Date: 10th February 2014

J Wyndham Prince
PO Box 4366
Penrith Westfield NSW 2750

Attn: Brett Buckpitt

JKW Ref 5892 - JORDAN SPRINGS – Village 4C,D,E&F
Importation of Fill

Brett,

In relation to works carried out at Jordan Springs Village 4C,D,E&F, JKW can confirm that no external material was imported to the site as a part of the bulk earthworks component of works.

The sequencing of the works produced a net excess of material on site and as such, this excess material was stockpiled in the approved stockpiling locations and compacted accordingly. These stockpiles remain on site for use as backfill for eventual sediment basin decommissioning and infill as part of the overall sediment basin strategy in place for the site

Regards,

Josh Vermeer
For JK Williams Contracting Pty Ltd.

RECEIVED
D/MGT
- 5 MAR 2014
PENRITH CITY COUNCIL

JK Williams Contracting Pty Ltd ABN 45 056 566 771
PO Box 308 Penrith NSW 2751
T: 02 4725 3400 F: 02 4725 3499 W: jkw.com.au

4E

GEOTECH TESTING PTY LTD®
ABN 71 076 676 321

Certified System
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SAI GLOBAL

Job No: 7508/129
Our Ref: 7508/129-AB Statement of Compliance
12 February 2014

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 4C, 4D, 4E & 4F**
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 4C, 4D, 4E & 4F 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.*

Head Office:
34 Borec Road, Penrith NSW 2750
P O Box 880 Penrith NSW 2751
Telephone: (02) 4722 2744 Facsimile: (02) 4722 2777
email: info@geotech.com.au www.geotech.com.au

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

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

Appendix	Relevant Information	Stage 4C	Stage 4D	Stage 4E	Stage 4F
A	**Summary of Site Fill Testing**	Report 7508/129-AA			
B	**Summary of Road Works Testing**	Report 7508/131-AA	Report 7508/134-AA	Report 7508/137-AA	Report 7508/140-AA
C	**Summary of Pipeline Backfill Testing**	Report 7508/132-AA	Report 7508/135-AA	Report 7508/138-AA	Report 7508/141-AA
D	**Soil Classification of Lots**	Report 7508/133-AA	Report 7508/136-AA	Report 7508/139-AA	No residential lots - N/A

Yours faithfully
GEOTECH TESTING PTY LTD

EMGED RIZKALLA
Director

APPENDIX A

SUMMARY OF SITE FILL TESTING

REPORT 7508/129-AA

GEOTECH TESTING PTY LTD®
ABN 71 076 676 321

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Job No: 7508/129
Our Ref: 7508/129-AA
Your Commitment No: 186390

12 February 2014

Maryland Development Company Pty Ltd
c/- Lend Lease Development Pty Ltd
P O Box 4
PARRAMATTA NSW 2124

Attention: Mr A Ali

Dear Sir

re: **Jordan Springs - Stages 4C, 4D, 4E & 4F**
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 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 results sheets. Seventy six compaction control tests were completed and the results are attached.

The test locations are indicated on the attached Drawings 7508/129-1 to 7508/129-5.

The fill comprised on-site materials gained from excavation (cut to fill). No other fill materials were imported to the site.

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 4C, 4D, 4E & 4F is classified as "Controlled" fill (Level 1) as defined in Australian Standard AS3870 and Council 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 7508/129-1 to 7508/129-5
Compaction Control Test Nos 1 to 76

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 Drawings 7508/129-1 to 7508/129-5. 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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FIELD DENSITY RESULTS

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

Laboratory: Penrith
Job No: 7508/129
Date: 13/09/2013

PROJECT: SITE FILL TESTING
STAGE 4C,4D,4E,4F JORDAN SPRINGS

TEST NUMBER			1	2	3	4	5	6	7	8
DATE TESTED			13/08/2013							
RESULTS										
Hilf Density Ratio	Standard	%	102	96	95	96	97.5	99	100.5	101
Moisture Variation from OMC	(-Drier/+Wetter)	%	0.0	0.0	0.0	0.0	-0.5	0.0	-0.5	0.0
Specification	**Density Ratio (Standard)**		**≥95%**	**Specification Moisture Variance from OMC**						**N/A**
TEST LOCATION										
Chainage	(Carriageway L/R)	m	-	-	-	-	-	-	-	-
Shown on Drawing No			7508/129-2							
Retested by Test			-	-	-	-	-	-	-	-
Reduced Level		m	32.90	32.39	32.47	32.67	31.05	31.35	31.70	30.97
FIELD & LABORATORY DATA										
Field Wet Density		t/m³	2.11	2.06	2.04	2.08	1.99	2.01	2.08	2.02
Field Moisture Content		%	16.5	15.0	16.5	16.5	20.0	17.5	18.0	18.0
Material retained on	19mm Sieve (wet)	%	<5	<5	<5	<5	<5	<5	<5	<5
Lab Compaction result from test number			1	2	3	4	5	6	7	8
Peak Converted Wet Density		t/m³	2.07	2.15	2.15	2.17	2.04	2.03	2.07	2.00
Apparent Optimum Moisture Content		%	16.5	15.0	16.5	17.0	20.5	17.5	18.5	18.0
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	2-3	2	2	2

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
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),
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

Material Description

1. CL-Clays of low plasticity, gravelly clays, sandy clays, silty clays
2. 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
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 - Recycled Concrete
15. Recycled Roadbase
16. RSB - Recycled Sub-base
17. CSS - Crushed Sandstone
18. RSS - Ripped Sandstone
19. Cowels Brown

* Cement Stabilised
# Lime Stabilised
$ Gypsum Stabilised

NATA
Accreditation Number 2734
Corporate Site Number 2727

Accredited for compliance with ISO/IEC 17025.

A Kench 13/09/2013
Approved Signatory

Head Office:
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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

Laboratory: Penrith
Job No: 7508/129
Date: 13/09/2013

PROJECT: SITE FILL TESTING
STAGE 4C,4D,4E,4F JORDAN SPRINGS

TEST NUMBER			9	10	11	12	13	14	15	16
DATE TESTED			14/08/2013							
RESULTS										
Hilf Density Ratio	Standard	%	98.5	98.5	98.5	97	98.5	102	103	101
Moisture Variation from OMC	(-Drier/+Wetter)	%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.5
Specification	**Density Ratio (Standard)**		**≥95%**	**Specification Moisture Variance from OMC**						**N/A**
TEST LOCATION										
Chainage	(Carriageway L/R)	m	-	-	-	-	-	-	-	-
Shown on Drawing No			7508/129-1							
Retested by Test			-	-	-	-	-	-	-	-
Reduced Level		m	23.21	22.81	23.80	23.10	23.50	23.97	23.88	23.44
FIELD & LABORATORY DATA										
Field Wet Density		t/m³	2.03	2.02	2.02	2.04	2.05	2.03	2.05	1.99
Field Moisture Content		%	19.0	18.5	18.5	19.0	19.0	19.5	21.0	20.0
Material retained on	19mm Sieve (wet)	%	<5	<5	<5	<5	<5	<5	<5	<5
Lab Compaction result from test number			9	10	11	12	13	14	15	16
Peak Converted Wet Density		t/m³	2.06	2.05	2.05	2.10	2.08	1.99	1.99	1.97
Apparent Optimum Moisture Content		%	19.0	18.5	18.5	19.0	19.0	19.0	21.0	18.5
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	3	2

Notes

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14: RTA T111, T120, T166, T173
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16. RTA T120, T162, T173
17. RTA T120, T164, T173

Material Description

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

* Cement Stabilised
# Lime Stabilised
$ Gypsum Stabilised

NATA
Accreditation Number 2734
Corporate Site Number 2727

Accredited for compliance with ISO/IEC 17025.

A Kench 13/09/2013
Approved Signatory

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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

Laboratory: Penrith
Job No: 7508/129
Date: 13/09/2013

PROJECT: SITE FILL TESTING
STAGE 4C,4D,4E,4F JORDAN SPRINGS

TEST NUMBER			17	18	19	20	21	22	23	24
DATE TESTED			14/08/2013				15/08/2013			
RESULTS										
Hilf Density Ratio	Standard	%	99	96.5	99.5	100.5	100	95	95	95
Moisture Variation from OMC	(-Drier/+Wetter)	%	0.0	1.0	-0.5	-0.5	0.5	0.0	0.0	0.5
Specification	**Density Ratio (Standard)**		**≥95%**	**Specification Moisture Variance from OMC**						**N/A**
TEST LOCATION										
Chainage	(Carriageway L/R)	m	-	-	-	-	-	-	-	-
Shown on Drawing No			7508/129-2							
Retested by Test			-	-	-	-	-	-	-	-
Reduced Level		m	31.04	31.37	31.63	31.56	30.72	31.11	30.86	30.49
FIELD & LABORATORY DATA										
Field Wet Density		t/m³	2.01	1.96	2.02	2.07	2.12	2.03	2.06	2.06
Field Moisture Content		%	19.5	18.5	19.0	18.5	15.5	20.0	19.5	20.0
Material retained on	19mm Sieve (wet)	%	<5	<5	<5	<5	<5	<5	<5	<5
Lab Compaction result from test number			17	18	19	20	21	22	23	24
Peak Converted Wet Density		t/m³	2.03	2.03	2.03	2.06	2.12	2.14	2.17	2.17
Apparent Optimum Moisture Content		%	19.5	18.0	19.5	19.0	15.0	20.0	19.5	19.5
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	2-3	2	2

Notes

1: Assigned Values have been obtained from our Penrith laboratory – Accreditation No 2734
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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

* Cement Stabilised
# Lime Stabilised
$ Gypsum Stabilised

NATA
Accreditation Number 2734
Corporate Site Number 2727

Accredited for compliance with ISO/IEC 17025.

A Kench 13/09/2013
Approved Signatory

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P O Box 880 Penrith NSW 2751
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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

Laboratory: Penrith
Job No: 7508/129
Date: 13/09/2013

PROJECT: SITE FILL TESTING
STAGE 4C,4D,4E,4F JORDAN SPRINGS

TEST NUMBER			25	26	27	28	29	30	31	32
DATE TESTED			16/08/2013							
RESULTS										
Hilf Density Ratio	Standard	%	96.5	95	98.5	97	96.5	97	96.5	98.5
Moisture Variation from OMC	(-Drier/+Wetter)	%	0.5	2.0	0.5	0.5	0.5	0.0	0.5	0.5
Specification	**Density Ratio (Standard)**		**≥95%**	**Specification Moisture Variance from OMC**						**N/A**
TEST LOCATION										
Chainage	(Carriageway L/R)	m	-	-	-	-	-	-	-	-
Shown on Drawing No			7508/129-1							
Retested by Test			-	-	-	-	-	-	-	-
Reduced Level		m	24.34	24.52	24.52	24.48	24.39	24.85	24.70	24.07
FIELD & LABORATORY DATA										
Field Wet Density		t/m³	2.03	2.07	2.06	2.05	2.08	2.06	2.05	2.06
Field Moisture Content		%	13.5	15.5	18.5	15.5	15.5	16.5	18.0	18.5
Material retained on	19mm Sieve (wet)	%	<5	<5	<5	<5	<5	<5	<5	<5
Lab Compaction result from test number			25	26	27	28	29	30	31	32
Peak Converted Wet Density		t/m³	2.10	2.18	2.09	2.11	2.15	2.12	2.12	2.09
Apparent Optimum Moisture Content		%	12.5	13.5	18.0	15.0	15.0	16.0	17.5	18.0
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 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
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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

Material Description

1. CL-Clays of low plasticity, gravelly clays, sandy clays, silty clays
2. 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
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 - Recycled Concrete
15. Recycled Roadbase
16. RSB - Recycled Sub-base
17. CSS - Crushed Sandstone
18. RSS - Ripped Sandstone
19. Cowels Brown

* Cement Stabilised
# Lime Stabilised
$ Gypsum Stabilised

Accredited for compliance with ISO/IEC 17025.

A Kench 13/09/2013
Approved Signatory

NATA
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Corporate Site Number 2727

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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

Laboratory: Penrith
Job No: 7508/129
Date: 13/09/2013

PROJECT: SITE FILL TESTING
STAGE 4C,4D,4E,4F JORDAN SPRINGS

TEST NUMBER			33	34	35	36	37	38	39	40
DATE TESTED			19/08/2013							
RESULTS										
Hilf Density Ratio	Standard	%	**102**	**95.5**	**95.5**	**95.5**	**95.5**	**95.5**	**95**	**96**
Moisture Variation from OMC	(-Drier/+Wetter)	%	**0.5**	**0.0**	**0.5**	**1.0**	**0.5**	**0.0**	**0.0**	**1.5**
Specification	**Density Ratio (Standard)**		**≥95%**	**Specification Moisture Variance from OMC**						**N/A**
TEST LOCATION										
Chainage	(Carriageway L/R)	m	-	-	-	-	-	-	-	-
Shown on Drawing No			7508/129-1				7508/129-2			
Retested by Test			-	-	-	-	-	-	-	-
Reduced Level		m	23.51	23.88	23.63	24.26	35.09	35.36	34.51	34.79
FIELD & LABORATORY DATA										
Field Wet Density		t/m³	2.07	2.03	2.02	2.03	2.02	2.04	2.04	2.06
Field Moisture Content		%	17.5	16.5	19.0	17.5	16.0	18.0	18.0	18.5
Material retained on	19mm Sieve (wet)	%	<5	<5	<5	<5	<5	<5	<5	<5
Lab Compaction result from test number			33	34	35	36	37	38	39	40
Peak Converted Wet Density		t/m³	2.03	2.13	2.12	2.13	2.12	2.14	2.15	2.15
Apparent Optimum Moisture Content		%	16.5	16.5	18.5	17.0	15.5	17.5	18.0	17.0
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

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16. RTA T120, T162, T173
17. RTA T120, T164, T173

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13. FCR40
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15. Recycled Roadbase
16. RSB - Recycled Sub-base
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18. RSS - Ripped Sandstone
19. Cowels Brown

* Cement Stabilised
# Lime Stabilised
$ Gypsum Stabilised

Form No R 020 Version 09 06/13 - issued by ER

NATA
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Corporate Site Number 2727

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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

Laboratory: Penrith
Job No: 7508/129
Date: 13/09/2013

PROJECT: SITE FILL TESTING
STAGE 4C,4D,4E,4F JORDAN SPRINGS

TEST NUMBER			41	42	43	44	45	46	47	48
DATE TESTED			20/08/2013							
RESULTS										
Hilf Density Ratio	Standard	%	97	98.5	98.5	102.5	95.5	97	97	99
Moisture Variation from OMC	(-Drier/+Wetter)	%	0.5	0.0	0.5	0.5	0.0	0.0	0.0	0.5
Specification	**Density Ratio (Standard)**		**≥95%**	**Specification Moisture Variance from OMC**						**N/A**
TEST LOCATION										
Chainage	(Carriageway L/R)	m	-	-	-	-	-	-	-	-
Shown on Drawing No			7508/129-1							
Retested by Test			-	-	-	-	-	-	-	-
Reduced Level		m	26.51	26.14	26.08	25.90	24.41	24.42	25.08	24.69
FIELD & LABORATORY DATA										
Field Wet Density		t/m³	2.02	2.06	2.06	2.09	2.04	2.01	2.05	2.04
Field Moisture Content		%	18.0	19.0	19.0	20.0	18.5	17.0	17.0	18.0
Material retained on	19mm Sieve (wet)	%	<5	<5	<5	<5	<5	<5	<5	<5
Lab Compaction result from test number			41	42	43	44	45	46	47	48
Peak Converted Wet Density		t/m³	2.08	2.09	2.09	2.04	2.14	2.07	2.11	2.06
Apparent Optimum Moisture Content		%	17.5	19.5	18.5	19.5	18.5	16.5	17.0	17.5
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

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16. RTA T120, T162, T173
17. RTA T120, T164, T173

Material Description

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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

* Cement Stabilised
# Lime Stabilised
$ Gypsum Stabilised

Form No R 020 Version 09 06/13 - issued by ER

NATA
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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

Laboratory: Penrith
Job No: 7508/129
Date: 13/09/2013

PROJECT: SITE FILL TESTING
STAGE 4C,4D,4E,4F JORDAN SPRINGS

TEST NUMBER			49	50	51	52	53	54	55	56
DATE TESTED			21/08/2013							22/08/2013
RESULTS										
Hilf Density Ratio	Standard	%	95	98	96.5	100	102	98	95	96.5
Moisture Variation from OMC	(-Drier/+Wetter)	%	0.5	0.0	1.0	0.5	0.5	0.0	0.5	0.5
Specification	**Density Ratio (Standard)**		**≥95%**	**Specification Moisture Variance from OMC**						**N/A**
TEST LOCATION										
Chainage	(Carriageway L/R)	m	-	-	-	-	-	-	-	-
Shown on Drawing No			7508/129-1				7508/129-2			7508/129-1
Retested by Test			-	-	-	-	-	-	-	-
Reduced Level		m	25.54	26.23	25.83	25.94	32.19	31.72	31.29	25.16
FIELD & LABORATORY DATA										
Field Wet Density		t/m³	1.99	2.03	2.04	2.06	2.03	1.98	2.01	2.03
Field Moisture Content		%	17.5	17.0	17.5	16.5	16.0	14.5	15.5	17.5
Material retained on	19mm Sieve (wet)	%	<5	<5	<5	<5	<5	<5	<5	<5
Lab Compaction result from test number			49	50	51	52	53	54	55	56
Peak Converted Wet Density		t/m³	2.09	2.07	2.11	2.06	1.99	2.02	2.12	2.10
Apparent Optimum Moisture Content		%	17.0	17.0	16.5	16.5	15.5	14.5	15.0	17.5
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

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13: RTA T111, T119, T120, T166
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15: RTA T120, T119, T162
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Material Description

1. CL-Clays of low plasticity, gravelly clays, sandy clays, silty clays
2. CI-Clay of medium plasticity, gravelly clays, sandy clays, silty clays
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7. SP-Sand, crushed dust, filling sand, washed sand
8. DGB20
9. DGB40
10. DGS20
11. DGS40
12. FCR20
13. FCR40
14. RC - Recycled Concrete
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17. CSS - Crushed Sandstone
18. RSS - Ripped Sandstone
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* Cement Stabilised
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Form No R 020 Version 09 06/13 - issued by ER

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FIELD DENSITY RESULTS

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ST MARYS NSW 1790

Laboratory: Penrith
Job No: 7508/129
Date: 13/09/2013

PROJECT: SITE FILL TESTING
STAGE 4C,4D,4E,4F JORDAN SPRINGS

TEST NUMBER			57	58	59	60	61	62	63	64
DATE TESTED			22/08/2013			23/08/2013				
RESULTS										
Hilf Density Ratio	Standard	%	95	95	95.5	96	99	102.5	102	98
Moisture Variation from OMC	(-Drier/+Wetter)	%	1.5	0.5	0.0	0.5	0.0	-4.0	-2.5	-2.0
Specification	**Density Ratio (Standard)**		**≥95%**	**Specification Moisture Variance from OMC**						**N/A**
TEST LOCATION										
Chainage	(Carriageway L/R)	m	-	-	-	-	-	-	-	-
Shown on Drawing No			7508/129-1						7508/129-2	
Retested by Test			-	-	-	-	-	-	-	-
Reduced Level		m	24.99	23.74	23.77	28.14	27.83	28.03	32.63	32.64
FIELD & LABORATORY DATA										
Field Wet Density		t/m³	2.05	2.03	2.03	2.04	2.10	2.04	2.07	2.00
Field Moisture Content		%	17.0	17.0	16.5	16.0	16.5	13.5	13.0	13.0
Material retained on	19mm Sieve (wet)	%	<5	<5	<5	<5	<5	<5	<5	<5
Lab Compaction result from test number			57	58	59	60	61	62	63	64
Peak Converted Wet Density		t/m³	2.16	2.14	2.13	2.13	2.12	1.99	2.03	2.04
Apparent Optimum Moisture Content		%	16.0	16.5	16.5	15.5	16.5	17.5	15.5	15.0
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

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18. RSS - Ripped Sandstone
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Corporate Site Number 2727

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ST MARYS NSW 1790

Laboratory: Penrith
Job No: 7508/129
Date: 13/09/2013

PROJECT: SITE FILL TESTING
STAGE 4C,4D,4E,4F JORDAN SPRINGS

TEST NUMBER			65	66	67	68	69	70		
DATE TESTED			23/08/2013	27/08/2013			10/09/2013			
RESULTS										
Hilf Density Ratio	Standard	%	**105**	**92.5**	**91.5**	**96**	**98**	**98**		
Moisture Variation from OMC	(-Drier/+Wetter)	%	**-2.0**	**0.0**	**1.5**	**0.0**	**0.0**	**-0.5**		
Specification	**Density Ratio (Standard)**		**≥95%**	**Specification Moisture Variance from OMC**						**N/A**
TEST LOCATION										
Chainage	(Carriageway L/R)	m	-	-	-	-	-	-		
Shown on Drawing No			7508/129-2		7508/129-3					
Retested by Test			-	TBA	TBA	-	-	-		
Reduced Level		m	32.69	32.73	35.60	35.07	34.57	34.32		
FIELD & LABORATORY DATA										
Field Wet Density		t/m³	2.11	2.00	2.02	2.06	2.02	2.00		
Field Moisture Content		%	13.5	16.0	16.5	16.5	19.0	18.0		
Material retained on	19mm Sieve (wet)	%	<5	<5	<5	<5	<5	<5		
Lab Compaction result from test number			65	66	67	68	69	70		
Peak Converted Wet Density		t/m³	2.01	2.16	2.21	2.15	2.06	2.04		
Apparent Optimum Moisture Content		%	15.5	15.5	15.0	16.5	19.0	18.5		
Number of Compaction Points			3	3	3	3	3	3		
Test Procedures - See Note Number			12	12	12	12	12	12		
Material Description - see below			2	2	2	2	2	2		

Notes

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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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9: Full details of Test Procedure 5.8.1 available on request
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14: RTA T111, T120, T166, T173
15: RTA T120, T119, T162
16. RTA T120, T162, T173
17. RTA T120, T164, T173

Material Description

1. CL-Clays of low plasticity, gravelly clays, sandy clays, silty clays
2. 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
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 - Recycled Concrete
15. Recycled Roadbase
16. RSB - Recycled Sub-base
17. CSS - Crushed Sandstone
18. RSS - Ripped Sandstone
19. Cowels Brown

* Cement Stabilised
# Lime Stabilised
$ Gypsum Stabilised

Form No R 020 Version 09 06/13 - issued by ER

NATA
Accreditation Number 2734
Corporate Site Number 2727

Accredited for compliance with ISO/IEC 17025.

A Kench 13/09/2013
Approved Signatory

Head Office:
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P O Box 880 Penrith NSW 2751
Telephone: (02) 4722 27

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

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

LEGEND

● Density Test

GEOTECH TESTING PTY LTD®
34 Borec Road
Penrith
NSW 2750
ABN 71 076 676 321

Ph: 02 4722 2744
Fx: 02 4722 2777
www.geotech.com.au
e-mail:info@geotech.com.au

NOTES

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

Location of Field Density Tests

Drawing No: 7508/129-1
Job No: 7508/129
Drawn By: MH
Date: 9 September 2013
Checked By: AK

File No: 7508-129
Layers: 0, Lay1

LEGEND

● Density Test

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

Location of Field Density Tests

Drawing No: 7508/129-2
Job No: 7508/129
Drawn By: MH
Date: 9 September 2013
Checked By: AK

File No: 7508-129
Layers: 0, Lay2

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

Location of Field Density Tests

Drawing No: 7508/129-3
Job No: 7508/129
Drawn By: MH
Date: 9 September 2013
Checked By: AK

File No: 7508-129
Layers: 0, Lay3

GEOTECH TESTING PTY LTD®
ABN 71 076 676 321

Certified System
Quality
ISO 9001
SAI GLOBAL

FIELD DENSITY RESULTS

MARYLAND DEVELOPMENT COMPANY PTY LTD
C/- LEND LEASE DEVELOPMENT P/L, PO BOX 4
PARRAMATTA NSW 2124

Laboratory: Penrith
Job No: 7508/129
Date: 06/11/2013

PROJECT: SITE FILL TESTING
STAGE 4C,4D,4E,4F JORDAN SPRINGS

TEST NUMBER			71	72	73	74	75	76	
DATE TESTED			12/09/2013				16/09/2013		
RESULTS									
Hilf Density Ratio	Standard	%	**95.5**	**96.5**	**96.5**	**95**	**95**	**97.5**	
Moisture Variation from OMC	(-Drier/+Wetter)	%	**1.5**	**1.5**	**1.5**	**1.5**	**1.5**	**2.0**	
Specification	**Density Ratio (Standard)**		**≥95%**	**Specification Moisture Variance from OMC**					**±2%**
TEST LOCATION									
Chainage	(Carriageway L/R)	m	-	-	-	-	-	-	
Shown on Drawing No			7508/129-4				7508/129-5		
Redoced Level		m	-	-	-	-	34.84	34.32	
Depth Below Subgrade		m	0.3	0.3	0.3	0.3	-	-	
FIELD & LABORATORY DATA									
Field Wet Density		t/m³	2.04	2.06	2.06	2.04	2.10	2.12	
Field Moisture Content		%	18.0	18.0	17.0	17.0	19.0	17.5	
Material retained on	19mm Sieve (wet)	%	<5	<5	<5	<5	<5	<5	
Lab Compaction result from test number			71	72	73	74	75	76	
Peak Converted Wet Density		t/m³	2.14	2.13	2.13	2.15	2.21	2.17	
Apparent Optimum Moisture Content		%	16.5	16.5	16.0	15.5	17.5	15.0	
Number of Compaction Points			3	3	3	3	3	3	
Test Procedures - See Note Number			12	12	12	12	12	12	
Material Description - see below			2	2	2	2	2	2	

Notes

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16. RTA T120, T162, T173
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11. DGS40
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14. RC - Recycled Concrete
15. Recycled Roadbase
16. RSB - Recycled Sub-base
17. CSS - Crushed Sandstone
18. RSS - Ripped Sandstone
19. Cowels Brown

* Cement Stabilised
\# Lime Stabilised
$ Gypsum Stabilised

NATA
Accreditation Number 2734
Corporate Site Number 2727

Accredited for compliance with ISO/IEC 17025.

A Kench 06/11/2013
Approved Signatory

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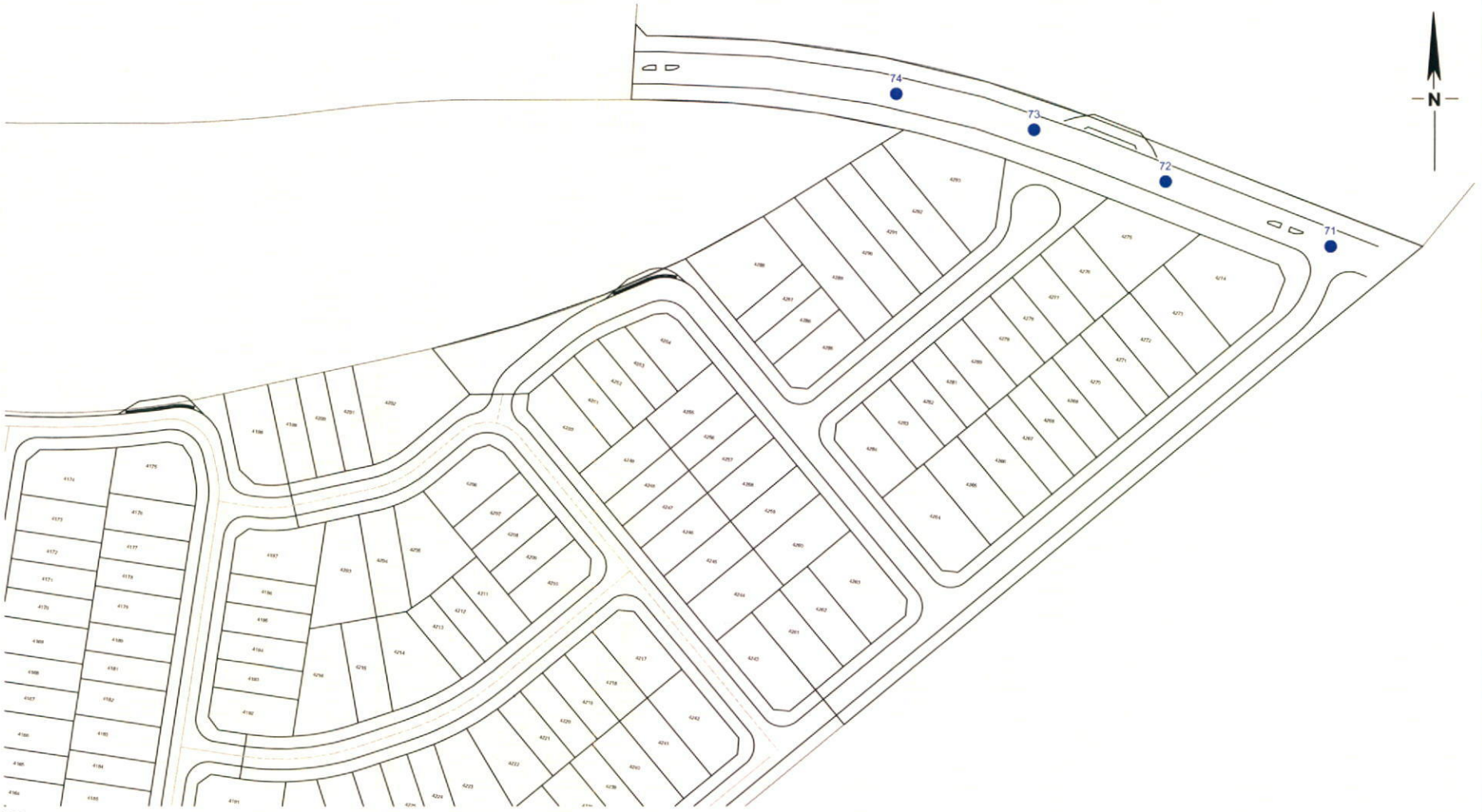

LEGEND

● Density Test

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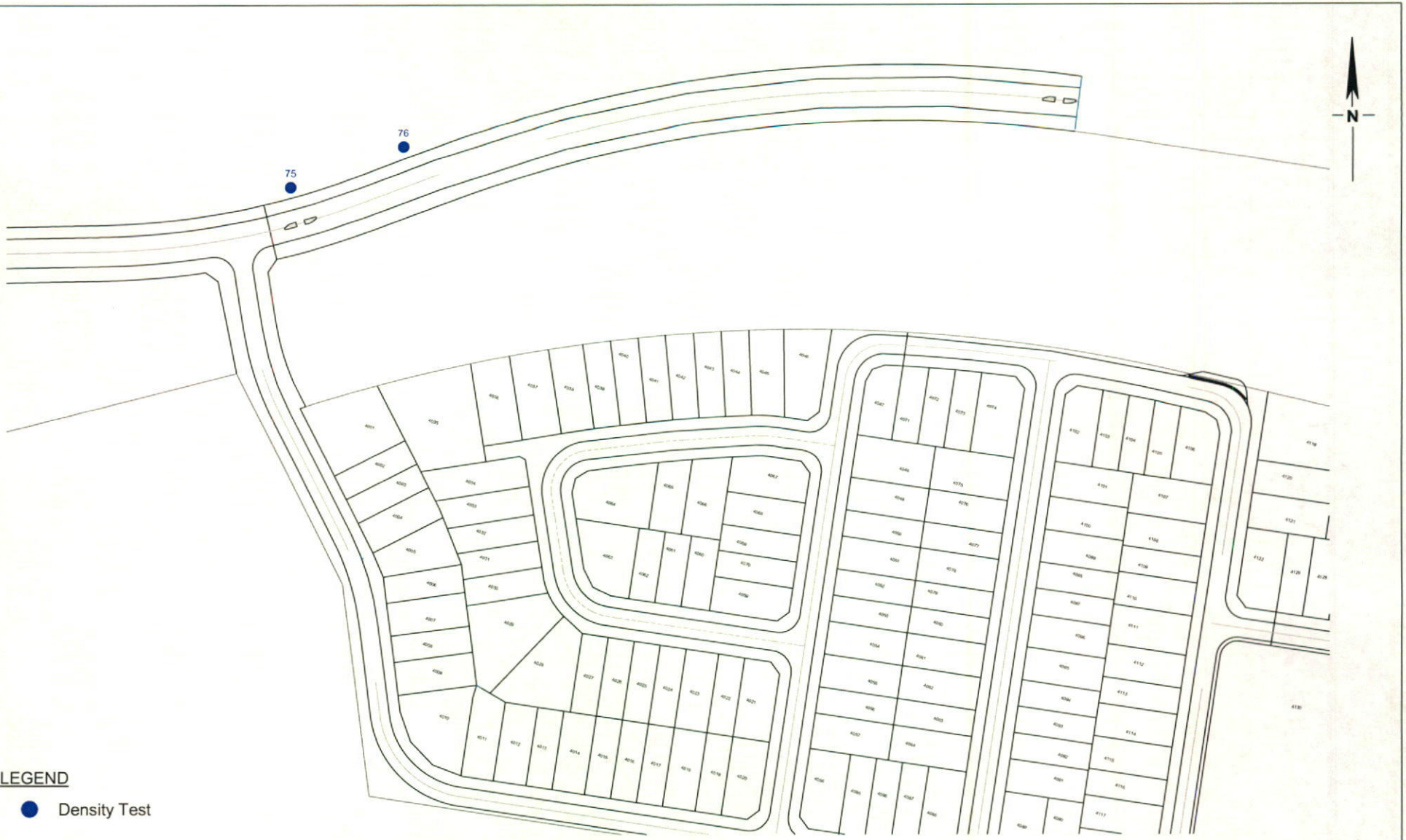
Maryland Development Company Pty Ltd
Stages 4A & 4B
Jordan Springs

Location of Field Density Tests

Drawing No: 7508/129-4
Job No: 7508/129
Drawn By: MH
Date: 4 November 2013
Checked By: AK

File No: 7508-129
Layers: 0, Lay4



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

Location of Field Density Tests

Drawing No: 7508/129-5
Job No: 7508/129
Drawn By: MH
Date: 4 November 2013
Checked By: AK

File No: 7508-129
Layers: 0, Lay5

APPENDIX B

SUMMARY OF FIELD DENSITY TESTING FOR ROADWORKS

Report 7508/131-AA
Report 7508/134-AA
Report 7508/137-AA
Report 7508/140-AA

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SAI GLOBAL

Job No: 7508/134
Our Ref: 7508/134-AA
Your Commitment No: 186390

12 February 2014

Maryland Development Company Pty Ltd
c/- Lend Lease Development Pty Ltd
P O Box 4
PARRAMATTA NSW 2124

Attention: Mr A Ali

Dear Sir

re: **Jordan Springs – Stage 4D**
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.

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

7508/134-AA
Stage 4D – 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	**5**	**CH 235 to 460**			
Chainage	**240**	**290**	**340**	**390**	**440**
Subgrade	1	2	3	4	14
Sub-base 1	23	24	25	26	27
Sub-base 2					
Base	38	39	40	41	42
Road	**7**	**CH 27 to 254**			
Chainage	**30**	**80**	**130**	**180**	**230**
Subgrade	9	10	11	12	13
Sub-base 1	19	20	21	22	28
Sub-base 2					
Base	33	34	35	36	37
Road	**8**	**CH 22 to 175**			
Chainage	**25**	**75**	**125**	**170**	
Subgrade	5	6	7	8	
Sub-base 1	15	16	17	18	
Sub-base 2					
Base	29	30	34	32	

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 42

GEOTECH TESTING PTY LTD®
ABN 71 076 676 321

Certified System
Quality
ISO 9001
SAI GLOBAL

FIELD DENSITY RESULTS

MARYLAND DEVELOPMENT COMPANY PTY LTD
C/- LEND LEASE DEVELOPMENT P/L, PO BOX 4
PARRAMATTA NSW 2124

Laboratory: Penrith
Job No: 7508/134
Date: 15/09/2013

PROJECT: PAVMENT TESTING
4D

TEST NUMBER			1	2	3	4	5	6	7	8
DATE TESTED			11/09/2013				23/09/2013			
RESULTS										
Density Ratio	Standard	%	102.5	104.5	106	104	102	108	104	105.5
Moisture Variation from OMC	(-Drier/+Wetter)	%	+ 0.5	- 1.0	- 2.0	- 1.0	+ 1.5	- 4.5	- 1.0	- 6.0
Specification	**Density Ratio (Standard)**		**≥100%**	**Specification Moisture Variance from OMC**						**N/A%**
TEST LOCATION										
Chainage	(Carriageway L/R)	m	240	290	340	390	25	75	125	170
Road Name/Number			Road 5				Road 8			
Retested by test			-	-	-	-	-	-	-	-
Level			Subgrade							
FIELD & LABORATORY DATA										
Field Dry Density		t/m³	1.87	1.88	1.90	1.88	1.85	1.75	1.86	1.80
Field Moisture Content		%	15.6	15.1	14.7	15.4	16.5	17.6	15.3	14.7
Material retained on	19 mm Sieve	%	<5	<5	<5	<5	<5	<5	<5	<5
Lab compaction result from test number			1	2	3	4	5	6	7	8
Maximum Dry Density		t/m³	1.82	1.80	1.79	1.81	1.81	1.62	1.79	1.71
Number of Compaction Points			4	4	4	4	4	4	4	4
Optimum Moisture Content		%	15.0	16.0	16.5	16.5	15.0	22.0	16.5	20.5
Test Procedures - See Notes			6	6	6	6	6	6	6	6
Material Description - see below			2	2	2	2	2	3	2	2-3

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* Cement Stabilised
# Lime Stabilised
$ Gypsum Stabilised

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

Accredited for compliance with ISO/IEC 17025.

A Kench 15/09/2013

Approved Signatory

NATA
Accreditation Number 2734
Corporate Site Number 2727

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FIELD DENSITY RESULTS

MARYLAND DEVELOPMENT COMPANY PTY LTD
C/- LEND LEASE DEVELOPMENT P/L, PO BOX 4
PARRAMATTA NSW 2124

Laboratory: Penrith
Job No: 7508/134
Date: 15/09/2013

PROJECT: PAVMENT TESTING
4D

TEST NUMBER			9	10	11	12	13	14	
DATE TESTED			23/09/2013					24/09/2013	
RESULTS									
Density Ratio	Standard	%	104	105	105.5	108	108	100	
Moisture Variation from OMC	(-Drier/+Wetter)	%	- 0.5	- 2.0	- 4.0	- 3.5	- 5.0	- 1.5	
Specification	**Density Ratio (Standard)**		**≥100%**	**Specification Moisture Variance from OMC**					**N/A%**
TEST LOCATION									
Chainage	(Carriageway L/R)	m	30	80	130	180	230	440	
Road Name/Number			Road 7					Road 5	
Retested by test			-	-	-	-	-	-	
Level			Subgrade						
FIELD & LABORATORY DATA									
Field Dry Density		t/m³	1.91	1.90	1.85	1.92	1.93	1.88	
Field Moisture Content		%	15.9	12.5	14.1	14.0	11.0	12.3	
Material retained on	19 mm Sieve	%	<5	<5	<5	<5	<5	<5	
Lab compaction result from test number			9	10	11	12	13	14	
Maximum Dry Density		t/m³	1.84	1.81	1.75	1.78	1.79	1.88	
Number of Compaction Points			4	4	4	4	4	4	
Optimum Moisture Content		%	16.5	14.5	18.0	17.5	16.0	14.0	
Test Procedures - See Notes			6	6	6	6	6	6	
Material Description - see below			2	2	2	2	2	0	

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9: Full details of Test Procedure 5.8.1 available on request
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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

Material Description

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7. 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

* Cement Stabilised
# Lime Stabilised
$ Gypsum Stabilised

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A Kench 15/09/2013

Approved Signatory

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Corporate Site Number 2727

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FIELD DENSITY RESULTS

MARYLAND DEVELOPMENT COMPANY PTY LTD
C/- LEND LEASE DEVELOPMENT P/L, PO BOX 4
PARRAMATTA NSW 2124

Laboratory: Penrith
Job No: 7508/134
Date: 19/11/2013

PROJECT: PAVMENT TESTING
STAGE 4D JORDAN SPRINGS

TEST NUMBER			15	16	17	18	19	20	21	22
DATE TESTED			09/10/2013				15/10/2013			
RESULTS										
Density Ratio	Modified	%	102	101.5	101	101.5	97	96	98	99
Moisture Variation from OMC	(-Drier/+Wetter)	%	- 2.0	- 2.0	- 1.5	- 1.5	+ 1.0	+ 1.0	0.0	+ 0.5
Specification	**Density Ratio (Modified)**		**≥95%**	**Specification Moisture Variance from OMC**						**N/A%**
TEST LOCATION										
Chainage	(Carriageway L/R)	m	20	70	120	170	30	80	130	180
Road Name/Number			Road 8				Road 7			
Retested by test			-	-	-	-	-	-	-	-
Level			Sub-base							
FIELD & LABORATORY DATA										
Field Dry Density		t/m³	2.22	2.21	2.20	2.21	2.12	2.09	2.14	2.16
Field Moisture Content		%	4.6	4.4	4.8	5.1	7.3	7.7	6.5	7.1
Material retained on	37.5 mm Sieve	%	<5	<5	<5	<5	<5	<5	<5	<5
Assigned Value Number			HQW75CSS-39				HQW75CSS-40			
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 Content		%	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5
Test Procedures - See Notes			7	7	7	7	7	7	7	7
Material Description - see below			17	17	17	17	17	17	17	17

Notes

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* Cement Stabilised
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FIELD DENSITY RESULTS

MARYLAND DEVELOPMENT COMPANY PTY LTD
C/- LEND LEASE DEVELOPMENT P/L, PO BOX 4
PARRAMATTA NSW 2124

Laboratory: Penrith
Job No: 7508/134
Date: 19/11/2013

PROJECT: PAVMENT TESTING
STAGE 4D JORDAN SPRINGS

TEST NUMBER			23	24	25	26	27			
DATE TESTED			22/10/2013				25/10/2013			
RESULTS										
Density Ratio	Modified	%	97.5	98.5	102.5	98	99.5			
Moisture Variation from OMC	(-Drier/+Wetter)	%	- 3.5	- 3.5	- 3.5	- 4.0	- 1.5			
Specification	**Density Ratio (Modified)**		**≥95%**	**Specification Moisture Variance from OMC**						**N/A%**
TEST LOCATION										
Chainage	(Carriageway L/R)	m	250	300	350	400	450			
Road Name/Number			Road 5							
Retested by test			-	-	-	-	-			
Level			Sub-base							
FIELD & LABORATORY DATA										
Field Dry Density		t/m³	2.17	2.19	2.27	2.18	2.21			
Field Moisture Content		%	2.4	2.5	2.3	2.2	4.7			
Material retained on	19 mm Sieve	%	<5	<5	<5	<5	<5			
Assigned Value Number			MDGB20-17							
Maximum Dry Density		t/m³	2.22	2.22	2.22	2.22	2.22			
Number of Compaction Points			4	4	4	4	4			
Optimum Moisture Content		%	6.0	6.0	6.0	6.0	6.0			
Test Procedures - See Notes			7	7	7	7	7			
Material Description - see below			8	8	8	8	8			

Notes

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

* Cement Stabilised
# Lime Stabilised
$ Gypsum Stabilised

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

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Corporate Site Number 2727

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FIELD DENSITY RESULTS

MARYLAND DEVELOPMENT COMPANY PTY LTD
C/- LEND LEASE DEVELOPMENT P/L, PO BOX 4
PARRAMATTA NSW 2124

Laboratory: Penrith
Job No: 7508/134
Date: 19/11/2013

PROJECT: PAVMENT TESTING
STAGE 4D JORDAN SPRINGS

TEST NUMBER		28							
DATE TESTED		25/10/2013							
RESULTS									
Density Ratio	Modified %	101.5							
Moisture Variation from OMC (-Drier/+Wetter)	%	- 1.5							
Specification	**Density Ratio (Modified)**	**≥95%**	**Specification Moisture Variance from OMC**						**N/A%**
TEST LOCATION									
Chainage	(Carriageway L/R) m	230							
Road Name/Number		Road 5							
Retested by test		-							
Level		Sub-base							
FIELD & LABORATORY DATA									
Field Dry Density	t/m³	2.21							
Field Moisture Content	%	4.8							
Material retained on	37.5 mm Sieve %	<5							
Assigned Value Number		HQW75CSS-40							
Maximum Dry Density	t/m³	2.18							
Number of Compaction Points		4							
Optimum Moisture Content	%	6.5							
Test Procedures - See Notes		7							
Material Description - see below		17							

Notes

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8. DGB20
9. DGB40
10. DGS20
11. DGS40
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14. RC - Recycled Concrete
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PARRAMATTA NSW 2124

Laboratory: Penrith
Job No: 7508/134
Date: 10/01/2013

PROJECT: PAVMENT TESTING
STAGE 4D JORDAN SPRINGS

TEST NUMBER				29	30	31	32	33	34	35	36
DATE TESTED				18/11/2013				22/11/2013			
RESULTS											
Density Ratio	Modified		%	98	98.5	98	99.5	98	102.5	100	100
Moisture Variation from OMC	(-Drier/+Wetter)		%	- 1.0	- 1.5	- 2.0	- 2.0	- 3.0	- 2.5	- 3.0	- 3.0
Specification	**Density Ratio (Modified)**			**≥98%**	**Specification Moisture Variance from OMC**						**N/A%**
TEST LOCATION											
Chainage	(Carriageway L/R)		m	25	75	125	175	30	80	130	180
Road Name/Number				Road 8				Road 7			
Retested by test				-	-	-	-	-	-	-	-
Level				Basecourse							
FIELD & LABORATORY DATA											
Field Dry Density			t/m³	2.18	2.19	2.18	2.21	2.18	2.27	2.22	2.22
Field Moisture Content			%	5.2	4.6	3.9	4.2	3.2	3.5	3.1	3.0
Material retained on	19 mm	Sieve	%	<5	<5	<5	<5	<5	<5	<5	<5
Assigned Value Number				MDGB20-18							
Maximum Dry Density			t/m³	2.22	2.22	2.22	2.22	2.22	2.22	2.22	2.22
Number of Compaction Points				4	4	4	4	4	4	4	4
Optimum Moisture Content			%	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Test Procedures - See Notes				7	7	7	7	7	7	7	7
Material Description - see below				8	8	8	8	8	8	8	8

Notes

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PARRAMATTA NSW 2124

Laboratory: Penrith
Job No: 7508/134
Date: 10/01/2013

PROJECT: PAVMENT TESTING
STAGE 4D JORDAN SPRINGS

TEST NUMBER			37	38	39	40	41	42		
DATE TESTED			22/11/2013	02/12/2013						
RESULTS										
Density Ratio	Modified	%	100	98	98.5	98	98	101		
Moisture Variation from OMC	(-Drier/+Wetter)	%	- 3.0	0.0	- 0.5	0.0	- 1.0	- 3.0		
Specification	**Density Ratio (Modified)**		**≥98%**	**Specification Moisture Variance from OMC**						**N/A%**
TEST LOCATION										
Chainage	(Carriageway L/R)	m	230	240	290	340	390	450		
Road Name/Number			Road 7	Road 5						
Retested by test			-	-	-	-	-	-		
Level			Basecourse							
FIELD & LABORATORY DATA										
Field Dry Density		t/m³	2.22	2.18	2.19	2.18	2.18	2.24		
Field Moisture Content		%	2.9	6.0	5.6	6.1	5.0	3.1		
Material retained on	19 mm Sieve	%	<5	<5	<5	<5	<5	<5		
Assigned Value Number			MDGB20-18							
Maximum Dry Density		t/m³	2.22	2.22	2.22	2.22	2.22	2.22		
Number of Compaction Points			4	4	4	4	4	4		
Optimum Moisture Content		%	6.0	6.0	6.0	6.0	6.0	6.0		
Test Procedures - See Notes			7	7	7	7	7	7		
Material Description - see below			8	8	8	8	8	8		

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17. RTA T120, T164, T173

Material Description

1. CL-Clays of low plasticity, gravelly clays, sandy clays, silty clays
2. 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
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 - Recycled Concrete
15. Recycled Roadbase
16. RSB - Recycled Sub-base
17. CSS - Crushed Sandstone
18. RSS - Ripped Sandstone
19. Cowels Brown

* Cement Stabilised
# Lime Stabilised
$ Gypsum Stabilised

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

NATA
Accreditation Number 2734
Corporate Site Number 2727

Accredited for compliance with ISO/IEC 17025.

A Kench 10/01/2013

Approved Signatory

Head Office:
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Prestons Laboratory:
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GEOTECH TESTING PTY LTD®
ABN 71 076 676 321

Certified System
Quality
ISO 9001
SAI GLOBAL

Job No: 7508/138
Our Ref: 7508/138-AA
Your Commitment No: 186390

12 February 2014

Maryland Development Company Pty Ltd
c/- Lend Lease Development Pty Ltd
P O Box 4
PARRAMATTA NSW 2124

Attention: Mr A Ali

Dear Sir

re: **Jordan Springs – Stage 4E**
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 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 October 2013 thirty two tests were carried out for the backfill operations for Roads 5, 9, & 10 and Lines 110, 112, 36/4 & 36/5.

Yours faithfully
GEOTECH TESTING PTY LTD

EMGED RIZKALLA
Director

Attached Compaction Control Test Nos 1 to 32

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FIELD DENSITY RESULTS

MARYLAND DEVELOPMENT COMPANY PTY LTD
C/- LEND LEASE DEVELOPMENT P/L, PO BOX 4
PARRAMATTA NSW 2124

Laboratory: Penrith
Job No: 7508/138
Date: 21/01/2014

PROJECT: PIPELINE BACKFILL TESTING
STAGE 4E JORDAN SPRINGS

TEST NUMBER			1	2	3	4	5	6	7	8
DATE TESTED			21/10/2013				22/10/2013			
RESULTS										
Density Index		%	72	77	81	82	75	77	77	78
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 ()**		≥70%	**Specification Moisture Variance from OMC**						N/A%
TEST LOCATION										
Chainage	(Carriageway L/R)	m	60	110	160	210	60	110	160	210
Road Name/Number			Road 9							
Retested by test			-	-	-	-	-	-	-	-
Level			Bedding				Overlay			
FIELD & LABORATORY DATA										
Field Dry Density		t/m³	1.59	1.62	1.65	1.66	1.61	1.62	1.62	1.63
Field Moisture Content		%	4.6	4.8	5.3	4.2	5.1	6.3	5.7	6.4
Material retained on	4.75 mm Sieve	%	<5	<5	<5	<5	<5	<5	<5	<5
Assigned Value Number			RGS-05							
Maximum Dry Density		t/m³	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80
Mould Size (Litre)			1	1	1	1	1	1	1	1
Minimum Dry Density		t/m3	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
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

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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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

Material Description

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9. DGB40
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11. DGS40
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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

* Cement Stabilised
# Lime Stabilised
$ Gypsum Stabilised

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

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Corporate Site Number 2727

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A Kench 21/01/2014

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FIELD DENSITY RESULTS

MARYLAND DEVELOPMENT COMPANY PTY LTD
C/- LEND LEASE DEVELOPMENT P/L, PO BOX 4
PARRAMATTA NSW 2124

Laboratory: Penrith
Job No: 7508/138
Date: 21/01/2014

PROJECT: PIPELINE BACKFILL TESTING
STAGE 4E JORDAN SPRINGS

TEST NUMBER		9	10	11	12	13	14	15	16
DATE TESTED		22/10/2013				24/10/2013			
RESULTS									
Density Index	%	**74**	**78**	**77**	**82**	**77**	**71**	**74**	**74**
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 ()**	**≥70%**	**Specification Moisture Variance from OMC**						**N/A%**
TEST LOCATION									
Chainage	(Carriageway L/R) m	10	60	160	210	10	60	110	160
Road Name/Number		Road 5							
Retested by test		-	-	-	-	-	-	-	-
Level		Bedding				Overlay			
FIELD & LABORATORY DATA									
Field Dry Density	t/m³	1.60	1.63	1.62	1.66	1.62	1.58	1.60	1.60
Field Moisture Content	%	4.9	6.1	5.4	5.9	4.8	5.6	5.2	4.5
Material retained on 4.75 mm Sieve	%	<5	<5	<5	<5	<5	<5	<5	<5
Assigned Value Number		RGS-05							
Maximum Dry Density	t/m³	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80
Mould Size (Litre)		1	1	1	1	1	1	1	1
Minimum Dry Density	t/m3	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
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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16. RTA T120, T162, T173
17. RTA T120, T164, T173

Material Description

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14. RC - Recycled Concrete
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18. RSS - Ripped Sandstone
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* Cement Stabilised
# Lime Stabilised
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Form No R022 Version 18 06/13 - issued by ER

NATA
Accreditation Number 2734
Corporate Site Number 2727

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A Kench 21/01/2014

Approved Signatory

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FIELD DENSITY RESULTS

MARYLAND DEVELOPMENT COMPANY PTY LTD
C/- LEND LEASE DEVELOPMENT P/L, PO BOX 4
PARRAMATTA NSW 2124

Laboratory: Penrith
Job No: 7508/138
Date: 21/01/2014

PROJECT: PIPELINE BACKFILL TESTING
STAGE 4E JORDAN SPRINGS

TEST NUMBER			17	18	19	20	21	22	23	24
DATE TESTED			28/10/2013				29/10/2013			
RESULTS										
Density Index		%	72	77	72	75	72	78	75	71
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 ()**		**≥70%**	**Specification Moisture Variance from OMC**						**N/A%**
TEST LOCATION										
Chainage	(Carriageway L/R)	m	10	60	110	5	10	60	110	5
Road Name/Number			Road 10			Line 36/4 36/5	Road 10			Line 36/4 36/5
Retested by test			-	-	-	-	-	-	-	-
Level			Bedding				Overlay			
FIELD & LABORATORY DATA										
Field Dry Density		t/m³	1.59	1.62	1.59	1.61	1.59	1.63	1.61	1.58
Field Moisture Content		%	5.4	5.1	5.7	6.0	4.8	4.6	4.4	4.0
Material retained on	4.75 mm Sieve	%	<5	<5	<5	<5	<5	<5	<5	<5
Assigned Value Number			RGS-05							
Maximum Dry Density		t/m³	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80
Mould Size (Litre)			1	1	1	1	1	1	1	1
Minimum Dry Density		t/m3	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
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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Material Description

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FIELD DENSITY RESULTS

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PARRAMATTA NSW 2124

Laboratory: Penrith
Job No: 7508/138
Date: 21/01/2014

PROJECT: PIPELINE BACKFILL TESTING
STAGE 4E JORDAN SPRINGS

TEST NUMBER			25	26	27	28	29	30	31	32
DATE TESTED			29/10/2013							
RESULTS										
Density Index		%	72	75	77	74	72	71	71	78
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 ()**		**≥70%**	**Specification Moisture Variance from OMC**						**N/A%**
TEST LOCATION										
Chainage	(Carriageway L/R)	m	10	60	110	10	10	60	110	10
Road Name/Number			Line 110			Line 112	Line 110			Line 112
Retested by test			-	-	-	-	-	-	-	-
Level			Bedding				Overlay			
FIELD & LABORATORY DATA										
Field Dry Density		t/m³	1.59	1.61	1.62	1.60	1.59	1.58	1.58	1.63
Field Moisture Content		%	5.1	4.6	5.4	5.8	4.6	5.7	6.2	5.5
Material retained on	4.75 mm Sieve	%	<5	<5	<5	<5	<5	<5	<5	<5
Assigned Value Number			RGS-05							
Maximum Dry Density		t/m³	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80
Mould Size (Litre)			1	1	1	1	1	1	1	1
Minimum Dry Density		t/m3	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
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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* Cement Stabilised
# Lime Stabilised
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ABN 71 076 676 321

Job No: 7508/138
Our Ref: 7508/138-AA
Your Commitment No: 186390

12 February 2014

Maryland Development Company Pty Ltd
c/- Lend Lease Development Pty Ltd
P O Box 4
PARRAMATTA NSW 2124

Attention: Mr A Ali

Dear Sir

re: **Jordan Springs – Stage 4E**
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 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 October 2013 thirty two tests were carried out for the backfill operations for Roads 5, 9, & 10 and Lines 110, 112, 36/4 & 36/5.

Yours faithfully
GEOTECH TESTING PTY LTD

EMGED RIZKALLA
Director

Attached Compaction Control Test Nos 1 to 32

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FIELD DENSITY RESULTS

MARYLAND DEVELOPMENT COMPANY PTY LTD
C/- LEND LEASE DEVELOPMENT P/L, PO BOX 4
PARRAMATTA NSW 2124

Laboratory: Penrith
Job No: 7508/138
Date: 21/01/2014

PROJECT: PIPELINE BACKFILL TESTING
STAGE 4E JORDAN SPRINGS

TEST NUMBER			1	2	3	4	5	6	7	8
DATE TESTED			21/10/2013				22/10/2013			
RESULTS										
Density Index		%	72	77	81	82	75	77	77	78
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 ()**		**≥70%**	**Specification Moisture Variance from OMC**						**N/A%**
TEST LOCATION										
Chainage	(Carriageway L/R)	m	60	110	160	210	60	110	160	210
Road Name/Number			Road 9							
Retested by test			-	-	-	-	-	-	-	-
Level			Bedding				Overlay			
FIELD & LABORATORY DATA										
Field Dry Density		t/m³	1.59	1.62	1.65	1.66	1.61	1.62	1.62	1.63
Field Moisture Content		%	4.6	4.8	5.3	4.2	5.1	6.3	5.7	6.4
Material retained on	4.75 mm Sieve	%	<5	<5	<5	<5	<5	<5	<5	<5
Assigned Value Number			RGS-05							
Maximum Dry Density		t/m³	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80
Mould Size (Litre)			1	1	1	1	1	1	1	1
Minimum Dry Density		t/m3	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
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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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

Material Description

1. CL-Clays of low plasticity, gravelly clays, sandy clays, silty clays
2. 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
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 - Recycled Concrete
15. Recycled Roadbase
16. RSB - Recycled Sub-base
17. CSS - Crushed Sandstone
18. RSS - Ripped Sandstone
19. Cowels Brown

* Cement Stabilised
# Lime Stabilised
$ Gypsum Stabilised

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NATA
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Corporate Site Number 2727

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FIELD DENSITY RESULTS

MARYLAND DEVELOPMENT COMPANY PTY LTD
C/- LEND LEASE DEVELOPMENT P/L, PO BOX 4
PARRAMATTA NSW 2124

Laboratory: Penrith
Job No: 7508/138
Date: 21/01/2014

PROJECT: PIPELINE BACKFILL TESTING
STAGE 4E JORDAN SPRINGS

TEST NUMBER			9	10	11	12	13	14	15	16
DATE TESTED			22/10/2013				24/10/2013			
RESULTS										
Density Index		%	74	78	77	82	77	71	74	74
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 ()**		**≥70%**	**Specification Moisture Variance from OMC**						**N/A%**
TEST LOCATION										
Chainage	(Carriageway L/R)	m	10	60	160	210	10	60	110	160
Road Name/Number			Road 5							
Retested by test			-	-	-	-	-	-	-	-
Level			Bedding				Overlay			
FIELD & LABORATORY DATA										
Field Dry Density		t/m³	1.60	1.63	1.62	1.66	1.62	1.58	1.60	1.60
Field Moisture Content		%	4.9	6.1	5.4	5.9	4.8	5.6	5.2	4.5
Material retained on	4.75 mm Sieve	%	<5	<5	<5	<5	<5	<5	<5	<5
Assigned Value Number			RGS-05							
Maximum Dry Density		t/m³	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80
Mould Size (Litre)			1	1	1	1	1	1	1	1
Minimum Dry Density		t/m3	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
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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Material Description

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13. FCR40
14. RC - Recycled Concrete
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* Cement Stabilised
# Lime Stabilised
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FIELD DENSITY RESULTS

MARYLAND DEVELOPMENT COMPANY PTY LTD
C/- LEND LEASE DEVELOPMENT P/L, PO BOX 4
PARRAMATTA NSW 2124

Laboratory: Penrith
Job No: 7508/138
Date: 21/01/2014

PROJECT: PIPELINE BACKFILL TESTING
STAGE 4E JORDAN SPRINGS

TEST NUMBER			17	18	19	20	21	22	23	24
DATE TESTED			28/10/2013				29/10/2013			
RESULTS										
Density Index		%	72	77	72	75	72	78	75	71
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 ()**		**≥70%**	**Specification Moisture Variance from OMC**						**N/A%**
TEST LOCATION										
Chainage	(Carriageway L/R)	m	10	60	110	5	10	60	110	5
Road Name/Number			Road 10			Line 36/4 36/5	Road 10			Line 36/4 36/5
Retested by test			-	-	-	-	-	-	-	-
Level			Bedding				Overlay			
FIELD & LABORATORY DATA										
Field Dry Density		t/m³	1.59	1.62	1.59	1.61	1.59	1.63	1.61	1.58
Field Moisture Content		%	5.4	5.1	5.7	6.0	4.8	4.6	4.4	4.0
Material retained on	4.75 mm Sieve	%	<5	<5	<5	<5	<5	<5	<5	<5
Assigned Value Number			RGS-05							
Maximum Dry Density		t/m³	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80
Mould Size (Litre)			1	1	1	1	1	1	1	1
Minimum Dry Density		t/m3	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
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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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 - Recycled Concrete
15. Recycled Roadbase
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* Cement Stabilised
# Lime Stabilised
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FIELD DENSITY RESULTS

MARYLAND DEVELOPMENT COMPANY PTY LTD
C/- LEND LEASE DEVELOPMENT P/L, PO BOX 4
PARRAMATTA NSW 2124

Laboratory: Penrith
Job No: 7508/138
Date: 21/01/2014

PROJECT: PIPELINE BACKFILL TESTING
STAGE 4E JORDAN SPRINGS

TEST NUMBER			25	26	27	28	29	30	31	32
DATE TESTED			29/10/2013							
RESULTS										
Density Index		%	72	75	77	74	72	71	71	78
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 ()**		**≥70%**	**Specification Moisture Variance from OMC**						**N/A%**
TEST LOCATION										
Chainage	(Carriageway L/R)	m	10	60	110	10	10	60	110	10
Road Name/Number			Line 110			Line 112	Line 110			Line 112
Retested by test			-	-	-	-	-	-	-	-
Level			Bedding				Overlay			
FIELD & LABORATORY DATA										
Field Dry Density		t/m³	1.59	1.61	1.62	1.60	1.59	1.58	1.58	1.63
Field Moisture Content		%	5.1	4.6	5.4	5.8	4.6	5.7	6.2	5.5
Material retained on	4.75 mm Sieve	%	<5	<5	<5	<5	<5	<5	<5	<5
Assigned Value Number			RGS-05							
Maximum Dry Density		t/m³	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80
Mould Size (Litre)			1	1	1	1	1	1	1	1
Minimum Dry Density		t/m3	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
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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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 - Recycled Concrete
15. Recycled Roadbase
16. RSB - Recycled Sub-base
17. CSS - Crushed Sandstone
18. RSS - Ripped Sandstone
19. Cowels Brown

* Cement Stabilised
# Lime Stabilised
$ Gypsum Stabilised

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MARYLAND DEVELOPMENT COMPANY PTY LTD

STAGE 4E
LAKESIDE PARADE & JUBILEE DRIVE
JORDAN SPRINGS

SITE CLASSIFICATION REPORT

REPORT NO 7508/139-AA 12 FEBRUARY 2014

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Job No: 7508/139
Our Ref: 7508/139-AA
Your Commitment No: 186390
12 February 2014

Maryland Development Company Pty Ltd
c/- Lend Lease Development Pty Ltd
P O Box 4
PARRAMATTA NSW 2124

Attention: Mr A Ali

Dear Sir

re: **Stage 4E – Lakeside Parade & 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 4E 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 thirty four lots (Lot 4251 to Lot 4294). Lots 4286 to 4294 were excluded, being a temporary detention basin.

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

Yours faithfully
GEOTECH TESTING PTY LTD

EMGED RIZKALLA
Director

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TABLE OF CONTENTS

APPENDICES

1.0 INTRODUCTION

This report describes geotechnical investigations for proposed dwellings to be constructed at a subdivision known as Jordan Springs, Stage 4D. The Project Manage, Mr A Ali of Lend Lease Development Pty Ltd commissioned the investigation. Lots numbered 4251 to 4294 (34 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 22 January 2014 (in conjunction with field work for adjoining Stages 4C & 4D) and consisted of excavation of seventeen test pits (TP1 to TP17) 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 7508/139-1 in Appendix A of this report.

3.0 SITE CONDITIONS

3.1 Surface Conditions

Stage 4E is located to the west of Stage 4D and is generally bound by Jubilee Drive to the south-east, Holly Crescent to the north and north-west and Lakeside Parade to the north-east. Stage 4E contains Tango Close. The Regional Park is located to the east of Jubilee Drive. At the time of field work 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	Fill: Clay & silty clay, low, medium & medium to high plasticity, brown, grey with some gravel, underlain by
Residual	Clay & shaley clay, low, medium & high plasticity, grey and orange

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.

4.0 LABORATORY TESTING

During the course of the investigation three 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 B and summarised below.

TP	Depth (m)	I_{ss} (%/pF)	Classification and Summary Description
4	0.0.8	3.4	CH: Silty clay, high plasticity, orange-brown and grey
11	0.7-0.9	3.5	CH: Silty clay, high plasticity, grey
16	0.5-0.7	3.5	CH: Silty clay, high plasticity, grey

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 7508/129-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.

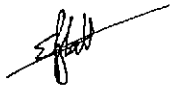
It is recommended that footings for proposed dwellings are founded on the same stratum below any topsoil or deleterious material to minimise the potential for differential movement.

The classifications presented in Appendix C are applicable to the Lots at the date of conducting the investigation, being 22 January 2014 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.

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 DETAILS

TEST PIT LOCATION PLAN
(Drawing No 7508/139-1)

TABLE A

Job No: 7508/139
Our Ref: 7508/139-AA (Stage 4 E)

TEST PIT NUMBER	DEPTH (m)	SAMPLE DEPTH (m)	MATERIAL DESCRIPTION
1	0.0-0.2		FILL; Silty Clay, low to medium plasticity, brown, inclusion of gravel and mulch, M<PL
	0.2-0.4	0.2-0.3	(CL) Silty CLAY, low plasticity, grey, M<PL, stiff
	0.4-0.9		(CH) Silty CLAY, high plasticity, grey, trace of ironstone, M<PL, stiff
	0.9-1.4		(CL-CI) Silty CLAY, low to medium plasticity, grey, with pockets of ironstone, M<PL, very stiff to hard
	1.4-2.5	2.0-2.1	(CL) Shaley CLAY, low plasticity, grey, with ironstone and shale fragments
2	0.0-0.2	0.0-0.1	(CL) Silty CLAY, low plasticity, grey, M<PL, firm to stiff
	0.2-0.7		(CH) Silty CLAY, high plasticity, orange mottled grey, M<PL, stiff
	0.7-1.6	1.5-1.6	(CL-CI) Silty CLAY, low to medium plasticity, grey, with pockets of ironstone, M<PL, very stiff to hard
	1.6-2.2		(CL) Shaley CLAY, low plasticity, grey, with ironstone and shale fragments, M<PL, hard
3	0.0-0.2		FILL; Silty Clay, low to medium plasticity, brown, inclusion of gravel and mulch, M<PL
	0.2-0.4		(CL) Silty CLAY, low plasticity, grey, M<PL, firm to stiff
	0.4-0.9	0.5-0.6	(CH) Silty CLAY, high plasticity, orange mottled grey, M<PL, stiff
	0.9-2.2	1.0-1.1	(CL-CI) Silty CLAY, low to medium plasticity, grey, with pockets of ironstone, M<PL, very stiff to hard
4	0.0-0.2		FILL; Silty Clay, low to medium plasticity, brown, inclusion of gravel and mulch, M<PL
	0.2-0.9	0.5-0.6	(CI-CH) Silty CLAY, medium to high plasticity, orange mottled grey, M<PL, stiff
		0.6-0.8	(CH) Silty CLAY, high plasticity, orange mottled grey, M<PL, stiff
	0.9-1.2		(CL-CI) Silty CLAY, low to medium plasticity, grey, with pockets of ironstone, M<PL, very stiff to hard
	1.2-2.2	1.5-1.6	(CL) Shaley CLAY, low plasticity, grey, with ironstone and shale fragments, M<PL, hard

TABLE A

Job No: 7508/139
Our Ref: 7508/139-AA (Stage 4 E)

TEST PIT NUMBER	DEPTH (m)	SAMPLE DEPTH (m)	MATERIAL DESCRIPTION
5	0.0-0.3	0.0-0.1	FILL; Silty Clay, low to medium plasticity, brown, inclusion of gravel and mulch, M<PL
	0.3-0.5		(CL) Silty CLAY, low plasticity, grey, M<PL, firm to stiff
	0.5-1.1		(CH) Silty CLAY, high plasticity, grey, trace of ironstone, M<PL, stiff
	1.1-1.7	1.5-1.6	(CL-CI) Silty CLAY, low to medium plasticity, grey, with pockets of ironstone, M<PL, very stiff to hard
	1.7-2.2		(CL) Shaley CLAY, low plasticity, grey, with ironstone and shale fragments, M<PL, hard
6	0.0-0.2	0.0-0.1	FILL; Silty Clay, low to medium plasticity, brown, inclusion of gravel and mulch, M<PL
	0.2-0.5		(CL) Silty CLAY, low plasticity, grey, M<PL, firm to stiff
	0.5-1.0		(CH) Silty CLAY, high plasticity, orange mottled grey, M<PL, stiff to very stiff
	1.0-2.2	2.0-2.1	(CL-CI) Silty CLAY, low to medium plasticity, grey, with pockets of ironstone, M<PL, very stiff to hard
7	0.0-0.15		FILL; Silty Clay, low to medium plasticity, brown, inclusion of gravel and mulch, M<PL
	0.15-0.3	0.2-0.3	(CL) Silty CLAY, low plasticity, grey, M<PL, firm to stiff
	0.3-0.7	0.5-0.6	(CH) Silty CLAY, high plasticity, orange mottled grey, M<PL, stiff
	0.7-2.1		(CL-CI) Silty CLAY, low to medium plasticity, grey, with pockets of ironstone, M<PL, very stiff to hard
8	0.0-0.1		FILL; Silty Clay, low to medium plasticity, brown, inclusion of gravel and mulch, M<PL
	0.1-0.4	0.1-0.2	(CL) Silty CLAY, low plasticity, grey, M<PL, firm to stiff
	0.4-1.0		(CH) Silty CLAY, high plasticity, orange mottled grey, M<PL, stiff
	1.0-2.1	1.5-1.6	(CL-CI) Silty CLAY, low to medium plasticity, grey, with pockets of ironstone, M<PL, very stiff to hard

TABLE A

Job No: 7508/139
Our Ref: 7508/139-AA (Stage 4 E)

TEST PIT NUMBER	DEPTH (m)	SAMPLE DEPTH (m)	MATERIAL DESCRIPTION
9	0.0-0.1		FILL; Silty Clay, low to medium plasticity, brown, inclusion of gravel and mulch, M<PL
	0.1-0.4	0.1-0.2	FILL; Silty Clay, medium plasticity, brown, trace of gravel, M<PL, stiff
	0.4-0.6		(CL) Silty CLAY, low plasticity, grey, M<PL, firm to stiff
	0.6-1.5	1.0-1.1	(CH) Silty CLAY, high plasticity, grey, trace of ironstone, M<PL, stiff
	1.5-2.1		(CL-CI) Silty CLAY, low to medium plasticity, grey, with pockets of ironstone, M<PL, very stiff to hard
10	0.0-0.1		FILL; Silty Clay, low to medium plasticity, brown, inclusion of gravel and mulch, M<PL
	0.1-0.4	0.1-0.2	FILL; Silty Clay, medium plasticity, grey-brown, with ironstone
	0.4-2.2	1.5-1.6	(CL-CI) Silty CLAY, low to medium plasticity, grey, with pockets of ironstone, M<PL, very stiff to hard
11	0.0-0.2	0.0-0.1	FILL; Silty Clay, low to medium plasticity, brown, inclusion of gravel and mulch, M<PL
	0.2-0.5		(CL) Silty CLAY, low plasticity, grey, M<PL, firm to stiff
	0.5-1.2	0.7-0.9	(CH) Silty CLAY, high plasticity, grey, trace of ironstone, M<PL, stiff
	1.2-2.2	2.0-2.1	(CL-CI) Silty CLAY, low to medium plasticity, grey, with pockets of ironstone, M<PL, very stiff to hard
12	0.0-0.1	0.0-0.1	FILL; Silty Clay, low to medium plasticity, brown, inclusion of gravel and mulch, M<PL
	0.1-0.6		FILL; Silty Clay, medium plasticity, brown, trace of gravel, M<PL, well compacted
	0.6-2.1	1.5-1.6	(CL-CI) Silty CLAY, low to medium plasticity, grey, with pockets of ironstone, M<PL, stiff to very stiff

TABLE A

Job No: 7508/139
Our Ref: 7508/139-AA (Stage 4 E)

TEST PIT NUMBER	DEPTH (m)	SAMPLE DEPTH (m)	MATERIAL DESCRIPTION
13	0.0-0.1		FILL; Silty Clay, low to medium plasticity, brown, inclusion of gravel and mulch, M<PL
	0.1-1.0	0.5-0.6	(CH) Silty CLAY, high plasticity, orange mottled grey, M<PL, stiff
	1.0-2.2	2.0-2.1	(CL-CI) Silty CLAY, low to medium plasticity, grey, with pockets of ironstone, M<PL, very stiff to hard
14	0.0-0.1	0.0-0.1	FILL; Silty Clay, low to medium plasticity, brown, inclusion of gravel and mulch, M<PL
	0.1-0.3		FILL; Silty Clay, medium plasticity, brown, trace of gravel, M<PL, well compacted
	0.6-2.1	1.5-1.6	(CH) Silty CLAY, high plasticity, grey, with pockets of ironstone, M<PL, very stiff to hard
15	0.0-0.1		FILL; Silty Clay, low to medium plasticity, brown, inclusion of gravel and mulch, M<PL
	0.1-1.0	0.5-0.6	(CH) Silty CLAY, high plasticity, grey, with pockets of ironstone, M<PL, very stiff to hard
	1.0-2.3	2.0-2.1	(CL-CI) Silty CLAY, low to medium plasticity, grey, with pockets of ironstone, M<PL, very stiff to hard
16	0.0-0.2	0.0-0.1	FILL; Silty Clay, medium plasticity, grey-brown, with ironstone, M<PL, well compacted
	0.2-1.5	0.5-0.7	(CH) Silty CLAY, high plasticity, grey, with pockets of ironstone, M<PL, very stiff to hard
	1.5-2.2	1.5-1.6	(CL) Shaley CLAY, low plasticity, grey, with ironstone and shale fragments, M<PL, hard
17	0.0-0.1		FILL; Silty Clay, low to medium plasticity, brown, inclusion of gravel and mulch, M<PL
	0.1-1.2	1.0-1.1	(CH) Silty CLAY, high plasticity, grey, with pockets of ironstone, M<PL, very stiff to hard
	1.2-2.2	2.0-2.1	(CL) Shaley CLAY, low plasticity, grey, with ironstone and shale fragments, M<PL, hard

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e-mail:info@geotech.com.au

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 4E
Jordan Springs

Test Pit Locations

Drawing No: 7508/139-1
Job No: 7508/139
Drawn By: MH
Date: 3 February 2014
Checked By: AK

File No: 7508-139
Layers: 0, Lay1

APPENDIX B

LABORATORY TEST RESULTS

GEOTECH TESTING PTY LTD®
ABN 71 076 676 321

Certified System
Quality
ISO 9001
SAI GLOBAL

MARYLAND DEVELOPMENT COMPANY PTY LTD
C/- LEND LEASE DEVELOPMENT P/L, PO BOX 4
PARRAMATTA NSW 2124

Job No:	7508/139
Tested By:	AN
Checked By:	AK
Date Tested:	28/01/2014
Laboratory	Penrith

SITE & EXPOSURE CLASSIFICATION
STAGE 4E JORDAN SPRINGS

TEST RESULTS - SHRINK / SWELL INDEX

Test Procedure: AS 1289 7.1.1

Sample Identification	Test Pit 4	Test Pit 11	Test Pit 16	
Depth (m)	0.6 - 0.8	0.7 - 0.9	0.5 - 0.7	
Laboratory Number	7508/139-1	7508/139-2	7508/139-3	
Test Description				
Moisture Content				
Initial %	23.9	15.7	20.6	
Final %	25.3	19.0	24.9	
Swell %	1.2	4.1	3.5	
Shrinkage %	5.5	4.2	4.5	
Shrink/Swell Index $\%/_pF$	3.4	3.5	3.5	
Material Description	(CH) Silty CLAY, high plasticity, orange-brown with grey mottling	(CH) Silty CLAY, high plasticity, grey, trace of fine to medium gravel	(CH) Silty CLAY, high plasticity, grey, trace of fine to medium gravel	

Accredited for compliance with ISO/IEC 17025.

A Kench 31/01/2014
Approved Signatory

NATA

NATA Accreditation Number 2734
Corporate Site Number 2727

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APPENDIX C

SUMMARY OF SITE CLASSIFICATIONS

SUMMARY OF SITE CLASSIFICATIONS

STAGE 4E
LAKESIDE PARADE & JUBILEE DRIVE
JORDAN SPRINGS

Lot	Classification	Lot	Classification
4251	H1	4268	H1
4252	H1	4269	H1
4253	H1	4270	H1
4254	H1	4271	M
4255	H1	4272	M
4256	H1	4273	M
4257	H1	4274	M
4258	H1	4275	M
4259	H1	4276	M
4260	H1	4277	H1
4261	M	4278	H1
4262	M	4279	H1
4263	M	4280	H1
4264	M	4281	H1
4265	H1	4282	H1
4266	H1	4283	M
4267	H1	4284	M
M: Moderately Reactive (Surface movement within 20-40mm)			
H1: Highly Reactive (Surface movement within 40mm to 60mm)			