-	-			
moisture variation from OMC (-dry,+wet)%		-1.0	1.0	1.0			
Moisture ratio	**%**	**95.0**	**105.5**	**105.5**			
Hilf density ratio (R_{HD})	**%**	**92.0**	**98.5**	**98.0**			

material description

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report No 10111-3

date of issue 08-Feb-2018

Client	Streetworks
Client address	4 Len Thomas Place, Narre Warren, 3805
Project	Acacia Stage 13
Location	Cranbourne South

Feature	Block Fill
Layer thickness (mm)	300

tested by	MH
time	All Day
date	06-Feb-2018
checked by	CC

Field density test procedure AS1289.2.1.1 and 5.8.1

Test No		**11**	**12**	**13**			
location	Lot No	1329	1319	1320			
Sampling procedures AS1289.1.1,1.2.1-Clause 6.4(b)							
depth from F.S.L.	m	Layer 4	Layer 1	Layer 2			
measurement depth	mm	275	275	275			
field wet density	t/m^3	1.68	1.81	1.68			
field dry density	t/m^3	1.46	1.54	1.44			
field moisture content	%	14.7	17.4	17.2			
laboratory compaction procedure AS1289 5.7.1							
compactive effort		standard	standard	standard			
oversize material retained on AS sieve	mm	19.0	19.0	19.0			
percent of oversize material	wet	0	0	0			
peak converted wet density	t/m^3	1.88	1.89	1.87			
adjusted peak converted wet density	t/m^3	-	-	-			
moisture variation from OMC (-dry,+wet)%		-3.5	-3.0	-1.5			
Moisture ratio	**%**	**80.5**	**84.5**	**92.0**			
Hilf density ratio (R_{HD})	**%**	**89.0**	**95.5**	**90.0**			

material description

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BY NUCLEAR GAUGE METHOD

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report No 10111-4

date of issue 09-Feb-2018

Client	Streetworks
Client address	4 Len Thomas Place, Narre Warren, 3805
Project	Acacia Stage 13
Location	Cranbourne South

Feature	Block Fill
Layer thickness (mm)	200

tested by	HC
time	All Day
date	07-Feb-2018
checked by	CC

Field density test procedure AS1289.2.1.1 and 5.8.1

Test No		**14**	**15**	**16**			
location	Lot No	1345	1344	1345			
Sampling procedures AS1289.1.1,1.2.1-Clause 6.4(b)							
depth from F.S.L.	m	Layer 2	Layer 2	Layer 3			
measurement depth	mm	175	175	175			
field wet density	t/m^3	1.90	1.96	2.00			
field dry density	t/m^3	1.56	1.63	1.64			
field moisture content	%	21.7	20.2	22.0			
laboratory compaction procedure AS1289 5.7.1							
compactive effort		standard	standard	standard			
oversize material retained on AS sieve	mm	19.0	19.0	19.0			
percent of oversize material	wet	0	0	0			
peak converted wet density	t/m^3	2.00	2.02	1.93			
adjusted peak converted wet density	t/m^3	-	-	-			
moisture variation from OMC (-dry,+wet)%		1.0	0.5	-1.0			
Moisture ratio	**%**	**104.5**	**103.5**	**96.5**			
Hilf density ratio (R_{HD})	**%**	**95.0**	**97.0**	**103.5**			

material description

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BY NUCLEAR GAUGE METHOD

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47 National Avenue, Pakenham VIC 3810

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report No 10111-5

date of issue 16-Feb-2018

Client	Streetworks
Client address	4 Len Thomas Place, Narre Warren, 3805
Project	Acacia Stage 13
Location	Cranbourne South

Feature	Block Fill
Layer thickness (mm)	300

tested by	MH
time	All Day
date	05-Feb-2018
checked by	CC

Field density test procedure AS1289.2.1.1 and 5.8.1

Test No		**7**	**8**	**9**	**10**		
location Lot No		1330 Retest of 4	1329	1328	1330		
Sampling procedures AS1289.1.1,1.2.1-Clause 6.4(b)							
depth from F.S.L.	m	Layer 2	Layer 3	Layer 3	Layer 3		
measurement depth	mm	275	275	275	275		
field wet density	t/m^3	1.94	1.93	1.99	1.95		
field dry density	t/m^3	1.56	1.68	1.71	1.69		
field moisture content	%	24.0	15.0	15.8	15.5		
laboratory compaction procedure AS1289 5.7.1							
compactive effort		standard	standard	standard	standard		
oversize material retained on AS sieve	mm	19.0	19.0	19.0	19.0		
percent of oversize material	wet	0	0	0	0		
peak converted wet density	t/m^3	2.00	1.96	1.96	1.99		
adjusted peak converted wet density	t/m^3	-	-	-	-		
moisture variation from OMC (-dry,+wet)%		1.0	-2.5	-2.5	-2.5		
Moisture ratio	**%**	**104.0**	**85.0**	**87.0**	**85.0**		
Hilf density ratio (R_{HD})	**%**	**97.0**	**98.5**	**101.0**	**98.0**		

material description

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COMPACTION ASSESSMENT

BY NUCLEAR GAUGE METHOD

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47 National Avenue, Pakenham VIC 3810

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report No 10111-6

date of issue 16-Feb-2018

Client	Streetworks
Client address	4 Len Thomas Place, Narre Warren, 3805
Project	Acacia Stage 13
Location	Cranbourne South

Feature	Block Fill
Layer thickness (mm)	200

tested by	HC
time	All Day
date	08-Feb-2018
checked by	CC

Field density test procedure AS1289.2.1.1 and 5.8.1

Test No		**17**	**18**	**19**	**20**	**21**	
location Lot No		1344	1345	1338	1339	1340	
Sampling procedures AS1289.1.1,1.2.1-Clause 6.4(b)							
depth from F.S.L.	m	Layer 4	Layer 5	Layer 1	Layer 2	Layer 1	
measurement depth	mm	175	175	175	175	175	
field wet density	t/m^3	1.92	2.05	1.93	1.90	1.89	
field dry density	t/m^3	1.64	1.76	1.63	1.56	1.66	
field moisture content	%	17.4	16.4	18.6	21.5	13.8	
laboratory compaction procedure AS1289 5.7.1							
compactive effort		standard	standard	standard	standard	standard	
oversize material retained on AS sieve	mm	19.0	19.0	19.0	19.0	19.0	
percent of oversize material	wet	0	0	0	0	0	
peak converted wet density	t/m^3	1.97	2.02	1.95	1.94	1.99	
adjusted peak converted wet density	t/m^3	-	-	-	-	-	
moisture variation from OMC (-dry,+wet)%		-1.5	-1.0	-3.0	-3.5	-4.0	
Moisture ratio	**%**	**93.0**	**93.5**	**86.0**	**86.0**	**76.5**	
Hilf density ratio (R_{HD})	**%**	**97.5**	**101.0**	**99.0**	**98.0**	**95.0**	

material description

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47 National Avenue, Pakenham VIC 3810

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report No 10111-7

date of issue 16-Feb-2018

Client	Streetworks
Client address	4 Len Thomas Place, Narre Warren, 3805
Project	Acacia Stage 13
Location	Cranbourne South

Feature	Block Fill
Layer thickness (mm)	200

tested by	HC
time	All Day
date	09-Feb-2018
checked by	CC

Field density test procedure AS1289.2.1.1 and 5.8.1

Test No		**22**	**23**	**24**			
location Lot No		1315	1316	1316			
Sampling procedures AS1289.1.1,1.2.1-Clause 6.4(b)							
depth from F.S.L.	m	Layer 1	Layer 1	Layer 2			
measurement depth	mm	175	175	175			
field wet density	t/m^3	2.02	1.95	1.95			
field dry density	t/m^3	1.76	1.66	1.67			
field moisture content	%	14.7	17.7	16.4			
laboratory compaction procedure AS1289 5.7.1							
compactive effort		standard	standard	standard			
oversize material retained on AS sieve	mm	19.0	19.0	19.0			
percent of oversize material	wet	0	0	0			
peak converted wet density	t/m^3	2.03	2.02	1.96			
adjusted peak converted wet density	t/m^3	-	-	-			
moisture variation from OMC (-dry,+wet)%		-1.5	-1.5	-1.5			
Moisture ratio	**%**	**91.5**	**93.0**	**93.0**			
Hilf density ratio (R_{HD})	**%**	**99.5**	**96.5**	**99.0**			

material description

Silty CLAY

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COMPACTION ASSESSMENT

BY NUCLEAR GAUGE METHOD

terra firma laboratories

47 National Avenue, Pakenham VIC 3810

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report No	10111-8
date of issue	13-Mar-2018

Client	Streetworks
Client address	4 Len Thomas Place, Narre Warren, 3805
Project	Acacia Stage 13
Location	Cranbourne South

Feature	Block Fill
Layer thickness (mm)	300

tested by	DW
time	All Day
date	27-Feb-2018
checked by	CC

Field density test procedure AS1289.2.1.1 and 5.8.1

Test No		**25**	**26**	**27**	**28**	**29**	**30**
location Lot		1318	1319	1320	1346	1347	1348
Sampling procedures AS1289.1.1,1.2.1-Clause 6.4(b)							
depth from F.S.L.	m	Layer 3	Layer 3	Layer 3	Layer 2	Layer 2	Layer 2
measurement depth	mm	275	275	275	275	275	275
field wet density	t/m^3	1.73	1.91	1.76	1.84	1.88	1.79
field dry density	t/m^3	1.56	1.64	1.56	1.55	1.58	1.42
field moisture content	%	11.1	16.3	13.2	19.0	18.9	25.8
laboratory compaction procedure AS1289 5.7.1							
compactive effort		standard	standard	standard	standard	standard	standard
oversize material retained on AS sieve	mm	19.0	19.0	19.0	19.0	19.0	19.0
percent of oversize material	wet	0	0	0	0	0	0
peak converted wet density	t/m^3	1.92	2.04	1.93	1.90	2.01	1.82
adjusted peak converted wet density	t/m^3	-	-	-	-	-	-
moisture variation from OMC (-dry,+wet)%		-4.0	0.5	-3.0	-2.0	0.5	-2.0
Moisture ratio	**%**	**73.0**	**104.5**	**82.0**	**91.5**	**103.5**	**92.5**
Hilf density ratio (R_{HD})	**%**	**90.0**	**93.5**	**91.5**	**97.0**	**93.5**	**98.0**

material description

Silty CLAY

NATA ACCREDITED FOR TECHNICAL COMPETENCE

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Accredited for compliance with ISO/IEC 17025- Testing

LABORATORY ACCREDITATION No **15357**

Approved Signature

C Caulfield

COMPACTION ASSESSMENT

BY NUCLEAR GAUGE METHOD

terra firma laboratories

47 National Avenue, Pakenham VIC 3810

ph 03 5943 0980 www.terrafirmalabs.com.au

report No 10111-9

date of issue 13-Mar-2018

Client	Streetworks
Client address	4 Len Thomas Place, Narre Warren, 3805
Project	Acacia Stage 13
Location	Cranbourne South

Feature	Block Fill
Layer thickness (mm)	300

tested by	DW
time	All Day
date	27-Feb-2018
checked by	CC

Field density test procedure AS1289.2.1.1 and 5.8.1

Test No		**31**	**32**	**33**			
location Lot		1349	1329	1330			
Sampling procedures AS1289.1.1,1.2.1-Clause 6.4(b)							
depth from F.S.L.	m	Layer 2	Layer 3	Layer 3			
measurement depth	mm	275	275	275			
field wet density	t/m^3	1.86	1.98	2.01			
field dry density	t/m^3	1.55	1.70	1.77			
field moisture content	%	19.8	16.2	13.4			
laboratory compaction procedure AS1289 5.7.1							
compactive effort		standard	standard	standard			
oversize material retained on AS sieve	mm	19.0	19.0	19.0			
percent of oversize material	wet	0	0	0			
peak converted wet density	t/m^3	1.95	1.96	1.95			
adjusted peak converted wet density	t/m^3	-	-	-			
moisture variation from OMC (-dry,+wet)%		-1.0	-2.5	-3.5			
Moisture ratio	**%**	**96.0**	**86.0**	**78.5**			
Hilf density ratio (R_{HD})	**%**	**95.5**	**101.0**	**103.0**			

material description

Silty CLAY

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C Caulfield

COMPACTION ASSESSMENT

BY NUCLEAR GAUGE METHOD

terra firma laboratories

47 National Avenue, Pakenham VIC 3810

ph 03 5943 0980 www.terrafirmalabs.com.au

report No 10111-10

date of issue 13-Mar-2018

Client	Streetworks
Client address	4 Len Thomas Place, Narre Warren, 3805
Project	Acacia Stage 13
Location	Cranbourne South

Feature	Block Fill
Layer thickness (mm)	300

tested by	KC
time	All Day
date	01-Mar-2018
checked by	CC

Field density test procedure AS1289.2.1.1 and 5.8.1

Test No		**34**	**35**	**36**	**37**	**38**	
location Lot No		1320 Retest of 27	1319 Retest of 26	1318 Retest of 25	1347 Retest of 29	1301	
Sampling procedures AS1289.1.1,1.2.1-Clause 6.4(b)							
depth from F.S.L.	m	Layer 3	Layer 3	Layer 3	Layer 2	Layer 1	
measurement depth	mm	275	275	275	275	275	
field wet density	t/m^3	1.85	1.89	1.84	1.89	1.91	
field dry density	t/m^3	1.56	1.55	1.53	1.53	1.63	
field moisture content	%	18.4	21.6	20.6	23.7	16.9	
laboratory compaction procedure AS1289 5.7.1							
compactive effort		standard	standard	standard	standard	standard	
oversize material retained on AS sieve	mm	19.0	19.0	19.0	19.0	19.0	
percent of oversize material	wet	0	0	0	0	0	
peak converted wet density	t/m^3	2.03	2.07	2.02	1.94	2.01	
adjusted peak converted wet density	t/m^3	-	-	-	-	-	
moisture variation from OMC (-dry,+wet)%		1.0	3.5	1.5	-1.5	0.5	
Moisture ratio	**%**	**104.5**	**120.5**	**107.0**	**93.0**	**103.5**	
Hilf density ratio (R_{HD})	**%**	**91.0**	**91.5**	**91.0**	**97.5**	**95.0**	

material description

Silty CLAY

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Approved Signature

C Caulfield

COMPACTION ASSESSMENT

BY NUCLEAR GAUGE METHOD

terra firma laboratories
47 National Avenue, Pakenham VIC 3810
ph 03 5943 0980 www.terrafirmalabs.com.au

report No 10111-11
date of issue 16-Mar-2018

Client	Streetworks
Client address	4 Len Thomas Place, Narre Warren, 3805
Project	Acacia Stage 13
Location	Cranbourne South

Feature	Block Fill
Layer thickness (mm)	300

tested by	BM
time	12:45 PM
date	14-Mar-2018
checked by	CC

Field density test procedure AS1289.2.1.1 and 5.8.1

Test No		**39**	**40**	**41**	**42**	**43**	
location Lot No		1329 Retest of 11	1320 Retest of 13	1320 Retest of 34	1319 Retest of 35	1318 Retest of 36	
Sampling procedures AS1289.1.1,1.2.1-Clause 6.4(b)							
depth from F.S.L.	m	Layer 4	Layer 2	Layer 3	Layer 3	Layer 3	
measurement depth	mm	275	275	275	275	275	
field wet density	t/m^3	1.98	2.03	2.01	1.99	1.86	
field dry density	t/m^3	1.75	1.80	1.77	1.78	1.66	
field moisture content	%	13.0	12.8	13.4	11.8	12.6	
laboratory compaction procedure AS1289 5.7.1							
compactive effort		standard	standard	standard	standard	standard	
oversize material retained on AS sieve	mm	19.0	19.0	19.0	19.0	19.0	
percent of oversize material	wet	0	0	0	0	0	
peak converted wet density	t/m^3	1.93	1.96	1.96	1.98	1.96	
adjusted peak converted wet density	t/m^3	-	-	-	-	-	
moisture variation from OMC (-dry,+wet)%		-2.5	-3.5	-3.5	-5.0	-3.5	
Moisture ratio	**%**	**84.5**	**77.5**	**78.0**	**70.0**	**79.0**	
Hilf density ratio (R_{HD})	**%**	**102.5**	**103.5**	**102.5**	**100.5**	**95.0**	

material description

Silty CLAY

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Approved Signature
C Caulfield

/ersion 6 October 2016