Clarence... a brighter place

DEVELOPMENT APPLICATION

PDPLANPMTD-2024/044742

PROPOSAL: Dwelling

LOCATION: 58 Frederick Henry Parade, Cremorne

RELEVANT PLANNING SCHEME: Tasmanian Planning Scheme - Clarence

ADVERTISING EXPIRY DATE: 08 July 2024

The relevant plans and documents can be inspected at the Council offices, 38 Bligh Street, Rosny Park, during normal office hours until 08 July 2024. In addition to legislative requirements, plans and documents can also be viewed at www.ccc.tas.gov.au during these times.

Any person may make representations about the application to the Chief Executive Officer, by writing to PO Box 96, Rosny Park, 7018 or by electronic mail to clarence@ccc.tas.gov.au. Representations must be received by Council on or before 08 July 2024.

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

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

Clarence City Council

Clarence... a brighter place

APPLICATION FOR DEVELOPMENT / USE OR SUBDIVISION

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

Proposal: DWELLING TO REPLACE 2 STOREY FIRE DAMAGED DWELLING.

Location:

Address 58 FREDERICK HENRY PARADE

Suburb/Town CREMORNE. TAS Postcode 7024

Current Owners/s:

Applicant:

Personal Information Removed

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

Estimated cost of development $ 995,000

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

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

If you had pre-application discussions with a Council Officer, please give their name: LINDA BERRY / WATSON

Current Use of Site: VACANT LAND (AFTER HOUSE FIRE)

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

Declaration:

- *I have read the Certificate of Title and Schedule of Easements for the land and am satisfied that this application is not prevented by any restrictions, easements or covenants.*
- *I authorise the provision of a copy of any documents relating to this application to any person for the purposes of assessment or public consultation. I agree to arrange for the permission of the copyright owner of any part of this application to be obtained. I have arranged permission for Council's representatives to enter the land to assess this application*
- *I declare that, in accordance with Section 52 of the Land Use Planning and Approvals Act 1993, that I have notified the owner of the intention to make this application. Where the subject property is owned or controlled by Council or the Crown, their signed consent is attached. Where the application is submitted under Section 43A, the owner's consent is attached.*
- *I declare that the information in this declaration is true and correct.*

Acknowledgement:

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

Applicant's Signature:

Signature [signature] *Date* 3.6.24

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

RESULT OF SEARCH

RECORDER OF TITLES

Issued Pursuant to the Land Titles Act 1980

SEARCH OF TORRENS TITLE

VOLUME	FOLIO
170713	151
EDITION	DATE OF ISSUE
1	09-Feb-2016

SEARCH DATE : 12-Mar-2024
SEARCH TIME : 03.43 PM

DESCRIPTION OF LAND

City of CLARENCE
Lot 151 on Sealed Plan 170713
Derivation : Part of 213 Acres Gtd. E. Grimsey
Prior CTs 54550/151 and 54550/152

SCHEDULE 1

C320648 & C869517 TRANSFER to NIGEL RONALD HEAVEN
Registered 09-Feb-2016 at 12.01 PM

SCHEDULE 2

Reservations and conditions in the Crown Grant if any
SP170713 EASEMENTS in Schedule of Easements
121725 BOUNDARY FENCES AND OTHER CONDITIONS in Transfer
116347 BOUNDARY FENCES AND OTHER CONDITIONS in Transfer
D16904 MORTGAGE to Westpac Banking Corporation Registered 10-Jun-2011 at 12.02 PM

UNREGISTERED DEALINGS AND NOTATIONS

No unregistered dealings or other notations

OWNER NIGEL RONALD HEAVEN,
GREGORY LAURENCE PRESCOTT

FOLIO REFERENCE C.T 54550/153,
C.T 54550/152
& C.T 54550/151

GRANTEE PART OF 213 ACRES GRANTED TO ELIAS GRIMSEY

PLAN OF SURVEY

BY SURVEYOR CRAIG BRADLEY ROGERSON
ROGERSON AND BIRCH SURVEYORS
UNIT 1 – 2 KENNEDY DRIVE, CAMBRIDGE PARK
PH 6248–5898 MOB. 0419–594–966

CITY OF CLARENCE

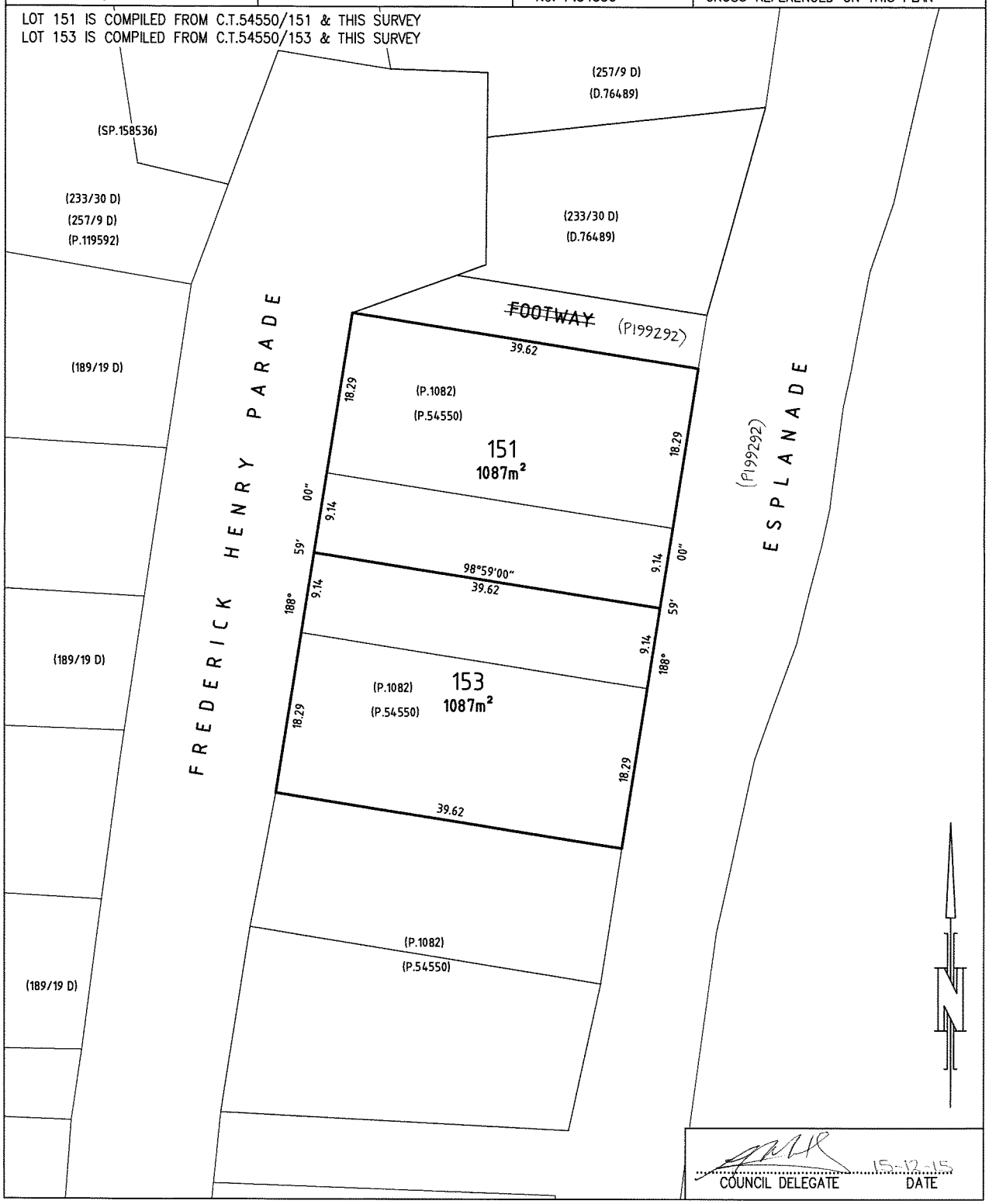
SCALE 1: 400 LENGTHS IN METRES

REGISTERED NUMBER
SP170713

APPROVED
EFFECTIVE FROM - 9 FEB 2016
Alice Kawa
Recorder of Titles

MAPSHEET MUNICIPAL CODE No. 107	LAST UPI No.	LAST PLAN No. P.54550	ALL EXISTING SURVEY NUMBERS TO BE CROSS REFERENCED ON THIS PLAN

LOT 151 IS COMPILED FROM C.T.54550/151 & THIS SURVEY
LOT 153 IS COMPILED FROM C.T.54550/153 & THIS SURVEY



DRAWING INDEX DA01

Development Application Set:

dwg no:	dwg title:	scale:	rev:	date:	by:
DA01	Title Page	N/A	None	28/5/24	EON
DA02	Proposed Site Plan	1:200	None	28/5/24	EON
DA03	Proposed Ground Floor Plan	1:100	None	28/5/24	EON
DA04	Proposed First Floor Plan	1:100	None	28/5/24	EON
DA05	Proposed Roof Plan	1:100	None	28/5/24	EON
DA06	Proposed Elevations 01	1:100	None	28/5/24	EON
DA07	Proposed Elevations 02	1:100	None	28/5/24	EON
DA08	Proposed 3D Images 01	1:100	None	28/5/24	EON
DA09	Proposed 3D Images 02	1:100	None	28/5/24	EON

PROJECT DETAILS

SITE INFORMATION

TOTAL SITE AREA:	1087 m^2
BUILD AREA FOOTPRINT:	217 m^2
HOUSE FLOOR AREA:	398 m^2
TOTAL FLOOR AREA:	**398 m^2**
CARPORT FLOOR AREA:	60 m^2
DECK AREA:	40 m^2
SITE COVERAGE:	**20%**

Title Reference	**Vol. - 170713**
	Folio - 151
Wind Classification	**N3**
Site Classification	**Class P**
Climate Zone	**7 (refer BCA)**
Corrosion Enviroment	**-**
BAL	**- N/A**

Dwelling and Carport to replace previous fire damaged two storey dwelling and carport

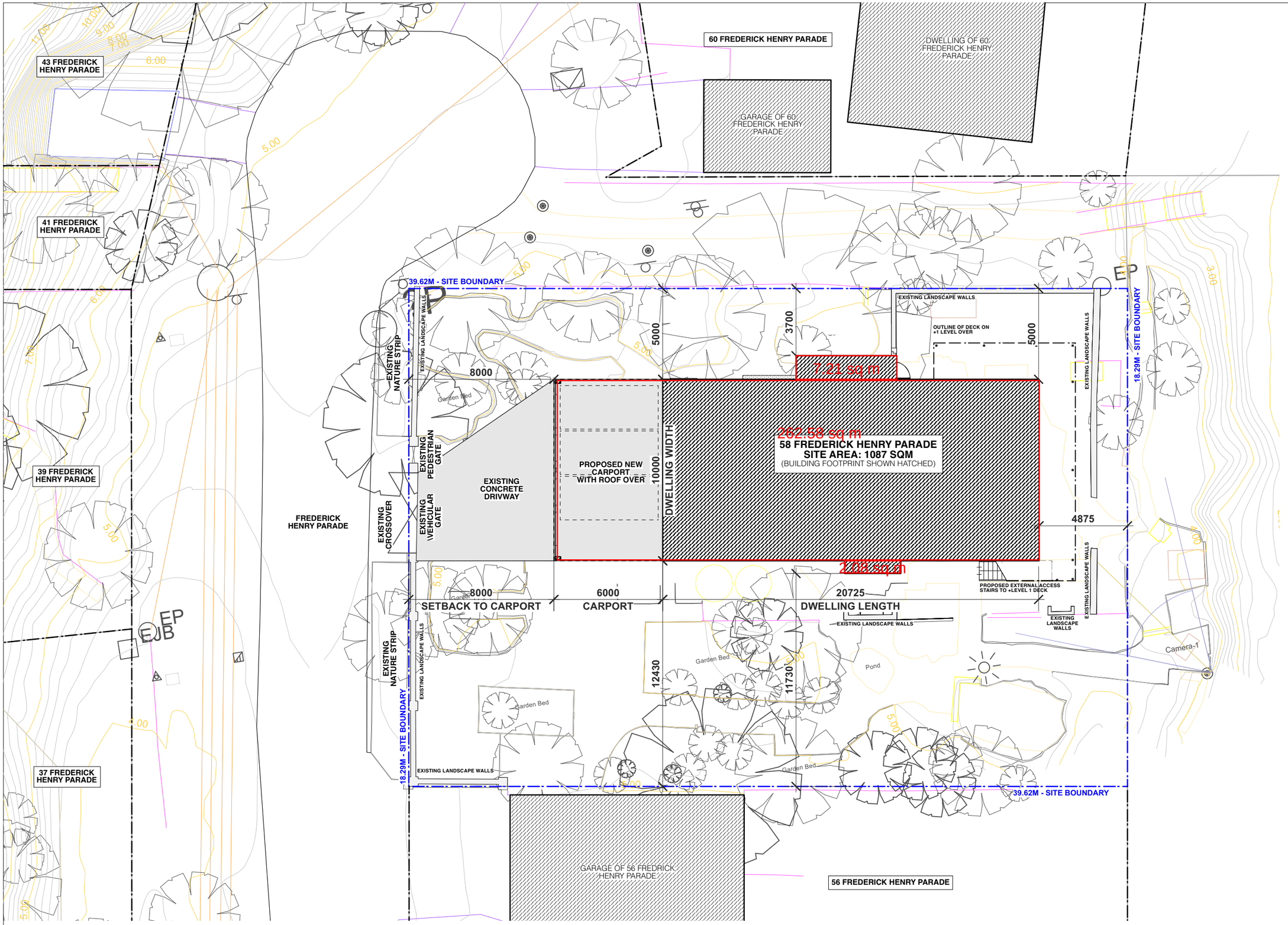
2405

Nigel Heaven

58 Fredrick Henry Parade

Cremorne Tasmania 7024

idw.
architecture + interiors
ACC NO. CC980Y



PROPOSED SITE PLAN
Scale: 1:200

SITE BOUNDARY

NOTE - DWELLING AND CARPORT LARGELY CONSTRUCTED OVER THE FOOTPRINT OF THE PREVIOUS TWO STOREY HOUSE AND CARPORT

NOT FOR CONSTRUCTION

DO NOT SCALE OFF DRAWINGS

Drawings are to be read in conjunction with all associated specifications, consultants' drawings, geotechnical report and any other written instructions

All works are to comply with the Building Code of Australia, relevant Australian Standards, local and any other relevant authority regulations and by-laws

Contractors are to verify all dimensions on site prior to commencing any work or producing shop drawings

All dimensions are in millimetres unless otherwise noted

Report all discrepancies to IDW

Rev
NO. DATE NOTE

Client
Nigel Heaven

Address
58 Fredrick Henry Parade

Project
Dwelling and Carport (Replacement)

Drawing
Proposed Site Plan

Dwg No.
DA02

Scale
1:200

Date
28/5/24

Rev	Drawn	Checked
	EON	AW

Status	Job No.
DA	2405

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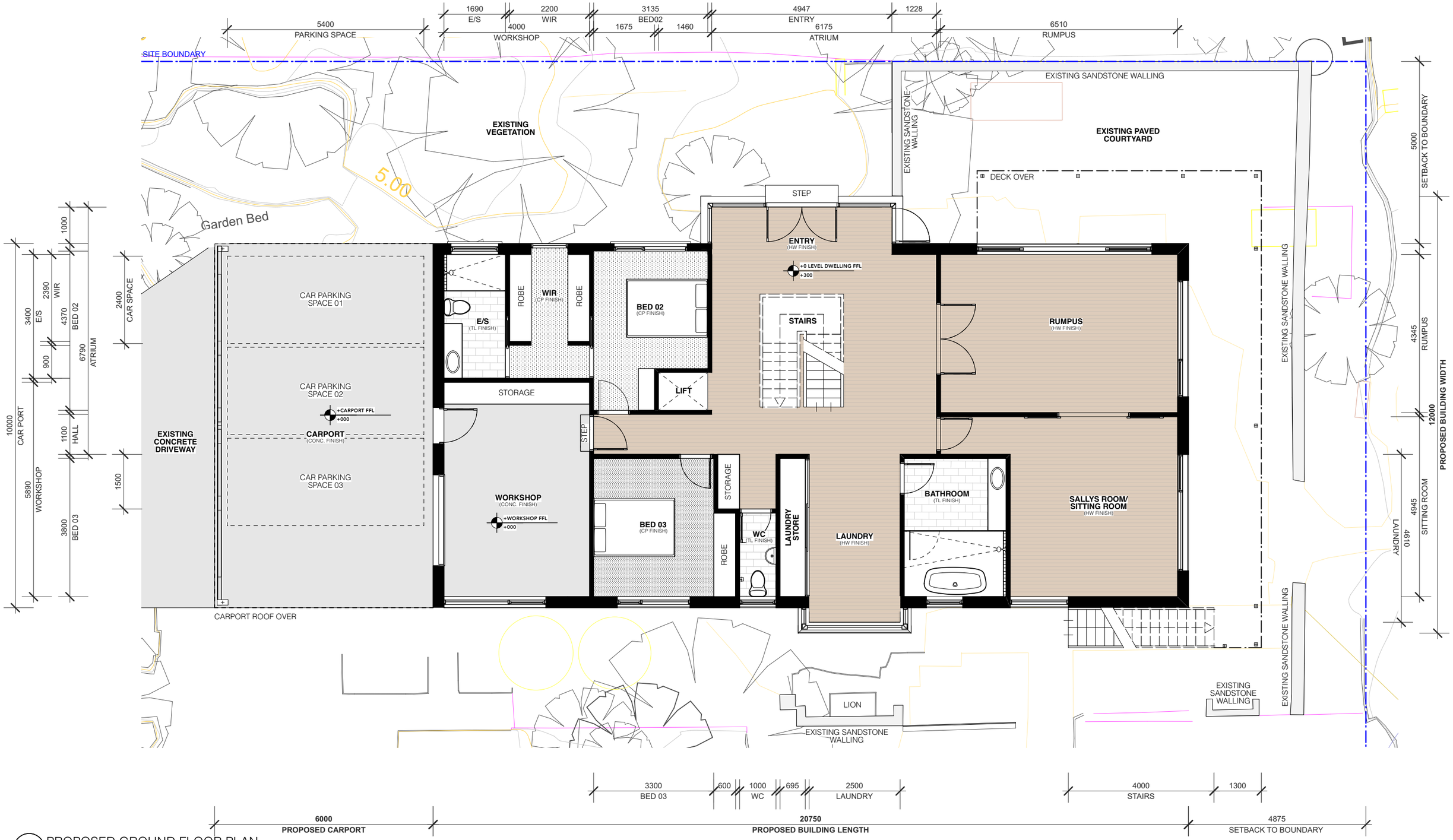
E info@idwarchitecture.com.au
W idwarchitecture.com.au
Acc No CC980Y



PROPOSED GROUND FLOOR PLAN

Scale: 1:100

CARPORT FLOOR AREA: **60 SQM**
DWELLING FLOOR AREA: **198 SQM**

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NOT FOR CONSTRUCTION

north

NO. DATE NOTE
Rev

Dwelling and Carport (Replacement)
Project

Nigel Heaven
Client

58 Fredrick Henry Parade
Address

DA
Status

2405
Job No.

Rev	EON	AW
	Drawn	**Checked**

28/5/24
Date

1:100
Scale

Proposed Ground Floor Plan
Drawing

DA03
Dwg No.

PROPOSED FIRST FLOOR PLAN

Scale: 1:100

DECK AREA: **40 SQM**
DWELLING FLOOR AREA: **200 SQM**

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NOT FOR CONSTRUCTION

north

NO. DATE NOTE
Rev

Dwelling and Carport (Replacement)
Project

Nigel Heaven
Client

58 Fredrick Henry Parade
Address

DA
Status

2405
Job No.

Rev

EON
Drawn

AW
Checked

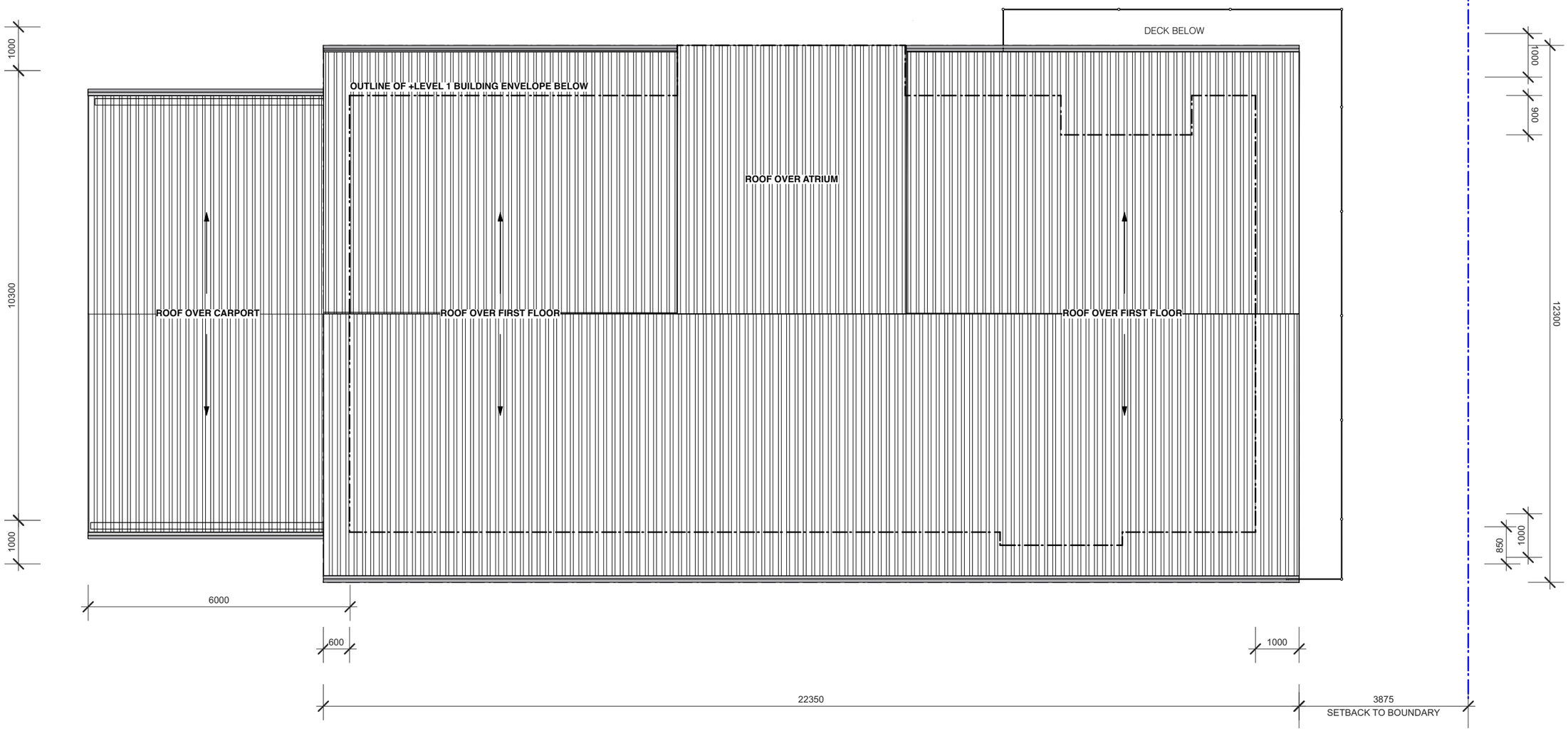
28/5/24
Date

1:100
Scale

Proposed First Floor Plan
Drawing

DA04
Dwg No.

SITE BOUNDARY



PROPOSED ROOF PLAN
Scale: 1:100

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NOT FOR CONSTRUCTION

north

NO. DATE NOTE
Rev

Dwelling and Carport (Replacement)
Project

Nigel Heaven
Client

58 Fredrick Henry Parade
Address

DA
Status

2405
Job No.

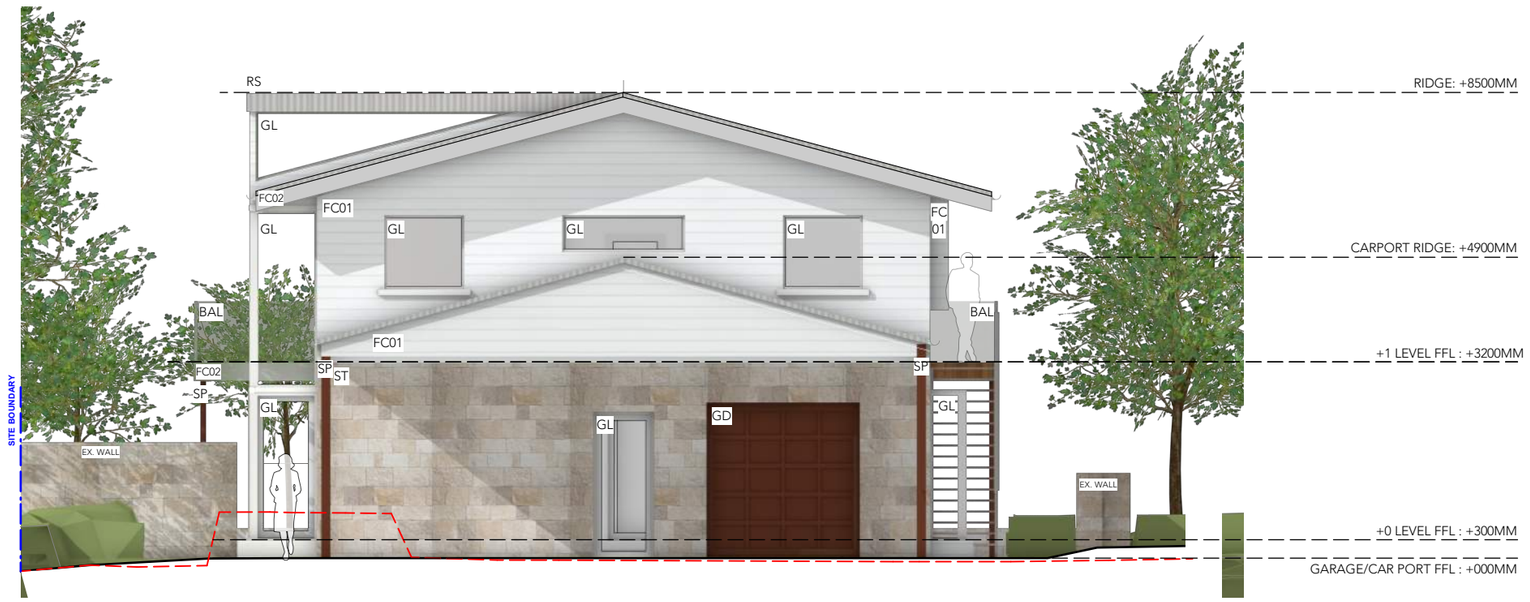
Rev	EON	AW
	Drawn	**Checked**

28/5/24
Date

1:100
Scale

Proposed Roof Plan
Drawing

DA05
Dwg No.



PROPOSED WEST ELEVATION
Scale: 1:100

PROPOSED NORTH ELEVATION
Scale: 1:100

MATERIAL KEY

RS - 16MM THICK RIB, LYSAGHT CUSTOM ORB ROOF SHEETIN(
COLOUR - SHALE GREY OR SIMILAR

GL - NATURAL ANNODISED ALUMINIUM FRAMES,
DOUBLE GLAZED PANES, COLOURBON FLASHING TO PE
OF OPENING

BAL - 16MM TOUGHENED GLASS BALUSTRADE

FC01 - HORIZONTAL WEATHERBOARD / FIBER CEMENT SHEET.
PAINTED, COLOUR TO BE MID-GREY TBC

FC02 - FIBER CEMENT SHEET BOARD, PAINTED. COLOUR TO BE
MID - GREY OR WHITE TBC

SP - STEEL POST - WRAPPED IN CORTEN STEEL PANELS

SM - PERFORATED STEEL MESH PANELS INSERTS

GD - STEEL ROLLER DOOR TO MATCH SP

NATURAL GROUND LINE

NOT FOR CONSTRUCTION

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Rev
NO. DATE NOTE

Client
Nigel Heaven

Address
58 Fredrick Henry Parade

Project
Dwelling and Carport (Replacement)

Drawing
Proposed Elevations 01

Dwg No.
DA06

Scale
1:100

Date
28/5/24

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PROPOSED EAST ELEVATION
Scale: 1:100

PROPOSED SOUTH ELEVATION
Scale: 1:100

MATERIAL KEY

RS - 16MM THICK RIB, LYSAGHT CUSTOM ORB ROOF SHEETING
COLOUR - SHALE GREY OR SIMILAR

GL - NATURAL ANNODISED ALUMINIUM FRAMES,
DOUBLE GLAZED PANES, COLOURBON FLASHING TO PERIMETER OF OPENING

BAL - 16MM TOUGHENED GLASS BALUSTRADE

FC01 - HORIZONTAL WEATHERBOARD / FIBER CEMENT SHEET.
PAINTED, COLOUR TO BE MID-GREY TBC

FC02 - FIBER CEMENT SHEET BOARD, PAINTED. COLOUR TO BE
MID - GREY OR WHITE TBC

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SM - PERFORATED STEEL MESH PANELS INSERTS

GD - STEEL ROLLER DOOR TO MATCH SP

NATURAL GROUND LINE

NOT FOR CONSTRUCTION

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Report all discrepancies to IDW

Rev
NO. DATE NOTE

Client
Nigel Heaven

Address
58 Fredrick Henry Parade

Project
Dwelling and Carport (Replacement)

Drawing
Proposed Elevations 02

Dwg No.
DA07

Scale
1:100

Date
28/5/24

Rev	Drawn	Checked
	EON	AW

Status	Job No.
DA	2405

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CARPORT AND DWELLING NORTH WEST VIEW

NOT FOR CONSTRUCTION

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Rev

NO.	DATE	NOTE

Client
Nigel Heaven

Address
58 Fredrick Henry Parade

Project
Dwelling and Carport (Replacement)

Drawing
Proposed 3D Images 01

Dwg No.
DA08

Scale
1:100

Date
28/5/24

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VIEW OF DWELLING FROM EASTERN BOUNDARY
Scale: 1:130

NOT FOR CONSTRUCTION

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Rev
NO. DATE NOTE

Client
Nigel Heaven

Address
58 Fredrick Henry Parade

Project
Dwelling and Carport (Replacement)

Drawing
Proposed 3D Images 02

Dwg No.
DA09

Scale
1:100

Date
28/5/24

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	EON	AW

Status	Job No.
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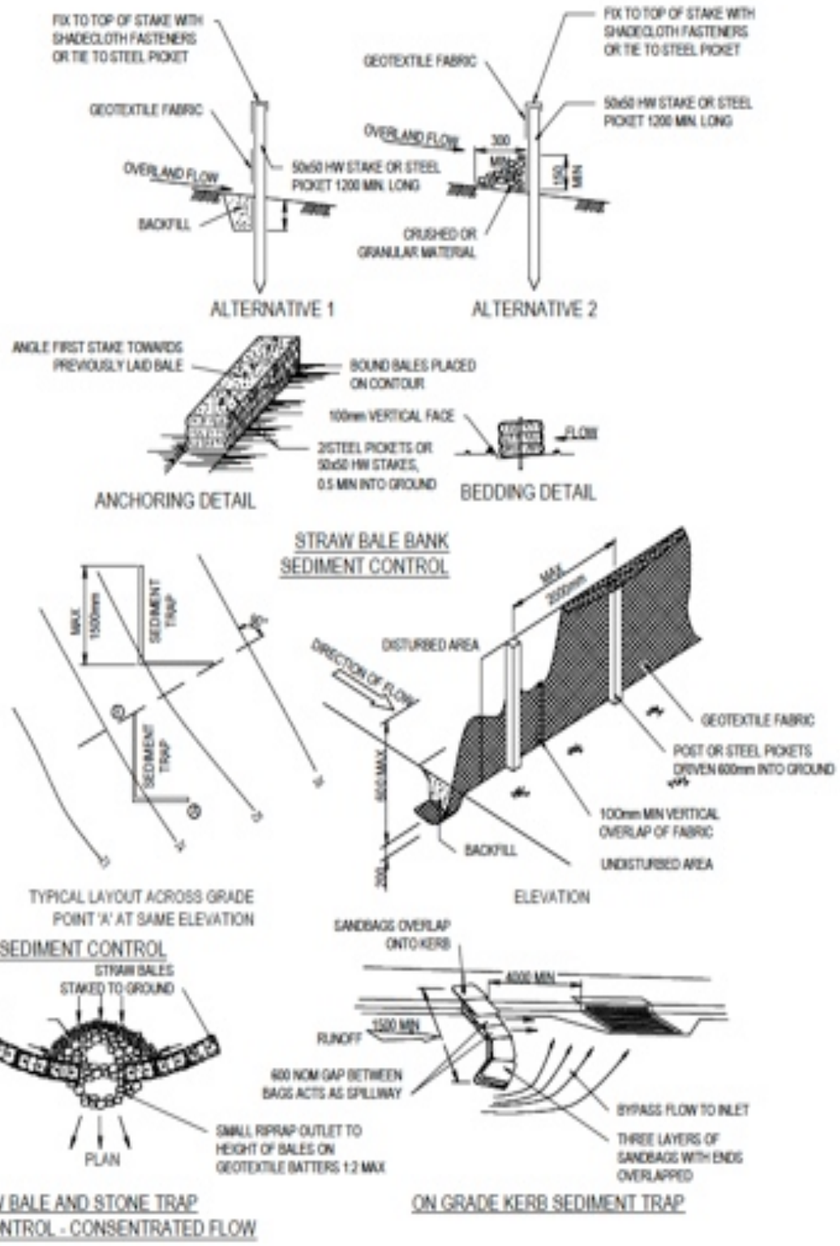
SOIL & WATER MANAGEMENT

1. **GENERAL**
   - Temporary drainage control flow should be diverted around the work site where possible.
   - All drainage, erosion and sediment controls to be installed and be operational before commencing up-slope earthworks.
   - All control measures to be inspected at least weekly and after significant runoff producing storms.
   - Control measures may be removed when on-site erosion is controlled and 70% permanent soil coverage is obtained over all upstream disturbed land.
   - In areas where runoff turbidity is to be controlled, exposed surfaces to be either mulched, covered with erosion control blankets or turfed if earthworks are expected to be delayed for more than 14 days.
   - Straw bale sediment traps are a secondary option which generally should not be used if other options are available.
2. **SEDIMENT FENCE**
   - Not to be located in areas of concentrated flow
   - Normally located along the contour with a maximum catchment area of 0.6HA per 100m length of fence.
   - Woven fabrics are preferred, non-woven fabrics may be used on small work sites, i.e operational period less than 6 months, or on sites where significant sediment runoff is not expected.
   - Fences are required 2m min from toe of of cut or fill batters, where not practical one fence can be at the toe with a second fence 1m min away. Fence should not be located parallel with toe if concentration of flow will occur behind the fence.
3. **TEMP CONSTRUCTION ENTRY / EXIT SEDIMENT TRAP**
   - Adjacent stormwater runoff to be diverted away from Entry / Exit
   - Wheel wash or spray unit may be required during wet weather.
4. Safety issues must be considered at all times, incorporate traffic control devices to the satisfaction of the Superintendant.
5. All dimensions in millimeters unless dictated otherwise.
6. **FIELD INLET**
   - A stabilised bypass overland flow path should exist adjacent to the field inlet.
   - Water level control perimeter banks may be required.
   - Blocks to be restrained by a horizontal timber rail at block joint height fixed to timber stakes at corners.
7. **CHECK DAMS**
   - Catchment area limited to 4HA
   - Use in minor open drains only, (velocity control), sediment collection is a secondary purpose.
8. **STRAW BALES**
   - Bales shall be placed at the toe of a slope or on the contour, in a row with ends tightly abutting the adjacent bales.
   - Each bale shall be embedded in the soil a minimum of 100mm on the downstream side and placed so the bindings are horizontal.
   - Bales shall be securely anchored in place with either two stakes or steel pickets driven through the bale. The first stake in each bale shall be driven toward the previously laid bale at an angle to force the bales together.
   - Inspections shall be frequent and repair or replacement shall be made promptly as needed. Replace at least 3 monthly.



SOIL & SEDIMENT MANAGEMENT STANDARD DETAILS

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Rev
NO. DATE NOTE

Client
Nigel Heaven

Address
58 Fredrick Henry Parade

Project
Dwelling and Carport (Replacement)

Drawing
Soil and Water Management on Building and Construction Sites

Dwg No.
RFI 10

Scale
N/A

Date
12/6/24

Rev	Drawn	Checked
	EON	AW

Status	Job No.
RFI	2405

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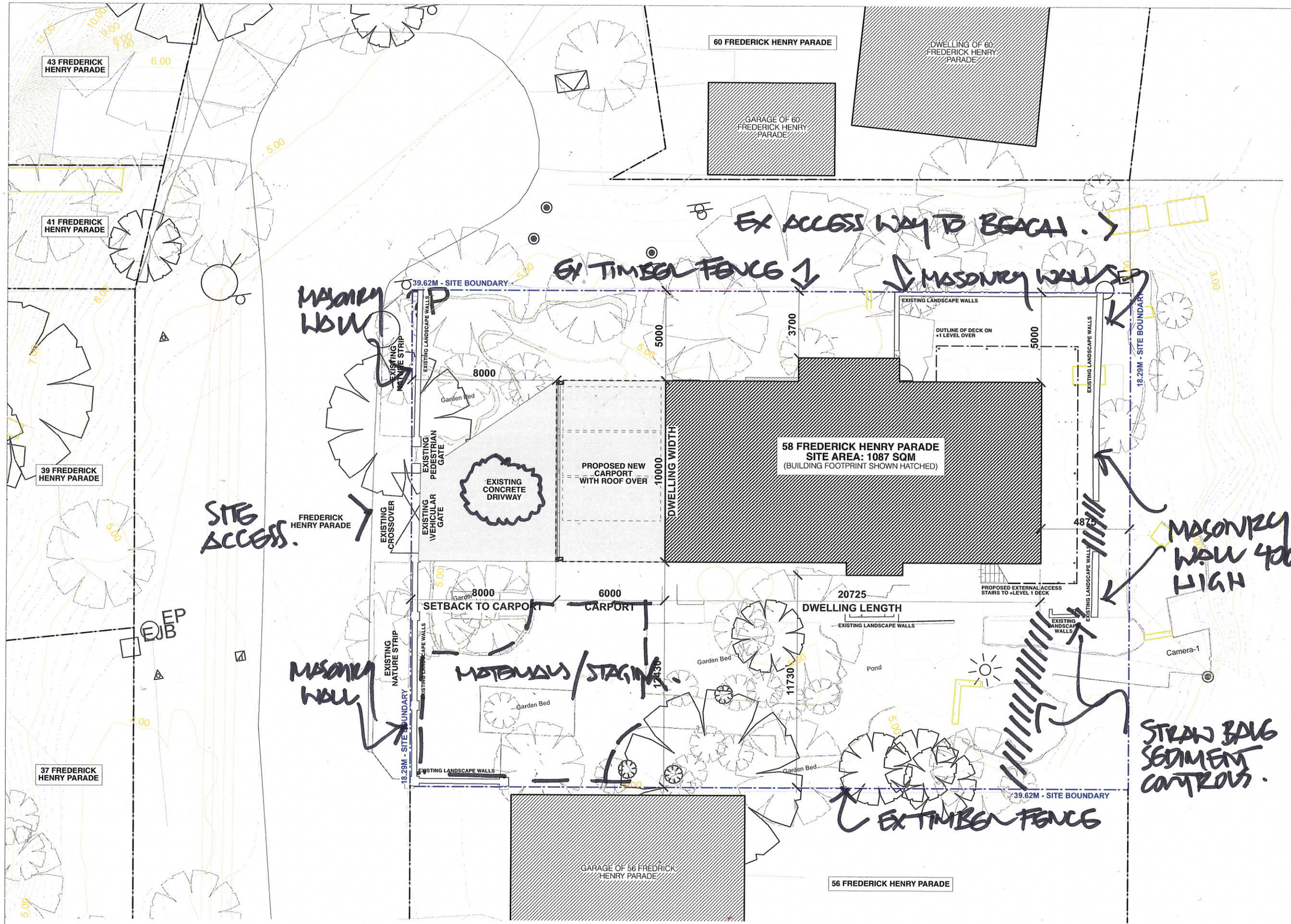

PROPOSED SITE PLAN
Scale: 1:200

SITE BOUNDARY

NOTE - DWELLING AND CARPORT LARGELY CONSTRUCTED OVER THE FOOTPRINT OF THE PREVIOUS TWO STOREY HOUSE AND CARPORT

north

NOT FOR CONSTRUCTION

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Rev
NO. DATE NOTE

Client
Nigel Heaven

Address
58 Fredrick Henry Parade

Project
Dwelling and Carport (Replacement)

Drawing
Proposed Site Plan

Dwg No.
DA02

Scale
1:200

Date
28/5/24

Rev	Drawn	Checked
	EON	AW

Status	Job No.
DA	2405

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N

W E

S

1:400-A3

0 1 2 4 10 20m

Horizontal Datum	GDA2020
Height Datum	AHD(TAS)1983
Horizontal Authority	SPM7857
	E: 542754.988
	N: 5244310.073
Height Authority	SPM7857
	1.748
Combined Scale Factor MGA->Planar	1.000377933

GENERAL COMMENTS AND DISCLAIMER:
This survey has been compiled using a combination of conventional and UG Service Detection survey techniques.

The survey from which this model was created was carried out to comply with the requirements of the client as set out in the scope of works contained in the survey instructions/brief for this project. Anybody who uses this survey for any purpose other than that for which it was carried out does so at his or her own risk.

Any public utilities and services shown in this model have been located by using visible surface features and underground service detection techniques.

Please note that not all buried pipes, cables and ducts can be detected and mapped in consideration of their depth, location, material type, geology and proximity to other utilities. Even an appropriate and professionally executed survey may not be able to achieve a 100% detection rate.

Property boundary overlays, where supplied, vary in accuracy but are generally to 0.5m. Therefore a Land Survey, as defined under the Surveying Act 2002, should be undertaken before any construction activity is carried out on or near the land boundaries depicted by this model.

Survey control information is regarded as suitable for the survey and correct at the time of survey. but should be verified before being used for any purpose.

WARNINGS:
1. Classification of subsurface utility information refer to AS5488.1:2019.
2. No design should be undertaken outside of survey extents. If design exceeds survey extents additional survey data should be acquired.

CERTIFIED LOCATOR
www.dbydlocator.com

LEGEND:
- FENCE
- LIST BOUNDARY
- COMPILED BOUNDARY
- TREE TRUNK
- DRIVEWAY
- POWER LINE
- BUILDING WALL
- BUILDING FLOOR LEVEL
- BACK OF KERB
- INVERT OF KERB
- EDGE OF PAVEMENT
- MAJOR CONTOUR
- MINOR CONTOUR

Rev No	Date	Revision Note	Drn	Ver.	App.
Rev 5					
Rev 4					
Rev 3					
Rev 2					
Rev 1	08/04/24	Detail Survey of 58 Frederick Henry Parade	JF	D01	RB

UDM Utility Detection & Mapping

UDM Group
www.udmgroup.com.au
23/15 Stanton Place, Cambridge, TAS 7170

Client: D R BUILDERS

Project: 58 Frederick Henry Parade
Cremorne, Tasmania 7024

Drawn	J.Foulston	Signed	
Date	08/04/24		
Checked	R.Brumby	Signed	
Date	08/04/24		

Drawing Title: DETAIL SURVEY

Project No.	240375
Scale	1:400
Sheet Size	A3
Drawing No.	240375 - D01
Page	1

COASTAL EROSION HAZARD ASSESSMENT

58 FREDERICK HENRY PARADE - CREMORNE

PROPOSED DWELLING

Client:	**DR Builders**
Certificate of Title:	**170713/151**
Investigation Date:	**Thursday, 11 April 2024**

Refer to this Report As

Enviro-Tech Consultants Pty. Ltd. 2024. Coastal Erosion Hazard Assessment Report for a Proposed Dwelling, 58 Frederick Henry Parade - Cremorne. Unpublished report for DR Builders by Enviro-Tech Consultants Pty. Ltd., 04 April 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 erosion hazards relating to the Site and its development.

Reporting Declaration –Coastal Erosion

This Hazard Assessment Report includes a Geotechnical Site Investigation which has been prepared in accordance with AS1726 and the Tasmanian Planning Scheme by a geotechnical practitioner with experience and competence in the preparation of coastal vulnerability assessment reports (see Attachment 5 for signed declaration & verification).

Executive Summary

Enviro-Tech Consultants Pty. Ltd. (Envirotech) were contracted by DR Builders on behalf of Nigel Heaven to prepare a Coastal Erosion Assessment for a proposed dwelling located at 58 Frederick Henry Parade Cremorne which is herein defined as the Site.

On publication of this report, we have not received a site plan for the proposed dwelling. Therefor our Site investigation is focused on the cadastral parcel of this address.

The Project Area encompasses the Site and a coastal escarpment fringing on Frederick Henry Bay. This coastal erosion assessment is based on Site specific testing and local information applicable to the Project Area.

The proposed development is exempt from planning but requires a coastal erosion hazard assessment to address the respective director's determination. A small portion of the Site is within the Flood prone areas overlay, however we suggest to not build in this section of the Site.

Coastal erosion modelling has been prepared with a 4 m of horizontal erosion projected at the Site within the building design life (2074). This allows for storm erosion, underlying recession, and recession from sea level rise. The Site boundary is 1m within the zone of slope adjustment and the next 10 m of the Site is in the zone of Reduced foundation Capacity at the surface. The resulting stable foundation zone resides 11 m inside of the Site boundary, and therefore the proposed building foundation should be designed to remain within the stable foundation zone.

It is concluded that:

- the work is unlikely to cause or contribute to coastal erosion on the land or on adjacent land.
- the works is not proposed on an actively mobile landform.
- the proposed work can achieve and maintain a tolerable risk for the intended life of the building.
- Coastal protection works are not required at the Site.

Building foundations are designated CLASS P.

1 Introduction

1.1 *Background*

Enviro-Tech Consultants Pty. Ltd. (Envirotech) were contracted by DR Builders to prepare a Coastal Erosion, for a proposed dwelling at 58 Frederick Henry Parade Cremorne which is herein defined as the Site (Map 1).

The Project Area encompasses the Site and a coastal escarpment fringing on Frederick Henry Bay. This coastal erosion assessment is based on Site specific testing and local information applicable to the Project Area.

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.
- Prepare a report encompassing the Project Area with modelling and hazard analysis to assess development risks, directors' determination and performance criteria codes based on building design life
- Prepare a desktop review of relevant geomorphologic information relevant to the Project Area and proposed development.
- Using available geographic information system (GIS) data, construct a geotechnical and coastal process model for the Project Area to interpret present and future Site conditions and how conditions may impact on the proposed development.
- Prepare a risk assessment for the proposed development in terms of coastal erosion ensuring relevant performance criteria, building regulations and directors determination are addressed; and
- Where applicable, provide recommendations on methods and design approach to reduce Site hazards.

1.3 *Cadastral Title*

The land studied in this report is defined by the title 170713/151.

1.4 *Project Area Setting*

The Project Area and Site location plans are presented in Map 2, Attachment 1. The Project Area is located on a coastal plain which was historically inland sea and beach barrier complex. The Site is set back approximately 8 m from the coast and in the future may be subject to coastal processes acting within Frederick Henry Bay.

2 Assessment

The proposal involves the development of a new dwelling. No formalised plans are available at the time of publication.

2.1 *Planning*

Planning code overlay mapping is presented in Attachment 1.

Planning code overlay descriptions, objectives, acceptable solutions and performance criteria are addressed in Attachment 2

2.1.1 Coastal Erosion Assessment

Coastal erosion hazard overlay mapping are presented in Map 5 and coastal erosion reporting requirements are summarised in Table 2.

2.2 *Building*

2.2.1 Coastal Erosion Hazard Overlay

Tasmanian Planning Scheme Only

An assessment is to be made on whether proposed work can achieve and maintain a tolerable risk from coastal erosion for the ***intended life of the building*** (2074) without requiring any specific coastal erosion protection measures.

The director's determination provisions are addressed which includes classification of the Site as Class P (problem Site which requires engineering design) and provision of an accompanying geotechnical site investigation written by a geotechnical practitioner[1].

3 Desktop Summary

3.1 *Topography*

The Site ranges in elevation from approximately 4m AHD through to 4.6 m AHD and has a near level gradient of approximately 1% (1°) to the east (Map 8). The Site is located at the Northern end of an aeolian dune ridge adjacent to Cremorne Beach. This dune ridge develops into a spit towards the South. The western direction of the Site is comprised of Aolian sand sheet deposits.

3.2 *Published Geology*

According to the 1:50,000 geological mapping by Mineral Resources Tasmania (MRT), as presented in Map 9, the geology of the Project Area comprises:

- Quaternary Aeolian dune sand deposits on the Site (Qhd)
- Quaternary Aeolian sand deposits (Qhw)

The North of the Site is comprised of a Jurassic dolerite outcrop.

[1] Geotechnical practitioner: a person holding a building services license issued under the Occupational Licensing Act 2005 in the class of engineer-civil; a geotechnical engineer acting within their area of competence; or an engineering geologist acting within their area of competence.

4 Soil Investigation

4.1 *Site Geology*

Soil testing locations are presented in Map 10.

Findings from the Soil assessment and engineering logs presented in The Geotechnical Site Investigation (GSI) report attached to this report (Attachment 6).

V4 – Cremorne Beach

Sand was encountered from surface to 2.3 m depth. The soil profile comprises predominantly fine to medium grained SAND. The soil layers have variable colouration indicating considerable changes to the local environment during the depositional phases.

4.2 *Geotechnical Testing Summary*

Findings from the geotechnical assessment are presented in GSI report in Attachment 6.

The sand density will not have an influence on erosion rates but will influence the internal friction angles and angle of repose of the dune following storm erosion. An internal friction angle of 35° is applied to the sand at the Site for geotechnical modelling.

5 Erosion Hazard Assessment

5.1 *Assessment Methods*

The coastal erosion assessment is presented in Attachment 3.

Coastline recession is modelled for the Project Area based on coastline erosion relationships with sea level rise which is forward projected to the building design life and 2100 scenarios. Procedures include:

5.1.1 Historical Aerial Images

Coastline recession been assessed by measuring coastal escarpment erosion rates in historical aerial images and comparing with historical sea levels. By forward projecting historical relationship to the building design life coastline progradation is determined for the Project Area.

5.1.2 Wave Modelling

1% AEP storm wave models are used in conjunction with bathymetry models to determine potential storm erosion closure depths (maximum lateral extent of storm erosion sediment deposition within the nearshore zone). Beach profile geometry, closure depths, and sea level rise projections are used to infer potential coastline recession trends.

5.1.3 Storm Erosion

Storm erosion potential is modelled independently of coastline recession and is determine based on storm erosion cycles occurring either side of the normal recession (coastline loss) or propagation (coastline growth) trend observed at the Site often attributes to sea level rise. The storm erosion cycles are often short (such as seasonal) or longer term (such as southern oscillation). This is determined for the Project Area based on previous regional beach typology modelling and observed historical storm bite (erosion) and recovery (accretion) cycles. Findings are presented in Table 1.

5.2 *Findings*

Historical aerial imagery has been assessed at the Site.

The scenarios indicate an overall trend of coastline progradation within the Project Area. Send accretion within the Project Area is most likely attributed to oversupply of sediment (sand) within the coastal setting. The incidence of historical storm erosion events has been factored into this assessment.

Table 1 Project area coastal erosion modelling

Parameter	2074 Building Design Life
Underlying Recession (m horizontal)	0
Sea level rise induced recession – wave analysis (m horizontal)	0
Sea level rise induced recession – aerial image analysis (m horizontal)	0
Storm Erosion Demand (m^3/m)	18
Storm Erosion Demand (m horizontal)	4
Projected Total Erosion (m horizontal)	**4**

The Site landform is vegetated and is therefore not considered actively mobile.

6 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 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 4.

6.1 *Planning*

6.1.1 Erosion Assessment

The proposed development is exempt from erosion code C11.

6.2 *Building*

6.2.1 Erosion Assessment

Modelling has been conducted for building purposes (directors determination) to assess whether proposed work can achieve and maintain a tolerable risk to erosion hazards for the ***intended life of the building*** without requiring any specific coastal erosion protection measures.

Given the recommendations presented herein, erosion risks associated with the proposed development are tolerable, provided that the proposed development is constructed within the stable foundation zone given a modelled storm erosion event by 2074 (within the building design life).

It is concluded from the coastal erosion assessment that at maximum, 0 m of coastal recession and 18 m3/m storm erosion demand could be expected at the Site within the 50-year building design life. This modelling does not account for the presence of the existing coastal protection structure. Recommendations are provided for seating the proposed structure into the stable foundation zone. This will allow for coastal erosion and wave runup processes to occur at the Site without affecting the rates of these processes.

7 Recommendations

7.1 *Stable Foundation Zone*

A stable foundation zone has been defined for the Site with reference to procedures outlined by Nielsen et. al., (1992) using geotechnical parameters from the field investigation. The stable foundation zone is a geometric zone assigned to a geotechnical cross section model and is used to define a soil depth where building structures should be founded.

7.2 *Building Foundations*

- Building footings should be deepened by way of piers or piles into the stable foundation zone.
- It is recommended that building structures do not extend laterally beyond the zone of reduced foundation capacity.

8 Concluding Statement

It is concluded that:

- the work is unlikely to cause or contribute to coastal erosion on the land or on adjacent land;
- the works is not proposed on an actively mobile landform
- the proposed work can achieve and maintain a tolerable risk for the intended life of the building
- Coastal protection works are not required at the Site.

Kris J Taylor BSc (Hons) | Environmental & Engineering Geologist

Director

Enviro-Tech Consultants Pty. Ltd.

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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 Waterways and Coastal Protection Overlay

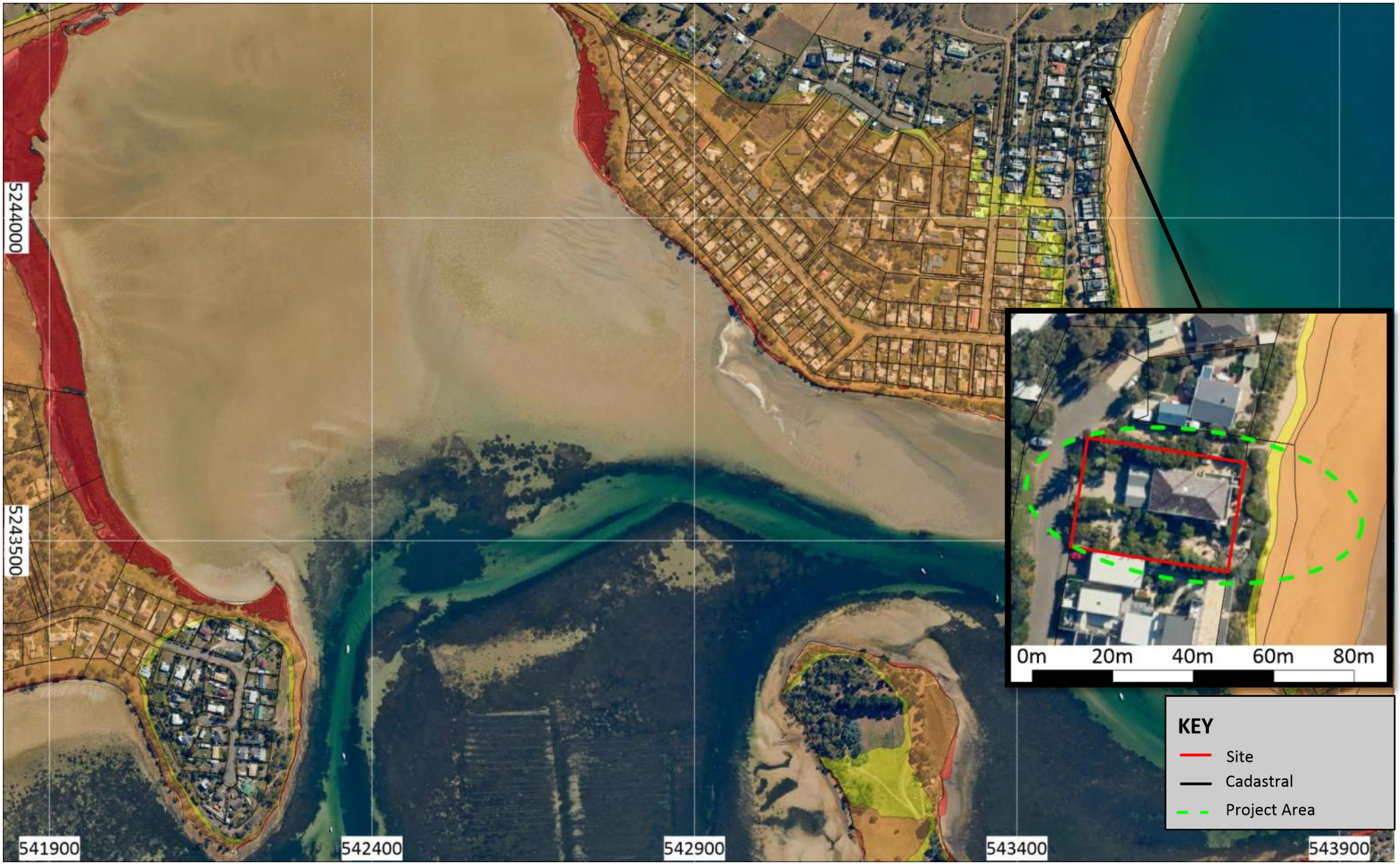
Map 4

Map 4 Future Coastal Refugia

Map 5

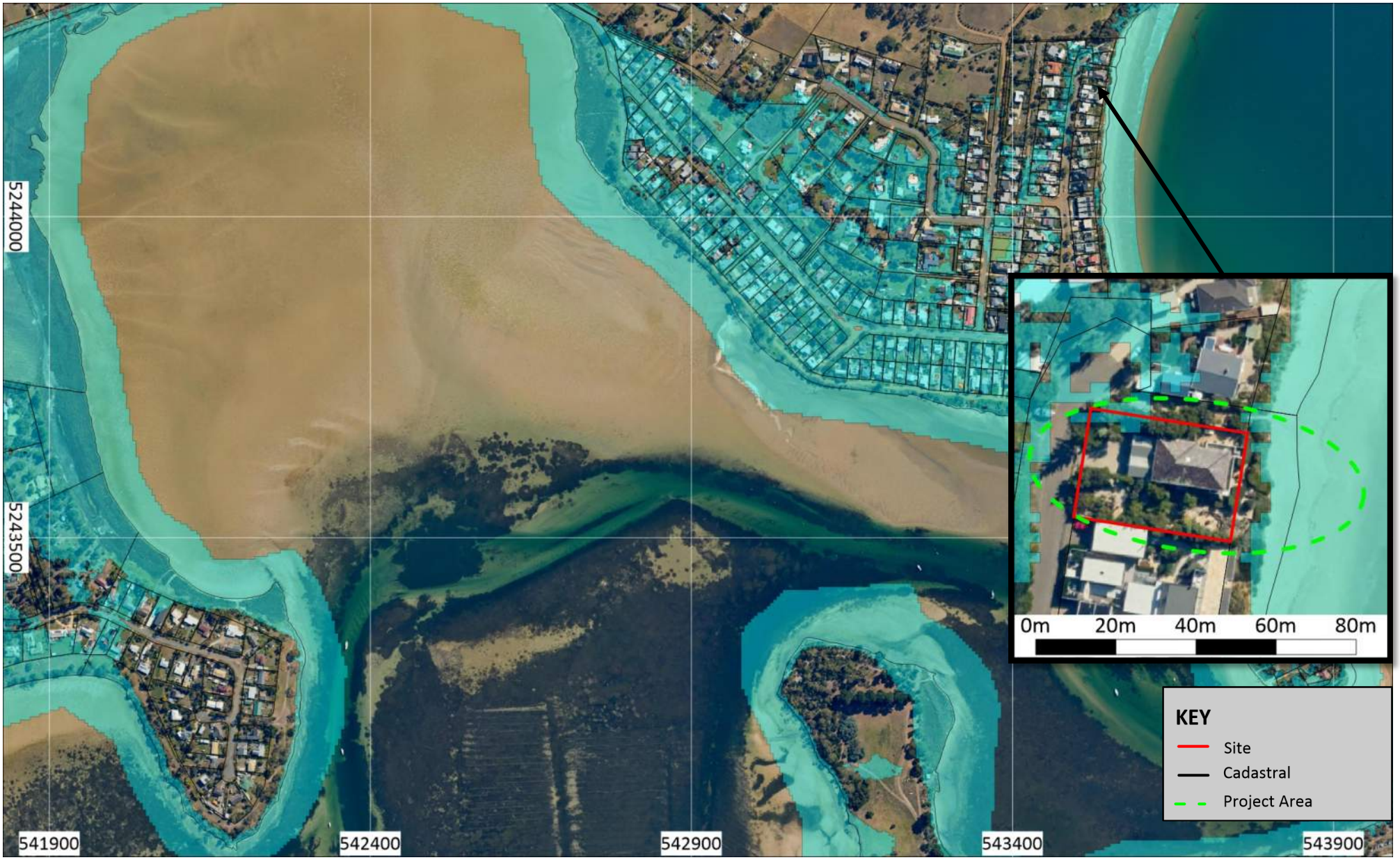
Map 5 Coastal erosion overlay

Map 6



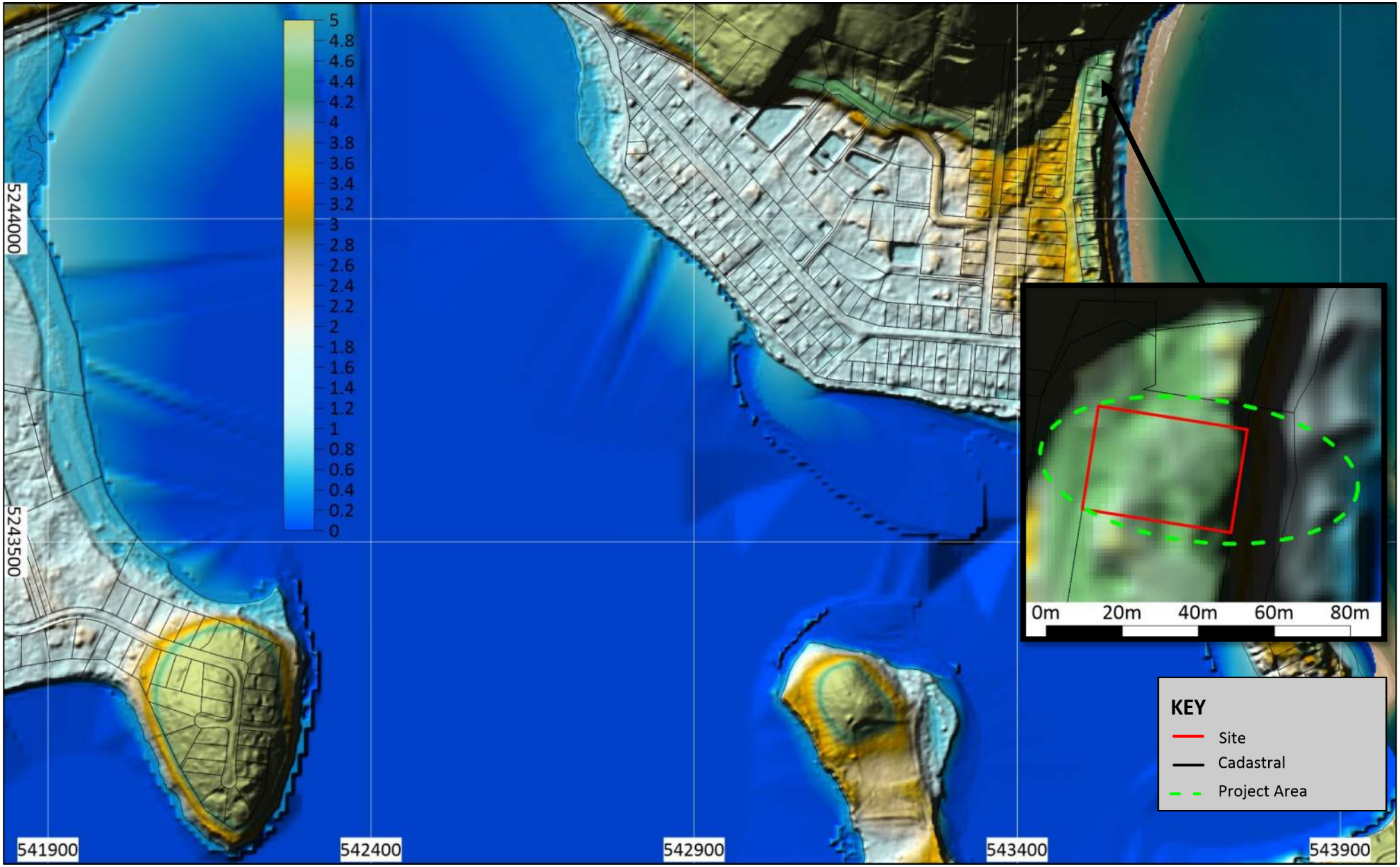
Map 6 Coastal inundation overlay

Map 7



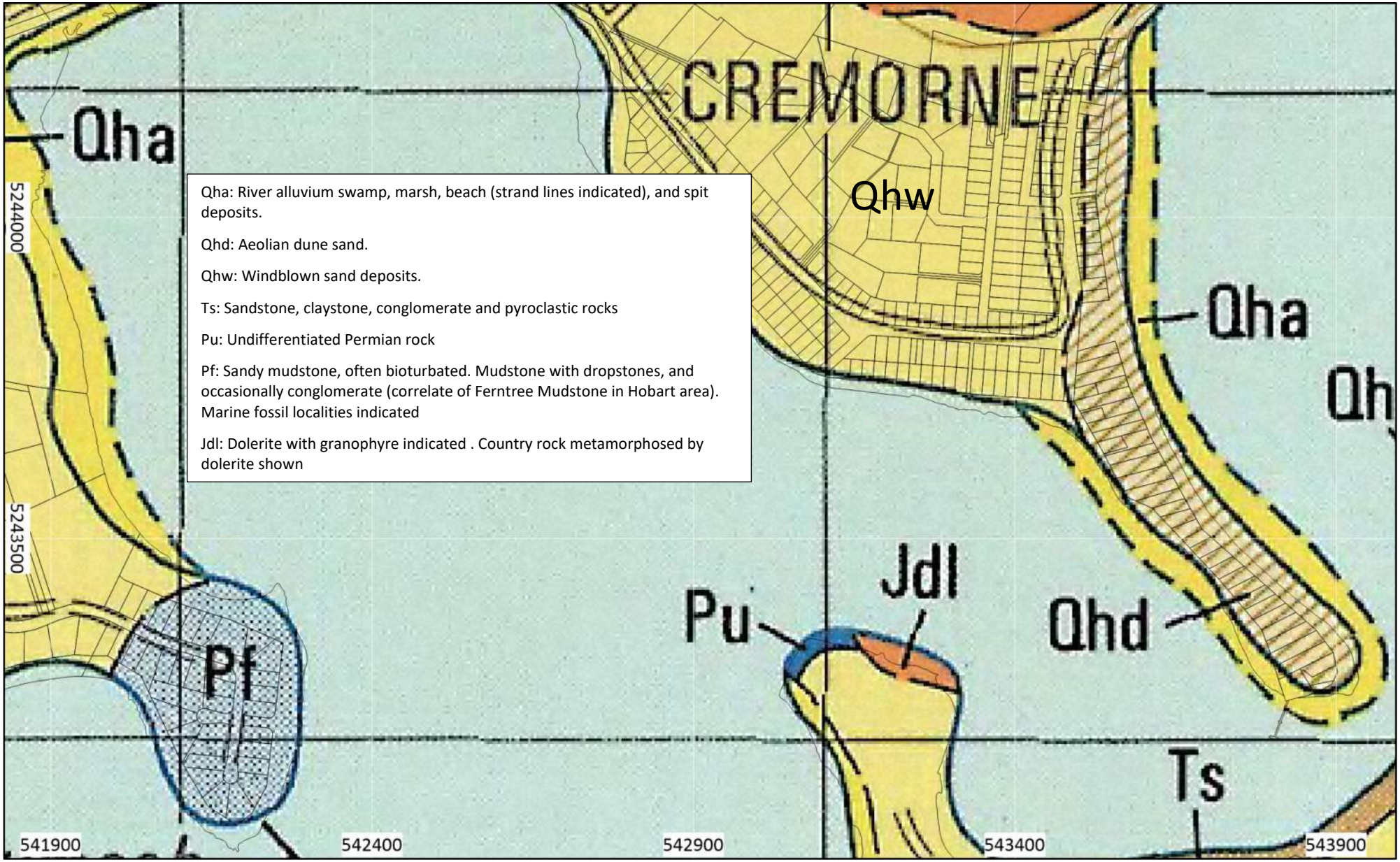
Map 7 Flood prone areas overlay – 1% AEP inundation mapping

Map 8



Map 8 Regional digital elevation model based on 2013 LIDAR

Map 9

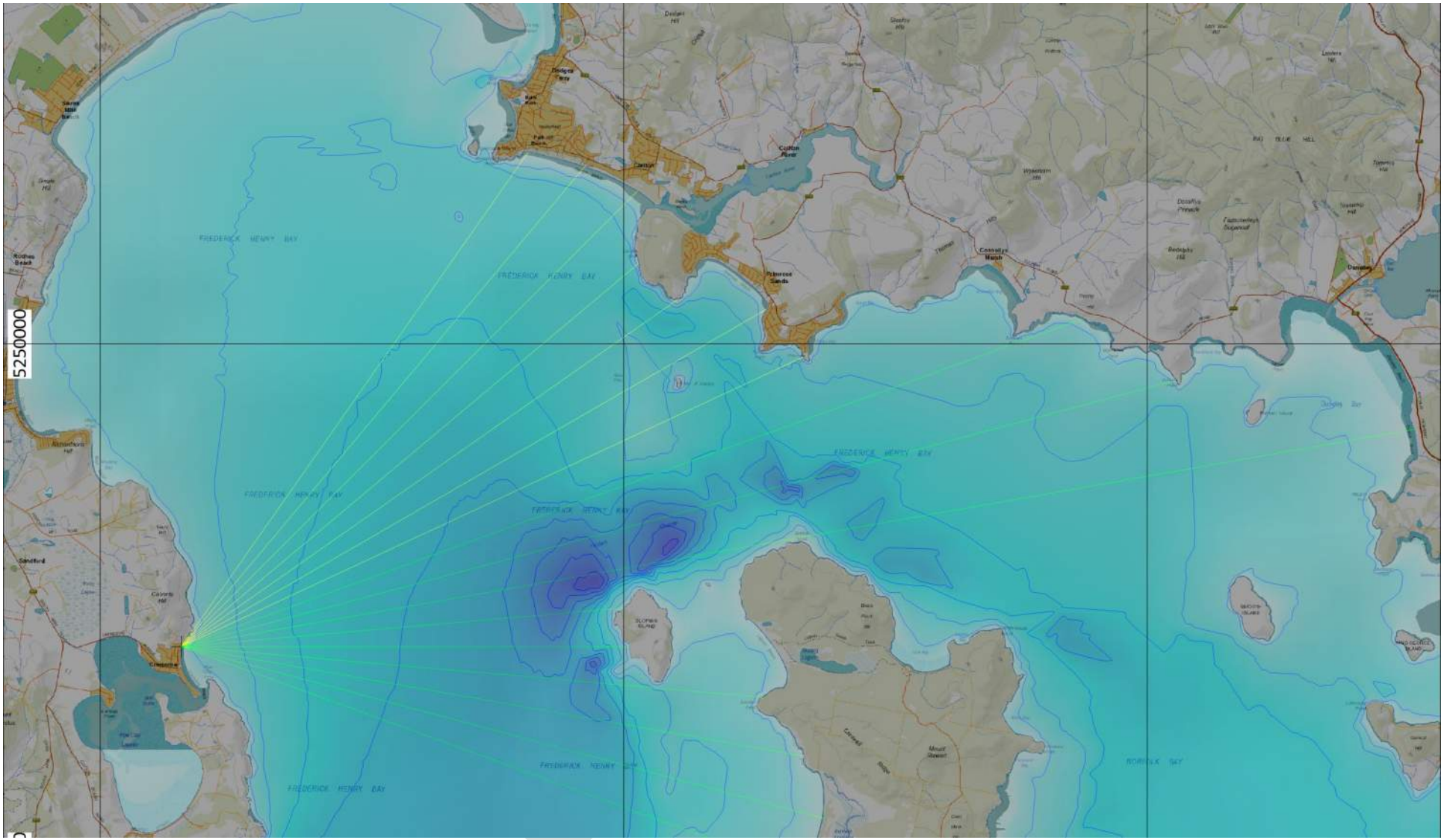


Map 9 1:50,000 Scale Mineral Resources Tasmania geology mapping

Map 10

Map 10 Soil testing locations

Map 11



Map 11 Radials used to generate the wind wave model for the Site.

Map 10

Map 12 Stable foundation zone

Attachment 2 Planning and Building Regulations (TPS)

Tasmanian Planning Scheme – Acceptable Solutions

C10.0 Coastal Erosion Hazard Overlay

The proposed building and works fall within The LIST Coastal Erosion Hazard Overlay (medium hazard band) as presented in Map 5

Code Overlay Reporting Requirements

The proposed development reporting requirements are summarised in Table 2 with the following to be addressed:

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

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

Table 2 Coastal Erosion Hazard Reporting Requirements Framework

Council	Clarence
Planning scheme code	Tasmanian Planning Scheme
Critical use, hazardous use, or vulnerable use	No
Low or medium coastal erosion hazard band	Medium
Parts of the Site are located within a High coastal erosion hazard band	No
Located in a non-urban zone	No
Actively mobile landform?	No
Proposed coastal protection works	No
Exemption from code	Yes, on the basis that development that requires authorisation under the Building Act 2016
Coastal erosion reporting requirements	Coastal Erosion Hazard Assessment & Geotechnical Site Investigation in accordance with directors determination
Coastal erosion code to be addressed	NA (exempt from planning)
Development building design life	Modelled to a 50 Year Building Design Life
Site classification requirements	Class P
In a coastal erosion investigation area	No
Coastal erosion investigation area report required	No

Directors Determination

Although a coastal erosion hazard assessment report may not be required for planning purposes, according to the director's determination, In determining an application for a Certificate of Likely Compliance, the building surveyor must:

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

(b) be satisfied that the proposed work will not cause or contribute to coastal erosion on the site or on adjacent land; 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 erosion protection measures; and

(d) be satisfied that the proposed work will not be located on actively mobile landforms, except where the work relates to protection measures or remediation works to protect land, property or human life.

Coastal Erosion Risk Assessment

To comply with the determination, this report assesses whether the proposed work can achieve and maintain a ***tolerable risk***[2] for the intended life of the building without requiring any specific coastal erosion protection measures. In accordance with the determination, this risk assessment has been prepared by a geotechnical practitioner[3] with experience and competence in the preparation of coastal erosion hazard reports.

2 Tolerable risk means the lowest level of likely risk from coastal erosion to secure the benefits of a use or development in a coastal erosion 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.

3 Geotechnical practitioner means any of the following: (a) an engineer-civil; (b) a geotechnical engineer licensed as an engineer-civil acting within their area of competence; (c) an engineering geologist with the qualifications and expertise specified in the Certificates by Qualified Persons for an Assessable Item Determination made by the Director of Building Control as amended or substituted from time to time, acting within their area of competence.

Attachment 3 Coastline Recession & Storm Erosion

Historical Recession Model

Assessment Method

An historical series of georeferenced aerial photographs and satellite imagery have been used in the analysis (Table 3). The margin of error of the image georeferencing is estimated to be in the order of 0.5 m.

Table 3 Details of aerial images used in the analysis

Photographic Measurements	Temporal Data
Photography Range (Years)	1946 to 2023
Number of Temporal Measurements	21

A relationship between sea level rise and coastline recession has been determined for the Project Area based on historical sea level rise curves (Church and White 2011) and sea level rise projections between 2010 and present for the local government area (McInnes et. al. 2016).

Given the Bruun relationship, a ratio of sea level rise vs horizontal recession is developed for the Site. Sea level rise projections adopted from local government area models are applied to the Bruun ratio to derive a coastline recession rate for the building design life.

Correlations are approximate due to interference from factors such as:

- Changing active erosion profile thickness,
- Underlying recession rates and

All the above influences were observed at the Site which are considered in the model interpretation.

Findings

Findings from the assessment are charted in Figure 1 illustrating the coastline position (m) relative to sea levels (m AHD) for various temporal points.

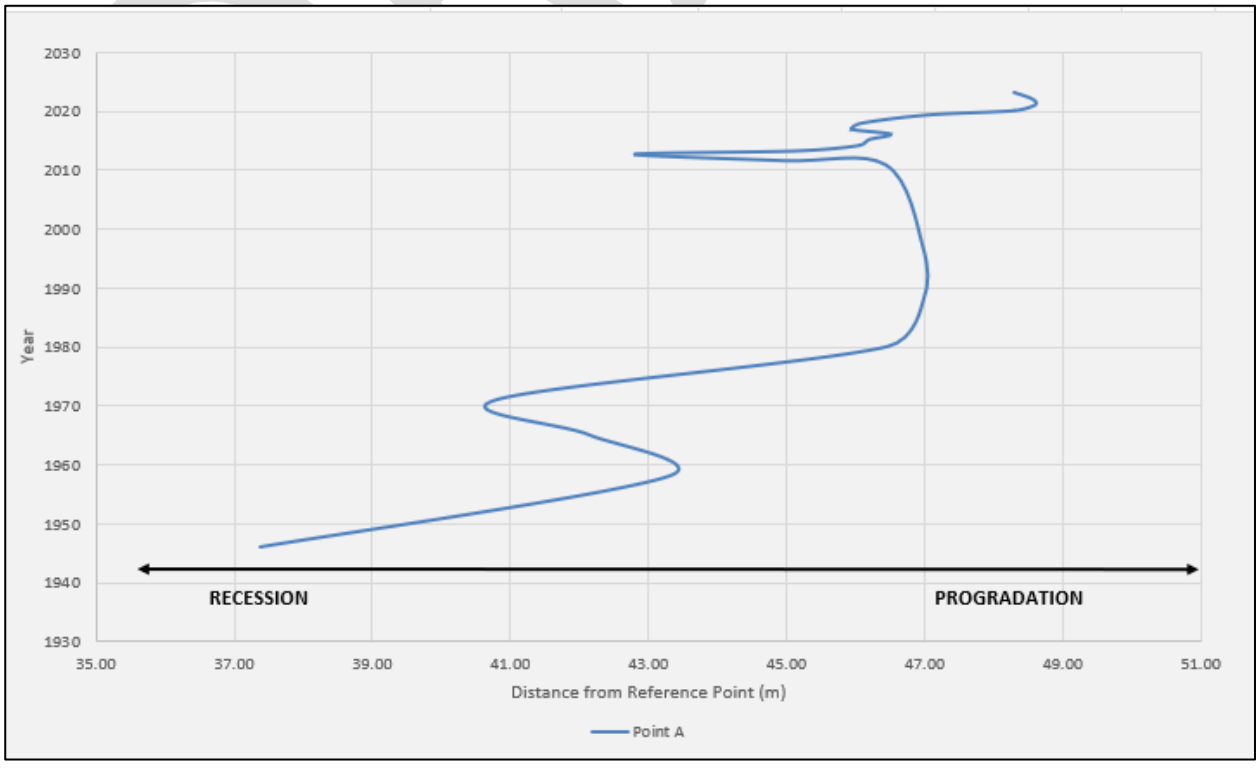


Figure 1 Measured coastline recession as distance of vegetation line relative to a fixed reference point

Parameters adopted in the assessment are presented in Table 4 with the following findings:

Projected coastline progradation (growth) within the building design life

Table 4 Forecast recession/progradation based on historical shoreline modelling

Variable	Units	Symbol	Year 2074
Sea Level	m	s	0.52
Sea level rise recession*	m	R	0
Underlying recession	m		0
Total recession	m		0

Storm Erosion Assessment

Assessment Method

The short-term deviation in coastline recession and progradation relative to the trendline illustrated Figure 1 are used to determine the storm erosion demand at the site.

This relationship is used to determine the total storm erosion demand cycles within the Project Area, which is determine by the sum deviation relative to the beach profile height to derive m^3/m storm erosion demand.

As the time series is less than what would ordinarily be required to determine design 1 in 100-year storm erosion demand or consecutive 1 in 100-year storm erosion demand for the Project Area, adjustments need to be made to the model.

Mariani et. al (2012) developed a broad model to assess storm erosion demand for various beach types around Australia, with 10 models developed for Tasmania. These models are used to derive 100-year average recurrence interval (ARI) values extrapolated from the measured the period.

Findings

It is estimated that the 100-year ARI storm erosion demand for the beach within the Project Area is 32.8 m3/m (Table 5). Making allowance for the current phase in the storm erosion/accretion cycle observed within the Project Area, the following is estimated:

100-year ARI storm erosion demand for the Project Area is calculated at 18.2 m^3/m

Table 5 Project Area storm erosion demand estimates

Storm Erosion Parameter	Units	
Profile		**Point A**
Temporal Observation Range	Years	77
Profile Height Within Erosion Zone	m	4.6
Measured Deviation (m horizonal)	m	6.6
Observed Storm Erosion Demand	m^3/m	30
Beach Typology		Wave Dominated- Low Tide Terrace
Projected 100 Year ARI Storm Erosion Demand	m^3/m	32.8
Projected 2 x 100 Year ARI Storm Erosion Demand	m^3/m	46.4
Projected 100 Year ARI (Present Cycle)	**m^3/m**	18.2

Stable Foundation Zone Analysis

Process

A stable foundation zone analysis has been prepared for the Site based on methods outlined by Nielsen et. al., 1992. The theory takes into consideration for slope instability within the face of the sand deposits. Slope instability scenarios are identified which need to be considered in any building design:

- **Wave Runup Erosion Zone** - The beach escarpment is often left with a vertical profile following storm erosion events. The profile will eventually collapse to the angle of repose as the sand desiccates.
- **Top of swash zone** – Due to the very low dune profile within the Project Area, following the projected erosion of the frontal dune, storm erosion occurs within the top of swash zone only which is defined by a 1:10 gradient between sea level and 2.0 m above sea level at the time.

Geotechnical Model

- A geotechnical cross section model has been developed for the Site (Figure 2 based on cross section presented in Map 10).
- The Site is not projected to be affected by coastal erosion processes by 2074.

Findings - Zone of Slope Adjustment

The following horizontal erosion is projected within the "Zone of Slope Adjustment" following loss of the calculated storm erosion demand:

5 m horizontal from storm erosion demand

Storm erosion demand modelled within the Project Area is equally confined to the beach (intertidal) zone as well as acting on the face of the sand dune. This could explain why there is observed progradation within the Project Area.

Modelling indicates that there is no coastal erosion (factoring coastline recession and storm erosion) within the boundary of the Site.

Findings – Stable Foundation Zone

Approximately 8.5 m of the Site boundary resides within the 2074 Zone of reduced foundation capacity which will require management, but most of the Site resides within the Stable Foundation Zone.

Foundations

All structures must be piered or piled into the stable foundation zone as presented in Figure 2 to compensate for lateral earth movement.

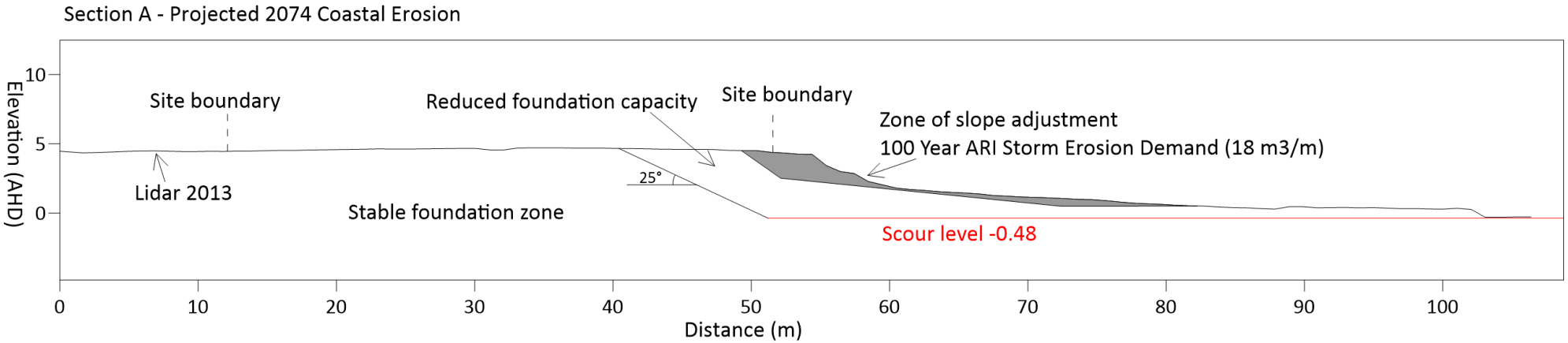


Figure 2 Coastal recession, storm erosion and inundation model for 2073 based on 1% AEP scenario

Landform Mobility

In accordance with the LIST mapping, dune mobility classification is based on vegetation cover. Dune mobility at the Site has not been classified (Figure 3). Using the same system, the dune landform at the Site is identified as having 70 to 100% vegetation coverage and is therefore defined at being 'transitory' according to Mowling (2006). As the Site comprises greater than 10% vegetation, the Site is not classified as being mobile.

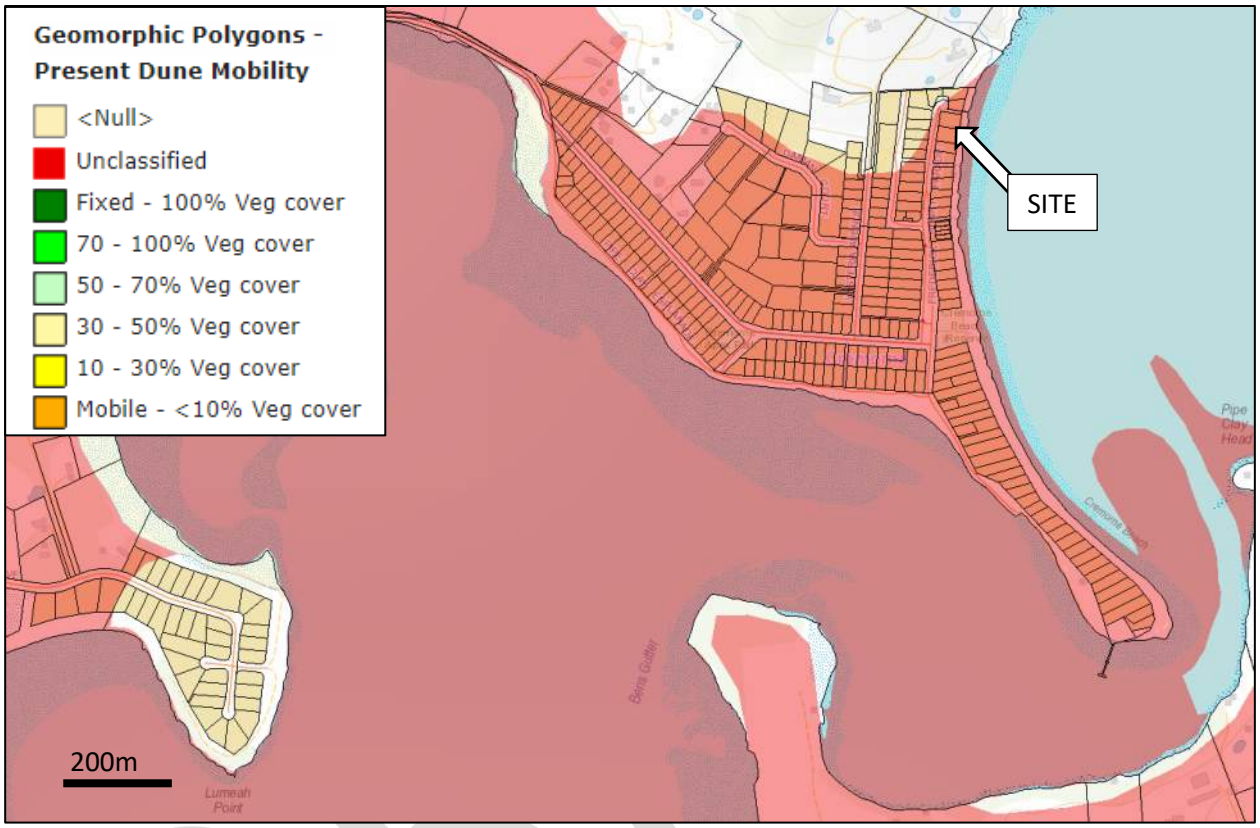


Figure 3 Dune mobility classification (The LIST)

Coastal Erosion Protection Works

Coastal erosion protection works are not required at the Site.

Attachment 4 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 is conceivable but only under exceptional circumstances over the building design life
RARE	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 5 Director's Determination Declaration

Coastal Erosion Hazard Reporting	Application
Geotechnical Site investigation undertaken consistent with AS 1726	This Geotechnical Site Investigation (AS1726) and has been written by a geotechnical practitioner with appropriate training and qualifications and over 13 year of experience in formulating coastal erosion models.
whether the work is likely to cause or contribute to coastal erosion on the land or on adjacent land;	Based on the provided plans and the coastal erosion hazard modelling, it is barely credible that the proposed works will cause or contribute to coastal erosion on the land or on adjacent land;
whether work is proposed on actively mobile landforms;	The Site landform comprises residual soils which are not considered a mobile landform.
whether the proposed work can achieve and maintain a *tolerable risk*[4] for the intended life of the building having regard to:	**Application/Management:**
nature, intensity and duration of the use	Given the recommended setbacks, the nature and intensity of the use will not influence risks within the building design life.
type, form and duration of the development	Development type and form involves footings founded into the 2074 stable foundation zone and through zone of reduced foundation capacity.
the likely change in the risk across the intended life of the building	An allowance has been made in this assessment for any potential changes in risk for the intended life of the proposed development.
the ability to adapt to a change in the risk	There is ample opportunity to adapt to changes within the building design life
The ability to maintain access to utilities and services	Access to services and utilities can be maintained.
the need for specific coastal erosion hazard reduction or protection measures on the site	Modelling is based on the absence of coastal erosion protection measures. Findings indicated that coastal protection measures are not required at the Site.
the need for coastal erosion hazard reduction or protection measures beyond the boundary of the site; and	Modelling is based on the absence of coastal erosion protection measures. Findings indicated that coastal protection measures are not required beyond the boundary of the Site.
any coastal erosion management plan in place for the site and/or adjacent land.	No coastal erosion management plan is recommended.
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 methodology specified in the Director's Determination - Coastal Erosion Hazard Area (version 1.2) by a suitably qualified geotechnical practitioner with relevant qualifications, experience, and competence in the preparation of Coastal Erosion Hazard reports.
Qualifications (Certificates by Qualified Persons for an Assessable Item Determination)	Bachelor of Science with first class honours in geology
Expertise - Geo-technical reports	Kris Taylor has 14 years of experience in coastal erosion 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 erosion assessment reports for planning and building
Level of current indemnity insurance	Current indemnity insurance of $2,000,000 ($4,000,000) Underwriters at Lloyd's covers soil and rock mechanics, erosion, coastal geomorphology, natural hazard, soil and rock testing, hydrology and environmental coastal inundation and erosion hazard assessments.

Kris Taylor Signed_____

[4] Tolerable risk means the lowest level of likely risk from coastal erosion to secure the benefits of a use or development in a coastal erosion 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 6 Geotechnical Site Investigation Report

DOYLE SOIL CONSULTING

SITE AND SOIL EVALUATION REPORT

FOUNDATION AND WINDLOADING ASSESSMENT

58 Fredrick Henry Parade

Cremorne

April 2024

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

SITE INFORMATION

Client: DR Builders

Address: 58 Fredrick Henry Parade, Cremorne (CT 170713/151)

Site Area: Approximately 1100 m^2

Date of inspection: 10/04/2024

Building type: New house

Services: Tank water and onsite wastewater

Planning Overlays: Waterway and Coastal Protection, Coastal Erosion Hazard Code Medium, Airport Obstacle Limitation Area, Flood Prone in Northwest corner.

Mapped Geology - Mineral Resources Tasmania 1:250 000 Southeast sheet:
Q = Quaternary Sediments

Soil Depth: >3.0m

Subsoil Drainage: Well-drained

Drainage lines / water courses: Cremorne Beach to the east

Vegetation: Gardens

Rainfall in previous 7 days: Approximately 2mm

SITE ASSESSMENT AND SAMPLE TESTING

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

- One test hole (TH) core:
  - TH1 with no refusal at 1.8m

- Two Dynamic Cone Penetrometer (DCP) tests:
  - DCP1 with no refusal at 2.8m
  - DCP2 with no refusal at 1.4m

SOIL PROFILES – Test Hole 1

Depth (m)	Horizon	Description and field texture grade	USCS Class
0 – 0.4	Fill	Mix of sand and aggregate, single grain, slightly moist with loose consistency.	**SP**
0.4 – 0.9	A1	Light yellowish brown (2.5Y 6/3), **Sand,** slightly moist, soft consistency, single grain.	**SP**
0.9 – 1.0	$2A_1$	Very dark grey (2.5Y 3/1), **Sand,** single grain, slightly moist, medium dense consistency.	**SP**
1.0 – 1.2	$2A_2$	Very dark brown (10YR 2/2), **Sand,** single grain, slightly moist, soft consistency.	**SP**
1.2 – 1.8	$2B_2$	Light yellowish brown (2.5Y 6/3), **Sand,** single grain, slightly moist, medium dense consistency. <u>No refusal.</u>	**SP**

SITE AND SOIL COMMENTS

The natural soil profiles are formed from windblown sands derived from Quaternary sediments. The profiles are moderately deep, with refusal occurring. The field textures of the soil profile are dominated by sand.

DCP TESTS AND ESTIMATED BEARING CAPACITY

A minimum bearing capacity of 100 kPa is required for strip and pad footings and under the edge footings and associated slab foundations (refer to tables below and *AS2870-2011 clause 2.4.5*). We provide estimated soil bearing strengths along with a variance range (+/-) based on a review of published literature relating field Dynamic Cone Penetrometer (DCP) readings to triaxial soil strength tests.

DCP testing is a method of estimating likely soil bearing capacity. However, surface layers (upper ~0.7 m) are subject to seasonal variation in soil moisture content, leading to possible higher DCP values in summer/drought conditions. Moisture-related variability in soil bearing capacity is most pronounced in coherent soils – i.e., clays and silty clays. These may be very stiff or hard when dry, while only soft to firm when moist/slightly moist - refer to *soil consistency* in above profile descriptions). Soil moisture below ~0.7 m will vary less with the season, meaning DCP values, hence, soil bearing capacity at these depths is likely to be representative year-round conditions.

When estimating the suitable foundation depth, we take in to account the interplay between soil bearing capacity and seasonally variable soil moisture conditions in the upper layers. The subsoils were slightly moist when tested (April 2024).

The data from DCP1 indicate the bearing capacity of the soil is at a *suitable* strength below 1.7 m.

The data from DCP2 indicate the bearing capacity of the soil is at a *suitable* strength below 1.1 m.

Based on the DCP data and core depths, the recommended foundation depth can range from approximately 1.1 to 1.7 m.

DCP 1				
Depth (mm)	DCP n-number (Blows/100 mm)	DCP Penetration Index (mm/Blow)	Estimated Bearing Capacity (kPa = n x 30)	Likely Variance (+/-)
0 - 100	2	50.0	60	20
100 - 200	3	33.3	90	30
200 - 300	4	25.0	120	40
300 - 400	4	25.0	120	40
400 - 500	5	20.0	150	50
500 - 600	4	25.0	120	40
600 - 700	2	50.0	60	20
700 - 800	3	33.3	90	30
800 - 900	4	25.0	120	40
900 - 1000	3	33.3	90	30
1000 - 1100	1.5	66.7	45	15
1100 - 1200	2.5	40.0	75	25
1200 - 1300	2	50.0	60	20
1300 - 1400	3	33.3	90	30
1400 - 1500	3	33.3	90	30
1500 - 1600	4	25.0	120	40
1600 - 1700	5	20.0	150	50
1700 - 1800	6	16.7	180	60
1800 - 1900	6	16.7	180	60
1900 - 2000	6	16.7	180	60
2000 - 2100	7	14.3	210	70
2100 - 2200	6	16.7	180	60
2200 - 2300	6	16.7	180	60
2300 - 2400	4	25.0	120	40
2400 - 2500	6	16.7	180	60
2500 - 2600	9	11.1	270	90
2600 - 2700	13	7.7	390	130
2700 - 2800	16	6.3	480	160

DCP 2				
Depth (mm)	**DCP n-number (Blows/100 mm)**	**DCP Penetration Index (mm/Blow)**	**Estimated Bearing Capacity (kPa = n x 30)**	**Likely Variance (+/-)**
0 - 100	2	50.0	60	20
100 - 200	3	33.3	90	30
200 - 300	4	25.0	120	40
300 - 400	4	25.0	120	40
400 - 500	3	33.3	90	30
500 - 600	3	33.3	90	30
600 - 700	4	25.0	120	40
700 - 800	5	20.0	150	50
800 - 900	4	25.0	120	40
900 - 1000	4	25.0	120	40
1000 - 1100	6	16.7	180	60
1100 - 1200	9	11.1	270	90
1200 - 1300	12	8.3	360	120
1300 - 1400	12	8.3	360	120

WIND CLASSIFICATION

The AS 4055-2021 *Wind load for Housing* classification of the site is:

Region: **A**

Terrain Category: **TC1**

Shielding Classification: **NS**

Topographic Classification: **T0**

Wind Classification: **N3**

Design Wind Gust Speed ($V_{h,u}$): **50 m/sec**

SITE CLASSIFICATION AND RECOMMENDATIONS

For standard foundations (100 kPa bearing capacity), the site meets the criteria for a **Class P** site classification, as set out in AS2870-2011 (construction). This classification is appropriate due to the presence of non-cohesive sands with low bearing capacity, to depths of approximately 1.1 – 1.8 m. We recommend founding on the deeper more competent materials below approximately 1.8 m.

However, if specialised stiffened raft-type slab foundations are utilised, where the slab is tied to the edge footings, a site classification of Class A is appropriate.

Note 1 – The materials at the suitable and recommended foundations depths, meet the reactivity levels of **Class A** or non-reactive, with little-to-no expected surface movement under normal soil moisture ranges for the location.

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

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

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

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

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

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

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

E) Loss of vegetation from near the building.

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

REPORT LIMITATIONS

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

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

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

In these cases, it is expected that the owner consult the author for a reclassification. This report requires certification via a form 55 certificate from Doyle Soil Consulting to validate its contents. Because site discrepancies may occur between this report and actual site conditions, it is a condition of certification of this report that the builder be provided with a copy of this report.

Robyn Doyle
B.Agr.Sc. CPSS
Soil Scientist and Wastewater Designer
Licence no. CC7149

Dr Richard Doyle
B.Sc.(Hons), M.Sc.(Geol), Ph.D. (Soil Sci.), CPSS (Certified Prof Soil Scientist)
Geologist and Soil Scientist

APPENDIX 1 – Approximate test hole and DCP locations

APPENDIX 2 – Definitions of Soil Horizons

Horizon name	Meaning
A1	Dark topsoils, zone of maximum organic activity
A2 or E	Leached, light/pale washed-out sandy layer
A3 or AB	Transition from A to B, more like A
B1 or BA	Transition from A to B, more like B
B2	Main subsoils layer with brown colouration, accumulations of clay, humus, iron oxide, etc
B3	Transitional from B2 to C
C	Weakly weathered soil parent materials

Subscript	Meaning
r	Reducing conditions (anaerobic)
t	Enriched in translocated clay
s	Iron/aluminium oxide accumulations in subsoil
g	Mottled, suggesting periodic/seasonal wetness
m	Cemented layer (oxides, carbonates, humus, silica etc)
k	Calcium carbonate (lime) accumulation
h	Humus accumulation in subsoil