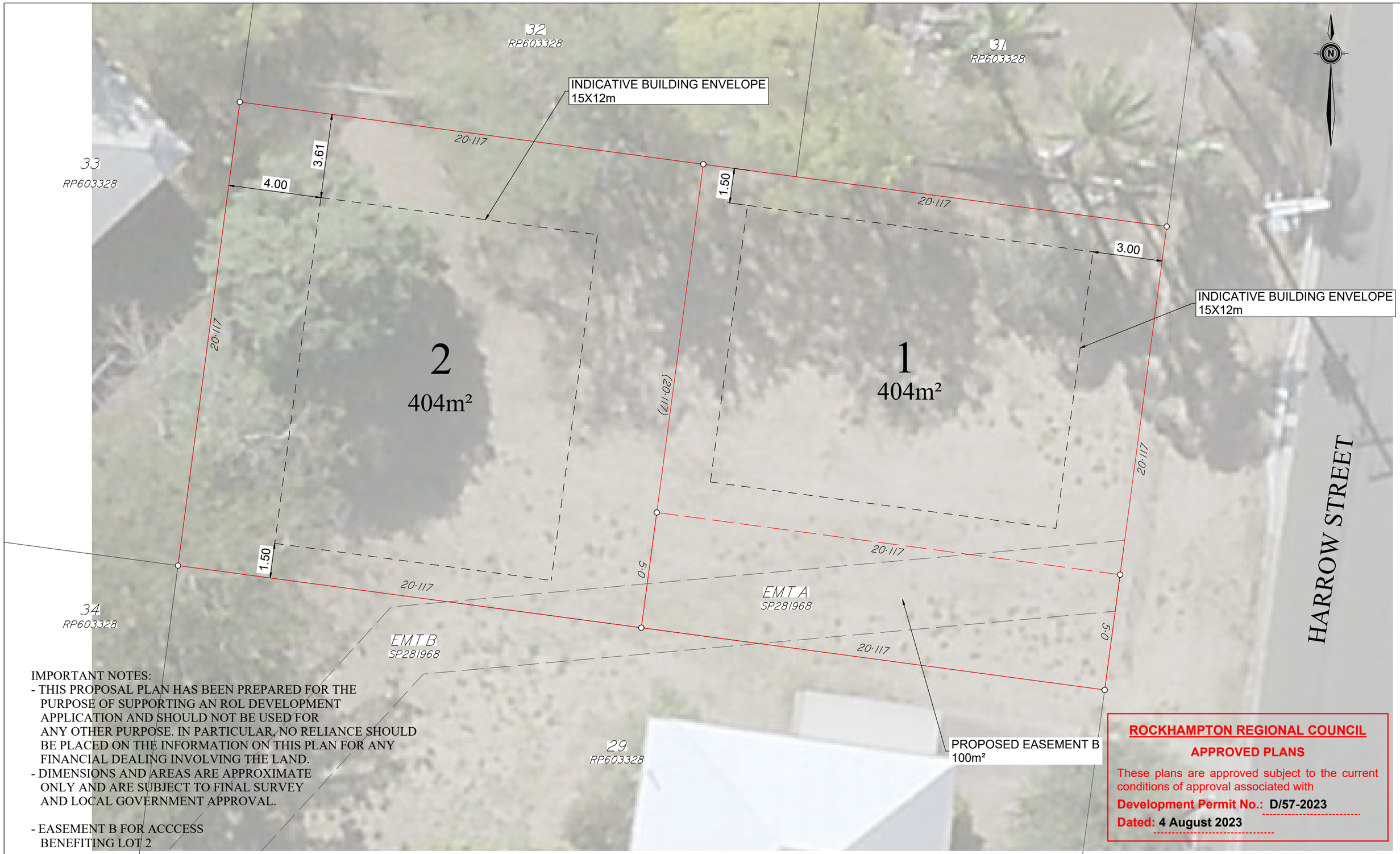

IMPORTANT NOTES:
- THIS PROPOSAL PLAN HAS BEEN PREPARED FOR THE PURPOSE OF SUPPORTING AN ROL DEVELOPMENT APPLICATION AND SHOULD NOT BE USED FOR ANY OTHER PURPOSE. IN PARTICULAR, NO RELIANCE SHOULD BE PLACED ON THE INFORMATION ON THIS PLAN FOR ANY FINANCIAL DEALING INVOLVING THE LAND.
- DIMENSIONS AND AREAS ARE APPROXIMATE ONLY AND ARE SUBJECT TO FINAL SURVEY AND LOCAL GOVERNMENT APPROVAL.

- EASEMENT B FOR ACCCESS BENEFITING LOT 2

THIS NOTE IS AN INTEGRAL PART OF THE PLAN

ROCKHAMPTON REGIONAL COUNCIL

APPROVED PLANS

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

Development Permit No.: D/57-2023

Dated: 4 August 2023

Scale Bar 1:150

3 0 3 6 12

Project:

REV.	DATE	DESCRIPTION	DRAWN	SURV	CHKD
A	26/03/23	ISSUED FOR DISCUSSION	LRT	LRT	LRT
B	28/03/23	BUILDING ENVELOPE ADDED	LRT	LRT	LRT

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ROCKHAMPTON
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Rockhampton, Qld 4700
E: rockhampton@sunrisesurveying.com.au

CLIENT.
BRENDAN JAMIESON

PROJECT.
RECONFIGURATION OF
LOT 30 ON RP603328

HORIZONTAL DATUM. MGA
VERTICAL DATUM. N/A
RL:

DRAWING DESCRIPTION.
PROPOSAL PLAN
PLAN OF LOTS 1 AND 2 AND EASEMENT B

Sheet 1 of 1

DRAWING NAME:
23040 1001 001-B

SCALE.
1: 150 @ A3

SITE ADDRESS.
2 HARROW STREET
WEST ROCKHAMPTON

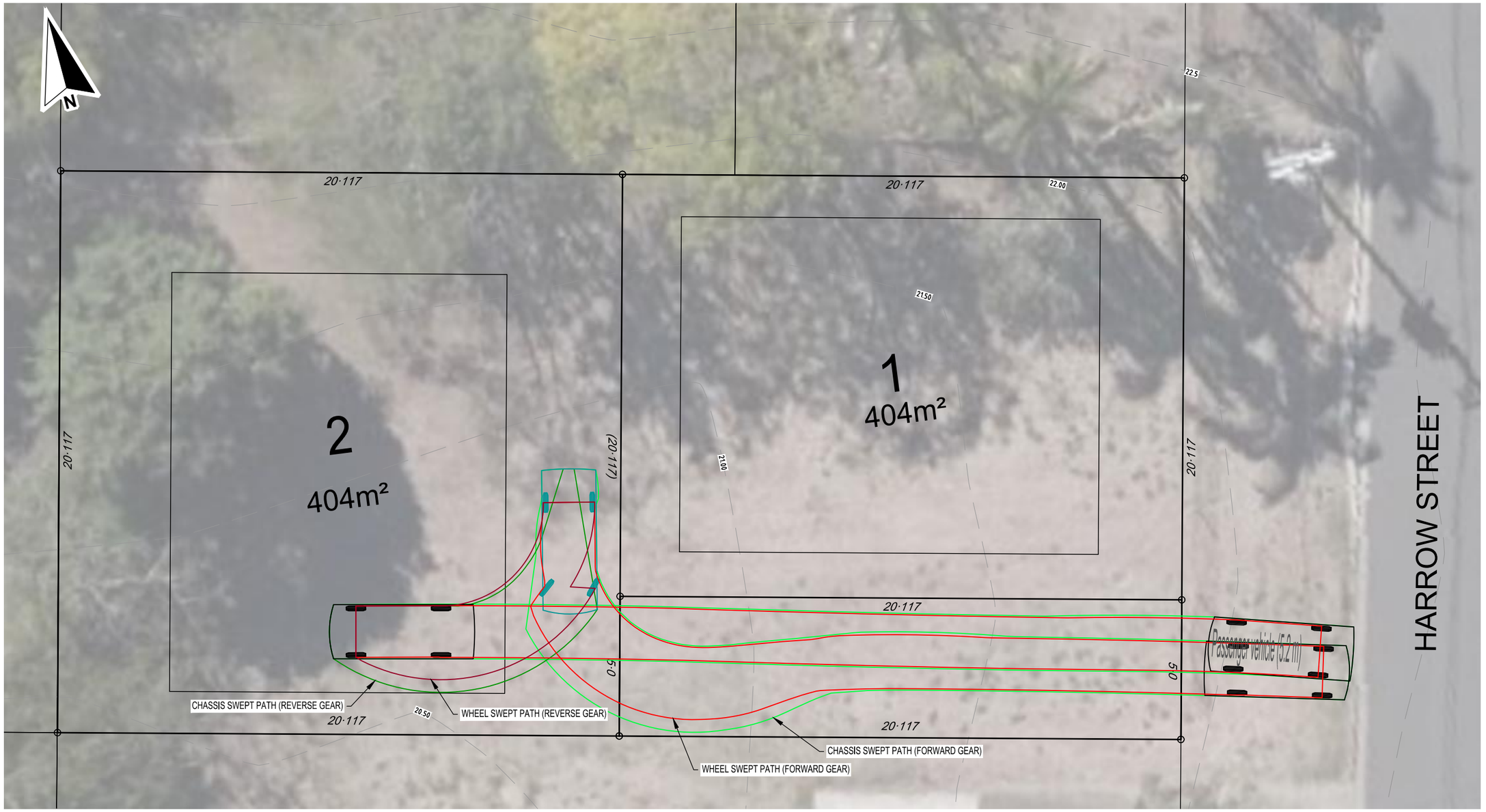
LOCAL AUTHORITY
ROCKHAMPTON REGIONAL

SURVEY DATE
N/A

CONTOUR INTERVAL
Minor: N/A
Major: N/A

REV
B

Drawing Plotted Tuesday, March 28, 2023 20:36:27 by LeighTingle



ROCKHAMPTON REGIONAL COUNCIL

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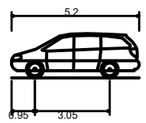

Passenger vehicle (5.2 m)	
Overall Length	5.200m
Overall Width	1.940m
Overall Body Height	1.804m
Min Body Ground Clearance	0.295m
Track Width	1.840m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	6.300m

0 0.75 1.5 2.25 3 1:150
LAYOUT

SCALES m. FULL SIZE A3

PRELIMINARY ISSUE

NOT FOR CONSTRUCTION

REV	REVISION DESCRIPTION	DATE
A	FOR DISCUSSION	14/04/2023

DILEIGH
CIVIL / STRUCTURAL DESIGN & PROJECT MANAGEMENT

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Drafted	AML
Designed	AML
Checked	ACD
Approved	GLENN BROWN
RPEQ 7682	Sign
04.07.2023	

B JAMIESON
RECONFIGURING OF A LOT
LOT 30 HARROW STREET, WEST ROCKHAMPTON
ONE RESIDENTIAL LOT INTO TWO LOTS
PRELIMINARY VEHICLE SWEPT PATHS

Dwg No. D23.084-01

CIVIL

Revision A

C:\Users\AshleighD\OneDrive - DILEIGH CONSULTING ENGINEERS PTY LTD\Data\20231D23.084_JAMIESON - Lot 30 Harrow St\C Drawings\Civil\D23.084.dwg, 01, 14/04/2023 12:05:34 PM, AshleighD, ISO full bleed A3 (297.00 x 420.00 MM), 1:1

2023

DILEIGH
CIVIL / STRUCTURAL DESIGN & PROJECT MANAGEMENT

Ashleigh Lucas

PROPOSED RECONFIGURATION OF A LOT
LOT 30 HARROW STREET, WEST ROCKHAMPTON

STORMWATER MANAGEMENT PLAN

FOR BRENDAN JAMIESON

D23.084

ROCKHAMPTON REGIONAL COUNCIL

APPROVED PLANS

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

Development Permit No.: D/57-2023

Dated: 4 August 2023

BRENDAN JAMIESON

STORMWATER MANAGEMENT PLAN

PROPOSED RECONFIGURATION OF A LOT
LOT 30 HARROW STREET, WEST ROCKHAMPTON

Document History & Status

REVISION	DATE	ISSUED TO	APPROVED FOR ISSUE BY
A	18/05/2023	Rockhampton Regional Council *Development Assessment*	Glenn Brown

Prepared By

Ashleigh Lucas
Cadet Engineer

Dileigh Consulting Engineers Pty Ltd
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Yeppoon QLD 4703
Australia

Reviewed By

Glenn Brown
Engineering Director
RPEQ 7682

Telephone: +61 7 4911 2553
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Date: 18/05/2023
Reference: D23.084

Table of Contents

1. Introduction 1
2. Existing Stormwater Conditions 1
   - 2.1 Site Runoff 1
   - 2.2 External and Road Flows 2
3. Overland Flow Mitigation 3
4. Conclusion 3

Appendix A – Stormwater and Conceptual Site Layout Drawings 4

Appendix B – RRC Services Plan 5

Appendix C – Combined Hazard Curves 6

1. Introduction

This report was prepared for Brendan Jamieson in support of a proposed development to the subject site at Lot 30, Harrow Street, West Rockhampton. The proponent is seeking approval to reconfigure the site from one residential lot into two residential allotments.

The land subject to this application is described as Lot 30 on RP603328 and has a site area of 809m^2.

2. Existing Stormwater Conditions

2.1 Site Runoff

The site is currently undeveloped with grass cover across the entire site. There is no existing formal access point for the current site. Refer Figure 1 below.

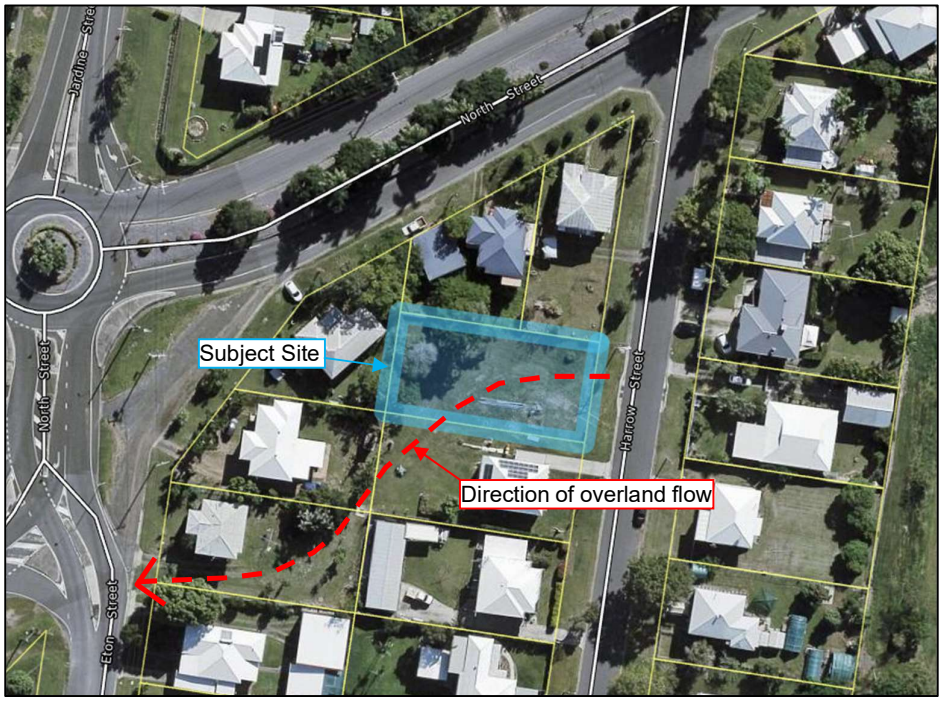

Figure 1: Site Locality Plan (Queensland Globe)

Site runoff generally flows overland as shallow sheet flow to the rear of the site towards stormwater infrastructure in Eton Street. While no clear formal overland flow path was identified, the general direction of flow is as shown in Figure 1.

Fall across the site is approximately 3.5%. Based on the existing undeveloped site conditions, the fraction impervious of the site is currently 0.0.

Under CMDG requirements, the site would be expected to have a fraction impervious up to 0.6 if developed as a single residence. Based on aerial imagery of the surrounding area, Dileigh considers an assumed developed fraction impervious of 0.3 for the subject site. The downstream stormwater infrastructure should have been designed with these assumptions taken into consideration.

2.2 External and Road Flows

It is noted the site is located at a sag point in Harrow Street. Large sag road gully units (double 2.4m road gully units on both sides) were observed in this location. Refer Figure 2 below.

Figure 2: Harrow Street road gully units (Google Street View)

Due to the apparent large upstream catchment and existing vertical road geometry, it was considered prudent to determine whether flows are overtopping the kerb and running overland across the subject site so that appropriate mitigation measures may be taken.

Based on a services plan provided by Rockhampton Regional Council (RRC) on 2 May 2023, the capacity of the existing upstream stormwater network was assessed. Refer Appendix B for RRC's services plan.

Analysis was undertaken utilising Watercom DRAINS. Refer drawings in Appendix A for catchment areas, longitudinal sections and results tables.

Based on the outcome of the DRAINS model, it was determined that the quantity of water overtopping the road and running across the subject site is approximately:

- 0.001m^3/s in a minor event (10% AEP)
- 0.487m^3/s in a major event (1% AEP)

The quantity of overtopping flow in a minor event is considered negligible and not in need of mitigation measures.

The DRAINS model indicates that the depth of flow overtopping the kerb in a major event is approximately 74mm with a D*V ratio of 0.15. In accordance with the Australian Institute Disaster Resilience Guideline, attached in Appendix C, safety hazards are not imposed for vehicles, people or buildings.

However, due to the existing topography of the site, mitigation measures are necessary to ensure flows do not enter the proposed residences and/or create nuisance flows for either the proposed development or the neighbouring allotments as a result of the proposed development.

3. Overland Flow Mitigation

The proposed development will increase the fraction impervious of the two proposed residential allotments to a maximum of 0.6 in accordance with CMDG Stormwater Guidelines. The overall site area may be higher than 0.6 when accounting for the proposed access easement, which is anticipated to be mostly impervious. Nominal building envelopes and access driveway geometry has been indicated on site drawings in Appendix A. Based on information provided by the site owner, it is intended for the proposed residences to be slab on ground construction.

Quantity mitigation is not required for a residential development. Measures will be implemented for the flows overtopping Harrow Street only.

In order to prevent Harrow Street overtopping flows from impacting the proposed residence on Lot 1, fill should be provided to raise the proposed building pad by approximately 250mm. The finished floor level should be nominated as at least 50mm above external ground level. The frontage of Lot 1 will be profiled as a shallow grassed v-drain to divert flows around the building towards the access easement.

A 150mm high nib kerb is to be provided along the south edge of the proposed access driveway to prevent concentrated nuisance flows to the neighbouring allotment. Flows will be directed west along the kerb to a proposed 600x600 grated inlet located in the existing stormwater easement on Lot 2. A strip drain is to be constructed at the entry to the Lot 2 carport to capture any shallow flows from the driveway not conveyed by the kerb. The strip drain is to break into the side of the proposed 600x600 chamber. A 225mm diameter uPVC pipe will then connect grated inlet to an existing stormwater chamber located nearby. Refer drawings in Appendix A for location.

It is recommended that the Lot 2 carport is open to prevent flows from ponding behind walls and causing damage to the structure and/or residence.

The DRAINS model indicates that the existing stormwater network has sufficient capacity to accommodate the overtopping flow re-entering the system at the nominated location downstream.

The end of the kerb is to be flared to return concentrated flows to sheet flow. Flows bypassing the grated inlet will follow the existing overland flow path through allotments west of the subject site in accordance with current stormwater conditions. A rock energy dissipator is to be constructed adjacent the grated inlet to prevent scour and reduce the velocity of uncaptured flows.

4. Conclusion

The existing external stormwater network was assessed. Results indicate that water is overtopping the kerb in Harrow Street in rainfall events greater than a 10% AEP storm. It is proposed to direct this flow away from the proposed residence in Lot 1 with a shallow grassed swale and by constructing Lot 1 in fill. Flows will be directed to a grated inlet connected into the existing stormwater network to allow overtopping flows to re-enter the system and prevent any nuisance flows.

Ashleigh Lucas
For and On Behalf of
Dileigh Consulting Engineers Pty Ltd

Appendix A – Stormwater and Conceptual Site Layout Drawings

RECONFIGURING OF A LOT

LOT 20 HARROW STREET, WEST ROCKHAMPTON

B JAMIESON

D23.084

CIVIL DESIGN

LOCALITY PLAN
(Not To Scale)

DESIGN DRAWING LIST INDEX	
SHEET NUMBER	**SHEET TITLE**
CIVIL	
C-00	TITLE PAGE
C-01	DRAINAGE LAYOUT PLAN
C-02	DRAINAGE CATCHMENTS
C-03	LONGITUDINAL SECTIONS SHEET 1 OF 4
C-04	LONGITUDINAL SECTIONS SHEET 2 OF 4
C-05	LONGITUDINAL SECTIONS SHEET 3 OF 4
C-06	LONGITUDINAL SECTIONS SHEET 4 OF 4
C-07	CALCULATION TABLES SHEET 1 OF 2
C-08	CALCULATION TABLES SHEET 2 OF 2

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ROCKHAMPTON REGIONAL COUNCIL

APPROVED PLANS

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

Development Permit No.: D/57-2023

Dated: 4 August 2023

PRELIMINARY ISSUE

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N

2
404m²

1
404m²

TOE OF LOT 1 FILL PAD
FILL TO BE APPROX. 150mm
TOE OF BATTER MIN. 2m FROM FRONTAGE BOUNDARY

OVERLAND FLOW PATH
OVERTOPPING HARROW STREET
MINOR FLOW 0.001m³/s
MAJOR FLOW 0.487m³/s
D*V=0.15

A A

I.L. 19.780m 750mmØ 4.7% I.L. 20.190m

I.L. 19.660m 750mmØ 6.1%

I.L. 18.980m

I.L. 18.970m

750mmØ 5.3%

STRIP DRAIN AT ENTRY TO LOT 2 CARPORT

600x600 GRATED INLET

NOMINAL ROCK ENERGY DISSIPATOR / SCOUR PROTECTION

I.L. 17.500m

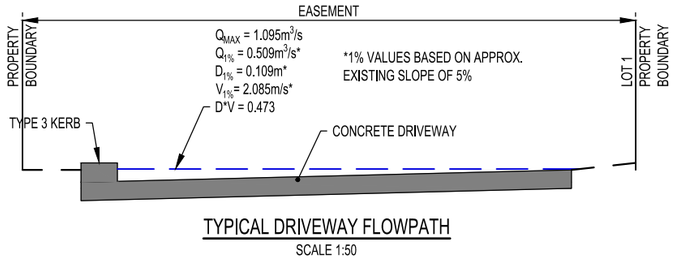
PROPOSED 225Ø uPVC AT 1% MIN
BREAK INTO EXISTING ACCESS CHAMBER AND MAKE GOOD

TYPE 3 BARRIER KERB IN ACCORDANCE WITH CMDG STANDARD DRAWING CMDG-R-060
LONGITUDINAL SLOPE TO BE NO LESS THAN 1.1% TO CONVEY 1% AEP FLOWS

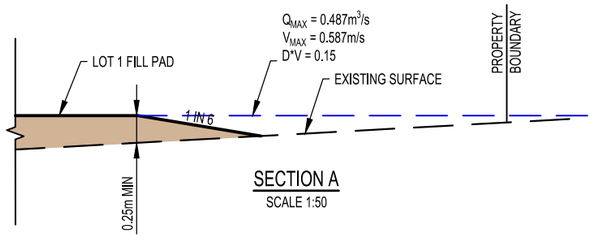
HARROW STREET

LEGEND

- EXISTING DRAINAGE
- EXISTING EASEMENT
- PROPOSED DRAINAGE



TYPICAL DRIVEWAY FLOWPATH
SCALE 1:50



SECTION A
SCALE 1:50

EXISTING LEVELS AND SERVICES

1. THE CONTRACTOR SHALL VERIFY THE LOCATIONS AND LEVELS OF ALL EXISTING SERVICES WITH THE RELEVANT AUTHORITIES INCLUDING "DIAL BEFORE YOU DIG" PRIOR TO COMMENCING CONSTRUCTION.
2. ANY COSTS ASSOCIATED WITH REPAIRING DAMAGE TO EXISTING SERVICES SHALL BE PAID FOR BY THE CONTRACTOR.
3. THE CONTRACTOR SHALL VERIFY THAT THE EXISTING LEVELS ARE AS PER THIS DESIGN WHERE CONNECTIONS TO EXISTING INFRASTRUCTURE ARE REQUIRED. ANY DIFFERENCES TO BE NOTIFIED TO THE ENGINEER PRIOR TO ORDERING MATERIALS OR COMMENCING ANY WORKS.
4. PRIOR TO COMMENCING WORKS THE CONTRACTOR SHALL VERIFY THAT THERE ARE NO CLASHES BETWEEN ANY CROSSING SERVICE OR PIPELINE. ANY CLASHES TO BE NOTIFIED TO THE ENGINEER PRIOR TO WORKS COMMENCING.
5. PRIOR TO COMMENCING WORKS THE CONTRACTOR SHALL VERIFY LOCATION AND DETAILS OF ALL EXISTING SERVICE CONNECTIONS TO NEW ALLOTMENTS PREVIOUSLY INSTALLED

0 0.75 1.5 2.25 3
LAYOUT 1:150

SCALES m. FULL SIZE A3

PRELIMINARY ISSUE

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REV	REVISION DESCRIPTION	DATE
A	FOR DISCUSSION	14/04/2023

DILEIGH
CIVIL / STRUCTURAL DESIGN & PROJECT MANAGEMENT

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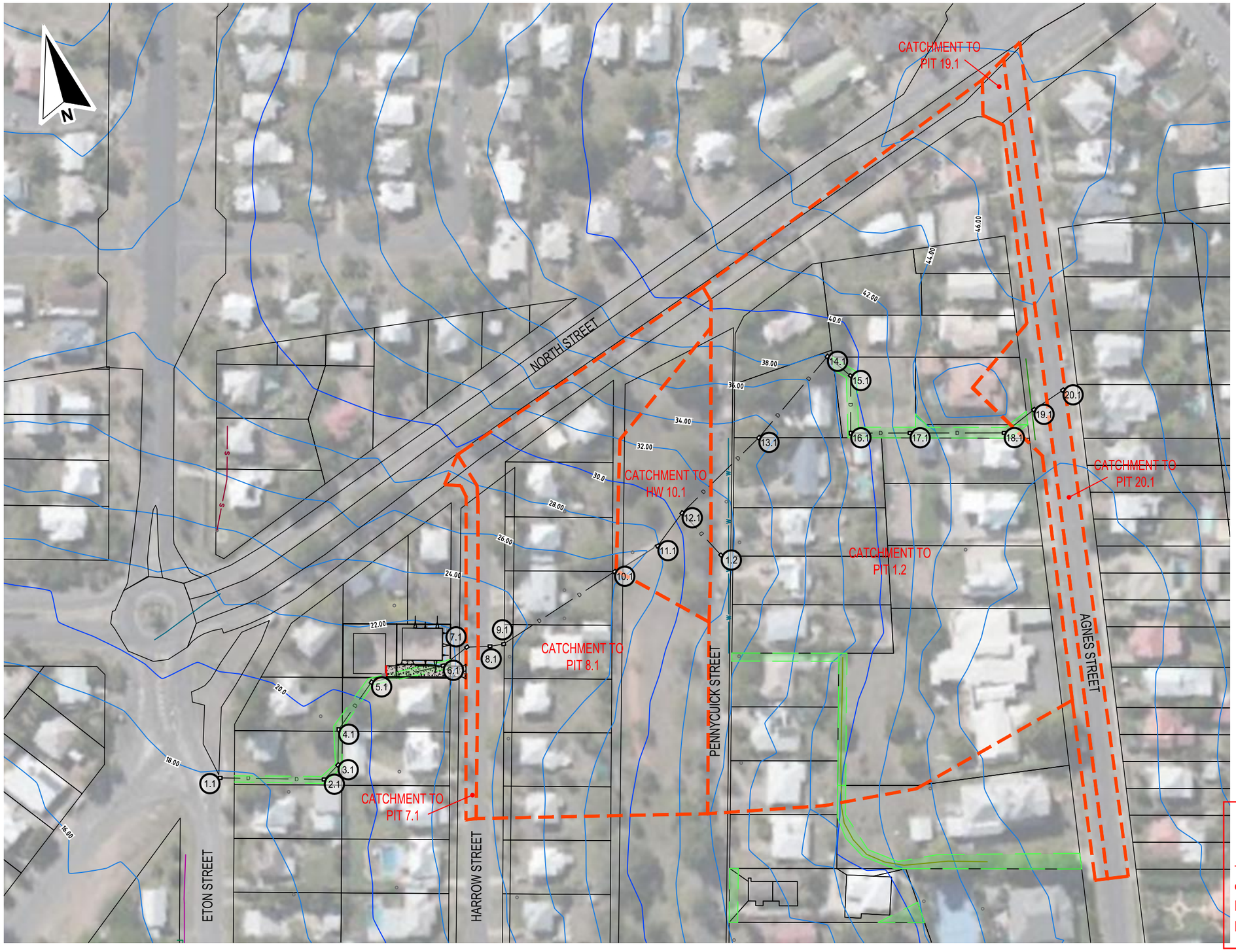
Drafted	AML
Designed	AML
Checked	ACD
Approved	GLENN BROWN
RPEQ 7682	Sign
18.05.2023	

B JAMIESON
RECONFIGURING OF A LOT
LOT 20 HARROW STREET, WEST ROCKHAMPTON
ONE RESIDENTIAL LOT INTO TWO LOTS
DRAINAGE LAYOUT PLAN

Dwg No. D23.084-01
CIVIL
Revision A

C:\Users\AshleighD\OneDrive - DILEIGH CONSULTING ENGINEERS PTY LTD\Data\2023\D23.084_JAMIESON - Lot 30 Harrow St\C Drawings\Civil\D23.084.dwg, 01, 18/05/2023 11:41:26 AM, AshleighD, ISO full bleed A3 (297.00 x 420.00 MM), 1:1



LEGEND

- EXISTING DRAINAGE
- EXISTING EASEMENT
- PROPOSED DRAINAGE
- EXISTING SURFACE CONTOUR
- DRAINAGE CATCHMENTS

ROCKHAMPTON REGIONAL COUNCIL

APPROVED PLANS

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Development Permit No.: D/57-2023

Dated: 4 August 2023

0 7.5 15 22.5 30 1:1500
LAYOUT

SCALES m. FULL SIZE A3

PRELIMINARY ISSUE

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Approved	GLENN BROWN
RPEQ 7682	Sign
18.05.2023	

B JAMIESON
RECONFIGURING OF A LOT
LOT 20 HARROW STREET, WEST ROCKHAMPTON
ONE RESIDENTIAL LOT INTO TWO LOTS
DRAINAGE CATCHMENTS

Dwg No. D23.084-02

CIVIL

Revision A

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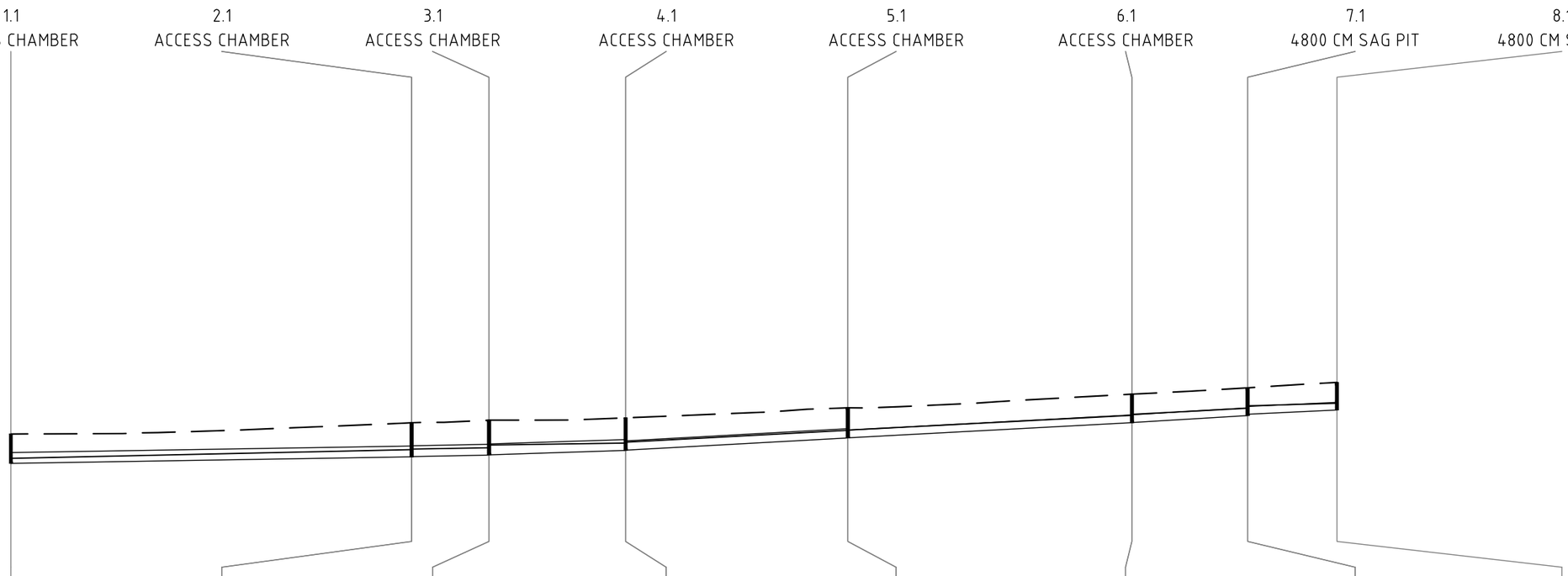
STORMWATER MANAGEMENT NOTES:

1. ALL CALCULATIONS CARRIED OUT IN ACCORDANCE WITH THE QUEENSLAND URBAN DRAINAGE MANUAL
2. SITE CATCHMENT TAKEN FROM ACTUAL SITE AREAS USING ACTUAL FRACTION IMPERVIOUS
3. EXISTING DRAINAGE NETWORK ANALYSED IN WATERCOM DRAINS BASED ON INFORMATION PROVIDED BY ROCKHAMPTON REGIONAL COUNCIL ON 2 MAY 2023



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INVERT LEVEL	15.020	15.650	15.675	15.825	15.850	16.280	16.300	17.490	17.500	18.970	18.980	19.660	19.780	20.190
EXISTING SURFACE	17.867	18.954		19.208		19.432		20.404		21.733		22.338		22.869
DESIGN SURFACE	17.867	18.954	18.954	19.208	19.208	19.432	19.432	20.404	20.404	21.733	21.733	22.338	22.338	22.869
CHAINAGE	0.000	38.853	46.359	59.594	81.148	108.682	119.907	128.564						
	38.853		7.507		13.235		21.554		27.535		11.224		8.657	

DRAINAGE LONGITUNDINAL SECTION FOR LINE 1

SCALES: HORIZONTAL 1:500 VERTICAL 1:500

ROCKHAMPTON REGIONAL COUNCIL

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0 2.5 5 7.5 10 LAYOUT 1:500

SCALES m. FULL SIZE A3

PRELIMINARY ISSUE

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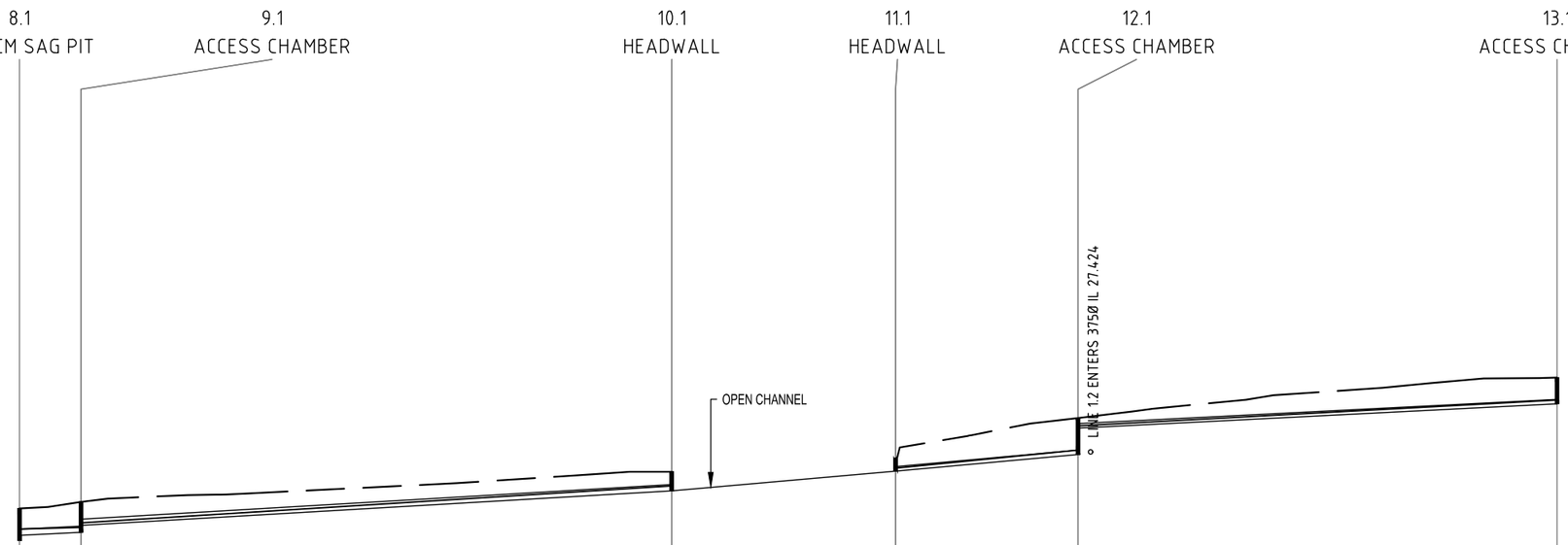
B JAMIESON
RECONFIGURING OF A LOT
LOT 20 HARROW STREET, WEST ROCKHAMPTON
ONE RESIDENTIAL LOT INTO TWO LOTS
LONGITUDINAL SECTIONS SHEET 1 OF 4

Dwg No. D23.084-03
CIVIL
Revision A



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VELOCITY (m/s)	4.15	4.40	0.00	5.25	3.54	
PIPE FLOW (l/sec)	742.000	737.000	-9999000.000	398.000	189.000	
PIPE DETAILS	2x5250 CONCRETE UNDER ROADS	2x5250 CONCRETE NOT UNDER ROADS	1200Ø Concrete under roads	3750 CONCRETE UNDER ROADS	3750 CONCRETE UNDER ROADS	
SLOPE/GRADE	5.0%	5.9%	8.8%	9.1%	5.1%	
DATUM RL -9.2						
HGL	21.150 / 21.283	21.667 / 24.769	25.079 / -9999.000	26.265 / 27.774	29.802 / 31.973	
DEPTH TO INVERT	2.254 / 2.549	1.970 / 1.597	1.080	3.059	0.839 / 2.198	
INVERT LEVEL	20.615 / 20.872	21.451 / 24.360	26.009	27.399	29.619 / 31.658	
EXISTING SURFACE	22.869 / 23.421	25.957	27.089	30.458	33.856	
DESIGN SURFACE	22.869 / 23.421	23.421 / 25.957	25.957 / 27.089	27.089 / 30.458	30.458 / 33.856	
CHAINAGE	128.564 / 133.712	183.284	202.058	217.364	257.552	
	5.148	49.572	18.774	15.305	40.188	

DRAINAGE LONGITUNDINAL SECTION FOR LINE 1

SCALES: HORIZONTAL 1:500 VERTICAL 1:500

ROCKHAMPTON REGIONAL COUNCIL

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0 2.5 5 7.5 10 LAYOUT 1:500

SCALES m. FULL SIZE A3

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DILEIGH CIVIL / STRUCTURAL DESIGN & PROJECT MANAGEMENT

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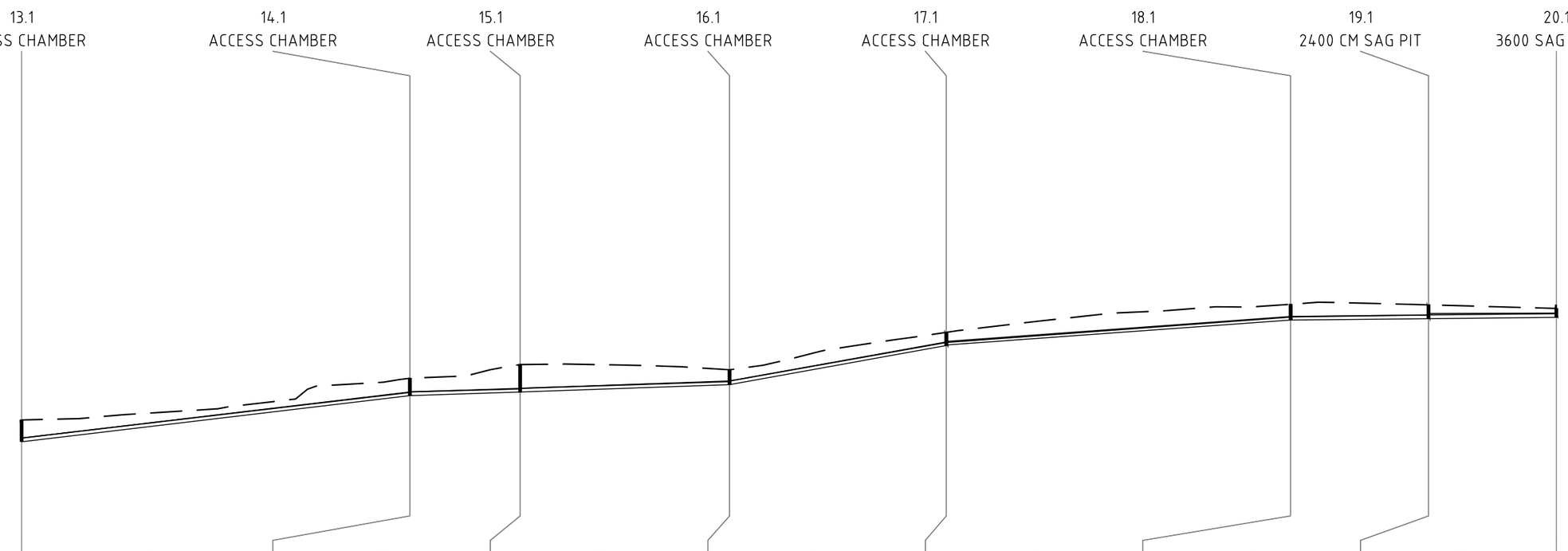
Drafted	AML
Designed	AML
Checked	ACD
Approved	GLENN BROWN
RPEQ 7682	Sign
18.05.2023	

B JAMIESON
RECONFIGURING OF A LOT
LOT 20 HARROW STREET, WEST ROCKHAMPTON
ONE RESIDENTIAL LOT INTO TWO LOTS
LONGITUDINAL SECTIONS SHEET 2 OF 4

Dwg No. D23.084-04

CIVIL

Revision A



STRUCTURE NAME	13.1 ACCESS CHAMBER	14.1 ACCESS CHAMBER	15.1 ACCESS CHAMBER	16.1 ACCESS CHAMBER	17.1 ACCESS CHAMBER	18.1 ACCESS CHAMBER	19.1 2400 CM SAG PIT	20.1 3600 SAG CM PIT
STRUCTURE TYPE								
CAPACITY (l/sec)	604	317	328	745	472	178	178	
VELOCITY (m/s)	4.95	3.01	3.11	5.65	4.05	1.74	1.69	
PIPE FLOW (l/sec)	205.000	192.000	199.000	191.000	192.000	192.000	110.000	
PIPE DETAILS	375Ø CONCRETE NOT UNDER ROADS	375Ø CONCRETE NOT UNDER ROADS	375Ø CONCRETE NOT UNDER ROADS	375Ø CONCRETE NOT UNDER ROADS	375Ø CONCRETE NOT UNDER ROADS	375Ø CONCRETE NOT UNDER ROADS	375Ø CONCRETE UNDER ROADS	
SLOPE/GRADE	11.9%	3.3%	3.5%	18.0%	7.2%	1.0%	1.0%	
DATUM RL 1.8								
HGL	32.002 36.671	36.723 37.035	37.085 37.788	37.838 41.785	41.786 44.384	44.405 44.589	44.730 45.606	
DEPTH TO INVERT	2.228 1.771	2.805	1.511	1.345	1.295 1.613	1.410	0.914	
INVERT LEVEL	31.628 36.349	36.719	37.469	41.469	41.519 44.068	44.214	44.348	
EXISTING SURFACE	33.856 38.120	39.524	38.980	42.814	45.681	45.624	45.262	
DESIGN SURFACE	33.856 38.120	38.120 39.524	39.524 38.980	38.980 42.814	42.814 45.681	45.681 45.624	45.624 45.262	
CHAINAGE	257.552 297.275	308.566	329.986	352.163	387.375	401.792	414.571	
	39.724	11.291	21.420	22.177	35.212	14.417	12.779	

DRAINAGE LONGITUNDINAL SECTION FOR LINE 1

SCALES: HORIZONTAL 1:500 VERTICAL 1:500

ROCKHAMPTON REGIONAL COUNCIL

APPROVED PLANS

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

Development Permit No.: D/57-2023

Dated: 4 August 2023

0 2.5 5 7.5 10 LAYOUT 1:500

SCALES m. FULL SIZE A3

PRELIMINARY ISSUE

NOT FOR CONSTRUCTION

REV	REVISION DESCRIPTION	DATE
A	FOR DISCUSSION	14/04/2023

DILEIGH
CIVIL / STRUCTURAL DESIGN & PROJECT MANAGEMENT

ACN 121 309 171
47 Normanby Street
Yeppoon, Queensland 4703

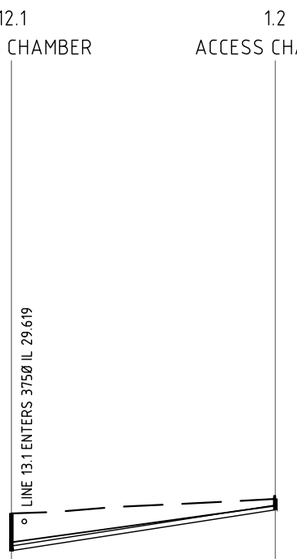
Phone: 07 49112553
Fax: 07 49383660
Email: admin@dileigh.com.au

Drafted	AML
Designed	AML
Checked	ACD
Approved	GLENN BROWN
RPEQ 7682	Sign
18.05.2023	

B JAMIESON
RECONFIGURING OF A LOT
LOT 20 HARROW STREET, WEST ROCKHAMPTON
ONE RESIDENTIAL LOT INTO TWO LOTS
LONGITUDINAL SECTIONS SHEET 3 OF 4

Dwg No. D23.084-05
CIVIL
Revision A

C:\Users\AshleighD\OneDrive - DILEIGH CONSULTING ENGINEERS PTY LTD\Data\2023\D23.084_JAMIESON - Lot 30 Harrow St\C Drawings\Civil\D23.084.dwg, 05, 18/05/2023 11:41:36 AM, AshleighD, ISO full bleed A3 (297.00 x 420.00 MM), 1:1



STRUCTURE NAME	12.1	1.2
STRUCTURE TYPE	ACCESS CHAMBER	ACCESS CHAMBER
CAPACITY (l/sec)	690	
VELOCITY (m/s)	5.51	
PIPE FLOW (l/sec)	214.000	
PIPE DETAILS	3750 CONCRETE UNDER ROADS	
SLOPE/GRADE	15.5%	
DATUM RL -2.4		
HGL	28.107	31.905
DEPTH TO INVERT	3.034	0.890
INVERT LEVEL	27.424	30.755
EXISTING SURFACE	30.458	31.645
DESIGN SURFACE	30.458	31.645
CHAINAGE	0.000	21.524
	21.524	

DRAINAGE LONGITUNDINAL SECTION FOR LINE 2

SCALES: HORIZONTAL 1:500 VERTICAL 1:500

ROCKHAMPTON REGIONAL COUNCIL

APPROVED PLANS

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Development Permit No.: D/57-2023

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0 2.5 5 7.5 10 1:500
LAYOUT

SCALES m. FULL SIZE A3

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RECONFIGURING OF A LOT
LOT 20 HARROW STREET, WEST ROCKHAMPTON
ONE RESIDENTIAL LOT INTO TWO LOTS
LONGITUDINAL SECTIONS SHEET 4 OF 4

Dwg No. D23.084-06

CIVIL

Revision A

LOCATION AND LAND-USE					TIME AND RUNOFF						INLET DESIGN								PIPE SYSTEM DESIGN								PIT RESULTS				
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33
	Pit, Node	Sub-	Land-		Constant	Kinematic Wave or Friends Formula Parameters			Total	Peak Sub-		Overflows Approaching Pit					Peak		Peak				U/S Pipe	D/S Pipe	U/S	D/S	Pipe	Pressure	Water	Ground	Pit	
AEP	or Basin Name	Catchment Area	Use Type	Percent-age	Flow Time	Length	Slope	Roughness	Entry Time, t_c	Catchmen Flowrate	Origin of Approach	Peak Flowrate(s	Flow Width	Depth x Velocity	Inlet Family	Inlet Size	Approach Flow	Bypass Flow(s)	Flow in Pipe	Reach Length	Pipe Slope	Pipe Diameter	Invert Level	Invert Level	HGL in Pipe	HGL in Pipe	Flow Velocity	Change Coeff.	Surface Elevation	Surface Level	Free-board	Name
		(ha)	(ILSAX)	(%)	(minutes)	(m)	(%)	n	(minutes)	(m^3/s)	Flows	(m^3/s)	(m)	(m^2/s)			(m^3/s)	(m^3/s)	(m^3/s)	(m)	(%)	(mm)	(m)	(m)	(m)	(m)	(m/s)	Ku	(m)	(m)	(m)	
									*worst storm																							
10%	**20.1**	0.2135	Paved	100	5				5	0.111					RGU, Barrier Kerb, 3%, 0.25% grade	Manning B450 3 S3600/A	0.111	0.017	0.11	13.069	1.03	375	44.348	44.214	44.776	44.73	1	18	45.61	45.625	0.02	**20.1**
			Supp.	0	2																											
			Grassed	0	15				15																							
1%	**20.1**	0.2135	Paved	< - - - - - - - - - -		as above		- - - - - - - - - - >	5	0.171					<- - - as above - - - >		0.171	0.06	0.113	< - - - - - - - - - - - - - as above - - - - - - - - - - - - - >			45.137	45.103	1.02	18	45.74	45.625	0	**20.1**
			Grassed						15																							
10%	**19.1**	0.191	Paved	100	5				5	0.099	20.1	0.017	14.29	0	RGU, Barrier Kerb, 3%, 0.25% grade	Manning B450 3 S2400/A	0.116	0	0.192	14.127	1.03	375	44.214	44.068	44.589	44.405	1.83	1	44.73	45.624	0.89	**19.1**
			Supp.	0	2																											
			Grassed	0	15				15																							
1%	**19.1**	0.191	Paved	< - - - - - - - - - -		as above		- - - - - - - - - - >	5	0.153	20.1	0.06	15.35	0.01	<- - - as above - - - >		0.213	0	0.274	< - - - - - - - - - - - - - as above - - - - - - - - - - - - - >			44.79	44.447	2.49	1	45.1	45.624	0.52	**19.1**
			Grassed						15																							
10%	**18.1**		Paved												Access Chamber	-	0		0.192	35.212	7.24	375	44.068	41.519	44.384	41.786	2.28	1	44.41	45.681	1.28	**18.1**
			Supp.																													
			Grassed																													
1%	**18.1**		Paved												<- - - as above - - - >		0		0.285	< - - - - - - - - - - - - - as above - - - - - - - - - - - - - >			44.422	41.845	2.79	1	44.45	45.681	1.23	**18.1**
			Grassed																													
10%	**17.1**		Paved												Access Chamber	-	0		0.191	22.177	18.04	375	41.469	37.469	41.785	37.838	1.93	1	41.79	42.814	1.03	**17.1**
			Supp.																													
			Grassed																													
1%	**17.1**		Paved												<- - - as above - - - >		0		0.285	< - - - - - - - - - - - - - as above - - - - - - - - - - - - - >			41.823	38.871	2.63	1	41.85	42.814	0.97	**17.1**
			Grassed																													
10%	**16.1**		Paved												Access Chamber	-	0		0.199	21.42	3.5	375	37.469	36.719	37.788	37.085	1.98	2.2	37.84	38.98	1.14	**16.1**
			Supp.																													
			Grassed																													
1%	**16.1**		Paved												<- - - as above - - - >		0		0.274	< - - - - - - - - - - - - - as above - - - - - - - - - - - - - >			38.182	37.661	2.48	2.2	38.87	38.98	0.11	**16.1**
			Grassed																													
10%	**15.1**		Paved												Access Chamber	-	0		0.192	11.291	3.28	375	36.719	36.349	37.035	36.723	1.93	1	37.08	39.524	2.44	**15.1**
			Supp.																													
			Grassed																													
1%	**15.1**		Paved												<- - - as above - - - >		0		0.274	< - - - - - - - - - - - - - as above - - - - - - - - - - - - - >			37.347	37.072	2.48	1	37.66	39.524	1.86	**15.1**
			Grassed																													
10%	**14.1**		Paved												Access Chamber	-	0		0.205	39.724	11.88	375	36.349	31.628	36.671	32.002	2.03	2.2	36.72	38.12	1.4	**14.1**
			Supp.																													
			Grassed																													
1%	**14.1**		Paved												<- - - as above - - - >		0		0.274	< - - - - - - - - - - - - - as above - - - - - - - - - - - - - >			36.699	32.034	2.56	2.2	37.07	38.12	1.05	**14.1**
			Grassed																													
10%	**13.1**		Paved												Access Chamber	-	0		0.189	40.188	5.07	375	31.658	29.619	31.973	29.802	3.54	1	32	33.856	1.85	**13.1**
			Supp.																													
			Grassed																													
1%	**13.1**		Paved												<- - - as above - - - >		0		0.284	< - - - - - - - - - - - - - as above - - - - - - - - - - - - - >			32.012	29.853	3.92	1	32.03	33.856	1.82	**13.1**
			Grassed																													
10%	**12.1**		Paved												Access Chamber	-	0		0.398	15.305	9.08	375	27.399	26.009	27.774	26.265	4.96	1	28.11	30.458	2.35	**12.1**
			Supp.																													
			Grassed																													
1%	**12.1**		Paved												<- - - as above - - - >		0		0.482	< - - - - - - - - - - - - - as above - - - - - - - - - - - - - >			27.774	26.322	4.89	1	28.47	30.458	1.99	**12.1**
			Grassed																													
10%	**HW1**	0.273	Paved	5	5				5	0.078	19.1	0.077	4	0.02			0.078	0.431	0.737	49.572	5.87	525	24.36	21.451	24.769	21.667	4.38	0.5	25.08	25	-0.08	**HW1**
			Supp.	0	2																											
			Grassed	95	15				15																							
1%	**HW1**	0.273	Paved	< - - - - - - - - - -		as above		- - - - - - - - - - >	5	0.13	19.1	0.128	4	0.03			0.13	1.18	0.775	< - - - - - - - - - - - - - as above - - - - - - - - - - - - - >			25.023	23.014	1.79	0.5	25.14	25	-0.14	**HW1**
			Grassed						15																							
10%	**9.1**		Paved												Access Chamber	-	0		0.742	5.148	4.99	525	20.872	20.615	21.283	21.15	2.04	1	21.35	23.421	2.08	**9.1**
			Supp.																													
			Grassed																													
1%	**9.1**		Paved												<- - - as above - - - >		0		0.859	< - - - - - - - - - - - - - as above - - - - - - - - - - - - - >			22.853	22.812	1.98	1	23.01	23.421	0.41	**9.1**
			Grassed																													
10%	**8.1**	1.202	Paved	55	5				5	0.428	HW1				RGU, Barrier Kerb, 3%, 0.25% grade	Manning B450 3 S4800/A	0.428	0.256	1.296	8.657	4.74	750	20.19	19.78	20.855	20.596	3.13	1	21.15	22.869	1.72	**8.1**
			Supp.	5	2																											
			Grassed	40	15				15																							
1%	**8.1**	1.202	Paved	< - - - - - - - - - -		as above		- - - - - - - - - - >	5	0.699	HW1				<- - - as above - - - >		0.699	1.106	1.489	< - - - - - - - - - - - - - as above - - - - - - - - - - - - - >			22.812	1.83E+25	3.37	1	22.84	22.869	0.03	**8.1**
			Grassed						15																							
10%	**7.1**	0.057	Paved	100	5				5	0.03	8.1				RGU, Barrier Kerb, 3%, 0.25% grade	Manning B450 3 S4800/A	0.03	0.001	1.564	11.224	6.06	750	19.66	18.98	20.362	19.768	3.64	1	20.6	22.338	1.74	**7.1**
			Supp.	0	2																											
			Grassed	0	15				15																							
1%	**7.1**	0.057	Paved	< - - - - - - - - - -		as above		- - - - - - - - - - >	5	0.046	8.1				<- - - as above - - - >		0.046	0.487	2.101	< - - - - - - - - - - - - - as above - - - - - - - - - - - - - >			4.71E+24	3268.52	4.76	1	1.83E+25	22.338	0	**7.1**
			Grassed						15																							

ROCKHAMPTON REGIONAL COUNCIL
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SCALES m. FULL SIZE A3

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B JAMIESON
RECONFIGURING OF A LOT
LOT 20 HARROW STREET, WEST ROCKHAMPTON
ONE RESIDENTIAL LOT INTO TWO LOTS
CALCULATION TABLES SHEET 1 OF 2

Dwg No. D23.084-07
CIVIL
Revision A

C:\Users\AshleighD\OneDrive - DILEIGH CONSULTING ENGINEERS PTY LTD\Data\2023\D23.084_JAMIESON - Lot 30 Harrow StC Drawings\Civil\D23.084_JAMIESON - Lot 30 Harrow StC Drawings\Civil\D23.084.dwg, 07, 18/05/2023 11:41:38 AM, AshleighD, ISO full bleed A3 (297.00 x 420.00 MM), 1:1

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33
	Pit, Node	Sub-	Land-		Constant	Kinematic Wave or Friends			Total	Peak Sub-		Overflows Approaching Pit					Peak		Peak				U/S Pipe	D/S Pipe	U/S	D/S	Pipe	Pressure	Water	Ground	Pit	
	or Basin	Catchment	Use	Percent-	Flow	Formula Parameters			Entry	Catchmen	Origin of	Peak	Flow	Depth x	Inlet	Inlet	Approach	Bypass	Flow in	Reach	Pipe	Pipe	Invert	Invert	HGL	HGL	Flow	Change	Surface	Surface	Free-	Pit
AEP	Name	Area	Type	age	Time	Length	Slope	Roughnes	Time, t_c	Flowrate	Approach	Flows	Width	Velocity	Family	Size	Flow	Flow(s)	Pipe	Length	Slope	Diameter	Level	Level	in Pipe	in Pipe	Velocity	Coeff.	Elevation	Level	board	Name
		(ha)	(ILSAX)	(%)	(minutes)	(m)	(%)	n	(minutes)	(m^3/s)		(m^3/s)	(m)	(m^2/s)			(m^3/s)	(m^3/s)	(m^3/s)	(m)	(%)	(mm)	(m)	(m)	(m)	(m)	(m/s)	Ku	(m)	(m)	(m)	
										*worst storm																						
10%	**6.1**		Paved												Access Chamber	-	0		1.594	27.535	5.34	750	18.97	17.5	19.676	18.248	3.7	1	19.77	21.733	1.97	**6.1**
			Supp.																													
			Grassed																													
1%	**6.1**		Paved												<- - - as above - - ->		0		2.101	<- - - - - - - - - - - - - as above - - - - - - - - - - - - ->					1511.69	18.422	4.76	1	3268.52	21.733	0	**6.1**
			Grassed																													
10%	**5.1**		Paved												Access Chamber	-	0		1.562	21.554	5.52	900	17.49	16.3	18.227	17.075	2.8	1	18.25	20.404	2.16	**5.1**
			Supp.																													
			Grassed																													
1%	**5.1**		Paved												<- - - as above - - ->		0		2.101	<- - - - - - - - - - - - - as above - - - - - - - - - - - - ->					18.295	17.568	3.5	1	18.42	20.404	1.98	**5.1**
			Grassed																													
10%	**4.1**		Paved												Access Chamber	-	0		1.562	13.235	3.25	1050	16.28	15.85	16.983	16.799	2.49	1	17.07	19.432	2.36	**4.1**
			Supp.																													
			Grassed																													
1%	**4.1**		Paved												<- - - as above - - ->		0		2.101	<- - - - - - - - - - - - - as above - - - - - - - - - - - - ->					17.289	17.219	2.39	1	17.57	19.432	1.86	**4.1**
			Grassed																													
10%	**3.1**		Paved												Access Chamber	-	0		1.562	7.507	2	1050	15.825	15.675	16.528	16.407	2.49	2.2	16.8	19.208	2.41	**3.1**
			Supp.																													
			Grassed																													
1%	**3.1**		Paved												<- - - as above - - ->		0		2.101	<- - - - - - - - - - - - - as above - - - - - - - - - - - - ->					16.668	16.566	2.76	2.2	17.22	19.208	1.99	**3.1**
			Grassed																													
10%	**2.1**		Paved												Access Chamber	-	0		1.561	38.853	1.62	1050	15.65	15.02	16.353	15.508	3.91	1	16.41	18.954	2.55	**2.1**
			Supp.																													
			Grassed																													
1%	**2.1**		Paved												<- - - as above - - ->		0		2.101	<- - - - - - - - - - - - - as above - - - - - - - - - - - - ->					16.468	15.602	4.21	1	16.57	18.954	2.39	**2.1**
			Grassed																													
10%	**1.2**	2.741	Paved	55	5				5	0.977					Anti-Ponding RGU, SAG ONLY	1200 lintel	0.977	0.765		21.524	15.48	375	30.755	27.424				18	31.9	31.645	0	**1.2**
			Supp.	5	2																											
			Grassed	40	15				15																							
1%	**1.2**	2.741	Paved	<- - - - - - - - - -		as above		- - - - - - - - - ->	5	1.593					<- - - as above - - ->		1.593	1.375		<- - - - - - - - - - - - - as above - - - - - - - - - - - - ->								18	31.95	31.645	0	**1.2**
			Grassed						15																							

ROCKHAMPTON REGIONAL COUNCIL

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Dated: **4 August 2023**

SCALES m. FULL SIZE A3

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RPEQ 7682	Sign
18.05.2023	

B JAMIESON
RECONFIGURING OF A LOT
LOT 20 HARROW STREET, WEST ROCKHAMPTON
ONE RESIDENTIAL LOT INTO TWO LOTS
CALCULATION TABLES SHEET 2 OF 2

Dwg No. D23.084-08

CIVIL

Revision A

Appendix B – RRC Services Plan

Stormwater Harrow to Agnes Street

A4 Page scale at 1: 1,495.77

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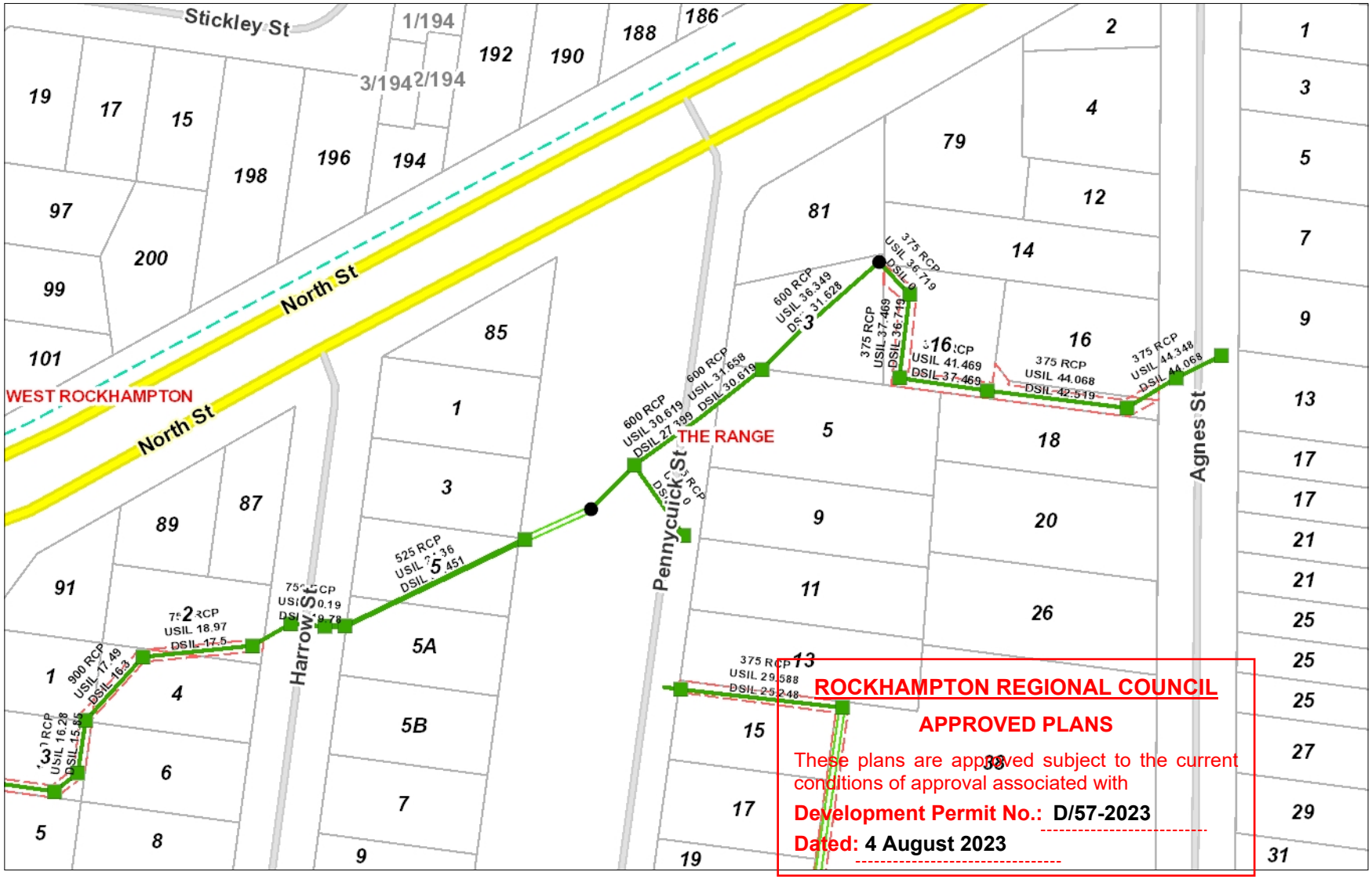

Legend

- Flood Mitigation Devices
- Culverts
- Headwalls
- Stormwater Junctions
- Pollution Trap
- Subsoil Clean-Out pit
- Stormwater Jump ups
- Stormwater Main
  - Connector; Reticulati
  - Culvert Pipe; LinkSla
  - Inter-Allotment
  - Low Flow Pipe
  - Other
- Stormwater Drop Structures
- Open Channel
  - Batter Chute, Open C Drain
  - Bio-Retention Swale
- Subsoil Drain
- Weirs
- Abandoned Junctions
- Abandoned Culverts
- Abandoned Headwalls
- Abandoned Mains
- Stormwater Basins
  - Bio-Retention
  - Detention/Retention
- Culverts Private
- Headwalls Private
- Stormwater Junctions Private
- Pollution Trap Private
- Subsoil Clean-Out pit Private
- Stormwater Jump Up Private
- Stormwater Main Private
- Open Channel Private
- Subsoil Drain Private
- Retention Basins Private
- Easements
- Property Parcels (Main)
- Roads1
  - Main Roads
  - Major Council Roads
  - Standard Council Ro
  - Access Roads
  - Private Roads
  - Unconstructed

ROCKHAMPTON REGIONAL COUNCIL

APPROVED PLANS

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

Development Permit No.: D/57-2023

Dated: 4 August 2023

GDA2020

Rockhampton Regional Council

Appendix C – Combined Hazard Curves

4 Indexing to flood hazard vulnerability curves

Once the flood hazard has been quantified and the timing aspects of flood hazard understood, the potential of the flood flows to cause damage or danger can be indexed against vulnerability curves linked to meaningful hazard thresholds.

The vulnerability of the community and its assets can be described by using thresholds related to the stability of people as they walk or drive through flood waters, or shelter in a building during a flood. The vulnerability to hazard will also be influenced by whether the primary consideration is, for example, strategic land-use planning, which is aimed at ensuring land use is compatible with the flood risk, or assessing development proposals or emergency management planning, which is aimed at addressing residual flood risks.

4.1 General flood hazard classification

A flood hazard assessment conducted as part of a flood study often provides baseline information for general consideration as part of an initial scoping exercise for a floodplain management study. In such a preliminary assessment of risks or as part of a constraints analysis for strategic land-use planning, a combined set of hazard vulnerability curves such as those presented in Figure 6 can be used as a general classification of flood hazard on a floodplain. Further information on the source of the hazard vulnerability curves presented in Figure 6 is available in Smith et al. (2014).

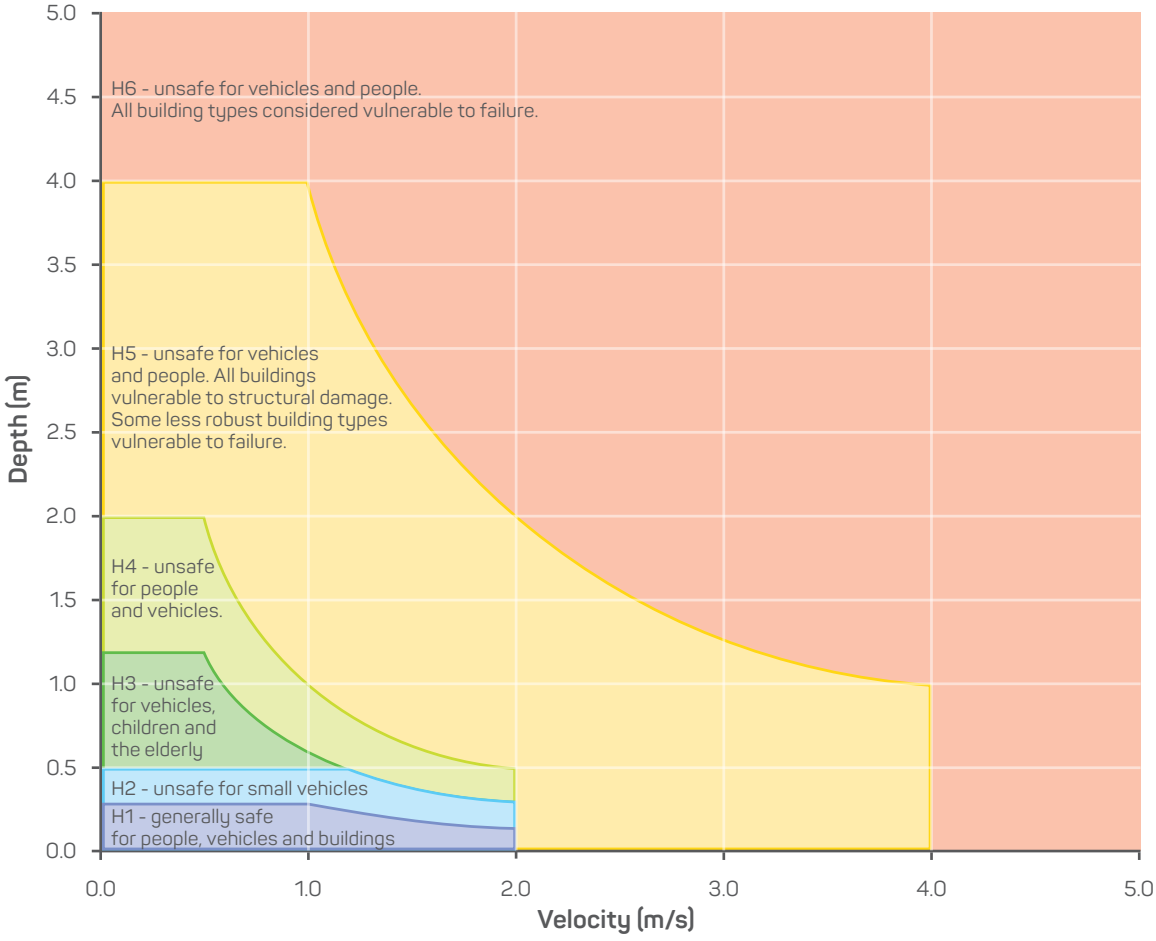

Figure 6: General flood hazard vulnerability curves

The combined flood hazard curves presented in Figure 6 set hazard thresholds that relate to the vulnerability of the community when interacting with floodwaters. The combined curves are divided into hazard classifications that relate to specific vulnerability thresholds as described in Table 1. Table 2 provides the limits for the classifications provided in Table 1.

A flood hazard map classified against these general vulnerability thresholds based on the flood behaviour derived using flow modelling for the example floodplain presented in Figure 3 is shown in Figure 7. Additional examples are provided in the appendix.

Table 1: Combined hazard curves – vulnerability thresholds

Hazard Vulnerability Classification	Description
H1	Generally safe for vehicles, people and buildings.
H2	Unsafe for small vehicles.
H3	Unsafe for vehicles, children and the elderly.
H4	Unsafe for vehicles and people.
H5	Unsafe for vehicles and people. All building types vulnerable to structural damage. Some less robust building types vulnerable to failure.
H6	Unsafe for vehicles and people. All building types considered vulnerable to failure.

Table 2: Combined hazard curves – vulnerability thresholds classification limits

Hazard Vulnerability Classification	Classification limit (D and V in combination) m^2/s	Limiting still water depth (D) m	Limiting velocity (V) m/s
H1	$D^*V \leq 0.3$	0.3	2.0
H2	$D^*V \leq 0.6$	0.5	2.0
H3	$D^*V \leq 0.6$	1.2	2.0
H4	$D^*V \leq 1.0$	2.0	2.0
H5	$D^*V \leq 4.0$	4.0	4.0
H6	$D^*V > 4.0$	-	-