

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

**Project Number:** PTP/05330  
**Letter Number:** PTP/05330 – 0002  
**Project Name:** Spring Mountain, Stage 18A,  
 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 18A,**  
**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 18A project located at New Beith undertaken between 13<sup>th</sup> August 2020 to 21<sup>st</sup> August 2020. 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 11,500m<sup>3</sup> of fill was placed at the site. Drawing Nos. 18-200-07, Revision B – *Earthworks Contour Plan Sheet 1*; 18-200-08, Revision B – *Earthworks Contour Plan Sheet 2*; and 18-200-09, Revision B – *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. 18-200-01, Revision B – *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 of Wet of OMC <sup>(1)</sup> )
Commercial – Fill to support minor loadings, including floor loadings	>98%	±2% (Dry of 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 twenty-six 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	26	26
Mean	99.5%	0.5% (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 18A in New Beith by Shadforth between 13<sup>th</sup> August 2020 to 21<sup>st</sup> August 2020 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 18A, New Beith between 13<sup>th</sup> August 2020 to 21<sup>st</sup> August 2020 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:

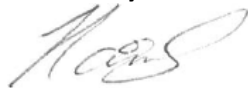
- I. This report only certifies the bulk earthworks activities supervised by Protest between 13<sup>th</sup> August 2020 to 21<sup>st</sup> August 2020. Protest does not take responsibility for any other bulk earthworks activities that have occurred before or after these dates;
- II. The installation 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 18A, 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:**



**Harrison Stamoudis**

*Undergraduate Engineer*

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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 – Dump truck, dozer and compactor, to place, spread and compact fill material. (Taken 12/08/2020)**



**Figure 2 – Water truck and compactor. To moisture condition and compact fill material. (Taken 13/08/2020)**



**Figure 3 – Dump truck and compactor, to place, spread and compact fill material. (Taken 19/08/2020)**



**Figure 4 – Excavator and dump trucks, to move stockpiled fill material. (Taken 20/08/2020)**

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

# Spring Mountain, Stage 18A

New Beith, QLD, 4124

## Legend

-  Location of Field Density Tests



Google Earth

100 m

Issue	Description	Date	DRN	CHK	APP
01	Field Density Location Plan	30/09/20	HS	KP	KP



CLIENT  
Shadforth Pty Ltd

TITLE  
Spring Mountain, Stage 18A  
New Beith, QLD, 4124

Job No.  
PTP/05330  
Drawing No.  
01





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



### Dry Density / Moisture Ratio Report

Client :	Shadforth				Report Number :	SR/PTP/05330 - 1/1	
Client Address :	99 Sandalwood Lane, Forest Glen, 4556, QLD				Report Date :	25/08/2020	
Project Name :	Spring Mountain Stage 18A				Test Request :	-	
Project Number :	PTP/05330				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/076854	S/076855	S/076856	S/076857			
Date Tested :	13/08/2020	13/08/2020	13/08/2020	13/08/2020			
Material Source :	Onsite	Onsite	Onsite	Onsite			
For use as :	General Fill	General Fill	General Fill	General Fill			
Test / Layer Depths :	150 / 150	150 / 150	150 / 150	150 / 150			
Sampling Method :	AS1289.1.2.1 - cl6.4a	AS1289.1.2.1 - cl6.4a	AS1289.1.2.1 - cl6.4a	AS1289.1.2.1 - cl6.4a			
Time :	10:43	10:43	10:43	10:43			
Lot Number :	-	-	-	-			
Location 1 :	E- 492021	E- 492010	E- 492016	E- 492017			
Location 2 :	N- 6929931	N- 6929927	N- 6929942	N- 6929954			
Location 3 :	1.1m Below FSL	1.1m Below FSL	1.1m Below FSL	1.1m Below FSL			
Location 4 :	-	-	-	-			
Test Fraction (mm) :	< 19mm	< 19mm	< 19mm	< 19mm			
Oversize Wet :	6%	9%	4%	14%			
Oversize Dry :	7%	8%	4%	14%			
Oversize Density - Dry (t/m <sup>3</sup> ) :	2.53	2.55	2.52	2.57			
Assigned MDR (Yes/No) :	No	No	No	No			
MDR Sample Number :	S/076854	S/076855	S/076856	S/076857			
MDR Test Date :	24/08/2020	24/08/2020	24/08/2020	24/08/2020			
Soil Description :	Sandy Gravelly Clay - Brown/Orange	Sandy Gravelly Clay - Brown/Orange	Sandy Gravelly Clay - Brown/Orange	Sandy Gravelly Clay - Brown/Orange			
<i>MDR Test Results</i>							
MDD (t/m <sup>3</sup> ) :	1.87	1.81	1.82	1.81			
OMC :	13.5%	12.5%	12.5%	12.5%			
ADJ MDD (t/m <sup>3</sup> ) :	1.90	1.86	1.83	1.89			
ADJ OMC :	13.0%	11.5%	12.0%	10.5%			
<i>Moisture Test Results</i>							
Field Moisture Content :	11.5%	11.0%	11.5%	10.5%			
Moisture Specification :	-	-	-	-			
Variation from OMC :	1.0% Dry of OMC	0.0% Dry of OMC	0.5% Dry of OMC	0.5% Dry of OMC			
Moisture Ratio :	91.0%	99.0%	96.5%	97.5%			
<i>Density Test Results</i>							
Field Dry Density (t/m <sup>3</sup> ) :	1.87	1.85	1.82	1.86			
Density Specification :	98%	98%	98%	98%			
Dry Density Ratio :	98.0%	99.5%	99.5%	98.0%			
Characteristic Value (Q020) :	CV(min) = 98.0%		CV(max) = 99.5%		Mean = 98.8%		Std. Dev. = 0.9%
					n = 4		k = 0.828
Degree of Saturation / Required :	-	-	-	-			
Remarks :	-						
 <small>WORLD RECOGNISED ACCREDITATION</small>	<small>Note: The results contained in this report relate only to the item/s that were tested/sampled</small> <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				<b>APPROVED SIGNATORY</b>   Kenney Pham - Signatory		



### Dry Density / Moisture Ratio Report

Client :	Shadforths			Report Number :	SR/PTP/05330 - 2/1	
Client Address :	99 Sandalwood Lane, Forest Glen, 4556, QLD			Report Date :	26/08/2020	
Project Name :	Spring Mountain Stage 18A			Test Request :	-	
Project Number :	PTP/05330			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/076848	S/076849	S/076850			
Date Tested :	11/08/2020	11/08/2020	11/08/2020			
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 - cl6.4a	AS1289.1.2.1 - cl6.4a	AS1289.1.2.1 - cl6.4a			
Time :	10:30	10:30	10:30			
Lot Number :	-	-	-			
Location 1 :	E- 491999	E- 492010	E- 492005			
Location 2 :	N- 6929690	N- 6929658	N- 6929683			
Location 3 :	0.3m Below FSL	0.3m Below FSL	0.3m Below FSL			
Location 4 :	-	-	-			
Test Fraction (mm) :	< 19mm	< 19mm	< 19mm			
Oversize Wet :	3%	4%	7%			
Oversize Dry :	2%	4%	7%			
Oversize Density - Dry (t/m <sup>3</sup> ) :	2.53	2.55	2.54			
Assigned MDR (Yes/No) :	No	No	No			
MDR Sample Number :	S/076848	S/076849	S/076850			
MDR Test Date :	25/08/2020	25/08/2020	25/08/2020			
Soil Description :	Sandy Gravelly Clay - Brown/Orange	Sandy Gravelly Clay - Brown/Orange	Sandy Gravelly Clay - Brown/Orange			
<i>MDR Test Results</i>						
MDD (t/m <sup>3</sup> ) :	1.77	1.81	1.73			
OMC :	13.0%	14.0%	13.5%			
ADJ MDD (t/m <sup>3</sup> ) :	1.78	1.83	1.77			
ADJ OMC :	13.0%	13.5%	12.5%			
<i>Moisture Test Results</i>						
Field Moisture Content :	10.5%	11.5%	10.5%			
Moisture Specification :	-	-	-			
Variation from OMC :	2.5% Dry of OMC	2.0% Dry of OMC	2.0% Dry of OMC			
Moisture Ratio :	82.5%	84.5%	84.5%			
<i>Density Test Results</i>						
Field Dry Density (t/m <sup>3</sup> ) :	1.76	1.80	1.75			
Density Specification :	98%	98%	98%			
Dry Density Ratio :	98.5%	98.0%	99.0%			
Characteristic Value (Q020) :	CV(min) = 98.1%		CV(max) = 98.9%	Mean = 98.5%	Std. Dev. = 0.5%	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  Base Laboratory Address - 1/9 Greg Chappell Drive, BURLEIGH HEADS, QLD, 4220			<b>APPROVED SIGNATORY</b>   Kenney Pham - Signatory		



### Dry Density / Moisture Ratio Report

Client :	Shadforths			Report Number :	SR/PTP/05330 - 3/1	
Client Address :	99 Sandalwood Lane, Forest Glen, 4556, QLD			Report Date :	27/08/2020	
Project Name :	Spring Mountain Stage 18A			Test Request :	-	
Project Number :	PTP/05330			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/076851	S/076852	S/076853			
Date Tested :	12/08/2020	12/08/2020	12/08/2020			
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 - cl6.4a	AS1289.1.2.1 - cl6.4a	AS1289.1.2.1 - cl6.4a			
Time :	10:36	10:37	10:37			
Lot Number :	-	-	-			
Location 1 :	E- 492043	E- 492023	E- 492057			
Location 2 :	N- 6929620	N- 6929645	N- 6929608			
Location 3 :	0.3m Below FSL	0.3m Below FSL	0.3m Below FSL			
Location 4 :	-	-	-			
Test Fraction (mm) :	< 19mm	< 19mm	< 19mm			
Oversize Wet :	12%	6%	13%			
Oversize Dry :	12%	6%	13%			
Oversize Density - Dry (t/m <sup>3</sup> ) :	2.53	2.52	2.57			
Assigned MDR (Yes/No) :	No	No	No			
MDR Sample Number :	S/076851	S/076852	S/076853			
MDR Test Date :	26/08/2020	26/08/2020	26/08/2020			
Soil Description :	Sandy Gravelly Clay - Brown/Orange	Sandy Gravelly Clay - Brown/Orange	Sandy Gravelly Clay - Brown/Orange			
<i>MDR Test Results</i>						
MDD (t/m <sup>3</sup> ) :	1.80	1.76	1.73			
OMC :	12.5%	13.0%	14.5%			
ADJ MDD (t/m <sup>3</sup> ) :	1.86	1.79	1.81			
ADJ OMC :	11.0%	12.0%	12.5%			
<i>Moisture Test Results</i>						
Field Moisture Content :	9.5%	12.5%	10.5%			
Moisture Specification :	-	-	-			
Variation from OMC :	1.5% Dry of OMC	0.5% Wet of OMC	1.5% Dry of OMC			
Moisture Ratio :	85.0%	104.5%	86.0%			
<i>Density Test Results</i>						
Field Dry Density (t/m <sup>3</sup> ) :	1.84	1.78	1.78			
Density Specification :	98%	98%	98%			
Dry Density Ratio :	98.5%	99.5%	98.5%			
Characteristic Value (Q020) :	CV(min) = 98.4%		CV(max) = 99.3%		Mean = 98.8%	Std. Dev. = 0.6%
					n = 3	k = 0.828
Degree of Saturation / Required :	-	-	-			
Remarks :	-					
 <small>WORLD RECOGNISED ACCREDITATION</small>	<small>Note: The results contained in this report relate only to the item/s that were tested/sampled</small> <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					<b>APPROVED SIGNATORY</b>   Kenney Pham - Signatory



### Dry Density / Moisture Ratio Report

Client :	Shadforths			Report Number :	SR/PTP/05330 - 4/1		
Client Address :	99 Sandalwood Lane, Forest Glen, 4556, QLD			Report Date :	27/08/2020		
Project Name :	Spring Mountain Stage 18A			Test Request :	-		
Project Number :	PTP/05330			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/077065	S/077066	S/077067				
Date Tested :	17/08/2020	17/08/2020	17/08/2020				
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 :	0	0	0				
Time :	11:15	11:15	11:15				
Lot Number :	-	-	-				
Location 1 :	E- 492029	E- 492030	E- 492021				
Location 2 :	N- 6929969	N- 6929970	N- 6929960				
Location 3 :	0.45m Below FSL	0.45m Below FSL	0.45m Below FSL				
Location 4 :	-	-	-				
Test Fraction (mm) :	< 19mm	< 19mm	< 19mm				
Oversize Wet :	9%	11%	12%				
Oversize Dry :	9%	11%	12%				
Oversize Density - Dry (t/m <sup>3</sup> ) :	2.51	2.54	2.55				
Assigned MDR (Yes/No) :	No	No	No				
MDR Sample Number :	S/077065	S/077066	S/077067				
MDR Test Date :	26/08/2020	26/08/2020	26/08/2020				
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> ) :	1.85	1.88	1.91				
OMC :	11.0%	14.5%	13.0%				
ADJ MDD (t/m <sup>3</sup> ) :	1.89	1.93	1.97				
ADJ OMC :	10.0%	13.0%	11.5%				
<i>Moisture Test Results</i>							
Field Moisture Content :	11.5%	12.5%	10.5%				
Moisture Specification :	-	-	-				
Variation from OMC :	1.0% Wet of OMC	0.5% Dry of OMC	1.0% Dry of OMC				
Moisture Ratio :	112.5%	97.0%	89.0%				
<i>Density Test Results</i>							
Field Dry Density (t/m <sup>3</sup> ) :	1.87	1.91	1.93				
Density Specification :	98%	98%	98%				
Dry Density Ratio :	98.5%	99.0%	98.0%				
<b>Characteristic Value (Q020) :</b>	<b>CV(min) = 98.1%</b>		<b>CV(max) = 98.9%</b>		<b>Mean = 98.5%</b>		
	<b>Std. Dev. = 0.5%</b>		<b>n = 3</b>		<b>k = 0.828</b>		
Degree of Saturation / Required :	-	-	-				
Remarks :	-						
 <small>WORLD RECOGNISED ACCREDITATION</small>	<small>Note: The results contained in this report relate only to the item/s that were tested/sampled</small> <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					<b>APPROVED SIGNATORY</b>   Kenney Pham - Signatory	
	Document Number :	RF1					Date :



### Dry Density / Moisture Ratio Report

Client :	Shadforths			Report Number :	SR/PTP/05330 - 14/1	
Client Address :	99 Sandalwood Lane, Forest Glen, 4556, QLD			Report Date :	2/09/2020	
Project Name :	Spring Mountain Stage 18A			Test Request :	-	
Project Number :	PTP/05330			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/077383	S/077384	S/077385			
Date Tested :	20/08/2020	20/08/2020	20/08/2020			
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 - cl6.4a	AS1289.1.2.1 - cl6.4a	AS1289.1.2.1 - cl6.4a			
Time :	10:23	10:24	10:24			
Lot Number :	-	-	-			
Location 1 :	E- 492047	E- 492045	E- 492039			
Location 2 :	N- 6929948	N- 6929941	N- 6929953			
Location 3 :	0.32m Below FSL	0.32m Below FSL	0.32m Below FSL			
Location 4 :	-	-	-			
Test Fraction (mm) :	< 19mm	< 19mm	< 19mm			
Oversize Wet :	8%	17%	13%			
Oversize Dry :	9%	19%	14%			
Oversize Density - Dry (t/m <sup>3</sup> ) :	2.50	2.52	2.50			
Assigned MDR (Yes/No) :	No	No	No			
MDR Sample Number :	S/077383	S/077384	S/077385			
MDR Test Date :	1/09/2020	1/09/2020	1/09/2020			
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> ) :	1.92	1.92	1.94			
OMC :	11.5%	12.5%	12.5%			
ADJ MDD (t/m <sup>3</sup> ) :	1.96	2.00	2.00			
ADJ OMC :	10.5%	10.0%	10.5%			
<i>Moisture Test Results :</i>						
Field Moisture Content :	10.0%	10.5%	10.0%			
Moisture Specification :	±2% of OMC	±2% of OMC	±2% of OMC			
Variation from OMC :	0.0% Dry of OMC	0.0% Wet of OMC	1.0% Dry of OMC			
Moisture Ratio :	98.0%	101.5%	91.5%			
<i>Density Test Results</i>						
Field Dry Density (t/m <sup>3</sup> ) :	1.95	1.98	1.97			
Density Specification :	98%	98%	98%			
Dry Density Ratio :	99.5%	99.0%	98.5%			
Characteristic Value (Q020) :	CV(min) = 98.6%	CV(max) = 99.4%	Mean = 99.0%	Std. Dev. = 0.5%	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/05330 - 15/1
Client Address :	99 Sandalwood Lane, Forest Glen, 4556, QLD				Report Date :	8/09/2020
Project Name :	Spring Mountain Stage 18A				Test Request :	-
Project Number :	PTP/05330				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/077640	S/077641	S/077642	S/077643		
Date Tested :	21/08/2020	21/08/2020	21/08/2020	21/08/2020		
Material Source :	Onsite	Onsite	Onsite	Onsite		
For use as :	General Fill	General Fill	General Fill	General Fill		
Test / Layer Depths :	150 / 150	150 / 150	150 / 150	150 / 150		
Sampling Method :	AS1289.1.2.1 - cl6.4a	AS1289.1.2.1 - cl6.4a	AS1289.1.2.1 - cl6.4a	AS1289.1.2.1 - cl6.4a		
Time :	05:18	05:18	05:18	05:18		
Lot Number :	-	-	-	-		
Location 1 :	E- 492068	E- 492064	E- 492027	E- 492025		
Location 2 :	N- 6929906	N- 6929918	N- 6929961	N- 6929968		
Location 3 :	F.L	F.L	F.L	F.L		
Location 4 :	-	-	-	-		
Test Fraction (mm) :	< 19mm	< 19mm	< 19mm	< 19mm		
Oversize Wet :	6%	6%	11%	10%		
Oversize Dry :	6%	6%	12%	11%		
Oversize Density - Dry (t/m <sup>3</sup> ) :	2.55	2.52	2.52	2.52		
Assigned MDR (Yes/No) :	No	No	No	No		
MDR Sample Number :	S/077640	S/077641	S/077642	S/077643		
MDR Test Date :	7/09/2020	7/09/2020	7/09/2020	7/09/2020		
Soil Description :	Sandy Gravelly Clay - Brown	Sandy Gravelly Clay - Brown	Sandy Gravelly Clay - Brown	Sandy Gravelly Clay - Brown		
<i>MDR Test Results</i>						
MDD (t/m <sup>3</sup> ) :	1.85	1.85	1.86	1.88		
OMC :	14.0%	9.5%	12.0%	11.5%		
ADJ MDD (t/m <sup>3</sup> ) :	1.88	1.88	1.91	1.94		
ADJ OMC :	13.0%	9.0%	10.5%	10.0%		
<i>Moisture Test Results :</i>						
Field Moisture Content :	10.5%	9.0%	9.0%	9.0%		
Moisture Specification :	±2% of OMC	±2% of OMC	±2% of OMC	±2% of OMC		
Variation from OMC :	<b>2.5% Dry of OMC</b>	<b>0.5% Dry of OMC</b>	<b>1.5% Dry of OMC</b>	<b>1.0% Dry of OMC</b>		
Moisture Ratio :	79.5%	96.5%	85.5%	88.5%		
<i>Density Test Results</i>						
Field Dry Density (t/m <sup>3</sup> ) :	1.93	1.94	1.98	1.95		
Density Specification :	98%	98%	98%	98%		
Dry Density Ratio :	<b>102.5%</b>	<b>103.0%</b>	<b>103.0%</b>	<b>100.5%</b>		
Characteristic Value (Q020) :	<b>CV(min) = 101.3%</b>		<b>CV(max) = 103.2%</b>	<b>Mean = 102.3%</b>	<b>Std. Dev. = 1.2%</b>	<b>n = 4</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</p> <p>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/05330 - 25/1
Client Address :	99 Sandalwood Lane, Forest Glen, 4556, QLD					Report Date :	25/09/2020
Project Name :	Spring Mountain Stage 18A					Test Request :	-
Project Number :	PTP/05330					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/077274	S/077275	S/077276	S/077277	S/077278	S/077279	
Date Tested :	19/08/2020	19/08/2020	19/08/2020	19/08/2020	19/08/2020	19/08/2020	
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 - cl6.4a	AS1289.1.2.1 - cl6.4a	AS1289.1.2.1 - cl6.4a	AS1289.1.2.1 - cl6.4a	AS1289.1.2.1 - cl6.4a	AS1289.1.2.1 - cl6.4a	
Time :	13:31	13:33	13:33	13:33	13:33	13:33	
Lot Number :	-	-	-	-	-	-	
Location 1 :	E- 491976	E- 491965	E- 491952	E- 491941	E- 491926	E- 491911	
Location 2 :	N- 6929709	6929710	N- 6929703	N- 6929704	N- 6929702	N- 6929700	
Location 3 :	0.4m Below FL	0.4m Below FL	0.4m Below FL	0.4m Below FL	0.4m Below FL	0.4m Below FL	
Location 4 :	-	-	-	-	-	-	
Test Fraction (mm) :	< 19mm	< 19mm	< 19mm	< 19mm	< 19mm	< 19mm	
Oversize Wet :	5%	5%	8%	7%	7%	10%	
Oversize Dry :	6%	6%	9%	8%	7%	11%	
Oversize Density - Dry (t/m <sup>3</sup> ) :	2.52	2.50	2.50	2.51	2.52	2.50	
Assigned MDR (Yes/No) :	No	No	No	No	No	No	
MDR Sample Number :	S/077274	S/077275	S/077276	S/077277	S/077278	S/077279	
MDR Test Date :	28/08/2020	28/08/2020	28/08/2020	28/08/2020	28/08/2020	28/08/2020	
Soil Description :	Sandy Gravelly Clay - Brown	Sandy Gravelly Clay - Brown	Sandy Gravelly Clay - Brown	Sandy Gravelly Clay - Brown	Sandy Gravelly Clay - Brown	Sandy Gravelly Clay - Brown	
<b>MDR Test Results</b>							
MDD (t/m <sup>3</sup> ) :	1.93	1.93	1.87	1.91	1.90	1.85	
OMC :	12.0%	13.5%	13.5%	12.5%	12.5%	13.5%	
ADJ MDD (t/m <sup>3</sup> ) :	1.95	1.95	1.92	1.95	1.93	1.91	
ADJ OMC :	11.5%	12.5%	12.5%	11.5%	11.5%	12.0%	
<b>Moisture Test Results :</b>							
Field Moisture Content :	10.5%	10.5%	13.0%	13.0%	12.0%	14.0%	
Moisture Specification :	-	-	-	-	-	-	
Variation from OMC :	0.5% Dry of OMC	2.0% Dry of OMC	0.5% Wet of OMC	1.5% Wet of OMC	0.5% Wet of OMC	2.0% Wet of OMC	
Moisture Ratio :	95.0%	84.5%	105.0%	111.0%	106.5%	117.0%	
<b>Density Test Results</b>							
Field Dry Density (t/m <sup>3</sup> ) :	1.97	1.93	1.92	1.91	1.90	1.89	
Density Specification :	98%	98%	98%	98%	98%	98%	
Dry Density Ratio :	101.0%	99.0%	100.0%	98.0%	98.5%	99.0%	
Characteristic Value (Q020) :	CV(min) = 98.4%	CV(max) = 100.1%	Mean = 99.3%	Std. Dev. = 1.1%	n = 6	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  Base Laboratory Address - 1/9 Greg Chappell Drive, BURLEIGH HEADS, QLD, 4220					<b>APPROVED SIGNATORY</b>  Kenney Pham - Signatory	



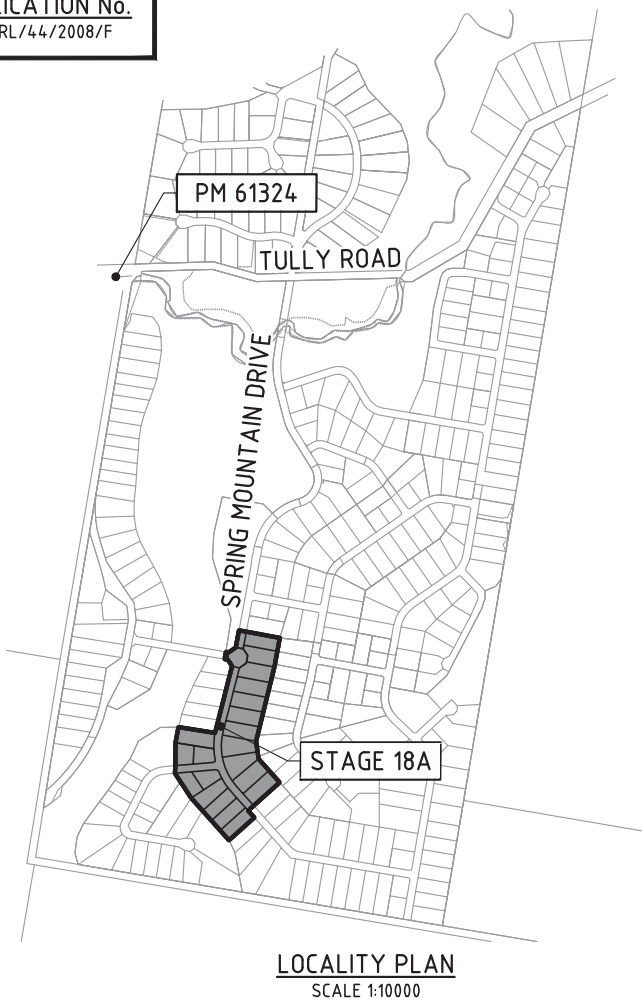
**PROTEST**  
**ENGINEERING**

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

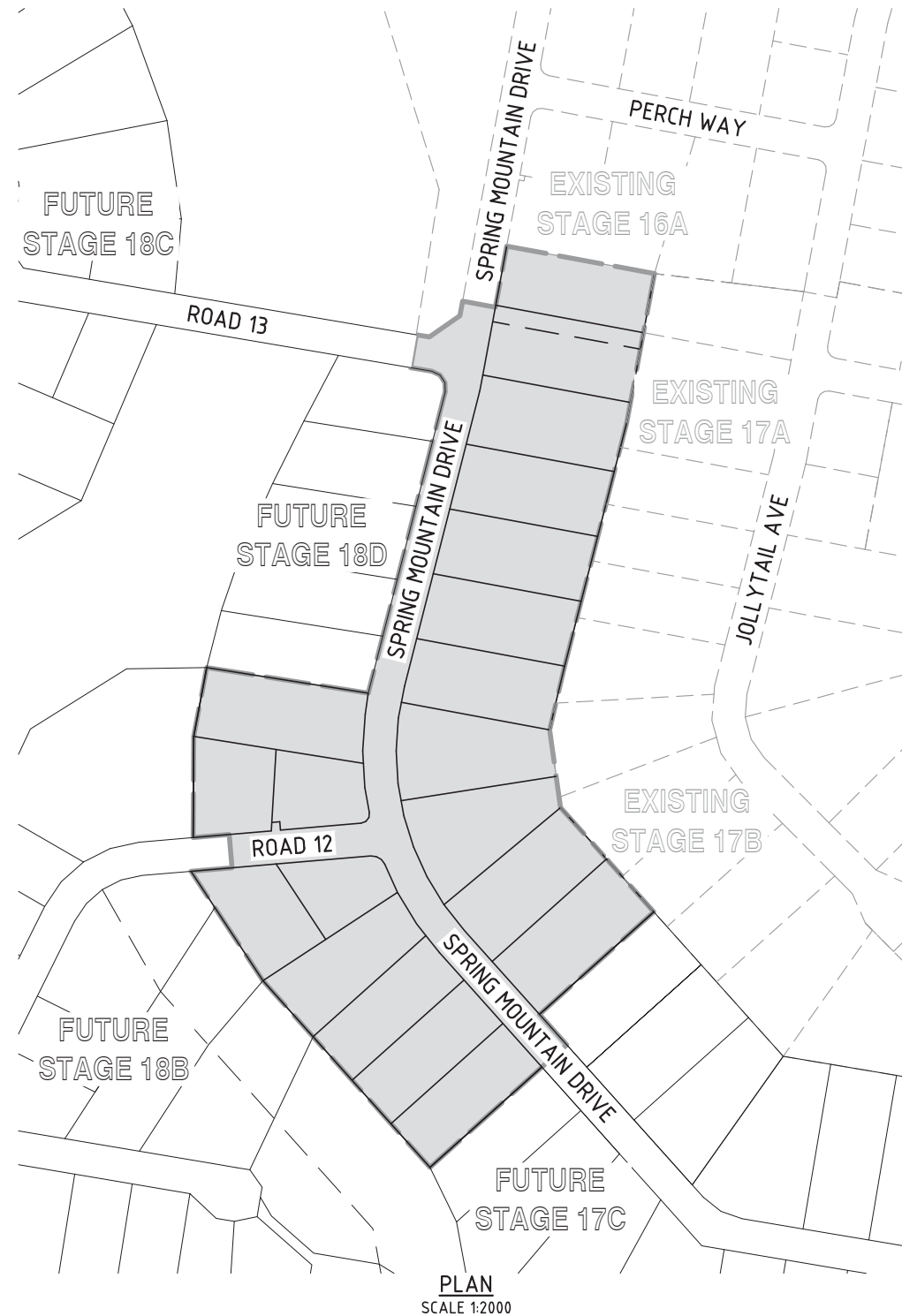
**Attachment 4**

**Referenced Drawings**

# SPRING MOUNTAIN ACREAGE ESTATE STAGE 18A



LOCALITY PLAN  
SCALE 1:10000



PLAN  
SCALE 1:2000

### GENERAL NOTES

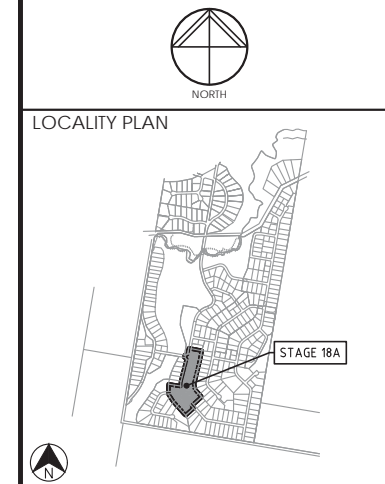
- ALL WORK SHALL BE JOINED NEATLY TO EXISTING CONSTRUCTION.
- WHERE REFERENCE IS MADE ON THESE DRAWINGS TO A KERB LINE, IT SHALL BE TAKEN TO MEAN THE KERB INVERT LINE.
- LEVELS FOR KERB AND CHANNEL CONSTRUCTION ARE SHOWN AT LIP OF CHANNEL UNLESS SHOWN OTHERWISE.
- KERB AND CHANNEL AND SPOON DRAINS SHALL 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.
- IF MACHINE MADE KERB AND CHANNEL IS USED, EXTRA FINES AND 20mm SLUMP IS REQUIRED.
- ALL DRAINAGE CENTRE LINES ARE 2m FROM INVERT OF KERB UNLESS OTHERWISE SHOWN.
- GULLY CONNECTIONS AND STORMWATER PIPES SHALL BE 375mm DIAMETER CLASS '2' R.C. PIPES UNLESS SHOWN OTHERWISE.
- 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.
- 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.
- THE MINIMUM CLEARANCE BETWEEN OUTER WALLS OF PIPES IN MANHOLES SHALL BE 150mm.
- SUBSURFACE DRAIN CLEANING POINTS SHALL BE INSTALLED IN ACCORDANCE WITH IPWEAQ STD DWG NO SEQ RS-142.
- 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".
- 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.
- 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.
- 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

- 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.
- 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.
- 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
18-200-01	GENERAL - LOCALITY PLAN, DRAWING INDEX AND NOTES
18-200-02	GENERAL - SETOUT PLAN
18-200-03	GENERAL - SETOUT TABLES
18-200-04	GENERAL - LAYOUT PLAN - SHEET 1
18-200-05	GENERAL - LAYOUT PLAN - SHEET 2
18-200-06	GENERAL - LAYOUT PLAN - SHEET 3
18-200-07	EARTHWORKS - CONTOUR PLAN - SHEET 1
18-200-08	EARTHWORKS - CONTOUR PLAN - SHEET 2
18-200-09	EARTHWORKS - CONTOUR PLAN - SHEET 3
18-200-10	ROADWORKS - LONGITUDINAL SECTION - SPRING MOUNTAIN DRIVE
18-200-11	ROADWORKS - CROSS SECTIONS - SPRING MOUNTAIN DRIVE - SHT 1
18-200-12	ROADWORKS - CROSS SECTIONS - SPRING MOUNTAIN DRIVE - SHT 2
18-200-13	ROADWORKS - CROSS SECTIONS - SPRING MOUNTAIN DRIVE - SHT 3
18-200-14	ROADWORKS - CROSS SECTIONS - SPRING MOUNTAIN DRIVE - SHT 4
18-200-15	ROADWORKS - LONGITUDINAL SECTION - ROAD 12
18-200-16	ROADWORKS - CROSS SECTIONS - ROAD 12
18-200-17	ROADWORKS - LONG. AND CROSS SECTIONS - ROAD 13
18-200-18	ROADWORKS - INTERSECTION DETAILS
18-200-19	ROADWORKS - SIGNS AND LINEMARKING PLAN
18-200-20	STORMWATER - CATCHMENT PLAN
18-200-21	STORMWATER - CALCULATION TABLE
18-200-22	STORMWATER - LONGITUDINAL SECTIONS - SHEET 1
18-200-23	STORMWATER - LONGITUDINAL SECTIONS - SHEET 2
18-200-24	STORMWATER - MANHOLE DETAILS
18-200-25	EROSION AND SEDIMENT CONTROL - LAYOUT PLAN - CONSTRUCTION PHASE - SHEET 1
18-200-26	EROSION AND SEDIMENT CONTROL - LAYOUT PLAN - CONSTRUCTION PHASE - SHEET 2
18-200-27	EROSION AND SEDIMENT CONTROL - LAYOUT PLAN - CONSTRUCTION PHASE - SHEET 3
18-200-28	EROSION AND SEDIMENT CONTROL - LAYOUT PLAN - POST CONSTRUCTION PHASE - SHEET 1
18-200-29	EROSION AND SEDIMENT CONTROL - LAYOUT PLAN - POST CONSTRUCTION PHASE - SHEET 2
18-200-30	EROSION AND SEDIMENT CONTROL - LAYOUT PLAN - POST CONSTRUCTION PHASE - SHEET 3
18-200-31	EROSION AND SEDIMENT CONTROL - NOTES
18-200-32	EROSION AND SEDIMENT CONTROL - DETAILS
18-200-33	WATER RETICULATION - LAYOUT PLAN - SHEET 1
18-200-34	WATER RETICULATION - LAYOUT PLAN - SHEET 2
18-200-35	WATER RETICULATION - LIVE CONNECTION DETAILS AND NOTES
18-200-36	SAFETY IN DESIGN



### REVISIONS

No	Description	Date	By
A	ISSUED FOR APPROVAL	27.11.19	DES
B	DIGITAL SIGNATURE	14.02.20	DES

Associated Consultants

Client

**PEET**

Project

**SPRING MOUNTAIN  
ACREAGE ESTATE  
STAGE 18A**

**KN GROUP PTY LTD**  
CONSULTING ENGINEERS

LEVEL 1 - 62 ASTOR TCE  
SPRING HILL, QLD 4000  
PHONE 07 3017 1900  
EMAIL kng@knpl.com.au  
ABN 35 112 053 611

Approved  
*M. Shaw* Mark Andrew Shaw BEng  
(Civil), MIEAust, RPEQ  
17544  
2020.02.14 16:11:57 +10'00'

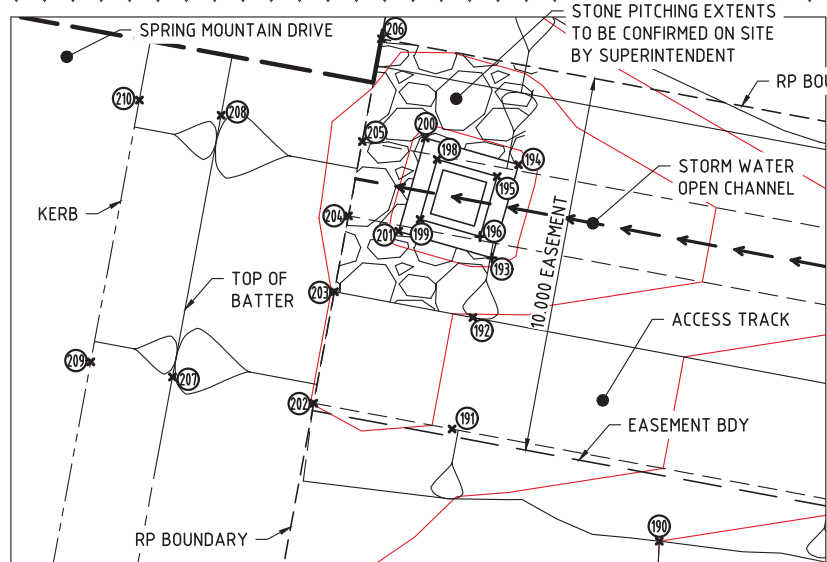
Drawing Title  
**GENERAL  
LOCALITY PLAN,  
DRAWING INDEX AND NOTES**

Drawn	Designed	Checked	Date
DES	JB	GG	JUN 19
Scale	AS SHOWN		Sheet
			01 of 36
A1	Drawing No	Revision	
	18-200-01	B	

### DATUM A.H.D.

P.M. No 61324  
E 491712.179  
N 6931003.529  
RL 69.322





**INSET A**  
SCALE 1:100

**INSET A - SETOUT TABLE**

PT No.	EASTING	NORTHING	LEVEL
190	492058.322	6930015.724	74.000
191	492052.839	6930018.691	73.036
192	492053.389	6930021.640	73.036
193	492053.895	6930023.218	72.406
194	492054.599	6930025.684	72.406
195	492054.032	6930025.370	72.186
196	492053.579	6930023.783	72.186
198	492052.445	6930025.823	72.186
199	492051.992	6930024.236	72.186
200	492052.130	6930026.389	72.406
201	492051.426	6930023.923	72.406
202	492049.177	6930019.373	72.991
203	492049.725	6930022.323	72.991
204	492050.096	6930024.329	72.905
205	492050.464	6930026.296	72.893
206	492050.967	6930029.012	73.100
207	492045.441	6930020.068	73.405
208	492046.728	6930026.991	73.368
209	492043.278	6930020.470	73.225
210	492044.565	6930027.393	73.189

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

DO NOT SCALE THIS DRAWING IF IN DOUBT - ASK!  
NORTH



**REVISIONS**

No	Description	Date	By
A	ISSUED FOR APPROVAL	27.11.19	DES
B	REVISED DETAILS	14.02.20	DES

Associated Consultants  
Client



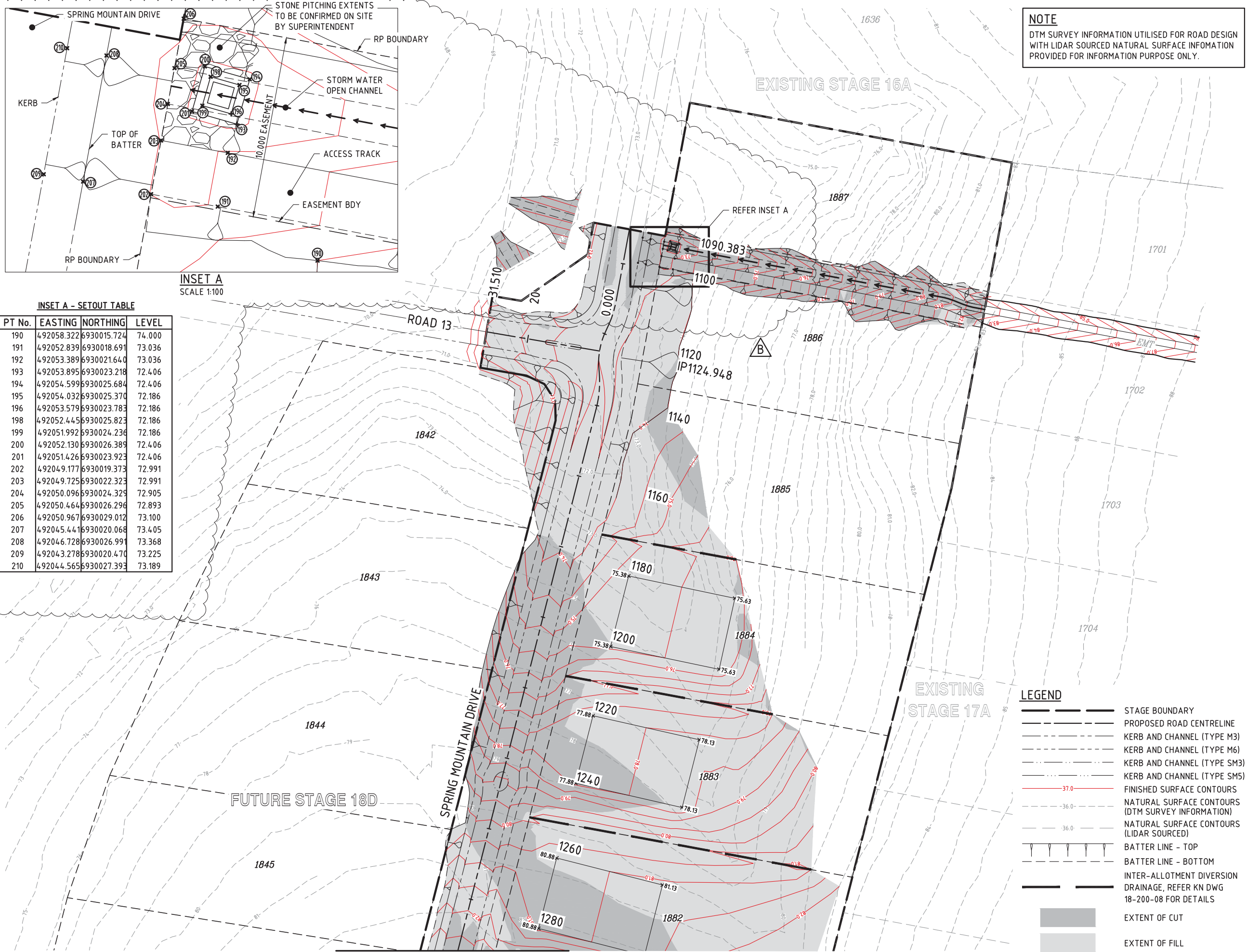
Project  
**SPRING MOUNTAIN ACREAGE ESTATE**  
STAGE 18A

**KN GROUP PTY LTD**  
CONSULTING ENGINEERS  
LEVEL 1 - 62 ASTOR TCE  
SPRING HILL, QLD 4000  
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EMAIL kng@knpl.com.au  
ABN 35 112 053 611

Approved  
*M. Shaw*  
Mark Andrew Shaw BEng (Civil), MIEAust, RPEQ  
17544  
2020.02.17 14:31:33 +10'00'

Drawing Title  
**EARTHWORKS CONTOUR PLAN SHEET 1**

Drawn DES	Designed JB	Checked GG	Date JUN 19
Scale AS SHOWN	Drawing No 18-200-07		Sheet 07 of 36
A1	Revision B		



REFER KN DWG 18-200-08  
**LAYOUT PLAN**  
SCALE 1:500



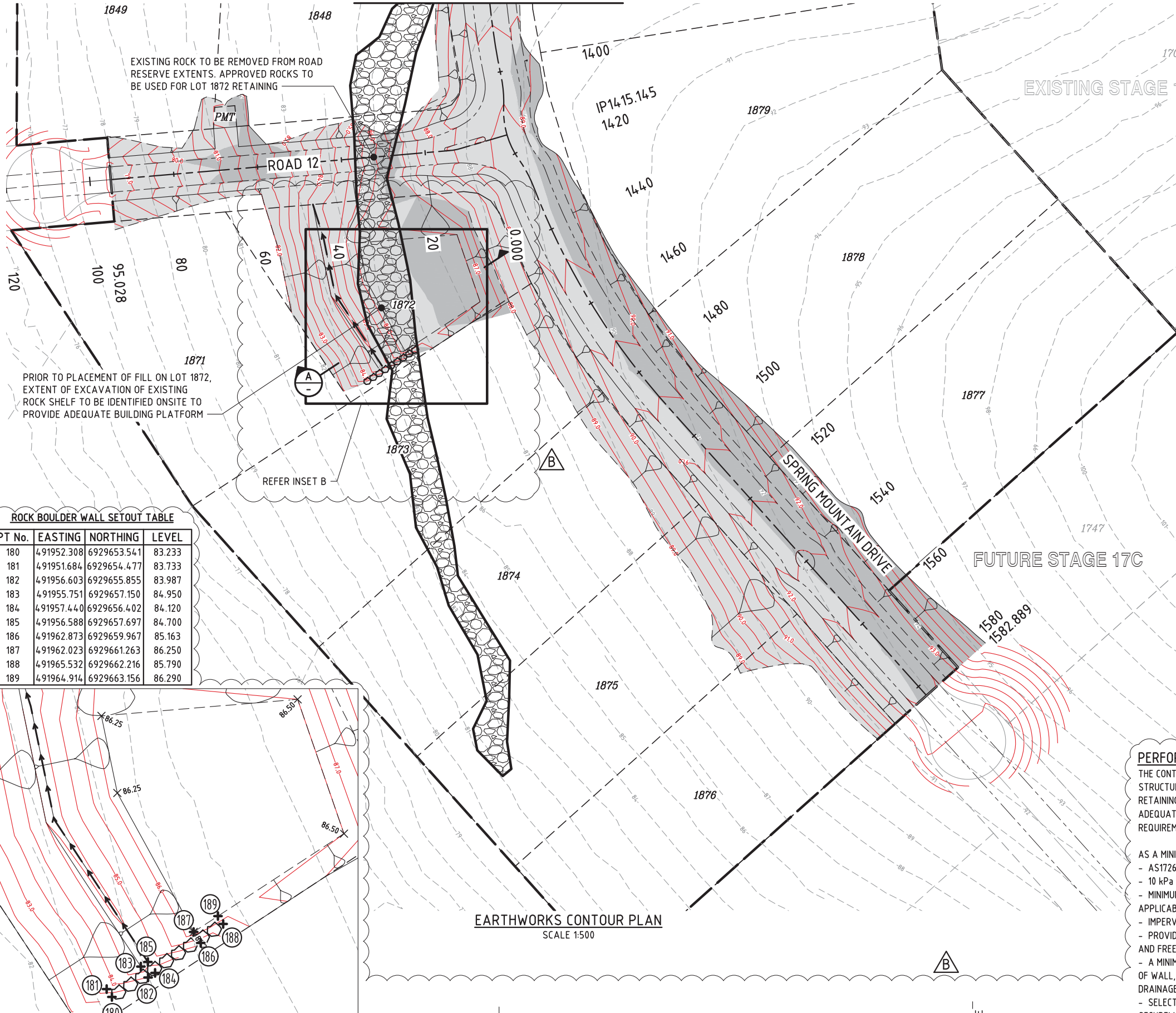
**LEGEND**

- STAGE BOUNDARY
- PROPOSED ROAD CENTRELINE
- KERB AND CHANNEL (TYPE M3)
- KERB AND CHANNEL (TYPE M6)
- KERB AND CHANNEL (TYPE SM3)
- KERB AND CHANNEL (TYPE SM5)
- FINISHED SURFACE CONTOURS
- NATURAL SURFACE CONTOURS (DTM SURVEY INFORMATION)
- NATURAL SURFACE CONTOURS (LIDAR SOURCED)
- BATTER LINE - TOP
- BATTER LINE - BOTTOM
- INTER-ALLOTMENT DIVERSION
- DRAINAGE, REFER KN DWG 18-200-08 FOR DETAILS
- EXTENT OF CUT
- EXTENT OF FILL

M:\2018\18200\_Spring Mountain Stage 18A\Engineering\Acad\18-200-07-09-EW-CONTOUR.dwg Plotted by: DS on: 17/02/2020 1:48:07 PM



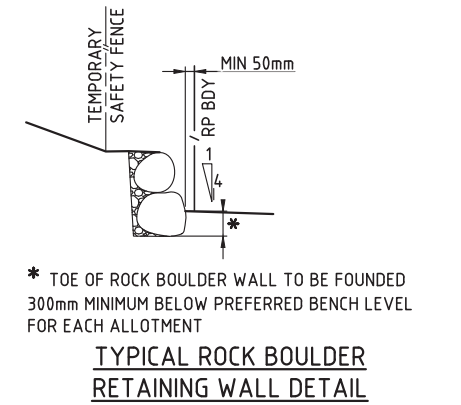
REFER KN DWG 18-200-08



**LEGEND**

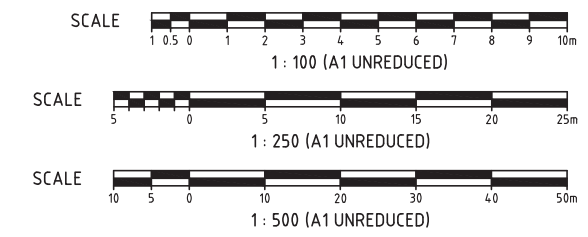
- STAGE BOUNDARY
- PROPOSED ROAD CENTRELINE
- KERB AND CHANNEL (TYPE M3)
- KERB AND CHANNEL (TYPE M6)
- KERB AND CHANNEL (TYPE SM3)
- KERB AND CHANNEL (TYPE SM5)
- 37.0 FINISHED SURFACE CONTOURS
- 36.0 NATURAL SURFACE CONTOURS (DTM SURVEY INFORMATION)
- 36.0 NATURAL SURFACE CONTOURS (LIDAR SOURCED)
- BATTER LINE - TOP
- BATTER LINE - BOTTOM
- ROCK BOULDER RETAINING WALL
- EXTENT OF CUT
- EXTENT OF FILL
- GRASS SWALE

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



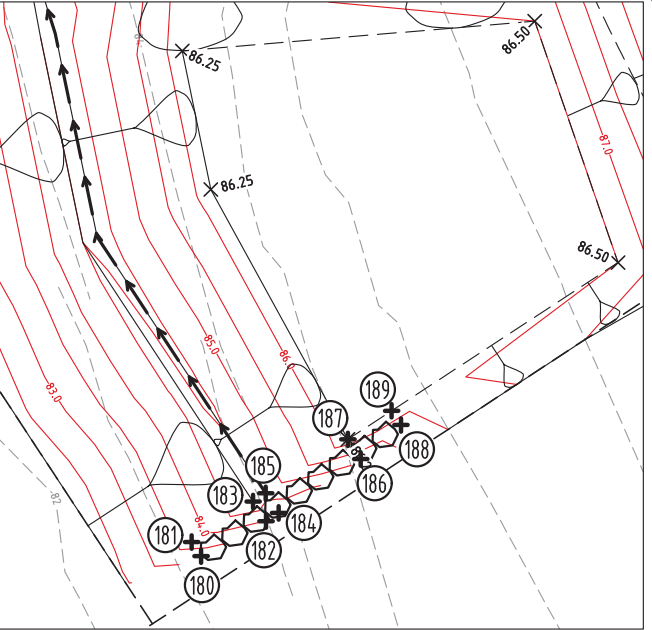
**PERFORMANCE REQUIREMENTS FOR RETAINING WALLS**  
THE CONTRACTOR IS TO PROVIDE CERTIFICATION, FROM AN APPROVED STRUCTURAL/GEOTECHNICAL ENGINEER FOLLOWING COMPLETION OF THE RETAINING WALL CONSTRUCTION, THAT THE WALLS ARE STRUCTURALLY ADEQUATE FOR ALL RELEVANT LOADING CONDITIONS (INCLUDING GCCC REQUIREMENTS & 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 GEOTEXTILE 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).

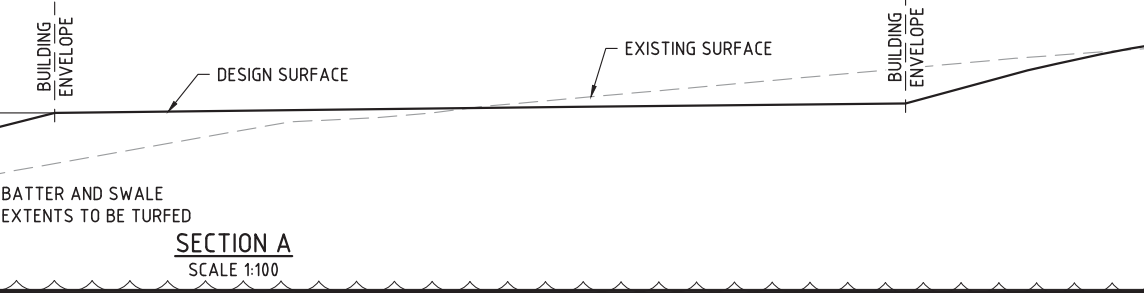


**ROCK BOULDER WALL SETOUT TABLE**

PT No.	EASTING	NORTHING	LEVEL
180	491952.308	6929653.541	83.233
181	491951.684	6929654.477	83.733
182	491956.603	6929655.855	83.987
183	491955.751	6929657.150	84.950
184	491957.440	6929656.402	84.120
185	491956.588	6929657.697	84.700
186	491962.873	6929659.967	85.163
187	491962.023	6929661.263	86.250
188	491965.532	6929662.216	85.790
189	491964.914	6929663.156	86.290



**EARTHWORKS CONTOUR PLAN**  
SCALE 1:500



DO NOT SCALE THIS DRAWING IF IN DOUBT - ASK!



**REVISIONS**

No	Description	Date	By
A	ISSUED FOR APPROVAL	27.11.19	DES
B	REVISED DETAILS	14.02.20	DES

Associated Consultants  
  
Client



Project  
**SPRING MOUNTAIN**  
ACREAGE ESTATE  
STAGE 18A



Approved  
*M. Shaw*  
Mark Andrew Shaw BEng (Civil), MIEAust, RPEQ 17544  
2020.02.17 14:31:57 +10'00'

Drawing Title  
**EARTHWORKS CONTOUR PLAN SHEET 3**

Drawn	Designed	Checked	Date
DES	JB	GG	JUN 19

Scale: AS SHOWN  
Sheet: 09 of 36  
Drawing No: 18-200-09  
Revision: B

M:\2018\18200\_Spring Mountain Stage 18A\Engineering\Acad\18-200-07\_09-EW-CONTOUR.dwg Plotted by: DS on 17/02/2020 1:48:19 PM