DEVELOPMENT APPLICATION

APPLICATION NUMBER:	PLN-26-052
PROPOSED DEVELOPMENT:	Residential (Outbuilding)
LOCATION:	9 Curlew Parade Claremont
APPLICANT:	Marcus Ralph Design
ADVERTISING START DATE:	30/06/2026
ADVERTISING EXPIRY DATE:	14/07/2026

Plans and documentation are available for inspection at Council's Offices, located at 374 Main Road, Glenorchy between 8.30 am and 5.00 pm, Monday to Friday (excluding public holidays) and the plans are available on Glenorchy City Council's website (**www.gcc.tas.gov.au**) until **14.07.2026.**

During this time, any person may make representations relating to the applications by letter addressed to the Chief Executive Officer, Glenorchy City Council, PO Box 103, Glenorchy 7010 or by email to gccmail@gcc.tas.gov.au.

Representations must be received by no later than 11.59 pm on **14.07.2026,** or for postal and hand delivered representations, by 5.00 pm on **14.07.2026.**

374 Main Road, Glenorchy
PO Box 103, Glenorchy TAS 7010
(03) 6216 6800 | gccmail@gcc.tas.gov.au
www.gcc.tas.gov.au
ABN 19 753 252 493

New Outbuilding

PROJECT SPECIFIC

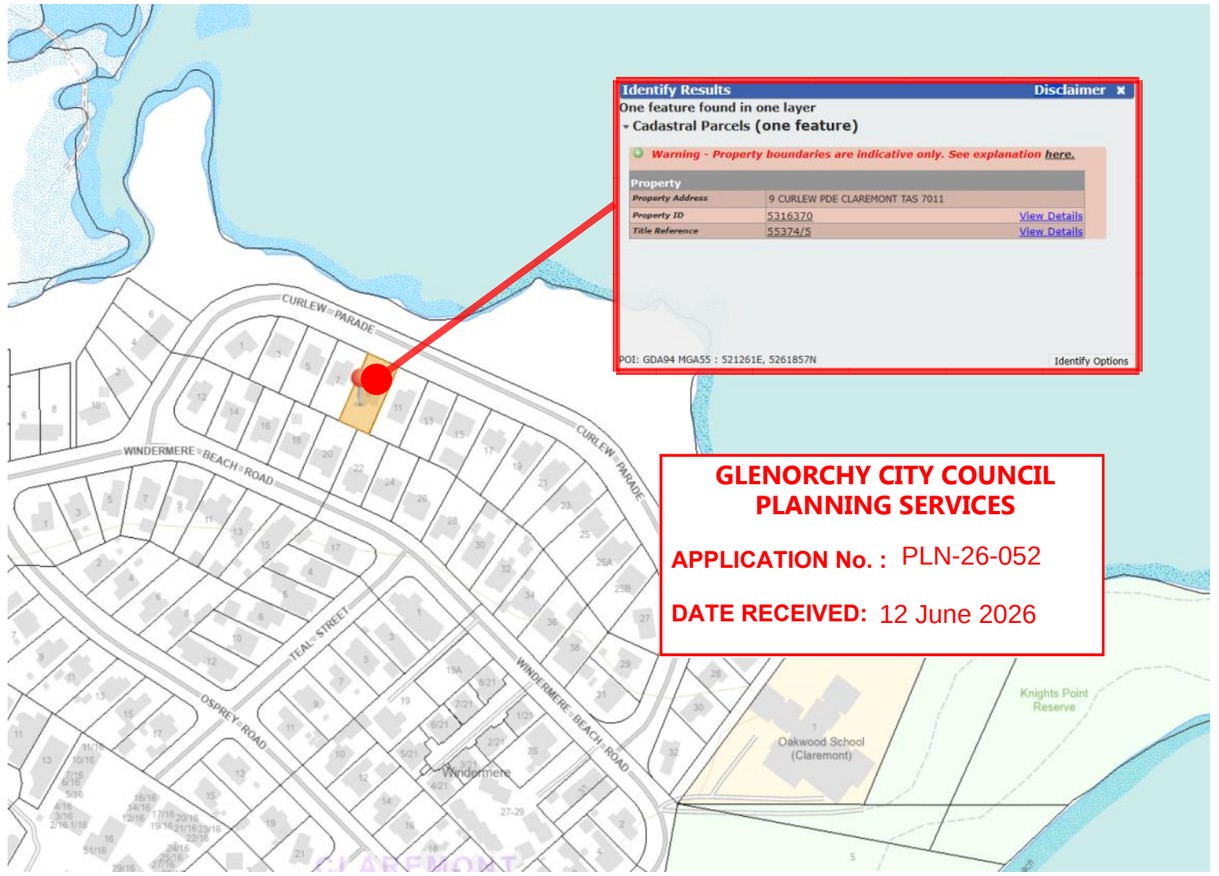
Ruth and Catrina Johston
9 Curlew Parade
Claremont

Tasmanian Planning Scheme
Title Reference : Vol 55374 / Folio 05

NCC DEEMED TO SATISFY Mr Marcus Ralph CC1317F
Climate Zone 7

existing site access

existing site access
to be retained



SITE INFORMATION

GLENORCHY CITY COUNCIL
PLANNING SERVICES
APPLICATION No. : PLN-26-113
DATE RECEIVED: 23/06/2026

Lot: 05
Title: 55374 folio 05
Land Size: 627.00 sqm

Council: Glenorchy Council
Zoning: 8 General Residential
Overlays: 10.00 Low Coastal Erosion Hazard Band

D.A APPROVAL: Planning approval required
BAL: refer to report by others
WIND CLASSISIFCATION : Refer to Steeline certification
CLIMATE ZONE: 7
ENERGY RATING :Na
BUILDING CLASSISIFCATION: 10A

Floor Plan

Proposed Garage	40.00 sqm
Proposed roofed area coverage	40.00 sqm site
existing dwelling cover	125.00 sqm site
Existign Carport to be demolished coverage	18.00 sqm site
Total Site Cover	165.00 sqm
Site Area	627.00 sqm
Site Coverage coverage	26.30 % site

LAYOUT	DRAWING ID	DRAWING NAME	UPDATED DATE
1102-00 location information	6.	DRAWING LIST (1)	12/06/2026 3:20 PM
1102-01 Site Plan	0.	Floor Plan (126)	12/06/2026 3:20 PM
1102-02 Part Site Plan	0.	Floor Plan (126)	12/06/2026 3:20 PM
1102-03 Floor Plan	0.	Floor Plan (121)	12/06/2026 3:20 PM
1102-04 Elevations	0.	Floor Plan (106)	12/06/2026 3:20 PM
1102-04 Elevations	0.	Floor Plan (120)	12/06/2026 3:20 PM
1102-04 Elevations	0.	Floor Plan (121)	12/06/2026 3:20 PM
1102-04 Elevations	0.	Floor Plan (121)	12/06/2026 3:20 PM
1102-04 Elevations	0.	Floor Plan (131)	12/06/2026 3:20 PM
1102-05 Carport demolition	0.	Floor Plan (133)	12/06/2026 3:20 PM

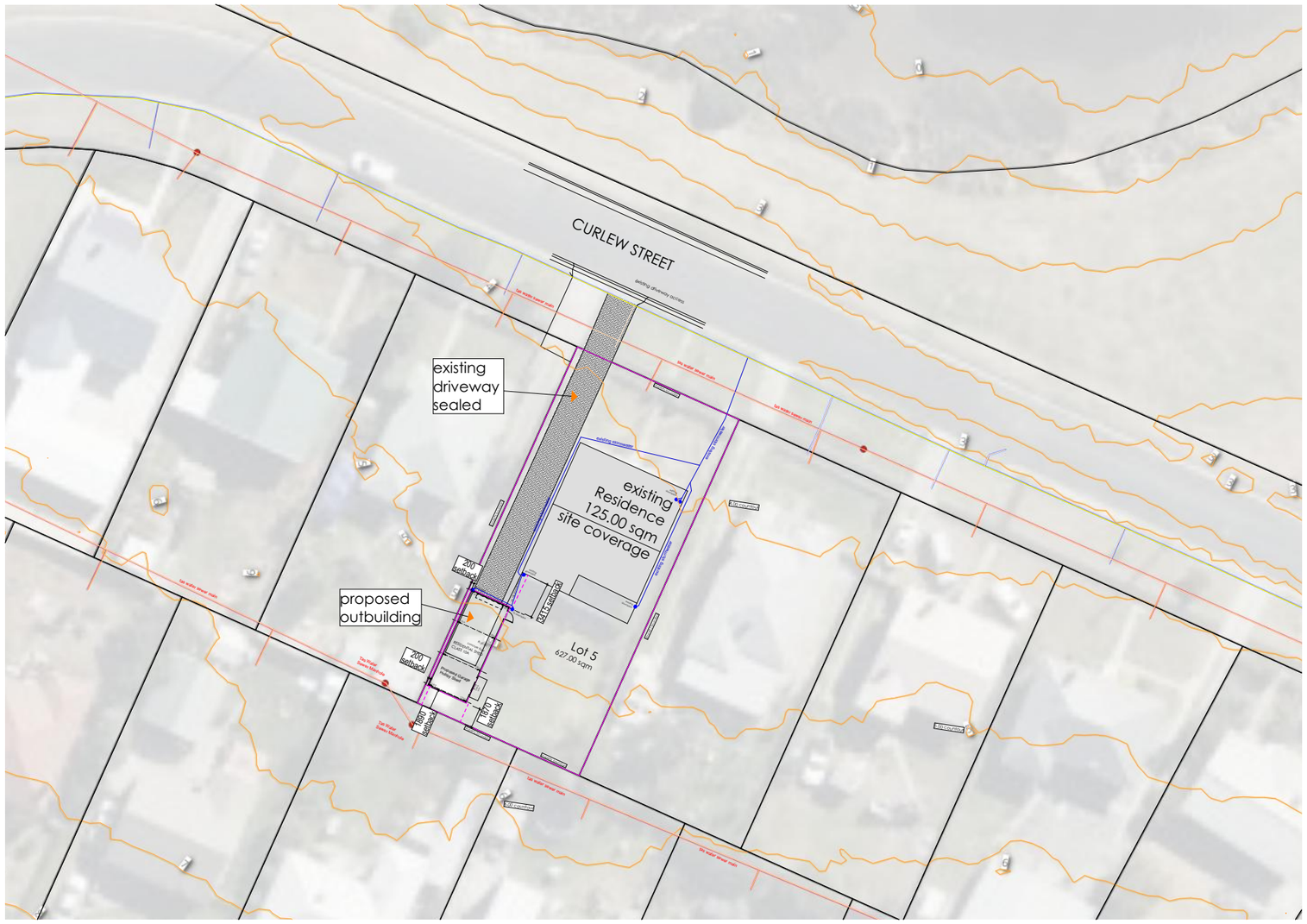
PROPERTY IDENTIFICATION

Steeline ROOFING TASMANIA
Service over and above
MARCUSRALPH
Design -architectural animation
Building designer accreditation CC1317F
13 Franklin street
Richmond, Tasmania 7025
0409 975 825 mob
e: marcusralph@bigpond.com

New Outbuilding
Ruth and Catrina Johston
9 Curlew Parade
Claremont

location information

date	issue revesion
17/04/2025	A
designed and drawn	revision-date
M.Ralph	Design Drawing
job no:	drawing no:
2026-1102	1102-00



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GLENORCHY CITY COUNCIL
PLANNING SERVICES
APPLICATION No. : PLN-26-052
DATE RECEIVED: 12 June 2026

the engineered plans for this class 10a structure
come with structural certification for Class :M REACTIVE SOIL
The owner has elected to classify the soil classification during construction
and will advise the builder on future actions once the excavation has been completed
and the natural soil profile can be determined by a suitable qualified person

signed Property Owner date

Steeline ROOFING TASMANIA

Service over and above

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New Outbuilding

Ruth and Catrina Johston
9 Curlew Parade
Claremont

Site Plan

date	issue revesion
17/04/2025	A
designed and drawn	revision-date
M.Ralph	**Design Drawing**
job no:	drawing no:
2026-1102	**1102-01**

Floor Plan

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PLANNING SERVICES
APPLICATION No. : PLN-26-052
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New Outbuilding

Ruth and Catrina Johston
9 Curlew Parade
Claremont

Part Site Plan

date	issue revesion
17/04/2025	A
designed and drawn	revision-date
M.Ralph	**Design Drawing**
job no:	drawing no:
2026-1102	**1102-02**

PLUMBING LAYOUT

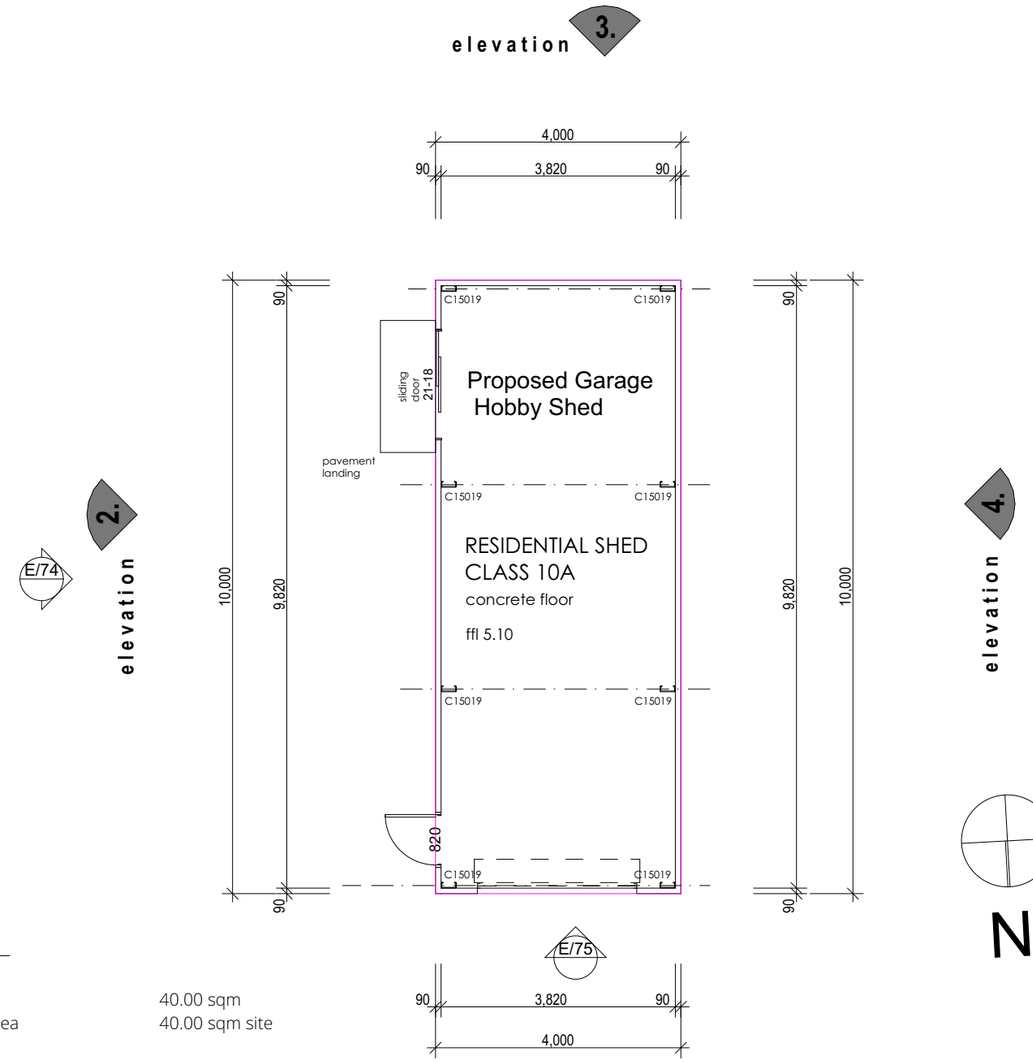
SCALE 1:100

Sewer and Stormwater lines are to be run along the underside concrete floor within compacted FCR.
When under a concrete slab or tTimber floor installation will comply with AS3500.
Refer to roof plan for fixing requirements of down pipes.
Connectio to council main or treatment plant will be inspected and approved by Local council inspectors.

PIPE SIZES RECOMENDED
PLUMBING LEGEND:
1. wc dn100
2. urinal dn40,50
3. sink dn50,
4. basin dn40,dn50
5 bath dn40, dn50
6. shower dn50, dn 65 recommended
7. trough dn40,dn50,dn65 or dn100

fwg floor waste gully primed by basin ,sink or trough dn 50 or from which fixture size is priming.

soil classification requires the plumbing contractor to take necessary measures to prevent UPVC AND PVC pipework and all water connection to new ridgid building structure to have flexible joint. refer to csiro advice and NCC for pipe connection details for reactive clay soils



FLOOR PLAN

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Steeline ROOFING TASMANIA

Service over and above

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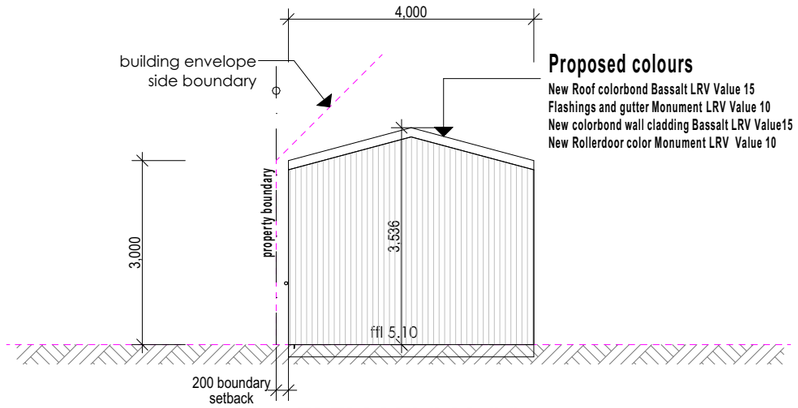
New Outbuilding

Ruth and Catrina Johston
9 Curlew Parade
Claremont

Floor Plan

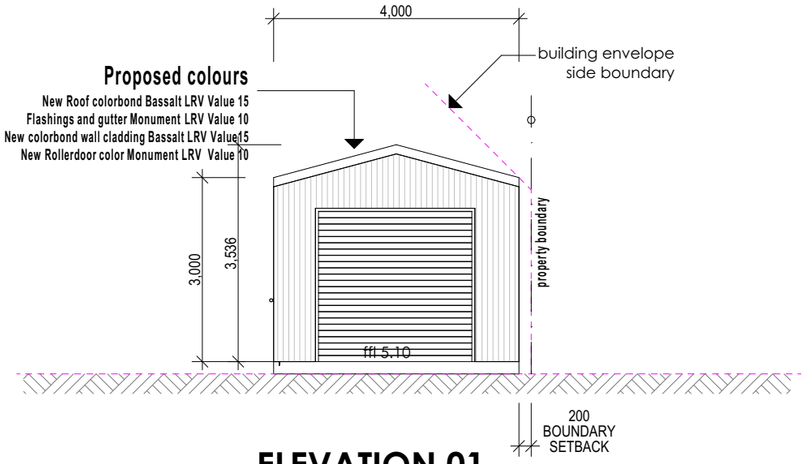
date	issue revesion
17/04/2025	A
designed and drawn	revision-date
M.Ralph	**Design Drawing**
job no:	drawing no:
2026-1102	**1102-03**



ELEVATION 03

SOUTH ELEVATION

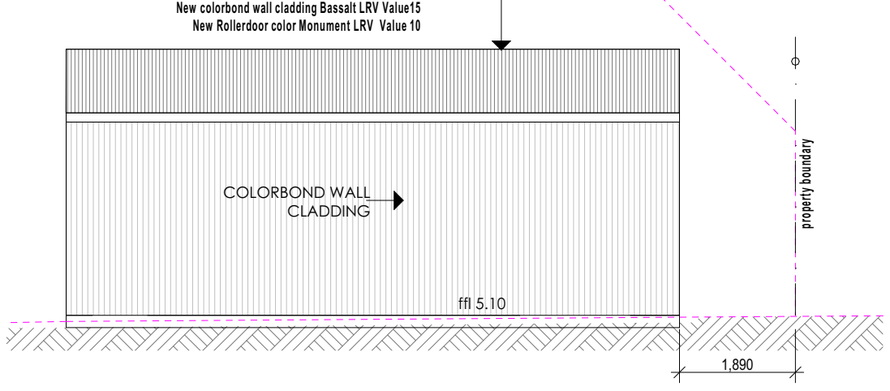
scale 1:100



ELEVATION 01

NORTH ELEVATION

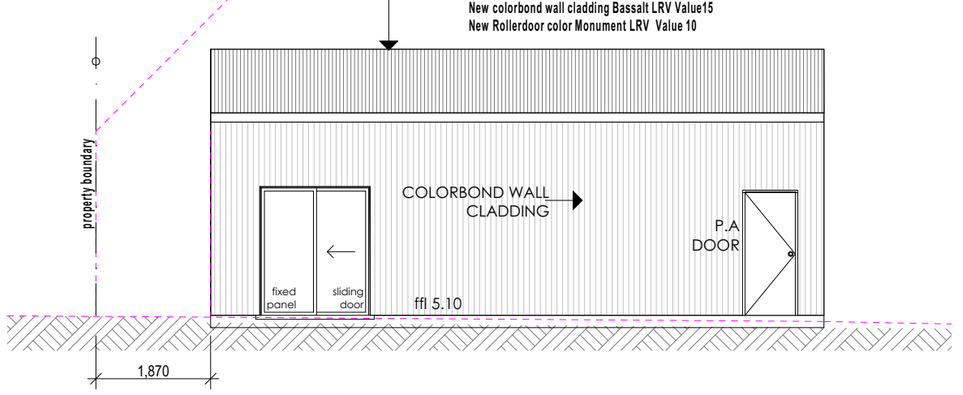
scale 1:100



ELEVATION 04

WEST ELEVATION

scale 1:100



ELEVATION 02

EAST ELEVATION

scale 1:100

Steeline
ROOFING TASMANIA

Service over and above

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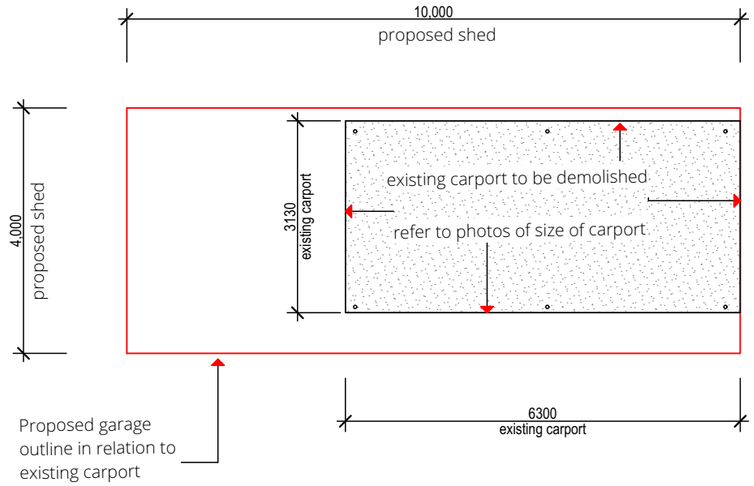
New Outbuilding

Ruth and Catrina Johston
9 Curlew Parade
Claremont

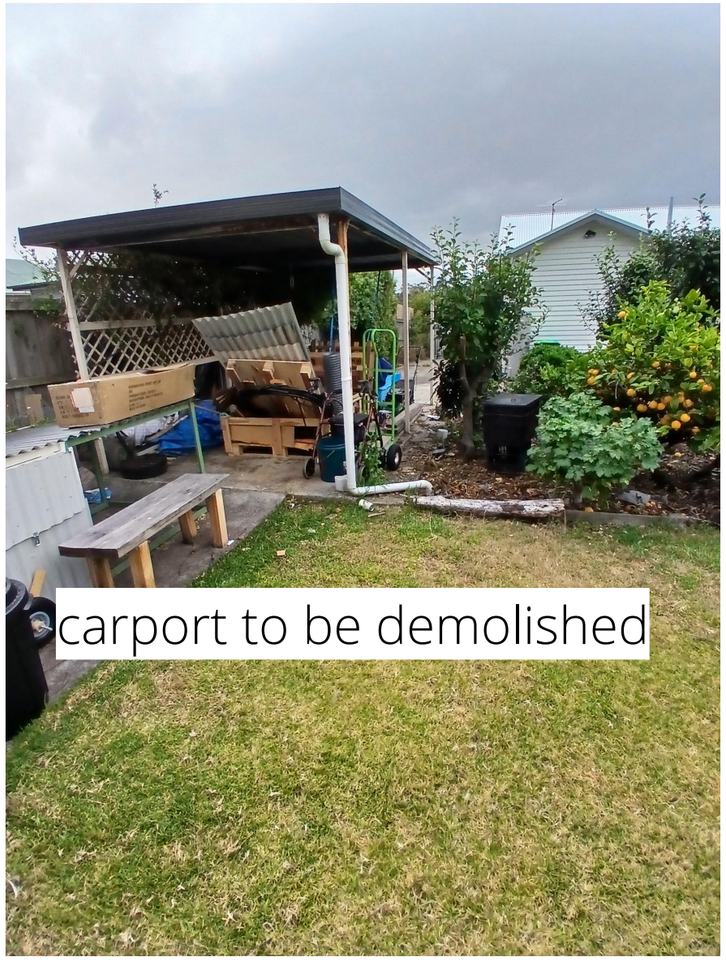
Elevations

date	issue revesion
17/04/2025	A
designed and drawn	revision-date
M.Ralph	**Design Drawing**
job no:	drawing no:
2026-1102	**1102-04**

carport to be demolished



carport to be demolished



carport to be demolished

GLENORCHY CITY COUNCIL
PLANNING SERVICES
APPLICATION No. : PLN-26-052
DATE RECEIVED: 12 June 2026

Steeline
ROOFING TASMANIA

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New Outbuilding

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Carport demolition

date	issue revesion
17/04/2025	A
designed and drawn	revision-date
M.Ralph	Design Drawing
job no:	drawing no:
2026-1102	1102-05

GEO-ENVIRONMENTAL SOLUTIONS

COASTAL EROSION VULNERABILITY ASSESSMENT

PROJECT:

Proposed Outbuilding

Site Address:

9 Curlew Parade,
Claremont
TAS
7011

CLIENT:

DATE:

1/06/2026

DOCUMENT CONTROL

Document Prepared By:

Geo-Environmental Solutions Pty Ltd

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29 Kirksway Place

Battery Point

TAS, 7004

P: +61 3 6223 1839

E: office@geosolutions.net.au

W: geosolutions.net.au

DOCUMENT CONTROL		
Report Title:	9 Curlew Parade Claremont TAS 7011	
Project Type:	Coastal Vulnerability Assessment	
Client:		
Project Job Number:	J12954	
Revision Version:	V01	
Date:	1/06/2026	
Approved By:	V. Gupta	
	Signature:	Date
		1/06/2026

FIGURES

TABLES

EXECUTIVE SUMMARY

Geo-Environmental Solutions Pty Ltd (GES) were contracted by Ruth & Catrina Johnston to prepare a coastal vulnerability assessment for a proposed outbuilding at Claremont, Tasmania. The project area consists of a single cadastral title (CT 55374/5) located at 9 Curlew Parade Claremont TAS 7011. (The Site)

An application to conduct construction works has triggered the assessment in accordance with the Tasmania Planning Scheme (TPS) – Glenorchy City Council and following of the Director's Determination for Coastal Erosion and which provides building requirements for building and demolition work in coastal erosion hazard areas.

GES have undertaken this assessment using available scientific literature and datasets. Estimations are determined by approximation with appropriate regional information applied where appropriate to site specific information. Data collection and site-specific modelling was undertaken in assessment of the site.

The proposal involves the construction of a new residential shed classified as a Class 10a building on the southwest corner of the site. The Project Area is located within Windermere Bay on the sheltered shores of the Derwent Estuary. The site is setback approximately 28 m landward from the existing shoreline, within a low-lying estuarine floodplain that grades from around 0 m AHD to approximately 3 m AHD. The proposed works are positioned further inland at approximately 5 m AHD.

GES has established that the site is located within a low-energy estuarine environment characterised by saltmarsh vegetation, intertidal mudflats and fine-grained sediments, and is sheltered from direct ocean swell and high-energy wave action. The shoreline is not subject to significant storm-driven erosion processes, with no evidence of active shoreline retreat or instability observed during site inspection. The coastal recession due to sea level rise is expected to be gradual and primarily driven by landward migration of saltmarsh and intertidal habitats in response to rising estuarine water levels, rather than wave-induced erosion processes. The designed setback has been determined to be approximately 20 meters from the 0-meter AHD contour line by 2100 (1% AEP). In this scenario, the proposed dwelling is positioned in a stable foundation zone, aligning with a designed building lifespan of 50 years in accordance with NCC regulations.

The proposed development meets the criteria for construction within a coastal erosion hazard area and complies with the C10.6.1 performance solution outlined in the coastal erosion hazard code, as specified in the Tasmanian Planning Scheme – Glenorchy City.

List of Abbreviations

AHD (83)	Australian Height Datum
AEP	Annual Exceedance Probability
ARI	Average Reoccurrence Interval
CEM	Coastal Engineering Model
CEHC	Coastal Erosion Hazards Code
CIHC	Costal Inundation Hazard Code
DCP	Dynamic Cone Penetrometer
DEM	Digital Elevation Model
DPAC	Department of Premier and Cabinet
ERMP	Erosion Risk Management plan
HWM	High Water Mark
GES	Geo-Environmental Solutions Pty Ltd
GIS	Geographical Information System
IPCC	Intergovernmental Panel on Climate Change
LiDAR	Light Detection And Ranging
LIST	Land and Information System, Tasmania
MRT	Mineral Resources Tasmania
NCCOE	National Committee on Coastal and Ocean Engineering
SB	Soil Bore
SPM	Shoreline Protection Manual
SSP	Surf Similarity Parameter
SWAN	Simulating Waves Nearshore
TPS	Tasmanian Planning Scheme
WRL	Water Research Laboratory (University of New South Wales)

1 INTRODUCTION

Geo-Environmental Solutions Pty Ltd (GES) were contracted by Ruth & Catrina Johnston to prepare a coastal vulnerability assessment for a proposed outbuilding at Claremont, Tasmania. The project area consists of a single cadastral title (CT 55374/5) located at 9 Curlew Parade Claremont TAS 7011. (The Site)

An application to conduct construction works has triggered the assessment in accordance with the Tasmania Planning Scheme (TPS) – Glenorchy City Council and following of the Director's Determination for Coastal Erosion and which provides building requirements for building and demolition work in coastal erosion hazard areas.

GES have undertaken this assessment using available scientific literature and datasets. Estimations are determined by approximation with appropriate regional information applied where appropriate to site specific information. Data collection and site-specific modelling was undertaken in assessment of the site.

2 OBJECTIVES

The objective of the site investigation is to:

- Identify which codes need to be addressed in terms of coastal vulnerability and identify the performance criteria relevant to the project which need addressing;
- Conduct a literature review of all geological, geomorphologic, hydrodynamic information and any erosion assessments which are relevant to the site;
- Review hydrodynamic assessments of the local area to determine projected sea level rise, storm tides and site-specific hydrodynamic conditions and where applicable, GES's site-specific soil investigation findings;
- Conduct a detailed erosion assessment of site erosion vulnerability in terms of long-term beach recession and short-term storm erosion.
- Conduct a site risk assessment for the proposed development ensuring relevant performance criteria are addressed; and
- Where applicable, provide recommendations on methods and design approach to reduce inundation and erosion impact.

3 SITE DETAILS

3.1 Project Area Land Title

The land studied in this report is defined by the following title reference:

- CT 55374/5

the 'Site' and/or the 'Project Area' in this report.

3.2 Project Area and proposed works

The Project Area is within Windermere Bay on the sheltered shores of the Derwent Estuary in the northern Hobart region of Tasmania, near Claremont. The bay forms part of a low-energy estuarine coastal environment that is protected from direct ocean wave action and is characterised by relatively calm waters, gently sloping foreshore areas, and tidal influences. The site covers an area of approximately 627square meters and is currently occupied by an existing dwelling in the middle of the site. The proposal involves the construction of a new residential shed classified as a Class 10a building on the southwest corner of the site. The driveway will remain unchanged along the western boundary via Curlew Parade.

The site boundary is set back approximately 28 meters from the High-Water Mark (HWM). Plans for proposed works have been provided to GES from Steeline Roofing Tasmania (Drawing Number: 2026-1102, dated 17/04/2025). The plans are presented in Figure 1

Figure 1 - Location of the site

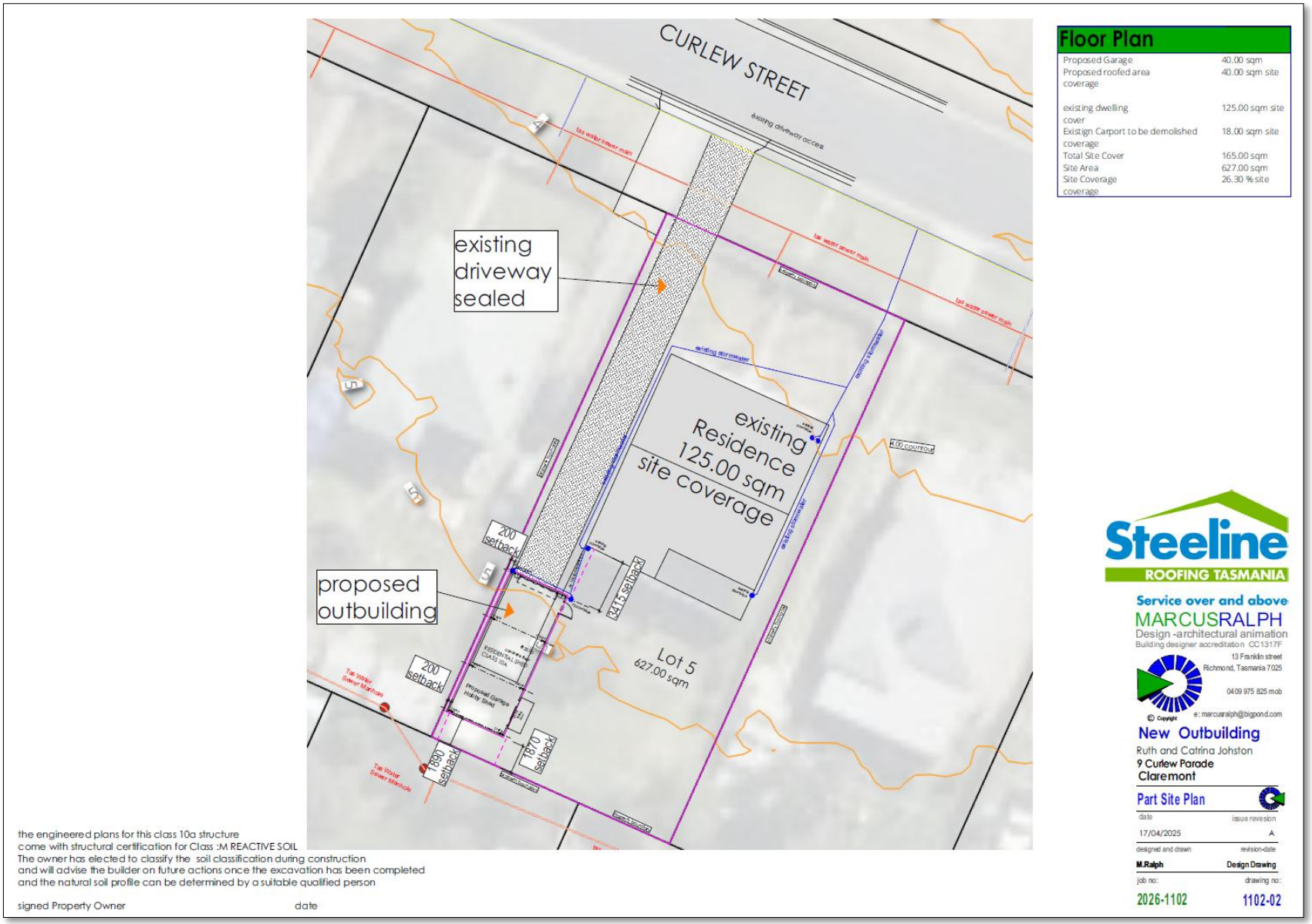

Figure 2 – Site Plan

4 PLANNING

4.1 Australian Building Code Board

This report presents a summary of the overall building construction risk to coastal erosion and inundation processes. This assessment has been conducted a 'normal' building design life category based on a 2025 baseline (ABCB 2015).

'The design life of buildings should be taken as 'Normal" for all building importance categories unless otherwise stated.'

As per Table 3-1, the following sub systems are identified for the proposed development:

- Building foundations subsystems are considered not accessible or economical to repair and therefore are to be designed with a 50-year life till 2075; and
- Wastewater subsystems are considered to have moderate ease of access but difficult or costly to replace or repair and are therefore to be designed with a 15-year life till 2038.

Table 3-1 Design life of building and plumbing installations and their components

Building Design Life Category	*Building Design Life (years)*	*Design life for components or sub systems readily accessible and economical to replace or repair (years)*	*Design life for components or sub systems with moderate ease of access but difficult or costly to replace or repair (years)*	*Design life for components or sub systems not accessible or not economical to replace or repair (years)*
Short	1 < dl < 15	5 or dl (if dl<5)	dl	dl
Normal	50	5	15	50
Long	100 or more	10	25	100

Note: Design Life (dl) in years

4.2 The Tasmanian Building Regulations 2016

The Tasmanian Building Regulations are regulated by the Consumer, Building and Occupation Services (CBOS) department and are formed from the Tasmanian Building Act 2016. New state-wide planning and building requirements are being implemented for hazardous areas. These include areas potentially subject to landslip, bushfire, flooding, coastal erosion, & costal inundation. Details of the Tasmanian Building Regulations are presented in Appendix 1.

4.3 Tasmanian Planning Scheme Overlay – Glenorchy City (TPS, 2021)

4.3.1 Coastal Erosion Hazard Code Overlay (CEHC)

The proposed works fall within low Coastal Erosion Hazard Overlay (Figure 3).

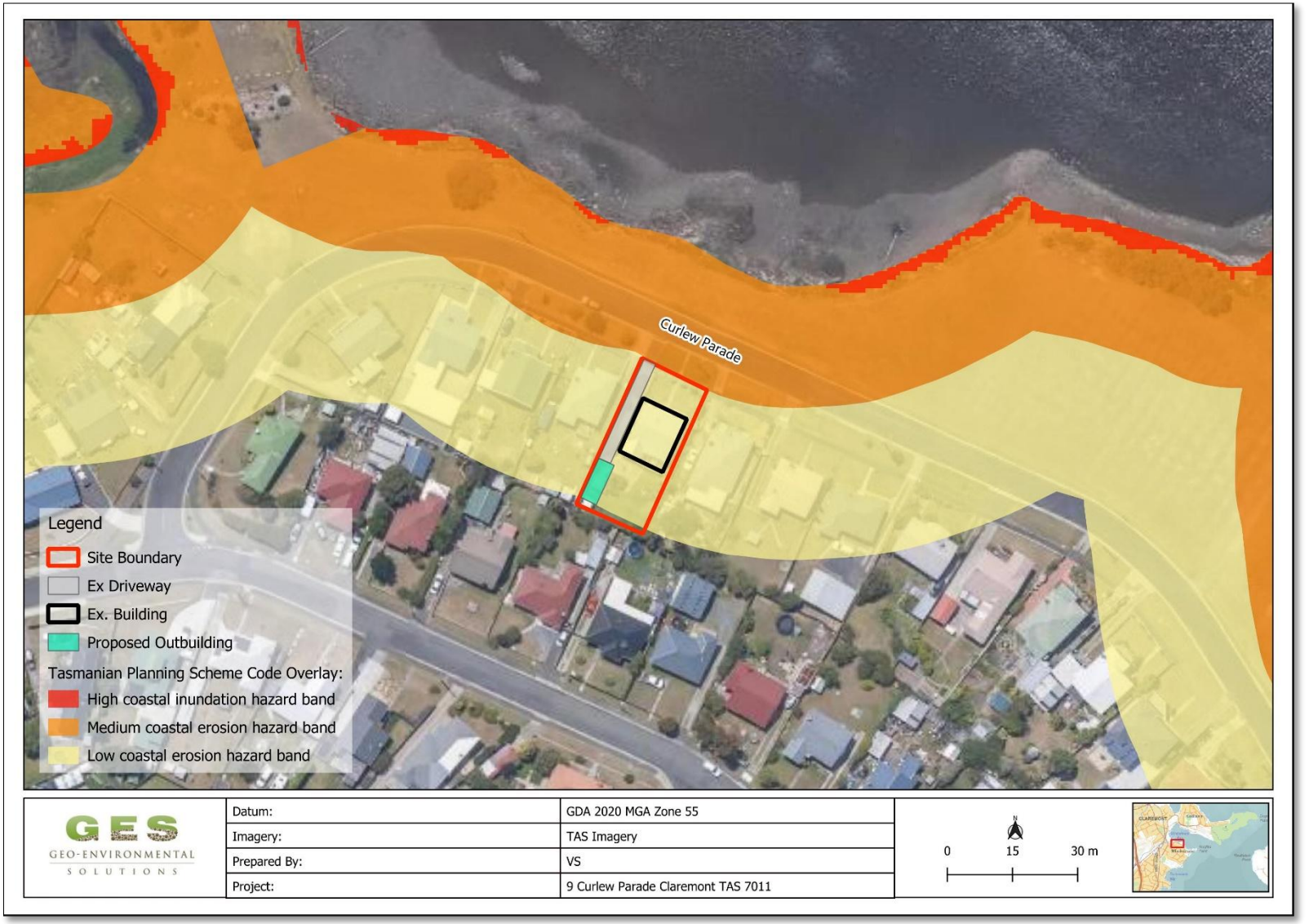

Figure 3 – Coastal Erosion Hazard Overlay (The List)

4.3.2 Coastal Inundation Hazard Code Overlay (CIHC)

The proposed works are not within a coastal inundation overlay. No further assessment required.

4.4 Development & Works Acceptable Solutions

Where applicable, the need for further performance criteria compliance is outlined in Appendix 1.

4.4.1 Coastal Erosion Hazard Code (CEHC)

C10.6.1.P1 Buildings and works.

Given that the proposed development resides in the CEHC Area, and there are no acceptable solutions for buildings and works in a CEHC Area,

The following performance criteria need to be addressed:

- *C10.6.1 P1.1 and P1.2*

5 SITE MAPPING

To assist in determination of the vulnerability of the site to erosion from coastal processes, it is important to determine the geological and geomorphological characteristics of the site.

5.1 Geology and Geomorphology

As per MRT mapping, the site is underlain by Undifferentiated Cenozoic sediments (TQ), which form part of the Undifferentiated Cenozoic sequences. These deposits generally comprise unconsolidated to weakly consolidated sediments of varying composition and age, including sands, silts, clays, gravels, and colluvial materials. The nature and thickness of these sediments can vary across the site and surrounding area, reflecting the complex depositional history associated with Cenozoic geological processes.

The site is located along the front line of the shoreline of Windermere Bay as part of Derwent River, separated from the shoreline by Curlew Parade. The shoreline was classified as muddy shores backed by harder bedrock. The site elevation near the front of the site is approximately 3.5-4m AHD, increasing to approximately 4-5 m AHD at the location where the proposed outbuilding is planned. The contours for the site were exported from Greater Hobart LiDAR 2013 DEM data using QGIS software.

5.2 Site Visit

GES has conducted site visit to assess the current shoreline condition and signs of the coastal erosion. The site observations indicate that the shoreline comprises a low-energy estuarine environment characterised by saltmarsh vegetation, intertidal mudflats and fine-grained sediments. At the time of inspection, the shoreline appeared stable, with no evidence of significant active erosion, scarping, shoreline retreat or other indicators of ongoing coastal instability. The foreshore environment is consistent with a depositional estuarine setting where sediment accumulation and saltmarsh development are the dominant geomorphic processes. Based on site observations and the sheltered nature of the bay, the shoreline is considered to have a low susceptibility to storm-driven erosion, with future coastal hazards more likely to be associated with gradual shoreline adjustment and increased inundation resulting from projected sea level rise. The typical shoreline condition is presented in Plate 1 and 2.

Plate 1 – Typical shoreline near the site

Plate 2 – Typical vegetation cover near the shoreline

Figure 4 – Geology and Hill shade model of the site with contours (Greater Hobart 2013 LIDAR data.)

6 COASTAL EROSION ASSESSMENT

Coastal erosion is the process of gradual wearing away of land by water, wind, and general weather conditions (DPIPWE 2008). It includes both short term erosion that may occur in a single erosion event or cluster of events (referred to as a 'storm bite,'), and coastal recession, the progressive, ongoing retreat of a shoreline due to multiple erosion events for a period of years or decades (Sharples et al. 2013).

6.1 Previous Studies

Table 1 Summary of Coastal Vulnerability Attributes Relevant to the Site (Source: The LIST)

Aspect	Description
Muddy Vulnerability: Coastal Vulnerability Mapping	Soft muddy shore mainly backed by bedrock
Coastal Vulnerability	Rocky (bedrock) shoreline undiff.
	Sloping rocky bottom in lowest intertidal to subtidal zone
Backshore Type Coastal Vulnerability	Bedrock (may include soil)

6.2 Sea Level Rise

While the Tasmanian Planning Scheme – Glenorchy City Council's Sea Level Rise (SLR) estimation predicts a rise of 0.8 meters by the year 2100, GES has chosen to utilize the latest and most up-to-date sea level rise projections. GES has opted for Canute 3.0, which is based on the IPCC AR6 projections, specifically the very high RCP8.5 climate scenario, to determine future sea level rise:

- *0.80m sea level rise by 2100 (Glenorchy City Council)*
- *1.01m sea level rise by 2100.*

6.3 Storm Tide

Storm tide events may be defined in terms of the culmination of astronomical tide and storm surge events. Maximum storm tide inundation levels have been adopted for the site based on a 1% AEP that an inundation event will occur. GES obtained data for storm tide levels from Canute 3.0 taking into account greenhouse gas emission scenario - very high RCP 8.5, Climate Model Ensemble Percentile Upper (95^{th}), IPCC Version AR6 (Baseline 1995 -2014). (Source: Canute 3.0)

- *The storm tide level adopted for the site is 1.24 m AHD.*

6.4 Swell and Local Waves

The site is within the bay which forms part of a low-energy estuarine coastal environment that is protected from direct ocean wave action and is characterised by relatively calm waters, gently sloping foreshore areas, and tidal influences. Coastal processes at the site are predominantly governed by tidal fluctuations, storm surge events, and long-term sea-level rise rather than significant coastal erosion associated with exposed open-coast conditions. As part of the broader Derwent Estuary system, the area provides recreational and environmental values while exhibiting coastal characteristics typical of a sheltered estuarine setting.

6.4.1 Wave Setup

Wave runup is the vertical distance that waves reach up the beach or coastal structures during storm events.

- Combined stillwater and wave set up (Canute 3.0) – 2.50m AHD.

6.5 Design Setbacks

When developing an understanding of the coastal erosion risk there are five key factors which need to be assessed (Mariani et al, 2012), these are detailed below:

- S1: Allowance for short term storm erosion (storm demand)
- S2: Allowance for ongoing underlying recession.
- S3: Allowance for recession due to future sea level rise (Bruun Rule)
- S4: Allowance for beach rotation and
- S5: Allowance for reduced foundation capacity (to Stable Foundation Zone)
- N: Design life of project – 50

The Figure 5 below presents the method of estimation of present day and future position of the coastal hazard lines diagrammatically for the sandy beaches investigated in the present study.

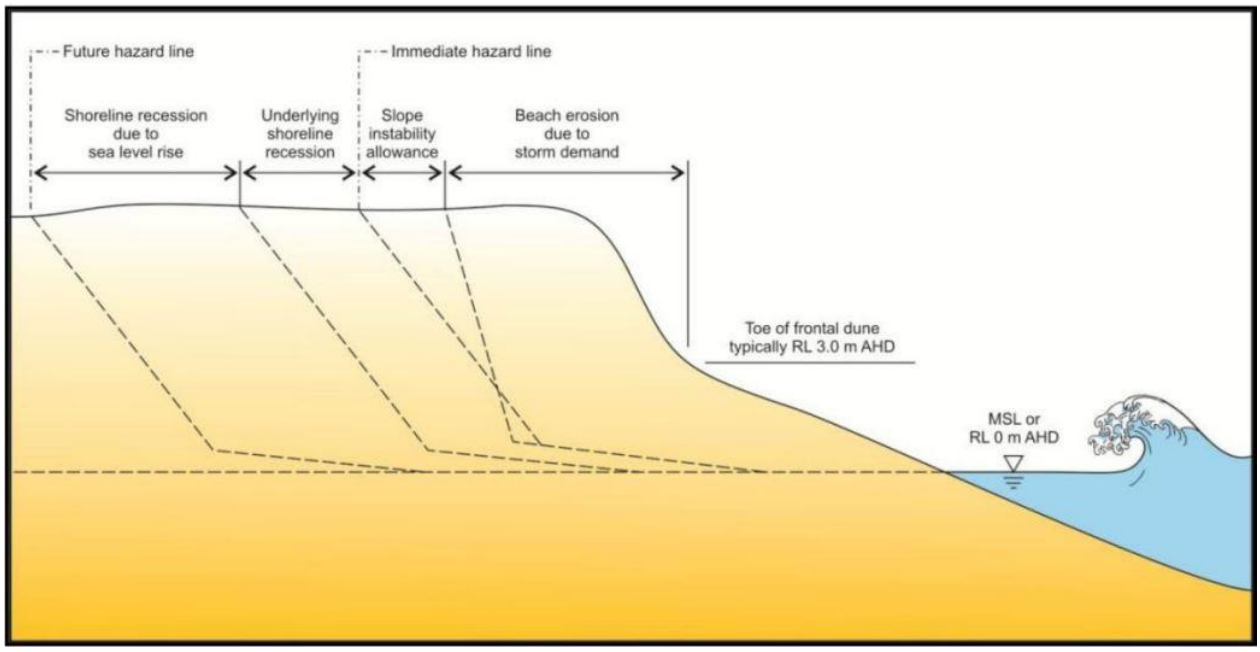

Figure 5 – Estimation of Coastal Hazard Lines

6.5.1 Allowance for Storm Erosion Demand (S1)

The" storm demand" refers to the volume of sand removed from sub- aerial beach and dunes (i.e. above 0m AHD) in response to an individual storm or series of closely spaced storms (Gordon, 1987).

A site inspection and review of available aerial imagery indicate that the shoreline near the site is a sheltered, low-energy estuarine environment characterised by saltmarsh vegetation, intertidal mudflats and fine-grained sediments. The site is protected from direct ocean swell and significant wave energy, with coastal processes primarily governed by tidal fluctuations and locally generated wind waves within the estuary. No evidence of substantial storm-induced erosion, erosion scarps, shoreline retreat or other indicators of active coastal instability was observed during the site inspection.

Given the sheltered nature of the bay and the absence of an exposed sandy shoreline susceptible to episodic storm erosion, a storm erosion demand allowance is not considered to be a dominant coastal hazard at this location. Historical shoreline behaviour and current site conditions indicate that shoreline changes are generally gradual and associated with estuarine sedimentation processes rather than significant storm-driven erosion events.

The storm erosion demand (S1) is considered negligible, and an allowance of 0 m has been adopted. Future coastal hazard exposure at the site is expected to be driven primarily by sea level rise and associated inundation processes rather than storm-induced shoreline recession.

6.5.2 Allowance for Long Term (underlying) Recession (S2)

Long-term (underlying) shoreline recession is not considered applicable to the site at Windermere Bay.

- *There is no underlying long - term recession occurring along the shoreline of Windermere Bay near the site.*

6.5.3 Allowance for Shoreline Recession due to sea level rise (S3)

The Bruun Rule has been applied to the site to estimate the response of the shoreline profile to sea-level rise. The Bruun Rule is widely used by government and non-government bodies to determine recession rates on sandy shores which are at risk of inundation. The Bruun Rule states that a typical concave-upward beach profile erodes sand from the beach face and deposits it offshore to maintain constant water depth. There are a few cases where the Bruun rule cannot be applied, which include where longshore drift is predominant, where there is dominant influence of surrounding headlands and in environments where wave activity is minimal. While there are objections to the Bruun Rule in some cases, there are no accepted alternatives.

6.5.3.1 Bruun Rule Model

The standard Bruun Rule has been applied to the site to determine sea level rise induced recession from the dominant waves active at the site.

The Standard Bruun Rule is typically expressed as R = s(L/(D + h)) or R= SLR*50 as illustrated in Figure 6.

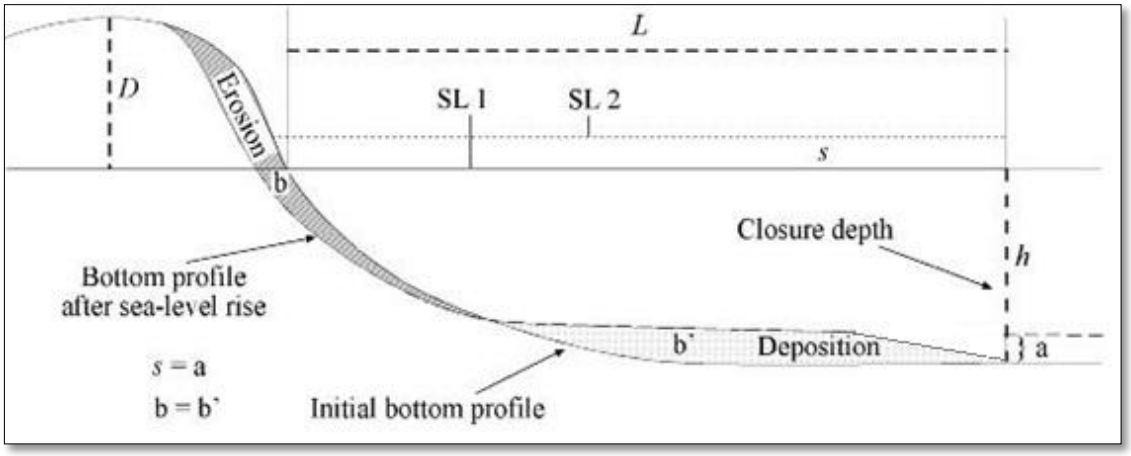

Figure 6 - Summary of standard Bruun Rule for Calculating Beach Recession

A simplified equation was employed to determine the coastal recession distance for the proposed dwelling on the site. In accordance with NCC regulations, the expected lifespan of the proposed building is 50 years. The findings of this analysis are provided below.

The Bruun Rule has been considered as a conceptual framework for estimating potential shoreline response to sea level rise. However, given the estuarine setting of Windermere Bay, characterised by saltmarsh and intertidal mudflats rather than a wave-dominated sandy beach profile, the assumptions underpinning the Bruun Rule are not strictly satisfied. Accordingly, shoreline response has been assessed qualitatively based on anticipated landward migration of intertidal habitats under projected sea level rise to 2100, rather than direct application of a classical Bruun equilibrium profile. Based on projected sea level rise to 2100 and the low-gradient nature of the estuarine platform, potential shoreline translation is

expected to be limited and largely controlled by existing site constraints. The adopted recession allowance of approximately 20 m to 2100 (1% AEP) has been derived using a combined slope-based shoreline translation approach and an assessment of the site's limited landward migration capacity due to physical constraints within the site such as the existing road and the existing dwelling.

- *The estimated coastal recession due to sea level rise for the site is 20m by 2100*

6.5.1 Allowance for Beach Rotation

No beach rotation is observed along the shoreline as is seen by the stable vegetation line observed near the site. Therefore, there will be no allowance for beach rotation included within the total coastal erosion.

6.5.2 Allowance for dune stability (Reduce Foundation Capacity to Stable Foundation Zone) (S4)

No allowance for dune stability is required, as the proposed building is located behind Curlew Parade and existing buildings, and there are no dunes present within the proposed development envelope. The site is therefore situated entirely within a stable foundation zone, and standard foundation design can be applied without additional setback or reduction in foundation capacity.

6.6 Summary of Erosion Allowance

The designed setback did not take into consideration the presence of the existing road and existing buildings, which could potentially reduce the exposure of the site to coastal erosion. The total erosion allowance as specified above has been calculated along the shoreline for 2100 is presented below within Table 2 and Figure 7.

Table 2 Summary of Design Setbacks at the site

S1 - Erode 2x1% AEP storm (m)	*S2 - Yearly Recede (m, p.a.)*	*S3 - Recession due to SLR (m)*	*S4 – Beach Rotation (m)*	*S5 - Dune Stability (m)*
0	*0*	*20*	*0*	*0*

Allowance for the design setback (DS) is defined as:

$$DS = S1 + N * S2 + S3 + S4 + S5$$

$$DS = 20m$$

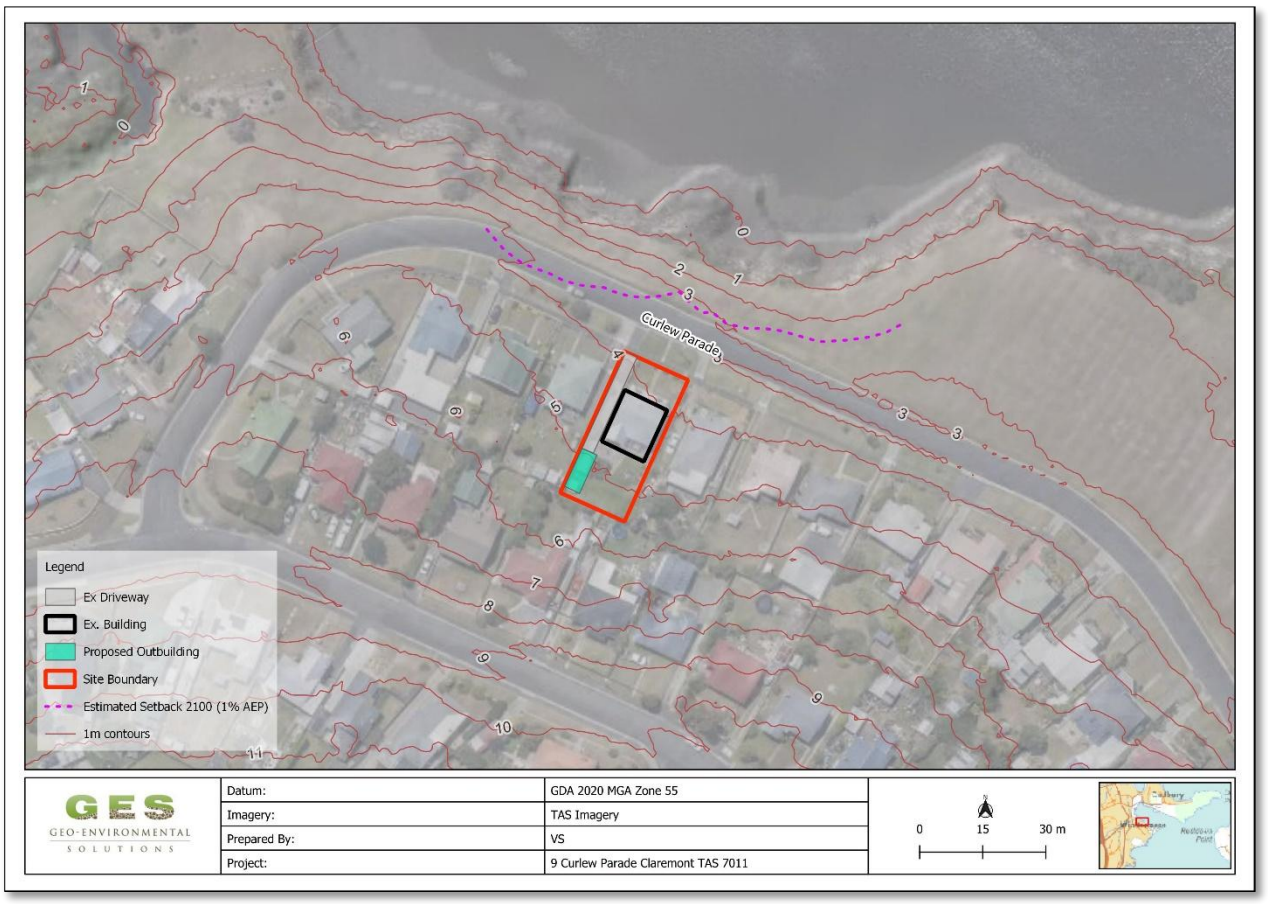

Figure 7 - Allowance for coastal erosion by 2100 (1% AEP)

7 RISK ASSESSMENT

The qualitative risk assessment criteria have been developed to identify key risks that may arise from building works in areas that are vulnerable to coastal erosion hazard. The risk assessment is based on the design life of the building to the year 2100 for a 1.01m AHD high SLR scenario.

The criteria are based on a risk assessment matrix consistent with the Australian Standard AS4360 on Risk Management (AS4360). The qualitative assessment of risk severity and likelihood were used to help provide a qualitative risk assessment based upon the coastal vulnerability assessment completed for the site. A detailed risk assessment addressing the performance criteria is presented in Appendix 5. GES has established from the risk assessment that the level of risk is acceptable by 2100.

8 CONCLUSIONS AND RECOMMENDATIONS

GES has established setbacks for the proposed works to account for both short and long-term erosion.

- The designed setback has been determined to be approximately 20 meters from the 0-meter AHD contour line.
- GES has established from the qualitative risk assessment that the proposed development works at the site are acceptable.
- The proposed building is located outside the designed coastal setback, and as such, no specific recommendations are required to meet setback requirements.
- As per the estimates of possible erosion by 2100 (1% AEP) and the setbacks of the proposed works, it is considered that the risk posed from future erosion to the property within the life of the development and use is low and acceptable.
- The proposed development satisfies the conditions for proposed works within the coastal erosion hazard area and satisfies C10.6.1 performance solution for the coastal erosion hazard code as per Tasmanian Planning Scheme – Glenorchy City Council (TPS 2021).

9 LIMITATIONS STATEMENT

The following limitations apply to this report:

- Climate Futures Light Detection and Ranging (LIDAR) digital elevation model is used for the site modelling;
- The values estimated in this report provide an order of magnitude for assessing climate change impacts and in particular climate change induced sea level rise impacts. The information is based on a collation of existing information and data, with some site specific modelling for planning purposes.

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APPENDIX 1 – ACCEPTABLE SOLUTIONS

Coastal Erosion Hazard Code (CEHC) Areas

C10.6.1 Buildings and works, excluding coastal protection works, within a coastal erosion hazard area

Objective:

That:

(a) building and works, excluding coastal protection works, within a coastal erosion hazard area, can achieve and maintain a tolerable risk from coastal erosion; and

(b) buildings and works do not increase the risk from coastal erosion to adjacent land and public infrastructure.

Acceptable Solutions	Performance Criteria
A1 No Acceptable Solution.	**P1.1** Buildings and works, excluding coastal protection works, within a coastal erosion hazard area must have a tolerable risk, having regard to: (a) whether any increase in the level of risk from coastal erosion requires any specific hazard reduction or protection measures; (b) any advice from a State authority, regulated entity or a council; and (c) the advice contained in a coastal erosion hazard report. **P1.2** A coastal erosion hazard report demonstrates that: (a) the building and works: (i) do not cause or contribute to any coastal erosion on the site, on adjacent land or public infrastructure; and (ii) can achieve and maintain a tolerable risk from a coastal erosion event in 2100 for the intended life of the use without requiring any specific coastal erosion protection works; (b) buildings and works are not located on actively mobile landforms, unless for engineering or remediation works to protect land, property and human life.

APPENDIX 2 – TASMANIAN BUILDING REGULATIONS 2016

Division 4 - Coastal erosion

57. Coastal erosion hazard areas

1) For the purposes of the Act, land is a coastal erosion hazard area if –
    a. the land is shown on a planning scheme overlay map as being land that is within a coastal erosion hazard area; and
    b. the land –
        i. is classified as land within a hazard band of a coastal erosion hazard area; or
        ii. is shown on a planning scheme overlay map as being land in an investigation area for a coastal erosion hazard area and the land has not been subsequently classified as being an acceptable risk.
2) For the purposes of the definition of hazardous area in section 4(1) of the Act –
    a. classification under a coastal erosion determination as being land that is within a hazard band of a coastal erosion hazard area is a prescribed attribute; and
    b. a coastal erosion hazard area is a hazardous area.

58. Works in coastal erosion hazard areas

1) A person must not perform work in a coastal erosion hazard area unless he or she is authorised to do so under the Act.
2) If a person intends to perform work in an investigation area of a coastal erosion hazard area, the person must, before performing the work, ensure that the land is classified in accordance with the coastal erosion determination –
    a. as being an acceptable risk; or
    b. into a hazard band for the coastal erosion hazard area.
3) A responsible person for work being performed in a coastal erosion hazard area must ensure that the work is being performed in accordance with the Act and the coastal erosion determination.
4) A person performing work in a coastal erosion hazard area must ensure that the work complies with the Act and the coastal erosion determination.

APPENDIX 3 - DIRECTORS DETERMINATION & BUILDING REGULATIONS 2016 - COASTAL EROSION HAZARD REPORTING

Coastal Erosion Hazard Assessment

This coastal erosion hazard report has been prepared in general accordance with methodology specified in the Directors Determination – Coastal Erosion Hazard Areas pursuant to section 20(3)(b) of the Building Act 2016 and regulation 51 of the Building Regulations 2016 (Document Version 1.2 Dated 27 September 2021).

This report has been prepared by Vinamra Gupta who has more than 7 years' experience as a Geotechnical Engineer. Vinamra has a master's degree in civil engineering. In his role at GES, he prepares technical reports such as Geotechnical Reports in accordance with AS1726 including Coastal Vulnerability Assessments, Stormwater Assessment, Landslip Assessments in Accordance Australian Geomechanics Guidelines (AGS 2007) and Site Classification Reports as per AS2870.

Practices used in this assessment are developed from recent literature, including regional public domain remote sensing, wave, sea level, and storm tide modelling data obtained through various government agencies. This data is refined to a local (site scale) using detailed bathymetry models and methods within the coastal engineering manual (CEM) as well as equations obtained from recent publications to determine wind setup, wave setup, and wave runup which is specific to the coastal setting.

Specific determinations regarding coastal hazard reporting as presented in the Director's Determination - Coastal Erosion Hazard Areas, Division 2, Section 4 'Coastal Hazard Reporting' are presented in the Table below.

Signature

Vinamra Gupta

Senior Geotechnical Engineer

Works in a Coastal Erosion Hazard Area

According to this director's determination, the following regulations are applicable for the works in a coastal erosion hazard area:

(1) The AS 2870 site classification of any land located in a coastal erosion hazard area must be Class P, on the basis that it may be subject to coastal erosion.

(2) A coastal erosion hazard report must be prepared.

(3) The design of the building footing system must be prepared by an engineer-civil.

(4) The building design (including footing system) must take into account the coastal erosion hazard report.

(5) 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.

(6) In determining an application for a permit, the permit authority must take into account the coastal erosion hazard report and any relevant coastal erosion management plan.

Report Determination Criteria	Coastal Erosion Hazard Report Compliance Checklist	Compliance	Specific Comments
4. (1)	Geotechnical practitioner with experience and competence in the preparation of coastal erosion hazard reports	Yes	
4. (1) (a)	Signed Declaration	Yes	Report Author:
4. (1) (b)	A report of a geotechnical site investigation undertaken consistent with AS 1726	Yes	The AS 1726 geotechnical model presented herein is based on deep sand profiles which are mapped at the site. No further information was required in the assessment given the site conditions are known.
4. (1) (c)	Conclusions based on consideration of the proposed work as to:		
4. (1) (c) (i)	whether the work is likely to cause or contribute to coastal erosion on the land or on adjacent land;	Yes	The works will not cause or contribute to coastal erosion on the land or on adjacent land within the proposed building design life.
4. (1) (c) (ii)	whether work is proposed on actively mobile landforms;	Yes	The proposed building site and works area is not regarded as being actively mobile.
4. (1) (c) (iii)	whether the work can achieve and maintain a tolerable risk for the intended life of the building having regard to:		
	• the nature, intensity and duration of the use;	Yes	This assessment has been conducted with measures put in place to ensure that within the building's design life, the risks are acceptable in line with sites typical of residential use and with typical intensity of use. This assessment is based on the intended use as outlined in the development application. Other aspects not considered in this assessment include site or foreshore disturbance as the result of the development of vehicle access tracks, unauthorised clearing of vegetation, and unauthorised pedestrian access tracks.
	• the type, form and duration of any development;	Yes	The proposed development is adequately set back from the beach dune to achieve tolerable risk. The design of the building footing system must be prepared by an engineer-civil. Beyond the design life of the development, it is always recommended that consideration is given to a footing system which will allow for greater ease for any future underpinning works, allowance for building retreat and allowance for future cross bracing if required.
	• the likely change in the risk across the intended life of the building;	Yes	Consideration is given to projected coastline recession based on site specific modelling, regionally specific sea level rise forecasts, and geotechnical foundation considerations consistent with a site-specific slope stability assessment (Neilsen et. al. 1992).

	• the ability to adapt to a change in the risk;	Yes	Additional buffer allowances are accounted for in the assessment.
	• the ability to maintain access to utilities and services;	Yes	The site will retain full access to utilities and services within the design life of the proposed development.
	• the need for specific coastal erosion hazard reduction or protection measures on the site;	Yes	Coastal erosion hazard reduction or protection measures are recommended on the site as part of the site engineering design for civil works and the risk is deemed tolerable
	• the need for coastal erosion hazard reduction or protection measures beyond the boundary of the site; and	NA	Coastal erosion hazard reduction or protection measures are not recommended beyond the boundary of the site based on the projected lifetime of the proposed development.
	• any coastal erosion management plan in place for the site and/or adjacent land.	NA	A coastal erosion management plan is not required to mitigate risks to the site within the lifetime of the proposed development.
4. (2)	protection measures for any hazardous chemical used, handled, generated or stored on the site, taking into consideration the potential risks of the hazardous chemical to human health and safety as a consequence of coastal erosion on the site or adjacent land.	Yes	Overall risks associated with the storage of hazardous chemicals at the site will not be heightened beyond what has been assessed as low risk based on recommendations. No additional protection measures are recommended for the storage of hazardous chemicals at the site.
4. (4)	The declaration format for a coastal erosion hazard report must contain:		
4. (4) (a)	details of, and be signed by, the person who prepared or verified the report;	Yes	
4. (4) (b)	confirmation they have the appropriate qualifications, expertise and level of current indemnity insurance;	Yes	
4. (4) (c)	confirmation that the report has been prepared in accordance with the specified methodology.	Yes	

APPENDIX 4 QUANTITATIVE RISK ASSESSMENT TABLES

Consequence Index

Consequence	Details - Storm Erosion and Inundation	Details – Waterways and Coastal Protection
Catastrophic	Loss of life, loss of significant environmental values due to a pollution event where there is not likely to be recovery in the foreseeable future.	Very serious environmental effects with impairment of ecosystem function. Long term, widespread effects on significant environment (eg. RAMSAR Wetland)
Major	Extensive injuries. Complete structural failure of development, destruction of significant property and infrastructure, significant environmental damage requiring remediation with a long-term recovery time.	Serious environmental impact effects with some impairment of ecosystem function. Relatively widespread medium-long term impacts.
Moderate	Treatment required, significant building or infrastructure damage i.e. loss of minor outbuildings such as car ports, garages and the like. Replacement of significant property components. linings, hard paved surfaces, cladding, flooring. Moderate environmental damage with a short-term natural or remedial recovery time.	Moderate effects on biological or physical environment (air, water) but not affecting ecosystem function. Moderate short term widespread impacts (e.g. significant spills)
Minor	Medium loss – repair of outbuildings and repair and minor replacement of building components of buildings. Replacement of floor/window coverings, some furniture through seepage (where applicable). Minor environmental damage easily remediated.	Minor effects on biological or physical environment. Minor short-term damage to small area of limited significance.
Insignificant	No injury, low loss – no replacement of habitable building components, some remediation of garden beds, gravel driveways etc. Environment can naturally withstand and recover without remediation. Inundation of the site, but ground based access is still readily available and habitable buildings are not inundated, including incorporated garages.	Limited damage to minimal area of low significance.

Likelihood Index

Level	Descriptor	Description	Guideline
A	Almost Certain	Consequence is expected to occur in most circumstances.	Occurs more than once per month.
B	Likely	Consequence will probably occur in most circumstances.	Occurs once every 1 month – 1 year.
C	Occasionally	Consequence should occur at some time.	Occurs once every 1 year - 10 years.
D	Unlikely	Consequence could occur at some time.	Occurs once every 10 years – 100 years.
E	Rare	Consequence may only occur in exceptional circumstances.	Occurs less than once every 100 years.

Source: AS/NZS 4360:2004 Risk Management

Qualitative Risk Matrix

Likelihood of the Consequence	Maximum Reasonable Consequence				
	(1) Insignificant	(2) Minor	(3) Moderate	(4) Major	(5) Catastrophic
(A) Almost certain	11 High	16 High	20 Extreme	23 Extreme	25 Extreme
(B) Likely	7 Moderate	12 High	17 High	21 Extreme	24 Extreme
(C) Occasionally	4 Low	8 Moderate	13 High	18 Extreme	22 Extreme
(D) Unlikely	2 Low	5 Low	9 Moderate	14 High	19 Extreme
(E) Rare	1 Low	3 Low	6 Moderate	10 High	15 High

Source: AS/NZS 4360:2004 Risk Management

APPENDIX 5 - QUANTATIVE RISK ASSESSMENT

BUILDING AND WORKS WITHIN A COASTAL EROSION HAZARD AREA

Performance Criteria C10.6.1 P1.1 Buildings and works, excluding coastal protection works, within a coastal erosion hazard area must have a tolerable risk, having regard to:	Relevance	Management Options	Managed Risk Assessment (where relevant)			Further Assessment Required
			Consequence	Likelihood	Risk	
(a) whether any increase in the level of risk from coastal erosion requires any specific hazard reduction or protection measures	The proposed works will not increase level of the risk	N/A	Insignificant (1)	Rare (E)	Low (1)	No
(b) any advice from a State authority, regulated entity or a council; and	N/A	N/A				
(c) the advice contained in a coastal erosion hazard report		N/A	Insignificant (1)	Rare (E)	Low (1)	No