DEVELOPMENT APPLICATION

PDPLANPMTD-2025/055242

PROPOSAL: Change of use to Secondary Residence & Outbuilding (Retrospective)

LOCATION: 41A Cremorne Avenue, Cremorne

RELEVANT PLANNING SCHEME: Tasmanian Planning Scheme - Clarence

ADVERTISING EXPIRY DATE: 01 October 2025

The relevant plans and documents can be inspected at the Council offices, 38 Bligh Street, Rosny Park, during normal office hours until 01 October 2025. In addition to legislative requirements, plans and documents can also be viewed at www.ccc.tas.gov.au during these times.

Any person may make representations about the application to the Chief Executive Officer, by writing to PO Box 96, Rosny Park, 7018 or by electronic mail to clarence@ccc.tas.gov.au. Representations must be received by Council on or before 01 October 2025.

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

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

City of Clarence
38 Bligh St Rosny Park
PO Box 96
Rosny Park TAS, 7018

03 6217 9500
clarence@ccc.tas.gov.au
ccc.tas.gov.au

Application for Development / Use or Subdivision

Use this form to obtain planning approval for developing or using land, including subdividing it into smaller lots or lot consolidation.

Proposal: Change Class 10a to Ancillary and new outbuilding/structure

Location: 41a Cremorne Avenue

Personal Information Removed

Estimated cost of development: $30,000

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Is the property on the Tasmanian Heritage Register? Yes ☐ No ■

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

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

n/a

Current use of site: Residential

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

Declaration

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

Acknowledgement

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

Applicant's signature

Personal Information Removed

Date:

Please refer to the development/use and subdivision checklist on the following pages to determine what documentation must be submitted with your application.

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Development/use or subdivision checklist

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

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

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

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

- ☐ Site analysis and site plan, including where relevant:
  - Existing and proposed use(s) on site.
  - Boundaries and dimensions of the site.
  - Topography, including contours showing AHD levels and major site features.
  - Natural drainage lines, watercourses and wetlands on or adjacent to the site.
  - Soil type.
  - Vegetation types and distribution, and trees and vegetation to be removed.

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- Location and capacity of any existing services or easements on/to the site.
- Existing pedestrian and vehicle access to the site.
- Location of existing and proposed buildings on the site.
- Location of existing adjoining properties, adjacent buildings and their uses.
- Any natural hazards that may affect use or development on the site.
- Proposed roads, driveways, car parking areas and footpaths within the site.
- Any proposed open space, communal space, or facilities on the site.
- Main utility service connection points and easements.
- Proposed subdivision lot boundaries.

☐ Where it is proposed to erect buildings, detailed plans with dimensions at a scale of 1:100 or 1:200 showing:

- Internal layout of each building on the site.
- Private open space for each dwelling.
- External storage spaces.
- Car parking space location and layout.
- Major elevations of every building to be erected.
- Shadow diagrams of the proposed buildings and adjacent structures demonstrating the extent of shading of adjacent private open spaces and external windows of buildings on adjacent sites.
- Relationship of the elevations to natural ground level, showing any proposed cut or fill.
- Materials and colours to be used on rooves and external walls.

☐ Where it is proposed to erect buildings, a plan of the proposed landscaping showing:

- Planting concepts.
- Paving materials and drainage treatments and lighting for vehicle areas and footpaths.
- Plantings proposed for screening from adjacent sites or public places.

☐ Any additional reports, plans or other information required by the relevant zone or code.

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

OWNER MADONIAN PTY. LTD.

FOLIO REFERENCE C.T. ~~6789/1~~ CT 119743-1

GRANTEE

Part of 213.0.0 granted to E.Grimsey

PLAN OF SURVEY

BY SURVEYOR Anthony Owen Carrick

Brooks Lark & Carrick, Surveyors
175 Collins Street Hobart

LOCATION

City of Clarence

SCALE: 1:2000 LENGTHS IN METRES

REGISTERED NUMBER

SP 134052

APPROVED
EFFECTIVE FROM 28 JUN 2000

Alice Kawa
Recorder of Titles

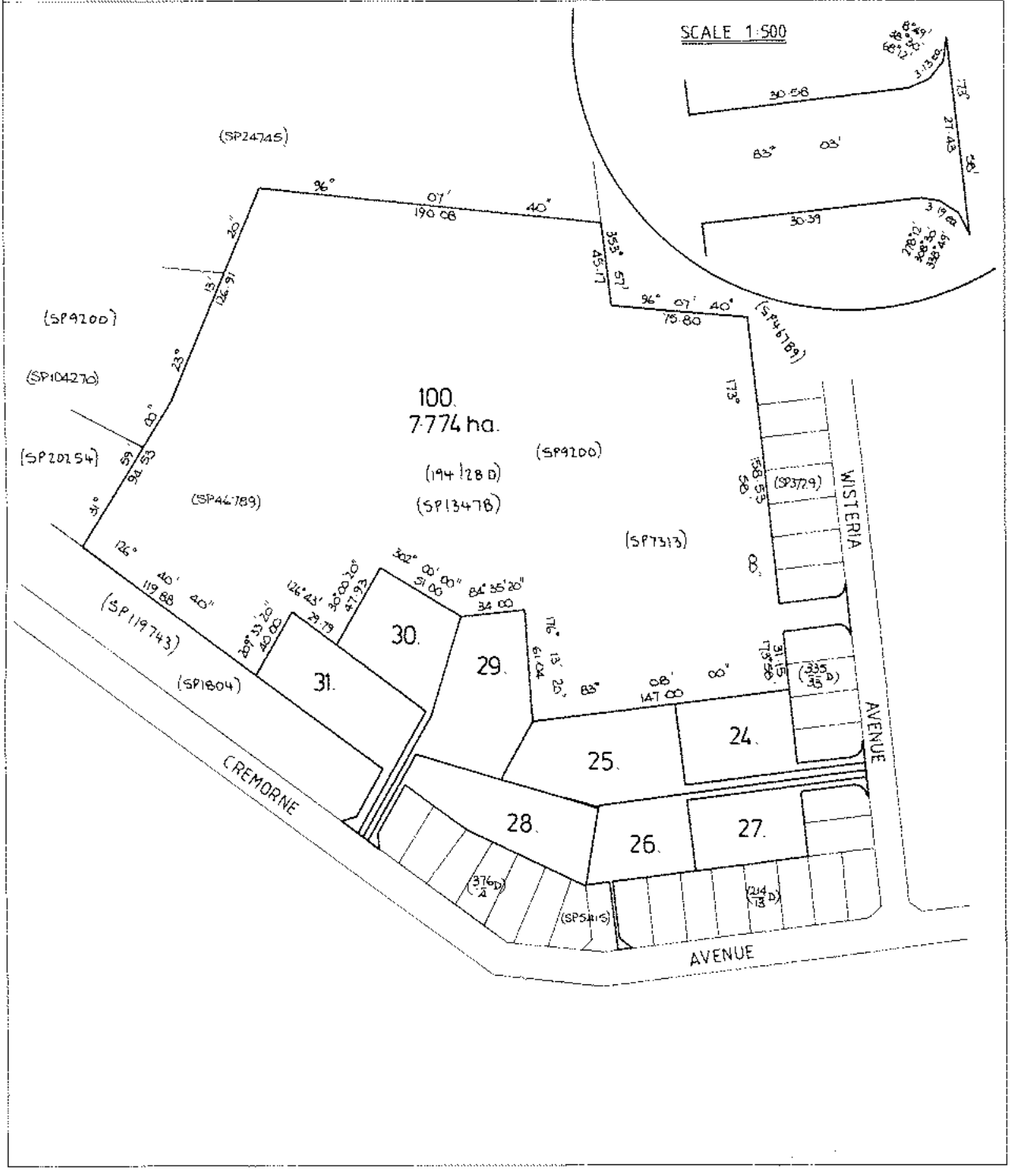
MAPSHEET MUNICIPAL CODE No. 107 (5424-31,41)

LAST UPI No. FCD 99

LAST PLAN NO. ~~SP 6789~~ SP119743

ALL EXISTING SURVEY NUMBERS TO BE CROSS REFERENCED ON THIS PLAN

SCALE 1:500



PLAN OF SURVEY
ANNEXURE SHEET
SHEET 1 OF 2 SHEETS

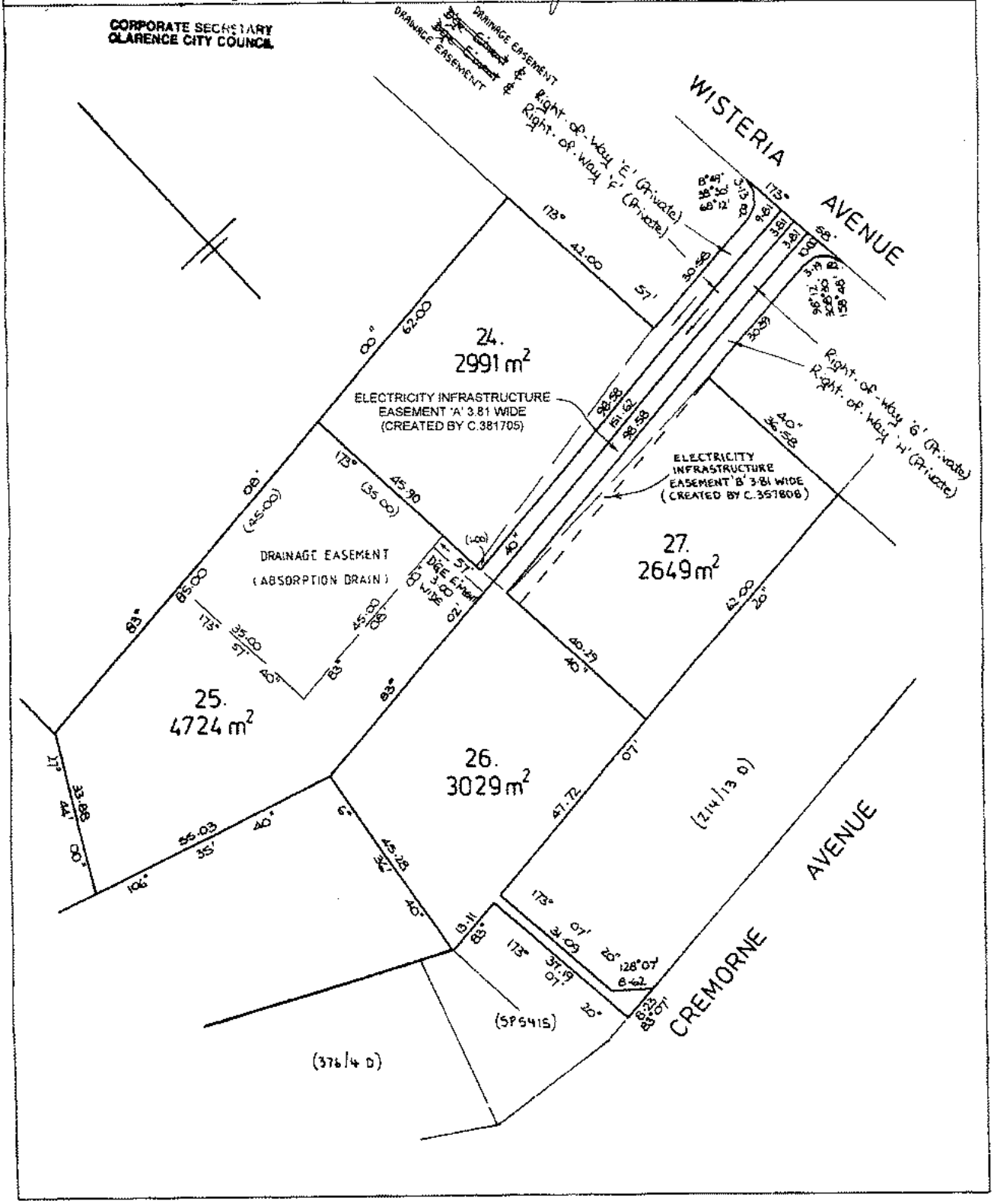
OWNER MADONIAN PTY. LTD
FOLIO REFERENCE C.T. 46789 - 8
SCALE 1: 750 LENGTHS IN METRES

Registered Number
SP134052

SIGNED FOR IDENTIFICATION PURPOSES
Council General Manager

THIS ANNEXURE SHEET FORMS PART OF THE ATTACHED INDEX PLAN.
THE SURVEYORS CERTIFICATE EXTENDS TO THE DETAILS ON THIS SHEET
Registered Surveyor Guy Saunick date 13/01/99

CORPORATE SECRETARY
CLARENCE CITY COUNCIL



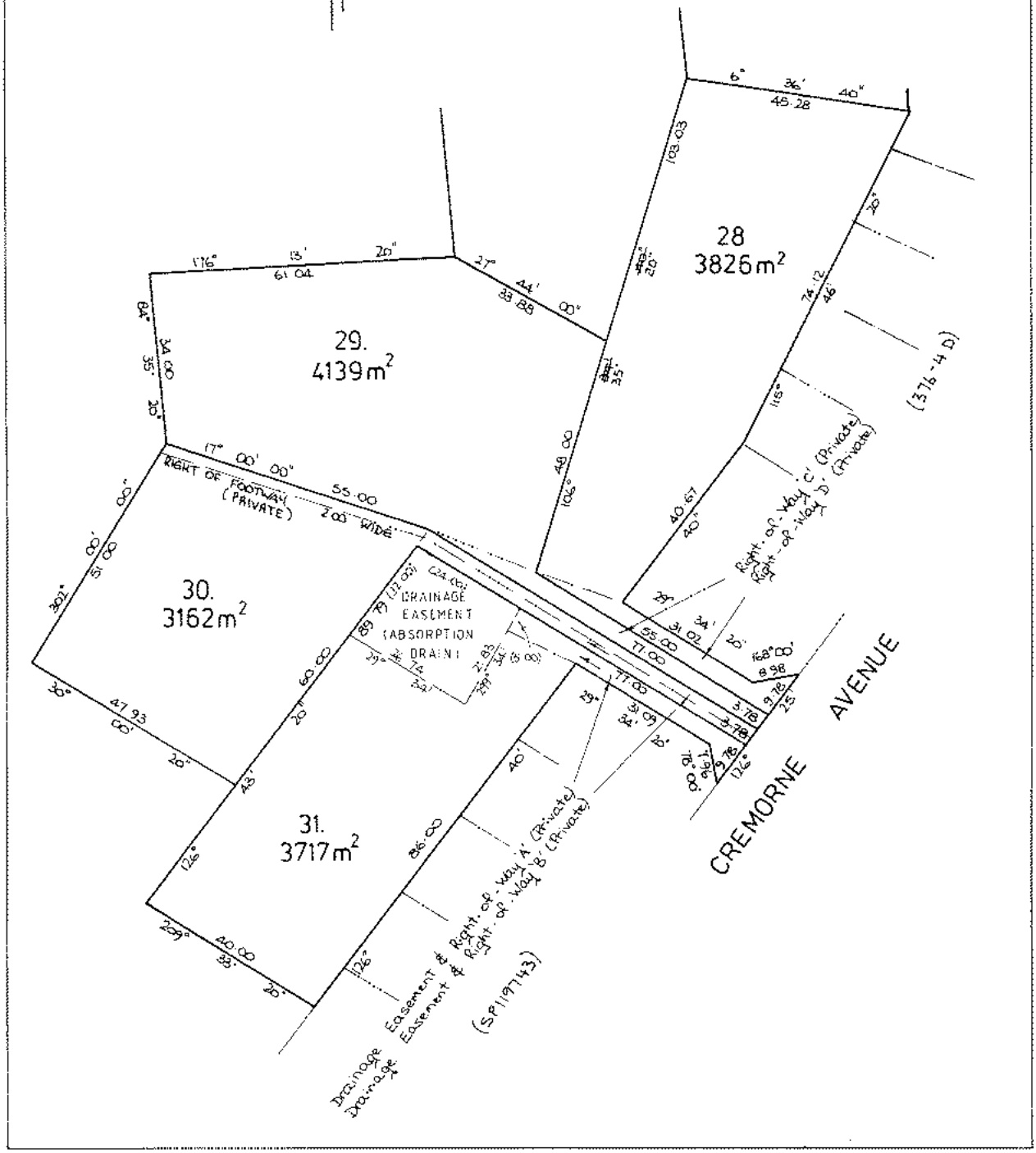
PLAN OF SURVEY
ANNEXURE SHEET
SHEET 2 OF 2 SHEETS

OWNER MADONIAN PTY LTD
FOLIO REFERENCE CT 46789.8
SCALE 1: 750 LENGTHS IN METRES

Registered Number
SP134052

SIGNED FOR IDENTIFICATION PURPOSES
~~Council General Manager~~
CORPORATE SECRETARY
CLARENCE CITY COUNCIL

THIS ANNEXURE SHEET FORMS PART OF THE ATTACHED INDEX PLAN.
THE SURVEYORS CERTIFICATE EXTENDS TO THE DETAILS ON THIS SHEET
Registered Surveyor Ray Barwick date 13/01/99



RESULT OF SEARCH

RECORDER OF TITLES

Issued Pursuant to the Land Titles Act 1980

SEARCH OF TORRENS TITLE

VOLUME	FOLIO
134052	29
EDITION	DATE OF ISSUE
6	22-Feb-2017

SEARCH DATE : 30-Aug-2025
SEARCH TIME : 03.45 PM

DESCRIPTION OF LAND

City of CLARENCE
Lot 29 on Sealed Plan 134052
Derivation : Part of 213 Acres Gtd to E Grimsey
Prior CT 119743/1

SCHEDULE 1

M608504 TRANSFER to DARYL JAMES BOGGS and JENNIFER MARY WATSON Registered 22-Feb-2017 at 12.01 PM

SCHEDULE 2

Reservations and conditions in the Crown Grant if any
SP 134052 EASEMENTS in Schedule of Easements
SP 13478, SP 46789, SP 134052 COVENANTS in Schedule of Easements
SP 134052 FENCING COVENANT in Schedule of Easements
SP 134052 COUNCIL NOTIFICATION under Section 83(5) of the Local Government (Building and Miscellaneous Provisions) Act 1993.
SP 46789 COUNCIL NOTIFICATION under Section 468(12) of the Local Government Act 1962
SP 7313 SP 9200 & SP 13478 FENCING PROVISION in Schedule of Easements
A122641 FENCING CONDITION in Transfer
SP 119743 COUNCIL NOTIFICATION under Section 83(5) of the Local Government (Building and Miscellaneous Provisions) Act 1993.
C240569 AGREEMENT pursuant to Section 71 of the Land Use Planning and Approvals Act 1993 Registered 15-Jun-2000 at noon

UNREGISTERED DEALINGS AND NOTATIONS

No unregistered dealings or other notations

SCHEDULE OF EASEMENTS	SP REGISTERED NUMBER 134052
NOTE: THE SCHEDULE MUST BE SIGNED BY THE OWNERS & MORTGAGEES OF THE LAND AFFECTED. SIGNATURES MUST BE ATTESTED.	

EASEMENTS AND PROFITS

Each lot on the plan is together with:-
(1) such rights of drainage over the drainage easements shown on the plan (if any) as may be necessary to drain the stormwater and other surplus water from such lot; and
(2) any easements or profits a prendre described hereunder.
Each lot on the plan is subject to:-
(1) such rights of drainage over the drainage easements shown on the plan (if any) as passing through such lot as may be necessary to drain the stormwater and other surplus water from any other lot on the plan; and
(2) any easements or profits a prendre described hereunder.
The direction of the flow of water through the drainage easements shown on the plan is indicated by arrows.

Drainage Easement

Lot 24 is together with a right of drainage over that part of Lot 25 marked ~~D'ge E'ment~~ 3.00 wide on the plan

Drainage Easement

Lot 25 is subject to a right of drainage over that part of Lot 25 marked ~~D'ge E'ment~~ 3.00 wide on the plan for the benefit of lot 24 and the Council .

Drainage Easement

Lot 24 is together with rights of carriageway over the areas marked ~~D'ge E'ment~~ and Right of Way 'F'(Private), Right of Way 'G'(Private) and Right of Way 'H' (Private) shown on the plan.

Drainage Easement

Lot 24 is subject to a right of carriageway over that part of lot 24 shown as ~~D'ge E'ment~~ & Right of Way 'E' (Private) on the plan for the benefit of lots 25, 26 and 27.

Drainage Easement

Lot 24 is together with right of drainage over the areas marked ~~D'ge E'ment~~ and Right of Way 'F' (Private) shown on the plan.

Drainage Easement

Lot 24 is subject to a drainage easement over that part of lot 24 marked ~~D'ge E'ment~~ & Right of Way 'E' (Private) shown on the plan for the benefit of lot 25 and the Council.

Lot 24 is together with a Drainage Easement (Absorption Drain) over that part of lot 25 shown as Drainage Easement (Absorption Drain) on the plan.

Drainage Easement

Lot 25 is together with rights of carriageway over the areas marked ~~D'ge E'ment~~ and Right of Way 'E' (Private), and Right of Way 'G' (Private) and Right of Way 'H'(Private) shown on the plan.

(USE ANNEXURE PAGES FOR CONTINUATION)

SUBDIVIDER: Madonian Pty. Ltd. FOLIO REF: 119743/1 SOLICITOR & REFERENCE: Butler McIntyre & Butler Phillip Kimber PAK 95 1728	PLAN SEALED BY: Clarence City Council DATE: 13 June 2000 SD 1998/033 REF NO. Council Delegate

NOTE: The Council Delegate must sign the Certificate for the purposes of identification.

ANNEXURE TO SCHEDULE OF EASEMENTS PAGE 2 OF 5 PAGES	Registered Number SP 134052
SUBDIVIDER: Madonian Pty. Ltd. FOLIO REFERENCE: 119743/1	

Lot 25 is together with a Drainage Easement over that part of lot 24 shown as ~~D'ge E'ment~~ Drainage Easement & Right of Way 'E' (Private) shown on the plan.

Lot 25 is subject to a right of carriageway over that part of lot 25 shown as ~~D'ge E'ment~~ Drainage Easement and Right of Way 'F' (Private) for the benefit of lots 24, 26 and 27.

Lot 25 is subject to a Drainage Easement over that part of lot 25 marked ~~D'ge E'ment~~ Drainage Easement & Right of Way 'F' (Private) shown on the plan for the benefit of lot 24 and the Council.

Lot 25 is subject to a Drainage Easement (Absorption Drain) over that part of lot 25 shown as Drainage Easement (Absorption Drain) for the benefit of lot 24 lot 100 and the Council.

Lot 26 is together with rights of carriageway over the areas marked ~~D'ge E'ment~~ Drainage Easement and Right of Way 'E'(Private), ~~D'ge E'ment~~ Drainage Easement and Right of Way 'F' (Private) and Right of Way 'H' (Private) shown on the plan.

Lot 26 is subject to a right of carriageway over that part of lot 26 shown as Right of Way 'G' (Private) on the plan to the benefit of lots 24, 25 and 27.

Lot 27 is together with rights of carriageway over the areas marked ~~D'ge E'ment~~ Drainage Easement and Right of Way 'E'(Private), ~~D'ge E'ment~~ Drainage Easement and Right of Way 'F' (Private) and Right of Way 'G' (Private) shown on the plan.

Lot 27 is subject to a right of carriageway over that part of lot 27 shown as Right of Way 'H' (Private) on the plan to the benefit of lots 24, 25 and 26.

Lot 28 is together with rights of carriageway over the areas marked Drainage Easement & Right of Way 'A' (Private), marked Drainage Easement & Right of Way 'B' (Private) and marked Right of Way 'C' (Private) shown on the plan.

Lot 28 is subject to a right of carriageway over that part of lot 28 shown as Right of Way 'D' (Private) on the plan to the benefit of lots 29, 30 and 31.

Lot 29 is together with rights of carriageway over the areas marked marked Drainage Easement & Right of Way 'A' (Private), marked Drainage Easement & Right of Way 'B' (Private) and Right-of-way 'D' (Private) shown on the plan.

Lot 29 is subject to a right of carriageway over that part of lot 29 shown as Right of Way 'C' (Private) on the plan to the benefit of lots 28, 30 and 31.

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

ANNEXURE TO SCHEDULE OF EASEMENTS PAGE 3 OF 5 PAGES	Registered Number SP 134052
SUBDIVIDER: Madonian Pty. Ltd. FOLIO REFERENCE: 119743/1	

Lot 30 is together with rights of carriageway over the areas marked Drainage Easement & Right of Way 'A' (Private), Right-of-way 'C' (Private) and Right-of-way 'D' (Private) shown on the plan.

Lot 30 is subject to a right of carriageway over that part of lot 30 shown as Drainage Easement & Right of Way 'B' (Private) shown on the plan for the benefit of lots 28, 29 and 31.

Lot 30 is subject to a Drainage Easement over that part of lot 30 marked Drainage Easement & Right of Way 'B' (Private) shown on the plan for the benefit of lot 31 and the Council.

Lot 30 is subject to a right of footway [statutory definition] over that part of lot 30 shown as Right of Footway 2.00 wide on the plan (Private) for the benefit of Lot 100.

Lot 30 is together with a drainage easement over that part of lot 31 marked Drainage Easement & Right-of-Way 'A'(Private).

Lot 30 is together with right of drainage over that part of Lot 31 marked Drainage Easement (Absorption Drain) shown on the plan.

Lot 31 is together with rights of carriageway over the areas marked Drainage Easement & Right of Way 'B' (Private), Right-of-way 'C'(Private) and Right-of-way 'D' (Private) shown on the plan.

Lot 31 is together with a Drainage Easement over that part of lot 30 marked Drainage Easement & Right of Way 'B' (Private) shown on the plan.

Lot 31 is subject to a right of carriageway over that part of lot 31 shown as Drainage Easement & Right of Way 'A' (Private) shown on the plan for the benefit of lots 28, 29 and 30.

Lot 31 is subject to a Drainage Easement over that part of lot 31 shown as Drainage Easement & Right of Way 'A' (Private) on the plan for the benefit of lot 30 and the Council.

Lot 31 is subject to a Drainage Easement (Absorption Drain) over that part of lot 31 shown as Drainage Easement (Absorption Drain) for the benefit of lot 30 and the Council.

Lot 100 is together with a Drainage Easement (Absorption Drain) over that part of lot 25 shown as Drainage Easement (Absorption Drain) on the plan and together with a Right of Footway [statutory definition] over that part of Lot 30 shown as Right of Footway 2.00 wide (Private) on the plan.

FENCING COVENANT

The owners of each lot on the plan covenant with the Vendor (Madonian Pty Ltd) that the Vendor shall not be required to fence.

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

ANNEXURE TO SCHEDULE OF EASEMENTS PAGE 4 OF 5 PAGES	Registered Number SP 134052
SUBDIVIDER: Madonian Pty. Ltd. FOLIO REFERENCE: 119743/1	

RESTRICTIVE COVENANT

The owner of each lot on the plan (except lot 100) covenant with the Vendor (Madonian Pty Ltd) and the owners for the time being of every other lot on the plan to the intent that the burden of this covenant may run with and bind the covenantor's lot and every part thereof and that the benefit thereof shall be annexed to and devolve with each and every part of every other lot shown on the plan, to observe the following stipulation: subject to the consent of Council to the contrary, not to subdivide the lot.

DEFINITIONS

Drainage Easement means: such rights of drainage over the drainage easements shown on the plan as may be necessary to drain the storm water and other surplus water from any lot and any road shown on the plan. The direction of flow of water through the drainage easements shown on the plan is indicated by arrows.

Drainage Easement (Absorption Drain) means: a Drainage Easement (as defined herein) together with the right to deposit such surface water or groundwater as is permitted to be passed through any lots or roads on the plan, into such absorption drains as may be permitted by Council and shown on the plan. In exercising those powers, the owner of the lot benefited must:

(a) ensure all work on the lot burdened is done properly and carried out as quickly as is practicable; and
(b) cause as little inconvenience as is practicable to the owner and any occupier of the lot burdened; and
(c) cause as little damage as is practicable to the lot burdened and any improvement on it; and
(d) restore the lot burdened as nearly as is practicable to its former condition (taking account of the purpose of the easement); and
(e) subject to taking account of the purpose of the easement, making good any damage.

Council means Clarence City Council

COVENANTS (Continued): Lot 100 on the plan which formerly comprised part of Lots 5 & 6 on SP46789 is burdened by the restrictive covenants created by SP Nos. 46789, 24745 & 13478 and more fully set forth in SP 46789.
Lots 24 to 31 inclusive on the plan which formerly comprised part of Lot 6 on SP 46789 are each burdened by the restrictive covenants created by SP 13478 and more fully set forth in SP 46789.

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

ANNEXURE TO SCHEDULE OF EASEMENTS PAGE 5 OF 5 PAGES	Registered Number SP 134052
SUBDIVIDER: Madonian Pty. Ltd. FOLIO REFERENCE: 119743/1	

Execution clauses:

Executed by Madonian Pty Ltd (registered proprietor of the land in folio of the register volume 119743 folio 1 by its authorised officers by order of the Board in the presence of

Director

Secretary

Manager
37 Honeywood Drive
Cremorne . Tasmania

Executed by Connect Credit Union registered proprietor of mortgage C..... by its authorised officers by order of the Board in the presence of

SIGNED by CONNECT CREDIT UNION OF TASMANIA LIMITED by its attorney, DAVID JOHN ANNING, under Power of Attorney No. 71/4692 (who declares that he has received no notice of revocation of the power) in the presence of:

.....
witness

File PAK 95 1728*

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

rh architecture

PO BOX 306, NEW NORFOLK, TAS 7140
ABN 36 948 393 536

12 September 2025

[redacted]

Project Ref: 25-036

RE: PLANNIG APPLICATION (DA 2025-055242) 41a CREMORNE AVENURE, CREMORNE.

Dear Ryan

I write regarding your RFI dated 11th September 2025 regarding the above project. Please find below our response for your consideration:

10.3.1 Discretionary Uses
Please provide for information addressing performance criterion P4 regarding the discretionary use of Residential (Multiple dwellings).
RHA RESPONSE: we have amended the drawings (A04) to clearly show that within the footprint of 90m^2 we are only proposing to utilize 60m^2 as habitable space (CLASS 1a) with the remainder as storage (CLASS 10a). We therefore consider the proposal to be ancillary and to be used in combination with the existing dwelling. The ancillary will share all services such as water, sewer and power with the main dwelling.

10.4.1 Residential Density for Multiple Dwellings.
Please provide for information addressing performance criteria P1.1 or P1.2 if the site is not capable of being connected to a full water supply service, a reticulated sewerage system and the public stormwater system.
RHA RESPONSE: as mentioned above the proposal will be for an ancillary and will share all services such as water, sewer and power with the main dwelling.

We hope that the above provides adequate explanation to close out the RFI, if you require any further information then please contact the undersigned.

Yours faithfully

[redacted]

DIRECTOR

BOGGS/ WATSON ANCILLARY

41A CREMORNE AVENUE, CREMORNE, TAS 7024

REVISION 2

ARCHITECTURAL

A-01	LOCATION PLAN	A-05	REFLECTED CEILING PLAN	A-09	PROPOSED ELEVATIONS
A-02	SITE PLAN	A-06	ROOF PLAN	A-10	SECTIONS
A-03	NCC CLASSIFICATION	A-07	DRAINAGE PLAN	A-11	SITE PHOTOGRAPHS
A-04	PROPOSED FLOOR PLANS	A-08	LIGHTING & POWER LAYOUT		

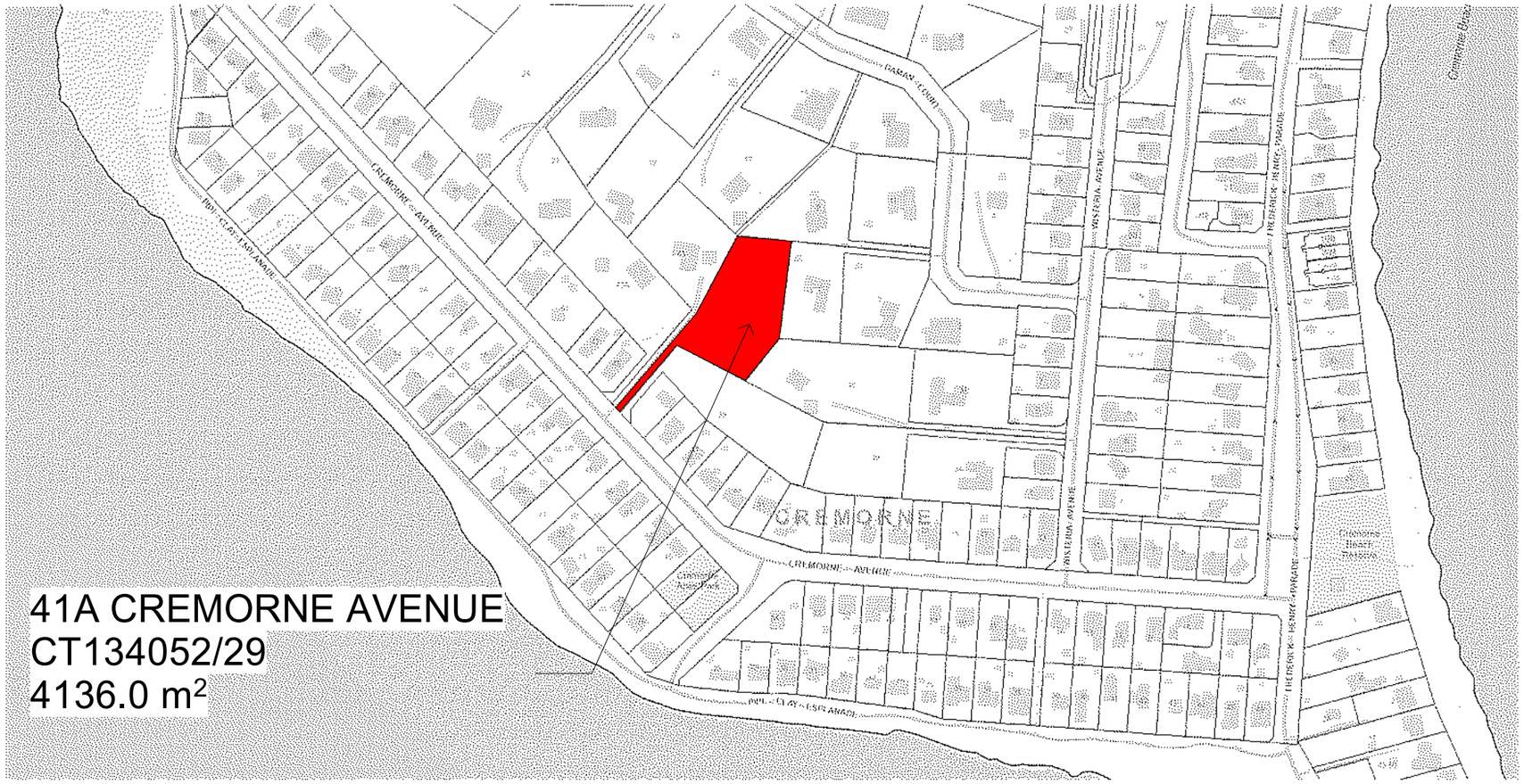
rh architecture

a: PO BOX 306, NEW NORFOLK, TASMANIA 7140

m: 0448 866 391 e: roy@rharchitecture.com.au

CBOS LIC. NO.: 132955139

DEVELOPMENT APPROVAL



LOCATION PLAN

AERIAL PLAN

SITE INFORMATION:	
Title Reference:	CT134052/29
Wind Classification	N2
Soil Classification	n/a
Climate Zone	7
BAL Level	n/a
Alpine Area	n/a
Corrosion Env.	n/a
Planning Zone:	Low Density
Planning Overlay:	Coastal Inundation Airport Limitation Flood Prone

AREA SCHEDULE:	
Site Area:	4136.0 m²
Existing House:	243.0 m²
Proposed Ancillary (RETROSPECTIVE CLASS CHANGE 10a TO 1a):	53.4 m²
Existing Storage (APPROVED):	36.6 m²
Proposed Storage:	45.0 m²

DEVELOPMENT APPROVAL - NOT FOR CONSTRUCTION

rh architecture
a: PO BOX 306, NEW NORFOLK, TASMANIA 7140
m: 0448 866 391 e: roy@rharchitecture.com.au
CBOS LIC. NO.: 132955139

REV	DATE	DETAILS	INIT.
2	12/09/25	UPDATED TO COUNCIL RFI	RH
1	13/08/25	DA APPLICATION	RH

Client/ Project Name
BOGGS/WATSON ANCILLARY RETROSPECTIVE APPROVAL
Project Address
41A CREMORNE AVENUE, CREMORNE, TAS 7024

drawn RH
checked RH
date 06/25
scale 1 : 500

sheet
LOCATION PLAN

project no: 25-036
sheet no. A-01
revision: 2

SITE DRAINAGE

SITE DRAINAGE SHALL BE IN ACCORDANCE WITH THE NCC AND AS 2870 REQUIREMENTS. ALL DRAINAGE SHALL BE DESIGNED AND CONSTRUCTED TO AVOID PONDING AGAINST OR NEAR FOOTINGS.

THE GROUND IN THE IMMEDIATE VICINITY OR THE PERIMETER FOOTINGS INCLUDING GROUND UPHILL FROM THE SLAB ON CUT AND FILL SITES, SHALL BE GRADED TO A FALL OF 5% AWAY FROM THE FOOTING OVER A MINIMUM DISTANCE OF 1000MM. SUB-SOIL DRAINAGE SYSTEMS INSTALLED FOR THE PURPOSE OF DIVERTING SEEPAGE AWAY FROM THE DWELLING SHALL BE CONSTRUCTED PRIOR TO THE COMMENCEMENT OF ANY BUILDING WORKS.

1 / A-02 SITE PLAN
1 : 500

DEVELOPMENT APPROVAL - NOT FOR CONSTRUCTION

rharchitecture
a: PO BOX 306, NEW NORFOLK, TASMANIA 7140
m: 0448 866 391 e: roy@rharchitecture.com.au
CBOS LIC. NO.: 132955139

REV	DATE	DETAILS	INIT.
2	12/09/25	UPDATED TO COUNCIL RFI	RH
1	13/08/25	DA APPLICATION	RH

Client/ Project Name
BOGGS/WATSON ANCILLARY RETROSPECTIVE APPROVAL

Project Address
41A CREMORNE AVENUE, CREMORNE, TAS 7024

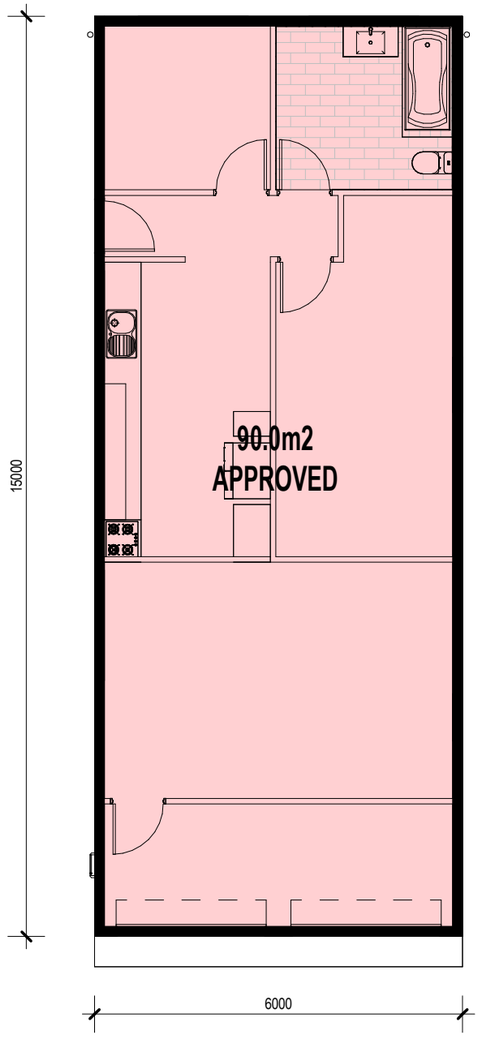
drawn RH
checked RH
date 06/25
scale As indicated

sheet SITE PLAN
project no: 25-036
sheet no. A-02
revision: 2

NCC BUILDING CLASSIFICATION

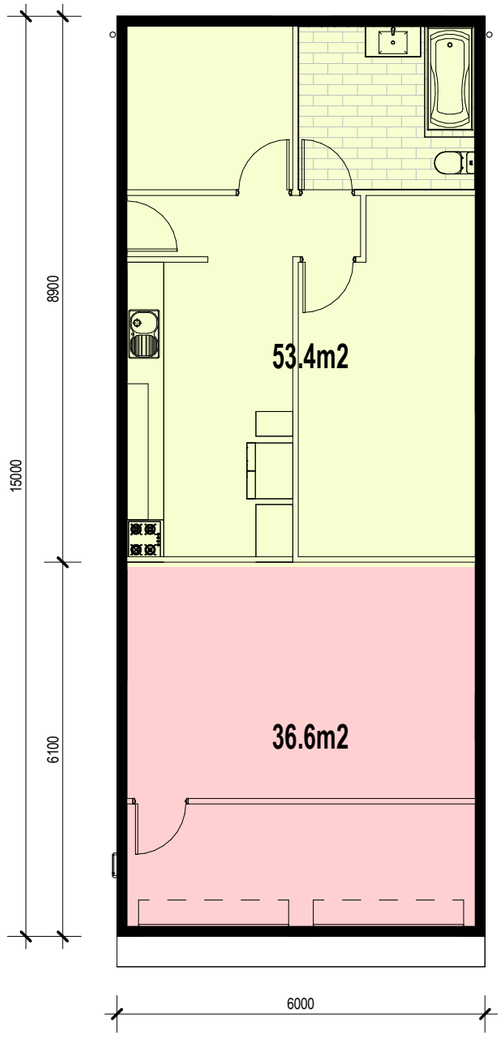
NCC CLASSIFICATION (class 1a)

NCC CLASSIFICATION (class 10a)



1 A-03 EXISTING NCC CLASSIFICATION

1 : 100



2 A-03 PROPOSED NCC CLASSIFICATION

1 : 100

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REV	DATE	DETAILS	INIT.
2	12/09/25	UPDATED TO COUNCIL RFI	RH
1	13/08/25	DA APPLICATION	RH

Client/ Project Name

BOGGS/WATSON ANCILLARY RETROSPECTIVE APPROVAL

Project Address

41A CREMORNE AVENUE, CREMORNE, TAS 7024

drawn RH

checked RH

date 06/25

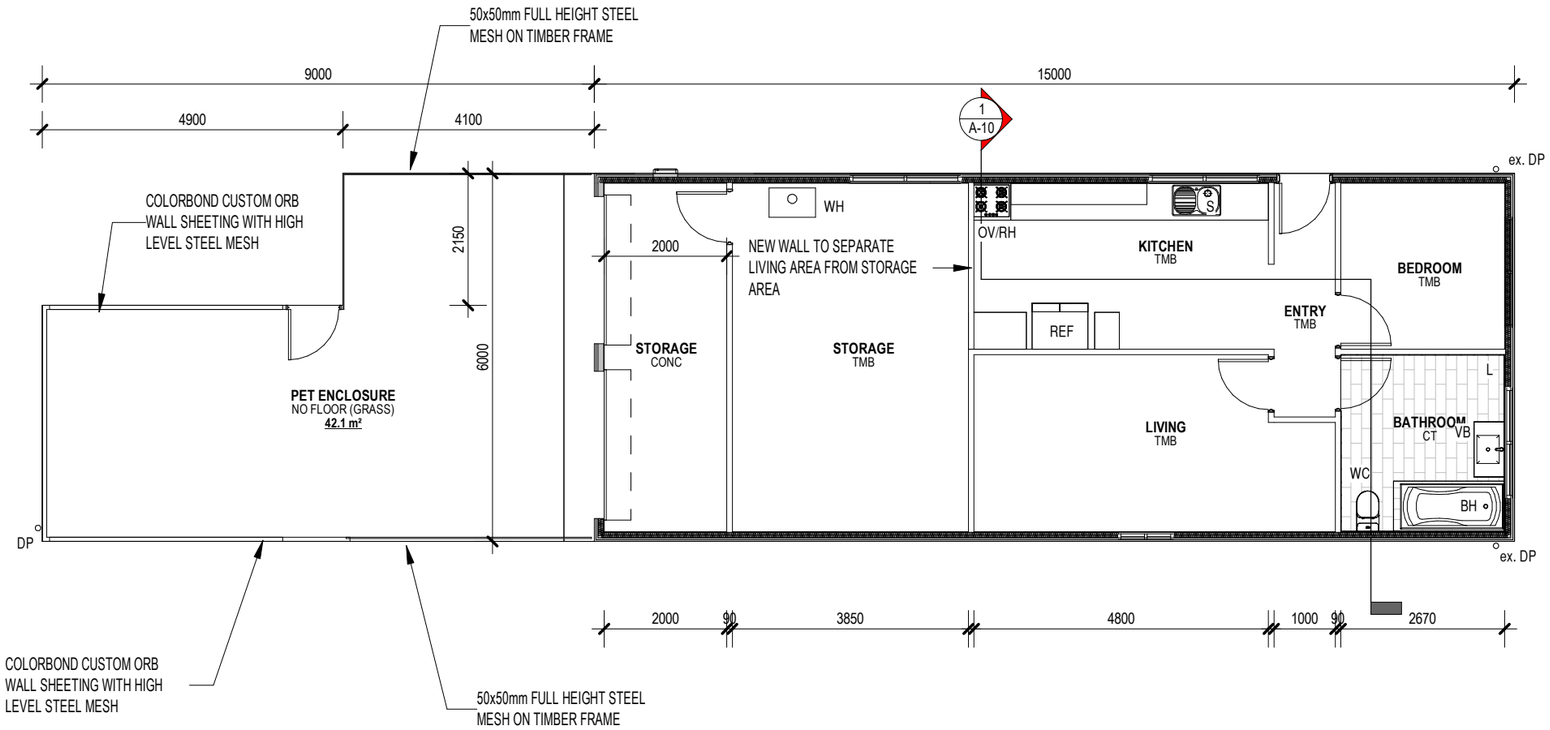
scale 1 : 100

sheet NCC CLASSIFICATION

project no: 25-036

sheet no. A-03

revision: 2



1 / A-04 PROPOSED GROUND FLOOR PLAN

1 : 100

LEGEND

FLOOR FINISHES

CT	-	CERAMIC TILING
TMB	-	LAMINATE TIMBER
CONC	-	CONCRETE (EXISTING)

FIXTURES & FITTINGS

REF	-	REFRIGERATOR
RH	-	RANGE HOOD
OV	-	COOKER/ OVEN
WH	-	WOOD HEATER
VB	-	VANITY BASIN
BH	-	BATH
SH	-	SHOWER
GS	-	TOUGHENED GLASS SCREEN
WC	-	TOILET
ex.DP	-	EXISTING DOWNPIPE

INSULATION SCHEDULE

NOTES:
CLEARANCE MUST BE PROVIDED FOR UNCOMPRESSED INSTALLATION OF BULK INSULATION.

R-VALUES WHERE NOTED FOR BULK INSULATION (BATTS) ARE TAKEN FROM BRADFORD INSULATION TABLES

ROOF AREA

CEILING	-	215mm Bulk insulation (or equivalent)	**R4.1**

WALL AREA

WALL	-	90mm Bulk insulation (or equivalent)	**R2.5**

FLOOR AREA

FLOOR	-	CONCRETE SLAB

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1 / 4 / 2 / 3 ELEVATION KEY

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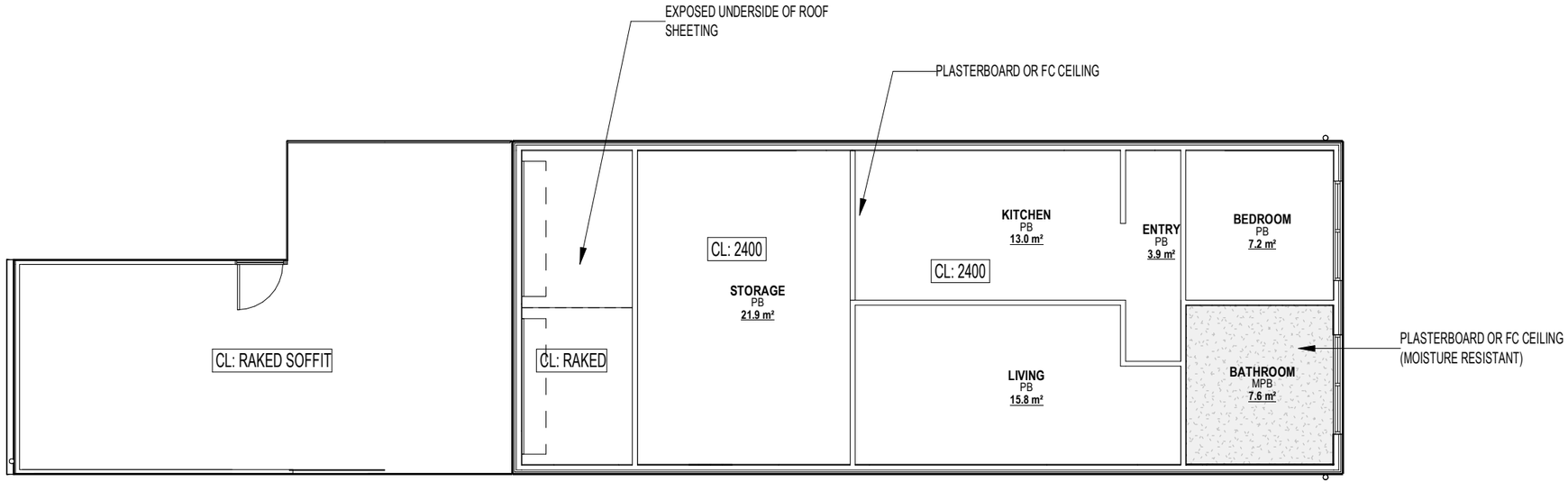
drawn RH
checked RH
date 06/25
scale As indicated

sheet
PROPOSED FLOOR PLANS

project no: 25-036
sheet no. A-04
revision: 2



1 / A-05 REFLECTED CEILING PLAN

1 : 100

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BOGGS/WATSON ANCILLARY RETROSPECTIVE APPROVAL

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drawn RH

checked RH

date 06/25

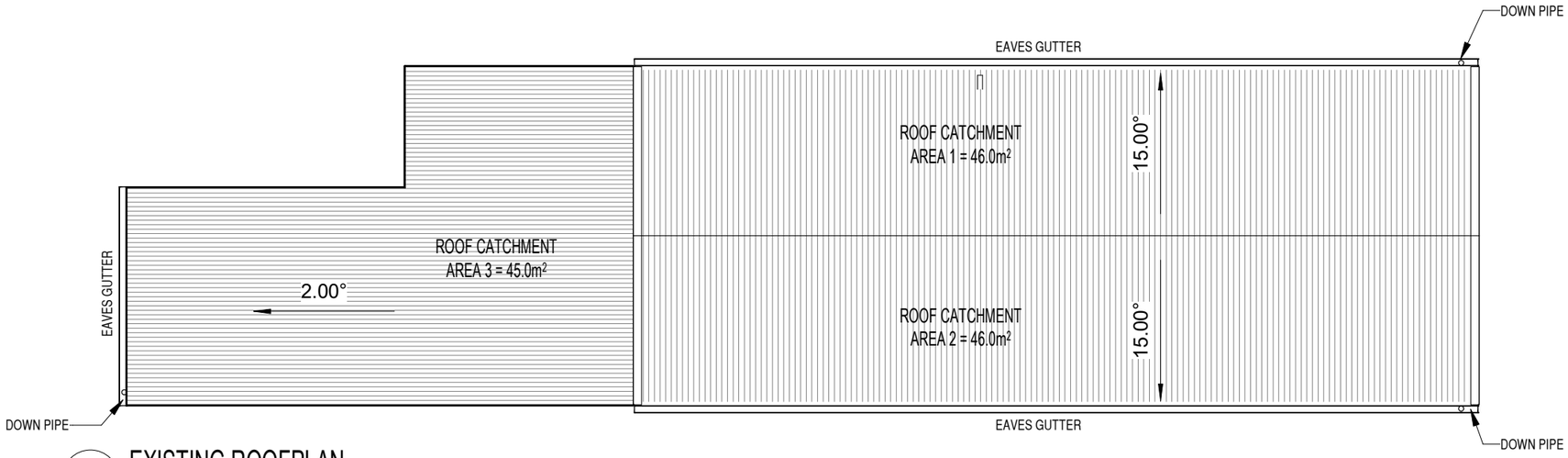
scale 1 : 100

sheet REFLECTED CEILING PLAN

project no: 25-036

sheet no. A-05

revision: 2



1 / A-06 EXISTING ROOFPLAN

1 : 100

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Project Address

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drawn RH

checked RH

date 06/25

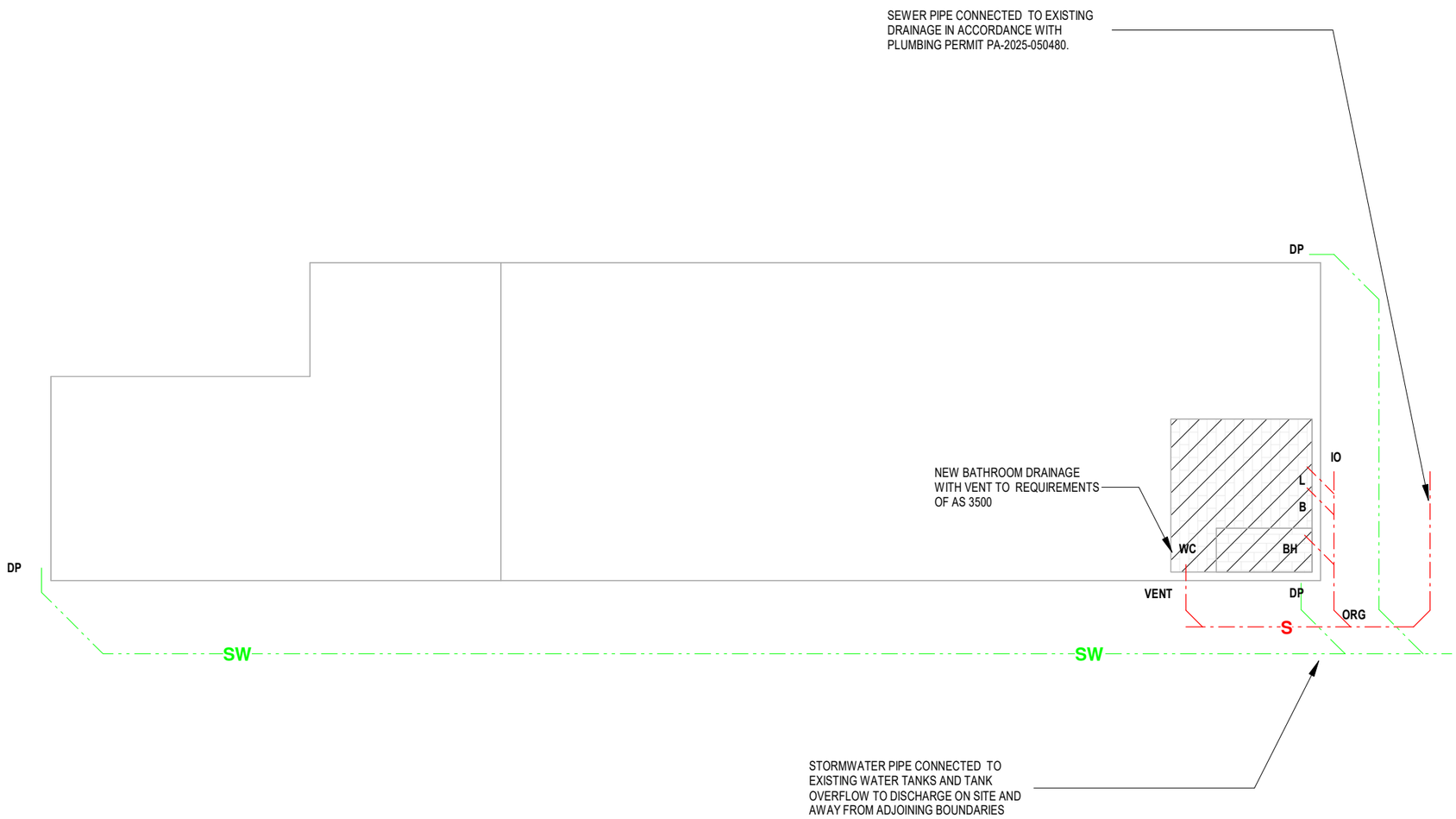
scale 1 : 100

sheet ROOF PLAN

project no: 25-036

sheet no. A-06

revision: 2



3 A-07 DRAINAGE PLAN
1 : 100

DRAINAGE LEGEND

FIXTURES & FITTINGS SHEDULE

B	BASIN	DN40
FW	FLOOR WASTE	DN50
BH	BATH	DN50
IO	INSPECTION OPENING	
ORG	OVERFLOW RELIEF GULLY AND TRAP OVER	
S	SINK	DN40
SH	SHOWER	DN50
L	LAUNDRY TUB	DN50
VENT	VENT TO EXTERNAL	DN50
WC	WATER CLOSET PAN	DN100

STANDARDS

ALL PLUMBING MUST BE INSTALLED TO MEET THE REQUIREMENTS OF THE CURRENT:

- N.C.C., AS3500.2 & AS3500.3
- WATER SERVICES ASSOCIATION OF AUSTALIA CODES (WSAA)
- LOCAL COUNCIL REQUIREMENTS
- TASWATER TECHNICAL STANDARDS
- ANY RELEVANT STANDARDS / MANUFACTURERS SPECIFICATIONS

PLUMBING NOTES

OVERFLOW RELIEF GULLY IS TO BE LOCATED 150mm BELOW THE LOWEST PLUMBING FIXTURE TO PROVIDE PROTECTION AGAINST SURCGARGE OF WASTE INTO THE BUILDING.

HYDRAULIC LAYOUT IS SHOWN INDICALIVELY, FINAL LAYOUT TO BE CONFIRMED BY PLUMBING SUB-CONTRACTOR ON SITE.

LOCATION OF VENT TO BE UPSTREAM OF SEWER AND THE FINAL LOCATION TO BE DETERMINED ON SITE BY PLUMBING SUB-CONTRACTOR

—S—	SEWER PIPE	DN100
--SW--	STORMWATER PIPE	DN100
	WET AREAS SHOWN HATCHED TO COMPLY WITH AS3740 & NCC 2022.	

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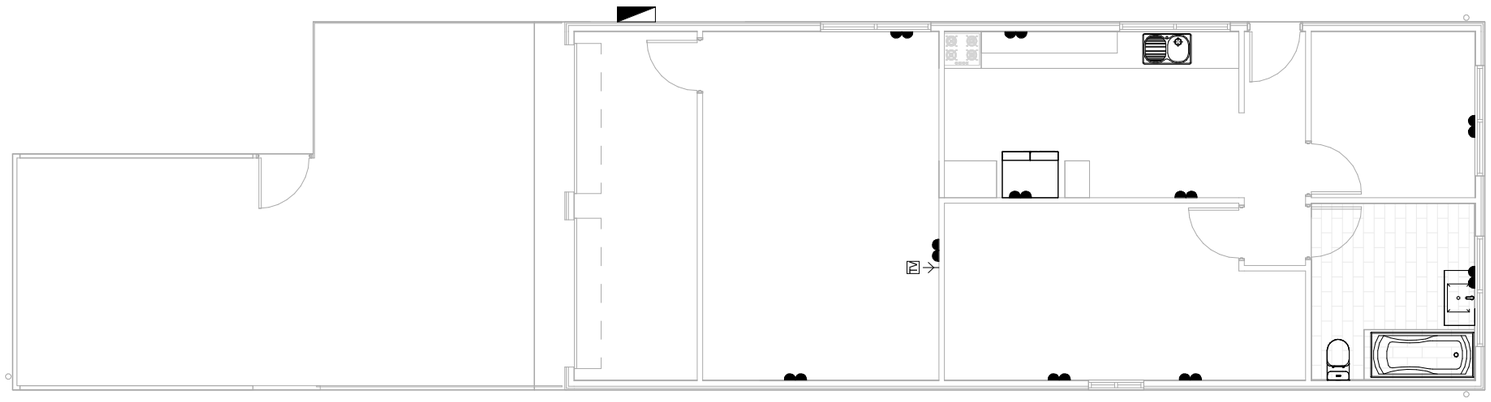
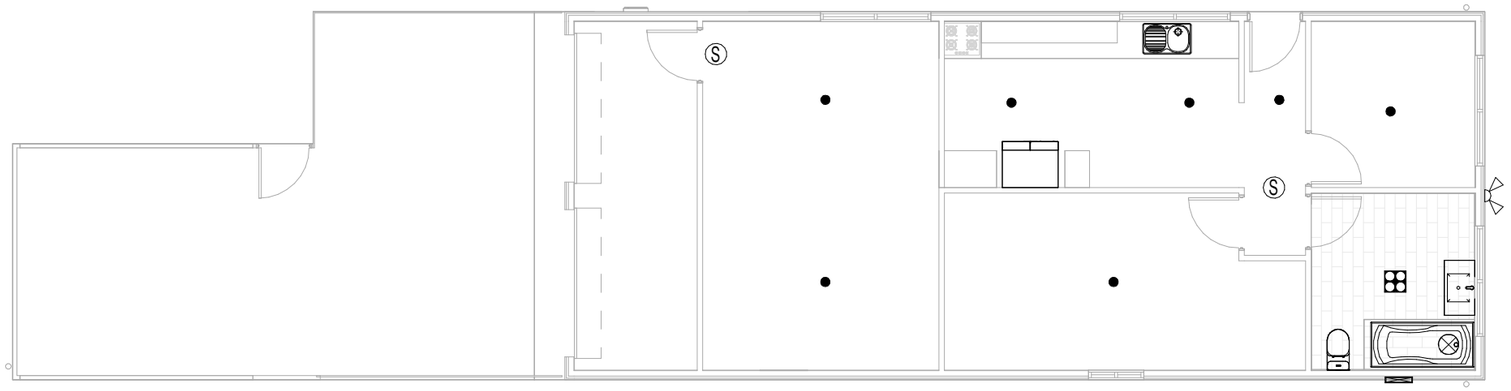
Project Address
41A CREMORNE AVENUE, CREMORNE, TAS 7024

drawn RH
checked RH
date 06/25
scale As indicated

sheet DRAINAGE PLAN
project no: 25-036
sheet no. A-07
revision: 2



1 / A-08 ELECTRICAL LAYOUT PLAN
1 : 100



2 / A-08 LIGHTING PLAN
1 : 100

ELECTRICAL LEGEND

LIGHT FITTINGS SHEDULE

- LIGHT SWITCH (SINGLE)
- S — SMOKE ALARM
- ELECTRIC WALL HEATER
- 13w LED RECESSED DOWNLIGHT
- TV — TV POINT

ELECTRICAL FITTINGS SHEDULE

- POWER POINT DOUBLE
- SWITCHBOARD

NOTES:

- ALL ELECTRICAL INSTALLATIONS TO BE IN ACCORDANCE WITH AUSTRALIAN STANDARDS AND LOCAL AUTHORITY REQUIRMENTS.

- ALL ROOMS TO BE PROVIDED WITH ARTIFICAL LIGHTING IN ACCORDANE WITH AS:1680.

- LED LIGHTS RATED IP OR IC ARE TO BE INSTALLED IN ACCORDANCE WITH MANUFACTURES RECOMMENDATIONS

- WHERE EXHAUST FANS ARE PROVIDED WITH NO OTHER FORM OF VENTILATION, FAN MUST BE ACTIVATED SIMULTANEOUSLY WITH LIGHT

- SMOKE ALARM TO BE CONNECTED TO THE MAINS POWER SUPPLY AND POSSES A BATTERY BACK-UP AND BE INTERCONNECTED TO PROVIDE A COMMON ALARM THROUGHOUT THE BUILDING AND AJACENT HOUSE, AND BE TO AS 3786-2014, AND INSTALLED TO NCC CLAUSE 3.7.5.5.

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1	13/08/25	DA APPLICATION	RH

Client/ Project Name
BOGGS/WATSON ANCILLARY RETROSPECTIVE APPROVAL
Project Address
41A CREMORNE AVENUE, CREMORNE, TAS 7024

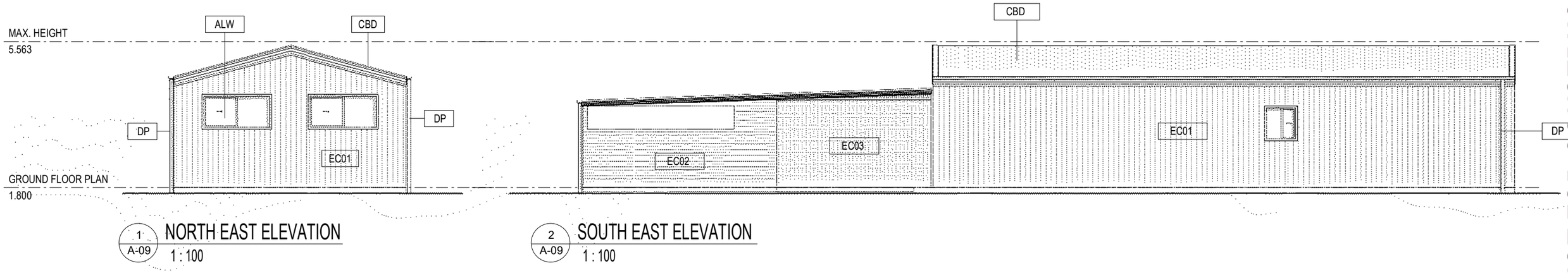
drawn: RH
checked: RH
date: 06/25
scale: As indicated

sheet: LIGHTING & POWER LAYOUT

project no: 25-036
sheet no.: A-08
revision: 2

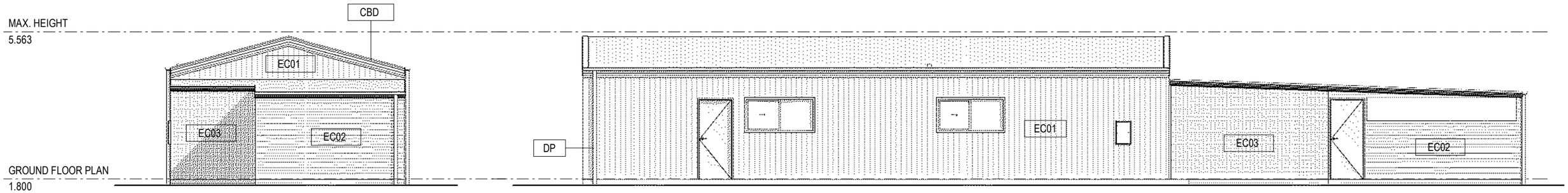
EXTERNAL FINISHES

ALW	-	ALUMINIUM GLAZED WINDOWS/ DOORS WITH POWDER COAT FINISH
EC01	-	EXTERNAL CLADDING TYPE 1 - METAL WALL SHEETING ON PROPRIETORY 70x19mm CAVITY BATTENS OVER WALL MEMBRANE, FLASHING TO JUNCTIONS, ABUTMENTS AND INTERFACES TO BE COLOUR MATCHED.
EC02	-	EXTERNAL CLADDING TYPE 2 - CUSTOM ORD METAL WALL SHEETING SCREW FIXED TO TIMBER FRAME WITH INTERNAL LINING OF FIBRE CEMENT SHEETING.
EC03	-	EXTERNAL CLADDING TYPE 3 - 50x50X3 SQUARE METAL MESH SCREW FIXED TO TIMBER FRAME.
DP	-	uPVC DOWNPIPE WITH PAINT FINISH TO MATCH EXTERNAL WALL, DOWN PIPES TO BE CONNECTED INTO STORMWATER TANKS
CBD	-	CUSTOM-ORB ROOF SHEETING , ON METAL PURLINS OVER ROOF MEMBRANE, ALLOW FOR FLASHING,



1 A-09 NORTH EAST ELEVATION
1 : 100

2 A-09 SOUTH EAST ELEVATION
1 : 100



3 A-09 SOUTH WEST ELEVATION
1 : 100

4 A-09 NORTH WEST ELEVATION
1 : 100

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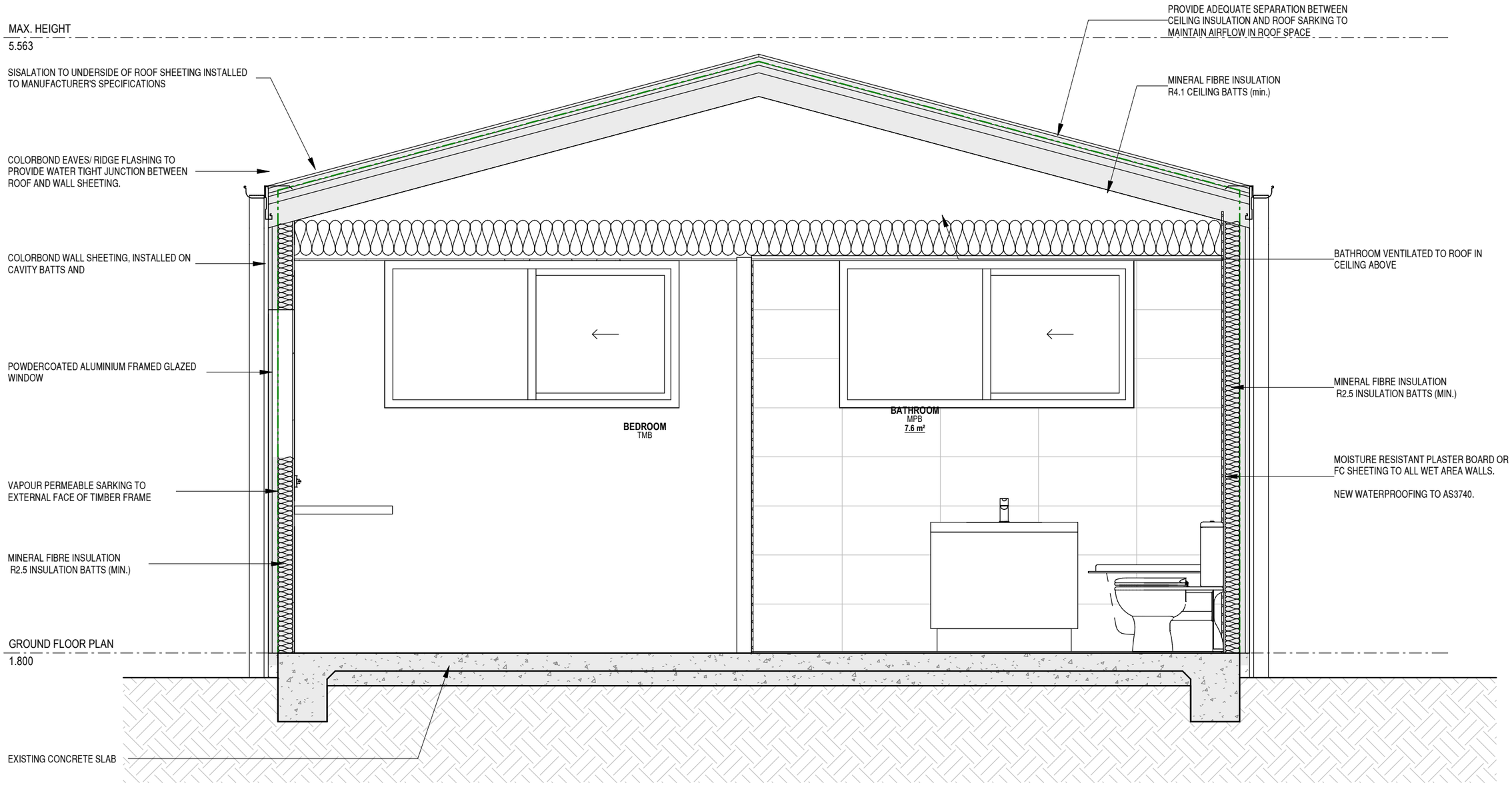
Client/ Project Name
BOGGS/WATSON ANCILLARY RETROSPECTIVE APPROVAL

Project Address
41A CREMORNE AVENUE, CREMORNE, TAS 7024

drawn RH
checked RH
date 06/25
scale As indicated

sheet
PROPOSED ELEVATIONS

25-036 project no:
A-09 sheet no.
2 revision:



1 / A-10 SECTION AA
1 : 25

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Client/ Project Name
BOGGS/WATSON ANCILLARY RETROSPECTIVE APPROVAL
Project Address
41A CREMORNE AVENUE, CREMORNE, TAS 7024

drawn RH
checked RH
date 06/25
scale 1 : 25

sheet SECTIONS

project no: 25-036
sheet no. A-10
revision: 2

DEVELOPMENT APPROVAL - NOT FOR CONSTRUCTION

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Client/ Project Name

BOGGS/WATSON ANCILLARY RETROSPECTIVE APPROVAL

Project Address

41A CREMORNE AVENUE, CREMORNE, TAS 7024

drawn RH

checked RH

date 06/25

scale

sheet SITE PHOTOGRAPHS

project no: 25-036

sheet no. A-11

revision: 2

COASTAL INUNDATION HAZARD ASSESSMENT

41A CREMORNE AVENUE - CREMORNE

PROPOSED SHED

Client:	**Daryl Boggs & Jennifer Watson**
Certificate of Title:	**134052/29**
Investigation Date:	**Tuesday, 1 October 2024**

Refer to this Report As

Enviro-Tech Consultants Pty. Ltd. 2024. Coastal Inundation Hazard Assessment Report for a Proposed Shed, 41A Cremorne Avenue - Cremorne. Unpublished report for Daryl Boggs & Jennifer Watson by Enviro-Tech Consultants Pty. Ltd., 01/10/2024.

Report Distribution

This report has been prepared by Enviro-Tech Consultants Pty. Ltd. for the use by parties involved in the proposed residential development of the property named above. It is to be used only to assist in managing any existing or potential inundation hazards relating to the Site and its development.

Reporting Declaration – Coastal Inundation

This Hazard Assessment Report includes an inundation assessment which has been prepared in accordance with the Tasmanian Planning Scheme and the Director's Determination – Coastal Inundation Hazard Areas and supervised by an environmental and engineering geologist with more than 10 years of experience and competence in coastal inundation modelling (see Attachment 7 for signed declaration & verification).

Executive Summary

Enviro-Tech Consultants Pty. Ltd. (Envirotech) were contracted by Fair Dinkum Builds Hobart on behalf of Daryl Boggs & Jennifer Watson to prepare a Coastal Inundation Assessment for a proposed dwelling located at 41A Cremorne Avenue Cremorne which is herein defined as the Site.

The development comprises an outbuilding with a finished floor level estimated at 1.8 m AHD. The outbuilding is exempt from planning but requires an assessment to address the director's determination for both coastal inundation and a riverine inundation.

Given the site has an elevation of 1.75 to 1.95 m AHD, and estimated outbuilding FFL at 1.85 m AHD, it is POSSIBLE that by 2075, the Site will be inundated by a 1% AEP storm tide event, with floodwaters in the H1 class meaning that the Site is safe for people, buildings and vehicles.

It is concluded that:

- The proposed building and work are unlikely to cause or contribute to coastal inundation on the land or on adjacent land.
- The proposed development does not require coastal inundation hazard reduction or protection measurement on or beyond the Site boundaries
- From this risk assessment that risks from inundation are LOW and tolerable in accordance with the director's determination based on a 1% AEP storm tide event within the building design life.

1 Introduction

1.1 *Background*

Enviro-Tech Consultants Pty. Ltd. (Envirotech) were contracted by Fair Dinkum Builds Hobart to prepare a Coastal Inundation Assessment for a proposed outbuilding at 41a Cremorne Avenue Cremorne which is herein defined as the Site (Map 1).

Envirotech have assessed risks based on the supplied Site plans for the proposed development, modelling constraints stipulated within the Directors Determination, the Tasmanian Planning Scheme, and the 2016 Tasmanian Building Regulations (TPS)

1.2 *Scope*

The scope of the Site investigation is to:

- Identify which overlay codes apply to the Site to determine development constraints including planning scheme exemptions, acceptable solutions, performance criteria as well as directors' determinations and building regulations specific to the identified hazards.
- Conduct inundation modelling and hazard analysis within the Site to assess directors' determination tolerable risks throughout the building design life and where applicable modelling to 2100 to address planning code performance criteria.
- Prepare a desktop review of relevant geomorphologic and hydrological information relevant to the Site and proposed development.
- Using available geographic information system (GIS) data, construct a hydrodynamic, and coastal process model for the Project Area/Site to interpret present and future Site conditions and how the proposed development may influence and be influenced by future Site processes.
- Prepare a risk assessment for the proposed development in terms of coastal inundation hazards ensuring relevant building regulations, Directors Determination, and where applicable performance criteria are addressed; and
- Where applicable, provide recommendations on methods and design approach to adapt to Site hazards.

1.3 *Cadastral Title*

The land studied in this report is defined by the title 134052/29.

1.4 *Site Setting*

The Site location plans are presented in Map 2, Attachment 1. The Project Site is located on aeolian sheet sand deposits. The Site is set back approximately 260 m from the coast and in the future may be subject to coastal processes acting within Pipe Clay Lagoon.

2 Assessment

2.1 *Proposed Development*

Table 1 summarises the provided design documents from which this assessment is based with plans presented in Attachment 2 with the Site outlay presented in Map 3.

Table 1 Project Design Drawings

Drafted By	Project ID	Date Generated	Pages
A. Brown	100312	23/08/2024	04

The proposal involves the development of an outbuilding[1] towards the northern part of the block with no proposed finished floor level. The Natural Ground Levels (NGL) within the proposed envelope range from 1.75 to 1.95 m AHD. The proposed outbuilding is proposed to be used for storage of a boat. With the slab constructed, it is presumed that the FFL will be at 1.85m AHD.

2.2 *Planning*

Planning code overlay mapping is presented in Attachment 1.

Planning code overlay descriptions, objectives, acceptable solutions and performance criteria are addressed in Attachment 3 (TPS)

2.2.1 Coastal Inundation Hazard Code

Coastal inundation hazard overlay mapping are presented in Map 4 and coastal inundation reporting requirements are summarised Table 3.

Although the proposed building and works fall within a coastal inundation overlay, given the proposed development requires authorisation under the Building Act 2016 (TPS C11.4.1) and does not trigger high risk planning criteria, the proposed development is exempt from planning Code C11.0 (Coastal Inundation Hazard Code).

2.2.2 Flood Prone Areas Hazard Code

Coastal inundation hazard overlay mapping is presented in Map 5.

The Flood Prone Areas Hazard Code does not need to be addressed on the basis that the building and works is within the coastal inundation hazard overlay.

2.3 *Building*

2.3.1 Coastal Inundation Risk Assessment (outbuilding or class 10 structure)

With respect to Class 1 and Class 10 structures, as well as ensuring finished floor levels of habitable rooms are managed, an assessment is to be made on whether proposed work can achieve and maintain a tolerable risk given a *1% AEP storm tide flooding event* for the intended life of the building (2075) without requiring any specific coastal inundation protection measures. Modelling herein includes an assessment of 1% AEP barometric low pressures, wind setup, wave runup and wave setup based on 2075 sea levels.

The most relevant modelling scenario relevant to the Site is for a storm tide (stillwater) event.

[1]In accordance with the Tasmanian Planning Scheme and Interim Planning Scheme, an outbuilding is defined a non-habitable detached building of Class 10a of the Building Code of Australia and includes a garage, carport or shed.

2.3.2 Flood Prone Areas (Riverine) Hazard Overlay

Given the pluvial nature of the flooding, a single inundation level applied to the Site. The defined riverine inundation level for the Site (based on 1% annual exceedance probability of inundation) is 1.85 m AHD.

In the Directors Determination, there are no risk assessment requirements for assessing tolerable risks to users of the Site.

3 Desktop Summary

3.1 *Topography*

The Site ranges in elevation from approximately 1.75 m AHD through to 1.95 m AHD and is near level (Map 6).

3.2 *Published Geology*

According to the 1:50,000 geological mapping by Mineral Resources Tasmania (MRT), as presented in Map 7, the geology of the Project Area comprises:

- Quaternary aeolian sand sheet deposits on the Site.

4 Inundation Assessment

4.1 *Assessment Methods*

Inundation levels are modelled by Envirotech based on Site-specific hydrodynamic and topographic/bathymetric conditions within the Site. The Site specified inundation levels and wave dynamics tolerable risks for Site building works and in determining the need for coastal protection works.

To comply with the director's determination, an assessment has been made based on storm tide event by 2075. The coastal hydrodynamic assessment is presented in Attachment 4 with an assessment based on:

- Projected 2075 sea levels
- 1% AEP barometric low conditions combined with astronomical tides.
- 1% AEP wind setup scenario
- Radials used in the assessment (Map 8) to determine local wind wave propagation
- Wave setup and wave runup probabilities

4.2 *Findings*

As presented in Table 2, making allowance for 2075 sea levels, wind setup, wave setup, wave runup as well as barometric low pressures:

The 1% AEP coastal inundation level is projected at 2.10 m AHD based on a storm tide.

Table 2 Site specific inundation level modelling

1% AEP Parameter	Units	2075
Storm Tide Levels	m AHD	2.10
Wave setup (southwesterly wind fetch)	m AHD	2.24
Wave runup (southwesterly wind)	m AHD	2.17

5 Risk Assessment

Qualitative risk evaluation criteria have been created to determine fundamental risks that may occur due to development in areas that are vulnerable to erosion or inundation hazards.

This qualitative risk assessment technique is based on AS/NZS ISO 31000:2009 and relies on descriptive or comparative characterisation of consequence, likelihood, and the level of risk comparative (rather than using absolute numerical measures).

A risk consequence/likelihood matrix has been selected which is consistent with AS/NZS ISO 31000:2009 guidelines.

Consequence/likelihood criteria have assisted in determining if any risk management measures are required at the Site to mitigate any potential hazards. Adopted consequence/likelihood criteria are presented in Attachment 6.

5.1 *Planning*

5.1.1 Coastal Inundation Assessment

As per Section 2.2.1, the proposed development is exempt from coastal inundation code C11.

5.2 *Building*

5.2.1 Coastal Inundation

Modelling has been conducted for Directors Determination purposes to assess whether the proposed building and work can achieve and maintain a tolerable risk for the intended life of the building without requiring any specific coastal inundation protection measures.

Based on inundation modelling prepared for the Site the following is concluded:

- It is POSSIBLE that the natural ground levels of the proposed outbuilding will be inundated based on a 1% AEP storm tide as modelled by Envirotech
- It is POSSIBLE that the natural ground levels of the proposed outbuilding will be inundated based on the Defined Flood Level
- The flood hazard class for the proposed works include:
    - The proposed outbuilding falls within the H1 hazard class indicating that it is generally safe for people, buildings and vehicles
- Given the recommendations, tolerable risk can be maintained, and no specific hazard reduction or protection measures are recommended.

6 Recommendations

6.1 *Finished Floor Levels*

It is assumed that the pad of the outbuilding will be elevated to 1.8 m AHD. Based on stillwater levels, the proposed shed finished ground levels and finished floor levels will reside in an H1 class.

6.2 *Inundation Protection Works*

Inundation protection works are not required at the Site.

7 Concluding Statement

The Site is exempt from planning code C11, and therefore, the Directors Determination must be addressed.

Within the building design life, the following can be concluded:

- With the outbuilding finished ground level and finished floor level at 1.8 m AHD, an H1 class assigned based on 1% AEP modelling for the stillwater setting within the building design life
- The Site is generally safe for people, vehicles and buildings based on building design life modelling constraints.
- The proposed work and use can achieve and maintain a tolerable risk for the intended life of the building without requiring any inundation protection measures.
- The proposed development is unlikely to cause or contribute to coastal inundation on the Site or on adjacent land

Niels Kijm BSc Msc | Environmental Engineer & Geomorphologist

Project manager

Enviro-Tech Consultants Pty. Ltd.

Kris Taylor BSc (hons) | Environmental & Engineering Geologist

Director

Enviro-Tech Consultants Pty. Ltd.

8 References

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Attachment 1 Maps

Map 1

Map 1 Site regional setting (The LIST)

Map 2

Map 2 Site and Project Area local setting

Map 3

Map 3 Proposed Site Development Plan

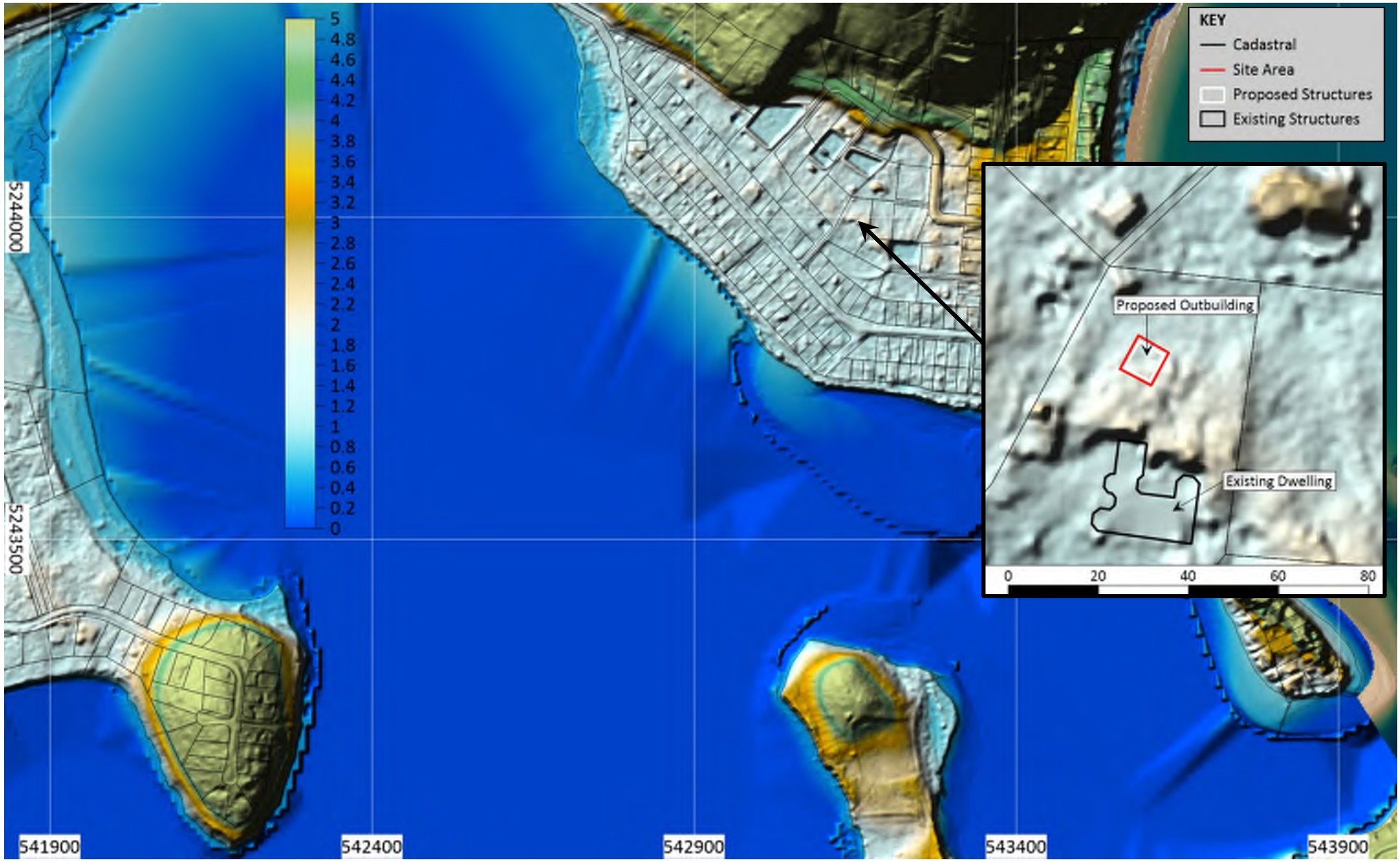
Map 4

Map 4 Coastal inundation overlay

Map 5

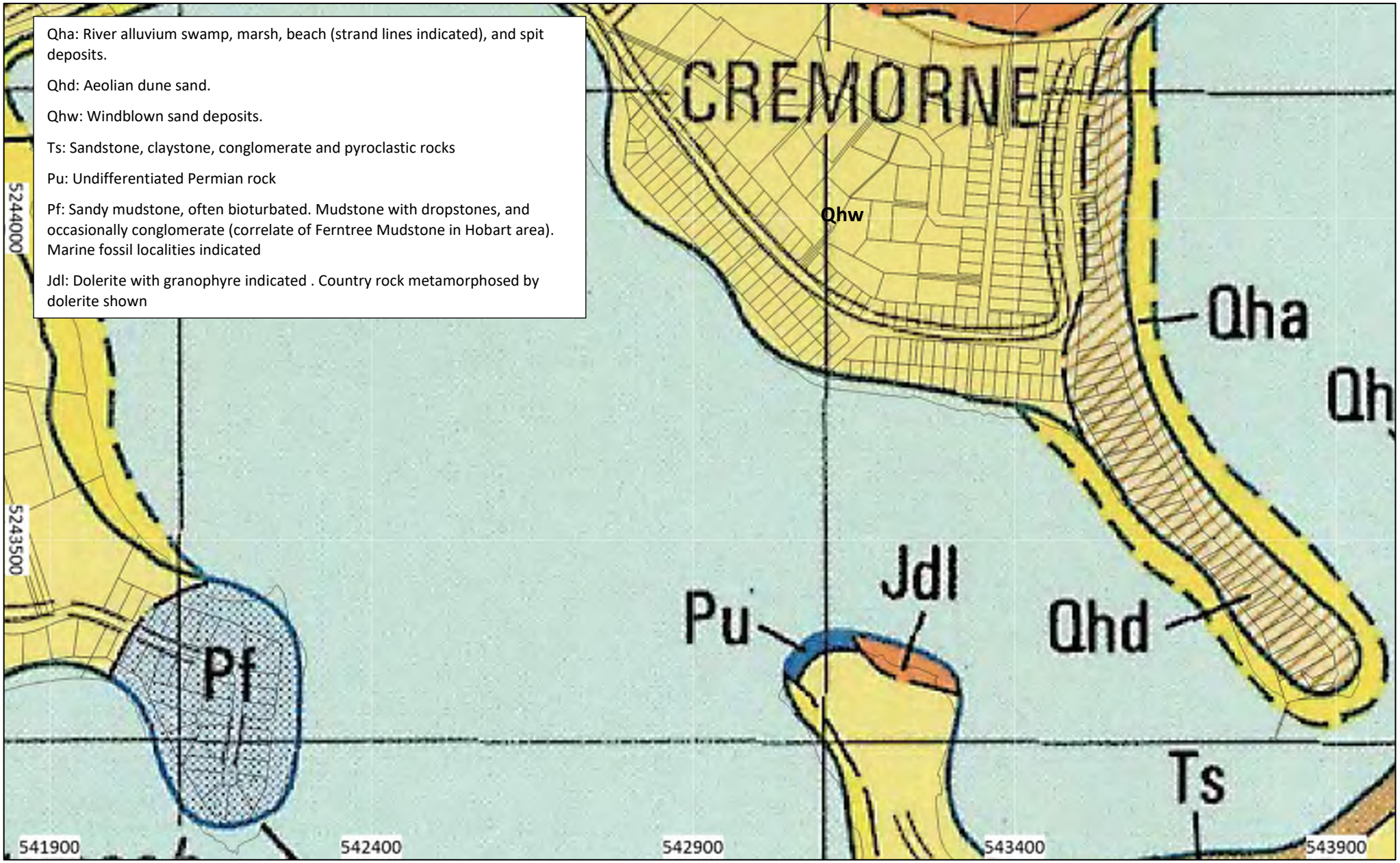
Map 5 Flood prone areas overlay – 1% AEP inundation mapping

Map 6



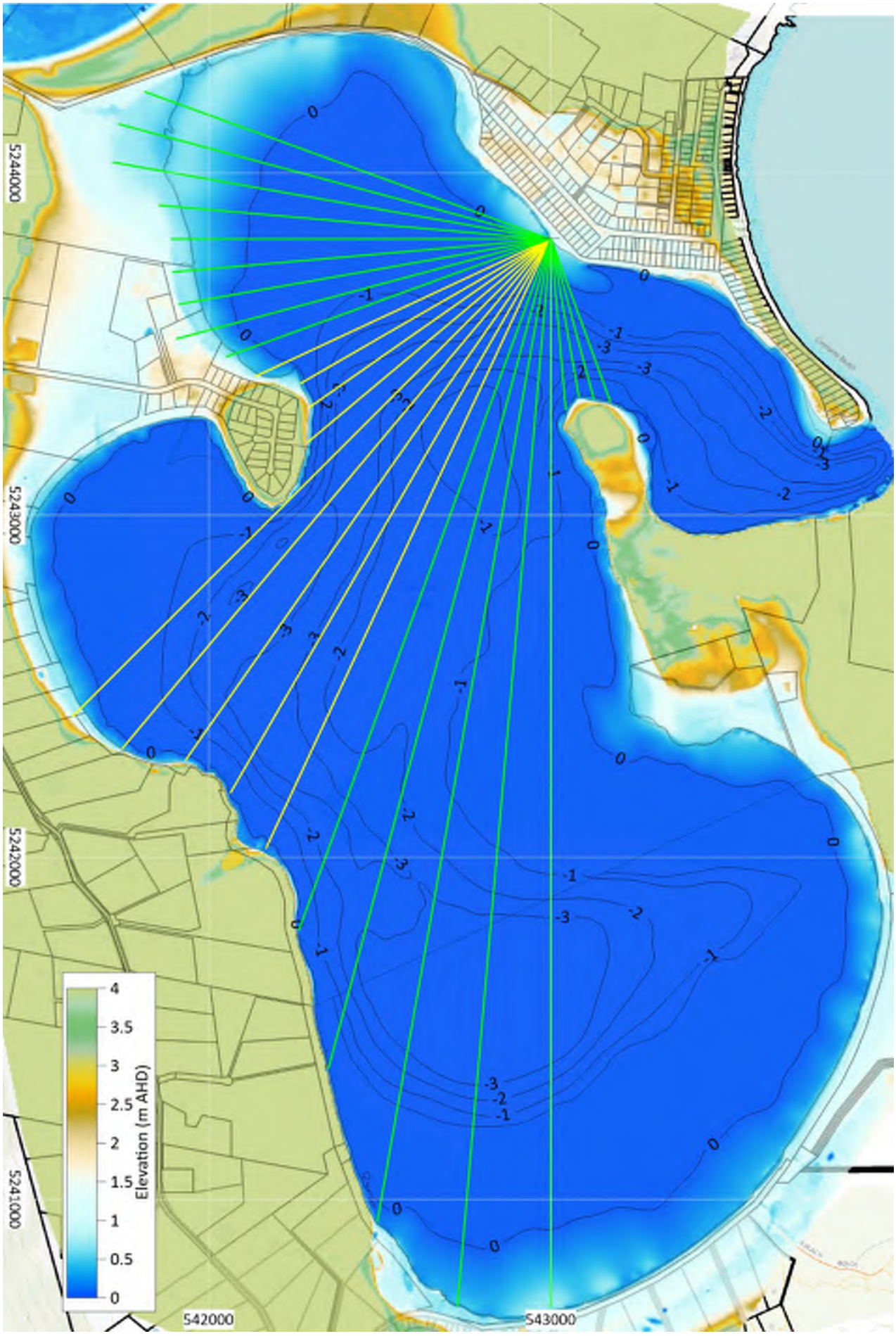
Map 6 Regional digital elevation model based on 2013 LIDAR

Map 7



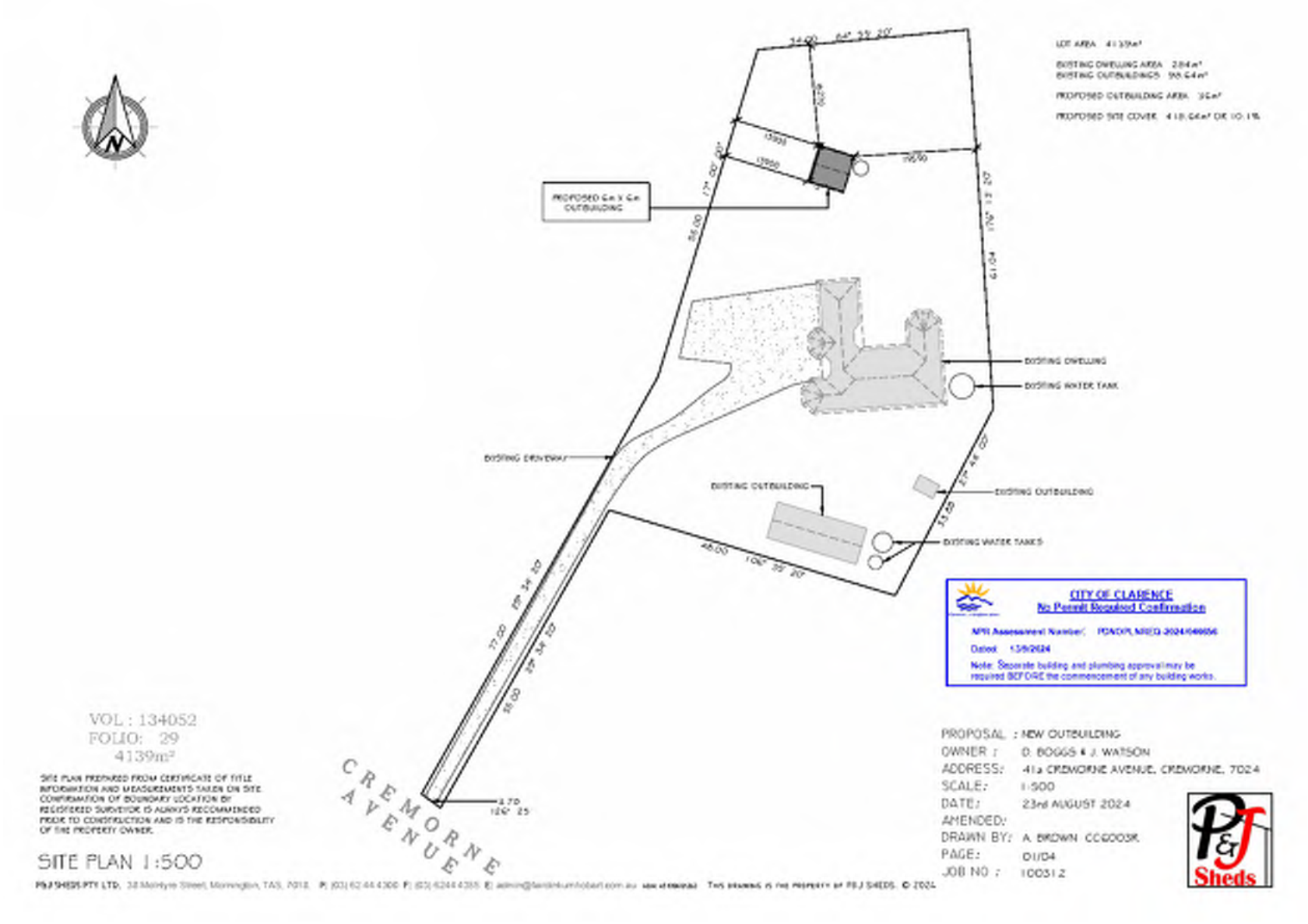
Map 7 1:50,000 Scale Mineral Resources Tasmania geology mapping

Map 8



Map 8 Radials used to generate the wind wave model for the Site.

Attachment 2 Preliminary Design Concept Plans



Attachment 3 Planning and Building Regulations

Coastal Inundation Hazards

Tasmanian Planning Scheme C11.0

The Site falls within The LIST Coastal Inundation Hazard Overlay (low hazard band) as presented in Map 4.

Code Overlay Reporting Requirements

The proposed development reporting requirements are summarised in Table 3 with the following to be addressed:

- Part 5 (Work in Hazardous Areas) of the Building Regulations 2016; Division 5 – Coastal Inundation
- Directors Determination – Coastal Inundation Hazard Areas.

The proposed development is exempt from C11 Coastal Inundation Hazard Code planning on the basis that the use or development requires authorisation under the Building Act 2016 (TPS C10.4.1).

Table 3 Coastal Inundation Hazard Reporting Requirements Framework

Council	Clarence
Planning Scheme	Tasmanian Planning Scheme
Critical use, hazardous use, or vulnerable use	No
Low or medium coastal inundation hazard band	Low
Parts of the Site are located within a high coastal inundation hazard band	No
Located within a non-urban zone	No
Requires inundation protection works	No
Exemption from code	Yes, on the basis that the development requires authorisation under the Building Act 2016
Coastal inundation reporting requirements	Coastal Inundation Hazard Assessment in accordance with directors determination
Coastal inundation code to be addressed	NA (exempt from planning)
Defined inundation level	2.5m AHD. Based on 1% AEP for year 2100 - as per Tasmanian Planning Scheme Local Provisions Schedule Table C11.1 Cremorne - Pipe Clay Esplanade
Minimum habitable room finished floor level based on the defined inundation level plus 0.3m freeboard (Tasmanian Building Regulations 2016)	2.8m AHD
Risk assessment modelling criteria	Be satisfied that the proposed work can achieve and maintain a tolerable risk for the intended life of the building (50 years) based on sea levels, astronomical tides, barometric low, wave setup, wave runup and wind setup
In a coastal inundation investigation area	No
Coastal inundation investigation area report required	No
Located within a flood-prone area hazard code overlay	Yes
Flood-prone area hazard code overlay to be addressed	Not in areas where the proposed building and works are located within the coastal inundation hazard overlay, but the Directors Determination still needs to be addressed

Directors Determination – Coastal Inundation Hazards

Residential structures and outdoor structures

Although a coastal inundation hazard assessment report may not be required for planning purposes, according to the director's determination, a coastal inundation hazard report must be prepared for proposed residential structures (Class 1) and outdoor structures (Class 10).

Certificate of Likely Compliance

In determining an application for a Certificate of Likely Compliance (2 (6), the building surveyor must:

(a) take into account the coastal inundation hazard report and any relevant coastal inundation management plan; and

(b) be satisfied that the proposed work will not cause or contribute to coastal inundation on the Site, on adjacent land or of public infrastructure; and

(c) be satisfied that the proposed work can achieve and maintain a tolerable risk for the intended life of the building without requiring any specific coastal inundation protection measures.

Buildings with habitable rooms[2] including residential structures (Class 1) within a coastal inundation hazard area must have finished floor level of at least 300 millimetres above the *defined flood level* for the land. Given Class 10 structures do not have habitable rooms and are not classified as a dwelling, Class 10 structures are to be assessed in terms of *tolerable risks* only.

Defined Flood Level

For the purposes of the Directors Determination – Coastal Inundation Hazard Areas and regulation 56(3) of the Building Regulations 2016, the defined flood level is the level above the 0 metres Australian Height Datum with a *one per cent probability of being exceeded in a storm surge flooding event in the year 2100*, as specified in the Local Provisions Schedule of the Tasmanian Planning Scheme.

Site Defined Flood Level (Cremorne - Pipe Clay Esplanade)

The defined flood level for the Site is based on TPS Table C11.1 Coastal Inundation Hazard Bands AHD Levels for 2100 with the following 1% annual exceedance probability of inundation:

Defined Coastal Inundation Flood Level: 2.5 m AHD

Tasmanian Building Regulations 2016

Habitable Room Finished Floor Levels (Cremorne - Pipe Clay Esplanade)

Tasmanian Building Regulations 2016, residential structures (Class 1) within a coastal inundation hazard area must have finished floor level of *habitable rooms*[3] at least 300 millimetres above the *defined flood level* for the land (which includes the Site) at or above:

Coastal Inundation Finished Floor Level: 2.8 m AHD

[2] habitable rooms "means any room of a dwelling other than a bathroom, laundry, toilet, pantry, walk-in wardrobe, corridor, stair, hallway, lobby, clothes drying room and other space of a specialised nature occupied neither frequently nor for extended periods."

[3] habitable rooms "means any room of a dwelling other than a bathroom, laundry, toilet, pantry, walk-in wardrobe, corridor, stair, hallway, lobby, clothes drying room and other space of a specialised nature occupied neither frequently nor for extended periods."

Coastal Inundation Modelling

Directors Determination

The directors determination requires an assessment of tolerable risk which is defined in the directors determination as 'the lowest level of likely risk from coastal inundation from a defined flood event[4] to secure the benefits of a use or development in a coastal inundation hazard area, and which can be managed through routine regulatory measures or by specific hazard management measures for the intended life of each use or development.'

This risk assessment is therefore two tiered and includes an assessment of:

- Tolerable risks associated with the lowest level of likely risk from coastal inundation from a defined flood event
- Management for the intended life of each use or development, and therefore modelling based on a 1% AEP flooding event within the building design life (2075)

Coastal Inundation Risk Modelling

Enviro-Tech have modelled 1% AEP storm tide processes for 2075 which includes 1% AEP astronomical tide, barometric low pressures, wind setup, wave runup and wave setup based on 2075 sea levels.

Flood-Prone Area Hazards

Tasmanian Planning Scheme - C12.0

The Site is located within the Clarence Council mapped 1% Annual Exceedance Probability (AEP) inland flooding hazard area (Map 5).

C12.2 Application of this Code

C12.2.5

The proposed development is exempt from C12.0 Flood-Prone Area Hazard Code planning on the basis that the code does not apply to land subject to the Coastal Inundation Hazard Code (C12.2.5).

Directors Determination - Riverine Inundation Hazard Areas

As the proposed building and works fall within the Flood Prone Areas Code, the Directors Determination is to be addressed regardless of whether the Project is exempt from planning Code 12 or not. According to the director's determination, a flood prone areas inundation assessment must be prepared for buildings with habitable rooms.

Non-Habitable Rooms

The Directors Determination does not specify any requirements for a risk assessment to be conducted for building and works proposed within a flood prone areas code. The determination, Tasmanian Building Act 2016 and Tasmanian Building Regulations 2016 stipulate finished floor levels for habitable rooms only which is not applicable in this case.

4 Defined flood event means a flood event that causes flooding to the defined flood level;

Tasmanian Building Regulations 2016

Defined Riverine Flood Level

For the Clarence Council, and for the purposes of regulation 54(2) of the Building Regulations 2016, the defined flood levels for floodplains of any other watercourses, have a 1% probability of being exceeded in any year according to a report adopted by the relevant council for the municipal area in which the land is located.

Site Defined Riverine Flood Level (building footprint inundation levels)

The defined riverine flood level for the Site[5] is based on Clarence Council 1% AEP flood modelling (as written in the determination, the level which has a 1% probability of being exceeded in any year according to a report adopted by the relevant council for the municipal area in which the land is located).

The defined riverine flood level for the Site is based on 1% annual exceedance probability inundation mapping by the Clarence City Council (Map 5) is:

Defined Riverine Inundation Flood Level: 1.85 m AHD

Tasmanian Building Act 2016

Definitions

For the purposes of the Tasmanian Building Act 2016, land that has previously been flooded, or land that has been assessed by the council of the relevant municipal area as having a reasonable probability of flooding, is land that is – (a) subject to riverine inundation (b) a hazardous area for the purposes of the definition of hazardous area in section 4(1) of the Act.

A person must not perform works on a building on land that is subject to riverine inundation unless the floor level of each habitable room of the building being erected, re-erected or added as part of the work, is at least 300 millimetres above the defined flood level for the land.

Site Finished Floor Levels

The floor level of each habitable room[6] of the building, being erected, re-erected or added as part of the work, is at least 300 millimetres above the defined flood level for the land. The following finished floor level is required for all habitable rooms:

Riverine Inundation Finished Floor Level: 2.15 m AHD

However, since the proposed development does not contain any habitable rooms, it has to be accessed against tolerable risk only. Given the previous inundation modelling, with the existing finished ground levels, the probability of the Site being inundated within the building design life is RARE.

[5] In coastal areas where the coastal and riverine overlay overlap, in terms of building regulations, the Site defined flood level is controlled by both the 1% AEP flood prone areas modelling and the local provisions schedule levels for the location (or whichever is limiting).

[6] habitable room - means any room of a habitable building other than a room used, or intended to be used, for a bathroom, laundry, toilet, pantry, walk-in wardrobe, corridor, stair, hallway, lobby, clothes drying room, service or utility room, or other space of a specialised nature occupied neither frequently nor for extended periods.

Attachment 4 Coastal Hydrodynamics

Stillwater Levels

Assessment Method

Stillwater levels influencing coastal processes within the Project Area are calculated from the combination of the following factors:

- **Storm Tide** - Present day astronomical tides combined with barometric low-pressure influence (coined storm tide). Storm tide inundation levels are adopted from 1% annual exceedance probability (AEP) modelling (McInnes O'Grady 2016).
- **Sea Levels** - are projected based on IPCC RCP8.5 scenarios which have been locally modelled for local government area (DPAC 2016) based on McInnes et. al. (2016). An allowance has been made for present sea level heights relative to Australian Height Datum (AHD). Projections are based on 2050 and 2100 scenarios which are all compiled from a 2010 baseline. The 50-year building design life (2075) scenario is extrapolated from the projection curve
- **Wind Setup** – are calculated based on procedures outlined in Kamphuis (2000) with 100-year ARI wind data adapted from AS1170 based on a 0.2 s wind gust of 41 m/s with 0.85 to 1.00 directional multipliers.

Findings

Project Area stillwater levels are presented in Table 4. The following is concluded:

- **1% AEP stillwater inundation level of 2.1 m AHD for 2075**

Table 4 Project Area 1% AEP Stillwater Levels

Parameter	Units	Scenario		
		2025	2050	2075
Sea Levels	m AHD	0.14	0.23	0.57
Local 1% AEP Storm Tide	m	1.34	1.34	1.34
Wind Setup	m	0.22	0.19	0.19
Total	m AHD	1.70	1.76	2.1

Wave Forecast Modelling

Assessment Method

Wave processes near the Site are used to calculate both coastal inundation levels (in addition to stillwater levels) and coastline recession rates based on the following:

- **Localised 'Wind' Waves –** Are modelled for the Project Area based on methods outlined in the Coastal Engineering Manual (2002). TAFI (<40 m depth) and Geoscience Australia deep-water bathymetry contours (>40 m depth), and coastal LIDAR are used to develop an accurate 3D bathymetry model. 100-year ARI wind data adapted from AS1170 based on a 0.2 s wind gust of 41 m/s with 0.85 to 1.00 directional multipliers. Wind speeds were calculated using the methods of the Shore Protection Manual (CERC, 1984) are used in wave propagation model for primary wave direction as illustrated in the radial map (Attachment 1- Map 8).
- **Nearshore Waves** – A combination of SWAN and CEM (2002) attenuation models are adopted in determining nearshore wave heights.

Breaker Zone Modelling

Assessment Method

Wave processes within the breaker zone are used to calculate coastal inundation levels which are specific to the Project Area (Figure 1) based on the following:

- **Wave Setup** – Wave setup is the increase of water level within the surf zone during wave-breaking. It is calculated from significant wave height, period, water depth and bathymetry gradient at the breaking point.
- **Wave Runup -** is the maximum onshore elevation reached by waves, relative to the shoreline position in the absence of waves. In this case, the wave runup is calculated from:
    - Wave runup is calculated based on the 2075 coastal erosion profile where applicable

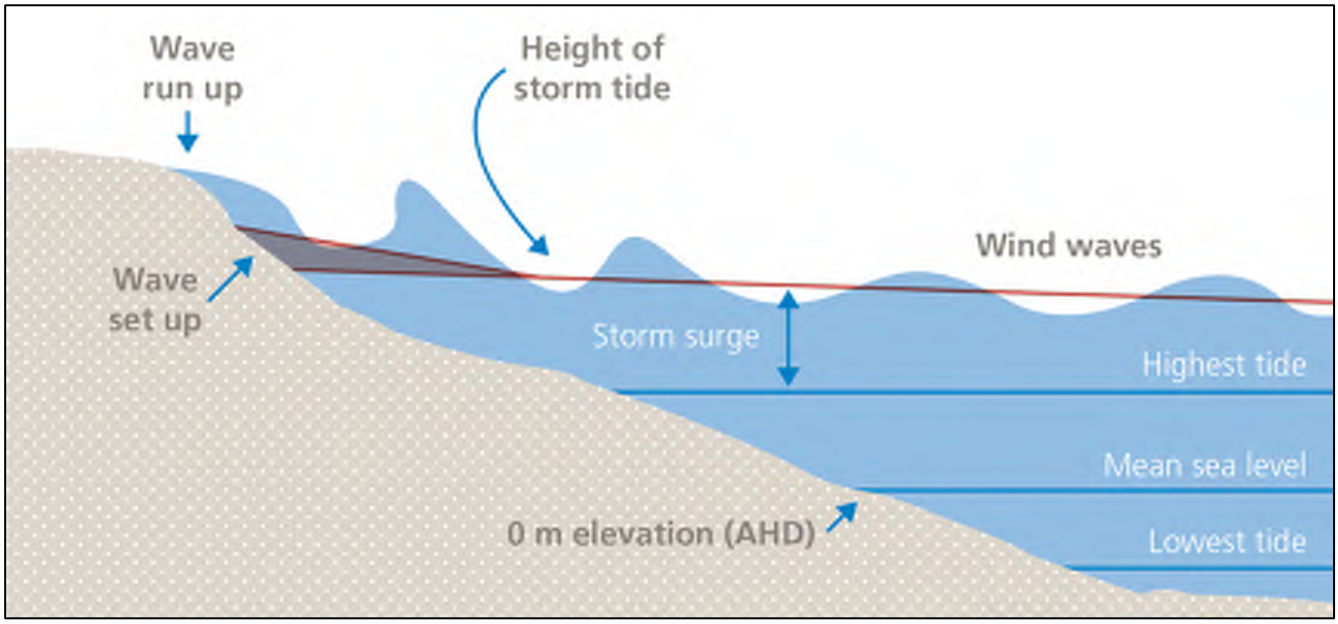


Figure 1 Schematic of coastal processes

Findings

Modelled wave runup and wave setup inundation levels are presented in Table 5 with the following findings:

1% AEP inundation level of 2.24 m AHD for 2075 with wave setup

Table 5 Summary of inundation levels within the Project Area based on modelled criteria [7]

1% AEP Parameter	Units	2075
Storm Tide Levels	m AHD	2.10
Wave setup (southwesterly wind fetch)	m AHD	2.24
Wave runup (southwesterly wind)	m AHD	2.17
Wave runup distance from Site boundary	m	0.00

[7] These levels modelled by Envirotech are for Site risk assessment purposes only and are not defined flood levels for determining habitable room finished floor levels.

Attachment 5 Inundation Risk Assessment

Inundation Levels

Inundation hazards at the Site are determined by inundation levels presented in Table 6. Wave runup levels are technically not inundation levels given they result in temporary submersion only.

Table 6 Summary if Site Inundation levels

Definition	Timeframe	Scenario	Inundation (m AHD)
Stillwater	Design Life 2075	1% AEP Stillwater	2.10
Wave Setup	Design Life 2075	1% AEP Wave Setup	2.24
Wave Runup	Design Life 2075	1% AEP Wave Runup	2.17
Defined Coastal	2100	1% AEP Storm Surge	2.50
Defined Riverine	2100	1% AEP	1.85

Site Elevations

Site elevations have been determined based on 2013 LIDAR as presented in Table 7.

Table 7 Summary of Site Elevations based on 2013 LIDAR

Location	Min (m AHD)	Max (m AHD)
Outbuilding FGL	1.75	1.95
Outbuilding FFL	1.85	1.85

Inundation Depths

Given the 1% AEP inundation modelling, the Site including the outbuilding footprint is projected to be inundated by stillwater, wave setup and wave runup (Table 8). Given a defined coastal inundation event, up to 0.75m inundation can be expected across the Site.

Table 8 Summary of Floodwater Depths

Definition	Stillwater (m)	Wave Setup (m)	Wave Runup (m)	Defined Coastal (m)	Defined Riverine (m)
Outbuilding FGL	0.15 to 0.35	0.3 to 0.5	0.2 to 0.4	0.55 to 0.75	0 to 0.1
Outbuilding FFL	0.25	0.4	0.3	0.65	0

Inundation Probability

The probability that the proposed building and works area is inundated is based on probability class descriptors presented in Attachment 6 and is summarised:

- Given the Site is set back from the coast, the most relevant inundation scenario for the Site is from a stillwater (storm tide) event
- It is POSSIBLE that the natural ground level of the proposed Site including the outbuilding footprint will be inundated by 1% AEP storm tide with wave setup event within the building design life.
- It is POSSIBLE that the Site will be inundation to the defined flood level within the building design life based on a 1% AEP stillwater flooding event.

Floodwater/Wave Runup Velocities

Given the 1% AEP inundation modelling, floodwater velocities are considered less than 0.2 m/s with very little to no movement expected given storm tide and storm surge flooding (Table 9).

Table 9 Summary of Floodwater Velocities

Definition	Stillwater (m/s)	Wave Setup (m/s)	Wave Runup (m/s)	Defined Coastal (m/s)	Defined Riverine (m/s)
Outbuilding FGL	0	0	0.5	0	0.2
Outbuilding FFL	0	0	0.5	0	0.2

Floodwater Hazard Classification

Based on Smith, Davey & Cox (2014) hazard class descriptors illustrated in Figure 2, the floodwater classification for the main building and inundation scenarios are presented in Table 10.

Table 10 Floodwater Hazard Classification

Definition	Stillwater	Wave Setup	Wave Runup	Defined Coastal	Defined Riverine
Outbuilding FGL	H1	H2	H2	H3	H1
Outbuilding FFL	H1	H2	H2	H3	H0

Risk Assessment

Within the building design life, the following can be concluded:

- With the outbuilding finished ground level and finished floor level at 1.8 m AHD, an H1 class assigned based on 1% AEP modelling for the stillwater setting within the building design life
- The Site is generally safe for people, vehicles and buildings based on building design life modelling constraints.

Risk Assessment Concluding Statements

- The proposed work and use can achieve and maintain a tolerable risk for the intended life of the building without requiring any inundation protection measures.
- The proposed development is unlikely to cause or contribute to coastal inundation on the Site or on adjacent land

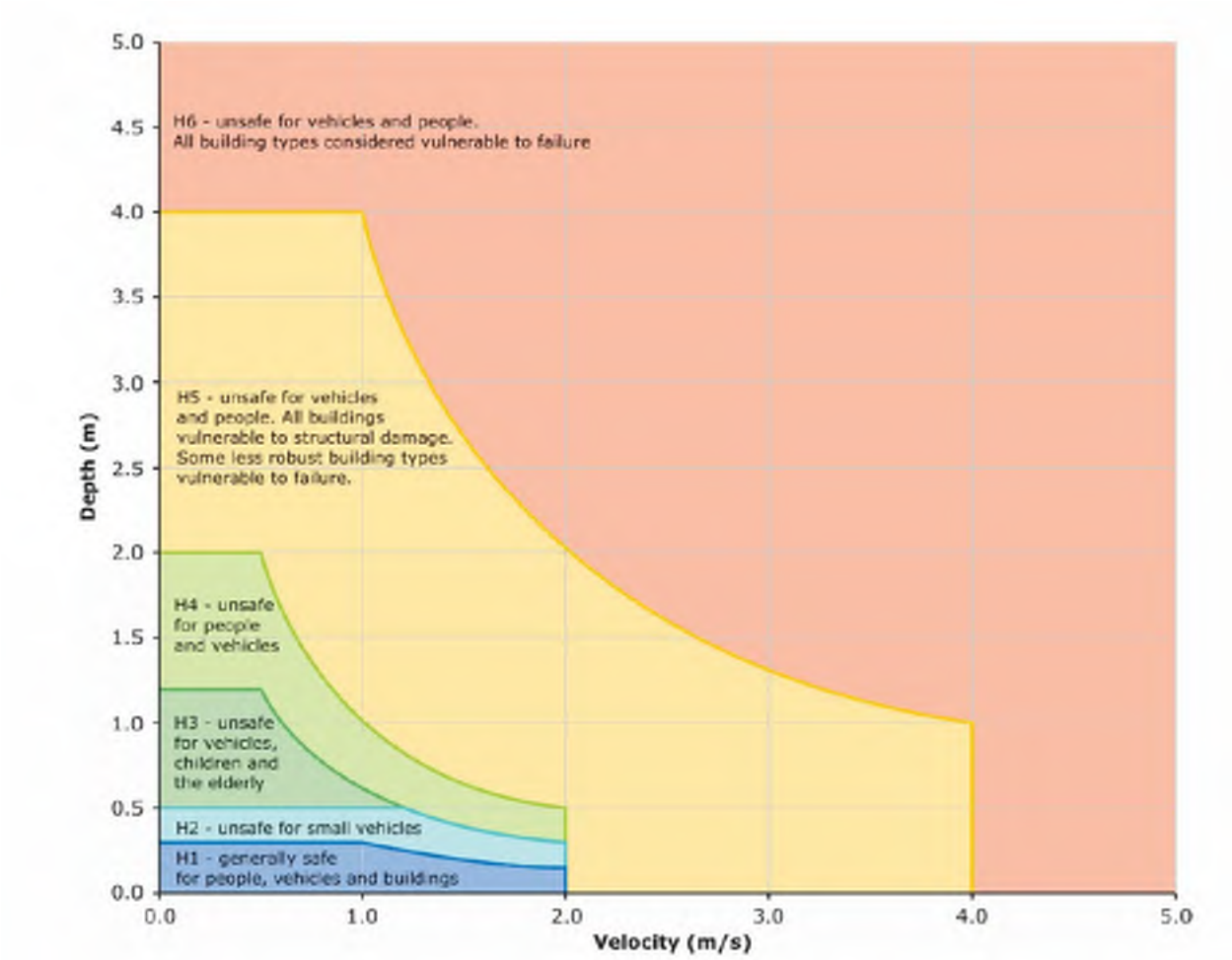


Figure 2 Flood Hazard Curve (Ball, et al., 2019)

Attachment 6 Risk Assessment Qualitative Terminology

DESCRIPTOR	QUALITATIVE MEASURES OF LIKELIHOOD
ALMOST CERTAIN	The event is expected to occur over the design life
LIKELY	The event will probably occur under adverse conditions over the design life
POSSIBLE	The event could occur under adverse conditions over the design life
UNLIKELY	The event might occur under very adverse circumstances over the design life.
RARE	The event is conceivable but only under exceptional circumstances over the design life.
BARELY CREDIBLE	The event is inconceivable or fanciful over the design life.

DESCRIPTOR	QUALITATIVE MEASURES OF CONSEQUENCES TO PROPERTY
CATASTROPHIC	Structure(s) completely destroyed and/or large-scale damage requiring major engineering works for stabilisation. Could cause at least one adjacent property major consequence damage.
MAJOR	Extensive damage to most of structure, and/or extending beyond site boundaries requiring significant stabilisation works. Could cause at least one adjacent property medium consequence damage.
MEDIUM	Moderate damage to some of structure, and/or significant part of site requiring large stabilisation works. Could cause at least one adjacent property minor consequence damage.
MINOR	Limited damage to part of structure, and/or part of site requiring some reinstatement stabilisation works.
INSIGNIFICANT	Little damage. (Note for high probability event (Almost Certain), this category may be subdivided at a notional boundary of 0.1%. See Risk Matrix.)

LIKELIHOOD	CONSEQUENCES TO PROPERTY				
	CATASTROPHIC	MAJOR	MEDIUM	MINOR	INSIGNIFICANT
ALMOST CERTAIN	VH	VH	VH	H	**L**
LIKELY	VH	VH	H	M	**L**
POSSIBLE	VH	H	M	M	**VL**
UNLIKELY	H	M	**L**	**L**	**VL**
RARE	M	**L**	**L**	**VL**	**VL**
BARELY CREDIBLE	**L**	**VL**	**VL**	**VL**	**VL**

RISK LEVEL		EXAMPLE IMPLICATIONS
VH	VERY HIGH RISK	Unacceptable without treatment. Extensive detailed investigation and research, planning and implementation of treatment options essential to reduce risk to Low; may be too expensive and not practical. Work likely to cost more than value of the property.
H	HIGH RISK	Unacceptable without treatment. Detailed investigation, planning and implementation of treatment options required to reduce risk to Low.
M	MODERATE RISK	May be tolerated in certain circumstances (subject to regulator's approval) but requires investigation, planning and implementation of treatment options to reduce the risk to Low. Treatment options to reduce to Low risk should be implemented as soon as practicable.
L	LOW RISK	Usually acceptable to regulators. Where treatment has been required to reduce the risk to this level, ongoing management is required.
VL	VERY LOW RISK	Acceptable. Manage by management procedures.

Attachment 7 Director's Determination Declaration

Coastal Inundation Hazard Reporting	Application
whether the development is likely to cause or contribute to coastal inundation on the Site or on adjacent land.	There is a BARELY CREDIBLE likelihood that the proposed building and works will contribute to coastal inundation on the site or adjacent land.
whether the proposed work can achieve and maintain a *tolerable risk*[8] for the intended life of the building having regard to:	**Application/Management**
nature, intensity and duration of the use	Risk modelling is based on fully occupied dwelling use. Risks are considered tolerable considering the nature, intensity and duration of the use based on 2075 storm tide inundation levels within a 50-year building design life (1% AEP modelling).
type, form and duration of the development	Based on the recommendations presented herein, risks are considered tolerable considering the type, form, and duration of the development
change in risk across the intended life of the building	This risk assessment is based on storm tide modelling given 2075 sea level for the Site. Based on the recommendations presented herein, tolerable risk can be maintained throughout the duration of the building design life until 2075
adaptation to any potential changes in risk	Given forecasting and graduated sea level rise processes, there is ample opportunity to adapt to changing risk
ability to maintain access to utilities and services	It is probable that services can be maintained throughout the life of the proposed development with occasional disruption caused by floodwater events.
the need for specific coastal inundation hazard reduction or protection measures on the Site;	With the proposed building design there is no need for specific coastal inundation hazard reduction or protection measures are recommended for the Site
the need for coastal inundation hazard reduction or protection measures beyond the boundary of the Site; and	With the proposed building design there is no need for coastal inundation hazard reduction or protection measures beyond the boundary of the Site
any coastal inundation management plan in place for the Site and/or adjacent land.	No coastal inundation management plan is in place for the Site or the adjacent land.
hazardous chemical used, handled, generated, or stored on the Site,	General household chemicals being stored are typically in low volumes and in sealed containers.
Details of the person who prepared or verified this report:	This coastal inundation hazard report has been prepared in accordance with a methodology specified in the Director's Determination - Coastal Inundation Hazard Area by a suitably qualified practitioner with relevant qualifications, experience and competence in the preparation of coastal inundation hazard reports.
Qualifications	Bachelor of Science with first class honours in geology
Expertise	Kris Taylor has over 10 years of experience in coastal inundation modelling with several reports externally reviewed by parties including the University of New South Wales Water Research Lab. Reports written include Crown Land pilot studies several reports for councils, and over 200 costal inundation assessments for planning and building
Level of current indemnity insurance	Current indemnity insurance of $2,000,000 ($4,000,000) Underwriters at Lloyd's covers **coastal geomorphology, natural hazard, hydrology and environmental coastal inundation hazard assessments.**

Kris Taylor Signed_____

[8] Tolerable risk means the lowest level of likely risk from coastal inundation to secure the benefits of a use or development in a coastal inundation hazard area, and which can be managed through routine regulatory measures or by specific hazard management measures for the intended life of each use or development.

Attachment 8 A builder's guide to preventing damage to dwellings

BUILDING TECHNOLOGY file

CSIRO

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Number Twenty-Two
August 2003

A builder's guide to preventing damage to dwellings

Part 2 – Sound construction methods

THE PROBLEMS

Site water problem identification
It is essential to investigate the site and prepare it in such a way that ground and surface water are prevented from entering the building footprint, whether the building has suspended floors or is footed on a ground slab. Site investigation methods are dealt with in BTF 19, which should be read prior to reading this BTF. It is also recommended that BTF 18 be read as additional information on this subject.

Legal considerations
Good site drainage always addresses both surface and ground water flows. Lack of attention to potential building movement caused by moisture migration can be a costly oversight for the builder, who may be found liable for damage long after any statutory warranty has expired. The Building Code of Australia (BCA) has not made site drainage mandatory, although it does set out acceptable construction practice in Volume 2, Clause 3.1.2, to be used where a local drainage authority deems it necessary. This makes for uncertainty in the minds of builders as to their responsibilities, but the courts tend to view the builder as the expert and, where some foreseeable damage occurs, it is usually found that the builder should have used methods that would have prevented the damage.

Where site investigation has revealed that there is existing or potential erosion problem, or where reactive clay subsoil is present, the builder is wise to give written advice to the owner and strongly recommend that ground drainage be installed. Where the owner declines in writing, some jurisdictions are known to have accepted that it is within the contractor's rights to continue the project. However, ground drainage is an area where contractors ignore or try to side-step at their own peril.

As to water entering a building, the BCA is quite clear. It is the task of the builder to prevent rainwater from entering a building, even when the rainwater is propelled by a storm of a magnitude that would only be expected to occur, on average, once in a hundred years. What is not so obvious to many is that water should not be allowed to enter the cavity, which is there not as a drain or repository for water that enters through openings, but as a break between the outer and inner leaves of exterior walls to prevent water from permeating through as it used to do when buildings were constructed of 230 mm solid brick-work. When water enters the cavity in volume, a wet, dark and enclosed environment is set up that can result in serious consequences for the health and amenity of the occupants.

Water problems in buildings are usually cumulative, resulting from several oversights rather than from a single source. This BTF is designed as a general checklist of commonly occurring flaws in construction methods, to help the builder deliver a product that will be durable, weatherproof and provide a healthy environment.

SURFACE AND GROUND WATER PREVENTION

It is no longer acceptable for a builder to claim that building movement is outside his or her power to prevent. The subsoil of land that is available for building development normally has an allowable bearing capacity well in excess of the loads imposed by class 1a buildings. The movement problems that are experienced by buildings are very often brought about by the failure of the builder and designers to deal with site water.

Surface and ground water that is allowed within the footprint of the building causes erosion and foundation soil movement, which in turn causes an exacerbation of cracking in slabs; cracking and failure in masonry and finishes; doming and dishing of floors; cupping and lifting of timber flooring; decay to timber members; degradation of metals and mortar; doming and dishing of roofs, leading to breakage of tiles and degradation of mortar beds.

Surface drainage methods
The basis of good surface water drainage is to:

- Have the finished exterior ground level at the building perimeter a minimum of 150 mm below finished floor level, ground floor cavity flashing weepholes or subfloor vents, whichever are the lowest. However, where a slab is used as part of a termite management system, 75 mm at the top of the slab edge must be visible or able to be made visible.
- In the finished ground, provide a 1:20 fall away from the building for at least the first metre. Nothing that needs to be watered, including lawn, should be within this graded area and it should preferably be a hard surface.

The above requirements mean that thought may need to be given to finished floor level etc. before the plans go to council.

Where there is natural topography that leads to surface water being encouraged toward the building, a dish or other surface drain should be installed and connected to the stormwater system through a pit.

Ground water drainage methods
If it is desired to keep the soil dry in areas other than the building footprint, it should be realised that this other drainage may not be sufficient to prevent water entering the footprint, and additional drainage for the building may be necessary. It should be understood that ground drainage is a complex subject, often requiring the expertise of an engineer who is suitably competent in hydrology and geotechnics. For anything other than straightforward problems, even drainers or builders experienced in installing ground drainage should engage a consultant to assist in the design. This section is therefore intended to give reminders to already competent people, and to assist others toward a rudimentary understanding to help them discuss the issues with a consultant. In addition, it is essential for a builder or drainer to comply with the minimum requirements of BCA Volume 2, Clause 3.1.2, and AS 3500.3.2, Sections 6–8, unless installing a system certified by an engineer.

The first step is to investigate the depth and volume of the subsoil flow of water. Test pits, particularly on the uphill perimeter of the footprint should be dug as outlined in BTF 19. It is, however, important to remember that ground drainage problems are not restricted to sloping sites. Some of the most susceptible sites are on flat land, particularly where the area is ringed by

higher ground. In addition, as explained in BTF 18, where warm, wet summers and colder, dry winters are experienced, the building itself will tend to cause inward water migration.

In any case, the minimum depth of drainage should comply with BCA Volume 2, Clause 3.1.2.4, that the top of the drain be a minimum of 400 mm below ground and 100 mm below the adjacent footing. This means that the trench should be dug at a safe distance from the footing to ensure that the foundation is not affected. If this is not practicable, temporary measures to support the trench walls may be needed and/or the strength of the pipe material may need to be increased. It is important to remember that in clay the allowable angle between the external bottom corner of the footing and the nearest part of the bottom of the trench is usually 45°, whereas the normally applicable angle for compact granular soil is 30°. These may be exceeded where the trench fill is well compacted and the piping is non-compressible, but supervision by a competent engineer is normally necessary for soil classification and strength issues. A good working arrangement is to locate the trench toward the edge of the area that is graded away from the building to allow run-off of surface water.

Having discovered the required depth, the next step is to establish whether it is above the depth of the local authority's stormwater system, to determine the method of dispersal of the captured water. It must be borne in mind that the BCA's minimum fall for ground drainage is 1:300, and a silt arrestor requires a minimum drop of 50 mm from the invert of the inlet to the inner roof of the outlet. If the depth of the ground drainage is too low for the council system, councils may allow a soakage pit for any naturally occurring ground water, so that the drainage can divert the water from the uphill side of the building to the downhill side. The builder should confirm this with the council.

Next, the type of drainage should be determined. For general purposes, a geocomposite system using 90 mm slotted stormwater pipe with fabric sock and geofabric perimeter material is adequate, however suppliers can advise on other systems. It is desirable in any ground drainage system and essential where the fall is shallower than 1:100 to install inspection openings to enable the system to be flushed out. These should be at changes of direction greater than 45° and at the connection to the stormwater system. Where practicable, pits make the ideal inspection opening, particularly when configured as silt arrestors.

Drainage to rock substrates
BTF 19 discusses the special drainage problems with rock foundations. While a solid rock foundation remains stable regardless of water flows, water damage to building elements and high subfloor relative humidity can have potentially serious consequences. When the ground floor is to be suspended, and particularly when using timber framing and/or flooring, drains should be cut around the perimeter where water can otherwise enter the subfloor. Totally preventing water entering the subfloor area can be impracticable because of faults and interstrata gaps. Where water flows on rock foundations cannot be prevented, the design should allow for an open subfloor and an increased minimum clearance between the floor and the ground, commensurate with the volume of water experienced. If a completely open subfloor is impracticable, openings should be as large as possible, particularly where subfloor walls would otherwise dam water. Watercourses should be cut out to divert water if this is beneficial to the aim of removing water as soon as possible. A mechanical ventilation system may need to be installed as an augmentation to the measures discussed above, but when relied upon without sufficient other precautions, such a system may be inadequate.

Subfloor ponding
When constructing dwellings with suspended floors, it is essential to grade the subfloor area so that no depressions remain that can allow water to pond. With rock foundations it may be necessary to use concrete to fill depressions.

Dampproof courses
Ground moisture usually carries salts and other chemicals. When moisture migrates through masonry by capillary action, some chemicals may be transported. It is often these chemicals that attack the building elements. Different dampproof course (DPC) materials are susceptible to different chemicals.

It is not always possible to predict the nature of pollutants to which the underside of a DPC will be exposed. This is one of the reasons that moisture should be kept away from the building. DPCs that have poor plasticity or develop poor plasticity through exposure to water and chemicals, are unsuited for use where building movement cannot be totally prevented, because they tend to break. When a DPC is discontinuous it allows water to penetrate the gap. This is one common way that rising damp occurs in buildings constructed in the modern era.

The safest suggestion for overcoming the problem of lack of durability in DPCs for applications where high moisture content is expected, is to double up, perhaps using two different types, one on top of the other.

Antcapping
Antcapping should never be used as a DPC unless is has been tested and designed for this purpose. Galvanising will break down over time when in constant contact with moisture, particularly when salts are present. It is essential to isolate the antcapping from any water in the masonry by using a DPC between. The galvanising should also be checked for quality and any cuts or damage should be coated with cold galvanising, because even when the antcapping is isolated from direct contact with water, constant high humidity in the air will tend to attack the steel. Once corrosion has eaten through the metal, termites are given a path of entry to the building. This is not a rare condition.

RAINWATER PREVENTION

In addition to surface and ground water considerations, there are several issues of construction that builders must address in order to prevent rainwater from entering the building.

Rainwater is not only a problem when it enters the living area as water, but also when it is allowed into the cavities and voids and onto building members that can degrade or decay. In addition, rainwater has a more insidious danger in that it gives life to fungus and promotes pests like dust mites – these conditions are conducive to illness in people who are abnormally susceptible to breathing disorders.

Builders and tradespeople often attempt to make a building weatherproof by the use of sealants. It should be realised that sealants cannot be regarded as a durable solution to most weatherproofing problems. Durability can only be attained by sound construction method.

Ridge capping
Mortar bedding to ridge capping is permeable, even with flexible pointing applied over it. Water can migrate through the bedding and pond on the tile above the bedding. Any condensation tends to perpetuate the moisture and, in addition, where summers are warm and wet and winters are cold and dry the tendency is for moisture to be drawn in. The above factors tend to create an overflow of water that may drip into the roof space or run down the soffit of the tiling, decaying battening or framing and/or eventually damaging fastenings. This flow adds to flows caused by the natural absorption of water through tiles and any wind-driven rain that penetrates the gaps between tiles. These are the flows that lead to inundation of the roof. Weepholes should be created in the beds at the depressions in tiles to allow water to flow to the top surface of the tiles.

Where footing movement occurs, usually due to the action of water on the foundation soil, the roof moves. Cut and pitched roofs will dome and dish in the same way that floors do, because of the uneven rise and fall of reactive clay soils. This movement causes a stress on rigid members of the roof structure such as mortar beds to hips, ridges and verges, which hog and sag, tending to crack the mortar and/or the tiles. When 1:2 cement: sand mortar pointing is used, this will retard the cracking, but it will eventually crack and when it does, the water entry will increase accordingly. On truss roofs the effect is less but still sufficient to cause cracking. If there is no footing movement, the pointing tends to last many years. Where some movement is expected, it is recommended that flexible pointing be used.

Sarking
In general, roof tiles are of marginal suitability for installing on a roof slope of less than 18° and should never be used where the pitch is lower than 15° For other roof slopes below 25°, the manufacturer's recommendations should be checked before

installing a particular profile. Where flat profile tiles are to be used on a roof that has a pitch below 25° or where any tiles are to be used on a roof below 20°, sarking should be installed to prevent water entering the roof void. Where the common rafter length is greater than 4500 mm and sarking is not fitted to the whole slope, the table shown below (source: AS 2050, Table 5) should be consulted and sarking may have to be fitted to the lower end of the slope.

SARKING REQUIREMENTS IN RELATION TO PITCH/RAFTER LENGTH

Roof (degrees of pitch)	Maximum rafter length without sarking (mm)
≥18<20	4500
≥20<22	5500
≥22	6000

In addition, on any slope with a pitch of 20° or less, an anti-ponding board should be installed between the bottom batten and the oversail to ensure that the sarking does not sag sufficiently to create ponding, or allow rainwater into the eaves or structural elements.

Guttering too high

The front bead of eaves guttering is usually higher than the highest point of the rear vertical face that sits against the fascia board. A common mistake where there is a long run to the downpipe, is to install the guttering with the front bead level with or above the top of the fascia so as to allow for fall to the downpipe. The reasons why this is an error are:

- Where there is a roof overhang, this allows water to overflow onto the eaves lining. In the case of framed external leaf walls, the rainwater is fed into the frame.
- Where there is no overhang and extruded bricks are used for the external leaf, the overflowing water spills into the core holes and saturates the brickwork from within.
- Where water cannot feed entirely into the extruded brickwork or where pressed clay bricks are used, rainwater falls directly into the cavity if one is present.

This is one of the reasons that the BCA calls for downpipes at a maximum of 12 m intervals. Such intervals mean that 6 m should be the maximum distance away from a downpipe for any part of the guttering. The minimum fall for eaves gutters is 1:500, so gutters can be installed with a 12 mm fall from the highest point to the downpipe.

Section 3 of AS 3500.3.2 requires that the front bead of the guttering is lower than the top of the fascia, so as to allow overflow and prevent rainwater entering the building. A process contained in AS 3500.3.2, Appendices G and H, is used to determine how much lower the front bead of the guttering must be than the top of the fascia board. Appendix G also contains some examples of acceptable alternatives.

Roof flashings

All metal materials on a roof should be compatible. Lead flashings should not be used with Colorbond/Zincalume roofing. Galvanic action will degrade the zinc and cause corrosion that will lead to roof leakage. In the event that re-roofing introduces Colorbond/Zincalume to a roof that has existing lead flashings, the lead should be coated on both sides using a suitable paint. Other incompatibilities are listed in AS 3500.3.2, Tables 4.2 and 4.3.

Rainwater spreaders

Where water is collected by guttering to an upper roof and deposited onto a lower roof via a spreader, the lower slope is called upon to carry an additional volume of water – sometimes too great a volume. It must be realised that tile systems are designed to prevent water entry in accordance with the performance requirements of the BCA Volume 2, Clause 2.2.1 (b), which states: '*(b) Surface water, resulting from a storm having an average recurrence interval of 100 years must not enter the building.*'

When rainwater is gathered from a large catchment and concentrated by a spreader on another catchment, the volume of water on that catchment may well be above the capacity of the tiling to cope, particularly in a case where wind is tending to drive the rain up the slope. This type of overloading cannot be taken into account by tile designers or building designers. If it is intended to use a rainwater spreader on a tiled roof, the tile manufacturer should be consulted. Spreaders may also create a local guttering overflow.

Another even more serious problem is caused by the practice of locating a spreader on a flashing. This allows the combination of wind and the proximity of the flashing and the tile to push water up and over the top of the tile, then into the roof space. This practice should never occur. If a spreader is allowable on a roof slope, it should always be well below any flashing, but the best practice is to run the water from the upper roof to the ground by a downpipe.

Roof/wall interfaces

Where a roof meets a cavity wall and the wall then becomes internal, such as a garage abutting a two-storey dwelling, a tray flashing is necessary to carry water to an external wall cavity flashing. Where the roof slopes away from the wall this can be a horizontal combination of overflashing and cavity flashing. The most important consideration is the provision of a positive method of transferral from the tray flashing to the standard floor-level cavity flashing so that no water can escape.

Where the roof slopes along the wall the combination overflashing/cavity flashing is stepped. A requirement of this is that the 'uphill' end of the cavity flashing be turned up to ensure that water follows the steps down to the standard floor-level cavity flashing. Other information is available in BCA Volume 2, Clause 2.2.4.10.

Cavity flashings

Brickwork is permeable. A single leaf of brickwork will allow water to migrate from the exterior to the cavity. This is the main reason that a cavity is necessary. In fact, when significant wind-driven rain falls against single-leaf brickwork, water can be plainly seen running down the internal face.

More and more is being learned about the problems associated with water that is trapped in the cavity. This water can quickly accumulate, but because it is not exposed to sunlight, it can take a significant time to dissipate. Water in a cavity is not just harmful to building elements, but it also promotes fungal growth and creates an ideal environment for termites, other insects, spiders and mites, including dust mites, which are known to be harmful to people who are susceptible to respiratory ailments. In addition, the humidity that is created can transfer moisture into the inner leaf of walling that is measurable on the internal face. This is particularly true in southern exposure rooms and is undesirable, particularly in living or bedroom areas.

Because cavity flashings are bedded into the masonry during the building of the wall, mortar is dropped into the flashing as the wall rises. These droppings accumulate and harden. Because of their height inconsistency, water will inevitably be dammed in the cavity. Also, weepholes become partially or fully blocked by these mortar droppings, further reducing the possibility that water will escape.

Mortar droppings should be cleaned out of the flashing before they become difficult to remove, at least once a day during the bricklaying process. As the wall rises and cleaning by hand becomes impracticable, a hose can be used, provided that the mortar beds at the flashing level are sufficiently cured to resist deterioration by the water. Anything that bridges the cavity between the inner and outer leaves of walling and allows the transfer of water to the inner leaf must be removed.

Another common defect is that the flashing does not extend to the outer edge of the external leaf. The function of a cavity flashing is to gather water and direct it to the external face of the brickwork. It usually also acts as a DPC whose function is to prevent vertical moisture migration (either up or down). A DPC or flashing that does not extend to the outer edge of the brickwork will allow migration down by gravity or up by capillary action.

If the brickwork is to be cement rendered, the flashing should be continuous to the face of the render. A neat way to overcome this is to create a v-joint at the flashing, then cut the flashing off at the inner extremity of the v-joint. This method creates a control joint that will prevent unsightly cracking of the render.

Weepholes
AS 3700, Clause 12.7.2.3, requires that weepholes are formed immediately above the cavity flashing and that mortar is removed from the joint so that the opening is clean and the flashing is exposed. This is to ensure the free flow of water from the cavity. It is not uncommon to find blocked weepholes, recessed DPCs and fouled cavity flashings all on the same job.

Window and door openings
The popularity of unevenly faced bricks has led to a problem at openings. The problem arises where brickwork reveals do not present a straight line against windows, and is exacerbated by the fact that these bricks are generally not suited to flush mortar bedding. Consequently, it is common to see gaps at window/reveal interfaces caused by brick unevenness and raked joints. Such gaps mean that the building envelope is not weatherproof within the requirements of the BCA.

It should be realised that the cavity is not envisaged as a part of a water removal system, but is there to prevent moisture permeation from the outer skin to the inner skin. It may also act as a last line of defence in the event of an extraordinary event, however the idea that a builder should leave gaps in the building envelope through which water can penetrate into the cavity is in direct conflict with the objectives and requirements of the BCA. An external wall that routinely allows water to enter the cavity, turns that cavity into a hazard to the building elements, and to the health and amenity of the occupants. It is the job of the builder to make the envelope weatherproof. The construction system must prevent significant volumes of water entering the cavity.

In the case of window and door reveals, the bricklayer, while being mindful of the danger of ceramic growth, should not rake or iron the joint past the leading edge of the frame. In some cases where gaps must be left because long walls make ceramic growth a hazard, or where the brick profile is badly uneven, storm moulds should be installed, and bedding should be left flush with the leading edge of the storm mould.

It is also common to see cases where an overwide cavity creates insufficient overlap between the window and the brickwork reveal. Where this occurs, storm moulds are also called for.

Window gaskets
When fitted to brick veneer construction, windows need to be clear of the brickwork sill so as to allow for timber shrinkage in the frame. The usual allowance is 5–10 mm clearance to ground floor windows and a minimum of 15 mm on the second storey. For this purpose, aluminium window assemblies are fitted with neoprene gaskets to bridge the gap between the window frame and the brickwork sill. As with reveals, the brickwork sill should have joints left flush from the leading edge of the gasket to the rear edge of the sill. Commonly, little attention is paid to seating the gasket to provide a waterproof surface. Mortar is left on top of sill bricks which, when timber shrinkage reduces or closes the gap, pushes the gasket up and away from the brick and allows water to enter the cavity. Mortar should be cleaned off the top of bricks while laying. In addition, bricklayers commonly turn the ends of gaskets down into the perpends at the sill/ reveal joints. This is poor practice, as it leaves a gap above the gasket where water can gain entry to the cavity and which also encourages water into the mortar where the gasket turns down. These gaskets should be cleanly cut off flush with the reveal and the mortar should be flush with the sill brickwork. If the reveal bed aligns with the gasket there is no reason that the gasket cannot be bedded into it.

Sills and thresholds
Where brickwork sills are significantly sloped, it is common to find that the bricks are cut to have a minimal overlap with the gasket. These gaskets need a minimum 15 mm overlap with the sill bricks where the sill is at 30° to the horizontal. For lesser angles the necessary overlap increases.

Brickwork patio and other door thresholds are often laid without any fall away from the building. This will always result in water entering the cavity. Some bricklayers fill the cavity in at the doorway to prevent water incursion, but this does not work and only inhibits the operation of the flashing. The builder must provide the bricklayer with sufficient height to allow for weepholes to be continued across the doorway as necessary, and for either a soldier course sill with sufficient fall or room to lay a sloped tiling threshold.

Subfloor vents
In dwellings having suspended ground floors, particularly where timber floor framing is used, adequate cross-flow ventilation must be installed to counteract condensation. BCA Volume 2, Section 3.4.1, gives minimum ventilation standards that are deemed to satisfy the performance requirements. The required ventilation area is based on the perimeter length of the building and differs depending on:
- The zone in which the dwelling is located.
- The moisture content of the foundation soil.

It is also important to realise that where the floor is lower to the ground, there is less volume of air to dissipate the moisture that is transferred to it from the ground.

Landscaping
Two important aspects of landscaping that relate to water entry were introduced in the surface drainage section above, viz.:
- The finished exterior ground level at the building perimeter should be a minimum of 150 mm below finished floor level, ground floor cavity flashing weepholes or subfloor vents, whichever are the lowest. However, if paving is to be used around the building perimeter, the clearance may be 50 mm. Where a slab is used as part of a termite management system, 75 mm at the top of the slab edge must be visible or able to be made visible.
- The finished ground should have a 1:20 fall away from the building for at least the first metre. Nothing that needs to be watered, including lawn, should be within this graded area and it should preferably be a hard surface.

In addition, the landscaper should only install automatic watering systems where the beds that they service are lower than the base of the footings or where they are separated from the building by a properly engineered surface and ground water drainage system.

FURTHER READING/REFERENCED DOCUMENTS

AS 2050, *Installation of Roof Tiles*, Standards Australia, Sydney, 2002.
AS 3500.3.2, *Stormwater Drainage – Acceptable Solutions*, Standards Australia, Sydney, 1998.
AS 3700, *Masonry Structures*, Standards Australia, Sydney, 2001.
BTF 18, *Foundation Maintenance and Footing Performance – A Homeowner's Guide*, CSIRO, Highett, Victoria, 2001.
BTF 19, *A Builder's Guide to Preventing Damage to Dwellings: Part 1 – Site Investigation and Preparation*, CSIRO, Highett, Victoria, 2003.
Building Code of Australia (BCA) Volume 2, Australian Building Codes Board, Canberra, 1996.

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CERTIFICATE OF QUALIFIED PERSON – ASSESSABLE ITEM

Section 321

Form 55

To: Daryl Boggs & Jennifer Watson *Owner /Agent*

41a Cremorne Avenue *Address*

Cremorne 7024 *Suburb/postcode*

Qualified person details:

Qualified person: Kris Taylor

Address: 162 Macquarie Street Phone No: 036224 9197

Hobart 7000 Fax No:

Licence No: NA Email address: office@envirotechtas.com.au

Qualifications and Insurance details: Bachelor of Science with Honours in Geology with PI Insurance to $2,000,000 including hydrology and environmental coastal inundation hazard assessments *(description from Column 3 of the Director's Determination - Certificates by Qualified Persons for Assessable Items*

Speciality area of expertise: Engineering Geology *(description from Column 4 of the Director's Determination - Certificates by Qualified Persons for Assessable Items)*

Details of work: Coastal Inundation Assessment

Address: 41A Cremorne Avenue Lot No: 29

Cremorne 7024 Certificate of title No: 134052/29

The assessable item related to this certificate: Coastal inundation hazard assessment prepared by a practitioner with experience and competence in the preparation of coastal inundation hazard reports

(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: Geological *(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 items, at any stage, as part of – *(tick one)*

(•) building work, plumbing work or plumbing installation or demolition work

OR

( ) a building, temporary structure or plumbing installation

In issuing this certificate the following matters are relevant –

Documents:	Enviro-Tech Consultants Pty. Ltd. 2024. Coastal Inundation Hazard Assessment Report for a Proposed Shed, 41A Cremorne Avenue - Cremorne. Unpublished report for Daryl Boggs & Jennifer Watson by Enviro-Tech Consultants Pty. Ltd., 01/10/2024
Relevant calculations:	
References:	- Director's Determination - Coastal Inundation Hazard Areas - Tasmanian Planning Scheme - State Planning Provisions 2023 - Part 5 (Work in Hazardous Areas) of the Building Regulations 2016; Division 5 – Coastal Inundation

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

- An assessment of building or demolition work in coastal inundation hazard areas in accordance with the Directors Determination
- To ensure that use or development subject to risk from coastal inundation is appropriately located and managed (TPS)

Scope and/or Limitations

Where exempt from planning, includes an assessment of tolerable risks based on a defined flood event based on the level above 0 meters Australian Height Datum with a one per cent probability of being exceeded in a storm surge flooding event in the year 2100 without requiring any specific coastal inundation protection measures.
Where not exempt from planning, includes an assessment of tolerable risk from a 1% annual exceedance probability coastal inundation event in 2100 for the intended life of the building without requiring any specific coastal inundation protection measures.

I certify the matters described in this certificate.

	Signed:	*Certificate No:*	*Date:*
Qualified person:			1/10/2024