

28 June 2021

Blackall-Tambo Regional Council
Rate Administration Officer
PO Box 21
Blackall Qld 4472

Attention: Kathy Dendle
Via email: rates@btrc.qld.gov.au

Dear Kathy,

RE: RESPONSE TO INFORMATION REQUEST
SECTION 13.2 OF THE DEVELOPMENT ASSESSMENT RULES
2A CORONATION DRIVE, BLACKALL QUEENSLAND 4472

We act on behalf of Churches of Christ in Queensland, the Applicant in relation to a Development Application lodged with Blackall-Tambo Regional Council under the *Planning Act 2016* (the Planning Act) over the above land seeking:

- Material Change of Use- Retirement Facility and Residential Care Facility

On 25 April 2021 we received an Information Request from Blackall-Tambo Regional Council under Part 3 of the *Development Assessment Rules* (DA Rules). In accordance with Section 13.2 (a) of the DA Rules, we now provide a response to all of the information requested.

Additionally, we seek a Minor Change to the Development Application in accordance with s52 of the Planning Act. The Minor Change involves the removal of the three water tanks in the north-west corner that were proposed as part of the initial proposal plans. The applicant has reviewed the development of which has identified these tanks are no longer required. This change is independent from the other changes resulting in response to the information request and is minor in nature and is not substantially different from the development proposed.

Response to Information Request

In support of our information response and Minor Change, we provide the following attachments:

- | | |
|---------------------|--|
| Attachment A | Car Parking Analysis, undertaken by Churches of Christ |
| Attachment B | Car Parking Letter, Prepared by Churches of Christ |

Attachment C Flood Risk Assessment, prepared by Hydra Logic

Attachment D Amended Proposal Plans, Prepared by Merrin and Cranston Architects

A response to each item of Council's Information Request is included below, in the order set out within the Information Request.

1. Accommodation Density

The proposed development will result in an on-site density of one room per 193m². It is noted that this density is alternative to AO6.2 of the Township Zone Code. Insufficient information has been provided to demonstrate that the proposed development achieves compliance with PO6 of the Township Zone Code.

The Applicant is requested to provide an assessment of the proposed development against PO6 of the Township Zone Code.

Response:

The current building on site provides for a 24-bed aged care facility. This proposed development is an extension to an existing retirement facility adding an additional 10 beds. Whilst it is acknowledged the development does not comply with Acceptable Outcome 6.2, it is considered to meet the corresponding Performance Outcome. The Performance Outcome reads:

PO6

Multiple dwellings, residential care facilities, retirement facilities and rooming accommodation are of a scale, density and character that is complementary and compatible with the surrounding residential area.

In response the proposal meets the PO based on the following:

- The proposed extension to the facility is of size and scale in keeping with the existing building that occupies the site and other building in the immediate locality;
- The height of the proposed extension is consistent with the existing building;
- The extension will not detract from the existing character of the area but will rather compliment it as described in the image below; and
- Considering the surrounding land uses located in the immediate vicinity, the proposed developed will not bring new or increased impacts to the area.

2. Car Parking Supply

The proposed development includes the provision of 10 additional units on the site with no increase to on-site parking. No information has been provided to demonstrate that the existing car parking supply will be sufficient to cater for any increase in demand. The planning scheme, through Table 6.2.2.1, does not provide a specific

parking rate for the use and instead the parking supply is to be sufficient to accommodate the amount of vehicle traffic likely to be generated by the particular use.

The Applicant is requested to provide further information demonstrating that the existing car parking supply is sufficient to support the demand generated by the proposed development and therefore complies with PO10 of the General Development Code. Information provided may be in the form of occupancy data for the existing car park.

Response:

Churches of Christ have undertaken a site survey analysis and recorded data from the usage of the facilities' carpark for a week long period (**Attachment A**). As per the data provided, at any one time there are the following maximum visitors, staff and residents using the carpark taking into consideration shift change:

- 2 spaces utilised for home care + bus
- 5 spaces utilised for staff in am
- 4 spaces utilised for staff in pm
- 1 space utilised for residents; and
- 5 space utilised for visitors.

Total=17 spaces

Whilst it is acknowledged that spaces utilised will increase for a shift change of employees, at worst a maximum 17 spaces may be utilised for a short period of time. Having 24 current spaces (being the current approval condition requirement), a balance 7 spaces remain unoccupied.

Additionally, as per **Attachment B**, Churches of Christ have appropriately considered any extra staffing that may be required for the additional 10 beds extension of the facility where it is anticipated that one additional staff will be required during a shift. Considering 17 spaces (including shift change) are utilised at most at any one time, together with increased staff and potential visitors (e.g. 1 x additional visitor from 1 to 2 per day), the 24 spaces still provide sufficient capacity to accommodate the ultimate proposed development and intensity of use. As such compliance with PO10 is achieved based on the above information.

3. Flooding

The site is identified by the planning scheme as being subject to flooding. As per Schedule 4 of the planning scheme, the defined flood level for Blackall is 282 metres AHO. Whilst detailed plans have been provided, which show the elevation of the floor level of the new building above ground level, no information has been provided as to site levels or the height (in metres AHO or similar) of the floor. Council is therefore unable to determine whether the proposed development achieves the desired freeboard of 300mm above the defined flood level specified in AO21.2 of the General Development Code. Further information is also required to demonstrate that the expansion of the existing use on the site remains compatible with the nature of flood risk on the site.

The Applicant is requested to provide the following information in relation to flooding:

- (a) Amended proposal plans which allow for the identification of the proposed floor level of all buildings in metres AHO, in order to allow Council to ascertain the compliance (or otherwise) of the proposed development with AO21.2 of the General Development Code.*
- (b) A risk assessment that demonstrates that the expansion of the use does not increase risks associated with flooding beyond a tolerable level, in compliance with AO21.1 of the General Development Code.*
- (c) Detail in relation to evacuation of the site in the event of a flood event in accordance with AO21.3 of the General Development Code.*

A detailed assessment of the proposed development against PO21 and/or all relevant corresponding Acceptable Outcomes of the General Development Code.

Response:

A Flood Risk Assessment (**Attachment C**) has been prepared to respond to this item. Specifically it details the following:

- A response to AO21.1-AO21.3 of the General Development Code provisions for development located in Flood Hazard Area;
- Risk Assessment of the site, providing a risk matrix detailing the likelihood of flood events;
- Detail on evacuation strategy within AO21.3 response.

4. Standby Generator

The proposal plans submitted show that the proposed development will involve the provision of a new generator near the existing car parks fronting Coronation Drive. No detail has been provided as to the appearance or scale of the generator. Further detail is required in order to allow Council to assess this aspect of the proposed development.

The Applicant is requested to provide further detail on the general size and appearance of the generator and, where appropriate, details of screening to be provided to ensure that the provision of the generator is not unsightly.

Response:

Please see within **Attachment A** amended Proposal Plans. As per the plans this generator is no longer required and has been removed.

Summary

We now request that Council continue its assessment of the application. Should you wish to discuss this matter further, please contact Jasmin Hurikino on (07) 3251 9413 or email: jasminhurikino@saundershavill.com.

Yours faithfully,

Saunders Havill Group

A handwritten signature in black ink, appearing to read 'J Hurikino', written in a cursive style.

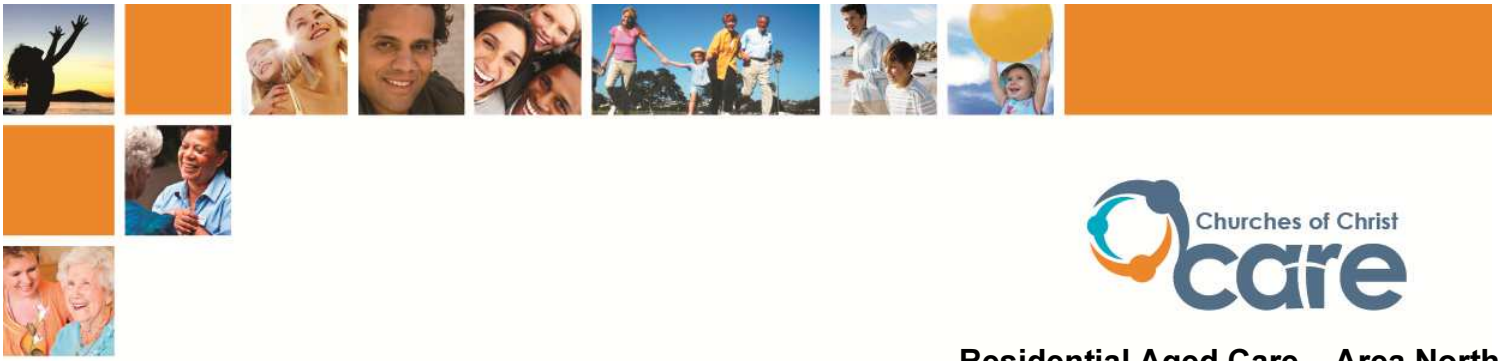
Jasmin Hurikino

Town Planner

Cars in Car Park

Barcoo Living mps - average week.

	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	SUNDAY
HOME CARE	2 + 1 bus	2 + 1 bus	2 + 1 bus	2 + 1 bus	2 + 1 bus	2 + 1 bus	2 + 1 bus
STAFF - AM	5	3	3	3	3	3	3
STAFF - PM	4	4	4	4	4	4	4
STAFF - NIGHT	2	1	1	2	1	1	1
RESIDENT	1	1	1	1	1	1	1
VISITORS	1	2	2	2	5	3	4



Residential Aged Care – Area North

Churches of Christ Care
4a Neptune St
Maryborough Qld 4650

Phone 07 4123 2514
Mobile 0428 818 241
Email geoff.potts@cofcqld.com.au
Web www.care.cofcql.com.au

13th May 2021

RE: Barcoo Living MPS Parking Spaces

To Whom It May Concern

Good afternoon

Churches of Christ are very excited to be expanding our services to the local Blackall community and its surrounding towns. We are very proud to be one of the largest employers in town and we are committed to supporting the Blackall community by employing local where possible, staying local when visiting, housing for staff and buying locally.

We are increasing our bed capacity by ten, this inevitably then relates to an increase in staff.

In response to concerns regarding parking spaces at Barcoo Living we offer the following:

We have monitored closely our current carpark usage. It has been determined that at all times throughout the day there were vacant parking bays. It is agreed that when we have specific celebratory days at the facility that an overflow may occur, however this happens now without complaint from staff or visitors and they are not frequent.

We have considered any extra staffing and possible visitors to the site and we remain confident that the current parking bays will be sufficient in to the future.

We respectfully submit that no further parking bays will be required due to our new planned extension.

If you have any queries regarding the above please don't hesitate to contact me on 0428 818 241.

Kind Regards

Geoff Potts
Acting Regional Manager
Area Norwest

Bringing the light of Christ into communities

A division of Churches of Christ in Queensland and working with Churches of Christ in Vic/Tas



Bringing the light of Christ into communities

A division of Churches of Christ in Queensland and working with Churches of Christ in Vic/Tas

Flood Risk Assessment
McLean Place Aged Care Extension
Blackall
May 2021



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Signed	
Date	24 May 2021
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- Appendix C Reference Point Risk Assessments
- Appendix D Risk Assessment Mapping

Executive Summary

HydraLogic was engaged by the Churches of Christ Qld to prepare a flood risk assessment of the proposed extension to the McLean Place Aged Care facility in Blackall, Queensland. This assessment references the floor plans and elevations prepared by Merrin & Cranston Architects (see **Appendix A**) and has been prepared in response to the Blackall-Tambo Region Planning Scheme's General Development Code AO21.1.

This flood risk assessment is compliant with AS/NZS ISO 31000:2009.

This assessment represents an analysis of flood risks which are anticipated to occur across the McLean Place Aged Care site based upon the existing site layout and proposed extension.

The technical parameters for the assessment were derived from digital elevation models of the local terrain created from LiDAR data and previous investigations into the design flood levels for Blackall. This assessment references the design flood levels presented in the report titled *Report on Flood Investigation for Blackall. Flood Investigation Level 2 – Unvalidated GIS Mapping Approach* dated October 2012 and prepared by the Queensland Reconstruction Authority (QRA) and referenced in the correspondence to the Department of Natural Resources and Mines (DNRM) (see **Appendix B**).

Site based flooding parameters have been referenced against national guidelines for hazards and vulnerability to derive a suite of possible risk profiles based on potential consequences and frequency of occurrence.

Risks across the site have been categorised based upon industry guidelines as being either:

- Broadly Acceptable;
- Tolerable; or
- Generally Intolerable.

The category of risk has been determined at 9 reference points across the site and evaluated for the scenarios of *with* and *without* the proposed extension.

The results of the assessment demonstrate the proposed extension of the McLean Place Aged Care facility does not increase the risks associated with flooding beyond a tolerable level.

1 Introduction

The Church of Christ Queensland's McLean Aged Care facility in Blackall, is seeking to expand the care and accommodation services offered by extending the existing facility to the west. The location of the subject site is presented in **Figure 1-1**.

The proposed extension is presented in the floor plans and elevations prepared by Merrin & Cranston Architects (see **Appendix A**).

The proposed extension encroaches into the Flood Hazard Area defined by the Blackall-Tambo Region Planning Scheme (the Planning Scheme). This encroachment triggers the requirement for the proposed development to respond to the provisions of the General Development Code for Development Located in a Flood Hazard Area. **Table 1-1** presents the relevant provision and summary response.

Table 1-1 Blackall-Tambo Planning Scheme General Development Code provisions for Development Located in a Flood Hazard Area

Development located in a Flood Hazard Area		
Performance Outcome	Acceptable Outcomes	Response
PO21 People and property are not exposed to intolerable risk from flood hazards.	AO21.1 New development is: • situated outside of mapped flood areas identified in Schedule 2 – Flood mapping; or • if within a mapped flood area, a fit for purpose risk assessment is conducted to ensure that development in that area does not increase risk beyond a tolerable level.	This report presents a fit for purpose This flood risk assessment that is compliant with AS/NZS ISO 31000:2009.
	AO21.2 New buildings in a mapped flood area identified in Schedule 2 – Flood mapping should include a finished floor level 300mm higher than the defined flood level for that area.	Schedule 4 of the Planning Scheme states the defined flood level for Blackall is 282.0 metres Australian Height Datum (AHD). Plans for the proposed extension prepared by Merrin & Cranston Architects show finished floor levels (FFL) for the proposed extension to be 283.35 mAHd. This level is consistent with the FFL of the existing building for the proposed extension.
	AO21.3 If located in a mapped flood area identified in Schedule 2 – Flood mapping, at least one evacuation	The existing entry and exit driveway for the McLean Place Aged Care facility connects to Coronation Drive. Based upon

	route is provided which allows safe passage for emergency evacuation during flood events (this must be sufficient to cater for evacuation and emergency access).	available LiDAR data the ground surface levels at both the entry and exit points are below the defined flood level for Blackall. The proposed extension does not modify the entry or exit conditions for the site. The FFLs throughout the facility remain approximately 1.0 m higher than minimum requirements for the defined flood event, hence it is unlikely for the evacuation of residents to be a preferred emergency response during a flood event. The potential flood frequency of a flood event which exceeds the FFLs of the existing facility has not been determined or recorded in this location. Beyond the driveway connection to Coronation Drive the entrance to the facility is flood-free for the defined flood level. This flood risk assessment has determined the risk at the driveway entrance and exit of the facility to be <i>Broadly Acceptable</i>. The proposed extension does not alter the assessment of the risk at the driveway entrance and exit of the site.
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The Planning Scheme requires a fit-for-purpose risk assessment to be undertaken to demonstrate the proposed extension does not increase the risks associated with flooding beyond a tolerable level. The State Planning Policy (SPP) defines a fit-for-purpose risk assessment as a risk assessment consistent with AS/NZS ISO 31000:2009 Risk Management undertaken by a suitably qualified person.

HydraLogic was engaged by the Churches of Christ Queensland to prepare a flood risk assessment of the proposed extension to the existing McLean Place Aged Care facility.

This flood risk assessment is compliant with AS/NZS ISO 31000:2009.

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 24/05/2021, DGM	McLean Place Aged Care Extension Blackall Flood Risk Assessment	Locality		
		Scale 1:5,000	Map No.	1.1

2 Risks Assessment Process

2.1 Flood hazards areas

Peak flood levels across the site and for the surrounding areas are dominated by regional flooding conditions emanating from the Barcoo River.

The technical parameters for the assessment were derived from digital elevation models of the local terrain and previous investigations into the design flood levels for Blackall. This assessment references the design flood levels presented in the report titled *Report on Flood Investigation for Blackall. Flood Investigation Level 2 – Unvalidated GIS Mapping Approach* dated October 2012 and prepared by the Queensland Reconstruction Authority (QRA) and referenced in the correspondence to the Department of Natural Resources and Mines (DNRM) (see **Appendix B**).

The assessment also considers the Defined Flood Level for Blackall as adopted by Council Resolution on 18 September 2019 and presented as Schedule 4 of the Planning Scheme. The resolution declares the Define Flood Level (DFL) for Blackall to be 282 metres Australian Height Datum (AHD). The DFL of 282 mAHD is also referenced in Council's Information Request Item 3. Flooding. The resolution also references 282 mAHD as the Estimated Flood AEP 1 in 100 years and cross references this to a level of 8.0 m at the BoM Gauge 036155 in the Barcoo River at Blackall. Based upon the correspondence presented in Appendix B a level of 8 m at the Bom Gauge would be equivalent to 283.03 mAHD. To accommodate this discrepancy this risk assessment has adopted the range of flood levels and frequencies outlined in **Table 2-1**.

Table 2-1 Adopted flood event levels and frequencies

BoM Gauge Level	AHD	AEP
8.0 m	283.03 m AHD	1 %
7.5 m	282.53 m AHD	2 %
7.0 m	282.00 m AHD*	DFL*
6.5 m	281.53 m AHD	5 %
4.9 m	279.93 m AHD	10 %

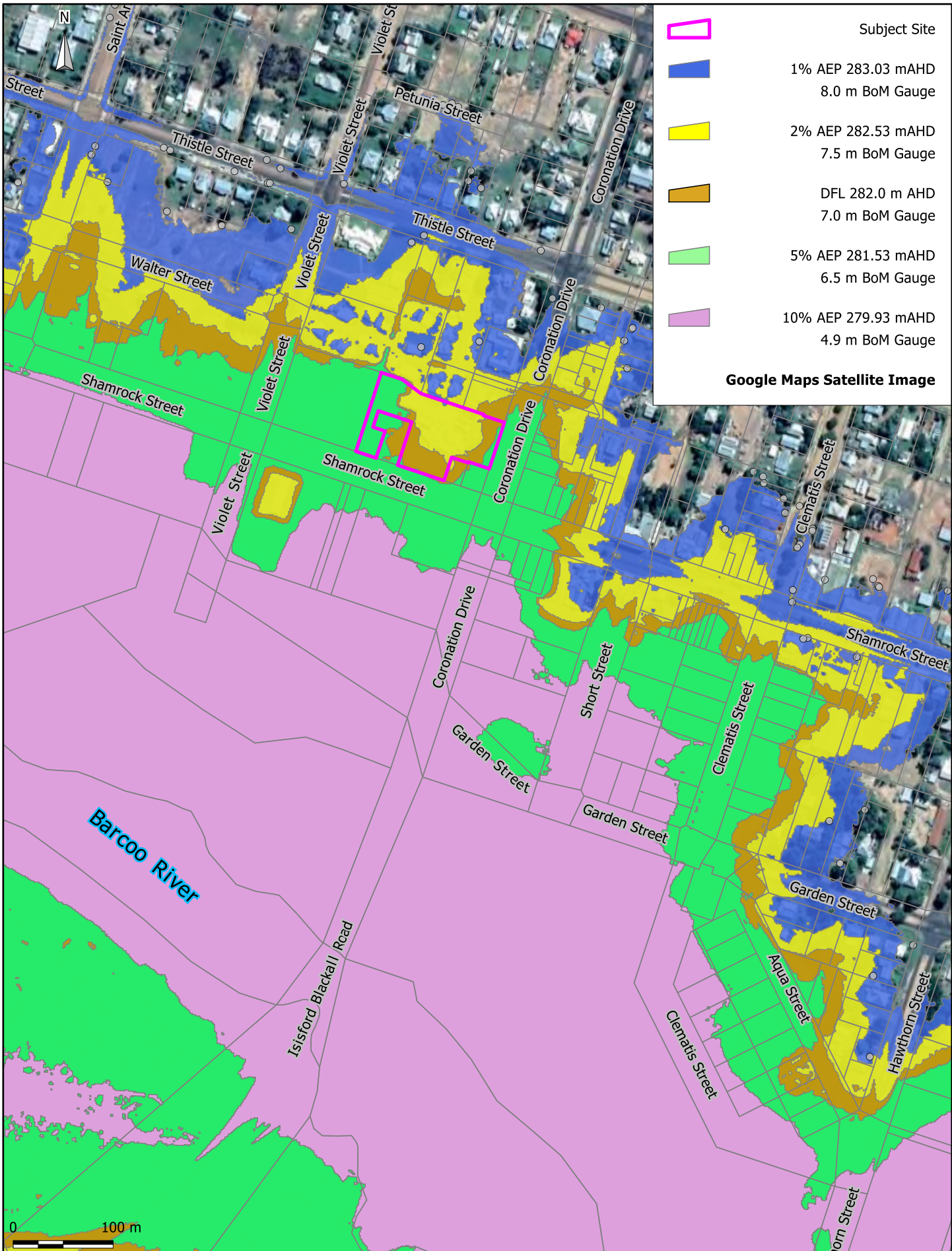
* As per Schedule 4 of the Blackall – Tambo Planning Scheme

The flood extents for the adopted flood events of **Table 2-1** are presented in **Figure 2-1**.

This flood risk assessment utilises available LiDAR data to present detailed mapping of the flood extents for the flood events considered. Based upon the ground levels from the LiDAR data and projections of design flood levels from the Barcoo River the depths of flooding across the floodplain were determined for the flood events considered.

The parameters of flood extent and depth for each flood event are used to inform the elements of *exposure* and *frequency* in the risk assessment process.

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2.2 State interest policy 2

The SPP requires a fit-for-purpose risk assessment to be undertaken to identify and achieve an acceptable or tolerable level of risk for personal safety and property in natural hazard areas.

The risk assessment approach outlined in the national best practice guideline, *Managing the floodplain*¹, is consistent with nationally agreed emergency risk assessment guidelines – the *National emergency risk assessment guidelines* (NERAG), and ISO 31000:2009 Risk management – principles and guidelines.

Managing the floodplain defines flood risk as a combination of the likelihood of occurrence of a flood event and the consequences of that event when it occurs. It further states that it is the human interaction with a flood that results in a flood risk to the community. This risk will vary with the frequency of exposure to this hazard, the severity of the hazard, and the vulnerability of the community and its supporting infrastructure to the hazard.

This definition can be simplified into the expressions of:

Risk = Likelihood x consequence

Where

Consequence = Exposure + Vulnerability – Tolerability.

The likelihood of a flood event is represented by the statistical frequency of the occurrence of the event. Likelihood is a common parameter of flood analysis and readily available for most assessments in the form of Average Exceedance Probability (AEP).

Quantifying *consequence* is more challenging.

Exposure can be quantified through an assessment of the flood hazard. The *Technical flood risk management guideline: Flood hazard* (Australian Institute for Disaster Resilience)² provides supplementary advice to support *Managing the floodplain* by outlining methods to quantify flood hazard. The technical guideline recommends establishing the flood behaviour of a location in terms of depth, velocity and time. This is typically achieved with a computational flood model. The flood hazard can be quantified as the depth (D) x velocity (V) and plotted over the time frame of the event to identify the maximum depth x velocity (DV) combination. Hydrodynamic time series data was not available for Blackall. However, depth parameters could be derived from the projected flood extents and the LiDAR data at a selection of reference points across the subject site. Nine reference points were utilised. Please refer to **Figure 2-2** for reference point locations. In the absence of velocity data for the Blackall flood extents a conservative estimate of 1 m/s was adopted. The McLean Aged Care site is approximately 300 m north of the banks of the Barcoo River and lies near the extent of the design flood events for Blackall where flood velocities would be expected to be low. The proposed

¹ Managing the Floodplain: A Guide to Best Practice in Flood Risk Management in Australia - Australian Institute for Disaster Resilience Handbook 7

² Guideline 7-3 Technical flood risk management guideline: Flood hazard (Australian Institute for Disaster Resilience)

extension to the facility has no influence on flood velocities and hence the parameter is a relative term when comparing risk profiles for the scenarios of *with* and *without* the extension.

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Once the flood hazard has been quantified (as DV) the potential of the flood flows to cause damage or danger can be indexed against vulnerability curves linked to meaningful hazard thresholds. A selection of vulnerability curves are provided in the technical guideline (Guideline 7-3). **Figure 2-3** presents the General Flood Hazard vulnerability curves from the technical guidelines.

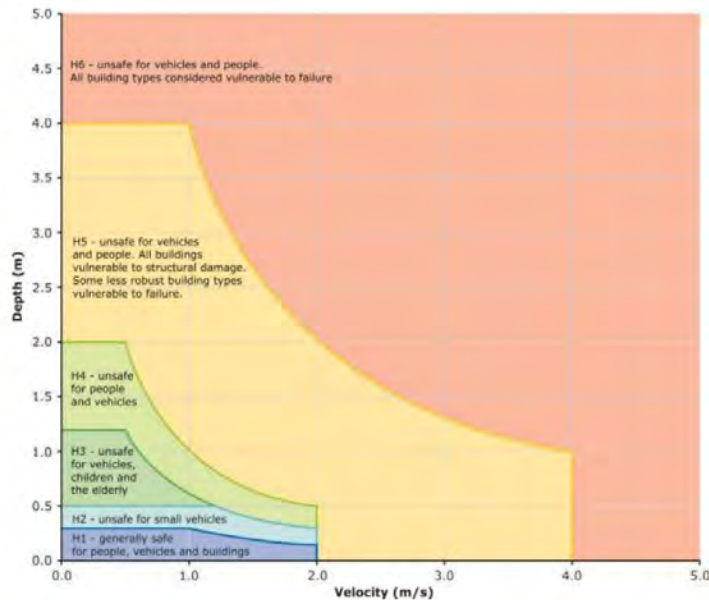


Figure 2-3 General flood hazard vulnerability curves (Guideline 7-3)

Vulnerability and tolerability are less tangible components of *consequence* to quantify. However, to do so, this risk assessment refers to the approach recommended by the Queensland Reconstruction Authority's (QRA) *Planning for stronger, more resilient floodplains*. The QRA's approach offers a weighting methodology to quantify the elements of consequence in terms of a consequence score. The score can then be applied to a risk matrix, to determine the nature of the risk in terms of acceptability. Using this weighting, each element is assigned a score of between 0 and 5 points based on the calculation process that supports the evaluation. The analysis results in a final score out of ten (10), with ten (10) representing the highest level of consequence, and zero (0) representing no consequence.

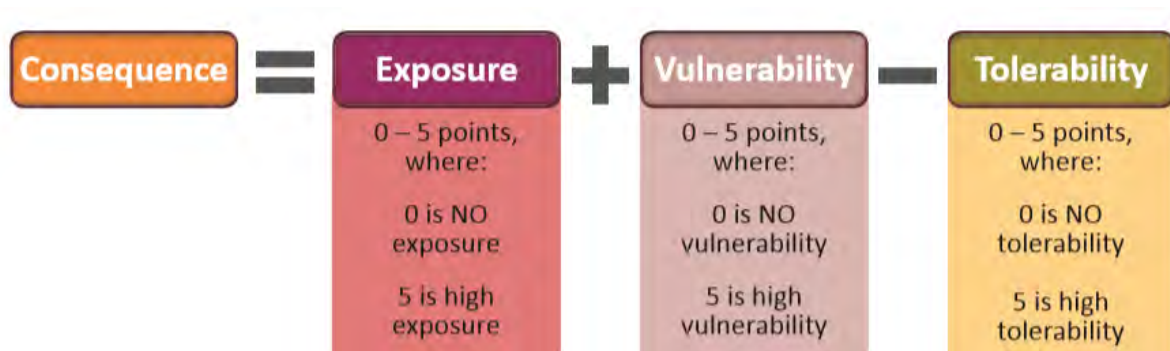


Figure 2-4 Quantifying consequence using a weighting approach (QRA)

Following this methodology, exposure was scored as a maximum rating of depth based upon the criteria presented in **Table 2-2**.

Table 2-2 Exposure scores

Exposure description	Depth Limit	Exposure score
Inundation less than 20 mm in depth Inundation to approximately sole of shoe depth	0.20	0
Inundation between 20 mm and 100 mm in depth Inundation to approximately shoe depth	0.10	1
Inundation between 100 and 250mm in depth Inundation to approximately mid-calf level on an adult/adolescent	0.25	2
Inundation between 250 and 500mm in depth Inundation to approximately knee level on an adult/adolescent	0.50	3
Inundation between 500mm and 1m in depth Inundation to approximately waist level on an adult/adolescent	1.00	4
Inundation more than 1m in depth Inundation above waist level of an adult/adolescent	1.00	5

Vulnerability scores were derived from the vulnerability thresholds presented in **Figure 2-3** and are presented in **Table 2-3**.

Table 2-3 Vulnerability scores

General Hazards	Vulnerability score
H1	1
H2	2
H3	3
H4	4
H5	5
H6	6

A tolerance score was determined for each flood condition (i.e. hazard). The tolerance scores are presented in **Table 2-4**.

Table 2-4 Tolerance Scores

Exposure description	Tolerance description	Tolerance score
Inundation less than 20 mm in depth Inundation to approximately sole of shoe depth	High tolerance - Acceptable situation with acceptable outcomes	5
Inundation between 20 mm and 100 mm in depth Inundation to approximately shoe depth	Tolerable - Broadly acceptable situation with acceptable outcomes	4
Inundation between 100 and 250mm in depth Inundation to approximately mid-calf level on an adult/adolescent	Some tolerance - an undesirable situation with acceptable outcomes	3
Inundation between 250 and 500mm in depth Inundation to approximately knee level on an adult/adolescent	Some intolerance - an undesirable situation with some adverse outcomes	2
Inundation between 500mm and 1m in depth Inundation to approximately waist level on an adult/adolescent	Intolerable - an unacceptable situation with significantly adverse outcomes	1
Inundation more than 1m in depth Inundation above waist level of an adult/adolescent	No tolerance - an unacceptable situation with unacceptable outcomes	0

By correlating the defined hazard to the results extracted from the flood model for each of the 9 reference points a tolerance score could be applied to each reference point for each flood event.

The tolerance scores, in conjunction with the hazard and vulnerability scores provide an overall consequence score for each of the 9 reference points for each adopted flood event.

As per the QRA methodology a likelihood x consequence risk matrix was developed to categorise the risks across each of the reference points as being either *Broadly Acceptable*, *Tolerable* and *Generally Intolerable*. This approach reflects the guidance provided in the National Emergency Risk Assessment Guidelines (NERAG) Handbook, 2015 (AIDR). According to NERAG, it is entirely appropriate and accepted practice that risks may be tolerated, provided that the risks are known and managed.

The adopted (likelihood x consequence) risk matrix is presented in **Figure 2-5**. This matrix reflects a standard risk matrix format with likelihood represented by a range of design flood events available for the subject site and consequence scores derived from site specific assessments of hazard, vulnerability and tolerance.

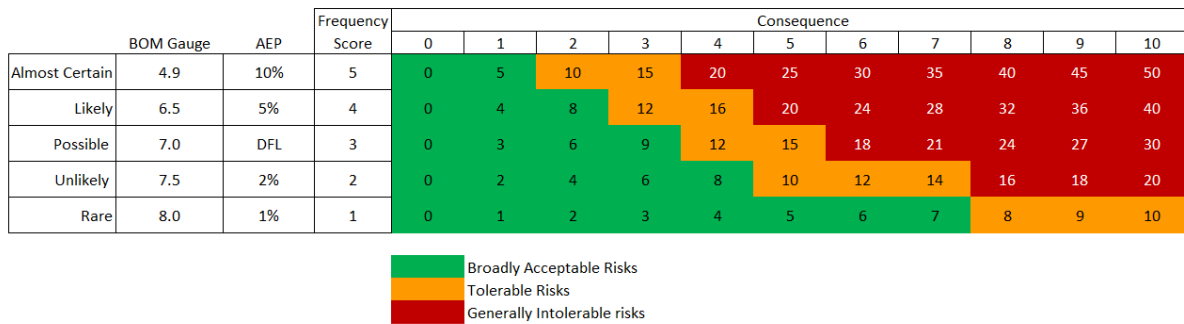


Figure 2-5 Risk Matrix

The risk assessment process was repeated for the scenario including the proposed extension to the existing facility. The results of the risk assessment with the proposed extension were then compared to the results of the risk assessment without the proposed extension.

Appendix C presents the Risk Assessment results for each reference point for each AEP flood event series.

Appendix D presents a comparison of the Risk Assessment results mapped to the site reference points for each of the adopted flood events for the scenarios of with and without the proposed extension.

3 Summary

This flood risk assessment is compliant with AS/NZS ISO 31000:2009.

This assessment represents a thorough analysis of flood risks which are anticipated to occur across the McLean Aged Care facility site based upon the proposed extension of the existing facility.

Risks across the site have been categorised based upon industry guidelines as being either:

- Broadly Acceptable;
- Tolerable; or
- Generally Intolerable.

The category of risk has been determined at 9 reference points across the site.

Based on the adopted flood events the results of the risk assessment demonstrate there are a range of flood risks across the existing site. The results of the assessment demonstrate the proposed extension of the McLean Place Aged Care facility does not increase the risks associated with flooding beyond a tolerable level.

Appendices

Appendix A Architect Plans and Elevations

Appendix B Correspondence referencing design flood levels for Blackall

Appendix C Reference Point Risk Assessments

Appendix D Risk Assessment Mapping

Appendix A

Architect Plans and Elevations



Rev	Date	Details	Ch
P03	04/03/21	TOWN PLANNING FEEDBACK	DC
P02	05/02/21	FOR CLIENT INFORMATION	DC
P01	22/01/21	FOR CLIENT INFORMATION	DC

REVISION DETAILS

PROJECT CAD MANAGER: DC

STATUS

PRELIMINARY

NOT FOR CONSTRUCTION

PROPRIETOR:



+ Barcoo Living Multi Purpose Service

PROJECT

McLean Place Aged Care Extension

Cnr Shamock St & Coronation St, Blackall
QLD, 4472



Ph: 07 3320 1620
Fax: 07 3320 1625
Email: reception@merrincranston.com
Nom: George Bellas Qld 2450, NSW 10791
ABN 60 010 242 878

TITLE

ELEVATIONS AND SECTIONS

SCALE 1:200 at A3 REVISION DATE 4/3/21

PROJECT No. SHEET No. REVISION

C732 SD.501 P03

Appendix B

Correspondence referencing design flood levels for Blackall



Department of Natural Resources and Mines
Level 3 Podium - Landcentre
Cnr Main and Vulture Streets
Woolloongabba QLD 4102
Australia

**DHI Water & Environment
Pty Ltd (license
registration only)**

Level 5, 67 Astor Terrace
Spring Hill
QLD-4000
Australia

+61 7 3236 9161 Telephone
+61 7 3236 9461 Telefax

dhi@dhigroup.com
<http://www.dhigroup.com.au>

Att: Graeme Milligan

Ref:

43801579

Init:

MOBA

Date:

16 December 2014

Additional Level 2 GIS Flood Mapping for Blackall

Dear Graeme

The Department of Natural Resources and Mines (DNRM) commissioned DHI Water & Environment Pty Ltd (DHI) to prepare additional Level 2 flood mapping for the town of Blackall using an unvalidated GIS mapping approach. The township of Blackall is located under the Local Government Area of Blackall-Tambo Regional Council.

In 2012, the Queensland Reconstruction Authority (QRA) undertook a Level 2 Flood Investigation for Blackall. This letter report provides a brief overview of the work previously conducted by QRA and summarises the additional mapping produced for the town by DHI. The aim of the additional mapping is to provide Council and the community with a better understanding of the relationship between peak levels at the BoM flood forecasting gauge 036155 in Blackall and the resulting impacts on the towns' infrastructure.

Flood Mapping Undertaken by QRA

In 2012, QRA produced several flood maps for the township of Blackall. The work undertaken by QRA including a description of the applied mapping methodology and its limitations is documented in the report titled "*Report on Flood Investigation for Blackall. Flood Investigation Level 2 – Unvalidated GIS Mapping Approach*" dated October 2012. The mapping outputs produced by QRA covered the below five events:

- April 1990 flood event (7.3 m at BoM Gauge 036155);
- 10% AEP design event (4.9 m at BoM Gauge 036155);
- 5% AEP design event (6.5 m at BoM Gauge 036155);
- 2% AEP design event (7.5 m at BoM Gauge 036155); and
- 1% AEP design event (8.0 m at BoM Gauge 036155).

Additional Flood Mapping Undertaken by DHI

As part of this study, DHI produced five additional flood maps for different flood heights at the BoM Gauge 036155 in Blackall using the same methodology as previously adopted by QRA. The flood heights were selected by DNRM to fill in the gaps between the levels previously mapped by QRA.

An overview of the peak water levels at the BoM gauge used for the mapping is provided in Table 1. The flood height of 3.5 m at the BoM gauge corresponds to the Isisford Blackall Road bridge deck level. The mapping outputs are enclosed as Appendix A and consist of five maps showing flood depths/extents in Blackall for the flood heights listed in Table 1.

Table 1 Overview of Additional Flood Maps Produced for Blackall

Map Number	Flood Height (m) at BoM Gauge 036155	Flood Level (mAHD) at BoM Gauge 036155
1	3.5	278.53
2	4.0	279.03
3	4.5	279.53
4	5.5	280.53
5	6.0	281.03

The mapping was undertaken in ArcGIS 10.1, after establishing a geodatabase. The ArcMap *.mxd files and the geodatabase with all GIS layers used for mapping was delivered to DNRM at project completion. Hard copies of each map have also been provided as laminated A3 prints.

Best regards

DHI

Monika Balicki
Senior Engineer
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Encls: *Appendix A – Additional Mapping Outputs for Blackall*

Appendix C

Reference Point Risk Assessments

Technical flood risk management guideline: Flood hazard

Reference Point		A				
BoM Gauge Height		8m	7.5m	7.0m	6.5m	4.9m
mAHd		283.03	282.53	282.03	281.53	279.93
Frequency		1%	2%	DFE	5%	10%
Depth	A	1.96	1.46	0.93	0.46	0
Velocity						
1		1.00	1.00	1.00	1.00	1.00
D*V						
		1.96	1.46	0.93	0.46	0
Exposure rating						
		5	5	4	3	0
General Vulnerability Rating						
		5	5	4	2	1
		H5	H5	H4	H2	H1
Tolerance rating						
		0	0	1	2	4
Consequence						
		10	10	7	3	0
Risk						
		10	20	21	12	0

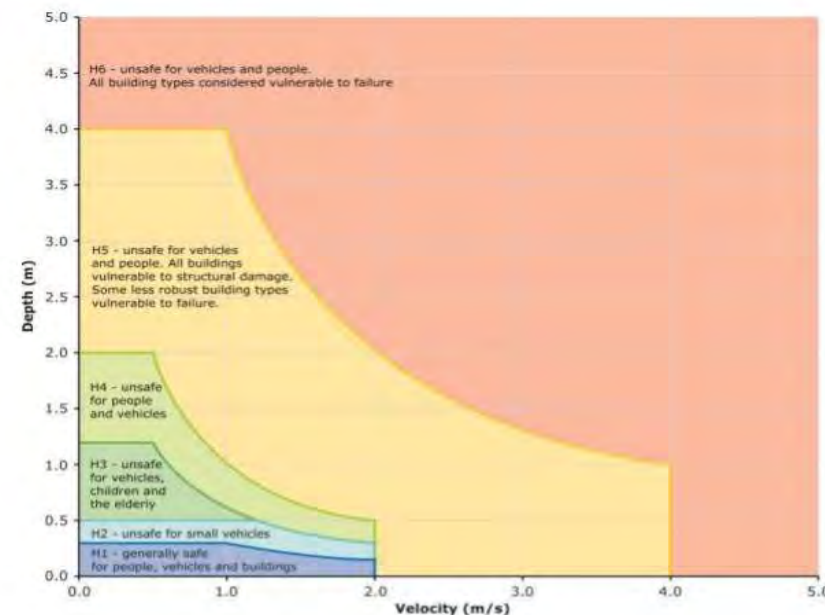


Figure 6 General flood hazard vulnerability curves

AUSTRALIAN DISASTER RESILIENCE HANDBOOK COLLECTION Flood Hazard Guideline 7-3 Supporting document for the implementation of Australian Disaster Resilience Handbook 7 Managing the Floodplain: A Guide to Best Practice in Flood Risk

				Consequence										
				0	1	2	3	4	5	6	7	8	9	10
BOM Gauge	AEP			0	5	10	15	20	25	30	35	40	45	50
Almost Certain	4.9	10%	5	0	4	8	12	16	20	24	28	32	36	40
Likely	6.5	5%	4	0	3	6	9	12	15	18	21	24	27	30
Possible	7.0	2%	3	0	2	4	6	8	10	12	14	16	18	20
Unlikely	7.5	1%	2	0	1	2	3	4	5	6	7	8	9	10
Rare	8.0	8m BOM	1	0	1	2	3	4	5	6	7	8	9	10

Broadly Acceptable Risks
 Tolerable Risks
 Generally Intolerable risks

Technical flood risk management guideline: Flood hazard

Reference Point		A + Extension				
BoM Gauge Height		8m	7.5m	7.0m	6.5m	4.9m
mAHd		283.03	282.53	282.03	281.53	279.93
Frequency		1%	2%	DFE	5%	10%
Depth	A	0	0	0	0	0
Velocity						
1		1.00	1.00	1.00	1.00	1.00
D*V						
		0	0	0	0	0
Exposure rating						
		0	0	0	0	0
General Vulnerability Rating						
		1	1	1	1	1
		H1	H1	H1	H1	H1
Tolerance rating						
		4	4	4	4	4
Consequence						
		0	0	0	0	0
Risk						
		0	0	0	0	0

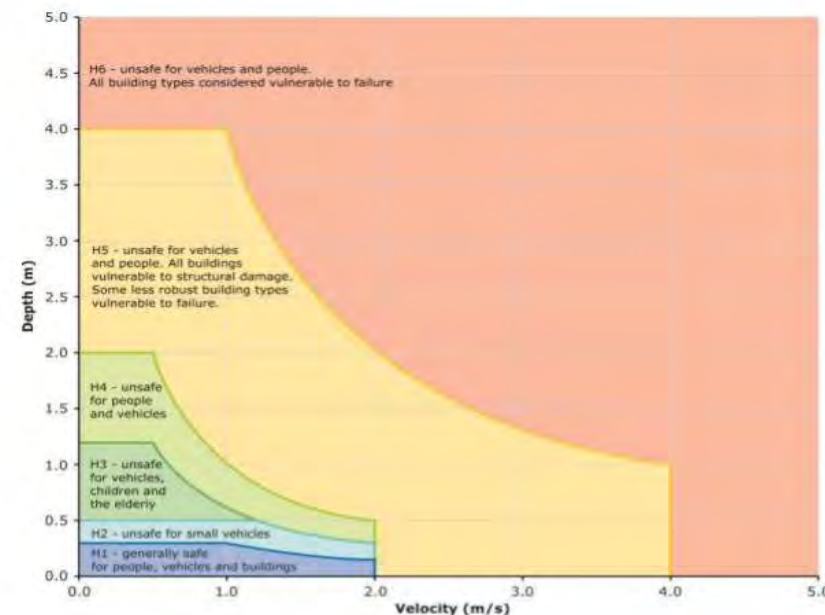


Figure 6 General flood hazard vulnerability curves

AUSTRALIAN DISASTER RESILIENCE HANDBOOK COLLECTION Flood Hazard Guideline 7-3 Supporting document for the implementation of Australian Disaster Resilience Handbook 7 Managing the Floodplain: A Guide to Best Practice in Flood Risk

				Consequence										
				0	1	2	3	4	5	6	7	8	9	10
BOM Gauge	AEP			0	5	10	15	20	25	30	35	40	45	50
Almost Certain	4.9	10%	5	0	4	8	12	16	20	24	28	32	36	40
Likely	6.5	5%	4	0	3	6	9	12	15	18	21	24	27	30
Possible	7.0	2%	3	0	2	4	6	8	10	12	14	16	18	20
Unlikely	7.5	1%	2	0	1	2	3	4	5	6	7	8	9	10
Rare	8.0	8m BOM	1	0	1	2	3	4	5	6	7	8	9	10

Broadly Acceptable Risks
 Tolerable Risks
 Generally Intolerable risks

Technical flood risk management guideline: Flood hazard

Reference Point		B				
BoM Gauge Height		8m	7.5m	7.0m	6.5m	4.9m
mAHd		283.03	282.53	282.03	281.53	279.93
Frequency		1%	2%	DFE	5%	10%
Depth	B	0	0	0	0	0
Velocity						
1		1.00	1.00	1.00	1.00	1.00
D*V						
		0	0	0	0	0
Exposure rating						
		0	0	0	0	0
General Vulnerability Rating						
		1	1	1	1	1
		H1	H1	H1	H1	H1
Tolerance rating						
		4	4	4	4	4
Consequence						
		0	0	0	0	0
Risk						
		0	0	0	0	0

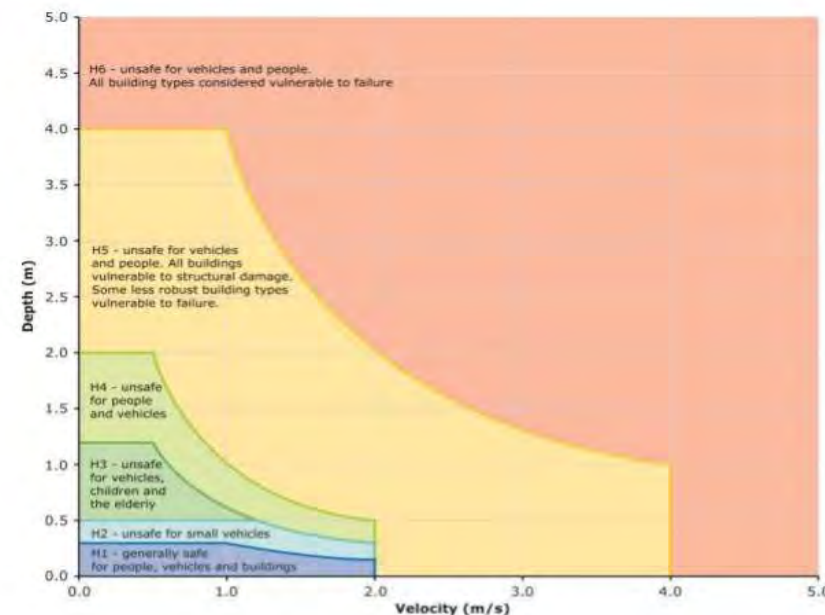


Figure 6 General flood hazard vulnerability curves

AUSTRALIAN DISASTER RESILIENCE HANDBOOK COLLECTION Flood Hazard Guideline 7-3 Supporting document for the implementation of Australian Disaster Resilience Handbook 7 Managing the Floodplain: A Guide to Best Practice in Flood Risk

				Consequence										
				0	1	2	3	4	5	6	7	8	9	10
Almost Certain	4.9	10%	5	0	5	10	15	20	25	30	35	40	45	50
Likely	6.5	5%	4	0	4	8	12	16	20	24	28	32	36	40
Possible	7.0	2%	3	0	3	6	9	12	15	18	21	24	27	30
Unlikely	7.5	1%	2	0	2	4	6	8	10	12	14	16	18	20
Rare	8.0	8m BOM	1	0	1	2	3	4	5	6	7	8	9	10

Broadly Acceptable Risks
 Tolerable Risks
 Generally Intolerable risks

Technical flood risk management guideline: Flood hazard

Reference Point		B + Extension				
BoM Gauge Height		8m	7.5m	7.0m	6.5m	4.9m
mAHd		283.03	282.53	282.03	281.53	279.93
Frequency		1%	2%	DFE	5%	10%
Depth	B	0	0	0	0	0
Velocity						
1		1.00	1.00	1.00	1.00	1.00
D*V						
		0	0	0	0	0
Exposure rating						
		0	0	0	0	0
General Vulnerability Rating						
		1	1	1	1	1
		H1	H1	H1	H1	H1
Tolerance rating						
		4	4	4	4	4
Consequence						
		0	0	0	0	0
Risk						
		0	0	0	0	0

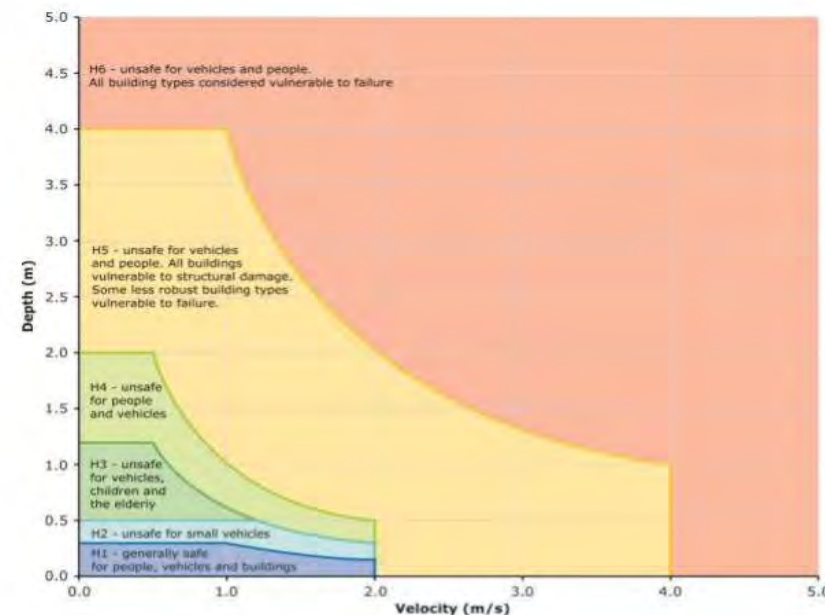


Figure 6 General flood hazard vulnerability curves

AUSTRALIAN DISASTER RESILIENCE HANDBOOK COLLECTION Flood Hazard Guideline 7-3 Supporting document for the implementation of Australian Disaster Resilience Handbook 7 Managing the Floodplain: A Guide to Best Practice in Flood Risk

				Consequence										
				0	1	2	3	4	5	6	7	8	9	10
BOM Gauge	AEP			0	5	10	15	20	25	30	35	40	45	50
Almost Certain	4.9	10%	5	0	4	8	12	16	20	24	28	32	36	40
Likely	6.5	5%	4	0	3	6	9	12	15	18	21	24	27	30
Possible	7.0	2%	3	0	2	4	6	8	10	12	14	16	18	20
Unlikely	7.5	1%	2	0	1	2	3	4	5	6	7	8	9	10
Rare	8.0	8m BOM	1	0	1	2	3	4	5	6	7	8	9	10

Broadly Acceptable Risks
 Tolerable Risks
 Generally Intolerable risks

Technical flood risk management guideline: Flood hazard

Reference Point		C				
BoM Gauge Height		8m	7.5m	7.0m	6.5m	4.9m
mAHd		283.03	282.53	282.03	281.53	279.93
Frequency		1%	2%	DFE	5%	10%
Depth	C	0	0	0	0	0
Velocity						
1		1.00	1.00	1.00	1.00	1.00
D*V						
		0	0	0	0	0
Exposure rating						
		0	0	0	0	0
General Vulnerability Rating						
		1	1	1	1	1
		H1	H1	H1	H1	H1
Tolerance rating						
		4	4	4	4	4
Consequence						
		0	0	0	0	0
Risk						
		0	0	0	0	0

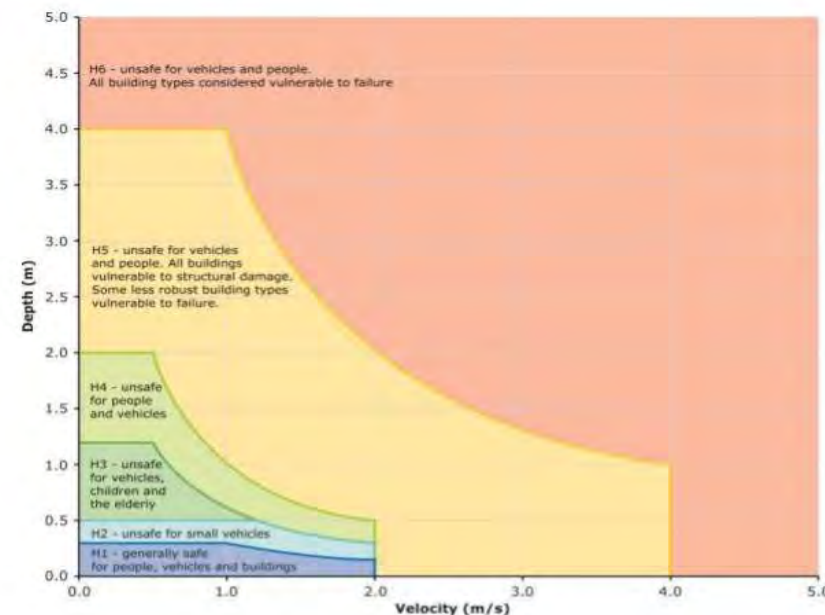


Figure 6 General flood hazard vulnerability curves

AUSTRALIAN DISASTER RESILIENCE HANDBOOK COLLECTION Flood Hazard Guideline 7-3 Supporting document for the implementation of Australian Disaster Resilience Handbook 7 Managing the Floodplain: A Guide to Best Practice in Flood Risk

				Consequence										
				0	1	2	3	4	5	6	7	8	9	10
Almost Certain	4.9	10%	5	0	5	10	15	20	25	30	35	40	45	50
Likely	6.5	5%	4	0	4	8	12	16	20	24	28	32	36	40
Possible	7.0	2%	3	0	3	6	9	12	15	18	21	24	27	30
Unlikely	7.5	1%	2	0	2	4	6	8	10	12	14	16	18	20
Rare	8.0	8m BOM	1	0	1	2	3	4	5	6	7	8	9	10

Broadly Acceptable Risks
 Tolerable Risks
 Generally Intolerable risks

Technical flood risk management guideline: Flood hazard

Reference Point		C + Extension				
BoM Gauge Height		8m	7.5m	7.0m	6.5m	4.9m
mAHd		283.03	282.53	282.03	281.53	279.93
Frequency		1%	2%	DFE	5%	10%
Depth	C	0	0	0	0	0
Velocity						
1		1.00	1.00	1.00	1.00	1.00
D*V						
		0	0	0	0	0
Exposure rating						
		0	0	0	0	0
General Vulnerability Rating						
		1	1	1	1	1
		H1	H1	H1	H1	H1
Tolerance rating						
		4	4	4	4	4
Consequence						
		0	0	0	0	0
Risk						
		0	0	0	0	0

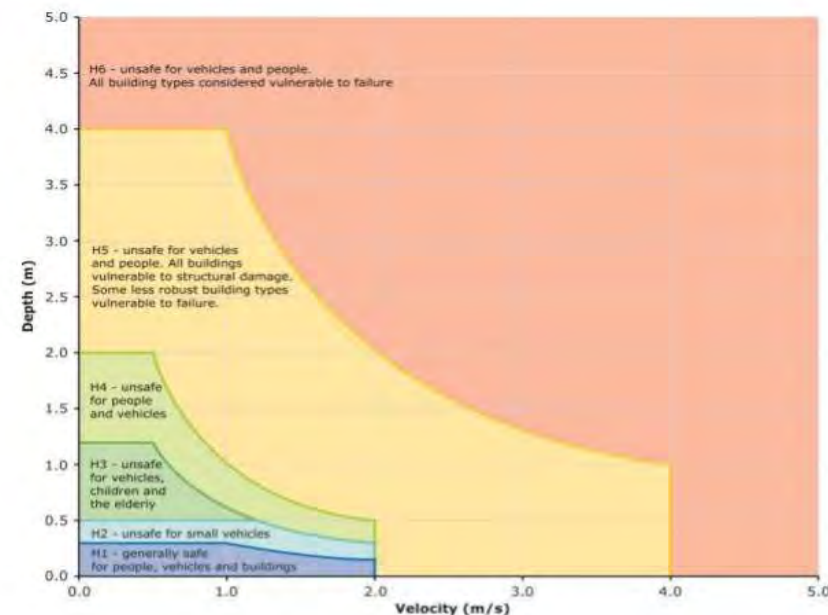


Figure 6 General flood hazard vulnerability curves

AUSTRALIAN DISASTER RESILIENCE HANDBOOK COLLECTION Flood Hazard Guideline 7-3 Supporting document for the implementation of Australian Disaster Resilience Handbook 7 Managing the Floodplain: A Guide to Best Practice in Flood Risk

				Consequence										
				0	1	2	3	4	5	6	7	8	9	10
Almost Certain				0	5	10	15	20	25	30	35	40	45	50
Likely				0	4	8	12	16	20	24	28	32	36	40
Possible				0	3	6	9	12	15	18	21	24	27	30
Unlikely				0	2	4	6	8	10	12	14	16	18	20
Rare				0	1	2	3	4	5	6	7	8	9	10

Broadly Acceptable Risks
 Tolerable Risks
 Generally Intolerable risks

Reference Point		D				
BoM Gauge Height		8m	7.5m	7.0m	6.5m	4.9m
mAHd		283.03	282.53	282.03	281.53	279.93
Frequency		1%	2%	DFE	5%	10%
Depth	D	1.84	1.34	0.81	0.34	0
Velocity						
1		1.00	1.00	1.00	1.00	1.00
D*V						
		1.84	1.34	0.81	0.34	0
Exposure rating						
		5	5	4	3	0
General Vulnerability Rating						
		5	5	4	2	1
		H5	H5	H4	H2	H1
Tolerance rating						
		0	0	1	2	4
Consequence						
		10	10	7	3	0
Risk						
		10	20	21	12	0

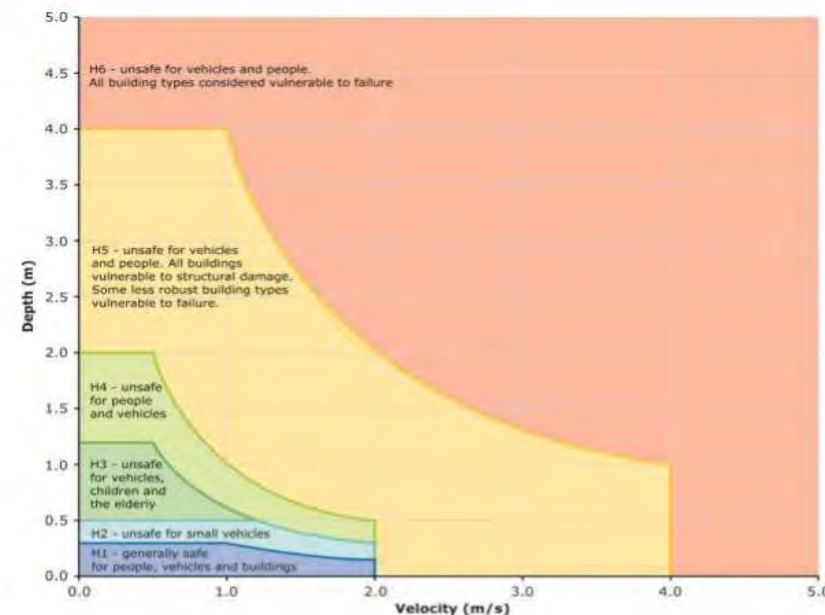


Figure 6 General flood hazard vulnerability curves

AUSTRALIAN DISASTER RESILIENCE HANDBOOK COLLECTION Flood Hazard Guideline 7-3 Supporting document for the implementation of Australian Disaster Resilience Handbook 7 Managing the Floodplain: A Guide to Best Practice in Flood Risk

				Consequence										
				0	1	2	3	4	5	6	7	8	9	10
BOM Gauge	AEP			0	5	10	15	20	25	30	35	40	45	50
Almost Certain	4.9	10%	5	0	4	8	12	16	20	24	28	32	36	40
Likely	6.5	5%	4	0	3	6	9	12	15	18	21	24	27	30
Possible	7.0	2%	3	0	2	4	6	8	10	12	14	16	18	20
Unlikely	7.5	1%	2	0	1	2	3	4	5	6	7	8	9	10
Rare	8.0	8m BOM	1	0	1	2	3	4	5	6	7	8	9	10

Broadly Acceptable Risks
 Tolerable Risks
 Generally Intolerable risks

Reference Point		D + Extension				
BoM Gauge Height		8m	7.5m	7.0m	6.5m	4.9m
mAHd		283.03	282.53	282.03	281.53	279.93
Frequency		1%	2%	DFE	5%	10%
Depth	D	1.84	1.34	0.81	0.34	0
Velocity						
1		1.00	1.00	1.00	1.00	1.00
D*V						
		1.84	1.34	0.81	0.34	0
Exposure rating						
		5	5	4	3	0
General Vulnerability Rating						
		5	5	4	2	1
		H5	H5	H4	H2	H1
Tolerance rating						
		0	0	1	2	4
Consequence						
		10	10	7	3	0
Risk						
		10	20	21	12	0

Technical flood risk management guideline: Flood hazard

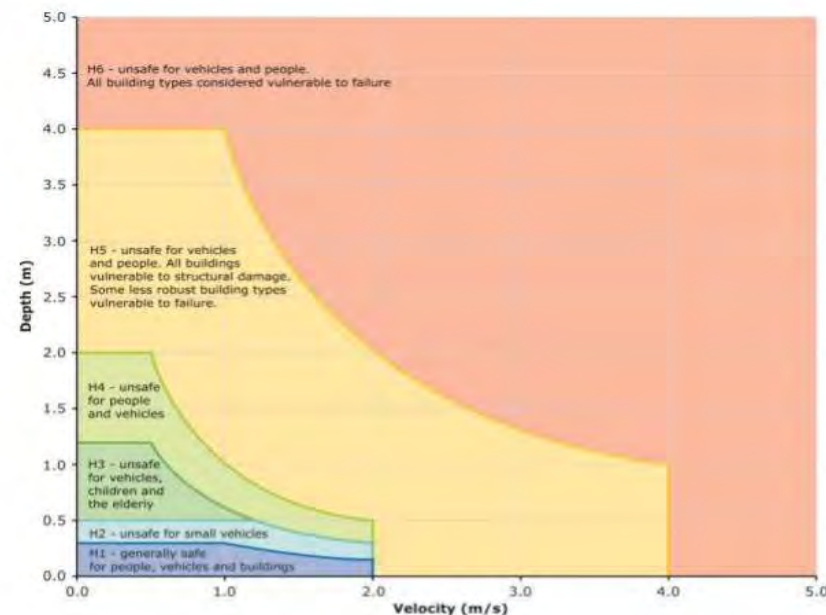


Figure 6 General flood hazard vulnerability curves

AUSTRALIAN DISASTER RESILIENCE HANDBOOK COLLECTION Flood Hazard Guideline 7-3 Supporting document for the implementation of Australian Disaster Resilience Handbook 7 Managing the Floodplain: A Guide to Best Practice in Flood Risk

				Consequence										
				0	1	2	3	4	5	6	7	8	9	10
BOM Gauge	AEP			0	5	10	15	20	25	30	35	40	45	50
Almost Certain	4.9	10%	5	0	4	8	12	16	20	24	28	32	36	40
Likely	6.5	5%	4	0	3	6	9	12	15	18	21	24	27	30
Possible	7.0	2%	3	0	2	4	6	8	10	12	14	16	18	20
Unlikely	7.5	1%	2	0	1	2	3	4	5	6	7	8	9	10
Rare	8.0	8m BOM	1	0	1	2	3	4	5	6	7	8	9	10

Broadly Acceptable Risks
 Tolerable Risks
 Generally Intolerable risks

Technical flood risk management guideline: Flood hazard

Reference Point		E				
BoM Gauge Height		8m	7.5m	7.0m	6.5m	4.9m
mAHd		283.03	282.53	282.03	281.53	279.93
Frequency		1%	2%	DFE	5%	10%
Depth	E	1.59	1.09	0.56	0.09	0
Velocity						
1		1.00	1.00	1.00	1.00	1.00
D*V						
		1.59	1.09	0.56	0.09	0
Exposure rating						
		5	5	4	1	0
General Vulnerability Rating						
		5	5	2	1	1
		H5	H5	H2	H1	H1
Tolerance rating						
		0	0	1	4	4
Consequence						
		10	10	5	0	0
Risk						
		10	20	15	0	0

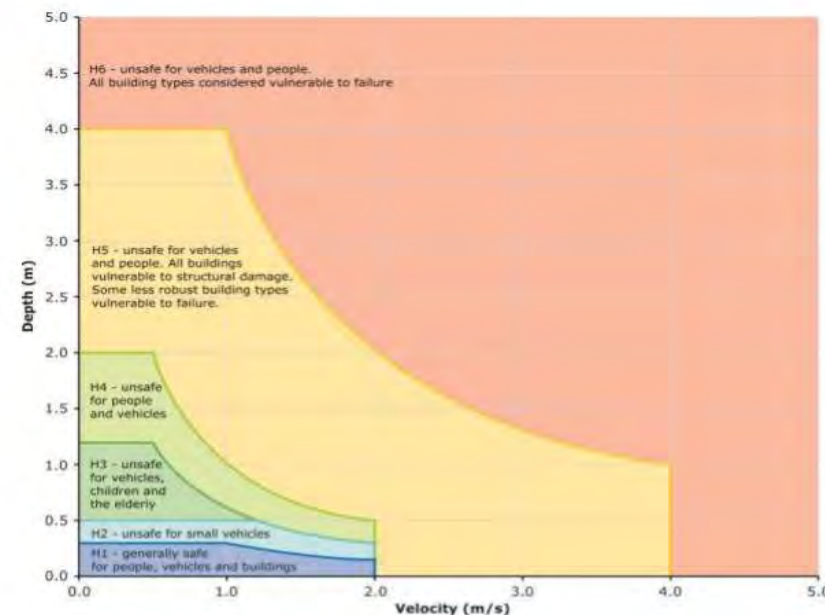


Figure 6 General flood hazard vulnerability curves

AUSTRALIAN DISASTER RESILIENCE HANDBOOK COLLECTION Flood Hazard Guideline 7-3 Supporting document for the implementation of Australian Disaster Resilience Handbook 7 Managing the Floodplain: A Guide to Best Practice in Flood Risk

				Consequence										
				0	1	2	3	4	5	6	7	8	9	10
	BOM Gauge	AEP		0	5	10	15	20	25	30	35	40	45	50
	Almost Certain	4.9	10%	5	4	8	12	16	20	24	28	32	36	40
	Likely	6.5	5%	4	3	6	9	12	15	18	21	24	27	30
	Possible	7.0	2%	3	2	4	6	8	10	12	14	16	18	20
	Unlikely	7.5	1%	2	1	2	3	4	5	6	7	8	9	10
				Rare	8.0	8m BOM	1							

Broadly Acceptable Risks
 Tolerable Risks
 Generally Intolerable risks

Technical flood risk management guideline: Flood hazard

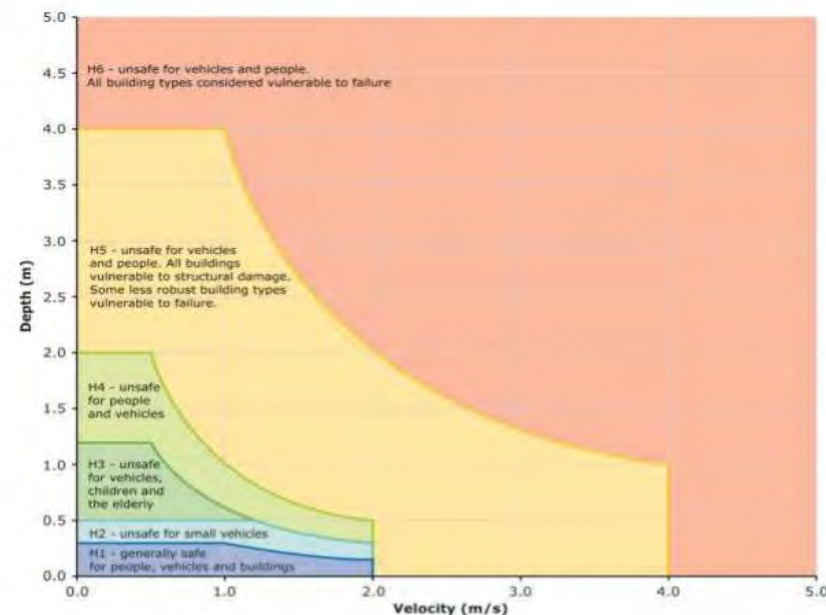


Figure 6 General flood hazard vulnerability curves

AUSTRALIAN DISASTER RESILIENCE HANDBOOK COLLECTION Flood Hazard Guideline 7-3 Supporting document for the implementation of Australian Disaster Resilience Handbook 7 Managing the Floodplain: A Guide to Best Practice in Flood Risk

Reference Point		E + Extension				
BoM Gauge Height		8m	7.5m	7.0m	6.5m	4.9m
mAHd		283.03	282.53	282.03	281.53	279.93
Frequency		1%	2%	DFE	5%	10%
Depth	E	1.59	1.09	0.56	0.09	0
Velocity						
1		1.00	1.00	1.00	1.00	1.00
D*V						
		1.59	1.09	0.56	0.09	0
Exposure rating		5	5	4	1	0
General Vulnerability Rating		5 H5	5 H5	2 H2	1 H1	1 H1
Tolerance rating		0	0	1	4	4
Consequence		10	10	5	0	0
Risk		10	20	15	0	0

				Consequence										
				0	1	2	3	4	5	6	7	8	9	10
Almost Certain	4.9	10%	5	0	5	10	15	20	25	30	35	40	45	50
Likely	6.5	5%	4	0	4	8	12	16	20	24	28	32	36	40
Possible	7.0	2%	3	0	3	6	9	12	15	18	21	24	27	30
Unlikely	7.5	1%	2	0	2	4	6	8	10	12	14	16	18	20
Rare	8.0	8m BOM	1	0	1	2	3	4	5	6	7	8	9	10

Broadly Acceptable Risks
 Tolerable Risks
 Generally Intolerable risks

Technical flood risk management guideline: Flood hazard

Reference Point		F				
BoM Gauge Height		8m	7.5m	7.0m	6.5m	4.9m
mAHd		283.03	282.53	282.03	281.53	279.93
Frequency		1%	2%	DFE	5%	10%
Depth	F	0.58	0.08	0	0	0
Velocity						
1		1.00	1.00	1.00	1.00	1.00
D*V						
		0.58	0.08	0	0	0
Exposure rating						
		4	1	0	0	0
General Vulnerability Rating						
		2	1	1	1	1
		H2	H1	H1	H1	H1
Tolerance rating						
		1	4	4	4	4
Consequence						
		5	0	0	0	0
Risk						
		5	0	0	0	0

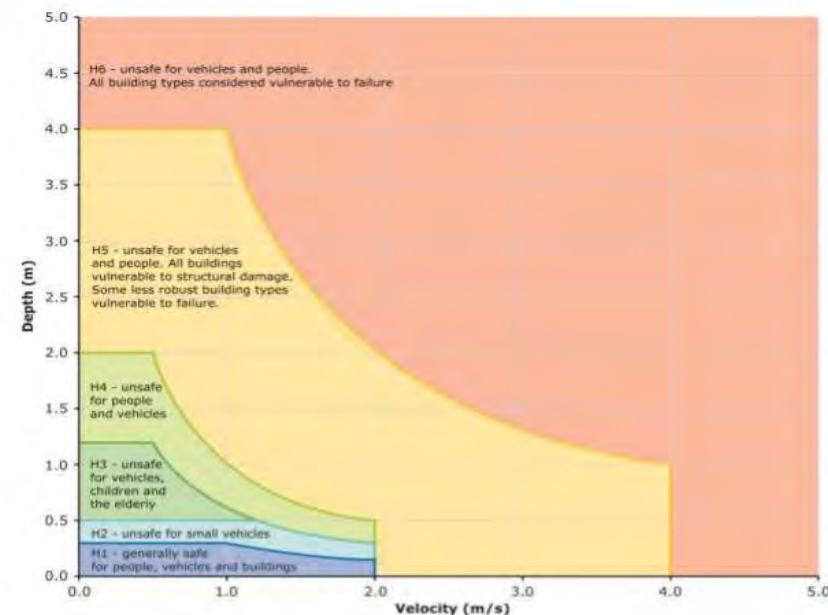


Figure 6 General flood hazard vulnerability curves

AUSTRALIAN DISASTER RESILIENCE HANDBOOK COLLECTION Flood Hazard Guideline 7-3 Supporting document for the implementation of Australian Disaster Resilience Handbook 7 Managing the Floodplain: A Guide to Best Practice in Flood Risk

				Consequence										
				0	1	2	3	4	5	6	7	8	9	10
Almost Certain	4.9	10%	5	0	5	10	15	20	25	30	35	40	45	50
Likely	6.5	5%	4	0	4	8	12	16	20	24	28	32	36	40
Possible	7.0	2%	3	0	3	6	9	12	15	18	21	24	27	30
Unlikely	7.5	1%	2	0	2	4	6	8	10	12	14	16	18	20
Rare	8.0	8m BOM	1	0	1	2	3	4	5	6	7	8	9	10

Broadly Acceptable Risks
 Tolerable Risks
 Generally Intolerable risks

Technical flood risk management guideline: Flood hazard

Reference Point		F + Extension				
BoM Gauge Height		8m	7.5m	7.0m	6.5m	4.9m
mAHd		283.03	282.53	282.03	281.53	279.93
Frequency		1%	2%	DFE	5%	10%
Depth	F	0.58	0.08	0	0	0
Velocity						
1		1.00	1.00	1.00	1.00	1.00
D*V						
		0.58	0.08	0	0	0
Exposure rating						
		4	1	0	0	0
General Vulnerability Rating						
		2	1	1	1	1
		H2	H1	H1	H1	H1
Tolerance rating						
		1	4	4	4	4
Consequence						
		5	0	0	0	0
Risk						
		5	0	0	0	0

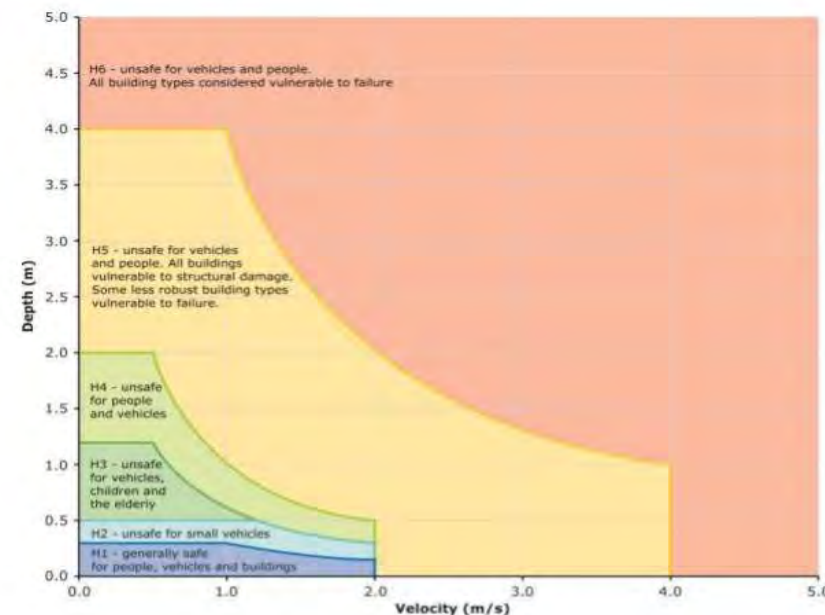


Figure 6 General flood hazard vulnerability curves

AUSTRALIAN DISASTER RESILIENCE HANDBOOK COLLECTION Flood Hazard Guideline 7-3 Supporting document for the implementation of Australian Disaster Resilience Handbook 7 Managing the Floodplain: A Guide to Best Practice in Flood Risk

				Consequence										
				0	1	2	3	4	5	6	7	8	9	10
Almost Certain	4.9	10%	5	0	5	10	15	20	25	30	35	40	45	50
Likely	6.5	5%	4	0	4	8	12	16	20	24	28	32	36	40
Possible	7.0	2%	3	0	3	6	9	12	15	18	21	24	27	30
Unlikely	7.5	1%	2	0	2	4	6	8	10	12	14	16	18	20
Rare	8.0	8m BOM	1	0	1	2	3	4	5	6	7	8	9	10

Broadly Acceptable Risks
 Tolerable Risks
 Generally Intolerable risks

Technical flood risk management guideline: Flood hazard

Reference Point		G				
BoM Gauge Height		8m	7.5m	7.0m	6.5m	4.9m
mAHd		283.03	282.53	282.03	281.53	279.93
Frequency		1%	2%	DFE	5%	10%
Depth	G	1.72	1.22	0.69	0.22	0
Velocity						
1		1.00	1.00	1.00	1.00	1.00
D*V						
		1.72	1.22	0.69	0.22	0
Exposure rating		5	5	4	2	0
General Vulnerability Rating		5 H5	5 H5	4 H4	1 H1	1 H1
Tolerance rating		0	0	1	3	4
Consequence		10	10	7	0	0
Risk		10	20	21	0	0

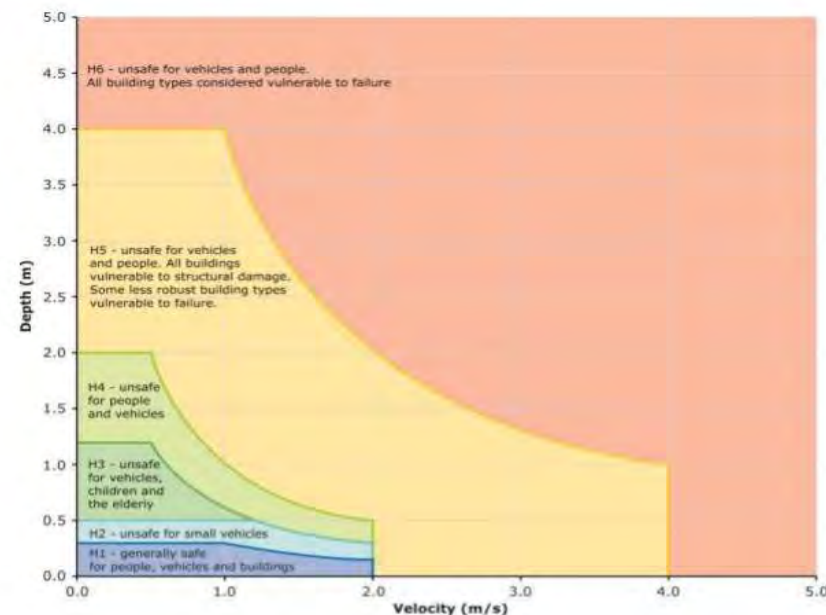


Figure 6 General flood hazard vulnerability curves

AUSTRALIAN DISASTER RESILIENCE HANDBOOK COLLECTION Flood Hazard Guideline 7-3 Supporting document for the implementation of Australian Disaster Resilience Handbook 7 Managing the Floodplain: A Guide to Best Practice in Flood Risk

				Consequence										
				0	1	2	3	4	5	6	7	8	9	10
BOM Gauge	AEP			0	5	10	15	20	25	30	35	40	45	50
Almost Certain	4.9	10%	5	0	4	8	12	16	20	24	28	32	36	40
Likely	6.5	5%	4	0	3	6	9	12	15	18	21	24	27	30
Possible	7.0	2%	3	0	2	4	6	8	10	12	14	16	18	20
Unlikely	7.5	1%	2	0	1	2	3	4	5	6	7	8	9	10
Rare	8.0	8m BOM	1	0	1	2	3	4	5	6	7	8	9	10

Broadly Acceptable Risks
 Tolerable Risks
 Generally Intolerable risks

Technical flood risk management guideline: Flood hazard

Reference Point		G + Extension				
BoM Gauge Height		8m	7.5m	7.0m	6.5m	4.9m
mAHd		283.03	282.53	282.03	281.53	279.93
Frequency		1%	2%	DFE	5%	10%
Depth	G	1.72	1.22	0.69	0.22	0
Velocity						
1		1.00	1.00	1.00	1.00	1.00
D*V						
		1.72	1.22	0.69	0.22	0
Exposure rating						
		5	5	4	2	0
General Vulnerability Rating						
		5	5	4	1	1
		H5	H5	H4	H1	H1
Tolerance rating						
		0	0	1	3	4
Consequence						
		10	10	7	0	0
Risk						
		10	20	21	0	0

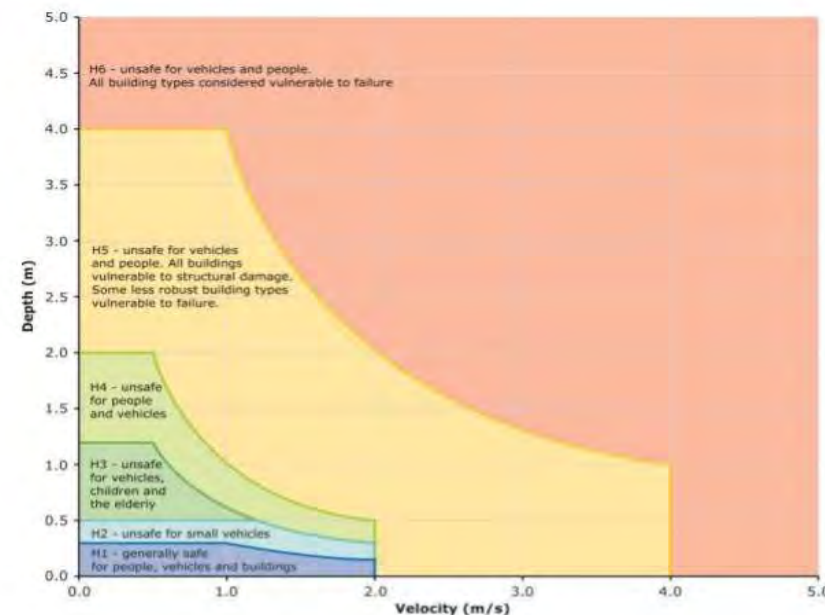


Figure 6 General flood hazard vulnerability curves

AUSTRALIAN DISASTER RESILIENCE HANDBOOK COLLECTION Flood Hazard Guideline 7-3 Supporting document for the implementation of Australian Disaster Resilience Handbook 7 Managing the Floodplain: A Guide to Best Practice in Flood Risk

				Consequence										
				0	1	2	3	4	5	6	7	8	9	10
BOM Gauge	AEP			0	5	10	15	20	25	30	35	40	45	50
Almost Certain	4.9	10%	5	0	4	8	12	16	20	24	28	32	36	40
Likely	6.5	5%	4	0	3	6	9	12	15	18	21	24	27	30
Possible	7.0	2%	3	0	2	4	6	8	10	12	14	16	18	20
Unlikely	7.5	1%	2	0	1	2	3	4	5	6	7	8	9	10
Rare	8.0	8m BOM	1	0	1	2	3	4	5	6	7	8	9	10

Broadly Acceptable Risks
 Tolerable Risks
 Generally Intolerable risks

Technical flood risk management guideline: Flood hazard

Reference Point		H				
BoM Gauge Height		8m	7.5m	7.0m	6.5m	4.9m
mAHd		283.03	282.53	282.03	281.53	279.93
Frequency		1%	2%	DFE	5%	10%
Depth	H	1.99	1.49	0.96	0.49	0
Velocity						
1		1.00	1.00	1.00	1.00	1.00
D*V						
		1.99	1.49	0.96	0.49	0
Exposure rating						
		5	5	4	3	0
General Vulnerability Rating						
		5	5	4	2	1
		H5	H5	H4	H2	H1
Tolerance rating						
		0	0	1	2	4
Consequence						
		10	10	7	3	0
Risk						
		10	20	21	12	0

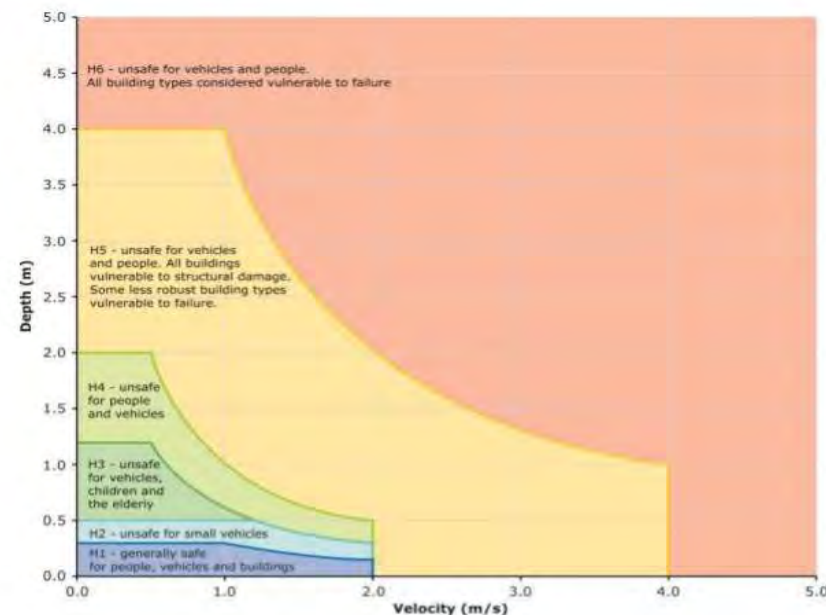


Figure 6 General flood hazard vulnerability curves

AUSTRALIAN DISASTER RESILIENCE HANDBOOK COLLECTION Flood Hazard Guideline 7-3 Supporting document for the implementation of Australian Disaster Resilience Handbook 7 Managing the Floodplain: A Guide to Best Practice in Flood Risk

				Consequence										
				0	1	2	3	4	5	6	7	8	9	10
BOM Gauge	AEP			0	5	10	15	20	25	30	35	40	45	50
Almost Certain	4.9	10%	5	0	4	8	12	16	20	24	28	32	36	40
Likely	6.5	5%	4	0	3	6	9	12	15	18	21	24	27	30
Possible	7.0	2%	3	0	2	4	6	8	10	12	14	16	18	20
Unlikely	7.5	1%	2	0	1	2	3	4	5	6	7	8	9	10
Rare	8.0	8m BOM	1	0	1	2	3	4	5	6	7	8	9	10

Broadly Acceptable Risks
 Tolerable Risks
 Generally Intolerable risks

Reference Point		H + Extension				
BoM Gauge Height		8m	7.5m	7.0m	6.5m	4.9m
mAHd		283.03	282.53	282.03	281.53	279.93
Frequency		1%	2%	DFE	5%	10%
Depth	H	1.99	1.49	0.96	0.49	0
Velocity						
1		1.00	1.00	1.00	1.00	1.00
D*V						
		1.99	1.49	0.96	0.49	0
Exposure rating		5	5	4	3	0
General Vulnerability Rating		5 H5	5 H5	4 H4	2 H2	1 H1
Tolerance rating		0	0	1	2	4
Consequence		10	10	7	3	0
Risk		10	20	21	12	0

Technical flood risk management guideline: Flood hazard

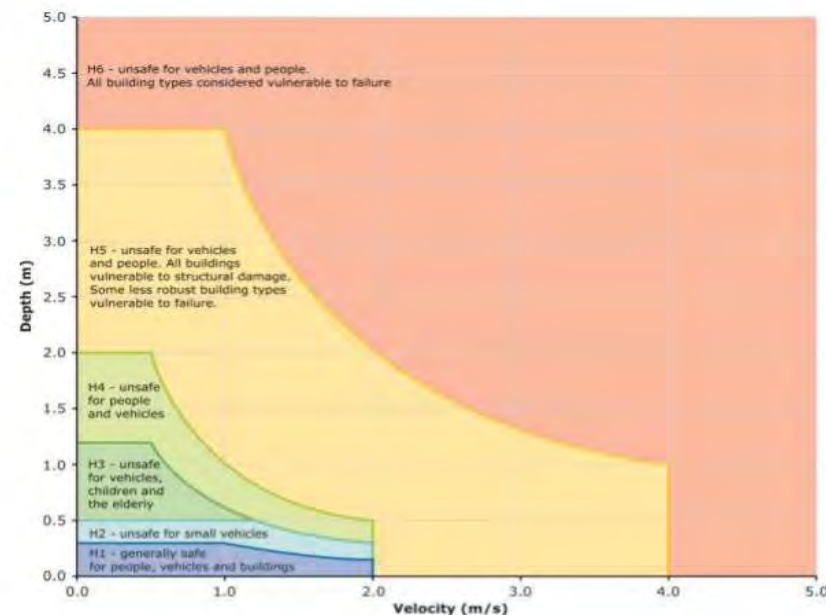


Figure 6 General flood hazard vulnerability curves

AUSTRALIAN DISASTER RESILIENCE HANDBOOK COLLECTION Flood Hazard Guideline 7-3 Supporting document for the implementation of Australian Disaster Resilience Handbook 7 Managing the Floodplain: A Guide to Best Practice in Flood Risk

				Consequence										
				0	1	2	3	4	5	6	7	8	9	10
BOM Gauge	AEP			0	5	10	15	20	25	30	35	40	45	50
Almost Certain	4.9	10%	5	0	4	8	12	16	20	24	28	32	36	40
Likely	6.5	5%	4	0	3	6	9	12	15	18	21	24	27	30
Possible	7.0	2%	3	0	2	4	6	8	10	12	14	16	18	20
Unlikely	7.5	1%	2	0	1	2	3	4	5	6	7	8	9	10
Rare	8.0	8m BOM	1	0	1	2	3	4	5	6	7	8	9	10

Broadly Acceptable Risks
 Tolerable Risks
 Generally Intolerable risks

Technical flood risk management guideline: Flood hazard

Reference Point		I				
BoM Gauge Height		8m	7.5m	7.0m	6.5m	4.9m
mAHD		283.03	282.53	282.03	281.53	279.93
Frequency		1%	2%	DFE	5%	10%
Depth	I	1.97	1.47	0.94	0.47	0
Velocity						
1		1.00	1.00	1.00	1.00	1.00
D*V						
		1.97	1.47	0.94	0.47	0
Exposure rating		5	5	4	3	0
General Vulnerability Rating		5 H5	5 H5	4 H4	2 H2	1 H1
Tolerance rating		0	0	1	2	4
Consequence		10	10	7	3	0
Risk		10	20	21	12	0

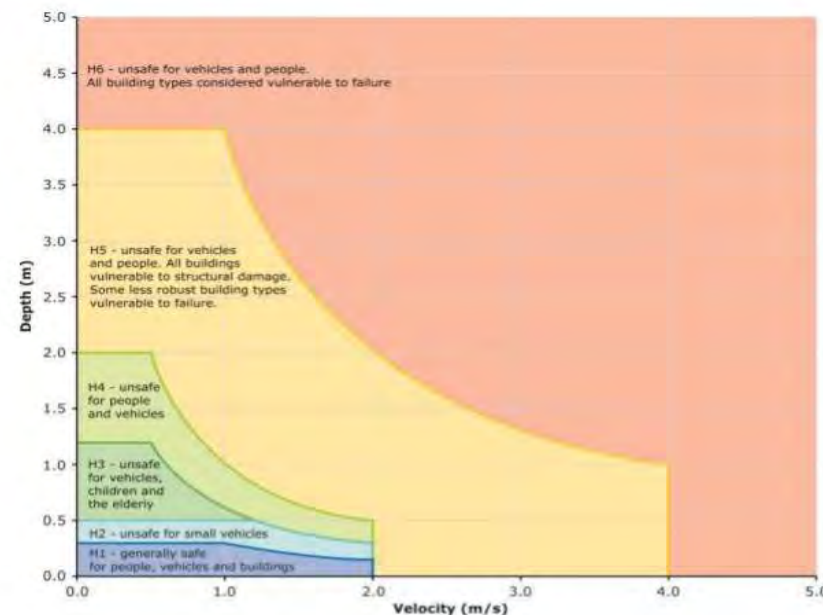


Figure 6 General flood hazard vulnerability curves

AUSTRALIAN DISASTER RESILIENCE HANDBOOK COLLECTION Flood Hazard Guideline 7-3 Supporting document for the implementation of Australian Disaster Resilience Handbook 7 Managing the Floodplain: A Guide to Best Practice in Flood Risk

				Consequence										
				0	1	2	3	4	5	6	7	8	9	10
Almost Certain	4.9	10%	5	0	5	10	15	20	25	30	35	40	45	50
Likely	6.5	5%	4	0	4	8	12	16	20	24	28	32	36	40
Possible	7.0	2%	3	0	3	6	9	12	15	18	21	24	27	30
Unlikely	7.5	1%	2	0	2	4	6	8	10	12	14	16	18	20
Rare	8.0	8m BOM	1	0	1	2	3	4	5	6	7	8	9	10

Broadly Acceptable Risks
 Tolerable Risks
 Generally Intolerable risks

Technical flood risk management guideline: Flood hazard

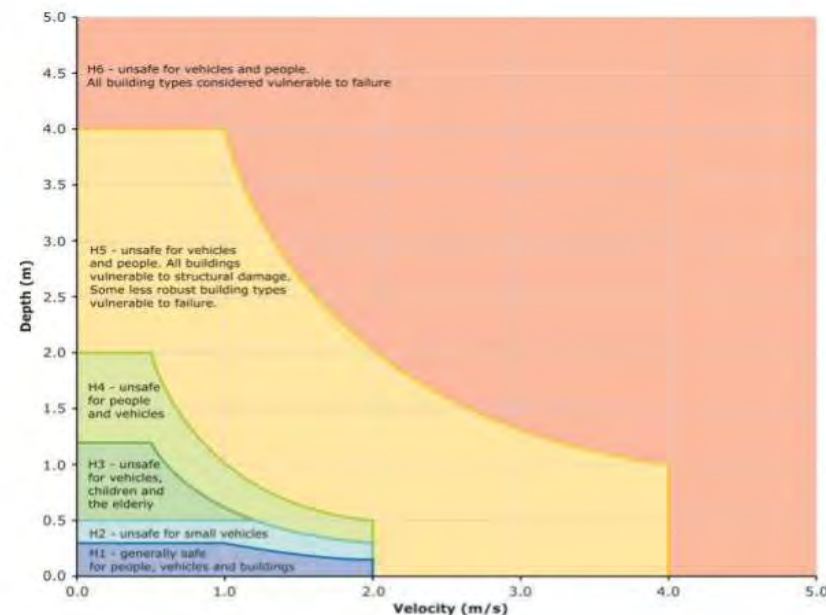


Figure 6 General flood hazard vulnerability curves

AUSTRALIAN DISASTER RESILIENCE HANDBOOK COLLECTION Flood Hazard Guideline 7-3 Supporting document for the implementation of Australian Disaster Resilience Handbook 7 Managing the Floodplain: A Guide to Best Practice in Flood Risk

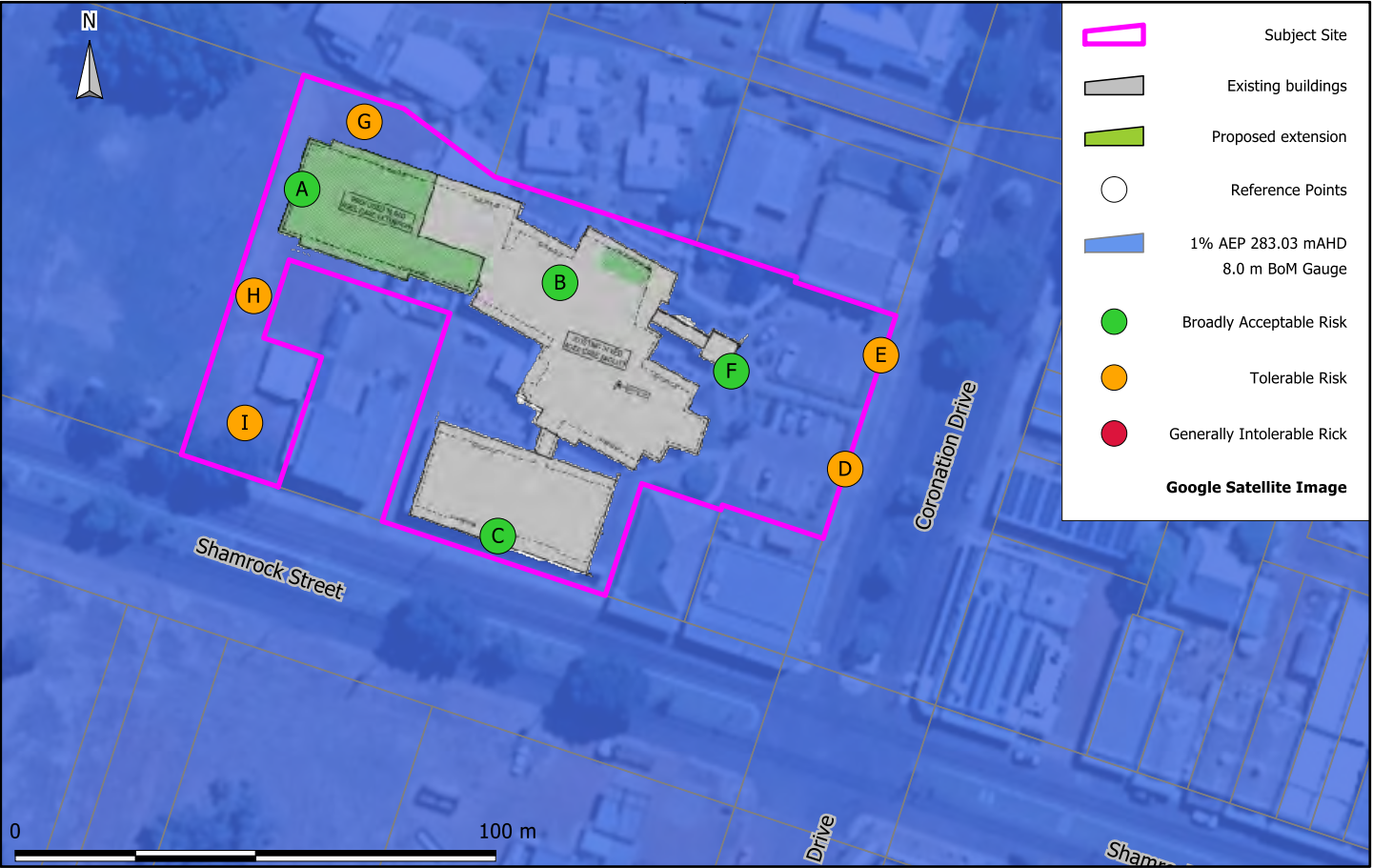
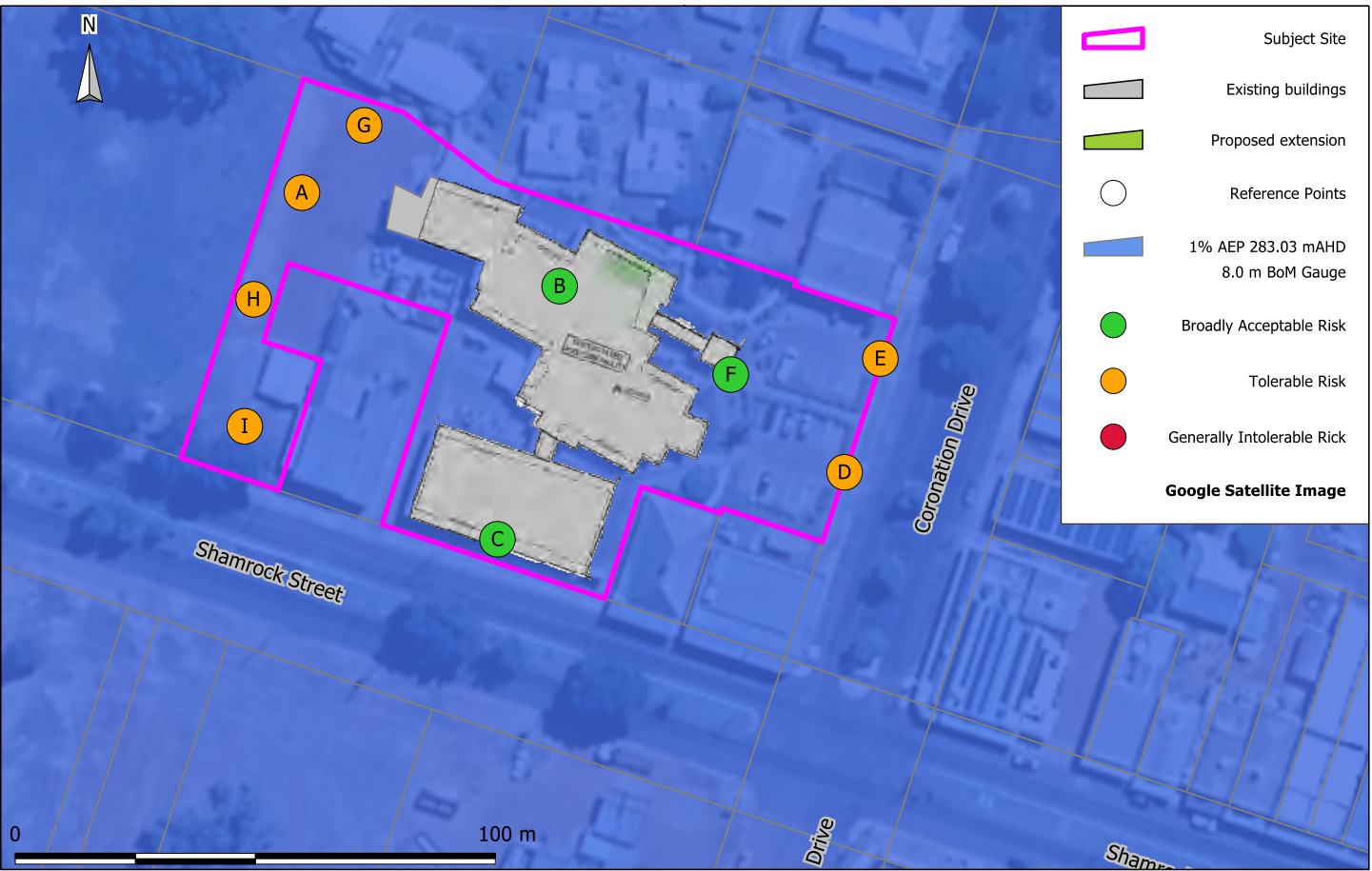
Reference Point		+ Extension				
BoM Gauge Height		8m	7.5m	7.0m	6.5m	4.9m
mAHd		283.03	282.53	282.03	281.53	279.93
Frequency		1%	2%	DFE	5%	10%
Depth		1.97	1.47	0.94	0.47	0
Velocity						
1		1.00	1.00	1.00	1.00	1.00
D*V						
		1.97	1.47	0.94	0.47	0
Exposure rating		5	5	4	3	0
General Vulnerability Rating		5 H5	5 H5	4 H4	2 H2	1 H1
Tolerance rating		0	0	1	2	4
Consequence		10	10	7	3	0
Risk		10	20	21	12	0

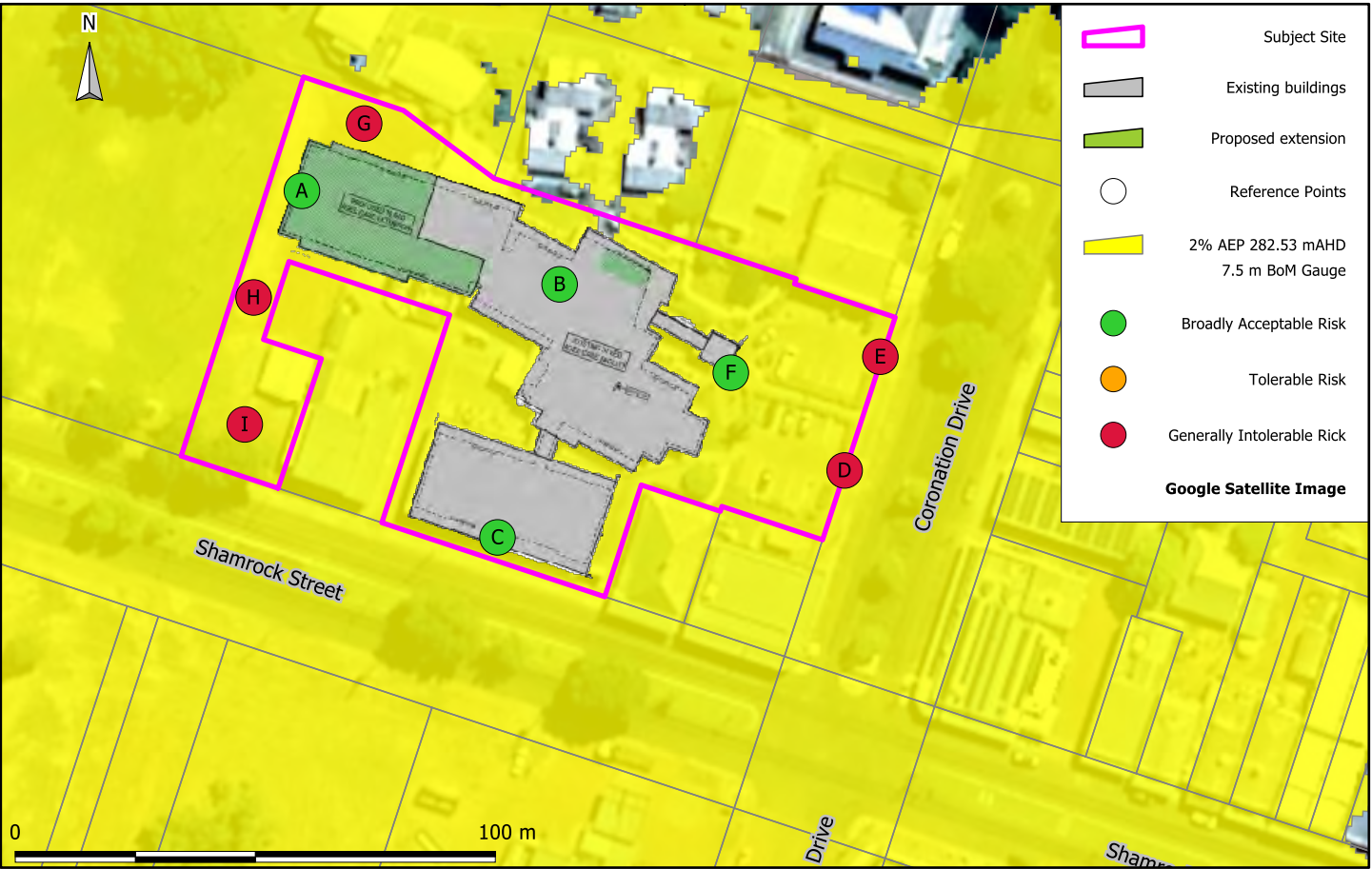
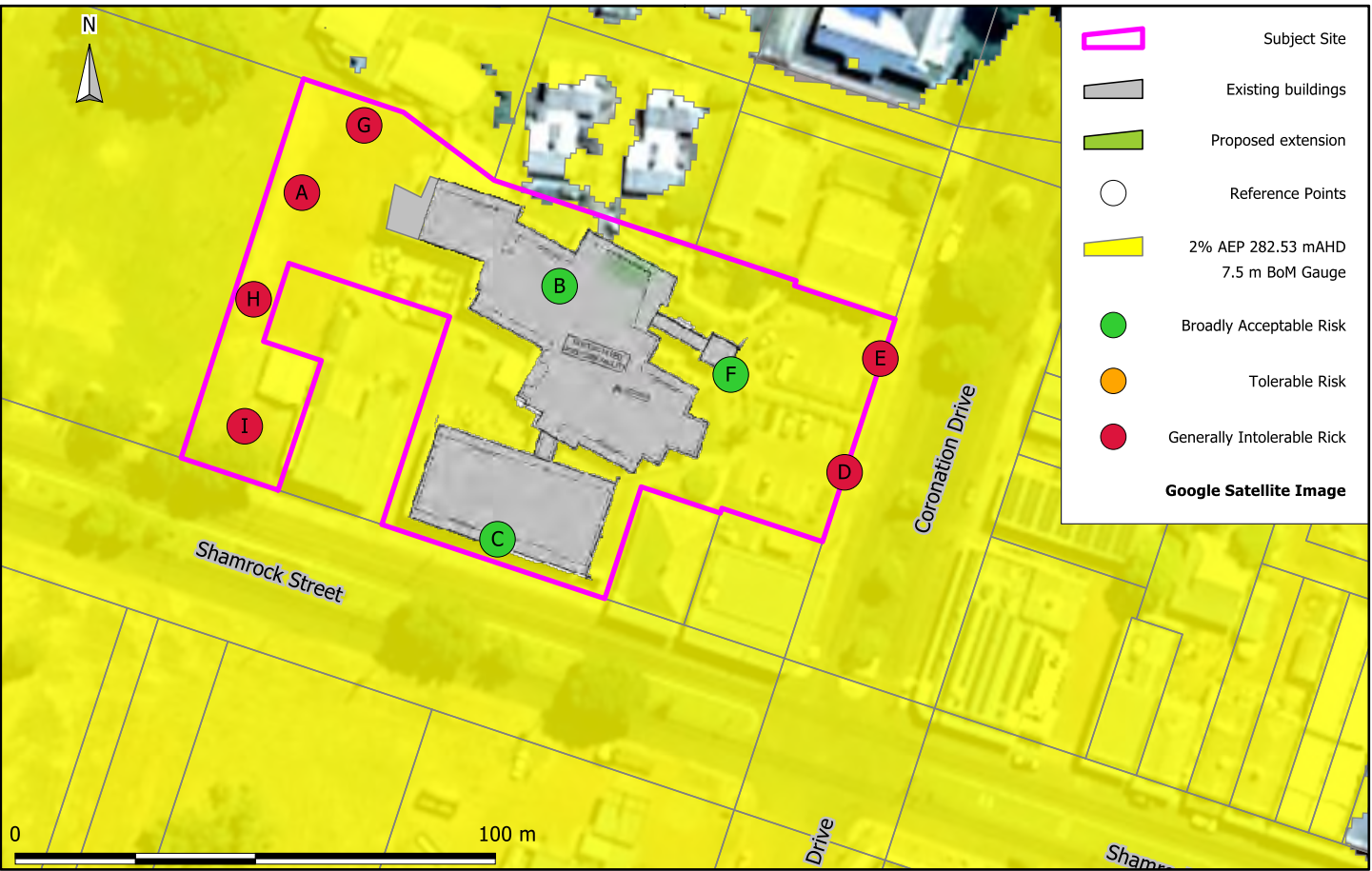
				Consequence										
				0	1	2	3	4	5	6	7	8	9	10
BOM Gauge	AEP			0	5	10	15	20	25	30	35	40	45	50
				0	4	8	12	16	20	24	28	32	36	40
				0	3	6	9	12	15	18	21	24	27	30
				0	2	4	6	8	10	12	14	16	18	20
				0	1	2	3	4	5	6	7	8	9	10

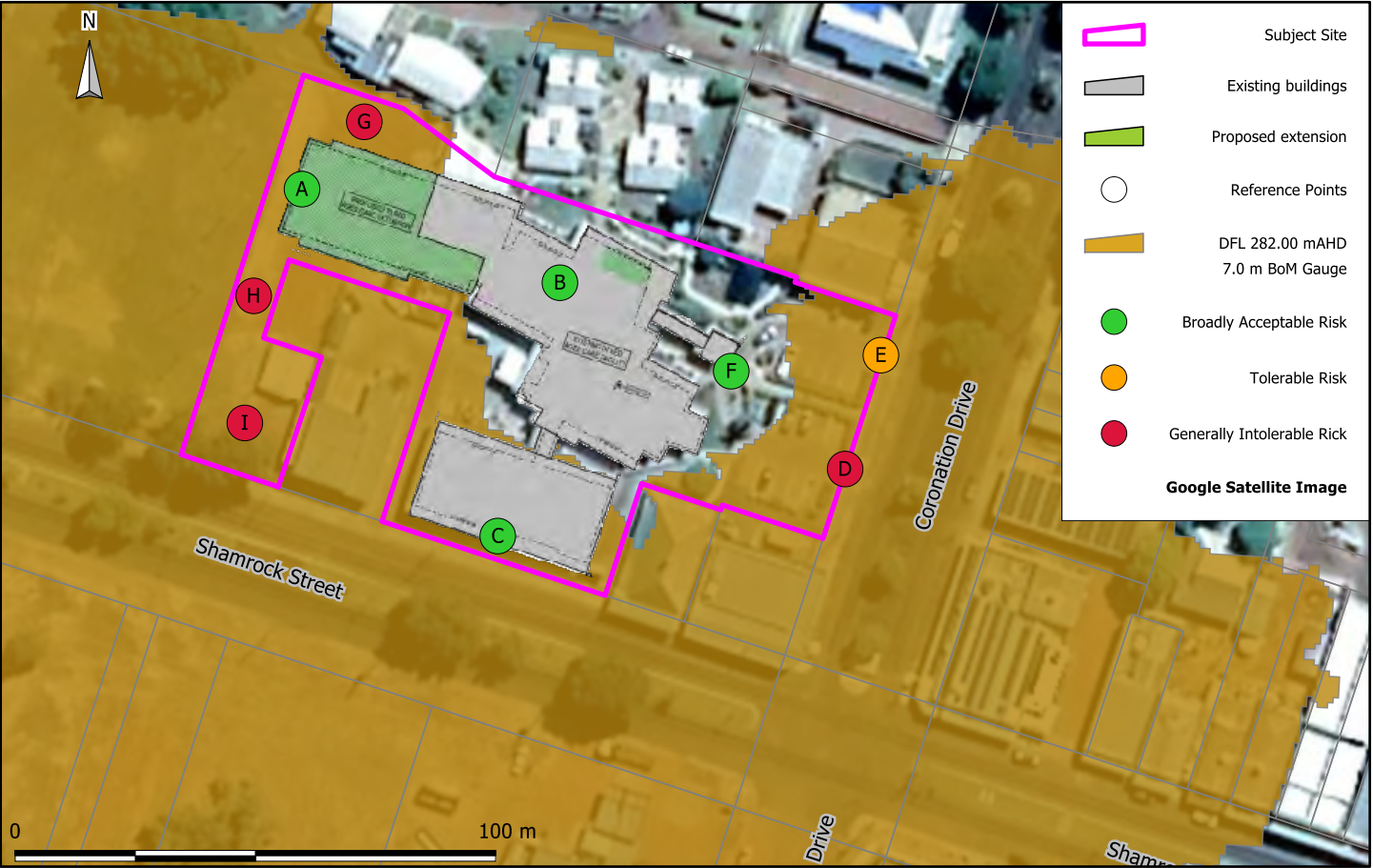
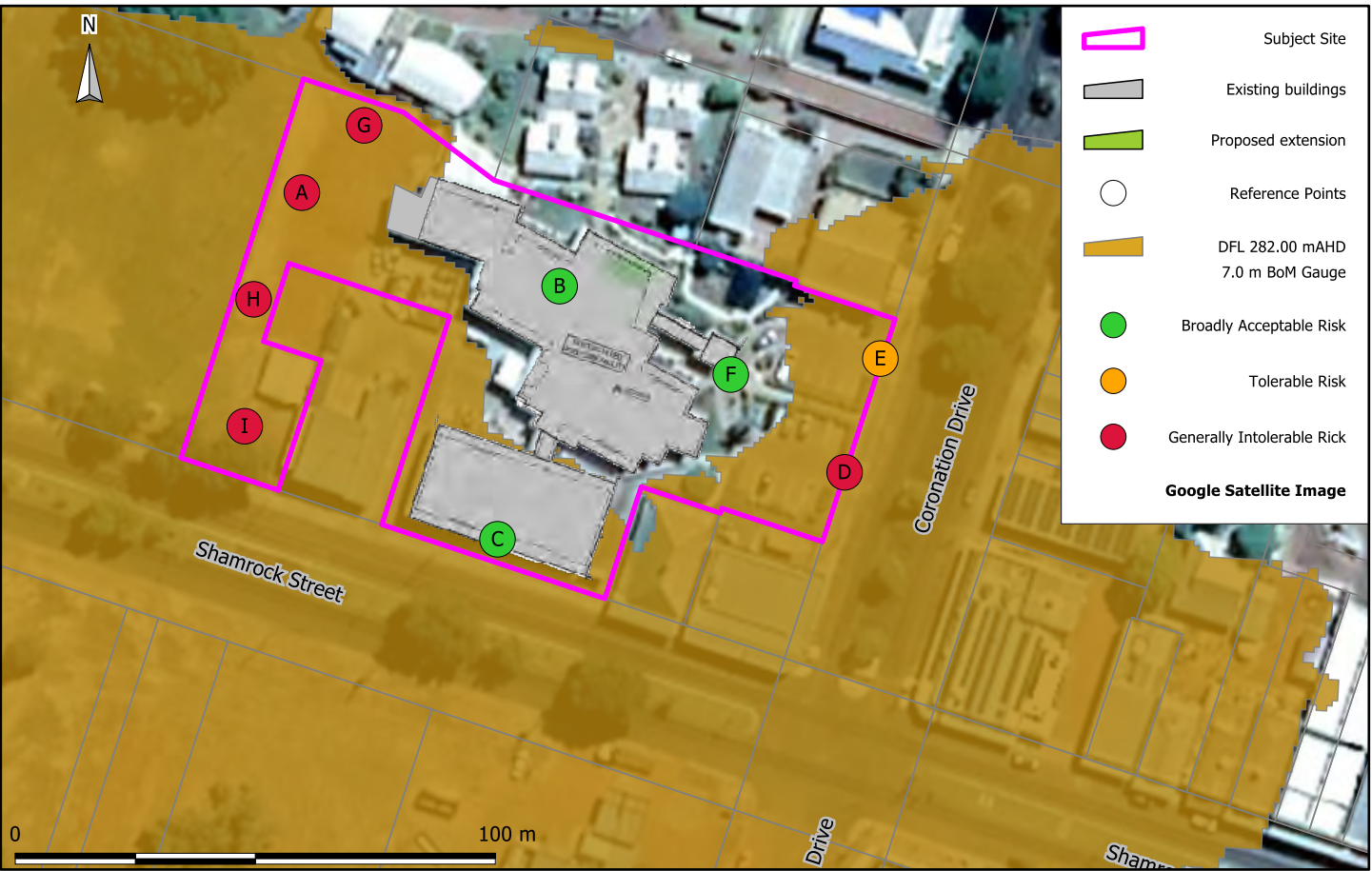
Broadly Acceptable Risks
 Tolerable Risks
 Generally Intolerable risks

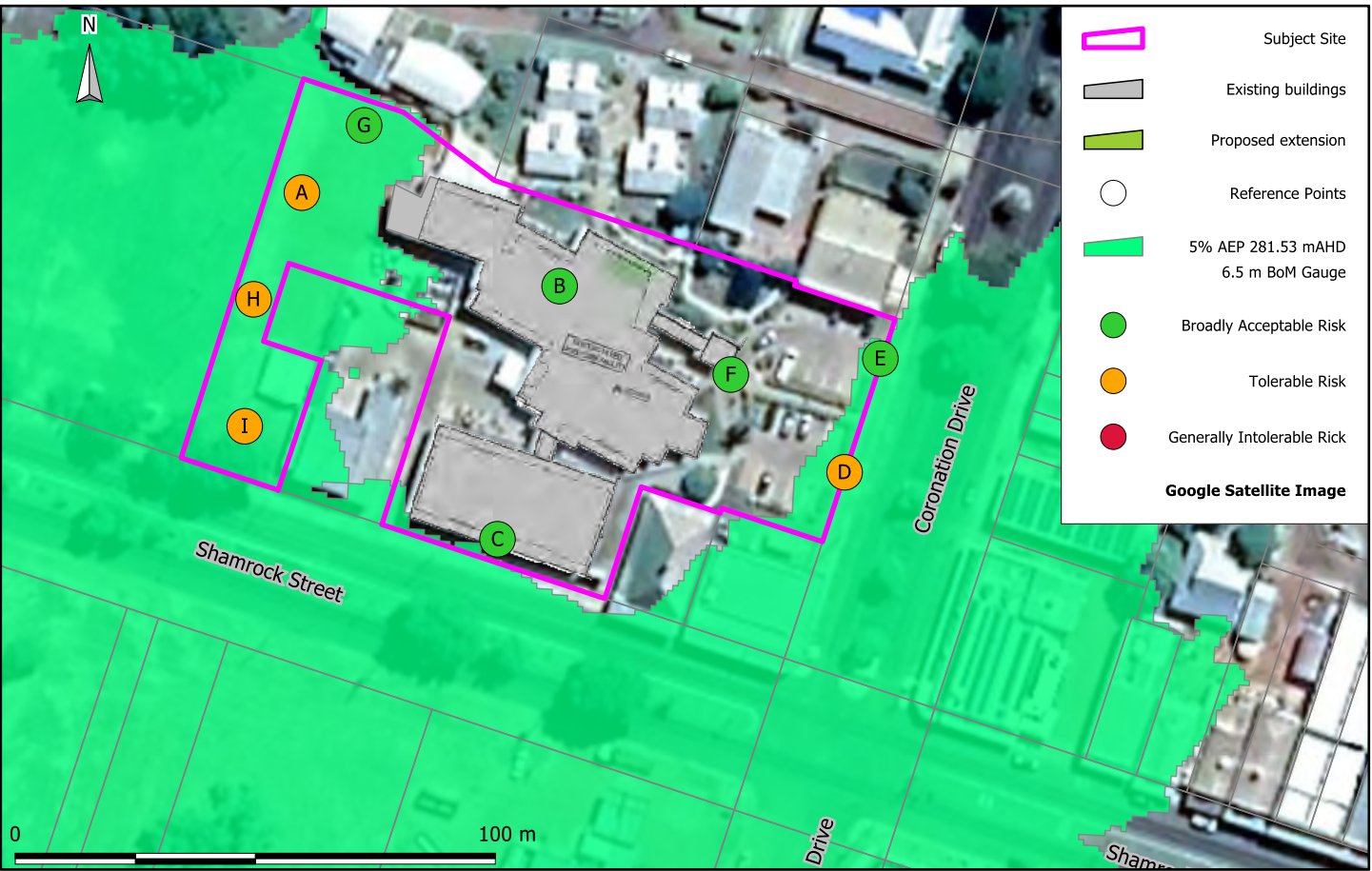
Appendix D

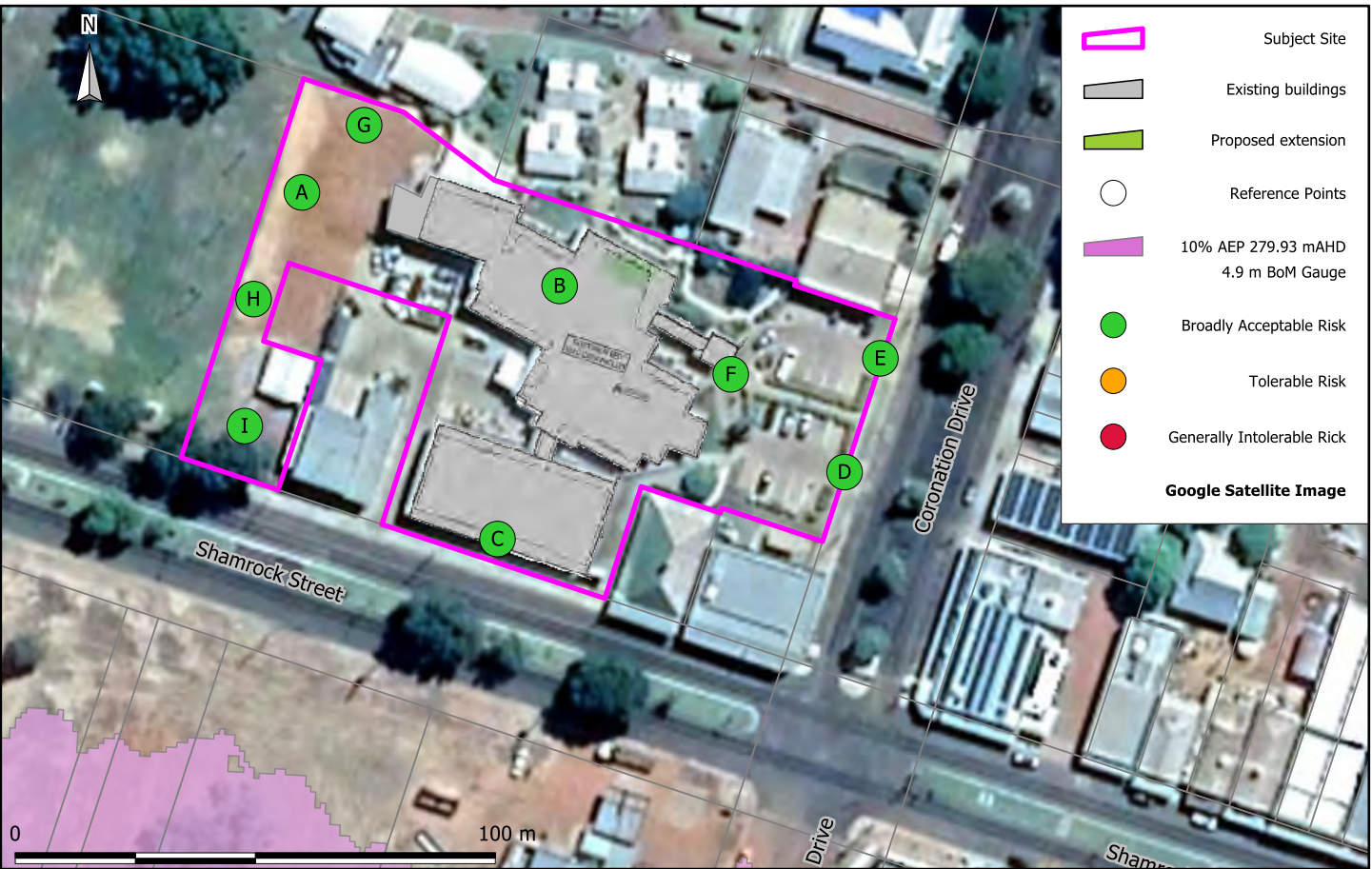
Risk Assessment Mapping











End of Report

NOTES - Site Plan

AREAS

REVISION DETAILS

PROJECT CAD MANAGER: DC

Churches of Christ
in Queensland

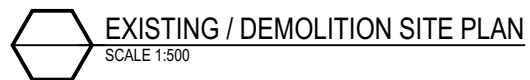
PROJECT

Cnr Shamock St & Coronation St, Blackall
QLD, 4472



EXISTING / DEMOLITION SITE PLAN

/Volumes/Current Projects/C732 CoC Barcoo RV Extension/02 Drawing Documents/00 Working CAD Files/03 Documentation/C732 Project Master 21.pln 23/6/21



SHAMROCK STREET

NOTES:
1. FIGURED DIMENSIONS TAKE PRECEDENCE OVER SCALED DIMENSIONS
2. VERIFY ALL DIMENSIONS ON SITE PRIOR TO CONSTRUCTION
3. IF IN DOUBT PLEASE ASK
4. COPYRIGHT MERRIN & CRANSTON PTY. LTD.

NOTES - Site Plan

GFA has been calculated as the building area to the face of the external walls. It does not include unenclosed balconies, stairs, ramps and other miscellaneous fixtures outside the external walls.

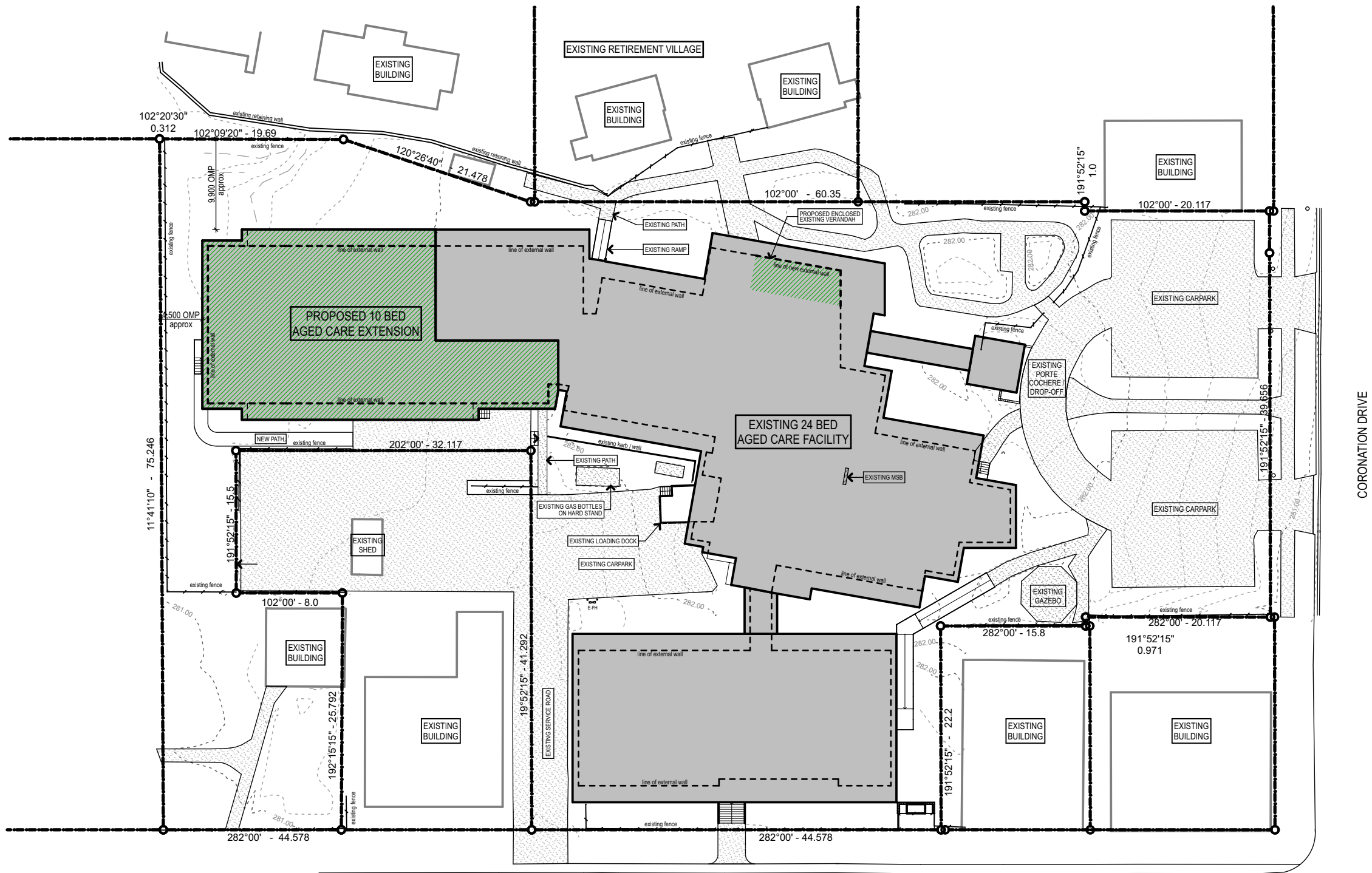
AREAS

EXISTING SITE AREA - to previous site boundaries	5,163 m ²
EXISTING SITE COVER - to previous site boundaries	41.9%
EXISTING SITE COVER - to approved new site boundaries	32%
EXISTING TOTAL GFA (approx.)	1,640 m ²
EXISTING GFA (to be demolished)	31 m ²

APPROVED NEW SITE AREA	6,602 m ²
PROPOSED SITE COVER	40.6%
PROPOSED EXTENSION GFA (approx.)	490 m ²
PROPOSED ENCLOSED VERANDAH GFA	37 m ²
PROPOSED TOTAL GFA	2,167 m ²

BEDROOMS

EXISTING BED NUMBERS	24
PROPOSED NEW BED NUMBERS	10
PROPOSED TOTAL BED NUMBERS	34



PROPOSED SITE PLAN
SCALE 1:500

SHAMROCK STREET

CORONATION DRIVE

B	23/06/21	DA RFI / REVISION	DC
A	11/03/21	DEVELOPMENT APPLICATION	DC
Rev	Date	Details	Ch

REVISION DETAILS

PROJECT CAD MANAGER: DC

STATUS

PRELIMINARY
NOT FOR CONSTRUCTION

PROPRIETOR:



+ Barcoo Living Multi Purpose Service

PROJECT

McLean Place Aged Care Extensions & Alterations

Cnr Shamock St & Coronation St, Blackall QLD, 4472



Ph: 07 3320 1620
Fax: 07 3320 1625
Email: reception@merrincranston.com
Nom: George Bellas Qld 2450, NSW 10791
ABN 60 010 242 878

TITLE

PROPOSED SITE PLAN

SCALE 1:500	at A3	REVISION DATE 23/6/21
-------------	-------	-----------------------

PROJECT No. C732	SHEET No. DA102	REVISION B
------------------	-----------------	------------

/Volumes/Current Projects/C732 CoC Barcoo RV Extension/02 Drawing Documents/03 CAD Files/03 Documentation/C732 Project Master 21.pln 23/6/21

NOTES:
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B	23/06/21	DA RFI / REVISION	DC
A	11/03/21	DEVELOPMENT APPLICATION	DC
Rev	Date	Details	Ch

REVISION DETAILS

PROJECT CAD MANAGER: DC

STATUS

PRELIMINARY
NOT FOR CONSTRUCTION

PROPRIETOR:



+ Barcoo Living Multi Purpose Service

PROJECT
McLean Place Aged Care Extensions & Alterations

Cnr Shamock St & Coronation St, Blackall
QLD, 4472



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ABN 60 010 242 878

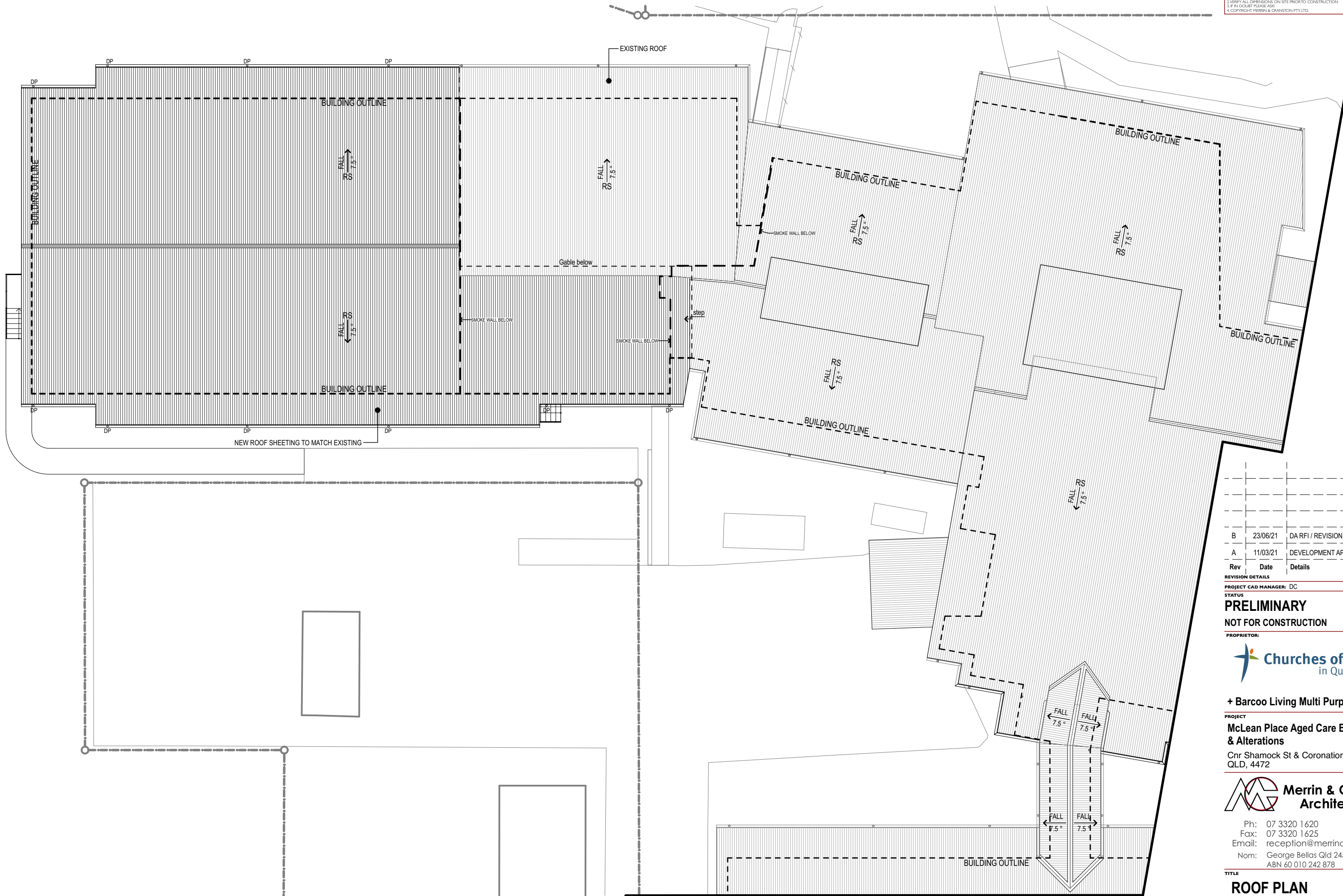
TITLE

**PROPOSED OVERALL
FLOOR PLAN**

SCALE	1:250	at	A3	REVISION DATE	23/6/21
PROJECT No.	C732	SHEET No.	DA103	REVISION	B

/Volumes/Current Projects/C732 CoC Barcoo RV Extension/02 Drawing Documents/00 Working CAD Files/03 Documentation/C732 Project Master 21.pln 23/6/21

NOTES:
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Rev	Date	Details	Ch
B	23/06/21	DA RFI / REVISION	DC
A	11/03/21	DEVELOPMENT APPLICATION	DC

REVISION DETAILS

PROJECT CAD MANAGER: DC

STATUS

PRELIMINARY

NOT FOR CONSTRUCTION

PROPRIETOR:



+ Barcoo Living Multi Purpose Service

PROJECT
McLean Place Aged Care Extensions & Alterations

Cnr Shamock St & Coronation St, Blackall
QLD, 4472



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ABN 60 010 242 878

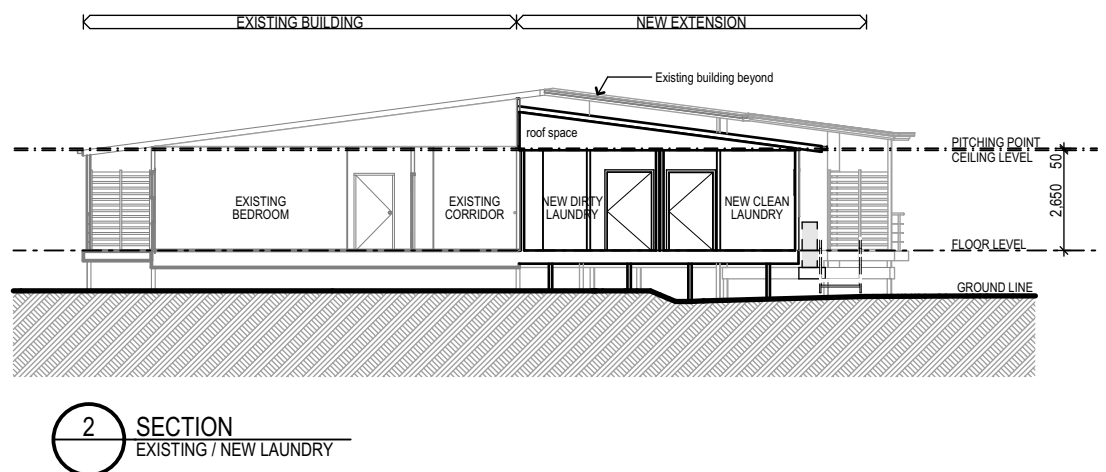
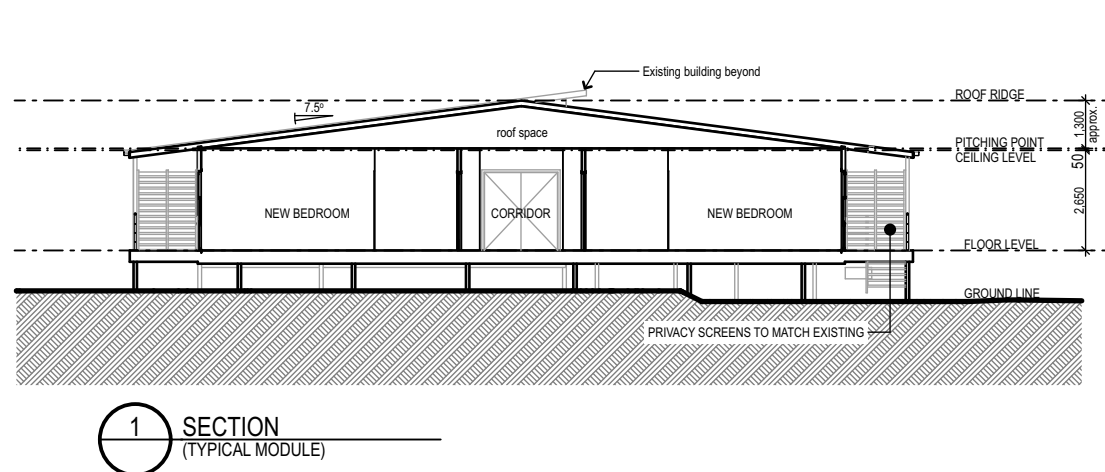
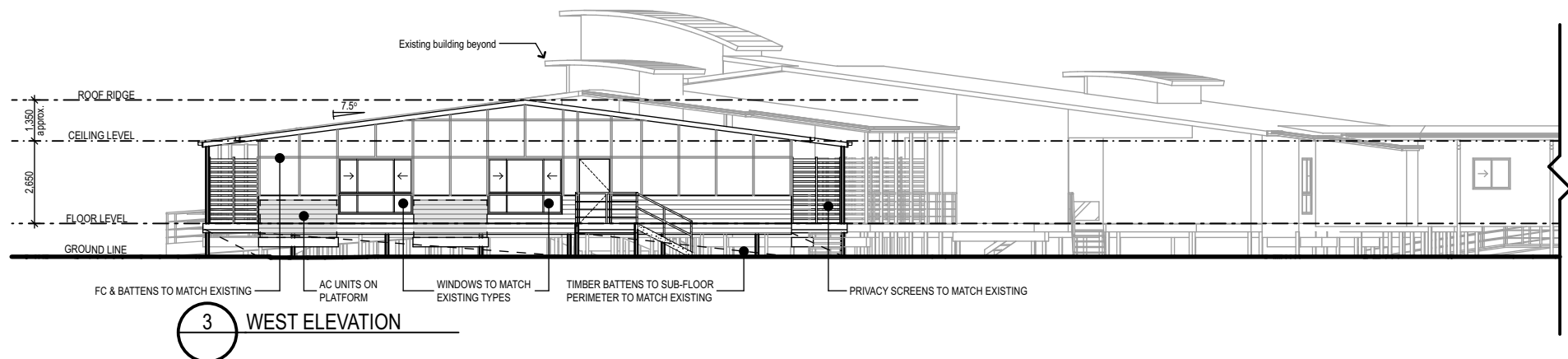
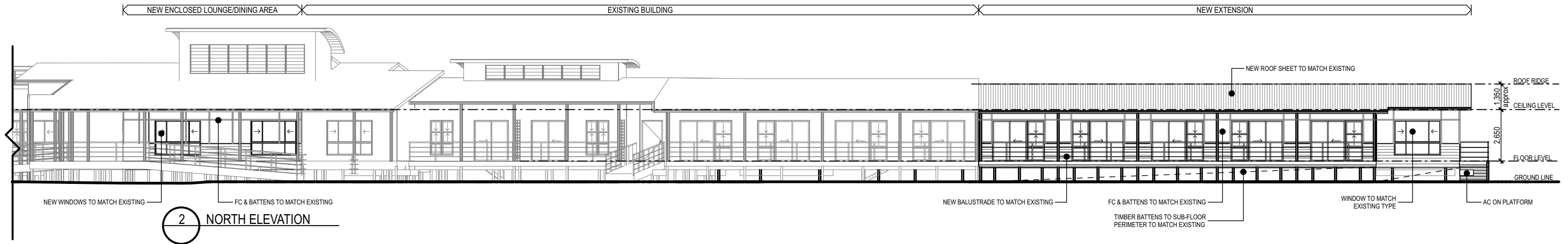
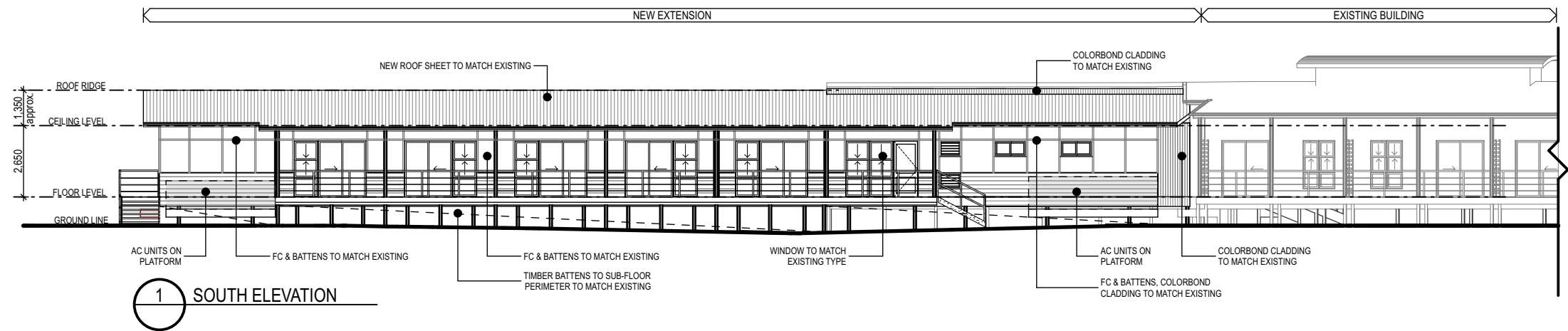
TITLE

ROOF PLAN

SCALE	1:200	at	A3	REVISION DATE	23/6/21
PROJECT No.	C732	SHEET No.	DA203	REVISION	B

Volume/Current Projects/C732 CoC Barcoo RV Extension/02 Drawing Documents/00 Working CAD Files/03 Documentation/C732 Project Master 21.pln 23/6/21

NOTES:
1. FIGURED DIMENSIONS TAKE PRECEDENCE OVER SCALED DIMENSIONS
2. VERIFY ALL DIMENSIONS ON SITE PRIOR TO CONSTRUCTION
3. IF IN DOUBT PLEASE ASK
4. COPYRIGHT MERRIN & CRANSTON PTY LTD.



Rev	Date	Details	Ch
B	23/06/21	DA RFI / REVISION	DC
A	11/03/21	DEVELOPMENT APPLICATION	DC

REVISION DETAILS
PROJECT CAD MANAGER: DC
STATUS
PRELIMINARY
NOT FOR CONSTRUCTION
NORTH



+ Barcoo Living Multi Purpose Service

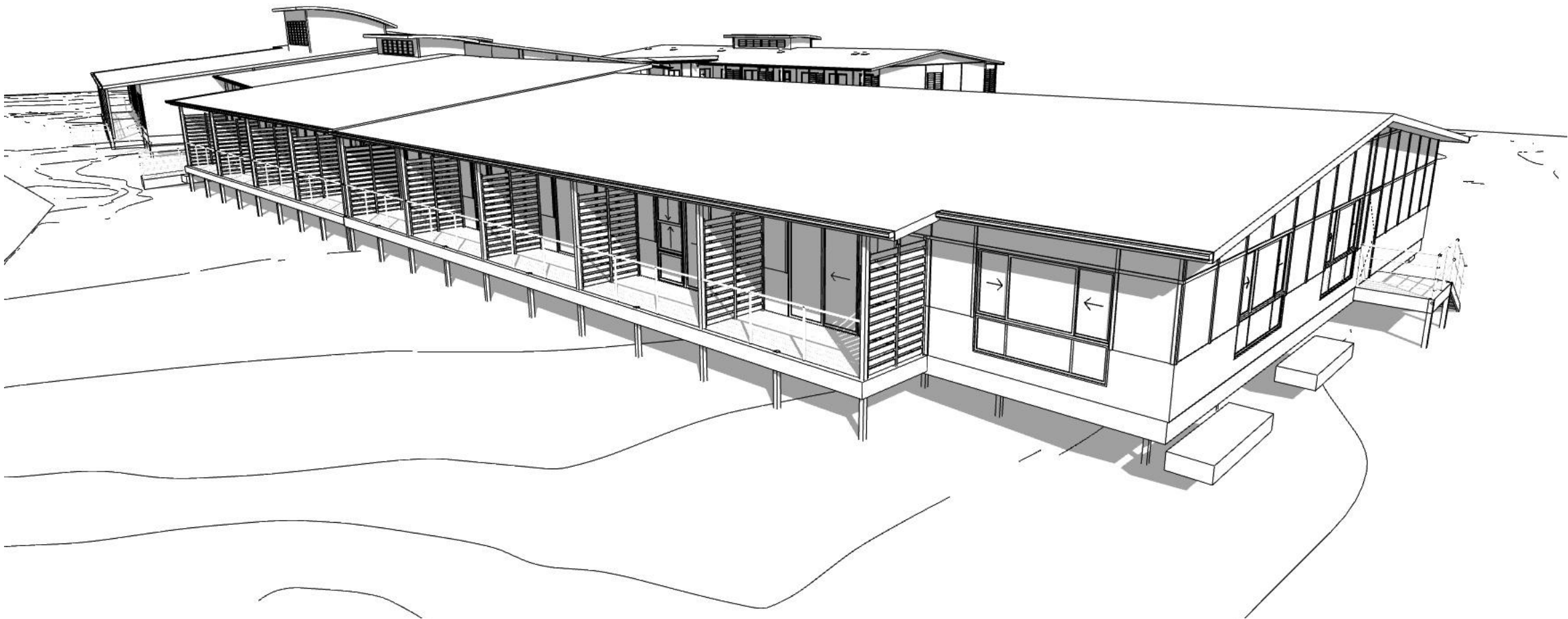
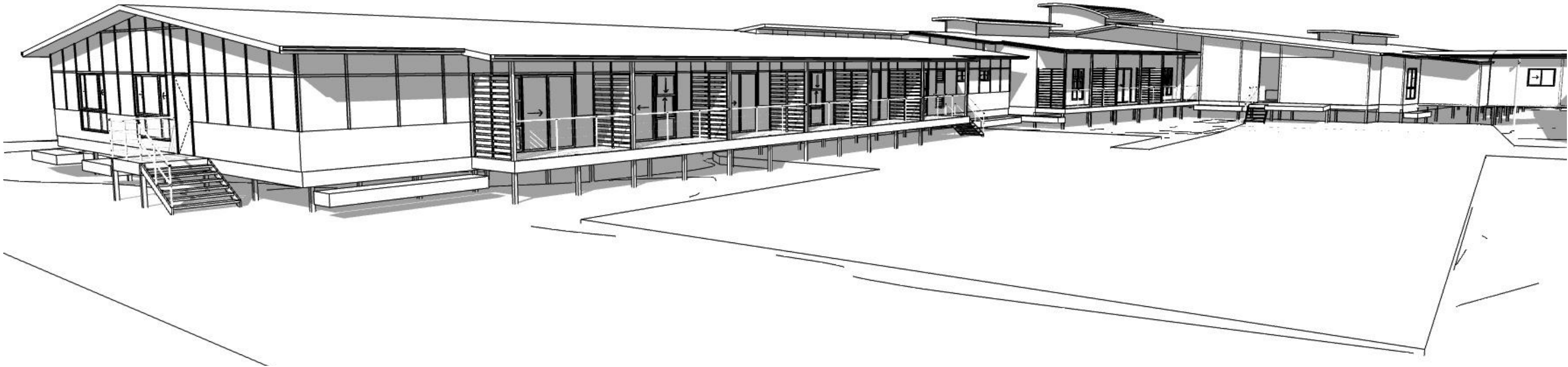
PROJECT
McLean Place Aged Care Extensions & Alterations
Cnr Shamock St & Coronation St, Blackall QLD, 4472



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Fax: 07 3320 1625
Email: reception@merrincranston.com
Nom: George Bellas Qld 2450, NSW 10791
ABN 60 010 242 878

TITLE
ELEVATIONS AND SECTIONS

SCALE	1:200	at	A3	REVISION DATE	23/6/21
PROJECT No.	C732	SHEET No.	DA501	REVISION	B



B	23/06/21	DA RFI / REVISION	DC
A	11/03/21	DEVELOPMENT APPLICATION	DC
Rev	Date	Details	Ch

REVISION DETAILS

PROJECT CAD MANAGER: DC

STATUS

PRELIMINARY
NOT FOR CONSTRUCTION

PROPRIETOR:



+ Barcoo Living Multi Purpose Service

PROJECT
McLean Place Aged Care Extensions & Alterations

Cnr Shamock St & Coronation St, Blackall
QLD, 4472



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TITLE

PERSPECTIVES

SCALE 1:1.67, 1:2 at A3 REVISION DATE 23/6/21

PROJECT No. C732 SHEET No. DA901 REVISION B