

**REVIEW OF ENVIRONMENTAL FACTORS (REF)  
PADDLECRAFT LAUNCHING FACILITY  
TABOURIE LAKE AT SHORT STREET  
LAKE TABOURIE**


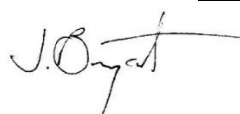
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### Document control

Item	Details
Project	Paddlecraft Launching Facility – Tabourie Lake at Short Street – Lake Tabourie
Client/Proponent	City Services, Shoalhaven City Council
Prepared By	City Services, Shoalhaven City Council

### Document status

Version	Author / Reviewer*	Name	Signed	Date
V1.0	Author	Geoff Young		05/04/2023
	Reviewer	Jeff Bryant		17/04/2023

\*Review and endorsement statement:

“I certify that I have reviewed and endorsed the contents of this REF document and, to the best of my knowledge, it is in accordance with the EP&A Act, the EP&A Regulation and the Guidelines approved under clause 170 of the EP&A Regulation, and the information it contains is neither false nor misleading”.

### Assessment and approvals overview

Item	Details
Assessment type	Division 5.1 (EP&A Act) - Review of Environmental Factors (REF)
Proponent	Shoalhaven City Council
Determining authority / authorities	Shoalhaven City Council
Required approvals (consents, licences and permits)	“Fisheries Permit” - Section 200 (and potentially 205) of the NSW <i>Fisheries Management Act 1994</i> . “Crown Lands Licence” – Section 5.21 of the NSW <i>Crown Land Management Act 2016</i>
Required publication	Yes – as per Section 171(4)(b)(i) of the NSW <i>Environmental Planning and Assessment Regulation 2021</i>

## 1. PROPOSAL AND LOCATION

### 1.1 Overview

The proposed activity is the construction of a paddlecraft launching facility into Tabourie Lake near Short Street, Lake Tabourie (Figure 1 p.5). Shoalhaven City Council (SCC) gained funding for the proposed activity under the Regional NSW Department of Primary Industries' Recreational Fishing and Camping Facilities Program.

The proposed activity would comprise:

- installation of 3000 millimetre (mm) long by 1000mm deep by 600mm wide reinforced concrete strip footing on the Lake's shore and associated excavation
- four 1000mm by 1500mm stepped fibre reinforced plastic (FRP) treads from the strip footing on the foreshore down into the lake
- ten piles driven into the bed of the lake to refusal or minimum two metre embedment
- installation of subsurface drainage and associated excavation
- placement of revetment underneath the facility comprising minimum 300mm diameter armour stone and geotextile filter.

The overall length of the structure would be 5.5 metres and generally 1.5 metres wide.

Refer to Figure 2 below and Appendix A for design plans.

Works would also involve the implementation of safeguards and mitigation measures prescribed in Section 7 of this Review of Environmental Factors (REF).

Shoalhaven City Council (SCC) is the proponent and the determining authority under Part 5 of the EP&A Act. The environmental assessment of the proposed activity and associated environmental impacts has been undertaken in the context of Clause 171 of the *Environmental Planning and Assessment Regulation 2021*. In doing so, this REF helps to fulfil the requirements of Section 5.5 of the Act that SCC examine and take into account to the fullest extent possible, all matters affecting or likely to affect the environment by reason of the activity.

### 1.2 Location

The proposed activity would be undertaken in and on the shore of Tabourie Lake (Figure 1 below).

The shore is crown reserve R59624 for the purposes of "public recreation" gazetted on 30 November 1979. SCC is not the appointed land manager under the NSW *Crown Land Management Act 2016* but has responsibility for the reserve under Section 48 of the NSW *Local Government Act 1993*.

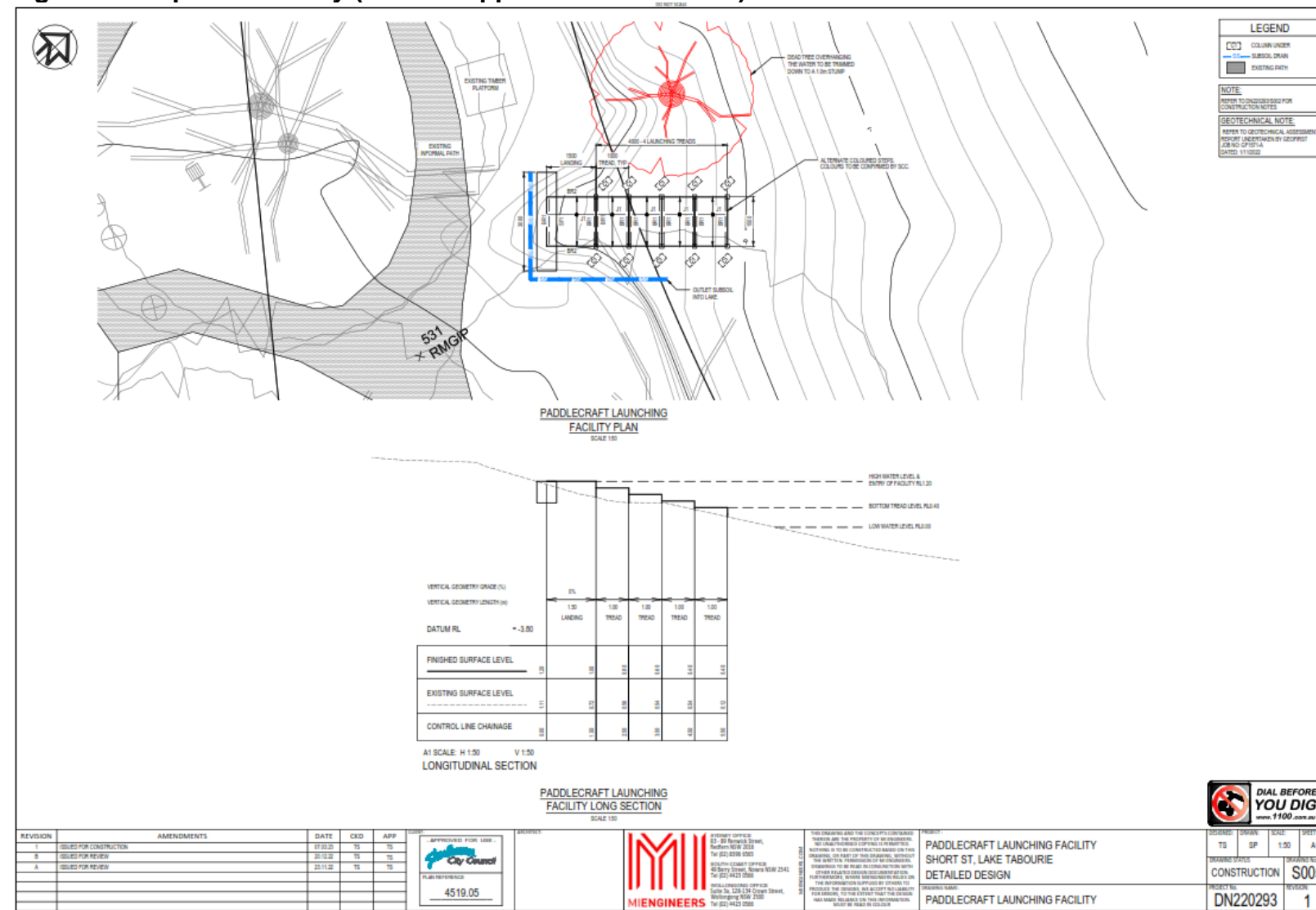
The facility would be accessed from Short Street and the reserve via informal access tracks



**Figure 1 Location of the proposed activity**

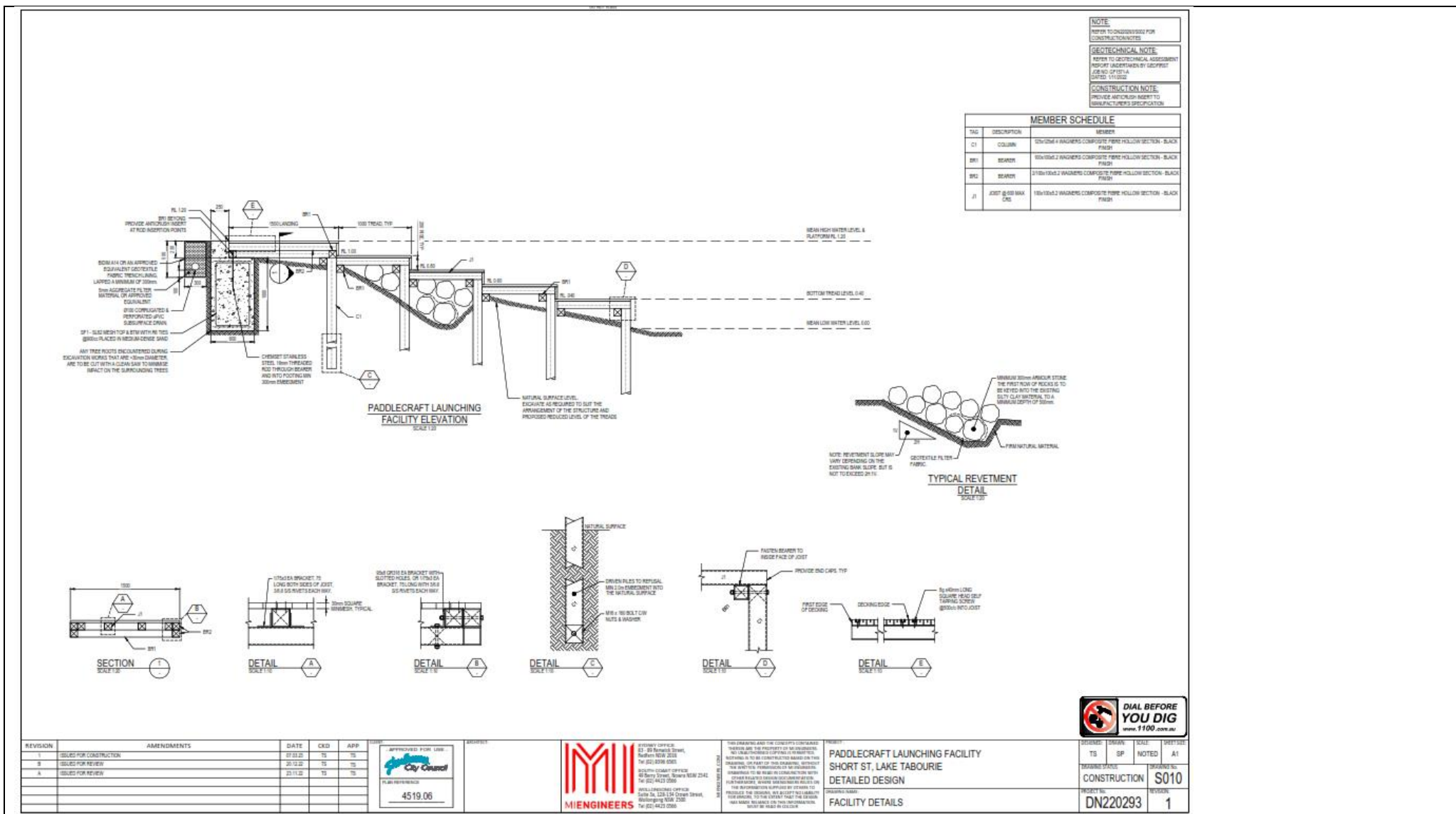


**Figure 2: Proposed activity (refer to Appendix A for details)**





# Review of Environmental Factors Part 5 Assessment EP&A Act 1979



## 2. EXISTING ENVIRONMENT

Photos of the site are provided in Section 2.4 below.

The site of the proposed activity was assessed by a SCC Environmental Operation Officer on 15 March 2023. Water levels were high, so visibility was limited to the shore. The site, however, has been inspected at lower levels previously by SCC Project Managers and photos were taken of the Lake bed showing no live seagrass present (refer to Section 2.4 below).

Investigations involved vegetation and habitat assessment, recording flora species within and immediately adjacent to the proposed activity, determination of vegetation communities including the presence of threatened ecological communities, and investigation of habitat availability for threatened flora and fauna species.

The shore is generally denuded of vegetation as it is subject to continual use as an informal access into the lake by people with paddlecraft. Its use as an informal paddlecraft accessway has also led to a local depression in the shore which concentrates stormwater runoff contributing to minor erosion of the shore. Either side of the proposed foundations are Swamp Oaks *Casuarina glauca* that are predominantly seedlings / epicormic shoots. Pruning of at least three branches from a mature Swamp Oak on the eastern side of the facility is, however, anticipated.

Tabourie Lake at the time of assessment was closed to the sea. Eelgrass *Zostera spp.* wrack was present both on the shore and in the water. Previous inspections indicated that no live seagrass exists on the bed of the lake in this location.

### 2.1 The waterway

Tabourie Lake is an intermittently closed and open lake and lagoon (ICOLL) with the entrance currently managed under an Entrance Management Plan and Crown Land Licence.

Tabourie Lake is one of many coastal lakes along the coastal strip south from Jervis Bay which are generally separated by low ridges and fed by small, short (10 kilometres or less) streams flowing to the sea. Tabourie Lake is typical of many South Coast coastal lakes:

- It is small and shallow covering an area of 1.4 km<sup>2</sup> with depths typically less than one metre. The Lake's small size relative to the catchment (43 km<sup>2</sup>) means that water levels are responsive to rainfall.
- Urban development is limited (~2% of the catchment area) and mostly confined to low-lying areas on the southern side of the Lake's entrance where the paddlecraft launching facility would be located.
- It is a popular tourist destination and recreation area.
- When the Lake is open to the sea, tidal inflows are insufficient to penetrate far into the lake basin due to its long, shallow entrance channel. As a result, the lake is mostly brackish and never totally flushed with seawater.

The substrate of the Lake comprises estuarine deposits of silt and sand of marine origin. Benthos and signs of benthic life were not observed but are likely. Similarly, fish such as Bream, Dusky



Flathead and Mullet would also be expected to occur in the Lake at the site of the proposed activity from time to time.

Saltmarsh or live seagrass does not occur at the site of the proposed development, however, seagrass wrack comprising Eelgrass *Zostera spp.* can accumulate at the site from time to time as was evident on the date of assessment.

The Lake is mapped as 'key fish habitat' for the purposes of the NSW *Fisheries Management Act 1994*.

The site is within flood liable land being mapped by SCC as existing Flood Planning Area for the purposes of the SCC Development Control Plan and Shoalhaven Local Environmental Plan (SLEP) (Figure 3 below).

**Figure 3 SCC Flood Planning Area (existing)**



## 2.2 Terrestrial Habitat and vegetation assessment

Vegetation communities mapped as occurring within or immediately around the proposed activity site are (Figure 4 p.11):

- Biometric SR512 Bangalay – Old-man Banksia open forest on coastal sands, Sydney Basin and South East Corner

- Biometric SR669 Woollybutt – White Stringybark – Forest Red Gum grassy woodland on coastal lowlands but is likely to be incorrect with Biometric SR648 Swamp Mahogany Swamp Sclerophyll Forest on coastal lowlands, Sydney Basin and South East Corner more likely to occur.

The vegetation at the site is most closely aligned with SR512 with Bangalay *Eucalyptus botryoides* and Swamp Oak *Casuarina glauca* present. This vegetation is aligned with the endangered ecological community (EEC) *Bangalay Sand Forest of the Sydney Basin and South East Corner Bioregions*.

No threatened flora nor suitable habitat for locally occurring threatened orchid species was identified on site during site environmental examinations.

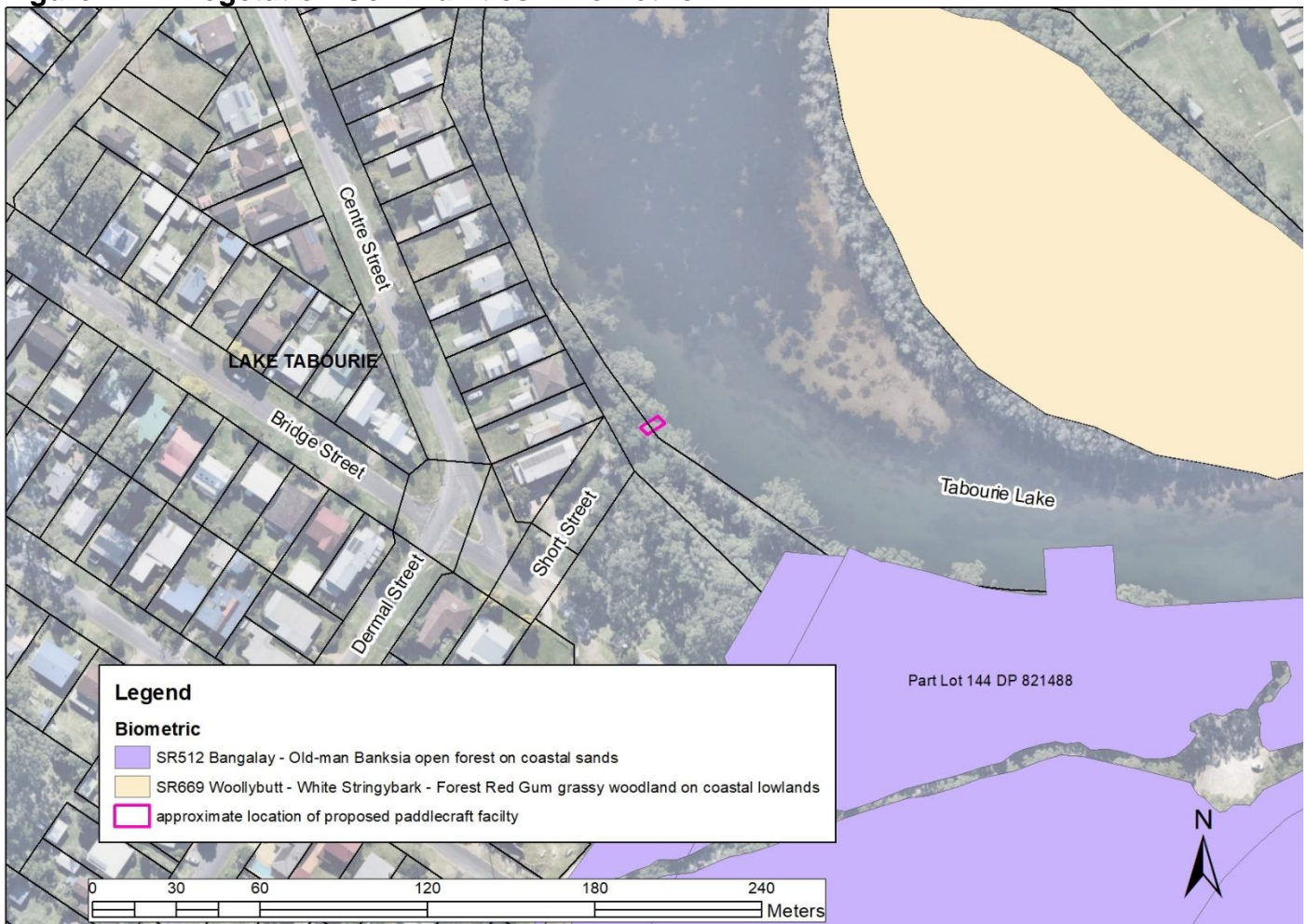
No Glossy Black Cockatoo (*Calyptorhynchus lathami*) feed trees (e.g. *Allocasuarina littoralis* with characteristic chewed cones), nor Yellow-bellied Glider (*Petaurus australis*) feed trees (e.g. e.g. *Corymbia gummifera* or *Eucalyptus punctata* with v-shaped feeding scars) occur within or in close proximity to the site. No signs of potential threatened fauna use of the site (e.g. bandicoot diggings, owl white-wash or other threatened fauna scats) were noted.

There are no hollow-bearing trees in the area that would be affected by the proposed activity.

A dead Bangalay stag overhanging the water (refer to Photo 5 in Section 2.4 below) is proposed to be shortened to a one metre stump to eliminate the potential of this tree falling into the water causing destabilising of the bank if the root plate were to lift. This stump does not appear to be hollow.



**Figure 4 Vegetation Communities - Biometric**



### 2.3 Geology

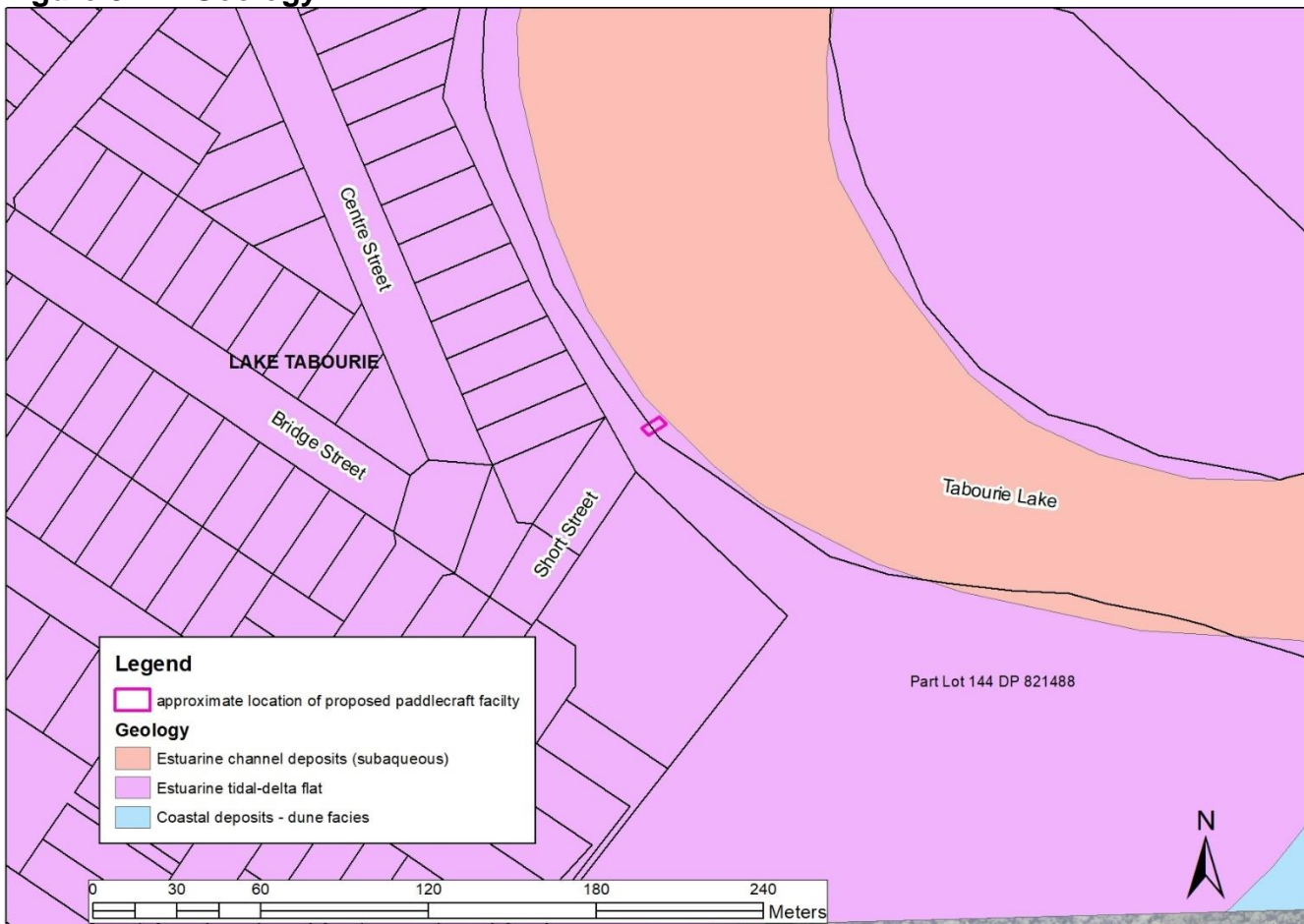
Being located on an estuarine tidal-delta flat, the geology of the proposed activity site comprises estuarine deposits on fine to medium-grained lithic-carbonate-quartz sand (marine-deposited), silt, clay, shell material, and polymictic gravel of a Holocene age (Figure 5 below, MinView 2023<sup>1</sup>).

In geotechnical investigations (Geofirst 2022), medium to dense marine sand was encountered from one metre to about four metres below the existing grade.

Being Holocene and estuarine in origin, the soils at the site have a higher risk of containing iron sulfides which when exposed to oxygen generate sulfuric acid *i.e.* acid sulfate soils. This is reflected in the acid sulfate soil risk map where the site is mapped as “class 3” risk along the shore and “class 1” risk for the lake bottom sediments (Figure 6 below).

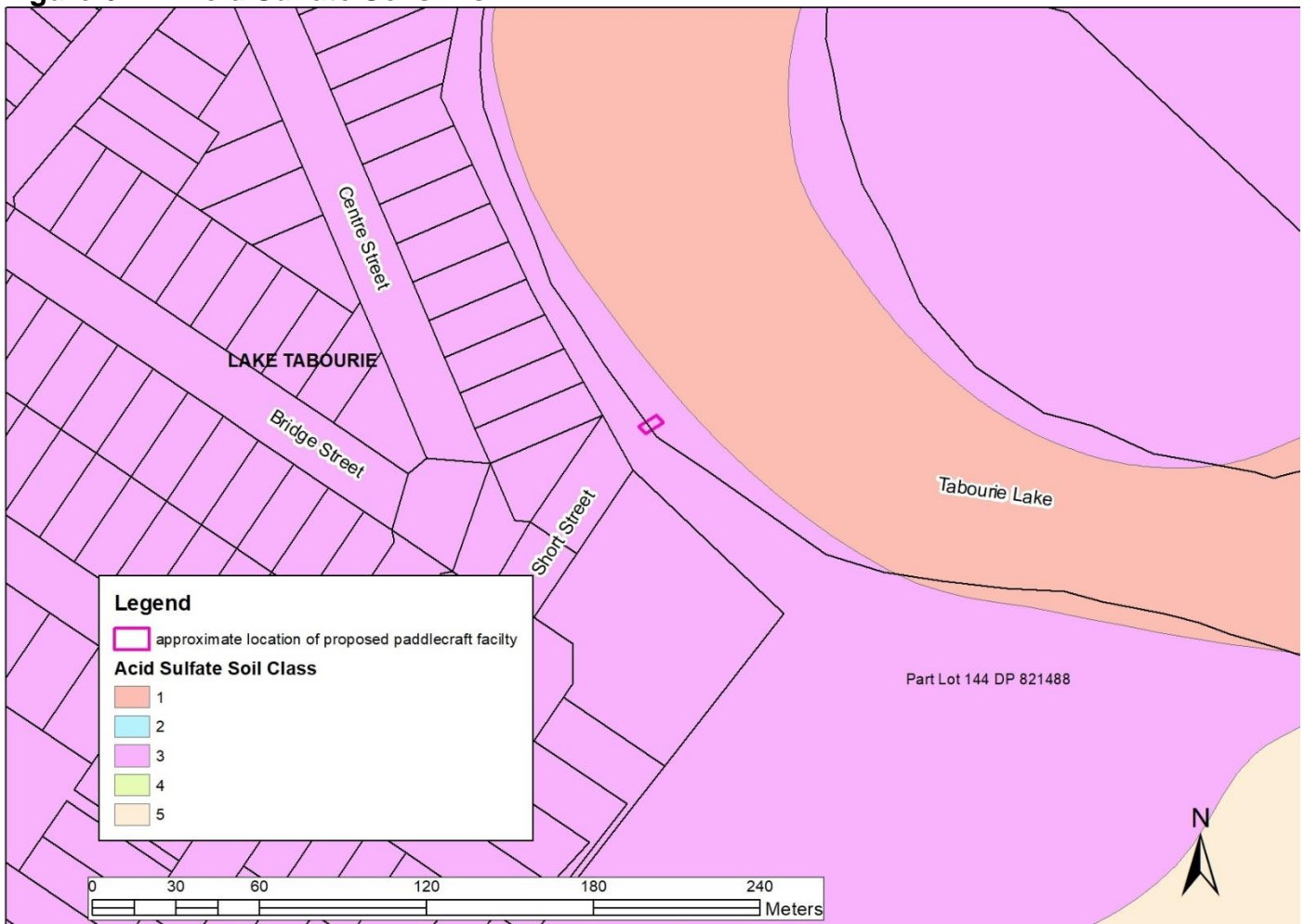
<sup>1</sup> <https://minview.geoscience.nsw.gov.au/#/?lon=148.5&lat=-32.5&z=7&l=>

**Figure 5      Geology**





**Figure 6 Acid Sulfate Soils Risk**



2.4 Photos

**Photo 1: approximate location of the subterranean drainage trench and strip footing**



**Photo 2: Site of the proposed activity at low lake levels.**





**Photo 3: Site of the proposed activity**



**Photo 4: Site of the proposed activity showing Eelgrass wrack on the shore and in the water**





**Photo 5: Dead Bangalay stag to be shortened to an approximate one metre stump to prevent destabilisation of the bank once adjacent excavations occur. The paddlecraft facility would be installed immediately behind this stag**





### 3. ASSESSMENT OF LIKELY IMPACTS ON THE ENVIRONMENT

#### 3.1 Impacts associated with the proposed activity

The proposal would involve the following disturbance and direct impacts:

- Pruning of approximately three minor branches of a mature Swamp Oak less than 10 centimetres diameter and containing no hollows or nests.
- Shortening of a dead Bangalay stag currently overhanging the lake adjacent to the proposed activity.
- Removal of approximately six small Swamp Oak saplings or epicormic shoots.
- Excavation of potentially acid sulfate soils for strip footing, diversion drainage and revetment.
- Reclamation of Tabourie Lake for minor revetment.

Other impacts on the environment, including indirect impacts have been considered, including:

- threatened species
- indigenous and non-indigenous heritage
- water quality, the riparian zone and key fish habitat
- development of flood liable land
- acid sulfate soils.

Each is discussed below.

#### 3.2 Vegetation removal

The impact to vegetation as described above is not significant for the following reasons:

- The trees affected are common species and do not contain hollows or nests.
- There are no plants in this area listed in the threatened species schedules of the NSW *Biodiversity Conservation Act 2016* (NSW BC Act) or the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).
- Fauna species listed in the threatened species schedules of the NSW BC Act and the EPBC Act are not likely to reside in this location or rely on this vegetation for food, refuge or breeding.
- The clearing would not have a significant impact on an endangered ecological community listed under the NSW BC Act and EPBC Act.
- The vegetation does not appear to provide important food sources for locally occurring threatened species and do not appear to contain nests or hollows.
- The vegetation is not mapped on the Biodiversity Values Map administered for the purposes of the NSW *Biodiversity Conservation Act 2016*.

An environmental impact statement (EIS) is therefore not warranted.

#### 3.3 Threatened species impact assessment (NSW)

Section 1.7 of the EP&A Act 1979 applies the provisions of Part 7 of the NSW *Biodiversity Conservation Act 2016* and Part 7A of the NSW *Fisheries Management Act 1994* that relate to the

operation of the Act in connection with the terrestrial and aquatic environment. Each are addressed below.

### 3.3.1 Part 7A Fisheries Management Act 1994

Part 7A relates to threatened species conservation. Section 220ZZ provides a “7-Part test of significance” to determine whether a proposed action is likely to significantly affect threatened species, populations or ecological communities and thereby require a species impact statement (SIS). The assessment is provided below:

***Part 1 In the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is to be placed at risk of extinction.***

There are no species listed on the schedules of the Act (<https://legislation.nsw.gov.au/view/html/inforce/current/act-1994-038#sch.4>) that have a reasonable potential to occur at the site of the proposed activity.

Grey Nurse Sharks *Carcharias taurus* have the potential to enter Lake Tabourie when the Lake is open to the sea. Grey Nurse Sharks are found predominantly in inshore coastal waters. They have been recorded at various depths, but mainly found in waters between 15 and 40 metres deep. It is unlikely that the species would occur at the site of the proposed activity due to the long, shallow entrance and the limited tidal exchange experienced in the Lake. When the Lake is open to the sea, tidal inflows are insufficient to penetrate far into the lake basin. As a result, the Lake is mostly brackish and not suitable for the species.

***Part 2 In the case of an endangered population, whether the proposed development or activity is likely to have an adverse effect on the lifecycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction.***

The endangered populations listed under the Act are:

- *Ambassis agassizii* Steindachner Agassiz’s glassfish, olive perchlet, western New South Wales population
- *Craterocephalus amniculus* Darling River Hardyhead, Hunter River population
- *Gadopsis marmoratus* river blackfish, Snowy River population
- *Tandanus tandanus* freshwater catfish, eel tailed catfish, Murray-Darling Basin population
- *Posidonia australis* seagrass, Port Hacking, Botany Bay, Sydney Harbour, Pittwater, Brisbane Waters and Lake Macquarie populations

These areas would be unaffected by the proposed activity.

***Part 3 In the case of an endangered ecological community or critically endangered ecological community whether the proposed development or activity:***

- I. is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or***

***II. is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction.***

The endangered ecological communities listed under the Act are:

- Aquatic ecological community in the natural drainage system of the lower Murray River catchment
- Aquatic ecological community in the natural drainage system of the lowland catchment of the Darling River
- Aquatic ecological community in the natural drainage system of the lowland catchment of the Lachlan River
- Aquatic ecological community in the catchment of the Snowy River in NSW

These areas would be unaffected by the proposed activity.

***Part 4 In relation to the habitat of a threatened species or ecological community:***

***I. The extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and***

***II. Whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and***

***III. The importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality.***

N/A – The area affected by the activity does not provide habitat for threatened species, populations or ecological communities (refer responses to Part 1 through Part 3 above)

***Part 5 Whether the proposed development or activity is likely to have an adverse effect on any critical habitat (either directly or indirectly),***

The only critical habitat currently on the register is “Critical Habitat of Grey Nurse Shark” with listed and mapped areas of:

- Bass Point (Shellharbour)
- Big and Little Seal Rocks
- Fish Rock and Green Island (South West Rocks)
- Julian Rocks (Byron Bay)
- Little Broughton Island (Port Stephens)
- Magic Point (Maroubra)
- Montague Island (Narooma)
- The Pinnacle (Forster)
- Tollgate Islands (Batemans Bay)

These areas would be unaffected by the proposed activity.

**Part 6      *Whether the proposed development or activity is consistent with a Priorities Action Statement***

As demonstrated in Part 1 above, the proposed activity would have no effect on threatened species.

**Part 7      *Whether the proposed development constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process***

<b>Key Threatening Process</b>	<b>Assessment</b>
Degradation of native riparian vegetation along NSW water courses	Minor and not significant – the proposed activity would only result in the pruning of a mature Swamp Oak and the shortening of a dead tree / stag overhanging the waterway.
Hook and line fishing in areas important for the survival on threatened fish species	Not applicable – proposal does not comprise or facilitate hook and line fishing.
Human-caused climate change	Not applicable – the proposal does not contribute to human-caused climate change.
Installation and operation of instream structures and other mechanisms that alter natural flow regimes of rivers and streams	Not applicable – the proposal does not involve the installation or operation of instream structures that would alter the natural flow regime.
Introduction of fish to waters within a river catchment outside their range	Not applicable – the proposal does not involve releasing fish.
Introduction of non-indigenous fish and marine vegetation to the coastal waters of NSW	Not applicable – the proposal does not involve the introduction of non-indigenous fish.
Removal of large woody debris from NSW rivers and streams	Not applicable – the proposal does not involve the removal of woody debris.
The current shark meshing program in NSW waters	Not applicable – the proposal does not involve shark meshing.



### 3.3.2 Part 7 Biodiversity Conservation Act 2016

Section 7.3 of the Act provides a 'five-part' test to determine whether a proposed development or activity is likely to significantly affect threatened species or ecological communities, or their habitats. Each Part is addressed below:

***Part A - In the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the lifecycle of the species such that a viable local population of the species is likely to be place at risk of extinction.***

An assessment of the potential for NSW threatened flora and fauna species occurring on-site or otherwise being impacted by the proposal was undertaken (refer to Appendix B). No species were assessed to be likely to occur at the site or be impacted by the proposed activity.

***Part B - In the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:***

- (i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or***
- (ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction***

The endangered ecological community (EEC) *Bangalay Sand Forest of the Sydney Basin and South East Corner Bioregions* (hereafter referred to as Bangalay Sand Forest) is mapped for the location of the proposed activity (Figure 7 below).

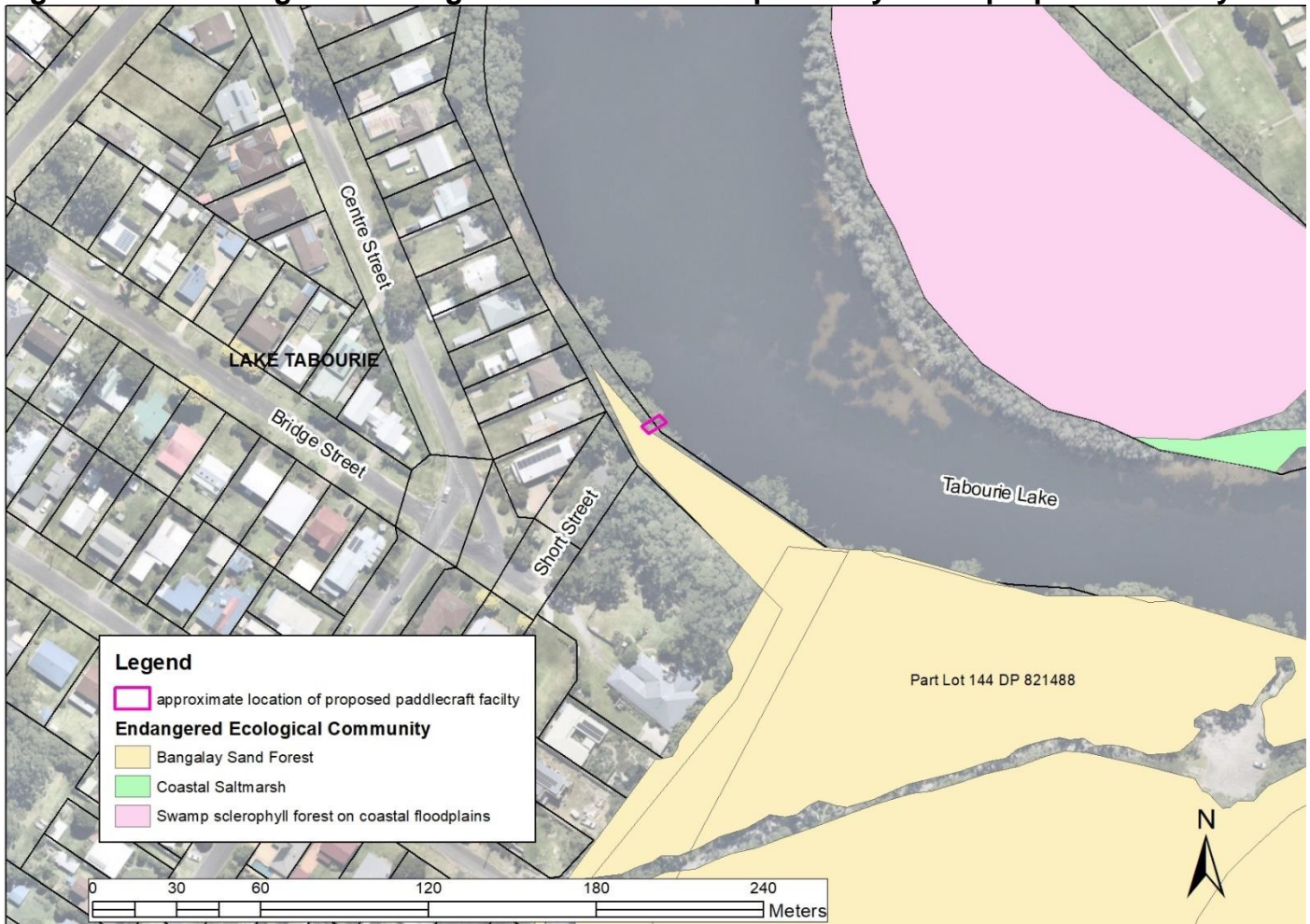
Bangalay Sand Forest is the name given to the ecological community associated with coastal sand plains of marine or aeolian origin. It occurs on deep, freely draining to damp sandy soils on flat to moderate slopes. Bangalay Sand Forest is characterised by the assemblage of species listed in the Scientific Committees Determination of the EEC

(<https://www.environment.nsw.gov.au/Topics/Animals-and-plants/Threatened-species/NSW-Threatened-Species-Scientific-Committee/Determinations/Final-determinations/2011-2012/Bangalay-Sand-Forest-of-the-Sydney-Basin-South-East-Corner-Bioregions-minor-amendment-Determination>) including Bangalay, Swamp Oak, *Commelina cyanea* Spiny-head Mat-rush *Lomandra longifolia*, and Sweet Pittosporum which occur at the site.

The proposed activity is unlikely to have a significant impact on the Bangalay Sand Forest EEC as disturbance to the local mapped extent is limited to the pruning of one mature Swamp Oak, two Swamp Oak saplings, and the shortening of one dead Bangalay stag. This impact is negligible in consideration of the mapped local extent of the community (Figure 7 below).

The proposal would not result in the fragmentation or isolation of areas of any EEC and is unlikely to adversely affect the extent or composition of any EEC such that a local occurrence of the EEC would be placed at risk of extinction. As species impact statement (SIS) or entry into the Biodiversity Offset Scheme is therefore not required.

**Figure 7 Endangered Ecological Communities in proximity to the proposed activity**



**Part C - In relation to the habitat of a threatened species or ecological community:**

- (i) the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity**
- (ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and**
- (iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality.**

No important habitat for threatened species would be removed or otherwise significantly impacted (see Part A).

No EEC would not be fragmented or isolated, nor removed or modified to an extent that would affect the long-term survival of the EEC occurring in the locality (refer to Part B).

The proposal will therefore not affect the long-term survival of any threatened species or endangered ecological community in the locality.

**Part D – Whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly).**

No “areas of outstanding biodiversity values” have been declared in the City of Shoalhaven.

**Part E – Whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process.**

There are no key threatening process listed in the NSW *Biodiversity Conservation Act 2016* considered relevant to the proposed activity.

### 3.4 Indigenous heritage

Under Section 86 of the NSW *National Parks and Wildlife Act 1974* (NPW Act) it is an offence to disturb, damage, or destroy any Aboriginal object without an Aboriginal Heritage Impact Permit (AHIP). The Act, however, provides that if a person who exercises 'due diligence' in determining that their actions will not harm Aboriginal objects has a defence against prosecution if they later unknowingly harm an object without an AHIP (Section 87(2) of the Act). To effect this, the NSW Department of Environment, Climate Change and Water have prepared the *Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales* (hereafter referred to as the 'Due Diligence Code') (DECCW 2010) to assist individuals and organisations to exercise due diligence when carrying out activities that may harm Aboriginal objects and to determine whether they should apply for an AHIP.

A search on the Aboriginal Heritage Information Management System (AHIMS) on 10 March 2023 indicated that there are no recorded Aboriginal sites or places in the vicinity of the proposal (refer to AHIMS report below in Figure 8 below).

The site of the proposed activity is within a landscape feature listed in the Due Diligence Code that has a higher propensity for Aboriginal objects *i.e.* within 200 metres of waters. As such a targeted site survey was undertaken on 15 March 2023. No objects were found with at least 80% visibility.

As the proposed activity would not impact any recorded or visible Aboriginal sites or places, the Due Diligence Guidelines requires no further assessment. An AHIP is not required, and the activity can proceed with caution. Cautionary measures are prescribed in Section 7 of this REF.



**Figure 8 Results of AHIMS Aboriginal heritage search**



**AHIMS Web Services (AWS)  
Search Result**

Your Ref/PO Number : Short street

Client Service ID : 762421

Shoalhaven City Council - Nowra

Date: 10 March 2023

PO Box 42 Bridge Rd

Nowra New South Wales 2541

Attention: Geoffrey Young

Email: geoff.young@shoalhaven.nsw.gov.au

Dear Sir or Madam:

**AHIMS Web Service search for the following area at Datum :GDA, Zone : 56, Eastings : 264185.0 - 264280.0, Northings : 6074690.0 - 6074783.0 with a Buffer of 0 meters, conducted by Geoffrey Young on 10 March 2023.**

The context area of your search is shown in the map below. Please note that the map does not accurately display the exact boundaries of the search as defined in the paragraph above. The map is to be used for general reference purposes only.



A search of Heritage NSW AHIMS Web Services (Aboriginal Heritage Information Management System) has shown that:

0	Aboriginal sites are recorded in or near the above location.
0	Aboriginal places have been declared in or near the above location. *

### 3.5 Non-indigenous heritage

No items of local heritage significance or any items on the State Heritage Register or listed in the Shoalhaven Local Environmental Plan occur near the site such that the proposed works might impact them. No further consideration is required.

### 3.6 Acid Sulfate Soils

The site of the proposed activity is mapped as Class 3 and Class 1 risk for acid sulfate soils (Figure 6 p.13).

The *Shoalhaven Local Environmental Plan 2014* (SLEP) indicates that a risk of exposure of acid sulfate soils exist on land mapped as Class 3 where works occur more than one metre below the natural ground surface or where works by which the watertable is likely to be lowered more than one metre below the natural ground surface. For Class 1 areas any excavation works would carry risk of exposure of acid sulfate soils.

Excavation for the proposed activity would be for:

- The drainage trench and strip footings – in Class 3 risk areas
- Placement of armour stone and modification of the bank to suit the arrangement of the structure and height of the treads – potentially in Class 1 risk area.

Consequently, the material that would be excavated shall be tested for the presence of potential acid sulfate soils. A full Acid Base Account assessment utilising the SPOCAS<sup>2</sup> analysis shall confirm the presence of acidity, potential acidity and liming rate to neutralise the acid prior to disposal. This requirement is reflected in the safeguards and environmental impact mitigation measures prescribed in Section 7 of this REF.

### 3.7 Flooding

The proposed activity would be in flood liable land (Figure 3 p.9)

The location of the proposed activity comprises a 1% Annual Exceedance Probability (AEP) high hazard floodway hazard and hydraulic category and a 2050 scenario Flood Planning Level of 3.6 metres AHD (Stone, M. *pers.comm.* 2023).

As the paddlecraft launching facility would be constructed close to the existing ground level it is unlikely to result in adverse flood impacts (Stone, M. *pers.comm.* 2023). The facility would also be constructed from flood compatible materials and has been designed to withstand the expected forces of floodwater including debris and buoyancy forces (MI Engineers 2023). The facility does not include electrical installations.

The proposed activity was forwarded to SCC's Lead – Floodplain Management for comment. Details are provided in Section 5 of this REF.

### 3.8 EP&A Regulation – Clause 171 matters of consideration

Clause 171(2) of the *Environmental Planning and Assessment Regulation 2021* lists the factors to be taken into account when consideration is being given to the likely impact of an activity on the

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<sup>2</sup> Suspension Peroxide Oxidisation Combined Acidity and Sulfur.

environment under Part 5 of the EP&A Act. The following assessment in Table 1 below deals with each of the factors in relation to the proposed activity.

**Table 1: Clause 171(2) Factors**

Does the proposal:	Assessment	Reason
a) Have any environmental impact on a community?	Positive	<p>Although some community members, particularly nearby residents, may be affected by slight increase in noise during construction, the proposed activity would benefit the community and visitors to the area through improved recreational facilities and safer water access.</p> <p>The proposed activity was initiated by the community through the NSW <i>Recreational Fishing and Camping Facilities Program</i>. The local community have been engaged throughout the design process (refer to Section 6).</p> <p>The proposed activity would not have any impact on other community services and infrastructure such as power, water, waste water, waste management, educational, medical or social services.</p>
b) Cause any transformation of a locality?	Positive	<p>The locality is situated on the shore of Tabourie Lake at the residential interface. The locality will remain the same except for the inclusion of the paddlecraft launching facility. The locality is currently utilised to launch paddlecraft resulting in erosion and destabilising the shore bank. The proposed activity would mitigate this impact.</p>
c) Have any environmental impact on the ecosystem of the locality?	Low adverse	<p>An assessment provided in Section 3.3 of this REF concludes that the proposed activity would not have a significant impact upon threatened species or endangered ecological communities.</p> <p>No significant habitat features would be removed or otherwise impacted. No food resources critical to the survival of a particular species would be removed.</p> <p>Aquatic ecosystems are not likely to be affected by the proposed activity and there is not likely to be any long-term or long-lasting impact through the input of sediment and nutrient into the ecosystem.</p> <p>Environmental safeguards and mitigation measures (Section 7) would be employed to minimise risk of impacts.</p>
d) Cause a diminution of the aesthetic, recreational, scientific or other environmental	Low adverse / positive	<p>In the context of the locality, with consideration of residential nearby, the visual impact of the activity would be minimal and complimentary. The proposed activity introduces a structure adjacent to a substantially altered environment, <i>i.e.</i> residential areas and cleared foreshore.</p>



Does the proposal:	Assessment	Reason
quality or value of a locality?		<p>The proposed activity would improve recreational values of and opportunities at the locality.</p> <p>Removal of vegetation and habitat will be minimal, occurring on existing edges and not resulting in significant fragmentation of habitat.</p> <p>The area that would be affected by the proposed activity has no significant value in terms of science or other environmental qualities. The proposed activity would have no impact on these values.</p>
e) Have any effect on a locality, place or building having aesthetic, anthropological, archaeological, architectural, cultural, historical, scientific, or social significance or other special value for present or future generations?	Negligible	<p>The site of the proposed activity has no significant aesthetic, architectural, cultural, historical, scientific or social values. As such, the proposed activity would have no impact on these items.</p> <p>No items in the vicinity of the work site which are listed on the State Heritage Register and the Shoalhaven Local Environmental Plan would be impacted by the proposal.</p> <p>The site is not within an Aboriginal Place declared under the <i>National Parks and Wildlife Act 1974</i>.</p> <p>In accordance with the NSW Department of Environment, Climate Change and Water's Due Diligence Code of Practice, the proposed activity does not require an Aboriginal Heritage Impact Permit as the activity is unlikely to harm an Aboriginal artefact (refer to Section 3.4).</p>
f) Have any impact on the habitat of protected fauna (within the meaning of the Biodiversity Conservation Act 2016)?	Low adverse	<p>A small area of marginal fauna habitat will be removed by the activity. No important habitat will be removed or otherwise impacted. The potential impact is therefore considered to be insignificant or inconsequential.</p> <p>The proposed activity would not have a significant impact upon threatened fauna (refer to Section 3.3 of this REF).</p> <p>The specified environmental mitigation measures (Section 7) would mitigate indirect impacts to fauna and habitat.</p>
g) Cause any endangering of any species of animal, plant or other form of life, whether living on land, in water or in the air?	Negligible	<p>There are no species likely to rely on the site of the proposed works to the extent that modification would put them further in danger.</p> <p>The prescribed environmental safeguards and mitigation measures (Section 7 of this REF) would minimise the risk of impact on resident fauna, fish, and flora.</p>
h) Have any long-term effects on the environment?	Negligible	<p>Works would be relatively short term and the noise generated will occur during normal working hours. There</p>

Does the proposal:	Assessment	Reason
		<p>are no sensitive receivers in the vicinity of the proposed works.</p> <p>The proposed activity would not use hazardous substances or use or generate chemicals which may build up residues in the environment.</p> <p>The possible impacts have been discussed in detail under Section 3. Refer also to the conclusions and recommendations in Section 7.</p>
i) Cause any degradation of the quality of the environment?	Low-adverse	<p>Aquatic ecosystems are not likely to be affected by the proposed activity and there is not likely to be any long-term or long-lasting impact through the input of sediment and nutrient into the ecosystem.</p> <p>The proposal would not intentionally introduce noxious weeds, vermin, or feral animals into the area or contaminate the soil.</p> <p>Environmental safeguards and mitigation measures (Section 7) would be employed to minimise risk of impacts.</p>
j) Cause any risk to the safety of the environment?	Negligible	<p>The proposed activity would not involve hazardous wastes and would not lead to increased bushfire or landslip risks.</p> <p>The activity is not anticipated to adversely affect flood behaviour or exacerbate flooding risks.</p>
k) Cause any reduction in the range of beneficial uses of the environment?	Positive	<p>The site and local environment will remain relatively unchanged.</p> <p>The area is currently being used as a paddlecraft launching area in a significantly modified environment. The proposed activity would improve this use and reduce the shore erosion currently occurring.</p>
l) Cause any pollution of the environment?	Low adverse	<p>The proposal would involve a temporary and local increase in noise during the construction phase due to the use of machinery. However this will not affect any sensitive receivers such as residential areas, schools, childcare centres and hospitals. Nearby residents would be notified of noise-generating works.</p> <p>Turbidity, sediment and erosion control in accordance with the Blue Book will be implemented to minimise movement of sediment into the Lake.</p> <p>It is unlikely that the activity (including the environmental impact mitigation measures) would result in water or air pollution, spillages, dust, odours, vibration or radiation.</p> <p>The proposal does not involve the use, storage or transportation of hazardous substances or the generation of chemicals which may build up residues in the environment.</p>

Does the proposal:	Assessment	Reason
		The material that would be excavated shall be tested for the presence of potential acid sulfate soils. A full Acid Base Account assessment utilising the SPOCAS analysis shall confirm the presence of acidity, potential acidity and liming rate to neutralise the acid prior to disposal. If necessary, an acid sulfate soil management plan would be prepared to facilitate treatment.
m) Have any environmental problems associated with the disposal of waste?	Negligible	<p>The waste that would be disposed off-site can be recycled or re-used in accordance with resource recovery exemptions or taken to a licensed waste facility.</p> <p>The material that would be excavated shall be tested for the presence of potential acid sulfate soils. A full Acid Base Account assessment utilising the SPOCAS analysis shall confirm the presence of acidity, potential acidity and liming rate to neutralise the acid prior to disposal. If necessary, an acid sulfate soil management plan would be prepared to facilitate treatment.</p> <p>There would be no trackable waste, hazardous waste, liquid waste, or restricted solid waste as described in the <i>NSW Protection of the Environment Operations Act 1997</i>.</p>
n) Cause any increased demands on resources (natural or otherwise) which are, or are likely to become, in short supply?	Negligible	The amount of resources that would be used are not considered significant and would not increase demands on current resources such that they would become in short supply.
o) Have any cumulative environmental effect with other existing or likely future activities?	Negligible	<p>The assessed low adverse or negligible impacts of the proposal are not likely to interact.</p> <p>Mitigation measures (Section 7) shall be implemented to minimise the risk of cumulative environmental effects.</p> <p>The current proposal would not significantly affect habitat connectivity or reduce any significant vegetation.</p> <p>No further construction activities are planned for this location.</p>
p) Any impact on coastal processes and coastal hazards, including those under projected climate change conditions	Negligible	<p>The proposed activity would have no effect on coastal processes including those projected under climate change conditions.</p> <p>It is of no consequence that the paddlecraft launching facility would not be available at high water levels as a launching facility would not be required at this time as water levels would be at or above the banks of the lake.</p>



Does the proposal:	Assessment	Reason
q) applicable local strategic planning statements, regional strategic plans or district plans made under the Act, Division 3.1	Positive	<p>The proposed activity is consistent with the <i>Shoalhaven 2040 Strategic Land-use Planning Statement</i>, including Planning Priority 2 <i>Delivering infrastructure</i> and Planning Priority 7 <i>Promoting a responsible visitor economy</i> <a href="https://doc.shoalhaven.nsw.gov.au/displaydoc.aspx?record=D20/437277">https://doc.shoalhaven.nsw.gov.au/displaydoc.aspx?record=D20/437277</a>.</p> <p>The activity is not inconsistent with the Illawarra Shoalhaven Regional Plan 2041 <a href="https://www.planning.nsw.gov.au/-/media/Files/DPE/Plans-and-policies/Plans-for-your-area/Regional-plans/Illawarra-Shoalhaven-Regional-Plan-05-21.pdf">https://www.planning.nsw.gov.au/-/media/Files/DPE/Plans-and-policies/Plans-for-your-area/Regional-plans/Illawarra-Shoalhaven-Regional-Plan-05-21.pdf</a>. Although the area of the proposed activity is mapped in the Planning Statement as “high environmental value” or “habitat corridor”, the vegetation proposed to be removed is minor and would not have a significant impact (refer to Section 3.2)</p>
r) other relevant environmental factors	n/a	Environmental factors have been addressed in Section 3 of this REF.

## 4. PERMISSIBILITY

### 4.1 *Environmental Planning & Assessment Act 1979*

Section 4.1 (Development that does not need consent) of the *Environmental Planning and Assessment Act 1979* (EP&A Act) states that:

*“If an environmental planning instrument provides that specified development may be carried out without the need for development consent, a person may carry the development out, in accordance with the instrument, on land to which the provision applies.”*

In this regard, Section 2.80(4) of the NSW *State Environmental Planning Policy (Transport and Infrastructure) 2021* (Transport and Infrastructure SEPP) states “development for the purpose of wharf or boating facilities may be carried out by or on behalf of a public authority without consent on any land.” “Wharf or boating facilities includes the facilities for launching any vessel, not just boats (refer to Dictionary in the Standard Instrument

<https://legislation.nsw.gov.au/view/html/inforce/current/epi-2006-155a#dict>). Clause 2.80(4) of the Transport and Infrastructure SEPP therefore applies, and the proposed activity does not require development consent.

As the proposed activity does not require development consent, and as it constitutes an ‘activity’ for the purposes of Part 5 of the EP&A Act, being carried out by (or on behalf of) a public authority, environmental assessment under Part 5 of the EP&A Act is required. This REF provides this assessment.

### 4.2 *Fisheries Management Act 1994*

Tabourie Lake is mapped as Key Fish Habitat for the purposes of the Fisheries Management Act 1994. The proposed activity will involve reclamation and dredging as defined in the Act.

The proposed activity would involve reclamation (rock revetment and piling) and dredging (excavation for concrete strip footing). Reclamation and dredging is regulated under Part 7 Division 3 of the Act <https://legislation.nsw.gov.au/view/html/inforce/current/act-1994-038#pt.7-div.3>. Section 200 of the Act prescribes circumstances where a local government can carry out dredging, *i.e.*:

- Under the authority of a permit (“Fisheries Permit”), or
- Work authorised under the Crown Land Management Act 2016, or
- Work authorised by a relevant public authority (other than a local government authority).

A permit issued under section 200 of the Act by NSW Department of Primary Industries (Fisheries) would ordinarily be required prior to commencing any works.

As the proposed activity requires authorisation under the *Crown Land Management Act 2016* (refer to Section 4.2 of this REF above), a separate Fisheries Permit associated with dredging and / or reclamation is not required.

There is no live marine vegetation or saltmarsh at the site of the proposed activity. Marine vegetation in the form of Eelgrass wrack may however be present during the construction of the paddlecraft facility. Wrack is protected from harm under Section 204A of the Act. ‘Harm’ includes to “gather, cut, pull up, destroy, poison, dig up, remove, injure, prevent light from reaching or

*otherwise harm the marine vegetation, or any part of it*" (s.204). If wrack is present at the time of construction the wrack is to be moved aside and left on-site, otherwise, a Fisheries Permit must be obtained prior to the works that may 'harm' the wrack.

Regarding the other provisions and controls in the Act the proposed activity:

- would not affect declared aquatic reserves (Part 7, Division 2 of the Act);
- would not involve blocking the passage of fish (s.219);
- would not impact mangroves (Part 7, Division 4);
- would not involve disturbance to gravel beds where salmon or trout spawn (s.208 of the Act);
- does not involve the release of live fish (Part 7, Division 7);
- does not involve the construction of dams and weirs (s.218);
- would not result in the blocking of the passage of fish;
- would not use explosives in a watercourse (Clauses 70 and 71 of the *Fisheries Management (General) Regulation 2019*).

The seven-part test of significance, provided in Section 3.3.1 of this REF, determined that the proposed activity is unlikely to significantly affect threatened species, populations or ecological communities. A species impact statement is not required.

#### 4.3 Crown Land Management Act 2016

The proposed activity would be undertaken on:

- Crown Land Reserve R59624 to which SCC is not the appointed land manager but has 'devolved' control and responsibility under Section 48 of the NSW *Local Government Act 1993*.
- The bed and shore of Tabourie Lake which is Crown Land.

Under Section 9.2 of the *Crown Land Management Act 2016*, a person must not erect a structure on Crown Land without authority (<https://legislation.nsw.gov.au/view/html/inforce/current/act-2016-058#sec.9.2>). To obtain authority, a Crown Lands Licence, issued under Section 5.21 of the Act must be obtained prior to the commencement of works.



#### 4.4 Other

A summary of other relevant legislation and permissibility is provided in Table 2 below.

**Table 2: Summary of other relevant legislation and permissibility**

<b>NSW STATE LEGISLATION</b>	
<b><i>Environmental Planning and Assessment Act 1979 (EP&amp;A Act)</i></b>	
Permissible	√ Not permissible <input type="checkbox"/>
<p>Justification:</p> <p>The Transport and Infrastructure SEPP provides for the proposed works to be undertaken without development consent (refer above). In circumstances where development consent is not required, the environmental assessment provisions outlined in Part 5 of the Act are required to be complied with. This REF fulfils this requirement.</p>	
<b><i>Protection of the Environment Operations Act 1997</i></b>	
Permissible	√ Not permissible <input type="checkbox"/>
<p>Justification: The proposed activity does not constitute scheduled development work or scheduled activities as listed in Schedule 1 of the Act. The proposed activity therefore does not require an environmental protection licence.</p>	
<b><i>Local Land Services Act 2013</i></b>	
Permissible	√ Not permissible <input type="checkbox"/>
<p>Justification:</p> <p>Any clearing of vegetation would be of a kind authorised under Section 60O(b)(ii) of the Local Land Services Act 2016 ("an activity carried out by a determining authority within the meaning of Part 5 of the Act after compliance with that Part."). No separate authorisation under the Act is required.</p>	
<b><i>National Parks and Wildlife Act 1974 (NP&amp;W Act)</i></b>	
Permissible	√ Not permissible <input type="checkbox"/>
<p>Justification:</p> <ul style="list-style-type: none"> <li>The proposed activity would not encroach into National Park estate.</li> <li>The Act provides the basis for the legal protection and management of Aboriginal sites in NSW. Under Sections 86 and 90 of the Act it is an offence to disturb an Aboriginal object or knowingly destroy or damage, or cause the destruction or damage to, an Aboriginal object or place, except in accordance with a permit of consent under section 87 and 90 of the Act.</li> <li>As there are no recorded sites or visible objects and as the site is on 'disturbed land', the Due Diligence Guidelines (DECCW 2010) requires no further assessment as it is reasonable to conclude that there is a low probability of objects occurring in the area of the proposed activity and an AHIP is not required. Refer to Section 3.4 of this REF for more information.</li> </ul>	

### **Biodiversity Conservation Act 2016**

Permissible ☒ Not permissible ☐

#### **Justification:**

- The proposed activity is unlikely to have a significant impact on species and communities listed in the schedules of the Act (refer to Section 3.2 of this REF).
- The proposed development is not within an area declared to be of “outstanding biodiversity value” as defined in the Act.
- The design and mitigation measures (Section 7) would ensure that no *serious and irreversible impacts on biodiversity values* (as defined by the BC Act) occur at the site of the proposed activity.

The proposed activity therefore is not deemed to be *likely to significantly affect threatened species* and an environmental impact statement (EIS) or a Biodiversity Development Assessment Report (BDAR) is not required.

It is also a defence to a prosecution for an offence under Part 2 of the Act (harming animals, picking plants, damaging the habitat of threatened species or ecological communities *etc*) if the work was essential for the carrying out of an activity by a determining authority within the meaning of Part 5 of the *Environmental Planning and Assessment Act 1979* after compliance with that Part. The activity will not remove vegetation that is listed under Schedule 1 Threatened Species, Schedule 2 Threatened ecological communities and Schedule 6 Protected Plants. Therefore the activity is considered permissible as this REF has been prepared and determined in accordance with the EP&A Act.

### **Water Management Act 2000**

Permissible ☒ Not permissible ☐

#### **Justification:**

- Local councils are exempt from s.91E(1) of the Act in relation to all controlled activities that they carry out in, on or under waterfront land (by virtue of clause 41 of the *Water Management (General) Regulation 2018*).
- The proposal would not interfere with the aquifer and therefore an interference licence is not required (s.91F).

### **State Environmental Planning Policy (Hazards and Resilience) 2021**

Permissible ☒ Not permissible ☐

#### **Justification:**

The proposed activity is not mapped as comprising coastal wetlands or littoral rainforest for the purpose of this SEPP. Other considerations of the SEPP are not applicable to the proposed activity.

### **Heritage Act 1977**

Permissible ☒ Not permissible ☐

The proposed activity would not disturb an item of state heritage significance. The proposal would constitute 'minor works' under 'Relics of local heritage significance: a guide for minor works with limited impact'. The proposal would not result in any direct impacts on heritage items or values. Works can be undertaken with caution under an applicable exception under s139(1) and (2) of the Act.

### **COMMONWEALTH LEGISLATION**

#### **Commonwealth *Environment Protection and Biodiversity Conservation Act 1999 (EP&BC Act)***

Permissible ☒ Not permissible ☐

##### **Justification:**

The proposed activity would not be undertaken on Commonwealth land and no matters of National Environmental Significance are likely to be significantly impacted by the proposed activity. The proposed activity is therefore not a controlled action and does not require commonwealth referral.

#### **Commonwealth *Native Title Act 1993***

Permissible ☒ Not permissible ☐

##### **Justification:**

- The proposed activity would affect Native Title.
- The applicable future act option is provided by Subdivision K (Facilities for Services to the Public) for the following reasons:
  - Most of the proposed activity (i.e. installation of the structure) would occur beyond the Crown Reserve R59624 and over the bed of Tabourie Lake, so Subdivision J would not apply.
  - The proposed activity relates to an onshore place.
  - The proposed activity relates to the construction, operation, use, maintenance or repair, by a local government body (i.e. Shoalhaven City Council), any of the things listed in S.24KA(2) (i.e. (b) a jetty or wharf and (m) any other thing that is similar to any one or more of the things mentioned in the paragraphs above)
  - The proposed activity would not prevent native title holders from having access to land and waters in the vicinity of the facility.
- An assessment was submitted to SCC's Native Title Manager for appropriate action on the 3 February 2023 (D23/39526). No further action by the proponent of the activity is required.



## 5. CONSULTATION WITH GOVERNMENT AGENCIES

### Section 2.10 – Consultation with councils - development with impacts on council-related infrastructure or services

No impacts to stormwater management systems, traffic and roads, sewerage systems, water infrastructure, nor excavation of footpaths, such as described under Section 2.10 (1) would occur.

The proposed activity may enclose a public space that may cause a disruption to pedestrians. As a consequence, a Notice of Intention was submitted to SCC's Environmental Services as it may be considered a 'natural area' to which Environmental Services are the 'asset custodian' on 3 February 2023 (SCC reference D23/39439). A response was received on 8 February 2023 (D23/144511) and stated:

"To include submission of *Native Title Futures Act Referral Notice*.

Many vessels are wheeled down to the water. The omission of a ramp will demand boats be dragged down steps to low water level for launching, which is not popular with users (*feedback from when I construct paddlecraft ramp with community at Bamarang Reserve into Calymea Ck*).

No mention of site rehabilitation or bank stabilisation in immediate area post construction. *Revegetation? Geofabrics? Other stabilisation strategies?"*

In response:

- Native Title Futures Act assessment was submitted to SCC's Native Title Manager on February 2023 (SCC D23/39526).
- The ramp was omitted due to budget constraints and recommendation from the community.
- Revetment and drainage would be installed to stabilised the area post construction.

No further consultation is required.

### Section 2.11 – Consultation with councils - development with impacts on local heritage

No impacts to any local heritage item would occur. Consultation under Section 2.11 is therefore not required.

### Section 2.12 – Consultation with councils - development with impacts on flood liable land

The proposed activity would be on flood liable land. As a consequence, a notice of intention was sent to SCC floodplain engineers on 4 February 2023 (D23/39439). A response was received on 14 February 2023 (D23/93522). The response states:

*"The location of the proposed Paddlecraft Launching Facility comprises a 1% AEP high hazard floodway combined hazard and hydraulic category and 2050 scenario Flood Planning Level of 3.6m AHD. Based on the concept design drawings the Paddlecraft Launching Facility will be constructed close to the existing ground level and hence will not result in adverse flood impacts.*

*The Paddlecraft Launching Facility should be constructed from flood compatible materials (as the entire structure is located below the flood planning level), all electrical installations should be constructed above the flood planning level (although there do not appear to be*

any) and the structure should be designed to withstand the forces of floodwater (including debris and buoyancy forces) up to the 1% AEP event.

*It is noted that the concept drawings shows the “high water level” at 1.2m AHD and upper platform 0.2m above this at 1.4m AHD. The planned opening level for Tabourie Lake is 1.3m AHD. Hence assuming the “high water level” refers to the trigger level in which Tabourie Lake would be mechanically opened by Council, then this should be updated to 1.3m AHD – which may also result in the need to raise the upper platform level.*

*Finally based on the contours provided on the plans, the Paddlecraft Launching Facility appears to be located in a local depression. If this area has an existing catchment, stormwater runoff could become concentrated beneath the Paddlecraft Launching Facility which could result in erosion given there will be no long-term vegetation beneath the structure.”*

In response:

- The structure would be constructed predominantly of fibre reinforced plastic (FRP) which is flood compatible.
- Electrical installations are not proposed.
- Forces of floodwater have been taken into account during the design (MI Engineers 2023).
- 1.2m AHD is the mean high water level as provided by Manly Hydraulics Laboratory (MHL) and represents the surface level of the shore.
- It is acknowledged that as the trigger level for opening the Lake’s entrance is 1.3m AHD, the entire facility could be inundated during higher lake levels and not be able to be utilised until flood waters recede. This was acceptable to the community and avoids the need to raise local surface areas to match.
- Rock revetment would be provided on the lake side of the concrete strip footing. The depth of the strip footing was determined to accommodate the slight surface depression on site. Subsoil drainage would also be installed to divert stormwater around the strip footing and the facility to limit/prevent erosion.

No further consultation is required.

#### Section 2.13 – Consultation with State Emergency Service (SES) - development with impacts on flood liable land

Although the proposed activity would be on flood liable land, the proposed activity does not constitute a “relevant provision” prescribed in the SEPP (Section 2.13(2) <https://legislation.nsw.gov.au/view/html/inforce/current/epi-2021-0732#sec.2.13>) . Notification to SES is therefore not required.

#### Section 2.14 – Consultation with councils - development with impacts on certain land within the coastal zone

The proposal would not occur within a coastal vulnerability area. Consultation is therefore not required.

### Section 2.15 – Consultation with public authorities other than councils

In consideration of the other consultation requirements specified under Section 2.15 of the Transport and Infrastructure SEPP, the proposed activity:

- would not be undertaken adjacent to land reserved under the *National Parks and Wildlife Act 1974* or land acquired under that Act
- would not be undertaken on land in Zone E1 National Parks and Nature Reserves or in an equivalent land use zone.
- would not increase the amount of artificial light in the night sky and located on land within the dark sky region as identified on the dark sky region map
- would not be undertaken within Defence communications facility buffer (only relevant to the defence communications facility near Morundah)
- would not be undertaken on land in a mine subsidence district within the meaning of the *Mine Subsidence Compensation Act 1961*
- would not have an impact on the Willandra Lakes Region World Heritage Property
- would not occur in a Western City operational area specified in the *Western Parkland City Authority Act 2018*.

These prescribed consultation requirements therefore do not apply.

The proposed activity does comprise a fixed or floating structure in or over navigable waters. In accordance with Section 2.15(2)(c) a Notice of Intention was forwarded onto Transport for NSW on the 3 February 2023 (SCC reference D23/39390). A response was received on the 8 February 2023 (SCC reference D23/91654). The response confirmed that Transport for NSW have no objection to the proposed activity. However, it was stated that “*It is important to note that the proponent, or other entity or contractor acting on their behalf, are not exempt from the provisions of the Marine Safety Act 1998, or any other relevant legislation, and all parties must comply with any direction given by NSW Maritime Authorised officers with regard to safe navigation or the prevention of pollution*”. A copy of the determination of consent was also requested. Both items are included in the environmental impact mitigation measures and safeguards prescribed in Section 7 of this REF.

### Section 2.16 – Consideration of Planning for Bush Fire Protection (PBP)

The proposed activity is not a development prescribed in this section (health services facilities, correctional centres, residential accommodation). Consideration of PBP is therefore not required.



## 6. COMMUNITY ENGAGEMENT

In accordance with Council's Community Engagement Policy, the proposal constitutes a *Local Area – Low Impact* activity.

The proposed activity was initiated by the local community under the Recreational Fishing and Camping Facilities Program and the local community, via the Tabourie Lake Ratepayers and Residents Association – TLRAA, have been consulted on a regular basis and were involved in determining the location of the facility and were involved in many of the design decisions and iterations. The TLRAA agreed with the concept and final design. Relevant documents include D23/48444, D23/12710 and D22/479527. Apart from progress updates, no further engagement is required. However as a courtesy, the owners and occupants of adjacent properties (30 and 32 Centre Street and 31 Bridge Street) shall be informed of the commencement date and relevant contact details at least a week prior to noise-generating works.

These engagement recommendations are reflected in the environmental impact mitigation measures and safeguards specified in Section 7 of this REF.

## 7. ENVIRONMENTAL SAFEGUARDS AND MEASURES TO MINIMISE IMPACTS

Safeguard / Measure	Responsibility
<b>Works planning, approvals, consultation &amp; notification</b>	
1. A Fisheries Permit shall be obtained for the dredging, reclamation and harm to marine vegetation (if 'harm' to Eelgrass wrack is required) prior to commencement of works.	SCC Project Manager (PM), SCC Environmental Operations Officer (EOO), and Construction Contractor
2. A Crown Lands licence shall be obtained prior to the commencement of works.	SCC PM, SCC EOO, and Construction Contractor
3. This REF shall be published on the NSW Planning Portal	SCC EOO
4. A copy of the determined REF shall be forwarded to Transport for NSW - Maritime	SCC EOO
5. The owners and occupants of adjacent properties (30 and 32 Centre Street and 31 Bridge Street) shall be informed of the commencement date and relevant contact details at least a week prior to noise-generating works.	SCC PM
6. The material that would be excavated shall be tested for the presence of potential acid sulfate soils prior to excavation. A full Acid Base Account assessment utilising the SPOCAS analysis shall confirm the presence of acidity, potential acidity and liming rate to neutralise the acid prior to disposal. If necessary, an acid sulfate soil management plan shall be prepared to facilitate treatment.	SCC EOO
<b>Site Establishment</b>	
7. Erosion and sediment controls in accordance with the 'Blue Book' (Landcom 2004) shall be installed and maintained to prevent the entry of sediment into waterways i.e. water diversion, minimising disturbance, erosion control, sediment capture and rapid re-establishment.	Site Manager; Construction Contractor
8. A hydrocarbon floating boom with turbidity curtain shall be installed in the Lake around the work site and: <ul style="list-style-type: none"> <li>a. the curtain shall be installed prior to the commencement of the activity.</li> </ul>	Construction Contractor

Safeguard / Measure	Responsibility
<ul style="list-style-type: none"> <li>b. a minimum of one curtain shall be installed to form a perimeter around the works site.</li> <li>c. the turbidity curtain shall be affixed so that there are no breaches or gaps between the curtain, hydrocarbon boom, and shoreline interface.</li> <li>d. the curtain shall be appropriately managed throughout the duration of the works. The primary curtain shall continually be monitored for visible signs of fuel spills or turbidity plumes, the perimeter of the curtain shall be inspected prior to undertaking the works each day and following a major rainfall or stormwater event.</li> <li>e. If the turbidity curtain is damaged and/or breached and pollution of the surrounding waters is imminent, all work shall immediately cease. Works shall not recommence until turbidity in the vicinity of the works area has returned to baseline conditions, the curtain repaired or replaced and the cause of the damage/breach is established and preventative measures implemented.</li> <li>f. Prior to the removal of the turbidity curtain and hydrocarbon floating boom, any sediment / turbidity shall be allowed to settle to further minimise the dispersion of suspended sediments.</li> </ul>	
<p>9. A Construction Environmental Management Plan (CEMP) for the proposed activity shall be prepared to address the prescribed safeguards and measures within this REF and any conditions specified in the Fisheries Permit and Crown Lands Licence.</p>	Construction Contractor
<b>Construction works</b>	
<p>10. Works shall be compliant with the conditions of the Fisheries Permit and Crown Lands Licence</p>	SCC PM and Construction Contractor
<p>11. All parties must comply with any direction given by authorised officers of the Transport for NSW Maritime, NSW Department of Primary Industries, and NSW Environment Protection Authority with regard to safe navigation and the prevention of pollution.</p>	SCC PM and Construction Contractor
<p>12. Erosion and sediment controls and the hydrocarbon boom and silt curtain shall be maintained in good working order</p>	Construction Contractor



Safeguard / Measure	Responsibility
for the duration of the works and subsequently until the site has been stabilised and the risk of erosion, sediment dispersal or hydrocarbon pollution (fuels and oils) is minimal.	
13. Vegetation removal shall be undertaken only to the extent required to carry out the works.	Construction Contractor
14. Eelgrass wrack shall be left on site (can be moved).	Construction Contractor
15. An emergency spill kit shall be always kept on-site with procedures to contain and collect any leakage or spillage of fuels, oils, greases, etc from plant and equipment.	Construction Contractor
16. Staff working at the site will be instructed to stop work immediately on identification of any suspected Aboriginal heritage artefact. If any objects are found, NSW Department of Planning, Industry and Environment (ph:131 555) shall be contacted.	Construction Contractor
17. Noise-generating construction activities shall be limited to the following hours to limit noise and traffic impacts to adjacent residents: 7:00 am to 6:00 pm Monday to Friday and 8:00 am to 5:00 pm Saturdays.	Construction Contractor
18. Any stockpiles of soil shall be located at least 10 metres away from the estuary and any stormwater flow-paths with erosion and sediment controls in place in accordance with the 'Blue Book' (Landcom 2004).	Construction Contractor
19. Any waste shall be managed, transported, stored, collected and disposed of in an environmentally satisfactory manner pursuant to NSW <i>Protection of the Environment Operations Act 1997</i> , and that all reasonable measures regarding the control and prevention of pollution and waste from being introduced into the estuary are implemented.	Construction Contractor
<b>Post construction</b>	
20. An asset form <u>must</u> be trimmed to file 44574E on commissioning of the assets in Accordance with POL15/8 Asset Accounting Policy section 3.1.4 and POL16/79 Asset Management Policy section 3.3.	SCC PM

## 8. SIGNIFICANCE EVALUATION & DECISION STATEMENT

This Review of Environmental Factors has assessed the likely environmental impacts, in the context of Part 5 of the *Environmental Planning and Assessment Act 1979*, of a proposal by Shoalhaven City Council to install a paddlecraft launching facility into Tabourie Lake near Short Street, Lake Tabourie.

In consideration of the proposal as described in Section 1, in accordance with any design plans referred to in this report, and assuming the implementation of all proposed safeguards and mitigation measures (Section 7), it is determined that:

1. It is unlikely that there will be any significant environmental impact as a result of the proposed work and an Environmental Impact Statement is not required for the proposed works.
2. The proposed activity will not be carried out in a declared area of outstanding biodiversity value and is not likely to significantly affect threatened species, populations or ecological communities, or their habitats and a Species Impact Statement / BDAR is not required.
3. The following statutory approvals, licences, permits and external government consultations are required:
  - a. Fisheries Permit for dredging and reclamation - s.200 (and potentially s.205) of the *Fisheries Management Act 1994*
  - b. Crown Lands licence - s.5.21 of the *Crown Land Management Act 2016*).
4. The proposed activity may proceed.

In accepting and adopting this REF, Shoalhaven City Council commits to ensuring the implementation of the proposed safeguards and mitigation measures identified in this report (Section 7) to minimise and/or prevent detrimental environmental impacts.

**Determined by:**



Paul McKenzie  
Acting - District Engineer - Southern  
Shoalhaven City Council

Date: 18/04/2023

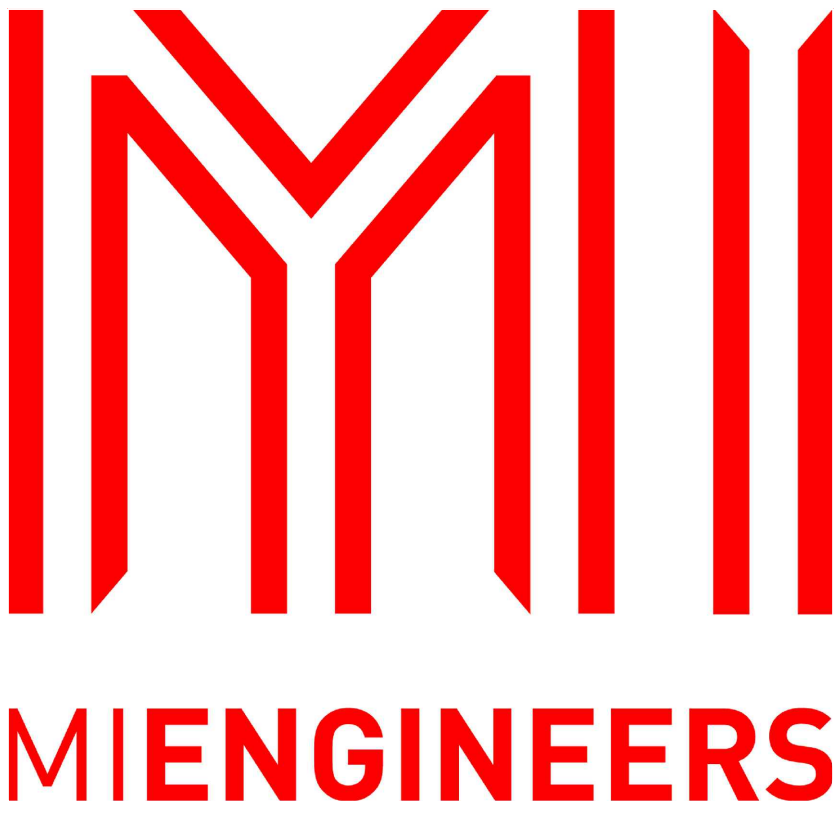
## 9. REFERENCES

- ASSMAC (Acid Sulfate Soils Management Advisory Committee) 1998 *Acid Sulfate Soils Manual*. ISBN 0 7347 0000 8
- DECCW (Department of Environment, Climate Change and Water, NSW) 2010 Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales. Available at: [https://www.dpi.nsw.gov.au/\\_data/assets/pdf\\_file/0005/634694/Policy-and-guidelines-for-fish-habitat.pdf](https://www.dpi.nsw.gov.au/_data/assets/pdf_file/0005/634694/Policy-and-guidelines-for-fish-habitat.pdf)
- Geofirst Pty Ltd 2022 *Geotechnical Report: Geotechnical Assessment for Proposed Paddlecraft Launching Facility Northern End of Short Street, Lake Tabourie NSW 2539*.
- Landcom 2004 *Managing Urban Stormwater: Soils and Construction – Volume 1*. Published by Landcom ISBN 0-97520-3037 <https://www.environment.nsw.gov.au/research-and-publications/publications-search/managing-urban-stormwater-soils-and-construction-volume-1-4th-edition>
- MI Engineers (2023) *Design Report – Proposed Paddlecraft Launching Facility: Short Street, Lake Tabourie, NSW 2539*. Unpublished report for Shoalhaven City Council (MI Engineers reference DN220293.R01c, SCC reference D23/87092).
- Personal communications**
- Stone, M. 2023 *Lead – Floodplain Management – Shoalhaven City Council* (SCC reference D23/93522)



## APPENDIX A – The Activity





SYDNEY OFFICE  
Level 1, 83 - 89 Renwick Street, Redfern 2016  
Tel (02) 8396 6565

SOUTH COAST OFFICE  
49 Berry Street, Nowra NSW 2541  
Tel (02) 4423 0566

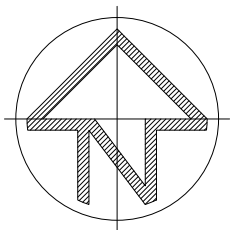
WOLLONGONG OFFICE  
Suite 3, 128/134 Crown Street, Wollongong NSW 2500  
Tel (02) 4423 0566

www.miengineers.com

# PADDLECRAFT LAUNCHING FACILITY

## SHORT ST, LAKE TABOURIE

### DETAILED DESIGN



### DRAWING INDEX

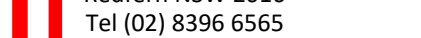

SCC	MIE
4519.02	DN220293 S001 COVER SHEET
4519.03	DN220293 S002 NOTES SHEET
4519.04	DN220293 S003 GENERAL ARRANGEMENT PLAN
4519.05	DN220293 S005 PADDLECRAFT LAUNCHING FACILITY
4519.06	DN220293 S010 FACILITY DETAILS



APPROXIMATE AREA OF WORKS

LOCALITY PLAN  
N.T.S.



REVISION	AMENDMENTS	DATE	CKD	APP	CLIENT:	ARCHITECT:	PROJECT :				DESIGNED:	DRAWN:	SCALE:	SHEET SIZE:					
1	ISSUED FOR CONSTRUCTION	07.03.23	TS	TS	<div>- APPROVED FOR USE -</div> <div></div> <div>PLAN REFERENCE</div> <div>4519.02</div>	<div></div> <div>MIENGINEERS</div>	SYDNEY OFFICE 83 - 89 Renwick Street, Redfern NSW 2016 Tel (02) 8396 6565	SOUTH COAST OFFICE 49 Berry Street, Nowra NSW 2541 Tel (02) 4423 0566	WOLLONGONG OFFICE Suite 3a, 128-134 Crown Street, Wollongong NSW 2500 Tel (02) 4423 0566	MIENGINEERS.COM	THIS DRAWING AND THE CONCEPTS CONTAINED THEREIN ARE THE PROPERTY OF MI ENGINEERS. NO UNAUTHORISED COPYING IS PERMITTED. NOTHING IS TO BE CONSTRUCTED BASED ON THIS DRAWING, OR PART OF THIS DRAWING, WITHOUT THE WRITTEN PERMISSION OF MI ENGINEERS. DRAWINGS TO BE READ IN CONJUNCTION WITH OTHER RELATED DESIGN DOCUMENTATION. FURTHERMORE, WHERE MIENGINEERS RELIES ON THE INFORMATION SUPPLIED BY OTHERS TO PRODUCE THE DESIGNS, WE ACCEPT NO LIABILITY FOR ERRORS, TO THE EXTENT THAT THE DESIGN HAS MADE RELIANCE ON THIS INFORMATION. MUST BE READ IN COLOUR	PADDLECRAFT LAUNCHING FACILITY SHORT ST, LAKE TABOURIE DETAILED DESIGN				TS	SP	-	A1
B	ISSUED FOR REVIEW	20.12.22	TS	TS								DRAWING STATUS				DRAWING No.			
A	ISSUED FOR REVIEW	23.11.22	TS	TS								CONSTRUCTION				S001			
												DRAWING NAME:				REVISION:			
												COVER SHEET				1			
												PROJECT No.				DN220293			



GENERAL NOTES

1. MAXIMUM DEPTH OF FILL (OTHER THAN BELOW) SHALL BE 400mm DEEP AND WELL COMPACTED IN 150mm LAYERS (AFTER COMPACTION) BY A MECHANICAL ROLLER. THIS FILL SHALL BE MOIST DURING COMPACTION.  
OR  
APPROVED SOUND GRANULAR FILL (FREE OF MATERIAL THAT WOULD PRECLUDE COMPACTION) SHALL BE PLACED TO A MAXIMUM DEPTH OF 800mm. FILL IS TO BE PLACED IN 200mm LAYERS (AFTER COMPACTION) BY A VIBRATING PLATE OR VIBRATING ROLLER. WHERE DEPTH OF FILL EXCEEDS 800mm CONTROLLED FILL SHALL BE PLACED IN ACCORDANCE WITH AS3798 (SEE TABLE 5.1 MINIMUM RELATIVE COMPACTION - ITEM 2) AND CERTIFIED BY A SUITABLY QUALIFIED GEOTECHNICAL ENGINEER. IF SOFT SPOTS ARE ENCOUNTERED THEN ALL SOFT MATERIAL IS TO BE REMOVED AND THEN BACKFILLED WITH A SUITABLE MATERIAL COMPACTED AS SPECIFIED ABOVE.
2. REMOVE ALL TOPSOIL, SOFT GROUND, GRASS AND OTHER DELETERIOUS MATERIAL FROM UNDER NEW FOUNDATIONS PRIOR TO CONSTRUCTION.
3. THE BUILDER AND OWNER ARE TO ENSURE THAT SITE DRAINAGE AND FOUNDATION MAINTENANCE IS CARRIED OUT IN ACCORDANCE WITH APPENDIX B OF AS2870 AS ENCLOSED IN THE SPECIFICATION. NOTE: DAMAGE CAN BE EXPECTED IF THE RECOMMENDATIONS OF APPENDIX B ARE NOT COMPLIED WITH.
4. THE ENGINEER SHALL VIEW AND APPROVE ALL CONCRETE WORK PRIOR TO THE POURING OF ANY CONCRETE.
5. THE INFORMATION CONTAINED ON THESE DRAWINGS IS FOR STRUCTURAL PURPOSES ONLY. IN ALL OTHER MATTERS, THE APPROVED ARCHITECTURAL DRAWING SHALL TAKE PRECEDENCE. ALL DISCREPANCIES SHALL BE REFERRED TO THE ENGINEER PRIOR TO PROCEEDING WITH CONSTRUCTION.
6. ALL WORK SHALL BE PROTECTED FROM TERMITE ATTACK IN ACCORDANCE WITH AS3660.1 AND LOCAL AUTHORITY REQUIREMENTS.
7. DURING CONSTRUCTION, THE STRUCTURE SHALL BE MAINTAINED IN A STABLE CONDITION AND NO PART SHALL BE OVERSTRESSED. THE DESIGN INSTALLATION AND MAINTENANCE OF ALL TEMPORARY PROPPING, BRACING AND SHORING SHALL BE PROVIDED BY THE CONTRACTOR TO KEEP THE WORKS AND EXCAVATIONS STABLE AT ALL TIMES. THE COST OF ALL SUCH WORK SHALL BE DEEMED TO BE INCLUDED IN THE CONTRACTORS TENDER.
8. ON CLASS H OR CLASS E SITES, PLUMBING AND DRAINAGE MUST BE CONSTRUCTED IN ACCORDANCE WITH THE RELEVANT SPECIFICATION.
9. THE BUILDER SHALL ENSURE THAT THE GROUND SURROUNDING THE STRUCTURE SLOPES AWAY FROM THE BUILDING WITH IMPERVIOUS MATERIALS.
10. ALL WORKS CONDUCTED SHALL BE IN ACCORDANCE WITH THE CURRENT EDITION OF THE RELEVANT AUSTRALIAN STANDARDS (INCLUDING ALL AMENDMENTS) AND THE CURRENT EDITION OF THE BUILDING CODE OF AUSTRALIA.
11. PROVIDE FINISHES AND FIXTURES THAT ALLOW FOR RELATIVE MOVEMENT BETWEEN OLD AND NEW STRUCTURES, TYPICAL.
12. WHERE ROCK IS ENCOUNTERED THE REMAINDER OF THE FOOTING SYSTEM SHALL BE FOUNDED ON ROCK AS APPROVED BY THE ENGINEER.
13. IN BUILDINGS WITH MASONRY AND/OR CONCRETE SURFACES EXPOSED TO SALINE SOILS OR ACID SULPHATE SOILS, THE CONCRETE RAFT, SLAB, STRIP OR PAD FOOTING SHALL BE PROTECTED FROM THE AGGRESSIVE SOIL OR GROUNDWATER BY:  
- ISOLATION OF THE CONCRETE OR MASONRY FROM THE AGGRESSIVE SOIL BY INSTALLING 0.5mm THICK DAMP-PROOFING MATERIAL IN ACCORDANCE WITH AS2870 AND AS2904.
14. THE CONTRACTOR IS TO ENSURE THAT ALL WORK IS DONE IN A SAFE MANNER AND IN ACCORDANCE WITH ALL APPLICABLE SAFEWORK NSW REGULATIONS AND ANY OTHER APPLICABLE STATUTORY AUTHORITY REGULATIONS.
15. THE OWNERS ATTENTION IS DRAWN TO THE ACCEPTABLE LEVELS OF FOUNDATION PERFORMANCE AS OUTLINED BY AS 2870. ACCORDINGLY CATEGORY 1 OR 2 DAMAGE MAY BE EXPECTED UNDER SOME CONDITIONS. SHOULD A HIGHER LEVEL OF CRACK CONTROL BE REQUIRED THEN THE ENGINEER SHOULD BE NOTIFIED SO THAT THIS CAN BE INCORPORATED INTO THE DESIGN.
16. IT IS THE CONTRACTOR'S RESPONSIBILITY TO CHECK THE LOCATION OF ALL EXISTING AND PROPOSED SERVICES PRIOR TO START OF CONSTRUCTION AND TO ALLOW TO ADJUST THESE AS REQUIRED TO PROVIDE FOR THE INTENT OF THE DESIGN.
17. WHERE MIENGINEERS RELIES ON THE INFORMATION SUPPLIED BY OTHERS TO PRODUCE THE DESIGNS, WE ACCEPT NO LIABILITY FOR ERRORS, TO THE EXTENT THAT THE DESIGN HAS MADE RELIANCE ON THIS INFORMATION.

CONCRETE NOTES

1. ALL WORKMANSHIP AND MATERIALS SHALL COMPLY WITH THE CURRENT EDITION OF AS3600 AND AS2870 FOR RESIDENTIAL CONSTRUCTION.
2. CONCRETE SHALL CONFORM TO THE FOLLOWING UNLESS NOTED OTHERWISE:
  - CEMENT TYPE GB TO AS3972
  - SLUMP OF 80mm ±10mm
  - MAXIMUM AGGREGATE SIZE OF 20mm
  - MAXIMUM DRYING SHRINKAGE STRAIN (TO AS1012 PART 13) SHALL NOT EXCEED 1000 MICROSTRAIN AT 56 DAYS UNLESS DESIGNATED AS SHRINKAGE LIMITED (SL)
  - STRENGTH GRADES FOR NORMAL CLASS (N) OR SPECIAL CLASS (S) AS SHOWN IN GENERAL NOTES
3. UNLESS NOTED OTHERWISE, THE CONCRETE MIX DESIGN SHALL MEET THE SPECIFICATION AND THE FOLLOWING CRITERIA:

ELEMENT	GRADE (MPa)	MIN. CEMENT CONTENT	W/C RATIO
FOOTINGS	N50	300	0.45

4. CLEAR CONCRETE COVER TO REINFORCEMENT SHALL BE AS FOLLOWS U.N.O.:

ELEMENT	TOP (mm)	BOTTOM (mm)	SIDE (mm)
FOOTINGS	65	65	65

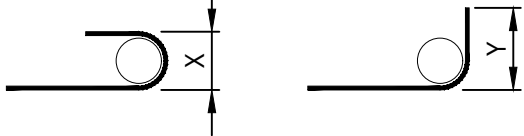
5. THE SIZES OF THE CONCRETE ELEMENTS DO NOT INCLUDE THICKNESSES OF ANY APPLIED FINISHES.
6. ALL CONCRETE SHALL BE COMPACTED ADEQUATELY IN ACCORDANCE WITH AS3600 BY THE USE OF A MECHANICAL VIBRATOR.
7. ALL CONCRETE SHALL BE CURED IN ACCORDANCE WITH AS3600.
8. BRICKWORK SHALL BE ARTICULATED CORRESPONDING TO THE LOCATIONS OF ANY KEYED JOINTS.
9. REINFORCEMENT SYMBOLS:  
N - DENOTES GRADE D500L DEFORMED BARS TO AS4671  
R - DENOTES GRADE R230N ROUND BARS TO AS4671  
SL - DENOTES WELDED GRADE D500L REINFORCING FABRIC TO AS4671
10. REINFORCEMENT IS REPRESENTED DIAGRAMMATICALLY AND NOT NECESSARILY IN TRUE PROJECTION.
11. SPLICES IN REINFORCEMENT SHALL BE MADE ONLY IN POSITIONS SHOWN OR OTHERWISE APPROVED IN WRITING BY THE ENGINEER. LAPS SHALL BE IN ACCORDANCE WITH AS3600 AND NOT LESS THAN THE DEVELOPMENT LENGTH FOR EACH BAR.

REINFORCEMENT LAP LENGTHS (LESS THEN 300mm OF CONCRETE BELOW THE BAR)							
BAR SIZE							
N12	N16	N20	N24	N28	N32	N36	N40
500	750	1000	1400	1700	2000	2300	2750

REINFORCEMENT LAP LENGTHS (MORE THEN 300mm OF CONCRETE BELOW THE BAR)							
BAR SIZE							
N12	N16	N20	N24	N28	N32	N36	N40
650	1000	1300	1800	2200	2600	3000	3600

12. MINIMUM OVERALL DIMENSIONS OF 180° HOOKS AND 90° COGS MAY BE NO SMALLER THEN THE FOLLOWING TABLE:

180° HOOKS OVERALL DIMENSION (X)					
PIN DIA.	BAR NOMINAL SIZE (D)				
	12	16	20	24	-
3D	60	-	-	-	-
4D	70	100	120	140	-
90° COGS OVERALL DIMENSION (Y)					
PIN DIA.	BAR NOMINAL SIZE (D)				
	12	16	20	24	-
3D	160	-	-	-	-
4D	170	200	240	280	-



STRIP FOOTING NOTES

1. ALL WORKMANSHIP AND MATERIALS SHALL COMPLY WITH THE CURRENT EDITION OF AS3600 AND AS2870 FOR RESIDENTIAL CONSTRUCTION.
2. ALL STRIP FOOTINGS SHALL BE FOUNDED ON NATURAL MATERIAL WITH AT LEAST 100kPa BEARING CAPACITY TO THE ENGINEERS APPROVAL, OR ARE TO BE SUPPORTED ON PIERS AS DETAILED.
3. WHERE STRIP FOOTINGS DO NOT BEAR DIRECTLY ON NATURAL MATERIAL OF 100kPa BEARING CAPACITY OR BEAR UPON FILL 400mm DEEP OR GREATER, THEN PIERS SHALL BE CONSTRUCTED AS SHOWN ON THE PLAN (OR AS DETERMINED NECESSARY BY THE ENGINEER AT THE TIME OF THE VIEWING).
4. THE ENGINEER SHALL VIEW AND APPROVE ALL WORK PRIOR TO POURING CONCRETE.

COMPOSITE FIBRE NOTES

1. ALL MATERIAL AND WORKMANSHIP SHALL COMPLY WITH THE MANUFACTURERS WORK INSTRUCTIONS AND QUALITY ASSURANCE STANDARDS.
2. UNLESS OTHERWISE NOTES OR APPROVED, COMPOSITE MATERIALS FOR USE IN THIS PROJECT SHALL BE MANUFACTURED FROM ECR GLASS AND VINYL ESTER RESIN CONFORMING WITH ISO 9001 STANDARD.
3. ALL MEMBERS SHALL BE IN SOUND CONDITION FREE FROM PITTING, DE-LAMINATIONS AND OTHER DEFECTS WHICH ARE LIKELY TO IMPAIR THE STRUCTURAL CAPACITY OF THE MEMBERS.
4. ALL COMPOSITE MEMBER PARTS OF THE HANDRAIL SYSTEM SHALL BE PAINTED USING URETHANE COATING TO PROVIDE EXTRA UV-RESISTENCE. COATING PROCEDURE SHALL BE IN ACCORDANCE WITH THE MANUFACTURERS GUIDE APPLICATION OF PROTECTIVE COATINGS.
5. AT ALL FACTORY AND AT SITE DRILLED HOLES, AN APPROVED ANTICRUSH INSERT SHALL BE PUSHED TO THE CORRECT PLACEMENT. THIS PREVENTS CRUSHING OF THE SECTION AND PROVIDES A LARGE BEARING AREA FOR STRUCTURAL BOLTS.
6. AN ALTERNATIVE METHOD FOR ANTI-CRUSHING IS TO BOLT THROUGH ONE SIDE WALL OF THE PROFILE ONLY. TO PROVIDE ACCESS TO THIS BOLT, A LARGE OVERSIZED HOLE IN THE WALL THAT IS NOT BEING BOLTED IS REQUIRED.
7. USE OF A WATERPROOFING COMPOUND TO SEAL ANY END CUT FIBRES, AS A RESULT OF DRILLING OR CUTTING THE COMPOSITE FIBRE PROFILES IS REQUIRED.

EXISTING AND DECOMMISSIONED SERVICES

1. ENSURE DBYD IS CARRIED OUT
2. CONTRACTOR IS TO LOCATE AND BE RESPONSIBLE FOR ENSURING ALL SUB-CONTRACTORS ARE AWARE OF EXISTING SERVICES AND TO PROVIDE SUFFICIENT PROTECTION
3. EARTHING OF ELECTRICAL INSTALLATIONS
4. REMOVE AS REQUIRED IN ACCORDANCE WITH WORK COVER CODES OF PRACTISE

PLANT AND MACHINERY

1. WORKING IN PROXIMITY TO MACHINERY ENSURE SWMS FOR WORKING IN PROXIMITY TO PLANT
2. ENSURE CLEAR PATHS OF MOVEMENT
3. SUITABLE PPE AND EQUIPMENT - EAR PROTECTION, HIGH VIS, SPOTTERS, RADIOS
4. SAFE WORKING AREA AND SUITABLE BARRIERS / DELINEATION
5. SUITABLE ACCESS FOR MACHINERY, DELIVERIES AND REMOVAL OF MATERIALS
6. TOWER CRANE LOCATIONS AND FOUNDATIONS DESIGNED BY SUITABLY QUALIFIED PERSON

HAZARDOUS MATERIALS AND MATERIAL HANDLING

1. DEMOLITION OF EXISTING STRUCTURES (HAZARDOUS MATERIALS REPORT) IE ASBESTOS, LEAD PAINT - ENSURE SWMS ARE IN PLACE WHEN REQUIRED AND WORKERS ARE QUALIFIED AND/OR TRAINED FOR EACH TASK.
2. PRESENCE OF HAZARDOUS MATERIALS IN THE EXISTING GROUND - MAY BE DISTURBED DURING EARTHWORKS
3. USE OF HAZARDOUS MATERIALS IN CONSTRUCTION - ENSURE WORKERS ARE FAMILIAR WITH MATERIAL DATA SHEETS (MDS) AND SWMS ASSOCIATED WITH MATERIALS AND PRODUCTS PROPOSED FOR USE
4. LARGE HEAVY MEMBERS THAT CANNOT BE CRANED -BUILDER CAN REQUEST SPLICE DETAILS TO EASE CONSTRUCTABILITY AND SAFE INSTALLATION
5. CONSIDER THE WORKING ENVIRONMENT AND SURROUNDING PROXIMITY TO POTENTIALLY HAZARDOUS MATERIALS
6. ENSURE SUFFICIENT VENTILATION FOR WORKS BEING PERFORMED

STRUCTURAL SAFETY

1. TEMPORARY SHORING OF EXCAVATIONS AS REQUIRED BY BUILDER WHERE EXCAVATIONS ARE REQUIRED IN PROXIMITY TO EXISTING STRUCTURES AND SERVICES CONSULT THE GEOTECHNICAL ENGINEER
2. TEMPORARY BRACING OF STRUCTURES DURING CONSTRUCTIONS
3. REASONABLE CONSTRUCTION LOADS ALLOWED FOR ON SLABS AND FRAMES (CONFIRM WITH ENGINEER FOR SPECIFIC VALUE)
4. PROVIDE FALL RESTRAINTS AND BARRIERS AS REQUIRED
5. WORKCOVER CODES OF PRACTISE FOR CONSTRUCTION OF STRUCTURES

EARTHWORKS

1. APPROPRIATE BARRIERS SHOULD BE INSTALLED AROUND ALL EXCAVATIONS.
2. BATTERS AND BENCHING SHOULD OCCUR ON EXCAVATIONS TO MINIMISE THE RISK OF COLLAPSE AND ENGULFMENT.
3. TEMPORARY SHORING SHOULD BE INSTALLED AS REQUIRED BY THE BUILDER AND DESIGNED BY AN ENGINEER AS NECESSARY.
4. CONFINED SPACES - ENSURE ANY WORKERS ARE CARRYING A CURRENT TICKET FOR SPECIFIED WORKS AND CARRY OUT WORK IN ACCORDANCE WITH WORK COVER CODES OF PRACTICE.
5. EXCAVATION IN PROXIMITY TO EXISTING BUILDINGS AND SERVICES TAKE CARE NOT TO UNDERMINE, ENGAGE SPECIALIST UNDERPINNING CONTRACTORS AS REQUIRED IF IN DOUBT ABOUT ANY COMPONENT OF A TASK, ASK THE SUPERVISOR.
6. IF YOU FEEL A TASK IS NOT SAFE TO CARRY OUT, DO NOT START WORK UNTIL APPROPRIATE MEASURES HAVE BEEN TAKEN TO MAKE THE TASK SAFE OR APPROPRIATE TRAINING HAS BEEN PROVIDED. MAKE SURE YOU AND FELLOW WORKERS ARE FAMILIAR WITH THE MEASURES (WORK COVER CODES, SWMS, MDS) IN PLACE TO MAKE THE TASK AS SAFE AS POSSIBLE. IF YOU SEE ANY UNSAFE PRACTISES TAKING PLACE, REPORT TO A SUPERVISOR. YOUR HEALTH AND SAFETY IS YOUR RESPONSIBILITY.

ACCESS AND SAFE MOVEMENT

1. LIMITING PUBLIC ACCESS
2. ENSURE SUITABLE FENCING TO KEEP PUBLIC OUT
3. DELINEATE BETWEEN WORK AREAS AND PATHS OF TRAVEL
4. PROVIDE SUFFICIENT TRAFFIC CONTROL AND BARRIERS TO SAFELY SEPARATE WORKERS AND MEMBERS OF PUBLIC FROM VEHICLES AND PLANT FROM WORKERS AND PUBLIC
5. APPROPRIATE BARRIERS AND FALL PREVENTION NEAR EDGES AND EXCAVATIONS
6. SAFE CROSSINGS AND EXCLUSION ZONES
7. PLANNED EMERGENCY EXIT ROUTES AND ASSEMBLY AREA


SAFE WORKING ENVIRONMENT

1. SAFE CLEAN/ CLEAR ACCESS TO SITE AND AROUND THE SITE
2. PPE SHALL BE USED FOR NOISY ACTIVITIES AND OR WORKING IN PROXIMITY TO PLANT
3. WORKING AT HEIGHTS PROVIDE APPROPRIATE SCAFFOLDING, TEMPORARY PLATFORMS AND FALL RESTRAINT (IF WORKING AT HEIGHTS ABOVE 2m)
4. SUFFICIENT WATER SUPPLY AND AMENITIES ON SITE
5. SLIPS AND TRIPS - FINISHED SURFACES APPROPRIATELY SLIP RESISTANCE, STEPS HIGHLIGHTED
6. SURROUNDING AREA SHOULD BE CONSIDERED DURING WRITING OF SWMS - WORKING IN BUSHLAND, IN CLOSE TO EXPLOSIVE CHEMICALS (I.E. PETROL STATIONS ETC)
7. MANUAL TASKS SHOULD BE CARRIED OUT IN A SAFE MANNER, BENDING KNEES, NOT LIFTING MORE THAN CAPABLE OF, USING MECHANICAL HELP AS REQUIRED
8. CHECK FOR OVERHEAD POWERLINES AND CLEARLY HIGHLIGHT THEIR LOCATION AND PROTECT WORKERS AND LINES FROM EACH OTHER
9. WORKING OVER OR IN PROXIMITY TO WATER - SUITABLE PROTECTION PROVIDED TO PREVENT FALLS, SUITABLE PPE PROVIDED WHEN WORKING OVER OR NEXT TO BODIES OF WATER
10. APPROPRIATE FALL RESTRAINTS SHOULD BE PROVIDED WHEN WORKING IN PROXIMITY TO CONTAMINATED WATER SUCH AS SEWAGE (HAZARDOUS MATERIALS)

SOFT SPOT NOTES

1. ALL SOFT SPOTS SHALL HAVE ALL LOOSE MATERIAL REMOVED AND SHALL BE BACK FILLED WITH SUITABLE MATERIAL AND COMPACTED AS INDICATED IN NOTE 1 OF GENERAL NOTES.

REVISION	AMENDMENTS	DATE	CKD	APP
1	ISSUED FOR CONSTRUCTION	07.03.23	TS	TS
B	ISSUED FOR REVIEW	20.12.22	TS	TS
A	ISSUED FOR REVIEW	23.11.22	TS	TS

CLIENT:
- APPROVED FOR USE -

PLAN REFERENCE
4519.03

ARCHITECT:



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Redfern NSW 2016  
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SOUTH COAST OFFICE  
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Tel (02) 4423 0566  
  
WOLLONGONG OFFICE  
Suite 3a, 128-134 Crown Street,  
Wollongong NSW 2500  
Tel (02) 4423 0566

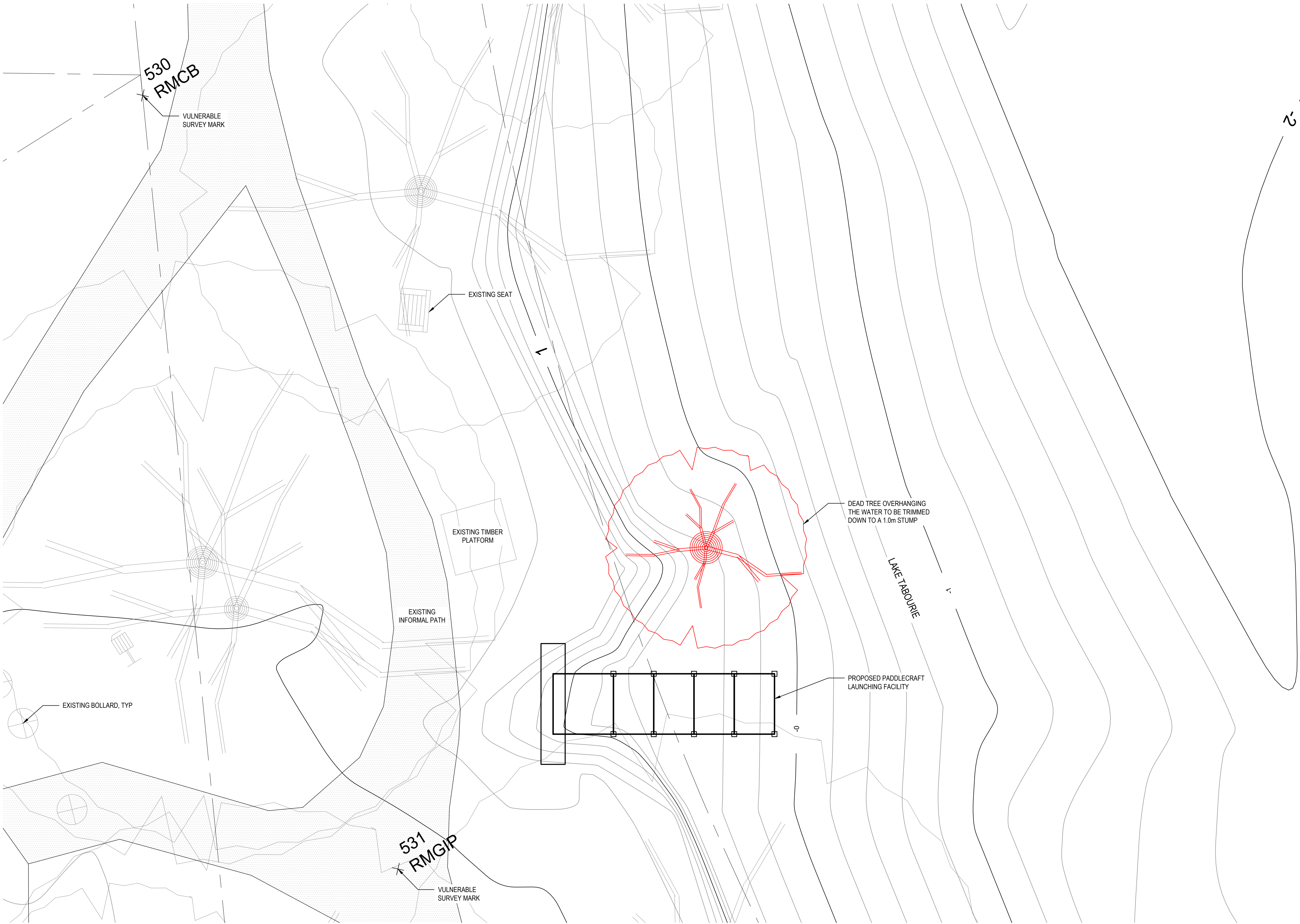
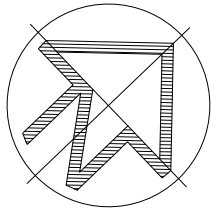
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PROJECT :	DESIGNED:	DRAWN:	SCALE:	SHEET SIZE:
PADDLECRAFT LAUNCHING FACILITY SHORT ST, LAKE TABOURIE DETAILED DESIGN	TS	SP	-	A1
	DRAWING STATUS			DRAWING No.
	CONSTRUCTION			S002
DRAWING NAME:	PROJECT No.	REVISION:		
NOTES SHEET	DN220293	1		







LEGEND

EXISTING PATH

NOTE:

REFER TO DN220293/S002 FOR CONSTRUCTION NOTES

GEOTECHNICAL NOTE:

REFER TO GEOTECHNICAL ASSESSMENT REPORT UNDERTAKEN BY GEOFIRST  
JOB NO: GF1571-A  
DATED: 1/11/2022

GENERAL ARRANGEMENT PLAN

SCALE 1:50




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REVISION	AMENDMENTS	DATE	CKD	APP
1	ISSUED FOR CONSTRUCTION	07.03.23	TS	TS

CIENT:

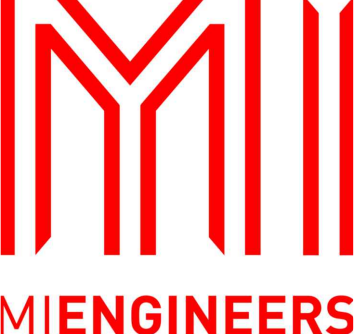
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PROJECT :

PADDLECRAFT LAUNCHING FACILITY  
SHORT ST, LAKE TABOURIE  
DETAILED DESIGN

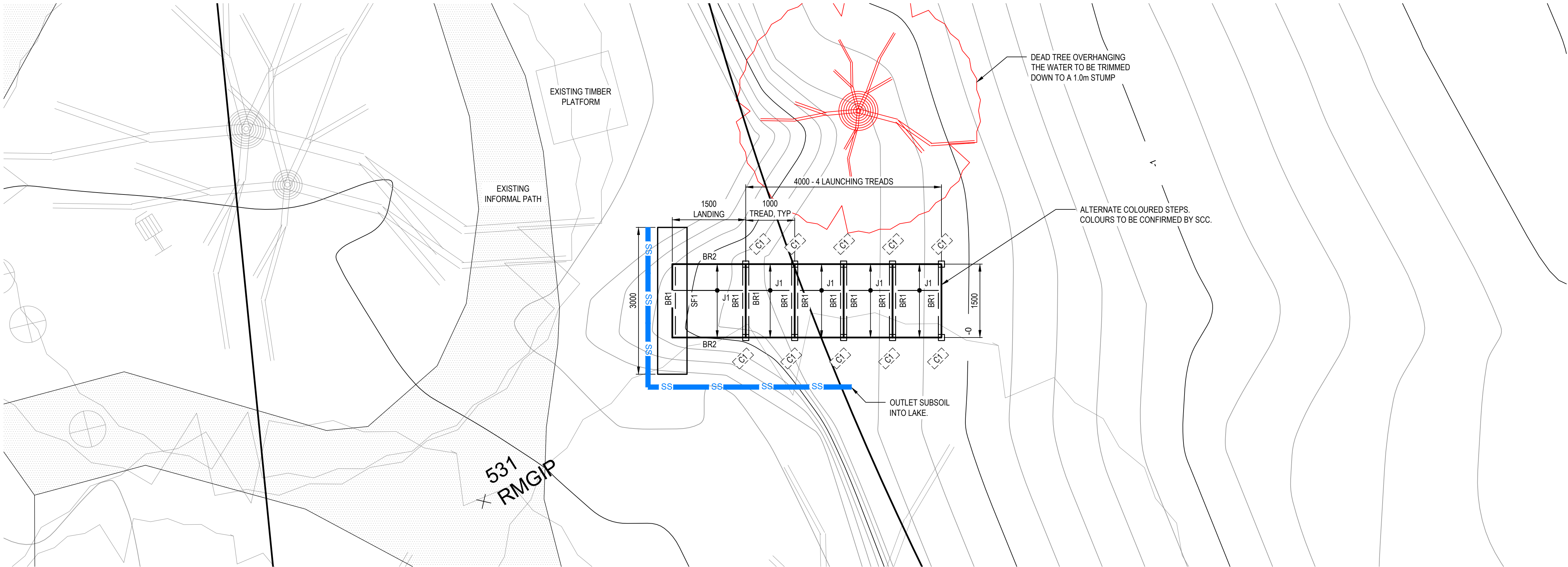
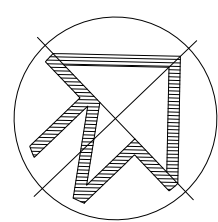
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GENERAL ARRANGEMENT PLAN

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PROJECT No. <div>DN220293</div>		REVISION: <div>1</div>	

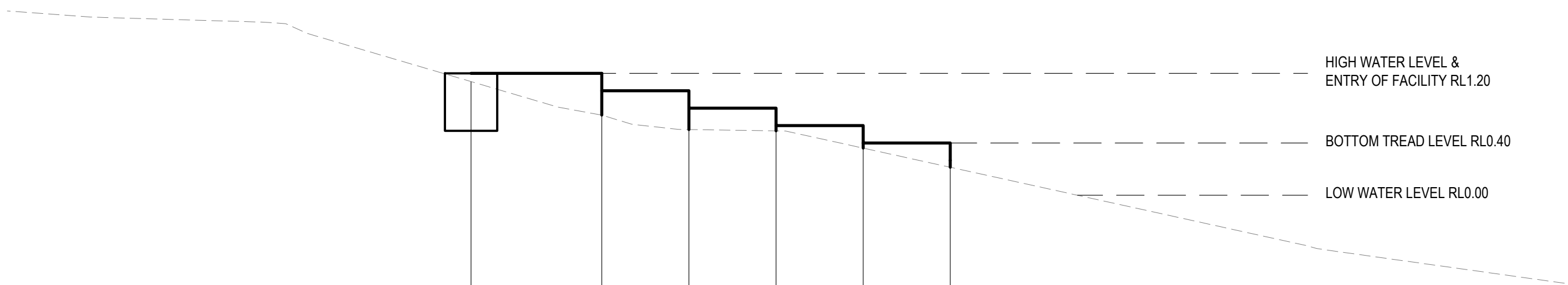


DO NOT SCALE



PADDLECRAFT LAUNCHING  
FACILITY PLAN

SCALE 1:50



VERTICAL GEOMETRY GRADE (%)

VERTICAL GEOMETRY LENGTH (m)

DATUM RL = -3.80

FINISHED SURFACE LEVEL	1.20	1.00	0.80	0.60	0.40	0.40
EXISTING SURFACE LEVEL	1.11	0.72	0.56	0.54	0.54	0.12
CONTROL LINE CHAINAGE	0.00	1.50	2.50	3.50	4.50	5.50

A1 SCALE: H 1:50

V 1:50

LONGITUDINAL SECTION

PADDLECRAFT LAUNCHING  
FACILITY LONG SECTION

SCALE 1:50

LEGEND

C1	COLUMN UNDER
SS	SUBSOIL DRAIN
	EXISTING PATH

NOTE:

REFER TO DN220293/S002 FOR  
CONSTRUCTION NOTES


GEOTECHNICAL NOTE:

REFER TO GEOTECHNICAL ASSESSMENT  
REPORT UNDERTAKEN BY GEOFIRST  
JOB NO: GF1571-A  
DATED: 1/11/2022

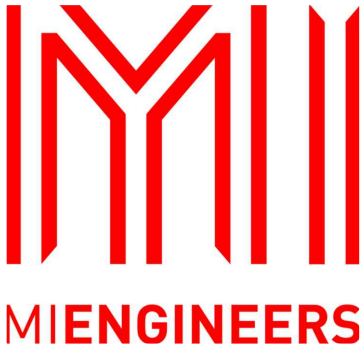


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REVISION	AMENDMENTS	DATE	CKD	APP
1	ISSUED FOR CONSTRUCTION	07.03.23	TS	TS
B	ISSUED FOR REVIEW	20.12.22	TS	TS
A	ISSUED FOR REVIEW	23.11.22	TS	TS

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PROJECT :

PADDLECRAFT LAUNCHING FACILITY  
SHORT ST, LAKE TABOURIE  
DETAILED DESIGN

DRAWING NAME:

PADDLECRAFT LAUNCHING FACILITY

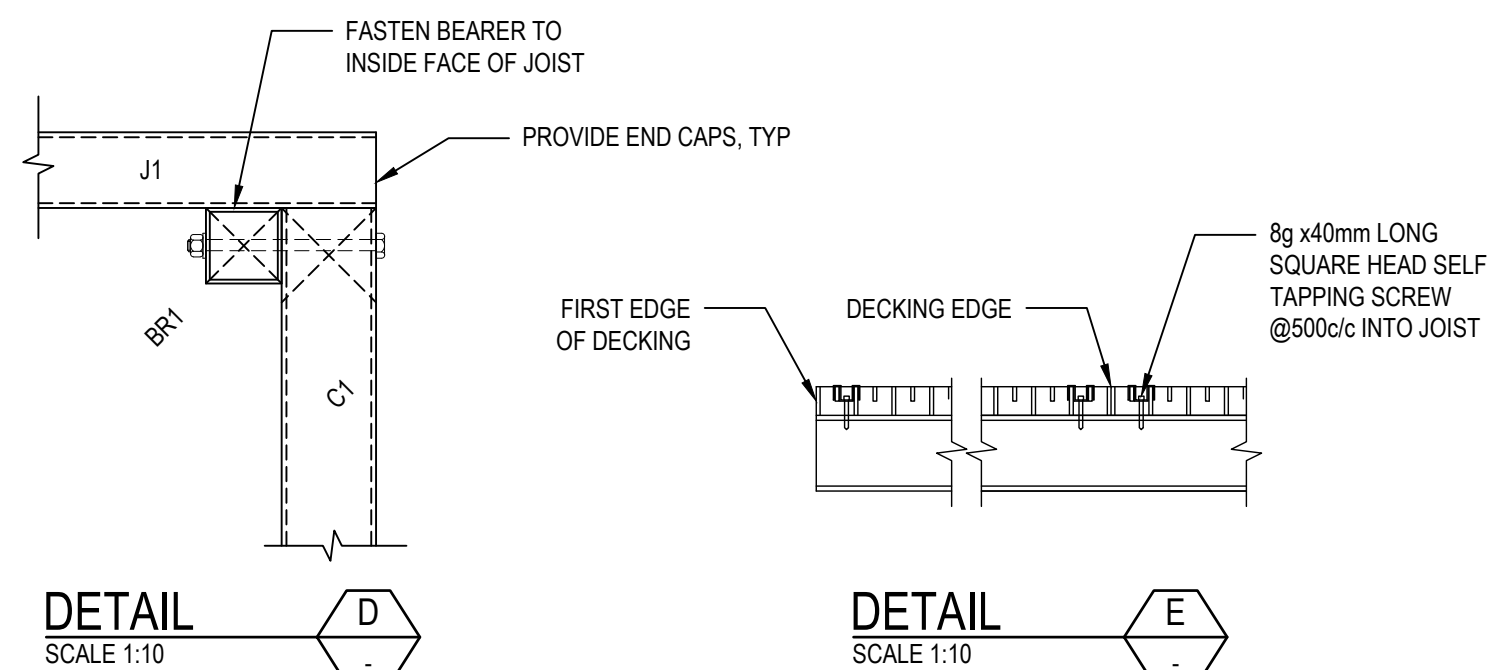
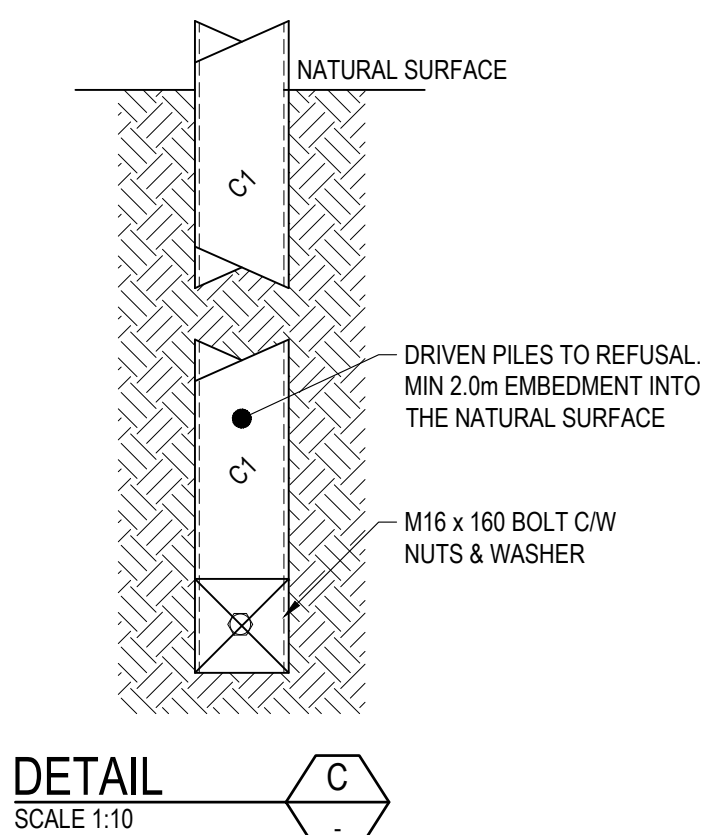
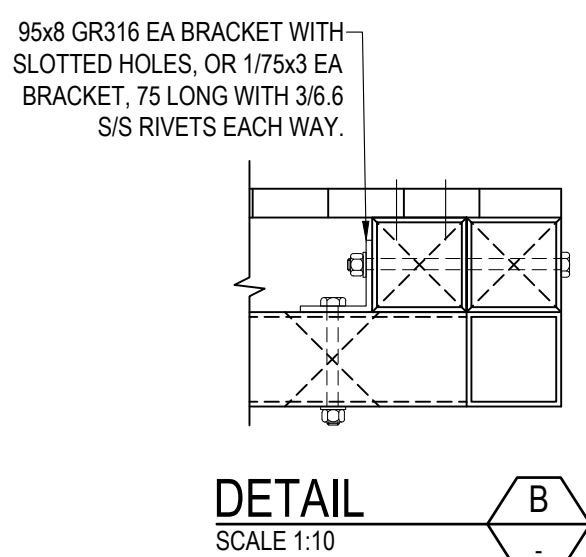
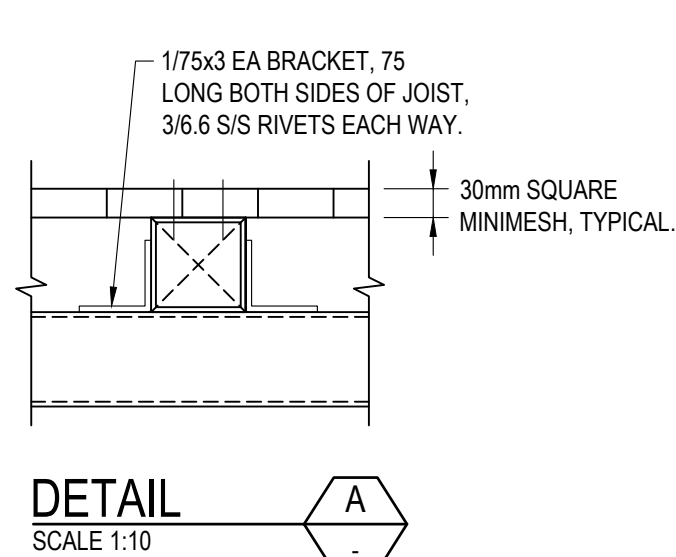
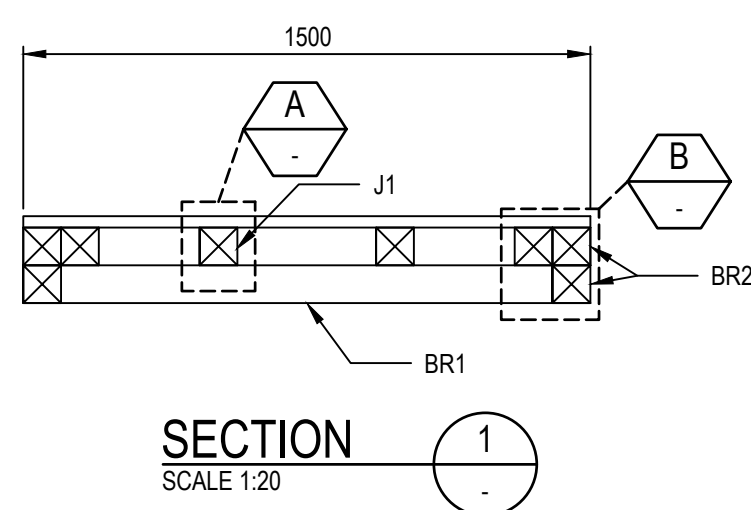
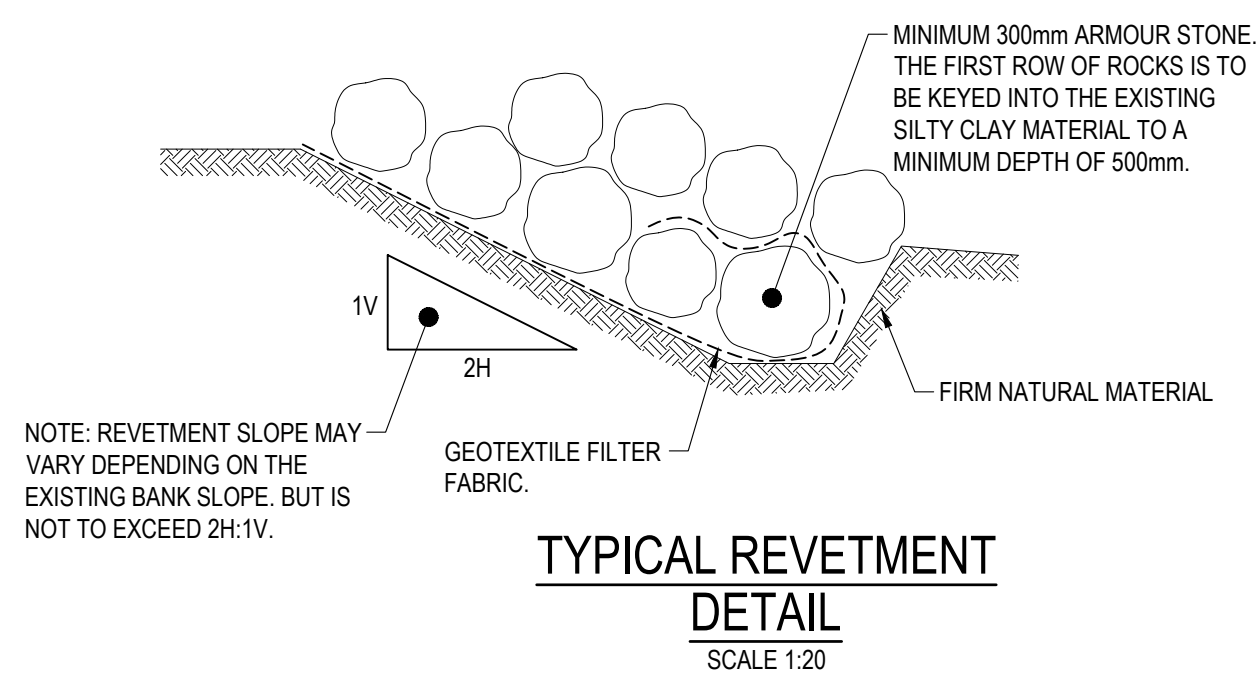
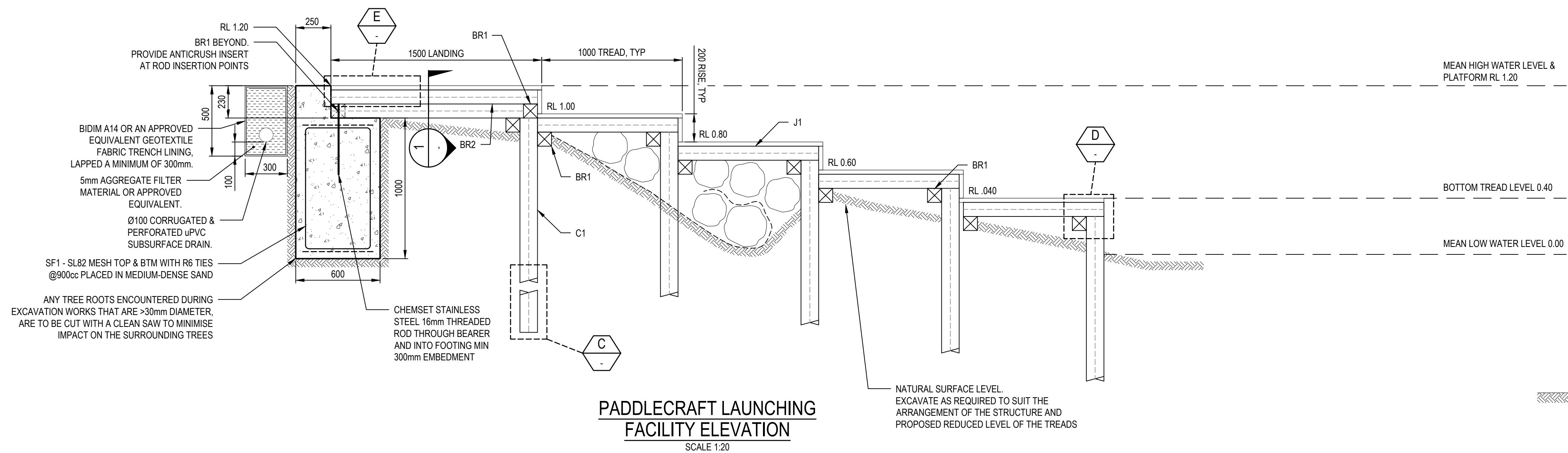
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CONSTRUCTION		S005	
PROJECT No.		REVISION:	
DN220293		1	

REFER TO DN220293/S002 FOR  
CONSTRUCTION NOTES


REFER TO GEOTECHNICAL ASSESSMENT  
REPORT UNDERTAKEN BY GEOFIRST  
JOB NO: GF1571-A  
DATED: 1/11/2022

PROVIDE ANTICRUSH INSERT TO  
MANUFACTURER'S SPECIFICATION

MEMBER SCHEDULE		
TAG	DESCRIPTION	MEMBER
C1	COLUMN	125x125x6.4 WAGNERS COMPOSITE FIBRE HOLLOW SECTION - BLACK FINISH
BR1	BEARER	100x100x5.2 WAGNERS COMPOSITE FIBRE HOLLOW SECTION - BLACK FINISH
BR2	BEARER	2/100x100x5.2 WAGNERS COMPOSITE FIBRE HOLLOW SECTION - BLACK FINISH
J1	JOIST @ 600 MAX CRS	100x100x5.2 WAGNERS COMPOSITE FIBRE HOLLOW SECTION - BLACK FINISH



REVISION	AMENDMENTS	DATE	CKD	APP
1	ISSUED FOR CONSTRUCTION	07.03.23	TS	TS
B	ISSUED FOR REVIEW	20.12.22	TS	TS
A	ISSUED FOR REVIEW	23.11.22	TS	TS

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DRAWING NAME:	
FACILITY DETAILS	



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DESIGNED:	DRAWN:	SCALE:	SHEET SIZE:
TS	SP	NOTED	A1
DRAWING STATUS		DRAWING No.	
CONSTRUCTION		S010	
PROJECT No.		REVISION:	
DN220293		1	



## APPENDIX B - Likelihood of Occurrence Table (NSW Threatened Species)

**NSW Threatened Species Likelihood of Occurrence Table**

The table of likelihood of occurrence evaluates the likelihood of threatened species to occur on the subject site. This list is derived from previously recorded species within a 5 km radius (taken from NSW BioNet Atlas on 31/3/2023) around the subject site. Ecology information unless otherwise stated, has been obtained from the *Threatened Biodiversity Profile Search* on the NSW OEH (Office of Environment & Heritage) online database (<https://www.environment.nsw.gov.au/threatenedspeciesapp/>).

**Likelihood of occurrence in study area**

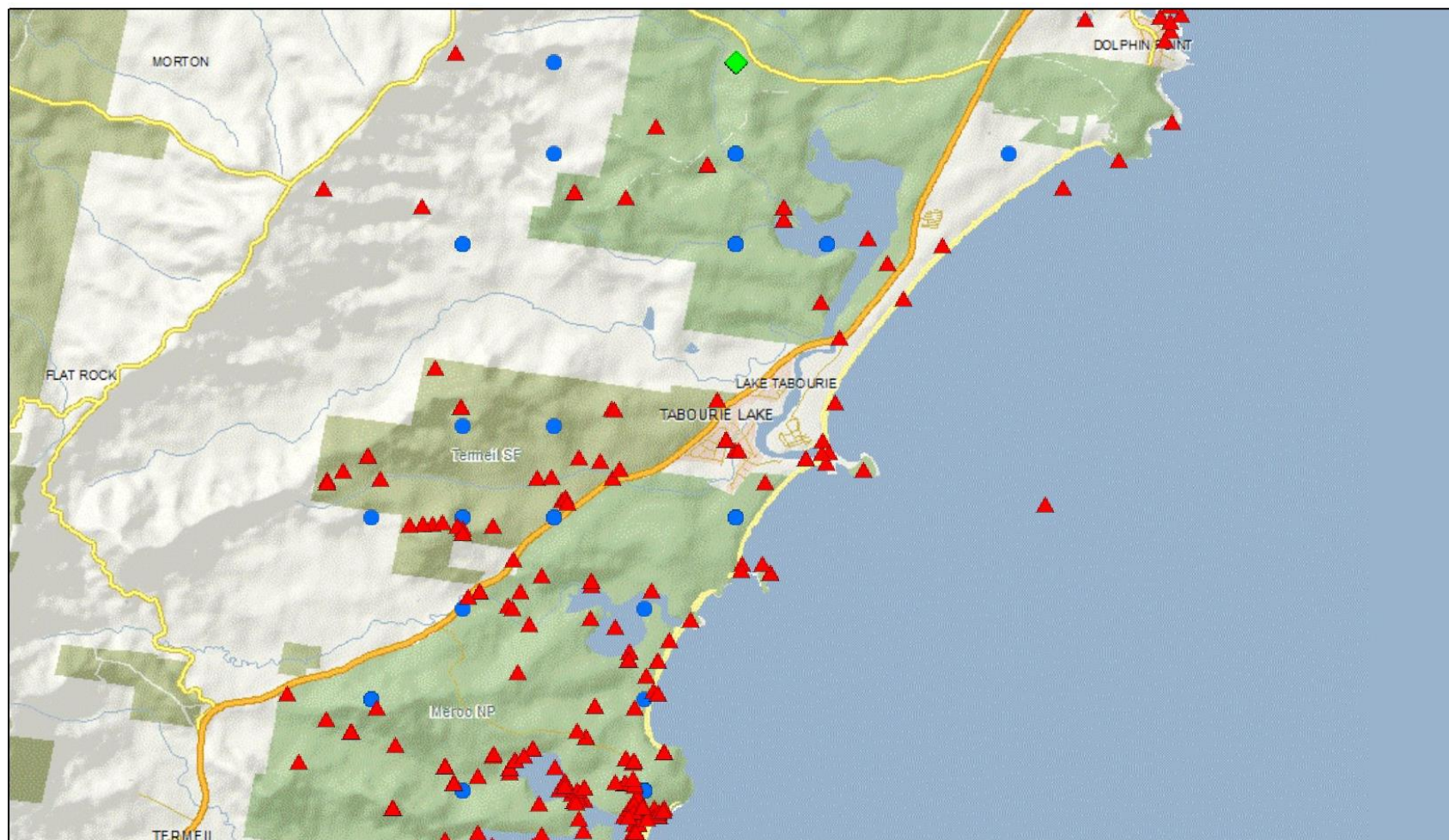
1. Unlikely – Species, population or ecological community is not likely to occur. Lack of previous recent (<25 years) records and suitable potential habitat limited or not available in the study area.
2. Likely – Species, population or ecological community could occur and study area is likely to provide suitable habitat. Previous records in the locality and/or suitable potential habitat in the study area.
3. Present – Species, population or ecological community was recorded during the field investigations.

**Possibility of impact**

1. Unlikely – The proposal would be unlikely to impact this species or its habitats. No NSW *Biodiversity Conservation Act 2016* “Test of Significance” or EPBC Act significance assessment is necessary for this species.
2. Likely – The proposal could impact this species, population or ecological community or its habitats. A NSW *Biodiversity Conservation Act 2016* “Test of Significance” and/or EPBC Act significance assessment is required for this species, population or ecological community.

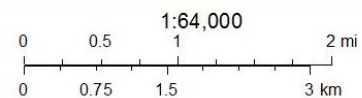
**Note that where further assessment is deemed required, this is undertaken within the REF as a Test of Significance (in the case of NSW listed species) or an EPBC Significant Impact Assessment (in the case of Commonwealth listed species).**





March 31, 2023

**drawGraphics\_poly**    ● spc2  
 — Override 1    ◆ spc3  
 ▲ spc0



## Review of Environmental Factors Part 5 Assessment EP&A Act 1979

<b>Species name</b>	<b>Status</b>	<b>Habitat requirements (<a href="http://www.environment.nsw.gov.au">www.environment.nsw.gov.au</a>)</b>	<b>Likelihood of presence within areas impacted by the activity</b>
<b>FLORA</b>			
Scrub Turpentine <i>Rhodamnia rubescens</i>	Endangered BC Act and Critically Endangered EPBC Act	Found in littoral, warm temperate and subtropical rainforest and wet sclerophyll forest usually on volcanic and sedimentary soils.	Not likely – no suitable habitat. Not present at the site.
Leafless Tongue Orchid <i>Cryptostylis hunteriana</i>	Vulnerable BC Act and EPBC Act	Larger populations typically occur in woodland dominated by Scribbly Gum, Silvertop Ash, Red Bloodwood and Black Sheoak and appears to prefer open areas.	Not likely – no suitable habitat
Tangled Bedstraw <i>Rhodamnia rubescens</i>	Endangered BC Act	In NSW (and ACT Territory in Jervis Bay), Tangled Bedstraw has been recorded in Turpentine forest and coastal Acacia shrubland.	Not likely – no suitable habitat
<b>AMPHIBIANS</b>			
Green and Golden Bell Frog <i>Litoria aurea</i>	Endangered BC Act Vulnerable EPBC Act	Inhabits marshes, dams and stream-sides, particularly those containing bullrushes ( <i>Typha</i> spp.) or spikerushes ( <i>Eleocharis</i> spp.)	Not likely – no suitable habitat
<b>BIRDS</b>			
Freckled Duck <i>Stictonetta naevosa</i>	Vulnerable BC Act	Prefer permanent freshwater swamps and creeks with heavy growth of Cumbungi, Lignum or Tea-tree. During drier times they move from ephemeral breeding swamps to more permanent waters such as lakes, reservoirs, farm dams and sewage ponds.	Not likely – no suitable habitat
Shy Albatross <i>Thalassarche cauta</i>	NSW BC Act Vulnerable EPBC Act Vulnerable	This pelagic or ocean-going species inhabits subantarctic and subtropical marine waters, spending the majority of its time at sea. While at sea, it soars on strong winds and when calm, individuals may rest on the ocean, in groups during the breeding season	Not likely – no suitable habitat

## Review of Environmental Factors Part 5 Assessment EP&A Act 1979

		<p>or as individuals at other times. Occasionally the species occurs in continental shelf waters, in bays and harbours. The species feeds on fish, crustaceans, offal and squid and may forage in mixed-species flocks. Food may be caught by seizing prey from the water's surface while swimming, by landing on top of prey, diving for prey beneath the water and by scavenging behind fishing vessels. Known breeding locations include Albatross Island off Tasmania, Auckland Island, Bounty Island and The Snares, off New Zealand, where nesting colonies of 6-500 nests occur and may contain other species such as the Australian Gannet. Located on sheltered sides of islands, on cliffs and ledges, in crevices and slopes, nests are used annually and consist of a mound of mud, bones, plant matter and rocks.</p>	
<p>Black-browed Albatross <i>Thalassarche melanophris</i></p>	<p>Vulnerable NSW BC Act Vulnerable EPBC Act</p>	<p>Inhabits Antarctic, subantarctic, subtropical marine and coastal waters over upwellings and boundaries of currents. Spends most of its time at sea, breeding on small isolated islands. This species feeds on fish, crustaceans, offal and squid and often forages in flocks with other seabirds. Nests annually on a mound of soil and vegetation, on the cliffs or steep slopes of vegetated Antarctic and subantarctic islands.</p>	<p>Not likely – no suitable habitat</p>
<p>White-bellied Sea-Eagle <i>Haliaeetus leucogaster</i></p>	<p>Vulnerable BC Act</p>	<p>The habitat for this species is characterised by the presence of large areas of open water including larger rivers, swamps, lakes and the sea. Breeding habitat consists of mature tall open forest, open forest, tall woodland, and swamp sclerophyll forest close to foraging habitat. Nest trees are typically large emergent eucalypts.</p>	<p>Possible – but not likely to be affected by the proposed activity as no vegetation removal is proposed. The species are transient and far ranging. It is possible that the species would fly over the site from time to time or to rest briefly. The proposed activity is unlikely to impact the species as the area does not provide important or useful habitat for the species. The species use of the site (flying over or resting) would not be affected by the proposal. No further assessment is therefore required.</p>

## Review of Environmental Factors Part 5 Assessment EP&A Act 1979

Little Eagle <i>Hieraaetus morphnoides</i>	Vulnerable <i>NSW BC Act</i>	Occupies open eucalypt forest, woodland or open woodland. She-oak or acacia woodlands and riparian woodlands of interior NSW are also used. Nests in tall living trees within a remnant patch, where pairs build a large stick nest in winter	Possible – but not likely to be affected by the proposed activity as no vegetation removal is proposed. The species are transient and far ranging. It is possible that the species would fly over the site from time to time or to rest briefly. The proposed activity is unlikely to impact the species as the area does not provide important or useful habitat for the species. The species use of the site (flying over or resting) would not be affected by the proposal. No further assessment is required.
Square-Tailed Kite <i>Lophoictinia isura</i>	Vulnerable <i>NSW BC Act</i>	Summer breeding migrant to the south-east, including the NSW south coast, arriving in September and leaving by March. Found in a variety of timbered habitats including dry woodlands and open forests. Shows a particular preference for timbered watercourses large hunting ranges of more than 100km <sup>2</sup> Nest within large hollow bearing trees generally within 200m of riparian areas.	Possible – but not likely to be affected by the proposed activity as no vegetation removal is proposed. The species are transient and far ranging. It is possible that the species would fly over the site from time to time or to rest briefly. The proposed activity is unlikely to impact the species as the area does not provide important or useful habitat for the species. The species use of the site (flying over or resting) would not be affected by the proposal. No further assessment is required.
Eastern Osprey <i>Pandion cristatus</i>	<i>NSW BC Act</i> Vulnerable	Favour coastal areas, especially the mouths of large rivers, lagoons and lakes. Feed on fish over clear, open water. Breed from July to September in NSW. Nests are made high up in dead trees or in dead crowns of live trees, usually within one kilometre of the sea.	Possible – but not likely to be affected by the proposed activity as no vegetation removal is proposed. The species are transient and far ranging. It is possible that the species would fly over the site from time to time or to rest briefly. The proposed activity is unlikely to impact the species as the area does not provide important or useful habitat for the species. The species use of the site (flying over or resting) would not be affected by the proposal. No further assessment is required.



## Review of Environmental Factors Part 5 Assessment EP&A Act 1979

Beach Stone-curlew <i>Esacus magnirostris</i>	NSW BC Act Endangered	The species is considered a vagrant to the south-eastern NSW. They are found exclusively along the coast, on a wide range of beaches, islands, reefs and in estuaries, and may often be seen at the edges of or near mangroves. They forage in the intertidal zone of beaches and estuaries, on islands, flats, banks and spits of sand, mud, gravel or rock, and among mangroves. Beach Stone-curlews breed above the littoral zone, at the backs of beaches, or on sandbanks and islands, among low vegetation of grass, scattered shrubs, scattered shrubs or low trees; also among open mangroves.	Not likely – no suitable habitat
Sooty Oystercatcher <i>Haematopus fuliginosus</i>	Vulnerable NSW BC Act	Shore bird – breeds in sand or coral scrapes on offshore islands. Favours rocky headlands, rocky shelves, exposed reefs with rock pools, beaches and muddy estuaries.	Not likely – no suitable habitat
Pied Oystercatcher <i>Haematopus longirostris</i>	Endangered NSW BC Act	Favours intertidal flats of inlets and bays, open beaches and sandbanks. Forages on exposed sand, mud and rock at low tide, for molluscs, worms, crabs and small fish. Nests mostly on coastal or estuarine beaches although occasionally they use saltmarsh or grassy areas. Nests are shallow scrapes in sand above the high tide mark, often amongst seaweed, shells and small stones.	Not likely – no suitable habitat
Eastern Hooded Dotterel <i>Thinornis cucullatus cucullatus</i>	NSW BC Act: Critically Endangered  EPBC Act: Vulnerable	In south-eastern Australia Eastern Hooded Dotterels prefer sandy ocean beaches, especially those that are broad and flat, with a wide wave-wash zone for feeding, much beachcast seaweed, and backed by sparsely vegetated sand-dunes for shelter and nesting. Occasionally Hooded Plovers are found on tidal bays and estuaries, rock platforms and rocky or sand-covered reefs near sandy beaches, and small beaches in lines of cliffs. They regularly use near-coastal saline and freshwater lakes and lagoons, often with saltmarsh. They often nest within 6 m of the fore-dune, mostly within 5 m of the high-water mark, but occasionally among or behind dunes.	Not likely – no suitable habitat

## Review of Environmental Factors Part 5 Assessment EP&A Act 1979

Little Tern <i>Sternula albifrons</i>	Endangered NSW BC Act	Mostly exclusively coastal, preferring sheltered environments; however may occur several kilometres from the sea in harbours, inlets and rivers (with occasional offshore islands or coral cay records). Nests in small, scattered colonies in low dunes or on sandy beaches just above the high tide mark near estuary mouths or adjacent to coastal lakes and islands. Nests in a scrape in the sand, which may be lined with shell grit, seaweed or small pebbles.	Not likely – no suitable habitat
Gang-gang Cockatoo <i>Callocephalon fimbriatum</i>	Vulnerable NSW BC Act, Endangered Commonwealth EPBC Act	In summer and spring the species is generally found in tall mountain forests and woodlands, particularly in heavily timbered and mature wet sclerophyll forests. In autumn and winter, the species often moves to lower altitudes in drier more open eucalypt forests and woodlands, particularly box-gum and box-iron bark assemblages, or in dry forests in coastal areas and often found in urban areas.	Possible occurring at the site. However no further assessment is required for the following reasons: <ul style="list-style-type: none"> <li>• No breeding habitat (hollow-bearing trees) would be removed.</li> <li>• The amount of vegetation that may be removed is insignificant relative to the habitat in the locality.</li> <li>• The vegetation that would be removed is marginal habitat without food sources essential to the species.</li> </ul>
Glossy Black Cockatoo <i>Calyptrorhynchus lathami</i>	Vulnerable NSW BC Act	The species inhabits open forest and woodlands of the coast and the Great Dividing Range where stands of sheoak occur. Black Sheoak <i>Allocasuarina littoralis</i> and Forest Sheoak <i>A.torulosa</i> are important foods.	Not likely – no suitable habitat.
Eastern Ground Parrot <i>Pezoporus wallicus wallicus</i>	Vulnerable NSW BC Act	The Eastern Ground Parrot occurs in near coastal low heathlands and sedgelands, generally below one metre in height and very dense (up to 90% projected foliage cover). These habitats provide a high abundance and diversity of food, adequate cover and suitable roosting and nesting opportunities for the Ground Parrot, which spends most of its time on or near the ground. When flushed, birds fly strongly and rapidly for up to	Not likely – no suitable habitat.

## Review of Environmental Factors Part 5 Assessment EP&A Act 1979

		several hundred metres, at a metre or less above the ground.	
Powerful Owl <i>Ninox strenua</i>	Vulnerable NSW BC Act	Coastal Woodland, Dry Sclerophyll Forest, wet sclerophyll forest and rainforest- Can occur in fragmented landscapes Roosts in dense vegetation comprising species such as Turpentine <i>Syncarpia glomulifera</i> , Black She-oak <i>Allocasuarina littoralis</i> , Blackwood <i>Acacia melanoxylon</i> , Rough-barked Apple <i>Angophora floribunda</i> , Cherry Ballart <i>Exocarpus cupressiformis</i> and a number of eucalypt species. requires old growth elements-hollow bearing tree resources for nesting and prey resource. Nests in large tree hollows in large eucalypts that are at least 150yrs old. Often in riparian areas. Large home range	Possible occurring at the site. However, no further assessment is required for the following reasons: <ul style="list-style-type: none"> <li>• No breeding habitat (hollow-bearing trees) would be removed.</li> <li>• The amount of vegetation that may be removed is insignificant relative to the habitat in the locality.</li> <li>• The vegetation that would be removed is marginal habitat without food sources essential to the species.</li> </ul>
Masked Owl – <i>Tyto novaehollandiae</i>	Vulnerable NSW BC Act	Dry eucalypt forests and woodlands from sea level to 1100 m. Inhabits forest but often hunts along the edges of forests, including roadsides. Roosts and breeds in moist eucalypt forested gullies, using large tree hollows or sometimes caves for nesting. Requires old growth elements-hollow bearing tree resources for nesting and prey source.	Possible occurring at the site. However, no further assessment is required for the following reasons: <ul style="list-style-type: none"> <li>• No breeding habitat (hollow-bearing trees) would be removed.</li> <li>• The amount of vegetation that may be removed is insignificant relative to the habitat in the locality.</li> <li>• The vegetation that would be removed is marginal habitat without food sources essential to the species.</li> </ul>
Sooty Owl <i>Tyto tenebricosa</i>	Vulnerable NSW BC Act	Occurs in rainforest, including dry rainforest, subtropical and warm temperate rainforest, as well as moist eucalypt forests	Unlikely to occur. No suitable habitat present on site.
Varied Sittella <i>Daphoenositta chrysoptera</i>	Vulnerable NSW BC Act	Inhabits eucalypt forests and woodlands, especially those containing rough-barked species and mature smooth-barked gums with dead branches, mallee and Acacia woodland	Possible occurring at the site. However, no further assessment is required for the following reasons:

## Review of Environmental Factors Part 5 Assessment EP&A Act 1979

			<ul style="list-style-type: none"> <li>No breeding habitat would be removed.</li> <li>The amount of vegetation that may be removed is insignificant relative to the habitat in the locality.</li> </ul> <p>The vegetation that would be removed is marginal habitat without food sources essential to the species.</p>
Dusky Woodswallow <i>Artamus cyanopterus</i>	Vulnerable NSW BC Act	The species primarily inhabits dry, open eucalypt forests and woodlands, including mallee associations, with an open or sparse understorey of eucalypt saplings, acacias and other shrubs, and ground-cover of grasses	<p>Possible occurring at the site. However, no further assessment is required for the following reasons:</p> <ul style="list-style-type: none"> <li>No breeding habitat would be removed.</li> <li>The amount of vegetation that may be removed is insignificant relative to the habitat in the locality.</li> </ul> <p>The vegetation that would be removed is marginal habitat without food sources essential to the species.</p>
Flame Robin <i>Petroica phoenicea</i>	Vulnerable NSW BC Act	Breeds in upland tall eucalypt forests and woodlands, often on ridges and slopes	Unlikely to occur. No suitable habitat present on site..
<b>MAMMALS</b>			
Spotted-tailed Quoll <i>Dasyurus maculatus</i>	Vulnerable BC Act and Endangered EPBC Act	Recorded across a range of habitat types. Qualls use hollow-bearing trees, fallen logs, other animal burrows, small caves and rock outcrops as den sites	Unlikely to occur. No suitable habitat present.
Brush-tailed Phascogale <i>Phascogale tapoatafa</i>	Vulnerable BC Act	Prefers dry sclerophyll open forest with sparse groundcover of herbs, grasses shrubs or leaf litter. Also inhabits heath, swamps, rainforest and wet sclerophyll forest. Agile climber foraging preferentially in rough barked trees of 25cm DBH or greater. Feeds mostly or arthropods but will also	<p>Possible occurring at the site. However, no further assessment is required for the following reasons:</p> <ul style="list-style-type: none"> <li>No breeding or shelter habitat would be removed.</li> </ul>



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		eat other invertebrates, nectar and sometimes small vertebrates. Nests and shelter in tree hollows with entrances 2.5 to 4 cm wide and use many different hollows over a short time span	<ul style="list-style-type: none"> <li>The amount of vegetation that may be removed is insignificant relative to the habitat in the locality.</li> </ul> <p>The vegetation that would be removed is marginal habitat without food sources essential to the species.</p>
Eastern Pygmy-possum <i>Cercartetus nanus</i>	Vulnerable BC Act	Found in a broad range of habitats from rainforest through sclerophyll forest and woodland, but in most areas woodlands and heath appear to be preferred. Feeds largely on nectar and pollen collected from banksias, eucalypts and bottlebrushes. The species shelters in tree hollows, rotten stumps, holes in the ground, abandoned bird-nests, dreys or thickets of vegetation	Unlikely to occur. No suitable habitat present.
Yellow-bellied Glider - <i>Petaurus Australis</i>	Vulnerable NSW BC Act	Forest with old growth elements. Large Eucalypt Hollows for denning- Inhabits mature or old growth Blackbutt-Bloodwood forest with heath understorey in coastal areas. Prefers mixed species stands with a shrub or Acacia mid storey. Feed primarily on plant and insect exudates, including nectar, sap, honeydew and manna with pollen and insects providing protein. Extract sap by incising (or biting into) the trunks and branches of favoured food trees, often leaving a distinctive 'V'-shaped scar. Very mobile and occupy large home ranges between 20 to 85 ha to encompass dispersed and seasonally variable food resources.	<p>Possible occurring at the site. However, no further assessment is required for the following reasons:</p> <ul style="list-style-type: none"> <li>No breeding or shelter habitat would be removed.</li> <li>The amount of vegetation that may be removed is insignificant relative to the habitat in the locality.</li> </ul> <p>The vegetation that would be removed is marginal habitat without food sources essential to the species.</p>
Squirrel Glider <i>Petaurus norfolcensis</i>	Vulnerable NSW BC Act	Inhabits mature or old growth Box, Box-Ironbark woodlands and River Red Gum forest west of the Great Dividing Range and Blackbutt-Bloodwood forest with heath understorey in coastal areas.	Unlikely to occur. No suitable habitat present.

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Southern Greater Glider <i>Petauroides volans</i>	Endangered NSW BC Act and Commonwealth EPBC Act	Feeds exclusively on eucalypt leaves, buds, flowers and mistletoe. Shelters during the day in tree hollows and will use up to 18 hollows in their home range.	<p>Possible occurring at the site. However, no further assessment is required for the following reasons:</p> <ul style="list-style-type: none"> <li>No breeding or shelter habitat would be removed.</li> <li>The amount of vegetation that may be removed is insignificant relative to the habitat in the locality.</li> </ul> <p>The vegetation that would be removed is marginal habitat without food sources essential to the species</p>
Grey-headed Flying-fox <i>Pteropus poliocephalus</i>	Vulnerable BC Act and EPBC Act	The species occurs in subtropical and temperate rainforests, tall sclerophyll forests and woodlands, heaths and swamps as well as gardens and cultivated fruit crops. Roosting camps are generally located within 20 km of a regular food source and are commonly found in gullies, close to water, in vegetation with a dense canopy. Feeds on the nectar and pollen native trees, in particular <i>Eucalypts</i> , <i>Melaleuca</i> and <i>Banksia</i> , and fruits of rainforest trees and vines.	<p>Possibly could occur at the site. However, no further assessment is required as:</p> <ul style="list-style-type: none"> <li>The site is not a camp.</li> <li>The amount of vegetation that may be removed is insignificant relative to the habitat in the locality.</li> <li>The vegetation that would be removed is marginal habitat and not useful to the species.</li> <li>The species will not reduce the amount of food or breeding resources nor create barriers to movement</li> </ul>
Eastern Coastal Free-tailed Bat <i>Micronomus norfolkensis</i>	Vulnerable BC Act	The bat is found along the east coast from south Queensland to southern NSW. Occurs in dry sclerophyll forest, woodland, swamp forests and mangrove forests east of the Great Dividing Range. Roosts mainly in tree hollows but will also roost under bark or in man-made structures.	<p>Possibly could occur at the site. However no further assessment is required as:</p> <ul style="list-style-type: none"> <li>The amount of habitat that may be removed is insignificant relative to the habitat in the locality.</li> <li>No roosting habitat would be removed.</li> </ul>

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			<ul style="list-style-type: none"> <li>The species will not reduce the amount of food or breeding resources nor create barriers to movement.</li> <li>The species has not actually been recorded at the site.</li> </ul>
Large-eared Pied Bat <i>Chalinolobus dwyeri</i>	Vulnerable NSW BC Act and Commonwealth EPBC Act	Found mainly in areas with extensive cliffs and caves. Roosts in caves (near their entrances), crevices in cliffs, old mine workings and in disused, bottle-shaped mud nests of the Fairy Martin, frequenting low to mid-elevation dry open forest and woodland close to these features.	Unlikely to occur. No suitable habitat present.
Southern Myotis <i>Myotis Macropus</i>	Vulnerable BC Act	The species is found in the coastal band from-west of Australia, across the top-end and south to western Victoria. Generally roost in groups of 10 to 15 close to water in caves, mine shafts, hollow-bearing trees, storm water channels, buildings, under bridges and in dense foliage. Forages over streams and pools catching insects and small fish by raking their feet across the water surface.	<p>Possibly could occur at the site. However, no further assessment is required as:</p> <ul style="list-style-type: none"> <li>The amount of habitat that may be removed is insignificant relative to the habitat in the locality.</li> <li>No roosting habitat would be removed.</li> <li>The species will not reduce the amount of food or breeding resources nor create barriers to movement.</li> <li>The species has not actually been recorded at the site.</li> </ul>
Golden-tipped Bat <i>Phoniscus papuensis</i>	Vulnerable BC Act	Found in rainforest and adjacent wet and dry sclerophyll forest up to 1000m. Also recorded in tall open forest, Casuarina-dominated riparian forest and coastal Melaleuca forests. Roosts mainly in rainforest gullies on small first- and second-order streams in usually abandoned hanging Yellow-throated Shrubwren and Brown Gerygone nests modified with an access hole on the underside. Bats may also roost under thick moss on tree trunks, tree hollows, dense foliage and epiphytes.	<p>Possibly could occur at the site. However, no further assessment is required as:</p> <ul style="list-style-type: none"> <li>The amount of habitat that may be removed is insignificant relative to the habitat in the locality.</li> <li>No roosting habitat would be removed.</li> <li>The species will not reduce the amount of food or breeding resources nor create barriers to movement.</li> </ul>



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			The species has not actually been recorded at the site.
Greater Broad-nosed Bat <i>Scoteanax rueppellii</i>	Vulnerable BC Act	The species is found mainly in the gullies and river systems that drains the Great Dividing Range, from north-eastern Victoria to the Atherton Tableland. It extends to the coast over much of its range. Utilises a variety of habitats from woodland through to moist and dry eucalypt forest and rainforest, though it is most commonly found in tall wet forest and rainforest, though it is commonly found in tall wet forest. Although this species usually roosts in tree hollows, it is also been found in buildings.	Possibly could occur at the site, however, no further assessment is required as: <ul style="list-style-type: none"> <li>• The amount of habitat that may be removed is insignificant relative to the habitat in the locality.</li> <li>• No roosting habitat would be removed.</li> <li>• The species will not reduce the amount of food or breeding resources nor create barriers to movement.</li> <li>• The species has not actually been recorded at the site.</li> </ul>
Eastern Cave Bat <i>Vespadelus trouhgtoni</i>	Vulnerable BC Act	This is a cave-roosting species that is usually found in dry open forest and woodland, near cliffs or rocky overhangs. Occasionally found along cliff-lines in wet eucalypt forest and rainforest.	Unlikely to occur. No suitable habitat present.
New Zealand Fur-seal <i>Arctocephalus forsteri</i>	Vulnerable BC Act	Prefers rocky parts of islands with jumbled terrain and boulders.	Unlikely to occur. No suitable habitat present.
Australia Fur-seal <i>Arctocephalus pusillus doriferus</i>	Vulnerable BC Act	Prefers rocky parts of islands with flat, open terrain. They occupy flatter areas than do New Zealand Fur-seals where they occur together.	Unlikely to occur. No suitable habitat present.

