



Job No: 7508/119

Our Ref: 7508/119-AB Statement of Compliance

30 August 2013

Maryland Development Company Pty Ltd c/- Lend Lease Development Pty Ltd P O Box 4366 PENRITH WESTFIELD NSW 2750

Attention: Mr A Ali

Dear Sir

re: Jordan Springs - Stages 4A & 4B Penrith City Council DA 12/0897 Statement of Compliance

Geotech Testing Pty Ltd was engaged by Maryland Development Company Pty Ltd to carry out geotechnical site compliance of Stages 4A & 4B at Jordan Springs, in accordance with Penrith City Council DA Consent No. 12/0897. The following conditions of consent have been satisfied as a result of the services carried out.

- Condition No 26 No fill material is to be imported to the site without the prior approval of Penrith City Council in accordance with the Sydney Regional Environmental Plan No. 20 (Hawkesbury Nepean River) (No.2-1997). No recycling of material for use as fill material shall be carried out on the site without the prior approval of Council.
- Condition No. 57 All filling shall be undertaken in accordance with AS3798 and Penrith City Council's Design Guidelines and Construction Specification for Civil Works. The level of testing shall be determined by the Geotechnical Testing Authority/Superintendent in consultation with the Principal Certifying Authority.
- Condition No. 58 Soil testing is to be carried out to enable each lot to be classified according to AS2870 "Residential Slabs and Footings".
- Condition No. 65(f) A Geotechnical Report certifying that all earthworks and road formation have been completed in accordance with AS3798 and Council's Design Guidelines and Construction specifications. The report shall include;
  - Compaction reports for road pavement construction.
  - Compaction reports for bulk earthworks and lot regrading.
  - Soil classification for all residential lots.
  - Statement of Compliance.
- Condition No. 75 Soil testing is to be carried out to enable each lot to be classified according to AS2870 "Residential Slabs and Footings". A copy of the report, including a plan showing the lot classification over the subdivision is to be submitted to Penrith City Council prior to issue of a Subdivision Certificate.

7508/119-AB Stages 4A & 4B Jordan Springs

This report consists of the following appendices, which provide the relevant compliance information (including test results and plans) for the works carried out to satisfy the above condition requirements.

- Appendix A Summary of Site Fill Testing
- Appendix B Summary of Field Density Testing for Road Works
- Appendix C Summary of Pipeline Backfill Testing
- Appendix D Soil Classification of Residential Lots

Yours faithfully GEOTECH TESTING PTY LTD

EMGED RIZKALLA Director

# APPENDIX A

SUMMARY OF SITE FILL TESTING

Report 7508/119-AA





Job No: 7508/119 Our Ref: 7508/119-AAR1 9 September 2013

Maryland Development Company Pty Ltd c/- Lend Lease Development Pty Ltd P O Box 4366
PENRITH WESTFIELD NSW 2750

Attention: Mr A Ali

Dear Sir

re: Jordan Springs - Stages 4A & 4B
Penrith City Council DA 12/0897 - Condition Nos 26, 57 & 65(f)

Summary of Site Fill Testing

As requested tests have been carried out in filled areas at the above project to satisfy the following Penrith City Council (PCC) requirements under DA 12/0897.

**Condition No 26** – No fill material is to be imported to the site without the prior approval of Penrith City Council in accordance with the Sydney Regional Environmental Plan No. 20 (Hawkesbury Nepean River) (No.2-1997). No recycling of material for use as fill material shall be carried out on the site without the prior approval of Council.

**Condition No. 57 -** All filling shall be undertaken in accordance with AS3798 and Penrith City Council's Design Guidelines and Construction Specification for Civil Works.

**Condition No. 65(f) -** A Geotechnical Report certifying that all earthworks and road formation have been completed in accordance with AS3798 and Council's Design Guidelines and Construction specifications. The report shall include;

- Compaction reports for road pavement construction
- Compaction reports for bulk earthworks and lot regrading.
- Soil classification for all residential lots
- Statement of Compliance

The scope of our services in which the works were carried out is set out in Attachment A.

The tests were undertaken within the terms of our NATA accreditation, at the dates and to the procedures shown on the test attached results sheets as attached. One hundred and two compaction control tests were completed and the results are attached. The test locations are indicated on the attached Drawings 7508/119-1 & 7508/119-2.

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Unit 4, 18-20 Whyalla Place, Prestons NSW 2170 Telephone: (02) 9607 6111 Facsimile: (02) 9607 6200

Prestons Laboratory:

7508/119-AAR1 Stages 4A & 4B Jordan Springs

The majority of the fill comprised on-site materials gained from excavation (cut to fill) and minor fill comprising materials excavated from the Woolworths Site (Corner of Jordan Springs & Lakeside Parade, Jordan Springs) comprising about 4,600m<sup>3</sup>. The imported fill was tested by CSTS Pty Ltd (Report ENV AB dated 17 January 2013) and reviewed by Geotech Testing Pty Ltd (Report 7508/29-AN dated 12 April 2013). The imported material was assessed as ENM.

Based on the fill quantities/survey data provided by the Client, the frequency of field density and compaction tests was generally in accordance with the provisions set down in Australian Standard AS3798 "Guidelines on Earthworks for Commercial & Residential Development". We certify that all locations tested the compacted fill and attained the wet density ratio shown on the test results sheets.

Based on site observations and testing, it is our professional opinion that the fill placed at Stages 4A & 4B is classified as "Controlled" fill (Level 1) as defined in Australian Standard AS3870 and Council's Design Guidelines and Construction specifications.

This report does not represent a geotechnical investigation of this site. We are able to provide guidance to designers as an additional service, if required.

Yours faithfully
GEOTECH TESTING PTY LTD

EMGED RIZKALLA

Director

Attached: Attachment A

Drawings 7508/119-1 & 7508/119-2 Compaction Control Test Nos 1 to 102

# ATTACHMENT "A" SCOPE OF TESTING SERVICES

The following work was undertaken:

#### STRIPPING & SURFACE PREPARATION

Observation of the stripped surface prior to fill placement. At the time of observation, the stripped area was free of significant fill, vegetation and highly organic topsoil. The surface was "proof rolled" and all soft or yielding areas were removed.

#### **TESTING OF FILL COMPACTION**

Level 1 site supervision with field density tests (and associated laboratory compaction tests) carried out at locations selected by our Geotechnician.

#### **PLAN OF EXTENT OF FILL**

Measurement of the extent of fill was not part of our commission. It is understood that this information will be supplied by the Project Surveyor.

#### LOCATIONS OF FIELD TESTS

In selection of field density test locations, no attempt was made to select "good" or "bad" locations. It should be noted that there may be no visual difference between areas of poorly compacted fill and well compacted fill.

The plan positions of the field density tests are indicated on Drawing Nos 7508/119-1 & 7508/119-2. The reduced levels of the field density tests are indicated on the field density test results sheets. It should be noted that the accuracy of location and level corresponds to the measurement method used and that discrepancies may result when positions are compared with detailed surveys. The surveyed method used was GPS supplied by the earthmoving contractor.

#### **FILL ACCEPTANCE CRITERIA**

It is understood that the criteria for fill acceptance indicated to us by the client was a minimum wet (Hilf) density ratio of at least 95% Standard (AS1289 5.4.1).

We do not warrant that the acceptance criteria set out above are appropriate to all or any of the work.

#### **BURIED SERVICES**

At the time of field density testing, it was not known whether all underground services had been installed.

Consideration must be given to the possible disruption of fill by subsequent service installation.

#### **BUILDING ON FILLED AREAS**

Prior to construction of any building on the filled areas, consideration should be given by the user to:

- the possibility of additional fill having been placed after the date of the last field density test.
- the presence of topsoil placed after completion of filling. The final contours on the as constructed drawings may include placed topsoil.
- variations in fill depth.

#### WARRANTY

The tests presented have been undertaken in accordance with standards ordinarily exercised by members of the profession that practice in the same locality and under similar conditions. There shall be no liability whatsoever in respect to any failure to exercise a degree or level of care beyond such reasonable care. No other warrant, express or implied is given, save where necessarily incorporated by statute.





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- 1. Site features are indicative and are not to scale.
- This drawing has been produced using a base plan provided by others to which additional information e.g test pits, borehole locations or notes have been added. Some or all of the plan may not be relevant at the time of producing this drawing

Maryland Development Company Pty Ltd Stages 4A & 4B Jordan Springs

Location of Field Density Tests

Drawing No: 7508/119-1 Job No: 7508/119 Drawn By: MH Date: 14 May 2013 Checked By: AK

File No: 7508-119 Layers: 0, Lay1





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NOTES

1. Site features are indicative and are not to scale.

 This drawing has been produced using a base plan provided by others to which additional information e.g test pits, borehole locations or notes have been added. Some or all of the plan may not be relevant at the time of producing this drawing Maryland Development Company Pty Ltd Stages 4A & 4B Jordan Springs

Location of Field Density Tests

Drawing No: 7508/119-2 Job No: 7508/119 Drawn By: MH Date: 31 May 2013 Checked By: AK

File No: 7508-119 Layers: 0, Lay2





#### FIELD DENSITY RESULTS

MARYLAND DEVELOPMENT COMPANY PTY LTD C/- LEND LEASE DEVELOPMENT P/L, PO BOX 1124 ST MARYS NSW 1790

Date: 15/05/2013

Job No:

PROJECT: SITE FILL TESTING

STAGES 4A & 4B, JORDAN SPRINGS

	STAGES 4A & 4B, JO	RDAN S	PRINGS							
TEST NUMBER		1	1	2	3	4	5	6	7	8
DATE TESTED		_		))	S )	11/04	1/2013	*	2 3	,
RESULTS										
Hilf Density Ratio	Standard	%	100.5	99	99	100	100	102	98.5	100.5
Moisture Variation from	m OMC (-Drier/+Wetter)	%	- 2.0	- 2.0	+ 0.5	- 1.0	+ 0.5	- 0.5	- 1.5	- 0.5
Specification	Density Ratio (Stand	ard)	≥95%	Specific	ation Mo	isture Va	riance fr	om OMC		N/A
TEST LOCATION		800								
Chainage	(Carriageway L/R)	m	23	4	:##:	(12)		-	774)	123
Shown on Drawing No		9E 970				7508	/119-1			
Retested by Test		Ī	8	-			-			-
Reduced Level		m	34.18	34.32	34.82	35.01	34.15	34.58	34.41	34.60
FIELD & LABORAT	TORY DATA									
Field Wet Density		t/m³	2.05	2.03	2.03	2.02	2.06	2.08	2.01	2.05
Field Moisture Content		%	17.5	15.5	19.5	19.5	20.0	18.5	18.0	22.5
Material retained on	19mm Sieve (wet)	%	<5%	<5%	<5%	<5%	<5%	<5%	<5%	<5%
Lab Compaction result from			1	2	3	4	5	6	7	8
Peak Converted Wet Dens	sity	t/m³	2.04	2.05	2.05	2.02	2.06	2.04	2.04	2.04
Apparent Optimum Moistui	re Content	F	19.5	17.0	19.0	20.5	19.0	19.0	19.5	23.0
Number of Compaction Po	ints	1	3	3	3	3	3	3	3	3
Test Procedures - See Not	te Number	Ţ	12	12	12	12	12	12	12	12
Material Description - see I	below	Ī	2	2	2	2	2	2	2	3
2: Assigned Values have been obtained	5.2.1, 5.3.1, 5.4.1 5.1.1, 5.4.1, 5.8.1 5.2.1, 5.4.1, 5.8.1 5.5.1, 5.6.1, 5.8.1	tation No 14234		e shown			11: AS 1289 1.2.1	I clause 6.4 (b), 2.1 I clause 6.4 (b), 2.1 I 19, T120, T166 I20, T166, T173 I19, T162 I62, T173		E**
Material Description										
1. CL-Clays of low plasticity, gravelly cl. 2. Cl-Clay of medium plasticity, gravelly 3. CH-Clays of high plasticity 4. SC-Clayey sands, sand-clay mixture 5. SM-Silty sands, sand-clay mixtures 6. GC-Clayey gravels, gravel-sand-clay	r clays, sandy clays, silty clays s y mixtures			11. DGS40 12. FCR20 13. FCR40 14. RC - Recycled 15. Recycled Roal 16. RSB - Recycle	dbase ed Sub-base		<ul> <li>Cement Stabilis</li> <li># Lime Stabilised</li> <li>\$ Gypsum Stabilis</li> </ul>			
<ol> <li>SP-Sand, crushed dust, filling sand,</li> <li>DGB20</li> <li>DGB40</li> </ol>	wasned sand			17. CSS - Crusher 18. RSS - Ripped 19. Cowels Brown	Sandstone					

Form No R 020 Version 08 04/13 - issued by ER



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A Kench 15/05/2013

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#### FIELD DENSITY RESULTS

MARYLAND DEVELOPMENT COMPANY PTY LTD C/- LEND LEASE DEVELOPMENT P/L, PO BOX 1124 ST MARYS NSW 1790

15/05/2013 Date:

Job No:

PROJECT: SITE FILL TESTING

THOUSENT.	STAGES 4A & 4B, JO	RDAN S	PRINGS							
TEST NUMBER		ſ	9	10	11	12	13	14	15	16
DATE TESTED			11/04/2013	2.70		12/04/2013	2,550		1335	/2013
RESULTS										
Hilf Density Ratio	Standard	%	100	99	98	96	96.5	99	96.5	97.5
Moisture Variation f	rom OMC (-Drier/+Wetter)	%	+ 0.5	0.0	0.0	0.0	0.0	+ 0.5	- 2.0	- 1.5
Specification	Density Ratio (Stand	ard)	≥95%	Specific	ation Mo	isture Va	riance fr	om OMC		N/A
TEST LOCATION	1	100								
Chainage	(Carriageway L/R)	m	48	ų.	141	(12)	-	(#E)	7(4)	2
Shown on Drawing No		-		955		7508	/119-1	7 Section		
Retested by Test		m	- 04.00	- 04.07	- 00.50	- 00.07	- 00.57	- 00.70	- 00.00	- 00.00
Reduced Level		3111	34.69	34.67	32.58	32.67	32.57	33.78	33.86	33.32
FIELD & LABOR	ATORY DATA									
Field Wet Density		t/m³	2.07	2.09	2.05	2.05	2.06	2.08	2.00	1.98
Field Moisture Content		%	20.5	20.0	18.0	14.0	14.0	13.5	14.0	13.5
Material retained on	19mm Sieve (wet)	%	<5%	<5%	<5%	<5%	<5%	<5%	<5%	<5%
Lab Compaction result f	rom test number		9	10	11	12	13	14	15	16
Peak Converted Wet De	ensity	t/m³	2.07	2.11	2.09	2.14	2.13	2.10	2.07	2.03
Apparent Optimum Mois	sture Content	1	20.0	20.0	18.0	14.0	13.5	13.0	16.0	15.0
Number of Compaction	Points		3	3	3	3	3	3	3	3
Test Procedures - See I	Note Number		12	12	12	12	12	12	12	12
Material Description - se	ee below	F	2-3	2-3	2	2	2	2	2	2
2: Assigned Values have been obt	1.1, 5.2.1, 5.3.1, 5.4.1 1.1, 5.1.1, 5.4.1, 5.8.1 1.1, 5.2.1, 5.4.1, 5.8.1 1.1, 5.5.1, 5.6.1, 5.8.1	tation No 14234		a shown			11: AS 1289 1.2	120, T166, T173 119, T162 162, T173	1.1, 5.3.1, 5.7.1	.1
Material Description				2/20/00/00/00/00/00/00/00/00/00/00/00/00			575e9500=50.35.39	w700007		
<ol> <li>CL-Clays of low plasticity, gravel</li> <li>Cl-Clay of medium plasticity, gra</li> <li>CH-Clays of high plasticity</li> <li>SC-Clayey sands, sand-clay mix</li> <li>SM-Silty sands, sand-silt mixture</li> </ol>	velly clays, sandy clays, silty clays tures			11. DGS40 12. FCR20 13. FCR40 14. RC - Recycled 15. Recycled Roa			* Cement Stabili # Lime Stabilised \$ Gypsum Stabil	i		
6. GC-Clayey gravels, gravel-sand-				16. RSB - Recycle						

GC-Clayey gravels, gravel-sand-clay mixtures SP-Sand, crushed dust, filling sand, washed sand 16. RSB - Recycled Sub-base 17. CSS - Crushed Sandstone DGB20 DGR40 19. Cowels Brown

18. RSS - Ripped Sandstone



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#### FIELD DENSITY RESULTS

MARYLAND DEVELOPMENT COMPANY PTY LTD C/- LEND LEASE DEVELOPMENT P/L, PO BOX 1124 ST MARYS NSW 1790

15/05/2013 Date:

Job No:

PROJECT: SITE FILL TESTING

	STAGES 4A & 4B, JO	RDAN S	PRINGS							
TEST NUMBER		Г	17	18	19	20	21	22	23	
DATE TESTED				15/04/2013	3.50		V-7-	1/2013		
RESULTS										
Hilf Density Ratio	Standard	%	99	98	98.5	99.5	98.5	99	98.5	
Moisture Variation f	rom OMC (-Drier/+Wetter)	%	- 1.5	+ 0.5	0.0	- 2.5	- 2.0	- 2.5	- 1.5	
Specification	Density Ratio (Stand	ard)	≥95%	Specific	ation Mo	isture Va	riance fr	om OMC		N/A%
TEST LOCATION	<b>V</b> .	12								
Chainage	(Carriageway L/R)	m	28	4	1 <del>4</del> 1	120	2		(74)	
Shown on Drawing No		-				7508/119-1				
Retested by Test			-	-		-	-	-	-	
Reduced Level		m	33.78	34.38	34.67	35.00	35.00	35.16	34.06	
FIELD & LABOR	ATORY DATA									
Field Wet Density		t/m³	2.01	2.09	2.04	2.03	2.03	2.02	2.02	
Field Moisture Content		%	14.0	16.5	16.5	15.5	15.5	16.0	15.5	
Material retained on	19mm Sieve (wet)	%	<5%	<5%	<5%	<5%	<5%	<5%	<5%	
Lab Compaction result f	from test number		17	18	19	20	21	22	23	
Peak Converted Wet De	ensity	t/m³	2.03	2.13	2.07	2.04	2.06	2.04	2.05	
Apparent Optimum Mois	sture Content		15.5	16.5	16.5	17.5	17.5	18.0	17.0	
Number of Compaction	Points		3	3	3	3	3	3	3	
Test Procedures - See I	Note Number		12	12	12	12	12	12	12	
Material Description - se	ee below		2	2	2	2	2	2	2	
Notes  1: Assigned Values have been ob 2: Assigned Values have been obt 3: Results have been calculated u 4: AS 1289 1.2.1 clause 6.4 (b), 2. 5: AS 1289 1.2.1 clause 6.4 (b), 2. 6: AS 1289 1.2.1 clause 6.4 (b), 2. 7: AS 1289 1.2.1 clause 6.4 (b), 2. 8: AS 1289 1.2.1 clause 6.4 (b), 2. 9: Full details of Test Procedure 5.	tation No 14234		e shown			11: AS 1289 1.2.	1 clause 6.4 (b), 2. 1 clause 6.4 (b), 2. 119, T120, T166 120, T166, T173 119, T162 162, T173		ti.	
Material Description	on									
CL-Clays of low plasticity, gravel     CI-Clay of medium plasticity, gra     CH-Clays of high plasticity     SC-Clayey sands, sand-clay mio     SM-Silty sands, sand-silt mixture	velly clays, sandy clays, silty clays			11. DGS40 12. FCR20 13. FCR40 14. RC - Recycled 15. Recycled Roa			* Cement Stabilised # Lime Stabilised \$ Gypsum Stabili			
6. GC-Clavey gravels, gravel-sand				16. RSB - Recycle						

GC-Clayey gravels, gravel-sand-clay mixtures SP-Sand, crushed dust, filling sand, washed sand

DGB20 DGR40 16. RSB - Recycled Sub-base 17. CSS - Crushed Sandstone

18. RSS - Ripped Sandstone 19. Cowels Brown



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#### FIELD DENSITY RESULTS

MARYLAND DEVELOPMENT COMPANY PTY LTD C/- LEND LEASE DEVELOPMENT P/L, PO BOX 1124 ST MARYS NSW 1790

15/05/2013 Date:

Job No:

PROJECT: SITE FILL TESTING

ACEC AA 8 AB JODDANI ODDINOO

	STAGES 4A & 4B, JO	RDAN S	PRINGS							
TEST NUMBER		Γ	24	25	26	27	28	29	30	31
DATE TESTED						23/0	4/2013			
RESULTS										
Hilf Density Ratio	Standard	%	104	101	99	99	97	95.5	97	97.5
Moisture Variation from	m OMC (-Drier/+Wetter)	%	- 1.5	+ 0.5	+ 1.0	+ 0.5	+ 0.5	0.0	0.0	0.0
Specification	Density Ratio (Standa	ard)	≥95%	Specific	ation Mo	isture Va	ariance fr	om OMC		N/A%
TEST LOCATION		181								
Chainage	(Carriageway L/R)	m	- 4	2		(4)	2	(±0)	7740	2
Shown on Drawing No	The state of the s	PESO				7508	/119-1			
Retested by Test		4	€.	ii ii	. 6	73	-		. 168	-
Reduced Level		m	34.06	34.75	35.54	35.02	32.25	32.70	33.29	32.71
FIELD & LABORA	TORY DATA									
Field Wet Density		t/m³	2.07	2.08	2.07	2.03	2.04	1.99	2.00	2.01
Field Moisture Content		%	18.5	19.0	20.0	18.0	17.5	17.5	17.5	1.0
Material retained on	19mm Sieve (wet)	%	<5%	<5%	<5%	<5%	<5%	<5%	<5%	<5%
Lab Compaction result from		~	24	25	26	27	28	29	30	31
Peak Converted Wet Dens		t/m³	1.99	2.06	2.09	2.05	2.10	2.08	2.06	2.06
Apparent Optimum Moistu	AND THE RESERVE THE PARTY OF TH	-	20.0	18.5	19.0	17.5	17.0	17.5	17.5	0.5
Number of Compaction Po		- 1	3	3	3	3	3	3	3	3
Test Procedures - See Not		- 1	12	12	12	12	12	12	12	12
Material Description - see	below	-	2-3	2	2	2	2	2	2	2
Notes		4						-		
2: Assigned Values have been obtained	5.2.1, 5.3.1, 5.4.1 5.1.1, 5.4.1, 5.8.1 5.2.1, 5.4.1, 5.8.1 5.5.1, 5.6.1, 5.8.1	ation No 14234		e shown			11: AS 1289 1.2.	120, T166, T173 119, T162 162, T173	1.1, 5.3.1, 5.7.1	61
Material Description	Ţ									
. CL-Clays of low plasticity, gravelly cl				11. DGS40 12. FCR20			<ul> <li>Cement Stabilised</li> <li># Lime Stabilised</li> </ul>			
<ul> <li>CI-Clay of medium plasticity, gravelly</li> <li>CH-Clays of high plasticity</li> </ul>	y days, sandy days, silty clays			12. FCR20 13. FCR40			# Lime Stabilised \$ Gypsum Stabili			
. SC-Clayey sands, sand-clay mixture	es .			14. RC - Recycled	d Concrete		-71	2003		
i. SM-Silty sands, sand-silt mixtures				15. Recycled Roa						
<ol> <li>GC-Clayey gravels, gravel-sand-clay</li> <li>SP-Sand, crushed dust, filling sand,</li> </ol>				<ol> <li>RSB - Recycle</li> <li>CSS - Crushe</li> </ol>						
3. DGB20	wasnou sdifu			18. RSS - Ripped						

9. DGB40 10. DGS20



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15/05/2013

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19. Cowels Brown

Prestons Laboratory:

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#### FIELD DENSITY RESULTS

MARYLAND DEVELOPMENT COMPANY PTY LTD C/- LEND LEASE DEVELOPMENT P/L, PO BOX 1124 ST MARYS NSW 1790

15/05/2013 Date:

Job No:

PROJECT: SITE FILL TESTING

	STAGES 4A & 4B, JO	RDAN S	PRINGS							
TEST NUMBER		Γ	32	33	34	35	36	37	38	39
DATE TESTED						24/04	/2013			
RESULTS						20				
Hilf Density Ratio	Standard	%	98.5	95	96	98	96.5	96	95.5	98
Moisture Variation fro	m OMC (-Drier/+Wetter)	%	- 0.5	+ 1.5	+ 1.5	+ 0.5	0.0	0.0	+ 0.5	0.0
Specification	Density Ratio (Stand	lard)	≥95%	Specific	ation Mo	isture Va	riance fr	om OMC		N/A%
TEST LOCATION		<u> </u>								
Chainage	(Carriageway L/R)	m	4	9	( <del>4</del> )	7500	-	(#E)	(1 <u>4</u> )	2
Shown on Drawing No		-		955	D-COME 1	7508/	119-1	20038	50-00	500
Retested by Test Reduced Level		m	32.84	33.29	33.20	34.21	33.21	33.15	33.63	33.71
CICLD 8 LABORA	TODY DATA									
FIELD & LABORA Field Wet Density	TORY DATA	t/m³	2.02	2.04	2.04	2.04	2.02	2.01	2.01	2.04
Field Moisture Content		%	18.5	17.5	18.0	17.0	18.5	17.0	17.5	17.0
Material retained on	19mm Sieve (wet)	%	<5%	<5%	<5%	<5%	<5%	<5%	<5%	<5%
Lab Compaction result fro			32	33	34	35	36	37	38	39
Peak Converted Wet Dens	sity	t/m³	2.05	2.15	2.13	2.08	2.09	2.09	2.11	2.08
Apparent Optimum Moistu	ire Content		19.0	16.5	16.5	17.0	18.5	17.0	17.0	17.0
Number of Compaction Po	oints		3	3	3	3	3	3	3	3
Test Procedures - See No			12	12	12	12	12	12	12	12
Material Description - see	below		2	2	2	2	2	2	2	2

- 6: AS 1289 1.2.1 clause 6.4 (b), 2.1.1, 5.1.1, 5.4.1, 5.8.1 7: AS 1289 1.2.1 clause 6.4 (b), 2.1.1, 5.2.1, 5.4.1, 5.8.1
- 8: AS 1289 1.2.1 clause 6.4 (b), 2.1.1., 5.5.1, 5.6.1, 5.8.1 9: Full details of Test Procedure 5.8.1 available on request

- 15: RTA T120, T119, T162
- 16. RTA T120, T162, T173
- 17. RTA T120, T164, T173

Cement Stabilised

\$ Gypsum Stabilised

# Lime Stabilised

# **Material Description**

- CL-Clays of low plasticity, gravelly clays, sandy clays, silty clays CI-Clay of medium plasticity, gravelly clays, sandy clays, silty clays
- CH-Clays of high plasticity SC-Clayey sands, sand-clay mixtures SM-Silty sands, sand-silt mixtures GC-Clayey gravels, gravel-sand-clay mixtures SP-Sand, crushed dust, filling sand, washed sand
- DGB20
- DGR40 0. DGS20

- 11. DGS40 12. FCR20 13 FCR40
- 14. RC Recycled Concrete 15. Recycled Roadbase 16. RSB - Recycled Sub-base 17. CSS - Crushed Sandstone
- 18. RSS Ripped Sandstone

19. Cowels Brown



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15/05/2013

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#### FIELD DENSITY RESULTS

MARYLAND DEVELOPMENT COMPANY PTY LTD C/- LEND LEASE DEVELOPMENT P/L, PO BOX 1124 ST MARYS NSW 1790

Date: 15/05/2013

Job No:

PROJECT: SITE FILL TESTING

STAGES 4A & 4B, JORDAN SPRINGS

	STAGES 4A & 4B, JO	RDAN S	PRINGS							
TEST NUMBER DATE TESTED		E	40	41	42	43 29/04/2013	44	45	46	
DECLU TO		232								
RESULTS Hilf Density Ratio	Standard	%	97	96.5	96.5	99	100.5	104.5	101.5	
Moisture Variation fro	om OMC (-Drier/+Wetter)	%	0.0	+ 0.5	+ 0.5	+ 0.5	- 3.0	- 2.5	- 2.5	
Specification	Density Ratio (Stand	ard)	≥95%	Specific	ation Mo	isture Va	riance fr	om OMC	•	N/A%
TEST LOCATION		181								
Chainage	(Carriageway L/R)	m	48		191	(2)			772)	
Shown on Drawing No		PE-977				7508/119-1		***		
Retested by Test		1	25			76			( ·	
Reduced Level		m	34.70	35.44	34.91	35.46	34.92	34.50	34.38	
FIELD & LABORA	TORY DATA									
Field Wet Density		t/m³	2.05	2.02	2.06	2.07	2.03	2.07	2.05	
Field Moisture Content		%	15.5	15.0	18.0	17.0	14.5	16.0	15.5	
Material retained on	19mm Sieve (wet)	%	<5%	<5%	<5%	<5%	<5%	<5%	<5%	
Lab Compaction result fro		~	40	41	42	43	44	45	46	
Peak Converted Wet Dens		t/m³	2.11	2.09	2.13	2.09	2.02	1.98	2.02	
Apparent Optimum Moistu	The state of the s	-	15.5	14.5	17.5	16.5	17.5	18.5	18.0	
Number of Compaction Po		- 1	3	3	3	3	3	3	3	
Test Procedures - See No		-	12	12	12	12	12	12	12	
Material Description - see		-	2	2	2	2	2	2	2	
2: Assigned Values have been obtain	,521,531,541 ,5.11,541,581 ,521,541,581 ,551,561,581	tation No 14234		se shown			11: AS 1289 1.2.1	I clause 6.4 (b), 2.1 I clause 6.4 (b), 2.1 I 19, T120, T166 I20, T166, T173 I19, T162 I62, T173		1
Material Description				44 00040			• 0			
<ol> <li>CL-Clays of low plasticity, gravelly of CI-Clay of medium plasticity, gravell</li> </ol>				11. DGS40 12. FCR20			<ul> <li>Cement Stabilis</li> <li># Lime Stabilised</li> </ul>			
CH-Clays of high plasticity				13. FCR40			\$ Gypsum Stabili			
SC-Clayey sands, sand-clay mixture	es			14. RC - Recycled						
<ol> <li>SM-Silty sands, sand-silt mixtures</li> <li>GC-Clayey gravels, gravel-sand-cla</li> </ol>	av mixtures			<ol> <li>Recycled Roa</li> <li>RSB - Recycle</li> </ol>						
<ol> <li>SP-Sand, crushed dust, filling sand,</li> </ol>				17. CSS - Crushe						
THE PERSON AND ADDRESS OF THE PERSON ADDRESS OF THE PERSON AND ADDRESS OF THE PERSON ADDRE				18. RSS - Ripped	Sandstone					
3. DGB20 3. DGB40				19. Cowels Brown						

Form No R 020 Version 08 04/13 - issued by ER



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Job No:

#### FIELD DENSITY RESULTS

MARYLAND DEVELOPMENT COMPANY PTY LTD C/- LEND LEASE DEVELOPMENT P/L, PO BOX 1124 ST MARYS NSW 1790

15/05/2013 Date:

PROJECT: SITE FILL TESTING

EST NUMBER		1	47	48	49	50	51	52	
OATE TESTED		<u></u>		30/04/2013	75.70		02/05/2013		27
RESULTS				~					
lilf Density Ratio	Standard	%	97	101	98	99	96.5	95.5	
Noisture Variation fr	om OMC (-Drier/+Wetter)	%	0.0	- 1.0	- 0.5	+ 0.5	- 2.0	0.0	
Specification	Density Ratio (Standa	ard)	≥95%	Specific	ation Mo	isture Va	ariance fr	om OMC	N/A
EST LOCATION	40. 95	100							
Chainage	(Carriageway L/R)	m	23	3		(2)		(4)	9
hown on Drawing No					7508/	119-1			
letested by Test			2		•	-			2
Reduced Level		m	34.23	34.02	34.17	33.47	34.06	33.62	
IELD & LABOR	ATORY DATA			35000000	F 500 See S	E SPOISS	1	16 80119020 16	
ield Wet Density		t/m³	2.04	2.07	2.04	2.02	2.06	2.06	
ield Moisture Content		%	16.0	16.5	17.0	13.5	13.5	13.5	
Material retained on	19mm Sieve (wet)	%	<5%	<5%	<5%	<5%	<5%	<5%	
ab Compaction result for		4/1003	47	48	49	50	51	52	_
eak Converted Wet De	Control of the Contro	t/m³	2.10	2.05	2.08	2.04	2.13	2.16	
pparent Optimum Mois lumber of Compaction I		-	16.5	17.5 3	17.0	13.0	15.5 3	13.5	-
est Procedures - See N		-	3 12	12	3 12	12	12	12	_
Material Description - se		-	2	2	2	2	2	2	
lotes	0.20.011		2	2				2	
Assigned Values have been obta Results have been calculated us: AS 1289 1.2.1 clause 6.4 (b), 2.1 AS 1289 1.2.1 clause 6.4 (b), 2.1 AS 1289 1.2.1 clause 6.4 (b), 2.1 AS 1289 1.2.1 clause 6.4 (b), 2.1	.1, 5.2.1, 5.3.1, 5.4.1 .1, 5.1.1, 5.4.1, 5.8.1	ation No 14234		e shown			11: AS 1289 1.2.	120, T166, T173 119, T162 162, T173	1, 5.7.1

 CL-Clays of low plasticity, gravelly clays, sandy clays, silty clays CI-Clay of medium plasticity, gravelly clays, sandy clays, silty clays CH-Clays of high plasticity SC-Clayey sands, sand-clay mixtures SM-Silty sands, sand-silt mixtures

GC-Clayey gravels, gravel-sand-clay mixtures SP-Sand, crushed dust, filling sand, washed sand DGB20

DGB40 0. DGS20

11. DGS40 Cement Stabilised 12. FCR20 # Lime Stabilised 13 FCR40 \$ Gypsum Stabilised 14. RC - Recycled Concrete 15. Recycled Roadbase



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16. RSB - Recycled Sub-base 17. CSS - Crushed Sandstone

18. RSS - Ripped Sandstone

19. Cowels Brown





Job No:

#### FIELD DENSITY RESULTS

MARYLAND DEVELOPMENT COMPANY PTY LTD C/- LEND LEASE DEVELOPMENT P/L, PO BOX 1124 ST MARYS NSW 1790

15/05/2013 Date:

PROJECT: SITE FILL TESTING

TEST NUMBER		T	53	54	55	56	57	58	59	60
DATE TESTED		3 3 83				03/05	5/2013			
RESULTS										
Hilf Density Ratio	Standard	%	96.5	97	100.5	97.5	100.5	98	101.5	100
Moisture Variation fr	om OMC (-Drier/+Wetter)	%	+ 0.5	+ 0.5	+ 0.5	- 0.5	0.0	0.0	0.0	0.0
Specification	Density Ratio (Standa	ard)	≥95%	Specific	ation Mo	isture Va	riance fr	om OMC		N/A%
TEST LOCATION	F.6.	300								
Chainage	(Carriageway L/R)	m	48	<u>u</u>	( <b>4</b> )	(2)	2	(4)	(74)	2
Shown on Drawing No	Charles and the State of the St					7508/	119-1			
Retested by Test			- 8		•	79	i i		· (4)	-
Reduced Level		m	33.05	32.44	32.79	33.60	34.18	33.86	33.39	33.16
FIELD & LABORA	ATORY DATA									
Field Wet Density		t/m³	2.01	2.03	2.05	2.01	2.10	2.06	2.13	2.07
Field Moisture Content		%	21.0	14.5	14.0	15.0	12.5	12.0	11.5	11.0
Material retained on	19mm Sieve (wet)	%	<5%	<5%	<5%	<5%	<5%	<5%	<5%	<5%
Lab Compaction result fr	rom test number		53	54	55	56	57	58	59	60
Peak Converted Wet De	nsity	t/m³	2.08	2.09	2.04	2.06	2.09	2.10	2.10	2.07
Apparent Optimum Mois	ture Content	- [	20.5	14.0	13.5	15.5	12.5	11.5	11.5	11.0
Number of Compaction F	Points	Ε	3	3	3	3	3	3	3	3
Test Procedures - See N	lote Number		12	12	12	12	12	12	12	12
Material Description - se	e below	3 -	2-3	2	2	2	1	1	1	1

- 3. Results have been calculated using infinite decimal places. Therefore, calculated values may vary from those shown 4: AS 1289 1.2.1 clause 6.4 (b), 2.1.1, 5.1.1, 5.3.1, 5.4.1
- 5: AS 1289 1.2.1 clause 6.4 (b), 2.1.1, 5.2.1, 5.3.1, 5.4.1 6: AS 1289 1.2.1 clause 6.4 (b), 2.1.1, 5.1.1, 5.4.1, 5.8.1
- 7: AS 1289 1.2.1 clause 6.4 (b), 2.1.1, 5.2.1, 5.4.1, 5.8.1 8: AS 1289 1.2.1 clause 6.4 (b), 2.1.1., 5.5.1, 5.6.1, 5.8.1
- 9: Full details of Test Procedure 5.8.1 available on request

- 12. AS 1289 1.2.1 clause 6.4 (b), 2.1.1, 5.7.1, 5.8.1
- 13: RTA T111, T119, T120, T166
- 14: RTA T111, T120, T166, T173
- 15: RTA T120, T119, T162
- 16. RTA T120, T162, T173 17. RTA T120, T164, T173

Cement Stabilised

\$ Gypsum Stabilised

# Lime Stabilised

# **Material Description**

- CL-Clays of low plasticity, gravelly clays, sandy clays, silty clays CI-Clay of medium plasticity, gravelly clays, sandy clays, silty clays
- CH-Clays of high plasticity SC-Clayey sands, sand-clay mixtures
- SM-Silty sands, sand-silt mixtures
- GC-Clayey gravels, gravel-sand-clay mixtures SP-Sand, crushed dust, filling sand, washed sand
- DGB20
- DGR40 0. DGS20

- 11. DGS40 12. FCR20 13 FCR40
- 14. RC Recycled Concrete
- 15. Recycled Roadbase 16. RSB - Recycled Sub-base 17. CSS - Crushed Sandstone
- 18. RSS Ripped Sandstone
- 19. Cowels Brown



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### FIELD DENSITY RESULTS

MARYLAND DEVELOPMENT COMPANY PTY LTD C/- LEND LEASE DEVELOPMENT P/L, PO BOX 1124 ST MARYS NSW 1790

Date: 7/6/2013

Job No:

PROJECT: SITE FILL TESTING

STAGES 4A & 4B, JORDAN SPRINGS

STAGES 4A & 4B, JC	KDAN 3	PKINGS			.,				
TEST NUMBER		61	62	63	64	65	66	67	68
DATE TESTED			6/5/2	2013			7/5/	2013	
RESULTS	Г	3802000		estatoros	r Kantaras	T mesessan	As social		8808
Hilf Density Ratio Standard	%	100	101.5	99.5	105	103.5	96.5	97	96
Moisture Variation from OMC (-Drier/+Wetter)	%	- 2.5	- 1.5	- 0.5	- 2.0	0.0	+ 0.5	0.0	0.0
Specification Density Ratio (Stand	lard)	≥95%	Specific	ation Moi	sture Va	riance fr	om OMC	*	N/A
TEST LOCATION	_		2.0						
Chainage		12	) s <u>a</u>	120	140		590	15.00	1726
Shown on Drawing No			16		7508	/119-2	(A)		Ñ.
Retested by Test		-	i -	1.00				-	
Reduced Level	m	33.87	32.85	35.98	35.87	35.88	35.14	36.17	36.49
300000000000000000000000000000000000000						1			17.8%.33
FIELD & LABORATORY DATA	was T	2.05	2.06	2.03	2.05	2.22	2.07	2.12	2.05
Field Wet Density	t/m³	7055	0 (2005) (50)	C 275.5 For			7.77	1750/177	
Field Moisture Content	%	18.0	16.5	22.5	21.0	16.5	16.5	19.0	17.0
Material retained on 19mm Sieve (wet)	%	<5%	<5%	<5%	<5%	<5%	<5%	<5%	<5%
Lab Compaction result from test number		61	62	63	64	65	66	67	68
Peak Converted Wet Density	t/m³	2.05	2.03	2.04	1.95	2.15	2.15	2.18	2.13
Apparent Optimum Moisture Content	100000	20.5	18.0	23.0	22.5	16.5	16.0	19.0	17.0
Number of Compaction Points		3	3	3	3	3	3	3	3
Test Procedures - See Note Number	ľ	12	12	12	12	12	12	12	12
Material Description - see below	1	2	2	3	3	2	2	2	2
Notes	900							1.5	
Assigned Values have been obtained from our Penrith laborator	y – Accreditat	ion No 2734				10: AS 1289 1.2	.1clause 6.4 (b),	2.11, 5.3.1, 5.5.1,	5.6.1
2: Assigned Values have been obtained from our Prestons laborate	ory – Accredit	ation No 14234	١			11: AS 1289 1.2	1clause 6.4 (b),	2.1.1, 5.3.1, 5.7.1	
3. Results have been calculated using infinite decimal places. Th	erefore, calcul	lated values n	nay vary from the	se shown			.1clause 6.4 (b),	2.11, 5.7.1, 5.8.1	
4: AS 1289 12.1clause 6.4 (b), 2.11, 5.11, 5.3.1, 5.4.1							Г119, Т120, Т166		
5: AS 1289 12.1clause 6.4 (b), 2.11, 5.2.1, 5.3.1, 5.4.1							T120, T166, T173		
6: AS 1289 12.1clause 6.4 (b), 2.11, 5.11, 5.4.1, 5.8.1 7: AS 1289 12.1clause 6.4 (b), 2.11, 5.2.1, 5.4.1, 5.8.1						15: RTA T 120, 16. RTA T 120,			
8: AS 1289 12.1clause 6.4 (b), 2.11, 5.5.1, 5.6.1, 5.8.1						17. RTA T 120,			
9: Full details of Test Procedure 5.8.1available on request						30 G) 3 G 6 G 6 G 6 G 7 G 6 G			
Material Description			manufacture and			A 10. VIII.	CLASS OF		
1 CL-Clays of low plasticity, gravelly clays, sandy clays, silty clays			11. DGS40			* Cement Sta			
<ol><li>CI-Clay of medium plasticity, gravelly clays, sandy clays, silty clays.</li></ol>	ays		12. FCR20			# Lime Stabili			
3. CH-Clays of high plasticity			13. FCR40	nd Conserve		\$ Gypsum Sta	ibilised		
SC-Clayey sands, sand-clay mixtures     SM-Silty sands, sand-silt mixtures			14. RC - Recycle 15. Recycled Ro						
GC-Clayey gravels, gravel-sand-clay mixtures			16. RSB - Recyc						
7. SP-Sand, crushed dust, filling sand, washed sand			17. CSS - Crush						
8. DGB20			18. RSS - Rippe						
9. DGB40			19. Cowels Brow	m					
10. DGS20									



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7/6/2013

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MARYLAND DEVELOPMENT COMPANY PTY LTD C/- LEND LEASE DEVELOPMENT P/L, PO BOX 1124 ST MARYS NSW 1790

Job No: 7508/119 7/6/2013

Date:

PROJECT: SITE FILL TESTING

TEST NUMBER		69	70	71	72	73	74	75	76
DATE TESTED	-		7/5/2	2013	•	8/5/2013		9/5/2013	
<u>RESULTS</u>									
Hilf Density Ratio Standard	%	102.5	96	99.5	94	90	101	101.5	101
Moisture Variation from OMC (-Drier/+Wetter)	%	- 2.5	+ 0.5	0.0	+ 0.5	0.0	0.0	0.0	- 1.5
Specification Density Ratio (Stand	ard)	≥95%	Specifica	ation Mo	isture Va	riance fro	m OMC		N/A%
TEST LOCATION	V6		10						
Chainage	ſ	*	-	(+)	(H)		5(4)	-	-
Shown on Drawing No					7508	119-2			
Retested by Test			) <u>12</u>		82	83	540	5.50	222.6
Reduced Level	m	36.42	36.60	35.79	36.08	31.99	35.53	36.50	36.93
FIELD & LABORATORY DATA									
Field Wet Density	t/m³	2.03	2.08	2.13	2.02	2.05	2.15	2.17	2.11
Field Moisture Content	%	15.0	16.0	17.5	17.5	17.5	18.5	16.5	15.5
Material retained on 19mm Sieve (wet)	%	<5%	<5%	<5%	<5%	<5%	<5%	<5%	<5%
Lab Compaction result from test number		69	70	71	72	73	74	75	76
Peak Converted Wet Density	t/m³	1.98	2.17	2.14	2.15	2.28	2.13	2.14	2.09
Apparent Optimum Moisture Content		17.5	15.5	17.5	17.5	17.5	18.5	16.5	17.0
		3	3	3	3	3	3	3	3
Number of Compaction Points		12	12	12	12	12	12	12	12
Number of Compaction Points Test Procedures - See Note Number					2	2	2	2	

- 4: AS 1289 12.1clause 6.4 (b), 2.11, 5.11, 5.3.1, 5.4.1
- 5: AS 1289 12.1clause 6.4 (b), 2.1.1, 5.2.1, 5.3.1, 5.4.1
- 6: AS 1289 12.1clause 6.4 (b), 2.11, 5.11, 5.4.1, 5.8.1
- 7: AS 1289 12.1clause 6.4 (b), 2.11, 5.2.1, 5.4.1, 5.8.1
- 8: AS 1289 12.1clause 6.4 (b), 2.11, 5.5.1, 5.6.1, 5.8.1
- 9: Full details of Test Procedure 5.8.1available on request

- 13: RTA T111, T119, T120, T166
- 14: RTA T111, T120, T166, T173
- 15: RTA T 120, T 119, T 162 16. RTA T120, T162, T173
- 17. RTA T 120, T 164, T 173

\* Cement Stabilised

\$ Gypsum Stabilised

# Lime Stabilised

#### **Material Description**

- 1 CL-Clays of low plasticity, gravelly clays, sandy clays, silty clays Cl-Clay of medium plasticity, gravelly clays, sandy clays, silty clays
- 3. CH-Clays of high plasticity
- 4. SC-Clayey sands, sand-clay mixtures 5. SM-Silty sands, sand-silt mixtures
- 6. GC-Clayey gravels, gravel-sand-clay mixtures
- 7. SP-Sand, crushed dust, filling sand, washed sand 8. DGB20
- 9. DGB40

13. FCR40 14. RC - Recycled Concrete

11. DGS40

12. FCR20

- 15. Recycled Roadbase
- 16. RSB Recycled Sub-base
- 17. CSS Crushed Sandstone
- 18. RSS Ripped Sandstone 19. Cowels Brown

10. DGS20 on 08 04/13 - issued by ER

TECHNICAL COMPETENCE Accreditation Number 2734

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7/6/2013

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Dow Nieke

Corporate Site Number 2727

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Prestons Laboratory:

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### FIELD DENSITY RESULTS

MARYLAND DEVELOPMENT COMPANY PTY LTD C/- LEND LEASE DEVELOPMENT P/L, PO BOX 1124 ST MARYS NSW 1790

7/6/2013 Date:

Job No:

PROJECT: SITE FILL TESTING

STAGES 4A & 4B, JORDAN SPRINGS

DATE TESTED									
	Ļ			9/5/2013				16/5/2013	
RESULTS									
Hilf Density Ratio Standard	%	107.5	101.5	103	102	104	100	95.5	93.5
Moisture Variation from OMC (-Drier/+Wetter)	%	- 4.5	+ 0.5	0.0	- 0.5	- 1.5	- 2.0	+ 0.5	+ 0.5
Specification Density Ratio (Stand	ard)	≥95%	Specifica	ation Moi	sture Va	riance fr	om OMC	* 2	N/A%
TEST LOCATION	-		wh.			N .		4	
Chainage		9	190	-		•	(-)		100 100
Shown on Drawing No	- 1				7508/	119-2			
Retested by Test	Ī	84	5-6	0+0	7-0	2-3	50-5	(0.40	101
Reduced Level	m	36.57	35.17	36.09	36.06	35.36	36.08	31.96	36.57
1000000 2010	9333	00.01	00.11	00.00	00.00	00.00	00.00	01.00	00.01
FIELD & LABORATORY DATA	700								
Field Wet Density	t/m³	2.09	2.15	2.23	2.19	2.22	2.10	2.08	2.01
Field Moisture Content	%	14.0	16.5	15.0	13.0	13.5	14.5	15.0	15.5
Material retained on 19mm Sieve (wet)	%	<5%	<5%	<5%	<5%	<5%	<5%	<5%	<5%
Lab Compaction result from test number	70	77	78	79	80	81	82	83	84
Peak Converted Wet Density	t/m³	1.94	2.12	2.16	2.15	2.13	2.10	2.18	2.15
	VIII	- NO.	7007	3 2500050			05300000	1510E	
Apparent Optimum Moisture Content	-	18.5	16.0	15.0	13.5	15.0	16.5	14.5	15.5
Number of Compaction Points	-	3	3	3	3	3	3	3	3
Test Procedures - See Note Number		12	12	12	12	12	12	12	12
Material Description - see below		2	2	2	2	2	2	2	2
Notes  1. Assigned Values have been obtained from our Penrith laborator  2. Assigned Values have been obtained from our Prestons laborate  3. Results have been calculated using infinite decimal places. The  4: AS 1289 12.1clause 6.4 (b), 2.11, 5.11, 5.3.1, 5.4.1  5: AS 1289 12.1clause 6.4 (b), 2.11, 5.21, 5.3.1, 5.4.1  6: AS 1289 12.1clause 6.4 (b), 2.11, 5.21, 5.4.1, 5.8.1  7: AS 1289 12.1clause 6.4 (b), 2.11, 5.21, 5.4.1, 5.8.1  8: AS 1289 12.1clause 6.4 (b), 2.11, 5.5.1, 5.6.1, 5.8.1  9: Full details of Test Procedure 5.8.1 available on request	ory – Accredit	tation No 14234		se shown		11: AS 1289 1.2. 12: AS 1289 1.2 13: RTAT111, T	T162, T173	2.11, 5.3.1, 5.7.1	
Material Description  1. CL-Clays of low plasticity, gravelly clays, sandy clays, silty clays  2. Cl-Clay of medium plasticity, gravelly clays, sandy clays, silty clays  3. CH-Clays of high plasticity  4. SC-Clayey sands, sand-clay mixtures  5. SM-Silty sands, sand-silt mixtures  6. GC-Clayey gravels, gravel-sand-clay mixtures  7. SP-Sand, crushed dust, filling sand, washed sand	iys		11. DGS40 12. FCR20 13. FCR40 14. RC - Recycle 15. Recycled Ro 16. RSB - Recycle 17. CSS - Crush	adbase led Sub-base		* Cement Stat # Lime Stabilis \$ Gypsum Sta	sed		



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### FIELD DENSITY RESULTS

MARYLAND DEVELOPMENT COMPANY PTY LTD C/- LEND LEASE DEVELOPMENT P/L, PO BOX 1124 ST MARYS NSW 1790

Date: 7/6/2013

Job No:

PROJECT: SITE FILL TESTING

STAGES 4A & 4B, JORDAN SPRINGS

TECT NUMBER		Г	85	86	87	88	89	90	91	92
TEST NUMBER		-	00	00	0/	502.57	(7.55)	90	91	92
DATE TESTED						20/5	/2013			
RESULTS										
Hilf Density Ratio	Standard	%	94	96	96	97.5	100.5	98.5	100.5	98
Moisture Variation from	n OMC (-Drier/+Wetter)	%	+ 2.0	0.0	- 1.5	- 1.5	- 2.0	0.0	0.0	0.0
Specification	Density Ratio (Standa	ard)	≥95%	Specific	ation Moi	sture Va	riance fr	om OMC		N/A
TEST LOCATION				20						
Chainage			- 1	12		(1 <b>4</b> 0)	1	590	5.63	2246
Shown on Drawing No				Li-		7508	/119-2			
Retested by Test		-	102			7000	1102			
Reduced Level		m	36.52	36.67	37.12	37.44	37.50	37.28	38.83	35.49
Reduced Level		- 111	30.32	30.07	31.12	31.44	37.30	31.20	30.03	33.49
FIELD & LABORAT	ORY DATA									
Field Wet Density		t/m³	2.01	2.03	1.99	1.99	2.08	2.09	2.08	2.08
Field Moisture Content		%	16.0	16.5	15.5	14.5	17.0	17.0	17.5	17.5
		1765								_
Material retained on	19mm Sieve (wet)	%	<5%	<5%	<5%	<5%	<5%	<5%	<5%	<5%
Lab Compaction result from	test number		85	86	87	88	89	90	91	92
Peak Converted Wet Densit	y	t/m³	2.14	2.11	2.07	2.04	2.07	2.12	2.07	2.12
Apparent Optimum Moisture	e Content		14.0	16.5	17.0	16.0	19.5	17.5	17.5	17.5
Number of Compaction Poi	nts		3	3	3	3	3	3	3	3
Test Procedures - See Note	Number		12	12	12	12	12	12	12	12
Material Description - see b	elow	h	2	2	2	2	2	2	2	2
2: Assigned Values have been of 3. Results have been calculated 4: AS 1289 12.1 clause 6.4 (b), 2.1 5: AS 1289 12.1 clause 6.4 (b), 2.1 6: AS 1289 12.1 clause 6.4 (b), 2.1 7: AS 1289 12.1 clause 6.4 (b), 2.1 8: AS 1289 12.1 clause 6.4 (b), 2.1 9: Full details of Test Procedure	1, 5,2,1,5,3,1,5,4,1 1,5,1,5,4,1,5,8,1 1,5,2,1,5,4,1,5,8,1 11,5,5,1,5,6,1,5,8,1 5,8,1 available on request	y – Accredit	ation No 14234		ose shown		11: AS 1289 1.2. 12: AS 1289 1.2 13: RTA T111, T	1clause 6.4 (b), .1clause 6.4 (b), .119, T120, T166 .120, T166, T173 T119, T162 T162, T173		5.6.1
Material Description  1. CL-Clays of low plasticity, grave				11. DGS40			* Cement Stat	ollicad		
	any ciays, sandy ciays, siny ciays ravelly clays, sandy clays, silty clay	'S		12. FCR20			# Lime Stabilis			
CH-Clays of high plasticity	,, -, ,			13. FCR40			\$ Gypsum Sta			
4. SC-Clayey sands, sand-clay m				14. RC - Recycle			30			
<ol><li>SM-Silty sands, sand-silt mixt.</li></ol>				15. Recycled Ro						
6. GC-Clayey gravels, gravel-sand				16. RSB - Recyc						
<ol> <li>SP-Sand, crushed dust, filling</li> </ol>	sand, washed sand			17. CSS - Crush						
8. DGB20 9. DGB40				18. RSS - Rippe 19. Cowels Brow						
9. DGB40 10. DGS20				D. COWEIS DIOV	vice:)					

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email: info@geotech.com.au www.geotech.com.au

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# **FIELD DENSITY RESULTS**

MARYLAND DEVELOPMENT COMPANY PTY LTD C/- LEND LEASE DEVELOPMENT P/L, PO BOX 1124 ST MARYS NSW 1790

Date: 7/6/2013

Job No:

PROJECT: SITE FILL TESTING

STAGES 4A & 4B, JORDAN SPRINGS

TEST NUMBER	Г	93	94	95	96	97	98	99	100
	-	93	94	95	(707)	1000	90	99	100
DATE TESTED	<u>.</u>				21/6	/2013			
RESULTS									
Hilf Density Ratio Standard	%	98	98	99	99.5	98	97	98.5	100
Moisture Variation from OMC (-Drier/+Wetter)	%	- 0.5	+ 0.5	+ 0.5	- 2.0	- 0.5	0.0	0.0	- 1.0
Specification Density Ratio (Sta	andard)	≥95%	Specifica	ation Mo	isture Va	riance fr	om OMC	i.	N/A
TEST LOCATION	_		×v.						
Chainage		2	- 12	-	1940	120	540	5.45	1726
Shown on Drawing No					7508	119-2			
Retested by Test	F	-		-				-	-
Reduced Level	m	35.91	36.15	36.21	34.99	35.78	35.47	35.76	36.16
	10	117777							
FIELD & LABORATORY DATA		0.04	0.00	0.00	0.00	0.00	0.07	0.00	0.00
Field Wet Density	t/m³	2.01	2.00	2.06	2.03	2.09	2.07	2.09	2.08
Field Moisture Content	%	16.0	15.5	15.5	15.5	15.5	15.0	15.0	14.5
Material retained on 19mm Sieve (wet)	%	<5%	<5%	<5%	<5%	<5%	<5%	<5%	<5%
Lab Compaction result from test number		93	94	95	96	97	98	99	100
Peak Converted Wet Density	t/m³	2.05	2.04	2.08	2.04	2.13	2.13	2.12	2.08
Apparent Optimum Moisture Content	5,5000,0	16.5	15.0	15.0	18.0	16.0	15.0	15.0	15.5
Number of Compaction Points		3	3	3	3	3	3	3	3
Test Procedures - See Note Number	-	12	12	12	12	12	12	12	12
Material Description - see below		2	2	2	2	2	2	2	2
Notes					-	-			77.
Assigned Values have been obtained from our Penrith labo     Assigned Values have been obtained from our Prestons lab     Results have been calculated using infinite decimal places     As 1289 12. Iclause 6.4 (b), 2.11, 5.1, 5.3.1, 5.4.1     AS 1289 12. Iclause 6.4 (b), 2.11, 5.2.1, 5.3.1, 5.4.1     AS 1289 12. Iclause 6.4 (b), 2.11, 5.2.1, 5.3.1, 5.4.1     AS 1289 12. Iclause 6.4 (b), 2.11, 5.2.1, 5.4.1, 5.8.1     AS 1289 12. Iclause 6.4 (b), 2.11, 5.2.1, 5.6.1, 5.8.1     Full details of Test Procedure 5.8.1 available on request	oratory – Accredit	ation No 14234		ise shown	:	11: AS 1289 1.2. 12: AS 1289 1.2 13: RTA T111, T	1clause 6.4 (b), 1clause 6.4 (b), 119, T120, T166 120, T166, T173 T119, T162 T162, T173	211,531,551, 211,531,571 211,571,581	
Material Description  1 CL-Clays of low plasticity, gravelly clays, sandy clays, silty of C-Clays of medium plasticity, gravelly clays, sandy clays, silt of CH-Clays of high plasticity  4. SC-Clayey sands, sand-clay mixtures  5. SM-Silty sands, sand-silt mixtures  6. GC-Clayey gravels, gravel-sand-clay mixtures  7. SP-Sand, crushed dust, filling sand, washed sand  8. DGB20  9. DGB40  10. DGS20			11. DGS40 12. FCR20 13. FCR40 14. RC - Recycle 15. Recycled Rc 16. RSB - Recycle 17. CSS - Crust 18. RSS - Rippe 19. Cowels Brov	hadbase cled Sub-base ned Sandstone nd Sandstone		* Cement Stat # Lime Stabilis \$ Gypsum Stat	sed		

Form No R 020 Version 08 04/13 - issued by ER



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#### FIELD DENSITY RESULTS

MARYLAND DEVELOPMENT COMPANY PTY LTD C/- LEND LEASE DEVELOPMENT P/L, PO BOX 1124 ST MARYS NSW 1790

Date: 7/6/2013

Job No:

PROJECT: SITE FILL TESTING

STAGES 4A & 4B, JORDAN SPRINGS

TEST NUMBER	Γ	101	102						
DATE TESTED		31/5	/2013			10.		3.0	
DATESTED	-		4.			100	100	388	:25
RESULTS									
Hilf Density Ratio Standard	%	102	99.5						
Moisture Variation from OMC (-Drier/+Wetter)	%	- 1.5	- 2.0						
Specification Density Ratio (Stand	lard)	≥95%	Specificat	ion Moi	sture V	ariance 1	rom OMC		N/A
TEST LOCATION	-		¥0 40			20	**		-17
Chainage		¥	12						
Shown on Drawing No		7508	/119-2						
Retest of Test		84	85						
Reduced Level	m	36.62	36.49						
FIELD & LABORATORY DATA									
Field Wet Density	t/m³	2.09	2.10	Ť		<b>*</b>	Ť	*	1
Field Moisture Content	%	15.5	14.5					3	-
	(0.00)	<5%	<5%			-	-	1	4
Material retained on 19mm Sieve (wet)	%					+	-	-	+
Lab Compaction result from test number	32 SS	101	102					-	
Peak Converted Wet Density	t/m³	2.05	2.11						
Apparent Optimum Moisture Content		17.0	17.0						
Number of Compaction Points		3	3						
Test Procedures - See Note Number		12	12						Ĭ
Material Description - see below		2	2						
Notes									
1 Assigned Values have been obtained from our Penrith laborator						10: AS 1289	1.2.1 clause 6.4 (b)	, 2.11, 5.3.1, 5.5.	1, 5.6.1
2: Assigned Values have been obtained from our Prestons laborate							l2.1clause 6.4 (b)		
<ol> <li>Results have been calculated using infinite decimal places. The</li> <li>AS 1289 12.1 clause 6.4 (b), 2.11, 5.11, 5.3.1, 5.4.1</li> </ol>	erefore, calcu	lated values n	nay vary from those	shown			1.2.1 clause 6.4 (b) 1, T119, T120, T166		1
5: AS 1289 12.1 clause 6.4 (b), 2.1 ( 5.2 1, 5.3 1, 5.4 1							1, T 120, T 166, T 173		
6: AS 1289 12.1clause 6.4 (b), 2.11, 5.11, 5.4.1, 5.8.1							0, T119, T162		
7: AS 1289 12.1clause 6.4 (b), 2.11, 5.2.1, 5.4.1, 5.8.1						16. RTA T12	0, T 162, T 173		
8: AS 1289 12.1clause 6.4 (b), 2.11, 5.5.1, 5.6.1, 5.8.1						17. RTA T12	0, T 164, T 173		
9: Full details of Test Procedure 5.8.1available on request									
Material Description			11 DGS40			* Cement S	e i distribuica		
<ol> <li>CL-Clays of low plasticity, gravelly clays, sandy clays, silty clays</li> <li>Cl-Clay of medium plasticity, gravelly clays, sandy clays, silty clays</li> </ol>	aue.		12. FCR20			# Lime Stab			
<ol><li>CH-Clays of high plasticity, gravery clays, sandy clays, sitty clays.</li></ol>	7.5		13. FCR40			\$ Gypsum 5			
SC-Clayey sands, sand-clay mixtures			14. RC - Recycled	Concrete			500		
<ol><li>SM-Silty sands, sand-silt mixtures</li></ol>			15. Recycled Road						
<ol><li>GC-Clayey gravels, gravel-sand-clay mixtures</li></ol>			16. RSB - Recycled						
7. SP-Sand, crushed dust, filling sand, washed sand			17. CSS - Crushed						
8. DGB20 9. DGB40			18. RSS - Ripped 3 19. Cowels Brown	andstone					
10. DGS20			D. JUNGS DIOWIT						



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# **APPENDIX B**

SUMMARY OF FIELD DENSITY TESTING FOR ROADWORKS

Report 7508/121-AA Report 7508/125-AA





Job No: 7508/121 Our Ref: 7508/121-AA 30 August 2013

Maryland Development Company Pty Ltd c/- Lend Lease Development Pty Ltd P O Box 1870

PENRITH NSW 2751

Attention: Mr A Ali

Dear Sir

re: Jordan Springs - Stage 4A

> Penrith City Council DA 12/0897 - Condition No. 65(f) Summary of Field Density Testing for Road Works

Geotech Testing Pty Ltd carried out field density tests and associated laboratory compaction tests at the above project to satisfy the following Penrith City Council (PCC) requirement under DA 12/0897.

Condition No. 65(f) - A Geotechnical Report certifying that all earthworks and road formation have been completed in accordance with AS3798 and Council's Design Guidelines and Construction specifications. The report shall include:

- Compaction reports for road pavement construction
- Compaction reports for bulk earthworks and lot regrading.
- Soil classification for all residential lots
- Statement of Compliance

The tests carried out assessed the degree of compaction in the subgrade and road pavement materials at the above site. All testing was undertaken within the terms of our NATA accreditation, at the dates and to the procedures shown on the attached test results certificates.

Field density tests were generally carried out at approximately 50 metre intervals. At the time of testing, there was no visible indication in the area surrounding each test that the area had been compacted in a manner different from that at the test location. Our observations did not include roller testing of any of the layers.

Laboratory compaction tests were carried out in accordance with AS1289 5.1.1 (Standard Compaction) and AS1289 5.2.1 (Modified Compaction). Where the density test results failed to indicate that the specified minimum dry density ratios (AS1289 5.4.1) had been achieved, the contractor was so advised. After the contractor advised that re-working had been carried out, the failed areas were retested. This process was repeated until the test results met the specification requirements.

7508/121-AA Stage 4A – Jordan Springs Summary of Field Density Testing for Road Works

We understand that the specification requirements for this project set by Penrith City Council are as follows.

Basecourse	98%	Modified
Sub-basecourse	95%	Modified
Subgrade	100%	Standard

The test numbers corresponding to the different locations/pavement layers tested are shown below.

ROAD 21							
Ch	225	275	325	375	425	460	
Subgrade	5/8	9	10	97	28	29	
Sub-base 1	20/21	22	23	39	40	53	
Sub-base 2	35/36	37	38	98	99	54	
Base	41/42	43	44	59	60	61	
ROAD 1							
Ch	25	75	125	175	225	275	325
Subgrade	30	6	7	1	2	3	4
Sub-base 1	49	24	25	26	27	101	50
Sub-base 2	62/55	63	64	65	66	67	56/68
Base	91	71	45	46	47	48	72
Ch	375	425	825	875	925	975	1025
Subgrade	103	102	11	12	13	14	83
Sub-base 1	51	52	75	76	77	78	79
Sub-base 2	57/69	58/70	80	81	82	88	89
Base	73	74	84	85	86	87	90
ROAD 2							
Ch	15	65	115	165	215		
Subgrade	15	16	17	18	19		
Sub-base	31	32	33	34	100		
Base	92	93	94	95	96		

It is our opinion that the pavement materials have been tested and satisfy the required specifications.

Yours faithfully GEOTECH TESTING PTY LTD

EMGED RIZKALLA Director

Attached Compaction Control Tests Nos 1 to 103





#### FIELD DENSITY RESULTS

MARYLAND DEVELOPMENT COMPANY PTY LTD C/- LEND LEASE DEVELOPMENT P/L, PO BOX 1124 ST MARYS NSW 1790

Date: 11/6/2013

Job No:

PROJECT: PAVEMENT TESTING

STACE AN IODDAN SPRINGS

TEST NUMBER			1	2	3	4	5	6	7	8
DATE TESTED				01/05	/2013	10	08/05/2013	09/05	09/05/2013	
RESULTS				800	54	ing	350 590	5	66	2-20
Density Ratio	Standard	%	106	106	101.5	103	105	107.5	104	101.5
Moisture Variation fr	rom OMC (-Drier/+Wetter)	%	- 3.0	- 3.5	- 0.5	- 2.0	- 0.5	- 3.0	- 1.5	- 2.5
Specification	Density Ratio (Stan	dard)	≥100%	Specific	ation Mo	isture Va	ariance fro	m OMC	22	N/A%
TEST LOCATION	N	102		XII	AN				N.	200
Chainage	(Carriageway L/R)	m	175	225	275	325	225	75	125	275
Road Name/Number			Roa	ad 1	50	Road 21	Roa	ad 1	Road 21	
Retested by test			₩.		(*)		983	250	38.3	(0 <b>#</b> ):
Level				X17	**	Sub	grade			37
FIELD & LABOR	ATORY DATA									
Field Dry Density	8	t/m³	1.83	1.78	1.80	1.78	1.98	1.95	1.98	1.96
Field Moisture Content		%	16.0	16.9	16.9	16.6	13.3	12.1	12.8	10.5
Material retained on	19 mm Sieve	%	<5	<5	<5	<5	<5	<5	<5	<5
Lab compaction result fro	om test number	.000	1	2	3	4	5	6	7	8
Maximum Dry Density		t/m³	1.73	1.68	1.77	1.73	1.89	1.81	1.90	1.93
Number of Compaction I	Points		4	4	4	4	4	4	4	4
Optimum Moisture Conte	ent	%	19.0	20.5	17.5	18.5	14.0	15.0	14.5	13.0
Test Procedures - See N	lotes		6	6	6	6	6	6	6	6
Material Description - se	e below		2	2	2-3	2	2	2	2	1-2

- Assigned Values have been obtained from our Penrith laboratory Accreditation No 2734
- 2: Assigned Values have been obtained from our Prestons laboratory Accreditation No 14234
- 3. Results have been calculated using infinite decimal places. Therefore, calculated values may vary from those shown
- 4: AS 1289 12.1 clause 6.4 (b), 2.11, 5.11, 5.3.1, 5.4.1 5: AS 1289 12.1 clause 6.4 (b), 2.11, 5.2.1, 5.3.1, 5.4.1
- 6: AS 1289 12.1clause 6.4 (b), 2.11, 5.11, 5.4.1, 5.8.1
- 7: AS 1289 12.1clause 6.4 (b), 2.11, 5.2.1, 5.4.1, 5.8.1
- 8: AS 1289 12.1clause 6.4 (b), 2.11, 5.5.1, 5.6.1, 5.8.1 9: Full details of Test Procedure 5.8.1available on request

- 10: AS 1289 1.2.1 clause 6.4 (b), 2.11, 5.3.1 5.5.1 5.6.1
- 1t AS 1289 12.1 clause 6.4 (b), 2.11, 5.3.1, 5.7.1
- 12. AS 1289 12.1 clause 6.4 (b), 2.11, 5.7.1, 5.8.1
- 13: RTA T111, T119, T120, T166 14: RTA T111, T120, T166, T173
- 15: RTA T 120, T 119, T 162
- 16. RTA T 120, T 162, T 173
- 17. RTA T 120, T 164, T 173

\* Cement Stabilised

\$ Gypsum Stabilised

# Lime Stabilised

#### **Material Description**

- 1 CL-Clays of low plasticity, gravelly clays, sandy clays, silty clays
- CI-Clay of medium plasticity, gravelly clays, sandy clays, silty clays 3. CH-Clays of high plasticity
- 4. SC-Clayey sands, sand-clay mixtures
- 5. SM-Silty sands, sand-silt mixtures
- GC-Clayey gravels, gravel-sand-clay mixtures
   SP-Sand, crushed dust, filling sand, washed sand
- 8. DGB20
- 9 DGB40 10 DGS20

- 11 DGS40 12. FCR20
- 13. FCR40
- 14. RC Recycled Concrete
- 15. Recycled Roadbase
- 16. RSB Recycled Sub-base
- 17. CSS Crushed Sandstone 18. RSS - Ripped Sandstone
- 19. Cowels Brown

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Approved Signatory

w Nieke

11/6/2013

TECHNICAL COMPETENCE Accreditation Number 2734

Corporate Site Number 2727

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Job No:

# **FIELD DENSITY RESULTS**

MARYLAND DEVELOPMENT COMPANY PTY LTD C/- LEND LEASE DEVELOPMENT P/L, PO BOX 1124

ST MARYS NSW 1790 Date: 11/6/2013

PROJECT: PAVEMENT TESTING

STAGE 4A, JORDAN SPRINGS

TEST NUMBER			9	10	11	12	13	14	15	16
DATE TESTED			13/0	5/2013		15/05	5/2013		16/05	/2013
NATIONAL OF BRIDGE TO A TOWN										
RESULTS	10251 \$1 \$1	Γ				T	1			
Density Ratio	Standard	%	109.5	108	110	108	109.5	110	107.5	104.5
Moisture Variation fr	rom OMC (-Drier/+Wetter)	%	- 6.0	- 5.0	- 5.5	- 3.5	- 4.5	- 4.0	- 4.5	- 4.0
Specification	Density Ratio (Stand	lard)	≥100%	Specific	ation Mo	isture Va	riance fr	om OMC	2	N/A%
TEST LOCATION	ASSET 4511 STREET	_	1000000	***						
Chainage	(Carriageway L/R)	m	325	375	825	875	925	975	15	65
Road Name/Number			Roa	ad 21		Ro	ad 1		Roa	ad 2
Retested by test					(2)	250		(:5)	10.7%	10.56
Level				W		Sub	grade		X :	
FIELD & LABOR	ATORY DATA									
Field Dry Density	ALIGHT DATE	t/m³	1.93	1.98	1.87	1.90	1.99	1.98	1.95	1.91
Field Moisture Content		%	10.7	10.4	15.6	14.3	11.4	12.0	11.0	12.2
Material retained on	10 Ci	%	<5	<5	<5	<5	<5	<5	<5	<5
	19 mm Sieve	%	Children .	10.75	98.53	1000		1007	2000	0.00
Lab compaction result fro	om test number		9	10	11	12	13	14	15	16
Maximum Dry Density		t/m³	1.76	1.83	1.70	1.76	1.82	1.80	1.81	1.83
Number of Compaction I	Points		4	4	4	4	4	4	4	4
Optimum Moisture Conte	ent	%	16.5	15.5	21.0	18.0	16.0	16.0	15.5	16.0
Test Procedures - See N	Votes	DOA PAR	6	6	6	6	6	6	6	6
Material Description - se			2	2	3	2	2	2	2	2
2: Assigned Values have bee	, 211, 5.21, 5.31, 5.4.1 , 211, 5.11, 5.41, 5.8.1 , 211, 5.21, 5.41, 5.8.1 , 211, 5.5.1, 5.6.1, 5.8.1	ory – Accredi	ation No 1423		ise shown	-	11: AS 1289 1.2. 12: AS 1289 1.2 13: RTA T111, T	1clause 6.4 (b), 1clause 6.4 (b), 119, T 120, T 166 120, T 166, T 173 T 119, T 162 T 162, T 173	2.11, 5.3.1, 5.5.1, 2.11, 5.3.1, 5.7.1 2.11, 5.7.1, 5.8.1	5.6.1
	rravelly clays, sandy clays, silty clays y, gravelly clays, sandy clays, silty cla ly mixtures nixtures sand-clay mixtures	ays		11. DGS40 12. FCR20 13. FCR40 14. RC - Recycled Rc 16. RSB - Recycled Rc 17. CSS - Crusl 18. RSS - Rippi 19. Cowels Brox	hadbase cled Sub-base ned Sandstone nd Sandstone		Cament Stat # Lime Stabilis \$ Gypsum Stat	sed		

Form No R022 Version 18 03/13 - Issued by ER



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11/6/2013

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Approved Signatory

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Job No:

### **FIELD DENSITY RESULTS**

MARYLAND DEVELOPMENT COMPANY PTY LTD C/- LEND LEASE DEVELOPMENT P/L, PO BOX 1124

ST MARYS NSW 1790 Date: 11/6/2013

PROJECT: PAVEMENT TESTING

STAGE 4A, JORDAN SPRINGS

TEST NUMBER			17	18	19			
DATE TESTED				16/05/2013				
RESULTS		-		F		T.		-
Density Ratio	Standard	%	105.5	106	107			
Moisture Variation f	rom OMC (-Drier/+Wetter)	%	- 4.0	- 3.5	- 2.5			: 8
Specification	Density Ratio (Stand	ard)	≥100%	Specific	ation Moistu	re Variance f	rom OMC	N/A
TEST LOCATION	N			100				
Chainage	(Carriageway L/R)	m	115	165	215			
Road Name/Number	1	53300		Road 2				
Retested by test		- 1	- 62	100	1 121	10	1	
Level		f		Subgrade				
					.1	4	1	
FIELD & LABOR	ATORY DATA		4.04	4.00	4.05	ar .		- 4
Field Dry Density		t/m³	1.91	1.93	1.95			_
Field Moisture Content		%	11.9	11.9	13.0			
Material retained on	19 mm Sieve	%	<5	<5	<5			
Lab compaction result from	om test number		17	18	19			
Maximum Dry Density		t/m³	1.81	1.82	1.82			
Number of Compaction	Points		4	4	4			
Optimum Moisture Cont		%	16.0	15.5	15.5	14	3	
Test Procedures - See N		70	6	6	6			
Material Description - se		-	2	2	2			
2: Assigned Values have ber 3: Results have been calcula 4: AS 1289 12.1clause 6.4 (b) 5: AS 1289 12.1clause 6.4 (b) 6: AS 1289 12.1clause 6.4 (b) 7: AS 1289 12.1clause 6.4 (b) 8: AS 1289 12.1clause 6.4 (b)	), 2.11, 5.21, 5.3.1, 5.4.1 ), 2.11, 5.11, 5.4.1, 5.8.1 ), 2.11, 5.21, 5.4.1, 5.8.1	ry – Accredi	tation No 14234		sse shown	11: AS 1289 1. 12: AS 1289 1 13: RTA T111,	), T 162, T 173	.1, 5.7.1
	On gravelly clays, sandy clays, silty clays ty, gravelly clays, sandy clays, silty clay	ys		11. DGS40 12. FCR20		* Cement St # Lime Stabi		
<ol><li>CH-Clays of high plasticity</li></ol>				13. FCR40	29007 (same 5)	\$ Gypsum S	tabilised	
4. SC-Clayey sands, sand-cla				14. RC - Recycl				
<ol> <li>SM-Silty sands, sand-silt r</li> <li>GC-Clayey gravels, gravel-</li> </ol>				15. Recycled Ro 16. RSB - Recycled Ro				
<ol> <li>SP-Sand, crushed dust, fil</li> </ol>	[1] [1] [1] [1] [1] [1] [1] [1] [1] [1]			17. CSS - Crush				
8. DGB20				18. RSS - Rippe				
9. DGB40				19. Cowels Brow	m			
10 DGS20								

10. DGS20 Form No R022 Version 18 03/13 - Issued by ER



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E van Niekerk 11/6/2013

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MARYLAND DEVELOPMENT COMPANY PTY LTD C/- LEND LEASE DEVELOPMENT P/L, PO BOX 1124 ST MARYS NSW 1790

Job No: 7508/121

11/6/2013

Date:

PROJECT: PAVEMENT TESTING

STAGE 4A, JORDAN SPRINGS

TEST NUMBER			20	21	22	23	24	25	26	27
DATE TESTED				16/05	/2013	•		21/05	/2013	
RESULTS		Œ				Į.				
Density Ratio	Modified	%	100	97	99.5	97	99	97.5	100	98
Moisture Variation fr	rom OMC (-Drier/+Wetter)	%	- 1.0	- 1.0	- 1.5	- 1.0	+ 0.5	- 0.5	- 1.0	+ 1.0
Specification	Density Ratio (Modif	ied)	≥95%	Specific	ation Mo	isture Va	riance fr	om OMC		N/A
TEST LOCATION	١	93		200	64	èd	500	O) 5	y/ :	2
Chainage	(Carriageway L/R)	m	225 L	275 R	325	375	75	125	175	225
Road Name/Number				Roa	d 21		8	Roa	ad 1	b.
Retested by test		-	24	-	(4)	(4)		(*)	()=1	825
Level		-		Sub-bas	a Laver 1			Sub-	-base	
20101		85		Oub oud	Layor			Oub	buou	
FIELD & LABORA	ATORY DATA									
Field Dry Density		t/m³	2.18	2.11	2.17	2.12	2.16	2.13	2.18	2.14
Field Moisture Content		%	5.4	5.6	5.2	5.7	7.1	5.9	5.3	7.3
Material retained on	37.5 mm Sieve	%	<5	<5	<5	<5	<5	<5	<5	<5
Assigned Value Number		,,,				- T	5CSS-35			
Maximum Dry Density		t/m³	2.18	2.18	2.18	2.18	2.18	2.18	2.18	2.18
Number of Compaction F	Points	VIII	4	4	4	4	4	4	4	4
		%	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5
Optimum Moisture Conte		/0	7	7		7	7			
Test Procedures - See N		-	- 15	35.	7	12.5		7	7	7
Material Description - see	e below	1.0	17	17	17	17	17	17	17	17
2: Assigned Values have bee	, 211, 5.21, 5.31, 5.4.1 , 211, 5.11, 5.4.1, 5.8.1 , 211, 5.21, 5.4.1, 5.8.1 , 211, 5.5.1, 5.6.1, 5.8.1	ry – Accredit	ation No 14234		se shown		1t: AS 1289 1.2. 12. AS 1289 1.2 13: RTA T111, T	T120, T166, T173 T119, T162 T162, T173	2.11, 5.3.1, 5.7.1	
Material Description 1 CL-Clays of low plasticity, g 2. Cl-Clay of medium plasticity	ys	11. DGS40 12. FCR20				* Cement Stat # Lime Stabilis				
<ol> <li>CH-Clays of high plasticity</li> <li>SC-Clayey sands, sand-cla</li> </ol>	000		13. FCR40 14. RC - Recycle			\$ Gypsum Sta	bilised			
5. SM-Silty sands, sand-silt m				15. Recycled Ro						
<ol> <li>GC-Clayey gravels, gravel-s</li> <li>SP-Sand, crushed dust, fill</li> </ol>	\$ \$ L.B. C.			16. RSB - Recyc 17. CSS - Crush						
8. DGB20	9			18. RSS - Rippe						

10. DGS20

9. DGB40



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11/6/2013

Approved Signatory

Boon Nieke

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19. Cowels Brown

Prestons Laboratory:

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MARYLAND DEVELOPMENT COMPANY PTY LTD C/- LEND LEASE DEVELOPMENT P/L, PO BOX 1124 ST MARYS NSW 1790

Date: 11/6/2013

7508/121

Job No:

PROJECT: PAVEMENT TESTING

STAGE 4A, JORDAN SPRINGS

	STAGE 4A, JORDAN SI	IVIIVO				44				
TEST NUMBER		Î	28	29	, i					
DATE TESTED		1	27/05	/2013			+	*		-
DATE TESTED		ı, L	27700	W2010	3		- 10		29	7.5
RESULTS										
Density Ratio	Standard	%	102	105.5						
Moisture Variation fr	om OMC (-Drier/+Wetter)	%	+ 1.5	- 1.0						82
Specification	Density Ratio (Standa	rd)	≥100%	Specifica	tion Mo	isture \	/ariance	from OMC		N/A%
TEST LOCATION	ĺ	.80		1			28		24	1200
Chainage	(Carriageway L/R)	m	225 R	375						
Road Name/Number			Road 21	Road 1			A	- 0		3 3
Retested by test		-	TTOUG Z I	Ttodd 1			-	-19		- 22
		1	Cube	- rodo	-					77
Level		-	Subg	grade				- 3	6	8
FIELD & LABORA	ATORY DATA									
Field Dry Density		t/m³	1.82	1.85			1			
Field Moisture Content		%	17.3	16.4			-	- 10		100
Material retained on	19 mm Sieve	%	<5	<5	-			- 3		8
		70					-	-23		
Lab compaction result fro	om test number	1000	28	29						
Maximum Dry Density		t/m³	1.78	1.75			- 1	- 0		6
Number of Compaction F	Points		4	4						
Optimum Moisture Conte	ent	%	16.0	17.5						
Test Procedures - See N	lotes		6	6				*		
Material Description - see		f	2	2						
2: Assigned Values have bee	211,521,531,54.1 211,511,541,58.1 211,521,541,58.1 211,551,561,58.1	- Accredi	tation No 14234		e shown		11: AS 1289 12: AS 1289 13: RTA T1 14: RTA T1 15: RTA T1 16: RTA T1	12.1clause 6.4 (b), 12.1clause 6.4 (b), 12.1clause 6.4 (b), 11, T19, T10, T10, 11, T19, T10, T10, 11, T10, T10, T10, 20, T19, T10, 20, T104, T173	2.11, 5.3.1, 5.7.1	Ė
	ravelly clays, sandy clays, silty clays y, gravelly clays, sandy clays, silty clays y mixtures ixtures sand-clay mixtures ing sand, washed sand	Mari		11. DGS40 12. FCR20 13. FCR40 14. RC - Recycled 15. Recycled Road 16. RSB - Recycle 17. CSS - Crushe 18. RSS - Ripped 19. Cowels Brown	dbase od Sub-base d Sandstone Sandstone		* Cements # Lime Stal \$ Gypsum	bilised		



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03/07/2013

# FIELD DENSITY RESULTS

MARYLAND DEVELOPMENT COMPANY PTY LTD C/- LEND LEASE DEVELOPMENT P/L, PO BOX 1124 ST MARYS NSW 1790

Job No: 7508/121

Date:

PROJECT: PAVEMENT TESTING

STAGE 4A, JORDAN SPRINGS

TEST NUMBER		1	30							
DATE TESTED		0	30/05/2013							
RESULTS		-						_	_	
Density Ratio	Standard	%	106						33.00	
Moisture Variation fro	om OMC (-Drier/+Wetter)	%	- 2.0							
Specification	Density Ratio (Stand	ard)	≥100%	Specifica	ion Mo	isture V	ariance f	rom OMO		N/A%
TEST LOCATION								,		
Chainage	(Carriageway L/R)	m	25							
Road Name/Number			Road 1							
Retested by test			(4)	20					(4.6)	
Level			Subgrade					22		\$ 5
FIELD & LABORA	TORY DATA									
Field Dry Density	NONI DAIA	t/m³	1.90	8				4	92	- 6
Field Moisture Content		%	14.0	<u> </u>				2	54 P2	-
Material retained on	19 mm Sieve	%	<5	et E					(4.8)	
Lab compaction result fro		70		12		5	1	+	S48	+
100.5	iii test numbei	+/1003	30	10					91.9	_
Maximum Dry Density	unias:	t/m³	1.79	8					39.60	+
Number of Compaction P		0/	4	s 8			ļ		20.60	
Optimum Moisture Conte		%	16.0						X 20	
Test Procedures - See No			6						X 20	
Material Description - see	Delow		2	ļ. J						
2: Assigned Values have been obtain	, 5.2.1, 5.3.1, 5.4.1 , 5.1.1, 5.4.1, 5.8.1 , 5.2.1, 5.4.1, 5.8.1 , 5.5.1, 5.6.1, 5.8.1	itation No 1423		e shown			11: AS 1289 1.2 12. AS 1289 1.2 13: RTA T111, 1	Γ162, T173	.1.1, 5.3.1, 5.7.1	5.6.1
Material Description CL-Clays of low plasticity, gravelly clays, sandy clays, silty clays Cl-Clay of medium plasticity, gravelly clays, sandy clays, silty clays CH-Clays of high plasticity SC-Clayey sands, sand-clay mixtures SM-Silty sands, sand-clay mixtures GC-Clayey gravels, gravel-sand-clay mixtures SP-Sand, crushed dust, filling sand, washed sand DGB20 DGB40 DGS20				11. DGS40 12. FCR20 13. FCR40 14. RC - Recycled Cd 15. Recycled Roadb 16. RSB - Recycled S 17. CSS - Crushed S 18. RSS - Ripped Sa 19. Cowels Brown	se Sub-base andstone		* Cement Stabil # Lime Stabilise \$ Gypsum Stabi	d		

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A Kench

03/07/2013

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MARYLAND DEVELOPMENT COMPANY PTY LTD C/- LEND LEASE DEVELOPMENT P/L, PO BOX 1124 ST MARYS NSW 1790

Job No: 7508/121

Date:

03/07/2013

PROJECT: PAVEMENT TESTING

STAGE 4A. JORDAN SPRINGS

TEST NUMBER		8	31	32	33	34	35	36	37	38			
DATE TESTED		Ī				31/05	31/05/2013						
RESULTS		85											
Density Ratio	Modified	%	98	97	97.5	98.5	100.5	101	99.5	99			
Moisture Variation fr	rom OMC (-Drier/+Wetter)	%	+ 1.0	+ 1.0	+ 0.5	+ 0.5	0.0	- 0.5	0.0	- 1.0			
Specification	Density Ratio (Modi	fied)	≥95%	≥95% Specification Moisture Variance from OMC									
TEST LOCATION													
Chainage	(Carriageway L/R)	m	15	65	115	165	225 L	225 R	275	325			
Road Name/Number			Road 2			24	Roa	d 21	T.:				
Retested by test			-	12	-	-	19	•	1	-			
Level				Sub-bas	e Layer 1			Sub-bas	e Layer 2				
FIELD & LABOR	ATORY DATA												
Field Dry Density		t/m³	2.20	2.17	2.18	2.21	2.19	2.20	2.17	2.16			
Field Moisture Content		%	6.8	6.6	6.3	6.3	6.7	6.2	6.5	5.4			
Material retained on	37.5 mm Sieve	%	16	15	15	15	<5	<5	<5	<5			
Assigned Value Number				260	92	HQW75	CSS-35						
Corrected Maximum Dry	Density	t/m³	2.24	2.24	2.24	2.24	2.18	2.18	2.18	2.18			
Number of Compaction	Points		4	4	4	4	4	4	4	4			
Corrected Optimum Moi		%	5.5	5.5	5.5	5.5	6.50	6.50	6.50	6.50			
Test Procedures - See N			7	7	7	7	7	7	7	7			
Material Description - se				17	17	17	17	17	17	17			

- 1: Assigned Values have been obtained from our Penrith laboratory Accreditation No 2734
- 2: Assigned Values have been obtained from our Prestons laboratory Accreditation No 14234
- 3. Results have been calculated using infinite decimal places. Therefore, calculated values may vary from those shown
- 4: AS 1289 1.2.1 clause 6.4 (b), 2.1.1, 5.1.1, 5.3.1, 5.4.1 5: AS 1289 1.2.1 dause 6.4 (b), 2.1.1, 5.2.1, 5.3.1, 5.4.1
- 6: AS 1289 1.2.1 clause 6.4 (b), 2.1.1, 5.1.1, 5.4.1, 5.8.1
- 7: AS 1289 1.2.1 clause 6.4 (b), 2.1.1, 5.2.1, 5.4.1, 5.8.1
- 8: AS 1289 1.2.1 clause 6.4 (b), 2.1.1., 5.5.1, 5.6.1, 5.8.1
- 9: Full details of Test Procedure 5.8.1 available on request

- 10: AS 1289 1.2.1 clause 6.4 (b), 2.1.1, 5.3.1, 5.5.1, 5.6.1
- 11: AS 1289 1.2.1 clause 6.4 (b), 2.1.1, 5.3.1, 5.7.1
- 12. AS 1289 1.2.1 clause 6.4 (b), 2.1.1, 5.7.1, 5.8.1
- 13: RTA T111, T119, T120, T166 14: RTA T111, T120, T166, T173
- 15: RTA T120, T119, T162
- 16. RTA T120, T162, T173
- 17. RTA T120, T164, T173

\* Cement Stabilised

\$ Gypsum Stabilised

# Lime Stabilised

#### Material Description

- CL-Clays of low plasticity, gravelly clays, sandy clays, silty clays
- CI-Clay of medium plasticity, gravelly clays, sandy clays, silty clays
- CH-Clays of high plasticity
- SC-Clayey sands, sand-clay mixtures SM-Silty sands, sand-silt mixtures
- GC-Clayey gravels, gravel-sand-clay mixtures
- SP-Sand, crushed dust, filling sand, washed sand
- DGB20
- DGB40 0. DGS20

- 11. DGS40
- 12. FCR20
- 13. FCR40
- 14. RC Recycled Concrete
- 15. Recycled Roadbase 16. RSB - Recycled Sub-base
- 17. CSS Crushed Sandstone
- 18. RSS Ripped Sandstone
- 19. Cowels Brown

Form No R022 Version 18 06/13 - issued by ER



Accredited for compliance with ISO/IEC 17025.

A Kench

03/07/2013

Accreditation Number 2734 Corporate Site Number 2727

Head Office:

34 Borec Road, Penrith NSW 2750 P O Box 880 Penrith NSW 2751

Telephone: (02) 4722 2744 Facsimile: (02) 4722 2777

Prestons Laboratory:

Unit 4, 18-20 Whyalla Place, Prestons NSW 2170 Telephone: (02) 9607 6111 Facsimile: (02) 9607 6200

email: info@geotech.com.au www.geotech.com.au

Approved Signatory





MARYLAND DEVELOPMENT COMPANY PTY LTD C/- LEND LEASE DEVELOPMENT P/L, PO BOX 1124 ST MARYS NSW 1790

Job No: 7508/121

Date:

03/07/2013

PROJECT: **PAVEMENT TESTING** 

STAGE 4A JORDAN SPRINGS

STAG	SE 4A, JORDAN S	PRING	iS							
TEST NUMBER DATE TESTED			39 04/06	40 5/2013						
RESULTS		8								
Density Ratio	Modified	%	100	100						
Moisture Variation from OM	C (-Drier/+Wetter)	%	- 1.0	- 0.5					3.0	
Specification Dens	ity Ratio (Modifie	d)	≥95%	Specific	ation Mo	oisture V	ariance f	rom OMO		N/A%
TEST LOCATION				W. 32						
Chainage (Carria	geway L/R)	m	375	425	×		ž.	38		
Road Name/Number	· , ,		Roa	d 21	2			4	813	7
Retested by test		F	_	2					(4 6)	÷
Level			Sub-base	e Layer 1	0: 2:			100	(A B)	9
					•		•	7.5		
FIELD & LABORATORY	/ DATA									
Field Dry Density		t/m³	2.18	2.18	¥			2	1980 1980	8
Field Moisture Content		%	5.7	6.2	2.2			20	14.62	5
Material retained on 37.5 m	m Sieve	%	<5	<5		s			S 19	
Assigned Value Number			HQW75	CSS-35			2		p. 19	
Maximum Dry Density		t/m³	2.18	2.18					30.00	
Number of Compaction Points			4	4					20.00	
Optimum Moisture Content		%	6.5	6.5						
Test Procedures - See Notes		Г	7	7					A1 -22	
Material Description - see below			17	17					***	
Notes  1: Assigned Values have been obtained from ou 2: Assigned Values have been obtained from ou 3: Results have been calculated using infinite de: AS 1289 1.2.1 clause 6.4 (b), 2.1.1, 5.1.1, 5.3. 5: AS 1289 1.2.1 clause 6.4 (b), 2.1.1, 5.1.1, 5.4. 7: AS 1289 1.2.1 clause 6.4 (b), 2.1.1, 5.1.1, 5.4. 8: AS 1289 1.2.1 clause 6.4 (b), 2.1.1, 5.2.1, 5.4. 8: AS 1289 1.2.1 clause 6.4 (b), 2.1.1, 5.5.1, 5.6. 9: Full details of Test Procedure 5.8.1 available of	Prestons laboratory – Accreditati imal places. Therefore, calculate 1, 5.4.1 1, 5.8.1 1, 5.8.1 1, 5.8.1	ion No 14234		e shown			11: AS 1289 1. 12. AS 1289 1. 13: RTA T111,	T162, T173	.1.1, 5.3.1, 5.7.1	5.6.1
Material Description				11. DGS40			* Cement Stab	Stand .		
<ol> <li>CL-Clays of low plasticity, gravelly clays, sandy</li> <li>Cl-Clay of medium plasticity, gravelly clays, sar</li> </ol>	50.00 (D) (N)			11. DGS40 12. FCR20			# Lime Stabilise			
CH-Clays of high plasticity				13. FCR40			\$ Gypsum Stab			
SC-Clayey sands, sand-clay mixtures				14. RC - Recycle						
<ol> <li>SM-Silty sands, sand-silt mixtures</li> <li>GC-Clayey gravels, gravel-sand-clay mixtures</li> </ol>				15. Recycled Ros 16. RSB - Recycl						
SP-Sand, crushed dust, filling sand, washed sand			<ol> <li>RSB - Recycled Sub-base</li> <li>CSS - Crushed Sandstone</li> </ol>							
8. DGB20 9. DGB40 10. DGS20				18. RSS - Ripped 19. Cowels Brown						

Form No R022 Version 18 06/13 - issued by ER



Accreditation Number 2734 Corporate Site Number 2727

34 Borec Road, Penrith NSW 2750

P O Box 880 Penrith NSW 2751

Head Office:

Prestons Laboratory:

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Telephone: (02) 4722 2744 Facsimile: (02) 4722 2777

email: info@geotech.com.au www.geotech.com.au

A Kench

Approved Signatory

03/07/2013





MARYLAND DEVELOPMENT COMPANY PTY LTD C/- LEND LEASE DEVELOPMENT P/L, PO BOX 1124 ST MARYS NSW 1790

Job No: 7508/121

Date:

03/07/2013

PROJECT: PAVEMENT TESTING

STAGE 4A, JORDAN SPRINGS

TEST NUMBER		8	41	42	43	44				Ĺ	
DATE TESTED		21/06/2013									
RESULTS		84_									
Density Ratio	Modified	%	100	98	100	98					
Moisture Variation f	om OMC (-Drier/+Wetter)	%	- 1.0	- 0.5	- 1.5	- 1.0					
Specification Density Ratio (Modified)			≥98%	Specification Moisture V			ariance f	N/A			
TEST LOCATION	N										
Chainage	(Carriageway L/R)	m	225 L	225 R	275	325					
Road Name/Number				Roa	d 21	50	5		* 19	ĺ	
Retested by test			-	72	3	ü	8		(4.6)	<u> </u>	
_evel				Based	course				Colors Colors	ž.	
FIELD & LABOR	ATORY DATA										
Field Dry Density		t/m³	2.25	2.22	2.27	2.26	1	4	(2)	175 17x	
Field Moisture Content		%	4.4	5.8	4.7	4.7			34 F2		
Material retained on 19 mm Sieve		%	<5	<5	<5	<5	- 8 t		34 22		
ab compaction result f	from test number	-	41	42	43	44	1		213		
Maximum Dry Density		t/m³	2.25	2.27	2.27	2.31			***		
Number of Compaction Points		F	4	4	4	4			93,60		
Optimum Moisture Content		%	5.5	6.5	6.0	5.5			99-60		
Test Procedures - See Notes Material Description - see below		T	7	7	7	7			80.00		
		ı	8	8	8	8					
2: Assigned Values have been ob	.1.1, 5.2.1, 5.3.1, 5.4.1 .1.1, 5.1.1, 5.4.1, 5.8.1 .1.1, 5.2.1, 5.4.1, 5.8.1 .1.1, 5.5.1, 5.6.1, 5.8.1	tation No 14234		se shown			11: AS 1289 1.2 12. AS 1289 1.2 13: RTA T111, T	1 clause 6.4 (b), 1 clause 6.4 (b), 119, T120, T166 120, T166, T173 119, T162 162, T173		5.6.1	
Material Description . CL-Clays of low plasticity, grave				11. DGS40			* Cement Stabil	ised			
<ol><li>CI-Clay of medium plasticity, gravelly clays, sandy clays, silty clays</li></ol>			12. FCR20				# Lime Stabilised				
CH-Clays of high plasticity     SC-Clayey sands, sand-clay mixtures			13. FCR40 14. RC - Recycled Concrete				\$ Gypsum Stabi	lised			
SG-Clayey sands, sand-clay mixtures     SM-Silty sands, sand-silt mixtures				15. Recycled Roa							
. GC-Clayey gravels, gravel-sand	16. RSB - Recycled Sub-base										
<ol> <li>SP-Sand, crushed dust, filling sa</li> <li>DGB20</li> </ol>	17. CSS - Crushed Sandstone 18. RSS - Ripped Sandstone										
DGB20 DGB40 0. DGS20				19. Cowels Brown							

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03/07/2013

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Approved Signatory





MARYLAND DEVELOPMENT COMPANY PTY LTD C/- LEND LEASE DEVELOPMENT P/L, PO BOX 1124 ST MARYS NSW 1790

PROJECT: PAVEMENT TESTING

STAGE 4A, JORDAN SPRINGS

Laboratory: Job No:

Date:

Penrith 7508/121 06/08/2013

Dago 1 of 11

TEST NUMBER				45	46	47	48	3 213	(2)
DATE TESTED	Į		02/07	/2013	9 3	Š			
RESULTS									
Density Ratio	Mo	odified	%	99	99	99.5	98		
Moisture Variation from OMC (-Drier/+Wetter) %		%	+ 0.5	+ 0.5	- 0.5	0.0			
Specification Density Ratio (Modified)			≥98%	Specific	ariance from OMC	N/A%			
TEST LOCATION			10						
Chainage	(Carriagewa	y L/R)	m	75	125	175	225		
Road Name/Number	mber				Roa	ad 1			
Retested by test				( <del>-</del>	( <del>*</del>			X	
Level	4				Based	course			
FIELD & LABORA	TORY DA	ATA							
Field Dry Density			t/m³	2.21	2.21	2.22	2.19	î î î	
Field Moisture Content			%	6.3	6.3	5.5	6.2		
Material retained on	19 mm	Sieve	%	<5	<5	<5	<5	× 24 6	
Assigned Value Number					MDGE	320-16		¥ 72 0	
Maximum Dry Density			t/m³	2.23	2.23	2.23	2.23	i 6 6	
Number of Compaction Points			4	4	4	4	8 6 6		
Optimum Moisture Content %		%	6.0	6.0	6.0	6.0	8 (4 %)		
Test Procedures - See Notes				7	7	7	7	8 3 3 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	
Material Description - see	holow			8	8	8	8	4 4 40	(F)

#### Notes

- Assigned Values have been obtained from our Penrith laboratory Accreditation No 2734
- Assigned Values have been obtained from our Prestons laboratory Accreditation No 14234
- 3. Results have been calculated using infinite decimal places. Therefore, calculated values may vary from those shown
- 4: AS 1289 1.2.1 dause 6.4 (b), 2.1.1, 5.1.1, 5.3.1, 5.4.1
- 5: AS 1289 1.2.1 dause 6.4 (b), 2.1.1, 5.2.1, 5.3.1, 5.4.1
- 6: AS 1289 1.2.1 dause 6.4 (b), 2.1.1, 5.1.1, 5.4.1, 5.8.1 7: AS 1289 1.2.1 clause 6.4 (b), 2.1.1, 5.2.1, 5.4.1, 5.8.1
- 8: AS 1289 1.2.1 clause 6.4 (b), 2.1.1., 5.5.1, 5.6.1, 5.8.1
- 9: Full details of Test Procedure 5.8.1 available on request

- 10: AS 1289 1.2.1 clause 6.4 (b), 2.1.1, 5.3.1, 5.5.1, 5.6.1 11: AS 1289 1.2.1 clause 6.4 (b), 2.1.1, 5.3.1, 5.7.1
- 12. AS 1289 1.2.1 clause 6.4 (b), 2.1.1, 5.7.1, 5.8.1
- 13: RTA T111, T119, T120, T166
- 14: RTA T111, T120, T166, T173
- 15: RTA T120, T119, T162 16 RTA T120 T162 T173
- 17. RTA T120, T164, T173

\* Cement Stabilised

\$ Gypsum Stabilised

# Lime Stabilised

- **Material Description**
- CL-Clays of low plasticity, gravelly clays, sandy clays, silty clays
- CI-Clay of medium plasticity, gravelly clays, sandy clays, silty clays
- CH-Clays of high plasticity SC-Clayey sands, sand-clay mixtures
- SM-Silty sands, sand-silt mixtures
- SP-Sand, crushed dust, filling sand, washed sand
- DGB20
- GC-Clayey gravels, gravel-sand-clay mixtures
- DGB40

- 11. DGS40
- 12. FCR20 13. FCR40
- 14. RC Recycled Concrete
- 15. Recycled Roadbase
- 16. RSB Recycled Sub-base
- 17. CSS Crushed Sandstone 18. RSS - Ripped Sandstone

Form No R022 Version 18 06/13 - issued by ER



Accredited for compliance with ISO/IEC 17025.

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06/08/2013

Accreditation Number 2734 Corporate Site Number 2727

Head Office:

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Prestons Laboratory:

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MARYLAND DEVELOPMENT COMPANY PTY LTD C/- LEND LEASE DEVELOPMENT P/L, PO BOX 1124 ST MARYS NSW 1790

PROJECT:

PAVEMENT TESTING

STAGE 4A, JORDAN SPRINGS

Laboratory: Job No:

Penrith 7508/121

Date: 06/08/2013

Page 2 of 11

TEST NUMBER DATE TESTED		49 50 51 52 53 54 55 56 03/07/2013								
RESULTS		_								
Density Ratio	Modified	%	95.5	96.5	96	97.5	97	96	96.5	95
Moisture Variation from OMC (-Drier/+Wetter)		%	+ 1.0	0.0	+ 0.5	- 1.0	+ 1.0	- 1.0	0.0	+ 1.5
Specification Density Ratio (Modified)			≥95%	≥95% Specification Moisture Variance from OMC						
TEST LOCATION	1									
Chainage	(Carriageway L/R)	m	25	325	375	425	460	460	25	325
Road Name/Number			Road 1 Road 21							ad 2
Retested by test			· · ·	: ##I		×		8 <b>=</b> 8	1840	
Level	-1	Sub-base Layer 1						Sub-base Layer 2		
FIELD & LABOR	ATORY DATA									
Field Dry Density		t/m³	2.09	2.11	2.10	2.13	2.12	2.10	2.11	2.08
Field Moisture Content		%	7.3	6.6	6.8	5.7	7.3	5.7	6.7	8.1
Material retained on	37.5 mm Sieve	%	<5	<5	<5	<5	<5	<5	<5	<5
Assigned Value Number		HQW75CSS-36								
Maximum Dry Density		t/m³	2.19	2.19	2.19	2.19	2.19	2.19	2.19	2.19
Number of Compaction Points Optimum Moisture Content %			4	4	4	4	4	4	4	4
		%	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5
Test Procedures - See N			7	7	7	7	7	7	7	7
Material Description - se	e below		17	17	17	17	17	17	17	17

#### Notes

- Assigned Values have been obtained from our Penrith laboratory Accreditation No 2734
- Assigned Values have been obtained from our Prestons laboratory Accreditation No 14234
- 3. Results have been calculated using infinite decimal places. Therefore, calculated values may vary from those shown
- 4: AS 1289 1.2.1 dause 6.4 (b), 2.1.1, 5.1.1, 5.3.1, 5.4.1
- 5: AS 1289 1.2.1 dause 6.4 (b), 2.1.1, 5.2.1, 5.3.1, 5.4.1
- 6: AS 1289 1.2.1 dause 6.4 (b), 2.1.1, 5.1.1, 5.4.1, 5.8.1 7: AS 1289 1.2.1 clause 6.4 (b), 2.1.1, 5.2.1, 5.4.1, 5.8.1
- 8: AS 1289 1.2.1 clause 6.4 (b), 2.1.1., 5.5.1, 5.6.1, 5.8.1

**Material Description** 

SC-Clayey sands, sand-clay mixtures SM-Silty sands, sand-silt mixtures

GC-Clayey gravels, gravel-sand-clay mixtures SP-Sand, crushed dust, filling sand, washed sand

CH-Clays of high plasticity

DGB20

DGB40

9: Full details of Test Procedure 5.8.1 available on request

CL-Clays of low plasticity, gravelly clays, sandy clays, silty clays

CI-Clay of medium plasticity, gravelly clays, sandy clays, silty clays

- 11. DGS40 12. FCR20
- 13. FCR40
- 14. RC Recycled Concrete
- 15. Recycled Roadbase 16. RSB - Recycled Sub-base
- 17. CSS Crushed Sandstone
- 18. RSS Ripped Sandstone

Form No R022 Version 18 06/13 - issued by ER



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06/08/2013

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10: AS 1289 1.2.1 clause 6.4 (b), 2.1.1, 5.3.1, 5.5.1, 5.6.1

11: AS 1289 1.2.1 clause 6.4 (b), 2.1.1, 5.3.1, 5.7.1

12. AS 1289 1.2.1 clause 6.4 (b), 2.1.1, 5.7.1, 5.8.1

13: RTA T111, T119, T120, T166

14: RTA T111, T120, T166, T173

15: RTA T120, T119, T162 16 RTA T120 T162 T173

17. RTA T120, T164, T173

\* Cement Stabilised

\$ Gypsum Stabilised

# Lime Stabilised





Penrith

7508/121

06/08/2013

Laboratory:

Job No:

Date:

## FIELD DENSITY RESULTS

MARYLAND DEVELOPMENT COMPANY PTY LTD C/- LEND LEASE DEVELOPMENT P/L, PO BOX 1124 ST MARYS NSW 1790

PROJECT:

PAVEMENT TESTING

STAGE 4A, JORDAN SPRINGS

TEST NUMBER			Γ	57	58		10	6)	0150	62
DATE TESTED			100	03/07	7/2013	ĝ.		Ü	323	1.50
RESULTS										
Density Ratio	M	odified	%	97.5	96		1			
Moisture Variation fr	om OMC (-D	rier/+Wetter)	%	- 1.0	0.0		5	5	8	
Specification	Density F	Ratio (Modifi	ed)	≥95%	Specific	ation Mois	ture Varia	nce from (	омс	N/A
TEST LOCATION			85							
Chainage	(Carriagewa	ay L/R)	m	375	425				e	
Road Name/Number				Ro	ad 2				51.9	
Retested by test			L	190	9#				93.60	
Level				Sub-bas	e Layer 2					
FIELD & LABORA	ATORY D	ATA								
Field Dry Density			t/m³	2.13	2.10		7	Ĩ		
Field Moisture Content			%	5.4	6.6					
Material retained on	37.5 mm	Sieve	%	<5	<5		,		0.0	
Assigned Value Number				HQW75	CSS-36		*		W 60	
Maximum Dry Density			t/m³	2.19	2.19		,		30 B	
Number of Compaction F	Points			4	4		7		the late	ľ
			%	6.5	6.5	3	8		\$4 P\$	
	otes			7	7		86		61 (5) (2) (5)	
Optimum Moisture Conte Test Procedures - See N Material Description - se				17	17	C 1 0	-0-4			

- Assigned Values have been obtained from our Penrith laboratory Accreditation No 2734
- 2: Assigned Values have been obtained from our Prestons laboratory Accreditation No 14234
- 3. Results have been calculated using infinite decimal places. Therefore, calculated values may vary from those shown
- 4: AS 1289 1.2.1 dause 6.4 (b), 2.1.1, 5.1.1, 5.3.1, 5.4.1
- 5: AS 1289 1.2.1 dause 6.4 (b), 2.1.1, 5.2.1, 5.3.1, 5.4.1
- 6: AS 1289 1.2.1 dause 6.4 (b), 2.1.1, 5.1.1, 5.4.1, 5.8.1
- 7: AS 1289 1.2.1 clause 6.4 (b), 2.1.1, 5.2.1, 5.4.1, 5.8.1
- 8: AS 1289 1.2.1 clause 6.4 (b), 2.1.1., 5.5.1, 5.6.1, 5.8.1
- 9: Full details of Test Procedure 5.8.1 available on request

CL-Clays of low plasticity, gravelly clays, sandy clays, silty clays

CI-Clay of medium plasticity, gravelly clays, sandy clays, silty clays

**Material Description** 

SC-Clayey sands, sand-clay mixtures SM-Silty sands, sand-silt mixtures

GC-Clayey gravels, gravel-sand-clay mixtures SP-Sand, crushed dust, filling sand, washed sand

CH-Clays of high plasticity

DGB20

DGB40

- - 11. DGS40
  - 12. FCR20
  - 13. FCR40
  - 14. RC Recycled Concrete 15. Recycled Roadbase
  - 16. RSB Recycled Sub-base
  - 17. CSS Crushed Sandstone
  - 18. RSS Ripped Sandstone

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11: AS 1289 1.2.1 clause 6.4 (b), 2.1.1, 5.3.1, 5.7.1

12. AS 1289 1.2.1 clause 6.4 (b), 2.1.1, 5.7.1, 5.8.1

13: RTA T111, T119, T120, T166

14: RTA T111, T120, T166, T173

15: RTA T120, T119, T162 16 RTA T120 T162 T173

17. RTA T120, T164, T173

\* Cement Stabilised

\$ Gypsum Stabilised

# Lime Stabilised

06/08/2013

Approved Signatory

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Penrith

## FIELD DENSITY RESULTS

MARYLAND DEVELOPMENT COMPANY PTY LTD C/- LEND LEASE DEVELOPMENT P/L, PO BOX 1124 ST MARYS NSW 1790

PROJECT: PAVEMENT TESTING

STAGE 4A, JORDAN SPRINGS

Job No: 7508/121 Date: 06/08/2013

Laboratory:

TEST NUMBER			59	60	61	9 9 9	
DATE TESTED				05/07/2013			
RESULTS							
Density Ratio	Modified	%	101	101	101		
Moisture Variation fr	om OMC (-Drier/+Wetter)	%	+ 0.5	+ 1.5	+ 0.5		8
Specification	Density Ratio (Mod	dified)	≥98%	Specific	ation Moist	ture Variance from OMC	N/A
TEST LOCATION		96					
Chainage	(Carriageway L/R)	m	375	425	460		
Road Name/Number				Road 21	Shi		
Retested by test				196	E .		
Level				Basecourse			
FIELD & LABOR	ATORY DATA						
Field Dry Density		t/m³	2.25	2.25	2.25		
Field Moisture Content		%	6.5	7.4	6.6		
Material retained on	19 mm Sieve	%	<5	<5	<5		
Assigned Value Number				MDGB20-16	5		
Maximum Dry Density		t/m³	2.23	2.23	2.23		
Number of Compaction F	Points		4	4	4		
Optimum Moisture Conte		%	6.0	6.0	6.0		
	lotes		7	7	7		
Test Procedures - See N							

- Assigned Values have been obtained from our Penrith laboratory Accreditation No 2734
- 2: Assigned Values have been obtained from our Prestons laboratory Accreditation No 14234
- 3. Results have been calculated using infinite decimal places. Therefore, calculated values may vary from those shown
- 4: AS 1289 1.2.1 dause 6.4 (b), 2.1.1, 5.1.1, 5.3.1, 5.4.1
- 5: AS 1289 1.2.1 dause 6.4 (b), 2.1.1, 5.2.1, 5.3.1, 5.4.1
- 6: AS 1289 1.2.1 dause 6.4 (b), 2.1.1, 5.1.1, 5.4.1, 5.8.1
- 7: AS 1289 1.2.1 clause 6.4 (b), 2.1.1, 5.2.1, 5.4.1, 5.8.1
- 8: AS 1289 1.2.1 clause 6.4 (b), 2.1.1., 5.5.1, 5.6.1, 5.8.1
- 9: Full details of Test Procedure 5.8.1 available on request

- 10: AS 1289 1.2.1 clause 6.4 (b), 2.1.1, 5.3.1, 5.5.1, 5.6.1
- 11: AS 1289 1.2.1 clause 6.4 (b), 2.1.1, 5.3.1, 5.7.1
- 13: RTA T111, T119, T120, T166

\* Cement Stabilised

\$ Gypsum Stabilised

# Lime Stabilised

#### **Material Description**

- CL-Clays of low plasticity, gravelly clays, sandy clays, silty clays
- CI-Clay of medium plasticity, gravelly clays, sandy clays, silty clays
- SM-Silty sands, sand-silt mixtures

- DGB20
- SP-Sand, crushed dust, filling sand, washed sand

- 12. AS 1289 1.2.1 clause 6.4 (b), 2.1.1, 5.7.1, 5.8.1
- 14: RTA T111, T120, T166, T173
- 15: RTA T120, T119, T162
- 16 RTA T120 T162 T173
- 17. RTA T120, T164, T173

- CH-Clays of high plasticity
- SC-Clayey sands, sand-clay mixtures
- GC-Clayey gravels, gravel-sand-clay mixtures
- DGB40

- 11. DGS40 12. FCR20
- 13. FCR40
- 14. RC Recycled Concrete 15. Recycled Roadbase
- 16. RSB Recycled Sub-base
- 17. CSS Crushed Sandstone
- 18. RSS Ripped Sandstone

Form No R022 Version 18 06/13 - issued by ER



Accredited for compliance with ISO/IEC 17025.

A Kench

06/08/2013

Approved Signatory

Accreditation Number 2734 Corporate Site Number 2727

Head Office:

34 Borec Road, Penrith NSW 2750 P O Box 880 Penrith NSW 2751

Prestons Laboratory:

Unit 4, 18-20 Whyalla Place, Prestons NSW 2170 Telephone: (02) 9607 6111 Facsimile: (02) 9607 6200

Telephone: (02) 4722 2744 Facsimile: (02) 4722 2777





MARYLAND DEVELOPMENT COMPANY PTY LTD C/- LEND LEASE DEVELOPMENT P/L, PO BOX 1124 ST MARYS NSW 1790

PROJECT: PAVEMENT TESTING

STAGE 4A, JORDAN SPRINGS

Laboratory: Job No:

Penrith 7508/121

Date: 06/08/2013

		241								Page 5 of 1
TEST NUMBER			62	63	64	65	66	67	68	69
DATE TESTED			15/07/2013				16/07	/2013		
RESULTS										
Density Ratio	Modified	%	97	98.5	98	96	95.5	97	97	97
Moisture Variation f	rom OMC (-Drier/+Wetter)	%	+ 1.5	0.0	- 0.5	+ 1.0	+ 1.0	+ 0.5	0.0	+ 1.0
Specification	Density Ratio (Mod	fied)	≥95%	Specific	ation Mo	isture Va	riance fr	om OMC		N/A%
TEST LOCATION	١	76								
Chainage	(Carriageway L/R)	m	25	75	125	175	225	275	325	375
Road Name/Number				200	90	Ro	ad 1	E 03	0	
Retested by test				(#)				183	) <del>(</del>	-
Level						Sub-bas	e Layer 2			
FIELD & LABOR	ATORY DATA									
Field Dry Density		t/m³	2.12	2.15	2.14	2.09	2.08	2.11	2.12	2.11
Field Moisture Content		%	8.1	6.5	6.1	7.7	7.5	7.1	6.7	7.6
Material retained on	37.5 mm Sieve	%	<5	<5	<5	<5	<5	<5	<5	<5
Assigned Value Numbe	r				50	HQW75	5CSS-37	2.00	9 E	598
Maximum Dry Density		t/m³	2.18	2.18	2.18	2.18	2.18	2.18	2.18	2.18
Number of Compaction	Points		4	4	4	4	4	4	4	4
Optimum Moisture Con		%	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5
Test Procedures - See			7	7	7	7	7	7	7	7
Material Description - se	ee below		17	17	17	17	17	17	17	17

#### Notes

- Assigned Values have been obtained from our Penrith laboratory Accreditation No 2734
- Assigned Values have been obtained from our Prestons laboratory Accreditation No 14234
- 3. Results have been calculated using infinite decimal places. Therefore, calculated values may vary from those shown
- 4: AS 1289 1.2.1 dause 6.4 (b), 2.1.1, 5.1.1, 5.3.1, 5.4.1
- 5: AS 1289 1.2.1 dause 6.4 (b), 2.1.1, 5.2.1, 5.3.1, 5.4.1
- 6: AS 1289 1.2.1 dause 6.4 (b), 2.1.1, 5.1.1, 5.4.1, 5.8.1
- 7: AS 1289 1.2.1 clause 6.4 (b), 2.1.1, 5.2.1, 5.4.1, 5.8.1
- 8: AS 1289 1.2.1 clause 6.4 (b), 2.1.1., 5.5.1, 5.6.1, 5.8.1 9: Full details of Test Procedure 5.8.1 available on request

- 10: AS 1289 1.2.1 clause 6.4 (b), 2.1.1, 5.3.1, 5.5.1, 5.6.1
- 11: AS 1289 1.2.1 clause 6.4 (b), 2.1.1, 5.3.1, 5.7.1 12. AS 1289 1.2.1 clause 6.4 (b), 2.1.1, 5.7.1, 5.8.1
- 13: RTA T111, T119, T120, T166
- 14: RTA T111, T120, T166, T173 15: RTA T120, T119, T162
- 16 RTA T120 T162 T173
- 17. RTA T120, T164, T173

\* Cement Stabilised

\$ Gypsum Stabilised

# Lime Stabilised

## **Material Description**

- CL-Clays of low plasticity, gravelly clays, sandy clays, silty clays
- CI-Clay of medium plasticity, gravelly clays, sandy clays, silty clays
- CH-Clays of high plasticity SC-Clayey sands, sand-clay mixtures
- SM-Silty sands, sand-silt mixtures
- GC-Clayey gravels, gravel-sand-clay mixtures
- SP-Sand, crushed dust, filling sand, washed sand
- DGB20 DGB40

Head Office:

- 11. DGS40 12. FCR20 13. FCR40
- 14. RC Recycled Concrete 15. Recycled Roadbase
- 16. RSB Recycled Sub-base
- 17. CSS Crushed Sandstone
- 18. RSS Ripped Sandstone

Form No R022 Version 18 06/13 - issued by ER



Accredited for compliance with ISO/IEC 17025.

A Kench

06/08/2013

Accreditation Number 2734

Corporate Site Number 2727

34 Borec Road, Penrith NSW 2750

P O Box 880 Penrith NSW 2751

Prestons Laboratory:

Unit 4, 18-20 Whyalla Place, Prestons NSW 2170 Telephone: (02) 9607 6111 Facsimile: (02) 9607 6200

Telephone: (02) 4722 2744 Facsimile: (02) 4722 2777





Penrith

7508/121

# FIELD DENSITY RESULTS

MARYLAND DEVELOPMENT COMPANY PTY LTD C/- LEND LEASE DEVELOPMENT P/L, PO BOX 1124 ST MARYS NSW 1790

PROJECT: PAVEMENT TESTING

STAGE 4A, JORDAN SPRINGS

Date: 06/08/2013

Laboratory:

Job No:

	60									Page 6 of
TEST NUMBER		6	70	50	ô	z.				134
DATE TESTED			16/07/2013	8	ý.	9			3	- 1 N
RESULTS										
Density Ratio	Modified	%	97							
Moisture Variation fr	om OMC (-Drier/+Wetter)	%	+ 1.0						(a)	5
Specification	Density Ratio (Modifi	ied)	≥95%	Specific	ation Mo	isture V	ariance fi	rom OMC	;	N/A
TEST LOCATION		40		•						
Chainage	(Carriageway L/R)	m	425	10						
Road Name/Number	, , ,	A5000	Road 1							1
Retested by test			-							
_evel			Sub-base Layer 2							
FIELD & LABOR	ATORY DATA									
Field Dry Density	AIONI DAIA	4/3	0.44	T .	9		1		T	T
		t/m³	2.11	**	×					+
Field Moisture Content		%	7.6	60						+
Material retained on	37.5 mm Sieve	%	<5	86					86	<del>                                     </del>
Assigned Value Number		00000	HQW75CSS-37						ļ	<u> </u>
Maximum Dry Density	Dail 19 65	t/m³	2.18							
Number of Compaction F		24000	4		Ť.	c c				
Optimum Moisture Conte		%	6.5	(0)				ŕ	100	
Test Procedures - See N	lotes		7	53	6				160 0130	
Material Description - se	e below		17	20	9				(42) (40)	5
2: Assigned Values have been obta	.1, 5.2.1, 5.3.1, 5.4.1 .1, 5.1.1, 5.4.1, 5.8.1 .1, 5.2.1, 5.4.1, 5.8.1 .1, 5.5.1, 5.6.1, 5.8.1	tation No 142	34	e shown			11: AS 1289 1.2.	1 clause 6.4 (b), 2. 1 clause 6.4 (b), 2. 119, T120, T166 120, T166, T173 119, T162 162, T173		.6.1
Material Descriptio										
. CL-Clays of low plasticity, gravelly				11. DGS40 12. FCR20			* Cement Stabilised	2-ma		
<ol> <li>CI-Clay of medium plasticity, grav</li> <li>CH-Clays of high plasticity</li> </ol>	eny ciays, sancy ciays, sitty ciays			12. FCR20 13. FCR40			# Lime Stabilised \$ Gypsum Stabil			
. SC-Clayey sands, sand-clay mixtu	ures			14. RC - Recycled	Concrete		- Jpouri Stabil			
. SM-Silty sands, sand-silt mixtures				15. Recycled Roa						
. GC-Clayey gravels, gravel-sand-c	28 TO 00 St. 100 St			16. RSB - Recycle						
<ol> <li>SP-Sand, crushed dust, filling san</li> <li>DGB20</li> </ol>	io, wasned sand			17. CSS - Crushe 18. RSS - Ripped						
				ruppou						

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19. Cowels Brown

A Kench

**Approved Signatory** 

06/08/2013

Accreditation Number 2734

Corporate Site Number 2727

Head Office: Prestons Laboratory:

34 Borec Road, Penrith NSW 2750 Unit 4, 18-20 Whyalla Place, Prestons NSW 2170 P O Box 880 Penrith NSW 2751

Telephone: (02) 4722 2744 Facsimile: (02) 4722 2777

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Penrith

## FIELD DENSITY RESULTS

MARYLAND DEVELOPMENT COMPANY PTY LTD C/- LEND LEASE DEVELOPMENT P/L, PO BOX 1124 ST MARYS NSW 1790

PROJECT: PAVEMENT TESTING

STAGE 4A, JORDAN SPRINGS

Job No: 7508/121 Date: 06/08/2013

Laboratory:

TEST NUMBER			71	72	73	74	3 00	62
DATE TESTED		Ę		16/07	7/2013			is.
RESULTS								
Density Ratio	Mod	ified %	102	102	98	98		
Moisture Variation fr	om OMC (-Drie	r/+Wetter) %	0.0	- 0.5	- 0.5	- 1.0		
Specification	Density Ra	tio (Modified)	≥98%	Specific	ation Mo	isture V	ariance from OMC	N/A
TEST LOCATION		88						
Chainage	(Carriageway I	_/R) m	25	325	375	425		
Road Name/Number				Roa	ad 1	20		
Retested by test			( <del>4</del> )	1961		*		
Level				Based	course			
FIELD & LABOR	ATORY DAT	A						
Field Dry Density		t/m³	2.27	2.28	2.18	2.19		
Field Moisture Content		%	5.9	5.4	5.5	5.0		
Material retained on	19 mm Si	eve %	<5	<5	<5	<5		
Assigned Value Number				MDGE	320-16	100		
Maximum Dry Density		t/m³	2.23	2.23	2.23	2.23		
Number of Compaction F	Points		4	4	4	4		
Optimum Moisture Conte		%	6.0	6.0	6.0	6.0	A	
Test Procedures - See N	lotes		7	7	7	7		
rest ribectuales been								

- Assigned Values have been obtained from our Penrith laboratory Accreditation No 2734
- 2: Assigned Values have been obtained from our Prestons laboratory Accreditation No 14234
- 3. Results have been calculated using infinite decimal places. Therefore, calculated values may vary from those shown
- 4: AS 1289 1.2.1 dause 6.4 (b), 2.1.1, 5.1.1, 5.3.1, 5.4.1
- 5: AS 1289 1.2.1 dause 6.4 (b), 2.1.1, 5.2.1, 5.3.1, 5.4.1
- 6: AS 1289 1.2.1 dause 6.4 (b), 2.1.1, 5.1.1, 5.4.1, 5.8.1 7: AS 1289 1.2.1 clause 6.4 (b), 2.1.1, 5.2.1, 5.4.1, 5.8.1
- 8: AS 1289 1.2.1 clause 6.4 (b), 2.1.1., 5.5.1, 5.6.1, 5.8.1
- 9: Full details of Test Procedure 5.8.1 available on request

- 10: AS 1289 1.2.1 clause 6.4 (b), 2.1.1, 5.3.1, 5.5.1, 5.6.1 11: AS 1289 1.2.1 clause 6.4 (b), 2.1.1, 5.3.1, 5.7.1
- 12. AS 1289 1.2.1 clause 6.4 (b), 2.1.1, 5.7.1, 5.8.1
- 13: RTA T111, T119, T120, T166
- 14: RTA T111, T120, T166, T173
- 15: RTA T120, T119, T162
- 16 RTA T120 T162 T173
- 17. RTA T120, T164, T173

\* Cement Stabilised

\$ Gypsum Stabilised

# Lime Stabilised

#### **Material Description**

- CL-Clays of low plasticity, gravelly clays, sandy clays, silty clays
- CI-Clay of medium plasticity, gravelly clays, sandy clays, silty clays
- CH-Clays of high plasticity SC-Clayey sands, sand-clay mixtures
- SM-Silty sands, sand-silt mixtures
- SP-Sand, crushed dust, filling sand, washed sand
- DGB20
- GC-Clayey gravels, gravel-sand-clay mixtures
- DGB40

- 11. DGS40 12. FCR20
- 13. FCR40
- 14. RC Recycled Concrete 15. Recycled Roadbase
- 16. RSB Recycled Sub-base
- 17. CSS Crushed Sandstone
- 18. RSS Ripped Sandstone

Form No R022 Version 18 06/13 - issued by ER



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06/08/2013

Accreditation Number 2734 Corporate Site Number 2727

Head Office:

34 Borec Road, Penrith NSW 2750 P O Box 880 Penrith NSW 2751

Prestons Laboratory:

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MARYLAND DEVELOPMENT COMPANY PTY LTD C/- LEND LEASE DEVELOPMENT P/L, PO BOX 1124 ST MARYS NSW 1790

PROJECT: PAVEMENT TESTING

STAGE 4A, JORDAN SPRINGS

Laboratory: Job No:

Date:

Penrith 7508/121

06/08/2013

TEST NUMBER		Ī	75	76	77	78	79	80	81	82
DATE TESTED			,,,	10		II	7/2013	50	Ŭ,	Ŭ.
RESULTS										
Density Ratio	Modified	%	97.5	96	96	97.5	97.5	97	98	96.5
Moisture Variation f	rom OMC (-Drier/+Wetter)	%	+ 1.0	0.0	+ 1.0	+ 1.0	+ 1.0	0.0	+ 0.5	- 0.5
Specification	Density Ratio (Mod	ified)	≥95%	Specific	ation Mo	isture Va	ariance fr	om OMC		N/A%
TEST LOCATION	J	26		<u> </u>						
Chainage	(Carriageway L/R)	m	825	875	925	975	1025	825	875	925
Road Name/Number				200	30	Roa	ad 1		200	200
Retested by test			(4)			*		8 <b>-</b> 83	(A)	
Level				Sı	ub-base Laye	ar 1		Si	ub-base Laye	r 2
FIELD & LABOR	ATORY DATA									
Field Dry Density		t/m³	2.13	2.09	2.09	2.13	2.13	2.11	2.14	2.10
Field Moisture Content		%	7.3	6.5	7.4	7.4	7.5	6.4	6.9	6.2
Material retained on	37.5 mm Sieve	%	<5	<5	<5	<5	<5	<5	<5	<5
Assigned Value Number	ſ		-	300	350	HQW75	5CSS-37		705.5	75
Maximum Dry Density		t/m³	2.18	2.18	2.18	2.18	2.18	2.18	2.18	2.18
Number of Compaction			4	4	4	4	4	4	4	4
Optimum Moisture Cont		%	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5
Test Procedures - See N			7	7	7	7	7	7	7	7
Material Description - se	e below		17	17	17	17	17	17	17	17

#### Notes

- Assigned Values have been obtained from our Penrith laboratory Accreditation No 2734
- Assigned Values have been obtained from our Prestons laboratory Accreditation No 14234
- 3. Results have been calculated using infinite decimal places. Therefore, calculated values may vary from those shown
- 4: AS 1289 1.2.1 dause 6.4 (b), 2.1.1, 5.1.1, 5.3.1, 5.4.1
- 5: AS 1289 1.2.1 dause 6.4 (b), 2.1.1, 5.2.1, 5.3.1, 5.4.1
- 6: AS 1289 1.2.1 dause 6.4 (b), 2.1.1, 5.1.1, 5.4.1, 5.8.1
- 7: AS 1289 1.2.1 clause 6.4 (b), 2.1.1, 5.2.1, 5.4.1, 5.8.1
- 8: AS 1289 1.2.1 clause 6.4 (b), 2.1.1., 5.5.1, 5.6.1, 5.8.1 9: Full details of Test Procedure 5.8.1 available on request
- CL-Clays of low plasticity, gravelly clays, sandy clays, silty clays 11. DGS40 CI-Clay of medium plasticity, gravelly clays, sandy clays, silty clays
- CH-Clays of high plasticity SC-Clayey sands, sand-clay mixtures SM-Silty sands, sand-silt mixtures

**Material Description** 

- GC-Clayey gravels, gravel-sand-clay mixtures SP-Sand, crushed dust, filling sand, washed sand
- DGB20 DGB40

- 12. FCR20 13. FCR40
- 14. RC Recycled Concrete 15. Recycled Roadbase
- 16. RSB Recycled Sub-base 17. CSS - Crushed Sandstone 18. RSS - Ripped Sandstone
- \* Cement Stabilised # Lime Stabilised
- \$ Gypsum Stabilised

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A Kench

10: AS 1289 1.2.1 clause 6.4 (b), 2.1.1, 5.3.1, 5.5.1, 5.6.1

11: AS 1289 1.2.1 clause 6.4 (b), 2.1.1, 5.3.1, 5.7.1

12. AS 1289 1.2.1 clause 6.4 (b), 2.1.1, 5.7.1, 5.8.1

13: RTA T111, T119, T120, T166

14: RTA T111, T120, T166, T173

15: RTA T120, T119, T162 16 RTA T120 T162 T173

17. RTA T120, T164, T173

06/08/2013

Accreditation Number 2734 Corporate Site Number 2727

Head Office:

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06/08/2013

## FIELD DENSITY RESULTS

MARYLAND DEVELOPMENT COMPANY PTY LTD C/- LEND LEASE DEVELOPMENT P/L, PO BOX 1124 ST MARYS NSW 1790

PROJECT:

PAVEMENT TESTING

STAGE 4A, JORDAN SPRINGS

Laboratory: Penrith Job No: 7508/121

Date:

TEST NUMBER DATE TESTED			83 26/07/2013	\$ \$			
RESULTS		202	740		90 99	20 200	and the same of th
Density Ratio	Standard	%	107.5				
Moisture Variation f	rom OMC (-Drier/+Wetter)	%	- 8.0				
Specification	Density Ratio (Stand	dard)	≥100%	Specification M	loisture Varia	nce from OMC	N/Aº
TEST LOCATION	l	82	**				
Chainage	(Carriageway L/R)	m	1025		5 8		
Road Name/Number			Road 1		5		
Retested by test			*				
Level			Subgrade				
FIELD & LABOR	ATORY DATA						
Field Dry Density		t/m³	1.87	Ĭ	î î	T T	
Field Moisture Content		%	7.3			X X X	
Material retained on	19 mm Sieve	%	<5		Y Y	92 00	
viateriai retained on	rom test number	İ	83			92 00	
		990020	1.74		1	1	
ab compaction result fr		t/m³	1.74				
ab compaction result for Maximum Dry Density		t/m³	4				
Lab compaction result for Maximum Dry Density Number of Compaction	Points	t/m³ %	7/4/21/21/20				
Material retained on Lab compaction result for Maximum Dry Density Number of Compaction Optimum Moisture Cont Test Procedures - See Naterial Description - see	Points ent Notes	W56548	4				

- 2: Assigned Values have been obtained from our Prestons laboratory Accreditation No 14234
- 3. Results have been calculated using infinite decimal places. Therefore, calculated values may vary from those shown
- 4: AS 1289 1.2.1 dause 6.4 (b), 2.1.1, 5.1.1, 5.3.1, 5.4.1
- 5: AS 1289 1.2.1 dause 6.4 (b), 2.1.1, 5.2.1, 5.3.1, 5.4.1
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- 7: AS 1289 1.2.1 clause 6.4 (b), 2.1.1, 5.2.1, 5.4.1, 5.8.1
- 8: AS 1289 1.2.1 clause 6.4 (b), 2.1.1., 5.5.1, 5.6.1, 5.8.1 9: Full details of Test Procedure 5.8.1 available on request

#### **Material Description**

- CL-Clays of low plasticity, gravelly clays, sandy clays, silty clays
- CH-Clays of high plasticity

- SP-Sand, crushed dust, filling sand, washed sand
- DGB20
- DGB40

- 11: AS 1289 1.2.1 clause 6.4 (b), 2.1.1, 5.3.1, 5.7.1
- 12. AS 1289 1.2.1 clause 6.4 (b), 2.1.1, 5.7.1, 5.8.1
- 13: RTA T111, T119, T120, T166
- 14: RTA T111, T120, T166, T173 15: RTA T120, T119, T162
- 16 RTA T120 T162 T173
- 17. RTA T120, T164, T173

\* Cement Stabilised

\$ Gypsum Stabilised

# Lime Stabilised

- CI-Clay of medium plasticity, gravelly clays, sandy clays, silty clays
- SC-Clayey sands, sand-clay mixtures
- SM-Silty sands, sand-silt mixtures
- GC-Clayey gravels, gravel-sand-clay mixtures

- 11. DGS40
- 12. FCR20
- 13. FCR40
- 14. RC Recycled Concrete 15. Recycled Roadbase
- 16. RSB Recycled Sub-base
- 17. CSS Crushed Sandstone
- 18. RSS Ripped Sandstone

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A Kench

06/08/2013

Accreditation Number 2734 Corporate Site Number 2727

Head Office:

34 Borec Road, Penrith NSW 2750 P O Box 880 Penrith NSW 2751

Prestons Laboratory:

Unit 4, 18-20 Whyalla Place, Prestons NSW 2170 Telephone: (02) 9607 6111 Facsimile: (02) 9607 6200

Telephone: (02) 4722 2744 Facsimile: (02) 4722 2777





MARYLAND DEVELOPMENT COMPANY PTY LTD C/- LEND LEASE DEVELOPMENT P/L, PO BOX 1124

ST MARYS NSW 1790

Laboratory: Job No:

Penrith 7508/121

Date:

06/08/2013

PROJECT: PAVEMENT TESTING

STAGE 4A, JORDAN SPRINGS

Page 10 of 11

TEST NUMBER			84	85	86	87		12
DATE TESTED				26/07	7/2013	07.27		10-10-10-10-10-10-10-10-10-10-10-10-10-1
RESULTS								
Density Ratio	Modified	%	101.5	102	99.5	99		
Moisture Variation f	rom OMC (-Drier/+Wetter)	%	- 0.5	- 1.0	- 1.5	0.0		
Specification	Density Ratio (Mod	ified)	≥98%	Specific	ation Mo	isture Va	riance from OMC	N/A%
TEST LOCATION	1	16						
Chainage	(Carriageway L/R)	m	825	875	925	975		
Road Name/Number				Ro	ad 1	10	0 6 13	
Retested by test		L		. 00				
Level				Base	course	,		
FIELD & LABOR	ATORY DATA							
Field Dry Density		t/m³	2.26	2.27	2.22	2.21		
Field Moisture Content		%	5.5	5.0	4.7	5.9		
Material retained on	19 mm Sieve	%	<5	<5	<5	<5		
Assigned Value Numbe	ſ		1	MDG	320-16			
Maximum Dry Density		t/m³	2.23	2.23	2.23	2.23		
Number of Compaction		10000	4	4	4	4	*	
Optimum Moisture Cont		%	6.0	6.0	6.0	6.0	(A)	
Test Procedures - See I			7	7	7	7	9 00	
Material Description - se	ee below		8	8	8	8		

#### Notes

- Assigned Values have been obtained from our Penrith laboratory Accreditation No 2734
- Assigned Values have been obtained from our Prestons laboratory Accreditation No 14234
- 3. Results have been calculated using infinite decimal places. Therefore, calculated values may vary from those shown
- 4: AS 1289 1.2.1 dause 6.4 (b), 2.1.1, 5.1.1, 5.3.1, 5.4.1
- 5: AS 1289 1.2.1 dause 6.4 (b), 2.1.1, 5.2.1, 5.3.1, 5.4.1
- 6: AS 1289 1.2.1 dause 6.4 (b), 2.1.1, 5.1.1, 5.4.1, 5.8.1
- 7: AS 1289 1.2.1 clause 6.4 (b), 2.1.1, 5.2.1, 5.4.1, 5.8.1
- 8: AS 1289 1.2.1 clause 6.4 (b), 2.1.1., 5.5.1, 5.6.1, 5.8.1 9: Full details of Test Procedure 5.8.1 available on request

- 10: AS 1289 1.2.1 clause 6.4 (b), 2.1.1, 5.3.1, 5.5.1, 5.6.1
- 11: AS 1289 1.2.1 clause 6.4 (b), 2.1.1, 5.3.1, 5.7.1 12. AS 1289 1.2.1 clause 6.4 (b), 2.1.1, 5.7.1, 5.8.1
- 13: RTA T111, T119, T120, T166
- 14: RTA T111, T120, T166, T173
- 15: RTA T120, T119, T162
- 16 RTA T120 T162 T173
- 17. RTA T120, T164, T173

\* Cement Stabilised

\$ Gypsum Stabilised

# Lime Stabilised

## **Material Description**

- CL-Clays of low plasticity, gravelly clays, sandy clays, silty clays
- CI-Clay of medium plasticity, gravelly clays, sandy clays, silty clays
- CH-Clays of high plasticity SC-Clayey sands, sand-clay mixtures
- SM-Silty sands, sand-silt mixtures
- GC-Clayey gravels, gravel-sand-clay mixtures
- DGB40

Head Office:

SP-Sand, crushed dust, filling sand, washed sand DGB20

- 11. DGS40 12. FCR20 13. FCR40
- 14. RC Recycled Concrete
- 15. Recycled Roadbase
- 16. RSB Recycled Sub-base 17. CSS - Crushed Sandstone
- 18. RSS Ripped Sandstone

Form No R022 Version 18 06/13 - issued by ER



Accredited for compliance with ISO/IEC 17025.

A Kench

06/08/2013

Accreditation Number 2734

Corporate Site Number 2727

34 Borec Road, Penrith NSW 2750 P O Box 880 Penrith NSW 2751

Prestons Laboratory:

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MARYLAND DEVELOPMENT COMPANY PTY LTD C/- LEND LEASE DEVELOPMENT P/L, PO BOX 1124

ST MARYS NSW 1790

PROJECT:

PAVEMENT TESTING

STAGE 4A, JORDAN SPRINGS

Penrith

7508/121

06/08/2013

Laboratory:

Job No:

Date:

TEST NUMBER		6	88	89	90		
DATE TESTED		8	00	31/07/2013			
RESULTS							
Density Ratio	Modified	%	98	100	102	I I	
Moisture Variation fro	om OMC (-Drier/+Wetter)	%	0.0	0.0	- 1.0		
Specification	Density Ratio (Modifi	ed)	≥95%	Specific	ation Moist	ture Variance from	OMC N
TEST LOCATION		16					
Chainage	(Carriageway L/R)	m	925	975	1025		
Road Name/Number			1000	Road 1	Sec		2 2
Retested by test			(#)	. 1961			
Level			Sub-base Layer 1	Sub-bas	e Layer 2		
FIELD & LABORA	TORY DATA						
Field Dry Density		t/m³	2.14	2.18	2.22	Î	
Field Moisture Content		%	6.7	6.3	5.3		
Material retained on	37.5 mm Sieve	%	<5	<5	<5		
Assigned Value Number			Н	QW75CSS-	37		
Maximum Dry Density		t/m³	2.18	2.18	2.18		
Number of Compaction P	oints		4	4	4		è 6
Optimum Moisture Conte	nt	%	6.5	6.5	6.5	8	3000
Test Procedures - See N			7	7	7		333
Material Description - see	Later and the second se		17	17	17	4	303

- 1: Assigned Values have been obtained from our Penrith laboratory Accreditation No 2734
- 2: Assigned Values have been obtained from our Prestons laboratory Accreditation No 14234
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- 5: AS 1289 1.2.1 dause 6.4 (b), 2.1.1, 5.2.1, 5.3.1, 5.4.1
- 6: AS 1289 1.2.1 dause 6.4 (b), 2.1.1, 5.1.1, 5.4.1, 5.8.1
- 7: AS 1289 1.2.1 clause 6.4 (b), 2.1.1, 5.2.1, 5.4.1, 5.8.1
- 8: AS 1289 1.2.1 clause 6.4 (b), 2.1.1., 5.5.1, 5.6.1, 5.8.1 9: Full details of Test Procedure 5.8.1 available on request

## **Material Description**

- CL-Clays of low plasticity, gravelly clays, sandy clays, silty clays
- CH-Clays of high plasticity
- SM-Silty sands, sand-silt mixtures
- GC-Clayey gravels, gravel-sand-clay mixtures
- SP-Sand, crushed dust, filling sand, washed sand
- DGB40

- 10: AS 1289 1.2.1 clause 6.4 (b), 2.1.1, 5.3.1, 5.5.1, 5.6.1 11: AS 1289 1.2.1 clause 6.4 (b), 2.1.1, 5.3.1, 5.7.1
- 12. AS 1289 1.2.1 clause 6.4 (b), 2.1.1, 5.7.1, 5.8.1 13: RTA T111, T119, T120, T166
- 14: RTA T111, T120, T166, T173
- 15: RTA T120, T119, T162 16 RTA T120 T162 T173
- 17. RTA T120, T164, T173

\* Cement Stabilised

\$ Gypsum Stabilised

# Lime Stabilised

- CI-Clay of medium plasticity, gravelly clays, sandy clays, silty clays
- SC-Clayey sands, sand-clay mixtures

- DGB20

- 11. DGS40
- 12. FCR20
- 13. FCR40
- 14. RC Recycled Concrete
- 15. Recycled Roadbase 16. RSB - Recycled Sub-base
- 17. CSS Crushed Sandstone
- 18. RSS Ripped Sandstone

Form No R022 Version 18 06/13 - issued by ER



Accredited for compliance with ISO/IEC 17025.

A Kench

06/08/2013

Accreditation Number 2734 Corporate Site Number 2727

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MARYLAND DEVELOPMENT COMPANY PTY LTD C/- LEND LEASE DEVELOPMENT P/L, PO BOX 1124 ST MARYS NSW 1790

PROJECT:

PAVEMENT TESTING

STAGE 4A, JORDAN SPRINGS

Laboratory: Penrith Job No: 7508/121 Date: 29/08/2013

Page 1 of 4

TEST NUMBER DATE TESTED		-	91	12 13					
RESULTS		54 <u>-</u>				Ç	2		
Density Ratio	Modified	%	100	101	101	99.5	100.5	102.5	
Moisture Variation f	rom OMC (-Drier/+Wetter)	%	0.0	+ 1.0	0.0	+ 2.0	0.0	- 1.5	
Specification	Density Ratio (Modif	ied)	≥98%	Specifica	ation Mo	isture Va	riance fi	om OMC	N/A%
TEST LOCATION	١	100		•					
Chainage	(Carriageway L/R)	m	1025	15	65	115	165	215	F-1.
Road Name/Number			Road 1	iq		Road 2	8	8 518	6.
Retested by test			·*1	1961		*		193	
Level					Base	course			
FIELD & LABOR	ATORY DATA								
Field Dry Density		t/m³	2.23	2.25	2.25	2.22	2.24	2.29	
Field Moisture Content		%	6.2	6.8	5.9	7.8	5.8	4.4	
Material retained on	19 mm Sieve	%	<5	<5	<5	<5	<5	<5	
Assigned Value Numbe	r		4		MDGI	B20-16	91	2 07 80	
Maximum Dry Density		t/m³	2.23	2.23	2.23	2.23	2.23	2.23	
Number of Compaction			4	4	4	4	4	4	
Optimum Moisture Con		%	6.0	6.0	6.0	6.0	6.0	6.0	
Test Procedures - See			7	7	7	7	7	7	6
Material Description - se	ee below		8	8	8	8	8	8	

#### Notes

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- 5: AS 1289 1.2.1 dause 6.4 (b), 2.1.1, 5.2.1, 5.3.1, 5.4.1
- 6: AS 1289 1.2.1 dause 6.4 (b), 2.1.1, 5.1.1, 5.4.1, 5.8.1 7: AS 1289 1.2.1 clause 6.4 (b), 2.1.1, 5.2.1, 5.4.1, 5.8.1
- 8: AS 1289 1.2.1 clause 6.4 (b), 2.1.1., 5.5.1, 5.6.1, 5.8.1
- 9: Full details of Test Procedure 5.8.1 available on request
- **Material Description**
- CL-Clays of low plasticity, gravelly clays, sandy clays, silty clays CI-Clay of medium plasticity, gravelly clays, sandy clays, silty clays
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- SM-Silty sands, sand-silt mixtures
- GC-Clayey gravels, gravel-sand-clay mixtures
- SP-Sand, crushed dust, filling sand, washed sand
- DGB20 DGB40

Head Office:

- 11. DGS40 12. FCR20 13. FCR40

  - 14. RC Recycled Concrete 15. Recycled Roadbase
  - 16. RSB Recycled Sub-base
  - 17. CSS Crushed Sandstone
  - 18. RSS Ripped Sandstone

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10: AS 1289 1.2.1 clause 6.4 (b), 2.1.1, 5.3.1, 5.5.1, 5.6.1

11: AS 1289 1.2.1 clause 6.4 (b), 2.1.1, 5.3.1, 5.7.1

12. AS 1289 1.2.1 clause 6.4 (b), 2.1.1, 5.7.1, 5.8.1

13: RTA T111, T119, T120, T166

14: RTA T111, T120, T166, T173

15: RTA T120, T119, T162 16 RTA T120 T162 T173

17. RTA T120, T164, T173

\* Cement Stabilised

\$ Gypsum Stabilised

# Lime Stabilised

29/08/2013

Accreditation Number 2734 Corporate Site Number 2727

34 Borec Road, Penrith NSW 2750

P O Box 880 Penrith NSW 2751

Form No R022 Version 18 06/13 - issued by ER

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Unit 4, 18-20 Whyalla Place, Prestons NSW 2170 Telephone: (02) 9607 6111 Facsimile: (02) 9607 6200

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MARYLAND DEVELOPMENT COMPANY PTY LTD C/- LEND LEASE DEVELOPMENT P/L, PO BOX 1124 ST MARYS NSW 1790

PROJECT:

PAVEMENT TESTING

STAGE 4A, JORDAN SPRINGS

Laboratory: Penrith Job No: 7508/121 Date: 29/08/2013

Dage 2 of 4

TEST NUMBER			97						2
DATE TESTED		87	07/08/2013						
RESULTS									
Density Ratio	Standard	%	106.5			1			
Moisture Variation f	from OMC (-Drier/+Wetter)	%	- 2.5					13	
Specification	Density Ratio (Stand	lard)	≥100%	Specification I	Moisture V	ariance f	rom OMC	;	N/Aº
TEST LOCATION	N								
Chainage	(Carriageway L/R)	mГ	375				1		1
Road Name/Number	(Calliageway Lift)	111	Road 21				1		<u> </u>
		- 1	Road 21			-		-	
Retested by test			190	5			9	100	
Level			Subgrade		o .				
FIELD & LABOR	ATORY DATA								
Field Dry Density		t/m³	1.84	î î	Î	8	1		
Field Moisture Content		%	16.3	*	<u> </u>	+	*	*	<u> </u>
Material retained on	19 mm Sieve	%	-		-	+		16	<del>                                     </del>
		70	<5		_			***	
Lab compaction result f	rom test number	(000004)	97					ļ	
Maximum Dry Density		t/m³	1.73		·				
Number of Compaction	Points		4		1	2		16	
Optimum Moisture Con	tent	%	19.0	10°	*	di-	4	65	r.
Test Procedures - See	Notes	0.9%	6	e e			9	i i	ÿ.
Material Description - s	ee below	ŀ	2	8			1		
2: Assigned Values have been ob	.1.1, 5.2.1, 5.3.1, 5.4.1 .1.1, 5.1.1, 5.4.1, 5.8.1 .1.1, 5.2.1, 5.4.1, 5.8.1 .1.1, 5.5.1, 5.6.1, 5.8.1	litation No 1423		e shown		11: AS 1289 1.2 12. AS 1289 1.2 13: RTA T111, T	162, T173	1.1, 5.3.1, 5.7.1	.6.1
Material Description 1. CL-Clays of low plasticity, grave				11. DGS40		* Cement Stabil	ised		
	avelly clays, sandy clays, silty clays			12. FCR20		# Lime Stabilise			
. CH-Clays of high plasticity	**************************************			13. FCR40		\$ Gypsum Stabi	lised		
. SC-Clayey sands, sand-clay mix				14. RC - Recycled Concrete		36.7			
. SM-Silty sands, sand-silt mixture				15. Recycled Roadbase					
. GC-Clayey gravels, gravel-sand	C 7 2 8 7 3 6 7 9 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7			16. RSB - Recycled Sub-base					
<ul> <li>SP-Sand, crushed dust, filling sa</li> <li>DGB20</li> </ul>	and, washed sand			<ol> <li>CSS - Crushed Sandstone</li> <li>RSS - Ripped Sandstone</li> </ol>					
. DGB20 . DGB40				19. Cowels Brown					
0 DGS20				TO. CONTOS DIONII					

Form No R022 Version 18 06/13 - issued by ER



Accredited for compliance with ISO/IEC 17025.

A Kench

29/08/2013

Accreditation Number 2734

Corporate Site Number 2727

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email: info@geotech.com.au www.geotech.com.au





MARYLAND DEVELOPMENT COMPANY PTY LTD C/- LEND LEASE DEVELOPMENT P/L, PO BOX 1124 ST MARYS NSW 1790

PROJECT:

PAVEMENT TESTING

STAGE 4A, JORDAN SPRINGS

Laboratory: Job No:

Date:

Penrith 7508/121

29/08/2013

Dago 3 of A

TEST NUMBER			98	99	100	101	102	0.00	62
DATE TESTED			771		07/08/2013		1	32	17
RESULTS									
Density Ratio	Modified	%	96.5	95.5	97.5	96	95.5		
Moisture Variation f	rom OMC (-Drier/+Wetter)	%	0.0	+ 0.5	+ 0.5	+ 1.5	+ 2.0		
Specification	Density Ratio (Modi	fied)	≥98%	Specific	ation Mo	isture Va	ariance from	ОМС	N/A%
TEST LOCATION	١	100							
Chainage	(Carriageway L/R)	m	375	425	215	275	425		
Road Name/Number	AND THE SECOND SHOP TO SECOND SHOP TO SECOND FOR		Ro	ad 21	Road 2	Ros	ad 1	9 8	
Retested by test			*	99	-	-	3 <b>.</b>	03.00	
Level			Sub-bas	se Layer 2	Su	ub-base Laye	er 1		
FIELD & LABOR	ATORY DATA			-	<u> </u>				
Field Dry Density	50 50 5 <del>3 50 6</del> 72 50 - namen nan a tau a	t/m³	2.10	2.08	2.13	2.09	2.08	T	Т
Field Moisture Content		%	6.7	6.8	7.1	7.8	8.3	* *	
Material retained on	37.5 mm Sieve	%	<5	<5	<5	<5	<5	8 0	
Assigned Value Numbe	ſ			Н	QW75CSS-3	37	91	68	
Maximum Dry Density		t/m³	2.18	2.18	2.18	2.18	2.18		
Number of Compaction			4	4	4	4	4	818	
Optimum Moisture Cont		%	6.5	6.5	6.5	6.5	6.5	\$4.65	
Test Procedures - See I			7	7	7	7	7	24 % 31 52	
Material Description - se	ee below		17	17	17	17	17	888	di

#### Notes

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- 9: Full details of Test Procedure 5.8.1 available on request

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- 11: AS 1289 1.2.1 clause 6.4 (b), 2.1.1, 5.3.1, 5.7.1
- 12. AS 1289 1.2.1 clause 6.4 (b), 2.1.1, 5.7.1, 5.8.1
- 13: RTA T111, T119, T120, T166 14: RTA T111, T120, T166, T173
- 15: RTA T120, T119, T162
- 16 RTA T120 T162 T173
- 17. RTA T120, T164, T173

\* Cement Stabilised

\$ Gypsum Stabilised

# Lime Stabilised

## **Material Description**

- CL-Clays of low plasticity, gravelly clays, sandy clays, silty clays
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- GC-Clayey gravels, gravel-sand-clay mixtures
- SP-Sand, crushed dust, filling sand, washed sand
- DGB20
- DGB40

Head Office:

- 11. DGS40
- 12. FCR20
- 13. FCR40
- 14. RC Recycled Concrete
- 15. Recycled Roadbase 16. RSB - Recycled Sub-base
- 17. CSS Crushed Sandstone
- 18. RSS Ripped Sandstone

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29/08/2013

Accreditation Number 2734

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MARYLAND DEVELOPMENT COMPANY PTY LTD C/- LEND LEASE DEVELOPMENT P/L, PO BOX 1124 ST MARYS NSW 1790

Job No:

Penrith 7508/121

Date:

Laboratory:

29/08/2013

PROJECT: PAVEMENT TESTING

STAGE 4A, JORDAN SPRINGS

Dage 4 of 4

		16								Page 4 of
TEST NUMBER		1	103	45					45	12
DATE TESTED			07/08/2013		9				2	17
SAIL ILOILS			07/00/2013	l .		l .			l .	
RESULTS										
Density Ratio	Standard	%	104.5					Ĭ		
Moisture Variation f	rom OMC (-Drier/+Wetter)	%	- 1.0	6	÷	3			8	
Specification	Density Ratio (Stand	lard)	≥100%	Specific	ation Mo	oisture V	ariance f	rom OMC		N/A
TEST LOCATION	V			-	TO SECURE CONTRACTOR OF SCHOOLS FOR SECURITY AND RECOVER.	ANALY COMPONENTIAL ANALY		The state of the s		313454
Chainage	(Carriageway L/R)	m	375							
Road Name/Number	(Camagena) 271)	1/1/1/1	Road 1				1		*	
37.500 B			Noau I		0	3	1	+	19	
Retested by test				<u> </u>				4	90	
Level			Subgrade							
FIELD & LABOR	ATORY DATA									
Field Dry Density		t/m³	1.85	ľ		T.	1	Ĭ	**	
Field Moisture Content		%	16.3	**	× .	i	†	*	1X	<u> </u>
Material retained on	19 mm Sieve	%		60	7			·	60	
		70	<5	100	0				65	
ab compaction result f	rom test number	1/10/27/20	103							
Maximum Dry Density		t/m³	1.77		*					
Number of Compaction	Points		4	10	ů.				10	ĺ
Optimum Moisture Cont	tent	%	17.5	n)	7.			2	10 <sup>1</sup> / <sub>2</sub>	i.
rest Procedures - See I		0.792.0	6	h)			•		6)	
Material Description - se			2		e F					
Notes		ě.				1			r's	L.
	tained from our Penrith laboratory - Accredit	ation No 2734					10: AS 1289 1.2	.1 clause 6.4 (b), 2.	1.1. 5.3.1. 5.5.1. 5	.6.1
	ained from our Prestons laboratory - Accred		34					1 clause 6.4 (b), 2.		
	sing infinite decimal places. Therefore, calcu	lated values m	nay vary from thos	e shown				.1 clause 6.4 (b), 2.	1.1, 5.7.1, 5.8.1	
4: AS 1289 1.2.1 clause 6.4 (b), 2.							13: RTA T111, T			
5: AS 1289 1.2.1 clause 6.4 (b), 2.								120, T166, T173		
6: AS 1289 1.2.1 dause 6.4 (b), 2. 7: AS 1289 1.2.1 dause 6.4 (b), 2.							15: RTA T120, T 16. RTA T120, T			
8: AS 1289 1.2.1 clause 6.4 (b), 2.							17. RTA T120, T			
9: Full details of Test Procedure 5.								52/6		
Material Description	on									
. CL-Clays of low plasticity, gravel	lly clays, sandy clays, silty clays			11. DGS40			* Cement Stabil	ised		
	velly clays, sandy clays, silty clays			12. FCR20			# Lime Stabilised			
. CH-Clays of high plasticity				13. FCR40			\$ Gypsum Stabil	ised		
. SC-Clayey sands, sand-clay mix				14. RC - Recycled						
<ul> <li>SM-Silty sands, sand-silt mixture</li> <li>GC-Clayey gravels, gravel-sand-</li> </ul>				<ol> <li>Recycled Roa</li> <li>RSB - Recycle</li> </ol>						
. SP-Sand, crushed dust, filling sa				17. CSS - Crushe						
DGB20	responded during			18. RSS - Ripped						
. DGB40				19. Cowels Brown						
0. DGS20				united too 60						

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Accredited for compliance with ISO/IEC 17025.

A Kench

29/08/2013

Accreditation Number 2734

Corporate Site Number 2727

34 Borec Road, Penrith NSW 2750

P O Box 880 Penrith NSW 2751

Head Office:

Prestons Laboratory:

Unit 4, 18-20 Whyalla Place, Prestons NSW 2170 Telephone: (02) 9607 6111 Facsimile: (02) 9607 6200

Telephone: (02) 4722 2744 Facsimile: (02) 4722 2777





Job No: 7508/125 Our Ref: 7508/125-AA 30 August 2013

Maryland Development Company Pty Ltd c/- Lend Lease Development Pty Ltd P O Box 1870
PENRITH NSW 2751

Attention: Mr A Ali

Dear Sir

re: Jordan Springs - Stage 4B

Penrith City Council DA 12/0897 - Condition No. 65(f) Summary of Field Density Testing for Road Works

Geotech Testing Pty Ltd carried out field density tests and associated laboratory compaction tests at the above project to satisfy the following Penrith City Council (PCC) requirement under DA 12/0897.

**Condition No. 65(f) -** A Geotechnical Report certifying that all earthworks and road formation have been completed in accordance with AS3798 and Council's Design Guidelines and Construction specifications. The report shall include;

- Compaction reports for road pavement construction
- Compaction reports for bulk earthworks and lot regrading.
- Soil classification for all residential lots
- Statement of Compliance

The tests carried out assessed the degree of compaction in the subgrade and road pavement materials at the above site. All testing was undertaken within the terms of our NATA accreditation, at the dates and to the procedures shown on the attached test results certificates.

Field density tests were generally carried out at approximately 50 metre intervals. At the time of testing, there was no visible indication in the area surrounding each test that the area had been compacted in a manner different from that at the test location. Our observations did not include roller testing of any of the layers.

Laboratory compaction tests were carried out in accordance with AS1289 5.1.1 (Standard Compaction) and AS1289 5.2.1 (Modified Compaction). Where the density test results failed to indicate that the specified minimum dry density ratios (AS1289 5.4.1) had been achieved, the contractor was so advised. After the contractor advised that re-working had been carried out, the failed areas were retested. This process was repeated until the test results met the specification requirements.

7508/125-AA

Stage 4B - Jordan Springs

Summary of Field Density Testing for Road Works

We understand that the specification requirements for this project set out by Penrith City Council are as follows.

Basecourse	98%	Modified
Sub-basecourse	95%	Modified
Subgrade	100%	Standard

The test numbers corresponding to the different locations/pavement layers tested are shown below.

ROAD 1							
Ch	475	525	575	625	675	725	775
Subgrade	1	2	3	4	5	6	7
Sub-base 1	12	13	14	15	16	17	18
Sub-base 2	23	24	25	26	27	28	29
Base	35	36	37	38	39	40	41
ROAD 3							
Ch	15	65	115	165			
Subgrade	8	9	10	11			
Sub-base 1	19	20	21	22			
Base	31	32	33	34			
ROAD 4							
Ch	15						
Subgrade	30						
Sub-base 1	42						
Base	43						

It is our opinion that the pavement materials have been tested and satisfy the required specifications.

Yours faithfully GEOTECH TESTING PTY LTD

**EMGED RIZKALLA** 

Director

Attached Compaction Control Tests Nos 1 to 43





7508/125

#### FIELD DENSITY RESULTS

MARYLAND DEVELOPMENT COMPANY PTY LTD C/- LEND LEASE DEVELOPMENT P/L, PO BOX 1124 ST MARYS NSW 1790

Date: 28/05/2013

Job No:

PROJECT: PAVEMENT TESTING

	STAGE 4B, JORDAN	SPRING	S							
TEST NUMBER		ſ	1	2	3	4	5	6	7	8
DATE TESTED		<u></u>	-	10/05	5/2013			14/05	5/2013	
RESULTS										
Density Ratio	Standard	%	105.5	103.5	105	102	107.5	105.5	104.5	102.5
Moisture Variation fr	om OMC (-Drier/+Wetter)	%	- 2.5	- 2.5	- 2.0	+ 1.0	- 2.0	- 1.5	- 2.0	0.0
Specification	Density Ratio (Standa	ard)	≥100%	Specific	ation Mo	isture Va	ariance fr	om OMC		N/A%
TEST LOCATION	201 105 C1	2000	30000000		20.00					
Chainage	(Carriageway L/R)	m	475	525	575	625	675	725	775	15
Road Name/Number	(	1296				Road 1				Road 3
Retested by test		Ī	25	2		72	8	(E)	1923	1
Level		ŧ				Sub	grade			
							×			
FIELD & LABORA	ATORY DATA		0.00598 - 0	979880	F 20 5 (85)		1 33555	F 1000980		W SSS
Field Dry Density		t/m³	1.99	1.99	1.97	1.94	1.91	1.96	1.96	1.96
Field Moisture Content		%	11.9	13.5	13.0	13.4	14.6	12.3	12.1	14.5
Material retained on	19 mm Sieve	%	<5	<5	<5	<5	<5	<5	<5	<5
Lab compaction result fro	om test number	1	1	2	3	4	5	6	7	8
Maximum Dry Density		t/m³	1.89	1.92	1.88	1.90	1.78	1.86	1.88	1.91
Number of Compaction F	Points	- [	4	4	4	4	4	4	4	4
Optimum Moisture Conte	ent	%	14.5	16.0	15.0	12.5	16.5	14.0	14.0	14.5
Test Procedures - See N	otes	3	6	6	6	6	6	6	6	6
Material Description - see	e below		2	2	2	1	2	2	2	2
2: Assigned Values have been obtain	1, 5.2.1, 5.3.1, 5.4.1 1, 5.1.1, 5.4.1, 5.8.1 1, 5.2.1, 5.4.1, 5.8.1 1., 5.5.1, 5.6.1, 5.8.1	ation No 14234		e shown			11: AS 1289 1.2.	120, T166, T173 119, T162 162, T173	1.1, 5.3.1, 5.7.1	i.11
Material Descriptio	n									
<ol> <li>CL-Clays of low plasticity, gravely</li> <li>Cl-Clay of medium plasticity, gravely</li> <li>CH-Clays of high plasticity</li> <li>SC-Clayey sands, sand-clay mixth</li> <li>SC-SM-Sitty sands, sand-sitt mixtures</li> <li>GC-Clayey gravels, gravel-sand-c</li> <li>SP-Sand, crushed dust, filling san</li> </ol>	elly clays, sandy clays, silty clays ures clay mixtures			11. DGS40 12. FCR20 13. FCR40 14. RC - Recycled 15. Recycled Ros 16. RSB - Recycle 17. CSS - Crushe	idbase ed Sub-base		Cement Stabilis     Lime Stabilised     Gypsum Stabilis			
SP-Sand, crushed dust, filling san     DGB20	u, washou baliu			18. RSS - Ripped						
9. DGB40				19. Cowels Brown						

10. DGS20



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28/05/2013 A Kench

Approved Signatory

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7508/125

#### FIELD DENSITY RESULTS

MARYLAND DEVELOPMENT COMPANY PTY LTD C/- LEND LEASE DEVELOPMENT P/L, PO BOX 1124 ST MARYS NSW 1790

Date: 28/05/2013

Job No:

PROJECT: PAVEMENT TESTING

STAGE 4B. JORDAN SPRINGS

	STAGE 4B, JORDAN	SPRING	SS						
TEST NUMBER DATE TESTED			9 14/05/2013						
RESULTS				· · · · · · · · · · · · · · · · · · ·	**				
Density Ratio	Standard	%	100.5						
Moisture Variation f	from OMC (-Drier/+Wetter)	%	- 0.5						
Specification	Density Ratio (Stand	ard)	≥100%	Specification M	loisture V	ariance f	rom OMC	:	N/A%
TEST LOCATION	Ň	0.000							
Chainage	(Carriageway L/R)	m[	65		1	9	6	10 0	
	(Carriageway L/K)	101			-	34	15	+	<del></del>
Road Name/Number			Road 3				ļ	+	
Retested by test		- 1					4		
Level		9	Subgrade			3	5		
FIELD & LABOR	ATORY DATA								
	AIORY DATA								
Field Dry Density		t/m³	1.94			ž			
Field Moisture Content		%	13.4						
Material retained on	19 mm Sieve	%	<5						
Lab compaction result f	from test number	1859	9			9	ě.		
Maximum Dry Density		t/m³	1.93		+	+	ė.	+	
	Deinte	VIII			-	3			
Number of Compaction			4		-	34	1.5	-	
Optimum Moisture Con		%	14.0						
Test Procedures - See	9970774	3	6			3	ė.	4	
Material Description - se	ee below		2				Ŷ.		
2: Assigned Values have been ob	.1.1, 5.2.1, 5.3.1, 5.4.1 .1.1, 5.1.1, 5.4.1, 5.8.1 .1.1, 5.2.1, 5.4.1, 5.8.1 .1.1, 5.5.1, 5.6.1, 5.8.1	tation No 1423		e shown		11: AS 1289 1.2 12: AS 1289 1.2 13: RTA T111, I	2.1 clause 6.4 (b), 2 2.1 clause 6.4 (b), 2 7119, T120, T166 7120, T166, T173 7119, T162 7162, T173		di.
Material Descripti							0.000		
<ol> <li>CL-Clays of low plasticity, grave</li> <li>CL-Clay of medium plasticity, grave</li> </ol>	elly clays, sandy clays, silty clays avelly clays, sandy clays, silty clays			11. DGS40 12. FCR20		<ul> <li>Cement Stabilise</li> <li># Lime Stabilise</li> </ul>			
<ol> <li>CH-Clays of high plasticity</li> </ol>	aveny days, sality days, sity days			13. FCR40		\$ Gypsum Stabi			
<ol> <li>SC-Clayey sands, sand-clay mix</li> </ol>	xtures			14. RC - Recycled Concrete		# OJPaulii oldu			
5. SM-Silty sands, sand-silt mixture				15. Recycled Roadbase					
6. GC-Clayey gravels, gravel-sand				16. RSB - Recycled Sub-base					
<ol><li>SP-Sand, crushed dust, filling sa</li></ol>	and, washed sand			17. CSS - Crushed Sandstone					
8. DGB20				18. RSS - Ripped Sandstone					
9. DGB40 10. DGS20				19. Cowels Brown					
	100 TO								

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A Kench

28/05/2013

Approved Signatory

Prestons Laboratory:
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Telephone: (02) 9607 6111 Facsimile: (02) 9607 6200





Penrith

7508/125

06/08/2013

Page 1 of 8

# FIELD DENSITY RESULTS

MARYLAND DEVELOPMENT COMPANY PTY LTD C/- LEND LEASE DEVELOPMENT P/L, PO BOX 1124 ST MARYS NSW 1790

PROJECT: PAVEMENT TESTING

STAGE 4B, JORDAN SPRINGS

Laboratory:

Job No:

Date:

		181								Page 1 of
TEST NUMBER			10	11		i.		6	635	12
DATE TESTED			27/05	5/2013	ý.			9	398	Ü
		Ļ	2,700	72010						
RESULTS										
Density Ratio	Standard	%	103.5	100.5			Î			
Moisture Variation f	rom OMC (-Drier/+Wetter)	%	- 1.0	+ 1.5	į.	9	57		* 13	
Specification	Density Ratio (Stand	dard)	≥100%	Specific	ation M	oisture	Variance	from OM	C	N/A%
TEST LOCATION	١									181045
Chainage	(Carriageway L/R)	m	119	165						
Road Name/Number	(Gamageway 2711)	10000	Road 3	Road 3	2		-	1	45 JO	+
			Noau 3	Noau 3			-	*	81.0	+
Retested by test		-	- 0		S		_	4	00,60	+
Level			Sub	grade					S.S.	
FIELD & LABOR	ATORY DATA									
Field Dry Density		t/m³	1.85	1.80		0	1			
Field Moisture Content		%	15.8	16.9	*		*	*	X1 20	+
Material retained on	19 mm Sieve	%	<5	<5	,			- 0	00 60	+
Test Number	13 IIIII Oleve	70	-	-	,		-	-	3865	+
		113	10	11					*10	-
Maximum Dry Density		t/m³	1.79	1.79						
Number of Compaction		20000	4	4						
Optimum Moisture Cont	ent	%	17.0	15.5				55	(A.B.)	2
Test Procedures - See I	Notes		6	6	8				(48) 686	
Material Description - se	ee below		2	2	9			9	000	
Notes						- L		94		Lat.
2: Assigned Values have been obt	1.1, 5.2.1, 5.3.1, 5.4.1 1.1, 5.1.1, 5.4.1, 5.8.1 1.1, 5.2.1, 5.4.1, 5.8.1 1.1., 5.5.1, 5.6.1, 5.8.1	ditation No 1423		e shown			11: AS 1289 1 12. AS 1289 1 13: RTA T111,	T162, T173	2.1.1, 5.3.1, 5.7.1	5.6.1
Material Description				**********			97800 (Lappeninted Lacon	000000000		
<ol> <li>CL-Clays of low plasticity, gravel</li> <li>CI-Clay of medium plasticity, gra</li> </ol>				11. DGS40 12. FCR20			* Cement Stal # Lime Stabilis			
CH-Clays of high plasticity	rony orays, sandy orays, siny diays			13. FCR40			\$ Gypsum Sta			
SC-Clayey sands, sand-clay mix	tures			14. RC - Recycled	Concrete		7 - 7,7			
<ol><li>SM-Silty sands, sand-silt mixture</li></ol>				15. Recycled Road						
<ol><li>GC-Clayey gravels, gravel-sand-</li></ol>	728 TO 00 00 00 00 00 00 00 00 00 00 00 00 00			16. RSB - Recycle						
<ol> <li>SP-Sand, crushed dust, filling sa</li> </ol>	nd, washed sand			17. CSS - Crushed						
8. DGB20				18. RSS - Ripped	Sandstone					
9. DGB40 10. DGS20				19. Cowels Brown						
Form No R022 Version 18 06/	13 - issued by FR									



Accredited for compliance with ISO/IEC 17025.

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06/08/2013

Accreditation Number 2734 Corporate Site Number 2727

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MARYLAND DEVELOPMENT COMPANY PTY LTD C/- LEND LEASE DEVELOPMENT P/L, PO BOX 1124 ST MARYS NSW 1790

PROJECT:

PAVEMENT TESTING

STAGE 4B, JORDAN SPRINGS

Laboratory: Job No:

Date:

Penrith 7508/125

06/08/2013

TEST NUMBER			12	13	14	15	16	17	18	19
DATE TESTED				40 Mario		20/06	5/2013		O STORES	
RESULTS										
Density Ratio	Modified	%	97	97	95	97.5	98	99	97	97.5
Moisture Variation for	rom OMC (-Drier/+Wetter)	%	+ 0.5	+ 1.0	+ 1.5	0.0	0.0	- 0.5	- 0.5	0.0
Specification	Density Ratio (Mod	fied)	≥95%	Specific	ation Mo	isture Va	riance f	rom OMC		N/A%
TEST LOCATION		26								
Chainage	(Carriageway L/R)	m	475	525	575	625	675	725	775	15
Road Name/Number	AND THE STREET WAS TO STREET AND THE STREET TO STREET THE			090	97.	Road 1	8		646	Road 3
Retested by test			: <b>*</b>	9#1		×		196	1941	. *:
Level						Sub-bas	e Layer 1			
FIELD & LABOR	ATORY DATA									
Field Dry Density		t/m³	2.12	2.12	2.08	2.13	2.15	2.17	2.12	2.14
Field Moisture Content		%	7.0	7.5	8.0	6.4	6.6	5.8	5.8	6.4
Material retained on	37.5mm Sieve	%	<5	<5	<5	<5	<5	<5	<5	<5
Assigned Value Number				****	10	HQW75	CSS-36		WEEK.	50
Maximum Dry Density		t/m³	2.19	2.19	2.19	2.19	2.19	2.19	2.19	2.19
Number of Compaction	Points		4	4	4	4	4	4	4	4
Optimum Moisture Cont	ent	%	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5
Test Procedures - See N			7	7	7	7	7	7	7	7
Material Description - se	e below	Г	17	17	17	17	17	17	17	17

#### Notes

- Assigned Values have been obtained from our Penrith laboratory Accreditation No 2734
- Assigned Values have been obtained from our Prestons laboratory Accreditation No 14234
- 3. Results have been calculated using infinite decimal places. Therefore, calculated values may vary from those shown
- 4: AS 1289 1.2.1 dause 6.4 (b), 2.1.1, 5.1.1, 5.3.1, 5.4.1
- 5: AS 1289 1.2.1 dause 6.4 (b), 2.1.1, 5.2.1, 5.3.1, 5.4.1
- 6: AS 1289 1.2.1 dause 6.4 (b), 2.1.1, 5.1.1, 5.4.1, 5.8.1 7: AS 1289 1.2.1 clause 6.4 (b), 2.1.1, 5.2.1, 5.4.1, 5.8.1
- 8: AS 1289 1.2.1 clause 6.4 (b), 2.1.1., 5.5.1, 5.6.1, 5.8.1
- 9: Full details of Test Procedure 5.8.1 available on request

- 10: AS 1289 1.2.1 clause 6.4 (b), 2.1.1, 5.3.1, 5.5.1, 5.6.1 11: AS 1289 1.2.1 clause 6.4 (b), 2.1.1, 5.3.1, 5.7.1
- 12. AS 1289 1.2.1 clause 6.4 (b), 2.1.1, 5.7.1, 5.8.1
- 13: RTA T111, T119, T120, T166
- 14: RTA T111, T120, T166, T173 15: RTA T120, T119, T162
- 16 RTA T120 T162 T173
- 17. RTA T120, T164, T173

\* Cement Stabilised

\$ Gypsum Stabilised

# Lime Stabilised

## **Material Description**

- CL-Clays of low plasticity, gravelly clays, sandy clays, silty clays
- CI-Clay of medium plasticity, gravelly clays, sandy clays, silty clays
- CH-Clays of high plasticity SC-Clayey sands, sand-clay mixtures
- SM-Silty sands, sand-silt mixtures
- GC-Clayey gravels, gravel-sand-clay mixtures
- SP-Sand, crushed dust, filling sand, washed sand
- DGB20 DGB40

- 11. DGS40 12. FCR20
  - 13. FCR40
  - 14. RC Recycled Concrete
  - 15. Recycled Roadbase
  - 16. RSB Recycled Sub-base 17. CSS - Crushed Sandstone
  - 18. RSS Ripped Sandstone

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06/08/2013

Accreditation Number 2734 Corporate Site Number 2727

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MARYLAND DEVELOPMENT COMPANY PTY LTD C/- LEND LEASE DEVELOPMENT P/L, PO BOX 1124

ST MARYS NSW 1790

Laboratory: Job No:

Penrith 7508/125

Date:

06/08/2013

PROJECT: PAVEMENT TESTING

STAGE 4B, JORDAN SPRINGS

Page 3 of 8

										•
TEST NUMBER			20	21	22	23	24	25	26	27
DATE TESTED		L		20/06/2013		5				
RESULTS							2			
Density Ratio	Modified	%	100.5	99	98.5	97.5	96.5	95.5	97	97
Moisture Variation f	rom OMC (-Drier/+Wetter)	%	- 1.5	- 1.0	- 1.0	+ 1.0	+ 2.0	+ 1.5	+ 1.0	+ 1.0
Specification	Density Ratio (Modi	fied)	≥95%	Specific	ation Mo	isture Va	riance fi	rom OMC		N/A%
TEST LOCATION	١	15								
Chainage	(Carriageway L/R)	m	65	115	165	475	525	575	625	675
Road Name/Number				Road 3	90		8	Road 1	***	00
Retested by test		L	*	196				193		-
Level			S	ub-base Laye	er 1	2	Sı	ub-base Laye	er 2	
FIELD & LABOR	ATORY DATA									
Field Dry Density		t/m³	2.20	2.17	2.16	2.13	2.10	2.08	2.12	2.12
Field Moisture Content		%	4.8	5.3	5.7	7.4	8.6	8.1	7.4	7.4
Material retained on	37.5mm Sieve	%	<5	<5	<5	<5	<5	<5	<5	<5
Assigned Value Numbe	r	/04/00/04 P	J.	HQW75CSS-	36		H	QW75CSS-	37	575
Maximum Dry Density		t/m³	2.19	2.19	2.19	2.18	2.18	2.18	2.18	2.18
Number of Compaction			4	4	4	4	4	4	4	4
Optimum Moisture Cont		%	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5
Test Procedures - See I			7	7	7	7	7	7	7	7
Material Description - se	ee below		17	17	17	17	17	17	17	17

#### Notes

- Assigned Values have been obtained from our Penrith laboratory Accreditation No 2734
- Assigned Values have been obtained from our Prestons laboratory Accreditation No 14234
- 3. Results have been calculated using infinite decimal places. Therefore, calculated values may vary from those shown
- 4: AS 1289 1.2.1 dause 6.4 (b), 2.1.1, 5.1.1, 5.3.1, 5.4.1
- 5: AS 1289 1.2.1 dause 6.4 (b), 2.1.1, 5.2.1, 5.3.1, 5.4.1
- 6: AS 1289 1.2.1 dause 6.4 (b), 2.1.1, 5.1.1, 5.4.1, 5.8.1
- 7: AS 1289 1.2.1 clause 6.4 (b), 2.1.1, 5.2.1, 5.4.1, 5.8.1 8: AS 1289 1.2.1 clause 6.4 (b), 2.1.1., 5.5.1, 5.6.1, 5.8.1
- 9: Full details of Test Procedure 5.8.1 available on request

- 10: AS 1289 1.2.1 clause 6.4 (b), 2.1.1, 5.3.1, 5.5.1, 5.6.1
- 11: AS 1289 1.2.1 clause 6.4 (b), 2.1.1, 5.3.1, 5.7.1 12. AS 1289 1.2.1 clause 6.4 (b), 2.1.1, 5.7.1, 5.8.1
- 13: RTA T111, T119, T120, T166
- 14: RTA T111, T120, T166, T173
- 15: RTA T120, T119, T162 16 RTA T120 T162 T173
- 17. RTA T120, T164, T173

\* Cement Stabilised

\$ Gypsum Stabilised

# Lime Stabilised

- **Material Description**
- CL-Clays of low plasticity, gravelly clays, sandy clays, silty clays
- CI-Clay of medium plasticity, gravelly clays, sandy clays, silty clays
- CH-Clays of high plasticity SC-Clayey sands, sand-clay mixtures
- SM-Silty sands, sand-silt mixtures
- GC-Clayey gravels, gravel-sand-clay mixtures
- SP-Sand, crushed dust, filling sand, washed sand
- DGB20 DGB40

- 11. DGS40 12. FCR20 13. FCR40
- 14. RC Recycled Concrete
- 15. Recycled Roadbase
- 16. RSB Recycled Sub-base 17. CSS - Crushed Sandstone
- 18. RSS Ripped Sandstone

Form No R022 Version 18 06/13 - issued by ER



Accredited for compliance with ISO/IEC 17025.

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06/08/2013

Accreditation Number 2734

Corporate Site Number 2727

Head Office:

34 Borec Road, Penrith NSW 2750 P O Box 880 Penrith NSW 2751

Prestons Laboratory:

Unit 4, 18-20 Whyalla Place, Prestons NSW 2170 Telephone: (02) 9607 6111 Facsimile: (02) 9607 6200

Telephone: (02) 4722 2744 Facsimile: (02) 4722 2777





MARYLAND DEVELOPMENT COMPANY PTY LTD C/- LEND LEASE DEVELOPMENT P/L, PO BOX 1124 ST MARYS NSW 1790

PROJECT: PAVEMENT TESTING

STAGE 4B, JORDAN SPRINGS

Laboratory: Penrith Job No: 7508/125 Date: 06/08/2013

Page 4 of 8

TEST NUMBER		Ī	28	29				35	6
DATE TESTED		8	22/07	7/2013					
RESULTS									
Density Ratio	Modified	%	98.5	96.5					
Moisture Variation f	rom OMC (-Drier/+Wetter)	%	+ 0.5	0.0			50	21 13	
Specification	Density Ratio (Modif	ied)	≥95%	Specification	on Moistu	re Varianc	e from OM	ic	N/A
TEST LOCATION	N .	25							
Chainage	(Carriageway L/R)	m	725	775	4			60.00	
Road Name/Number	V-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1	Ascess	Ro	ad 1				0110	
Retested by test			(#)	19 <b>4</b> 1					
Level			Sub-bas	e Layer 2					
FIELD & LABOR	ATORY DATA			200			**		9-7
Field Dry Density	AIORIDAIA	t/m³	2.15	2.10	T T	7	7	-T	F
Field Moisture Content		%		6.7				X 2 X	+
Material retained on	37.5mm Sieve	%	7.1 <5	6.7 <5			- 8	8885	+
Assigned Value Numbe	976.0007 C30500	<sup>70</sup> -		CSS-37		-	4	- W86	+
Maximum Dry Density		t/m³	2.18	2.18	-	-	-	813	+
Number of Compaction	Points	-	4	22 Proteonories				- <del>1</del>	ł
Optimum Moisture Conf		%	6.5	6.5		4		(44)	2
Test Procedures - See		70	7	7				56.65	-
Material Description - se		F	17	17	i i			(18) (18)	8
Notes	55 551011	4	11.	II .			5	Act of the	Š.
1: Assigned Values have been ob 2: Assigned Values have been obt 3. Results have been calculated ut 4: AS 1289 1.2.1 clause 6.4 (b), 2. 5: AS 1289 1.2.1 clause 6.4 (b), 2. 6: AS 1289 1.2.1 clause 6.4 (b), 2. 7: AS 1289 1.2.1 clause 6.4 (b), 2. 9: Full details of Test Procedure 5.	1.1, 5.2.1, 5.3.1, 5.4.1 1.1, 5.1.1, 5.4.1, 5.8.1 1.1, 5.2.1, 5.4.1, 5.8.1 1.1., 5.5.1, 5.6.1, 5.8.1 8.1 available on request	itation No 14234		e shown		11: AS 128 12: AS 128 13: RTA T 14: RTA T 15: RTA T 16: RTA T	39 1.2.1 clause 6.4 (b) 111, T119, T120, T166, T17: 120, T166, T17: 120, T162, T173 120, T164, T173 120, T164, T173	, 2.1.1, 5.3.1, 5.7.1 , 2.1.1, 5.7.1, 5.8.1 6	5.6.1
Material Description  1. CL-Clays of low plasticity, gravelender  2. Cl-Clay of medium plasticity, gravelender  3. CH-Clays of high plasticity  4. SC-Clayey sands, sand-clay mix  5. SM-Silty sands, sand-silt mixture	lly clays, sandy clays, silty clays avelly clays, sandy clays, silty clays atures			11. DGS40 12. FCR20 13. FCR40 14. RC - Recycled Conc 15. Recycled Roadbase	rete	* Cement # Lime Sta \$ Gypsum	bilised		

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GC-Clayey gravels, gravel-sand-clay mixtures

DGB20

DGB40

SP-Sand, crushed dust, filling sand, washed sand



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16. RSB - Recycled Sub-base

17. CSS - Crushed Sandstone

18. RSS - Ripped Sandstone

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**Approved Signatory** 

06/08/2013

Accreditation Number 2734

Corporate Site Number 2727

Head Office:

34 Borec Road, Penrith NSW 2750 Unit 4, 18-20 Whyalla Place, Prestons NSW 2170 P O Box 880 Penrith NSW 2751

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Telephone: (02) 9607 6111 Facsimile: (02) 9607 6200





7508/125

06/08/2013

# FIELD DENSITY RESULTS

MARYLAND DEVELOPMENT COMPANY PTY LTD C/- LEND LEASE DEVELOPMENT P/L, PO BOX 1124 ST MARYS NSW 1790

PROJECT:

PAVEMENT TESTING

STAGE 4B, JORDAN SPRINGS

Laboratory: Penrith

Job No:

Date:

Page 5 of 8

		Vec								Page 5 of
TEST NUMBER		Ī	30							12
DATE TESTED			26/07/2013	8		-		- 8		els Ch
		L	20/01/2010							l .
RESULTS										
Density Ratio	Standa	rd %	108.5				Ĩ			
Moisture Variation f	rom OMC (-Drier/+V	Vetter) %	- 4.5			7			;	
Specification	Density Ratio	ananasa nor sasa	≥100%	Specificatio	n Moistı	ure Variar	ce from	OMC		N/A
TEST LOCATION	AND THE PART OF SECURE AND SECURE	(								
Chainage		, "[	20							
	(Carriageway L/R)	) m	I South Control of	0		-		- 21		
Road Name/Number			Road 4			-	-	- 6		
Retested by test		<u> </u>	*	80				00.0		
Level			Subgrade							
FIELD & LABOR	ATORY DATA									
Field Dry Density		t/m³	1.93	ľ ľ	T	7	Ĩ	1		ľ
Field Moisture Content		%	9.3	*		_	X	***		
Material retained on	19 mm Sieve	1977	<5	× v	-	-	-			
material retained on	19 IIIII Sieve	70	-	8				896	5	
Test Number		00000	30							
Maximum Dry Density		t/m³	1.78							
Number of Compaction	Points		4	16		1				
Optimum Moisture Cont	ent	%	14.0	60°		8		- 1		
Test Procedures - See I	Notes		6	P. 1		*		- 4		7
Material Description - se	ee below	ŀ	1-2		- 1	*	-	- 3		
Notes		8	1-2	y's			5	39.0		2
1: Assigned Values have been obt 2: Assigned Values have been obt 3. Results have been calculated us 4: AS 1289 1.2.1 clause 6.4 (b), 2. 5: AS 1289 1.2.1 clause 6.4 (b), 2. 6: AS 1289 1.2.1 clause 6.4 (b), 2. 7: AS 1289 1.2.1 clause 6.4 (b), 2. 8: AS 1289 1.2.1 clause 6.4 (b), 2. 9: Full details of Test Procedure 5.	ained from our Prestons labora sing infinite decimal places. Th 1.1, 5.1, 5.3.1, 5.4.1 1.1, 5.2.1, 5.3.1, 5.4.1 1.1, 5.2.1, 5.4.1, 5.8.1 1.1, 5.2.1, 5.4.1, 5.8.1 1.1, 5.5.1, 5.6.1, 5.8.1	tory - Accreditation No 1423		e shown		11: AS 12. AS 13: RT 14: RT 15: RT 16. RT	1289 1.2.1 claus 1289 1.2.1 claus 1289 1.2.1 claus A T111, T119, T1 A T110, T120, T1 A T120, T162, T1 A T120, T164, T1	e 6.4 (b), 2.1. e 6.4 (b), 2.1. 20, T166 66, T173 62	1, 5.3.1, 5.7.1	6.1
Material Description				approximate designation of the second		Sheller As Assessed	200.00 Sec. 0.00 (100.			
CL-Clays of low plasticity, gravel     CL Clay of modium plasticity, gravel				11. DGS40 12. FCR20			ent Stabilised Stabilised			
<ol> <li>CI-Clay of medium plasticity, gra</li> <li>CH-Clays of high plasticity</li> </ol>	veny ciays, sandy ciays, silty di	ays		12. FCR20 13. FCR40			Stabilised um Stabilised			
CR-Claye of night plasticity     SC-Clayey sands, sand-clay mix	tures			14. RC - Recycled Concre	e	ф Сурс	uni Glaviliseu			
<ol> <li>SM-Silty sands, sand-silt mixture</li> </ol>				15. Recycled Roadbase	70					
6. GC-Clayey gravels, gravel-sand-				16. RSB - Recycled Sub-b	ase					
. SP-Sand, crushed dust, filling sa				17. CSS - Crushed Sandst						
3. DGB20				18. RSS - Ripped Sandsto	ne					
9. DGB40				19. Cowels Brown						

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06/08/2013

Accreditation Number 2734 Corporate Site Number 2727

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MARYLAND DEVELOPMENT COMPANY PTY LTD C/- LEND LEASE DEVELOPMENT P/L, PO BOX 1124

ST MARYS NSW 1790

Laboratory: Job No:

Penrith 7508/125

Date:

06/08/2013

PROJECT: PAVEMENT TESTING

STAGE 4B, JORDAN SPRINGS

Page 6 of 8

										9-1-1-1			
TEST NUMBER			31	32	33	34	35	36	37	38			
DATE TESTED		L	26/07/2013										
RESULTS		- CAY											
Density Ratio	Modified	%	101.5	100	100	102.5	99.5	102	102.5	101.5			
Moisture Variation f	om OMC (-Drier/+Wetter)	%	- 0.5	- 0.5	- 1.0	- 1.0	- 0.5	- 2.0	- 1.5	- 1.5			
Specification	Density Ratio (Mod	lified)	≥98%	Specific	ation Mo	isture Va	riance fr	rom OMC	:	N/A%			
TEST LOCATION		18											
Chainage	(Carriageway L/R)	m	15	65	115	165	475	525	575	625			
Road Name/Number				Ro	ad 3	20		Ro	ad 1				
Retested by test			*	196	*	*		1+3					
Level						Based	course						
FIELD & LABOR	ATORY DATA												
Field Dry Density		t/m³	2.26	2.23	2.23	2.29	2.22	2.27	2.29	2.26			
Field Moisture Content		%	5.4	5.4	4.8	5.0	5.5	4.2	4.6	4.6			
Material retained on	19 mm Sieve	%	<5	<5	<5	<5	<5	<5	<5	<5			
Assigned Value Number				200	50	MDGE	320-16			575			
Maximum Dry Density		t/m³	2.23	2.23	2.23	2.23	2.23	2.23	2.23	2.23			
Number of Compaction	Points		4	4	4	4	4	4	4	4			
Optimum Moisture Cont		%	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0			
Test Procedures - See N			7	7	7	7	7	7	7	7			
Material Description - se	e below		8	8	8	8	8	8	8	8			

#### Notes

- Assigned Values have been obtained from our Penrith laboratory Accreditation No 2734
- Assigned Values have been obtained from our Prestons laboratory Accreditation No 14234
- 3. Results have been calculated using infinite decimal places. Therefore, calculated values may vary from those shown
- 4: AS 1289 1.2.1 dause 6.4 (b), 2.1.1, 5.1.1, 5.3.1, 5.4.1
- 5: AS 1289 1.2.1 dause 6.4 (b), 2.1.1, 5.2.1, 5.3.1, 5.4.1
- 6: AS 1289 1.2.1 dause 6.4 (b), 2.1.1, 5.1.1, 5.4.1, 5.8.1
- 7: AS 1289 1.2.1 clause 6.4 (b), 2.1.1, 5.2.1, 5.4.1, 5.8.1
- 8: AS 1289 1.2.1 clause 6.4 (b), 2.1.1., 5.5.1, 5.6.1, 5.8.1 9: Full details of Test Procedure 5.8.1 available on request
- **Material Description**
- CL-Clays of low plasticity, gravelly clays, sandy clays, silty clays CI-Clay of medium plasticity, gravelly clays, sandy clays, silty clays
- CH-Clays of high plasticity
- SC-Clayey sands, sand-clay mixtures SM-Silty sands, sand-silt mixtures
- GC-Clayey gravels, gravel-sand-clay mixtures
- SP-Sand, crushed dust, filling sand, washed sand DGB20
- DGB40

- 11. DGS40 12. FCR20
  - 13. FCR40
  - 14. RC Recycled Concrete
  - 15. Recycled Roadbase
  - 16. RSB Recycled Sub-base
  - 17. CSS Crushed Sandstone 18. RSS - Ripped Sandstone

Accredited for compliance with ISO/IEC 17025.

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10: AS 1289 1.2.1 clause 6.4 (b), 2.1.1, 5.3.1, 5.5.1, 5.6.1

11: AS 1289 1.2.1 clause 6.4 (b), 2.1.1, 5.3.1, 5.7.1

12. AS 1289 1.2.1 clause 6.4 (b), 2.1.1, 5.7.1, 5.8.1

13: RTA T111, T119, T120, T166

14: RTA T111, T120, T166, T173

15: RTA T120, T119, T162 16 RTA T120 T162 T173

17. RTA T120, T164, T173

\* Cement Stabilised

\$ Gypsum Stabilised

# Lime Stabilised

06/08/2013

Form No R022 Version 18 06/13 - issued by ER



Accreditation Number 2734 Corporate Site Number 2727

Head Office:

34 Borec Road, Penrith NSW 2750 P O Box 880 Penrith NSW 2751

Prestons Laboratory:

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Telephone: (02) 4722 2744 Facsimile: (02) 4722 2777 email: info@geotech.com.au www.geotech.com.au





MARYLAND DEVELOPMENT COMPANY PTY LTD C/- LEND LEASE DEVELOPMENT P/L, PO BOX 1124 ST MARYS NSW 1790

PROJECT:

PAVEMENT TESTING

STAGE 4B, JORDAN SPRINGS

Penrith

7508/125

06/08/2013

TEST NUMBER			39	40	41		3 090	12
DATE TESTED		Ī	2000	29/07/2013		3		
RESULTS								
Density Ratio	Modified	%	102	100.5	102.5			
Moisture Variation fr	om OMC (-Drier/+Wette	er) %	- 0.5	- 0.5	- 1.5			
Specification	Density Ratio (M	odified)	≥98%	Specific	ation Mois	ture Varian	ce from OMC	N/Aº
TEST LOCATION		100						
Chainage	(Carriageway L/R)	m	675	725	775			
Road Name/Number	AND THE STREET WAS AND THE STREET, AND THE STREET A			Road 1	500			
Retested by test			3 <b>4</b> 3	19 <del>4</del> 0	. *			
Level				Basecourse	bi .			
FIELD & LABOR	ATORY DATA							
Field Dry Density		t/m³	2.27	2.24	2.29	1		
Field Moisture Content		%	5.4	5.6	4.5			
Material retained on	19 mm Sieve	%	<5	<5	<5			
Assigned Value Number				MDGB20-16	3		9/65	
Maximum Dry Density		t/m³	2.23	2.23	2.23			ľ
	oints		4	4	4	2		
Number of Compaction F		%	6.0	6.0	6.0			
	ent	/0						
Number of Compaction F		70	7	7	7		3 (415) (315)	

- Assigned Values have been obtained from our Penrith laboratory Accreditation No 2734
- 2: Assigned Values have been obtained from our Prestons laboratory Accreditation No 14234
- 3. Results have been calculated using infinite decimal places. Therefore, calculated values may vary from those shown
- 4: AS 1289 1.2.1 dause 6.4 (b), 2.1.1, 5.1.1, 5.3.1, 5.4.1
- 5: AS 1289 1.2.1 clause 6.4 (b), 2.1.1, 5.2.1, 5.3.1, 5.4.1
- 6: AS 1289 1.2.1 dause 6.4 (b), 2.1.1, 5.1.1, 5.4.1, 5.8.1
- 7: AS 1289 1.2.1 clause 6.4 (b), 2.1.1, 5.2.1, 5.4.1, 5.8.1
- 8: AS 1289 1.2.1 clause 6.4 (b), 2.1.1., 5.5.1, 5.6.1, 5.8.1
- 9: Full details of Test Procedure 5.8.1 available on request

# **Material Description**

- CL-Clays of low plasticity, gravelly clays, sandy clays, silty clays
- CH-Clays of high plasticity

- SP-Sand, crushed dust, filling sand, washed sand

- 10: AS 1289 1.2.1 clause 6.4 (b), 2.1.1, 5.3.1, 5.5.1, 5.6.1
- 11: AS 1289 1.2.1 clause 6.4 (b), 2.1.1, 5.3.1, 5.7.1

Laboratory:

Job No:

Date:

- 12. AS 1289 1.2.1 clause 6.4 (b), 2.1.1, 5.7.1, 5.8.1
- 13: RTA T111, T119, T120, T166
- 14: RTA T111, T120, T166, T173 15: RTA T120, T119, T162
- 16 RTA T120 T162 T173
- 17. RTA T120, T164, T173

\* Cement Stabilised

\$ Gypsum Stabilised

# Lime Stabilised

- CI-Clay of medium plasticity, gravelly clays, sandy clays, silty clays
- SC-Clayey sands, sand-clay mixtures
- SM-Silty sands, sand-silt mixtures
- GC-Clayey gravels, gravel-sand-clay mixtures
- DGB20
- DGB40

- 11. DGS40 12. FCR20

  - 13. FCR40
  - 14. RC Recycled Concrete 15. Recycled Roadbase
  - 16. RSB Recycled Sub-base
  - 17. CSS Crushed Sandstone
  - 18. RSS Ripped Sandstone

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06/08/2013

Accreditation Number 2734 Corporate Site Number 2727

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7508/125

06/08/2013

# FIELD DENSITY RESULTS

MARYLAND DEVELOPMENT COMPANY PTY LTD C/- LEND LEASE DEVELOPMENT P/L, PO BOX 1124 ST MARYS NSW 1790

PROJECT:

PAVEMENT TESTING

STAGE 4B, JORDAN SPRINGS

Laboratory: Penrith

Job No:

Date:

Dage 8 of 8

		100								Page 8 of
TEST NUMBER			42							
DATE TESTED			31/07/2013	2	e S				8	el- th
DATE TEOTED		8	31/01/2013		l					
RESULTS										
Density Ratio	Modified	%	97							
Moisture Variation f	rom OMC (-Drier/+Wetter)	%	+ 1.0	3	è	-			à ·	
Specification	Density Ratio (Modi	fied)	≥95%	Specific	ation Mo	isture Va	riance f	rom OMC		N/A%
TEST LOCATION	١									
Chainage	(Carriageway L/R)	m	20							
Road Name/Number	(Garriagoway 271)	11000	Road 4			1			0	
			Noau 4	9				-	2	
Retested by test			(4)	G)	0,			93	60	
Level			Sub-base	v.	à.					
FIELD & LABOR	ATORY DATA									
Field Dry Density	ATORT DATA	t/m³	2.12		Ť	Ť .	ì	1		
Field Moisture Content		%		×	X	<u> </u>			100	
	525000 5450	9357	7.4	80	,				60	
Material retained on	37.5mm Sieve	%	<5						De.	
Assigned Value Numbe	r		HQW75CSS-37							
Maximum Dry Density		t/m³	2.18	18					13	ľ
Number of Compaction	Points	ninciae	4	**		1		*	3	
Optimum Moisture Conf		%	6.5	65	5				65	ř
Test Procedures - See		70		67	ē.				6)	
Material Description - se			7	8	6 0				3	8
	ee below	4	17	67				i i	Ç.	ş
2: Assigned Values have been obt	1.1, 5.2.1, 5.3.1, 5.4.1 1.1, 5.1.1, 5.4.1, 5.8.1 1.1, 5.2.1, 5.4.1, 5.8.1 1.1., 5.5.1, 5.6.1, 5.8.1	editation No 1423		e shown			11: AS 1289 1.2.	120, T166, T173 119, T162 162, T173	1.1, 5.3.1, 5.7.1	6.1
Material Description				44 80000						
<ol> <li>CL-Clays of low plasticity, gravel</li> <li>CI-Clay of medium plasticity, gra</li> </ol>				11. DGS40 12. FCR20			* Cement Stabilised	2-ma		
<ol> <li>CH-Clays of high plasticity</li> </ol>	,,-, same, sale, sale sale			13. FCR40			\$ Gypsum Stabil			
4. SC-Clayey sands, sand-clay mix	tures			14. RC - Recycle	Concrete					
5. SM-Silty sands, sand-silt mixture	s			15. Recycled Roa						
<ol><li>GC-Clayey gravels, gravel-sand</li></ol>				16. RSB - Recycle						
7. SP-Sand, crushed dust, filling sa	nd, washed sand			17. CSS - Crushe						
8. DGB20				18. RSS - Ripped						
9. DGB40 10. DGS20				19. Cowels Brown	I.c.					

Form No R022 Version 18 06/13 - issued by ER



Accredited for compliance with ISO/IEC 17025.

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06/08/2013

Accreditation Number 2734 Corporate Site Number 2727

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Penrith

# FIELD DENSITY RESULTS

MARYLAND DEVELOPMENT COMPANY PTY LTD C/- LEND LEASE DEVELOPMENT P/L, PO BOX 1124 ST MARYS NSW 1790

PROJECT: PAVEMENT TESTING

STAGE 4B, JORDAN SPRINGS

Job No: 7508/125 Date: 29/08/2013

Laboratory:

TEST NUMBER		-	10	1 1					
TEST NUMBER		ļ	43					5	
DATE TESTED		2	06/08/2013						
RESULTS									
Density Ratio	Modified	%	102				Ī		
Moisture Variation f	rom OMC (-Drier/+Wetter)	%	- 0.5			1		3	
Specification	Density Ratio (Mod	ified)	≥98%	Specification N	Moisture V	ariance fi	rom OMC		N/A
TEST LOCATION	And the state of t		Turkey critical and	• ****	10.1 CO-00.0 Territorio (10.0 Co-00.0		-100 P. 101 C SO C 104 S. C		
Chainage	580 WC14 - CU JUGO 1080 WE194	m	20						
	(Carriageway L/R)	HIL	10.000		S	+		12	
Road Name/Number			Road 4					19	
Retested by test			-	3.60				(r)	
Level			Basecourse	)					
FIELD & LABOR	ATORY DATA								
Field Dry Density		t/m³	2.27	Î Î	1	1			
Field Moisture Content		%	5.7	+ +	+	1	1		
Material retained on	19 mm Sieve	%		6	+	+		65	
material retained on		70	<5		_			66	
Assigned Value Number		(0000000)	MDGB20-16					L <sub>2</sub>	
Maximum Dry Density		t/m³	2.23						
Number of Compaction	Points		4		1			15-	
Optimum Moisture Cont	ent	%	6.0	10°			i i	65	ř
Test Procedures - See N		CORKI	7	in) in	3	1	-	10)	
Material Description - se		ŀ	8						
Notes	70 D010W	5	0					r'i	
Assigned Values have been obta     Assigned Values have been obta	1.1, 5.2.1, 5.3.1, 5.4.1 1.1, 5.1.1, 5.4.1, 5.8.1 1.1, 5.2.1, 5.4.1, 5.8.1 1.1., 5.5.1, 5.6.1, 5.8.1	editation No 1423		se shown		11: AS 1289 1.2.	1 clause 6.4 (b), 2. 1 clause 6.4 (b), 2. 119, T120, T166 120, T166, T173 119, T162 162, T173		M
Material Description				Notice to the second se		Shipping and the control of the cont	evinaev		
. CL-Clays of low plasticity, gravell				11. DGS40 12. FCR20		* Cement Stabilised			
<ol> <li>CI-Clay of medium plasticity, gra-</li> <li>CH-Clays of high plasticity</li> </ol>	velly clays, sandy clays, slity clays			12. FCR20 13. FCR40		# Lime Stabilised \$ Gypsum Stabil			
. SC-Clayey sands, sand-clay mix	tures			14. RC - Recycled Concrete		y Cypsum Stabil	iou.		
. SM-Silty sands, sand-silt mixture				15. Recycled Roadbase					
GC-Clayey gravels, gravel-sand-				16. RSB - Recycled Sub-base					
. SP-Sand, crushed dust, filling sa	nd, washed sand			17. CSS - Crushed Sandstone					
DGB20				18. RSS - Ripped Sandstone					
DGB40				19. Cowels Brown					

Form No R022 Version 18 06/13 - issued by ER



Accredited for compliance with ISO/IEC 17025.

A Kench

**Approved Signatory** 

29/08/2013

Accreditation Number 2734

Corporate Site Number 2727

Head Office: Prestons Laboratory:

34 Borec Road, Penrith NSW 2750 Unit 4, 18-20 Whyalla Place, Prestons NSW 2170 P O Box 880 Penrith NSW 2751

Telephone: (02) 4722 2744 Facsimile: (02) 4722 2777

Telephone: (02) 9607 6111 Facsimile: (02) 9607 6200

# APPENDIX C

SUMMARY OF PIPELINE BACKFILL TESTING

Report 7508/122-AA Report 7508/126-AA





Job No: 7508/122 Our Ref: 7508/122-AA 30 August 2013

Maryland Development Company Pty Ltd c/- Lend Lease Development Pty Ltd P O Box 4366 PENRITH WESTFIELD NSW 2750

Attention: Mr A Ali

Dear Sir

re: Jordan Springs - Stage 4A Penrith City Council DA 12/0897 **Summary of Pipeline Backfill Testing** 

As requested, Geotech Testing Pty Ltd carried out field density tests and associated laboratory compaction tests in order to assess the degree of compaction during backfill operations of open trenches in accordance with Council's Design Guidelines and Construction Specification. All testing was undertaken within the terms of our NATA accreditation, at the dates and to the procedures shown on the test results sheets.

Field density tests were generally carried out at approximately 50m intervals, and individual test results provided on the attached test result sheets.

Laboratory compaction tests were carried out in accordance with AS1289 5.5.1 (Density Index) and the results exceeded the specification requirements.

As at 29 August 2013, backfill operations were completed for Roads 1, 2 & 21.

Yours faithfully GEOTECH TESTING PTY LTD

**EMGED RIZKALLA** 

Director

Attached Compaction Control Test Nos 1 to 38





MARYLAND DEVELOPMENT COMPANY PTY LTD C/- LEND LEASE DEVELOPMENT P/L, PO BOX 1124 ST MARYS NSW 1790

Job No: 7508/122

Date:

28/6/2013

PROJECT: PIPELINE BACKFILL TESTING STAGE 4A, JORDAN SPRINGS

TEST NUMBER			1	2	3	4	5	6	7	8
DATE TESTED			27/5/2013							
RESULTS		16 <u>-</u>								
Density Index		%	76	73	84	84	71	76	81	79
Moisture Variation from OMC (-Drier/+Wetter)		%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Specification	≥70%	Specific	ation Mo	isture Va	riance fr	om OMC		N/A		
TEST LOCATION										
Chainage		m	45	95	145	195	245	295	345	395
Road Name/Number			.00	8	3	Road	No 1		0.	Č.
Retested by test			4	72	¥	34	2.	-	4	340
Level		m				Bed	ding			
FIELD & LABOR	ATORY DATA	- 2								
Field Dry Density		t/m³	1.55	1.54	1.58	1.58	1.53	1.55	1.57	1.56
Field Moisture Content		%	11.6	9.7	10.9	10.0	10.1	12.9	15.1	11.1
Material retained on	4.75 mm Sieve	%	<5	<5	<5	<5	<5	<5	<5	<5
Assigned Value Number					×	JSB	S10		40	
Corrected Maximum Dry	Density	t/m³	1.65	1.65	1.65	1.65	1.65	1.65	1.65	1.65
Mould Size (Litre)			1	1	1	1	1	1	1	1
Minimum Dry Density		t/m3	1.30	1.30	1.30	1.30	1.30	1.30	1.30	1.30
Test Procedures - See N			8	8	8	8	8	8	8	8
Material Description - se	e below	Г	7	7	7	7	7	7	7	7

- 1: Assigned Values have been obtained from our Penrith laboratory Accreditation No 2734
- 2: Assigned Values have been obtained from our Prestons laboratory Accreditation No 14234
- 3. Results have been calculated using infinite decimal places. Therefore, calculated values may vary from those shown
- 4: AS 1289 1.2.1 clause 6.4 (b), 2.1.1, 5.1.1, 5.3.1, 5.4.1 5: AS 1289 1.2.1 dause 6.4 (b), 2.1.1, 5.2.1, 5.3.1, 5.4.1
- 6: AS 1289 1.2.1 clause 6.4 (b), 2.1.1, 5.1.1, 5.4.1, 5.8.1
- 8: AS 1289 1.2.1 dause 6.4 (b), 2.1.1., 5.5.1, 5.6.1, 5.8.1
- 9: Full details of Test Procedure 5.8.1 available on request
- 7: AS 1289 1.2.1 dause 6.4 (b), 2.1.1, 5.2.1, 5.4.1, 5.8.1

- 10: AS 1289 1.2.1 clause 6.4 (b), 2.1.1, 5.3.1, 5.5.1, 5.6.1
- 11: AS 1289 1.2.1 clause 6.4 (b), 2.1.1, 5.3.1, 5.7.1
- 12. AS 1289 1.2.1 clause 6.4 (b), 2.1.1, 5.7.1, 5.8.1
- 13: RTA T111, T119, T120, T166 14: RTA T111, T120, T166, T173
- 15: RTA T120, T119, T162 16. RTA T120, T162, T173
- 17. RTA T120, T164, T173

\* Cement Stabilised

\$ Gypsum Stabilised

# Lime Stabilised

#### Material Description

- CL-Clays of low plasticity, gravelly clays, sandy clays, silty clays
- CI-Clay of medium plasticity, gravelly clays, sandy clays, silty clays
- CH-Clays of high plasticity
- SC-Clayey sands, sand-clay mixtures SM-Silty sands, sand-silt mixtures
- GC-Clayey gravels, gravel-sand-clay mixtures
- SP-Sand, crushed dust, filling sand, washed sand
- DGB20

Form No R022 Version 18 06/13 - issued by ER

DGB40 0. DGS20

Head Office:

- 11. DGS40
- 12. FCR20 13. FCR40
- 14. RC Recycled Concrete
- 15. Recycled Roadbase
- 16. RSB Recycled Sub-base
- 17. CSS Crushed Sandstone
- 18. RSS Ripped Sandstone
- 19. Cowels Brown

Accredited for compliance with ISO/IEC 17025.

E van Niekerk

28/6/2013

Accreditation Number 2734 Corporate Site Number 2727

34 Borec Road, Penrith NSW 2750

P O Box 880 Penrith NSW 2751

Prestons Laboratory:

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Telephone: (02) 4722 2744 Facsimile: (02) 4722 2777





MARYLAND DEVELOPMENT COMPANY PTY LTD C/- LEND LEASE DEVELOPMENT P/L, PO BOX 1124 ST MARYS NSW 1790

Job No: 7508/122

Date:

28/6/2013

PROJECT: PIPELINE BACKFILL TESTING STAGE 4A JORDAN SPRINGS

TEST NUMBER		9	10	11	12	13	14	15	16
DATE TESTED	L	29/5/2013							
RESULTS	-								
Density Index	%	84	91	76	86	91	100	79	73
Moisture Variation from OMC (-Drier/+Wetter)		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Specification Density Ratio (Densi	ity Inde:	≥70%	Specific	ation Mo	isture Va	riance fr	om OMC		N/A
TEST LOCATION									
Chainage	m	45	95	145	195	245	295	345	395
Road Name/Number		388	ψ.	305	Road	No 1	8 .00		C.
Retested by test		-	- 2	3	3	-	-	4	4
Level	m				Top / 0	Overlay			
FIELD & LABORATORY DATA									
Field Dry Density	t/m³	1.58	1.61	1.55	1.59	1.61	1.65	1.56	1.54
Field Moisture Content	%	7.9	7.5	8.7	8.7	8.2	6.5	7.2	9.0
Material retained on 4.75 mm Sieve	%	<5	<5	<5	<5	<5	<5	<5	<5
Assigned Value Number		1010		92	JS	BS		40	22
Corrected Maximum Dry Density	t/m³	1.65	1.65	1.65	1.65	1.65	1.65	1.65	1.65
Mould Size (Litre)		1	1	1	1	1	1	1	1
Minimum Dry Density	t/m3	1.30	1.30	1.30	1.30	1.30	1.30	1.30	1.30
Test Procedures - See Notes	Г	8	8	8	8	8	8	8	8

#### Notes

- 1: Assigned Values have been obtained from our Penrith laboratory Accreditation No 2734
- 2: Assigned Values have been obtained from our Prestons laboratory Accreditation No 14234
- 3. Results have been calculated using infinite decimal places. Therefore, calculated values may vary from those shown
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- 5: AS 1289 1.2.1 dause 6.4 (b), 2.1.1, 5.2.1, 5.3.1, 5.4.1
- 6: AS 1289 1.2.1 clause 6.4 (b), 2.1.1, 5.1.1, 5.4.1, 5.8.1 7: AS 1289 1.2.1 dause 6.4 (b), 2.1.1, 5.2.1, 5.4.1, 5.8.1
- 8: AS 1289 1.2.1 dause 6.4 (b), 2.1.1., 5.5.1, 5.6.1, 5.8.1
- 9: Full details of Test Procedure 5.8.1 available on request

- 10: AS 1289 1.2.1 clause 6.4 (b), 2.1.1, 5.3.1, 5.5.1, 5.6.1
- 11: AS 1289 1.2.1 clause 6.4 (b), 2.1.1, 5.3.1, 5.7.1
- 12. AS 1289 1.2.1 clause 6.4 (b), 2.1.1, 5.7.1, 5.8.1
- 13: RTA T111, T119, T120, T166 14: RTA T111, T120, T166, T173
- 15: RTA T120, T119, T162
- 16. RTA T120, T162, T173
- 17. RTA T120, T164, T173

\* Cement Stabilised

\$ Gypsum Stabilised

# Lime Stabilised

#### Material Description

- CL-Clays of low plasticity, gravelly clays, sandy clays, silty clays
- CI-Clay of medium plasticity, gravelly clays, sandy clays, silty clays
- CH-Clays of high plasticity
- SC-Clayey sands, sand-clay mixtures
- SM-Silty sands, sand-silt mixtures
- GC-Clayey gravels, gravel-sand-clay mixtures SP-Sand, crushed dust, filling sand, washed sand
- DGB20
- DGB40 0. DGS20

- 11. DGS40 12. FCR20
- 13. FCR40
- 14. RC Recycled Concrete
- 15. Recycled Roadbase 16. RSB - Recycled Sub-base
- 17. CSS Crushed Sandstone
- 18. RSS Ripped Sandstone
- 19. Cowels Brown

Form No R022 Version 18 06/13 - issued by ER



Accreditation Number 2734 Corporate Site Number 2727 Accredited for compliance with ISO/IEC 17025.

E van Niekerk

28/6/2013

Approved Signatory

Head Office:

34 Borec Road, Penrith NSW 2750

P O Box 880 Penrith NSW 2751 Telephone: (02) 4722 2744 Facsimile: (02) 4722 2777 Prestons Laboratory:

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Telephone: (02) 9607 6111 Facsimile: (02) 9607 6200





MARYLAND DEVELOPMENT COMPANY PTY LTD C/- LEND LEASE DEVELOPMENT P/L, PO BOX 1124 ST MARYS NSW 1790

Job No: 7508/122

Date:

28/6/2013

PROJECT: PIPELINE BACKFILL TESTING STAGE 4A JORDAN SPRINGS

TEGT NUMBER	8	27	40	40	- 00	0.4	-00	00	0.4
TEST NUMBER	L	17	18	19	20	21	22	23	24
DATE TESTED	69		30/5/	/2013			4/6/2	2013	
RESULTS									
Density Index	%	91	76	73	86	79	102	76	79
Moisture Variation from OMC (-Drier/+Wetter)		N/A	N/A	N/A N/A	N/A	N/A	N/A	N/A	N/A
Specification Density Ratio (Density Inde			Specific	ation Mo	isture Va	riance fr	om OMC		N/A
TEST LOCATION									
Chainage	m	20	70	120	170	220	20	70	120
Road Name/Number			300	98	Road	No 2		.0.	6.
Retested by test		-	-	2	ü	12	-	-	-
Level				Bedding		2	χ.	Top / Overlay	y
FIELD & LABORATORY DATA									
Field Dry Density	t/m³	1.61	1.55	1.54	1.59	1.56	1.66	1.55	1.56
Field Moisture Content	%	8.0	9.0	8.5	7.5	8.5	6.4	9.2	9.2
Material retained on 4.75 mm Sieve	%	<5	<5	<5	<5	<5	<5	<5	<5
Assigned Value Number			000	99/	JSB	S10		40	05
Corrected Maximum Dry Density	t/m³	1.65	1.65	1.65	1.65	1.65	1.65	1.65	1.65
Mould Size (Litre)		1	1	1	1	1	1	1	1
Minimum Dry Density	t/m3	1.30	1.30	1.30	1.30	1.30	1.30	1.30	1.30
Test Procedures - See Notes		8	8	8	8	8	8	8	8
Material Description - see below		7	7	7	7	7	7	7	7

#### Notes

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- 3. Results have been calculated using infinite decimal places. Therefore, calculated values may vary from those shown
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- 8: AS 1289 1.2.1 dause 6.4 (b), 2.1.1., 5.5.1, 5.6.1, 5.8.1
- 9: Full details of Test Procedure 5.8.1 available on request
- 7: AS 1289 1.2.1 dause 6.4 (b), 2.1.1, 5.2.1, 5.4.1, 5.8.1

- 10: AS 1289 1.2.1 clause 6.4 (b), 2.1.1, 5.3.1, 5.5.1, 5.6.1
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- 12. AS 1289 1.2.1 clause 6.4 (b), 2.1.1, 5.7.1, 5.8.1
- 13: RTA T111, T119, T120, T166 14: RTA T111, T120, T166, T173
- 15: RTA T120, T119, T162
- 16. RTA T120, T162, T173
- 17. RTA T120, T164, T173

\* Cement Stabilised

\$ Gypsum Stabilised

# Lime Stabilised

#### Material Description

- CL-Clays of low plasticity, gravelly clays, sandy clays, silty clays
- CI-Clay of medium plasticity, gravelly clays, sandy clays, silty clays
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- SC-Clayey sands, sand-clay mixtures SM-Silty sands, sand-silt mixtures
- SP-Sand, crushed dust, filling sand, washed sand
- DGB20
- GC-Clayey gravels, gravel-sand-clay mixtures
- DGB40 0. DGS20

15. Recycled Roadbase 16. RSB - Recycled Sub-base

11. DGS40

12. FCR20

13. FCR40

14. RC - Recycled Concrete

- 17. CSS Crushed Sandstone
- 18. RSS Ripped Sandstone 19. Cowels Brown

Form No R022 Version 18 06/13 - issued by ER



Accreditation Number 2734 Corporate Site Number 2727 Accredited for compliance with ISO/IEC 17025.

E van Niekerk

28/6/2013

Approved Signatory

Head Office:

34 Borec Road, Penrith NSW 2750 P O Box 880 Penrith NSW 2751

Telephone: (02) 4722 2744 Facsimile: (02) 4722 2777

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MARYLAND DEVELOPMENT COMPANY PTY LTD C/- LEND LEASE DEVELOPMENT P/L, PO BOX 1124 ST MARYS NSW 1790

Job No: 7508/122

Date:

28/6/2013

PROJECT: PIPELINE BACKFILL TESTING STAGE 4A, JORDAN SPRINGS

TEST NUMBER		1	25	26	27	28	29	30	ľ
DATE TESTED			4/6/2013		6/6/2013				
RESULTS		vice .							
Density Index		%	88	93	88	95	84	100	
Moisture Variation from OMC (-Drier/+Wetter)		Netter) %	N/A	N/A	N/A	N/A	N/A	N/A	
Specification Density Ratio (Density Inde			≥70%	Specific	ation Mo	isture Va	riance fr	rom OMC	±4%
TEST LOCATION	5								
Chainage		m	170	220	825	875	925	975	
Road Name/Number			Roa	d No 2		Road	l No 1	8 8 8	ĺ
Retested by test			4	25 <u>4</u> 1	340	ŭ	19	-	ř.
Level		4	Top /	Overlay		Bed	lding	\$4.65 \$4.65	
FIELD & LABOR	ATORY DATA								
Field Dry Density		t/m³	1.60	1.62	1.60	1.63	1.58	1.65	
Field Moisture Content		%	8.7	7.6	8.1	8.8	8.7	8.1	
Material retained on	4.75 mm Sieve	9 %	<5	<5	<5	<5	<5	<5	
Assigned Value Number	9		173		JSB	S10			
Corrected Maximum Dry	Density	t/m³	1.65	1.65	1.65	1.65	1.65	1.65	
Mould Size (Litre)			1	1	1	1	1	1	
Minimum Dry Density		t/m3	1.30	1.30	1.30	1.30	1.30	1.30	
Test Procedures - See N	lotes		8	8	8	8	8	8	
Material Description - se	a halaw	F	7	7	7	7	7	7	

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- 15: RTA T120, T119, T162
- 16. RTA T120, T162, T173
- 17. RTA T120, T164, T173

\* Cement Stabilised

\$ Gypsum Stabilised

# Lime Stabilised

#### Material Description

- CL-Clays of low plasticity, gravelly clays, sandy clays, silty clays
- CI-Clay of medium plasticity, gravelly clays, sandy clays, silty clays
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- GC-Clayey gravels, gravel-sand-clay mixtures
- SP-Sand, crushed dust, filling sand, washed sand
- DGB20
- DGB40 0. DGS20

- 11. DGS40
- 12. FCR20 13. FCR40
- 14. RC Recycled Concrete
- 15. Recycled Roadbase
- 16. RSB Recycled Sub-base 17. CSS - Crushed Sandstone
- 18. RSS Ripped Sandstone
- 19. Cowels Brown

Form No R022 Version 18 06/13 - issued by ER



Accreditation Number 2734 Corporate Site Number 2727 Accredited for compliance with ISO/IEC 17025.

E van Niekerk

28/6/2013

Approved Signatory

Dow Nieke

Head Office:

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MARYLAND DEVELOPMENT COMPANY PTY LTD C/- LEND LEASE DEVELOPMENT P/L, PO BOX 1124 ST MARYS NSW 1790

PROJECT:

Laboratory: Job No:

Penrith 7508/122

Date:

05/08/2013

PIPELINE BACKFILL TESTING STAGE 4A, JORDAN SPRINGS

	OTAGE IX, CONBAIN									Page 1 of
TEST NUMBER			31	32	33	34	35	36	37	38
DATE TESTED						21/06	5/2013			
RESULTS										
Density Index		%	79	>100	>100	79	81	93	71	91
Moisture Variation fr	%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Specification	Density Ratio ()		≥70%	Specific	ation Mo	isture Va	ariance fi	rom OMC		N/A%
TEST LOCATION		85								
Chainage	(Carriageway L/R)	m	1025	825	875	925	225	275	325	375
Road Name/Number				Roa	ad 1	97	Road 21			
Retested by test		-	*	9.		-				
Level			Bedding	S	Тор			Bed	lding	
FIELD & LABOR	ATORY DATA									
Field Dry Density		t/m³	1.56	1.66	1.71	1.56	1.57	1.62	1.53	1.61
Field Moisture Content		%	7.5	5.2	10.2	9.2	14.8	15.9	16.7	10.7
Material retained on	4.75 mm Sieve	%	<5	<5	<5	<5	<5	<5	<5	<5
Assigned Value Number		7040000000	4		30	JSB	S-10	22		5/0/
Maximum Dry Density		t/m³	1.65	1.65	1.65	1.65	1.65	1.65	1.65	1.65
Mould Size (Litre)			1	1	1	1	1	1	1	1
Minimum Dry Density		t/m3	1.30	1.30	1.30	1.30	1.30	1.30	1.30	1.30
Test Procedures - See N			8	8	8	8	8	8	8	8
Material Description - se	e below		7	7	7	7	7	7	7	7

#### Notes

- Assigned Values have been obtained from our Penrith laboratory Accreditation No 2734
- Assigned Values have been obtained from our Prestons laboratory Accreditation No 14234
- 3. Results have been calculated using infinite decimal places. Therefore, calculated values may vary from those shown
- 4: AS 1289 1.2.1 dause 6.4 (b), 2.1.1, 5.1.1, 5.3.1, 5.4.1
- 5: AS 1289 1.2.1 dause 6.4 (b), 2.1.1, 5.2.1, 5.3.1, 5.4.1
- 6: AS 1289 1.2.1 dause 6.4 (b), 2.1.1, 5.1.1, 5.4.1, 5.8.1 7: AS 1289 1.2.1 clause 6.4 (b), 2.1.1, 5.2.1, 5.4.1, 5.8.1
- 8: AS 1289 1.2.1 clause 6.4 (b), 2.1.1., 5.5.1, 5.6.1, 5.8.1
- 9: Full details of Test Procedure 5.8.1 available on request

- 10: AS 1289 1.2.1 clause 6.4 (b), 2.1.1, 5.3.1, 5.5.1, 5.6.1
- 11: AS 1289 1.2.1 clause 6.4 (b), 2.1.1, 5.3.1, 5.7.1 12. AS 1289 1.2.1 clause 6.4 (b), 2.1.1, 5.7.1, 5.8.1
- 13: RTA T111, T119, T120, T166
- 14: RTA T111, T120, T166, T173
- 15: RTA T120, T119, T162
- 16 RTA T120 T162 T173

\* Cement Stabilised

\$ Gypsum Stabilised

# Lime Stabilised

17. RTA T120, T164, T173

## **Material Description**

- CL-Clays of low plasticity, gravelly clays, sandy clays, silty clays
- CI-Clay of medium plasticity, gravelly clays, sandy clays, silty clays
- CH-Clays of high plasticity SC-Clayey sands, sand-clay mixtures
- SM-Silty sands, sand-silt mixtures
- GC-Clayey gravels, gravel-sand-clay mixtures
- SP-Sand, crushed dust, filling sand, washed sand
- DGB20 DGB40

- 11. DGS40 12. FCR20
- 13. FCR40
- 14. RC Recycled Concrete 15. Recycled Roadbase
- 16. RSB Recycled Sub-base
- 17. CSS Crushed Sandstone
- 18. RSS Ripped Sandstone

Form No R022 Version 18 06/13 - issued by ER



Accredited for compliance with ISO/IEC 17025.

A Kench

05/08/2013

Accreditation Number 2734 Corporate Site Number 2727

Head Office:

34 Borec Road, Penrith NSW 2750 P O Box 880 Penrith NSW 2751

Prestons Laboratory:

Unit 4, 18-20 Whyalla Place, Prestons NSW 2170 Telephone: (02) 9607 6111 Facsimile: (02) 9607 6200

Telephone: (02) 4722 2744 Facsimile: (02) 4722 2777 email: info@geotech.com.au www.geotech.com.au





Job No: 7508/126 Our Ref: 7508/126-AA 30 August 2013

Maryland Development Company Pty Ltd c/- Lend Lease Development Pty Ltd P O Box 4366 PENRITH WESTFIELD NSW 2750

Attention: Mr A Ali

Dear Sir

re: Jordan Springs - Stage 4B Penrith City Council DA 12/0897 **Summary of Pipeline Backfill Testing** 

As requested, Geotech Testing Pty Ltd carried out field density tests and associated laboratory compaction tests in order to assess the degree of compaction during backfill operations of open trenches, in accordance with Council's Design Guidelines and Construction Specification. All testing was undertaken within the terms of our NATA accreditation, at the dates and to the procedures shown on the test results sheets.

Field density tests were generally carried out at approximately 50m intervals and individual test results provided on the attached test result sheets.

Laboratory compaction tests were carried out in accordance with AS1289 5.5.1 (Density Index) and the results exceeded the specification requirements.

As at 29 August 2013 backfill operations for Road No 1 were completed.

Yours faithfully GEOTECH TESTING PTY LTD

**EMGED RIZKALLA** 

Director

Attached Compaction Control Test Nos 1 to 4





MARYLAND DEVELOPMENT COMPANY PTY LTD C/- LEND LEASE DEVELOPMENT P/L, PO BOX 1124 Job No: 7508/126

ST MARYS NSW 1790

Date: 28/6/2013

PROJECT: PIPELINE BACKFILL TESTING STAGE 4B. JORDAN SPRINGS

TEST NUMBER DATE TESTED					3 /2013			
RESULTS		_						
Density Index		%	84	95	91	84		
Moisture Variation from OMC (-Drier/+Wetter) 9		%	% N/A	N/A	N/A	N/A		
Specification Density Ratio (Density Inde				Specific	ation Mo	isture Varia	nce from OMC	N/A%
TEST LOCATION								
Chainage		m	475	525	575	625		
Road Name/Number				Road	No 1	50		
Retested by test			4	28 <u>4</u> 1	2	2	\$6.5¢	
Level		m		Bed	lding		が (対象) (対象)	2
FIELD & LABORATOR	Y DATA							
Field Dry Density		t/m³	1.58	1.63	1.61	1.58	828	8
Field Moisture Content		%	8.1	6.5	6.0	7.6		5
Material retained on 4.75 n	nm Sieve	%	<5	<5	<5	<5		
Assigned Value Number				JSB	S 10	20 8		
Corrected Maximum Dry Density		t/m³	1.65	1.65	1.65	1.65		
Mould Size (Litre)			1	1	1	1	88 50	
Minimum Dry Density		t/m3	1.30	1.30	1.30	1.30		
Test Procedures - See Notes			8	8	8	8		
Material Description - see below		Г	7	7	7	7		

- 1: Assigned Values have been obtained from our Penrith laboratory Accreditation No 2734
- 2: Assigned Values have been obtained from our Prestons laboratory Accreditation No 14234
- 3. Results have been calculated using infinite decimal places. Therefore, calculated values may vary from those shown
- 4: AS 1289 1.2.1 clause 6.4 (b), 2.1.1, 5.1.1, 5.3.1, 5.4.1
- 5: AS 1289 1.2.1 clause 6.4 (b), 2.1.1, 5.2.1, 5.3.1, 5.4.1
- 6: AS 1289 1.2.1 clause 6.4 (b), 2.1.1, 5.1.1, 5.4.1, 5.8.1
- 7: AS 1289 1.2.1 clause 6.4 (b), 2.1.1, 5.2.1, 5.4.1, 5.8.1
- 8: AS 1289 1.2.1 clause 6.4 (b), 2.1.1., 5.5.1, 5.6.1, 5.8.1
- 9: Full details of Test Procedure 5.8.1 available on request

- 10: AS 1289 1.2.1 clause 6.4 (b), 2.1.1, 5.3.1, 5.5.1, 5.6.1
- 11: AS 1289 1.2.1 clause 6.4 (b), 2.1.1, 5.3.1, 5.7.1
- 12. AS 1289 1.2.1 clause 6.4 (b), 2.1.1, 5.7.1, 5.8.1
- 13: RTA T111, T119, T120, T166
- 14: RTA T111, T120, T166, T173
- 15: RTA T120, T119, T162 16. RTA T120, T162, T173
- 17. RTA T120, T164, T173

\* Cement Stabilised

\$ Gypsum Stabilised

# Lime Stabilised

#### Material Description

- CL-Clays of low plasticity, gravelly clays, sandy clays, silty clays
- CI-Clay of medium plasticity, gravelly clays, sandy clays, silty clays
- CH-Clays of high plasticity
- SC-Clayey sands, sand-clay mixtures SM-Silty sands, sand-silt mixtures
- GC-Clayey gravels, gravel-sand-clay mixtures
- SP-Sand, crushed dust, filling sand, washed sand

- DGB20
- DGB40 0. DGS20

Head Office:

- 12. FCR20 13. FCR40

11. DGS40

- 14. RC Recycled Concrete 15. Recycled Roadbase
- 16. RSB Recycled Sub-base
- 17. CSS Crushed Sandstone
- 18. RSS Ripped Sandstone
- 19. Cowels Brown

Form No R022 Version 18 06/13 - issued by ER



Accreditation Number 2734 Corporate Site Number 2727

34 Borec Road, Penrith NSW 2750

P O Box 880 Penrith NSW 2751

Accredited for compliance with ISO/IEC 17025.

E van Niekerk

28/6/2013

Approved Signatory

Prestons Laboratory:

Unit 4, 18-20 Whyalla Place, Prestons NSW 2170 Telephone: (02) 9607 6111 Facsimile: (02) 9607 6200

Telephone: (02) 4722 2744 Facsimile: (02) 4722 2777

# **APPENDIX D**

SOIL CLASSIFICATION OF RESIDENTIAL LOTS

Report 7508/123-AA Report 7508/127-AA





#### MARYLAND DEVELOPMENT COMPANY PTY LTD

STAGE 4A JUBILEE DRIVE, JORDAN SPRINGS

SITE CLASSIFICATION REPORT

**REPORT NO 7508/123-AA 30 AUGUST 2013** 





Job No: 7508/123 Our Ref: 7508/123-AA

Your Commitment No: 185719

30 August 2013

Maryland Development Company Pty Ltd c/- Lend Lease Development Pty Ltd P O Box 4366
PENRITH WESTFIELD NSW 2750

Attention: Mr A Ali

Dear Sir

re: Stage 4A – Jubilee Drive, Jordan Springs
Penrith City Council DA 12/0897 – Condition Nos 58, 65(f) & 75
Site Classification Report (AS2870-2011)

Geotech Testing Pty Ltd was engaged by Maryland Development Company Pty Ltd to carry out geotechnical site compliance of Stages 4A at Jordan Springs, in accordance with Penrith City Council DA Consent No. 12/0897. The following conditions of consent have been satisfied by this Site Classification Report:

- Condition No. 58 Soil testing is to be carried out to enable each lot to be classified according to AS2870 "Residential Slabs and Footings".
- Condition No. 65(f) A Geotechnical Report certifying that all earthworks and road formation have been completed in accordance with AS3798 and Council's Design Guidelines and Construction specifications. The report shall include;
  - Compaction reports for road pavement construction.
  - Compaction reports for bulk earthworks and lot regrading.
  - Soil classification for all residential lots.
  - Statement of Compliance.
- Condition No. 75 Soil testing is to be carried out to enable each lot to be classified according to AS2870 "Residential Slabs and Footings". A copy of the report, including a plan showing the lot classification over the subdivision is to be submitted to Penrith City Council prior to issue of a Subdivision Certificate.

This report contains information on surface and sub-surface conditions encountered at the site, together with an assessment of the site classifications in accordance with Australian Standard AS2870-2011. The report covers seventy lots from Lot 4001 to Lot 4070

If you have any questions, please do not hesitate to contact the undersigned.

Yours faithfully GEOTECH TESTING PTY LTD

EMGED RIZKALLA Director

Head Office: 34 Borec Road, Penrith NSW 2750 P O Box 880 Penrith NSW 2751

Telephone: (02) 4722 2744 Facsimile: (02) 4722 2777

Prestons Laboratory: Unit 4, 18-20 Whyalla Place, Prestons NSW 2170 Telephone: (02) 9607 6111 Facsimile: (02) 9607 6200

email: info@geotech.com.au www.geotech.com.au

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4.0	L	ABORATORY TESTING	2
5.0	D	ISCUSSION & RECOMMENDATIONS	2
5	.1	Assessment of Fill	2
5	.2	Site Classification	2

# **APPENDICES**

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APPENDIX B	Table B - Laboratory Test Results
APPENDIX C	Table C - Summary of Site Classification
APPENDIX D	Fill Plan

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7508/123-AA Jordan Springs - Stage 4A

#### 1.0 INTRODUCTION

This report describes geotechnical investigations for proposed dwellings to be constructed at a subdivision known as Jordan Springs, Stage 4A. The Project Manager Mr A Ali of Lend Lease Development Pty Ltd commissioned the investigation. Lots numbered 4001 to 4070 (70 lots) are covered in this report.

Site classification in accordance with AS2870-2011 is only applicable for the design of footing systems for a single dwelling, house, townhouse or similar structure that would be detached or separated by a party wall or common wall. AS2870 is not suitable for dwellings situated vertically above or below another dwelling, including buildings classified as Class 1 and Class 10a in the Building Code of Australia (BCA). Therefore, a geotechnical investigation would be required for other dwellings to be classified in accordance with the BCA.

It is understood that the proposed dwellings are to be of brick veneer construction, and wall loadings are expected to be in the range of 15kN/m to 50kN/m. The maximum working load (safe bearing pressure) would be in the order of 50kPa for ground supported floor slabs and 100kPa for strip and pad footings (AS2870-2011).

#### 2.0 FIELD WORK

Field work was carried out on 2 August 2013 (in conjunction with field work for the adjoining Stage 4B), and consisted of excavation of thirty nine test pits (TP1 to TP39) using a standard rubber tyred backhoe with a 450mm bucket, and taken to depths up to 1.5m. The approximate test pit locations are indicated on Drawing No 7508/123-1 in Appendix A of this report.

#### 3.0 SITE CONDITIONS

#### 3.1 Surface Conditions

Stage 4A is located to the east and north of Jubilee Drive and is bound by East-West Riparian Corridor to the north, and stage 4B to the east. Stage 4A contains Cordyline Loop and Wildflower Circle. At the time of field work, the construction of the roads was completed, the lots were devoid of vegetation, and there were no trees.

#### 3.2 Sub-Surface Conditions

A summary of the field data obtained is presented in Appendix A. The test pit investigation revealed the following generalised sub-surface profile.

Fill: Clay, medium to high plasticity, red-brown, grey, with fine gravel, underlain by

Residual Clay, medium to high and high plasticity, grey mottled red

Shale bedrock was not encountered in any of the test pits.

Groundwater was not observed in the test pits during the short time that they remained open. It must be noted that fluctuations in the level of groundwater might occur due to variations in rainfall, temperature and/or other factors not evident during investigation.

7508/123-AA Jordan Springs - Stage 4A

### 4.0 LABORATORY TESTING

During the course of the investigation, six undisturbed samples (U<sub>50</sub>) of the fill and residual clay materials were recovered for laboratory testing, aimed at determining the reactivity of the materials to variations in moisture changes.

The test conducted was Shrink/Swell Index Determination (Iss) in accordance with Australian Standard AS1289 7.1.1. The detailed results are included in Appendix D and summarised below.

TP	Depth (m)	I <sub>ss</sub> (%/pF)	Classification and Summary Description
3	0.3-0.6	3.0	Fill: Clay, high plasticity, red-brown & grey, some fine gravel
9	0.5-0.8	2.9	CH: Clay, high plasticity, red-brown & grey, some fine gravel
14	0.7-1.0	4.3	CH: Clay, high plasticity, red-brown & grey, some fine gravel
17	0.3-0.6	2.9	Fill: Clay, high plasticity, red-brown & grey, some fine gravel
23	0.5-0.8	4.0	CH: Clay, high plasticity, red-brown & grey
30	0.3-0.6	3.7	Fill: Clay, high plasticity, red-brown & grey

One sample from TP35 (0.7-1.0m depth), which was not suitable for shrink swell testing, was tested for plasticity Index and indicated medium plasticity clay. The results are presented in Appendix B.

#### 5.0 DISCUSSION & RECOMMENDATIONS

#### 5.1 Assessment of Fill

Fill materials have been placed at the site and field work revealed that the majority of the lots are filled. The fill was tested during placement and compaction by Geotech Testing Pty Ltd (Site Fill Summary Report 7508/119-AA) and is classified as "Controlled". The depth and extent of fill placed on the Lots will be determined by the Project Surveyor, Whelans Insites Pty Ltd.

#### 5.2 Site Classification

Based on the above information, site classifications to AS2870-2011 are summarised in Appendix C. It should be noted that lots containing more than 400mm of clay fill would originally be classified as Class P in accordance with AS2870-2011. However, based on the results of this investigation, which included laboratory testing, the lots are classified as detailed in Appendix C.

It is recommended that footings for proposed dwellings are founded on the same stratum below any topsoil or deleterious material to minimise the potential for differential movement.

The classifications presented in Appendix C are applicable to the Lots at the date of conducting the investigation, being 2 August 2013, and have been made on the following assumptions;

- The design and construction requirements of AS2870 must be followed.
- The recommendations for foundation performance and site maintenance set out in Appendix B of AS2870 must be followed.
- The proposed dwellings must be in accordance with AS2870. A detailed geotechnical investigation will be required for other dwellings that would be classified in accordance with the BCA.

3

7508/123-AA Jordan Springs - Stage 4A

It is recommended that house owners are made aware of recommendations in the CSIRO publication, "Guide to Home Owners on Foundation Maintenance and Footing Performance" and AS2870 Appendix H of AS2871-2011.

**GEOTECH TESTING PTY LTD** 

# **APPENDIX A**

**TABLE A: TEST PIT DEATILS** 

TEST PIT LOCATION PLAN (Drawing No 7508/123-1)

# **TABLE A**

Job No: 7508/123 Page 1 of 7
Our Ref: 7508/123-AA

TEST PIT NUMBER	DEPTH (m)	SAMPLE DEPTH (m)	MATERIAL DESCRIPTION
1	0.0-0.3	0.0-0.1	FILL; Silty Clay, low to medium plasticity, grey, with gravels and root fibre
	0.3-1.5	1.0-1.1	(CI-CH) Silty CLAY, medium to high plasticity, brown and grey
2	0.0-0.2	0.0-0.1	FILL; Silty Clay, low to medium plasticity, grey, with gravels and root fibre
	0.2-0.6	0.5-0.6	FILL; Silty CLAY, high plasticity, red-brown, grey with fine to medium gravel
	0.6-1.5		(CI-CH) Silty CLAY, medium to high plasticity, brown and grey
3	0.0-0.15	0.0-0.1	FILL; Silty Clay, low to medium plasticity, grey, with gravels and root fibre
	0.15-0.6	U <sub>50</sub> (0.3-0.6) 0.5-0.6	FILL; Silty CLAY, high plasticity, red-brown, grey with fine to medium gravel
	0.6-1.5		(CI-CH) Silty CLAY, medium to high plasticity, brown and grey
4	0.0-0.2	0.0-0.1	FILL; Silty Clay, low to medium plasticity, grey, with gravels and root fibre
	0.2-0.5		FILL; Silty CLAY, high plasticity, red-brown, grey with fine to medium gravel
	0.5-1.0	0.5-0.6	(CI-CH) Silty CLAY, medium to high plasticity, brown and grey
	1.0-1.5		(CH) CLAY, high plasticity, pale grey and yellow-brown
5	0.0-0.2	0.0-0.1	FILL; Silty Clay, low to medium plasticity, grey, with gravels and root fibre
	0.2-0.5		FILL; Silty CLAY, high plasticity, red-brown, grey with fine to medium gravel
	0.5-0.8		(CI-CH) Silty CLAY, medium to high plasticity, brown and grey
	0.8-1.5	1.0-1.1	(CH) CLAY, high plasticity, pale grey and yellow-brown
	i		

# **TABLE A**

Job No: 7508/123 Page 2 of 7 Our Ref: 7508/123-AA

TEST PIT					
NUMBER	DEPTH (m)	SAMPLE DEPTH (m)	MATERIAL DESCRIPTION		
6	0.0-0.3	0.0-0.1	FILL; Silty Clay, low to medium plasticity, grey, with gravels and root fibre		
	0.3-1.2	0.5-0.6	(CI-CH) Silty CLAY, medium to high plasticity, brown and grey		
	1.2-1.5		(CH) CLAY, high plasticity, pale grey and yellow-brown		
7	0.0-0.4	0.0-0.1	FILL; Silty Clay, low to medium plasticity, grey, with gravels and root fibre		
	0.4-1.5	0.5-0.6	(CH) CLAY, high plasticity, pale grey and yellow-brown		
8	0.0-0.3	0.0-0.1	FILL; Silty Clay, low to medium plasticity, grey, with gravels, root fibre and shale fragments		
	0.3-1.5	0.5-0.6	(CH) CLAY, high plasticity, pale grey and yellow-brown		
9	0.0-0.2	0.0-0.1	FILL; Silty Clay, low to medium plasticity, grey, with gravels, root fibre and sand		
	0.2-1.5	0.5-0.6 U <sub>50</sub> (0.5-0.8)	(CH) CLAY, high plasticity, pale grey and yellow-brown, with ironstone fragments		
10	0.0-0.1	0.0-0.1	FILL; Silty Clay, low to medium plasticity, grey, with gravels and root fibre		
	0.1-1.5	1.0-1.1	(CI) Shaley CLAY, medium plasticity, pale grey mottled red-brown, with ironstone fragment		
11	0.0-0.2	0.0-0.1	FILL; Silty Clay, low to medium plasticity, grey, with gravels and root fibre		
	0.2-1.5	0.5-0.6	(CI) Shaley CLAY, medium plasticity, pale grey mottled red-brown, with ironstone fragment		
12	0.0-0.1	0.0-0.1	FILL; Silty Clay, low to medium plasticity, grey, with gravels and root fibre		
	0.1-1.5	0.5-0.6	(CI) Shaley CLAY, medium plasticity, pale grey mottled red-brown, with ironstone fragment		

# **TABLE A**

Job No: 7508/123 Page 3 of 7 Our Ref: 7508/123-AA

	Our Ref: 7508/123-AA						
TEST PIT NUMBER	DEPTH (m)	SAMPLE DEPTH (m)	MATERIAL DESCRIPTION				
13	0.0-0.15	0.0-0.1	FILL; Silty Clay, low to medium plasticity, grey, with gravels and root fibre				
	0.15-1.5	0.5-0.6	(CI) Shaley CLAY, medium plasticity, pale grey mottled red-brown, with ironstone fragment				
14	0.0-0.2	0.0-0.1	FILL; Silty Clay, low to medium plasticity, grey, with gravels and root fibre				
	0.2-0.8	0.5-0.6	(CH) CLAY, high plasticity, pale grey and yellow-brown				
	0.8-1.5	U <sub>50</sub> (0.7-1.0)	(CH) Shaley CLAY, high plasticity, pale grey mottled red- brown, with ironstone fragment				
15	0.0-0.2	0.0-0.1	FILL; Silty Clay, low to medium plasticity, grey, with gravels and root fibre				
	0.2-1.5	1.0-1.1	(CH) CLAY, high plasticity, pale grey and yellow-brown				
16	0.0-0.2	0.0-0.1	FILL; Silty Clay, low to medium plasticity, grey, with gravels and root fibre				
	0.2-1.0	0.5-0.6	(CH) CLAY, high plasticity, pale grey and yellow-brown				
	1.0-1.5		(CH) Shaley CLAY, high plasticity, pale grey mottled red- brown, with ironstone fragment				
17	0.0-0.6	0.0-0.1 U <sub>50</sub> (0.3-0.6)	FILL; Silty Clay, high plasticity, grey, with gravels and root fibre				
	0.6-1.5	0.5-0.6	(CH) CLAY, high plasticity, pale grey and yellow-brown				
18	0.0-0.1	0.0-0.1	FILL; Silty Clay, low to medium plasticity, grey, with gravels and root fibre				
	0.1 – 0.6	0.5-0.6	FILL; Silty CLAY, medium to high plasticity, red-brown, grey with fine to medium gravel				
	0.6-0.8		(CI-CH) Silty CLAY, medium to high plasticity, brown and grey				
	0.8-1.5		(CH) CLAY, high plasticity, pale grey and yellow-brown				

# **TABLE A**

Job No: 7508/123 Page 4 of 7
Our Ref: 7508/123-AA

TEST PIT NUMBER	DEPTH (m)	SAMPLE DEPTH (m)	MATERIAL DESCRIPTION		
19	0.0-0.2	0.0-0.1	FILL; Silty Clay, low to medium plasticity, grey, with gravels and root fibre		
	0.2-0.7	0.5-0.6	FILL; Silty CLAY, medium to high plasticity, red-brown, grey with fine to medium gravel		
	0.7-1.5		(CH) Silty CLAY, high plasticity, brown and grey		
20	0.0-0.1	0.0-0.1	FILL; Silty Clay, low to medium plasticity, grey, with gravels and root fibre		
	0.1-1.0		FILL; Silty CLAY, medium to high plasticity, red-brown, grey with fine to medium gravel		
	1.0-1.5	1.0-1.1	(CH) Silty CLAY, high plasticity, brown and grey		
21	0.0-0.2	0.0-0.1	FILL; Silty Clay, low to medium plasticity, grey, with gravels and root fibre		
	0.2-1.0	0.5-0.6	FILL; Silty CLAY, medium to high plasticity, red-brown, grey with fine to medium gravel		
	1.0-1.5		(CH) Silty CLAY, high plasticity, brown and grey		
22	0.0-0.2	0.0-0.1	FILL; Silty Clay, low to medium plasticity, grey, with gravels and root fibre		
	0.2-0.7	0.5-0.6	FILL; Silty CLAY, medium to high plasticity, red-brown, grey with fine to medium gravel		
	0.7-0.9		(CH) Silty CLAY, high plasticity, brown and grey		
	0.9-1.5		(CH) CLAY, high plasticity, pale grey and yellow-brown		
23	0.0-0.3	0.0-0.1	FILL; Silty Clay, low to medium plasticity, grey, with gravels and root fibre		
	0.3-0.5		FILL; Silty CLAY, medium to high plasticity, red-brown, grey with fine to medium gravel		
	0.5-1.0	0.5-0.6 U <sub>50</sub> (0.5-0.8)	(CH) Silty CLAY, to high plasticity, brown and grey		
	1.0-1.5		(CH) CLAY, high plasticity, pale grey and yellow-brown		

# **TABLE A**

Job No: 7508/123 Page 5 of 7
Our Ref: 7508/123-AA

TEST PIT NUMBER	DEPTH (m)	SAMPLE DEPTH (m)	MATERIAL DESCRIPTION
24	0.0-0.1	0.0-0.1	FILL; Silty Clay, low to medium plasticity, grey, with gravels and root fibre
	0.1-0.5		FILL; Silty CLAY, medium to high plasticity, red-brown, grey with fine to medium gravel
	0.5-1.0	0.5-0.6	(CH) Silty CLAY, high plasticity, brown and grey
	1.0-1.5		(CH) CLAY, high plasticity, pale grey and yellow-brown
25	0.0-0.2	0.0-0.1	FILL; Silty Clay, low to medium plasticity, grey, with gravels and root fibre
	0.2-1.0		(CH) Silty CLAY, high plasticity, brown and grey
	1.0-1.5	1.0-1.1	(CH) CLAY, high plasticity, pale grey and yellow-brown
26	0.0-0.3	0.0-0.1	FILL; Silty Clay, low to medium plasticity, grey, with gravels and root fibre
	0.3-1.2	0.5-0.6	(CH) Silty CLAY, high plasticity, brown and grey
	1.2-1.5		(CH) CLAY, high plasticity, pale grey and yellow-brown
27	0.0-1.0	0.0-0.1	FILL; Silty CLAY, medium to high plasticity, red-brown and grey, with fine to medium gravel
	1.0-1.5	0.5-0.6	(CH) CLAY, high plasticity, pale grey and yellow-brown
28	0.0-0.1	0.0-0.1	FILL; Silty Clay, low to medium plasticity, grey, with gravels and root fibre
	0.1-1.0	0.5-0.6	FILL; Silty CLAY, medium to high plasticity, red-brown and grey, with fine to medium gravel
1.0-1.5 (CH) CLAY,			(CH) CLAY, high plasticity, pale grey and yellow-brown
29	0.0-0.1	0.0-0.1	FILL; Silty Clay, low to medium plasticity, grey, with gravels and root fibre
	0.1-0.9	0.5-0.6	FILL; Silty CLAY, medium to high plasticity, red-brown and grey, with fine to medium gravel
	0.9-1.5		(CH) CLAY, high plasticity, pale grey and yellow-brown

# **TABLE A**

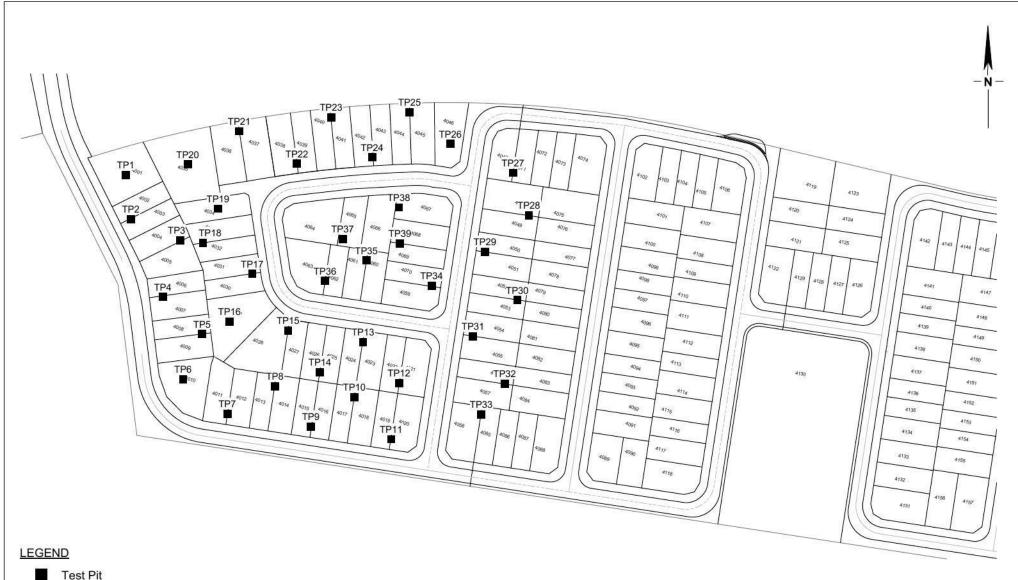
Job No: 7508/123 Page 6 of 7 Our Ref: 7508/123-AA

	Our Ref: 7508/123-AA						
TEST PIT NUMBER	DEPTH (m)	SAMPLE DEPTH (m)	MATERIAL DESCRIPTION				
30	0.0-0.1	0.0-0.1	FILL; Silty Clay, low to medium plasticity, grey, with gravels and root fibre				
	0.1-0.9	U <sub>50</sub> (0.3-0.6)	FILL; Silty CLAY, high plasticity, red-brown and grey, with fine to medium gravel				
	0.9-1.5	1.0-1.1	(CH) CLAY, high plasticity, pale grey and yellow-brown				
31	0.0-0.4	0.0-0.1	FILL; Silty CLAY, medium to high plasticity, red-brown and grey, with fine to medium gravel				
	0.4-1.5	0.5-0.6	(CH) CLAY, high plasticity, pale grey and yellow-brown				
32	0.0-0.7	0.0-0.1	FILL; Silty CLAY, medium to high plasticity, red-brown and grey, with fine to medium gravel				
	0.7-1.0	0.5-0.6	(CH) CLAY, high plasticity, pale grey and yellow-brown				
	1.0-1.5		(CI) Shaley CLAY, medium plasticity, pale grey mottled red-brown, with ironstone fragment				
33			FILL; Silty CLAY, medium to high plasticity, red-brown and grey, with fine to medium gravel				
	0.4-1.0	0.5-0.6	(CH) CLAY, high plasticity, pale grey and yellow-brown				
	1.0-1.5		(CI) Shaley CLAY, medium plasticity, pale grey mottled red-brown, with ironstone fragment				
34	0.0-0.1	0.0-0.1	FILL; Silty Clay, low to medium plasticity, grey, with gravels and root fibre				
	0.1-1.5	0.5-0.6	(CH) CLAY, high plasticity, pale grey and yellow-brown				
35	0.0-0.1	0.0-0.1	FILL; Silty Clay, low to medium plasticity, grey, with gravels and root fibre				
	0.1-0.7		FILL; Silty CLAY, medium to high plasticity, red-brown and grey, with fine to medium gravel				
	0.7-1.5	U <sub>50</sub> (0.7-1.0)	(CI) CLAY, medium plasticity, pale grey and yellow-brown				

# **TABLE A**

Job No: 7508/123 Page 7 of 7
Our Ref: 7508/123-AA

TEST PIT NUMBER	DEPTH (m)	SAMPLE DEPTH (m)	MATERIAL DESCRIPTION
36	0.0-0.3	0.0-0.1	FILL; Silty Clay, low to medium plasticity, grey, with gravels and root fibre
	0.3-1.0	0.5-0.6	(CI-CH) Silty CLAY, medium to high plasticity, brown and grey
	1.0-1.5		(CH) CLAY, high plasticity, pale grey and yellow-brown
37	0.0-0.2	0.0-0.1	FILL; Silty Clay, low to medium plasticity, grey, with gravels and root fibre
	0.2-0.9	0.5-0.6	FILL; Silty CLAY, high plasticity, red-brown and grey, with fine to medium gravel
	0.9-1.5		(CH) CLAY, high plasticity, pale grey and yellow-brown
38	0.0-0.1	0.0-0.1	FILL; Silty Clay, low to medium plasticity, grey, with gravels and root fibre
	0.1-0.4		FILL; Silty CLAY, high plasticity, red-brown and grey, with fine to medium gravel
	0.4-1.5	0.5-0.6	(CH) CLAY, high plasticity, pale grey and yellow-brown
39	0.0-0.1	0.0-0.1	FILL; Silty Clay, low to medium plasticity, grey, with gravels and root fibre
	0.1-0.4		FILL; Silty CLAY, high plasticity, red-brown and grey, with fine to medium gravel
	0.4-1.5	0.5-0.6	(CH) CLAY, high plasticity, pale grey and yellow-brown





34 Borec Road NSW 2750 ABN 71 076 676 321 Ph: 02 4722 2744

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#### NOTES

- 1. Site features are indicative and are not to scale.
- 2. This drawing has been produced using a base plan provided by others to which additional information e.g test pits, borehole locations or notes have been added. Some or all of the plan may not be relevant at the time of producing this drawing

Maryland Development Company Pty Ltd Stage 4A Jordan Springs

**Test Pit Locations** 

Drawing No: 7508/123-1 Job No: 7508/123 Drawn By: MH Date: 23 July 2013 Checked By: ZA

File No: 7508-123 Layers: 0, Lay1

# **APPENDIX B**

### TABLE B LABORATORY TEST RESULTS





MARYLAND DEVELOPMENT COMPANY PTY LTD C/- LEND LEASE DEVELOPMENT P/L, PO BOX 1124 ST MARYS NSW 1790

Job No: 7508/123 Tested By: AN

Checked By: AK

Date Tested: 07/08/2013 Laboratory Penrith

# SITE & EXPOSURE CLASSIFICATION STAGE 4A, JORDAN SPRINGS

#### TEST RESULTS - SHRINK / SWELL INDEX

Page 1 of 2

Test Procedure: AS 1289 7.1.1					
Sample Identification	Test Pit 3	Test Pit 9	Test Pit 14	Test Pit 17	
Depth (m)	0.3 - 0.6	0.5 - 0.8	0.7 - 1.0	0.3 - 0.6	
Laboratory Number	7508/123-1	7508/123-2	7508/123-3	7508/123-4	
Test Description					
Moisture Content					
Initial %	21.0	19.6	21.3	12.5	
Final %	23.9	25.2	25.7	20.3	
Swell %	2.3	9.4	9.1	6.8	
Shrinkage %	4.3	2.3	3.1	1.8	
Shrink/Swell Index %/ <sub>p</sub> F	3.0	3.9	4.3	2.9	
Material Description	15 (Factor)	(CH) CLAY, high plasticity, red-brown & grey, some fine to medium gravel	plasticity, red-brown		

Form No R007 Version 12 06/13

Accredited for compliance with ISO/IEC 17025.

A Kench

22/08/2013

Approved Signatory



NATA Accreditation Number 2734 Corporate Site Number 2727

Head Office: 34 Borec Road, Penrith NSW 2750 P O Box 880 Penrith NSW 2751 Prestons Laboratory. Unit 4, 18-20 Whyalla Place, Prestons NSW 2170

P O Box 880 Penrith NSW 2751 Telephone: (02) 9607 6111 Facsimile: (02) 9607 6200 Telephone: (02) 4722 2744 Facsimile: (02) 4722 2777





MARYLAND DEVELOPMENT COMPANY PTY LTD C/- LEND LEASE DEVELOPMENT P/L, PO BOX 1124 ST MARYS NSW 1790

# SITE & EXPOSURE CLASSIFICATION STAGE 4A, JORDAN SPRINGS

# TEST RESULTS - ATTERBERG LIMITS Test Procedure AS1289 3.1.2, 3.2.1, 3.3.1, 3.4.1

Page 1 of 1

					Page 1 of 1
Job No:	7508/123		Tested By:	AK	
Laboratory	Penrith		Checked By:	AK	
Date Tested	15/08/2013				
Sample Identi	ification	Test Pit 35			
Laboratory Nu	umber	7508/123-7			
Depth (m)		0.7 - 1.0			
Test Descrip	otion				
Liquid Limit (\	<b>W</b> <sub>L</sub> )	31%			
Plastic Limit (	W <sub>P</sub> )	17%			
Plastic Index	(I <sub>P</sub> )	14%			
Linear Shrink	age (LS)	8.0%			
Mould Length	(mm)	125			
Sample Histo	ory	Oven Dried Dry Sieved			
Material Des	cription	(CI) CLAY, medium plasticity, pale grey & yellow-brown			

Form No R004 Version 12 - 06/13 - Issued by ER



Accredited for compliance with ISO/IEC 17025.

A Kench

30/08/2013

Approved Signatory

Nata Accreditation Number 2734 Corporate Site Number 2727

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email: info@geotech.com.au www.geotech.com.au

# **APPENDIX C**

# **SUMMARY OF SITE CLASSIFICATIONS**

# TABLE C SUMMARY OF SITE CLASSIFICATIONS STAGE 4A JUBILEE DRIVE, JORDAN SPRINGS

Lot	Class	Lot	Class	Lot	Class
4001	H1	4025	H1	4048	H1
4002	H1	4026	H1	4049	H1
4003	H1	4027	H1	4050	H1
4004	H1	4028	H1	4051	H1
4005	H1	4029	H1	4052	H1
4006	H1	4030	H1	4053	H1
4007	H1	4031	H1	4054	H1
4008	H1	4032	H1	4055	H1
4009	H1	4033	H1	4056	H1
4010	H1	4034	H1	4057	H1
4011	H1	4035	H1	4058	H1
4012	H1	4036	H1	4059	H1
4013	H1	4037	H1	4060	H1
4014	H1	4038	H1	4061	H1
4015	H1	4039	H1	4062	H1
4016	H1	4040	H1	4063	H1
4017	H1	4041	H1	4064	H1
4018	H1	4042	H1	4065	H1
4019	H1	4043	H1	4066	H1
4020	H1	4044	H1	4067	H1
4021	H1	4045	H1	4068	H1
4022	H1	4046	H1	4069	H1
4023	H1	4047	H1	4070	H1
4024	H1		*		in the second





#### MARYLAND DEVELOPMENT COMPANY PTY LTD

STAGE 4B JUBILEE DRIVE, JORDAN SPRINGS

SITE CLASSIFICATION REPORT

**REPORT NO 7508/127-AA 30 AUGUST 2013** 





Job No: 7508/127 Our Ref: 7508/127-AA

Your Commitment No: 185719

30 August 2013

Maryland Development Company Pty Ltd c/- Lend Lease Development Pty Ltd P O Box 4366
PENRITH WESTFIELD NSW 2750

Attention: Mr A Ali

Dear Sir

re: Stage 4B - Jubilee Drive, Jordan Springs
Penrith City Council DA 12/0897 - Condition Nos 58, 65(f) & 75
Site Classification Report (AS2870-2011)

Geotech Testing Pty Ltd was engaged by Maryland Development Company Pty Ltd to carry out geotechnical site compliance of Stage 4B at Jordan Springs, in accordance with Penrith City Council DA Consent No. 12/0897. The following conditions of consent have been satisfied by this Site Classification Report:

- Condition No. 58 Soil testing is to be carried out to enable each lot to be classified according to AS2870 "Residential Slabs and Footings".
- Condition No. 65(f) A Geotechnical Report certifying that all earthworks and road formation have been completed in accordance with AS3798 and Council's Design Guidelines and Construction specifications. The report shall include;
  - Compaction reports for road pavement construction.
  - Compaction reports for bulk earthworks and lot regrading.
  - Soil classification for all residential lots.
  - Statement of Compliance.
- Condition No. 75 Soil testing is to be carried out to enable each lot to be classified according to AS2870 "Residential Slabs and Footings". A copy of the report, including a plan showing the lot classification over the subdivision is to be submitted to Penrith City Council prior to issue of a Subdivision Certificate.

This report contains information on surface and sub-surface conditions encountered at the site, together with an assessment of the site classifications in accordance with Australian Standard AS2870-2011. The report covers forty eight lots (Lot 4071 to Lot 4118).

If you have any questions, please do not hesitate to contact the undersigned.

Yours faithfully GEOTECH TESTING PTY LTD

EMGED RIZKALLA Director

Head Office: 34 Borec Road, Penrith NSW 2750 P O Box 880 Penrith NSW 2751

Telephone: (02) 4722 2744 Facsimile: (02) 4722 2777

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3.0	S	ITE CONDITIONS	1
3	.1	Surface Conditions	1
3	.2	Sub-Surface Conditions	1
4.0	L	ABORATORY TESTING	2
5.0	D	ISCUSSION & RECOMMENDATIONS	2
5	.1	Assessment of Fill	2
5	.2	Site Classification	2

# **APPENDICES**

APPENDIX A	Table A: Test Pit Details Test Pit Location Plan (Drawing No 7508/127-1)
APPENDIX B	Table B - Laboratory Test Results
APPENDIX C	Table C - Summary of Site Classification
APPENDIX D	Fill Plan

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7508/127-AA Jordan Springs - Stage 4B

#### 1.0 INTRODUCTION

This report describes geotechnical investigations for proposed dwellings to be constructed at a subdivision known as Jordan Springs, Stage 4B. The Project Manager, Mr A Ali, of Lend Lease Development Pty Ltd commissioned the investigation. Lots numbered 4071 to 4118 (48 lots) are covered in this report.

Site classification in accordance with AS2870-2011 is only applicable for the design of footing systems for a single dwelling, house, townhouse or similar structure that would be detached or separated by a party wall or common wall. AS2870 is not suitable for dwellings situated vertically above or below another dwelling, including buildings classified as Class 1 and Class 10a in the Building Code of Australia (BCA). Therefore, a geotechnical investigation would be required for other dwellings to be classified in accordance with the BCA.

It is understood that the proposed dwellings are to be of brick veneer construction, and wall loadings are expected to be in the range of 15kN/m to 50kN/m. The maximum working load (safe bearing pressure) would be in the order of 50kPa for ground supported floor slabs, and 100kPa for strip and pad footings (AS2870-2011).

#### 2.0 FIELD WORK

Field work was carried out on 6 August 2013 (in conjunction with field work for the adjoining Stage 4A) and consisted of excavation of twenty three test pits (TP40 to TP62) using a standard rubber tyred backhoe with a 450mm bucket, and taken to depths up to 1.5m. The approximate test pit locations are indicated on Drawing No 7508/127-1 in Appendix A of this report.

#### 3.0 SITE CONDITIONS

#### 3.1 Surface Conditions

Stage 4B is located to the north and west of Jubilee Drive and is bound by East-West Riparian Corridor to the north, Stage 4A to the west, and Stage 4C to the east. Stage 4B contains Cordyline Loop and Mulla Avenue. At the time of field work, the construction of the roads was completed, the lots were devoid of vegetation and there were no trees.

#### 3.2 Sub-Surface Conditions

A summary of the field data obtained is presented in Appendix A. The test pit investigation revealed the following generalised sub-surface profile.

Fill: Clay, medium to high plasticity, red-brown, grey, with fine gravel, underlain by

Residual Clay, low to medium plasticity, grey mottled red

Shale bedrock was not encountered in any of the test pits.

Groundwater was not observed in the test pits during the short time that they remained open. It must be noted that fluctuations in the level of groundwater might occur due to variations in rainfall, temperature and/or other factors not evident during investigation.

7508/127-AA Jordan Springs - Stage 4B

#### 4.0 LABORATORY TESTING

During the course of the investigation two undisturbed ( $U_{50}$ ) samples of the fill and residual clay materials were recovered for laboratory testing, aimed at determining the reactivity of the materials to variations in moisture changes.

The test conducted was Shrink/Swell Index Determination (Iss) in accordance with Australian Standard AS1289 7.1.1. The detailed results are included in Appendix D and summarised below.

TP	Depth (m)	I <sub>ss</sub> (%/pF)	Classification and Summary Description		
42	0.3-0.6	2.5	Fill: Silty Clay, medium to high plasticity, brown & grey, some fine gravel		
60	0.3-0.6	1.0	Fill: Silty Clay, low plasticity, yellow-brown, some fine gravel		

Samples from TP46 (0.7-1.0m depth) & TP53 (0.5-0.8m depth), which were not suitable for shrink swell testing, were tested for plasticity Index and indicated medium plasticity clay. The results are presented in Appendix B.

### 5.0 DISCUSSION & RECOMMENDATIONS

#### 5.1 Assessment of Fill

Fill materials have been placed at the site and field work revealed that the majority of the lots are filled. The fill was tested during placement and compaction by Geotech Testing Pty Ltd (Site Fill Summary Report 7508/119-AA) and is classified as "Controlled". The depth and extent of fill placed on the Lots will be determined by the Project Surveyor, Whelans Insites Pty Ltd.

#### 5.2 Site Classification

Based on the above information, site classifications to AS2870-2011 are summarised in Appendix C. It should be noted that lots containing more than 400mm of clay fill (assessed as controlled fill) would originally be classified as Class P in accordance with AS2870-2011. However, based on the results of this investigation, including laboratory testing, the lots are classified as detailed in Appendix C.

It is recommended that footings for proposed dwellings are founded on the same stratum, below any topsoil or deleterious material to minimise the potential for differential movement.

The classifications presented in Appendix C are applicable to the Lots at the date of conducting the investigation, being 6 August 2013 and have been made on the following assumptions;

- The design and construction requirements of AS2870 must be followed.
- The recommendations for foundation performance and site maintenance set out in Appendix B of AS2870 must be followed.
- The proposed dwellings must be in accordance with AS2870. A detailed geotechnical investigation
  will be required for other dwellings that would be classified in accordance with the BCA.

3

7508/127-AA Jordan Springs - Stage 4B

It is recommended that house owners are made aware of recommendations in the CSIRO publication, "Guide to Home Owners on Foundation Maintenance and Footing Performance" and AS2870 Appendix H of AS2871-2011.

**GEOTECH TESTING PTY LTD** 

# **APPENDIX A**

**TABLE A: TEST PIT DEATILS** 

TEST PIT LOCATION PLAN (Drawing No 7508/127-1)

# TABLE A

Job No: 7508/127 Page 1 of 4 Our Ref: 7508/127-AA

Our Ref: 7508/127-AA				
TEST PIT NUMBER	DEPTH (m)	SAMPLE DEPTH (m)	MATERIAL DESCRIPTION	
TP40	0.0-0.1	0.0-0.1	FILL: Silty Clay, medium plasticity, grey, with gravels and root fibre (topsoil)	
	0.1-0.5		FILL: Silty Clay, medium to high plasticity, brown & grey, trace of fine to medium gravel	
	0.5-1.5	1.0-1.1	(CI-CH) Silty CLAY, medium to high plasticity, brown and grey, M>PL, VSt	
TP41	0.0-0.1	0.0-0.1	FILL: Silty Clay, medium plasticity, grey, with gravels and root fibre (topsoil)	
	0.1-0.4		FILL: Silty Clay, medium to high plasticity, brown & grey, trace of fine to medium gravel	
	0.4-1.5	0.5-0.6	(CI-CH) Silty CLAY, medium to high plasticity, brown and grey, M>PL, VSt	
TP42	0.0-0.05	0.0-0.05	FILL: Silty Clay, medium plasticity, grey, with gravels and root fibre (topsoil)	
	0.05-0.9	U <sub>50</sub> (0.3-0.6) 0.5-0.6	FILL: Silty Clay, medium to high plasticity, brown & grey, trace of fine to medium gravel	
	0.9-1.5		(CI-CH) Silty CLAY, medium to high plasticity, brown and grey, M>PL, VSt	
TP43	0.0-0.1	0.0-0.1	FILL: Silty Clay, medium plasticity, grey, with gravels and root fibre (topsoil)	
	0.1-1.5	0.5-0.6	(CI-CH) Silty CLAY, medium to high plasticity, brown and grey, M>PL, VSt	
TP44	0.0-0.1	0.0-0.1	FILL: Silty Clay, medium plasticity, grey, with gravels and root fibre (topsoil)	
	0.1-0.9	0.5-0.6	FILL: Silty Clay, medium to high plasticity, brown & grey, trace of fine to medium gravel	
	0.9-1.5		(CI-CH) Silty CLAY, medium to high plasticity, brown and grey, M>PL, VSt	
TP45	0.0-0.1	0.0-0.1	FILL: Silty Clay, medium plasticity, grey, with gravels and root fibre (topsoil)	
	0.1-1.5	1.0-1.1	(CI-CH) Silty CLAY, medium to high plasticity, brown and grey, M>PL, VSt	

# TABLE A

Job No: 7508/127 Page 2 of 4 Our Ref: 7508/127-AA

Our Ref: 7508/127-AA				
TEST PIT NUMBER	DEPTH (m)	SAMPLE DEPTH (m)	MATERIAL DESCRIPTION	
TP46	0.0-0.2	0.0-0.1	FILL: Silty Clay, medium plasticity, grey, with gravels and root fibre (topsoil) and tree roots	
	0.2-1.5	0.5-0.6 U50 (0.7-1.0)	(CI) Silty CLAY, medium plasticity, brown and grey, M>PL, VSt	
TP47	0.0-0.2	0.0-0.1	FILL: Silty Clay, medium plasticity, grey, with gravels and root fibre (topsoil)	
	0.2-0.4		FILL: Silty Clay, medium to high plasticity, brown & grey, trace of fine to medium gravel	
	0.4-1.5	0.5-0.6	(CI) Silty CLAY, medium plasticity, brown and grey, M>PL, VSt	
TP48	0.0-0.3	0.0-0.1	FILL: Silty Clay, medium plasticity, grey, with gravels and root fibre (topsoil)	
	0.3-1.5	0.5-0.6	(CI) Silty CLAY, medium plasticity, brown and grey, M>PL, VSt	
TP49	0.0-0.3	0.0-0.1	FILL: Silty Clay, medium plasticity, grey, with gravels and root fibre (topsoil)	
	0.3-0.6	0.5-0.6	FILL: Silty Clay, medium to high plasticity, brown & grey, trace of fine to medium gravel	
	0.6-1.5		(CI-CH) Silty CLAY, medium to high plasticity, brown and grey, M>PL, VSt	
TP50	0.0-0.4	0.0-0.1	FILL: Silty Clay, medium plasticity, grey, with gravels and root fibre (topsoil)	
	0.4-1.5	1.0-1.1	(CI) Silty CLAY, medium plasticity, brown and grey, M>PL, VSt	
TP51	0.0-0.2	0.0-0.1	FILL: Silty Clay, medium plasticity, grey, with gravels and root fibre (topsoil)	
	0.2-0.6	0.5-0.6	FILL: Silty Clay, medium to high plasticity, brown & grey, trace of fine to medium gravel	
	0.6-1.5		(CI) Silty CLAY, medium plasticity, brown and grey, M>PL, VSt	
3	X			

# TABLE A

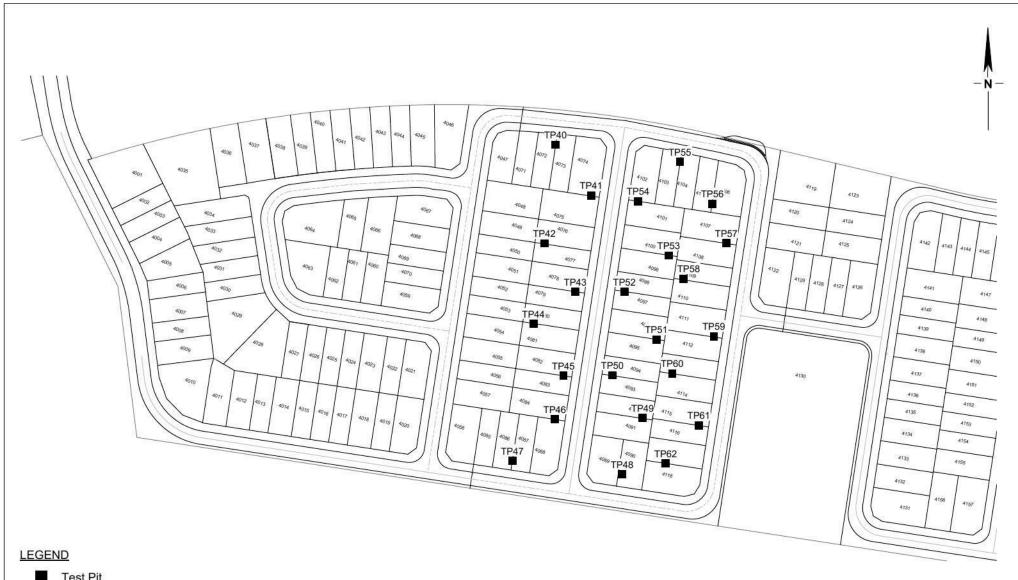
Job No: 7508/127 Page 3 of 4 Our Ref: 7508/127-AA

Our Ref: 7508/127-AA  TEST PIT SAMPLE MATERIAL RECORDETION				
NUMBER	DEPTH (m)	DEPTH (m)	MATERIAL DESCRIPTION	
TP52	0.0-0.1	0.0-0.1	FILL: Silty Clay, medium plasticity, grey, with gravels and root fibre (topsoil)	
	0.1-1.5	0.5-0.6	(CL-CI) Silty CLAY, low to medium plasticity, brown and grey, M>PL, VSt	
TP53	0.0-0.2	0.0-0.1	FILL: Silty Clay, medium plasticity, grey, with gravels and root fibre (topsoil)	
	0.2-0.5		FILL: Silty Clay, medium to high plasticity, brown & grey, trace of fine to medium gravel	
	0.5-1.5	0.5-0.6 U <sub>50</sub> (0.5-0.8)	(CL-CI) Silty CLAY, low to medium plasticity, brown and grey, M>PL, VSt	
TP54	0.0-0.2	0.0-0.1	FILL: Silty Clay, medium plasticity, grey, with gravels and root fibre (topsoil)	
	0.2-1.5	0.5-0.6	(CI) Silty CLAY, medium plasticity, yellow brown and brown, M≥PL, VSt	
TP55	0.0-0.1	0.0-0.1	FILL: Silty Clay, medium plasticity, grey, with gravels and root fibre (topsoil)	
	0.1-1.5	1.0-1.1	(CI) Silty CLAY, medium plasticity, yellow brown and brown, M≥PL, VSt	
TP56	0.0-0.2	0.0-0.1	FILL: Silty Clay, medium plasticity, grey, with gravels and root fibre (topsoil)	
	0.2-1.5	0.5-0.6	(CI) Silty CLAY, medium plasticity, yellow brown and brown, M≥PL, VSt	
TP57	0.0-0.1	0.0-0.1	FILL: Silty Clay, medium plasticity, grey, with gravels and root fibre (topsoil)	
	0.1-1.5	0.5-0.6	(CI) Silty CLAY, medium plasticity, yellow brown and brown, M≥PL, VSt	
TP58	0.0-0.2	0.0-0.1	FILL: Silty Clay, medium plasticity, grey, with gravels and root fibre (topsoil)	
	0.2-0.5		FILL: Silty Clay, medium to high plasticity, brown & grey, trace of fine to medium gravel	
19	0.5-1.5	0.5-0.6	(CI) Silty CLAY, medium plasticity, brown and grey, M>PL, VSt	

# TABLE A

Job No: 7508/127 Page 4 of 4

Our Ref:	Our Ref: 7508/127-AA					
TEST PIT NUMBER	DEPTH (m)	SAMPLE DEPTH (m)	MATERIAL DESCRIPTION			
TP59	0.0-0.2	0.0-0.1	FILL: Silty Clay, medium plasticity, grey, with gravels and root fibre (topsoil)			
	0.2-1.5	0.5-0.6	(CI) Silty CLAY, medium plasticity, brown and grey, M>PL, VSt			
TP60	0.0-0.2	0.0-0.1	FILL: Silty Clay, medium plasticity, grey, with gravels and root fibre (topsoil)			
	0.2-0.6	U <sub>50</sub> (0.3-0.6)	FILL: Silty Clay, medium to high plasticity, brown & grey, trace of fine to medium gravel			
	0.6-1.5	1.0-1.1	(CI) Silty CLAY, medium plasticity, yellow brown and brown, M≥PL, VSt			
TP61	0.0-0.3	0.0-0.1	FILL: Silty Clay, medium plasticity, grey, with gravels and root fibre (topsoil)			
	0.3-1.5	0.5-0.6	(CI) Silty CLAY, medium plasticity, brown and grey, M>PL, VSt			
TP62	0.0-0.4	0.0-0.1	FILL: Silty Clay, low plasticity, grey, with gravels and root fibre (topsoil)			
	0.4-1.5	0.5-0.6	(CI) Silty CLAY, medium plasticity, brown and grey, M>PL, VSt			



Test Pit



34 Borec Road NSW 2750 ABN 71 076 676 321

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#### NOTES

- 1. Site features are indicative and are not to scale.
- 2. This drawing has been produced using a base plan provided by others to which additional information e.g test pits, borehole locations or notes have been added. Some or all of the plan may not be relevant at the time of producing this drawing

#### Maryland Development Company Pty Ltd Stage 4B Jordan Springs

**Test Pit Locations** 

Drawing No: 7508/127-1 Job No: 7508/127 Drawn By: MH Date: 23 July 2013 Checked By: ZA

File No: 7508-127 Layers: 0, Lay1

# **APPENDIX B**

### TABLE B LABORATORY TEST RESULTS





MARYLAND DEVELOPMENT COMPANY PTY LTD C/- LEND LEASE DEVELOPMENT P/L, PO BOX 1124 ST MARYS NSW 1790

Job No: 7508/127

Tested By: TS Checked By: AK

Date Tested: 12/08/2013 Laboratory Penrith

# SITE & EXPOSURE CLASSIFICATION STAGE 4B, JORDAN SPRINGS

#### TEST RESULTS - SHRINK / SWELL INDEX

Page 1 of 1

Test Procedure: AS 1289 7.1.1				
Sample Identification	Test Pit 42	Test Pit 60		
Depth (m)	0.3 - 0.6	0.3 - 0.6		
Laboratory Number	7508/127-1	7508/127-4		
Test Description				
Moisture Content				
Initial %	12.9	12.0		
Final %	18.8	17.7		
Swell %	5.5	3.3		
Shrinkage %	1.7	0.2		
Shrink/Swell Index %/ <sub>p</sub> F	2.5	1.0		
Material Description	FILL: Silty Clay, medium to high plasticity, brown & grey, trace of fine to medium gravel	FILL: Silty Clay, low plasticity, yellow-brown, trace of fine to medium gravel		

Form No R007 Version 12 06/13

Accredited for compliance with ISO/IEC 17025.

A Kench

22/08/2013

Approved Signatory



NATA Accreditation Number 2734 Corporate Site Number 2727

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MARYLAND DEVELOPMENT COMPANY PTY LTD C/- LEND LEASE DEVELOPMENT P/L, PO BOX 1124 ST MARYS NSW 1790

### SITE & EXPOSURE CLASSIFICATION STAGE 4B, JORDAN SPRINGS

# **TEST RESULTS - ATTERBERG LIMITS** Test Procedure AS1289 3.1.2, 3.2.1, 3.3.1, 3.4.1

					Page 1 of 1
Job No: Laboratory Date Tested	7508/127 Penrith 20/08/2013		Tested By: Checked By:	HW AK	
Sample Identi	fication	Test Pit 46	Test Pit 53		
Laboratory Nu	mber	7508/127-2	7508/127-3		
Depth (m)		0.7 - 1.0	0.5 - 0.8		
Test Descrip	tion				
Liquid Limit (V	V <sub>L</sub> )	47%	27%		
Plastic Limit (	<b>W</b> <sub>P</sub> )	18%	16%		
Plastic Index (	l <sub>P</sub> )	29%	11%		
Linear Shrinka	age (LS)	13.0%	5.5%		
Mould Length	(mm)	125	127		
Sample Histo	ry	O∨en Dried Dry Sieved	Oven Dried Dry Sieved		
Material Desc	ription	(CI) Silty CLAY, medium plasticity, brown & grey	(CL-CI) Silty CLAY, low to medium plasticity, brown & grey		

Form No R004 Version 12 - 06/13 - Issued by ER



Accredited for compliance with ISO/IEC 17025.

A Kench

30/08/2013

Approved Signatory

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# **APPENDIX C**

# **SUMMARY OF SITE CLASSIFICATIONS**

# TABLE C SUMMARY OF SITE CLASSIFICATIONS STAGE 4B JUBILEE DRIVE, JORDAN SPRINGS

Lot	Class	Lot	Class
4071	H1	4095	М
4072	H1	4096	М
4073	H1	4097	М
4074	H1	4098	М
4075	H1	4099	М
4076	H1	4100	М
4077	H1	4101	М
4078	H1	4102	М
4079	H1	4103	М
4080	H1	4104	М
4081	H1	4105	М
4082	H1	4106	М
4083	H1	4107	М
4084	H1	4108	М
4085	H1	4109	М
4086	М	4110	М
4087	М	4111	М
4088	М	4112	М
4089	М	4113	М
4090	М	4114	М
4091	М	4115	М
4092	М	4116	М
4093	М	4117	М
4094	М	4118	М

M: Moderately Reactive (Surface movement within 20-40mm),

H1: Highly Reactive (Surface movement within 40mm to 60mm)