

MOLONEY & SONSTM

ENGINEERING



A & J JOHNSON

ENGINEERING REPORT

61 BUTLER RD, BOULDERCOMBE Q

7 June 2018

RP/001.CE18014-Rev B

Contract No. CE18014 - 1 into 4 Lot Subdivision – Engineering Report

ROCKHAMPTON REGIONAL COUNCIL

APPROVED PLANS

These plans are approved subject to the current conditions of approval associated with

Development Permit No.: D/20-2018

Dated: 5 July 2018

A/ PO BOX 3203 RED HILL ROCKHAMPTON Q4701
MOLONEY & SONS
ABN: 39 133 970 689



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Moloney & Sons Engineering™
Po Box 3203
ROCKHAMPTON QLD 4701
Ph: +614 88 434 954
2018

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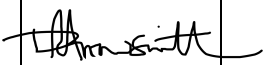
Issue	Date	Issue Description	Author	Checked	Approved
A		Issued for Approval	LM	DA	DA RPEQ 07637
B	08/06/18	Issued for Approval	LM	DA	DA  RPEQ 07637



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INTRODUCTION

Moloney & Sons Engineering has been engaged to prepare the following Engineering Report on behalf of A & J Johnson in care of Vision Surveys, in support of the pending approval for 1 into 4 Lot Reconfigure of a Lot (ROL) at 61 Butler Rd, Bouldercombe Q. In order to specifically address the requested further information items from Rockhampton Regional Council (RRC) in their recent RFI dated 16 March 2018.

The total area of the site is approximately 4 hectares and currently exists as a rural residential property.

The existing site conditions are detailed on drawing 18072-PP-01 included as APPENDIX A.

This report will include the address of the stormwater overland flow path impacts and engineering access (Lot 4) assessment of the proposed development, including clarification of the specific requests outlined in the RFI from RRC.

SITE CHARACTERISTICS

The proposed development is located on the western side of the Burnett Highway, at 61 Butler Rd within the Bouldercombe township community. Figure 1 below shows the location of the proposed development.

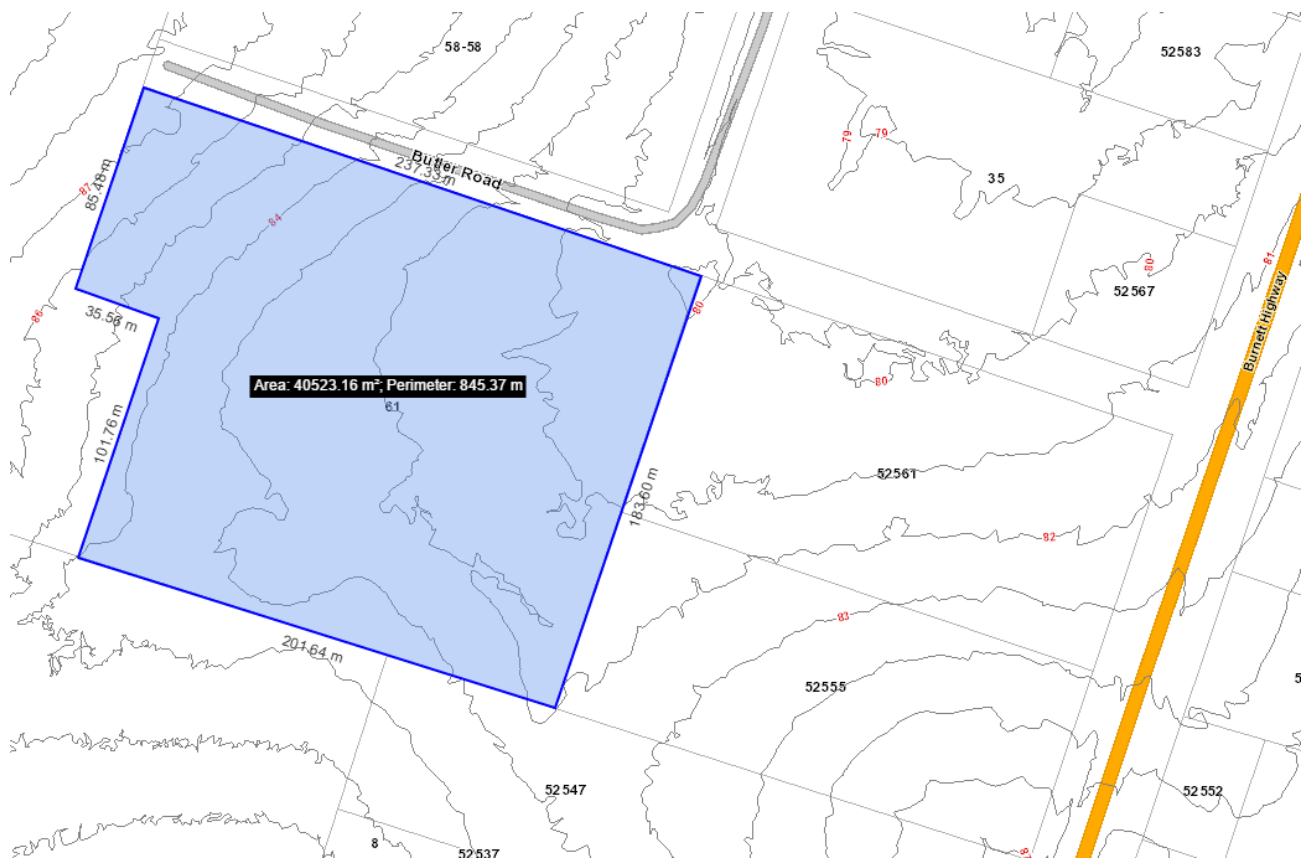


Figure 1 Development Location



The existing allotment of 1 MPH32072, consists of approximately 4ha of rural residential land, including one existing dwelling with farm sheds, yard and storage space.

TERRAIN

The general terrain for the property is sloping down from the Southwest property corner to the Northeast property boundary/corner. The level difference between the two corners is approximately 4m. Overland flows and stormwater discharge would generally concentrate to the Northeast property corner.

STORMWATER MANAGEMENT METHODOLOGY

1.1. Introduction/Background

Rockhampton Regional Council previously issued an Information Request in response to a development application for Reconfiguration of Lot on the subject site. This report has been prepared to respond to Item 1.0 & 2.0 of the Information Request.

A direct response to Item 1.0 is presented below:

1.0 Engineering Requirements

- 1.1. Please Provide an overland flow path assessment report for the subject land prepared and certified by a Registered Professional Engineer of Queensland that as a minimum includes:
 - 1.1.1. Identification of catchments of these flow paths;
 - 1.1.2. An assessment of the peak discharge of a one percent (1%) Annual Exceedance Probability defined flood event;
 - 1.1.3. Identification of all areas of the subject land to be provided as dedications/easements in favour of Council for the purpose of conveyance of the one percent (1%) Annual Exceedance Probability defined flood event. These dedication/easement areas as must be detailed on a suitably scaled and adequately dimensioned conceptual layout plan; and
 - 1.1.4. Details of all calculations, assumptions and data files (where applicable).

Response:

Refer the following assessment

The developments stormwater drainage system will be designed to comply with QUDM & CMDG stormwater code guidelines.



1.2. Site Characteristics

As previously mentioned the total area of the subject site is approximately 1.012 hectares and currently exists as a sizeable single residential dwelling, with shed & impervious internal driveways.

The site currently grades from approximately RL 64.5m AHD in the south-east of the property to approximately RL 58.5m AHD in the north-west corner.

1.3. Hydrological Methodology

The existing site, 61 Butler Rd, forms part of a catchment that encompasses proportions of neighboring external upstream properties; Lot 1 MPH4101, Lot 2 MPH31939, Lot 3 MPH616960, Lot 1 & 2 MPH4015, 133 & 115 Government Rd.

In assessing the hydrological conditions, this report will consider and assume that:

- » The existing external contributing portions of the catchment will be all considered as the like fraction impervious categories for Rural Residential land, with and adopted factor of 0.10;
- » The subject property (61 Butler Rd) will accept run-off from the external contributories from within and manage through sites proposed internal overland stormwater conveyance strategy;
- » There will be no change from the catchments pre-developed to post-developed condition in fraction impervious, i.e. run-off coefficient. As the purpose of the analysis is to determine the required location for the catchments overland conveyance;

In support of this application, this report will further investigate the stormwater management requirements by the use of the rational method in accordance with the Queensland Urban Drainage Manual.



1.4. Existing Rural Catchment Characteristics

1.4.1. Catchment A:

The catchment area, which currently drains into and across 61 Butler Rd, is approximately 24.7 hectares.

The Minor Design Storm Event has been designed to cater for the 2year ARI storm event, whilst the Major Design Storm Event is the 100 year ARI, as per RRC's CMDG Stormwater Management Guideline Table D5.04.2.

The existing sites catchment grades at approximately 2% along its flow path, based upon an equal-area slope.

For establishing the estimated generated stormwater run-off for fully developed scenario of Catchment A, the time of concentration in accordance with QUDM's Section 4.1 for Rural Catchments, adopting Bransby-Williams formula was calculated to be 67 minutes.

Rainfall Intensities, for the Bouldercombe QLD, were sourced from the Australia Bureau of Meteorology IFD Rainfall System;

- » Minor Storm Event (2 year ARI) 42.6mm/hr; &
- » Major Storm Event (100 year ARI) 101mm/hr.

In accordance with Tables 4.5.1 to 4.5.4 of QUDM, the existing runoff coefficient (C_{10}) of 0.59. Based upon the above calculations, the following flow rates generated by the upstream catchment were as follows:

- » Minor Storm Event (2 year ARI) 1.46 m³/sec, &
- » Major Storm Event (100 year ARI) 4.90 m³/sec.

1.4.2. Catchment B:

Whilst there is a remainder of the subject property which still contributes to a portion of Catchment B. This catchments flow remains as un-concentrated overland sheet flow, which ultimately contributes and flows to Stream C which flows north to the culverts beneath Butler Rd, 160m west of the Burnett Highway.

As Stream B does not fall within the subject property and there is no concentrated flow path from this catchments generated run-off, all easements will reside with the analysis of Catchment A only.

1.5. Hydrodynamic Modelling

1.5.1. Model Analysis

A River & Flood Analysis was developed for the subject shallow concentrated flow path based on the Autodesk Module which utilizes the HECRAS 5.0 programming, in order to determine the extent of inundation across the site. The model was based on shape file format 0.25cm tiles from Rockhampton Regional Councils GIS Data handling resources.

The discharges presented in the above Section 1.4.1 were input into the model, with Manning's values used throughout the model are presented in APPENDIX C. The existing inundation plots show the 100yr & 2yr ARI events, presented further in APPENDIX A (Plans CE18014-002 & CE18014-003).



1.5.2. Summary & Analysis Results

As per Item 1.1.3 of the RFI by RRC, the proposed 1 into 4 Lot subdivision will require that there be a dedicated easement drawn to encompass the full extent of the 1% ARI event.

It has been adopted at the request of the property owner, that the dedicated easement in favour of RRC be drawn over the existing 1% ARI flood event extent demonstrated on drawing CE18014-003. Therefore, from this impact plot it can be confirmed that the shallow 1% ARI flood event can be conveyed within the easement defined in APPENDIX D (18072-PP-01 Rev B by Vision Surveys), as per Item 1.1 of the RRC RFI.

By incorporating the recommendations of this report into the proposed design, Moloney & Sons can confirm the 1% ARI storm event will be completely incorporated within the proposed drainage easement, safeguarding against any potential actionable damage and/or adverse effect caused to effected properties by the proposed subdivision.



ACCESS ASSESSMENT – LOT 4

As part of previously issued Information Request from Rockhampton Regional Council, the below will address the issue raised as part of Item 1.2

A direct response to Item 1.2 is presented below:

1.0 Engineering Requirements

- 1.2 Provide an Engineering assessment to demonstrate that any future development on proposed Lot 4, complies with the Capricorn Municipal Development Guidelines requirements and particularly regarding sight distance in accordance with Austroad recommendations.

Response:

The proposed development currently fronts Butler Rd, along its complete northern boundary. Butler Rd is considered classified as an Access Place/Street, currently servicing five (5) separate dwellings. Butler Rd's profile consists of an approx. 4m unsealed graveled road with no formed table drains for the frontage of the development and a road corridor of 20m.

No posted speed signage is recorded on site for the full length of the Butler Rd, however a Design Speed of 40km/h has been adopted for the purposes of this study.

In accordance with Austroads Part 4A (*Unsignalised & Signalised Intersections*) the Safe Intersection Sight Distance will be adopted as 75m, rounding to the nearest 5m from the calculated 73.3m.

Adoptions:

- A coefficient of deceleration of 0.26 has been adopted, to accommodate braking on an unsealed surface in accordance with Austroads Part 3 (*Geometric Road Design*) Table 5.3;
- CMDG Design Specifications outline a max design speed of 30km/hr for an Access Place & 40km/hr for an Access Street, 40km/hr has been adopted for the purpose of this study considering the road environment & local use;
- Driver Reaction Time of 1.5s has been adopted considered the alert use being a private access, low speed & traffic environment and rural character of use, in accordance with Austroads Part 3 (*Geometric Road Design*) Table 5.2;

Equation 1 Austroads Part 4A Section 3.2.2 SISD Formula

$$SISD = \frac{D_r \times V}{3.6} + \frac{V^2}{254 \times (d + 0.01 \times a)}$$

Table 1 Safe Intersection Sight Distance (SISD)

Safe Intersection Sight Distance		
Speed (V)	40	km/hr
reaction time (RT)	1.5	seconds
observation time	3	seconds
DT	4.50	seconds
Decel Coefficient (d)	0.27	
Longitudinal grade (a)	0	



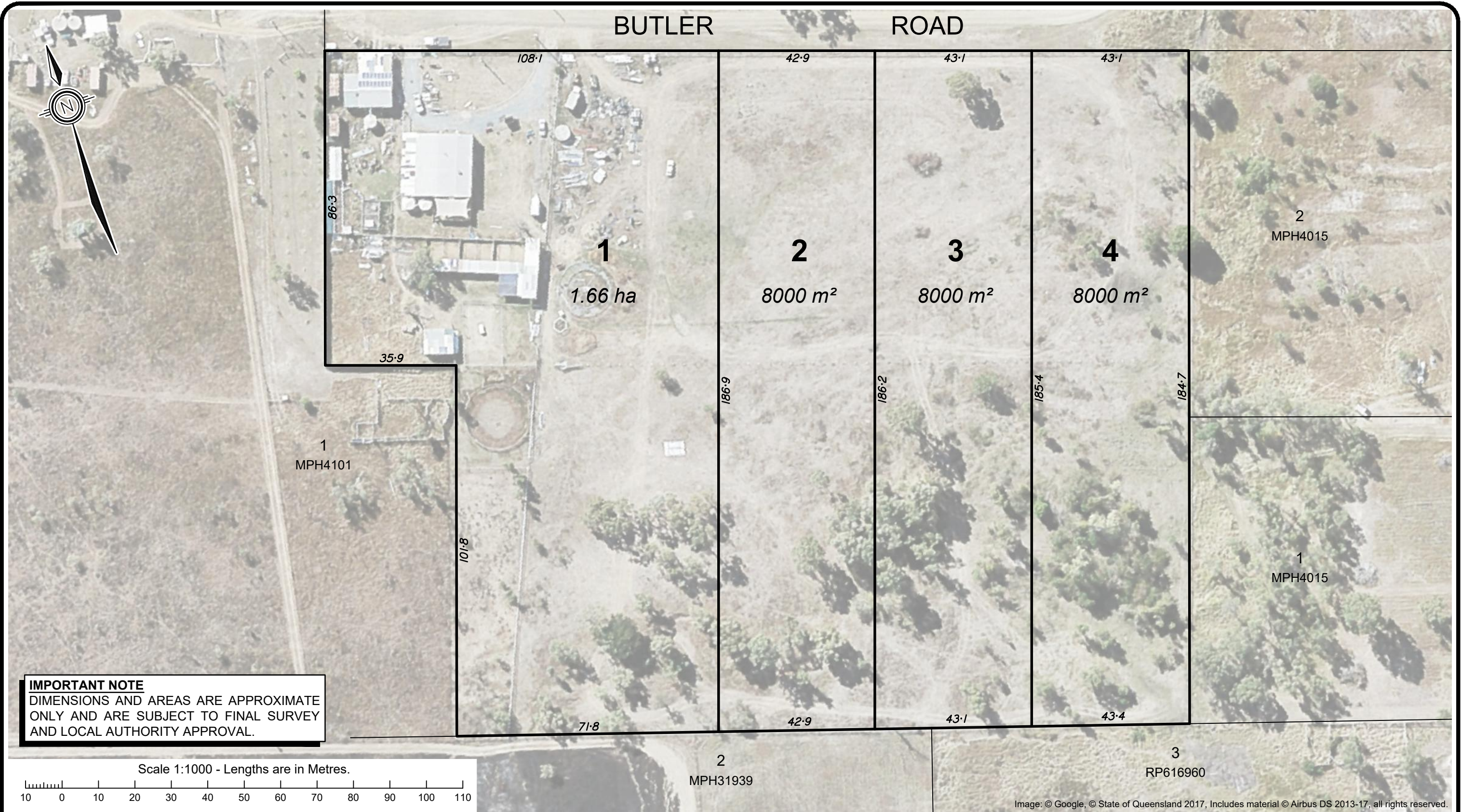
SISD	73.33	m
Eye Height (h1)	1.1	m
Object height (h2)	1.25	m

Please refer to APPENDIX B (CE18014-004) for illustration of the suitable driveway access location in accordance with the abovementioned SISD parameters.

We thank you for your assistance with this application & hope the above and enclosed is satisfactory. If you should have any questions at all, please do not hesitate to contact our office and speak with either Lloyd Moloney or Derek Arrowsmith.




APPENDIX A — 18072-PP-01 REV A by Vision Surveys



A	Original Issue	AD	LT	22/02/2018
Rev	Description	Drawn	Checked	Date
This plan was prepared as a proposed subdivision and should not be used for any other purpose. The dimensions, areas and total number of lots shown hereon are subject to field survey and also to the requirements of Council and any other authority which may have requirements under any relevant legislation. In particular, no reliance should be placed on the information on this plan for any financial dealing involving the land. This note is an integral part of the plan.				

PROPOSAL PLAN	
PROJECT: Proposed Subdivision - One (1) Lot Into Four (4) Lots	
LOCATION: 61 Butler Road, Bouldercombe	
Real Property Description: Lot 1 on MPH32072	
CLIENT: Andrew and Julie Johnson	
Horiz. Datum: MGA 94 Zone 56	
Vert. Datum: N/A	
Local Authority: Rockhampton Regional	Contour Interval: N/A



Airlie Beach | Mackay | Townsville | Rockhampton | Brisbane | Gold Coast
E : admin@visionsurveysqld.com.au P : 13000VISION

Scale: 1 : 1000 @ A3	Drawing No: 18072-PP-01
Drawn: AD	Sheet: 1 of 1
Surveyor: N/A	Revision: A



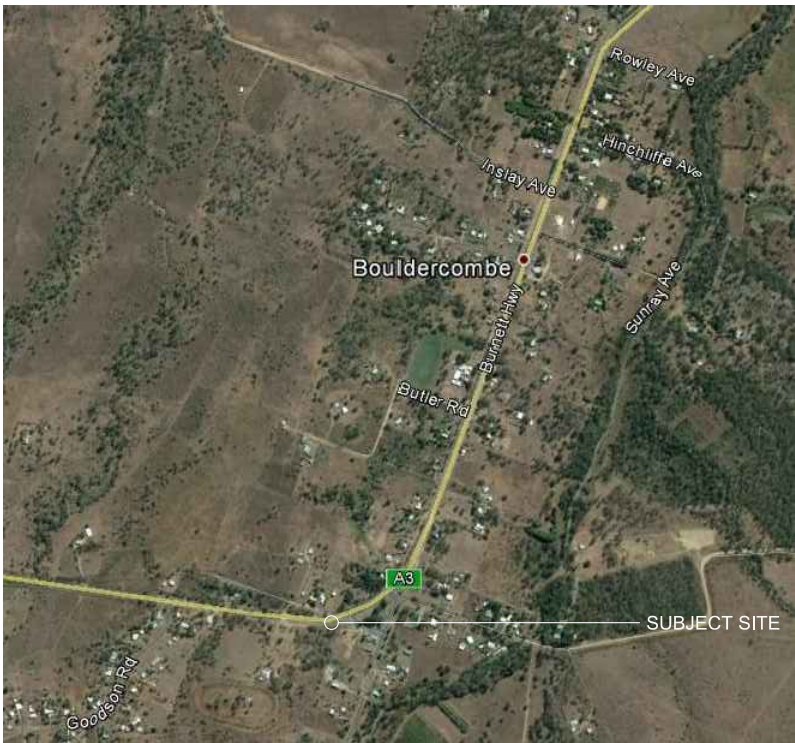
APPENDIX B — CE18014 Engineering Drawings



A & J JOHNSON

1 INTO 4 LOT SUBDIVISION - LOT 1 MPH32072

61 BUTLER RD - BOULDERCOMBE - QLD



SUBJECT SITE
NOT SCALE

BOULDRECOMBE

DESIGN FILE No: CE18014
DESIGN STANDARD: AR&R / QUDM DESIGN GUIDELINES

GENERAL

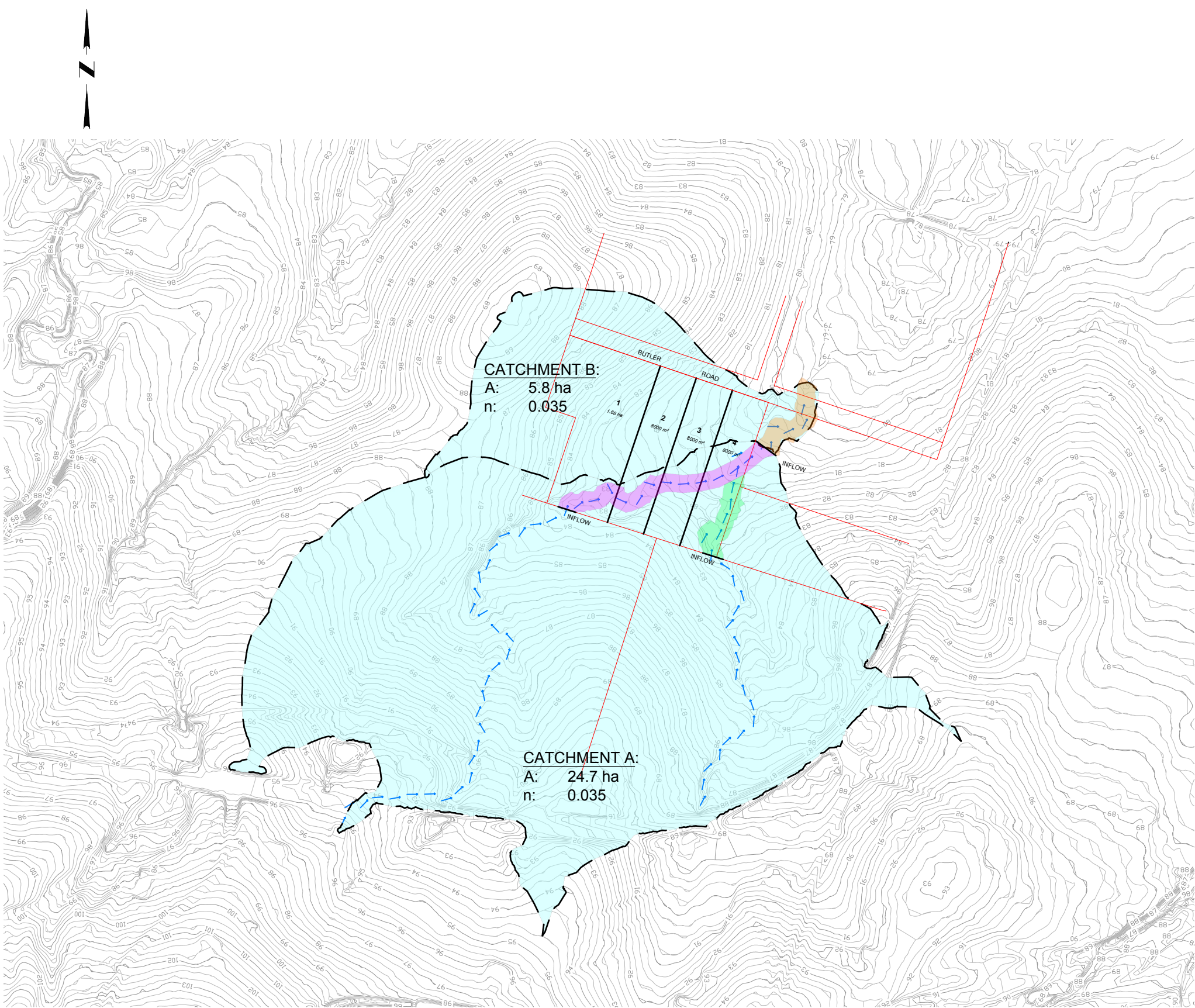
1. THESE DRAWINGS SHALL BE READ IN CONJUNCTION WITH ALL OTHER CONSULTANTS DRAWINGS AND SPECIFICATIONS.
2. BEFORE PROCEEDING WITH THE WORK ANY DISCREPANCIES IN THE CONTRACT DOCUMENTS SHALL BE REFERRED FOR DECISION TO THE ENGINEER.
3. DO NOT SCALE FROM DRAWINGS.
4. CONTRACTOR SHALL VERIFY ALL LOCATIONS OF SERVICES, ALL DIMENSIONS AND LEVELS PRIOR TO CONSTRUCTION, AS SERVICES SHOWN ARE DERIVED FROM GIS SPATIAL DATA RECORDS.
5. ALL MATERIALS/CONSTRUCTION & WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE SPECIFICATIONS AND THE LOCAL AUTHORITY'S STANDARD DRAWINGS AND BY-LAWS.
6. THE CONTRACTOR IS RESPONSIBLE TO OBTAIN ALL RELEVANT APPROVALS PRIOR TO COMMENCEMENT OF WORKS.
7. CONSTRUCTION TO BE IN ACCORDANCE WITH AUS-SPEC AND RRC CONSTRUCTION SPECIFICATIONS SPECIFIED.
8. UNDERGROUND SERVICE LOCATIONS SHOWN ON THIS PLAN HAVE BEEN DETERMINED BY FIELD SURVEY AND/OR GIS OFFICE RECORDS, AND MAY NOT REPRESENT ALL SERVICES OR EXACT LOCATIONS. THE CONTRACTOR MUST ACCURATELY LOCATE AND DEPTH ALL SERVICES LIKELY TO BE ENCOUNTERED DURING CONSTRUCTION, PRIOR TO COMMENCING ANY EXCAVATION WORKS.

DETAIL SURVEY BY:
CONTOUR DATA PROVIDED BY RRC GIS DATA SERVICES
SURVEY: MGA94 ZONE 56
STANDARD DRAWINGS:
CMDG STANDARD DESIGN DRAWINGS & GUIDELINES /
QUDM / AR&R GUIDELINES / INSTITUTE OF PUBLIC
WORKS ENGINEERING AUSTRALIA (IPWEA)

DRAWING SCHEDULE

DRAWING No.	DESCRIPTION
CE18014-001	COVERSHEET
CE18014-002	EXISTING SITE LAYOUT PRE-DEVELOPED CATCHINGS
CE18014-003	EXISTING SITE LAYOUT GENERAL ARRANGEMENT
CE18014-004	LOT 4 SITE ACCESS

FIRST ISSUE	DESIGN	DRAWN	DATE	AMENDMENT DETAILS	DESIGN CHECK	SCALE	IF IN DOUBT - ASK!	ISSUE FOR APPROVAL	CLIENT	PROJECT	P.O. Box 3203 RED HILL ROCKHAMPTON, Q 4701 Telephone: (+614) 88 434 954 E-Mail: info@moloneyandsons.com.au	MOLONEY & SONS TM ENGINEERING EXCELLENCE - INTEGRITY - INNOVATION ROCKHAMPTON • GLADSTONE • ROMA • MILES • CHINCHILLA • BRISBANE GOLD COAST • COFFS HARBOUR • SYDNEY	DRAWING TITLE	DRAWING NUMBER	ISSUE
A	PJ	JO	17/05/18	ISSUED FOR APPROVAL	LM				A & J JOHNSON	1 INTO 4 LOT SUBDIVISION 61 BUTLER RD BOULDERCOMBE - QLD			COVERSHEET		
B	PJ	JO	07/06/18	ISSUED FOR RFI RESPONSE	JO	DO NOT SCALE PHYSICALLY OR ELECTRONICALLY	CE18014	DEREK ARROWSMITH RPEQ 07637 FOR & ON BEHALF OF MOLONEY & SONS ENGINEERING						CE18014-001	B



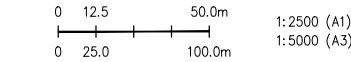
LEGEND


- Existing Lot Boundary
- Proposed Lot Boundary
- Existing Flow Path
- Catchment Boundary
- Stream A
- Stream B
- Stream C
- Existing Surface Contours

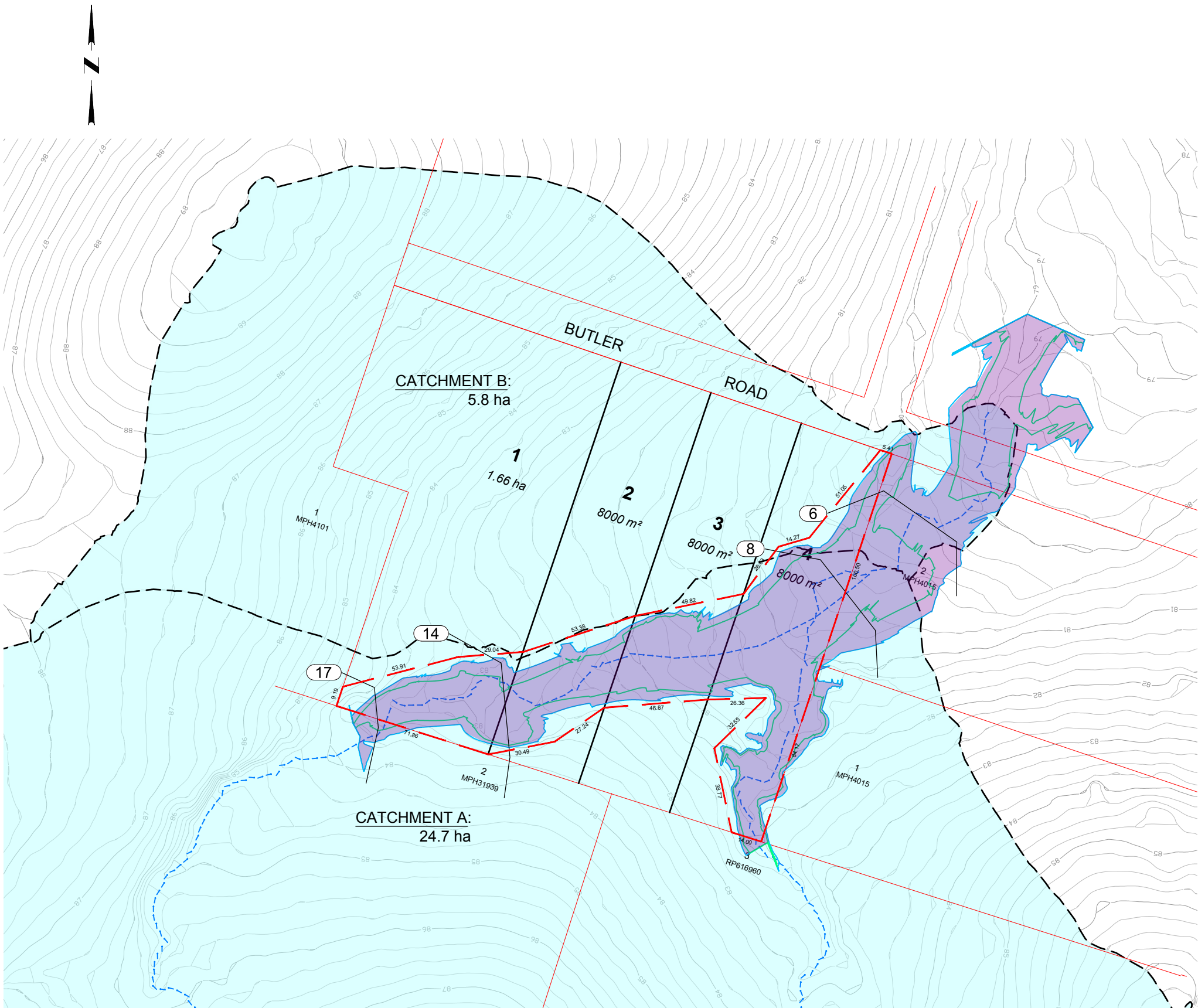
CONTRIBUTORY CATCHMENT PARAMETERS:

CATCHMENT A:	
AREA:	24.7 ha
FRACTION IMP, f:	0.1
ToC:	67 min
1% AEP INTENSITY:	101 mm/h
0.393% AEP INTENSITY:	42.6 mm/h
C10:	0.590
1.0% AEP PEAK FLOW:	4.907 m ³ /s
0.393% AEP PEAK FLOW:	1.466 m ³ /s

PLAN LAYOUT
SCALE 1:5000



FIRST ISSUE	DESIGN	DRAWN	DATE	AMENDMENT DETAILS		DESIGN CHECK	SCALE	IF IN DOUBT - ASK!	ISSUE FOR APPROVAL	CLIENT A & J JOHNSON	PROJECT 1 INTO 4 LOT SUBDIVISION 61 BUTLER RD BOULDERCOMBE - QLD	<div><div><div>MOLONEY & SONS™</div><div>ENGINEERING</div><div>EXCELLENCE - INTEGRITY - INNOVATION</div></div><div>P.O. Box 3203 RED HILL ROCKHAMPTON, Q. 4701</div><div>Telephone: (+614) 88 434 954 E-Mail: info@moloneyandsons.com.au</div></div>	DRAWING TITLE EXISTING SITE LAYOUT PRE-DEVELOPMENT CATCHINGS		DRAWING NUMBER	ISSUE					
	A	PJ	JO	17/05/18	ISSUED FOR APPROVAL								LM	DO NOT SCALE PHYSICALLY OR ELECTRONICALLY	RMS REGISTRATION No. CE18014	APPROVED DEREK ARROWSMITH RPEQ 07637	FOR & ON BEHALF OF MOLONEY & SONS ENGINEERING			CE18014-002	B
	B	PJ	JO	07/06/18	ISSUED FOR RFI RESPONSE																
						DRAWN CHECK															
						JO															



PLAN LAYOUT
SCALE 1:2000

LEGEND

- Existing Lot Boundary
- Proposed Lot Boundary
- Existing Flow Path
- Q₁₀₀ Extents
- Q₂ Extents
- Proposed Drainage Easement
- Catchment Boundary
- Existing Q₁₀₀ Flood Extents
- Existing Surface Contours

Profile: Q100 Flow Discharge = 4.91 cms
Computed Water Surface = 80.29 m

Profile: Q2 Flow Discharge = 1.47 cms
Computed Water Surface = 80.15 m

SECTION #6

Profile: Q100 Flow Discharge = 4.91 cms
Computed Water Surface = 80.83 m

Profile: Q2 Flow Discharge = 1.47 cms
Computed Water Surface = 80.74 m

SECTION #8

Profile: Q100 Flow Discharge = 4.91 cms
Computed Water Surface = 83.10 m

Profile: Q2 Flow Discharge = 1.47 cms
Computed Water Surface = 82.98 m

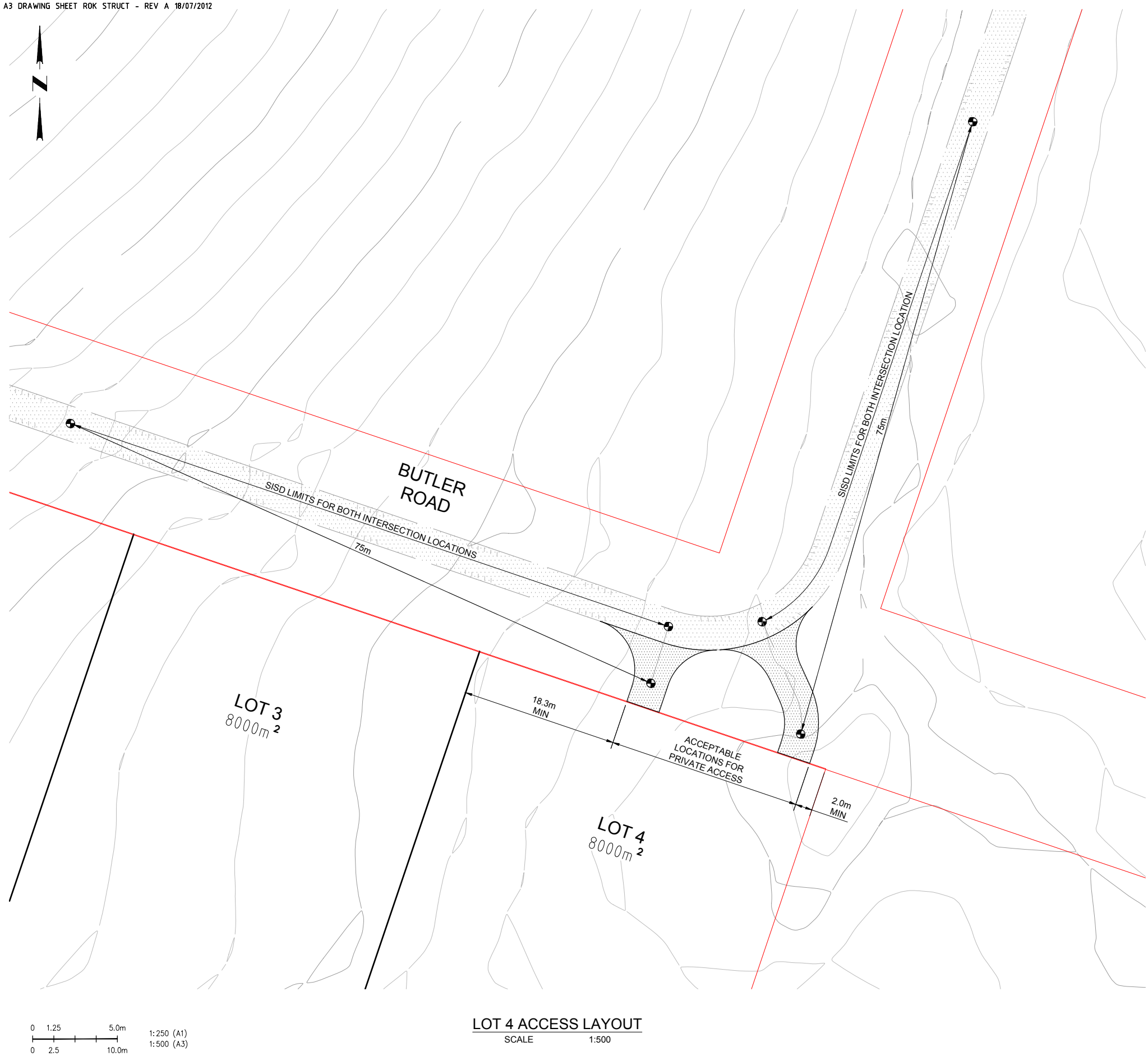
SECTION #14

Profile: Q100 Flow Discharge = 4.91 cms
Computed Water Surface = 83.75 m

Profile: Q2 Flow Discharge = 1.47 cms
Computed Water Surface = 83.62 m

SECTION #17

FIRST ISSUE				AMENDMENT DETAILS				DESIGN CHECK	SCALE				IF IN DOUBT - ASK!		ISSUE FOR APPROVAL		CLIENT	PROJECT				DRAWING TITLE		DRAWING NUMBER		ISSUE
DESIGN	DESIGN	DATE																								
PJ	JO	17/05/18																								
A	PJ	JO	17/05/18	ISSUED FOR APPROVAL				LM									A & J JOHNSON				EXISTING SITE LAYOUT GENERAL ARRANGEMENT					
B	PJ	JO	25/05/18	ADDED PROPOSED DRAINAGE EASEMENT																						
C	PJ	JO	07/06/18	ISSUED FOR RFI RESPONSE																						




LEGEND

- Existing Lot Boundary
- Proposed Lot Boundary
- Existing Flow Path
- Existing Gravel Road
- Proposed Gravel Driveway
- Existing Surface Contours

GENERAL NOTES

- ANY NEW PRIVATE ACCESSSES TO BE CONSTRUCTED IN ACCORDANCE WITH CMDG STD DRG CMDG-R-040.
- THESE DRAWINGS SHALL BE READ IN CONJUNCTION WITH ALL OTHER CONSULTANTS DRAWINGS AND SPECIFICATIONS.
- BEFORE PROCEEDING WITH THE WORK ANY DISCREPANCIES IN THE CONTRACT DOCUMENTS SHALL BE REFERRED FOR DECISION TO THE ENGINEER.
- DO NOT SCALE FROM DRAWINGS.
- CONTRACTOR SHALL VERIFY ALL LOCATIONS OF SERVICES, ALL DIMENSIONS AND LEVELS PRIOR TO CONSTRUCTION.
- ALL MATERIALS/CONSTRUCTION & WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE SPECIFICATIONS AND THE LOCAL AUTHORITY'S STANDARD DRAWINGS AND BY-LAWS.
- THE CONTRACTOR IS RESPONSIBLE TO OBTAIN ALL RELEVANT APPROVALS PRIOR TO COMMENCEMENT OF WORKS.

LOT 4 ACCESS LAYOUT
SCALE 1:500

FIRST ISSUE				AMENDMENT DETAILS		DESIGN CHECK	SCALE		IF IN DOUBT - ASK!		ISSUE FOR APPROVAL		CLIENT	PROJECT		P.O. Box 3203 RED HILL ROCKHAMPTON, Q 4701 Telephone: (+614) 88 434 954 E-Mail: info@moloneyandsons.com.au		 MOLONEY & SONS™ ENGINEERING EXCELLENCE - INTEGRITY - INNOVATION ROCKHAMPTON • GLADSTONE • ROMA • MILES • CHINCHILLA • BRISBANE GOLD COAST • COFFS HARBOUR • SYDNEY		DRAWING TITLE	
A	PJ	JO	17/05/18	ISSUED FOR APPROVAL		LM							A & J JOHNSON	1 INTO 4 LOT SUBDIVISION 61 BUTLER RD BOULDERCOMBE - QLD						DEVELOPED SITE CONTOUR	
B	PJ	JO	07/06/18	ISSUED FOR RFI RESPONSE																	
AMENDMENTS						DRAWN CHECK			RMB REGISTRATION No.		APPROVED		DEREK ARROWSMITH RPEQ 07637								
						JO			CE18014		FOR & ON BEHALF OF MOLONEY & SONS ENGINEERING								DRAWING NUMBER		
																			CE18014-004		
																			ISSUE		
																			B		



APPENDIX C — Detailed Stormwater Calculations

Catchment A - (Pre-development)

	tc
	mins
	67
	0
Total	67 Adopted

Bransby-Williams $58.L/A^{0.1}Se^{0.2}$

L= **867** km
S= **2.1** %

RL 80.49
RL 94.261

Rainfall Intensity Table

Return period	1	2	5	10	20	50	100
67	38.4	42.6	56.6	66.5	76.4	89.9	101

Total Catchment Area **247019**
Area of Impervious **24701.9** m²

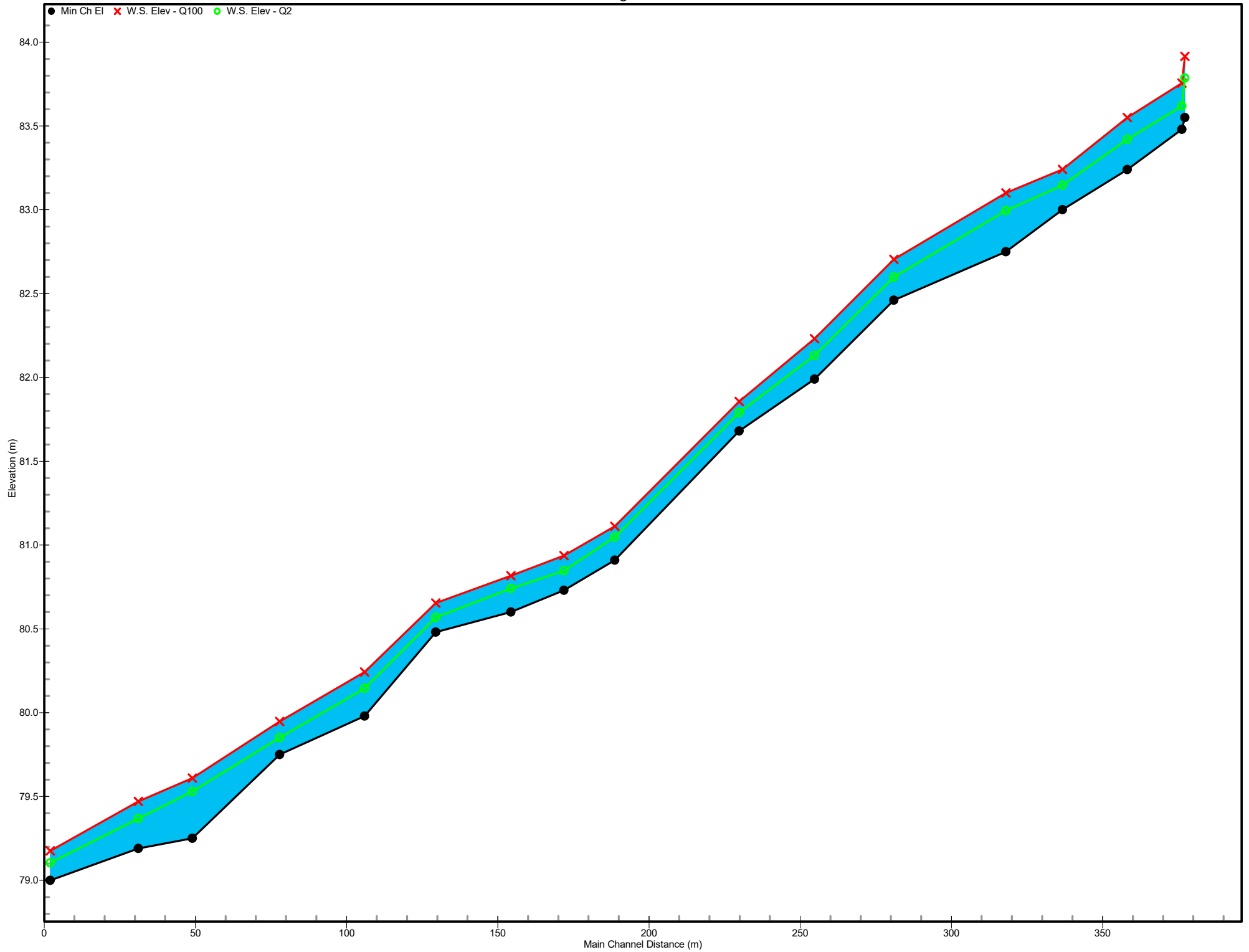
Q= F*C*I*A

	F	C	I	A	Q	Fy	Vol. generated
	factor	co eff	mm/hr	ha	m ³ /sec	factor	storm (m ³)
Q2	0.00278	0.502	42.60	24.7019	1.466	0.85	7809.7
Q5	0.00278	0.561	56.60	24.7019	2.177	0.95	11597.1
Q10 - Minor	0.00278	0.590	66.50	24.7019	2.692	1.00	14342.6
Q20	0.00278	0.620	76.40	24.7019	3.248	1.05	17301.8
Q50	0.00278	0.679	89.90	24.7019	4.185	1.15	22298.0
Q100 - Major	0.00278	0.708	101.00	24.7019	4.907	1.20	26140.3

C10 value **0.59**

fi value 0.10 QUDM Table 4.5.1 (Rural Residential)

Existing Scenario



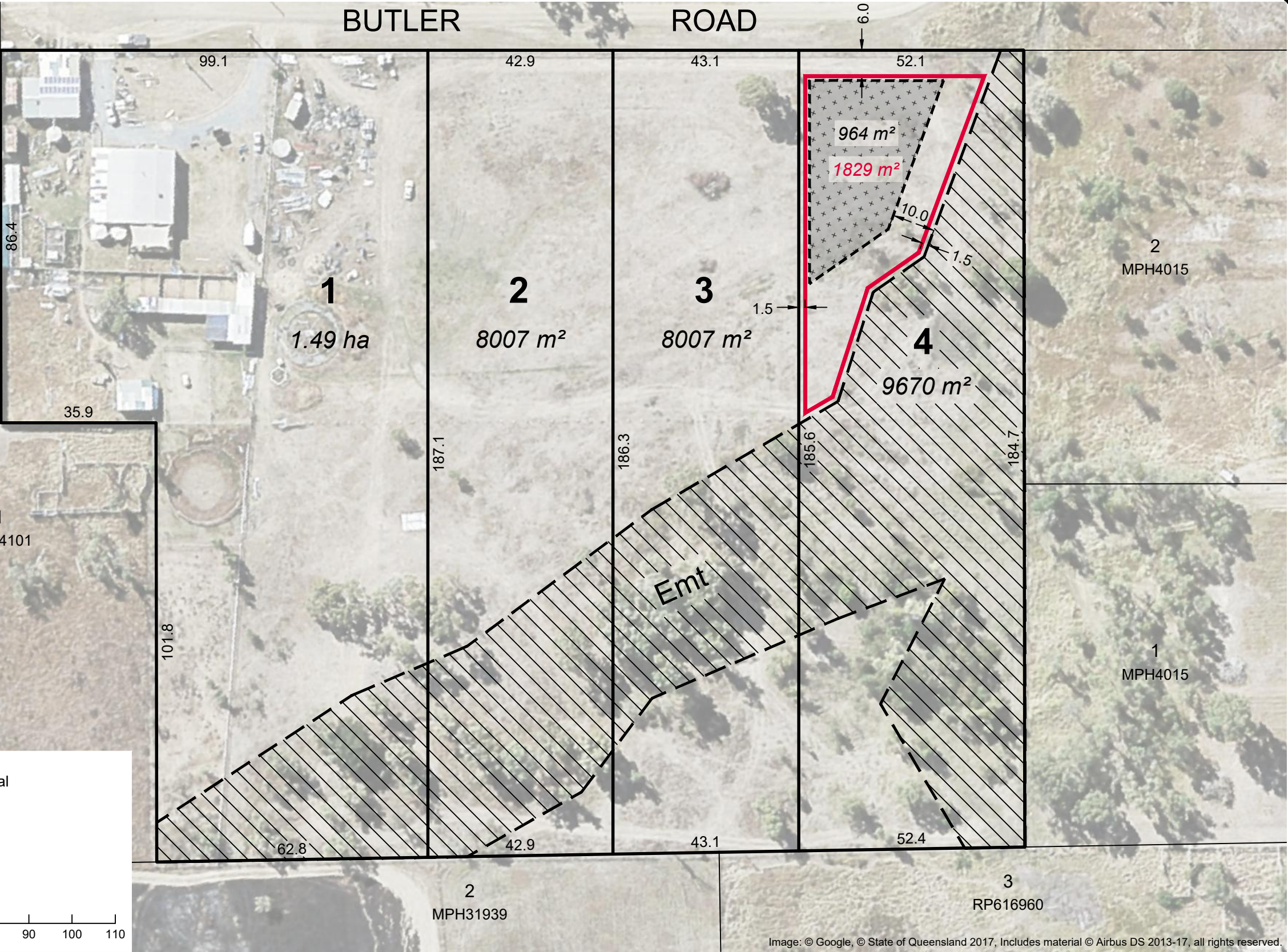
HEC-RAS Profile Output Table - Standard Table 1

River Station	Profile	Q Total (m³/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m²)	Top Width (m)	Froude # Chl
18	Q100	4.91	83.55	83.915	83.915	83.991	0.024449	1.22	4.02	28.07	1.03084
18	Q2	1.47	83.55	83.785	83.785	83.848	0.024316	1.11	1.33	10.66	1.00381
17	Q100	4.91	83.48	83.755	83.736	83.828	0.018007	1.20	4.11	23.56	0.91417
17	Q2	1.47	83.48	83.619	83.611	83.663	0.020961	0.93	1.57	14.68	0.90981
16	Q100	4.91	83.24	83.550	83.503	83.599	0.008936	1.01	5.15	26.06	0.67475
16	Q2	1.47	83.24	83.420		83.443	0.007626	0.67	2.25	18.09	0.57358
15	Q100	4.91	83.00	83.241	83.241	83.314	0.020951	1.20	4.18	29.81	0.96964
15	Q2	1.47	83.00	83.147	83.140	83.181	0.021798	0.82	1.80	21.08	0.89331
14	Q100	4.91	82.75	83.101		83.123	0.005013	0.66	7.50	42.79	0.48875
14	Q2	1.47	82.75	82.994		83.004	0.004975	0.45	3.29	31.52	0.44127
13	Q100	4.91	82.46	82.704	82.704	82.774	0.023155	1.17	4.22	32.59	0.99923
13	Q2	1.47	82.46	82.599	82.599	82.642	0.027122	0.92	1.60	18.46	0.99875
12	Q100	4.91	81.99	82.231		82.262	0.007704	0.80	6.36	37.84	0.60144
12	Q2	1.47	81.99	82.131		82.144	0.007120	0.52	2.90	30.37	0.52427
11	Q100	4.91	81.68	81.856		81.890	0.013726	0.92	6.06	51.70	0.77334
11	Q2	1.47	81.68	81.790		81.804	0.014063	0.61	2.78	46.68	0.70586
10	Q100	4.91	80.91	81.112	81.110	81.165	0.023455	1.01	4.87	45.44	0.96906
10	Q2	1.47	80.91	81.047	81.041	81.070	0.023504	0.67	2.18	36.06	0.87584
9	Q100	4.91	80.73	80.937		80.962	0.006874	0.70	7.11	49.54	0.55821
9	Q2	1.47	80.73	80.846		80.858	0.007718	0.47	3.12	38.32	0.52741
8	Q100	4.91	80.60	80.817		80.838	0.007077	0.69	7.79	63.57	0.56099
8	Q2	1.47	80.60	80.741		80.750	0.004713	0.44	3.49	38.33	0.43119
7	Q100	4.91	80.48	80.654	80.608	80.673	0.006459	0.65	8.33	69.59	0.53432
7	Q2	1.47	80.48	80.569		80.580	0.011189	0.49	3.11	52.58	0.61207
6	Q100	4.91	79.98	80.243	80.243	80.358	0.040767	1.37	3.29	25.23	1.28444
6	Q2	1.47	79.98	80.145	80.145	80.196	0.026048	1.06	1.48	14.77	1.01995
5	Q100	4.91	79.75	79.948		79.966	0.005273	0.64	8.30	55.83	0.49290
5	Q2	1.47	79.75	79.851		79.860	0.005212	0.43	3.63	42.41	0.44487
4	Q100	4.91	79.25	79.610		79.653	0.014224	0.96	5.58	47.46	0.79274
4	Q2	1.47	79.25	79.530	79.518	79.553	0.018965	0.67	2.26	36.18	0.80754
3	Q100	4.91	79.19	79.471	79.397	79.484	0.004529	0.48	9.79	74.62	0.43301
3	Q2	1.47	79.19	79.369	79.324	79.377	0.004697	0.45	3.78	44.81	0.43184
2	Q100	4.91	79.00	79.176	79.171	79.236	0.020016	1.09	4.61	35.83	0.93048
2	Q2	1.47	79.00	79.104	79.101	79.128	0.020010	0.68	2.16	32.69	0.82672



APPENDIX D — 18072-PP-01 REV B by Vision Surveys

IMPORTANT NOTE
DIMENSIONS AND AREAS ARE APPROXIMATE ONLY AND ARE SUBJECT TO FINAL SURVEY AND LOCAL AUTHORITY APPROVAL.



- Indicative Area Available for Effluent Disposal
- Indicative Area for a Building Envelope
- Proposed Drainage Easement

Scale 1:1000 - Lengths are in Metres.

10 0 10 20 30 40 50 60 70 80 90 100 110

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Rev	Description	Drawn	Checked	Date
B	Add proposed drainage easement	AD	AH	06/06/2018
A	Original Issue	AD	LT	22/02/2018

This plan was prepared as a proposed subdivision and should not be used for any other purpose. The dimensions, areas and total number of lots shown hereon are subject to field survey and also to the requirements of Council and any other authority which may have requirements under any relevant legislation. In particular, no reliance should be placed on the information on this plan for any financial dealing involving the land. This note is an integral part of the plan.

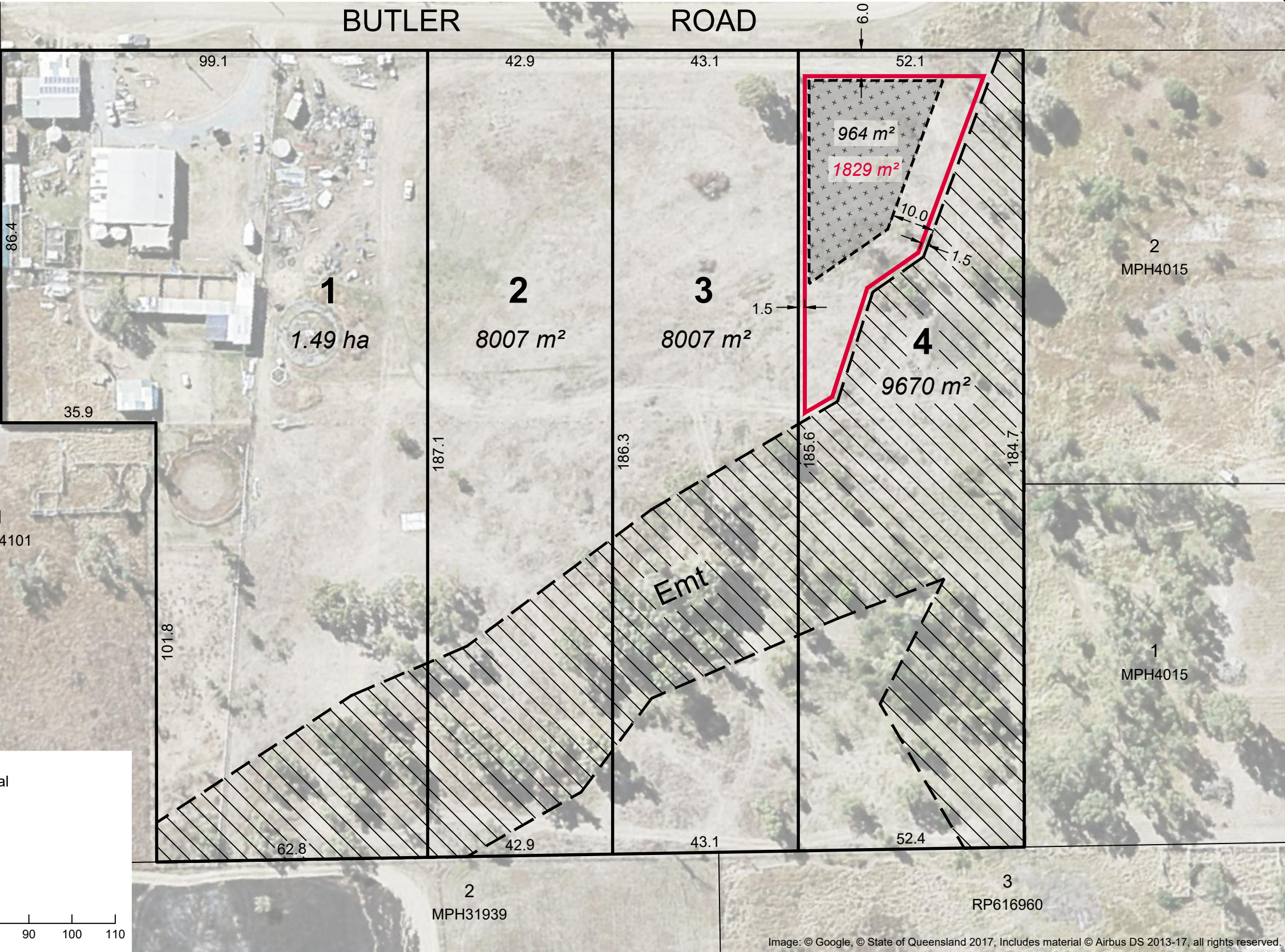
PROPOSAL PLAN	
PROJECT: Proposed Subdivision - One (1) Lot Into Four (4) Lots	
LOCATION: 61 Butler Road, Bouldercombe	
Real Property Description: Lot 1 on MPH32072	
CLIENT: Andrew and Julie Johnson	
Horiz. Datum: MGA 94 Zone 56	
Vert. Datum: N/A	
Local Authority: Rockhampton Regional	Contour Interval: N/A

Airlie Beach | Mackay | Townsville | Rockhampton | Brisbane | Gold Coast
E : admin@visionsurveysqld.com.au P : 13000VISION

Scale: 1 : 1000 @ A3	Drawing No: 18072-PP-01
Drawn: AD	Sheet: 1 of 1
Surveyor: N/A	Revision: B

Appendix B

IMPORTANT NOTE
DIMENSIONS AND AREAS ARE APPROXIMATE ONLY AND ARE SUBJECT TO FINAL SURVEY AND LOCAL AUTHORITY APPROVAL.



- Indicative Area Available for Effluent Disposal
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Scale 1:1000 - Lengths are in Metres.

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Horiz. Datum: MGA 94 Zone 56	
Vert. Datum: N/A	
Local Authority: Rockhampton Regional	Contour Interval: N/A

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Scale: 1 : 1000 @ A3	Drawing No: 18072-PP-01
Drawn: AD	Sheet: 1 of 1
Surveyor: N/A	Revision: B

IMPORTANT NOTE
DIMENSIONS AND AREAS ARE APPROXIMATE ONLY AND ARE SUBJECT TO FINAL SURVEY AND LOCAL AUTHORITY APPROVAL.



ROCKHAMPTON REGIONAL COUNCIL
APPROVED PLANS
These plans are approved subject to the current conditions of approval associated with **Development Permit No.: D/20-2018**
Dated: 5 July 2018

Indicative Area Available for Effluent Disposal

Indicative Area for a Building Envelope

Proposed Drainage Easement

Scale 1:1000 - Lengths are in Metres.

10

0

10

20

30

40

50

60

70

80

90

100

110

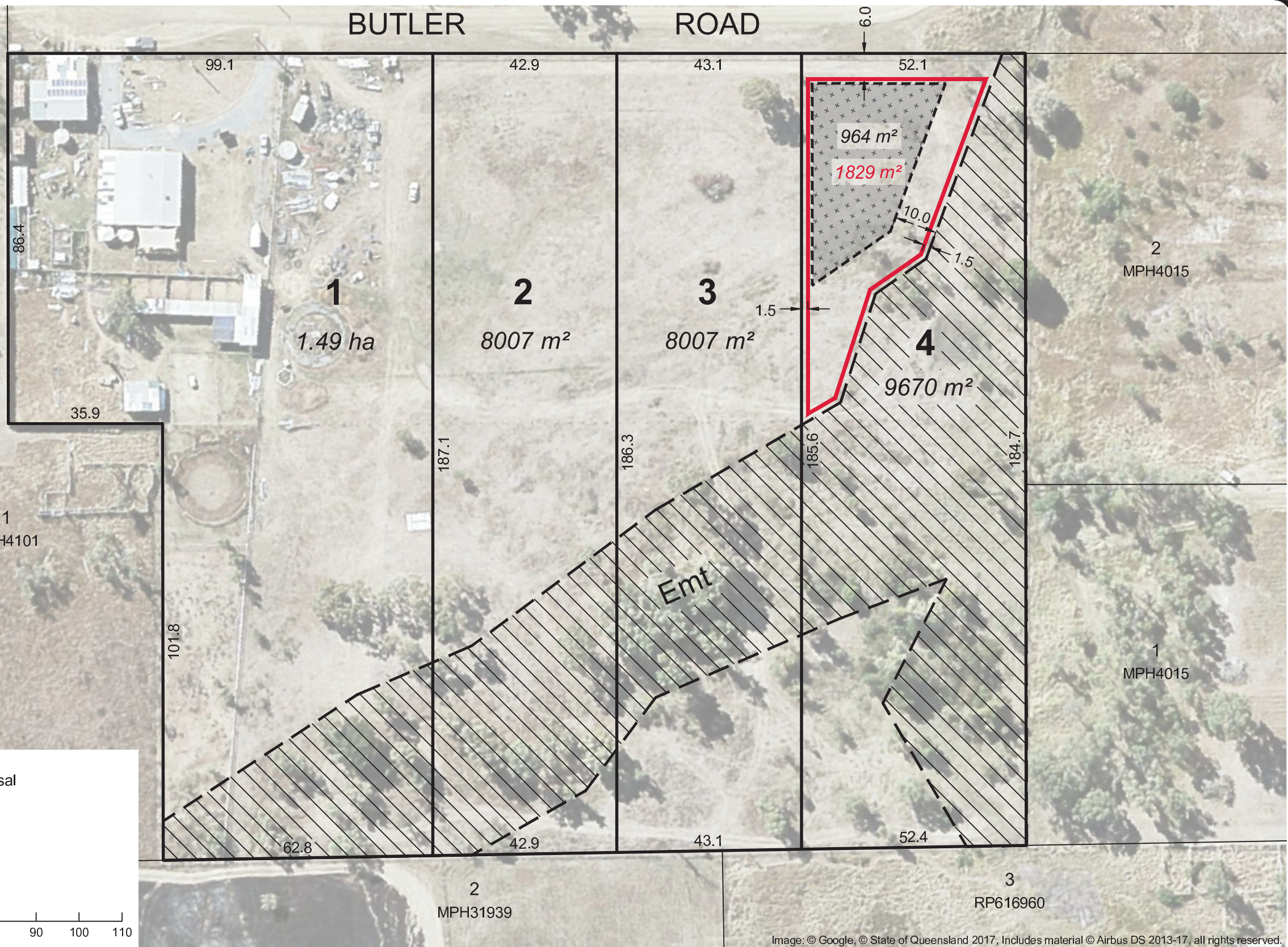


Image: © Google, © State of Queensland 2017, Includes material © Airbus DS 2013-17, all rights reserved.

B	Add proposed drainage easement	AD	AH	06/06/2018
A	Original Issue	AD	LT	22/02/2018
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Horiz. Datum: MGA 94 Zone 56	
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Local Authority: Rockhampton Regional	Contour Interval: N/A

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SURVEYS

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Scale: 1 : 1000 @ A3

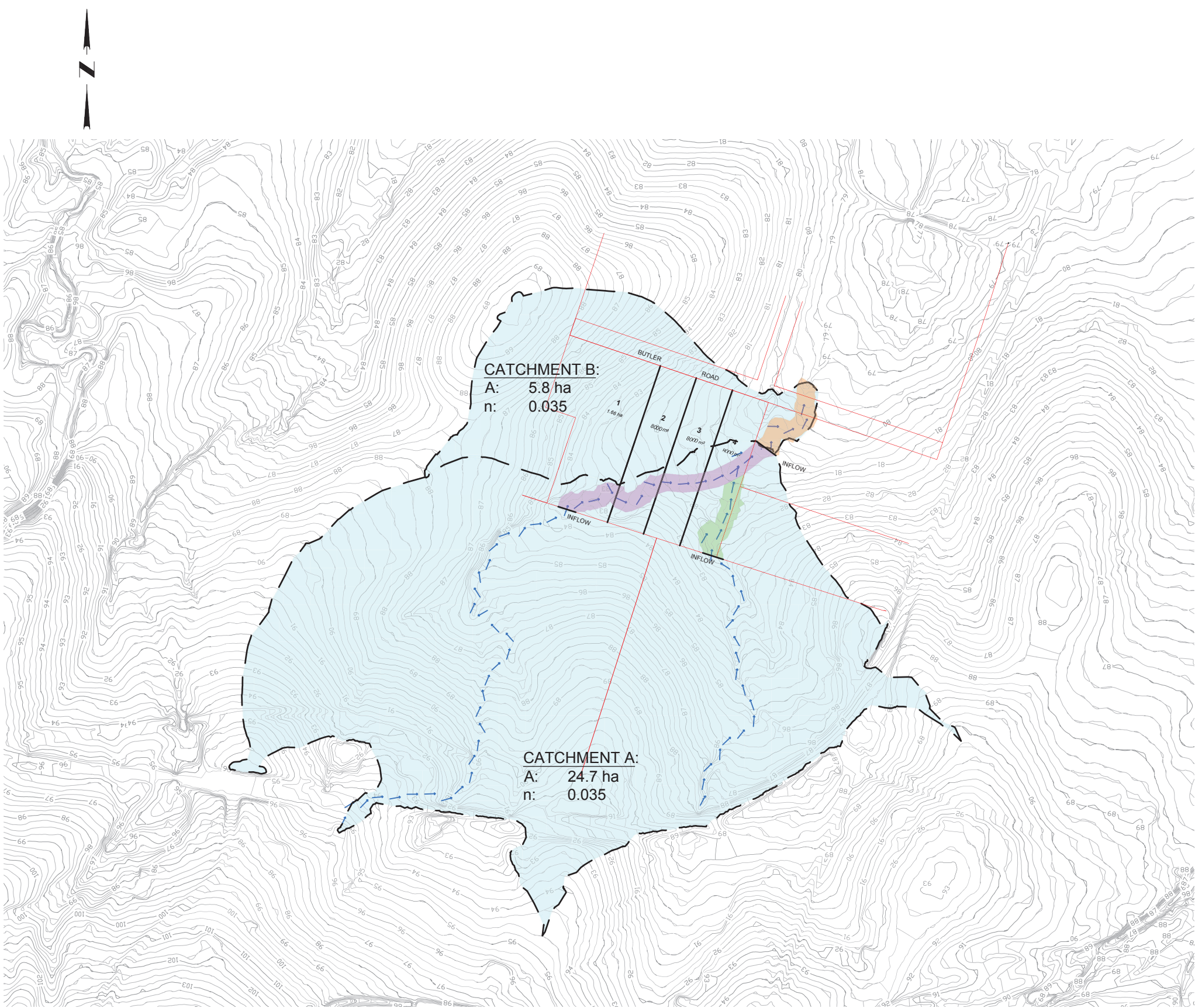
Drawing No: 18072-PP-01

Drawn: AD

Sheet: 1 of 1

Surveyor: N/A

Revision: B



LEGEND

- Existing Lot Boundary
- Proposed Lot Boundary
- Existing Flow Path
- Catchment Boundary
- Stream A
- Stream B
- Stream C
- Existing Surface Contours

ROCKHAMPTON REGIONAL COUNCIL

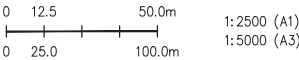
APPROVED PLANS

These plans are approved subject to the current conditions of approval associated with
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Dated: 5 July 2018

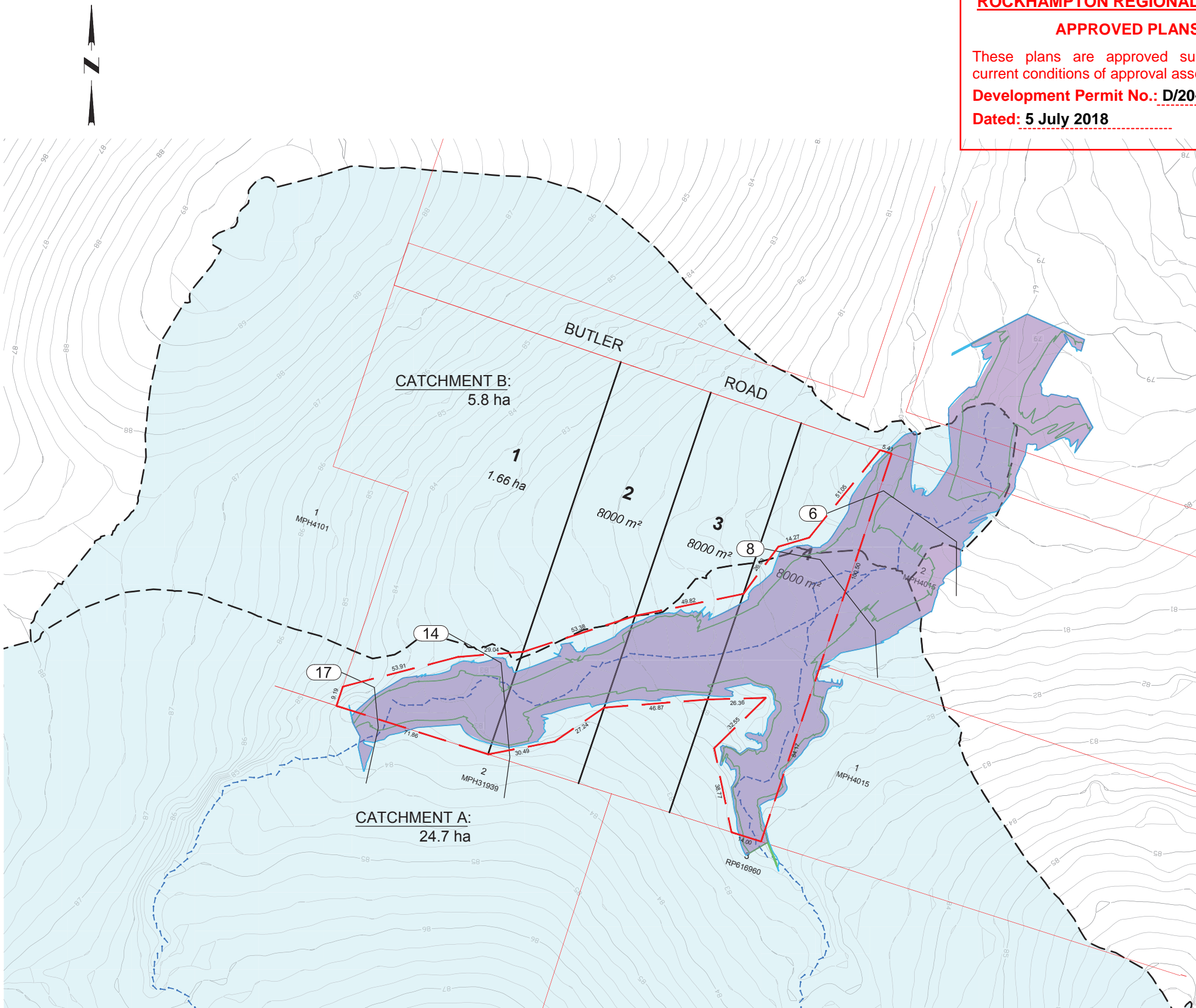
CONTRIBUTORY CATCHMENT PARAMETERS:

CATCHMENT A:	
AREA:	24.7 ha
FRACTION IMP, f:	0.1
ToC:	67 min
1% AEP INTENSITY:	101 mm/h
0.393% AEP INTENSITY:	42.6 mm/h
C10:	0.590
1.0% AEP PEAK FLOW:	4.907 m ³ /s
0.393% AEP PEAK FLOW:	1.466 m ³ /s

PLAN LAYOUT
SCALE 1:5000



FIRST ISSUE				DESIGN CHECK		SCALE		IF IN DOUBT - ASK!		ISSUE FOR APPROVAL		CLIENT		DRAWING TITLE	
DATE	DESIGN	DRAWN	AMENDMENT DETAILS	LM								A & J JOHNSON	EXISTING SITE LAYOUT PRE-DEVELOPMENT CATCHINGS		
17/05/18	PJ	JO	ISSUED FOR APPROVAL												
17/06/18	PJ	JO	ISSUED FOR RFI RESPONSE												
					</										



ROCKHAMPTON REGIONAL COUNCIL

APPROVED PLANS

These plans are approved subject to the current conditions of approval associated with

Development Permit No.: D/20-2018

Dated: 5 July 2018

LEGEND

- Existing Lot Boundary
- Proposed Lot Boundary
- Existing Flow Path
- Q₁₀₀ Extents
- Q₂ Extents
- Proposed Drainage Easement
- Catchment Boundary
- Existing Q₁₀₀ Flood Extents
- Existing Surface Contours

Profile: Q100 Flow Discharge = 4.91 cms
Computed Water Surface = 80.29 m

Profile: Q2 Flow Discharge = 1.47 cms
Computed Water Surface = 80.15 m

SECTION #6

Profile: Q100 Flow Discharge = 4.91 cms
Computed Water Surface = 80.83 m

Profile: Q2 Flow Discharge = 1.47 cms
Computed Water Surface = 80.74 m

SECTION #8

Profile: Q100 Flow Discharge = 4.91 cms
Computed Water Surface = 83.10 m

Profile: Q2 Flow Discharge = 1.47 cms
Computed Water Surface = 82.98 m

SECTION #14

Profile: Q100 Flow Discharge = 4.91 cms
Computed Water Surface = 83.75 m

Profile: Q2 Flow Discharge = 1.47 cms
Computed Water Surface = 83.62 m

SECTION #17

PLAN LAYOUT
SCALE 1:2000

FIRST ISSUE				AMENDMENT DETAILS		DESIGN CHECK	SCALE		IF IN DOUBT - ASK!		ISSUE FOR APPROVAL		CLIENT	PROJECT		P.O. Box 3203 RED HILL ROCKHAMPTON, Q. 4701 Telephone: (+614) 88 434 954 E-Mail: info@moloneyandsons.com.au		DRAWING TITLE		DRAWING NUMBER		ISSUE	
DESIGN ISSUE	DESIGN PJ	DATE JO											A & J JOHNSON	1 INTO 4 LOT SUBDIVISION 61 BUTLER RD BOULDERCOMBE - QLD		ROCKHAMPTON • GLADSTONE • ROMA • MILES • CHINCHILLA • BRISBANE GOLD COAST • COFFS HARBOUR • SYDNEY		EXISTING SITE LAYOUT GENERAL ARRANGEMENT		CE18014-003		C	
A	PJ	JO	17/05/18	ISSUED FOR APPROVAL		LM			RMS REGISTRATION No.		DEREK ARROWSMITH RPEQ 07637												
B	PJ	JO	25/05/18	ADDED PROPOSED DRAINAGE EASEMENT					APPROVED		FOR & ON BEHALF OF MOLONEY & SONS ENGINEERING												
C	PJ	JO	07/06/18	ISSUED FOR RFI RESPONSE		JO			CE18014														



Existing Lot Boundary

Proposed Lot Boundary

Existing Flow Path

Existing Gravel Road

Proposed Gravel Driveway

Existing Surface Contours

These plans are approved subject to the current conditions of approval associated with **Development Permit No.: D/20-2018**
Dated: 5 July 2018

1. ANY NEW PRIVATE ACCESSES TO BE CONSTRUCTED IN ACCORDANCE WITH CMDG STD DRG CMDG-R-040.
2. THESE DRAWINGS SHALL BE READ IN CONJUNCTION WITH ALL OTHER CONSULTANTS DRAWINGS AND SPECIFICATIONS.
3. BEFORE PROCEEDING WITH THE WORK ANY DISCREPANCIES IN THE CONTRACT DOCUMENTS SHALL BE REFERRED FOR DECISION TO THE ENGINEER.
4. DO NOT SCALE FROM DRAWINGS.
5. CONTRACTOR SHALL VERIFY ALL LOCATIONS OF SERVICES, ALL DIMENSIONS AND LEVELS PRIOR TO CONSTRUCTION.
6. ALL MATERIALS/CONSTRUCTION & WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE SPECIFICATIONS AND THE LOCAL AUTHORITY'S STANDARD DRAWINGS AND BY-LAWS.
7. THE CONTRACTOR IS RESPONSIBLE TO OBTAIN ALL RELEVANT APPROVALS PRIOR TO COMMENCEMENT OF WORKS.

[illegible]