



47 National Avenue,
Pakenham VIC 3810

ph: 03 9769 5799
fax: 03 9769 4799
mob: 0417 004 072
tseymour@terrafirmalabs.com.au

www.terrafirmalabs.com.au

ABN: 11 925 206 385

**Geotechnical Report
Level One Inspection and Testing**

**Acacia Ridge Stage 7
Cranbourne**

Prepared for:

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

PROJECT No 9384

14 September 2017.

Prepared by:

TERRA FIRMA LABORATORIES
Geotechnical Inspection and Testing Authority

47 National Avenue,
Pakenham VIC 3810
Phone: 03 9769 5799 Fax: 03 9769 4799
Email: tseymour@terrafirmalabs.com.au

Geotechnical Report Level One Inspection and Testing Acacia Ridge Stage 7

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 Ridge Stage 7. This work was conducted over the period of 18/01/2017 to 04/09/2017.

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 701 to 703 and 710 to 748.

Please note lot numbers 704-709 contain less than 300mm of fill and as per AS3798-2007 do not require fill placement supervision and/or compaction testing. 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*. 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.

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.

Inspection and Testing

2.3. 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.

2.4. 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.

2.5. Fill Construction

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

- *Excavator*
- *Compactor*
- *Dump Truck*
- *Water Cart*
- *Scraper*
- *Pad Foot Roller*
- *Dozer*
- *Tractor*

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.

3. Compaction Control Testing

Testing comprised of a total of 56 in-situ density tests, with a summary of results included in Appendix 2. Test Reports are referenced in Appendix 3.

Test numbers 6, 10, 15, 16, 83, 84, 85, 90, 95, 97, 105, 106, 111, 122 and 124 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.

4. 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.

5. Clean Fill

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

6. 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 18/01/2017 or work completed after the 04/09/2017, may be certified as being compliant with the specification.

For and on behalf of
Terra Firma Laboratories,



Tom Seymour
Lab Manager



47 National Avenue,
Pakenham VIC 3810

ph: 03 9769 5799
fax: 03 9769 4799
mob: 0417 004 072
tseymour@terrafirmalabs.com.au

www.terrafirmalabs.com.au

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APPENDICES

Appendix 1: Site Plans

Appendix 2: Test Summary

Appendix 3: Test Reports

WARNING

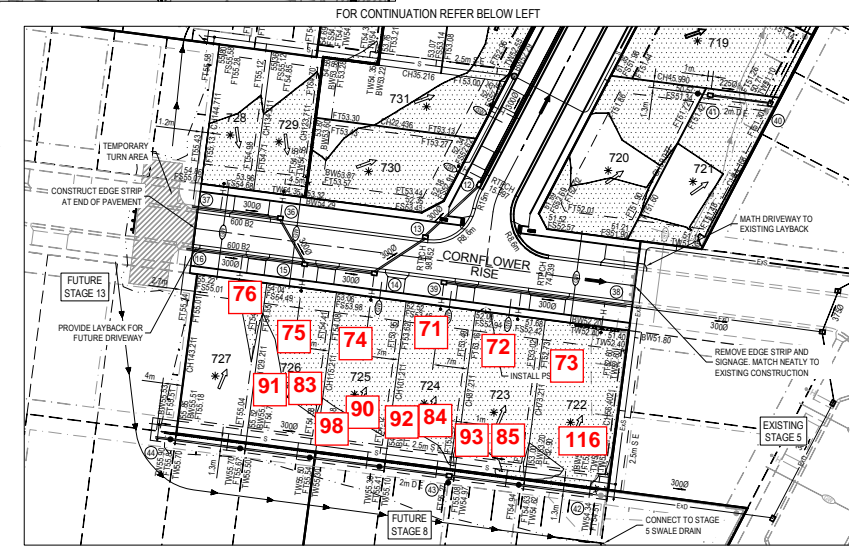
Beware of Underground Services
 The locations of underground services are approximate only and their exact position should be proven on site.
 No guarantee is given that all existing services are shown.
 Locate all underground services before commencement of works.
DIAL 1100 BEFORE YOU DIG
 www.1100.com.au

NOTE: FENCING
 VEHICLE EXCLUSION MEASURES WHERE ROADS ABUT A RESERVE ARE TO FORM PART OF THE LANDSCAPE WORKS.

NOTE: OPEN DRAINS
 EXISTING OPEN DRAINS TO BE EXCAVATED TO A SOUND BASE AND FILLED AS SPECIFIED.

NOTE: DRIVEWAYS
 1. DRIVEWAYS TO LOTS 730, 731, 737 & 738 TO BE 4.0m WIDE.
 2. DOUBLE DRIVEWAY TO LOTS 720 & 721 TO BE 8.0m WIDE.

NOTE: HOUSE DRAINS
 1. HOUSE DRAINS TO LOTS 734 & 740 TO BE OFFSET 2.0m FROM SIDE BOUNDARY.
 2. HOUSE DRAIN TO LOT 728 TO BE OFFSET 6.0m FROM SIDE BOUNDARY.
 3. HOUSE DRAINS TO LOT 730, 733 & 737 TO BE OFFSET 6.5m FROM SIDE BOUNDARY.



FOR CONTINUATION REFER BELOW LEFT

STREET NAME	SERVICES OFFSET SCHEDULE								
	ROAD RESERVE	BACK OF KERB	SEWER	GAS	NON DRINKING WATER	DRINKING WATER	COMMUNICATIONS	ELECTRICITY	LIGHT POLES
BINDARRI GROVE	18.00	5.20	1.00 N	2.10 N	2.60 N	3.10 N	1.85 S	2.60 S	4.40 S
COORONG STREET	15.00	2.20 N / 5.20 S		2.10 S	2.60 S	3.10 S	0.50 N	1.10 N	1.40 N
CORNFLOWER RISE	18.00	5.20		2.25 S	2.70 S	3.20 S	1.85 N	2.60 N	4.40 N
FREYCINET DRIVE	18.00	5.20	0.80 E	2.10 W	2.60 W	3.10 W	1.85 E	2.60 E	4.40 E
LINDENDERRY ROAD	18.00	5.20		2.10 S	2.60 S	3.10 S	1.85 N	2.60 N	4.40 N
RIVERWOOD DRIVE (LOT 705)	27.00	5.85		2.25 E	3.00 E	3.80 E	2.05 W	2.80 W	5.05 W
RIVERWOOD DRIVE (RESERVE)	24.00	5.15 W / 5.85 E		2.25 E	3.00 E	3.80 E	0.70 W	1.40 W	4.35 W



47 National Ave
 Pakenham
 Vic 3810

Test Location Plan

Client : Streetworks Pty Ltd

Project : Acacia Stage 7

Scale
 NTS



Level One Test Summary

Client: Streetworks Pty Ltd
Project: Acacia Stage 7

Specification: 95%
Project No: 9384

Date:	Test Number:	Layer:	Retest of:	Density:	Pass/Fail:	Lot No:	Report No:
18/01/2017	1	L1		96	PASS	710	9384-1
18/01/2017	2	L2		100	PASS	711	9384-1
18/01/2017	3	L2		100	PASS	712	9384-1
19/01/2017	4	L1		97.5	PASS	713	9384-2
19/01/2017	5	L1		99.5	PASS	714	9384-2
19/01/2017	6	L1		93.5	FAIL	715	9384-2
21/01/2017	7	L1	6	99	PASS	715	9384-3
21/01/2017	8	L2		99	PASS	716	9384-3
21/01/2017	9	L1		96	PASS	717	9384-3
21/01/2017	10	L1		93	FAIL	718	9384-3
23/01/2017	11	L1	10	96.5	PASS	718	9384-4
23/01/2017	12	L2		100	PASS	717	9384-4
23/01/2017	13	L3		100.5	PASS	715	9384-4
23/01/2017	14	L3		101	PASS	713	9384-4
24/01/2017	15	L3		91.5	FAIL	718	9384-5
24/01/2017	16	L2		94.5	FAIL	719	9384-5
25/01/2017	17	L3	15	101	PASS	718	9384-6
25/01/2017	18	L2	16	102	PASS	719	9384-6
25/01/2017	19	L2		98	PASS	720	9384-6
25/01/2017	20	L1		99	PASS	721	9384-6
30/01/2017	21	L4		105	PASS	719	9384-7
30/01/2017	22	L3		104	PASS	720	9384-7
25/07/2017	71	L1		98.5	PASS	724	9384-23
25/07/2017	72	L1		96.5	PASS	723	9384-23
25/07/2017	73	L1		98	PASS	722	9384-23
26/07/2017	74	L2		95	PASS	726	9384-22
26/07/2017	75	L2		95	PASS	727	9384-22
26/07/2017	76	L2		96	PASS	725	9384-22
28/07/2017	77	L1		96	PASS	737	9384-24
28/07/2017	78	L1		96	PASS	737	9384-24
28/07/2017	79	L1		95	PASS	738	9384-24
29/07/2017	80	L1		95	PASS	738	9384-25
29/07/2017	81	L1		95.5	PASS	738	9384-25
29/07/2017	82	L1		96.5	PASS	743	9384-25
8/08/2017	83	L2		92.5	FAIL	726	9384-26
8/08/2017	84	L3		94.5	FAIL	724	9384-26
8/08/2017	85	L3		91	FAIL	723	9384-26
8/08/2017	86	L2		96.5	PASS	742	9384-26
8/08/2017	87	L3		96.5	PASS	741	9384-26
9/08/2017	88	L2		96	PASS	738	9384-27
9/08/2017	89	L3		95.5	PASS	737	9384-27

9/08/2017	90	L4		94.5	FAIL	725	9384-27
9/08/2017	91	L2	83	95.5	PASS	726	9384-27
9/08/2017	92	L3	84	99	PASS	724	9384-27
9/08/2017	93	L3	85	95	PASS	723	9384-27
10/08/2017	94	L4		97	PASS	740	9384-28
10/08/2017	95	L1		94	FAIL	728	9384-28
10/08/2017	96	L1		95	PASS	729	9328-28
10/08/2017	97	L1		92	FAIL	730	9328-28
11/08/2017	98	L4	90	97.5	PASS	725	9384-29
11/08/2017	99	L1		96	PASS	731	9384-29
11/08/2017	100	L1		96	PASS	732	9384-29
11/08/2017	101	L5		96.5	PASS	739	9384-29
12/08/2017	102	L1	95	96	PASS	728	9384-30
12/08/2017	103	L2		99	PASS	728	9384-30
12/08/2017	104	L1	97	95	PASS	730	9384-30
12/08/2017	105	L2		85.5	FAIL	730	9384-30
12/08/2017	106	L5		93.5	FAIL	737	9384-30
18/08/2017	107	L2	105	95.5	PASS	730	9384-31
18/08/2017	108	L5	106	96.5	PASS	737	9384-31
18/08/2017	109	L3		95.5	PASS	736	9384-31
18/08/2017	110	L3		95	PASS	735	9384-31
19/08/2017	111	L2		94	FAIL	732	9384-32
19/08/2017	112	L2		97	PASS	731	9384-32
19/08/2017	113	L3		97	PASS	730	9384-32
21/08/2017	114	L2	111	95	PASS	732	9384-33
21/08/2017	115	L3		95	PASS	730	9384-33
21/08/2017	116	L3		95.5	PASS	729	9384-33
21/08/2017	117	L3		97.5	PASS	728	9384-33
1/09/2017	118	FSL		99	PASS	703	9387-34
1/09/2017	119	FSL		99.5	PASS	702	9384-34
1/09/2017	120	FSL		97.5	PASS	701	9384-34
2/09/2017	121	L1		98	PASS	744	9384-35
2/09/2017	122	L1		94.5	FAIL	745	9384-35
2/09/2017	123	L1		98	PASS	746	9384-35
2/09/2017	124	L1		90	FAIL	747	9384-35
2/09/2017	125	L1		95	PASS	748	9384-35
4/09/2017	126	L1	122	98	PASS	745	9384-36
4/09/2017	127	L1	124	95.5	PASS	747	9384-36



COMPACTION ASSESSMENT

BY NUCLEAR GAUGE METHOD

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

report No 9384-1
 date of issue 14/09/2017

Client	Streetworks
Client address	4 Len Thomas Place, Narre Warren, 3805
Project	Acacia Ridge Stage 7
Location	Cranbourne

Feature	Block Fill
Layer thickness (mm)	300

tested by	CC
time	All Day
date	18-Jan-2017
checked by	CC

Field density test procedure AS1289.2.1.1 and 5.8.1						
Test No		1	2	3		
location	Lot No	710	711	712		
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	1.94	1.95	1.95		
field dry density	t/m ³	1.65	1.61	1.65		
field moisture content	%	17.7	20.9	18.0		
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	2.03	1.96	1.95		
adjusted peak converted wet density	t/m ³	-	-	-		
moisture variation from OMC (-dry,+wet)%		-1.0	-1.5	-1.5		
Moisture ratio	%	95.5	94.0	92.5		
Hilf density ratio (R_{HD})	%	96.0	99.5	100.5		
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- Testing

LABORATORY ACCREDITATION No 15357

This is a revised report

Approved Signature
 C Caulfield



COMPACTION ASSESSMENT

BY NUCLEAR GAUGE METHOD

47 National Avenue, Pakenham VIC 3810
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report No 9384-2
 date of issue 14/09/2017

Client	Streetworks
Client address	4 Len Thomas Place, Narre Warren, 3805
Project	Acacia Ridge Stage 7
Location	Cranbourne

Feature	Block Fill
Layer thickness (mm)	300

tested by	CC
time	All Day
date	19-Jan-2017
checked by	CC

Field density test procedure AS1289.2.1.1 and 5.8.1						
Test No		4	5	6		
location	Lot No	713	714	715		
Sampling procedures AS1289.1.1,1.2.1-Clause 6.4(b)						
depth from F.S.L.	m	L1	L1	L1		
measurement depth	mm	275	275	275		
field wet density	t/m ³	1.94	1.95	1.87		
field dry density	t/m ³	1.63	1.63	1.56		
field moisture content	%	19.2	20.2	19.2		
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	1.99	1.96	2.00		
adjusted peak converted wet density	t/m ³	-	-	-		
moisture variation from OMC (-dry,+wet)%		-1.5	-2.0	1.0		
Moisture ratio	%	93.5	91.5	106.0		
Hilf density ratio (R_{HD})	%	97.5	99.5	93.5		
material description						
Silty CLAY						



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BY NUCLEAR GAUGE METHOD

47 National Avenue, Pakenham VIC 3810
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report No 9384-3
 date of issue 14/09/2017

Client	Streetworks
Client address	4 Len Thomas Place, Narre Warren, 3805
Project	Acacia Ridge Stage 7
Location	Cranbourne

Feature	Block Fill
Layer thickness (mm)	300

tested by	CC
time	All Day
date	21-Jan-2017
checked by	CC

Field density test procedure AS1289.2.1.1 and 5.8.1						
Test No		7	8	9	10	
location	Lot No	715 Retest of #6	716	717	718	
Sampling procedures AS1289.1.1,1.2.1-Clause 6.4(b)						
depth from F.S.L.	m	L1	L2	L1	L1	
measurement depth	mm	275	275	275	275	
field wet density	t/m ³	1.95	1.95	1.96	1.96	
field dry density	t/m ³	1.65	1.57	1.61	1.58	
field moisture content	%	17.9	23.9	21.7	24.3	
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	1.97	1.97	2.04	2.11	
adjusted peak converted wet density	t/m ³	-	-	-	-	
moisture variation from OMC (-dry,+wet)%		-0.5	1.0	1.0	1.0	
Moisture ratio	%	98.0	105.0	105.5	103.5	
Hilf density ratio (R_{HD})	%	99.0	99.0	96.0	93.0	
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 9384-4
 date of issue 15/09/2017

Client	Streetworks
Client address	4 Len Thomas Place, Narre Warren, 3805
Project	Acacia Ridge Stage 7
Location	Cranbourne

Feature	Backfill
Layer thickness (mm)	300

tested by	BM
time	All Day
date	24-Jan-2017
checked by	CC

Field density test procedure AS1289.2.1.1 and 5.8.1						
Test No		11	12	13	14	
location	Lot No	718	717	715	713	
		Retest of #10				
Sampling procedures AS1289.1.1,1.2.1-Clause 6.4(b)						
depth from F.S.L.	m	L1	L2	L3	L3	
measurement depth	mm	275	275	275	275	
field wet density	t/m ³	1.99	2.05	2.07	1.98	
field dry density	t/m ³	1.69	1.66	1.80	1.63	
field moisture content	%	17.8	23.3	15.4	22.0	
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	2.06	2.05	2.07	1.96	
adjusted peak converted wet density	t/m ³	-	-	-	-	
moisture variation from OMC (-dry,+wet)%		3.5	1.0	-1.0	0.5	
Moisture ratio	%	124.0	105.0	94.5	103.0	
Hilf density ratio (R_{HD})	%	96.5	100.0	100.5	101.0	
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 9384-5
 date of issue 15/07/2017

Client	Streetworks
Client address	4 Len Thomas Place, Narre Warren, 3805
Project	Acacia Ridge Stage 7
Location	Cranbourne

Feature	Block Fill
Layer thickness (mm)	300

tested by	CC
time	All Day
date	25-Jan-2017
checked by	CC

Field density test procedure AS1289.2.1.1 and 5.8.1						
Test No		15	16			
location	Lot No	718	719			
Sampling procedures AS1289.1.1,1.2.1-Clause 6.4(b)						
depth from F.S.L.	m	L3	L2			
measurement depth	mm	275	275			
field wet density	t/m ³	1.90	2.01			
field dry density	t/m ³	1.61	1.73			
field moisture content	%	17.6	16.1			
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	2.08	2.13			
adjusted peak converted wet density	t/m ³	-	-			
moisture variation from OMC (-dry,+wet)%		1.0	0.5			
Moisture ratio	%	106.5	104.5			
Hilf density ratio (R_{HD})	%	91.5	94.5			
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 9384-6
 date of issue 15/09/2017

Client	Streetworks
Client address	4 Len Thomas Place, Narre Warren, 3805
Project	Acacia Ridge Stage 7
Location	Cranbourne

Feature	Block Fill
Layer thickness (mm)	300

tested by	MW
time	All Day
date	25-Jan-2017
checked by	CC

Field density test procedure AS1289.2.1.1 and 5.8.1

Test No		17	18	19	20		
location	Lot No	718	719	720	721		
		Retest 15	Retest 16				
Sampling procedures AS1289.1.1,1.2.1-Clause 6.4(b)							
depth from F.S.L.	m	L3	L2	L2	L1		
measurement depth	mm	275	275	275	275		
field wet density	t/m ³	1.94	2.02	1.98	2.04		
field dry density	t/m ³	1.62	1.63	1.63	1.79		
field moisture content	%	20.0	23.7	21.4	14.0		

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	1.92	1.98	2.02	2.07		
adjusted peak converted wet density	t/m ³	-	-	-	-		

moisture variation from OMC (-dry,+wet)%		-3.0	1.0	1.0	-3.0		
--	--	------	-----	-----	------	--	--

Moisture ratio	%	86.0	104.5	105.0	81.5		
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Hilf density ratio (R_{HD})	%	101.0	102.0	98.0	99.0		
--	----------	--------------	--------------	-------------	-------------	--	--

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 9384-7
 date of issue 15/09/2017

Client	Streetworks
Client address	4 Len Thomas Place, Narre Warren, 3805
Project	Acacia Ridge Stage 7
Location	Cranbourne

Feature	Block Fill
Layer thickness (mm)	300

tested by	MW
time	All Day
date	30-Jan-2017
checked by	CC

Field density test procedure AS1289.2.1.1 and 5.8.1						
Test No		21	22			
location	Lot No	719	720			
Sampling procedures AS1289.1.1,1.2.1-Clause 6.4(b)						
depth from F.S.L.	m	L4	L3			
measurement depth	mm	275	275			
field wet density	t/m ³	2.06	2.07			
field dry density	t/m ³	1.74	1.72			
field moisture content	%	18.5	20.1			
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	1.96	2.00			
adjusted peak converted wet density	t/m ³	-	-			
moisture variation from OMC (-dry,+wet)%		-1.5	-1.5			
Moisture ratio	%	92.0	93.0			
Hilf density ratio (R_{HD})	%	105.0	104.0			
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 9384-22
 date of issue 15/09/2017

Client	Streetworks
Client address	4 Len Thomas Place, Narre Warren, 3805
Project	Acacia Ridge Stage 7
Location	Cranbourne

Feature	Block Fill
Layer thickness (mm)	300

tested by	SP
time	All Day
date	26-Jul-2017
checked by	CC

Field density test procedure AS1289.2.1.1 and 5.8.1

Test No		74	75	76		
location	Lot No	725	726	727		
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	1.96	1.98	2.01		
field dry density	t/m ³	1.64	1.67	1.68		
field moisture content	%	19.2	18.5	20.0		

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	2.06	2.09	2.10		
adjusted peak converted wet density	t/m ³	-	-	-		

moisture variation from OMC (-dry,+wet)%		1.0	2.0	1.0		
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Moisture ratio	%	106.0	111.5	105.5		
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Hilf density ratio (R_{HD})	%	95.0	95.0	96.0		
--	----------	-------------	-------------	-------------	--	--

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 9384-23
 date of issue 15/09/2017

Client	Streetworks
Client address	4 Len Thomas Place, Narre Warren, 3805
Project	Acacia Ridge Stage 7
Location	Cranbourne

Feature	Block Fill
Layer thickness (mm)	300

tested by	SP
time	PM
date	25-Jul-2017
checked by	CC

Field density test procedure AS1289.2.1.1 and 5.8.1						
Test No		71	72	73		
location	Lot No	724	723	722		
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	2.05	2.00	2.07		
field dry density	t/m ³	1.69	1.69	1.75		
field moisture content	%	21.1	18.2	17.9		
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	2.07	2.12		
adjusted peak converted wet density	t/m ³	-	-	-		
moisture variation from OMC (-dry,+wet)%		2.0	1.0	2.0		
Moisture ratio	%	112.5	106.0	112.5		
Hilf density ratio (R_{HD})	%	98.5	96.5	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 9384-24
 date of issue 15/09/2017

Client	Streetworks
Client address	4 Len Thomas Place, Narre Warren, 3805
Project	Acacia Ridge Stage 7
Location	Cranbourne

Feature	Block Fill
Layer thickness (mm)	300

tested by	SP
time	All Day
date	31-Jul-2017
checked by	CC

Field density test procedure AS1289.2.1.1 and 5.8.1						
Test No		77	78	79		
location	Lot No	737	737	738		
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	2.01	1.98	1.98		
field dry density	t/m ³	1.71	1.67	1.67		
field moisture content	%	17.7	18.3	18.8		
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	2.10	2.07	2.08		
adjusted peak converted wet density	t/m ³	-	-	-		
moisture variation from OMC (-dry,+wet)%		0.5	0.5	1.0		
Moisture ratio	%	103.5	104.0	106.5		
Hilf density ratio (R_{HD})	%	96.0	96.0	95.0		
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 9384-25
 date of issue 15/09/2017

Client	Streetworks
Client address	4 Len Thomas Place, Narre Warren, 3805
Project	Acacia Ridge Stage 7
Location	Cranbourne

Feature	Block Fill
Layer thickness (mm)	300

tested by	SP
time	PM
date	31-Jul-2017
checked by	CC

Field density test procedure AS1289.2.1.1 and 5.8.1

Test No		80	81	82		
location	Lot No	738	738	743		
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	1.99	1.95	1.94		
field dry density	t/m ³	1.67	1.65	1.60		
field moisture content	%	18.6	18.0	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	2.09	2.04	2.01		
adjusted peak converted wet density	t/m ³	-	-	-		

moisture variation from OMC (-dry,+wet)%		1.0	0.5	0.5		
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Moisture ratio	%	105.5	103.5	103.0		
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Hilf density ratio (R_{HD})	%	95.0	95.5	96.5		
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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 9384-26
 date of issue 15/09/2017

Client	Streetworks
Client address	4 Len Thomas Place, Narre Warren, 3805
Project	Acacia Ridge Stage 7
Location	Cranbourne

Feature	Block Fill
Layer thickness (mm)	300

tested by	SP
time	04:34 PM
date	08-Aug-2017
checked by	CC

Field density test procedure AS1289.2.1.1 and 5.8.1

Test No		83	84	85	86	87
location	Lot No	726	724	723	742	741
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 2	Layer 3
measurement depth	mm	275	275	275	275	275
field wet density	t/m ³	1.95	1.97	1.95	1.98	2.00
field dry density	t/m ³	1.62	1.63	1.62	1.67	1.72
field moisture content	%	20.0	21.1	20.4	18.6	16.6

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	2.10	2.08	2.14	2.06	2.07
adjusted peak converted wet density	t/m ³	-	-	-	-	-

moisture variation from OMC (-dry,+wet)%		3.0	3.0	3.0	0.0	1.0
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Moisture ratio	%	117.5	117.0	117.5	101.5	107.5
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Hilf density ratio (R_{HD})	%	92.5	94.5	91.0	96.5	96.5
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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 9384-27
 date of issue 15/09/2017

Client	Streetworks
Client address	4 Len Thomas Place, Narre Warren, 3805
Project	Acacia Ridge Stage 7
Location	Cranbourne

Feature	Block Fill
Layer thickness (mm)	300

tested by	SP
time	PM
date	09-Aug-2017
checked by	CC

Field density test procedure AS1289.2.1.1 and 5.8.1

Test No		88	89	90	91	92	93
location	Lot No	738	737	725	726 Retest of 83	724 Retest of 84	723 Retest of 85
Sampling procedures AS1289.1.1,1.2.1-Clause 6.4(b)							
depth from F.S.L.	m	Layer 2	Layer 3	Layer 4	Layer 2	Layer 3	Layer 3
measurement depth	mm	275	275	275	275	275	275
field wet density	t/m ³	2.00	2.00	2.00	1.98	1.99	1.96
field dry density	t/m ³	1.66	1.71	1.67	1.65	1.65	1.60
field moisture content	%	20.5	17.4	19.5	20.3	20.7	22.2

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	2.08	2.10	2.11	2.08	2.01	2.06
adjusted peak converted wet density	t/m ³	-	-	-	-	-	-

moisture variation from OMC (-dry,+wet)%		2.5	1.0	2.5	1.5	3.5	3.0
--	--	-----	-----	-----	-----	-----	-----

Moisture ratio	%	115.5	105.5	114.0	107.0	120.5	116.5
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Hilf density ratio (R_{HD})	%	96.0	95.5	94.5	95.5	99.0	95.0
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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 9384-28
 date of issue 15/09/2017

Client	Streetworks
Client address	4 Len Thomas Place, Narre Warren, 3805
Project	Acacia Ridge Stage 7
Location	Cranbourne

Feature	Block Fill
Layer thickness (mm)	300

tested by	SP
time	04:34 PM
date	10-Aug-2017
checked by	CC

Field density test procedure AS1289.2.1.1 and 5.8.1

Test No		94	95	96	97		
location	Lot No	740	728	729	730		
Sampling procedures AS1289.1.1,1.2.1-Clause 6.4(b)							
depth from F.S.L.	m	Layer 4	Layer 1	Layer 1	Layer 1		
measurement depth	mm	275	275	275	275		
field wet density	t/m ³	1.99	1.97	1.94	1.93		
field dry density	t/m ³	1.67	1.64	1.64	1.64		
field moisture content	%	19.1	20.3	18.7	17.9		

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	2.06	2.09	2.04	2.09		
adjusted peak converted wet density	t/m ³	-	-	-	-		

moisture variation from OMC (-dry,+wet)%		0.0	1.5	1.0	0.5		
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Moisture ratio	%	101.5	108.5	106.0	103.5		
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Hilf density ratio (R_{HD})	%	97.0	94.0	95.0	92.0		
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material description

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COMPACTION ASSESSMENT

BY NUCLEAR GAUGE METHOD

47 National Avenue, Pakenham VIC 3810
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report No 9384-29
 date of issue 15/09/2017

Client	Streetworks
Client address	4 Len Thomas Place, Narre Warren, 3805
Project	Acacia Ridge Stage 7
Location	Cranbourne

Feature	Block Fill
Layer thickness (mm)	300

tested by	SP
time	PM
date	11-Aug-2017
checked by	CC

Field density test procedure AS1289.2.1.1 and 5.8.1

Test No		98	99	100	101		
location	Lot No	725	731	732	739		
		Retest of 90					
Sampling procedures AS1289.1.1,1.2.1-Clause 6.4(b)							
depth from F.S.L.	m	Layer 4	Layer 1	Layer 1	Layer 5		
measurement depth	mm	275	275	275	275		
field wet density	t/m ³	2.03	1.98	1.97	1.96		
field dry density	t/m ³	1.70	1.66	1.63	1.65		
field moisture content	%	19.1	19.1	21.1	18.7		

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	2.08	2.06	2.05	2.03		
adjusted peak converted wet density	t/m ³	-	-	-	-		

moisture variation from OMC (-dry,+wet)%		1.0	0.5	-0.5	0.0		
--	--	-----	-----	------	-----	--	--

Moisture ratio	%	106.0	102.5	98.5	100.0		
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Hilf density ratio (R_{HD})	%	97.5	96.0	96.0	96.5		
--	----------	-------------	-------------	-------------	-------------	--	--

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 9384-30
 date of issue 15/09/2017

Client	Streetworks
Client address	4 Len Thomas Place, Narre Warren, 3805
Project	Acacia Ridge Stage 7
Location	Cranbourne

Feature	Block Fill
Layer thickness (mm)	300

tested by	SP
time	PM
date	12-Aug-2017
checked by	CC

Field density test procedure AS1289.2.1.1 and 5.8.1

Test No		102	103	104	105	106	
location	Lot No	728	728	730	730	737	
		Retest of 95		Retest of 97			
Sampling procedures AS1289.1.1,1.2.1-Clause 6.4(b)							
depth from F.S.L.	m	Layer 1	Layer 2	Layer 1	Layer 2	Layer 5	
measurement depth	mm	275	275	275	275	275	
field wet density	t/m ³	1.98	2.08	1.95	1.81	1.92	
field dry density	t/m ³	1.61	1.76	1.69	1.58	1.62	
field moisture content	%	22.9	18.2	15.4	14.5	18.8	

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	2.07	2.10	2.06	2.11	2.06	
adjusted peak converted wet density	t/m ³	0.00	0.00	0.00	0.00	0.00	

moisture variation from OMC (-dry,+wet)%		1.0	1.0	1.0	-1.5	0.5	
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Moisture ratio	%	104.5	105.0	106.5	90.0	102.0	
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Hilf density ratio (R_{HD})	%	96.0	99.0	95.0	85.5	93.5	
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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 9384-31
 date of issue 15/09/2017

Client	Streetworks
Client address	4 Len Thomas Place, Narre Warren, 3805
Project	Acacia Ridge Stage 7
Location	Cranbourne

Feature	Block Fill
Layer thickness (mm)	300

tested by	SP
time	All Day
date	18-Aug-2017
checked by	CC

Field density test procedure AS1289.2.1.1 and 5.8.1

Test No		107	108	109	110		
location	Lot No	730	737	736	735		
		Retest of 105	Retest of 106				
Sampling procedures AS1289.1.1,1.2.1-Clause 6.4(b)							
depth from F.S.L.	m	Layer 2	Layer 5	Layer 3	Layer 3		
measurement depth	mm	275	275	275	275		
field wet density	t/m ³	1.97	1.99	1.99	1.96		
field dry density	t/m ³	1.69	1.68	1.67	1.64		
field moisture content	%	16.6	18.7	18.8	19.5		

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	2.07	2.07	2.08	2.06		
adjusted peak converted wet density	t/m ³	-	-	-	-		

moisture variation from OMC (-dry,+wet)%		1.0	0.5	1.0	1.0		
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Moisture ratio	%	107.0	104.0	105.5	104.5		
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Hilf density ratio (R_{HD})	%	95.5	96.5	95.5	95.0		
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material description

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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 9384-32
 date of issue 15/09/2017

Client	Streetworks
Client address	4 Len Thomas Place, Narre Warren, 3805
Project	Acacia Ridge Stage 7
Location	Cranbourne

Feature	Block Fill
Layer thickness (mm)	225

tested by	SP
time	All Day
date	21-Aug-2017
checked by	CC

Field density test procedure AS1289.2.1.1 and 5.8.1						
Test No		111	112	113		
location	Lot No	732	731	730		
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	200	200	200		
field wet density	t/m ³	1.91	1.96	1.94		
field dry density	t/m ³	1.59	1.59	1.62		
field moisture content	%	20.3	23.1	20.0		
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	2.03	2.02	2.00		
adjusted peak converted wet density	t/m ³	-	-	-		
moisture variation from OMC (-dry,+wet)%		-1.0	-1.5	0.5		
Moisture ratio	%	96.0	94.0	103.0		
Hilf density ratio (R_{HD})	%	94.0	97.0	97.0		
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- Testing

LABORATORY ACCREDITATION No 15357

This is a revised Report

Approved Signature
 C Caulfield



COMPACTION ASSESSMENT

BY NUCLEAR GAUGE METHOD

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

report No 9384-33
 date of issue 14/09/2017

Client	Streetworks
Client address	4 Len Thomas Place, Narre Warren, 3805
Project	Acacia Ridge Stage 7
Location	Cranbourne

Feature	Block Fill
Layer thickness (mm)	225

tested by	SP
time	All Day
date	21-Aug-2017
checked by	CC

Field density test procedure AS1289.2.1.1 and 5.8.1						
Test No		114	115	116	117	
location	Lot No	732	730	729	728	
		Retest of 111				
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	200	200	200	200	
field wet density	t/m ³	1.98	1.97	2.02	2.05	
field dry density	t/m ³	1.64	1.66	1.68	1.73	
field moisture content	%	20.2	18.9	20.4	18.8	
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	2.08	2.08	2.11	2.10	
adjusted peak converted wet density	t/m ³	-	-	-	-	
moisture variation from OMC (-dry,+wet)%		1.0	1.0	3.5	1.0	
Moisture ratio	%	104.5	105.5	120.5	104.5	
Hilf density ratio (R_{HD})	%	95.0	95.0	95.5	97.5	
material description						
Silty CLAY						



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 C Caulfield



COMPACTION ASSESSMENT

BY NUCLEAR GAUGE METHOD

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

report No 9384-34
 date of issue 04-Sep-2017

Client	Streetworks
Client address	4 Len Thomas Place, Narre Warren, 3805
Project	Acacia Ridge Stage 5 and 7
Location	Cranbourne

Feature	Block Fill
Layer thickness (mm)	300

tested by	TR
time	All Day
date	01-Sep-2017
checked by	CC

Field density test procedure AS1289.2.1.1 and 5.8.1						
Test No		118	119	120		
location	Lot No	703	702	701		
Sampling procedures AS1289.1.1,1.2.1-Clause 6.4(b)						
depth from F.S.L.	m	FSL	FSL	FSL		
measurement depth	mm	275	275	275		
field wet density	t/m ³	2.03	2.02	1.99		
field dry density	t/m ³	1.71	1.68	1.68		
field moisture content	%	18.7	20.0	18.2		
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	2.05	2.03	2.04		
adjusted peak converted wet density	t/m ³	-	-	-		
moisture variation from OMC (-dry,+wet)%		1.0	1.0	1.0		
Moisture ratio	%	104.5	105.0	106.0		
Hilf density ratio (R_{HD})	%	99.0	99.5	97.5		
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 9384-35
 date of issue 05-Sep-2017

Client	Streetworks
Client address	4 Len Thomas Place, Narre Warren, 3805
Project	Acacia Ridge Stage 5 and 7
Location	Cranbourne

Feature	Block Fill
Layer thickness (mm)	300

tested by	TR
time	All Day
date	02-Sep-2017
checked by	CC

Field density test procedure AS1289.2.1.1 and 5.8.1

Test No		121	122	123	124	125	
location	Lot No	744	745	746	747	748	
Sampling procedures AS1289.1.1,1.2.1-Clause 6.4(b)							
depth from F.S.L.	m	Layer-1	Layer-1	Layer-1	Layer-1	Layer-1	
measurement depth	mm	275	275	275	275	275	
field wet density	t/m ³	2.12	2.01	2.09	1.90	1.92	
field dry density	t/m ³	1.80	1.73	1.78	1.59	1.60	
field moisture content	%	17.6	16.5	17.4	19.0	19.7	

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	2.16	2.13	2.13	2.11	2.02	
adjusted peak converted wet density	t/m ³	-	-	-	-	-	

moisture variation from OMC (-dry,+wet)%		3.5	1.5	0.5	1.0	1.0	
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Moisture ratio	%	124.0	110.0	103.5	106.0	106.0	
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Hilf density ratio (R_{HD})	%	98.0	94.5	98.0	90.0	95.0	
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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 9384-36
 date of issue 08-Sep-2017

Client	Streetworks
Client address	4 Len Thomas Place, Narre Warren, 3805
Project	Acacia Ridge Stage 5 and 7
Location	Cranbourne

Feature	Block Fill
Layer thickness (mm)	300

tested by	TR
time	04:00 PM
date	04-Sep-2017
checked by	CC

Field density test procedure AS1289.2.1.1 and 5.8.1

Test No		126	127			
location	Lot No	745	747			
		Retest of 122	Retest of 124			
Sampling procedures AS1289.1.1,1.2.1-Clause 6.4(b)						
depth from F.S.L.	m	Layer-1	Layer-1			
measurement depth	mm	275	275			
field wet density	t/m ³	2.09	1.96			
field dry density	t/m ³	1.80	1.67			
field moisture content	%	16.2	17.9			

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	2.06			
adjusted peak converted wet density	t/m ³	-	-			

moisture variation from OMC (-dry,+wet)%		1.0	1.0			
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Moisture ratio	%	107.0	106.5			
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Hilf density ratio (R_{HD})	%	98.0	95.5			
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material description

Silty CLAY



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