PLAN OF SUBDIVISION

PDA Surveyors incorporating WALTER SURVEYS
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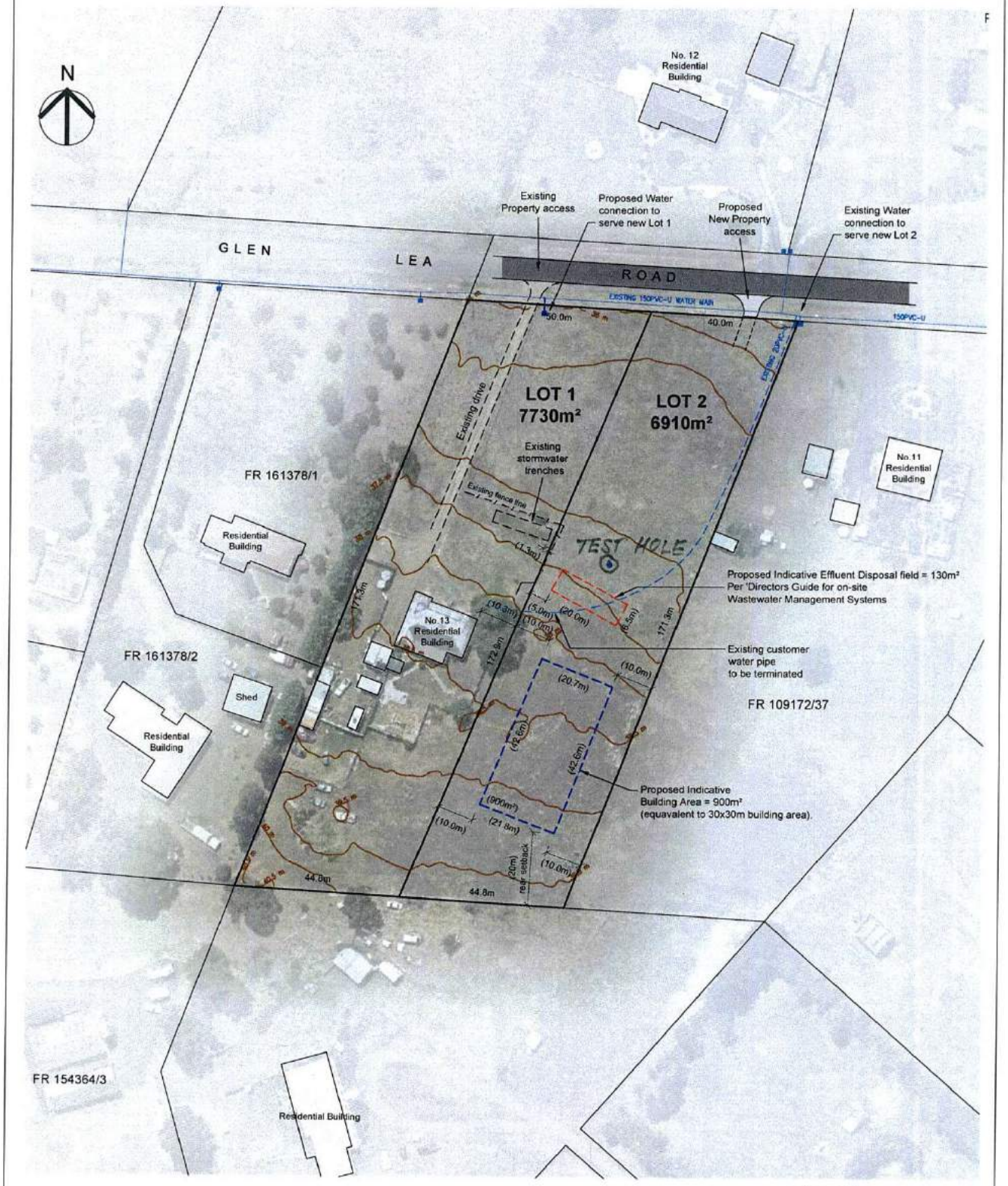
EMAIL: pda.hbt@pda.com.au

Owners	Suzanne Roberta Doyle	Address	13 Glen Lea Road, Brighton
		Council	Brighton Council
Title References	FR 109172/36	Planning Scheme	Brighton Interim Planning Scheme 2015
		Zone & Overlay	13.0 Rural Living; 117.WCP
Schedule Of Easements	Schedule of Easements on file for details.		

This plan has been prepared only for the purpose of obtaining preliminary subdivision approval from the Council and the information shown hereon should be used for no other purpose. All measurements and areas are subject to final survey.

Scale	Date	PDA Reference	Map reference	PID	Point of Interest GDA94 MGA55
1:1000	11 November 2020	46085CT-1A	5227-41	1491251	520768E, 5274095N



FIGURE

HOBART
C.M. Terry, B. SURV. (Tas.), M.SSSI. (Director)
H. Clement, B. SURV. (Tas.), M.SSSI (Director)
M.S.G. Denholm, B. GEOM. (Tas.), M.SSSI (Director)
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A.M. Peacock, B. APP. SC. (SURV), M.SSSI. (Consultant)
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Our Ref: 46085CT

14 December 2020

The General Manager
Brighton Council

Sent via: development@brighton.tas.gov.au

Dear Sir/Madam,

Planning Permit Application for a 1 lot subdivision
At 13 Glen Lea Road, Brighton

In accordance with instructions from our client, this application for planning permit proposes the subdivision of land (creating 1 additional lot).

To support this application, the following is submitted:

- Planning assessment report;
- A scaled and dimensioned Plan of Subdivision;
- Completed Planning Permit Application form; and
- Current copy of title, plan and any relevant schedule of easements.

Please forward an invoice for the fee as soon as possible to ensure prompt payment.

We will forward the required bushfire Hazard report and management plan by separate cover when it is available.

In accordance with section 52(i)(c) of the Land Use Planning and Approvals Act 1993 we advise that the owner has been notified of this application.

Yours faithfully
PDA Surveyors

Per: 

Craig Terry
Managing Director & Registered Land Surveyor

PLANNING ASSESSMENT REPORT

Proposal: ONE LOT SUBDIVISION

The Land: 13 GLEN LEA ROAD, BRIGHTON

Owner: Suzanne Doyle

THE LAND
The subject land is located at 13 Glen Lea Road, Brighton. The land contains a single existing dwelling and associated outbuildings, which are located at the rear western edge of the site. The land is gently undulating to flat land and is clear of any remnant or significant native vegetation.

The surrounding area is almost exclusively used for rural living purposes on varying sized lots ranging between 0.5ha to 2ha in size. The only alternative use in the immediate area is on a title on the opposite side of Glen Lea Road, which is identified as public open space that adjoins the Jordan River.

THE PROPOSAL
The application proposes to subdivide the land by creating two lots. One lot will contain the existing dwelling and all outbuildings, while the other proposed lot will be vacant. Both lots will have direct frontage to Glen Lea Road. The lot for the existing dwelling will maintain its own driveway, while the new vacant lot will have its own new vehicle crossover via its own lot frontage.

The proposal shown on the enclosed plan of subdivision details an indicative building area, and indicative location for an effluent disposal area to demonstrate capacity of the new lot against the relevant provisions of the Planning Scheme.

PLANNING SCHEME
The land is subject to the provisions of the Brighton Interim Planning Scheme 2015.

There are no exemptions for this type of subdivision under other clauses in the Scheme. Clause 9.7.1 states that a permit is required for development involving a plan of subdivision.

The land is located in the Rural Living Zone and is also subject to the Bushfire Prone Areas Overlay and partially affected by the Waterway and Coastal Protection Areas Overlay.

RURAL LIVING ZONE

The purpose of the Rural Living Zone at Clause 13.1 (relevant to this application) is:

- To provide for residential use or development on large lots in a rural setting where services are limited.
- To provide for compatible use and development that does not adversely impact on residential amenity.
- To avoid land use conflict with adjacent Rural Resource or Significant Agriculture zoned land by providing for adequate buffer areas.

There specified Local Area Objectives and Desired Future Character Statements Purpose for the Rural Living Zone Area A designation are as follows:

Local Area Objective is - Rural Living Area A is to provide for higher density rural living closer to settlements and urban fringe areas, with greater service provision and fewer environmental constraints. This objective is implemented by having a minimum lot size of 5000m2.

Desired Future Character Statement is- Rural Living Area A will develop at a higher density than other Rural Living areas, capitalising on their proximity to settlements, whilst still providing for rural values and a high level of amenity and privacy. This character statement will be achieved by ensuring that siting and scale of development does not cause unreasonable impacts on neighbouring amenity.

For this type of subdivision, the relevant development standards of the Rural Living Zone are 13.5.1 (Lot Design), 13.5.3 (Ways and Public Open Space) and 13.5.4 (Services).

13.5.1 LOT DESIGN

The following provides justification as to how the design of the subdivision meets either the acceptable solutions, performance criteria or a combination of both:

A1
Each of the lots is at least 5000m^2 in size.

A2/P2
The parts of the proposal that meets the acceptable solution is:

- That the land is not within the vicinity of any land that is located in the Rural Resource Zone, Significant Agricultural Zone or Environmental Management Zone.
- The building area on the vacant lot has an average slope of less than 1 in 5.
- The building area on the vacant lot is clear of easements and/restrictive covenants on title.
- The proposal does meet all applicable standards in relevant Codes in the Scheme (see below).
- The building area has direct orientation to the north for a distance of 26m, which provides more than ample area for good solar access for a future dwelling.
- The flat to gently undulating topography will mean that excavation associated with future development will be minimised.
- The building area is provided with a generous area around it to ensure privacy and amenity, albeit that 20m side setbacks are not strictly achieved. There is sufficient scope on each lot to establish fencing and or landscaping areas to provided added certainty for residential amenity.

A3
Each lot has a minimum frontage of 40 metres.

A4
No lot is an internal lot.

A5/P5
Similarly as stated above for the new lot, the setbacks for the existing dwelling on Lot 1 is provided with a generous area around it to ensure privacy and amenity, albeit that 20m side setbacks are not strictly achieved. There is sufficient scope on each lot to establish fencing and or landscaping areas to provided added certainty for residential amenity.

It should be noted that the setback development standards at Clause 13.4.2 are the same measure that is used for assessment for lots in Rural Living Zone Area B and Area C. Those Areas can have lots with a minimum lot size at least double the size than that proposed in this application. This means that those side boundary setbacks would be more easily achieved on larger lots. It would be preferable with smaller lot size expectations that smaller side

setbacks could be considered to be an acceptable solution. Notwithstanding this design preference, the proposal remains consistent with the performance criteria as stated above.

13.5.3 WAYS AND PUBLIC OPEN SPACE

The following provides justification as to how the design of the subdivision meets the acceptable solutions/performance criteria:

- The proposal does not include any ways or public open space.
- Given Council's Public Open Space policy, it is expected that a cash in lieu payment will be required as a result of any permit that may be granted requiring a 5% cash contribution of the unimproved value of any additional Lots, in line with Council's existing policy.

13.5.4 SERVICES

The following provides justification as to how the design of the subdivision meets the acceptable solutions/performance criteria:

A1 Each lot as shown on the plan, is provided with a connection to a reticulated water supply.

P2 A review of the Directors Guidelines for On-site Wastewater Management Systems (the standard) has been undertaken during the design of this subdivision to ensure that the existing and future development is capable of complying with this standard for on-site waste water treatment.

The waste disposal field for the existing dwelling is located within its own lot and has at least a 1.3m setback to the new boundary. Lot 2 has shown capacity to locate an area of at least 130m^2 for an indicative effluent disposal field (shown on the plan), which is compliant with a minimum area in the standard for heavier clay soil profiles (worst case scenario drainage) and able to meet the required setbacks from boundaries (generally 2 metres from boundaries). Given that the actual soil profile for the subject land is identified as "Undifferentiated alluvial soils" it is expected that an area of less than 130m^2 will be necessary.

P3 Given the size of the lots and the need for additional water supply to service the rural lifestyle land use, it is reasonable to say that stormwater will be contained on site via water storage tanks and a compliant overlflow system. There is no need to add any formal stormwater system to the land for this purpose.

CODES

E1.0 BUSHFIRE PRONE AREAS CODE

'Bushfire-prone area' means:

a) Land that is within the boundary of a bushfire-prone area shown on an overlay on a planning scheme map; or
b) Where there is no overlay on a planning scheme map land that is within 100m of an area of bushfire-prone vegetation equal to or greater than 1ha.

This code applies to:

- Subdivision of land that is located within, or partially within, a bushfire-prone area; and
- A use, on land that is located within, or partially within, a bushfire-prone area that is a vulnerable use or hazardous use.

On the basis that the subject land is located in a bushfire prone area, it is necessary for the subdivision to be able to demonstrate that it can be compliant with the provisions of this code and Australian Standard *AS3959–2009 Construction of buildings in bushfire-prone areas*.

A Bushfire Hazard Report and BHMP is being prepared and will be supplied separately to this application. The design of the subdivision has taken into consideration these requirements.

E5.0 ROAD AND RAILWAY ASSETS CODE

As the Code is relevant to this proposal, the following assessment is provided.

E5.6.2 ROAD ACCESSES – A2
The subject site is located on a road that has a speed limit of 60 km/hr. Each lot has no more than one access each and therefore meets the Acceptable Solution at this clause.

E5.6.4 SIGHT DISTANCES AT ACCESSES – A1
The subject site and the surrounding context is located in an area that has a flat to mildly undulating profile. In that regard, there are generally unencumbered sight distances from both the existing and proposed new accesses for the subdivision, and will easily accommodate the required minimum site distance of 80 metres in either direction along Glen Lea Road for both accesses.

E6.0 PARKING AND ACCESS CODE

As the Code is relevant to this proposal, the following assessment is provided.

E6.7.1 NUMBER OF VEHICULAR ACCESSES – A1
Each lot has a single lot access per road frontage as specified in the acceptable solution.

E6.7.2 DESIGN OF VEHICULAR ACCESSES – A1
AS/NZS 2890.1:2004 Parking Facilities Part 1: Off-street car parking requires:

- Location - no specific requirements for this proposal
- Sight distance = 55m (easily achieved)
- Geometry – there is ample area on each lot and orientation to road to ensure that the new or existing access can comply with geometry requirements of the Standard.
- Gradient – not particularly relevant in this application given the flat profile of the land, as this part of the standard seeks to limit the creation of access that have steep gradients beyond 1 in 20.

E6.7.14 ACCESS TO A ROAD
There is sufficient area at the frontage of Lot 2 to construct a new vehicle access that can comply with the road authority's standards/LGAT standard drawings. Lot 1 contains an existing vehicle access. There are not considered to be any particular site constraints that would necessitate more detail design at this conceptual stage in regard to access for each lot. It is expected that any permit conditions will control the construction and/or upgrade of access for each lot.

E7.0 STORMWATER MANAGEMENT CODE

As the Code is relevant to this proposal, the following assessment is provided.

P1 Given the generous size of each lot and each lots capacity to collect and re-use stormwater or dispose of on-site, it is not considered necessary to provide a new connection to a formal stormwater system (albeit that the existing subdivision does have access to a drainage easement on an adjoining lot – see title for detail).

E11.0 WATERWAY AND COASTAL PROTECTION CODE

As the Code is relevant to this proposal, the following assessment is provided.

P1 The Waterway and Coastal Protection Area only applies to a portion of the subject land. Within that area there are no works associated with the subdivision that will occur other than a single connection to the reticulated water supply for Lot 1, which will be constructed via

a sub-surface connection and the works area. On that basis the proposal is consistent with the performance criteria for the following reasons:

- The proposal minimises the impact on natural values as the subject land is located more than 300m from the closest waterway (Jordon River to the northwest).
- The existing dwelling and building area for Lot 2 and respective waste water disposal areas are outside the Waterway and Coastal Protection Area.
- The subject land is not located within a Potable Water Supply Area.

OTHER MATTERS

The proposal does not breach any restrictive covenants contained within the Schedule of Easements.

CONCLUSION

Given the above assessment, this report/proposed subdivision has demonstrated compliance with the requirements of the Brighton Interim Planning Scheme 2015.

We seek that the Council support this application in its current form and grant a planning permit.

We are satisfied that the permit may contain conditions relating to:

- The construction of the new vehicle crossover for Lots 2 and other associated infrastructure requirements.
- Procedural requirements relating to the creation of titles.
- Requirements of TasWater as it relates to the connection to the reticulated water supply.
- Possible need to make a cash in lieu payment for a public open space contribution.

It is not envisaged that there would be any other substantial planning matters that the permit will need to control.

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Title References	FR 109172/36	Planning Scheme	Brighton Interim Planning Scheme 2015
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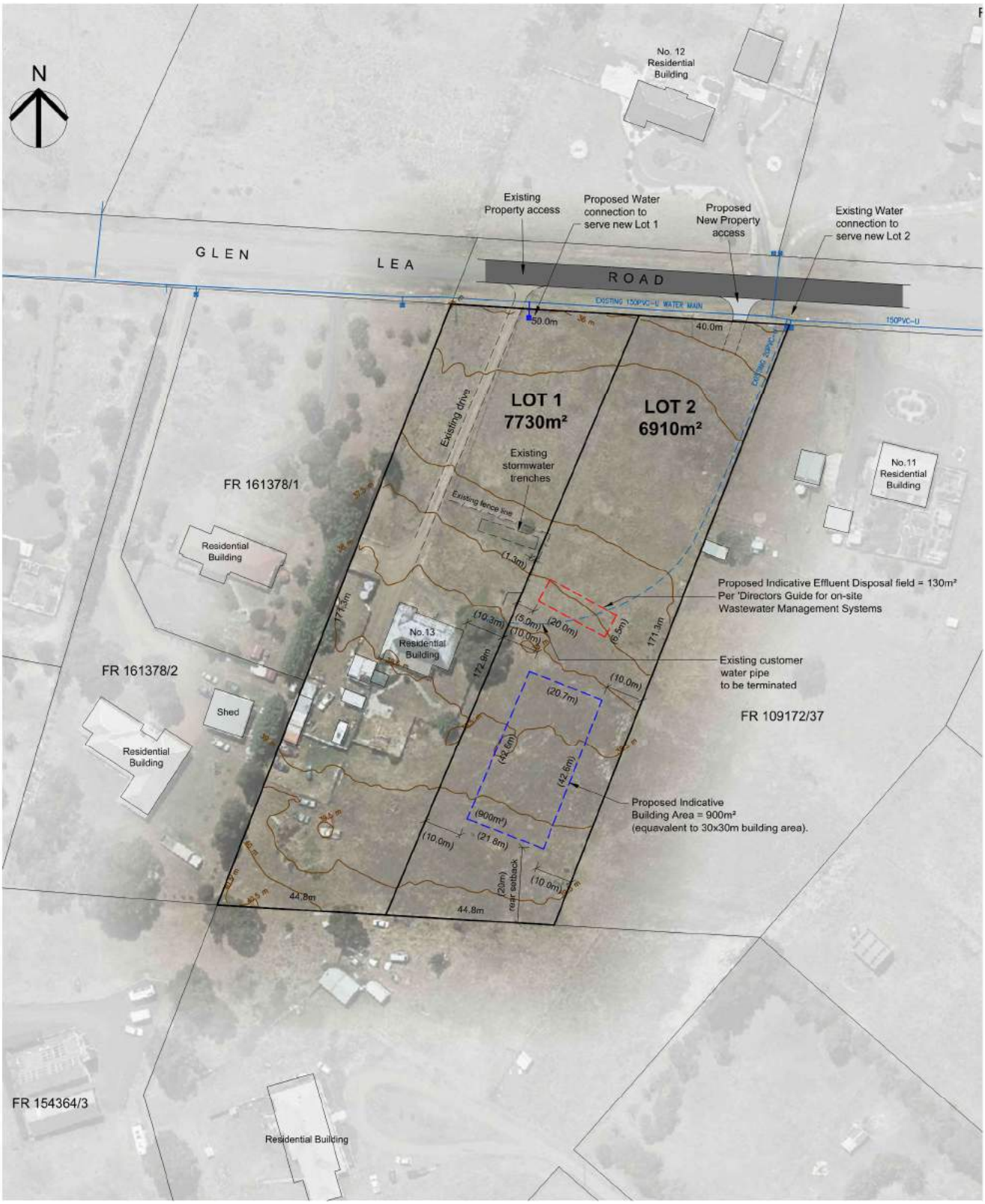

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Bushfire Hazard Report – 46085CT

Two lot subdivision - 13 Glen Lea Rd Brighton

Jim Mulcahy (BSc, GradDipEnvStud; Accreditation BFP - 159)

11 December 2020

CONTENTS

Disclaimer

All reasonable steps have been taken to ensure that the information and advice contained in this report is an accurate reflection of the fire hazard affecting the proposed development at the time of the assessment and the hazard management measures necessary to meet the standards prescribed in *E1.0 Bushfire Prone Areas Code* of the *Brighton Interim Planning Scheme 2015* and *Australian Standard AS 3959-2009*.

The prescribed hazard management measures are designed to reduce bushfire risk to any dwelling(s) constructed on the site. The effectiveness of these measures relies on their implementation in full and their maintenance for the life of the development. No liability can be accepted for actions by landowners or third parties that undermine or compromise the integrity of prescriptions and recommendations contained in this report.

Due to the unpredictable nature of bushfires, particularly under extreme weather conditions, landowners should be aware that implementation and maintenance of the hazard management measures outlined in this report cannot guarantee that a building will survive a bushfire event.

Australian Standards

AS3959 – 2009 Construction of Buildings in Bushfire-Prone Areas has recently been superseded by *AS3959:2018*.

AS3959 remains relevant for this report and will remain relevant until *E1.0 Bushfire Prone Areas Code* of the various *Interim Planning Schemes* has been updated to reference the new standard.

In respect of *Bushfire Attack Level* (BAL) determinations based on vegetation type and slope, the content of Table 2.4.4 in AS3959-2009 is the same as Table 2.6 in AS3959:2018. The new standard does include some changes to the description of *Low threat vegetation* and the *Classification of Vegetation*, but these changes do not materially affect the analysis contained in this report. As a result, to the best of the author's knowledge and understanding, the conclusions and prescribed separation distances contained in this report and the attached *Bushfire Hazard Management Plan* are consistent with the provisions of both AS3959-2009 and AS3959:2018.

Executive Summary

Owners	Suzanne Roberta Doyle
Applicant	PDA Surveyors

Title references	FR 109172/36
PID	1491251
Address	13 Glen Lea Rd Brighton
Land size	1.464ha

Municipality	Brighton
Planning Scheme	*Brighton Interim Planning Scheme 2015*
Zoning	*Rural Living*

Proposed development	Two lot subdivision
Date of site assessment	3 December 2020
Bushfire Assessment	Current and future dwellings are capable of meeting the requirements of BAL-19 in respect of hazard management areas, access for fire-fighting and water supplies for fire-fighting
Conclusion	Compliant development

The proposed subdivision occurs within the *Bushfire Prone Areas* overlay of the *Brighton Interim Planning Scheme 2015* (the Scheme). The Scheme requires that the bushfire risk to the development and appropriate hazard management responses to those risks be considered during the planning process. The proposed subdivision has been assessed against the requirements of *E1.0 Bushfire Prone Areas Code* of the Scheme (the Code) and *AS 3959-2009 Construction of Buildings in Bushfire Prone Areas* (*AS 3959*).

A *Bushfire Hazard Management Plan* has been prepared, showing an *Indicative Building Area* for Lot 2 and *Hazard Management Areas* which demonstrate the potential for existing and future dwellings to achieve a *Bushfire Attack Level* (BAL) rating of BAL-19 under Table 2.4.4 of *AS 3959*.

The *Bushfire Hazard Management Plan* demonstrates compliance with the acceptable solutions for subdivision under the Code and has been certified. It will accompany the final version of this report and will be provided to Brighton Council as part of a development application for the proposed subdivision.

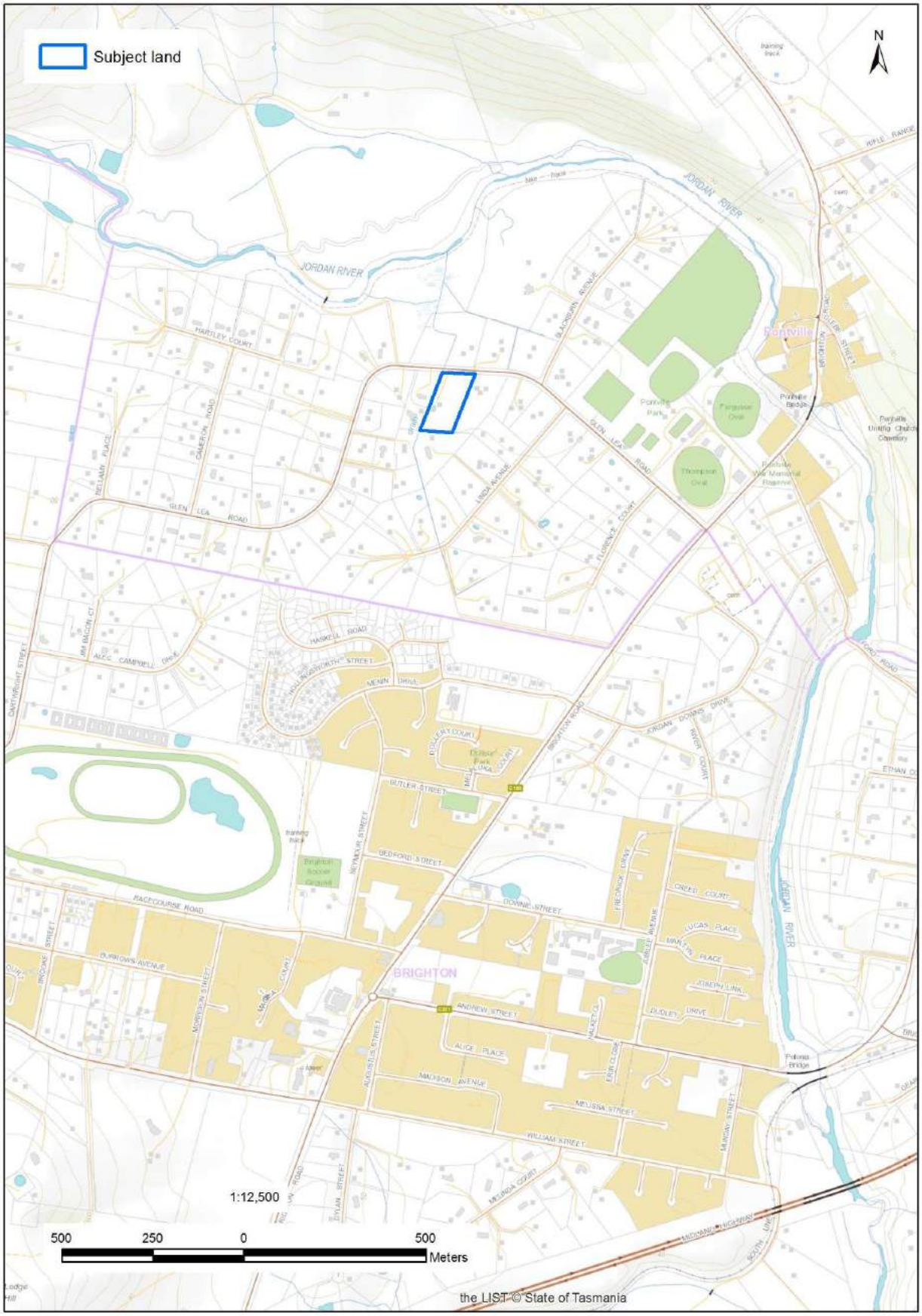

Figure 1. Location of the subject land

1.0 Introduction

This report has been prepared by Mr Jim Mulcahy, *Provisionally Accredited Person* under Section 60B of the *Fire Service Act 1979* (Accreditation number BFP-159).

The report has been prepared in support of a development application for a two lot subdivision at 13 Glen Lea Rd Brighton (see Figure 2). The subject land lies within the *Bushfire Prone Areas* overlay of the *Brighton Interim Planning Scheme 2015* (the Scheme).

1.1 Purpose

The planning system in Tasmania aims for an integrated approach to development in bushfire prone areas between subdivision and the future construction of dwellings. The detailed planning requirements aimed at delivering this integrated approach have been codified under *Planning Directive 5.1 - Bushfire-Prone Areas Code* (Tasmanian Planning Commission, 2017), which has in turn been reproduced in the Scheme as *E1.0 Bushfire Prone Areas Code* (the Code).

The purpose of the Code is "*to ensure that use and development is appropriately designed, located, serviced, and constructed, to reduce the risk to human life and property, and the cost to the community, caused by bushfires*".

The purpose of this report is to facilitate the integrated approach between subdivision and future construction of dwellings on the subject land and to demonstrate that the proposed development complies with the relevant provisions of the Code and *AS 3959-2009 Construction of Buildings in Bushfire Prone Areas* (AS 3959).

1.2 Scope

This report considers the bush-fire prone vegetation in the vicinity of the proposed subdivision, assesses the bushfire threat to current and future dwellings and outlines appropriate bushfire hazard management measures in respect of:

- minimum separation distances required for existing and future dwellings to achieve BAL-19 under table 2.4.4 of *AS 3959*;
- provision of *Hazard Management Areas* which deliver the required separation distances to achieve BAL-19 under table 2.4.4 of *AS 3959*;
- establishment and maintenance requirements and management recommendations for *Hazard Management Areas*;
- access for fire-fighting; and
- water supplies for fire-fighting.

1.3 Limitations

Statutory requirements

This report only deals with the potential bushfire risk to the proposed subdivision development. Other statutory requirements relating to the development are generally outside the scope of the report, although other planning issues which intersect with bushfire hazard management needs are referenced as appropriate.

Changing circumstances over time

The recommendations in this report are based on the surrounding vegetation at the time of the site inspection and the author's professional assessment of the fire hazard posed by that vegetation. Vegetation in an early successional state has been assessed based on what the vegetation will likely develop into if it is not managed. It is not possible, however, to accurately predict environmental changes over time and the impacts of those changes on the future bushfire hazard at the site, particularly where those outcomes are dependent on land management decisions on adjoining properties.

Limitations of scope

The attached *Bushfire Hazard Management Plan* defines an '*Indicative Building Area*' for Lot 2 based on meeting the acceptable solutions for subdivision under the *Rural Living Zone* and the *Code*. In light of this limited scope, the following issues are worth noting.

- Section 11F (2) (a) of the *Tasmanian Building Act 2016 – Building Amendment (Bushfire-Prone Areas) Regulations 2016*, incorporating the *Director's Determination for Building in Bushfire-Prone Areas*, provides that a *Bushfire Hazard Management Plan* undertaken for the purposes of a subdivision approval can be utilised to satisfy the bushfire planning requirements of a subsequent application to build on a lot arising from that subdivision, *"unless that bushfire hazard management plan is more than 6 years old."*
- The *Indicative Building Area* for Lot 2 is larger than would generally be required for a single residential structure. A future dwelling constructed to BAL-19 (or higher) may be located anywhere within the *Indicative Building Area.* The required *Hazard Management Area* can be reduced to suit the actual building footprint as long as the minimum separation distances identified under the attached *Bushfire Hazard Management Plan* are maintained.
- The acceptable solutions under the *Rural Living Zone* require setbacks of 20m from front, side and rear boundaries. In defining the *Indicative Building Area* for Lot 2 it is presumed that side setbacks of 10m will be acceptable to Council under the performance criteria.

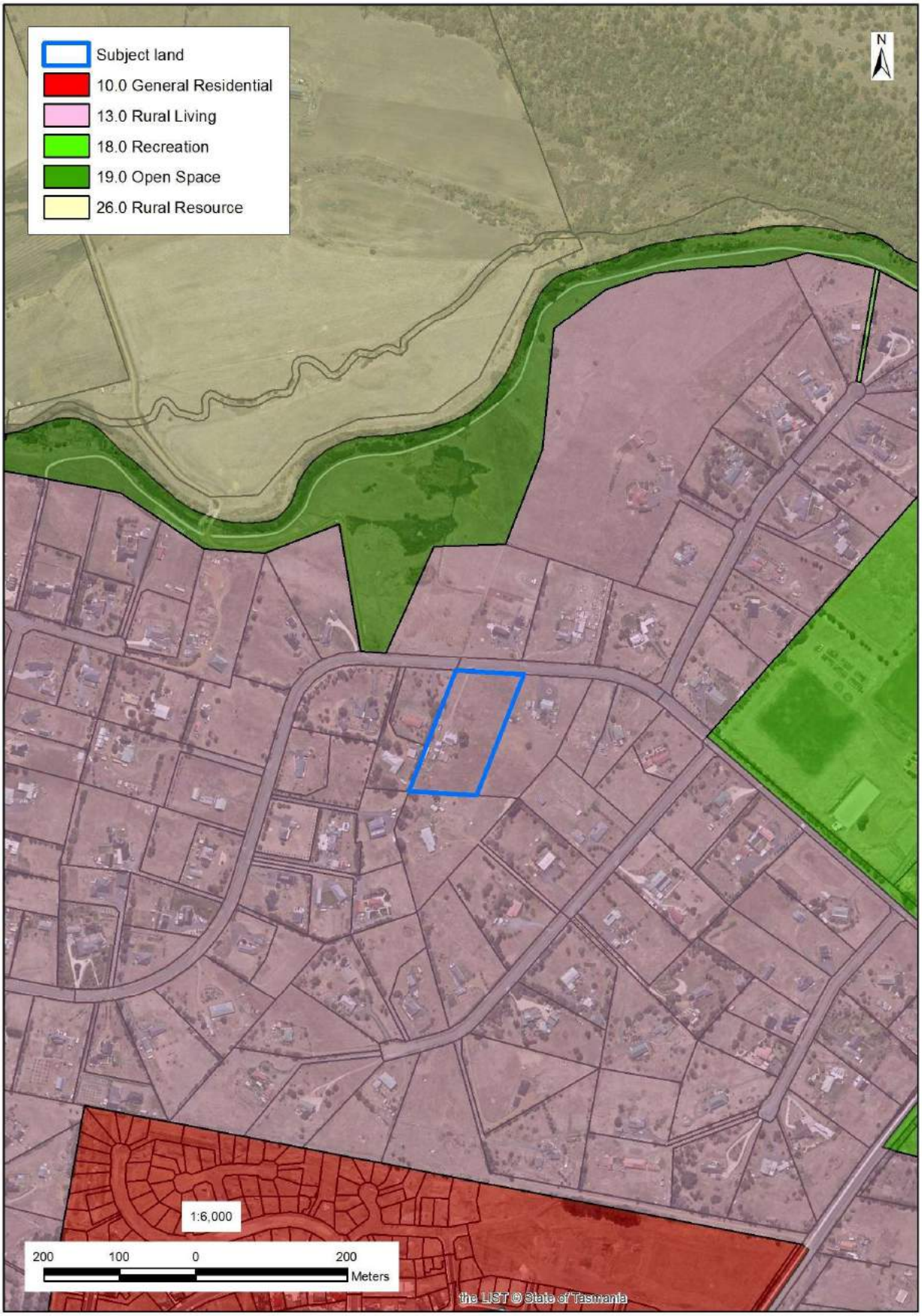

Figure 2. Zoning and context

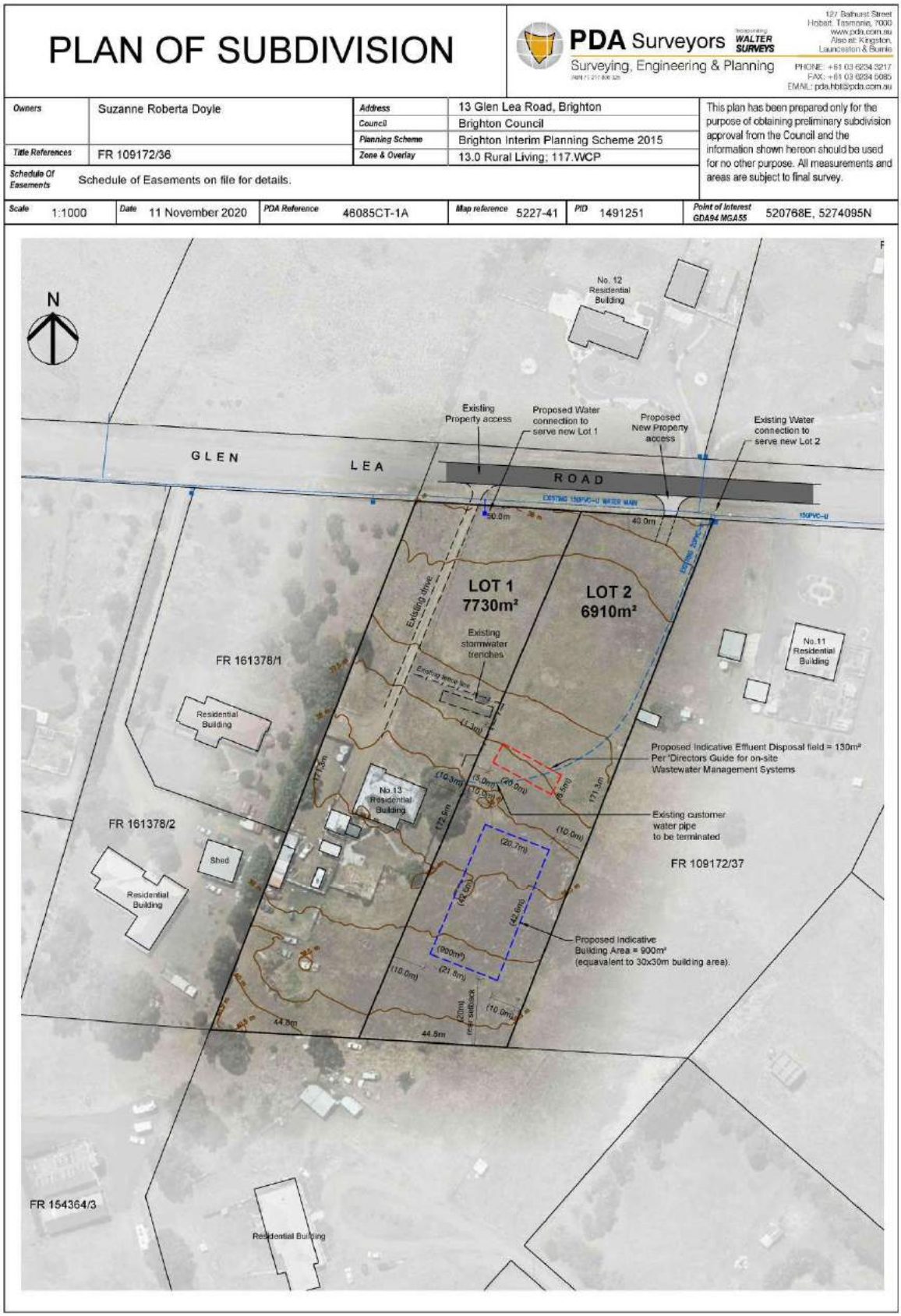

Figure 3. Subdivision proposal

2.0 Site description

2.1 The subject land

The subject land is 1.464ha of land in a single title located on the southern side of Glen Lea Rd in Brighton. The land has a north-easterly aspect and is relatively flat, falling from approximately 40.5m above sea level (asl) in the south-west corner to approximately 35.5m asl in the north-east corner at grades of around 3^0. Vegetation on the subject land is predominantly comprised of pasture, with some lawn and exotic gardens around the existing dwelling.

2.2 Context

The subject land is bounded to the north by Glen Lea Rd. Except for an area of *Open Space* zoning to the north-west associated with the Jordan River, the land is surrounded in all directions by 'rural living' properties ranging in size from 1-2.5ha, most of which have been developed for residential use.

Most of the vegetation around the subject land is pasture that is managed to some degree through slashing, mowing and/or grazing. Surrounding properties typically feature some areas of more intensively managed 'lawn' and garden plantings in the immediate vicinity of dwellings. Several surrounding properties also feature linear boundary plantings of trees and shrubs for screening and shelter purposes, including the block immediately to the west.

3.0 Development proposal

A two-lot subdivision is proposed (see Figure 3), which will create a lot of 7730m^2 containing the existing dwelling (Lot 1) and a lot of 6910m^2 (Lot 2). The subdivision proposal includes the following features relevant to an assessment of bushfire hazard.

- Lot 2 can support an *Indicative Building Area* with separation distances from the lot boundaries that are sufficient for *Hazard Management Areas* (at BAL-19) to be accommodated entirely within the lot boundaries.
- There are outbuildings within 6m of the existing dwelling that need to be considered as part of the dwelling for the purposes of assessing bushfire hazard.
- The existing dwelling on Lot 1 can achieve separation distances from bushfire prone vegetation within the lot boundaries that meet the requirements of BAL-19.
- Existing water hydrants on Glen Lea Rd are not close enough to provide a compliant water supply for fire-fighting to service existing and future dwellings.
- Both lots are capable of supporting a compliant property access for fire-fighting and static water supplies for fire-fighting purposes.

4.0 Bushfire Threat Assessment

4.1 General

Fire Danger Index: FDI 50 (this index applies across Tasmania).

Bushfire History: the *Fire History* layer of the *Land Information System Tasmania* (LIST) shows that blocks immediately south of the subject land were affected by bushfire in 2002-3 (Broadmarsh/Bluff Rd).

Under ember attack and extreme conditions, the property could potentially be subject to bushfire attack from any direction. In terms of the probability of extreme fire weather conditions, the main hazard is from the north.

With appropriate management, current and future dwellings on the subject land are very unlikely to be subject to a head-fire attack, but the site is at risk from bushfire and the potential impacts of forest fires in the broader landscape should not be underestimated in terms of their potential to create ember attack on the site and to spark grass fires on and around the subject land.

4.2 Hazard Assessment

The subject land and surrounds were surveyed by the author on 3 December 2020 with reference to the draft subdivision layout and proposed *Indicative Building Area* for Lot 2. Information and images were collected which allowed assessment of *Bushfire Attack Level* (BAL) using *Method 1 (Simplified Procedure)* of *AS3959*.

Vegetation and slope were assessed within 500m of the subject land to provide context. A more detailed assessment was then undertaken for 100m in every direction from the existing dwelling and the *Indicative Building Area* on Lot 2. Minimum separation distances required for current and future dwellings to meet the requirements of BAL-19 under Table 2.4.4 of *AS3959* were calculated for each combination of vegetation and slope and the separation distances overlaid to determine the 'primary hazard' and the effective slope under that hazard.

The current bushfire attack level (BAL) was then calculated for the existing dwelling and the *Indicative Building Area* to determine the separation distances and *Hazard Management Areas* required to meet the requirements of BAL-19 under Table 2.4.4 of *AS3959* (see Figure 4 and Table 1). This assessment was used to prepare the attached *Bushfire Hazard Management Plan* (BHMP).

4.2 Bushfire-prone vegetation

For the purposes of this report, pasture or lawn in close proximity to a dwelling on the same lot, or in the same paddock as a dwelling on the same lot, has been classified as 'low threat vegetation'. Exotic gardens have also been classified as 'low threat vegetation'.

Bushfire-prone vegetation in the form of pasture occurs in all directions within 100m of the existing dwelling on Lot 1 and the *Indicative Building Area* on Lot 2. For the purposes of this report, most areas of pasture have been classified as *G (i). Grassland*.

Illustrative photos of vegetation on and around the subject land can be found at Appendix A.

5.0 Bushfire Protection Measures

5.1 Limitations on hazard management

There are no natural values or other considerations on the subject land that would limit hazard management potential.

5.2 Hazard Management Areas

The objectives of providing *Hazard Management Areas* are:

- to facilitate an integrated approach between subdivision and subsequent building on a lot;
- to provide for sufficient separation of building areas from bushfire-prone vegetation to reduce radiant heat levels, direct flame attack and ember attack at the building area; and
- to provide protection for lots at any stage of a staged subdivision.

5.2.1 Code provisions

The requirements for *Hazard Management Areas* within a subdivision are detailed in E1.6.1 of the Code.

The acceptable solutions under E1.6.1 A1 of the Code require that:

(b) The proposed plan of subdivision: …

(iii) shows hazard management areas between bushfire-prone vegetation and each building area that have dimensions equal to, or greater than, the separation distances required for BAL-19 in Table 2.4.4 of AS3959; …

5.2.2 Existing conditions

Land surrounding the existing dwelling on Lot 1 and the *Indicative Building Area* on Lot 2 is currently occupied either by low threat vegetation or pasture (*G i Grassland*). Most of the pasture on the subject land and on adjoining properties is currently managed through slashing, mowing and/or grazing.

5.2.3 Compliance

The bushfire hazard assessment (see Tables 1-2 and Figure 4) indicates that both lots require *Hazard Management Areas* to provide separation distances that will allow existing and future dwellings to meet the requirements of BAL-19 under Table 2.4.4 of *AS3959*.

The attached *Bushfire Hazard Management Plan* shows an *Indicative Building Area* for Lot 2 and defines *Hazard Management Areas* with sufficient separation distances from bushfire prone vegetation to allow current and future dwellings to meet the requirements of BAL-19.

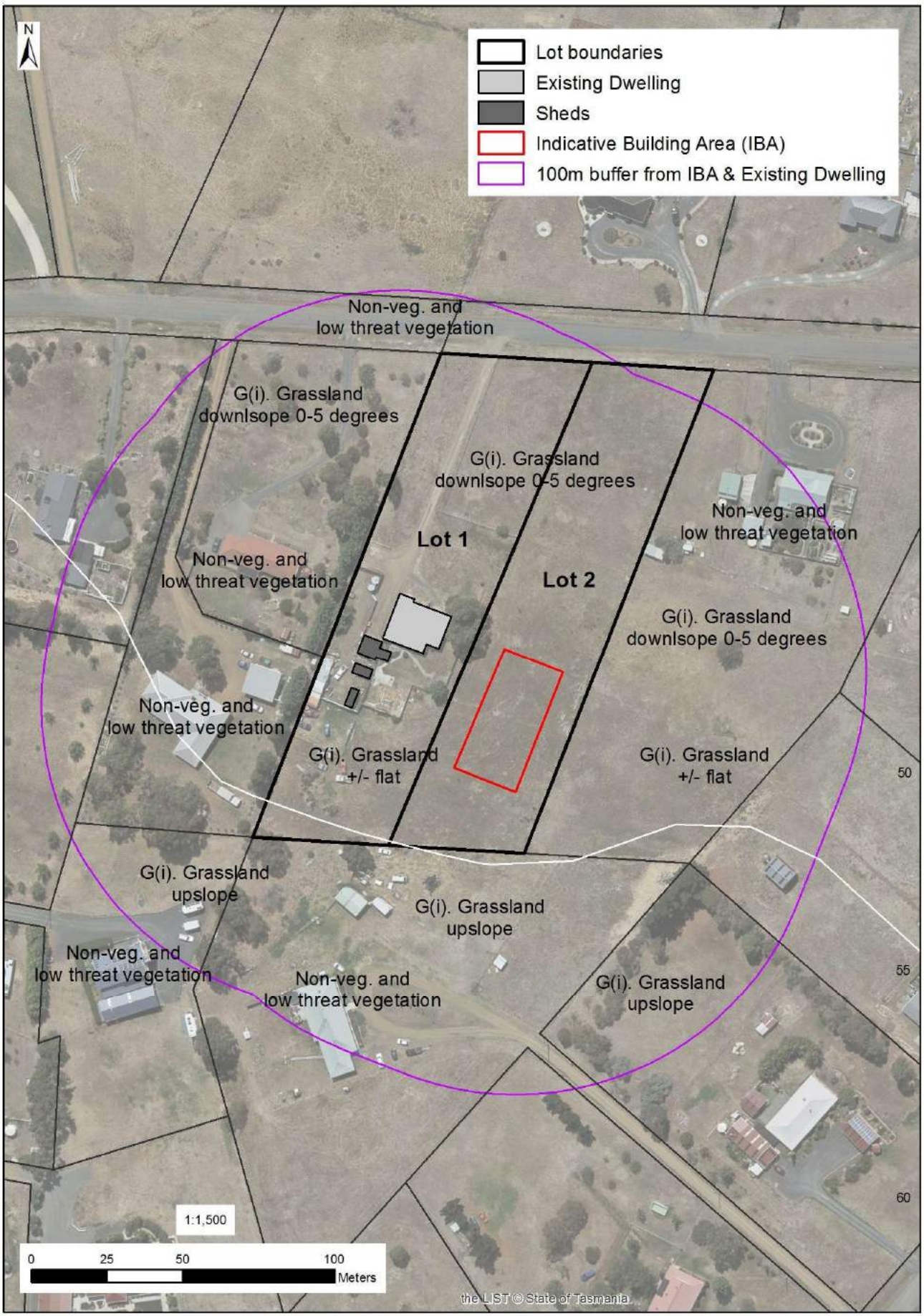

Figure 4. Bushfire Hazard Assessment Map

Table 1. Separation distance calculations for the existing dwelling and associate outbuildings on Lot 1

Direction	Vegetation Classification	Effective Slope under vegetation	Approx. distance from existing dwelling (m)	Current BAL rating	Separation distance to achieve BAL-19	Prescribed hazard management area
North	Low threat/non-veg. (lawn, garden & drive)*	-	0-30	-	-	11m
	G (i). Grassland	Downslope 3^0	30-90	BAL-12.5	11-<16m	
	Low threat/non-veg. (road & verge)*	-	90-100	-	-	
East	Low threat/non-veg. (lawn & garden)*	-	0-6	-	-	To boundary (10m)
	G (i). Grassland	+/- flat across slope	6-100	BAL-29	10-<14m	
South	Low threat/non-veg. (lawn & garden)*	-	0-23	-	-	To fence (23m+)
	G (i). Grassland	Upslope	23-100	BAL-12.5	10-<14m	
West	Non veg (drive)	-	0-6	-	-	To boundary (17m+)
	Low threat/non-veg. (lawn, garden & drive)*	-	6-82	-	-	
	G (i). Grassland	+/- flat across slope	82-100	-	10-<14m	

Table 2. Separation distance calculations for *Indicative Building Area* on Lot 2

Direction	Vegetation Classification	Effective Slope under vegetation	Approx. distance from existing dwelling (m)	Current BAL rating	Separation distance to achieve BAL-19	Prescribed hazard management area
North	G (i). Grassland	Downslope 3^0	0-100	BAL-FZ	11-<16m	11m
East	G (i). Grassland	+/- flat across slope	0-100	BAL-FZ	10-<14m	To boundary (10m)
South	G (i). Grassland	Upslope	0-100	BAL-FZ	10-<14m	10m
West	G (i). Grassland	+/- flat across slope	0-55	BAL-FZ	10-<14m	To boundary (10m)
	Low threat/non-veg. (dwelling & garden)*	-	55-100	-	-	

Vegetation classification as per AS3959-2009 amendment 3, Table 2.3 and Figures 2.4(A)-2.4(G) * Exclusion under AS3959-2009 2.2.3.2

5.2.4 Establishment and maintenance of Hazard Management Areas

To minimise bushfire hazard to current and future dwellings, land within *Hazard Management Areas* must be maintained as *low threat vegetation* and/or *non-vegetated land* for the life of the development. In making choices about landscaping and garden plantings, owners must consider the need to maintain effective *Hazard Management Areas* into the future.

Establishment and maintenance of *Hazard Management Area*s is largely a matter of formalising existing management - regular mowing, slashing and/or grazing of pasture /lawn surrounding the existing dwelling and the *Indicative Building Area* on Lot 2 (as well as the area within the *Indicative Building Area*).

General management guidelines for establishment and maintenance of *Hazard Management Areas* can be found in Schedule 1 of this report and the attached *Bushfire Hazard Management Plan*.

5.3 Fire-fighting access

The objectives for roads, property access and fire trails within a subdivision are:

- to allow safe access and egress for residents, fire fighters and emergency services personnel;
- to provide access to the bushfire-prone vegetation that allows both property to be defended when under bushfire attack and for hazard management works to be undertaken;
- to provide access to water supplies for fire appliances;
- that design and construction allow for fire appliances to be manoeuvred; and
- that design allows connectivity, and where needed, offers multiple evacuation points.

5.3.1 Code provisions for access

Existing hydrants on Glen Lea Rd are not close enough to provide compliant water supplies for fire-fighting to service the existing dwelling on Lot 1 or the furthest reaches of the *Indicative Building Area* on Lot 2. As a result, property access is required to access a compliant fire-fighting water point.

The requirements for property access within a subdivision are detailed in E1.6.2 and Table E2 of the Code. The content of Table E2 has been reproduced in Schedule 2 of this report. The acceptable solutions under clause E1.6.2 A1 require that:

(b) A proposed plan of subdivision showing … the location of property access to building areas is included in a bushfire hazard management plan that:

(i) demonstrates … proposed private accesses will comply with Table E2 ...; and

(ii) is certified by the TFS or accredited person.

5.3.2 Existing conditions

Glen Lea Rd is a sealed, Council-maintained road approximately 6m wide along the frontage to the subject land. It is compliant with the Code in respect of access for fire-fighting. The gravel driveway to the existing dwelling on Lot 1 is approximately 3m wide and terminates in a parking/turning area. It is not currently compliant with the Code but could be widened to provide a compliant access.

5.3.3 Compliance – access for fire-fighting

The *Indicative Property Access* provisions shown on the *Bushfire Hazard Management Plan* at Attachment A demonstrate that compliant property access for fire-fighting can be provided to both lots.

The exact location, alignment and engineering design for any property access to service Lot 2 will be detailed as part of a future development application for construction of a dwelling. The developers, consultants and contractors must ensure at this time that design and construction of the property access complies in all respects with the detailed standards outlined in Schedule 2 of this report.

5.4 Provision of water supplies for fire-fighting purposes

The objective in provision of water supply for fire-fighting purposes is that:

- adequate, accessible and reliable water supply for the purposes of fire-fighting can be demonstrated at the subdivision stage and allow for the protection of life and property associated with the subsequent use and development of bush fire-prone areas.

5.4.1 Code provisions

The requirements for provision of static water supplies for fire-fighting purposes are detailed in E1.6.3 A2 and Table E5 of the Code. The content of Table E5 has been reproduced in Schedule 3 of this report. The acceptable solutions under E1.6.3 A2 require that:

(b) the TFS or accredited person certifies that a proposed plan of subdivision demonstrates that a static water supply, dedicated to fire-fighting, will be provided and located compliant with Table E5.

5.4.2 Existing conditions

The development occurs in an area serviced with reticulated water supply by the water corporation, but existing hydrants along Glen Lea Rd are not close enough to provide compliant water supplies for fire-fighting to service the existing dwelling on Lot 1 or the furthest reaches of the *Indicative Building Area* on Lot 2. No new reticulated water supply or hydrants are proposed for fire-fighting purposes. As a result, for the purposes of this report it is assumed that static water supplies for fire-fighting in the form of water tanks will be used to service the development.

5.4.3 Compliance - water supplies for fire-fighting

The *Indicative Water Tanks for Fire-fighting* and the *Indicative Property Access* provisions shown on the *Bushfire Hazard Management Plan* at Attachment A demonstrate the capacity of both lots to accommodate static water supplies compliant with the Code.

The actual location and specifications of dedicated water tanks for fire-fighting purposes to service the lots is at the discretion of the owners/developers. If they choose not to locate tanks at the locations shown on the *Bushfire Hazard Management Plan*, they must ensure that the design and installation of tanks complies in all respects with the detailed standards outlined in Schedule 3 of this report.

6.0 Recommendations

It is recommended that:

- the existing driveway be widened and upgraded at the next available opportunity to provide property access compliant with the Code;
- a water tank dedicated to fire-fighting be installed at the next available opportunity to service the existing dwelling on Lot 1; and
- the construction elements of the existing dwelling on Lot 1 are considered with reference to the standards required under AS3959 for BAL-19 and if appropriate, the owners consider upgrading elements to make the building more resistant to bushfire attack.

7.0 Conclusions

The attached *Bushfire Hazard Management Plan* demonstrates the capacity of the subdivision to comply with the Code and AS3959 in respect of an *Indicative building area* for Lot 2, *Provision of hazard management areas*, *Public and fire-fighting access* and *Provision of water supply for fire-fighting purposes.* As a result, the *Bushfire Hazard Management Plan* has been certified.

8.0 References

Standards Australia Limited (2009). AS3959-2009 *Construction of buildings in bushfire prone areas* (incorporating amendments 1, 2 & 3). Standards Australia, Sydney.

Standards Australia Limited (2018). AS3959:2018 *Construction of buildings in bushfire prone areas*. Standards Australia, Sydney.

Tasmanian Planning Commission (2017). *Planning Directive No.5.1 – Bushfire prone Areas Code*. Tasmanian Planning Commission, Hobart.

Tasmanian Planning Commission (2019). *Brighton Interim Planning Scheme 2015.* Retrieved from iplan: http://www.iplan.tas.gov.au.

The Bushfire Planning Group (2005). *Guidelines for development in bushfire prone areas of Tasmania – Living with fire in Tasmania,* Tasmania Fire Service, Hobart.

Appendix A. Illustrative photos of vegetation

Image 1 Closest hydrant on Glen Lea Rd relative to existing dwelling (at right)

Image 2 property access to existing dwelling on Lot 1

Appendix A. Illustrative photos of vegetation

Image 3 Alignment of proposed property access to service Lot 2

Image 4 Existing turning area and potential hardstand west of existing dwelling on Lot 1

Appendix A. Illustrative photos of vegetation

Image 5. Vegetation west of the existing dwelling on Lot 1 and potential tank site (at right)

Image 6 Lawn and pasture (Gi Grassland) north of the existing dwelling on Lot 1

Appendix A. Illustrative photos of vegetation

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Image 7 Lawn and pasture (Gi Grassland) east of the existing dwelling on Lot 1

Image 8 Lawn directly south of the existing dwelling on Lot 1

Appendix A. Illustrative photos of vegetation

Image 9 Pasture (Gi Grassland) north of the Indicative Building Area on Lot 2

Image 10 Pasture (Gi Grassland) east of the Indicative Building Area on Lot 2

Appendix A. Illustrative photos of vegetation

Image 11 Pasture (Gi Grassland) south of the Indicative Building Area on Lot 2

Image 12 Pasture (Gi Grassland) west of the Indicative Building Area on Lot 2

Schedule 1. Guidelines for establishment and maintenance of *Hazard Management Areas*[118]

Hazard Management Areas

Where not explicit, the following general advice should be applied to both the management of existing vegetation and the design and establishment of new plantings. More detailed advice about the principles and practices involved with bushfire hazard management can be found in *Guidelines for Development in Bushfire-Prone Areas of Tasmania* (Tasmania Fire Service, 2005).

1. An annual inspection and maintenance of *Hazard Management Areas* should be conducted prior to summer or any other identified period of high fire risk.
2. Hazard management does not require the removal of all standing vegetation. Strategically retained or established areas of trees and shrubs can assist in mitigating bushfire risk by acting as an ember screen and wind break, particularly if comprised of relatively low flammability species.
3. To reduce the overall density of vegetation available to fuel a fire and to minimise potential for transmission of fire, areas of trees and shrubs should be thinned or separated to create discontinuous 'clumps' and a minimum 20m separation should be maintained between any retained/planted clumps.
4. Flammable vegetation should not be retained or planted directly adjacent to dwellings or in corridors which can form a 'wick' to the vicinity of dwellings.
5. A minimum 2m horizontal separation should be maintained between the canopies of any retained or planted trees and low branches should be removed to create a minimum 2m vertical separation between the tree canopy and underlying shrubs or ground cover.
6. No trees should overhang dwellings and retained or planted trees should ideally be sited a minimum distance of 1.5 times their mature height from dwellings.
7. Grassland, pasture and lawn must be kept short (<100mm) to act as 'low threat vegetation'.
8. Fine fuels such as leaves, bark and twigs should be removed from the ground periodically, particularly leading into summer or any other identified period of high fire risk.
9. Landscaping choices and management of flammable materials in the area immediately adjacent to dwellings is particularly important to minimise bushfire risk, particularly directly adjacent to flammable building elements (eg wooden decks and cladding) and glazed elements (eg windows and sliding glass doors).

   It is recommended that non-combustible elements such as paths, paving and inorganic mulch (eg gravel or pebbles) are employed under and directly adjacent to dwellings and decks, with only minimal planting of relatively low-flammability vegetation (preferably low-growing shrubs and ground-cover).

   Other appropriate landscaping choices in the vicinity of dwellings may include maintained lawn, swimming pools, ornamental gardens comprised of recognised 'low flammability' species, vegetable gardens and orchards.
10. Flammable materials such as stored fuel (including gas cylinders), firewood, building materials and organic mulch (eg wood chips or bark) should not be stored under or directly adjacent to dwellings and decks.

Schedule 2. Requirements for property access in the subdivision to comply with *E1.0 Bushfire Prone Areas Code*

Property access for fire-fighting

Property access is required for a fire appliance to access a fire-fighting water point on both lots and must meet the following standards to comply with the Code:

(a) all-weather construction;

(b) load capacity of at least 20 tonnes, including for bridges and culverts;

(c) minimum carriageway width of 4 metres;

(d) minimum vertical clearance of 4 metres;

(e) minimum horizontal clearance of 0.5 metres from the edge of the carriageway;

(f) cross falls of less than 3 degrees (1:20 or 5%);

(g) dips less than 7 degrees (1:8 or 12.5%) entry and exit angle;

(h) curves with a minimum inner radius of 10 metres;

(i) maximum gradient of 15 degrees (1:3.5 or 28%) for sealed roads, and 10 degrees (1:5.5 or 18%) for unsealed roads; and

(j) terminate with a turning area for fire appliances provided by one of the following:

  (i) a turning circle with a minimum inner radius of 10 metres;

  (ii) a property access encircling the building; or

  (iii) a hammerhead “T” or “Y” turning head 4 metres wide and 8 metres long.

Schedule 3. Requirements for static water supply for fire-fighting to comply with *E1.0 Bushfire Prone Areas Code*

Provision of static water supplies for fire-fighting purposes

Static water supplies dedicated for fire-fighting purposes are required to service both lots and must meet the following standards to comply with the Code.

A. *Distance between building area to be protected and water supply*

The following requirements apply:

a) the building area to be protected must be located within 90m of the fire-fighting water point of a static water supply; and

b) the distance must be measured as a hose lay, between the fire-fighting water point and the furthest part of the building area.

B. *Static Water Supplies*

A static water supply:

a) may have a remotely located off-take connected to the static water supply;

b) may be a supply for combined use (fire-fighting and other uses) but the specified minimum quantity of fire-fighting water must be available at all times;

c) must be a minimum of 10,000l per building area to be protected; this volume of water must not be used for any other purpose including fire-fighting sprinklers and spray systems;

d) must be metal, concrete or lagged by non-combustible materials if above ground; and

e) if a tank can be located so it is shielded in all directions in compliance with section 3.5 of *Australian Standards AA3959-2009 Construction of buildings in bushfire-prone areas*, the tank may be constructed of any material, provided that the lowest 400mm of the tank is protected by:
(i) metal;
(ii) non-combustible material; or
(iii) fibre-cement a minimum of 6mm thickness.

C. *Fittings, pipework and accessories (including stands and tank supports)*

Fittings and pipework associated with a fire-fighting water point for a static water supply must:

a) have a minimum nominal internal diameter of 50mm;

b) be fitted with a valve with a minimum nominal internal diameter of 50mm;

c) be metal or lagged by non-combustible materials if above ground;

d) if buried, have a minimum depth of 300mm (compliant with *AS/NZS 160-19600.1-2003 clause 5.23*);

e) provide a DIN or NEN standard forged Storz 65mm coupling fitted with a suction washer for connection to fire-fighting equipment;

f) ensure the coupling is accessible and available for connection at all times;

g) ensure the coupling is fitted with a blank cap and securing chain (minimum 220mm length);

h) ensure underground tanks have either an opening at the top of not less than 250mm diameter or a coupling compliant with this Table; and

i) if a remote offtake is installed, ensure the offtake is in a position that is:

(i) visible;

(ii) accessible to allow connection by fire-fighting equipment;

(iii) at a working height of 450-600mm above ground level; and

(iv) protected from possible damage, including damage by vehicles.

D. Signage for static water connections

The fire-fighting water point for a static water supply must be identified by a sign permanently fixed to the exterior of the assembly in a visible location. The sign must:

a) comply with water tank signage requirements within *Australian Standard AS2304-2011 Water storage tanks for fire protection systems*; or

b) comply with the Tasmania Fire Service Guideline:

(i) marked with the letter 'W' contained within a circle, with the letter in upper case and not less than 100mmm in height;

(ii) marked in fade-resistant material with white reflective lettering and circle on a red background;

(iii) located within 1m of the water connection point in a situation which will not impede access or operation; and

(iv) no less than 400mm above ground.

E. Hardstand

A hardstand area for fire appliances must be:

a) no more than 3m from the fire-fighting water point, measured as a hose lay (including the minimum water level in dams, swimming pools and the like);

b) no closer than 6m from the building area to be protected;

c) a minimum width of 3m constructed to the same standard as the carriageway; and

d) connected to the property access by a carriageway equivalent to the standard of the property access.

ATTACHMENT A. *Bushfire Hazard Management Plan*

Address: 13 Glen Lea Rd Brighton
Title(s): FR 109172/36
Scheme: Brighton Interim Planning Scheme 2015

BUSHFIRE HAZARD MANAGEMENT PLAN

PDA Surveyors
Surveying, Engineering & Planning
WALTER SURVEYS

Date: 11 December 2020
PDA Reference: 46085CT
Map Reference: 46085CT_BHMP_v1

This plan has been prepared for the purpose of obtaining subdivision approval from Brighton Council. It should be read in conjunction with 46085CT_Bushfire Hazard Report_v1 (PDA, 11 December 2020). All relevant consultants and contractors should be provided with a full A3 copy of this plan. Dimensions and areas are subject to final survey. Some details are indicative only to demonstrate the capacity for compliance.

Certification No: PDA_Cert_46085

Jim Mulcahy
Acc. No BFP - 159
Scope 1 & 3B; provisional 3C

- Lot boundaries
- Indicative property access
- Existing Dwelling
- Shed
- Indicative Building Area (IBA)
- Hazard Management Area
- Existing Hydrant
- Indicative Water Tanks for Fire-fighting

1. Hazard Management Areas

a. Hazard Management Areas must be established at the time of development and maintained as 'low threat vegetation' and/or 'non- vegetated land' (as defined by Clause 2.2.3.2 of AS3959-2009) for the life of the development.

b. No trees should overhang dwellings and retained or planted trees should ideally be sited a minimum distance of 1.5 times their mature height away from buildings.

c. Trees and shrubs should be thinned or separated to create discontinuous 'clumps' and a minimum 20m separation should be maintained between retained or planted clumps.

d. A minimum 2m horizontal separation should be maintained between the canopies of any retained or planted trees and low branches should be removed to create a minimum 2m vertical separation between the tree canopy and underlying shrubs or ground cover.

e. Grassland, pasture & lawn must be kept short (<100mm).

f. Fine fuels such as leaves, bark and twigs should be removed from the ground periodically, particularly leading into summer or any other identified period of high fire risk.

g. Flammable vegetation should not be retained or planted under or directly adjacent to dwellings (particularly decks, flammable cladding and glazed elements) or in corridors which can act as a 'wick' to channel fire to dwellings.

h. Flammable materials such as firewood, building materials, organic mulch and fuel should not be stored under decks or dwellings nor directly adjacent to dwellings.

2. Fire-fighting Access

a. Glen Lea Rd is compliant with the provisions of Table E1 of the Bushfire Prone Areas Code (the Code).

b. The existing hydrant on Glen Lea Rd is nmore than 120m hose lay from the furthest parts of the Existing Dwelling and the Indicative Building Area on Lot 2, so property access is required to access a fire-fighting water point.

c. This plan shows Indicative Property Access to service both lots which is 4m wide, has compliant turning arcs and features compliant turning areas providing hardstands within 3m of Indicative Water Tanks for Fire-fighting.

d. At the time of construction, the developer must ensure that the property access to Lot 2 complies in all respects with Table E2 of the Code.

3. Water Supplies for Fire-fighting

a. Reticulated water supply is available to the site, but the existing hydrant on Glen Lea Rd is more than 120m hose lay from the furthest parts of the Existing Dwelling and the Indicative Building Area on Lot 2.

b. This plan shows Indicative Water Tanks for Fire-fighting which are located within 3m of a hardstand, more than 6m from the Existing Dwelling/Indicative Building Area and within 90m hose lay of the furthest parts of the Existing Dwelling/Indicative Building Area.

c. At the time of installation, the developer must ensure that static water supplies for fire-fighting comply in all respects with E1.6.3 and Table E5 of the Code.

4. Construction of future dwellings

a. This plan only certifies that a future dwelling constructed within Indicative Building Areas on Lot 2 can achieve the separation distances required to allow construction to BAL-19.

BUSHFIRE-PRONE AREAS CODE

CERTIFICATE[1] UNDER S51(2)(d) *LAND USE PLANNING AND APPROVALS ACT 1993*

1. Land to which certificate applies

The subject site includes property that is proposed for use and development and includes all properties upon which works are proposed for bushfire protection purposes.

Street address:	13 Glen Lea Rd Brighton
Certificate of Title / PID:	FR 109172/36

2. Proposed Use or Development

Description of proposed Use and Development:	Two lot subdivision
Applicable Planning Scheme:	*Brighton Interim Planning Scheme 2015*

3. Documents relied upon

This certificate relates to the following documents:

Title	Author	Date	Version
46085CT_Bushfire Hazard Report_v1	Jim Mulcahy	11 December 2020	1
46085CT_BHMP_v1	Jim Mulcahy	11 December 2020	1

[1] This document is the approved form of certification for this purpose and must not be altered from its original form.

4. Nature of Certificate

The following requirements are applicable to the proposed use and development:

☐	**E1.4 / C13.4 – Use or development exempt from this Code**	
	Compliance test	**Compliance Requirement**
☐	E1.4(a) / C13.4.1(a)	Insufficient increase in risk

☐	**E1.5.1 / C13.5.1 – Vulnerable Uses**	
	Acceptable Solution	**Compliance Requirement**
☐	E1.5.1 P1 / C13.5.1 P1	***Planning authority discretion required. A proposal cannot be certified as compliant with P1.***
☐	E1.5.1 A2 / C13.5.1 A2	Emergency management strategy
☐	E1.5.1 A3 / C13.5.1 A2	Bushfire hazard management plan

☐	**E1.5.2 / C13.5.2 – Hazardous Uses**	
	Acceptable Solution	**Compliance Requirement**
☐	E1.5.2 P1 / C13.5.2 P1	***Planning authority discretion required. A proposal cannot be certified as compliant with P1.***
☐	E1.5.2 A2 / C13.5.2 A2	Emergency management strategy
☐	E1.5.2 A3 / C13.5.2 A3	Bushfire hazard management plan

☒	**E1.6.1 / C13.6.1 Subdivision: Provision of hazard management areas**	
	Acceptable Solution	**Compliance Requirement**
☐	E1.6.1 P1 / C13.6.1 P1	***Planning authority discretion required. A proposal cannot be certified as compliant with P1.***
☐	E1.6.1 A1 (a) / C13.6.1 A1(a)	Insufficient increase in risk
☒	E1.6.1 A1 (b) / C13.6.1 A1(b)	Provides BAL-19 for all lots (including any lot designated as 'balance')
☐	E1.6.1 A1(c) / C13.6.1 A1(c)	Consent for Part 5 Agreement

☐	**E1.6.2 / C13.6.2 Subdivision: Public and fire fighting access**	
	Acceptable Solution	**Compliance Requirement**
☐	E1.6.2 P1 / C13.6.2 P1	***Planning authority discretion required. A proposal cannot be certified as compliant with P1.***
☐	E1.6.2 A1 (a) / C13.6.2 A1 (a)	Insufficient increase in risk
☒	E1.6.2 A1 (b) / C13.6.2 A1 (b)	Access complies with relevant Tables

☐	**E1.6.3 / C13.1.6.3 Subdivision: Provision of water supply for fire fighting purposes**	
	Acceptable Solution	**Compliance Requirement**
☐	E1.6.3 A1 (a) / C13.6.3 A1 (a)	Insufficient increase in risk
☐	E1.6.3 A1 (b) / C13.6.3 A1 (b)	Reticulated water supply complies with relevant Table
☐	E1.6.3 A1 (c) / C13.6.3 A1 (c)	Water supply consistent with the objective
☐	E1.6.3 A2 (a) / C13.6.3 A2 (a)	Insufficient increase in risk
☒	E1.6.3 A2 (b) / C13.6.3 A2 (b)	Static water supply complies with relevant Table
☐	E1.6.3 A2 (c) / C13.6.3 A2 (c)	Static water supply consistent with the objective

5. Bushfire Hazard Practitioner

Name:	Jim Mulcahy	**Phone No:**	6234 3217
Postal Address:	127 Bathurst St Hobart 7000	**Email Address:**	Jim.Mulcahy@pda.com.au
Accreditation No:	BFP – 159	**Scope:**	1 & 3B, provisional 3C

6. Certification

I certify that in accordance with the authority given under Part 4A of the *Fire Service Act 1979* that the proposed use and development:

☐ Is exempt from the requirement Bushfire-Prone Areas Code because, having regard to the objective of all applicable standards in the Code, there is considered to be an insufficient increase in risk to the use or development from bushfire to warrant any specific bushfire protection measures, or

☒ The Bushfire Hazard Management Plan/s identified in Section 3 of this certificate is/are in accordance with the Chief Officer's requirements and compliant with the relevant **Acceptable Solutions** identified in Section 4 of this Certificate.

Signed:
certifier

Name: Jim Mulcahy **Date:** 24 December 2020

Certificate Number: PDA_Cert_46085

(for Practitioner Use only)

GEOTECH 21-041

ROCK SOLID GEOTECHNICS PTY LTD

21/2/2021

CLIENT:
Mr Josh Doyle
c/ PDA Surveyors – Mr Craig Terry
Craig.Terry@pda.com.au

Peter Hofto
163 Orielton Road
ORIELTON
TAS 7172
0417 960 769
peter@rocksolidgeotechnics.com.au

Geotechnical Assessment - Subdivision of Land at 13 Glen Lea Road, Pontville

This report assesses the onsite wastewater potential of the land designated for a two-lot subdivision at 13 Glen Lea Road, Pontville Bay (Figure 1).

Number 13 Glen Lea Road will be divided into Lot 1 (7730m^2) and Lot 2 (6910m^2).

This assessment considers investigation requirements outlined in a RFI from the Brighton Council, specifically:

1 Please provide a report from a qualified wastewater designer stating:

A *That the location of the existing wastewater system is satisfactory; and*

B *That a wastewater system is suitable for the proposed new lot.*

INVESTIGATION

A field survey was completed on Thursday 18 February, 2021, encompassing field mapping of geological and geomorphological features and hazards to assess the site for onsite wastewater disposal potential. A test holes was completed Lot 2 (4WD mounted SAMPLA25 mechanical auger with 100mm diameter solid flight augers).

The Mines Department 1:25000 Digital Geological Map 'Tea Tree' indicates that the site is underlain by Triassic sediments.

Mr Brent Bastian (Senior Environmental Health Officer – Sorell Council) kindly supplied a copy of the plan of the current onsite wastewater system for the residence at 13 Glen Lea Road (Figure 2).

A That the location of the existing wastewater system is satisfactory.

The current 5-bedroom residence on Lot 1 is serviced with a split blackwater and greywater system.

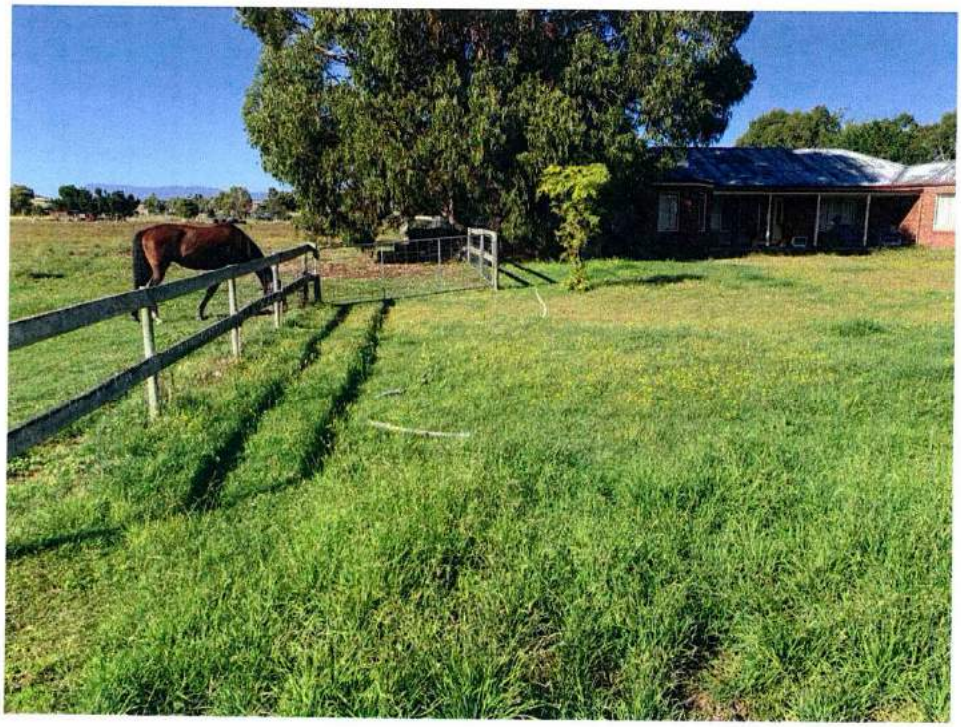
The blackwater is collected in a septic tank, and discharges to an absorption trench in a Land Application Area sited to the northeast of the residence (Plate 1).

Plate 1 – looking to the northeast at the blackwater LAA from the residence. The LAA lies this side of the small tree.

The greywater is collected in a sump tank fitted with a submersible pump (located on the eastern side of the residence), and discharges to the surface of the land to the northeast of the residence via a movable flexible hose (Plates 2 & 3).

Plate 2 – greywater sump tank - fitted with a submersible pump.

Plate 3 – Looking to the south at the residence with the greywater movable flexible hose in the foreground.



The List Map Aerial Photo (Figure 3) shows the blackwater trench in proximity to the internal fence lines. The land at the blackwater LAA slopes to the north / northeast at 2-3 degrees.

The blackwater LAA (absorption trench) will need to be a minimum of 1.5m from the proposed new boundary between Lots 1 & 2. This is outlined in the Director's Guidelines for Onsite Wastewater – setback distances – A3 of the compliance table attached below (1.5m minimum setback distance from side-slope boundary).

The eastern end of the blackwater trench is 1.5m from the proposed new internal boundary between Lots 1 & 2. The location of the existing wastewater system is therefore satisfactory.

As the greywater surface discharge hose is movable it can currently be moved away from the proposed boundary, so as not to impact on the land in proposed Lot 2.

B That a wastewater system is suitable for the proposed new lot.

Proposed Lot 2 is a 6910m^2, vacant block. There is no evidence of any geotechnical hazards on the site. The site is covered in grass and minor reeds, and is devoid of trees. The land generally slopes to the northeast at between 2 and 3 degrees.

A test hole was completed to assess the site for onsite wastewater disposal suitability. The location of the test hole is marked on Figure 1. The profile encountered in Test Hole #1 consisted of:

0.00 – 0.20m	SAND: fine grained, brown / greyish brown, rootlets - TOPSOIL
0.20 – 0.70m	SAND: fine grained, light grey, dry
0.70 – 1.25m	clayey SAND: fine to medium grained, greyish brown, 20-25% clay, moist
1.25 – 2.10m	sandy CLAY / clayey SAND: medium plasticity clay, fine to medium grained sand, brown / greyish brown, moist
2.10m+	Hole terminated at required depth – 2.10m.

Groundwater was not encountered in the hole.

The site is classified as CLASS 1 (SAND) over CLASS 4 (clay LOAM).

Lot 2 has ample suitable land for the installation of an onsite wastewater system for a single residence.

Plate 4 – Lot 2 – Test Hole #1.

SITE AND SOIL EVALUATION REPORT Lot 2 - 13 Glen Lea Road, Pontville

Soil Category: (as stated in AS/NZS 1547-2000) 1,...2,...3,...4,...5,...6	Modified Emerson Test Required	No
Geology:	Triassic sediments	

Slope:	2-3 degrees
Drainage lines / water courses:	Nil
Vegetation:	Grass
Site History: (land use)	Vacant land

Aspect:	Northeast
Pre-dominant wind direction:	Northwest to southwest
Site Stability: Will on-site wastewater disposal affect site stability?	No
Is geological advice required?	No
Drainage/Groundwater:	Not encountered
Depth to seasonal groundwater (m):	Not Encountered
Date of Site Evaluation:	18-2-2021
Weather Conditions: (on the day of evaluation and during the last week)	Fine
Name: Peter Hofto - Rock Solid Geotechnics Pty Ltd	
Signed:	

A LAA must also be in a suitable location to be acceptable. It is therefore logical that the LAA setback distance requirements in the Director's Guidelines are also addressed.

Compliance Table Directors Guidelines for OSWM		
Acceptable Solutions	**Performance Criteria**	**Compliance achieved by**
5.1 To ensure sufficient land is available for sustainable onsite wastewater management for buildings.		
A1 A new dwelling must be provided with a LAA that complies with Table 3.	P1 A new dwelling must be provided with a LAA that meets all of the following: a) The LAA is sized in accordance with the requirements of AS/NZS 1547; and b) A risk assessment in accordance with Appendix A of AS/NZS 1547 has been completed that demonstrates that the risk is acceptable.	Complies with A1 Class 4 site. 120m^2 of LAA required /bedroom.
7. Standards for Wastewater Land Application Areas		
A1 Horizontal separation distance from a building to a LAA must comply with one of the following: a) be no less than 6m; b) be no less than: (i) 3m from an upslope boundary or level	P1 The LAA is located so that the risk of wastewater reducing the bearing capacity of a building's foundations is acceptably low.	Complies with A1 LAA can be >6m from any building

building; (ii) If primary treated effluent to be no less than 4m plus 1m for every degree of average gradient from a downslope building; (iii) If secondary treated effluent and subsurface application, no less than 2m plus 0.25m for every degree of average gradient from a downslope building.		
A2 Horizontal separation distance from downslope surface water to a LAA must comply with (a) or (b) (a) be no less than 100m; or (b) be no less than the following: (i) if primary treated effluent 15m plus 7m for every degree of average gradient to downslope surface water; or (ii) if secondary treated effluent and subsurface application, 15m plus 2m for every degree of average gradient to down slope surface water.	P2 Horizontal separation distance from downslope surface water to a LAA must comply with all of the following: a) Setbacks must be consistent with AS/NZS 1547 Appendix R; b) A risk assessment in accordance with Appendix A of AS/NZS 1547 has been completed that demonstrates that the risk is acceptable.	Complies with A2 LAA > 100m from any surface water.
A3 Horizontal separation distance from a property boundary to a LAA must comply with either of the following: (a) be no less than 40m from a property boundary; or (b) be no less than: (i) 1.5m from an upslope or level property boundary; & (ii) If primary treated effluent 2m for every degree of average gradient from a downslope property boundary; or (iii) If secondary treated effluent and subsurface application, 1.5m plus 1m for every degree of average gradient from a downslope property boundary.	P3 Horizontal separation distance from a property boundary to a LAA must comply with all of the following: (a) Setback must be consistent with AS/NZS 1547 Appendix R; and (b) A risk assessment in accordance with Appendix A of AS/NZS 1547 has been completed that demonstrates that the risk is acceptable.	Complies with A3 LAA to be minimum 1.5m setback from side-slope or upslope property boundary. 2-3° slope. Primary treated effluent minimum 6m setback from lower northern property boundary.
A4 Horizontal separation distance from a downslope bore, well or similar water supply to a LAA must be no less than 50m and not be within the zone of influence of the bore whether up or down gradient.	P4 Horizontal separation distance from a downslope bore, well or similar water supply to a LAA must comply with all of the following: (a) Setback must be consistent with AS/NZS 1547 Appendix R; and (b) A risk assessment completed in accordance with Appendix A of AS/NZS 1547 demonstrates that the risk is acceptable.	Complies with A4 No known potable bores within 50m of the site.
A5 Vertical separation distance between groundwater & a LAA must be no less than: (a) 1.5m if primary treated effluent; or (b) 0.6m if secondary treated effluent	P5 Vertical separation distance between groundwater and a LAA must comply with the following: (a) Setback must be consistent with AS/NZS 1547 Appendix R; and (b) A risk assessment completed in accordance with Appendix A of AS/NZS 1547 that demonstrates that the risk is acceptable	Complies with A5 Groundwater not encountered.
A6 Vertical separation distance between a limiting layer & a LAA must be no less than: (a) 1.5m if primary treated effluent; or (b) 0.5m if secondary treated effluent	P6 Vertical setback must be consistent with AS/NZS1547 Appendix R.	Complies with A6 Limiting Layer not encountered.

RECCOMENDATIONS

The current wastewater system that services the residence at 13 Glen Lea Road is wholly contained on proposed Lot 1.

The location of the existing wastewater system on proposed Lot 1 is satisfactory.

Proposed Lot 2 can sustain an onsite wastewater system for a single residence.

Peter Hofto
Rock Solid Geotechnics P/L

CONDITIONS OF INVESTIGATION

This report remains the property of Rock Solid Geotechnics Pty. Ltd. (RSG). It must not be reproduced in part or full, or used for any other purpose without written permission of this company. The investigations have been conducted, & the report prepared, for the sole use of the client or agent mentioned on the cover page. Where the report is to be used for any other purpose RSG accepts no responsibility for such other use. The information in this report is current and suitable for use for a period of two years from the date of production of the report, after which time it cannot be used for Building or Development Application.

This report should not be used for submission for Building or Development Application until RSG has been paid in full for its production. RSG accepts no liability for the contents of this report until full payment has been received.

The results & interpretation of conditions presented in this report are current at the time of the investigation only. The investigation has been conducted in accordance with the specific client's requirements &/or with their servants or agent's instructions.

This report contains observations & interpretations based often on limited subsurface evaluation. Where interpretative information or evaluation has been reported, this information has been identified accordingly & is presented based on professional judgement. RSG does not accept responsibility for variations between interpreted conditions & those that may be subsequently revealed by whatever means.

Due to the possibility of variation in subsurface conditions & materials, the characteristics of materials can vary between sample & observation sites. RSG takes no responsibility for changed or unexpected variations in ground conditions that may affect any aspect of the project. The classifications in this report are based on samples taken from specific sites. The information is not transferable to different sites, no matter how close (ie. if the development site is moved from the original assessment site an additional assessment will be required).

It is recommended to notify the author should it be revealed that the sub-surface conditions differ from those presented in this report, so additional assessment & advice may be provided.

Investigations are conducted to standards outlined in Australian Standards:

- AS1726-1993: Geotechnical Site Investigations
- AS1547-2012: Onsite Domestic Wastewater Management

& as specified in 'Guidelines for Geotechnical Assessment of Subdivisions and Recommended Code of Practise for Site Classification to AS2870 in Tasmania' - Institute of Engineers, Tasmanian Division.

Any assessment that has included an onsite wastewater system design will require a further site visit / inspection once the system has been installed. After the inspection to verify that the system has been installed as per RSG's design a statement will be provided. An additional fee applies for the site visit & issuing the certificate.

RSG is not responsible for the correct installation of wastewater systems. Any wastewater installation is the sole responsibility of the owner/agent and certified plumber. Any variation to the wastewater design must be approved by RSG, and an amended Special Plumbing Permit obtained from the relevant council. The registered plumber must obtain a copy and carefully follow the details in the council issued Special Plumbing Permit. A "Certificate of Completion" will be based on surface visual inspection only, to verify the location of the system. All underground plumbing works are the responsibility of the certified plumber.

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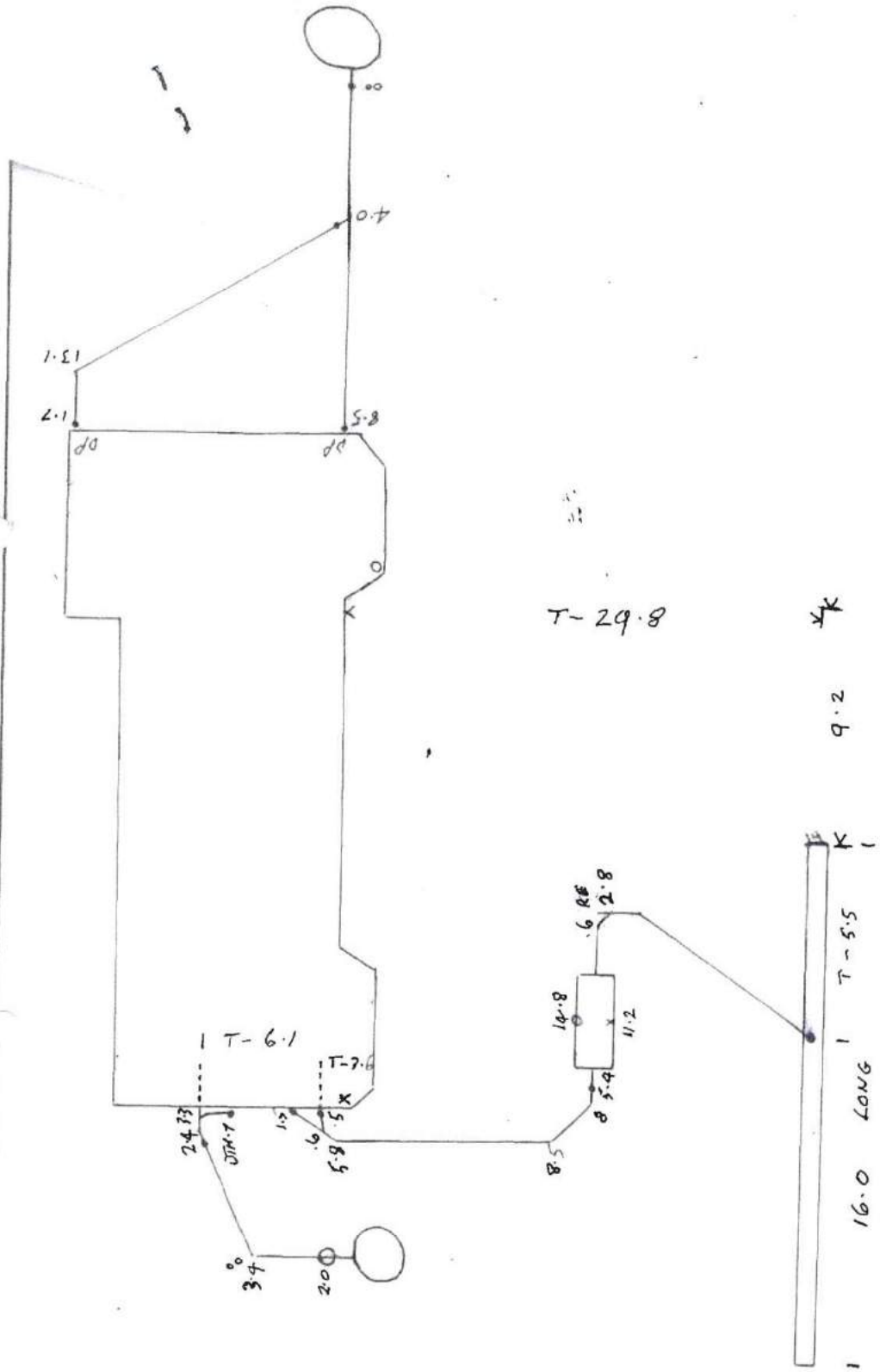
PETER HOFTO
ROCK SOLID GEOTECHNICS PTY LTD



FIGURE

1000805.032

BUILDER:
DESIGNED: RB
DRAINER: N. JEFFREY
DATE: 29-8-96

B/A No. 110/96
SEPTIC TANK No. 1343
LOCATION: 13 GLEN LEA RD.

GDA94 MGA55 : 520954E, 5274173N 1:846 **Disclaimer and Copyright Notice**

Submission to Planning Authority Notice

Council Planning Permit No.	SA 2020/049	**Council notice date**	25/01/2021
TasWater details			
TasWater Reference No.	TWDA 2021/00098-BTN	**Date of response**	04/02/2021
TasWater Contact	Georgia Bowen	**Phone No.**	0467 795 944
Response issued to			
Council name	BRIGHTON COUNCIL		
Contact details	development@brighton.tas.gov.au		
Development details			
Address	13 GLEN LEA RD, PONTVILLE	**Property ID (PID)**	1491251
Description of development	Subdivision - 2 lots		

Schedule of drawings/documents

Prepared by	Drawing/document No.	Revision No.	Date of Issue
PDA Surveyors	Plan of Subdivision / 46085CT-1A	-	11/11/2020

Conditions

Pursuant to the *Water and Sewerage Industry Act* 2008 (TAS) Section 56P(1) TasWater imposes the following conditions on the permit for this application:

CONNECTIONS, METERING & BACKFLOW

1. A suitably sized water supply with metered connections to each lot of the development must be designed and constructed to TasWater's satisfaction and be in accordance with any other conditions in this permit.
2. Any removal/supply and installation of water meters and/or the removal of redundant and/or installation of new and modified property service connections must be carried out by TasWater at the developer's cost.
3. Prior to commencing construction of the subdivision/use of the development, any water connection utilised for construction must have a backflow prevention device and water meter installed, to the satisfaction of TasWater.

DEVELOPMENT ASSESSMENT FEES

4. The applicant or landowner as the case may be, must pay a development assessment fee of $211.63, to TasWater, as approved by the Economic Regulator and the fee will be indexed, until the date paid to TasWater.

   The payment is required within 30 days of the issue of an invoice by TasWater.

Advice

General

For information on TasWater development standards, please visit
http://www.taswater.com.au/Development/Development-Standards

For application forms please visit http://www.taswater.com.au/Development/Forms

Service Locations

Please note that the developer is responsible for arranging to locate the existing TasWater infrastructure and clearly showing it on the drawings. Existing TasWater infrastructure may be located by a surveyor and/or a private contractor engaged at the developers cost to locate the infrastructure.

(a) A permit is required to work within TasWater's easements or in the vicinity of its infrastructure. Further information can be obtained from TasWater

(b) TasWater has listed a number of service providers who can provide asset detection and location services should you require it. Visit www.taswater.com.au/Development/Service-location for a list of companies

(c) TasWater will locate residential water stop taps free of charge

Declaration

The drawings/documents and conditions stated above constitute TasWater's Submission to Planning Authority Notice.

Authorised by

Jason Taylor
Development Assessment Manager

TasWater Contact Details			
Phone	13 6992	Email	development@taswater.com.au
Mail	GPO Box 1393 Hobart TAS 7001	Web	www.taswater.com.au

Application for Planning Approval

Land Use Planning and Approvals Act 1993

APPLICATION NO.
DA2020/416

LOCATION OF AFFECTED AREA

27 RIVIERA DRIVE, OLD BEACH

DESCRIPTION OF DEVELOPMENT PROPOSAL

MULTIPLE DWELLINGS (1 ADDITIONAL)

THE APPLICATION MAY BE VIEWED AT www.brighton.tas.gov.au AND AT THE COUNCIL OFFICES, 1 TIVOLI ROAD, OLD BEACH. ANY PERSON MAY MAKE WRITTEN REPRESENTATIONS CONCERNING AN APPLICATION UNTIL **18TH MARCH 2021** ADDRESSED TO THE GENERAL MANAGER, 1 TIVOLI ROAD, OLD BEACH, 7017 OR BY EMAIL ATdevelopment@brighton.tas.gov.au.
REPRESENTATIONS SHOULD INCLUDE A DAYTIME TELEPHONE NUMBER TO ALLOW COUNCIL OFFICERS TO DISCUSS, IF NECESSARY, ANY MATTERS RAISED.

JAMES DRYBURGH
GENERAL MANAGER

Brighton
going places

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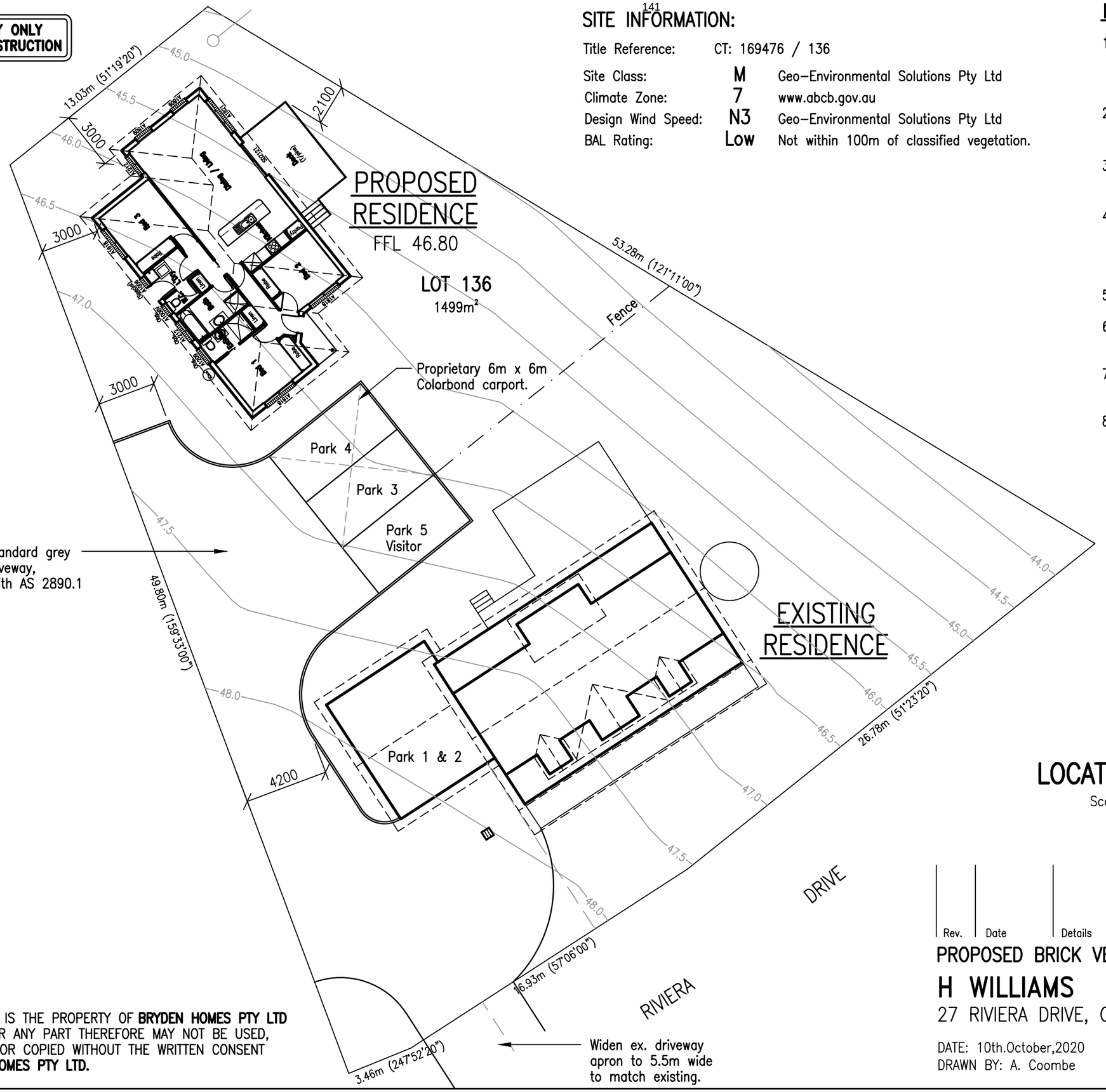

SITE INFORMATION:

Title Reference:	CT: 169476 / 136	
Site Class:	M	Geo-Environmental Solutions Pty Ltd
Climate Zone:	7	www.abcb.gov.au
Design Wind Speed:	N3	Geo-Environmental Solutions Pty Ltd
BAL Rating:	Low	Not within 100m of classified vegetation.

Notes:

1. All work to be carried out in accordance with The Building Code of Australia, The HIA Specification, Brighton Council By-Laws and approval.
2. Builder to check and verify all dimensions, set-outs and levels prior to commencement of any building works.
3. All plumbing shall be in accordance with Local Council By-Laws and the National Plumbing and Drainage Code AS 3500.
4. Walls and roofs are to be framed, fixed and braced in accordance with AS 1684. All timber sizes are in direct reference to AS 1684 and manufactured sizes must not be undersized to those specified.
5. All glazing must conform to the requirements of AS 1288 and the BCA Part 3.6.
6. Smoke alarms shall be fitted in accordance with AS 3786 and the BCA Part 3.7.2. Connect to consumer mains power.
7. Provide water resistant plasterboard and splash backs to wet areas all in accordance with the BCA Part 3.8.1. and/or AS 3740.
8. O.R.G. To be located a minimum of 150mm below Finished Floor Level.

DRAWING SCHEDULE:

LOCATION PLAN

Scale 1:200

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Rev.	Date	Details

PROPOSED BRICK VENEER RESIDENCE for

H WILLIAMS

27 RIVIERA DRIVE, OLD BEACH

DATE: 10th.October,2020
DRAWN BY: A. Coombe

SCALES: 1:200,
Accreditation No: CC104R

D01

PRELIMINARY ONLY
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3.1.2.3 Surface Water Drainage

(a) External finished surface to give a slope of not less than 50mm over the first 1m from the building.
(b) Finished slab height of slab–on–ground must be not less than:–
- 150mm above finished ground level;
- 100mm above sandy, well drained areas;
- 50mm above paved or concentrated areas that slope away from the building in accordance with (a).

Connection of Downpipes:

The builder shall ensure that all downpipes are connected to the stormwater drainage system as soon as possible to prevent any erosion, swelling or saturation of susceptible foundation soils.

Provide flexible couplings to plumbing fittings in accordance with BCA requirements.

Notes:

1. All work to be carried out in accordance with The Building Code of Australia, The HIA Specification, Brighton Council By–Laws and approval.
2. Builder to check and verify all dimensions, set–outs and levels prior to commencement of any building works.
3. All plumbing shall be in accordance with Local Council By–Laws and the National Plumbing and Drainage Code AS 3500.
4. Walls and roofs are to be framed, fixed and braced in accordance with AS 1684. All timber sizes are in direct reference to AS 1684 and manufactured sizes must not be undersized to those specified.
5. All glazing must conform to the requirements of AS 1288 and the BCA Part 3.6.
6. Smoke alarms shall be fitted in accordance with AS 3786 and the BCA Part 3.7.2. Connect to consumer mains power.
7. Provide water resistant plasterboard and splash backs to wet areas all in accordance with the BCA Part 3.8.1. and/or AS 3740.
8. O.R.G. To be located a minimum of 150mm below Finished Floor Level.

SITE PLUMBING NOTES

Waste Pipe Key

1.	W.C.	100 ø
3.	Sink	50 ø
4.	Basin	50 ø
5.	Bath	40 ø
6.	Shower	50 ø
7.	Trough	50 ø
V.	Vent	50 ø

Hot and Cold water reticulation shall be generally 20 ø and 15 ø to fixtures.

Stormwater pipework shall be DN 100 UPVC Class SN6 unless noted otherwise.

Sewer pipework shall be DN 100 UPVC Class SN6 unless noted otherwise.

All downpipes ø90 u.n.o.

PROPOSED RESIDENCE
FFL 46.80

13.03m (51°19'20")
53.28m (121°11'00")
49.80m (159°33'00")
26.78m (51°23'20")
16.93m (57°06'00")
3.46m (24°52'20")

45.0 45.5 46.0 46.5 47.0 47.5 48.0 44.0 44.5 45.0 45.5 46.0 46.5 47.0 47.5 48.0

I.O. Dp. O.R.G. 3. 7. 1. 5. 4. 6. sw s

DN 100 Ag. Drain min. 1000 deep. Grade 1:100 min.

600 sq. Poly pit.

Remove ex. sewer.

Excavate and remove ex. soakage trench. Redirect ex. overflow to new drainage system.

Fence

Ex. 10,000 L. Site retention tank.

LOT 136
1499m²

Proposed standard grey concrete driveway, compliant with AS 2890.1

Ex. Sump.

Connect internal drainage to Ex. G.P., 2.1m deep, as directed by Council's Plumbing Inspector.

EXISTING RESIDENCE

DRIVE

RIVIERA

Existing DN 25 water connection. Provide 2 x DN20 water connections to serve dwellings with a DN20 meter on manifold, at Developer's cost.

N

DRAINAGE PLAN

Scale 1:200

Rev.	Date	Details

PROPOSED BRICK VENEER RESIDENCE for

H WILLIAMS

27 RIVIERA DRIVE, OLD BEACH

DATE: 10th.October,2020
DRAWN BY: A. Coombe

SCALES: 1:200,
Accreditation No: CC104R

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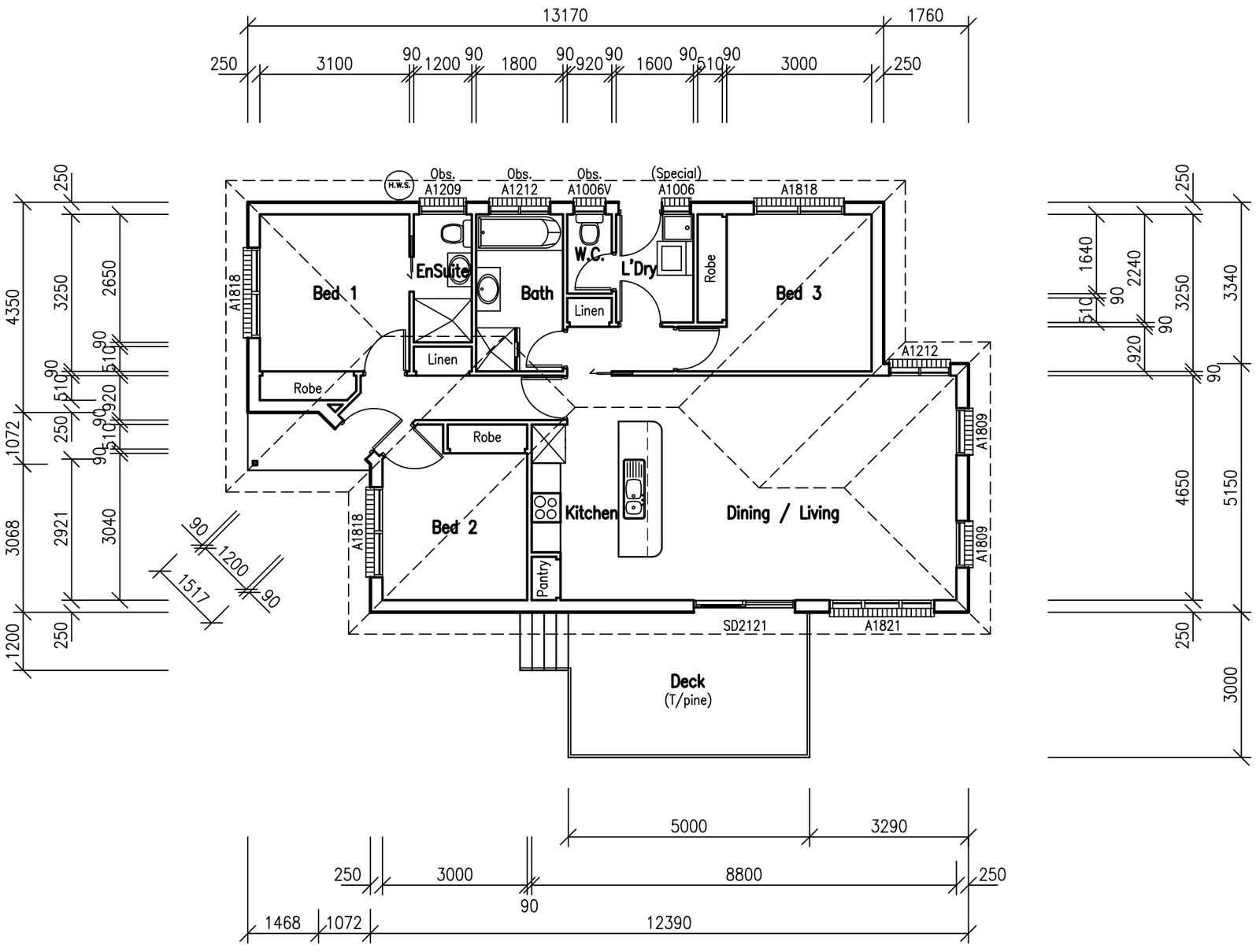

FLOOR PLAN
Floor Area = 110.94m² (11.94sq.)
SCALE 1:100

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Rev.	Date	Details

PROPOSED BRICK VENEER RESIDENCE for

H WILLIAMS

27 RIVIERA DRIVE, OLD BEACH

DATE: 10th.October,2020
DRAWN BY: A. Coombe

SCALES: 1:100,
Accreditation No: CC104R

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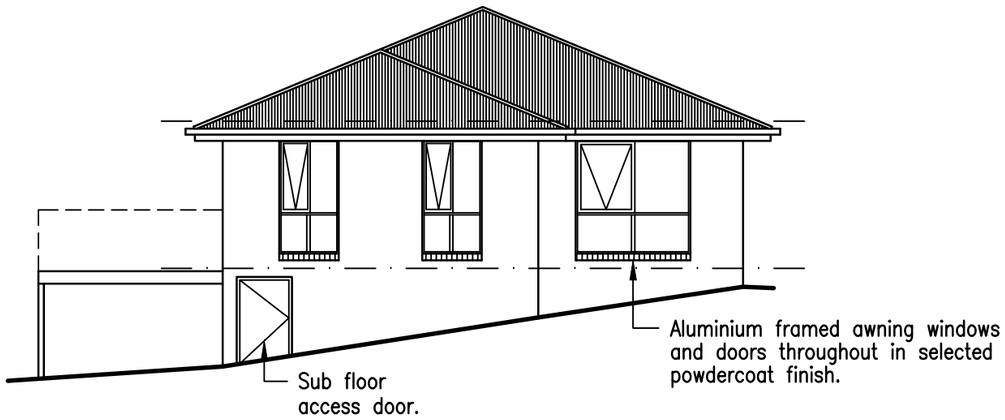
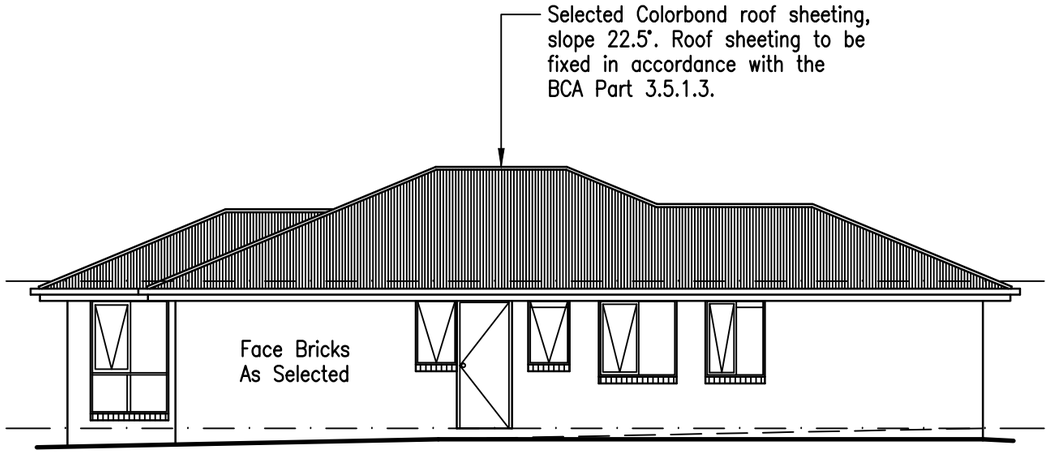


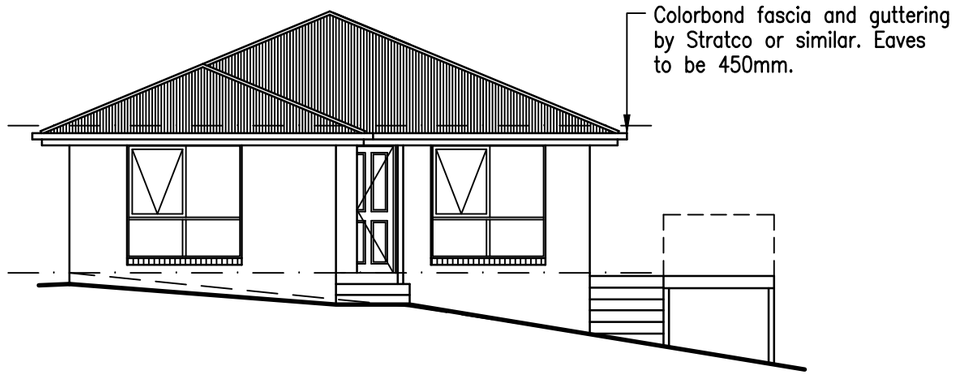
NORTH WEST ELEVATION

SCALE 1:100



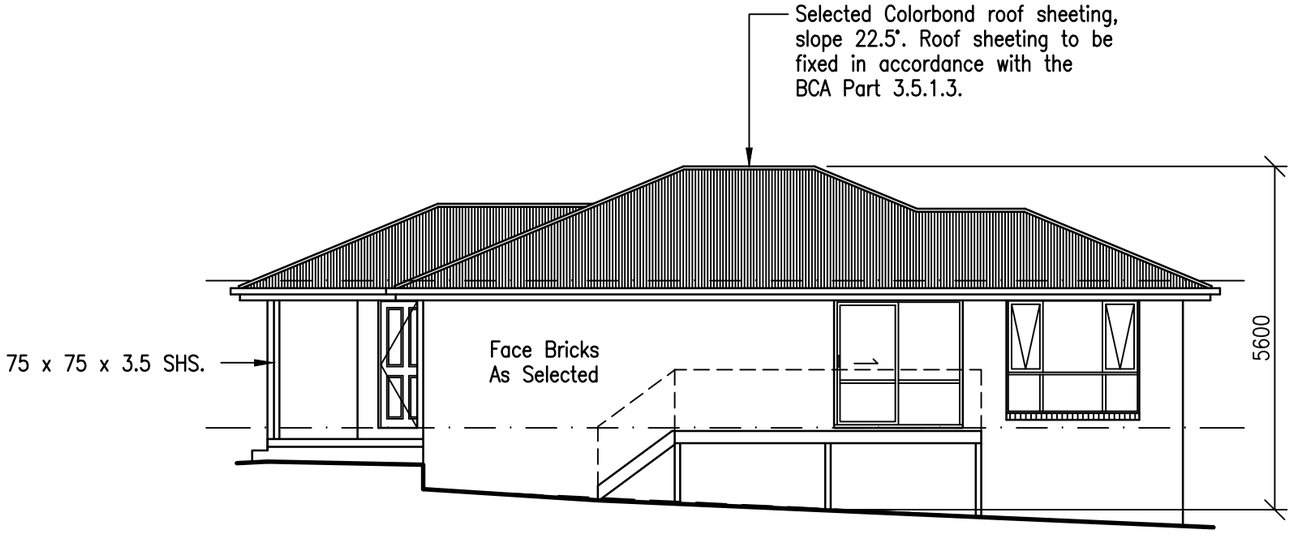
SOUTH WEST ELEVATION

SCALE 1:100



SOUTH EAST ELEVATION

SCALE 1:100



NORTH EAST ELEVATION

SCALE 1:100

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PROPOSED BRICK VENEER RESIDENCE for

H WILLIAMS

27 RIVIERA DRIVE, OLD BEACH

DATE: 10th.October,2020
DRAWN BY: A. Coombe

SCALES: 1:100,
Accreditation No: CC104R

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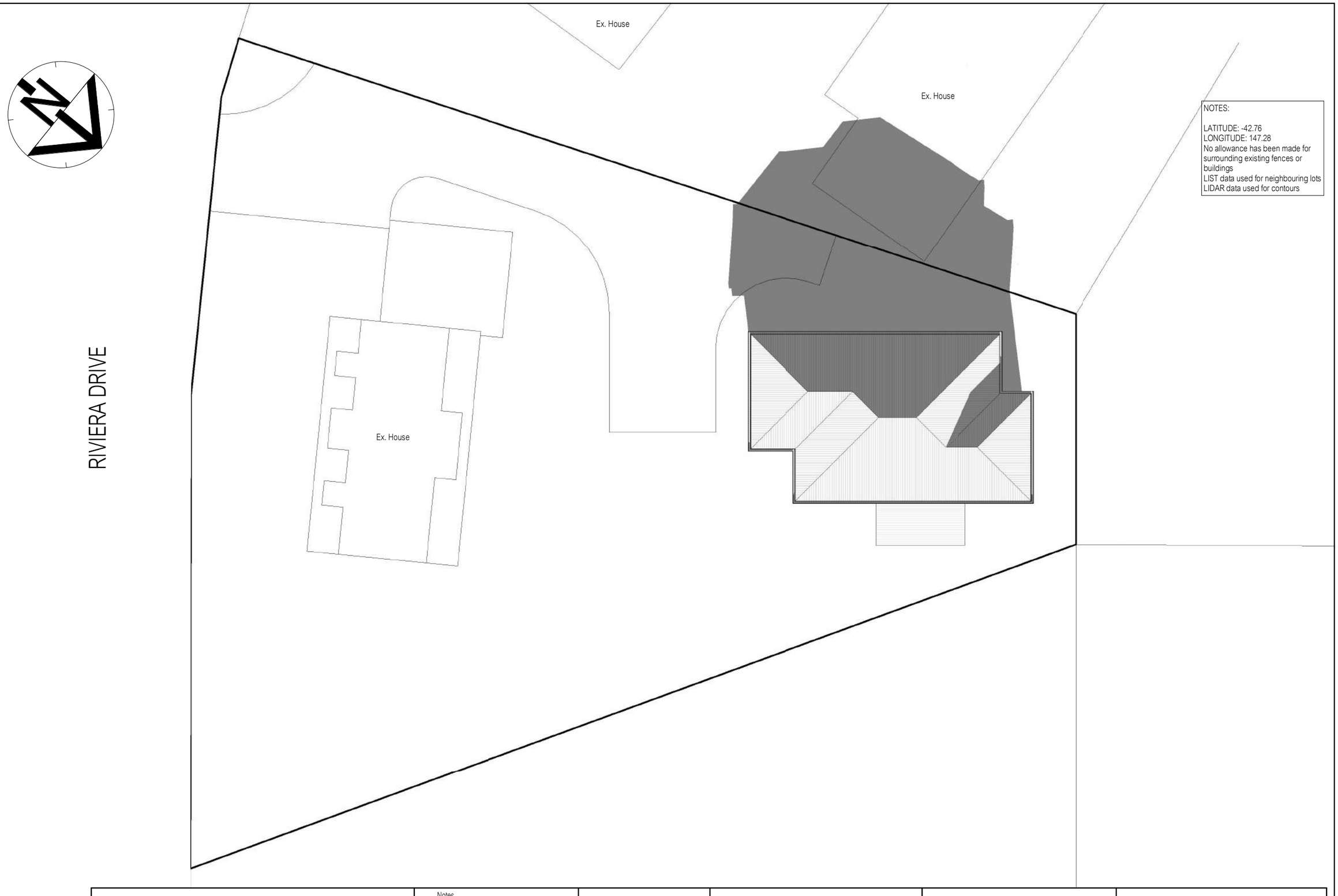


NOTES:

LATITUDE: -42.76
LONGITUDE: 147.28
No allowance has been made for surrounding existing fences or buildings
LIST data used for neighbouring lots
LIDAR data used for contours

No.	Date	Int.	Amendment changes as per cover sheet

Notes
- Builder to verify all dimensions and levels on site prior to commencement of work
- All work to be carried out in accordance with the current National Construction Code.
- All materials to be installed according to manufacturers specifications.
- Do not scale from these drawings.
- No changes permitted without consultation with designer.

Designer:

ANOTHER PERSPECTIVE PTY LTD
PO BOX 21
NEW TOWN
LIC. NO. CC2204H (A. Strugnell)
Ph: (03) 6231 4122
Fx: (03) 6231 4166
Email:
info@anotherperspective.com.au

Client / Project info

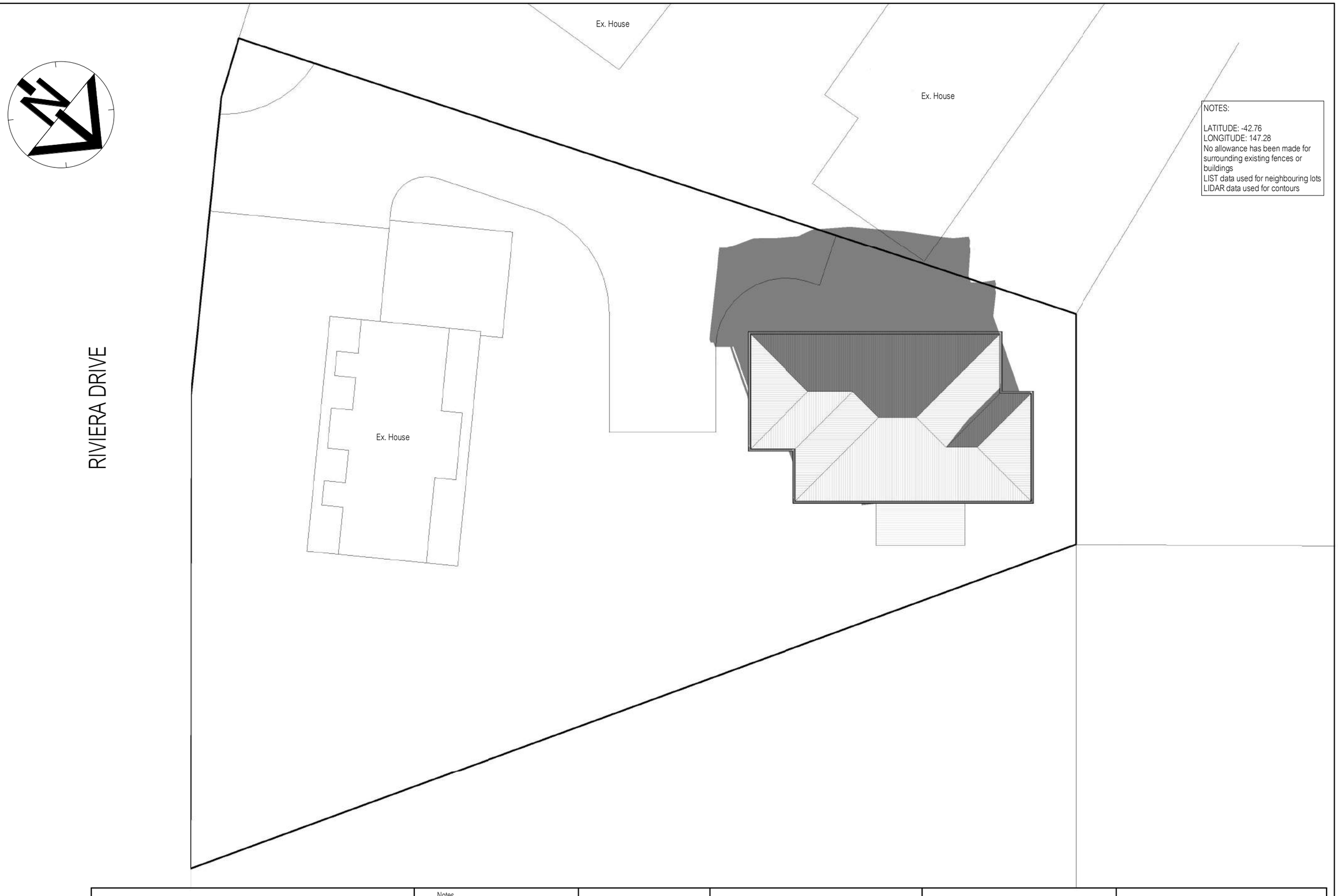
PROPOSED BRYDEN HOMES DEVELOPMENT

27 Riviera Drive,
OLD BEACH

another perspective drafting&design

SHADOWS 9AM 21 JUNE 2021

Drawn	LH	AP2020-1919	
Date	06 January 2021	Sheet	S01/S08
Scale	1 : 200		



No.	Date	Int.	Amendment changes as per cover sheet

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- All materials to be installed according to manufacturers specifications.
- Do not scale from these drawings.
- No changes permitted without consultation with designer.

Designer:

ANOTHER PERSPECTIVE PTY LTD
PO BOX 21
NEW TOWN
LIC. NO. CC2204H (A. Strugnell)
Ph: (03) 6231 4122
Fx: (03) 6231 4166
Email:
info@anotherperspective.com.au

Client / Project info

PROPOSED BRYDEN HOMES DEVELOPMENT

27 Riviera Drive,
OLD BEACH

another perspective drafting&design

SHADOWS 10AM 21 JUNE 2021

Drawn	LH	AP2020-1919	
Date	06 January 2021	Sheet	S02/S08
Scale	1 : 200		

NOTES:

LATITUDE: -42.76
LONGITUDE: 147.28
No allowance has been made for surrounding existing fences or buildings
LIST data used for neighbouring lots
LIDAR data used for contours

No.	Date	Int.	Amendment changes as per cover sheet

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PROPOSED BRYDEN HOMES DEVELOPMENT

27 Riviera Drive,
OLD BEACH

another perspective drafting&design

SHADOWS 11AM 21 JUNE 2021

Drawn	LH	AP2020-1919	
Date	06 January 2021	Sheet	
Scale	1 : 200	S04/S08	

NOTES:

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LONGITUDE: 147.28
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LIDAR data used for contours

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PROPOSED BRYDEN HOMES DEVELOPMENT

27 Riviera Drive,
OLD BEACH

another perspective drafting&design

SHADOWS 12PM 21 JUNE 2021

Drawn	LH	AP2020-1919	
Date	06 January 2021	Sheet	
Scale	1 : 200	S05/S08	

No.	Date	Int.	Amendment changes as per cover sheet

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Client / Project info

PROPOSED BRYDEN HOMES DEVELOPMENT

27 Riviera Drive,
OLD BEACH

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SHADOWS 1PM 21 JUNE 2021

Drawn	LH	AP2020-1919	
Date	06 January 2021	Sheet	S06/S08
Scale	1 : 200		

No.	Date	Int.	Amendment changes as per cover sheet

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Client / Project info

PROPOSED BRYDEN HOMES DEVELOPMENT

27 Riviera Drive,
OLD BEACH

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SHADOWS 2PM 21 JUNE 2021

Drawn	LH	AP2020-1919	
Date	06 January 2021	Sheet	S07/S08
Scale	1 : 200		

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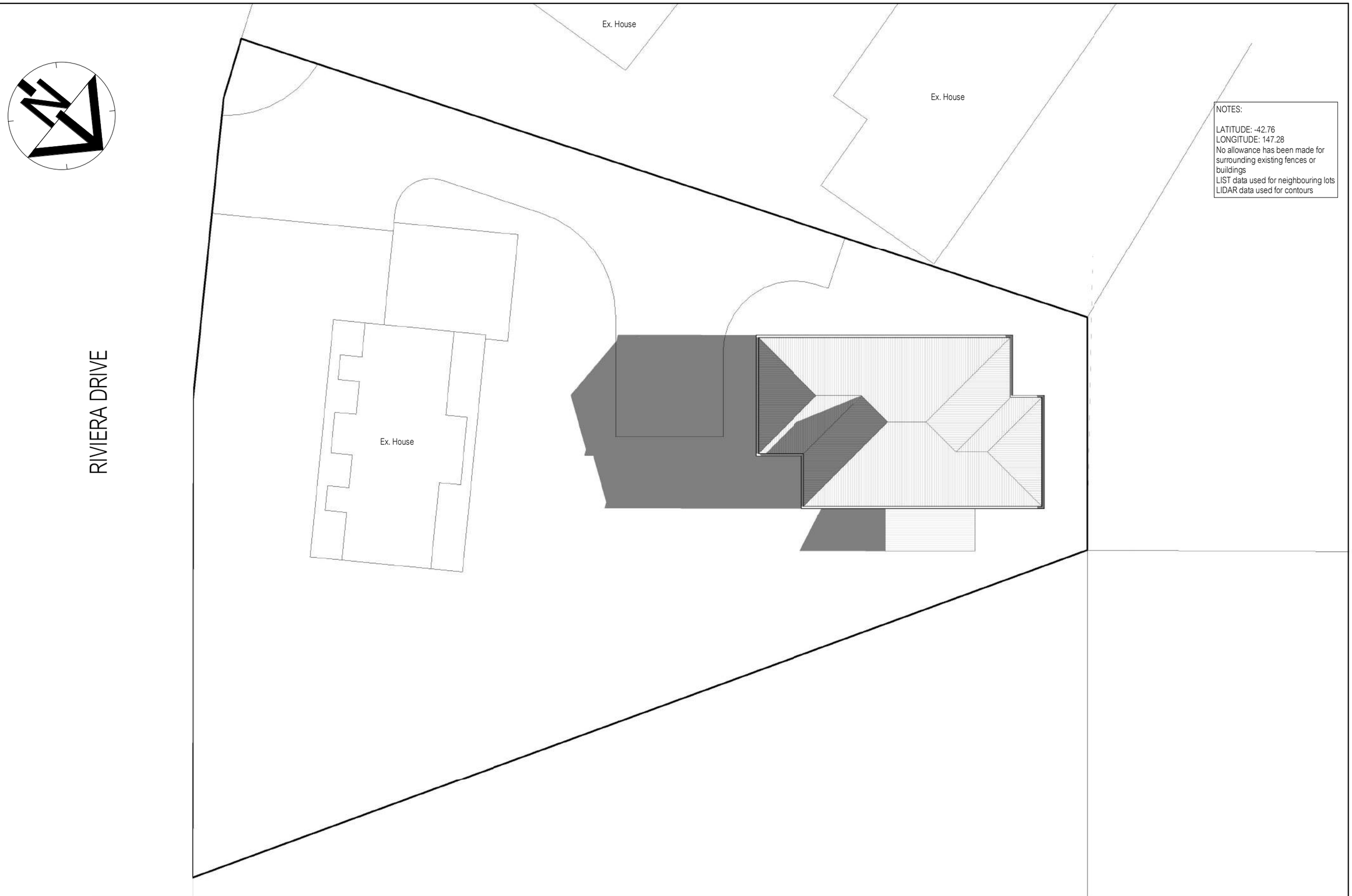

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LONGITUDE: 147.28
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LIDAR data used for contours

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TST

Client / Project info

PROPOSED BRYDEN HOMES DEVELOPMENT

27 Riviera Drive,
OLD BEACH

another perspective drafting&design

SHADOWS 3PM 21 JUNE 2021

Drawn	LH	AP2020-1919	
Date	06 January 2021	Sheet	
Scale	1 : 200	S08/S08	

Submission to Planning Authority Notice

Council Planning Permit No.	DA 2020/416	Council notice date	26/11/2020
TasWater details			
TasWater Reference No.	TWDA 2020/02008-BTN	Date of response	03/12/2020
TasWater Contact	Al Cole	Phone No.	0439605108
Response issued to			
Council name	BRIGHTON COUNCIL		
Contact details	development@brighton.tas.gov.au		
Development details			
Address	27 RIVIERA DR, OLD BEACH	Property ID (PID)	3365152
Description of development	Multiple Dwellings x 2 (1 new + 1 ex)		

Schedule of drawings/documents

Prepared by	Drawing/document No.	Revision No.	Date of Issue
Bryden Homes	Location Plan/P01	N/A	10/10/2020

Conditions

Pursuant to the *Water and Sewerage Industry Act* 2008 (TAS) Section 56P(1) TasWater imposes the following conditions on the permit for this application:

CONNECTIONS, METERING & BACKFLOW

1. A suitably sized water supply with metered connections and sewerage system and connections to the development must be designed and constructed to TasWater's satisfaction and be in accordance with any other conditions in this permit.
2. Any removal/supply and installation of water meters and/or the removal of redundant and/or installation of new and modified property service connections must be carried out by TasWater at the developer's cost.
3. Prior to commencing construction/use of the development, any water connection utilised for construction/the development must have a backflow prevention device and water meter installed, to the satisfaction of TasWater.

DEVELOPMENT ASSESSMENT FEES

4. The applicant or landowner as the case may be, must pay a development assessment fee of $211.63, to TasWater, as approved by the Economic Regulator and the fees will be indexed, until the date paid to TasWater.

   The payment is required within 30 days of the issue of an invoice by TasWater.

Advice

General

For information on TasWater development standards, please visit http://www.taswater.com.au/Development/Development-Standards

For application forms please visit http://www.taswater.com.au/Development/Forms

Service Locations

Please note that the developer is responsible for arranging to locate the existing TasWater infrastructure

and clearly showing it on the drawings. Existing TasWater infrastructure may be located by a surveyor and/or a private contractor engaged at the developers cost to locate the infrastructure.
A copy of the GIS is included in email with this notice and should aid in updating of the documentation. The location of this infrastructure as shown on the GIS is indicative only.

(a) A permit is required to work within TasWater's easements or in the vicinity of its infrastructure. Further information can be obtained from TasWater

(b) TasWater has listed a number of service providers who can provide asset detection and location services should you require it. Visit www.taswater.com.au/Development/Service-location for a list of companies

(c) TasWater will locate residential water stop taps free of charge

(d) Sewer drainage plans or Inspection Openings (IO) for residential properties are available from your local council.

Metering Vacant Lot

TasWater records indicate this property does not have a water meter installed on the connection to the TasWater water supply.

Prior to obtaining Building/Plumbing Approvals from council, the owner should make application to TasWater for the supply & installation of a water meter. TasWater will proceed to install a water meter on the water connection and forward an invoice for $266.72.

NOTE: In accordance with the WATER AND SEWERAGE INDUSTRY ACT 2008 - SECT 56ZB A regulated entity may charge a person for the reasonable cost of –

(a) a meter; and

(b) installing a meter.

56W Consent

The plans submitted with the application for the Certificate for Certifiable Work (Building) and/or (Plumbing) will need to show footings of proposed buildings located over or within 2.0m from TasWater pipes and will need to be designed by a suitably qualified person to adequately protect the integrity of TasWater's infrastructure, and to TasWater's satisfaction, be in accordance with AS3500 Part 2.2 Section 3.8 to ensure that no loads are transferred to TasWater's pipes. These plans will need to also include a cross sectional view through the footings which clearly shows;

(a) Existing pipe depth and proposed finished surface levels over the pipe;

(b) The line of influence from the base of the footing must pass below the invert of the pipe and be clear of the pipe trench and;

(c) A note on the plan indicating how the pipe location and depth were ascertained.

Boundary Trap Area

The proposed development is within a boundary trap area and the developer will need to provide a boundary trap that prevents noxious gases or persistent odours back venting into the property's sanitary drain. The boundary trap is to be be contained within the property boundaries and the property owner remains responsible for the ownership, operation and maintenance of the boundary trap.

Advice to Planning Authority (Council) and developer on fire coverage

TasWater cannot provide a supply of water for the purposes of firefighting to the lots on the plan.

Advice to the Drainage Authority

The combined system is at capacity in this area. TasWater cannot accept additional flows of stormwater into this area within the combined system over those currently discharged.

The Drainage Authority will be required to either refuse or condition the development to ensure the current service standard of the combined system is not compromised.

TasWater have a small number of townships that are on Boil Water and Do Not Consume Alerts. Please visit http://www.taswater.com.au/News/Outages---Alerts for a current list of these areas.

Declaration

The drawings/documents and conditions stated above constitute TasWater's Submission to Planning Authority Notice.

Authorised by

Jason Taylor
Development Assessment Manager

TasWater Contact Details			
Phone	13 6992	Email	development@taswater.com.au
Mail	GPO Box 1393 Hobart TAS 7001	Web	www.taswater.com.au

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Accredited Practitioners: Design +
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Planning Applications +
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10 Restdown drive Otago
Phone 0429901003
onshoredesigns@bigpond.com

Discretionary application

january 2021

Development Application Compliance report

Prepared for

Brighton Council

obo

BRETT KENNETH MILLER
KATHLEEN FRANCES MILLER
7 WALLACE STREET
BRIDGEWATER 7030

Prepared by

Michael Eastwood
onshoredesigns@bigpond.com
mobile 0429901003

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Proposed Development Summary

The application (DA) is required for the proposed development on the property title CT 199710/1. The property title has two (2) defined zones. The main area is 26.0 Rural Resource with a section of 10.0 General Residential to the NE of the title. Access to the property is from another title (owned by my client CT 31371/1) , a right of way and is zoned 28.0 Utilities and is a permitted access to the allotment.

The proposal is for a change to multiple use to include the existing main use Resource Development Use (hothouses) ,Pleasure Boat Facility use (Hovercraft rides) in the Rural Resource Zone and proposed Tourist Operation (private playgroup, including bumper cars, inflatable jumping castle and inflatable slide). Parking for the proposed will be on the Open Space Zoned Title in which had been the parking area for the previous use .
The existing use (Resource Development) is a permitted use class.
Pleasure Boat Facility is a Discretionary use.
Tourist Operation (private playgroup) is a Discretionary Use

Existing Use: The existing business was a large collective of hot houses (in excess of over 8500m2 of glassed hothouses) producing tomatoes in a large commercial enterprise supplying a large majority of the markets in Tasmania. With the existing use there was a constant amount of commercial traffic using the existing access to the property (Wallace Street). When this was in operation there were also trains using the Hobart line. In this time there were in excess of twenty (20) employers working on site and there parking area was where the existing bitumen parking (existing parking) is shown on the site plan however with a reduction in parking spaces for the proposed new Resource Development enterprise as described below.

My client intends to revitalise the produce of commercial food but in a lesser scale and using different techniques. Two areas of the large hot houses will remain (approx. 3000m2). The proposal is to use the existing swimming pool (in disrepair) and create an aquaponics industry capable of growing a large range of sustainable produce for the commercial market.

Use: Pleasure Boat Facility.
The change of use (Multiple Use) of the proposal is to provide hovercraft rides, from the site, to areas of the Derwent River.
The proposal is to provide a building to house and protect the hovercraft, whilst not in use. There is no requirement for a solid floor (slab). The position of 12.5m long*7.5m wide building will be positioned on an area that has previously been used as a building area. (hot houses). Parking for this new use (enterprise) is as shown on the site plan and is in the existing area used for parking for the previous use. This area is the Open Space Zone as shown on the site plan.

Use: Tourist Operation (private playgroups)
The proposal to provide private playgroups (emphasis on children's party's providing bump car rides, inflatable jumping castle and inflatable slide.)

The proposal is to provide a 9.2 wide *20m long roofed building to house the bump car rides with a 12m*2.4m container to place the bumper cars when not in use or need repairs. Jumping castle is inflatable , slide is inflatable. The proposal is to provide pick up and drop off facility using the owners small bus.

There will be an office building (6m*3m) and toilets (6m*3m). Both these building are portable.

See site plans

Introduction

This report forms part of a Development Application for **Multiple Uses** in the **26:0 Rural Resource Zone, 10.0 General Residential Zone** of allotment CT 199710/1 and **Vehicle Parking Use in the Open Space Zone** of allotment CT 175791/1 and relies on the **Performance Criteria** to satisfy part of the relevant planning standards. The report is to be read in conjunction with the design drawings prepared by **Michael Eastwood** that form part of this application.

It is the intent of this report to demonstrate compliance with all relevant scheme standards that form part of the 2015 Brighton Interim Planning Scheme and that are applicable to this application.

Appendices:

Documents

1. Brighton Council Application Form
2. Titles and folio plans
3. Reference to additional reports

Drawings

4. Site plans, floor plans, elevations.

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Date	January 2021
Applicant Details	**Michael Eastwood** 10 Restdown Drive. Otago onshoredesigns@bigpond.com mobile 0429901003
Owner Details	BRETT KENNETH MILLER KATHLEEN FRANCES MILLER 7 WALLACE STREET BRIDGEWATER 7030
Property Details	Cert Title no CT 199710/1 **Size: 1.429ha** CT 175791/1 (parking)
Development Address	7 WALLACE STREET BRIDGEWATER 7030
Development Type	**Proposed Class 10 building**

Development Area

Proposed	
Hovercraft Shed	93.75m^2
Bumpcar Shed	184m^2
Container	29m^2
Office	18m^2
Toilets	18m^2
Total	**342m^2**

Zones	**Rural Resource/General residential incorporating parking in the Open Space Zone** (CT 175791/1)
Uses	Resource Development Use (hothouses/aquaponics) Pleasure Boat Facility use (Hovercraft rides). Tourist Operation (private playgroup, bump-car, jumping castle and slide)
Qualification	Resource Development – Permitted (existing) Pleasure Boat Facility - Discretionary Tourist Operation -Discretionary Vehicle parking – Discretionary
Application	**Discretionary Use**

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Applicable Planning Scheme Zones and Codes

ZONE	**26.0 - Rural Resource** **10.0- General Residential** **19.0- Open Space**

CODES

E5	ROAD AND RAILWAY CODE see TIA
E6	PARKING AND ACCESS CODE see TIA
E7	STORMWATER AND MANAGEMENT CODE see Report
E11	WATERWAYS AND COASTAL PROTECTION CODE see Report
E15	INUNDATION PRONE AREAS CODE see Report
E16	COASTAL EROSION HAZARD CODE see Report
E17	SIGNS CODE

COMPLIANCE WITH PLANNING SCHEME

The proposed development (hovercraft shed, bump car shed and office) are within a defined **Rural Resource Zone**. Proposed parking and toilets are within the defined **Open Space Zone**. Each scheme standard will be addressed in relation to the proposal.

26.0 Rural Resource Zone

26.2 Use Table

Use: Existing Resource Development Use (hot houses)
Use: Pleasure Boat Facility use (Hovercraft rides). Discretionary Use Class
Use: Tourist Operation (private playgroup). Discretionary use Class
26.3 Use Standards

26.3.3 Discretionary Uses

P1

The proposed Pleasure Boat Facility and Tourist Operation Uses are a non-agricultural use but do not conflict with or fetter agricultural use on the site or adjoining land. The ground and area is not suitable for a direct agricultural Use and no direct agricultural use exists. The existing Use is Resource Development and General Residential and this is for the hothouses and accompanying outbuildings that produced tomatoes on a large commercial enterprise and will now be used for aquaponics on a reduced scale. The business had been run down and no longer operated on a sustainable level. Some of the hothouses are to remain and a similar pursuit of sustainable aquaponics (incorporating the existing swimming pool) is to be setup in a new commercial enterprise. There are no agricultural uses on adjoining land.

26.4 Development Standards for Buildings and Works

26.4.1 Building Height

A1

Hovercraft shed and bump car- 4m max height (acceptable)
Toilet and office building 3.6m max height (acceptable)

26.4.2 Setback

A1

The proposed office building is the closest to the frontage from the Rural Resource Zone and >20m. This has been determined by the setback to 31371/1 Utilities allotment owned by my client. Its difficult to determine what is perceived as the frontage in this situation. See site plan

P2

The proposed Hovercraft building has a setback to the high tide mark of approximately 32m. See site plan.

a) The building setback of the hovercraft building to the high tide mark is on an existing building area and is in a position where the existing hothouses used to be. The topography of the site offer little bearing to the setbacks and it could be that a precedent was applied with the positioning of other buildings on the allotment.
b) The size and shape of the site provides little incite into the regulated setbacks due to the nature of the site and its boundaries being the waters edge at low tide and the owners property's to the North.
c) The buildings existing on the site have similar setbacks to that proposed. The existing large shed has a 3m setback to boundary's. The existing remaining hothouses have a setback of 2m to the existing neighbours residential property and the existing small cabin has a setback to the hightide mark of around 9m. What im determining is the setbacks required are within the setbacks existing.
d) The proposed hovercraft shed will be are alternate Evening Haze , Cove & mangrove(all low reflective colour-bond colours) . Camouflage effect. . A light reflectance of <40%
e) The proposed is not on a skyline or prominent ridgeline.
f) There is no impact to native vegetation as the proposed is to be placed on ground that has previously been developed (hot houses) building area.

A3 **NA** Not a sensitive use.

A4 **NA**

26.4.3 Design

A1

c) The proposed is located in and area not requiring the clearing of native vegetation and not on a skyline or ridgeline.

A2

The proposed is using colours with a light reflectance value not greater than 40 percent. The colours of the hovercraft shed and bump car building are alternate Evening Haze , Cove & mangrove(all low reflective colour-bond colours) . Camouflage effect.

A3

NA. Flat land. No excavation required

26.4.4 Plantation Forestry

A1

NA.

10.0 General Residential Zone

10.2 Use Table

The existing Class 10 building is an existing building as part of the existing Resource Development use. No change to this zoning

The proposed development vehicle parking is within the defined **Open Space Zone**. Each scheme standard will be addressed in relation to the proposal.

19.0 Open Space Zone

19.2 Use Table

Use: Vehicle parking – Discretionary Use

19.3 Use Standards

19.3.1 Hours of Operation

A1

The Open Space Zone is within 50m of a Residential Zone

a) Opening hours will be between 8.00 am to 6.00 pm Mondays to Saturdays inclusive;
b) Other hours will be
10.00 am to 4.00 pm Sundays and Public Holidays;
except for office and administrative tasks.

19.3.2 Noise

NA. Noise is in relation to vehicle parking. There will be no noise from vehicles above the limits in A1 and no use of amplified loud speakers as described in A2

19.3.3 External Lighting

A1

There will be minimal external lighting maybe all that is required for a security reason.

a) Only security lighting to carpark
b) Security lighting will be baffled to the residential zoned property and will only provide lighting to access areas of the slide and bump car and within the

hovercraft building to deter persons trespassing on site for security and insurance purposes. Although the area I mentioned above (b) is not in entirely in the Open Space Zone it's a reference to all external security lighting.

19.3.4 Commercial Vehicle Movements

A1

Commercial vehicle movements, (including loading and unloading and garbage removal), to or from a site within 50 m of a residential zone will be within the hours of:

(a) 7.00 am to 5.00 pm Mondays to Fridays inclusive;

(b) 9.00 am to 12 noon Saturdays;

(c) Nil Sundays and Public Holidays.

There is no direct commercial vehicle requirement with this application

19.3.5 Discretionary Use

P1

I believe the Discretionary use (Vehicle Parking) can argue the fact that the parking on the Open Space Zoned land is primarily for parking for the use on the Rural Resource Zone proposed development. The remaining area of the Open Space Zoned property can be used for passive recreation and also Natural and cultural values management use due to the significance of the area, close to the shoreline, having aboriginal significance.

19.4 Development Standards for Buildings and Works

19.4.1 Building Height

NA parking only

19.4.2 Setback

NA. No building on Zone

19.4.3 Landscaping

A1 landscaping will be provided close to the frontage of the site to the residential zoned part of the allotment mainly to provide screening to the entrance.

A2 As above

19.4.4 Fencing

NA. The only fencing required, on the boundary of the Open Space Zoned land to the Rural Resource Zoned land (main proposed development) may be the requirement to provide security fencing

RELEVANT CODE

E5 Road and Railway Assets Code

See Traffic Impact Assessment by Midson Traffic.

RELEVANT CODE

E6 Car Parking and Access Code.

To be read in conjunction to Traffic Impact Assessment by Midson Traffic.

E6.6 Use Standards

E6.6.1 Car Parking Numbers

See TIA

E6.6.2 Number of Accessible Car Parking Spaces for People with a Disability

A1

a) The disabled parking spaces required for this application and use is one (1) space to satisfy the relevant provisions of the NCC

b) The space is incorporated into the overall car park design.

c) The proposed is located as close as practical to the building entrance

E6.6.3 Number of Motorcycle Parking Spaces

A1 NA but one (1) is provided

E6.6.4 Number of Bicycle Parking Spaces

A1 NA

6.7 Development Standards

E6.7.1 Number of Vehicular Accesses

A1 Existing access

E6.7.2 Design of Vehicular Accesses

A1 NA

A2 (a)
Non-commercial vehicle access; the location, sight distance, width and gradient of an access will be designed and constructed to comply with section 3 – "Access Facilities to Off-street Parking Areas and Queuing Areas" of AS/NZS 2890.1:2004 Parking Facilities Part 1: Off-street car parking

Parking angle 90 degrees
Parking space size 2400*5400 except for disabled 4800 wide
Parking space for motorcycles 1200*2500

Two way roadway 5.5m wide
Level grade
Access driveway width 6m
Control point at entrance for queuing 2 cars
Parking turning radius is adequate and can be shown

E6.7.3 Vehicular Passing Areas Along an Access

See TIA

E6.7.4 On-Site Turning

A1

On-site turning is provided to enable vehicles to exit the site in a forward direction.
See site plan.

E6.7.5 Layout of Parking Areas

A1

The layout of car parking spaces, access aisles, circulation roadways and ramps are designed and constructed to comply with section 2 “Design of Parking Modules, Circulation Roadways and Ramps” of AS/NZS 2890.1:2004 Parking Facilities Part 1: Off-street car parking and have sufficient headroom to comply with clause 5.3 “Headroom” of the same Standard.
See site plan for access aisles ect. Headroom is sufficient for vehicles

E6.7.6 Surface Treatment of Parking Areas

A1

The parking spaces and vehicle circulation roadways will not unreasonably detract from the amenity of users, adjoining occupiers or the quality of the environment through dust or mud generation or sediment transport, having regard to all of the following:

(a) The existing parking spaces for the original business were bitumen sealed.
The proposed car parking area for the new use will require the existing bitumen remains to be re-sealed
The driveway surface to the back of the existing shed will be covered and compacted with decomposed granite that
provides a relatively stable dust free surface that requires little maintenance.

(b) The characteristics of this use is in a natural environment and I believe is adequate for this type of use and area.

(c) The measures to mitigate mud or dust generation or sediment transport is to keep a watch on the condition of the decomposed granite driveway and parking area and provide maintenance when required. This would be the use of moisture control and regular compaction checks.

Note: The owners cannot afford to totally seal the driveway and at the moment the only part un sealed is the driveway to the rear of the existing shed. If the proposed is a viable venture it would be the intent of the owners to eventually seal the driveway although I do find the decomposed granite would be an excellent surface if well maintained.

E6.7.7 Lighting of Parking Areas

A1 NA. The requirement will not require use out of daylight hours

E6.7.8 Landscaping of Parking Areas

P1

The position of the parking spaces is in an area that is screened from the streetscape. The driveway access to the parking area is screened by a fence and espalier fruiting trees

a) There will be no visual impact on the streetscape due to the position of the proposed parking area
b) The existing fencing and espalier fruiting trees soften the boundary of the car parking area and reduce the amenity impact on the neighbouring property.
c) I believe this does not apply to this onsite parking area that can be immediately viewed directly from the owners dwelling.

E6.7.9 Design of Motorcycle Parking Areas

A1

(a) The proposed motorcycling parking area is located, designed and constructed to comply with section 2.4.7 “Provision for Motorcycles” of AS/NZS 2890.1:2004 Parking Facilities Part 1: Off-street car parking. Size 1.2m * 2.4m See site plan

(b) The Motorcycling Parking is located within 30 m of the main entrance to the building. See site plan

E6.7.10 Design of Bicycle Parking Facilities

NA Not required in this use however the owner may provide some safe bicycle parking as the facility is to be used by children who may access the proposed by cycling and require safe parking/storage of there bicycles.

E6.7.11 Bicycle End of Trip Facilities

NA

E6.7.12 Siting of Car Parking

NA Not in any of those Zones noted.

E6.7.13 Facilities for Commercial Vehicles

NA No requirement for commercial vehicles other than that existing. See TIA

E6.7.14 Access to a Road

The access to the property is the existing access. see site and site plan

RELEVANT CODE

See Engineers report

E7.0 Stormwater Management Code

E7.7.1 Stormwater Drainage and Disposal

A1 There are no new impervious surfaces in this application.

The existing/new carparking area has some existing bitumen.

A2 The carparking areas are all drained as existing.

A3

a) Existing stormwater system consisting of ag drains to pit and existing line to the river. See site plan
a) Stormwater runoff is no greater than that pre-existing.

A4

Impossible to put a major stormwater drainage system due to location and topographic reasons

RELEVANT CODES

E11 WATERWAYS AND COASTAL PROTECTION CODE

E15 INUNDATION PRONE AREAS CODE

E16 COASTAL EROSION HAZARD CODE

I believe all the above Codes have been addressed in the Coastal Vulnerability Assessment from GES Geo-Environmental Solutions

RELEVANT CODE

E17.0 Signs Code

NA. Only using signs that are exempt.

Internal sign that is associated with the business name and not illuminated.

Transom sign that is not illuminated

Conclusion

The owners have decided to continue developing the existing use as a aquaponics/hydroponics business providing produce for the local market but in a lot smaller scale than what was existing.

The other uses are the hovercraft rides through to New Norfolk. (pleasure boat facility). The requirement for this is a new building to give cover protection to the hovercraft. A removable office is to be included and a removable toilet block to service the patrons.

The children's party's (bumber cars and jumping castle/slide) will cater for small groups and will be a pick up and drop off service. Private bus parking provided.

Signed:

Michael Eastwood

Onshore Designs

PROJECT INFORMATION

BUILDING DESIGNER:	MICHAEL EASTWOOD
ACCREDITATION No:	CC 1066 S
LAND TITLE REFERENCE NUMBERs:	31371/1, 175791/1, 199710/1 (main title)
FLOOR AREA	90 m^2 (hovercraft building) 184 m^2 (bumber shed)
DECK FLOOR AREA	NA
DESIGN WIND SPEED:	N3
SOIL CLASSIFICATION:	M
CLIMATE ZONE:	7
BUSHFIRE-PRONE BAL RATING:	NA
ALPINE AREA:	NOT APPLICABLE
CORROSION ENVIRONMENT:	HIGH
FLOODING:	NO
LANDSLIP:	NO
DISPERSIVE SOILS:	UNKNOWN
SALINE SOILS:	UNKNOWN
SAND DUNES:	NA
MINE SUBSIDENCE:	NO
LANDFILL:	NA
DATUM LEVEL AT KERB:	NA
GROUND LEVEL:	RL
FINISHED FLOOR LEVEL:	RL
OVERFLOW RELIEF GULLY LEVEL:	RL

Proposed Multiple use
Existing Resource Development (aquaponics)
Pleasure Boat Facility (hovercraft rides), Tourist Operation (private party,s)

7 Wallace Street
Bridgewater TAS
7030

PLANNING APPLICATION

AMMENDED 18/01/21

Michael Eastwood
Onshore Design
buiding designSTUDIO
www.buildingdesignstudio.com.au

office 80 Cowle Road, Bridgewater
mail/ 10 Restdown Drive, Otago, 7017
0429901003
onshoredesigns@bigpond.com

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Drawing List

Sheet Number	Sheet Name
A0	Title Sheet
A1	Site Plan 1 to 700
A2	Site Plan 1 to 400

SITE PLAN 700

1 : 750

AMMENDED 18/12/20

Rev.	Date	Description

BUILDING DESIGNERS AUSTRALIA TAS

Printed Date
20/01/2021 9:33:10 AM

Onshore Designs
Building Designers
building design STUDIO
mail: 10 Restdown Drive, Otago, 7017
phone: mob 0429901003
web: www.buildingdesignstudio.com.au
email: onshoredesigns@bigpond.com

Job Title
Proposed Development
at 7 Wallace St
Bridgewater 7030

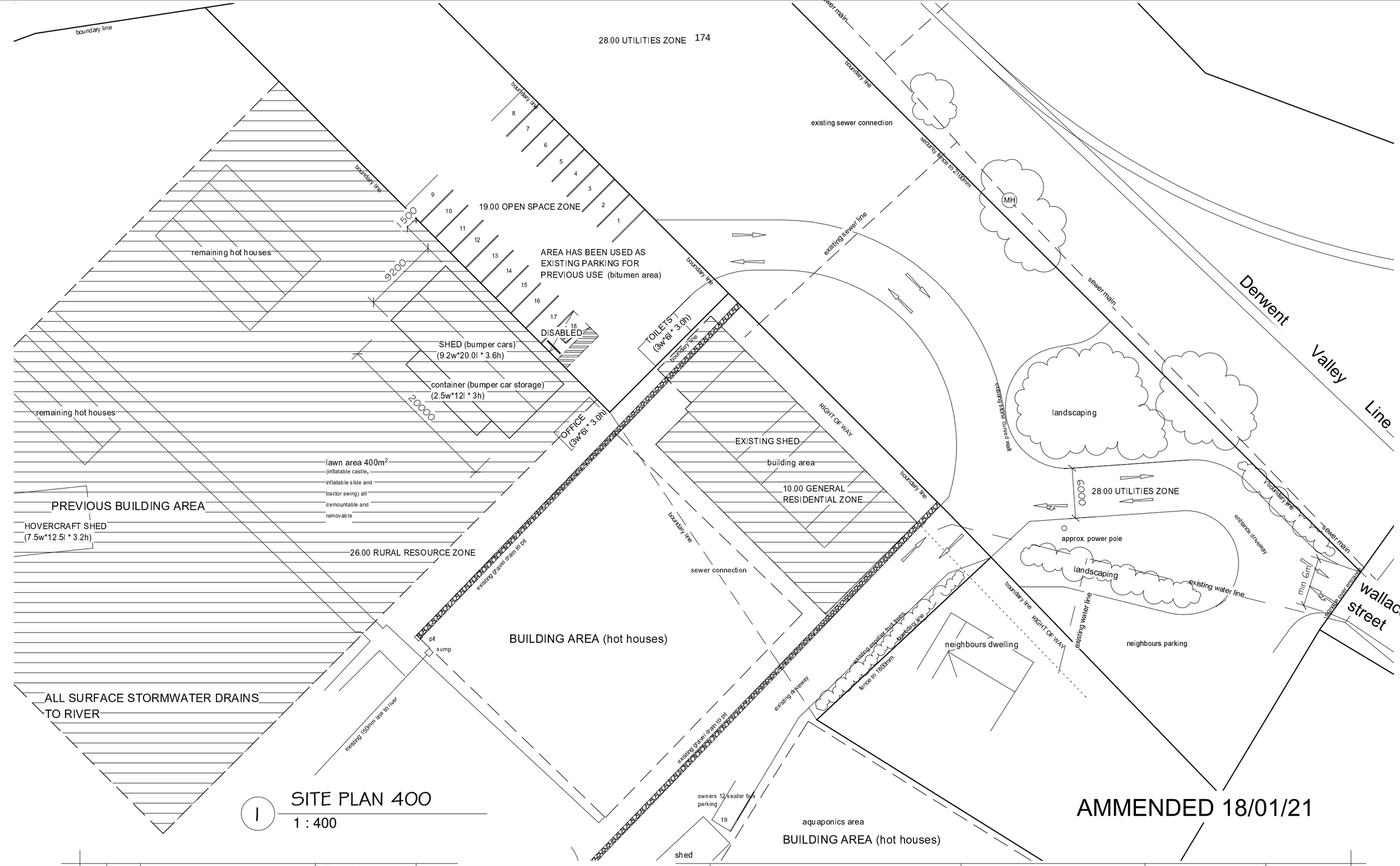
for Brett and Kathleen Miller

Drawing Title
Site Plan 1 to 700

Date: 18/01/21
Drawn By: Michael Eastwood
Acreditation No. CC 1066 S
Scale: **1 : 750**

Project No:

Sheet No: A1



1 SITE PLAN 400
1 : 400

AMMENDED 18/01/21

Rev.	Date	Description

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Building Designers
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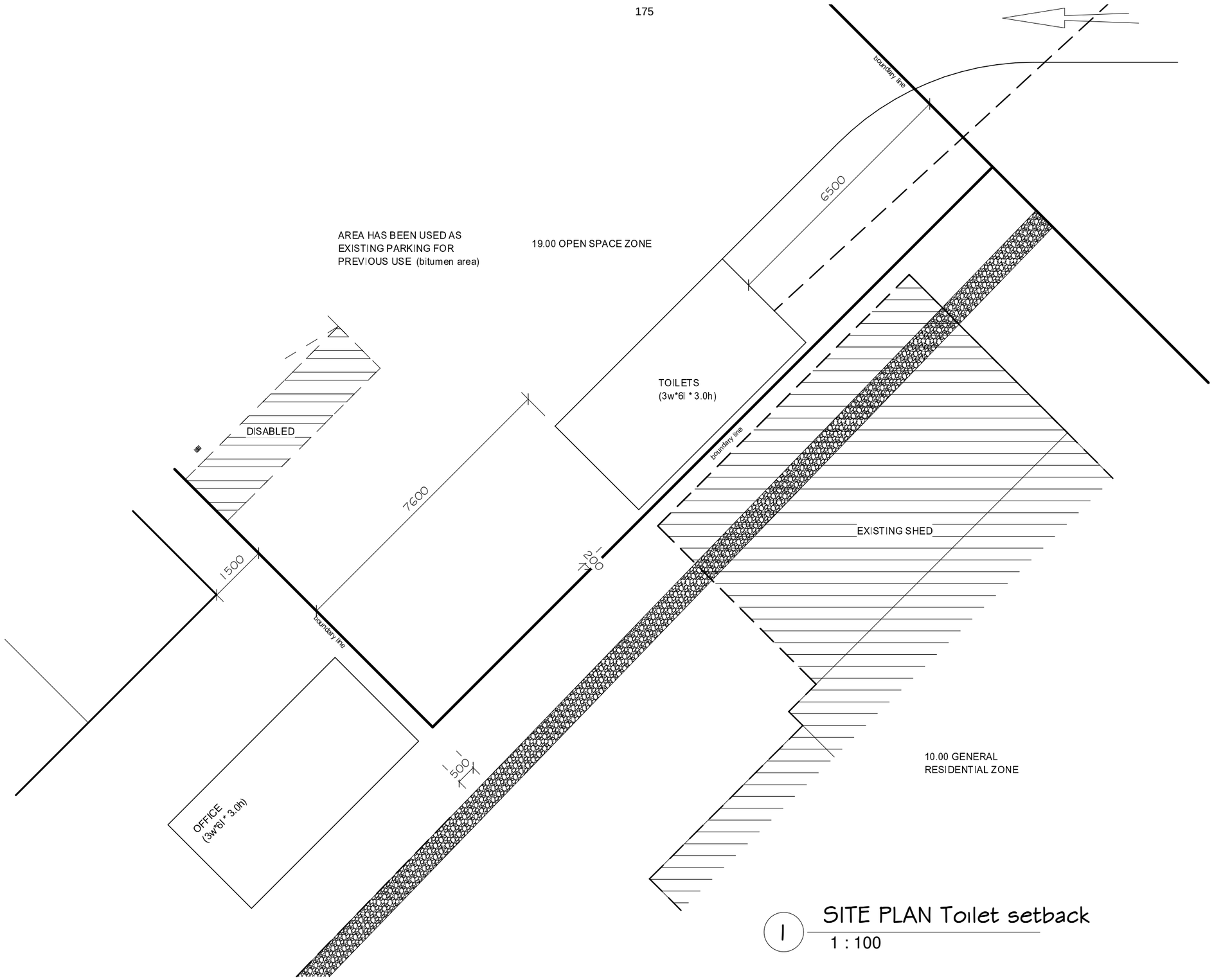
email: onshoredesigns@bigpond.com

Job Title
Proposed Development
at 7 Wallace St
Bridgewater 7030

for Brett and Kathleen Miller

Drawing Title
Site Plan 1 to 400

Date: 18/01/21
Project No:
Drawn By: Michael Eastwood
Sheet No: A2
Acreditation No. CC 1066 S
Scale: **1 : 400**



1 SITE PLAN Toilet setback
1 : 100

Rev.	Date	Description

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Printed Date
1/03/2021 11:34:35 AM

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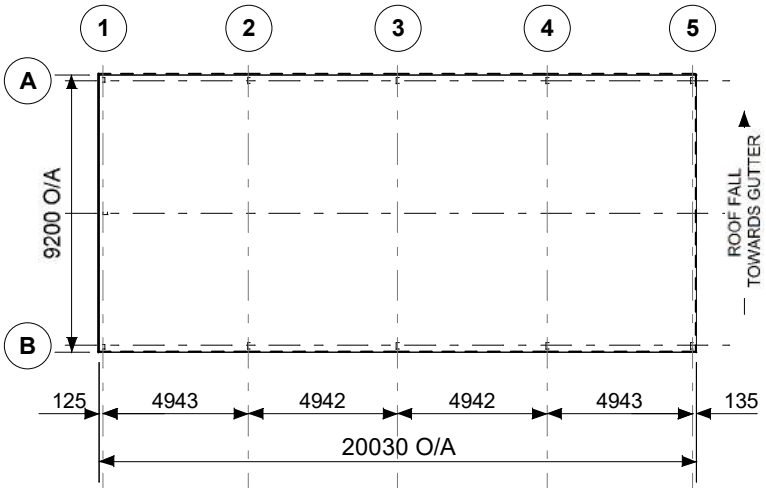
Job Title
Proposed Development
at 7 Wallace St
Bridgewater 7030

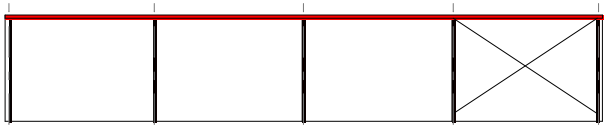
for Brett and Kathleen Miller

Drawing Title
Site Plan- Toilet setback

Date: 18/01/21
Drawn By: Michael Eastwood
Acreditation No. CC 1066 S
Scale: **1 : 100**
Project No:
Sheet No: A3



GROUND FLOOR PLAN



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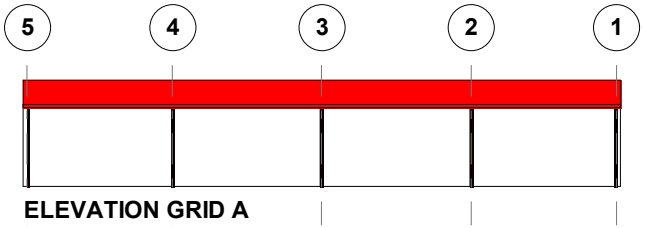

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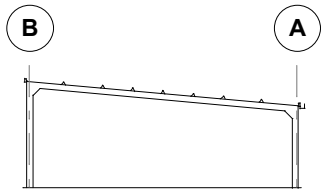
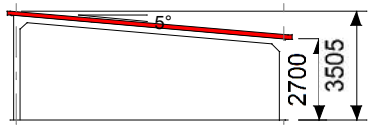


SECTION GRID 2, 3, 4



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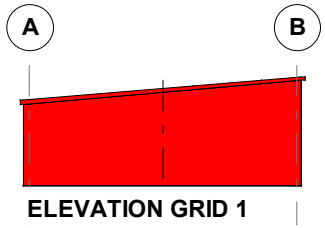

ELEVATION GRID 1

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CLADDING

ITEM	PROFILE (min)	FINISH	COLOUR
ROOF	TRIMDEK 0.42 BMT	CB	AA
WALLS	TRIMDEK 0.42 BMT	CB	AA
CORNERS	-	CB	AA
BARGE	-	CB	AA
GUTTER	SQUARELINE	CB	AA

0.35bmt=0.40tct; 0.42bmt=0.47tct; 0.48bmt=0.53tct

ACCESSORY SCHEDULE & LEGEND

QTY	MARK	DESCRIPTION

ARCHITECTURAL DRAWING ONLY, NOT FOR CONSTRUCTION USE

WIND DESIGN

IMPORTANCE LEVEL	REGION	TERRAIN	Ms
2	A	2.5	1.0

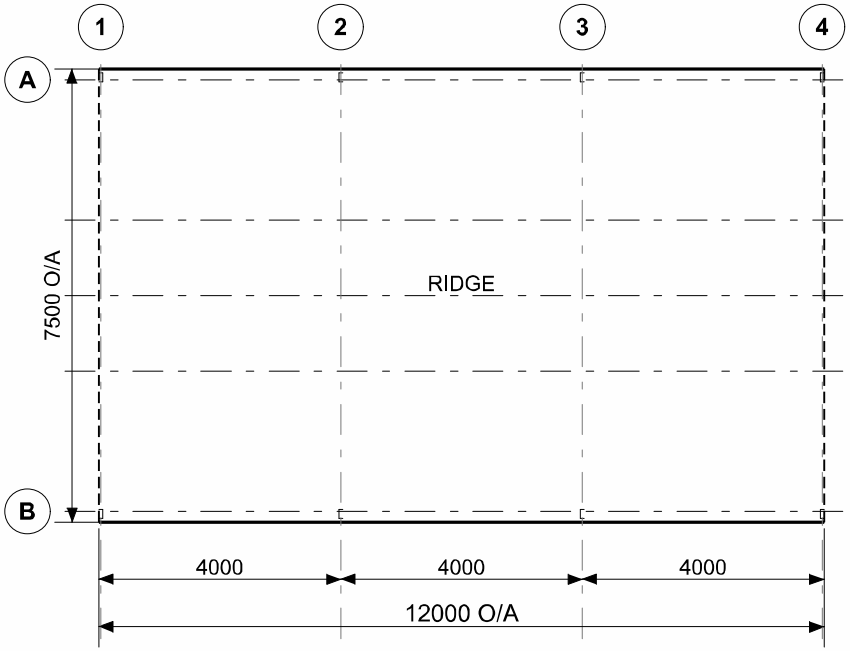
CLIENT
Brett Miller

SITE
TBA
BRIDGEWATER TAS 7030

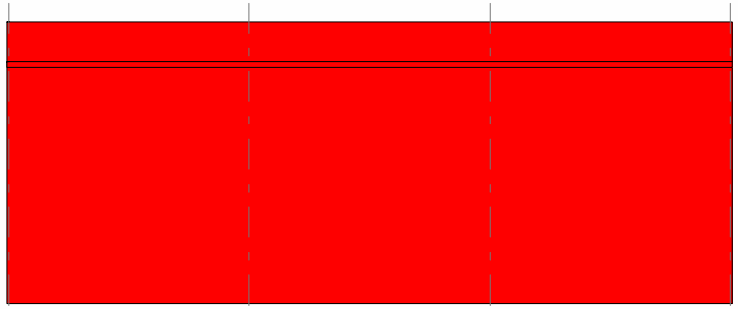
BUILDING
BIG G SKILLION
9200 SPAN x 2700/3505 EAVE x 20030 LONG

TITLE
GENERAL ARRANGEMENT

SCALE	DRAWING NUMBER	REV	PAGE
A4 SHEET 1:250	**BRWT6-0297**	**A**	**1/1**



FRAME ROOF PLAN



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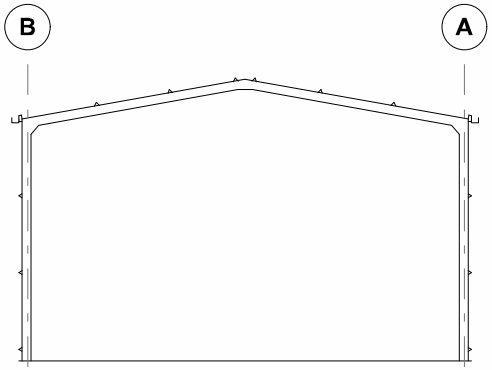
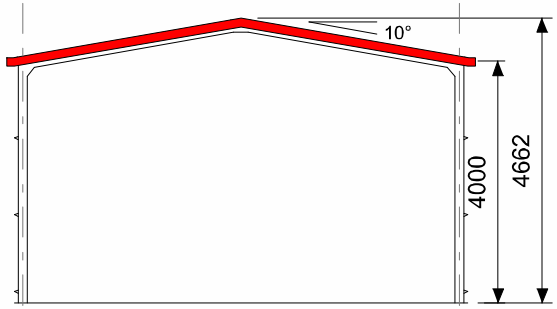


SECTION GRID 2, 3



ELEVATION GRID 4

Cont. on page 2

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Solutions Pty Ltd
trading as RANBUILD

CLADDING

ITEM	PROFILE (min)	FINISH	COLOUR
ROOF	CUSTOM ORB 0.42 BMT	CB	AA
WALLS	TRIMDEK 0.42 BMT	CB	AA
CORNERS	-	CB	AA
BARGE	-	CB	AA
GUTTER	HI-QUAD	CB	AA

0.35bmt=0.40tct; 0.42bmt=0.47tct; 0.48bmt=0.53tct

ACCESSORY SCHEDULE & LEGEND

QTY	MARK	DESCRIPTION

ARCHITECTURAL DRAWING ONLY, NOT FOR CONSTRUCTION USE

WIND DESIGN

IMPORTANCE LEVEL	REGION	TERRAIN	Ms
2	A	2.5	1.0

CLIENT
Brett Miller

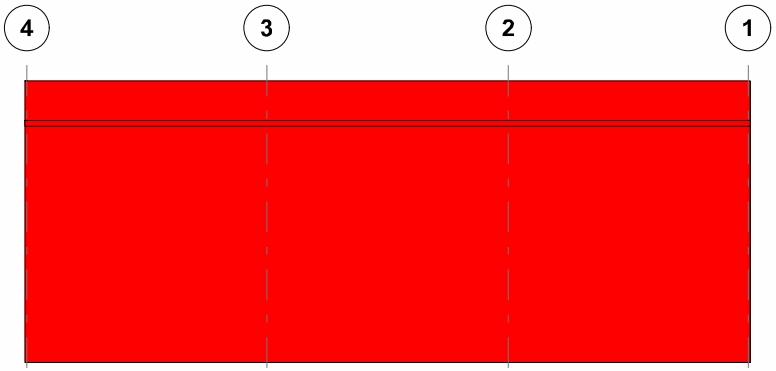
SITE
TBA
BRIDGEWATER TAS 7030

BUILDING
SUNDOWN DELUXE
7500 SPAN x 4000 EAVE x 12000 LONG

TITLE
GENERAL ARRANGEMENT

SCALE	DRAWING NUMBER	REV	PAGE
A4 SHEET 1:125	**BRWT6-0472**	**A**	**1/2**

Cont. on page 1



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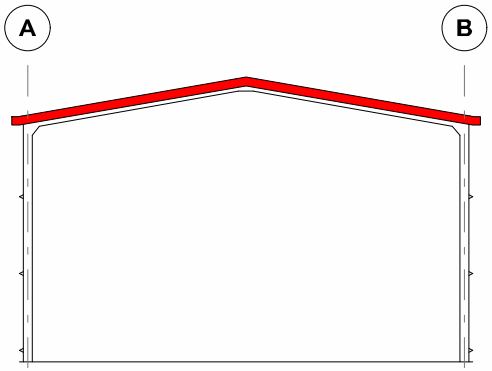

ELEVATION GRID 1

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SCALE	REV
A4 SHEET 1:125	A
DRAWING NUMBER	PAGE
BRWT6-0472	2/2

GES

GEO-ENVIRONMENTAL

SOLUTIONS

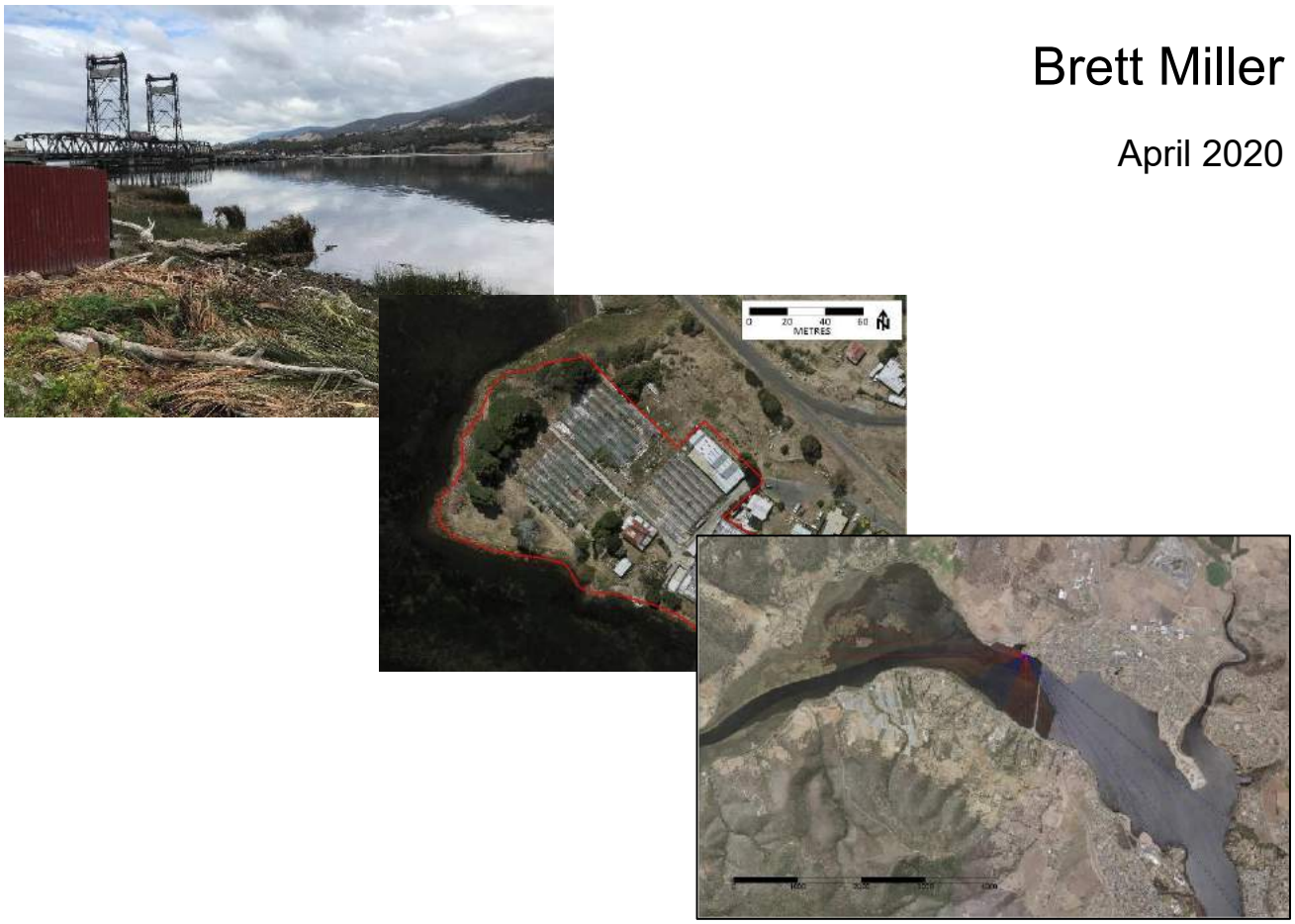
COASTAL VULNERABILITY ASSESSMENT

7 Wallace Street, Bridgewater

CLIENT

Brett Miller

April 2020



Geo-Environmental Solutions P/L 29 Kirksway Place, Battery Point 7004. Ph 6223 1839 Fax 6223 4539

Tables

Figures

Executive Summary

Geo-Environmental Solutions Pty Ltd (GES) were contracted by Brett Miller to prepare a coastal erosion and inundation hazard assessment for a property at Bridgewater. The project area consists of a single cadastral title (located at 7 Wallace Street (The Site)). An application to conduct construction works has triggered the assessment in accordance with the Interim Planning Scheme (IPS) 2015.

A 'first pass assessment' has been conducted for the site area by Sharples (2008) which involved an assessment of coastline geomorphology and vulnerability to inundation and erosion processes. The need for a second pass assessment is based on a requirement to assess site inundation potential and erosion hazards. *A detailed coastal inundation and erosion hazard assessment has been conducted for the site.*

The site has an area of approximately 1.62 Ha and appears to have its coastal boundary at the edge of the Derwent River (the low water mark). The elevation of the site ranges from 0 to 2.7 m AHD. Photo 1 shows the edge of the riverbank is lined with reeds, with a small area exposing underlying cobbles which lines the edge of the shoreline, providing some shoreline armouring.

A soil assessment was conducted for foundation design by GES. A push probe borehole was completed at various locations and identified dolerite rock at a depth of between 0.8 and 1.6 m depth.

The following can be concluded from the inundation assessment:

- The Tasmanian Building Regulations do not stipulate design finished floor levels for non-habitable buildings. In accordance with the Directors Determination (2020), the finished floor level of any proposed habitable space should be at 2.5 m AHD, which is compiled from site-specific design levels within the planning scheme inundation prone areas code Table 15.1 reference for Bridgewater
- GES have identified that largest 1% AEP wave condition at the site is generated from a westerly wind wave with an offshore significant height of 0.9 m at 1.4 m water depth and a nearshore and largely attenuated significant wave height of 0.9 m near the site;
- Wave run up inundation levels for 2070 are calculated to be at 2.2 m AHD based on calculated 1% AEP wind waves from the west (the largest wave runup at the site)
- It is recommended that the finished floor levels for buildings established at the site are at or above 2.2 m AHD. On this basis, there is a low risk that the floors will be inundated by 2070 based on a 1% AEP event.

The following can be concluded from the coastal erosion assessment:

- It is established that up to 25 m of coastline recession may be expected by 2070. .
- As the proposed structures are not located within the zone of reduced foundation capacity, the foundations should be designed to account for the site classification Class M.

The following are recommended from the assessment:

- Given the extensive coastal erosion hazard overlay, the only possible way to subdivide the property is for creation of a lot for the purposes of public open space, public reserve or utilities;
- As indicated in section 4.6.2, there is a residential building exclusion zone which applies to the portion of the lot within the IPAC High hazard overlay. This portion may be allocated to public open space for the purpose of subdividing the lot. Allocation may not have to be limited to waterfront areas.
- As the proposed structures are not located within the zone of reduced foundation capacity, the foundations should be designed to account for the site classification Class M.
- For proposed buildings within the low inundation prone code area, it is recommended that finished floor levels are constructed at or above 2.2 m AHD to achieve a tolerable risk.
- Infilling may be conducted in waterways and coastal protection area, provided they are not classified as a wetland.
- A soil and water management plan is required if there is proposed building works at the site;
- Any works are to be undertaken generally in accordance with 'Wetlands and Waterways Works Manual' (DPIWE, 2003) and “Tasmanian Coastal Works Manual” (DPIPWE, Page and Thorp, 2010), and the unnecessary use of machinery within watercourses or wetlands is avoided.

List of Abbreviations

AHD(83)	Australian Height Datum
AEP	Annual Exceedance Probability
CEM	Coastal Engineering Model
CEHC	Coastal Erosion Hazards Code
DCP	Dynamic Cone Penetrometer
DEM	Digital Elevation Model
DPAC	Department of Premier and Cabinet
ERMP	Erosion Risk Management plan
GES	Geo-Environmental Solutions Pty Ltd
GIS	Geographical Information System
IPAC	Inundation Prone Areas Code
IPCC	Intergovernmental Panel on Climate Change
IPS	Interim Planning Scheme
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
TAFI	Tasmanian Aquiculture and Fisheries Institute
WRL	Water Research Laboratory (University of New South Wales)

1 Introduction

Geo-Environmental Solutions Pty Ltd (GES) were contracted by Brett Miller to prepare a coastal erosion and inundation hazard assessment for a property at Bridgewater. The project area consists of a single cadastral title (located at 7 Wallace Street (The Site)). An application to conduct construction works has triggered the assessment in accordance with the Interim Planning Scheme (IPS) 2015.

A 'first pass assessment' has been conducted for the site area by Sharples (2008) which involved an assessment of coastline geomorphology and vulnerability to inundation and erosion processes. The need for a second pass assessment is based on a requirement to assess site inundation potential and erosion hazards. *A detailed coastal inundation and erosion hazard assessment has been conducted for 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 relevant performance criteria relevant to the project which need addressing;
- Conduct a literature review of all geological, geomorphologic, hydrodynamic information and any 'First or Second Pass Assessments' which are relevant to the site;
- Conduct a detailed inundation and erosion hazard assessment;
- 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 impact.

3 Site Details

3.1 Project Area Land Title

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

- CT 199710/1 (7 Wallace Street);

This parcel of land is referred to as the 'Site' and/or the 'Project Area' in this report.

3.2 Project Area Regional Coastal Setting

The Project Area is located between Mawson Point and Bridgewater Causeway (Figure 1). The site is subject to the following hydraulic influences:

- Wind fetch across the River Derwent from the west, southwest and the south and the following:
    - Wave setup; and
    - Wave run-up.
- Sea level rise; and
- Tides and associated water currents.

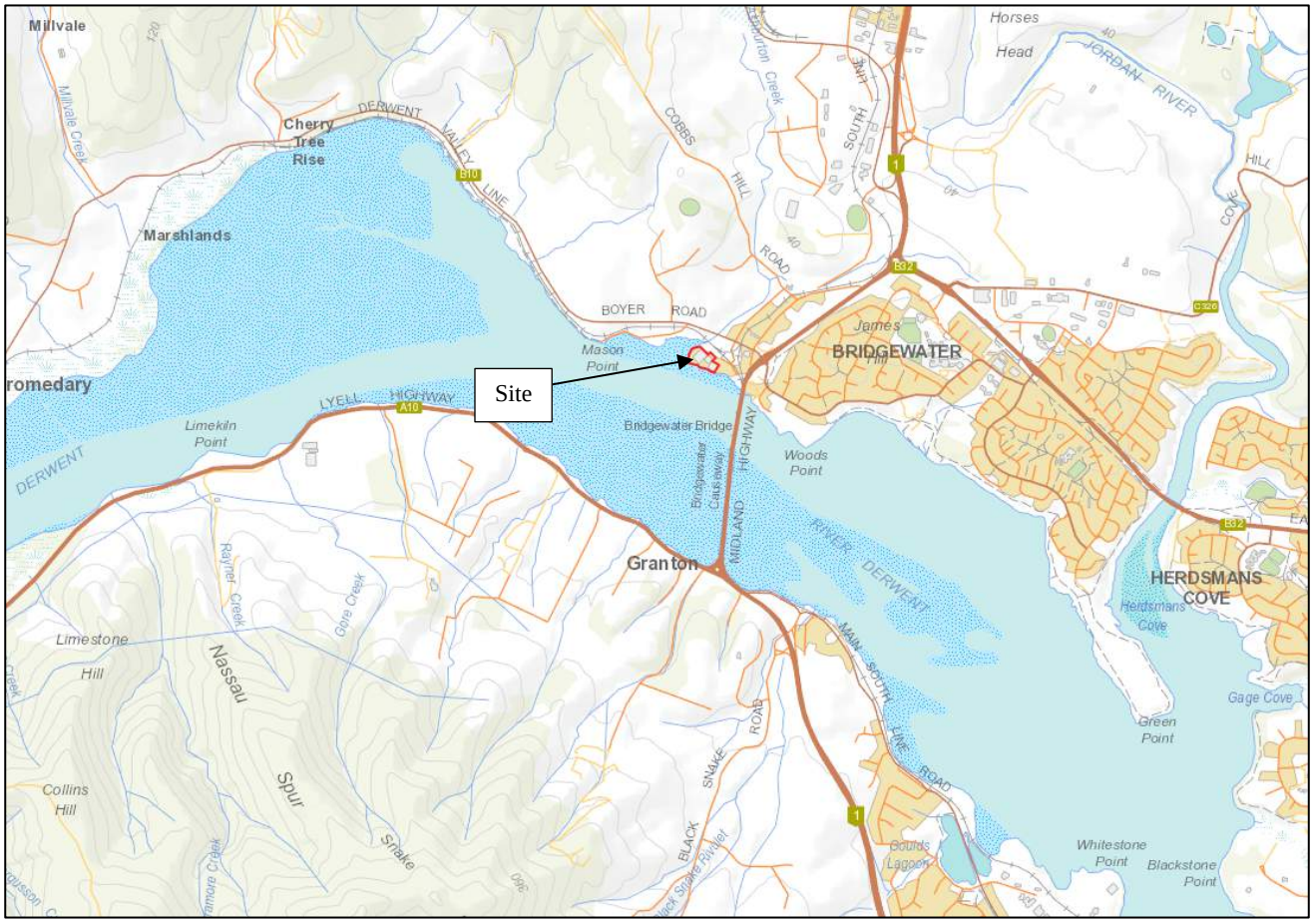


Figure 1 Site Location

3.3 Project Area Local Setting

The site has an area of approximately 1.62 Ha and appears to have its coastal boundary at the edge of the Derwent River (the low water mark). The elevation of the site ranges from 0 to 2.7 m AHD. Photo **1** shows the edge of the riverbank is lined with reeds, with a small area exposing underlying cobbles which lines the edge of the shoreline, providing some shoreline armouring.

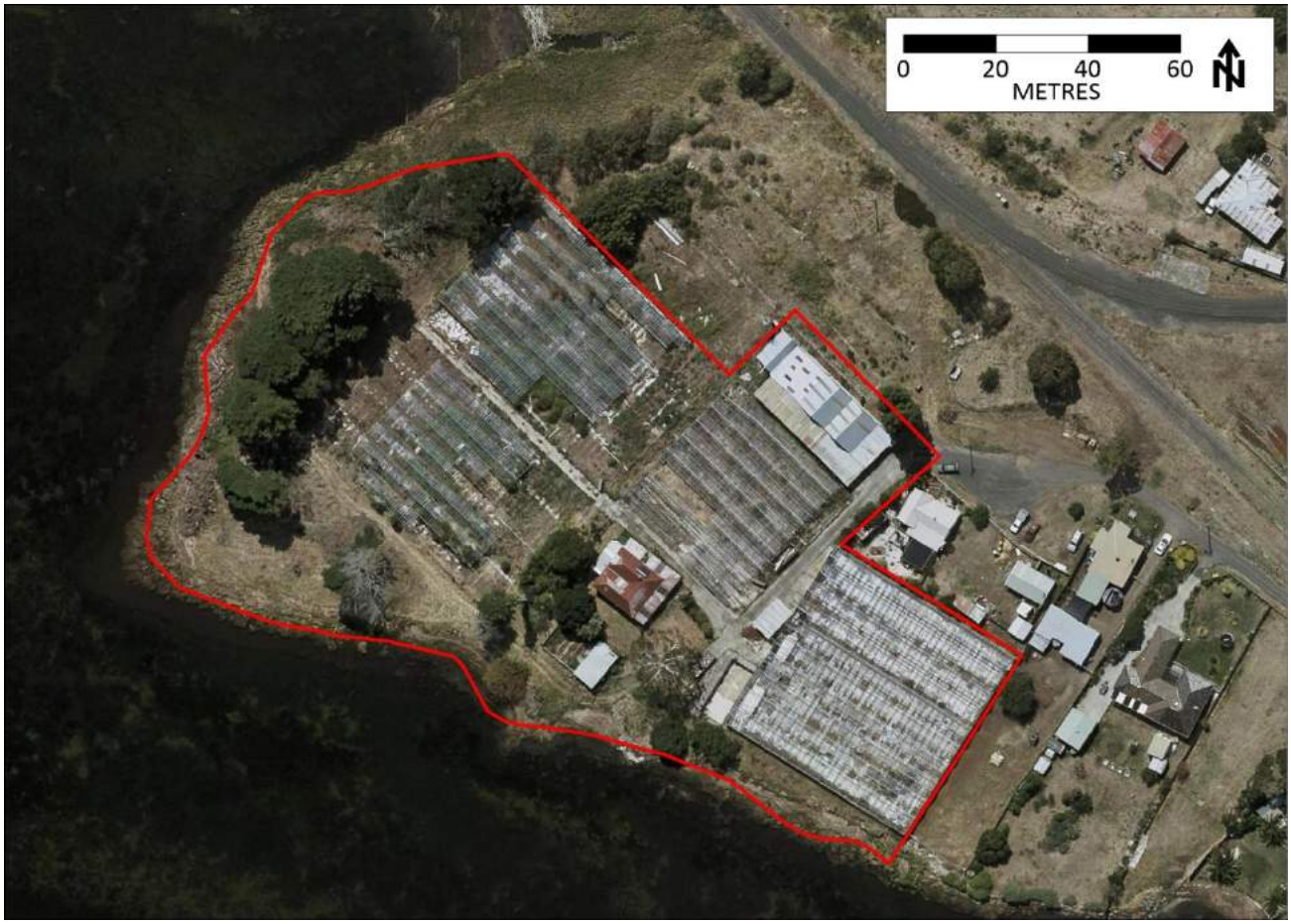


Figure 2 Site Local Setting outlined in red (The LIST)

Photo 1. Cobbles lining the shoreline on the northern **edge of the site, overlooking the** Derwent River

4 Planning

4.1 Australian Building Code Board

This report presents a summary of the overall site risk to coastal erosion and inundation processes. This assessment has been conducted for the year 2070 which is representative of a 'normal' 50-year building design life category based on a 2018 baseline (ABCB 2015).

Per the Australian Building Code Board (ABCB 2015), when addressing building minimum design life:

> *'The design life of buildings should be taken as 'Normal" for all building importance categories unless otherwise stated.'*
>
> As per Table 3-1, the building design life is 50 years for a normal building.

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 Interim Planning Scheme Overlays

4.3.1 Waterways & Coastal Protection Areas (WCPA) Overlay

Part of the site falls within the Waterways & Coastal Protection Areas (WCPA) overlay (Figure 3).

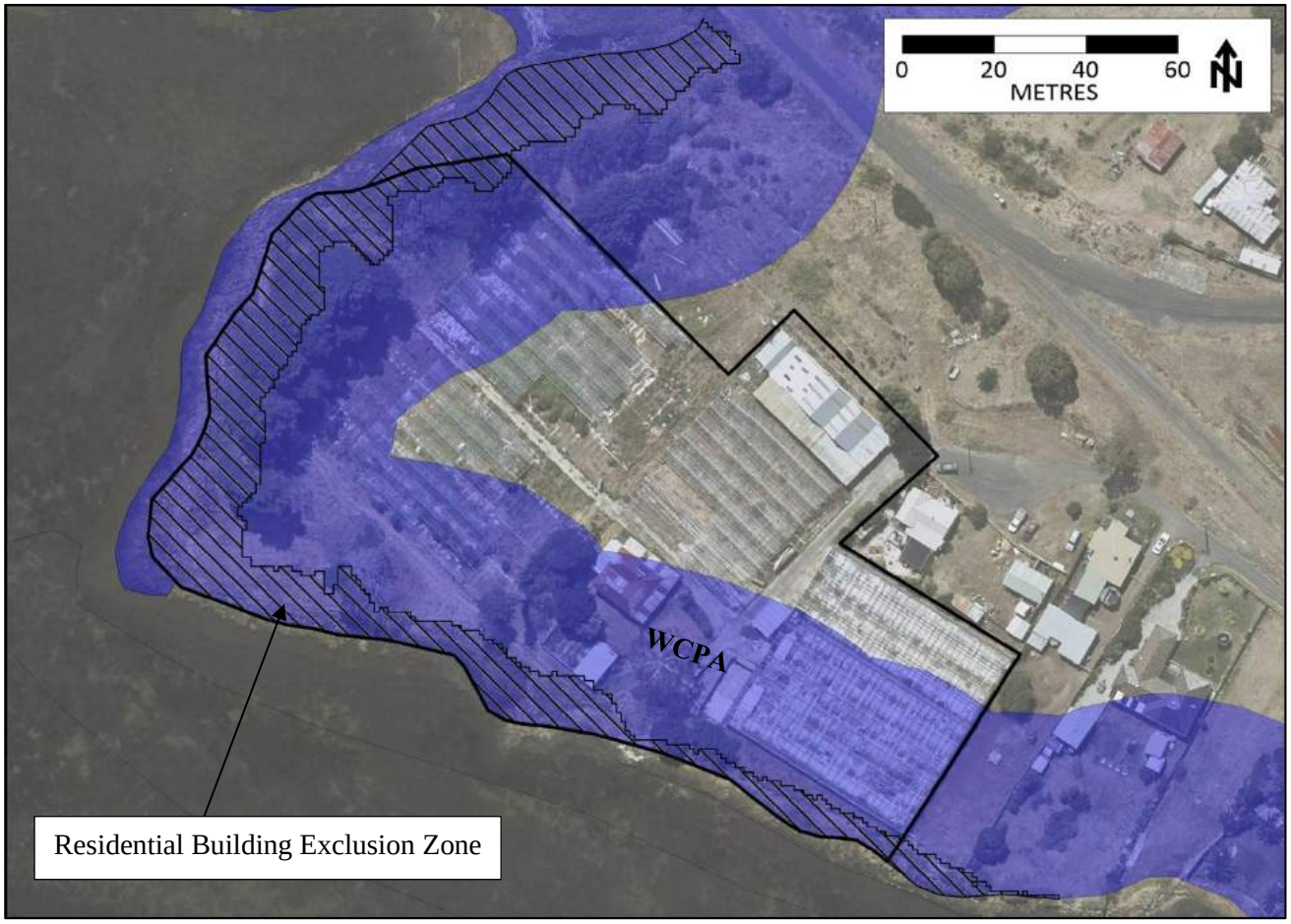


Figure 3 WCPA Overlay near the Site (The LIST)

4.3.2 Inundation Prone Areas Code (IPAC) Overlay

Part of the site falls within the high hazard Inundation Prone Areas Code (IPAC) overlay which is excluded from residential building development (Figure 4).

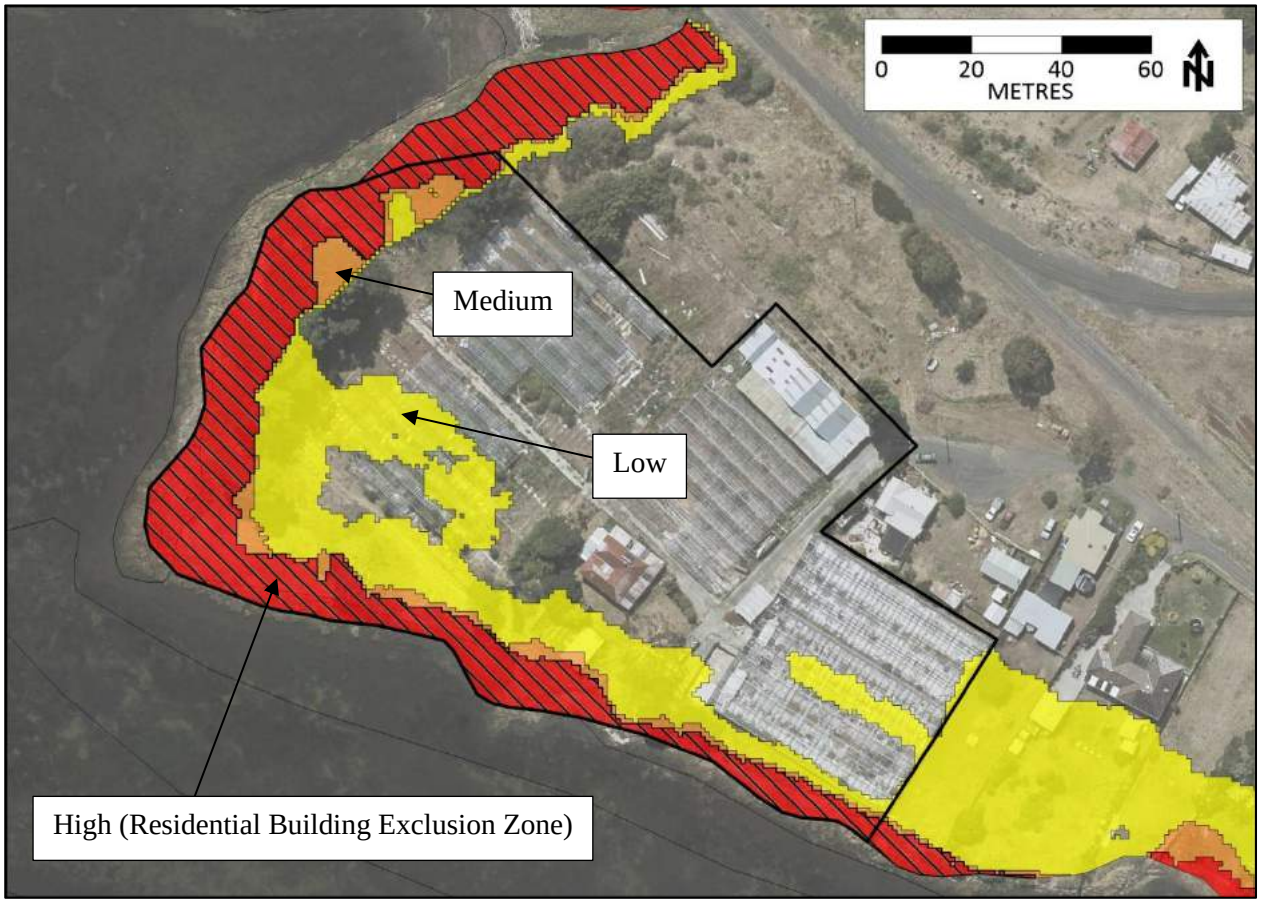


Figure 4 IPAC Overlay near the Site (The LIST)

4.3.3 Coastal Erosion Hazards Code (CEHC) Overlay

The majority of the site is within the Coastal Erosion Hazards Code (CEHC) overlay (Figure 5).

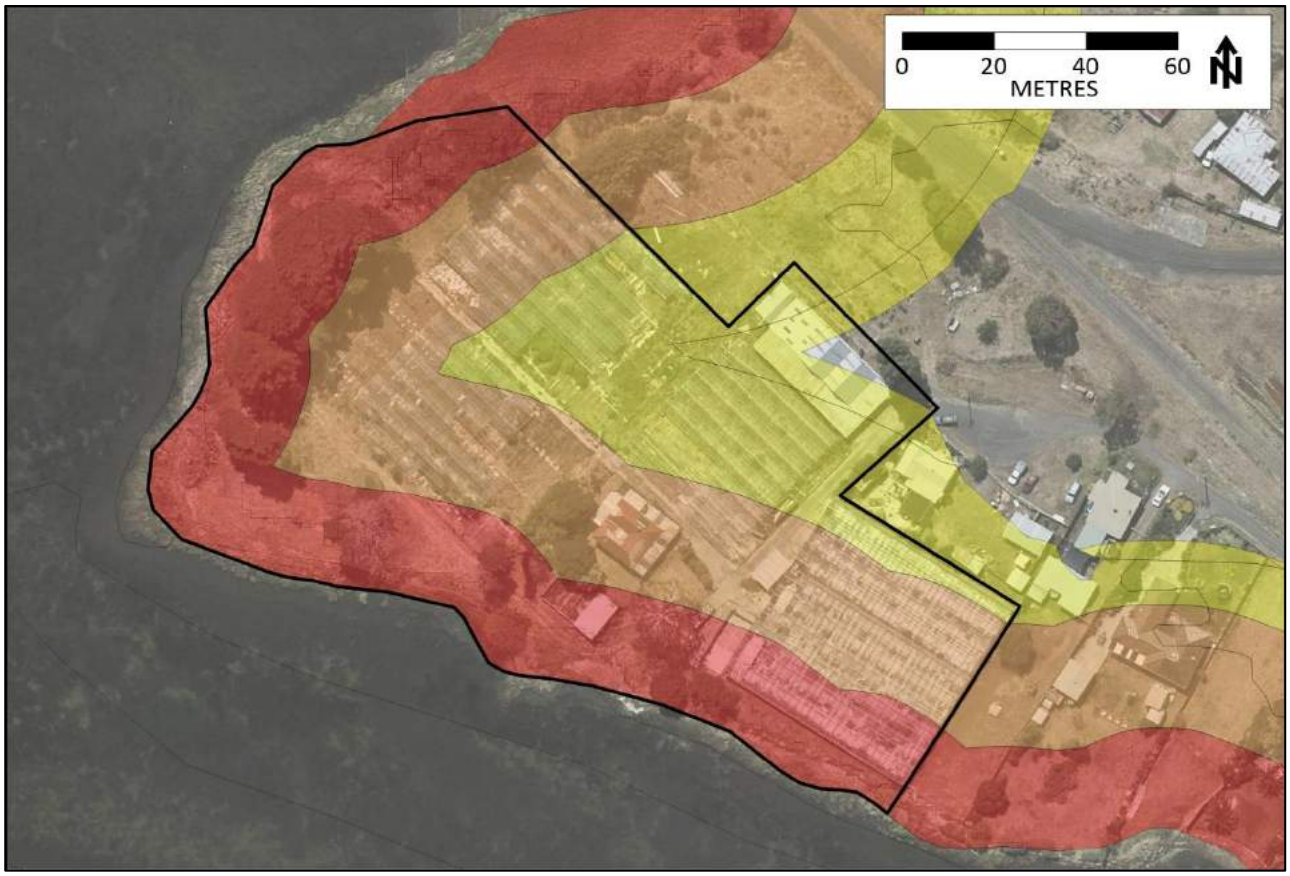


Figure 5 CEHC Overlay near the Site (The LIST)

4.4 Proposed Development

The existing site layout plan is presented in Figure 6. Preliminary plans for the site have been provided to GES dated 18/12/20. An assessment has been conducted based on the plans provided.

Table 1 Summary of Proposed Development Areas Falling Within Potential Coastal Vulnerability Zones

Site Location	Elevation Range (m AHD)	WCPA (E11) Overlay	IPAC (E15) Overlay Low Risk	IPAC (E15) Overlay Medium Risk	IPAC (E15) Overlay High Risk	CEHC (E16) Overlay
Proposed Dodgem Car Arena	2.3 to 2.6	14%	-	-	-	100% (Low)
Proposed Hovercraft Shed	1.9 to 2.4	58%	25%	-	-	100% (Medium)

- Not within overlay

Figure 6 Site Layout & Borehole Locations

4.5 Acceptable Solutions

Where applicable, the need for further performance criteria compliance is summarised in Appendix 2.

4.5.1 Waterways and Coastal Protection Areas (WCPA)

E11.7.1 A1 Building and Works

Any building and works within the coastal erosion hazard overlay will require a Waterways and Coastal Protection Assessment.

As the proposed building and works is within a WCPC area and is not within a building area on a plan of subdivision approved under this planning scheme, the proposed building ***does not meet*** *E11.7.1 A1 acceptable solutions for buildings and works.*

As a note, E11.7.1 P1 (h) indicates the landfilling of wetlands should be avoided

4.5.2 Inundation Prone Areas Code (IPAC)

E15.6 Change of Use

Based on the IPAC code alone, the existing Shed 1 may be changed into a residential use provided that the floor levels are raised to 2.5 m AHD and a risk assessment is done for the existing building.

E15.7.3 A3 A non-habitable building in the ***Low*** *IPAC overlay*

Must have a floor area of no greater than 60 m2 unless subject to a risk assessment.

4.5.3 Coastal Erosion Hazards Code (CEHC)

E16.6 A1 Change of Use

Any existing non habitable buildings at the site which are proposed to be changed to a habitable building will require a risks assessment done.

E16.7.1 A1 Buildings and works

In areas of the site that reside in the in the CEHC Area, there are no acceptable solutions for buildings and works in a CEHC Area, the E16.7.1 P1 performance criteria will need to be addressed.

4.6 Performance Criteria

4.6.1 Change of Use

Any potential change of use of existing non habitable buildings will be assessed in terms of addressing relevant IPAC and CEHC codes and where applicable building regulations.

4.6.2 Building and Works

Any potential building works (outbuilding, extension or new dwelling) in an IPAC low hazard overlay will be assessed as will be proposed building works in a CEHC and WCPA overlay.

5 Site Physical Assessment

5.1 Site Geology

According to the MRT 1:25,000 mapping, the site geology comprises of ‘older alluvium of river terrace, predominantly dolerite derived (Map Unit: Qpad).

5.2 Site Soil Assessment

A soil assessment was conducted for the site by GES (Figure 6). A push probe borehole was completed at the site. Hard dolerite has encountered between 0.8 and 1.6 m depth.

Table 2 Site Soil Profile

Depth To (m)				Horizon	Description
BH1	BH2	BH3	BH4		
0.1	0.1	0.3	0.1	Fill	Dark brown (SW) trace of clay, single grain, slightly moist, medium dense consistency
0.6	0.2			Rock	Greyish brown (GS) 50% stones & granite
			1.1	B2	Light olive brown (CH) moderate polyhedral structure, slightly moist, stiff consistency, high plasticity.
1.1	0.8		1.6	BC	Olive yellow & greyish brown (CL), week polyhedral structure. Slightly moist, hard consistency, 50% fine gravels 10% stones. Refusal on dolerite
		0.4		A3	Strong brown (SC) 10% clay, week polyhedral structure. Slightly moist, hard consistency.
		0.8		B/C	Olive brown & Light Grey (CI) moderate polyhedral structure, slightly moist, very stiff consistency, medium plasticity, 10% gravels, refusal on dolerite.

5.3 NRM Assessment

The LIST presents a summary of the site coastal vulnerability over a 100 m section of the coastline near the site (Appendix 4). The site is reported to have the following geomorphic conditions:

- Moderately to very steep or cliffed soft clayey-gravelly or colluvial;
- Soft muddy shore mainly backed by bedrock

The site has the following natural values:

- Geovalue -2 (moderate geoconservation priority)
- Natural values index – 3 (low integrated conservation value - CFEV)

6 Inundation Assessment

6.1 Scope of Works

GES have conducted a site-specific assessment to determine the longer-term recession potential. The following assessment scope of works has been adopted for the site:

- Conduct targeted site-specific modelling;
- Assess site inundation levels for the proposed 50-year design life of the structure (to 2070) as well as for 2100;
- Conduct site specific hydrodynamic modelling to determine 1% AEP wave run-up and wave setup for 2070 which may impact on site erosion potential; and
- Use the hydrodynamic information to determine the likelihood of soft sediment erosion along the shoreline.

6.2 Site Baseline Seawater Levels

6.2.1 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. Storm tide levels are obtained from the IPS (2015) inundation hazard tables.

The storm tide level adopted for the site 1.33 m

6.2.2 Sea Level Rise

The IPS (2015) has adopted the following sea level rise estimates-based RPC projections with reference to a 2010 baseline:

- 0.2 m rise by 2050; and
- 0.39 m rise by 2070.

Based on these figures, sea level elevations presented in Table 3 are applied to the site. 2070 projections are used reference the design life of the proposed structures.

Table 3 Present Day & Projected Inundation Levels for Various Scenarios

Scenario	Present Day	Normal subsystems with 15 Year Design Life[1]	Normal subsystems with 50 Year Design Life[2]
Projected IPS Scenario for Brighton	**2020 IPS**	**2035 IPS**	**2070 IPS**
Sea Levels (m AHD)	0.03	0.10	0.39

1 Includes decks, retaining structures, wastewater treatment systems, and small non habitable buildings

2 Residential and commercial buildings and extensions as well as large non habitable buildings

6.2.3 Stillwater Levels

The effects of storm tide may be combined with sea levels projections to provide baseline water levels (reported in m AHD) which are referred to as still water level.

The still-water levels adopted for the site are presented in Table 4.

Table 4 1% ARI Stillwater Levels at the Site based on Present Day and 2070 Sea Level Projections

Stillwater Elevations	2020 IPS	2070 IPS
Sea Levels (m AHD) Sea Levels (m AHD)	0.03	0.39
Local 1% AEP Storm Tide Influence (above 0 m AHD)	1.33	1.33
Local Wind Setup (m)*	0.14	0.12
Wind Setup Direction	west	west
Summary (m AHD)	1.50	1.84

6.3 Site Hydrodynamics

Coastal process hydrodynamics were assessed at the site. Information collected is used to assist in interpreting site specific:

- Maximum site inundation levels;
- Effects of storm inundation levels on site erosion;
- Longer term recession trends.

Without consideration of site hydrodynamic wave models, these potential hazards cannot be addressed. Depending on the planning requirements and the level of site risk, this information may or may not have not have been utilised in the site inundation and/or erosion model. It is recognised however, that a site specific coastal processes study is imperative in any coastal vulnerability assessment which seeks to identify the potential hazards and potential risks to assets and life.

Nearshore wave heights are also calculated from localised wind conditions.

Where applicable, the wind fetch wave model has been developed based on the CEM (2008) and SPM (1984) formulations which interpret site bathymetry, topography and wind speeds.

Hydrodynamic risks are measured in terms of 1% AEP events. Site specific processes considered in this section include but are not limited to the following (some of which are detailed in Figure 8):

- Wave runup;
- Wave setup; and
- Wind setup.

A 300 mm freeboard value has been adopted by the IPS (2015) to account to for the Tasmanian Building Act 2000 regulations. Site hydrodynamic factors are included within this 300 mm freeboard zone which essentially defines any hydrodynamic inundation processes which are above the adopted still water levels. The 300 mm value will tend to overestimate inundation levels at some sites and underestimate inundation levels at other sites.

As wind setup, wave setup and wave runup normally occur simultaneously during storm surge events, these components are combined with extreme tide and storm surge predictions to provide maximum inundation levels for the site. Wave models have been generated for the site to define the site specific hazards.

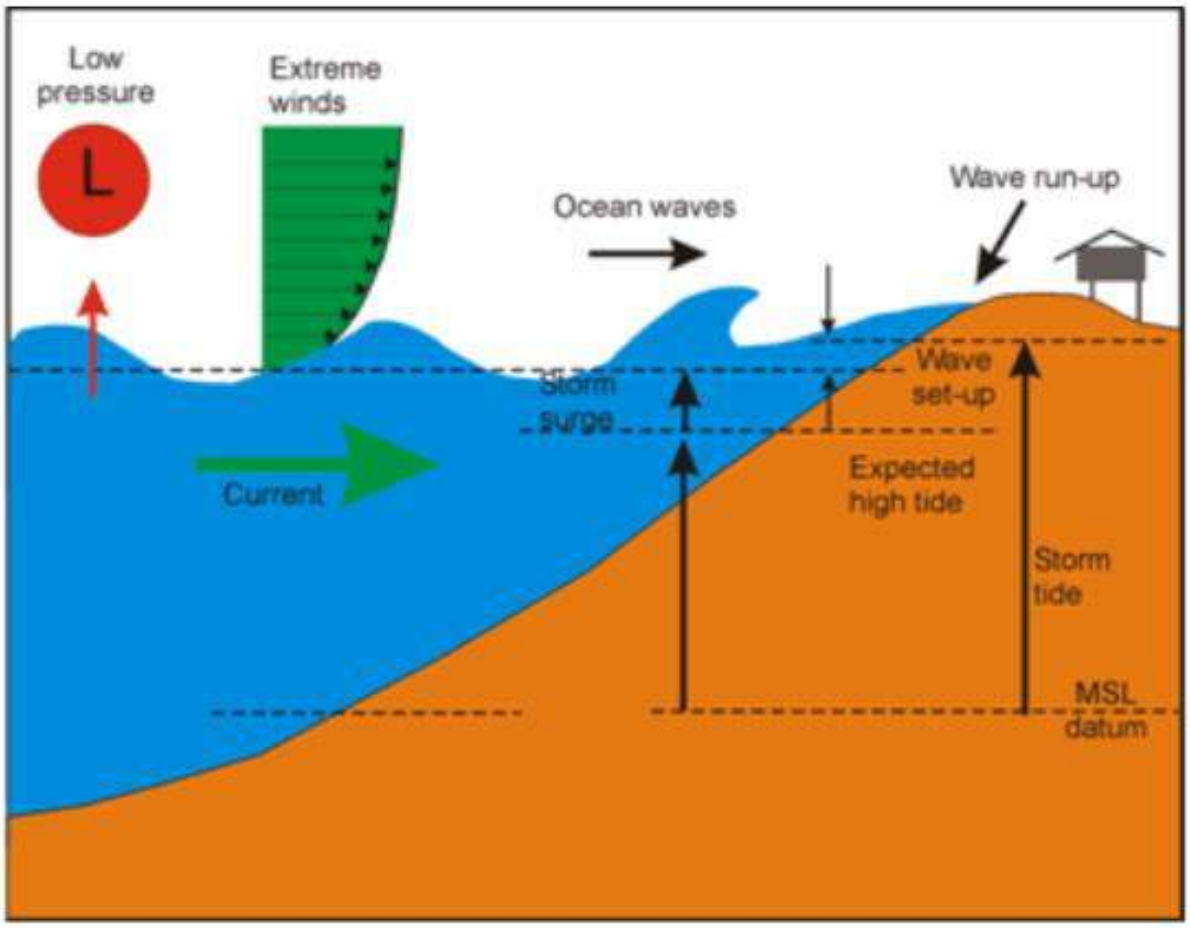


Figure 7 Hydrodynamic Parameters Associated with Storm Surge Events

6.3.1 Site Wave Conditions

Radials were used to derive local wave conditions at the site are presented in Appendix 4. Table 5 provides a summary of the dominant waves intercepting the site.

Table 5 Summary of Dominant Waves Intercepting the Site

Wave Details	Local Wind Fetch	Local Wind Fetch	Local Wind Fetch
Direction	West	Southwest	Southeast
Design Significant Wave Height (m)*	0.9	0.7	0.8
Design Wave Period (s)*	2.6	2.1	2.6
Approach Angle	30	25	30

6.3.2 Dominant Wave Characteristics

The most dominant wave originates from a westerly wind wave (summarised in Table 6).

Table 6 Details of the Dominant Wave Intercepting the Site

Wave Position	Parameter	Value
Nearshore (Design Significant Wave)	Origin	Local Wind Fetch
	Direction	West
	Approach Angle	30
	Wave Height (m)	0.9
	Design Period (s)	2.6
Breaking	Breaker Height (m)	0.9
	Breaking Depth (m)	1.4
	Breaking Angle	23
	Nearshore Gradient (%)	6.0

6.3.3 Nearshore Hydrodynamics

Hydrodynamic variables calculated for the site are presented in Table 7. Inundation levels at the site are calculated from these individual components combined with the stillwater levels.

Table 7 Site 1% AEP Wave Hydrodynamics Based on Present Day & 2070 Scenarios

Coastal Process	2020 IPS	2070 IPS
Modelled Worst Case Scenario Combined Wave & Wind Setup	Westerly Wind	Westerly Wind
Wave Setup (m)	0.14	0.15
Wind Setup (m)	0.14	0.12
Wave Runup Scenario	Westerly Wind	Westerly Wind
R2% Wave Runup Based on Mase (1989)*	0.53	0.35

6.4 Site Inundation Levels

Table 8 presents a summary of the site inundation levels based on 1% AEP still water, wind setup where applicable, wave runup and wave setup inundation levels for present day and 2070 building design life scenarios.

Table 8 Site Coastal Inundation Levels Based on Present Day & 2070 1% AEP Scenarios

1% AEP Inundation Levels (m AHD)	2020 IPS	2070 IPS
Coastal Still Water Elevations Including Wind Setup	1.50	1.84
Wave Setup Inundation	1.64	1.99
R2% Wave Runup Elevations Based on (Mase 1989)*	2.02	2.19

Wave runup at the site is expected to reach elevations of approximately 2.02 m AHD under present conditions and approximately 2.19 m AHD by 2070 based on a 1% AEP present day storm event and projected sea levels (DPAC 2012).

6.5 Summary

The following can be concluded from the inundation assessment:

- The Tasmanian Building Regulations do not stipulate design finished floor levels for non-habitable buildings.
- GES have identified that largest 1% AEP wave condition at the site is generated from a westerly wind wave with an offshore significant height of 0.9 m at 1.4 m water depth and a nearshore and largely attenuated significant wave height of 0.9 m near the site;
- Wave run up inundation levels for 2070 are calculated to be at 2.2 m AHD based on calculated 1% AEP wind waves from the west (the largest wave runup at the site)
- It is recommended that the finished floor levels for buildings established at the site are at or above 2.2 m AHD. On this basis, there is a low risk that the floors will be inundated by 2070 based on a 1% AEP event.

7 Coastal Erosion Assessment

7.1 Scope of Works

Table 9.presents a summary of the various methods adopted by GES to identify erosion hazards in vulnerable coastal zones.

Table 9 Summary of Assessment Approaches for Identify Site Erosion Hazards

Investigative Approach	Investigation Details	Typical Application
Short Term Site Historical Aerial Imaging	Assess historical short term shoreline positions relative to known storm events to forward project sediment storm erosion demand.	Used where Tasmarc surveys are not available or there is no previous storm erosion modelling done for the site.
Storm Erosion Demand	Conduct a detailed assessment of site storm erosion vulnerability due to coastal processes as well as available geological and geomorphological information	Where site is in an inferred to be in an erosion hazard zone and where the proposed development building cannot be founded on a stable foundation.
Shoreline Recession Model	Development of a long term shoreline recession model based on projected DPAC (2012) sea level rise scenarios and using calculated closure depths and various Bruun Rule formulations (1988)	Where site is in an inferred to be in an erosion hazard zone and where the proposed development building cannot be founded on a stable foundation.
Stable Foundation Zones	Development of a cross section through the site detailing zone of reduced foundation capacity and the stable foundation zone through Nielsen et. al. (1992) methods	Where site is in an inferred to be in an erosion hazard zone and where the proposed development building cannot be founded on a stable foundation.

7.2 Aerial Imagery Recession Assessment

The coastline positions from 19 separate historical aerial images dating back to 2005 were compared with historical sea level measurements (Church & White 2011) and projected 2050 and 2100 sea levels as outlined in the IPS (2015) workings. Workings from the assessment are presented in Appendix 5.

Findings from the assessment are presented in Table 10.

Table 10 Summary of Coastline Recession Analysis

Variable	Value
Recession Profile ID	Point
2050 & 2100 sea level rise planning allowance adopted given 2010 baseline (DPAC 2016)	0.23 & 0.85 m
Confidence In Relationship (R^2)	0.27
Computer Generated Bruun Rule Relationship (horizontal recession per metre sea level rise)	65
Manually Inferred Recession Trend (Bruun Rule Relationship)	No Adjustment
Adopted Bruun Rule Relationship	**65**
Projected 2070 Horizontal Recession Relative to Geoscience Australia LIDAR	**25**

A coastline recession of 25 m horizontal is recommended for the site by 2070 based on the 2008 LIDAR Survey

7.3 Storm Erosion Demand Assessment

A storm erosion demand of 3 m3/m is recommended for the site.

7.4 Stable Foundation Zone

As the proposed structures are not located within the zone of reduced foundation capacity, the foundations should be designed to account for the site classification Class M.

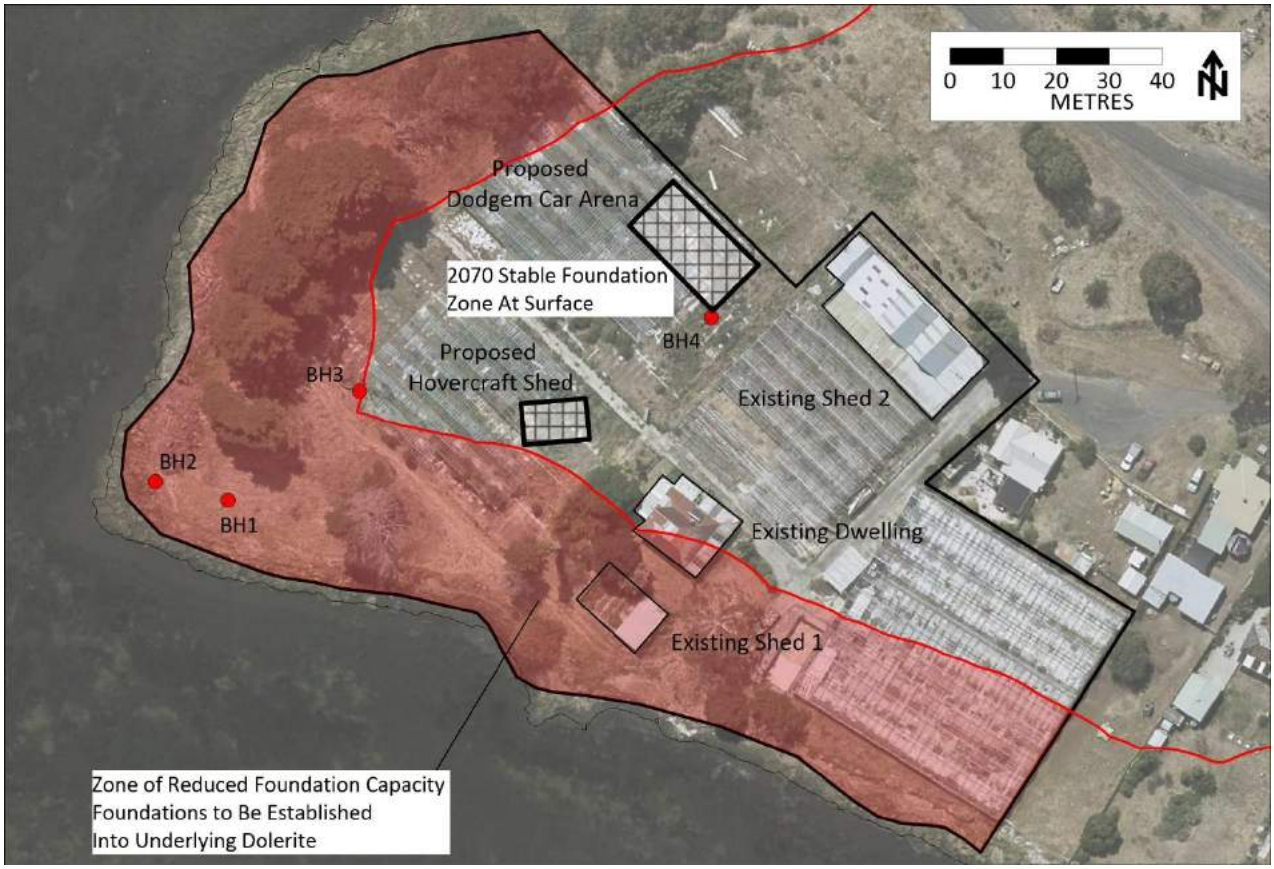


Figure 8 Summary of Projected 2070 Erosion Conditions

7.5 Summary

The following can be concluded from the coastal erosion assessment:

- It is established that up to 25 m of coastline recession may be expected by 2070.
- As the proposed structures are not located within the zone of reduced foundation capacity, the foundations should be designed to account for the site classification Class M.

8 Risk Assessment

Qualitative risk assessment criteria have been developed to identify key risks that may arise from building works in areas that are vulnerable to erosion or inundation hazards.

The criteria are based on a risk assessment matrix consistent with Australian Standard AS4360 on Risk Management (AS4360). The qualitative assessment of risk severity and likelihood (Appendix 3) are used to help provide a qualitative risk assessment based upon the coastal vulnerability assessment completed for the site.

GES has established from the qualitative risk assessment that the level of risk is within the lowest bounds and the proposed development works at the site are acceptable.

9 Recommendations

- Given the extensive coastal erosion hazard overlay, the only possible way to subdivide the property is for creation of a lot for the purposes of public open space, public reserve or utilities;
- As indicated in section 4.6.2, there is a residential building exclusion zone which applies to the portion of the lot within the IPAC High hazard overlay. This portion may be allocated to public open space for the purpose of subdividing the lot. Allocation may not have to be limited to waterfront areas.
- It is recommended that construction be designed in accordance with Class M site classification as structures are not within the zone of reduced foundation capacity.
- For proposed buildings within the low inundation prone code area, it is recommended that finished floor levels are constructed at or above 2.2 m AHD to achieve acceptable risk.
- Infilling may be conducted in waterways and coastal protection area, provided they are not classified as a wetland.
- A soil and water management plan is required if there is proposed building works at the site;
- Any works are to be undertaken generally in accordance with 'Wetlands and Waterways Works Manual' (DPIWE, 2003) and “Tasmanian Coastal Works Manual” (DPIPWE, Page and Thorp, 2010), and the unnecessary use of machinery within watercourses or wetlands is avoided.

The site is in a very low risk setting in terms of erosion susceptibility. The proposed development and the site is free from any potential obstructions which may result from an extreme worst case scenario 1% AEP erosion event for 2070.

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Senor Environmental & Engineering Geologist

10 Limitations

The following limitations apply to this report:

- Wave modelling in accordance with the CEM (2008), the SPM (1984) and wind parameters from AS/NZS 1170.2:2011;
- Navionics, TAFI, Geoscience Australia and Australia Hydrographic Service bathymetry;
- Light Detection And Ranging (LIDAR) digital elevation model (metadata file in Appendix 1) is calibrated or assessed to the closest ground control point for determining relative accuracy (Appendix 2);
- Storm surge observations where applicable
- The LIST cadastral information
- Photogrammetric modelling of historic coastal recession and/or progradation for the site was not undertaken. However, historic aerial photographs for the project area were reviewed and incorporated into a geographic information system enabling preliminary measurements of dune variations.
- 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.

11 References

AMS 2007. American Meteorological Society Glossary of Meteorology. Retrieved 2007-06-30. Antarctic Climate & Ecosystems Cooperative Research Centre (ACE CRC), 2010.

AS 1170.2:2011. Australian and New Zealand Standard. Structural Design Actions. Part 2: Wind Actions.

AS/NZS ISO 31000:2009. Risk Management – Principles and Guidelines. Standards Australia.

AS/NZS ISO 31010:2009. Risk Management – Risk Assessment Techniques. Standards Australia.

Australian Bureau of Meteorology (2007). (BOM) Meteorological Averages. Weather Station Data; http://www.bom.gov.au/climate/data/weather-data.shtml, accessed September 2010

Bruun, P., 1988, "The Bruun Rule of Erosion by Sea Level Rise: A Discussion on Large Scale Two- and Three-Dimensional Usages", Journal of Coastal Research, 4(4), 627-648.

CARLEY, J.T., BLACKA, M.J., TIMMS, W.A., ANDERSEN, M.S., MARIANI, A., RAYNER, D.S., McARTHUR, J. & COX, R.J., 2008: Coastal Processes, Coastal Hazards, Climate Change and Adaptive Responses for Preparation of a Coastal Management Strategy for Clarence City, Tasmania; Technical Report 2008/04, Water Research Laboratory, University of New South Wales, November 2008.

CEM. United States (Coastal Engineering Model) 2008, EM 1110-2-1100, 2008.

Church, J. A. and N.J. White 2011, Sea-level rise from the late 19th to the early 21st Century. Surveys in Geophysics, doi:10.1007/s10712-011-9119-1.

Cowell, P.J., Thom, B.G., Jones, R.A., Everts C.H., Simanovic, D., 2006. Management of Uncertainty in Predicting Climate Change Impact on Beaches. Journal of Coastal Research, 22(1), 232-245. West Palm Beach (Florida), ISSN 0749-0208

CSIRO (Commonwealth Scientific and Industrial Organisation) 2012, Sea level rise: understanding the past, improving projections for the future.

Davies, J.L., 1959: Sea Level Change and Shoreline Development in South-Eastern Tasmania; Papers and Proceedings of the Royal Society of Tasmania, Vol. 93, p. 89 – 95.

Davies, J.L., 1961: Tasmanian Beach Ridge Systems in Relation to Sea Level Change; Papers and Proceedings of the Royal Society of Tasmania, Vol. 95, p. 35 – 40.

Davies, J.L., 1978: Beach Sand and Wave Energy in Tasmania; in: J.L. Davies & M.A.J. Williams (Eds), Landform Evolution in Australasia, ANU Press, Canberra, p. 158-167.

DCC (Department of Climate Change) 2009, Climate Change Risks to Australia's Coasts, A First Pass National Assessment.

Dean, R.G. & Darymple, R.A. 1991. WATER WAVE MECHANICS FOR ENGINEERS AND SCIENTISTS. Advanced Series on Ocean Engineering — Volume 2. Published by World Scientific Publishing Co. Pte. Ltd. 5 Toh Tuck Link, Singapore 596224

Dean, R.G. & Darymple, R.A. 2002: Coastal Processes with Engineering Applications; Cambridge University Press, UK.

Dickson, M.E., Walkden, M.J.A. and Hall, J.W., 2007. Systematic impacts of climate change on an eroding coastal region over the twenty-first century. Climatic Change, in press.

DPIPWE, 2008. Sea-Level Extremes in Tasmania, Summary and Practical Guide for Planners and Managers.

DPIWE, 2008, Coastal Hazards. In Tasmania General Information Paper, DPIWE Tasmania Page

Estimating Sea Level Rise in an Uncertain Future. Sea Level rise extremes assessment Web Tool. web tool www.slr.sealevelrise.info accessed on September 2010.

http://www.climatechange.gov.au/publications/coastline/climate-change-risks-to-australias-coasts.aspx. Accessed September 2010.

Hughes, Steven A. Estimating irregular wave runup on rough, impermeable slopes. No. ERDC/CHL-CHENT-III-70. ENGINEER RESEARCH AND DEVELOPMENT CENTER VICKSBURG MS COASTAL AND HYDRAULICSLAB, 2005.

Hunter, J. 2008, Historical and Projected Sea-Levels Extremes for Hobart and Burnie, Tasmania, Technical Report prepared by the Antarctic and Climate and Ecosystems Cooperative Research Centre – December 2007. Published by the Department of Primary Industries and Water, Tasmania.

Hunter, J., 2010. Estimating Sea-Level Extremes Under Conditions of Uncertain Sea-Level Rise, Climatic Change, 99:331-350, DOI:10.1007/s10584-009-9671-6.

IPCC (Intergovernmental Panel on Climate Change) 2001, Technical Summary of the Working Group I Report and summary for Policymakers, The United Nations Intergovernmental Panel on Climate Change, Cambridge, University Press, UK. 2001

IPCC (Intergovernmental Panel on Climate Change) 2007, Climate Change – The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, (ISBN 978 0521 88009-1 Hardback; 978 0521 70596-7 Paperback), [Solomon, S., D. Qin, M. Manning, Z. Chen, M. Marquis, K.B. Averyt, M. Tignor and H.L. Miller (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, 996 pp. 2007

IPCC (Intergovernmental Panel on Climate Change) 2013, Climate Change 2013: The physical Science Basis. Contribution of Working Group I to the Fifth Assesssment Report of the Intergovernmental Panel on Climate Change (Stocker, T.F., D. Qin, G.K. Plattner, M. Tignor, S.K. Allen, J. Boschung, A. Nauels, Y. Xia, V. Bex and P.M. Midgley (eds). Cambridge University Press, Cambridge, United Kingdom and New York, USA.

Komar, P.D., 1998. Beach Processes and Sedimentation. Second Edition. Colege of Oceanic and Atmospheric Sciences Oregon State University. Prentice Hall. Upper Saddle River, New Jersey 07458.

Kulmar, M., D.Lord & B.Sanderson, 2005. "Future Directions For Wave Data Collection In New South Wales", Proceedings of Australasian Coasts and Ports conference, Adelaide, The Institute of Engineers Australia.

Lord, D.B. and M. Kulmar, 2000. "The 1974 storms revisited: 25 years' experience in Ocean Wave Measurement along the South East Australian Coast", Proceedings International Conference of Coastal Engineering, pp 559-572, American Society of Civil Engineers, USA.

Mase, H. (1989), 'Random Wave Runup Height on Gentle Slopes', Journal of the Waterway, Port, Coastal and Ocean Engineering Division, American Society of Civil Engineers, pp 593-609

NCCOE, (National Committee on Coastal and Ocean Engineering, Engineers Australia) 2004, Guidelines for responding to the effects of Climate Change in coastal and Ocean Engineering, The Institution of Engineers Australia.

Nielsen, A.F., D.B.Lord & H.G.Poulos, 1992. Dune Stability Considerations for Building Foundations. Engineers Australia, Vol CE34, No 2, June.

Pilkey,O.H and J.A.G. Cooper, 204. "Society and Sea Level Rise", Science, 303, pp1781-1782.

Pugh, D.T. (1987), Tides, Surges and MeanSea-Level, John Wiley and Sons, Chichester,UK.

Ranasinghe, Roshanka, Phil Watson, Doug Lord, David Hanslow and Peter Cowell, 2007. "Sea Level Rise, Coastal Recession and the Bruun Rule", Proceedings of Australasian Coasts and Ports Conference, Melbourne, The Institute of Engineers Australia.

Sharples, C. 2006. Indicative Mapping of Tasmanian Coastal Vulnerability to Climate Change and Sea Level Rise: Explanatory Report; 2nd Edition. Consultant Report to Department of Primary Industries & Water, Tasmania. http:/www.dpiw.tas.gov.au/climatechange.

Sharples, C., Mount, R., Pedersen, T., 2009. THE AUSTRALIAN COASTAL SMARTLINE GEOMORPHIC AND STABILITY MAP VERSION 1: MANUAL AND DATA DICTIONARY. School of Geography & Environmental Studies, University of Tasmania . Manual version 1.1

Sharples, C., 2010: Shoreline Change at Roches Beach, South-eastern Tasmania, 1957 – 2010; Technical Report, Antarctic Climate and Ecosystems Co-operative Research Centre, Hobart, 101 pp.

Sharples, C., Donaldson, P., 2014. Kingborough Responding to Coastal Hazards: Part A. A FIRST PASS COASTAL HAZARD ASSESSMENT FOR KINGBOROUGH LOCAL GOVERNMENT AREA, TASMANIA. Report to: Kingborough Council. Blue Wren Group, School of Land and Food (Geography), University of Tasmania

Shore Protection Manual. 1984. 4th ed., 2 Vol., U.S. Army Engineer Waterways Experiment Station, U.S. Government Printing Office, Washington, D.C., 1,088 p.

SPM (Shore Protection Manual) 1984, 4th ed., 2 Vol., U.S. Army Engineer Waterways Experiment Station, U.S. Government Printing Office, Washington, D.C., 1,088 p.

Taw 1974. Wave run-up and overtopping. Technical advisary comittiee on Water Defences in The Netherlands. Government Publishing Office, The Hague, The Netherlands.

TCCO (Tasmanian Climate Change Office) 2012, Derivation of the Tasmanian Sea Level Rise Planning Allowances. Technical Paper

USGS (United States Geological Survey) 2003. Glossary of Coastal Terminology, US Coastal and Marine Geology. Washington Department of Ecology.

Van der Meer, J.W. Wave run-up and overtopping. Chapter 8 in: "Seawalls, dikes and revetments". Edited by K.W. Pilarczyk. Balkema, Rotterdam.

Van der Meer, J.W., & Stam C.J.M. (1992) Wave run-up on smooth and rock slopes. ASCE, Journal of WPC and OE, Vol. 188, No. 5. 534-550.

Appendix 1 Tasmanian Building Regulations 2016

Division 3 - Coastal inundation

Building in flood hazard areas - Construction standards

As identified in the directors Determination and regulation 56(3) of the Building Regulations 2016, the defined flood level is the level above the 0 metre Australian Height Datum with a one percent probability of being exceeded in a storm surge flooding event in the year 2100, as specified in the Coastal Inundation Hazard Band Levels List for the relevant locality in the relevant Local Provisions Schedule of the Tasmanian Planning Scheme

55. Coastal inundation hazard areas

1) For the purposes of the Act, land is a coastal inundation hazard area if –
    a. the land is shown on a planning scheme overlay map as being land that is within a coastal inundation hazard area; and
    b. the land –
        i. is classified as land within a hazard band of a coastal inundation hazard area; or
        ii. is shown on a planning scheme overlay map as being land in an investigation area for a coastal inundation 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 inundation determination as being land that is within a hazard band of a coastal inundation hazard area is a prescribed attribute; and
    b. a coastal inundation hazard area is a hazardous area.

56. Works in coastal inundation hazard areas

1) A person must not perform work in a coastal inundation 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 inundation hazard area, the person must, before performing the work, ensure the land is classified, in accordance with the coastal inundation determination –
    a. as being an acceptable risk; or
    b. into a hazard band for the coastal inundation hazard area.
3) A person must not perform work on a building on land in a coastal inundation hazard area unless the floor level of each habitable room of the building, being erected, re-erected or added as part of the work, is at least 300 millimetres above the defined flood level for the land.
4) A responsible person for work being performed in a coastal inundation hazard area must ensure that the work is being performed in accordance with the Act and the coastal inundation determination.
5) A person performing work in a coastal inundation hazard area must ensure that the work complies with the Act and the coastal inundation determination.

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 2 Planning Scheme Acceptable Solutions

Waterways and Coastal Protection Areas (WCPA)

Standard	Code	Acceptable Solution		Performance Criteria
Use	E11.6	There are no use standards in this code.		
Development	E11.7.1 Buildings & Works	A1	Building and works within a Waterway and Coastal Protection Area must be within a building area on a plan of subdivision approved under this planning scheme.	P1
		A2	Building and works within a Future Coastal Refugia Area must be within a building area on a plan of subdivision approved under this planning scheme.	P2
		A3	Buildings and works within a Potable Water Supply Area must be within a building area on a plan of subdivision approved under this planning scheme.	P3
		A4	Development must involve no new stormwater point discharge into a watercourse, wetland or lake.	P4
	E11.7.2 Dependent on a Coastal Location	A1	An extension to an existing boat ramp, car park, jetty, marina, marine farming shore facility or slipway must be no more than 20% of the size of the facility existing at the effective date.	P1
		A2	No Acceptable Solution for dredging and reclamation.	P2
		A3	No Acceptable Solution for coastal protection works initiated by the private sector.	P3
Subdivision	E11.8.1 Subdivison	A1	Subdivision of a lot, all or part of which is within a Waterway and Coastal Protection Area, Future Coastal Refugia Area or Potable Water Supply Area must comply with one or more of the following: a) be for the purpose of separation of existing dwellings; b) be for the creation of a lot for public open space, public reserve or utility; c) no works, other than boundary fencing works, are within a Waterway and Coastal Protection Area, Future Coastal Refugia Area or Potable Water Supply Area; d) the building area, bushfire hazard management area, services and vehicular access driveway are outside the Waterway and Coastal Protection Area, Future Coastal Refugia Area or Potable Water Supply Area.	P1

Coastal Erosion Hazard Code (CEHC) Areas

Standard	Code	Acceptable Solution		Performance Criteria
Use	E16.6 Change of Use	A1	A1 No Acceptable solution	P1
Development	E16.7.1 Buildings & Works	A1	A1 No Acceptable solution	P1
	E16.7.2 Dependent on a Coastal Location	A1	A1 An extension to an existing boat ramp, car park, jetty, marina, marine farming shore facility or slipway must be no more than 20% of the size of the facility existing at the effective date.	P1
		A2	A2 No Acceptable Solution for dredging and reclamation.	P2
		A3	A3 No Acceptable Solution for coastal protection works initiated by the private sector.	P3
Subdivision	E16.8.1 CEHC Area	A1	No Acceptable solution	P1
		A2	No Acceptable solution	P2
	Dependent on a Coastal Location	A1	No Acceptable solution	P1

Inundation Prone Areas Code (IPAC)

Standard	Code	Acceptable Solution		Performance Criteria
Use	E15.6 Change of Use	A1	Change of use of a non-habitable building to a habitable building or a use involving habitable rooms must comply with all of the following: a. floor level of habitable rooms is no less than the AHD level for the Coastal Inundation Low Hazard Area in Table E15.1; b. floor level of habitable rooms is no less than the AHD level for the 1% AEP plus 300mm if in an area subject to riverine flooding.	P1
Development	E15.7.1 High Coastal IPAC	A1	For a habitable building, including extensions to existing habitable buildings, there is no Acceptable Solution.	P1
		A2	A non-habitable building, an outbuilding or a Class 10b building under the Building Code of Australia, there is no acceptable solution.	P2
	E15.7.2 Medium Coastal IPAC	A1	New habitable building - No Acceptable solution	P1
		A2	An extension to an existing habitable building must comply with **one** of the following: (a) new habitable rooms must comply with both of the following: I. Floor level no lower than the Minimum Level for the Coastal Inundation Low Hazard Area in Table E15.1, II. Floor area of the extension no more than 40 m2 from the date of commencement of this planning scheme; (b) new habitable rooms must be above ground floor	P2
		A3	A non-habitable building, an outbuilding or a Class 10b building under the Building Code of Australia, must have a floor area no more than 40 m2.	P3
	E15.7.3 Low Coastal IPAC	A1	A new habitable building must comply with the following: Floor level no lower than the Minimum Level for the Coastal Inundation Low Hazard Area in Table E15.1;	P1
		A2	An extension to a habitable building must comply with either of the following: (a) floor level of habitable rooms is no lower than the Minimum Level for the Coastal Inundation Low Hazard Area in Table E15.1; (b) floor area is no more than 60 m2	P2
		A3	A non-habitable building, an outbuilding or a Class 10b building under the Building Code of Australia, must have a floor area no more than 60 m^2.	P3
	E15.7.4 Riverine IPAC	A1	A new habitable building must have a floor level no lower than the 1% AEP (100 yr ARI) storm event plus 300 mm.	P1
		A2	An extension to an existing habitable building must comply with one of the following: a) floor level of habitable rooms is no lower than the 1% AEP (100 yr ARI) storm event plus 300 mm; b) floor area of the extension no more than 60 m2 as at the date of commencement of this planning scheme.	P2
		A3	The total floor area of all non-habitable buildings, outbuildings and Class 10b buildings under the Building Code of Australia, on a site must be no more than 60 m2.	P3
	E15.7.5 Riverine & Coastal IPAC	A1	For landfill, or solid walls greater than 5 m in length and 0.5 m in height, there is no acceptable solution.	P1
		A2	No acceptable solution where mitigation required	P2
		A3	A land application area for onsite wastewater management must comply with all of the following: a) horizontal separation distance from low water mark or from the top of bank of a watercourse or lake must be no less than 100 m; b) vertical separation distance from the water table must be no less than 1.5 m.	P3
	E15.7.6 Dependent on a Coastal Location	A1	An extension to an existing boat ramp, car park, jetty, marina, marine farming shore facility or slipway must be no more than 20% of the size of the facility existing at the effective date.	P1
		A2	No acceptable solution.	P2
		A3	No Acceptable Solution for coastal protection works initiated by the private sector.	P3
Subdi vision	E15.8.1 Medium and High IPAC	A1	No Acceptable Solution.	P1

Appendix 3 NRM Assessment

Feature	
Segment Id	15859
Segment Length (m)	100
Minimum Vulnerability: Coastal Vulnerability Mapping	Not a minimal vulnerability shoreline
Cliff Vulnerability: Coastal Vulnerability Mapping	Not a cliffed shoreline
Unclassified Vulnerability: Coastal Vulnerability Mapping	Not an unclassified vulnerability shoreline
Erosion Vulnerability: Coastal Vulnerability Mapping	Moderately to very steep or cliffed soft clayey-gravelly or colluvial
Sandy Vulnerability: Coastal Vulnerability Mapping	Not a sandy shoreline
Muddy Vulnerability: Coastal Vulnerability Mapping	Soft muddy shore mainly backed by bedrock
Coastal Vulnerability0	Muddy or silty shoreline
Coastal Vulnerability	No distinctively different lower intertidal shoreline element
Backshore Type Coastal Vulnerability	Bedrock (may include soil)
Artificial Shore	No
Industry1 500M	No industry present within 500m
Industry2 500M	No industry present within 500m
Industry3 500M	No industry present within 500m
Industry1 1Km	No industry present within 1km
Industry2 1Km	No industry present within 1km
Industry3 1Km	No industry present within 1km
Foreshore Structure1	No structure present
Structure1 Use Frequency	NA
Foreshore Structure2	No structure present
Structure2 Use Frequency	NA
Foreshore Structure3	No structure present
Structure3 Use Frequency	NA
Foreshore Structure4	No structure present
Structure4 Use Frequency	NA
Construction Level 100M	1 - 25%
Construction Level 500M	Mostly construction
Cleared Level 100M	76 - 100%
Cleared Level 500M	All cleared
Recreation Use1	No listed recreation use
Recreation1 Use Frequency	NA
Recreation Use2	No listed recreation use
Recreation2 Use Frequency	NA
Recreation Use3	No listed recreation use
Recreation3 Use Frequency	NA
Biological Feature Significance Value	
Protected Area	
Access1	Access Road
Access2	
Access3	
Access4	
Access5	
Vegetation Viability Coastal Values	Not assessed
Vegetation Significance Coastal Values	Non-native
Coastal Values	Not assessed
Vegetation Condition Coastal Values	NA
Habitat Condition SE Strategy	Not assessed
Conservation Significance SE Strategy	Not assessed
Reserve Class CAR	
Public Land Classification	Public Reserve
Coastal Zone Type PWS	

Marine Reserve	
LGA Reserve	
WHA	
Classification	4
Zoning	Recreation
Geomorphic Condition	Significantly disturbed
Actual Habitat Listed Significant SPP	
Potential Habitat Listed Significant SPP	
Geovalue	2
Sensitivity TGD	
Geomorphic Value	3
Tourism Use	No listed tourism use
European Heritage	Derwent River Conservation Area
Carcinus Maenas	Unknown
Crassostrea Gigas	Unlikely
Spartina Anglica	Absent
Undaria Pinnatifida	Unlikely
A Arenaria	Unlikely
A Populifolia	Unlikely
E Paralias	Unknown
E Villosa	Unlikely
T Junceiforme	Unlikely
Pollution Source1 500M	
Pollution Source2 500M	Urban stormwater outfall
Pollution Source3 500M	
Pollution Source1 1Km	Rural runoff
Pollution Source2 1Km	Urban stormwater outfall
Pollution Source3 1Km	Sewage outfall
Biology Attribute Value	3
Geomorphic Attribute Value	3
Natural Value Index	3
Amenities Attribute Value	5
Recreational Tourism Value	5
Value0	1
Human Use Value Index	4
Eco Disturbance Attribute Condition	4
Geomorphic Attribute Condition	4
Introduced Species Attribute Condition	3
Condition Index	4
Anthropogenic Modification Attribute Pressure	3
Pollution Attribute Pressure	5
Recreational Tourism Attribute Pressure	1
Pressure	5
Introduced Species Attribute Pressure	2
Pressure Index	3
Further Information	An explanatory report accompanies this dataset and can be obtained from http://www.aquenal.com.au/reports.htm or by emailing coastal.enquiries@environment.tas.gov.au

Natural Values Index

Foreshores within or directly adjacent to protected natural areas are assumed to have a higher degree of naturalness compared to those adjacent to developed areas. This indicator aims to identify foreshores that are part of wider natural functioning systems, rather than focussing on individual ecological elements. High value protected areas are selected based on reservation status and the associated restrictions on activities.

Natural Value Index of 1

Significant community or habitat present.

Foreshores assigned the highest value score (i.e. a score of 1) under this indicator are those within or directly adjacent to a dedicated formal reserve equivalent to IUCN (International Union for Conservation of Nature) protected area management categories i, ii, iii, iv, or vi (see IUCN Guidelines for Applying Protected Area Management Categories (Dudley 2008) for Shore Base: A Coastal Management Tool Aquenal Pty Ltd 96 further detail). Formal reserves include National Parks, State Reserves, Game Reserves, Nature Reserves, Historic sites, Forest Reserves, Conservation areas, and areas with a Conservation Covenant.

Natural Value Index of 2

Medium Integrated Conservation Value (CFEV)

High value foreshores (i.e. those assigned a score of 2) are those within or directly adjacent to areas not listed under IUCN equivalents but included in other Informal Reserves, and State or Forestry Managed Land.

Geomorphic Attribute Value (Geomorphology)

Geomorphic value is derived from a calculation of geoconservation priority (Geovalue) and the sensitivity category applied to sites of geoconservation significance by the Tasmanian Geoconservation Database (TGD). Geovalues (Sharples and Mowling 2006) are designed to highlight coastal segments which are most likely to warrant management attention regarding the maintenance of geoconservation value.

Geovalue of 1

Indicates high geoconservation priority, with coastal segments having either the highest sensitivity to disturbance, and/or the most natural condition.

Geovalue of 2

Indicate moderate geoconservation priority.

Geovalue of 3

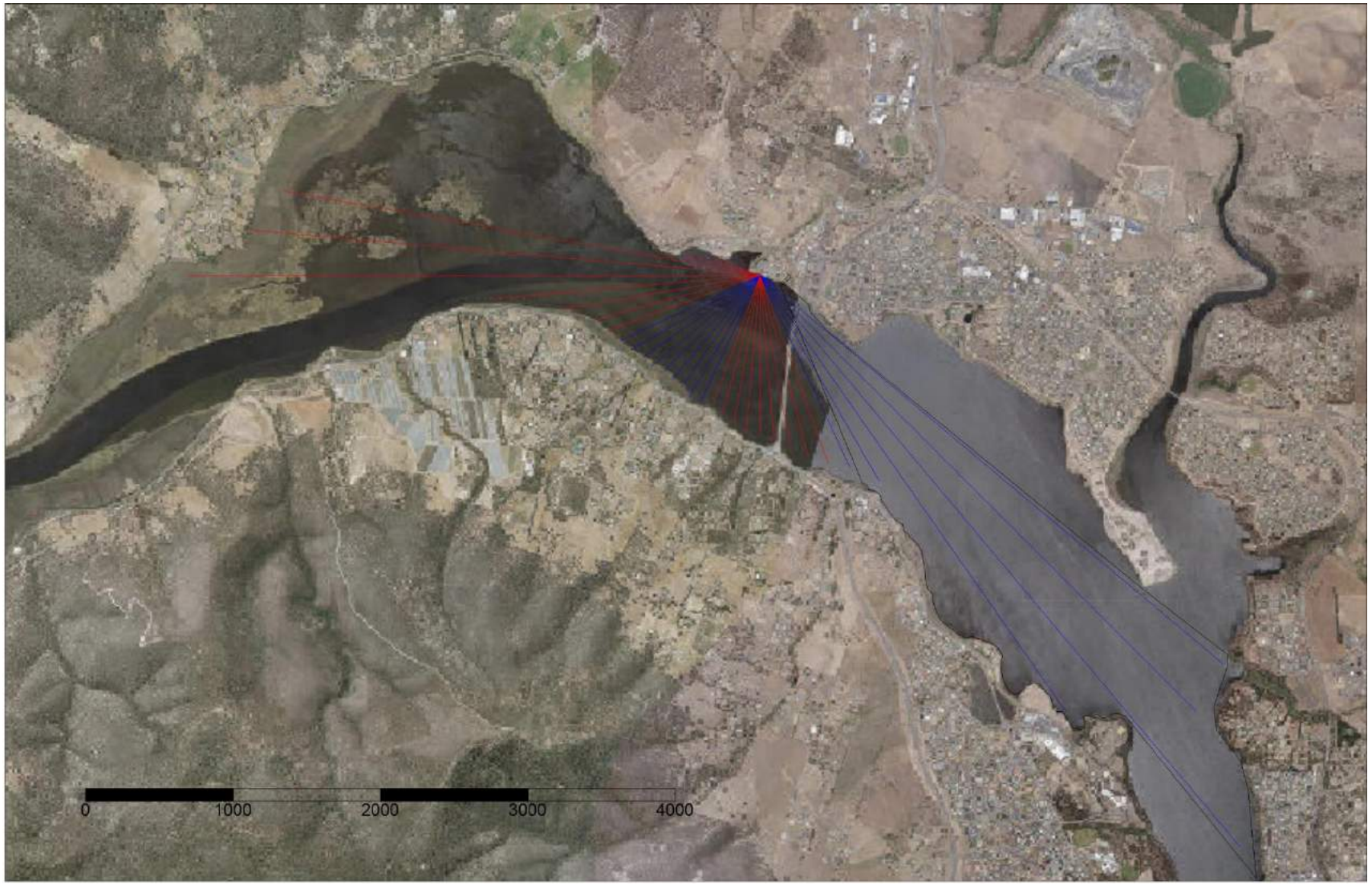
Indicate moderate to low geoconservation priority.

Geovalue of 4

Indicates lowest geoconservation priority where coastal segments are of low sensitivity to disturbance, yet are significantly disturbed. This mainly refers to hard rock shores that have been extensively modified.

See Sharples and Mowling (2006) for further information on calculation of Geovalues.

Appendix 4 Wave Modelling Figures



Appendix 5 Risk Assessment References

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.

Source: AN/NSW 4360:2004 Risk Management

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 6 Qualitative Risk Assessment

E16.7.1 P1 Building and Works in a WCPA

Performance Criteria E11.7.1 P1 **Building and works within a Waterway and Coastal Protection Area must satisfy all of the following:**	**Relevance**	**Management Options**	**Managed Risk Assessment (where relevant)**			**Further Assessment Required**
			Consequence	**Likelihood**	**Risk**	
(a) avoid or mitigate impact on natural values	The local area has a Natural Value Index of 3 indicating that it is not a high conservation value area (Appendix 3). The site is largely modified with introduced flora.	A soil and water management plan is required if there is proposed building works at the site.	Insignificant (1)	Rare (E)	Low (1)	No
(b) mitigate and manage adverse erosion, sedimentation and runoff impacts on natural values	Given the soil type at the site, there is a low risk that the soil will be subject to significant erosion.	See E11.7.1 P1 (a)	Minor (2)	Unlikely (D)	Low (5)	No
(c) avoid or mitigate impacts on riparian or littoral vegetation	The site has the boundary line at the high tide mark. The ecosystem is heavily degraded from upstream activities. Where applicable, a flora and fauna assessment may be required.		Minor (2)	Unlikely (D)	Low (5)	No
(d) maintain natural streambank and streambed condition, (where it exists)	Not applicable					
(e) maintain in-stream natural habitat, such as fallen logs, bank overhangs, rocks and trailing vegetation	Not applicable					
(f) avoid significantly impeding natural flow and drainage	There is a low risk that infilling of the site will result in a significant impediment to natural flow and drainage.		Minor (2)	Unlikely (D)	Low (5)	No
(g) maintain fish passage (where applicable);	Not applicable					
(h) avoid landfilling of wetlands	Preliminary findings have identified a narrow fringe or wetland within the title (The LIST).	This fringe of wetland should not be infilled.	Minor (2)	Unlikely (D)	Low (5)	No
(i) works are undertaken generally in accordance with 'Wetlands and Waterways Works Manual' (DPIWE, 2003) and "Tasmanian Coastal Works Manual" (DPIPWE, Page and Thorp, 2010), and the unnecessary use of machinery within watercourses or wetlands is avoided.		Works are undertaken generally in accordance with 'Wetlands and Waterways Works Manual' (DPIWE, 2003) and "Tasmanian Coastal Works Manual" (DPIPWE, Page and Thorp, 2010), and the unnecessary use of machinery within watercourses or wetlands is avoided.				

NEW HABITABLE BUILDING – COASTAL IPAC MEDIUM

Performance Criteria E15.7.2 P1 **A new habitable building must satisfy all of the following:**	**Relevance**	**Management Options**	**Managed Risk Assessment (where relevant)**			**Further Assessment Required**
			Consequence	**Likelihood**	**Risk**	
(a) floor level of habitable rooms must be no lower than the Minimum Level for the Coastal Inundation Low Hazard Area in Table E15.1;		All finished floor levels of new dwellings are to be at 2.2				
(b) risk to users of the site, adjoining or nearby land is acceptable;	Based on 2070 timeframe, there is a low risk of site inundation at 2.2 m AHD.		Insignificant (1)	Rare (E)	Low (1)	No
(c) risk to adjoining or nearby property or public infrastructure is acceptable;	See E15.7.2 P1 (b)		Insignificant (1)	Rare (E)	Low (1)	No
(d) risk to buildings and other works arising from wave run-up is adequately mitigated through siting, structural or design methods;	See E15.7.2 P1 (b)		Insignificant (1)	Rare (E)	Low (1)	No
(e) need for future remediation works is minimised;	See E15.7.2 P1 (b)		Insignificant (1)	Rare (E)	Low (1)	No
(f) access to the site will not be lost or substantially compromised by expected future sea level rise either on or off-site;	See E15.7.2 P1 (b)		Insignificant (1)	Rare (E)	Low (1)	No
(g) provision of any developer contribution required pursuant to policy adopted by Council for coastal protection works;	See E15.7.2 P1 (b)		Insignificant (1)	Rare (E)	Low (1)	No

NEW HABITABLE BUILDING EXTENSION – COASTAL IPAC MEDIUM

Performance Criteria E15.7.2 P2 **An extension to an existing habitable building must satisfy all of the following:**	**Relevance**	**Management Options**	**Managed Risk Assessment (where relevant)**			**Further Assessment Required**
			Consequence	**Likelihood**	**Risk**	
(a) new habitable rooms must satisfy one of the following: (i) floor level no lower than the Minimum Level for the Coastal Inundation Low Hazard Area in Table E15.1; (ii) floor level no lower than the existing floor level and a floor area of the extension no more than 40 m2 as at the date of commencement of this planning scheme;	The medium inundation hazard band is very narrow. It is unlikely that a 40 m^2 extension will extend into this overlay.		Unlikely (D)	Rare (E)	Low (3)	
(b) risk to users of the site, adjoining or nearby land is not increased;	Low risk of inundation by 2070	See E15.7.2 P2 (a)	Unlikely (D)	Rare (E)	Low (3)	
(c) risk to adjoining or nearby property or public infrastructure is not increased;	Low risk of inundation by 2070	See E15.7.2 P2 (a)	Unlikely (D)	Rare (E)	Low (3)	
(d) provision of any developer contribution required pursuant to policy adopted by Council for coastal protection works.	Low risk of inundation by 2070	See E15.7.2 P2 (a)	Unlikely (D)	Rare (E)	Low (3)	

Non-Habitable Building, an Outbuilding or a Class 10b Buildings With A Floor Area Exceeding 40 m^2 – Coastal IPAC MEDIUM

Performance Criteria E15.7.2 P3 **A non-habitable building, an outbuilding or a Class 10b building under the Building Code of Australia, must satisfy all of the following:**	**Relevance**	**Management Options**	**Managed Risk Assessment (where relevant)**			**Further Assessment Required**
			Consequence	**Likelihood**	**Risk**	
(a) risk to users of the site, adjoining or nearby land is acceptable;	The medium inundation hazard band is very narrow. Any building in this overlay is likely to encroach into the inundation high overlay.					
(b) risk to adjoining or nearby property or public infrastructure is acceptable;	See E15.7.2 P3 (b)					
(c) risk to buildings and other works arising from wave run-up is adequately mitigated through siting, structural or design methods;	See E15.7.2 P3 (b)					
(d) need for future remediation works is minimised;	See E15.7.2 P3 (b)					
(e) provision of any developer contribution required pursuant to policy adopted by Council for coastal protection works,	See E15.7.2 P3 (b)					

NEW DWELLING – Coastal IPAC LOW

Performance Criteria E15.7.3 P1 **A new habitable building must satisfy all of the following:**	**Relevance**	**Management Options**	**Managed Risk Assessment (where relevant)**			**Further Assessment Required**
			Consequence	**Likelihood**	**Risk**	
(a) risk to users of the site, adjoining or nearby land is acceptable;	Based on modelling for 2070, there is a low risk that parts of the Low Inundation hazard overlay area will be inundated above 2.1 m AHD.	It is recommended that finished floor levels are constructed at or above 2.2 m AHD to achieve acceptable risk.	Minor (2)	Unlikely (D)	Low (5)	No
(b) risk to adjoining or nearby property or public infrastructure is acceptable;	Low risk	See E15.7.3 P1 (a)	Minor (2)	Unlikely (D)	Low (5)	No
(c) risk to buildings and other works arising from wave run-up is adequately mitigated through siting, structural or design methods;	Low risk	See E15.7.3 P1 (a)	Minor (2)	Unlikely (D)	Low (5)	No
(d) need for future remediation works is minimised;	Low risk	See E15.7.3 P1 (a)	Minor (2)	Unlikely (D)	Low (5)	No
(e) access to the site will not be lost or substantially compromised by expected future sea level rise either on or off-site;	Low risk	See E15.7.3 P1 (a)	Minor (2)	Unlikely (D)	Low (5)	No
(f) provision of any developer contribution required pursuant to policy adopted by Council for coastal protection works;						

BUILDING EXTENSION - Coastal IPAC LOW

Performance Criteria E15.7.3 P2 **An extension to an existing habitable building must satisfy all of the following:**	**Relevance**	**Management Options**	**Managed Risk Assessment (where relevant)**			**Further Assessment Required**
			Consequence	**Likelihood**	**Risk**	
(a) floor level no lower than the existing floor level	There is the potential for an extension into this overlay. Based on modelling for 2070, there is a low risk that parts of the Low Inundation hazard overlay area will be inundated above 2.1 m AHD. The building finished floor is estimated at 2.2 m AHD.					
(b) risk to users of the site, adjoining or nearby land is not increased;	See E15.7.3 P2 (b)					
(c) risk to adjoining or nearby property or public infrastructure is not increased;	See E15.7.3 P2 (b)					

E15.7.3 P3 Non Habitable Building – Coastal IPAC LOW

Performance Criteria E15.7.3 P3 A non-habitable building must satisfy all of the following:	Relevance	Management Options	Managed Risk Assessment (where relevant)			Further Assessment Required
			Consequence	Likelihood	Risk	
(a) risk to users of the site, adjoining or nearby land is acceptable;	Low risk given 2070 timeframes		Insignificant (1)	Rare (E)	Low (1)	No
(b) risk to adjoining or nearby property or public infrastructure is acceptable;	See E15.7.3 P3 (a)		Insignificant (1)	Rare (E)	Low (1)	No
(c) need for future remediation works is minimised;	See E15.7.3 P3 (a)		Insignificant (1)	Rare (E)	Low (1)	No
(d) provision of any developer contribution required pursuant to policy adopted by Council for coastal protection works,	See E15.7.3 P3 (a)		Insignificant (1)	Rare (E)	Low (1)	No

LANDFILL OR SOLID WALLS BUILT IN AN INUNDATION OVERLAY

Objective:

To ensure that landfill works do no unreasonably increase the risk from riverine, watercourse and inland flooding, and risk from coastal inundation.

Performance Criteria E15.7.5 P1 **Landfill, or solid walls greater than 5 m in length and 0.5 m in height, must satisfy all of the following:**	**Relevance**	**Management Options**	**Managed Risk Assessment (where relevant)**			**Further Assessment Required**
			Consequence	**Likelihood**	**Risk**	
(a) no adverse effect on flood flow over other property through displacement of overland flows;	Infilling is unlikely to have any adverse floodwater flow affect at the site.	Infilling may be conducted in WCPA areas provided they are not classified as a wetland.	Minor (2)	Unlikely (D)	Low (5)	No
(b) the rate of stormwater discharge from the property must not increase;	Not applicable		Minor (2)	Unlikely (D)	Low (5)	No
(c) stormwater quality must not be reduced from pre-development levels.	Not applicable		Minor (2)	Unlikely (D)	Low (5)	No

Change of Use in An Erosion Hazard Overlay

Performance Criteria E16.6 P1 Change of use of a non habitable building to a use involving habitable rooms must satisfy all of the following:	Relevance	Management Options	Managed Risk Assessment (where relevant)			Further Assessment Required
			Consequence	Likelihood	Risk	
(a) the use must not increase the risk to users of the site;	Consideration given to the 2070 zone of reduced foundation capacity.	As the proposed structures are not located within the zone of reduced foundation capacity, the foundations should be designed to account for the site classification Class M.	Minor (2)	Unlikely (D)	Low (5)	No
(b) any increased reliance on public infrastructure must not result in an unacceptable level of risk;	See E16.6 P1 (b)		Minor (2)	Unlikely (D)	Low (5)	No
(c) need for future remediation works is minimised;	See E16.6 P1 (b)		Minor (2)	Unlikely (D)	Low (5)	No
(d) access to the site must not be lost or substantially compromised by increased future erosion expected to result from future sea level rise, either on or off-site;	See E16.6 P1 (b)		Minor (2)	Unlikely (D)	Low (5)	No
(e) provision of any developer contribution required pursuant to policy adopted by Council for coastal protection works.	See E16.6 P1 (b)		Minor (2)	Unlikely (D)	Low (5)	No

BUILDING AND WORKS WITHIN A COSTAL EROSION HAZARD AREA

Performance Criteria E16.7.1 P1 **Buildings and works must satisfy all of the following:**	**Relevance**	**Management Options**	**Preliminary Risk Assessment (where relevant)**			**Further Assessment Required**
			Consequence	**Likelihood**	**Risk**	
(a) not increase the level of risk to the life of the users of the site or hazard for adjoining or nearby properties or public infrastructure;	Consideration given to the 2070 zone of reduced foundation capacity.	As the proposed structures are not located within the zone of reduced foundation capacity, the foundations should be designed to account for the site classification Class M.	Minor (2)	Unlikely (D)	Low (5)	No
(b) erosion risk arising from wave run-up, including impact and material suitability, may be mitigated to an acceptable level through structural or design methods used to avoid damage to, or loss of, buildings or works;	This has been considered in modelling.		Minor (2)	Unlikely (D)	Low (5)	No
(c) erosion risk is mitigated to an acceptable level through measures to modify the hazard where these measures are designed and certified by an engineer with suitable experience in coastal, civil and/or hydraulic engineering;	Within building design life, no mitigation required if founded outside of the zone of reduced foundation capacity and in accordance with Class M site classification.		Minor (2)	Unlikely (D)	Low (5)	No
(d) need for future remediation works	Within building design life, no remediation required		Minor (2)	Unlikely (D)	Low (5)	No
(e) health and safety of people is not placed at risk	See E16.7.1 P1 (a)		Minor (2)	Unlikely (D)	Low (5)	No
(f) important natural features are adequately protected	See E11		Minor (2)	Unlikely (D)	Low (5)	No
(g) public foreshore access is not obstructed where the managing public authority requires it to continue to exist	NA		Minor (2)	Unlikely (D)	Low (5)	No
(h) access to the site will not be lost or substantially compromised by expected future erosion whether on the proposed site or off-site	NA		Minor (2)	Unlikely (D)	Low (5)	No
(i) provision of a developer contribution for required mitigation works consistent with any adopted Council Policy, prior to commencement of works.	NA		Minor (2)	Unlikely (D)	Low (5)	No
(j) not be located on an actively mobile landform	NA		Minor (2)	Unlikely (D)	Low (5)	No

7 Wallace Street, Bridgewater
Storm Water Report
REV01

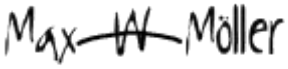
Before the flood we map the risk

Prepared For:
Brett Miller

Level 4, 116 Bathurst Street
Hobart 7000
TASMANIA- AUSTRALIA

Document Information

Title	*Client*	*Document Number*	*Project Manager*
7 Wallace Street, Bridgewater, Stormwater Study	Brett Miller	FS-HOB-2059	Max W. Möller *BEng,FIEAust,EngExec,CPEng,NER,APEC Engineer, IntPE(Aus)* *Managing Director* / Principal Hydraulic Engineer

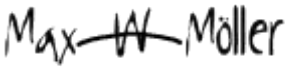


Prepared by: ..... Date: 28th December 2020

Max W. Möller

Reviewed by: ..... Date: 28th December 2020

John Holmes



Authorised by: ..... Date: 28th December 2020

Max W. Möller

Revision History					
Rev No.	**Description**	**Prepared by**	**Reviewed by**	**Authorised by**	**Date**
00	7 Wallace Street, Bridgewater, Stormwater Management Plan	Max W. Möller	John Holmes	Max W. Möller	28/12/2020
01	New Swale Drain Location Amended	Max W. Möller	John Holmes	Max W. Möller	01/01/2020

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1. Introduction

Flüssig Spatial has been engaged to undertake a site-specific Stormwater Management Plan (SMP) for the new sheds at number 7 Wallace Street, Bridgewater, including, but not limited to, lot and stormwater drainage analysis and MUSIC Modelling to stated stormwater quality standards. The purpose of this report is to determine the hydraulic characteristics and stormwater infrastructure capacity of a 5% AEP storm event and treatment on the existing and post-development scenarios for the two new roofed areas to comply with E7.7.1 Stormwater Drainage and Disposal.

E7.7.1 Performance Criteria P1:
Stormwater from new impervious surfaces must be managed by any of the following:

- Disposed of on-site with soakage devices having regard to the suitability of the site, the system design and water sensitive urban design principles.
- Collected for re-use on the site.
- Disposed of to public stormwater infrastructure via pump system which is designed, maintained and managed to minimise the risk of failure to the satisfaction of the council.

2. Site Characteristics

2.1 Site Location

7 Wallace Street, Bridgewater is located on the southern border of the **Brighton Council** municipality and is an approximately 1.62ha proposed development.

The development site is surrounded by rural resources, general residence, open areas, and utilities areas at the east boundary with Wallace Street St and the west boundary onto the River Derwent (Figure 1).

Figure 1. 7 Wallace Street, Bridgewater development location

2.2 Topography

7 Wallace Street, Bridgewater, is approximately 1.62 ha and draining from approximately 2.6m AHD to 0.6m AHD to the outlet. The land use is predominantly rural resources area.

3. Proposal

3.1 Proposed Development

The proposed development consists of two new sheds, stormwater retention tanks to each shed and grassed swale drainage from all impervious surfaces is proposed. Design of the development was not undertaken as part of the engagement by Flüssig Spatial. Figure 2 shows the plan proposed by a third-party designer.

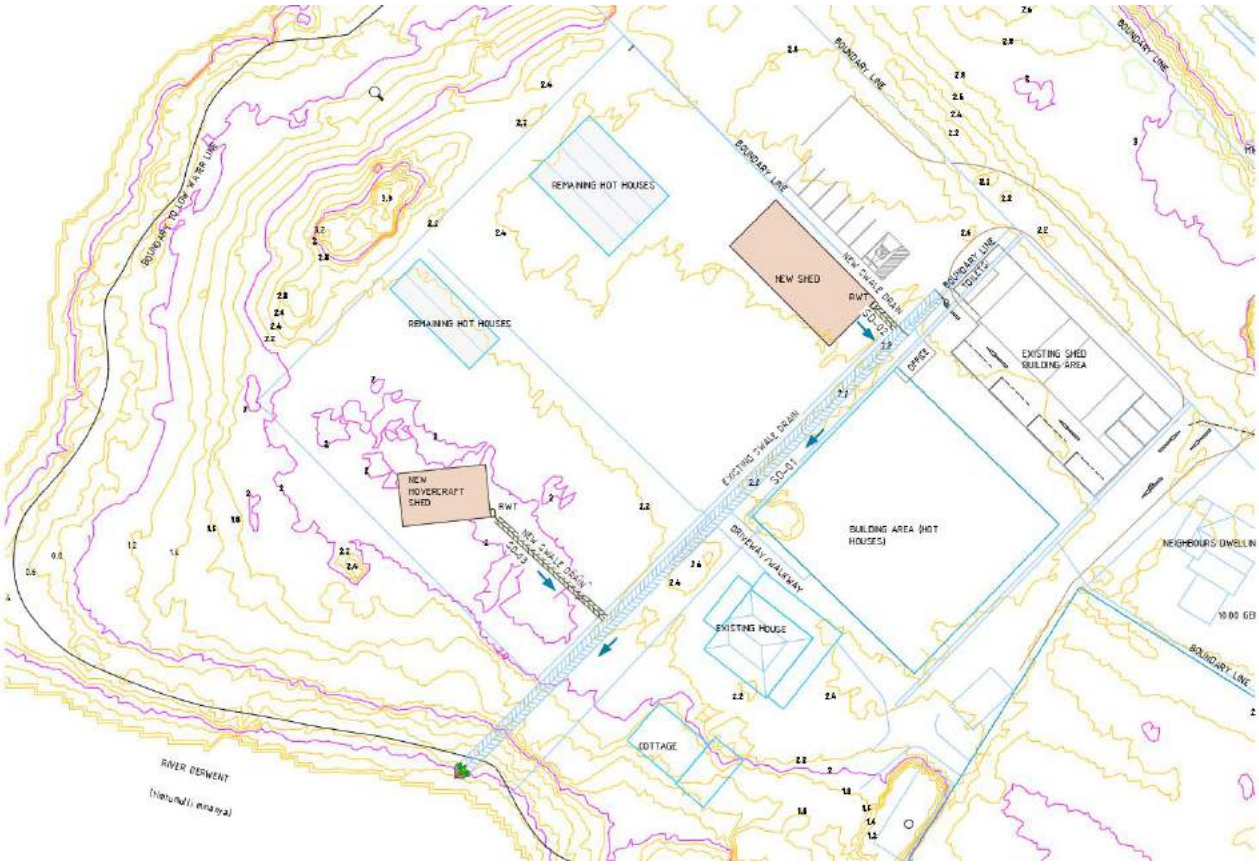


Figure 2. Proposed Stormwater Concept Plan

3.1.1 Survey Data

All survey data was supplied by the client as a processed AutoCAD DEM. The provided data has been incorporated into various software to undertake the analysis.

4. Stormwater Quantity

4.1 Catchment Analysis

The roof catchment was modelled using the rational method as required by Brighton Council Stormwater Runoff Management Policy. The catchment characteristics (Coefficient of Runoff, time of concentration etc.) were taken from site plans and policy documents.

4.2 Catchment Conditions

Brighton Council does not have any existing stormwater assets in the vicinity of the 7 Wallace Street subdivision. The existing ground conditions service the entire catchment area.

4.2.1 Design Intensity Storms

Design storm durations were calculated using Bransby-Williams formula for time of concentration (t_c) which gives a t_c = 5min for the new roof catchments. 5% AEP rainfall amount (mm/hr) was taken from the BOM 2016 IFD curves (Table 1).

Table 1. BoM IFD table

Annual Exceedance Probability (AEP)								
Duration	**Duration in min**	**63.20%**	**50%**	**20%**	**10%**	**5%**	**2%**	**1%**
1 min	1	58.9	66.8	93.3	113	134	163	187
2 min	2	50.8	57.3	78.1	92.7	107	126	139
3 min	3	44.9	50.7	69.5	82.8	96.3	114	127
4 min	4	40.4	45.7	63.1	75.5	88.3	106	119
5 min	5	36.9	41.8	58	69.8	82	98.9	113
10 min	10	26.8	30.4	42.6	51.8	61.6	75.8	87.7
15 min	15	21.7	24.6	34.6	42.1	50.1	61.9	71.7
20 min	20	18.6	21.1	29.6	36	42.7	52.6	60.9
25 min	25	16.4	18.6	26.1	31.7	37.5	46	53.1
30 min	30	14.9	16.8	23.5	28.5	33.6	41.1	47.2
45 min	45	11.8	13.4	18.6	22.3	26.2	31.6	36
1 hour	60	10.1	11.4	15.7	18.8	21.9	26.2	29.6
1.5 hours	90	8	9.05	12.4	14.7	17.1	20.1	22.5
2 hours	120	6.8	7.7	10.5	12.4	14.3	16.8	18.7
3 hours	180	5.41	6.12	8.34	9.82	11.3	13.1	14.5
4.5 hours	270	4.28	4.86	6.62	7.79	8.9	10.4	11.4
6 hours	360	3.62	4.11	5.62	6.61	7.55	8.81	9.75
9 hours	540	2.83	3.22	4.43	5.23	5.99	7.03	7.82
12 hours	720	2.36	2.69	3.72	4.41	5.07	5.99	6.7

4.2.2 Land use

Roughness values for this model were derived from the ARR 2019 Guidelines. The Manning's n values are as follows in Table 2.

Table 2. Manning's n coefficients

Land Use	Manning's n
Swale Channel	0.025
Road	0.018
Urban Yards	0.035
Buildings	0.3

4.2.3 Runoff Coefficients

As per ARR2019 guidelines, the following Runoff Coefficient C_{10} values in Table 3 were adopted for the above land use area.

Table 3. Runoff Coefficients

Surface	Co-efficient of Runoff (C_{10})
Pervious	0.3
Impervious	0.9

4.3 Development Runoff

Stormwater runoff from the development site has been assessed under pre- and post-development models to determine the potential impact the development at 7 Wallace Street has on the immediate local flows. As per planning guidelines it is a requirement that this does not have a negative impact from pre to post development.

The site was modelled using Infoworks ICM hydrology (RAFTS) module, which uses the Australian designed Laurenson method to calculate runoff to the River Derwent. The catchment characteristics (% impervious, roughness etc.) were taken from best practice manuals.

Table 4. Site Characteristics

	Pre-Development		Post-Development	
Land Use	Area (ha)	% of total land	Area (ha)	% Impervious
Total Impervious	0.3	18.5	0.32	19.7
Total Pervious	1.32	81.5	1.30	80.3

4.4 Model Results

The pre- and post-development for the two new impervous area scenarios were calculated against the 5% AEP storm events. The storm durations derived from the time of concentration were 5 minutes.

The pre and post conditions can be seen in Table 5 below showing the peak discharge and increase in peak discharge from pre to post development as well as the maximum allowable discharge.

Table 5. Discharge rates pre- and post-development

Design Event (AEP)	New Roofed Areas Peak Discharge (m^3/s)		
	Pre-Development	Post-Development	Difference
5%	0.0025	0.0061	0.0036

5. Water Quality

Water quality modelling for the site has been undertaken with the urban stormwater improvement conceptualisation software MUSIC. The modelling conducted in MUSIC has been done in accordance with MUSIC Modelling Guidelines (BMT WBM, August 2019) and the Tasmanian State Stormwater Strategy. This document provides a guide to water quality modelling methodology and outlines the assumptions that should be made when selecting input parameters.

Recommendations for the improvement of the water quality on site would include the diversion of stormwater flows from the subdivision to a primary treatment (treatment train). This would reduce the pollutants in the receiving waters further and be a safe design option if future usage of this sub catchment provides higher pollutant storm water runoff.

5.1 Stormwater Quality Treatment (construction phase)

During construction, many pollutants are generated from various sources. These pollutants can easily be captured in stormwater runoff and introduced into the downstream receiving environment, polluting the waterways. Some of the main construction phase pollutants are described below:

- Litter from construction – material packaging, paper, plastic, food packaging, off-cuts etc.
- Sediment erosion and transports from excavated material and fresh surfaces
- Hydrocarbons – equipment and machinery
- Toxic material – cement, solvents, paints, cleaning agents etc.
- pH altering substances – cement, cleaning agents etc.

Construction phase pollutants should be planned and mitigated for by a designed site-specific SWMP as part of the drawing set:

5.2 Stormwater Quality Modelling

Stormwater pollutant modelling for the development at 7 Wallace Street was undertaken using Model for Urban Stormwater Improvement Conceptualisation (MUSIC) software, version 6.3.0 under the guidelines of the State Stormwater Strategy and Interim Planning Scheme.

This model splits the catchment into the following typical areas:

- Roof Catchment
- Revegetated land

The following fraction impervious (fi) and land areas in Table 6 have been adopted in the modelling as per the concept design measurements. Revegetated land was left to freely drain to the node as there is no mechanism to drain this area to a treatment device.

Table 6. Adopted Fraction Impervious

Catchment Area (ha)	Roof Shed		Roof Hovercraft Shed		Pervious	
	Area (ha)	fi	Area (ha)	fi	Area (ha)	fi
1.62	0.0184	1	0.0093	1	1.6	0

5.2.1 Council Planning Quality Removal Standards

Brighton Council Interim Planning Scheme 2015 has adopted the pollutant removal targets and best practice from the State Stormwater Strategy 2010. See Table 7 for target removal rates.

Table 7. State Stormwater Strategy Pollutant Removal Targets

Parameter	Result Pollutant Retention on Developed Site
Total Suspended Solids (TSS) (kg/yr)	80%
Total Phosphorous (TP) (kg/yr)	45%
Total Nitrogen (TN) (kg/yr)	45%
Total Pollutants (kg/yr)	100%

5.3 Treatment Train

To achieve stormwater pollutant removal targets outlined above and considering site constraints, this model utilised a primary treatment train (Figure 3). The treatment train consists of a primary grassed swale drains servicing each lot.

5.4 Quality Results

The MUSIC pollutant load reductions can be seen detailed in Table 8 below. As can be seen when comparing the MUSIC results to the required state stormwater strategy target load reductions, the specified treatment train outlined above and as seen in Figure 3, shows that all targets either meet or exceed reduction targets.

Table 8. Pollutant Removal Achieved vs Targets

Parameter	Required Load Reduction (%)	MUSIC Modelled Load Reduction (%)	State Stormwater Targets Achieved (Y/N)
Total Suspended Solids (TSS) (kg/yr)	80.0	96.2	Y
Total Phosphorous (TP) (kg/yr)	45.0	79.9	Y
Total Nitrogen (TN) (kg/yr)	45.0	69.9	Y
Total Pollutants (kg/yr)	90.0	100	Y

Based on the water quality assessment using the MUSIC software, it is found that the pollutant reduction improvement can be achieved by adopting the proposed grassed swale drain.

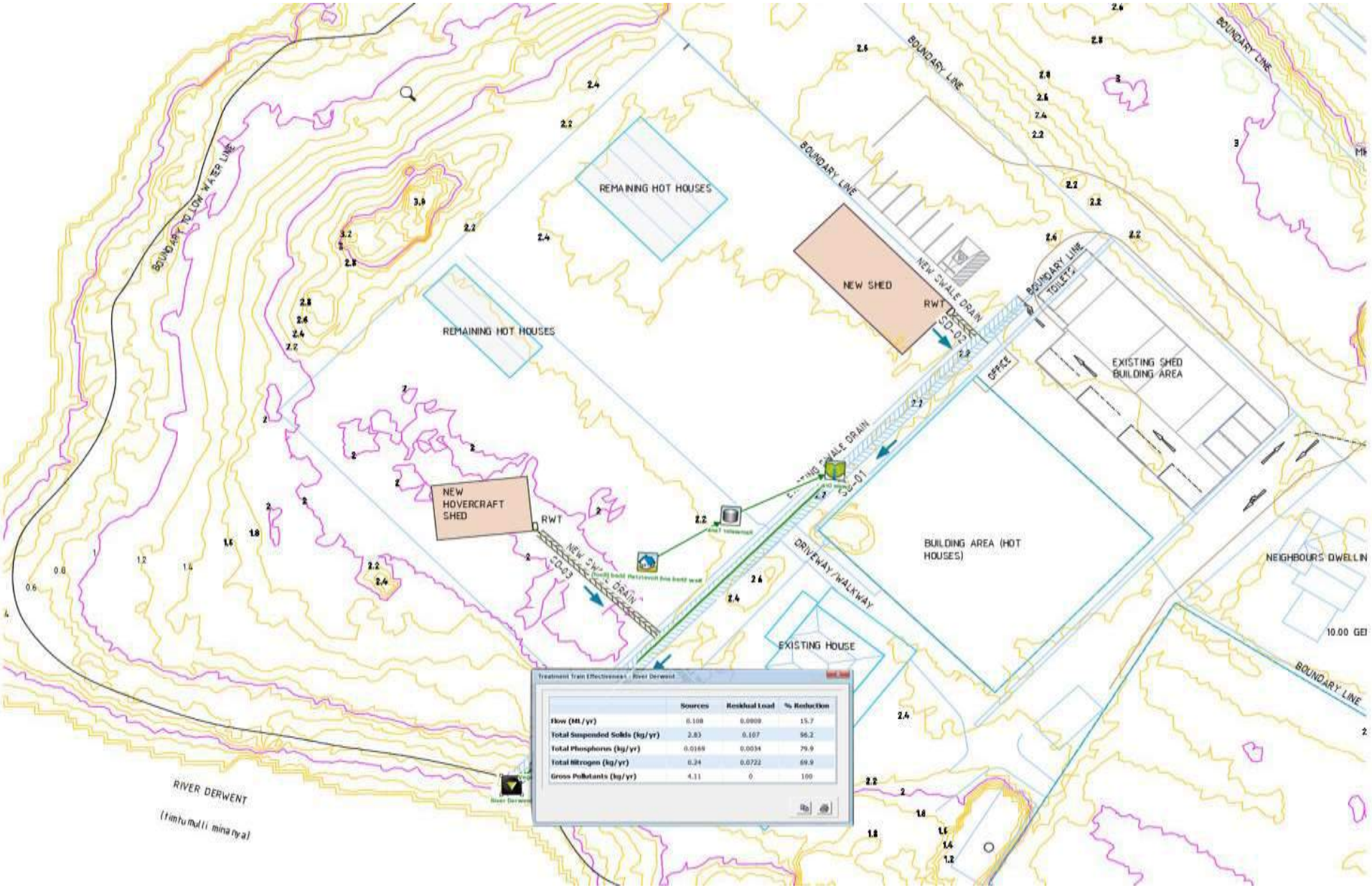


Figure 3. MUSIC Treatment Train Effectiveness Result

5.5 Quality Summary

Flüssig Spatial recommends the following be undertaken to ensure the ongoing stormwater quality from the developed site:

1. Construction quality control should be implemented to prevent pollution during construction
2. Installation of primary grassed swale drain in the order specified in this document
3. Maintenance plans need to be created and adhered to ensure the ongoing operation of the systems

6. Conclusion

The Stormwater System Management Plan for 7 Wallace Street, Bridgewater development site has reviewed the post development quantity and quality scenarios. Post-development quantity and quality has been assessed against the Brighton Council Stormwater Runoff Management Policy and the State Stormwater Strategy to ensure the post-development flows meet specified standards.

The following conclusions were derived in this report:

1. The total volume of 0.0036m^3 is stored from the new two roofed areas and drains freely to the swale drain.
2. Grassed swales drain designed and sized using MUSIC can achieve required pollutant removal through the construction and dimensions specified in Appendix A.

Under the Stormwater Management Plan, the development site will meet current specified standards for both quantity and quality control.

7. Limitations

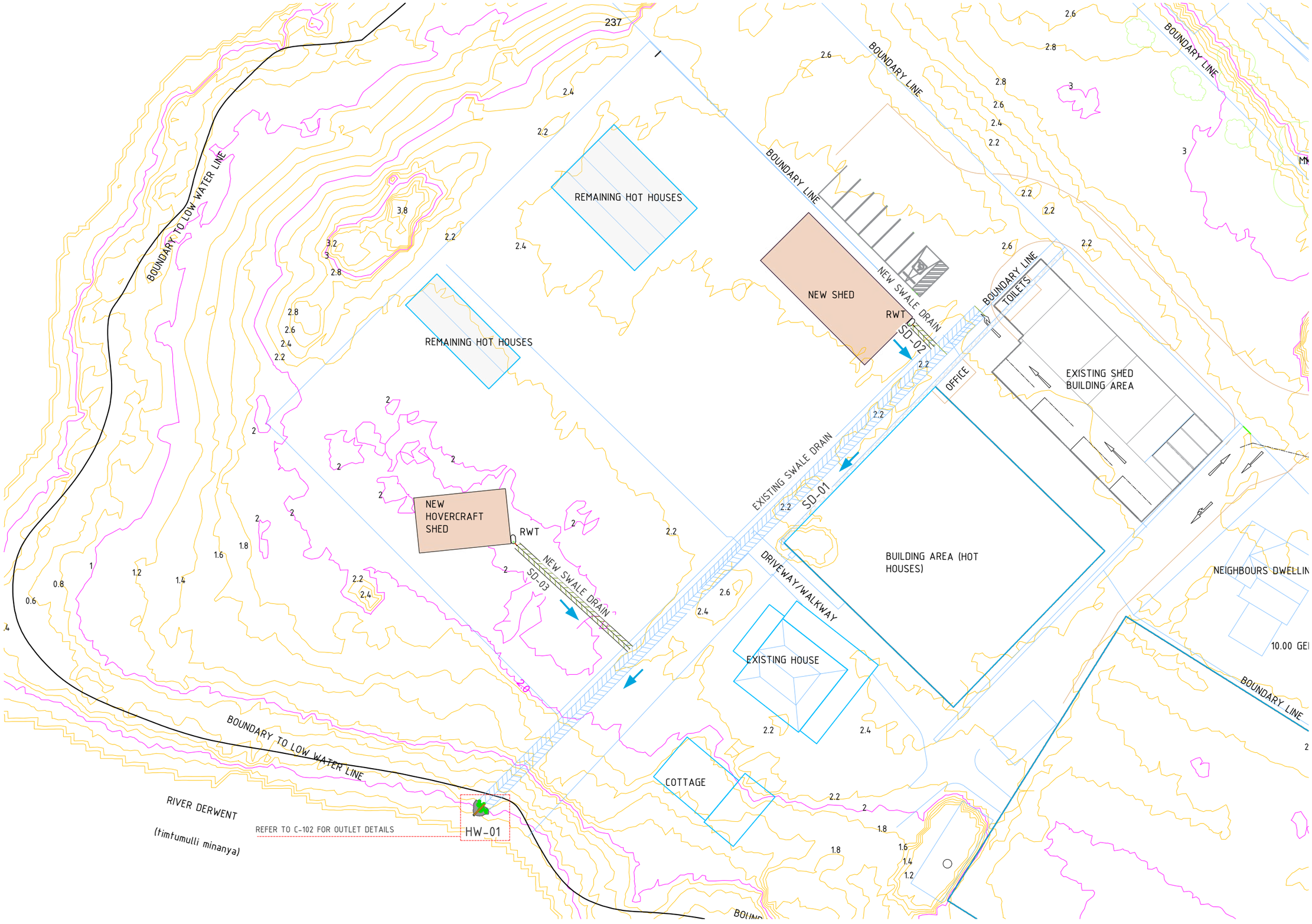
Flüssig Spatial was engaged by the developer of 7 Wallace Street, Bridgewater for the purpose of a site-specific stormwater management plan as per the Brighton Interim Planning Scheme 2015. This study is deemed suitable for purpose at the time of undertaking the study. If conditions of the subdivision change, the plan will need to be reviewed against all changes.

This report is to be used in full and may not be used in part to support any other objective other than what has been outlined within, unless specific written approval to do otherwise is granted by Flüssig Spatial.

Flüssig Spatial accepts no responsibility for the accuracy of third-party documents supplied for the purpose of this stormwater management plan.

Appendices

Appendix A: FS_HBO_2059-Stormwater Concept Plan and Details REV01



LEGEND

STORMWATER FLOW DIRECTION

EXISTING CONTOURS

RWT NEW DETENTION RAIN WATER TANK

STORMWATER PLAN
SCALE 1:500

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01	NEW SWALE DRAINS LOCATION AMENDED	MM	01.01.21

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CLIENT: BRETT AND KATHLEEN MILLER

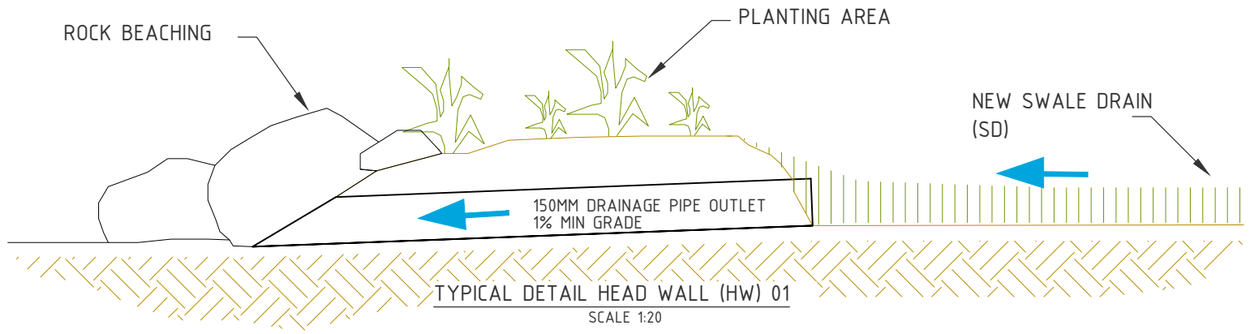
SITE: 7 WALLACE ST BRIDGEWATER 7030

TITLE: STORMWATER CONCEPT PLAN

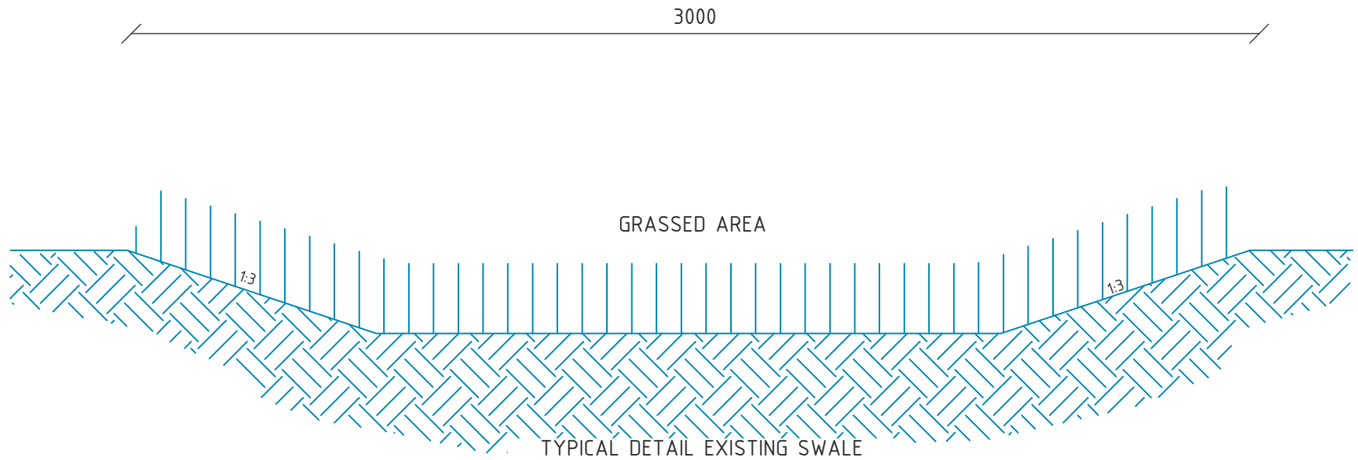
PROJECT: 7 WALLACE ST BRIDGEWATER 7030, PROPOSED STORMWATER PLAN

SCALE AT A3:	DATE:	DRAWN:	CHECKED:
1:500	26.11.2020	DH	MM

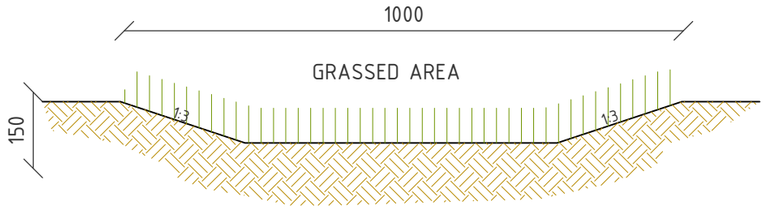
PROJECT NO:	DRAWING NO:	REVISION:
FS_HOB_2059	C-101	01



TYPICAL DETAIL HEAD WALL (HW) 01
SCALE 1:20



TYPICAL DETAIL EXISTING SWALE
DRAIN (SD 01)
SCALE 1:20



TYPICAL DETAIL SWALE DRAIN 02 & 03
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CLIENT: BRETT AND KATHLEEN MILLER

SITE: 7 WALLACE ST BRIDGEWATER 7030

TITLE: TYPICAL DETAILS

PROJECT: 7 WALLACE ST BRIDGEWATER 7030, PROPOSED STORMWATER PLAN

SCALE AT A3:	DATE:	DRAWN:	CHECKED:
1:20	26.11.2020	DH	MM

PROJECT NO:	DRAWING NO:	REVISION:
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MIDSON traffic pty ltd

Brett and Kathleen Miller

7 Wallace Street, Pleasure Boat Facility Development
Traffic Impact Assessment

January 2021

ENGINEERS AUSTRALIA

PROFESSIONAL ENGINEER OF THE YEAR
INDIVIDUAL AWARDS
TASMANIA
WINNER 2016

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1. Introduction

1.1 Background

Midson Traffic were engaged by Brett and Kathleen Miller to prepare a traffic impact assessment for a proposed pleasure boat facility, aquaponics development and children's party hire venue development at 7 Wallace Street, Bridgewater.

1.2 Traffic Impact Assessment (TIA)

A traffic impact assessment (TIA) is a process of compiling and analysing information on the impacts that a specific development proposal is likely to have on the operation of roads and transport networks. A TIA should not only include general impacts relating to traffic management, but should also consider specific impacts on all road users, including on-road public transport, pedestrians, cyclists and heavy vehicles.

This TIA has been prepared in accordance with the Department of State Growth (DSG) publication, *A Framework for Undertaking Traffic Impact Assessments*, September 2007. This TIA has also been prepared with reference to the Austroads publication, *Guide to Traffic Management,* Part 12: *Traffic Impacts of Developments*, 2019.

Land use developments generate traffic movements as people move to, from and within a development. Without a clear understanding of the type of traffic movements (including cars, pedestrians, trucks, etc), the scale of their movements, timing, duration and location, there is a risk that this traffic movement may contribute to safety issues, unforeseen congestion or other problems where the development connects to the road system or elsewhere on the road network. A TIA attempts to forecast these movements and their impact on the surrounding transport network.

A TIA is not a promotional exercise undertaken on behalf of a developer; a TIA must provide an impartial and objective description of the impacts and traffic effects of a proposed development. A full and detailed assessment of how vehicle and person movements to and from a development site might affect existing road and pedestrian networks is required. An objective consideration of the traffic impact of a proposal is vital to enable planning decisions to be based upon the principles of sustainable development.

This report also addresses the relevant clauses of E5, *Road and Railway Assets Code,* and E6, *Parking and Access Code,* of the Brighton Interim Planning Scheme, 2015.

1.3 Statement of Qualification and Experience

This TIA has been prepared by an experienced and qualified traffic engineer in accordance with the requirements of Council's Planning Scheme and The Department of State Growth's, *A Framework for Undertaking Traffic Impact Assessments*, September 2007, as well as Council's requirements.

The TIA was prepared by Keith Midson. Keith's experience and qualifications are briefly outlined as follows:

- 25 years professional experience in traffic engineering and transport planning.
- Master of Transport, Monash University, 2006

- Master of Traffic, Monash University, 2004
- Bachelor of Civil Engineering, University of Tasmania, 1995
- Engineers Australia: Fellow (FIEAust); Chartered Professional Engineer (CPEng); Engineering Executive (EngExec); National Engineers Register (NER)

1.4 Project Scope

The project scope of this TIA is outlined as follows:

- Review of the existing road environment in the vicinity of the site and the traffic conditions on the road network.
- Provision of information on the proposed development with regards to traffic movements and activity.
- Identification of the traffic generation potential of the proposal with respect to the surrounding road network in terms of road network capacity.
- Review of the parking requirements of the proposed development. Assessment of this parking supply with Planning Scheme requirements.
- Traffic implications of the proposal with respect to the external road network in terms of traffic efficiency and road safety.

1.5 Subject Site

The subject site is located at 7 Wallace Street, Bridgewater. The existing use of the site is Resource Development and General Residential. This consisted of hothouses and accompanying outbuildings that produced tomatoes on a large commercial enterprise. The resource development business had been run down and no longer operated on a sustainable level.

The subject site and surrounding road network is shown in Figure 1.

Figure 1 Subject Site & Surrounding Road Network

Image Source: LIST Map, DPIPWE

1.6 Reference Resources

The following references were used in the preparation of this TIA:

- Brighton Interim Planning Scheme, 2015 (Planning Scheme)
- Austroads, *Guide to Traffic Management,* Part 12: *Traffic Impacts of Developments*, 2019
- Austroads, Guide to Road Design, Part 4A: Unsignalised and Signalised Intersections, 2017
- Department of State Growth, *A Framework for Undertaking Traffic Impact Assessments*, 2007
- Roads and Maritime Services NSW, *Guide to Traffic Generating Developments*, 2002 (RMS Guide)
- Roads and Maritime Services NSW, *Updated Traffic Surveys,* 2013 (Updated RMS Guide)
- Australian Standards, AS2890.1, *Off-Street Parking*, 2004 (AS2890.1)
- Australian Standards, AS2890.2, *Off-Street Commercial Vehicle Facilities*, 2002 (AS2890.2)

2. Existing Conditions

2.1 Transport Network

For the purpose of this report, the transport network consists of Boyer Road, Wallace Street, the Derwent Valley railway line and the South Line railway.

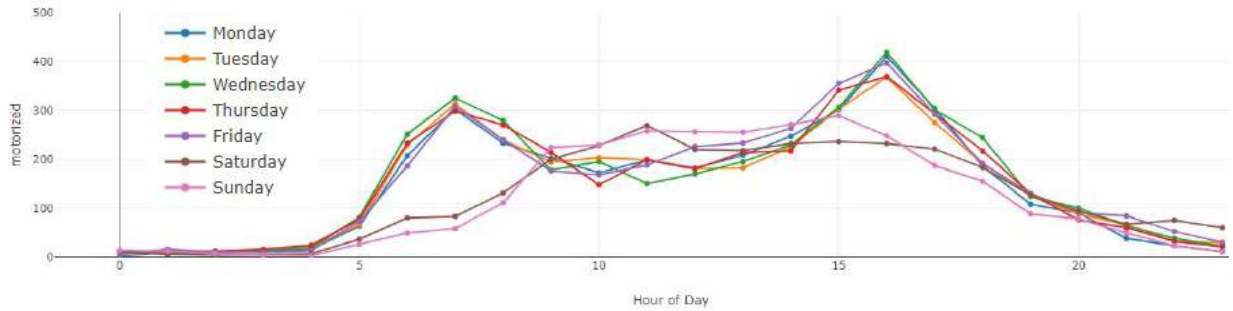
2.1.1 Boyer Road

Boyer Road is a State Growth owned road that connects between the Midland Highway in Bridgewater and Rocks Road in New Norfolk along the eastern shore of the Derwent River. Under the Tasmanian Road Hierarchy, Boyer Road is categorised as an "Other Road" which is defined as follows:

> *"Other Roads are primarily access roads for private properties.*
>
> *Some may be used for comparatively low frequency heavy freight vehicle transport, for example:*
>
> - *Log transport – but they are not the most important log transport roads and experience fluctuation in use; and*
> - *Farm property access – for purposes including delivery of fuel and supplies, stock transport, crop delivery and milk pickup.*
>
> *While a few of these roads may currently carry larger numbers of heavy freight vehicles, they may duplicate existing Trunk, Regional Freight or Regional Access Roads and are not DIER's strategically preferred heavy freight vehicle routes."*

Boyer Road currently carries 3,300 vehicles per day[1] near the subject site, with a peak flow of approximately 400 vehicles per hour (PM peak). The hourly distribution of traffic flow on Boyer Road west of Sorell Street is shown in Figure 2.

Figure 2 Boyer Road Hourly Traffic Flow



[1] Department of State Growth traffic data, November 2018

Boyer Road connects to Main Road at a roundabout with a mountable central island. A railway level crossing is located in Boyer Road north of the subject site. The railway crossing is controlled by lights.

Boyer Road near the railway crossing is shown in Figure 3.

Figure 3 Boyer Road

2.1.2 Wallace Street

Wallace Street is a local access road that connects to Boyer Road at a four-way junction with Sorell Street located opposite Wallace Street. It provides access to 7 properties along its length (including the subject site).

Wallace Street crosses the Derwent Valley Railway Line and the South Line at level railway crossings.

Wallace Street near the subject site is shown in Figure 4. The intersection of Wallace Street with Boyer Road is shown in Figure 4.

Figure 4 Wallace Street near Subject Site

Figure 5 Wallace Street/ Boyer Road Intersection

2.1.3 Derwent Valley Railway Line

The Derwent Valley Line connects between Maydena and Bridgewater along the western and northern side of the Derwent River. The railway has been closed north of New Norfolk since 1995.

The railway line is currently operated by Pacific National.

The section of the Derwent Valley Line that crosses Wallace Street is no longer in operation. The crossing is shown in Figure 6.

Figure 6 Wallace Street Derwent Valley Line Crossing

2.1.4 South Line Railway

The South Line is a freight rail corridor connecting Hobart to Tasmania's northern ports. The South Line connects with the Derwent Valley Line immediately to the north of the Boyer Road level crossing.

The South Line level crossing at Boyer Road is shown in Figure 3 and the South Line level crossing at Wallace Street is shown in Figure 7.

Figure 7 Wallace Street South Line Crossing

2.2 Road Safety Performance

Crash data can provide valuable information on the road safety performance of a road network. Existing road safety deficiencies can be highlighted through the examination of crash data, which can assist in determining whether traffic generation from the proposed development may exacerbate any identified issues.

Crash data was obtained from the Department of State Growth for a five-year period between 1st January 2016 and 31st December 2020 for the full length of Wallace street. Only one crash was reported during this time. This crash occurred at 7:05PM on 29th September 2016 at the intersection of Wallace Street and Boyer Road. The crash involved two vehicles in a 'cross-traffic' collision and resulted in first aid at the scene.

3. Proposed Development

3.1 Development Proposal

The proposed development is a Pleasure Boat Facility (hovercraft). Some of the hothouses are to remain and a similar pursuit of sustainable aquaponics (incorporating the existing swimming pool) is to be setup in a new commercial enterprise (used for aquaponics on a significantly reduced scale from the previous operations). There are no agricultural uses on adjoining land.

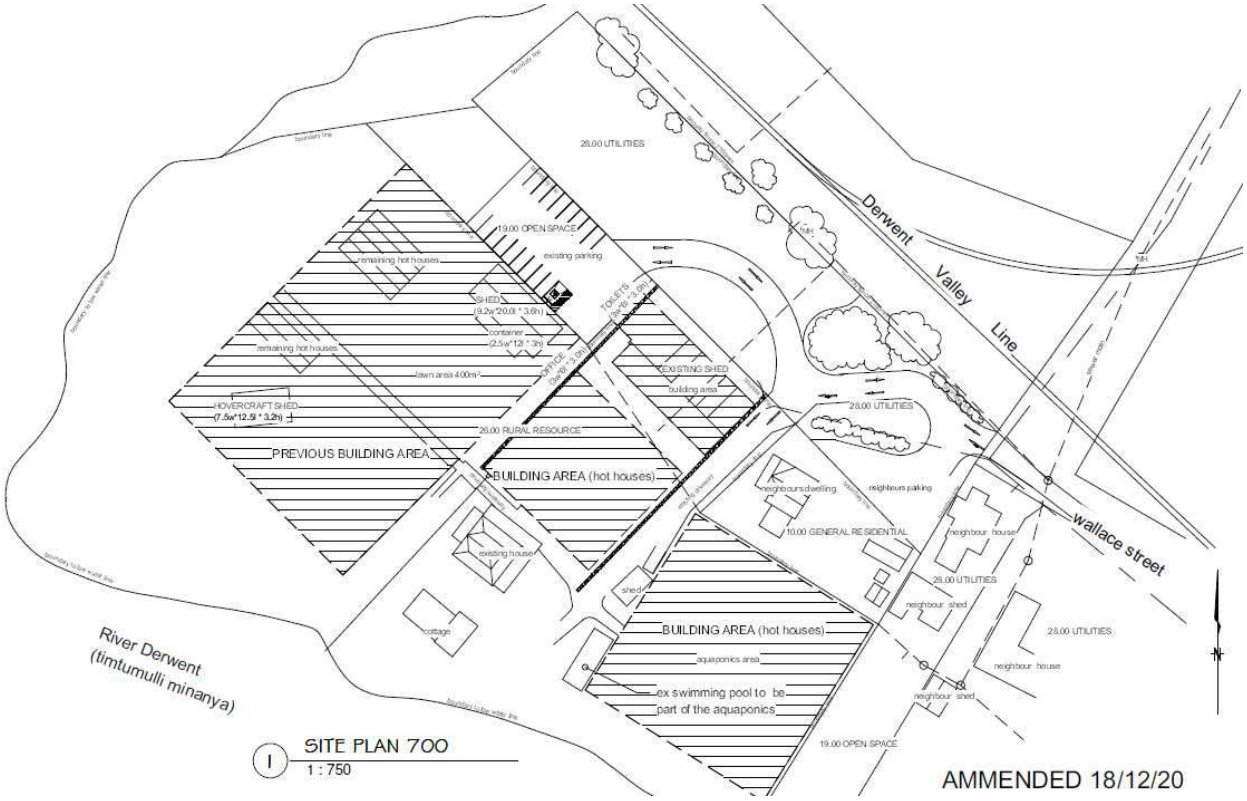
The pleasure boat facility carries a maximum 12 people (including 2 staff and 10 guests) for a two-hour turnaround. The maximum number of trips during peak times will be four per day. A total of 40 guests per day will therefore access the facility (over an eight hour period).

The use of a 12-seater minibus is proposed for hotel pick up and drop off to service.

A children's party hire business is also proposed for the site. The activities include bumper cars, inflatable castles and slide, and tractor swing. Parties will cater for group bookings of up to 10 children (not open to the general public). This component will operate several times per week. The minibus will be used to collect children who are local to the area. This will reduce traffic generation for the children's party hire component of the development.

The proposed development layout plans are shown in Figure 8.

Figure 8 Proposed Development Plans



4. Traffic Impacts

4.1 Traffic Generation

Traffic generation was calculated from first principles.

4.1.1 Previous Use Traffic Generation

The previous use of the site was resource development. The previous operations associated with the hot houses employed more than twenty people when in full production and the road and access was frequently used by commercial vans picking up produce for delivery.

On this basis the traffic generation of the previous use of the site when in full operation is estimated to be 60 two-way vehicle movements per day. The peak generation was likely to be 20 vehicles per hour.

4.1.2 Proposed Development Traffic Generation

Pleasure boat facility

The hovercraft associated with the development has a maximum occupancy of 12 people, which includes 2 crew. During peak operations the proposed pleasure boat facility will cater for up to 40 people per day (4 sessions with 10 guests per session). As a worst-case scenario, if all customers arrive by car the total traffic generation will be 40 vehicles per day (assuming that the average occupancy is 2 people per car and 1 inward and 1 outward trip per car).

Additional movements associated with management of the facility are likely to increase the total traffic generation to approximately 44 vehicles per day.

The peak traffic volume is likely to be 8 vehicles per hour consisting of 4 inward and 4 outward trips.

It is noted that the use of a 12-seater minibus will reduce the traffic generation significantly. When used extensively the traffic generation will be approximately 12 vehicle trips per day with a peak of 2 vehicles per hour.

Party Hire Facility

The children's party hire facility will operate several times per week. With up to 10 children arriving by car the traffic generation is likely to be 10 trips (assuming 2 children per car and one inward and one outward trip per event). If two children's parties are held in one day the traffic generation is likely to be 20 trips per day. The peak generation is likely to be 10 vehicles per hour.

It is noted that the minibus will be used to transport children who are local to the area to and from the party hire facility. This will reduce traffic generation when parties are hired that utilise the minibus service.

Aquaponics Facility

The aquaponics operations will have up to four staff. The traffic generation of this component of the development is likely to be 12 vehicles per day. The peak generation is likely to be 4 trips per hour.

Total development traffic generation

The total traffic generation is likely to vary between 28 and 76 vehicles per day. The peak generation is likely to be up to 22 vehicles per hour.

4.1.3 Net Change in Traffic Generation

The proposed development is likely to have a reduction of traffic generation compared to the previous use of the site the majority of the time (ie. when children's party hire events are not scheduled or the use of the minibus exceeds the use of private car transport).

On days when all three components of the development occur simultaneously the traffic generation may be up to 16 vehicles per day greater than the previous use of the site.

4.2 Trip Distribution

All traffic will access the site via Wallace Street and Boyer Road.

4.3 Traffic Generation Impacts

The Acceptable Solution A3 of Clause E5.5.1 of the Planning Scheme states "*The annual average daily traffic (AADT) of vehicle movements, to and from a site, using an existing access or junction, in an area subject to a speed limit of 60km/h or less, must not increase by more than 20% or 40 vehicle movements per day, whichever is the greater*".

In this case the development generally will have a lower traffic generation than the previous use of the site except during times when all components of the development are operating concurrently. Under these circumstances the development will not generate more than 40 vehicle movements per day more than the previous use of the site (40 vehicle movements is greater than 20% of 60 movements).

The Acceptable Solution A3 of Clause E5.5.1 of the Planning Scheme is therefore met.

4.4 Access Impacts

The Acceptable Solution A2 of Clause E5.6.2 states "*No more than one access providing both entry and exit, or two accesses providing separate entry and exit, to roads in an area subject to a speed limit of 60km/h or less*".

The development proposes one entry on Wallace Street (existing access) and therefore meets the requirements of the Acceptable Solution A2 of Clause E5.6.2 of the Planning Scheme.

4.5 Sight Distance

The Acceptable Solution A1 of Clause E5.6.4 states "*Sight distances at an access or junction must comply with the Safe Intersection Sight Distance shown in Table E5.1*".

The requirements of Table E5.1 are reproduced in Table 1.

Table 1 Planning Scheme Sight Distance Requirements

Vehicle Speed	Safe Intersection Sight Distance (S.I.S.D) in metres, for speed limit of:	
km/h	60 km/h or less	Greater than 60 km/h
50	80	90
60	105	115
70	130	140
80	165	175
90		210
100		250
110		290

The General Urban Speed limit of 50-km/h applies to Wallace Street however the 85th percentile speed is lower due to the dead-end nature of the road. The minimum SISD value provided in Table E5.1 is 80 metres. The available sight distance exceeds80-metres at the access with Wallace Street.

The Acceptable Solution A1 of Clause E5.6.4 of the Planning Scheme is met.

4.6 Access Design

The Acceptable Solution A1 of Clause E6.7.2 of the Planning Scheme states: "*Design of vehicle access points must comply with all of the following: (a) in the case of non-commercial vehicle access; the location, sight distance, width and gradient of an access must be designed and constructed to comply with section 3 – "Access Facilities to Off-street Parking Areas and Queuing Areas" of AS/NZS 2890.1:2004 Parking Facilities Part 1: Off-street car parking; and (b) in the case of commercial vehicle access; the location, sight distance, geometry and gradient of an access must be designed and constructed to comply with all access driveway provisions in section 3 "Access Driveways and Circulation Roadways" of AS2890.2 - 2002 Parking facilities Part 2: Off-street commercial vehicle facilities*".

The site will accommodate non-commercial vehicles (cars) and commercial vehicles (minibus associated with the pleasure craft component and small trucks associated with the aquaponics component).

4.6.1 Non-Commercial Vehicle Access

The design of the vehicle access complies with the following AS2890.1 access requirements:

- Access width – the car park is classified as Class 2[2]. The access width requirements for Class 2, accessing less than 25 spaces, fronting onto a local road[3], is 3.0 to 5.5 metres combined entry and exit. The access widths (combined entry and exit) comply with these requirements.

[2] AS2890.1 defines Class 2 as "Long-term city and town centre parking, sports facilities, entertainment centres, hotels, motels, airport visitors (generally medium-term parking)".
[3] AS2890.1 defines 'local road' as "a road or street used primarily for access to abutting properties". This classification also includes 'collector road' for the purpose of access width design.

- Access gradient – the gradient between the edge of the frontage road and the property line is effectively level. The grades of the access driveway does not exceed AS2890.1 maximum gradient of 20% and therefore comply with AS2890.1 requirements.
- Sight distance – AS2890.1 requires a minimum of 45 metres sight distance at a domestic property access (desirable minimum requirement is 69 metres) for a frontage road speed of 50-km/h. This sight distance is available, therefore complying with AS2890.1 requirements.

4.6.2 Commercial Vehicle Access

The proposed development will cater for commercial vehicles in the form of:

- Minibus for the pleasure craft component.
- Vans and utility vehicles associated with the aquaponics component.

AS2890.2 requires that the service area is dependent on a combination of:

(a) The maximum size of vehicle likely to use the facility.
(b) The frequency with which vehicles of different classification use the facility; and
(c) Whether the public road from which the facility is accessed is a major or minor road.

The following points are relevant for the site:

a. The maximum size of a vehicle using the access is a minibus. The access caters for a minibus and dedicated minibus parking is provided on-site.
b. The frequency of use of the access will be up to 10 times per day when the minibus is utilised as the only vehicle associated with the pleasure craft facility.
c. Access into the site is via a minor road. This access is existing and has been in use for many years for similar sized vehicles without issue.

The access is therefore deemed to meet the requirements of AS2890.2.

4.6.3 Access Design Summary

The design of the vehicle access points complies with the requirements of AS2890.1 and AS2890.2, therefore Acceptable Solution A1 of Clause E6.7.2 is met.

4.7 Pedestrian Impacts

The proposed development is well connected to the surrounding road network's pedestrian infrastructure. Road verges on Wallace Street provide pedestrian connectivity to Boyer Road. Footpaths are provided along both sides of Boyer Road.

The proposed development will generate a relatively small amount of pedestrian activity. These pedestrian movements can be accommodated safely and efficiently in the network.

4.8 Railway Level Crossing Impacts

The existing railway level crossing of the South Line/ Derwent Valley Line is a passive crossing. Existing signage is in place on both approaches to the crossing (consisting of "Railway Crossing", "Stop" signage, and "Look for Trains").

The existing railway level crossing was investigated from a risk management perspective. The following is relevant:

- The traffic generation of the proposed development will similar to the previous use of the site when it was Resource Development Use. Most days the traffic generation will be lower than the previous use. Traffic generation will only be slightly greater than the previous use when all components of the site are operational simultaneously and the minibus is not in use (estimated to be approximately 16 additional vehicles per day).
- Wallace Street is a dead-end road with very low traffic volumes (estimated to be less than 100 vehicles per day). Wallace Street will not have traffic growth into the future.
- The existing railway level crossing is clear and obvious for vehicles approaching the crossing. It is likely that the majority of vehicles approaching the crossing will originate from Boyer Road/ Old Main Road. An active railway level crossing is located on Boyer Road which is located approximately 65 metres from the Wallace Street crossing. It is therefore likely that vehicles approaching the site on this approach will be stopped at the Boyer Road active crossing, or will be able to safely cross the Wallace Street passive crossing prior to the passage of a train (as the short travel distance on this approach would almost certainly require a vehicle to stop at the Boyer Road crossing if a train were approaching, or have sufficient clearance if not stopped at the Boyer Road active crossing).
- The Boyer Road active crossing is visible on the northbound Wallace Street approach to the passive crossing. Site investigations indicate that the audible warning signs of the Boyer Road approach are clear and obvious on the Wallace Street approach.
- Vehicle approaching Wallace Street from the western approach of Boyer Road will be clearly able to view the Boyer Road active crossing prior to entering the Wallace Street junction. The distance travelled on this approach to the Wallace Street passive crossing is similar to the distance to the Boyer Road active crossing and therefore the amount of warning provided will be similar. In the event of a train approaching, vehicles would observe the activation of the Boyer Road crossing prior to entering Wallace Street.
- The use of a minibus to transfer visitors of the pleasure water craft development will reduce the traffic generation of the site, as well as provide a level of driver familiarity with the crossing.

Based on the above assessment, no upgrade to the crossing is considered necessary. It is recommended that line marking on the approaches to the passive railway crossing be reinstated to further enhance the presence of the crossing.

4.9 Road Safety Impacts

No significant adverse road safety impacts are foreseen for the proposed development. This is based on the following:

- There is sufficient spare capacity in Wallace Street and Boyer Road to absorb the relatively small peak hour traffic generated from the proposed development (16 trips per hour).
- The access to the site has been in use for many years without issue.
- The existing road safety performance of the road network near the subject site does not indicate that there are any specific road safety deficiencies that might be exaggerated by the small increase in traffic volume.
- There is adequate sight distance from the access for the prevailing vehicle speeds on Wallace Street in accordance Planning Scheme and AS2890.1 requirements.

5. Parking Assessment

5.1 Parking Provision

The proposed development will provide a total of 19 on-site car parking spaces. This includes 1 disabled parking space.

A dedicated minibus parking space is provided.

5.2 Planning Scheme Requirements

The Acceptable Solution A1 of Clause E6.6.1 of the Planning Scheme states "*The number of on-site car parking spaces must be no less than the number specified in Table E6.1*".

Table E6.1 states that the parking requirements are "*subject to a traffic and parking assessment*" for 'pleasure boat facility' land use. The parking requirements for 'resource development' is no requirement under Table E6.1.

Using first principles the following is relevant:

- Assuming all pleasure craft guests arrive by car with an average occupancy of 2 guests per car, the parking requirement is 5 cars. With some overlap between guest departures and guest arrivals, the peak parking demand is likely to be less than 8 cars. Staff parking is likely to be required for two cars.
- The resource development component of the development (whilst not having a requirement under Table E6.1) is likely to require 4 parking spaces (1 for each staff).
- The childrens party component of the development is likely to require up to 5 cars.
- The total parking requirement is up to 19 cars if all parking demands peak simultaneously. The provision of 19 parking spaces will therefore cater for parking demands associated with the development.

The parking provision therefore meets the requirements of Acceptable Solution A1 of Clause E6.6.1 of the Planning Scheme.

5.3 On-Site Turning

The Acceptable Solution A1 of Clause E6.7.4 of the Planning Scheme states:

> *"On-site turning must be provided to enable vehicles to exit a site in a forward direction, except where the access complies with any of the following:*
>
> *(a) it serves no more than two dwelling units;*
>
> *(b) it meets a road carrying less than 6000 vehicles per day".*

In this case all vehicles can enter and exit the site in a forward motion (noting that the site meets a road that carries significantly less than 6,000 vehicles per day). The Acceptable Solution A1 of Clause E6.7.4 of the Planning Scheme is met.

5.4 Car Parking Layout

The Acceptable Solution A1 of Clause E6.7.5 of the Planning Scheme states: "*The layout of car parking spaces, access aisles, circulation roadways and ramps must be designed and constructed to comply with section 2 "Design of Parking Modules, Circulation Roadways and Ramps" of AS/NZS 2890.1:2004 Parking Facilities Part 1: Off-street car parking and must have sufficient headroom to comply with clause 5.3 "Headroom" of the same Standard*".

The Australian Standards, AS2890.1 requires the following minimum dimensions for User Class 2:

- Aisle width 2.5 metres
- Space length 5.4 metres
- Aisle width 5.8 metres

All spaces comply with these dimensional requirements and therefore the Acceptable Solution A1 of Clause E6.7.5 of the Planning Scheme is met.

6. Conclusions

This traffic impact assessment (TIA) investigated the traffic and parking impacts of a proposed pleasure boat facility and aquaponics development at 7 Wallace Street, Bridgewater.

The key findings of the TIA are summarised as follows:

- The traffic generation of the proposed development is likely to be up to be between 28 and 76 vehicles per day with a peak of up to 22 vehicles per hour. The traffic generation will typically be less than the previous use of the site when it was a resource development (agriculture) site, but will exceed the traffic generation of the previous use by up to 16 vehicles per day when all components of the development are operating simultaneously.
- The existing South Line passive railway level crossing in Wallace Street is deemed to be safe for the low traffic volumes utilising the crossing. Line marking on the approaches to the passive level crossing should be reinstated to reinforce the presence of the crossing.
- The provision of 19 on-site car parking spaces meets the requirements of Acceptable Solution A1 of Clause E6.6.1 of the Planning Scheme.

Based on the findings of this report and subject to the recommendations above, the proposed development is supported on traffic grounds.

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Environmental
Consultants Pty Ltd

Avifauna assessment of the impact of a proposed hovercraft operation in the River Derwent Conservation Area, Bridgewater to New Norfolk, Tasmania

Prepared for
Flying Tigers Hovercraft Adventure

by G. Barry Baker
June 2020

Avifauna assessment of the impact of a proposed hovercraft operation in the River Derwent Conservation Area, Bridgewater to New Norfolk, Tasmania

Executive Summary

This report presents the findings of an avifauna assessment to document whether any species listed on the *Environment Protection and Biodiversity Conservation Act 1999* (*EPBC Act*) or on Tasmania's *Threatened Species Protection Act 1995* (*TSP Act*) are likely to occur on a section of the Derwent River between Bridgewater and New Norfolk (the 'site') which is the site of a proposed operation of a 12 seat hovercraft.

A desktop assessment was undertaken, building on the knowledge of the author who has previously conducted bird surveys in the River Derwent Marine Conservation Area that encompasses the site of the proposed activity. A total of 85 species of birds (native and introduced) were found to have been recorded at the site. Eleven of these species are listed as matters of environmental significance under the EPBC Act or as threatened under the TSP Act — Australasian bittern, Crested tern , Great crested grebe, Great egret, Kelp gull, Pacific gull, Silver gull, Swift parrot, Grey goshawk, Tasmanian wedge-tailed eagle and White-bellied sea-eagle.

This assessment concluded that the proposed operation is unlikely to detrimentally impact the 11 bird species. Most of these species are common and/or likely to occur only occasionally in the area of the proposed hovercraft operation. One species, the Australasian bittern, is an endangered species that is likely resident in the area. It is a cryptic species that favours reedbed habitats. The proposed hovercraft activity will avoid the favoured reedbed habitats of this species, which should ensure the species continues to thrive in the upper Derwent River valley. This assessment is supported by the continual presence of Australasian bitterns at the site over the last 10 years, despite regular use of the waterway by powerboat enthusiasts that launch and use vessels in the Murphys Flat Conservation Area and have a greater environmental footprint in terms of noise and nature of their operation. It is also recommended that the hovercraft commander reduces speed when flocks of birds are visible on the water, and avoids unpredictable movements of the craft to minimise high intensity disturbance stimulus to birds.

1. Introduction

Latitude 42 Environmental Consultants Pty Ltd (Latitude 42) were contracted by Brett Miller of Flying Tigers Hovercraft Adventure (hereafter referred to as "Flying Tigers") to assess the impact on bird species of the operation of a 12 seat hovercraft within the River Derwent Marine Conservation Area from a property at

Wallace Avenue, Bridgewater to the town of New Norfolk (‘**the site’**). At the time this report was prepared, Flying Tigers was seeking approval from the Tasmanian Parks and Wildlife Service (TasParks), Department of Primary Industries, Parks, Water and Environment (DPIPWE), to undertake the proposed activity.

The proposed activity comprises launching the hovercraft from a residential block at 7 Wallace Street (Title reference: CT 199710/1) which has frontage to the northern bank of the Derwent River near Bridgewater (Figure 1, GES 2020).

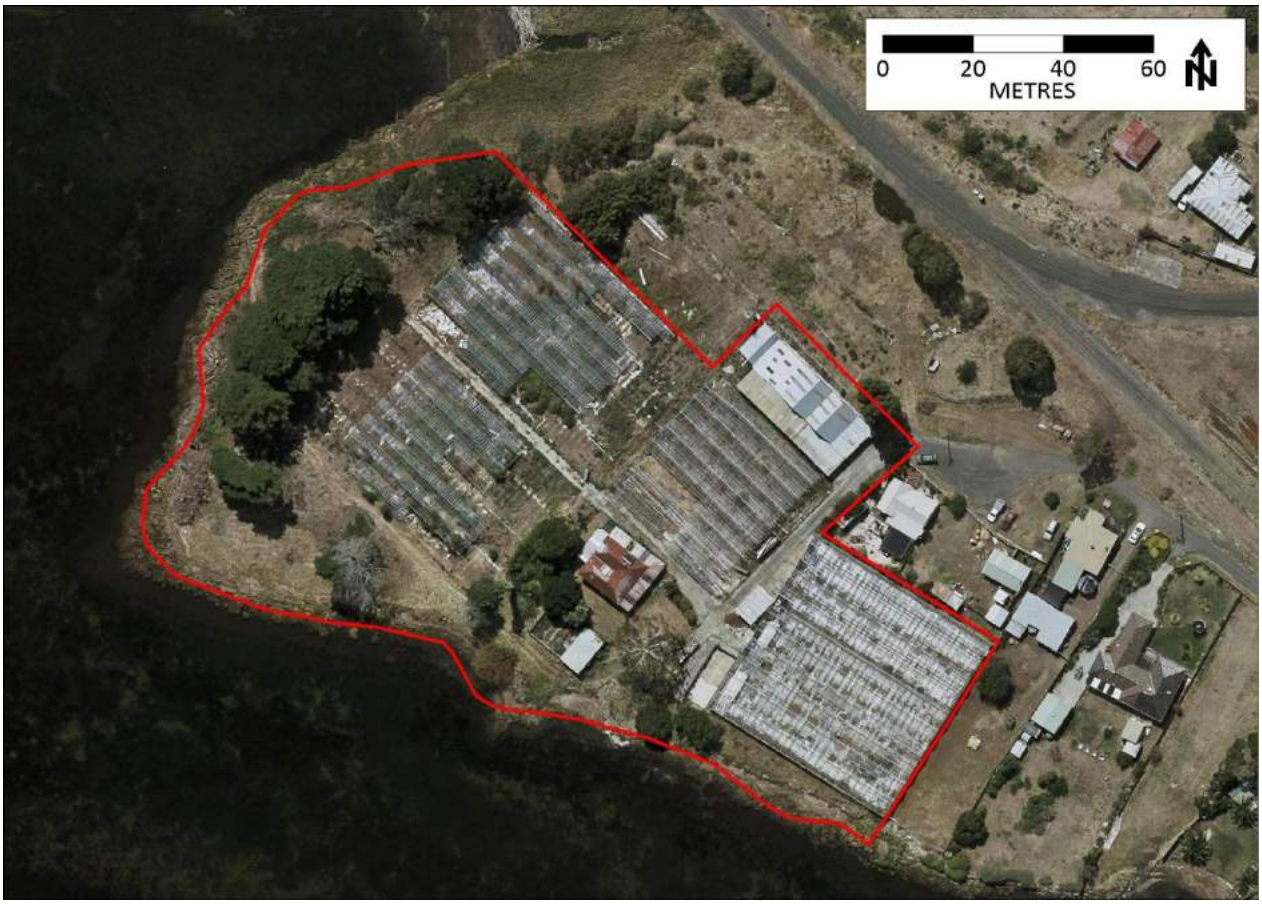


Figure 1. Hovercraft launch site, 7 Wallace Street, Bridgewater, Tasmania, outlined in red. Map extracted from The List and annotated by Geo-Environmental Solutions Pty Ltd (GES 2020).

Once deployed the hovercraft, an Air Vehicles Tiger 12, max cruising 30 knots, will proceed along the centre of the Derwent River west to Boyer (near New Norfolk) before returning by the same route (Figure 2). The Air Vehicles Tiger 12 hovercraft was manufactured in 1985 by Air Vehicles, Isle of Wight, and is one of the quietest hovercraft ever manufactured, emitting 62dB at full power (http://www.jameshovercraft.co.uk/hover/tiger12.php).The purpose of the activity is to provide joy rides, with the vehicle continually moving and not stopping. While air-cushion vehicles like hovercraft are capable of travelling over land, water and other surfaces, the proposed activity will be restricted to the Derwent River waterway, except when being launched at Bridgewater.

The site occurs within the Derwent River Marine Conservation Area, one of a number of Marine Conservation Areas that form part of the Bruny bioregion. The Bruny bioregion has a low tidal range and a strongly dissected coastline with extensive bays protected from swell by islands and peninsulas. It has the highest level of marine endemism in Tasmania. The area was proclaimed a conservation area under the Nature Conservation Act 2002 on 9 December 2009. This reserve class provides for the protection and maintenance of the natural and cultural values of the area and the sustainable use of natural resources.

Figure 2. Derwent River, showing the proposed area of operation for Flying Tigers Hovercraft Adventure. Hovercraft tours will commence from west of Bridgewater bridge (RHS yellow circle) and proceed along the centre of the Derwent River west to Boyer (LHS yellow circle) before returning by the same route. The hovercraft route will avoid areas of natural reedbed vegetation.

The River Derwent MCA lies between New Norfolk in the west and Dogshear Point in the east. The reserve area contains habitat for migratory wading birds, black swans, ducks, crabs, platypus, frogs, snakes, fish, and a diversity of invertebrates. (https://parks.tas.gov.au/explore-our-parks/marine-reserves/marine-conservation-areas#RiverDerwen%E2%80%8Bt%C2%A0%3Cbr%3E).This report focusses on birds only.

The reserve area in the River Derwent was first proclaimed a "sanctuary with respect to black swans" on 4 March 1920 under the Animals and Birds Protection Act 1919. In 1941 the original proclamation was

revoked and replaced with a new proclamation under the Animals and Birds Protection Act 1928 declaring the area a "sanctuary for birds generally". The motivation for changing the proclamation was to protect all birds in the reserve particularly native ducks which were being hunted in the reserve. There is currently no statutory management plan for the River Derwent Conservation Area.

Adjacent to the Derwent River Marine Conservation Area is Murphys Flat Conservation Area, an area of 66 hectares, approximately 2.7 kilometres long and 550 metres wide at its maximum width. It is located within a wetland complex on the southern shore of the River Derwent beside the Lyell Highway between Granton and New Norfolk. The area is recognised as being particularly species rich, with expansive areas of marshes, underwater grasses, tidal flats and reed beds that provide habitat and breeding areas for large populations of fish, platypus and waterfowl (Parks and Wildlife Service 2010).

Murphys Flat Conservation Area comprises 25 to 30 per cent of the remaining wetlands in the River Derwent. It is listed within both the Directory of Wetlands of National Significance and the Tasmanian Geoconservation Database. Birds are particularly abundant in the reserve due largely to the diverse habitat. The vicinity is well known for its large population of black swans and is a likely hunting and foraging area for five significant bird species including the wedge-tailed eagle, white-bellied sea-eagle, swift parrot, masked owl, great crested grebe, as well as the secretive Australasian bittern (Parks and Wildlife Service 2010).

The purpose of this assessment is to identify avifauna species that may occur between the private land at Bridgewater and along the Derwent River to as far west as New Norfolk (the site), with a focus on identifying species that may be of conservation significance and which may affect future development and/or use of the site. This report presents the findings of the avifauna assessment, based on a desktop review and site visit, which aimed to:

- document whether any species listed on the *Environment Protection and Biodiversity Conservation Act 1999* (*EPBC Act*) or on Tasmania's *Threatened Species Protection Act 1995* (*TSP Act*) are likely to occur on the private land at Bridgewater and along the Derwent River between Bridgewater and New Norfolk (hereinafter '**the site'**);
- assess the avifauna values of the site; and
- provide a list of bird species, particularly species protected by legislation, which may occur or are known to occur along the river corridor.

2. Methods

Desktop assessment

There was an overall paucity of general and scientific information for the site of the proposed activity, particularly records for the distribution and abundance of birds. Consequently, the desktop assessment entailed searches of bird species potentially using the the site by accessing the following databases and online tools:

- the *Environment Protection and Biodiversity Conservation Act 1999* (*EPBC Act*) Protected Matters Search Tool (hereafter referred to as **PMST**) (DAWE 2020), a search of the species or species habitats that are known to occur, likely to occur or may occur on the site of the proposed activity with both a 1 km and a 5 km buffer. This search tool determines whether matters of national environmental significance or other matters protected by the *EPBC Act* are likely to occur in the area of interest but the information is indicative only and local knowledge and information should be sought where possible (DAWE 2020);
- Tasmania's *Threatened Species Protection Act 1995* (*TSP Act*) Natural Values Atlas (hereafter referred to as **NVA**) (DPIPWE 2020), a search of the species or species habitat that are known to occur or have the potential to occur on the site with a 500 m and a 5 km buffer. The NVA is Tasmania's comprehensive database for flora and fauna information including threatened species and contains information and locations on more than 20,000 species from Tasmania (DPIPWE 2011);
- BirdLife Australia's *Birdata* database, formerly the online tool for entering data into the Atlas of Australian Birds (BirdLife Australia 2020) (hereafter referred to as '***Birdata'***), which has been developed and maintained by BirdLife Australia, a non-government organisation dedicated to the conservation of Australian birds. *Birdata* is one of the largest continent-wide, wildlife databases in the world. It aims to collect and disseminate data to benefit the conservation of Australia's birds and their habitats through the use of structured monitoring methods, principally by using 2 ha, 20 minute counts at multiple sites, or through less-rigorous 500 m searches. It contains more than ten million records from over 600,000 surveys and is continuously updated with additional surveys accumulating at the rate of 700–1000 per week (BirdLife Australia unpublished data). The Atlas data have been collected in a standardised manner for over 20 years through a well-established network of volunteers. A search of these data (BirdLife Australia 2020) was undertaken based on a polygon drawn around the area of the site with a 1 km buffer, which encompasses the River Derwent and riparian vegetation between the Bridgewater Bridge New Norfolk.

Threatened species categories

A flora or fauna species is described as threatened if it is at risk of becoming extinct through a range of factors that may be natural or human induced. Species may be listed under the Commonwealth *EPBC Act* and/or the Tasmanian *TSP Act.* The *EPBC Act* categorises species into:

i. Extinct;

ii. Extinct in the wild: species that can no longer be found in the wild, but still exist in captivity;

iii. Critically Endangered: species in extreme danger of becoming extinct in the immediate future;

iv. Endangered: species in danger of extinction, while the factors causing them to be endangered continue operating;

v. Vulnerable: species which are at risk of becoming endangered;

vi. Conservation Dependent: species whose survival is dependent on conservation activities.

In addition species can be listed as 'migratory' species (listed under one or more of the following international migratory agreements: the Japan – Australia Migratory Birds Agreement (JAMBA), the China – Australia Migratory Birds Agreement (CAMBA), the Republic of Korea – Australia Migratory Birds Agreement (ROKAMBA), or the Convention on Migratory Species (CMS)) or as 'marine" species.

Species in the Critically Endangered, Endangered and Vulnerable categories are considered 'threatened species'.

The *TSP Act* categorises threatened species into:

i. Endangered: species is in danger of extinction because long-term survival is unlikely while factors causing it to be endangered continue operating. Within this category a species may be *presumed extinct* if it has not been recorded in the wild within the past 50 years;

ii. Vulnerable: species likely to become endangered while factors causing it to be vulnerable continue operating;

iii. Rare: species that have a small population or distribution within Tasmania that is not endangered or vulnerable but is at risk.

Limitations of desktop assessment

There are limitations when species lists are derived from database searches such as those described above. In particular, searches may:

- include species that have been recorded in the specified buffer zone (e.g. a 1 km radius) on only one or two occasions;
- include species that are vagrant and have been recorded at the site but are not normally residents i.e. vagrants can be recorded almost anywhere;
- include species that are now locally extinct but still appear because these databases are historic records;
- include species that have specific habitat requirements that may be present in the surrounding region but not on the actual site;
- include species that have complex life histories or are not well understood, so that deciding whether they frequent the site or are vagrants is difficult;
- result in database lists that are underwritten by observations from spatially or temporally limited surveys such that unsubstantiated observations can appear as fact; and/or,
- result in an amalgamation of long-term observations so that an area can appear to have a more diverse fauna than is actually present from year to year.

As a consequence of the above limitations, some species included in the lists produced from database searches may not be present on the site. However, in the absence of data obtained from systematic surveys of species at the site, database searches are an invaluable tool for producing species lists for a particular location.

No systematic on-ground surveys across the entire site were undertaken which could validate the database records because of travel restrictions imposed by the Tasmanian government's response to the COVID-19 pandemic. However, the Derwent River Marine Conservation Area and Murphys Flat Conservation Area are well known to the author, who is familiar with the bird fauna of the area , conducted surveys within the reserves, and has contributed data to BirdLife Australia's *Birdata* database.

Hovercraft operational considerations

With respect to above water noise changes and visual disturbance, it is very difficult to separate out the relative contribution of noise and visual stimuli in causing a disturbance response to birds due to hovercraft and the available literature generally makes no distinction (Natural England 2017 and references therein). Therefore, these pressures are reviewed collectively, and the potential impacts outlined below are drawn from experiences in the United Kingdom (Natural England 2017).

Studies have found that birds generally show similar disturbance responses to hovercraft as other vessels (Brooks 2014, cited in Natural England 2017). However, unlike other vessels, hovercraft are not constrained to just the water column. This allows them to operate in very shallow water inaccessible to other craft and also in areas of exposed soft sediment intertidal habitat (such as mudflat, sandflat or gravel)

which can be inaccessible on foot. Waterbirds foraging or roosting within these habitats are therefore particularly vulnerable to potential hovercraft disturbance (Natural England 2017). All of these concerns are not relevant to this assessment as the proponent is intending to conduct all operations in the centre of the river and avoiding sensitive waterbird habitats such as reedbeds and the shoreline.

In general, regular and defined human movements are less disturbing than erratic and random movements to waterbirds (Smit & Visser 1993, cited in Natural England 2017). In this respect, recreational hovercraft often produce high speed, unpredictable movements and subsequently a relatively high intensity disturbance stimulus. Research in the United Kingdom found that birds reacted with a flight response of distances between 75 and 500 m from a hovercraft, with some species appearing particularly sensitive (e.g. ducks), which took flight when the craft was up to 500m away while other species appeared less sensitive (e.g. swans and gulls which remained within 100m of the craft (MacCallum 2014; Gaál 2014, cited in Natural England 2017). In general, the primary responses observed are likely to include increased vigilance, avoidance walking and flight responses. The level of response will vary depending on a range of factors including the frequency of disturbance and the level of habituation as a result of existing activity. Repetitive disturbance events can result in possible long-term effects such as loss of weight, condition and a reduction in reproductive success, leading to population impacts (Natural England 2017).

3. Results and Discussion

Based on the results of the database searches, a total of 85 species of birds (native and introduced) have been recorded on or within 1 km of Derwent River Marine Conservation Area and Murphys Flat Conservation Area. This includes 70 species obtained from the *Birdata* database (BirdLife Australia 2020), and an additional 15 species obtained from another database, BirdLife Tasmania, and the NVA and/or PMST searches (Table 1). Data for the Derwent River Marine Conservation Area was excellent, with 42 structured surveys undertaken and reported to Birdata within the last 10 years. Some of these surveys will have encompassed the Murphys Flat Conservation Area, and there was a further four dedicated surveys for that area.

Included in the 85 species are 11 that are listed as matters of environmental significance under the EPBC Act or as threatened under the TSP Act. These are:

Australasian bittern	**Kelp gull**	**Grey goshawk**
Crested tern	**Pacific gull**	**Tasmanian wedge-tailed eagle**
Great crested grebe,	**Silver gull**	**White-bellied sea-eagle**
Great egret	**Swift parrot**	

Of these, the following six species have been discounted due to the reasons explained below:

- ***Crested tern*** is a listed migratory species that was detected only three times in 46 structured surveys. It is common and primarily a coastal species that rarely ventures far inland or along rivers. There are no conservation concerns for the species and the proposed activity is unlikely to impact the tern unfavourably.
- ***Great crested grebe*** is listed as Endangered under the TSP Act, but nationally is not threatened. It breeds on freshwater wetlands with a combination of open water for feeding and aquatic vegetation for building and anchoring the nest. When not breeding it favours large deep freshwater bodies with clear water and fish, but also will congregate on large saline lakes (Menkhorst et al. 2017). It was not recorded in structured surveys and is likely an occasional visitor. The proposed activity is unlikely to impact this species unfavourably.
- ***Great egret, kelp gull, Pacific gull*** and ***silver gull*** are all listed as Migratory and/or Marine Species on the *EPBC Act.* They are all common species and considered nationally to be 'Least Concern' (Garnett et al. 2011). Great egret and Pacific gull were recorded only once in 46 structured surveys and are uncommon along this section of the Derwent River. Kelp and silver gulls were more commonly reported in surveys but are unlikely to breed in the area. It is considered that the proposed activity will not impact any of these four species.

All of the other Tasmanian or Commonwealth listed species identified by the above processes are discussed below.

Australasian bittern*:* Listed as Endangered on the *EPBC Act*. The Australasian Bittern is a large, stocky, thick-necked, heron-like bird. The species grows to a length of 66–76 cm, has a wingspan of 1050-1180 cm, and weighs 0.9–1.4 kg. Garnett et al. (2011) suggested there were less than 1000 mature Australasian Bitterns within the Australian population, and that the population was likely declining. The Australasian Bittern occurs mainly in freshwater wetlands. It favours wetlands with tall dense vegetation, where it

forages in still, shallow water up to 0.3 m deep, often at the edges of pools or waterways, or from platforms or mats of vegetation over deep water. It favours permanent and seasonal freshwater habitats, particularly those dominated by sedges, rushes and reeds or cutting grass growing over a muddy or peaty substrate. The diet includes aquatic animals such as small fish, frogs, freshwater crayfish, spiders, insects and small reptiles (TSSC 2019).

Suitable habitat for this species occurs at the proposed development site, principally around the Murphys Flat area, although birds may occur elsewhere in the Derwent River Marine Conservation Area. Reporting rate from the *Birdata* surveys was low (1/46, 2%) but the species is highly cryptic and detection probability in general surveys is low unless species-specific detection techniques are employed. BirdLife Tasmania has 11 records for the last 10 years, with birds occurring in January, March, April, June, September and October —hence the species may be present all year, although it is known to be migratory elsewhere (TSSC 2019).

Regular disturbance of birds is likely to be detrimental to their persistence in the Derwent Valley, so it is recommended that all vessels traversing the river contain activities to deeper water and avoid reedbeds. Doing this, as the proposed hovercraft operation is intending, will ensure the species is not impacted by the proposed activity.

***Swift parrot**:* Listed as Critically Endangered on the *EPBC Act* and Endangered on the *TSP Act*. The swift parrot is a small, fast-flying, nectarivorous parrot. It has a single, migratory population and occurs predominantly in eucalypt forest in south-eastern Australia. It breeds only in Tasmania between September and January each year where it forages primarily on the flowers of blue gum (*Eucalyptus globulus*) and black gum (*E. ovata*) (Webb et al. 2012). It arrives from mainland Australia across Bass Strait in August/September and migrates back north to mainland Australia in March/April (Saunders and Tzaros 2011). The swift parrot is usually seen in small groups of up to 30 birds. Swift parrots were not detected in any of the 46 structured *Birdata* surveys, indicating they do not frequent the site regularly, but there is a single record in the BirdLife Tasmania database. There is no evidence, based on site visits, to indicate that the site contains important foraging or roosting habitat for this species, particularly along the Derwent River site and the record may have been of a bird flying over the site. Swift parrots are not an aquatic species and the proposed activity will not impact the parrot.

Grey goshawk: Listed as Endangered on the *TSP Act* but nationally 'Least Concern' (Garnett et al. 2011). This raptor typically has a large home range and would occur in the Derwent River valley and likely hunt in riparian vegetation. However, it is not an aquatic species is unlikely to be impacted by the operations of a hovercraft.

***Tasmanian wedge-tailed eagle** (Aquila audax fleayi)*: Listed as Endangered under the EPBC Act and the TSP Act. As for the grey goshawk, eagles occur in the Derwent River valley but their reporting rate (1/46 surveys, RR 2%) was low, indicating they only occasionally hunt in the riparian vegetation of the Derwent

River from time to time. The Tasmanian wedge-tailed eagle is not an aquatic species and is unlikely to be impacted by the operations of a hovercraft.

White-bellied sea-eagle*:* Listed as Vulnerable on the *TSP Act* and Migratory and Marine on the *EPBC Act*. Survey data showed low reporting rates at the site (2/46, RR 4%), indicating this highly visible raptor uses the site only occasionally. While sea-eagles will snatch prey from the water they are not generally to be an aquatic species, and they are unlikely to be threatened by the proposed activity.

4. Summary

This desktop assessment revealed that 11 Commonwealth or State listed bird species occur along the section of the River Derwent River Marine Conservation Area and Murphys Flat Conservation Area in which the proponent is intending to run a hovercraft operation. The proposed operation is unlikely to detrimentally impact these bird species. Of most concern is the Australasian bittern. The proposed activity will avoid the favoured reedbed habitats of this species, which should ensure the species continues to thrive in the upper Derwent River valley. This assessment is supported by the continual presence of Australasian bitterns at the site over the last 10 years, despite regular use of the waterway by powerboat enthusiasts that launch and use vessels in the Murphys Flat Conservation Area.

It is also recommended that the hovercraft be operated in a way that reduces speed when flocks of birds are visible on the water, and unpredictable movements of the craft are avoided to minimise high intensity disturbance stimulus.

References

Barrett, G., Silcocks, A., Barry, S., Cunningham, R. Poulter, R. 2003. *The New Atlas of Australian Birds*. Birds Australia, Melbourne.

BirdLife Australia. 2020. Atlas and Birdata. http://www.birdlife.org.au/projects/atlas-and-birdata accessed 24 May 2020.

Conservation Advice Botaurus poiciloptilus (Australasian Bittern)

Department of Agriculture, Water and the Environment (DAWE). 2020. Protected matters search tool. http://www.environment.gov.au/epbc/pmst/index.html . Accessed 24 May 2020.

DPIPWE. 2020. Natural Values Atlas https://www.naturalvaluesatlas.tas.gov.au Accessed 23 May 2020.

Garnett, S.T., Szabo, J.K and Dutson, G. 2011. The 2010 Action Plan for Australian Birds. CSIRO Publishing, Collingwood.

Geo-Environmental Solutions Pty Ltd (GES) 2020. *Coastal Vulnerability Assessment, 7 Wallace Street, Bridgewater*. Report prepared for Brett Miller. Geo-Environmental Solutions P/L, Battery Point, Tasmania.

Higgins, P.J. (ed.). 1999. *Handbook of Australian, New Zealand and Antarctic Birds. Volume Four - Parrots to Dollarbird*. Oxford University Press, Melbourne.

Menkhorst P, Rogers D, Clarke R, Davies J, Marsack P, Franklin K. 2017. *The Australian bird guide*. CSIRO Publishing, Clayton South.

Natural England 2017. Evidence Information Note EIN031 Marine recreation evidence briefing: hovercraft. Downloaded from www.gov.uk/natural-england 5 June 2020

Parks and Wildlife Service. 2010. *Murphys Flat Conservation Area Management Statement*. Department of Primary Industries, Parks, Water and Environment, Hobart.

Saunders DL, Tzaros C. 2011. National Recovery Plan for the Swift parrot *Lathamus discolor*. Birds Australia, Melbourne.

TSSCC (Threatened Species Scientific Committee). 2019. Conservation Advice *Botaurus poiciloptilus* Australasian Bittern. Department of the Environment and Energy, Canberra. Accessed 24 May 2020 from: http://www.environment.gov.au/biodiversity/threatened/species/pubs/1001-conservation-advice-18012019.pdf .

Webb MH, Holdsworth MC., Webb J. 2012. Nesting requirements of the endangered swift parrot (*Lathamus discolor*). Emu 112, 181–188.

Table 1. Bird species recorded as occurring in a search of the BirdLife Australia *Birdata* database (BirdLife Australia 2020), together with reporting rates (RR). The search area was defined by a polygon drawn around the section of the River Derwent between the Bridgewater Bridge to New Norfolk and included a 1 km buffer along the river corridor. Records cover the 10-year period January 2010 — May 2020. Also shown are incidental records for species not detected in Birdata surveys, provided by BirdLife Tasmania (unpublished data, used with permission).

***EPBC Act* status:** VU = Vulnerable, EN = Endangered, CR = Critically Endangered, EX = Presumed Extinct, M = migratory, Ma = marine.
***TSP Act* status:** R = rare, VU = vulnerable, EN = endangered, X = presumed extinct.

Common Name	Scientific Name	Data source	EPBC status	TSP Act status	Derwent River RR (n=42)	Murphys Flat RR (n=4)	Comment
Australasian bittern	Botaurus poiciloptilus	Birdata, BirdsTas	EN			0.25	cryptic species, 11 records over last 10 years
Australasian grebe	Tachybaptus novaehollandiae	BirdsTas					
Australasian pipit	Anthus novaeseelandiae	Birdata			0.02	0.25	
Australasian shoveler	Spatula rhynchotis	Birdata			0.10	0.25	
Australian magpie	Gymnorhina tibicen	Birdata			0.02		
Australian pelican	Pelecanus conspicillatus	Birdata			0.12	0.25	
Australian shelduck	Tadorna tadornoides	BirdsTas					
Australian white ibis	Threskiornis molucca	BirdsTas					
Australian wood duck	Chenonetta jubata	Birdata			0.02		
Beautiful firetail	Stagonopleura bella	BirdsTas					
Black currawong	Strepera fuliginosa	Birdata			0.02		
Black swan	Cygnus atratus	Birdata			0.48	1.00	
Black-faced cormorant	Phalacrocorax fuscescens	Birdata			0.07		
Black-faced cuckoo-shrike	Coracina novaehollandiae	Birdata			0.05		
Black-headed honeyeater	Melithreptus affinis	Birdata			0.12		
Blue-winged parrot	Neophema chrysostoma	Birdata			0.02	0.25	
Brown falcon	Falco berigora	Birdata			0.05	0.25	

Common Name	Scientific Name	Data source	EPBC status	TSP Act status	Derwent River RR (n=42)	Murphys Flat RR (n=4)	Comment
Brown goshawk	Accipiter fasciatus	Birdata			0.02		
Brown thornbill	Acanthiza pusilla	Birdata			0.05		
Brush bronzewing	Phaps elegans	BirdsTas					
Chestnut teal	Anas castanea	Birdata			0.19	0.50	
Common blackbird	Turdus merula	Birdata			0.26	0.25	
Common bronzewing	Phaps chalcoptera	BirdsTas					
Common greenfinch	Chloris	Birdata			0.02		
Common starling	Sturnus vulgaris	Birdata			0.24	0.75	
Crescent honeyeater	Phylidonyris pyrrhopterus	Birdata			0.10	0.25	
Crested tern	Thalasseus bergii	Birdata	Ma		0.07	0.25	Listed migratory species; occasional visitor to site
Dusky woodswallow	Artamus cyanopterus	Birdata			0.14	0.25	
Eastern rosella	Platycercus eximius	BirdsTas					
Eurasian coot	Fulica atra	Birdata			0.33	0.50	
European goldfinch	Carduelis	Birdata			0.14	0.50	
Flame robin	Petroica phoenicea	BirdsTas					
Forest raven	Corvus tasmanicus	Birdata			0.33	0.25	
Galah	Eolophus roseicapilla	Birdata			0.02	0.25	
Golden whistler	Pachycephala pectoralis	Birdata			0.02		
Great cormorant	Phalacrocorax carbo	Birdata			0.12	0.50	
Great crested grebe	Podiceps cristatus	BirdsTas		EN			Not recorded in structured surveys, likely occasional visitor
Great egret	Ardea alba	Birdata	M,Ma		0.02		Listed migratory species; occasional visitor to site
Green rosella	Platycercus caledonicus	Birdata			0.17		

Common Name	Scientific Name	Data source	EPBC status	TSP Act status	Derwent River RR (n=42)	Murphys Flat RR (n=4)	Comment
Grey butcherbird	Cracticus torquatus	Birdata			0.07	0.25	
Grey currawong	Strepera versicolor	Birdata			0.10		
Grey fantail	Rhipidura fuliginosa	Birdata			0.24	0.25	
Grey goshawk	Accipiter novaehollandiae	BirdsTas		EN			Not an aquatic species, unlikely to be impacted by development
Grey shrike-thrush	Colluricincla harmonica	Birdata			0.12		
Grey teal	Anas gracilis	Birdata			0.07	0.50	
Hardhead	Aythya australis	Birdata			0.02	0.25	
Hoary-headed grebe	Poliocephalus poliocephalus	Birdata			0.14	0.50	Irregular migrant, visitor or vagrant
House sparrow	Passer domesticus	Birdata			0.31	0.75	
Kelp gull	Larus dominicanus	Birdata	Ma		0.29	0.25	Listed migratory species; non-threatened bird
Laughing kookaburra	Dacelo novaeguineae	Birdata			0.07		
Little black cormorant	Phalacrocorax sulcirostris	Birdata			0.36	0.75	
Little egret	Egretta garzetta	Birdata			0.02		
Little grassbird	Megalurus gramineus	BirdsTas					
Little pied cormorant	Microcarbo melanoleucos	Birdata			0.31	0.75	
Little wattlebird	Anthochaera chrysoptera	Birdata			0.10		
Masked lapwing	Vanellus miles	Birdata			0.21	0.50	
Musk duck	Biziura lobata	Birdata			0.12	1.00	
Musk lorikeet	Glossopsitta concinna	Birdata			0.02		
New Holland honeyeater	Phylidonyris novaehollandiae	Birdata			0.24		
Noisy miner	Manorina melanocephala	BirdsTas					

Common Name	Scientific Name	Data source	EPBC status	TSP Act status	Derwent River RR (n=42)	Murphys Flat RR (n=4)	Comment
Northern mallard	Anas platyrhynchos	Birdata			0.05		
Pacific black duck	Anas superciliosa	Birdata			0.21	1.00	
Pacific gull	Larus pacificus	Birdata	Ma		0.02		Listed migratory species; non-threatened bird
Purple swamphen	Porphyrio porphyrio	Birdata			0.02		
Rainbow lorikeet	Trichoglossus haematodus	BirdsTas					
Scarlet robin	Petroica multicolor	Birdata			0.10		
Silver gull	Chroicocephalus novaehollandiae	Birdata	Ma		0.21	0.75	Listed migratory species; non-threatened bird
Silvereye	Zosterops lateralis	Birdata			0.14	0.25	
Spotless crake	Porzana tabuensis	BirdsTas					
Spotted pardalote	Pardalotus punctatus	Birdata			0.07		
Spotted turtledove	Streptopelia chinensis	BirdsTas					
Striated pardalote	Pardalotus striatus	Birdata			0.12		
Sulphur-crested cockatoo	Cacatua galerita	Birdata			0.02		
Superb fairy-wren	Malurus cyaneus	Birdata			0.50	0.25	
Swamp harrier	Circus approximans	Birdata			0.10		
Swift parrot	Lathamus discolor	BirdsTas	CR	EN			No suitable habitat in development area; not an aquatic species, unlikely to be impacted by development
Tasmanian native-hen	Tribonyx mortierii	Birdata			0.33	0.75	
Tree martin	Petrochelidon nigricans	Birdata			0.07		
Wedge-tailed eagle	Aquila audax	Birdata	EN	EN	0.02		Not an aquatic species, unlikely to be impacted by development

Common Name	Scientific Name	Data source	EPBC status	TSP Act status	Derwent River RR (n=42)	Murphys Flat RR (n=4)	Comment
Welcome swallow	Hirundo neoxena	Birdata			0.07		
White-bellied sea-eagle	Haliaeetus leucogaster	Birdata	M,Ma	VU	0.02	0.25	Not an aquatic species, unlikely to be impacted by development
White-faced heron	Egretta novaehollandiae	Birdata			0.07		
Yellow wattlebird	Anthochaera paradoxa	Birdata			0.21	0.25	
Yellow-rumped thornbill	Acanthiza chrysorrhoa	Birdata			0.05		
Yellow-tailed black-cockatoo	Zanda funereus	Birdata			0.12		
Yellow-throated honeyeater	Nesoptilotis flavicollis	Birdata			0.19	0.25	

PWS Reserve Activity Assessment - Level 2 to 4

Activity Title: Flying Tigers Hovercraft Adventure, River Derwent Marine Conservation Area
RAA No. 3644

RAA Administration and Tracking

Important Dates and Information

Date RAA drafting commenced:	07/07/2020	RAA Checklist approved:	23/09/2020
Date RAA circulated for comment:	PWS I/C	Decision required by:	ASAP
Return comments on RAA to	Matt Lindus, RIC, Seven Mile Beach Field Centre		
PWS Cost Centre (if assigned)	N/A		

Step 1. Activity Summary

This step states the details of the proposed activity. Enough information must be provided so that someone unfamiliar with the activity will gain a clear idea of what is involved and where the activity will occur. Use the Maplink, Natural Values Atlas and PWS Site Register reports to help in filling out this step (see RAA Manual).

1.1 Contact Details (who)

Initiating Organisation	Freycinet Hover Explorer Pty Ltd, trading as Flying Tigers Hovercraft Adventure		
Initiating Person	Brett Miller	Phone contact:	0403719180
Initiating Person Email	millerbrettk@hotmail.com		
Initiating Person Address	7 Wallace Street, Bridgewater ,7030 ,TAS		
PWS Contact Officer	Matt Lindus	Phone contact:	61079211
PWS Contact Officer Email	Matthew.lindus@parks.tas.gov.au		

1.2 Location Information (where)

Location of Activity	River Derwent from 7 Wallace Street Bridgewater to New Norfolk.		
Reserve Name & Tenure	River Derwent Marine Conservation Area		
Grid Ref (GDA): Easting	518164E	Northing	5268237N
PWS Field Centre	Seven Mile Beach	PWS Region	Southern
AMS/RSF Site Number	SSSMB39556	AMS/RSF Site Name	River Derwent MCA
Map. Number (1:25000)	5026	Map Name (1:25000)	New Norfolk

1.3 Description (what)

Operation of a 12 seat Hovercraft within the River Derwent Marine CA from 7 Wallace Street, Bridgewater up to New Norfolk (30 minute stop in New Norfolk) & return (approx. 1.5 hour tour), the flight will transit via the centre of the River Derwent & stay to the North of Murphys Flat Conservation Area (Attachment 1)

A local 20 minute “Joy Ride” in local area of Hovercraft Base at 7 Wallace Street Bridgewater (Attachment 2)

Note: operations from SE corner of 7 Wallace Street, Bridgewater with rights to low water mark (Attachment 3). There is no vegetation around the proposed alighting area (Attachment 4). For transit onto the water there are reeds on the waters edge however due to the nature of Hovering on a cushion of air, no blades or propellers protruding underneath to cut into anything it travels over, minimal or no damage can be expected. Hovercraft can hover over eggs without cracking them.

(Also of interest, I have videos (YouTube links are : https://youtu.be/2fcOt3DGofM & https://www.youtube.com/watch?v=OYOpe-d-QQ8) of much noisier Hovercraft travelling at speed in close proximity to water birds on the water with no reaction from the birds, just empathising the Eco qualities of this type of craft & suitability for environmentally sensitive areas.)

1.4 Objective/s and Outcome/s Sought

Provide a unique experience of flying in the World’s quietest commercial Hovercraft & demonstrating the diverse capabilities of this craft. Give passengers the opportunity of experiencing this magnificent area & its associated Fauna, Flora & History from a different perspective in a comfortable & exciting way. Our aim is for passengers to walk away with a memorable experience & share with family & friends the beauty & diversity of this region.

1.5 Outputs or Products

Operating a 12 seater Air Vehicles Tiger 12 Hovercraft. AMSA survey 2D. AMSA Certificate of Competence with associated SMS (Attachment 5). Experienced Master operating Hovercraft. Quietest commercial Hovercraft in World at 62 dB at max power. Minimal footprint, equivalent to Sea Gull standing on one foot & less than tidal impact. Hovercraft used in environmental sensitive area’s around the world by relevant authorities due to low environmental impact & footprint.

We will give commentary on local points of interest & concern i.e.:

- Endangered avifauna such as the Australasian Bittern, Swift Parrot, Grey Goshawk, Tasmanian Wedge Tail Eagle & White-bellied sea eagle.
- 85 different bird breeds in region.
- Aboriginal interest site
- New Norfolk & historic points of interest.

Pick up from Hovercraft on arrival New Norfolk public wharf or slipway by 12 seat minibus for New Norfolk town tour, supporting local business. Drop off at Hovercraft 30 to 45 minutes later for return trip to Bridgewater.

Also offering 20 minute joy rides on the River Derwent in front of Hovercraft Base at 7 Wallace Street, Bridgewater.

Venture will provide much needed employment in a low socio-economic area.

It will be a drawcard for visitors & Tourists to the Area & therefore other businesses in the area will also benefit.

1.6 Evaluation (How will you know if the objectives/outcomes have been achieved?

With Social media so prevalent in our society, we will pay attention to comments & get a good indication how things are progressing & also feedback from our customers. So we will be evaluating daily & evolving our Business to suit. It is a commercial venture, so obviously if we do not make a profit, we would be failing.

1.7 Need (why)

Showcase & educate the public on our unique & fragile environment, highlighting the River Derwent history as well. Provide local employment. Create a drawcard for the area so other businesses will also prosper.

1.8 Timetable (when)

As soon as this application & DA by Brighton Council have been approved we are ready to operate.

1.9 Summary of Environmental Benefits and Adverse Impacts (summary Use the Maplink report to assist here)

Help educate the public & bring awareness of Fauna & Flora of the region in a unique & environmental friendly vessel.

As can be seen from the attached Avifauna assessment (Attachment 6), there will be no or minimal adverse impacts on Flora & Fauna habitats. The 62 dB emitted from the Hovercraft at max power will only be temporary as once the Hovercraft is on the Hover power is reduced. A lawn mower emits 90dB by comparison. The proposed Hovercraft alighting zone is set back at least 100m from neighbour's residential properties, so noise will not be an issue. We will transit to New Norfolk via the centre of the River Derwent and to the North of Murphys Flat Conservation area on the River Derwent therefore minimising any disturbance to sensitive areas, if we encounter flocks of birds enroute we will reduce speed.

1.10 Summary of Cultural and Social Benefits and Adverse Impacts (summary)

Help educate the public on the History of the region, both Indigenous & European settlement. Provide a unique opportunity to fly in a Hovercraft & learn how it works. Provide a different mode of transport from Bridgewater to New Norfolk. Our departure point from 7 Wallace Street Bridgewater is from a 5.5 acre property on a private peninsula, at least 100m from nearest neighbours. So noise & any visual impact will be minimal. On arrival into New Norfolk, the 5kts speed limit will again result in minimal impact, low power (low noise). The enroute part of the journey is in the centre of River Derwent & again noise & visual impact are minimised. The 20 minute joy rides planned to operate immediately in front of our property will be a transit straight out to centre of the River Derwent (the river is very wide at our location) & then carry out manurvers & return to our property. Again noise will not be an issue due to area of operation & visual impact minimal due to the relatively small size of Hovercraft.

Ski Club operates sometimes, so normal boating protocol & right of way rules will apply. I have a Marine radio which can be used to communicate with traffic or ski base (otherwise mobile phone). I will only transit through the ski area when clear to do so & only for a short time. I will work with the Ski Club as they did with the previous Jet Boat operator based out of New Norfolk to resolve any issues that may arise.

1.11 Summary of Economic Benefits and Adverse Impacts (summary)

Provide a major Tourism drawcard for the area. Provide employment in the low socioeconomic area of Bridgewater, initially casual labour but as Business establishes & grows, these will become full time employment positions. Flow on effects to surrounding local business, food, beverage, retail etc. in the Brighton Shire from our visiting customers.

New Norfolk town tours will benefit local business there, also Mini Bus driver is employed. We will also offer pick-up & drop off to Hobart venues (including Cruise Terminal) return to Bridgewater using a 12 seat Mini Bus.

Local mechanic has our service contract for Hovercraft maintanence & company Mini Bus service. Buy from local fuel stations for Diesel fuel.

We can only see positive benefits for the region. There is no other water operators offering a service from Bridgewater to New Norfolk. We will offer a unique environmently friendly experience that will benefit the Community economically.

No adverse impacts that can be forseen but if an issue should arise, we would address it immediately.

1.12 Alternatives (other ways)

Explain the other options that were considered to meet your outcome/s and cost and why they were not preferred? State why the preferred option is supported. (Attach additional information if necessary at part 1.13)

	Options	Comments
Do nothing	Yes at this stage.	Solid, viable & only practical solution for my Hovercraft operation. Own to low water mark therefore easy access to river.

		Protected waterways compared to more open coastal areas, therefore more opportunity to operate due to Hovercraft wind/sea limits. Low water traffic density, almost non-existant. Maintance facility on Base. Picturese environment people will want to see. All positive reasons to stick with current proposal.
Eliminate	N/A	Proponent
Isolate/Substitute	N/A	Proponent
Engineer	N/A	Proponent
Administrate	N/A	Proponent
Preferred Option	N/A	Proponent

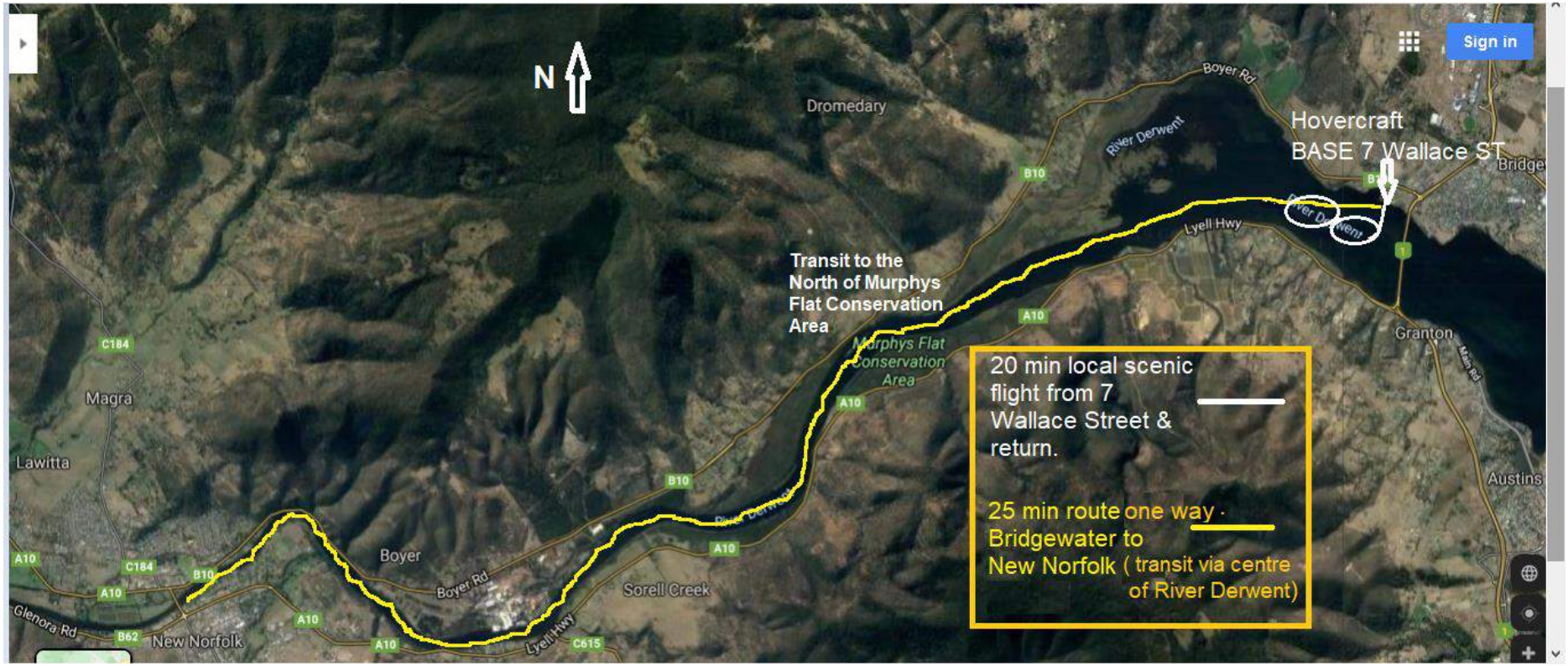
1.13 Attachments

No.	Description/Details of Attachment eg. maps, photos, reports
1	Proposed route to New Norfolk & return
2	Proposed 20 minute Joy Ride route
3	7 Wallace Street Bridgewater Hovercraft Base
4	Photo's of water entry site at bridgewater
5	Tiger 12 Hovercraft picture
6	Avifauna Assesment
7	Coastal Vulnerability Assessment
8	AH7774 Site Recording Form
9	Freycinet Hover Explorer Pty Ltd Safety Management Plan (Draft)
10	

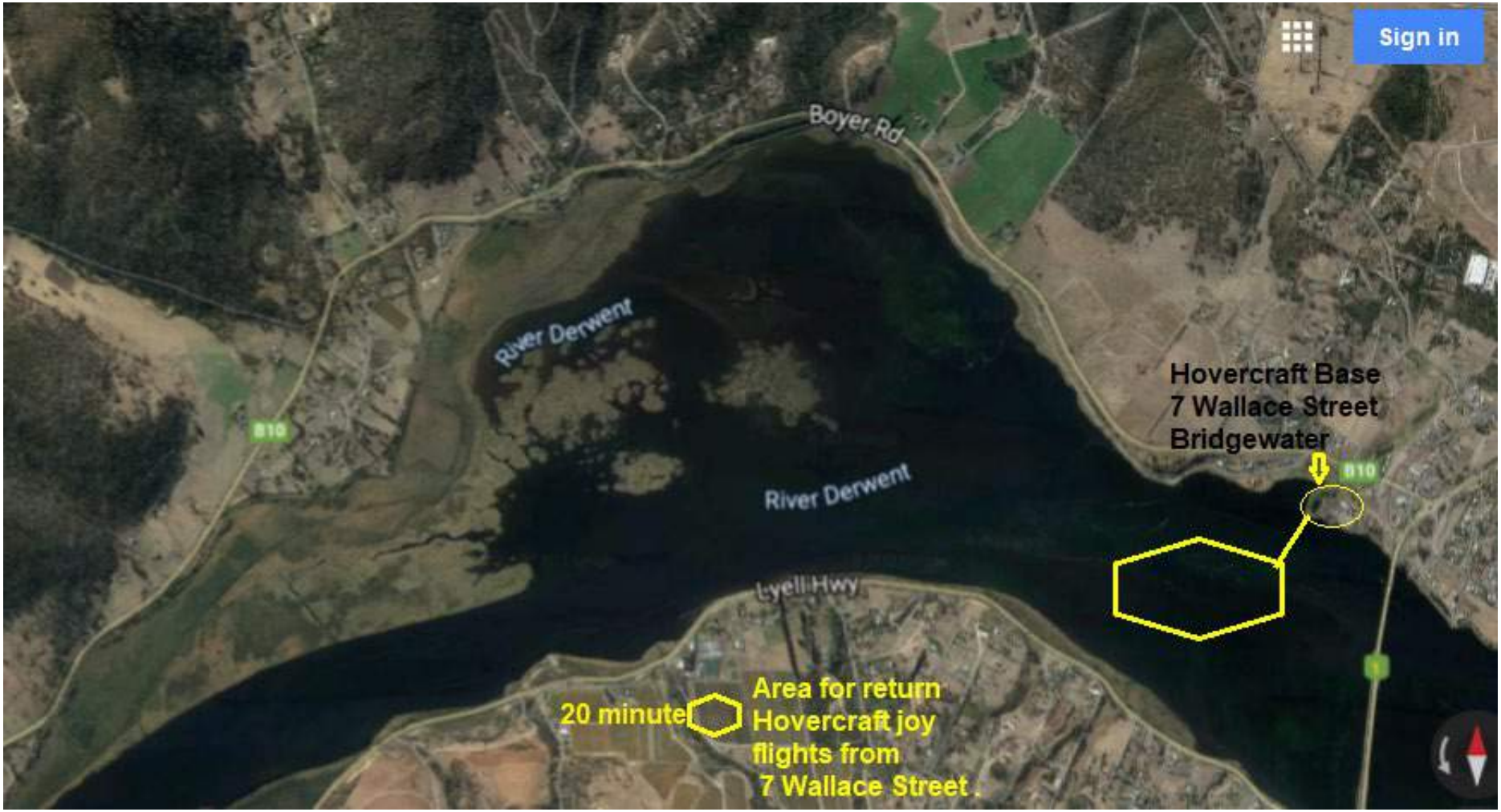
1.14 Third Party Description and Interest in the Activity

Myself & wife Kathleen Miller are the only directors of Freycinet Hover Explorer Pty Ltd, a family business. DA in with Brighton Council as we also require approval from them to operate from 7 Wallace Street, Bridgewater. Aboriginal Heritage Council have done a desktop review of this property & found a middens site discovered in 1997 (no evidence exists today of any shells) but our proposed operation will not damage that site in any case (see attached site plan & photo's).

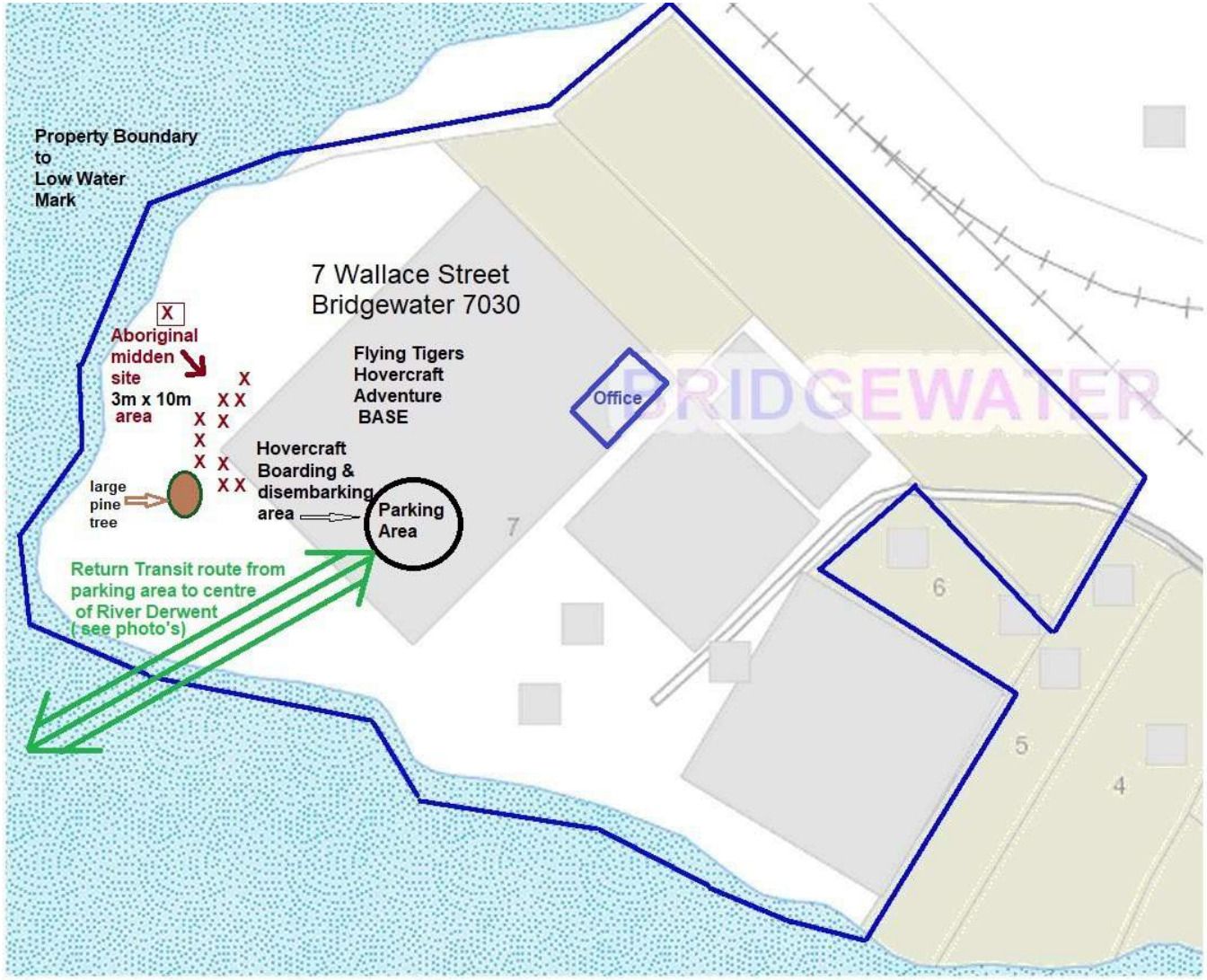
RAA 3644 - Attachment 1 - Tour Route



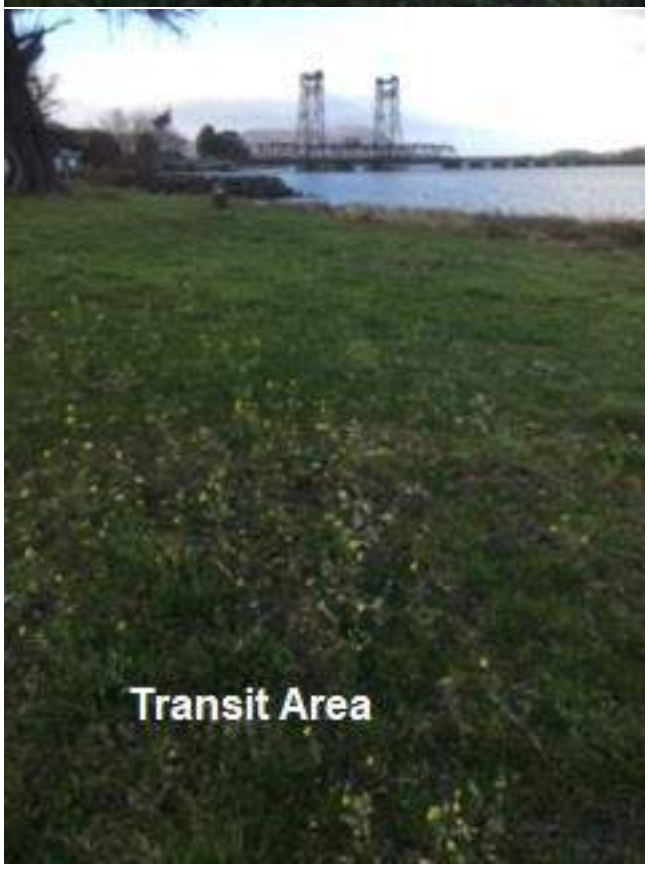
RAA 3644 - Attachment 2 - Short Tour



RAA 3644 – Attachment 3 -7 Wallace Street, Bridgewater



RAA 3644 – Attachment 4 - Photos of water entry site at Bridgewater




Transit
Area


Water edge entry
point area


X
Looking from shoreline up towards parkng bay (X) at Low tide


Looking from parking area to water entry point

RAA 3644 - Attachment 5 - Tiger 12 Hovercraft

TASMANIAN ABORIGINAL LAND COUNCIL: Coastal Site Recording Form

Field No.: BW 1 TALC No.: TASI No.: 7774

Recorded by: S. STANTON Date: 18 / 7 /1997

Archaeologists Name (If present): D. PARHAM

Project Name: BRIDGEWATER BRIDGE PLANNING STUDY

Where is the site?

Map: 8312 East: 182 North: 681

1. Is the shore? Sandy: ☐ Sand and rocks: ☐ Rocky: ☑

2. How far from the site to the ~~sea~~ RIVER 30 metres

3. How far from the site to rocks with shell fish? 30 metres

4. How far from the site to fresh water? 150 metres (RIVER IS SALINE AT TIMES)

Where does the fresh water come from?

Lagoon: ☐ Creek: ☑

River: ☐ Other: ☐ What? _____

Is the fresh water always there? Yes: ☑ No: ☐

5. What is the vegetation around the site? Tick more than one if necessary.

Marsupial lawn: ☐ Grass: ☐ Rushes: ☐ - PINE TREES - BOX THORNS

Ti tree/Melaleucca scrub: ☐ Heath: ☐ Other: ☑ What? - GRASS

	Yes	No
6a. Is the site on top of a dune?	☐	☑
6b. Is the site in a hollow?	☐	☑

If the answers are no, which way does the site face? LEVEL - OPEN ASPECT.

7. Where is the site in the dunes? N/A.

Near the sea ☐ _____

In the middle of the dunes ☐ _____

Near the button grass ☐ _____

8. How visible is the ground in the area?

Very poor	Poor	Moderate	Good	Very good
☐	☐	☑	☐	☐
0-10%	11-30%	31-60%	61-80%	80-100%

What is the Site?

9. What is the size of the site? Length 10 M. Width 3 M.

10. Is the site? Simple (One thing): ☑ Complex (more than one thing): ☐

If the site is complex please fill in a separate form for each part of the site.

Please turn over

What is it (continued)

11a. What sort of site is it?

Isolated artefact: ☐	Artefact scatter: ☐	Other: ☐
Occupied shelter: ☐	Unoccupied shelter: ☐	Specify other: _____
Shell midden: ☑	Seal hides: ☐	_____
Engraving: ☐	Stone arrangement: ☐	_____

11b. If it is a shell midden, what sort is it?

Hut: ☐	Linear: ☐	Large concentration: ☐
	Deflated: ☐	Small concentration: ☑ (DISTURBED CONTEXT)

11c. If it is stratified, how many separate layers of shells or artefacts are there? N/A

Number:	1	2	3	4	5	6	7
Thickness:	☐	☐	☐	☐	☐	☐	☐

State if the depth of the layer is measured in inches or centimetres

12. What is in the midden? Count the shell in each level or sample area. If there are less than thirty shells simply indicate the shells that are present in the site with a cross and put a "C" in the box with the most common type of shell. Do the same for the stone tools.

Level/sample	1	2	3	4	5	6	7	
Warenner:	☐	☐	☐	☐	☐	☐	☐	*Turbo undulata*
Mutton fish:	☐	☐	☐	☐	☐	☐	☐	*Haliotis sp.*
Brown mussel:	☐	☐	☐	☐	☐	☐	☐	*Brachiodontes sp.*
Black mussel:	☐	☐	☐	☐	☐	☐	☐	*Mytilus edulis*
Big limpet:	☐	☐	☐	☐	☐	☐	☐	*Cellana solida/Patella sp.*
Small limpet:	☐	☐	☐	☐	☐	☐	☐	*Patteloida sp.*
Big whelk:	☐	☐	☐	☐	☐	☐	☐	*Cymatium spengleri*
Small whelk:	☐	☐	☐	☐	☐	☐	☐	*Dicathais sp.*
Perriwinkle:	☐	☐	☐	☐	☐	☐	☐	*Austrocochlea sp.*
Chiton:	☐	☐	☐	☐	☐	☐	☐	*Plaxiphora sp./ Isnochiton sp.*
Crayfish:	☐	☐	☐	☐	☐	☐	☐	*Jansus novoholondae*
Other:	☑	☐	☐	☐	☐	☐	☐	Specify: OYSTER.

State size of sample areas: _____ m^2

Stone tools

Formal tool types seen:

Spongolite:	☐	☐	☐	☐	☐	☐	☐	_____
Black chert:	☐	☐	☐	☐	☐	☐	☐	_____
Silcrete:	☐	☐	☐	☐	☐	☐	☐	_____
Grey quartz:	☐	☐	☐	☐	☐	☐	☐	_____

Stone (continued)

Level/sample	1	2	3	4	5	6	7
White quartz:	☐	☐	☐	☐	☐	☐	☐
Quartzite:	☐	☐	☐	☐	☐	☐	☐
Other:	☐	☐	☐	☐	☐	☐	☐

Formal tool types seen (cont.): _____

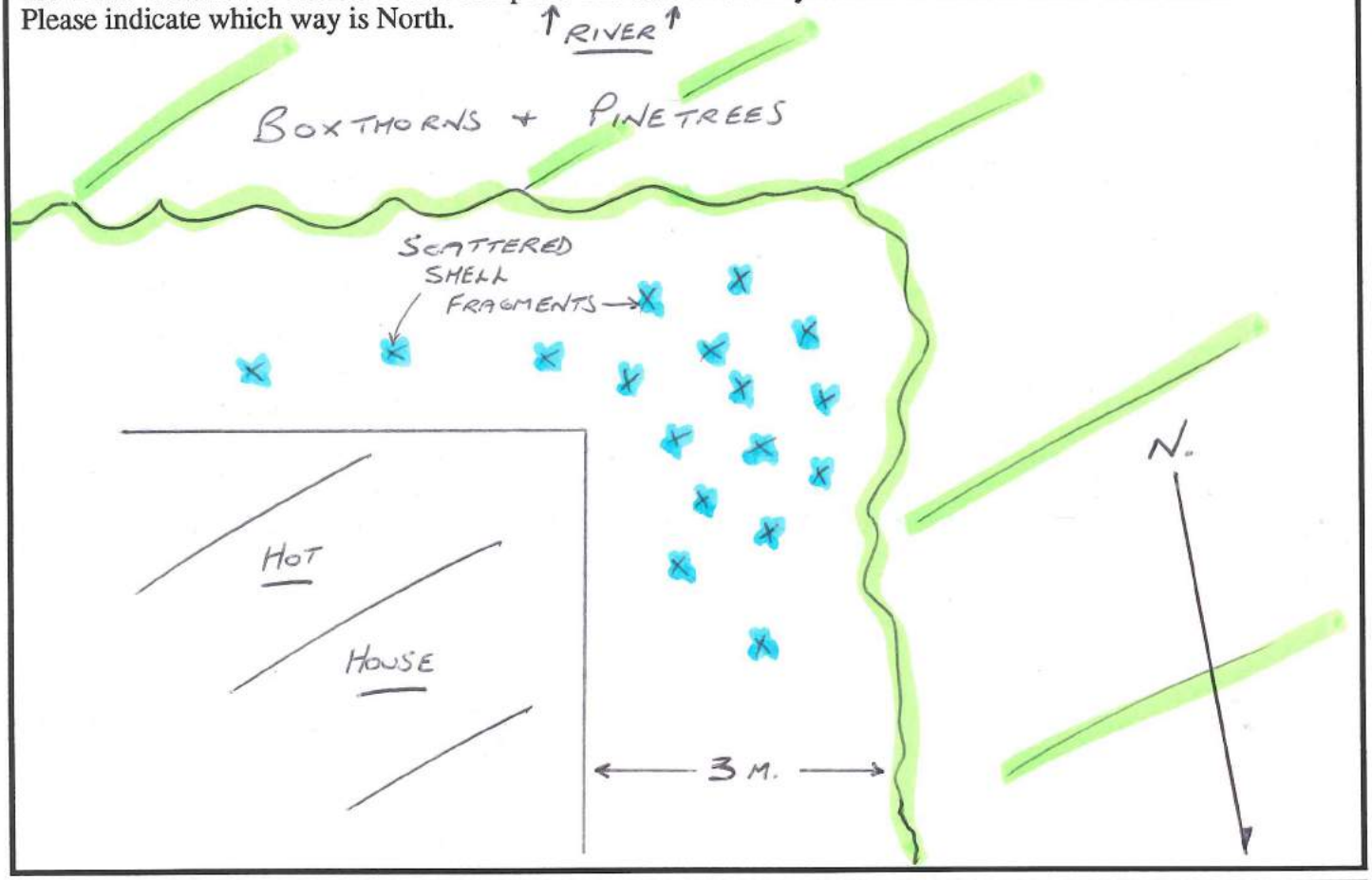
Specify other: _____

Bones

	☐	☐	☐	☐	☐	☐	☐

What animal bones are in which levels? _____

13. Draw a sketch of the site if it is complex. Indicate where any counts of shell or stone were done. Please indicate which way is North.



What is happening to the site?

14. How much of the site is disturbed? ☐ % or Not known: ✓

IT APPEARS THAT A LARGE PERCENTAGE IS DISTURBED HOWEVER THERE MAY BE MATERIAL IN SITU BELOW THE SURFACE.

15. What has caused the disturbance? Tick more than one if necessary.

Four wheel drives:	☐	Four wheel bikes:	☐
Stock:	☐	Native animals:	☐
Stream:	☐	Waves:	☐
Wind:	☐	Other:	✓

AGRICULTURAL ACTIVITY + BUILDING (HOT HOUSE) CONSTRUCTION.

Please turn over

14. If there is any disturbance at the site, record the depth and whether the disturbance is new or old.

Area	1	2	3	4	5	6
Size						
Type of Disturbance						
Depth of disturbance						
Age of disturbance						

17. Do the dunes in the area have a stepped appearance? N/A

Yes: ☐ No: ☐

18. Any other details? _____

19. Describe the site: _____

Site BW 1 - TASI 7774 - Grid reference 8312 182 681 - Shell midden.
(Previously identified as site 294 by Officer)

This site is located in a highly disturbed area adjacent to the south west corner of a large hot house complex, approximately 250 metres west (or upstream) of the Bridgewater Bridge. The site consists of small fragments of oyster shell spread over approximately 10 metres in length by several metres wide. The shell extends along the northern and southern border of the hot house which may indicate that the material was exposed during the original excavation for foundations of the building. Due to the highly disturbed nature of the area it is not possible to ascertain the full extent of the site, that is, whether or not there is undisturbed midden deposit below the disturbed topsoil. The site does not appear to extend into the pine trees and boxthorns which lie between the hothouse and the riverbank.

20. Notes

Are there photographs of the site? Yes: ☑ No: ☐

Tasmanian Government

Department of Primary Industries, Parks, Water and Environment

GPO Box 1751, Hobart, TAS 7001 Australia
Ph (03) 6165 4234 Fax 03) 6173 0226
www.parks.tas.gov.au

Mr James Dryburgh
General Manager
Brighton Council
1 Tivoli Road
OLD BEACH TAS 7017

Dear Mr Dryburgh

CROWN CONSENT - FLYING TIGERS HOVERCAFT ADVENTURES - RIVER DERWENT MARINE CONSERVATION AREA

This letter, issued in accordance with section 52 of the *Land Use Planning and Approvals Act 1993*, is to confirm that the Crown consents to the making of the enclosed Application for Planning Permit insofar as the proposed development relates to Reserved land known as the River Derwent Marine Conservation Area, reserved pursuant to section 11 of the *Nature Conservation Act 2002*.

Crown consent is only given to the lodgement of the application by Freycinet Hover Explorer Pty Ltd (trading as Flying Tigers Hovercraft Adventures), for the operation of a hovercraft tour within the River Derwent Marine Conservation Area. The Tasmania Parks and Wildlife Service (PWS) can confirm that it is the relevant managing authority for the River Derwent Marine Conservation Area.

Please note that Crown consent is only given to the lodgement of the application as stated, and that any variation will require the further consent of the Crown.

This letter does not imply or constitute any Crown approval to undertake works or activities, nor that final approvals have been obtained. Should the council grant a planning permit for the proposed development, the proponent will need to seek a final Authority from the Crown before commencing any works or activities on the respective Reserved land.

The PWS is in the process of completing an assessment of the proposed use (Reserve Activity Assessment # 3644), and has deemed it to be consistent with the relevant management objectives under the *National Parks and Reserves Management Act 2002*. A formal licence, with conditions, is yet to be prepared.

Any questions regarding this matter may be directed to Matt Lindus, PWS Ranger in Charge, Seven Mile Beach Field Centre, on 6107 9211 or Matthew.Lindus@parks.tas.gov.au

Yours sincerely

Louise Wilson
A/DEPUTY SECRETARY
PARKS AND WILDLIFE SERVICE

Signed pursuant to an Instrument of Delegation dated 24 July 2019.

31 January 2021