



Level 1 Geotechnical Inspection, Testing and Assessment Cherrybrook Future Stages 5, 6, 7, 9, 10, 11, 12, 13, 15, 23 & 26

11512/P/762

Prepared for fgf Developments Pty Ltd

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Document History

Effective Date	Description of Revision	Prepared By	Reviewed By	Approved By
25/06/2019	Rev-4	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 Future Stages 5,6,7,9,10,11,12,13,15,23 &26

ADDRESS: Cherrybrook Estate – Bentley Park QLD 4869

The earthworks were carried out from 23/10/2018 to 16/04/2019.

Current levels surveyed for future stages included in Appendix C.

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 Future Stages 5,6,7,9,10,11,12,13,15,23 & 26 project was a large scale cut to fill operation with approximately 10344m³ of fill placed.

The area to be filled was stripped and proof rolled in accordance with the specification requirements. The fill material generally comprised of Sandy 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 23 field density tests were carried out throughout the earthworks. The average density ratio was 99.7 % with a standard deviation of **2.54** %.

Conclusion

It is considered that the placement of fill at, Cherrybrook Estate – 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*'.



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Table 1-1 Summary of field density test results - **Cherrybrook Future Stages 5,6,7,9,10,11,12,13,15,23 &26**

Date	Lot no.	Density ratio (1)
23/10/2018	1002 & 1003	100.5
23/10/2018	902 & 903	99.5
24/10/2018	1002	99.0
24/10/2018	610	100.0
29/10/2018	1004	102.5
29/10/2018	906	96.5
29/10/2018	901	103.0
1/11/2018	904	102.0
1/11/2018	1003	102.0
1/11/2018	609	95.0
2/11/2018	1201	100.5
2/11/2018	1102	100.0
2/11/2018	1106	95.5
7/11/2018	1305	100.0
7/11/2018	902	100.5
15/11/2018	1103	96.5
15/11/2018	607	98.0
20/11/2018	2301	102.0
22/11/2018	704	95.0
27/11/2018	1201	104.0
27/11/2018	1203	99.5
16/4/2019	1103	100.0
16/04/2019	1102	102.5

No. of tests:	23	Mean:	99.7 %	Standard Dev:	2.54 %
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Notes:

1. Standard laboratory compaction used, AS1289.5.7.1.

Appendix A – Field Density Test Results

WET DENSITY RATIO REPORT

Client:	fgf Developments	Report Number:	11512/R/22180-1
Client Address:	PO Box 6665, Cairns	Project Number:	11512/P/762
Project:	180901 - Cherrybrook Estate Stages 4 & 8	Lot Number:	Lots 1002 & 610
Location:	Cairns	Internal Test Request:	11512/T/11385
Component:	Field Densities	Client Reference/s:	TR 434 [GF-1 & GF-2]
Area Description:	Cherrybrook Estate Stages 4 & 8	Report Date / Page:	8/11/2018 Page 1 of 1

Test Procedures:	AS1289.5.7.1, AS1289.5.8.1, AS1289.2.1.1
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Sample Number	11512/S/57731	11512/S/57732		
ID / Client ID	-	-		
Lot Number	Lots 1002 & 610	Lots 1002 & 610		
Date / Time Tested	24/10/2018 11:18	24/10/2018 11:33		
Material Source	Onsite	Onsite		
Material Type	General Fill	General Fill		
Sampling Method	AS1289.1.2.1 CI 6.4b	AS1289.1.2.1 CI 6.4b		
Depths: Test / Nom / Actual (mm)	175 / 200 / 200	150 / 150 / 150		
Standard or Modified	Standard	Standard		
	GF-1	GF2		
	Lot 1002	Lot 610		
	Centre of Lot	Centre of Lot		
	RL 58.0	RL 56.2		
Test Fraction (mm)	< 19.0 mm	< 19.0 mm		
Sample Oversize (%)	0	0		
Compaction Sample Number	11512/S/57731	11512/S/57732		
Sample Description	Red Silty Clay	Light Brown Silty Clay		
Moisture Test Results:				
Field Moisture Content (%)	11.5	11.0		
Adjusted / Moisture Variation (%)	0.0	2.0		
Optimum Moisture Content (%)	11.5	13.0		
Moisture Variation from OMC	(Wetter than OMC)	(Drier than OMC)		
Moisture Ratio (%)	102.0	84.0		
Density Test Results:				
Field Wet Density (t/m³)	2.10	2.02		
Adj/Peak Conv Wet Density (t/m³)	2.12	2.02		
Density Ratio Required (%)	95	95		
Hilf Density Ratio (%)	99.0	100.0		

Remarks



The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.
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WET DENSITY RATIO REPORT

Client:	fgf Developments	Report Number:	11512/R/22181-1
Client Address:	PO Box 6665, Cairns	Project Number:	11512/P/762
Project:	180901 - Cherrybrook Estate Stages 4 & 8	Lot Number:	Lots 1002 - 906 & 901
Location:	Cairns	Internal Test Request:	11512/T/11412
Component:	Field Densities	Client Reference/s:	TR 435
Area Description:	Cherrybrook Estate Lots 1004 - 906 & 901	Report Date / Page:	8/11/2018 Page 1 of 1

Test Procedures:	AS1289.5.7.1, AS1289.5.8.1, AS1289.2.1.1
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Sample Number	11512/S/57881	11512/S/57882	11512/S/57883	
ID / Client ID	GF - 3	GF - 4	GF - 5	
Lot Number	Lots 1002 - 906 & 901	Lots 1002 - 906 & 901	Lots 1002 - 906 & 901	
Date / Time Tested	29/10/2018 10:58	29/10/2018 11:18	29/10/2018 11:35	
Material Source	Onsite	Onsite	Onsite	
Material Type	General Fill	General Fill	General Fill	
Sampling Method	AS1289.1.2.1 CI 6.4b	AS1289.1.2.1 CI 6.4b	AS1289.1.2.1 CI 6.4b	
Depths: Test / Nom / Actual (mm)	175 / 200 / 200	175 / 200 / 200	175 / 200 / 200	
Standard or Modified	Standard	Standard	Standard	
	GF - 3	GF - 4	GF - 5	
	Lot 1004	Lot 906	Lot 901	
	Centre of Lot	Centre of Lot	Centre of Lot	
	RL 58	RL 59		
Test Fraction (mm)	< 19.0 mm	< 19.0 mm	< 19.0 mm	
Sample Oversize (%)	10	0	14	
Compaction Sample Number	11512/S/57881	11512/S/57882	11512/S/57883	
Sample Description	Red Gravely Sandy Clay	Light Brown Sandy Silt	Light Brown Sandy Silt	
Moisture Test Results:				
Field Moisture Content (%)	10.1	7.4	7.3	
Adjusted / Moisture Variation (%)	2.0	4.5	4.0	
Optimum Moisture Content (%)	12.5	11.5	12.0	
Moisture Variation from OMC	(Drier than OMC)	(Drier than OMC)	(Drier than OMC)	
Moisture Ratio (%)	82.0	63.0	62.0	
Density Test Results:				
Field Wet Density (t/m³)	2.24	2.04	2.20	
Adj/Peak Conv Wet Density (t/m³)	2.19	2.12	2.14	
Density Ratio Required (%)	95	95	95	
Hilf Density Ratio (%)	102.5	96.5	103.0	

Remarks



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WET DENSITY RATIO REPORT

Client:	fgf Developments	Report Number:	11512/R/22182-1
Client Address:	PO Box 6665, Cairns	Project Number:	11512/P/762
Project:	180901 - Cherrybrook Estate Stages 4 & 8	Lot Number:	
Location:	Cairns	Internal Test Request:	11512/T/11445
Component:	Field Densities	Client Reference/s:	TR 437
Area Description:	Cherrybrook Estate	Report Date / Page:	8/11/2018 Page 1 of 2

Test Procedures:	AS1289.5.7.1, AS1289.5.8.1, AS1289.2.1.1
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Sample Number	11512/S/58092	11512/S/58093	11512/S/58094	11512/S/58095
ID / Client ID	GF 10	GF 9	GF 8	GF 7
Lot Number	-	-	-	-
Date / Time Tested	1/11/2018 11:01	1/11/2018 11:11	1/11/2018 11:33	1/11/2018 11:49
Material Source	Onsite	Onsite	Onsite	Onsite
Material Type	General Fill	General Fill	General Fill	General Fill
Sampling Method	AS1289.1.2.1 CI 6.4b	AS1289.1.2.1 CI 6.4b	AS1289.1.2.1 CI 6.4b	AS1289.1.2.1 CI 6.4b
Depths: Test / Nom / Actual (mm)	175 / 200 / 200	175 / 200 / 200	175 / 200 / 200	175 / 200 / 200
Standard or Modified	Standard	Standard	Standard	Standard
	GF 10	GF 9	GF 8	GF 7
	Lot 408	Lot 410	Lot 904	Lot 1003
	Centre of Lot	Centre of Lot	Centre of Lot	Centre of Lot
	RL 55.4	RL 55.0	RL 60.0	RL 58.5
Test Fraction (mm)	< 19.0 mm	< 19.0 mm	< 19.0 mm	< 19.0 mm
Sample Oversize (%)	2	4	3	4
Compaction Sample Number	11512/S/58092	11512/S/58093	11512/S/58094	11512/S/58095
Sample Description	Silty clay, rock gravel	Red Gravelly Clay	Silty clay, rock gravel	Silty clay, rock gravel
Moisture Test Results:				
Field Moisture Content (%)	8.8	7.8	9.0	8.2
Adjusted / Moisture Variation (%)	3.5	3.5	4.0	3.5
Optimum Moisture Content (%)	12.5	11.5	13.0	12.0
Moisture Variation from OMC	(Drier than OMC)	(Drier than OMC)	(Drier than OMC)	(Drier than OMC)
Moisture Ratio (%)	70.5	67.0	70.0	69.0
Density Test Results:				
Field Wet Density (t/m ³)	2.06	2.05	2.16	2.15
Adj/Peak Conv Wet Density (t/m ³)	2.11	2.09	2.12	2.11
Density Ratio Required (%)	95	95	95	95
Hilf Density Ratio (%)	97.5	98.0	102.0	102.0

Remarks



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WET DENSITY RATIO REPORT

Client:	fgf Developments	Report Number:	11512/R/22182-1
Client Address:	PO Box 6665, Cairns	Project Number:	11512/P/762
Project:	180901 - Cherrybrook Estate Stages 4 & 8	Lot Number:	
Location:	Cairns	Internal Test Request:	11512/T/11445
Component:	Field Densities	Client Reference/s:	TR 437
Area Description:	Cherrybrook Estate	Report Date / Page:	8/11/2018 Page 2 of 2

Test Procedures:	AS1289.5.7.1, AS1289.5.8.1
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Sample Number	11512/S/58096			
ID / Client ID	GF 6			
Lot Number	-			
Date / Time Tested	1/11/2018 12:12			
Material Source	Onsite			
Material Type	General Fill			
Sampling Method	AS1289.1.2.1 CI 6.4b			
Depths: Test / Nom / Actual (mm)	175 / 200 / 200			
Standard or Modified	Standard			
	GF 6			
	Lot 609			
	Centre of Lot			
	RL 56.4			
Test Fraction (mm)	< 19.0 mm			
Sample Oversize (%)	0			
Compaction Sample Number	11512/S/58096			
Sample Description	Red silty clay, rock material			
Moisture Test Results:				
Field Moisture Content (%)	-			
Adjusted / Moisture Variation (%)	5.0			
Optimum Moisture Content (%)	-			
Moisture Variation from OMC	-			
Moisture Ratio (%)	-			
Density Test Results:				
Field Wet Density (t/m ³)	1.95			
Adj/Peak Conv Wet Density (t/m ³)	2.06			
Density Ratio Required (%)	95			
Hilf Density Ratio (%)	95.0			

Remarks



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WET DENSITY RATIO REPORT

Client:	fgf Developments	Report Number:	11512/R/22206-1
Client Address:	PO Box 6665, Cairns	Project Number:	11512/P/762
Project:	180901 - Cherrybrook Estate Stages 4 & 8	Lot Number:	Various
Location:	Cairns	Internal Test Request:	11512/T/11379
Component:	Field Densities	Client Reference/s:	MTR 433
Area Description:	Cherrybrook Estate Stages 4 & 8	Report Date / Page:	8/11/2018 Page 1 of 1

Test Procedures:	AS1289.5.7.1, AS1289.5.8.1, AS1289.2.1.1
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Sample Number	11512/S/57705	11512/S/57706	11512/S/57707	
ID / Client ID	NS-1	NS-2	NS-3	
Lot Number	Lot 1002/1003	Lot 902/903	Lot 409	
Date / Time Tested	23/10/2018	23/10/2018	23/10/2018	
Material Source	Onsite	Onsite	Onsite	
Material Type	Ground Surface Treatment	Ground Surface Treatment	Ground Surface Treatment	
Sampling Method	AS1289.1.2.1 CI 6.4b	AS1289.1.2.1 CI 6.4b	AS1289.1.2.1 CI 6.4b	
Depths: Test / Nom / Actual (mm)	150 / GST / GST	150 / GST / GST	150 / GST / GST	
Standard or Modified	Standard	Standard	Standard	
Lot No.	Lots 1002 & 1003	Lots 902 & 903	Lot 409	
Location	Centreline	Centreline	Centreline	
	10m From Back Boundary of Lot	12m From Back Boundary of Lot	Centre of Lot	
RL	Natural Surface	Natural Surface	Natural Surface	
Test Fraction (mm)	< 19.0 mm	< 19.0 mm	< 19.0 mm	
Sample Oversize (%)	0	0	0	
Compaction Sample Number	11512/S/57705	11512/S/57706	11512/S/57707	
Sample Description	Brown Clayey Silt	Brown Clayey Silt	Brown Clayey Silt	
Moisture Test Results:				
Field Moisture Content (%)	10.3	10.6	8.9	
Adjusted / Moisture Variation (%)	4.0	4.0	4.0	
Optimum Moisture Content (%)	14.0	14.5	13.0	
Moisture Variation from OMC	(Drier than OMC)	(Drier than OMC)	(Drier than OMC)	
Moisture Ratio (%)	72.5	72.5	69.0	
Density Test Results:				
Field Wet Density (t/m³)	1.94	1.92	1.90	
Adj/Peak Conv Wet Density (t/m³)	1.94	1.92	1.96	
Density Ratio Required (%)	95	95	95	
Hilf Density Ratio (%)	100.5	99.5	96.5	

Remarks



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WET DENSITY RATIO REPORT

Client:	fgf Developments	Report Number:	11512/R/22218-1
Client Address:	PO Box 6665, Cairns	Project Number:	11512/P/762
Project:	180901 - Cherrybrook Estate Stages 4 & 8	Lot Number:	Various
Location:	Cairns	Internal Test Request:	11512/T/11464
Component:	Field Densities	Client Reference/s:	TR 439 GF11 & GF 12
Area Description:	Lots 1305 & 902	Report Date / Page:	9/11/2018 Page 1 of 1

Test Procedures:	AS1289.5.7.1, AS1289.5.8.1, AS1289.2.1.1
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Sample Number	11512/S/58200	11512/S/58201		
ID / Client ID	GF 11	GF 12		
Lot Number	Lot 1305	Lot 902		
Date / Time Tested	7/11/2018 11:11	7/11/2018 11:37		
Material Source	Onsite	Onsite		
Material Type	General Fill	General Fill		
Sampling Method	AS1289.1.2.1 CI 6.4b	AS1289.1.2.1 CI 6.4b		
Depths: Test / Nom / Actual (mm)	175 / 200 / 200	175 / 200 / 200		
Standard or Modified	Standard	Standard		
	GF 11	GF 12		
	Lot 1305	Lot 902		
	Centre of Lot	Centre of Lot		
	3m From South Boundary			
Test Fraction (mm)	< 19.0 mm	< 19.0 mm		
Sample Oversize (%)	0	0		
Compaction Sample Number	11512/S/58200	11512/S/58201		
Sample Description	Red Silty Clay	Red Silty Clay		
Moisture Test Results:				
Field Moisture Content (%)	9.1	9.2		
Adjusted / Moisture Variation (%)	4.0	3.5		
Optimum Moisture Content (%)	13.0	13.0		
Moisture Variation from OMC	(Drier than OMC)	(Drier than OMC)		
Moisture Ratio (%)	70.5	71.5		
Density Test Results:				
Field Wet Density (t/m³)	2.07	2.08		
Adj/Peak Conv Wet Density (t/m³)	2.07	2.07		
Density Ratio Required (%)	95	95		
Hilf Density Ratio (%)	100.0	100.5		

Remarks



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WET DENSITY RATIO REPORT

Client:	fgf Developments	Report Number:	11512/R/22294-1
Client Address:	PO Box 6665, Cairns	Project Number:	11512/P/762
Project:	180901 - Cherrybrook Estate Stages 4 & 8	Lot Number:	Various
Location:	Cairns	Internal Test Request:	11512/T/11506
Component:	Field Densities	Client Reference/s:	TR 441 15/11/2018
Area Description:	Lots 1103 & 607	Report Date / Page:	19/11/2018 Page 1 of 1

Test Procedures:	AS1289.5.7.1, AS1289.5.8.1, AS1289.2.1.1
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Sample Number	11512/S/58404	11512/S/58405		
ID / Client ID	GF 13	GF 14		
Lot Number	1103	607		
Date / Time Tested	15/11/2018 14:27	15/11/2018 14:44		
Material Source	Onsite	Onsite		
Material Type	General Fill	General Fill		
Sampling Method	AS1289.1.2.1 CI 6.4b	AS1289.1.2.1 CI 6.4b		
Depths: Test / Nom / Actual (mm)	175 / 200 / 200	175 / 200 / 200		
Standard or Modified	Standard	Standard		
	Lot 1103	Lot 607		
	Centre of Lot	Centre of Lot		
	RL 60.8	RL 54.8		
		1.5m West of East Boundary		
Test Fraction (mm)	< 19.0 mm	< 19.0 mm		
Sample Oversize (%)	4	3		
Compaction Sample Number	11512/S/58404	11512/S/58405		
Sample Description	Brown Silty Gravelly Clay	Brown Silty Gravelly Clay		
Moisture Test Results:				
Field Moisture Content (%)	10.8	10.1		
Adjusted / Moisture Variation (%)	1.0	-0.5		
Optimum Moisture Content (%)	11.5	10.0		
Moisture Variation from OMC	(Drier than OMC)	(Wetter than OMC)		
Moisture Ratio (%)	93.0	103.0		
Density Test Results:				
Field Wet Density (t/m³)	2.11	2.14		
Adj/Peak Conv Wet Density (t/m³)	2.19	2.19		
Density Ratio Required (%)	95	95		
Hilf Density Ratio (%)	96.5	98.0		

Remarks	Surplus Fill used from Retaining Wall Excavation
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WET DENSITY RATIO REPORT

Client:	fgf Developments	Report Number:	11512/R/22315-1
Client Address:	PO Box 6665, Cairns	Project Number:	11512/P/762
Project:	180901 - Cherrybrook Estate Stages 4 & 8	Lot Number:	
Location:	Cairns	Internal Test Request:	11512/T/11447
Component:	Field Densities	Client Reference/s:	TR 438
Area Description:	Cherrybrook Estate Stages 4 & 8	Report Date / Page:	21/11/2018 Page 1 of 1

Test Procedures:	AS1289.5.7.1, AS1289.5.8.1, AS1289.2.1.1
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Sample Number	11512/S/58099	11512/S/58100	11512/S/58101	
ID / Client ID	NS 6	NS 4	NS 5	
Lot Number	-	-	-	
Date / Time Tested	2/11/2018	2/11/2018	2/11/2018	
Material Source	Onsite	Onsite	Onsite	
Material Type	Insitu Material	Insitu Material	Insitu Material	
Sampling Method	AS1289.1.2.1 CI 6.4b	AS1289.1.2.1 CI 6.4b	AS1289.1.2.1 CI 6.4b	
Depths: Test / Nom / Actual (mm)	150 / GST / GST	150 / GST / GST	150 / GST / GST	
Standard or Modified	Standard	Standard	Standard	
	NS 6	NS 4	NS 5	
	Lot 1201	Lot 1102	Lot 1106	
	Centre of Lot	Centre of Lot	Centre of Lot	
	GST	GST	GST	
Test Fraction (mm)	< 19.0 mm	< 19.0 mm	< 19.0 mm	
Sample Oversize (%)	0	0	0	
Compaction Sample Number	11512/S/58099	11512/S/58100	11512/S/58101	
Sample Description	Silty clay gravel	Silty clay gravel	Silty clay gravel	
Moisture Test Results:				
Field Moisture Content (%)	10.5	10.6	13.0	
Adjusted / Moisture Variation (%)	2.0	4.0	2.5	
Optimum Moisture Content (%)	12.5	14.5	15.5	
Moisture Variation from OMC	(Drier than OMC)	(Drier than OMC)	(Drier than OMC)	
Moisture Ratio (%)	85.5	72.0	84.5	
Density Test Results:				
Field Wet Density (t/m³)	2.08	2.03	1.91	
Adj/Peak Conv Wet Density (t/m³)	2.06	2.02	2.00	
Density Ratio Required (%)	95	95	95	
Hilf Density Ratio (%)	100.5	100.0	95.5	

Remarks



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Accredited for compliance with ISO/IEC 17025 - Testing

Accreditation Number: 1986
Corporate Site Number: 11512



Approved Signatory: Craig Wilson
Form ID: W5ASRep Rev 2

WET DENSITY RATIO REPORT

Client:	fgf Developments	Report Number:	11512/R/22352-1
Client Address:	PO Box 6665, Cairns	Project Number:	11512/P/762
Project:	180901 - Cherrybrook Estate Stages 4 & 8	Lot Number:	
Location:	Cairns	Internal Test Request:	11512/T/11537
Component:	Field Densities	Client Reference/s:	TR 444 [22/11/2018]
Area Description:	Cherrybrook Estate Stages 4 & 8	Report Date / Page:	27/11/2018 Page 1 of 2

Test Procedures:	AS1289.5.7.1, AS1289.5.8.1, AS1289.2.1.1
------------------	--

Sample Number	11512/S/58577	11512/S/58578	11512/S/58579	11512/S/58580
ID / Client ID	GF 16	GF 17	Elec 1	Elec 2
Lot Number	-	-	-	-
Date / Time Tested	22/11/2018 13:41	22/11/2018 13:55	22/11/2018 14:11	22/11/2018 14:24
Material Source	Onsite	Onsite	Onsite	Onsite
Material Type	General Fill	General Fill	General Fill	General Fill
Sampling Method	AS1289.1.2.1 CI 6.4b	AS1289.1.2.1 CI 6.4b	AS1289.1.2.1 CI 6.4b	AS1289.1.2.1 CI 6.4b
Depths: Test / Nom / Actual (mm)	175 / 200 / 200	175 / 200 / 200	175 / 200 / 200	175 / 200 / 200
Standard or Modified	Standard	Standard	Standard	Standard
	Lot 704	Lot 801	Lot 409/410 to 507	Lot 406 to 405
	Centre of Lot	Centre of Lot	Road 03	Cherrybrook Drive
	RL 57.00	2m West of East Side	Electrical Line 1	Electrical Line 2
	General Fill	General Fill	Overlay	Overlay
Test Fraction (mm)	< 19.0 mm	< 19.0 mm	< 19.0 mm	< 19.0 mm
Sample Oversize (%)	0	0	3	8
Compaction Sample Number	11512/S/58577	11512/S/58578	11512/S/58579	11512/S/58580
Sample Description	Brown Silty Gravelly Clay	Light Brown Clay	Red Brown Silty Gravelly Clay	Red/Brown Silty Gravelly Clay
Moisture Test Results:				
Field Moisture Content (%)	11.4	6.1	9.7	10.0
Adjusted / Moisture Variation (%)	2.0	4.0	2.0	0.0
Optimum Moisture Content (%)	13.5	10.0	11.5	10.0
Moisture Variation from OMC	(Drier than OMC)	(Drier than OMC)	(Drier than OMC)	(Drier than OMC)
Moisture Ratio (%)	84.5	61.0	83.5	99.0
Density Test Results:				
Field Wet Density (t/m³)	1.98	1.89	2.12	2.26
Adj/Peak Conv Wet Density (t/m³)	2.09	2.04	2.20	2.29
Density Ratio Required (%)	95	95	98	98
Hilf Density Ratio (%)	95.0	92.5	96.5	98.5

Remarks



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Accreditation Number: 1986
Corporate Site Number: 11512



Approved Signatory: Craig Wilson
Form ID: W5ASRep Rev 2

WET DENSITY RATIO REPORT

Client:	fgf Developments	Report Number:	11512/R/22352-1
Client Address:	PO Box 6665, Cairns	Project Number:	11512/P/762
Project:	180901 - Cherrybrook Estate Stages 4 & 8	Lot Number:	
Location:	Cairns	Internal Test Request:	11512/T/11537
Component:	Field Densities	Client Reference/s:	TR 444 [22/11/2018]
Area Description:	Cherrybrook Estate Stages 4 & 8	Report Date / Page:	27/11/2018 Page 2 of 2

Test Procedures:	AS1289.5.7.1, AS1289.5.8.1, AS1289.2.1.1
------------------	--

Sample Number	11512/S/58581			
ID / Client ID	WM 1			
Lot Number	-			
Date / Time Tested	22/11/2018 14:44			
Material Source	Onsite			
Material Type	General Fill			
Sampling Method	AS1289.1.2.1 CI 6.4b			
Depths: Test / Nom / Actual (mm)	175 / 200 / 200			
Standard or Modified	Standard			
	Lot 410 to 507			
	Road 03			
	Watermain 1			
	Overlay			
Test Fraction (mm)	< 19.0 mm			
Sample Oversize (%)	0			
Compaction Sample Number	11512/S/58581			
Sample Description	Red Gravely Clay			
Moisture Test Results:				
Field Moisture Content (%)	6.7			
Adjusted / Moisture Variation (%)	3.5			
Optimum Moisture Content (%)	10.5			
Moisture Variation from OMC	(Drier than OMC)			
Moisture Ratio (%)	65.0			
Density Test Results:				
Field Wet Density (t/m³)	2.10			
Adj/Peak Conv Wet Density (t/m³)	2.15			
Density Ratio Required (%)	98			
Hilf Density Ratio (%)	98.0			

Remarks

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WET DENSITY RATIO REPORT

Client:	fgf Developments	Report Number:	11512/R/22357-2
Client Address:	PO Box 6665, Cairns	Project Number:	11512/P/762
Project:	180901 - Cherrybrook Estate Stages 4 & 8	Lot Number:	2301
Location:	Cairns	Internal Test Request:	11512/T/11523
Component:	Field Density	Client Reference/s:	TR 443 - 20/11/2018
Area Description:	GF 15	Report Date / Page:	30/11/2018 Page 1 of 1

Test Procedures:	AS1289.5.7.1, AS1289.5.8.1, AS1289.2.1.1
------------------	--

Sample Number	11512/S/58489			
ID / Client ID	GF 15			
Lot Number	2301			
Date / Time Tested	20/11/2018 12:36			
Material Source	Onsite			
Material Type	General Fill			
Sampling Method	AS1289.1.2.1 CI 6.4b			
Depths: Test / Nom / Actual (mm)	125 / 150 / 150			
Standard or Modified	Standard			
	RL 21.60			
	Centre of Lot			
	3m North of South Boundary			
Test Fraction (mm)	< 19.0 mm			
Sample Oversize (%)	0			
Compaction Sample Number	11512/S/58489			
Sample Description	Brown gravelly silt			
Moisture Test Results:				
Field Moisture Content (%)	7.7			
Adjusted / Moisture Variation (%)	3.5			
Optimum Moisture Content (%)	11.5			
Moisture Variation from OMC	(Drier than OMC)			
Moisture Ratio (%)	67.5			
Density Test Results:				
Field Wet Density (t/m³)	2.13			
Adj/Peak Conv Wet Density (t/m³)	2.09			
Density Ratio Required (%)	95			
Hilf Density Ratio (%)	102.0			

Remarks	Re-Issued Report Replaces Report No 11512/R/22357-1 (reason:).
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	The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards. Accredited for compliance with ISO/IEC 17025 - Testing		
	Accreditation Number:	1986	
	Corporate Site Number:	11512	
	Approved Signatory: Craig Wilson		
	Form ID: W5ASRep Rev 2		

WET DENSITY RATIO REPORT

Client:	fgf Developments	Report Number:	11512/R/22420-2
Client Address:	PO Box 6665, Cairns	Project Number:	11512/P/762
Project:	180901 - Cherrybrook Estate Stages 4 & 8	Lot Number:	
Location:	Cairns	Internal Test Request:	11512/T/11547
Component:	Field Densities	Client Reference/s:	TR 445 27/11/2018
Area Description:	Lots 801/1201/1203	Report Date / Page:	10/01/2019 Page 1 of 1

Test Procedures:	AS1289.5.7.1, AS1289.5.8.1, AS1289.2.1.1
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Sample Number	11512/S/58713	11512/S/58714	11512/S/58715	
ID / Client ID	GF 17 Retest	GF 18	GF 19	
Lot Number	-	-	-	
Date / Time Tested	27/11/2018 10:33	27/11/2018 10:45	27/11/2018 11:01	
Material Source	Onsite	Onsite	Onsite	
Material Type	General Fill	General Fill	General Fill	
Sampling Method	AS1289.1.2.1 CI 6.4b	AS1289.1.2.1 CI 6.4b	AS1289.1.2.1 CI 6.4b	
Depths: Test / Nom / Actual (mm)	175 / 200 / 200	175 / 200 / 200	175 / 200 / 200	
Standard or Modified	Standard	Standard	Standard	
	Lot 801	Lot 1201	Lot 1203	
	Centre of Lot	Centre of Lot	Centre of Lot	
	2m West of East Side			
	General Fill	General Fill	General Fill	
Test Fraction (mm)	< 19.0 mm	< 19.0 mm	< 19.0 mm	
Sample Oversize (%)	4	1	3	
Compaction Sample Number	11512/S/58713	11512/S/58714	11512/S/58715	
Sample Description	Red/Brown Silty Gravelly Clay	Brown Gravelly Silty Clay	Red Gravelly Sandy Clay	
Moisture Test Results:				
Field Moisture Content (%)	9.5	9.8	10.3	
Adjusted / Moisture Variation (%)	2.0	2.0	0.5	
Optimum Moisture Content (%)	11.5	12.0	11.0	
Moisture Variation from OMC	(Drier than OMC)	(Drier than OMC)	(Drier than OMC)	
Moisture Ratio (%)	83.5	83.0	94.5	
Density Test Results:				
Field Wet Density (t/m³)	2.19	2.16	2.18	
Adj/Peak Conv Wet Density (t/m³)	2.19	2.08	2.19	
Density Ratio Required (%)	95	95	95	
Hilf Density Ratio (%)	100.0	104.0	99.5	

Remarks	Re-Issued Report Replaces Report No 11512/R/22420-1 (reason:).
---------	---

	The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards. Accredited for compliance with ISO/IEC 17025 - Testing		
	Accreditation Number:	1986	
	Corporate Site Number:	11512	
	Approved Signatory: Craig Wilson		Form ID: W5ASRep Rev 2



WET DENSITY RATIO REPORT

Client:	fgf Developments	Report Number:	11512/R/23117-3
Client Address:	PO Box 6665, Cairns	Project Number:	11512/P/762
Project:	180901 - Cherrybrook Estate Stages 4 & 8	Lot Number:	Various
Location:	Cairns	Internal Test Request:	11512/T/11842
Component:	Field Density	Client Reference/s:	MTR 890
Area Description:	Lot: 1103 & 1102 - General Fill	Report Date / Page:	9/05/2019 Page 1 of 1

Test Procedures:	AS1289.5.7.1, AS1289.5.8.1, AS1289.2.1.1
------------------	--

Sample Number	11512/S/60393	11512/S/60394		
ID / Client ID	GF-20	GF-21		
Lot Number	1103	1102		
Date / Time Tested	16/04/2019 10:00	16/04/2019 10:00		
Material Source	Insitu Material	Insitu Material		
Material Type	General Fill	General Fill		
Sampling Method	AS1289.1.2.1 CI 6.4b	AS1289.1.2.1 CI 6.4b		
Depths: Test / Nom / Actual (mm)	275 / 300 / 300	275 / 300 / 300		
Standard or Modified	Standard	Standard		
Lot No.	1103	1102		
Location	Centre of Lot	Centre of Lot		
RL	Final Lift	Final Lift		
Test Fraction (mm)	< 19.0 mm	< 19.0 mm		
Sample Oversize (%)	5	5		
Compaction Sample Number	11512/S/60393	11512/S/60394		
Sample Description	Red/Brown Silty Gravelly Sandy	red silty		
Moisture Test Results:				
Field Moisture Content (%)	10.5	9.0		
Adjusted / Moisture Variation (%)	0.0	2.0		
Optimum Moisture Content (%)	10.5	11.5		
Moisture Variation from OMC	(Drier than OMC)	(Drier than OMC)		
Moisture Ratio (%)	98.0	79.5		
Density Test Results:				
Field Wet Density (t/m ³)	2.27	2.26		
Adj/Peak Conv Wet Density (t/m ³)	2.27	2.21		
Density Ratio Required (%)	95	95		
Hilf Density Ratio (%)	100.0	102.5		

Remarks	Re-Issued Report Replaces Report No 11512/R/23117-2 (reason: Project details amended).
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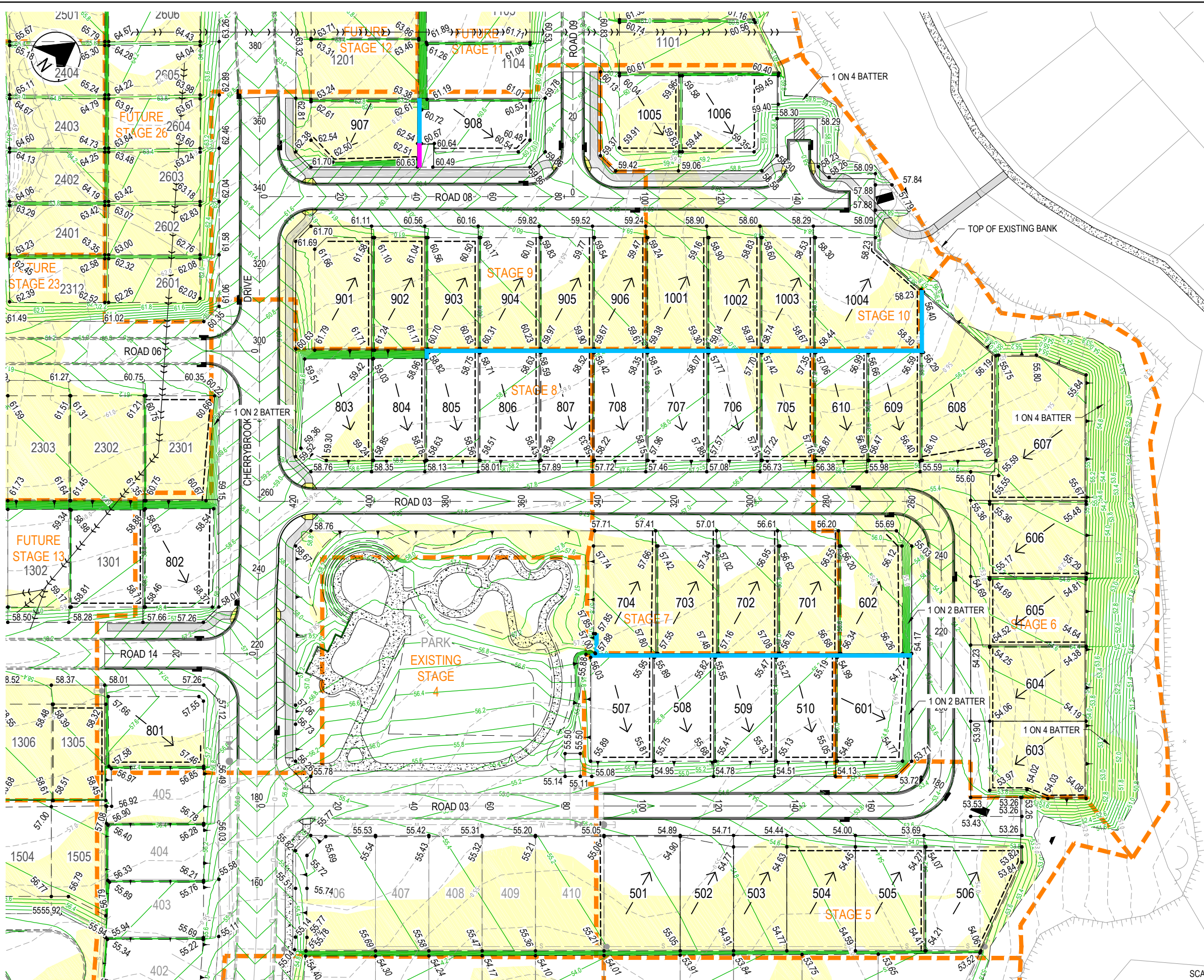
Accreditation Number: 1986

Corporate Site Number: 11512

Approved Signatory: Craig Wilson

Form ID: W5ASRep Rev 2

Appendix B – Allotment Fill Map



LEGEND

- AREAS OF FILL
- FINISHED SURFACE LEVEL
- NATURAL SURFACE LEVEL
- FALL OF LOTS
- CONCRETE PATHWAY (2m WIDE U.N.O.)
- TEMPORARY CUT-OFF DRAIN
- BATTER
- STAGE BOUNDARY
- DESIGN SURFACE CONTOURS (0.2m INTERVAL)
- BATTER BUND
- EXISTING SURFACE CONTOURS (0.5m INTERVAL)
- EXISTING STORMWATER
- EXISTING SEWER
- EXISTING WATER
- RETAINING WALL (CONCRETE SLEEPERS, DESIGN BY OTHERS)
- RETAINING WALL TO ERGON PADMOUNT (IN ACCORDANCE WITH ERGON SPECIFICATIONS)

NOTES

1. FOR NOTES, REFER DRG. DG-0502.

TYPICAL SECTION - FRONT BATTER SET BACK
N.T.S.

0.3m
4 (MAX.)
1

TYPICAL SECTION - SIDE AND REAR BATTER SET BACK
N.T.S.

0.3m
BDY
1

CONSTRUCT 150mm HIGH x 300mm WIDE BUND TO REDUCE BATTER SCOUR. REFER PLAN FOR LOCATIONS.

TYPICAL SECTION - INTERFACE BATTER DETAILS
N.T.S.

EARTHWORKS REQUIRED FOR PROPOSED STAGE

PROPOSED STAGE

FUTURE STAGE

PROPERTY BOUNDARY

5.0m

LOT LEVEL

INT LEVEL

EXTENT OF PROPOSED STAGE EARTHWORKS

NATURAL SURFACE

NATURAL SURFACE

SCALE 1:500 (A1)
1:1000 (A3)

0 10 20 30 40 50m

REV	DATE	DRAWN	REV'D	APP'D	REVISION	DRAWING NUMBER	REFERENCE DRAWING TITLE
B	09.10.18	PAM	RJC	DMc	RPEQ SIGNED		
A	16.06.17	JAH	RJC	DMc	INITIAL ISSUE		

ISSUED FOR CONSTRUCTION
FGF DEVELOPMENTS

RECEIVED
By Arielle McIlveen at 11:59 am, Oct 17, 2018

JACOBS

ABN 57 001 024 095
2000 GORDON STREET
2000 GORDON STREET
CARPENTARIA, QLD 4870
AUSTRALIA

TEL: 08 17 4031 4599
FAX: 08 17 4031 3967
WWW.JACOBS.COM.AU

CLIENT: WALKER ROAD PTY LTD
PROJECT: CHERRYBROOK - STAGES 5 TO 10

DRAWN: JAH
DESIGNED: PAM

DRAWING CHECK: RJB
DESIGN REVIEW: RJC

REVIEWED: D.McEWAN
DATE: 16.06.17

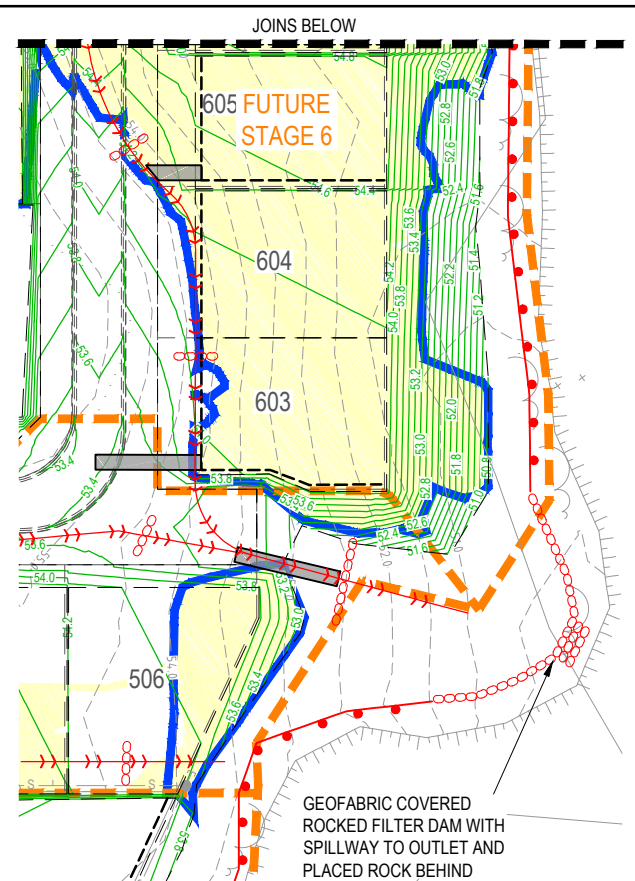
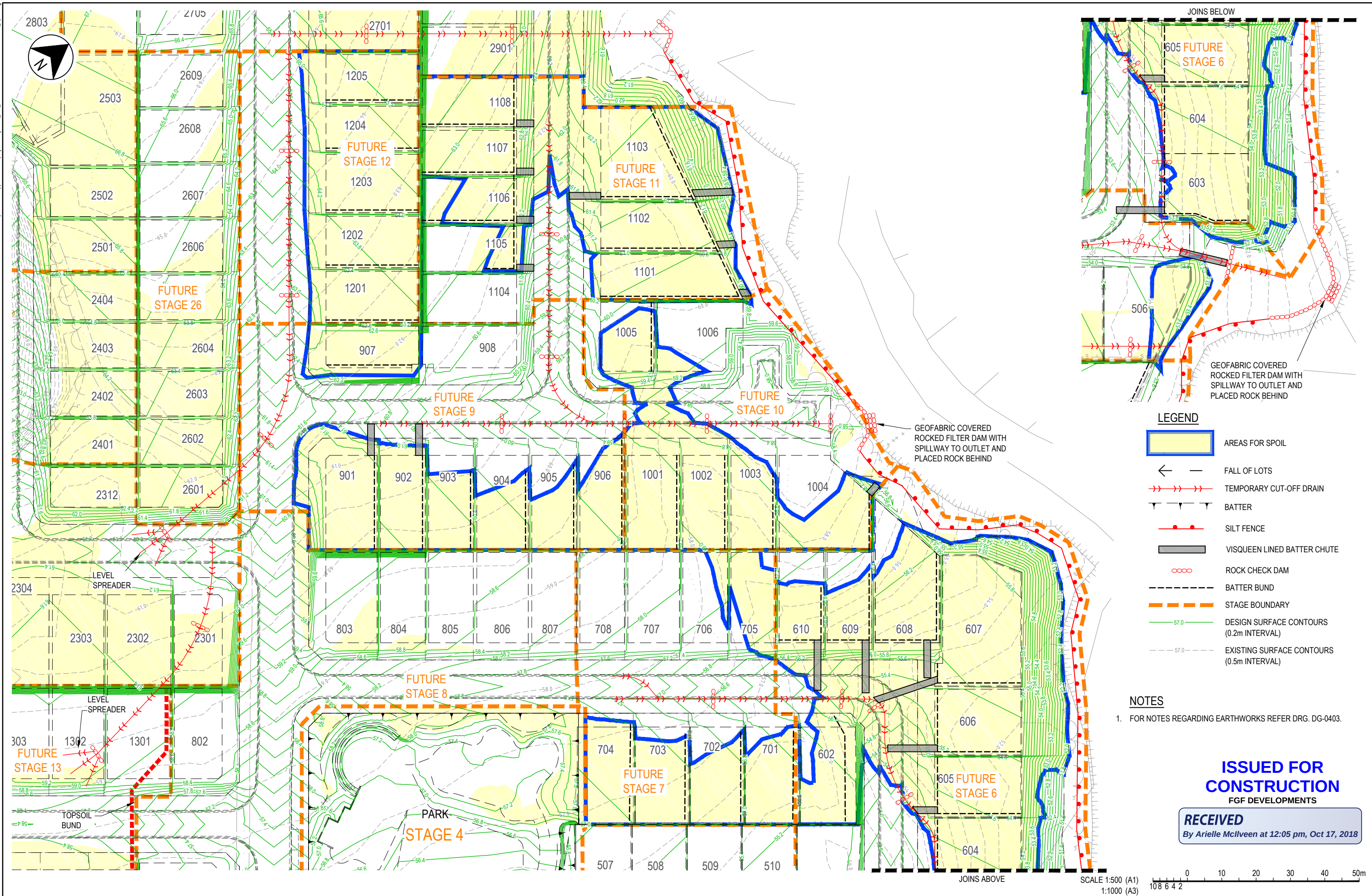
APPROVED: [Signature]
DATE: 09.10.18

TITLE: EARTHWORKS

SCALE: 1:500 (A1)

DRAWING NO: IH035500-CI-DG-0504

REV: B



- LEGEND**
- AREAS FOR SPOIL
 - FALL OF LOTS
 - TEMPORARY CUT-OFF DRAIN
 - BATTER
 - SILT FENCE
 - VISQUEEN LINED BATTER CHUTE
 - ROCK CHECK DAM
 - BATTER BUND
 - STAGE BOUNDARY
 - DESIGN SURFACE CONTOURS (0.2m INTERVAL)
 - EXISTING SURFACE CONTOURS (0.5m INTERVAL)

NOTES

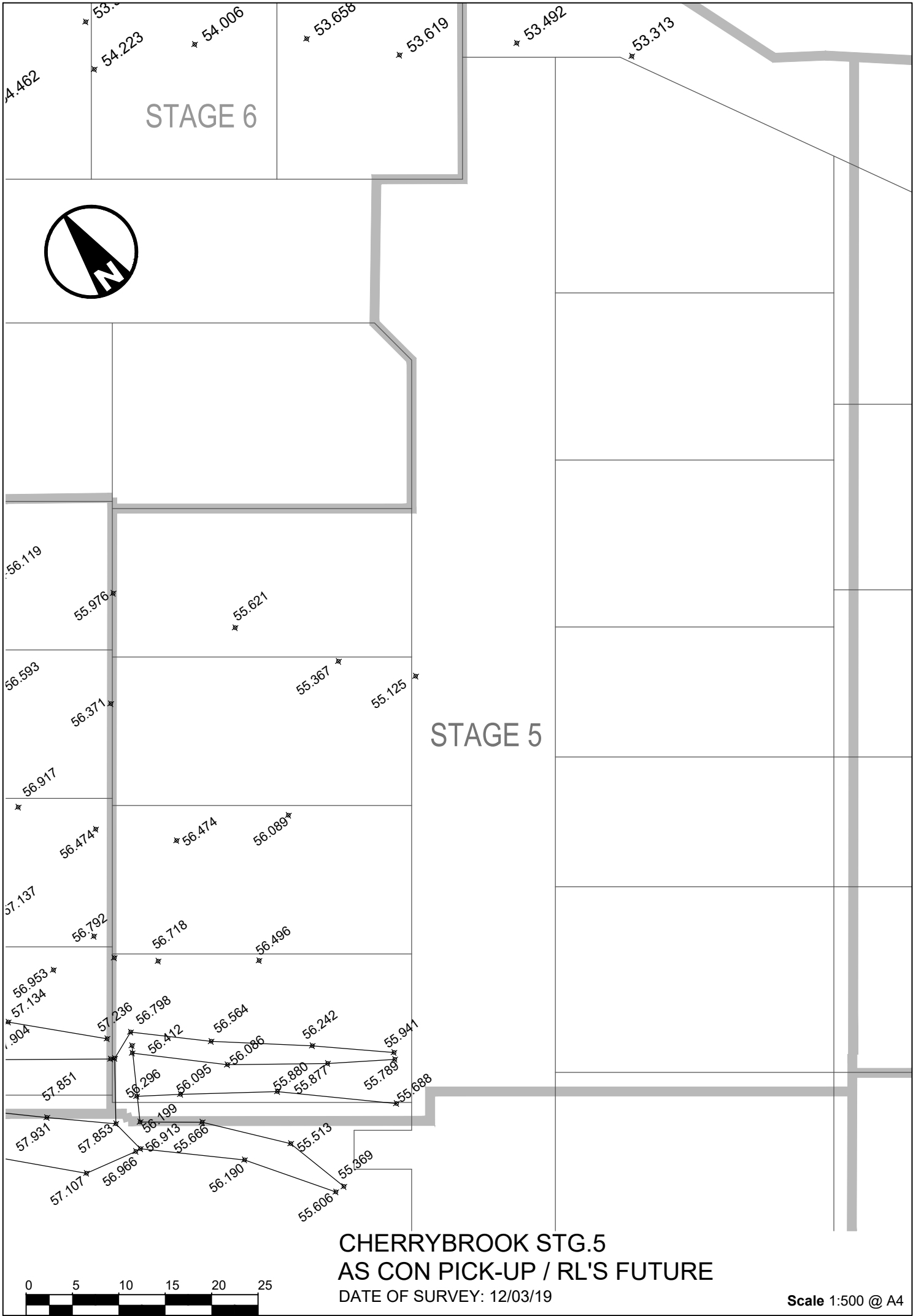
1. FOR NOTES REGARDING EARTHWORKS REFER DRG. DG-0403.

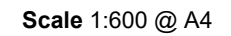
ISSUED FOR CONSTRUCTION
FGF DEVELOPMENTS
RECEIVED
By Arielle McIlveen at 12:05 pm, Oct 17, 2018

REV	DATE	DRAWN	REV'D	APP'D	REVISION	DRAWING NUMBER	REFERENCE DRAWING TITLE
D	09.10.18	PAM	RJC	DMc	EARTHWORKS REVISED IN PARK		
C	11.09.18	JP	RJC	DMc	AREAS FOR SPOIL UPDATED		
B	22.06.17	PAM	RJC	DMc	PADMOUNT LOCATION UPDATED		
A	26.05.17	JAH	RJC	DMc	INITIAL ISSUE		

JACOBS		CLIENT: WALKER ROAD PTY LTD		TITLE: EARTHWORKS SPOIL PLAN	
ABN 57 001 024 095		PROJECT: CHERRYBROOK - STAGE 4		SCALE: 1:500 (A1)	
2017 06 17 4031 4599		DRAWN: JAH		DRAWING NO: IH035500-CI-DG-0416	
CARMS, LD 4870 AUSTRALIA		DESIGNED: PAM		REV: D	
		DRAWING CHECK: RJB			
		REVIEWED: D.McEWAN			
		DATE: 26.05.17			
		APPROVED: [Signature]			
		DATE: 09.10.18			

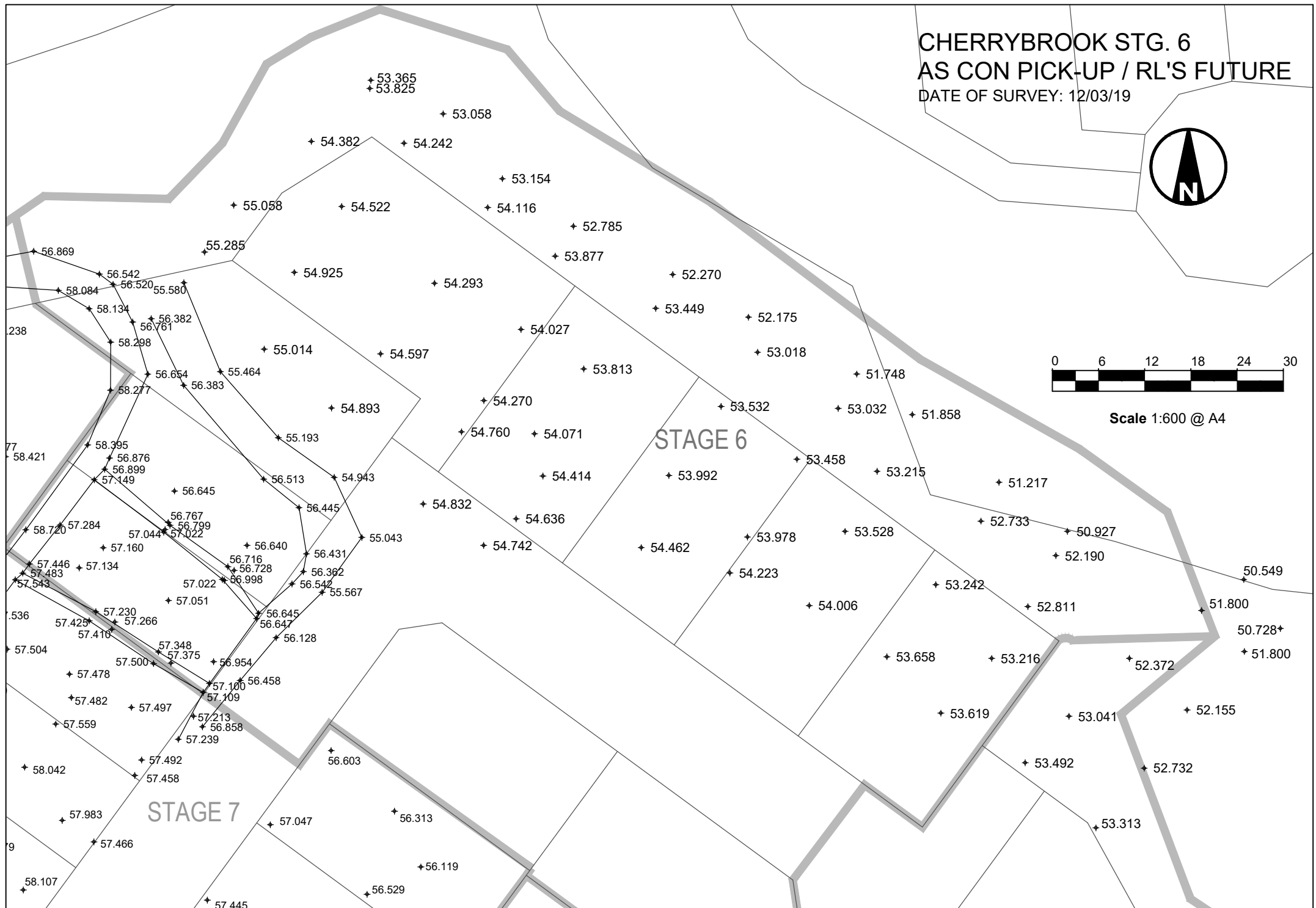
Appendix C – Current Fill Level Maps

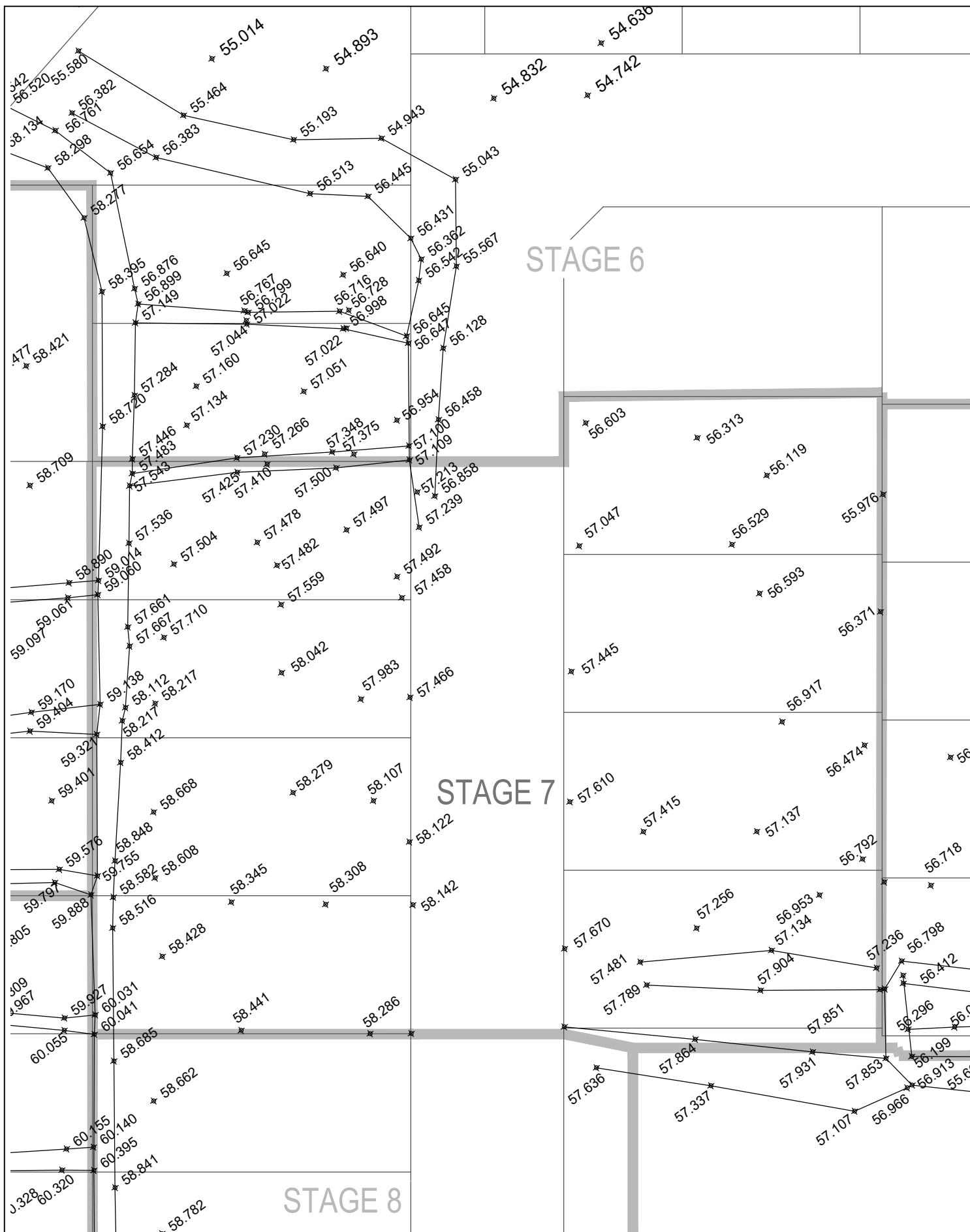




STAGE 6

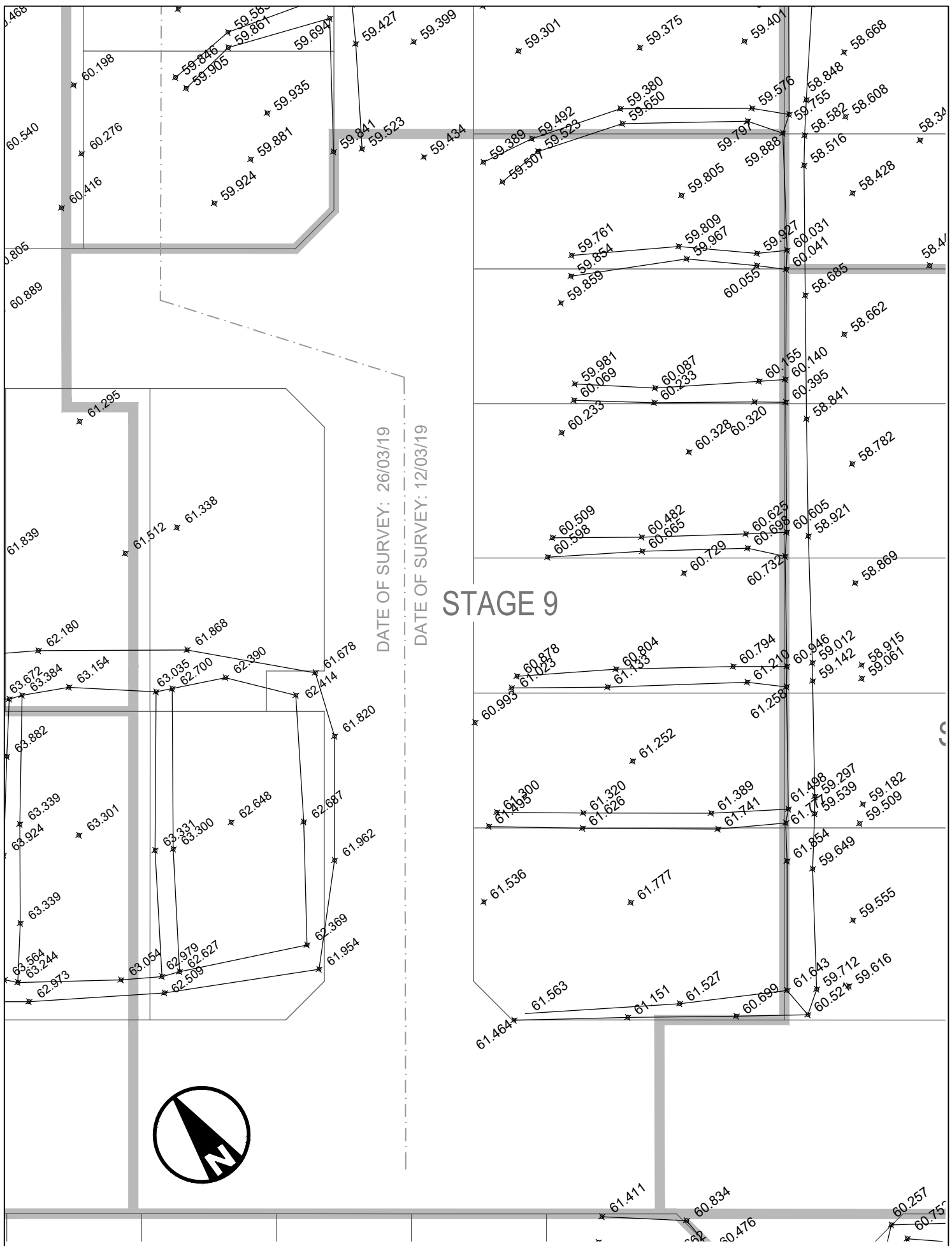
STAGE 7





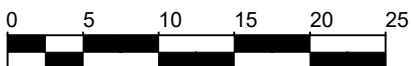
CHERRYBROOK STG.7
AS CON PICK-UP / RL'S FUTURE
DATE OF SURVEY: 12/03/19

Scale 1:500 @ A4



STAGE 9

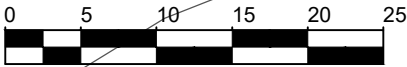
CHERRYBROOK STG.9
AS CON PICK-UP / RL'S FUTURE
DATE OF SURVEY: 12/03/19 & 26/03/19



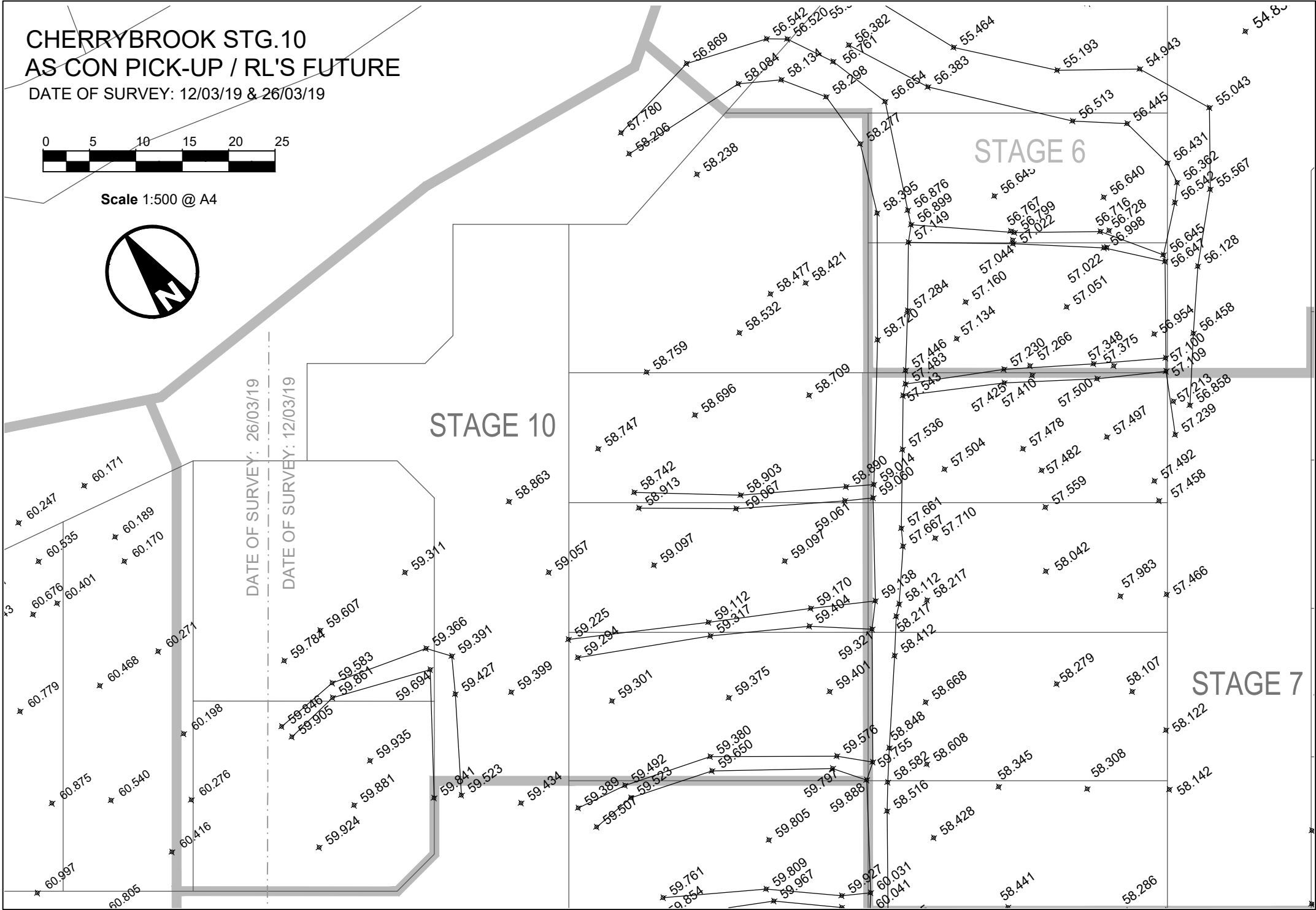
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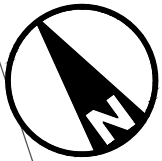
CHERRYBROOK STG.10
AS CON PICK-UP / RL'S FUTURE

DATE OF SURVEY: 12/03/19 & 26/03/19



Scale 1:500 @ A4



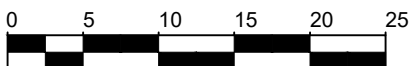


DATE OF SURVEY: 26/03/19

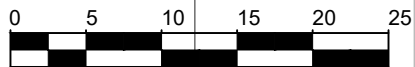
DATE OF SURVEY: 12/03/19

STAGE 11

CHERRYBROOK STG.11
AS CON PICK-UP / RL'S FUTURE
DATE OF SURVEY: 26/03/19

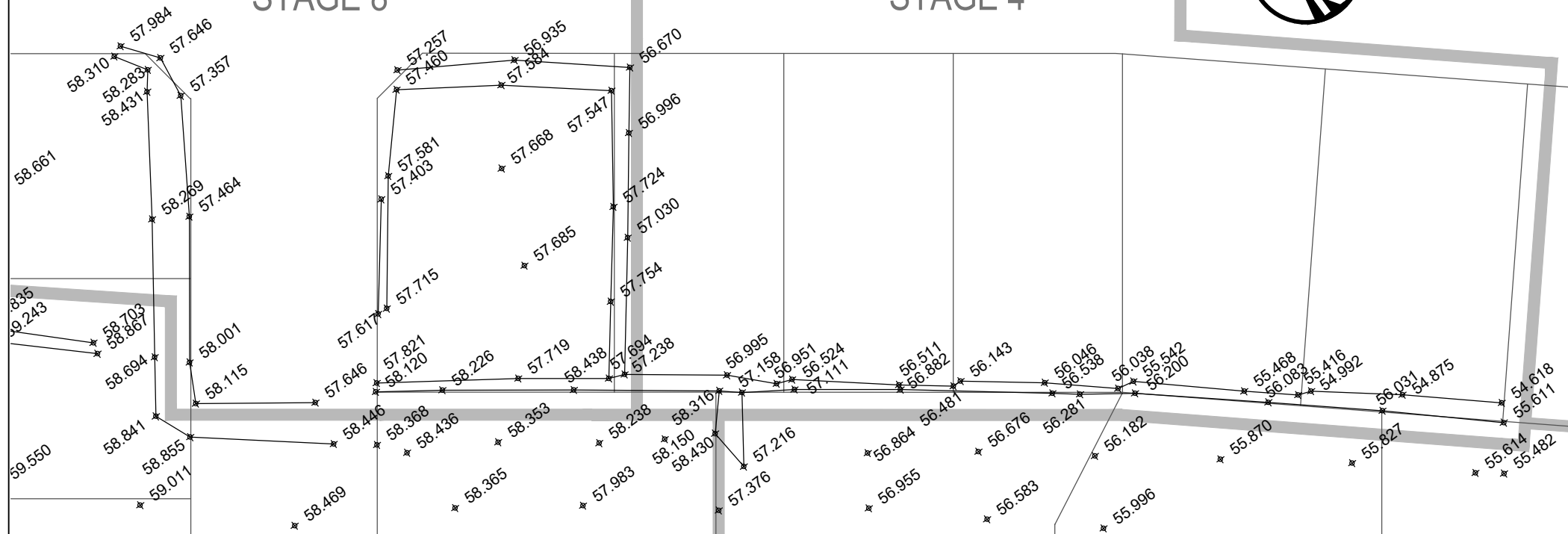


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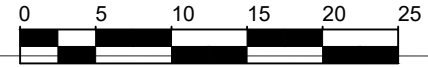
CHERRYBROOK STG.12
AS CON PICK-UP / RL'S FUTURE
DATE OF SURVEY: 26/03/19

DATE OF SURVEY: 12/03/19



CHERRYBROOK STG 8, 13, 23 & 26 AS CON PICK-UP / RL'S FUTURE

DATE OF SURVEY: 12/03/19



Scale 1:500 @ A4

STAGE 9

STAGE 8

STAGE 26

STAGE 23

STAGE 13

