

**REVIEW OF ENVIRONMENTAL FACTORS (REF)  
JETTY REPLACEMENT AND KAYAK FACILITY  
YOORALLA BAY, CONJOLA PARK**

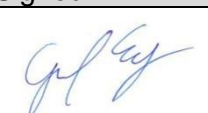
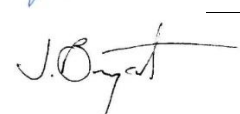
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## Document control

Item	Details
Project	Jetty Replacement and Kayak Launching Facility – Yooralla Bay, Conjola Park
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		20/07/2023
	Reviewer	Jeff Bryant		26/07/2023

\*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)	<p>"Fisheries Permit" - Section 200 (and potentially 205) of the NSW <i>Fisheries Management Act 1994</i>.</p> <p>"Crown Lands Licence" – Section 5.21 of the NSW <i>Crown Land Management Act 2016</i></p>
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 and background

The proposed activity is the replacement and extension of an existing jetty, the installation of a new kayak launching facility and connecting concrete paths in Yooralla Bay, Conjola Park (Figure 1 p.7). Shoalhaven City Council (SCC) gained funding for the proposed activity under the Black Summer Bushfire Recovery Grants Program.

The proposed activity would comprise (refer to Figure 2 below and Appendix A for design plans and report):

- demolition and removal of existing timber jetty which is approximately 18 metres long and 1.5 metres wide
- replacement of the jetty with:
  - a composite fibre (FRP) ramp - 7.5 m long by 1.5 m wide
  - FRP jetty – 16.3 m long by 1.5 m wide
  - FRP gangway – 8.5 m long by 1.5 m wide
  - floating pontoon structure – 18 m long by 2.4 m wide
  - associated piles / piers (18)
- installation of a 30 metre long, 2.4 metres wide FRP kayak launching facility, serviceable for all tidal planes and (limited) lake-level rises, and supported by 20 piles / piers.
- construction of a two metre wide (plus 0.6 metre flat verge) concrete shared users path (SUP) connecting the two structures to the existing footpath at Hoylake Grove Reserve; approximately 134 metres in length.
- Widening (approximately by one metre) of the existing path in Hoylake Grove Reserve to three metres
- minor modification of embankments either side of the path to match terrain with path and design levels
- installation of precast box culvert under the SUP with associated headwalls and rock scour protection.
- installation of signage, bollards, barrier fences, and seating along the concrete path
- drainage works including under-path culverts and associated scour protection.

The replacement jetty has been designed to achieve the compliant grades to AS1428.1 (*Design for access and mobility, Part 1: General requirements for access – new building work*) for both the highest astronomical tide and lowest astronomical tide levels (MI Engineers 2023).

The proposed activity forms part of the Conjola Connected Communities Masterplan (<https://doc.shoalhaven.nsw.gov.au/displaydoc.aspx?record=D20/339430>) and the Draft Yooralla Bay Concept Plan (<https://doc.shoalhaven.nsw.gov.au/displaydoc.aspx?record=D20/331289>) ,



connecting the existing boat ramp, proposed jetty and kayak launching facility to the existing park facilities at Hoylake Grove Reserve. Although not fully adopted by SCC, many of the elements identified in the plans including the proposed activity were endorsed by SCC<sup>1</sup>.

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 Design details

Design Plans and Report are provided in Appendix A. However, in summary:

- the replacement jetty and kayak launching facility has been designed to achieve grades compliant to AS1428.1 (Design for access and mobility – general requirements for access – new building work) for both highest (HAT) and lowest astronomical tides (LAT)
- the jetty would extend out into the Lake such that at LAT, the depth of the water (when lake is open to the ocean) is approximately 1.5 m deep, enabling larger boats to comfortably dock without bottoming-out
- the jetty floating pontoon piles would extend one metre above the 2050 1% AEP (annual exceedance probability) flood level of 3.3 metres
- the jetty floating pontoons would be 18 metres long to cater for two 6 metre long vessels (1.5 x design length) in accordance with the NSW *Boat Ramp Facility Guidelines* (TfNSW 2015)
- fibre-reinforced polymer (FRP) would be used for framing members for and decking for both the jetty and kayak launching facility
- the kayak launching facility extends from the foreshore 30 metres into the Lake, stepping down in 170 millimetre increments every 3.5 metres and is designed to be submerged at tidal ranges and lake heights when Lake is closed.
- the maximum AHD height of the kayak launching facility would 1.0 metres which is the trigger height for the manual opening of the Lake. The entire structure has been designed to be useable at this height
- piers for both structures would be concrete piles embedded three metres into the sandstone bedrock utilising sleeved continuous flight auger operated from barge and shore

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<sup>1</sup> SCC Strategy and Assets Committee Meeting Tuesday 9 February 2021

- the shared users path (SUP) would have a minimum width of 2.0 metres in accordance with the minimum width specified in *Austroads – Guide to Road Design Part 6A: Paths for walking and cycling*<sup>2</sup>
- the SUP would be widened to 3.0 metres to reduce user conflicts in the Hoylake Reserve
- the SUP pavement would be 32MPa concrete 125 millimetres thick, with a 65 millimetre cover to reinforcement.

The design and construction methodology may change slightly based on recommendations from the construction contractor when engaged. Any significant changes will require a review of this REF.

### 1.3 Location

The proposed activity would be undertaken in and on the shore of Yooralla Bay, Conjola Park (Figure 1 below). Yooralla Bay is an embayment of the larger Lake Conjola.

The shore comprises Lot 114 DP 209594 ('Lot 114') and Lot 18 DP 703426 ('Lot 18') which are both owned by SCC in freehold title with a community land classification (to mean high water mark). Lot 114 has a 'park' category with Lot 18 having a 'natural area' category under the NSW *Local Government 1993*.

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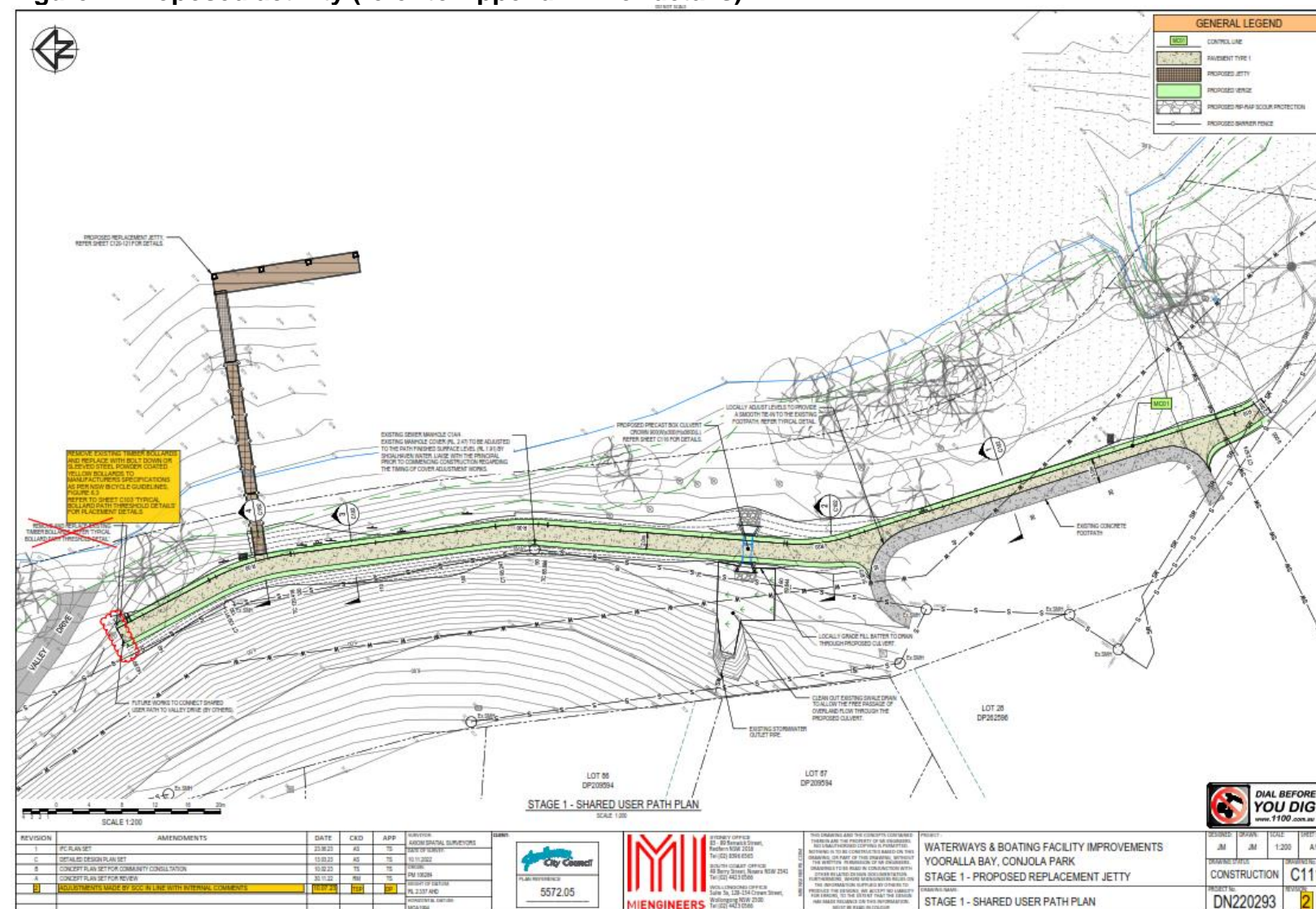
<sup>2</sup> The minimum 2.0 metre width is acceptable as the path would be a "low access path" and cyclist volumes and operational speeds are anticipated to be low [https://austroads.com.au/publications/road-design/agrd06a/media/AGRD06A-17\\_Guide\\_to\\_Road\\_Design\\_Part6A\\_Paths\\_for\\_Walking\\_and\\_Cycling\\_Ed2.1.pdf](https://austroads.com.au/publications/road-design/agrd06a/media/AGRD06A-17_Guide_to_Road_Design_Part6A_Paths_for_Walking_and_Cycling_Ed2.1.pdf)

**Figure 1 Location of the proposed activity (refer to Appendix A for detailed plans)**

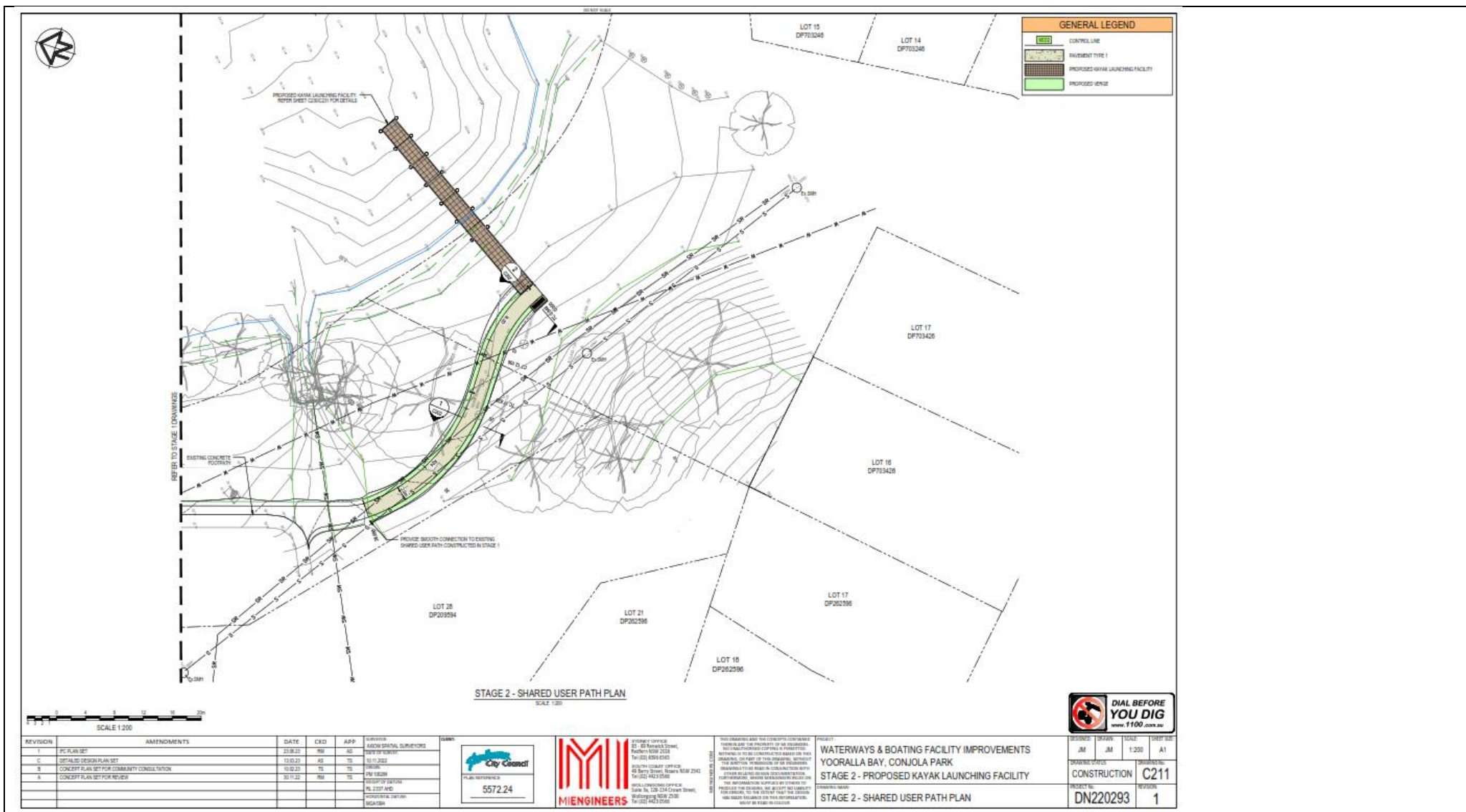




**Figure 2: Proposed activity (refer to Appendix A for details)**



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



## 2. EXISTING ENVIRONMENT

Photos of the site are provided in Section 2.5 below.

The site of the proposed activity was assessed by a SCC Environmental Operation Officer on 12 April 2023.

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, seagrass and saltmarsh, and investigation of habitat availability for threatened flora and fauna species.

### 2.1 The waterway

Lake Conjola, to which Yooralla Bay is an embayment, 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. Lake Conjola is an intermittently closed and open lake and lagoon (ICOLL) with the entrance currently managed under an Entrance Management Plan and Crown Land Licence. The entrance is currently open and has been since 10 February 2020 (SCC 2021) when the lake level exceeded the emergency trigger point specified in the Lake Conjola Interim Entrance Management Policy (GHD 2013).

When the entrance is open, water levels are relatively stable, varying across the tidal range; attenuated by relatively shallow entrance (Spurway 2013). Water levels vary to a much greater extent over a scale of months in response to the combined effects of rainfall, catchment runoff and evaporation. In the extreme, the water level could potentially rise up to 2 metres above mean sea level during severe floods (Spurway 2013).

When the lake is closed elevated lake levels can be experienced. At this point, infrastructure and the shore of the lake can be inundated including jetties and paths (SCC 2021). The jetty would be at 1.24 m AHD and the Kayak launching facility at maximum 1.0 m and incrementing down to 0.32 m AHD.

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.

Patches of live Eelgrass *Zostera muelleri* occur at the site of the proposed jetty replacement and kayak facility with Eelgrass wrack present both on the shore and in the water at both sites (Figure 4 p.13).

The Lake mapped by NSW Department of Primary Industries as 'key fish habitat' for the purposes of the NSW *Fisheries Management Act 1994*.

The site is entirely 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).



## 2.2 Terrestrial Habitat and vegetation assessment

Vegetation communities mapped as occurring within or immediately around the proposed activity site are (Figure 3 p.12):

- Plant Community Type (PCT) 4027 Estuarine Swamp Oak – Mangrove Forest
- PCT 3191 South Coast Ranges Moist Gully Forest
- PCT 3267 Shoalhaven Foothills Turpentine Forest
- PCT 3654 Shoalhaven Lowland Bloodwood Shrub Forest

PCT 4027 is known to be associated with the Endangered Ecological Community *Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions*.

The shore at the site of proposed activity is highly degraded subject to regular mowing of predominantly non-native and native grasses including Kikuyu *Cenchrus clandestinus*, Paspalum *Paspalum dilatatum*, and Couch *Cynodon dactylon*. A narrow strip of foreshore vegetation occurs on the fringe of the lake dominated by Swamp Oak *Casuarina glauca* and Swamp Mahogany *Eucalyptus robusta*, with Bangalay *E.botryoides*, Woollybutt *E.longifolia*, Isolepis *Isolepis nodosa*, Bare Twigrush *Baumea juncea*, Sea Rush *Juncus kraussii*, Common Reed *Phragmites australis*, Sweet Pittosporum *Pittosporum undulatum*, Bracken *Pteridium esculentum*, Mat Rush *Lomandra longifolia*, and *Lobelia anceps (alata)*. The exotic weeds Vasey Grass *Paspalum urvillei*, Spear Thistle *Cirsium vulgare* and Turkey Rhubarb *Rumex sagittatus* are also present.

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.

**Figure 3 Plant Community Types mapped in the vicinity of the proposed activity**



### 2.3 Aquatic ecology

Riparian and aquatic habitat types present at the site of the proposed activity were the water column, unvegetated soft substrates (sand/mud), seagrass, the existing jetty, submerged timber (small tree branches) and riparian vegetation.

The water column and the unvegetated soft substrates with a sparse layer of leaves and fallen branches comprise the predominant habitat. No fish were observed but Yellow Bream *Acanthoparus australis* are anticipated to occur around the jetty and seagrass patch and Dusky Flathead *Platycephalus fuscus* on the unvegetated sediments.

As the water was turbid at the time no benthos or presence of benthos (e.g. invertebrate burrows) was observed at the site, but are anticipated to occur.

The narrow band of riparian vegetation consist predominantly of Swamp Oaks and rushes and sedges such as Bare Twigrush, Sea-rush and *Isolepsis nodosa* growing at the water's edge.

Seagrasses in the form of live *Zostera* patches and wrack were present were observable at the site of the proposed jetty (Figure 4 below).



A narrow band of live *Zostera* has also been recorded previously at the end of the proposed kayak launching facility (Figure 4 below). Turbidity of the water did not allow this patch to be observed but, for the purpose of this REF, it is assumed to be present.

Although not present at the site of the proposed activity a few scattered macroalgae plants (red and brown) were present along the nearby foreshore. The aquatic weed *Caulerpa taxifolia* was not observed.

**Figure 4 Location of *Zostera* seagrass**



## 2.4 Geology

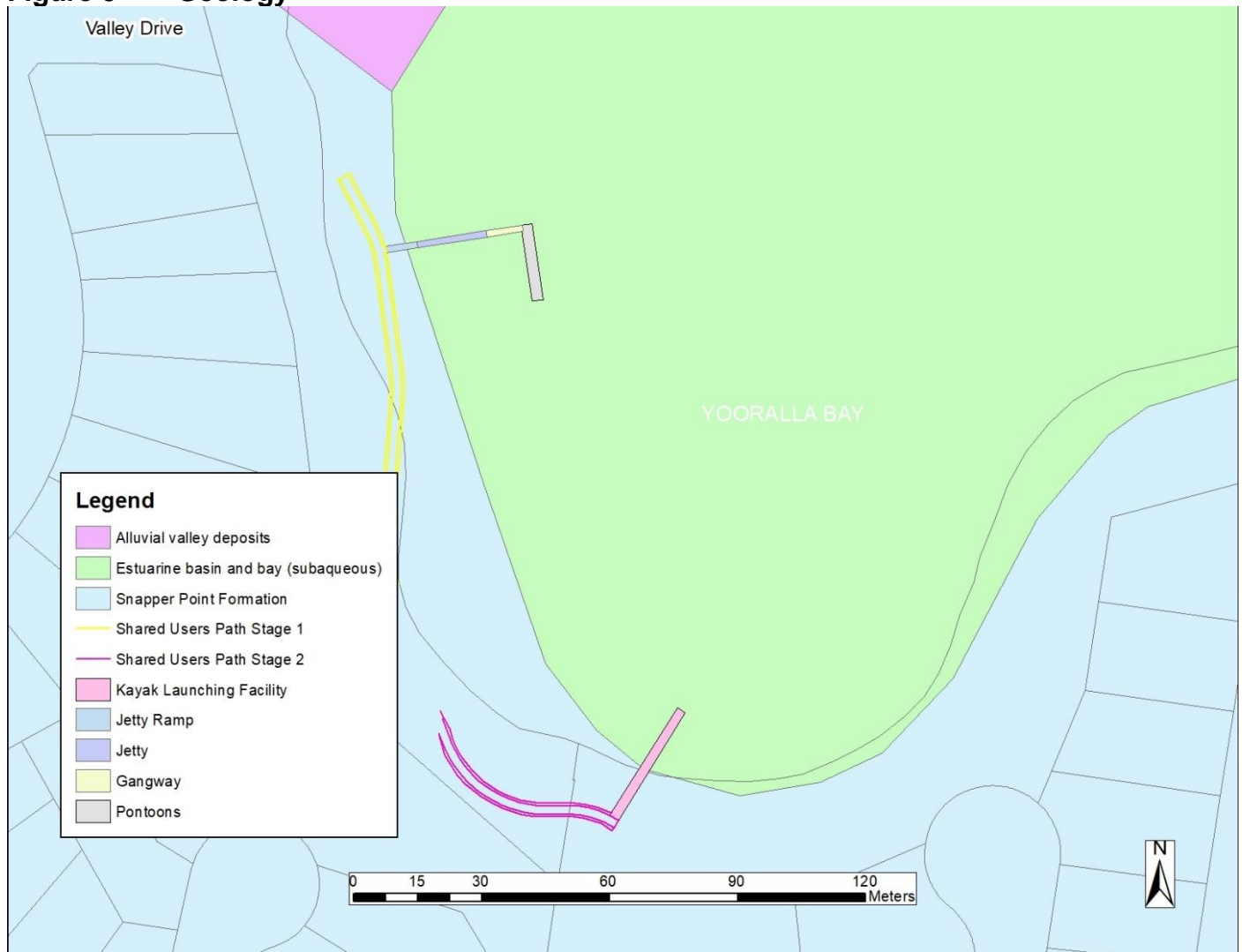
Being located on an estuarine basin, the geology of the proposed activity site comprises clay, silt, shell, very fine to fine-grained lithic-quartz sand fluvially and/or marine deposits of the Holocene age. The components of the proposed activity on the shore would be undertaken on Snapper Point Sandstone Formation (Figure 5 below, MinView 2023<sup>3</sup>). This sandstone is exposed in outcrops around the foreshore edge.

<sup>3</sup> <https://minview.geoscience.nsw.gov.au/#/?lon=148.5&lat=-32.5&z=7&l=>

Geotechnical investigations (Geofirst 2022) indicated that sandstone was encountered at shallow (0.15 metres) depths on the shore but deeper (~2 metres) within the lake. Based on their investigations, Geofirst (2022) recommended that all piles should be embedded at least three metres into the sandstone and the aggressivity exposure classification of severe to very severe should be adopted for concrete and steel footings.

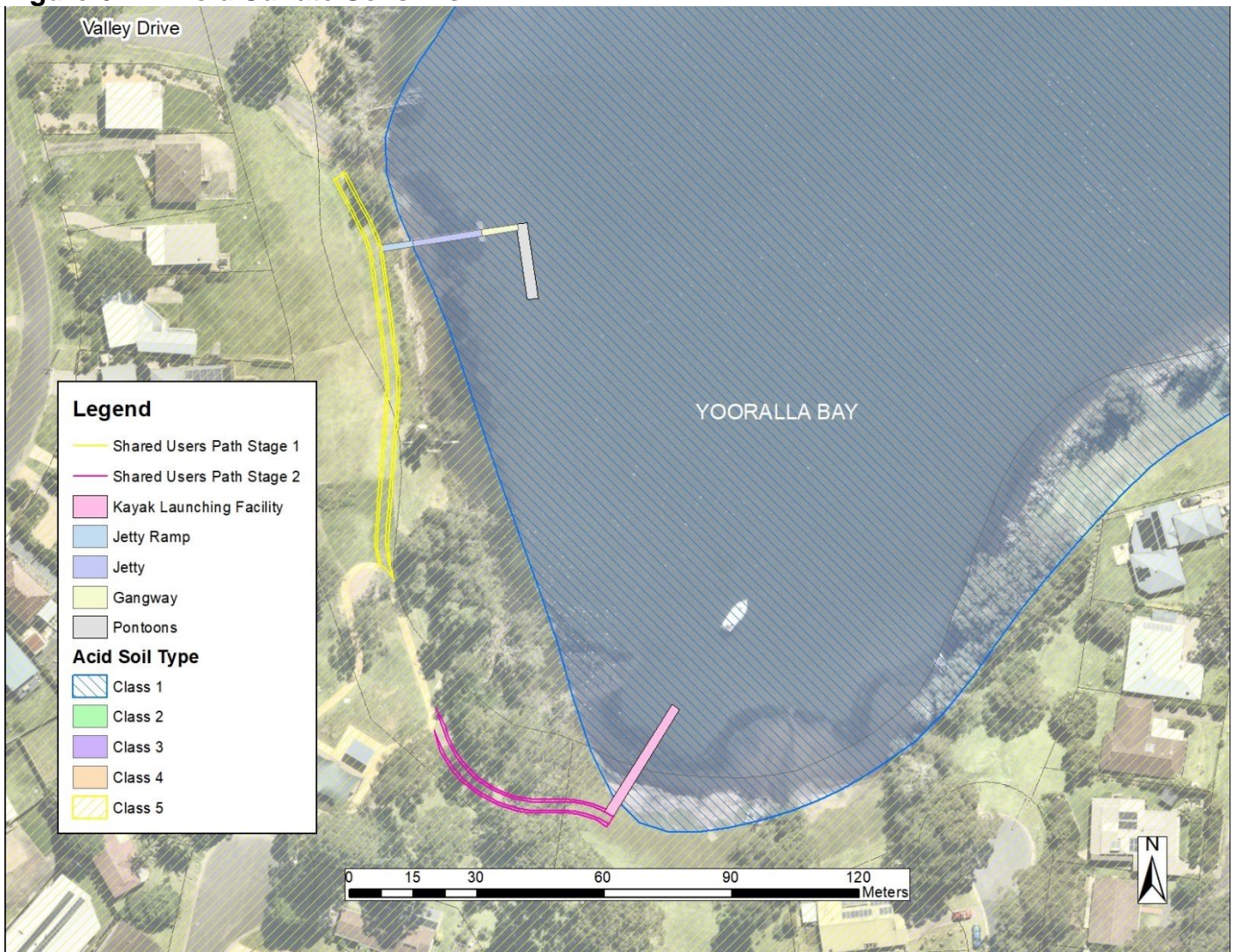
Being Holocene and estuarine in origin, the lake bottom sediments at the site have a higher risk of containing iron sulfides, which when exposed to oxygen, generate sulfuric acid *i.e.* acid sulfate soils. This is reflected in the acid sulfate soil risk map where the site is mapped as “class 5” risk along the shore and “class 1” risk for the lake bottom sediments (Figure 6 below).

**Figure 5 Geology**





**Figure 6 Acid Sulfate Soils Risk**





2.5 Photos

**Photo 1: Existing jetty to be replaced**

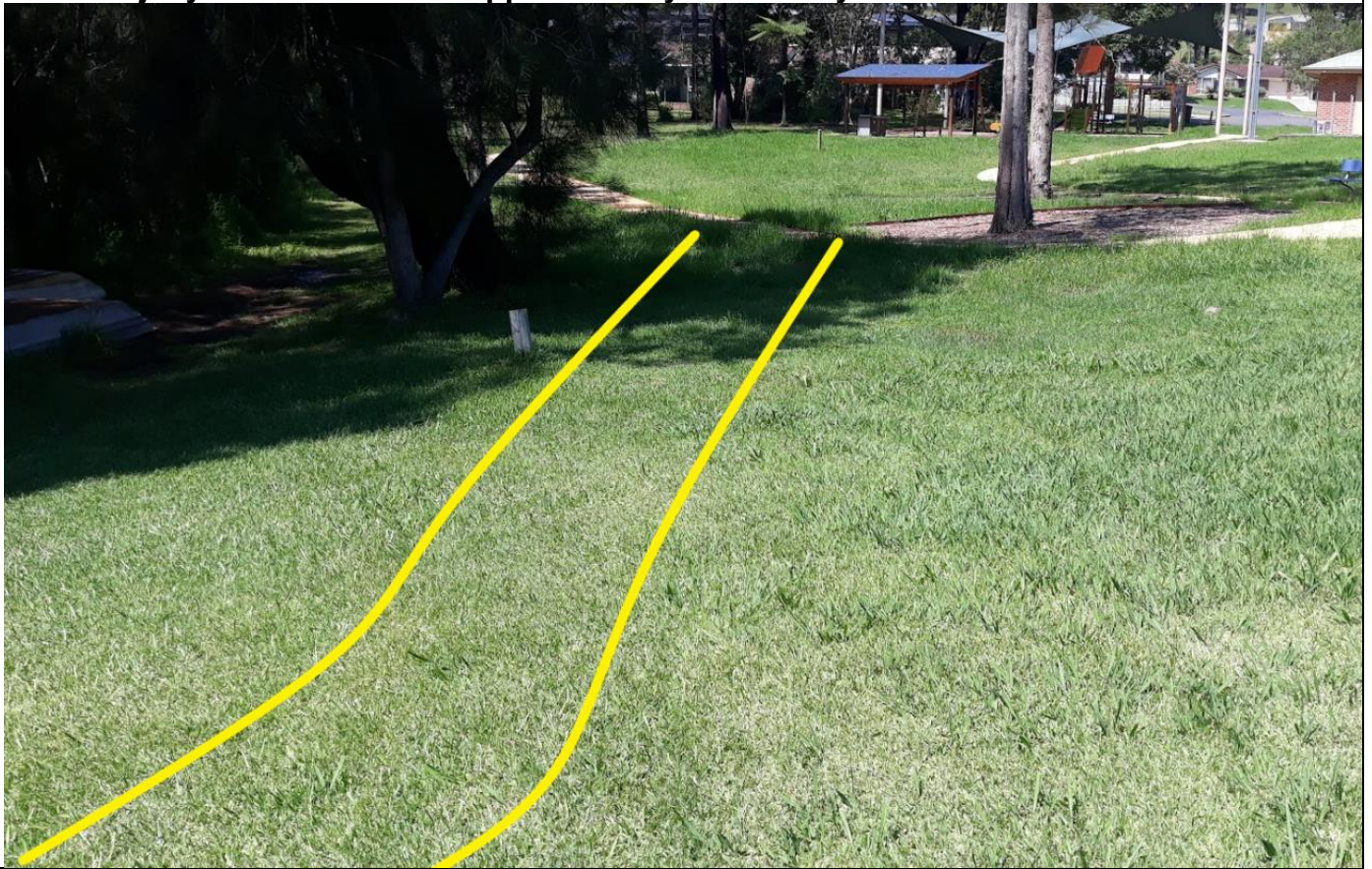


**Photo 2: approximate location of the 2 metre wide concrete path connecting the boat ramp at Valley Drive to the proposed jetty (background of the photo) to Hoylake Grove Reserve**

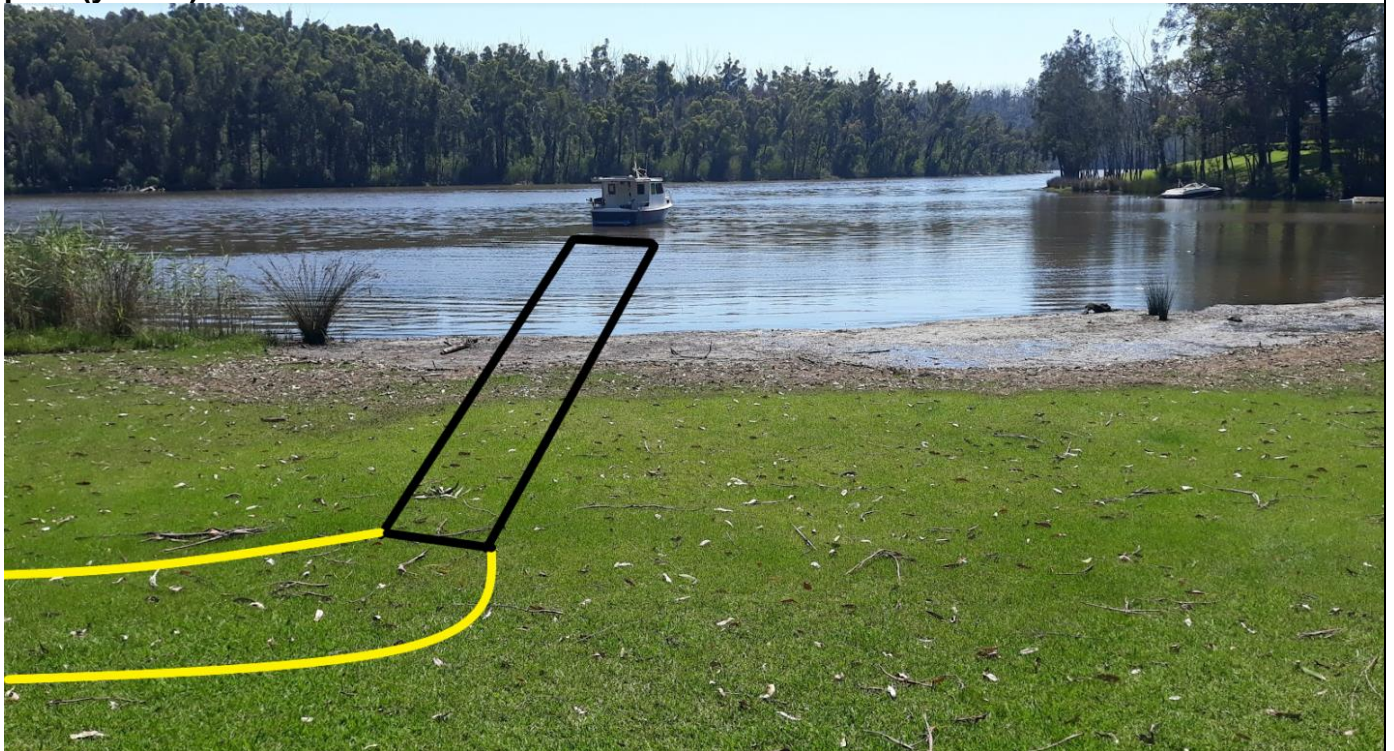




**Photo 3: Existing concrete path at Hoylake Grove Reserve to which the concrete path from the jetty would connect – approximately shown in yellow**



**Photo 4: Location of proposed kayak launching facility (black) and associated concrete path (yellow)**





**Photo 5: Zostera seagrass at the existing jetty**



### 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:

- Potential harm to approximately 34m<sup>2</sup> of *Zostera* seagrass.
- Minor removal of native foreshore vegetation comprising:
  - up to two *Ficinia (Isolepsi nodosa)* (a species listed as marine vegetation regulated under the NSW *Fisheries Management Act 1994*)
  - one small Swamp Oak *Casuarina glauca* sapling)
  - one clump of *Lobelia alata*
  - up to two Spiky-headed Mat-rush *Lomandra longifolia*

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:

- 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.

Greynurse Shark *Carcharias taurus* have been known to enter Lake Conjola from their preferred habitat around Green Island when the entrance is open to the sea. Greynurse Sharks, however, are typically found near the bottom (at depths of 10 to 40 metres) in deep sandy or gravel filled gutters, or in rocky caves (DoPI 2013b) this habitat is not present at the site of the proposed activity and if the species is in the area of the proposed activity during construction it would swim away without harm.

No other species, populations or ecological communities listed in the schedules of the Act are anticipated to occur in Yooralla Bay.

The proposal is therefore unlikely to result in any impact on threatened species or their habitat.

As demonstrated in Table 1 below, the proposed activity would not contribute significantly to key threatening processes, as listed under Part 7A of the Act.

The proposed activity therefore does not require an Environmental Impact Statement (EIS) or Species Impact Statement (SIS) under the Act.

**Table 1: Key threatening processes – Fisheries Management Act 1994**

Key Threatening Process (KTP)	Assessment
Degradation of native riparian vegetation along the NSW water courses	Not applicable – The subject waterway is estuarine. Estuarine and marine waters are excluded from this KTP as the degradation of riparian vegetation in these areas does not adversely affect two or more listed threatened species, populations or ecological communities (Fisheries Scientific Committee 2007).
Hook and line fishing in areas important for the survival of threatened fish species.	Not applicable – the proposed activity does not involve hook and line fishing.
Human-caused climate change.	Not applicable – the proposed activity would not contribute significantly to climate change and would not prevent implementation of the relevant Priorities Action Statement.
Installation and operation of instream structures and other mechanisms that alter natural flow regimes of rivers and streams.	Not applicable – Structures that have minimal impact on flow are excluded from the KTP (Fisheries Scientific Committee 2006).
Introduction of fish to waters within a catchment outside their natural range.	Not applicable – the proposed activity does not involve the introduction and movement of fish.
Introduction of non-indigenous fish and marine vegetation to the coastal waters of New South Wales.	Not applicable – the proposed activity does not involve the introduction and movement of non-indigenous fish or marine vegetation.



Removal of large wood debris from New South Wales and rivers and streams.	Not applicable – Currently there is only minor woody debris present in the works area i.e small branches that would not be removed. The prescribed environmental safeguards (Section 7 of this REF) also require that no woody debris is to be removed from the embayment.
The current shark meshing program in New South Wales waters	Not applicable – the proposed activity 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). The following species were assessed to require further assessment:

- Beach Stone-curlew *Esacus magnirostris*
- Pied Oystercatcher *Haematopus longirostris*
- Swift Parrot *Lathamus discolor*
- Grey-headed Flying-fox *Pteropus poliocephalus*

#### Beach Stone-curlew and Pied Oystercatcher

The Beach Stone-curlew is 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 or low trees; also among open mangroves. Beach Stone-curlews are usually seen alone or in pairs, but sometimes occur in small groups. Birds forage by stalking slowly like a heron or with quicker dashes after prey. The diet consists of crabs and other marine invertebrates. They are mainly active at dawn, dusk and at night, but birds are often seen when they shift or move about sedately during the day. Less strictly nocturnal than the related Bush Stone-curlew (*Burhinus grallarius*). In NSW, clutches have been recorded from early October to late March, but elsewhere in temperate Australia, breeding has been recorded from September. Their nests are just a shallow scrape in sand or gravel, above the tidal zone at the backs of beaches, or on sandbanks and islands or among open mangroves. Only one egg is laid, but birds will re-lay after the failure of a breeding attempt. Both parents defend the nest and care for the young. The young are precocial but appear not to be independent until they are 7-12 months old (OEH 2017a).

The Pied Oystercatcher 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. The chisel-like bill is used to pry open or break into shells of oysters and other shellfish. 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. Two to three eggs are laid between August and January. The female is the primary incubator and the young leave the nest within several days (OEH 2017b).

The intertidal zone near the proposed kayak launching facility could comprise suitable (albeit low-quality) foraging habitat for both species. The proposed activity however is unlikely to have an adverse effect on the lifecycle of the species such that a viable local population of the species is likely to be placed at risk of extinction for the following reasons:

- The proposed activity would not impact breeding habitat.
- A local population is not known for the location with the species being recorded only in the vicinity (five kilometre radius) of the proposed activity
- The kayak launching facility would only remove approximately 20m<sup>2</sup> of low-quality potential foraging habitat which is considered insignificant in comparison to the remaining foraging habitat along the estuary and beach shore-line nearby
- Both species are highly mobile and would leave the site if they were present during the construction of the facility.
- The proposed activity would have no impact on the tidal regimes of the embayment.

A species impact statement (SIS) and/or entry into the Biodiversity Offset Scheme (BOS) is therefore not required for these species.

#### Swift Parrot

The Swift Parrot breeds in Tasmania during the spring and summer, migrating in the autumn and winter months to south-eastern Australia. On the mainland they occur where eucalypts are flowering profusely or where there are abundant lerp (From Sap-sucking bugs) infestations. Favoured feed trees include winter flowering species such as Swamp Mahogany *Eucalyptus robusta* (which occurs at the site), Spotted Gum *Corymbia maculata*, Red Bloodwood *C. gummifera*, Forest Red Gum *E. tereticornis*, Mugga Ironbark *E. sideroxylon*, and White Box *E. albens* (OEH 2022).

The Swamp Mahogany trees at the site may provide foraging habitat for the species. The proposed activity however is unlikely to have an adverse effect on the lifecycle of the species such that a viable local population of the species is likely to be placed at risk of extinction for the following reasons:

- The proposed activity would not impact breeding habitat.
- A local population is not known for the location with the species being recorded only in the vicinity (five kilometre radius) of the proposed activity.
- The proposed activity would not remove any trees.
- The species is highly mobile and would leave the site if present during the construction of the facility.

A species impact statement (SIS) and/or entry into the Biodiversity Offset Scheme (BOS) is therefore not required for these species.

### Grey-headed Flying-fox (GHFF)

GHFF are generally found within 200 km of the eastern coast of Australia, from Rockhampton in Queensland to Adelaide in South Australia. Occur in subtropical and temperate rainforests, tall sclerophyll forests and woodlands, heaths and swamps as well as urban 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. Individual camps may have tens of thousands of animals and are used for mating, and for giving birth and rearing young. Annual mating commences in January and conception occurs in April or May; a single young is born in October or November. Site fidelity to camps is high; some camps have been used for over a century. Can travel up to 50 km from the camp to forage; commuting distances are more often <20 km. Feed on the nectar and pollen of native trees, in particular Eucalyptus, Melaleuca and Banksia, and fruits of rainforest trees and vines. Also forage in cultivated gardens and fruit crops.

A known GHFF camp is located approximately 1.5 kilometres to the west of the proposed location in the Yatte Yattah Nature Reserve and the species has been recorded in Conjola Park. The proposed activity however is unlikely to have an adverse effect on the lifecycle of the species such that a viable local population of the species is likely to be placed at risk of extinction for the following reasons:

- The proposed activity would not impact breeding habitat or camp sites.
- A local population is not known for the location with the species being recorded only in the vicinity (five kilometre radius) of the proposed activity.
- The proposed activity would not remove any trees or food resources.

A species impact statement (SIS) and/or entry into the Biodiversity Offset Scheme (BOS) is required for this species.

### **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**

Five endangered ecological communities (EECs) are mapped as occurring in the landscape in the vicinity (five kilometre radius) of the proposed activity (Figure 7 below). Although not mapped as such in Figure 7 below, the vegetation fringing the lake and near to the proposed activity could comprise the endangered ecological community *Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions* (hereafter referred to as 'Swamp Oak Floodplain Forest') due to the dominating presence of Swamp Oak *Casuarina glauca* and presence of other species listed in the Scientific Committees Determination for the EEC <https://www.environment.nsw.gov.au/Topics/Animals-and-plants/Threatened-species/NSW-Threatened-Species-Scientific-Committee/Determinations/Final-determinations/2011-2012/Swamp-Oak-Floodplain-Forest-of-the-NSW-North-Coast-minor-amendment-Determination> .

Swamp Oak Floodplain Forest is found on the coastal floodplains of NSW. It has a dense to sparse tree layer in which Swamp Oak is the dominant species. The community is associated with grey-black clay-loams and sandy loams where the groundwater is saline or subsaline, on waterlogged or periodically inundated flats, drainage lines, lake margins and estuarine fringes associated with coastal floodplains (OEH 2022b).

The Swamp Oak Forest at the site is highly disturbed and fragmented being cleared for residential development and presumed pastoral activities prior to residential development and maintained by mowing as foreshore parkland (refer to photos in Section 2.5 of this REF).

The proposed activity avoids clearing any species listed in the Scientific Committee's Determination and does not encroach into any of the disjunct remnant patches of Swamp Oak Forest. The proposed activity would be undertaken predominantly on cleared mown parkland non-native grasses such as Paspalum, Couch Grass, and Buffalo Grass.

The proposal would not result in or exacerbate the fragmentation or isolation of areas of the community and is unlikely to adversely affect the extent or composition of the community such that the local occurrence of the EEC (fringes of the estuary) would be placed at risk of extinction. A species impact statement (SIS) or entry into the BOS 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 further 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 13 April 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 12 April 2023. No objects were found.

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 : Yooralla Bay

Client Service ID : 772660

Shoalhaven City Council - Nowra

Date: 13 April 2023

PO Box 42 Bridge Rd

Nowra New South Wales 2541

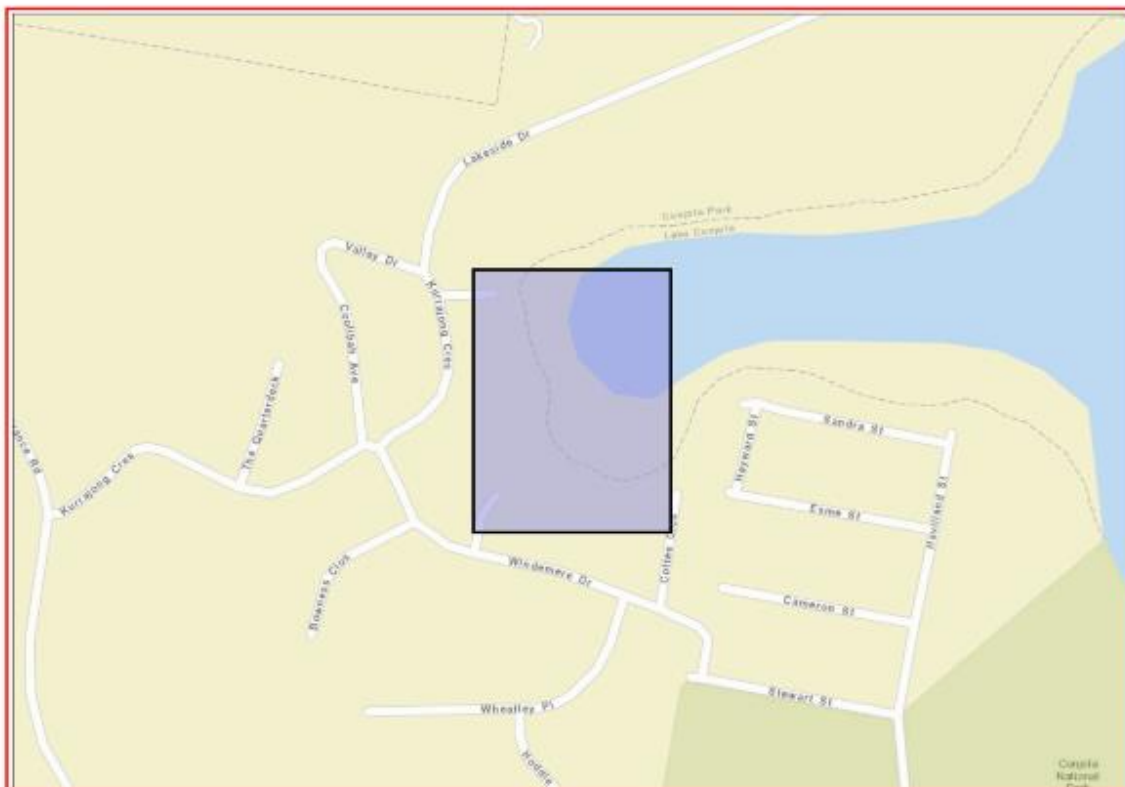
Attention: Geoffrey Young

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 : 266985.0 - 267171.0, Northings : 6094934.0 - 6095190.0 with a Buffer of 0 meters, conducted by Geoffrey Young on 13 April 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 concrete piles would be installed into the bottom sediments of Yooralla Bay which have been mapped as Class 1 risk for acid sulfate soils (Figure 6 p.15).

The *Shoalhaven Local Environmental Plan 2014* (SLEP) indicates that a risk of exposure of acid sulfate soils exist on land mapped as Class 1 where any works occur that expose soil to air.

The concrete piles would be installed in Class 1 risk bottom sediment through sleeved continuous flight auger (CFA) which according to MI Engineers (2023) could extract and contain extracted spoil within the system whilst piling.

Consequently, the bottom sediment material above the sandstone bedrock 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>4</sup> analysis shall confirm the presence of acidity, potential acidity and liming rate to neutralise the acid prior to disposal. If confirmed as acidic or potentially acidic, an Acid Sulfate Soil Management Plan shall be prepared in accordance with the Acid Sulfate Soil Manual (ASSMAC 1998). 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. The proposed activity is however, unlikely to result in adverse flood impacts (Stone, M. *pers.comm.* 2023).

The location of the proposed activity comprises a 1% Annual Exceedance Probability (AEP) high hazard flood storage and hydraulic category and a 2050 scenario Flood Planning Level of 3.3 metres AHD. The floating pontoon piles will extend one metre above this level thereby securing the pontoon structure during these events.

The replacement jetty, having a surface level of 1.24 m AHD, would be below the 1% AEP and would be submerged. However, under the current Conjola Entrance Management Plan, the lake is manually opened at 1.0m AHD. The jetty therefore is unlikely to be submerged for long-periods of time. The jetty would also be constructed from flood compatible materials and does not include electrical installations.

The kayak launching facility (and concrete path approaches) being at maximum level of 1.0m AHD would be submerged prior to entrance being opened. The length of time the entire facility could be submerged is unknown depending on the nature of the opening and weather conditions but is not expected to exceed one week. The launching facility would still be usable during time of submergence. The facility would also be constructed from flood compatible materials and does not include electrical installations.

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<sup>4</sup> Suspension Peroxide Oxidisation Combined Acidity and Sulfur.



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

### 3.8EP&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 environment under Part 5 of the EP&A Act. The following assessment in Table 2 below deals with each of the factors in relation to the proposed activity.

**Table 2: 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.</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 Yooralla Lake at the residential interface. The locality will remain the same except for the inclusion of the new replacement jetty with pontoons, kayak launching facility and concrete shared users path.</p> <p>The locality is currently used as a community recreation area with existing jetty, boat ramp, play equipment. The proposed activity would complement the locality.</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 significantly 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,	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 complementary. The proposed activity</p>

Does the proposal:	Assessment	Reason
recreational, scientific or other environmental quality or value of a locality?		<p>introduces a structure adjacent to a substantially altered environment, <i>i.e.</i> residential areas and cleared foreshore with existing watercraft facilities.</p> <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>

Does the proposal:	Assessment	Reason
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 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 significantly 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 recreational and watercraft area in a significantly modified environment. The proposed activity would improve this use.</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 kayak launching facility would not be submerged at high water levels as it would be temporary (as the height is at the Lake Conjola Entrance Opening Trigger of 1.0 metres), the launching facility would not be required at this time as water levels would be at or above the banks of the lake, the facility</p>

Does the proposal:	Assessment	Reason
		would still be usable and would be built of suitable materials.
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> and does not impact any areas mapped in the Planning Statement as “high environmental value” or “habitat corridor”.</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*

The entire Lake Conjola is mapped as Key Fish Habitat for the purposes of the Fisheries Management Act 1994. The proposed activity will involve reclamation and dredging and harm to Marine vegetation as defined in the Act.

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> and will require a Section 200 Permit to be issued by the NSW Department of Primary Industries – Fisheries prior to any works within the Lake and shore.

The proposed activity would potentially harm marine vegetation being approximately 34m<sup>2</sup> of Eelgrass seagrass (Figure 4 p.13) and potentially two *Isolepis nodosa* plants at the site of the jetty replacement.

If seagrass 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 therefore not required.

#### 4.3 Crown Land Management Act 2016

The proposed activity would be undertaken on the bed and foreshore of Yooralla Bay 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 Local Government Act 1993

The proposed activity would be undertaken on SCC owned community land with:

- Lot 114 DP 209594 categorised under the Act as “Park”,
- Lot 18 DP 703426 categorised under the Act as “Natural Area” with two subcategories of “Bushland” and “Wetland”.

Section 35 of the Act provides that community land is required to be used and managed in accordance with the plan of management (PoM) applying to the land.

The PoM applying to Lot 114 is the Generic Community Land Plan of Management – Parks (<https://doc.shoalhaven.nsw.gov.au/displaydoc.aspx?record=D11/116070>). The proposed activity is consistent with this PoM as it meets many of the prescribed objectives such as “*To encourage, promote and facilitate recreational, cultural, social and educational pastimes and activities*”, “*to improve pedestrian / cycle access to parks*” and “*to improve signage to parks to increase community awareness of their location*”. The PoM applying to Lot 18 is the *Generic Community Land Plan of Management – Natural Areas* (<https://doc.shoalhaven.nsw.gov.au/displaydoc.aspx?record=D16/208141>). The proposed activity is consistent with this PoM as it is consistent with the recreational values of Natural Areas described in the PoM i.e. “*The Shoalhaven’s natural areas provide many opportunities for outdoor/nature base recreational pursuits which are popular with residents and visitors. Natural Areas are used for activities such as walking, cycling, horse riding, fishing, swimming...*”. The proposed activity also meets many of the prescribed objectives such as “*To provide for community use of and access to the land in such a manner as will minimise and mitigate any disturbance caused by human intrusion*”, “*To regularly maintain walking tracks and build structures to minimise risk to visitors*”, “*To provide for recreational activities which will not significantly impact on the natural environment*”, and “*To provide access within Natural Areas which meets recreational*”.

*needs and does not cause significant damage to the environment*". The proposed activity therefore complies with the Act and no further consideration is required.

### 4.5 Other

A summary of other relevant legislation and permissibility is provided in Table 3 below.

**Table 3: 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 <input checked="" type="checkbox"/> Not permissible <input type="checkbox"/>	
<b>Justification:</b> 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.	
<b><i>State Environmental Planning Policy (Hazards and Resilience) 2021</i></b>	
Permissible <input checked="" type="checkbox"/> Not permissible <input type="checkbox"/>	
<b>Justification:</b> 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.	
<b><i>Protection of the Environment Operations Act 1997</i></b>	
Permissible <input checked="" type="checkbox"/> Not permissible <input type="checkbox"/>	
<b>Justification:</b> 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.	
<b><i>Local Land Services Act 2013</i></b>	
Permissible <input checked="" type="checkbox"/> Not permissible <input type="checkbox"/>	
<b>Justification:</b> 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.	
<b><i>National Parks and Wildlife Act 1974 (NP&amp;W Act)</i></b>	
Permissible <input checked="" type="checkbox"/> Not permissible <input type="checkbox"/>	
<b>Justification:</b> <ul style="list-style-type: none"> <li>The proposed activity would not encroach into National Park estate.</li> </ul>	



- 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.
- 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.

### **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).

### 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:
  - A portion of the proposed activity would occur on the bed of Lake Conjola beyond reserved or leased land, 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 (D23/53012). No further action by the proponent of the activity is required.

## 5. CONSULTATION WITH GOVERNMENT AGENCIES

### 5.1 Transport and Infrastructure SEPP 2021 requirements

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

The proposed activity would:

- (a) not have an impact on stormwater management
- (b) unlikely generate traffic to an extent that it would strain the capacity of the road system
- (c) not involve connection to, or have a substantial impact on the capacity of the sewerage system
- (d) not involve connection to, and use of a substantial volume of water from the water supply system
- (e) unlikely to cause a disruption to pedestrian or vehicular traffic
- (f) not involve excavation of a footpath or road.

Consultation under Section 2.10 is therefore not 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 (D23/52899). A response was received on 20 February 2023 (D23/142913). The response states:

*“Based on the concept design drawings the proposed infrastructure is unlikely to result in adverse flood impacts.*

*All infrastructure 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.*

*The replacement jetty has a surface level of 1.2m AHD. Whilst this is above the current planned opening level of 1.0m AHD for Lake Conjola, it is unknown what the entrance opening trigger levels may be in the future following completion of the CMP [Coastal Management Program prepared under the NSW Coastal Management Act 2016] and management actions coming from this. Nigel [Nigel Smith, SCC Lead – Coastal Management] may be able to comment on whether this level is adequate based on what entrance investigations have been completed or are planned for the CMP. We need to make sure the level is high enough to not be adversely impacted by the SLR [sea level rise] in its design life. Also proposed infrastructure should be able to accommodate a slightly higher planned opening level.”*

In response (MI Engineers 2023):

- All materials comply with *Supporting Document 1 – Chapter G9 – Guidelines for Development on Flood Prone Land*.
  - *The two marine structures are to be constructed of FRP material with stainless steel connections*
  - *The floating pontoons are purpose-built modules made from high impact and stress resistant UV stabilised polyethylene and are designed to be bolted to a structural frame. Modules contain polyurethane foam filling for additional security.*
  - *The shared user path is a monolithic concrete slab on ground.*
- Electrical installations are not proposed.
- The proposed structures have been designed to withstand hydrodynamic pressure, hydrostatic pressure, short-duration impact, debris force and buoyancy forces.

Additional comments were received from the Coastal Management Team (SCC reference D23/144116) on 24 February 2023. The response states:

*“I cannot find anywhere if this structure has been designed for sea level rise with an associated structural design life.*

*I would also like to see how the design has considered wind wave loading, as well as wave uplift forces. I am confident these forces would not govern the structural design (debris loading might though) but they should still be considered through the design process.*

*Following on from Mark’s comments about Lake water levels, I would like to understand how MIE have assessed the functionality of their design, For instance, if we had another February 2020 event where there was a period of significantly elevated water levels, would the new structure fail?”*

In response MI Engineers (MI Engineers 2023) contend that:

- The proposed structures have been designed for a 50-year design life. Based on the information provided by SCC’s Flood Certificate, the projected sea level / flood level rise is anticipated to be approximately 300 millimetres. Using the current mean sea level of RL 0.32 AHD, the projected 2100 MSL is expected to be approximately RL 0.62 AHD. Given the underside of the proposed jetty is RL 0.752 AHD, the jetty will maintain freeboard with the 2100 anticipated sea level rise.
- The proposed kayak launching facility is purposely designed to be a low-lying structure for convenient entry / exit of kayaks and the like. In the projected 2100MSL event, the structure (RL 1.0m AHD) will achieve approximately 400mm freeboard.
- The proposed structures have been designed to withstand wave loading, debris loading, and wave uplift forces.

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. So, 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 D23/52751). A response was received on 23 February 2023 (SCC reference D23/144234). The response confirmed that Transport for NSW have no objection to the proposed activity, provided that:

*“1. Each side of the jetty structure oriented in the direction of the navigable channel must be painted white and have reflective material (e.g. discs or strips) placed so that they can be seen by any passing vessel. Reason: To provide for safe navigation of vessels by providing visibility to passing vessels.*

*2. All pile caps on the jetty structure must be painted white and have reflective material (e.g. discs or strips) placed so they can be seen by any passing vessels. Reason: To provide for safe navigation of vessels by providing visibility to passing vessels.*

...

*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, an all parties must comply with any direction given by NSW Maritime Authorised officers with regard to safe navigation or the prevention of pollution”.*

Proprietary white pile caps have been incorporated into the design (Appendix A). All other 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

The proposed activity form part of the Conjola Connected Communities Masterplan (<https://doc.shoalhaven.nsw.gov.au/displaydoc.aspx?record=D20/339430>) and the Draft Yooralla Bay Concept Plan (<https://doc.shoalhaven.nsw.gov.au/displaydoc.aspx?record=D20/331289>) , connecting the existing boat ramp, proposed jetty and kayak launching facility to the existing park facilities at Hoylake Grove Reserve. Both plans were prepared after much engagement with the community and the Conjola Community Recovery Association (CRAA). Although not fully adopted by SCC, many of the elements identified in the plans including the proposed activity were endorsed by SCC.

The proposed activity would be procured through both the Black Summer Bushfire Recovery Grants Program to fund improvements to the Yooralla Bay foreshore and from funds donated to the CCRA. The donated CRAA funds were held in trust by SCC and were subject of a survey. The survey was sent to residents within a 10 kilometre radius of the proposed activity site. Notifications were also place on the electronic community noticeboard at Lake Conjola, and social media posts were published on the Conjola Community Association's Facebook page. Hard copies of the survey were made available for collection from the Lake Conjola Local Post Office, the Ulladulla Service Centre, and the Civic Administration Centre in Nowra. The survey was launched at a community event held at the proposed activity site on 25 February 2023.

The results of the survey demonstrated strong support for the establishment of a path from the Yooralla Bay Boat Ramp, along Hoylake Grove Foreshore to Cottee Close. This was ranked second out of the nine potential projects presented in the survey (details can be found in SCC document reference D23/139157). The Jetty replacement and kayak launching facility would aid in establishing parts of that footpath, consistent with feedback from the Conjola Park community.

Regarding the proposed activity, further engagement was undertaken utilising an information item and questionnaire on SCC's website (Conjola Improvements Page) [https://getinvolved.shoalhaven.nsw.gov.au/hoy-lake-grove/news\\_feed/jetty-replacement-and-kayak-facility-yooralla-bay](https://getinvolved.shoalhaven.nsw.gov.au/hoy-lake-grove/news_feed/jetty-replacement-and-kayak-facility-yooralla-bay) where plans were made available to download. The results of the survey confirmed that the community supported the proposed activity with the replacement of the Jetty of higher priority (SCC document D23/274863).

In response to the release of the plans the CCA submitted a response to SCC's Project Team seeking changes and clarification (D23/271475). A summary of these changes and clarification and SCC's subsequent response are provided in Table 4 below.

**Table 4: CCA submission and subsequent SCC response**

CCA submission	SCC response
<i>Can consideration be given to moving the kayak launch to instead run parallel with the new jetty (which is located in a deeper water area)?</i>	The location of the kayak facility is reflective of the Yooralla Bay Masterplan by TAKT architecture which was a result of extensive community consultation in 2020. A driving factor towards the separation of the two facilities is safety as it provides a buffer between powered and non-powered watercraft. Council has further investigated the location of the facility, it's length and the tides that it services and can provide the
<i>Other options - extending proposed kayak launch length beyond 30m to give reliable access to open water in</i>	

CCA submission	SCC response
<i>current location OR making the new jetty wider. However given the new jetty is L shaped (with spaces for boat mooring?), running the kayak alongside it will create an upside down U shape. This will also allow a safe swimming area within the upside down U shape. Moving would also allow easier road access for kayaks (from Valley Drive and Hoylake Grove equally).</i>	following information. From the Manly Hydraulics Laboratory (MHL) tide data from 1992 to 2013, for lake Conjola, the water level is above 0.00m AHD 98.8% of the time. At 0.00m AHD the water level would be 320mm lower than the end of the kayak facility. Considering that kayak's float above the water level, entering a kayak at this water level should not be an issue. As such, Council considers the location and lowest RL of the facility acceptable.
<i>Discussion of how high the jetty will be as current jetty has frequently gone under water. If it were higher and wider, it might be able to accommodate steps with seating which would be great for older residents and fishing etc</i>	The replacement jetty will be much higher than the existing jetty at an RL of 1.24. Based on the same MHL data referenced above, a water level above RL 1.24 would only occur ≈0.06% of the time. No change to the plans were undertaken.
<i>Can we also widen the foreshore path (between Valley Drive to Cottee Close &amp; beyond) to a Shared User Path (minimum 2.5m) to accommodate kayaks, wheelchairs, e-bikes, cargo-bikes, etc</i>	The shared user path has been designed at 2.0m which is consistent with most shared user paths throughout the Shoalhaven. Wider paths are used in some locations where very high user volume or specific grant conditions have warranted it however for the low user volume anticipated at this project Council considers 2.0m to be adequate. No change to the plans were undertaken.
<i>Can we request that there is no crossover of the foreshore path with the kid's bike loop at the Hoylake Grove playground for safety reasons</i>	Council understands the concern regarding merging of the proposed pathway and the existing pathway at the Hoylake Grove playground. The path has been redesigned in this area so that an overall path width of 3.0m is achieved. A 3.0m path should be suitable for all users in this location. The kid's bike loop was constructed much larger than originally envisaged in the TAKT architecture masterplan and as a result there is less space available to have separate paths without affecting the shoreline vegetation.
<i>Lastly (and this may be outside the scope of this project), can we still please allow kayaks to go out from the Sandra St beach (previously used for boats &amp; kayaks, but now cordoned off)?</i>	This is outside the scope of the proposed activity. The demolition of the Sandra Street boat ramp was a condition of NSW Department of Primary Industries' Fisheries Permit for the construction of the Havilland Street boat ramp. Council is unable to re-open the ramp and associated vehicular access.

The level of engagement undertaken for the proposed activity is consistent with Council's Community Engagement Policy (POL12-28). Apart from notifying the relevant community bodies and residents about the commencement date and noise-generating activities, no further engagement is required prior to works commencing.



## 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 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 (for the works below mean high water mark)	SCC PM, SCC EOO, and Construction Contractor
3. This REF shall be published on the NSW Planning Portal	SCC EOO
4. 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 shall be prepared to facilitate treatment.	Construction Contractor
5. This REF shall be reviewed when Construction Contractor is engaged and methodology is agreed and finalised.	SCC EOO
<b>Site Establishment</b>	
6. A waterway traffic management plan shall be prepared to safely manage public use of the waterway in the vicinity of the proposed activity.	Construction Contractor
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. The waterway traffic management plan shall be implemented.</p>	Construction Contractor
<p>12. The contractor shall maintain public access to the boat ramp.</p>	Construction Contractor
<p>13. During demolition of the existing jetty, the lower parts of the existing piles shall be left in place by cutting off existing</p>	Construction Contractor

<b>Safeguard / Measure</b>	<b>Responsibility</b>
piles at lake floor level or above any marine growth if present.	
14. 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.	SCC PM and Construction Contractor
15. Erosion and sediment controls and the hydrocarbon boom and silt curtain shall be maintained in good working order 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.	Construction Contractor
16. Vegetation removal shall be undertaken only to the extent required to carry out the works.	Construction Contractor
17. Eelgrass wrack shall be left on site (can be moved).	Construction Contractor
18. 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
19. 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
20. 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
21. 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
22. Each side of the structures oriented in the direction of the navigable channel must be painted white and have reflective	Construction Contractor

Safeguard / Measure	Responsibility
material (e.g. discs or strips) placed so that they can be seen by any passing vessel.	
23. All pile caps on the jetty structure must be painted white and have reflective material (e.g. discs or strips) placed so they can be seen by any passing vessels.	Construction Contractor
24. 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>	
25. 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
26. Any post-construction conditions of the Fisheries Permit and Crown Lands Licence shall be accomplished.	SCC PM or EOO



## 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 the replacement and extension of an existing jetty, the installation of a new kayak launching facility and connecting concrete paths in Yooralla Bay, Conjola Park.

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. A Fisheries Permit and a Crown Lands licence is required. No additional statutory approvals, licences, permits and external government consultations are required.
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:**



Troy Punnett  
District Engineer - Southern  
Shoalhaven City Council

Date: 07/05/2023

## 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)
- DoPI (Department of Primary Industries, NSW) 2013 *Policy and Guidelines for Fish Habitat Conservation and Management*. ISBN 978 1 74256 283  
[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)
- DoPI (Department of Primary Industries, NSW) 2013b *Factsheet: Greynurse Shark (Sarcharias taurus)*. [https://www.dpi.nsw.gov.au/\\_data/assets/pdf\\_file/0004/635053/Primefact-582-Greynurse-shark.pdf](https://www.dpi.nsw.gov.au/_data/assets/pdf_file/0004/635053/Primefact-582-Greynurse-shark.pdf)
- Fisheries Scientific Committee 2006 *Determination: Installation and Operation of Instream Structures and Other Mechanisms That Alter Natural Flow Regimes of Rivers and Streams*. [https://www.dpi.nsw.gov.au/\\_data/assets/pdf\\_file/0010/636517/FR21-instream-structures.pdf](https://www.dpi.nsw.gov.au/_data/assets/pdf_file/0010/636517/FR21-instream-structures.pdf)
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- Geofirst Pty Ltd 2022 *Geotechnical Report: Geotechnical Assessment for Proposed Jetty Replacement and Kayak Facility Yooralla Bay, Conjola Park, NSW 2539*. Unpublished report for MI Engineers (SCC reference D23/128725)
- GHD 2013 *Lake Conjola Interim Entrance Management Policy*. Unpublished report for Shoalhaven City Council (reference D19/98428).
- 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 Jetty Replacement and Kayak Facility – Yooralla Bay, Conjola Park, NSW 2539*. Unpublished report for Shoalhaven City Council (MI Engineers reference DN220293.R02 dated 3 May 2023).
- OEH (NSW Office of Environment and Heritage). 2017a. Beach Stone-curlew – profile. Available at: <https://www.environment.nsw.gov.au/threatenedspeciesapp/profile.aspx?id=10280>
- OEH (NSW Office of Environment and Heritage). 2017c. Pied Oystercatcher – profile. Available at: <https://www.environment.nsw.gov.au/threatenedspeciesapp/profile.aspx?id=10386>
- OEH (NSW Office of Environment and Heritage). 2022 Swift Parrot – profile. Available at: <https://www.environment.nsw.gov.au/threatenedspeciesapp/profile.aspx?id=10455>
- OEH (NSW Office of Environment and Heritage). 2022 Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South east Corner Bioregions – profile.

Available at:

<https://www.environment.nsw.gov.au/threatenedspeciesapp/profile.aspx?id=10945>

SCC (Shoalhaven City Council) 2021 *Review of Environmental Factors – Management of Lake Conjola Entrance* (SCC Reference D20/383332)

Spurway (Peter Spurway and Associates Pty Ltd) 2013 *Review of Environmental Factors – Lake Conjola Entrance management* (SCC reference D19/187626)

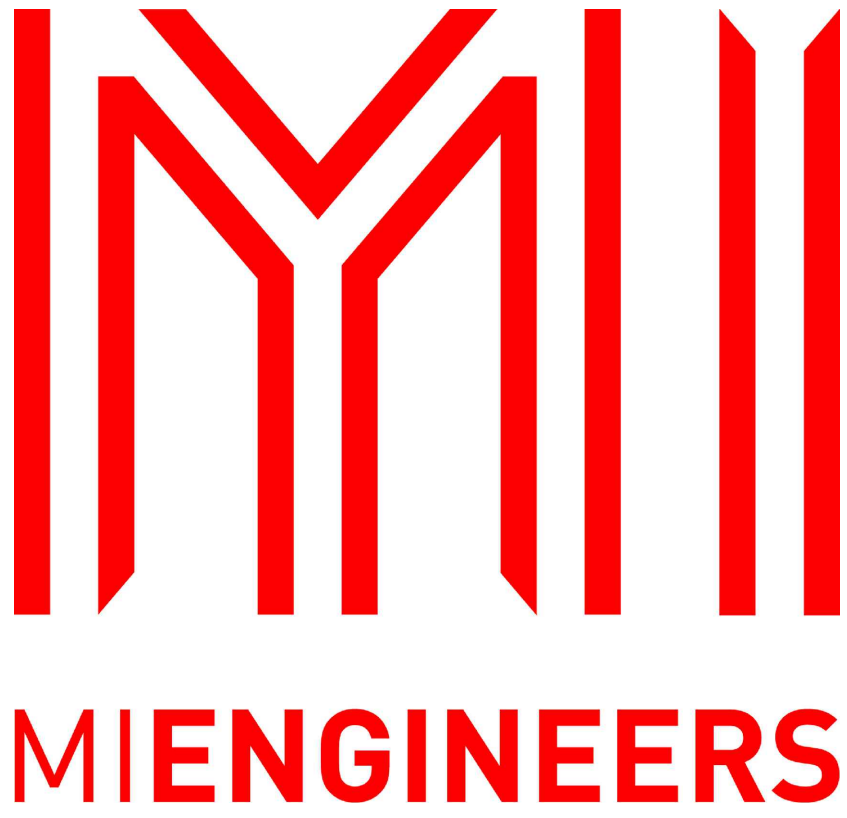
TfNSW (Transport for NSW) 2015 *NSW Boat Ramp Facility Guidelines*. Roads and Maritime Services

### **Personal communications**

Stone, M. 2023 *Lead – Floodplain Management – Shoalhaven City Council* (SCC reference D23/142913)

## 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

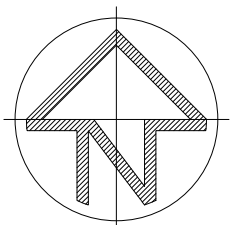
WOLLONGONG OFFICE  
Suite 3, 128/134 Crown Street, Wollongong NSW 2500  
Tel (02) 4423 0566

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# WATERWAYS & BOATING FACILITY IMPROVEMENTS

## YOORALLA BAY, CONJOLA PARK

### STAGE 1 - PROPOSED REPLACEMENT JETTY



LOCALITY PLAN  
N.T.S.

### DRAWING INDEX

SCC REF	MI REF
5572.01	DN220293 C101 STAGE 1 - COVER SHEET
5572.02	DN220293 C102 STAGE 1 - TYPICAL CROSS SECTIONS
5572.03	DN220293 C103 STAGE 1 - TYPICAL DETAILS
5572.04	DN220293 C110 STAGE 1 - SITE & STAGING LAYOUT PLAN
5572.05	DN220293 C111 STAGE 1 - SHARED USER PATH PLAN
5572.06	DN220293 C113 STAGE 1 - MC01 LONGITUDINAL SECTION
5572.07	DN220293 C115 STAGE 1 - MC01 CROSS SECTIONS
5572.08	DN220293 C116 STAGE 1 - CULVERT LAYOUT PLAN & DETAILS
5572.09	DN220293 C117 STAGE 1 - CULVERT SLAB PLAN & DETAILS
5572.10	DN220293 C120 STAGE 1 - VALLEY DRIVE REPLACEMENT JETTY PLAN
5572.11	DN220293 C121 STAGE 1 - VALLEY DRIVE REPLACEMENT JETTY DETAILS
5572.12	DN220293 C150 STAGE 1 - SIGNAGE AND LINEMARKING PLAN

APPROXIMATE AREA OF WORKS - - - - -

NOMINATION OF PROPRIETARY ITEMS DOES NOT INDICATE EXCLUSIVE PREFERENCE BUT INDICATES REQUIRED PROPERTIES OF THE ITEM. SIMILAR ALTERNATIVES HAVING THE REQUIRED PROPERTIES MAY BE CONSIDERED FOR APPROVAL. APPROVAL OF AN ALTERNATIVE PRODUCT DOES NOT AUTHORISE A VARIATION TO THE CONTRACT.

INSTALL PROPRIETARY ITEMS IN ACCORDANCE WITH MANUFACTURERS REQUIREMENTS AND RECOMMENDATIONS

LEGEND	
— S — S —	EXISTING SEWER LINE
— SR — SR —	EXISTING SEWER RISING MAIN
— W — W —	EXISTING WATER MAIN
— SW — SW —	EXISTING STORMWATER LINE
---	BOUNDARY LINE
---	EASEMENT
PP	EXISTING POWER POLE
EX. WM	EXISTING WATER METER
EX. HYD	EXISTING HYDRANT
EX. SV	EXISTING STOP VALVE
Ex. SMH	EXISTING SEWER MANHOLE
	EXISTING SEALED ROAD

REVISION	AMENDMENTS	DATE	CKD	APP	SURVEYOR: AXIOM SPATIAL SURVEYORS
1	IFC PLAN SET	23.06.23	AS	TS	DATE OF SURVEY: 10.11.2022
C	DETAILED DESIGN PLAN SET	13.03.23	AS	TS	ORIGIN: PM 106284
B	CONCEPT PLAN SET FOR COMMUNITY CONSULTATION	10.02.23	TS	TS	HEIGHT OF DATUM: RL 2.337 AHD
A	CONCEPT PLAN SET FOR REVIEW	30.11.22	TS	TS	HORIZONTAL DATUM: MGA1994
2	ADJUSTMENTS MADE BY SCC IN LINE WITH INTERNAL COMMENTS	10.07.23	TSP	DP	

CLIENT:

PLAN REFERENCE

5572.01

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PROJECT :

WATERWAYS & BOATING FACILITY IMPROVEMENTS

YOORALLA BAY, CONJOLA PARK

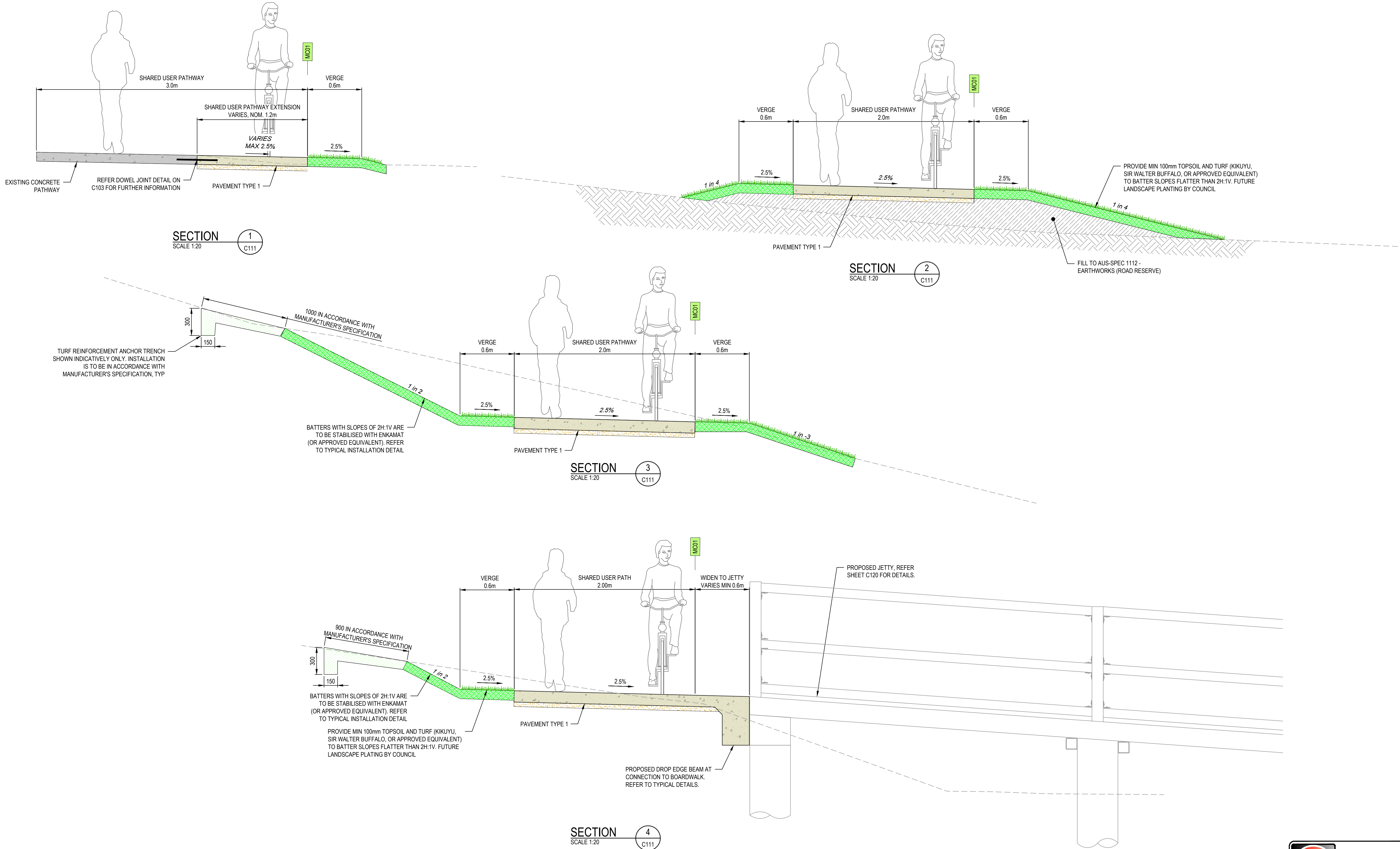
STAGE 1 - PROPOSED REPLACEMENT JETTY

DRAWING NAME:

STAGE 1 - COVER SHEET


DESIGNED:	DRAWN:	SCALE:	SHEET SIZE:
TS	JM	-	A1
DRAWING STATUS		DRAWING No.	
CONSTRUCTION		C101	
PROJECT No.		REVISION:	
DN220293		2	





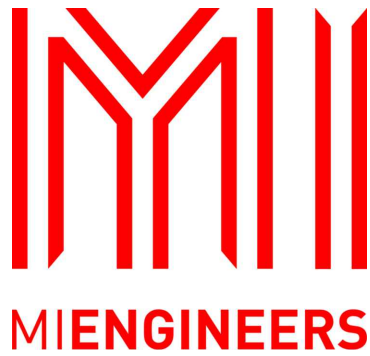
REVISION	AMENDMENTS	DATE	CKD	APP	SURVEYOR: AXIOM SPATIAL SURVEYORS
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A	CONCEPT PLAN SET FOR REVIEW	30.11.22	TS	TS	HORIZONTAL DATUM: MGA1994

CLIENT:



PLAN REFERENCE

5572.02



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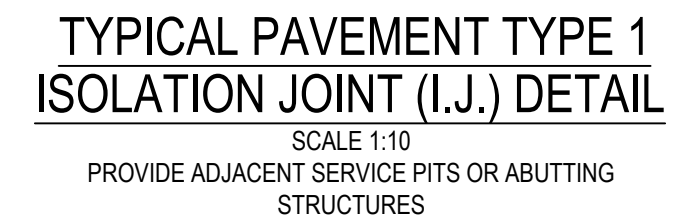
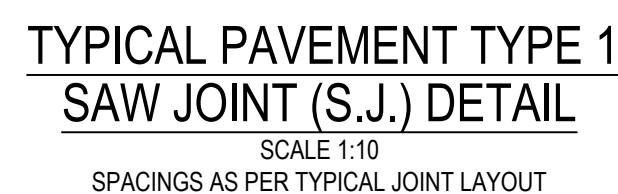
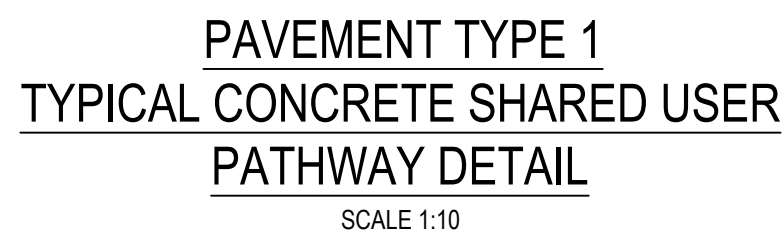
PROJECT :

WATERWAYS & BOATING FACILITY IMPROVEMENTS  
YOORALLA BAY, CONJOLA PARK  
STAGE 1 - PROPOSED REPLACEMENT JETTY

DRAWING NAME:  
STAGE 1 - TYPICAL CROSS SECTIONS

DESIGNED: JM	DRAWN: JM	SCALE: 1:20	SHEET SIZE: A1
DRAWING STATUS CONSTRUCTION		DRAWING No. C102	
PROJECT No. DN220293		REVISION: 1	





**NOTE:**  
THE ABOVE TYPICAL DETAIL SHOWS THE SOIL FILLING METHOD FOR INFORMATION ONLY. ALL INSTALLATION IS TO BE IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATIONS AND GUIDELINES. ALTERNATIVE SEEDING METHODS MAY BE USED WITH APPROVAL FROM COUNCIL.

TEMPORARY EROSION PROTECTION IS TO BE PROVIDED PRIOR TO ESTABLISHMENT OF VEGETATION COVER



NOTE: NEW JOINTS TO MATCH JOINTING LAYOUT OF EXISTING FOOTPATH WHERE WIDENING IS REQUIRED (APPROX. MC01 CH10 TO CH50)



POWDER COATED  
STEEL BOLLARD WITH  
CLASS 2 REFELCTIVE  
TAPE AS PER NSW  
BICYCLE GUIDELINES,  
FIGURE 6.3

INSTALL BOLT DOWN OR SLEEVED POWDER COATED YELLOW  
STEEL BOLLARDS IN LIEU OF TIMBER BOLLARDS TO  
MANUFACTURERS SPECIFICATIONS  
REFER TO NSW BICYCLE GUIDELINES, FIGURE 6.3 REGARDING  
BOLLARD TYPE.  
PLACEMENT OF BOLLARDS AS PER THE TYPICAL DETAIL.

~~TIMBER BOLLARD NOTES~~

1. ~~ALL CUT EDGES (INCLUDING ENDS OF POSTS) ARE TO BE RESEALED WITH "PROTIUM RESEAL" PRIOR TO STAINING.~~
2. ~~COAT ALL TIMBER TO COUNCIL'S SPECIFICATION~~
3. ~~THE STAIN MUST BE AN OIL BASED PRODUCT TO ADHERE TO THE RESEAL~~
4. ~~RE-COAT YEARLY TO MAINTAIN COLOUR (NOTE, RE-COATING BY OTHERS)~~

REVISION	AMENDMENTS	DATE	CKD	APP	SURVEYOR: AXIOM SPATIAL SURVEYORS
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A	CONCEPT PLAN SET FOR REVIEW	30.11.22	RM	TS	HORIZONTAL DATUM: MGA1994
2	ADJUSTMENTS MADE BY SCC IN LINE WITH INTERNAL COMMENTS	10.07.23	TSP	DP	

CLIENT:

*Shoalhaven*  
City Council

PLAN REFERENCE

5572.03



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**PROJECT :**

WATERWAYS & BOATING FACILITY IMPROVEMENTS  
YOORALLA BAY, CONJOLA PARK  
STAGE 1 - PROPOSED REPLACEMENT JETTY

DRAWING NAME:

STAGE 1 - TYPICAL DETAILS

				<b>DIAL BEFORE YOU DIG</b> <a href="http://www.1100.com.au">www.1100.com.au</a>			
DESIGNED:		DRAWN:		SCALE:		SHEET SIZE:	
JM		JM		1:20		A1	
DRAWING STATUS				DRAWING No.			
CONSTRUCTION				C103			
PROJECT No.				REVISION:			
DN220293				2			







GENERAL LEGEND	
	CONTROL LINE
	PAVEMENT TYPE 1
	PROPOSED JETTY
	PROPOSED VERGE
	PROPOSED RIP-RAP SCOUR PROTECTION
	PROPOSED BARRIER FENCE



REVISION	AMENDMENTS	DATE	CKD	APP
1	IFC PLAN SET	23.06.23	AS	TS
C	DETAILED DESIGN PLAN SET	13.03.23	AS	TS
B	CONCEPT PLAN SET FOR COMMUNITY CONSULTATION	10.02.23	TS	TS
A	CONCEPT PLAN SET FOR REVIEW	30.11.22	RM	TS

SURVEYOR: AXIOM SPATIAL SURVEYORS
DATE OF SURVEY: 10.11.2022
ORIGIN: PM 106284
HEIGHT OF DATUM: RL 2.337 AHD
HORIZONTAL DATUM: MGA1994

CLIENT: 
PLAN REFERENCE: 5572.04

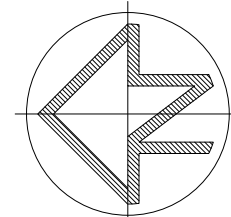
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PROJECT: WATERWAYS & BOATING FACILITY IMPROVEMENTS YOORALLA BAY, CONJOLA PARK STAGE 1 - PROPOSED REPLACEMENT JETTY
DRAWING NAME: STAGE 1 - SITE & STAGING LAYOUT PLAN

	DESIGNED: JM	DRAWN: JM	SCALE: 1:500	SHEET SIZE: A1
DRAWING STATUS: CONSTRUCTION	DRAWING No. C110	PROJECT No. DN220293	REVISION: 1	





## GENERAL LEGEND

MC01	CONTROL LINE
	PAVEMENT TYPE 1
	PROPOSED JETTY
	PROPOSED VERGE
	PROPOSED RIP-RAP SCOUR PROTECTION
	PROPOSED BARRIER FENCE

PROPOSED REPLACEMENT JETTY,  
REFER SHEET C120-121 FOR DETAILS.

REMOVE EXISTING TIMBER BOLLARDS  
AND REPLACE WITH BOLT DOWN OR  
SLEEVED STEEL POWDER COATED  
YELLOW BOLLARDS TO  
MANUFACTURERS SPECIFICATIONS  
AS PER NSW BICYCLE GUIDELINES,  
FIGURE 6.3  
REFER TO SHEET C103 'TYPICAL  
BOLLARD PATH THRESHOLD DETAILS'  
FOR PLACEMENT DETAILS

REMOVE AND REPLACE EXISTING  
TIMBER BOLLARDS. REFER TYPICAL  
BOLLARD PATH THRESHOLD DETAIL.

EXISTING SEWER MANHOLE C1A/4.  
EXISTING MANHOLE COVER (RL 2.47) TO BE ADJUSTED  
TO THE PATH FINISHED SURFACE LEVEL (RL 1.91) BY  
SHOALHAVEN WATER. LIAISE WITH THE PRINCIPAL  
PRIOR TO COMMENCING CONSTRUCTION REGARDING  
THE TIMING OF COVER ADJUSTMENT WORKS.

PROPOSED PRECAST BOX CULVERT  
CROWN 900(W)x300(H)x3600(L).  
REFER SHEET C116 FOR DETAILS.

LOCALLY ADJUST LEVELS TO PROVIDE  
A SMOOTH TIE-IN TO THE EXISTING  
FOOTPATH. REFER TYPICAL DETAIL.

EXISTING CONCRETE  
FOOTPATH

LOCALLY GRADE FILL BATTER TO DRAIN  
THROUGH PROPOSED CULVERT.

CLEAN OUT EXISTING SWALE DRAIN  
TO ALLOW THE FREE PASSAGE OF  
OVERLAND FLOW THROUGH THE  
PROPOSED CULVERT.

EXISTING STORMWATER  
OUTLET PIPE.

LOT 28  
DP262596

LOT 86  
DP209594

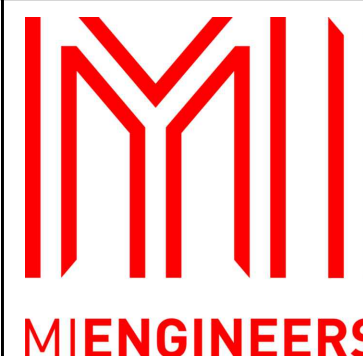
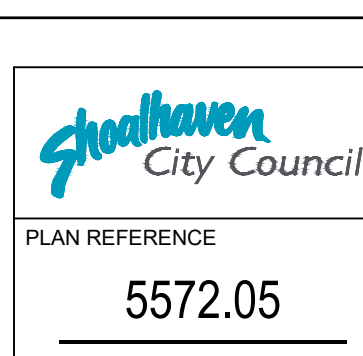
LOT 87  
DP209594

## STAGE 1 - SHARED USER PATH PLAN

SCALE 1:200



REVISION	AMENDMENTS	DATE	CKD	APP	SURVEYOR: AXIOM SPATIAL SURVEYORS	CLIENT:
1	IFC PLAN SET	23.06.23	AS	TS	DATE OF SURVEY: 10.11.2022	 PLAN REFERENCE <b>5572.05</b>
C	DETAILED DESIGN PLAN SET	13.03.23	AS	TS	ORIGIN: PM 106284	
B	CONCEPT PLAN SET FOR COMMUNITY CONSULTATION	10.02.23	TS	TS	HEIGHT OF DATUM: RL 2.337 AHD	
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2	ADJUSTMENTS MADE BY SCC IN LINE WITH INTERNAL COMMENTS	10.07.23	TSP	DP		



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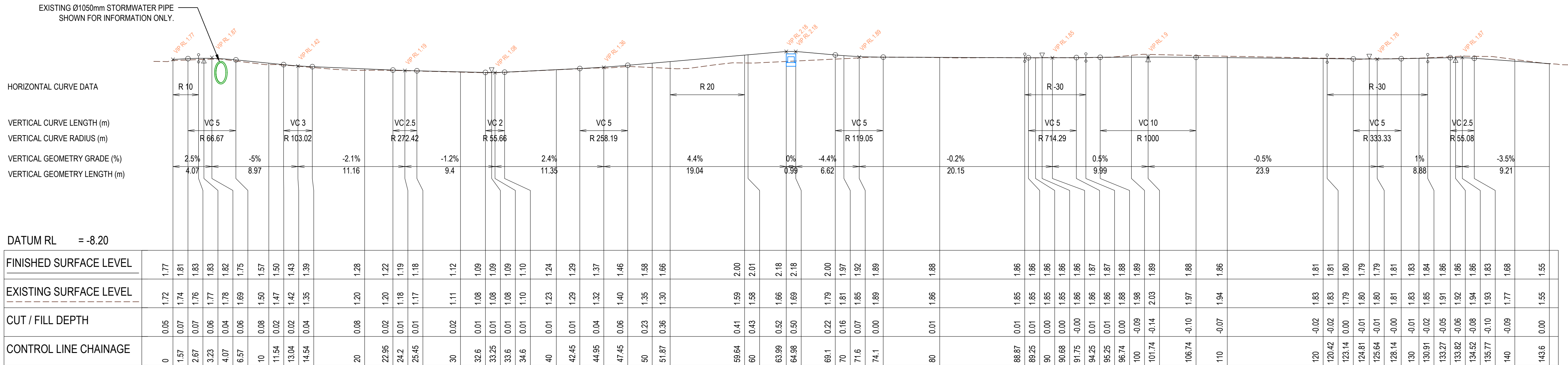
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PROJECT:  
**WATERWAYS & BOATING FACILITY IMPROVEMENTS  
YOORALLA BAY, CONJOLA PARK  
STAGE 1 - PROPOSED REPLACEMENT JETTY**

DRAWING NAME:  
**STAGE 1 - SHARED USER PATH PLAN**

DESIGNED: JM	DRAWN: JM	SCALE: 1:200	SHEET SIZE: A1
DRAWING STATUS <b>CONSTRUCTION</b>		DRAWING No. <b>C111</b>	
PROJECT No. <b>DN220293</b>		REVISION: <b>2</b>	






A1 SCALE: H 1:250, V 1:125  
LONGITUDINAL SECTION MC01

REVISION	AMENDMENTS	DATE	CKD	APP	SURVEYOR: AXIOM SPATIAL SURVEYORS
1	IFC PLAN SET	23.06.23	AS	TS	DATE OF SURVEY: 10.11.2022
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A	CONCEPT PLAN SET FOR REVIEW	30.11.22	RM	TS	HORIZONTAL DATUM: MGA1994

CLIENT:



PLAN REFERENCE  
5572.06



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PROJECT :  
WATERWAYS & BOATING FACILITY IMPROVEMENTS  
YOORALLA BAY, CONJOLA PARK  
STAGE 1 - PROPOSED REPLACEMENT JETTY

DRAWING NAME:  
STAGE 1 - MC01 LONGITUDINAL SECTION

DESIGNED: JM	DRAWN: JM	SCALE: 1:200	SHEET SIZE: A1
DRAWING STATUS CONSTRUCTION		DRAWING No. C113	
PROJECT No. DN220293		REVISION: 1	



DATUM RL -1.30

FINISHED SURFACE LEVEL									
CUT / FILL DEPTH									
EXISTING SURFACE LEVEL									
OFFSET									

A1 SCALE: H 1:100, V 1:100

CH 30.00

DATUM RL -1.20

FINISHED SURFACE LEVEL									
CUT / FILL DEPTH									
EXISTING SURFACE LEVEL									
OFFSET									

A1 SCALE: H 1:100, V 1:100

CH 20.00

DATUM RL -0.90

FINISHED SURFACE LEVEL									
CUT / FILL DEPTH									
EXISTING SURFACE LEVEL									
OFFSET									

A1 SCALE: H 1:100, V 1:100

CH 10.00

DATUM RL -1.00

FINISHED SURFACE LEVEL									
CUT / FILL DEPTH									
EXISTING SURFACE LEVEL									
OFFSET									

A1 SCALE: H 1:100, V 1:100

CH 60.00

DATUM RL -1.20

FINISHED SURFACE LEVEL									
CUT / FILL DEPTH									
EXISTING SURFACE LEVEL									
OFFSET									

A1 SCALE: H 1:100, V 1:100

CH 50.00

DATUM RL -1.20

FINISHED SURFACE LEVEL									
CUT / FILL DEPTH									
EXISTING SURFACE LEVEL									
OFFSET									

A1 SCALE: H 1:100, V 1:100

CH 40.00

DATUM RL -0.90

FINISHED SURFACE LEVEL									
CUT / FILL DEPTH									
EXISTING SURFACE LEVEL									
OFFSET									

A1 SCALE: H 1:100, V 1:100

CH 90.00

DATUM RL -0.80

FINISHED SURFACE LEVEL									
CUT / FILL DEPTH									
EXISTING SURFACE LEVEL									
OFFSET									

A1 SCALE: H 1:100, V 1:100

CH 80.00

DATUM RL -1.00

FINISHED SURFACE LEVEL									
CUT / FILL DEPTH									
EXISTING SURFACE LEVEL									
OFFSET									

A1 SCALE: H 1:100, V 1:100

CH 70.00

DATUM RL -1.70

FINISHED SURFACE LEVEL									
CUT / FILL DEPTH									
EXISTING SURFACE LEVEL									
OFFSET									

A1 SCALE: H 1:100, V 1:100

CH 120.00

DATUM RL -0.90

FINISHED SURFACE LEVEL									
CUT / FILL DEPTH									
EXISTING SURFACE LEVEL									
OFFSET									

A1 SCALE: H 1:100, V 1:100

CH 110.00

DATUM RL -0.70

FINISHED SURFACE LEVEL									
CUT / FILL DEPTH									
EXISTING SURFACE LEVEL									
OFFSET									

A1 SCALE: H 1:100, V 1:100

CH 100.00

DATUM RL -1.20

FINISHED SURFACE LEVEL									
CUT / FILL DEPTH									
EXISTING SURFACE LEVEL									
OFFSET									

A1 SCALE: H 1:100, V 1:100

CH 143.60

DATUM RL -0.80

FINISHED SURFACE LEVEL									
CUT / FILL DEPTH									
EXISTING SURFACE LEVEL									
OFFSET									

A1 SCALE: H 1:100, V 1:100

CH 140.00

DATUM RL -0.80

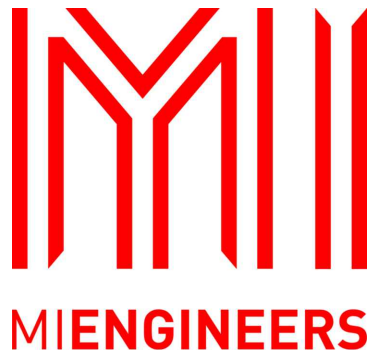
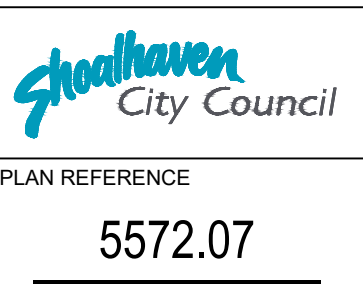
FINISHED SURFACE LEVEL									
CUT / FILL DEPTH									
EXISTING SURFACE LEVEL									
OFFSET									

A1 SCALE: H 1:100, V 1:100

CH 130.00

REVISION	AMENDMENTS	DATE	CKD	APP	SURVEYOR: AXIOM SPATIAL SURVEYORS
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CLIENT:



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PROJECT :

WATERWAYS & BOATING FACILITY IMPROVEMENTS  
YOORALLA BAY, CONJOLA PARK  
STAGE 1 - PROPOSED REPLACEMENT JETTY

DRAWING NAME:

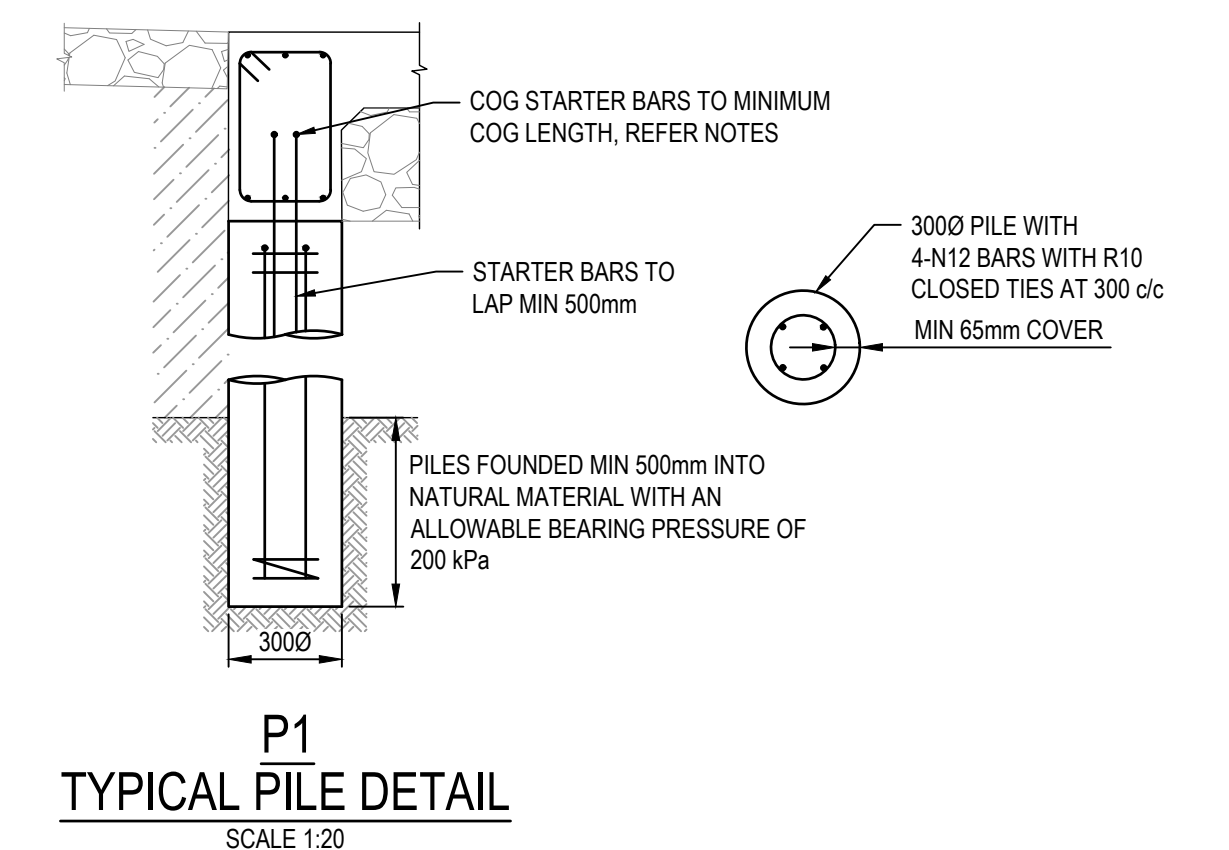
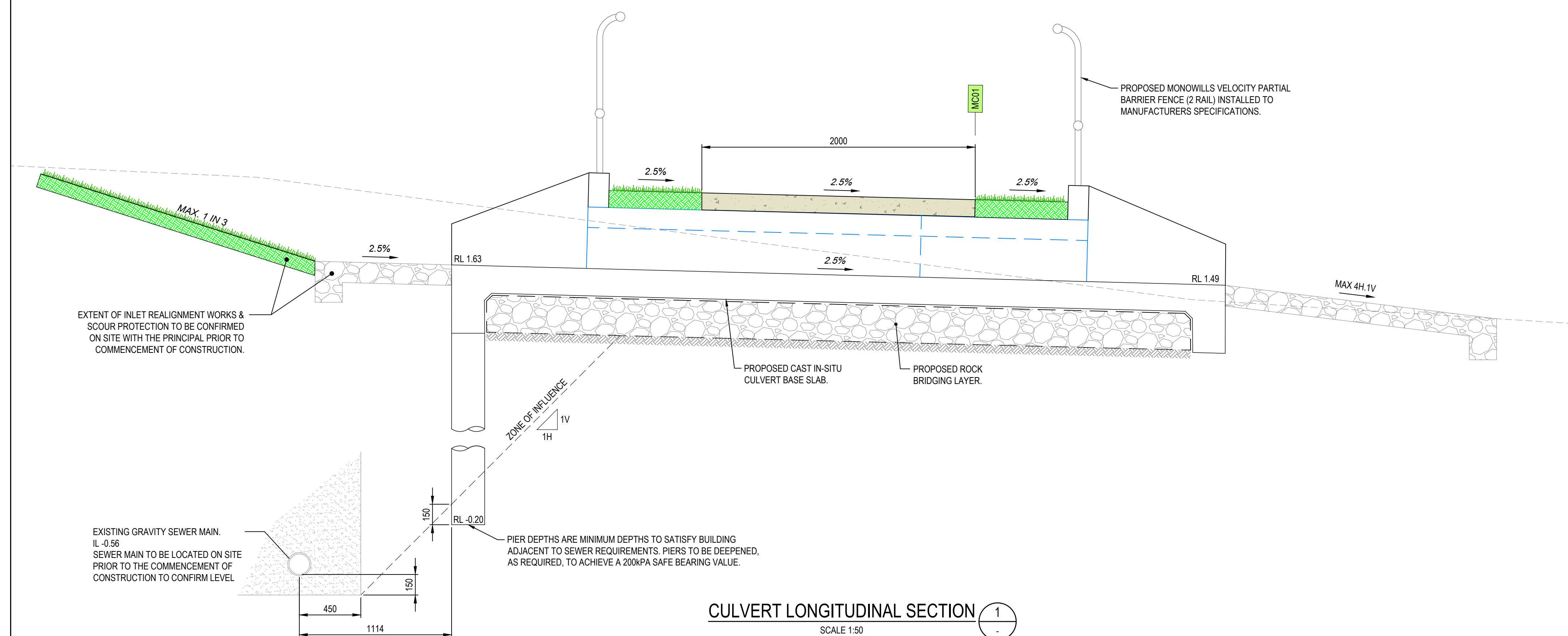
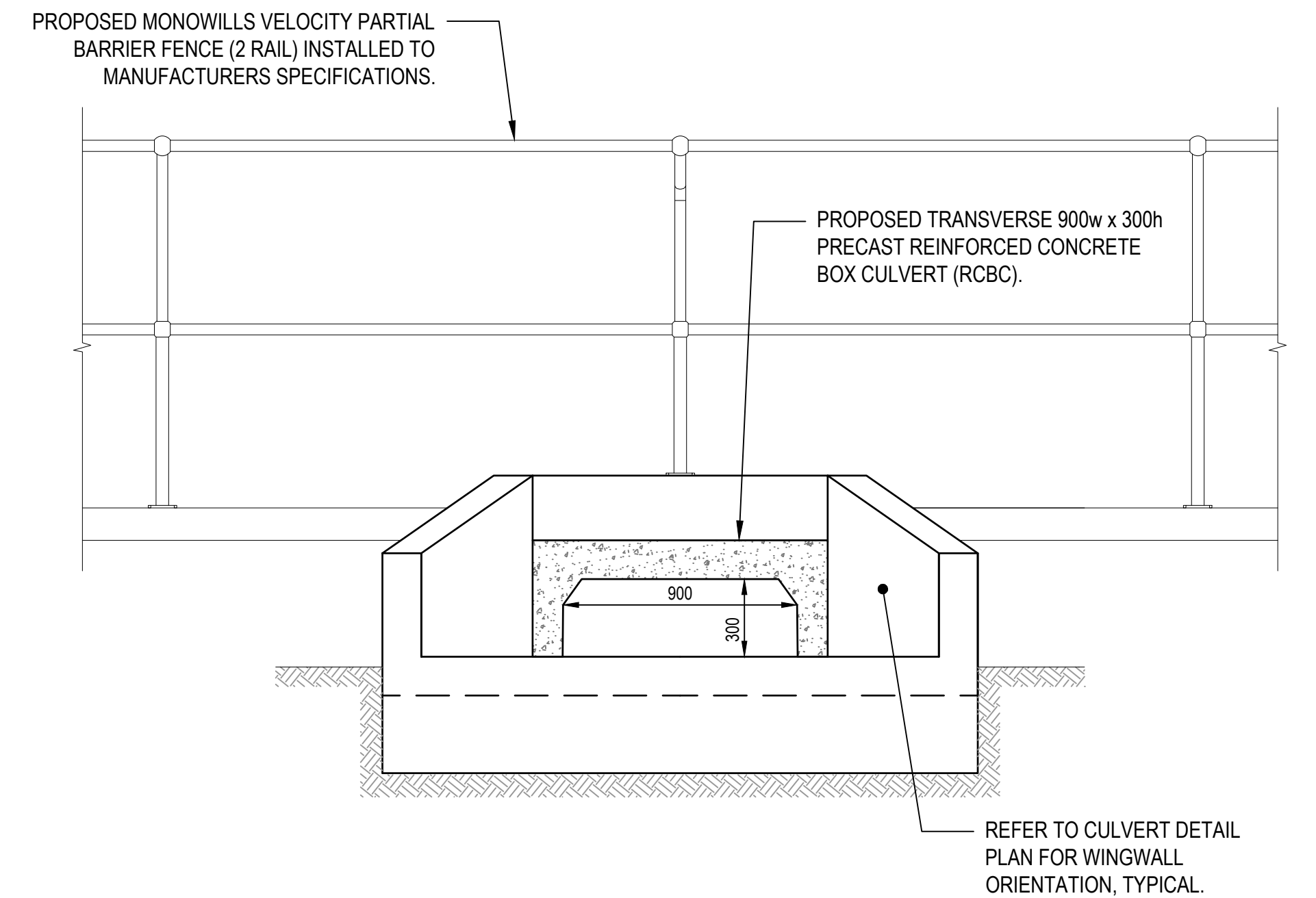
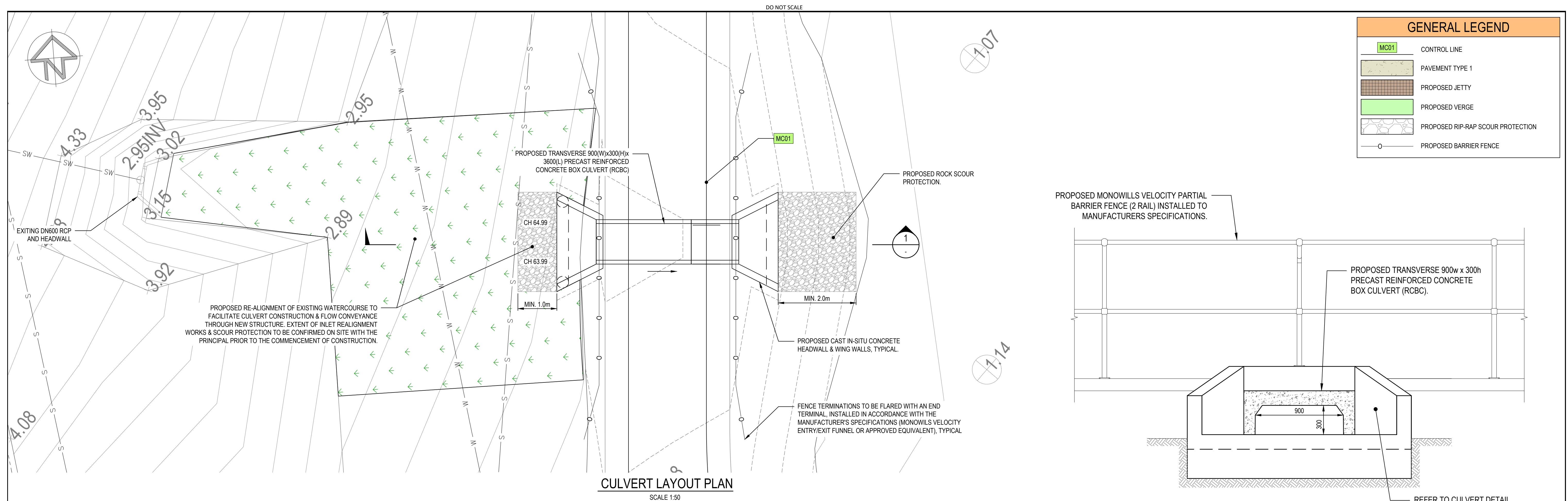
STAGE 1 - MC01 CROSS SECTIONS





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DESIGNED:	DRAWN:	SCALE:	SHEET SIZE:
JM	JM	1:100	A1
DRAWING STATUS		DRAWING No.	
CONSTRUCTION		C115	
PROJECT No.		REVISION:	
DN220293		1	





REVISION		AMENDMENTS		DATE	CKD	APP	SURVEYOR: AXIOM SPATIAL SURVEYORS DATE OF SURVEY: 10.11.2022 ORIGIN: PM 106284 HEIGHT OF DATUM: RL 2337 AHD HORIZONTAL DATUM: MGA1994	CUSTOMER: <div> PLAN REFERENCE 5572.08</div> 	<div><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</div><div>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</div></div>	PROJECT :  WATERWAYS & BOATING FACILITY IMPROVEMENTS YOORALLA BAY, CONJOLA PARK STAGE 1 - PROPOSED REPLACEMENT JETTY  DRAWING NAME: STAGE 1 - CULVERT LAYOUT PLAN & DETAILS				DESIGNED: JM	DRAWN: JM	SCALE: 1:50	SHEET SIZE: A1
							DRAWING STATUS CONSTRUCTION		DRAWING No. C116								
							PROJECT No. DN220293		REVISION: 1								





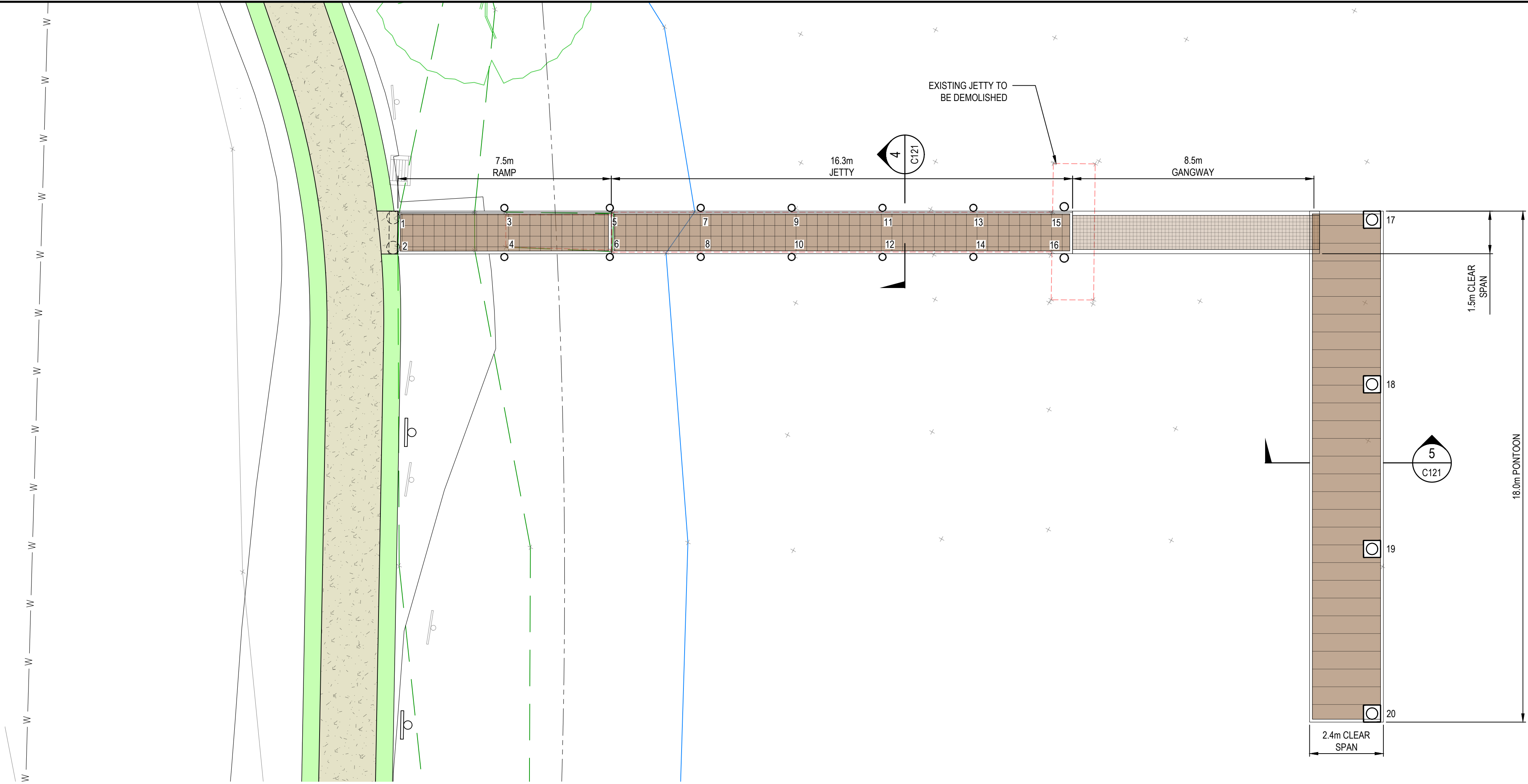
IF THE ACTUAL PRECAST CROWN UNIT DIMENSIONS VARY FROM VALUES SHOWN ABOVE, THE BASE SLAB, HEAD WALL AND WING WALL DIMENSIONS MAY NEED TO BE ADJUSTED.

TEMPORARY EXCAVATION  
SLOPE SHOWN FOR  
INFORMATION ONLY.  
TEMPORARY EXCAVATION  
SUPPORT IS TO BE  
DETERMINED ON SITE BY  
CONTRACTOR, TYPICAL



REVISION		AMENDMENTS		DATE	CKD	APP	SURVEYOR: AXIOM SPATIAL SURVEYORS	CLIENT:	<div><div><div><div></div><div>Shoalhaven City Council</div></div><div>PLAN REFERENCE 5572.09</div></div><div><div><div></div><div>MIENGINEERS</div></div></div></div>	<div><div><div><div></div><div>SYDNEY OFFICE 83 - 89 Renwick Street, Redfern NSW 2016 Tel (02) 8396 6565</div></div><div><div><div></div><div>SOUTH COAST OFFICE 49 Berry Street, Nowra NSW 2541 Tel (02) 4423 0566</div></div><div><div><div></div><div>WOLLONGONG OFFICE Suite 3a, 128-134 Crown Street, Wollongong NSW 2500 Tel (02) 4423 0566</div></div></div></div></div></div>	<div><div><div><div></div><div>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</div></div></div></div>	PROJECT :				DESIGNED:	DRAWN:	SCALE:	SHEET SIZE:	
1	IFC PLAN SET			23.06.23	AS	TS	DATE OF SURVEY: 10.11.2022						WATERWAYS & BOATING FACILITY IMPROVEMENTS YOORALLA BAY, CONJOLA PARK STAGE 1 - PROPOSED REPLACEMENT JETTY				TS	JM	NOTED	A1
C	DETAILED DESIGN PLAN SET			13.03.23	AS	TS	ORIGIN: PM 106284						DRAWING STATUS CONSTRUCTION				DRAWING No. C117			
B	CONCEPT PLAN SET FOR COMMUNITY CONSULTATION			10.02.23	TS	TS	HEIGHT OF DATUM: RL 2.337 AHD						DRAWING NAME: STAGE 1 - CULVERT SLAB PLAN & DETAILS							
A	CONCEPT PLAN SET FOR REVIEW			30.11.22	TS	TS	HORIZONTAL DATUM: MGA1994						PROJECT No. DN220293				REVISION: 1			

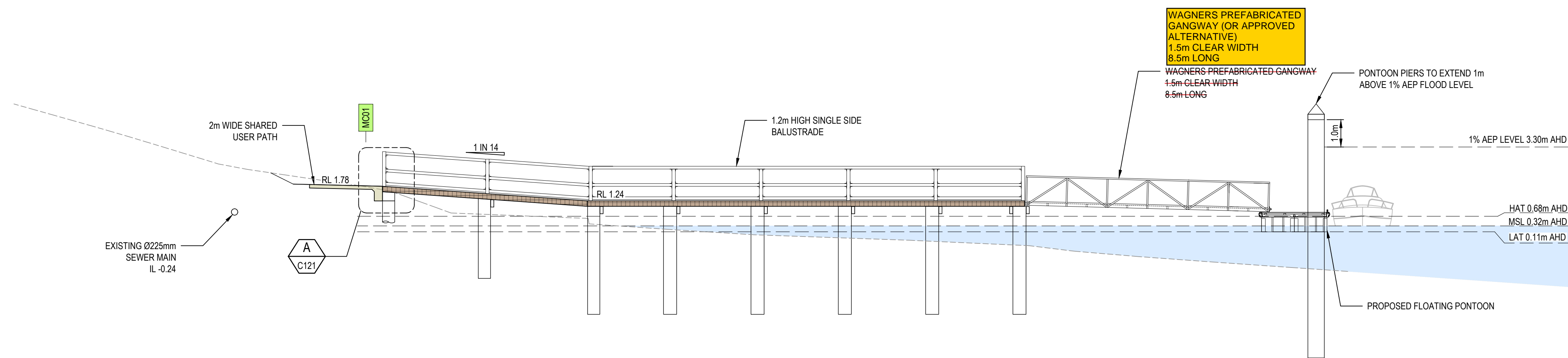


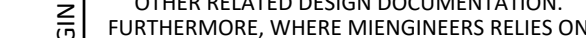
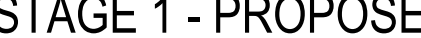


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ZONE - 56			
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2	267036.2193	6095514.5757	
3	267040.0204	6095513.9167	
4	267040.2152	6095512.6499	
5	267043.6826	6095514.4830	
6	267043.8784	6095513.2099	
7	267046.9490	6095514.6862	
8	267047.0442	6095513.6262	
9	267050.0153	6095515.4535	
10	267050.2101	6095514.1886	
11	267053.1874	6095513.9818	
12	267053.3727	6095514.6745	
13	267056.3415	6095516.4228	
14	267056.5353	6095515.1624	
15	267059.5098	6095516.8271	
16	267059.6924	6095515.6851	
17	267070.2512	6095518.3731	
18	267071.1326	6095516.7326	
19	267072.0141	6095506.0958	
20	267072.8955	6095501.7358	

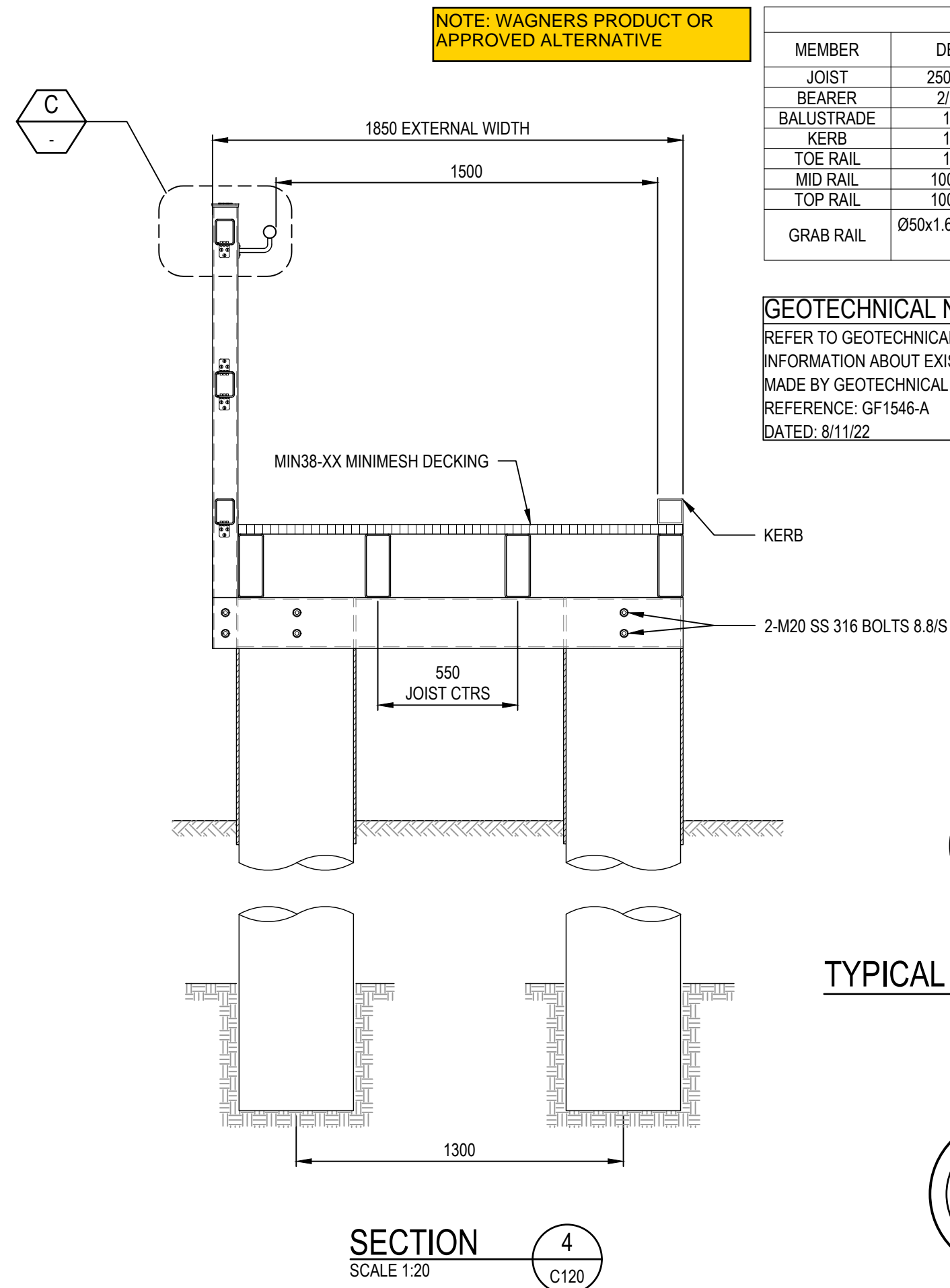
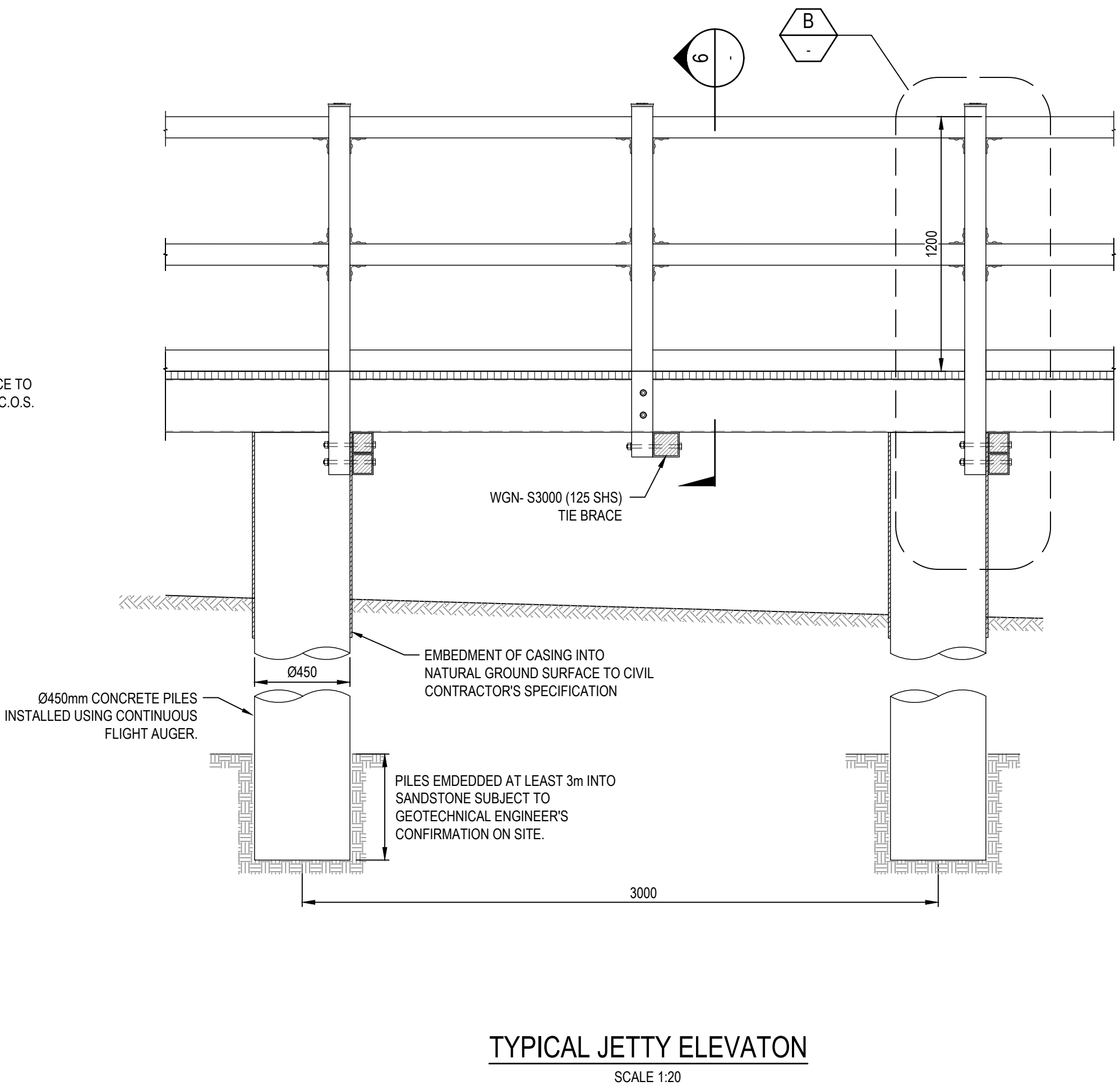
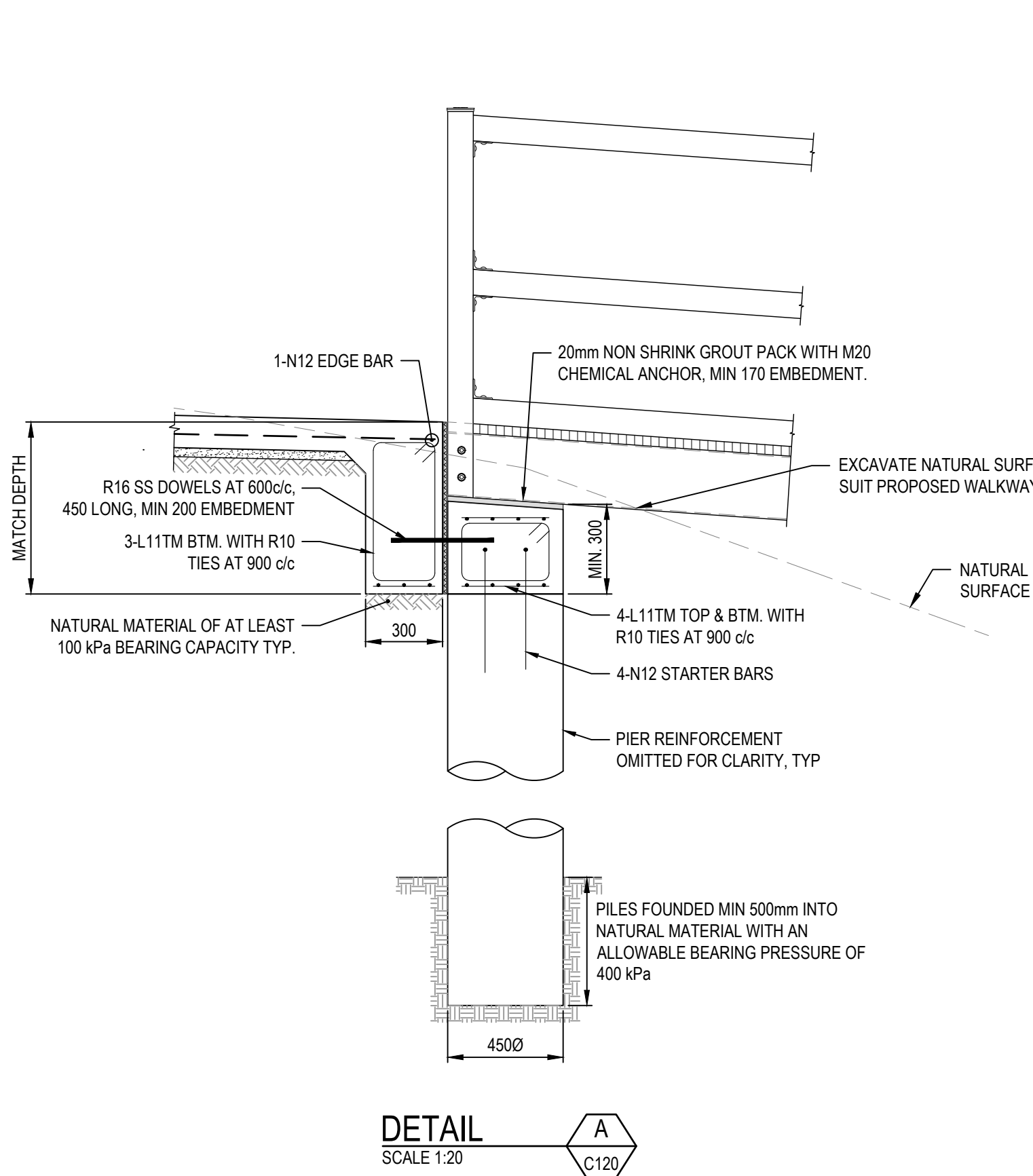
## JETTY LONGITUDINAL SECTION

SCALE 1:100



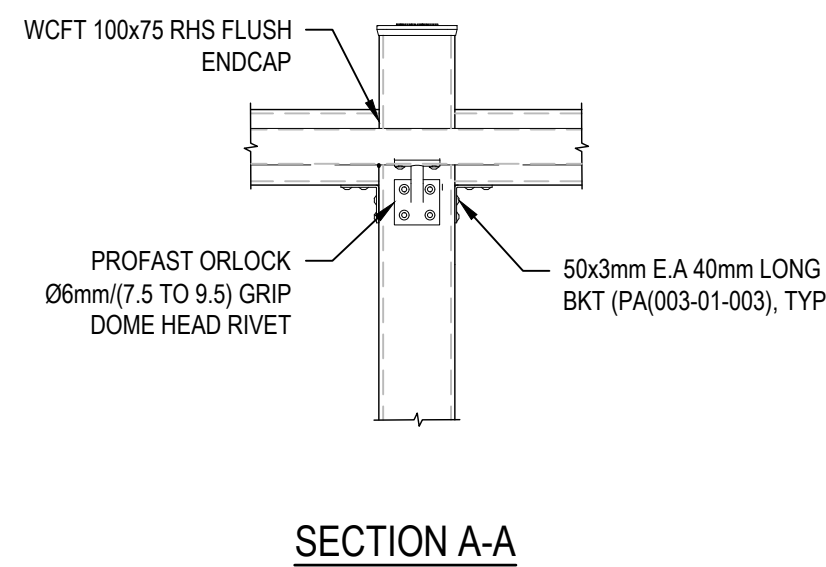
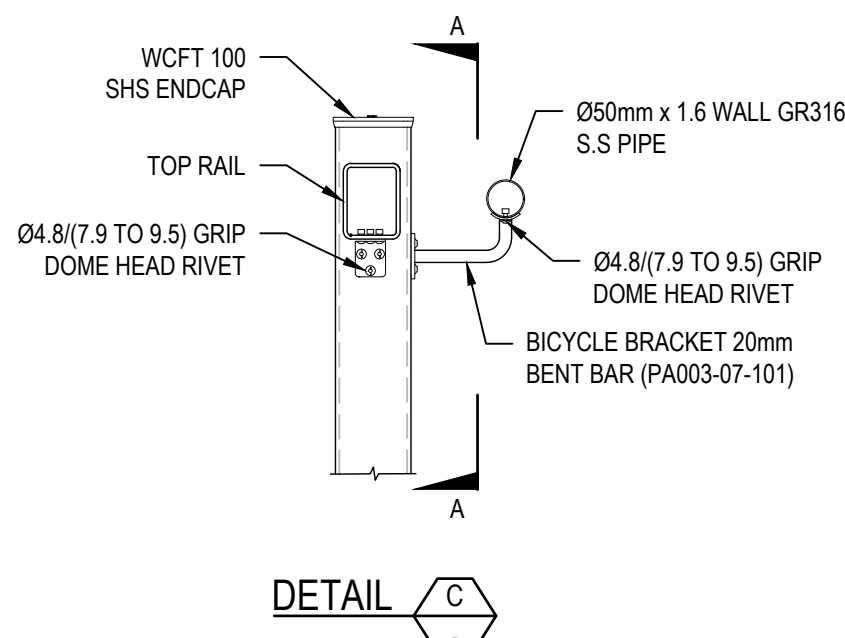
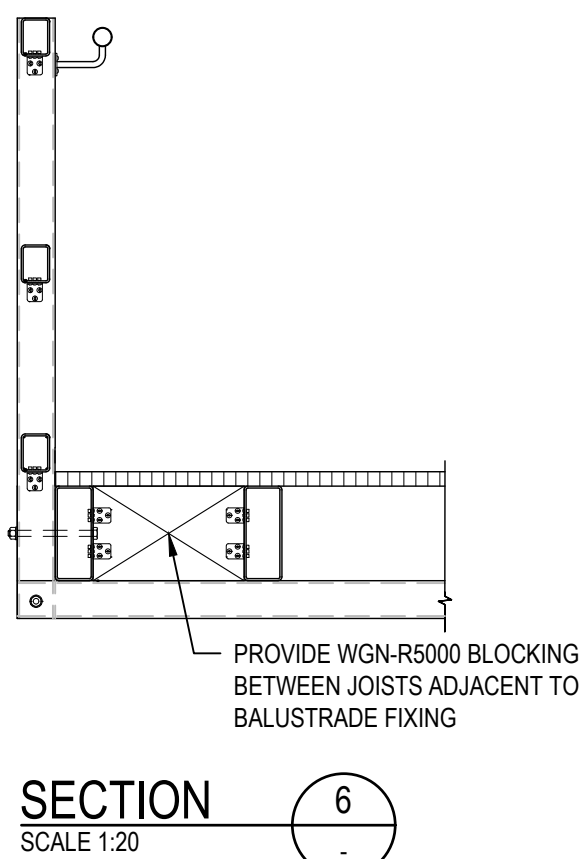
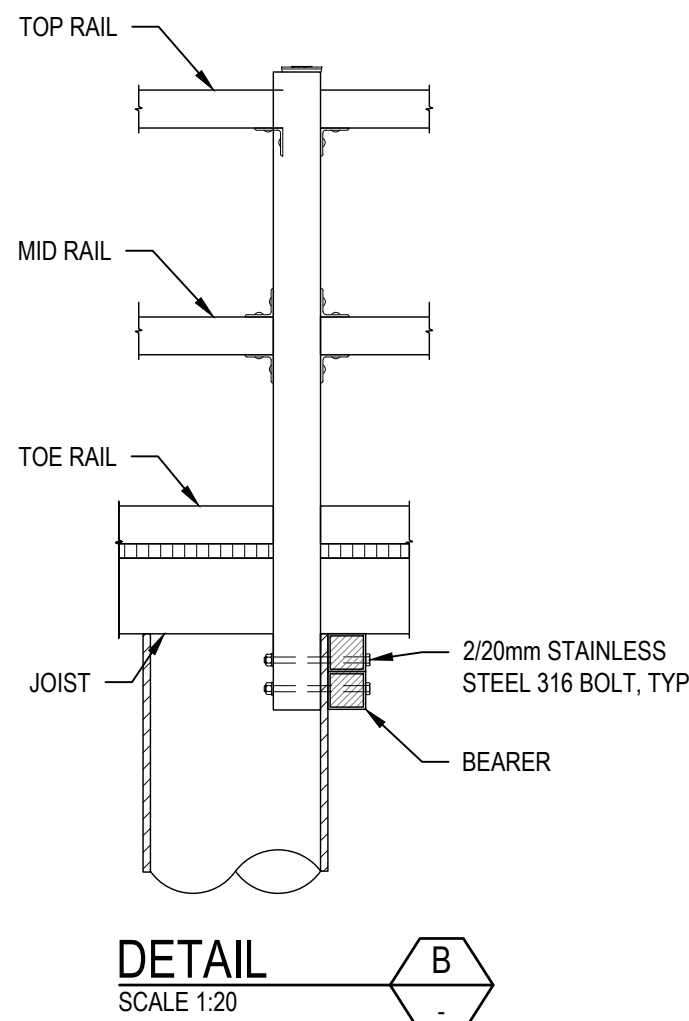
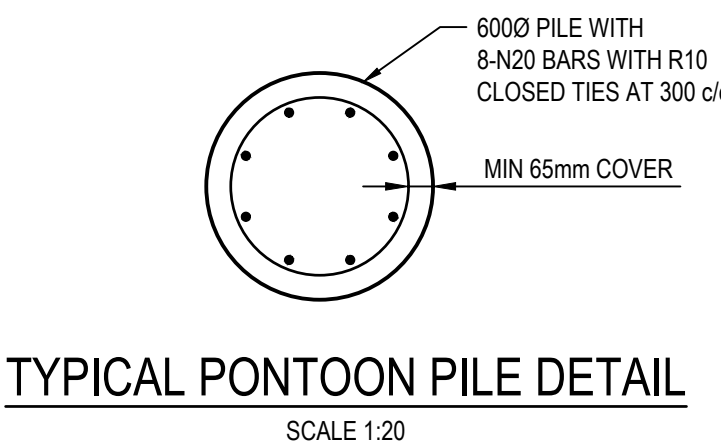
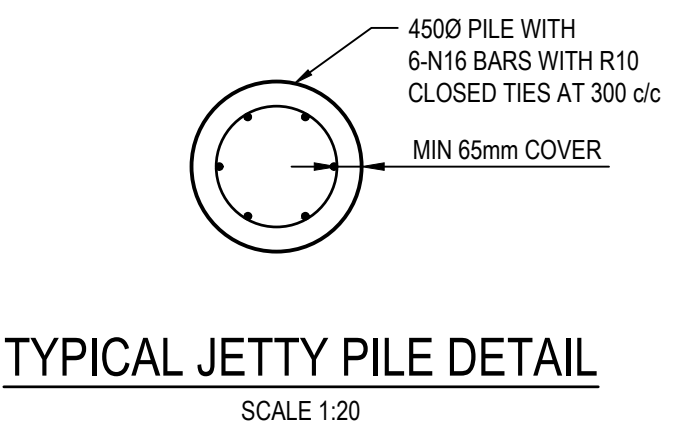
REVISION		AMENDMENTS		DATE	CKD	APP	SURVEYOR: AXIOM SPATIAL SURVEYORS  DATE OF SURVEY:  ORIGIN: PM 106284  HEIGHT OF DATUM: RL 237 AHD  HORIZONTAL DATUM: MGA1994	CUSTOMER:    PLAN REFERENCE  5572.10	 MIENGINEERS SYDNEY OFFICE 83 - 89 Renwick Street, Redfern NSW 2016 Tel (02) 8396 6565  SOUTH COAST OFFICE 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	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	PROJECT :  WATERWAYS & BOATING FACILITY IMPROVEMENTS YOORALLA BAY, CONJOLA PARK STAGE 1 - PROPOSED REPLACEMENT JETTY  DRAWING NAME:  STAGE 1 - VALLEY DRIVE REPLACEMENT JETTY PLAN	DESIGNED: TS	DRAWN: JM	SCALE: 1:100	SHEET SIZE: A1
A	ADJUSTMENTS MADE BY SCC IN LINE WITH INTERNAL COMMENTS	10.07.23	TSP	DP								DRAWING STATUS CONSTRUCTION	DRAWING No. C120	PROJECT No. DN220293	REVISION: 2



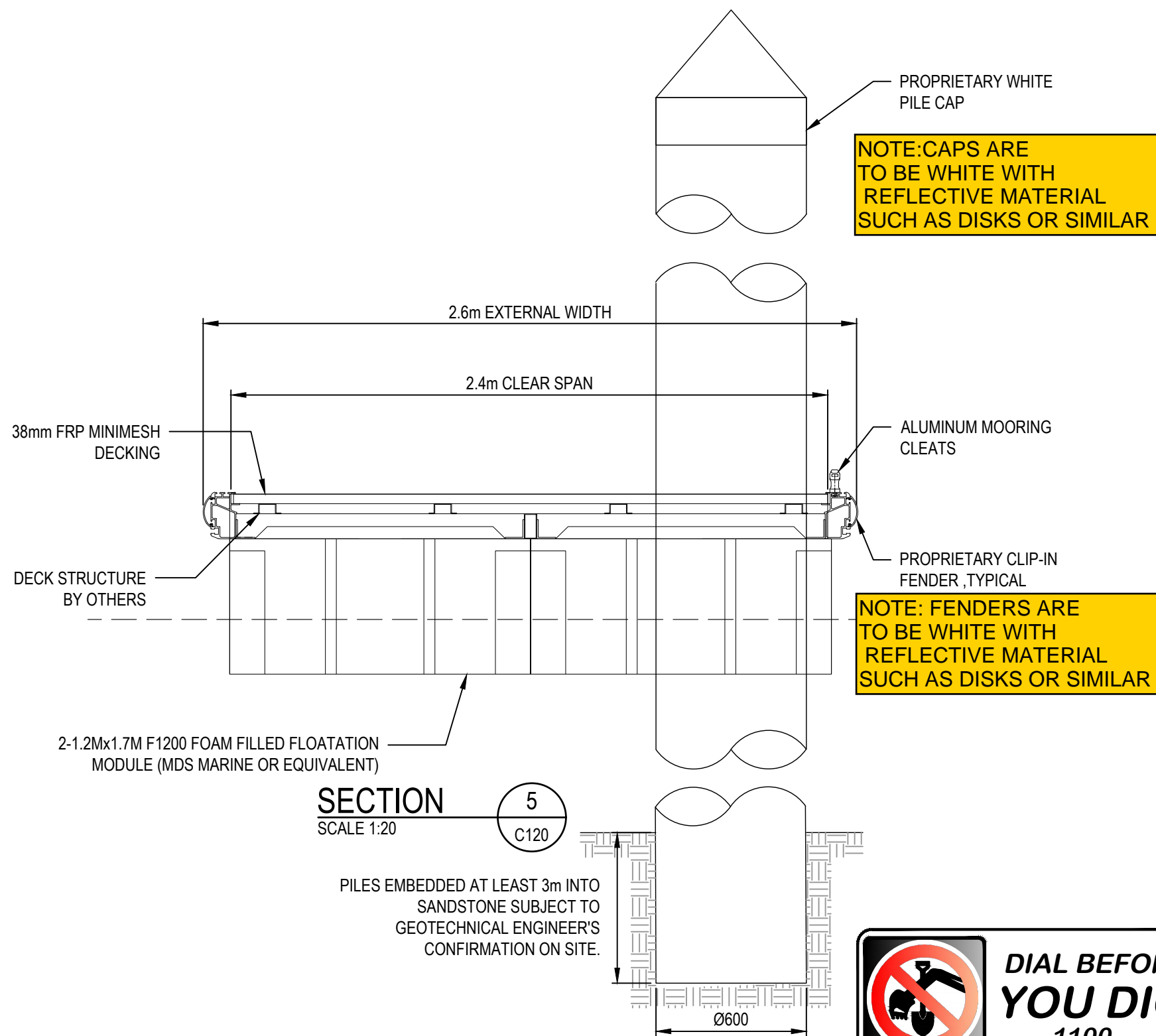


SCHEDULE		
MEMBER	DESCRIPTION	WAGNERS PRODUCT CODE
JOIST	250x100x8 1 RHS	WGN-R5000
BEARER	2/100x5 2 SHS	WGN-B1020
BALUSTRADE	100x5 2 SHS	WGN-S1000
KERB	100x5 2 SHS	WGN-S1000
TOE RAIL	100x5 2 SHS	WGN-S1000
MID RAIL	100x75x5 2 RHS	WGN-R1000
TOP RAIL	100x75x5 2 RHS	WGN-R1000
GRAB RAIL	Ø50x1.6 WALL GR316 S.S PIPE	-

**GEOTECHNICAL NOTE:**  
REFER TO GEOTECHNICAL REPORT BY GEOFIRST PTY LTD FOR INFORMATION ABOUT EXISTING SOIL CONDITIONS AND RECOMMENDATIONS MADE BY GEOTECHNICAL ENGINEER.  
REFERENCE: GF1546-A  
DATED: 8/11/22



BALUSTRADE CONNECTION DETAIL  
SCALE 1:20



REVISION	AMENDMENTS	DATE	CKD	APP	SURVEYOR: AXIOM SPATIAL SURVEYORS
1	IFC PLAN SET	23.06.23	AS	TS	DATE OF SURVEY: 10.11.2022
C	DETAILED DESIGN PLAN SET	13.03.23	AS	TS	ORIGIN: PM 106284
B	CONCEPT PLAN SET FOR COMMUNITY CONSULTATION	10.02.23	TS	TS	HEIGHT OF DATUM: RL 2.337 AHD
A	CONCEPT PLAN SET FOR REVIEW	30.11.22	MW	TS	HORIZONTAL DATUM: MGA1994

CLIENT:
PLAN REFERENCE 5572.11

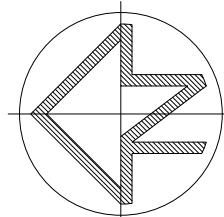
	SYDNEY OFFICE 83 - 89 Renwick Street, Redfern NSW 2016 Tel (02) 8396 6565 SOUTH COAST OFFICE 49 Berry Street, Nowra NSW 2541 Tel (02) 4423 0566 WOLLONGONG OFFICE Suite 3a, 128-134 Crown Street, Wollongong NSW 2500 Tel (02) 4423 0566
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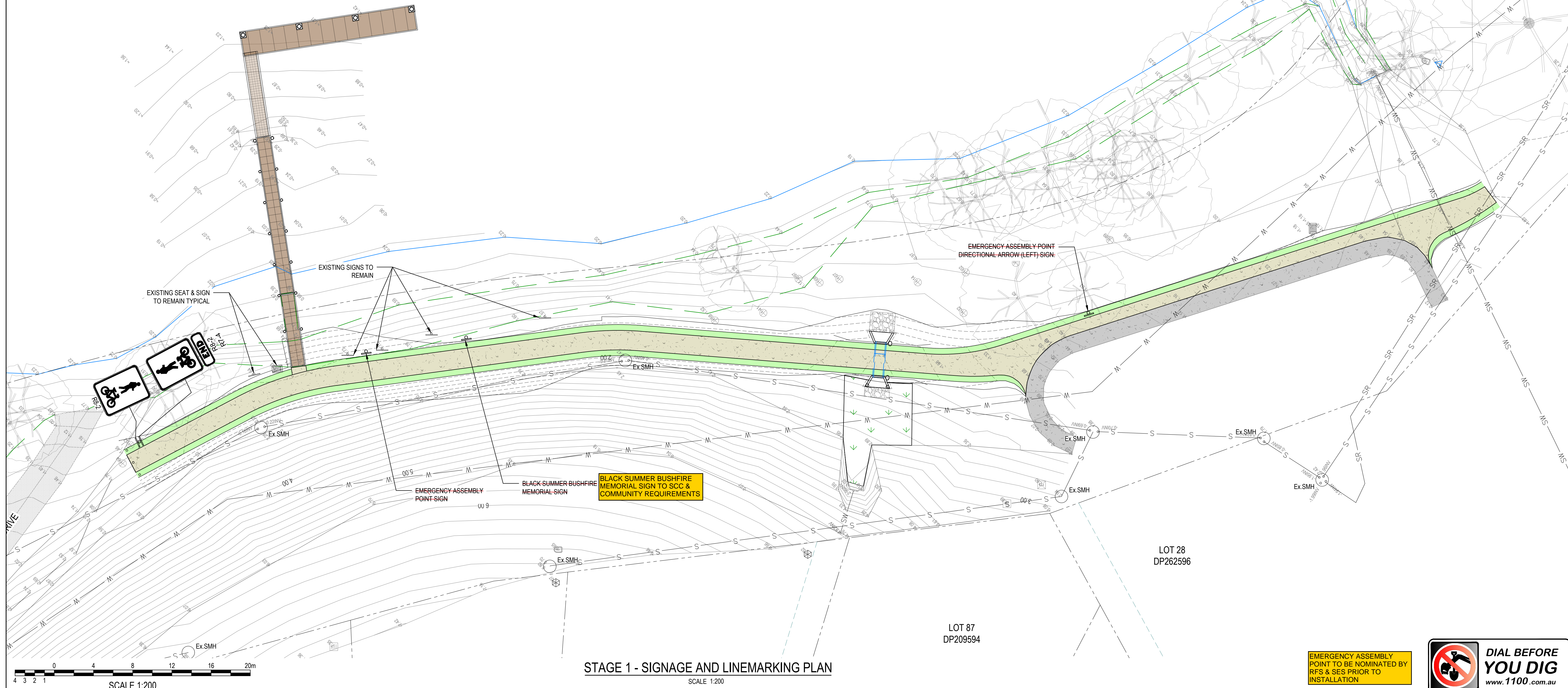
PROJECT :
WATERWAYS & BOATING FACILITY IMPROVEMENTS YOORALLA BAY, CONJOLA PARK STAGE 1 - PROPOSED REPLACEMENT JETTY
DRAWING NAME:
STAGE 1 - VALLEY DRIVE REPLACEMENT JETTY DETAILS

DESIGNED:	DRAWN:	SCALE:	SHEET SIZE:
TS	JM	1:20	A1
DRAWING STATUS	DRAWING No.	REVISION:	
CONSTRUCTION	C121	1	
PROJECT No.	DN220293		





GENERAL LEGEND	
	CONTROL LINE
	PAVEMENT TYPE 1
	PROPOSED JETTY
	PROPOSED VERGE
	PROPOSED RIP-RAP SCOUR PROTECTION
	PROPOSED BARRIER FENCE



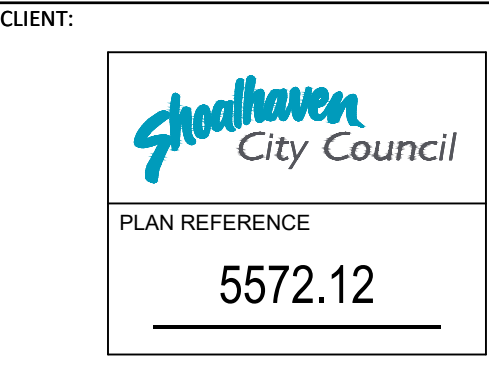
STAGE 1 - SIGNAGE AND LINEMARKING PLAN  
SCALE 1:200

EMERGENCY ASSEMBLY  
POINT TO BE NOMINATED BY  
RFS & SES PRIOR TO  
INSTALLATION



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REVISION	AMENDMENTS	DATE	CKD	APP	SURVEYOR: AXIOM SPATIAL SURVEYORS
1	IFC PLAN SET	23.06.23	AS	TS	DATE OF SURVEY: 10.11.2022
C	DETAILED DESIGN PLAN SET	13.03.23	AS	TS	ORIGIN: PM 106284
B	CONCEPT PLAN SET FOR COMMUNITY CONSULTATION	10.02.23	TS	TS	HEIGHT OF DATUM: RL 2.337 AHD
A	CONCEPT PLAN SET FOR REVIEW	30.11.22	MW	TS	HORIZONTAL DATUM: MGA1994
2	ADJUSTMENTS MADE BY SCC IN LINE WITH INTERNAL COMMENTS	10.07.23	TSP	DP	



PLAN REFERENCE  
**5572.12**



**MIENGINEERS**

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83 - 89 Renwick Street,  
Redfern NSW 2016  
Tel (02) 8396 6565

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Tel (02) 4423 0566

WOLLONGONG OFFICE  
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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

PROJECT :

**WATERWAYS & BOATING FACILITY IMPROVEMENTS**

**YOORALLA BAY, CONJOLA PARK**

**STAGE 1 - PROPOSED REPLACEMENT JETTY**

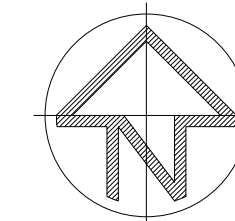
DRAWING NAME:  
**STAGE 1 - SIGNAGE AND LINEMARKING PLAN**

DESIGNED: JM	DRAWN: JM	SCALE: 1:200	SHEET SIZE: A1
DRAWING STATUS <b>CONSTRUCTION</b>		DRAWING No. <b>C150</b>	
PROJECT No. <b>DN220293</b>		REVISION: <b>2</b>	




# YOORALLA BAY, CONJOLA PARK

## STAGE 2 - PROPOSED KAYAK LAUNCHING FACILITY



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LEGEND	
— S ——— S ———	EXISTING SEWER LINE
— SR ——— SR ———	EXISTING SEWER RISING MAIN
— W ——— W ———	EXISTING WATER MAIN
— SW ——— SW ———	EXISTING STORMWATER LINE
— ——— ———	BOUNDARY LINE
- - - - -	EASEMENT
PP ○	EXISTING POWER POLE
EX. WM ⊗	EXISTING WATER METER
EX. HYD ○	EXISTING HYDRANT
EX. SV ✕	EXISTING STOP VALVE
Ex.SMH ○	EXISTING SEWER MANHOLE
	EXISTING SEALED ROAD



LOCALITY PLAN

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N.T.S.

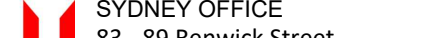
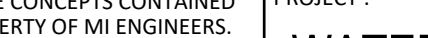
DRAWING INDEX	
SCC REF	MI REF
5572.20	DN220293 C201 STAGE 2 - COVER SHEET
5572.21	DN220293 C202 STAGE 2 - TYPICAL CROSS SECTIONS
5572.22	DN220293 C203 STAGE 2 - TYPICAL DETAILS
5572.23	DN220293 C210 STAGE 2 - SITE & STAGING LAYOUT PLAN
5572.24	DN220293 C211 STAGE 2 - SHARED USER PATH PLAN
5572.25	DN220293 C213 STAGE 2 - MC02 LONGITUDINAL SECTION
5572.26	DN220293 C215 STAGE 2 - MC02 CROSS SECTIONS
5572.27	DN220293 C230 STAGE 2 - KAYAK LAUNCHING JETTY PLAN
5572.28	DN220293 C231 STAGE 2 - KAYAK LAUNCHING JETTY DETAILS

APPROXIMATE AREA OF WORKS — — — — —

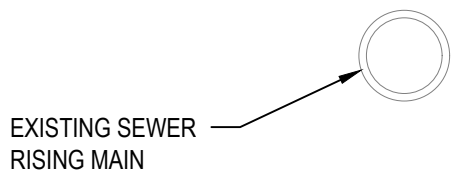
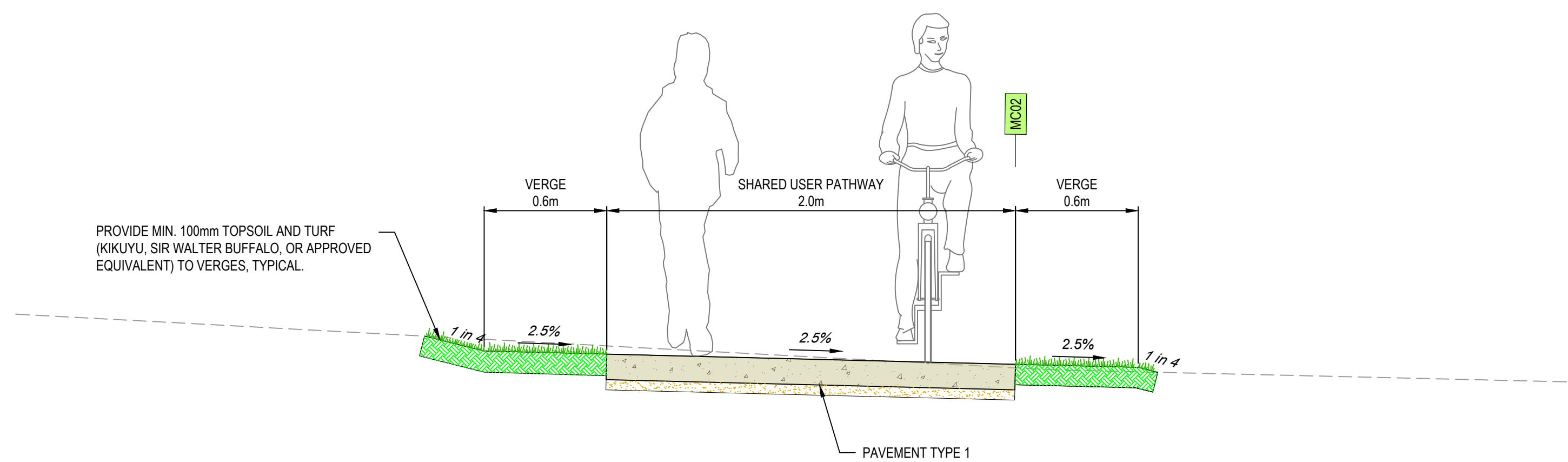
NOMINATION OF PROPRIETARY ITEMS DOES NOT INDICATE EXCLUSIVE PREFERENCE BUT INDICATES REQUIRED PROPERTIES OF THE ITEM. SIMILAR ALTERNATIVES HAVING THE REQUIRED PROPERTIES MAY BE CONSIDERED FOR APPROVAL. APPROVAL OF AN ALTERNATIVE PRODUCT DOES NOT AUTHORISE A VARIATION TO THE CONTRACT.

**INSTALL PROPRIETARY ITEMS IN ACCORDANCE WITH  
MANUFACTURERS REQUIREMENTS AND RECOMMENDATIONS**

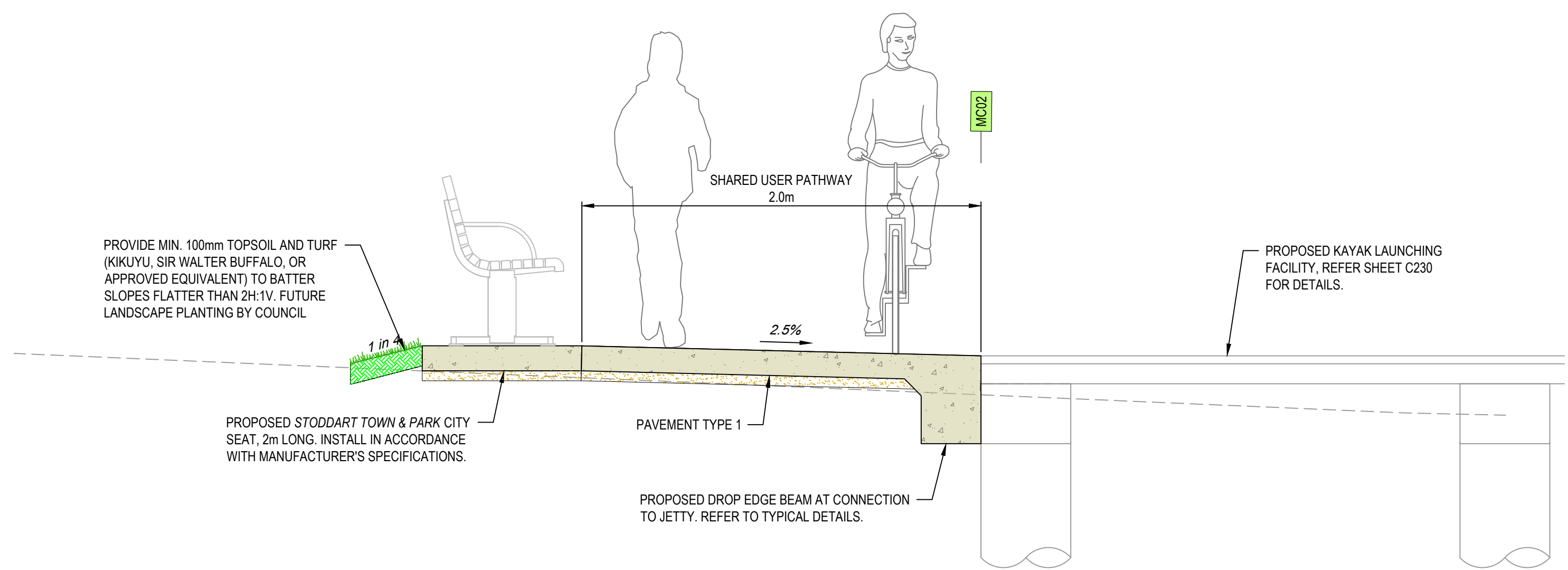


REVISION	AMENDMENTS	DATE	CKD	APP	SURVEYOR: AXIOM SPATIAL SURVEYORS DATE OF SURVEY: 10.11.2022 ORIGIN: PM 106284 TS HEIGHT OF DATUM: RL 2.337 AHD HORIZONTAL DATUM: MGA1994	CLIENT:  PLAN REFERENCE 5572.20 	SYDNEY OFFICE 83 - 89 Renwick Street, Redfern NSW 2016 Tel (02) 8396 6565 SOUTH COAST OFFICE 49 Berry Street, Nowra NSW 2541 Tel (02) 4423 0566 WOLLONGONG OFFICE Suite 3a, 128-134 Crown Street, Wollongong NSW 2500 Tel (02) 4423 0566	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	PROJECT :  WATERWAYS & BOATING FACILITY IMPROVEMENTS YOORALLA BAY, CONJOLA PARK STAGE 2 - PROPOSED KAYAK LAUNCHING FACILITY  DRAWING NAME:  STAGE 2 - COVER SHEET	DESIGNED: TS DRAWN: JM SCALE: - SHEET SIZE: A1	DRAWING STATUS  CONSTRUCTION	DRAWING No.  C201	PROJECT No.  DN220293	REVISION:  2
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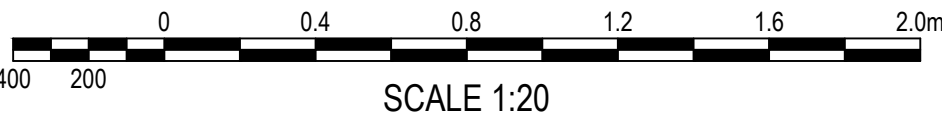




SECTION 1  
SCALE 1:20




SECTION 2  
SCALE 1:20



REVISION	AMENDMENTS	DATE	CKD	APP	SURVEYOR: AXIOM SPATIAL SURVEYORS
1	IFC PLAN SET	23.06.23	RM	AS	DATE OF SURVEY: 10.11.2022
C	DETAILED DESIGN PLAN SET	13.03.23	AS	TS	ORIGIN: PM 106284
B	CONCEPT PLAN SET FOR COMMUNITY CONSULTATION	10.02.23	TS	TS	HEIGHT OF DATUM: RL 2.337 AHD
A	CONCEPT PLAN SET FOR REVIEW	30.11.22	TS	TS	HORIZONTAL DATUM: MGA1994

CLIENT:



PLAN REFERENCE  
5572.21



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83 - 89 Renwick Street,  
Redfern NSW 2016  
Tel (02) 8396 6565  
SOUTH COAST OFFICE  
49 Berry Street, Nowra NSW 2541  
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PROJECT :  
WATERWAYS & BOATING FACILITY IMPROVEMENTS  
YOORALLA BAY, CONJOLA PARK  
STAGE 2 - PROPOSED KAYAK LAUNCHING FACILITY

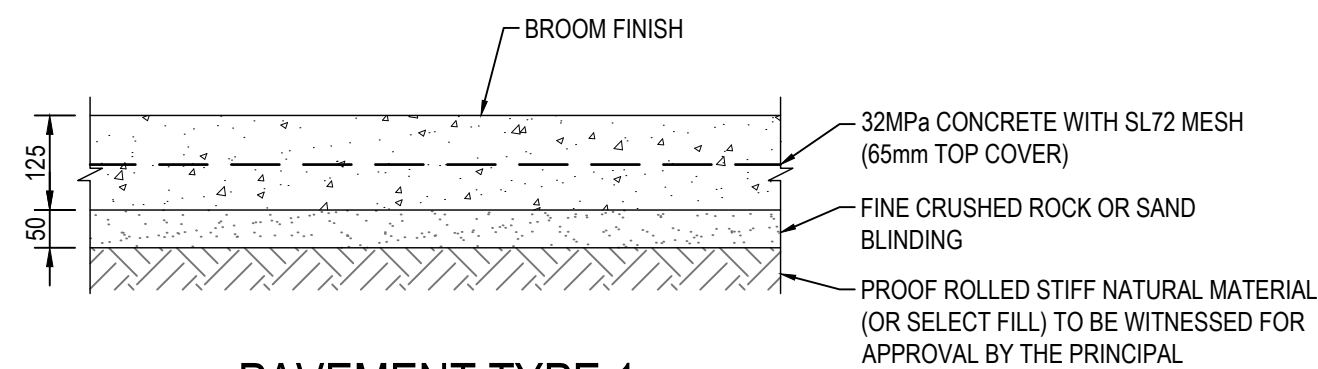
DRAWING NAME:  
STAGE 2 - TYPICAL CROSS SECTIONS



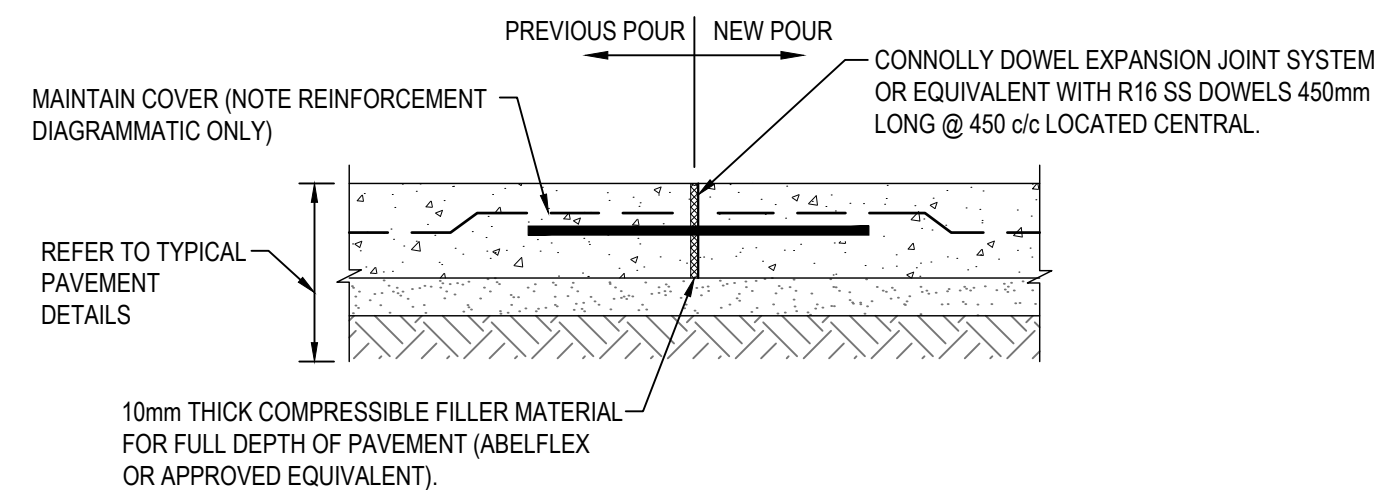
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DESIGNED: JM	DRAWN: JM	SCALE: 1:20	SHEET SIZE: A1
DRAWING STATUS CONSTRUCTION			DRAWING No. C202
PROJECT No. DN220293			REVISION: 1

DO NOT SCALE

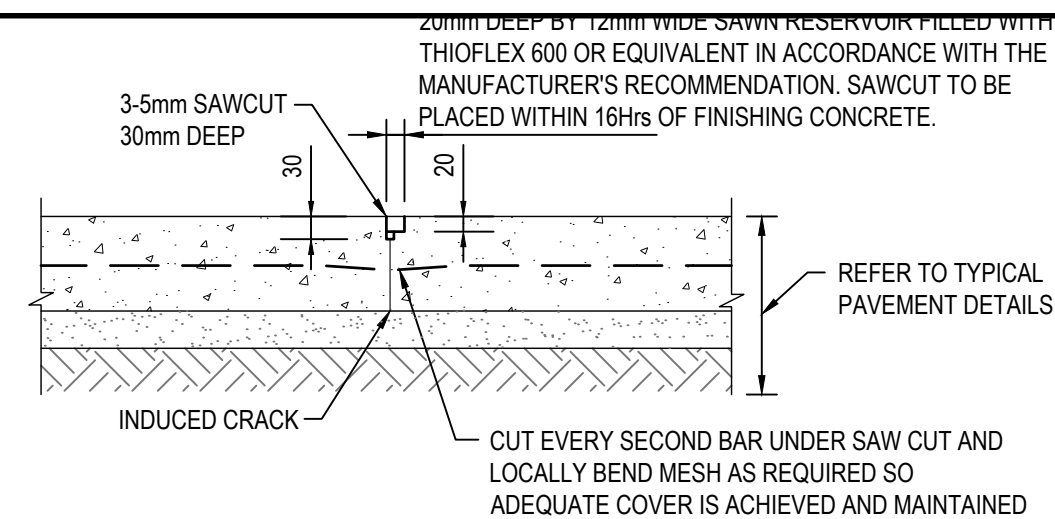


PAVEMENT TYPE 1  
TYPICAL CONCRETE SHARED USER  
PATHWAY DETAIL  
SCALE 1:10

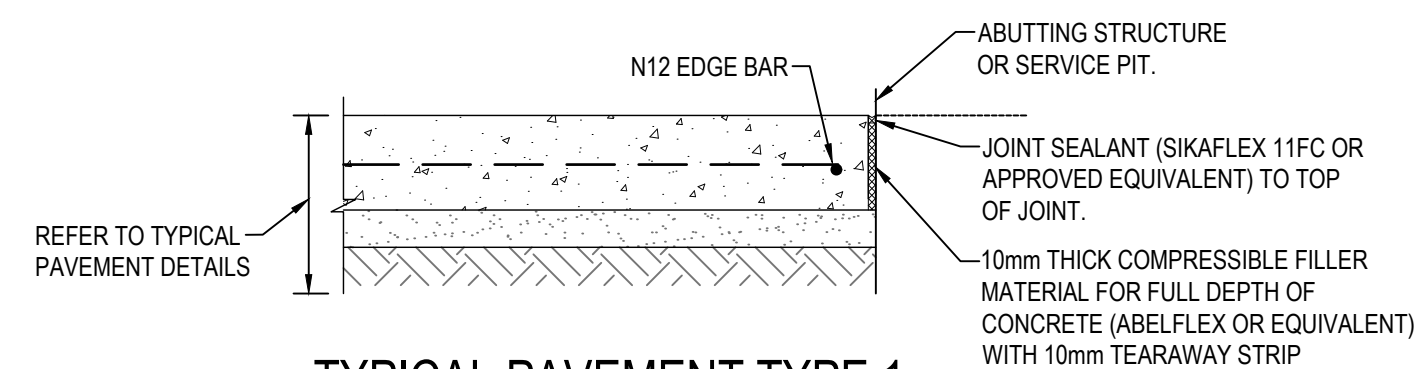


**TYPICAL PAVEMENT TYPE 1  
DOWELED JOINT (D.J.) DETAIL**

SCALE 1:10  
SPACINGS AS PER TYPICAL JOINT LAYOUT

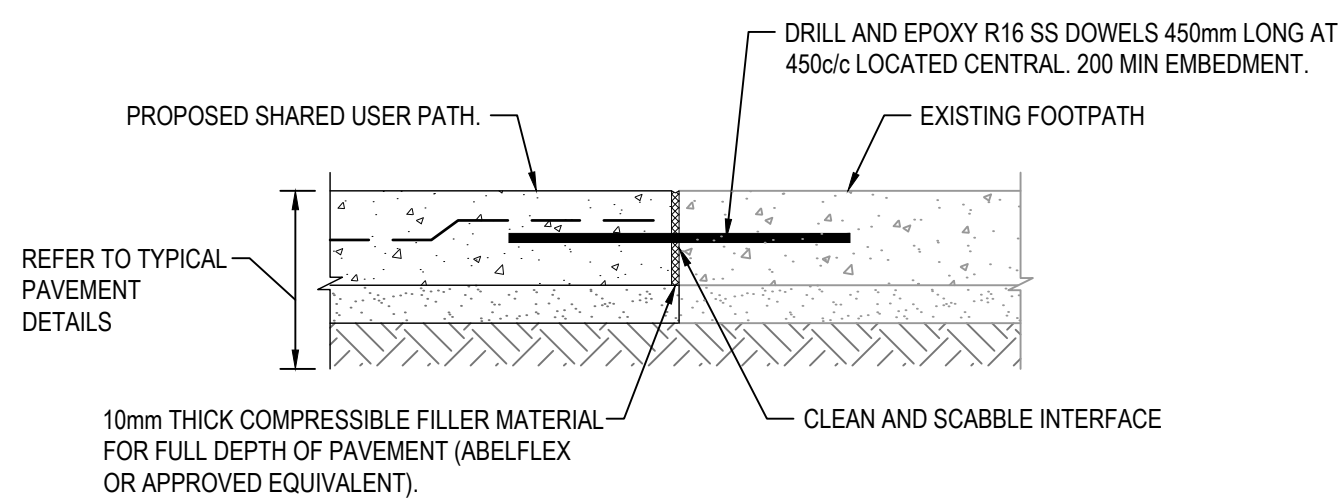


**TYPICAL PAVEMENT TYPE 1**  
**SAW JOINT (S.J.) DETAIL**  
SCALE 1:10  
SPACINGS AS PER TYPICAL JOINT LAYOUT

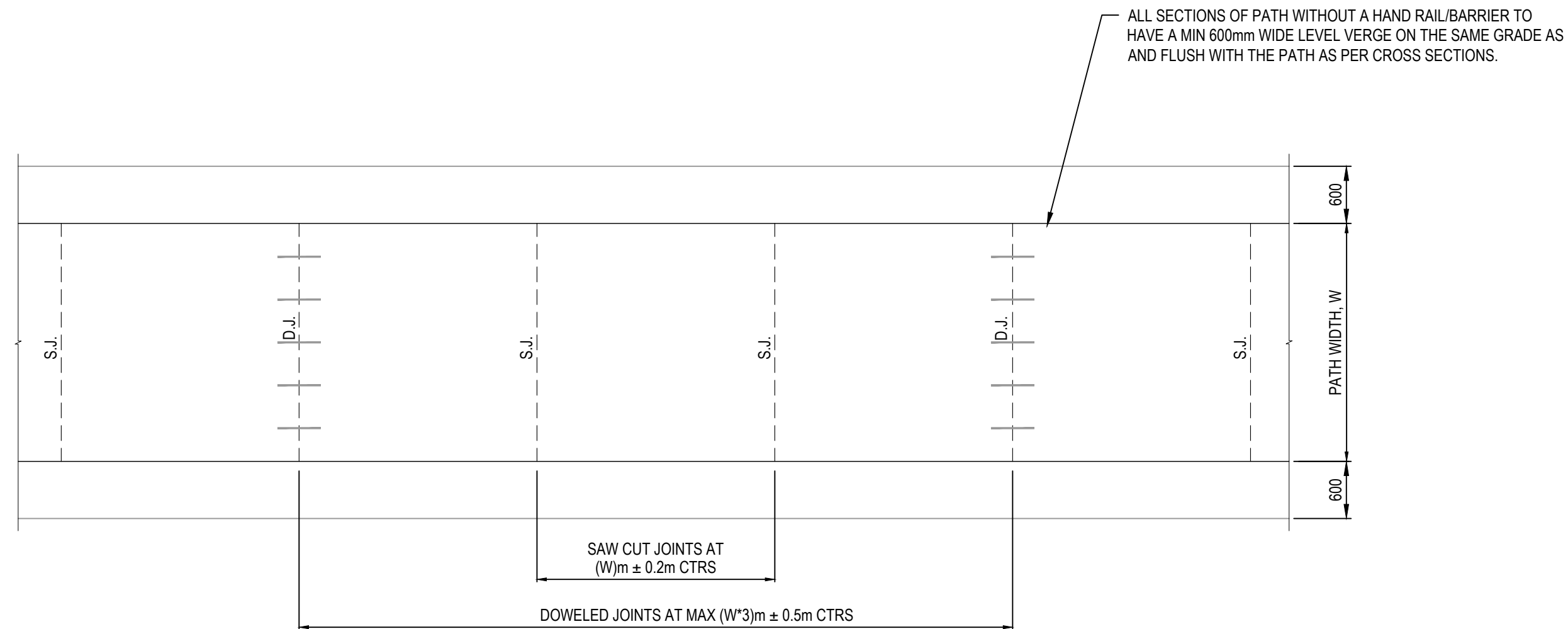


**TYPICAL PAVEMENT TYPE 1  
ISOLATION JOINT (I.J.) DETAIL**

SCALE 1:10  
PROVIDE ADJACENT SERVICE PITS OR ABUTTING  
STRUCTURES



PAVEMENT TYPE 1 TYPICAL  
CONNECTION TO EXISTING FOOTPATH  
SCALE 1:10



TYPICAL PAVEMENT TYPE 1 JOINT LAYOUT PLAN  
SCALE 1:50

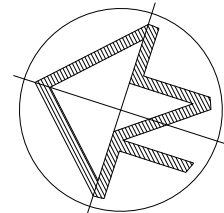
[illegible]





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1	IFC PLAN SET	23.06.23	RM	AS	DATE OF SURVEY: 10.11.2022	Shoalhaven City Council	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	WATERWAYS & BOATING FACILITY IMPROVEMENTS YOORALLA BAY, CONJOLA PARK	JM	JM	1:500	A1
C	DETAILED DESIGN PLAN SET	13.03.23	AS	TS	ORIGIN: PM 106284	PLAN REFERENCE 5572.23			STAGE 2 - PROPOSED KAYAK LAUNCHING FACILITY	DRAWING STATUS CONSTRUCTION		DRAWING No. C210	
B	CONCEPT PLAN SET FOR COMMUNITY CONSULTATION	10.02.23	TS	TS	HEIGHT OF DATUM: RL 2.337 AHD				STAGE 2 - SITE & STAGING LAYOUT PLAN	PROJECT No. DN220293		REVISION: 1	
A	CONCEPT PLAN SET FOR REVIEW	30.11.22	RM	TS	HORIZONTAL DATUM: MGA1994								





DO NOT SCALE

### GENERAL LEGEND

MC02	CONTROL LINE
	PAVEMENT TYPE 1
	PROPOSED KAYAK LAUNCHING FACILITY
	PROPOSED VERGE

REFER TO STAGE 1 DRAWINGS

PROPOSED KAYAK LAUNCHING FACILITY.  
REFER SHEET C230/C231 FOR DETAILS

EXISTING CONCRETE  
FOOTPATH

PROVIDE SMOOTH CONNECTION TO EXISTING  
SHARED USER PATH CONSTRUCTED IN STAGE 1

LOT 28  
DP209594

LOT 21  
DP262596

LOT 18  
DP262596

LOT 17  
DP262596

LOT 16  
DP703426

LOT 17  
DP703426

LOT 15  
DP703246

LOT 14  
DP703246

### STAGE 2 - SHARED USER PATH PLAN

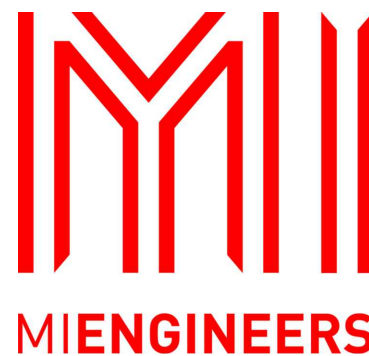
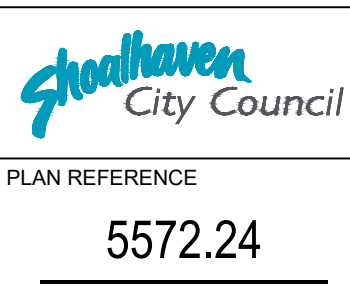
SCALE 1:200



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B	CONCEPT PLAN SET FOR COMMUNITY CONSULTATION	10.02.23	TS	TS	HEIGHT OF DATUM: RL 2.337 AHD
A	CONCEPT PLAN SET FOR REVIEW	30.11.22	RM	TS	HORIZONTAL DATUM: MGA1994

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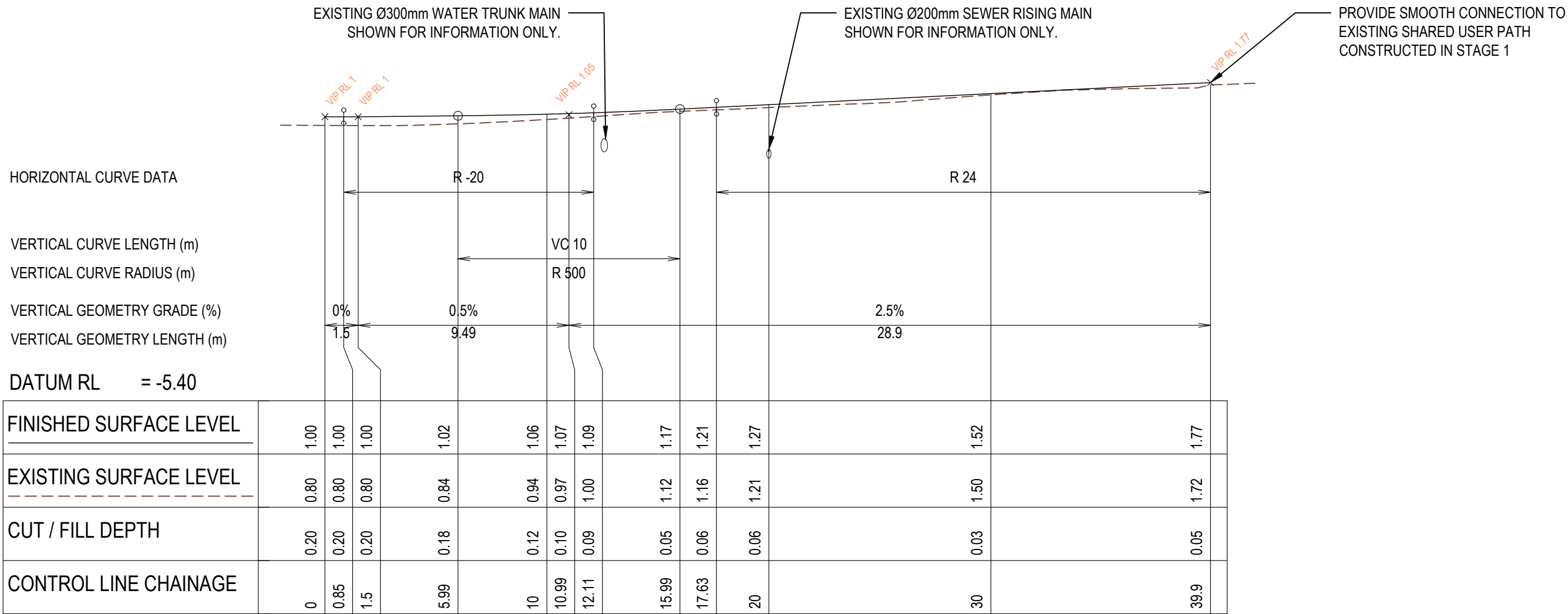
PROJECT :

**WATERWAYS & BOATING FACILITY IMPROVEMENTS  
YOORALLA BAY, CONJOLA PARK  
STAGE 2 - PROPOSED KAYAK LAUNCHING FACILITY**

DRAWING NAME:

**STAGE 2 - SHARED USER PATH PLAN**


DESIGNED:	DRAWN:	SCALE:	SHEET SIZE:
JM	JM	1:200	A1
DRAWING STATUS		DRAWING No.	
CONSTRUCTION		C211	
PROJECT No.		REVISION:	
DN220293		1	



A1 SCALE: H 1:200, V 1:100  
LONGITUDINAL SECTION MC02

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1	IFC PLAN SET	23.06.23	RM	AS	DATE OF SURVEY: 10.11.2022
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B	CONCEPT PLAN SET FOR COMMUNITY CONSULTATION	10.02.23	TS	TS	HEIGHT OF DATUM: RL 2.337 AHD
A	CONCEPT PLAN SET FOR REVIEW	30.11.22	RM	TS	HORIZONTAL DATUM: MGA1994

CLIENT:



PLAN REFERENCE

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PROJECT :

WATERWAYS & BOATING FACILITY IMPROVEMENTS

YOORALLA BAY, CONJOLA PARK

STAGE 2 - PROPOSED KAYAK LAUNCHING FACILITY

DRAWING NAME:

STAGE 2 - MC02 LONGITUDINAL SECTION



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DESIGNED: JM

DRAWN: JM

SCALE: 1:200

SHEET SIZE: A1

DRAWING STATUS

CONSTRUCTION

DRAWING No.

C213

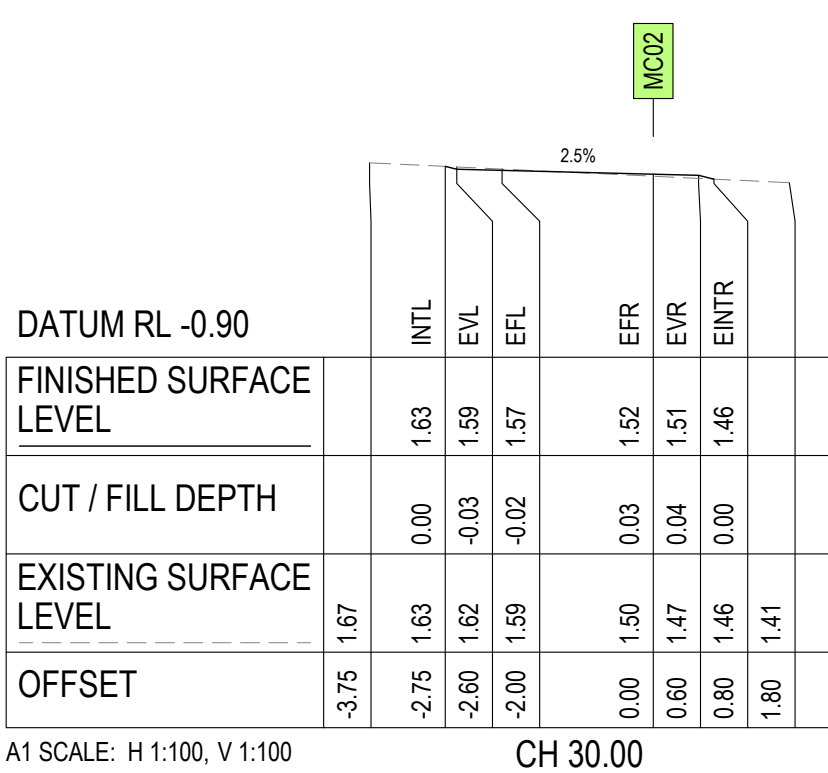
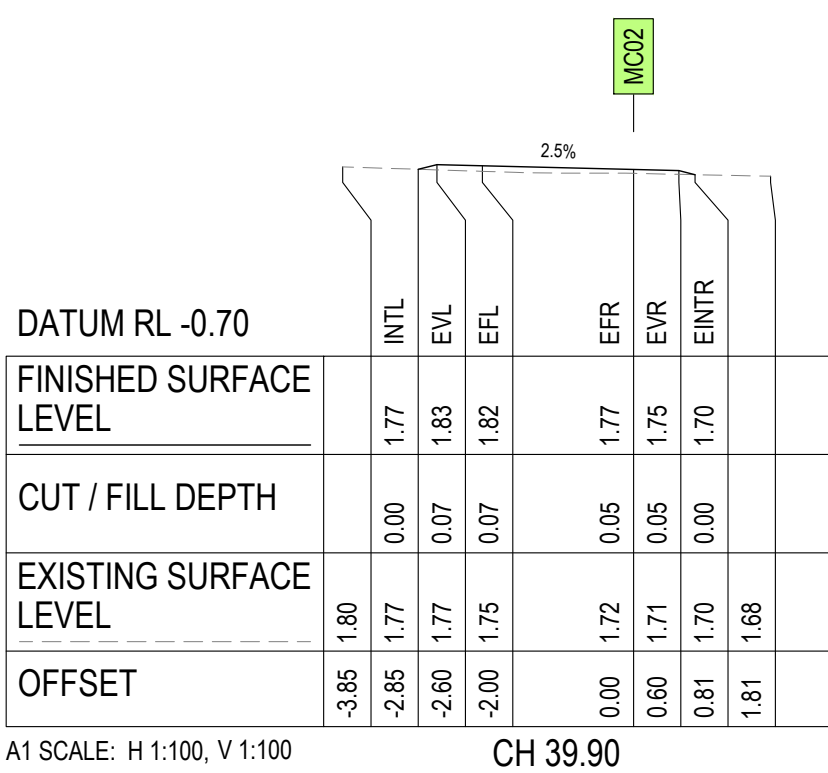
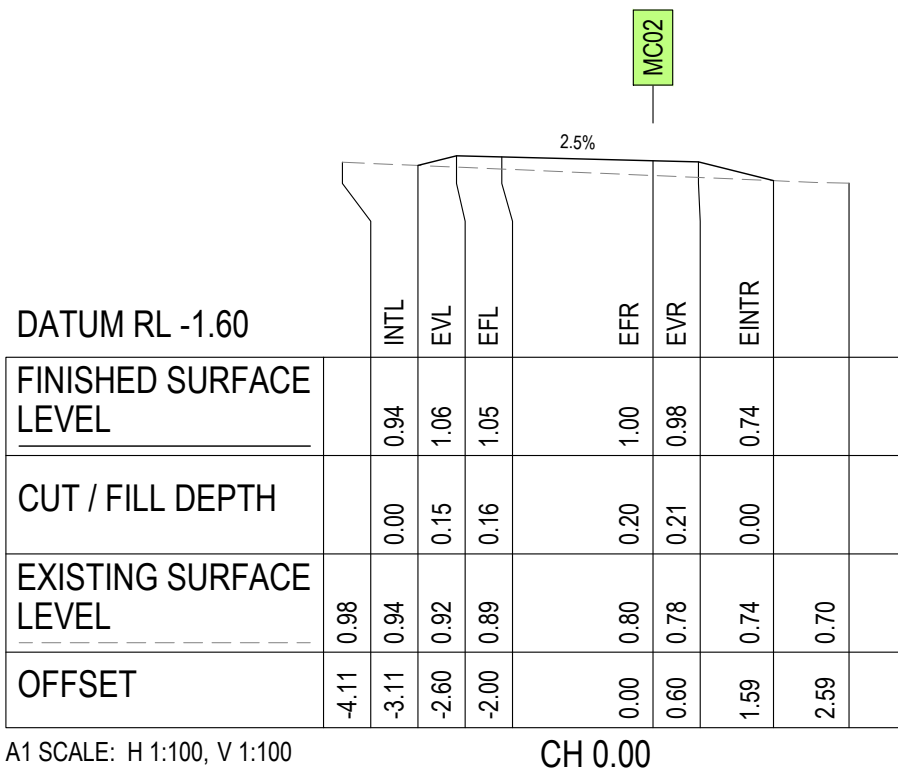
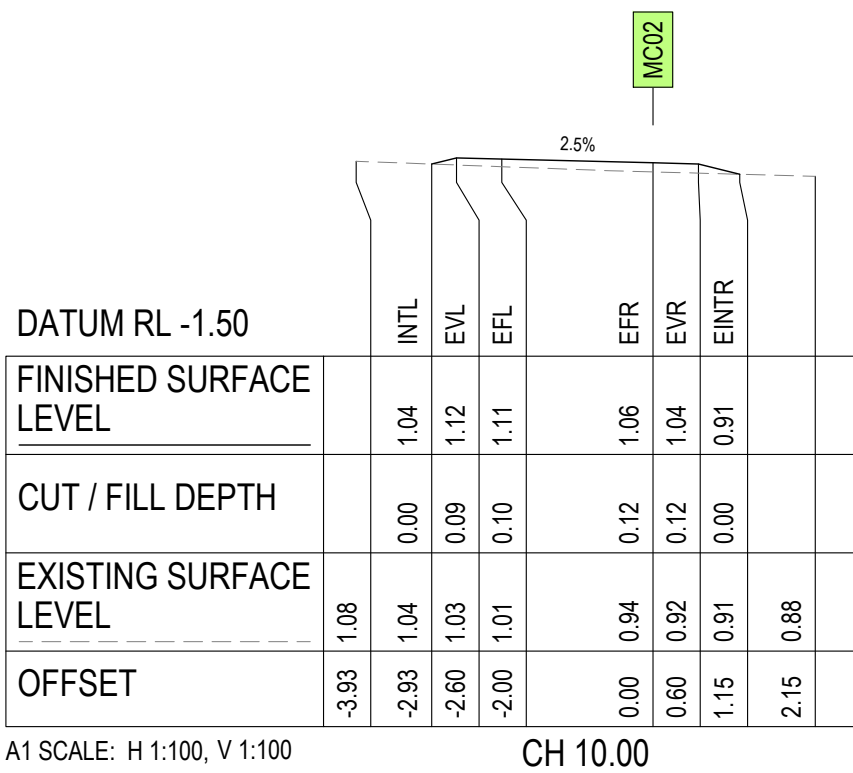
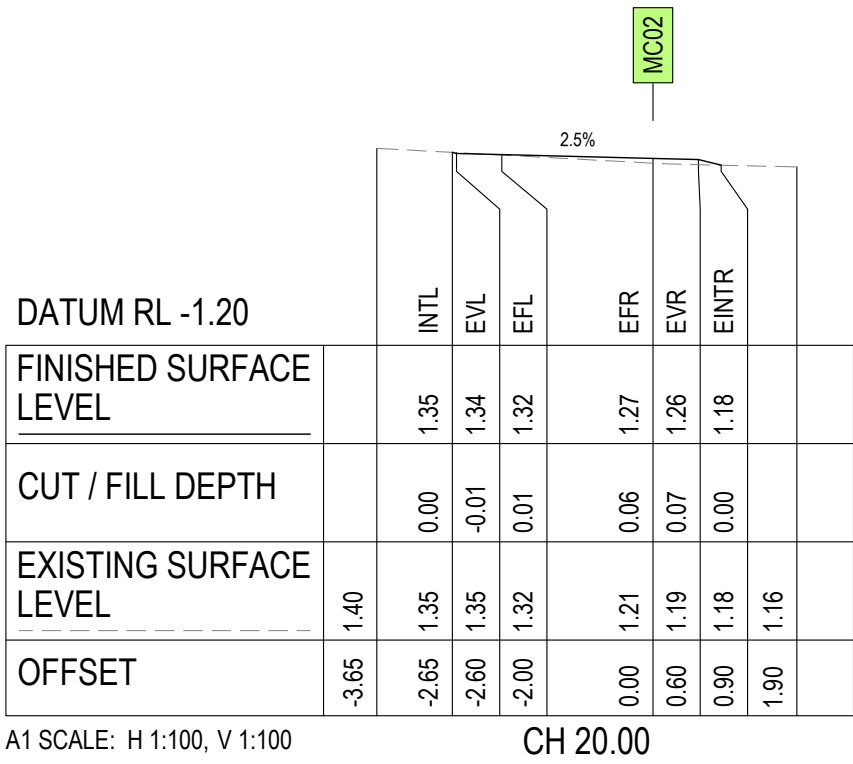
PROJECT No.

DN220293

REVISION:


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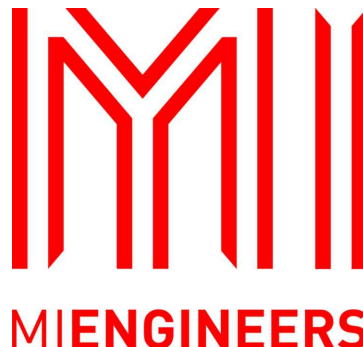




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A	CONCEPT PLAN SET FOR REVIEW	30.11.22	TS	TS	HORIZONTAL DATUM: MGA1994

CLIENT:


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5572.26



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WATERWAYS & BOATING FACILITY IMPROVEMENTS  
YOORALLA BAY, CONJOLA PARK  
STAGE 2 - PROPOSED KAYAK LAUNCHING FACILITY

DRAWING NAME:  
STAGE 2 - MC02 CROSS SECTIONS

DESIGNED: JM	DRAWN: JM	SCALE: 1:100	SHEET SIZE: A1
DRAWING STATUS CONSTRUCTION		DRAWING No. C215	
PROJECT No. DN220293		REVISION: 1	





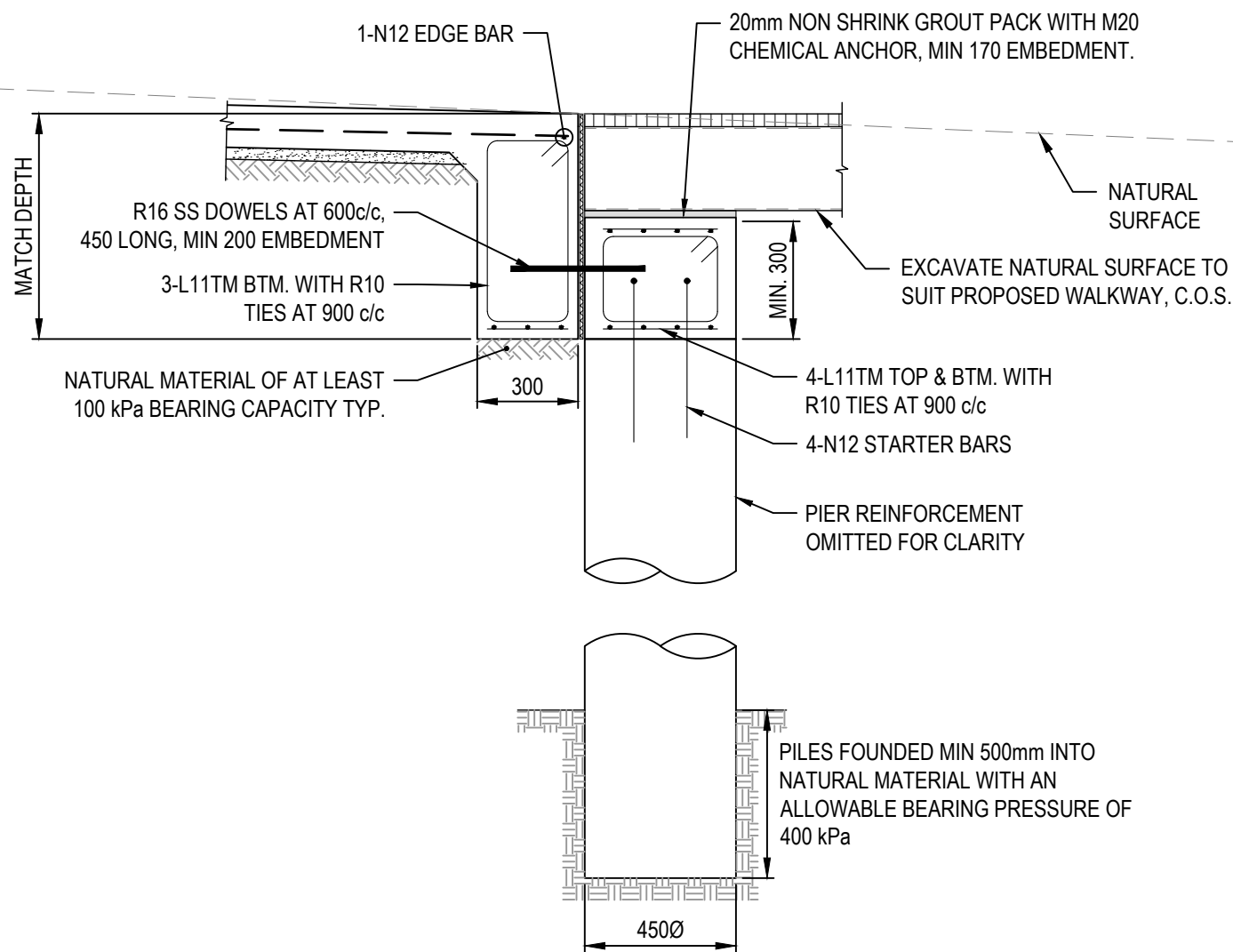


NOTE: WAGNERS PRODUCT OR APPROVED ALTERNATIVE

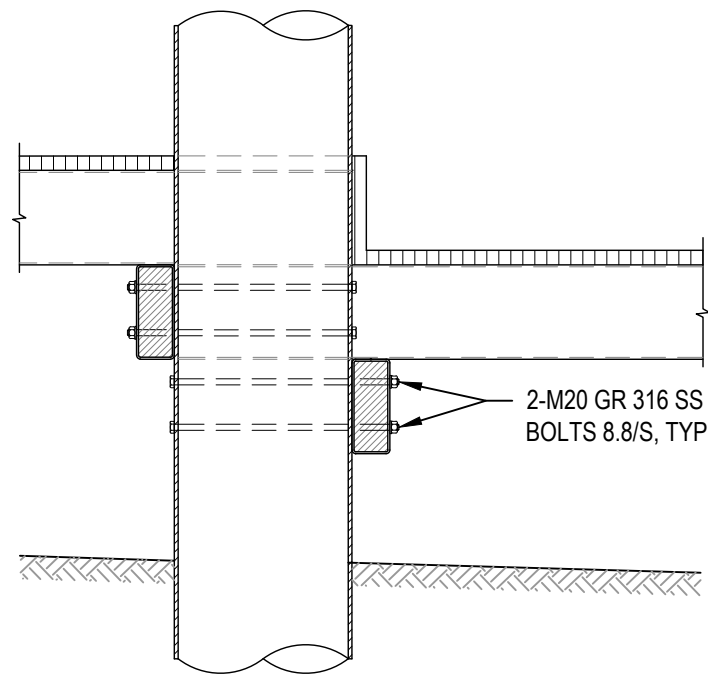
SCHEDULE		
MEMBER	DESCRIPTION	WAGNERS PRODUCT CODE
JOIST	250x100x8.1 RHS	WGN-R5000
BEARER	250x100x8.1 RHS	WGN-R5000

GEOTECHNICAL NOTE:  
REFER TO GEOTECHNICAL REPORT BY GEOFIRST PTY LTD FOR  
INFORMATION ABOUT EXISTING SOIL CONDITIONS AND RECOMMENDATIONS  
MADE BY GEOTECHNICAL ENGINEER.  
REFERENCE: GF1546-A  
DATED: 8/11/22

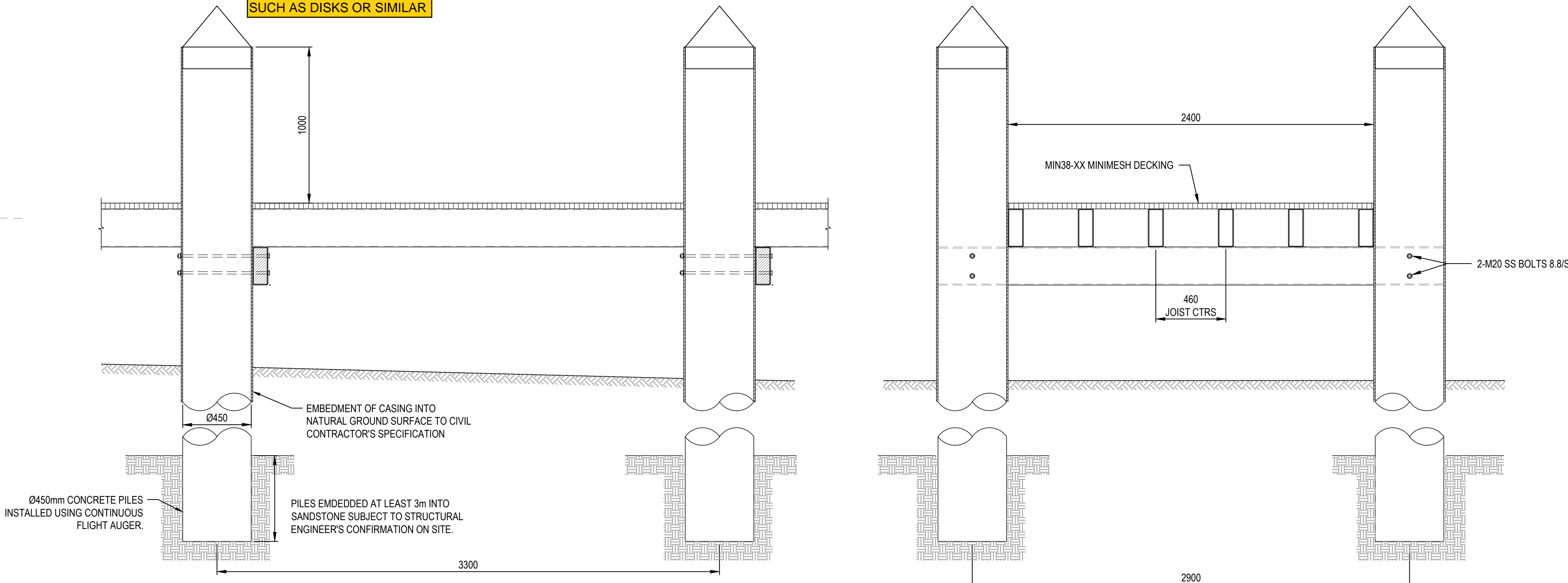
NOTE: CAPS AND PILES  
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REFLECTIVE MATERIAL  
SUCH AS DISKS OR SIMILAR



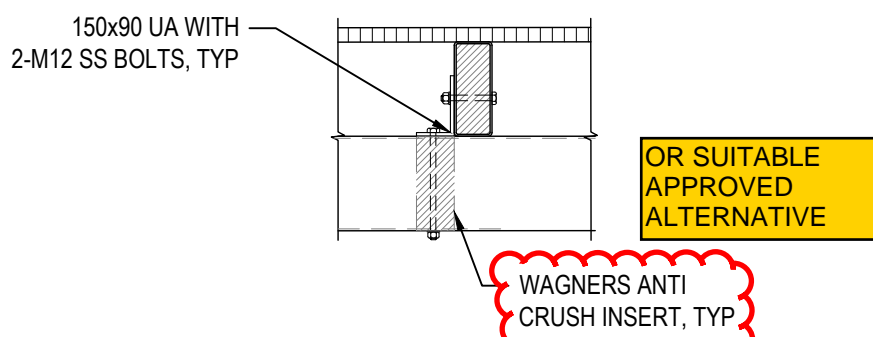
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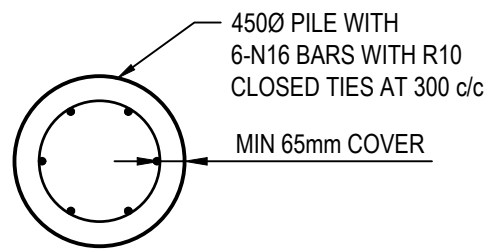
DETAIL B  
SCALE 1:20



SECTION 3  
SCALE 1:20



TYPICAL BEARER - JOIST  
CONNECTION DETAIL  
SCALE 1:20



TYPICAL JETTY PILE DETAIL  
SCALE 1:20

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1	IFC PLAN SET	23.06.23	TS	AS	DATE OF SURVEY: 10.11.2022	 PLAN REFERENCE 5572.28		MIENGINEERS.COM	DRAWING NAME: STAGE 2 - KAYAK LAUNCHING JETTY DETAILS	DRAWING STATUS CONSTRUCTION	DRAWING No. C231
C	DETAILED DESIGN PLAN SET	13.03.23	AS	TS	ORIGIN: PM 106284						
B	CONCEPT PLAN SET FOR COMMUNITY CONSULTATION	10.02.23	TS	TS	HEIGHT OF DATUM: RL 2.337 AHD						
A	CONCEPT PLAN SET FOR REVIEW	30.11.22	RM	TS	HORIZONTAL DATUM: MGA1994						



## 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 1/05/2023) 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**

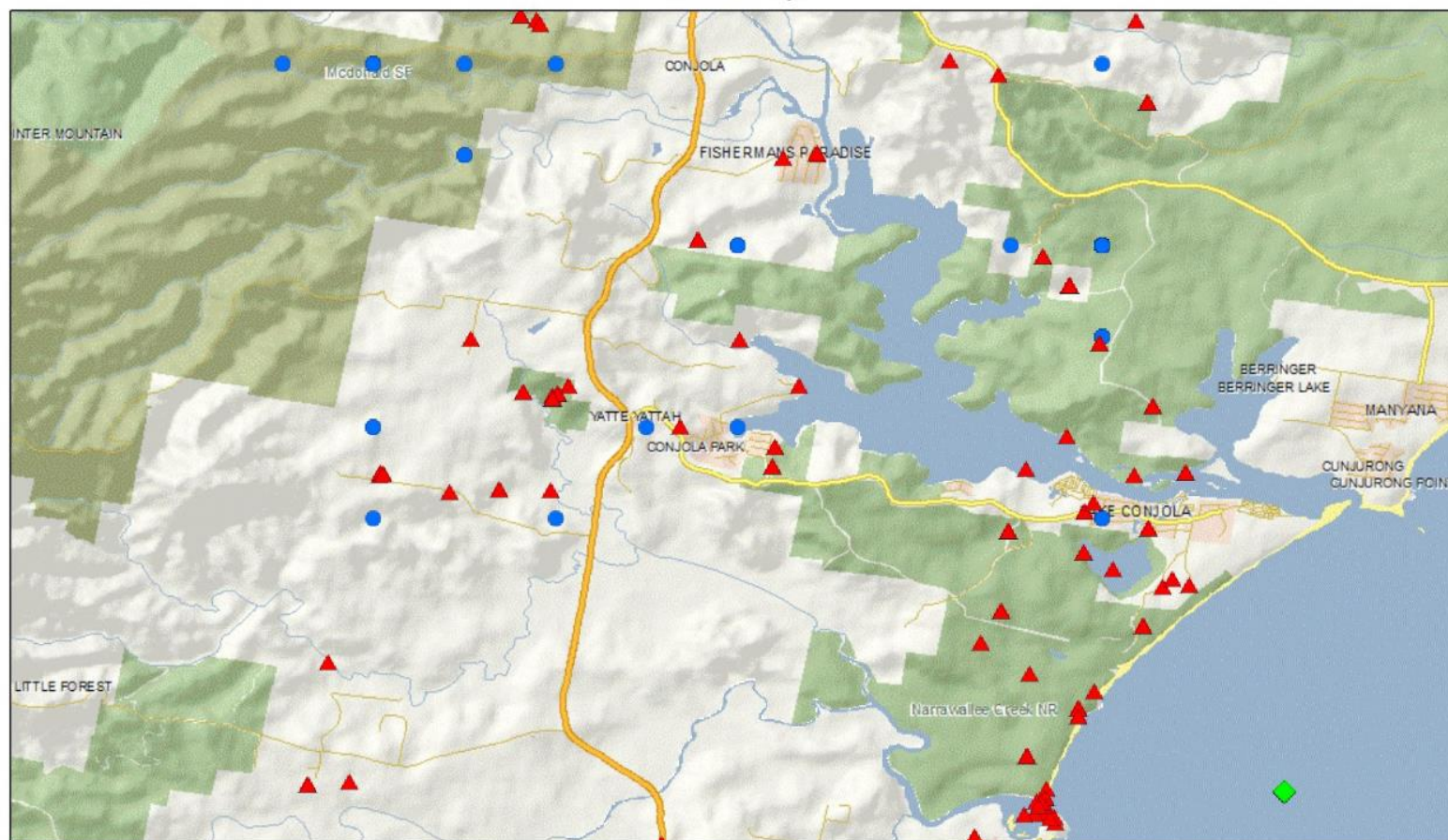
1. Unlikely – Species, population or ecological community is not likely to occur. Lack of previous recent (<25 years) records and suitable potential habitat limited or not available in the study area.
2. Likely – Species, population or ecological community could occur and study area is likely to provide 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).**

**Atlas Map**



April 17, 2023

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

1:64,000  
 0 0.5 1 2 mi  
 0 0.75 1.5 3 km



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

Species name	Status	Habitat requirements ( <a href="http://www.environment.nsw.gov.au">www.environment.nsw.gov.au</a> )	Likelihood of presence within areas impacted by the activity
<b>FLORA</b>			
Scrub Turpentine <i>Rhodamnia rubescens</i>	Endangered NSW BC Act and Critically Endangered EPBC Act	Species is found in littoral, warm temperate and subtropical and wet sclerophyll forest usually on volcanic and sedimentary soils.	Unlikely to occur. No suitable habitat present within the site. Not observed during site inspections.
<b>AMPHIBIANS</b>			
Green and Golden Bell Frog <i>Litoria aurea</i>	Vulnerable <i>EPBC Act</i> Endangered <i>NSW BC Act</i>	Marshes, dams and stream-sides, particularly those containing bullrushes ( <i>Typha</i> spp.) or spikerushes ( <i>Eleocharis</i> spp.). Optimum habitat for the species includes water-bodies that are unshaded, free of predatory fish such as Plague Minnow ( <i>Gambusia holbrooki</i> ), with a grassy area nearby and diurnal sheltering sites available.	Unlikely to occur. No suitable habitat present within the site.
<b>BIRDS</b>			
White-throated Needletail <i>Hirundapus caudacutus</i>	Vulnerable and Migratory <i>EPBC Act</i>	Almost exclusively aerial, from heights of less than 1 m up to more than 1000 m above the ground. Because they are aerial, it has been stated that conventional habitat descriptions are inapplicable, but there are, nevertheless, certain preferences exhibited by the species. Although they occur over most types of habitat, they are probably recorded most often above wooded areas, including open forest and rainforest, and may also fly between trees or in clearings, below the canopy, but they are less commonly recorded flying above woodland. They also commonly occur over heathland, but less often over treeless areas, such as grassland or swamps. When flying above farmland, they are more often recorded above partly cleared pasture, plantations or remnant vegetation at the edge of paddocks. In coastal areas, they are sometimes seen flying over	Possibly occurring over or in proximity to the site, but unlikely to utilise or rely on available habitat within the site.

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

		sandy beaches or mudflats, and often around coastal cliffs and other areas with prominent updraughts, such as ridges and sand-dunes. They are sometimes recorded above islands well out to sea.	
Black Bittern <i>Ixobrychus flavicollis</i>	Vulnerable NSW BC Act	The Black Bittern inhabits both terrestrial and estuarine wetlands, generally in areas of permanent water and dense vegetation. Where permanent water is present, the species may occur in flooded grassland, forest, woodland, rainforest and mangroves. Roosts in trees or on ground amongst dense reeds, nests in branches overhanging water	Unlikely to occur within the site. No suitable breeding or foraging habitat present.
White-bellied Sea-Eagle <i>Haliaeetus leucogaster</i>	NSW BC Act Vulnerable  Migratory EPBC Act	Found in coastal habitats (especially those close to the sea-shore) and around terrestrial wetlands in tropical and temperate regions of mainland Australia and its offshore islands. The habitats occupied by the sea-eagle are characterized by the presence of large areas of open water (larger rivers, swamps, lakes, the sea). Birds have been recorded in (or flying over) a variety of terrestrial habitats. The species is mostly recorded in coastal lowlands, but can occupy habitats up to 1400 m above sea level on the Northern Tablelands of NSW and up to 800 m above sea level in Tasmania and South Australia. Birds have been recorded at or in the vicinity of freshwater swamps, lakes, reservoirs, billabongs, saltmarsh and sewage ponds. They also occur at sites near the sea or sea-shore, such as around bays and inlets, beaches, reefs, lagoons, estuaries and mangroves.	Possibly occurring over or in proximity to the site, but unlikely to utilise available habitat within the site. No breeding habitat.
Little Eagle <i>Hieraaetus morphnoides</i>	Vulnerable NSW BC Act	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	Possibly occurring over or in proximity to the site, but unlikely to utilise available habitat within the site. No stick nests in proposed works site.
Square-Tailed Kite <i>Lophoictinia isura</i>	Vulnerable NSW BC Act	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> .	Possibly occurring over or in proximity to the site, but unlikely to utilise available habitat within the site.



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

		Breeding is from July to February, with nest sites generally located along or within 200m of riparian areas, near watercourses, in a fork or on large horizontal limbs.	
Eastern Osprey <i>Pandion cristatus</i>	Vulnerable NSW BC Act	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.	Possibly occurring over or in proximity to the site, but unlikely to utilise available habitat within the site. No stick nests in proposed works site.
Beach Stone-curlew <i>Esacus magnirostris</i>	Endangered NSW BC Act	Beach Stone-curlews 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 may often be seen at the edges of estuaries, on islands, flats, banks and spits of sand, mud, gravel or rock and among mangroves.	Potential to occur. The site of the proposed activity represents potential foraging habitat. Impact assessment provided at Section 3.3.2 of this REF.
Sooty Oystercatcher <i>Haematopus fuliginosus</i>	Vulnerable NSW BC Act	Shore bird. Found around the entire Australian coast, including offshore islands, being most common in Bass Strait. Small numbers of the species are evenly distributed along the NSW coast. The availability of suitable nesting sites may limit populations. Favours rocky headlands, rocky shelves, exposed reefs with rock pools, beaches and muddy estuaries. Forages on exposed rock or coral at low tide for foods such as limpets and mussels. Breeds in spring and summer, almost exclusively on offshore islands, and occasionally on isolated promontories. The nest is a shallow scrape on the ground, or small mounds of pebbles, shells or seaweed when nesting among rocks.	Unlikely to occur. No suitable habitat present within the site.
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.	Potential to occur. The site of the proposed activity represents potential foraging habitat. Potential to occur. The site of the proposed activity represents potential foraging habitat. Impact assessment provided at Section 3.3.2 of this REF.

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

<p>Eastern Hooded Dotteral (Hooded Plover) <i>Thinornis cucullatus cucullatus</i></p>	<p>Critically Endangered NSW <i>BC Act</i></p> <p>Vulnerable <i>EPBC Act</i></p>	<p>In south-eastern Australia Hooded Plovers 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. Hooded Plovers forage in sand at all levels of the zone of wave wash during low and mid-tide or among seaweed at high-tide, and occasionally in dune blowouts after rain. At night they favour the upper zones of beaches for roosting. When on rocks they forage in crevices in the wave-wash or spray zone, avoiding elevated rocky areas and boulder fields. In coastal lagoons they forage in damp or dry substrates and in shallow water, depending on the season and water levels. In eastern Australia, Hooded Plovers usually breed from August to March on sandy ocean beaches strewn with beachcast seaweed, in a narrow strip between the high-water mark and the base of the fore-dunes. 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.</p>	<p>Unlikely to occur. No suitable habitat present within the site.</p>
<p>Eastern Curlew <i>Numenius madagascariensis</i></p>	<p>Critically Endangered <i>EPBC Act</i></p>	<p>Most commonly associated with sheltered coasts, especially estuaries, bays, harbours, inlets and coastal lagoons, with large intertidal mudflats or sandflats, often with beds of seagrass. Occasionally, the species occurs on ocean beaches (often near estuaries), and coral reefs, rock platforms, or rocky islets. The birds are often recorded among saltmarsh and on mudflats fringed by mangroves, and sometimes use the mangroves. The birds are also found in saltworks and sewage farms. The numbers of Eastern Curlew recorded during one study were correlated with wetland areas.</p> <p>Mainly forages on soft sheltered intertidal sandflats or mudflats, open and without vegetation or covered with seagrass, often</p>	<p>Unlikely to occur within the site. No suitable habitat present.</p>



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		<p>near mangroves, on saltflats and in saltmarsh, rockpools and among rubble on coral reefs, and on ocean beaches near the tideline. The birds are rarely seen on near-coastal lakes and in grassy areas.</p> <p>Roosts on sandy spits and islets, especially on dry beach sand near the high-water mark, and among coastal vegetation including low saltmarsh or mangroves. It occasionally roosts on reef-flats, in the shallow water of lagoons and other near-coastal wetlands. Eastern Curlews are also recorded roosting in trees and on the upright stakes of oyster-racks.</p>	
<p>Little Tern <i>Sternula albifrons</i></p>	<p>Endangered NSW BC Act Migratory EPBC Act</p>	<p>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.</p>	<p>Unlikely to occur within the site. No suitable habitat present.</p>
<p>Gang-gang Cockatoo <i>Callocephalon fimbriatum</i></p>	<p>Vulnerable NSW BC Act</p>	<p>Tall mountain forests and woodlands, particularly in heavily timbered and mature wet sclerophyll forests. In winter, may occur at lower altitudes in drier more open eucalypt forests and woodlands, and often found in urban areas. preferring more open eucalypt forests and woodlands, particularly in box-ironbark assemblages, or in dry forest in coastal areas. Favours old growth attributes for nesting and roosting</p>	<p>Unlikely to occur within the site. No suitable habitat present.</p>
<p>Glossy Black-cockatoo <i>Calyptorhynchus lathamii</i></p>	<p>Vulnerable NSW BC Act</p>	<p>The species inhabits open forest and woodlands of the coast where stands of she-oak occur. In the locality the species feed almost exclusively on the seeds of the black she-oak <i>Allocasuarina littoralis</i> shredding the cones with their bill.</p>	<p>Unlikely to occur within the site. No suitable habitat present. No breeding or foraging habitat present.</p>
<p>Little Lorikeet <i>Glossopsitta discolor</i></p>	<p>Vulnerable NSW BC Act</p>	<p>The Little Lorikeet is distributed widely across the coastal and Great Divide regions of eastern Australia from Cape York to South Australia. NSW provides a large portion of the species' core habitat. Forages primarily in the canopy of open <i>Eucalyptus</i></p>	<p>Unlikely to occur within the site. No suitable habitat present.</p>

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		forest and woodland, yet also finds food in <i>Angophora</i> , <i>Melaleuca</i> and other nectar and fruit bearing trees. Riparian habitats are particularly used, due to higher soil fertility and hence greater productivity.	
Swift Parrot <i>Lathamus discolor</i>	Critically Endangered EPBC Act Endangered NSW BC Act	Migrates to the Australian south-east mainland between March and October. On the mainland they occur in areas where eucalypts are flowering profusely or where there are abundant lerp (from sap-sucking bugs) infestations. Favoured feed trees include winter flowering species such as Swamp Mahogany <i>Eucalyptus robusta</i> , Spotted Gum <i>Corymbia maculata</i> , Red Bloodwood <i>C. gummifera</i> , Mugga Ironbark <i>E. sideroxylon</i> , and White Box <i>E. albens</i> . Commonly used lerp infested trees include Inland Grey Box <i>E. microcarpa</i> , Grey Box <i>E. moluccana</i> and Blackbutt <i>E. pilularis</i> . Return to some foraging sites on a cyclic basis depending on food availability. Following winter they return to Tasmania where they breed from September to January, nesting in old trees with hollows and feeding in forests dominated by Tasmanian Blue Gum <i>Eucalyptus globulus</i> .	Suitable foraging habitat present. Species has potential to occur in the activity area. Impact assessment is provided in Section 3.3.2
Barking Owl <i>Ninox connivens</i>	Vulnerable NSW BC Act	The Barking Owl inhabits woodland and open forest, including fragmented remnants and partly cleared farmland. It is flexible in its habitat use, and hunting can extend in to closed forest and more open areas. Sometimes able to successfully breed along timbered watercourses in heavily cleared habitats (e.g. western NSW) due to the higher density of prey found on these fertile riparian soils. Roosts in shaded portions of tree canopies, including tall midstorey trees with dense foliage such as <i>Acacia</i> and <i>Casuarina</i> species. Breeds in hollows of large, old trees	Possibly occurring over or in proximity to the site, but unlikely to utilise available habitat within the site to any significant extent. No breeding habitat (hollow-bearing trees).
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	Possibly occurring over or in proximity to the site, but unlikely to utilise available habitat within the site to any significant extent. No breeding habitat (hollow-bearing trees).



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		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	
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 forest.	Unlikely to occur within the site. No suitable habitat present.
Brown Treecreeper <i>Climacteris picumnus victorae</i>	Vulnerable NSW BC Act	The Brown Treecreeper is found in eucalypt woodlands (including Box-Gum Woodland) and dry open forest of the inland slopes and plains inland of the Great Dividing Range; mainly inhabits woodlands dominated by stringybarks or other rough-barked eucalypts, usually with an open grassy understorey, sometimes with one or more shrub species; also found in mallee and River Red Gum Forest bordering wetlands.	Possibly occurring over or in proximity to the site, but unlikely to utilise available habitat within the site to a significant extent.
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	Possibly occurring over or in proximity to the site, but unlikely to utilise available habitat within the site to a significant extent.
Scarlet Robin <i>Petroica boodang</i>	Vulnerable NSW BC Act	The Scarlet Robin is primarily a resident in dry forests and woodlands, but some adults and young birds disperse to more open habitats after breeding. Scarlet Robin habitat usually contains abundant logs and fallen timber: these are important components of its habitat.	Unlikely to occur within the site. No suitable habitat present.
Pink Robin <i>Petroica rodinogaster</i>	Vulnerable NSW BC Act	The Pink Robin inhabits rainforest and tall, open eucalypt forest, particularly in densely vegetated gullies.	Unlikely to occur within the site. No suitable habitat present.
<b>MAMMALS</b>			
Spotted-tailed Quoll <i>Dasyurus maculatus</i>	Vulnerable NSW BC Act and Endangered EPBC Act	The species has been recorded across a range of habitat types, including rainforest, open forest, woodland, coastal heath and inland riparian forest, from the sub-alpine zone to the coastline. Quolls use hollow-bearing trees, fallen logs, other animal burrows, small caves and rock outcrops as den sites.	Unlikely to occur within the site. No suitable habitat present.

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Southern Brown Bandicoot (eastern) <i>Isoodon obesulus obesulus</i>	Endangered NSW BC Act and EPBC Act	Southern Brown Bandicoots are largely crepuscular (active mainly after dusk and/or before dawn). They are generally only found in heath or open forest with a heathy understorey on sandy or friable soils	Unlikely to occur within the site. No suitable habitat present.
Koala <i>Phascolarctos cinereus</i>	Endangered NSW BC Act and EPBC Act	The koala inhabits eucalypt woodland and forests.	Unlikely to occur within the site. No suitable habitat present. Insufficient area of habitat disjunct from other areas of potential habitat.
Eastern Pygmy-possum <i>Cercartetus nanus</i>	Vulnerable NSW BC Act	Found in a broad range of habitats from rainforest through sclerophyll (including Box-Ironbark) forest and woodland to heath, but in most areas woodlands and heath appear to be preferred.	Unlikely to occur within the site. No suitable habitat present.
Yellow-bellied Glider <i>Petaurus australis</i>	Vulnerable NSW BC Act and EPBC Act.	Occurs in tall mature eucalypt forest generally in areas with high rainfall and nutrient rich soils. Feeds primarily on plant and insect exudates, including nectar, sap, honeydew and mana with pollen and insects providing protein	Unlikely to occur within the site. No suitable habitat present. No hollows suitable for the species is present in the activity area and no signs of feeding is apparent.
Squirrel Glider <i>Petaurus norfolkensis</i>	Vulnerable NSW BC Act	The Squirrel Gliders 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. Require abundant tree hollows for refuge and nest sites.	Unlikely to occur within the site. No suitable habitat present.
Greater Glider <i>Petauroides Volans</i>	Endangered NSW BC Act and EPBC Act	The greater glider is an arboreal nocturnal marsupial, predominantly solitary and largely restricted to eucalypt forests and woodlands of eastern Australia. It is typically found in highest abundance in taller, montane eucalypt forests of fertile soils with relatively old trees and abundant hollows.	Unlikely to occur within the site. No suitable habitat present.
Long-nosed Potoroo <i>Potorous tridactylus</i>	Vulnerable NSW BC Act and EPBC Act	The species inhabits coastal heaths and dry and wet sclerophyll forests. Dense understorey with occasional open areas is an essential part of habitat, and may consist of grass-trees, sedges, ferns or heath, or of low shrubs of tea-trees or melaleucas. A sandy loam soil is also a common feature.	Unlikely to occur within the site. No suitable habitat present.



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Grey-headed Flying-fox <i>Pteropus poliocephalus</i>	Vulnerable NSW BC Act and EPBC Act	Occurs in subtropical and temperate rainforests, tall sclerophyll forests and woodlands, heaths and swamps as well as urban gardens and cultivated fruit crops. Roosting camps are generally located within 20 kilometres of a regular food source and are commonly found in gullies, close to water, in vegetation with a dense canopy. The species feeds on the nectar and pollen of native trees, in particular <i>Eucalyptus</i> , <i>Melaleuca</i> and <i>Banksia</i> , and fruits of rainforest trees and vines	Suitable foraging habitat present. Species has potential to occur in the activity area. Impact assessment is provided in Section 3.3.2
Eastern Coastal Free-tailed Bat <i>Micronomus norfolkensis</i>	Vulnerable NSW BC Act	Occur 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 on in man-made structures.	Possibly occurring over or in proximity to the site, but unlikely to utilise available habitat within the site to a significant extent. No roosting habitat or food resources affected.
Eastern False Pipistrelle <i>Falsistrellus tasmaniensis</i>	Vulnerable NSW BC Act	Prefers moist habitats, with trees taller than 20m. Generally roosts in eucalypt hollows, but has also been found under loose bark on trees or in buildings.	Possibly occurring over or in proximity to the site, but unlikely to utilise available habitat within the site to a significant extent. No roosting habitat or food resources affected.
Southern Myotis <i>Myotis macropus</i>	Vulnerable NSW BC Act	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.	Possibly occurring over or in proximity to the site, but unlikely to utilise available habitat within the site. No roosting habitat or food resources affected.
Greater Broad-nosed Bat <i>Scoteanax rueppellii</i>	Vulnerable NSW BC Act	The Greater Broad-nosed Bat is found mainly in the gullies and river systems that drain the Great Dividing Range. The species utilises a variety of habitats from woodland to moist and dry eucalypt forest and rainforest, though it is most commonly found in tall wet forests. Although this species usually roosts in tree hollows, it has been found in buildings.	Possibly occurring over or in proximity to the site, but unlikely to utilise available habitat within the site. No roosting habitat or food resources affected.
Large Bent-winged Bat <i>Miniopterus orianae oceanensis</i>	Vulnerable NSW BC Act	Caves are the primary roosting habitat, but also use derelict mines, stormwater tunnels, buildings and other man-made structures. The species form discrete populations centred on a	Possibly occurring over or in proximity to the site, but unlikely to utilise available habitat within the

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		maternity cave that is used annually. At other times of the year, populations disperse within about 300 km range of maternity caves.	site. No roosting habitat or food resources affected.
Australian Fur-seal <i>Arctocephalus pusillus doriferus</i>	Vulnerable NSW BC Act	Prefers rocky parts of islands with flat open terrain.	Unlikely to occur within the site. No suitable habitat present.
Southern Right Whale <i>Eubalaena australis</i>	Endangered NSW BC Act and EPBC Act	Temperate and subpolar oceanic waters of the Southern Hemisphere, with a circumpolar distribution between about 20°S and 55°S with some records further south to 63°S.	Unlikely to occur within the site. No suitable habitat present.



