



DEVELOPMENT APPLICATION

PDPLANPMTD-2023/040287

PROPOSAL: Dwelling & Outbuilding

LOCATION: 919 Cambridge Road, Cambridge

RELEVANT PLANNING SCHEME: Tasmanian Planning Scheme - Clarence

ADVERTISING EXPIRY DATE: 26 March 2024

The relevant plans and documents can be inspected at the Council offices, 38 Bligh Street, Rosny Park, during normal office hours until 26 March 2024. 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 26 March 2024.

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.

Clarence City Council



APPLICATION FOR DEVELOPMENT / USE OR SUBDIVISION

The personal information on this form is required by Council for the development of land under the Land Use Planning and Approvals Act 1993. We will only use your personal information for this and other related purposes. If this information is not provided, we may not be able to deal with this matter. You may access and/or amend your personal information at any time. How we use this information is explained in our **Privacy Policy**, which is available at www.ccc.tas.gov.au or at Council offices.

Proposal:

New Dwelling and Shed

Location:

Address 919 Cambridge Road

Suburb/Town Cambridge

Postcode 7170

Current Owners/s:

Applicant:

Personal Information Removed

Tax Invoice for application fees to be in the name of: (if different from applicant)

Estimated cost of development

\$ 750,000

Is the property on the Tasmanian Heritage Register?

Yes

No

(if yes, we recommend you discuss your proposal with Heritage Tasmania prior to lodgement as exemptions may apply which may save you time on your proposal)

If you had pre-application discussions with a Council Officer, please give their name

Current Use of Site:

Vacant Lot

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. Where the application is submitted under Section 43A, the owner's 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.*

Applicant's Signature:

Signature..... 	Date..... 16/11/2023
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PLEASE REFER TO THE DEVELOPMENT/USE AND SUBDIVISION CHECKLIST ON THE FOLLOWING PAGES TO DETERMINE WHAT DOCUMENTATION MUST BE SUBMITTED WITH YOUR APPLICATION.

Documentation required:

1. **MANDATORY DOCUMENTATION**

This information is required for the application to be valid. An application lodged without these items is unable to proceed.

- 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 Council.

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

2. **ADDITIONAL DOCUMENTATION**

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 plan 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.*

Clarence City Council

DEVELOPMENT/USE OR SUBDIVISION CHECKLIST



- 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 Council's Planning Officers on (03) 6217 9550 who will be pleased to assist.

SEARCH OF TORRENS TITLE

VOLUME 174150	FOLIO 114
EDITION 3	DATE OF ISSUE 13-Sep-2023

SEARCH DATE : 16-Nov-2023

SEARCH TIME : 11.31 AM

DESCRIPTION OF LAND

City of CLARENCE
 Lot 114 on Sealed Plan 174150
 Derivation : Part of Lot 38278, 21.28ha Gtd. to The Director
 of Housing
 Prior CT 171403/1

SCHEDULE 1

N153570 TRANSFER to JASMIN LOUISE BURDEN and JAKE ASHLEY
 BURDEN Registered 13-Sep-2023 at noon

SCHEDULE 2

Reservations and conditions in the Crown Grant if any
 SP174150 COVENANTS in Schedule of Easements
 SP174150 FENCING PROVISION in Schedule of Easements
 D17771 AGREEMENT pursuant to Section 71 of the Land Use
 Planning and Approvals Act 1993 Registered
 21-Dec-2011 at 12.01 PM
 D152059 AGREEMENT pursuant to Section 71 of the Land Use
 Planning and Approvals Act 1993 Registered
 02-Apr-2015 at 12.01 PM
 E49971 AGREEMENT pursuant to Section 71 of the Land Use
 Planning and Approvals Act 1993 Registered
 15-Jun-2016 at noon
 E360795 MORTGAGE to Westpac Banking Corporation Registered
 13-Sep-2023 at 12.01 PM

UNREGISTERED DEALINGS AND NOTATIONS

No unregistered dealings or other notations

SCHEDULE OF EASEMENTS	Registered Number
NOTE: THE SCHEDULE MUST BE SIGNED BY THE OWNERS & MORTGAGEES OF THE LAND AFFECTED. SIGNATURES MUST BE ATTESTED.	SP 174 150

PAGE 1 OF 3 PAGE/S

EASEMENTS AND PROFITS

Each lot on the plan is together with:-

- (1) such rights of drainage over the drainage easements shown on the plan (if any) as may be necessary to drain the stormwater and other surplus water from such lot; and
- (2) any easements or profits a prendre described hereunder.

Each lot on the plan is subject to:-

- (1) such rights of drainage over the drainage easements shown on the plan (if any) as passing through such lot as may be necessary to drain the stormwater and other surplus water from any other lot on the plan; and
- (2) any easements or profits a prendre described hereunder.

The direction of the flow of water through the drainage easements shown on the plan is indicated by arrows.

1. EASEMENTS

(a) Rights of Way

Lot 109 on the Plan is SUBJECT TO a Right of Carriageway (appurtenant to lots 108 and 110 on the plan) over the area marked 'RIGHT OF WAY (PRIVATE) 10.00 WIDE' shown passing through the said Lot on the Plan.

Lots 108 and 110 on the Plan are TOGETHER WITH a Right of Carriageway over the area marked 'RIGHT OF WAY (PRIVATE) 10.00 WIDE' shown passing through the said Lot 109 on the Plan.

(b) Drainage

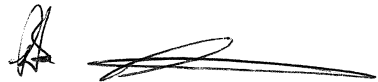
Lots 108 on the Plan is SUBJECT a Right of Drainage (appurtenant to Clarence City Council) over the area marked "DRAINAGE EASEMENT 2.00 WIDE" shown passing through the said Lots on the Plan.

Lots 117 and 118 on the Plan are SUBJECT a Right of Drainage (appurtenant to Clarence City Council) over the area marked "DRAINAGE EASEMENT 3.00 WIDE" shown passing through the said Lots on the Plan.


2. COVENANTS

- (a) The owners of each and every lot on the Plan hereby covenant with each and every other owner for the time being of every lot on the Plan and the Clarence City Council to the intent that the burden of the covenant may run with and bond the Covenantor's lot and every part thereof and the benefit thereof may be annexed to and devolve with each and every part of every other lot on the plan and the Clarence City Council to observe the following stipulation:

- Not to use any part of the land within the said Lot to obtain direct vehicular access to or from Tasman Highway.



(USE ANNEXURE PAGES FOR CONTINUATION)

SUBDIVIDER: R E & R D Stanton Holdings Pty Ltd & Palicave Pty Ltd FOLIO REF: 171403/1 SOLICITOR & REFERENCE: Bulter McIntyre & Butler (JGS)	PLAN SEALED BY: Clarence City Council DATE: 28-11-17 50-2016/17 REF NO.  Council Delegate
<p>NOTE: The Council Delegate must sign the Certificate for the purposes of identification.</p>	

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ANNEXURE TO SCHEDULE OF EASEMENTS PAGE 2 OF 3 PAGES	Registered Number SP 174 150
SUBDIVIDER: R E & R D Stanton Holdings Pty Ltd & Palicave Pty Ltd FOLIO REFERENCE: CT 171403/1	

3. FENCING PROVISION

In respect of any lot on the plan the Vendors (**R E & R D Stanton Holdings Pty Ltd** and **Palicave Pty Ltd**) shall not be required to fence.

4. INTERPRETATION


In this schedule of easements, unless the contrary intention appears:

“**Clarence City Council**” means Clarence City Council of 38 Bligh Street, Bellerive in Tasmania and includes its successors, assigns and licensees and includes where appropriate, the Authorised Persons .

“**Right of Carriageway**” means a right of carriage way as defined within Schedule 8 of the *Conveyancing and Law of Property Act 1884 (Tas)*.

“**Right of Drainage**” means a right of drainage as defined within Schedule 8 of the *Conveyancing and Law of Property Act 1884 (Tas)*.


SIGNED BY R E & R D Stanton Holdings Pty Ltd ACN 009 539 655, in accordance with Section 127 of the *Corporations Act 2001*:



 Director/Secretary

ROSS EUGENE STANTON

 Print Full Name



 Director/Secretary

Edrei Mark Stanton

 Print Full Name




NOTE: Every annexed page must be signed by the parties to the dealing or where the party is a corporate body be signed by the persons who have attested the affixing of the seal of that body to the dealing.

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<p>ANNEXURE TO SCHEDULE OF EASEMENTS</p> <p>PAGE 3 OF 3 PAGES</p>	<p>Registered Number</p> <p>SP 174 150</p>
<p>SUBDIVIDER: R E & R D Stanton Holdings Pty Ltd & Palicave Pty Ltd FOLIO REFERENCE: CT 171403/1</p>	

SIGNED by **Palicave Pty Ltd** by its Attorney
Con Tsamassiros under power no. PA92533
who hereby declares that he has received no notice
of revocation of the said power in the presence of:

)
)
)
)

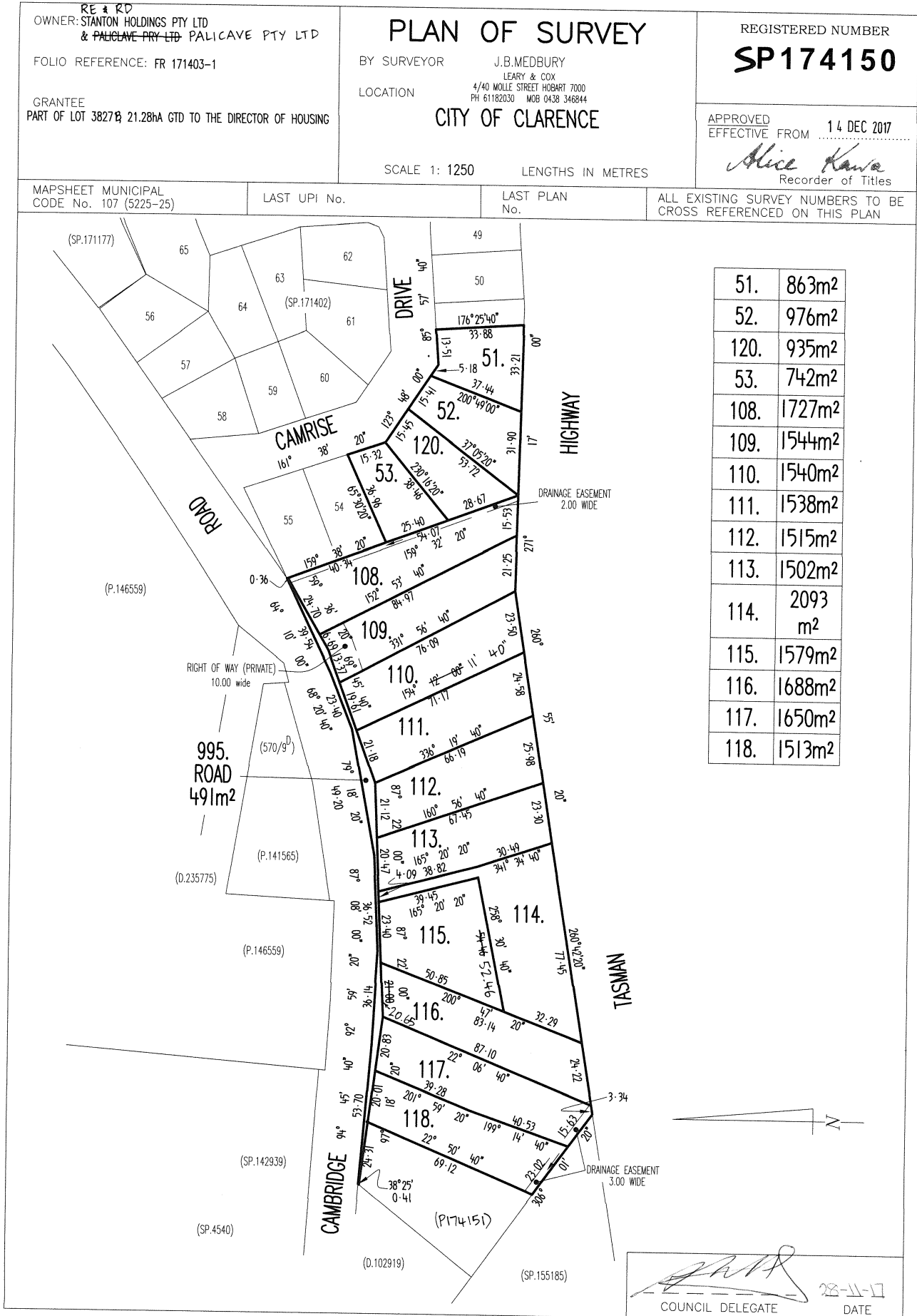



Jason Samec
Director
Butler McIntyre Investments Ltd
20 Murray Street, HOBART
Ph: (03) 6222 9444



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PINNACLE














919 Cambridge Road, Cambridge

Owner(s) or Clients	Jasmin & Jake Burden	Title Reference	174150/114
Building Classification	1a & 10a	Zoning	Low Density Residential
Designer	Jason Nickerson CC6073Y	Land Size	2093m ²
Total Floor Area (Combined)	248.53m ² Deck 43.75m ²	Design Wind Speed	N2
Alpine Area	N/A	Soil Classification	M
Other Hazards	Safeguarding of Airports, Flood-prone area, Road and Railway Assets, Bushfire-prone	Climate Zone	7
		Corrosion Environment	Low
		Bushfire Attack Level (BAL)	29

(e.g., High wind, earthquake, flooding, landslip, dispersive soils, sand dunes, mine subsidence, landfill, snow & ice, or other relevant factors)

ID	Sheet Name	Issue
A.01	Location Plan	DA - 03
A.02	Site Plan	DA - 03
A.03	Floor Plan - Dwelling	DA - 03
A.04	Elevations	DA - 03
A.05	Elevations	DA - 03
A.06	Shed Plans	DA - 03
A.07	Roof Plan	DA - 03

Legend

-  - Electrical Connection
-  - Electrical Turret
-  - Sewer Connection
-  - Stormwater Connection
-  - Telstra Connection
-  - Telstra Pit
-  - Water Meter
-  - Water Stop Valve
-  - Fire Hydrant
-  - Solar Bollard Light
-  - Spotlight with sensor

Survey Notes from Surveyor

"THIS PLAN AND ASSOCIATED DIGITAL MODEL IS PREPARED FOR PINNACLE DRAFTING FROM A COMBINATION OF FIELD SURVEY AND EXISTING RECORDS FOR THE PURPOSE OF DESIGNING NEW CONSTRUCTIONS ON THE LAND AND SHOULD NOT BE USED FOR ANY OTHER PURPOSE.

THE TITLE BOUNDARIES AS SHOWN ON THIS PLAN WERE NOT MARKED AT THE TIME OF THE SURVEY AND HAVE BEEN DETERMINED BY PLAN DIMENSIONS ONLY AND NOT BY FIELD SURVEY. NO MEASUREMENTS OR OFFSETS ARE TO BE DERIVED BETWEEN THE FEATURES IN THIS PLAN AND THE BOUNDARY LAYERS. THE RELATIONSHIP BETWEEN THE FEATURES IN THIS MODEL AND THE BOUNDARY LAYERS CANNOT BE USED FOR ANY SET OUT PURPOSES OR TO CONFIRM THE POSITION OF THE TITLE BOUNDARIES ON SITE.

SERVICES SHOWN HAVE BEEN LOCATED WHERE VISIBLE BY FIELD SURVEY. SERVICES DENOTED AS BEING "PER DBYD ONLY" ARE APPROXIMATE AND FOR ILLUSTRATIVE PURPOSES ONLY. PRIOR TO ANY DEMOLITION, EXCAVATION OR CONSTRUCTION ON THE SITE, THE RELEVANT AUTHORITY SHOULD BE CONTACTED FOR POSSIBLE LOCATION OF FURTHER UNDERGROUND SERVICES AND DETAILED LOCATIONS OF ALL SERVICES.

IF SUBSEQUENT DESIGN IS INTENDED FOR CONSTRUCTION SETOUT, FUTURE SURVEYING SETOUT COSTS ARE INCREASED IF THE DIGITAL DATA PROVIDED IS ROTATED, SCALED OR MOVED.




THIS NOTE FORMS AN INTEGRAL PART OF THE PLAN/DATA. ANY REPRODUCTION OF THIS PLAN/MODEL WITHOUT THIS NOTE ATTACHED WILL RENDER THE INFORMATION SHOWN INVALID.

Important Note
Refer to soil report completed by GES dated September 2023

Important Note
Refer to flood hazard report completed by Flussig Engineers dated February 2024 for details on flood mitigation measures.

Important Note
Refer to bushfire report completed by Futura dated February 2024 for details on Bushfire rating & management.



-  Access Panel
-  Articulation Joint
-  Smoke Alarm

Construction of sanitary compartments 10.4.2 of NCC 2022

The door to a fully enclosed sanitary compartment must -

- open outwards; or
- slide; or
- be readily removable from the outside of the compartment.

unless there is a clear space of at least 1.2 m, measured in accordance with Figure 10.4.2 of NCC 2022 Vol II, between the closet pan within the sanitary compartment and the doorway.

Note: Safe Movement & Egress

Openable windows greater than 4m above the surface below are to be fitted with a device to limit opening or a suitable screen so a 125mm sphere cannot pass through. Except for Bedrooms, where the requirement is for heights above 2m. Refer to clauses 11.3.7 and 11.3.8 of NCC 2022 for further information on suitable protective devices.

Note: Paved Areas

All paths and patios to fall away from dwelling.

Note: Stair Construction

All stairs to be constructed in accordance with NCC Vol II 2022 Part 11.2.2:

- Riser: Min 115mm - Max 190mm
- Going: Min 240mm - Max 355mm
- Slope (2R+G): Max 550 - Min 700
- For stairways serving non-habitable room used infrequently, refer to table 11.2.2(b).

Landings to comply with Clause 11.2.5 and be a minimum of 750mm deep measured 500mm from the inside edge of the landing.

Slip resistance of treads, nosings and ramps to comply with Clause 11.2.4.

Heights of rooms & other spaces 10.3.1 of NCC 2022

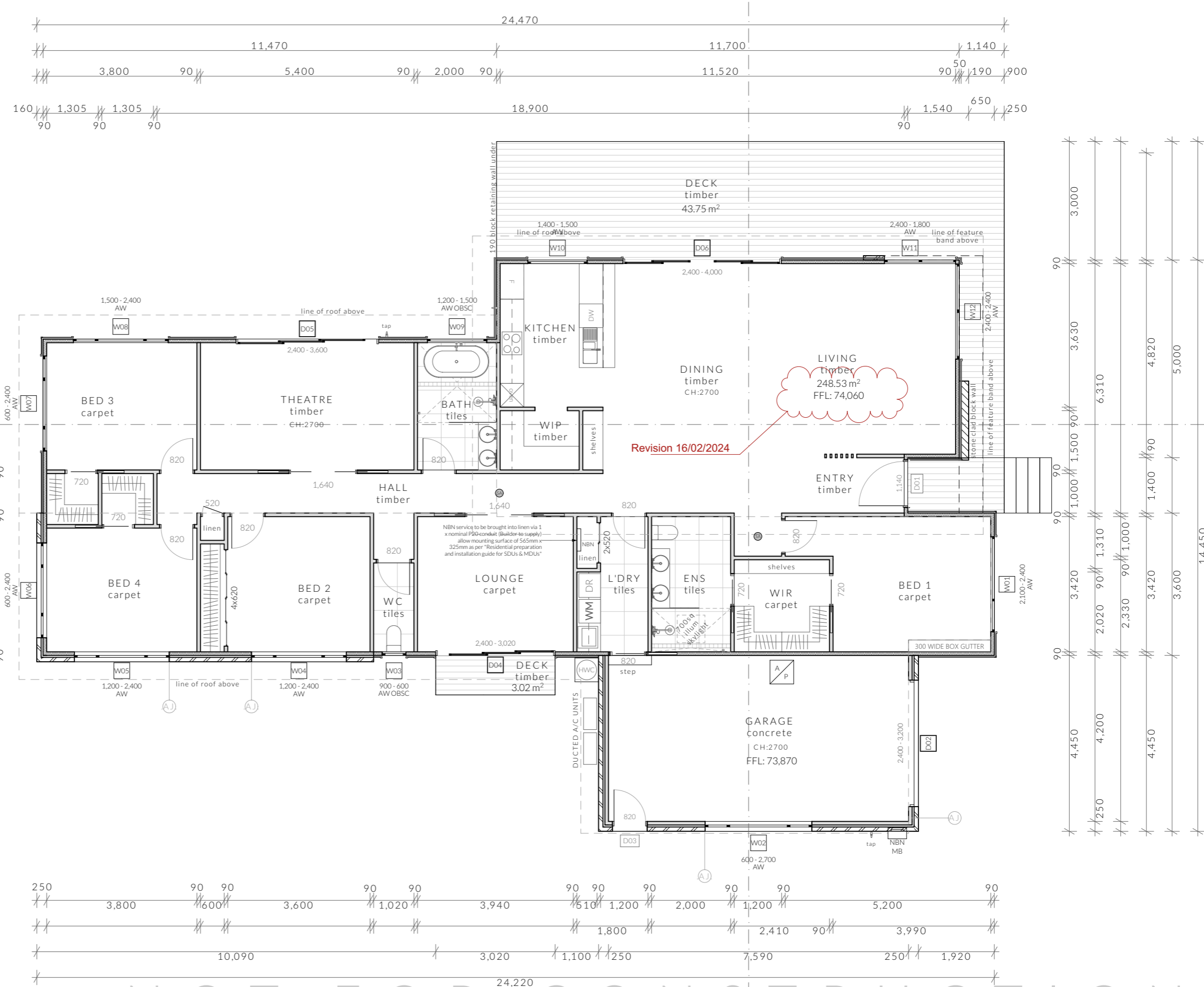
Heights of rooms and other spaces must not be less than;

- (a) in a habitable room excluding a kitchen - 2.4 m; and
- (b) in a kitchen - 2.1 m; and
- (c) in a corridor, passageway or the like - 2.1 m; and
- (d) in a bathroom, shower room, laundry, sanitary compartment, airlock, pantry, storeroom, garage, car parking area or the like - 2.1 m; and
- (e) in a room or space with a sloping ceiling or projections below the ceiling line within - See NCC directly for these items
- (f) in a stairway, ramp, landing, or the like - 2.0 m measured vertically above the nosing line of stairway treads or the floor surface of a ramp, landing or the like.

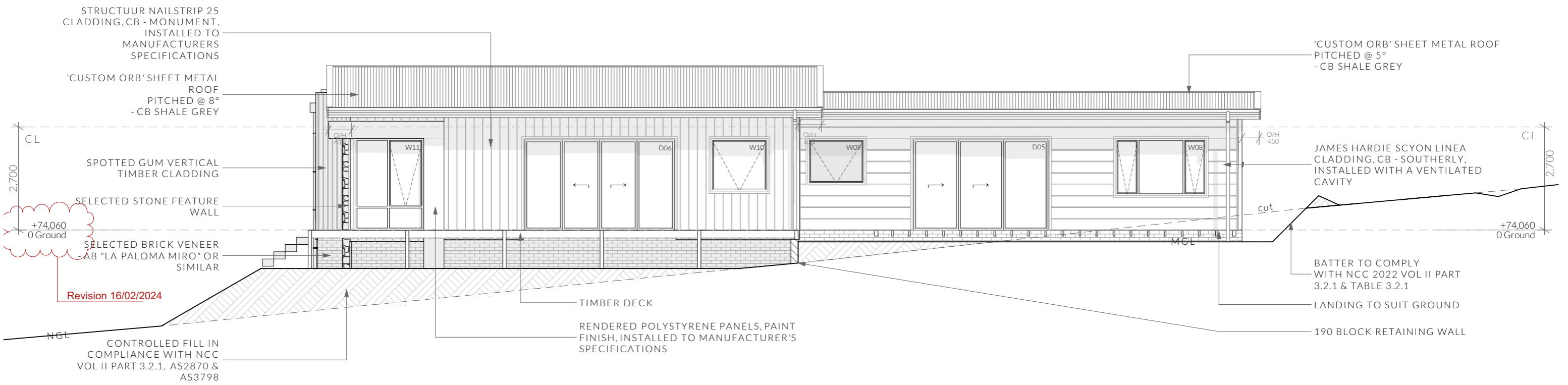
If required onsite, the builder may work within the tolerances of the above as specified within the NCC 2022 Vol II. Builder to contact Pinnacle before undertaking works.

Floor Areas

Total Floor Area	248.53m ²
Deck	43.75m ²
Deck	3.02m ²

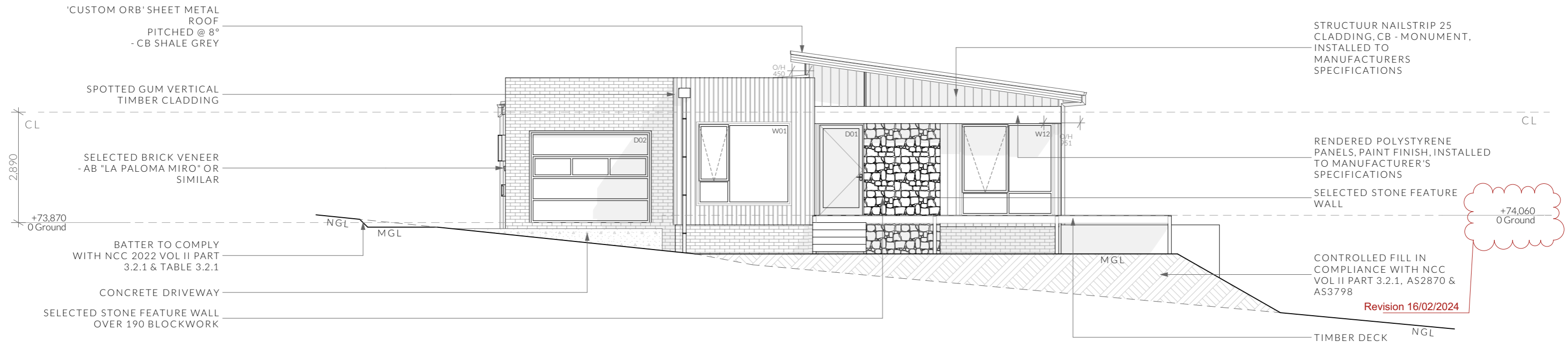


PINNACLE	PINNACLE DRAFTING & DESIGN 7/3 Abernant Way, Cambridge 7170 03 6248 4218 admin@pinnacledrafting.com.au www.pinnacledrafting.com.au Licence: CC6073Y	Floor Plan - Dwelling	Scale: 1:100 @ A3 Pg. No: A.03	Proposal: New Dwelling & Shed Client: Jasmin & Jake Burden Address: 919 Cambridge Road, Cambridge	Date: 07/11/2023 Drawn by: JD Job No: 067-2023 Engineer: TBA Building Surveyor: TBA	Issue Date DA 02 16.02.2024 DA 03 16.02.2024	Description Council RFI Council RFI - Driveway levels	N 	These drawings are the property of Pinnacle Drafting & Design Pty Ltd. reproduction in whole or part is strictly forbidden without written consent. © 2023. These drawings are to be read in conjunction with all drawings and documentation by Engineers, Surveyors and any other consultants referred to within this drawing set as well as any CLC and/or permit documentation. DO NOT SCALE FROM DRAWINGS; All Contractors are to verify dimensions on site before commencing any orders, works or requesting/producing shop drawings. ANY AND ALL DISCREPANCIES DISCOVERED BY OUTSIDE PARTIES ARE TO BE BROUGHT TO THE ATTENTION OF THE PINNACLE DRAFTING & DESIGN PTY LTD.	 BUILDING DESIGNERS ASSOCIATION OF AUSTRALIA
	Document Set ID: 5210588 Version: 1, Version Date: 04/03/2024	Revision: DA - 03 Approved by: JRN								



North Elevation

1:100



East Elevation

1:100

NOTE
Clearances between cladding and ground shall comply with Clause 7.5.7 of the NCC 2022 and shall be a minimum clearance of:
100mm in low rainfall intensity areas or sandy, well-drained areas; or 50mm above impermeable areas that slope away from the building; or 150mm in any other case.

Wall cladding must extend a minimum of 50 mm below the bearer or lowest horizontal part of the suspended floor framing.
U.N.O in builders specifications or located in saline environments or if using a glazed finish brick, brickwork is to be installed in stretcher bond pattern with raked joints.

As per NCC parts 11.3.7 and 11.3.8,
Openable windows greater than 4m above ground level are to be fitted with a device to limit the opening or a suitable screen so a 125mm sphere cannot pass through, and withstand a force of 250N. Except for bedrooms, where the requirement is for heights above 2m.

All stairs to be constructed in accordance with NCC 2022 Vol II Part 11.2.2
Riser: Min 115mm - Max 190mm Going: Min 240mm - Max 355mm Slope (2R+G): Max 550 - Min 700

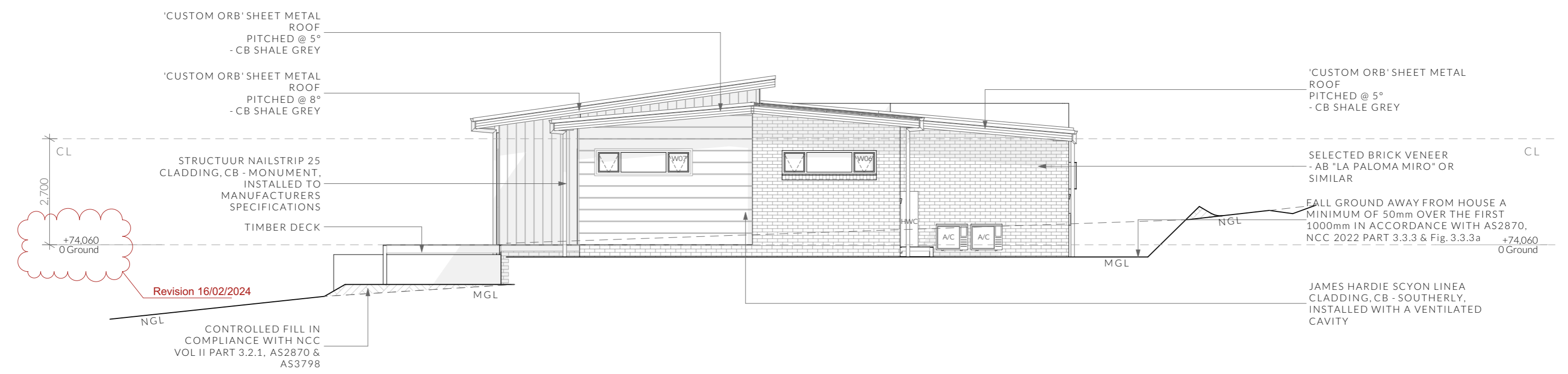
NOT FOR CONSTRUCTION

	PINNACLE DRAFTING & DESIGN 7/3 Abernant Way, Cambridge 7170 03 6248 4218 admin@pinnacledrafting.com.au www.pinnacledrafting.com.au Licence: CC6073Y	Elevations Revision: DA - 03 Approved by: JRN	Scale: 1:100 @ A3 Pg. No: A.04	Proposal: New Dwelling & Shed Client: Jasmin & Jake Burden Address: 919 Cambridge Road, Cambridge	Date: 07/11/2023 Drawn by: JD Job No: 067-2023 Engineer: TBA Building Surveyor: TBA	Issue Date DA02 16.02.2024 DA03 16.02.2024	Description Council RFI Council RFI - Driveway levels	These drawing are the property of Pinnacle Drafting & Design Pty Ltd. reproduction in whole or part is strictly forbidden without written consent. © 2023. These drawings are to be read in conjunction with all drawings and documentation by Engineers, Surveyors and any other consultants referred to within this drawing set as well as any CLC and/or permit documentation. DO NOT SCALE FROM DRAWINGS; All Contractors are to verify dimensions on site before commencing any orders, works or requesting/producing shop drawings. ANY AND ALL DISCREPANCIES DISCOVERED BY OUTSIDE PARTIES ARE TO BE BROUGHT TO THE ATTENTION OF THE PINNACLE DRAFTING & DESIGN PTY LTD.	
	Document Set ID: 5210588 Version: 1, Version Date: 04/03/2024								



South Elevation

1:100



West Elevation

1:100

NOTE
Clearances between cladding and ground shall comply with Clause 7.5.7 of the NCC 2022 and shall be a minimum clearance of: 100mm in low rainfall intensity areas or sandy, well-drained areas; or 50mm above impermeable areas that slope away from the building; or 150mm in any other case.

Wall cladding must extend a minimum of 50 mm below the bearer or lowest horizontal part of the suspended floor framing.
U.N.O in builders specifications or located in saline environments or if using a glazed finish brick, brickwork is to be installed in stretcher bond pattern with raked joints.

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	Document Set ID: 5210588 Version: 1, Version Date: 04/03/2024								

Ventilation of roof spaces NCC 2022

Part 10.8.3

A roof must have a roof space that-

- (a) is located-
 - (i) immediately above the primary insulation layer; or
 - (ii) immediately above sarking with a vapour permeance of not less than 1.14 µg/N.s, which is immediately above the primary insulation layer; or
 - (iii) immediately above ceiling insulation; and
- (b) has a height of not less than 20 mm; and
- (c) is either-
 - (i) ventilated to outdoor air through evenly distributed openings in accordance with Table 10.8.3; or
 - (ii) located immediately underneath the roof tiles of an unsarked tiled roof.

Stormwater Notes

All gutters, downpipes and rain heads to be designed and installed in compliance with AS3500.3 & NCC 2022 Volume II Part 7.4.

Roofing Cladding

Roof cladding, flashings, cappings, roof sheeting and fixings are to be installed in accordance with NCC 2022 Volume II Part 7.2 for sheet roofing and Part 7.3 for tiled and shingle roofing.

Eaves & Soffit Linings

To comply with NCC 2022 Vol II Part 7.5.5 and where provided, external fibre-cement sheets and linings used as eaves and soffit linings must-

- (a) comply with AS/NZS 2908.2 or ISO 8336; and
- (b) be fixed in accordance with Table 7.5.5 and Figure 7.5.5 using-
 - (i) 2.8 x 30 mm fibre-cement nails; or
 - (ii) No. 8 wafer head screws (for 4.5 mm and 6 mm sheets only); or
 - (iii) No. 8 self embedding head screws (for 6 mm sheets only).

Refer to table 7.5.5 for trimmer and fastener spacings.

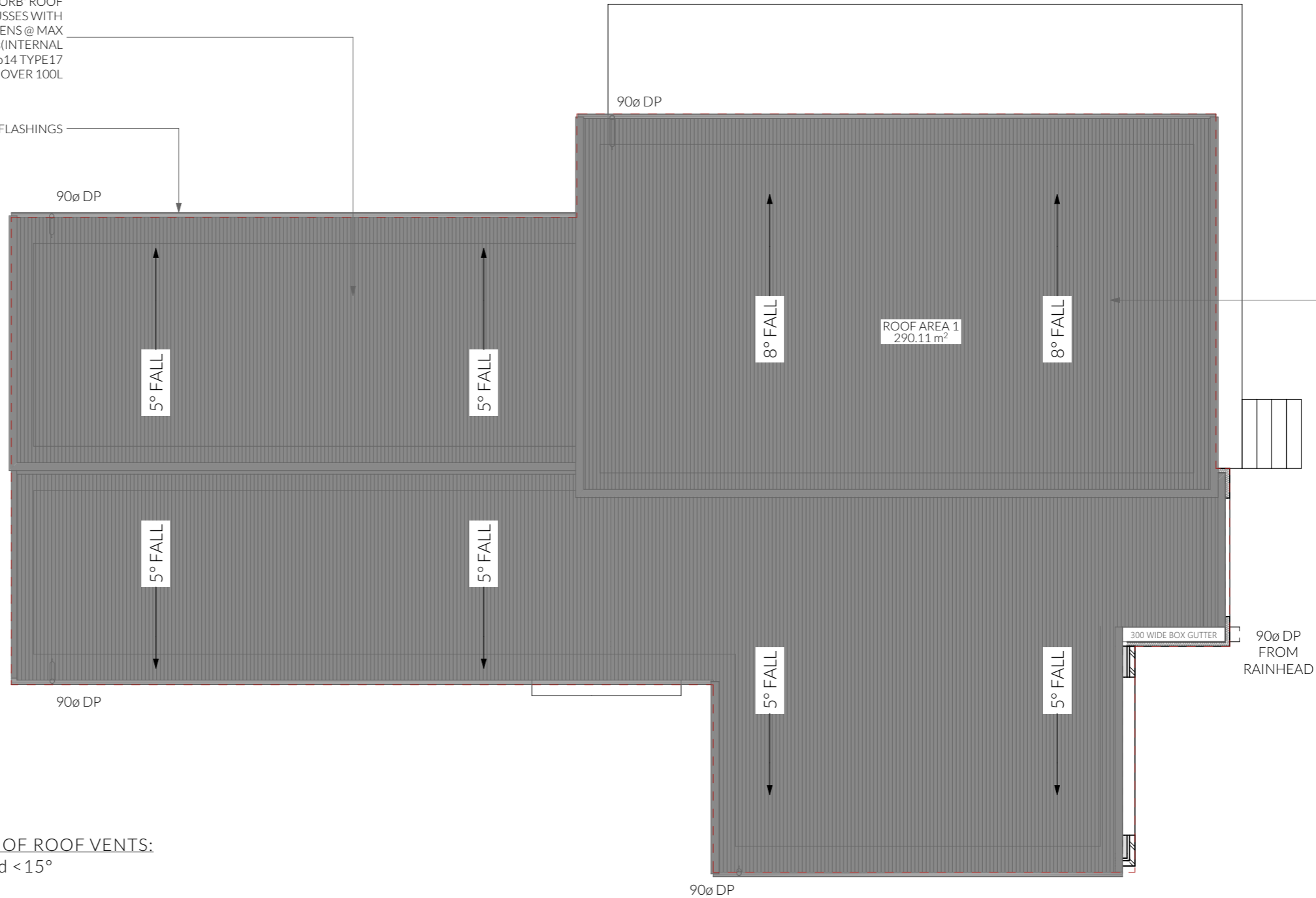
Parapet cappings

Where a wall cladding is used to form a parapet wall, the cladding must be attached to a supporting frame and have a capping installed that complies with the following:

- (a) Cappings must-
 - (i) be purpose made, machine-folded sheet metal or equivalent sections of a material compatible with all up and downstream metal roof covering materials in accordance with 7.2.2(2); and
 - (ii) extend not less than 50 mm down the sides of the parapet; and
 - (iii) be separated from the supporting framing by a vapour permeable sarking installed in accordance with (f); and
 - (iv) be fixed with either self drilling screws or rivets with rubber washers at intervals of not more than 500 mm that do not penetrate the top of cappings, except at joints and corners.
- (b) The top of the capping must slope a minimum of 5 degrees.
- (c) Joints in cappings must-
 - (i) overlap by not less than 50 mm in the direction of flow; and
 - (ii) be securely fastened at intervals of not more than 40 mm; and
 - (iii) have sealant installed between laps.
- (d) Fixing for cappings must be compatible with the capping material in accordance with 7.2.2.
- (e) Lead cappings must not be used with pre-painted steel or zinc/aluminium steel or on any roof if the roof is part of a drinking water catchment area.
- (f) Sarking must comply with AS 4200.1 and be installed behind all wall cladding where parapets are installed, with-
 - (i) each adjoining sheet or roll being-
 - (A) overlapped not less than 150 mm; or
 - (B) taped together; and
 - sarking fixed to supporting members at not more than 300 mm centres.

SHEET METAL 'CUSTOM ORB' ROOF PITCHED @ 5° OVER TRUSSES WITH 70x35 MGP12 ROOF BATTENS @ MAX 900ctrs(END SPAN) 1200ctrs(INTERNAL SPAN), BUGLE FIX W/No14 TYPE17 BATTEN SCREWS. OVER 100L

SHEET METAL FASCIA & FLASHINGS



SHEET METAL 'CUSTOM ORB' ROOF PITCHED @ 8° OVER TRUSSES WITH 70x35 MGP12 ROOF BATTENS @ MAX 900ctrs(END SPAN) 1200ctrs(INTERNAL SPAN), BUGLE FIX W/No14 TYPE17 BATTEN SCREWS. OVER 100L

REQUIRED NUMBER OF ROOF VENTS:
 ROOF PITCH > 10° and < 15°
 MONOPITCH ROOF

REQUIRED VENT AREA
 Low Vents = 1.22m² (48.8m x 25,000mm²)
 High Vents = 0.12m² (24.4m x 5,000mm²)

EAVE VENTS
 BUILDERS EDGE EAVE VENT (EV4020)
 30x 400X200mm(0.042m²) VENTS EVENLY SPACED
 OR
 25mm CONTINUOUS VENT

RIDGE VENT SYSTEM
 BUILDERS EDGE EAVE VENT (EV4020)
 5mm CONTINUOUS VENT

ROOF PITCH	VENTILATION OF OPENINGS (TABLE 10.8.3)
>10° AND < 15°	25,000 mm ² /m provided at the eaves and 5,000 mm ² /m at high level
(1) Ventilation openings are specified as a minimum free open area per metre length of the longest horizontal dimension of the roof.	
(2) For the purposes of this Table, high level openings are openings provided at the ridge or not more than 900 mm below the ridge or highest point of the roof space, measured vertically.	

NOT FOR CONS

	PINNACLE DRAFTING & DESIGN 7/3 Abernant Way, Cambridge 7170 03 6248 4218 admin@pinnacledrafting.com.au www.pinnacledrafting.com.au Licence: CC6073Y	Roof Plan Revision: DA - 03 Approved by: JRN	Scale: 1:100 @ A3 Pg. No: A.07	Proposal: New Dwelling & Shed Client: Jasmin & Jake Burden Address: 919 Cambridge Road, Cambridge	Date: 07/11/2023 Drawn by: JD Job No: 067-2023 Engineer: TBA Building Surveyor: TBA	Issue Date DA02 16.02.2024 DA03 16.02.2024	Description Council RFI Council RFI - Driveway levels		These drawings are the property of Pinnacle Drafting & Design Pty Ltd. reproduction in whole or part is strictly forbidden without written consent. © 2023. These drawings are to be read in conjunction with all drawings and documentation by Engineers, Surveyors and any other consultants referred to within this drawing set as well as any CLC and/or permit documentation. DO NOT SCALE FROM DRAWINGS; All Contractors are to verify dimensions on site before commencing any orders, works or requesting/producing shop drawings. ANY AND ALL DISCREPANCIES DISCOVERED BY OUTSIDE PARTIES ARE TO BE BROUGHT TO THE ATTENTION OF THE PINNACLE DRAFTING & DESIGN PTY LTD.	
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TRAFFIC NOISE ASSESSMENT

919 Cambridge Road, Cambridge, TAS 7170

Date: 16 February 2024

Number of Pages: 20 (inc.)

DOCUMENT CONTROL

Revision	Issue Date	Item	Author	Review
0	16/02/2024	Noise Impact Assessment	RF	MF

CLIENT

Report Issued	Attention	Phone	Email
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Recommendations made in this report are intended to resolve acoustical problems only. We make no claim of expertise in other areas and draw your attention to the possibility that our recommendations may not meet the structural, fire, thermal, or other aspects of building construction

We encourage clients to check with us before using materials or equipment that are alternative to those specified in our Acoustical Report.

The integrity of acoustic structures is very dependent on installation techniques. For example, a small crack between the top of a wall and a ceiling can reduce the effective sound transmission loss of a wall from R_w 50 to R_w 40. Therefore, the use of contractors that are experienced in acoustic construction is encouraged. Furthermore, two insulation products may have the same thermal R rating but the sound absorption of one may be entirely deficient, therefore the use of materials and equipment that are supported by acoustic laboratory test data is encouraged.



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EXECUTIVE SUMMARY

Alpha Acoustics has been engaged by Pinnacle Drafting & Design to carry out a traffic noise assessment for a proposed residential development at 919 Cambridge Road, Cambridge, TAS 7170.

The plan consists of a one-story residential development. The development is within 30 m of a major road with a speed limit of 110 km/hr, being Tasman Highway.

The proposed development has been assessed against acoustic issues contained within:

- a. Clarence Council planning scheme requirements:
 - i. *C3.0 Road and Railway Assets Code – C3.7.1 Subdivision for sensitive uses within a road or railway attenuation area*
 - ii. *C9.0 Attenuation Code – C9.6.1 (P1) Development Standards for Subdivision*
- b. Tasmanian State Road Traffic Noise Management Guidelines
- c. Tasmanian Noise Measurement Procedures Manual

The following conclusions apply to this assessment:

- The traffic noise criteria of LA10, 18hr 63 dBA is met as shown in Figure 4.4.

1 INTRODUCTION AND SITE DESCRIPTION

Alpha Acoustics has been engaged by Pinnacle Drafting & Design to carry out a traffic noise assessment for a proposed residential development at 919 Cambridge Road, Cambridge, TAS 7170.

The plan consists of a one-story residential development. The development is within 30 m of a major road with a speed limit of 110 km/hr, being Tasman Highway.

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 - ii. *C9.0 Attenuation Code – C9.6.1 (P1) Development Standards for Subdivision*
- b. Tasmanian State Road Traffic Noise Management Guidelines
- c. Tasmanian Noise Measurement Procedures Manual

Figure 1.1 Development site 919 Cambridge Road, Cambridge, TAS 7170

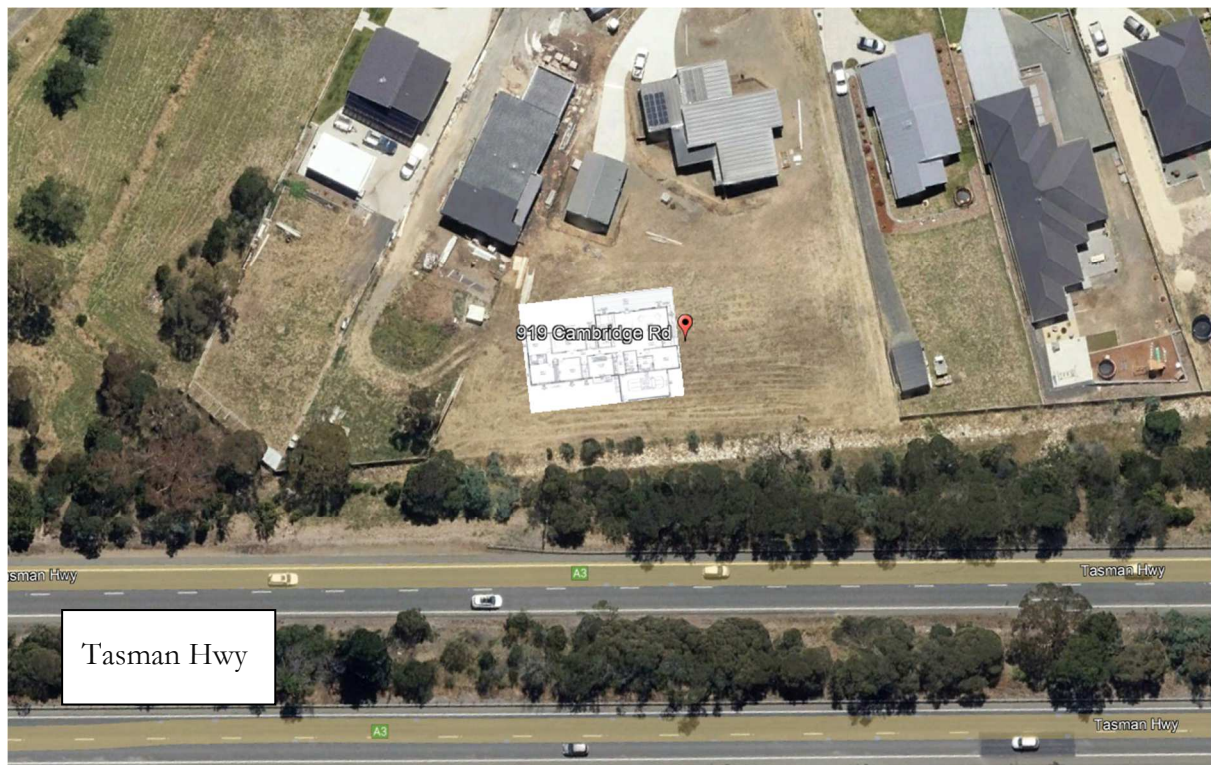


Figure 1.2 Location Map of 919 Cambridge Road, Cambridge, TAS 7170



Figure 1.3 Measurement Location Photograph



2 NOISE SURVEY AND INSTRUMENTATION

An on-site noise survey was conducted Friday 9th February 2024. Measurement Location (ML1) is 1.5m above the ground level as shown in Figure 1.2. The measured levels are considered free field. The measurement location was exposed to traffic noise from the Tasman Highway.

In addition, an attended noise survey was undertaken to identify sources of noise in the locale and gain an understanding of the character of the environment.

All instrumentation used in this assessment holds a current calibration certificate from a certified NATA calibration laboratory. Table 2.1 shows the instruments were used to measure the ambient noise levels.

Table 2.1 Noise Instrumentation

Description	Model No.	Serial No.
Noise Logger	Rion NL21	00187367
Condenser Microphone 0.5” diameter	UC-52	117142
Acoustical Calibrator	B&K 4231	267 1553
Microphone Windscreen	Acoustically transparent foam	

Ambient sound pressure levels were measured generally in accordance with Australian Standard AS1055.1:1997 - ‘Acoustics-Description and measurement of environmental noise - Part 1: General procedures’. Ambient noise levels were recorded at continuous 15-minute intervals.

The measured levels include the noise levels from all sources. The observed survey revealed that the noise environment was dominated by emissions from the subject road traffic.

It was decided to use the Shortened L10(18-hour) measurement approach, which is outlined in section 18.9 of the Noise Measurement Procedures Manual, Second Edition, July 2008 and is shown below:

18.9 Shortened L_{10(18hr)} measurement procedure

A good estimate of the L_{10(18hr)} can be derived from a shortened measurement period. For this shortened L_{10(18hr)} procedure, one hourly L₁₀ measurements must be made over any three consecutive hours between 1000 and 1700 hours. The L_{10(3hr)} is calculated as the arithmetic mean of the three measured values and the L_{10(18hr)} is calculated from the relation:

$$L_{10(18hr)} = L_{10(3hr)} - 1 \text{ dB(A)}$$

This procedure is preferred if attended measurements are required. The responsible regulatory authority may require either the shortened or normal procedure to be used in any particular case.

Tabular noise measurement results are shown below:

	L90	Leq	Measured LA10 1hr Noise Level dB(A)
10:00:00	55.9	60	62.4
11:00:00	56.7	60.4	62.7
12:00:00	56.7	60.1	62.4

$$L_{10(18hr)} = L_{10(3hr)} - 1$$

$$L_{10(18hr)} = (62.4+62.7+62.4)/3 - 1$$

$$L_{10(18hr)} = 61.5$$

Therefore, the criterion relevant noise statistic measured at ML1 is L_{10(18hr)} **61.5**.

3 CRITERIA

3.1 Council Noise Criteria

The Clarence Valley Council traffic noise criteria for developing residential lots is found in the Tasmanian Planning Scheme including:

“C3.7 Development Standards for Subdivision

C3.7.1 Subdivision for sensitive uses within a road or railway attenuation area

Objective:	
<i>To minimise the effects of noise, vibration, light and air emissions on lots for sensitive uses within a road or railway attenuation area, from existing and future major roads and the rail network.</i>	
Acceptable Solutions	Performance Criteria
<p>A1</p> <p><i>A lot, or a lot proposed in a plan of subdivision, intended for a sensitive use must have a building area for the sensitive use that is not within a road or railway attenuation area.</i></p>	<p>P1</p> <p><i>A lot, or a lot proposed in a plan of subdivision, intended for sensitive uses within a road or railway attenuation area, must be sited, designed or screened to minimise the effects of noise, vibration, light and air emissions from the existing or future major road or rail network, having regard to:</i></p> <ul style="list-style-type: none"> <i>(a) the topography of the site;</i> <i>(b) any buffers created by natural or other features;</i> <i>(c) the location of existing or proposed buildings on the site;</i> <i>(d) the frequency of use of the rail network;</i> <i>(e) the speed limit and traffic volume of the road;</i> <i>(f) any noise, vibration, light and air emissions from the rail network or road;</i> <i>(g) the nature of the road;</i> <i>(h) the nature of the intended uses;</i> <i>(i) the layout of the subdivision;</i> <i>(j) the need for the subdivision;</i> <i>(k) any traffic impact assessment;</i> <i>(l) any mitigating measures proposed;</i> <i>(m) any recommendations from a suitably qualified person for mitigation of noise; and</i> <i>(n) any advice received from the rail or road authority.”</i>

“C9.6.1 Development Standards for Subdivision

C9.6.1 Lot Design

<p>Objective:</p> <p><i>To provide for subdivision so that a lot intended for a sensitive use:</i></p> <p><i>(a) is located to avoid an activity with potential to cause emissions and enable appropriate levels of amenity; and</i></p> <p><i>(b) does not conflict with, interfere with or constrain an existing activity with potential to cause emissions.</i></p>	
<p>Acceptable Solutions</p>	<p>Performance Criteria</p>
<p>A1</p> <p><i>Each lot, or a lot proposed in a plan of subdivision, within an attenuation area must:</i></p> <p><i>(a) be for the creation of separate lots for existing buildings;</i></p> <p><i>(b) be for the creation of a lot where a building for a sensitive use can be located entirely outside the attenuation area; or</i></p> <p><i>(c) not be for the creation of a lot intended for a sensitive use.</i></p>	<p>P1</p> <p><i>Each lot, or a lot proposed in a plan of subdivision, within an attenuation area must not result in the potential for a sensitive use to be impacted by emissions, having regard to:</i></p> <p><i>(a) the nature of the activity with the potential to cause emissions, including:</i></p> <p style="margin-left: 40px;"><i>(i) operational characteristics of the activity;</i></p> <p style="margin-left: 40px;"><i>(ii) scale and intensity of the activity; and</i></p> <p style="margin-left: 40px;"><i>(iii) degree of emissions from the activity; and</i></p> <p><i>(b) the intended use of the lot.”</i></p>

3.2 Tasmanian State Traffic Noise Criteria

To meet Meander Valley Council's Planning Scheme for traffic noise intrusion the proposed site is assessed against the Tasmanian State noise criteria set out in the:

- Tasmanian State Road Traffic Noise Management Guidelines
- Tasmanian Noise Measurement Procedures Manual

The worst affected building façade noise level should be no more than

- **LA10,18hr ≤ 63dBA**

Or where an external traffic noise can't be practically met, internal traffic noise levels should be no more than:

- **LAeq (16 hour) 35 dBA.** [LAeq (16hour) = LA10(18hour) – 2.0 dB(A)]

4 NOISE IMPACT ASSESSMENT

4.1 Traffic Noise Intrusion

For the purpose of the Development Application, the traffic noise impacts onto the site have been assessed using State Growth's *Tasmanian State Road Traffic Noise Management Guidelines (2015)*. This is the most fit-for-purpose document to assess the impacts of road traffic noise in the Tasmanian road network and is also endorsed by EPA Tasmania.

Table 4.1 Noise Source Modelling Parameters

Queensland Government State Planning Policy	Tasman Highway			
Proximity from Land Parcel to Noise Source	20m South			
Speed Limit of Noise Source	110 km/hr			
Traffic Volumes over the three-hour measurement period	Westbound		Eastbound	
	Car	Truck	Car	Truck
	3990	192	4962	240
Predicted Traffic Volumes Average over 24-hrs (2024)	71616 Cars and 3456 Trucks			
Traffic Growth Percentage	3 %			
Percentage of Traffic Volume Heavy Vehicles	4.8 %			
Calculated Noise Level Increase (2024-2034)	1.28 dB			

Table 4.2 Predicted Current LA10 18hr (2024) noise levels at dwelling (dBA, free field)

Assessment Location	Measurements LA10,18hr 2024	Modelled LA10,18hr 2024
Calibration Point	61.5	62.5

*Modelled noise levels were found to be within ± 2 dB of calibrated values. Therefore, the traffic noise model is considered to have a reasonable degree of fit.

Table 4.4 Calculated Future traffic noise levels.

Level	Façade facing...	Room	L10(18h) dB(A)	Criteria	Pass?
gf	east	Bed 1	58.4	63	Yes
gf	east	Entry	48.3	63	Yes
gf	east	Living	57.5	63	Yes
gf	north	Bed 3	53.4	63	Yes
gf	north	Dining	46.1	63	Yes
gf	north	Kitchen	50.9	63	Yes
gf	north	Living	46	63	Yes
gf	north	Lounge	60.7	63	Yes
gf	north	Theatre	51.3	63	Yes
gf	south	Bed 1	59	63	Yes
gf	south	Bed 2	62.4	63	Yes
gf	south	Bed 4	62.8	63	Yes
gf	west	Bed 3	59.2	63	Yes
gf	west	Bed 4	60.3	63	Yes
gf	west	Kitchen	50.4	63	Yes

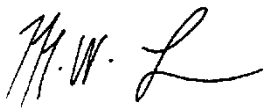
5 CONCLUSION

Alpha Acoustics has been engaged by Pinnacle Drafting & Design to carry out a traffic noise assessment for a proposed residential development at 919 Cambridge Road, Cambridge, TAS 7170.

The plan consists of a one-story residential development. The development is within 30 m of a major road with a speed limit of 110 km/hr, being Tasman Highway.

The following conclusions apply to this assessment:

- The traffic noise criteria of LA10, 18hr 63 dBA is met as shown in Table 4.4 and Appendix D.



MATTHEW FISHBURN BE(Mech) Hons, MAAS, MIEAust, CPEng, RPEQ [14356]

Principal Consulting Acoustical Engineer

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- Access Panel
- Articulation Joint
- Smoke Alarm

Construction of sanitary compartments 10.4.2 of NCC 2022

The door to a fully enclosed sanitary compartment must -

- open outwards; or
- slide; or
- be readily removable from the outside of the compartment.

unless there is a clear space of at least 1.2 m, measured in accordance with Figure 10.4.2 of NCC 2022 Vol I, between the closet pan within the sanitary compartment and the doorway.

Note: Safe Movement & Egress

Openable windows greater than 4m above the surface below are to be fitted with a device to limit opening or a suitable screen so a 125mm sphere cannot pass through. Except for bedrooms, where the requirement is for heights above 2m. Refer to clauses 11.3.7 and 11.3.8 of NCC 2022 for further information on suitable protective devices.

Note: Paved Areas

All paths and patios to fall away from dwelling.

Note: Stair Construction

All stairs to be constructed in accordance with NCC Vol II 2022 Part 11.2.2:
 Riser: Min 115mm - Max 190mm
 Going: Min 240mm - Max 355mm
 Slope (2R:G): Max 5:50 - Min 7:100
 For stairways serving non-habitable rooms used infrequently, refer to table 11.2.2(b).

Landings to comply with Clause 11.2.5 and be a minimum of 750mm deep measured 500mm from the inside edge of the landing.

Slip resistance of treads, nosings and ramps to comply with Clause 11.2.4.

Heights of rooms & other spaces 10.3.1 of NCC 2022

Heights of rooms and other spaces must not be less than:

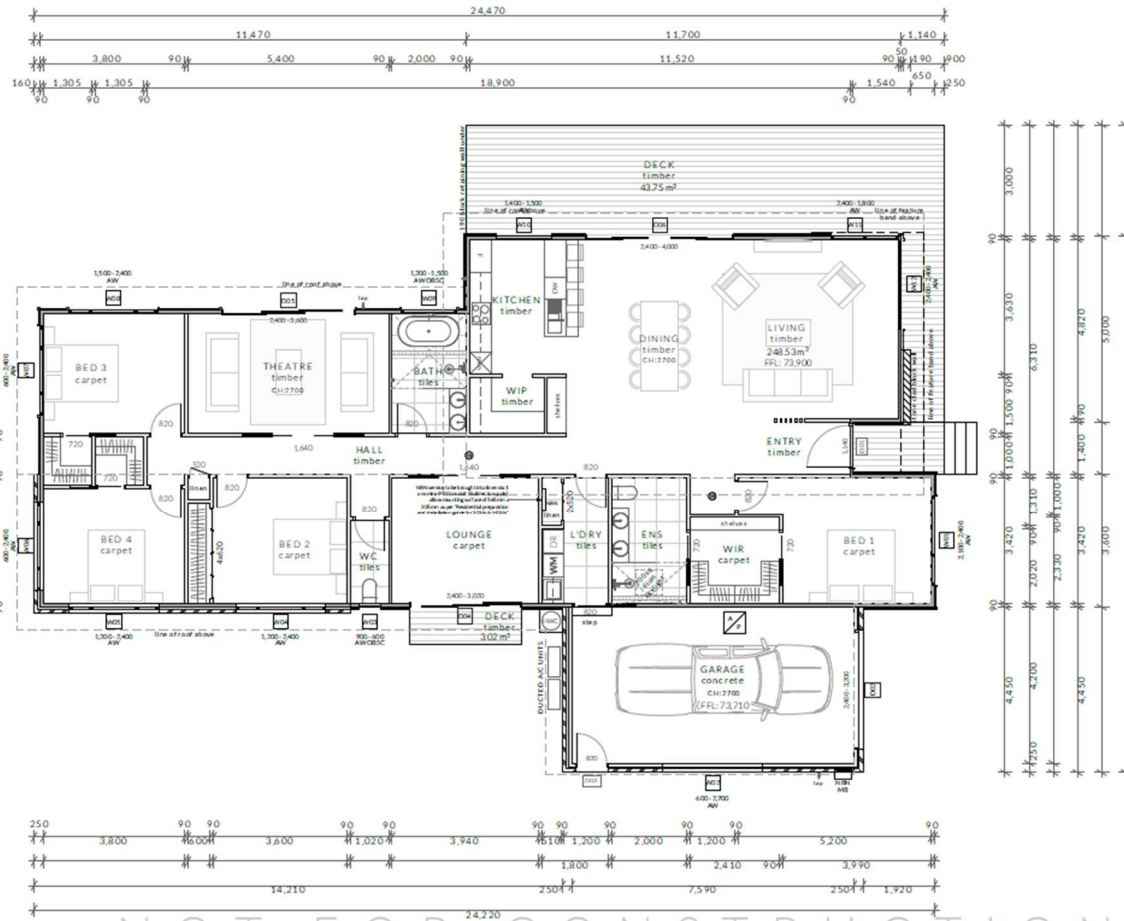
- (a) in a habitable room excluding a kitchen - 2.4 m; and
- (b) in a kitchen - 2.1 m; and
- (c) in a corridor, passageway or the like - 2.1 m; and
- (d) in a bathroom, shower room, laundry, sanitary compartment, airlock, pantry, storeroom, garage, car parking area or the like - 2.1 m; and
- (e) in a room or space with a sloping ceiling or projections below the ceiling line within - See NCC directly for these items.

(f) in a stairway, ramp, landing, or the like - 2.0 m measured vertically above the nosing line of stairway treads or the floor surface of a ramp, landing or the like.

If required onsite, the builder may work within the tolerances of the above as specified within the NCC 2022 Vol II. Builder to contact Pinnacle before undertaking works.

Floor Areas

Total Floor Area	248.53m ²
Deck	43.75m ²
Deck	3.02m ²



	PINNACLE DRAFTING & DESIGN 7/3 Abbott Way, Cambridge 7170 03 42 48 42 18 admin@pinnacledrafting.com.au www.pinnacledrafting.com.au Licence: C66231Y	Floor Plan - Dwelling Revision: DA-01 Approved by: JBN	Scale: 1:100 @A3 Pj. No: A.03	Proposal: New Dwelling & Shed Client: Jasmin & Jake Burden Address: 919 Cambridge Road, Cambridge	Date: 07/11/2023 Drawn by: JD Job No: 067-2023 Engineer: TBA Building Surveyor: TBA	Issue Date Description		This drawing is the property of Pinnacle Drafting & Design Pty Ltd and is not to be reproduced in whole or part without the written consent of Pinnacle Drafting & Design Pty Ltd. It is to be used for the purposes only for which it was prepared and is not to be used for any other purpose without the written consent of Pinnacle Drafting & Design Pty Ltd. It is not to be used for any other purpose without the written consent of Pinnacle Drafting & Design Pty Ltd. It is not to be used for any other purpose without the written consent of Pinnacle Drafting & Design Pty Ltd.	
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APPENDIX B – NOISE MODEL OUTPUTS

Traffic Noise Calibration

J3165_919 Cambridge Road, Cambridge, TAS 7170		2
Assessed receiver levels Calibration		
Receiver	L10(18h)	
	dB(A)	
Cal pt	62.5	

Future Traffic Noise

J3165_919 Cambridge Road, Cambridge, TAS 7170		2
Assessed receiver levels Future		
Receiver	L10(18h)	
	dB(A)	
Cal pt	62.5	
gf,east,Bed 1	58.4	
gf,east,Entry	48.3	
gf,east,Living	57.5	
gf,north,Bed 3	53.4	
gf,north,Dining	46.1	
gf,north,Kitchen	50.9	
gf,north,Living	46.0	
gf,north,Lounge	60.7	
gf,north,Theatre	51.3	
gf,south,Bed 1	59.0	
gf,south,Bed 2	62.4	
gf,south,Bed 4	62.8	
gf,west,Bed 3	59.2	
gf,west,Bed 4	60.3	
gf,west,Kitchen	50.4	

APPENDIX C – GLOSSARY OF ACOUSTIC TERMS

The following is a brief description of the technical terms used to describe traffic noise to assist in understanding the technical issues presented in this document.

Event maximum sound pressure level ($L_{A\%,adj,T}$), L01

The L01 level is calculated as the noise level equalled and exceeded for 1% of the measurement time, for example 9 seconds in any 15 minute interval. L01 is an appropriate level to characterise single events, such as from impulsive or distinctive pass-by noise. In this Report, the measured L01 levels for day/evening/night are not averaged but are arranged from low to high in the relevant day/evening/night interval and the value that is found at the 90th percentile (L10 of L01 sample) in the interval is recorded as its “L01” level. The level can be adjusted for tonality or impulsiveness.

Average maximum sound pressure level ($L_{A\%,adj,T}$), L10

The “L10” level is an indicator of “steady-state” noise or intrusive noise conditions from traffic, music and other relatively non-impulsive noise sources. The L10 level is calculated as the noise level equalled and exceeded for 10% the measurement time, for example 90 seconds in any 15 minute interval. The measured L10 time-intervals for day/evening/night are arithmetically averaged to present the “average maximum” levels of the environment for day/evening/night. The level can be adjusted for tonality or impulsiveness.

Background sound pressure level ($L_{A90,T}$), L90

Commonly called the "L90" or "background" level and is an indicator of the quietest times of day, evening or night. The L90 level is calculated as the noise level equalled and exceeded for 90% the measurement time. The measured L90 time-intervals are arithmetically averaged to present the “average background” levels of the environment for day/evening/night. The level is recorded in the absence of any noise under investigation. The level is not adjusted for tonality or impulsiveness.

Equivalent Continuous or time average sound pressure level ($L_{Aeq,T}$), L_{eq}

Commonly called the "Leq" level it is the logarithmic average noise level from all sources far and near. The maximum 1-hour levels within the day/evening/night time intervals are referenced for building design. The level can be adjusted for tonality.

Façade-adjusted level

A sound level that is measured at a distance of 1.0 metre from a wall or facade. The level is nominally 2.5 dB higher than the free-field level.

Free-field level

A sound level that is measured at a distance of more than 3.5 metres from a wall or facade.

Weighted Sound Reduction Index, R_w

A single number value used to compare the sound reduction index of building elements. Similar to the Sound Transmission Class (STC) rating that is still in common use. R_w and STC are not identical though may be considered, for most applications, as being interchangeable. A high R_w indicates high sound reduction.

APPENDIX D – NOISE MODEL OUTPUTS

Traffic Noise Model – 1.8m high noise barrier at Ground Level



Prepared for
Jasmin Burden

919 Cambridge Road Cambridge

FLOOD HAZARD REPORT

FE_23129_REV00
15 February 2024

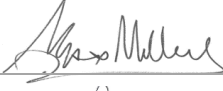



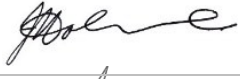
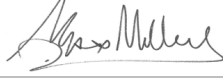
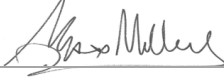
flüssig
ENGINEERS

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

Document Information

Title	Client	Document Number	Project Manager
919 Cambridge Road, Cambridge Flood Hazard Report	Jasmin Burden	FE_23129	Max W. Möller <i>BEng, FIEAust, EngExec, CPEng, NER, APEC Engineer, IntPE(Aus.)</i> Managing Director / Principal Hydraulic Engineer

Document Initial Revision

REVISION 00	Staff Name	Signature	Date
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Document Revision History

Rev No.	Description	Reviewed by	Authorised by	Date

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Acronyms

AEP: Annual Exceedance Probability
 ARR: Australian Rainfall and Runoff
 CC: Climate Change
 TPS: Tasmanian Planning Scheme
 CFT: Climate Futures Tasmania
 RCP: Representative Concentration Pathway

1. Introduction

Flüssig Engineers has been engaged by **Jasmin Burden**, to undertake a site-specific flood hazard report for the dwelling at number 919 Cambridge Road, Cambridge in the **Clarence City Council** municipality. The purpose of this report is to determine the hydraulic characteristics on the existing and post-development scenarios and the flood hazard for the 1% AEP plus climate change (CC).

1.1 Development

The proposed development contains a new two-storey dwelling with a 249 m² footprint and a concrete driveway of 452 m² at 919 Cambridge Road, Cambridge. The site is approximately 2093 m² and is currently vacant. This development triggers the inundation code as the development falls within Clarence City Council, flood prone area.

1.2 Objectives and Scope

This flood analysis has been written to meet the standards of the Tasmanian Planning Scheme - Clarence (TPS), with the intent of understanding the development risk with respect to riverine flooding. The objectives of this study are:

- Provide an assessment of the site's flood characteristics under the combined 1% AEP + CC scenario.
- Provide comparison of flooding for pre- and post-development against acceptable and performance criteria.
- Provide flood mitigation recommendations for the development, where appropriate.

1.3 Limitations

This study is limited to the objectives of the engagement by the client, 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.
- The study is to determine the effects of the new development on flooding behaviour and should not be used as a full flood study into the 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 919 Cambridge Road is approximately 44 ha. The land use of the catchment is zoned predominantly Landscape Conservation and Rural Living, with the specific site being zoned Low Density Residential.

Figure 1 below outlines the approximate contributing catchment for the 919 Cambridge Road, Cambridge development site.

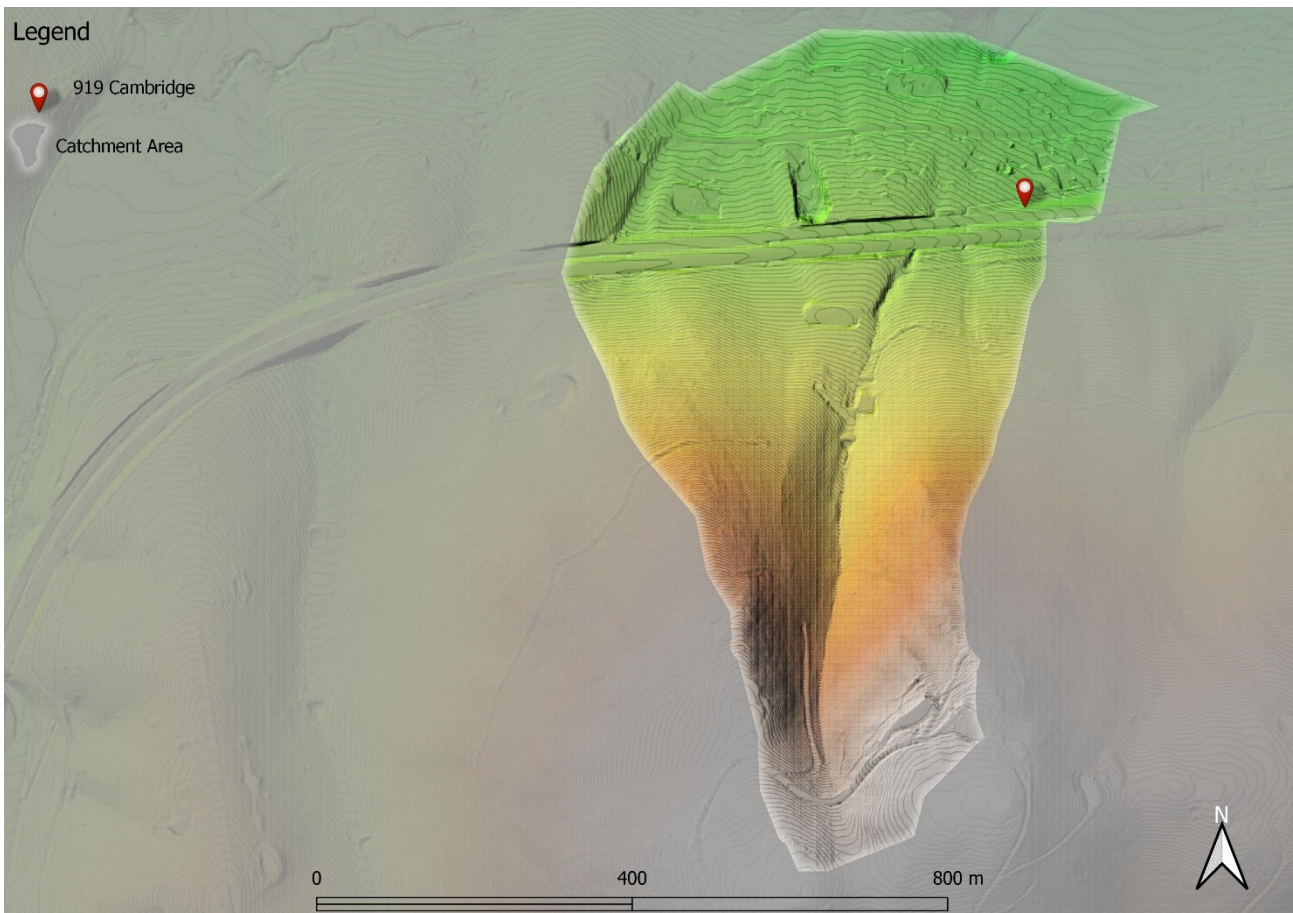


Figure 1. Contributing Catchment, 919 Cambridge Road, Cambridge

2.2 Hydrology

The following Table 2 states the adopted hydrological parameters for the RAFTS catchment, derived from best practice documents.

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
44	28/1	3.7/0.0	0.045	0.02	-0.285

2.2.1 Design Rainfall Events

TPS 2021 requires modelling of flood events of 1% AEP (100yr ARI) for the life of the development. Therefore, the design events assessed in this analysis are limited to the 1% AEP + CC design events. Due to the size and grade of the catchment the peak rainfall time was restricted to between 10 min – 6 hrs.

Figure 2 shows the box and whisker output for the 1% AEP model run. The model shows that the 1% AEP 10-minute storm temporal pattern 9 was the worst-case median storm. Therefore, this storm event was used within the hydraulic model.

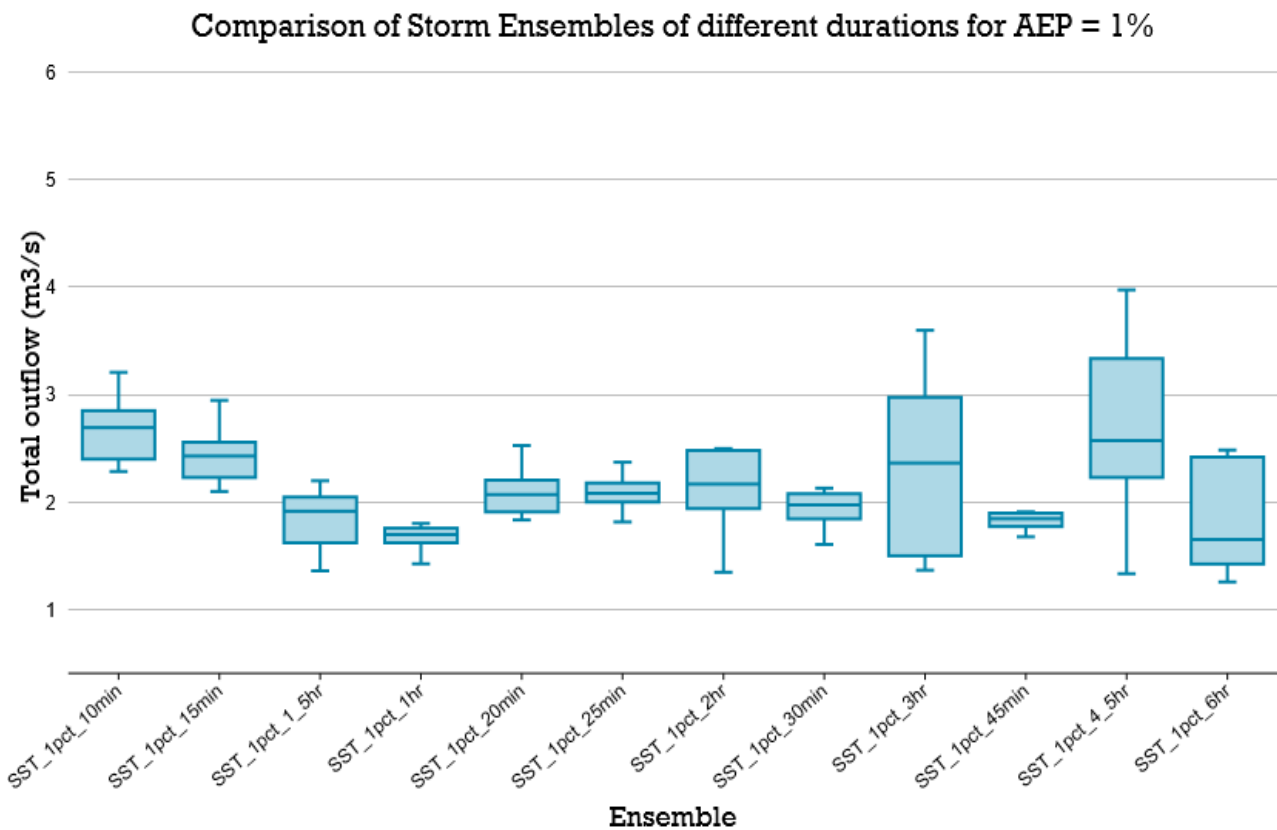


Figure 2. 1% AEP Box and Whisker Plot

2.2.2 Climate Change

As per ARR 2019 Guidelines, for an increase in rainfall due to climate change at 2100, it is recommended the use of RCP 8.5. Table 3 shows the RCP 8.5 increase compared to the revised increase of 14.6% suggested by Climate Futures Tasmania. Therefore, the ARR 8.5 increase of 16.3% was adopted in the model as a conservative estimate.

Table 3. Climate Change Increases

Climate Zone	CFT increase @ 2100	ARR 8.5 increase @ 2100
South-East Tasmania	14.6 %	16.3 %

2.3 Hydraulics

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

2.3.1 Extents and topography

The area of concern is situated in the south of the catchment. The catchment originates from Mount Rumney to the south, approximately 184 mAHD higher than the site location and the mainstream with an average gradient of approximately 21 %.

2.3.2 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.

2.3.3 Survey

The 2D surface model was taken from a combination of LiDAR 2019 to create a 1m and 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 (Figure 3).

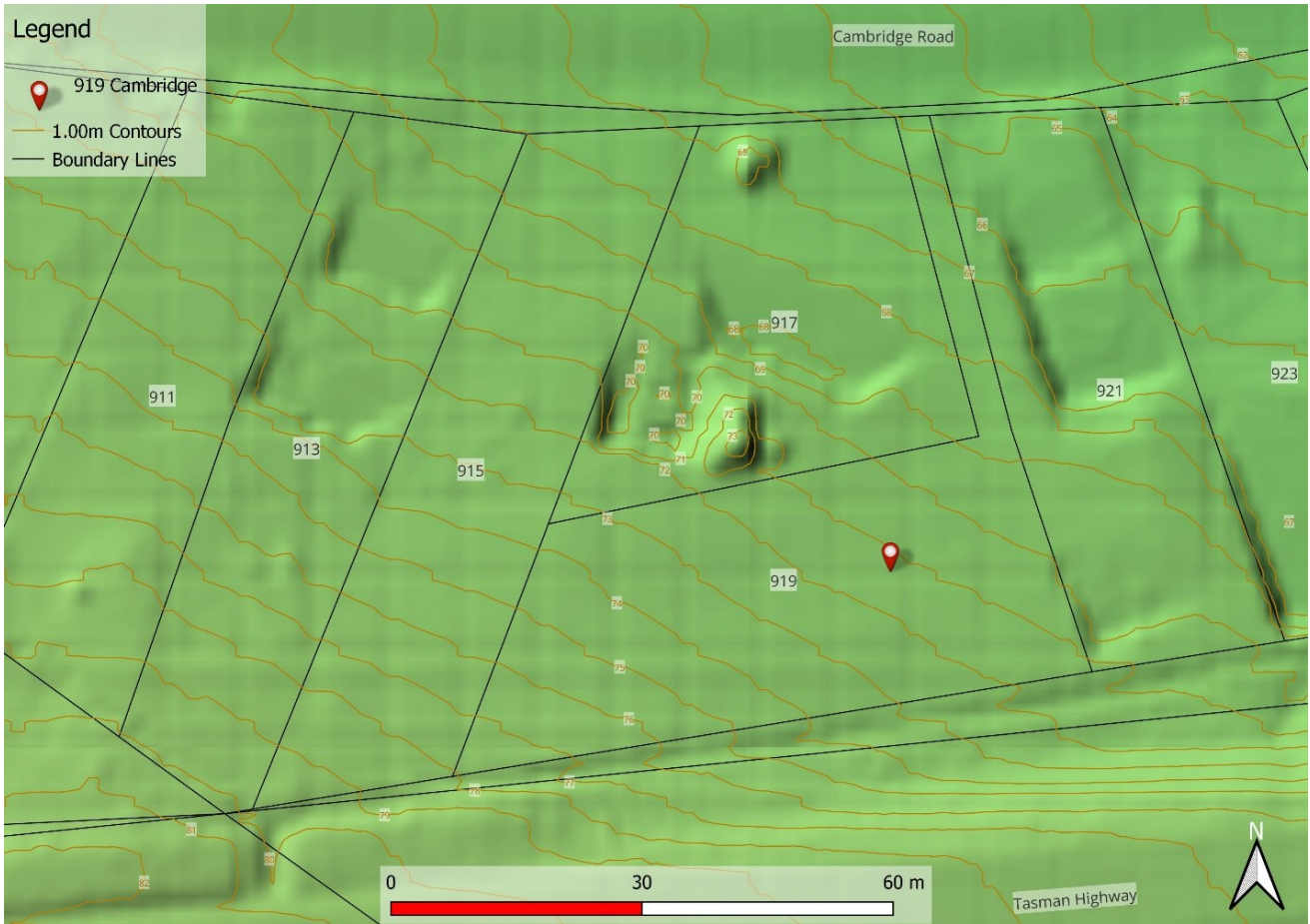


Figure 3. 1m DEM (hill shade) of lot area, 919 Cambridge Road.

2.3.4 Roughness (Manning’s n)

Table 4 shows Manning’s values used in the model. Values for this layer were derived from the ARR 2019 Guidelines.

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

2.3.5 Walls

All significant fences and retaining structures were included as 2D linear wall structures within the 2D model. Fences were modelled 300 mm above the ground level.

2.3.6 Buildings

Buildings were represented as mesh polygons with a high Manning’s n value within the model. Buildings with unknown floor levels were set with a minimum 300 mm above ground. 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, hallways etc.

2.4 Development Runoff

Stormwater runoff from the development site has been assessed under pre- and post-development models to determine the potential impact the development at 919 Cambridge Road has on the immediate local flows. As per planning guidelines it is a requirement that this does not have a negative impact from pre to post development.

Site characteristics for the pre- and post-development model are summarised in Table 5.

Table 5. Site Characteristics

Land Use	Pre-Development		Post-Development	
	Area (m ²)	% Total land	Area (m ²)	% Total land
Pervious	2093	100	1392	67
Impervious	0	0	701	33

3. Model Results

The result of 1% AEP + CC were run through the pre-development and post-development model scenarios to compare the changes to flooding onsite and to surrounding properties.

3.1 Flood depth and extent

It can be seen from the pre-development model runs (Figure 4), that some minor flooding occurs within the lot boundaries and surrounding properties. The overland flow path flows through the southern lot boundary and flows through the centre of the lot and exits through to Cambridge Road.

The pre-development flood depth at the marked cross-sectional line is 0.06 m, that shows an increase to 0.10 m in the post-development scenario (Figure 5).

Figure 5 shows the effect the development has on the overland flow path. **2 x open drains with dimensions 1.2 m wide 0.15 m deep** are recommended at the southern lot boundary to channel the overland flow and divert it through the driveway. This is recommended to be further re-enforced by **2 x 0.3 m high earth bunds** that are to be constructed at the top of the batter as shown in Figure 5.

Following the proposed development, along with the mitigation options, flood extents within the lot is concentrated within the driveway before exiting via Cambridge Road.

The maximum flood level at the proposed building envelope is 73.76 mAHD.

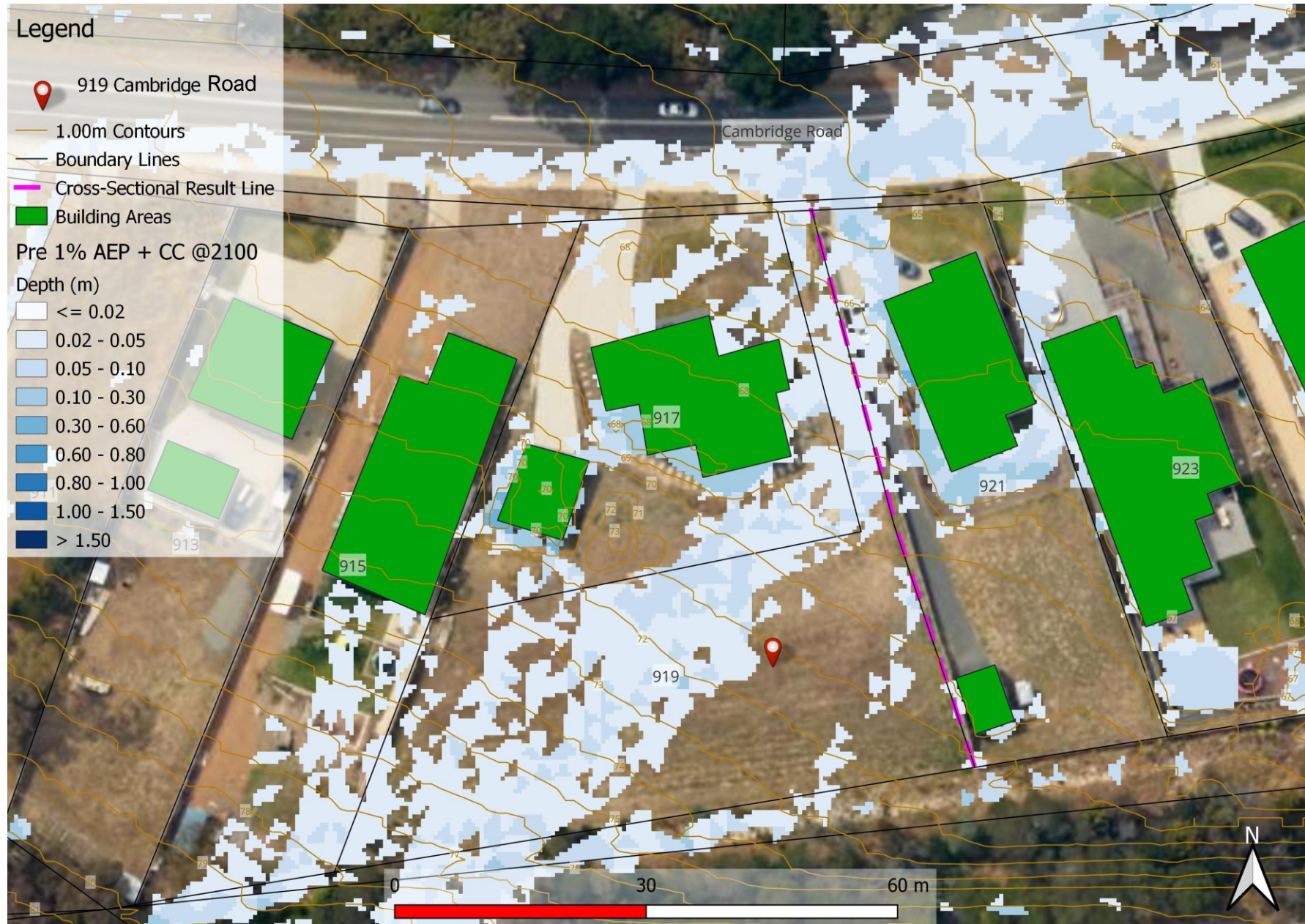


Figure 4. Pre-Development 1%+CC Flood Depths and extents

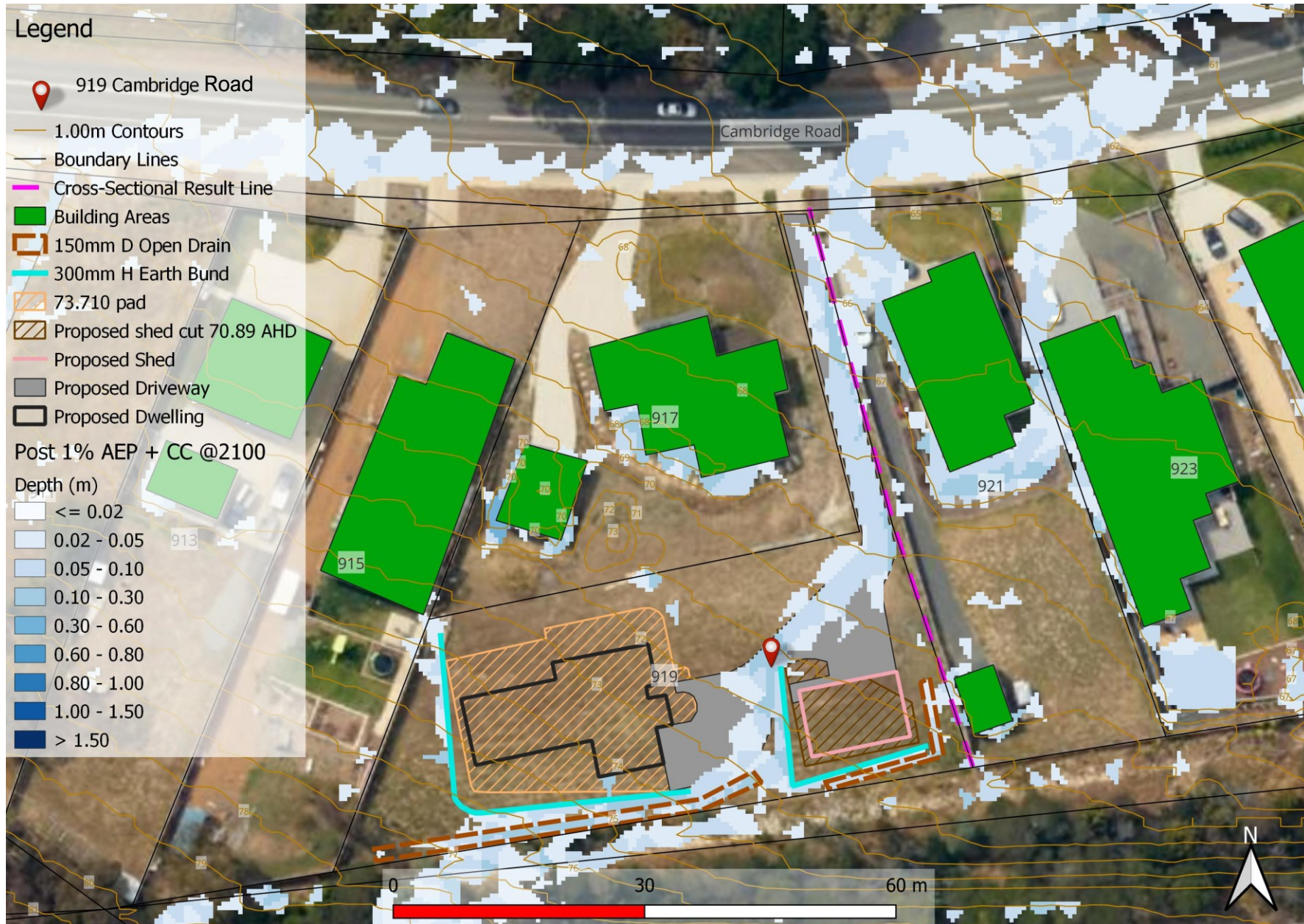


Figure 5. Post Development 1%+CC Flood Depth and extents

3.2 Displacement of Overland Flow on Third Party Property

Figure 5 shows the post-development flows that, when compared against pre-development, there appears to be no increase in flood depths/extents on surrounding properties around 919 Cambridge Road. The post-development hazard rating on the neighbouring properties and surrounding infrastructure remains at the same rating seen in the pre-development scenario.

It is therefore deemed that the post development model does not affect flood depths on surrounding properties.

3.3 Development Effects on Stormwater Discharge

Figure 6 below shows the discharge hydrograph at the cross-sectional result line for the lot at 919 Cambridge Road area only. The graph was captured in the model for both pre- and post-development runs and combined in a graph to demonstrate the change in net-discharge. It demonstrates that there is an increase of 0.06 m/s in net velocity from the pre-development velocity of 0.45 m/s to the post-development velocity of 0.51 m/s. The post development discharge shows a slight increase of 0.01 m³/s from the pre-development discharge of 0.74 m³/s to the post-development discharge of 0.75 m³/s.

As the discharge in the pre-development scenario is relatively low, the slight increase is more likely due to model sensitivity and has no real impact on discharge from the lot following development. It is therefore deemed that the post development model does not increase net discharge.

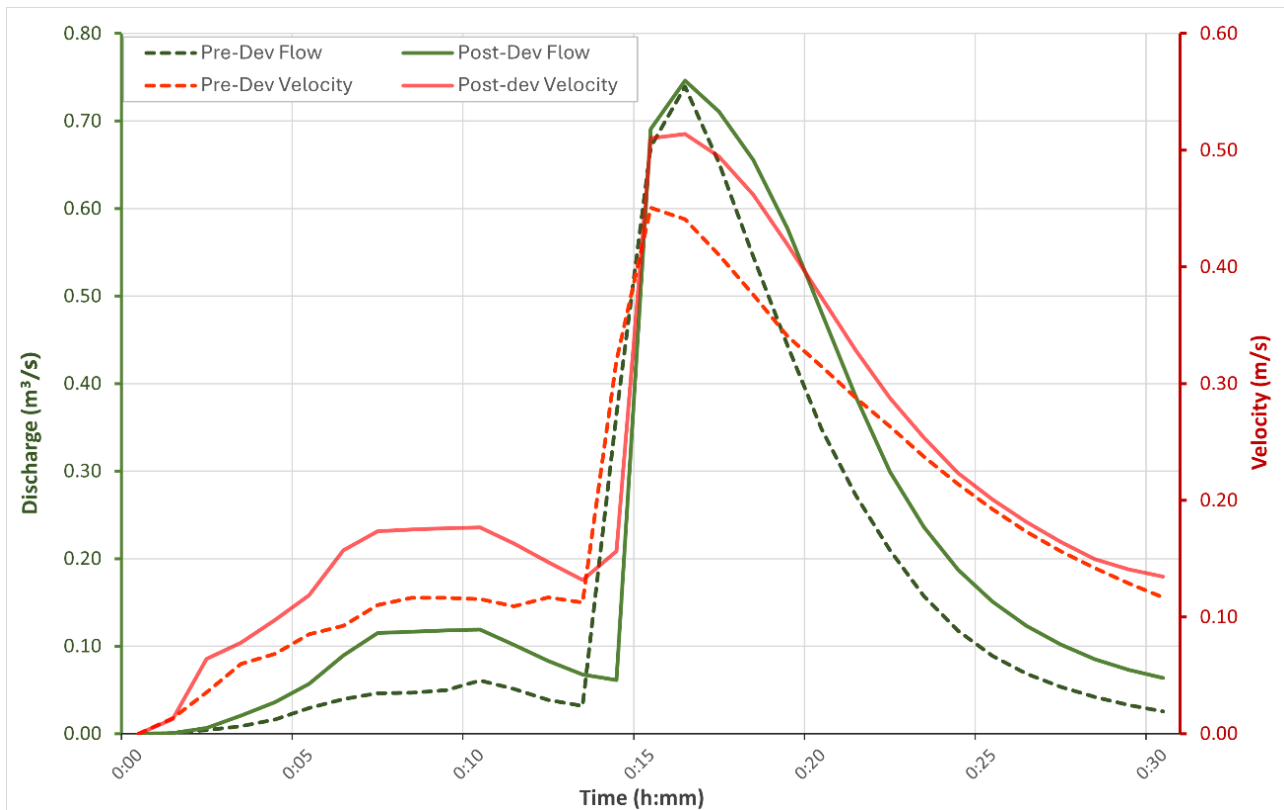


Figure 6. Pre and Post Development Net Discharge 1% AEP +CC, 919 Cambridge Road

3.4 Model Summary

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

	Pre-development	Post-development	Net Change
Depth (m)	0.06	0.10	0.04
Velocity (m/s)	0.45	0.51	0.06
Discharge (m ³ /s)	0.74	0.75	0.01

3.5 New Habitable Building

To meet the performance criteria of the Building Regulations S.54, the construction of a new habitable building is required to have a habitable floor level >300mm above the 1% AEP + CC flood level. The new development at 919 Cambridge Road, Cambridge must meet this regulation as shown in Table 7. (The floor level >1% AEP + CC flood level + 300 mm does not apply for non-habitable areas).

Table 7. Habitable Floor Construction Levels

House level	1% AEP +CC flood level (mAHD)	Minimum Floor Level required (mAHD)	Proposed floor level (mAHD)
Proposed Dwelling	73.76	74.06	73.90

As shown above, the finished floor level must be raised by 0.16 m to comply with section 54 of the Building Regulations. Habitable floor areas of the ground floor are clear from inundation.

4. Flood Hazard

Appendix A shows the pre and post development velocity and depth. In the pre-development scenario, the maximum velocity and depth at the cross-sectional line are 0.45 m/s and 0.06 m respectively. This places the hazard rating at **H1 – Generally safe for people, vehicles and buildings** as adopted by Australian Flood Resilience and Design Handbook as shown in Figure 7.

Following the construction of the proposed dwelling, the maximum velocity and depth shows an increase of 0.06 m/s and 0.04 m respectively at the cross-sectional line on the eastern lot boundary which does not increase the hazard rating within the dwelling and within the surrounding lots. The pre and post hazard maps are shown in the Appendix A.

As this study does not extend to the public access roads we cannot comment on the accessibility to the site, only within the site. Therefore, this report would advise that residents and visitors remain inside in the event of a flood unless instructed by emergency services.

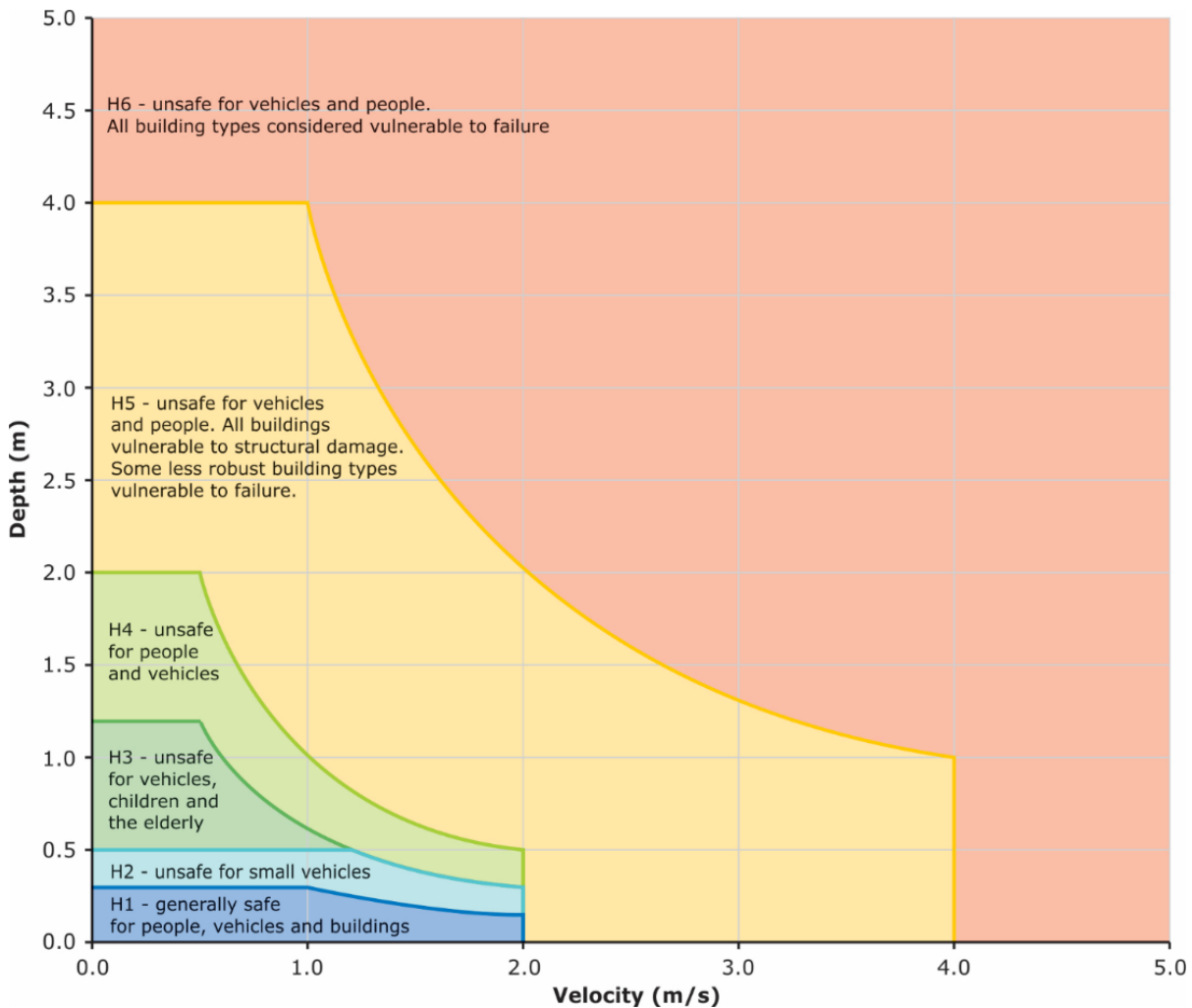


Figure 7. Hazard Categories Australian Disaster and Resilience Handbook

4.1 Tolerable Risk

Flood analysis into the lot at 919 Cambridge Road, Cambridge shows the proposed dwelling is located within a shallow overland flow path with majority of the surrounding area rated low (H1) hazard rating in the 1% AEP plus climate change event. This means the site is considered generally safe for all ages, and structures.

Velocities and depths, although relatively small, still present some risks from erosion and debris movement. Assuming appropriate structural considerations are applied, it is deemed that the structure proposed, intended to be a habitable class 1a dwelling with an asset life of 50 years (BCA2022), can achieve a tolerable risk to flooding over its asset life, assuming the recommendations of this report are adhered to.

Table 8 TPS C12.5.1 Uses within a flood prone area

C12.5.1 Uses within a flood prone 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 building;	(a) Proposed new dwelling and driveway within a lot affected by a shallow, slow moving flood path.
(b) the advice in a flood hazard report;	(b) Assuming recommendations of this report are implemented along with the recommended finished floor levels, no additional flood protection measures required for the life expectancy of a habitable 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 9. TPS C12.6.1 Building and works within a flood prone area

C12.6.1 Building and works within a flood prone area			
<p>Objective: (a) building and works within a flood-prone hazard area can achieve and maintain a tolerable risk from flood; and</p> <p>(b) buildings and works do not increase the risk from flood to adjacent land and public infrastructure.</p>			
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)	Proposed new dwelling and driveway
(b)	whether any increase in the level of risk from flood requires any specific hazard reduction or protection measures;	(b)	No increase in the level of risk following the proposed development and recommendations.
(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)	There is no increase in the level of risk within the lot, adjacent land and to surrounding infrastructure.
(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)	Can achieve tolerable risk without flood protection measures provided the recommendations in this report are followed.

5. Conclusion

The Flood Hazard Report for 919 Cambridge Road, Cambridge has reviewed the potential pre- vs post-development flood scenarios.

The following conclusions and observations were derived in this report:

1. A comparison of the post-development peak flows for the 1% AEP at 2100 were undertaken against the Tasmanian Planning Scheme – Clarence, C12.5.1 & C12.6.1.
2. An increase of 0.04 m in flood depths for the 1% AEP + CC at the cross-sectional line in the post-development model compared to the pre-development model.
3. Building Regulations S.54 requires a floor level of no less than the values stated in Table 7.
4. Peak discharge sees a slight increase of 0.01 m³/s from pre- to post-development, riverine flood scenarios.
5. There is an increase in velocity of 0.06 m/s from pre- to post-development along the cross-sectional results line.
6. The pre-development model shows the hazard from flooding in the area is H1 remains unchanged in the post-development scenario.

6. Recommendations

Flussig Engineers therefore recommend the following engineering design be adopted for proposed dwelling to ensure the works meets the Inundation Code and the Building Regulations:

1. The proposed dwelling must have a minimum finished floor level of **74.06 mAHD**.
2. 2 x open drains 1.20 m wide, 0.15 m deep to be constructed as shown in Figure 5.
3. 2 x high earth bunds 0.3 m high (or equivalent e.g. solid block wall) to be constructed as shown in Figure 5.
4. The new dwelling to be designed to resist flood forces including debris for the given flood conditions.
5. The building pads must be constructed to fall away from the habitable buildings and have adequate stormwater drainage within the pad extents.
6. No additional solid structures to be constructed around the property without further flood assessment.
7. Future use of lot areas to be limited to areas deemed safe under the ARR Disaster manual categories.
8. All future proposed structures within the flood extent not shown within this report will require a separate report addressing their impacts.

Under the requirements of Flood Hazard Report, the proposed dwelling will meet current acceptable solutions and performance criteria under the Tasmanian Planning Scheme 2021.

7. Limitations

Flüssig Engineers were engaged by **Jasmin Burden**, for the purpose of a site-specific Flood Hazard Report for 919 Cambridge Road, Cambridge as per C12.5.1 and C12.6.1 of the Tasmanian Planning Scheme - Clarence 2021. This study is deemed suitable for purpose at the time of undertaking the study. If the conditions of the development should change, the plan will need to be reviewed against all changes.

This report is to be used in full and may not be used in part to support any other objective other than what has been outlined within, unless specific written approval to do otherwise is granted by Flüssig Engineers.

Flüssig Engineers accepts no responsibility for the accuracy of third-party documents supplied for the purpose of this flood report.

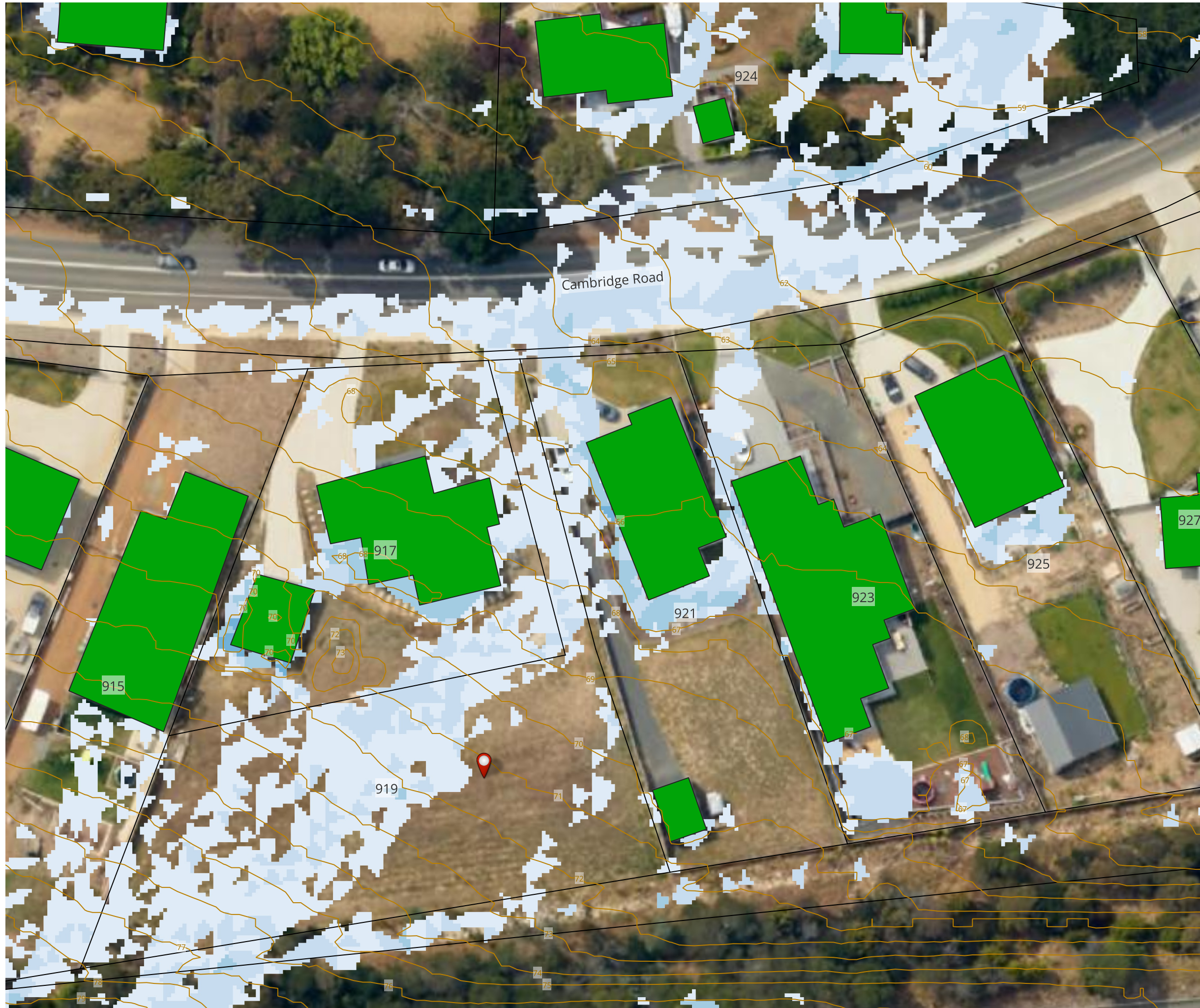
8. References

- Australian Disaster Resilience Guideline 7-3: Technical flood risk management guideline: Flood hazard, 2014, Australian Institute for Disaster Resilience CC BY-NC
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9. Appendices


Appendix A Flood Maps

PRE 1% AEP + CC @2100



Legend

 919 Cambridge


 1.00m Contours


 Boundary Lines


 Building Areas


Pre 1% AEP + CC @2100


Depth (m)


 <= 0.02


 0.02 - 0.05


 0.05 - 0.10


 0.10 - 0.30

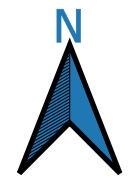
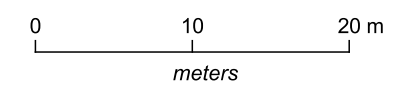
 0.30 - 0.60

 0.60 - 0.80

 0.80 - 1.00

 1.00 - 1.50

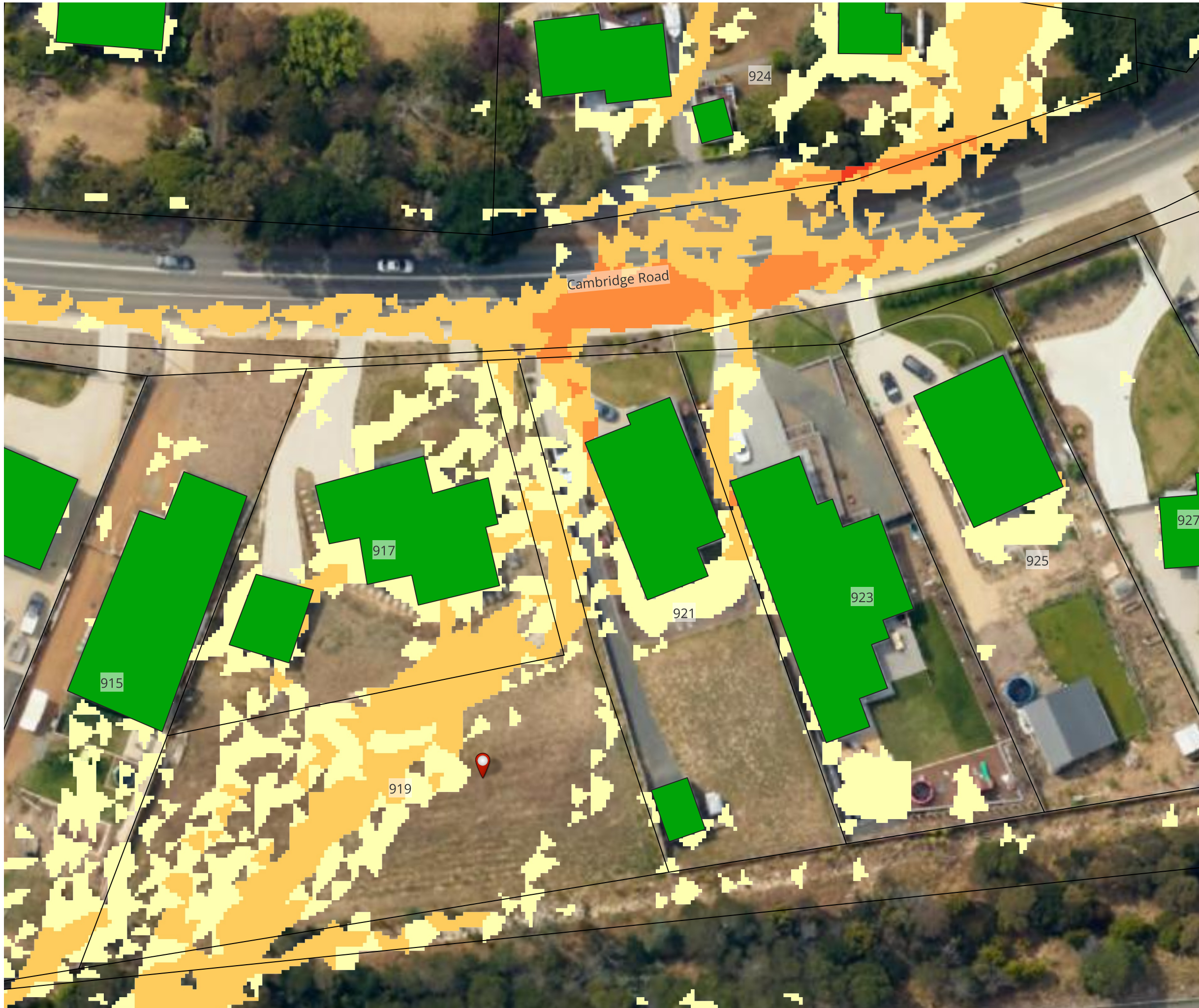
 > 1.50



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PRE 1% AEP + CC @2100



Legend


 919 Cambridge


 Boundary Lines


 Building Areas


Pre 1% AEP + CC @2100


Velocity (m/s)

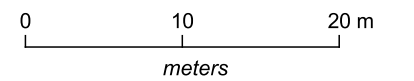
 ≤ 0.50

 0.50 - 1.00

 1.00 - 1.50

 1.50 - 2.00

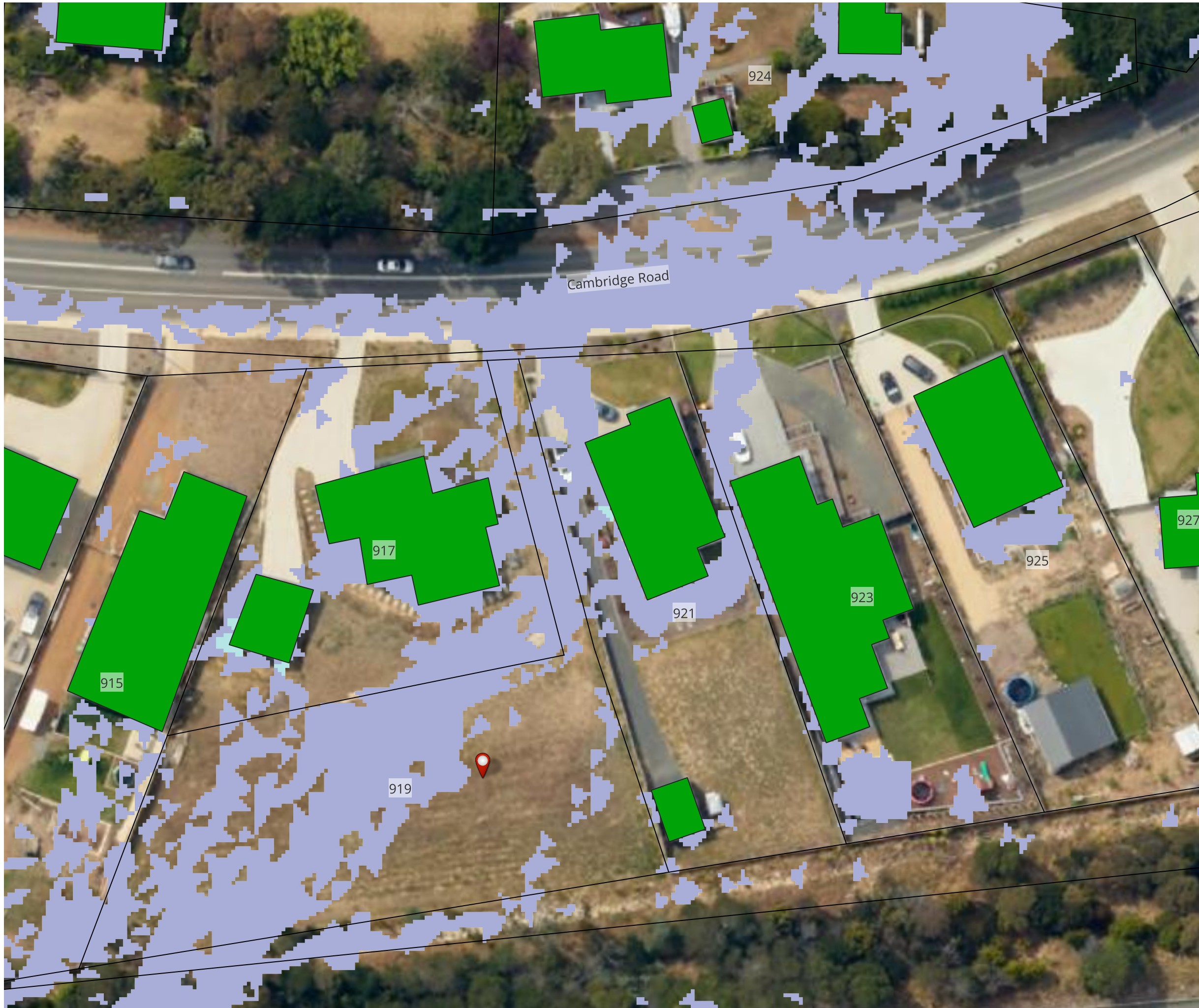
 > 2.00



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PRE 1% AEP + CC @2100



Legend

 919 Cambridge

 Boundary Lines

 Building Areas

Pre 1% AEP + CC @2100

Hazard

 H1

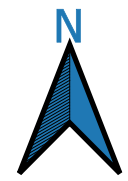
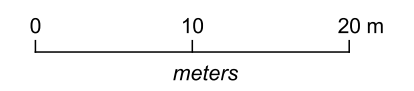
 H2

 H3

 H4

 H5

 H6



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POST 1% AEP + CC @2100

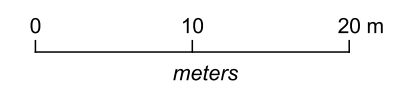


Legend

- 919 Cambridge
- Boundary Lines
- 1.00m Contours
- Building Areas
- 150mm D Open Drain
- 300mm H Earth Bund
- 73.710 pad
- Proposed Driveway
- Proposed Dwelling
- Proposed Shed
- Proposed shed cut 70.89 AHD

Post 1% AEP + CC @2100

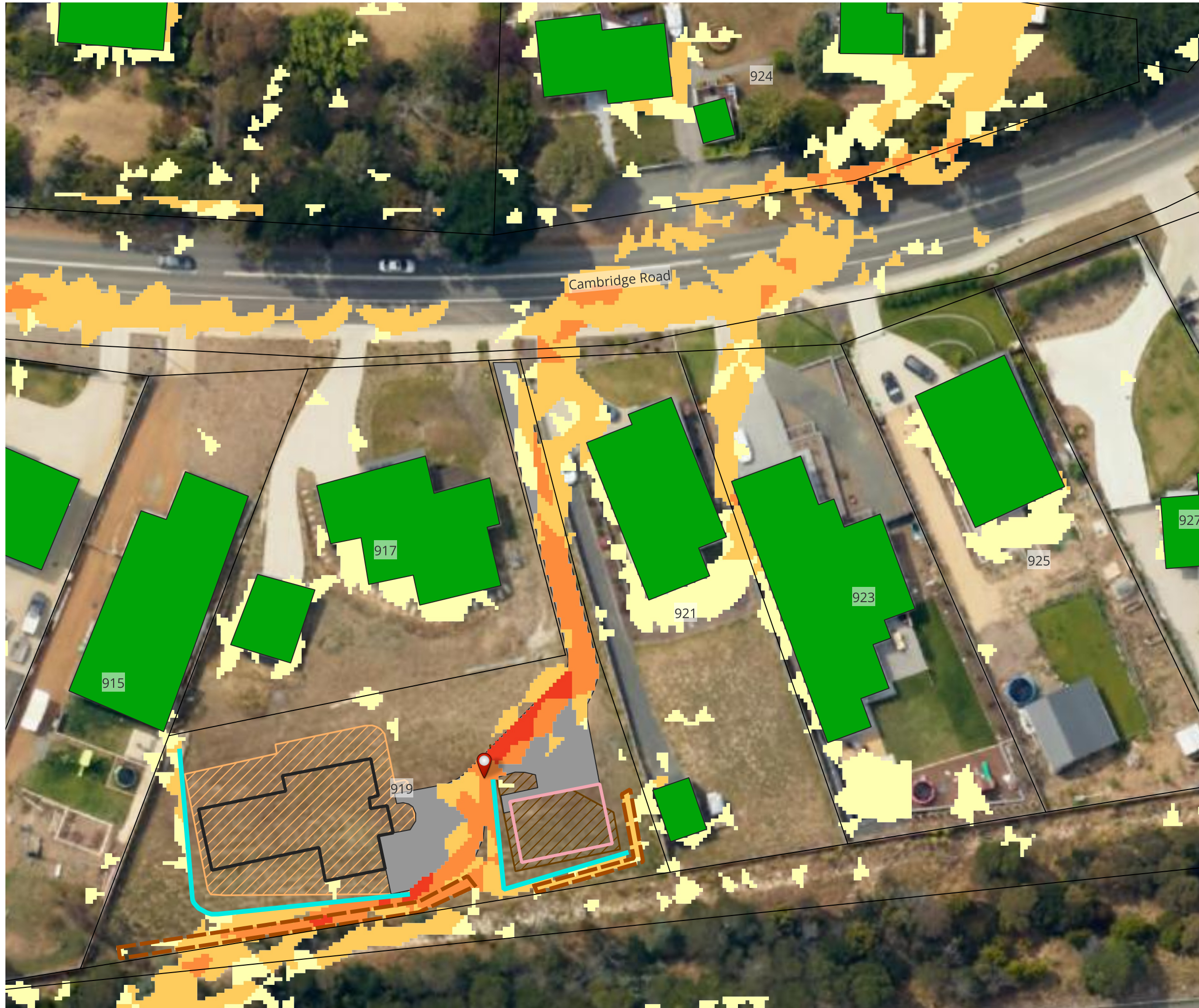
- Depth (m)
- <= 0.02
 - 0.02 - 0.05
 - 0.05 - 0.10
 - 0.10 - 0.30
 - 0.30 - 0.60
 - 0.60 - 0.80
 - 0.80 - 1.00
 - 1.00 - 1.50
 - > 1.50



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116 Bathurst St, Level 4 Hobart, 7000,
TASMANIA

POST 1% AEP + CC @2100



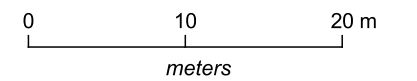
Legend

- 919 Cambridge
- Boundary Lines
- Building Areas
- 300mm H Earth Bund
- 73.710 pad
- Proposed Driveway
- Proposed Dwelling
- Proposed Shed
- Proposed shed cut 70.89 AHD

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Velocity (m/s)

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



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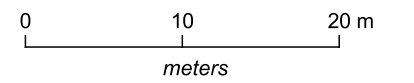
Legend

- 919 Cambridge
- Boundary Lines
- Building Areas
- 150mm D Open Drain
- 300mm H Earth Bund
- 73.710 pad
- Proposed Driveway
- Proposed Dwelling
- Proposed Shed
- Proposed shed cut 70.89 AHD

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Hazard

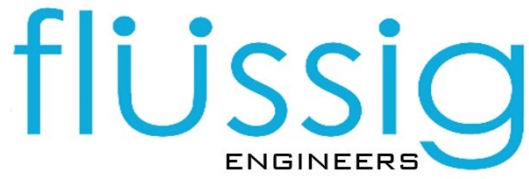
- H1
- H2
- H3
- H4
- H5
- H6



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