

**Shadforth Pty Ltd**  
 99 Sandalwood Lane,  
 Forest Glen, QLD, 4556

**Project Number:** PTP/05620  
**Letter Number:** PTP/05620 – 0001 – Rev1  
**Project Name:** Spring Mountain, Stage 18B,  
 New Beith

**Attention:** Lincoln Redgen  
**Email:** [Lincoln.Redgen@shadcivil.com.au](mailto:Lincoln.Redgen@shadcivil.com.au)

**Report on Level 1 Earthworks**  
**Spring Mountain, Stage 18B,**  
**New Beith, QLD, 4124**

## 1. Introduction

This report summarises the results of inspection and testing provided by Protest Engineering (Protest) for the bulk earthworks as part of the Spring Mountain, Stage 18B project located at New Beith undertaken between 4th November 2020 to 8th March 2021. 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 15,200m<sup>3</sup> of fill was placed at the site. Drawing Nos. 18-201-06, Revision A – *Earthworks Contour Plan Sheet 1*; 18-201-02, Revision A – *Earthworks Contour Plan Sheet 2*; and 18-201-08, Revision A – *Earthworks Contour Plan Sheet 3* attached are the bulk earthworks cut to fill plans. 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 500m<sup>3</sup> placed for a *Type 1 – Large Scale Operation*.

Based off the information provided within the general notes (Drawing No. 18-201-01, Revision A – *General Locality Plan, Drawing Index and Notes*), the minimum relative compaction requirements were not specified and therefore the criteria in AS3798, Table 5.1 was adopted. 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 (%)
Residential – lot, fill, house, sites	>95%	±2% (Dry/Wet of OMC <sup>(1)</sup> )
Commercial – Fill to support minor loadings, including floor loadings	>98%	±2% (Dry/Wet of OMC <sup>(1)</sup> )

(Notes: <sup>(1)</sup> Optimum Moisture Content)

## 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 sandy gravelly clay. Filling materials were placed onsite in uniform layers not exceeding 150mm thick compacted layers with the plant detailed below. The material used as fill was moisture conditioned at the fill source and during placement and blended to achieve suitable moisture content for compaction. The following heavy plant were used throughout the bulk earthworks component:

- Water Truck
- Dump Trucks
- Pad Foot Roller
- Excavators
- Compactor
- Dozer

A total of forty-three (43) 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.

A summary of the test results is presented in Table 2 with the individual reports attached and the approximate test locations are shown on the marked earthworks layout plan attached.

**Table 2. Summary of Density Testing**

Item	Compaction	Moisture Variation
No. of tests	43	43
Mean	100.5%	1.0% (Dry of OMC <sup>(1)</sup> )

(Notes: <sup>(1)</sup> Optimum Moisture Content)

## 3. Compliance

Based on the level 1 supervision and test results, it is our opinion that the bulk earthworks placed and compacted at Spring Mountain, Stage 18B in New Beith by Shadforth between 4th November 2020 to 8th March 2021 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 Spring Mountain, Stage 18B, New Beith between 4th November 2020 to 8th March 2021 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 4th November 2020 to 8th March 2021. 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 Spring Mountain, Stage 18B, New Beith. 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.

**Written By:**



**Lachlan Cameirao**

*Trainee Laboratory Technician*

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**Reviewed By:**



**Kenney Pham**

*Branch Manager*

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

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**Attachment 1**

**Site Images**



*Figure 1 – Heavy machinery placing and spreading out fill. (Taken 05.11.2020)*



*Figure 2 – Water cart moisture conditioning fill area during compaction (Taken 05.11.2020)*



*Figure 3 – Overview of heavy machinery working the pad. (Taken 09.11.2020)*



*Figure 4 – Compactor working in conjunction with water truck and excavator. (Taken 19.11.2020)*



**Figure 5 – Dump truck and digger transferring fill material. (Taken 13.11.2020)**



**Figure 6 – Pad foot roller and water truck working fill pad. (Taken 13.11.2020)**

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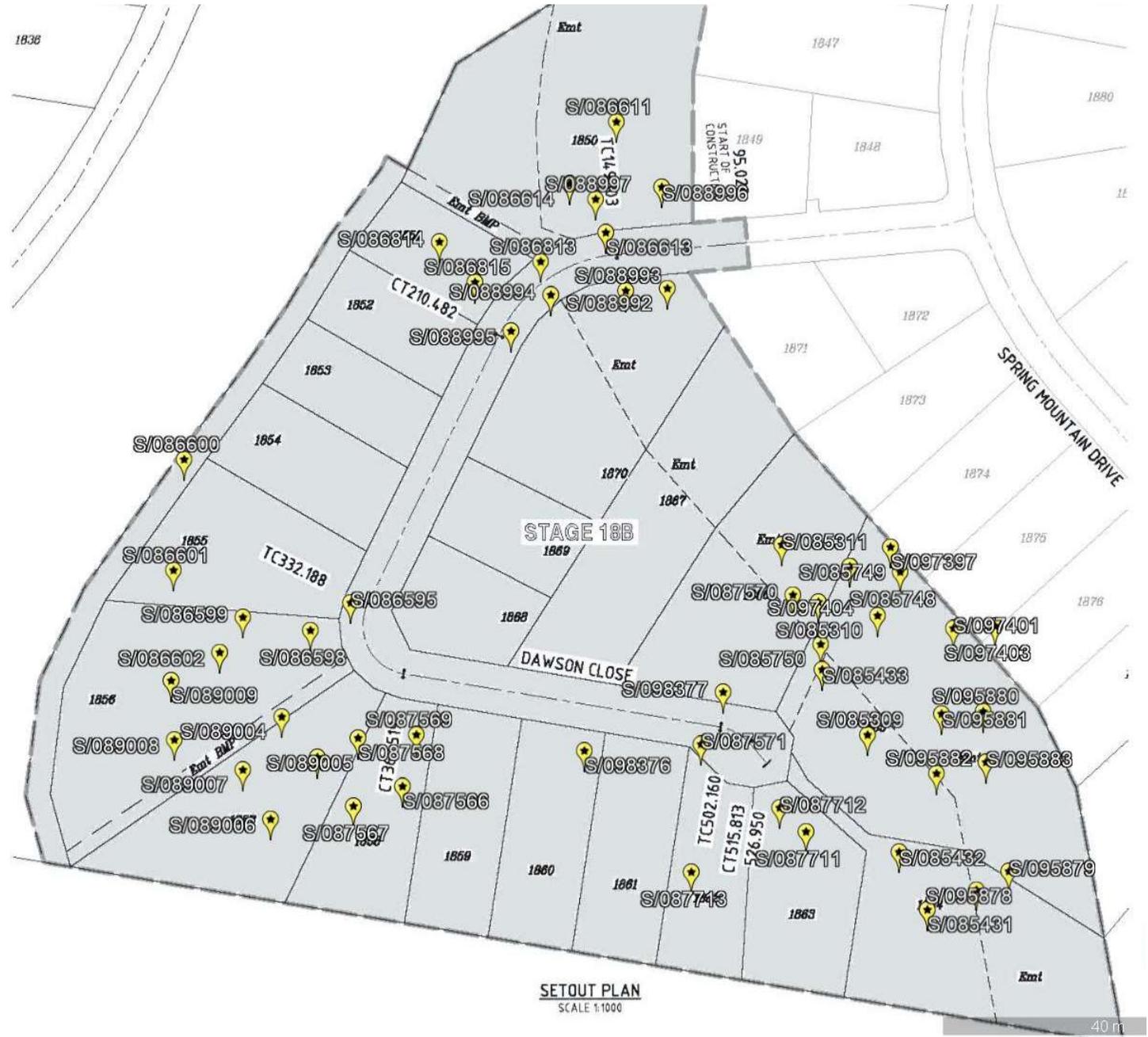
**Attachment 2**  
**Testing Location Plan**

# Spring Mountain Stage 18B

Field Density Test Location Plan

## Legend

📍 Field Density



Google Earth

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CONTROL LINE DETAILS - DAWSON CLOSE

SETOUT PLAN  
SCALE 1:1000

Issue	Description	Date	DRN	CHK	APP
01	Field Density Location Plan	08/04/2021	KP	KP	KP



CLIENT  
Shadforth

TITLE  
Spring Mountain Stage 18B

Job No.  
PTP/05620

Drawing No.  
01

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**Attachment 3**  
**Density Reports**

### Dry Density / Moisture Ratio Report

Client :	Shadforth			Report Number :	SR/PTP/05620 - 10/1	
Client Address :	99 Sandalwood Lane, Forest Glen, 4556, QLD			Report Date :	21/12/2020	
Project Name :	Spring Mountain Stage 18B			Test Request :	-	
Project Number :	PTP/05620			Page 1 of 1		
Location :	New Beith					
Test Methods :	AS1289.5.4.1, AS1289.5.8.1, AS1289.2.1.1, AS1289.5.1.1					
Sample Number :	S/085431	S/085432	S/085433			
Date Tested :	5/11/2020	5/11/2020	5/11/2020			
Material Source :	Onsite	Onsite	Onsite			
For use as :	General Fill	General Fill	General Fill			
Test / Layer Depths :	150 / 150	150 / 150	150 / 150			
Sampling Method :	AS1289.1.2.1 - cl6.4b	AS1289.1.2.1 - cl6.4b	AS1289.1.2.1 - cl6.4b			
Time :	12:45	12:47	12:48			
Lot Number :	-	-	-			
Location 1 :	E- 491847	E- 491841	E- 491838			
Location 2 :	N- 6929683	N- 6929684	N- 6929697			
Location 3 :	0.8m Below F.L	0.8m Below F.L	0.8m Below F.L			
Location 4 :	-	-	-			
Test Fraction (mm) :	< 19mm	< 19mm	< 19mm			
Oversize Wet :	-	-	-			
Oversize Dry :	-	-	-			
Oversize Density - Dry (t/m <sup>3</sup> ) :	-	-	-			
Assigned MDR (Yes/No) :	No	No	No			
MDR Sample Number :	S/085431	S/085432	S/085433			
MDR Test Date :	13/11/2020	13/11/2020	13/11/2020			
Soil Description :	Gravelly Sandy Clay - Brown	Gravelly Sandy Clay - Brown	Gravelly Sandy Clay - Brown			
<i>MDR Test Results</i>						
MDD (t/m <sup>3</sup> ) :	1.88	1.90	1.96			
OMC :	11.5%	12.0%	10.0%			
ADJ MDD (t/m <sup>3</sup> ) :	-	-	-			
ADJ OMC :	-	-	-			
<i>Moisture Test Results :</i>						
Field Moisture Content :	10.0%	10.5%	8.5%			
Moisture Specification :	±2% of OMC	±2% of OMC	±2% of OMC			
Variation from OMC :	1.5% Dry of OMC	1.5% Dry of OMC	1.5% Dry of OMC			
Moisture Ratio :	89.0%	88.5%	83.0%			
<i>Density Test Results</i>						
Field Dry Density (t/m <sup>3</sup> ) :	1.90	1.92	1.96			
Density Specification :	98%	98%	98%			
Dry Density Ratio :	101.0%	101.0%	99.5%			
Characteristic Value (Q020) :	CV(min) = 99.8%	CV(max) = 101.2%	Mean = 100.5%	Std. Dev. = 0.9%	n = 3	k = 0.828
Degree of Saturation / Required :	-	-	-			
Remarks :	-					
 <p>WORLD RECOGNISED ACCREDITATION</p>	<p>Note: The results contained in this report relate only to the item/s that were tested/sampled</p> <p><b>Accredited for Compliance with ISO/ IEC 17025 - Testing</b></p> <p>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><b>APPROVED SIGNATORY</b></p>  <p>Kenney Pham - Signatory</p>		

### Dry Density / Moisture Ratio Report

Client :	Shadforths			Report Number :	SR/PTP/05620 - 11/1	
Client Address :	99 Sandalwood Lane, Forest Glen, 4556, QLD			Report Date :	21/12/2020	
Project Name :	Spring Mountain Stage 18B			Test Request :	-	
Project Number :	PTP/05620			Page 1 of 1		
Location :	New Beith					
Test Methods :	AS1289.5.4.1, AS1289.5.8.1, AS1289.2.1.1, AS1289.5.1.1					
Sample Number :	S/085748	S/085749	S/085750			
Date Tested :	6/11/2020	6/11/2020	6/11/2020			
Material Source :	Onsite	Onsite	Onsite			
For use as :	General Fill	General Fill	General Fill			
Test / Layer Depths :	150 / 150	150 / 150	150 / 150			
Sampling Method :	AS1289.1.2.1 - cl6.4b	AS1289.1.2.1 - cl6.4b	AS1289.1.2.1 - cl6.4b			
Time :	13:27	13:29	13:29			
Lot Number :	-	-	-			
Location 1 :	E- 491847	E- 491842	E- 491838			
Location 2 :	N- 6929711	N- 6929709	N- 6929700			
Location 3 :	RL - 73.25	RL - 73.25	RL - 73.25			
Location 4 :	-	-	-			
Test Fraction (mm) :	< 19mm	< 19mm	< 19mm			
Oversize Wet :	4%	3%	3%			
Oversize Dry :	5%	3%	3%			
Oversize Density - Dry (t/m <sup>3</sup> ) :	2.50	2.50	2.50			
Assigned MDR (Yes/No) :	No	No	No			
MDR Sample Number :	S/085748	S/085749	S/085750			
MDR Test Date :	13/11/2020	13/11/2020	13/11/2020			
Soil Description :	Silty Clay, Brown	Silty Clay, Brown	Silty Clay, Brown			
<i>MDR Test Results</i>						
MDD (t/m <sup>3</sup> ) :	1.85	1.80	1.79			
OMC :	12.5%	13.5%	14.0%			
ADJ MDD (t/m <sup>3</sup> ) :	1.87	1.82	1.81			
ADJ OMC :	12.0%	13.0%	13.5%			
<i>Moisture Test Results :</i>						
Field Moisture Content :	11.5%	12.0%	11.5%			
Moisture Specification :	±2% of OMC	±2% of OMC	±2% of OMC			
Variation from OMC :	<b>0.5% Dry of OMC</b>	<b>1.5% Dry of OMC</b>	<b>2.0% Dry of OMC</b>			
Moisture Ratio :	95.5%	89.0%	85.5%			
<i>Density Test Results</i>						
Field Dry Density (t/m <sup>3</sup> ) :	1.84	1.82	1.84			
Density Specification :	98%	98%	98%			
Dry Density Ratio :	<b>98.5%</b>	<b>99.5%</b>	<b>101.5%</b>			
Characteristic Value (Q020) :	<b>CV(min) = 98.6%</b>	<b>CV(max) = 101.1%</b>	<b>Mean = 99.8%</b>	<b>Std. Dev. = 1.5%</b>	<b>n = 3</b>	<b>k = 0.828</b>
Degree of Saturation / Required :	-	-	-			
Remarks :	-					
 <p>WORLD RECOGNISED ACCREDITATION</p>	<p>Note: The results contained in this report relate only to the item/s that were tested/sampled</p> <p><b>Accredited for Compliance with ISO/ IEC 17025 - Testing</b></p> <p>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><b>APPROVED SIGNATORY</b></p>  <p>Kenney Pham - Signatory</p>		

### Dry Density / Moisture Ratio Report

Client :	Shadforth			Report Number :	SR/PTP/05620 - 12/1	
Client Address :	99 Sandalwood Lane, Forest Glen, 4556, QLD			Report Date :	21/12/2020	
Project Name :	Spring Mountain Stage 18B			Test Request :	-	
Project Number :	PTP/05620			Page 1 of 1		
Location :	New Beith					
Test Methods :	AS1289.5.4.1, AS1289.5.8.1, AS1289.2.1.1, AS1289.5.1.1					
Sample Number :	S/086813	S/086814	S/086815			
Date Tested :	13/11/2020	13/11/2020	13/11/2020			
Material Source :	On site	On site	On site			
For use as :	General Fill	General Fill	General Fill			
Test / Layer Depths :	150 / 150	150 / 150	150 / 150			
Sampling Method :	AS1289.1.2.1 - cl6.4b	AS1289.1.2.1 - cl6.4b	AS1289.1.2.1 - cl6.4b			
Time :	11:04	11:10	11:10			
Lot Number :	-	-	-			
Location 1 :	E-491774	E-491777	E-491776			
Location 2 :	N-6929723	N-6929731	N-6929740			
Location 3 :	RL-73.85	RL-73.85	RL-73.85			
Location 4 :	-	-	-			
Test Fraction (mm) :	< 19mm	< 19mm	< 19mm			
Oversize Wet :	-	-	-			
Oversize Dry :	-	-	-			
Oversize Density - Dry (t/m <sup>3</sup> ) :	-	-	-			
Assigned MDR (Yes/No) :	No	No	No			
MDR Sample Number :	S/086813	S/086814	S/086815			
MDR Test Date :	24/11/2020	24/11/2020	24/11/2020			
Soil Description :	Sandy Gravelly Clay - brown	Sandy Gravelly Clay - brown	Sandy Gravelly Clay - brown			
<i>MDR Test Results</i>						
MDD (t/m <sup>3</sup> ) :	1.82	1.86	1.85			
OMC :	13.5%	9.0%	10.0%			
ADJ MDD (t/m <sup>3</sup> ) :	-	-	-			
ADJ OMC :	-	-	-			
<i>Moisture Test Results :</i>						
Field Moisture Content :	13.5%	10.0%	9.0%			
Moisture Specification :	±2% of OMC	±2% of OMC	±2% of OMC			
Variation from OMC :	<b>0.0% Dry of OMC</b>	<b>1.0% Wet of OMC</b>	<b>1.0% Dry of OMC</b>			
Moisture Ratio :	99.0%	111.0%	90.5%			
<i>Density Test Results</i>						
Field Dry Density (t/m <sup>3</sup> ) :	1.84	1.89	1.89			
Density Specification :	98%	98%	98%			
Dry Density Ratio :	<b>101.0%</b>	<b>101.5%</b>	<b>102.0%</b>			
Characteristic Value (Q020) :	<b>CV(min) = 101.1%</b>		<b>CV(max) = 101.9%</b>	<b>Mean = 101.5%</b>	<b>Std. Dev. = 0.5%</b>	<b>n = 3</b>
						<b>k = 0.828</b>
Degree of Saturation / Required :	-	-	-			
Remarks :	-					
	Note: The results contained in this report relate only to the item/s that were tested/sampled <b>Accredited for Compliance with ISO/ IEC 17025 - Testing</b> Protest Engineering (Gold Coast) Accreditation Number - 19667 Base Laboratory Site Number - 22838 - Gold Coast			<b>APPROVED SIGNATORY</b>  Kenney Pham - Signatory		
	Base Laboratory Address - 1/9 Greg Chappell Drive, BURLEIGH HEADS, QLD, 4220					

### Dry Density / Moisture Ratio Report

Client :	Shadforths			Report Number :	SR/PTP/05620 - 13/1	
Client Address :	99 Sandalwood Lane, Forest Glen, 4556, QLD			Report Date :	30/11/2020	
Project Name :	Spring Mountain Stage 18B			Test Request :	-	
Project Number :	PTP/05620			Page 1 of 1		
Location :	New Beith					
Test Methods :	AS1289.5.4.1, AS1289.5.8.1, AS1289.2.1.1, AS1289.5.1.1					
Sample Number :	S/085309	S/085310	S/085311			
Date Tested :	4/11/2020	4/11/2020	4/11/2020			
Material Source :	Onsite	Onsite	Onsite			
For use as :	General Fill	General Fill	General Fill			
Test / Layer Depths :	150 / 150	150 / 150	150 / 150			
Sampling Method :	AS1289.1.2.1 - cl6.4b	AS1289.1.2.1 - cl6.4b	AS1289.1.2.1 - cl6.4b			
Time :	06:41	00:00	00:00			
Lot Number :	-	-	-			
Location 1 :	E: 491843	E: 491845	E: 491834			
Location 2 :	N: 6929689	N: 6929703	N: 6929712			
Location 3 :	FL	FL	FL			
Location 4 :	-	-	-			
Test Fraction (mm) :	< 19mm	< 19mm	< 19mm			
Oversize Wet :	1%	-	-			
Oversize Dry :	1%	-	-			
Oversize Density - Dry (t/m <sup>3</sup> ) :	2.50	-	-			
Assigned MDR (Yes/No) :	No	No	No			
MDR Sample Number :	S/085309	S/085310	S/085311			
MDR Test Date :	30/10/2020	29/10/2020	30/10/2020			
Soil Description :	Sandy Clay - Brown	Sandy Clay - Brown	Sandy Clay - Brown			
<i>MDR Test Results</i>						
MDD (t/m <sup>3</sup> ) :	1.87	1.92	1.82			
OMC :	14.5%	12.0%	15.0%			
ADJ MDD (t/m <sup>3</sup> ) :	1.87	-	-			
ADJ OMC :	14.5%	-	-			
<i>Moisture Test Results :</i>						
Field Moisture Content :	14.5%	10.0%	14.5%			
Moisture Specification :	-	-	-			
Variation from OMC :	<b>0.0% Dry of OMC</b>	<b>2.0% Dry of OMC</b>	<b>0.5% Dry of OMC</b>			
Moisture Ratio :	100.0%	83.0%	97.5%			
<i>Density Test Results</i>						
Field Dry Density (t/m <sup>3</sup> ) :	1.86	1.98	1.81			
Density Specification :	98%	98%	98%			
Dry Density Ratio :	<b>99.0%</b>	<b>103.0%</b>	<b>99.0%</b>			
Characteristic Value (Q020) :	<b>CV(min) = 98.4%</b>	<b>CV(max) = 102.2%</b>	<b>Mean = 100.3%</b>	<b>Std. Dev. = 2.3%</b>	<b>n = 3</b>	<b>k = 0.828</b>
Degree of Saturation / Required :	-	-	-			
Remarks :	-					
 <p>Note: The results contained in this report relate only to the item/s that were tested/sampled  <b>Accredited for Compliance with ISO/ IEC 17025 - Testing</b>          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>	<b>APPROVED SIGNATORY</b>  Kenney Pham - Signatory					

### Dry Density / Moisture Ratio Report

Client :	Shadforths			Report Number :	SR/PTP/05620 - 14/1	
Client Address :	99 Sandalwood Lane, Forest Glen, 4556, QLD			Report Date :	21/12/2020	
Project Name :	Spring Mountain Stage 18B			Test Request :	-	
Project Number :	PTP/05620			Page 1 of 1		
Location :	New Beith					
Test Methods :	AS1289.5.4.1, AS1289.5.8.1, AS1289.2.1.1, AS1289.5.1.1					
Sample Number :	S/086611	S/086613	S/086614			
Date Tested :	12/11/2020	12/11/2020	12/11/2020			
Material Source :	On site	On site	On site			
For use as :	General Fill	General Fill	General Fill			
Test / Layer Depths :	150 / 150	150 / 150	150 / 150			
Sampling Method :	AS1289.1.2.1 - cl6.4b	AS1289.1.2.1 - cl6.4b	AS1289.1.2.1 - cl6.4b			
Time :	10:43	10:47	10:47			
Lot Number :	-	-	-			
Location 1 :	E-491790	E-491779	E-491775			
Location 2 :	N-6929674	N-6929687	N-6929693			
Location 3 :	RL-75.84	RL-75.84	RL-75.84			
Location 4 :	-	-	-			
Test Fraction (mm) :	< 19mm	< 19mm	< 19mm			
Oversize Wet :	-	-	-			
Oversize Dry :	-	-	-			
Oversize Density - Dry (t/m <sup>3</sup> ) :	-	-	-			
Assigned MDR (Yes/No) :	No	No	No			
MDR Sample Number :	S/086611	S/086613	S/086614			
MDR Test Date :	30/11/2020	30/11/2020	30/11/2020			
Soil Description :	Sandy Clay	Sandy Clay	Sandy Clay			
<i>MDR Test Results</i>						
MDD (t/m <sup>3</sup> ) :	1.95	1.95	1.94			
OMC :	13.0%	13.5%	13.0%			
ADJ MDD (t/m <sup>3</sup> ) :	-	-	-			
ADJ OMC :	-	-	-			
<i>Moisture Test Results</i>						
Field Moisture Content :	11.5%	11.0%	10.5%			
Moisture Specification :	-	-	-			
Variation from OMC :	1.5% Dry of OMC	2.0% Dry of OMC	3.0% Dry of OMC			
Moisture Ratio :	90.0%	84.0%	79.0%			
<i>Density Test Results</i>						
Field Dry Density (t/m <sup>3</sup> ) :	1.91	1.96	1.91			
Density Specification :	98%	98%	98%			
Dry Density Ratio :	98.0%	100.0%	99.0%			
Characteristic Value (Q020) :	CV(min) = 98.2%	CV(max) = 99.8%	Mean = 99.0%	Std. Dev. = 1.0%	n = 3	k = 0.828
Degree of Saturation / Required :	-	-	-			
Remarks :	-					
	Note: The results contained in this report relate only to the item/s that were tested/sampled <b>Accredited for Compliance with ISO/ IEC 17025 - Testing</b> Protest Engineering (Gold Coast) Accreditation Number - 19667 Base Laboratory Site Number - 22838 - Gold Coast			<b>APPROVED SIGNATORY</b>  Kenney Pham - Signatory		
	Base Laboratory Address - 1/9 Greg Chappell Drive, BURLEIGH HEADS, QLD, 4220					

### Dry Density / Moisture Ratio Report

Client :	Shadforth	Report Number :	SR/PTP/05620 - 15/1
Client Address :	99 Sandalwood Lane, Forest Glen, 4556, QLD	Report Date :	21/12/2020
Project Name :	Spring Mountain Stage 18B	Test Request :	-
Project Number :	PTP/05620	Page 1 of 1	
Location :	New Beith		

Test Methods :	AS1289.5.4.1, AS1289.5.8.1, AS1289.2.1.1, AS1289.5.1.1
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Sample Number :	S/087566	S/087567	S/087568	S/087569	S/087570	S/087571
Date Tested :	19/11/2020	19/11/2020	19/11/2020	19/11/2020	19/11/2020	19/11/2020
Material Source :	Onsite	Onsite	Onsite	Onsite	Onsite	Onsite
For use as :	General Fill					
Test / Layer Depths :	150 / 150	150 / 150	150 / 150	150 / 150	150 / 150	150 / 150

Sampling Method :	AS1289.1.2.1 - cl6.4b					
Time :	05:27	05:28	05:28	05:28	05:28	05:28
Lot Number :	-	-	-	-	-	-
Location 1 :	E- 491847	E- 491841	E- 491830	E- 491825	E- 491822	E- 491823
Location 2 :	N- 6929692	N- 6929695	N- 6929693	N- 6929698	N- 6929699	N- 6929689
Location 3 :	RL-74.10	RL-74.10	RL-74.10	RL-74.10	RL-74.10	RL-74.10
Location 4 :	0	0	0	0	0	0

Test Fraction (mm) :	< 19mm					
Oversize Wet :	-	-	-	-	-	-
Oversize Dry :	-	-	-	-	-	-
Oversize Density - Dry (t/m³) :	-	-	-	-	-	-
Assigned MDR (Yes/No) :	No	No	No	No	No	No
MDR Sample Number :	S/087566	S/087567	S/087568	S/087569	S/087570	S/087571
MDR Test Date :	2/12/2020	2/12/2020	2/12/2020	2/12/2020	2/12/2020	2/12/2020
Soil Description :	Sandy Clay					

<i>MDR Test Results</i>						
MDD (t/m³) :	1.79	1.78	1.77	1.88	1.88	1.87
OMC :	12.0%	12.5%	12.5%	11.5%	13.0%	12.0%
ADJ MDD (t/m³) :	-	-	-	-	-	-
ADJ OMC :	-	-	-	-	-	-

<i>Moisture Test Results :</i>						
Field Moisture Content :	11.0%	12.0%	11.5%	11.5%	11.0%	11.5%
Moisture Specification :	±2% of OMC					
Variation from OMC :	1.0% Dry of OMC	0.5% Dry of OMC	0.5% Dry of OMC	0.0% Wet of OMC	2.0% Dry of OMC	0.5% Dry of OMC
Moisture Ratio :	91.0%	97.5%	94.0%	101.0%	83.5%	94.0%

<i>Density Test Results</i>						
Field Dry Density (t/m³) :	1.81	1.76	1.78	1.87	1.85	1.85
Density Specification :	95%	95%	95%	95%	95%	95%
Dry Density Ratio :	101.0%	99.0%	100.5%	99.0%	98.5%	99.0%

Characteristic Value (Q020) :	CV(min) = 98.7%	CV(max) = 100.3%	Mean = 99.5%	Std. Dev. = 1.0%	n = 6	k = 0.828
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Degree of Saturation / Required :	-	-	-	-	-	-
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Remarks :	-
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 <p>WORLD RECOGNISED ACCREDITATION</p>	<p>Note: The results contained in this report relate only to the item/s that were tested/sampled</p> <p><b>Accredited for Compliance with ISO/ IEC 17025 - Testing</b></p> <p>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><b>APPROVED SIGNATORY</b></p>  <p>Kenney Pham - Signatory</p>
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### Dry Density / Moisture Ratio Report

Client :	Shadforth			Report Number :	SR/PTP/05620 - 16/1	
Client Address :	99 Sandalwood Lane, Forest Glen, 4556, QLD			Report Date :	21/12/2020	
Project Name :	Spring Mountain Stage 18B			Test Request :	-	
Project Number :	PTP/05620			Page 1 of 1		
Location :	New Beith					
Test Methods :	AS1289.5.4.1, AS1289.5.8.1, AS1289.2.1.1, AS1289.5.1.1					
Sample Number :	S/087711	S/087712	S/087713			
Date Tested :	20/11/2020	20/11/2020	20/11/2020			
Material Source :	Onsite	Onsite	Onsite			
For use as :	General Fill	General Fill	General Fill			
Test / Layer Depths :	150 / 150	150 / 150	150 / 150			
Sampling Method :	AS1289.1.2.1 - cl6.4b	AS1289.1.2.1 - cl6.4b	AS1289.1.2.1 - cl6.4b			
Time :	05:54	05:55	05:55			
Lot Number :	-	-	-			
Location 1 :	E- 491838	E- 491823	E- 491821			
Location 2 :	N- 6929681	N- 6929688	N- 6929674			
Location 3 :	RL- 74.58	RL- 74.58	RL- 74.58			
Location 4 :	-	-	-			
Test Fraction (mm) :	< 19mm	< 19mm	< 19mm			
Oversize Wet :	-	-	-			
Oversize Dry :	-	-	-			
Oversize Density - Dry (t/m <sup>3</sup> ) :	-	-	-			
Assigned MDR (Yes/No) :	No	No	No			
MDR Sample Number :	S/087711	S/087712	S/087713			
MDR Test Date :	4/12/2020	4/12/2020	4/12/2020			
Soil Description :	Sandy Clay	Sandy Clay	Sandy Clay			
<i>MDR Test Results</i>						
MDD (t/m <sup>3</sup> ) :	1.94	1.94	1.83			
OMC :	10.0%	10.0%	11.5%			
ADJ MDD (t/m <sup>3</sup> ) :	-	-	-			
ADJ OMC :	-	-	-			
<i>Moisture Test Results :</i>						
Field Moisture Content :	10.5%	8.5%	10.5%			
Moisture Specification :	±2% of OMC	±2% of OMC	±2% of OMC			
Variation from OMC :	<b>0.0% Wet of OMC</b>	<b>2.0% Dry of OMC</b>	<b>0.5% Dry of OMC</b>			
Moisture Ratio :	102.5%	82.0%	94.5%			
<i>Density Test Results</i>						
Field Dry Density (t/m <sup>3</sup> ) :	1.97	1.97	1.84			
Density Specification :	98%	98%	98%			
Dry Density Ratio :	<b>102.0%</b>	<b>101.5%</b>	<b>101.0%</b>			
Characteristic Value (Q020) :	<b>CV(min) = 101.1%</b>		<b>CV(max) = 101.9%</b>	<b>Mean = 101.5%</b>	<b>Std. Dev. = 0.5%</b>	<b>n = 3</b>
						<b>k = 0.828</b>
Degree of Saturation / Required :	-	-	-			
Remarks :	-					
	Note: The results contained in this report relate only to the item/s that were tested/sampled <b>Accredited for Compliance with ISO/ IEC 17025 - Testing</b> Protest Engineering (Gold Coast) Accreditation Number - 19667 Base Laboratory Site Number - 22838 - Gold Coast			<b>APPROVED SIGNATORY</b>  Kenney Pham - Signatory		
	Base Laboratory Address - 1/9 Greg Chappell Drive, BURLEIGH HEADS, QLD, 4220					

### Dry Density / Moisture Ratio Report

Client :	Shadforth	Report Number :	SR/PTP/05620 - 25/1
Client Address :	99 Sandalwood Lane, Forest Glen, 4556, QLD	Report Date :	21/12/2020
Project Name :	Spring Mountain Stage 18B	Test Request :	-
Project Number :	PTP/05620	Page 1 of 1	
Location :	New Beith		

Test Methods :	AS1289.5.4.1, AS1289.5.8.1, AS1289.2.1.1, AS1289.5.1.1
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Sample Number :	S/086595	S/086598	S/086599	S/086600	S/086601	S/086602
Date Tested :	12/11/2020	12/11/2020	12/11/2020	12/11/2020	12/11/2020	12/11/2020
Material Source :	On site					
For use as :	Fill	Fill	Fill	Fill	Fill	Fill
Test / Layer Depths :	150 / 150	150 / 150	150 / 150	150 / 150	150 / 150	150 / 150

Sampling Method :	AS1289.1.2.1 - cl6.4b					
Time :	09:25	09:33	09:33	09:33	09:33	09:33
Lot Number :	-	-	-	-	-	-
Location 1 :	E-491773	E-491769	E-491773	E-491763	E-491761	E-491766
Location 2 :	N-6929713	N-6929701	N-6929701	N-6929726	N-6929713	N-6929703
Location 3 :	RL-72.300	RL-74.950	RL-75.100	RL-73.350	RL-74.21	RL-75.76
Location 4 :	-	-	-	-	-	-

Test Fraction (mm) :	< 19mm					
Oversize Wet :	4%	3%	18%	6%	3%	4%
Oversize Dry :	4%	4%	4%	4%	4%	4%
Oversize Density - Dry (t/m <sup>3</sup> ) :	2.50	1.67	1.67	1.67	1.67	1.67
Assigned MDR (Yes/No) :	No	No	No	No	No	No
MDR Sample Number :	S/086595	S/086598	S/086599	S/086600	S/086601	S/086602
MDR Test Date :	24/11/2020	24/11/2020	24/11/2020	24/11/2020	24/11/2020	24/11/2020
Soil Description :	Sandy Clay, Brown	Sandy Clay, Brown	Sandy Clay, Brown	Silty Clay, Brown	Sandy Clay, Brown	Sandy Clay, Brown

<i>MDR Test Results</i>						
MDD (t/m <sup>3</sup> ) :	1.80	1.91	1.79	1.82	1.83	1.78
OMC :	13.0%	11.5%	12.5%	12.5%	15.5%	14.0%
ADJ MDD (t/m <sup>3</sup> ) :	1.82	1.90	1.78	1.81	1.82	1.78
ADJ OMC :	12.5%	11.0%	12.0%	12.0%	14.5%	13.5%

<i>Moisture Test Results :</i>						
Field Moisture Content :	10.0%	11.5%	9.0%	10.0%	14.0%	13.5%
Moisture Specification :	-	-	-	-	-	-
Variation from OMC :	<b>2.5% Dry of OMC</b>	<b>0.5% Wet of OMC</b>	<b>2.5% Dry of OMC</b>	<b>2.0% Dry of OMC</b>	<b>0.5% Dry of OMC</b>	<b>0.0% Dry of OMC</b>
Moisture Ratio :	81.5%	103.5%	77.5%	82.5%	95.5%	100.0%

<i>Density Test Results</i>						
Field Dry Density (t/m <sup>3</sup> ) :	1.83	1.92	1.76	1.84	1.83	1.82
Density Specification :	98%	98%	98%	98%	98%	98%
Dry Density Ratio :	<b>100.5%</b>	<b>101.0%</b>	<b>99.0%</b>	<b>101.5%</b>	<b>100.5%</b>	<b>102.5%</b>

Characteristic Value (Q020) :	<b>CV(min) = 99.9%</b>	<b>CV(max) = 101.8%</b>	<b>Mean = 100.8%</b>	<b>Std. Dev. = 1.2%</b>	<b>n = 6</b>	<b>k = 0.828</b>
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Degree of Saturation / Required :	-	-	-	-	-	-
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Remarks :	-
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 <p>Note: The results contained in this report relate only to the item/s that were tested/sampled  <b>Accredited for Compliance with ISO/ IEC 17025 - Testing</b>          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>	<p><b>APPROVED SIGNATORY</b></p>  Kenney Pham - Signatory
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### Dry Density / Moisture Ratio Report

Client :	Shadforth					Report Number :	SR/PTP/05620 - 31/1
Client Address :	99 Sandalwood Lane, Forest Glen, 4556, QLD					Report Date :	2/03/2021
Project Name :	Spring Mountain Stage 18B					Test Request :	-
Project Number :	PTP/05620					Page 1 of 1	
Location :	New Beith						
Test Methods :	AS1289.5.4.1, AS1289.5.8.1, AS1289.2.1.1, AS1289.5.1.1						
Sample Number :	S/095878	S/095879	S/095880	S/095881	S/095882	S/095883	
Date Tested :	18/02/2021	18/02/2021	18/02/2021	18/02/2021	18/02/2021	18/02/2021	
Material Source :	Onsite	Onsite	Onsite	Onsite	Onsite	Onsite	
For use as :	General Fill	General Fill	General Fill	General Fill	General Fill	General Fill	
Test / Layer Depths :	150 / 150	150 / 150	150 / 150	150 / 150	150 / 150	150 / 150	
Sampling Method :	AS1289.1.2.1 - cl6.4b	AS1289.1.2.1 - cl6.4b	AS1289.1.2.1 - cl6.4b	AS1289.1.2.1 - cl6.4b	AS1289.1.2.1 - cl6.4b	AS1289.1.2.1 - cl6.4b	
Time :	06:01	06:02	06:02	06:02	06:02	06:03	
Lot Number :	-	-	-	-	-	-	
Location 1 :	E- 492113	E- 492106	E- 492111	E- 492124	E- 492130	E- 492133	
Location 2 :	N- 6929476	N- 6929484	N- 6929476	N- 6929473	N- 6929482	N- 6929490	
Location 3 :	0.2m Below F.L	0.4m Below F.L	0.4m Below F.L	0.8m Below F.L	0.8m Below F.L	1.2m Below F.L	
Location 4 :	-	-	-	-	-	-	
Test Fraction (mm) :	< 19mm	< 19mm	< 19mm	< 19mm	< 19mm	< 19mm	
Oversize Wet :	-	-	-	-	-	-	
Oversize Dry :	-	-	-	-	-	-	
Oversize Density - Dry (t/m <sup>3</sup> ) :	-	-	-	-	-	-	
Assigned MDR (Yes/No) :	No	No	No	No	No	No	
MDR Sample Number :	S/095878	S/095879	S/095880	S/095881	S/095882	S/095883	
MDR Test Date :	23/02/2021	23/02/2021	23/02/2021	23/02/2021	23/02/2021	23/02/2021	
Soil Description :	Silty, Sandy Clay - Brown	Silty, Sandy Clay - Brown	Silty, Sandy Clay - Brown	Silty, Sandy Clay - Brown	Silty, Sandy Clay - Brown	Silty, Sandy Clay - Brown	
<b>MDR Test Results</b>							
MDD (t/m <sup>3</sup> ) :	1.88	1.87	1.86	1.84	2.01	2.01	
OMC :	11.0%	12.0%	10.0%	11.0%	8.0%	10.5%	
ADJ MDD (t/m <sup>3</sup> ) :	-	-	-	-	-	-	
ADJ OMC :	-	-	-	-	-	-	
<b>Moisture Test Results :</b>							
Field Moisture Content :	10.5%	11.5%	9.5%	11.5%	9.5%	9.5%	
Moisture Specification :	-	-	-	-	-	-	
Variation from OMC :	0.5% Dry of OMC	0.5% Dry of OMC	0.5% Dry of OMC	0.5% Wet of OMC	1.5% Wet of OMC	1.5% Dry of OMC	
Moisture Ratio :	97.0%	97.0%	94.0%	104.5%	119.0%	87.5%	
<b>Density Test Results</b>							
Field Dry Density (t/m <sup>3</sup> ) :	1.91	1.86	1.84	1.83	1.98	1.97	
Density Specification :	98%	98%	98%	98%	98%	98%	
Dry Density Ratio :	102.0%	99.5%	98.5%	99.5%	98.5%	98.0%	
Degree of Saturation / Required :	-	-	-	-	-	-	
Remarks :	-						
	Note: The results contained in this report relate only to the item/s that were tested/sampled <b>Accredited for Compliance with ISO/ IEC 17025 - Testing</b> Protest Engineering (Gold Coast) Accreditation Number - 19667 Base Laboratory Site Number - 22838 - Gold Coast  Base Laboratory Address - 8/36 Blanck Street, ORMEAU, QLD 4208					<b>APPROVED SIGNATORY</b>    Kenney Pham - Signatory	

### Dry Density / Moisture Ratio Report

Client :	Shadforth					Report Number :	SR/PTP/05620 - 35/1
Client Address :	99 Sandalwood Lane, Forest Glen, 4556, QLD					Report Date :	19/03/2021
Project Name :	Spring Mountain Stage 18B					Test Request :	-
Project Number :	PTP/05620					Page 1 of 1	
Location :	New Beith						
Test Methods :	AS1289.5.4.1, AS1289.5.8.1, AS1289.2.1.1, AS1289.5.1.1						
Sample Number :	S/097397	S/097401	S/097402	S/097403	S/097404		
Date Tested :	1/03/2021	1/03/2021	1/03/2021	1/03/2021	1/03/2021		
Material Source :	Onsite	Onsite	Onsite	Onsite	Onsite		
For use as :	General Fill	General Fill	General Fill	General Fill	General Fill		
Test / Layer Depths :	150 / 150	150 / 150	150 / 150	150 / 150	150 / 150		
Sampling Method :	AS1289.1.2.1 - cl6.4b	AS1289.1.2.1 - cl6.4b	AS1289.1.2.1 - cl6.4b	AS1289.1.2.1 - cl6.4b	AS1289.1.2.1 - cl6.4b		
Time :	12:26	12:28	12:28	12:28	12:28		
Lot Number :	-	-	-	-	-		
Location 1 :	E- 491847	E- 491854	E- 491842	E- 491859	E- 491838		
Location 2 :	N- 6929711	N- 6929701	N- 6929709	N- 6929701	N- 6929705		
Location 3 :	FSL	0.3m Below FSL	0.45m Below FSL	FSL	0.75m Below FSL		
Location 4 :	0	0	0	0	0		
Test Fraction (mm) :	< 19mm	< 19mm	< 19mm	< 19mm	< 19mm		
Oversize Wet :	-	-	-	-	-		
Oversize Dry :	-	-	-	-	-		
Oversize Density - Dry (t/m <sup>3</sup> ) :	-	-	-	-	-		
Assigned MDR (Yes/No) :	No	No	No	No	No		
MDR Sample Number :	S/097397	S/097401	S/097402	S/097403	S/097404		
MDR Test Date :	8/03/2021	8/03/2021	8/03/2021	8/03/2021	8/03/2021		
Soil Description :	Sandy, Gravelly Clay	Sandy, Gravelly Clay	Sandy, Gravelly Clay	Sandy, Gravelly Clay	Sandy, Gravelly Clay		
<b>MDR Test Results</b>							
MDD (t/m <sup>3</sup> ) :	1.91	1.92	1.94	1.95	1.96		
OMC :	13.5%	14.0%	12.5%	12.0%	10.5%		
ADJ MDD (t/m <sup>3</sup> ) :	-	-	-	-	-		
ADJ OMC :	-	-	-	-	-		
<b>Moisture Test Results :</b>							
Field Moisture Content :	11.5%	12.0%	10.0%	10.0%	9.0%		
Moisture Specification :	±2% of OMC	±2% of OMC	±2% of OMC	±2% of OMC	±2% of OMC		
Variation from OMC :	<b>2.0% Dry of OMC</b>	<b>2.0% Dry of OMC</b>	<b>2.0% Dry of OMC</b>	<b>2.0% Dry of OMC</b>	<b>1.0% Dry of OMC</b>		
Moisture Ratio :	85.0%	84.0%	82.5%	83.0%	88.5%		
<b>Density Test Results</b>							
Field Dry Density (t/m <sup>3</sup> ) :	1.97	1.93	2.01	2.02	2.01		
Density Specification :	95%	95%	95%	95%	95%		
Dry Density Ratio :	<b>103.0%</b>	<b>100.5%</b>	<b>103.5%</b>	<b>104.0%</b>	<b>103.0%</b>		
Degree of Saturation / Required :	-	-	-	-	-		
Remarks :	-						
 <p>Note: The results contained in this report relate only to the item/s that were tested/sampled  <b>Accredited for Compliance with ISO/ IEC 17025 - Testing</b>          Protest Engineering (Gold Coast) Accreditation Number - 19667          Base Laboratory Site Number - 22838 - Gold Coast          Base Laboratory Address - 8/36 Blanck Street, ORMEAU, QLD 4208</p>	<b>APPROVED SIGNATORY</b>  Kenney Pham - Signatory						

### Dry Density / Moisture Ratio Report

Client :	Shadforth		Report Number :	SR/PTP/05620 - 40/1		
Client Address :	99 Sandalwood Lane, Forest Glen, 4556, QLD		Report Date :	19/03/2021		
Project Name :	Spring Mountain Stage 18B		Test Request :	-		
Project Number :	PTP/05620		Page 1 of 1			
Location :	New Beith					
Test Methods :	AS1289.5.4.1, AS1289.5.8.1, AS1289.2.1.1, AS1289.5.1.1					
Sample Number :	S/098376	S/098377				
Date Tested :	8/03/2021	8/03/2021				
Material Source :	Onsite	Onsite				
For use as :	General fill	General fill				
Test / Layer Depths :	150 / 150	150 / 150				
Sampling Method :	AS1289.1.2.1 - cl6.4b	AS1289.1.2.1 - cl6.4b				
Time :	06:27	06:28				
Lot Number :	-	-				
Location 1 :	E- 491809	E- 491826				
Location 2 :	N- 6929689	N- 6929695				
Location 3 :	0.8m Below F.L	1.2m Below F.L				
Location 4 :	0	0				
Test Fraction (mm) :	< 19mm	< 19mm				
Oversize Wet :	-	-				
Oversize Dry :	-	-				
Oversize Density - Dry (t/m <sup>3</sup> ) :	-	-				
Assigned MDR (Yes/No) :	No	No				
MDR Sample Number :	S/098376	S/098377				
MDR Test Date :	11/03/2021	11/03/2021				
Soil Description :	Sandy, Gravelly Clay	Sandy, Gravelly Clay				
<i>MDR Test Results</i>						
MDD (t/m <sup>3</sup> ) :	1.77	1.89				
OMC :	13.5%	12.0%				
ADJ MDD (t/m <sup>3</sup> ) :	-	-				
ADJ OMC :	-	-				
<i>Moisture Test Results :</i>						
Field Moisture Content :	11.5%	11.5%				
Moisture Specification :	±2% of OMC	±2% of OMC				
Variation from OMC :	1.5% Dry of OMC	1.0% Dry of OMC				
Moisture Ratio :	88.0%	93.5%				
<i>Density Test Results</i>						
Field Dry Density (t/m <sup>3</sup> ) :	1.80	1.94				
Density Specification :	95%	95%				
Dry Density Ratio :	101.5%	102.5%				
Degree of Saturation / Required :	-	-				
Remarks :	-					
 <p>Note: The results contained in this report relate only to the item/s that were tested/sampled  <b>Accredited for Compliance with ISO/ IEC 17025 - Testing</b>          Protest Engineering (Gold Coast) Accreditation Number - 19667          Base Laboratory Site Number - 22838 - Gold Coast          Base Laboratory Address - 8/36 Blanck Street, ORMEAU, QLD 4208</p>	<b>APPROVED SIGNATORY</b>  Kenney Pham - Signatory					

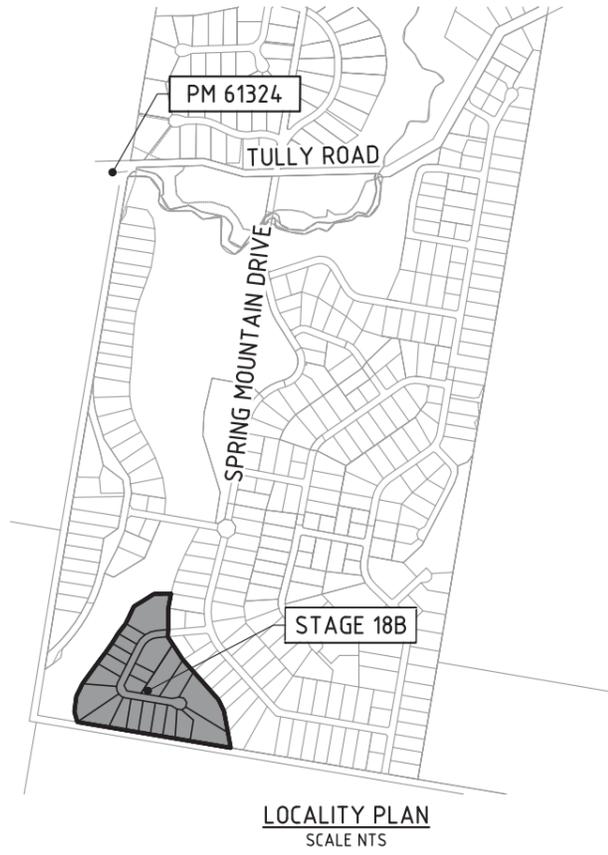
**PROTEST**  
**ENGINEERING**

**GEOTECHNICAL // TESTING SERVICES // STRUCTURAL**

**Attachment 4**

**Referenced Drawings**

# SPRING MOUNTAIN ACREAGE ESTATE STAGE 18B



LOCALITY PLAN  
SCALE NTS



PLAN  
SCALE 1:2000

**GENERAL NOTES**

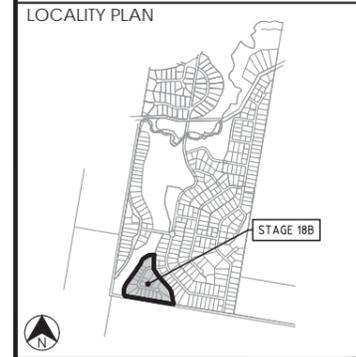
1. ALL WORK SHALL BE JOINED NEATLY TO EXISTING CONSTRUCTION.
2. WHERE REFERENCE IS MADE ON THESE DRAWINGS TO A KERB LINE, IT SHALL BE TAKEN TO MEAN THE KERB INVERT LINE.
3. LEVELS FOR KERB AND CHANNEL CONSTRUCTION ARE SHOWN AT LIP OF CHANNEL UNLESS SHOWN OTHERWISE.
4. KERB AND CHANNEL AND SPOON DRAINS SHALL BE CONSTRUCTED IN ACCORDANCE WITH INSTITUTE OF PUBLIC WORKS ENGINEERING AUSTRALIA STANDARD DWG NO SEQ RS-80. SPOON DRAINS ACROSS ROAD INTERSECTIONS SHALL BE IN ACCORDANCE WITH INSTITUTE OF PUBLIC WORKS ENGINEERING AUSTRALIA STD DWG NO SEQ RS-80. THE CONCRETE SHALL BE CLASS N32 AND THE DEPTH INCREASED BY 50mm TO 175mm AT INVERT. FLUSH KERB TO BE INCREASED IN DEPTH BY 50mm TO 280mm.
5. IF MACHINE MADE KERB AND CHANNEL IS USED, EXTRA FINES AND 20mm SLUMP IS REQUIRED.
6. ALL DRAINAGE CENTRE LINES ARE 2m FROM INVERT OF KERB UNLESS OTHERWISE SHOWN.
7. GULLY CONNECTIONS AND STORMWATER PIPES SHALL BE 375mm DIAMETER CLASS '2' R.C. PIPES UNLESS SHOWN OTHERWISE.
8. THE CONTRACTOR SHALL INITIALLY EXCAVATE THE PAVEMENT BOX TO 280mm BELOW THE FINISHED PAVEMENT LEVEL SHOWN ON THE DRAWINGS. HE SHALL THEN NOTIFY THE ENGINEER WHO WILL FIX THE PAVEMENT THICKNESS TO BE CONSTRUCTED FOLLOWING THE RESULTS OF SUB-GRADE TESTING.
9. NOTWITHSTANDING THE LIMITS OF CUTTING AND FILLING SHOWN ON THE DRAWINGS, THE ACTUAL LIMITS SHALL BE DETERMINED ON SITE BY THE ENGINEER AND SIMILARLY THE FINISHED SURFACE CONTOURS MAY BE ADJUSTED BY WRITTEN DIRECTION OF THE ENGINEER DURING CONSTRUCTION.
10. THE MINIMUM CLEARANCE BETWEEN OUTER WALLS OF PIPES IN MANHOLES SHALL BE 150mm.
11. SUBSURFACE DRAIN CLEANING POINTS SHALL BE INSTALLED IN ACCORDANCE WITH IPWEAQ STD DWG NO SEQ RS-142.
12. CONSTRUCTION LOAD CONTROL ON THE INSTALLATION OF REINFORCED CONCRETE STORMWATER PIPE WORK SHALL BE UNDERTAKEN IN ACCORDANCE WITH THE RECOMMENDATIONS DEFINED IN THE CONCRETE PIPE ASSOCIATIONS OF AUSTRALASIA'S "THE INSTALLATIONS OF STEEL REINFORCED CONCRETE PIPES - MINIMUM PIPE COVER REQUIRED FOR VARIOUS COMPACTORS".
13. PRIOR TO COMMENCEMENT OF CONSTRUCTION, THE CONTRACTOR SHALL ERECT A 2 STRAND WIRE FENCE INCLUDING SAFETY BARRIER MESH TO THE PERIMETER OF VEGETATION TO BE RETAINED AND/OR EXCLUSION ZONES.
14. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THE LOCATION AND DEPTH OF EXISTING SERVICES WITH RELEVANT AUTHORITIES/DIAL BEFORE YOU DIG PRIOR TO COMMENCING WORKS.
15. THE CONTRACTOR SHALL NOTE THE PRESENCE OF EXISTING SERVICES ASSOCIATED WITH THE WORKS. SPECIAL CARE MUST BE TAKEN BY THE CONTRACTOR IN THE VICINITY OF ALL SERVICES.

**ROOFWATER**

1. THE ENDS OF 150mm ROOFWATER CONNECTIONS FROM LOT DIRECTLY TO GULLY PIT SHALL BE CAPPED AND LOCATED WITH NOT LESS THAN 300mm AND NOT MORE THAN 450mm COVER UNLESS OTHERWISE APPROVED.
2. PROVIDE 1 x KERB ADAPTORS FOR ALL LOTS GRADING TO KERB AND CHANNEL AS PER LAYOUT PLAN. ALL KERB ADAPTORS SHALL BE CAST INTO KERB AND CHANNEL.
3. ROOFWATER KERB ADAPTORS SHALL BE LOCATED IN THE KERB AND CHANNEL FOR EACH ALLOTMENT THAT DRAINS PREDOMINANTLY TO THE ROAD FRONTAGE. KERB ADAPTORS SHALL BE LOCATED 0.6 METERS OFF THE SIDE BOUNDARY POSITION OR IF THE ALLOTMENT DRAINS PREDOMINANTLY TO ONE SIDE BOUNDARY THEN LOCATE BOTH KERB ADAPTORS 0.3 METERS AND APART 0.5 METERS OFF THE LOWER BOUNDARY LINE.

**DRAWING INDEX**

DRAWING NO.	DRAWING TITLE
18-201-01	GENERAL - LOCALITY PLAN, DRAWING INDEX AND NOTES
18-201-02	GENERAL - SETOUT PLAN
18-201-03	GENERAL - LAYOUT PLAN - SHEET 1
18-201-04	GENERAL - LAYOUT PLAN - SHEET 2
18-201-05	GENERAL - LAYOUT PLAN - SHEET 3
18-201-06	EARTHWORKS - CONTOUR PLAN - SHEET 1
18-201-07	EARTHWORKS - CONTOUR PLAN - SHEET 2
18-201-08	EARTHWORKS - CONTOUR PLAN - SHEET 3
18-201-09	EARTHWORKS - BUSHFIRE ACCESS TRAIL - TYPICAL SECTIONS
18-201-10	ROADWORKS - LONGITUDINAL SECTION - DAWSON CLOSE
18-201-11	ROADWORKS - CROSS SECTIONS - DAWSON CLOSE - SHEET 1
18-201-12	ROADWORKS - CROSS SECTIONS - DAWSON CLOSE - SHEET 2
18-201-13	ROADWORKS - CROSS SECTIONS - DAWSON CLOSE - SHEET 3
18-201-14	ROADWORKS - INTERSECTION DETAILS
18-201-15	STORMWATER - CATCHMENT PLAN
18-201-16	STORMWATER - CALCULATION TABLE
18-201-17	STORMWATER - LONGITUDINAL SECTIONS AND GULLY DETAIL
18-201-18	STORMWATER - CULVERT DETAIL
18-201-19	EROSION AND SEDIMENT CONTROL - LAYOUT PLAN - CONSTRUCTION PHASE - SHEET 1
18-201-20	EROSION AND SEDIMENT CONTROL - LAYOUT PLAN - CONSTRUCTION PHASE - SHEET 2
18-201-21	EROSION AND SEDIMENT CONTROL - LAYOUT PLAN - CONSTRUCTION PHASE - SHEET 3
18-201-22	EROSION AND SEDIMENT CONTROL - LAYOUT PLAN - POST CONSTRUCTION PHASE - SHEET 1
18-201-23	EROSION AND SEDIMENT CONTROL - LAYOUT PLAN - POST CONSTRUCTION PHASE - SHEET 2
18-201-24	EROSION AND SEDIMENT CONTROL - LAYOUT PLAN - POST CONSTRUCTION PHASE - SHEET 3
18-201-25	EROSION AND SEDIMENT CONTROL - NOTES
18-201-26	EROSION AND SEDIMENT CONTROL - DETAILS
18-201-27	WATER RETICULATION - LAYOUT PLAN - SHEET 1
18-201-28	WATER RETICULATION - LAYOUT PLAN - SHEET 2
18-201-29	WATER RETICULATION - LIVE CONNECTION DETAILS AND NOTES
18-201-30	SAFETY IN DESIGN
18-201-31	TARP EXTENTS - SHEET 1
18-201-32	TARP EXTENTS - SHEET 2
18-201-33	TARP EXTENTS - SHEET 3



REVISIONS

No	Description	Date	By
A	ISSUED FOR APPROVAL	11/06/20	DES



Client

Project

SPRING MOUNTAIN  
ACREAGE ESTATE  
STAGE 18B



Approved  
*M. Shaw* Mark Andrew Shaw BEng (Civil), MIEAust, RPEQ 17544  
2020.06.11 15:41:29 +10'00"

Drawing Title  
GENERAL  
LOCALITY PLAN,  
DRAWING INDEX AND NOTES

Drawn	Designed	Checked	Date
LMS	JB	GG	JUN 20
Scale	Sheet		Revision
AS SHOWN	01 of 33		
A1	Drawing No 18-201-01	Revision A	

DATUM A.H.D.  
P.M. No 61324  
E 491712.179  
N 6931003.529  
RL 69.322



**NOTE**  
DTM SURVEY INFORMATION UTILISED FOR ROAD DESIGN WITH LIDAR SOURCED NATURAL SURFACE INFORMATION PROVIDED FOR INFORMATION PURPOSE ONLY.

**LEGEND**

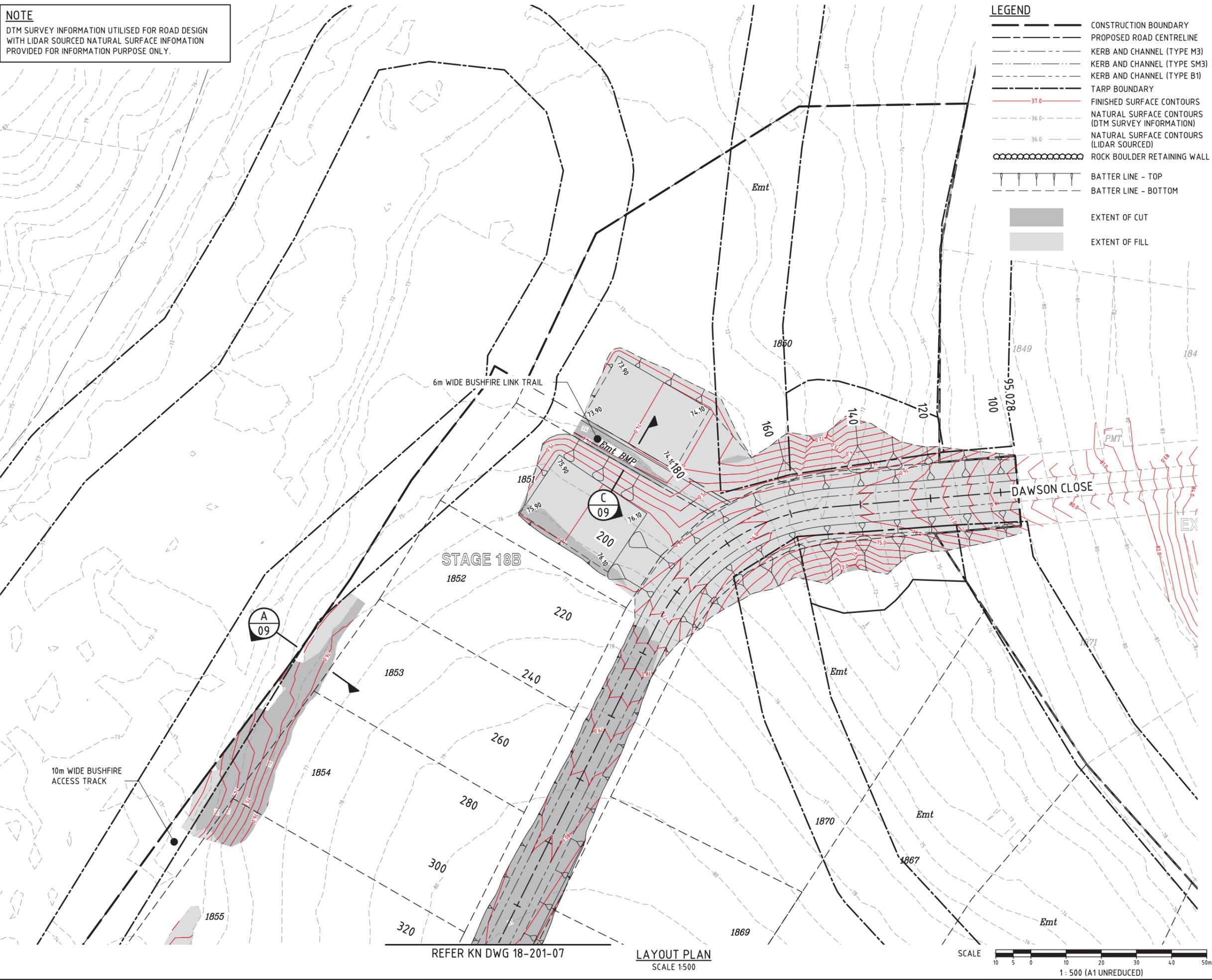
- CONSTRUCTION BOUNDARY
- PROPOSED ROAD CENTRELINE
- KERB AND CHANNEL (TYPE M3)
- KERB AND CHANNEL (TYPE SM3)
- KERB AND CHANNEL (TYPE B1)
- TARP BOUNDARY
- FINISHED SURFACE CONTOURS
- NATURAL SURFACE CONTOURS (DTM SURVEY INFORMATION)
- NATURAL SURFACE CONTOURS (LIDAR SOURCED)
- ROCK BOULDER RETAINING WALL
- BATTER LINE - TOP
- BATTER LINE - BOTTOM
- EXTENT OF CUT
- EXTENT OF FILL

DO NOT SCALE THIS DRAWING IF IN DOUBT - ASK!



REVISIONS

No	Description	Date	By
A	ISSUED FOR APPROVAL	11/06/20	DES



Project

**SPRING MOUNTAIN**  
ACREAGE ESTATE  
STAGE 18B



Approved

*M. Shaw* Mark Andrew Shaw BEng  
(Civil), MIEAust, RPEQ 17544  
2020.06.11 15:42:41 +10'00"

Drawing Title

**EARTHWORKS  
CONTOUR PLAN  
SHEET 1**

Drawn LMS	Designed JB	Checked GG	Date JUN 20
Scale AS SHOWN	Sheet 06 of 33		Revision A
A1	Drawing No 18-201-06	Revision A	

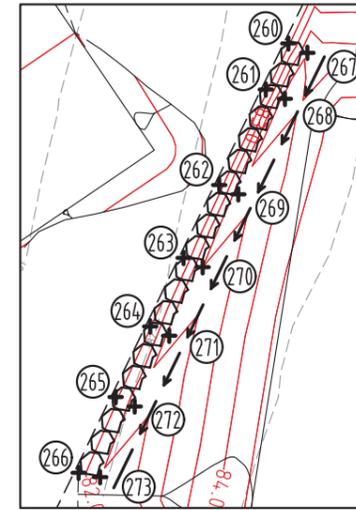
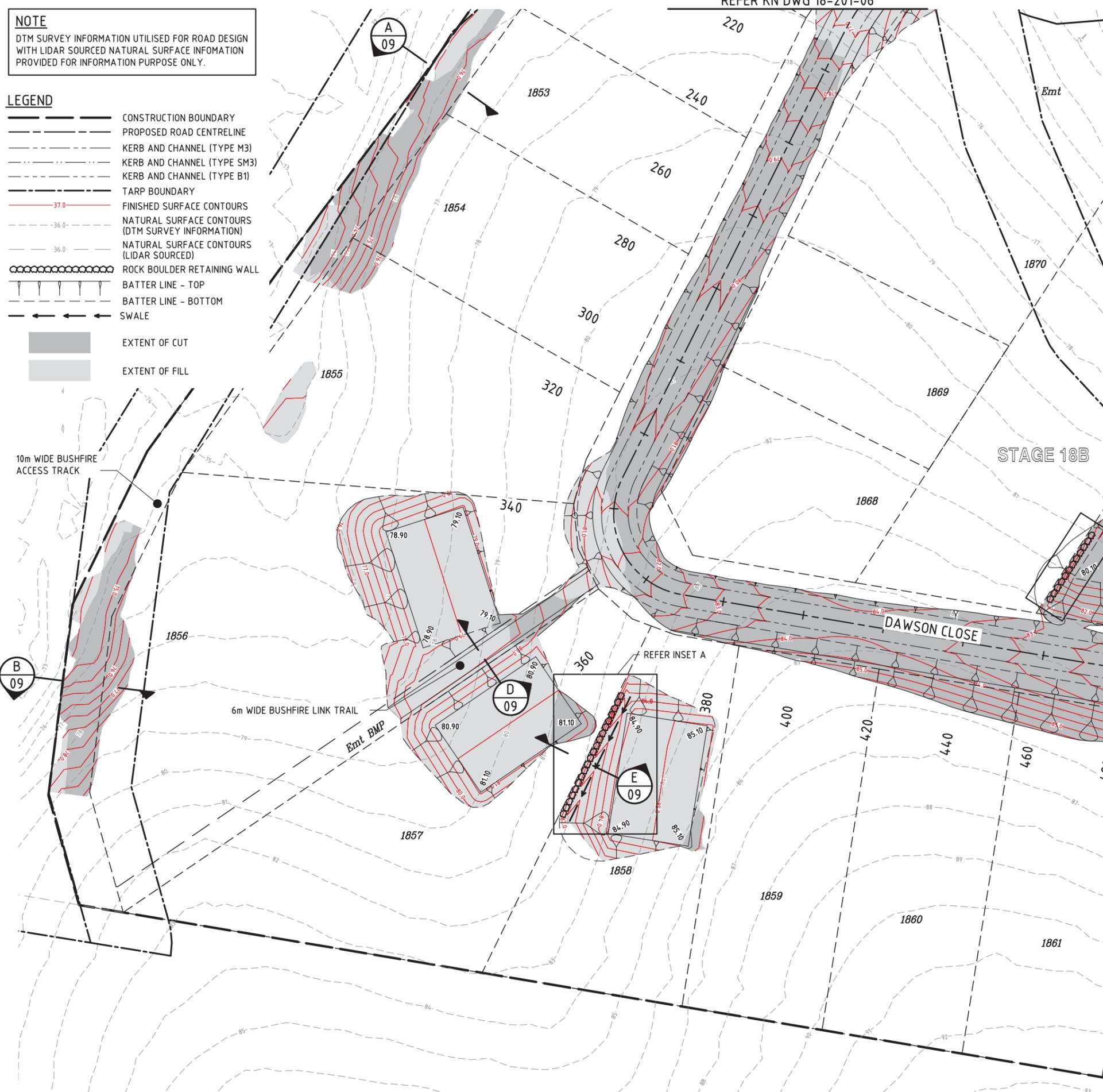
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REFER KN DWG 18-201-07 LAYOUT PLAN SCALE 1:500

SCALE 1: 500 (A1 UNREDUCED)

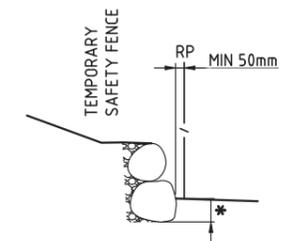
**NOTE**  
DTM SURVEY INFORMATION UTILISED FOR ROAD DESIGN WITH LIDAR SOURCED NATURAL SURFACE INFORMATION PROVIDED FOR INFORMATION PURPOSE ONLY.

- LEGEND**
- CONSTRUCTION BOUNDARY
  - PROPOSED ROAD CENTRELINE
  - KERB AND CHANNEL (TYPE M3)
  - KERB AND CHANNEL (TYPE SM3)
  - KERB AND CHANNEL (TYPE B1)
  - TARP BOUNDARY
  - 37.0 FINISHED SURFACE CONTOURS
  - 36.0 NATURAL SURFACE CONTOURS (DTM SURVEY INFORMATION)
  - 36.0 NATURAL SURFACE CONTOURS (LIDAR SOURCED)
  - ROCK BOULDER RETAINING WALL
  - BATTER LINE - TOP
  - BATTER LINE - BOTTOM
  - SWALE
  - EXTENT OF CUT
  - EXTENT OF FILL



**INSET A - SETOUT TABLE**

PT No.	EASTING	NORTHING	LEVEL
260	491734.749	6929502.500	82.393
261	491733.158	6929499.244	82.322
262	491729.862	6929492.500	82.198
263	491727.341	6929487.341	82.087
264	491724.976	6929482.500	81.947
265	491722.532	6929477.500	81.893
266	491719.917	6929472.148	81.790
267	491736.097	6929501.841	83.950
268	491734.506	6929498.585	84.335
269	491731.210	6929491.841	83.861
270	491728.689	6929486.683	83.499
271	491726.323	6929481.841	83.158
272	491723.880	6929476.841	82.807
273	491721.436	6929471.841	82.456



\* TOE OF ROCK BOULDER WALL TO BE FOUNDED 300mm MINIMUM BELOW PREFERRED BENCH LEVEL FOR EACH ALLOTMENT

**TYPICAL ROCK BOULDER RETAINING WALL DETAIL**

**PERFORMANCE REQUIREMENTS FOR RETAINING WALLS**

THE CONTRACTOR IS TO PROVIDE CERTIFICATION, FROM AN APPROVED STRUCTURAL/GEO TECHNICAL ENGINEER FOLLOWING COMPLETION OF THE RETAINING WALL CONSTRUCTION, THAT THE WALLS ARE STRUCTURALLY ADEQUATE FOR ALL RELEVANT LOADING CONDITIONS (INCLUDING GCCC REQUIREMENTS & MIN 10 kPa SURCHARGE LOADING).

- AS A MINIMUM THE FOLLOWING CONSTRUCTION STANDARD IS REQUIRED:
- AS1726, AS4678 AND AS1170;
  - 10 kPa SURCHARGE LOADING;
  - MINIMUM 300mm EMBEDMENT OF FIRST COURSE BOULDER (WHERE APPLICABLE);
  - IMPERVIOUS BACKFILL TO EMBEDMENT TRENCH;
  - PROVIDE GEOFABRIC LAYER TO REAR OF BOULDERS (WHERE APPLICABLE) AND FREE DRAINING BACKFILL BEHIND;
  - A MINIMUM 100mm DIAMETER SLOTTED PVC DRAINAGE PIPE FULL LENGTH OF WALL, INSTALLED ABOVE IMPERVIOUS BACKFILL WITH CONNECTION TO DRAINAGE OUTLET;
  - SELECT AND PLACE BOULDERS IN A MANNER TO ENSURE THAT THEY ARE SECURELY INTERLOCKED (WHERE APPLICABLE).

**LAYOUT PLAN**  
SCALE 1:500



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LOCALITY PLAN



REVISIONS

No	Description	Date	By
A	ISSUED FOR APPROVAL	11/06/20	DES

Client

**PEET**

Project

**SPRING MOUNTAIN**  
ACREAGE ESTATE  
STAGE 18B



Approved  
*M. Shaw* Mark Andrew Shaw BEng (Civil), MIEAust, RPEQ 17544  
2020.06.11 15:42:52 +10'00"

Drawing Title  
**EARTHWORKS**  
**CONTOUR PLAN**  
**SHEET 2**

Drawn	Designed	Checked	Date
LMS	JB	GG	JUN 20
Scale	AS SHOWN		Sheet 07 of 33
A1	18-201-07	Revision A	

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LOCALITY PLAN



REVISIONS

No	Description	Date	By
A	ISSUED FOR APPROVAL	11/06/20	DES

Client

**PEET**

Project

**SPRING MOUNTAIN**  
ACREAGE ESTATE  
STAGE 18B



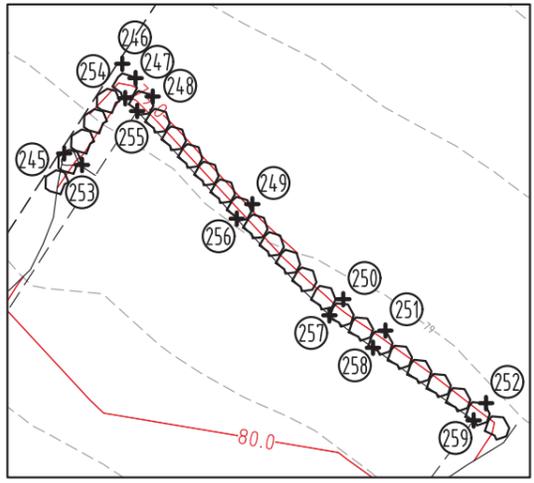
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*M. Shaw* Mark Andrew Shaw BEng  
(Civil), MIEAust, RPEQ 17544  
2020.06.11 15:43:12 +10'00'

Drawing Title  
**EARTHWORKS  
CONTOUR PLAN  
SHEET 3**

Drawn	Designed	Checked	Date
LMS	JB	GG	JUN 20
Scale	AS SHOWN		Sheet
A1	18-201-08		08 of 33
Drawing No	Revision		
18-201-08	A		

**INSET B - SETOUT TABLE**

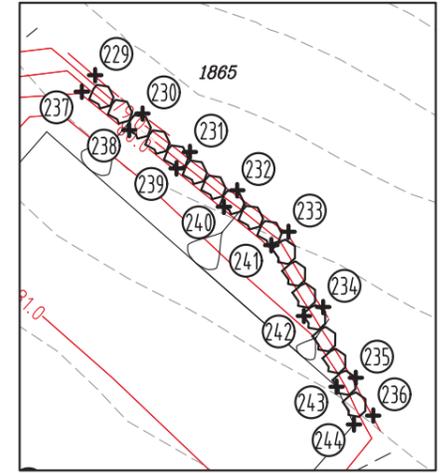
PT No.	EASTING	NORTHING	LEVEL
245	491859.771	6929556.095	79.257
246	491863.885	6929562.430	78.581
247	491864.823	6929561.417	78.637
248	491866.035	6929560.108	78.688
249	491873.084	6929552.500	78.786
250	491879.521	6929545.783	79.171
251	491882.500	6929543.569	79.245
252	491889.627	6929538.435	79.109
253	491861.029	6929555.278	79.632
254	491864.094	6929559.997	79.600
255	491864.935	6929559.089	79.900
256	491871.983	6929551.481	79.900
257	491878.540	6929544.645	79.900
258	491881.623	6929542.352	79.900
259	491888.751	6929537.218	79.900



**INSET B**  
SCALE 1:250

**INSET C - SETOUT TABLE**

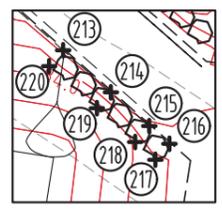
PT No.	EASTING	NORTHING	LEVEL
229	491935.193	6929504.668	78.431
230	491938.544	6929501.955	78.398
231	49194.1895	69294.99.242	78.577
232	49194.5.247	69294.96.529	78.737
233	49194.8.870	69294.93.596	78.903
234	49195.1.326	69294.88.275	79.427
235	49195.3.636	69294.83.270	79.813
236	49195.4.869	69294.80.600	79.951
237	491934.249	6929503.502	79.958
238	491937.600	6929500.789	79.958
239	49194.0.952	69294.98.076	79.958
240	49194.4.303	69294.95.363	79.958
241	49194.7.655	69294.92.650	79.958
242	49194.9.964	69294.87.646	80.342
243	49195.2.274	69294.82.642	80.900
244	491953.507	69294.79.971	80.900



**INSET C**  
SCALE 1:250

**INSET D - SETOUT TABLE**

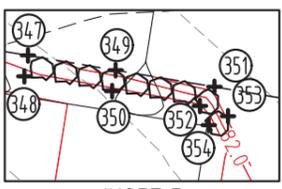
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213	491931.748	69294.61.947	82.890
214	491935.123	69294.58.977	82.946
215	491937.837	69294.56.589	83.089
216	491939.263	69294.55.334	83.224
217	491938.272	69294.54.208	83.600
218	491936.846	69294.55.463	83.950
219	491934.132	69294.57.851	84.250
220	491930.758	69294.60.820	83.820



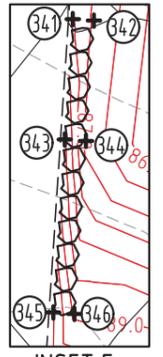
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SCALE 1:250

**INSET E - SETOUT TABLE**

PT No.	EASTING	NORTHING	LEVEL
347	491952.500	69294.59.380	82.136
348	491952.251	69294.57.900	82.674
349	491958.711	69294.58.335	81.700
350	491958.463	69294.56.856	82.626
351	491965.703	69294.57.160	81.230
352	491964.674	69294.55.812	82.578
353	491966.663	69294.55.085	81.335
354	491965.301	69294.54.456	82.900



**INSET E**  
SCALE 1:250



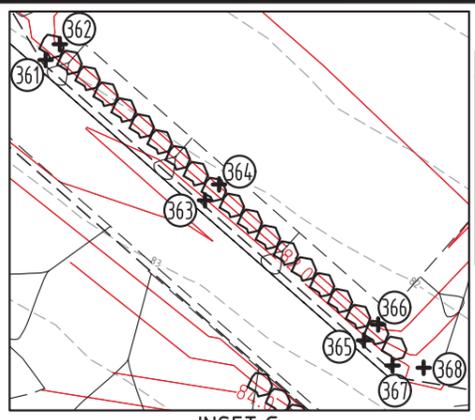
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SCALE 1:250

**INSET F - SETOUT TABLE**

PT No.	EASTING	NORTHING	LEVEL
341	491892.500	69294.48.243	87.524
342	491893.997	69294.48.144	86.930
343	491891.936	69294.39.731	88.553
344	491893.432	69294.39.632	86.822
345	491891.125	69294.27.500	90.029
346	491892.622	69294.27.401	88.900

**INSET G - SETOUT TABLE**

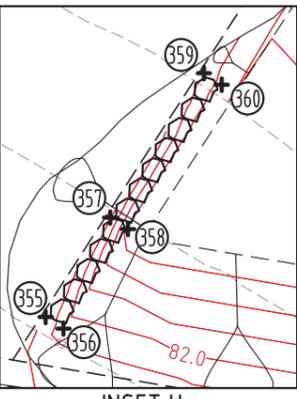
PT No.	EASTING	NORTHING	LEVEL
361	491916.771	69294.83.653	82.367
362	491917.777	69294.84.766	81.395
363	491928.047	69294.73.731	82.555
364	491929.038	69294.74.857	81.397
365	491939.293	69294.63.834	82.742
366	491940.298	69294.64.947	81.399
367	49194.1.314	69294.62.055	82.776
368	49194.3.521	69294.61.896	82.260



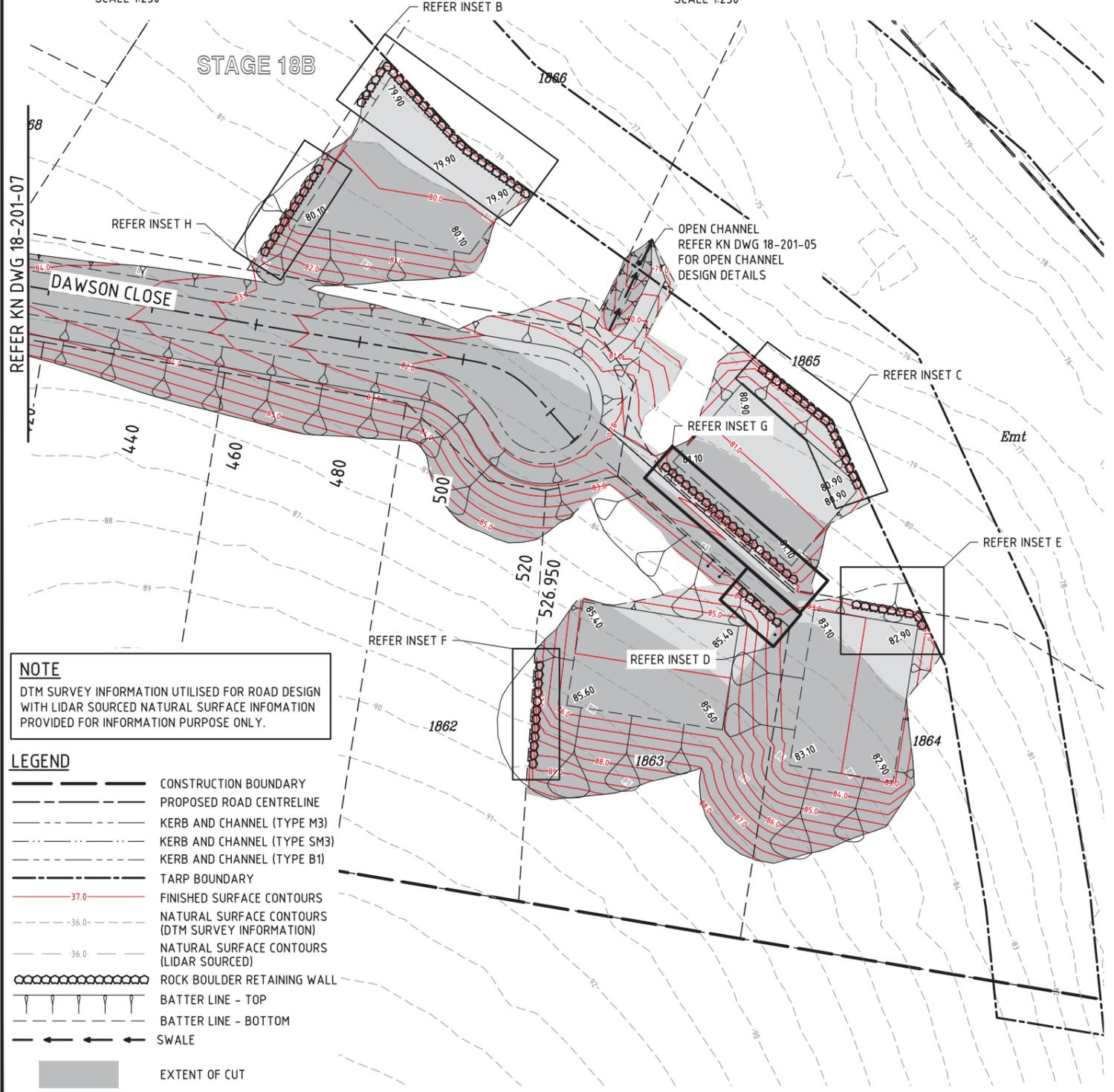
**INSET G**  
SCALE 1:250

**INSET H - SETOUT TABLE**

PT No.	EASTING	NORTHING	LEVEL
355	491839.742	6929525.256	82.907
356	491840.999	6929524.444	82.220
357	491844.311	6929532.293	82.068
358	491845.568	6929531.476	80.400
359	491850.940	692954.250	80.907
360	491852.198	692954.1683	80.330



**INSET H**  
SCALE 1:250



**EARTHWORKS CONTOUR PLAN**  
SCALE 1:500



**NOTE**  
DTM SURVEY INFORMATION UTILISED FOR ROAD DESIGN WITH LIDAR SOURCED NATURAL SURFACE INFORMATION PROVIDED FOR INFORMATION PURPOSE ONLY.

- LEGEND**
- CONSTRUCTION BOUNDARY
  - PROPOSED ROAD CENTRELINE
  - KERB AND CHANNEL (TYPE M3)
  - KERB AND CHANNEL (TYPE SM3)
  - KERB AND CHANNEL (TYPE B1)
  - TARP BOUNDARY
  - FINISHED SURFACE CONTOURS
  - NATURAL SURFACE CONTOURS (DTM SURVEY INFORMATION)
  - NATURAL SURFACE CONTOURS (LIDAR SOURCED)
  - ROCK BOULDER RETAINING WALL
  - BATTER LINE - TOP
  - BATTER LINE - BOTTOM
  - SWALE

- EXTENT OF CUT
- EXTENT OF FILL

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