

Level 1 Supervision & Inspection
Report

Maidens Green, Stage 1
Moama

23860/P/307



25 Nov 2021 3:42:18 pm
36.0995S 144.7666E ±3.00m
Moama

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05/05/2022

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Document Control

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1 Introduction

Construction Sciences Pty Ltd was commissioned by Northern Construction Group to provide Level 1 supervision & testing services for the placement of allotment fill material for the proposed Maidens Green – Stage 1 located in Moama, NSW for Controlled Fill Lot Testing.

This report represents the results of inspection activities, compaction and moisture control, and laboratory testing carried out for the placement and quality of fill material at the project.

All works were carried out in accordance with:

- AS 1289 “*Methods of Testing Soils for Engineering Purposes*”.
- AS3798-2007 “*Guidelines on earthworks for commercial & residential developments*”

Material used in the earthworks for level 1 areas of stage 1 was sourced from onsite and conditioned for use. It has been estimated that the quantity of material was approximately 400m³ of controlled fill.

2 Earthworks Specification

The earthworks are to be carried out in general accordance with AS3798-2007 ‘*Guidelines on earthworks for commercial & residential developments*’.

The specification requirements were that allotment fill materials are to be placed and compacted to a density ratio of not less than 95% standard compaction as determined by AS 1289 “*Methods of Testing Soils for Engineering Purposes*”. Site Inspections and Testing

2.1 Existing Surface Assessments

Prior to commencement of filling, it was confirmed that all unsuitable and weaker material such as top soil, Silt, uncontrolled or loose soil, organic effected material and other wet/soft areas had been appropriately stripped to a firm base in accordance with AS 3798-2007. The exposed surface, after removal of unsuitable material, was compacted and checked for soft areas by proof rolling. Where no movement or vertical deflection was detected, the stripped surface was assessed to be suitable for the placement of fill.

2.2 Fill Placement

All fill material on site was thoroughly visibly inspected by Construction Sciences site representative to ensure it meets the “**suitable material**” requirements outlined in AS3798-2007.

The fill material placed/compacted typically comprised of:

- Sandy Silty CLAY of medium plasticity.

Placement of fill was carried out using the following plants:

- 1* Laser Bucket
- 1* Compactor
- 1* Water Cart
- 1* Grader

The fill material was spread in near-horizontal layers, moisture conditioned and compacted in successive layers, using available compactors.

2.3 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*'.

The density tests were conducted using a nuclear density/moisture meter in accordance with AS 1289 5.8.1 "Determination of field density and field moisture content of a soil a nuclear surface moisture-density gauge".

Disturbed samples taken from each density test site were tested at Construction Sciences' NATA accredited soil laboratory, using the Hilf rapid compaction method, in accordance with AS 1289 5.7.1.

A total of Five (5) field density tests were carried out throughout the earthworks. The average density ratio for earthworks fill was 97.3% with a standard deviation ratio of 2.0%. The average moisture ratio for the earthworks fill was 72.7% with a standard deviation of 7.2%.

These (5) Five compaction tests equate approximately to 1 test per 80m³ of fill.

All density test results carried out in the engineered fill material are included in Appendix A.
All density reports are included in Appendix B.

3 General Statement of Compliance

It is considered that the placement of fill material at Maidens Green – Stage 1, Moama was carried out in accordance with AS3798-2007 "Guidelines on earthworks for commercial and residential developments". It is concluded that the fill was placed and compacted to a density ratio not less than the specified requirements.

4 Limit of Liability

This report has been produced for, and is the property of our client Northern Construction Group.

Construction Sciences accepts no liability to any third party, and will not enter into any communication with a third party regarding this report.

Construction Sciences will not release this report to any third party without the written permission of our Client.

Appendix A

Summary of Field Density Tests

COMPACTION TESTING RESULT SUMMARY							
Client: Northern Construction Group		Controlled Fill					
Project: 23860/P/307 - Maidens Green - Stage 1							
Client Reference	Sample Number	Field Moisture (%)	Est OMC (%)	Moisture Ratio (%)	Field Density (t/m ³)	PCWD (t/m ³)	Wet Density Ratio (%)
Controlled Fill - Lot 8	23860/S/81790	9.8	14	70	1.92	2.01	96
Controlled Fill - Lot 3	23860/S/81791	12.2	14.5	85.5	2.08	2.07	100.5
Controlled Fill - Lot 12	23860/S/82386	9.6	14	69	1.92	2	95.5
Controlled Fill - Lot 16	23860/S/82387	9.6	14	68.5	1.93	1.99	97
Controlled Fill - Lot 19	23860/S/82388	10.4	15	70.5	1.94	2	97.5
		<i>MEAN:</i>		72.7	<i>MEAN:</i>		97.3
		Standard Deviation:		7.2	Standard Deviation:		2.0

Appendix B

Test Reports



WET DENSITY RATIO REPORT

Client: Northern Construction Group Client Address: 33 Mundarra Rd, Echuca Project: Maidens Green Stage 1 Location: Moama Component: Stage 1 West Area Description: Lots 3 & 8	Report Number: 23860/R/36837-3 Project Number: 23860/P/307 Lot Number: Various Internal Test Request: 23860/T/16464 Client Reference/s: Controlled Fill Report Date / Page: 5/05/2022 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	23860/S/81790	23860/S/81791	
ID / Client ID	-	-	
Lot Number	08	03	
Date / Time Tested	1/12/2021 14:00	1/12/2021 14:00	
Material Source	Insitu	Insitu	
Material Type	Existing	Existing	
Sampling Method	AS1289.1.2.1 Cl 6.4b	AS1289.1.2.1 Cl 6.4b	
Depths: Test / Nom / Actual (mm)	125 / 150 / 150	125 / 150 / 150	
Standard or Modified	Standard	Standard	
Location	Lot 08	Lot 03	
RL	FSL	FSL	
Test Fraction (mm)	< 19.0 mm	< 19.0 mm	
Sample Oversize (%)	0	0	
Compaction Sample Number	23860/S/81790	23860/S/81791	
Sample Description	Existing	Existing	
Moisture Test Results:			
Field Moisture Content (%)	9.8	12.2	
Adjusted / Moisture Variation (%)	4.0	2.0	
Optimum Moisture Content (%)	14.0	14.5	
Moisture Variation from OMC	(Drier than OMC)	(Drier than OMC)	
Moisture Ratio (%)	70.0	85.5	
Density Test Results:			
Field Wet Density (t/m ³)	1.92	2.08	
Adj/Peak Conv Wet Density (t/m ³)	2.01	2.07	
Density Ratio Required (%)	95	95	
Hilf Density Ratio (%)	96.0	100.5	

Remarks	Re-Issued Report Replaces Report No 23860/R/36837-2 (reason: Data Entry Error),.
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Accredited for compliance with ISO/IEC 17025 – Testing		
	Accreditation Number: 1986 Corporate Site Number: 23860	Approved Signatory: Brenton Pump Form ID: W5ASRep Rev 2



LOT REPORT - WET DENSITY RATIO

Client: Northern Construction Group Client Address: 33 Mundarra Rd, Echuca Project: Maidens Green Stage 1 Location: Moama Supplied To: Northern Construction Group Area Description: Stage 6 & 1	Report Number: 23860/R/38993-1 Project Number: 23860/P/307 Lot Number: Internal Test Request: 23860/T/16604 Client Reference/s: Allotment Fill Report Date / Page: 5/05/2022 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	23860/S/82386	23860/S/82387	23860/S/82388
ID / Client ID	Stage 1	Stage 1	Stage 1
Lot Number	-	-	-
Date / Time Tested	14/12/2021 10:15	14/12/2021 10:15	14/12/2021 10:15
Material Source	Insitu	Insitu	Insitu
Material Type	Existing	Existing	Existing
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	298999.417	298992.990	298976.053
Northing	6002870.339	6002799.455	6002750.974
RL m	94.92	94.85	94.74
Lot	Lot 12	Lot 16	Lot 19
Test Fraction (mm)	< 19.0 mm	< 19.0 mm	< 19.0 mm
Sample Oversize (%)	0	0	0
Compaction Sample Number	23860/S/82386	23860/S/82387	23860/S/82388
Sample Description	Existing	Existing	Existing
Moisture Test Results:			
Field Moisture Content (%)	9.6	9.6	10.4
Adjusted / Moisture Variation (%)	4.5	4.5	4.5
Optimum Moisture Content (%)	14.0	14.0	15.0
Moisture Variation from OMC	(Drier than OMC)	(Drier than OMC)	(Drier than OMC)
Moisture Ratio (%)	69.0	68.5	70.5
Density Test Results:			
Field Wet Density (t/m ³)	1.92	1.93	1.94
Adj/Peak Conv Wet Density (t/m ³)	2.00	1.99	2.00
Density Ratio Required (%)	95	95	95
Hilf Density Ratio (%)	95.5	97.0	97.5

Remarks

Accredited for compliance with ISO/IEC 17025 – Testing	
 Accreditation Number: 1986 Corporate Site Number: 23860	Approved Signatory: Brenton Pump Form ID: W5ASRepSum Rev 4

LOT REPORT - WET DENSITY RATIO

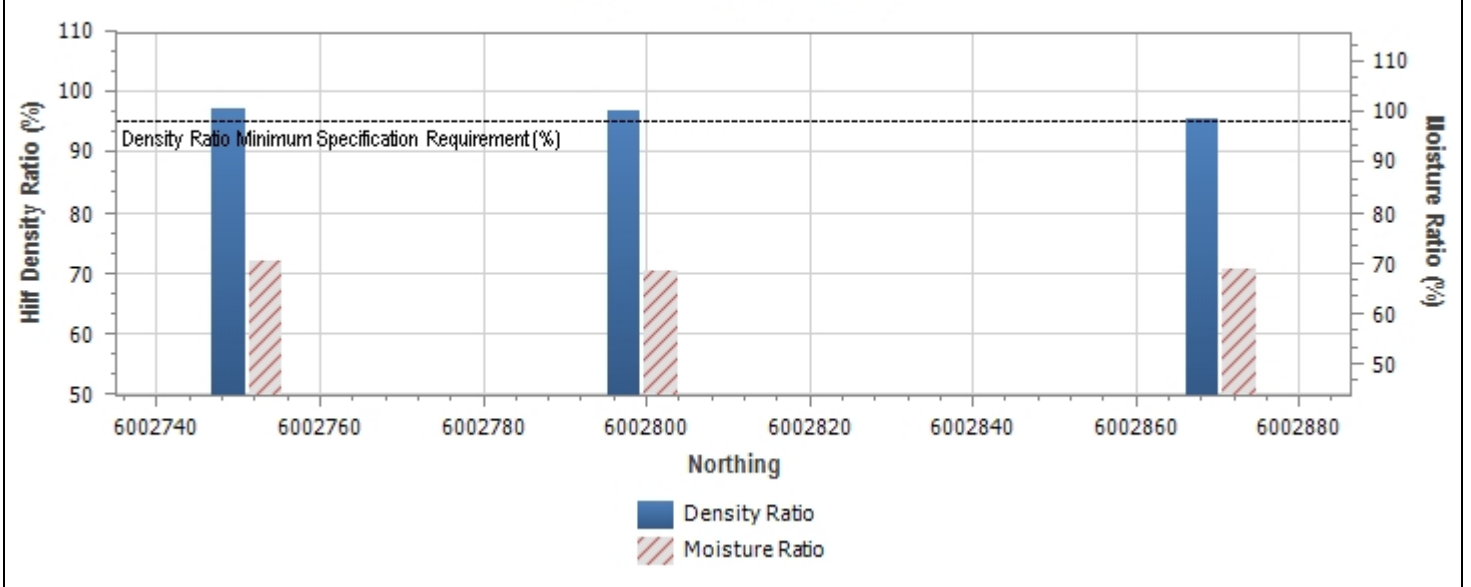
Client: Northern Construction Group	Report Number: 23860/R/38993-1
Client Address: 33 Mundarra Rd, Echuca	Project Number: 23860/P/307
Project: Maidens Green Stage 1	Lot Number:
Location: Moama	Internal Test Request: 23860/T/16604
Supplied To: Northern Construction Group	Client Reference/s: Allotment Fill
Area Description: Stage 6 & 1	Report Date / Page: 5/05/2022 Page 2 of 2

Test Procedures:	AS1289.5.7.1, AS1289.5.8.1, AS1289.2.1.1
Statistical Analysis Test Method:	Lot Average (Lot average calculations are not covered by endorsement)

Nuclear Gauge Calibration Details

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



LOT TEST RESULT SUMMARY



Tests in Lot = 3	Lot Minimum	Lot Maximum	Lot Mean	Standard Deviation
Moisture Ratio (%)	68.6	70.3	69.3	0.875
Half Density Ratio (%)	95.7	97.3	96.6	0.834

Lot Number: -
Mean Density Ratio (%): 96.6
Mean Moisture Ratio (%): 69.3

Remarks

	Accredited for compliance with ISO/IEC 17025 – Testing	
	Accreditation Number: 1986 Corporate Site Number: 23860	Approved Signatory: Brenton Pump Form ID: W5ASRepSum Rev 4

Appendix C

Site Images – Stripping Inspection

Client:	Northern Construction Group	Test Request Number:	23860/T/17599
Project:	Maidens Green Stage 1	Project Number:	23860/P/307
Client Reference:	Site Stripping Inspection	Inspector:	Brenton Pump
Owner:	-	Inspection Date:	25/11/2021
Constructor:	Northern Construction Group	Arrival Time:	15:35
Superintendent:	Damian Smith	Departure Time:	16:00

Earthworks in current progress	Element:	
	Result:	Site stripping of all topsoil and organic matter, levelling and foundation preparation.

Materials testing	Element:	Refer to material, type, source, purpose of testing, sampling methods and locations, test types, sample reference numbers, results obtained, and to whom distributed.
	Result:	None required for stripping inspection

Field density testing	Element:	Refer to types of test, section of work to which tests apply, test locations and levels, test reference numbers, results obtained, and to whom distributed.
	Result:	N/A

Laboratory compaction testing	Element:	Refer to test methods, location of sampling, sample reference numbers, results obtained, and to whom distributed.
	Result:	N/A

Works meeting geotechnical requirements	Element:	Refer to work type (e.g. stripping, subgrade compaction), basis of assessment (e.g. inspection, test reference numbers, and the like), extent of works apparently complying and requirements met.
	Result:	Site stripping deemed satisfactory with all organic matter removed. No soft areas were apparent while proof roll carried out with the present water cart.

Works failing to meet geotechnical requirements	Element:	Refer to work type (e.g., stripping, subgrade compaction), basis of assessment (e.g., inspection, test reference numbers, and the like), extent of work apparently failing to comply, requirements not met, action taken (instructions issued, retests ordered, and the like).
	Result:	None

Remarks	Element:	Include observations on works, site conditions, meetings or conversations on site, and the like.
	Result:	Nil

Reviewed By:	Brenton Pump	Corrective Action Required?	No	Re-Inspection Date:	-
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Corrective Action Details



25 Nov 2021 3:42:30 pm
36.0995S 144.7667E ±3.00m
Moama



25 Nov 2021 3:42:18 pm
36.0995S 144.7666E ±3.00m
Moama



25 Nov 2021 3:41:27 pm
36.0996S 144.7659E ±3.00m
Moama



25 Nov 2021 3:42:16 pm
36.0995S 144.7666E ±3.00m
Moama



25 Nov 2021 3:42:09 pm
36.0995S 144.7666E ±3.00m
Moama



25 Nov 2021 3:41:22 pm
36.0996S 144.7659E ±3.50m
Moama



25 Nov 2021 3:42:43 pm
36.0995S 144.7669E ±3.00m
Moama



25 Nov 2021 3:40:23 pm
36.0977S 144.7663E ±2.50m
Moama