Level 2 Report

131007 – SPRINGBROOK ESTATE STAGE 12B

11519/P/328

Prepared for
FGF Developments

28th May 2015

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Document Information

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1	28.05.2015	Jamie Naylor		Mick Midgley	

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INTRODUCTION

Cardno Construction Sciences Pty Ltd was commissioned by **FGF Developments** to provide Level 2 type testing services as described is AS3798-2007 *'Guidelines on earthworks for commercial and residential developments'* for the placement of fill throughout Springbrook Stage 12B subdivision. Relevant lots include:

Lot 1215,	Lot 1220,	Lot 1225,
Lot 1216,	Lot 1221,	Lot 1226,
Lot 1217,	Lot 1222,	Lot 1227.
Lot 1218,	Lot 1223,	
Lot 1219,	Lot 1224,	

The earthworks were carried out from 09/09/2014 to 12/05/2015.

COMPACTION CONTROL TESTING

Upon request for testing received from FGF Developments a Cardno Construction Sciences technician attended the project site to carry out Compaction control tests on the existing fill material. All test results are included in Appendix A. A summary of the test results is included as Table 1. A total of 10 field density tests were carried out throughout the earthworks. The average density ratio was 97.7% (STD) with a standard deviation of 0.79%. This report is to certify that the placement of fill, as found, met the requirements of Level 2 in accordance with AS 3798-2007. We certify that this material has been placed in accordance with Level 2 conditions as referenced AS3798 - 2007 which outlines "controlled fill" placement.

During the site classification investigations that Cardno Construction Sciences will conduct, additional compaction testing will be completed to ensure that engineering principles can be applied and the site can be classified in accordance with AS2870-2011, adhering to the controlled fill clause, 2.5.3.

TABLE 1
SUMMARY OF FIELD DENSITY TEST RESULTS
SPRINGBROOK ESTATE STAGE 12B

DATE	Test Request	LEVEL (1)	TEST LOCATION	DENSITY RATIO(1)
24/4/2015	-	FL	Lot 1226, 4m off Left boundary, 11m off South boundary	97.5
24/4/2015	-	FL	Lot 1225, 5m off Left boundary, 10m off South boundary	98.5
24/4/2015	-	FL	Lot 1224, 9m off Left boundary, 7m off South boundary	96.0
24/4/2015	-	FL	Lot 1222, 4m off Left boundary, 9m off North boundary	98.5
24/4/2015	-	FL	Lot 1223, 7m off Left boundary, 8m off South boundary	97.5
14/2/2014	-	FL	Lot 1219, Front of Lot	98.0
14/2/2014	-	FL	Lot 1219, Front of Lot	97.5
14/2/2014	-	FL	Lot 1220, Centre of Lot	97.0
14/2/2014	-	FL	Lot 1220, Front of Lot	98.0
14/2/2014	-	FL	Lot 1229, Back of Lot	98.5

No. of Tests: 10 **Mean: 97.7%** **Standard Dev: 0.79%**

NOTES

(1) Standard laboratory compaction used, AS1289.5.1.1.

131007 – SPRINGBROOK ESTATE
STAGE 12B

APPENDIX A
FIELD DENSITY TEST RESULTS

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LOT REPORT - WET DENSITY RATIO

Client:	fgf Developments	Report Number:	11519/R/3999-1
Client Address:	P.O Box 6665, Cairns,	Project Number:	11519/P/328
Project:	131007 - Springbrook Estate - Stage 12A-C & 10B	Lot Number:	STAGE 12B
Location:	Redlynch	Internal Test Request:	11519/T/2774
Component:	Compliance Testing	Client Reference/s:	
Area Description:	Springbrook Estate - Redlynch	Report Date / Page:	18/02/2014 Page 1 of 2

Test Procedures:	AS1289.5.7.1, AS1289.5.8.1

Sample Number	11519/S/12958	11519/S/12959	11519/S/12960	11519/S/12961
ID / Client ID	MTR 126	MTR 126	MTR 126	MTR 126
Lot Number	STAGE 12B	STAGE 12B	STAGE 12B	STAGE 12B
Date / Time Tested	14/02/2014	14/02/2014	14/02/2014	14/02/2014
Material Source	Cut/Fill	Cut/Fill	Cut/Fill	Cut/Fill
Material Type	General Fill	General Fill	General Fill	General Fill
Sampling Method	AS1289.1.2.1 Cl 6.4b	AS1289.1.2.1 Cl 6.4b	AS1289.1.2.1 Cl 6.4b	AS1289.1.2.1 Cl 6.4b
Depths: Test / Nom / Actual (mm)	125 / 150 / -	125 / 150 / -	125 / 150 / -	125 / 150 / -
Standard or Modified	Standard	Standard	Standard	Standard
Allotment No	Stage 12B	Stage 12B	Stage 12B	Stage 12B
Offset From	Lot 1219	Lot 1220	Lot 1220	Lot 1219
Offset Location	Front of Lot	Centrre	Front of Lot	Centre
Level	Finished Level	Finished Level	Finished Level	Finished Level
Test Fraction (mm)	< 19.0mm	< 19.0mm	< 19.0mm	< 19.0mm
Sample Oversize (%)	0	0	0	0
Density of Oversize (t/m³)	-	-	-	-
Compaction Sample Number	11519/S/12958	11519/S/12959	11519/S/12960	11519/S/12961
Sample Description	-	-	-	-
Moisture Test Results:				
Field Moisture Content (%)	-	-	-	-
Adjusted / Moisture Variation (%)	2.0	-0.5	0.0	0.0
Optimum Moisture Content (%)	-	-	-	-
Moisture Variation from OMC	-	-	-	-
Moisture Ratio (%)	**-**	**-**	**-**	**-**
Density Test Results:				
Field Wet Density (t/m³)	2.08	2.03	2.01	2.04
Adj/Peak Conv Wet Density (t/m³)	2.13	2.09	2.06	2.08
Density Ratio Required (%)	95	95	95	95
Hilf Density Ratio (%)	**97.5**	**97.0**	**97.0**	**98.0**

Remarks

NATA

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

Accreditation Number: 11519

Approved Signatory: Anton Wespe
Form ID: W5ASRepSum Rev 1

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LOT REPORT - WET DENSITY RATIO

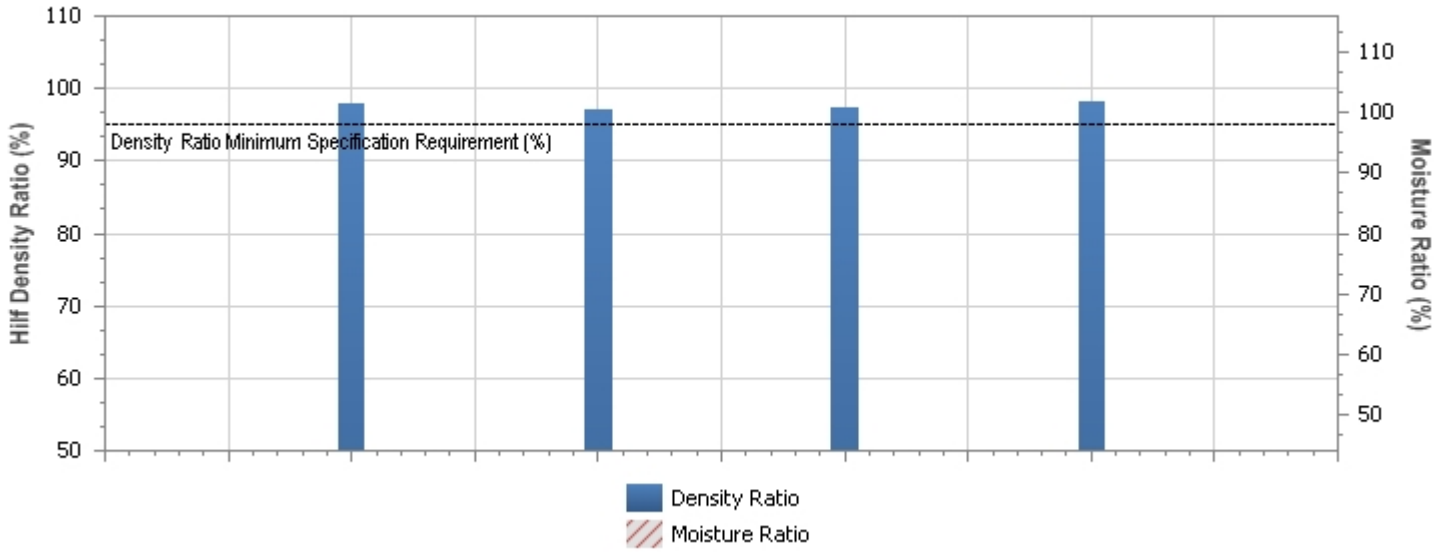
Client:	fgf Developments	Report Number:	11519/R/3999-1
Client Address:	P.O Box 6665, Cairns,	Project Number:	11519/P/328
Project:	131007 - Springbrook Estate - Stage 12A-C & 10B	Lot Number:	STAGE 12B
Location:	Redlynch	Internal Test Request:	11519/T/2774
Component:	Compliance Testing	Client Reference/s:	
Area Description:	Springbrook Estate - Redlynch	Report Date / Page:	18/02/2014 Page 2 of 2

Test Procedures:	AS1289.5.7.1, AS1289.5.8.1
Statistical Analysis Test Method:	Lot Average (Lot average calculations are not covered by NATA endorsement)

Nuclear Gauge Calibration Details

Calibration Number	-	Material Source	-
Calibration Last Updated	-	Material Type	-
Calibration Depth (mm)	-	-	

LOT TEST RESULT SUMMARY



Tests in Lot = 4	Lot Minimum	Lot Maximum	Lot Mean	Standard Deviation
Moisture Ratio (%)	-	-	-	-
Hilf Density Ratio (%)	97.1	98.0	97.5	0.424

Lot Number:	STAGE 12B
Mean Density Ratio (%):	97.5
Mean Moisture Ratio (%):	-

Remarks

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WET DENSITY RATIO REPORT

Client:	fgf Developments	Report Number:	11512/R/6220-1
Client Address:	PO Box 6665, Cairns	Project Number:	11512/P/447
Project:	Springbrook Estate Stage 10A/12B&C	Lot Number:	
Location:	Redlynch	Internal Test Request:	11512/T/4121
Component:	Compliance Testing	Client Reference/s:	MTR
Area Description:	Springbrook Estate Redlynch	Report Date / Page:	01/05/2015 Page 1 of 2

Test Procedures:	AS1289.5.7.1, AS1289.5.8.1

Sample Number	11512/S/19463	11512/S/19464	11512/S/19465	11512/S/19466
ID / Client ID	-	-	-	-
Lot Number	-	-	-	-
Date / Time Tested	24/04/2015	24/04/2015	24/04/2015	24/04/2015
Material Source	Existing Material	Existing Material	Existing Material	Existing Material
Material Type	Allotment Fill	Allotment Fill	Allotment Fill	Allotment Fill
Sampling Method	AS1289.1.2.1 Cl 6.4b	AS1289.1.2.1 Cl 6.4b	AS1289.1.2.1 Cl 6.4b	AS1289.1.2.1 Cl 6.4b
Depths: Test / Nom / Actual (mm)	175 / - / 200	175 / - / 200	175 / - / 200	175 / - / 200
Standard or Modified	Standard	Standard	Standard	Standard
Allotment No	1226	1225	1224	1222
Offset From	4m Off LB	5m Off LB	9m Off LB	6m Off LB
Offset Location	11m Off SB	10m Off SB	7m Off SB	9m Off NB
Level	FL	FL	FL	FL
Test Fraction (mm)	< 19.0mm	< 19.0mm	< 19.0mm	< 19.0mm
Sample Oversize (%)	0	0	0	0
Density of Oversize (t/m³)	-	-	-	-
Compaction Sample Number	11512/S/19463	11512/S/19464	11512/S/19465	11512/S/19466
Sample Description	Existing Material	Existing Material	Existing Material	Existing Material
Moisture Test Results:				
Field Moisture Content (%)	-	-	-	-
Adjusted / Moisture Variation (%)	1.0	0.5	0.0	0.0
Optimum Moisture Content (%)	-	-	-	-
Moisture Variation from OMC	-	-	-	-
Moisture Ratio (%)	**-**	**-**	**-**	**-**
Density Test Results:				
Field Wet Density (t/m³)	1.85	1.89	1.83	1.89
Adj/Peak Conv Wet Density (t/m³)	1.90	1.92	1.90	1.92
Density Ratio Required (%)	95	95	95	95
Hilf Density Ratio (%)	**97.5**	**98.5**	**96.0**	**98.5**

Remarks

NATA

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Accreditation Number: 1986
Corporate Site Number: 11512

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WET DENSITY RATIO REPORT

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Client Address:	PO Box 6665, Cairns	Project Number:	11512/P/447
Project:	Springbrook Estate Stage 10A/12B&C	Lot Number:	
Location:	Redlynch	Internal Test Request:	11512/T/4121
Component:	Compliance Testing	Client Reference/s:	MTR
Area Description:	Springbrook Estate Redlynch	Report Date / Page:	01/05/2015 Page 2 of 2

Test Procedures:	AS1289.5.7.1, AS1289.5.8.1

Sample Number	11512/S/19467			
ID / Client ID	-			
Lot Number	-			
Date / Time Tested	24/04/2015			
Material Source	Existing Material			
Material Type	Allotment Fill			
Sampling Method	AS1289.1.2.1 Cl 6.4b			
Depths: Test / Nom / Actual (mm)	175 / - / 200			
Standard or Modified	Standard			
Allotment No	1223			
Offset From	7m Off LB			
Offset Location	8m Off NB			
Level	FL			
Test Fraction (mm)	< 19.0mm			
Sample Oversize (%)	0			
Density of Oversize (t/m³)	-			
Compaction Sample Number	11512/S/19467			
Sample Description	Existing Material			
Moisture Test Results:				
Field Moisture Content (%)	-			
Adjusted / Moisture Variation (%)	-2.0			
Optimum Moisture Content (%)	-			
Moisture Variation from OMC	-			
Moisture Ratio (%)	**-**			
Density Test Results:				
Field Wet Density (t/m³)	1.96			
Adj/Peak Conv Wet Density (t/m³)	2.01			
Density Ratio Required (%)	95			
Hilf Density Ratio (%)	**97.5**			

Remarks

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