APPENDIX H

Flood Impact Assessment prepared by Imbris

brazier motti

imbris

350 Ross River Road Development

Flood Impact Assessment

Reference No. HUR001-350RRR-001

Prepared for Hurst Constructions Qld Pty Ltd

Document Control

Document	Flood Impact Assessment
Project Name:	344-350 Ross River Road Hammond Way FIA
Project Number:	HUR001

Issue Register

Distribution List	Date Issued	Revision No.
Hurst Constructions Qld Pty Ltd	10/10/25	Draft

Company Details

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This Report is provided for the exclusive use of the Client (Hurst Constructions Qld Pty Ltd) pursuant to the Scope of Works which requires Imbris Australia Pty Ltd (IMBRIS) to provide Services relating to preparing a preliminary flood impact assessment for a proposed subdivision at 344-350 Ross River Road, Cranbrook, 4814. The development designs studied herein are conceptual in nature, this work is not a detailed design nor intended for construction. Further, more detailed assessments supported by detailed survey collection are expected.

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Table of Contents

List of Figures

Executive Summary

A flood impact assessment has been completed in relation to the development of Lot 3 on SP146326 (344-346 Ross River Road) and Lots 1 and 2 on RP721729 (348 and 350 Ross River Road, respectively). It is proposed that these adjoining residential lots will be developed into an affordable housing complex comprising of two buildings, car parking and landscaped areas. The lots are located in the suburb of Cranbrook within the Townsville City Council (TCC) Local Government Area.

Townsville City Plan 2014 (Version 2024/01) Part 8.2.6.3 and Schedule 6.7 provide the local government planning scheme policy in relation to flood hazard. Under the assumptions described within this report, the outcomes from the flood impact assessment in relation to TCC planning scheme policy performance outcomes are summarised in Table 1.

Table 1 – TCC Planning Scheme Policy (SC6.7.3.1.1) Performance Outcomes & Response.

	Performance Outcome	Response
1	Development in medium and high hazard areas is designed and located to minimise susceptibility to and potential impacts of flooding.	No development is proposed within the high flood hazard area. The site is within the very low, low and medium flood hazard areas on the TCC flood hazard overlay. The proposed subdivision has been designed to incorporate raised building pads where required and ensure property access to all lots remains within the low flood hazard risk up to the defined flood event.
2	Development in high hazard areas does not significantly impede the flow of flood waters through the site or worsen flood flows external to the site.	No development is proposed in the high hazard area.
3	Development does not intensify use in high hazard areas, in order to avoid risks to people and property.	No development is proposed in the high hazard area.
4	Siting and layout of development maintains the safety of people and property in medium hazard areas.	Flood modelling of the developed case flood hazard area shows that the proposed building pads and driveway accesses are within the “Generally safe for vehicles, people and buildings” hazard category, based on Australian Emergency Management Institute definitions.
5	Signage is provided within high and medium flood hazard areas to alert residents and visitors to the flood hazard.	Signage to be confirmed as part of wider development application.
6	Development within high and medium flood hazard areas ensures any changes to the depth, duration, velocity of flood waters are contained within the site.	No development is proposed in the high flood hazard area. Based on 2D modelling of the predicted developed case flood hazard, no significant change in flood level or flow velocity is expected outside of the subject development lot up to the Defined Flood Event.
7	Development within high and medium flood hazard does not directly, indirectly or cumulatively worsen flood characteristics outside the development site, having regard to: 1. increased scour and erosion; or 2. loss of flood storage; or 3. loss of or changes to flow paths; or 4. flow acceleration or retardation; or reduction in flood warning times.	No development is proposed in the high hazard area. Based on 2D modelling of the predicted developed case flood hazard, no significant change in flood level or flow velocity is expected outside of the subject development lot up to the Defined Flood Event.
8	Facilities with a role in emergency management and vulnerable community services are able to function effectively during and immediately after flood events.	N/A.
9	Public safety and the environment are not adversely affected by the detrimental impacts of flooding on hazardous materials manufactured or stored in bulk.	N/A

1.0 Introduction

1.1 Background

A flood impact assessment has been completed for Hurst Constructions Qld Pty Ltd in relation to the proposed reconfiguration of Lot 3 on SP146326 at 344-346 Ross River Road and Lots 1 & 2 on RP721729 at 348 and 350 Ross River Road, Cranbrook, Queensland (4814) in the Townsville City Council (TCC) Local Government Area (LGA).

This report describes the assumptions and outcomes of the flood impact assessment in relation to TCC Planning Scheme requirements.

1.2 Subject Property

Lot 3 on SP146326 and Lots 1 & 2 on RP721729 are adjoining residential lots in the suburb of Cranbrook (4814) comprising a total area of approximately 5,255m^2. Figure 1 shows the proposed development plan for the combined lots (344-350 Ross River Road) involving two residential buildings with a central driveway access connecting to Ross River Road and to the council road reserve leading to Albert Street ("the Laneway").

The properties are zoned as medium-density residential and have previously been significantly modified from a natural condition. Concrete building pads remain from two demolished dwellings on 344-346 and 348 Ross River Road. A derelict dwelling is located at 350 Ross River Road.

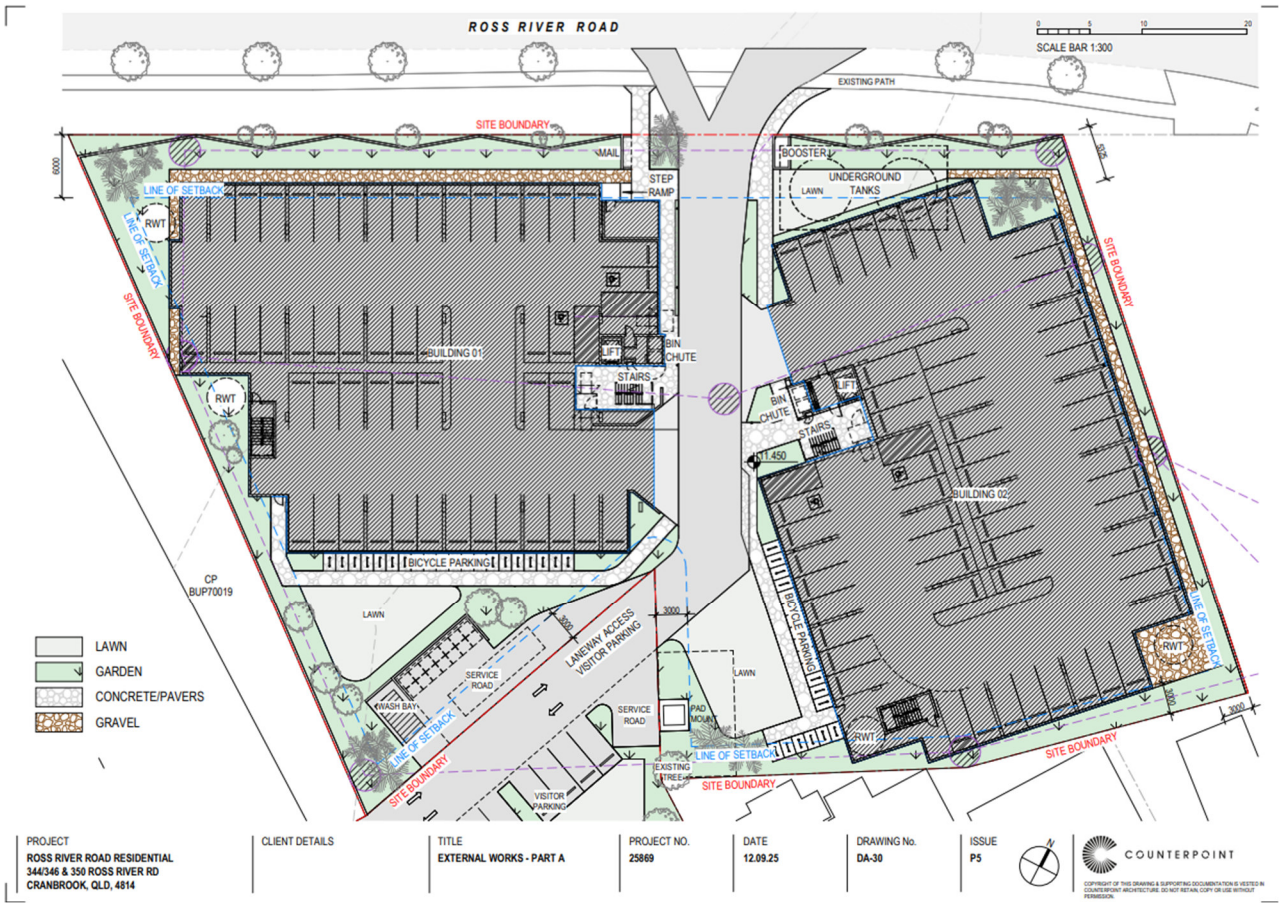


Figure 1 Subject property layout and residential development plan

1.3 Scope of Works

The scope of works for this flood impact assessment included:

- Review of the available background data including publicly available mapping data, reports and the previous flood modelling for the site
- Undertake a site visit to confirm existing conditions at the site and the location/dimensions of existing drainage infrastructure in the vicinity of the site (where accessible)
- Confirm the existing case water surface elevation, flow velocity, water depth and flood hazard for the subject site and immediate surrounds for standard Annual Exceedance Probability (AEP) events up to the TCC Planning Scheme Defined Flood Event (DFE)
- Determine the developed case water surface elevation, flow velocity, water depth and flood hazard for the subject site and immediate surrounds for standard Annual Exceedance Probability (AEP) events up to the DFE
- Determine the potential flood impact (developed case minus existing case flood depths) of the proposed development up to the DFE
- Consider the performance outcomes of the proposed lot reconfiguration in relation to TCC assessment benchmarks.

1.4 Data and Information Provided

The following data and documents were sourced to support this study:

- Preferred site subdivision layout (Counterpoint Architects Pty Ltd)
- 344-350 Ross River Road Development Stormwater Management Plan (LCJ Engineers Pty Ltd, 3rd October 2025)
- Aerial LiDAR Survey at a 1 m horizontal resolution. Aerial survey data used to develop the topography for the hydraulic model has a vertical accuracy of ± 0.15 m on clear, hard surfaces and a horizontal accuracy of ± 0.45m
- Previous flood modelling and accompanying reports for the Ross River catchment provided by TCC, which was undertaken as part of the *TCC Townsville Recalibrated Flood Modelling and Mapping Project – Ross River Flood Study* (AECOM, 2021)

2.0 Flood Impact Assessment

2.1 Approach

The 2014 Townsville City Plan provides the applicable local government planning scheme policy in relation to flood hazard (Part 8.2.6.3 and Schedule 6.7).

TCC commissioned the development and calibration of a 2D TUFLOW flood model in 2021 for the Ross River catchment. The development of the TUFLOW flood model is documented in detail within the Townsville Recalibrated Flood Modelling and Mapping – Ross River (Rev V02, August 2021) report and these details are not repeated herein.

TCC has developed a Temporary Local Planning Instrument (TLPI) for City Wide Flood Hazard Regulation which provides some updated administrative definitions, flood hazard overlay code assessment provisions, and planning scheme policies. TCC endorsed the submission to the minister in April 2025. If approved by the Minister and formally adopted by TCC this TLPI will suspend and override Part 8.2.6.3 and Schedule 6.7 of the 2014 Townsville City Plan and formally align the TCC Planning Scheme with the Queensland Building Regulation 2021, Queensland State Flood Risk Management Framework (2021) and Australian Rainfall and Runoff (ARR) Engineering Guidelines (October 2024).

Since the ARR Engineering Guidelines and Queensland State Regulations already supersede the 2014 Townsville City Plan and formal adoption of the TLPI by TCC is expected soon, the approach undertaken for this study aims to meet the requirements of the Townsville City Plan 2014 and the TLPI. The adopted flood risk design events and TCC supplied flood model data used in this study are provided in Table 2.

Table 2 – Model Scenarios adopted (TCC TLPI 01/2025 SC6.7.4.3.4)

Adopted Flood Risk Design Event	Flood Model Data Used
50% AEP	20% AEP Present Day
20% AEP	10% AEP Present Day
10% AEP	5% AEP Present Day
5% AEP	2% AEP Present Day
2% AEP	2% AEP with Climate Change
1% AEP (DFE)	1% AEP with Climate Change

2.2 Existing Flood Hazard

The subject property is located in the upper reaches of the Ross Creek catchment and drains to the Aitkenvale drain network upstream of the Stockland shopping centre. The entire lot area is flat, with no distinct formal or informal watercourse channels through the property.

Figure 3 shows the project site catchment delineation with the approximate overland flowpaths and subsurface pipe drainage network identified.

There is minimal drainage catchment area upstream of the subject site. There is no formal outflow drainage path from the property. The site generally drains to the south-east, through the car park of an adjacent commercial property and around to a low point on Albert Street close to the end of the Laneway. Ponding of water occurs at a low point on lot 3/SP146326 during all flood events. Outflows occur overland via the car park once the ponded water on the property reaches the level of the car park to the south-east.

Existing adjacent developments to the west of the subject site at 352 Ross River Road (Nathan Court) and 354 Ross River Road (Cranbrae Village) drain to Albert Street via existing pit and pipe networks. In rare and extreme flood events, some overflows from these properties are expected to enter the TCC road reserve ('the laneway") once the capacity of the pipe networks is exceeded.

Figure 2 Catchments and flowpaths (solid blue lines indicate existing pipe network, dashed blue lines indicate overland drainage flowpaths).

The latest TCC flood risk mapping shows that the southern portion of the subject property is within the Medium Flood Risk area (Figure 3). No part of the site is within the High or Very High Flood Risk area. The designation of a medium flood hazard is primarily due to water ponding, with water depths being up to 200 mm in the DFE. Flow velocities across the property site are close to zero.

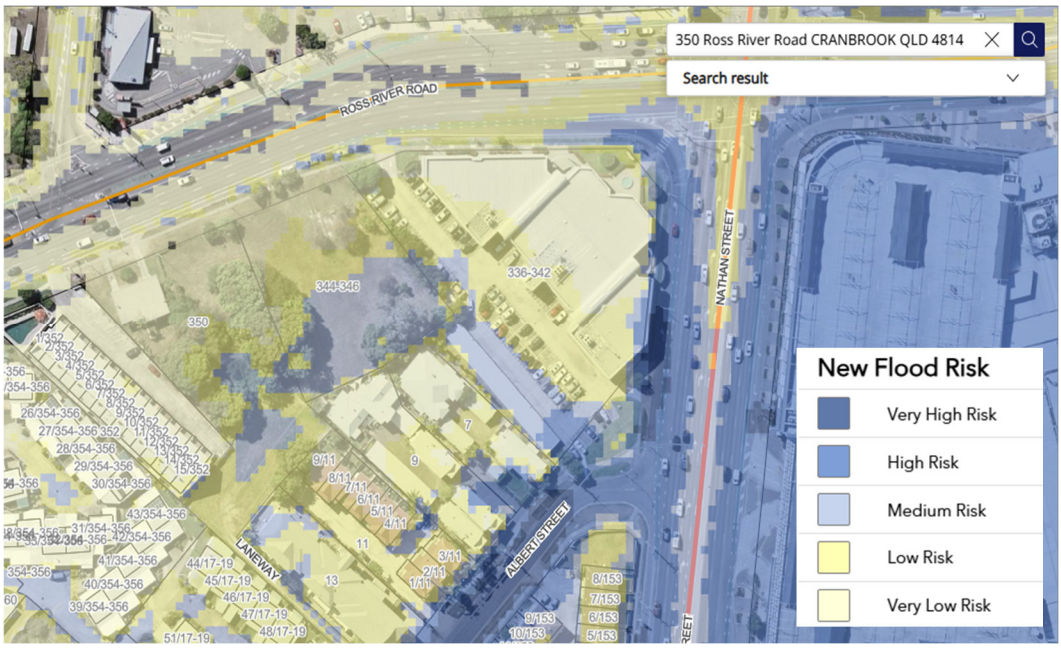


Figure 3 Flood Hazard Risk at 344-350 Ross River Road, Cranbrook. (Source: TCC Flood Information Portal, retrieved 05/09/25)

The TCC supplied hydraulic model was updated to run in the latest TUFLOW software version (2025.0.2) and to include building pads and an existing private stormwater pipe which runs underneath the Laneway, connecting a low point to the rear of 352 Ross River Road with the Albert Street pipe network.

The hydraulic model was run for standard design flood scenarios up to the DFE using the supplied model data as defined in Table 2. The baseline flood events were simulated for the catchment-wide critical duration and temporal patterns as defined in Volume 2 of the Townsville Recalibrated Flood Modelling and Mapping – Ross River (August 2021). These were the 120-minute-hour and the 180-minute storms. The catchment hydrology is modelled entirely within the 2D TUFLOW model using the rain-on-grid approach.

Maps of the existing flood depths and extents for all events up to the 1% AEP are provided in Appendix A. Due to the lack of any formal drainage channel immediately upstream of 350 Ross River Road, flooding across the site is characterised as shallow overland flow with ponding at low points ranging 0.1 - 0.3 m depth across southern section of the subject site and in the adjacent laneway.

2.3 Developed Case Flood Impact Assessment

A site stormwater management plan has been completed for the proposed development (refer to Figure 4 for layout, LCJ Engineers Pty Ltd 03/10/2025). As outlined in the stormwater management plan, it is proposed that rainfall up to the 1% AEP will be captured via the building roof and gutter system and detained on-site across 4 storage tanks, each with a 15 mm diameter orifice outflow connecting to the underground pipe network which leads to Albert Street. Stormwater will be released into the proposed pipe system over a 12-24 hour period.

The existing case flood model was updated to reflect the proposed subdivision layout and stormwater network with building footprints as shown in Figure 5. The building pads are proposed to be filled to a minimum level of 11.35 m AHD (1% AEP + 300 mm freeboard). It is noted that the lower floor of the proposed buildings is designated for car parking and the proposed habitable floor levels are much higher.

The hydraulic model surface roughness was also updated to include the proposed building footprints.

In addition to the filling associated with the proposed raised buildings pads and driveways, it was assumed that the exterior landscaped lawn areas are lower than the building pads in order to detain excess stormwater prior to its release via the underground pipe network.

Since it is also proposed to modify the Laneway as part of the development, this was upgrade was also included in the hydraulic model. It is assumed that generally no raising of current laneway level occurs except in the vicinity of the subject property access and that shallow overflow paths into the laneway from Nathan Court and Cranbrae Residential are not blocked by solid fencing.

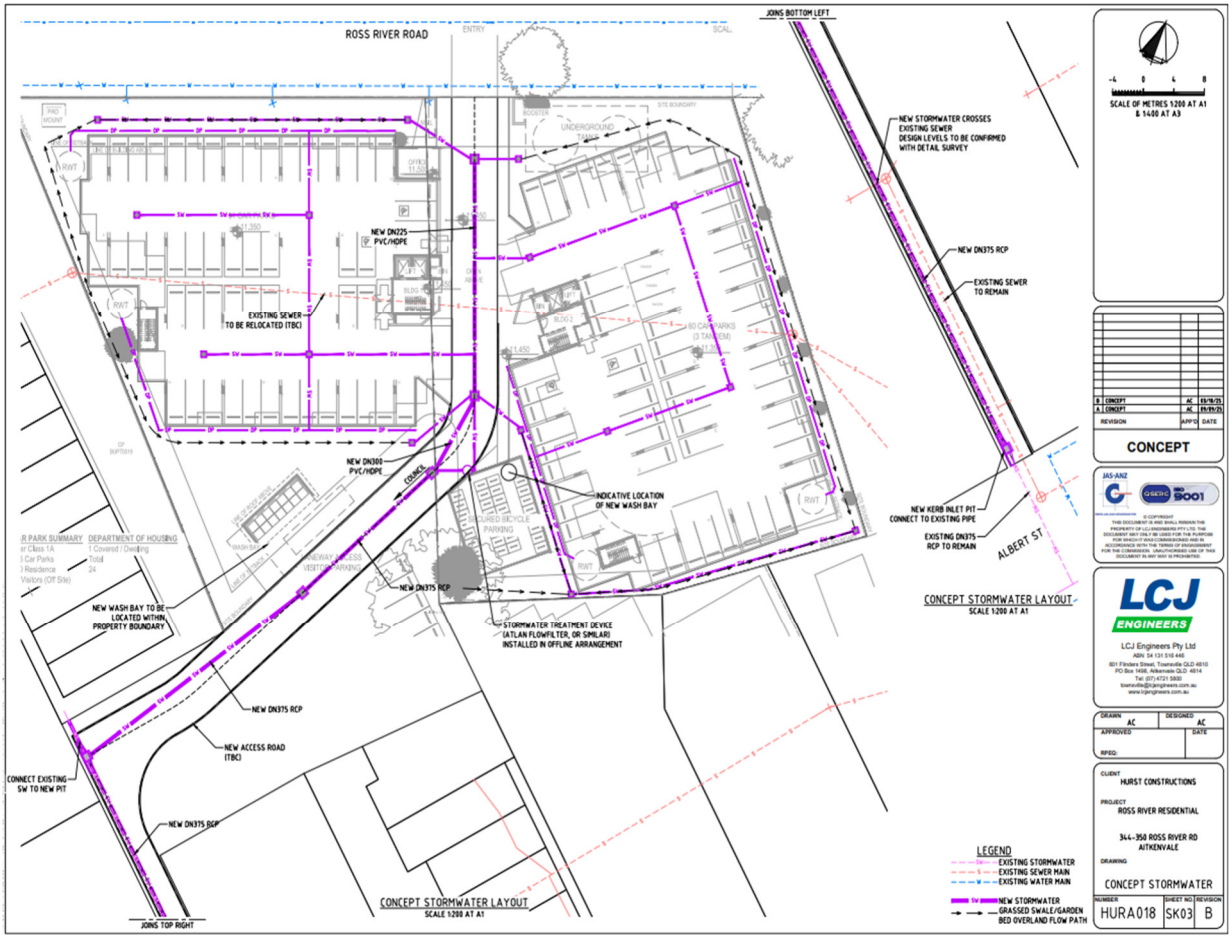


Figure 4 Concept Stormwater Layout from the Stormwater Management Plan (LCJ, 03/10/25)

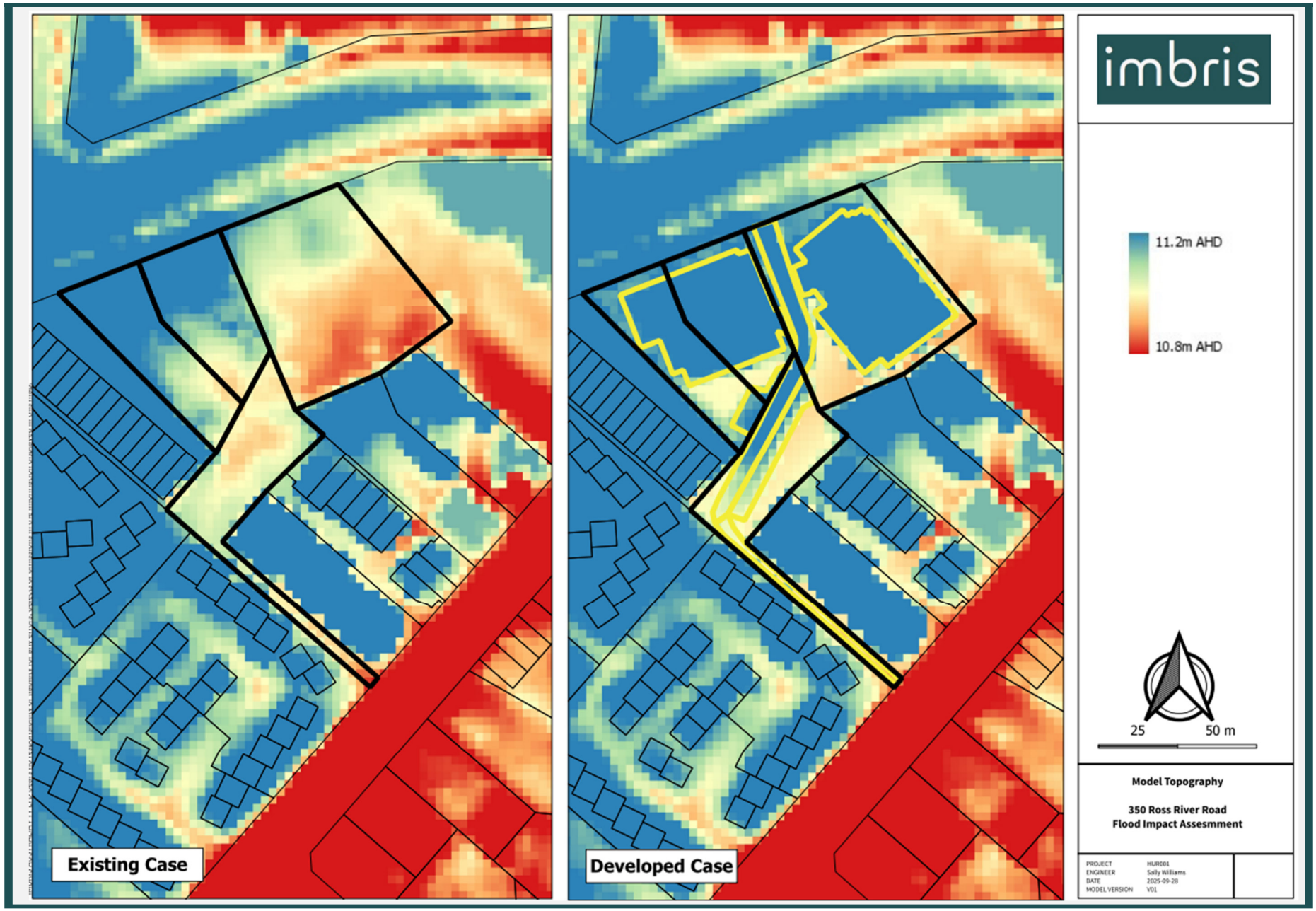


Figure 5 Hydraulic Model Topography (Existing and Developed)

2.4 Results and Discussion

The developed case model was run for the same critical durations and for all AEPs as the existing case. Maps of the maximum water depth and flow velocity, and the difference in water surface level (afflux) between the developed case and the existing case are provided in Appendix A.

Key outcomes of the developed case flood impact assessment include:

- Up to the DFE, peak water depths in lawn areas surrounding the building pads are in the order of 0.1-0.25 m (Maps A1-A6).
- No significant increases (i.e. < 10 mm) in peak flood levels are predicted outside of the proposed development lot up to the DFE (Maps A7-A12).
- Overland flow velocities across the site remain below 0.25 m/s up to the DFE (Map A13).
- Although inundated in some parts, the access road via the rear laneway is expected to remain trafficable up to the DFE.
- Figure 6 shows the flood hazard map for the developed case. Hazard categories are defined according to the "Technical flood risk management guideline: Flood hazard - Supporting document for the implementation of Australian Emergency Management Handbook 7, Managing the floodplain: Best practice in flood risk management in Australia" by the Australian Emergency Management Institute.
- Figure 6 shows that for the developed-case scenario the subject lot remains within the "H1: No restrictions" category.

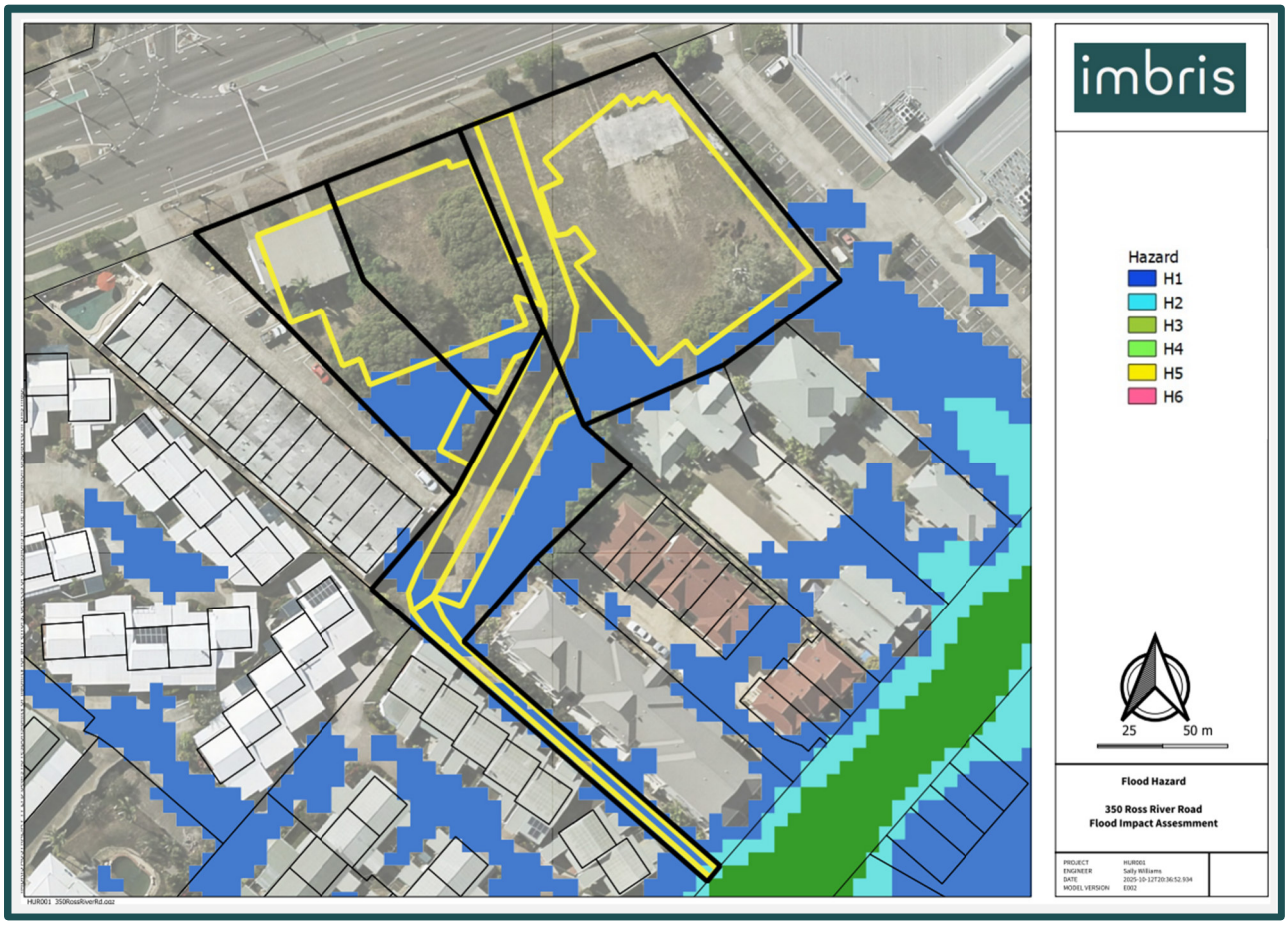


Figure 6 Developed Case 1% AEP Flood Hazard Mapping

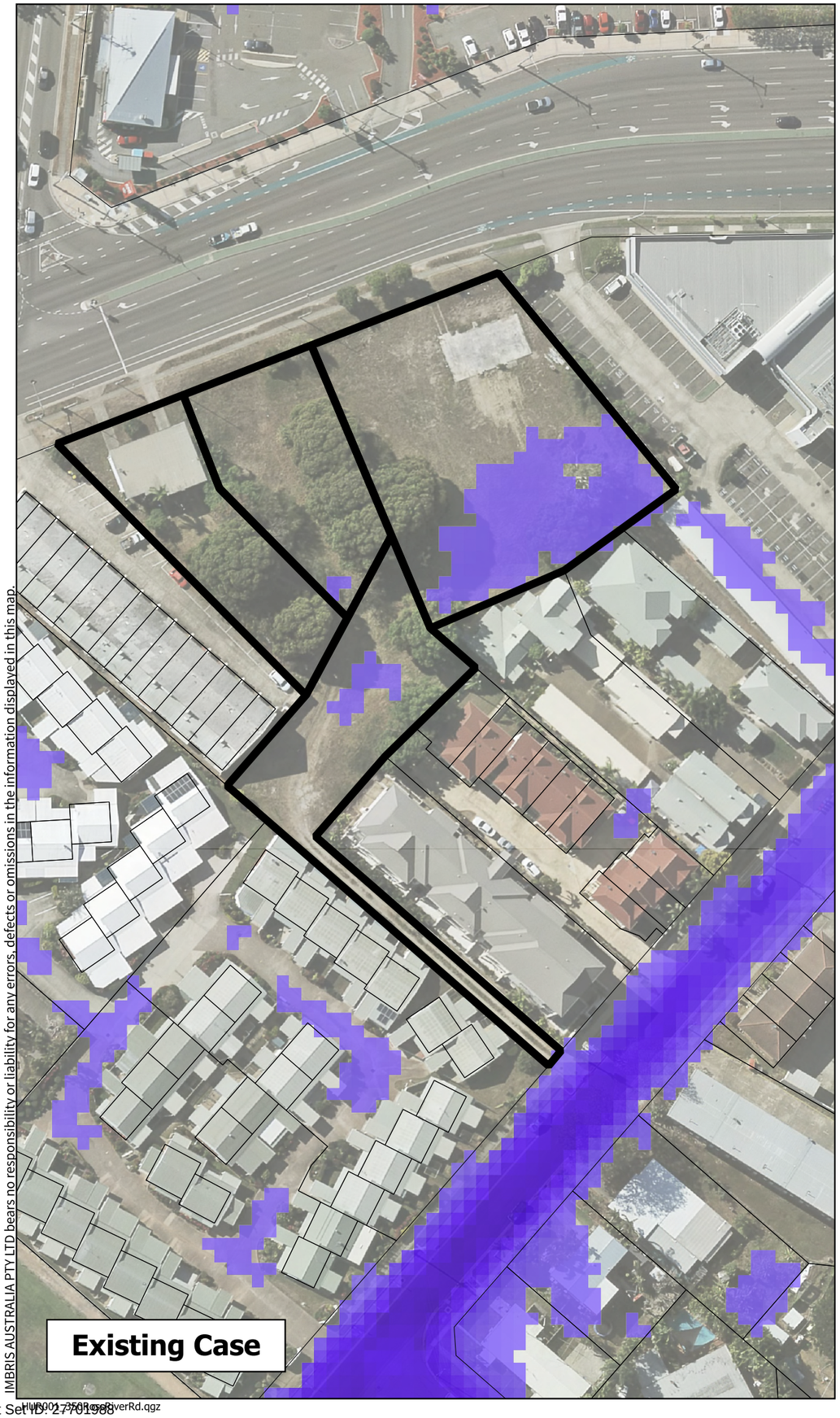
3.0 Conclusion

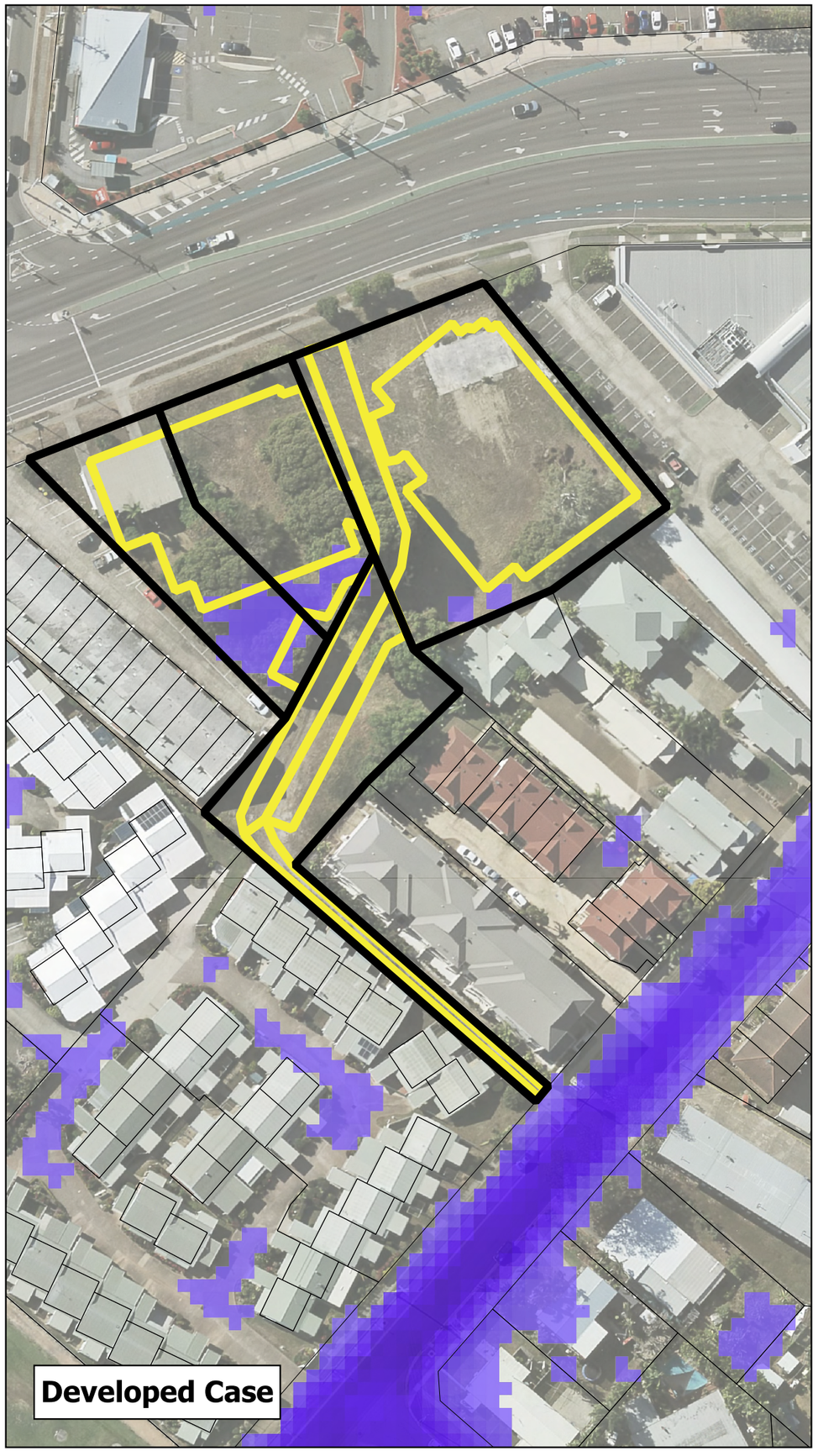
A flood impact assessment has been undertaken in relation to the proposed development of Lot 3 on SP146326 (344-346 Ross River Road) and Lots 1 and 2 on RP721729 (348 and 350 Ross River Road, respectively).

Under the assumptions described within this report, the impacts on flood events up to the TCC DFE have been evaluated to confirm no adverse impacts on flood levels, depths, flow velocities and time of inundation external to the site.

Townsville City Council (TCC) Flood Hazard Planning Scheme Policy (Part 8.2.6.3 and Schedule 6.7.3.1.1) outlines several assessment benchmarks associated for proposed developments. The development outcomes in relation to these benchmarks are summarised in Table 1.

Appendix A - Mapping





HUR001_350RossRiverRd.qgz

imbris

Water Depth
(m)
- >0.1
- 0.3
- 0.5
- 0.75
- 1
- 1.5
- 2
- >3

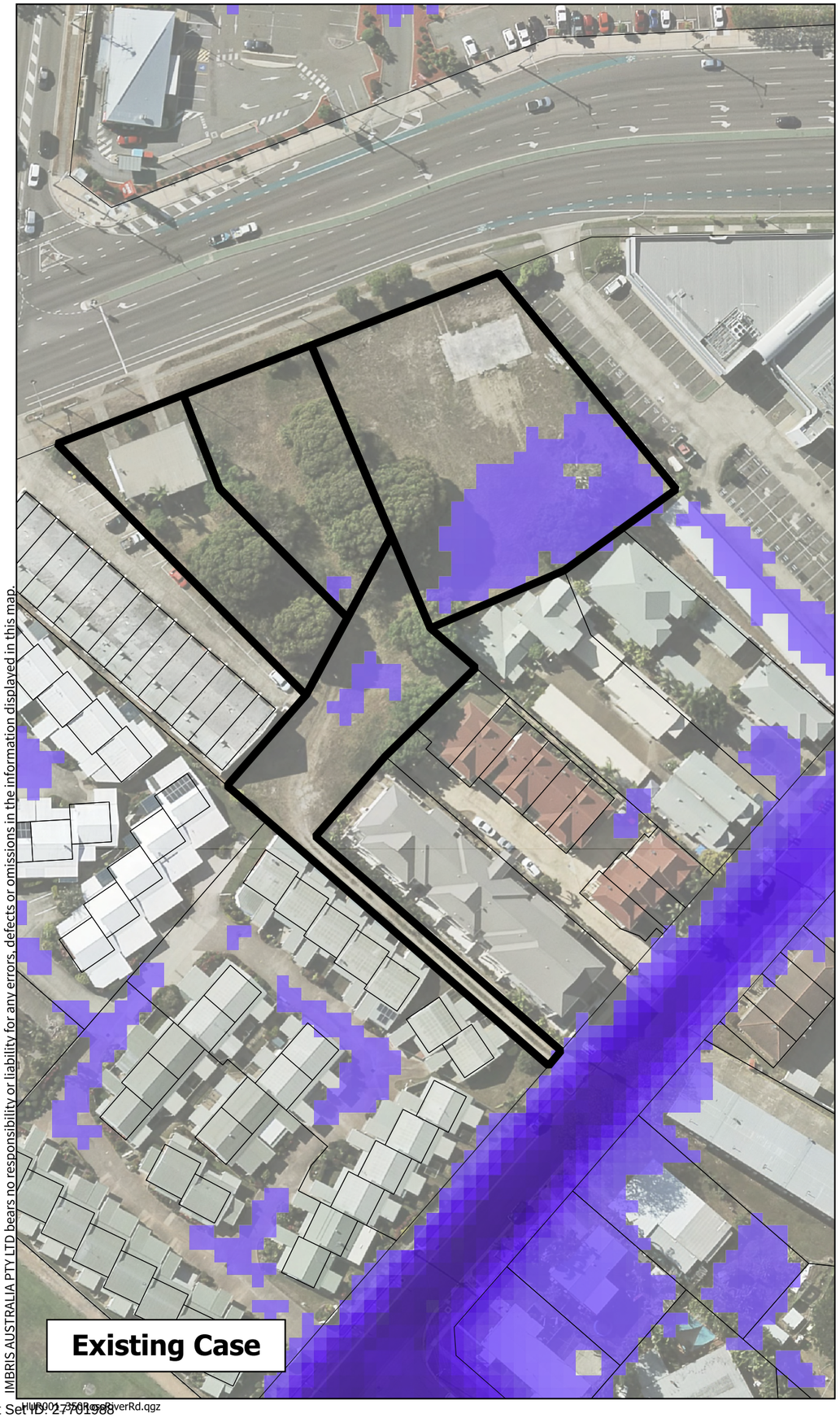
25 50 m

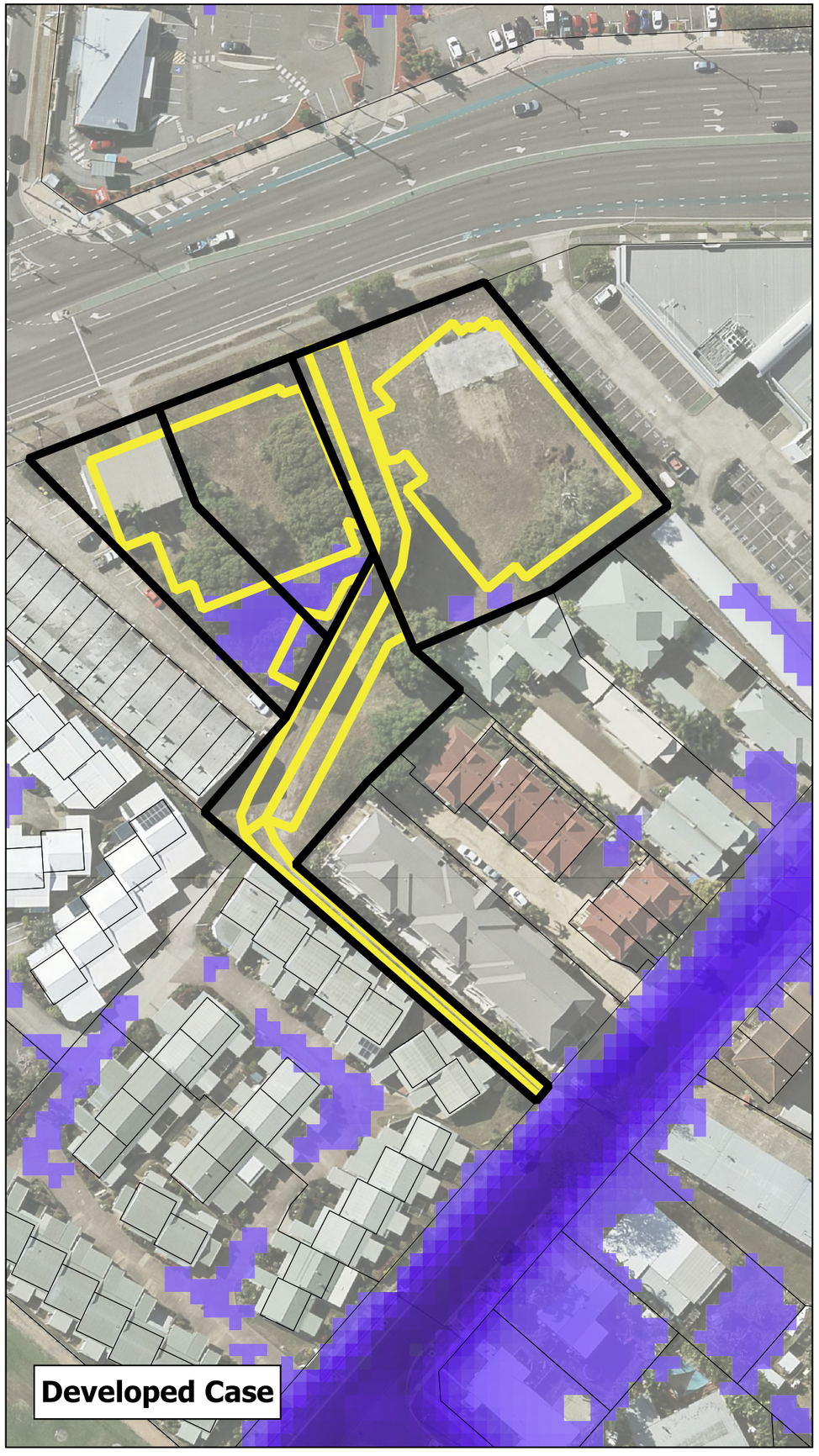
50% AEP - Maximum Water Depth

350 Ross River Road
Flood Impact Assesmment

PROJECT	HUR001
ENGINEER	Sally Williams
DATE	2025-09-28
MODEL VERSION	V01

Map A1





imbris

Water Depth
(m)
- >0.1
- 0.3
- 0.5
- 0.75
- 1
- 1.5
- 2
- >3

25 50 m

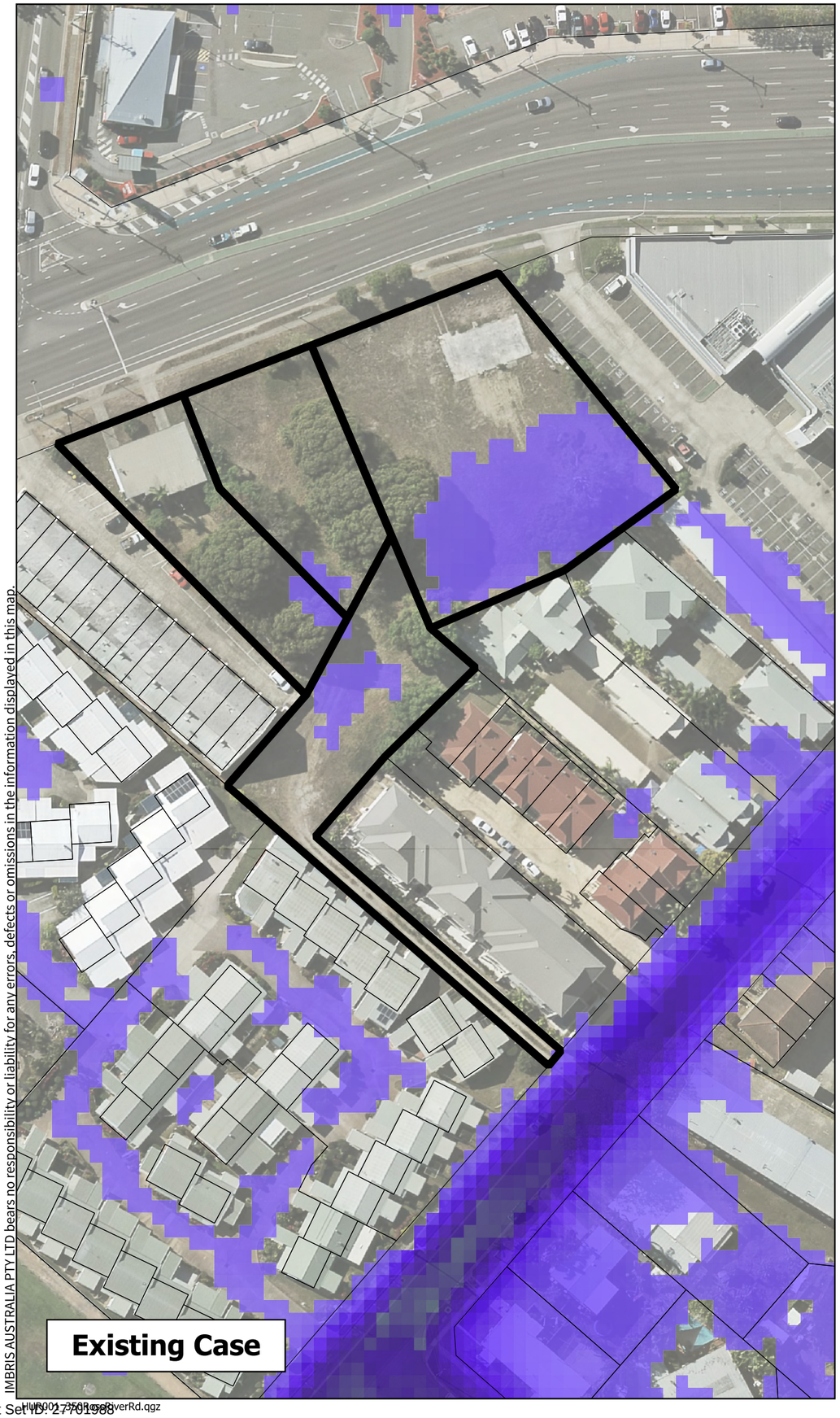
20% AEP - Maximum Water Depth

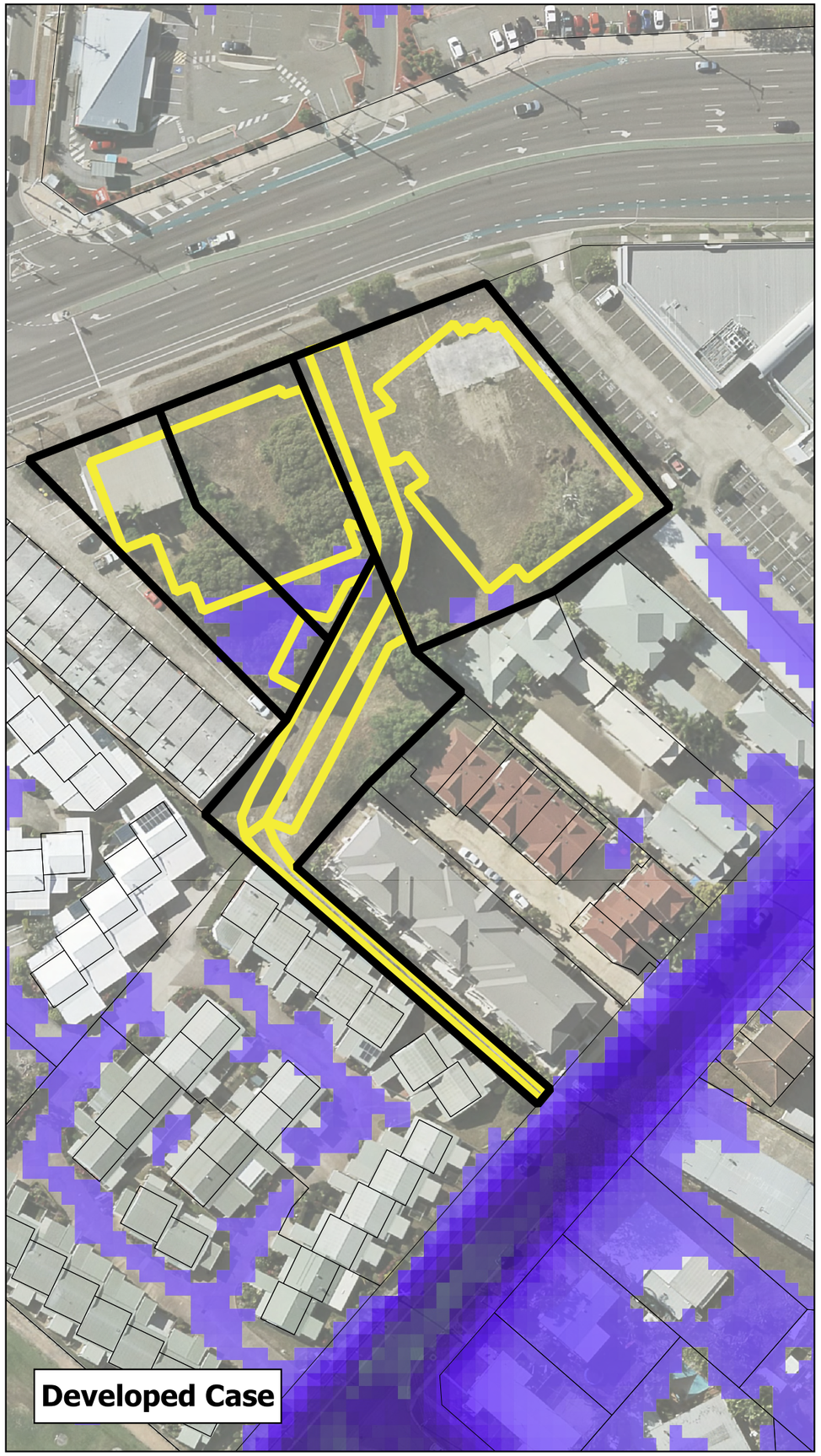
350 Ross River Road
Flood Impact Assesmment

PROJECT	HUR001
ENGINEER	Sally Williams
DATE	2025-09-28
MODEL VERSION	V01

Map A2

HUR001_350RossRiverRd.qgz





HUR001_350RossRiverRd.qgz

imbris

Water Depth
(m)
- >0.1
- 0.3
- 0.5
- 0.75
- 1
- 1.5
- 2
- >3

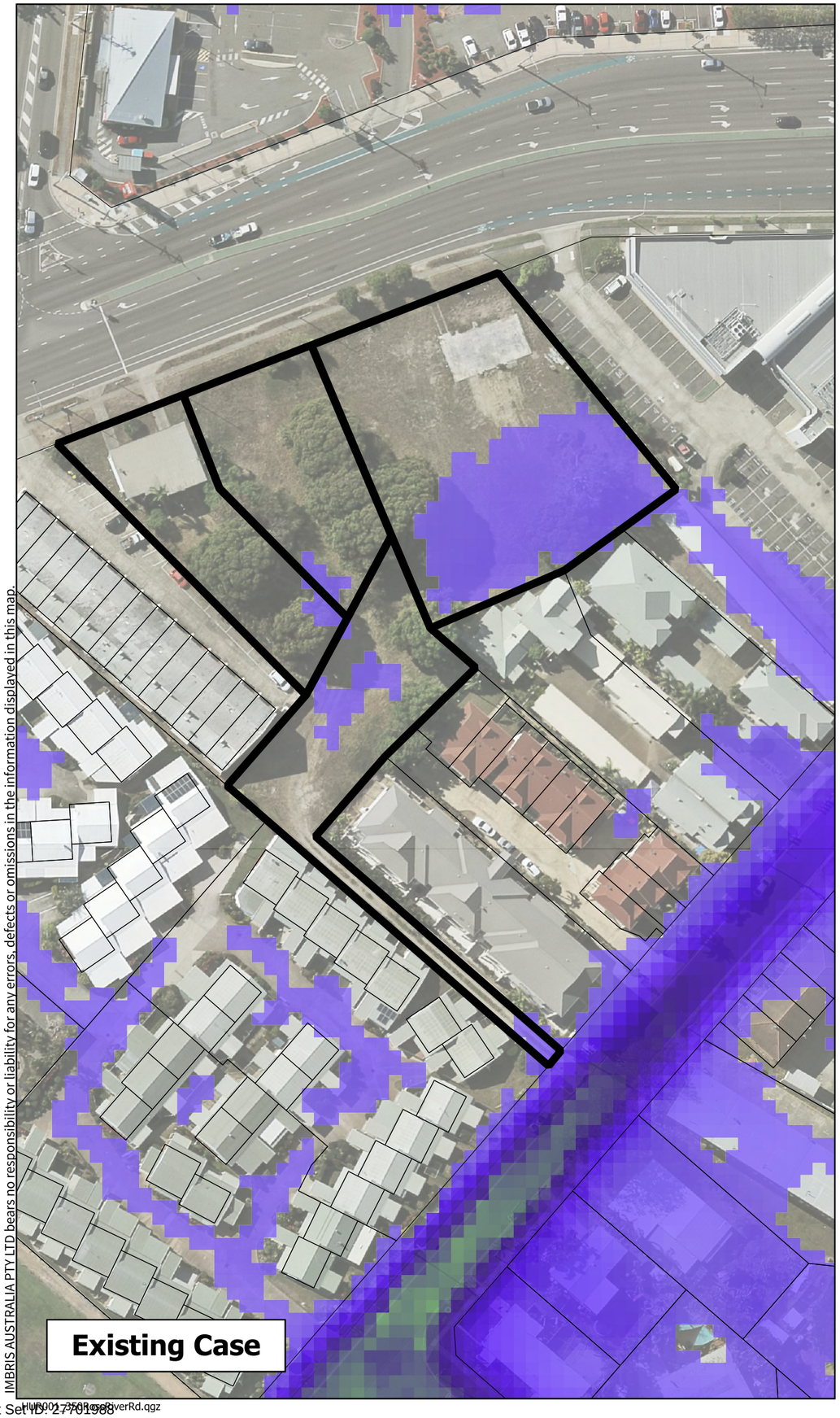
25 50 m

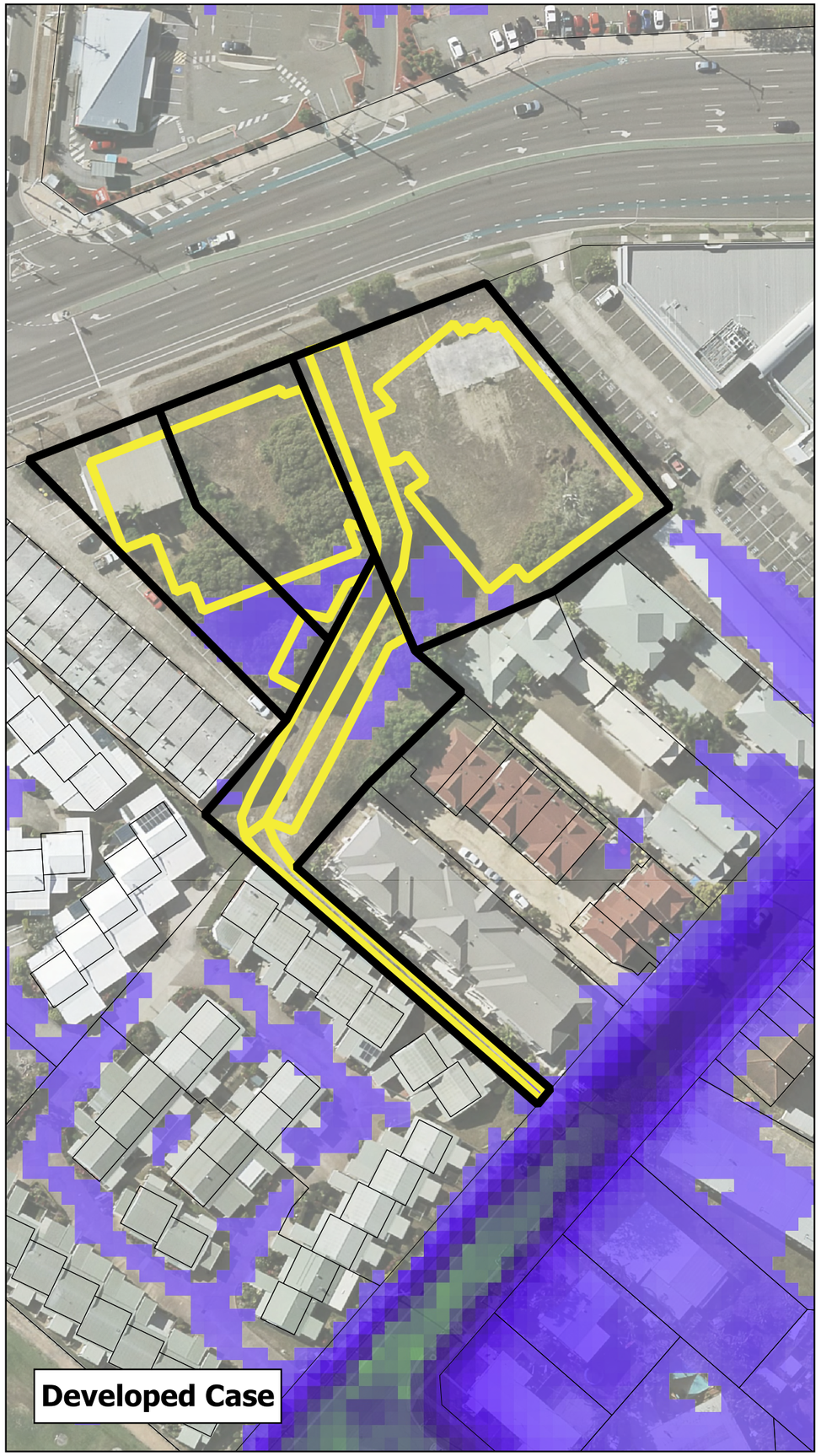
10% AEP - Maximum Water Depth

350 Ross River Road
Flood Impact Assesmment

PROJECT	HUR001
ENGINEER	Sally Williams
DATE	2025-09-28
MODEL VERSION	V01

Map A3





HUR001_350RossRiverRd.qgz

imbris

Water Depth
(m)
- >0.1
- 0.3
- 0.5
- 0.75
- 1
- 1.5
- 2
- >3

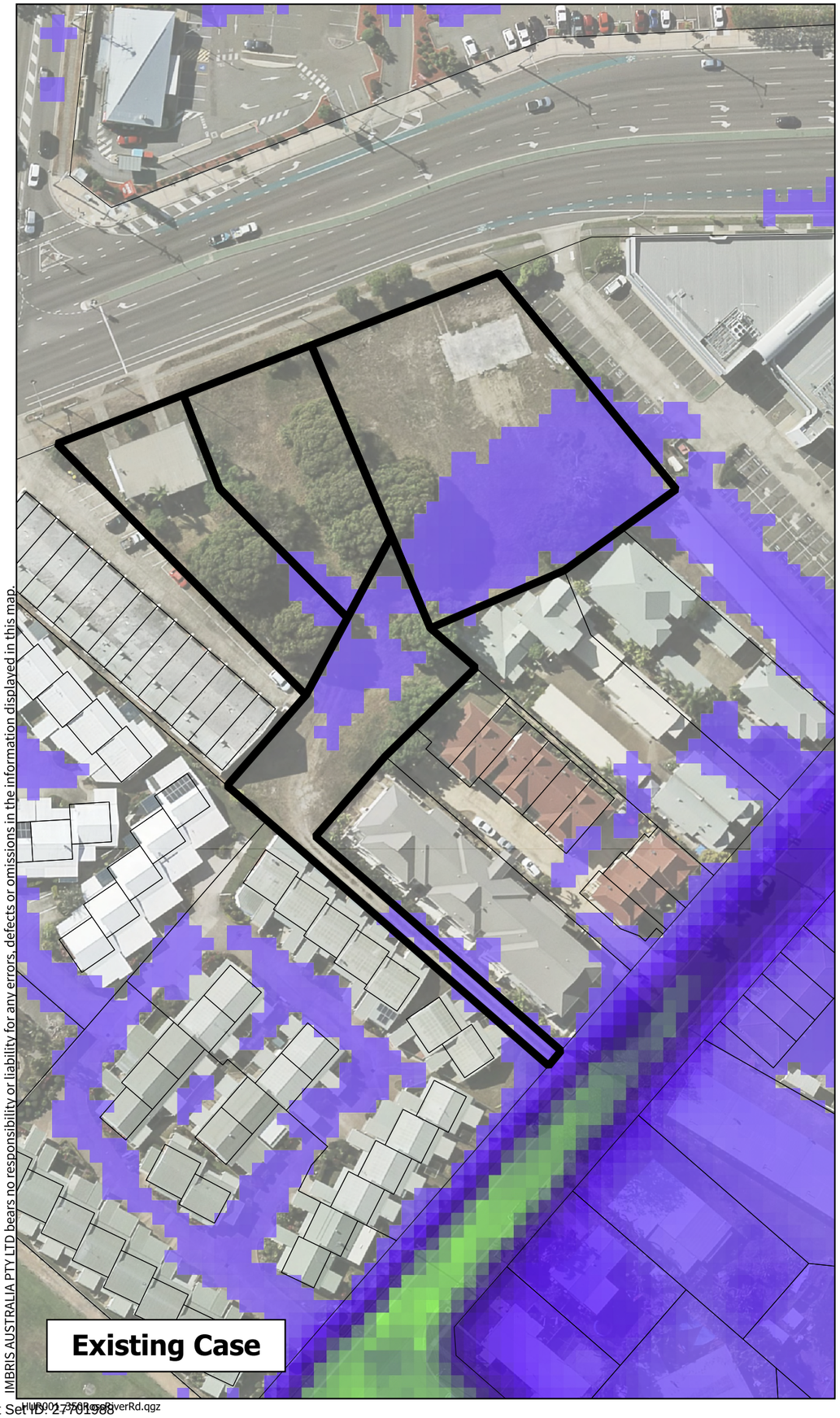
25 50 m

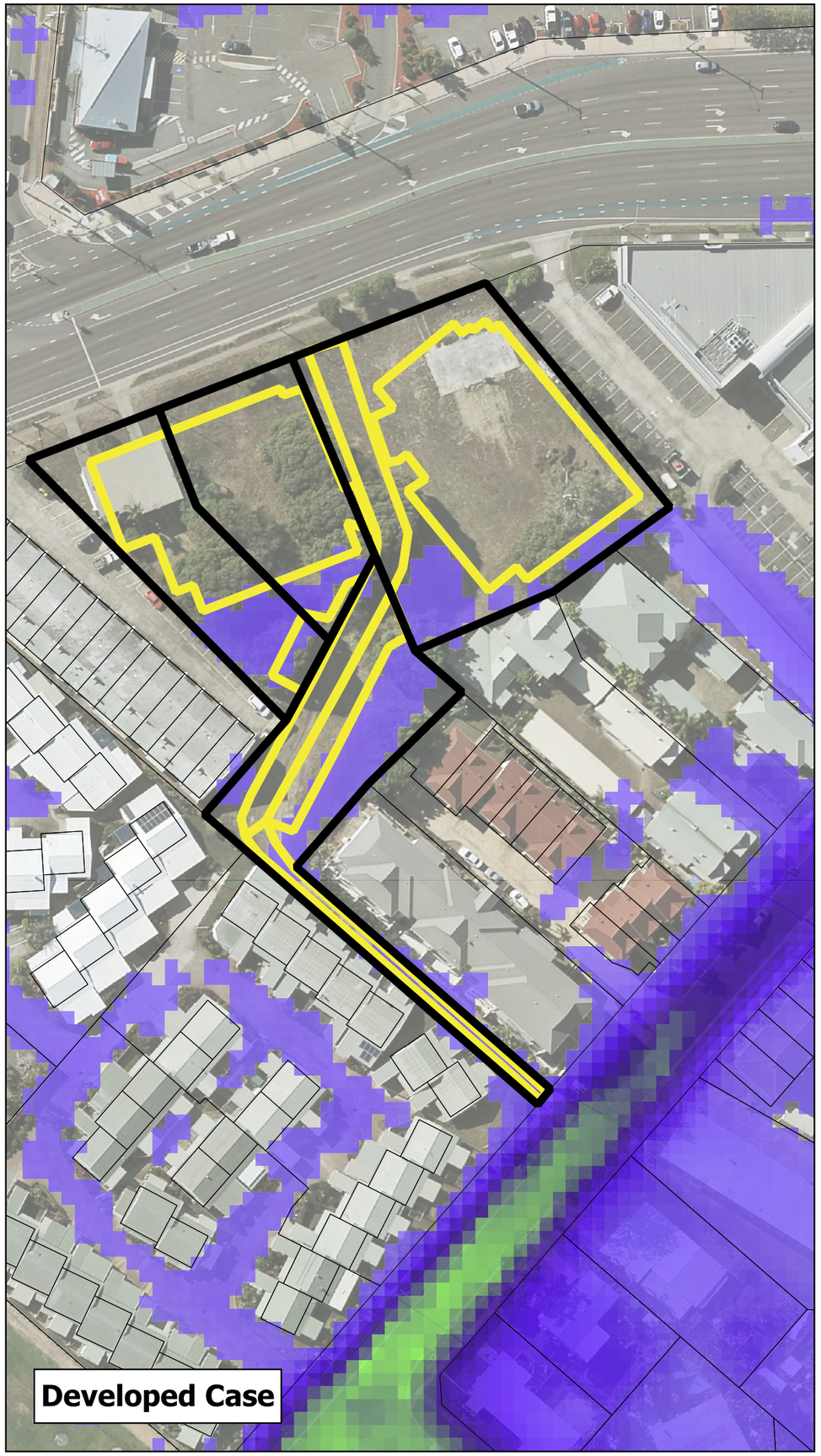
5% AEP - Maximum Water Depth

350 Ross River Road
Flood Impact Assesmment

PROJECT	HUR001
ENGINEER	Sally Williams
DATE	2025-09-28
MODEL VERSION	V01

Map A4





HUR001_350RossRiverRd.qgz

imbris

Water Depth
(m)
- >0.1
- 0.3
- 0.5
- 0.75
- 1
- 1.5
- 2
- >3

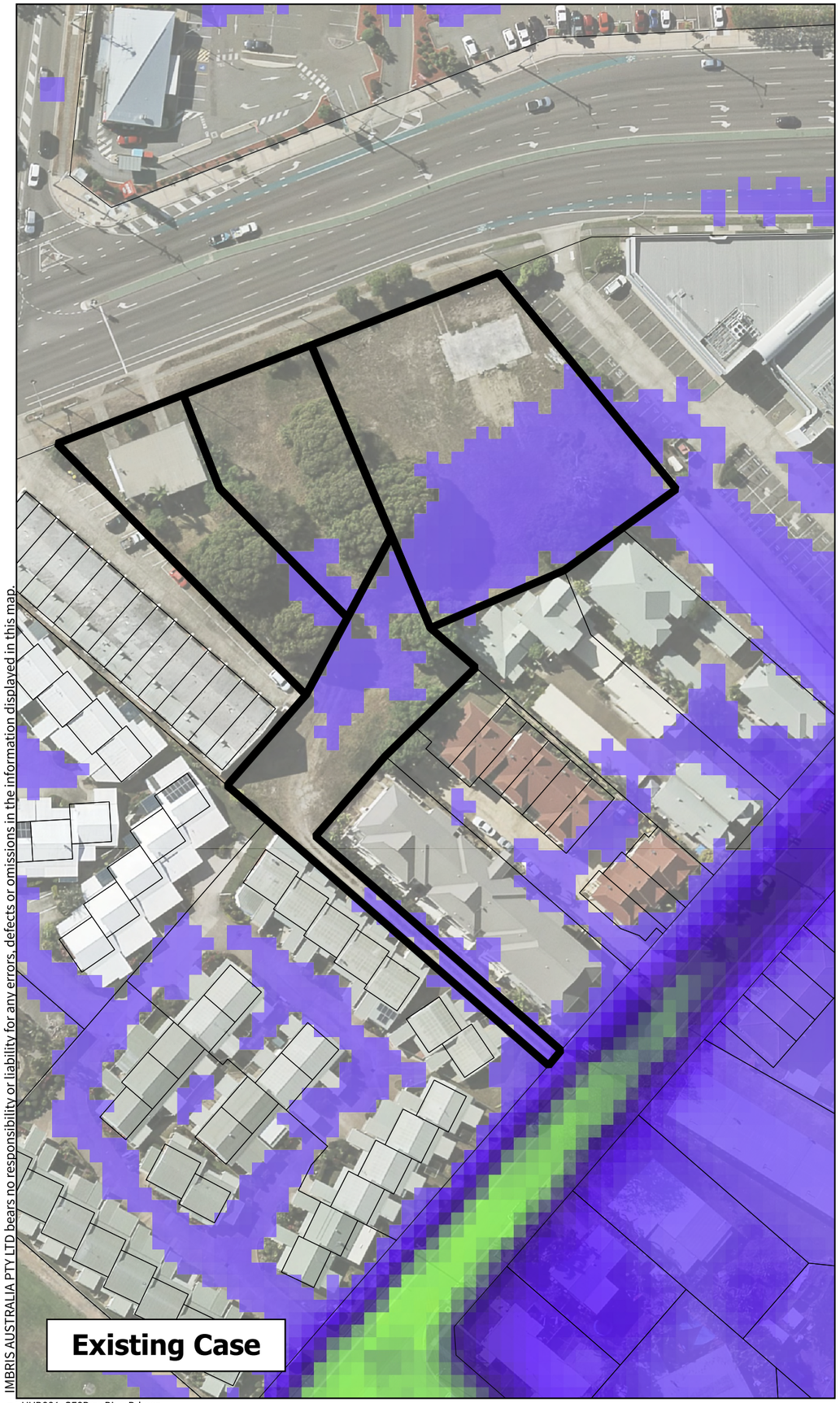
25 50 m

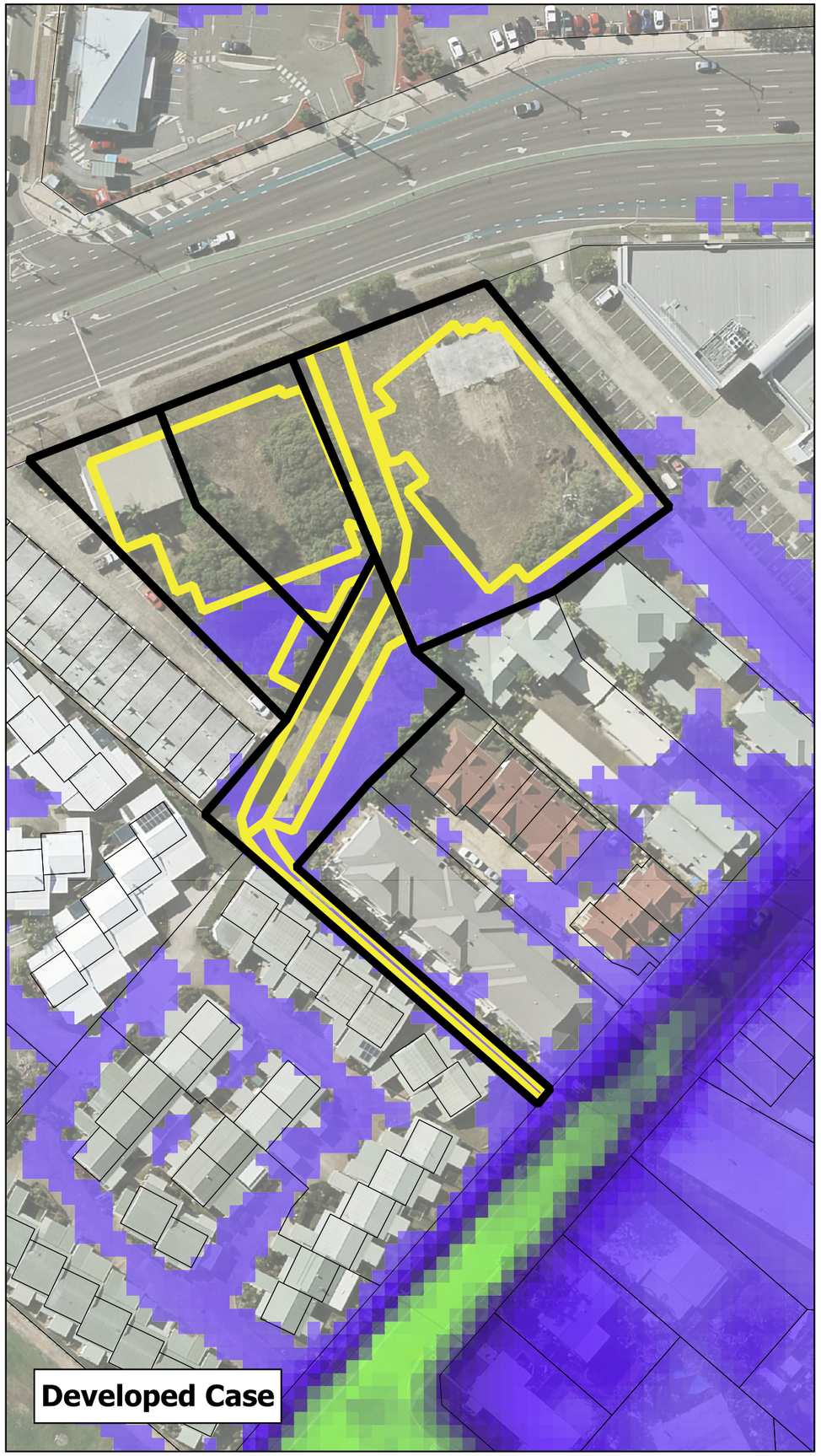
2% AEP - Maximum Water Depth

350 Ross River Road
Flood Impact Assesmment

PROJECT	HUR001
ENGINEER	Sally Williams
DATE	2025-09-28
MODEL VERSION	V01

Map A5





HUR001_350RossRiverRd.qgz

imbris

Water Depth
(m)
- >0.1
- 0.3
- 0.5
- 0.75
- 1
- 1.5
- 2
- >3

25 50 m

1% AEP - Maximum Water Depth

350 Ross River Road
Flood Impact Assesmment

PROJECT	HUR001	**Map A6**
ENGINEER	Sally Williams	
DATE	2025-09-28	
MODEL VERSION	V01	

imbris

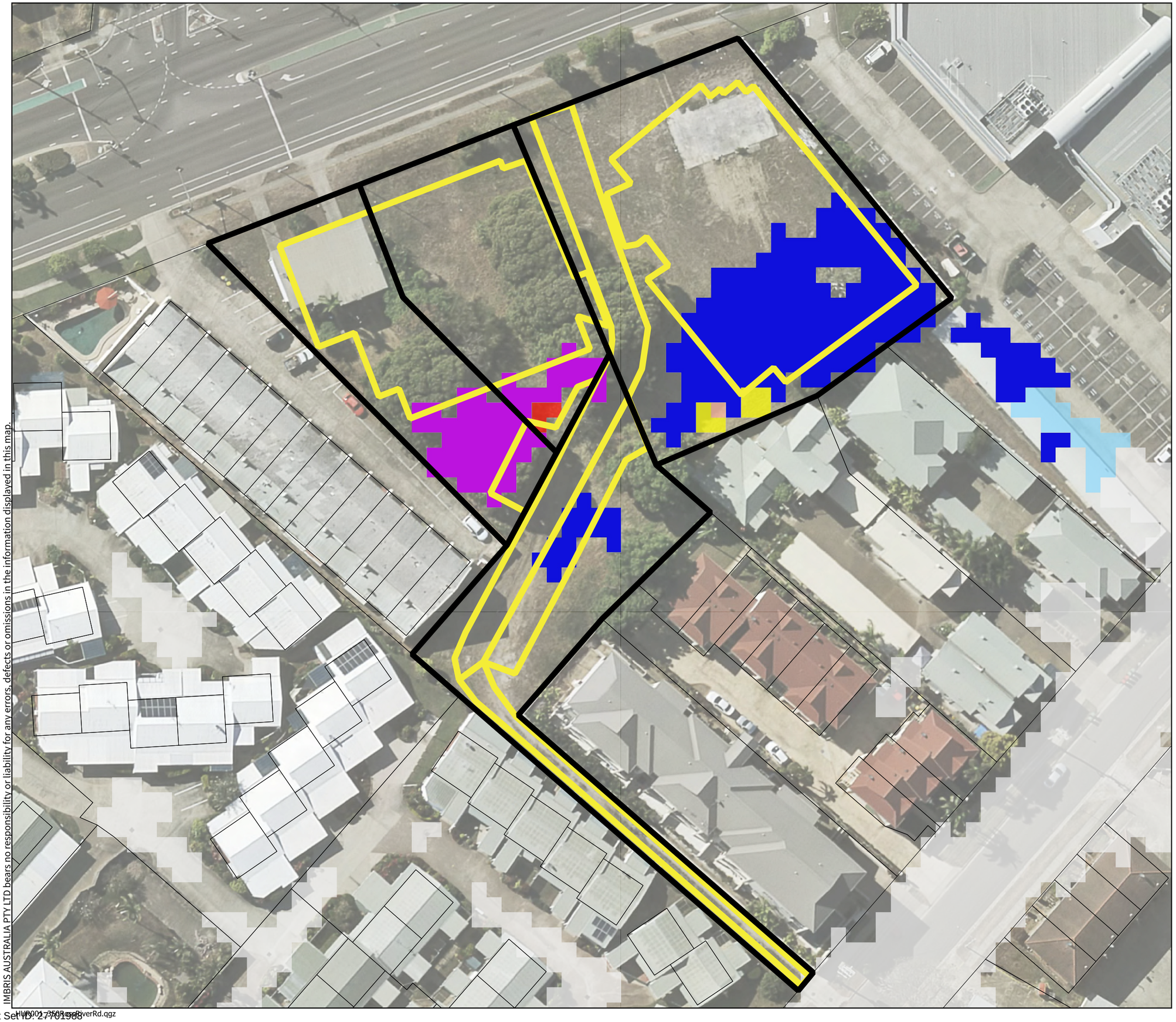
50% AEP - Afflux

350 Ross River Road
Flood Impact Assesmment

PROJECT	HUR001
ENGINEER	Sally Williams
DATE	2025-10-12T20:45:18.705
MODEL VERSION	E002

Map A7

HUR001_250RossRiverRd.qgz



imbris

20% AEP - Afflux

350 Ross River Road
Flood Impact Assesmment

PROJECT	HUR001	**Map A8**
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DATE	2025-10-12T20:47:50.289	
MODEL VERSION	E002	

HUR001_350RossRiverRd.qgz

imbris

10% AEP - Afflux

350 Ross River Road
Flood Impact Assesmment

PROJECT	HUR001	**Map A9**
ENGINEER	Sally Williams	
DATE	2025-10-12T20:48:27.130	
MODEL VERSION	E002	

HUR001_350RossRiverRd.qgz

imbris

5% AEP - Afflux

350 Ross River Road
Flood Impact Assesmment

PROJECT	HUR001
ENGINEER	Sally Williams
DATE	2025-10-12T20:50:08.188
MODEL VERSION	E002

Map A10

HUR001_350RossRiverRd.qgz

imbris

Water Level Difference (m)

- <-0.01
- -0.01 - 0.01
- 0.01 - 0.025
- 0.025 - 0.05
- 0.05 - 0.10
- 0.10 - 0.20
- >0.2
- Was Wet Now Dry
- Was Dry Now Wet

25 50 m

2% AEP - Afflux

350 Ross River Road
Flood Impact Assesmment

PROJECT	HUR001
ENGINEER	Sally Williams
DATE	2025-10-13T07:20:57.759
MODEL VERSION	E002

Map A11

HUR001_350RossRiverRd.qgz

imbris

1% AEP - Afflux

350 Ross River Road
Flood Impact Assesmment

PROJECT	HUR001
ENGINEER	Sally Williams
DATE	2025-10-13T07:19:46.233
MODEL VERSION	E002

Map A12

HUR001_350RossRiverRd.qgz

Velocity (m/s)
- < 0.25
- 0.25 - 0.50
- 0.50 - 0.75
- 0.75 - 1.00
- 1.00 - 1.25
- 1.25 - 1.50
- 1.50 - 2.00
- 2.00 - 2.50
- 2.50 - 3.00
- > 3.00

25 50 m

1% AEP - Maximum Flow Velocity

350 Ross River Road
Flood Impact Assesmment

PROJECT	HUR001
ENGINEER	Sally Williams
DATE	2025-10-12T20:54:46.456
MODEL VERSION	E002

Map A13

HUR001_350RossRiverRd.qgz

APPENDIX I

State Code 1 Assessment

brazier motti

State code 1: Development in a state-controlled road environment

State Development Assessment Provisions guideline - State Code 1: Development in a state-controlled road environment. This guideline provides direction on how to address State Code 1.

Table 1.1 Development in general

Performance outcomes	Acceptable outcomes	Response
Buildings, structures, infrastructure, services and utilities		
PO1 The location of the development does not create a safety hazard for users of the **state-controlled road.**	**AO1.1** Development is not located in a **state-controlled road**. AND **AO1.2** Development can be maintained without requiring access to a **state-controlled road**.	**Complies** Refer to the Traffic Impact Assessment prepared by Premise (***Appendix F***).
PO2 The design and construction of the development does not adversely impact the **structural integrity** or physical condition of the **state-controlled road** or **road transport infrastructure**.	No acceptable outcome is prescribed.	**Complies** Refer to the Traffic Impact Assessment prepared by Premise (***Appendix F***).
PO3 The location of the development does not obstruct **road transport infrastructure** or adversely impact the operating performance of the **state-controlled road**.	No acceptable outcome is prescribed.	**Complies** Refer to the Traffic Impact Assessment prepared by Premise (***Appendix F***).
PO4 The location, placement, design and operation of advertising devices, visible from the **state-controlled road**, do not create a safety hazard for users of the **state-controlled road**.	No acceptable outcome is prescribed.	**Not applicable.**

Performance outcomes	Acceptable outcomes	Response
PO5 The design and construction of buildings and **structures** does not create a safety hazard by distracting users of the **state-controlled road**.	**AO5.1** Facades of buildings and **structures** fronting the **state-controlled road** are made of non-reflective materials. AND **AO5.2** Facades of buildings and **structures** do not direct or reflect point light sources into the face of oncoming traffic on the **state-controlled road**. AND **AO5.3** External lighting of buildings and **structures** is not directed into the face of oncoming traffic on the **state-controlled road**. AND **AO5.4** External lighting of buildings and **structures** does not involve flashing or laser lights.	**Complies** Refer to concept design plans showing external material. These aspects can be conditioned. External lighting will be as per Australian Standard.
PO6 Road, pedestrian and bikeway bridges over a **state-controlled road** are designed and constructed to prevent projectiles from being thrown onto the **state-controlled road**.	**AO6.1** Road, pedestrian and bikeway bridges over the **state-controlled road** include throw protection screens in accordance with section 4.11 of the Design Criteria for Bridges and Other Structures Manual, Department of Transport and Main Roads, 2020.	**Not applicable.**
Landscaping		
PO7 The location of landscaping does not create a safety hazard for users of the **state-controlled road**.	**AO7.1** Landscaping is not located in a **state-controlled road**. AND **AO7.2** Landscaping can be maintained without requiring access to a **state-controlled road**.	**Complies** Landscaping is proposed internal to the site.

Performance outcomes	Acceptable outcomes	Response
	AND **AO7.3** Landscaping does not block or obscure the sight lines for vehicular access to a **state-controlled road**.	
Stormwater and overland flow		
PO8 Stormwater run-off or overland flow from the development site does not create or exacerbate a safety hazard for users of the **state-controlled road**.	No acceptable outcome is prescribed.	**Complies** Refer to Stormwater Management Plan prepared by LCJ Engineers (***Appendix E***).
PO9 Stormwater run-off or overland flow from the development site does not result in a material worsening of the operating performance of the **state-controlled road** or **road transport infrastructure**.	No acceptable outcome is prescribed.	**Complies** Refer to Stormwater Management Plan prepared by LCJ Engineers (***Appendix E***).
PO10 Stormwater run-off or overland flow from the development site does not adversely impact the **structural integrity** or physical condition of the **state-controlled road** or **road transport infrastructure**.	No acceptable outcome is prescribed.	**Complies** Refer to Stormwater Management Plan prepared by LCJ Engineers (***Appendix E***).
PO11 Development ensures that stormwater is lawfully discharged.	**AO11.1** Development does not create any new points of discharge to a **state-controlled road.** AND **AO11.2** Development does not concentrate flows to a **state-controlled road**. AND **AO11.3** Stormwater run-off is discharged to a **lawful point of discharge**. AND	**Complies** Refer to Stormwater Management Plan prepared by LCJ Engineers (***Appendix E***).

Performance outcomes	Acceptable outcomes	Response
	AO11.4 Development does not worsen the condition of an existing **lawful point of discharge** to the **state-controlled road**.	
Flooding		
PO12 Development does not result in a material worsening of flooding impacts within a **state-controlled road**.	**AO12.1** For all flood events up to 1% **annual exceedance probability**, development results in negligible impacts (within +/- 10mm) to existing flood levels within a **state-controlled road**. AND **AO12.2** For all flood events up to 1% **annual exceedance probability**, development results in negligible impacts (up to a 10% increase) to existing peak velocities within a **state-controlled road**. AND **AO12.3** For all flood events up to 1% **annual exceedance probability**, development results in negligible impacts (up to a 10% increase) to existing time of submergence of a **state-controlled road**.	**Complies** Refer to the Flood Impact Assessment prepared by Imbris (***Appendix H***).
Drainage Infrastructure		
PO13 Drainage infrastructure does not create a safety hazard for users in the **state-controlled road**.	**AO13.1** Drainage infrastructure is wholly contained within the development site, except at the **lawful point of discharge**. AND	**Complies** Refer to Stormwater Management Plan prepared by LCJ Engineers (***Appendix E***).

Performance outcomes	Acceptable outcomes	Response
	AO13.2 Drainage infrastructure can be maintained without requiring access to a **state-controlled road**.	
PO14 Drainage infrastructure associated with, or within, a **state-controlled road** is constructed, and designed to ensure the **structural integrity** and physical condition of existing drainage infrastructure and the surrounding drainage network.	No acceptable outcome is prescribed.	**Complies** Refer to Stormwater Management Plan prepared by LCJ Engineers (***Appendix E***).

Table 1.2 Vehicular access, road layout and local roads

Performance outcomes	Acceptable outcomes	Response
Vehicular access to a state-controlled road or within 100 metres of a state-controlled road intersection		
PO15 The location, design and operation of a **new or changed access** to a **state-controlled road** does not compromise the safety of users of the **state-controlled road**.	No acceptable outcome is prescribed.	**Not applicable**
PO16 The location, design and operation of a **new or changed access** does not adversely impact the **functional requirements** of the **state-controlled road**.	No acceptable outcome is prescribed.	**Not applicable**
PO17 The location, design and operation of a **new or changed access** is consistent with the **future intent** of the **state-controlled road**.	No acceptable outcome is prescribed.	**Not applicable**
PO18 New or changed access is consistent with the access for the relevant **limited access road policy**: 1. **LAR 1** where direct access is prohibited; or 2. **LAR 2** where access may be permitted, subject to assessment.	No acceptable outcome is prescribed.	**Not applicable**
PO19 New or changed access to a **local road** within 100 metres of an intersection with a **state-controlled road** does not compromise the safety of users of the **state-controlled road**.	No acceptable outcome is prescribed.	**Not applicable**

Performance outcomes	Acceptable outcomes	Response
PO20 New or changed access to a **local road** within 100 metres of an intersection with a **state-controlled road** does not adversely impact on the operating performance of the intersection.	No acceptable outcome is prescribed.	**Not applicable**
Public passenger transport and active transport		
PO21 Development does not compromise the safety of users of **public passenger transport infrastructure**, **public passenger services** and **active transport infrastructure**.	No acceptable outcome is prescribed.	**Complies** Refer to the Traffic Impact Assessment prepared by Premise (***Appendix F***).
PO22 Development maintains the ability for people to access **public passenger transport infrastructure, public passenger services** and **active transport infrastructure**.	No acceptable outcome is prescribed.	**Complies** Refer to the Traffic Impact Assessment prepared by Premise (***Appendix F***).
PO23 Development does not adversely impact the operating performance of **public passenger transport infrastructure, public passenger services** and **active transport infrastructure**.	No acceptable outcome is prescribed.	**Complies** Refer to the Traffic Impact Assessment prepared by Premise (***Appendix F***).
PO24 Development does not adversely impact the **structural integrity** or physical condition of **public passenger transport infrastructure** and **active transport infrastructure**.	No acceptable outcome is prescribed.	**Complies** Refer to the Traffic Impact Assessment prepared by Premise (***Appendix F***).

Table 1.3 Network impacts

Performance outcomes	Acceptable outcomes	Response
PO25 Development does not compromise the safety of users of the **state-controlled road** network.	No acceptable outcome is prescribed.	**Complies** Refer to the Traffic Impact Assessment prepared by Premise (***Appendix F***).
PO26 Development ensures **no net worsening** of the operating performance of the **state-controlled road** network.	No acceptable outcome is prescribed.	**Complies** Refer to the Traffic Impact Assessment prepared by Premise (***Appendix F***).
PO27 Traffic movements are not directed onto a **state-controlled road** where they can be accommodated on the **local road** network.	No acceptable outcome is prescribed.	**Complies** Refer to the Traffic Impact Assessment prepared by Premise (***Appendix F***).

Performance outcomes	Acceptable outcomes	Response
PO28 Development involving haulage exceeding 10,000 tonnes per year does not adversely impact the pavement of a **state-controlled road**.	No acceptable outcome is prescribed.	Not applicable.
PO29 Development does not impede delivery of **planned upgrades** of **state-controlled roads**.	No acceptable outcome is prescribed.	Not applicable.
PO30 Development does not impede delivery of **corridor improvements** located entirely within the **state-controlled road corridor**.	No acceptable outcome is prescribed.	Not applicable

Table 1.4 Filling, excavation, building foundations and retaining structures

Performance outcomes	Acceptable outcomes	Response
PO31 Development does not create a safety hazard for users of the **state-controlled road** or **road transport infrastructure**.	No acceptable outcome is prescribed.	**Complies** To be conditioned.
PO32 Development does not adversely impact the operating performance of the **state-controlled road**.	No acceptable outcome is prescribed.	**Complies** Refer to the Traffic Impact Assessment prepared by Premise (***Appendix F***).
PO33 Development does not undermine, damage or cause subsidence of a **state-controlled road**.	No acceptable outcome is prescribed.	**Complies** To be conditioned.
PO34 Development does not cause ground water disturbance in a **state-controlled road**.	No acceptable outcome is prescribed.	**Complies** To be conditioned.
PO35 Excavation, boring, piling, blasting and fill compaction do not adversely impact the physical condition or **structural integrity** of a **state-controlled road** or **road transport infrastructure**.	No acceptable outcome is prescribed.	**Complies** To be conditioned.
PO36 Filling and excavation associated with the construction of **new or changed access** do not compromise the operation or capacity of existing drainage infrastructure for a **state-controlled road.**	No acceptable outcome is prescribed.	**Complies** To be conditioned.

Table 1.5 Environmental emissions

Statutory note: Where a **state-controlled road** is co-located in the same transport corridor as a railway, the development should instead comply with Environmental emissions in State code 2: Development in a railway environment.

Performance outcomes	Acceptable outcomes	Response
Reconfiguring a lot		
Involving the creation of 5 or fewer new residential lots adjacent to a state-controlled road or type 1 multi-modal corridor		
PO37 Development minimises free field noise intrusion from a **state-controlled road.**	**AO37.1** Development provides a noise barrier or earth mound which is designed, sited and constructed: 1. to achieve the maximum free field acoustic levels in reference table 2 (item 2.1); 2. in accordance with: a. Chapter 7 integrated noise barrier design of the Transport Noise Management Code of Practice: Volume 1 (Road Traffic Noise), Department of Transport and Main Roads, 2013; b. Technical Specification-MRTS15 Noise Fences, Transport and Main Roads, 2019; c. Technical Specification-MRTS04 General Earthworks, Transport and Main Roads, 2020. OR **AO37.2** Development achieves the maximum free field acoustic levels in reference table 2 (item 2.1) by **alternative noise attenuation measures** where it is not practical to provide a noise barrier or earth mound. OR **AO37.3** Development provides a **solid gap-free fence** or other **solid gap-free structure** along the full extent of the boundary closest to the **state-controlled road**.	Not applicable
Involving the creation of 6 or more new residential lots adjacent to a state-controlled road or type 1 multi-modal corridor		

Performance outcomes	Acceptable outcomes	Response
PO38 Reconfiguring a lot minimises free field noise intrusion from a **state-controlled road.**	**AO38.1** Development provides noise barrier or earth mound which is designed, sited and constructed: 1. to achieve the maximum free field acoustic levels in reference table 2 (item 2.1); 2. in accordance with: a. Chapter 7 integrated noise barrier design of the Transport Noise Management Code of Practice: Volume 1 (Road Traffic Noise), Department of Transport and Main Roads, 2013; b. Technical Specification-MRTS15 Noise Fences, Transport and Main Roads, 2019; c. Technical Specification-MRTS04 General Earthworks, Transport and Main Roads, 2020. OR **AO38.2** Development achieves the maximum free field acoustic levels in reference table 2 (item 2.1) by **alternative noise attenuation measures** where it is not practical to provide a noise barrier or earth mound.	**Not applicable**
Material change of use (accommodation activity)		
Ground floor level requirements adjacent to a state-controlled road or type 1 multi-modal corridor		
PO39 Development minimises noise intrusion from a **state-controlled road** in **private open space**.	**AO39.1** Development provides a noise barrier or earth mound which is designed, sited and constructed: 1. to achieve the maximum free field acoustic levels in reference table 2 (item 2.2) for **private open space** at the ground floor level; 2. in accordance with:	**Complies** Refer to the Noise Impact Assessment prepared by Stantec (***Appendix G***).

Performance outcomes	Acceptable outcomes	Response
	a. Chapter 7 integrated noise barrier design of the Transport Noise Management Code of Practice: Volume 1 (Road Traffic Noise), Department of Transport and Main Roads, 2013; b. Technical Specification-MRTS15 Noise Fences, Transport and Main Roads, 2019; c. Technical Specification-MRTS04 General Earthworks, Transport and Main Roads, 2020. OR **AO39.2** Development achieves the maximum free field acoustic level in reference table 2 (item 2.2) for **private open space** by **alternative noise attenuation measures** where it is not practical to provide a noise barrier or earth mound.	
PO40 Development (excluding a **relevant residential building** or **relocated building)** minimises noise intrusion from a **state-controlled road** in **habitable rooms** at the facade.	**AO40.1** Development (excluding a **relevant residential building** or **relocated building**) provides a noise barrier or earth mound which is designed, sited and constructed: 1. to achieve the maximum building façade acoustic level in reference table 1 (item 1.1) for **habitable rooms**; 2. in accordance with: a. Chapter 7 integrated noise barrier design of the Transport Noise Management Code of Practice: Volume 1 (Road Traffic Noise), Department of Transport and Main Roads, 2013; b. Technical Specification-MRTS15 Noise Fences, Transport and Main Roads, 2019;	**Complies** Refer to the Noise Impact Assessment prepared by Stantec (***Appendix G***).

Performance outcomes	Acceptable outcomes	Response
	c. Technical Specification-MRTS04 General Earthworks, Transport and Main Roads, 2020. OR **AO40.2** Development (excluding a **relevant residential building** or **relocated building**) achieves the maximum building façade acoustic level in reference table 1 (item 1.1) for **habitable rooms** by **alternative noise attenuation measures** where it is not practical to provide a noise barrier or earth mound.	
PO41 Habitable rooms (excluding a **relevant residential building** or **relocated building**) are designed and constructed using materials to achieve the maximum internal acoustic level in reference table 3 (item 3.1).	No acceptable outcome is provided.	**Complies** Refer to the Noise Impact Assessment prepared by Stantec (***Appendix G***).
Above ground floor level requirements (accommodation activity) adjacent to a state-controlled road or type 1 multi-modal corridor		
PO42 Balconies, podiums, and roof decks include: 1. a continuous **solid gap-free structure** or balustrade (excluding gaps required for drainage purposes to comply with the Building Code of Australia); 2. highly acoustically absorbent material treatment for the total area of the soffit above balconies, podiums, and roof decks.	No acceptable outcome is provided.	**Complies** Refer to the Noise Impact Assessment prepared by Stantec (***Appendix G***).
PO43 Habitable rooms (excluding a **relevant residential building** or **relocated building**) are designed and constructed using materials to achieve the maximum internal acoustic level in reference table 3 (item 3.1).	No acceptable outcome is provided.	**Complies** Refer to the Noise Impact Assessment prepared by Stantec (***Appendix G***).
Material change of use (other uses)		
Ground floor level requirements (childcare centre, educational establishment, hospital) adjacent to a state-controlled road or type 1 multi-modal corridor		
PO44 Development:	No acceptable outcome is provided.	**Not applicable**

Performance outcomes	Acceptable outcomes	Response
1. provides a noise barrier or earth mound that is designed, sited and constructed: a. to achieve the maximum free field acoustic level in reference table 2 (item 2.3) for all **outdoor education areas** and **outdoor play areas**; b. in accordance with: i. Chapter 7 integrated noise barrier design of the Transport Noise Management Code of Practice: Volume 1 (Road Traffic Noise), Department of Transport and Main Roads, 2013; ii. Technical Specification-MRTS15 Noise Fences, Transport and Main Roads, 2019; iii. Technical Specification-MRTS04 General Earthworks, Transport and Main Roads, 2020; or 2. achieves the maximum free field acoustic level in reference table 2 (item 2.3) for all **outdoor education areas** and **outdoor play areas** by **alternative noise attenuation measures** where it is not practical to provide a noise barrier or earth mound.		
PO45 Development involving a **childcare centre** or **educational establishment**: 1. provides a noise barrier or earth mound that is designed, sited and constructed: 2. to achieve the maximum building facade acoustic level in reference table 1 (item 1.2); 3. in accordance with: a. Chapter 7 integrated noise barrier design of the Transport Noise Management	No acceptable outcome is provided.	**Not applicable**

Performance outcomes	Acceptable outcomes	Response
Code of Practice: Volume 1 (Road Traffic Noise), Department of Transport and Main Roads, 2013; b. Technical Specification-MRTS15 Noise Fences, Transport and Main Roads, 2019; c. Technical Specification-MRTS04 General Earthworks, Transport and Main Roads, 2020; or 4. achieves the maximum building facade acoustic level in reference table 1 (item 1.2) by **alternative noise attenuation measures** where it is not practical to provide a noise barrier or earth mound.		
PO46 Development involving: 1. **indoor education areas** and **indoor play areas**; or 2. sleeping rooms in a **childcare centre**; or 3. **patient care areas** in a **hospital** achieves the maximum internal acoustic level in reference table 3 (items 3.2-3.4).	No acceptable outcome is provided.	**Not applicable**
Above ground floor level requirements (childcare centre, educational establishment, hospital) adjacent to a state-controlled road or type 1 multi-modal corridor		
PO47 Development involving a **childcare centre** or **educational establishment** which have balconies, podiums or elevated **outdoor play areas** predicted to exceed the maximum free field acoustic level in reference table 2 (item 2.3) due to noise from a **state-controlled road** are provided with: 1. a continuous **solid gap-free structure** or balustrade (excluding gaps required for drainage purposes to comply with the Building Code of Australia);	No acceptable outcome is provided.	**Not applicable**

Performance outcomes	Acceptable outcomes	Response
2. highly acoustically absorbent material treatment for the total area of the soffit above balconies or elevated **outdoor play areas**.		
PO48 Development including: 1. **indoor education areas** and **indoor play areas** in a **childcare centre** or **educational establishment**; or 2. sleeping rooms in a **childcare centre**; or 3. **patient care areas** in a **hospital** located above ground level, is designed and constructed to achieve the maximum internal acoustic level in reference table 3 (items 3.2-3.4).	No acceptable outcome is provided.	**Not applicable**
Air, light and vibration		
PO49 Private open space, **outdoor education areas** and **outdoor play areas** are protected from air quality impacts from a **state-controlled road**.	**AO49.1** Each dwelling or unit has access to a **private open space** which is shielded from a **state-controlled road** by a building, **solid gap-free fence**, or other **solid gap-free structure**. OR **AO49.2** Each **outdoor education area** and **outdoor play area** is shielded from a **state-controlled road** by a building, **solid gap-free fence,** or other **solid gap-free structure**.	**Not applicable**

Performance outcomes	Acceptable outcomes	Response
PO50 Patient care areas within **hospitals** are protected from vibration impacts from a **state-controlled road** or **type 1 multi-modal corridor**.	**AO50.1 Hospitals** are designed and constructed to ensure vibration in the patient treatment area does not exceed a vibration dose value of $0.1m/s^{1.75}$. AND **AO50.2 Hospitals** are designed and constructed to ensure vibration in the ward of a **patient care area** does not exceed a vibration dose value of $0.4m/s^{1.75}$.	**Not applicable**
PO51 Development is designed and sited to ensure light from infrastructure within, and from users of, a **state-controlled road** or **type 1 multi-modal corridor**, does not: 1. intrude into buildings during night hours (10pm to 6am); 2. create unreasonable disturbance during evening hours (6pm to 10pm).	No acceptable outcomes are prescribed.	**Not applicable**

Table 1.6: Development in a future state-controlled road environment

Performance outcomes	Acceptable outcomes	Response
PO52 Development does not impede delivery of a **future state-controlled road**.	**AO52.1** Development is not located in a **future state-controlled road**. OR ALL OF THE FOLLOWING APPLY: **AO52.2** Development does not involve filling and excavation of, or material changes to, a **future state-controlled road**. AND	**Not applicable**

Performance outcomes	Acceptable outcomes	Response
	AO52.3 The intensification of lots does not occur within a **future state-controlled road**. AND **AO52.4** Development does not result in the landlocking of parcels once a **future state-controlled road** is delivered.	
PO53 The location and design of **new or changed access** does not create a safety hazard for users of a **future state-controlled road**.	**AO53.1** Development does not include **new or changed access** to a **future state-controlled road**.	**Not applicable**
PO54 Filling, excavation, building foundations and **retaining structures** do not undermine, damage or cause subsidence of a **future state-controlled road**.	No acceptable outcome is prescribed.	**Not applicable**
PO55 Development does not result in a material worsening of stormwater, flooding, overland flow or drainage impacts in a **future state-controlled road** or **road transport infrastructure**.	No acceptable outcome is prescribed.	**Not applicable**
PO56 Development ensures that stormwater is lawfully discharged.	**AO56.1** Development does not create any new points of discharge to a **future state-controlled road**. AND **AO56.2** Development does not concentrate flows to a **future state-controlled road**. AND **AO56.3** Stormwater run-off is discharged to a **lawful point of discharge**. AND	**Not applicable**

Performance outcomes	Acceptable outcomes	Response
	AO56.4 Development does not worsen the condition of an existing **lawful point of discharge** to the **future state-controlled road**.	