

Shadforth
 99 Sandalwood Lane,
 Forest Glen, QLD, 4556

Project Number: PTP/03821
Letter Number: PTP/03821 – 0008
Project Name: Rosewood Green Estate
 Stage 1B

Attention: Campbell Thompson
Email: Campbell.Thompson@shadcivil.com

Report on Level 1 Earthworks
207 Rosewood Thagoona Road,
Rosewood, QLD, 4340

1. Introduction

This report summarises the results of inspection and testing provided by Protest Engineering (Protest) for the bulk earthworks as part of the Rosewood Green Estate Stage 1B project located at 207 Rosewood Thagoona Road undertaken between 8 October 2019 to 20 October 2019. The works were undertaken at the request of Shadforth.

The scope of inspection and testing undertaken was in general accordance with AS3798-2007 *Guidelines on Earthworks for Commercial and Residential Developments*. As part of the inspection and testing undertaken, Protest provided Level 1 supervision in accordance with Section 8.2 of AS3798-2007.

Approximately 8,600m³ of fill was placed at the site with a maximum depth of approximately 1.0m. *Drawing C3D, Revision 1 – Cut and Fill Plan* attached is the bulk earthworks cut to fill plan. The frequency of field density testing adopted for this project was based on AS3798-2007, Table 8.1 with a minimum of one test per 500m³ placed for a *Type 1 – Large Scale Operation*.

The minimum relative compaction requirements are specified in *Drawing C2D, Revision 1 – Bulk Earthworks Plan* and is attached. A summary of the criteria is summarized in Table 1.

Table 1: Test Request Compaction and Moisture Content Specification

Fill Types	Maximum Dry Density Ratio (%)	Optimum Moisture Content Variation (%)
Filling to Building Platforms	>98%	±2% (Dry of Wet of OMC ⁽¹⁾)
Subgrade	>100%	±2% (Dry of Wet of OMC ⁽¹⁾)
General Filling	>95%	±2% (Dry of Wet of OMC ⁽¹⁾)

(Notes: ⁽¹⁾ Optimum Moisture Content)

It is understood that the Level 1 Inspection was conducted according to the referenced standards and a Protest representative was on-site full time during the placement and compaction of the fill materials.

2. Earthworks Activities

Foundation preparation observed by Protest comprised the removal of topsoil and unsuitable materials across the cut to fill area exposing the underlying natural materials. A test roll was performed on the natural soils using a pad foot roller and no noticeable movement was observed on the final pass.

Following successful proof rolling, filling operations comprised the placement and compaction of material obtained from onsite cuts which were typically gravelly silty sandy clay. The fill was placed in loose uniform layers not exceeding 200mm in thickness with scrapers. Fill materials were moisture conditioned prior and during the placement. Placed layers were the trimmed with the grader to obtain the required surface levels and compacted with the pad foot roller.

A total of seventeen field density ratio tests were undertaken at select locations during the filling operations. Field density testing was carried out using a nuclear gauge and in accordance with the test method outlined in AS1289.5.8.1. The relative compaction was then determined by comparing the recorded field density with the laboratory maximum dry density (standard compaction) outlined in test method AS1289.5.1.1.

If during field density testing the readings on the nuclear gauge indicated that the required relative field density may not be achieved, the gauge data was not recorded, and the area was subsequently reworked (as required) and then retested to confirm the relative density.

A summary of the test results is presented in Table 2 and the approximate test locations are shown in the drawing attached.

Table 2: Summary of Density Testing

Item	Compaction	Moisture Variation
No. of tests	17	17
Mean	99.5	1.5% (Dry of OMC ⁽¹⁾)

(Notes: ⁽¹⁾ Optimum Moisture Content)

3. Compliance

As far as it has been able to determine, it is our opinion that the bulk earthworks placed and compacted at 207 Rosewood Thagoona Road in Ripley by Shadforth between 8 October 2019 to 20 October 2019 comply with the above-mentioned specifications and can be considered as Level 1 'controlled' or structural fill.

4. Comments

Based on the results of the inspections and field density testing whilst Protest were on-site, it is considered that the bulk earthworks at 207 Rosewood Thagoona Road between 8 October 2019 to 20 October 2019 have been undertaken in general accordance with AS3798-2007 *Guidelines on Earthworks for Commercial and Residential Developments*. Protest believes consideration should be given to the following:

- I. This report only certifies the bulk earthworks activities supervised by Protest between 8 October 2019 to 20 October 2019. Protest does not take responsibility for any other bulk earthworks activities that have occurred before or after these dates;
- II. The installation of services or any activities that may cause disruption of the compacted filling;

- III. The suitability of the filled land to support the proposed structures; and
- IV. Any variation in filling depth of extent of areas that is not noted within this report or on the individual test report sheets.

5. Constraints

- I. Protest has prepared this report for the bulk earthworks at 207 Rosewood Thagoona Road, Rosewood. This report was produced for the sole use of Shadforth. It should not be used by or depended upon for other projects or purposes on the same or other site or by a third party. In the preparation of this report Protest has relied upon information provided by the client and/or their agents.
- II. The results provided in this report are indicative of the subsurface conditions on the site only at the specific sampling or testing locations, and then only to the depths investigated along with the time the work was carried out. It is known that subsurface conditions can suddenly change due to irregular geological processes and as a result of human influences. Such changes may occur after Protest field testing has been completed.
- III. Certain ground conditions and the materials behaviour observed or contained at the test locations may alter from those which may be encountered elsewhere on the site. Should variations in subsurface conditions be encountered, then additional advice should be sought from Protest and, if required, amendments made.
- IV. Protest cannot be held responsible for interpretations or conclusions made by others unless they are supported by an expressed statement, interpretation, outcome or conclusion given in this report.

We trust that the above information is suitable for your present requirements. Should you have any queries, please do not hesitate to contact the undersigned.

Protest Engineering



Kenney Pham
Laboratory Division Manager

Approved By



Samuel Bamford
Branch Manager

- Attachments:
- 1. Site Images;
 - 2. Test Location Plan;
 - 3. Density Reports;
 - 4. Referenced Drawings.

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Attachment 1

Site Images



Figure 1 – Topsoil strip and removal of organic/unsuitable material across the site area using the 623G Scraper. (Taken 8 October 2019)



Figure 2 – 623G Scrapers used throughout bulk earthworks component to spread and place fill. (Taken 10 October 2019)



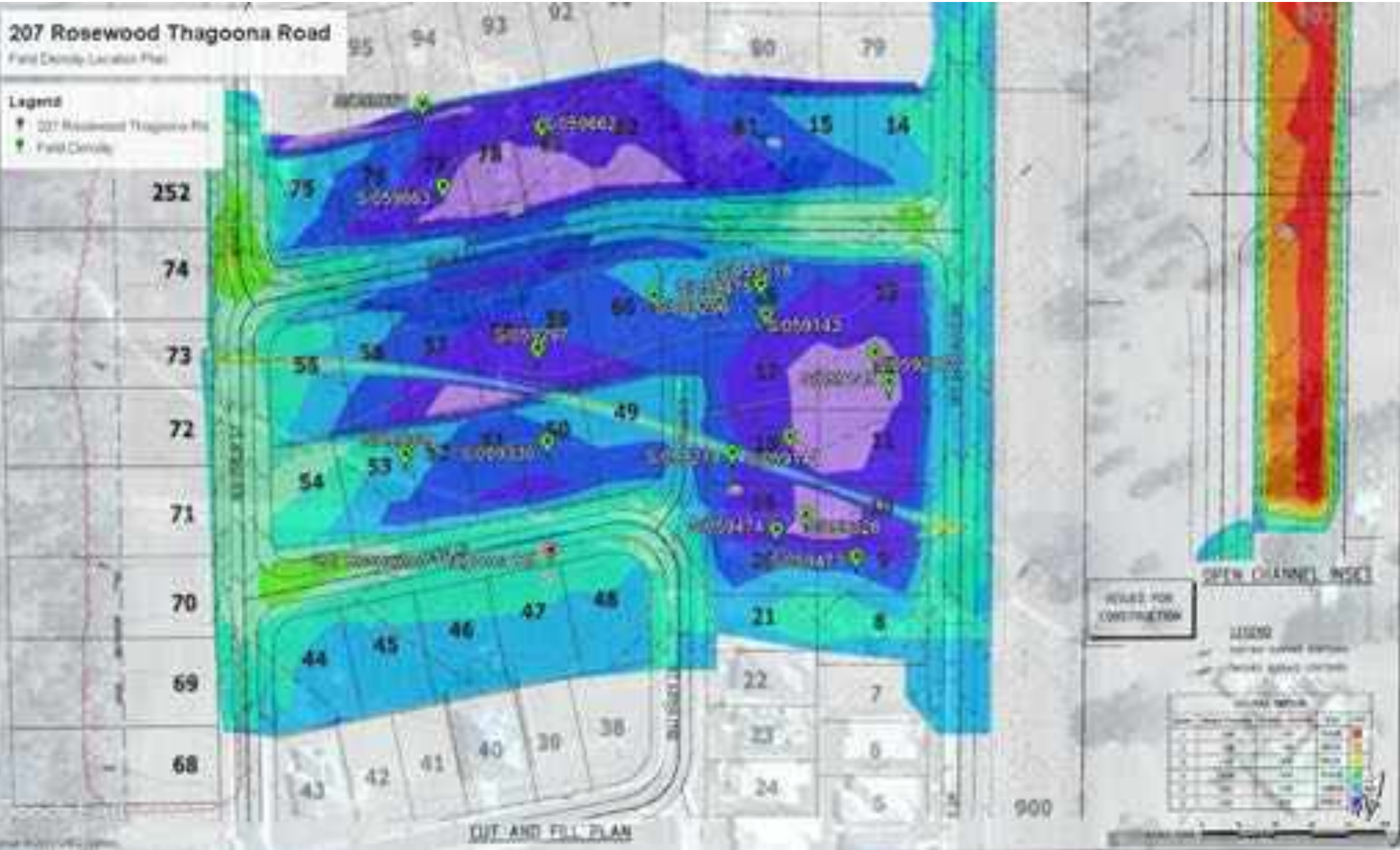
Figure 3 – Water cart used during the bulk earthworks component to moisture condition fill prior and during placement. (Taken 11 October 2019)



Figure 4 – Pad foot roller and grader used to trim and compact placed fill materials. (Taken 11 October 2019)

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Attachment 2
Testing Location Plan



01	Field Density Test Location Plan	19/12/19	KP	KP	KP
Issue	Description	Date	DRN	CHK	APP



CLIENT
Shadforth

TITLE
207 Rosewood Thagoona Road



Job No.
PTP/03821
Drawing No.
01





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Attachment 3
Density Reports



Dry Density / Moisture Ratio Report

Client :	Shadforth			Report Number :	SR/PTP/03821 - 1/1	
Client Address :	99 Sandalwood Ln, Forest Glen QLD, 4556			Report Date :	12/10/2019	
Project Name :	207 Rosewood Thagoona Road			Test Request :	-	
Project Number :	PTP/03821			Page 1 of 1		
Location :	Rosewood					
Test Methods :	AS1289.5.4.1, AS1289.5.8.1, AS1289.2.1.1, AS1289.5.1.1					
Sample Number :	S/059143	S/059144	S/059145			
Date Tested :	10/10/2019	10/10/2019	10/10/2019			
Material Source :	Onsite	Onsite	Onsite			
Material Type :	General fill	General fill	General fill			
Test / Layer Depths :	150 / 150	150 / 150	150 / 150			
Sampling Method :	AS1289.1.2.1 - cl6.4	AS1289.1.2.1 - cl6.4	AS1289.1.2.1 - cl6.4			
Time :	10:00	10:10	10:30			
Lot Number :	-	-	-			
Location 1 :	E: 461743	E: 461764	E: 461780			
Location 2 :	N: 6943578	N: 6943553	N: 6943578			
Location 3 :	0.5m Below finish level	0.5m Below finish level	Finish level			
Location 4 :	-	-	-			
Test Fraction (mm) :	< 19mm	< 19mm	< 19mm			
Oversize Wet :	-	-	-			
Oversize Dry :	-	-	-			
Oversize Density - Dry (t/m ³) :	-	-	-			
Assigned MDR (Yes/No) :	No	No	No			
MDR Sample Number :	S/059143	S/059144	S/059145			
MDR Test Date :	11/10/2019	11/10/2019	11/10/2019			
Soil Description :	Silty Clay	Silty Clay	Silty Clay			
<i>MDR Test Results</i>						
MDD (t/m ³) :	1.55	1.58	1.56			
OMC :	18.5%	20.5%	19.0%			
ADJ MDD (t/m ³) :	-	-	-			
ADJ OMC :	-	-	-			
<i>Moisture Test Results</i>						
Field Moisture Content :	17.0%	18.0%	17.5%			
Moisture Specification :	±2% of OMC	±2% of OMC	±2% of OMC			
Variation from OMC :	1.5% Dry of OMC	2.0% Dry of OMC	1.0% Dry of OMC			
Moisture Ratio :	91.0%	89.5%	94.0%			
<i>Density Test Results</i>						
Field Dry Density (t/m ³) :	1.52	1.54	1.54			
Density Specification :	95%	95%	95%			
Dry Density Ratio :	98.0%	97.5%	98.5%			
Characteristic Value (Q020) :	CV(min) = 97.6%	CV(max) = 98.4%	Mean = 98.0%	Std. Dev. = 0.5%	n = 3	k = 0.828
Degree of Saturation / Required :	-	-	-			
Remarks :	-					
 <p>Accredited for Compliance with ISO / IEC 17025 - Testing Protest Engineering (Gold Coast) Accreditation Number - 19667 Base Laboratory Site Number - 22838 - Gold Coast Base Laboratory Address - 1/9 Greg Chappell Drive, BURLEIGH HEADS, QLD, 4220</p>	APPROVED SIGNATORY  Samuel Bamford - Signatory					



Dry Density / Moisture Ratio Report

Client :	Shadforths			Report Number :	SR/PTP/03821 - 2/1	
Client Address :	99 Sandalwood Ln, Forest Glen QLD, 4556			Report Date :	15/10/2019	
Project Name :	207 Rosewood Thagoona Road			Test Request :	-	
Project Number :	PTP/03821			Page 1 of 1		
Location :	Rosewood					
Test Methods :	AS1289.5.4.1, AS1289.5.8.1, AS1289.2.1.1, AS1289.5.1.1					
Sample Number :	S/059217	S/059218	S/059219			
Date Tested :	11/10/2019	11/10/2019	11/10/2019			
Material Source :	Onsite	Onsite	Onsite			
Material Type :	General fill	General fill	General fill			
Test / Layer Depths :	150 / 150	150 / 150	150 / 150			
Sampling Method :	AS1289.1.2.1 - cl6.4	AS1289.1.2.1 - cl6.4	AS1289.1.2.1 - cl6.4			
Time :	11:30	11:40	11:50			
Lot Number :	-	-	-			
Location 1 :	E: 461773	E: 461738	E: 461753			
Location 2 :	N: 6943583	N: 6943584	N: 6943542			
Location 3 :	Finish level	Finish level	Finish level			
Location 4 :	-	-	-			
Test Fraction (mm) :	< 19mm	< 19mm	< 19mm			
Oversize Wet :	-	-	-			
Oversize Dry :	-	-	-			
Oversize Density - Dry (t/m ³) :	-	-	-			
Assigned MDR (Yes/No) :	No	No	No			
MDR Sample Number :	S/059217	S/059218	S/059219			
MDR Test Date :	12/10/2019	12/10/2019	12/10/2019			
Soil Description :	Silty Clay	Silty Clay	Silty Clay			
<i>MDR Test Results</i>						
MDD (t/m ³) :	1.58	1.55	1.58			
OMC :	22.5%	23.0%	21.0%			
ADJ MDD (t/m ³) :	-	-	-			
ADJ OMC :	-	-	-			
<i>Moisture Test Results</i>						
Field Moisture Content :	21.0%	21.0%	19.5%			
Moisture Specification :	±2% of OMC	±2% of OMC	±2% of OMC			
Variation from OMC :	1.0% Dry of OMC	2.0% Dry of OMC	1.5% Dry of OMC			
Moisture Ratio :	95.0%	92.0%	93.0%			
<i>Density Test Results</i>						
Field Dry Density (t/m ³) :	1.56	1.56	1.61			
Density Specification :	95%	95%	95%			
Dry Density Ratio :	98.0%	100.5%	102.0%			
Characteristic Value (Q020) :	CV(min) = 98.5% CV(max) = 101.8% Mean = 100.2% Std. Dev. = 2.0% n = 3 k = 0.828					
Degree of Saturation / Required :	-	-	-			
Remarks :	-					
 Accredited for Compliance with ISO / IEC 17025 - Testing Protest Engineering (Gold Coast) Accreditation Number - 19667 Base Laboratory Site Number - 22838 - Gold Coast Base Laboratory Address - 1/9 Greg Chappell Drive, BURLEIGH HEADS, QLD, 4220				APPROVED SIGNATORY  Samuel Bamford - Signatory		



Dry Density / Moisture Ratio Report

Client :	Shadforth		Report Number :	SR/PTP/03821 - 3/1	
Client Address :	99 Sandalwood Ln, Forest Glen QLD, 4556		Report Date :	15/10/2019	
Project Name :	207 Rosewood Thagoona Road		Test Request :	-	
Project Number :	PTP/03821		Page 1 of 1		
Location :	Rosewood				
Test Methods :	AS1289.5.4.1, AS1289.5.8.1, AS1289.2.1.1, AS1289.5.1.1				
Sample Number :	S/059296	S/059297			
Date Tested :	14/10/2019	14/10/2019			
Material Source :	Onsite	Onsite			
Material Type :	General fill	General fill			
Test / Layer Depths :	150 / 150	150 / 150			
Sampling Method :	AS1289.1.2.1 - cl6.4	AS1289.1.2.1 - cl6.4			
Time :	10:20	10:30			
Lot Number :	-	-			
Location 1 :	E: 461715	E: 461707			
Location 2 :	N: 6943568	N: 6943552			
Location 3 :	0.3m Below finish level	0.3m Below finish level			
Location 4 :	-	-			
Test Fraction (mm) :	< 19mm	< 19mm			
Oversize Wet :	-	-			
Oversize Dry :	-	-			
Oversize Density - Dry (t/m ³) :	-	-			
Assigned MDR (Yes/No) :	No	No			
MDR Sample Number :	S/059296	S/059297			
MDR Test Date :	14/10/2019	14/10/2019			
Soil Description :	Silty Clay	Silty Clay			
<i>MDR Test Results</i>					
MDD (t/m ³) :	1.63	1.60			
OMC :	25.5%	24.0%			
ADJ MDD (t/m ³) :	-	-			
ADJ OMC :	-	-			
<i>Moisture Test Results</i>					
Field Moisture Content :	24.0%	23.0%			
Moisture Specification :	±2% of OMC	±2% of OMC			
Variation from OMC :	1.5% Dry of OMC	1.0% Dry of OMC			
Moisture Ratio :	95.0%	96.0%			
<i>Density Test Results</i>					
Field Dry Density (t/m ³) :	1.56	1.53			
Density Specification :	95%	95%			
Dry Density Ratio :	95.5%	96.0%			
Characteristic Value (Q020) :	CV(min) = 95.5%	CV(max) = 96.0%	Mean = 95.8%	Std. Dev. = 0.4%	n = 2 k = 0.828
Degree of Saturation / Required :	-	-			
Remarks :	-				
	Accredited for Compliance with ISO / IEC 17025 - Testing Protest Engineering (Gold Coast) Accreditation Number - 19667 Base Laboratory Site Number - 22838 - Gold Coast			APPROVED SIGNATORY 	
	Base Laboratory Address - 1/9 Greg Chappell Drive, BURLEIGH HEADS, QLD, 4220			Samuel Bamford - Signatory	



Dry Density / Moisture Ratio Report

Client :	Shadforth			Report Number :	SR/PTP/03821 - 4/1	
Client Address :	99 Sandalwood Ln, Forest Glen QLD, 4556			Report Date :	17/10/2019	
Project Name :	207 Rosewood Thagoona Road			Test Request :	-	
Project Number :	PTP/03821			Page 1 of 1		
Location :	Rosewood					
Test Methods :	AS1289.5.4.1, AS1289.5.8.1, AS1289.2.1.1, AS1289.5.1.1					
Sample Number :	S/059328	S/059329	S/059330			
Date Tested :	15/10/2019	15/10/2019	15/10/2019			
Material Source :	Onsite	Onsite	Onsite			
Material Type :	General Fill	General Fill	General Fill			
Test / Layer Depths :	150 / 150	150 / 150	150 / 150			
Sampling Method :	AS1289.1.2.1 - cl6.4	AS1289.1.2.1 - cl6.4	AS1289.1.2.1 - cl6.4			
Time :	10:50	11:30	11:40			
Lot Number :	Lots 10-19	Lot 52	Lot 50			
Location 1 :	E: 461778	E: 461678	E: 461709			
Location 2 :	N: 6943537	N: 6943500	N: 6943521			
Location 3 :	Level: -0.5m Below Finish Level	Level: Finish Level	Level: Finish Level			
Location 4 :	-	-	-			
Test Fraction (mm) :	< 19mm	< 19mm	< 19mm			
Oversize Wet :	-	-	-			
Oversize Dry :	-	-	-			
Oversize Density - Dry (t/m ³) :	-	-	-			
Assigned MDR (Yes/No) :	No	No	No			
MDR Sample Number :	S/059328	S/059329	S/059330			
MDR Test Date :	16/10/2019	16/10/2019	16/10/2019			
Soil Description :	Silty Sandy Clay	Silty Sandy Clay	Silty Sandy Clay			
<i>MDR Test Results</i>						
MDD (t/m ³) :	1.79	1.60	1.56			
OMC :	18.5%	22.0%	25.0%			
ADJ MDD (t/m ³) :	-	-	-			
ADJ OMC :	-	-	-			
<i>Moisture Test Results</i>						
Field Moisture Content :	18.0%	21.5%	23.5%			
Moisture Specification :	±2% of OMC	±2% of OMC	±2% of OMC			
Variation from OMC :	0.5% Dry of OMC	0.5% Dry of OMC	1.5% Dry of OMC			
Moisture Ratio :	96.5%	98.5%	93.0%			
<i>Density Test Results</i>						
Field Dry Density (t/m ³) :	1.74	1.58	1.57			
Density Specification :	95%	95%	95%			
Dry Density Ratio :	97.5%	99.0%	100.5%			
Characteristic Value (Q020) :	CV(min) = 97.8%	CV(max) = 100.2%	Mean = 99.0%	Std. Dev. = 1.5%	n = 3	k = 0.828
Degree of Saturation / Required :	-	-	-			
Remarks :	-					
	Accredited for Compliance with ISO / IEC 17025 - Testing Protest Engineering (Gold Coast) Accreditation Number - 19667 Base Laboratory Site Number - 22838 - Gold Coast Base Laboratory Address - 1/9 Greg Chappell Drive, BURLEIGH HEADS, QLD, 4220			APPROVED SIGNATORY  Samuel Bamford - Signatory		

Dry Density / Moisture Ratio Report

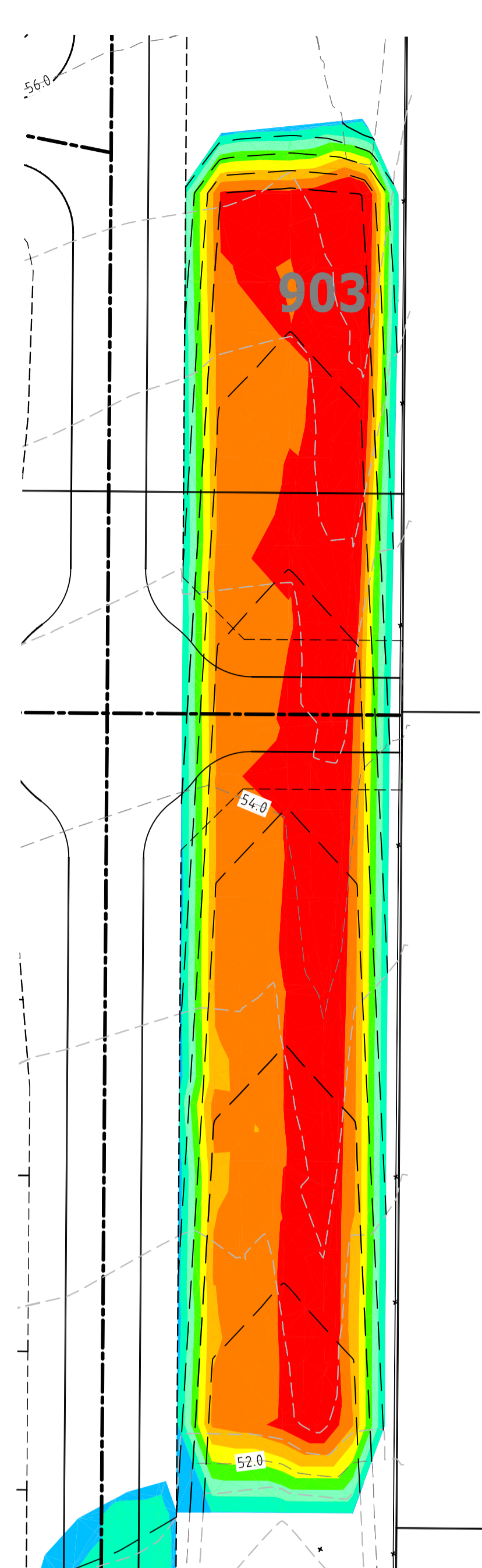
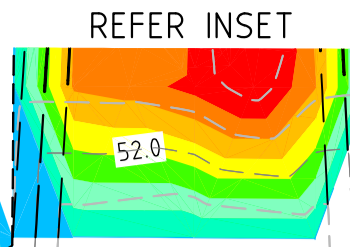
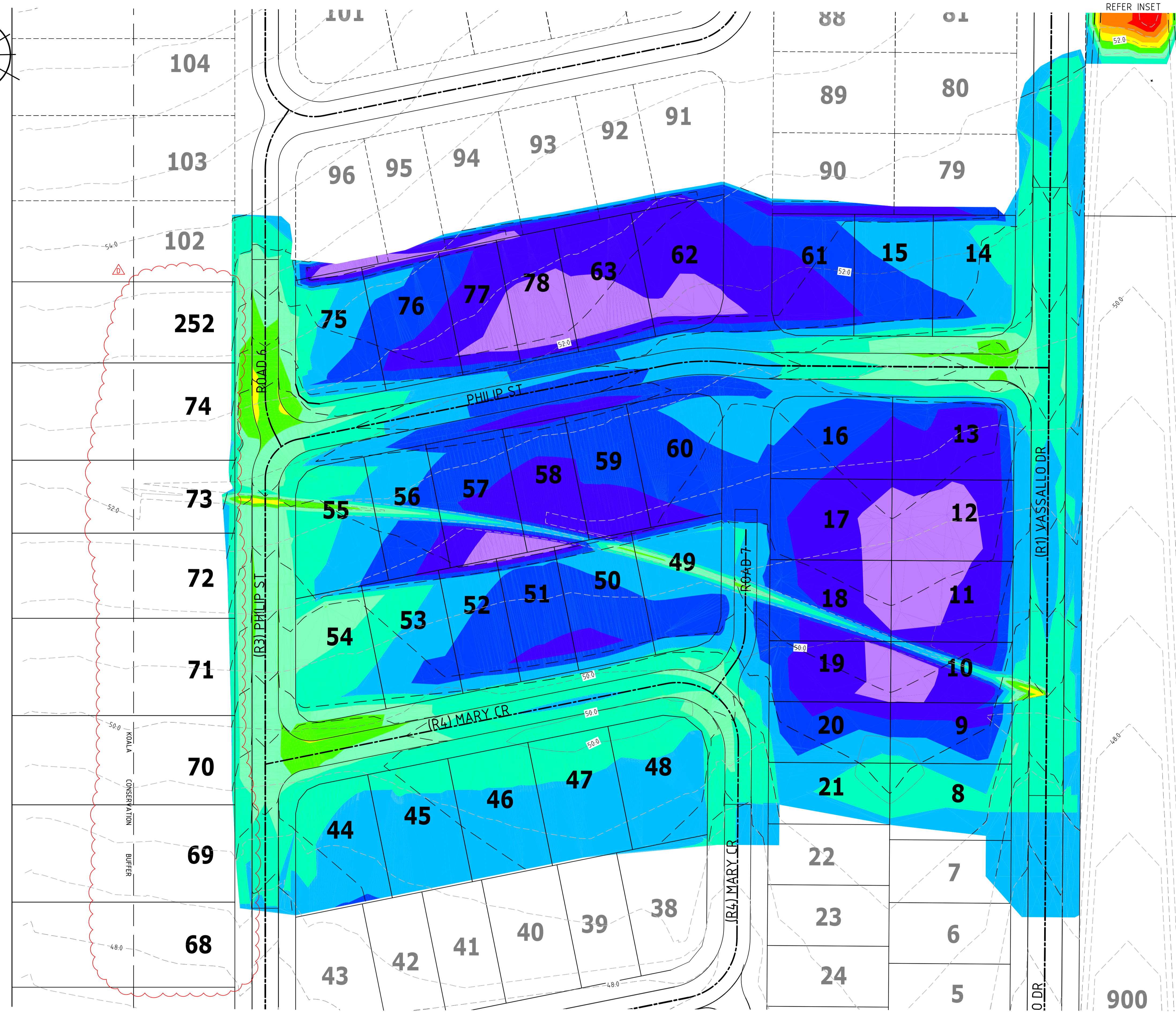
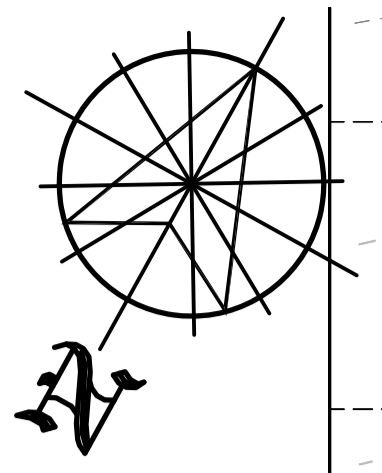
Client :	Shadforth			Report Number :	SR/PTP/03821 - 5/1	
Client Address :	99 Sandalwood Ln, Forest Glen QLD, 4556			Report Date :	21/10/2019	
Project Name :	207 Rosewood Thagoona Road			Test Request :	-	
Project Number :	PTP/03821			Page 1 of 1		
Location :	Rosewood					
Test Methods :	AS1289.5.4.1, AS1289.5.8.1, AS1289.2.1.1, AS1289.5.1.1					
Sample Number :	S/059473	S/059474	S/059475			
Date Tested :	17/10/2019	17/10/2019	17/10/2019			
Material Source :	Onsite	Onsite	Onsite			
Material Type :	General fill	General fill	General fill			
Test / Layer Depths :	150 / 150	150 / 150	150 / 150			
Sampling Method :	AS1289.1.2.1 - cl6.4	AS1289.1.2.1 - cl6.4	AS1289.1.2.1 - cl6.4			
Time :	13:00	13:10	13:20			
Lot Number :	-	-	-			
Location 1 :	E: 461795	E: 461773	E: 461731			
Location 2 :	N: 6943534	N: 6943530	N: 6943575			
Location 3 :	Finish level	Finish level	Finish level			
Location 4 :	-	-	-			
Test Fraction (mm) :	< 19mm	< 19mm	< 19mm			
Oversize Wet :	-	-	-			
Oversize Dry :	-	-	-			
Oversize Density - Dry (t/m ³) :	-	-	-			
Assigned MDR (Yes/No) :	No	No	No			
MDR Sample Number :	S/059473	S/059474	S/059475			
MDR Test Date :	18/10/2019	18/10/2019	18/10/2019			
Soil Description :	Silty Sandy Clay	Silty Sandy Clay	Silty Sandy Clay			
<i>MDR Test Results</i>						
MDD (t/m ³) :	1.81	1.84	1.82			
OMC :	14.0%	12.5%	13.0%			
ADJ MDD (t/m ³) :	-	-	-			
ADJ OMC :	-	-	-			
<i>Moisture Test Results</i>						
Field Moisture Content :	12.5%	10.5%	11.0%			
Moisture Specification :	±2% of OMC	±2% of OMC	±2% of OMC			
Variation from OMC :	2.0% Dry of OMC	2.0% Dry of OMC	2.0% Dry of OMC			
Moisture Ratio :	87.5%	84.0%	83.5%			
<i>Density Test Results</i>						
Field Dry Density (t/m ³) :	1.82	1.84	1.85			
Density Specification :	95%	95%	95%			
Dry Density Ratio :	100.5%	100.0%	102.0%			
Characteristic Value (Q020) :	CV(min) = 100.0% CV(max) = 101.7%		Mean = 100.8%	Std. Dev. = 1.0%	n = 3	k = 0.828
Degree of Saturation / Required :	-	-	-			
Remarks :	-					
	Accredited for Compliance with ISO/ IEC 17025 - Testing Protest Engineering (Gold Coast) Accreditation Number - 19667 Base Laboratory Site Number - 22838 - Gold Coast			APPROVED SIGNATORY  Samuel Bamford - Signatory		
	Base Laboratory Address - 1/9 Greg Chappell Drive, BURLEIGH HEADS, QLD, 4220					

Dry Density / Moisture Ratio Report

Client :	Shadforth			Report Number :	SR/PTP/03821 - 12/1	
Client Address :	99 Sandalwood Ln, Forest Glen QLD, 4556			Report Date :	27/10/2019	
Project Name :	207 Rosewood Thagoona Road			Test Request :	-	
Project Number :	PTP/03821			Page 1 of 1		
Location :	Rosewood					
Test Methods :	AS1289.5.4.1, AS1289.5.8.1, AS1289.2.1.1, AS1289.5.1.1					
Sample Number :	S/059661	S/059662	S/059663			
Date Tested :	22/10/2019	22/10/2019	22/10/2019			
Material Source :	Onsite	Onsite	Onsite			
Material Type :	General fill	General fill	General fill			
Test / Layer Depths :	150 / 150	150 / 150	150 / 150			
Sampling Method :	AS1289.1.2.1 - cl6.4	AS1289.1.2.1 - cl6.4	AS1289.1.2.1 - cl6.4			
Time :	09:00	09:10	09:20			
Lot Number :	-	-	-			
Location 1 :	E: 461630	E: 461661	E: 461645			
Location 2 :	N: 6943583	N: 6943580	N: 6943569			
Location 3 :	0.5m Below finish level	Finish level	Finish level			
Location 4 :	-	-	-			
Test Fraction (mm) :	< 19mm	< 19mm	< 19mm			
Oversize Wet :	-	-	-			
Oversize Dry :	-	-	-			
Oversize Density - Dry (t/m ³) :	-	-	-			
Assigned MDR (Yes/No) :	No	No	No			
MDR Sample Number :	S/059661	S/059662	S/059663			
MDR Test Date :	23/10/2019	23/10/2019	23/10/2019			
Soil Description :	Sandy Silty Clay	Sandy Silty Clay	Sandy Silty Clay			
<i>MDR Test Results</i>						
MDD (t/m ³) :	1.85	1.82	1.91			
OMC :	13.5%	14.0%	12.0%			
ADJ MDD (t/m ³) :	-	-	-			
ADJ OMC :	-	-	-			
<i>Moisture Test Results :</i>						
Field Moisture Content :	13.0%	13.0%	10.5%			
Moisture Specification :	±2% of OMC	±2% of OMC	±2% of OMC			
Variation from OMC :	0.5% Dry of OMC	1.5% Dry of OMC	1.5% Dry of OMC			
Moisture Ratio :	97.0%	91.0%	88.5%			
<i>Density Test Results</i>						
Field Dry Density (t/m ³) :	1.88	1.84	1.94			
Density Specification :	95%	95%	95%			
Dry Density Ratio :	101.5%	101.0%	101.5%			
Characteristic Value (Q020) :	CV(min) = 101.1%	CV(max) = 101.6%	Mean = 101.3%	Std. Dev. = 0.3%	n = 3	k = 0.828
Degree of Saturation / Required :	-	-	-			
Remarks :	-					
 <p>Accredited for Compliance with ISO/ IEC 17025 - Testing Protest Engineering (Gold Coast) Accreditation Number - 19667 Base Laboratory Site Number - 22838 - Gold Coast</p> <p>Base Laboratory Address - 1/9 Greg Chappell Drive, BURLEIGH HEADS, QLD, 4220</p>				<p>APPROVED SIGNATORY</p>  Samuel Bamford - Signatory		

PROTEST
ENGINEERING
GEOTECHNICAL // TESTING SERVICES // STRUCTURAL

Attachment 4
Referenced Drawings



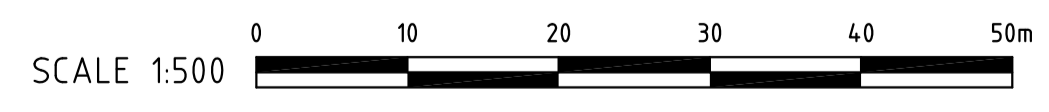
ISSUED FOR CONSTRUCTION

OPEN CHANNEL INSET

LEGEND

- - - 46.0 EXISTING SURFACE CONTOURS
- - - 46.0 FINISHED SURFACE CONTOURS

CUT/FILL DEPTHS				
Number	Minimum Elevation	Maximum Elevation	Area	Color
1	-2.00	-1.50	1242.80	Red
2	-1.50	-1.00	1397.45	Orange
3	-1.00	-0.50	1263.39	Yellow
4	-0.50	-0.01	10712.82	Green
5	0.01	0.50	14095.46	Blue
6	0.50	0.95	7490.32	Purple



CUT AND FILL PLAN

HUNT MICHEL & PARTNERS

Postal Address: 24 DARLING STREET IPSWICH Q 4305
 CONSULTING ENGINEERS CIVIL AND STRUCTURAL A.B.N. 75 074 746 599
 PH 3812 2399 FAX 3812 1900 EMAIL dan@hmengineers.com.au

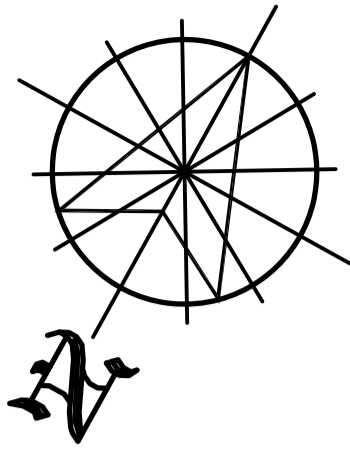
CLIENT
 ROSEWOOD GREEN DEVELOPMENT
 PO BOX 3715
 ROUSE HILL NSW 2155

PROJECT
 ROSEWOOD GREEN ESTATE
 STAGE 1B
 ROSEWOOD QLD 4340

DRAWING TITLE
 CUT AND FILL PLAN

REV	DATE	APPROVED:
D	27.08.19	<i>Daniel Michel</i> DANIEL MICHEL RPEQ 3766 DIRECTOR, HUNT MICHEL & PARTNERS
C	18.05.18	
B	09.06.16	
A	11.04.16	

DESIGNED: N.K.
 DRAWN: N.K.
 CHECKED: D.M.
 SCALE: AS SHOWN
 DATE:
 JOB No. 216006
 DWG No. C3D



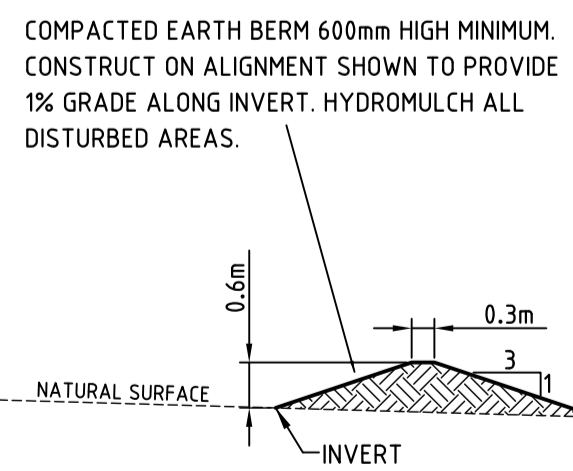
BULK EARTHWORKS NOTES

- STRIP SITE OF ALL TOP SOIL AND ORGANIC MATTER. THIS MATERIAL IS NOT TO BE USED AS STRUCTURAL FILL. SPREAD TOPSOIL TO FOOTPATHS AND BATTERED BANKS.
- UNDERLYING SOILS TO BE PROOF-ROLLED WITH A MIN 10T VIBRATING SHEEPSFOOT ROLLER. REMOVE ANY SOFT SPOTS.
- EXCAVATED NON-ORGANIC SOILS MAY BE USED FOR BULK FILLING. IMPORTED FILL IS TO BE A MINIMUM CBR15 AND HAVE A MAXIMUM GRAIN SIZE OF 25mm.
- ALL FILLING IS TO BE PLACED IN LOOSE LAYERS NO GREATER THAN 200mm THICK TO THE FOLLOWING COMPACTION STANDARDS.

LOCATION	MINIMUM RELATIVE COMPACTION %
FILLING TO BUILDING PLATFORMS	98% STD
SUBGRADE	100% STD
GENERAL FILLING	95% STD

- ALL WORKMANSHIP, MATERIALS AND TESTING TO BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS ROADS OF THE QUEENSLAND TRANSPORT DEPARTMENT AND IPSWICH PLANNING SCHEME POLICIES AND STANDARD DRAWINGS.
- ALL SUPERVISION AND TESTING IS TO BE TO LEVEL 1 IN ACCORDANCE WITH AS 3798 GUIDELINES ON EARTHWORKS FOR COMMERCIAL AND RESIDENTIAL DEVELOPMENTS.
- PROVIDE B GRADE COUCH TO THE FOLLOWING AREAS:
 - BETWEEN FOOTPATH AND KERB.
 - 1 STRIP ON OUTSIDE OF FOOTPATHS.
 - BETWEEN KERB AND MAIN CHANNEL.
 - 2 STRIPS ALONGSIDE OTHER KERBS.
 - FULL VERGE ALONG VASSALLO DRIVE.
 - SWALES
 - BATTERS STEEPER THAN 1 in 6.
 REFER TO LANDSCAPE DRAWINGS FOR SURFACE FINISHES TO MAIN CHANNEL.
- HYDROMULCH ALL REMAINING DISTURBED AREAS.
- ANY EXCESS FILL MATERIAL IS TO BE STOCKPILED ON A FUTURE STAGE OR REMOVED OFF SITE AS DIRECTED BY THE ENGINEER.
- ADDITIONAL SOIL TESTING INCLUDING SOAKED CBR TESTS WILL BE REQUIRED TO DETERMINE THE STAGE SPECIFIC SOIL CONDITIONS.
- REFER TO SOIL REPORT BY MORRISON GEOTECHNIC FOR ADDITIONAL EARTHWORKS INFORMATION.

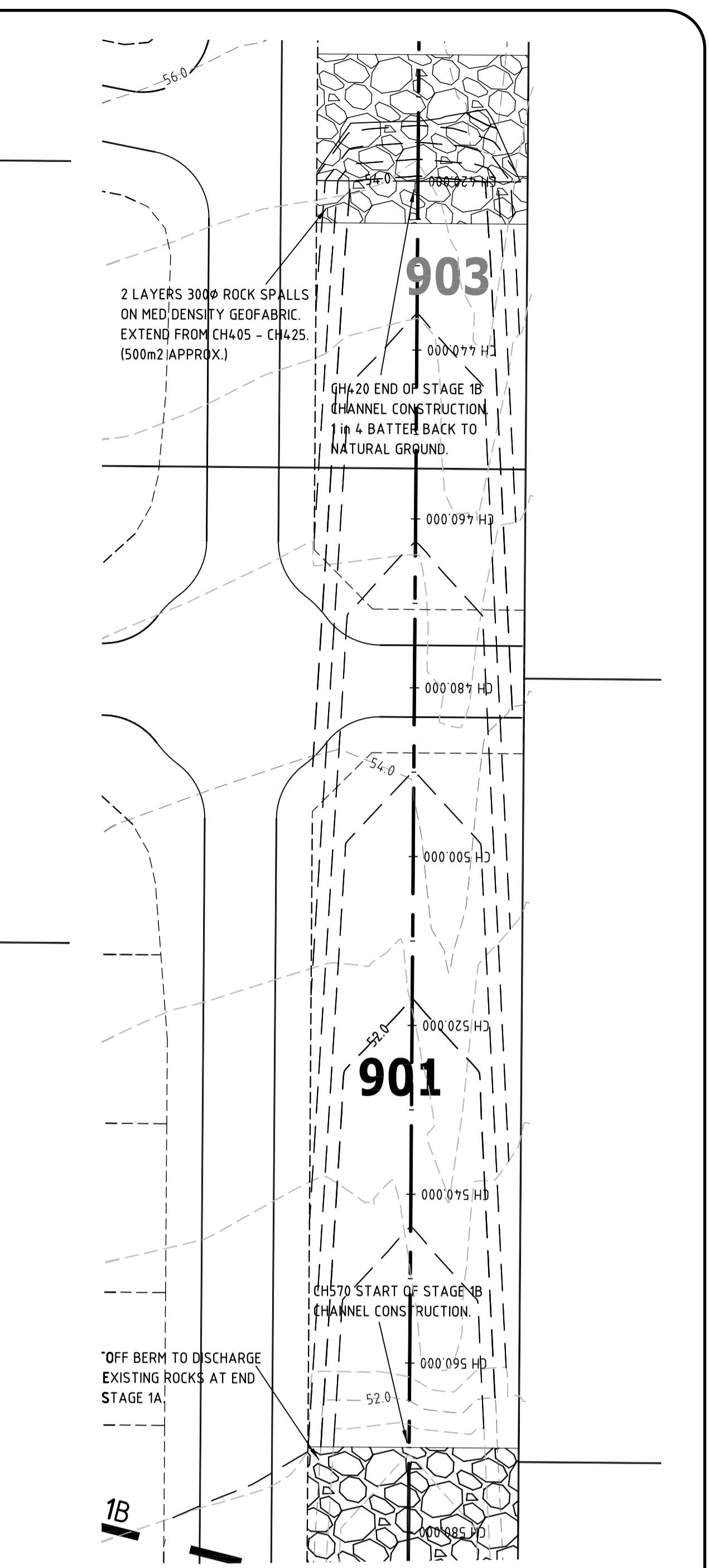
ISSUED FOR CONSTRUCTION



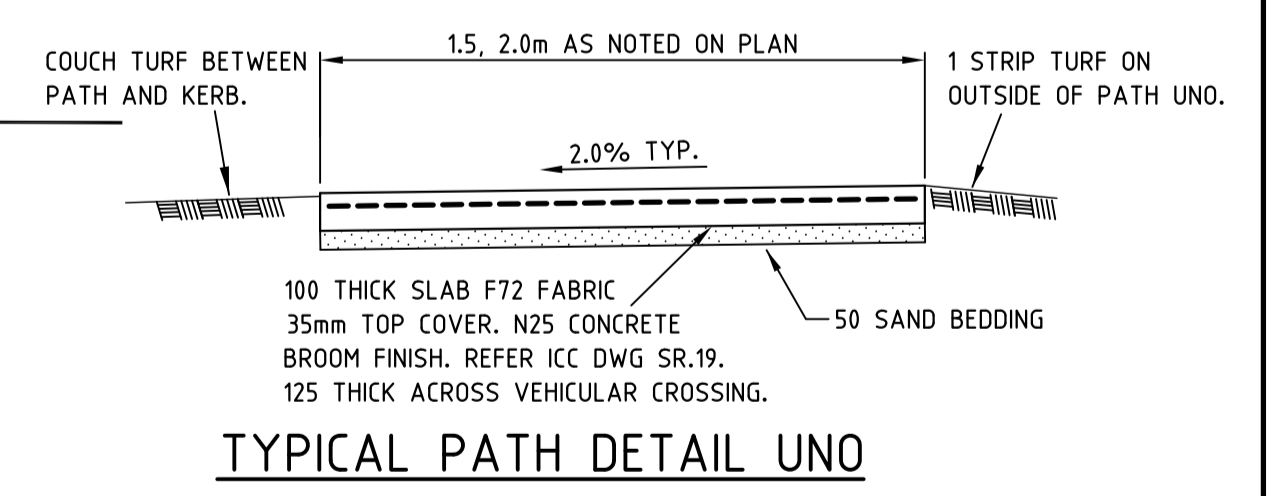
CUTOFF BERM
SCALE = 1:100



BULK EARTHWORKS PLAN



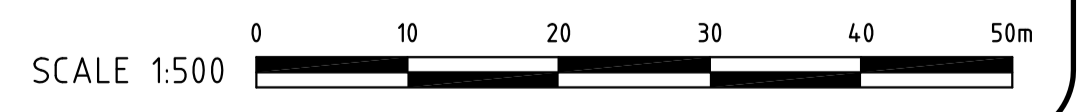
OPEN CHANNEL INSET



TYPICAL PATH DETAIL UNO

LEGEND

- EXISTING SURFACE CONTOURS
- FINISHED SURFACE CONTOURS



HUNT MICHEL & PARTNERS

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CLIENT

ROSEWOOD GREEN DEVELOPMENT
 PO BOX 3715
 ROUSE HILL NSW 2155

PROJECT

ROSEWOOD GREEN ESTATE
 STAGE 1B
 ROSEWOOD QLD 4340

DRAWING TITLE

BULK EARTHWORKS PLAN

REV	DATE	APPROVED:
D	LOT LAYOUT AMENDED	27.08.19
C	LOT DENSITY REDUCED	17.05.18
B	CONSTRUCTION ISSUE	09.06.16
A	OPERATIONAL WORKS SUBMISSION	11.04.16

APPROVED:
Daniel Michel
 DANIEL MICHEL RPEQ 3766
 DIRECTOR, HUNT MICHEL & PARTNERS

DESIGNED: N.K.	JOB No. 216006
DRAWN: N.K.	DWG No. C2D
CHECKED: D.M.	
SCALE: AS SHOWN	
DATE:	