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**Geotechnical Report
Level One Inspection and Testing**

**Roses Estate Stage 4
Beaconsfield**

Prepared for:

**Streetworks Pty Ltd
4 Len Thomas Place,
Narre Warren, 3805**

PROJECT No: 9063

24 January 2017

Prepared by:

TERRA FIRMA LABORATORIES
Geotechnical Inspection and Testing Authority

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Geotechnical Report Level One Inspection and Testing Rose Estate Stage 4

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 Rose Estate Stage 4. This work was conducted over the period of 9/08/2017 to 20/12/2016.

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 66 to 80. The site will be a Residential Area.

The area on which fill was placed is shown on site plan (Appendix 1) based on drawings prepared by Dalton Consulting Engineers 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:

- Grader
- Pad Foot Roller
- Loader
- Dump truck
- Water truck
- Excavator
- Dozer
- Backhoe
- Compactor

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

Test numbers 1 and 32 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 9/08/2016 or work completed after the 20/12/2017, may be certified as being compliant with the specification.

For and on behalf of
Terra Firma Laboratories,



Tom Seymour
Lab Manager



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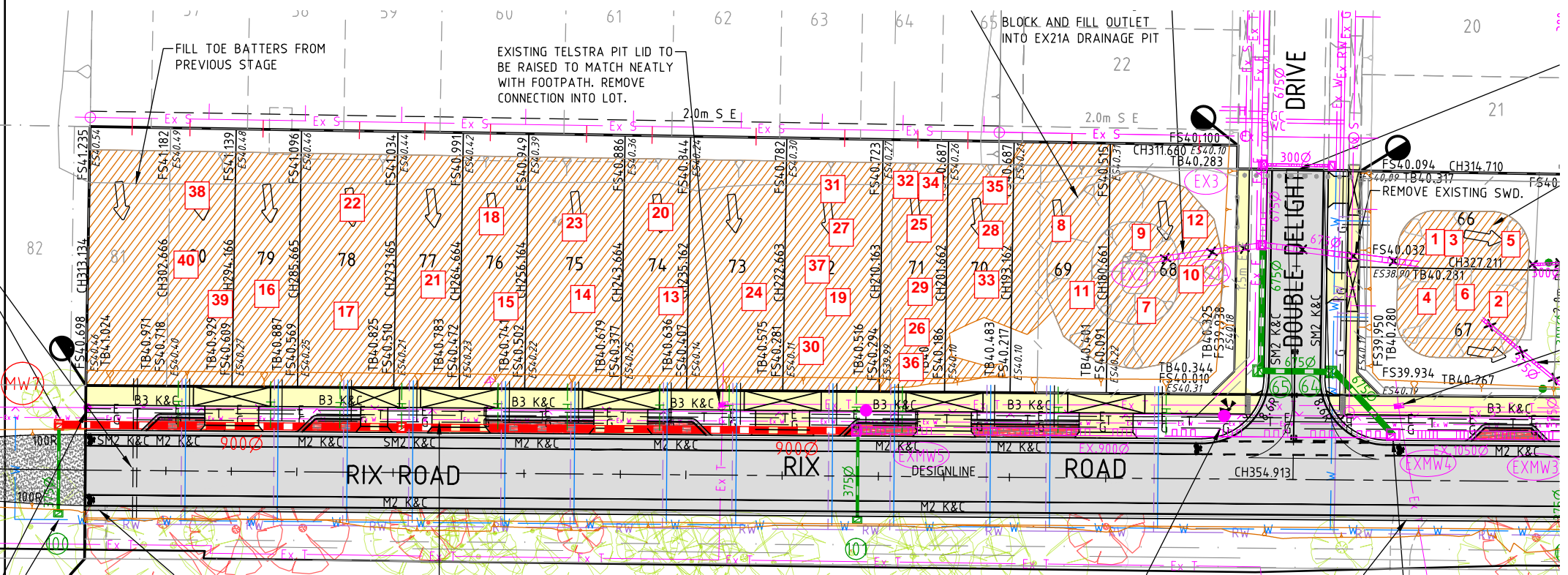
ABN: 11 925 206 385

APPENDICES

Appendix 1: Site Plans

Appendix 2: Test Summary

Appendix 3: Test Reports



12 Enterprise Ave
Berwick
Vic 3806

Test Location Plan

Client : Streetworks Pty Ltd

Project : Roses Estate Stage 4

Scale
NTS



Level One Test Summary

Client: Streetworks Pty Ltd **Specification:** 95%
Project: Roses Estate Stage 4 **Project No:** 9063

Date:	Test Number:	Layer:	Retest of:	Density:	Pass/Fail:	Lot No:	Report No:
9/08/2016	1	L2		94.5	FAIL	66	9063-1
9/08/2016	2	L3		97	PASS	67	9063-2
9/08/2016	3	L2	1	96.5	PASS	66	9063-2
9/08/2016	4	L5		97.5	PASS	67	9063-2
10/08/2016	5	L6		96	PASS	66	9063-3
10/08/2016	6	L7		95.5	PASS	67	9063-3
11/08/2016	7	L2		95	PASS	68	9063-4
11/08/2016	8	L4		97	PASS	69	9063-4
11/08/2016	9	L6		95	PASS	68	9063-4
15/08/2016	10	L7		97.5	PASS	68	9063-5
15/08/2016	11	L8		96	PASS	69	9063-5
15/08/2016	12	L8		96.5	PASS	68	9063-5
27/08/2016	13	L1		99	PASS	74	9063-7
27/08/2016	14	L1		96.5	PASS	75	9063-7
27/08/2016	15	L1		100	PASS	76	9063-7
27/08/2016	16	L2		98	PASS	79	9063-8
27/08/2016	17	L2		97	PASS	78	9063-8
27/08/2016	18	L2		97	PASS	76	9063-8
30/08/2016	19	L3		98	PASS	72	9063-6
30/08/2016	20	L3		101.5	PASS	74	9063-6
30/08/2016	21	L3		100	PASS	77	9063-6
5/09/2016	22	L4		98.5	PASS	78	9063-9
5/09/2016	23	L4		101	PASS	75	9063-9
5/09/2016	24	L4		100	PASS	73	9063-9
6/09/2016	25	L1		97	PASS	71	9063-10
6/09/2016	26	L2		98	PASS	71	9063-10
6/09/2016	27	L2		98.5	PASS	72	9063-10
7/09/2016	28	L3		97	PASS	70	9063-11
7/09/2016	29	L3		97.5	PASS	71	9063-11
7/09/2016	30	L3		97	PASS	72	9063-11
8/09/2016	31	L4		98	PASS	72	9063-12
8/09/2016	32	L4		94	FAIL	71	9063-12
8/09/2016	33	L4		97	PASS	70	9063-12
15/12/2016	34	L4	32	99.5	PASS	71	9063-13
15/12/2016	35	L5		95	PASS	70	9063-14
15/12/2016	36	L5		97.5	PASS	71	9063-15
15/12/2016	37	L5		98	PASS	72	9063-15
16/12/2016	38	L1		98	PASS	80	9063-16
19/12/2016	39	L2		99	PASS	80	9063-17
20/12/2016	40	L3		98.5	PASS	80	9063-18



COMPACTION ASSESSMENT

BY NUCLEAR GAUGE METHOD

12 Enterprise Avenue Berwick Vic 3806
 ph 97695799 fax 97694799

report No 9063-1
 date of issue 12-Aug-2016

Client	Streetworks
Client address	4 Len Thomas Place, Narre Warren, 3805
Project	Roses Estate Stage 4
Location	208 Rix road, Beaconsfield

Feature	Block Fill
Layer thickness (mm)	300

tested by	BM
time	All Day
date	09-Aug-2016
checked by	DB

Field density test procedure AS1289.2.1.1 and 5.8.1							
Test No		1					
location	Lot No	66					
Sampling procedures AS1289.1.1,1.2.1-Clause 6.4(b)							
depth from F.S.L.	m	L2					
measurement depth	mm	275					
field wet density	t/m ³	2.06					
field dry density	t/m ³	1.77					
field moisture content	%	16.3					
laboratory compaction procedure AS1289 5.7.1							
compactive effort		standard					
oversize material retained on AS sieve	mm	19.0					
percent of oversize material	wet	0					
peak converted wet density	t/m ³	2.18					
adjusted peak converted wet density	t/m ³	-					
moisture variation from OMC (-dry,+wet)%		3.0					
Moisture ratio	%	123.0					
Hilf density ratio (R_{HD})	%	94.5					
material description							
Silty CLAY							



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

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 D Burgess



COMPACTION ASSESSMENT
BY NUCLEAR GAUGE METHOD

12 Enterprise Avenue Berwick Vic 3806
ph 97695799 fax 97694799

report No 9063-2
date of issue 12-Aug-2016

Client	Streetworks
Client address	4 Len Thomas Place, Narre Warren, 3805
Project	Roses Estate Stage 4
Location	208 Rix road, Beaconsfield

Feature	Block Fill
Layer thickness (mm)	300

tested by	AK
time	All Day
date	09-Aug-2016
checked by	DB

Field density test procedure AS1289.2.1.1 and 5.8.1

Test No		2	3	4		
location	Lot No	67	66 Retest of 1	67		
Sampling procedures AS1289.1.1,1.2.1-Clause 6.4(b)						
depth from F.S.L.	m	L3	L2	L5		
measurement depth	mm	275	275	275		
field wet density	t/m ³	2.06	2.06	2.08		
field dry density	t/m ³	1.77	1.77	1.80		
field moisture content	%	16.3	16.4	15.3		

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	2.12	2.13	2.13		
adjusted peak converted wet density	t/m ³	-	-	-		
moisture variation from OMC (-dry,+wet)%		3.0	1.5	1.0		
Moisture ratio	%	124.0	110.0	108.0		
Hilf density ratio (R_{HD})	%	97.0	96.5	97.5		

material description

Silty CLAY



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12 Enterprise Avenue Berwick Vic 3806
ph 97695799 fax 97694799

report No 9063-3
date of issue 12-Aug-2016

Client	Streetworks
Client address	4 Len Thomas Place, Narre Warren, 3805
Project	Roses Estate Stage 4
Location	208 Rix road, Beaconsfield

Feature	Block Fill
Layer thickness (mm)	300

tested by	AK
time	All Day
date	10-Aug-2016
checked by	DB

Field density test procedure AS1289.2.1.1 and 5.8.1

Test No		5	6			
location	Lot No	66	67			
Sampling procedures AS1289.1.1,1.2.1-Clause 6.4(b)						
depth from F.S.L.	m	L6	L7			
measurement depth	mm	275	275			
field wet density	t/m ³	2.05	2.05			
field dry density	t/m ³	1.75	1.75			
field moisture content	%	16.9	17.1			

laboratory compaction procedure AS1289 5.7.1

compactive effort		standard	standard			
oversize material retained on AS sieve	mm	19.0	19.0			
percent of oversize material	wet	0	0			
peak converted wet density	t/m ³	2.13	2.14			
adjusted peak converted wet density	t/m ³	-	-			
moisture variation from OMC (-dry,+wet)%		1.5	1.5			
Moisture ratio	%	108.0	110.5			
Hilf density ratio (R_{HD})	%	96.0	95.5			

material description

Silty CLAY



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12 Enterprise Avenue Berwick Vic 3806
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report No 9063-4
date of issue 15-Aug-2016

Client	Streetworks
Client address	4 Len Thomas Place, Narre Warren, 3805
Project	Roses Estate Stage 4
Location	208 Rix road, Beaconsfield

Feature	Block Fill
Layer thickness (mm)	300

tested by	AK
time	All Day
date	11-Aug-2016
checked by	DB

Field density test procedure AS1289.2.1.1 and 5.8.1

Test No		7	8	9		
location	Lot No	68	69	68		
Sampling procedures AS1289.1.1,1.2.1-Clause 6.4(b)						
depth from F.S.L.	m	L2	L4	L6		
measurement depth	mm	275	275	275		
field wet density	t/m ³	2.04	2.07	2.04		
field dry density	t/m ³	1.76	1.78	1.74		
field moisture content	%	16.0	16.2	17.3		

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	2.15	2.13	2.15		
adjusted peak converted wet density	t/m ³	-	-	-		
moisture variation from OMC (-dry,+wet)%		2.5	1.5	2.0		
Moisture ratio	%	119.0	109.5	113.0		
Hilf density ratio (R_{HD})	%	95.0	97.0	95.0		

material description

Silty CLAY



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12 Enterprise Avenue Berwick Vic 3806
ph 97695799 fax 97694799

report No 9063-5
date of issue 19-Aug-2016

Client	Streetworks
Client address	4 Len Thomas Place, Narre Warren, 3805
Project	Roses Estate Stage 4
Location	208 Rix road, Beaconsfield

Feature	Block Fill
Layer thickness (mm)	300

tested by	AK
time	All Day
date	15-Aug-2016
checked by	DB

Field density test procedure AS1289.2.1.1 and 5.8.1

Test No		10	11	12		
location	Lot No	68	69	68		
Sampling procedures AS1289.1.1,1.2.1-Clause 6.4(b)						
depth from F.S.L.	m	L7	L8	L8		
measurement depth	mm	275	275	275		
field wet density	t/m ³	2.06	2.06	2.07		
field dry density	t/m ³	1.75	1.74	1.75		
field moisture content	%	18.0	18.1	17.8		

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	2.12	2.15	2.14		
adjusted peak converted wet density	t/m ³	-	-	-		
moisture variation from OMC (-dry,+wet)%		3.0	2.5	1.5		

Moisture ratio	%	119.5	117.0	111.0		
Hiif density ratio (R_{HD})	%	97.5	96.0	96.5		

material description

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12 Enterprise Avenue Berwick Vic 3806
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report No 9063-6
 date of issue 01-Sep-2016

Client	Streetworks
Client address	4 Len Thomas Place, Narre Warren, 3805
Project	Roses Estate Stage 4
Location	208 Rix road, Beaconsfield

Feature	Block Fill
Layer thickness (mm)	300

tested by	TW
time	All Day
date	30-Aug-2016
checked by	DB

Field density test procedure AS1289.2.1.1 and 5.8.1

Test No		19	20	21		
location	Lot No	72	74	77		
Sampling procedures AS1289.1.1,1.2.1-Clause 6.4(b)						
depth from F.S.L.	m	L3	L3	L3		
measurement depth	mm	275	275	275		
field wet density	t/m ³	2.11	2.10	2.11		
field dry density	t/m ³	1.86	1.76	1.84		
field moisture content	%	13.6	19.2	14.8		

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	2.16	2.07	2.11		
adjusted peak converted wet density	t/m ³	-	-	-		

moisture variation from OMC (-dry,+wet)%		-0.5	-0.5	-0.5		
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Moisture ratio	%	97.0	98.0	97.5		
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Hilf density ratio (R_{HD})	%	98.0	101.5	100.0		
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material description

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COMPACTION ASSESSMENT

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12 Enterprise Avenue Berwick Vic 3806
 ph 97695799 fax 97694799

report No 9063-7
 date of issue 01-Sep-2016

Client	Streetworks
Client address	4 Len Thomas Place, Narre Warren, 3805
Project	Roses Estate Stage 4
Location	208 Rix road, Beaconsfield

Feature	Block Fill
Layer thickness (mm)	300

tested by	SB
time	All Day
date	27-Aug-2016
checked by	DB

Field density test procedure AS1289.2.1.1 and 5.8.1						
Test No		13	14	15		
location	Lot No	74	75	76		
Sampling procedures AS1289.1.1,1.2.1-Clause 6.4(b)						
depth from F.S.L.	m	Layer 1	Layer 1	Layer 1		
measurement depth	mm	275	275	275		
field wet density	t/m ³	2.07	2.03	2.06		
field dry density	t/m ³	1.77	1.76	1.76		
field moisture content	%	16.5	15.4	17.5		
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	2.09	2.10	2.06		
adjusted peak converted wet density	t/m ³	-	-	-		
moisture variation from OMC (-dry,+wet)%		1.0	1.0	0.5		
Moisture ratio	%	107.0	106.5	102.0		
Hilf density ratio (R_{HD})	%	99.0	96.5	100.0		
material description						
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COMPACTION ASSESSMENT

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12 Enterprise Avenue Berwick Vic 3806
 ph 97695799 fax 97694799

report No 9063-8
 date of issue 01-Sep-2016

Client	Streetworks
Client address	4 Len Thomas Place, Narre Warren, 3805
Project	Roses Estate Stage 4
Location	208 Rix road, Beaconsfield

Feature	Block Fill
Layer thickness (mm)	300

tested by	SB
time	All Day
date	29-Aug-2016
checked by	DB

Field density test procedure AS1289.2.1.1 and 5.8.1

Test No		16	17	18		
location	Lot No	79	78	76		
Sampling procedures AS1289.1.1,1.2.1-Clause 6.4(b)						
depth from F.S.L.	m	Layer 2	Layer 2	Layer 2		
measurement depth	mm	275	275	275		
field wet density	t/m ³	2.04	2.08	2.09		
field dry density	t/m ³	1.78	1.84	1.83		
field moisture content	%	14.1	13.2	14.0		

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	2.08	2.15	2.16		
adjusted peak converted wet density	t/m ³	-	-	-		

moisture variation from OMC (-dry,+wet)%		0.0	-0.5	0.0		
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Moisture ratio	%	101.0	96.5	101.5		
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Hilf density ratio (R_{HD})	%	98.0	97.0	97.0		
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COMPACTION ASSESSMENT

BY NUCLEAR GAUGE METHOD

12 Enterprise Avenue Berwick Vic 3806
 ph 97695799 fax 97694799

report No 9063-9
 date of issue 07-Sep-2016

Client	Streetworks
Client address	4 Len Thomas Place, Narre Warren, 3805
Project	Roses Estate Stage 4
Location	208 Rix road, Beaconsfield

Feature	Block Fill
Layer thickness (mm)	300

tested by	BM
time	All Day
date	05-Sep-2016
checked by	DB

Field density test procedure AS1289.2.1.1 and 5.8.1						
Test No		22	23	24		
location	Lot No	78	75	73		
Sampling procedures AS1289.1.1,1.2.1-Clause 6.4(b)						
depth from F.S.L.	m	L4	L4	L4		
measurement depth	mm	275	275	275		
field wet density	t/m ³	2.06	2.11	2.15		
field dry density	t/m ³	1.75	1.82	1.88		
field moisture content	%	17.8	15.9	14.1		
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	2.09	2.09	2.14		
adjusted peak converted wet density	t/m ³	-	-	-		
moisture variation from OMC (-dry,+wet)%		1.0	0.5	0.5		
Moisture ratio	%	105.5	103.0	105.0		
Hilf density ratio (R_{HD})	%	98.5	101.0	100.0		
material description						
Silty CLAY						



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COMPACTION ASSESSMENT
BY NUCLEAR GAUGE METHOD

12 Enterprise Avenue Berwick Vic 3806
ph 97695799 fax 97694799

report No 9063-10
date of issue 09-Sep-2016

Client	Streetworks
Client address	4 Len Thomas Place, Narre Warren, 3805
Project	Roses Estate Stage 4
Location	208 Rix road, Beaconsfield

Feature	Block Fill
Layer thickness (mm)	300

tested by	BM
time	All Day
date	06-Sep-2016
checked by	DB

Field density test procedure AS1289.2.1.1 and 5.8.1

Test No		25	26	27		
location	Lot No	71	71	72		
Sampling procedures AS1289.1.1,1.2.1-Clause 6.4(b)						
depth from F.S.L.	m	L1	L2	L2		
measurement depth	mm	275	275	275		
field wet density	t/m ³	2.03	2.02	2.06		
field dry density	t/m ³	1.75	1.70	1.79		
field moisture content	%	16.1	19.3	15.2		

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	2.10	2.07	2.09		
adjusted peak converted wet density	t/m ³	-	-	-		
moisture variation from OMC (-dry,+wet)%		0.5	1.5	1.0		

Moisture ratio	%	102.0	108.0	106.5		
Hiif density ratio (R_{HD})	%	97.0	98.0	98.5		

material description

Silty CLAY



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D Burgess



COMPACTION ASSESSMENT
BY NUCLEAR GAUGE METHOD

12 Enterprise Avenue Berwick Vic 3806
ph 97695799 fax 97694799

report No 9063-11
date of issue 12-Sep-2016

Client	Streetworks
Client address	4 Len Thomas Place, Narre Warren, 3805
Project	Roses Estate Stage 4
Location	208 Rix road, Beaconsfield

Feature	Block Fill
Layer thickness (mm)	300

tested by	BM
time	All Day
date	07-Sep-2016
checked by	DB

Field density test procedure AS1289.2.1.1 and 5.8.1

Test No		28	29	30		
location	Lot No	70	71	72		
Sampling procedures AS1289.1.1,1.2.1-Clause 6.4(b)						
depth from F.S.L.	m	L3	L3	L3		
measurement depth	mm	275	275	275		
field wet density	t/m ³	2.05	2.14	2.05		
field dry density	t/m ³	1.78	1.94	1.78		
field moisture content	%	15.6	10.5	15.2		

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	2.12	2.20	2.11		
adjusted peak converted wet density	t/m ³	-	-	-		
moisture variation from OMC (-dry,+wet)%		0.5	-1.0	0.5		
Moisture ratio	%	102.5	92.0	103.0		
Hilf density ratio (R_{HD})	%	97.0	97.5	97.0		

material description

Silty CLAY



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COMPACTION ASSESSMENT
BY NUCLEAR GAUGE METHOD

12 Enterprise Avenue Berwick Vic 3806
ph 97695799 fax 97694799

report No 9063-12
date of issue 12-Sep-2016

Client	Streetworks
Client address	4 Len Thomas Place, Narre Warren, 3805
Project	Roses Estate Stage 4
Location	208 Rix road, Beaconsfield

Feature	Block Fill
Layer thickness (mm)	300

tested by	BM
time	All Day
date	08-Sep-2016
checked by	DB

Field density test procedure AS1289.2.1.1 and 5.8.1

Test No		31	32	33		
location	Lot No	72	71	70		
Sampling procedures AS1289.1.1,1.2.1-Clause 6.4(b)						
depth from F.S.L.	m	L4	L4	L4		
measurement depth	mm	275	275	275		
field wet density	t/m ³	2.03	2.03	2.02		
field dry density	t/m ³	1.79	1.84	1.75		
field moisture content	%	13.3	10.5	15.6		

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	2.07	2.16	2.09		
adjusted peak converted wet density	t/m ³	-	-	-		
moisture variation from OMC (-dry,+wet)%		-1.5	-2.0	-3.0		

Moisture ratio	%	90.5	83.5	84.5		
Hiif density ratio (R_{HD})	%	98.0	94.0	97.0		

material description

Silty CLAY



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COMPACTION ASSESSMENT

BY NUCLEAR GAUGE METHOD

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

report No 9063-13
 date of issue 16-Dec-2016

Client	Streetworks
Client address	4 Len Thomas Place, Narre Warren, 3805
Project	Roses Estate Stage 4
Location	208 Rix road, Beaconsfield

Feature	Block Fill
Layer thickness (mm)	300

tested by	TW
time	All Day
date	15-Dec-2016
checked by	DB

Field density test procedure AS1289.2.1.1 and 5.8.1							
Test No			34				
location	Lot No		71				
Sampling procedures AS1289.1.1,1.2.1-Clause 6.4(b)			Retest of Test 32				
depth from F.S.L.	m		L4				
measurement depth	mm		275				
field wet density	t/m ³		2.07				
field dry density	t/m ³		1.82				
field moisture content	%		13.8				
laboratory compaction procedure AS1289 5.7.1							
compactive effort			standard				
oversize material retained on AS sieve	mm		19.0				
percent of oversize material	wet		0				
peak converted wet density	t/m ³		2.08				
adjusted peak converted wet density	t/m ³		-				
moisture variation from OMC (-dry,+wet)%			0.5				
Moisture ratio	%		103.5				
Hilf density ratio (R_{HD})	%		99.5				
material description							
Silty CLAY							



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COMPACTION ASSESSMENT
 BY NUCLEAR GAUGE METHOD

report No 9063-14
 date of issue 20-Dec-2016

Client Streetworks
 Client address 4 Len Thomas Place, Narre Warren, 3805
 Project Roses Estate Stage 4
 Location 208 Rix road, Beaconsfield

chainage Block Fill
 Layer thickness (mm) 300

tested by TR
 time: All Day
 date: 15-Dec-2016
 checked by DB

test procedures AS1289.2.1.1 & 5.8.1

test No		35				
location	Lot No	70				
Sampling procedures AS1289.1.1,1.2.1-Clause 6.4(b)						
depth from F.S.L.	m	L5				
measurement depth	mm	275				
field wet density	t/m ³	2.12				
field dry density	t/m ³	1.82				
field moisture content	%	16.5				
laboratory compaction procedure AS1289.5.1.1 Standard Compaction						
standard maximum dry density	t/m ³	1.92				
standard optimum moisture content	%	11.5				

test procedure AS1289.5.4.1

oversize material retained on AS sieve	mm	19.0				
percent of oversize material	wet	0				
percent of oversize material	dry	0				
adjusted standard maximum dry density	t/m ³	0.00				
adjusted standard optimum moisture content	%	0.0				
moisture variation (-dry,+wet)	%	5.0				
moisture ratio (R_m)	%	142.0				
dry density ratio (R_D)	%	95.0				

material description

Silty CLAY

compaction test details

date mat'l sampled 15-Dec-2016
 material source on site - stockpile
 material stabilised
 time elapsed



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COMPACTION ASSESSMENT

BY NUCLEAR GAUGE METHOD

47 National Avenue, Pakenham VIC 3810
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report No 9063-15
 date of issue 20-Dec-2016

Client	Streetworks
Client address	4 Len Thomas Place, Narre Warren, 3805
Project	Roses Estate Stage 4
Location	208 Rix road, Beaconsfield

Feature	Block Fill
Layer thickness (mm)	300

tested by	TR
time	All Day
date	15-Dec-2016
checked by	DB

Field density test procedure AS1289.2.1.1 and 5.8.1

Test No		36	37			
location	Lot No	71	72			
Sampling procedures AS1289.1.1,1.2.1-Clause 6.4(b)						
depth from F.S.L.	m	Layer-5	Layer-5			
measurement depth	mm	275	275			
field wet density	t/m ³	2.16	2.14			
field dry density	t/m ³	1.85	1.57			
field moisture content	%	16.7	36.0			

laboratory compaction procedure AS1289 5.7.1

compactive effort		standard	standard			
oversize material retained on AS sieve	mm	19.0	19.0			
percent of oversize material	wet	0	0			
peak converted wet density	t/m ³	2.22	2.19			
adjusted peak converted wet density	t/m ³	-	-			

moisture variation from OMC (-dry,+wet)%		3.0	1.0			
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Moisture ratio	%	123.0	103.5			
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Hilf density ratio (R_{HD})	%	97.5	98.0			
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material description

Silty CLAY



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BY NUCLEAR GAUGE METHOD

47 National Avenue, Pakenham VIC 3810
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report No 9063-16
 date of issue 20-Dec-2016

Client	Streetworks
Client address	4 Len Thomas Place, Narre Warren, 3805
Project	Roses Estate Stage 4
Location	208 Rix road, Beaconsfield

Feature	Block Fill
Layer thickness (mm)	300

tested by	MW
time	All Day
date	16-Dec-2016
checked by	DB

Field density test procedure AS1289.2.1.1 and 5.8.1							
Test No		38					
location	Lot No	80					
Sampling procedures AS1289.1.1,1.2.1-Clause 6.4(b)							
depth from F.S.L.	m	Layer 1					
measurement depth	mm	275					
field wet density	t/m ³	2.05					
field dry density	t/m ³	1.73					
field moisture content	%	18.8					
laboratory compaction procedure AS1289 5.7.1							
compactive effort		standard					
oversize material retained on AS sieve	mm	19.0					
percent of oversize material	wet	0					
peak converted wet density	t/m ³	2.10					
adjusted peak converted wet density	t/m ³	-					
moisture variation from OMC (-dry,+wet)%		2.5					
Moisture ratio	%	115.5					
Hilf density ratio (R_{HD})	%	98.0					
material description							
Silty CLAY							



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BY NUCLEAR GAUGE METHOD

47 National Avenue, Pakenham VIC 3810
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report No 9063-17
 date of issue 21-Dec-2016

Client	Streetworks
Client address	4 Len Thomas Place, Narre Warren, 3805
Project	Roses Estate Stage 4
Location	208 Rix road, Beaconsfield

Feature	Block Fill
Layer thickness (mm)	300

tested by	MW
time	All Day
date	19-Dec-2016
checked by	DB

Field density test procedure AS1289.2.1.1 and 5.8.1							
Test No		39					
location	Lot No	80					
Sampling procedures AS1289.1.1,1.2.1-Clause 6.4(b)							
depth from F.S.L.	m	Layer 2					
measurement depth	mm	275					
field wet density	t/m ³	2.16					
field dry density	t/m ³	1.91					
field moisture content	%	13.1					
laboratory compaction procedure AS1289 5.7.1							
compactive effort		standard					
oversize material retained on AS sieve	mm	19.0					
percent of oversize material	wet	0					
peak converted wet density	t/m ³	2.18					
adjusted peak converted wet density	t/m ³	-					
moisture variation from OMC (-dry,+wet)%		-1.5					
Moisture ratio	%	90.5					
Hilf density ratio (R_{HD})	%	99.0					
material description							
Silty CLAY							



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COMPACTION ASSESSMENT

BY NUCLEAR GAUGE METHOD

47 National Avenue, Pakenham VIC 3810
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report No 9063-18
 date of issue 22-Dec-2016

Client	Streetworks
Client address	4 Len Thomas Place, Narre Warren, 3805
Project	Roses Estate Stage 4
Location	208 Rix road, Beaconsfield

Feature	Block Fill
Layer thickness (mm)	300

tested by	BM
time	All Day
date	20-Dec-2016
checked by	DB

Field density test procedure AS1289.2.1.1 and 5.8.1							
Test No		40					
location	Lot No	80					
Sampling procedures AS1289.1.1,1.2.1-Clause 6.4(b)							
depth from F.S.L.	m	Layer 3					
measurement depth	mm	275					
field wet density	t/m ³	1.93					
field dry density	t/m ³	1.63					
field moisture content	%	18.2					
laboratory compaction procedure AS1289 5.7.1							
compactive effort		standard					
oversize material retained on AS sieve	mm	19.0					
percent of oversize material	wet	0					
peak converted wet density	t/m ³	1.96					
adjusted peak converted wet density	t/m ³	-					
moisture variation from OMC (-dry,+wet)%		-2.0					
Moisture ratio	%	90.0					
Hilf density ratio (R_{HD})	%	98.5					
material description							
Silty CLAY							



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