

WORKS INSPECTION & TESTING Bulk Earthworks

PROPOSED
RESIDENTIAL
DEVELOPMENT

**72 Acacia Road
Karawatha**

JOB NO: P1900 comp01



Prepared for Shadforths Civil Contractors
03rd July 2020

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Appendix A Bulk Earthworks - Compaction

INTRODUCTION

Construction Sciences was commissioned by **Shadforths Civil Contractors** to carry out the geotechnical inspection and testing required for the proposed development at 72 Acacia Road, Karawatha, which was carried out between 17th March and 21st April 2020.

SCOPE OF WORKS

The Earthworks on this development was monitored in accordance with the scope of our commission as follows:-

Level 1 : Bulk earthworks stripping and filling was inspected and tested on a Level 1 basis, in accordance with AS 3798-2007.

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

SPECIFICATION REQUIREMENTS

Earthworks on this development was inspected and tested in accordance with the specification of the design engineer, **CLA Consultants, Civil Engineers** and to the specifications of the local authority, **Brisbane City Council**.

The following table is a summary of the basic compaction and quality 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>Bulk Earthworks Fill</i>	<i>95% Wet Density Ratio - Standard</i>

SITE WORKS - BULK EARTHWORKS

General : Full time site inspection was maintained in accordance with Level 1 requirements whilst earthworks were carried out on this development. Fill areas included residential allotments, roads and embankments.

The areas to be filled were stripped and proof rolled in accordance with the specification requirements. Areas displaying instability were generally excavated until competent conditions were encountered. Benching was provided on slopes where filling was to be placed.

The natural ground in the areas of filling generally comprised gravelly to silty and sandy CLAYS, brown/grey mottled orange and red and clayey SANDS, light grey/grey mottled orange.

The material used in the bulk earthworks filling was sourced from site cutting to design levels.

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".

All test results are included in Appendix A. A summary of the test results is included as Table 1. A total of 30 field density tests were carried out throughout the earthworks. The average wet density ratio was recorded to be 99.3%. The maximum wet density ratio was 105% and minimum was 95%.

CONCLUSION


We confirm that:

- (a) Our representative was in full time site attendance whilst bulk earthworks filling was in progress between 17th March and 21st April 2020 at 72 Acacia Road, Karawatha.
- (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 wet density ratio.
- (e) All test results pertaining to the development are included within appendix A of this report.




WAYNE GORMAN
LABORATORY MANAGER
Construction Sciences



	CLIENT: SHADFORTHS CIVIL CONTRACTORS	JOB No.: P 1900
	PROJECT: 72 ACACIA RODA, KARAWATHA	SKETCH No.: SK 1
	TEST ITEM: SITE PHOTOS	DATE ISSUED: 03/07/2020



	CLIENT: SHADFORTHS CIVIL CONTRACTORS	JOB No.: P 1900
	PROJECT: 72 ACACIA RODA, KARAWATHA	SKETCH No.: SK 2
	TEST ITEM: SITE PHOTOS	DATE ISSUED: 03/07/2020



	CLIENT: SHADFORTHS CIVIL CONTRACTORS	JOB No.: P 1900
	PROJECT: 72 ACACIA RODA, KARAWATHA	SKETCH No.: SK 3
	TEST ITEM: SITE PHOTOS	DATE ISSUED: 03/07/2020

Table 1

Client:	Shadforths Civil Contractors	Date Range:	17/03/2020 to 21/04/2020
Project:	1979/P/1900 - 72 Acacia Road	Material Source:	Onsite
		Material Type:	Bulk Fill

Sample Client Reference	Sample Number	Sample Date/Time	Source	Material	Easting	Northing	RL	Wet Density Ratio	Moisture Variation
EW-01	1979/S/129116	17/03/2020 10:10	On-Site	Bulk Fill	477.00	493.50	37.49	96.5	2
EW-02	1979/S/129117	17/03/2020 10:20	On-Site	Bulk Fill	263.80	259.68	37.62	99.5	0
EW-03	1979/S/129207	18/03/2020 13:50	On-Site	Bulk Fill	488.11	283.24	38.62	98	-2
EW-04	1979/S/129208	18/03/2020 14:00	On-Site	Bulk Fill	480.25	278.53	38.49	95	0
EW-05	1979/S/129209	18/03/2020 14:10	On-Site	Bulk Fill	484.50	271.68	38.70	100.5	0
EW-06	1979/S/129210	18/03/2020 14:20	On-Site	Bulk Fill	522.31	248.10	37.99	97.5	0.5
EW-07	1979/S/129266	19/03/2020 10:20	On-Site	Bulk Fill	538.57	255.83	37.65	97	1.5
EW-08	1979/S/129267	19/03/2020 10:32	On-Site	Bulk Fill	531.90	258.92	37.96	101.5	2
EW-09	1979/S/129268	19/03/2020 10:40	On-Site	Bulk Fill	587.24	267.77	38.29	102	0.5
EW-10	1979/S/129319	20/03/2020 10:00	On-Site	Bulk Fill	466.07	309.62	32.09	98.5	0.5
EW-11	1979/S/129320	20/03/2020 10:10	On-Site	Bulk Fill	466.71	308.45	36.45	99	0.5
EW-12	1979/S/129416	23/03/2020 12:30	On-Site	Bulk Fill	458.6	308.8	37.56	101.5	1
EW-13	1979/S/129417	23/03/2020 12:45	On-Site	Bulk Fill	452.51	303.52	37.26	103	-0.5
EW-14	1979/S/129587	25/03/2020 10:45	On-Site	Bulk Fill	444.09	328.01	37.3	98	1.5
EW-15	1979/S/129588	25/03/2020 10:55	On-Site	Bulk Fill	470.99	322.04	37.4	97	0
EW-16	1979/S/129589	25/03/2020 10:58	On-Site	Bulk Fill	483.0	307.0	37.87	102	0
EW-17	1979/S/129590	25/03/2020 11:09	On-Site	Bulk Fill	497.89	292.7	38.38	100.5	-2
EW-18	1979/S/129811	27/03/2020 10:15	On-Site	Bulk Fill	316.88	388.36	36.82	96	-2
EW-19	1979/S/129812	27/03/2020 10:25	On-Site	Bulk Fill	318.73	372.55	37.50	105	2
EW-20	1979/S/129813	27/03/2020 10:38	On-Site	Bulk Fill	369.68	399.68	36.44	102.5	1.5
EW-21	1979/S/130064	31/03/2020 9:35	On-Site	Bulk Fill	349.73	321.46	38.81	100	0
EW-22	1979/S/130065	31/03/2020 9:50	On-Site	Bulk Fill	444.20	340.80	36.89	99.5	0.5
EW-23	1979/S/130381	3/04/2020 10:00	On-Site	Bulk Fill	263.21	577.31	38.96	96	2.5
EW-24	1979/S/130579	6/04/2020 11:40	On-Site	Bulk Fill	242.44	571.57	39.54	97	2
EW-25	1979/S/130761	8/04/2020 10:52	On-Site	Bulk Fill	260.75	566.01	39.53	99	0
EW-26	1979/S/130762	8/04/2020 11:02	On-Site	Bulk Fill	256.74	531.30	39.68	97	0
EW-27	1979/S/131033	14/04/2020 10:02	On-Site	Bulk Fill	246.22	511.15	40.05	102.5	0
EW-28	1979/S/131034	14/04/2020 10:15	On-Site	Bulk Fill	259.42	525.50	40.58	99	0
EW-29	1979/S/131035	14/04/2020 10:45	On-Site	Bulk Fill	509148	6944582	F/L	97.5	0
EW-30	1979/S/131717	21/04/2020 9:35	On-Site	Bulk Fill	509231	6944568	35.0	101	2

APPENDIX

A

BULK EARTHWORKS
FILL



WET DENSITY RATIO REPORT

Client: Shadforths Civil Contractors Client Address: 99 Sandalwood Lane, Forest Glen Project: 72 Acacia Road Location: Karawatha Component: Bulk Earthworks Area Description: Lot 48	Report Number: 1979/R/47433-1 Project Number: 1979/P/1900 Lot Number: 48 Internal Test Request: 1979/T/25820 Client Reference/s: Docket Number: WR 2811 Report Date / Page: 25/03/2020 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	1979/S/129266	1979/S/129267	1979/S/129268	
ID / Client ID	EW-07	EW-08	EW-09	
Lot Number	48	48	48	
Date / Time Tested	19/03/2020 10:20	19/03/2020 10:32	19/03/2020 10:40	
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)	175 / 200 / 200	175 / 200 / 200	175 / 200 / 200	
Standard or Modified	Standard	Standard	Standard	
Easting: m	538.57	531.90	587.24	
Northing m	255.83	258.92	267.77	
RL: m	37.65	37.96	38.29	
Allotment:	48	48	48	
Test Fraction (mm)	< 19.0 mm	< 19.0 mm	< 19.0 mm	
Sample Oversize (%)	1	3	0	
Compaction Sample Number	1979/S/129266	1979/S/129267	1979/S/129268	
Sample Description	Clayey Sand - Light Grey	Clayey Sand - Light Grey	Clay - Light Brown	
Moisture Test Results:				
Field Moisture Content (%)	14.5	11.2	23.5	
Adjusted / Moisture Variation (%)	1.5	1.5	0.5	
Optimum Moisture Content (%)	16.0	13.0	24.0	
Moisture Variation from OMC	(Drier than OMC)	(Drier than OMC)	(Drier than OMC)	
Moisture Ratio (%)	90.5	86.0	97.5	
Density Test Results:				
Field Wet Density (t/m ³)	2.01	2.12	1.98	
Adj/Peak Conv Wet Density (t/m ³)	2.07	2.08	1.94	
Density Ratio Required (%)	95	95	95	
Hilf Density Ratio (%)	97.0	101.5	102.0	

Remarks



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: 1979



Approved Signatory: Dean Stimpson
Form ID: W5ASRep Rev 2



WET DENSITY RATIO REPORT

Client: Shadforths Civil Contractors Client Address: 99 Sandalwood Lane, Forest Glen Project: 72 Acacia Road Location: Karawatha Component: Bulk Earthworks Area Description: Stage 2	Report Number: 1979/R/47458-1 Project Number: 1979/P/1900 Lot Number: 18/03 Internal Test Request: 1979/T/25798 Client Reference/s: Docket Number: WR 2810 Report Date / Page: 27/03/2020 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	1979/S/129207	1979/S/129208	1979/S/129209	1979/S/129210
ID / Client ID	EW-03	EW-04	EW-05	EW-06
Lot Number	18/03	18/03	18/03	18/03
Date / Time Tested	18/03/2020 13:50	18/03/2020 14:00	18/03/2020 14:10	18/03/2020 14:20
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)	175 / 200 / 200	175 / 200 / 200	175 / 200 / 200	175 / 200 / 200
Standard or Modified	Standard	Standard	Standard	Standard
Easting: m	488.11	480.25	484.50	522.31
Northing m	283.24	278.53	271.68	248.10
RL: m	38.62	38.49	38.70	37.99
Allotment:	48	48	48	48
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/129207	1979/S/129208	1979/S/129209	1979/S/129210
Sample Description	Clay - Light Brown	Clay - Grey mottled Brown	Clay - Grey mottled Brown	Clay - Grey
Moisture Test Results:				
Field Moisture Content (%)	18.1	15.8	16.8	19.3
Adjusted / Moisture Variation (%)	-2.0	0.0	0.0	0.5
Optimum Moisture Content (%)	16.0	15.5	16.5	20.0
Moisture Variation from OMC	(Wetter than OMC)	(Wetter than OMC)	(Wetter than OMC)	(Drier than OMC)
Moisture Ratio (%)	113.0	101.5	101.0	97.5
Density Test Results:				
Field Wet Density (t/m ³)	2.08	1.95	2.03	1.92
Adj/Peak Conv Wet Density (t/m ³)	2.12	2.05	2.02	1.97
Density Ratio Required (%)	95	95	95	95
Hilf Density Ratio (%)	98.0	95.0	100.5	97.5

Remarks

	<p style="text-align: center; font-size: small;">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</p> <p>Accreditation Number: 1986 Corporate Site Number: 1979</p>	 Approved Signatory: Dean Stimpson Form ID: W5ASRep Rev 2
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WET DENSITY RATIO REPORT

Client: Shadforths Civil Contractors Client Address: 99 Sandalwood Lane, Forest Glen Project: 72 Acacia Road Location: Karawatha Component: Bulk Earthworks Area Description: Stage 2	Report Number: 1979/R/47481-1 Project Number: 1979/P/1900 Lot Number: - Internal Test Request: 1979/T/25829 Client Reference/s: WR 2812 Report Date / Page: 30/03/2020 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	1979/S/129319	1979/S/129320		
ID / Client ID	EW-10	EW-11		
Lot Number	-	-		
Date / Time Tested	20/03/2020 10:00	20/03/2020 10:10		
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)	175 / 200 / 200	175 / 200 / 200		
Standard or Modified	Standard	Standard		
Easting	m 466.07	466.71		
Northing	m 309.62	308.45		
RL	m 32.09	36.45		
	43	43		
Test Fraction (mm)	< 19.0 mm	< 19.0 mm		
Sample Oversize (%)	0	0		
Compaction Sample Number	1979/S/129319	1979/S/129320		
Sample Description	Silty Clay - Brown	Clay - Brown		
Moisture Test Results:				
Field Moisture Content (%)	23.4	24.8		
Adjusted / Moisture Variation (%)	0.5	0.5		
Optimum Moisture Content (%)	24.0	25.5		
Moisture Variation from OMC	(Drier than OMC)	(Drier than OMC)		
Moisture Ratio (%)	98.5	98.0		
Density Test Results:				
Field Wet Density (t/m ³)	1.93	1.88		
Adj/Peak Conv Wet Density (t/m ³)	1.96	1.90		
Density Ratio Required (%)	95	95		
Hilf Density Ratio (%)	98.5	99.0		

Remarks

	<p style="text-align: center; font-size: small;">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</p> <p>Accreditation Number: 1986 Corporate Site Number: 1979</p>	 Approved Signatory: Dean Stimpson Form ID: W5ASRep Rev 2
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WET DENSITY RATIO REPORT

Client: Shadforths Civil Contractors Client Address: 99 Sandalwood Lane, Forest Glen Project: 72 Acacia Road Location: Karawatha Component: Bulk Earthworks Area Description: Stage 2	Report Number: 1979/R/47529-1 Project Number: 1979/P/1900 Lot Number: - Internal Test Request: 1979/T/25847 Client Reference/s: Docket Number: WR 2813 Report Date / Page: 1/04/2020 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	1979/S/129416	1979/S/129417		
ID / Client ID	EW-12	EW-13		
Lot Number	-	-		
Date / Time Tested	23/03/2020 12:30	23/03/2020 12:45		
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)	175 / 200 / 200	175 / 200 / 200		
Standard or Modified	Standard	Standard		
Easting: m	458.6	452.51		
Northing m	308.8	303.52		
RL: m	37.56	37.26		
Allotment:	43	43		
Test Fraction (mm)	< 19.0 mm	< 19.0 mm		
Sample Oversize (%)	0	0		
Compaction Sample Number	1979/S/129416	1979/S/129417		
Sample Description	Sandy Clay - Brown	Sandy Clay - Brown		
Moisture Test Results:				
Field Moisture Content (%)	18.1	23.3		
Adjusted / Moisture Variation (%)	1.0	-0.5		
Optimum Moisture Content (%)	19.0	23.0		
Moisture Variation from OMC	(Drier than OMC)	(Wetter than OMC)		
Moisture Ratio (%)	96.0	102.0		
Density Test Results:				
Field Wet Density (t/m ³)	1.97	1.96		
Adj/Peak Conv Wet Density (t/m ³)	1.94	1.91		
Density Ratio Required (%)	95	95		
Hilf Density Ratio (%)	101.5	103.0		

Remarks

	<p style="text-align: center; font-size: small;">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</p> <p>Accreditation Number: 1986 Corporate Site Number: 1979</p>	 Approved Signatory: Dean Stimpson Form ID: W5ASRep Rev 2
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WET DENSITY RATIO REPORT

Client: Shadforths Civil Contractors Client Address: 99 Sandalwood Lane, Forest Glen Project: 72 Acacia Road Location: Karawatha Supplied To: n/a Area Description:	Report Number: 1979/R/47544-1 Project Number: 1979/P/1900 Lot Number: Internal Test Request: 1979/T/25792 Client Reference/s: Docket Number: WR 2809 Report Date / Page: 2/04/2020 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	1979/S/129116	1979/S/129117		
ID / Client ID	EW-01	EW-02		
Lot Number	-	-		
Date / Time Tested	17/03/2020 10:10	17/03/2020 10:20		
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)	175 / 200 / 200	175 / 200 / 200		
Standard or Modified	Standard	Standard		
Easting: m	477.00	263.80		
Northing m	493.50	259.68		
RL: m	37.49	37.62		
Allotment:	48	48		
Test Fraction (mm)	< 19.0 mm	< 19.0 mm		
Sample Oversize (%)	0	0		
Compaction Sample Number	1979/S/129116	1979/S/129117		
Sample Description	Sandy Clay - Brown	Sandy Clay - Brown		
Moisture Test Results:				
Field Moisture Content (%)	14.5	18.3		
Adjusted / Moisture Variation (%)	2.0	0.0		
Optimum Moisture Content (%)	16.5	18.5		
Moisture Variation from OMC	(Drier than OMC)	(Drier than OMC)		
Moisture Ratio (%)	88.5	99.0		
Density Test Results:				
Field Wet Density (t/m ³)	1.95	2.00		
Adj/Peak Conv Wet Density (t/m ³)	2.02	2.01		
Density Ratio Required (%)	95	95		
Hilf Density Ratio (%)	96.5	99.5		

Remarks

	<p style="text-align: center; font-size: small;">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</p> <p>Accreditation Number: 1986 Corporate Site Number: 1979</p>	 Approved Signatory: Dean Stimpson Form ID: W5ASRep Rev 2
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WET DENSITY RATIO REPORT

Client: Shadforths Civil Contractors Client Address: 99 Sandalwood Lane, Forest Glen Project: 72 Acacia Road Location: Karawatha Component: Bulk Earthworks Area Description: Stage 2	Report Number: 1979/R/47569-1 Project Number: 1979/P/1900 Lot Number: Internal Test Request: 1979/T/25883 Client Reference/s: Docket Number: WR 2815 Report Date / Page: 6/04/2020 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	1979/S/129587	1979/S/129588	1979/S/129589	1979/S/129590
ID / Client ID	EW-14	EW-15	EW-16	EW-17
Lot Number	-	-	-	-
Date / Time Tested	25/03/2020 10:45	25/03/2020 10:55	25/03/2020 10:58	25/03/2020 11:09
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)	175 / 200 / 200	175 / 200 / 200	175 / 200 / 200	175 / 200 / 200
Standard or Modified	Standard	Standard	Standard	Standard
Easting: m	444.09	470.99	483.0	497.89
Northing m	328.01	322.04	307.0	292.7
RL: m	37.3	37.4	37.87	38.38
Allotment:	42	42	43	43
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/129587	1979/S/129588	1979/S/129589	1979/S/129590
Sample Description	Silty CLAY, Light Grey/Mottle Ora	Silty CLAY, Pale Brown	Silty CLAY, Pale Brown	Sand CLAY, Grey / Mottle Red
Moisture Test Results:				
Field Moisture Content (%)	24.8	21.1	31.4	18.6
Adjusted / Moisture Variation (%)	1.5	0.0	0.0	-2.0
Optimum Moisture Content (%)	26.5	21.0	31.5	16.5
Moisture Variation from OMC	(Drier than OMC)	(Drier than OMC)	(Wetter than OMC)	(Wetter than OMC)
Moisture Ratio (%)	93.5	99.5	100.5	111.5
Density Test Results:				
Field Wet Density (t/m ³)	1.89	1.87	1.93	2.07
Adj/Peak Conv Wet Density (t/m ³)	1.93	1.93	1.89	2.06
Density Ratio Required (%)	95	95	95	95
Hilf Density Ratio (%)	98.0	97.0	102.0	100.5

Remarks

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WET DENSITY RATIO REPORT

Client: Shadforths Civil Contractors Client Address: 99 Sandalwood Lane, Forest Glen Project: 72 Acacia Road Location: Karawatha Component: Bulk Earthworks Area Description: Stage 2	Report Number: 1979/R/47638-1 Project Number: 1979/P/1900 Lot Number: - Internal Test Request: 1979/T/25916 Client Reference/s: Docket Number: WR 2817 Report Date / Page: 14/04/2020 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	1979/S/129811	1979/S/129812	1979/S/129813	
ID / Client ID	EW-18	EW-19	EW-20	
Lot Number	-	-	-	
Date / Time Tested	27/03/2020 10:15	27/03/2020 10:25	27/03/2020 10:38	
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)	175 / 200 / 200	175 / 200 / 200	175 / 200 / 200	
Standard or Modified	Standard	Standard	Standard	
Easting m	316.88	318.73	369.68	
Northing m	388.36	372.55	399.68	
RL m	36.82	37.50	36.44	
	27	28	29	
Test Fraction (mm)	< 19.0 mm	< 19.0 mm	< 19.0 mm	
Sample Oversize (%)	0	0	0	
Compaction Sample Number	1979/S/129811	1979/S/129812	1979/S/129813	
Sample Description	Clayey SAND, Pale Grey / Mottle	Silty CLAY, Pale Grey / Mottle Ora	Sandy CLAY, Light Grey / Mottle	
Moisture Test Results:				
Field Moisture Content (%)	20.8	24.3	18.3	
Adjusted / Moisture Variation (%)	-2.0	2.0	1.5	
Optimum Moisture Content (%)	18.5	26.5	20.0	
Moisture Variation from OMC	(Wetter than OMC)	(Drier than OMC)	(Drier than OMC)	
Moisture Ratio (%)	111.0	92.5	92.5	
Density Test Results:				
Field Wet Density (t/m ³)	1.81	1.99	2.05	
Adj/Peak Conv Wet Density (t/m ³)	1.88	1.90	1.99	
Density Ratio Required (%)	95	95	95	
Hilf Density Ratio (%)	96.0	105.0	102.5	

Remarks

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WET DENSITY RATIO REPORT

Client: Shadforth's Civil Contractors	Report Number: 1979/R/47746-1
Client Address: 99 Sandalwood Lane, Forest Glen	Project Number: 1979/P/1900
Project: 72 Acacia Road	Lot Number: -
Location: Karawatha	Internal Test Request: 1979/T/25957
Component: Bulk Earthworks	Client Reference/s: Docket Number: WR 2819
Area Description: Stage 2	Report Date / Page: 17/04/2020 Page 1 of 1

Test Procedures:	AS1289.5.7.1, AS1289.5.8.1, AS1289.2.1.1
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Sample Number	1979/S/130064	1979/S/130065		
ID / Client ID	EW-21	EW-22		
Lot Number	-	-		
Date / Time Tested	31/03/2020 09:35	31/03/2020 09:50		
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)	175 / 200 / 200	175 / 200 / 200		
Standard or Modified	Standard	Standard		
Easting: m	349.73	444.20		
Northing m	321.46	340.80		
RL: m	38.81	36.89		
Allotment:	7	38		
Test Fraction (mm)	< 19.0 mm	< 19.0 mm		
Sample Oversize (%)	0	0		
Compaction Sample Number	1979/S/130064	1979/S/130065		
Sample Description	Clayey SAND, Grey	Clayey SAND, Brown		
Moisture Test Results:				
Field Moisture Content (%)	15.2	18.6		
Adjusted / Moisture Variation (%)	0.0	0.5		
Optimum Moisture Content (%)	15.0	19.0		
Moisture Variation from OMC	(at OMC)	(Drier than OMC)		
Moisture Ratio (%)	100.0	98.0		
Density Test Results:				
Field Wet Density (t/m ³)	2.17	2.06		
Adj/Peak Conv Wet Density (t/m ³)	2.17	2.08		
Density Ratio Required (%)	95	95		
Hilf Density Ratio (%)	100.0	99.5		

Remarks

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WET DENSITY RATIO REPORT

Client: Shadforth's Civil Contractors Client Address: 99 Sandalwood Lane, Forest Glen Project: 72 Acacia Road Location: Karawatha Component: Bulk Earthworks Area Description: Stage 1	Report Number: 1979/R/47821-1 Project Number: 1979/P/1900 Lot Number: - Internal Test Request: 1979/T/26034 Client Reference/s: Docket Number: WR 2822 Report Date / Page: 22/04/2020 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	1979/S/130579			
ID / Client ID	EW-24			
Lot Number	-			
Date / Time Tested	6/04/2020 11:40			
Material Source	On-Site			
Material Type	Bulk Fill			
Sampling Method	AS1289.1.2.1 CI 6.4b			
Depths: Test / Nom / Actual (mm)	175 / 200 / 200			
Standard or Modified	Standard			
Easting: m	242.44			
Northing m	571.57			
RL: m	39.54			
Allotment:	65			
Test Fraction (mm)	< 19.0 mm			
Sample Oversize (%)	0			
Compaction Sample Number	1979/S/130579			
Sample Description	Silty Clay Brown			
Moisture Test Results:				
Field Moisture Content (%)	15.2			
Adjusted / Moisture Variation (%)	2.0			
Optimum Moisture Content (%)	17.5			
Moisture Variation from OMC	(Drier than OMC)			
Moisture Ratio (%)	87.5			
Density Test Results:				
Field Wet Density (t/m ³)	1.93			
Adj/Peak Conv Wet Density (t/m ³)	1.99			
Density Ratio Required (%)	95			
Hilf Density Ratio (%)	97.0			

Remarks

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WET DENSITY RATIO REPORT

Client: Shadforth's Civil Contractors Client Address: 99 Sandalwood Lane, Forest Glen Project: 72 Acacia Road Location: Karawatha Component: Bulk Earthworks Area Description: Stage 1	Report Number: 1979/R/47825-1 Project Number: 1979/P/1900 Lot Number: - Internal Test Request: 1979/T/26012 Client Reference/s: Docket Number: WR 2821 Report Date / Page: 22/04/2020 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	1979/S/130381			
ID / Client ID	EW-23			
Lot Number	-			
Date / Time Tested	3/04/2020 10:00			
Material Source	On-Site			
Material Type	Bulk Fill			
Sampling Method	AS1289.1.2.1 CI 6.4b			
Depths: Test / Nom / Actual (mm)	175 / 200 / 200			
Standard or Modified	Standard			
Easting: m	263.21			
Northing m	577.31			
RL: m	38.96			
Allotment:	64			
Test Fraction (mm)	< 19.0 mm			
Sample Oversize (%)	17			
Compaction Sample Number	1979/S/130381			
Sample Description	Clay - Brown			
Moisture Test Results:				
Field Moisture Content (%)	16.0			
Adjusted / Moisture Variation (%)	2.0			
Optimum Moisture Content (%)	18.5			
Moisture Variation from OMC	(Drier than OMC)			
Moisture Ratio (%)	87.5			
Density Test Results:				
Field Wet Density (t/m ³)	2.00			
Adj/Peak Conv Wet Density (t/m ³)	2.07			
Density Ratio Required (%)	95			
Hilf Density Ratio (%)	96.0			

Remarks

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WET DENSITY RATIO REPORT

Client: Shadforths Civil Contractors Client Address: 99 Sandalwood Lane, Forest Glen Project: 72 Acacia Road Location: Karawatha Component: Bulk Earthworks Area Description: Stage 1	Report Number: 1979/R/47828-1 Project Number: 1979/P/1900 Lot Number: - Internal Test Request: 1979/T/26068 Client Reference/s: Docket Number: WR 2824 Report Date / Page: 22/04/2020 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	1979/S/130761	1979/S/130762		
ID / Client ID	EW-25	EW-26		
Lot Number	-	-		
Date / Time Tested	8/04/2020 10:52	8/04/2020 11:02		
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)	175 / 200 / 200	175 / 200 / 200		
Standard or Modified	Standard	Standard		
Easting: m	260.75	256.74		
Northing m	566.01	531.30		
RL: m	39.53	39.68		
Allotment:	66	67		
Test Fraction (mm)	< 19.0 mm	< 19.0 mm		
Sample Oversize (%)	0	0		
Compaction Sample Number	1979/S/130761	1979/S/130762		
Sample Description	Clay - Brown	Clay - Brown		
Moisture Test Results:				
Field Moisture Content (%)	20.1	20.8		
Adjusted / Moisture Variation (%)	0.0	0.0		
Optimum Moisture Content (%)	20.0	21.0		
Moisture Variation from OMC	(Drier than OMC)	(Drier than OMC)		
Moisture Ratio (%)	99.5	99.0		
Density Test Results:				
Field Wet Density (t/m ³)	2.04	2.02		
Adj/Peak Conv Wet Density (t/m ³)	2.06	2.08		
Density Ratio Required (%)	95	95		
Hilf Density Ratio (%)	99.0	97.0		

Remarks

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WET DENSITY RATIO REPORT

Client: Shadforths Civil Contractors Client Address: 99 Sandalwood Lane, Forest Glen Project: 72 Acacia Road Location: Karawatha Component: Bulk Earthworks Area Description: Stage 1	Report Number: 1979/R/48143-1 Project Number: 1979/P/1900 Lot Number: - Internal Test Request: 1979/T/26118 Client Reference/s: Docket Number: WR 2825 Report Date / Page: 6/05/2020 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	1979/S/131033	1979/S/131034	1979/S/131035	
ID / Client ID	EW-27	EW-28	EW-29	
Lot Number	-	-	-	
Date / Time Tested	14/04/2020 10:02	14/04/2020 10:15	14/04/2020 10:45	
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)	175 / 200 / 200	175 / 200 / 200	175 / 200 / 200	
Standard or Modified	Standard	Standard	Standard	
Easting: m	246.22	259.42	509148	
Northing m	511.15	525.50	6944582	
RL: m	40.05	40.58	F/L	
Allotment:	69	70	Culvert 1	
Test Fraction (mm)	< 19.0 mm	< 19.0 mm	< 19.0 mm	
Sample Oversize (%)	0	0	0	
Compaction Sample Number	1979/S/131033	1979/S/131034	1979/S/131035	
Sample Description	Silty Clay Brown	Silty Clay Brown	Silty Clay Brown	
Moisture Test Results:				
Field Moisture Content (%)	18.5	13.1	12.4	
Adjusted / Moisture Variation (%)	0.0	0.0	0.0	
Optimum Moisture Content (%)	18.5	13.0	12.5	
Moisture Variation from OMC	(Drier than OMC)	(Drier than OMC)	(at OMC)	
Moisture Ratio (%)	99.0	99.0	100.0	
Density Test Results:				
Field Wet Density (t/m ³)	2.06	2.00	1.96	
Adj/Peak Conv Wet Density (t/m ³)	2.00	2.03	2.01	
Density Ratio Required (%)	95	95	95	
Hilf Density Ratio (%)	102.5	99.0	97.5	

Remarks

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WET DENSITY RATIO REPORT

Client: Shadforth's Civil Contractors Client Address: 99 Sandalwood Lane, Forest Glen Project: 72 Acacia Road Location: Karawatha Component: Earthworks Area Description: Stage 2	Report Number: 1979/R/48390-1 Project Number: 1979/P/1900 Lot Number: 30 Internal Test Request: 1979/T/26207 Client Reference/s: Docket Number: WR 2831 Report Date / Page: 15/05/2020 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	1979/S/131717		
ID / Client ID	EW-30		
Lot Number	30		
Date / Time Tested	21/04/2020 09:35		
Material Source	On-Site		
Material Type	Bulk Fill		
Sampling Method	AS1289.1.2.1 CI 6.4b		
Depths: Test / Nom / Actual (mm)	175 / 200 / 200		
Standard or Modified	Standard		
Easting: m	509231		
Northing m	6944568		
RL: m	35.0		
Allotment:	30		
Test Fraction (mm)	< 19.0 mm		
Sample Oversize (%)	0		
Compaction Sample Number	1979/S/131717		
Sample Description	Sandy Clay		
Moisture Test Results:			
Field Moisture Content (%)	15.2		
Adjusted / Moisture Variation (%)	2.0		
Optimum Moisture Content (%)	17.5		
Moisture Variation from OMC	(Drier than OMC)		
Moisture Ratio (%)	88.0		
Density Test Results:			
Field Wet Density (t/m ³)	1.94		
Adj/Peak Conv Wet Density (t/m ³)	1.93		
Density Ratio Required (%)	95		
Hilf Density Ratio (%)	101.0		

Remarks

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