NOTICE OF PROPOSED DEVELOPMENT

Notice is hereby given that an application has been made for planning approval for the following development:

SITE: 11 Eularminner Street, Carlton

PROPOSED DEVELOPMENT:
DWELLING

The relevant plans and documents can be inspected at the Council Offices at 47 Cole Street, Sorell during normal office hours, or the plans may be viewed on Council's website at www.sorell.tas.gov.au until **Monday 4th August 2025.**

Any person may make representation in relation to the proposal by letter or electronic mail (sorell.council@sorell.tas.gov.au) addressed to the General Manager. Representations must be received no later than **Monday 4th August 2025.**

APPLICANT: **CMH Industries Pty LTd**

APPLICATION NO: **DA 2025 / 119 1**
DATE: **17 July 2025**

Part B: Please note that Part B of this form is publicly exhibited.

Full description of Proposal:	*Use:* Dwelling *Development:* Construction of a single dwelling *Large or complex proposals should be described in a letter or planning report.*
Design and construction cost of proposal:	$ 300,000 -

Is all, or some the work already constructed:	No: ☑ Yes: ☐

Location of proposed works:	Street address: 11 Eurlamminer Street Suburb: CARLTON Postcode: 7173 Certificate of Title(s) Volume: 84583 Folio: 2

Current Use of Site	Vacant Land

Current Owner/s:	Name(s) Peter Waters

Is the Property on the Tasmanian Heritage Register?	No: ☑ Yes: ☐	*If yes, please provide written advice from Heritage Tasmania*
Is the proposal to be carried out in more than one stage?	No: ☑ Yes: ☐	*If yes, please clearly describe in plans*
Have any potentially contaminating uses been undertaken on the site?	No: ☑ Yes: ☐	*If yes, please complete the Additional Information for Non-Residential Use*
Is any vegetation proposed to be removed?	No: ☑ Yes: ☐	*If yes, please ensure plans clearly show area to be impacted*
Does the proposal involve land administered or owned by either the Crown or Council?	No: ☑ Yes: ☐	*If yes, please complete the Council or Crown land section on page 3*
If a new or upgraded vehicular crossing is required from Council to the front boundary please complete the Vehicular Crossing (and Associated Works) application form https://www.sorell.tas.gov.au/services/engineering/		

Prepared for:

CMH Industries Pty Ltd

11 Eularminner Street Carlton

FLOOD HAZARD REPORT

FE_25603

05 May 2025

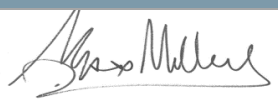
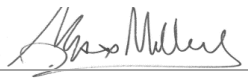
flüssig Engineers

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

Document Information

Title	Client	Document Number	Project Manager
11 Eularminner Street, Carlton, Flood Hazard Report	**CMH Industries Pty Ltd**	FE_25603	**Max W. Möller** *BEng, FIEAust, EngExec, CPEng, NER, APEC Engineer, IntPE (Aus.)* *Managing Director / Principal Hydraulic Engineer*

Document Initial Revision

REVISION 00	Staff Name	Signature	Date
Prepared by	Max W. Moller ***Principal Hydraulic Engineer***		20/04/2025
Prepared by	Ash Perera ***Hydraulic Engineer***		20/04/2025
Prepared by	Christine Keane ***Water Resources Analyst***		01/05/2025
GIS Mapping	Fraser Cumming ***Undergraduate Engineer***		01/05/2025
Reviewed by	John Holmes ***Senior Engineer***		05/05/2025
Authorised by	Max W. Möller ***Principal Hydraulic Engineer***		05/05/2025

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
RCP: Representative Concentration Pathway
CFT: Climate Futures Tasmania

1. Introduction

Flüssig Engineers has been engaged by **CMH Industries Pty Ltd,** to undertake a site-specific flood hazard report for the proposed residential development at number 11 Eularminner Street, Carlton in the **Sorell 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 consists of a new 180 m^2 dwelling, a new 80 m^2 concrete driveway and a new 30 m^2 shed, introducing impervious area to the property. The site is approximately 1472 m^2 located within an existing subdivision in Carlton. This development triggers the C12.0 Code of the Tasmanian Planning Scheme as the development falls within Sorell Council, flood prone hazard area.

1.2 Objectives and Scope

This flood analysis has been written to meet the standards of the Tasmanian Planning Scheme - Sorell (TPS) and S.54 of the Tasmanian Building Regulations 2016, 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 for pre- and post-development against acceptable and performance criteria and 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 data provided 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 full contributing catchment for 11 Eularminner Street, Carlton is approximately 224 ha including the tributaries from the hills north of Carlton River Road and west of Lyeena Street, that flows into the Carlton River.

The land use of the catchment is a mix of Rural Living, Low Density Residential, Environmental Management and Open Space with the specific site being listed as Low Density Residential.

Figure 1 below outlines the approximate contributing catchment for the development site at 11 Eularminner Street, Carlton.

Figure 1. Full Contributing Catchment, 11 Eularminner Street, Carlton

2.2 Hydrology

The following Table 2 shows the combined initial and continuing rainfall loss values adopted for the RAFTS full and localised catchment model. These values were based on detailed aerial imagery, and site visit. The values were conservatively selected using best practice and guidance from the *Australian Rainfall & Runoff Revision Project 6 – Urban Catchments Stage 2 Report*.

Table 2. Parameters for RAFTS catchment

Full 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
224	29-22/1	3.7-2/0.0	0.045	0.02	-0.285

2.2.1 Design Rainfall Events

Under the Tasmanian Planning Scheme (TPS) 2021, developments must be assessed against the 1% Annual Exceedance Probability (AEP) event (equivalent to the 100-year ARI) across the full design life of the development. This assessment has therefore been based on 1% AEP events with allowances for future climate change (CC).

Due to the characteristics of the site and the surrounding catchment, critical storm durations were assessed across a range from 10 minutes to 4.5 hours. While shorter duration storms, such as the 10-minute event, can produce more intense rainfall rates, it was the longer-duration 4.5-hour storm that resulted in the most severe ponding and flood conditions on site. This is consistent with outcomes from previous studies in the area that have been accepted by Sorell Council.

Figure 3 presents the box-and-whisker results from the 1% AEP storm ensemble. The 4.5-hour storm, particularly under temporal pattern 8, generated the highest flood depths and widespread ponding across the lot. As such, this duration was selected as the critical design event for hydraulic modelling.

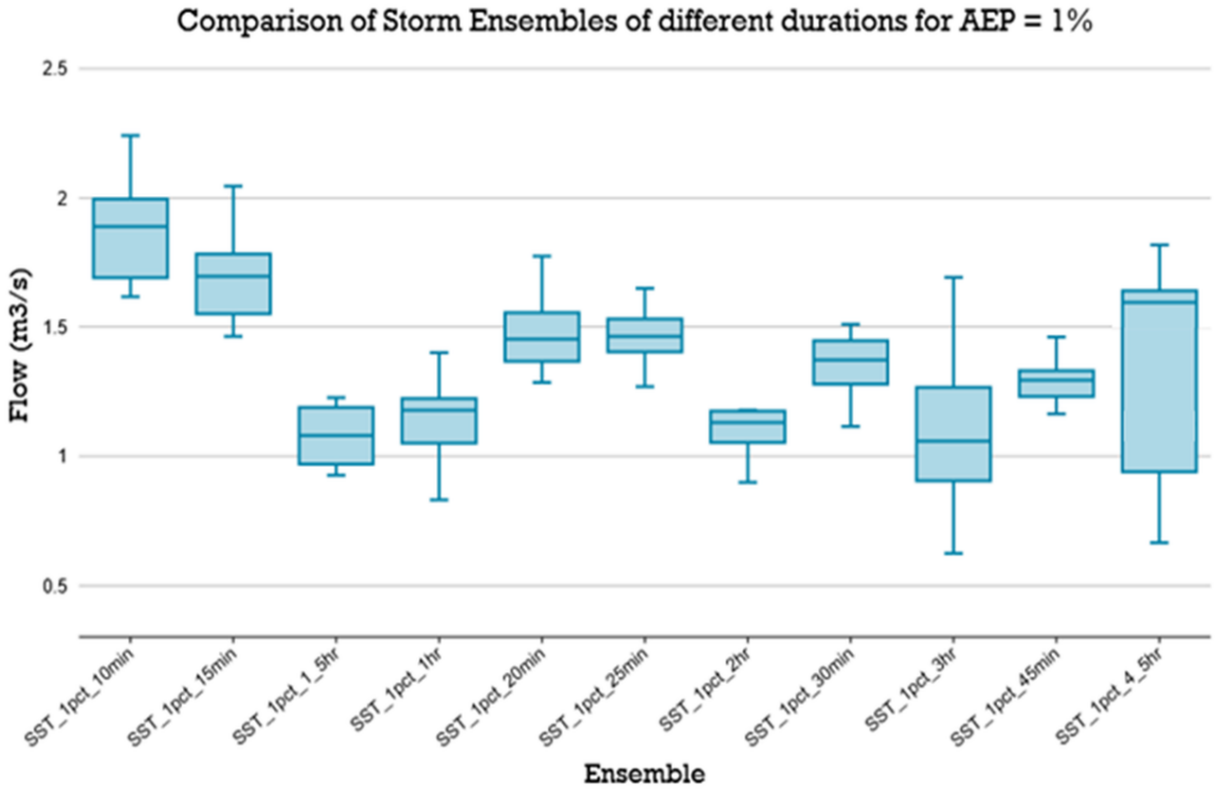

Figure 2. 1% AEP Box and Whisker Plot

2.2.2 Climate Change

As per the ARR 2019 Guide for Flood Estimation (Version 4.2), the recommended approach for estimating increases in rainfall due to climate change projections for the year 2100 scenario.

According to Table 3 of the guide, a multiplication factor of 1.58 is adopted for rainfall durations of less than 1 hour under the SSP5-8.5 2100 scenario for the localised catchment. This factor accounts for the anticipated intensification of extreme rainfall events due to climate change impacts and adopted by the Council. Table 3 below shows the applied climate change factor.

Table 3. Climate Change Increases

Parameter	Localised Catchment SSP5-8.5 @ 2100
4.5 - hours Rainfall Intensity	58% Increase

2.3 Hydraulics

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

2.3.1 Calibration/Validation

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

2.3.2 Survey

The 2D surface model was taken from LiDAR 2019 and supplied survey data to create a 1m and 0.25m 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).

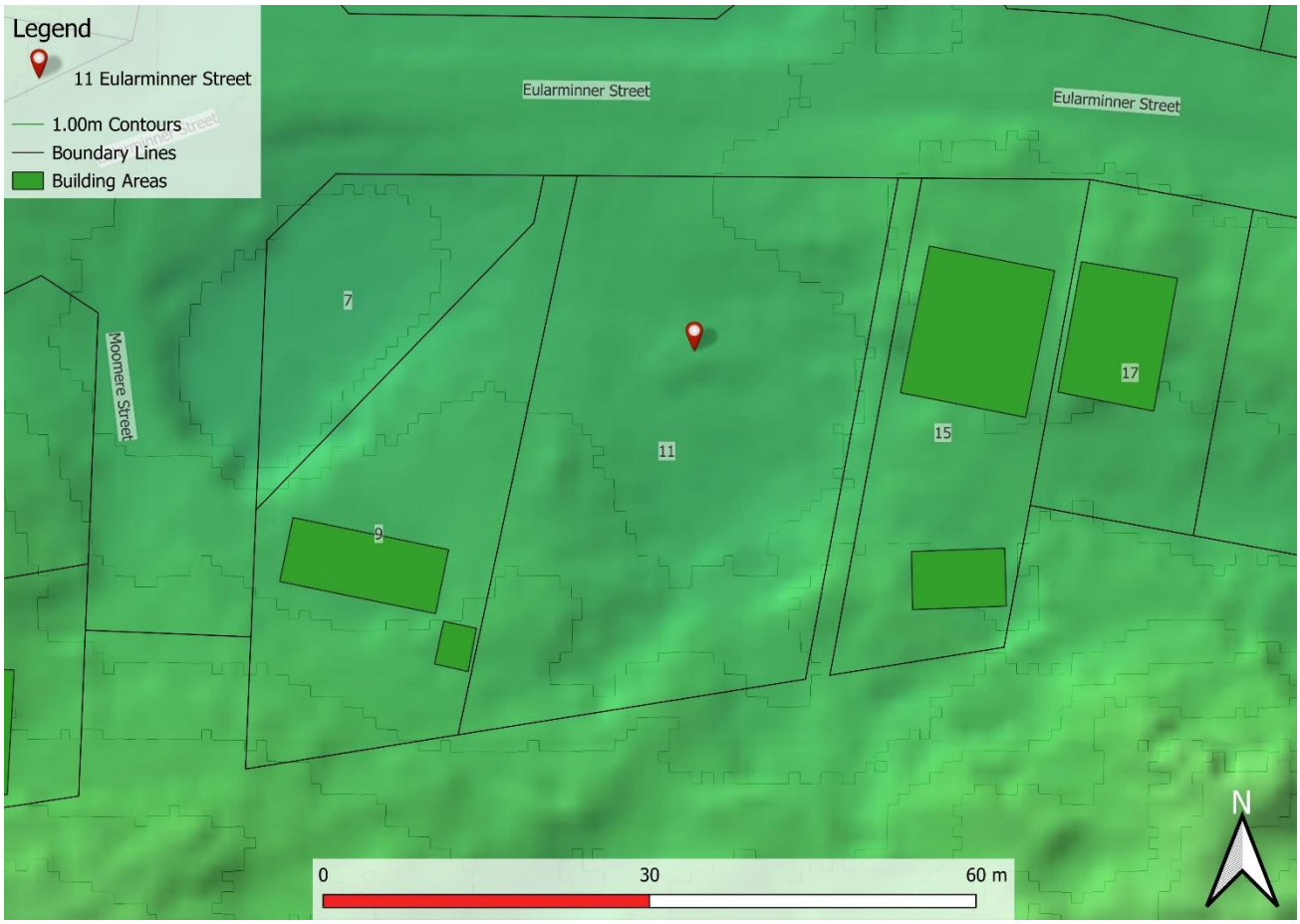

Figure 3. 1m DEM (Hill shade) of Lot Area, 11 Eularminner Street, Carlton

2.3.3 Roads

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

In our Digital Elevation Model (DEM), a "z-line" refers to a line representing a constant elevation or contour line. These lines connect the existing kerb points of equal elevation on the terrain surface, allowing for visualisation of the terrain's shape and elevation changes.

2.3.4 Buildings

Specifically, residential houses and commercial buildings were integrated into the DEM by elevating the corresponding grid cells representing these structures by a standardised height of 0.3 meters above the

natural ground surface. Subsequently, the re-sampled grids were utilised to establish the Infoworks ICM model, thus forming a foundational framework for the subsequent analysis and simulation of flood dynamics.

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

2.3.5 Walls

All significant fences and retaining structures were incorporated into the 2D model as 2D linear wall elements. Pallet fences were modelled with a maximum height of 250 mm, representing the estimated depth at which they are likely to collapse during a 1% AEP rainfall event. Solid material walls were modelled using a realistic height to reflect their structural integrity and expected behaviour under flood conditions.

2.3.6 Structures

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

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

2.3.7 Roughness (Manning's n)

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

Table 4. Manning's Coefficients (ARR 2019)

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

3. Model Results

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

3.1 Pre-Development Scenario

The site at 11 Eularminner Street, Carlton is located on gently sloping ground within a local catchment.

As shown in flood modelling maps in Figure 4, during heavy rain, water flows across the property in a shallow, localised pattern, mostly towards the southern boundary and into the vegetated land between the rear of the lot and Carlton Beach.

Flood modelling for the 1% AEP event, including climate change projections to the year 2100, shows that the site experiences shallow ponding, mostly in the central and northern parts of the lot. Most flood depths are less than 300 mm, although lower areas can reach up to 580 mm due to dips in the natural surface. There are no signs of fast or focused flow paths, showing that water spreads out slowly across the site.

Flow speeds are low, generally between 0.1 m/s and 0.4 m/s, meaning the water moves gently and has little potential to cause erosion or damage.

Most runoff from the surrounding area is captured by the council-owned wetland across Eularminner Street, which acts as a natural storage area. Some water still reaches the lot, where it collects briefly before slowly flowing through the back of the site and towards Carlton Beach.

Flood hazard mapping places the entire property in the H1 to H3 categories under ARR 2019, confirming that floodwater depths and speeds are deep enough not to be unsafe for vehicles, children, and the elderly.

3.2 Post-Development Scenario

Post-development modelling for the 1% AEP + climate change (2100) event, as depicted in Figure 5, shows that the proposed development will keep the existing overland flow path, with most surface water still flowing through the central and southern parts of the lot. Local runoff will continue draining into the easement along the southern boundary, maintaining its connection to the downstream shoreline.

Flood depths are expected to rise slightly due to small changes in surface materials and the presence of new buildings. Despite this, flood depths across the site will remain between 0.10 m and 0.59 m, and water will still spread out as shallow sheet flow. The development does not create any focused flow paths or major changes to flow patterns.

Some ponding of around 0.41 m to 0.53 m is expected near the proposed driveway and next to the garage, caused by low points and slight changes in surface levels. These areas are small and don't significantly affect overall flow behaviour on site.

Flow velocities remain similar to pre-development conditions, mostly under 0.25 m/s, which means the development does not create fast-moving water or increase risks such as erosion or damage to structures.

The proposed house is located in an area with a modelled flood depth of up to 0.59 m. To manage this, the dwelling will be built on piers to meet the required minimum floor level.

Hazard mapping shows the site remains within the H1–H3 range after development, meaning the flood could be unsafe for vehicles, children, and the elderly stays the same.

To further reduce risk, the new dwelling will have a finished floor level (FFL) 300mm or above the modelled 1% AEP + climate change flood level, meeting development standards and protecting from flooding.

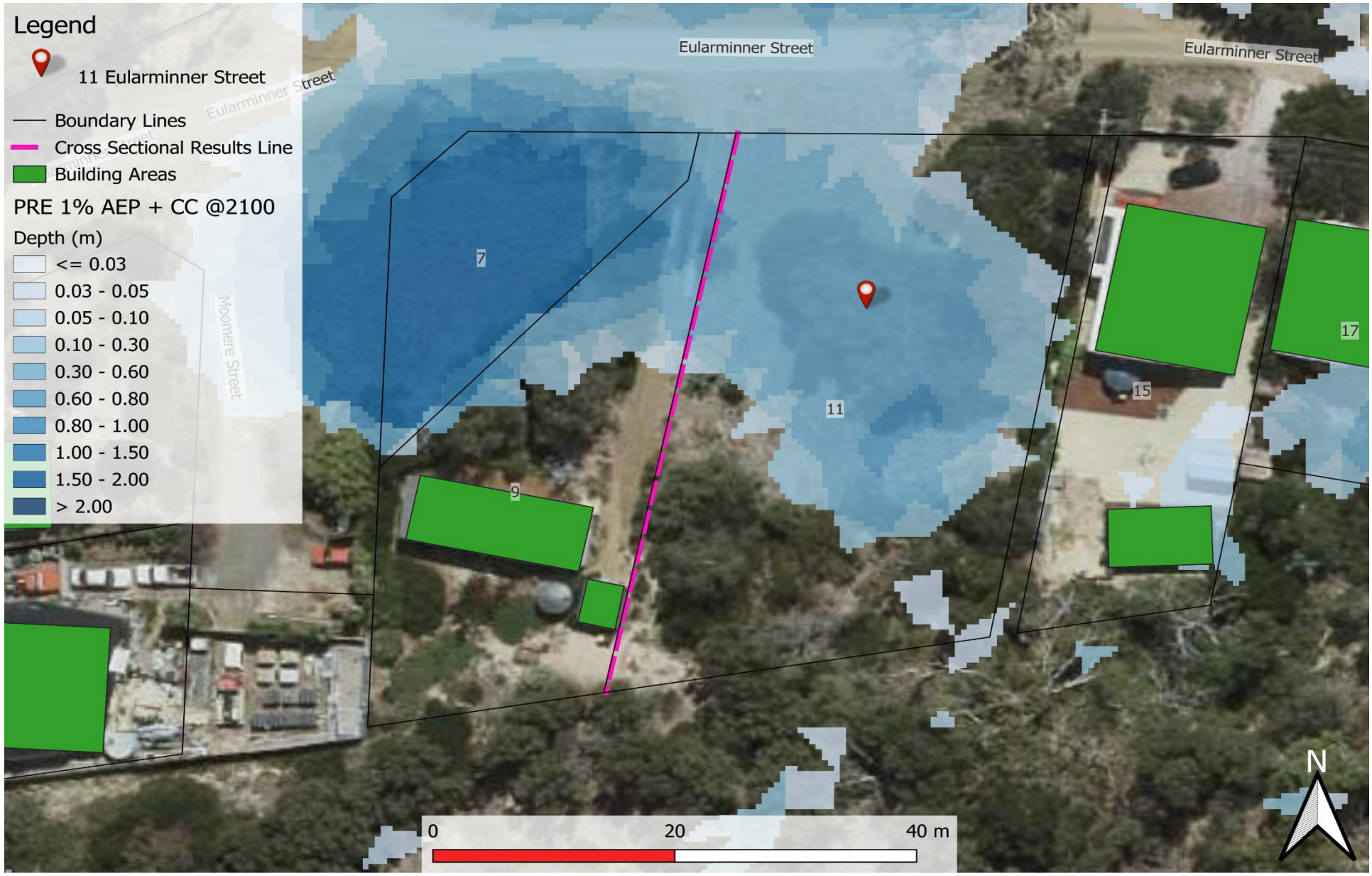

Figure 4. Pre-Development 1%+CC Flood Depths and extents

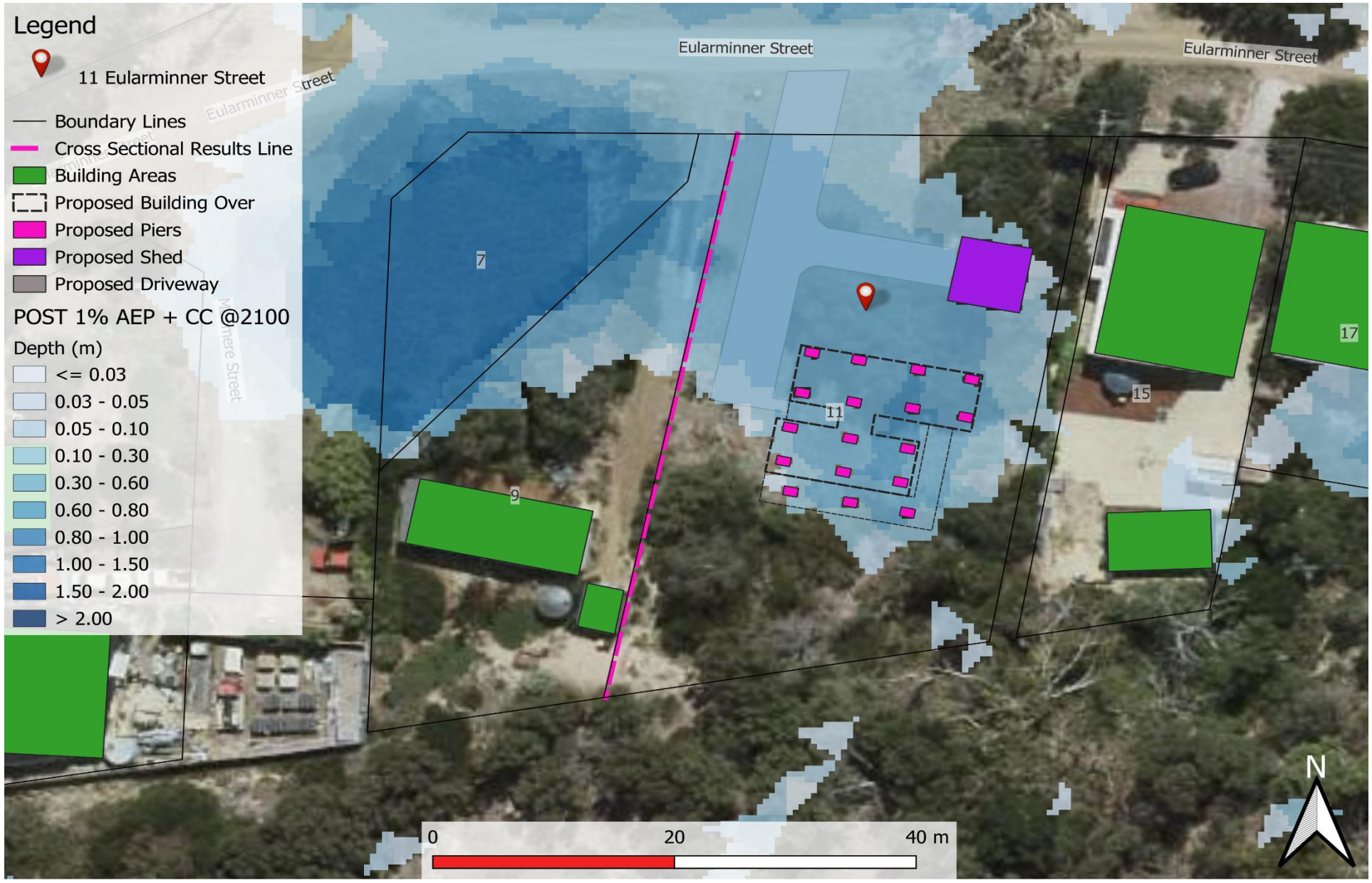

Figure 5. Post Development 1%+CC Flood Depth and extents

3.3 Displacement of Overland Flow on Third Party Property

Figure 5 shows the post-development flow conditions. When compared to the pre-development case, there is no increase in flood levels or extents on the southern neighbouring properties near 11 Eularminner Street, Carlton. The modelling confirms that the proposed development does not have a detrimental impact on flooding either within the site or on surrounding land, with the maximum depth reaching 0.59 m and velocity remaining at 0.4 m/s.

As discussed further in Section 4, the flood hazard on nearby properties and surrounding infrastructure remains the same, classified as H1–H3. This is consistent with pre-development conditions and means that while flooding could be unsafe for vehicles, children, and the elderly, the development does not make it worse.

3.4 Development Effects on Stormwater Discharge

Figure 6 presents the discharge hydrograph for the 11 Eularminner Street site, illustrating the comparative flow characteristics between pre- and post-development conditions. This graph, derived from hydraulic modelling outputs, captures net discharge variations across both scenarios to assess potential impacts resulting from the proposed development.

The analysis indicates that post-development conditions result in a negligible increase of 0.001 m^3/s in net discharge, suggesting that any additional runoff generated by the new structures and grading adjustments remains minimal and within acceptable limits. Additionally, a slight increase in velocity of 0.001 m/s is observed, though this change is insignificant in influencing overall flow behaviour or presenting an elevated flood hazard. These results confirm that the development has minimal impact on site hydrology, ensuring that overland flow characteristics remain consistent with pre-development conditions.

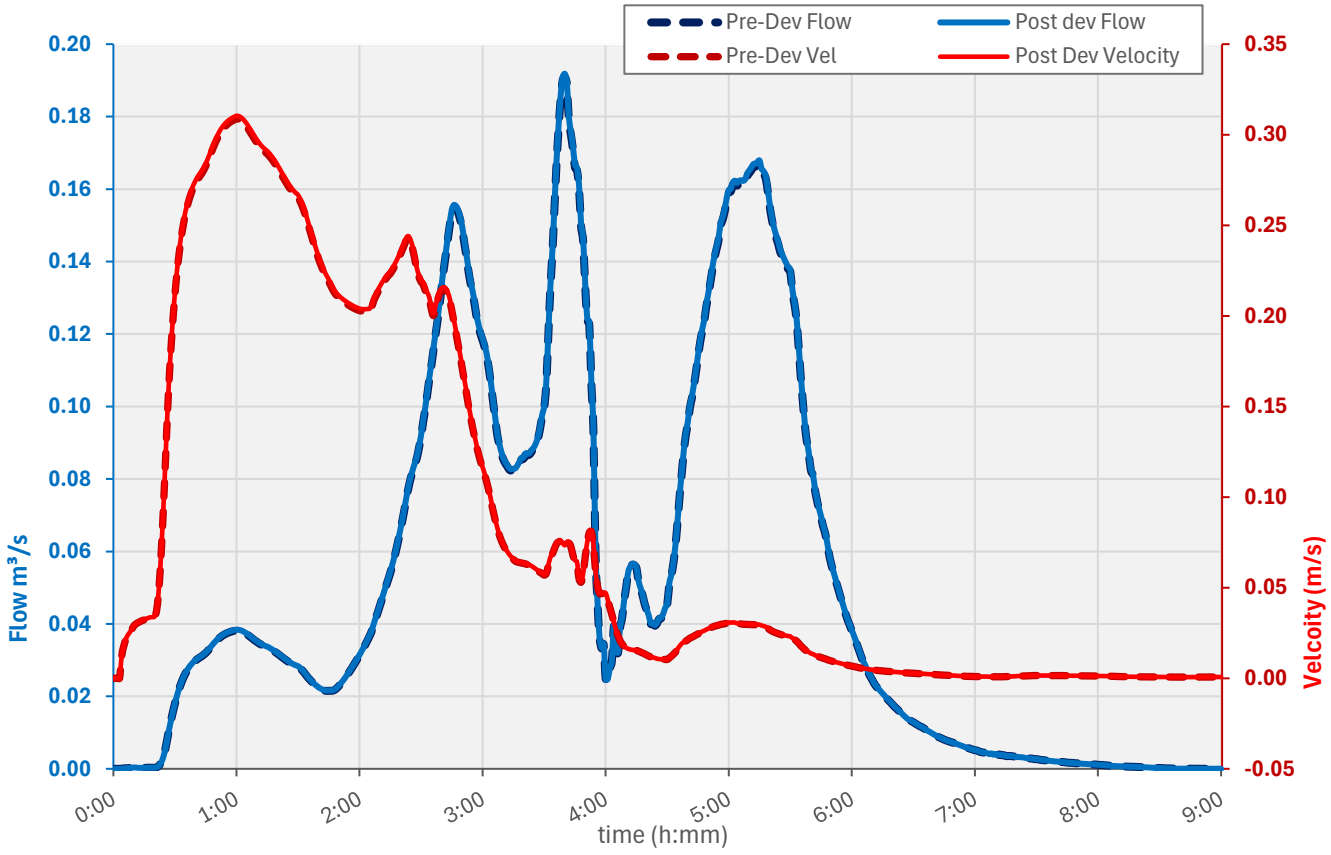

Figure 6. Pre and Post Development Net Discharge 1% AEP +CC, 11 Eularminner Street

3.5 Model Summary

Table 5. Pre-development and post-development results at the cross-sectional line within the lot

	Pre-development	Post-development	Net Change
Depth (m)	0.574	0.577	0.003
Velocity (m/s)	0.191	0.192	0.001
Discharge (m^3/s)	0.309	0.310	0.001

3.6 New Habitable Building

To meet the performance criteria of the Building Regulations 2016 S.54, the construction of a new habitable building is required to have a habitable floor level is greater than 300mm above the 1% AEP + CC flood level. The new development at 11 Eularminner Street, Carlton must meet this regulation as shown in Table 6. (The floor level >1% AEP + CC flood level + 300 mm does not apply for non-habitable areas).

Table 6. Habitable Floor Construction Levels

Habitable Floor	1% AEP +CC flood level (mAHD)	Minimum Floor Level required (mAHD)
Proposed Dwelling	2.0	2.3

4. Flood Hazard

Appendix A provides a detailed assessment of flood velocity and depth along the northern boundary of the lot, comparing pre- and post-development conditions. In the pre-development scenario, modelling shows a maximum velocity of 0.31 m/s and a flood depth of 0.57 m at the reference cross-section. Based on the Australian Flood Resilience and Design Handbook, this results in a hazard rating of H1–H3, meaning conditions are unsafe for vehicles, children, and the elderly, as shown in Figure 7.

After development, the modelling shows that velocity remains unchanged at 0.31 m/s, while flood depth increases slightly by 0.003 m. These small changes suggest the development causes only minor impacts to local flood behaviour. Importantly, the highest hazard rating remains at H3, which is consistent with the pre-development condition. The hazard rating maps in Appendix A support this outcome.

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

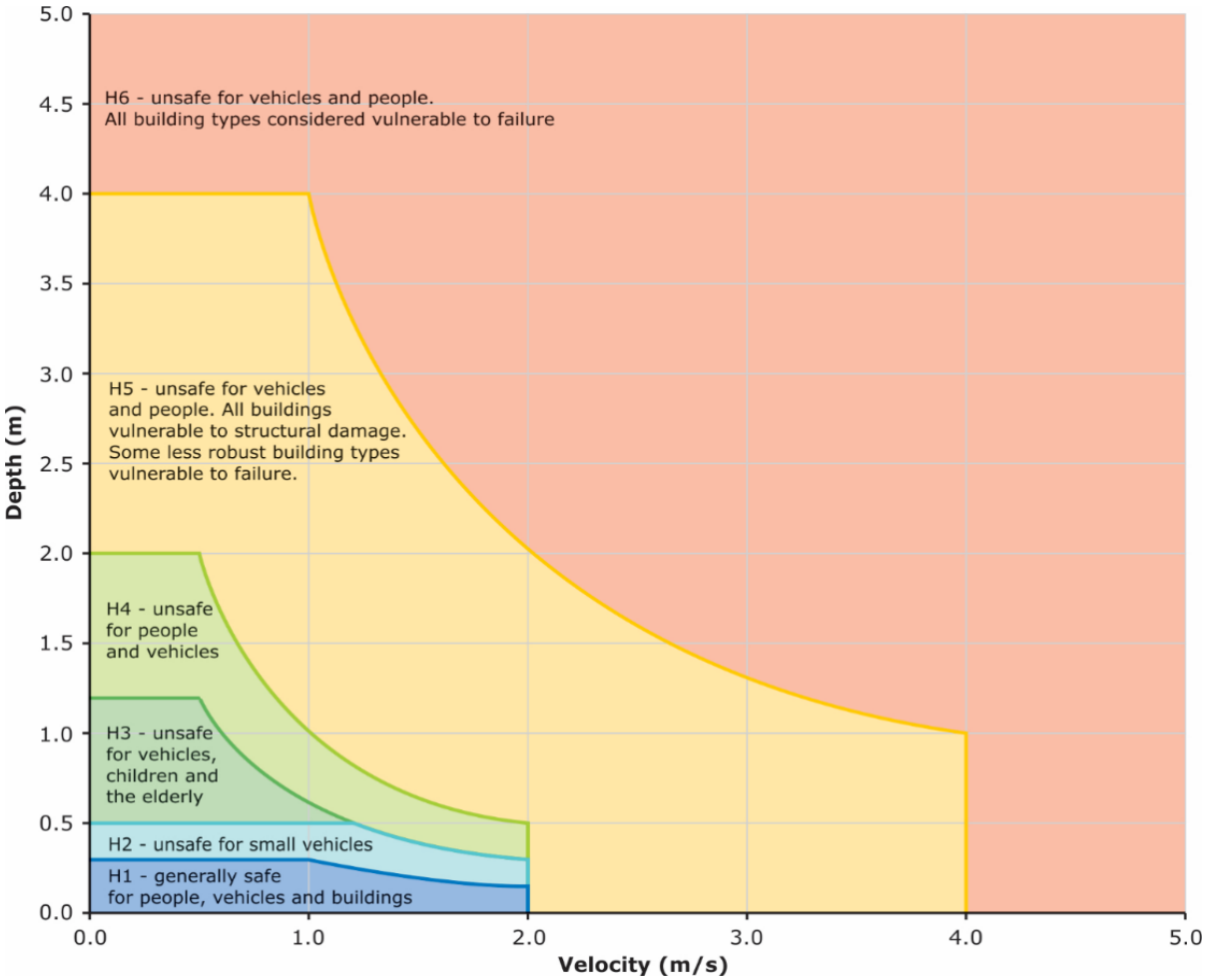

Figure 7. Hazard Categories Australian Disaster and Resilience Handbook

4.1 Tolerable Risk

Flood analysis for 11 Eularminner Street, Carlton shows that the proposed house and driveway are located within an overland flow path with moderate flood depths. Most of the area is rated as H3 hazard under the 1% AEP plus climate change scenario, meaning floodwaters in this location are unsafe for vehicles, children, and the elderly. While this rating indicates a manageable risk, local flow conditions still need to be carefully addressed in the design and construction of the development.

Flood depths and velocities on the lot may still cause erosion, sediment movement, and carry debris or vehicles during storm events. To reduce these risks, all parts of the structure must be built to handle water pressure, buoyancy, and flow forces. Construction methods should use flood-resistant materials and designs that limit damage and keep the structure stable during flooding. Bollards and a chain barrier must be installed along the driveway and boundary with No. 9 Eularminner Street to prevent vehicles from being moved into the neighbouring property during a 1% AEP flood.

If these structural measures are followed, the proposed dwelling, classified as a Class 1a habitable building under the BCA 2019, is expected to maintain an acceptable level of flood risk over its 50-year design life. However, this depends on full compliance with the report's recommendations, including proper construction practices, site grading, and resilient design. To further reduce risk to future occupants, a shelter-in-place strategy should be adopted, requiring residents to remain safely inside the building until floodwaters drop to safe evacuation levels.

Table 7 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 at 11 Eularminner Street, Carlton, within a slow moving overland 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 H3.

Table 8. TPS C12.6.1 Building and works within a flood-prone hazard area

C12.6.1 Building and works within a flood-prone hazard area			
Objective: (a) building and works within a flood-prone hazard area can achieve and maintain a tolerable risk from flood; and (b) buildings and works do not increase the risk from flood to adjacent land and public infrastructure.			
Performance Criteria			
P1.1		**P1.1**	
Buildings and works within a flood-prone hazard area must achieve and maintain a tolerable risk from a flood, having regard to:		Response from flood report	
(a)	the type, form, scale and intended duration of the development;	(a)	Proposed new dwelling development.
(b)	whether any increase in the level of risk from flood requires any specific hazard reduction or protection measures;	(b)	No increase in level of risk observed following the development.
(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 mitigation measures provided the minimum floor level recommendations are followed.

5. Conclusion

The flood modelling and assessment for 11 Eularminner Street, Carlton confirms that the proposed development can proceed with moderated flood risk, provided that all design and construction measures outlined in this report are followed.

- Under pre-development conditions, the site experiences shallow overland flow and ponding primarily in the central and northern sections of the lot. Flood depths remain mostly under 0.30 m, with localised depressions reaching up to 0.58 m. Flow velocities are low (0.1–0.4 m/s), and the entire site falls within the H1–H3 hazard range, indicating present but manageable flood risk.
- Post-development modelling shows that the proposed dwelling and associated works maintain the existing overland flow path. Slight increases in flood depth are observed (up to 0.59 m), with velocities remaining below 0.4 m/s. These changes do not result in increased flood impact on neighbouring properties or internal flow concentration. The hazard classification remains unchanged at H1–H3.
- The habitable floor level of the proposed dwelling has been designed to comply with the Building Regulations 2016 (S.54), setting the finished floor level (FFL) at 2.3 m AHD, 300 mm above the modelled 1% AEP + CC (2100) flood level of 2.0 m AHD.
- Structural design measures, including flood-resistant materials, hydrostatic and hydrodynamic load considerations, and barriers to prevent vehicle displacement, are required to ensure long-term resilience of the development. The proposed installation of bollards and a chain barrier along the boundary with 9 Eularminner Street is necessary to control flood-driven vehicle movement.
- The development does not introduce adverse flood impacts to adjacent properties, and site-specific flood behaviour remains consistent with pre-development conditions.
- Given the flood characteristics and hazard ratings, a shelter-in-place approach is recommended. Occupants should remain indoors during flood events until water levels recede to safe evacuation thresholds, as advised by emergency services.

6. Recommendations

Based on the outcomes of the hydraulic modelling and flood hazard assessment for 11 Eularminner Street, Carlton, the following recommendations are made to ensure the proposed development meets acceptable flood risk standards:

- The habitable floor level must be set no lower than 2.3 m AHD. This allows a minimum 300 mm freeboard above the modelled 1% AEP + climate change (Year 2100) flood level of 2.0 m AHD, as required under the Building Regulations 2016 (Section 54).
- All structural elements of the proposed dwelling must be designed to resist hydrostatic and hydrodynamic forces, including water pressure, buoyancy, and flow impact. Construction should incorporate flood-resistant materials and design strategies suited for prolonged water exposure.
- Bollards and a chain barrier must be installed along the driveway and the shared boundary with No. 9 Eularminner Street to prevent vehicle movement during flood events, reducing the risk of property damage and off-site impacts.
- Site grading must direct overland flow away from habitable areas and into designated drainage paths. The reshaping of local surface depressions should avoid creating concentrated flow or increasing ponding.
- A shelter-in-place emergency response plan should be adopted, with future occupants advised to remain indoors during flood events until floodwaters recede to safe evacuation levels, unless directed otherwise by emergency services.

- Ensure that the overland flow path remains unobstructed over time. Landscaping, fencing, and future works underneath sub-floor must not block or divert surface flows.
- All construction and flood mitigation measures must meet Sorell Council requirements and align with the Tasmanian Planning Scheme 2021 (C12.0) and Building Code of Australia provisions for flood-affected areas.

7. Limitations

This Flood Hazard Report has been prepared by Flüssig Engineers for **CMH Industries Pty Ltd**, for the proposed residential development at 11 Eularminner Street, Carlton. The assessment has been carried out in accordance with the requirements of Clauses C12.5.1 and C12.6.1 of the Tasmanian Planning Scheme – Sorell 2021, and is based on the site conditions, development layout, and available information at the time of assessment.

The findings, modelling results, and recommendations presented in this report are specific to the proposed development layout, finished floor levels, and surrounding catchment conditions as understood at the time of reporting. Should any modifications occur to the site layout, building location, surface levels, drainage infrastructure, or relevant design parameters, this report may no longer reflect the actual flood behaviour or hazard conditions. In such cases, a revised flood assessment must be undertaken to ensure ongoing compliance with flood risk provisions and regulatory requirements.

This document must be read and used in full. It must not be quoted, reproduced, or relied upon in part, or for any purpose other than that specifically outlined in this report, without the prior written consent of Flüssig Engineers.

This report relies on supporting information such as site surveys, development plans, and background flood data provided by third parties. Flüssig Engineers accepts no responsibility for the accuracy or completeness of third-party information used in this assessment. The conclusions drawn are based solely on the assumptions and data available at the time of modelling.

No liability will be accepted by Flüssig Engineers for any use of this report beyond the original scope or intended purpose, particularly where used to support alternate developments, planning applications, or design changes not assessed within this study.

8. References

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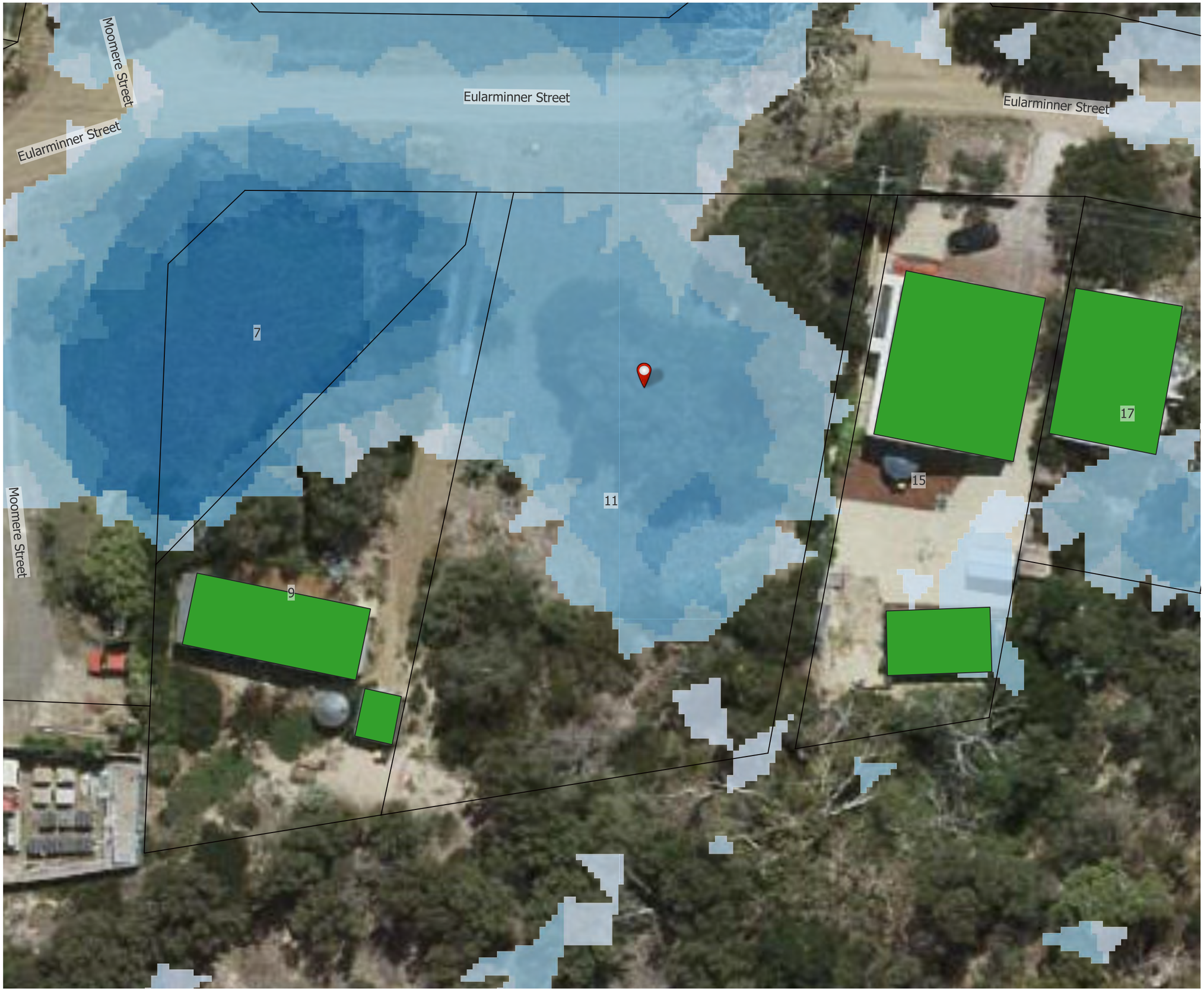
- Standards Australia, 2022, AS/NZS 3500.3: Plumbing and Drainage – Stormwater Drainage

9. Appendices

Appendix A Flood Maps

PRE 1% AEP + CC @2100



Legend

11 Eularminner Street

Boundary Lines

Building Areas

PRE 1% AEP + CC @2100

Depth (m)

- <= 0.03
- 0.03 - 0.05
- 0.05 - 0.10
- 0.10 - 0.30
- 0.30 - 0.60
- 0.60 - 0.80
- 0.80 - 1.00
- 1.00 - 1.50
- 1.50 - 2.00
- > 2.00

0 9 18 m

meters

N

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admin@flussig.com.au
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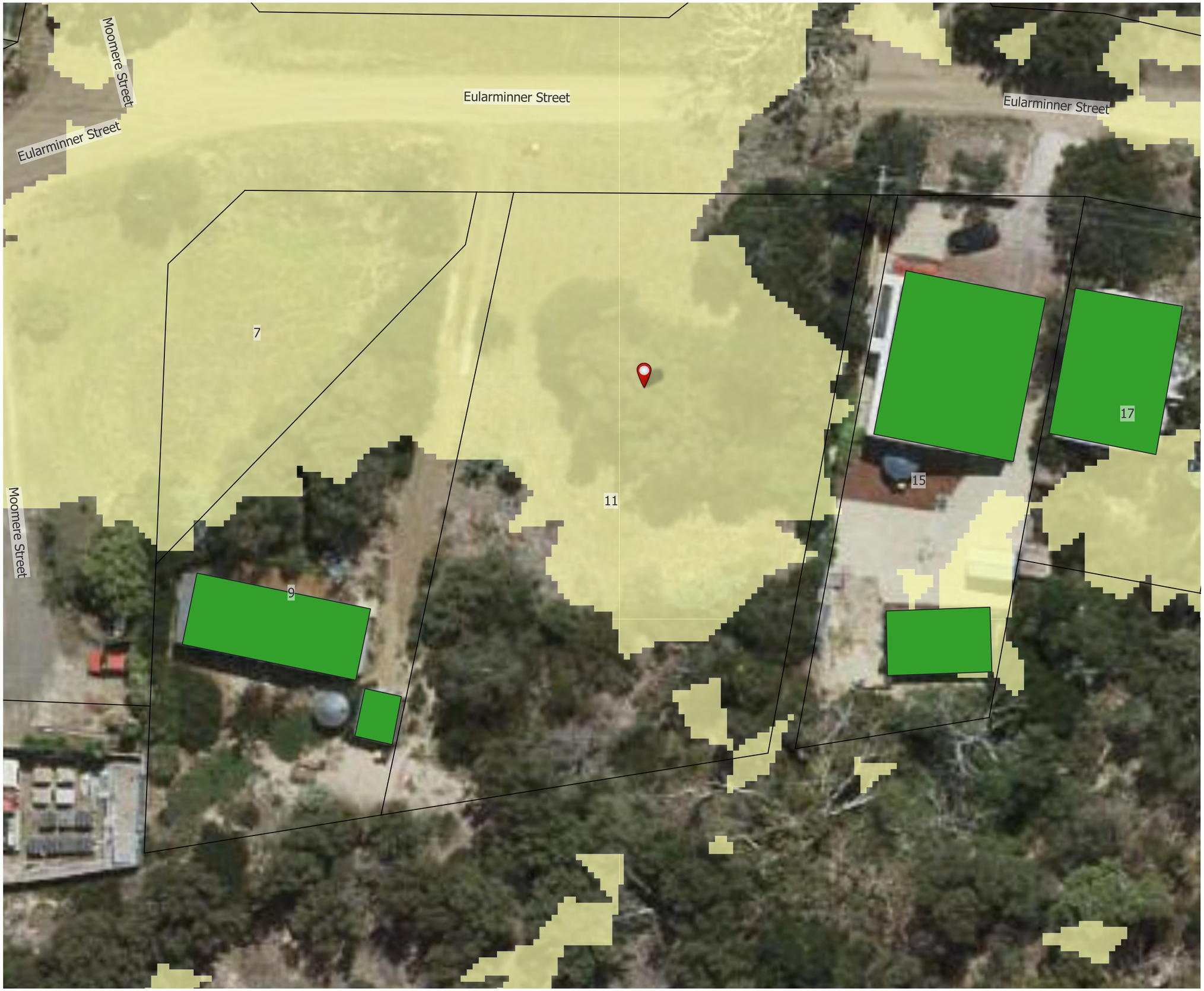
www.flussig.com.au
116 Bathurst St, Level 4
Hobart, 7000, TASMANIA

- 05-05-2025 - Flussig Engineers Map CRS: GDA94 / MGA zone 55 EPSG:28355

PRE 1% AEP + CC @2100



Legend

11 Eularminner Street

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

0 9 18 m

meters

N

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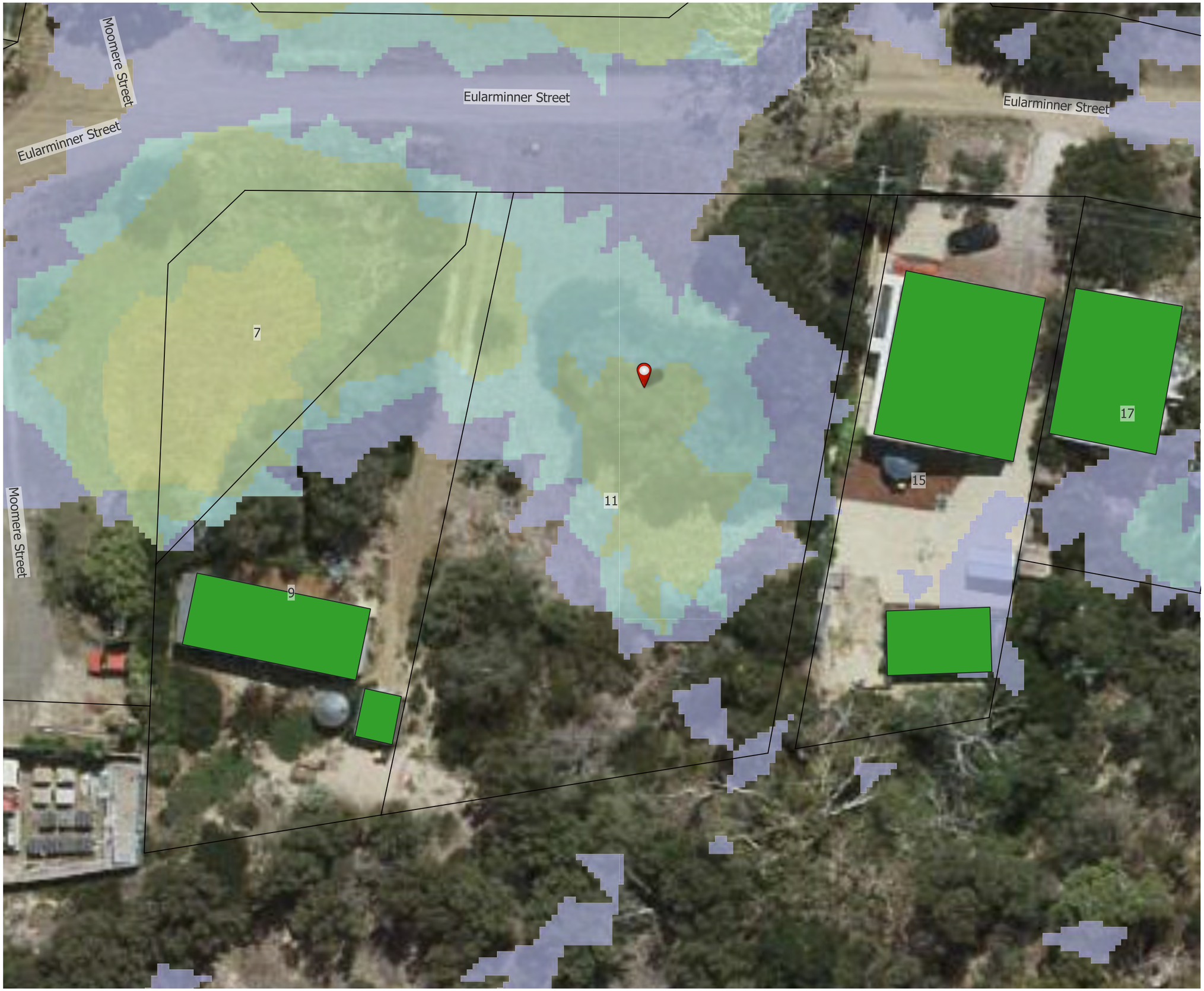
PRE 1% AEP + CC @2100



Legend

11 Eularminner Street

Boundary Lines

Building Areas

PRE 1% AEP + CC @2100

Hazard

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

0 9 18 m

meters

N

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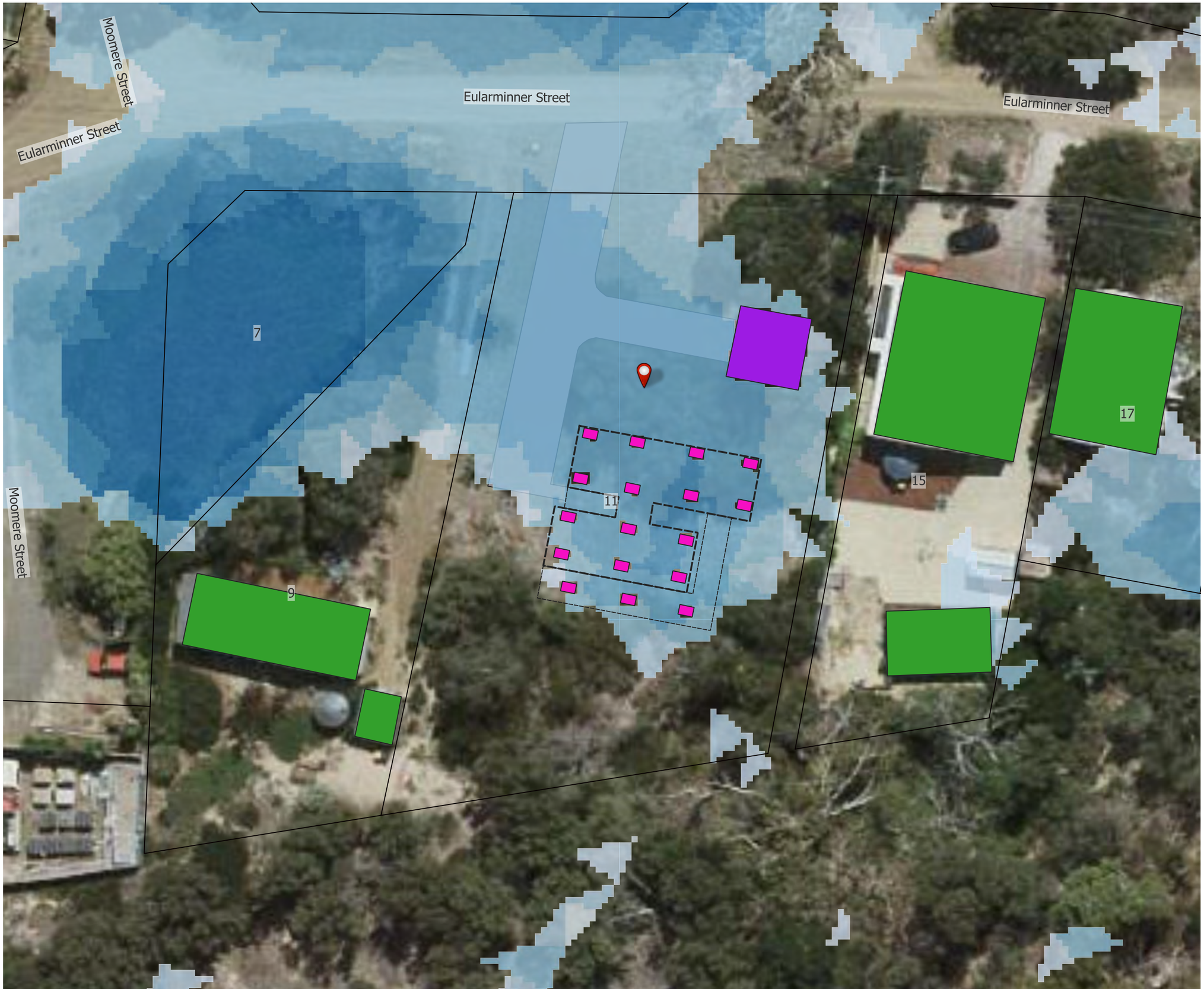
POST 1% AEP + CC @2100



Legend

11 Eularminner Street

- Boundary Lines
- Building Areas
- Proposed Building Over
- Proposed Piers
- Proposed Shed
- Proposed Driveway

POST 1% AEP + CC @2100

Depth (m)

- <= 0.03
- 0.03 - 0.05
- 0.05 - 0.10
- 0.10 - 0.30
- 0.30 - 0.60
- 0.60 - 0.80
- 0.80 - 1.00
- 1.00 - 1.50
- 1.50 - 2.00
- > 2.00

0 9 18 m

meters

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POST 1% AEP + CC @2100

Legend

11 Eularminner Street

- Boundary Lines
- Building Areas
- Proposed Building Over
- Proposed Piers
- Proposed Shed
- Proposed Driveway

POST 1% AEP + CC @2100

Velocity (m/s)

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

0 9 18 m

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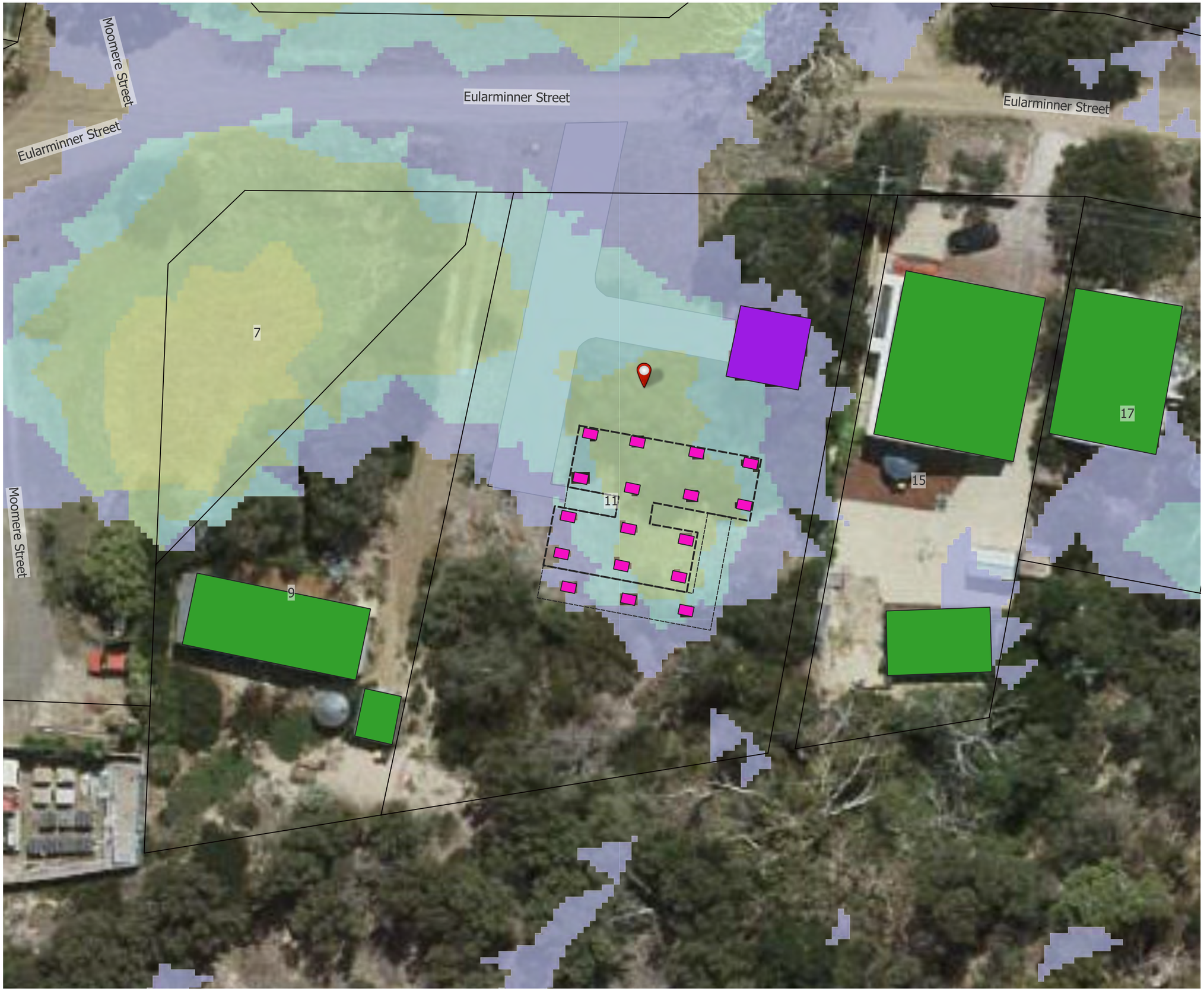
POST 1% AEP + CC @2100



Legend

11 Eularminner Street

- Boundary Lines
- Building Areas
- Proposed Building Over
- Proposed Piers
- Proposed Shed
- Proposed Driveway

POST 1% AEP + CC @2100

Hazard

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

0 9 18 m

meters

N

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- 05-05-2025 - Flussig Engineers Map CRS: GDA94 / MGA zone 55 EPSG:28355

Contact Project Manager: **Max Möller**

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DOYLE SOIL CONSULTING

SITE AND SOIL EVALUATION REPORT

FOUNDATION AND WINDLOADING ASSESSMENT

11 Eularminner St

Carlton

April 2025

Doyle Soil Consulting: 6/76 Auburn Rd Kingston Beach 7050 – 0488 080 455 – robyn@doylesoilconsulting.com.au

SITE INFORMATION

Client: Creative Homes Hobart

Address: 11 Eularminner St, Carlton (CT 84583/2)

Site Area: Approximately 1476 m^2

Date of inspection: 02/04/2025

Building type: New house

Services: Tank water supply and onsite wastewater management

Relevant Planning Overlays: Southern beaches onsite wastewater and stormwater management, specific area plan, flood prone hazard area

Mapped Geology - Mineral Resources Tasmania 1:250 000 southeast sheet: **Qh** = Quaternary sand, gravel, and mud of alluvial, lacustrine and littoral origin

Soil Depth: > 2.0 m

Subsoil Drainage: Moderately-well drained

Drainage lines/water courses: Carlton beach 200 m southwest

Vegetation: grass and brush

Rainfall in previous 7 days: Approximately 3 mm

Slope: Approximately 1-6° to the south

SITE ASSESSMENT AND SAMPLE TESTING

Site investigation and soil classification in accordance with AS 2870-2011 *Residential slabs and footings* and in accordance with AS 4055-2021 *Wind load for Housing.* Test holes were dug using a Christie Post Driver Soil Sampling Kit, comprising CHPD78 Christie Post Driver with Soil Sampling Tube (50 mm OD x 1600/2100 mm). For test hole and DCP locations, see Appendix 1.

- Two test hole (TH) cores:
  - TH1 with **no refusal** at 2.0 m
  - TH2 with **no refusal** at 1.8 m
- One Dynamic Cone Penetrometer (DCP) test:
  - DCP1 with **no refusal** at 1.8 m

SOIL PROFILES – Test Hole 1

Depth (m)	Horizon	Description and field texture grade	USCS Class
0.0 – 0.3	A1	Very dark grey (7.5YR 3/1), **Sand**, single grain, dry loose consistency, common roots	**SP**
0.3 – 0.55	A2	Grey (7.5YR 6/1), **Sand**, single grain, dry loose consistency, few roots	**SP**
0.55 – 1.0	$B2_1$	Brown (7.5YR 4/2), **Sand**, single grain, slightly moist medium dense consistency. moist below 0.8m	**SP**
1.0 – 1.3	$B2_2$	Grey (7.5YR 6/1), **Sand**, single grain, saturated dense consistency	**SP**
1.3 – 2.0	$B2_3$	Dark grey (2.5Y 4/1), **Sand**, single grain, saturated dense consistency. <u>No refusal</u>	**SP**

SOIL PROFILES – Test Hole 2

Depth (m)	Horizon	Description and field texture grade	USCS Class
0.0 – 0.3	A1	Very dark grey (7.5YR 3/1), **Sand**, single grain, dry loose consistency, common roots	**SP**
0.3 – 0.6	A2	Light brownish grey (10YR 6/2), **Sand**, single grain, dry loose consistency, few roots	**SP**
0.6 – 0.8	$B2_{1g}$	Very pale brown (10YR 7/3) common rusty orange brown mottles, **Sand**, single grain, moist dense consistency, seasonally wet	**SP**
0.8 – 1.3	$B2_2$	Grey (7.5YR 6/1), **Sand**, single grain, saturated dense consistency	**SP**
1.3 – 1.8	$B2_3$	Dark grey (2.5Y 4/1), **Sand**, single grain, saturated dense consistency. <u>No Refusal</u>	**SP**

SITE AND SOIL COMMENTS

The soil profiles are formed from windblown sand (dune) deposits. The profiles are moderately deep with no refusal occurring at approximately 1.8 to 2.0 m depth. The field textures of the soil profile are dominated by sand which is moist and dense below approximately 0.8 – 1.0 m. The DCP indicates a low bearing capacity to at least 0.8 m. Founding on the deeper, more competent sands, at and below approximately 1.8 m depth, is recommended.

At time of testing the water table was at approximately 0.8 – 1.0 m depth. Soil mottling indicates the intermittent water table can be as shallow as approximately 0.6 m depth.

DCP TESTS AND ESTIMATED BEARING CAPACITY

A minimum bearing capacity of 100 kPa is required for strip and pad footings and under the edge footings and associated slab foundations (refer to tables below and *AS2870-2011 clause 2.4.5*). We provide estimated soil bearing strengths along with a variance range (+/-) based on a review of published literature relating field Dynamic Cone Penetrometer (DCP) readings to triaxial soil strength tests. A safety factor of 3 is normal use to estimate the ALLOWABLE bearing capacity from the estimated ULTIMATE bearing capacity to cater to these field variations in soil type and geology and changes in strength of soil with moisture levels.

The data from DCP1 indicate the bearing capacity of the soil is at a *suitable* strength below 1.0 m. However, the deeper more competent sands at and below approximately 1.8 m would be the *recommended* foundation material.

DCP 1				
Depth (mm)	DCP n-number (Blows/100 mm)	DCP Penetration Index (mm/Blow)	Estimated Bearing Capacity (kPa = n x 30)	Likely Variance (+/-)
0 - 100	1	100.0	30	10
100 - 200	1	100.0	30	10
200 - 300	2	50.0	60	20
300 - 400	2	50.0	60	20
400 - 500	2	50.0	60	20
500 - 600	3	33.3	90	30
600 - 700	4	25.0	120	40
700 - 800	7	14.3	210	70
800 - 900	8	12.5	240	80
900 - 1000	8	12.5	240	80
1000 - 1100	10	10.0	300	100
1100 - 1200	11	9.1	330	110
1200 - 1300	10	10.0	300	100
1300 - 1400	10	10.0	300	100
1400 - 1500	10	10.0	300	100
1500 - 1600	10	10.0	300	100
1600 - 1700	11	9.1	330	110
1700 - 1800	12	8.3	360	120

WIND CLASSIFICATION

The following wind classification for the site is in accordance with AS 4055-2021 (*Wind loads for Housing*). For structures other than class 1 and class 10 structures, or that exceed the geometric limits in Clause 1.2 of AS 4055-2021, the wind classification shall be calculated in accordance with AS 1170.2-2021 (*Structural Design Actions – Wind Actions)*.

The wind classification for the site, per AS 4055-2021:

Region:	**A**
Terrain Category:	**TC1 – open water within 200 m**
Shielding Classification:	**PS – partial shielding**
Topographic Classification:	**To – lower 3rd of slope feature**
Wind Classification:	**N2**
Design Wind Gust Speed ($V_{h,u}$):	**40 m/sec**

SITE CLASSIFICATION AND RECOMMENDATIONS

For standard foundations (100 kPa bearing capacity), the site meets the criteria for a **Class P** site classification, as set out in AS2870-2011 (construction). This classification is appropriate due to the presence of non-cohesive sands with low bearing capacity to approximately 1.0 m depth. Founding on the deeper more competent sands at or below approximately 1.8 m depth, is recommended.

Note 1 – In addition to the **Class P** site classification, the site meets the reactivity levels of Class A or non-reactive sand, with no surface movement under normal soil moisture ranges for the location.

Note 2 – All foundations require ongoing adequate drainage and vegetation management – please refer to the attached CSIRO foundation management BTF 18 sheet.

Note 3 – If any foundations are placed on FILL that is > 0.5 m in depth, then **Class P** is applicable.

Note 4 – Based on the upper 0.6 m of soil, all plumbing fixtures and fittings should be installed using **Class A** as per *Appendix G AS/NZS 3500.2.2021*.

General Notes – Important points pertinent to the maintenance of foundation soil conditions

This report relates to the soil and site conditions on the property at the time of the site assessment. The satisfactory long-term performance of footings is dependent upon ongoing site maintenance by the owner.

Examples of abnormal moisture conditions developing after construction include the following:

A) The effect of trees too close to the footings.
B) Excessive or irregular watering of gardens adjacent to the footings.
C) Failure to maintain site drainage affecting footings.
D) Failure to repair plumbing leaks affecting footings.
E) Loss of vegetation from near the building.

All earthworks on site must comply with AS 3798-2007 Guidelines on Earthworks for commercial and residential developments.

REPORT LIMITATIONS

Whilst every attempt is made to describe sub-surface conditions, natural variation will occur that cannot be determined by limited investigative soil testing. Therefore, discrepancies are possible between test results and observations during construction. It is our intention to accurately indicate the most probable soil type(s) and conditions for the area assessed. However, due to the nature of sampling an area, variations in soil type, soil depth and site conditions may occur.

We accept no responsibility for any differences between what we have reported and actual site and soil conditions for particular regions we could not directly assess at the time of inspection.

It is recommended that during construction, Doyle Soil Consulting and/or the design engineer be notified of any major variation to the foundation conditions as predicted in this report. Any changes to the site through excavations may alter the site classification.

In these cases, it is expected that the owner consults the author for a reclassification. This report requires certification via a form 55 certificate from Doyle Soil Consulting to validate its contents.

Because site discrepancies may occur between this report and actual site conditions, it is a condition of certification of this report that the builder be provided with a copy of this report.

Rowan Mason
B.Agr.Sc.(Hons).
Soil Scientist

Robyn Doyle
B.Agr.Sc.
CPSS (Certified Prof Soil Scientist)
Soil Scientist and Wastewater Designer
Licence no. CC7149

APPENDIX 1 – Approximate test hole and DCP locations

APPENDIX 2 – Definitions of Soil Horizons

Horizon name	Meaning
A1	Dark topsoils, zone of maximum organic activity
A2 or E	Leached, light/pale washed-out sandy layer
A3 or AB	Transition from A to B, more like A
B1 or BA	Transition from A to B, more like B
B2	Main subsoils layer with brown colouration, accumulations of clay, humus, iron oxide, etc
B3	Transitional from B2 to C
C	Weakly weathered soil parent materials
Subscript	**Meaning**
r	Reducing conditions (anaerobic)
t	Enriched in translocated clay
s	Iron/aluminium oxide accumulations in subsoil
g	Mottled, suggesting periodic/seasonal wetness
m	Cemented layer (oxides, carbonates, humus, silica etc)
k	Calcium carbonate (lime) accumulation
h	Humus accumulation in subsoil

CERTIFICATE OF QUALIFIED PERSON – ASSESSABLE ITEM

Section 321

Form **55**

To: Creative Homes Hobart *Owner name*

PO Box 88 *Address*

Glenorchy TAS 7010 *Suburb/postcode*

Qualified person details:

Qualified person: Robyn Doyle

Address: 6/76 Auburn Rd

Kingston Beach 7050

Phone No: 0488 080 455

Fax No:

Licence No: N/A

Email address: robyn@doylesoilconsulting.com.au

Qualifications and Insurance details: Soil Scientist
Certified Professional Soil Scientist (CPSS)
Professional Indemnity cover –

About Underwriting -Lloyd's of London
ENG 21 000305

(description from Column 3 of the Director's Determination - Certificates by Qualified Persons for Assessable Items

Speciality area of expertise: Classification of foundation conditions according to AS2870-2011

(description from Column 4 of the Director's Determination - Certificates by Qualified Persons for Assessable Items)

Details of work:

Address: 11 Eularminner St

Carlton TAS 7173

Lot No: 2

Certificate of title No: 84583/2

The assessable item related to this certificate: Site and soil classification

(description of the assessable item being certified)
Assessable item includes –
- *a material;*
- *a design*
- *a form of construction*
- *a document*
- *testing of a component, building system or plumbing system*
- *an inspection, or assessment, performed*

Certificate details:

Certificate type: Geotechnical Assessment

(description from Column 1 of Schedule 1 of the Director's Determination - Certificates by Qualified Persons for Assessable Items n)

This certificate is in relation to the above assessable item, at any stage, as part of - *(tick one)*

building work, plumbing work or plumbing installation or demolition work: X

or

a building, temporary structure or plumbing installation: ☐

In issuing this certificate the following matters are relevant –

Documents:	The attached Geotechnical Assessment Report for the address detailed above in, 'Details of Work'.
Relevant calculations:	Refer to above report.
References:	AS1726-2017 Geotechnical site investigations CSIRO Building Technology File -18

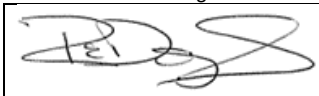
Substance of Certificate: *(what it is that is being certified)*

Geotechnical Assessment -Site and soil classification

Scope and/or Limitations

The classification applies to the site as inspected and does not account for future alteration to foundation conditions as a result of earthworks, drainage condition changes or variations in site maintenance.

I certify the matters described in this certificate.

	Signed:	*Certificate No:*	*Date:*
Qualified person:		1717	16/04/2025

Foundation Maintenance and Footing Performance:
A Homeowner's Guide

PUBLISHING

BTF 18-2011
replaces
Information
Sheet 10/91

Buildings can and often do move. This movement can be up, down, lateral or rotational. The fundamental cause of movement in buildings can usually be related to one or more problems in the foundation soil. It is important for the homeowner to identify the soil type in order to ascertain the measures that should be put in place in order to ensure that problems in the foundation soil can be prevented, thus protecting against building movement.

This Building Technology File is designed to identify causes of soil-related building movement, and to suggest methods of prevention of resultant cracking in buildings.

Soil Types

The types of soils usually present under the topsoil in land zoned for residential buildings can be split into two approximate groups – granular and clay. Quite often, foundation soil is a mixture of both types. The general problems associated with soils having granular content are usually caused by erosion. Clay soils are subject to saturation and swell/shrink problems.

Classifications for a given area can generally be obtained by application to the local authority, but these are sometimes unreliable and if there is doubt, a geotechnical report should be commissioned. As most buildings suffering movement problems are founded on clay soils, there is an emphasis on classification of soils according to the amount of swell and shrinkage they experience with variations of water content. The table below is Table 2.1 from AS 2870-2011, the Residential Slab and Footing Code.

Causes of Movement

Settlement due to construction

There are two types of settlement that occur as a result of construction:

- Immediate settlement occurs when a building is first placed on its foundation soil, as a result of compaction of the soil under the weight of the structure. The cohesive quality of clay soil mitigates against this, but granular (particularly sandy) soil is susceptible.
- Consolidation settlement is a feature of clay soil and may take place because of the expulsion of moisture from the soil or because of the soil's lack of resistance to local compressive or shear stresses. This will usually take place during the first few months after construction, but has been known to take many years in exceptional cases.

These problems are the province of the builder and should be taken into consideration as part of the preparation of the site for construction. Building Technology File 19 (BTF 19) deals with these problems.

Erosion

All soils are prone to erosion, but sandy soil is particularly susceptible to being washed away. Even clay with a sand component of say 10% or more can suffer from erosion.

Saturation

This is particularly a problem in clay soils. Saturation creates a bog-like suspension of the soil that causes it to lose virtually all of its bearing capacity. To a lesser degree, sand is affected by saturation because saturated sand may undergo a reduction in volume, particularly imported sand fill for bedding and blinding layers. However, this usually occurs as immediate settlement and should normally be the province of the builder.

Seasonal swelling and shrinkage of soil

All clays react to the presence of water by slowly absorbing it, making the soil increase in volume (see table below). The degree of increase varies considerably between different clays, as does the degree of decrease during the subsequent drying out caused by fair weather periods. Because of the low absorption and expulsion rate, this phenomenon will not usually be noticeable unless there are prolonged rainy or dry periods, usually of weeks or months, depending on the land and soil characteristics.

The swelling of soil creates an upward force on the footings of the building, and shrinkage creates subsidence that takes away the support needed by the footing to retain equilibrium.

Shear failure

This phenomenon occurs when the foundation soil does not have sufficient strength to support the weight of the footing. There are two major post-construction causes:

- Significant load increase.
- Reduction of lateral support of the soil under the footing due to erosion or excavation.

In clay soil, shear failure can be caused by saturation of the soil adjacent to or under the footing.

GENERAL DEFINITIONS OF SITE CLASSES

Class	Foundation
A	Most sand and rock sites with little or no ground movement from moisture changes
S	Slightly reactive clay sites, which may experience only slight ground movement from moisture changes
M	Moderately reactive clay or silt sites, which may experience moderate ground movement from moisture changes
H1	Highly reactive clay sites, which may experience high ground movement from moisture changes
H2	Highly reactive clay sites, which may experience very high ground movement from moisture changes
E	Extremely reactive sites, which may experience extreme ground movement from moisture changes

Notes

1. Where controlled fill has been used, the site may be classified A to E according to the type of fill used.
2. Filled sites. Class P is used for sites which include soft fills, such as clay or silt or loose sands; landslip; mine subsidence; collapsing soils; soil subject to erosion; reactive sites subject to abnormal moisture conditions or sites which cannot be classified otherwise.
3. Where deep-seated moisture changes exist on sites at depths of 3 m or greater, further classification is needed for Classes M to E (M-D, H1-D, H2-D and E-D).

Tree root growth
Trees and shrubs that are allowed to grow in the vicinity of footings can cause foundation soil movement in two ways:

- Roots that grow under footings may increase in cross-sectional size, exerting upward pressure on footings.
- Roots in the vicinity of footings will absorb much of the moisture in the foundation soil, causing shrinkage or subsidence.

Unevenness of Movement

The types of ground movement described above usually occur unevenly throughout the building's foundation soil. Settlement due to construction tends to be uneven because of:

- Differing compaction of foundation soil prior to construction.
- Differing moisture content of foundation soil prior to construction.

Movement due to non-construction causes is usually more uneven still. Erosion can undermine a footing that traverses the flow or can create the conditions for shear failure by eroding soil adjacent to a footing that runs in the same direction as the flow.

Saturation of clay foundation soil may occur where subfloor walls create a dam that makes water pond. It can also occur wherever there is a source of water near footings in clay soil. This leads to a severe reduction in the strength of the soil which may create local shear failure.

Seasonal swelling and shrinkage of clay soil affects the perimeter of the building first, then gradually spreads to the interior. The swelling process will usually begin at the uphill extreme of the building, or on the weather side where the land is flat. Swelling gradually reaches the interior soil as absorption continues. Shrinkage usually begins where the sun's heat is greatest.

Effects of Uneven Soil Movement on Structures

Erosion and saturation
Erosion removes the support from under footings, tending to create subsidence of the part of the structure under which it occurs. Brickwork walls will resist the stress created by this removal of support by bridging the gap or cantilevering until the bricks or the mortar bedding fail. Older masonry has little resistance. Evidence of failure varies according to circumstances and symptoms may include:

- Step cracking in the mortar beds in the body of the wall or above/below openings such as doors or windows.
- Vertical cracking in the bricks (usually but not necessarily in line with the vertical beds or perpends).

Isolated piers affected by erosion or saturation of foundations will eventually lose contact with the bearers they support and may tilt or fall over. The floors that have lost this support will become bouncy, sometimes rattling ornaments etc.

Seasonal swelling/shrinkage in clay
Swelling foundation soil due to rainy periods first lifts the most exposed extremities of the footing system, then the remainder of the perimeter footings while gradually permeating inside the building footprint to lift internal footings. This swelling first tends to create a dish effect, because the external footings are pushed higher than the internal ones.

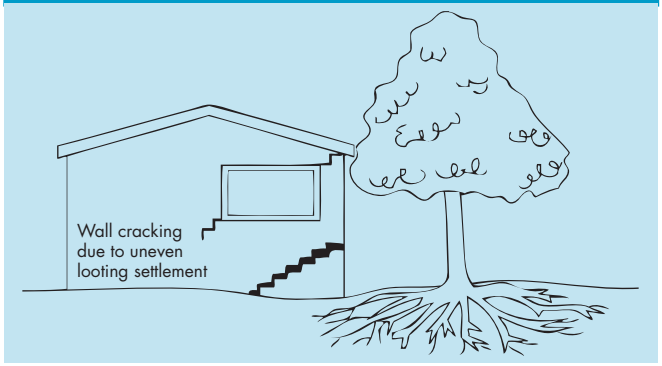
The first noticeable symptom may be that the floor appears slightly dished. This is often accompanied by some doors binding on the floor or the door head, together with some cracking of cornice mitres. In buildings with timber flooring supported by bearers and joists, the floor can be bouncy. Externally there may be visible dishing of the hip or ridge lines.

As the moisture absorption process completes its journey to the innermost areas of the building, the internal footings will rise. If the spread of moisture is roughly even, it may be that the symptoms will temporarily disappear, but it is more likely that swelling will be uneven, creating a difference rather than a disappearance in symptoms. In buildings with timber flooring supported by bearers and joists, the isolated piers will rise more easily than the strip footings or piers under walls, creating noticeable doming of flooring.

As the weather pattern changes and the soil begins to dry out, the external footings will be first affected, beginning with the locations where the sun's effect is strongest. This has the effect of lowering the external footings. The doming is accentuated and cracking reduces or disappears where it occurred because of dishing, but other cracks open up. The roof lines may become convex.

Doming and dishing are also affected by weather in other ways. In areas where warm, wet summers and cooler dry winters prevail, water migration tends to be toward the interior and doming will be accentuated, whereas where summers are dry and winters are cold and wet, migration tends to be toward the exterior and the underlying propensity is toward dishing.

Trees can cause shrinkage and damage



Movement caused by tree roots
In general, growing roots will exert an upward pressure on footings, whereas soil subject to drying because of tree or shrub roots will tend to remove support from under footings by inducing shrinkage.

Complications caused by the structure itself
Most forces that the soil causes to be exerted on structures are vertical – i.e. either up or down. However, because these forces are seldom spread evenly around the footings, and because the building resists uneven movement because of its rigidity, forces are exerted from one part of the building to another. The net result of all these forces is usually rotational. This resultant force often complicates the diagnosis because the visible symptoms do not simply reflect the original cause. A common symptom is binding of doors on the vertical member of the frame.

Effects on full masonry structures
Brickwork will resist cracking where it can. It will attempt to span areas that lose support because of subsided foundations or raised points. It is therefore usual to see cracking at weak points, such as openings for windows or doors.

In the event of construction settlement, cracking will usually remain unchanged after the process of settlement has ceased.

With local shear or erosion, cracking will usually continue to develop until the original cause has been remedied, or until the subsidence has completely neutralised the affected portion of footing and the structure has stabilised on other footings that remain effective.

In the case of swell/shrink effects, the brickwork will in some cases return to its original position after completion of a cycle, however it is more likely that the rotational effect will not be exactly reversed, and it is also usual that brickwork will settle in its new position and will resist the forces trying to return it to its original position. This means that in a case where swelling takes place after construction and cracking occurs, the cracking is likely to at least partly remain after the shrink segment of the cycle is complete. Thus, each time the cycle is repeated, the likelihood is that the cracking will become wider until the sections of brickwork become virtually independent.

With repeated cycles, once the cracking is established, if there is no other complication, it is normal for the incidence of cracking to stabilise, as the building has the articulation it needs to cope with the problem. This is by no means always the case, however, and monitoring of cracks in walls and floors should always be treated seriously.

Upheaval caused by growth of tree roots under footings is not a simple vertical shear stress. There is a tendency for the root to also exert lateral forces that attempt to separate sections of brickwork after initial cracking has occurred.

The normal structural arrangement is that the inner leaf of brickwork in the external walls and at least some of the internal walls (depending on the roof type) comprise the load-bearing structure on which any upper floors, ceilings and the roof are supported. In these cases, it is internally visible cracking that should be the main focus of attention, however there are a few examples of dwellings whose external leaf of masonry plays some supporting role, so this should be checked if there is any doubt. In any case, externally visible cracking is important as a guide to stresses on the structure generally, and it should also be remembered that the external walls must be capable of supporting themselves.

Effects on framed structures
Timber or steel framed buildings are less likely to exhibit cracking due to swell/shrink than masonry buildings because of their flexibility. Also, the doming/dishing effects tend to be lower because of the lighter weight of walls. The main risks to framed buildings are encountered because of the isolated pier footings used under walls. Where erosion or saturation causes a footing to fall away, this can double the span which a wall must bridge. This additional stress can create cracking in wall linings, particularly where there is a weak point in the structure caused by a door or window opening. It is, however, unlikely that framed structures will be so stressed as to suffer serious damage without first exhibiting some or all of the above symptoms for a considerable period. The same warning period should apply in the case of upheaval. It should be noted, however, that where framed buildings are supported by strip footings there is only one leaf of brickwork and therefore the externally visible walls are the supporting structure for the building. In this case, the subfloor masonry walls can be expected to behave as full brickwork walls.

Effects on brick veneer structures
Because the load-bearing structure of a brick veneer building is the frame that makes up the interior leaf of the external walls plus perhaps the internal walls, depending on the type of roof, the building can be expected to behave as a framed structure, except that the external masonry will behave in a similar way to the external leaf of a full masonry structure.

Water Service and Drainage

Where a water service pipe, a sewer or stormwater drainage pipe is in the vicinity of a building, a water leak can cause erosion, swelling or saturation of susceptible soil. Even a minuscule leak can be enough to saturate a clay foundation. A leaking tap near a building can have the same effect. In addition, trenches containing pipes can become watercourses even though backfilled, particularly where broken rubble is used as fill. Water that runs along these trenches can be responsible for serious erosion, interstrata seepage into subfloor areas and saturation.

Pipe leakage and trench water flows also encourage tree and shrub roots to the source of water, complicating and exacerbating the problem. Poor roof plumbing can result in large volumes of rainwater being concentrated in a small area of soil:

- Incorrect falls in roof guttering may result in overflows, as may gutters blocked with leaves etc.
- Corroded guttering or downpipes can spill water to ground.
- Downpipes not positively connected to a proper stormwater collection system will direct a concentration of water to soil that is directly adjacent to footings, sometimes causing large-scale problems such as erosion, saturation and migration of water under the building.

Seriousness of Cracking

In general, most cracking found in masonry walls is a cosmetic nuisance only and can be kept in repair or even ignored. The table below is a reproduction of Table C1 of AS 2870-2011.

AS 2870-2011 also publishes figures relating to cracking in concrete floors, however because wall cracking will usually reach the critical point significantly earlier than cracking in slabs, this table is not reproduced here.

Prevention/Cure

Plumbing
Where building movement is caused by water service, roof plumbing, sewer or stormwater failure, the remedy is to repair the problem. It is prudent, however, to consider also rerouting pipes away from the building where possible, and relocating taps to positions where any leakage will not direct water to the building vicinity. Even where gully traps are present, there is sometimes sufficient spill to create erosion or saturation, particularly in modern installations using smaller diameter PVC fixtures. Indeed, some gully traps are not situated directly under the taps that are installed to charge them, with the result that water from the tap may enter the backfilled trench that houses the sewer piping. If the trench has been poorly backfilled, the water will either pond or flow along the bottom of the trench. As these trenches usually run alongside the footings and can be at a similar depth, it is not hard to see how any water that is thus directed into a trench can easily affect the foundation's ability to support footings or even gain entry to the subfloor area.

Ground drainage
In all soils there is the capacity for water to travel on the surface and below it. Surface water flows can be established by inspection during and after heavy or prolonged rain. If necessary, a grated drain system connected to the stormwater collection system is usually an easy solution.

It is, however, sometimes necessary when attempting to prevent water migration that testing be carried out to establish watertable height and subsoil water flows. This subject is referred to in BTF 19 and may properly be regarded as an area for an expert consultant.

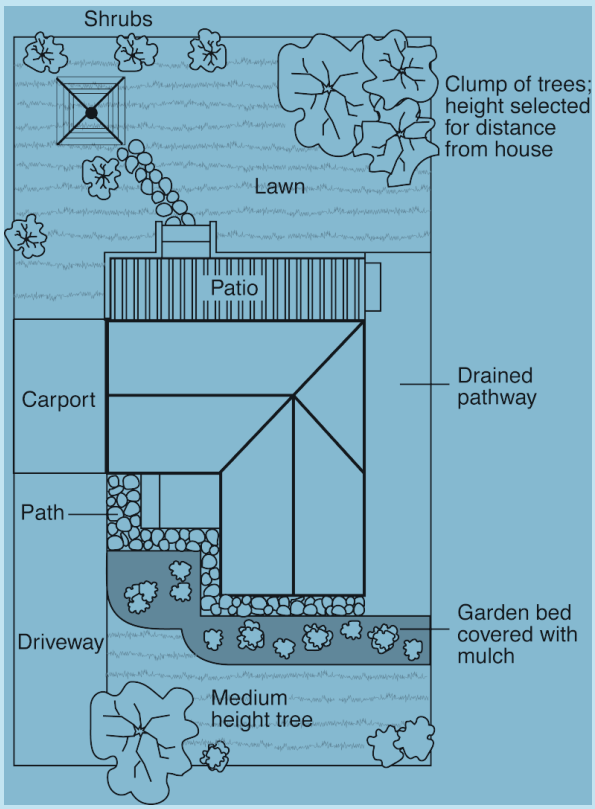
Protection of the building perimeter
It is essential to remember that the soil that affects footings extends well beyond the actual building line. Watering of garden plants, shrubs and trees causes some of the most serious water problems.

For this reason, particularly where problems exist or are likely to occur, it is recommended that an apron of paving be installed around as much of the building perimeter as necessary. This paving should

CLASSIFICATION OF DAMAGE WITH REFERENCE TO WALLS

Description of typical damage and required repair	Approximate crack width limit (see Note 3)	Damage category
Hairline cracks	<0.1 mm	0
Fine cracks which do not need repair	<1 mm	1
Cracks noticeable but easily filled. Doors and windows stick slightly.	<5 mm	2
Cracks can be repaired and possibly a small amount of wall will need to be replaced. Doors and windows stick. Service pipes can fracture. Weathertightness often impaired.	5–15 mm (or a number of cracks 3 mm or more in one group)	3
Extensive repair work involving breaking-out and replacing sections of walls, especially over doors and windows. Window and door frames distort. Walls lean or bulge noticeably, some loss of bearing in beams. Service pipes disrupted.	15–25 mm but also depends on number of cracks	4

Gardens for a reactive site



extend outwards a minimum of 900 mm (more in highly reactive soil) and should have a minimum fall away from the building of 1:60. The finished paving should be no less than 100 mm below brick vent bases.

It is prudent to relocate drainage pipes away from this paving, if possible, to avoid complications from future leakage. If this is not practical, earthenware pipes should be replaced by PVC and backfilling should be of the same soil type as the surrounding soil and compacted to the same density.

Except in areas where freezing of water is an issue, it is wise to remove taps in the building area and relocate them well away from the building – preferably not uphill from it (see BTF 19).

It may be desirable to install a grated drain at the outside edge of the paving on the uphill side of the building. If subsoil drainage is needed this can be installed under the surface drain.

Condensation

In buildings with a subfloor void such as where bearers and joists support flooring, insufficient ventilation creates ideal conditions for condensation, particularly where there is little clearance between the floor and the ground. Condensation adds to the moisture already present in the subfloor and significantly slows the process of drying out. Installation of an adequate subfloor ventilation system, either natural or mechanical, is desirable.

Warning: Although this Building Technology File deals with cracking in buildings, it should be said that subfloor moisture can result in the development of other problems, notably:

- Water that is transmitted into masonry, metal or timber building elements causes damage and/or decay to those elements.
- High subfloor humidity and moisture content create an ideal environment for various pests, including termites and spiders.
- Where high moisture levels are transmitted to the flooring and walls, an increase in the dust mite count can ensue within the living areas. Dust mites, as well as dampness in general, can be a health hazard to inhabitants, particularly those who are abnormally susceptible to respiratory ailments.

The garden

The ideal vegetation layout is to have lawn or plants that require only light watering immediately adjacent to the drainage or paving edge, then more demanding plants, shrubs and trees spread out in that order.

Overwatering due to misuse of automatic watering systems is a common cause of saturation and water migration under footings. If it is necessary to use these systems, it is important to remove garden beds to a completely safe distance from buildings.

Existing trees

Where a tree is causing a problem of soil drying or there is the existence or threat of upheaval of footings, if the offending roots are subsidiary and their removal will not significantly damage the tree, they should be severed and a concrete or metal barrier placed vertically in the soil to prevent future root growth in the direction of the building. If it is not possible to remove the relevant roots without damage to the tree, an application to remove the tree should be made to the local authority. A prudent plan is to transplant likely offenders before they become a problem.

Information on trees, plants and shrubs

State departments overseeing agriculture can give information regarding root patterns, volume of water needed and safe distance from buildings of most species. Botanic gardens are also sources of information. For information on plant roots and drains, see Building Technology File 17.

Excavation

Excavation around footings must be properly engineered. Soil supporting footings can only be safely excavated at an angle that allows the soil under the footing to remain stable. This angle is called the angle of repose (or friction) and varies significantly between soil types and conditions. Removal of soil within the angle of repose will cause subsidence.

Remediation

Where erosion has occurred that has washed away soil adjacent to footings, soil of the same classification should be introduced and compacted to the same density. Where footings have been undermined, augmentation or other specialist work may be required. Remediation of footings and foundations is generally the realm of a specialist consultant.

Where isolated footings rise and fall because of swell/shrink effect, the homeowner may be tempted to alleviate floor bounce by filling the gap that has appeared between the bearer and the pier with blocking. The danger here is that when the next swell segment of the cycle occurs, the extra blocking will push the floor up into an accentuated dome and may also cause local shear failure in the soil. If it is necessary to use blocking, it should be by a pair of fine wedges and monitoring should be carried out fortnightly.

This BTF was prepared by John Lewer FAIB, MIAMA, Partner, Construction Diagnosis.

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STORMWATER ASSESSMENT

11 Eularminner Street

Carlton

July 2025

GEO-ENVIRONMENTAL SOLUTIONS

Investigation Details

Client:	CMH Industries Pty Ltd
Site Address:	11 Eularminner Street, Carlton
Date of Inspection:	10/06/2025
Proposed Works:	New house
Investigation Method:	Hand Auger
Inspected by:	C. Cooper

Site Details

Certificate of Title (CT):	84583/2
Title Area:	Approx. 1476 m²
Applicable Planning Overlays:	Bushfire-prone areas, Flood-prone Areas
Slope & Aspect:	1° N facing slope
Vegetation:	Grass & Weeds

Background Information

Geology Map:	MRT
Geological Unit:	Quaternary Sediments
Climate:	Annual rainfall 500mm
Water Connection:	Tank
Sewer Connection:	Unserviced-On-site required
Testing and Classification:	Onsite Stormwater Retention

Investigation

A number of bore holes were completed to identify the distribution and variation of the soil materials at the site, bore hole locations are indicated on the site plan. See soil profile conditions presented below. Tests were conducted across the site to obtain bearing capacities of the material at the time of this investigation.

Soil Profile Summary

BH1 Depth (m)	BH2 Depth (m)	USCS	Description
0.00-0.40	0.00-0.20	SP	**SAND**: dark grey, slightly moist, loose,
0.40-0.70	0.20-0.60	SP	**SAND**: light grey, slightly moist, loose,
0.70-1.00	0.60-0.80	SP	**SAND**: pale brown, moist to wet, medium dense,
1.00-1.2+	0.80-1.2+	SP	**SAND**: grey, wet, medium dense, no refusal

Site Notes

The soil onsite has formed from Quaternary sediments and consist of relatively deep sandy profiles. A watertable was encountered at approx. 0.7m in BH1 and 0.6m in BH2.

Soil Conditions

The soil on site has developed from Quaternary sediments and consists of deep sandy profiles. The soil has an estimated permeability of approximately 3-5m/day

GES have identified the following at the site:

- The site has a <5% grade and presents a low risk to slope stability and landslip.
- There are no proposals for cuts or changes of grade which may impact on any proposed onsite stormwater absorption.
- The soil onsite has been identified as comprising of sands. No soil dispersion was identified.
- A water table was observed between 0.6-0.7m at the time of the investigation
- There is a low risk of the natural soils being impacted by contamination
- No bedrock was encountered

Soil Dispersion

The soil is non-dispersive.

Existing Conditions and Assumptions

The site covers an area of approximately 1476m^2 with a total roof area of approx. 186m^2 consisting of a proposed dwelling with roof area of approx. 150m^2 and a proposed shed with roof area approx. 36m^2. There is no public stormwater system that the property can connect to, and it is therefore it is proposed that stormwater from the site would be routed through the proposed conventional underground drainage system comprising of Grated Sumps and PVC Pipes, coupled with tank detention and soakage trench elements for on-site detention.

The stormwater management report is prepared in accordance with the design criteria listed below:

- The stormwater drainage system is designed using Bureau of Meteorology (BOM) published rainfall Intensity Frequency Duration (IFD) data as a minor / major system to accommodate the 5% AEP / 20 min storm events.
- The flow rate of stormwater leaving the site shall be designed so that it does not exceed the pre-developed flow rate for both the minor and major rain events.
- The total site discharges are modelled as described in *Storm Drainage Design in Small Urban Catchments,* a handbook for Australian practice by *Australian Rainfall and Runoff (ARR2019)*, Book 9 – Runoff in Urban Areas.

Detention Calculations

Detention calculations area provided in Appendix A

Summary and Conclusions

- Detention design to be adopted as per design and documentation.
- The designed solution complies with the performance solution design check carried out.
- The 12m^2 base (6m x 2m), 0.45m deep soakage trench is designed over a 20-minute storm duration for proposed development based on the use of a rainwater tank with a minimum of 3000L detention required
- DN100 slotted PVC pipe with geotextile covering on top of aggregate to be installed within the soakage trench.

It is also recommended that regular inspection and maintenance is conducted to ensure the stormwater system is operating without obstruction. A schematic of recommended checks is attached.

GES Stormwater Maintenance Plan Checklist

Indicative frequency	Inspection and criteria	Maintenance activities (where required)
Annual	Check whether any tree branches overhang the roof or are likely to grow to overhang the roof	If safe and where permitted, consider pruning back any overhanging branches
	Check that access covers to storage tanks are closed	Secure any open access covers to prevent risk of entry
	Check that screens on inlets, overflows and other openings do not have holes and are securely fastened	Repair any defective screens to keep out mosquitoes
	Inspect tank water for presence of rats, birds, frogs, lizards or other vermin or insects	Remove any infestations, identify point of entry and close vermin and insect-proof mesh
	Inspect tank water for presence of mosquito larvae (inspect more frequently in sub-tropical and tropical northern Australia, based on local requirements)	Identify point of entry and close with insect-proof mesh with holes no greater than 1.6 mm in diameter
	Inspect gutters for leaf accumulation and ponding	Clean leaves from gutters-remove more regularly if required. If water is ponding, repair gutter to ensure water flows to downpipe
	Check signage at external roof water taps and that any removable handle taps are being properly used	Replace or repair the missing or damaged signage and fittings
	Check plumbing and pump connections are watertight/without leakage	Repair any leaks as necessary
	Check suction strainers, in-line strainers and pump location for debris	Clean suction strainers, in-line strainers or debris from pump location
	Check pump installation is adequate for reliable ongoing operation	Modify and repair as required
	Check first flush diverter, if present	Clean first flush diverter, repair and replace if necessary
	Check health of absorption trench area and surrounding grass or plants	Investigate any adverse impacts observed that might be due to irrigation
	Check condition of roof and coatings	Investigate and resolve any apparent changes to roof condition, such as loss of material coatings
Triennial	Drain, clean out and check the condition of the tank walls and roof to ensure no holes have arisen due to tank deterioration	Repair any tank defects

	Check sediment levels in the tank	Organise a suitable contractor to remove accumulated sediment if levels are approaching those that may block tank outlets
	Undertake a systematic review of operational control of risks to the system	Identify the reason for any problems during inspections and take actions to prevent failures occurring in future
After 20 years and then every 5 years	Monitor the effectiveness of the stormwater absorption area to assess for any clogging due to algal growth, or blocking due to tree roots/grass growth/trench failure.	Clean or replace clogged equipment
Ongoing	Inspect and follow up on any complaints or concerns raised that could indicate problems with the system	Repair or replace any problems that are notified

APPENDIX A: STORMWATER DETENTION CALCULATIONS

STORAGE TRENCH

Hydrology		
Total Catchment Area	186	m2
Runoff Coefficient	1	
Annual Recurrence Interval (ARI)	20	yr
Ground Conditions		
Hydraulic conductivity (K)	5.000	m/day
	3.470	mm/min
Adjusted Rate (15% clogging factor)	2.950	mm/min
Trench Design		
Length	6	m
Width	2	m
Depth	0.45	m
Infiltration Area	12	m2
Porosity	0.35	%
Trench Storage	1.9	m3
	1890	L
Detention tank data		
Tank Storage	3	m3
Tank Underflow	0.734	L/s
Tank Underflow	44.04	L/min
Total Available storage	4.9	m3
	4890	L

Final Check

Criteria	Requirement	Design	Check
Total Detention needed	2340	4890	OK
Trench Capacity underflow for 5% AEP 20-minute storm	1399	1890	OK

STORM CHECK					
Storm Duration	**Intensity**	**Inflow Volume**	**Outflow Volume**	**Required Storage**	**Emptying time**
	(mm/hr)	**(m^3)**	**(L)**	**(L)**	**(hr)**
1 min	**142**	440	35	405	0.19
2 min	**113**	701	71	630	0.30
3 min	**102**	949	106	842	0.40
4 min	**93.7**	1162	142	1020	0.48
5 min	**87.2**	1352	177	1175	0.55
10 min	**65.7**	2037	354	1683	0.79
15 min	**53.4**	2483	531	1952	0.92
20 min	**45.4**	2815	708	2107	0.99
25 min	**39.8**	3085	885	2200	1.04
30 min	**35.7**	3320	1062	2258	1.06
45 min	**27.8**	3878	1593	2285	1.08
1 hour	**23.3**	4334	2124	2210	1.04
1.5 hour	**18.3**	5106	3185	1920	0.90
2 hour	**15.5**	5766	4247	1519	0.72
3 hour	**12.3**	6863	6371	492	0.23
4.5 hour	**9.98**	8353	9556	-	-
6 hour	**8.62**	9620	12742	-	-
9 hour	**7.03**	11768	19113	-	-
12 hour	**6.06**	13526	25484	-	-
18 hour	**4.87**	16305	38226	-	-
24 hour	**4.11**	18347	50967	-	-
30 hour	**3.56**	19865	63709	-	-
36 hour	**3.15**	21092	76451	-	-
48 hour	**2.55**	22766	101935	-	-
72 hour	**1.83**	24507	152902	-	-
			Full volume	1890	1.08
Notes:					
Inflow volume calculated using Equation 10.1 (WSUD Guidelines: Chapter 10)					
Outflow volume calculated using Equation 10.2 (WSUD Guidelines: Chapter 10)					
Required storage and emptying time is left blank when outflow volume exceeds inflow volume					

Location

Label: 11 Eularminner Street, Carlton

Easting: 552211

Northing: 5253202

Zone: 55

Latitude: Nearest grid cell: 42.8625 (S)

Longitude: Nearest grid cell: 147.6375 (E)

IFD Design Rainfall Intensity (mm/h)

Issued: 07 July 2025

Rainfall intensity for Durations, Exceedance per Year (EY), and Annual Exceedance Probabilities (AEP).
FAQ for New ARR probability terminology

Table | Chart

Unit: mm/h

	Annual Exceedance Probability (AEP)						
Duration	**63.2%**	**50%#**	**20%***	**10%**	**5%**	**2%**	**1%**
1 min	64.8	72.9	100	121	142	172	198
2 min	55.1	61.5	82.5	97.5	113	131	145
3 min	48.9	54.7	73.9	87.6	102	119	133
4 min	44.2	49.6	67.5	80.4	93.7	111	125
5 min	40.6	45.6	62.3	74.5	87.2	105	119
10 min	29.6	33.3	46.1	55.6	65.7	80.5	93.0
15 min	23.9	27.0	37.4	45.1	53.4	65.6	76.0
20 min	20.5	23.1	31.9	38.5	45.4	55.7	64.3
25 min	18.1	20.4	28.0	33.8	39.8	48.6	55.9
30 min	16.3	18.4	25.2	30.3	35.7	43.3	49.7
45 min	13.0	14.6	19.9	23.8	27.8	33.3	37.8
1 hour	11.1	12.5	16.9	20.0	23.3	27.7	31.1
1.5 hour	8.91	9.99	13.4	15.8	18.3	21.4	23.8
2 hour	7.65	8.57	11.5	13.5	15.5	18.0	19.9
3 hour	6.19	6.95	9.29	10.8	12.3	14.3	15.7
4.5 hour	5.02	5.65	7.56	8.80	9.98	11.5	12.6
6 hour	4.31	4.87	6.54	7.62	8.62	9.96	11.0
9 hour	3.46	3.93	5.32	6.20	7.03	8.18	9.04
12 hour	2.94	3.34	4.56	5.34	6.06	7.10	7.88
18 hour	2.29	2.62	3.61	4.26	4.87	5.76	6.44
24 hour	1.89	2.17	3.02	3.58	4.11	4.90	5.50
30 hour	1.62	1.86	2.60	3.09	3.56	4.27	4.82
36 hour	1.41	1.62	2.28	2.72	3.15	3.79	4.28
48 hour	1.13	1.30	1.83	2.20	2.55	3.08	3.49
72 hour	0.808	0.929	1.31	1.57	1.83	2.21	2.51
96 hour	0.631	0.724	1.02	1.22	1.41	1.70	1.94
120 hour	0.520	0.595	0.831	0.989	1.14	1.38	1.56
144 hour	0.445	0.509	0.704	0.833	0.956	1.15	1.31
168 hour	0.391	0.447	0.614	0.720	0.820	0.985	1.12

Note:
The 50% AEP IFD **does not** correspond to the 2 year Average Recurrence Interval (ARI) IFD. Rather it corresponds to the 1.44 ARI.
* The 20% AEP IFD **does not** correspond to the 5 year Average Recurrence Interval (ARI) IFD. Rather it corresponds to the 4.48 ARI.

STORMWATER DETENTION V5.05

Geo-Environmental Solutions

Location: Carlton
Site: 186m² with tc = 20 and tcs = 15 mins.
PSD: AEP of 5%, Above ground PSD = 0.73L/s
Storage: AEP of 5%, Above ground volume = 2.34m³

Design Criteria

(Custom AEP IFD data used)

Location =	Carlton	
Method =	E	(A)RI 2001,A(E)P 2019
PSD annual exceedance probabiliy (APE) =	5	%
Storage annual exceedance probabiliy (APE) =	5	%
Storage method =	A	(A)bove,(P)ipe,(U)nderground,(C)ustom

Site Geometry

Site area (As) =	186	m²	=	0.0186 Ha
Pre-development coefficient (Cp) =	0.30			
Post development coefficient (Cw) =	1.00			
Total catchment (tc) =	20	minutes		
Upstream catchment to site (tcs) =	15	minutes		

Coefficient Calculations

Pre-development

Zone	Area (m²)	C	Area * C
Concrete	0	0.90	0
Roof	0	1.00	0
Gravel	0	0.50	0
Garden	186	0.30	56
Total	186 m²		56

Cp = ΣArea*C/Total = 0.300

Post development

Zone	Area (m²)	C	Area * C
Concrete	0	0.90	0
Roof	186	1.00	186
Gravel	0	0.50	0
Garden	0	0.30	0
Total	186 m²		186

Cw = ΣArea*C/Total = 1.000

Permissible Site Discharge (PSD) (AEP of 5%)

PSD Intensity (I) =	45.4	mm/hr	For catchment tc = 20 mins.
Pre-development (Qp = Cp*I*As/0.36) =	0.70	L/s	
Peak post development (Qa = 2*Cw*I*As/0.36) =	4.69	L/s	=(0.103 x I) Eq. 2.24
Storage method =	A		(A)bove,(P)ipe,(U)nderground,(C)ustom
Permissible site discharge (Qu = PSD) =	0.734	L/s	

Above ground - Eq 3.8

$0 = PSD^2 - 2*Qa/tc*(0.667*tc*Qp/Qa + 0.75*tc+0.25*tcs)*PSD + 2*Qa*Qp$

Taking x as = PSD and solving

a = 1.0 b = -9.7 c = 6.6

$PSD = -b \pm \sqrt{(b^2-4ac)}/(2a)$

PSD = 0.734 L/s

Below ground pipe - Eq 3.3

$Qp = PSD*[1.6*tcs/\{tc*(1-2*PSD/(3*Qa))\}-0.6*tcs^{2\cdot67}/\{tc*(1-2*PSDp/(3*Qa))\}^{2\cdot67}]$

= 0.70

PSD = 0.729 L/s

Below ground rectangular tank - Eq 3.4

t =tcs/(tc*(1-2*PSD/(3*Qa))) = 0.834

$Qp = PSD*[0.005-0.455*t+5.228*t^2-1.045*t^3-7.199*t^4+4.519*t^5]$

= 0.70

PSD = 0.707 L/s

Design Storage Capacity (AEP of 5%)

Above ground (Vs) = [0.5*Qa*td-[(0.875*PSD*td)(1-0.917*PSD/Qa)+(0.427*td*PSD²/Qa)]]*60/10³ m³ Eq 4.23

Below ground pipe (Vs) = [(0.5*Qa-0.637*PSD+0.089*PSD²/Qa)*td]*60/10³ m³ Eq 4.8

Below ground rect. tank (Vs) = [(0.5*Qa-0.572*PSD+0.048*PSD²/Qa)*td]*60/10³ m³ Eq 4.13

td (mins)	I (mm/hr)	Qa (L/s)	Above Vs (m³)	Pipe Vs (m³)	B/G Vs (m³)
5	87.2	9.0	1.17		
16	51.5	5.3	1.98		
22	43.0	4.4	2.14		
28	37.2	3.8	2.24		
34	33.0	3.4	2.29		
39	30.4	3.1	2.32		
45	27.8	2.9	2.33		
51	25.7	2.7	2.34		
56	24.3	2.5	2.33		
62	22.8	2.4	2.32		

Table 1 - Storage as function of time for AEP of 5%

Type	td (mins)	I (mm/hr)	Qa (L/s)	Vs (m³)
Above	49.3	26.3	2.7	**2.34**
Pipe				
B/ground				

Table 2 - Storage requirements for AEP of 5%

Frequency of operation of Above Ground storage

Qop2 = 0.75 Cl 2.4.5.1

Qp2 =Qop2*Qp1 (where Qp1=PSD) = 0.55 L/s at which time above ground storage occurs

I = 360*Qp2/(2*Cw*As*10³) = 5.3 mm/h Eq 4.24

Period of Storage

Time to Fill:

Above ground (tf) = td*(1-0.92*PSD/Qa) Eq 4.27

Below ground pipe (tf) = td*(1-2*PSD/(3*Qa)) Eq 3.2

Below ground rect. tank (tf) = td*(1-2*PSD/(3*Qa)) Eq 3.2

Time to empty:

Above ground (te) = (Vs+0.33*PSD²*td/Qa*60/10³)*(1.14/PSD)*(10³/60) Eq 4.28

Below ground pipe (te) = 1.464/PSD*(Vs+0.333*PSD²*td/Qa*60/10³)*(10³/60) Eq 4.32

Below ground rect. tank (te) = 2.653/PSD*(Vs+0.333*PSD²*td/Qa*60/10³)*(10³/60) Eq 4.36

Storage period (Ps = tf + te) Eq 4.26

Type	td (mins)	Qa (L/s)	Vs (L/s)	tf (mins)	te (mins)	Ps (mins)
Above	49.3	2.7	2.3	37.0	65.5	102.6
Pipe						
B/ground						

Table 3 - Period of Storage requirements for AEP of 5%

Orifice

Permissible site discharge (Qu=PSD) = 0.73 L/s (Above ground storage)

Orifice coefficient (CD) = 0.61 For sharp circular orifice

Gravitational acceration (g) = 9.81 m/s²

Maximum storage depth above orifice (H) = 150 mm

Orifice flow (Q) = CD*Ao*√(2*g*H)

Therefore:

Orifice area (Ao) = 701 mm²

Orifice diameter (D = √(4*Ao/π)) = 29.9 mm

CERTIFICATE OF THE RESPONSIBLE DESIGNER

Section 94
Section 106
Section 129
Section 155

Form **35**

To: CMH Industries Pty Ltd *Owner name*
80 Cowle Road *Address*
Bridgewater 7030 *Suburb/postcode*

Designer details:

Name: Vinamra Gupta
Category: Civil Engineer
Business name: Geo-Environmental Solutions
Phone No: 03 6223 1839
Business address: 29 Kirksway Place
Battery Point 7004
Fax No: N/A
Licence No: 685982720
Email address: office@geosolutions.net.au

Details of the proposed work:

Owner/Applicant CMH Industries Pty Ltd
Designer's project reference No. J11792
Address: 11 Eularminner Street
Lot No: 84583/2
Carlton 7173

Type of work: Building work ☐ Plumbing work ☒ *(X all applicable)*

Description of work:
On-Site stormwater system - design

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Plans Reference:P2
Date Received:17/07/2025

(new building / alteration / addition / repair / removal / re-erection water / sewerage / stormwater / on-site wastewater management system / backflow prevention / other)

Description of the Design Work (Scope, limitations or exclusions): *(X all applicable certificates)*

Certificate Type:	Certificate	Responsible Practitioner
	☐ Building design	Architect or Building Designer
	☐ Structural design	Engineer or Civil Designer
	☐ Fire Safety design	Fire Engineer
	☒ Civil design	Civil Engineer or Civil Designer
	☐ Hydraulic design	Building Services Designer
	☐ Fire service design	Building Services Designer
	☐ Electrical design	Building Services Designer
	☐ Mechanical design	Building Service Designer
	☐ Plumbing design	Plumber-Certifier; Architect, Building Designer or Engineer
	☐ Other (specify)	

Deemed-to-Satisfy: ☐ Performance Solution: ☒ *(X the appropriate box)*

Other details:

Onsite stormwater retention

Design documents provided:

The following documents are provided with this Certificate –

Document description:

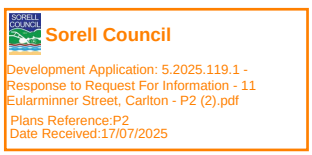
Drawing numbers:	Prepared by: Geo-Environmental Solutions	Date: Jul-25
Schedules:	Prepared by:	Date:
Specifications:	Prepared by: Geo-Environmental Solutions	Date: Jul-25
Computations:	Prepared by:	Date:
Performance solution proposals: Onsite stormwater retention	Prepared by: Geo-Environmental Solutions	Date: Jul-25
Test reports:	Prepared by: Geo-Environmental Solutions	Date: Jul-25

Standards, codes or guidelines relied on in design process:

AS3500 (Parts 0-5)-2013 Plumbing and drainage set.

Any other relevant documentation:

Stormwater Assessment - 11 Eularminner Street Carlton - Jul-25



Attribution as designer:

I Vinamra Gupta, am responsible for the design of that part of the work as described in this certificate;

The documentation relating to the design includes sufficient information for the assessment of the work in accordance with the *Building Act 2016* and sufficient detail for the builder or plumber to carry out the work in accordance with the documents and the Act;

This certificate confirms compliance and is evidence of suitability of this design with the requirements of the National Construction Code.

	Name: (print)	*Signed*	*Date*
Designer:	Vinamra Gupta		09/07/2025
Licence No:	685982720		

Assessment of Certifiable Works: (TasWater)

Note: single residential dwellings and outbuildings on a lot with an existing sewer connection are not considered to increase demand and are not certifiable.

If you cannot check ALL of these boxes, LEAVE THIS SECTION BLANK.

TasWater must then be contacted to determine if the proposed works are Certifiable Works.

I confirm that the proposed works are not Certifiable Works, in accordance with the Guidelines for TasWater CCW Assessments, by virtue that all of the following are satisfied:

- [x] The works will not increase the demand for water supplied by TasWater
- [x] The works will not increase or decrease the amount of sewage or toxins that is to be removed by, or discharged into, TasWater's sewerage infrastructure
- [x] The works will not require a new connection, or a modification to an existing connection, to be made to TasWater's infrastructure
- [x] The works will not damage or interfere with TasWater's works
- [x] The works will not adversely affect TasWater's operations
- [x] The work are not within 2m of TasWater's infrastructure and are outside any TasWater easement
- [x] I have checked the LISTMap to confirm the location of TasWater infrastructure
- [x] If the property is connected to TasWater's water system, a water meter is in place, or has been applied for to TasWater.

Certification:

I ..... Vinamra Gupta..... being responsible for the proposed work, am satisfied that the works described above are not Certifiable Works, as defined within the *Water and Sewerage Industry Act 2008,* that I have answered the above questions with all due diligence and have read and understood the Guidelines for TasWater CCW Assessments.

Note: the Guidelines for TasWater Certification of Certifiable Works Assessments are available at: www.taswater.com.au

	Name: (print)	*Signed*	*Date*
Designer:	Vinamra Gupta		09/07/2025

New Services

STORMWATER PIPE
WITH FLOW DIRECTION

GRATED STORMWATER PIT
450x450 CLASS A
ACO GALVANISED HEELGUARD OR SIMILAR
ENGINEER APPROVED

Performance Solution Compliance Notes:

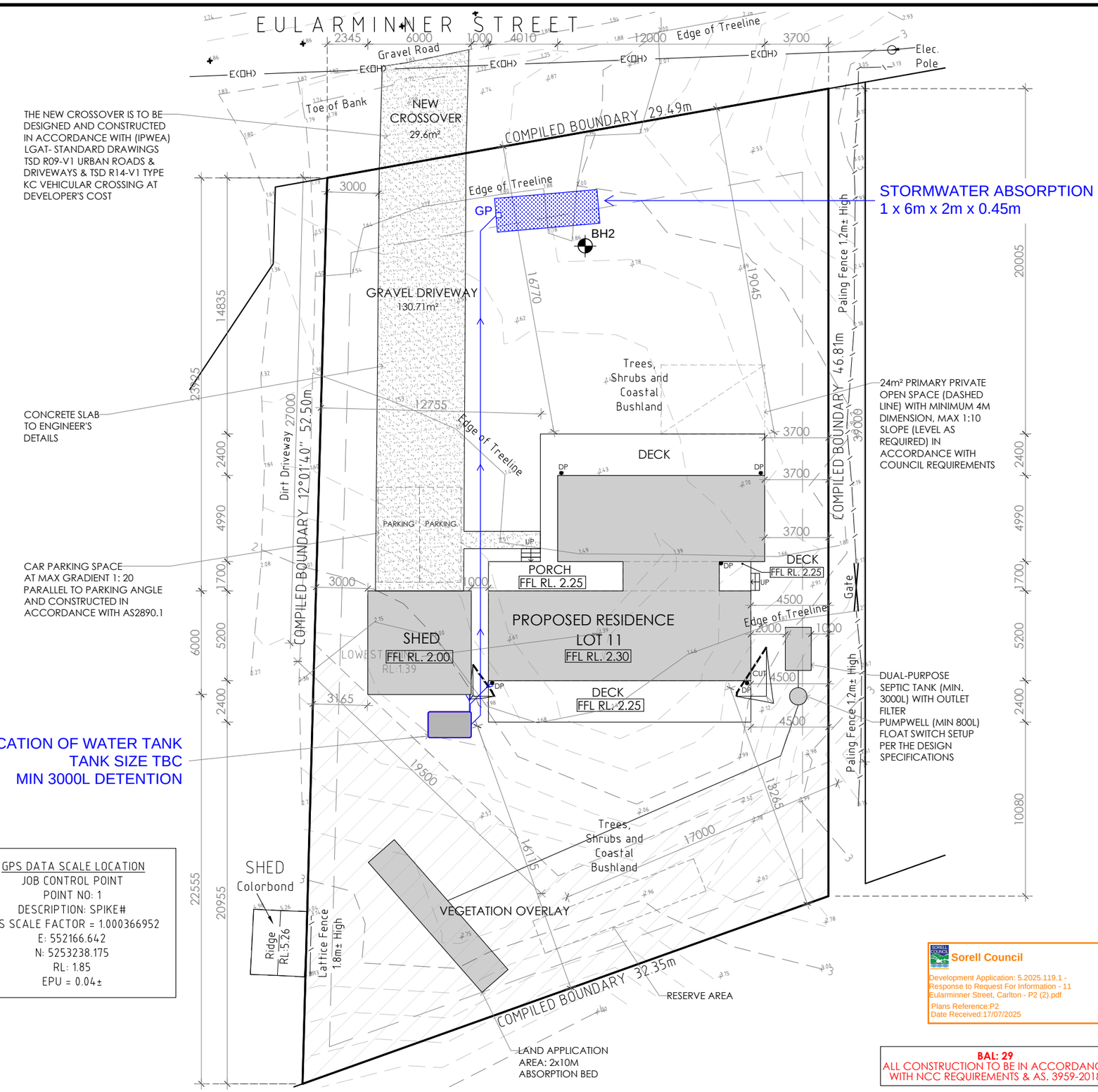
AS 3500.3 - CL 7.10
- 7.10.1 - OVERFLOW IS SAFE AND DOES NOT COMPROMISE FREEBOARD TO HABITABLE SPACES.

GENERAL
- AS/NZS 3500.3: PART 3 STORMWATER DRAINAGE AUSTRALIAN RAINFALL AND RUN-OFF VOLUME 8: URBAN STORMWATER MANAGEMENT
- AUSTRALIAN RUNOFF QUALITY - A GUIDE TO WATER SENSITIVE URBAN DESIGN
- STORM DRAINAGE DESIGN IN SMALL URBAN CATCHMENTS: A HANDBOOK FOR AUSTRALIAN PRACTICE
- WATER SENSITIVE URBAN DESIGN (WSUD) ENGINEERING PROCEDURE: STORMWATER
- WATER SERVICES ASSOCIATION OF AUSTRALIA CODE (WSAA)

Stormwater Services Notes:

1. ALL SITE SAFETY & MANAGEMENT PROCEDURES SHALL BE IN ACCORDANCE WITH THE DEPARTMENT OF STATE GROWTH SPECIFICATIONS:
   SECTION 168 OCCUPATIONAL HEALTH AND SAFETY
   & SECTION 176 ENVIRONMENTAL MANAGEMENT.
2. ALL PIPES UNDER TRAFFICABLE AREAS ARE TO BE BACKFILLED

   FULL DEPTH WITH 20 F.C.R. AND FULLY COMPACTED.
3. ALL STORMWATER PIPES TO BE PVC-U-SWJ CLASS "SN8" TO AS1254 UNO.
4. ALL DRAIN AND TRENCH CONSTRUCTION SHALL COMPLY WITH THE LGAT STANDARD DRG TSD G01.
5. ANY EXCAVATED TRENCHES IN EXCESS OF 1.5M IN DEPTH ARE TO BE ADEQUATELY SHORED TO PREVENT COLLAPSE DURING WORKS.



GPS DATA SCALE LOCATION
JOB CONTROL POINT
POINT NO: 1
DESCRIPTION: SPIKE#
GPS SCALE FACTOR = 1.000366952
E: 552166.642
N: 5253238.175
RL: 1.85
EPU = 0.04±

•DP 90mm DOWNPIPE

NOTE: ALL PROPOSED STORMWATER TO BE DISCHARGED TO EXISTING INFRASTRUCTURE

EROSION AND SEDIMENT CONTROL MEASURES ARE TO BE IMPLEMENTED ON THE SITE IN ACCORDANCE WITH COUNCIL REQUIREMENTS

PROPOSED SITE PLAN

NOTES

SITE PREPARATION
THE SITE IS TO BE DISTURBED AS MINIMALLY AS POSSIBLE TO THE EXTENT REQUIRED TO CARRY OUT THE BUILDING WORKS.
EARTHWORKS SHALL BE CARRIED OUT IN ACCORDANCE WITH NCC PART 3.2.
UN-RETAINED EMBANKMENT GRADIENTS SHALL BE IN ACCORDANCE WITH NCC TABLE 3.2.1.
DRAINAGE SHALL BE IN ACCORDANCE WITH NCC PART 3.3.2.
THE BUILDER AND SUBCONTRACTOR SHALL ENSURE THAT ALL STORMWATER DRAINS, SEWER PIPES AND THE LIKE ARE LOCATED AT A SUFFICIENT DISTANCE FROM ANY BUILDINGS FOOTING AND/OR SLAB EDGE BEAMS SO AS TO PREVENT GENERAL MOISTURE PENETRATION, DAMPNESS, WEAKENING & UNDERMINING OF ANY BUILDING AND IT'S FOOTING SYSTEM.
LOCATION OF ALL EXISTING SERVICES TO BE CONFIRMED ON SITE PRIOR TO CONSTRUCTION.

ATTENTION OF OWNER
THE OWNERS ATTENTION IS DRAWN TO THE FACT THAT FOUNDATIONS AND ASSOCIATED DRAINAGE FOR ALL SITES REQUIRES CONTINUING MAINTENANCE TO ASSIST FOOTING PERFORMANCE. ADVICE FOR FOUNDATION MAINTENANCE IS CONTAINED IN THE CSIRO BUILDING TECHNOLOGY FILE 18 AND IT IS THE OWNERS RESPONSIBILITY TO MAINTAIN THE SITE IN ACCORDANCE WITH THIS DOCUMENT.

SOIL AND WATER MANAGEMENT NOTES:
DRAINAGE LINES ARE TO BE INSTALLED PRIOR TO THE PLACEMENT OF ROOF AND GUTTERING. ONCE DWELLING IS ROOFED, CONNECT IMMEDIATELY.
APPLY TEMPORARY COVERING TO DISTURBED AREAS THAT WILL REMAIN EXPOSED FOR 14 DAYS OR MORE DURING CONSTRUCTION (EG. WATERPROOF BLANKET, VEGETATION OR MULCH)

PROTECT ANY NEARBY OR ON-SITE DRAINAGE PITS FROM SEDIMENT BY INSTALLING SEDIMENT TRAPS AROUND THEM.
LIMIT ENTRY/EXIT TO ONE POINT AND STABILISE.
INSTALL FACILITIES TO REMOVE DIRT/ MUD FROM VEHICLE WHEELS BEFORE THEY LEAVE THE SITE.

SITE TO BE VEGETATED AND PLANTED ACCORDING TO THE HOBART REGIONAL SOIL AND WATER MANAGEMENT CODE OF PRACTICE.

BUILDER AND SUBCONTRACTORS TO VERIFY ALL DIMENSIONS AND LEVELS PRIOR TO THE COMMENCEMENT OF ANY WORK. GIVE 24 HOURS MINIMUM NOTICE WHERE AMENDMENTS ARE REQUIRED TO DRAWINGS. THESE DRAWINGS ARE TO BE READ IN CONJUNCTION WITH DOCUMENTATION LISTED ON THE COVER PAGE. DO NOT SCALE DRAWINGS.
DIMENSIONS ARE TO TAKE PREFERENCE OVER SCALE. BUILDING SPECIFICATION AND ENGINEERS DRAWINGS SHALL OVERRIDE ARCHITECTURAL DRAWINGS.

-THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER DRAWING SHEETS, CONSULTANTS DRAWINGS, DOCUMENTS, SCHEDULES AND SPECIFICATIONS (AS APPLICABLE).
-THE BUILDER AND SUBCONTRACTOR SHALL ENSURE THAT ALL STORMWATER DRAINS, SEWER PIPES AND THE LIKE ARE LOCATED AT A SUFFICIENT DISTANCE FROM ANY BUILDINGS FOOTING AND/OR SLAB EDGE BEAMS SO AS TO PREVENT GENERAL MOISTURE PENETRATION, DAMPNESS, WEAKENING & UNDERMINING OF ANY BUILDING AND ITS FOOTING SYSTEM.
- LOCATION OF ALL EXISTING ONSITE SERVICES TO BE CONFIRMED ONSITE PRIOR TO CONSTRUCTION

IMPORTANT!
SITE INFORMATION AS DRAWN IS APPROXIMATE ONLY. FINAL SITE INFORMATION IS SUBJECT TO A DETAILED CONTOUR SURVEY BY LICENSED SURVEYOR.

Sorell Council
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Plans Reference:P2
Date Received:17/07/2025

BAL: 29
ALL CONSTRUCTION TO BE IN ACCORDANCE WITH NCC REQUIREMENTS & AS. 3959-2018

SOIL CLASSIFICATION:	--
WIND CLASSIFICATION:	--

SITE COVERAGE	
SITE AREA	1471.8 m²
PROPOSED BUILDING FOOTPRINT	161.7 m²
PROPOSED SITE COVERAGE	10.99

PRELIMINARY

02

PROJECT NORTH

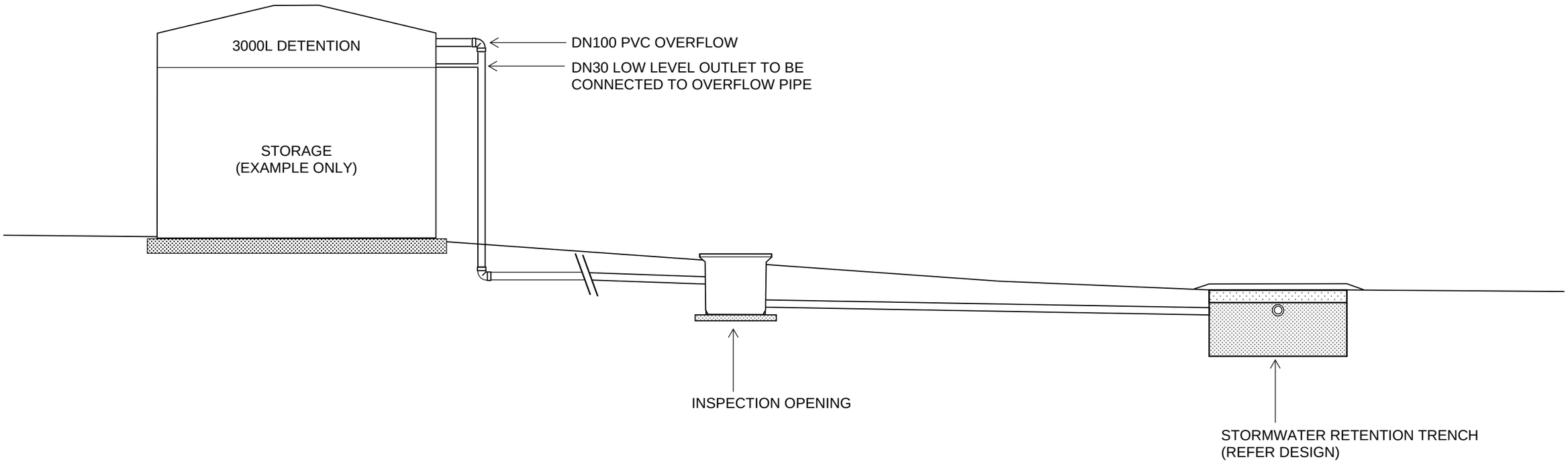
CONTRACTOR MUST VERIFY ALL DIMENSIONS AND LEVELS AT THE JOB PRIOR TO COMMENCING ANY WORK OR MAKING ANY SHOP DRAWINGS.
DO NOT SCALE DRAWINGS.
ALWAYS USE WRITTEN DIMENSIONS.

REV:	DESCRIPTION:	BY:	DATE:
D	MOVE THE HOUSE TO THE PREVIOUS SETBACKS	QT	07/5/25
E	ADD THE WASTE WATER AREA	NN	02/6/25
F	FLIPPING DESIGN, MOVE THE SHED, CHANGE ROOF	NN	02/7/25
G	CHANGE WINDOW& EXTEND ENTRY, LAUNDRY	NN	03/7/25

CREATIVE HOMES HOBART
CREATIVE HOMES HOBART, CNR OF ELWICK ROAD & BROOKER HIGHWAY, GLENORCHY 7010 PH: 03 6272 3000

JOB ADDRESS: 11 Eularminner Street Carlton		CLIENT: Troy Mason	
DESIGNER: I. Brown	ACCRED. NO.: CC6652	SHEET:	2 of 11
DRAWN: N. Nguyen	DATE: April 2025	DESIGN TYPE:	Custom
CHECKED:	DATE:	DRAWING NO:	---
SCALE: 1:250	REV: G		

GES
GEO-ENVIRONMENTAL
SOLUTIONS
29 Kirksway Place, Battery Point
T| 62231839 E| office@geosolutions.net.au



Do not scale from these drawings. Dimensions to take precedence over scale.	STORMWATER DETENTION SCHEMATIC CROSS-SECTION			RAINWATER TANK - SIZE TBC WITH 3000L DETENTION		Sheet 1 of 1 Drawn by: SR

Design notes:

1. Absorption bed dimensions of up to 20m long by 0.45m deep by 2m wide – total storage volume calculated at average 35% porosity.
2. Base of bed to be excavated level and smearing and compaction avoided.
3. 90-100mm slotted pipe should be placed in the top 100mm of the 20mm aggregate
4. Geotextile or filter cloth to be placed over the pipe to prevent clogging of the pipes and aggregate
5. Construction on slopes up to 20% to allow trench depth range 550mm upslope edge to 400mm on down slope edge.
6. All works on site to comply with AS3500 and Tasmanian Plumbing code.

GES
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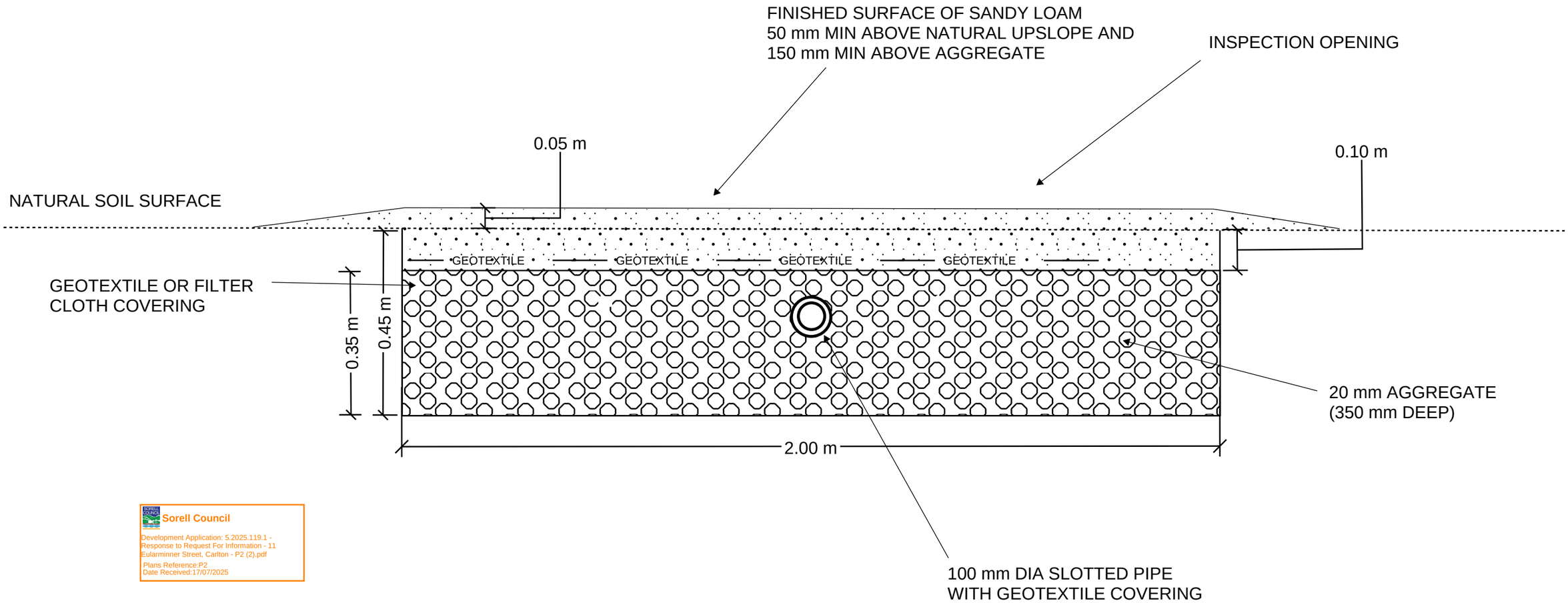


Do not scale from these drawings. Dimensions to take precedence over scale.	Geo-Environmental Solutions Stormwater trench			Stormwater Absorption Detail

DOYLE SOIL CONSULTING

SITE AND SOIL EVALUATION REPORT

ONSITE WASTEWATER ASSESSMENT

11 Eularminner St

Carlton

May 2025

ATTENTION:
Printed Copies of this report must be printed in colour, and in full.
No responsibility is otherwise taken for its contents

Doyle Soil Consulting: 6/76 Auburn Rd Kingston Beach 7050 – 0488 080 455 – robyn@doylesoilconsulting.com.au

SITE INFORMATION

Client: Creative Homes Hobart

Address: 11 Bellarmine St, Carlton (CT 84583/2)

Site Area: Approximately 1476 m^2

Date of inspection: 02/04/2025

Building type: New house

Services: Tank water supply and onsite wastewater management

Relevant Planning Overlays: Southern beaches onsite wastewater and stormwater management specific area plan, flood-prone hazard area

Mapped Geology - Mineral Resources Tasmania 1:50 000 Sorell sheet: **Qhd** = Quaternary sand dunes – mobile, stabilised by vegetation

Soil Depth: >2.0 m

Subsoil Drainage: free draining material, poorly drained site – water table below 0.5 m in low-lying areas.

Drainage lines/water courses: Carlton Beach 200 m southwest

Vegetation: coastal vegetation

Rainfall in previous 7 days: Approximately 3 mm

Slope at proposed LAA: Approximately 4-5° NE

SITE ASSESSMENT AND SAMPLE TESTING

Site and soil assessment in accordance with AS1547-2012 *Onsite domestic wastewater assessment and design*.

Emerson Dispersion test on subsoils.

Test holes were dug using a Christie Post Driver Soil Sampling Kit, comprising CHPD78 Christie Post Driver with Soil Sampling Tube (50 mm OD x 1600/2100 mm).

SITE AND SOIL COMMENTS

The natural soil profiles are formed from deep Quaternary dune deposits. The profiles are deep with no test hole refusal occurring at 1.9 m. The field textures of the soil profile are dominated by fine sand, which is poorly graded with loose to medium-dense consistency.

The minimum depth to the seasonal water table is estimated at 0.6 m below the soil surface at both test holes. See test hole locations on the Site Plan.

Site constraints (to be addressed by suitably designed OWMS):

- Water table at min. 0.6m depth in low lying areas
- Flood-prone area overlay in low lying areas
- Low-to-no fall from buildings to potential Land application areas.

Site strengths: (to be exploited by suitably designed OWMS):

- Deep soil: > 1.9 m
- Sand (Cat. 1) soil materials
- Low average annual rainfall (504 mm/annum at Dodges Ferry BOM station)
- Estimated maximum linear loading rate (LLR) of approx. 70 L/m/day

The site constraints may be addressed by pump-dosing primary treated effluent (from a septic tank and pump well) to a suitably sized absorption bed in the highly permeable and elevated area of sand dune deposits in the SW of the property. This will ensure sufficient vertical setback distance to the identified water table. This will result in the clearance of up to 90m^2 with in the Priority vegetation area overlay. Compliance with C7.6.2 of Tasmanian Planning Scheme – State Planning Provisions (*Clearance within a priority vegetation area*) provided in design section of this report. Temporary clearance (revegetation proposed) is considered preferable to locating the LAA within a flood-prone area with shallow water table.

Anchor blocks may be required on both the septic tank and the pump well due to the shallow water table.

SOIL PROFILES – Test Hole 1

Depth (m)	Horizon	Description and field texture grade	USCS Class
0.0 – 0.3	A1	Very dark grey (7.5YR 3/1), **Sand**, single grain, dry loose consistency, common roots	**1**
0.3 – 0.6	A2	Grey (7.5YR 6/1), **Sand**, single grain, dry loose consistency, few roots	**1**
0.6 – 1.0	$B2_1$	Brown (7.5YR 4/2), **Sand**, single grain, slightly moist medium dense consistency becoming moist from 0.8 m	**1**
1.0 – 1.3	$B2_2$	Grey (7.5YR 6/1), **Sand**, single grain, saturated dense consistency	**1**
1.3 – 1.9	$B2_3$	Dark grey (2.5Y 4/1), **Sand**, single grain, saturated dense consistency no refusal	**1**

Key to Soil Horizon Nomenclature	
Horizon name	**Meaning**
A1	Dark topsoils, zone of maximum organic activity
A2 or E	Leached, light/pale washed-out sandy layer
A3 or AB	Transition from A to B, more like A
B1 or BA	Transition from A to B, more like B
B2	Main subsoils layer with brown colouration, accumulations of clay, humus, iron oxide, etc
B3	Transitional from B2 to C
C	Weakly weathered soil parent materials
Subscript	**Meaning**
r	Reducing conditions (anaerobic)
t	Enriched in translocated clay
s	Iron/aluminium oxide accumulations in subsoil
g	Mottled, suggesting periodic/seasonal wetness
m	Cemented layer (oxides, carbonates, humus, silica etc)
k	Calcium carbonate (lime) accumulation
h	Humus accumulation in subsoil

SOIL PROFILES – Test Hole 2

Depth (m)	Horizon	Description and field texture grade	USCS Class
0.0 – 0.3	A1	Very dark grey (7.5YR 3/1), **Sand**, single grain, dry loose consistency, common roots	**1**
0.3 – 0.6	A2	Light brownish grey (10YR 6/2), **Sand**, single grain, dry loose consistency, few roots	**1**
0.6 – 0.8	$B2_1$	Very pale brown (10YR 7/3) common fine strong brown mottles, **Sand**, single grain, moist dense consistency, seasonally wet	**1**
0.8 – 1.3	$B2_2$	Grey (7.5YR 6/1), **Sand**, single grain, saturated dense consistency	**1**
1.3 – 1.9	$B2_3$	Dark grey (2.5Y 4/1), **Sand**, single grain, saturated dense consistency, <u>No Refusal</u>	**1**

WASTEWATER LAND APPLICATION AREA SETBACKS

Required setback from foundations: 6 m

Required setback from downslope surface water: 100 m

Required setback from downslope boundary: 8 m

Required setback from upslope and side boundaries: 1.5 m

Required vertical setback to groundwater: 1.5 m below the LAA (Table R1 of AS1547-2012)

WASTEWATER CLASSIFICATION AND DESIGN

In accordance with AS1547-2012, the soil is **Category 1** material (Sand).

Primary treatment is recommended

Wastewater loading: 5 persons @ 120 L/day (tank) - 600 L/day

Design Loading Rate (DLR): 30 mm/day for LAA

Minimum Land Application Area (LAA) required: 20 m^2 in-ground absorption bed

The (proposed) 3-bedroom house requires a design flow allowance of 600 L/day (up to 5 persons @ 120 L/person/day). The proposal is to install a dual-purpose septic tank (min 3000 L with outlet filter) which feeds into a pump-well (min 800 L). The pumpwell will dose an in-ground absorption bed in the raised sand dune area at the rear of the property to achieve the acceptable vertical setback distance to the identified water table. A wired-in highwater alarm is required in the pumpwell.

Using a DLR of 30 mm/day, a minimum absorption area of 20 m^2 is required. This may be installed as one absorption bed, **10.0 m long x 2.0 m wide x 0.4 m deep**. Base of the bed to be **levelled** prior to backfilling with aggregate and the pressure distribution system.

Minimum 200 mm of local sandy topsoil to be mounded over the finished, secured with jute mesh, and locally vegetation species planted to aid in evapotranspiration. Install bed in line

with the contour. Inspection openings to be placed at approximately 1/4 and 3/4 along the length of the distribution bed.

Soil treatment via pump-dosed beds is best achieved using small, frequent, doses. **Pump float switches should be setup to deliver approx. 108 L doses** (see Appendix 2 for bed dosing calcs). At the design hydraulic load, this will result in approximately six doses per day, and a total pump run time of 6 mins per day. Supply main to the bed will drain back to the pumpwell between cycles.

The calculated minimum pump capacity for the proposed design is **97 L/min @ 9.1 m head**. A **Zenox ZHS-040-A** is a suitable unit for dosing the distribution system. See Appendix 2 for hydraulic design calculations, minimum pump capacity and dosing requirements.

Use (min) 32 mm Lilac LDPE pipe for the supply main from the pumpwell.

Use **DN30 PN12 PCV-U** pipe for the distribution manifold (in the bed), with **5 mm holes drilled at 700 mm spacing in the top invert of the pipe**. These specifications, combined with the specified dose volume, ensure the system is adequately charged for flushing during each cycle, and provides small enough dose volumes to achieve a high level of (aerobic) soil treatment.

Test the pressurised system for uniform distribution and adequate pressure (i.e. 1.0 –1.5 m squirt height) prior to covering and documenting with photo evidence. Top the finished bed with geotextile.

This design results in a LLR of 60 L/m/day. The max. LLR for the site is 70 L/m/day, therefore surface seepage should not occur in the areas down slope of the LAA.

Compliance with *the Directors Guidelines 2016* is shown in the attached table for acceptable criteria. It is recommended that during construction Doyle Soil Consulting be notified of any major variation to the soil conditions or loading rate as predicted in this report.

To comply with C7.6.2 of Tasmanian Planning Scheme – State Planning Provisions (Clearance within a priority vegetation area):

Objective:	That clearance of native vegetation within a priority vegetation area: (a) does not result in an unreasonable loss of priority vegetation; (b) is appropriately managed to protect identified priority vegetation adequately; and (c) minimises and appropriately manages impacts from construction and development activities.
Acceptable Solutions	
A1 Clearance of native vegetation within a priority vegetation area must be within a building area on a sealed plan approved under this planning scheme.	Non-compliance
Performance Criteria	
P1.1 Clearance of native vegetation within a priority vegetation area must be for:	
(a) an existing use on the site, provided any clearance is contained within the minimum area necessary to be cleared to provide adequate bushfire protection, as recommended by the Tasmania Fire Service or an accredited person;	N/A
(b) buildings and works associated with the construction of a single dwelling or an associated outbuilding;	Construction of the 20m^2 absorption bed is considered '*works associated with the construction of a single dwelling*'
(c) subdivision in the General Residential Zone or Low Density Residential Zone;	N/A
(d) use or development that will result in significant long term social and economic benefits and there is no feasible alternative location or design;	N/A
(e) clearance of native vegetation where it is	N/A

demonstrated that on-going pre-existing management cannot ensure the survival of the priority vegetation and there is little potential for long-term persistence; or	
(f) the clearance of native vegetation that is of limited scale relative to the extent of priority vegetation on the site.	Of the total 430 m^2 of mapped priority vegetation (PV) area, it is proposed that up to 90m^2 may be cleared to construct the in-ground effluent absorption bed (20m^2) – see Spec Sheet. This equates to approximately 20% of the mapped PV area. Once constructed, the finished surface of the bed will be secured with jute mesh and planted with local species. Revegetation of the cleared area beyond the bed may be achieved by laying down the limbs of the cleared vegetation, to facilitate regeneration of the local plant species through natural seed dispersal.

P1.2 Clearance of native vegetation within a priority vegetation area must minimise adverse impacts on priority vegetation, having regard to:	
(a) the design and location of buildings and works and any constraints such as topography or land hazards;	Buildings to be outside of Priority Vegetation overlay
(b) any particular requirements for the buildings and works;	Temporary clearance of up to 90m^2 (3-5 individual shrubs) with the proposal to regenerate the majority of the cleared area through natural regeneration (see above).
(d) minimising impacts resulting from bushfire hazard management measures through siting and fire-resistant design of habitable buildings;	N/A for OWMS design

(c) any mitigation measures implemented to minimise the residual impacts on priority vegetation;	Once constructed the finished surface of the absorption bed will be secured with jute mesh and planted with local plant species.
(e) any on-site biodiversity offsets; and	Revegetation of the cleared area beyond the bed may be achieved by laying down the limbs of the cleared vegetation, to facilitate regeneration of the local plant species through natural seed dispersal.
(f) any existing cleared areas on the site.	N/A

Doyle Soil should be notified before the plumber commences work. The plumber is to provide photos of the installation, showing:

- The depth of the bed with tape measure
- The base of the trench excavated level
- Geotextile fabric down all sides of the trench
- Distribution manifold placement and pressure testing
- Geotextile fabric over aggregate
- Secured topsoil over cover
- Outlet filter in septic tank

A Form 71b and as-installed plan should accompany photos. Doyle Soil will not be providing a certificate of compliance until all have been sited.

Robyn Doyle
B.Agr.Sc.
CPSS (Certified Prof Soil Scientist)
Soil Scientist and Wastewater Designer
Licence no. CC7149

Rowan Mason
B.Agr.Sc.(hons)
Soil Scientist

APPENDIX 1 – TRENCH™

Doyle Soil Consulting

Land suitability and system sizing for on-site wastewater management

Trench 3.0 (Australian Institute of Environmental Health)

Assessment Report

OWMS design from proposed 3-bedroom dweling

Assessment for	Creative Homes Hobart	Assess. Date	23-May-35
		Ref. No.	
Assessed site(s)	11 Eularminner Street, Carlton	Site(s) inspected	2-Apr-25
Local authority	Sorell Council	Assessed by	R Doyle

This report summarises wastewater volumes, climatic inputs for the site, soil characteristics and sustem sizing and design issues. Site Capability and Environmental sensitivity issues are reported separately, where 'Alert' columns flag factors with high (A) or very high (AA) limitations which probably require special consideration for system design(s). Blank spaces on this page indicate data have not been entered into TRENCH.

Wastewater Characteristics

Wastewater volume (L/day) used for this assessment = 600 (using the 'No. of bedrooms in a dwelling' method)
Septic tank wastewater volume (L/day) = 200
Sullage volume (L/day) = 400
Total nitrogen (kg/year) generated by wastewater = 4.4
Total phosphorus (kg/year) generated by wastewater = 1.1

Climatic assumptions for site (Evapotranspiration calculated using the crop factor method)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Mean rainfall (mm)	39	32	45	35	42	53	33	49	46	44	43	43
Adopted rainfall (R, mm)	39	32	45	35	42	53	33	49	46	44	43	43
Retained rain (Rr, mm)	35	29	41	31	38	48	30	44	42	39	39	39
Max. daily temp. (deg. C)												
Evapotrans (ET, mm)	156	137	104	70	47	31	34	50	72	104	118	149
Evapotr. less rain (mm)	**121**	**108**	**63**	**38**	**9**	**-17**	**5**	**6**	**30**	**65**	**79**	**110**

Annual evapotranspiration less retained rain (mm) = 618

Soil characterisitics

Texture = sand Category = 1 Thick. (m) = 3
Adopted permeability (m/day) = 2.8 Adopted LTAR (L/sq m/day) = 30 Min depth (m) to water = 1.85

Proposed disposal and treatment methods

Proportion of wastewater to be retained on site: All wastewater will be disposed of on the site
The preferred method of on-site primary treatment: In dual purpose septic tank(s)
The preferred method of on-site secondary treatment: In-ground
The preferred type of in-ground secondary treatment: Evapotranspiration bed(s)
The preferred type of above-ground secondary treatment: None
Site modifications or specific designs: Not needed

Suggested dimensions for on-site secondary treatment system

Total length (m) = 9
Width (m) = 2
Depth (m) = 0.35
Total disposal area (sq m) required = 40
comprising a Primary Area (sq m) of: 20
and a Secondary (backup) Area (sq m) of: 20

Sufficient area is available on site

To enter comments, click on the line below 'Comments'. (This yellow-shaded box and the buttons on this page will not be printed.)

Comments

The calculated DLR for the category 1 soil is 30 mm/day. A total land application area of 20 sq m is required. Therefore the system should have the capacity to cope with predicted climatic and loading events.

Doyle Soil Consulting

Land suitability and system sizing for on-site wastewater management

Trench 3.0 (Australian Institute of Environmental Health)

Site Capability Report

OWMS design from proposed 3-bedroom dweling

Assessment for	Creative Homes Hobart	Assess. Date	23-May-35
		Ref. No.	
Assessed site(s)	11 Eularminner Street, Carlton	Site(s) inspected	2-Apr-25
Local authority	Sorell Council	Assessed by	R Doyle

This report summarises data relating to the physical capability of the assessed site(s) to accept wastewater. Environmental sensitivity and system design issues are reported separately. The 'Alert' column flags factors with high (A) or very high (AA) site limitations which probably require special consideration in site acceptability or for system design(s). Blank spaces indicate data have not been entered into TRENCH.

Alert	Factor	Units	Value	Confid level	Limitation Trench	Limitation Amended	Remarks
A	Expected design area	sq m	450		High		
AA	Density of disposal systems	/sq km	75		Very high		
	Slope angle	degrees	5		Very low		
	Slope form	Convex converging			Moderate		
	Surface drainage		Good		Very low		
	Flood potential	Site floods <1:100 yrs			Very low		
	Heavy rain events		Very rare		Very low		
	Aspect (Southern hemi.)		Faces N		Very low		
	Frequency of strong winds		Common		Low		
	Wastewater volume	L/day	600		Moderate		
	SAR of septic tank effluent		1.0		Low		
	SAR of sullage		2.5		Moderate		
	Soil thickness	m	3.0		Very low		
	Depth to bedrock	m	6.0		Very low		
	Surface rock outcrop	%	0		Very low		
	Cobbles in soil	%	0		Very low		
A	Soil pH		4.0		High		
	Soil bulk density	gm/cub. cm	1.4		Very low		
	Soil dispersion	Emerson No.	8		Very low		
AA	Adopted permeability	m/day	2.8		Very high		
	Long Term Accept. Rate	L/day/sq m	30		Low		

To enter comments, click on the line below 'Comments'. (This yellow-shaded box and the buttons on this page will not be printed.)

Comments

The site is suitable for onsite wastewater disposal with a sufficient area available.The site is limited by a shallow water table and flood hazard in the low lying areas. Therefore, primary treated effleunt is to be pump-dosed to an absorption bed in the naturally elevated sand dune at the rear of the property.

Doyle Soil Consulting

Land suitability and system sizing for on-site wastewater management

Trench 3.0 (Australian Institute of Environmental Health)

Environmental Sensitivity Report

OWMS design from proposed 3-bedroom dweling

Assessment for	Creative Homes Hobart	Assess. Date	23-May-35
		Ref. No.	
Assessed site(s)	11 Eularminner Street, Carlton	Site(s) inspected	2-Apr-25
Local authority	Sorell Council	Assessed by	R Doyle

This report summarises data relating to the environmental sensitivity of the assessed site(s) in relation to applied wastewater. Physical capability and system design issues are reported separately. The 'Alert' column flags factors with high (A) or very high (AA) limitations which probably require special consideration in site acceptability or for system design(s). Blank spaces indicate data have not been entered into TRENCH.

Alert	Factor	Units	Value	Confid level	Limitation Trench	Limitation Amended	Remarks
AA	Cation exchange capacity	mmol/100g	10		Very high		
AA	Phos. adsorp. capacity	kg/cub m	0.1		Very high		
	Annual rainfall excess	mm	-618		Very low		
	Min. depth to water table	m	1.85		Low		
	Annual nutrient load	kg	5.5		Low		
	G'water environ. value	Indust non-sensit			Very low		
	Min. separation dist. required	m	8		Very low		
	Risk to adjacent bores						Factor not assessed
	Surf. water env. value	Indust non-sensit			Very low		
	Dist. to nearest surface water	m	250		Moderate		
AA	Dist. to nearest other feature	m	8		Very high		
	Risk of slope instability		Low		Low		
	Distance to landslip	m	5000		Very low		

To enter comments, click on the line below 'Comments'. (This yellow-shaded box and the buttons on this page will not be printed.)

Comments

There will be an acceptable environmental risk due to the approximate vertical separation of 1.5 m from the base of the LAA to the water table. This should provide adequate soil treatment of the primary treated effluent before meeting the ground water.

APPENDIX 2 – Design Hydraulics, System Componentry, Pump Capacity and float Switch Setup

System sizing and componentry for pump-dosed absorption bed - 11 Eularminner Rd, Carlton			
Design hydraulic load (L/day)	Design Loading Rate (mm/day)	Application area (m^2)	System flow rate (L/min)
600	30	20.0	97
Number of absorption beds	Sequencing valve required?	Make & model	
1	No	N/A	
Supply line material	Supply main ID (mm)	Supply line length (m)	
LILAC LDPE PRESSURE PIPE (32/3)	31.7	30	
Distribution lateral length (m)	Number of distribution laterals	Distribution lateral material	Distribution lateral ID (mm)
9.4	2	PVCU - DN30 - (PN12)	37.5
Perforation Spacing (mm)	Number of perforations	Perforation diameter (mm)	Estimated flow rate per perforation @ 1.5 m head (L/min)
700	27	5	3.60

Dynamic Head Calculation	
Component	Approx. Head loss (m)
Supply line (friction @ flow rate)	4.1
Sequencing valve (friction @ flow rate)	N/A
Other Fittings (friction)	1.0
Approx. Elevation differential (bottom of pumpwell to distribution manifold)	2.5
Required head @ distribution manifold	1.5
Total Dynamic Head (TDH)	**9.1**

Pump Requirements	
Min. pump capacity	Max. pumping time @ 600 L/day
97.2 L/min @ 9.1 m Head	6 mins/day
Suitable pump	**Xenox ZHS-040**

Dose Volume and Pump Float-switch Setup			
Supply main void volume (L)	Distribution manifild void volume (L)	Set float-switches to pump (L)	Volume delivered per dose (L)
24	21	129	105

Dosing rates in accordance with: *Converse, 2000. Pressure Distribution Network Design* - i.e., individual dose volume to:

(a) be minimum 5 times the distribution manifold total void volume; and ✓

(b) not exceed 20% the daily hydraulic load volume ✓

Acceptable Solutions	**Performance Criteria**	**Compliance**
A1 Horizontal separation distance from a building to a land application area must comply with one of the following: a) be no less than 6m; or b) be no less than: i) 3m from an upslope building or level building; ii) If primary treated effluent to be no less than 4m plus 1m for every degree of average gradient from a downslope building; iii) If secondary treated effluent and subsurface application, no less than 2m plus 0.25m for every degree of average gradient from a downslope building	P1 The land application area is located so that a) the risk of wastewater reducing the bearing capacity of a building's foundations is acceptably low.; and b) is setback a sufficient distance from a downslope excavation around or under a building to prevent inadequately treated wastewater seeping out of that excavation	Complies with A1 (a) Land application area will be located with minimum separation distance to proposed building of 11.5 m (6 m required).
A2 Horizontal separation distance from downslope surface water to a land application area must comply with (a) or (b) a) be no less than 100m; or b) be no less than the following: i) if primary treated effluent 15m plus 7m for every degree of average gradient to downslope surface water; or ii) if secondary treated effluent and subsurface application, 15m plus 2m for every degree of average gradient to down slope surface water.	P2 Horizontal separation distance from downslope surface water to a land application area must comply with all of the following: a) Setback must be consistent with AS/NZS 1547 Appendix R; b) A risk assessment in accordance with Appendix A of AS/NZS 1547 has been completed that demonstrates that the risk is acceptable.	Complies with A2 (a) Land application area located > 100m from downslope surface water Sorell Council Development Application: 5.2025.119.1 - Response to Request For Information - 11 Eularminner Street, Carlton - P2 (2).pdf Plans Reference:P2 Date Received:17/07/2025

A3 Horizontal separation distance from a property boundary to a land application area must comply with either of the following: a) be no less than 40m from a property boundary; or b) be no less than: i) 1.5m from an upslope or level property boundary; and ii) If primary treated effluent 2m for every degree of average gradient from a downslope property boundary; or iii) If secondary treated effluent and subsurface application, 1.5m plus 1m for every degree of average gradient from a downslope property boundary.	P3 Horizontal separation distance from a property boundary to a land application area must comply with all of the following: a) Setback must be consistent with AS/NZS 1547 Appendix R; and b) A risk assessment in accordance with Appendix A of AS/NZS 1547 has been completed that demonstrates that the risk is acceptable.	Complies with A3 (b) (i) Land application area will be located with a minimum separation distance of 1.5m from an upslope or level property boundary. Complies with A3 (b) (ii) Land application area will be located with a minimum separation distance of 8 m of downslope property boundary (8 m required).
A4 Horizontal separation distance from a downslope bore, well or similar water supply to a land application area must be no less than 50m and not be within the zone of influence of the bore whether up or down gradient.	P4 Horizontal separation distance from a downslope bore, well or similar water supply to a land application area must comply with all of the following: a) Setback must be consistent with AS/NZS 1547 Appendix R; and b) A risk assessment completed in accordance with Appendix A of AS/NZS 1547 demonstrates that the risk is acceptable	No bore or well identified within 50m

A5 Vertical separation distance between groundwater and a land application area must be no less than: a) 1.5m if primary treated effluent; or b) 0.6m if secondary treated effluent	P5 Vertical separation distance between groundwater and a land application area must comply with the following: a) Setback must be consistent with AS/NZS 1547 Appendix R; and b) A risk assessment completed in accordance with appendix A of AS/NZS 1547 that demonstrates that the risk is acceptable	Complies with A5 (a)
A6 Vertical separation distance between a limiting layer and a land application area must be no less than: a) 1.5m if primary treated effluent; or b) 0.5m if secondary treated effluent	P6 Vertical setback must be consistent with AS/NZS1547 Appendix R.	No limiting layer identified.
A7 nil	P7 A wastewater treatment unit must be located a sufficient distance from buildings or neighbouring properties so that emissions (odour, noise or aerosols) from the unit do not create an environmental nuisance to the residents of those properties	Complies

To comply with the Southern Beaches On-site Waste Water Management Specific Area Plan

SOR-S2.6.1 Uses within the Southern Beaches On-site Wastewater Management Specific Area Plan

Acceptable Solutions:	**Comment:**
A1 No change, expansion, or intensification of residential or business use on the site.	Non-compliance therefore P1 must be addressed

Performance Criteria	**Comment:**
P1 The change, expansion, or intensification of a residential or business use on the site does not cause any adverse environmental impact or impact on public health, having regard to: (a) the extent and nature of the land available on the property to accommodate an on-site wastewater management system (including the land application area) for the proposed development; and (b) the land application area is setback a sufficient distance from watercourses, property boundaries and groundwater.	Complies: deep sand across the property. The elevated area of dune at the south of the property has sufficient area to accommodate an in-ground absorption bed, sized using an appropriate DLR for primary treatment and accommodation for 5 EP. Complies – the setbacks are consistent with the Directors Guidelines 2016

SOR – S2.7 Development Standards for Buildings and Works

SOR-S2.7.1 On-site wastewater

Acceptable Solutions	**Comment:**
A1 Development must: (a) not cover more than 20% of the site. (b) not be located on land shown on an overlay map, as within: (i) a flood-prone hazard area.	Complies – area assigned to treatment system, pumping and land application approx. 30 sq m. Block = approx. 1450 sqm Complies – see Site Plan with flood hazard overlay marked up

(ii) a landslip hazard area. (iii) a coastal erosion hazard area. (iv) a waterway and coastal protection area; or (v) a coastal inundation hazard area.	Complies Complies Complies Complies
(c) be located on a site with a soil depth of at least 1.5m.	Complies: soil > 2 m deep
(d) be located on a site where the average gradient of the land does not exceed 10%; and	Complies.
in the case of a dwelling, provide 65m^2 of land for wastewater land application area per bedroom which is located at least 1.5m from an upslope or side slope boundary and 5m from a downslope boundary.	Non-compliance. See P2

Performance Criteria	**Comment:**
P1 The site must provide sufficient area for management of on-site wastewater, having regard to:	
(a) the topography of the site.	Complies. Slope around the LAA between 4-6 degrees
(b) the capacity of the site to absorb wastewater.	Complies: Local soil are deep highly permeable sands. Due to the flood hazard overlay and the seasonal water table evident at 0.6 m depth at the lowest point on the property, the absorption bed is to be in the elevated area of dune at the south/rear of the property.
(c) the size and shape of the site.	Complies – ample area for a 20 sqm LAA
(d) the existing buildings and any constraints imposed by existing development.	Complies – no existing development
(e) the area of the site to be covered by the proposed development.	Complies – ample area for a 20 sqm LAA

(f) the provision for landscaping, vehicle parking, driveways, and private open space. (g) any adverse impacts on the quality of ground, surface, and coastal waters. (h) any adverse environmental impact on surrounding properties and the locality; and any written advice from a suitably qualified person (onsite wastewater management) about the adequacy of the on-site wastewater management system.	Complies – ample area for a 20 sqm LAA Complies – min 1.5 m separation from base of absorption bed to inferred shallowest depth seasonal water table. Complies – non identified, aside from a small area of vegetation clearing for installation of LAA

Acceptable Solutions	**Comment:**
A2 An outbuilding, driveway or parking area or addition or alteration to a building must not encroach onto an existing land application area.	Complies – none are in close proximity to the LAA.

CERTIFICATE OF THE RESPONSIBLE DESIGNER

Section 94
Section 106
Section 129
Section 155

Form **35**

To: Creative Homes Hobart *Owner name*
PO Box 88 *Address*
Glenorchy TAS 7010 *Suburb/postcode*

Designer details:

Name: Robyn Doyle
Category: Bldg srvcs dsgnr-hydraulic domestic
Business name: Doyle Soil Consulting
Phone No: 0488080455
Business address: 6/76 Auburn Rd
Kingston Beach 7050
Fax No:
Licence No: CC7418
Email address: robyn@doylesoilconsulting.com.au

Details of the proposed work:

Owner/Applicant Peter Waters
Designer's project reference No. 2025-5
Address: 11 Eularminner St
Lot No: 2
Carlton TAS 7173

Type of work: Building work ☐ Plumbing work ☒ *(X all applicable)*

Description of work:
On-site wastewater Design

Sorell Council
Development Application: 5.2025.119.1 - Response to Request For Information - 11 Eularminner Street, Carlton - P2 (2).pdf
Plans Reference:P2
Date Received:17/07/2025

(new building / alteration / addition / repair / removal / re-erection water / sewerage / stormwater / on-site wastewater management system / backflow prevention / other)

Description of the Design Work (Scope, limitations or exclusions): *(X all applicable certificates)*

Certificate Type:	Certificate	Responsible Practitioner
	☐ Building design	Architect or Building Services Designer
	☐ Structural design	Structural Engineer
	☐ Fire Safety design	Fire Engineer
	☐ Civil design	Civil Engineer
	☒ Hydraulic design	Building Services Designer
	☐ Fire service design	Building Services Designer
	☐ Electrical design	Building Services Designer
	☐ Mechanical design	Building Service Designer
	☐ Plumbing design	Plumber
	☐ Other (specify)	

Deemed-to-Satisfy: ☒ Performance Solution: ☐ *(X the appropriate box)*

Other details:

Design documents provided:

The following documents are provided with this Certificate –

Document description:

Drawing numbers:	Prepared by: Doyle Soil Consulting	Date: May 2025
Schedules:	Prepared by:	Date:
Specifications:	Prepared by: Doyle Soil Consulting	Date: May 2025
Computations:	Prepared by: Doyle Soil Consulting	Date: May 2025
Performance solution proposals:	Prepared by:	Date:
Test reports:	Prepared by: Doyle Soil Consulting	Date: May 2025

Standards, codes or guidelines relied on in design process:

AS1547-2012 On site domestic wastewater management.

National Construction Code 2022 Vol 3

Directors Guidelines for On-site Wastewater Management Systems, Director of Building Control (Tasmania) 2017

Any other relevant documentation:

Site and soil evaluation and design report -Proposed onsite wastewater management system by Robyn Doyle

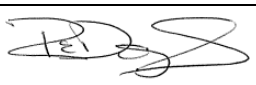
Cromer, W. C. (2021). *Site and Soil Evaluation Report, and System Design for Upgraded On- site Wastewater Management, 91 Spitfarm Ro9ad, Opossum Bay.* Unpublished report for J. Mackerprang by William C. Cromer Pty. Ltd., 29 November 2021

Attribution as designer:

I, Robyn Doyle, am responsible for the design of that part of the work as described in this certificate.

The documentation relating to the design includes sufficient information for the assessment of the work in accordance with the *Building Act 2016* and sufficient detail for the builder or plumber to carry out the work in accordance with the documents and the Act.

This certificate confirms compliance and is evidence of suitability of this design with the requirements of the National Construction Code.

	Name: (print)	*Signed*	*Date*
Designer:	R Doyle		16/04/2025
Licence No:	CC7418		

Assessment of Certifiable Works: (TasWater)

Note: single residential dwellings and outbuildings on a lot with an existing sewer connection are not considered to increase demand and are not certifiable.

If you cannot check ALL of these boxes, LEAVE THIS SECTION BLANK.

TasWater must then be contacted to determine if the proposed works are Certifiable Works.

I confirm that the proposed works are not Certifiable Works, in accordance with the Guidelines for TasWater CCW Assessments, by virtue that all of the following are satisfied:

- [X] The works will not increase the demand for water supplied by TasWater
- [X] The works will not increase or decrease the amount of sewage or toxins that is to be removed by, or discharged into, TasWater's sewerage infrastructure
- [X] The works will not require a new connection, or a modification to an existing connection, to be made to TasWater's infrastructure
- [X] The works will not damage or interfere with TasWater's works
- [X] The works will not adversely affect TasWater's operations
- [X] The work are not within 2m of TasWater's infrastructure and are outside any TasWater easement
- [X] I have checked the LISTMap to confirm the location of TasWater infrastructure
- [X] If the property is connected to TasWater's water system, a water meter is in place, or has been applied for to TasWater.

Certification:

I, ……Robyn Doyle……being responsible for the proposed work, am satisfied that the works described above are not Certifiable Works, as defined within the *Water and Sewerage Industry Act 2008,* that I have answered the above questions with all due diligence and have read and understood the Guidelines for TasWater CCW Assessments.

Note: the Guidelines for TasWater Certification of Certifiable Works Assessments are available at: www.taswater.com.au

	Name: (print)	*Signed*	*Date*
Designer:	Robyn Doyle		27/05/2025

CERTIFICATE OF QUALIFIED PERSON – ASSESSABLE ITEM

Section 321

Form **55**

To: Creative Homes Hobart *Owner name*
PO Box 88 *Address*
Glenorchy 7010 *Suburb/postcode*

Qualified person details:

Qualified person: Robyn Doyle
Address: 6/76 Auburn Rd
Kingston Beach 7050
Phone No: 0488 080 455
Fax No:
Licence No: N/A
Email address: robyn@doylesoilconsulting.com.au

Qualifications and Insurance details: Certified Professional Soil Scientist (CPSS)
Professional Indemnity cover –

About Underwriting -Lloyd's of London
ENG 21 000305

(description from Column 3 of the Director's Determination - Certificates by Qualified Persons for Assessable Items

Speciality area of expertise: Site and Soil evaluation and land application system design

(description from Column 4 of the Director's Determination - Certificates by Qualified Persons for Assessable Items)

Details of work:

Address: 11 Eularminna St
Carlton 7173
Lot No: 2
Certificate of title No: 84583/2

The assessable item related to this certificate: Onsite wastewater management -Site evaluation and soil classification for onsite wastewater management capability

Including
Characterisation of wastewater and predicted hydraulic loadings
Selection of land application area
Determination of design loading rate

(description of the assessable item being certified)
Assessable item includes –
- *a material;*
- *a design*
- *a form of construction*
- *a document*
- *testing of a component, building system or plumbing system*
- *an inspection, or assessment, performed*

Certificate details:

Certificate type: On-site wastewater management - Site and soil evaluation

(description from Column 1 of Schedule 1 of the Director's Determination - Certificates by Qualified Persons for Assessable Items n)

This certificate is in relation to the above assessable item, at any stage, as part of - *(tick one)*

building work, plumbing work or plumbing installation or demolition work: X

or

a building, temporary structure or plumbing installation:

In issuing this certificate the following matters are relevant –

Documents:	AS/NZS 1547-2012 On-Site Domestic Wastewater Management
Relevant calculations:	
References:	AS1547-2012 On-Site Domestic Wastewater Management Directors Guidelines for On-Site wastewater Management Systems - CBOS -2017

Substance of Certificate: *(what it is that is being certified)*

Site and soil evaluation

Scope and/or Limitations

The classification applies to the site as inspected and does not account for future alteration to foundation conditions as a result of earthworks, drainage condition changes or variations in site maintenance.

I certify the matters described in this certificate.

	Signed:	*Certificate No:*	*Date:*
Qualified person:		1740	27/5/2025

CERTIFIED PROFESSIONAL SOIL SCIENTIST
CPSS
Ms Robyn Doyle

DOYLE SOIL CONSULTING

AS1547:2012 – Loading Certificate – Septic System Design

This loading certificate is provided in accordance with Clause 7.4.2(d) of AS/NZS 1547:2012 and sets out the design criteria and the limitations associated with the use of the system.

Site Address: 11 Eularminner St, Carlton

System Capacity: 5 people @ 120 L/person/day

Summary of Design Criteria

DLR: 30 L/m^2/day.

Absorption area: 20 m^2

Reserve area location /use: area assigned

Water-saving features fitted: Standard fixtures

Allowable variation from design flows: 1 event @ 200 % daily loading per quarter

Typical loading change consequences: Expected to be minimal due to capacity of system and site area (provided loading changes within 25 % of design)

Overloading consequences: Continued overloading may cause hydraulic failure of the absorption area and require upgrading/extension of the area. Risk considered acceptable due to intended use being for holiday home/shack.

Underloading consequences: Lower than expected flows will have minimal consequences on system operation unless the house has long periods of non-occupation. Under such circumstances additional maintenance of the system may be required. Risk considered acceptable.

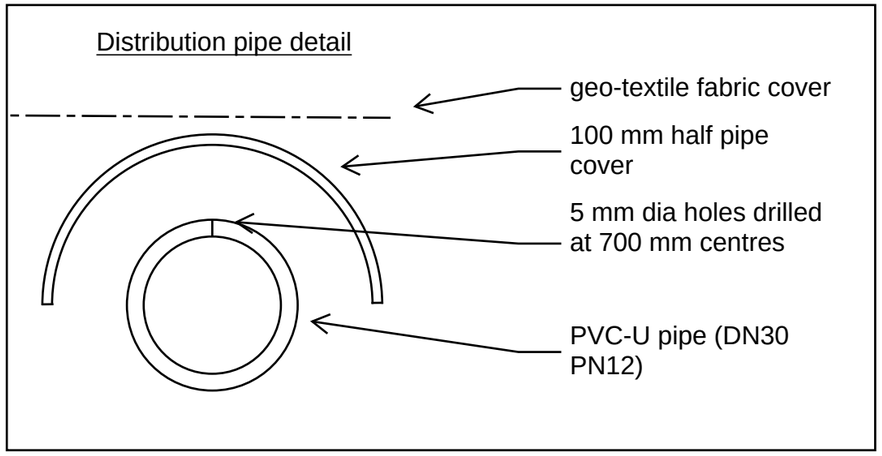
Lack of maintenance / monitoring consequences: Issues of underloading/overloading and condition of the absorption area require monitoring and maintenance, if not completed system failure may result in unacceptable health and environmental risks. Septic tank de-sludging must also be monitored to prevent excessive sludge and scum accumulation. Monitoring and servicing by the property owner required to ensure compliance.

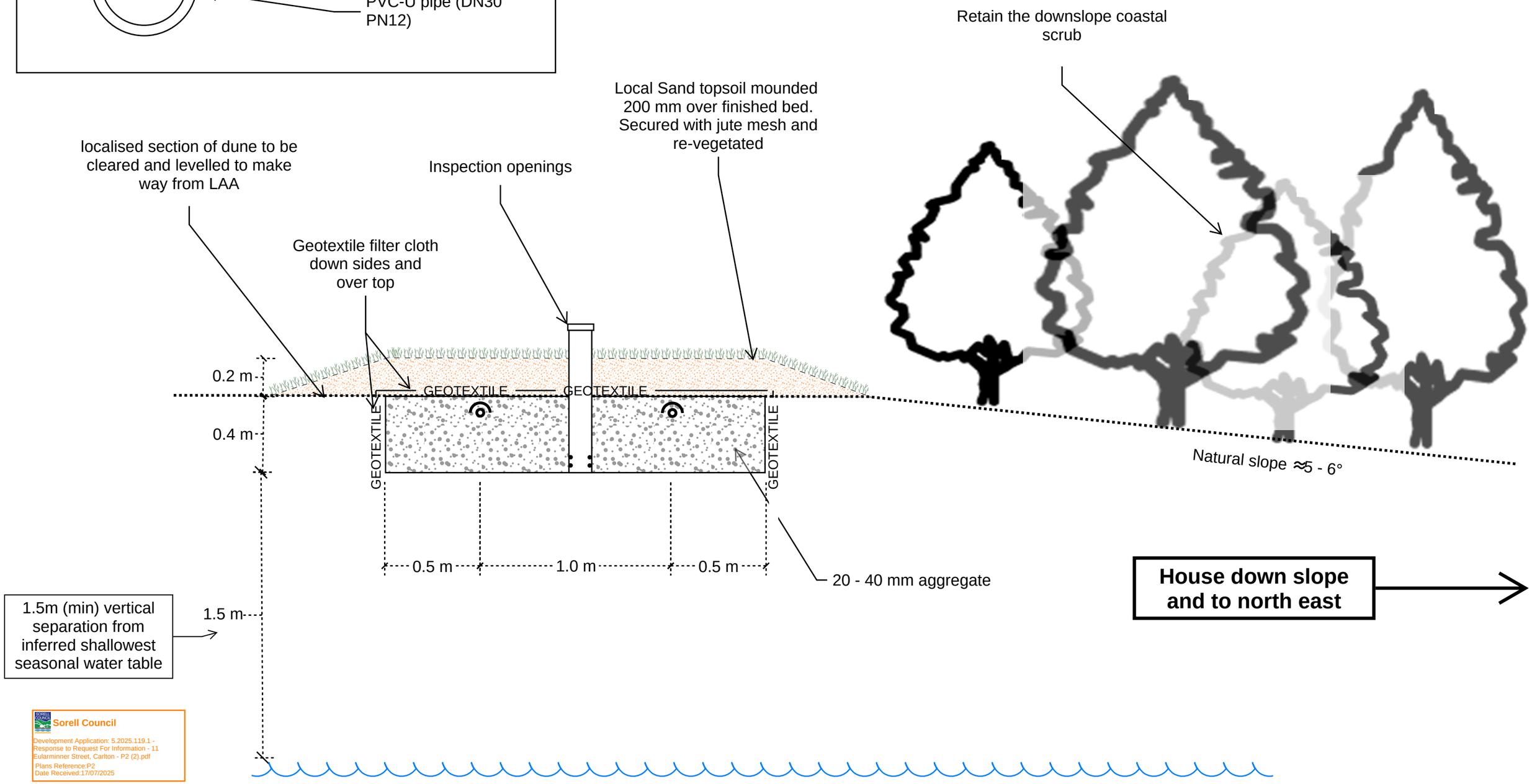
Other operational considerations: Owners/occupiers must be aware of the operational requirements and limitations of the system: the absorption area must not be subject to traffic by vehicles or heavy stock and should be fenced-off if deemed necessary to avoid this; The absorption area must be maintained with adequate grass cover to assist in evapotranspiration of treated effluent. The septic tank must be de-sludged at least every 3 years, and any other infrastructure such as septic tank outlet filters must also be cleaned regularly (approx. every 6 months depending upon usage). Foreign materials such as rubbish and solid waste must be kept out of the system.

11 Eularminner Street, Carlton

Cross section: Pressure-dosed Absorption Bed

DOYLE SOIL CONSULTING





All onsite wastewater management systems are site-specific. Installer to refer closely to DSC report and design spec sheets. Contact the system designer with any questions or proposed changes to the system prior to proceeding with changes. Failure to do so may prevent designer certification/sign-off

Design notes:

1. Clear and level the approximate area to become the LAA

2. Absorption bed dims: 10.0 m x 2.0 m x 0.4 m - constructed in-line with the contour.

3. Install the distribution manifold in the upper 100 mm of the aggregate. i.e. lay 300 mm depth of aggregate then construct the manifold, then cover with the remaining 50-100 mm depth of aggregate.

4. The distribution manifold to be approximately level

5. For distribution manifold: us **PVCU - DN30 - (PN12) pipe drilled with 5 mm holes** in the top invert of pipe at 7**00 mm centres.** Half circle 100 mm PVC pipe (non-perforated), laid over each perforated lateral to direct water jet downwards. two approx 9400 mm laterals are required.

6. Geotextile down the sides of the bed and to top the aggregate layer

7. Inspection openings to be place at approximately 1/4 and 3/4 along the length of the aggregate layer.

8. Manual flush valves to be installed at far end of distribution laterals, covered with lilac coloured valve box installed flush with finished bed surface. Lines to manually be flushed annually.

9. Cover cover finished bed with 200 of local sandy soil, secured with jute mesh. re-vegetate.

10. **Minimum pump capacity for the proposed design is 97 L/min @ 9.1 m head.** A Zenox ZHS - 040-A is a suitable unit for pump dosing the system. See Appendix 2 for hydraulic design calculations and minimum pump capacity requirements. Wired-in high-water alarm required in pumpwell.

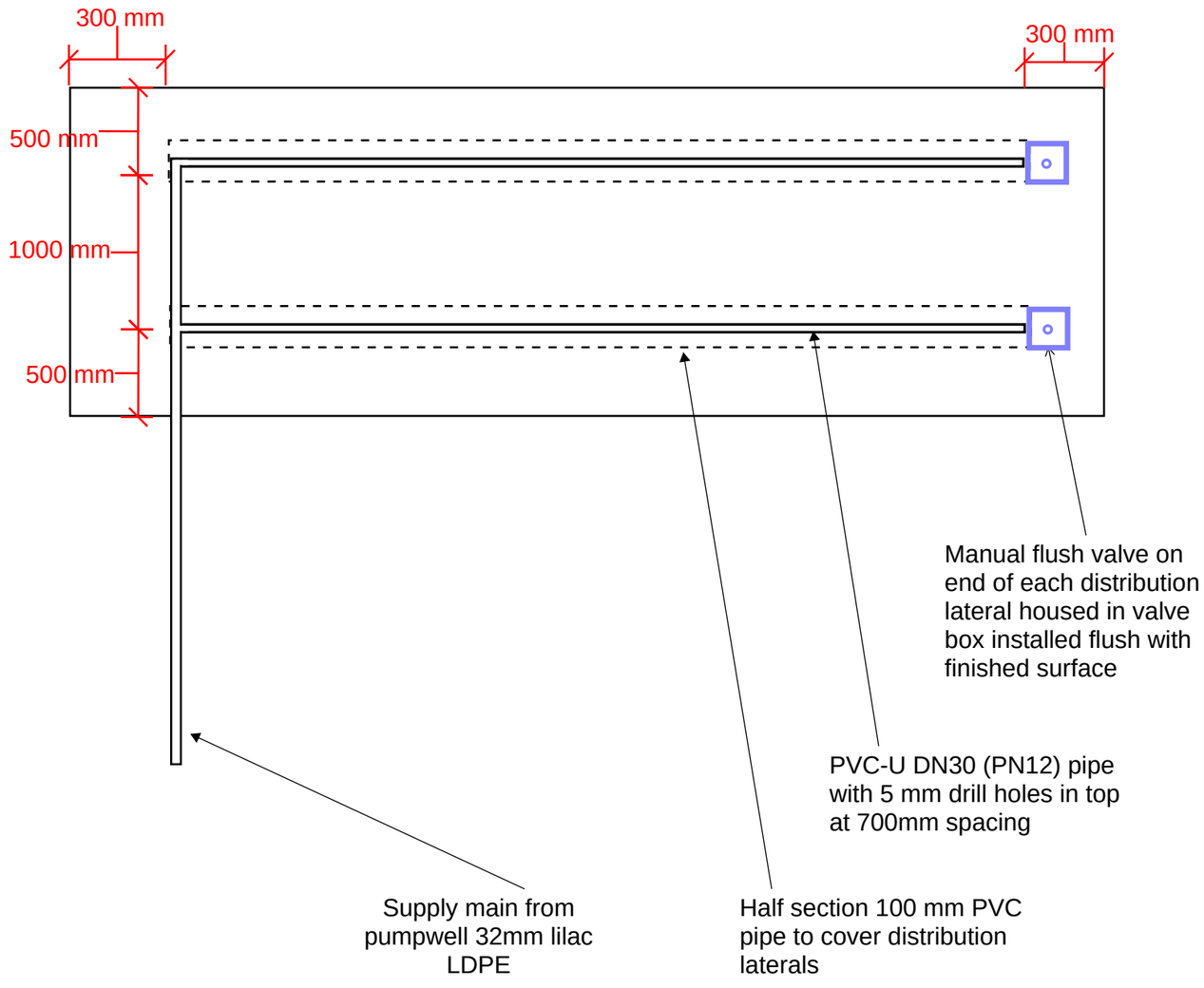
11. Pump float switches in pumpwell should be setup to deliver approx. 108 L doses

12. All works to comply with AS3500 and Australian Plumbing Code.

11 Eularminner St, Carlton

Plan view: Pressure-dosed Absorption Bed (not to scale)

DOYLE SOIL CONSULTING



All onsite wastewater management systems are site-specific. Installer to refer closely to DSC report and design spec sheets. Contact the system designer with any questions or proposed changes to the system prior to proceeding with changes. Failure to do so may prevent designer certification/sign-off

NETCO PACKAGED 800 LITRE POLYETHYLENE PUMP STATION

MODEL	NOMINAL DEPTH	CAPACITY
NPE-800-S	1270 mm	800 L

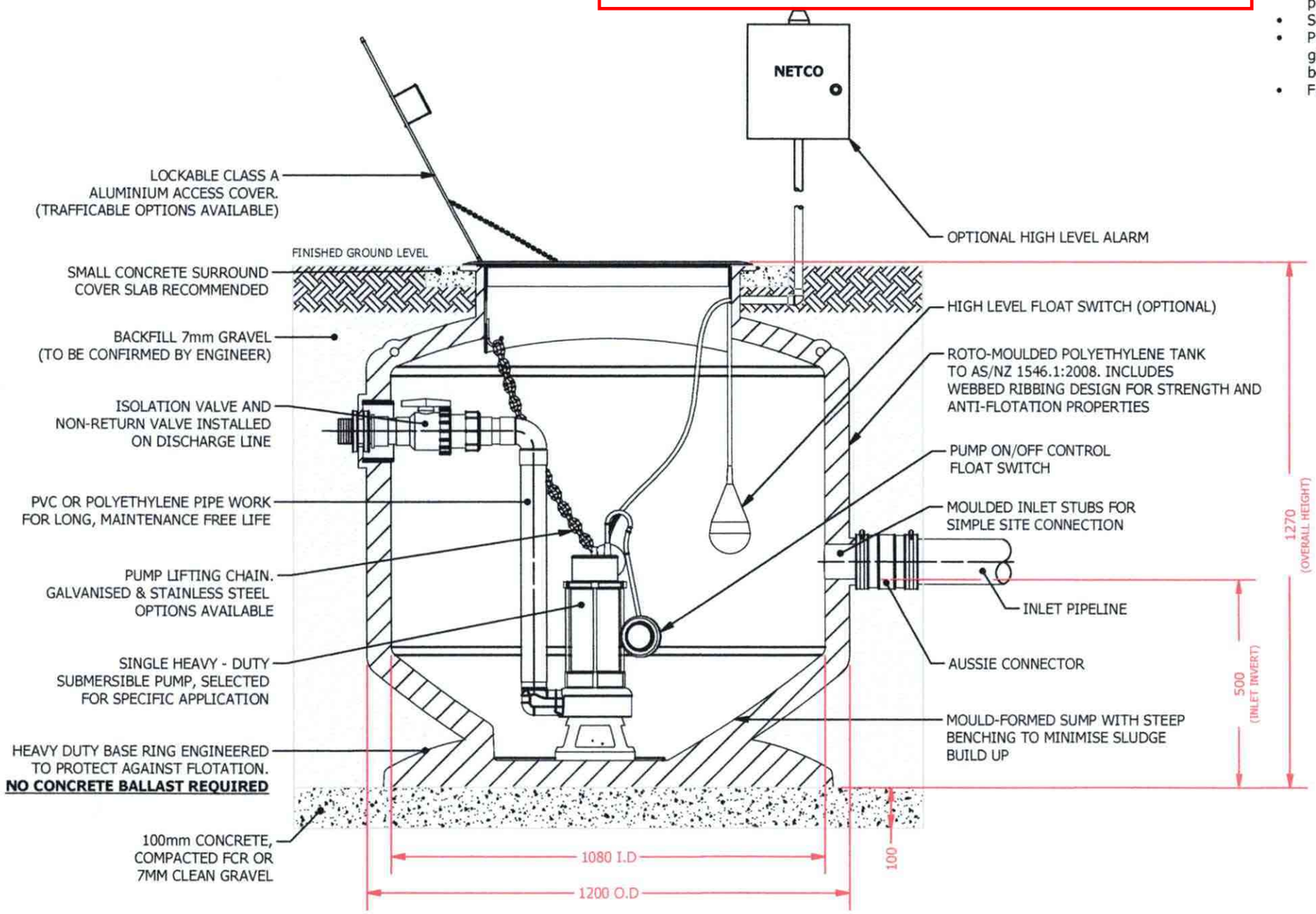
OWMS Designer notes:

DOYLE SOIL CONSULTING

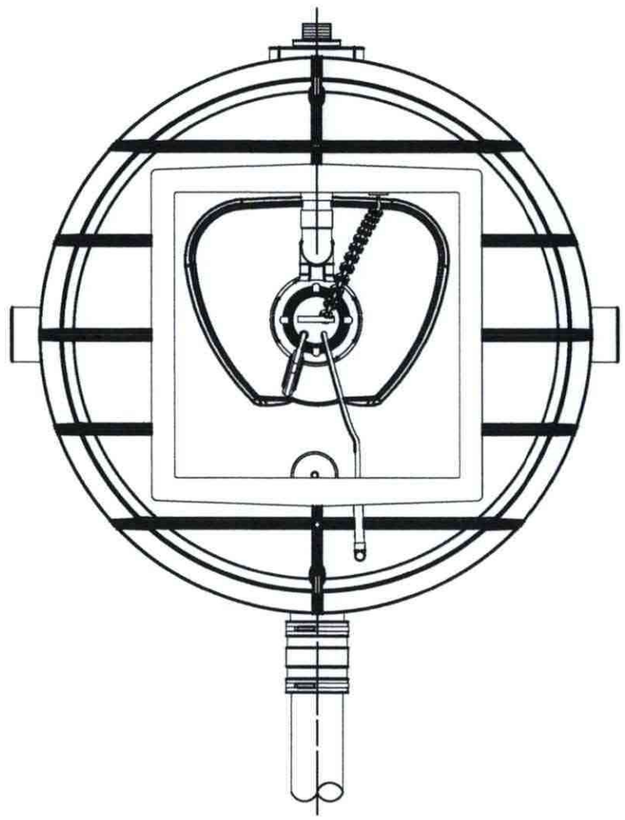
Minimum pump capacity for the proposed design is 97 L/min @ 9.1 m head. A Zenox ZHS - 040-A is a suitable unit for pump dosing the system. See Appendix 2 for hydraulic design calculations and minimum pump capacity requirements. Wired-in high-water alarm required in pumpwell. Pump float switch should be setup to deliver approx. 108 L doses.

INSTALLATION NOTES:

- Excavate the installation site to a depth 100 mm greater than the overall pump chamber height.
- Fill the base of the excavation with a 100 mm thick concrete slab or 100 mm bed of compacted FCR or 7mm clean gravel.
- Fill the pump chamber with 300 mm - 400 mm water prior to placement on 100 mm base.
- Confirm with site engineer regarding backfill requirements. As a minimum, backfill the excavation with 7mm clean gravel.
- Vent penetrations and inlet penetrations to be made on site and sealed through inlet stub or via rubber connection through the chamber wall using a multi-seal or similar. Vent to be as close as possible to the top of the chamber. All penetrations to be perpendicular to the chamber wall.
- Electrician to install conduit(s) for the pump(s) through the chamber wall using plain to screwed adaptors. Seal cables on the inside of conduits. Ensure adequate power supply.
- When commissioning, set overloads to amperage shown on pump nameplate. Record voltage and running current whilst pump is under load.
- Set high level alarm float switch 100 mm above pump start float switch.
- Pump chamber is to be regularly cleaned with a handheld hose and pump and alarm operation checked. In sewage or high grease applications, the chamber should be degreased on a regular basis by a waste removal contractor. Pump(s) should be removed for service on a 12-month cycle (approximately).
- Full installation guidelines are available for download at www.netcopumps.com.au



PUMP STATION TYPICAL SECTION



PUMP STATION PLAN VIEW
(COVER REMOVED FOR CLARITY)

NO.	REVISION	DATE	BY	APPROVED
1	ORIGINAL DRAWING	18.08.2020	J.M	L.C

DRAWING STATUS: APPROVED

DO NOT SCALE

DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE NOTED

REFERENCE DRAWINGS

	SIGNED	DATE
DRAWN	J.M	18.08.2020
CHECKED	L.C	18.08.2020
DESIGNED	J.M	18.08.2020
APPROVED	L.C	18.08.2020

NETCO PUMPS & EQUIPMENT
100 SUNDERLAND STREET, DERWENT PARK
TASMANIA 7009
(03) 6272 6628
sales@netcopumps.com.au

PROJECT NAME: NETCO POLYETHYLENE PUMPING STATIONS
DRAWING TITLE: 800 LITRE POLYETHYLENE PUMPING STATION SINGLE FREESTANDING PUMP MODEL: NPE-800-S
DRAWING NUMBER: 2008-NPE800-001
SCALE AT A3: NTS
REVISION: 1

11 Eularminner St, Carlton

DOYLE SOIL CONSULTING

Sorell Council

Development Application: 5.2025.119.1 - Response to Request For Information - 11 Eularminner Street, Carlton - P2 (2).pdf

Plans Reference:P2
Date Received:17/07/2025

Dual-purpose septic tank (min 3000L) with outlet filter. Final location TBD by installer to achieve sufficient fall from fixtures.

Pumpwell (min. 800 L) with float switch set to deliver approx 108 L doses.

Septic tank and pumpwell may require anchor blocks due to shallow water table.

Land Application Area: 20 m^2
- installed as one in-ground absorption bed
- pump-dosed via pumpwell
- dims: 10 m x 2.0 m x 0.4 m
- see Spec Sheet for distribution network design

Min 100 m downslope water setback
Min 8 m downslope boundary setbacks
Min 1.5 m setback from upslope/side foundations
Max 6 m setback from downslope

Refer to DSC report

Approximate test hole locations

Contours = 0.25 m

15 m

Prepared by
Rowan Mason
23/5/25

Robyn Doyle
Building Services Designer
Hydraulic
CC7418
27/5/2025

Designs of onsite wastewater management systems are site-specific. Installer to refer closely to DSC report and design spec sheets. Contact the system designer with any questions or proposed changes to the system prior to proceeding with changes. Failure to do so may prevent designer certification/sign-off

CREATIVE HOMES HOBART, CNR OF ELWICK ROAD & BROOKER HIGHWAY, GLENORCHY 7010 PH: 03 6272 3000

PROJECT ADDRESS: 11 EULARMINNER STREET, CARLTON

TITLE REFERENCE: VOLUME: 84583 FOLIO: 2

CLIENTS: TROY MASON

DESIGNER: Inge Brown, CC 6652

DRAWINGS:
01 COVER PAGE
02 PROPOSED SITE PLAN
03 PROPOSED FLOOR PLAN
04 PROPOSED ROOF PLAN
05 PROPOSED ELEVATIONS
06 PROPOSED ELEVATIONS
07 SECTION A-A
08 TYPICAL SECTION DETAILS
09 WINDOW SCHEDULE
10 BAL 29 REQUIREMENTS

FLOOR AREAS:

FLOOR AREA:	143.9 m²
PORCH:	7.7 m²
TOTAL AREA:	151.7 m²
DECK:	53.4 m²

SOIL CLASSIFICATION: --

WIND CLASSIFICATION: --

CLIMATE ZONE: 7

BUSHFIRE ATTACK LEVEL: BAL 29

ALPINE AREA: N/A

CORROSION ENVIRONMENT: N/A

DOCUMENTATION INDEX

The documentation listed below should be read in conjunction with these drawings and form the basis of construction documentation for the project

Document	*Revision*	*By*
Working drawings planning issue (these drawings)	E	Creative Homes Hobart
Survey plan SP251848-01	A	Survey Plus
Soil assessment		Doyle Soil Consulting

BAL: 29
ALL CONSTRUCTION TO BE IN ACCORDANCE WITH NCC REQUIREMENTS & AS. 3959-2018

GENERAL NOTES:

1. THIS PLAN HAS BEEN PREPARED BY SURVEY PLUS FROM A COMBINATION OF EXISTING RECORDS AND FIELD SURVEY FOR THE PURPOSES OF SHOWING THE PHYSICAL FEATURES OF THE LAND AND SHOULD NOT BE USED FOR ANY OTHER PURPOSE.

2. TITLE BOUNDARIES SHOWN WERE NOT VERIFIED OR MARKED BY SURVEY PLUS AT THE TIME OF THIS SURVEY.

3. SERVICES SHOWN ON THIS PLAN WERE LOCATED WHERE POSSIBLE BY FIELD SURVEY. THEY ARE NOT A COMPLETE PICTURE OF SERVICES ON SITE. ALL SERVICE LOCATIONS ARE TO BE VERIFIED BEFORE COMMENCEMENT OF ANY WORK ON SITE, IN PARTICULAR THOSE SERVICES NOT PREVIOUSLY LOCATED THROUGH FIELD SURVEY.

4. SURVEY PLUS CAN NOT ACCEPT LIABILITY WHATSOEVER FOR LOSS OR DAMAGE CAUSED TO ANY UNDERGROUND SERVICE WHETHER SHOWN BY OUR SURVEY OR NOT.

5. THIS NOTE IS AN INTEGRAL PART OF THIS PLAN/DATA. REPRODUCTION OF THIS PLAN OR ANY PART OF IT WITHOUT THIS NOTE BEING INCLUDED IN FULL WILL RENDER THE INFORMATION SHOWN ON SUCH A REPRODUCTION INVALID AND NOT SUITABLE FOR USE WITHOUT PRIOR AUTHORITY OF SURVEY PLUS.

6. HORIZONTAL DATUM IS MGA (GDA94).

7. VERTICAL DATUM IS AHD.

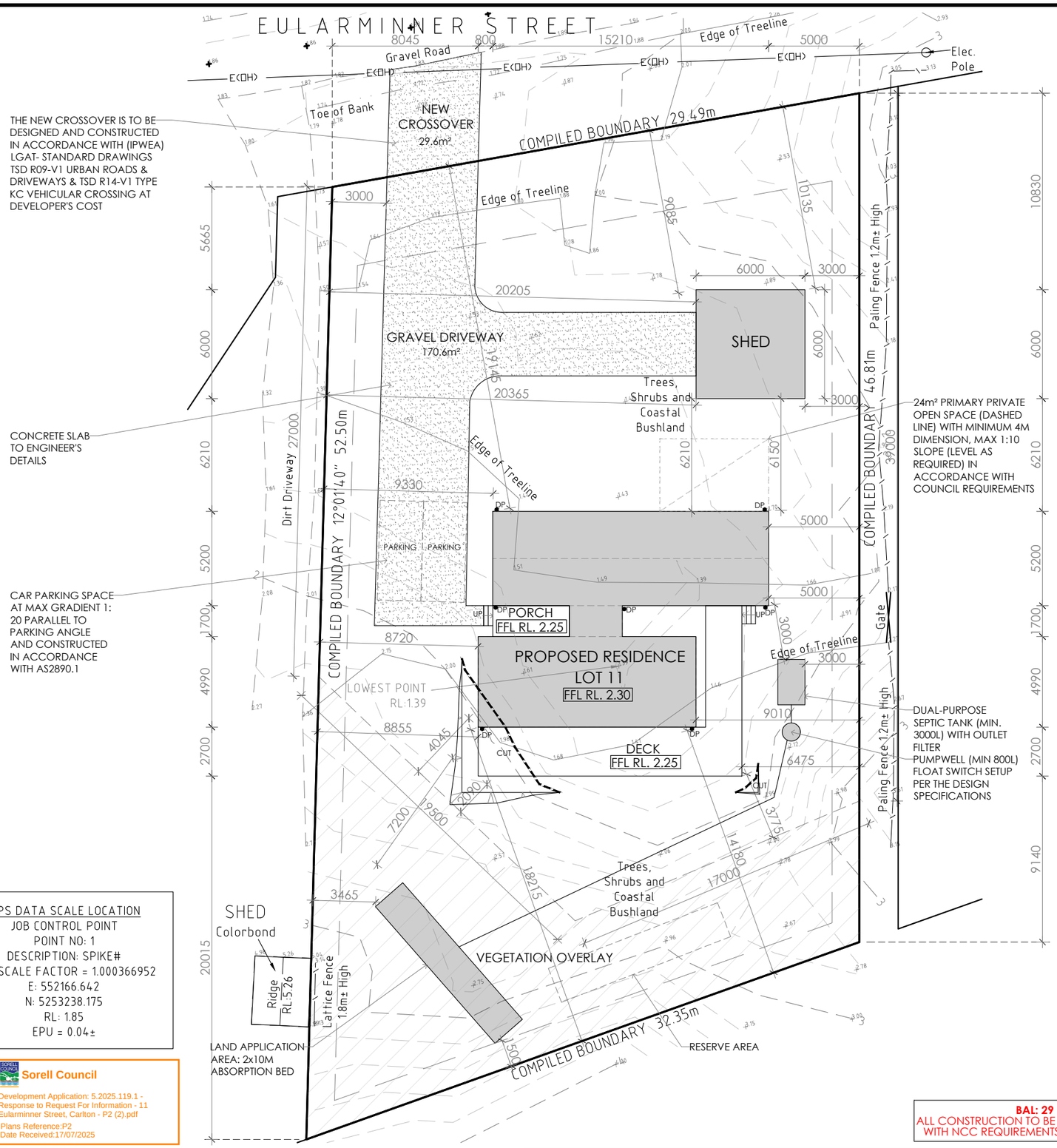
8. CONTOUR INTERVAL IS 0.2 METRE, INDEX IS 1.0 METRE.

9. SURVEY BY ROBOTIC TOTAL STATION AND GPS.

10. DUE TO THE AGE OF TITLE SURVEY IF ANY CONSTRUCTION WORKS ARE TO BE UNDERTAKEN ON OR NEAR THE TITLE BOUNDARY OR PRESCRIBED SETBACKS A RE-MARK SURVEY BY A REGISTERED LAND SURVEYOR WILL BE REQUIRED.

11. BOUNDARIES ARE COMPILED ONLY FROM SP84583 AND RELEVANT SURVEY INFORMATION OBTAINED FROM LAND TITLES OFFICE AND ARE APPROXIMATE AND SUBJECT TO SURVEY.

12. 3D DATA TURNED OFF IN LAYER CONTROL.
- 3D TIN
- MAJOR CONTOUR 3D
- MINOR CONTOUR 3D



NOTES

SITE PREPARATION

THE SITE IS TO BE DISTURBED AS MINIMALLY AS POSSIBLE TO THE EXTENT REQUIRED TO CARRY OUT THE BUILDING WORKS.
EARTHWORKS SHALL BE CARRIED OUT IN ACCORDANCE WITH NCC PART 3.2.
UN-RETAINED EMBANKMENT GRADIENTS SHALL BE IN ACCORDANCE WITH NCC TABLE 3.2.1.
DRAINAGE SHALL BE IN ACCORDANCE WITH NCC PART 3.3.2.
THE BUILDER AND SUBCONTRACTOR SHALL ENSURE THAT ALL STORMWATER DRAINS, SEWER PIPES AND THE LIKE ARE LOCATED AT A SUFFICIENT DISTANCE FROM ANY BUILDINGS FOOTING AND/OR SLAB EDGE BEAMS SO AS TO PREVENT GENERAL MOISTURE PENETRATION, DAMPNESS, WEAKENING & UNDERMINING OF ANY BUILDING AND IT'S FOOTING SYSTEM.
LOCATION OF ALL EXISTING SERVICES TO BE CONFIRMED ON SITE PRIOR TO CONSTRUCTION.

ATTENTION OF OWNER

THE OWNERS ATTENTION IS DRAWN TO THE FACT THAT FOUNDATIONS AND ASSOCIATED DRAINAGE FOR ALL SITES REQUIRES CONTINUING MAINTENANCE TO ASSIST FOOTING PERFORMANCE. ADVICE FOR FOUNDATION MAINTENANCE IS CONTAINED IN THE CSIRO BUILDING TECHNOLOGY FILE 18 AND IT IS THE OWNERS RESPONSIBILITY TO MAINTAIN THE SITE IN ACCORDANCE WITH THIS DOCUMENT.

SOIL AND WATER MANAGEMENT NOTES:

DRAINAGE LINES ARE TO BE INSTALLED PRIOR TO THE PLACEMENT OF ROOF AND GUTTERING. ONCE DWELLING IS ROOFED, CONNECT IMMEDIATELY.
APPLY TEMPORARY COVERING TO DISTURBED AREAS THAT WILL REMAIN EXPOSED FOR 14 DAYS OR MORE DURING CONSTRUCTION (EG. WATERPROOF BLANKET, VEGETATION OR MULCH)

PROTECT ANY NEARBY OR ON-SITE DRAINAGE PITS FROM SEDIMENT BY INSTALLING SEDIMENT TRAPS AROUND THEM.
LIMIT ENTRY/EXIT TO ONE POINT AND STABILISE.
INSTALL FACILITIES TO REMOVE DIRT/ MUD FROM VEHICLE WHEELS BEFORE THEY LEAVE THE SITE.

SITE TO BE VEGETATED AND PLANTED ACCORDING TO THE HOBART REGIONAL SOIL AND WATER MANAGEMENT CODE OF PRACTICE.

BUILDER AND SUBCONTRACTORS TO VERIFY ALL DIMENSIONS AND LEVELS PRIOR TO THE COMMENCEMENT OF ANY WORK. GIVE 24 HOURS MINIMUM NOTICE WHERE AMENDMENTS ARE REQUIRED TO DRAWINGS. THESE DRAWINGS ARE TO BE READ IN CONJUNCTION WITH DOCUMENTATION LISTED ON THE COVER PAGE. DO NOT SCALE DRAWINGS.
DIMENSIONS ARE TO TAKE PREFERENCE OVER SCALE.
BUILDING SPECIFICATION AND ENGINEERS DRAWINGS SHALL OVERRIDE ARCHITECTURAL DRAWINGS.

-THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER DRAWING SHEETS, CONSULTANTS DRAWINGS, DOCUMENTS, SCHEDULES AND SPECIFICATIONS (AS APPLICABLE).
-THE BUILDER AND SUBCONTRACTOR SHALL ENSURE THAT ALL STORMWATER DRAINS, SEWER PIPES AND THE LIKE ARE LOCATED AT A SUFFICIENT DISTANCE FROM ANY BUILDINGS FOOTING AND/OR SLAB EDGE BEAMS SO AS TO PREVENT GENERAL MOISTURE PENETRATION, DAMPNESS, WEAKENING & UNDERMINING OF ANY BUILDING AND ITS FOOTING SYSTEM.
- LOCATION OF ALL EXISTING ONSITE SERVICES TO BE CONFIRMED ONSITE PRIOR TO CONSTRUCTION

IMPORTANT!
SITE INFORMATION AS DRAWN IS APPROXIMATE ONLY. FINAL SITE INFORMATION IS SUBJECT TO A DETAILED CONTOUR SURVEY BY LICENSED SURVEYOR.

GPS DATA SCALE LOCATION
JOB CONTROL POINT
POINT NO: 1
DESCRIPTION: SPIKE#
GPS SCALE FACTOR = 1.000366952
E: 552166.642
N: 5253238.175
RL: 1.85
EPU = 0.04±

•DP 90mm DOWNPIPE

NOTE: ALL PROPOSED STORMWATER TO BE DISCHARGED TO EXISTING INFRASTRUCTURE

EROSION AND SEDIMENT CONTROL MEASURES ARE TO BE IMPLEMENTED ON THE SITE IN ACCORDANCE WITH COUNCIL REQUIREMENTS

Sorell Council
Development Application: 5.2025.119.1 - Response to Request For Information - 11 Eularminner Street, Carlton - P2 (2).pdf
Plans Reference:P2
Date Received:17/07/2025

SOIL CLASSIFICATION:	--
WIND CLASSIFICATION:	--

SITE COVERAGE		
SITE AREA	1471.8	m²
PROPOSED BUILDING FOOTPRINT	151.7	m²
PROPOSED SITE COVERAGE	10.30	

BAL: 29
ALL CONSTRUCTION TO BE IN ACCORDANCE WITH NCC REQUIREMENTS & AS. 3959-2018

PROPOSED SITE PLAN

PRELIMINARY

02

PROJECT NORTH

CONTRACTOR MUST VERIFY ALL DIMENSIONS AND LEVELS AT THE JOB PRIOR TO COMMENCING ANY WORK OR MAKING ANY SHOP DRAWINGS.
DO NOT SCALE DRAWINGS.
ALWAYS USE WRITTEN DIMENSIONS.

REV:	DESCRIPTION:	BY:	DATE:
B	CHANGE THE FFL & REMOVE ALL CLADDING TO GROUND	NN	28/04/25
C	BAL 29 UPDATE	QT	07/5/25
D	MOVE THE HOUSE TO THE PREVIOUS SETBACKS	QT	07/5/25
E	ADD THE WASTE WATER AREA	NN	02/6/25

CREATIVE HOMES HOBART
CREATIVE HOMES HOBART, CNR OF ELWICK ROAD & BROOKER HIGHWAY, GLENORCHY 7010 PH: 03 6272 3000

JOB ADDRESS: 11 Eularminner Street Carlton		CLIENT: Troy Mason	
DESIGNER: I. Brown	ACCRED. NO.: CC6652	SHEET:	2 of 10
DRAWN: N. Nguyen	DATE: April 2025	DESIGN TYPE:	Custom
CHECKED:	DATE:	DRAWING NO:	---
SCALE: 1:250	REV: E		

AREAS:	
FLOOR AREA:	143.9 m²
PORCH:	7.7 m²
TOTAL AREA:	151.7 m²
DECK:	53.4 m²

LEGEND:

DP	DOWNPIPE LOCATION
SHR	SHOWER
BTH	BATH
VB	VANITY BASIN
WC	TOILET
OHC	OVERHEAD CUPBOARDS
REF	REFRIGERATOR
P	PANTRY
RH	RANGE HOOD
UBO	UNDER BENCH OVEN
CT	COOK TOP
S	SINK
DW	DISH WASHER
T	TROUGH
WM	WASHING MACHINE
MH	MANHOLE
CSD	CAVITY SLIDING DOOR
AAW	ALUM. AWNING WINDOW
AFW	ALUM. FIXED WINDOW
ASD	ALUM. SLIDING DOOR
B/O	BEAM OVER
BAL	BALUSTRADE

BAL SELECTED BALUSTRADE TO BUILDER'S STANDARD DETAIL INSTALLED IN ACCORDANCE WITH NCC

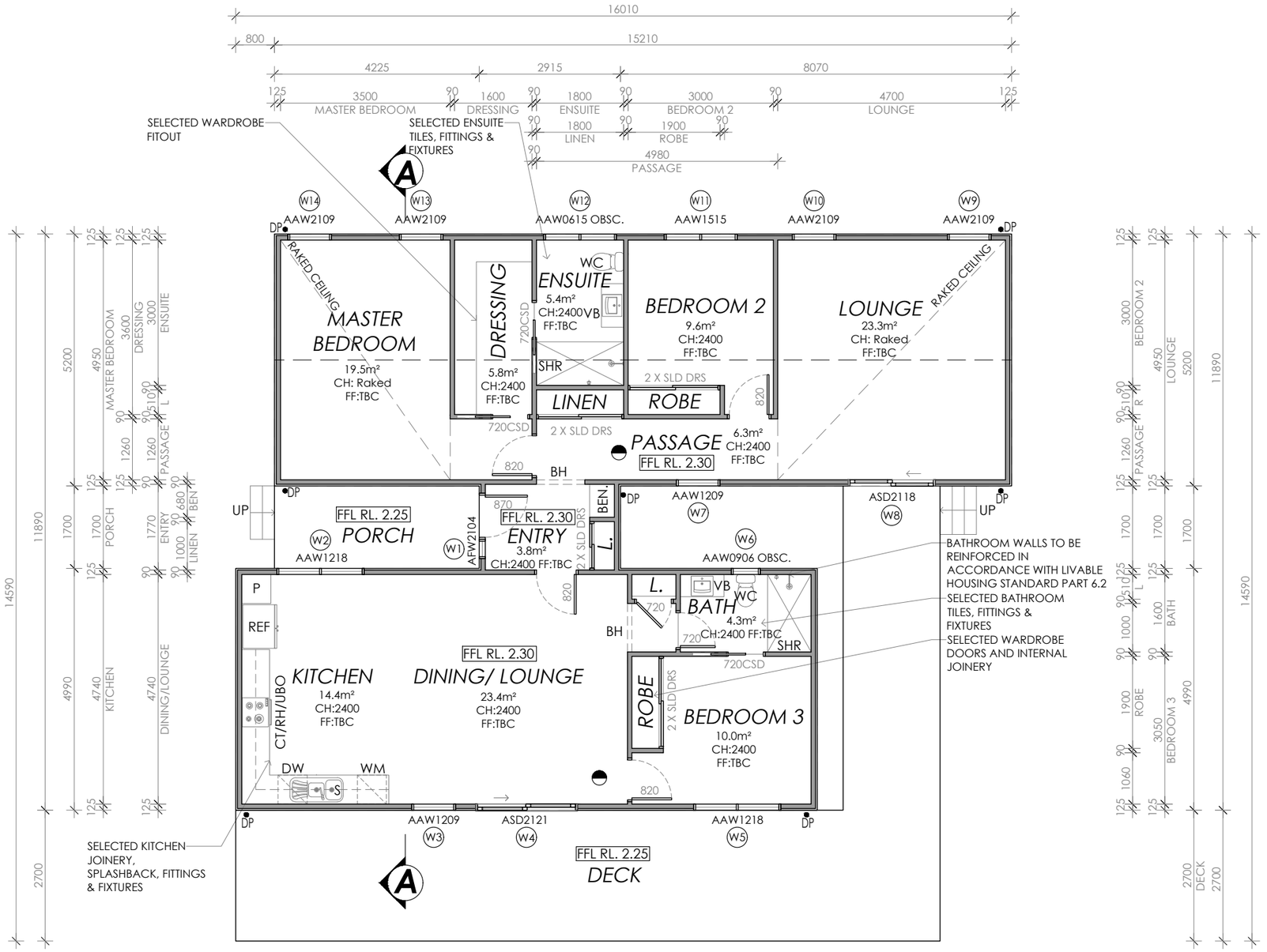
MASONRY ARTICULATION JOINT - LOCATION TO ENGINEER'S DETAILS

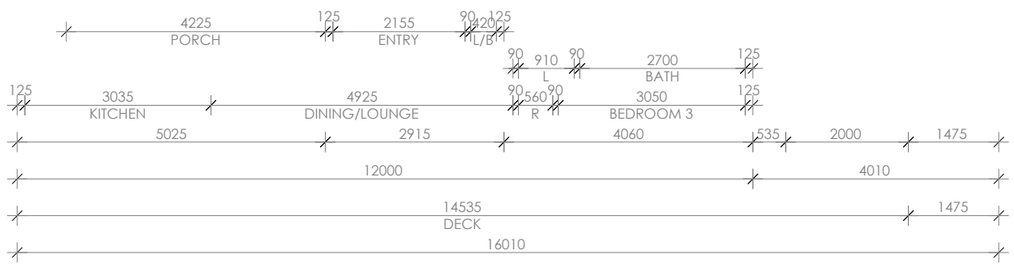
CEILING MOUNTED INTERCONNECTED SMOKE DETECTORS, MAINS WIRED WITH BATTERY BACKUP, ALL IN ACCORDANCE WITH AS 3786.

DP 90mm DOWNPIPE

NOTE: LIFT OFF HINGES TO WC TO BE INSTALLED AS REQUIRED IN ACCORDANCE WITH NCC.

BAL: 29
ALL CONSTRUCTION TO BE IN ACCORDANCE WITH NCC REQUIREMENTS & AS. 3959-2018





Framing NCC H1D6
All timber framing, fixing and bracing shall comply with AS 1684 and the requirements of NCC H1D6. Manufactured sizes must not be undersized to those specified, for all timber sizes, stress grades, spacing and wall bracing refer to Engineer's details. Tie-down details shall be in accordance with Engineer's details and comply with NCC H1D6 (4). Structural steel members shall comply with the requirements of clauses in NCC H1D6 (3). Refer to Engineer's details where provided.

Glazing NCC H1D8
All windows to be aluminium awning style, double glazed (obscured safety glass to bathrooms as shown on drawings) All glazing shall comply with the requirements of AS 2047 & AS 1288 and NCC H1D8.

Human impact safety requirements shall comply with NCC H1D8 (3) and Part 8.4 of the ABCB Housing provisions.

Note:
Builder and subcontractors to verify all dimension and levels prior to the commencement of any work. Give 24hrs minimum notice where amendments are required to design of working drawings. These drawings are to be read in conjunction with Engineer's and Surveyor's drawings and notes. Do not scale drawings. Dimensions are to take preference over scale. Building specification and Engineer's drawings shall override architectural drawings. All construction work shall be carried out in accordance with the state building regulations, local council by-laws and relevant NCC and AS codes.

Important notice for attention of Owners: the Owners attention is drawn to the fact that foundations and associated drainage in all sites requires continuing maintenance to assist footing performance. Advice for foundation maintenance is contained in the CSIRO building technology file 18 and it is the Owners responsibility to maintain the site in accordance with this document.

Energy efficiency:
Insulation must comply with AS/NZS4859.1 and be installed in accordance with ABCB housing provisions Part 13.2.2 and comply with minimum R values for climate zone 7.
Bulk insulation between external studs to be insulated with min R2.0. (Ensure batts fit within cavity without compression, making sure that there is at least 25mm gap from the reflective surface). External walls are to be clad with vapour permeable reflective foil over the outside of the timber frame. Ceiling to be insulated with R4.0 and vapour permeable sarking. Floor to be insulated with Min R1.7 batts where applicable. Seal exhaust fans to Ensuite, Bathroom, Laundry and Kitchen. All downlights to be IC rated. Construction of the external walls, floor and roof for compliance with building sealing requirements shall comply with *BCA 2019 Part 3.12*

General:
All flashings, weep holes and damp proof coursing to be in accordance with NCC Housing provisions Part 5.7. Fibre cement sheet in accordance with NCC Housing provisions Part 7.5. Block construction in accordance NCC Housing provisions Part 5. Plasterboard linings to internal walls and ceilings with selected cornice. (see below for wet areas)

Wet areas: All wet areas shall comply with the requirements of ABCB Housing provisions Part 10.2. Provide waterproof plasterboard sheeting to all walls and ceilings. Provide ceramic tiles or other approved water resistant lining in accordance with Part 10.2.9 to a minimum height of 1800mm to shower walls and to a height of min 150mm behind baths, basins, sinks, troughs, washing machines and wall fixtures.

For construction of floor wastes refer to NCC ABCB Housing provisions part 10.2.12. For typical installation requirements for substrate preparation, penetrations, flashings/ junctions, membranes, screeds, hobs, baths, showers, door jambs and screens refer to ABCB Housing provisions part 10.2.14-32.

Sorell Council
Development Application: 5.2025.119.1 - Response to Request For Information - 11 Eularminner Street, Carlton - P2 (2).pdf
Plans Reference:P2
Date Received:17/07/2025

PROPOSED FLOOR PLAN
FLOOR AREA: 151.7m²

PRELIMINARY

03

PROJECT NORTH

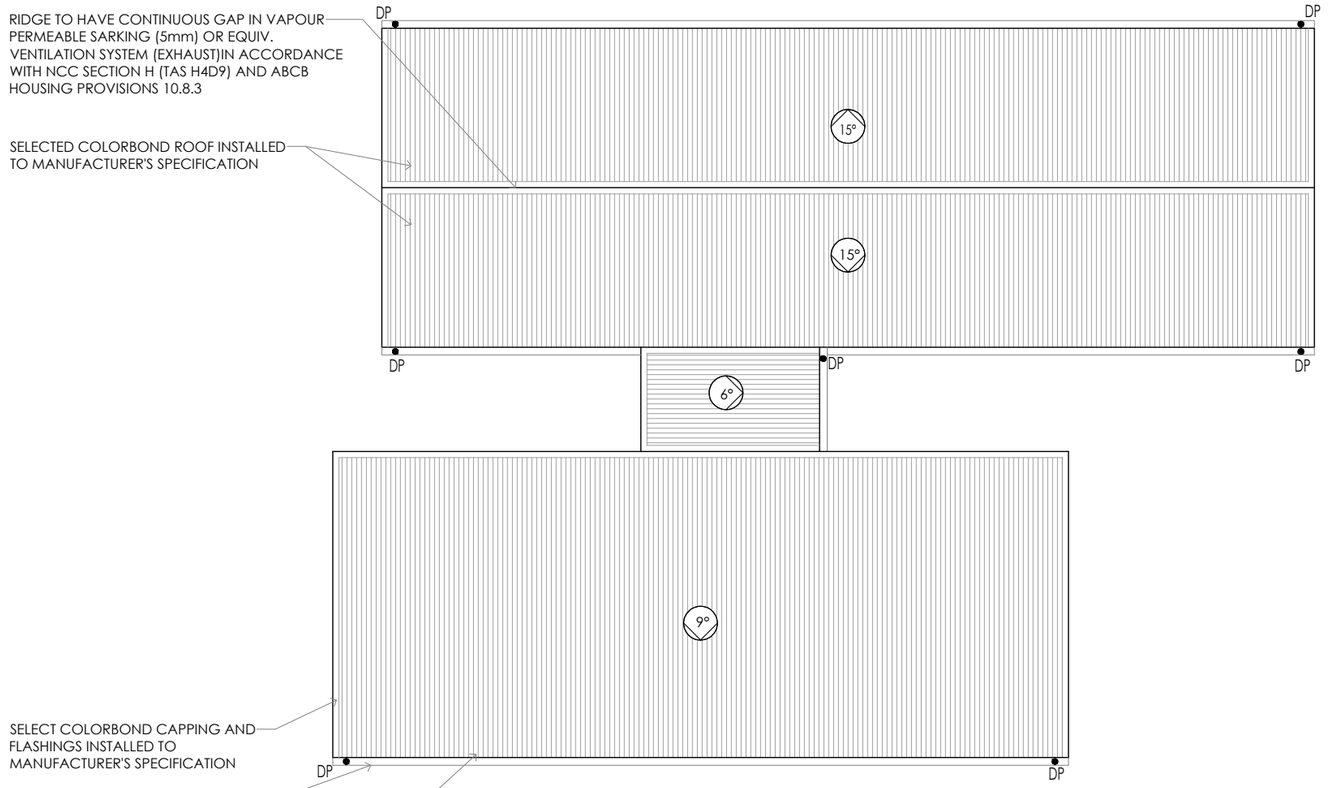
CONTRACTOR MUST VERIFY ALL DIMENSIONS AND LEVELS AT THE JOB PRIOR TO COMMENCING ANY WORK OR MAKING ANY SHOP DRAWINGS.

DO NOT SCALE DRAWINGS.
ALWAYS USE WRITTEN DIMENSIONS.

REV:	DESCRIPTION:	BY:	DATE:
B	CHANGE THE FFL & REMOVE ALL CLADDING TO GROUND	NN	28/04/25
C	BAL 29 UPDATE	QT	07/5/25
D	MOVE THE HOUSE TO THE PREVIOUS SETBACKS	QT	07/5/25
E	ADD THE WASTE WATER AREA	NN	02/6/25

CREATIVE HOMES HOBART
CREATIVE HOMES HOBART, CNR OF ELWICK ROAD & BROOKER HIGHWAY, GLENORCHY 7010 PH: 03 6272 3000

JOB ADDRESS: 11 Eularminner Street Carlton		CLIENT: Troy Mason	
DESIGNER: I. Brown	ACCRED. NO.: CC6652	SHEET:	3 of 10
DRAWN:N. Nguyen	DATE: April 2025	DESIGN TYPE:	Custom
CHECKED:	DATE:	DRAWING NO:	---
SCALE: 1:100	REV: E		



PROPOSED ROOF PLAN

BAL: 29
ALL CONSTRUCTION TO BE IN ACCORDANCE WITH NCC REQUIREMENTS & AS. 3959-2018

● DP 90mm DOWNPIPE

Framing NCC H1D6
All timber framing, fixing and bracing shall comply with AS 1684 and the requirements of NCC H1D6. Manufactured sizes must not be undersized to those specified, for all timber sizes, stress grades, spacing and wall bracing refer to Engineer's details. Tie-down details shall be in accordance with Engineer's details and comply with NCC H1D6 (4). Structural steel members shall comply with the requirements of clauses in NCC H1D6 (3). Refer to Engineer's details where provided.

Glazing NCC H1D8
All windows to be aluminium awning style, double glazed (obscured safety glass to bathrooms as shown on drawings) All glazing shall comply with the requirements of AS 2047 & AS 1288 and NCC H1D8.

Human impact safety requirements shall comply with NCC H1D8 (3) and Part 8.4 of the ABCB Housing provisions.

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General:
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Wet areas: All wet areas shall comply with the requirements of ABCB Housing provisions Part 10.2. Provide waterproof plasterboard sheeting to all walls and ceilings. Provide ceramic tiles or other approved water resistant lining in accordance with Part 10.2.9 to a minimum height of 1800mm to shower walls and to a height of min 150mm behind baths, basins, sinks, troughs, washing machines and wall fixtures.

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PRELIMINARY

04

PROJECT NORTH

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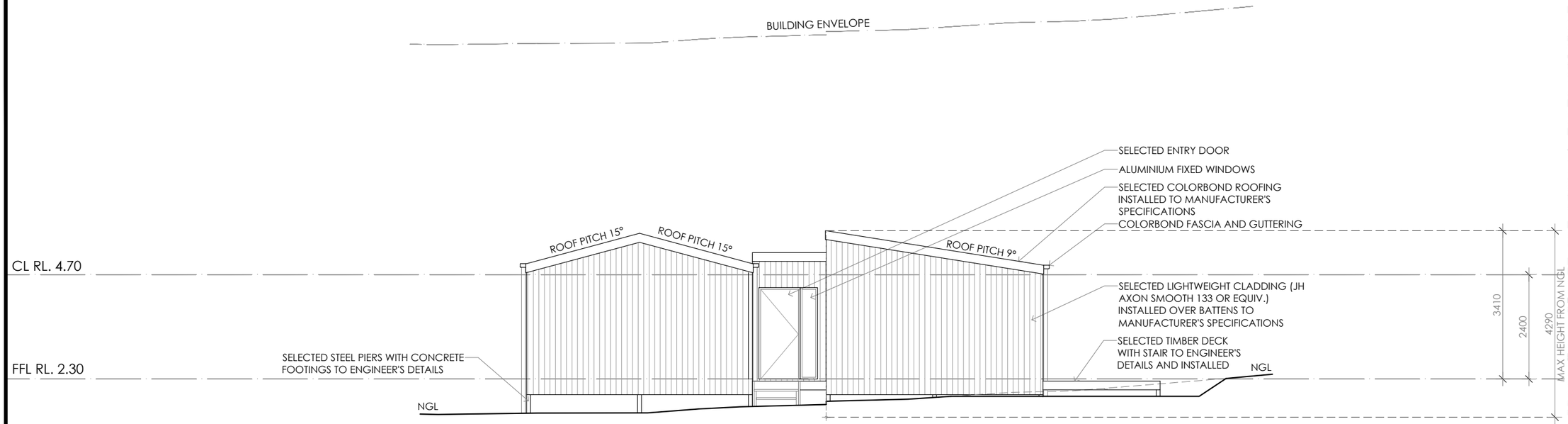
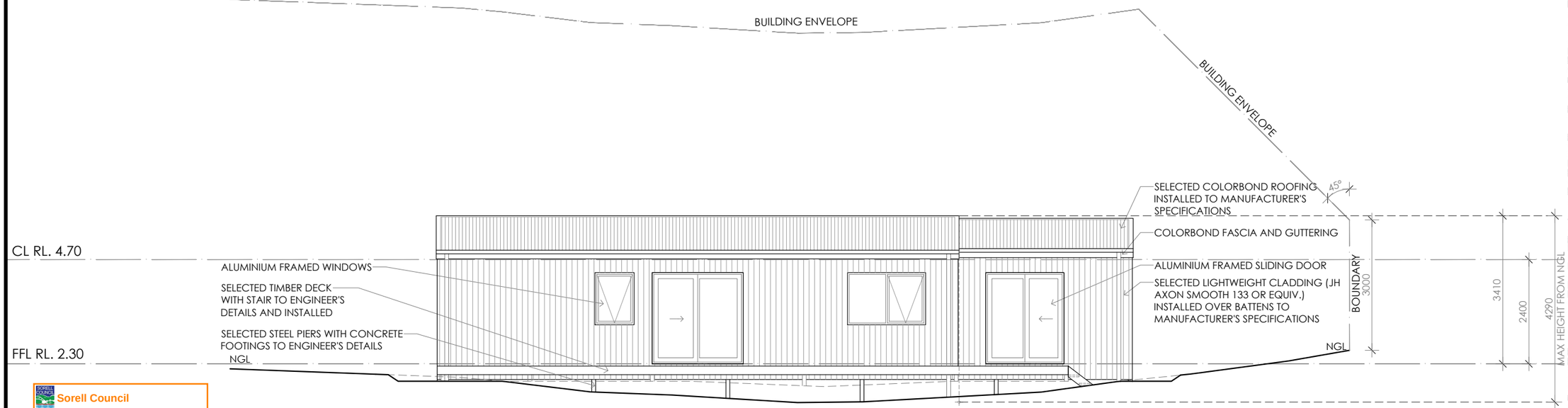
CREATIVE HOMES HOBART, CNR OF ELWICK ROAD & BROOKER HIGHWAY, GLENORCHY 7010 PH: 03 6272 3000

JOB ADDRESS: 11 Eularminner Street Carlton
CLIENT: Troy Mason

DESIGNER: I. Brown	ACCRED. NO.: CC6652	SHEET:	4 of 10
DRAWN: N. Nguyen	DATE: April 2025	DESIGN TYPE:	Custom
CHECKED:	DATE:	DRAWING NO:	---
SCALE: 1:100	REV: E		



WESTERN ELEVATION



SOUTHERN ELEVATION

Framing NCC H1D6
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BAL: 29
ALL CONSTRUCTION TO BE IN ACCORDANCE WITH NCC REQUIREMENTS & AS. 3959-2018

Sorell Council
Development Application: 5.2025.119.1 - Response to Request For Information - 11 Eularminner Street, Carlton - P2 (2).pdf
Plans Reference:P2
Date Received:17/07/2025

PRELIMINARY

05

PROJECT NORTH

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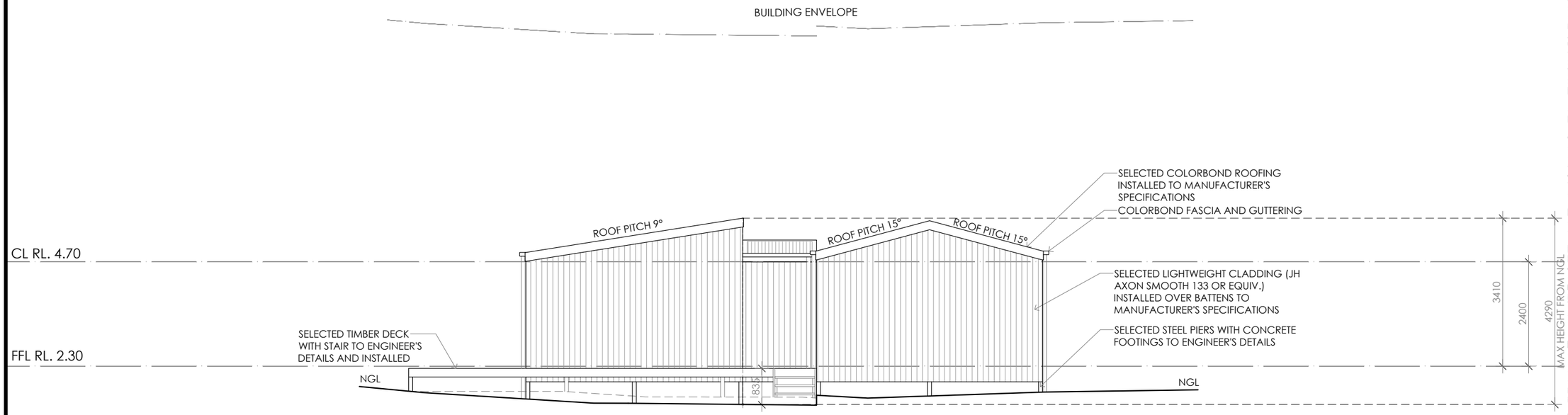
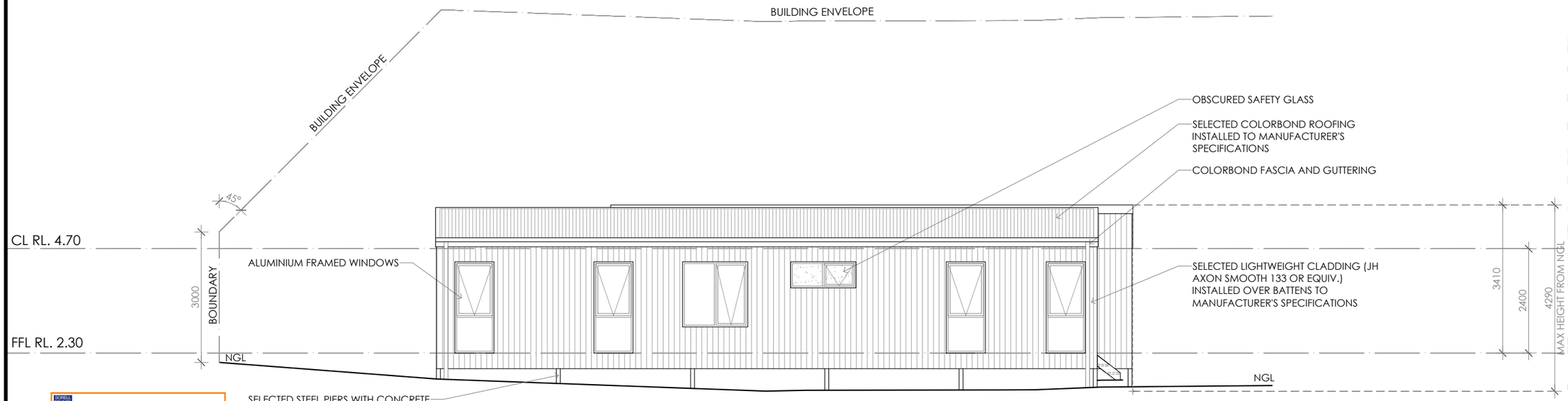
CREATIVE HOMES HOBART, CNR OF ELWICK ROAD & BROOKER HIGHWAY, GLENORCHY 7010 PH: 03 6272 3000

JOB ADDRESS: 11 Eularminner Street Carlton
CLIENT: Troy Mason

DESIGNER: I. Brown	ACCRED. NO.: CC6652	SHEET:	5 of 10
DRAWN: N. Nguyen	DATE: April 2025	DESIGN TYPE:	Custom
CHECKED:	DATE:	DRAWING NO:	---
SCALE: 1:100	REV: E		



EASTERN ELEVATION



NORTHERN ELEVATION

Framing NCC H1D6
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BAL: 29
ALL CONSTRUCTION TO BE IN ACCORDANCE WITH NCC REQUIREMENTS & AS. 3959-2018

PRELIMINARY

06

PROJECT NORTH

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CREATIVE HOMES HOBART
CREATIVE HOMES HOBART, CNR OF ELWICK ROAD & BROOKER HIGHWAY, GLENORCHY 7010 PH: 03 6272 3000

JOB ADDRESS: 11 Eularminner Street Carlton
CLIENT: Troy Mason

DESIGNER: I. Brown	ACCRED. NO.: CC6652	SHEET:	6 of 10
DRAWN:N. Nguyen	DATE: April 2025	DESIGN TYPE:	Custom
CHECKED:	DATE:	DRAWING NO:	---
SCALE: 1:100	REV: E		

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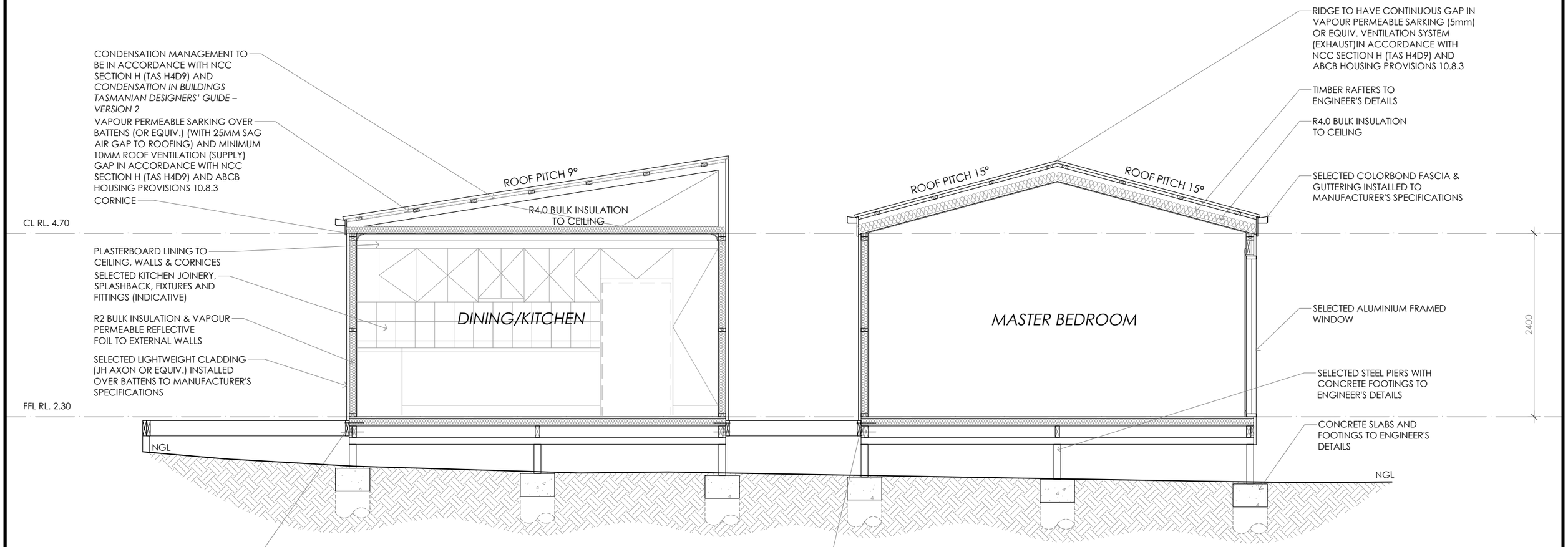

BAL: 29
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TRUSS MANUFACTURER TO NOTE:
ALL TRUSSES TO BE DESIGNED TO BE SUPPORTED BY ALL EXTERNAL WALLS FOR BOTH DEAD AND WIND LOADS.

SECTION A-A

Sorell Council
Development Application: 5.2025.119.1 - Response to Request For Information - 11 Eularminner Street, Carlton - P2 (2).pdf
Plans Reference:P2
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PRELIMINARY

07

PROJECT NORTH

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JOB ADDRESS: 11 Eularminner Street Carlton
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DESIGNER: I. Brown	ACCRED. NO.: CC6652	SHEET:	7 of 10
DRAWN: N. Nguyen	DATE: April 2025	DESIGN TYPE:	Custom
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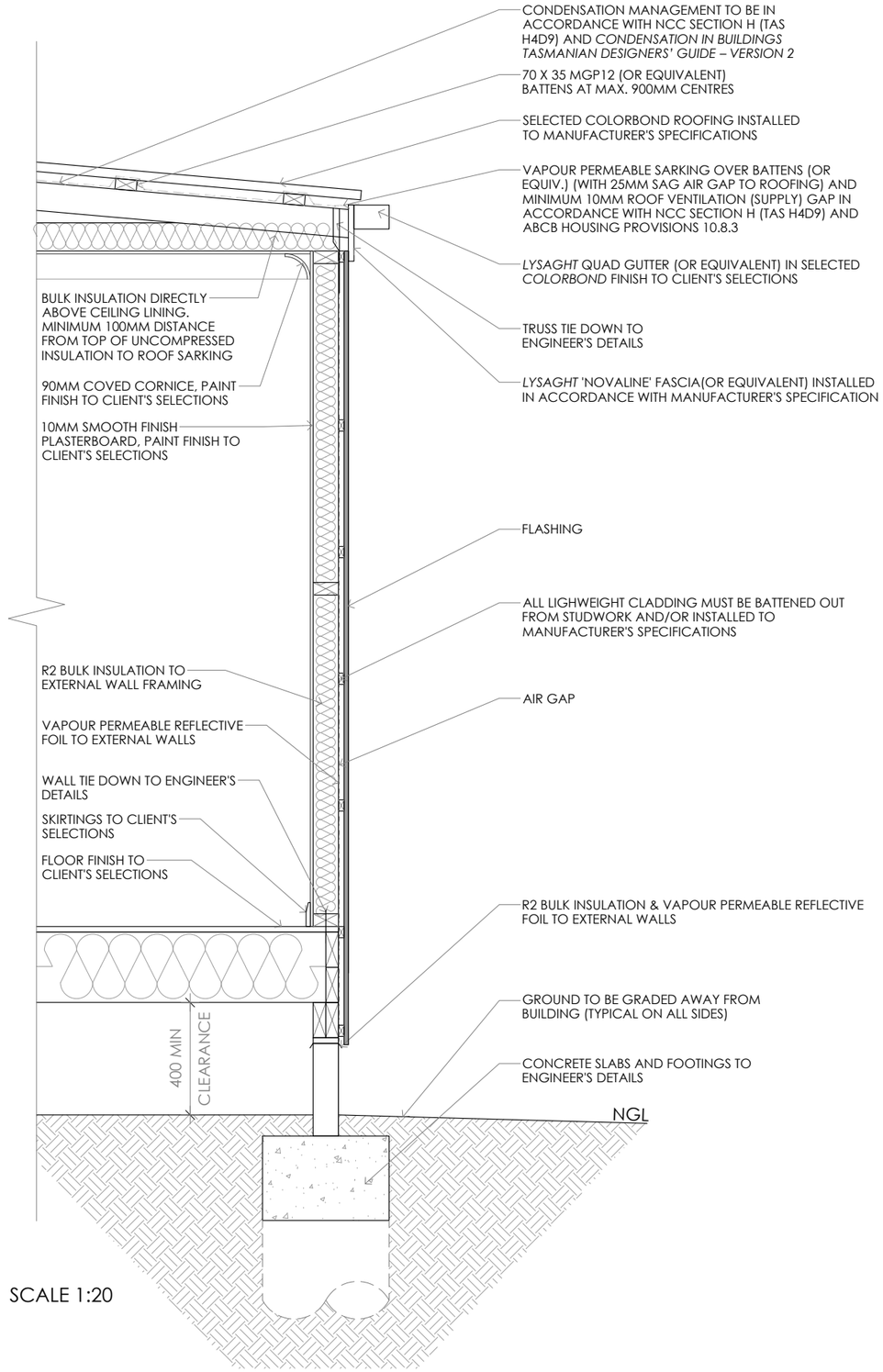
SCALE: 1:50	REV: E		



FLOOR, WALL & ROOF DETAIL SCALE 1:20

TYPICAL SECTION DETAILS

PRELIMINARY

08

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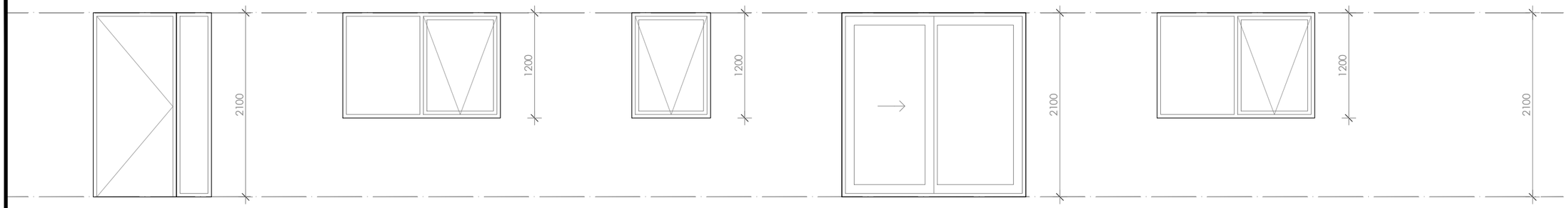

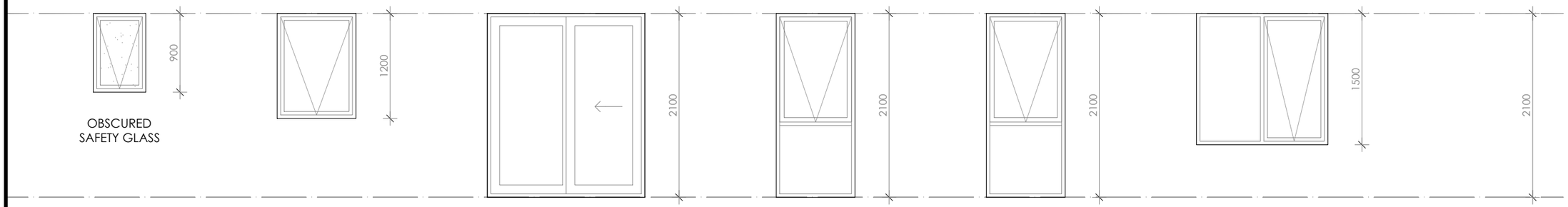

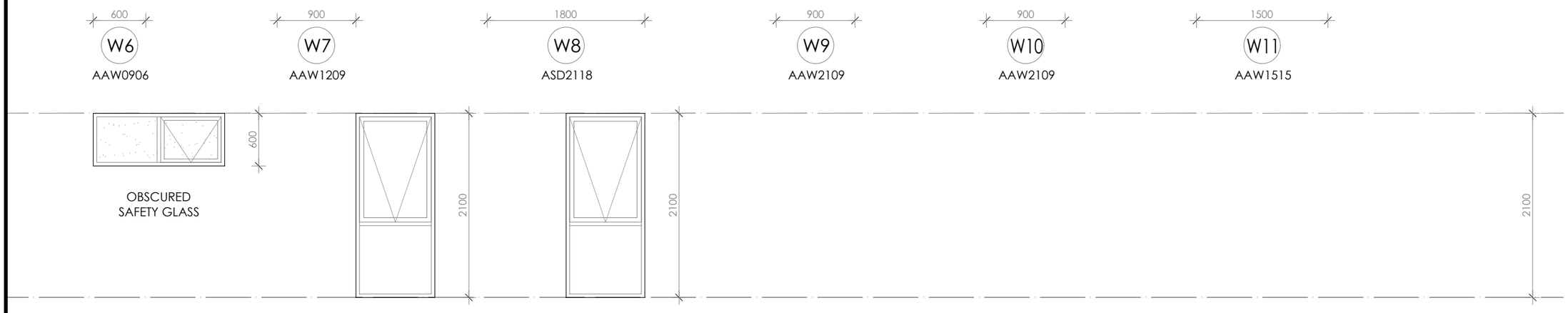

WINDOW SCHEDULE

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fg FIXED GLAZING

PRELIMINARY

09

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E	ADD THE WASTE WATER AREA	NN	02/6/25

CREATIVE HOMES HOBART
CREATIVE HOMES HOBART, CNR OF ELWICK ROAD & BROOKER HIGHWAY, GLENORCHY 7010 PH: 03 6272 3000

JOB ADDRESS:
11 Eularminner Street
Carlton

CLIENT:
Troy Mason

DESIGNER: I. Brown	ACCRED. NO.: CC6652	SHEET:	9 of 10
DRAWN: N. Nguyen	DATE: April 2025	DESIGN TYPE:	Custom
CHECKED:	DATE:	DRAWING NO:	---
SCALE: 1:50	REV: E		

BUILDING ELEMENTS		BAL 29 REQUIREMENTS
TILED ROOF		FULLY SARKED (FLAMMABILITY INDEX <5) • INSTALLED DIRECTLY BELOW TILE BATTENS • MUST COVER ENTIRE ROOF AREA, INCLUDING RIDGE & BE INSTALLED SO THAT THERE ARE NO GAPS WHERE SARKING MEETS FASCIA, GUTTERS, VALLEYS & THE LIKE
SHEET ROOF		FULLY SARKED (FLAMMABILITY INDEX <5) INSTALLED DIRECTLY BELOW BATTENS • FOIL-BACKED INSULATION BLANKETS MAY BE INSTALLED OVER BATTENS • GAPS GREATER THAN 3mm TO BE SEALED BY: A. MESH WITH MAX 2mm APERTURE, MADE OF CORROSION RESISTANT STEEL OR BRONZE B. MINERAL WOOL C. OTHER NON-COMUSTIBLE MATERIAL D. COMBINATION OF ABOVE ITEMS
FASCIA & BARGEBOARDS		BUSH-FIRE RESISTING TIMBER, OR METAL (TO BE FIXED AT 450 CENTRES)
EAVES LININGS		FIBRE-CEMENT SHEET MINIMUM 4.5mm THICKNESS
WINDOWS		BEHIND BUSH-FIRE SHUTTERS (COMPLETELY PROTECTED), OR • ALL FRAMES, JOINERY & HARDWARE TO BE METAL • ALL FRAMES & JOINERY TO BE BUSH-FIRE RESISTING TIMBER • ALL GLAZING TO BE 5mm TOUGHENED GLASS • ALL FRAMES & JOINERY TO BE METAL-REINFORCED PVC-U • OPENABLE PORTIONS OF WINDOW SHALL BE SCREENED ECTERNALLY OR INTERNALLY A. SHALL HAVE A MESH OR PERFORATED SHEET WITH MAX 2mm APERTURE, MADE OF CORRSION-RESISTANT STEEL OR BRONZE B. GAPS BETWEEN PERIMETER OF SCREEN ASSEMBLY & BUILDING ELEMENT IT IS FITTED TO SHALL NOT EXCEED 3mm C. THE FRAME SUPPORTING THE MESH OR PERFORATED STEEL SHALL BE METAL OR FIRE RESISITING TIMBER
EXTERNAL SLIDING DOORS		BEHIND BUSH-FIRE SHUTTERS OR EXTERNAL SCREENS (COMPLETELY PROTECTED), OR • ALL FRAMES & HARDWARE TO BE METAL • ALL GLAZING TO BE 6mm TOUGHENED GLASS • ALL FRAMES TO BE FIRE-RESISITING TIMBER • ALL FRAMES TO BE METAL-REINFORCED PVC-U • SLIDING DOORS SHALL BE TIGHT-FITTING IN THE FRAMES
EXTERNAL WALLS	LIGHTWEIGHT CLADDING	ANY CLADDING FIXED EXTERNALLY TO A FULLY-SARKED TOMBER OR STEEL FRAMED WALL TO BE: • FIBRE-CEMENT MIN 6mm THICKNESS • STEEL SHEETING • BUSHFIRE-RESISITING TIMBER COMBINATION OF ABOVE ITEMS
	BRICK	90mm MINIMUM THICKNESS
	FRAMING	NOT REQUIRED
	JOINTS	ALL EXTERNAL SURFACE JOINTS SHALL BE COVERED, SEALED, OVERLAPPED, BACKED OR BUTT-JOINTED TO PREVENT GAPS GREATED THAN 3mm
	VENTS & WEEPHOLES	ALL GAPS WIDER THAN 3mm TO BE SCREENED WITH MESH WITH MAX 2mm APERTURE, MADE OF CORRSION-RESISTANT STEEL OR BRONZE, UNLESS IN EXTERNAL WALL OF SUBFLOOR SPACE

BUILDING ELEMENTS		BAL 29 REQUIREMENTS
EXTERNAL HINGED DOORS		BEHIND BUSH-FIRE SHUTTERS OR EXTERNAL SCREENS (COMPLETELY PROTECTED), OR • NON-COMBUSTIBLE MATERIALS • IF SOLID TIMBER, MIN 35mm THICK FOR <400mm ABOVE THRESHOLD • IF FULLY FRAMED GLAZED DOOR (GLAZING AS PER WINDOWS) WITH FRAMING MADE OF NO-COMBUSTIBLE MATERIAL OR BUSHFIRE-RESISTING TIMBER • ALL FRAMES TO BE METAL OR BUSHFIRE-RESISTING TIMBER OR METAL REINFORCED PVC-U • ALL HARDWARE TO BE METAL • DOORS SHALL BE TIGHT-FITTING IN THE FRAMES & TO AN ABUTTING DOOR, IF APPLICABLE WEATHER STRIP, DRAUGHT EXCLUDERS/SEALS SHALL BE INSTALLED AT THE BASE OF ALL EXTERNAL DOORS
DOORS: VEHICLE ACCESS DOORS		THE FOLLOWING APPLY TO VEHICLE ACCESS DOORS: • ALL DOORS SHALL BE NON-COMBUSTIBLE OR BUSH-FIRE RESISTING TIMBER. • PANEL LIFT, TILT DOORS OR SLIDE-HUNG DOOR SHARE BE FITTED WITH SUITABLE WEATHER STRIPS, DAUGHT EXCLUDERS/SEALS AS APPROPRIATE TO THE DOOR TYPE, WITH A GAP NOT GREATER THAN 3mm ROLLER DOOR SHALL HAVE GUIDE TRACKS WITH A MAX. GAP NO GREATER THAN 3mm & SHALL BE FITTED WITH A NYLON BRUSH THAT IS IN CONTACT WITH DOORS
FLOORS: FLOORING JOISTS BEARERS	ENCLOSED SUB-FLOOR	ENSURE EXTERNAL WALL IS BAL 29 COMPLIANT AS NOTED PREVIOUSLY
	UNENCLOSED SUB-FLOOR	ALL MATERIALS SHALL BE NON-COMBUSTIBLE OR BUSH-FIRE RESISTING TIMBER
DECKING RAMPS ETC	ENCLOSED	• ENSURE EXTERNAL WALL IS BAL 29 COMPLIANT AS NOTED PREVIOUSLY • ALL OPENINGS GREATER THAN 3mm TO BE SCREENED WITH MESH OR PERFORATED SHEET WITH MAX 2mm APERTURE, MADE OF CORRSION-RESISTANT STEEL OR BRONZE • SUPPORTS-NR FRAMING-NR
	UNENCLOSED	ALL MATERIAS SHALL BE NON-COMBUSTIBLE OR BUSH-FIRE RESISTANT TIMBER
BALUSTRADES, HANDRAILS & OTHER BARRIERS		• THOSE PARTS OF THE HANDRAILS & BALUSTRADES THAT ARE > 125mm FROM THE BUILDING HAVE NO REQUIREMENTS THOSE PARTS OF THE HANDRAILS & BALUSTRADES THAT ARE < 125mm FROM ANY GLAZING & COMBUSTIBLE WALLS SHALL BE NON-COMBUSTIBLE MATERIALS OR BUSH-FIRE RESISTANT TIMBER
ROOF PENETRATIONS & VENT		• ALL OPENINGS & VENTILATORS SHALL BE FITTED WITH NON-COMBUSTIBLE EMBER GUARDS • ANY PENETRATING PIPE OF COUNDUIT SHALL BE NON-COMBUSTIBLE • ALL GLAZED ASSEMBLIES FOR ROOF LIGHTS WHERE ROOF PITCH IS $<18^0$, NON-COMBUSTIBLE EMBER GUARDS SHALL BE FITTED GAPS > 3mm TO BE SEALED WITH NON-COMBUSTIBLE MATERIAL
GUTTER & DOWNPIPES		DOWNPIPES- NR ALL GUTTERS & ASSOCIATED HARDARE TO BE NON-COMBUSTIBLE

BAL 29 REQUIREMENTS

PRELIMINARY

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PROJECT NORTH

CONTRACTOR MUST VERIFY ALL DIMENSIONS AND LEVELS AT THE JOB PRIOR TO COMMENCING ANY WORK OR MAKING ANY SHOP DRAWINGS.

DO NOT SCALE DRAWINGS.
ALWAYS USE WRITTEN DIMENSIONS.

REV:	DESCRIPTION:	BY:	DATE:
B	CHANGE THE FFL & REMOVE ALL CLADDING TO GROUND	NN	28/04/25
C	BAL 29 UPDATE	QT	07/5/25
D	MOVE THE HOUSE TO THE PREVIOUS SETBACKS	QT	07/5/25
E	ADD THE WASTE WATER AREA	NN	02/6/25

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