



DEVELOPMENT APPLICATION

PDPLANPMTD-2026/062636

PROPOSAL: Additions & Alterations & Outbuilding (Single Dwelling)

LOCATION: 3 Belar Street, Howrah

RELEVANT PLANNING SCHEME: Tasmanian Planning Scheme - Clarence

ADVERTISING EXPIRY DATE: 16/09/2026 00:00:00

The relevant plans and documents can be inspected at the Council offices, 38 Bligh Street, Rosny Park, during normal office hours until 16/09/2026 00:00:00. In addition to legislative requirements, plans and documents can also be viewed at www.ccc.tas.gov.au during these times.

Any person may make representations about the application to the Chief Executive Officer, by writing to PO Box 96, Rosny Park, 7018 or by electronic mail to clarence@ccc.tas.gov.au. Representations must be received by Council on or before 16/09/2026 00:00:00.

To enable Council to contact you if necessary, would you please also include a day time contact number in any correspondence you may forward.

Any personal information submitted is covered by Council's privacy policy, available at www.ccc.tas.gov.au or at the Council offices.

Planning Application

Use this form to obtain planning approval for the use and development of land, including change of use, subdividing land into smaller lots, lot consolidation, or signage.

Please refer to the Planning Application checklist on the following pages to determine what documentation must be submitted with your application.

Proposal: **Proposed Shed, Additions & Alterations to existing dwelling**

Location: **3 Belar Street, Howrah 7018**

Personal Information Removed



exemptions may apply which may save you time on your proposal.

If you had pre-application discussions with City of Clarence, please provide planner's name:

Ryan Peterson

Current use of site:

Residential dwelling

Does the proposal involve land administered or owned by the Crown or Council? Yes ☒ No ☐

Declaration

- I have read the Certificate of Title and Schedule of Easements for the land and am satisfied that this application is not prevented by any restrictions, easements or covenants.
- I authorise the provision of a copy of any documents relating to this application to any person for the purposes of assessment or public consultation. I agree to arrange for the permission of the copyright owner of any part of this application to be obtained. I have arranged permission for Council's representatives to enter the land to assess this application
- I declare that, in accordance with Section 52 of the Land Use Planning and Approvals Act 1993, that I have notified the owner of the intention to make this application. Where the subject property is owned or controlled by Council or the Crown, their signed consent is attached.
- I declare that the information in this declaration is true and correct.

Acknowledgement

- I acknowledge that the documentation submitted in support of my application will become a public record held by Council and may be reproduced by Council in both electronic and hard copy format in order to facilitate the assessment process; for display purposes during public consultation; and to fulfil its statutory obligations. I further acknowledge that following determination of my application, Council will store documentation relating to my application in electronic format only.

Personal Information Removed



Planning Application checklist

Mandatory Documents

This information is required for the application to be valid. We are unable to proceed with an application without these documents.

- ☐ Details of the location of the proposed use or development.
- ☐ A copy of the current Certificate of Title, Sealed Plan, Plan or Diagram and Schedule of Easements and other restrictions for each parcel of land on which the use or development is proposed.
- ☐ Full description of the proposed use or development.
- ☐ Description of the proposed operation. May include where appropriate: staff/student/customer numbers; operating hours; truck movements; and loading/unloading requirements; waste generation and disposal; equipment used; pollution, including noise, fumes, smoke or vibration and mitigation/management measures.
- ☐ Declaration the owner has been notified if the applicant is not the owner.
- ☐ Crown or Council consent (if publically-owned land).
- ☐ Any reports, plans or other information required by the relevant zone or code.
- ☐ Fees prescribed by the City of Clarence.

Application fees (please phone 03 6217 9550 to determine what fees apply). An invoice will be emailed upon lodgement.

Additional Documents

In addition to the mandatory information required above, Council may, to enable it to consider an application, request further information it considers necessary to ensure that the proposed use or development will comply with any relevant standards and purpose statements in the zone, codes or specific area plan, applicable to the use or development.

- ☐ Site analysis and site plan, including where relevant:
 - Existing and proposed use(s) on site.
 - Boundaries and dimensions of the site.
 - Topography, including contours showing AHD levels and major site features.
 - Natural drainage lines, watercourses and wetlands on or adjacent to the site.
 - Soil type.
 - Vegetation types and distribution, and trees and vegetation to be removed.
 - Location and capacity of any existing services or easements on/to the site.
 - Existing pedestrian and vehicle access to the site.
 - Location of existing and proposed buildings on the site.
 - Location of existing adjoining properties, adjacent buildings and their uses.
 - Any natural hazards that may affect use or development on the site.
 - Proposed roads, driveways, car parking areas and footpaths within the site.
 - Any proposed open space, communal space, or facilities on the site.
-



- Main utility service connection points and easements.
 - Proposed subdivision lot boundaries.
- ☐ Where it is proposed to erect buildings, detailed plans with dimensions at a scale of 1:100 or 1:200 showing:
- Internal layout of each building on the site.
 - Private open space for each dwelling.
 - External storage spaces.
 - Car parking space location and layout.
 - Major elevations of every building to be erected.
 - Shadow diagrams of the proposed buildings and adjacent structures demonstrating the extent of shading of adjacent private open spaces and external windows of buildings on adjacent sites.
 - Relationship of the elevations to natural ground level, showing any proposed cut or fill.
 - Materials and colours to be used on rooves and external walls.
- ☐ Where it is proposed to erect buildings, a plan of the proposed landscaping showing:
- Planting concepts.
 - Paving materials and drainage treatments and lighting for vehicle areas and footpaths.
 - Plantings proposed for screening from adjacent sites or public places.
- ☐ Any additional reports, plans or other information required by the relevant zone or code.
-

This list is not comprehensive for all possible situations. If you require further information about what may be required as part of your application documentation, please contact City of Clarence Planning team on (03) 6217 9550.



SEARCH OF TORRENS TITLE

VOLUME 72344	FOLIO 45
EDITION 6	DATE OF ISSUE 16-Oct-2025

SEARCH DATE : 08-July-2026

SEARCH TIME : 09.10 am

DESCRIPTION OF LAND

City of CLARENCE

Lot 45 on Diagram [72344](#) (formerly being 357-35D)

Derivation : Part of 150 Acres 3 Roods Gtd. to K.L. Murray.

Prior CT [3034/5](#)SCHEDULE 1

[N282975](#) TRANSFER to JOHN WILLIAM CASTINE Registered
16-Oct-2025 at 12.01 pm

SCHEDULE 2

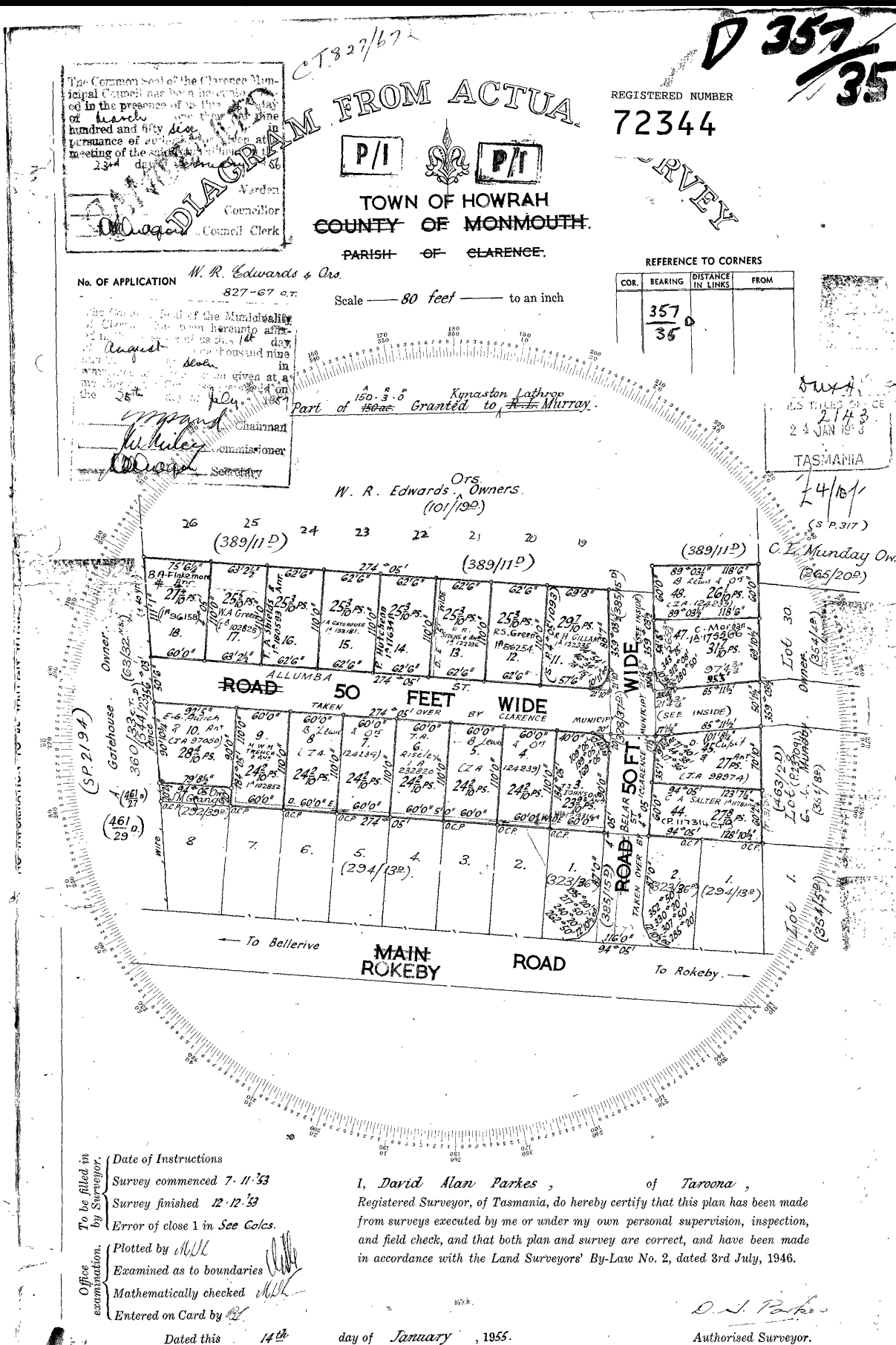
Reservations and conditions in the Crown Grant if any
BENEFITING EASEMENT: Right of carriage way over the roads
shown on Diagram No. [72344](#)

[A98974](#) FENCING CONDITION in Transfer

[E432649](#) MORTGAGE to Commonwealth Bank of Australia
Registered 16-Oct-2025 at 12.02 pm

UNREGISTERED DEALINGS AND NOTATIONS

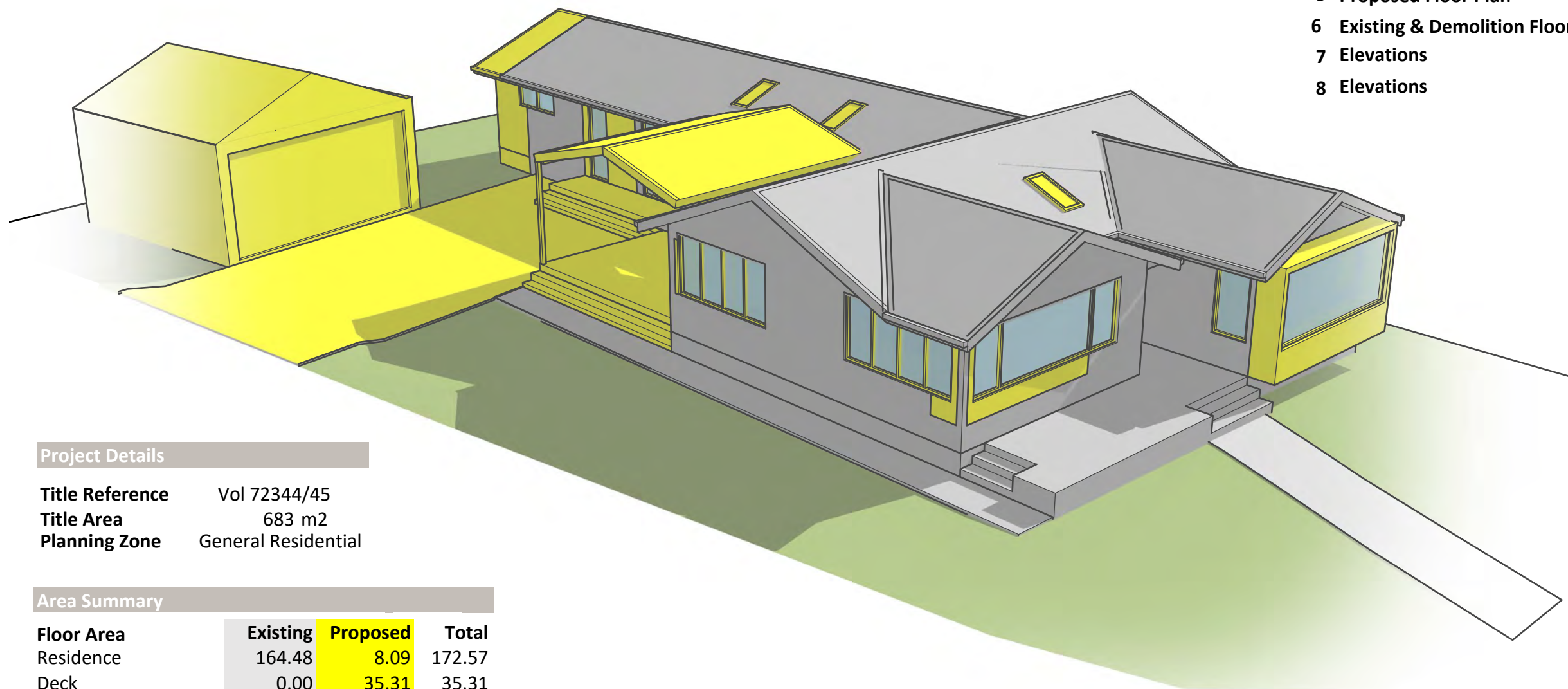
No unregistered dealings or other notations



- Proposed structure
- Existing structure

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- 2 Aerial Plan
- 3 Site & Access Plan
- 4 Perspectives
- 5 Proposed Floor Plan
- 6 Existing & Demolition Floor Plan
- 7 Elevations
- 8 Elevations



Project Details

Title ReferenceVol 72344/45

Title Area683 m2

Planning ZoneGeneral Residential

Area Summary

Floor Area	Existing	Proposed	Total
Residence	164.48	8.09	172.57
Deck	0.00	35.31	35.31
Shed	0.00	36.23	36.23
Total	164.48	79.63	244.11

Site Cover

Title Area	683.00		
	Existing	Proposed	Total
Building foot print	164.48	44.32	208.80
Covered Outdoor area	0.00	26.64	26.64
total	164.48	70.96	235.44
Site Cover	24.1%	11.1%	34.5%

David Reinbold building design

ABN: 93202 133 447 ACC NO: CC4256Y

Po Box 353
North Hobart 7002
Phone: 0407 356 649
davidmreinbold@gmail.com

Proposed

Additions, alterations & shed
3 Belar Street, Howrah, Tas 7018

For

John Castine

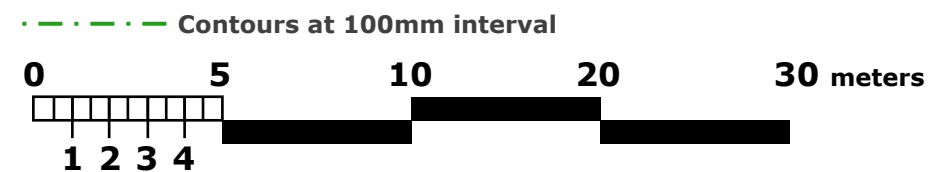
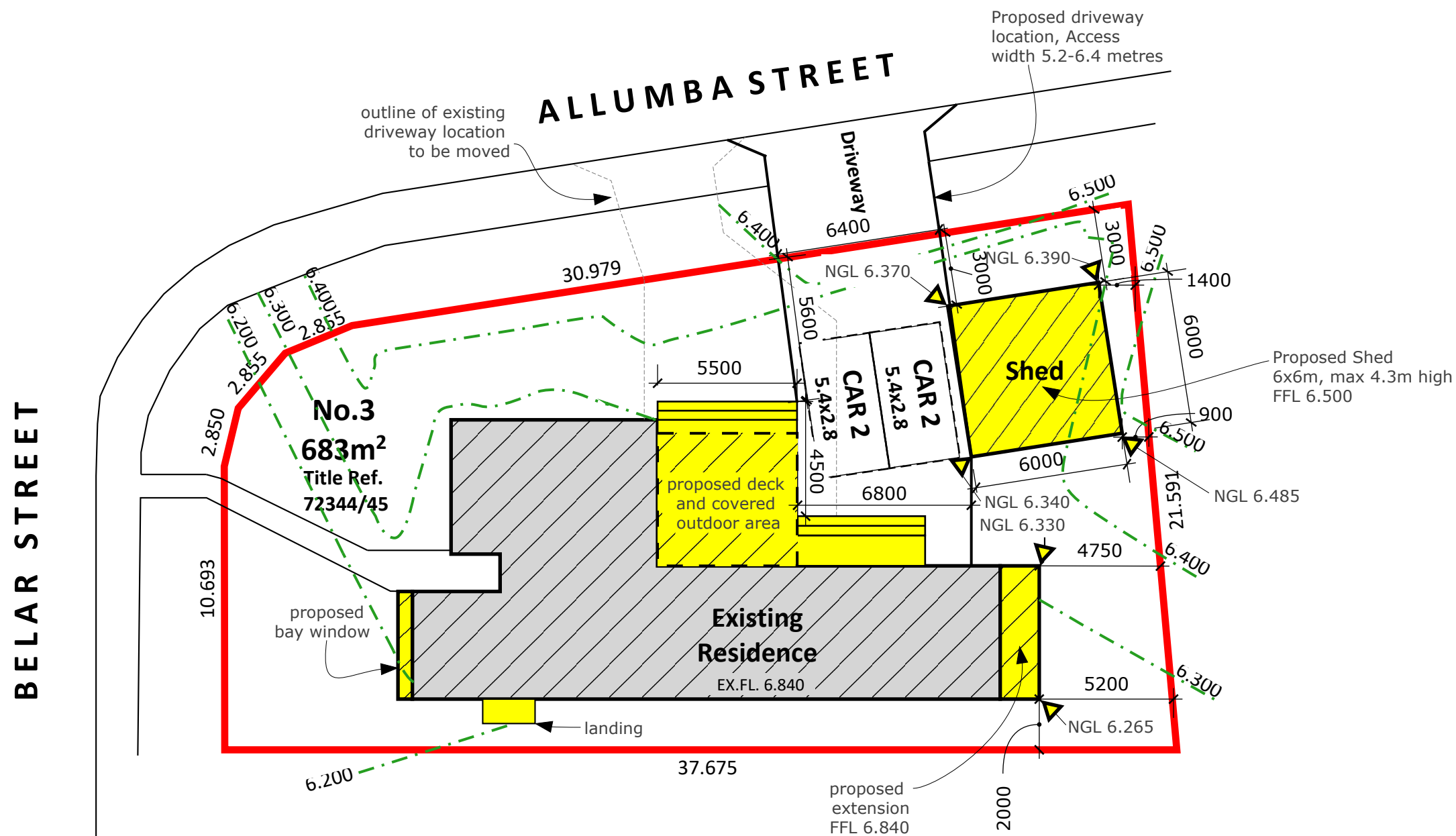
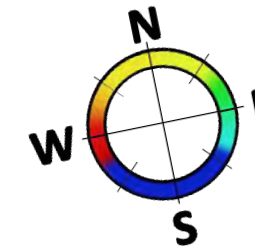
Original Plans - 08/07/2026
Amendment 1 - 26/07/2026
Amendment 2 - 27/07/2026

Date

August 27, 2026

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-  Proposed structure
-  Existing structure



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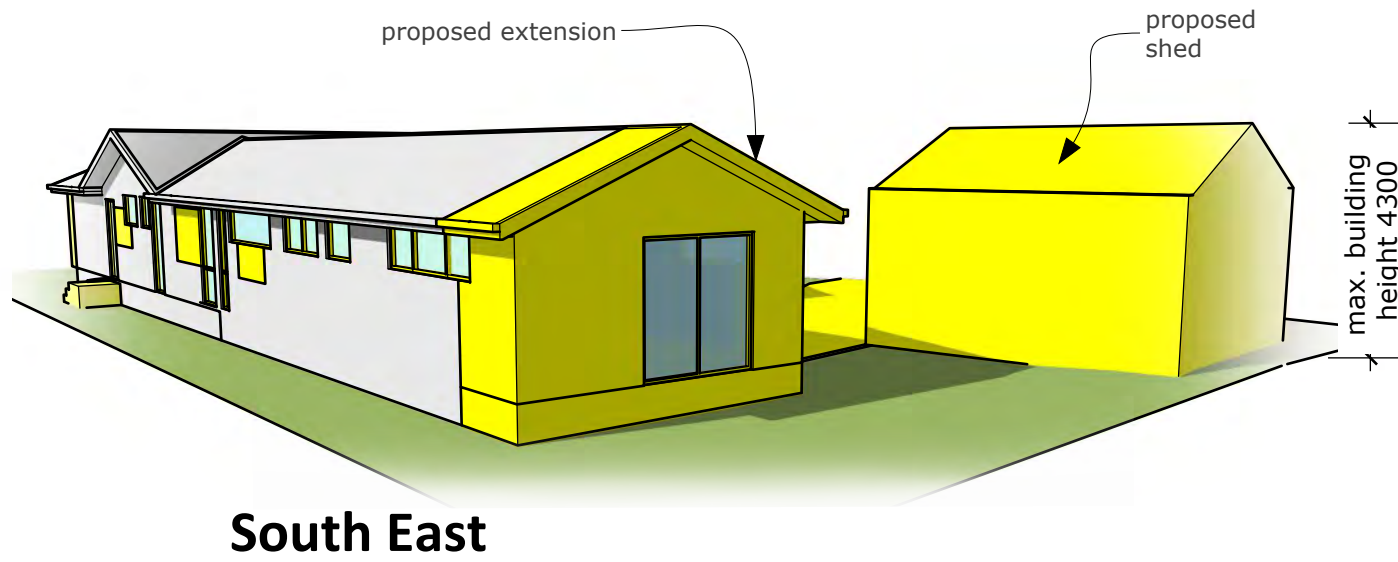
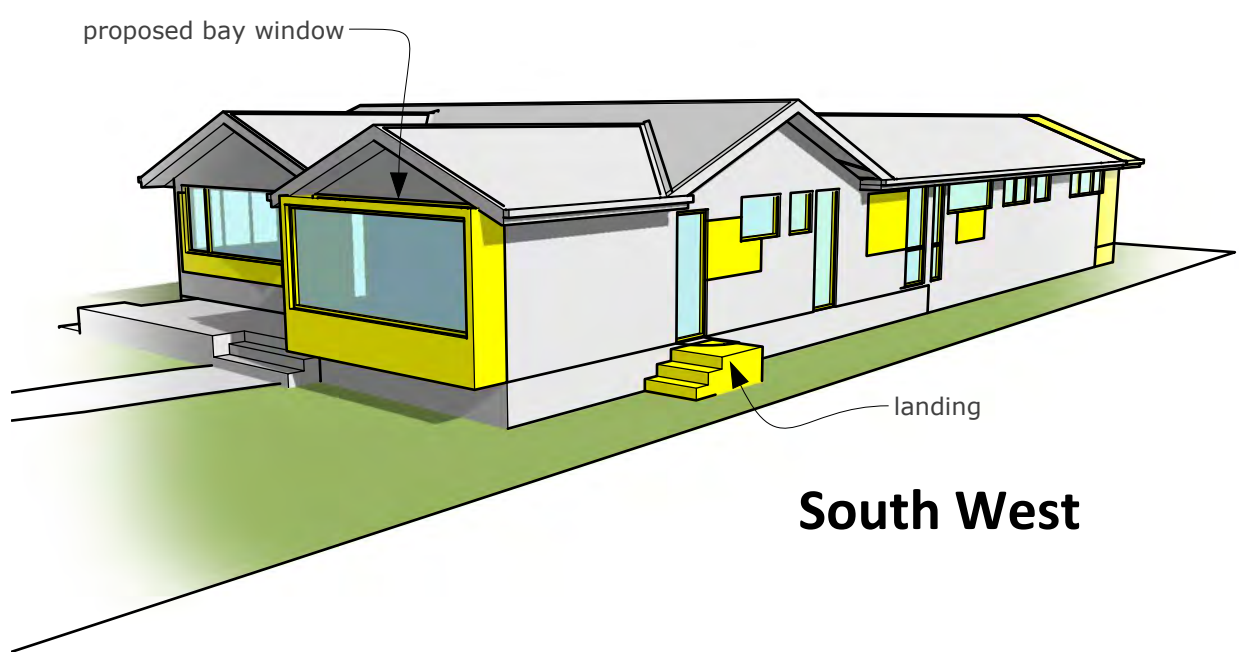
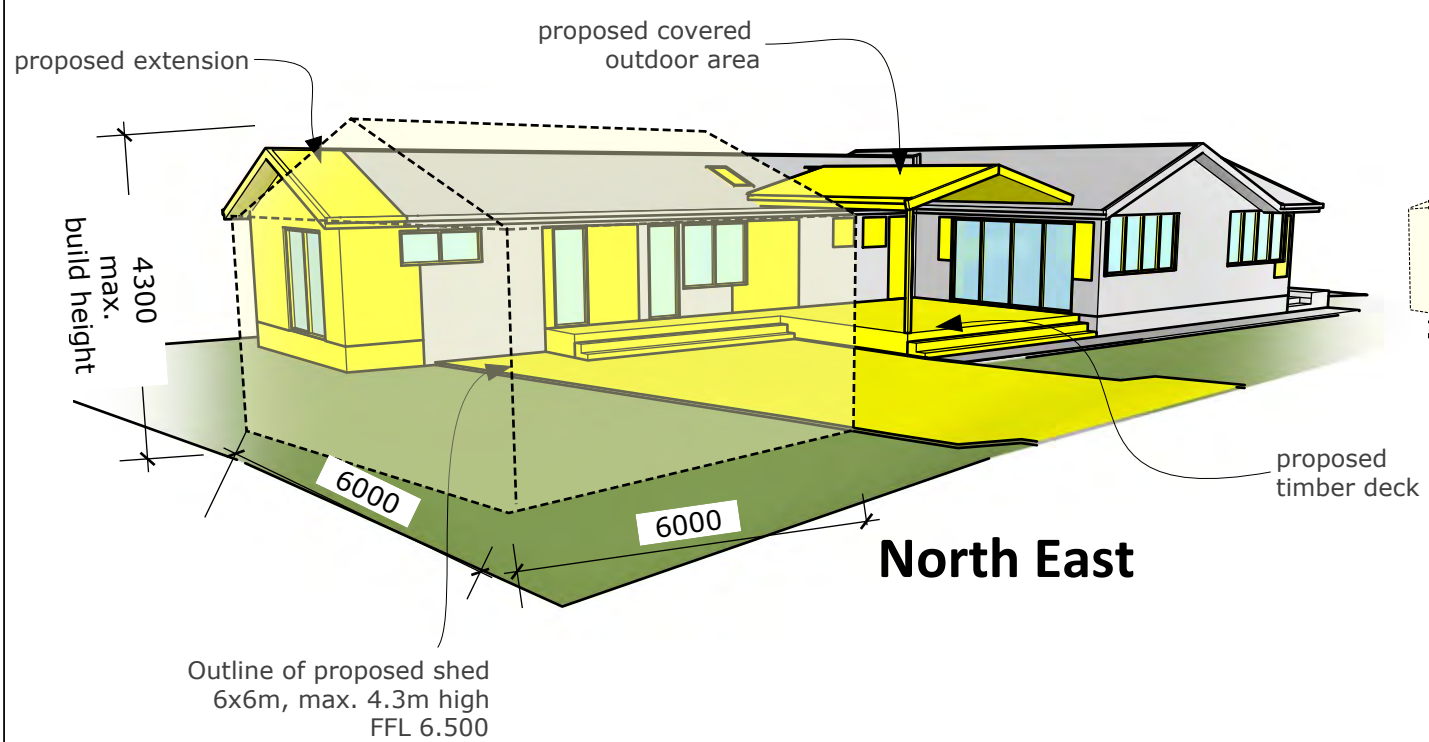
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Site & Access Plan

3

8

 Proposed structure
 Existing structure



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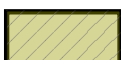
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For
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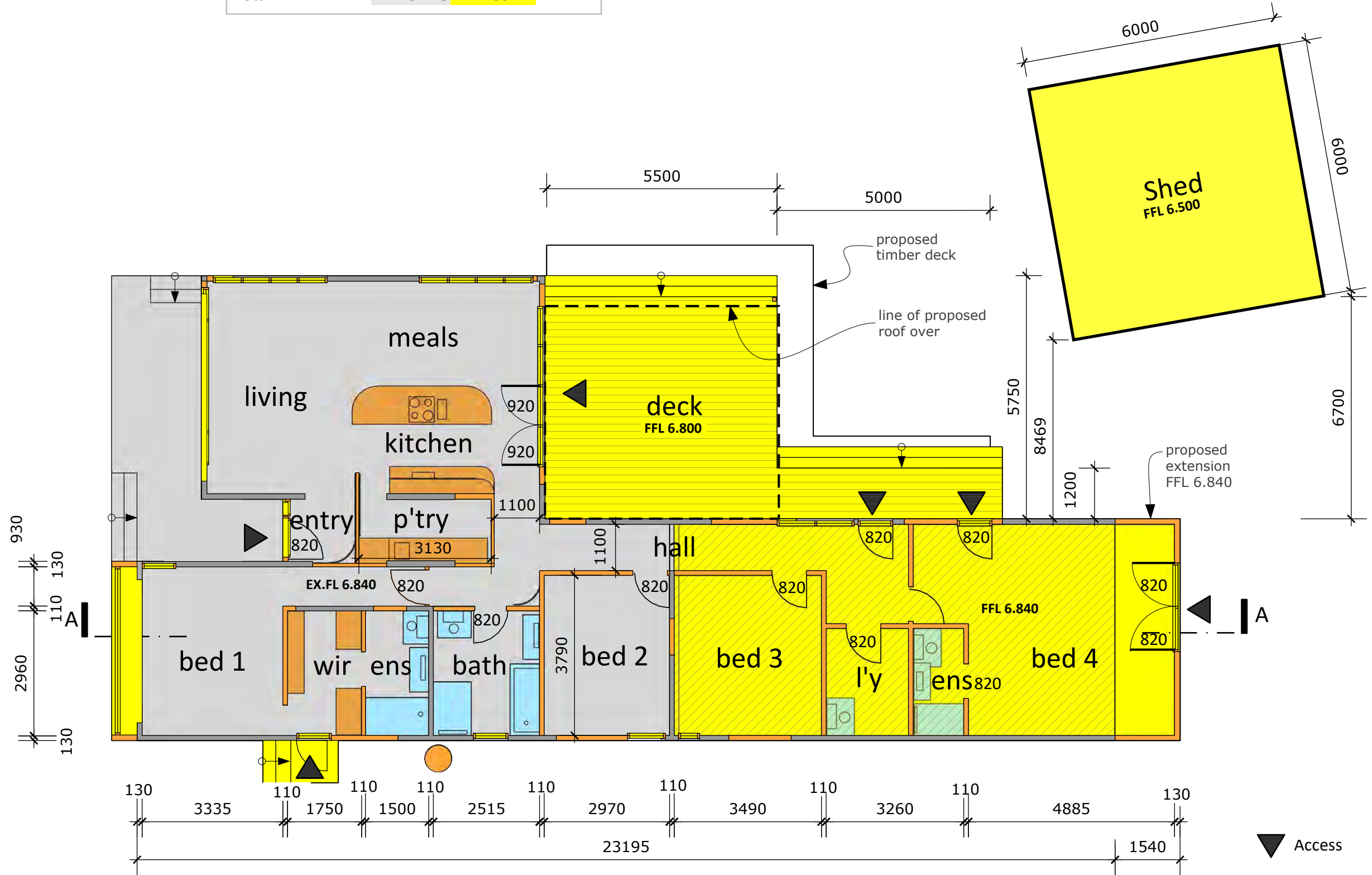
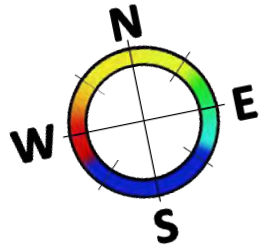
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-  Proposed structure
-  Existing structure
-  Raised existing floor

Area Summary

Floor Area	Existing	Proposed	Total
Residence	164.48	8.09	172.57
Deck	0.00	41.40	41.40
Shed	0.00	36.23	36.23
Total	164.48	85.72	250.20



1:100 (A3)

Proposed Floor Plan

David Reinbold building design

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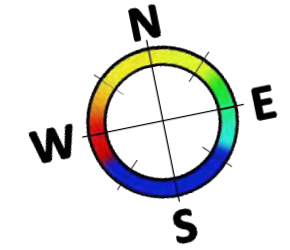
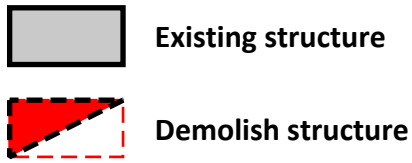
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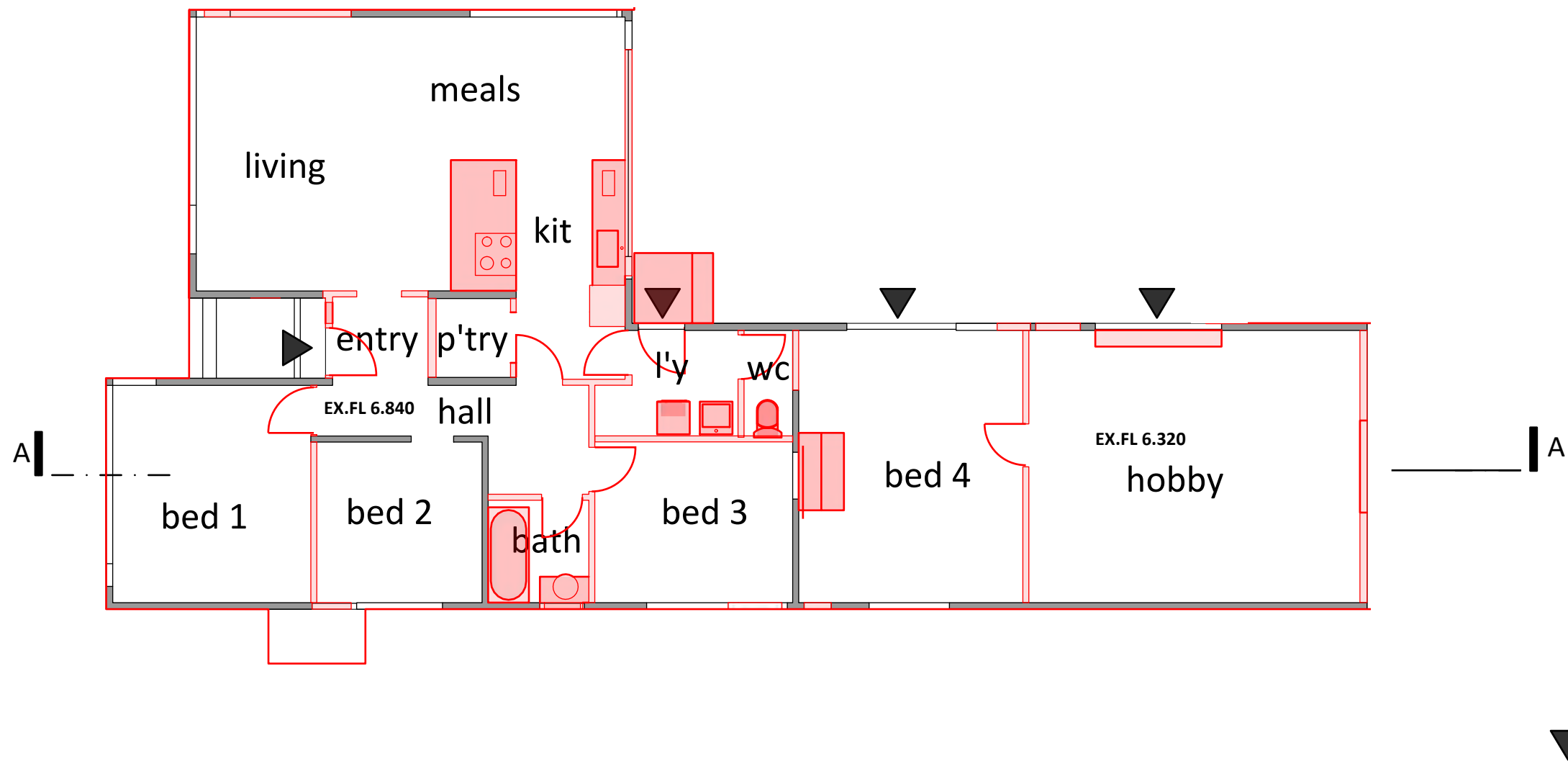
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1:100 (A3)

Existing & Demolition Floor Plan



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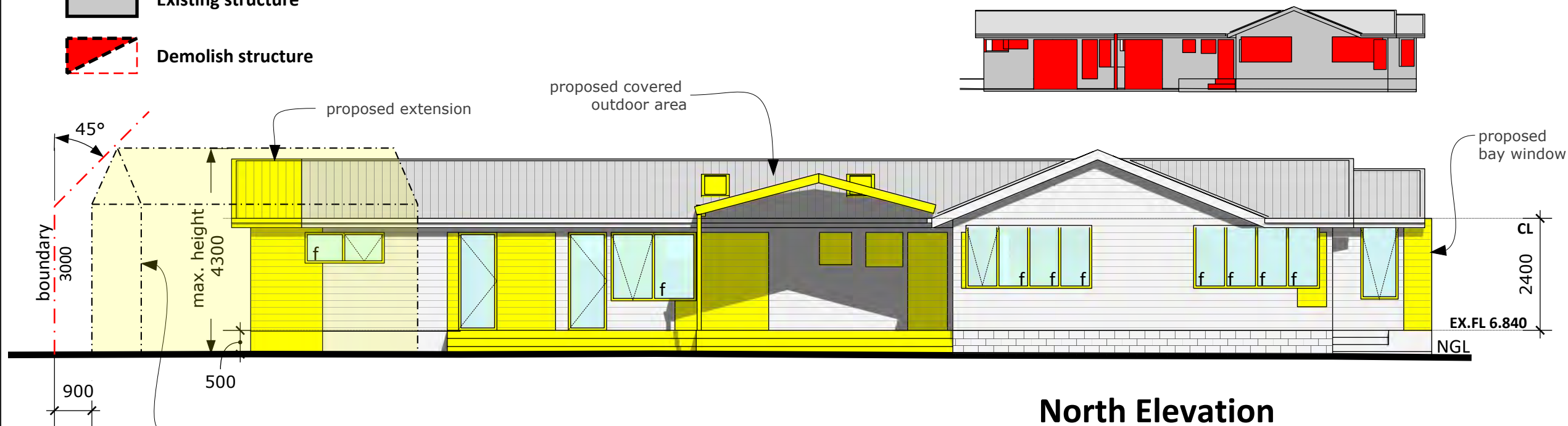
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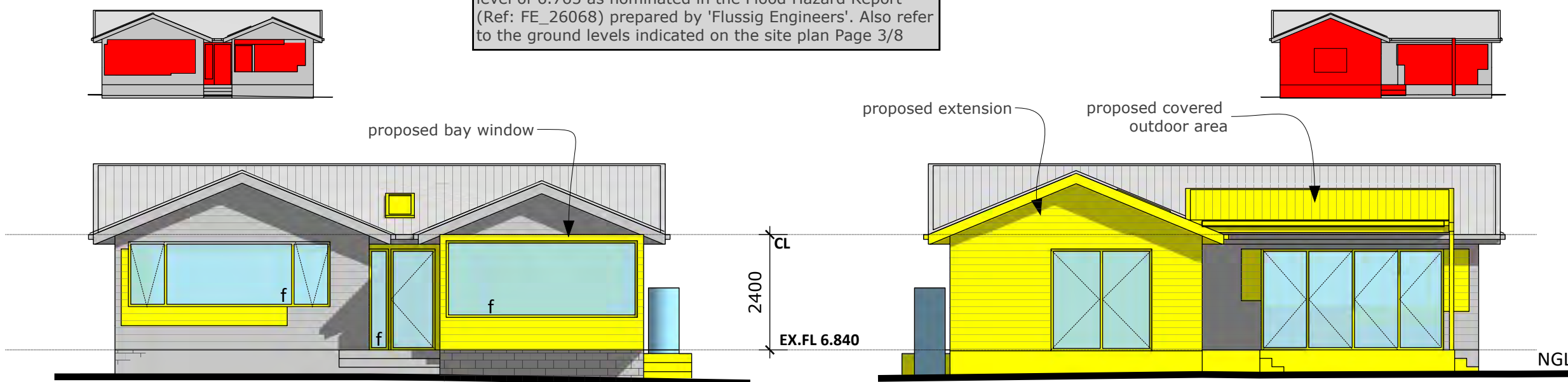
8

-  Proposed structure
-  Existing structure
-  Demolish structure



North Elevation

the Habitable floor level of FFL 6.840 exceeds, and therefore complies with the recommended minimum floor level of 6.765 as nominated in the Flood Hazard Report (Ref: FE_26068) prepared by 'Flussig Engineers'. Also refer to the ground levels indicated on the site plan Page 3/8



West Elevation

East Elevation

NGL = Natural ground level

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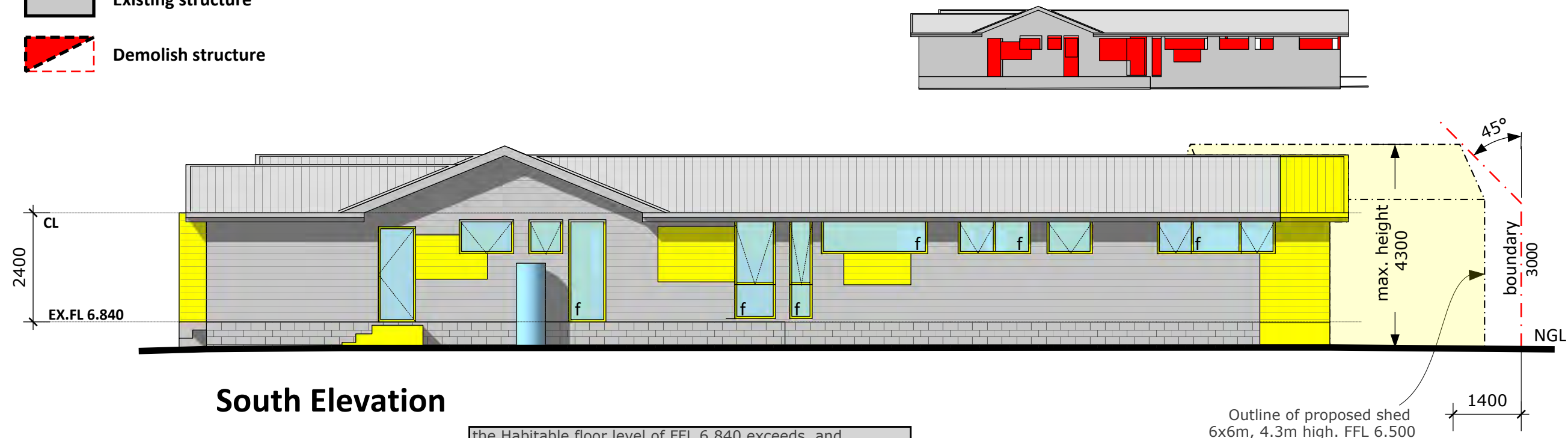
For
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Amendment 2 - 27/07/2026

Date
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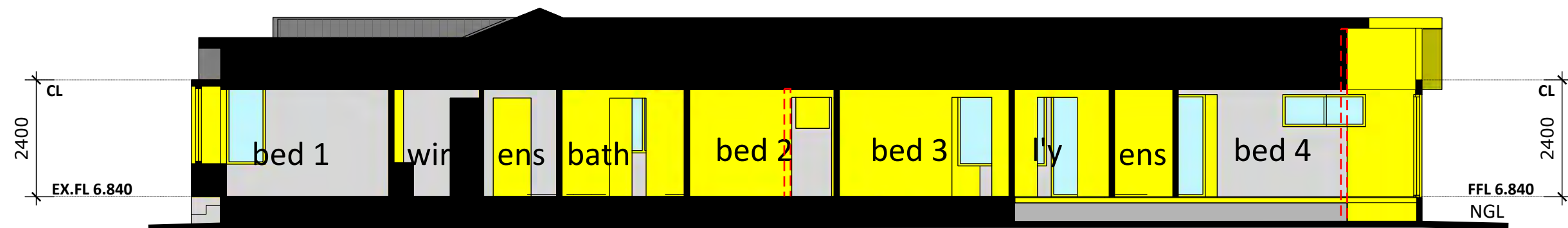
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-  Proposed structure
-  Existing structure
-  Demolish structure



South Elevation

the Habitable floor level of FFL 6.840 exceeds, and therefore complies with the recommended minimum floor level of 6.765 as nominated in the Flood Hazard Report (Ref: FE_26068) prepared by 'Flussig Engineers'. Also refer to the ground levels indicated on the site plan Page 3/8



Section A-A

NGL = Natural ground level

David Reinbold building design

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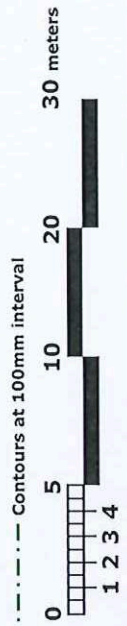
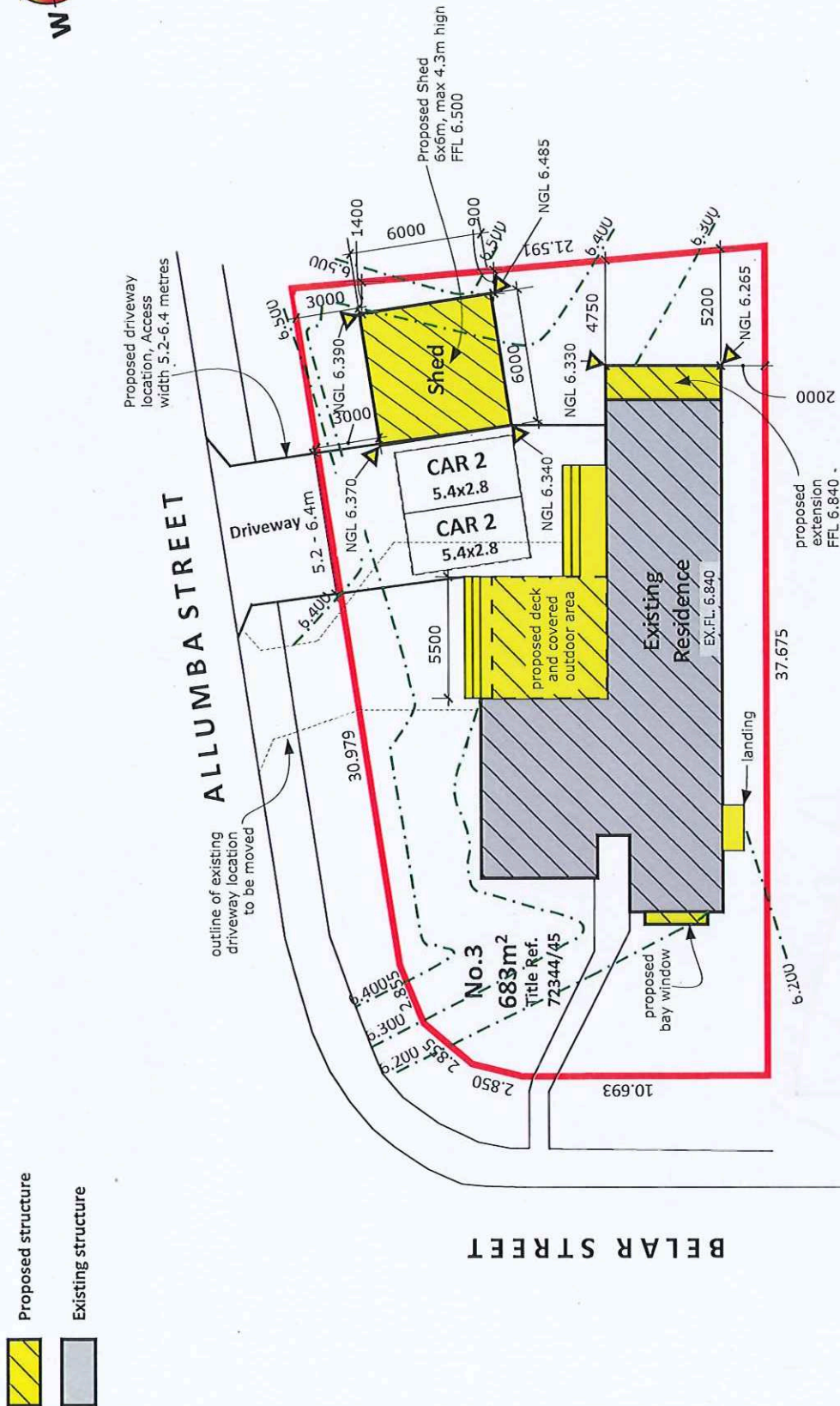
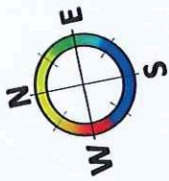
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For
John Castine

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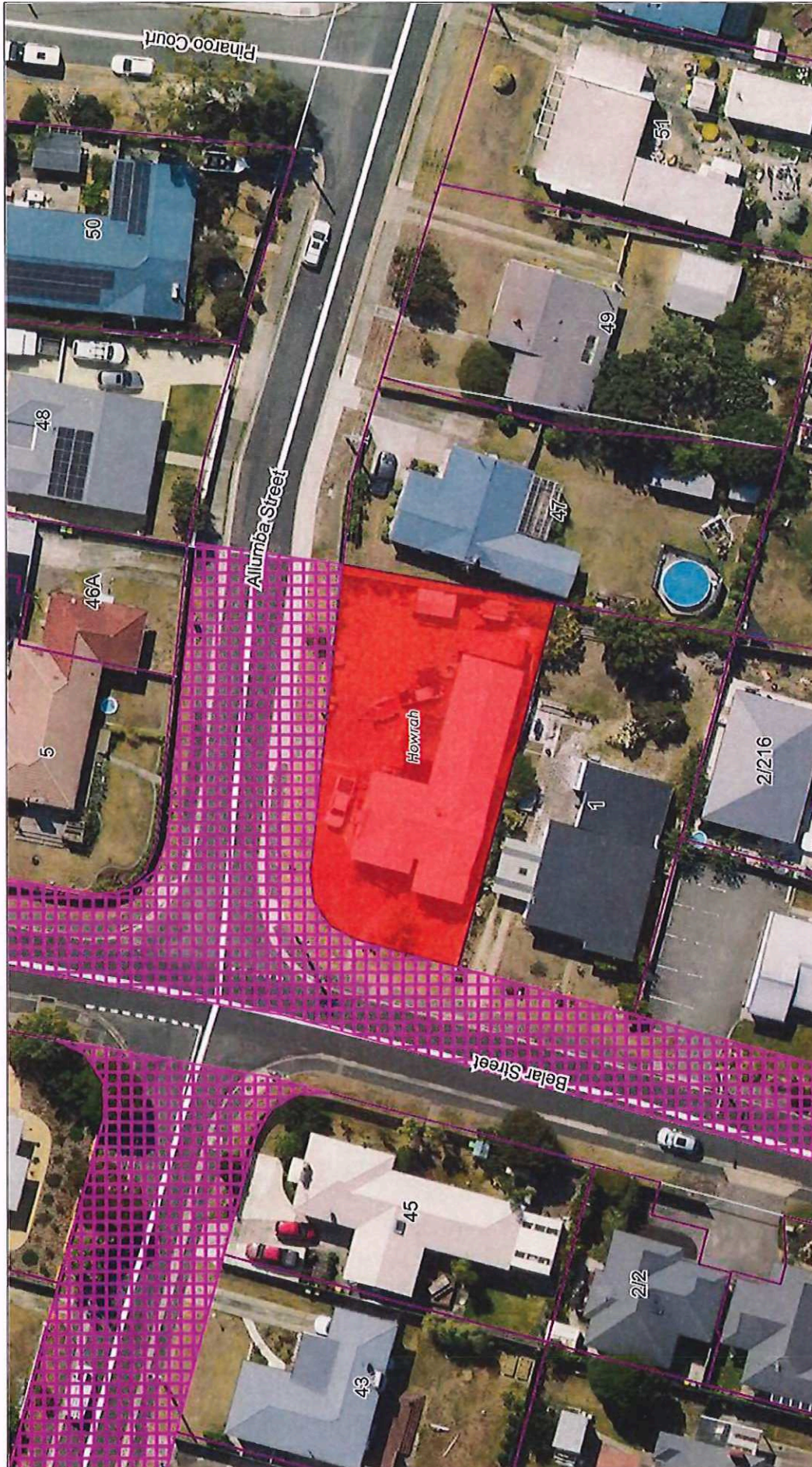
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13/08/2026

1:564

This map has been produced by Clarence City Council using data from a range of agencies. The City bears no responsibility for the accuracy of this information and accepts no liability for its use by other parties.



Prepared for
Castine Constructions Pty Ltd

3 Belar Street Howrah

FLOOD HAZARD REPORT



FE_26068

23 February 2026

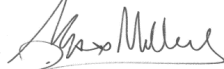


L4/ 116 BATHURST ST
HOBART TASMANIA 7000
ABN: 16 639 276 181

Document Information

Title	Client	Document Number	Project Manager
3 Belar Street, Howrah, Flood Hazard Report	Castine Constructions Pty Ltd	FE_26068	Max W. Möller <i>Principal Hydraulic Engineer</i>

Document Initial Revision

REVISION 00	Staff Name	Signature	Date
Prepared by	Max W. Moller <i>Principal Hydraulic Engineer</i>		02/02/2026
Prepared by	Ash Perera <i>Senior Hydraulic Engineer</i>		02/02/2026
Prepared by	Christine Keane <i>Senior Water Resources Analyst</i>		02/02/2026
GIS Mapping	Fraser Cumming <i>GIS Specialist</i>		06/02/2026
Reviewed by	John Holmes <i>Senior Engineer</i>		20/02/2026
Reviewed by	Max W. Möller <i>Principal Hydraulic Engineer</i>		23/02/2026
Authorised by	Max W. Moller <i>Principal Hydraulic Engineer</i>		23/02/2026

Document Revision History

Rev No.	Description	Prepared by	Authorised by	Date

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1. Introduction

Flüssig Engineers has been engaged by **Castine Constructions Pty Ltd** to undertake a site-specific Flood Hazard Report for the development at 3 Belar Street, Howrah in the **Clarence City Council** municipality. The purpose of this report is to determine the flood characteristics on the existing and post-development hazard scenarios for the 1% AEP plus climate change, for the purpose of development.

1.1 Development

The proposed development involves the construction of deck area adjoining the existing dwelling along with a new shed. The existing dwelling and shed currently occupy approximately 205 m² of the 680 m² lot. The proposed works will add an additional 40 m² deck to the dwelling and a new shed of approximately 40 m². This development triggers the inundation code as the development falls within Clarence City Council, flood prone area.

1.2 Objectives and Scope

This report is to assess the proposed development at 3 Belar Street, Howrah under C12.0 Flood Prone Areas Hazard Code of the Tasmanian Planning Scheme - Clarence. The objectives of this study are:

- Provide an assessment of the site's flood characteristics under the combined 1% AEP plus climate change (CC) scenario.
- Provide comparison of flooding for post-development against acceptable solution and performance criteria.
- Provide flood mitigation recommendations for a potential future development, where appropriate.

1.3 Limitations

This study is limited to the objectives of the engagement by the clients, the availability and reliability of data, and including the following:

- The flood model is limited to a 1% AEP + CC worst case temporal design storm.
- All parameters have been derived from best practice manuals and available relevant studies (if applicable) in the area.
- All provided data by the client or government bodies for the purpose of this study is deemed fit for purpose and has not been checked for accuracy.
- The study is to determine the effects of the new development on flooding behaviour and should not be used as a full flood study outside the specified area without further assessment.

1.4 Relevant Planning Scheme Requirements

Table 1. TPS Planning Scheme Requirements

Planning Scheme Code	Objective
C12.5.1 Uses within a flood prone area	That a habitable building can achieve and maintain a tolerable risk from flood
C12.6.1 Building and works within a flood prone area	(a) building and works within a flood-prone hazard area can achieve and maintain a tolerable risk from flood; and
	(b) buildings and works do not increase the risk from flood to adjacent land and public infrastructure.

2. Model Build

2.1 Overview of Catchment

The contributing catchment for 3 Belar Street, Howrah is approximately 75 ha stretching north of the development site to Waverley Flora Park with an average slope of 12.5 %. The land use of the catchment is Open Space, Utilities and General Residential with the specific site being listed as General Residential.

Figure 1 below outlines the approximate contributing catchment for the site at 3 Belar Street, Howrah.

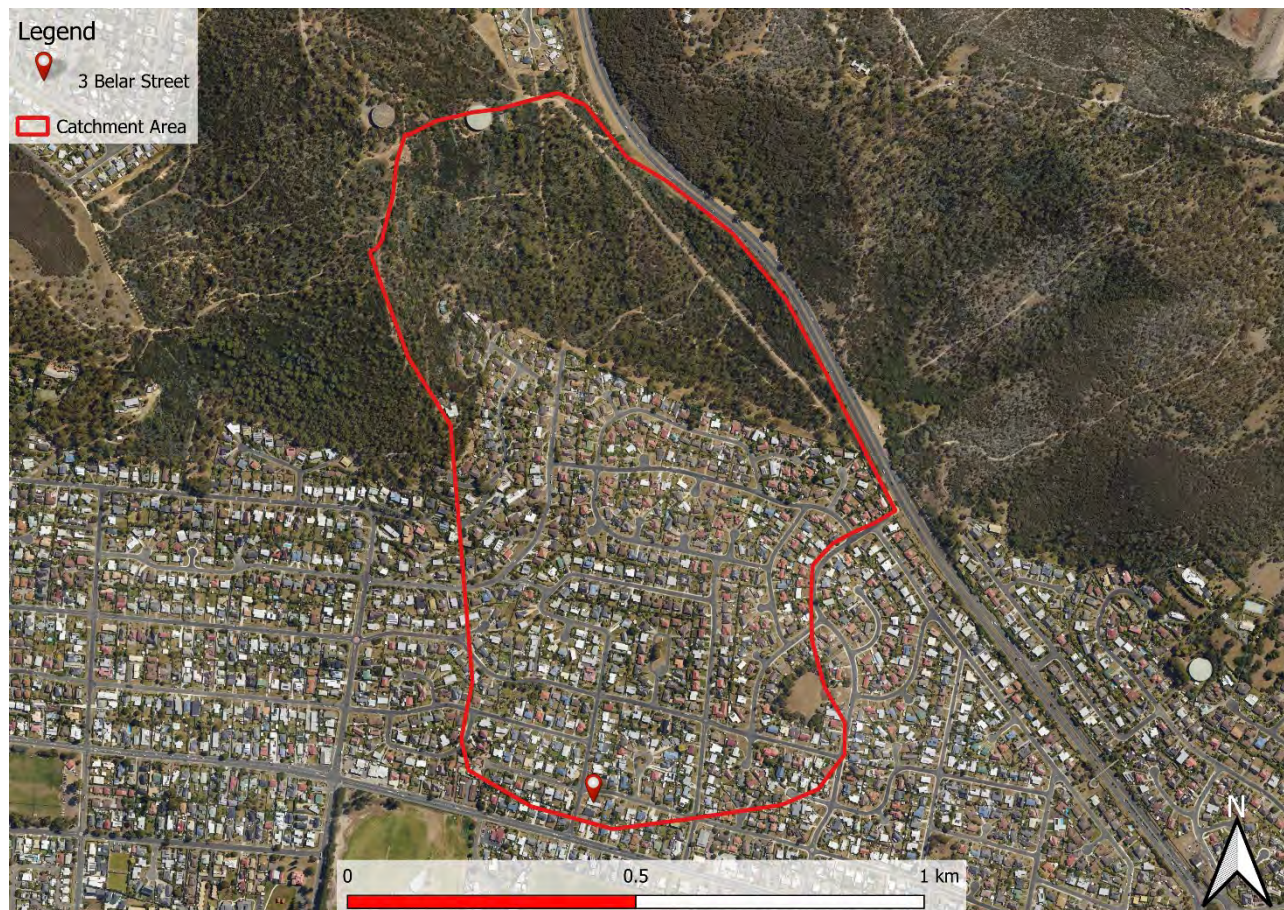


Figure 1. Contributing Catchment, 3 Belar Street, Howrah

2.2 Hydrology

The following Table 2 states the adopted hydrological parameters for the RAFTS catchment, as per best practice guidelines.

Table 2. Parameters for RAFTS catchment

Catchment Area (ha)	Initial Loss Perv/imp (mm)	Continuing Loss Perv/imp (mm/hr)	Manning's N pervious	Manning's N impervious	Non-linearity factor
75	28/1	3.7/0.0	0.045	0.02	-0.285

2.2.1 Design Rainfall Events

Figure 2 shows the box and whisker output of the model run. The model shows that the 1% AEP 10-minute storm temporal pattern 7 was the worst-case median storm. Therefore, this storm event was used within the hydraulic model. This particular storm event was selected as the worst-case scenario for further integration into the hydraulic model. The utilisation of this specific storm pattern ensures a

comprehensive assessment of the system's response under conditions representing a high level of hydrological stress, thereby enhancing the model's ability to simulate and address extreme weather scenarios.

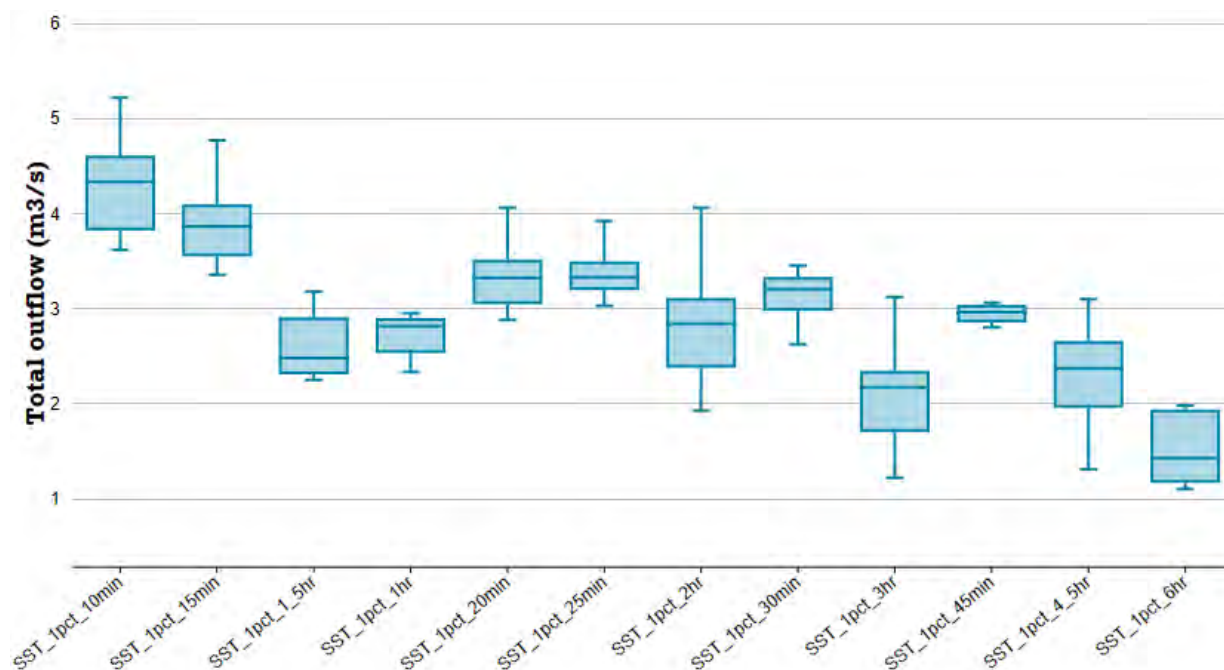


Figure 2. 1% AEP Flood Event Model, Box and Whisker Plot

2.2.2 Climate Change

The ARR 2019 Guide for Flood Estimation, Version 4.2, is regarded as the industry standard for assessing projected increases in rainfall under climate change conditions for the year 2100 scenario.

According to the guide, a multiplication factor of 1.86 is adopted for rainfall durations of less than 1 hour under the SSP5-8.5 at 2100 scenario for the localised catchment. This factor accounts for the anticipated intensification of extreme rainfall events due to climate change impacts and is generally adopted by councils which is shown below in Table 3.

Table 3. Climate Change Increases

Parameter	Localised Catchment SSP5-8.5 @ 2100
<1 - hour Rainfall Intensity	86% Increase

2.3 Hydraulics

A 1D-2D hydraulic model was created to determine the flood level through the target area.

2.3.1 Calibration/Validation

This catchment has no stream gauge to calibrate the model against a real-world storm event. Similarly, there is little historical information available, and no past flood analysis undertaken to validate against the flows obtained in the model.

2.3.2 Survey

The 2D surface model was taken from LiDAR 2019 to create a 1m cell size DEM. For the purposes of this report, 1m cells are enough to capture accurate flow paths. The DEM with hill shading can be seen below in Figure 3.



Figure 3. 1m DEM (Hill shade) of Lot Area, 3 Belar Street

2.3.3 Key Stormwater Assets including pipes and pits

Pipes and pits were modelled as 1D underground network within the localised catchment model to provide insight into the capacity of the stormwater system. Where data was missing, this was inferred from surrounding data and where invert levels were missing, a 600 mm cover was applied.

2.3.4 Roads

Roads often form the basis for overland flow in high frequency events; however, the kerb and channel are not always picked up by the DEM surface. To correct for the drainage lines, mesh polygons were used to delineate road corridors with the roads incorporating a z-line along the gutter to ensure the kerb invert is represented in the mesh.

2.3.5 Buildings

Specifically, residential houses and commercial buildings were integrated into the DEM by elevating the corresponding grid cells representing these structures by a standardised height of 0.3 meters above the natural ground surface. Subsequently, the re-sampled grids were utilised to establish the Infoworks ICM model, thus forming a foundational framework for the subsequent analysis and simulation of flood dynamics.

This method allows for flow through the building if the flood levels/ pressure become great enough. The aim is to mimic flow through passageways such as doors, windows, and hallways.

2.3.6 Walls

All significant fences and retaining structures were incorporated into the 2D model as 2D linear wall elements. Pallet fences were modelled with a maximum height of 250 mm, representing the estimated

depth at which they are likely to collapse during a 1% AEP rainfall event. Solid material walls were modelled using a realistic height to reflect their structural integrity and expected behaviour under flood conditions.

2.3.7 Structures

In the process of crafting a two-dimensional grid to depict the ground surface of the floodplain, we initiated by re-sampling high-resolution LiDAR data to generate a digital elevation model (DEM) through the utilisation of GIS software.

Within this procedure, the attention was directed towards identifying and incorporating pertinent features such as residential structures, commercial buildings, walls, and roadways. Ensuring the comprehensive inclusion of these features within the re-sampled DEM was of utmost importance.

2.3.8 Roughness (Manning's n)

The model grid's roughness and equivalent Manning's n values were derived from land use data. Table 4 shows Manning's values used in the model. Values for this layer were derived from the ARR 2019 Guidelines. These parameters have proven effective in previous flood mapping projects undertaken in Tasmania.

Table 4. Manning's Coefficients (ARR 2019)

Land Use	Roads	Open Channel	Rural	Residential	Parks	Buildings	Piped Infrastructure
Manning's n	0.018	0.035	0.04	0.045	0.05	0.3	0.013

3. Model Results

The result of 1% AEP + CC were run through the pre-development scenario to analyse the changes to flooding onsite and to surrounding properties.

3.1 Pre-Development Scenario

It can be seen from the pre-development model runs (Figure 4), that there is a moderate overland flood path originating from the north and northeast and entering the lot via the north lot boundary flowing towards the existing dwelling through to the east and south boundaries. The maximum depth in the pre-development scenario within the lot is 0.132 m observed at the centre of the lot in a low point adjacent to the existing dwelling. The maximum depth at the cross-sectional results line at the southern lot boundary is 0.10 m.

In the pre-development scenario, the maximum velocity within the site reaches approximately 0.66 m/s, occurring along the eastern boundary as the overland flow enters from Allumba Street. The flow then traverses the northern boundary and passes between the existing dwelling and shed before continuing toward the eastern and southern boundaries.

Hazard classifications across the site are limited to H1 under pre-development conditions, as flood depths and velocities remain low, as the allotment is generally flat and low-lying, with no significant natural depressions that would allow for ponding.

3.2 Post-Development Scenario

Figure 5 provides a post-development analysis of flood risks at 3 Belar Street, Howrah, focusing on the flood extent of the overland flow path that affects the lot. The analysis includes the impact of the proposed deck extension and shed has on the neighbouring properties including recommendations for mitigating flood risks.

The post-development hydraulic modelling results for the 1 % AEP + Climate Change (2100) scenario indicate that flooding on site at 3 Belar Street is slightly modified due to the minor increase in building footprint which is an extension to the existing dwelling and the proposed shed increasing the amount of roofed area.

In the post-development scenario, the maximum depth within the lot is 0.15 m on the northern side of the proposed shed as depths of less than 0.11 m are observed on the eastern lot boundary. The maximum flood depth at the proposed extension is 0.125 m.

Velocity within the lot reaches a maximum of 0.70 m/s again along the northern side of the proposed shed, with velocities of less than 0.5 m/s observed in the eastern side of the lot.

Hazard mapping indicates that there is no increase in hazard classification or extent within the lot or on surrounding properties, with the H1 hazard remaining throughout the lot and posing no increase in Hazard classification on the surrounding properties.

Although the overland flow paths are altered due to changes in building footprint between the pre- and post-development scenarios, the relative increase is only minor. The overland flow continues to discharge towards the southeast side of the lot, with no increase in flow depth, velocity, or impact to neighbouring properties.

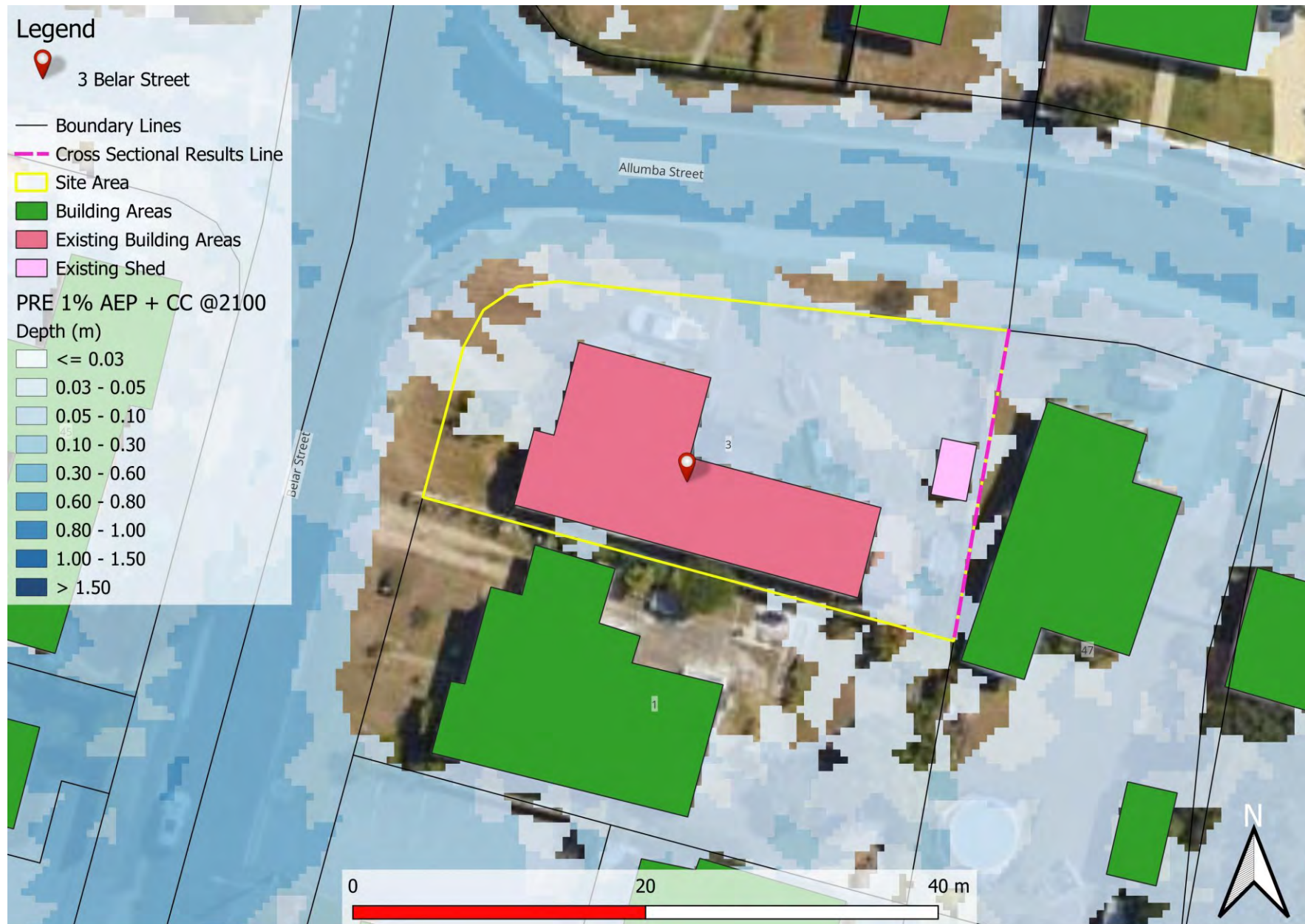


Figure 4. Pre-Development Scenario 1% AEP + CC Depth

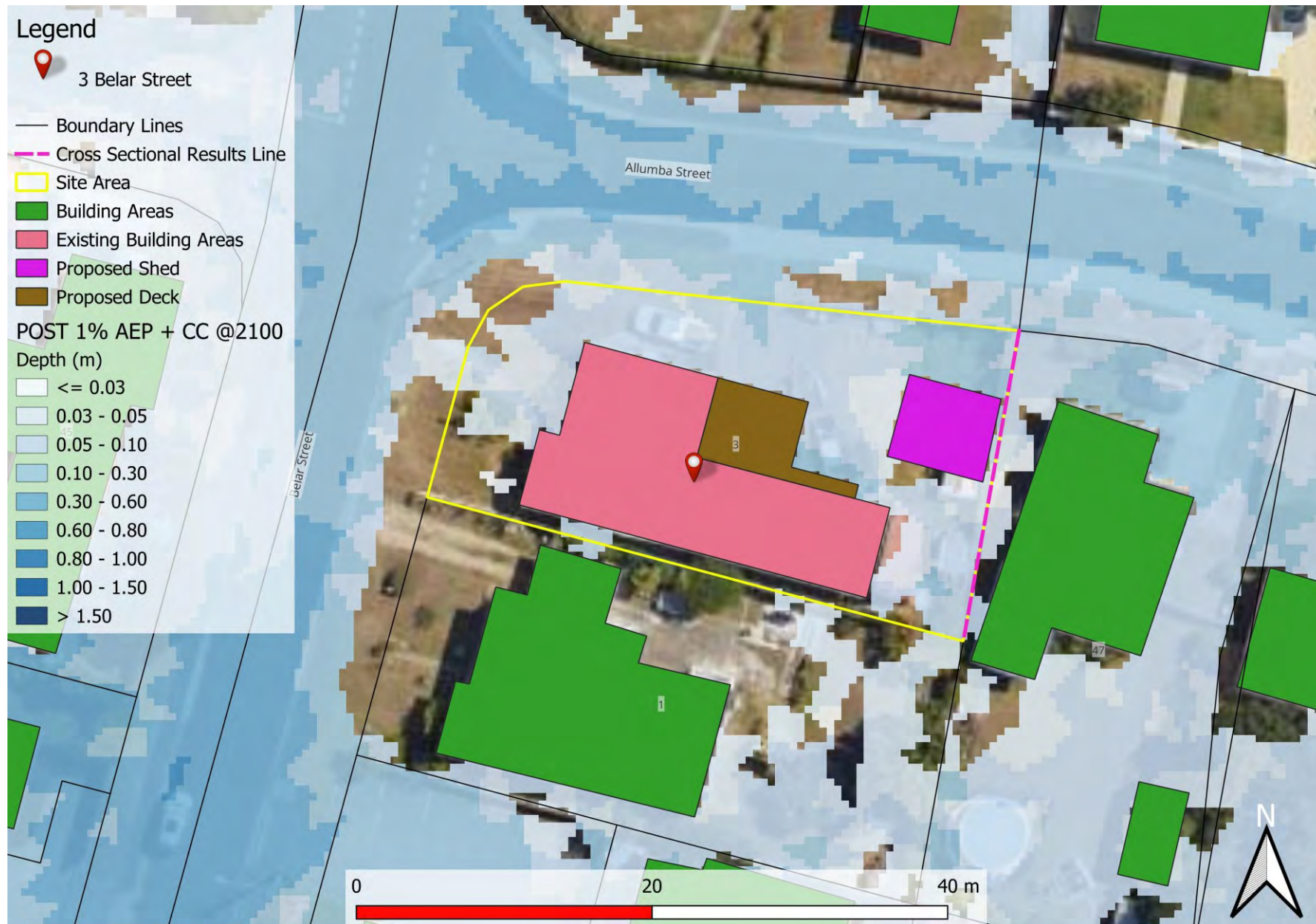


Figure 5. Post-Development Scenario 1% AEP + CC Depth

3.3 Displacement of Overland Flow on Third Party Property

Post-development flows in Figure 5 show that when compared against pre-development in Figure 4, there is relatively limited increase in flood depths on adjacent properties surrounding the lot, with the overland flow relatively unimpeded to continue towards the natural overland flow path to the east and south boundaries of the lot.

Therefore, it can be stated that the development does not have any measurable effect on third party property.

3.4 Development Effects on Flooding

Figure 6 shows the net discharge hydrograph from the cross-sectional result line on the southern lot boundary. The peak discharge in the pre-development scenario is 0.4 m³/s which increases by 0.026 m³/s to 0.426 m³/s in the post-development scenario. The maximum velocity also increased by 0.02 m/s from 0.64 m/s in the pre-development scenario to 0.66 m/s in the post-development scenario. As there is only a relatively minor increase in discharge and velocity compared to the pre-development scenario, this can be considered to have no adverse impact on stormwater infrastructure.

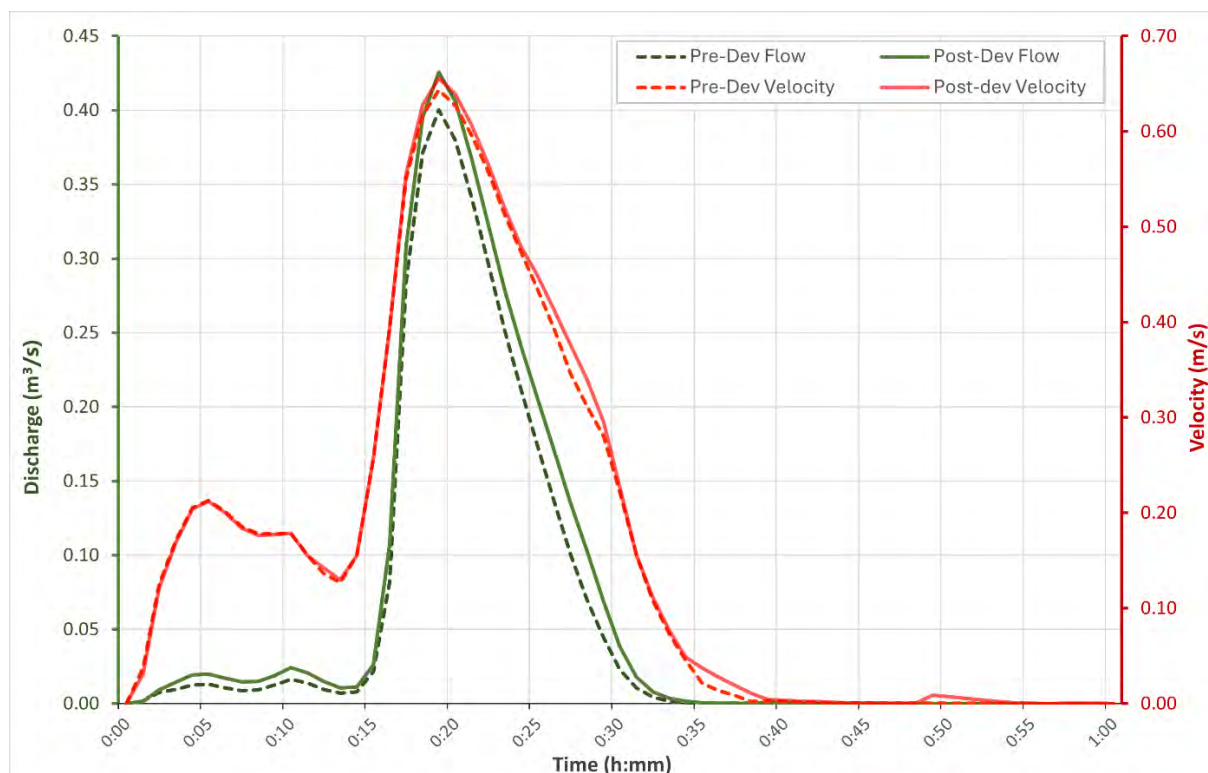


Figure 6. Pre and Post development net discharge and velocity 1% AEP + CC.

3.5 New Habitable Building

To meet the performance criteria of the Building Regulations, the construction is required to have a habitable floor level >300mm above the >1% AEP + CC flood level. The development at 3 Belar Street, Howrah must meet this regulation as shown in Table 5. (The floor level >1% AEP + CC flood level + 300mm does not apply for non-habitable areas including garages).

Table 5. Habitable Floor Construction Levels

Habitable Floor	1% AEP +CC flood level (mAHD)	Minimum Floor Level required (mAHD)
Proposed Deck	6.465	6.765

Based on email correspondence received from the client dated 18/02/2026, the measured vertical distance between the finished ground level adjacent to the extension and the top of the internal floorboards is 0.56 m. The maximum modelled flood depth at the extension under the 1% AEP plus climate change event is 0.125 m.

Applying the required 0.30 m freeboard results in a minimum required habitable floor level clearance of 0.425 m above ground. As the measured floor level of 0.56 m exceeds the required 0.425 m, the existing floor level complies with the Building Regulations for the 1% AEP plus climate change flood event.

3.6 Model Summary

Table 6. Pre-development and post-development at the cross-sectional line

	Pre-development	Post-development	Net Change
Depth (m)	0.10	0.11	+ 0.01
Velocity (m/s)	0.64	0.66	+ 0.02
Discharge (m ³ /s)	0.40	0.42	+ 0.02

4. Flood Hazard

Under existing conditions prior to development, the proposed location of the dwelling is subject to be inundated to < 0.132 m flood depth and < 0.66 m/s velocity. This places the hazard rating as adopted by Australian Flood Resilience and Design Handbook as a maximum H1 – *Generally safe for people, vehicles and buildings*, as shown in Appendix A – Hazard maps. The post-development scenario observes no increase in Hazard classification where flood depths and velocities see a relatively minor increase.

The assessment focuses on the development site, nearby properties, the road, and close infrastructure. Areas beyond this, such as broader public access routes, were not included in the analysis. This report covers flood behaviour and safety around the site only. During a flood event, occupants and visitors should remain indoors unless directed otherwise by emergency services.

A summary of the hazard ratings is shown in Figure 7.

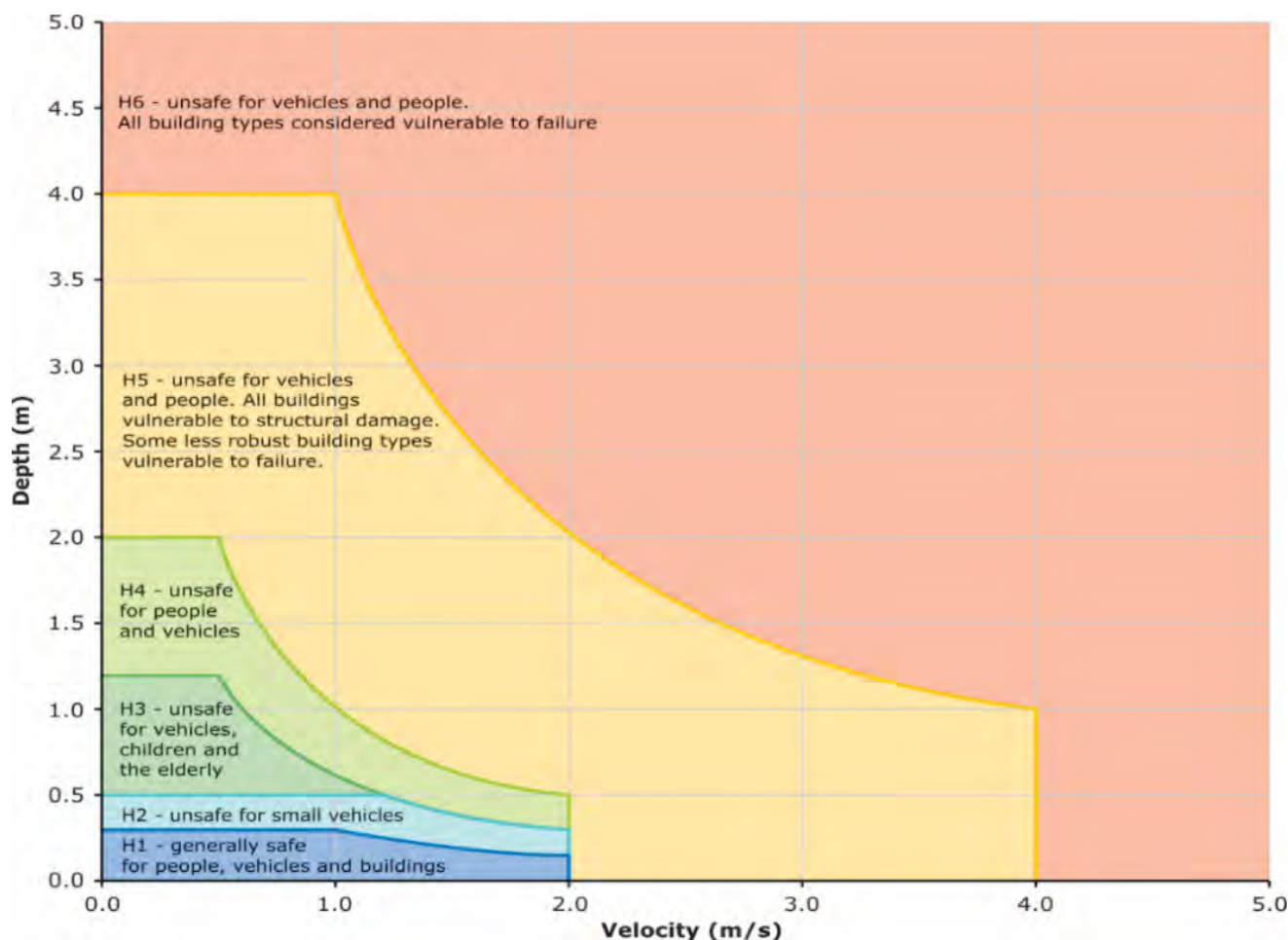


Figure 7. Hazard Categories Australian Disaster and Resilience Handbook

4.1 Tolerable Risk

The lot at 3 Belar Street, Howrah is subject to shallow and slow-moving overland floodplain flow during the 1 percent AEP event including climate change. The immediate surrounding area is predominantly classified within the low hazard range, generally H1 to H2, which indicates limited depth and velocity. Although these conditions represent a lower risk profile when compared with deeper or higher velocity flooding, they still present meaningful hazards. Even relatively minor depths and velocities can mobilise sediment, cause localised erosion, transport debris, and direct runoff towards building openings.

The assessment has identified that the proposed development extends from the existing dwelling, increasing the building footprint. This configuration increases the potential for water to enter through the proposed shed; however, the structure is non-habitable and is not intended for permanent occupation. Flood depths and velocities at the location remain low and within tolerable risk thresholds, with no increase in hazard classification across the site. Accordingly, the residual flood risk associated with the proposed development is considered acceptable and does not pose a safety risk to occupants or adjoining properties.

If all recommendations contained within this report are implemented and maintained throughout the structure's life, the proposed Class 1a dwelling, designed for a fifty-year asset life in accordance with BCA2022, can achieve a tolerable level of flood risk. This means the expected flood behaviour is manageable, and the structure can perform safely under the defined design conditions without unacceptable impacts to property or occupant safety.

5. TPS summary Report summary against TPS – Clarence

Table 7. Tasmanian Planning Scheme – Clarence summary C12.5.1

C12.5.1 Uses within a flood prone hazard area			
Objectives: That a habitable building can achieve and maintain a tolerable risk from flood			
Performance Criteria			
P1.1		P1.1	
A change of use that, converts a non-habitable building to a habitable building, or a use involving a new habitable room within an existing building, within a flood-prone hazard area must have a tolerable risk, having regard to:		Response from flood report	
(a)	the location of the proposed works;	(a)	Proposed deck extending from the existing dwelling and construction of a new shed.
(b)	the advice in a flood hazard report;	(b)	Assuming recommendations of this report are implemented, no additional flood protection measures required for the life expectancy of the building.
(c)	any advice from a state authority, regulated entity or a council;	(c)	N/A
P1.2		P1.2	
A flood hazard report also demonstrates that:		Response from flood report	
(a)	any increase in the level of risk from flood does not require any specific hazard reduction or protection measures;	(a)	No increase in level of risk from pre-development scenario.
(b)	the use can achieve and maintain a tolerable risk from a 1% annual exceedance probability flood event for the intended life of the use without requiring any flood protection measures	(b)	Maximum hazard rating at the proposed development is at H1

Table 8. Tasmanian Planning Scheme – Clarence summary C12.6.1

C12.6.1 Building and works within a flood prone area			
Objective: (a) building and works within a flood-prone hazard area can achieve and maintain a tolerable risk from flood; and, (b) buildings and works do not increase the risk from flood to adjacent land and public infrastructure.			
Performance Criteria			
P1.1		P1.1	
Buildings and works within a flood-prone hazard area must achieve and maintain a tolerable risk from a flood, having regard to:		Response from flood report	
(a)	the type, form, scale and intended duration of the development;	(a)	A proposed deck extending from the existing dwelling at the same FFL and the construction of a new shed.
(b)	whether any increase in the level of risk from flood requires any specific hazard reduction or protection measures;	(b)	No increase in risk following the new additions and internal alterations requiring specific hazard reduction measures.
(c)	any advice from a State authority, regulated entity or a council; and	(c)	N/A
(d)	the advice contained in a flood hazard report.	(d)	Flood report and recommendations provided within.
Performance Criteria			
P1.2		P1.2	
A flood hazard report also demonstrates that the building and works:		Response from Flood Report	
(a)	do not cause or contribute to flood on the site, on adjacent land or public infrastructure; and	(a)	No significant increase to flow and velocity from the proposed development.
(b)	can achieve and maintain a tolerable risk from a 1% annual exceedance probability flood event for the intended life of the use without requiring any flood protection measures.	(b)	Assuming recommendations of this report the proposed development can achieve a tolerable risk to the 1% AEP storm event for the life expectancy of the building.

6. Conclusion

The Flood Hazard Report for 3 Belar Street, Howrah development site has reviewed the potential development flood scenario.

The following conclusions were derived in this report:

1. A comparison of the post-development peak flows for the 1% AEP at 2100 were undertaken against C12.0 of the Tasmanian Planning Scheme – Clarence Flood Prone Areas code.
2. Depth increases slightly at the cross-sectional result line by 0.01 m to 0.11 m in the post-development scenario from 0.10 m in pre-development.
3. Peak velocity sees a slight increase of 0.02 m/s from 0.64 m/s to 0.66 m/s in the post-development flood scenario.
4. Discharge shows a slight increase of 0.02 m³/s between pre- and post-development riverine flood scenarios from 0.40 m³/s to 0.42 m³/s.
5. Hazard from flooding within the lot remain at the maximum category of H1 for both pre and post development riverine scenarios, including on neighbouring properties.

7. Recommendations

Flüssig Engineers therefore recommends the following engineering design be adopted for the development and future use to ensure the works meets the Inundation Code:

1. The extension to have a minimum floor level as per Table 5. (minimum FFL = 6.765 mAHD or higher).
2. Provide a minimum vertical separation of 0.425 m between the finished floor level (FFL) and the adjoining ground level at the entrance to the proposed extension.
3. Proposed structures, located in the inundation area, are to be designed to resist flood forces including debris.
4. Any change in external building layout or addition of other solid structures will require further flood assessment.
5. The proposed deck and shed must be designed to resist flood forces including debris for the given flood conditions.
6. All future proposed structures within the flood extent not shown within this report will require a separate design and report addressing their impacts.
7. Any future redevelopment or alteration that increases impervious surfaces within the lot should be supported by a revised stormwater and flood assessment to confirm that runoff can still be safely managed onsite.

Under the requirements of this Flood Hazard Report, the proposed development will meet current acceptable solutions and performance criteria under the Tasmanian Planning Scheme – Clarence.

8. Limitations

Flüssig Engineers were engaged by **Castine Constructions Pty Ltd**, for the purpose of a site-specific Flood Hazard Report for 3 Belar Street, Howrah as per C12.0 of the Tasmanian Planning Scheme – Clarence. This study is deemed suitable for purpose at the time of undertaking the study. If the conditions of the site should change, the report will need to be reviewed against all changes.

The results, findings, and interpretations contained in this report are based on the existing site conditions, available LiDAR surface data, hydraulic modelling, and other third-party information provided to Flüssig Engineers. Should any aspect of the site, catchment, or proposed development design change, including modifications to ground levels, drainage patterns, or surrounding infrastructure, the flood behaviour and associated risks may also change. In such cases, this report must be re-evaluated and updated to reflect those modifications before further use.

This report must be read and used in its entirety. It may not be quoted, reproduced, or relied upon in part or for any purpose other than that expressly stated within, unless prior written consent is obtained from Flüssig Engineers.

Flüssig Engineers accepts no responsibility or liability for errors or inaccuracies arising from information supplied by external sources, third-party consultants, or other data providers used in preparing this report. The outcomes and conclusions presented herein are valid only for the conditions and assumptions explicitly described in this document.

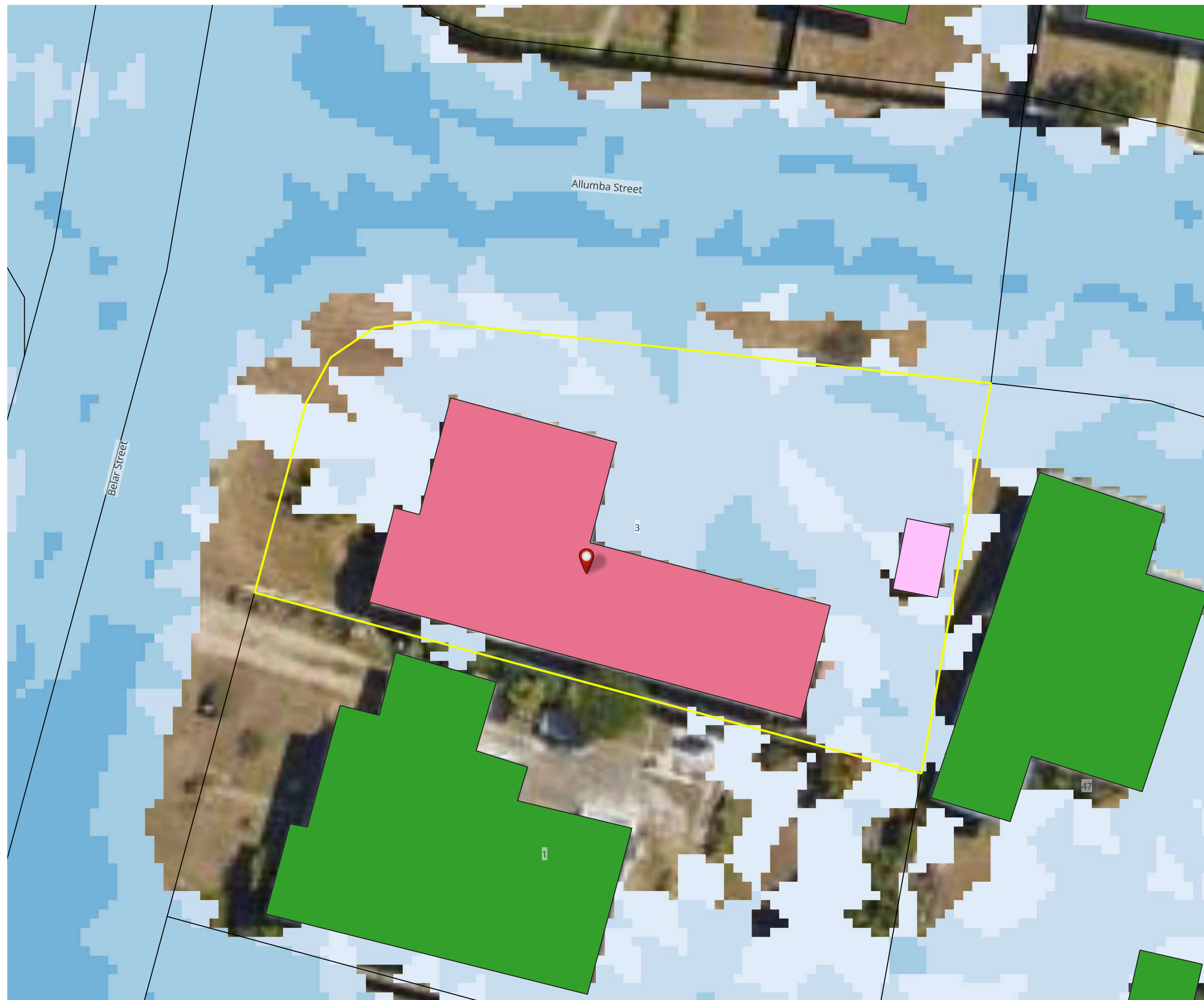
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Appendices

Appendix A Flood Study Maps

PRE 1% AEP + CC @ 2100



Legend



3 Belar Street

— Boundary Lines

□ Site Area

■ Building Areas

■ Existing Building Areas

■ Existing Shed

PRE 1% AEP + CC @2100

Depth (m)

□ ≤ 0.03

□ 0.03 - 0.05

□ 0.05 - 0.10

□ 0.10 - 0.30

□ 0.30 - 0.60

□ 0.60 - 0.80

□ 0.80 - 1.00

□ 1.00 - 1.50

□ > 1.50



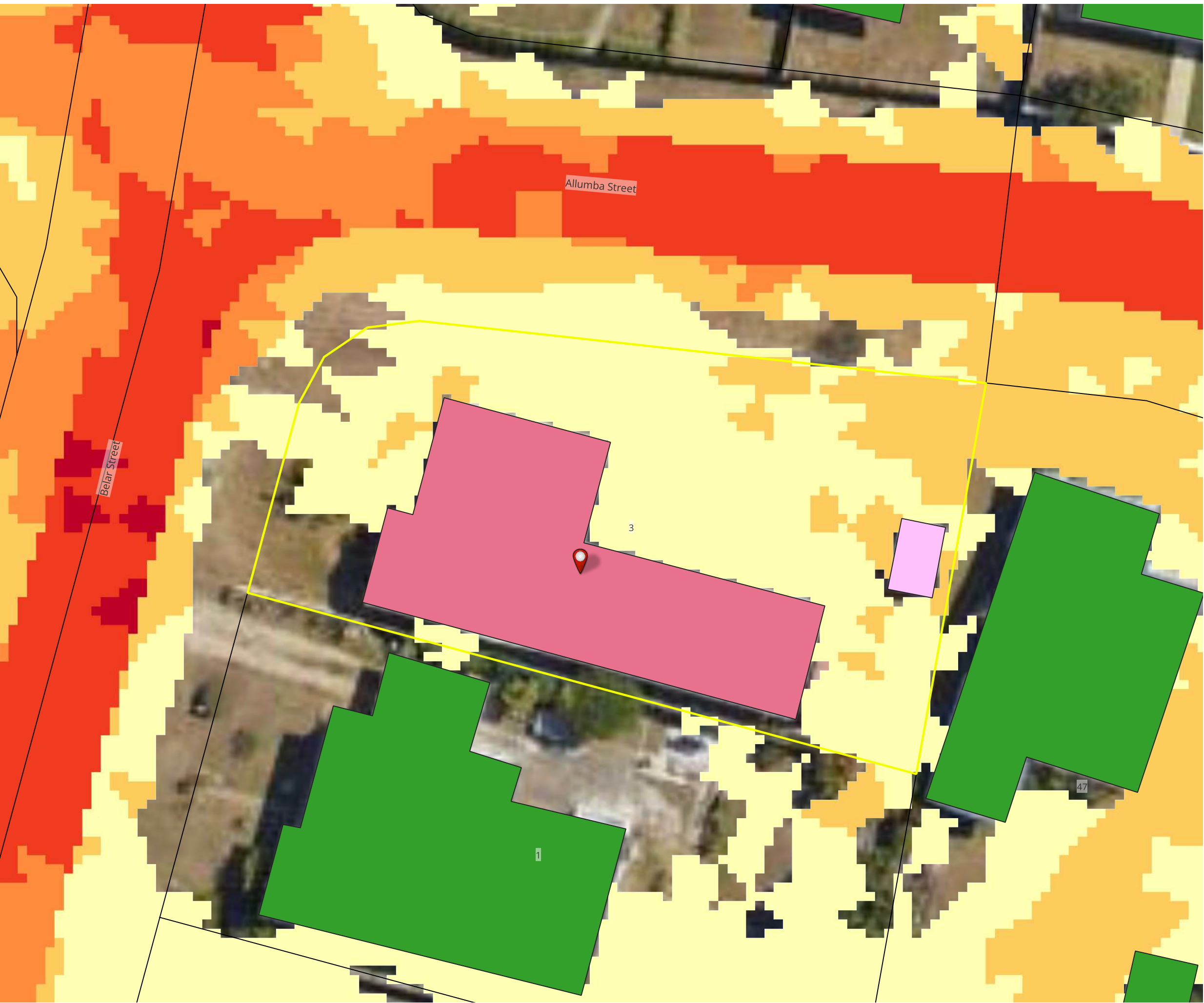
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PRE 1% AEP + CC @ 2100



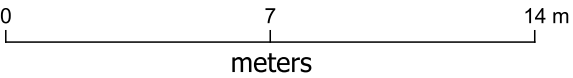
Legend

- 3 Belar Street
- Boundary Lines
- Site Area
- Building Areas
- Existing Building Areas
- Existing Shed

PRE 1% AEP + CC @2100

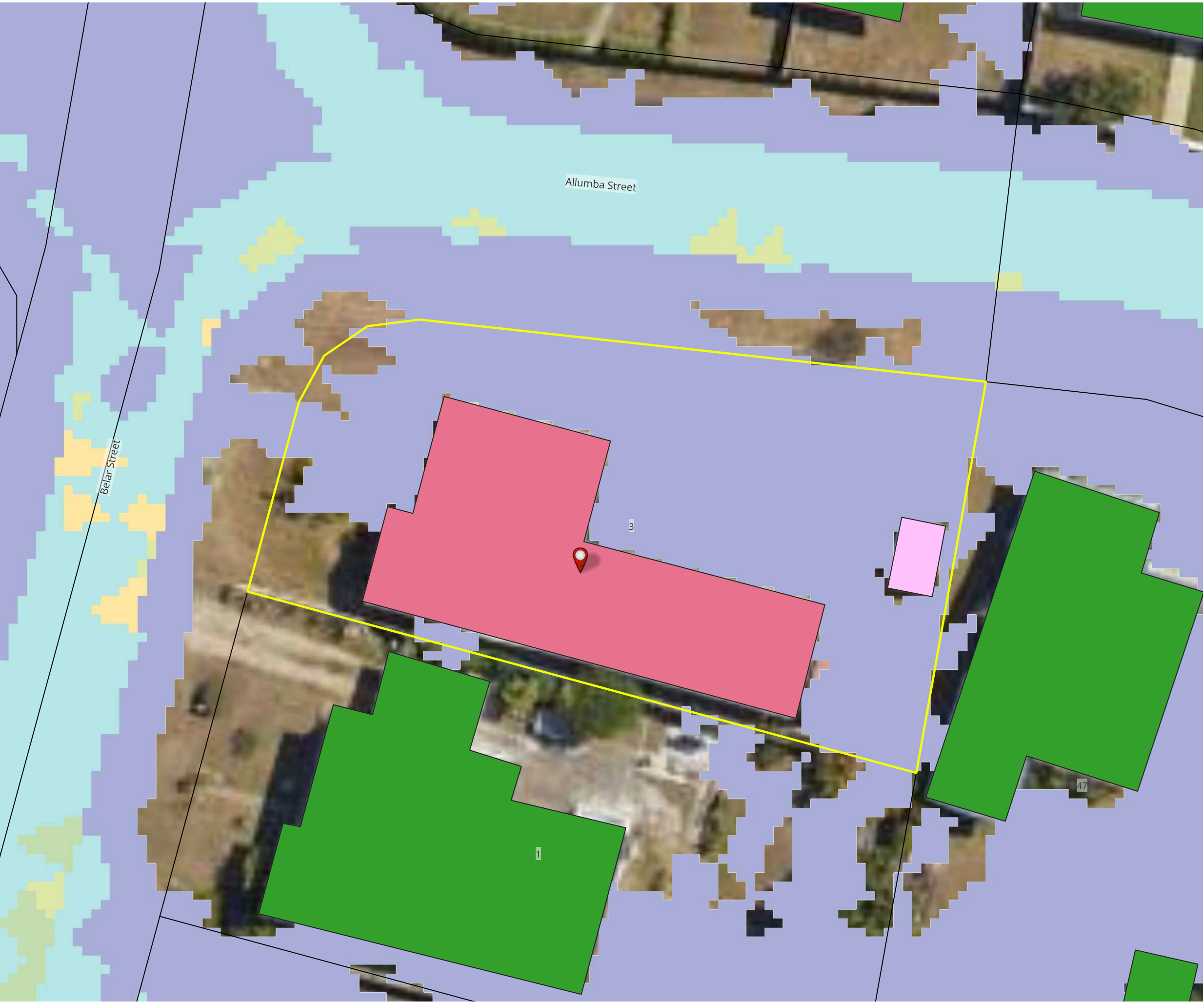
Velocity (m/s)

- <= 0.50
- 0.50 - 1.00
- 1.00 - 1.50
- 1.50 - 2.00
- > 2.00



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PRE 1% AEP + CC @ 2100



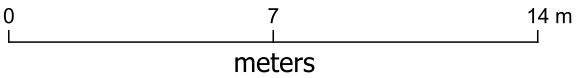
Legend

- 3 Belar Street
- Boundary Lines
- Site Area
- Building Areas
- Existing Building Areas
- Existing Shed

PRE 1% AEP + CC @2100

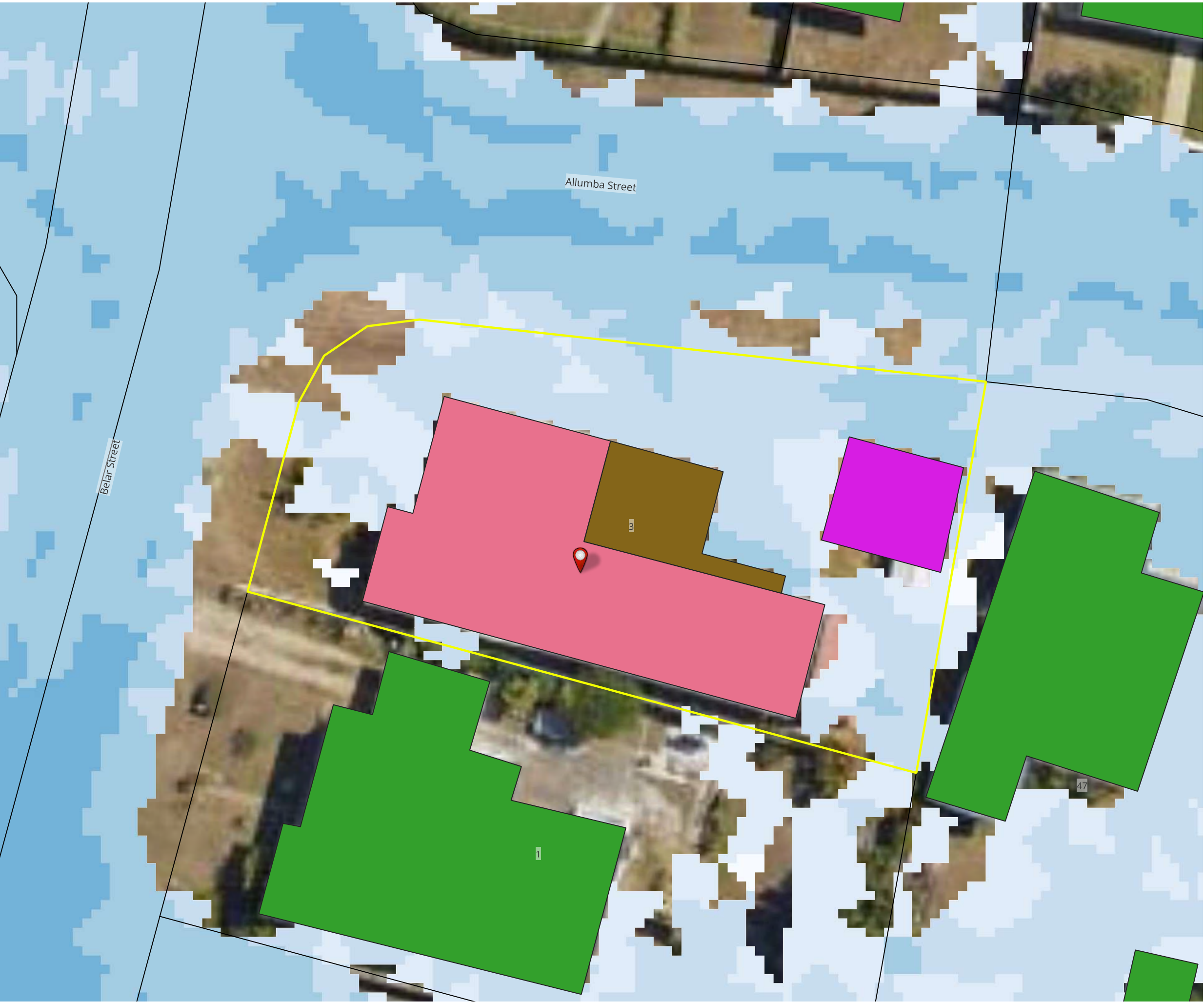
Hazard

- H1
- H2
- H3
- H4
- H5
- H6



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POST 1% AEP + CC @ 2100



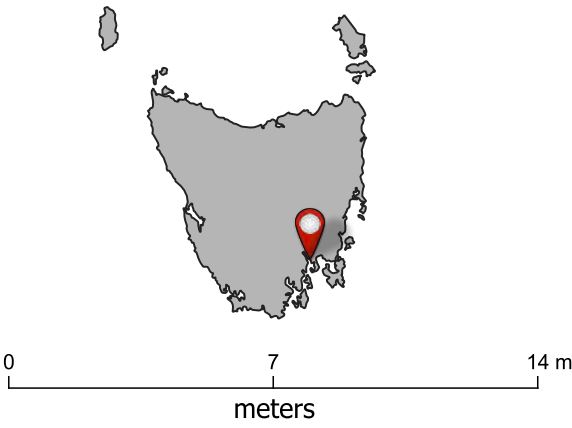
Legend

- 3 Belar Street
- Boundary Lines
- Site Area
- Building Areas
- Existing Building Areas
- Proposed Shed
- Proposed Deck

POST 1% AEP + CC @2100

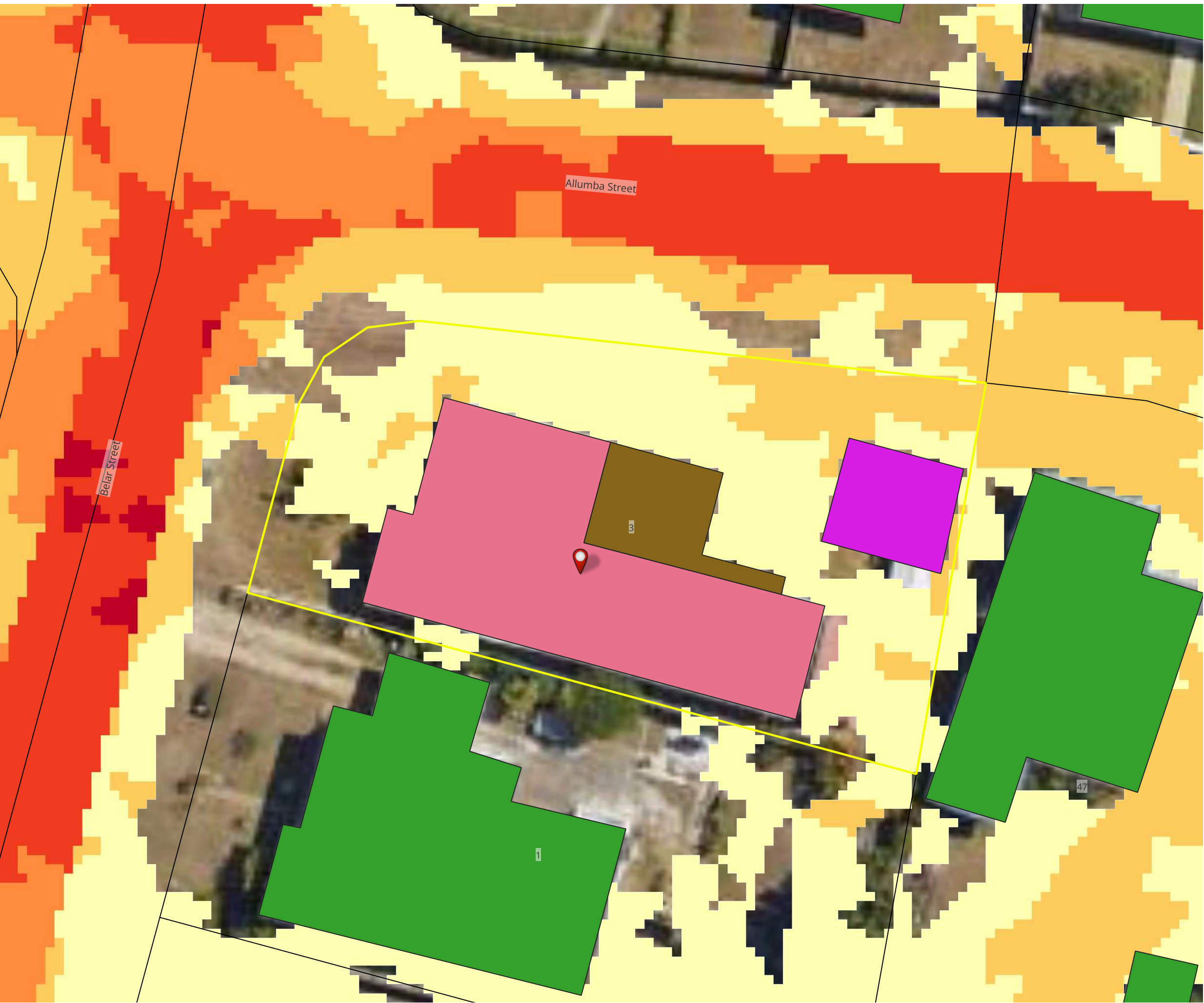
Depth (m)

	<= 0.03
	0.03 - 0.05
	0.05 - 0.10
	0.10 - 0.30
	0.30 - 0.60
	0.60 - 0.80
	0.80 - 1.00
	1.00 - 1.50
	> 1.50



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POST 1% AEP + CC @ 2100



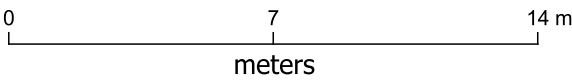
Legend

- 3 Belar Street
- Boundary Lines
- Site Area
- Building Areas
- Existing Building Areas
- Proposed Shed
- Proposed Deck

POST 1% AEP + CC @2100

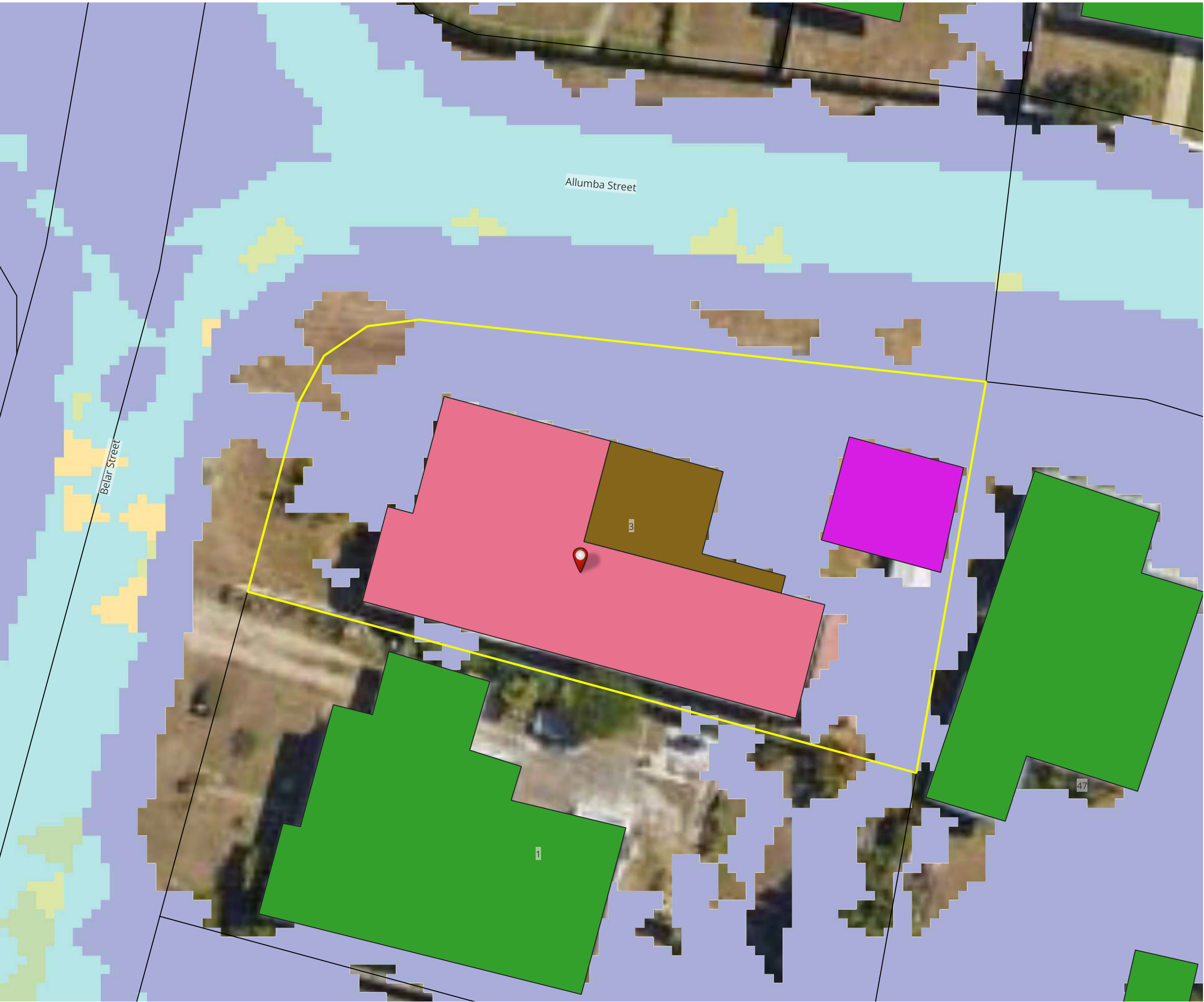
Velocity (m/s)

- ≤ 0.50
- 0.50 - 1.00
- 1.00 - 1.50
- 1.50 - 2.00
- > 2.00



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POST 1% AEP + CC @ 2100



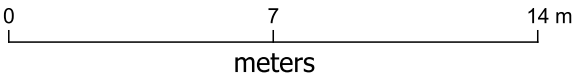
Legend

- 3 Belar Street
- Boundary Lines
- Site Area
- Building Areas
- Existing Building Areas
- Proposed Shed
- Proposed Deck

POST 1% AEP + CC @2100

Hazard

- H1
- H2
- H3
- H4
- H5
- H6



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