



Level 1 Geotechnical Inspection, Testing and Assessment Cherrybrook Stage 23A

11512/P/1073

fgf Developments Pty Ltd

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Document History

Effective Date	Description of Revision	Prepared By	Reviewed By	Approved By
10/05/2024		Craig Wilson	Peter Gode	Peter Gode

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Introduction

Construction Sciences is the largest private provider of construction materials testing services across Australia. We have a total staff of over 600 staff in 48 permanent offices/laboratories.

We have provided QA testing services to some of the largest road and mining infrastructure projects in these states, as well as overseas.

Over the last 3 to 4 years, Construction Sciences has established more site laboratories for road, rail, mining, and other large infrastructure projects than any other company.

We benefit our clients with the following clear differentiators;

Staff Mobilisation: Construction Sciences' geographic expansion and mobility allow for teams to be available when required, and currently we have the lion's share of major projects in Australia.

Quality Management: Construction Sciences' purpose-built software, COMPLY provides our clients with confidence, by knowing project data is securely stored. COMPLY has a built-in secure audit trail and a fully tracked Quality system. We are also ISO9001 compliant and certified.

Client Relationships: We listen to your needs and respond with innovative solutions that are tailored for your business. We believe in building relationships with our staff and local community.

Safety: At Construction Sciences we embrace a 'safety' culture and it is a key consideration with every project. Currently we are over 2 years LTI (lost time injury) free.

Construction Sciences Pty Ltd was commissioned by **fgf Developments Pty Ltd** to provide Level 1 inspection and testing services for the placement of fill at the residential development:-

PROJECT: Cherrybrook Stage 23A

ADDRESS: Cherrybrook Drive, Bentley Park, QLD 4869

The earthworks were carried out from 10/11/2023 to 29/11/2023

Lots 2301, 2302, 2303, 2304, 2305, 2306, 2307 and 2308 and the Road 6 area had fill placed during the earthworks.

Specification Requirements

Filling was carried out in accordance with AS3798-2007 '*Guidelines on earthworks for commercial and residential developments*' and with the project specification prepared for the project.

The specification requirements were that all fill was to be placed and compacted in layers to a density ratio of not less than 95% of the maximum density as determined by AS1289.5.7.1 (standard compaction).

Site Works

The Cherrybrook Stage 23A project was a large scale cut to fill operation with approximately 6678m³ of fill placed.

Areas to be filled were stripped and proof rolled in accordance with the specification requirements.

The fill material generally comprised of Silty CLAY.

Compaction Control Testing

Compaction control tests were carried out at regular intervals throughout the placement of fill in accordance with the minimum test frequency recommendations included in AS3798-2007 '*Guidelines on earthworks for commercial and residential developments*'. All test results are included in the Appendix A. A summary of the test results is included as Table 1. A total of 18 field density tests were carried out throughout the earthworks. The average density ratio was 98.1 % with a standard deviation of 2.14 %.

Conclusion

It is considered that the placement of fill at Cherrybrook Stage 23A, Cherrybrook Drive, Bentley Park, QLD 4869 was carried out in a controlled manner and the fill was compacted to a density ratio not less than the specified requirement. It is concluded that the fill may be deemed to be '*controlled fill*' in accordance with AS2870 – 2011 '*Residential Slabs & Footings*'.



Craig Wilson
LABORATORY MANAGER
CONSTRUCTION SCIENCES



Phone +07 4033 7815 Direct +61 7 4033 7815 Fax +61 7 47288024 Mobile +61 477 990 048
Address Shed 3, 5 Commercial Place, Earlville, Queensland 4870 Australia

Email craig.wilson@constructionsciences.net Web www.constructionsciences.net

Table 1-1 Summary of field density test results - Cherrybrook Stage 23A

Date	Location.	Density ratio (1)
14/11/2023	Lot 2305	97.0
14/11/2023	Lot 2306	95.0
14/11/2023	Lot 2307	99.5
14/11/2023	Lot 2308	96.5
15/11/2023	Lot 2308	95.5
15/11/2023	Lot 2307	98.0
15/11/2023	Lot 2306	98.5
16/11/2023	Road 6	97.5
16/11/2023	Road 6	100.5
16/11/2023	Lot 2308	100.0
17/11/2023	Lot 2307	98.0
17/11/2023	Road 6	100.5
17/11/2023	Road 6	97.5
20/11/2023	Lot 2308	102.5
20/11/2023	Lot 2307	101.0
20/11/2023	Lot 2306	97.5
23/11/2023	Latitude: -17.008657 / Longitude: 145.713790	95.0
23/11/2023	Latitude: -17.008705 / Longitude: 145.73726	95.5

No. of tests:	18	Mean:	98.1%	Standard Dev:	2.14%
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Notes:

- Standard laboratory compaction used, AS1289.5.7.1.

Appendix A – Field Density Test Results



WET DENSITY RATIO REPORT

Client: ffg Developments Client Address: PO Box 6665, Cairns Project: Cherrybrook Stage 23A Location: Cairns Component: Field Density Area Description: Lot 2305 - 2308 General Fill	Report Number: 11512/R/48907-1 Project Number: 11512/P/1073 Lot Number: Various Internal Test Request: 11512/T/23959 Client Reference/s: TR 1876 (#231005) Report Date / Page: 20/11/2023 Page 1 of 1
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Test Procedures:	AS1289.5.7.1, AS1289.5.8.1
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Sample Number	11512/S/128179	11512/S/128180	11512/S/128181	11512/S/128182
ID / Client ID	TR 1876	TR 1876	TR 1876	TR 1876
Lot Number	2305	2306	2307	2308
Date / Time Tested	14/11/2023 07:10	14/11/2023 07:12	14/11/2023 07:16	14/11/2023 07:19
Material Source	Site Stockpile	Site Stockpile	Site Stockpile	Site Stockpile
Material Type	Insitu Material	Insitu Material	Insitu Material	Insitu Material
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)	275 / 300 / 300	275 / 300 / 300	275 / 300 / 300	275 / 300 / 300
Standard or Modified	Standard	Standard	Standard	Standard
Lot No.	2305	2306	2307	2308
Location	Nth Est Boundary	Nth Est Boundary	Nth Est Boundary	Nth Wst Boundary
RL	General Fill	General Fill	General Fill	General Fill
Test Fraction (mm)	< 19.0 mm	< 19.0 mm	< 19.0 mm	< 19.0 mm
Sample Oversize (%)	0	0	0	1
Compaction Sample Number	11512/S/128179	11512/S/128180	11512/S/128181	11512/S/128182
Sample Description	Red silty sandy gravel	Red silty sandy gravel	Red silty sandy gravel	Red silty sndt gravel
Moisture Test Results:				
Field Moisture Content (%)	-	-	-	-
Adjusted / Moist. Variation (%)	2.0	2.5	4.5	3.0
Density Test Results:				
Field Wet Density (t/m ³)	2.05	1.98	2.05	2.00
Adj/Peak Conv Wet Density (t/m ³)	2.12	2.08	2.06	2.08
Density Ratio Required (%)	95	95	95	95
Hilf Density Ratio (%)	97.0	95.0	99.5	96.5

Remarks

<div style="text-align: center;">  <p>Accredited for compliance with ISO/IEC 17025 – Testing</p> </div> <p>Accreditation Number: 1986 Corporate Site Number: 11512</p>	 Approved Signatory: Craig Wilson Form ID: W5ASRep Rev 3
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WET DENSITY RATIO REPORT

Client: ffg Developments Client Address: PO Box 6665, Cairns Project: Cherrybrook Stage 23A Location: Cairns Component: Compliance Testing Area Description: fill	Report Number: 11512/R/48961-1 Project Number: 11512/P/1073 Lot Number: Various Internal Test Request: 11512/T/23978 Client Reference/s: level 1 TR1877 Report Date / Page: 27/11/2023 Page 1 of 1
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Test Procedures:	AS1289.5.7.1, AS1289.5.8.1
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Sample Number	11512/S/128235	11512/S/128236	11512/S/128237	
ID / Client ID	GF5	GF6	GF7	
Lot Number	2308	2307	2306	
Date / Time Tested	15/11/2023 07:20	15/11/2023 07:35	15/11/2023 07:50	
Material Source	Onsite	Onsite	Onsite	
Material Type	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	
Depths: Test / Nom / Actual (mm)	275 / 300 / 300	275 / 300 / 300	275 / 300 / 300	
Standard or Modified	Standard	Standard	Standard	
Latitude	-17.008823	-17.008649	-17.008991	
Longitude	145.713635	145.713515	145.713422	
Level	Fill	Fill	Fill	
Test Fraction (mm)	< 19.0 mm	< 19.0 mm	< 19.0 mm	
Sample Oversize (%)	0	0	2	
Compaction Sample Number	11512/S/128235	11512/S/128236	11512/S/128237	
Sample Description	Silty CLAY	Silty CLAY	Silty CLAY	
Moisture Test Results:				
Field Moisture Content (%)	-	-	-	
Adjusted / Moist. Variation (%)	0.5	-1.0	0.5	
Density Test Results:				
Field Wet Density (t/m ³)	1.92	1.96	1.99	
Adj/Peak Conv Wet Density (t/m ³)	2.01	2.00	2.02	
Density Ratio Required (%)	95	95	95	
Hilf Density Ratio (%)	95.5	98.0	98.5	

Remarks

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Accreditation Number: 1986 Corporate Site Number: 11512	



WET DENSITY RATIO REPORT

Client: ffg Developments Client Address: PO Box 6665, Cairns Project: Cherrybrook Stage 23A Location: Cairns Component: Compliance Testing Area Description: Fill	Report Number: 11512/R/48963-1 Project Number: 11512/P/1073 Lot Number: Various Internal Test Request: 11512/T/23992 Client Reference/s: TR-1877 Report Date / Page: 27/11/2023 Page 1 of 1
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Test Procedures:	AS1289.5.7.1, AS1289.5.8.1
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Sample Number	11512/S/128283	11512/S/128284	11512/S/128285	
ID / Client ID	GF8	GF9	GF10	
Lot Number	Road 6	Road 6	2308	
Date / Time Tested	16/11/2023 07:25	16/11/2023 07:35	16/11/2023 07:50	
Material Source	Onsite	Onsite	Onsite	
Material Type	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	
Depths: Test / Nom / Actual (mm)	275 / 300 / 300	275 / 300 / 300	275 / 300 / 300	
Standard or Modified	Standard	Standard	Standard	
Latitude	-17.008758	-17.008946	-17.008894	
Longitude	145.713603	145.713516	145.713421	
Level	Fill	Fill	Fill	
	Road 6 CH140	Road 6 CH120		
Test Fraction (mm)	< 19.0 mm	< 19.0 mm	< 19.0 mm	
Sample Oversize (%)	0	0	0	
Compaction Sample Number	11512/S/128283	11512/S/128284	11512/S/128285	
Sample Description	Silty CLAY	Silty CLAY	Silty CLAY	
Moisture Test Results:				
Field Moisture Content (%)	-	-	-	
Adjusted / Moist. Variation (%)	0.5	1.5	2.0	
Density Test Results:				
Field Wet Density (t/m ³)	1.94	2.02	2.06	
Adj/Peak Conv Wet Density (t/m ³)	1.99	2.00	2.05	
Density Ratio Required (%)	95	95	95	
Hilf Density Ratio (%)	97.5	100.5	100.0	

Remarks

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WET DENSITY RATIO REPORT

Client: ffg Developments Client Address: PO Box 6665, Cairns Project: Cherrybrook Stage 23A Location: Cairns Component: Compliance Testing Area Description: Fill	Report Number: 11512/R/48964-1 Project Number: 11512/P/1073 Lot Number: Various Internal Test Request: 11512/T/23986 Client Reference/s: Level 1 TR-1878 Report Date / Page: 27/11/2023 Page 1 of 1
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Test Procedures:	AS1289.5.7.1, AS1289.5.8.1
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Sample Number	11512/S/128252	11512/S/128253	11512/S/128254
ID / Client ID	GF11	GF12	GF13
Lot Number	2307	Road 6	Road 6
Date / Time Tested	17/11/2023 07:15	17/11/2023 07:15	17/11/2023 07:15
Material Source	Onsite	Onsite	Onsite
Material Type	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
Depths: Test / Nom / Actual (mm)	275 / 300 / 300	275 / 300 / 300	275 / 300 / 300
Standard or Modified	Standard	Standard	Standard
Latitude	-17.008747	-17.008907	-17.009128
Longitude	145.713662	145.713474	145.713383
Level	Fill	Fill	Fill
		Road 6 CH130	Road 6 CH110
Test Fraction (mm)	< 19.0 mm	< 19.0 mm	< 19.0 mm
Sample Oversize (%)	0	0	0
Compaction Sample Number	11512/S/128252	11512/S/128253	11512/S/128254
Sample Description	Silty CLAY	Silty CLAY	Silty CLAY
Moisture Test Results:			
Field Moisture Content (%)	-	-	-
Adjusted / Moist. Variation (%)	1.0	1.5	2.0
Density Test Results:			
Field Wet Density (t/m ³)	2.03	2.10	2.00
Adj/Peak Conv Wet Density (t/m ³)	2.07	2.10	2.06
Density Ratio Required (%)	95	95	95
Hilf Density Ratio (%)	98.0	100.5	97.5

Remarks

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WET DENSITY RATIO REPORT

Client: ffg Developments Client Address: PO Box 6665, Cairns Project: Cherrybrook Stage 23A Location: Cairns Component: Compliance Testing Area Description: fill	Report Number: 11512/R/48956-1 Project Number: 11512/P/1073 Lot Number: Various Internal Test Request: 11512/T/23999 Client Reference/s: TR-1879 Report Date / Page: 26/11/2023 Page 1 of 1
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Test Procedures:	AS1289.5.7.1, AS1289.5.8.1, AS1289.2.1.1
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Sample Number	11512/S/128362	11512/S/128363	11512/S/128364
ID / Client ID	GF14	GF15	GF16
Lot Number	2308	2307	2306
Date / Time Tested	20/11/2023 07:30	20/11/2023 07:30	20/11/2023 07:30
Material Source	Onsite	Onsite	Onsite
Material Type	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
Depths: Test / Nom / Actual (mm)	275 / 300 / 300	275 / 300 / 300	275 / 300 / 300
Standard or Modified	Standard	Standard	Standard
Latitude	-17.008717	-17.008897	-17.009051
Longitude	145.713190	145.713528	145.713414
Level	Fill	Fill	Fill
Test Fraction (mm)	< 19.0 mm	< 19.0 mm	< 19.0 mm
Sample Oversize (%)	6	8	12
Compaction Sample Number	11512/S/128362	11512/S/128363	11512/S/128364
Sample Description	Gravelly Clay	Gravelly Clay	Gravelly Clay
Moisture Test Results:			
Field Moisture Content (%)	9.3	8.9	9.4
Adjusted / Moist. Variation (%)	4.5	4.0	4.0
Density Test Results:			
Field Wet Density (t/m ³)	2.09	2.07	2.03
Adj/Peak Conv Wet Density (t/m ³)	2.04	2.05	2.08
Density Ratio Required (%)	95	95	95
Hilf Density Ratio (%)	102.5	101.0	97.5

Remarks

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WET DENSITY RATIO REPORT

Client: ffg Developments Client Address: PO Box 6665, Cairns Project: Cherrybrook Stage 23A Location: Cairns Component: Compliance Testing Area Description: fill	Report Number: 11512/R/49040-1 Project Number: 11512/P/1073 Lot Number: Internal Test Request: 11512/T/24037 Client Reference/s: Level 1 Report Date / Page: 1/12/2023 Page 1 of 1
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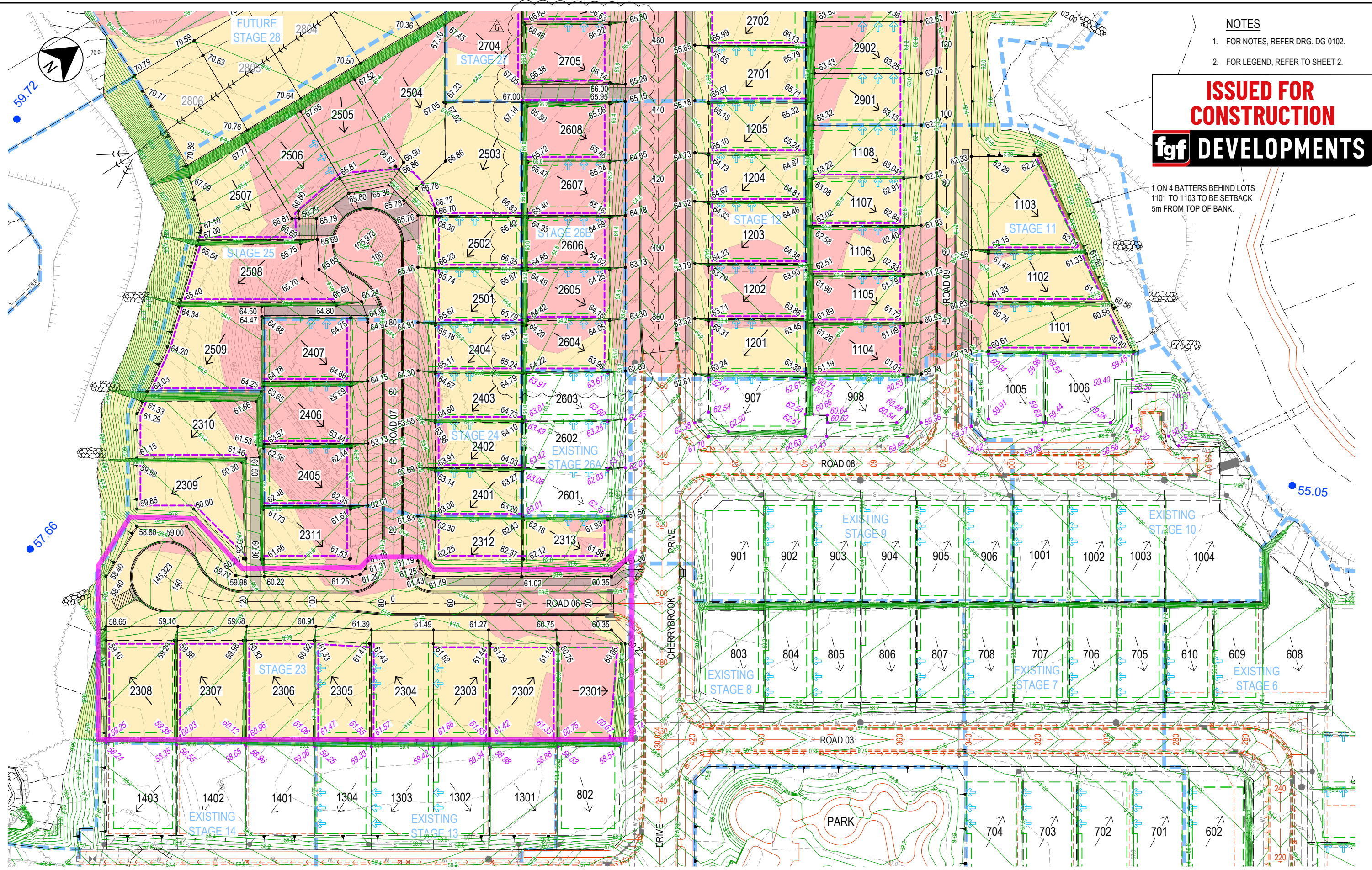
Test Procedures:	AS1289.5.7.1, AS1289.5.8.1
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Sample Number	11512/S/128532	11512/S/128533	
ID / Client ID	-	-	
Lot Number	-	-	
Date / Time Tested	23/11/2023 07:30	23/11/2023 07:45	
Material Source	Onsite	Onsite	
Material Type	General Fill	General Fill	
Sampling Method	AS1289.1.2.1 Cl 6.4b	AS1289.1.2.1 Cl 6.4b	
Depths: Test / Nom / Actual (mm)	275 / 300 / 300	275 / 300 / 300	
Standard or Modified	Standard	Standard	
Latitude	-17.008657	-17.008705	
Longitude	145.713790	145.73726	
Level	Fill	Fill	
Test Fraction (mm)	< 19.0 mm	< 19.0 mm	
Sample Oversize (%)	11	12	
Compaction Sample Number	11512/S/128532	11512/S/128533	
Sample Description	Gravelly Silty Brown Clay	Gravelly Silty Brown Clay	
Moisture Test Results:			
Field Moisture Content (%)	-	-	
Adjusted / Moist. Variation (%)	2.0	2.5	
Density Test Results:			
Field Wet Density (t/m ³)	2.06	2.07	
Adj/Peak Conv Wet Density (t/m ³)	2.17	2.17	
Density Ratio Required (%)	95	95	
Hilf Density Ratio (%)	95.0	95.5	

Remarks

<div style="text-align: center;">Accredited for compliance with ISO/IEC 17025 – Testing</div>  <p>Accreditation Number: 1986 Corporate Site Number: 11512</p>	 Approved Signatory: Craig Wilson Form ID: W5ASRep Rev 3
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Appendix B – Allotment Fill Map



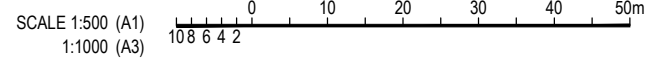
NOTES

- FOR NOTES, REFER DRG. DG-0102.
- FOR LEGEND, REFER TO SHEET 2.

ISSUED FOR CONSTRUCTION

fgf DEVELOPMENTS

1 ON 4 BATTERS BEHIND LOTS 1101 TO 1103 TO BE SETBACK 5m FROM TOP OF BANK.



REV	DATE	DRAWN	REV'D	APP'D	REVISION
F	28.06.23	GMS	NLL	RJC	LOTS REVISED
E	29.03.23	RC	SB	RJC	LOT 2608 BUILD TO BOUNDARY REMOVED
D	10.08.22	GMS	RJB	RJC	FOR CONSTRUCTION ISSUE
C	11.07.22	GMS	RJB	RJC	LOT DRAINAGE AMENDED, NOTE ADDED
B	17.06.22	GMS	RJB	RJC	LOT GRADING AMENDED, RETAINING WALL ADDED
A	08.12.21	GMS	NLL	RJC	INITIAL ISSUE

DRAWING NUMBER	REFERENCE DRAWING TITLE

Jacobs

ASN 37 001 024 095 and ACN 001 024 095
 Jacobs Group (Australia) Pty Ltd
 2 James Street
 CAIRNS, QLD 4870
 AUSTRALIA

Tel: +61 7 4031 4599
 Fax: +61 7 4031 3967
 Web: www.jacobs.com

CLIENT	WALKER ROAD PTY LTD
PROJECT	CHERRYBROOK - STAGES 11, 12, 23 TO 25, 26B, 27, 29 & 30
DRAWN	GMS
DESIGNED	GMS
DRAWING CHECK	RJB
DESIGN REVIEW	RJC
REVIEWED	N.LEE LONG
DATE	08.12.21
APPROVED	<i>[Signature]</i>
DATE	10.08.22

TITLE	EARTHWORKS SHEET 1 OF 2
SCALE	AS SHOWN
DRAWING No.	IH035500-11-CI-DRG-0201
REV	F

