

Works Inspection & Testing – Bulk Earthworks

PEBBLE CREEK RESIDENTIAL DEVELOPMENT – STAGE 9

Prepared for **BMD Urban Pty Ltd**

24th July 2023





Document Information

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Appendix A : Site Works Photographs

Appendix B : Earthworks Testing

Appendix C : Lot Certificates



1. Introduction & Scope of Works

Construction Sciences was commissioned by BMD Urban Pty Ltd to carry out the geotechnical inspection and testing required for a proposed residential subdivision at Pebble Creek Residential Development – Stage 9

Inspection and testing of the earthworks was carried out during the 8th of April 2022 to the 2nd of August 2022.

Works on this development were monitored in accordance with the scope of our commission as follows:-

Level 1 : Earthworks stripping and filling was inspected and tested on a Level 1 basis, in accordance with AS 3798.

Scope of Level 1 responsibility: ***“The primary objective of Level 1 Inspection and Testing is for the geotechnical inspection and testing authority (GITA) to be able to express an opinion on the compliance of the work. The GITA is responsible for ensuring that the inspection and testing is sufficient for this purpose.***

The GITA needs to have competent personnel on site at all times while earthwork operations are undertaken. Such operations include the following:

- (a) Completion of removal of topsoil.***
- (b) Placing of imported or cut material.***
- (c) Compaction and adding/removal of moisture.***
- (d) Trenching and backfilling, where applicable.***
- (e) Test rolling.***
- (f) Testing.***

The superintendent should agree on a suitable inspection and testing plan prior to the commencement of the works”.

reference AS3798 – Section 8.2



2. Specification Requirements

Earthworks on this development were inspected and tested in accordance with the specification of the design engineer Colliers International Engineering & Design Pty Ltd and to the specifications of the local authority Logan City Council.

The following table is a summary of the basic compaction requirements for the project.

Testing procedures used to confirm that these requirements were met were all in accordance with Australian Standard test methods.

SPECIFICATIONS	
<i>Item</i>	<i>Minimum Compaction Requirement</i>
<i>Earthworks Fill</i>	<i>95% Wet Density Ratio</i>



3. Site Works – Bulk Earthworks

3.1 General

Full time site inspection was maintained in accordance with Level 1 requirements whilst earthworks were carried out.

The natural ground in the areas of filling generally comprised sandy clays.

The material used in the bulk earthworks filling was site won.

3.2 Compaction Control Testing

Compaction control testing via the nuclear densometer method was carried out at regular intervals throughout the placement of fill, in accordance with the minimum test frequency recommendations included in AS3798 "Guidelines on Earthworks for Commercial and Residential Developments".

A total of 6 field density tests were carried out throughout the earthworks. The average density ratio was recorded to be 99.1%.

Approximate test locations are marked on attached sketch P2136 SK1 included in Appendix B.

Progressive photographs taken during the bulk earthworks operations are included in Appendix A.



4. Conclusion

We confirm that:

- (a) Our representative was in full time site attendance whilst earthworks filling was in progress during / between 8th of April 2022 to the 2nd of August 2022.
- (b) Pre – fill ground preparation was carried out in accordance with the specifications and site instruction given.
- (c) The structural filling placed to design levels during the term of our engagement on a “Level 1” basis can be termed “controlled filling”.
- (d) The results of the compaction control testing indicate that the fill placed during the term of our site attendance, was compacted to at least the minimum specified density ratio.
- (e) All test results pertaining to the bulk earthworks are included within Appendix B of this report.

MATHEW TYRRELL
LABORATORY MANAGER
Construction Sciences



Appendix A

Site Works Photographs



**Construction
Sciences**

SITE WORKS PHOTOGRAPHS

Job No.:

P2136

Client:

BMD

Project:

Pebble Creek - Stage 9



SITE WORKS PHOTOGRAPHS

Job No.:

P2136

Client:

BMD

Project:

Pebble Creek - Stage 9



SITE WORKS PHOTOGRAPHS

Job No.:

P2136



Client:

BMD

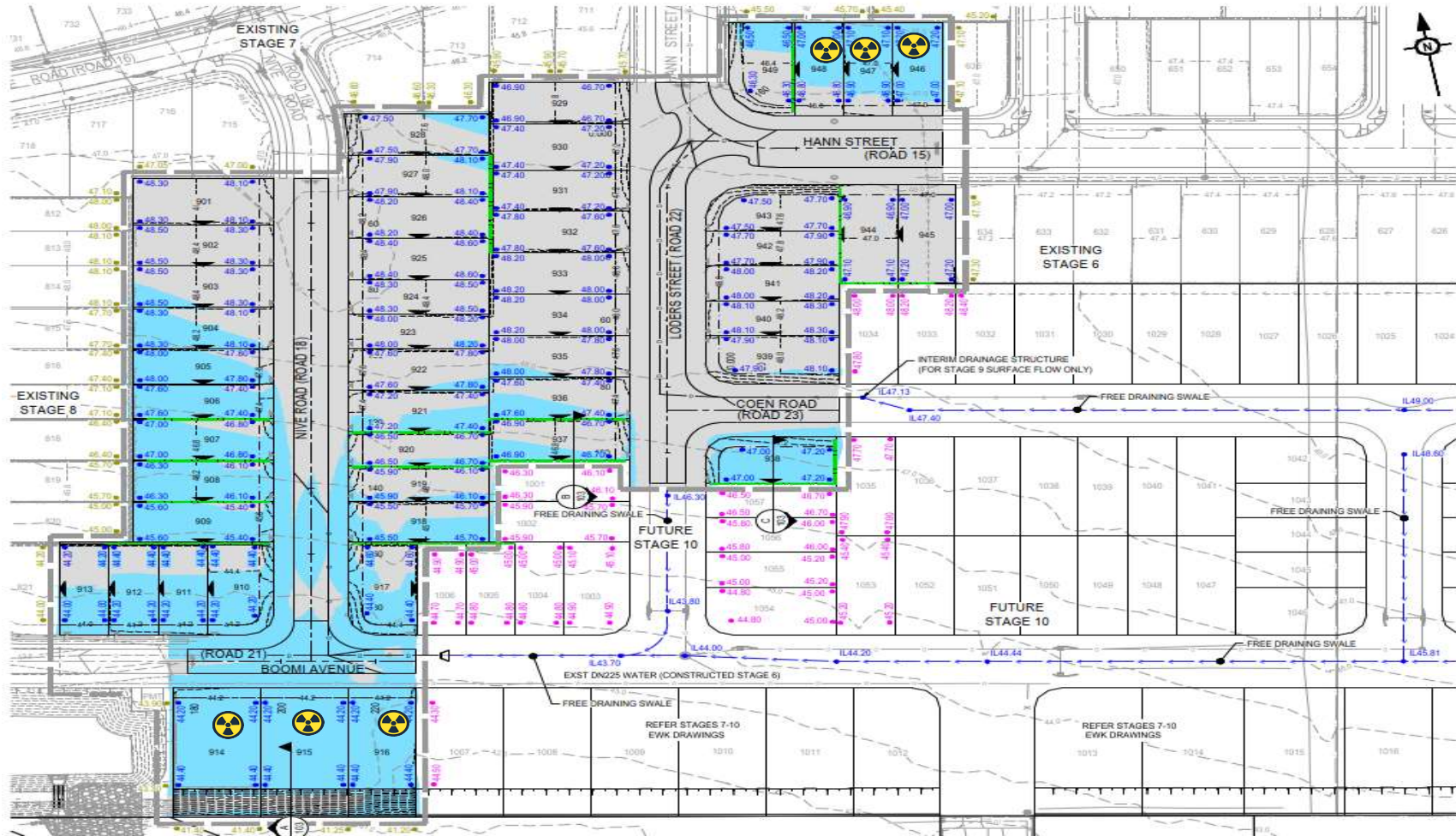
Project:

Pebble Creek - Stage 9



Appendix B

Bulk Earthworks



Denotes approximate field density test location



**Construction
Sciences**

BULK EARTHWORKS

Client: BMD Urban
Project: Pebble Creek Stage 9

Job No.: P2136

Sketch No.: SK1

Date Issued: 24/07/2023



WET DENSITY RATIO REPORT

Client: BMD Urban Pty Ltd Client Address: PO Box 197, WYNNUM Project: Pebble Creek Stages 7-10 Location: South Maclean Component: Bulk Earthworks Area Description: Stages 7-10	Report Number: 1979/R/79238-1 Project Number: 1979/P/2136 Lot Number: Internal Test Request: 1979/T/39160 Client Reference/s: Bulk Earthworks Report Date / Page: 4/11/2022 Page 1 of 4
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Test Procedures:	AS1289.5.7.1, AS1289.5.8.1, AS1289.2.1.1
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Sample Number	1979/S/197408	1979/S/197409	1979/S/197410	1979/S/197411
ID / Client ID	-	-	-	-
Lot Number	-	-	-	-
Date / Time Tested	2/08/2022	2/08/2022	2/08/2022	2/08/2022
Material Source	On-Site	On-Site	On-Site	On-Site
Material Type	Bulk Fill	Bulk Fill	Bulk Fill	Bulk 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)	275 / 300 / 300	275 / 300 / 300	275 / 300 / 300	275 / 300 / 300
Standard or Modified	Standard	Standard	Standard	Standard
Location	Lot 825 N/E Corner 13m S, 6m W	Lot 824 N/E Corner 10m S, 4m W	Lot 823 N/E Corner 12m S, 5m W	Lot 822 N/E Corner 8m S, 6m W
Level	F/L	F/L	F/L	F/L
Test Fraction (mm)	< 19.0 mm	< 19.0 mm	< 19.0 mm	< 19.0 mm
Sample Oversize (%)	1	0	2	1
Compaction Sample Number	1979/S/197408	1979/S/197409	1979/S/197410	1979/S/197411
Sample Description	Clayey Sand	Clayey Sand	Clayey Sand	Clayey Sand
Moisture Test Results:				
Field Moisture Content (%)	14.1	11.5	12.9	10.5
Adjusted / Moist. Variation (%)	1.5	1.5	1.5	0.0
Optimum Moisture Content (%)	15.5	13.0	14.5	10.5
Moisture Variation from OMC	(Drier than OMC)	(Drier than OMC)	(Drier than OMC)	(Wetter than OMC)
Moisture Ratio (%)	91.0	90.0	89.5	101.0
Density Test Results:				
Field Wet Density (t/m ³)	2.03	2.09	2.10	2.07
Adj/Peak Conv Wet Density (t/m ³)	2.13	2.15	2.13	2.13
Density Ratio Required (%)	95	95	95	95
Hilf Density Ratio (%)	95.5	97.0	98.5	97.0

Remarks

Accredited for compliance with ISO/IEC 17025 – Testing	
	Approved Signatory: Dean Stimpson Form ID: W5ASMRRep Rev 2
Accreditation Number: 1986 Corporate Site Number: 1979	



WET DENSITY RATIO REPORT

Client: BMD Urban Pty Ltd Client Address: PO Box 197, WYNNUM Project: Pebble Creek Stages 7-10 Location: South Maclean Component: Bulk Earthworks Area Description: Stages 7-10	Report Number: 1979/R/79238-1 Project Number: 1979/P/2136 Lot Number: Internal Test Request: 1979/T/39160 Client Reference/s: Bulk Earthworks Report Date / Page: 4/11/2022 Page 2 of 4
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Test Procedures:	AS1289.5.7.1, AS1289.5.8.1, AS1289.2.1.1
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Sample Number	1979/S/197412	1979/S/197413	1979/S/197414	1979/S/197415
ID / Client ID	-	-	-	-
Lot Number	-	-	-	-
Date / Time Tested	2/08/2022	2/08/2022	2/08/2022	2/08/2022
Material Source	On-Site	On-Site	On-Site	On-Site
Material Type	Bulk Fill	Bulk Fill	Bulk Fill	Bulk 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)	275 / 300 / 300	275 / 300 / 300	275 / 300 / 300	275 / 300 / 300
Standard or Modified	Standard	Standard	Standard	Standard
Location	Lot 1035 N/E Corner 13m S, 4m W	Lot 1036 N/W Corner 13m S, 5m E	Lot 1037 N/E Corner 9m S, 2m W	Lot 1038 N/E Corner 14m S, 5m W
Level	F/L	F/L	F/L	F/L
Test Fraction (mm)	< 19.0 mm	< 19.0 mm	< 19.0 mm	< 19.0 mm
Sample Oversize (%)	4	1	2	2
Compaction Sample Number	1979/S/197412	1979/S/197413	1979/S/197414	1979/S/197415
Sample Description	Clayey Sand	Clayey Sand	Clayey Sand	Clayey Sand
Moisture Test Results:				
Field Moisture Content (%)	11.1	13.8	11.7	11.9
Adjusted / Moist. Variation (%)	1.5	1.5	1.5	1.5
Optimum Moisture Content (%)	12.5	15.5	13.5	13.5
Moisture Variation from OMC	(Drier than OMC)	(Drier than OMC)	(Drier than OMC)	(Drier than OMC)
Moisture Ratio (%)	89.0	90.0	88.0	88.0
Density Test Results:				
Field Wet Density (t/m ³)	2.21	2.04	1.95	2.04
Adj/Peak Conv Wet Density (t/m ³)	2.16	2.12	2.06	2.15
Density Ratio Required (%)	95	95	95	95
Hilf Density Ratio (%)	102.0	96.0	95.0	95.0

Remarks

Accredited for compliance with ISO/IEC 17025 – Testing	
	Approved Signatory: Dean Stimpson Form ID: W5ASMRRep Rev 2
Accreditation Number: 1986 Corporate Site Number: 1979	



WET DENSITY RATIO REPORT

Client: BMD Urban Pty Ltd Client Address: PO Box 197, WYNNUM Project: Pebble Creek Stages 7-10 Location: South Maclean Component: Bulk Earthworks Area Description: Stages 7-10	Report Number: 1979/R/79238-1 Project Number: 1979/P/2136 Lot Number: Internal Test Request: 1979/T/39160 Client Reference/s: Bulk Earthworks Report Date / Page: 4/11/2022 Page 3 of 4
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Test Procedures:	AS1289.5.7.1, AS1289.5.8.1, AS1289.2.1.1
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Sample Number	1979/S/197416	1979/S/197417	1979/S/197418	1979/S/197419
ID / Client ID	-	-	-	-
Lot Number	-	-	-	-
Date / Time Tested	2/08/2022	2/08/2022	2/08/2022	2/08/2022
Material Source	On-Site	On-Site	On-Site	On-Site
Material Type	Bulk Fill	Bulk Fill	Bulk Fill	Bulk 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)	275 / 300 / 300	275 / 300 / 300	275 / 300 / 300	275 / 300 / 300
Standard or Modified	Standard	Standard	Standard	Standard
Location	Lot 1039 N/W Corner 10m S, 3m E	Lot 1040 N/W Corner 8m S, 5m E	Lot 1041 N/W Corner 18m S, 5m E	Lot 946 S/E Corner 17m N, 5m W
Level	F/L	F/L	F/L	F/L
Test Fraction (mm)	< 19.0 mm	< 19.0 mm	< 19.0 mm	< 19.0 mm
Sample Oversize (%)	3	1	2	4
Compaction Sample Number	1979/S/197416	1979/S/197417	1979/S/197418	1979/S/197419
Sample Description	Clayey Sand	Clayey Sand	Clayey Sand	Clayey Sand
Moisture Test Results:				
Field Moisture Content (%)	12.3	12.4	11.4	11.2
Adjusted / Moist. Variation (%)	1.5	1.5	1.5	1.5
Optimum Moisture Content (%)	14.0	14.0	13.0	13.0
Moisture Variation from OMC	(Drier than OMC)	(Drier than OMC)	(Drier than OMC)	(Drier than OMC)
Moisture Ratio (%)	88.5	89.0	89.0	87.0
Density Test Results:				
Field Wet Density (t/m ³)	1.97	2.11	2.04	2.02
Adj/Peak Conv Wet Density (t/m ³)	2.06	2.13	2.03	2.02
Density Ratio Required (%)	95	95	95	95
Hilf Density Ratio (%)	95.5	99.0	100.0	100.0

Remarks

Accredited for compliance with ISO/IEC 17025 – Testing		
	Accreditation Number: 1986 Corporate Site Number: 1979	Approved Signatory: Dean Stimpson Form ID: W5ASMRRep Rev 2



WET DENSITY RATIO REPORT

Client: BMD Urban Pty Ltd	Report Number: 1979/R/79238-1
Client Address: PO Box 197, WYNNUM	Project Number: 1979/P/2136
Project: Pebble Creek Stages 7-10	Lot Number:
Location: South Maclean	Internal Test Request: 1979/T/39160
Component: Bulk Earthworks	Client Reference/s: Bulk Earthworks
Area Description: Stages 7-10	Report Date / Page: 4/11/2022 Page 4 of 4

Test Procedures:	AS1289.5.7.1, AS1289.5.8.1, AS1289.2.1.1
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Sample Number	1979/S/197420	1979/S/197421	1979/S/197422
ID / Client ID	-	-	-
Lot Number	-	-	-
Date / Time Tested	2/08/2022	2/08/2022	2/08/2022
Material Source	On-Site	On-Site	On-Site
Material Type	Bulk Fill	Bulk Fill	Bulk 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
Location	Lot 947 S/E Corner 19m N, 3m W	Lot 948 S/E Corner 12m N, 5m W	Lot 739 S/E Corner 17m N, 4m W
Level	F/L	F/L	F/L
Test Fraction (mm)	< 19.0 mm	< 19.0 mm	< 19.0 mm
Sample Oversize (%)	2	2	1
Compaction Sample Number	1979/S/197420	1979/S/197421	1979/S/197422
Sample Description	Clayey Sand	Clayey Sand	Clayey Sand
Moisture Test Results:			
Field Moisture Content (%)	11.1	10.5	10.8
Adjusted / Moist. Variation (%)	1.5	1.5	1.5
Optimum Moisture Content (%)	12.5	12.0	12.5
Moisture Variation from OMC	(Drier than OMC)	(Drier than OMC)	(Drier than OMC)
Moisture Ratio (%)	89.0	87.5	86.5
Density Test Results:			
Field Wet Density (t/m ³)	2.09	2.04	2.09
Adj/Peak Conv Wet Density (t/m ³)	2.05	2.13	2.18
Density Ratio Required (%)	95	95	95
Hilf Density Ratio (%)	102.0	96.0	96.0

Remarks

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Accreditation Number: 1986 Corporate Site Number: 1979	



WET DENSITY RATIO REPORT

Client: BMD Urban Pty Ltd Client Address: PO Box 197, WYNNUM Project: Pebble Creek Stages 7-10 Location: South Maclean Component: Bulk Earthworks Area Description: Stages 7-10	Report Number: 1979/R/65207-1 Project Number: 1979/P/2136 Lot Number: Internal Test Request: 1979/T/35741 Client Reference/s: WR5572 Report Date / Page: 13/04/2022 Page 1 of 3
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Test Procedures:	AS1289.5.7.1, AS1289.5.8.1, AS1289.2.1.1
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Sample Number	1979/S/182071	1979/S/182072	1979/S/182073	1979/S/182074
ID / Client ID	EW-06	EW-07	EW-08	EW-09
Lot Number	-	-	-	-
Date / Time Tested	8/04/2022 08:15	8/04/2022 08:20	8/04/2022 08:25	8/04/2022 08:30
Material Source	On-Site	On-Site	On-Site	On-Site
Material Type	Bulk Fill	Bulk Fill	Bulk Fill	Bulk 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)	275 / 300 / 300	275 / 300 / 300	275 / 300 / 300	275 / 300 / 300
Standard or Modified	Standard	Standard	Standard	Standard
Location	Lot 916 N/E Corner 8m S, 6m W	Lot 1007 N/E Corner 4m S, 8m W	Lot 1008 N/E Corner 20m S, 3m W	Lot 1009 N/E Corner 16m S, 4m W
Level	RL: 42.9	RL: 44.1	RL: 44.2	RL: 44.3
Test Fraction (mm)	< 19.0 mm	< 19.0 mm	< 19.0 mm	< 19.0 mm
Sample Oversize (%)	0	0	0	0
Compaction Sample Number	1979/S/182071	1979/S/182072	1979/S/182073	1979/S/182074
Sample Description	Sandy CLAY - Brown	Sandy CLAY - Brown	Sandy CLAY - Brown	Sandy CLAY - Brown
Moisture Test Results:				
Field Moisture Content (%)	13.0	13.9	13.5	12.8
Adjusted / Moist. Variation (%)	1.5	1.5	1.5	0.0
Optimum Moisture Content (%)	14.5	15.5	15.0	13.0
Moisture Variation from OMC	(Drier than OMC)	(Drier than OMC)	(Drier than OMC)	(at OMC)
Moisture Ratio (%)	89.5	90.5	90.0	100.0
Density Test Results:				
Field Wet Density (t/m ³)	2.12	2.12	2.11	2.11
Adj/Peak Conv Wet Density (t/m ³)	2.16	2.14	2.14	2.20
Density Ratio Required (%)	95	95	95	95
Hiif Density Ratio (%)	98.5	99.0	98.5	96.0

Remarks

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Accreditation Number: 1986 Corporate Site Number: 1979	



WET DENSITY RATIO REPORT

Client: BMD Urban Pty Ltd Client Address: PO Box 197, WYNNUM Project: Pebble Creek Stages 7-10 Location: South Maclean Component: Bulk Earthworks Area Description: Stages 7-10	Report Number: 1979/R/65207-1 Project Number: 1979/P/2136 Lot Number: Internal Test Request: 1979/T/35741 Client Reference/s: WR5572 Report Date / Page: 13/04/2022 Page 2 of 3
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Test Procedures:	AS1289.5.7.1, AS1289.5.8.1, AS1289.2.1.1
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Sample Number	1979/S/182075	1979/S/182076	1979/S/182077	1979/S/182078
ID / Client ID	EW-10	EW-11	EW-12	EW-13
Lot Number	-	-	-	-
Date / Time Tested	8/04/2022 08:35	8/04/2022 08:40	8/04/2022 08:45	8/04/2022 08:50
Material Source	On-Site	On-Site	On-Site	On-Site
Material Type	Bulk Fill	Bulk Fill	Bulk Fill	Bulk 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)	275 / 300 / 300	275 / 300 / 300	275 / 300 / 300	275 / 300 / 300
Standard or Modified	Standard	Standard	Standard	Standard
Location	Lot 1010 N/E Corner 12m S, 6m W	Lot 1011 N/E Corner 8m S, 4m W	Lot 1012 N/E Corner 18m S, 8m W	Lot 1013 N/E Corner 14m S, 6m W
Level	RL: 44.3	RL: 44.2	RL: 44.4	RL: 44.0
Test Fraction (mm)	< 19.0 mm	< 19.0 mm	< 19.0 mm	< 19.0 mm
Sample Oversize (%)	0	2	0	0
Compaction Sample Number	1979/S/182075	1979/S/182076	1979/S/182077	1979/S/182078
Sample Description	Sandy CLAY - Brown	Sandy CLAY - Brown	Sandy CLAY - Brown	Sandy CLAY - Brown
Moisture Test Results:				
Field Moisture Content (%)	14.6	14.5	14.5	14.3
Adjusted / Moist. Variation (%)	1.5	1.5	1.5	1.5
Optimum Moisture Content (%)	16.0	16.0	16.0	16.0
Moisture Variation from OMC	(Drier than OMC)	(Drier than OMC)	(Drier than OMC)	(Drier than OMC)
Moisture Ratio (%)	90.0	90.5	89.5	90.5
Density Test Results:				
Field Wet Density (t/m ³)	2.14	2.12	2.15	2.16
Adj/Peak Conv Wet Density (t/m ³)	2.17	2.14	2.18	2.22
Density Ratio Required (%)	95	95	95	95
Hilf Density Ratio (%)	99.0	99.0	98.5	97.5

Remarks

Accredited for compliance with ISO/IEC 17025 – Testing	
 Accreditation Number: 1986 Corporate Site Number: 1979	Approved Signatory: Dean Stimpson Form ID: W5ASMRRep Rev 2



WET DENSITY RATIO REPORT

Client: BMD Urban Pty Ltd Client Address: PO Box 197, WYNNUM Project: Pebble Creek Stages 7-10 Location: South Maclean Component: Bulk Earthworks Area Description: Stages 7-10	Report Number: 1979/R/65207-1 Project Number: 1979/P/2136 Lot Number: Internal Test Request: 1979/T/35741 Client Reference/s: WR5572 Report Date / Page: 13/04/2022 Page 3 of 3
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Test Procedures:	AS1289.5.7.1, AS1289.5.8.1, AS1289.2.1.1
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Sample Number	1979/S/182079	1979/S/182080	1979/S/182081	1979/S/182082
ID / Client ID	EW-14	EW-15	EW-16	EW-17
Lot Number	-	-	-	-
Date / Time Tested	8/04/2022 08:55	8/04/2022 09:00	8/04/2022 09:05	8/04/2022 09:10
Material Source	On-Site	On-Site	On-Site	On-Site
Material Type	Bulk Fill	Bulk Fill	Bulk Fill	Bulk 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)	275 / 300 / 300	275 / 300 / 300	275 / 300 / 300	275 / 300 / 300
Standard or Modified	Standard	Standard	Standard	Standard
Location	Lot 1014 N/E Corner 10m S, 4m W	Lot 1015 N/E Corner 22m S, 10m W	Lot 1016 N/E Corner 19m S, 5m W	Lot 1017 N/E Corner 17m S, 3m W
Level	RL: 44.1	RL: 44.2	RL: 44.3	RL: 44.5
Test Fraction (mm)	< 19.0 mm	< 19.0 mm	< 19.0 mm	< 19.0 mm
Sample Oversize (%)	1	0	0	0
Compaction Sample Number	1979/S/182079	1979/S/182080	1979/S/182081	1979/S/182082
Sample Description	Sandy CLAY - Brown	Sandy CLAY - Brown	Sandy CLAY - Brown	Sandy CLAY - Brown
Moisture Test Results:				
Field Moisture Content (%)	14.6	12.6	13.5	13.8
Adjusted / Moist. Variation (%)	1.5	1.5	1.0	1.5
Optimum Moisture Content (%)	16.0	14.0	14.5	15.0
Moisture Variation from OMC	(Drier than OMC)	(Drier than OMC)	(Drier than OMC)	(Drier than OMC)
Moisture Ratio (%)	90.0	89.5	92.0	91.0
Density Test Results:				
Field Wet Density (t/m ³)	2.15	2.15	2.14	2.14
Adj/Peak Conv Wet Density (t/m ³)	2.16	2.21	2.20	2.21
Density Ratio Required (%)	95	95	95	95
Hilf Density Ratio (%)	99.0	97.5	97.5	96.5

Remarks

Accredited for compliance with ISO/IEC 17025 – Testing	
	Approved Signatory: Dean Stimpson Form ID: W5ASMRRep Rev 2
Accreditation Number: 1986 Corporate Site Number: 1979	



WET DENSITY RATIO REPORT

Client: BMD Urban Pty Ltd Client Address: PO Box 197, WYNNUM Project: Pebble Creek Stages 7-10 Location: South Maclean Component: Bulk Earthworks Area Description: Stages 7-10	Report Number: 1979/R/65598-1 Project Number: 1979/P/2136 Lot Number: Internal Test Request: 1979/T/36040 Client Reference/s: WR5811 Report Date / Page: 10/05/2022 Page 1 of 2
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Test Procedures:	AS1289.5.7.1, AS1289.5.8.1, AS1289.2.1.1
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Sample Number	1979/S/184104	1979/S/184105	1979/S/184106	1979/S/184107
ID / Client ID	EW-34	EW-35	EW-36	EW-37
Lot Number	-	-	-	-
Date / Time Tested	4/05/2022 11:40	4/05/2022 11:45	4/05/2022 11:55	4/05/2022 12:00
Material Source	On-Site	On-Site	On-Site	On-Site
Material Type	Bulk Fill	Bulk Fill	Bulk Fill	Bulk 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)	275 / 300 / 300	275 / 300 / 300	275 / 300 / 300	275 / 300 / 300
Standard or Modified	Standard	Standard	Standard	Standard
Location	Lot 914 N/E Corner 6m S, 5m W	Lot 915 N/E Corner 10m S, 4m W	Bio Basin Southern Basin Wall 10m W	Bio Basin Southern Basin Wall 22m W
Level	42.7	42.7	43.1	43.2
Test Fraction (mm)	< 19.0 mm	< 19.0 mm	< 19.0 mm	< 19.0 mm
Sample Oversize (%)	0	0	0	0
Compaction Sample Number	1979/S/184104	1979/S/184105	1979/S/184106	1979/S/184107
Sample Description	Clayey SAND - Light Brown	Clayey SAND - Light Brown	Clayey SAND - Brown	Clayey SAND - Light Brown
Moisture Test Results:				
Field Moisture Content (%)	12.6	12.5	12.9	12.4
Adjusted / Moist. Variation (%)	1.5	1.5	1.5	1.5
Optimum Moisture Content (%)	14.5	14.0	14.5	13.5
Moisture Variation from OMC	(Drier than OMC)	(Drier than OMC)	(Drier than OMC)	(Drier than OMC)
Moisture Ratio (%)	88.0	88.5	90.0	90.5
Density Test Results:				
Field Wet Density (t/m ³)	2.10	2.11	2.12	2.14
Adj/Peak Conv Wet Density (t/m ³)	2.16	2.08	2.09	2.16
Density Ratio Required (%)	95	95	95	95
Hiif Density Ratio (%)	97.0	101.0	101.5	98.5

Remarks

<div style="text-align: center;">Accredited for compliance with ISO/IEC 17025 – Testing</div>  <p>Accreditation Number: 1986 Corporate Site Number: 1979</p>	<div style="text-align: center;">  Approved Signatory: Dean Stimpson Form ID: W5ASMRRep Rev 2 </div>
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WET DENSITY RATIO REPORT

Client: BMD Urban Pty Ltd Client Address: PO Box 197, WYNNUM Project: Pebble Creek Stages 7-10 Location: South Maclean Component: Bulk Earthworks Area Description: Stages 7-10	Report Number: 1979/R/65598-1 Project Number: 1979/P/2136 Lot Number: Internal Test Request: 1979/T/36040 Client Reference/s: WR5811 Report Date / Page: 10/05/2022 Page 2 of 2
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Test Procedures:	AS1289.5.7.1, AS1289.5.8.1, AS1289.2.1.1
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Sample Number	1979/S/184108	1979/S/184109	
ID / Client ID	EW-38	EW-39	
Lot Number	-	-	
Date / Time Tested	4/05/2022 12:05	4/05/2022 12:10	
Material Source	On-Site	On-Site	
Material Type	Bulk Fill	Bulk 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	
Location	Bio Basin	Bio Basin	
	Southern Basin Wall	Eastern Basin Wall	
	38m W	12m N	
Level	43.3	43.3	
Test Fraction (mm)	< 19.0 mm	< 19.0 mm	
Sample Oversize (%)	2	0	
Compaction Sample Number	1979/S/184108	1979/S/184109	
Sample Description	Clayey SAND - Brown	Clayey SAND - Light Brown	
Moisture Test Results:			
Field Moisture Content (%)	12.2	13.1	
Adjusted / Moist. Variation (%)	1.5	1.5	
Optimum Moisture Content (%)	13.5	14.5	
Moisture Variation from OMC	(Drier than OMC)	(Drier than OMC)	
Moisture Ratio (%)	90.5	90.5	
Density Test Results:			
Field Wet Density (t/m ³)	2.15	2.14	
Adj/Peak Conv Wet Density (t/m ³)	2.15	2.16	
Density Ratio Required (%)	95	95	
Hilf Density Ratio (%)	99.5	99.0	

Remarks

Accredited for compliance with ISO/IEC 17025 – Testing	
	
Accreditation Number: 1986 Corporate Site Number: 1979	Approved Signatory: Dean Stimpson Form ID: W5ASMRRep Rev 2



Appendix C

Lot Certificates

Project Ref: 1979/P/2136

24/07/2023

BMD Urban Pty Ltd
PO Box 197
Wynnum, QLD 4178

Dear Sir/Madam,

INSPECTION OF PLACEMENT AND COMPACTION OF ALLOTMENT FILL
Lot 903 - South Maclean - Pebble Creek Residential Development

This is to confirm that placement and compaction of the allotment fill for the above project and Lot was supervised by Construction Sciences Pty Ltd under Level 1 arrangements as described in AS3798-2007 "Guidelines on earthworks for commercial and residential developments".

This indicates that the fill was compacted to at least the minimum density ratio in accordance with the specification requirements and it is considered that the fill may be deemed to be "controlled fill" in accordance with AS2870-2011 "Residential Slabs & Footings".

It may be that non-structural topsoil was placed on the block after completion of the structural fill. This would need to be removed as part of the site preparation for building and driveway construction.

I trust this meets your requirements. Please do not hesitate to contact me if you have any queries.

Yours faithfully



Mathew Tyrrell
Laboratory Manager
Construction Sciences

Project Ref: 1979/P/2136

24/07/2023

BMD Urban Pty Ltd
PO Box 197
Wynnum, QLD 4178

Dear Sir/Madam,

INSPECTION OF PLACEMENT AND COMPACTION OF ALLOTMENT FILL
Lot 904 - South Maclean - Pebble Creek Residential Development

This is to confirm that placement and compaction of the allotment fill for the above project and Lot was supervised by Construction Sciences Pty Ltd under Level 1 arrangements as described in AS3798-2007 "Guidelines on earthworks for commercial and residential developments".

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Yours faithfully



Mathew Tyrrell
Laboratory Manager
Construction Sciences

Project Ref: 1979/P/2136

24/07/2023

BMD Urban Pty Ltd
PO Box 197
Wynnum, QLD 4178

Dear Sir/Madam,

INSPECTION OF PLACEMENT AND COMPACTION OF ALLOTMENT FILL
Lot 905 - South Maclean - Pebble Creek Residential Development

This is to confirm that placement and compaction of the allotment fill for the above project and Lot was supervised by Construction Sciences Pty Ltd under Level 1 arrangements as described in AS3798-2007 "Guidelines on earthworks for commercial and residential developments".

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Mathew Tyrrell
Laboratory Manager
Construction Sciences

Project Ref: 1979/P/2136

24/07/2023

BMD Urban Pty Ltd
PO Box 197
Wynnum, QLD 4178

Dear Sir/Madam,

INSPECTION OF PLACEMENT AND COMPACTION OF ALLOTMENT FILL
Lot 906 - South Maclean - Pebble Creek Residential Development

This is to confirm that placement and compaction of the allotment fill for the above project and Lot was supervised by Construction Sciences Pty Ltd under Level 1 arrangements as described in AS3798-2007 "Guidelines on earthworks for commercial and residential developments".

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Laboratory Manager
Construction Sciences

Project Ref: 1979/P/2136

24/07/2023

BMD Urban Pty Ltd
PO Box 197
Wynnum, QLD 4178

Dear Sir/Madam,

INSPECTION OF PLACEMENT AND COMPACTION OF ALLOTMENT FILL
Lot 907 - South Maclean - Pebble Creek Residential Development

This is to confirm that placement and compaction of the allotment fill for the above project and Lot was supervised by Construction Sciences Pty Ltd under Level 1 arrangements as described in AS3798-2007 "Guidelines on earthworks for commercial and residential developments".

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Construction Sciences

Project Ref: 1979/P/2136

24/07/2023

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PO Box 197
Wynnum, QLD 4178

Dear Sir/Madam,

INSPECTION OF PLACEMENT AND COMPACTION OF ALLOTMENT FILL
Lot 908 - South Maclean - Pebble Creek Residential Development

This is to confirm that placement and compaction of the allotment fill for the above project and Lot was supervised by Construction Sciences Pty Ltd under Level 1 arrangements as described in AS3798-2007 "Guidelines on earthworks for commercial and residential developments".

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Laboratory Manager
Construction Sciences

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24/07/2023

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PO Box 197
Wynnum, QLD 4178

Dear Sir/Madam,

INSPECTION OF PLACEMENT AND COMPACTION OF ALLOTMENT FILL
Lot 909 - South Maclean - Pebble Creek Residential Development

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Construction Sciences

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PO Box 197
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INSPECTION OF PLACEMENT AND COMPACTION OF ALLOTMENT FILL
Lot 910 - South Maclean - Pebble Creek Residential Development

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Construction Sciences

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24/07/2023

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Wynnum, QLD 4178

Dear Sir/Madam,

INSPECTION OF PLACEMENT AND COMPACTION OF ALLOTMENT FILL
Lot 911 - South Maclean - Pebble Creek Residential Development

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Construction Sciences

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24/07/2023

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Wynnum, QLD 4178

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Lot 912 - South Maclean - Pebble Creek Residential Development

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Construction Sciences

Project Ref: 1979/P/2136

24/07/2023

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PO Box 197
Wynnum, QLD 4178

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INSPECTION OF PLACEMENT AND COMPACTION OF ALLOTMENT FILL
Lot 913 - South Maclean - Pebble Creek Residential Development

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Laboratory Manager
Construction Sciences

Project Ref: 1979/P/2136

24/07/2023

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Wynnum, QLD 4178

Dear Sir/Madam,

INSPECTION OF PLACEMENT AND COMPACTION OF ALLOTMENT FILL
Lot 914 - South Maclean - Pebble Creek Residential Development

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Laboratory Manager
Construction Sciences

Project Ref: 1979/P/2136

24/07/2023

BMD Urban Pty Ltd
PO Box 197
Wynnum, QLD 4178

Dear Sir/Madam,

INSPECTION OF PLACEMENT AND COMPACTION OF ALLOTMENT FILL
Lot 915 - South Maclean - Pebble Creek Residential Development

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Construction Sciences

Project Ref: 1979/P/2136

24/07/2023

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Wynnum, QLD 4178

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Laboratory Manager
Construction Sciences

Project Ref: 1979/P/2136

24/07/2023

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Wynnum, QLD 4178

Dear Sir/Madam,

INSPECTION OF PLACEMENT AND COMPACTION OF ALLOTMENT FILL
Lot 917 - South Maclean - Pebble Creek Residential Development

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Laboratory Manager
Construction Sciences

Project Ref: 1979/P/2136

24/07/2023

BMD Urban Pty Ltd
PO Box 197
Wynnum, QLD 4178

Dear Sir/Madam,

INSPECTION OF PLACEMENT AND COMPACTION OF ALLOTMENT FILL
Lot 918 - South Maclean - Pebble Creek Residential Development

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Yours faithfully



Mathew Tyrrell
Laboratory Manager
Construction Sciences

Project Ref: 1979/P/2136

24/07/2023

BMD Urban Pty Ltd
PO Box 197
Wynnum, QLD 4178

Dear Sir/Madam,

INSPECTION OF PLACEMENT AND COMPACTION OF ALLOTMENT FILL
Lot 919 - South Maclean - Pebble Creek Residential Development

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Laboratory Manager
Construction Sciences

Project Ref: 1979/P/2136

24/07/2023

BMD Urban Pty Ltd
PO Box 197
Wynnum, QLD 4178

Dear Sir/Madam,

INSPECTION OF PLACEMENT AND COMPACTION OF ALLOTMENT FILL
Lot 920, South Maclean - Pebble Creek Residential Development

This is to confirm that placement and compaction of the allotment fill for the above project and Lot was supervised by Construction Sciences Pty Ltd under Level 1 arrangements as described in AS3798-2007 "Guidelines on earthworks for commercial and residential developments".

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Laboratory Manager
Construction Sciences

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24/07/2023

BMD Urban Pty Ltd
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Wynnum, QLD 4178

Dear Sir/Madam,

INSPECTION OF PLACEMENT AND COMPACTION OF ALLOTMENT FILL
Lot 921 - South Maclean - Pebble Creek Residential Development

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Construction Sciences

Project Ref: 1979/P/2136

24/07/2023

BMD Urban Pty Ltd
PO Box 197
Wynnum, QLD 4178

Dear Sir/Madam,

INSPECTION OF PLACEMENT AND COMPACTION OF ALLOTMENT FILL
Lot 922 - South Maclean - Pebble Creek Residential Development

This is to confirm that placement and compaction of the allotment fill for the above project and Lot was supervised by Construction Sciences Pty Ltd under Level 1 arrangements as described in AS3798-2007 "Guidelines on earthworks for commercial and residential developments".

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Laboratory Manager
Construction Sciences

Project Ref: 1979/P/2136

24/07/2023

BMD Urban Pty Ltd
PO Box 197
Wynnum, QLD 4178

Dear Sir/Madam,

INSPECTION OF PLACEMENT AND COMPACTION OF ALLOTMENT FILL
Lot 923 - South Maclean - Pebble Creek Residential Development

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Laboratory Manager
Construction Sciences

Project Ref: 1979/P/2136

24/07/2023

BMD Urban Pty Ltd
PO Box 197
Wynnum, QLD 4178

Dear Sir/Madam,

**INSPECTION OF PLACEMENT AND COMPACTION OF ALLOTMENT FILL
Lot 926 - South Maclean - Pebble Creek Residential Development**

This is to confirm that placement and compaction of the allotment fill for the above project and Lot was supervised by Construction Sciences Pty Ltd under Level 1 arrangements as described in AS3798-2007 "Guidelines on earthworks for commercial and residential developments".

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Laboratory Manager
Construction Sciences

Project Ref: 1979/P/2136

24/07/2023

BMD Urban Pty Ltd
PO Box 197
Wynnum, QLD 4178

Dear Sir/Madam,

INSPECTION OF PLACEMENT AND COMPACTION OF ALLOTMENT FILL
Lot 927 - South Maclean - Pebble Creek Residential Development

This is to confirm that placement and compaction of the allotment fill for the above project and Lot was supervised by Construction Sciences Pty Ltd under Level 1 arrangements as described in AS3798-2007 "Guidelines on earthworks for commercial and residential developments".

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I trust this meets your requirements. Please do not hesitate to contact me if you have any queries.

Yours faithfully



Mathew Tyrrell
Laboratory Manager
Construction Sciences

Project Ref: 1979/P/2136

24/07/2023

BMD Urban Pty Ltd
PO Box 197
Wynnum, QLD 4178

Dear Sir/Madam,

INSPECTION OF PLACEMENT AND COMPACTION OF ALLOTMENT FILL
Lot 928 - South Maclean - Pebble Creek Residential Development

This is to confirm that placement and compaction of the allotment fill for the above project and Lot was supervised by Construction Sciences Pty Ltd under Level 1 arrangements as described in AS3798-2007 "Guidelines on earthworks for commercial and residential developments".

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Laboratory Manager
Construction Sciences

Project Ref: 1979/P/2136

24/07/2023

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Wynnum, QLD 4178

Dear Sir/Madam,

INSPECTION OF PLACEMENT AND COMPACTION OF ALLOTMENT FILL
Lot 935 - South Maclean - Pebble Creek Residential Development

This is to confirm that placement and compaction of the allotment fill for the above project and Lot was supervised by Construction Sciences Pty Ltd under Level 1 arrangements as described in AS3798-2007 "Guidelines on earthworks for commercial and residential developments".

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Laboratory Manager
Construction Sciences

Project Ref: 1979/P/2136

24/07/2023

BMD Urban Pty Ltd
PO Box 197
Wynnum, QLD 4178

Dear Sir/Madam,

INSPECTION OF PLACEMENT AND COMPACTION OF ALLOTMENT FILL
Lot 936 - South Maclean - Pebble Creek Residential Development

This is to confirm that placement and compaction of the allotment fill for the above project and Lot was supervised by Construction Sciences Pty Ltd under Level 1 arrangements as described in AS3798-2007 "Guidelines on earthworks for commercial and residential developments".

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Construction Sciences

Project Ref: 1979/P/2136

24/07/2023

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PO Box 197
Wynnum, QLD 4178

Dear Sir/Madam,

INSPECTION OF PLACEMENT AND COMPACTION OF ALLOTMENT FILL
Lot 937 - South Maclean - Pebble Creek Residential Development

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Construction Sciences

Project Ref: 1979/P/2136

24/07/2023

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PO Box 197
Wynnum, QLD 4178

Dear Sir/Madam,

INSPECTION OF PLACEMENT AND COMPACTION OF ALLOTMENT FILL
Lot 938 - South Maclean - Pebble Creek Residential Development

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Laboratory Manager
Construction Sciences

Project Ref: 1979/P/2136

24/07/2023

BMD Urban Pty Ltd
PO Box 197
Wynnum, QLD 4178

Dear Sir/Madam,

INSPECTION OF PLACEMENT AND COMPACTION OF ALLOTMENT FILL
Lot 939 - South Maclean - Pebble Creek Residential Development

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Laboratory Manager
Construction Sciences

Project Ref: 1979/P/2136

24/07/2023

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PO Box 197
Wynnum, QLD 4178

Dear Sir/Madam,

INSPECTION OF PLACEMENT AND COMPACTION OF ALLOTMENT FILL
Lot 946 - South Maclean - Pebble Creek Residential Development

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24/07/2023

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24/07/2023

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Yours faithfully



Mathew Tyrrell
Laboratory Manager
Construction Sciences

Located across Australia and New Zealand

QLD

Airlie
Beenleigh
Brisbane (Acacia Ridge)
Brisbane (Beenleigh)
Brisbane (Brendale)
Brisbane (Petrie)
Cairns
Emerald
Gladstone
Gold Coast
Mackay
Moranbah
Rockhampton
Petrie
Sunshine Coast
Toowoomba
Townsville

NSW

Ballina
Coffs Harbour
Grafton
Lynwood
Newcastle
Sydney (Glendenning)
Sydney (Seven Hills)
Sydney (St Peters)
Taree
Wollongong

VIC

Ararat
Bendigo
Echuca
Melbourne (Chadstone)
Melbourne (Keysborough)
Melbourne (Pakenham)
Melbourne (Oaklands Junction)
Melbourne (Sunshine West)
Traralgon

WA

Bunbury
Kalgoorlie
Newman
Perth
Port Hedland

SA

Adelaide
Port Augusta

NT

Darwin

ACT

Canberra

NZ

Wellington